

9-7 U-6

CONVENTIONAL SIGNS

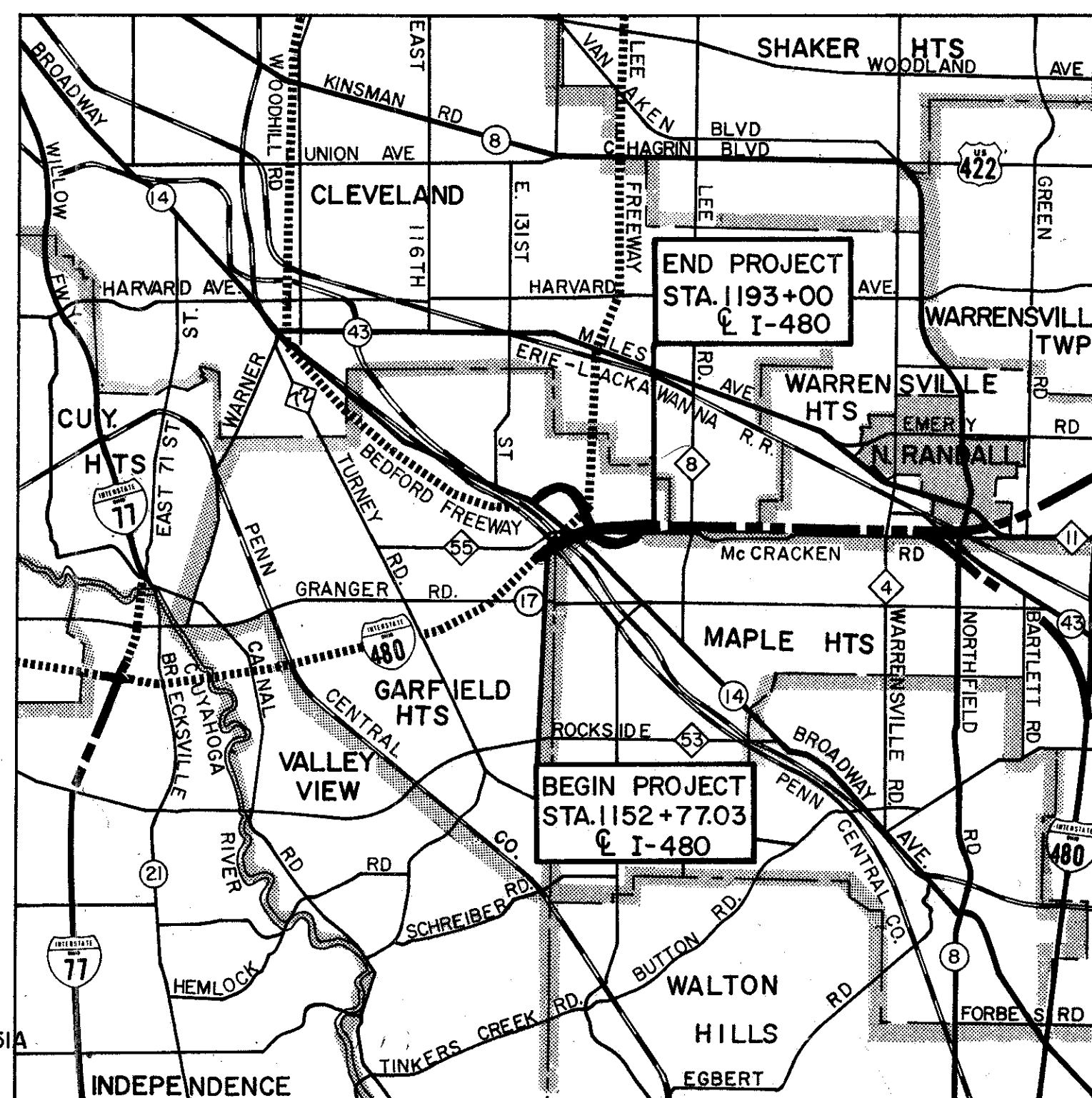
PROPERTY LINE	—	—
EXISTING RIGHT OF WAY	—	—
SUBDIVISION LINE	—	—
SUBLOT LINE OR EXISTING EASEMENT	—	—
ORIGINAL TOWNSHIP LOT LINE	—	—
CORPORATION LINE	—	—
LIMITED ACCESS LINE	—	—
LIMITED ACCESS LINE AND RIGHT OF WAY LINE	—	—
RIGHT OF WAY LINE AND HIGHWAY EASEMENT LINE	—	—
AERIAL EASEMENT LINE	—	—
TEMPORARY RIGHT OF WAY	—	—
SEWER EASEMENT LINE	—	—
SLOPE EASEMENT LINE	—	—
CHANNEL EASEMENT	—	—
PARTICIPATION LINE	—	—
CENTER LINE	—	—
FENCE LINE	—	—
GUARD RAIL (EXISTING)	—	—
GUARD RAIL (PROPOSED)	—	—
RAILROAD	—	—
POWER POLES	—	—
TELEPHONE POLES	—	—
POWER AND TELEPHONE POLES	—	—
LIGHT POLES	—	—
TREES (EXISTING)	—	—
ELECTRICAL TOWER	—	—
WATER LINE	—	—
GAS LINE	—	—
TELEPHONE CONDUIT	—	—
EXISTING SEWERS (R/W PLANS)	—	—
EXISTING STORM SEWER (DRAINAGE PLANS)	—	—
EXISTING SANITARY SEWER (DRAINAGE PLANS)	—	—
OIL LINE	—	—
FIRE HYDRANT (EXISTING)	—	—
FIRE HYDRANT (PROPOSED)	—	—
MANHOLE (EXISTING)	—	—
MANHOLE (PROPOSED STORM)	—	—
MANHOLE (PROPOSED SANITARY)	—	—
CATCH BASIN OR INLET (EXISTING)	—	—
CATCH BASIN OR INLET (PROPOSED)	—	—

MICROFILMED
DEC 21 1982

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
CUY-480-21.40

CUYAHOGA COUNTY
CITY OF GARFIELD HTS.
CITY OF MAPLE HTS.

GRADE SEPARATION WITH PENN CENTRAL TRANSPORTATION COMPANY
AND NORFOLK AND WESTERN RY. CO.



LOCATION MAP
SCALE

INDEX OF SHEETS

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Sheets 331 & 332 revised 9-27-74 EBL
Sheets 311, 319, & 321 revised 12-27-74 EBL

SUPPLEMENTAL SPECIFICATIONS

NUMBER	DATE	NUMBER	DATE
		839	11-25-70
808	1-1-71	941	11-25-70
815	9-20-72	1001	9-20-72
816	9-20-72		
836	1-1-71		
838	5-18-70		

PORTION TO BE IMPROVED
EXISTING FREEWAYS
STATE ROADS
COUNTY ROADS
OTHER ROADS
FUTURE CONSTRUCTION
UNDER CONSTRUCTION

SCALE
PLAN 1"=201.50' PROFILE HOR 1"=201.100'
CROSS SECTIONS 1"=10' PROFILE VERT 1"=5', 10', 20'

LINE DATA

Begin Project I-480 Sta. 1152+77.03
End Project I-480 Sta. 1193+00.00
Net Length of Project = 4,022.97 Lin. Ft. or 0.761 Miles

Work Additions

WB I-480 Sta. 1149+42 # To Sta. 1152+77.03 = 335.03 Lin. Ft.
Bedford Freeway Sta. 35+31.29 To Sta. 74+54.29 = 3,923.00 Lin. Ft.
Orchard Road Sta. 4+66 To Sta. 11+00 = 634.00 Lin. Ft.
Net Length of Work: 8,915 Lin. Ft. or 1.688 Miles

STANDARD DRAWINGS

NUMBER	DATE	NUMBER	DATE
BR-2-67	10-15-71	HW-E	6-1-65
BP-1	6-1-65	GR-5	1-1-71
BP-2	12-1-68	GR-6	1-1-71
BP-3	1-1-71	HL-1, HL-4 thru HL-10	3-6-73
BP-4	1-1-71	HL-2, HL-3	7-27-73
BP-5	6-1-72	HL-11, HL-12	4-6-73
I-2	6-6-69	HL-17A, HL-17B	4-6-73
BP-7	1-1-66	HW-4	1-1-70
CB-2-2AEB	6-1-65	I-2A	6-6-69
CB-3A	6-1-65	I-3	1-20-70
CB-4	9-1-69	L-1	6-1-71
CB-5	9-1-69	MC-1	6-13-69
CB-6	6-1-65	MC-3	6-1-71
F-1	6-1-72	MC-4	6-13-69
F-2	1-1-71	MC-5	6-1-71
F-3	3-10-69	MC-7	10-1-68
F-6	10-1-66	MC-8	12-1-67
HI-15, HL-16	4-6-73	MH-1	10-1-68
		MH-1A	10-1-68
GR-2A	1-1-71	AS-1-57	6-12-69
GR-2B	11-9-71	BR-1-67 1 of 3	10-15-71
GR-3	11-9-71	RB-1-55	2-2-59
GR-4	11-9-71	SD-1-69 1-4	6-12-69

ISSUE NO. 1

FHWA REGION	STATE	PROJECT
5	OHIO	I-480-4(3)174

1
390

LIMITED ACCESS

THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR OF TRANSPORTATION IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02, REVISED CODE OF OHIO.

CUYAHOGA COUNTY
CUY-480-21.40

PROJECT DESIGNATION CUY. 80-21.40 APPEARING THROUGHOUT THIS PLAN SHALL BE CONSIDERED TO READ CUY-480-21.40.

"FEDERAL ROAD DIVISION 2" APPEARING IN THE UPPER RIGHT HAND BLOCKS SHALL BE CONSIDERED TO READ FHWA REGION 5.

1-480-4(31)174

1973 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

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 9-26-73

Joseph J. Lowell
DISTRICT DEPUTY DIRECTOR OF TRANSPORTATION

APPROVED
DATE 7-15-74

Robert B. Pfeifer
ENGINEER, BUREAU OF BRIDGES

APPROVED
DATE 11-26-73

C. J. Schaefer
ENGINEER, BUREAU OF ROADWAY DESIGN

APPROVED
DATE 11-26-73

William E. Slatt
ASSISTANT DEPUTY DIRECTOR FOR HIGHWAY DESIGN

APPROVED
DATE 11-26-73

Julius J. Keenan
ASSISTANT DEPUTY DIRECTOR FOR REAL ESTATE

APPROVED
DATE 11-26-73

William S. Brunkle
ASSISTANT DEPUTY DIRECTOR FOR PROGRAM DEVELOPMENT

APPROVED
DATE

CHIEF ENGINEER, DIVISION OF HIGHWAYS

APPROVED
DATE 11-26-73

William W. Baker
DEPUTY DIRECTOR, DIVISION OF HIGHWAYS

APPROVED
DATE 11-27-73

William P. McKenna
ASSISTANT DIRECTOR, DEPARTMENT OF TRANSPORTATION

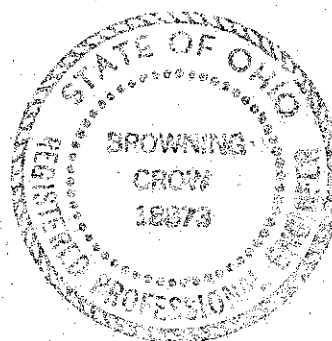
APPROVED
DATE 11-28-73

Director, DEPARTMENT OF TRANSPORTATION

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

H.G. SOURS
ASSOCIATE
COLUMBUS

Browning Crow
BROWNING CROW



FILE NO.	CUYAHOGA COUNTY 00351
DATE OF LETTING	CUY. 480-21.40
CONTRACT NO.	

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ENGINEER DATE

Rev. 1-9-74
Rev. 12-7-73

MICROFILMED
DEC 21 1982

SCHEMATIC PLAN

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

2
390

CUYAHOGA COUNTY
CUY. 480-21.40

PROPOSED STRUCTURE - BEDFORD FREEWAY AND RAMP B-OBS OVER RELOCATED McCracken Road

TYPE: Continuous rolled beams with reinforced concrete deck and substructure.

SPANS: Br 13L 38'-9", 64'-3", 40'-3"
Br 13R 48'-9", 69'-3", 48'-7" (Measured along & Ramp B-OBS)

ROADWAYS: Br 13L 76'-0" f.f. of parapet with raised Concrete Barrier Median.
Br 13R 28'-0" f.f. of parapet

DESIGN LOAD: HS20-44

SKEWS: Br 13L -07°26'02" Left forward to local tangent
Br 13R -23°50'55" Right forward to local tangent

WEARING SURFACE: 1 1/2" Asphalt Concrete on 13.2 1/2" on 13L

APPROACH SLABS: AS-1-67 (20 feet long)

ALIGNMENT: Br 13L-Tangent
Br 13R-13°30'00" Left, Spiral

SUPERELEVATION: Br 13L-Varies .0156 ft. per ft. to 0.0 ft. per ft.
Br 13R-Varies .042 ft. per ft. to .083 ft. per ft.

PROPOSED STRUCTURE - LANE OBS-E-B OVER RELOCATED McCracken Road

TYPE: Continuous steel girders with reinforced concrete deck and substructures

SPAN: 61'-8", 95'-1", 66'-5" (Measured along & Lane OBS-E-B)

ROADWAY: 42'-0" f.f. of parapets (Initial)

DESIGN LOAD: HS20-44

SKEW: 46°51'13" Left Forward

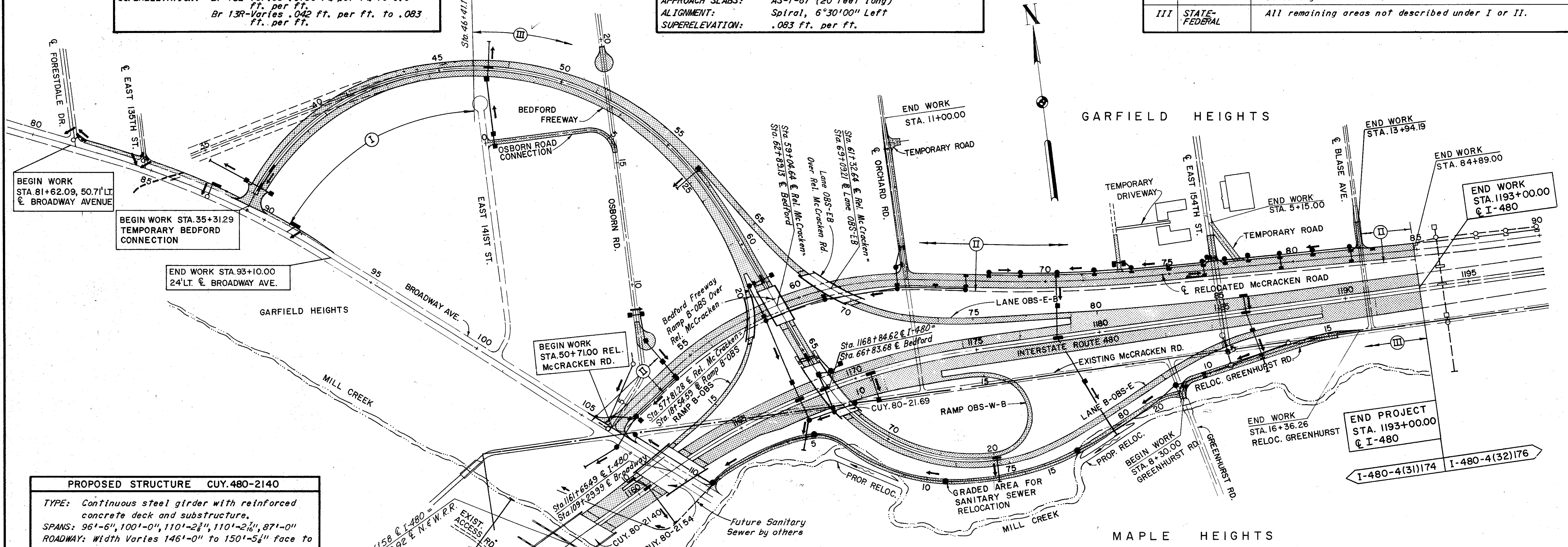
WEARING SURFACE: 2 1/2" Asphalt Concrete

APPROACH SLABS: AS-1-67 (20 feet long)

ALIGNMENT: Spiral, 6°30'00" Left

SUPERELEVATION: .083 ft. per ft.

CODE	TYPE	PARTICIPATION LIMITS
I	100% STATE	From Sta. 81+62.09 to Sta. 93+10.00 Broadway Ave. From Sta. 35+31.29 to Sta. 46+41.15 Bedford Freeway
II	COUNTY, STATE-FEDERAL	From Sta. 50+71 to Sta. 84+89 & Relocated McCracken Rd. Bounded on the South by a line 40' RT. of the & and Bounded on the North by the Construction Limits not including cross roads.
III	STATE-FEDERAL	All remaining areas not described under I or II.



PROPOSED STRUCTURE CUY. 480-2140

TYPE: Continuous steel girder with reinforced concrete deck and substructure.

SPANS: 96'-6", 100'-0", 110'-2", 110'-2", 87'-0"

ROADWAY: Width Varies 146'-0" to 150'-5" face to face of parapets, with Concrete Barrier Median.

LOAD FREQUENCY: HS20-44 and Interstate Alternate Loading.

SKEW: Varies

WEARING SURFACE: 2 1/2" Asphalt Concrete

APPROACH SLABS: AS-1-67 (25 feet long)

ALIGNMENT: Tangent

SUPERELEVATION: Varies, .0156 ft. per ft. to 0.00 ft. per ft.

PROPOSED STRUCTURE CUY. 480-2154

TYPE: Continuous rolled beam with reinforced concrete deck and substructure.

SPANS: 51'-11", 74'-9", 52'-9" (Measured along & I-480)

ROADWAY: Width varies 160'-4" to 170'-2" face to face of parapets, with Concrete Barrier Median.

DESIGN LOAD: HS20-44 and Interstate Alternate Loading

SKEW: 22°44'03" Right Forward

WEARING SURFACE: 2 1/2" Asphalt Concrete

APPROACH SLABS: AS-1-67 (25 feet long)

ALIGNMENT: Spiral, 2°00'00" Right

SUPERELEVATION: I-480 Varies .0156 ft. per ft. to .047 ft. per ft. Ramp B-OBS .0156 ft. per ft.

PROPOSED STRUCTURE - CUY. 480-2169

TYPE: Continuous steel girder with reinforced concrete deck and substructure.

SPANS: 92'-2", 120'-9" (Measured along & Bedford Expressway)

ROADWAY: 76'-0" face to face of parapet with concrete barrier median

DESIGN LOAD: HS20-44

SKEW: 16°57'37" Left. Forward to Local Tangent

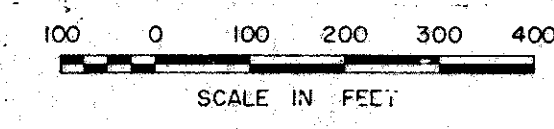
WEARING SURFACE: 1 1/2" Asphalt Concrete

APPROACH SLABS: AS-1-67 (25 feet long)

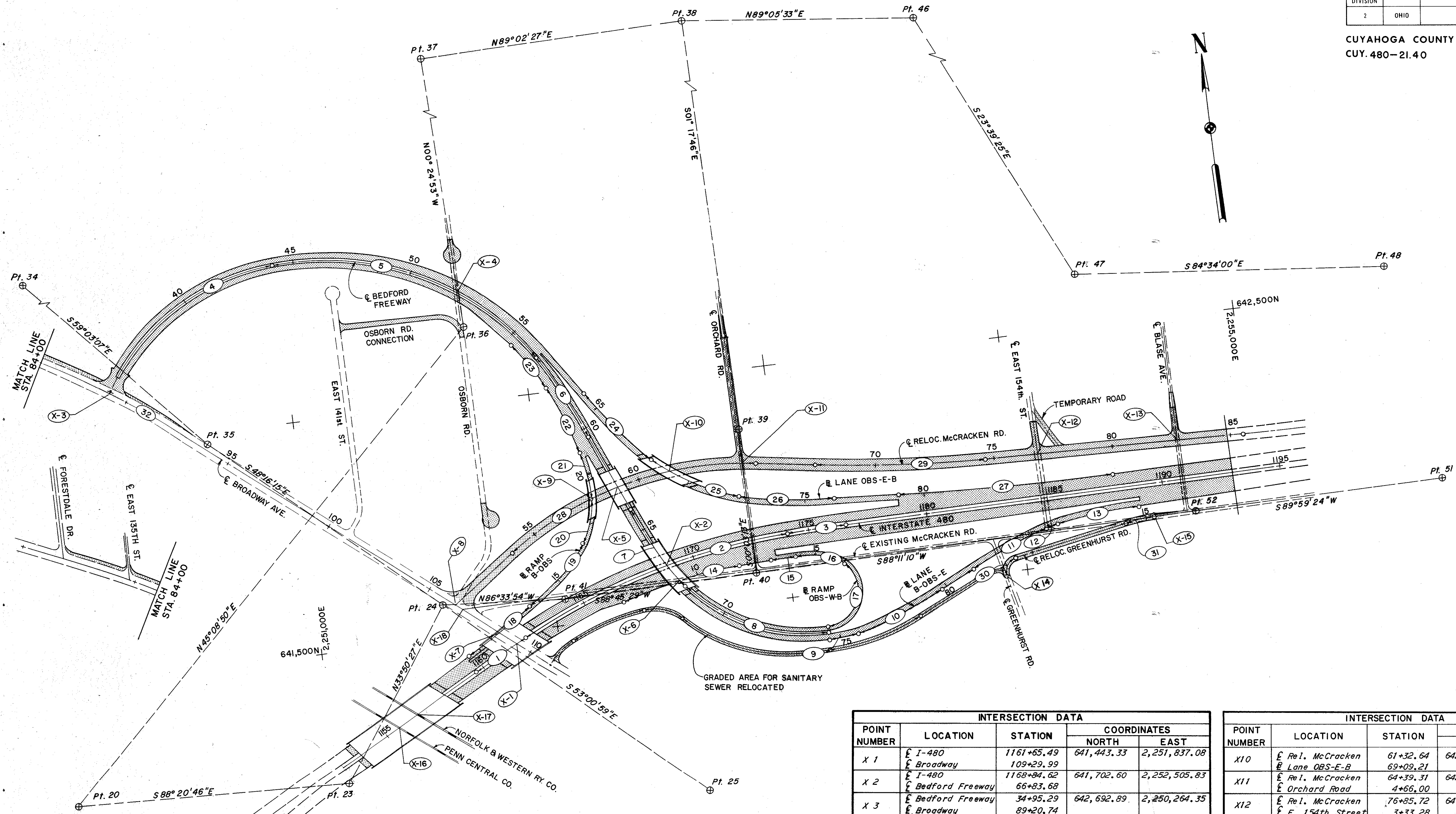
ALIGNMENT: Spiral, 8°00'00" Left

SUPERELEVATION: Varies .0156 ft. per ft. to .083 ft. per ft.

URBAN RADIAL (WITH OUT LEE BEDFORD FREEWAYS)		
Design Designation	East of Broadway	West of Broadway
Current A.D.T. (1972)	67,884	79,644
Design Year A.D.T. (1992)	77,582	91,022
D.D.H.V.	4,460	5,230
D (Directional Distribution)	67-33	55-45
T (Per cent B.C. Trucks)	3%	3%
V (Design Speed)	60	60



SCALE 1"=200'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE ERA DATE 5-21-69 CONSULTING ENGINEERS
TRCD. DATE KANSAS CITY CLEVELAND NEW YORK
CRD. I.M. DATE 6-21-69

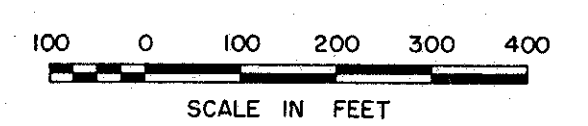


The geometrics for this project have been calculated to the nearest thousandth of a foot for distances and the nearest tenth of a second for angles and bearings. The calculated distances, angles and bearings have been rounded to the nearest hundredth of a foot and even second for inclusion in the plans. Complementary geometric information may not check exactly if only plan data is used for calculations.

INTERSECTION DATA				
POINT NUMBER	LOCATION	STATION	COORDINATES	
			NORTH	EAST
X 1	E I-480	1161+65.49	641,443.33	2,251,837.08
	E Broadway	109+29.99	641,702.60	2,252,505.83
X 2	E I-480	1168+84.62	641,702.60	2,252,505.83
	E Bedford Freeway	66+83.68	642,692.89	2,250,264.35
X 3	E Bedford Freeway	34+95.29	642,692.89	2,250,264.35
	E Broadway	89+20.74	642,956.18	2,251,762.89
X 4	E Bedford Freeway	52+06.26	642,956.18	2,251,762.89
	E Osborn Road	17+49.96	642,059.80	2,252,338.94
X 5	E Bedford Freeway	62+89.13	642,059.80	2,252,338.94
	E Rel. McCracken	59+04.64	641,633.80	2,252,552.02
X 6	E Bedford Freeway	67+66.58	641,633.80	2,252,552.02
	E Ramp OBS-W/E	9+14.93	641,498.78	2,251,762.60
X 7	E Ramp B-OBS	11+33.88	641,498.78	2,251,762.60
	E Broadway	108+41.88	641,633.93	2,251,601.68
X 8	E Rel. McCracken	50+46.81	641,633.93	2,251,601.68
	E Broadway	106+27.11	642,022.00	2,252,221.55
X 9	E Rel. McCracken	57+81.28	642,022.00	2,252,221.55
	E Ramp B-OBS	18+54.59		

INTERSECTION DATA				
POINT NUMBER	LOCATION	STATION	COORDINATES	
			NORTH	EAST
X 10	E Rel. McCracken	61+32.64	642,102.57	2,252,562.64
X 11	E Lane OBS-E-B	69+09.21	642,103.27	2,252,868.73
	E Orchard Road	4+66.00	641,995.44	2,254,109.02
X 12	E Rel. McCracken	76+85.72	641,995.44	2,254,109.02
	E E. 154th Street	3+33.28	641,983.17	2,254,700.51
X 13	E Rel. McCracken	82+77.34	641,983.17	2,254,700.51
	E Blase Avenue	12+60.75	641,492.31	2,253,918.42
X 14	E Rel. Greenhurst	8+30.00	641,492.31	2,253,918.42
	E Exist. Greenhurst	8+30.00	641,671.24	2,254,564.63
X 15	E Rel. Greenhurst	15+36.26	641,671.24	2,254,564.63
	E Exist. McCracken	29+35.92	641,145.74	2,251,315.92
X 16	E I-480	1155+65.34	641,145.74	2,251,315.92
	E Penn. Railroad	5976+48.50	641,193.72	2,251,399.34
X 17	E I-480	1156+61.58	641,193.72	2,251,399.34
	E N/W Railroad	444+30.92	641,611.90	251,628.88
X 18	E Broadway	106+62.11	641,611.90	251,628.88
	E Exist. McCracken	0+00.00		

SCALE 1" = 200'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE RHA DATE 4-11-68 CONSULTING ENGINEERS
 TRCD. RHA DATE 4-11-68 KANSAS CITY CLEVELAND NEW YORK
 CKD. IM DATE 4-1-70



GEOMETRICS TABLE

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

4
390

CUYAHOGA COUNTY
CUY. 480-21.40

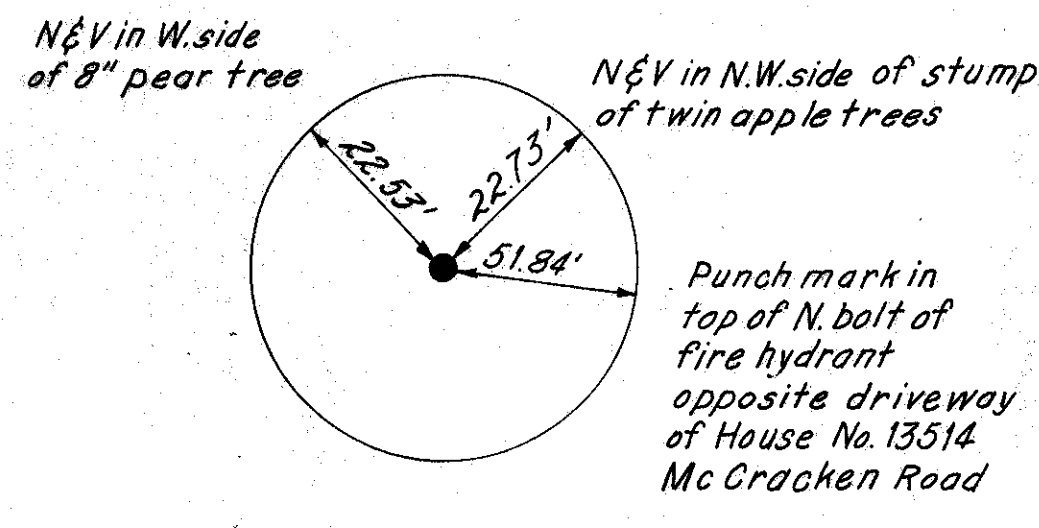
LINE	CURVE	P. C.			P. I.			P. T.			Δ	D	R	T	L	E
		STATION	N CO-ORD.	E CO-ORD.	STATION	N CO-ORD.	E CO-ORD.	STATION	N CO-ORD.	E CO-ORD.						
Interstate 480	2	1162+14.53	641,466.24	251,880.45	1168+20.35	641,745.08	252,418.28	1174+08.58	641,782.32	253,022.95	23°52'52"	2°00'00"	2,864.79	605.82'	1,194.05'	63.36'
Bedford Freeway	4	34+95.29	642,592.89	250,264.35	39+88.73	643,118.28	250,514.40	44+06.18	643,160.43	251,006.03	54°39'12"	6°00'00"	954.93	493.44'	910.89'	119.95'
	5	44+06.18	643,160.43	251,006.03	50+91.30	643,218.95	251,688.64	56+41.15	642,645.35	252,063.30	61°44'54"	5°00'00"	1,145.92	685.12'	1,234.97'	189.19'
	8	68+00.15	641,607.35	252,572.67	71+52.03	641,334.48	252,794.84	74+54.29	641,343.58	253,146.60	52°19'53"	8°00'00"	716.20	351.88'	654.14'	81.77'
Lane B-OBS-E	9	74+54.29	641,311.59	253,147.42	75+16.71	641,313.21	253,209.82	74+78.84	641,325.14	253,271.09	9°32'17"	7°39'28"	748.20	62.42'	124.55'	2.60'
	12	84+87.93	641,675.77	254,107.41	85+14.32	641,682.97	254,132.80	85+40.70	641,688.76	254,158.55	3°09'58"	6°00'00"	954.93	26.39'	52.77'	0.36'
Ramp OBS W-B	14	6+74.26	641,572.55	252,319.44	9+19.68	641,649.88	252,552.36	11+62.43	641,665.80	252,797.27	14°38'42"	3°00'00"	1,909.86	245.42'	488.17'	15.70'
	15	12+89.53	641,671.05	252,924.10	13+51.21	641,678.05	252,985.65	14+12.86	641,678.73	253,047.32	3°04'59"	2°30'00"	2,291.83	61.68'	123.32'	0.83'
	17	16+12.86	641,632.33	253,238.64	20+08.33	641,377.80	253,541.32	19+75.34	641,367.57	253,145.98	138°27'26"	38°11'50"	150.00	395.47'	362.48'	272.96'
Ramp B-OBS	18	9+78.53	641,416.10	251,636.87	11+43.54	641,502.01	251,777.96	13+08.63	641,595.91	251,913.87	3°18'10"	1°00'00"	5,729.58	165.19'	330.28'	2.38'
	20	16+58.63	641,836.02	252,165.55	17+59.21	641,923.14	252,215.82	18+56.15	642,023.55	252,221.64	26°39'53"	13°30'00"	424.41	100.58'	197.52'	11.76'
	22	20+56.15	642,221.36	252,197.29	22+12.66	642,373.10	252,158.95	23+67.94	642,512.98	252,088.75	12°28'17"	4°00'00"	1,432.39	156.51'	311.79'	8.52'
	23	23+67.94	642,512.98	252,088.75	24+83.75	642,616.49	252,036.80	25+98.72	642,706.94	251,964.46	12°00'00"	5°11'59"	1,101.92	115.82'	230.78'	6.07'
Lane OBS E-B	25	68+19.66	642,159.86	252,493.86	70+24.71	642,020.79	252,644.55	72+22.60	641,962.51	252,841.16	26°11'29"	6°30'00"	881.47	205.06'	402.95'	23.54'
	27	78+92.86	641,891.50	253,506.26	83+46.67	641,863.71	253,959.21	88+00.00	641,871.82	254,412.95	4°32'08"	0°30'00"	11,459.16	453.81'	907.14'	8.98'
Relocated McCracken	28	53+76.81	641,830.21	251,866.97	59+67.96	642,181.82	252,342.18	64+98.11	642,095.92	252,927.06	44°51'07"	4°00'00"	1,432.39	591.15'	1,121.30'	117.19'
	29	67+48.11	642,059.60	253,174.41	71+06.87	642,007.47	253,529.36	74+64.70	642,000.03	253,888.04	7°09'57"	1°00'00"	5,729.58	358.76'	716.59'	11.22'
Relocated Greenhurst	30	8+30.00	641,492.31	253,918.42	8+92.93	641,553.44	253,903.48	9+27.10	641,565.45	253,965.25	92°43'39"	95°29'35"	60.00	62.93'	97.10'	26.95'
	31	14+13.09	641,658.22	254,442.30	14+74.82	641,670.00	254,502.90	15+36.26	641,671.24	254,564.63	9°51'14"	8°00'00"	716.20	61.74'	123.17'	2.66'
Existing Broadway	32	83+38.70	642,968.75	249,752.60	88+13.89	642,778.71	250,188.13	92+83.33	642,479.64	250,557.41	15°25'43"	1°38'00"	3,508.02	475.19'	944.63'	32.04'

NOTE Add 2,000,000 to all East Coordinates.

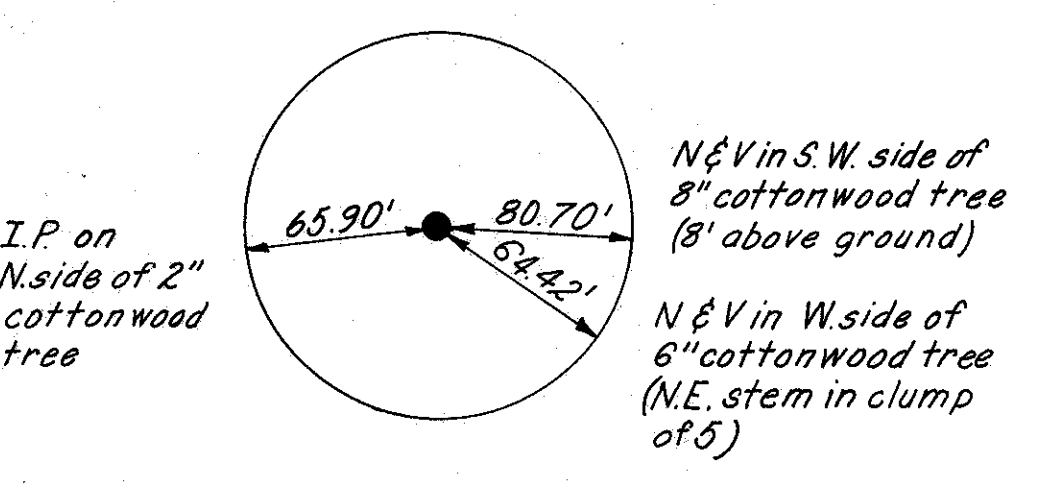
LINE	CURVE	T.S.	S.C.	C.S.	S.T.	θ _s	L _s	ST	LT	P	T ₁	T ₂
Interstate 480	1 & 3	Sta. 1159+64.53	Sta. 1162+14.53	Sta. 1174+08.58	Sta. 1176+58.58	2°30'00"	250.00	83.35	166.68	0.91		
		N. 641,344.77	N. 641,466.24	N. 641,782.32	N. 641,790.43							
		E. 251,661.96	E. 251,880.45	E. 253,022.95	E. 253,272.80							
Bedford Freeway	6			Sta. 56+41.15	Sta. 60+41.15	10°00'00"	400.00	133.72	267.09	5.81		
				N. 642,645.35	N. 642,297.81							
				E. 252,063.30	E. 252,241.44							
	7	Sta. 64+00.15	Sta. 68+00.15			16°00'00"	400.00	134.33	267.76	9.28		
		N. 641,957.72	N. 641,607.35									
		E. 252,382.58	E. 252,572.67									
Lane B-OBS-E	10			Sta. 75+78.84	Sta. 79+78.84	15°18'56"	400.00	134.24	267.67	8.88		
				N. 641,325.14	N. 641,469.55							
				E. 253,271.09	E. 253,642.75							
	11 & 13	Sta. 81+37.92	Sta. 84+87.92	Sta. 85+40.70	Sta. 88+90.70	10°30'00"	350.00	117.04	233.74	5.34		
		N. 641,540.13	N. 641,675.77	N. 641,688.76	N. 641,723.28							
		E. 253,785.32	E. 254,107.41	E. 254,158.55	E. 254,506.32							
Ramp OBS-W-B	16		Sta. 16+12.86	Sta. 14+12.86		35°41'50"	200.00			10.23	134.36	74.43
			N. 641,632.33	N. 641,678.73								
			E. 253,238.64	E. 253,047.32								
Ramp B-OBS	19		Sta. 16+58.63	Sta. 13+08.63		21°52'30"	350.00			11.07	228.68	127.14
			N. 641,836.02	N. 641,595.91								
			E. 252,165.55	E. 251,913.87								
	21		Sta. 20+56.15	Sta. 18+56.15		9°30'00"	200.00			2.76	82.64	118.93
			N. 642,221.36	N. 642,023.55								
			E. 252,197.29	E. 252,221.64								
Lane OBS-E-B	24 & 26	Sta. 64+19.66	Sta. 68+19.66	Sta. 72+22.60	Sta. 76+22.60	13°00'00"	400.00	133.99	267.39	7.55		
		N. 642,471.63	N. 642,159.86	N. 641,962.51	N. 641,908.06							
		E. 252,244.73	E. 252,493.86	E. 252,841.16	E. 253,236.51							

SCALE: **HOWARD, NEEDLES, TAMMEN & BERGENDOFF**
 MADE RHA DATE 4-11-68 CONSULTING ENGINEERS
 TRCD RHA DATE 4-11-68
 CKD IM DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

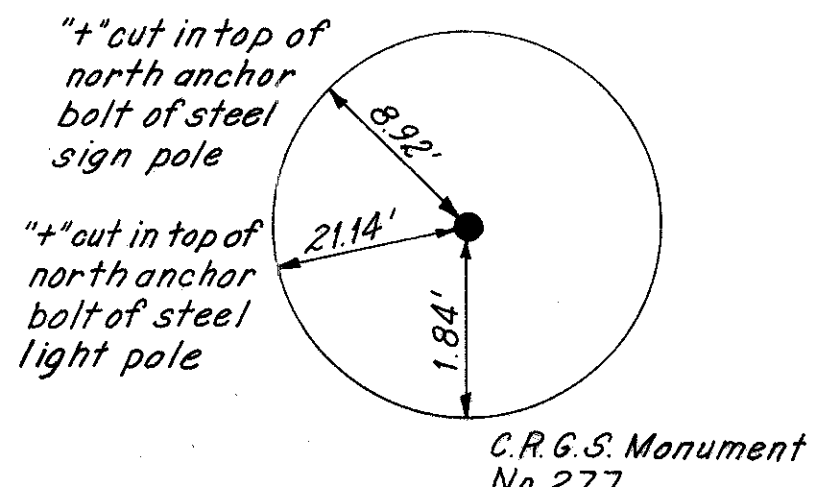
CUYAHOGA COUNTY
CUY. 480-21.40



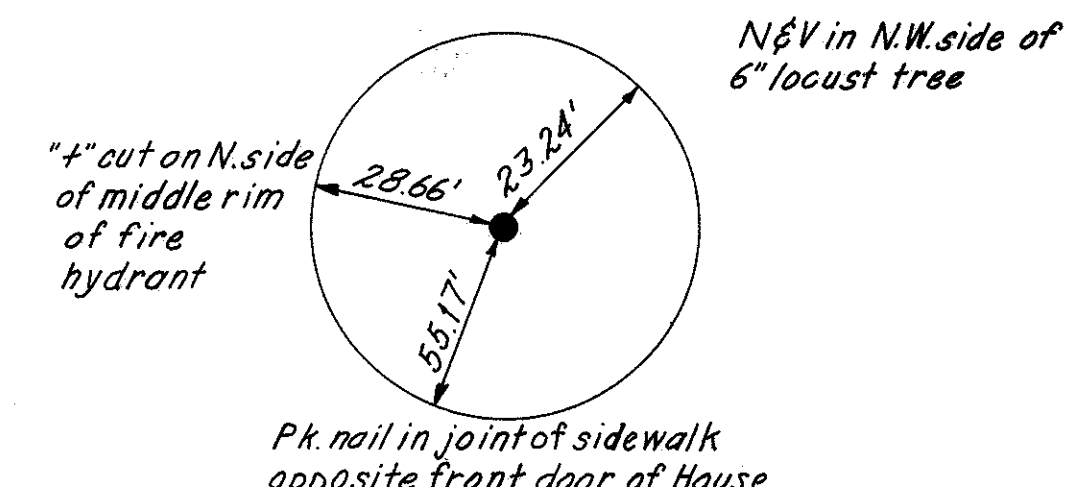
POINT 20
H.N.T.B. brass cap on I.P.



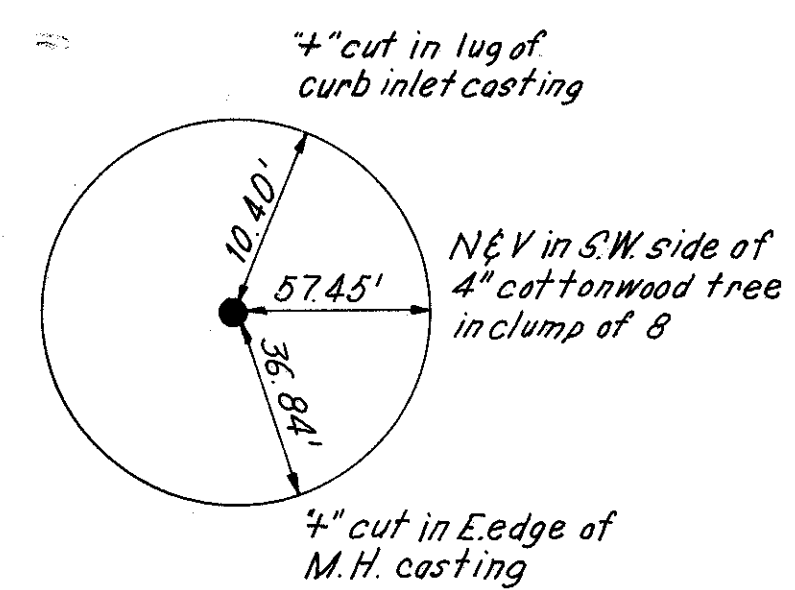
POINT 23
H.N.T.B. brass cap on I.P.



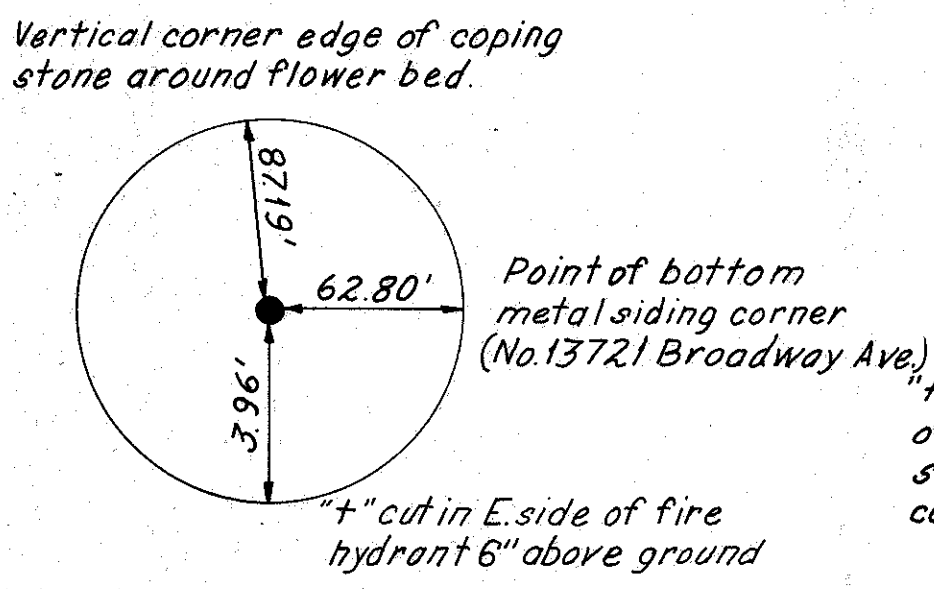
POINT 24
H.N.T.B. brass cap on I.P.
(At Broadway & McCracken)



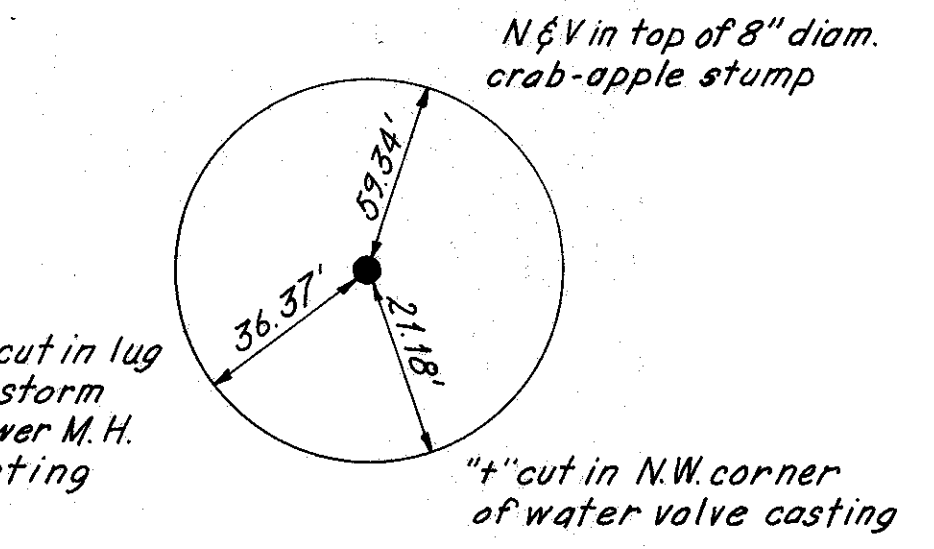
POINT 25
H.N.T.B. brass cap on I.P.



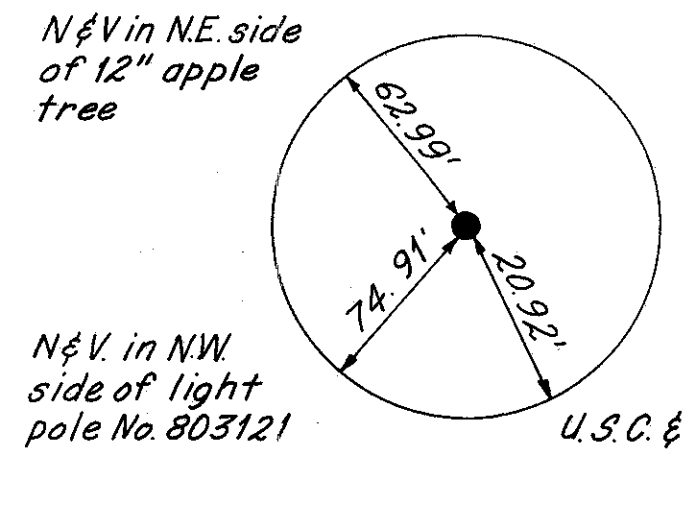
POINT 34
Screw in curb
(At Broadway & Forestdale Dr.)



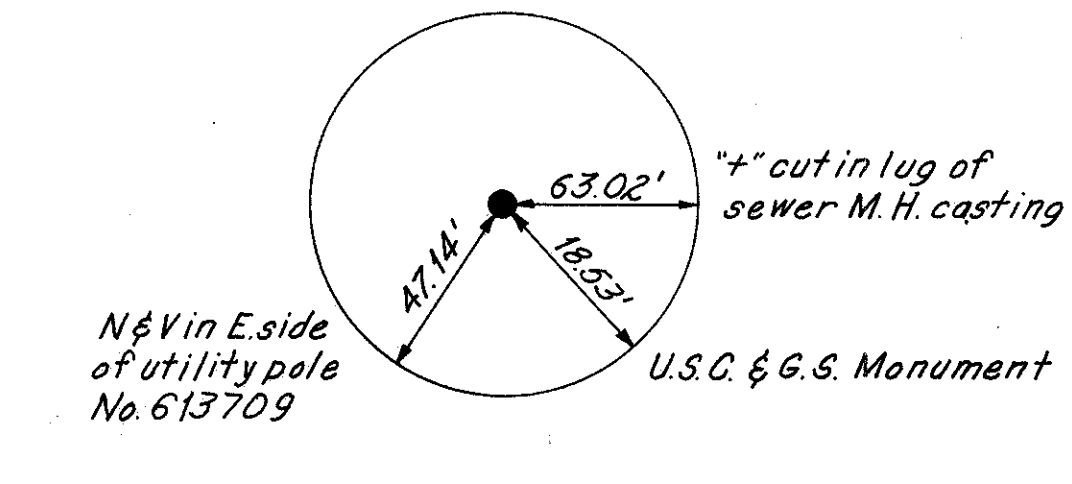
POINT 35
Screw in sidewalk



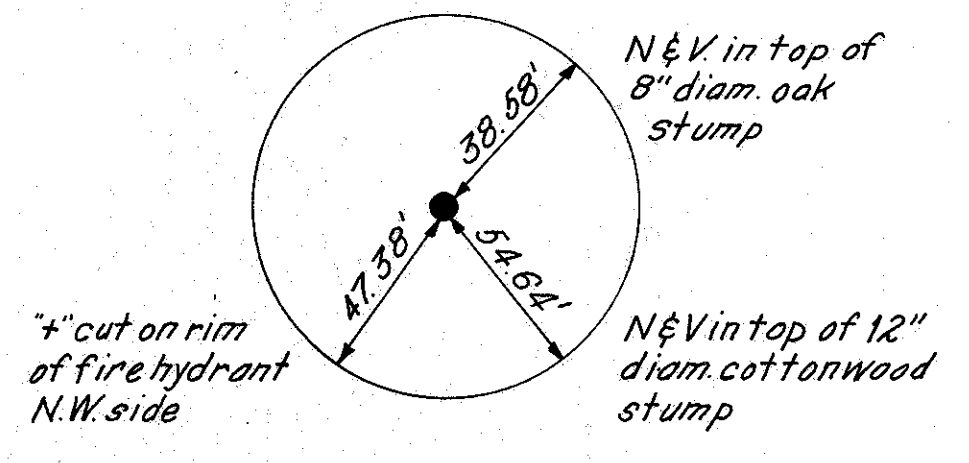
POINT 36
H.N.T.B. brass cap on I.P. at edge
of pavement (Osborn Road)



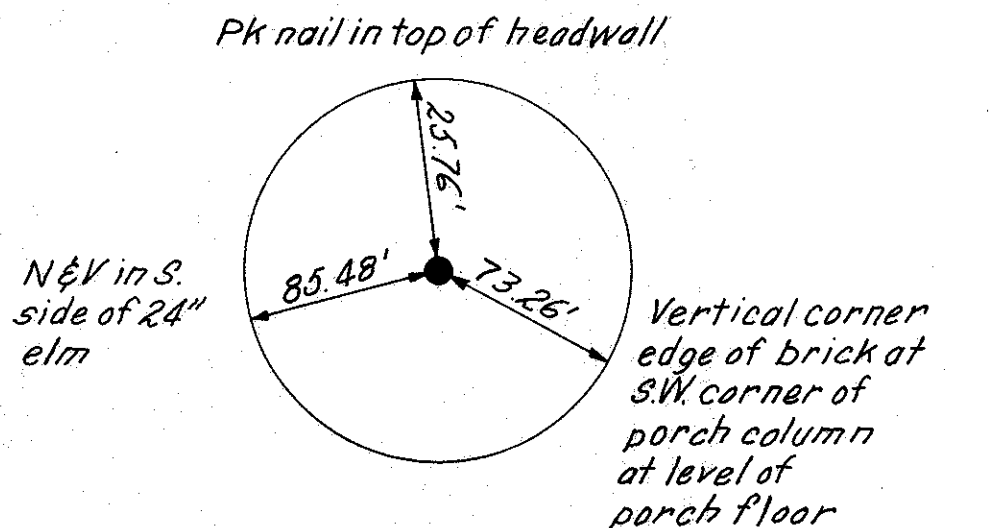
POINT 37
Screw in pavement
(Hole in asphalt & point
set in concrete at E.
143rd St. & Ohio Ave.)



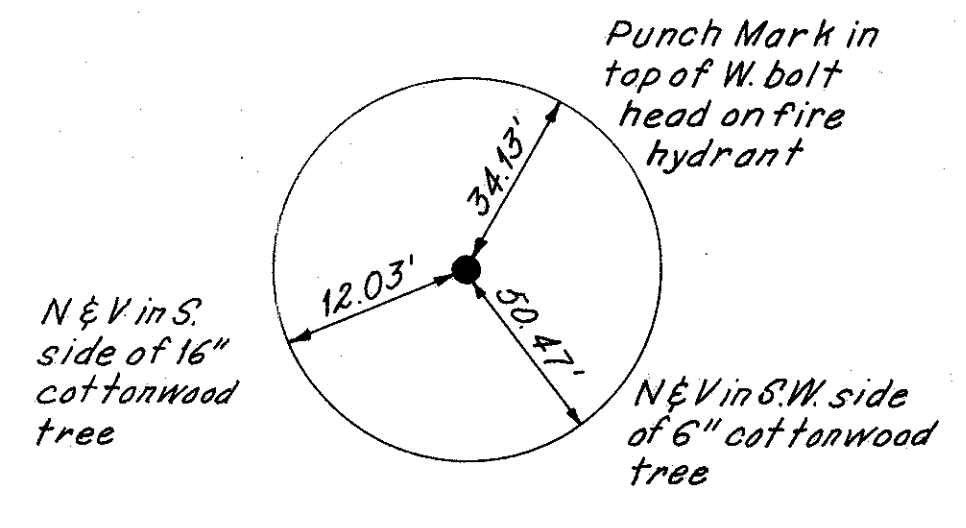
POINT 38
Monument at intersection of center lines
of streets (Ohio Ave. & E. 149th St.)



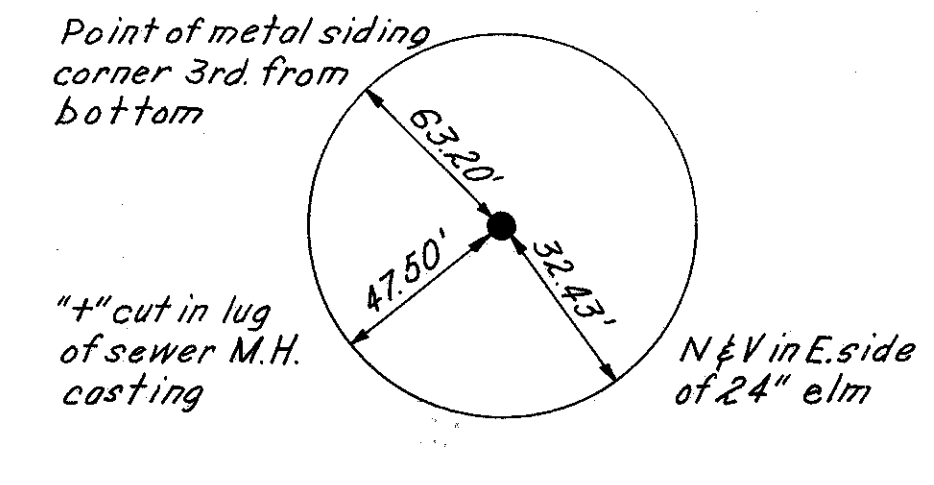
POINT 39
Bolt in pavement
(Orchard Road)



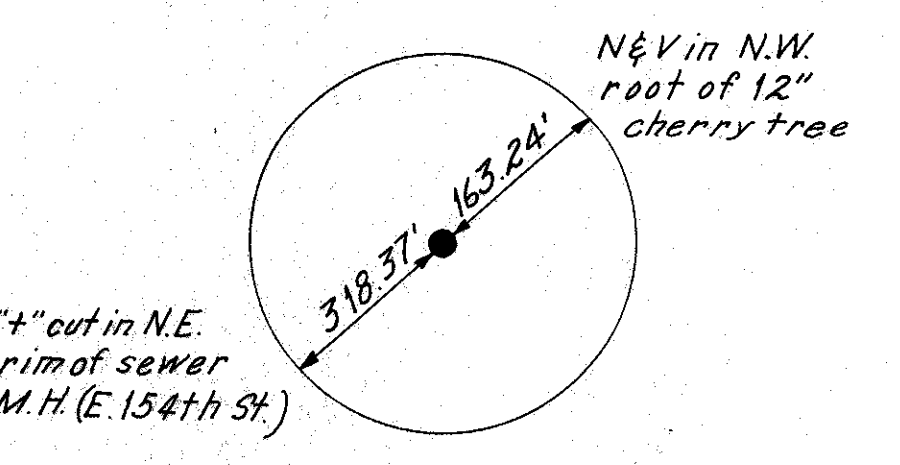
POINT 40
H.N.T.B. brass cap on I.P.
1' from edge of pavement



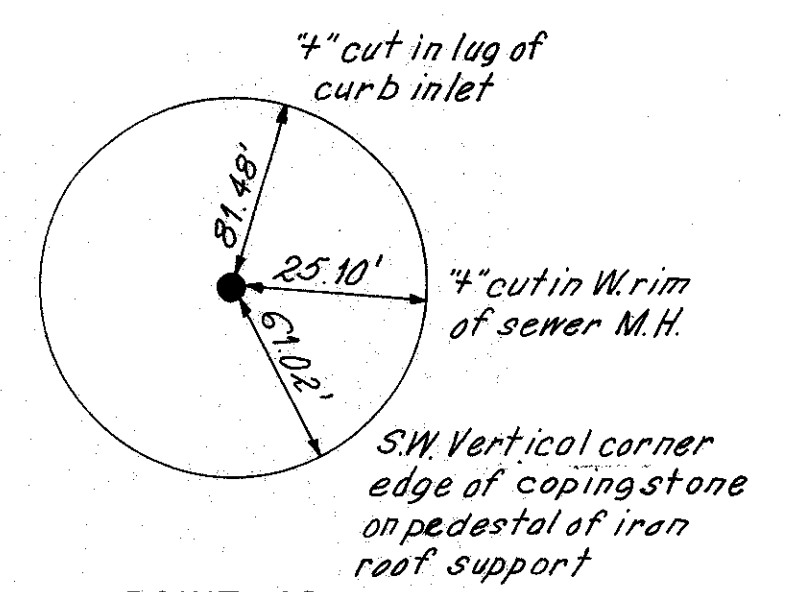
POINT 41
H.N.T.B. brass cap on I.P.
3' from edge of pavement
(McCracken Road)



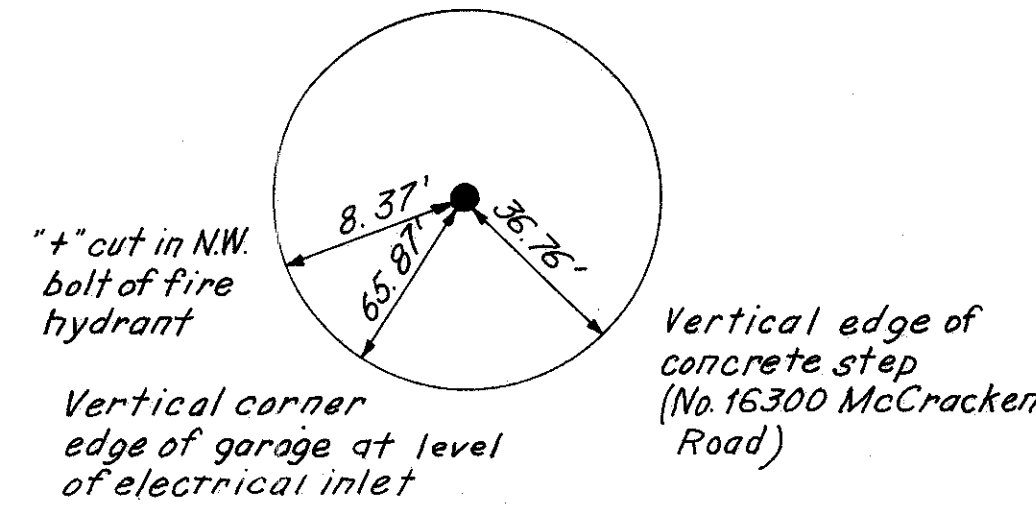
POINT 46
Bolt in pavement
(At E. 153rd St. & Ohio Ave.)



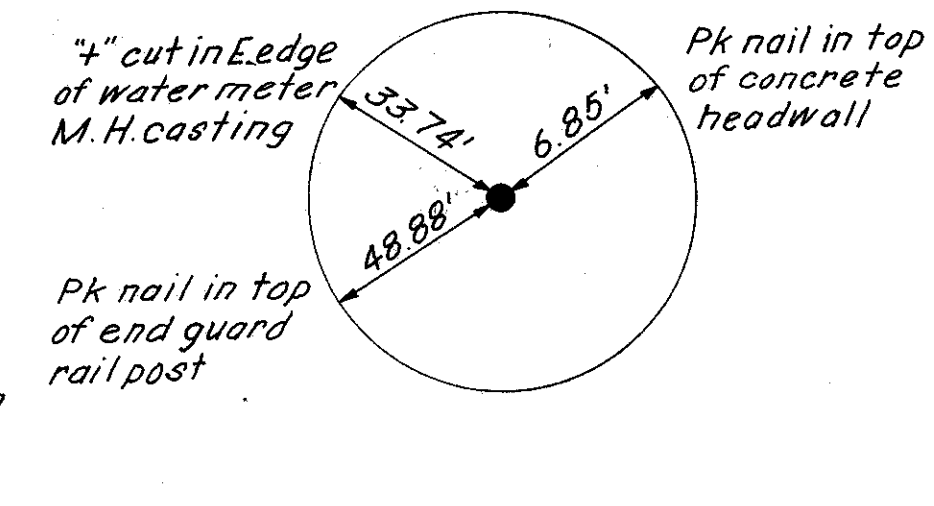
POINT 47
H.N.T.B. brass cap on I.P.



POINT 48
Monument at intersection of center lines
of streets (Highview Dr. & Myrtle Ave.)



POINT 51
H.N.T.B. brass cap on I.P.



POINT 52
At cross of the "T" on H.N.T.B. brass
cap on I.P. (Blase Ave. & McCracken Rd.)

BENCH MARKS		
NO.	DESCRIPTION	ELEV.
T.B.M. 1	Railroad spike, utility pole No. 326089 N.E. corner of Broadway Avenue and E. 141st Street.	845.686
20	Top of S.W. bolt, 2.5' S. of railroad signal, 45' S. of railroad tracks and McCracken Road	861.391
21	N.E. flange bolt of fire plug at N.E. angle of Broadway Avenue and McCracken Road	851.202
22	N.E. flange bolt of fire plug, 120' N.W. of 14712 Broadway Avenue, E. side of street.	883.947
31	N.E. flange bolt of fire plug at T-intersection of E. 131st Street and Broadway Avenue	837.126
32	N.E. flange bolt on fire plug at T-intersection of Forestdale Drive and Broadway Avenue	837.295
33	S.E. flange bolt on fire plug at 13721 Broadway Avenue	844.466
34	E. flange bolt on fire plug at 4912 Osborn Road	898.272
35	E. flange bolt on fire plug at 4736 Osborn Road (E. 143rd Street)	912.518
36	E. flange bolt on fire plug, 65' S. of 4928 Orchard Avenue	908.858
37	S. flange bolt on fire plug, 60' E. of 14611 McCracken Road	869.806
38	E. flange bolt on fire plug at 4612 Osborn Road	904.372
44	W. flange bolt on fire plug at 4933 E. 154th Street, 160' N.W. of Amoza Laboratory	913.619
46	S. flange bolt on fire plug at 15819 McCracken Road	876.037
47	S. corner of water valve in front of 15315 (Model Pattern Company) intersection Greenhurst Road and McCracken Road	865.009

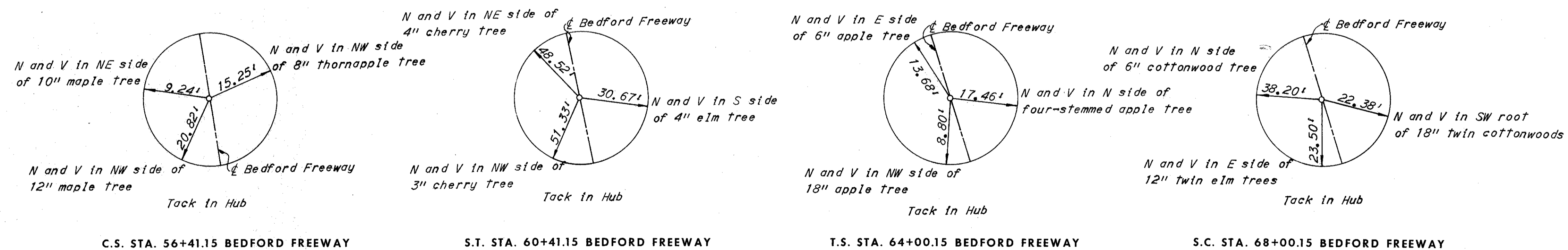
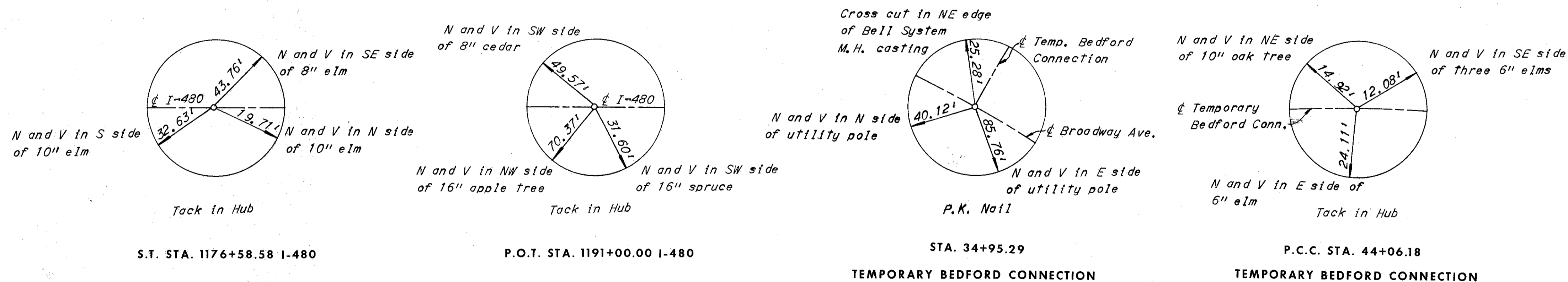
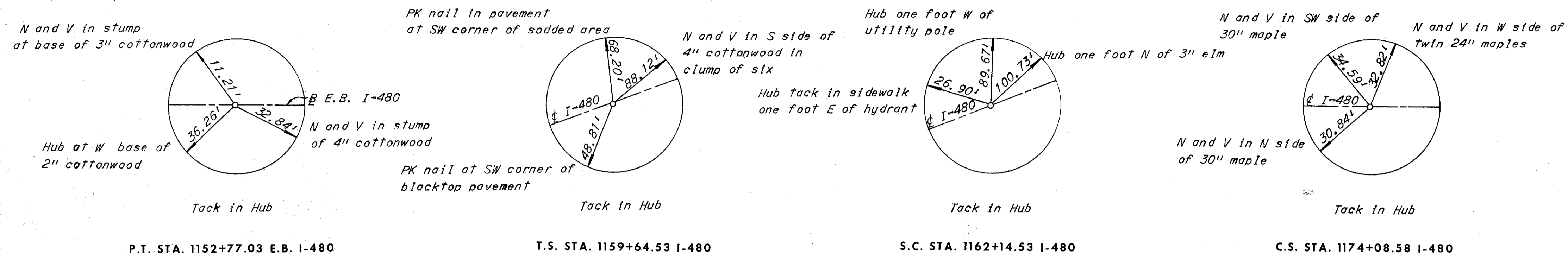
POINT	COORDINATES	
	NORTH	EAST
20	640,967.52	2,249,926.98
23	640,934.69	2,251,063.84
24	641,646.30	2,251,540.96
25	640,723.17	2,252,766.73
34	643,062.47	2,249,614.99
35	642,443.73	2,250,646.86
36	642,805.08	2,251,774.03
37	644,233.26	2,251,763.69
38	644,251.01	2,252,823.94
39	642,243.46	2,252,869.37
40	641,624.56	2,252,869.94
41	641,609.16	2,252,159.71
46	644,264.52	2,253,677.04
47	642,730.14	2,254,349.21
48	642,607.06	2,255,643.18
51	641,683.33	2,255,766.55
52	641,683.15	2,254,719.86

CENTERLINE REFERENCE POINTS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

5-A
390

CUYAHOGA COUNTY
CUY. 480-21.40



LEGEND

P.K. Nail = Parker Kelon Nail
N and V = Nail and vee

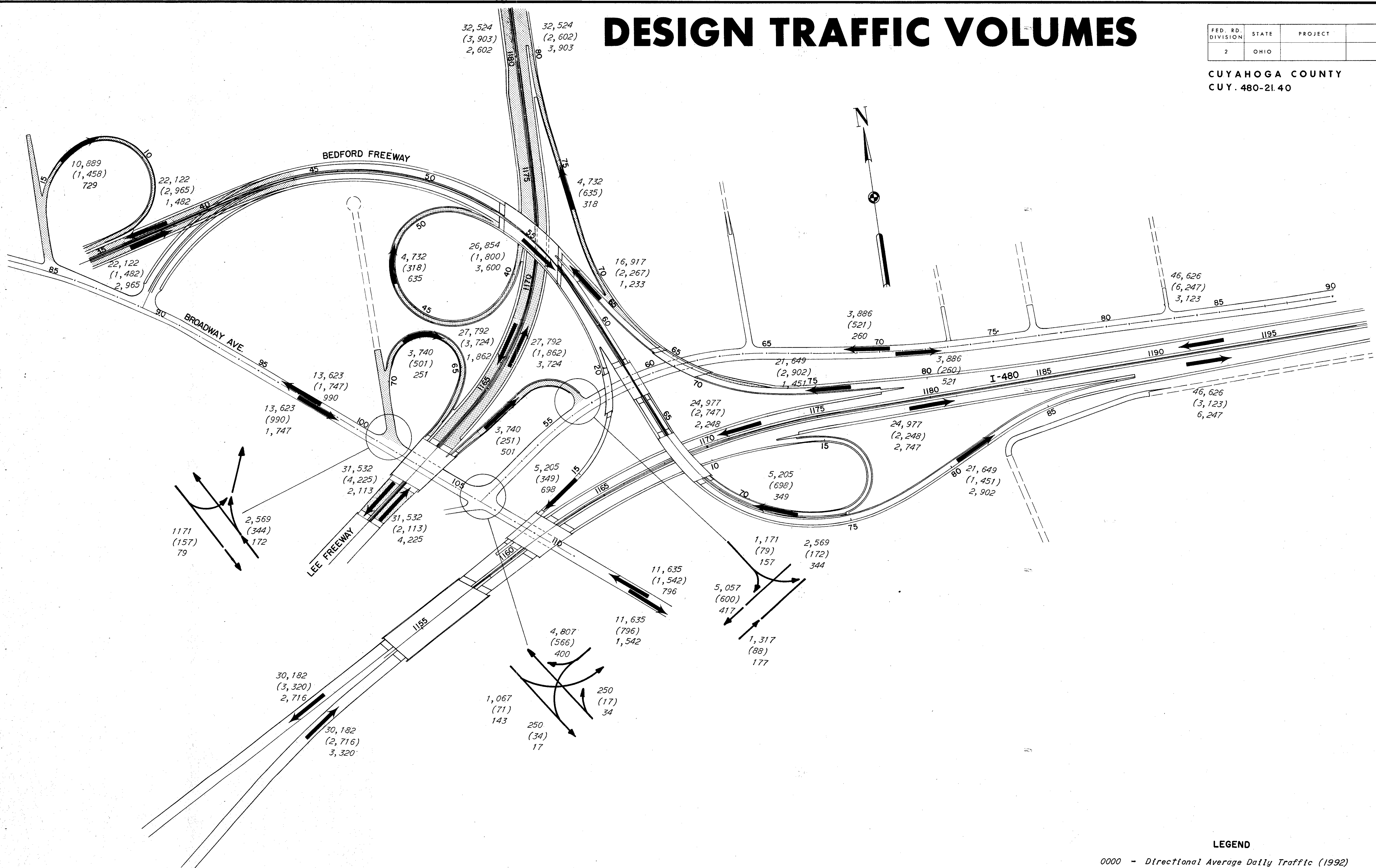
SCALE None HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE I.M. DATE 9-15-72 CONSULTING ENGINEERS
TRCD I.M. DATE 9-15-72 KANSAS CITY CLEVELAND NEW YORK
CKD R.R.H. DATE 9-15-72

DESIGN TRAFFIC VOLUMES

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

6
390

CUYAHOGA COUNTY
CUY. 480-21.40



- LEGEND**
- 0000 - Directional Average Daily Traffic (1992)
 - (000) - Directional Design Hourly Volume (1992 A.M. Peak)
 - 000 - Directional Design Hourly Volume (1992 P.M. Peak)
 - ▨ - Future Construction

SCALE 1"=200'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE RHA DATE 4-11-68 CONSULTING ENGINEERS
 TRCD RHA DATE 4-11-68
 CKD JM DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

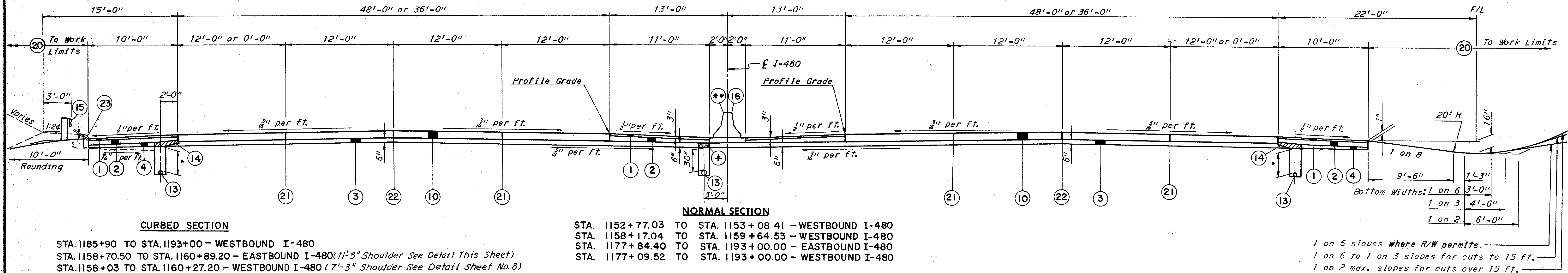
TYPICAL SECTIONS

TYPE 451

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

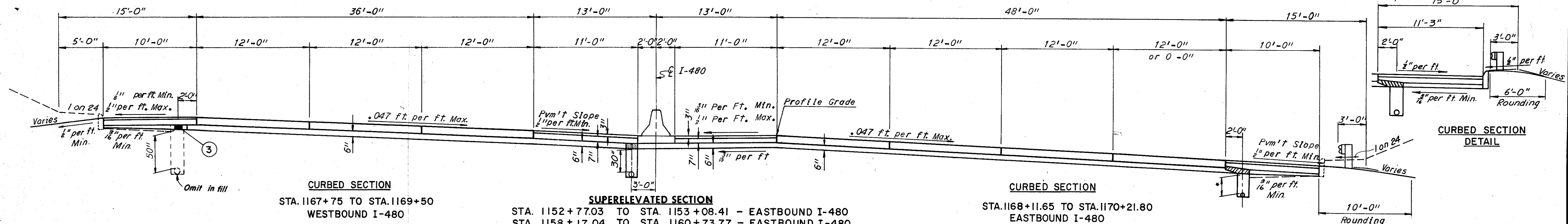
7
390

CUYAHOGA COUNTY
CUY.480-21.40



CURBED SECTION

STA. 1185+90 TO STA. 1193+00 - WESTBOUND I-480
 STA. 1158+70.50 TO STA. 1160+89.20 - EASTBOUND I-480 (11'-3" Shoulder See Detail This Sheet)
 STA. 1158+03 TO STA. 1160+27.20 - WESTBOUND I-480 (7'-3" Shoulder See Detail Sheet No. 8)



LEGEND

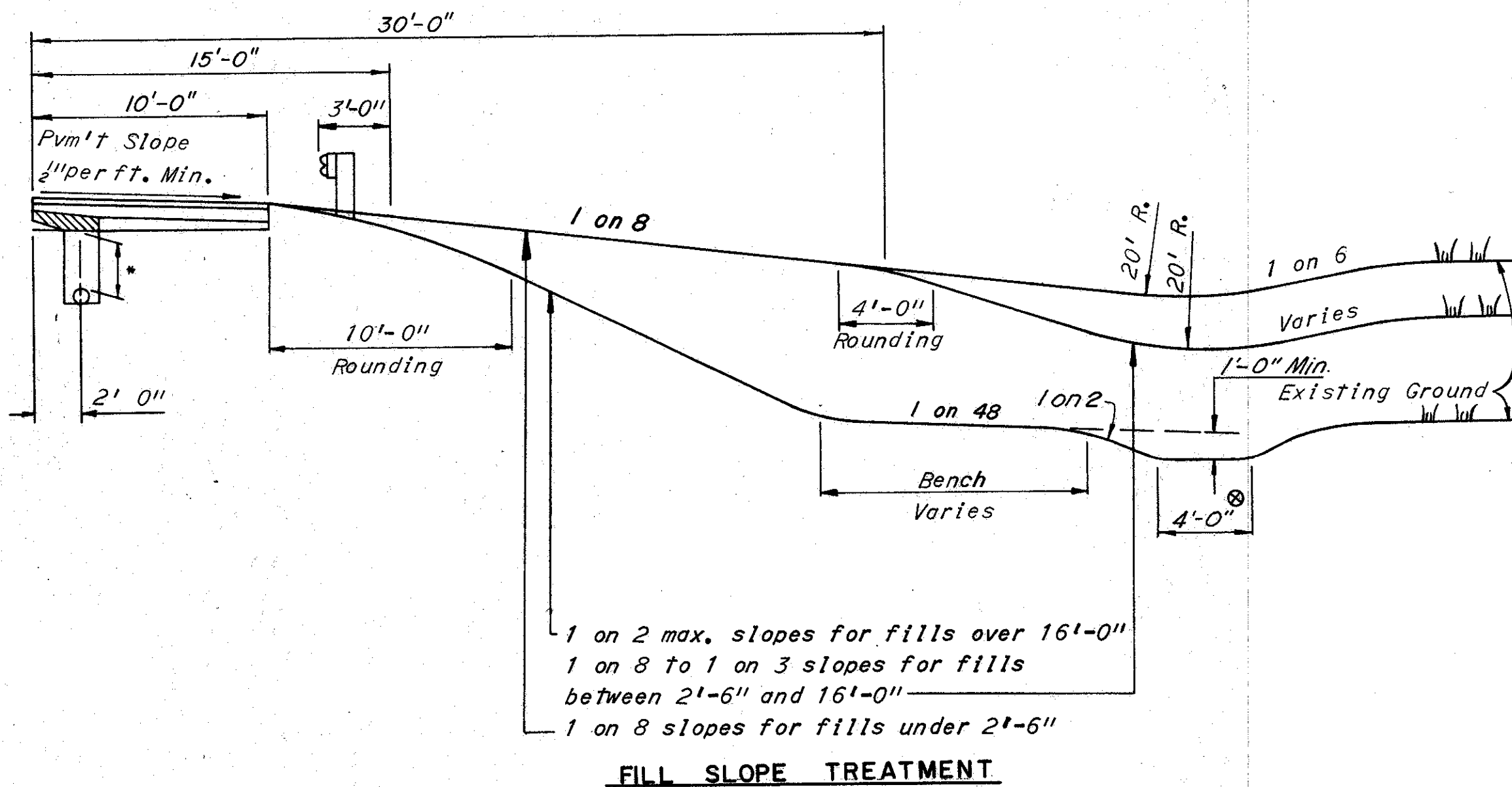
- ① Item 301 Bituminous Aggregate Base 702.01(85-100 AC-20) or 702.09, RT-11 or RT-12, as per plan (See note in proposal)
- ② Item 304 Aggregate Base
- ③ Item 310 Subbase, Grading "A", as per plan
- ④ Item 310 Subbase
- ⑩ Item 451 10" Reinforced Portland Cement Concrete Pavement
- ⑬ Item 605 6" Pipe Underdrains, as per plan
- ⑭ Item Special Special Drainage Connection, using No. 9 Aggregate (See note in proposal)
- ⑮ Item 606 Guard Rail, Type 5
- ⑯ Item 622 Concrete Barrier
- ⑳ Item 659 Seeding and Mulching (See General Notes)
- ㉑ Standard Longitudinal Joint
- ㉒ Standard Key Joint without Tie Bars
- ㉓ Item 609 Concrete Curb, Standard Type 6

NOTES:

Unless otherwise noted, dimensions and or callouts shown on the top section shall apply to all sections on this sheet.
 Typical Sections are intended to show general roadway and pavement features only. For details see Paved Shoulder details, Plan Sheets and Cross Section sheets.
 Earth shoulders adjacent to uncurbed pavement or paved shoulders shall be finished 1" below the pavement or paved shoulder edge.
 * Unless otherwise shown in the plans, underdrains shall be laid parallel to the pavement edge with:
 50" cover from bottom of subbase to the top of the pipe (deep in cut)
 30" cover from bottom of subbase to the top of the pipe (shallow in fill and median)
 Transition from shallow to deep (unclassified)
 ** See Concrete Barrier Detail Sheet No. 9
 ⊕ Remove subbase for width of Item 603 trench and replace with new backfill material in accordance with 605.03(c) immediately prior to placing Item 304 Aggregate Base course. Cost shall be included in price bid per Lin.Ft. for Item 605.

SEQUENCE OF OPERATIONS:

- (1) Install pipe underdrain on outside shoulder, where required. Installation of shallow underdrain in median may be deferred until Item 451 is placed.
 - (2) Place subbase out to outside edge of underdrain or to one foot beyond edge of pavement where no underdrain is present. Payment shall be made for all subbase placed in this operation.
 - (3) Construct Item 451 pavement.
 - (4) Remove subbase and any contaminated backfill over drain and replace with No. 9 Aggregate, as shown by ⑭.
 - (5) Complete shoulder construction.
- ⊕ Unless otherwise shown in the plans.



SCALE 3/8" = 1'-0"
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE R.H.A. DATE 4/11/68 CONSULTING ENGINEERS
 TRCD J.E.M. DATE 4/24/68
 CRO. I.M. DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

TYPICAL SECTIONS

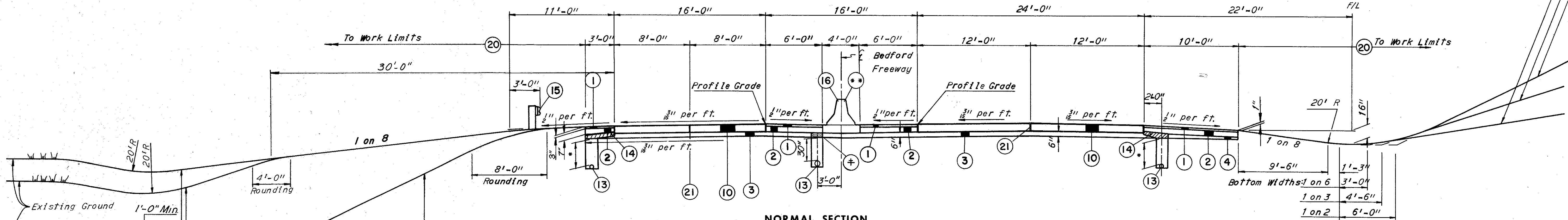
TYPE 451

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

8
390

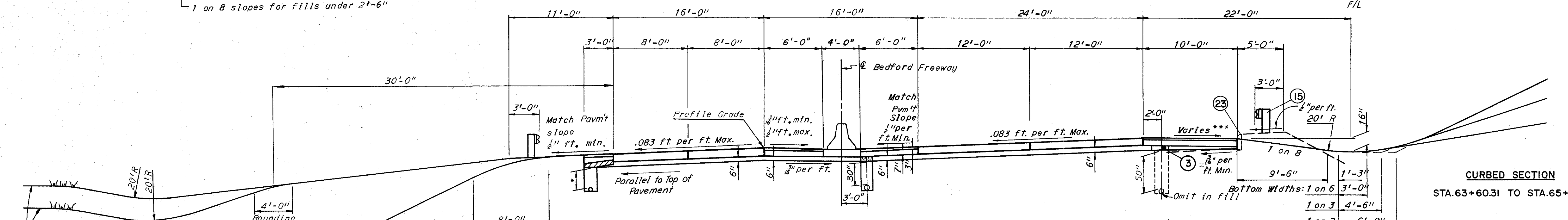
CUYAHOGA COUNTY
CUY.480-21.40

1 on 2 max. slopes for cuts over 15 ft.
1 on 6 to 1 on 3 slopes for cuts to 15 ft.
1 on 6 slopes where R/W permits



NORMAL SECTION
STA. 61+63.36 TO STA. 62+17.54

Existing Ground
1'-0" Min.
1 on 2 Max.
4'-0" ⊕
1 on 8
Bench Varies
1 on 2 max. slopes for fills over 16'-0"
1 on 8 to 1 on 3 slopes for fills between 2'-6" and 16'-0"
1 on 8 slopes for fills under 2'-6"



SUPERELEVATED SECTION
STA. 56+41.15 TO STA. 61+63.36
STA. 63+62.80 TO STA. 65+88.92
STA. 68+07.24 TO STA. 74+54.29

Existing Ground
1'-0" Min.
1 on 2 Max.
4'-0" ⊕
1 on 8
Bench Varies

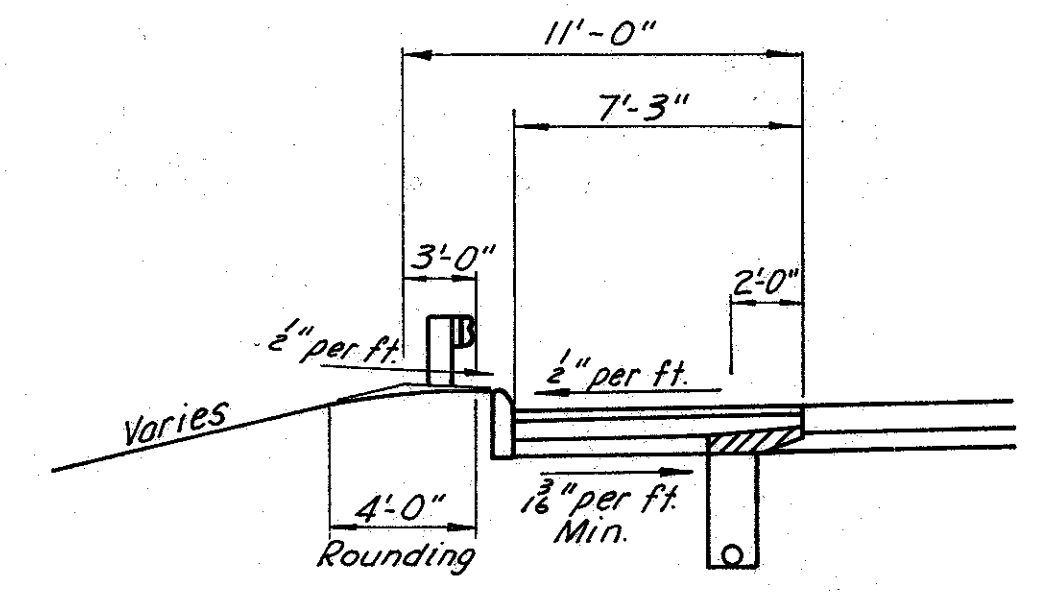
NOTES:
Unless otherwise noted, dimensions and or callouts shown on the top section shall apply to all sections on this sheet.
Typical Sections are intended to show general roadway and pavement features only. For details see Paved Shoulder details, Plan Sheets and Cross Section sheets.
Earth shoulders adjacent to uncurbed pavement or paved shoulders shall be finished 1" below the pavement or paved shoulder edge.

* Unless otherwise shown in the plans, underdrains shall be laid parallel to the pavement edge with:
50" cover from bottom of subbase to the top of the pipe (deep in cut)
30" cover from bottom of subbase to the top of the pipe (shallow in fill and median)
Transition from shallow to deep (unclassified)
*** See paved shoulder details
** See Concrete Barrier Detail Sheet No. 9
⊕ Remove subbase for width of Item 603 trench and replace with new backfill material in accordance with 605.03(c) immediately prior to placing Item 304 Aggregate Base course. Cost shall be included in price bid per Lin.Ft. for Item 605.

SEQUENCE OF OPERATIONS:
(1) Install pipe underdrain on outside shoulder, where required. Installation of shallow underdrain in median may be deferred until Item 451 is placed.
(2) Place subbase out to outside edge of underdrain or to one foot beyond edge of pavement where no underdrain is present. Payment shall be made for all subbase placed in this operation.
(3) Construct Item 451 pavement.
(4) Remove subbase and any contaminated backfill over drain and replace with Na9 Aggregate, as shown by (14).
(5) Complete shoulder construction.

LEGEND

- ① Item 301 Bituminous Aggregate Base 702.01 (85-100 AC-20) or 702.09, RT-11 or RT-12, as per plan (See note in proposal)
- ② Item 304 Aggregate Base
- ③ Item 310 Subbase, Grading "A", as per plan
- ④ Item 310 Subbase
- ⑩ Item 451 10" Reinforced Portland Cement Concrete Pavement
- ⑬ Item 605 6" Pipe Underdrains, as per plan
- ⑭ Item Special Special Drainage Connection, using No.9 Aggregate (See note in proposal)
- ⑮ Item 606 Guard Rail, Type 5
- ⑯ Item 622 Concrete Barrier
- ⑳ Item 659 Seeding and Mulching (See General Notes)
- ㉑ Standard Longitudinal Joint
- ㉓ Item 609 Concrete Curb, Standard Type 6



CURBED SECTION
STA. 63+66.80 TO STA. 65+73.50

⊕ Unless otherwise shown in the plans.

SCALE 1/4" = 1'-0"
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE R.H.A. DATE 4/11/68 CONSULTING ENGINEERS
TRCD J.E.W. DATE 4/24/68
CKD I.M. DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

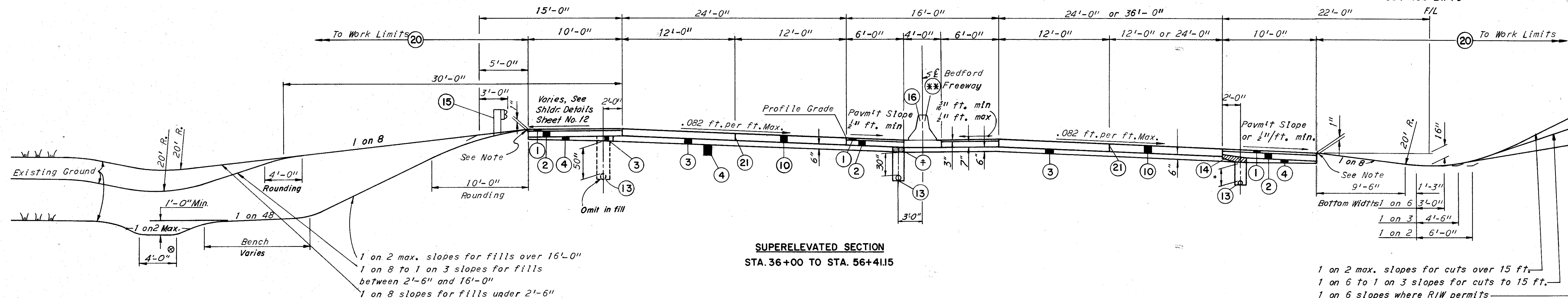
TYPICAL SECTIONS

TYPE 451

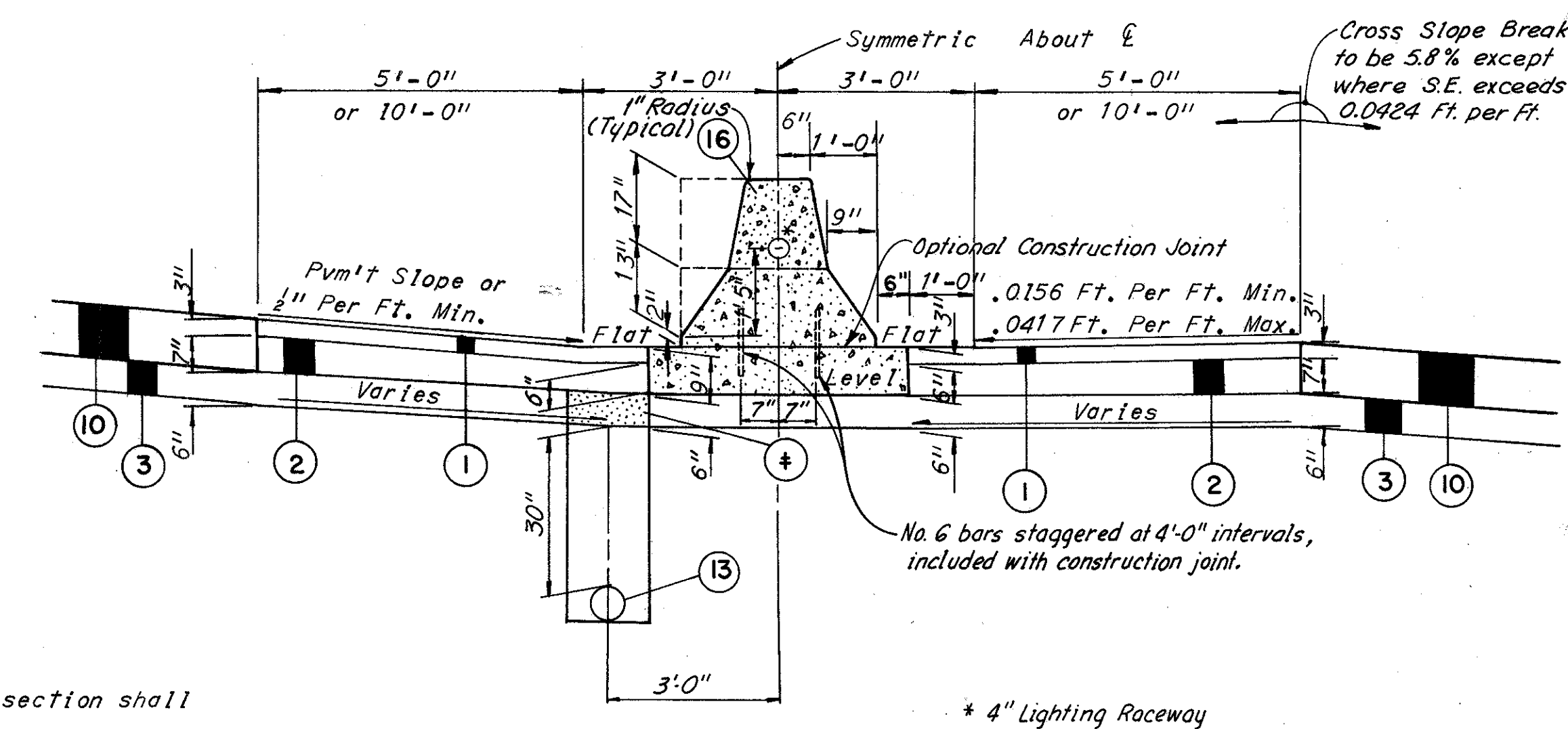
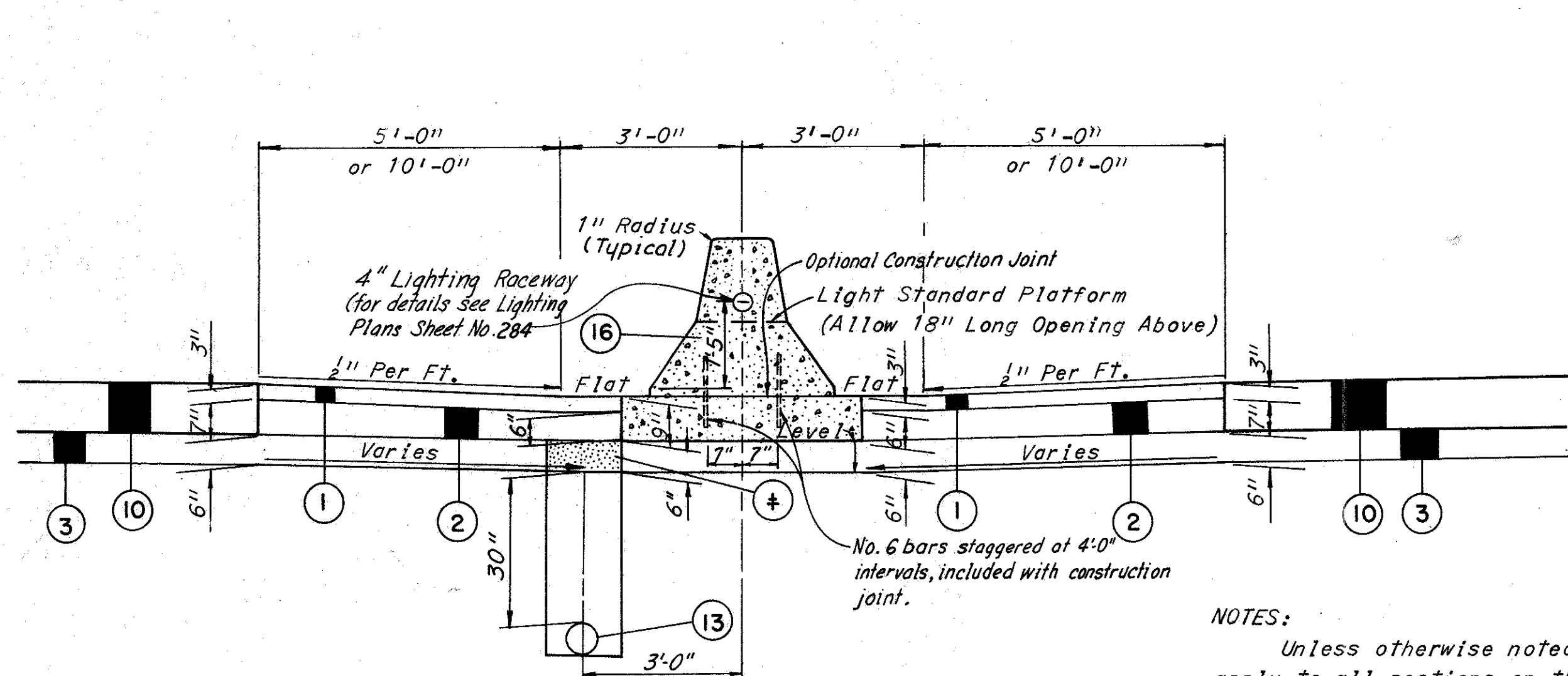
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
CUY 480-21.40



⊗ Unless otherwise shown in the plans



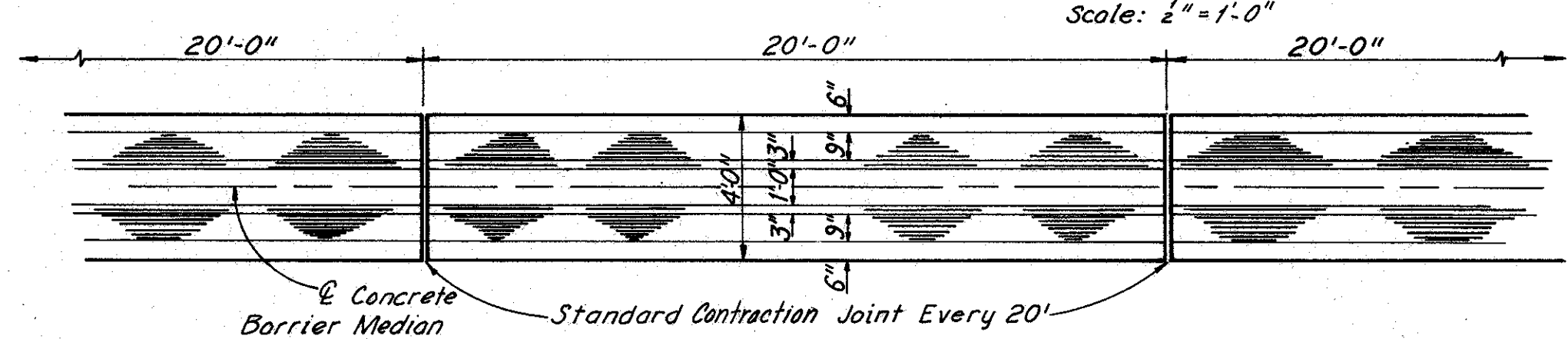
NOTES:
Unless otherwise noted, dimensions and or callouts shown on the top section shall apply to all sections on this sheet.
Typical Sections are intended to show general roadway and pavement features only. For details see Paved Shoulder details, Plan Sheets and Cross Section sheets.
Earth shoulders adjacent to uncurbed pavement or paved shoulders shall be finished 1" below the pavement or paved shoulder edge.

* Unless otherwise shown in the plans, underdrains shall be laid parallel to the pavement edge with:
50" cover from bottom of subbase to the top of the pipe (deep in cut)
30" cover from bottom of subbase to the top of the pipe (shallow in fill and median)
Transition from shallow to deep (unclassified)

** See Concrete Barrier Details shown on this sheet
⊕ Remove subbase for width of Item 603 trench and replace with new backfill material in accordance with 605.03(c) immediately prior to placing Item 304 Aggregate Base course. Cost shall be included in price bid per Lin.Ft. for Item 605.

SEQUENCE OF OPERATIONS:
(1) Install pipe underdrain on outside shoulder, where required. Installation of shallow underdrain in median may be deferred until Item 451 is placed.
(2) Place subbase out to outside edge of underdrain or to one foot beyond edge of pavement where no underdrain is present. Payment shall be made for all subbase placed in this operation.
(3) Construct Item 451 pavement.
(4) Remove subbase and any contaminated backfill over drain and replace with No.9 Aggregate, as shown by (14).
(5) Complete shoulder construction.

- LEGEND**
- ① Item 301 Bituminous Aggregate Base 702.01 (85-100 AC-20) or 702.09, RT-11 or RT-12, as per plan (See note in proposal)
 - ② Item 304 Aggregate Base
 - ③ Item 310 Subbase, Grading "A", as per plan
 - ④ Item 310 Subbase
 - ⑩ Item 451 10" Reinforced Portland Cement Concrete Pavement
 - ⑬ Item 605 6" Pipe Underdrains, as per plan
 - ⑭ Item Special Special Drainage Connection, using No.9 Aggregate (See note in proposal)
 - ⑮ Item 606 Guard Rail, Type 5
 - ⑯ Item 622 Concrete Barrier
 - ⑰ Item 659 Seeding and Mulching (See General Notes)
 - ⑱ Standard Longitudinal Joint



SCALE: 3/8" = 1'-0"
HOWARD, NEEDLES, TAMMEN & BERGENOFF
MADE R.H.A. DATE 4/10/68 CONSULTING ENGINEERS
TRCD J.E.M. DATE 7/25/68
CKD J.M. DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

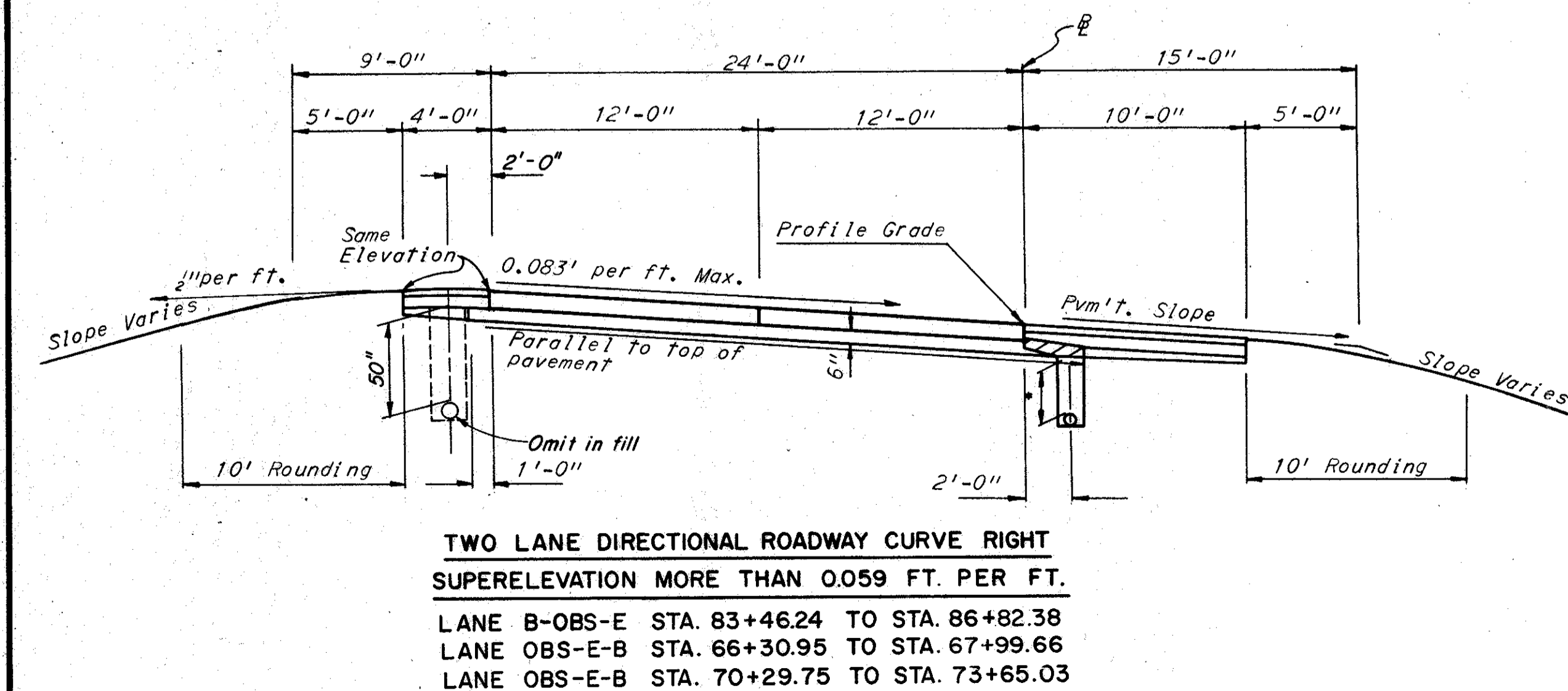
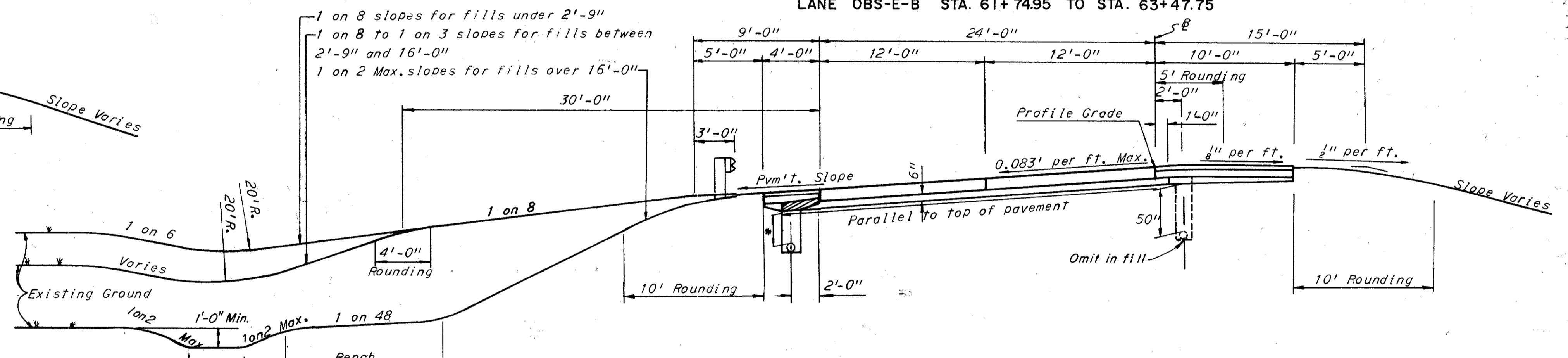
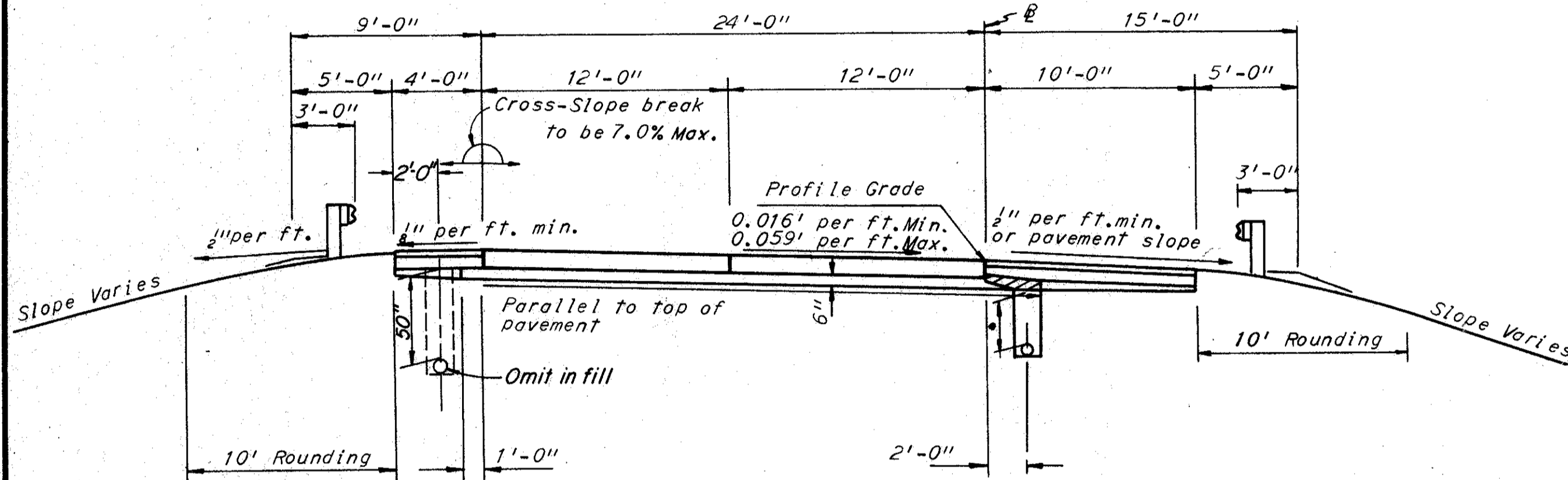
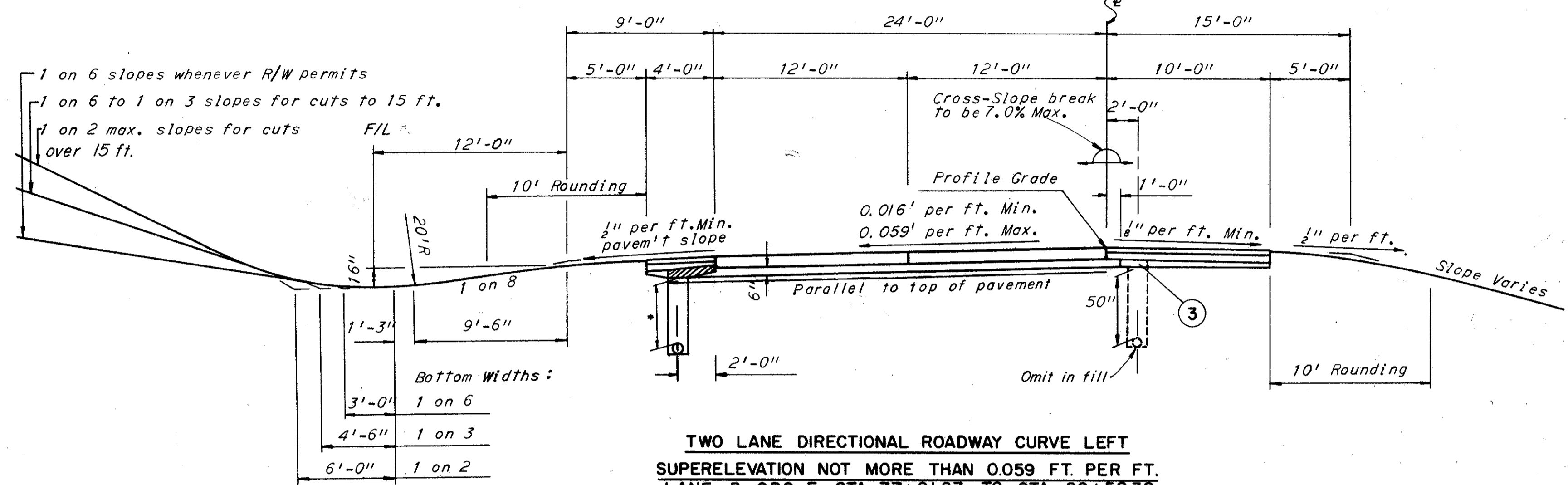
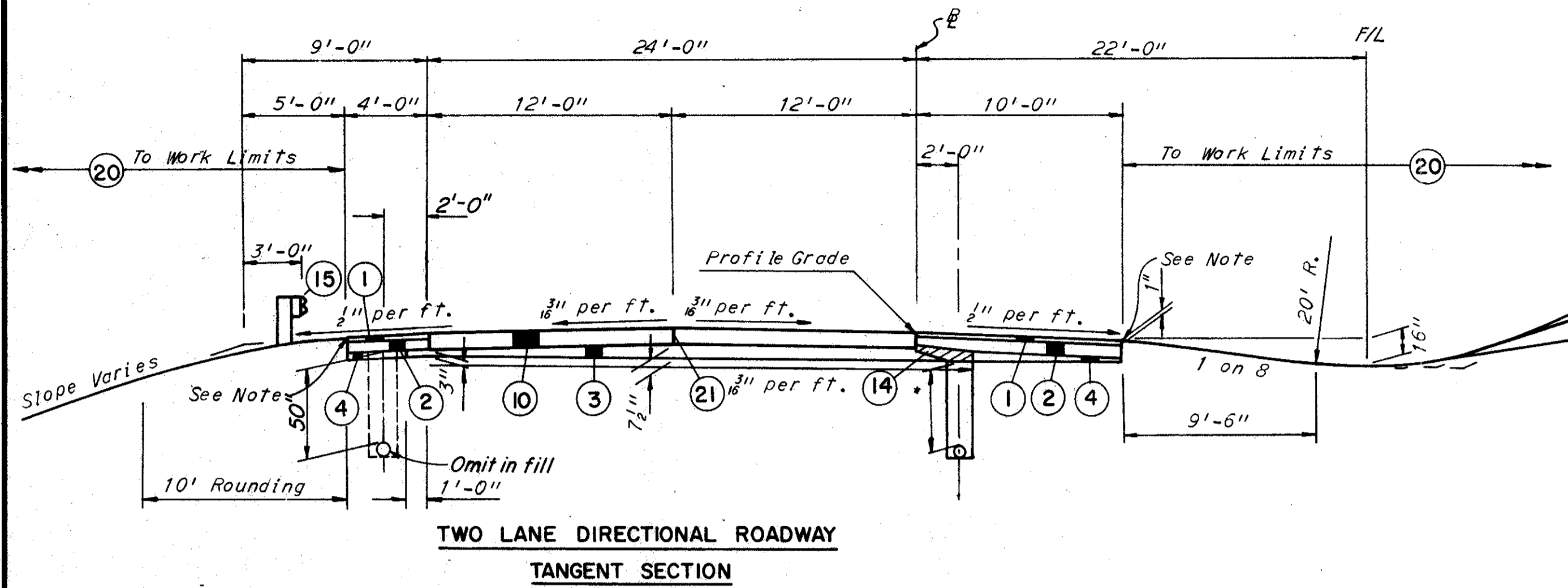
TYPICAL SECTIONS

TYPE 451

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
CUY. 480-21.40



- LEGEND**
- ① Item 301 Bituminous Aggregate Base 702.01 (35-100 AC-20) or 702.09 RT-11 or RT-12, as per plan (See Note in Proposal)
 - ② Item 304 Aggregate Base
 - ③ Item 310 Subbase, Grading "A", as per plan.
 - ④ Item 310 Subbase
 - ⑩ Item 451 10" Reinforced Portland Cement Concrete Pavement
 - ⑬ Item 605 6" Pipe Underdrains, as per plan
 - ⑭ Item Special Drainage Connection, using No.9 Aggregate (See Notes in proposal).
 - ⑮ Item 606 Guard Rail, Type 5
 - ⑳ Item 659 Seeding and Mulching (See General Notes)
 - ㉑ Standard Longitudinal Joint

NOTES:

All two lane directional roadway typical sections are shown facing in the direction of travel.

Unless otherwise noted, dimensions and/or callouts shown on the top left section shall apply to all sections on this sheet.

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

Earth shoulder adjacent to uncurbed pavement or paved shoulders shall be finished 1" below the pavement or paved shoulder edge.

*Unless otherwise shown in the plans, underdrains shall be laid parallel to the pavement edge with:

- 50" cover from bottom of subbase to the top of the pipe (deep in cut)
- 30" cover from bottom of subbase to the top of the pipe (shallow in fill and median)
- Transition from shallow to deep (unclassified)

SEQUENCE OF OPERATIONS:

- (1) Install pipe underdrain on outside shoulder, where required. Installation of shallow underdrain in median may be deferred until Item 451 is placed.
- (2) Place subbase out to outside edge of underdrain or to one foot beyond edge of pavement where no underdrain is present. Payment shall be made for all subbase placed on this operation.
- (3) Construct Item 451 pavement.
- (4) Remove subbase and any contaminated backfill over drain and replace with No.9 Aggregate as shown by ⑭.
- (5) Complete shoulder construction.

SCALE 3/16" = 1'-0"
MADE I.M. DATE 3-3-68
TRCD I.M. DATE 3-3-68
CKD R.P.R. DATE 4-3-68

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

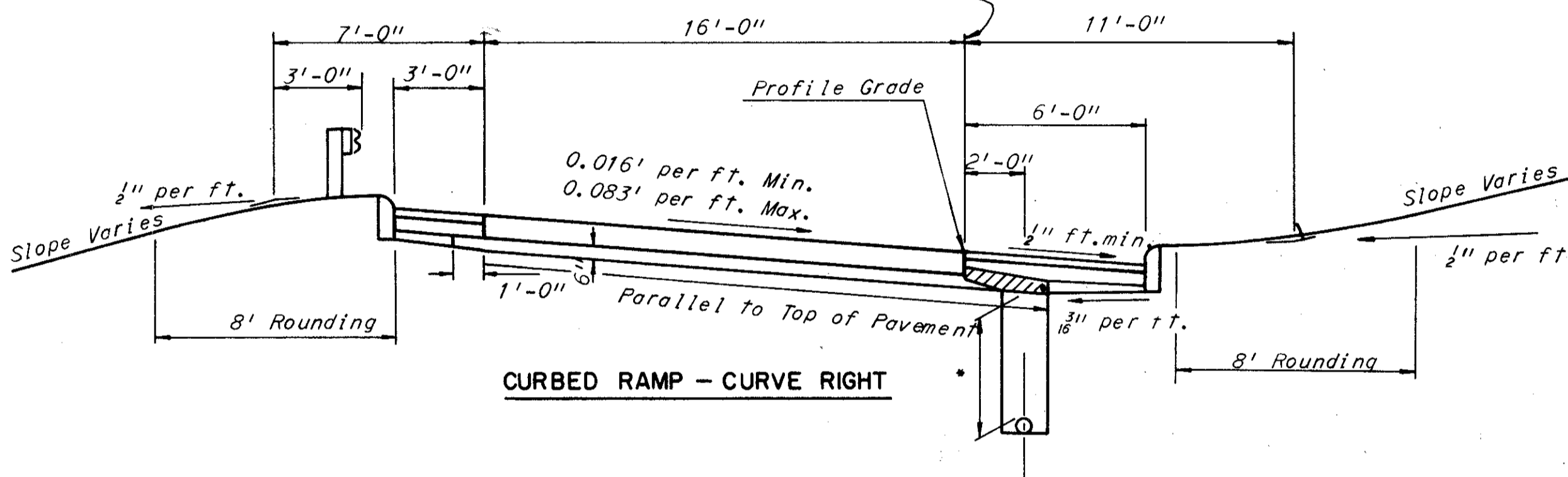
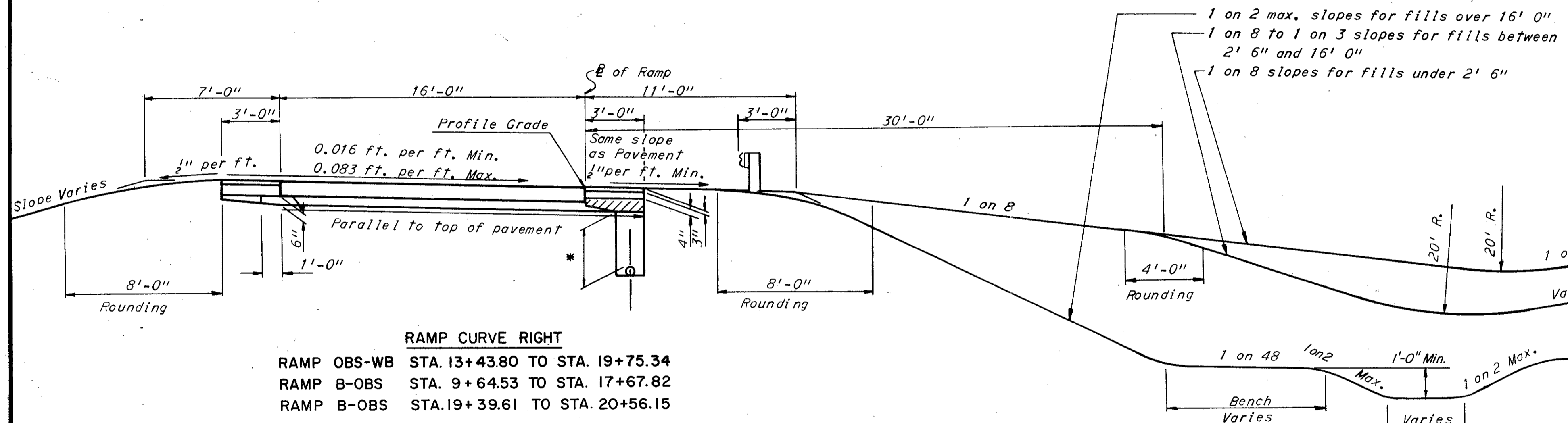
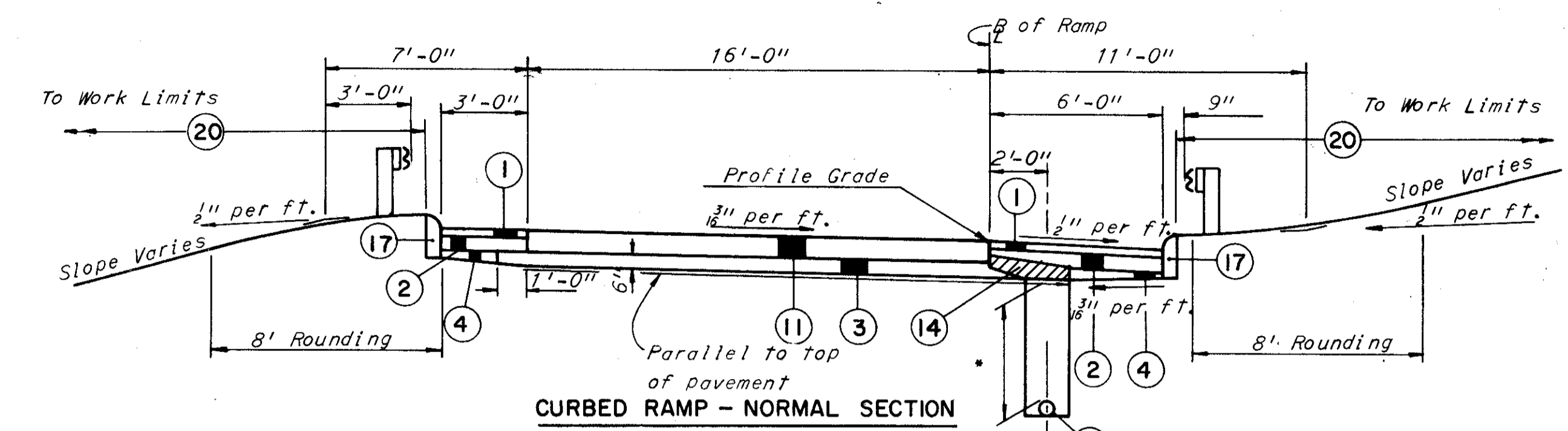
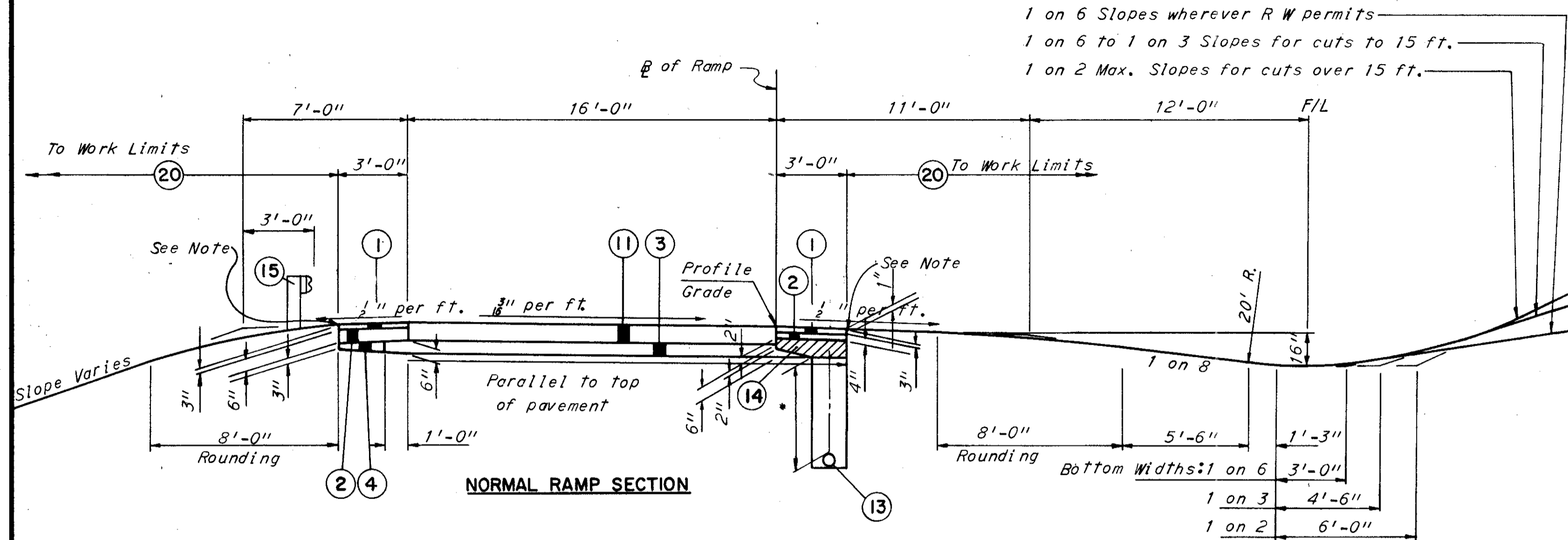
TYPICAL SECTIONS

TYPE 451

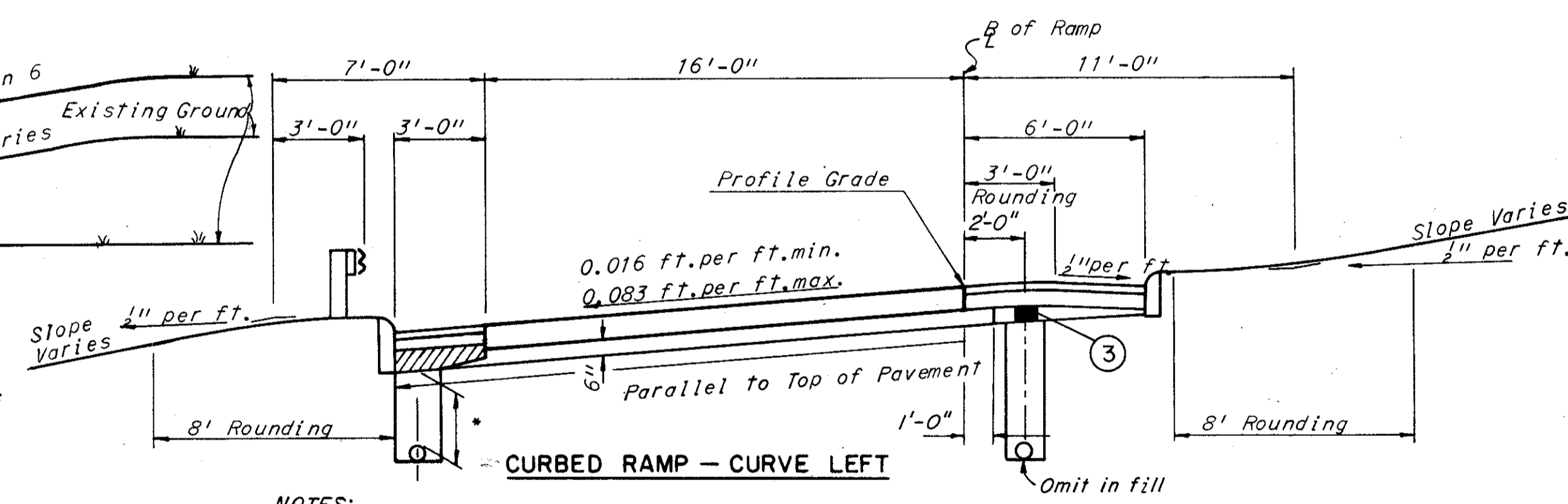
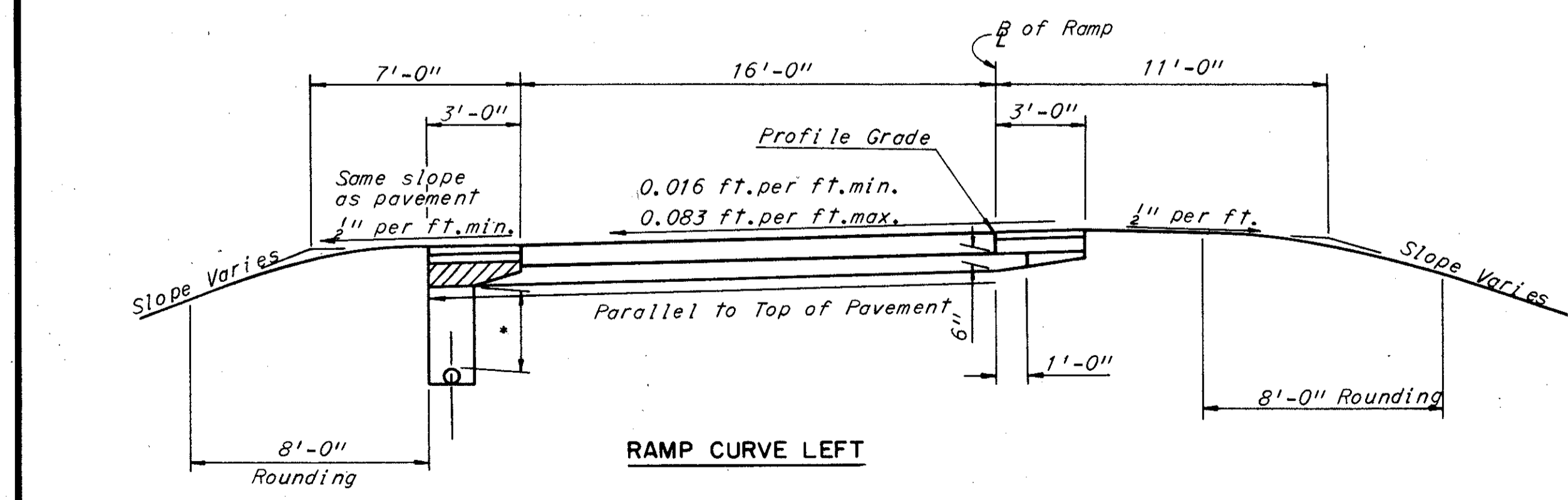
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY
CUY. 480-21.40



RAMP CURVE RIGHT
RAMP OBS-WB STA. 13+43.80 TO STA. 19+75.34
RAMP B-OBS STA. 9+64.53 TO STA. 17+67.82
RAMP B-OBS STA. 19+39.61 TO STA. 20+56.15



- LEGEND**
- ① Item 301 Bituminous Aggregate Base 702.01 (85-100 AC-20) or 702.09, RT-11 or RT-12, as per plan (See note in proposal)
 - ② Item 304 Aggregate Base
 - ③ Item 310 Subbase, Grading "A", as per plan.
 - ④ Item 310 Subbase
 - ⑪ Item 451 9" Reinforced Portland Cement Concrete Pavement
 - ⑬ Item 605 6" Pipe Underdrains, as per plan
 - ⑭ Item Special Drainage Connection, using No. 9 Aggregate (See Note in Proposal)
 - ⑮ Item 606 Guard Rail, Type 5
 - ⑰ Item 609 Concrete Curb, Standard Type 6
 - ⑳ Item 659 Seeding and Mulching (See General Notes)

NOTES:

All ramp typical sections are shown facing in the direction of travel. Unless otherwise noted, dimensions and/or callouts shown on the top section shall apply to the sections below it.

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

Earth shoulders adjacent to uncurbed pavement or paved shoulders shall be finished 1" below the pavement or paved shoulder edge.

*Unless otherwise shown in the plans, underdrains shall be laid parallel to the pavement edge with:

- 50" cover from bottom of subbase to the top of the pipe (deep in cut)
- 30" cover from bottom of subbase to the top of the pipe (shallow in fill median)
- Transition from shallow to deep (unclassified)

- SEQUENCE OF OPERATIONS:**
- (1) Install pipe underdrain on outside shoulder, where required.
 - (2) Place subbase out to outside edge of underdrain or to one foot beyond edge of pavement where no underdrain is present. Payment shall be made for all subbase placed on this operation.
 - (3) Construct Item 451 pavement.
 - (4) Remove subbase and any contaminated backfill over drain and replace with as shown by ⑭.
 - (5) Complete shoulder construction.

SCALE 1/4" = 1'-0"
MADE IM DATE 3-21-68
TRCD IM DATE 3-21-68
CKD PPR DATE 4-3-68
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

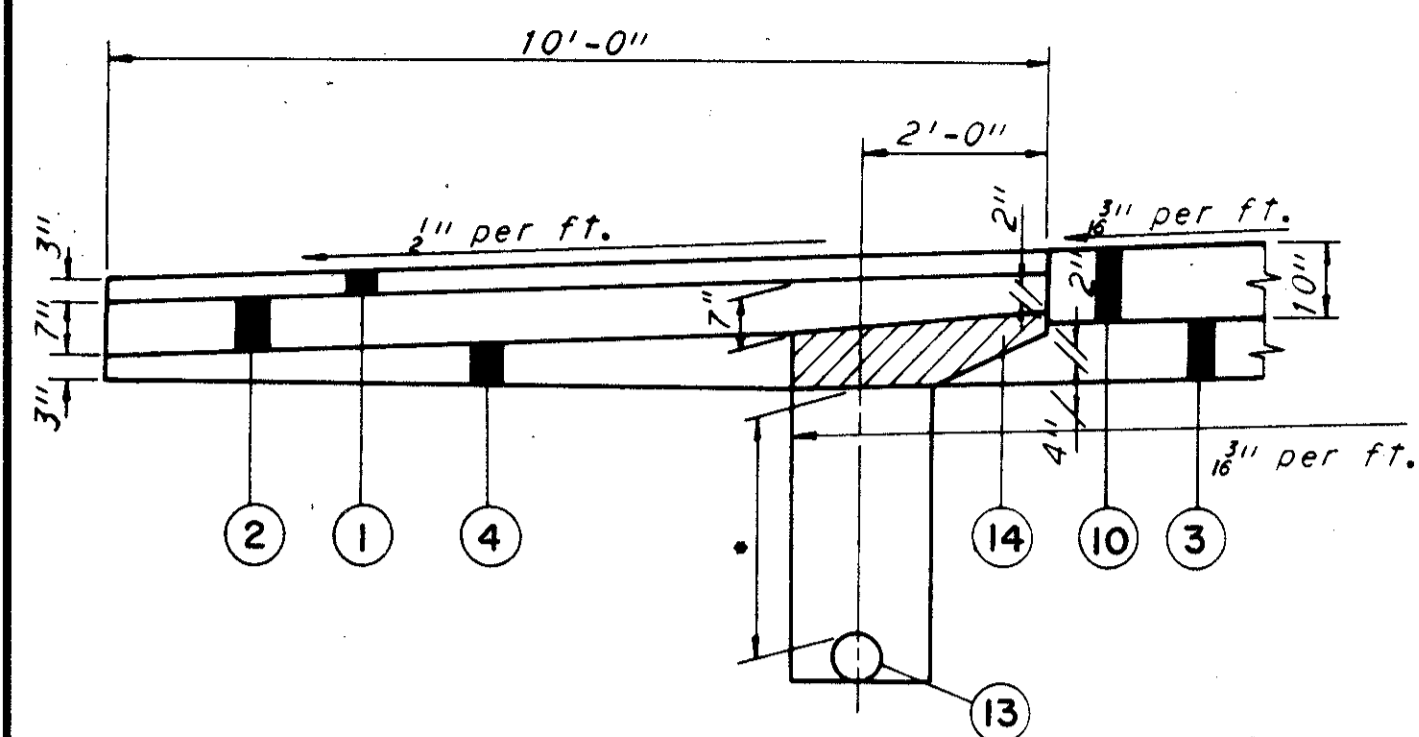
TYPICAL SECTIONS

TYPE 451 PAVED SHOULDERS

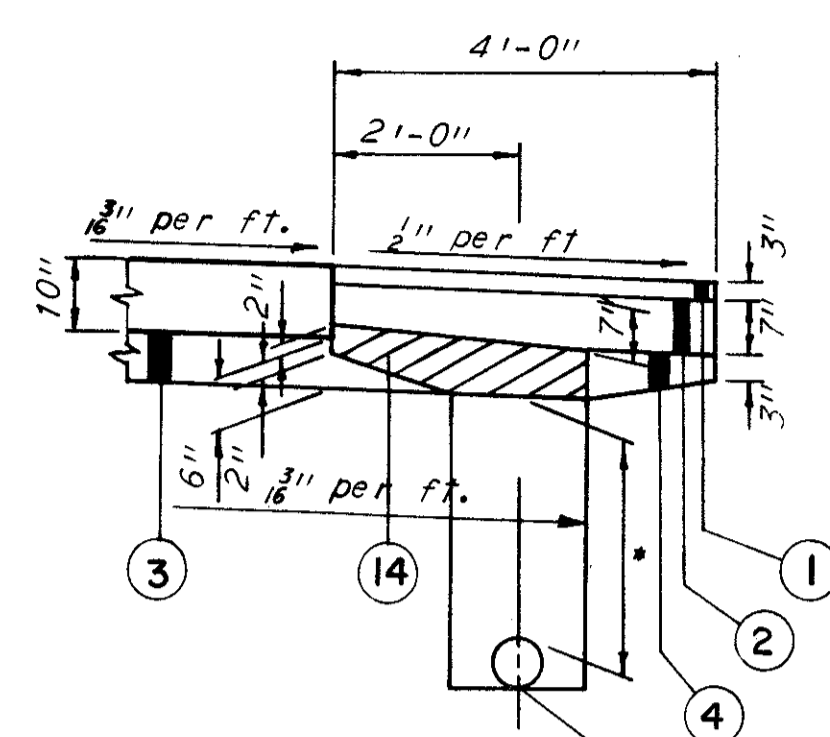
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

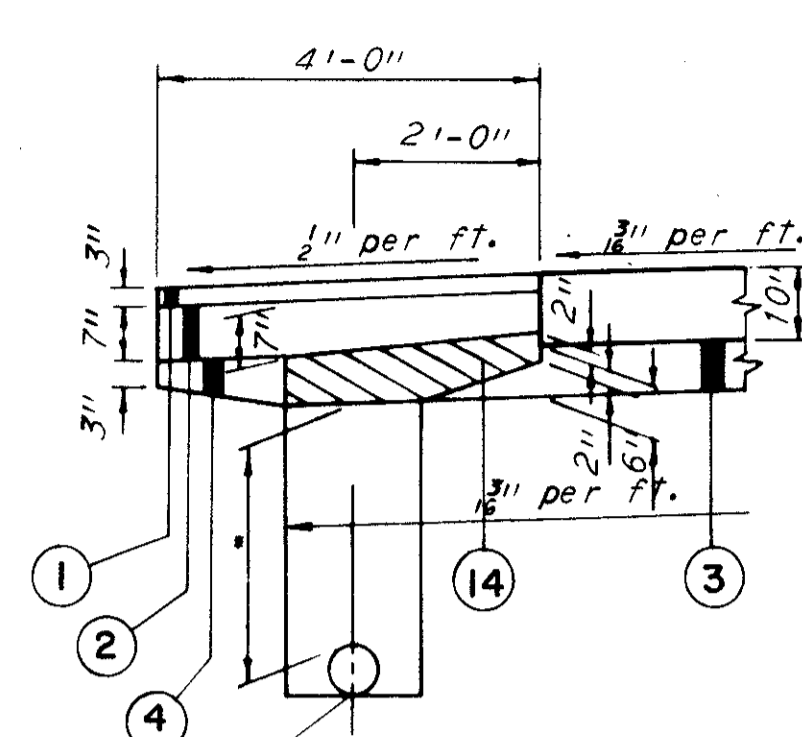
CUYAHOGA COUNTY
CUY.480-21.40



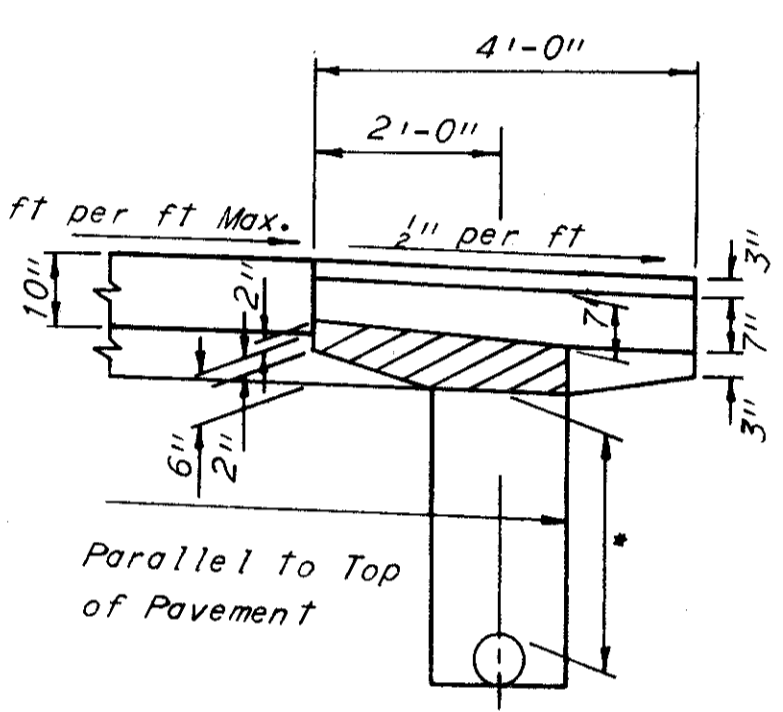
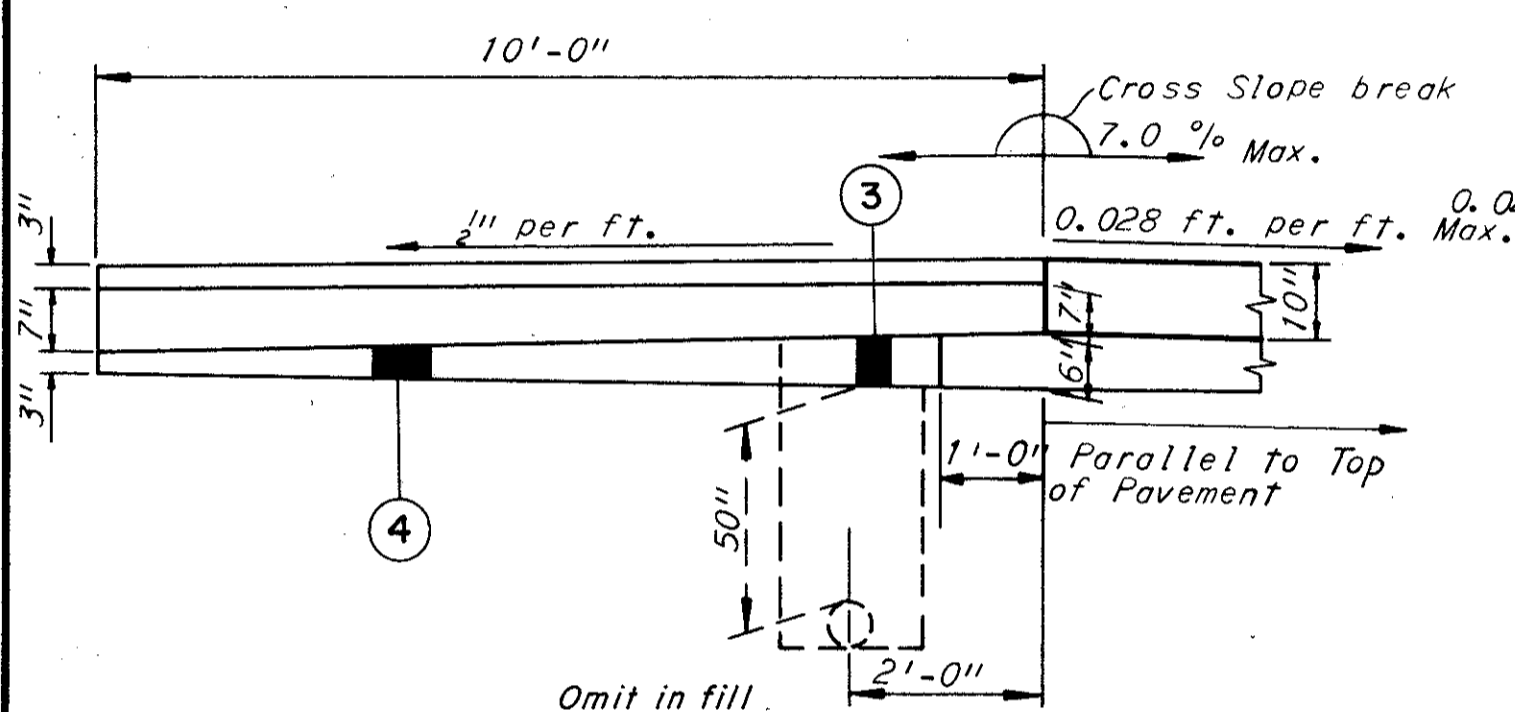
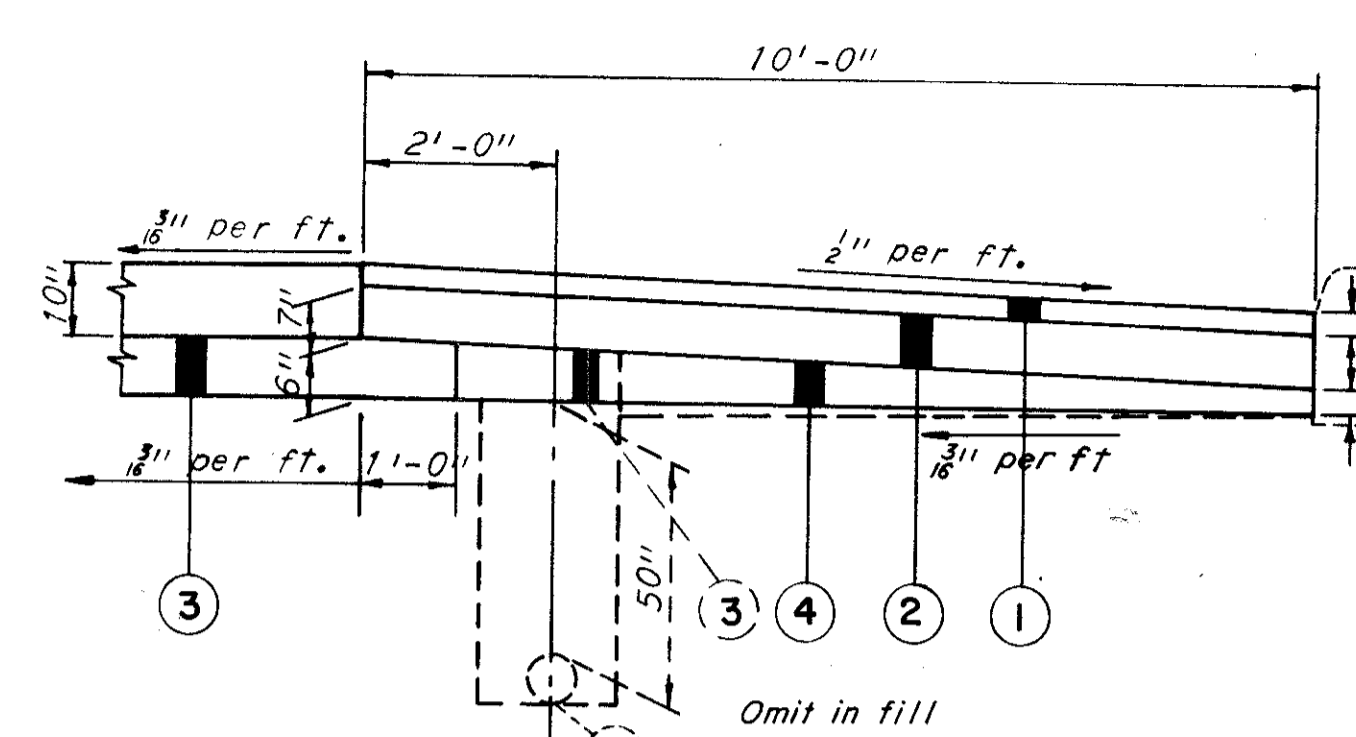
THREE PAVEMENT LANES OR MORE



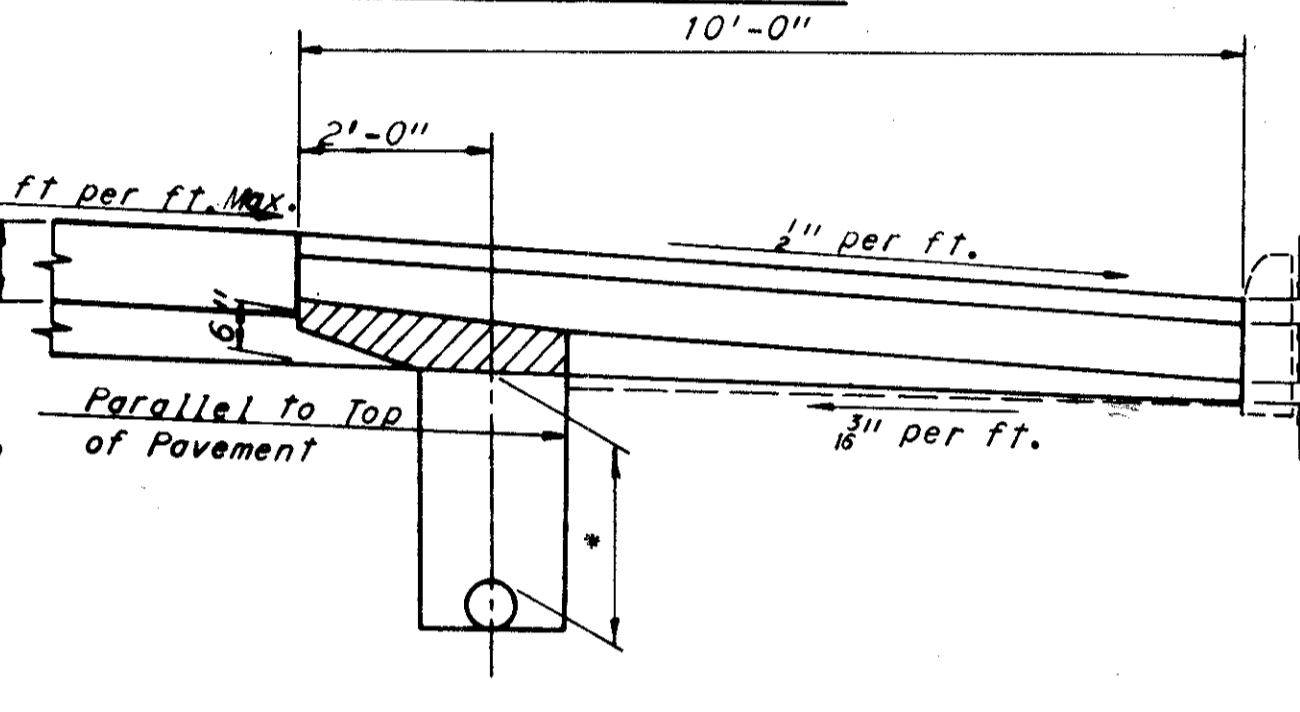
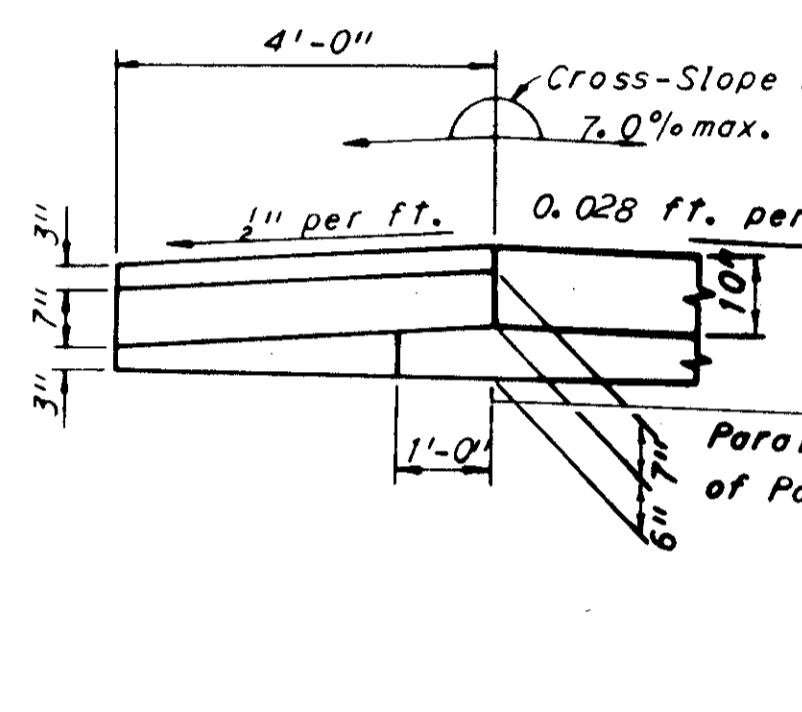
NORMAL SECTION



TWO PAVEMENT LANES



TRANSITION SECTION



NOTES:

Unless otherwise noted, dimensions and/or callouts shown on the top section shall apply to the sections below it.

Unless otherwise shown in the plans, underdrains shall be laid parallel to the pavement edge with:

50" cover from bottom of subbase to the top of the pipe (deep in cut)

30" cover from bottom of subbase to the top of the pipe (shallow in fill and median)

Transition from shallow to deep (unclassified)

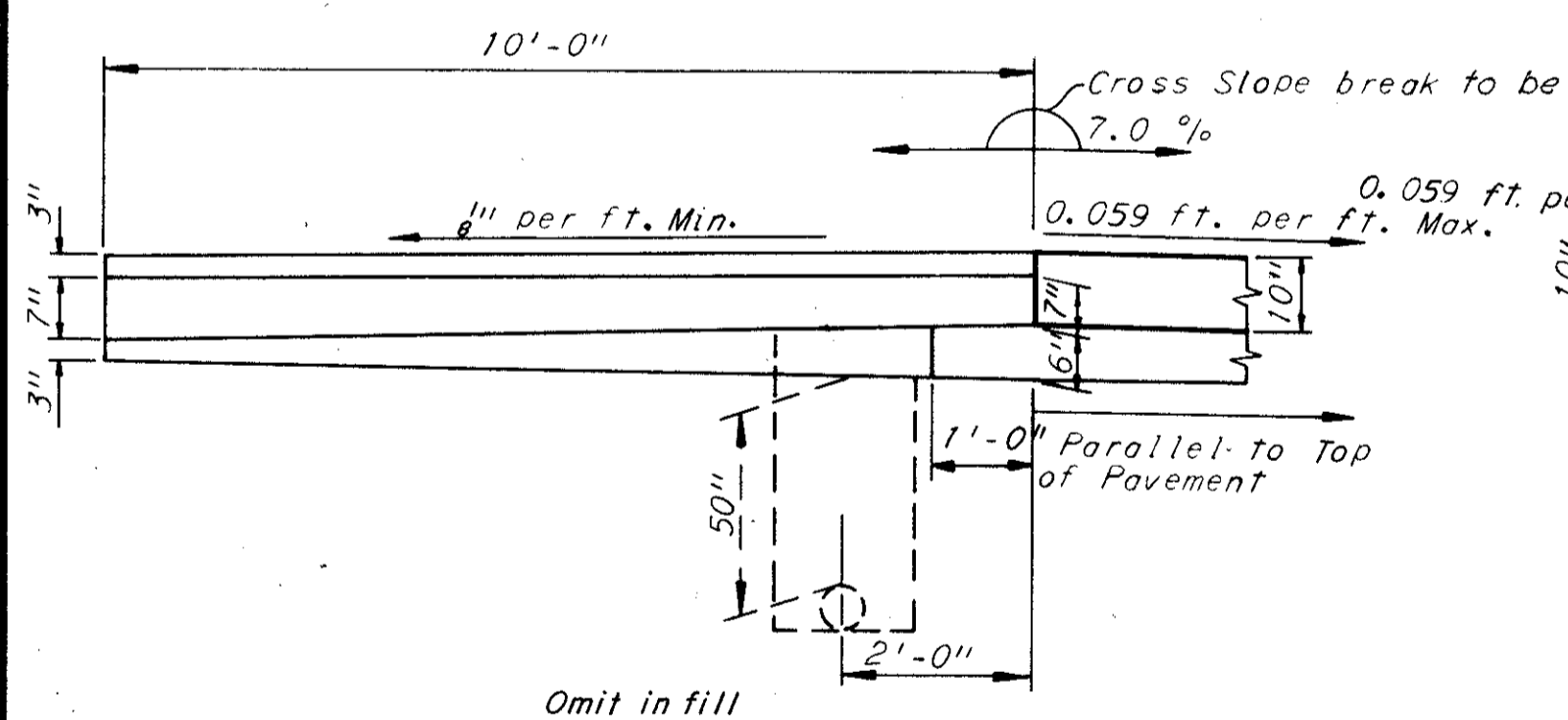
The paved shoulder details shown on this sheet, except for the section shown in the top left corner, shall apply for any width of pavement.

SEQUENCE OF OPERATIONS:

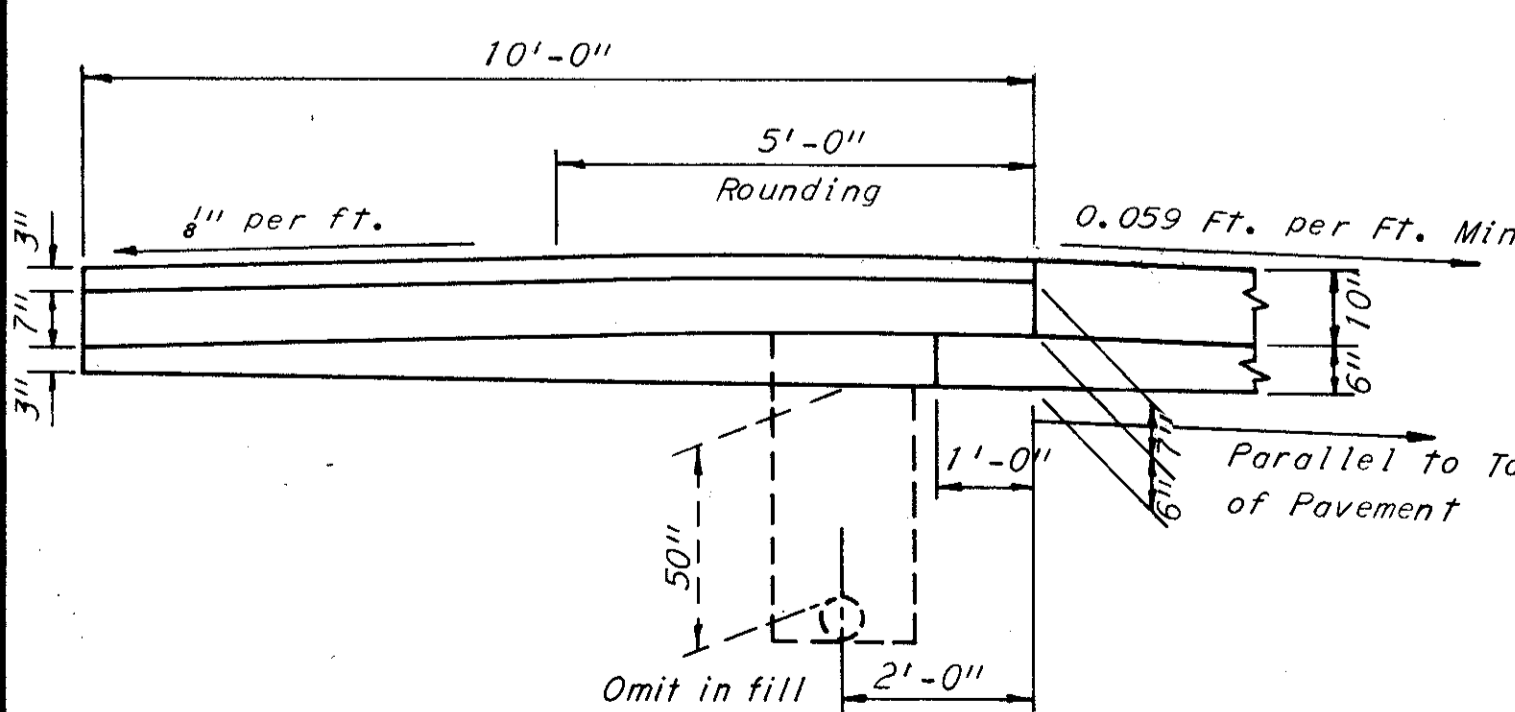
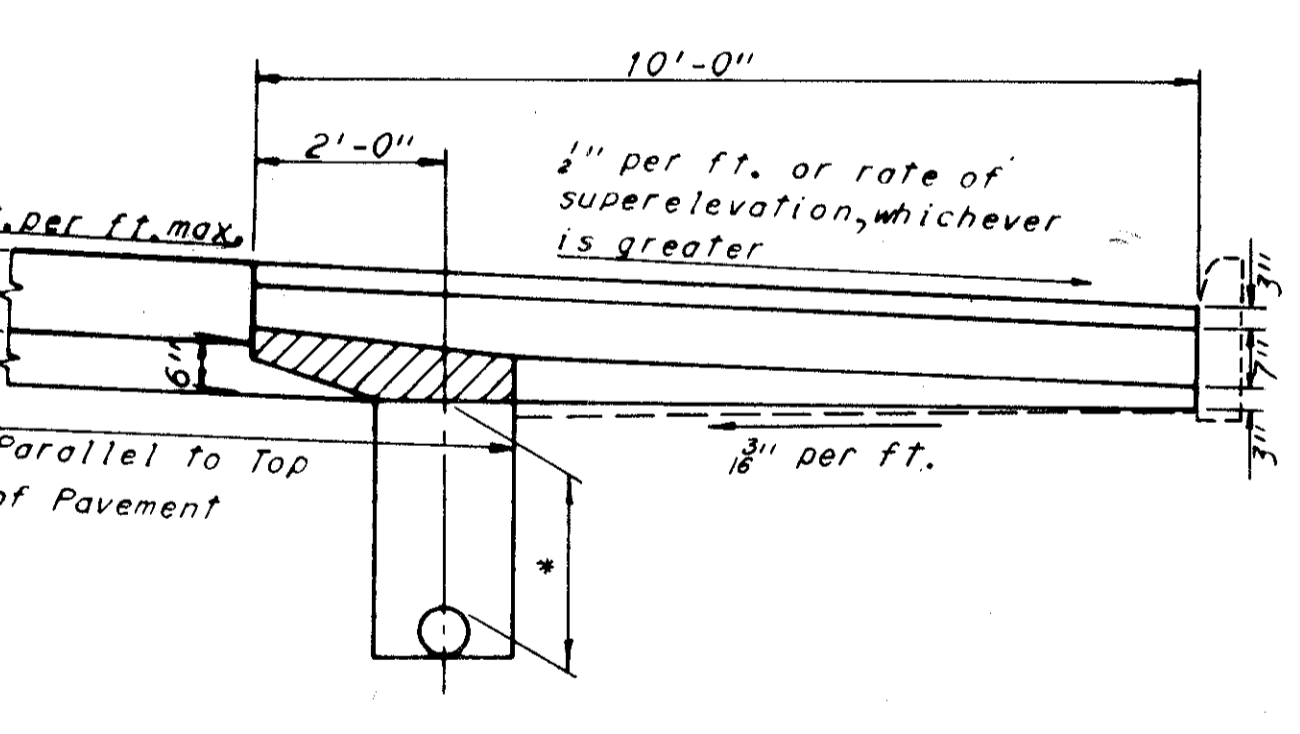
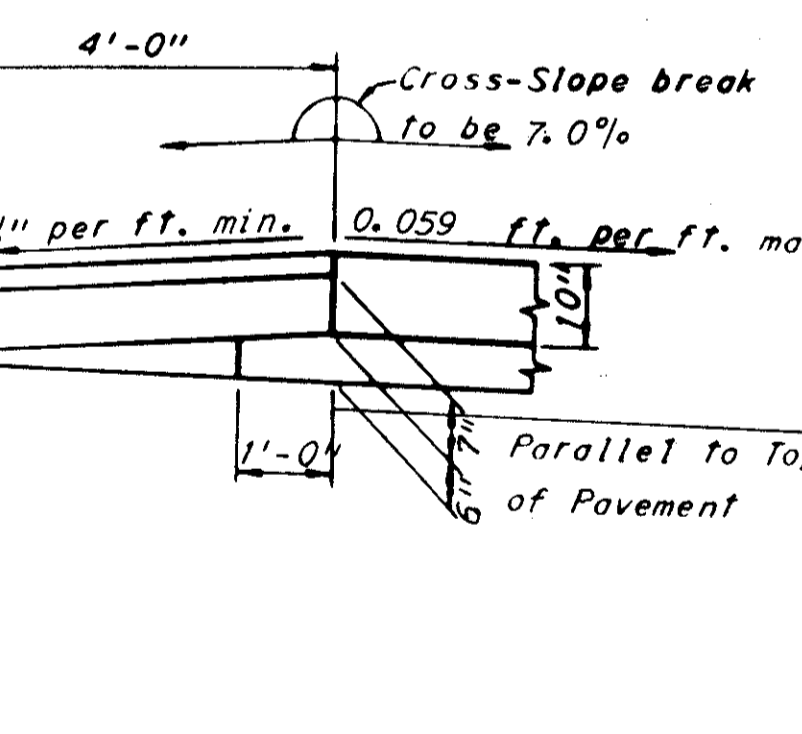
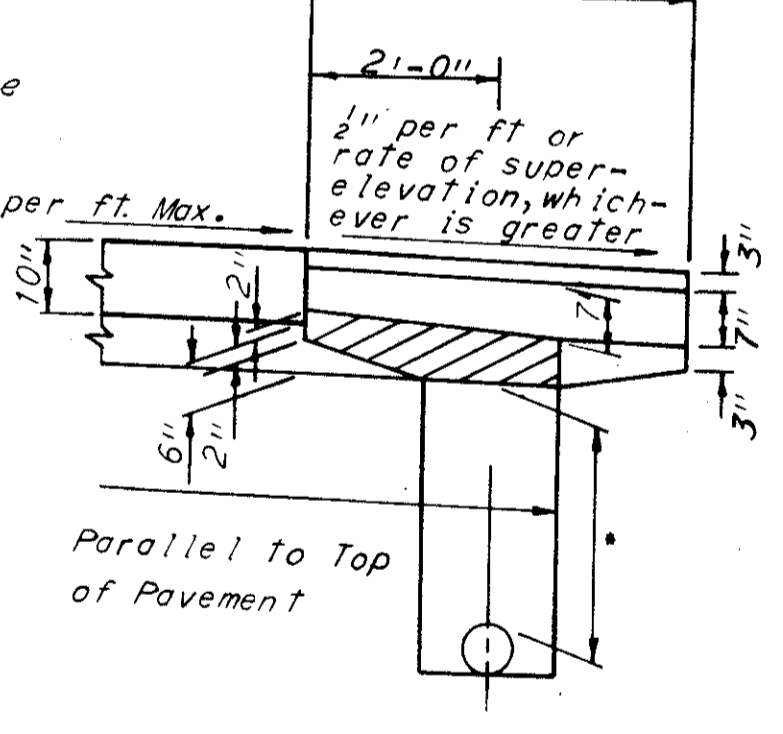
- Install pipe underdrain on outside shoulder, where required. Installation of shallow underdrain in median may be deferred until Item 451 is placed.
- Place subbase out to outside edge of underdrain or to one foot beyond edge of pavement where no underdrain is present. Payment shall be made for all subbase placed on this operation.
- Construct Item 451 pavement.
- Remove subbase and any contaminated backfill over drain and replace with No.9 Aggregate, as shown by (14).
- Complete shoulder construction.

LEGEND

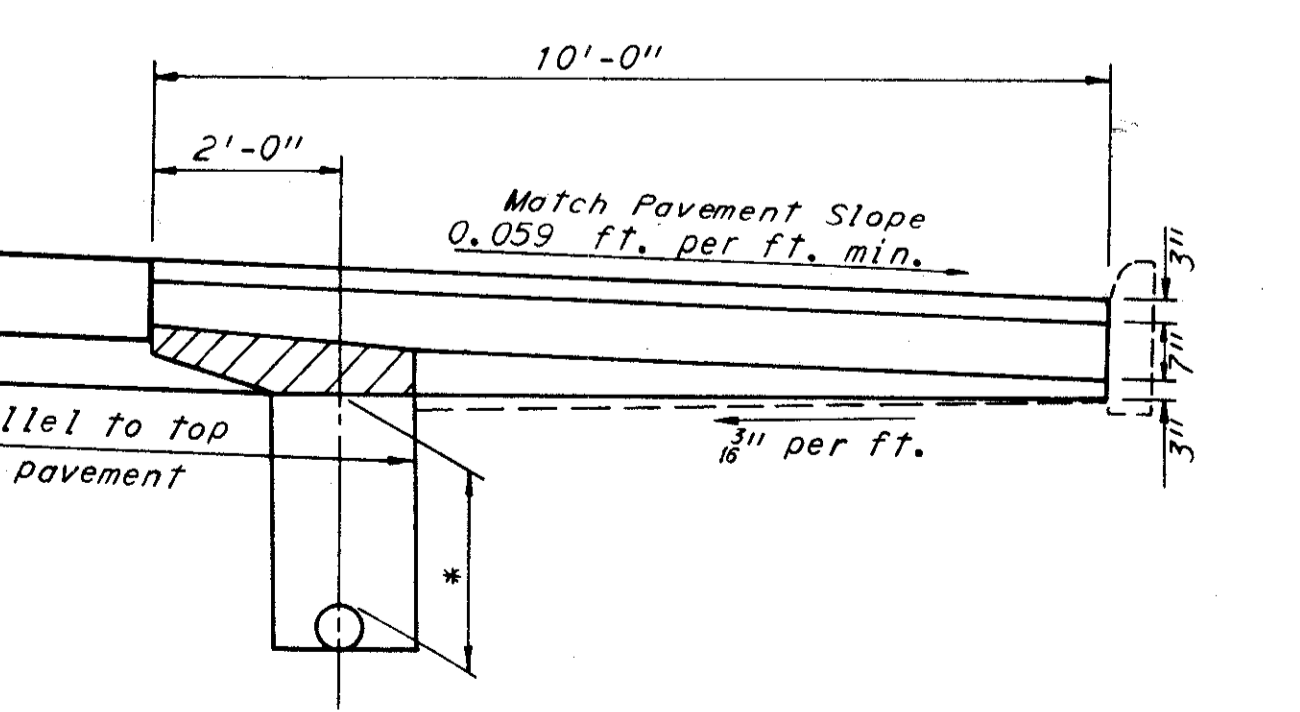
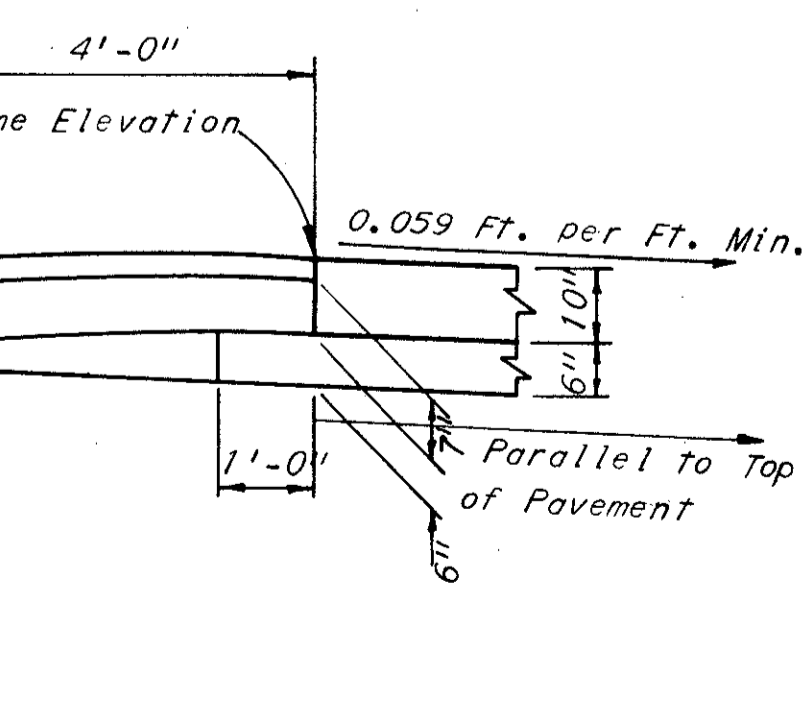
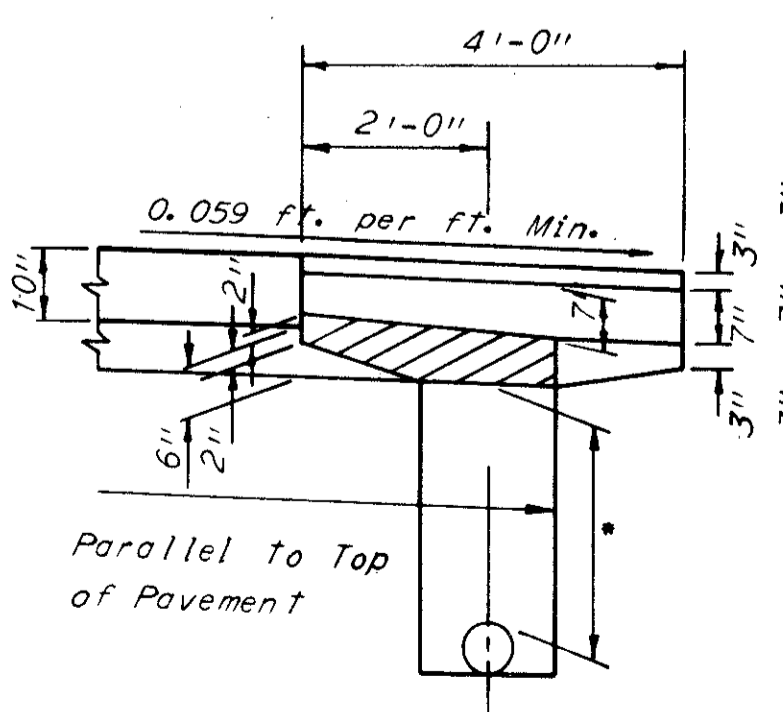
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|---|--------------|--------------------------------------------------------------------------------------------------------------|
| ① | Item 301 | Bituminous Aggregate Base 702.01(85-100 AC-20) or 702.09, RT-11 or RT-12, as per plan (See note in proposal) |
| ② | Item 304 | Aggregate Base |
| ③ | Item 310 | Subbase, Grading "A", as per plan. |
| ④ | Item 310 | Subbase |
| ⑩ | Item 451 | 10" Reinforced Portland Cement Concrete Pavement |
| ⑬ | Item 605 | 6" Pipe Underdrains, as per plan |
| ⑭ | Item Special | Drainage Connection, using No.9 Aggregate (See Note in Proposal) |



SUPERELEVATION NOT MORE THAN 0.059 FT. PER FT.



SUPERELEVATION MORE THAN 0.059 FT. PER FT.



SCALE: 1/2" = 1'-0"
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE SDH DATE 1-21-68 CONSULTING ENGINEERS
 TRCD SDH DATE 1-22-68
 CKD RPR DATE 1-25-68 KANSAS CITY CLEVELAND NEW YORK

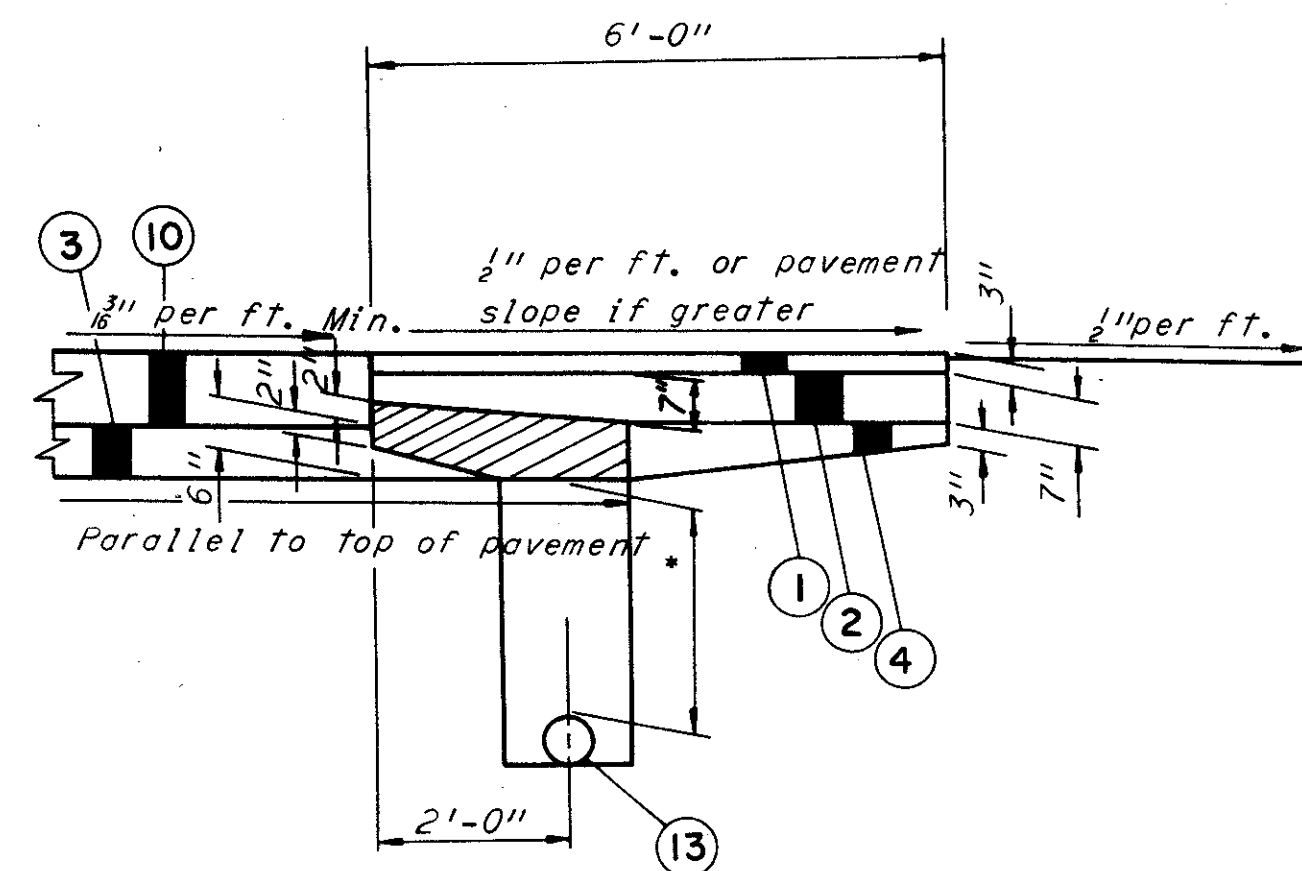
TYPICAL SECTIONS

TYPE 451 PAVED SHOULDERS

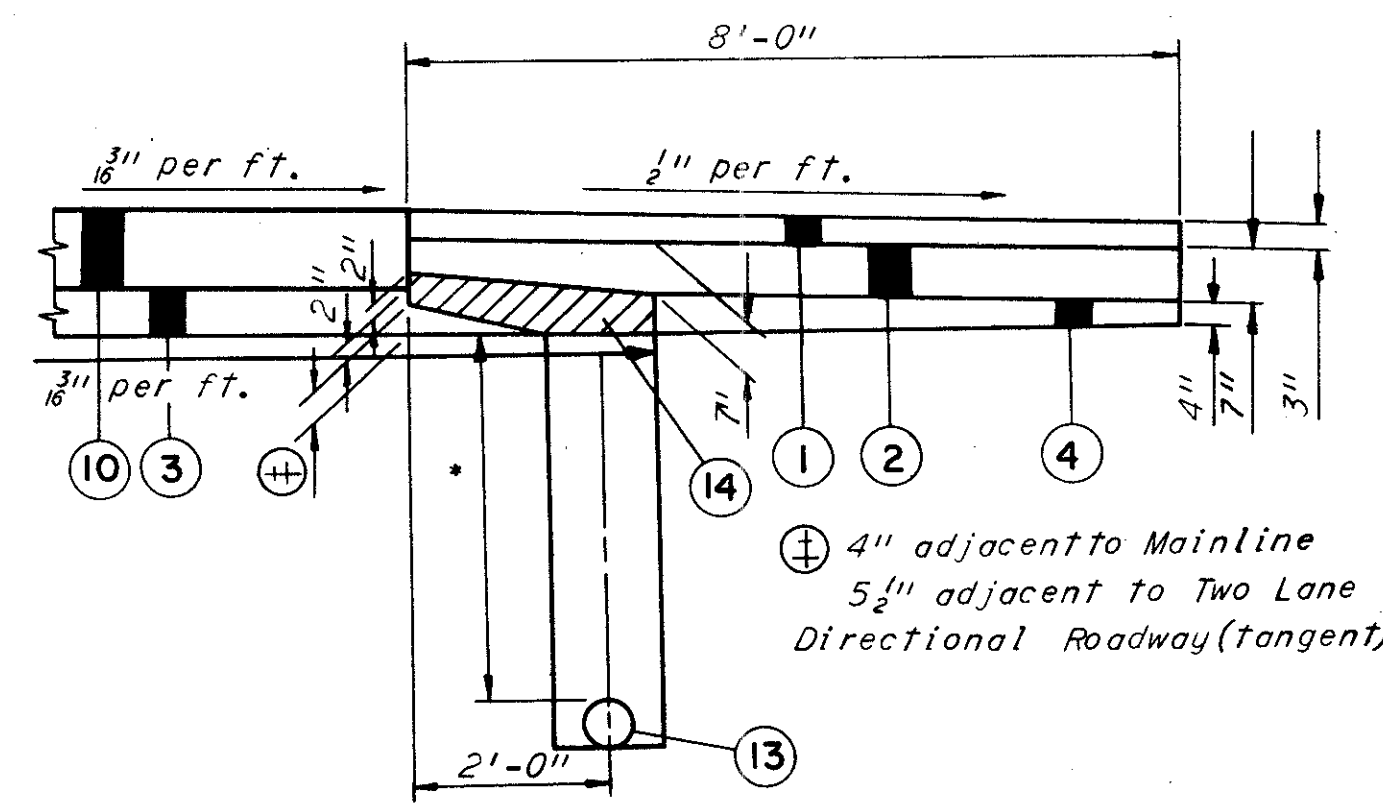
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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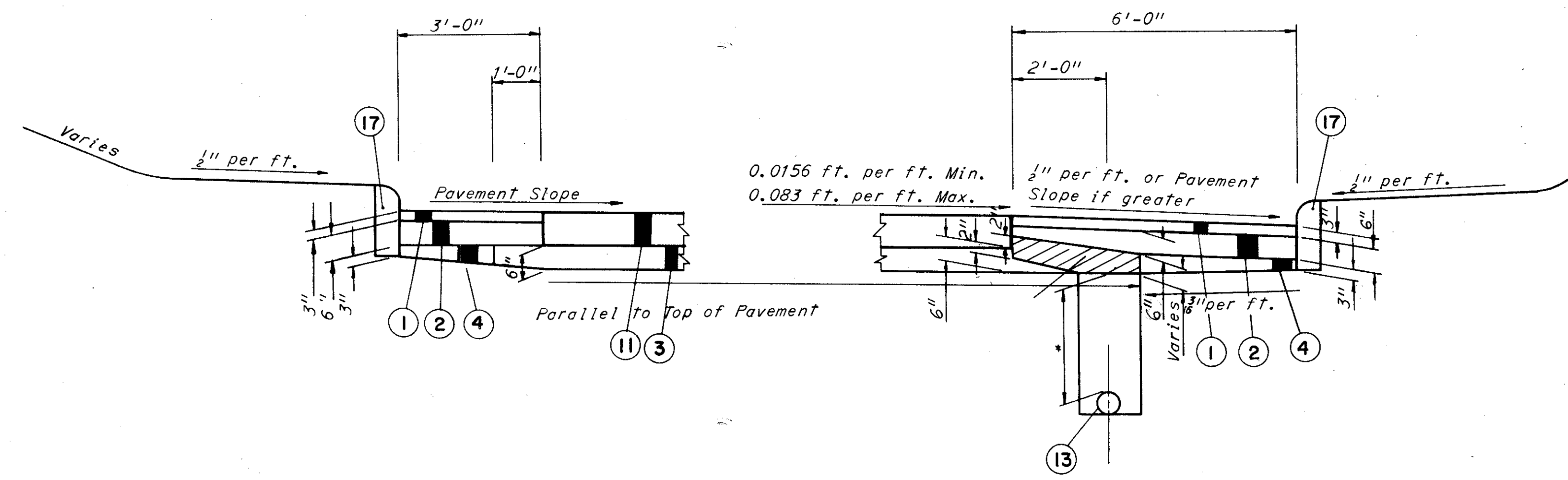
CUYAHOGA COUNTY
CUY. 480-21.40



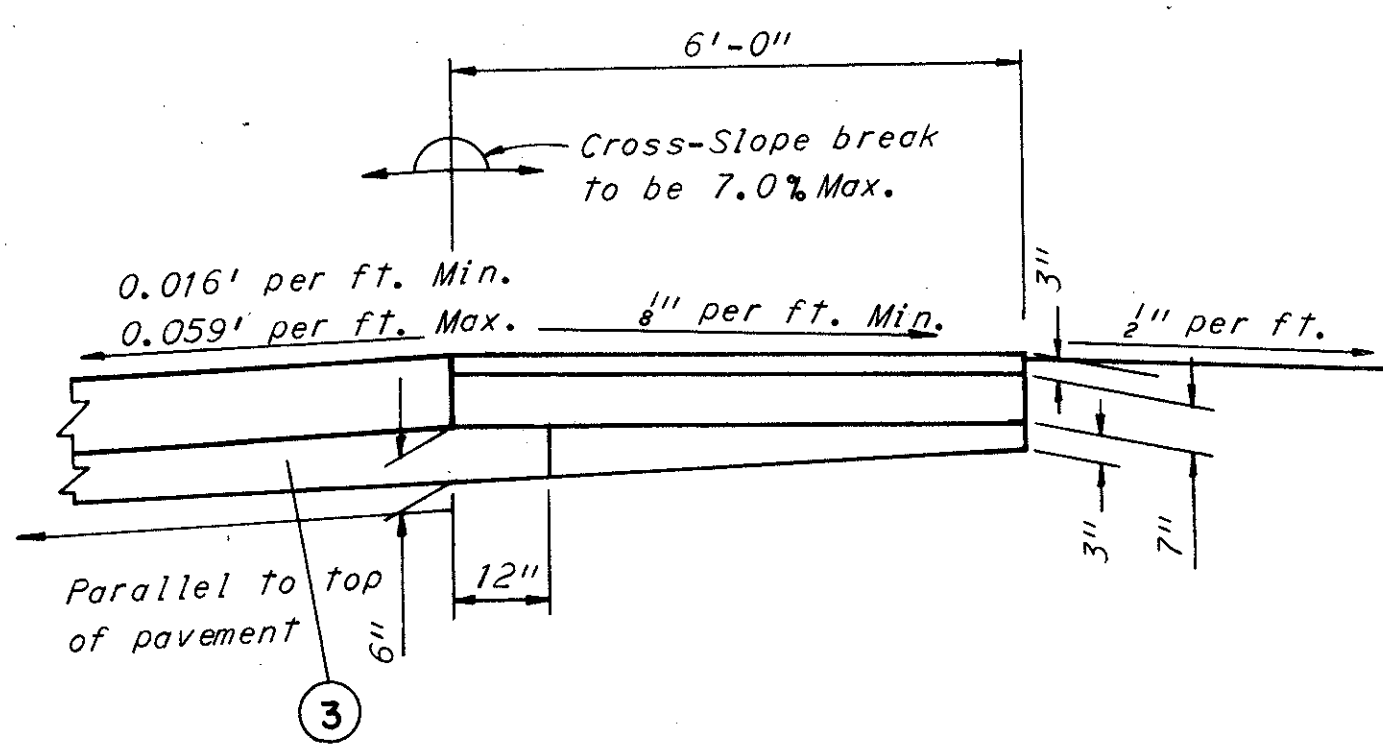
TANGENT SECTION OR CURVE RIGHT



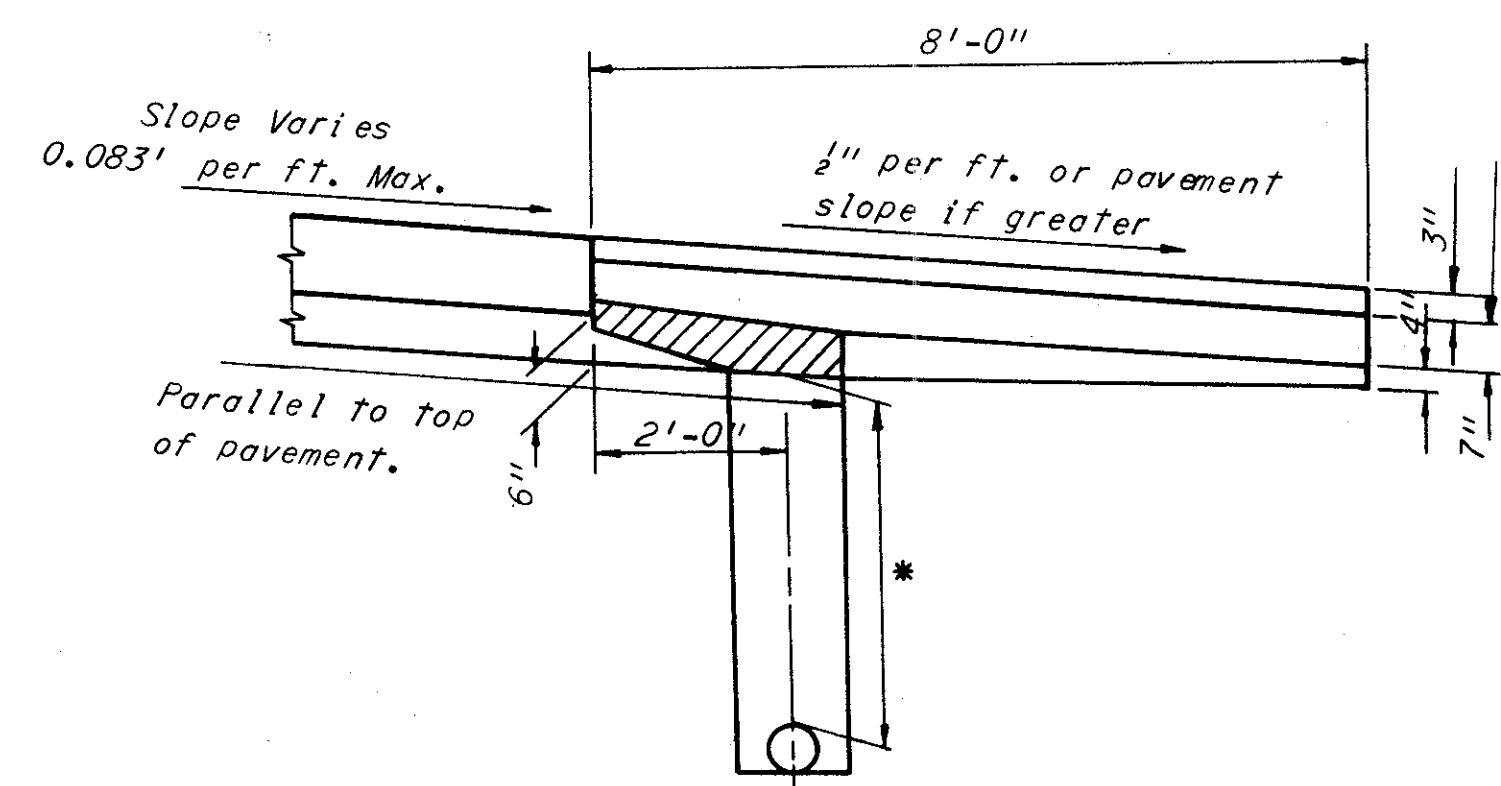
NORMAL SECTION



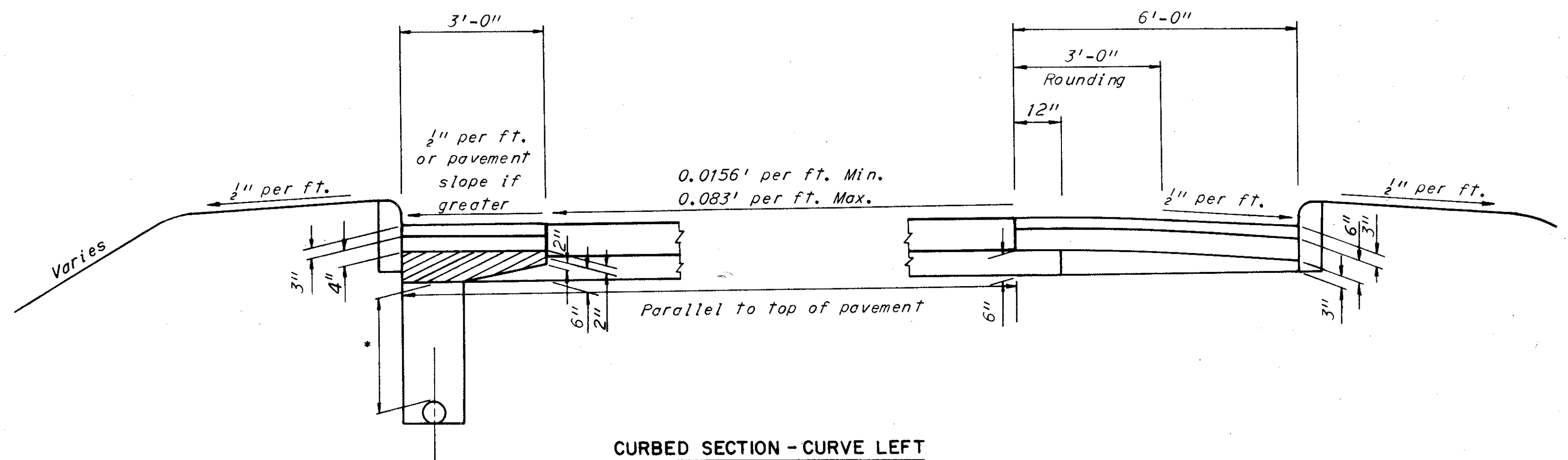
CURBED SECTION - TANGENT OR CURVE RIGHT



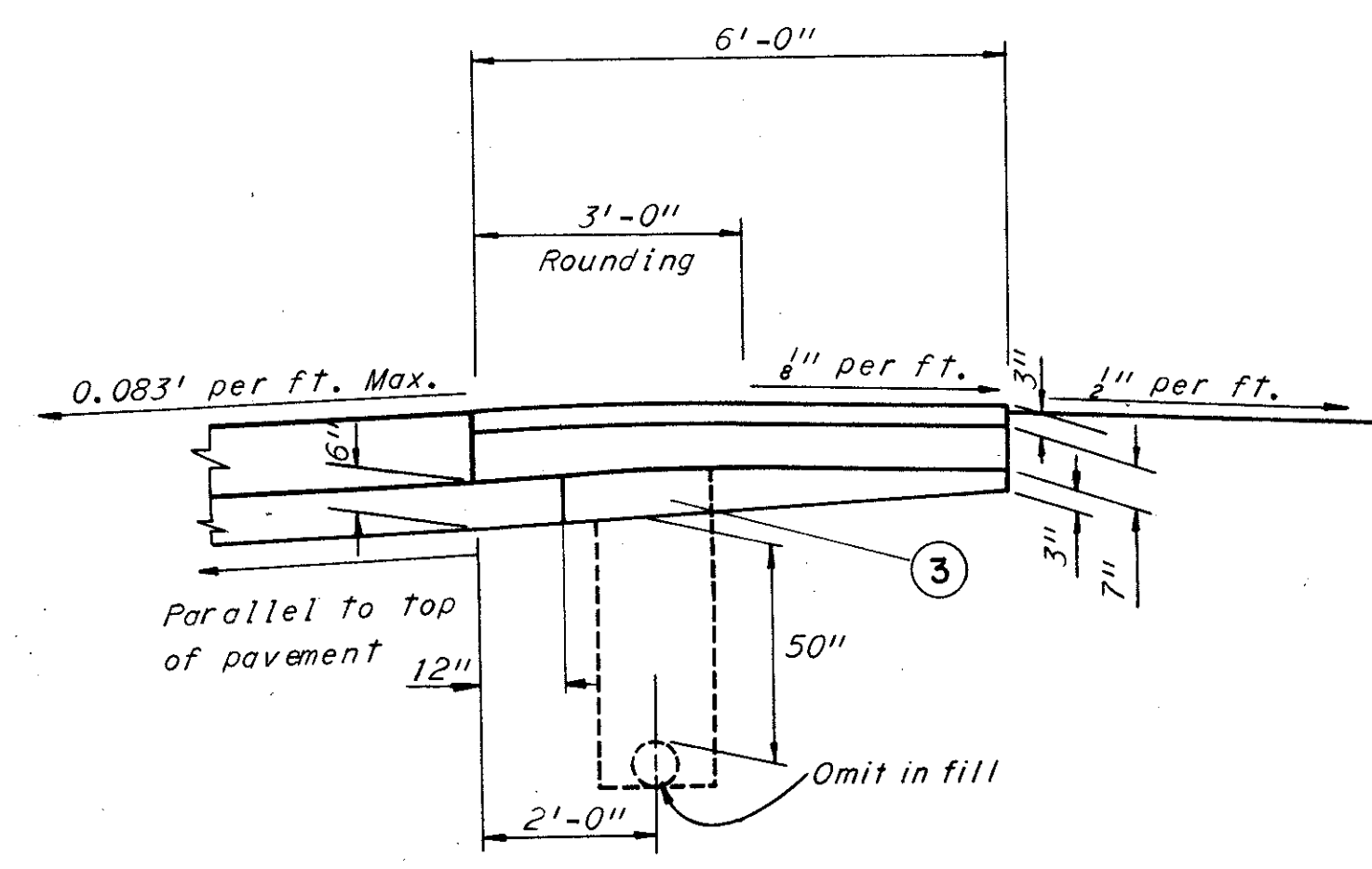
CURVE LEFT - S.E. NOT MORE THAN 0.059 FT. PER FT.



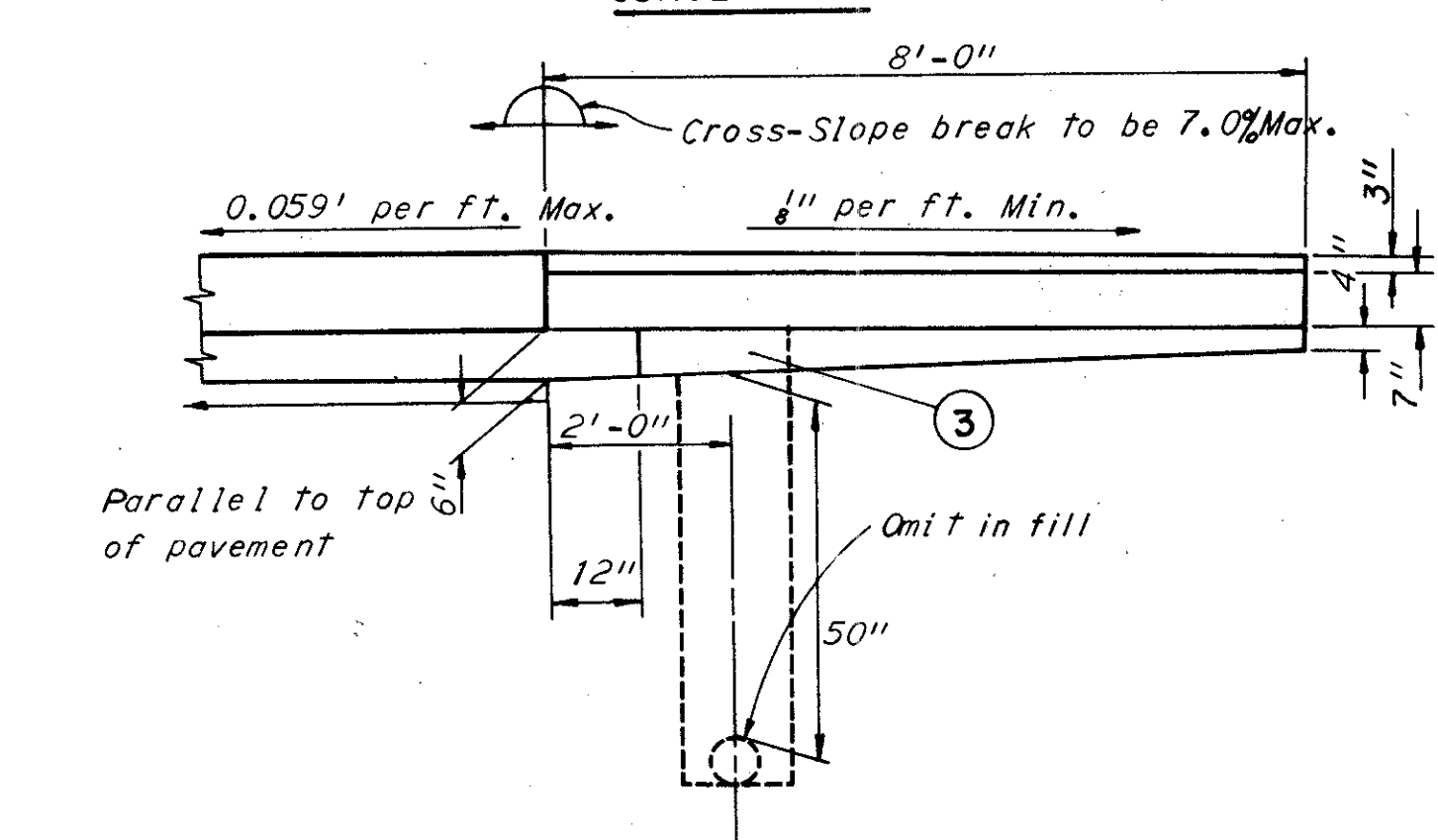
CURVE RIGHT



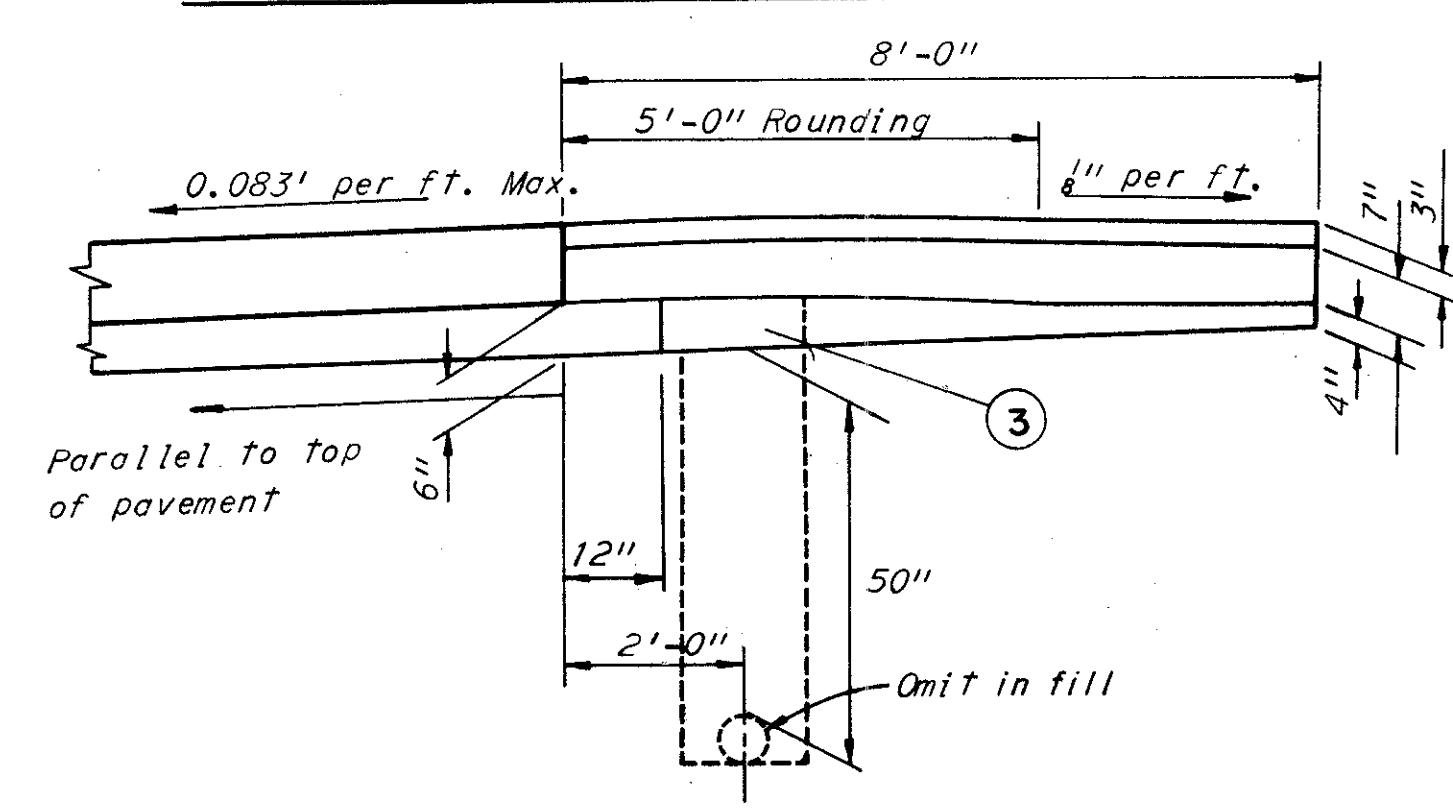
CURBED SECTION - CURVE LEFT



CURVE LEFT - S.E. MORE THAN 0.059 FT. PER FT.



CURVE LEFT - S.E. NOT MORE THAN 0.059 FT. PER FT.



CURVE LEFT - S.E. MORE THAN 0.059 FT. PER FT.

LEGEND

- ① Item 301 Bituminous Aggregate Base 702.01 (85-100 AC-20) or 702.09, RT-11 or RT-12, as per plan (See note in proposal)
- ② Item 304 Aggregate Base
- ③ Item 310 Subbase, Grading "A", as per plan.
- ④ Item 310 Subbase
- ⑩ Item 451 10" Reinforced Portland Cement Concrete Pavement
- ⑪ Item 451 9" Reinforced Portland Cement Concrete Pavement
- ⑬ Item 605 6" Pipe Underdrains, as per plan
- ⑭ Item Special Drainage Connection, using No. 9 Aggregate (See Note in Proposal)
- ⑰ Item 609 Concrete Curb, Standard Type 6

NOTES:

- Unless otherwise noted, dimensions and/or callouts shown on the top section shall apply to the sections below it.
- *Unless otherwise shown in the plans, underdrains shall be laid parallel to the pavement edge with:
- 50" cover from bottom of subbase to the top of the pipe (deep in cut)
- 30" cover from bottom of subbase to the top of the pipe (shallow in fill and median)
- Transition from shallow to deep (unclassified)

SEQUENCE OF OPERATIONS:

- (1) Install pipe underdrain on outside shoulder, where required. Installation of shallow underdrain in median may be deferred until Item 451 is placed.
- (2) Place subbase out to outside edge of underdrain or to one foot beyond edge of pavement where no underdrain is present. Payment shall be made for all subbase placed in this operation.
- (3) Construct Item 451 pavement.
- (4) Remove subbase and any contaminated backfill over drain and replace with No. 9 Aggregate, as shown by ⑭.
- (5) Complete shoulder construction.

SCALE 1/2" = 1'-0"
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE 1 M DATE 3-14-68 CONSULTING ENGINEERS
 TRCD 1 M DATE 3-14-68
 CKD R.P.R. DATE 4-4-68 KANSAS CITY CLEVELAND NEW YORK

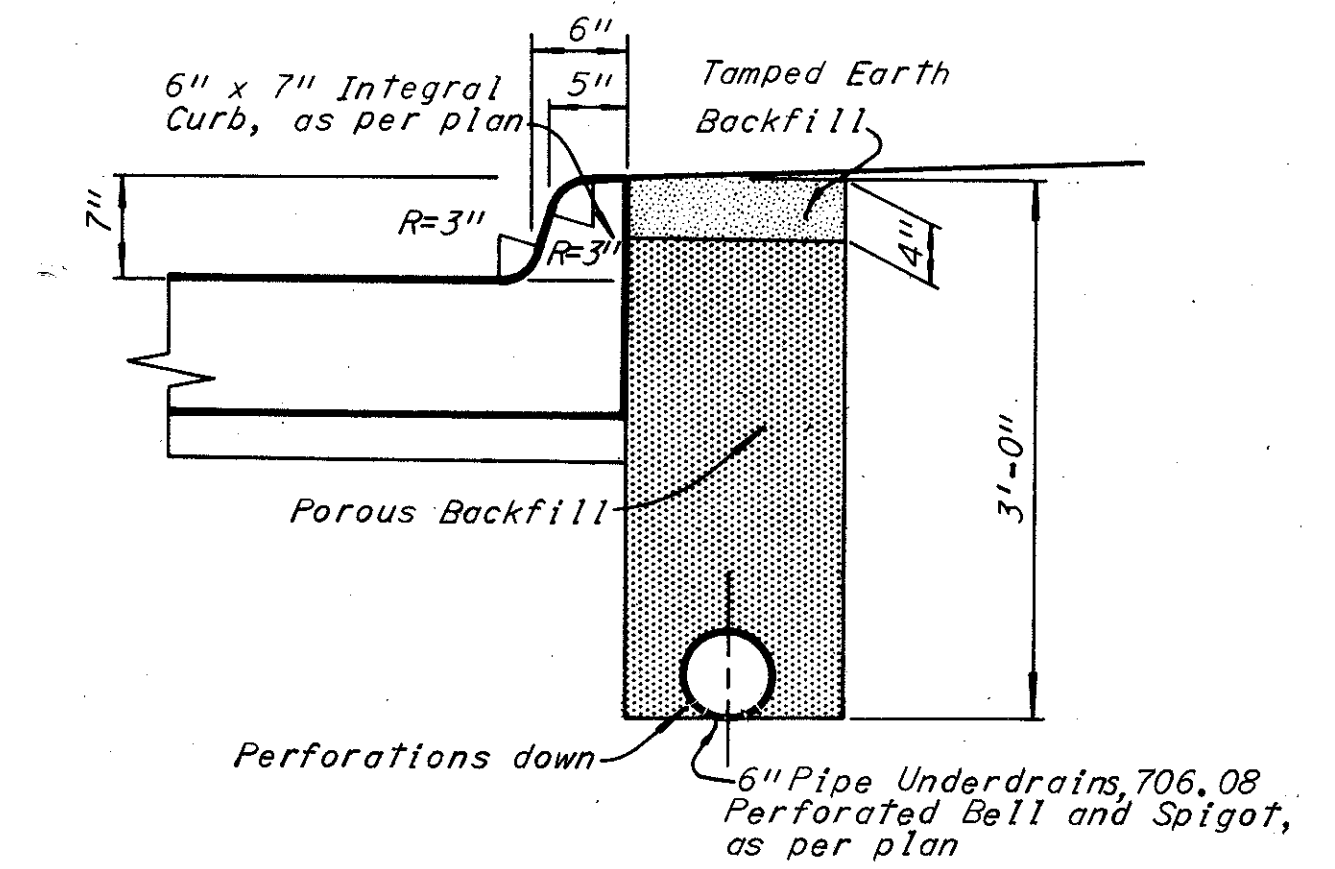
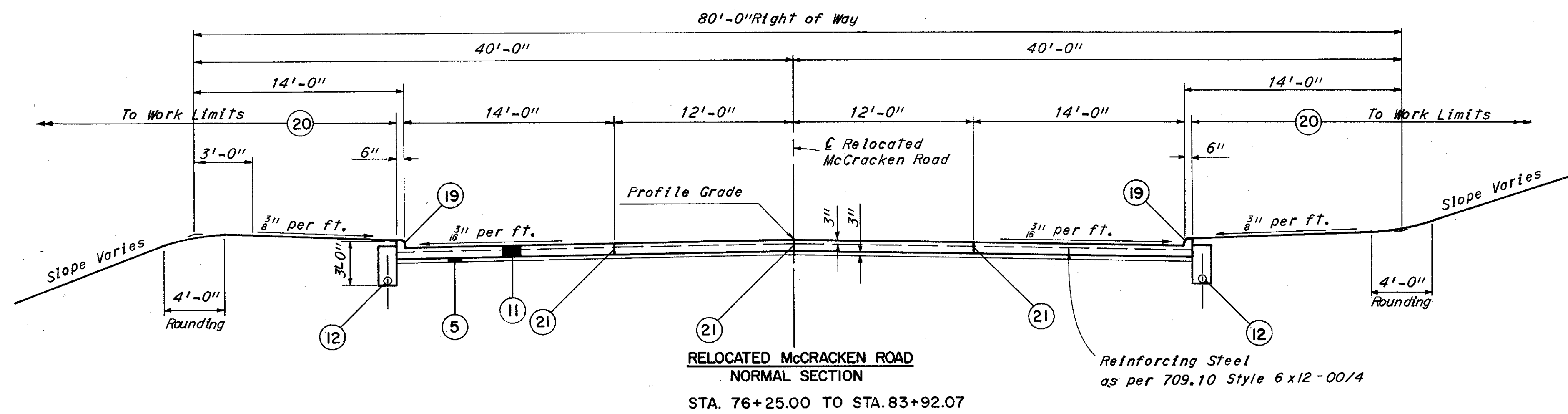
TYPICAL SECTIONS

TYPE 451

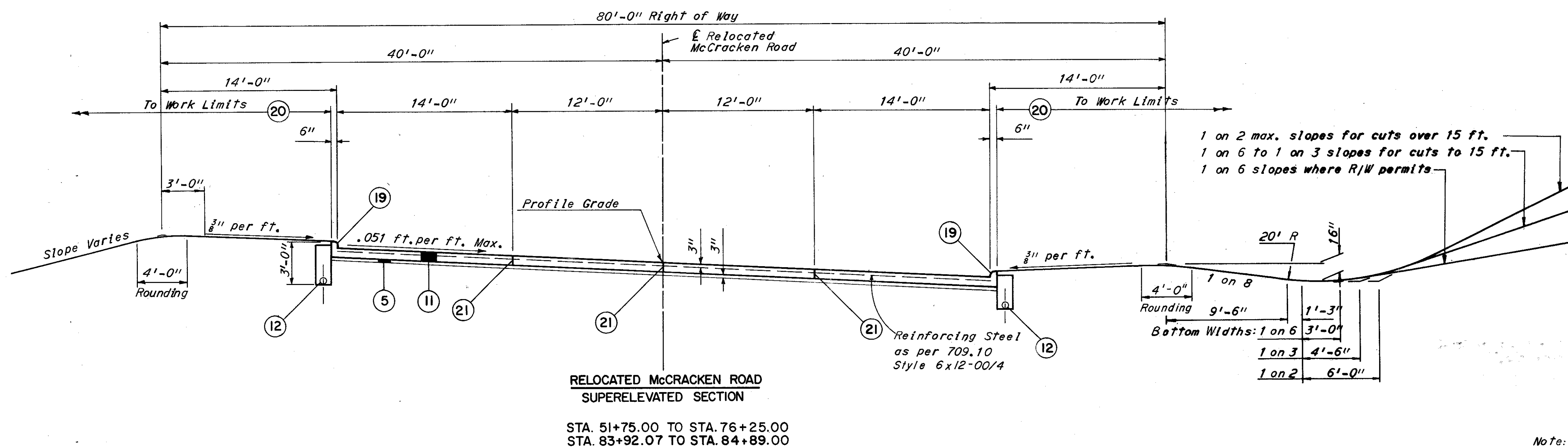
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
CUY. 480-21.40



ITEM 605 6" PIPE UNDERDRAINS USING 706.08 PERFORATED BELL AND SPIGOT PIPE, AS PER PLAN AND ITEM 609 CONCRETE CURB, INTEGRAL 6" X 7", AS PER PLAN



LEGEND

- 5 Item 310 Subbase, 703.08 or 703.10
- 11 Item 451 9" Reinforced Portland Cement Concrete, mod. as per plan
- 12 Item 605 6" Pipe Underdrain 706.08, Perforated Bell and Spigot, as per plan
- 19 Item 609 Concrete Curb, Integral 6"x7", as per plan
- 20 Item 659 Seeding and Mulching (See General Notes)
- 21 Standard Longitudinal Joint

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

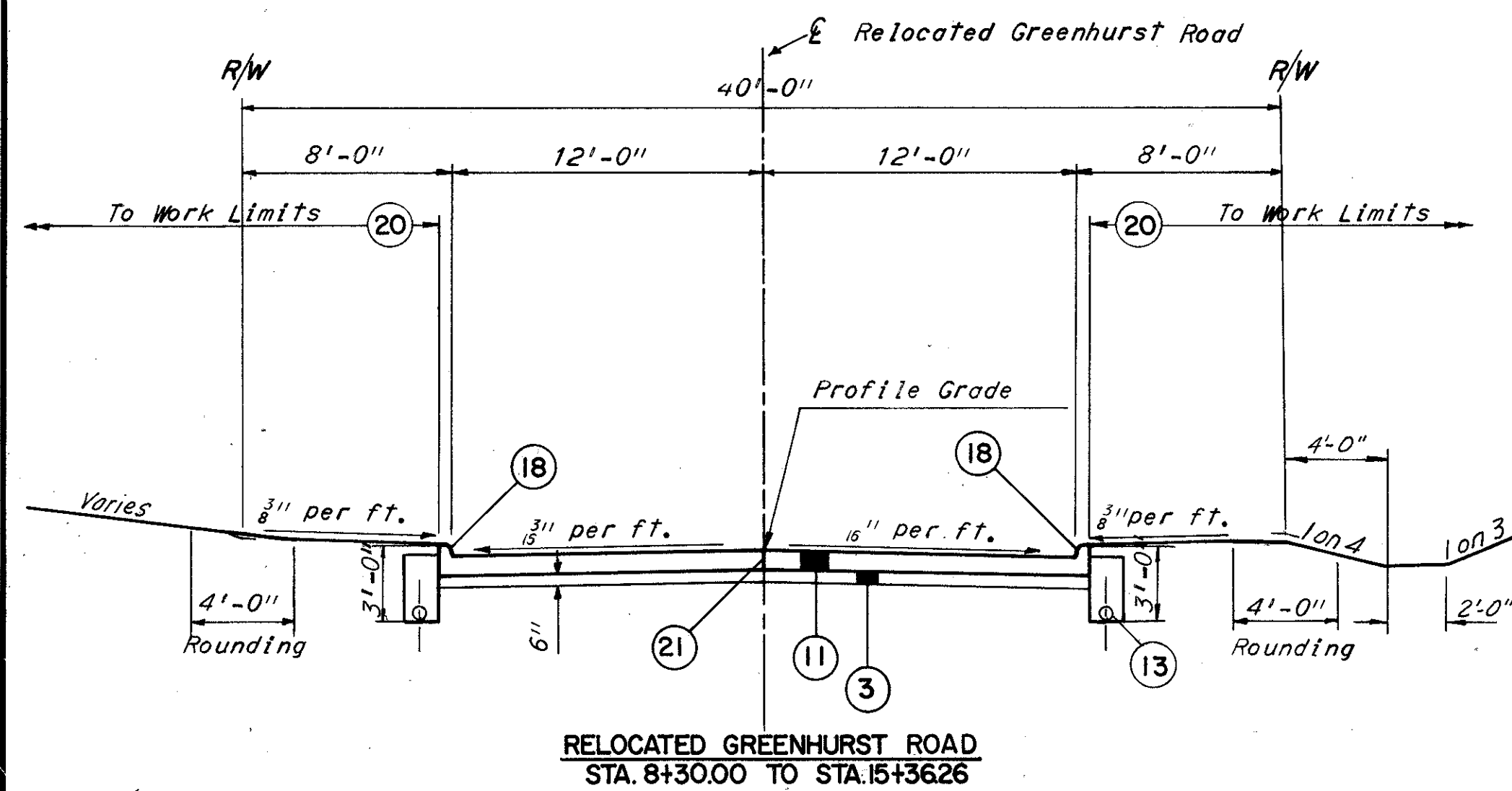
SCALE 3/4" = 1'-0" HOWARD, NEEDLES, TAMMEN & BERGENOFF
MADE P.H.A. DATE 4/11/68 CONSULTING ENGINEERS
TRCD. J.E.M. DATE 4/24/69
CKD. I.M. DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

TYPICAL SECTIONS

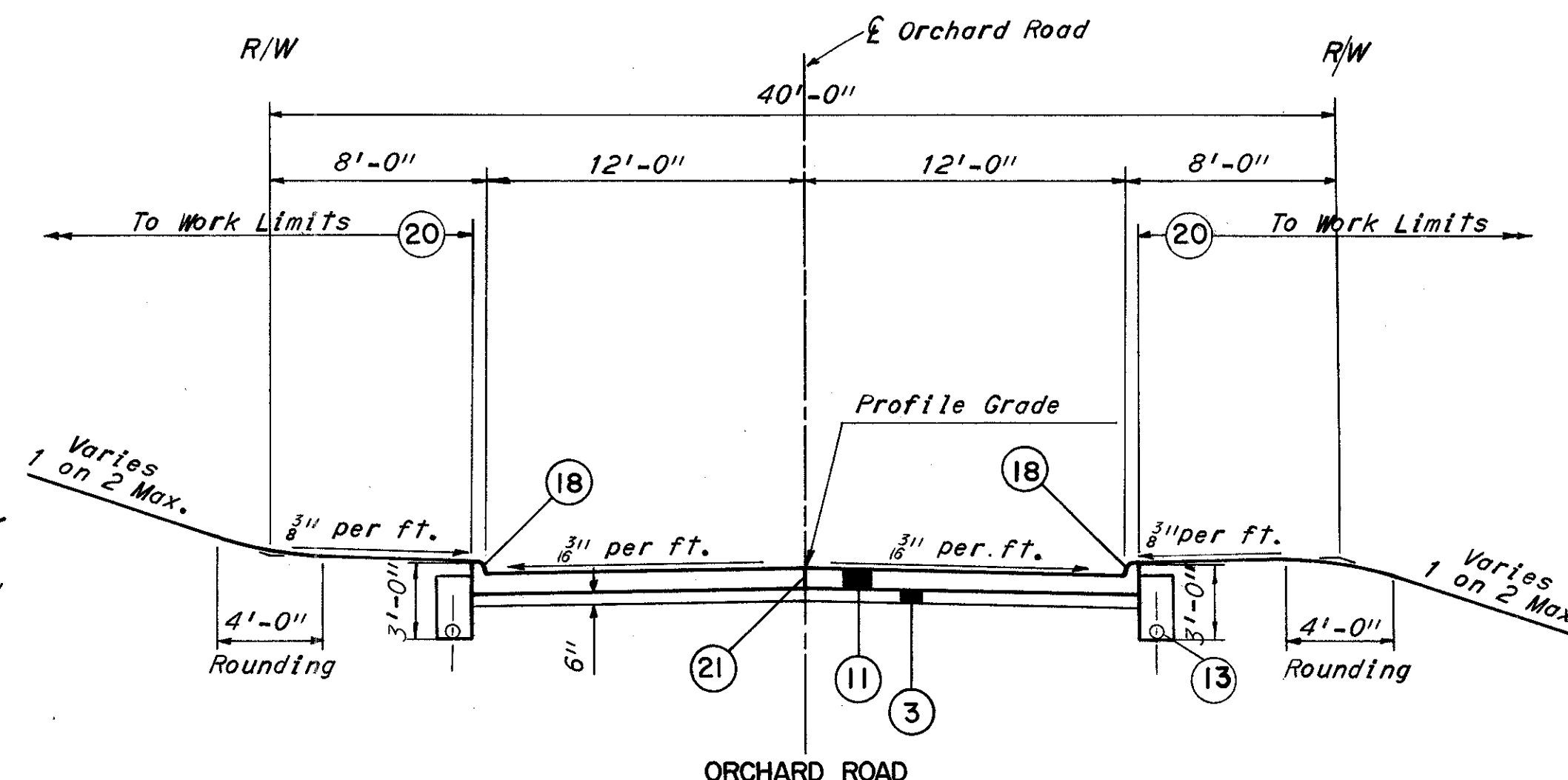
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
CUY. 480-21.40

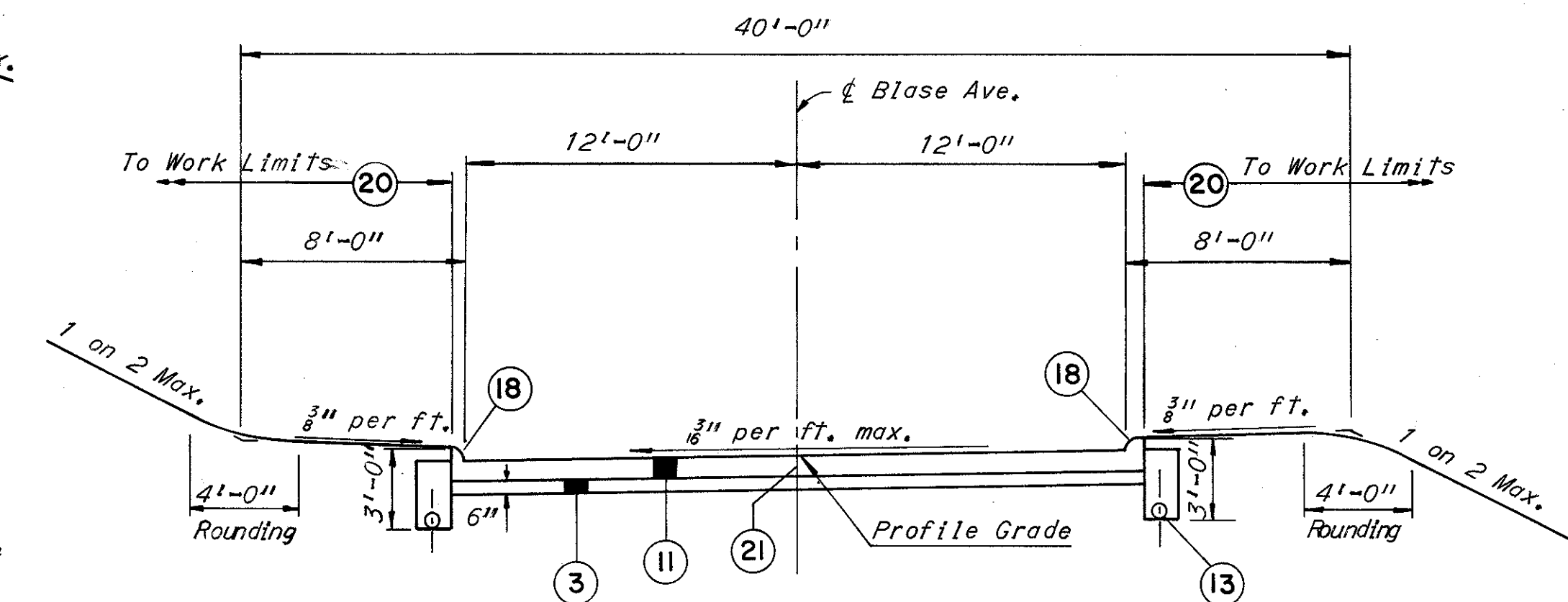


RELOCATED GREENHURST ROAD
STA. 8+30.00 TO STA. 15+36.26

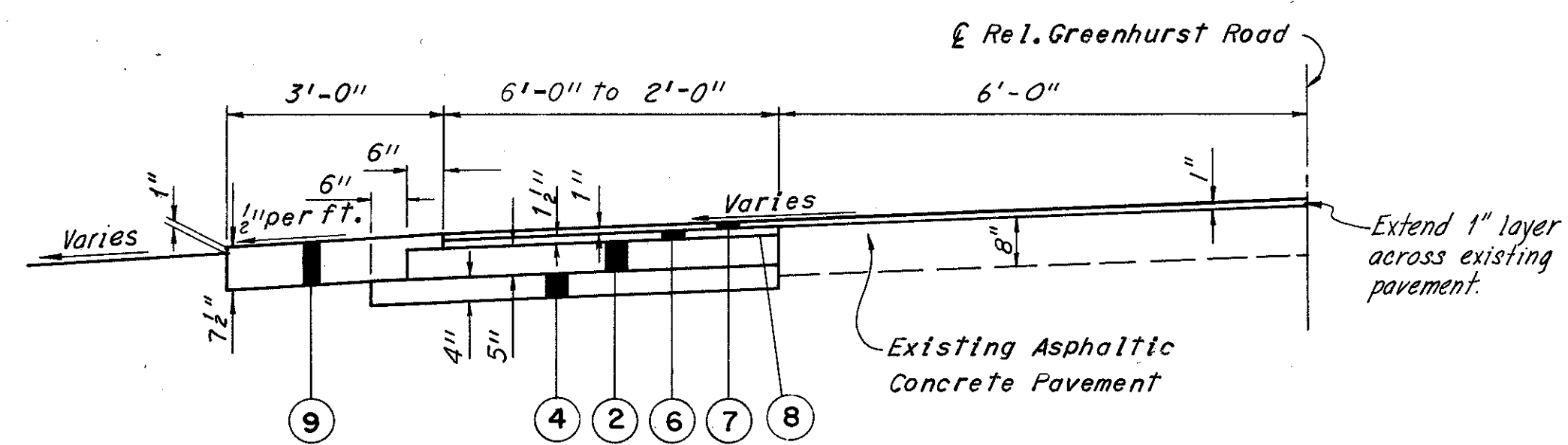


ORCHARD ROAD
STA. 5+25 TO STA. 10+00 *

*Limiting Sta. for Underdrains = 9+40

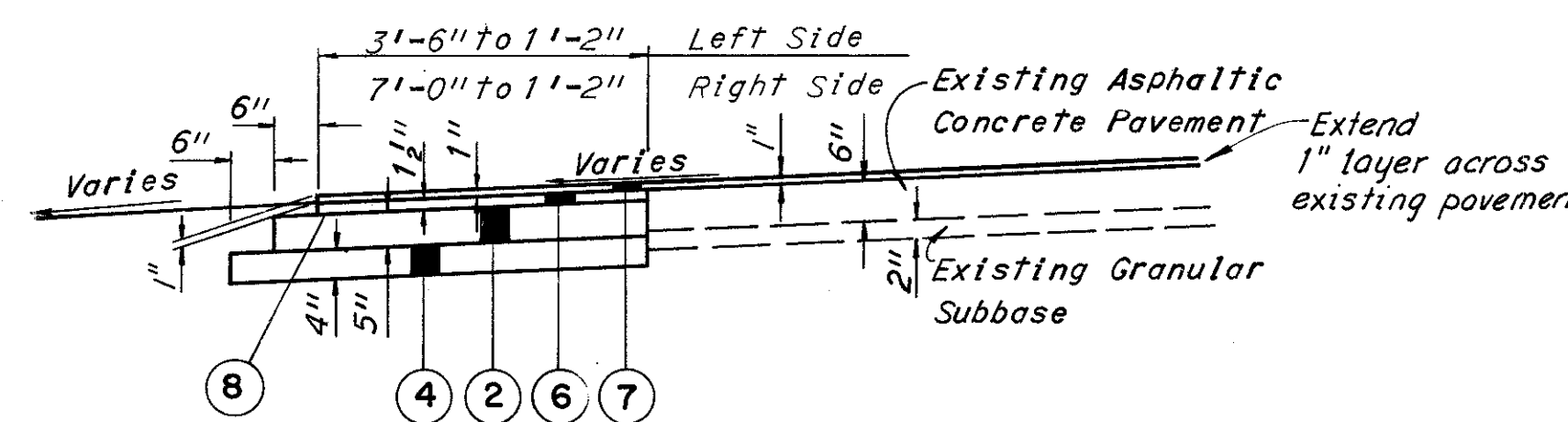


BLASE AVE.
STA. 13+18.05 TO STA. 13+94.19



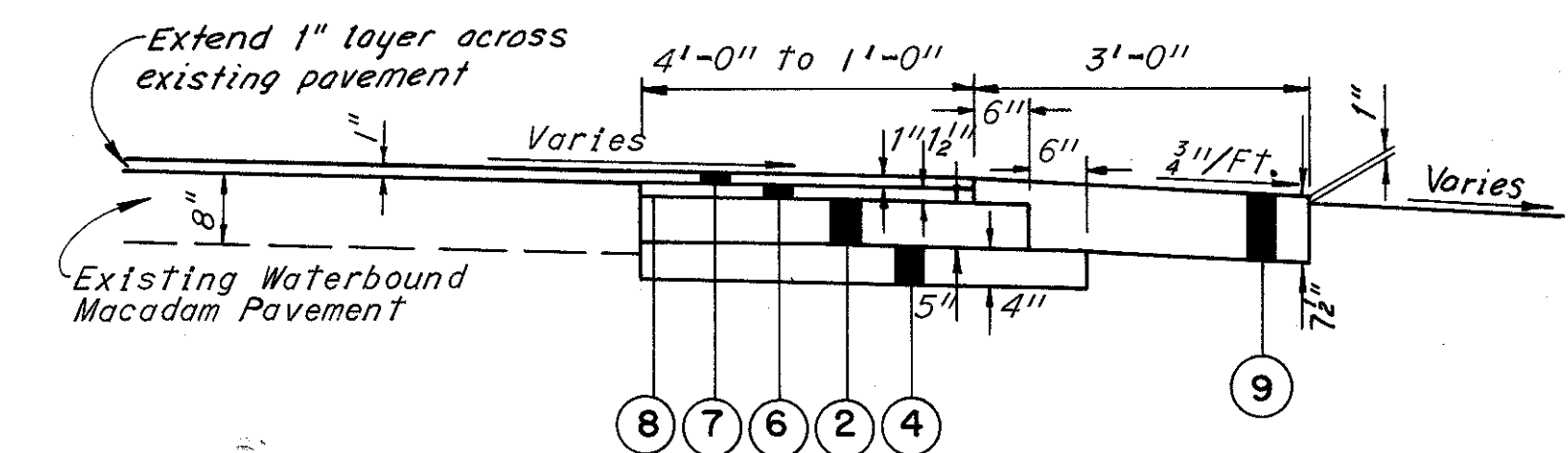
RELOCATED GREENHURST ROAD TAPER
STA. 15+36.26 TO STA. 16+36.26
LEFT SIDE ONLY

Scale 1/2" = 1'-0"

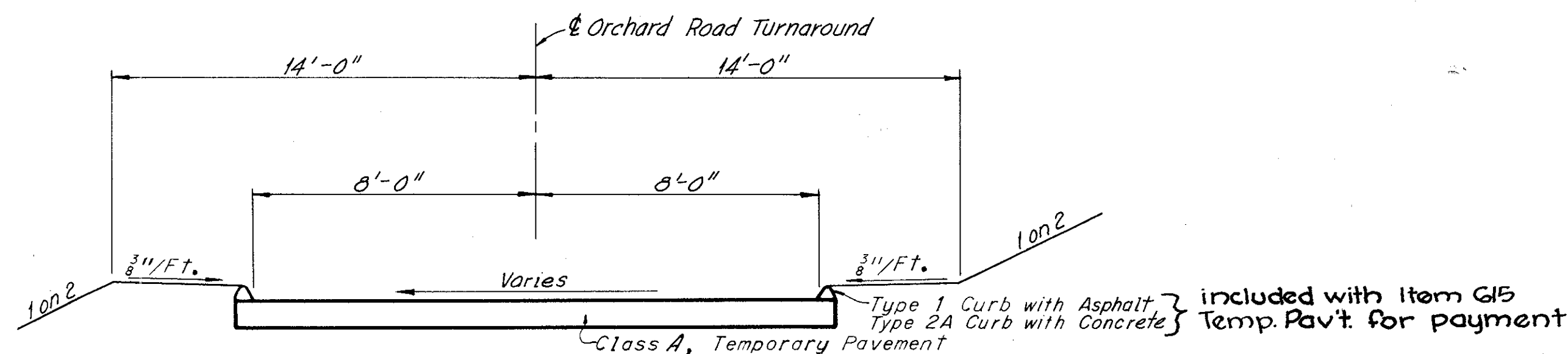


ORCHARD ROAD TAPER
STA. 10+00 TO STA. 11+00
RIGHT AND LEFT SIDE

Scale 1/2" = 1'-0"



BLASE AVE. TAPER
STA. 13+94.19 TO STA. 14+58.43



ORCHARD ROAD TURNAROUND
No Scale

LEGEND

- ② Item 304 Aggregate Base
- ③ Item 310 Subbase, Grading "A", as per plan
- ④ Item 310 Subbase
- ⑥ Item 402 Asphalt Concrete (70-85) or (AC-20)
- ⑦ Item 404 Asphalt Concrete (70-85) or (AC-20)
- ⑧ Item 408 Bituminous Prime Coat, 702.09, RT-2, or RT-3 applied at the rate of 0.40 Gal. per sq. yd.
- ⑨ Item 411 Stabilized Crushed Aggregate
- ⑪ Item 451 9" Reinforced Portland Cement Concrete Pavement
- ⑬ Item 605 6" Pipe Underdrains, as per plan
- ⑱ Item 609 Concrete Curb, Standard Type 2-A
- ⑳ Item 659 Seeding and Mulching (See General Notes)
- ㉑ Standard Longitudinal Joint

SCALE: 3/4" = 1'-0" or as shown
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
MADE P.H.A. DATE 2/11/68
TRCD. S.E.N. DATE 2/12/68
KANSAS CITY CLEVELAND NEW YORK
CKD IM DATE 4-1-70

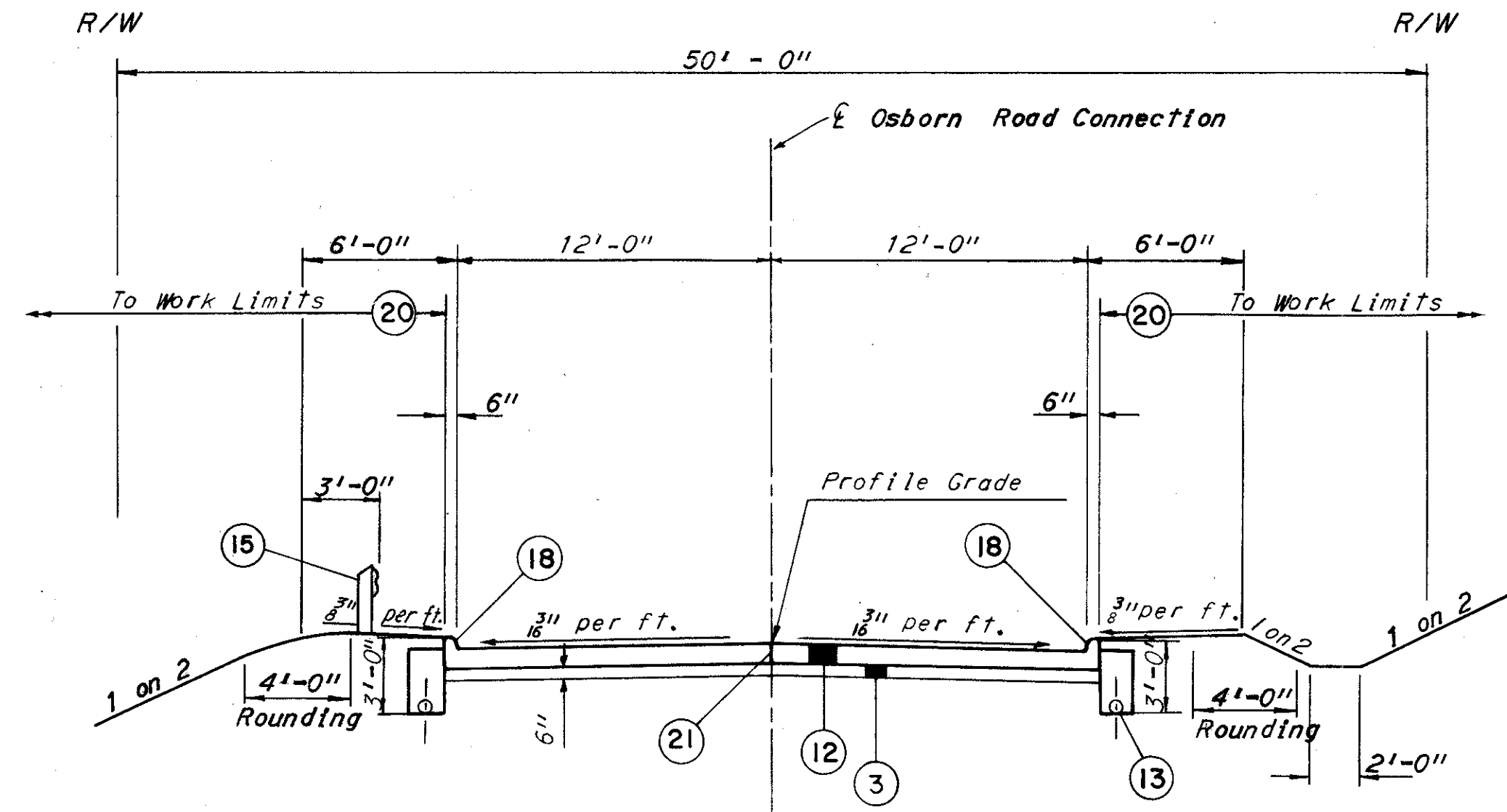
Note: Typical Sections are intended to show general roadway and pavement features only. For Details see Plan Sheets and Cross-Section Sheets.

TYPICAL SECTIONS

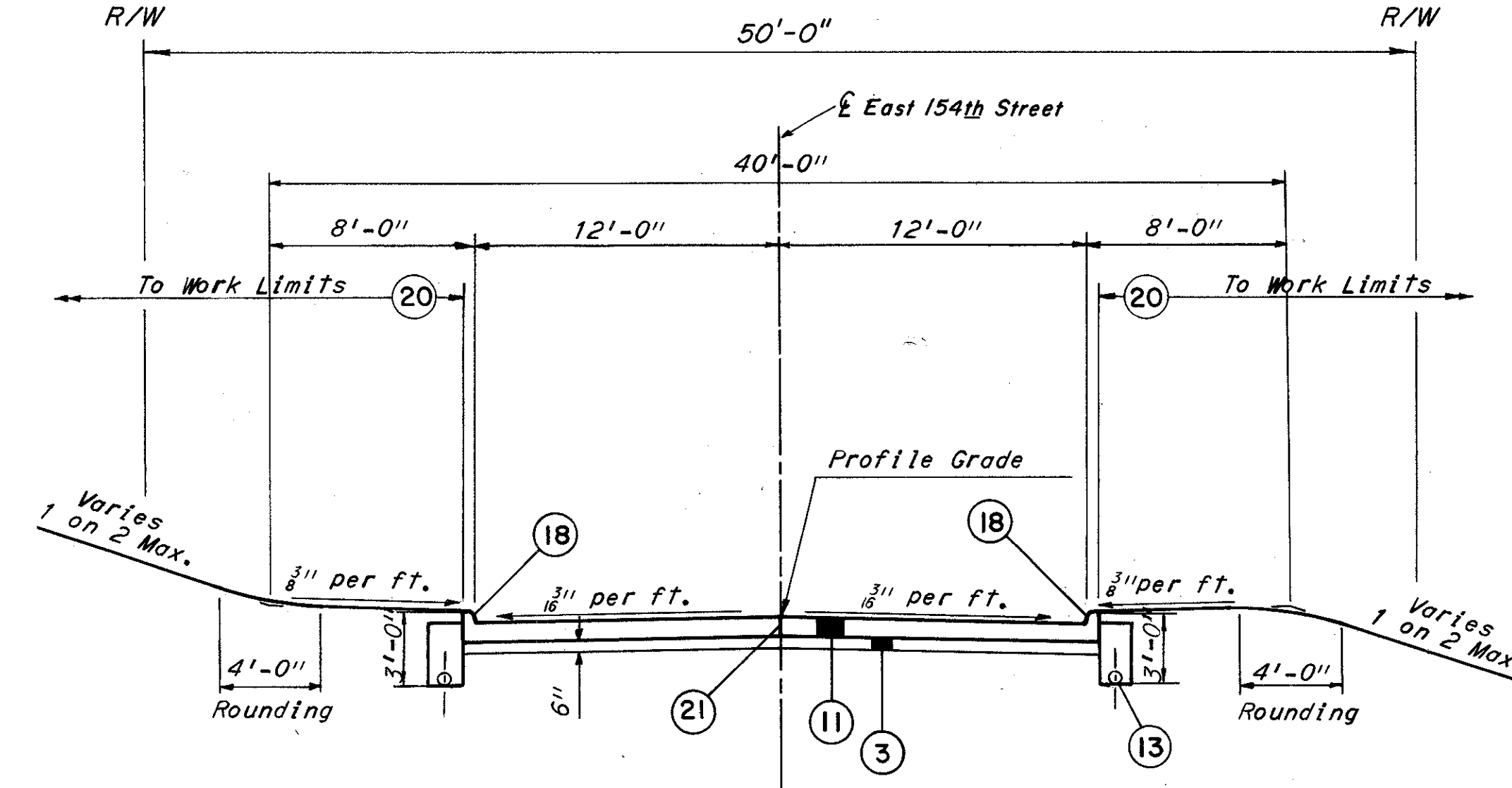
FED. RD. DIVISION	STATE	PROJECT
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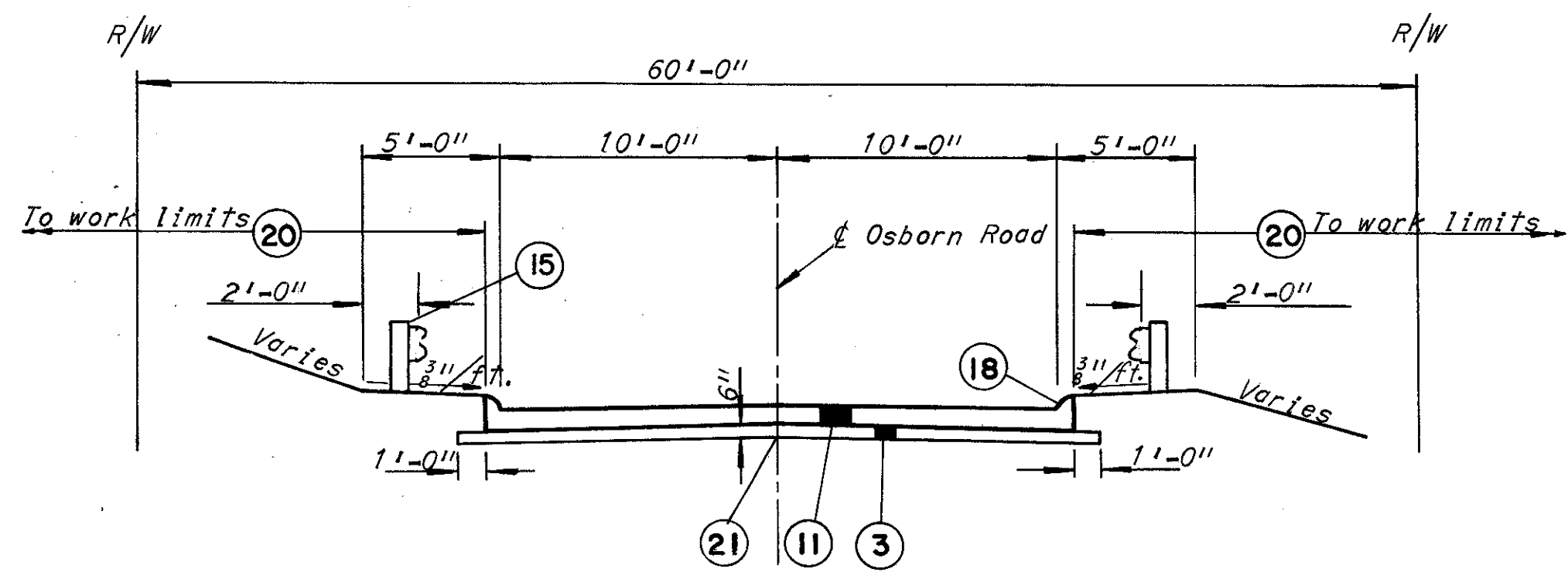
CUYAHOGA COUNTY
C.U.Y. 480-21.40



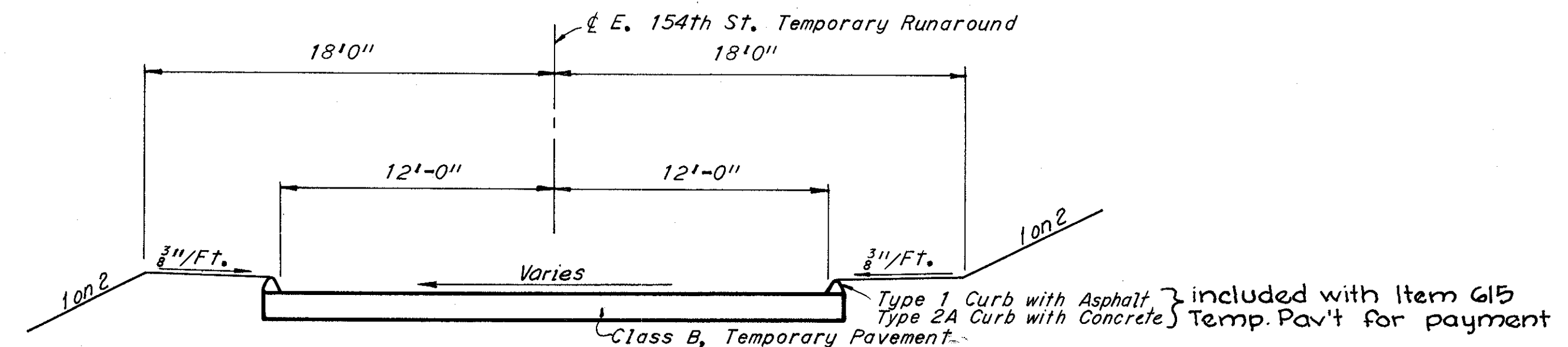
OSBORN ROAD CONNECTION



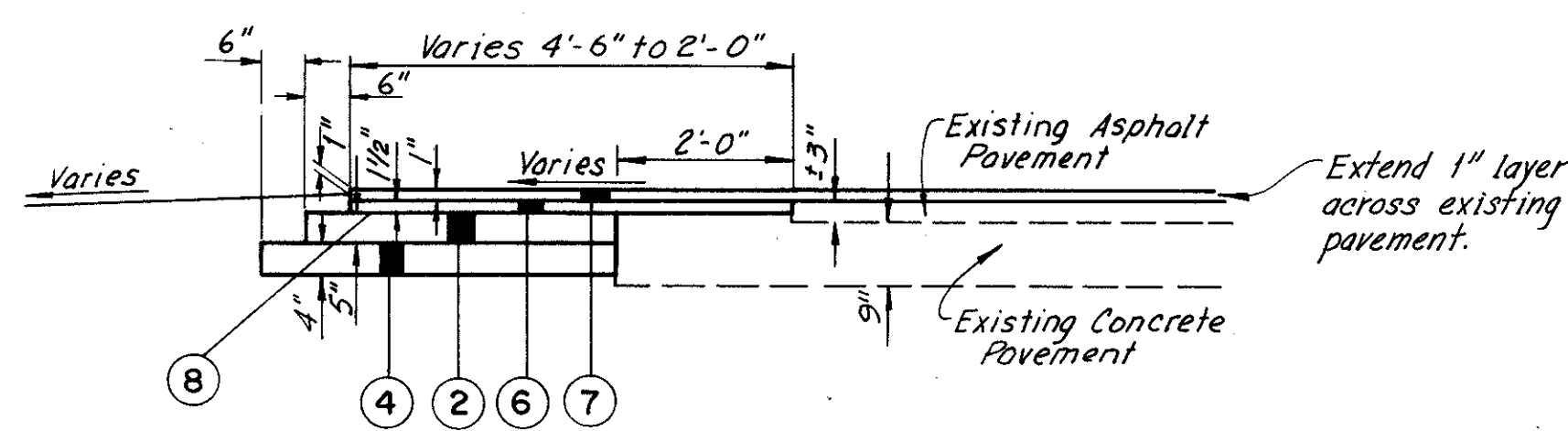
EAST 154th STREET
STA. 4+00.00 TO STA. 4+59.50



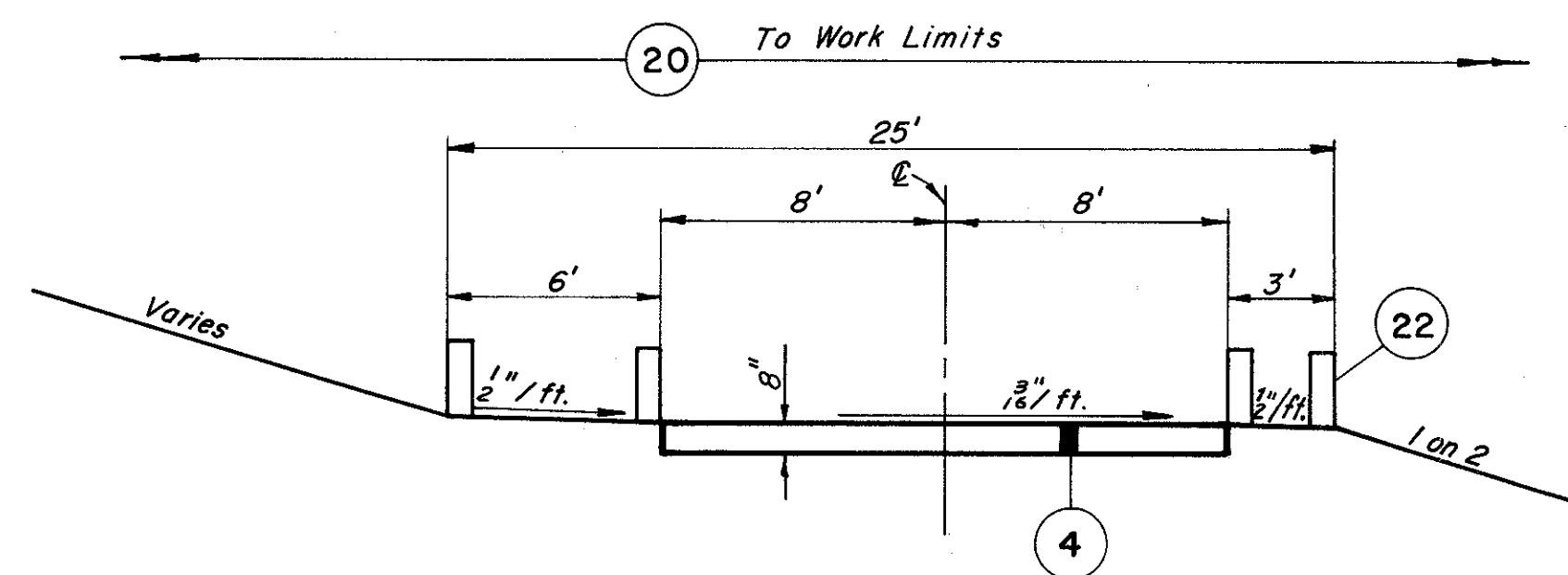
OSBORN ROAD CUL-DE-SAC



E. 154th ST. TEMPORARY RUNAROUND
Scale: 1"=5'



OSBORN ROAD TAPER
STA. 14+54.35 TO STA. 15+54.35
RIGHT AND LEFT SIDE
Scale: 1/2"=1'-0"



GRADED AREA FOR SANITARY SEWER RELOCATED

LEGEND

- (2) Item 304 Aggregate Base
- (3) Item 310 Subbase, Grading "A", as per plan
- (4) Item 310 Subbase
- (6) Item 402 Asphalt Concrete (70-85, or AC-20)
- (7) Item 404 Asphalt Concrete (70-85, or AC-20)
- (8) Item 408 Bituminous Prime Coat, 702.09 RT-2 or RT-3 as applied at the rate of 0.40 Gal. per sq. yd.
- (11) Item 451 9" Reinforced Portland Cement Concrete Pavement
- (12) Item 452 7" Plain Portland Cement Concrete Pavement
- (13) Item 605 6" Pipe Underdrains, as per plan
- (15) Item 606 Guard Rail, Type 5 (Barricade Rail Osborn Rd. Only)
- (18) Item 609 Concrete Curb, Type 2-A
- (20) Item 659 Seeding and Mulching (See General Notes)
- (21) Standard Longitudinal Joint
- (22) Item 606 Guard Post

SCALE 3/16"=1', or as shown
MADE R.H.A. DATE 4-11-68
TRCD J.E.W. DATE 4-24-68
CKD L.M. DATE 4-1-70
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

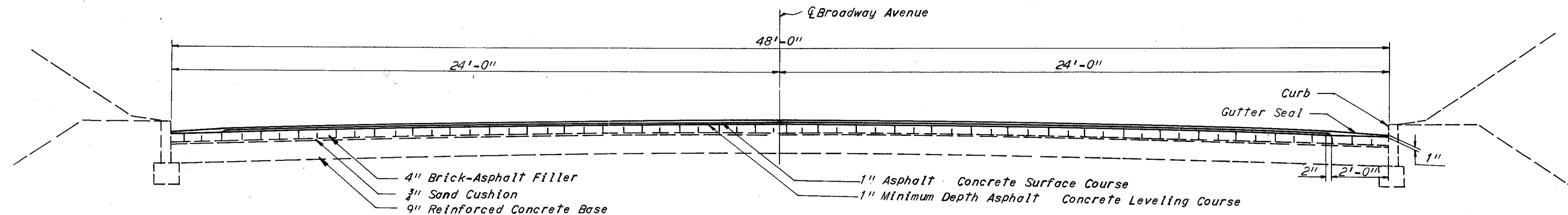
Rev. 1-974

TYPICAL SECTIONS

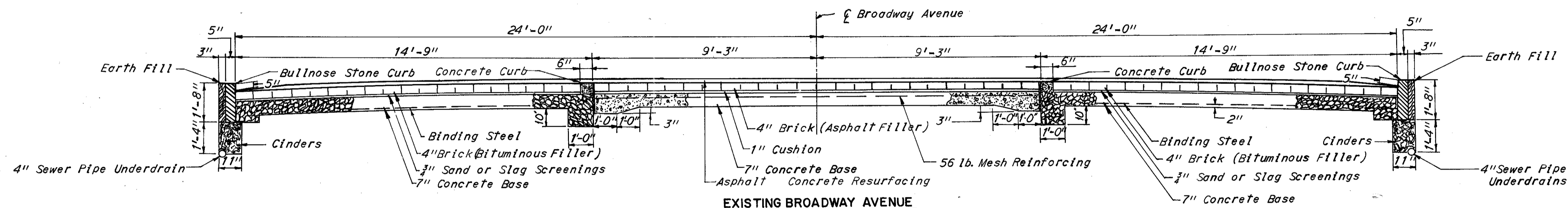
FED. RD. DIVISION	STATE	PROJECT	
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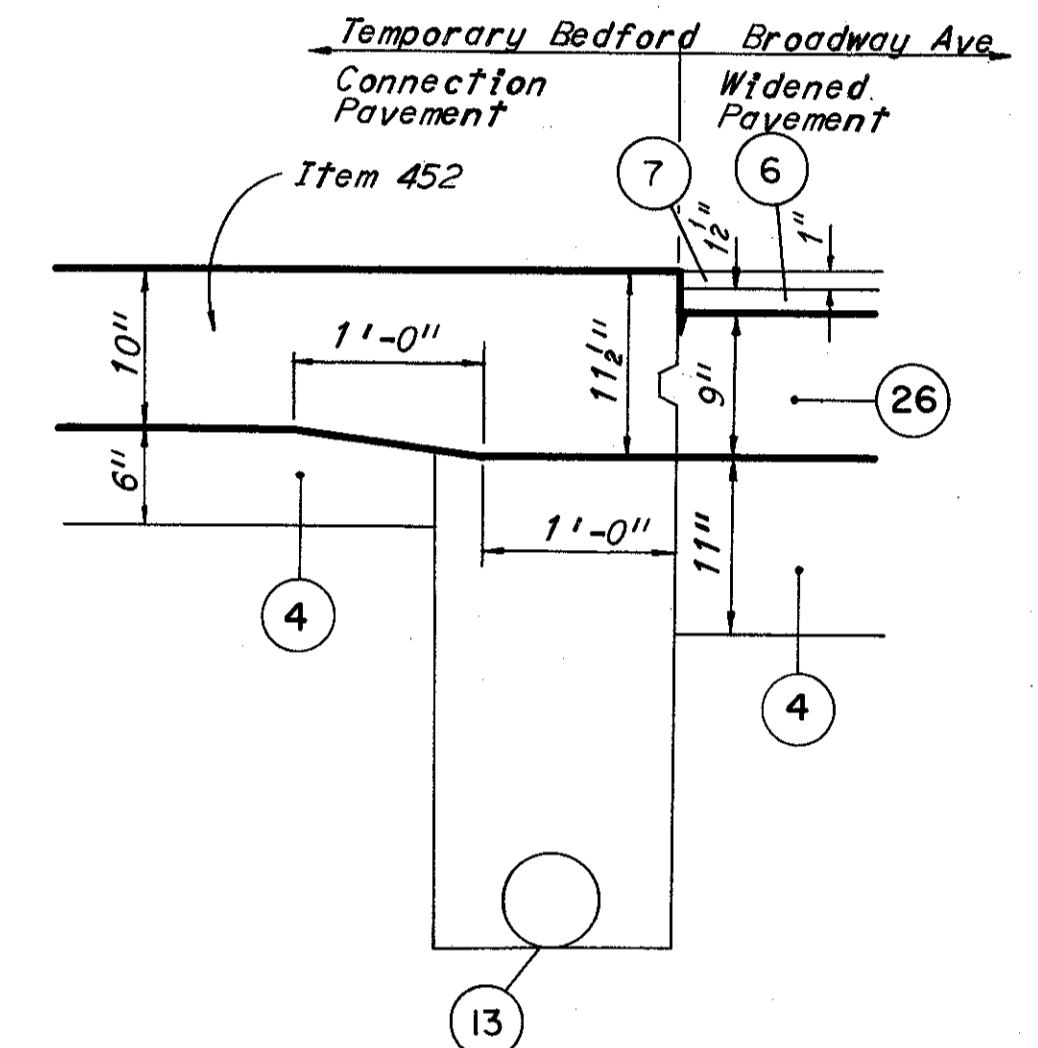
CUYAHOGA COUNTY
CUY.480-21.40



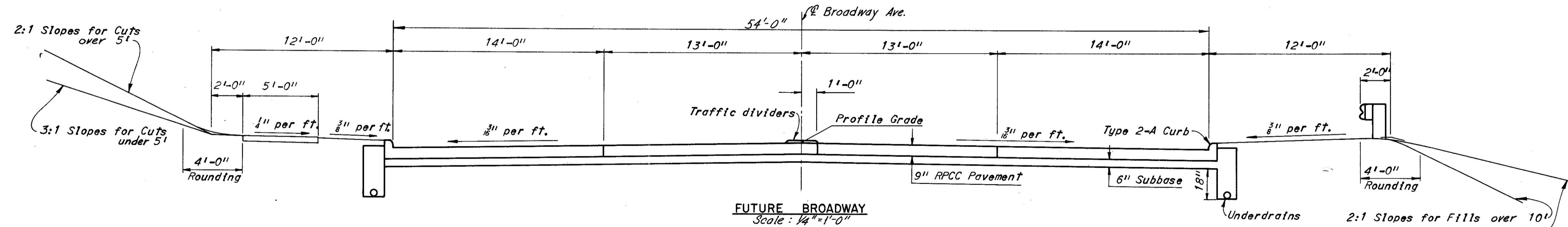
EXISTING BROADWAY AVENUE
STA. 80+00 TO STA. 105+72.6
Scale: 3/8" = 1'-0"



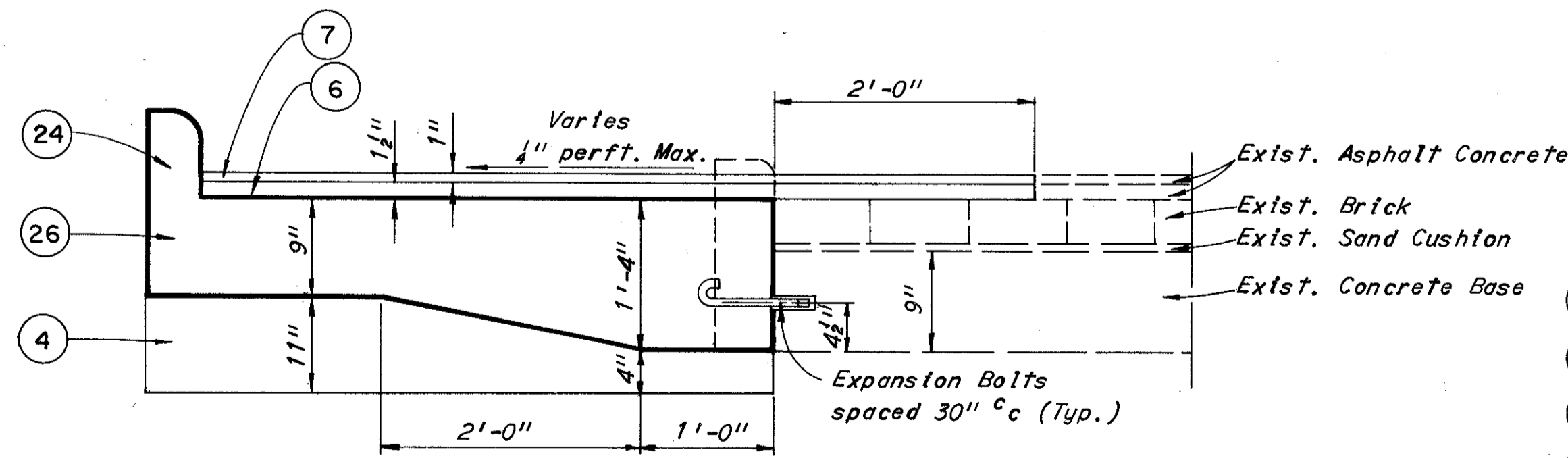
EXISTING BROADWAY AVENUE
STA. 106+62.03 TO STA. 110+00
Scale: 3/8" = 1'-0"



STANDARD KEY JOINT MODIFIED
AS PER PLAN
No Scale



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



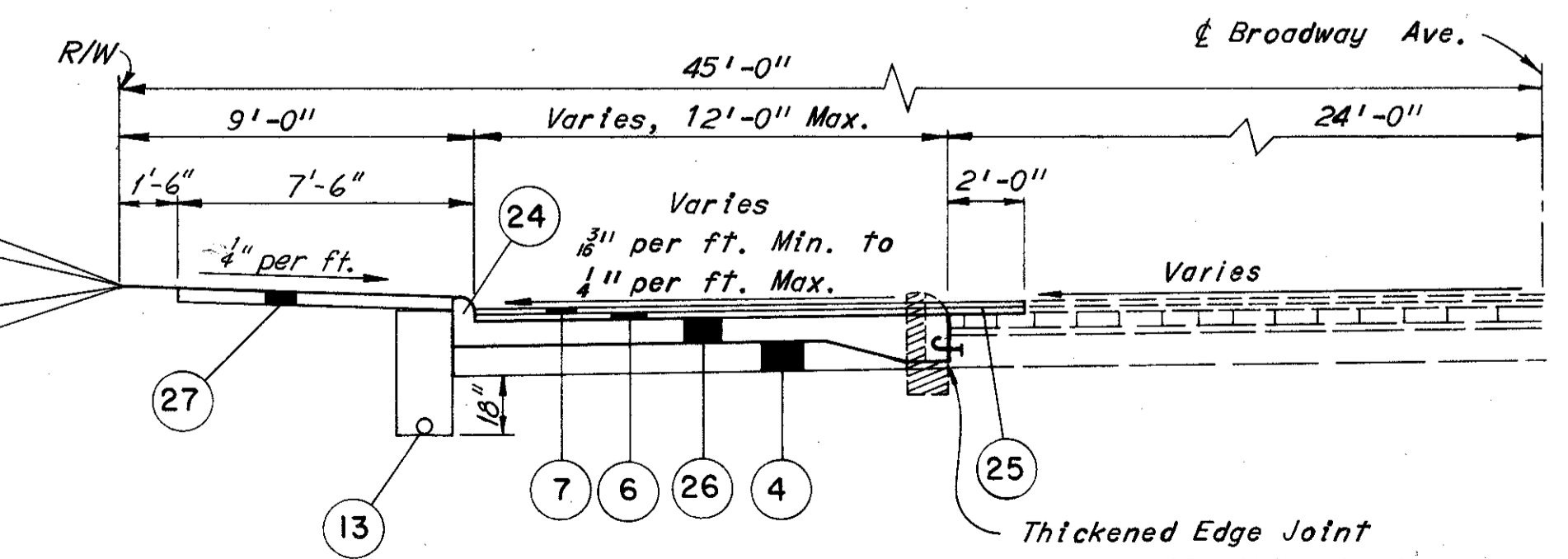
THICKENED EDGE JOINT
No Scale

Note:
The cost of joint to be included in the pertinent pavement item.

LEGEND

- 4 ITEM 310 Subbase Grading "A", as per plan
- 6 ITEM 402 Asphalt Concrete (70-85 or AC-20)
- 7 ITEM 404 Asphalt Concrete (70-85 or AC-20)
- 13 ITEM 605 6" Pipe Underdrains, as per plan
- 24 ITEM 609 Concrete Curb, Standard Type 2-B
- 25 ITEM 202 Wearing Course Removed
- 26 ITEM 305 Portland Cement Concrete Base
- 27 ITEM 608 4" Concrete Walk

- 2:1 for Cut Slopes over: 5'-0"
- 3:1 for Cut Slopes Under: 5'-0"
- 4:1 for Fills under 10'-0"
- 2:1 for Fills over 10'-0"



PAVEMENT WIDENING TYPICAL
Scale: 1/4" = 1'-0"

Thickened Edge Joint
See Detail, this sheet.

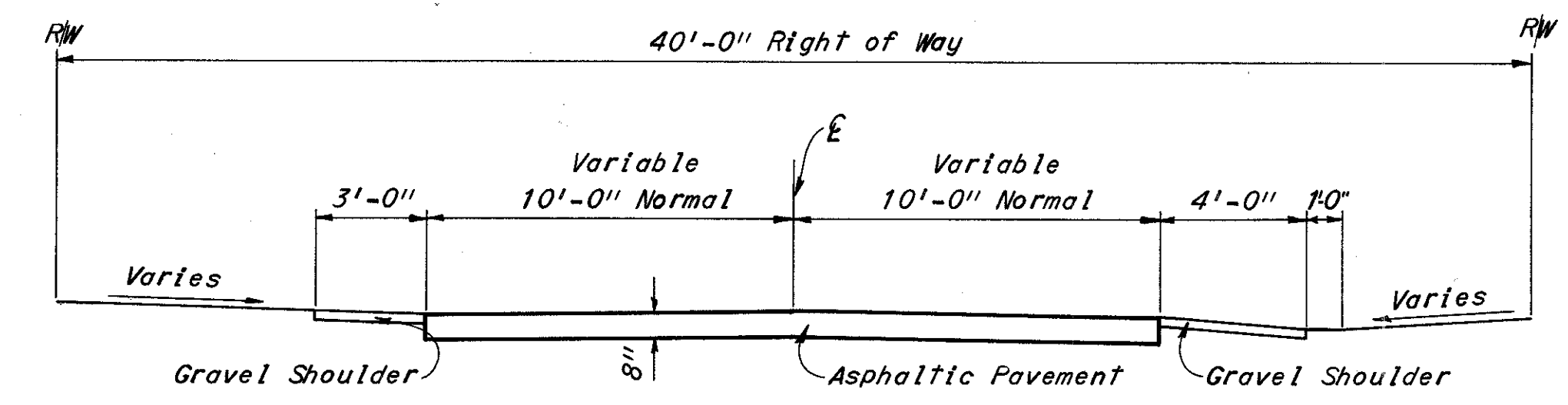
SCALE as shown
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE P.D.J. DATE 8-22-66 CONSULTING ENGINEERS
TRCD P.D.J. DATE 8-22-66 KANSAS CITY CLEVELAND NEW YORK
CKD. R.P.R. DATE 8-23-66

EXISTING TYPICAL SECTIONS

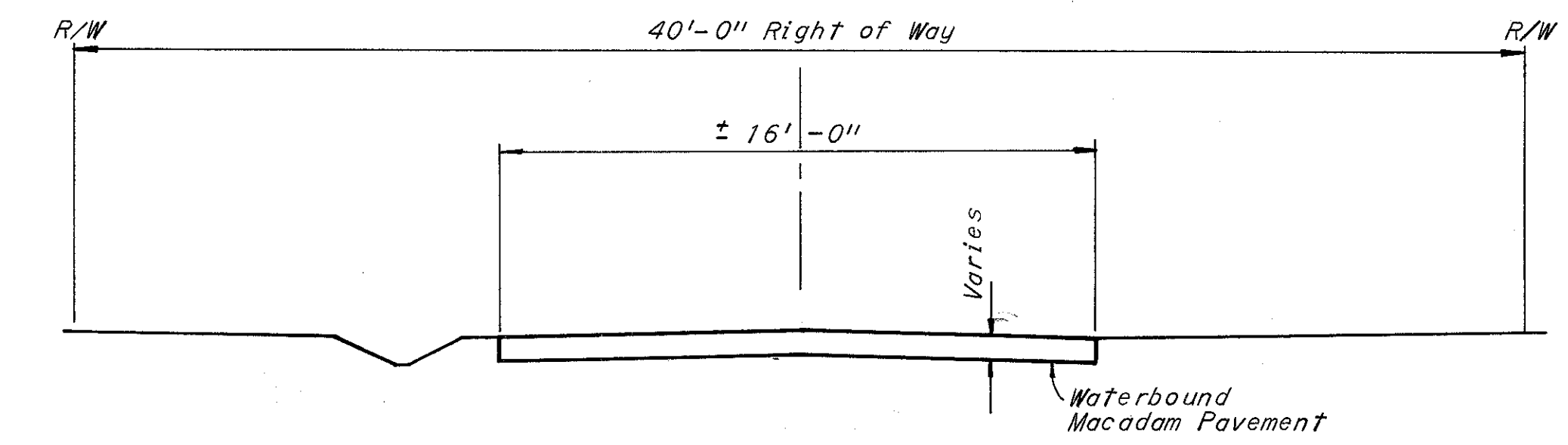
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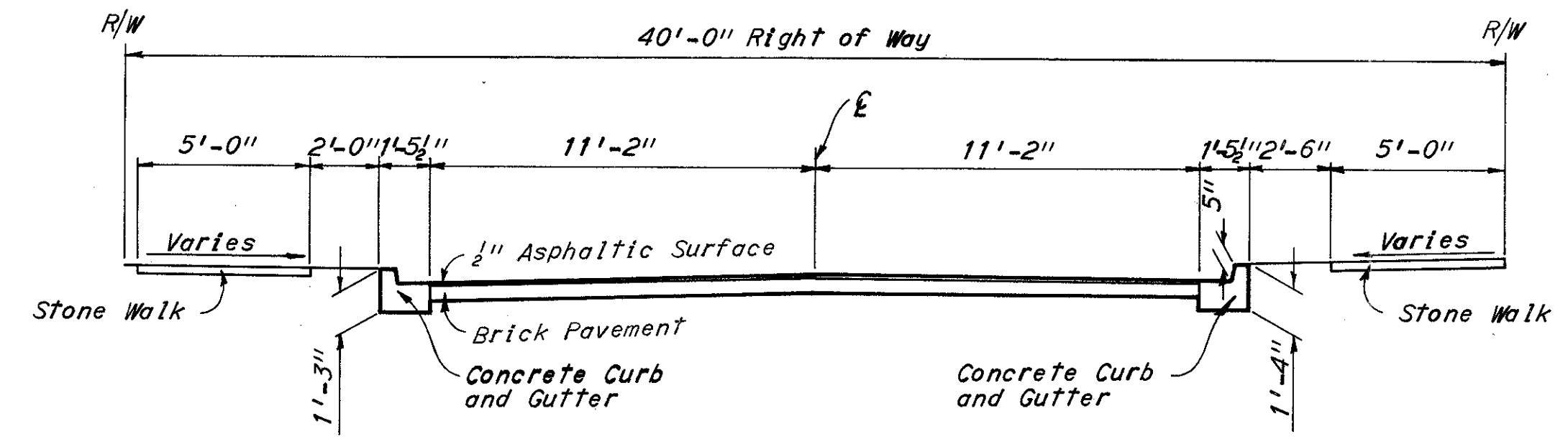
CUYAHOGA COUNTY
CUY. 480-21.40



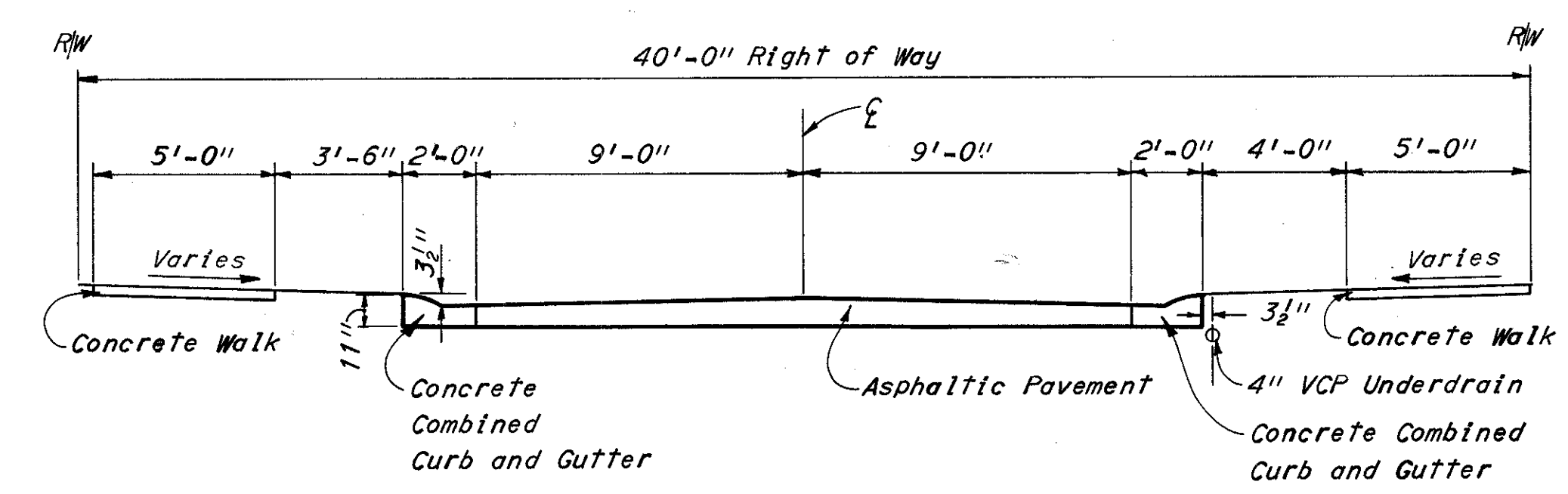
EXISTING McCRACKEN ROAD
STA. 29+00 TO STA. 30+50



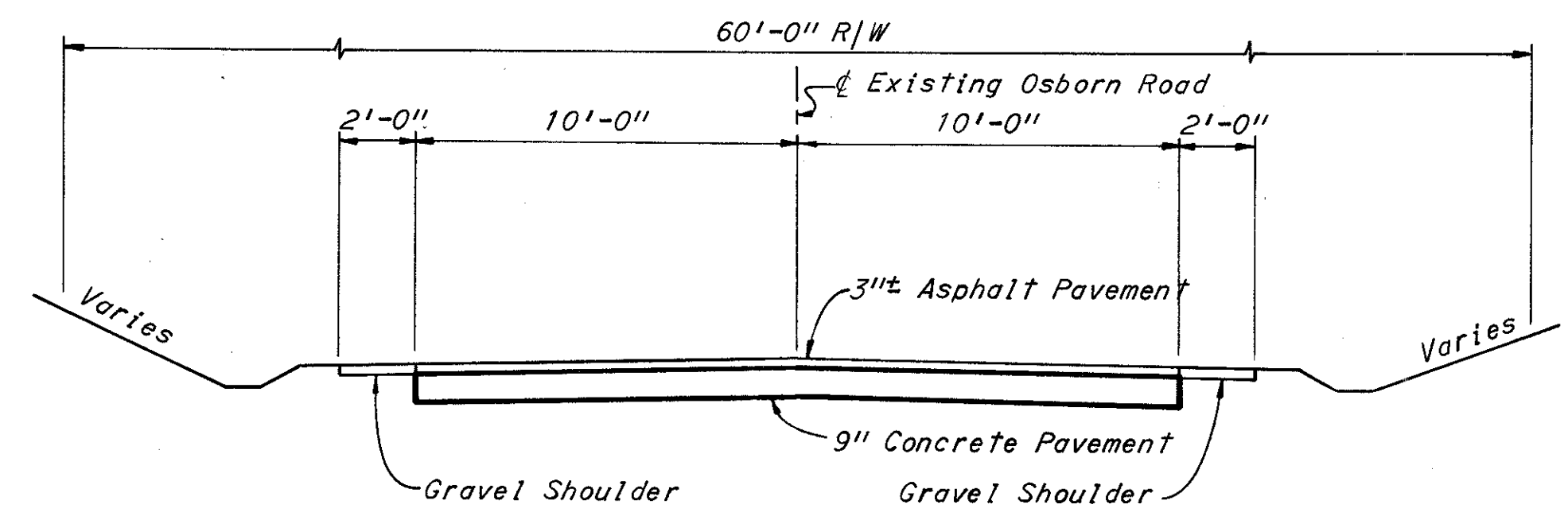
EXISTING BLASE AVE



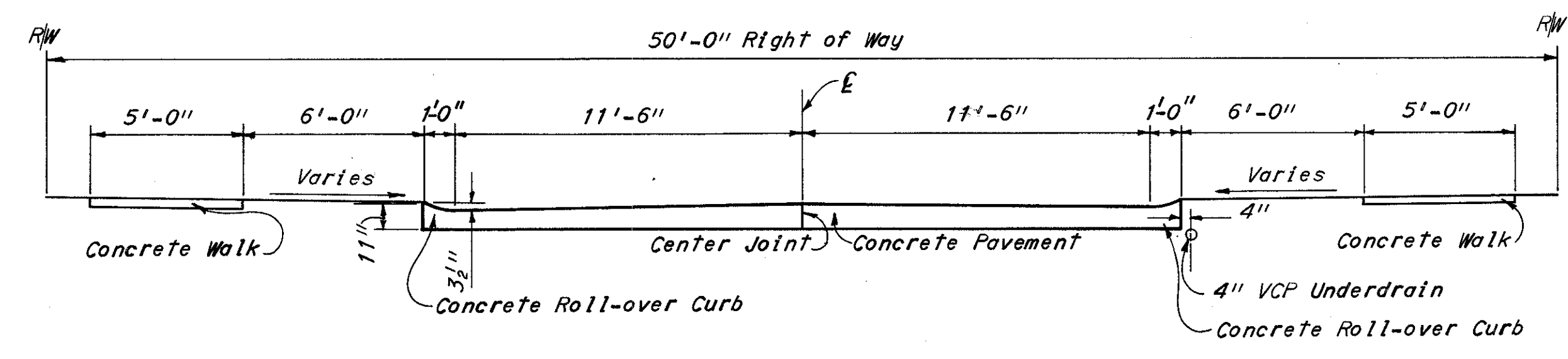
EXISTING GREENHURST ROAD



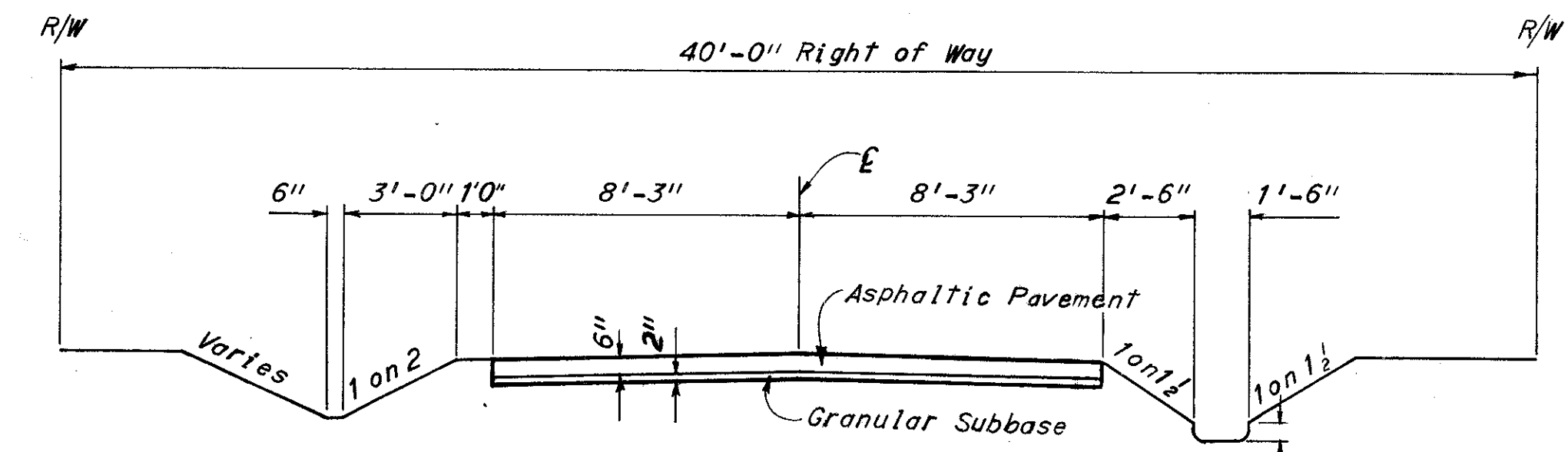
EXISTING EAST 135TH STREET



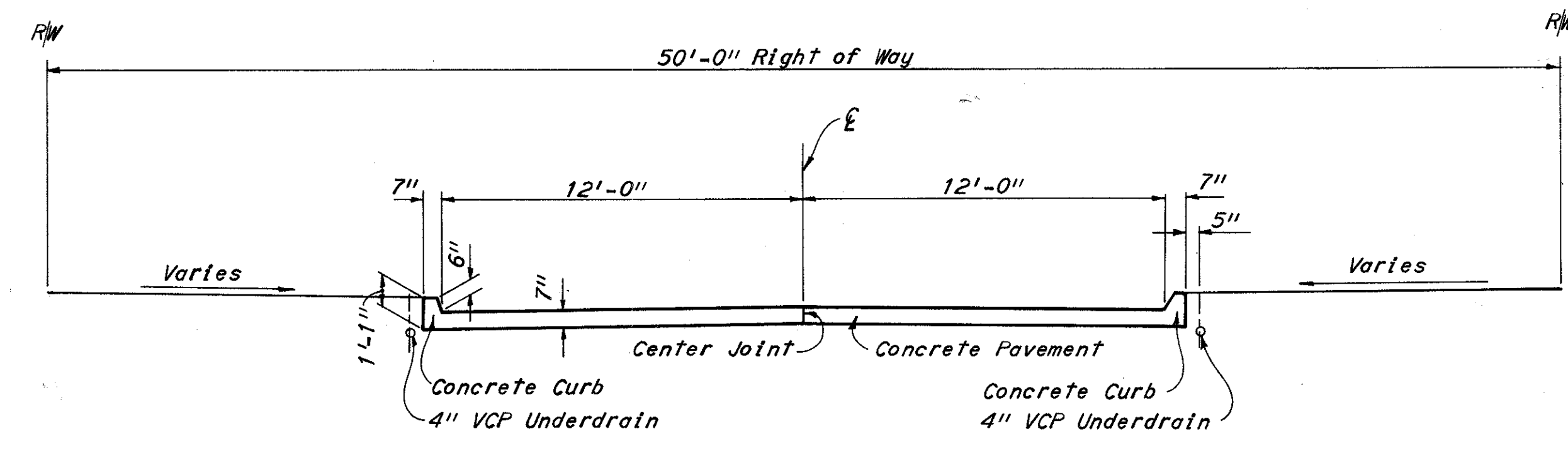
EXISTING OSBORN ROAD



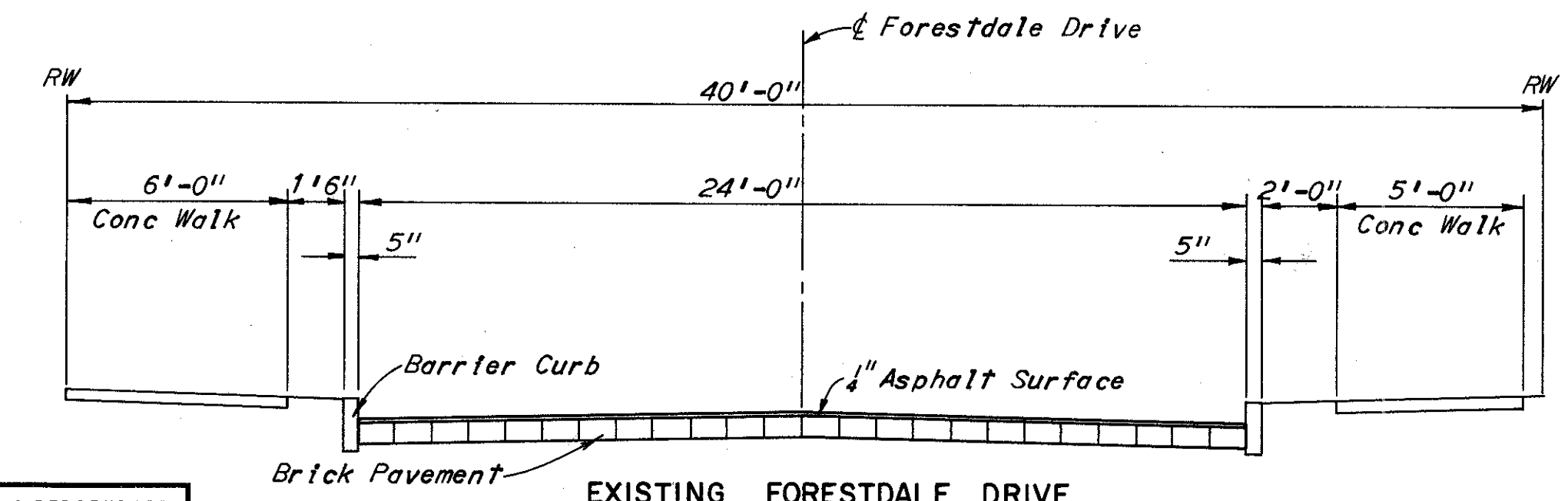
EXISTING EAST 141ST STREET



EXISTING ORCHARD ROAD



EXISTING EAST 154TH STREET



EXISTING FORESTDALE DRIVE
Scale: 1/4"=1'-0"

SCALE: 1/4" = 1'-0"
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE R.H.A. DATE 3/11/68 CONSULTING ENGINEERS
TRCD. J.E.N. DATE 4/2/68
CKD. J.M. DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

GENERAL NOTES

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CUY.480-21.40

GENERAL

ROADWAY

ELEVATION DATUM

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

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 does not guarantee their accuracy or completeness.

UTILITIES

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

East Ohio Gas Company, 1201 East 55th Street, Cleveland, Ohio 44103
 Cleveland Electric Illuminating Company, 55 Public Square, Cleveland Ohio 44113
 City of Cleveland Water Department, 1201 Lakeside Avenue, Cleveland, Ohio 44114
 Ohio Bell Telephone Company, Room 700, 920 Superior Ave. West, Cleveland, Ohio 44113
 City of Garfield Heights, 5555 Turney Road, Garfield Heights, Ohio 44125
 City of Maple Heights, 5353 Lee Road, Maple Heights, Ohio 44137
 Sun Pipe Line Co. Stow Ohio 44224
 Cuyahoga County Sanitary Engineer, 1219 Ontario, Cleveland, Ohio 44113

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 this project. Estimated quantities of materials shall not be ordered for delivery to the project unless authorized by the Engineer.

FIELD OFFICE

The Contractor shall provide a suitable field office having a minimum of 800 square feet of floor space and in addition to the requirements of Item 619, he shall provide and maintain sanitary provisions as per 107.06. All the above is included in the lump sum price bid for Item 619, Field Office.

COOPERATION - TRAFFIC CONTROL DEVICES

The Contractor is hereby advised that a separate contract may be awarded for the furnishing and erecting of certain Traffic Control Devices within the work limits of this project prior to completion of construction operations.

The Contractor shall cooperate with the separate contractor to arrange a suitable work schedule, subject to the approval of the Engineer, to permit the separate Contractor to work and operate necessary equipment within work limits 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.

TRAFFIC MAINTENANCE

Two-way traffic for local access shall be maintained at all times by use of existing pavements, proposed pavements and temporary roadways surfaced with 410 aggregate and stabilized with Item 616 calcium chloride. It is not intended that temporary roadways be used exclusively for maintaining traffic on this project but that maximum usage be made of existing and proposed pavements. The limits and duration of use of temporary roadways shall be held to an absolute minimum, and in all cases shall be subject to the approval of the Engineer.

Relocated Greenhurst Road shall be constructed and opened to traffic before the closing of existing McCracken Road from Broadway Avenue to Relocated Greenhurst Road will be permitted.

The Osborn Road Connection and the East 154th Street Temporary Connections shall be constructed in accordance with the notes and details shown on Sheet Nos. 42 and 44.

Access to East 154th Street and Blase Avenue through the project must be maintained at all times by use of their existing connections to McCracken Road, the East 154th Street Temporary Connection, or Relocated McCracken Road.

Connections to existing McCracken Road cannot be closed until Relocated McCracken Road is opened to traffic to either Lee Road or Broadway Avenue. The pavement for the East 154th Street Temporary Connection shall be removed and the area restored immediately after Relocated McCracken Road is opened to traffic.

Construction on Orchard Road shall follow a schedule which permits free entrance and exit to homes in the construction area at all times. Traffic in this area shall be routed to Ohio Avenue or to Lee Road via Relocated McCracken Road.

Work on Broadway Avenue shall be done in such a manner that two lanes of traffic shall be maintained in each direction at all times except for brief periods when one lane is maintained in each direction as approved by the Engineer. The work shall be adequately protected with temporary guide markers or barricades.

A 30' clearance area was provided under Structure CUY480-21.40. Traffic shall be maintained on the existing Access Road located in this 30' clearance area according to notes shown on Sheet No. of the Bridge Plans.

The method of maintaining traffic which the Contractor desires to adopt and which is developed according to the guidelines given above shall be submitted to the Engineer for his approval. The Engineer shall notify the affected municipalities two weeks prior to closing of any existing roads.

Payment for all of the above shall be included in the lump sum price bid for Item 614 "Maintaining Traffic", except temporary roads, and pavements shall be paid for as Item 615.

Quantities of the following items are estimated and are included for use only when and in amounts as directed by the Engineer. The amounts of these items and their location shall be recorded as used, and payment will be included in the Final Payment Estimate.

ITEM 410	TRAFFIC COMPACTED SURFACE, TYPE A OR B	100 Cu. Yds.
ITEM 410	TRAFFIC COMPACTED SURFACE, TYPE C	100 Cu. Yds.
ITEM 616	CALCIUM CHLORIDE	20 Tons
ITEM 616	WATER	500 M. Gals.
ITEM 404	ASPHALT CONCRETE OR AN APPROVED BITUMINOUS PREMIXED SURFACE COURSE FOR MAINTAINING TRAFFIC	100 Cu. Yds.

LIGHTS AND SIGNS AT ADJACENT ROAD INTERSECTIONS

The Contractor shall, in addition to the general requirements of Item 614 on this project, perform the following:

- (a) Provide, erect and maintain standard 48" x 30" size "Road Closed" signs, sign supports and lights at the following locations during the period in which the affected roads are closed to traffic.

Osborn Road just South of Dressler Avenue
 Osborn Road at Station 12+00.00
 Greenhurst Road at Station 8+20

- (b) Payment for providing, erecting, maintaining and removing lights, signs and sign supports shall be included in the lump sum price bid for Item 614 "Maintaining Traffic".

ITEM 622 CONCRETE BARRIER

The lin. ft. payment shall include all materials and labor necessary to complete the item as detailed in these plans, including transitions at bridge piers, sign supports, nose areas, and lead-in parapets to the following structures; Bedford Freeway over Reloc. McCracken Road and Ramp B-OBS over Reloc. McCracken Road.

Impressed or sawed contraction joints 2 1/2" minimum depth shall be used at 20' intervals. The maximum joint opening shall be held to a minimum and shall not extend into the base. Impressed joints shall be tapered with a maximum opening of 3/8".

1/2" expansion joints shall be used on either side of bridge piers and overhead sign supports or as required by the Engineer.

The cost of all the above shall be included in the unit price bid per lineal foot of Concrete Barrier.

ITEM 659 AGRICULTURAL LIMING, AS PER PLAN

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 project but will be non-preformed where tests indicate the item is not needed.

SEEDING

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

COMMERCIAL FERTILIZER

All areas to be seeded under Item 659 or Item 667 or sodded under Item 660 shall have commercial fertilizer 12-12-12 applied at the rate of twenty (20) pounds per 1,000 sq. ft.

ROUNDING OF CORNERS ON CROSS SECTIONS

The rounded corners shown on the typical sections apply to all cross sections even though otherwise shown in these plans.

REMOVAL OF EXISTING PIPE

The removal of all existing pipe drains which would normally be removed in various excavation items shall be included for payment in the unit price bid for the respective excavation items, unless otherwise itemized in the plans.

ITEM 203 PROOF ROLLING

An estimated quantity for this item has been provided in the General Summary for use in proof rolling of subgrade for the mainline, ramp, and directional roadway pavements, and for paved shoulders, in accordance with Item 203.

MONUMENTS

Monuments shall be constructed in accordance with details shown on Standard Drawing MC-1. For locations, see Sheet No. 363.

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CUY.-480-21.40

ROADWAY

GRADING ON ADJACENT PROJECT

The Contractor is required to do grading work within the area of the adjacent project to the West as shown in detail on sheet 4B.

Work on this section must be so scheduled as to provide full cooperation with the Contractor for the adjoining project.

TREES AND STUMPS REMOVED

All trees and stumps specifically marked for removal within the construction limits of this project shall be removed under the lump sum price bid for Item 201, Clearing and Grubbing.

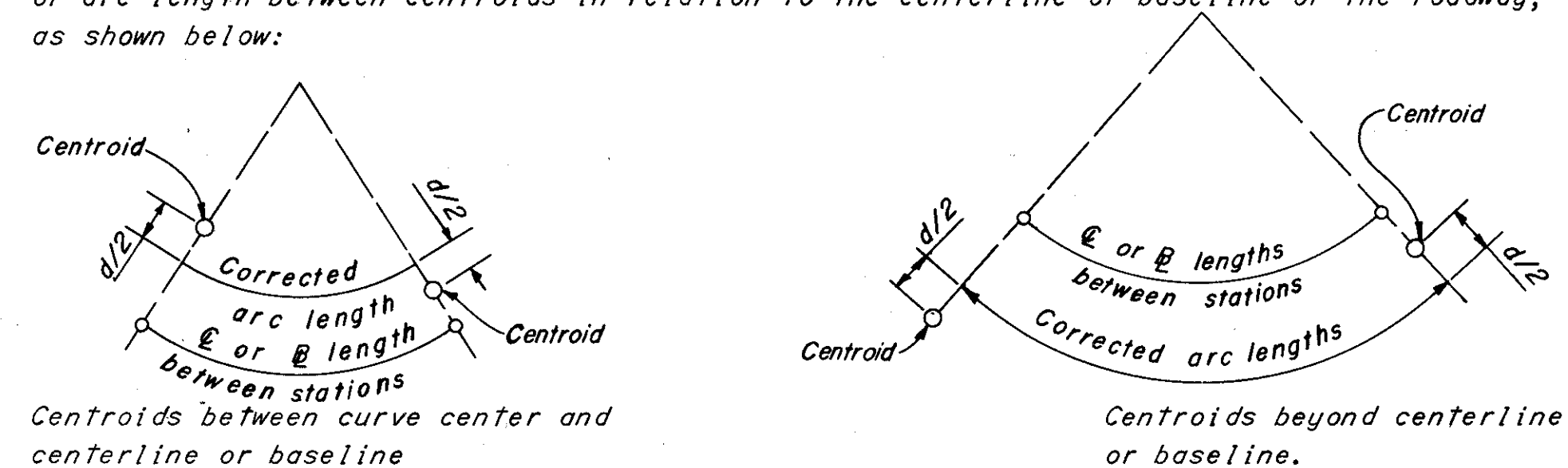
The following is an approximate estimate of the number of trees and stumps to be removed.

Sizes	No. of Trees	No. of Stumps
18"	903	30
30"	553	18
48"	74	2
60"	4	

The above estimate is approximate and the State of Ohio reserves the right to order the removal of additional trees or stumps outside of the limits of construction but within the right-of-way and or easement lines. Payment for the removal of these additional trees or stumps shall be included in the lump sum price bid for Item 201, Clearing and Grubbing.

EARTHWORK COMPUTATIONS

Adjustments have been made in earthwork quantities when warranted by roadway curvature and by end area centroid location. These adjustments have been made by correction of arc length between centroids in relation to the centerline or baseline of the roadway, as shown below:



d = Radius difference between centroids
Corrected arc lengths are indicated on Cross Section plan sheets where applicable.

PAVEMENT

FUTURE LANE CONSTRUCTION

To provide for future lane construction, the Contractor shall provide and install standard longitudinal key joints with the female end of the standard hook bolt cast into the concrete pavement at 30" spacing as called for on Standard Drawing BP-3.

The above joints shall be placed at the following locations:

Sta. 64+23 to Sta. 67+80 @ Lane OBS-EB

After the forms have been removed, the $\frac{3}{8}$ " tap bolt shall be re-inserted into the hook bolt to protect the threads and left in place in lieu of the male end of the hook bolt. The exposed metal shall then be painted with two coats of asphalt varnish.

Payment for all of the above shall be included in the unit price bid for the pertinent pavement item.

310 SUBBASE GRADING "A" AS PER PLAN

Material for this item shall meet the requirements of Grading "A" of 310.02 except that no more than 10% of the material shall pass a No. 200 sieve after all operations of placing and compacting have been completed.

The Contractor shall place 6 inches of Item 310 Subbase under all bridge approach slabs and shall be compensated therefore at the unit price bid for Item 310 Subbase Grading "A", as per plan.

LOCATIONS OF GUARDRAIL

The locations of guardrail runs as shown in these plans are subject to adjustment to assure that the planned installations will afford maximum protection for traffic.

CONTRACTION AND EXPANSION JOINTS

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

ITEM 606 GUARD POST, AS PER PLAN

Both access points for the Graded Area for Sanitary Sewer Relocation will be protected by guard posts as shown on Sheet No. 66. A steel chain, galvanized according to ASTM A-153, and with a minimum tensile strength of 3000 pounds will be attached to each post with galvanized hook bolts. At each end post a $\frac{5}{8}$ " galvanized eyebolt will be driven through the post and securely bolted by spot-welding the nuts. One end of the chain shall be permanently attached to this eyebolt. A heavy duty safety lock as approved by the Engineer will be supplied for both entrances.

Payment for this item including all labor and necessary materials will be included in the unit price bid for Item 606 Guard Post, as per plan.

GUARD RAIL TERMINAL SECTION

Where indicated on the plan, guard rail shall be terminated by using a Terminal Section. This shall consist of bolting a Standard Terminal as detailed on Standard Drawing GR-2A to the rail element at the last post. Also, the three end posts of each Terminal Section shall be encased in a minimum 4-inch thickness of Class C concrete for the full depth of the post below the ground line. Payment for the Terminal Section shall be included in the unit price bid for Item 606 Guard Rail Type 5.

PAVEMENT

ITEM 451-9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT, MODIFIED AS PER PLAN (RELOCATED McCRACKEN ROAD)

The pavement shall be modified by using reinforcing mesh fabric of No. 00/4 gage steel wire spaced at 6" center to center in place of the wire specified in Standard Construction Drawing BP-2.

Contraction Joint: The location of the joints shall be clearly marked on the forms in such a manner that the center line can be readily determined for the sawing operation. Spacing between successive contraction joints shall not generally exceed 30 feet except where hinge joints are used.

Hinge Joints: When called for on the Plans or in the Proposal, two hinge joints shall be sawed into the pavement, at the 1/3 points, between successive contraction joints or between adjacent contraction and expansion joints. Hinge joints shall not be placed as an extension of either a contraction, expansion or construction joint in an adjacent slab, but may be used to extend a longitudinal tied joint of a more or less perpendicular intersecting roadway when approved by the Engineer. In order to insure the correct identification of the sawed joint for extension when adjacent or future lanes are placed, a 3" block letter, C, for contraction or construction and H for hinge, shall be impressed 1/4" into the finished slab adjacent to and at each end of the joint. If it is not possible to place two successive hinge joints as herein specified, contraction joints shall be used. When hinged joints are used the spacing between successive contraction and/or expansion joints shall not generally exceed 75 feet and the intermediate hinge joint spacing shall not exceed 25 feet except as approved by the Engineer.

Hinge joints shall be constructed in the same manner as contraction joints except that no dowel assembly is required and the reinforcing mesh in the pavement or base shall be carried through the joint. Care shall be taken that the mesh reinforcement is not cut when the joint is being sawed.

Sealing Joints: Joints shall be sealed in accordance with Item 451. The recommended widths of saw cut and preformed elastic joint sealers are listed in the following table.

Type of Joint	Spacing between Jts. (Ft.)	JOINT SEAL WIDTHS	
		Width of Saw Cut (In.)	Neoprene Comp. Seal Width (In.)
Contraction	75*	5/16	13/16
Contraction	30	1/4	9/16
Contraction	25' and less	1/4	7/16
Hinge	--	1/4	7/16

*Hinge Joints are used at the 1/3 points.

Surface Finishing: Unless otherwise specified the final surface texture of the pavement shall be a broom finish using a broom of an approved type, not less than 18 inches in width of bass or bassine fiber not more than 5 inches in length. The strokes shall be from edge to edge of the slab, one stroke per width of broom, with adjacent strokes slightly overlapped and shall be drawn without "tearing" of the concrete and so as to produce regular corrugations approximately 1/16 inch in depth.

Brooms shall be washed thoroughly at frequent intervals during each day. Any coarse or long bristles which cause irregularities shall be trimmed or removed.

ITEM 609 CONCRETE CURB, INTEGRAL 6"x7", AS PER PLAN

Curb shall be constructed according to the dimensions shown on Sheet No. 14 and be paid for as Item 609 Concrete Curb, Integral 6"x7", as per plan.

SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE I.M. DATE 4-1-70 CONSULTING ENGINEERS
TRCD. I.M. DATE 4-1-70
CKD. N.H.B. DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

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DRAINAGE

REVIEW OF DRAINAGE FACILITIES

Before any work is started on the project, and again before final acceptance by the State, representatives of the State, the City and the Contractor shall make a visual inspection of the existing storm and sanitary sewers within the work limits which are to remain in service and which may be affected by the work. Records of the inspections shall be kept in writing by the State.

All new conduits, inlets, catch basins 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 a condition reasonably comparable to that determined by the original inspection. Any change in the condition resulting from the Contractor's operations shall be corrected by the Contractor to the satisfaction of the Engineer.

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

MAINTENANCE OF SEWER FLOWS

The Contractor shall conduct his operations so as to maintain sewer flows at all times until new facilities are completed and placed into operation either by use of existing facilities or by other acceptable methods.

Payment for any additional costs involved in maintaining these flows by pumping or by any other means approved by the Engineer shall be included in the unit prices bid for the respective items of 603 Conduit.

SANITARY FLOW INTO I-480 OR BEDFORD FREEWAY DRAINAGE SYSTEMS

This plan makes no provision for connecting, nor shall the Engineer or Contractor connect any existing or new drainage into the highway drainage system when such drains carry flow from any plumbing fixtures including floor drains and sink drains or drains from livestock lots or barns.

Existing pipe carrying flow which comes within the category outlined above shall be plugged with Class C concrete at the right-of-way line. Payment for said plugging shall be included in the unit price bid for Item 203 Excavation, (or the pertinent 202 Item).

TREATED SANITARY FLOW INTO HIGHWAY DRAINAGE SYSTEMS OTHER THAN I-480 OR BEDFORD FREEWAY

Treated sanitary flow may be discharged into the highway drainage system provided the owner has secured the approval of the local health authorities and has acquired from the State Highway Department, the official permit to have the connection made.

In each case where a permit has been issued for a sanitary connection to be made into a highway drainage conduit, it shall be provided with an inspection well, in accordance with Standard Construction Drawing No. MC-8, located approximately one foot inside the right-of-way line.

The following estimated quantities have been included in the general summary, for use as directed by the Engineer, in making the above described connections:

Item 603, 6" Conduit, Type "C" = 400 Lin. Ft.
Item 604, Inspection Wells = 5 Each

and necessary bends and branches which shall be included for payment in the pertinent conduit item. None of the above materials shall be ordered by the Contractor until authorized by the Engineer.

RESILIENT AND FLEXIBLE GASKET JOINTS 706.11 OR 706.12

Joint as described above shall be required in all conduit used for sanitary sewer construction on this project

ROOF AND FIELD DRAINS

If during the highway construction the existing flows of private roof or field drains or enclosed natural drainage sources, would reach the road through natural channels if such water was not conducted artificially or disrupted, these drains are to be connected to the storm drainage system as directed by the field engineer. The following estimated quantities have been included in the General Summary, for use as directed by the Engineer, in making the above connections.

ITEM 603 6" Type "B" Conduit 300 Lin. Ft.

STANDARD NO. 6 CATCH BASIN, AS PER PLAN

The Standard Drawing of this structure is modified to include a 2" additional depression of the grate by warping the shoulder pavement within 5 feet upstream of the basin.

ITEM 202 SEPTIC TANK REMOVED

An estimated quantity of 10 each, 202 Septic Tank Removed has been provided in the general summary to be used as directed by the Engineer.

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ITEM SPECIAL SANITARY CURB CONNECTIONS

This item shall be built according to details shown on Sheet No. 101.

Payment for accepted quantities will be made at contract prices for Item Special Sanitary Curb Connections, and will include all materials, excavation, backfill, labor and incidentals necessary to complete this work.

TYPE C CONDUIT 706.08 CONCRETE ENCASED

Encasement to be constructed as shown on Sheet No. 102.

The cost of this operation shall be included in the unit price bid for the pertinent 603 Conduit item.

6" PIPE UNDERDRAINS, AS PER PLAN

Backfill, above the 6" of No. 8 Aggregate above the underdrain, shall be restricted to sand, meeting the requirements of Section 703.02 of the Specifications. Payment for the above shall be included in the price bid for Item 605, Pipe Underdrains as per plan.

EXTRA DEPTH CATCH BASINS

Catch basins 4 feet deep and over and having a minimum interior dimension of 2'-8" shall have steps meeting the requirements of Item 604. Spacing of the steps shall be 12" minimum and 16" maximum.

INSPECTION OF CITY SEWERS

Prior to final approval of any newly installed sewer system and of reconstructed sewer, the Contractor shall furnish to the city photographs of the entire sewer system installed or repaired. An inspection must show that the sewer system has been constructed on a sound engineering basis, is free of any and all accumulations of foreign substances, and is of sound workmanship. If in the opinion of the Engineer the sewers are large enough for visual inspection including television survey, such a visual inspection shall be made in lieu of photographs. A report of the visual inspection shall be submitted to the City as a permanent record.

The cost of this operation shall be included in the unit price bid for the pertinent 603 conduit item.

SPRING DRAINS

Reference is made to Standard Construction Drawing MC-1 showing the method of draining any spring that may be shown on the plan or encountered during construction as determined by the Engineer. The following estimated quantities have been included in the General Summary for this purpose:

Item 605-6" Unclassified Pipe Underdrains, 707.01 Type III or 707.12 as per plan = 100 Lin. Ft.

Item 605 - Aggregate Drains for Springs, as per plan = 6 Lin. Ft.

The Contractor shall not order materials for "Spring Drains" until authorized by the Engineer and in the event no springs are encountered, the item shall be nonperformed.

STANDARD NO. 1-A MANHOLE WITH 706.11 JOINTS, AS PER PLAN

The Manhole frame and cover used for this item shall be identical with the castings shown on Sheet No. 105 for the Special No. 1 Manhole.

Manhole steps shall be made of cast iron and conform with Neenah Catalog No. R-1981-S or approved equal as shown on Sheet No. 102.

ITEM 605-6" PIPE UNDERDRAINS USING 706.08 PERFORATED BELL AND SPIGOT PIPE, AS PER PLAN

The pipe shall have three centering lugs cast in the bell of the pipe. There shall also be a spacer cast in the bell to provide a 3/8" gap between the adjacent bell and spigot ends.

The depth of the pipe underdrains is three (3) feet below top of curb unless otherwise shown on the plan and profile sheets.

Payment will be based on the actual number of Linear Feet of pipe with granular filters complete in place measured from end to end of the pipe which includes the depth as shown on the details of modified depths as shown on the plan and profile.

SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE I.M. DATE 4-1-70 CONSULTING ENGINEERS
TRCD. I.M. DATE 4-1-70
CKD. H.N.B. DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

GENERAL NOTES

FED. RD. DIVISION	STATE	PROJECT	
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CUY.480-21.40

DRAINAGE

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 where placed on slopes exceeding 1 on 4.

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 MC 4.

The cost of joints and collar shall be included in the contract unit price bid for the pertinent 603 Conduit Item.

STREAM CROSSINGS

A quantity of 50 cubic yards of Item 601, Rock Channel Protection Type B has been estimated and included in the General Summary for use in constructing stream crossings at the right-of-way fence. The Rock Channel Protection may not be necessary at all locations shown on the plans and shall be provided only where and as directed by the Engineer.

MANHOLES, CATCH BASINS AND INLETS

Removal and disposal of structures, not specifically abandoned or removed under Item 202 shall be paid for under "Item 203, Roadway Excavation".

CONNECTIONS TO EXISTING PIPE

Where the plans provide for proposed conduit to be connected to, or to cross either over or under an existing sewer, it shall be the responsibility of the Contractor to locate the existing pipe both as to line and grade before he starts to lay the proposed conduit.

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

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" Item 605, 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.

ITEM 603 6" CONDUIT, TYPE B 706.08 WITH 706.12 JOINTS, AS PER PLAN (SEE S-10 SHEET NO.96.)

The work for this item consists of replacing the existing sanitary house connection in full compliance with local codes as shown on sheet No.95. It is the Contractor's responsibility to locate the existing sanitary house connection and provide a 6" Test Tee with vitrified clay stopper finished 6" below existing ground and located from 1'-0" to 2'-0" maximum beyond the R/W line. The Tee connection on the line shall be concrete encased providing 6" minimum cover for a minimum length of 2'-0" around the connection.

All material, labor and incidentals will be included in the unit price bid for Item 603 5" Conduit Type B 706.08 with 706.12 joints, as per plan.

RAILROAD

ITEM 603, PIPE CULVERTS, SEWERS AND DRAINS UNDER RAILROAD

As a part of this contract it will be necessary to construct a 33 inch conduit under the tracks of the Penn Central Co. and the Norfolk and Western Railway Co. The conduit shall be jacked into place, or placed by some other method approved by the State and both Companies. If jacked into place, no trench excavation or equipment shall be closer than 10'-0" to the centerline of the near track, trenches shall be adequately supported and the specification requirement for Class B Bedding shall be disregarded. If installation is by the open trench method, the Contractor shall provide Class B Bedding for the conduit.

The Contractor shall pay to the Penn Central Co. and the Norfolk and Western Railway Co. all costs for watchmen, flagmen, temporary track supports or any other work deemed necessary by the Companies, or occasioned by the operations or negligence of the contractor, or any subcontractor, in carrying forward work under railroad tracks, or on work affecting safety of railroad operations. The Contractor shall be held responsible for protecting against surface subsidence, damage or disturbance to adjacent property and facilities from his construction methods. In case loose material is encountered and cave ins occur or are anticipated, all operations shall be discontinued, shoring approved by the railroad shall be installed and all voids filled by pressure grouting or other methods approved by the railroad before work is continued. Corrective measures required due to settlement or upheaval of the railroad tracks, during the operation or for a period of thirty (30) days after completion of installation, will be performed by railroad forces at the sole cost and expense of the Contractor. Final payment to the Contractor under the terms of this contract will not be made until he has complied with this provision.

The Contractor shall first secure State and both Companies approval of any methods of operation under railroad tracks, or affecting the safety of railroad operations. The companies will perform its engineering review of methods of operations and engineering supervision of construction without cost to the Contractor.

The Contractor, before bidding, shall consult with the Companies as to when watchmen to protect railroad traffic will be required in view of the contractor's operations. The Contractor shall execute a bond in favor of both the State and Companies as required by Section 5525-16 of the Revised Code of Ohio.

The Contractor shall cooperate with the local officials of the Penn Central Co. and the Norfolk and Western Railway Co. in work adjacent to railroad tracks, in order to avoid delay to, or interference with railroad traffic, and shall notify the Companies twenty-four hours in advance of operations that will or might affect safety of train operation.

TEMPORARY WATER POLLUTION, SOIL EROSION AND SILTATION CONTROL

The following estimated quantities are to be used as directed by the Engineer for temporary control measures. For details see Proposal Note.

Item 207-Temporary Seeding and Mulching.....	40,306.....Sq.Yds.
Item 659 Commercial Fertilizer	7.48..Tons
Item 207-Water.....	87.....M. Gallons
Item 207-Temporary Slope Drains.....	860.....Lin.Ft.
Item 207-Temporary Benches, Dikes, Dams, and Sediment Basins.....	541.....Cu.Yds.
Item 650 Repair Seeding and Mulching.....	10,076.....Sq.Yds.
Item 207-Mowing.....	45.....M Sq.Ft.

ITEM 604 FURNISH COMPLETE CASTINGS FOR EXISTING MANHOLE , AS PER PLAN

All existing structures to be adjusted to grade have been field checked to determine that the existing castings are suitable for salvage and reuse at the particular structure to be adjusted to grade. However, existing castings may prove to be unsuitable, as determined by the engineer, during construction of the project. To provide for this contingency an estimated quantity of one (1) each "604, Furnish Complete Castings For Existing Manhole, As Per Plan"

has been included in the general summary to be used in any quantity required, as determined by the engineer. It shall be the Contractor's responsibility to provide the casting of the required type, size and strength for the particular structure in question.

The Contractor is cautioned to use extreme care in the removal, storage and placement of all existing castings. Any castings damaged by the Contractor's negligent operations, as determined by the Engineer, shall be replaced with the proper new casting by the Contractor, at no expense to the State.

COMPUTATIONS AND SUB-SUMMARIES

FED. RD. DIVISION	STATE	PROJECT
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Quantity Calculations

Made By NMB Date 4-21-72

Checked By IM Date 5-1-72

CUYAHOGA COUNTY
CUY-480-21.40

ITEM 203 EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION AND EMBANKMENT							
STATION		EXCAVATION NOT INCLUDING EMB. CONSTRUCTION (C.Y.)			EMBANKMENT (C.Y.)		
From	To	I	II	III	I	II	III
I-480 EASTBOUND							
1151+00	1192+50			58,762			136,257
I-480 WESTBOUND							
1151+00	1192+50			109,379			154,583
BEDFORD FREEWAY							
35+19	46+41.15	18,015			37,241		
46+41.15	74+54.30			100,247			103,329
LANE B-OBS-E							
74+54.29	87+00			4,044			38,204
LANE OBS-EB							
62+36	77+99			57,975			727
RELOC. McCracken Road							
50+75	64+00			43,118			18
50+70.81	84+38		201,265		46,063		
RAMP B-OBS							
12+50	17+50			25,605			5,429
RAMP OBS-WB							
13+79	19+75.34			7,995			10,720
OSBORN ROAD Cul-De-Sac							
18+80	19+79.70			696			70
7+56	8+75			785			334
OSBORN ROAD CONNECTION							
0+11.50	5+74.11			972			553
ORCHARD ROAD							
5+75	11+00			8,777			0
East 154th St.							
4+00	4+59.50			138			104
BLASE AVENUE							
13+00	14+58.43			71			125
RELOC. GREENHURST ROAD							
8+30	16+36.26			684			2,125
BROADWAY AVE.							
81+50	93+10	1181			162		
DRAINAGE							
				1,877			4,968
PARTICIPATION LIMIT TOTAL		19,196	201,265	427,125	37,403	46,063	457,486
TOTAL		647,586			540,952		

ITEM 203 EMBANKMENT USING GRANULAR MATERIAL, AS PER PLAN		
STATION		EMBANKMENT Cu. Yds.
From	To	
BEDFORD FREEWAY		
61+30.00	61+97.54	914.00x3.67 = 124.24 Cu. Yds.
		27
TOTAL (Part. Limit III)		124.24 Cu. Yds.
Use 124 Cu. Yds.		

ITEM 203 PROOF ROLLING		
	AREA (Sq. Yds.) I	AREA (Sq. Yds.) III
Under Item 451-10" R.P.C. Concrete Pavement	6,303	58,296
Under Item 451-9" R.P.C. Concrete Pavement		2,404
Under Item 301-Area Under the Shoulders	3,571	28,660
Under Item 611-Approach Slabs		1,637
PARTICIPATION LIMIT TOTAL	9,874 Sq. Yds.	90,997 Sq. Yds.
	9,874 Sq. Yds.	90,997 Sq. Yds.
	3,000 Sq. Yds./Hr.	3,000 Sq. Yds./Hr.
	= 3.29 Hours	= 30.33 Hours
TOTAL	33.62 Hours	
	Use 34 Hours	

ITEM 203 SUBGRADE COMPACTION			
	AREA (Sq. Yds.) I	AREA (Sq. Yds.) II	AREA (Sq. Yds.) III
Under Item 451-10" R.P.C. Concrete Pavement	6,303		58,296
Under Item 451-9" R.P.C. Concrete Pavement		20,351	2,404
Under Item 452-7" P.P.C. Concrete Pavement			1,616
Under Item 301-Area Under the Shoulders	3,571		28,660
Under Item 611-Approach Slabs			1,637
Under Item 612-Concrete Median	17		102
Under Item 622-Concrete Barrier	438		2,561
PARTICIPATION LIMIT TOTAL	10,329	20,351	95,276
TOTAL	125,956 Sq. Yds.		

ITEM 622 CONCRETE BARRIER				
STATION		LENGTH (Lin. Ft.)		REMARKS
From	To	I	III	
I-480				
1158+17.04	1159+70.00		152.96	Sign Transition
1159+80.00	1160+73.77		73.77	20' Less For Inlet
1162+58.23	1167+95.00		536.77	Sign Transition
1168+05.00	1182+28.00		1,343.00	Sign Transition
1182+38	1193+00.00		1,042.00	80' Less For 4 Inlets 20' Less For Inlet
BEDFORD FREEWAY				
36+15.00	46+41.15	986.15		40' Less For 2 Inlets
46+41.15	54+95.00		833.85	Sign Transition
				20' Less For Inlet
55+05.00	59+83.00		478.00	Sign Transition
59+93.00	62+17.54		224.54	
63+62.80	65+88.92		206.12	20' Less For Inlet
68+07.24	74+54.29		627.04	20' Less For Inlet
74+54.29	75+60.00		105.71	
75+60.00	75+70.00		10.00	Barrier Transition
61+35.00	62+11.14		76.14	Near Modular Crash Cushion
RAMP B-OBS				
19+57.50	20+10.50		53.00	Near Modular Crash Cushion
PARTICIPATION LIMIT TOTAL		986.15	5,552.90*	*210 Less For Light Pole Found.
TOTAL		6,539.05 Lin Ft.		
Use 6,539 Lin Ft.				

ITEM 659 SEEDING AND MULCHING				
	AREA (Sq. Yds.) I	AREA (Sq. Yds.) II	AREA (Sq. Yds.) III	
Total adjusted Right of way (Excluding pavement, paved shoulders, concrete Median, Concrete Curbs and Bridges)				
	18,991	29,619		168,289
Deduction For				
Riprap				45
Rock, Channel Protection Type B	5			159
Sodding	7			141
Sodding Special Berm and Slope, Protection.				832
Seeding and Jute Matting	947	125		12,794
Paved Gutter				203
	-959	18,991	-125	29,619
	-959		-125	-14,174
PARTICIPATION LIMIT TOTAL	18,032	29,494		154,115
TOTAL	201,641 Sq. Yds.			

ITEM 659 COMMERCIAL FERTILIZER (12-12-12)			
	AREA (Sq. Yds.) I	AREA (Sq. Yds.) II	AREA (Sq. Yds.) III
Seeded and Sodded Area			
	18,986	29,619	167,886
	= 18,986x9x20	= 29,619x9x20	= 167,886x9x20
	1,000x2,000	1,000x2,000	1,000x2,000
PARTICIPATION LIMIT TOTAL	1.71 Tons	2.66 Tons	15.11 Tons
TOTAL	19.48 Tons		

ITEM 659 AGRICULTURAL LIMING MATERIAL, As Per Plan			
	AREA I	AREA II	AREA III
Seeded and Sodded Area			
	18,986 x 9	29,619 x 9	167,886 x 9
	43,560	43,560	43,560
	= 3.92 Acres	= 6.12 Acres	= 34.69 Acres
	3.92 x 10	6.12 x 10	34.69 x 10
PARTICIPATION LIMIT TOTAL	= 39.20 Tons	= 61.20 Tons	= 346.90 Tons
TOTAL	447.30 Tons		

COMPUTATIONS AND SUB-SUMMARIES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY.-480-21.40

Quantity Calculations
Made By NNB Date 4-72
Checked By NNB Date 5-72

ITEM 310 SUBBASE, GRADING "A", As Per Plan (Cont'd)					
STATION		DISTANCE	END AREA	VOLUME (Cu. Yds.)	
From	To	Lin. Ft.	Sq. Ft.	I	III
BEDFORD FREEWAY Westbound					
51+00.00	56+41.15	9,670.92 Sq.Ft. x0.5 Ft.	Calcs.		178.17
56+41.15	57+41.15	100.00	12.8125		47.45
57+41.15	58+41.15	100.00	12.8125		47.45
58+41.15	74+54.29	1,613.14 - 454.67	13.8125		571.19
LANE B-OBS-E					
74+54.29	75+78.84	3,381.85 Sq.Ft. x0.5 Ft.	Calcs.		62.63
75+78.84	79+78.84	10,926.57 Sq.Ft. x0.5 Ft.	Calcs.		202.34
79+78.84	80+00.00	21.16	13.8125		10.82
80+00.00	80+58.00	58.00	14.625		31.42
80+58.00	81+37.92	79.92	13.8125		40.89
81+37.92	84+87.92	9,753.05 Sq.Ft. x0.5 Ft.	Calcs.		180.61
84+87.92	85+40.70	1,474.90 Sq.Ft. x0.5 Ft.	Calcs.		27.31
85+40.70	88+90.70	9,753.05 Sq.Ft. x0.5 Ft.	Calcs.		180.61
88+90.70	89+00.00	9.30	13.8125		4.76
LANE OBS-E-B					
61+74.95	64+19.66	244.71	13.8125		125.19
64+19.66	67+79.70	10,029.53 Sq.Ft. x0.5 Ft.	Calcs.		185.73
70+49.80	72+22.60	172.80 (892.65-881.47)	13.8125		89.52
72+22.60	76+22.60	11,153.87 Sq.Ft. x0.5 Ft.	Calcs.		206.55
76+22.60	78+92.86	270.26	13.8125		138.26
61+74.95	63+24.00	1/2(149.05)(4+13)0.5	Nose Subbase		23.46
RAMP B-OBS					
9+64.53	9+78.35	13.82	8.8125		4.51
9+78.35	13+08.63	1,966.30 Sq.Ft. x0.5 Ft.	Calcs.		36.41
13+08.63	16+58.63	350.00	9.8125		127.20
16+58.63	17+47.70	1,915.20 Sq.Ft. x0.5 Ft.	Calcs.		35.47
19+59.60	20+15.50	55.90	10.3125		21.35
20+15.50	20+56.15	340.00 Sq.Ft. x0.5 Ft.	Nose Gate Area		6.30
20+15.50	20+56.15	40.65 x 1/2(22.625+23.625) x0.5			17.41
RAMP OBS-WB					
13+43.80	14+12.86	1,498.83 Sq.Ft. x0.5 Ft.	Calcs.		27.76
14+12.86	16+12.86	200.00	10.8125		80.09
16+12.86	19+75.34	8,266.59 Sq.Ft. x0.5 Ft.	Calcs. 26		153.09
RELOCATED GREENHURST ROAD					
8+30.00	9+27.10	97.10	13.75		49.95
9+27.10	14+13.09	485.99	13.75		247.49
14+13.09	15+36.26	123.17	13.75		62.73
East 154th Street					
3+59.78	3+91.12	31.34	12.00		13.93
3+91.12	4+59.50	68.38	13.75		34.82
77+25.37	3+91.12	259.13 Sq.Ft. x0.5 Ft.	Calcs. 29		4.79
76+41.29	3+91.12	295.48 Sq.Ft. x0.5 Ft.	Calcs. 30		5.47
BLASE AVENUE					
12+87.25	13+18.05	30.80	12.00		13.69
13+18.05	13+94.19	76.14	13.75		38.78
83+17.66	13+18.05	251.88 Sq.Ft. x0.5 Ft.	Calcs.		4.66
82+33.62	13+18.05	288.80 Sq.Ft. x0.5 Ft.	Calcs.		5.35

ITEM 310 SUBBASE, GRADING "A", As Per Plan (Cont'd)					
STATION		DISTANCE	END AREA	VOLUME (Cu. Yds.)	
From	To	Lin. Ft.	Sq. Ft.	I	III
ORCHARD ROAD					
4+92.50	5+26.92	34.42	12.00		15.30
5+26.92	10+00.00	473.08	13.75		240.92
5+26.92	64+73.30	225.33 Sq.Ft. x0.5 Ft.	Calcs.		4.17
5+26.92	63+91.86	323.57 Sq.Ft. x0.5 Ft.	Calcs.		5.99
OSBORN ROAD CUL-DE-SAC					
18+78.51	19+53.51	4685.74 Sq.Ft. x0.5 Ft.	Calcs.		86.77
19+58.11	19+79.70	21.59	10.00		8.00
19+43.31	19+79.00	403.40 Sq.Ft.	Calcs.		7.48
19+43.31	19+58.11	167.85 Sq.Ft.	Calcs. 43		18.65
7+56.26	8+31.26	4,660.97 Sq.Ft. x0.5 Ft.	Calcs.		86.31
7+93.70	8+75.00	1,742.24 Sq.Ft. x0.5 Ft.	Calcs.		32.26
OSBORN ROAD CONNECTION					
0+11.50	0+22.50	11.00	12.00		4.89
0+22.50	0+37.50	15.00	12.875		7.15
0+37.50	5+74.11	536.61	13.75		237.27
0+11.50	0+22.50	56.54 Sq.Ft. x0.5 Ft.	Calcs.		1.05
0+11.50	0+36.50	225.45 Sq.Ft. x0.5 Ft.	Calcs.		4.18
BEDFORD FREEWAY APPROACH SLABS					
61+97.54	62+15.54	1,234.13 Sq.Ft. x0.5 Ft.	Calcs.		22.85
63+64.80	63+82.80	18.00	29.00		19.33
65+63.92	65+86.92	23.00	29.00		24.70
68+09.24	68+32.24	23.00	29.00		24.70
LANE OBS-E-B APPROACH SLABS					
67+79.66	67+97.66	18.00	13.00		8.67
70+31.75	70+49.75	18.00	13.00		8.67
RAMP B-OBS APPROACH SLABS					
19+59.60	19+41.60	18.00	9.00		6.00
17+47.70	17+65.70	18.00	9.00		6.00
12+23.40	12+46.40	23.00	9.00		7.67
10+20.00	10+43.00	23.00	8.00		6.81
PARTICIPATION LIMIT TOTAL					1,995.36
TOTAL					17,001.25 Cu. Yds.
					Use 17,001 Cu. Yds.

SCALE: **HOWARD, NEEDLES, TAMMEN & BERGENDOFF**
MADE NNB DATE 4-20-72 CONSULTING ENGINEERS
TRCD. G.T. DATE 4-20-72
CKD. J.M. DATE 5-1-72 KANSAS CITY CLEVELAND NEW YORK

COMPUTATIONS AND SUB-SUMMARIES

FED. RD. DIVISION	STATE	PROJECT	
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CUYAHOGA COUNTY
CUY.-480-21.40

Quantity Calculations
Made By NNB Date 4-72
Checked By IM Date 5-72

Item 310 Subbase, 703.08 or 703.10 (Part. Limit II)

Station	Distance	End Area	Volume	
From To	Line, Ft.	Sq. Ft.	Cu. Yds.	
Relocated McCracken Road				
50+70.81	51+30.69	59.88	13.00	28.83
51+30.69	51+55.00	24.31	13.438	12.10
51+55.00	63+91.86	1,236.86	13.875	635.61
63+91.86	64+24.77	32.91	13.438	16.38
64+24.77	64+47.77	23.29	13.563	11.70
64+47.77	64+73.30	25.82	13.438	12.85
64+73.30	66+45.00	171.70	13.875	88.24
66+45.00	75+76.00	931.00	13.813	476.27
75+76.00	76+41.29	65.29	13.875	33.55
76+41.29	76+72.60	31.31	13.438	15.59
76+72.60	76+96.62	24.02	13.563	12.06
76+96.62	77+25.37	28.75	13.438	14.31
77+25.37	82+33.62	508.25	13.875	261.19
82+33.62	82+64.55	30.93	13.438	15.39
82+64.55	82+88.56	24.01	13.563	12.06
82+88.56	83+17.66	29.10	13.438	14.49
83+17.66	84+89.00	171.34	13.875	88.05
51+30.69	105+40.65	1,027.59 sq. ft. x 0.25 ft.	Calcs. 37	9.51
51+55.00	107+36.84	1,183.86 sq. ft. x 0.25 ft.	Calcs. 39-3	10.96
TOTAL (PARTICIPATION LIMIT II)				1,769.14
				<i>Use 1,769 Cu. Yds.</i>

Item 404 ASPHALT CONCRETE T-1"

STATION	Side	LENGTH	AREA	VOLUME (Cu. Yds.)	REMARKS
From To		(Ft.)	(Sq. Ft.)	I III	
ORCHARD ROAD TAPER					
10+00	11+00	Lt.	100	$\frac{1}{2} \times 100 \times (3.5+1.166)$	0.72
10+00	10+21	Rt.	21	$\frac{1}{2} \times 21 \times (7.0+5.90)$	0.42
10+00	11+00	Lt. & Rt.	100	100×14.00	4.32
BLASE AVENUE TAPER					
13+94.19	14+58.43	Lt. & Rt.	64.24	$2 \times \frac{1}{2} \times 64.24 \times (4.00+1.00)$	1.00
13+94.19	14+58.43	Lt. & Rt.	64.24	64.24×16.00	3.17
RELOCATED GREENHURST ROAD TAPER					
15+36.26	16+36.26	Lt.	100	$\frac{1}{2} \times 100 \times (6.00+2.00)$	1.85
OSBORN ROAD TAPER					
14+54.35	15+54.35	Lt. & Rt.	100	$2 \times \frac{1}{2} \times 100 \times (4.5+2.0)$	2.01
14+54.35	15+54.35	Lt. & Rt.	100	100×16	4.94
BROADWAY AVE:					
0+50.62	0+79.56				
Forestdale	E. 135th ST.	Lt.		See Calcs.	8.33
0+57.02	93+10.00				
E. 135th ST.	Broadway	Lt.		See Calcs.	30.15
PARTICIPATION LIMIT TOTAL				38.48	18.43
TOTAL				56.91	57 Cu. Yds.

Item 451 9" Reinforced Portland Cement Concrete Pavement (Part. Limit III)

Station	Length x Width	Area	Calculations	
From To	Line, Ft.	Sq. Yds.		
# Ramp B-OBS				
9+64.53	9+78.35	13.82 x 14	21.50 L = 13.82'	
9+78.35	13+08.63	1,586.63 sq. ft.	176.29 calcs. 24	
13+08.63	16+58.63	350 x 16	622.22 L = 350'	
16+58.63	17+47.7	1,544.01 sq. ft.	171.55 calcs. 23	
19+59.60	20+15.50	55.90 x 17	105.59 L = 55.90 A = $\frac{1}{2}(b+b')$	
# Ramp OBS-WB				
13+43.80	14+12.86	1,245.55 sq. ft.	138.39 calcs. 25	
14+12.86	16+12.86	200 x 18	400.00 L = 200'	
16+12.86	19+75.34	6,916.068 sq. ft.	768.45 calcs. 26	
Relocated Greenhurst Road				
8+30.00	9+27.10	2,427.5 sq. ft.	269.72 calcs. 28	
9+27.10	14+13.09	485.99 x 25	1,349.97 L = 485.99	
14+13.09	15+36.26	3,079.07 sq. ft.	342.12 calcs. 27	
East 154th Street				
3+59.78	4+59.5	99.72 x 25	277.00 L = 99.72	
3+59.78	3+87.54	197.675 sq. ft.	21.96 calcs. 29 (turnout)	
3+59.78	3+91.12	237.5 sq. ft.	26.39 calcs. 30 (turnout)	
Blase Avenue				
12+87.25	13+94.19	106.94 x 25	297.06 L = 106.94	
12+87.25	13+15.5	202.955 sq. ft.	22.55 calcs. 31 (turnout)	
12+87.25	13+18.05	231.32 sq. ft.	25.70 calcs. 32 (turnout)	
Orchard Road				
4+92.50	10+00.00	507.5 x 25	1,409.72 L = 507.5	
5+16.72	64+73.3	156.32 sq. ft.	17.37 calcs. 40 (turnout)	
5+26.92	63+91.86	263.75 sq. ft.	29.31 calcs. 41 (turnout)	
Osborn Road				
18+78.51	19+53.51	4,506.80 sq. ft.	500.76 calcs. 43-1	
19+58.11	19+79.70	20 x 21.59	47.98 Area = L x W	
19+43.31	19+79.70	167.76 sq. ft.	35.94 calcs. 42 (Rt. Lt.)	
19+43.31	19+58.11	167.85 sq. ft.	18.65 calcs. 43	
7+56.26	8+31.26	4,498.53 sq. ft.	499.84 calcs. 45	
7+93.7	8+75.0	1,601.43 sq. ft.	177.93 calcs. 45	
TOTAL (PARTICIPATION LIMIT III)				7,773.96 Sq. Yds.
				<i>Use 7,774 Sq. Yds.</i>

Item 402 ASPHALT CONCRETE T-1 1/2"

STATION	Side	LENGTH	AREA	VOLUME (Cu. Yds.)	REMARKS
From To		(Ft.)	(Sq. Ft.)	I III	
ORCHARD ROAD TAPER					
10+00	11+00	Lt.	100	$\frac{1}{2} \times 100 \times (3.5+1.166)$	1.08
10+00	10+21	Rt.	21	$\frac{1}{2} \times 21 \times (7.0+5.90)$	0.63
BLASE AVE. TAPER					
13+94.19	14+58.43	Lt. & Rt.	2x64.24	$\frac{1}{2} \times 64.24 \times (4+1)$	1.50
RELOCATED GREENHURST ROAD TAPER					
15+36.26	16+36.26	Lt.	100	$\frac{1}{2} \times 100 \times (6.0+1.167)$	1.67
OSBORN ROAD TAPER					
14+54.35	15+54.35	Lt. & Rt.	2x100	$\frac{1}{2} \times 100 \times (4.5+2.0)$	3.01
BROADWAY AVE.					
0+50.62	0+79.56				
Forestdale	E. 135th ST.	Lt.		Calcs.	12.49
0+57.02	93+10.00				
E. 135th ST.	Broadway	Lt.		Calcs.	45.23
PARTICIPATION LIMIT TOTAL				57.72	7.89
TOTAL				65.61	66 Cu. Yds.
					<i>Use 66 Cu. Yds.</i>

Item 408 BITUMINOUS PRIME COAT: 702.09, RT-2 or RT-3

STATION	SIDE	AREA	VOLUME	
From To		(Sq. Ft.)	(Gal.)	
ORCHARD ROAD TAPER				
10+00	11+00	Lt.	$\frac{1}{2} \times 100 \times (3.5+1.166)$	10.38
10+00	10+21	Rt.	$\frac{1}{2} \times 21 \times (7.0+5.90)$	6.02
10+00	11+00	Lt. & Rt.	100×14.00	62.22
BLASE AVENUE TAPER				
13+94.19	14+58.43	Lt. & Rt.	$2 \times \frac{1}{2} \times 64.24 \times (4.0+1.0)$	14.28
13+94.19	14+58.43	Lt. & Rt.	64.24×16.00	45.68
RELOCATED GREENHURST ROAD TAPER				
15+36.26	16+36.26	Lt.	$\frac{1}{2} \times 100 \times (6.0+2.00)$	17.78
OSBORN ROAD TAPER				
14+54.35	15+54.35	Lt. & Rt.	$2 \times \frac{1}{2} \times 100 \times (4.5+2.0)$	28.89
14+54.35	15+54.35	Lt. & Rt.	100×16.00	71.11
TOTAL (PARTICIPATION LIMIT III)				256.36
				<i>Use 256 Gallons.</i>

Item 411 Stabilized Crushed Aggregate (Part. Limit III)

Station	Side	Length	Area	Volume	
From To		(Ft.)	(Sq. Ft.)	(Cu. Yds.)	
Blase Avenue					
13+94.19	14+58.43	Lt. & Rt.	64.24	See Calcs.	6.94
					411-1 2411-2
Relocated Greenhurst Road					
15+36.26	16+36.26	Lt.	100	See Calcs.	5.67
					411-3
TOTAL (PARTICIPATION LIMIT III)				12.61	
				<i>Use 13 Cu. Yds.</i>	

Item 451 9" Reinforced Portland Cement Concrete Pavement, (mod. as per plan) (Part. Limit III)

Station	Length x Width	Area	Calculations	
From To	Line, Ft.	(Sq. Yds.)		
Relocated McCracken Road				
50+70.81	84+89.00	3,418.19 x 53	20,129.34 L = 3,418.19'	
51+30.69	105+40.65	889.43 sq. ft.	98.83 calcs. 37 (turnout)	
51+55.00	107+36.84	1,042.79 sq. ft.	115.87 calcs. 38 (turnout)	
105+40.65	105+58.98	18.33 sq. ft.	2.04 calcs. 39-1 Taper Detail "A"	
107+30.10	107+50.00	46.22 sq. ft.	5.14 calcs. 39-2 Taper Detail "A"	
TOTAL (PARTICIPATION LIMIT II)				20,351.22 Sq. Yds.
				<i>Use 20,351 Sq. Yds.</i>

SCALE: 1"=40'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE NNB DATA 4-21-72
TRCD GT DATE 4-21-72 CONSULTING ENGINEERS
CKD IM DATE 5-1-72 KANSAS CITY CLEVELAND NEW YORK

COMPUTATIONS AND SUB-SUMMARIES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

30
390

CUYAHOGA COUNTY
CUY. 480-21.40

Quantity Calculations
Made By *NNB* Date 4-72
Checked By *IM* Date 5-72 *Refer to calc. 2-3

ITEM 451 10" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT					
STATION		LENGTH x WIDTH Lin. Ft.	AREA (Sq. Yds.)		CALCULATIONS
From	To		I	III	
<i>I-480 Main Line</i>					
1158+17.04	1193+00.00	3,298.50x72		26,388.00	L=3,482.96+184.46
<i>I-480 Eastbound</i>					
1158+61.80	1160+73.20	2,478.51 Sq. Ft.		275.39	CALCS.
1163+05.90	1163+11.60	34.26 Sq. Ft.		3.81	CALCS.
1163+11.60	1174+08.58	1,075.92x12		1,434.56	L=1,096.98+2,809.789±2,864.789
1165+50.00	1166+50.00	600.00 Sq. Ft.		66.67	CALCS. (Taper)
1165+50.00	1165+66.67	16.67 Sq. Ft.		1.85	CALCS. Detail "A"
1166+50.00	1166+66.53	16.53x12		22.04	A=LxW
6+74.26	11+62.43	9,182.08 Sq. Ft.		1,020.23	CALCS. (Taper)
11+62.43	12+89.53	4,491.08 Sq. Ft.		499.00	CALCS. (Taper)
12+89.53	13+43.80	2,189.50 Sq. Ft.		243.28	CALCS. (Taper)
1174+08.58	1176+58.58	2,963.52 Sq. Ft.		329.28	CALCS.
1176+58.58	1180+60.00	401.42x12.00		535.23	
1180+60.00	1189+00.00	5,040.00 Sq. Ft.		560.00	A=½BxH
1189+00.00	1193+00.00	14,400.00 Sq. Ft.		1,600.00	CALCS.
<i>I-480 Westbound</i>					
1158+11.63	1159+64.53	3,436.00 Sq. Ft.		381.78	CALCS.
1178+91.00	1188+00.00	21,827.22 Sq. Ft.		2,425.25	CALCS.
1188+00.00	1193+00.00	500.00x12.00		666.67	
<i>BEDFORD FREEWAY Main Line</i>					
35+31.29	46+41.15	1109.86x48.00		5,919.25	
35+31.29	35+65.00	33.71x16.00		59.93	CALCS.
46+41.15	56+41.15	1,000.00x48.00		5,333.33	
<i>BEDFORD FREEWAY Eastbound</i>					
35+31.29	36+01.43	716.88 Sq. Ft.		79.65	COMPUTER CALCS.
35+65.00	36+15.00	50.00x13.00		72.22	
36+15.00	36+90.00	75.00(12+4)±2		66.67	
36+90.00	37+34.00	44.00x4.00		19.56	
52+89.65	53+89.65	100.00x6.00		66.67	CALCS.
53+89.65	60+88.48	8,431.43 Sq. Ft.		936.83	CALCS.
60+88.48	61+91.81	1041.10 Sq. Ft.		115.56	CALCS.
56+41.15	74+54.29	1,359.56x24.00		3,625.49	L=1813.14-453.58
25+98.72	20+56.15	3,115.72 Sq. Ft.		346.19	CALCS.
90+01.56	89+90.36	11.20 Sq. Ft.		1.24	CALCS.
52+89.65	53+06.32	16.67 Sq. Ft.		1.85	CALCS.
60+88.48	61+30.00	340.00 Sq. Ft.		37.78	NOSE GORE AREA
<i>BEDFORD FREEWAY Westbound</i>					
35+31.29	36+06.96	747.94 Sq. Ft.		83.10	COMPUTER CALCS.
46+41.15	56+41.15	10,365.58 Sq. Ft.		1,151.73	CALCS.
56+41.15	57+41.15	100.00x15.00		166.67	
57+41.15	58+41.15	100.00x15.00		166.67	
58+41.15	74+54.29	1,159.56x16.00		2,061.44	L=1613.14-453.58
88+38.09	88+49.29	11.20 Sq. Ft.		1.24	CALCS.

ITEM 451 10" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT (CONT'D)					
STATION		LENGTH x WIDTH Lin. Ft.	AREA (Sq. Yds.)		CALCULATIONS
From	To		I	III	
<i>LANE B-OBS-E</i>					
74+59.29	75+78.84	2,943.00 Sq. Ft.		327.00	CALCS.
75+78.84	79+78.84	9,498.53 Sq. Ft.		1,055.40	CALCS.
79+78.84	81+37.92	159.08x24.00		424.21	
81+37.92	84+87.92	8,466.71 Sq. Ft.		940.75	CALCS.
84+87.92	85+40.70	1,282.27 Sq. Ft.		142.47	CALCS.
85+40.70	88+90.70	8,466.71 Sq. Ft.		940.75	CALCS.
88+90.70	89+00.00	9.30x24.00		24.80	
<i>LANE OBS-E-B</i>					
61+74.95	64+19.66	244.71x29.00		652.56	
64+19.66	67+79.66	8,718.57 Sq. Ft.		968.74	CALCS.
70+49.75	72+22.60	4,201.57 Sq. Ft.		466.84	CALCS.
72+22.60	76+22.60	9,682.70 Sq. Ft.		1,075.86	CALCS.
76+22.60	78+92.86	270.26x24.00		720.69	
<i>RAMP B-OBS</i>					
20+15.50	20+56.15	40.65(210+200)±2		92.59	
<i>PARTICIPATION LIMIT TOTAL</i>					
TOTAL				6,302.86	58,295.91
					64,598.77 Sq. Yds.
					Use 64,599 Sq. Yds.

ITEM 452 7" PLAIN PORTLAND CEMENT CONCRETE PAVEMENT (Part. Limit III)					
STATION		LENGTH x WIDTH Lin. Ft.	AREA (Sq. Yds.)		CALCULATIONS
From	To		I	III	
<i>OSBORN ROAD CONNECTION</i>					
0+11.50	0+22.50	11 x 24		29.33	
0+22.50	0+37.50	15 x 24.50		40.83	
0+37.50	5+74.11	536.61 x 25		1490.58	L=536.61
0+11.50	0+22.50	39.305 Sq. Ft.		4.37	CALC.
0+11.50	0+37.50	177.76 Sq. Ft.		19.75	CALC.
<i>BROADWAY AVE. at Graded Area for Sanitary Sewer Relocation</i>					
110+82	111+22	40 x 7		*31.11	
<i>TOTAL (PARTICIPATION LIMIT III)</i>					
				1584.86 Sq. Yds.	
					Use 1585 Sq. Yds.
*T=8"					

ITEM 611 REINFORCED CONCRETE APPROACH SLABS						
STATION		LENGTH x WIDTH Lin. Ft.	AREA (Sq. Yds.)	404	407	
From	To			2 1/2" C.Y.	1 1/2" C.Y.	Tack Coat # Gal.
<i>I-480</i>						
1152+73.41	1153+08.41	2x25x48	266.67	19	27	.93
1158+17.04	1158+42.04	25x48+½x25(57.79+57.17)	*213.17	15	21	.75
1160+48.77	1160+73.77	(25x48)+(25x36)	233.33	16	23	.82
1162+58.23	1162+83.23	(25x48)+(25x36)	233.33	16	23	.82
<i>BEDFORD FREEWAY</i>						
61+97.54	62+17.54	(16x20)+(34x20)+(½x20x1.25)	*112.50	8	11	.39
63+62.80	63+82.80	(16x20)+(24x20)	*88.88	6	9	.31
65+63.92	65+88.92	(16x25)+(24x25)	111.11	5	11	.39
68+07.24	68+32.24	(16x25)+(24x25)	111.11	5	11	.39
<i>LANE OBS-EB</i>						
67+79.66	67+99.66	20x24	*53.33	4	5	.19
70+29.75	70+49.75	20x24	*53.33	4	5	.19
<i>RAMP B-OBS</i>						
10+20.00	10+45.00	25x16	44.44	3	4	.16
12+21.40	12+46.40	25x16	44.44	3	4	.16
17+47.70	17+67.70	20x16	*35.55	2	4	.12
19+39.60	19+59.60	20x16	*35.55	2	4	.12
TOTAL (PARTICIPATION LIMIT III) *T=12"			379.14 Sq. Yds.			
TOTAL (PARTICIPATION LIMIT III) T=13"			1,257.60 Sq. Yds.			
TOTAL (PARTICIPATION LIMIT III)				108	162	5.74

* 0.1 gal. per sq. yd.

ITEM 612 STANDARD CONCRETE MEDIAN					
STATION		SIDE	LENGTH x WIDTH (Sq. Ft.)	AREA (Sq. Yds.)	
From	To			(Part. Limit I)	
<i>BEDFORD FREEWAY</i>					
35+65.00	36+15.00	Rt.	50.00x3.00	16.67	
TOTAL (Part. Limit I)			16.67 Sq. Yds.		
			Use 17 Sq. Yds.		

ITEM 612 4" CONCRETE MEDIAN, As Per Plan					
STATION		SIDE	LENGTH x WIDTH (Sq. Ft.)	AREA (Sq. Yds.)	
From	To			(Part. Limit III)	
<i>BEDFORD FREEWAY</i>					
61+30.00	61+97.54	Rt.	914.00	101.55	
TOTAL (Part. Limit III)			101.55 Sq. Yds.		
			Use 102 Sq. Yds.		

GENERAL SUMMARY

TYPE CODE 7221

Quantity Calculations
 Made By NNB Date 4-72
 Checked By I.M. Date 5-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

33
390

CUYAHOGA COUNTY
 CUY. 480-21.40

SHEET NUMBER																	COST PARTICIPATION			TOTAL QUANT.	UNIT	ITEM	DESCRIPTION
24	25	26	27	28	29	30	31	40	41	42	44	46	72-A	73	I	II	III						
PAVEMENT																							
	2,686														298	-	2,388	2,686	cu.yds.	301	bituminous aggregate base: 702.01 (85-100 or AC20) or 702.09, RT-11 or RT-12, as per plan		
		5,958						21	139	1	162			6	674	-	5,613	6,287	cu.yds.	304	aggregate base		
	1,167														1,167	-	-	1,167	sq.yds.	305	9" Portland cement concrete base		
				17,001											1,995	-	15,006	17,001	cu.yds.	310	subbase, grading A, as per plan		
					3,008										569	-	2,439	3,008	cu.yds.	310	subbase		
						1,769									-	1,769	-	1,769	cu.yds.	310	subbase 703.08 or 703.10		
							66								58	-	8	66	cu.yds.	402	asphalt concrete (70-85 or AC20)		
							57	108		8	9	1	48		41	-	192	233	cu.yds.	404	asphalt concrete (70-85 or AC20)		
								162									162	162	gals.	407	Tack Coat: 702.04, MS-2 or RS-1; or 702.02, RC-70 or RC-250		
								5.74									5.74	5.74	tons	407	Cover aggregate		
							256								-	-	256	256	gals.	408	bituminous prime coat: 702.09, RT-2 or RT-3		
																	13	13	cu.yds.	411	stabilized crushed aggregate		
																	7,774	7,774	sq.yds.	451	9" reinforced Portland cement concrete pavement		
																	20,351	20,351	sq.yds.	451	9" reinforced Portland cement concrete pavement, modified as per plan		
															6,303	-	58,296	64,599	sq.yds.	451	10" reinforced Portland cement concrete pavement		
																	1,585	1,822	sq.yds.	452	7" plain Portland cement concrete pavement		
																	31	31	sq.yds.	452	8" plain Portland cement concrete pavement		
																		64	64	lin.ft.	609	asphalt concrete curb, Standard Type 1 (70-85 or AC-20)	
																		4,669	4,669	lin.ft.	609	concrete curb, Standard Type 2A	
																		1,035	1,035	lin.ft.	609	concrete curb, Standard Type 2B	
																		55	55	lin.ft.	609	concrete curb, Standard Type 3	
																		45	45	lin.ft.	609	concrete curb, Standard Type 3A	
																		2,191	2,191	lin.ft.	609	concrete curb, Standard Type 6	
																		333	333	lin.ft.	609	concrete curb, Standard Type 7	
																		591	591	lin.ft.	609	concrete curb, Standard Type 8	
																		6,599	6,599	lin.ft.	609	concrete curb, Integral 6"x7"	
																		1,258	1,258	sq.yds.	611	reinforced concrete approach slabs (T=13")	
																		379	379	sq.yds.	611	reinforced concrete approach slabs (T=12")	
																		17	17	sq.yds.	612	Standard concrete median	
																		102	102	sq.yds.	612	4" concrete median, as per plan	
																		6,589	6,589	lin.ft.	622	concrete barrier	
																		62	62	cu.yds.	special	drainage connection using no. 9 aggregate	
																				lump	special	Modular crash cushion impact attenuator	
																		239	239	lin.ft.	special	Pressure relief joint	

SCALE: HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE NNB DATE 5-2-72 CONSULTING ENGINEERS
 TRCD NNB DATE 5-5-72
 CKD I.M. DATE 5-17-72 KANSAS CITY CLEVELAND NEW YORK

GENERAL SUMMARY

TYPE CODE 7221

Quantity Calculations
Made By NNB Date 4-72
Checked By IM Date 5-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

35
390

CUYAHOGA COUNTY
CUY. 480-21.40

SHEET NUMBER															COST PARTICIPATION			TOTAL	UNIT	ITEM	DESCRIPTION
21	22	45	46	47	86	88	89	91	93	96	I	II	III	QUANT.							
																	DRAINAGE				
										114	114	-	-	114	lin. ft.	603	27" conduit, Type B				
										169	169	-	-	169	lin. ft.	603	27" conduit, Type C				
					140						-	-	140	140	lin. ft.	603	27" conduit, Type C, 706.02 or 706.08 E.S. or 707.13				
								360			-	-	360	360	lin. ft.	603	30" conduit, Type B				
					110						-	-	110	110	lin. ft.	603	33" conduit, Type B, 706.02 Class III				
					202						-	-	202	202	lin. ft.	603	33" conduit, Type B, 706.02 Class V, under railroad as per plan				
							105				-	-	105	105	lin. ft.	603	33" conduit, Type C, 706.02 or 706.08 E.S. or 707.13				
					22								22	22	lin. ft.	603	33" conduit, Type F, 707.05 Type C				
								202			-	-	202	202	lin. ft.	603	42" conduit, Type B				
								22			-	-	22	22	lin. ft.	603	42" conduit, Type F, 707.05 Type C				
5													5	5	each	604	inspection well				
	1												1	1	each	604	furnish complete castings for existing manhole, as per plan				
					2	3		2	1	1	1	-	-	1	each	604	Standard No. 2-10 median inlet				
						1				3	1	-	-	11	each	604	Standard No. 1-38 median inlet				
												-	-	1	each	604	Standard No. 1-38 median inlet, modified as per plan				
			1	1	2	2					2	-	-	4	each	604	Standard No. 2-A-6 paved shoulder inlet				
					1						-	-	-	1	each	604	Standard No. 2-A-12 paved shoulder inlet				
					1				1		-	-	-	2	each	604	Standard No. 2-A-14 paved shoulder inlet				
							2				-	-	-	2	each	604	Standard No. 2-2-A catch basin				
								2			-	-	-	2	each	604	Standard No. 2-2-B catch basin				
				4			4		6	2	4	-	-	12	each	604	Standard No. 3-A catch basin				
							8		14		-	28	-	28	each	604	Cuyahoga County No. 3-C catch basin				
								2			-	-	-	2	each	604	Standard No. 4 catch basin				
					1						-	-	-	1	each	604	Standard No. 4 catch basin, modified as per plan				
						4				4	2	1	-	5	each	604	Standard No. 5 catch basin				
						1					-	1	-	1	each	604	Standard No. 5 catch basin using Grate B				
					1				1	2	-	-	-	4	each	604	Standard No. 6 catch basin, modified as per plan				
							1				-	-	-	1	each	604	Standard No. 6 catch basin				
							1				-	-	-	1	each	604	Standard No. 2-A-6 paved shoulder inlet, modified as per plan				
					1	3			1		-	-	-	5	each	604	Standard No. 1 manhole				
					1	7		4	7		-	19	-	19	each	604	Cuyahoga County No. 1 manhole				
							1				-	-	-	1	each	604	Standard No. 1-A manhole				
								2			-	2	-	2	each	604	Cuyahoga County No. 2 manhole				
						280	628	296		565	3,417			4,442	lin. ft.	605	6" shallow pipe underdrains, as per plan				
										1,263				1,766	lin. ft.	605	6" deep pipe underdrains, as per plan				
										325				100	lin. ft.	605	6" unclassified pipe underdrains, as per plan				
														100	lin. ft.	605	6" unclassified pipe underdrains, 707.01 Type III, or 707.12, as per plan				
										3,129				1,697	lin. ft.	605	6" pipe underdrains, 706.08 perforated, as per plan				
														6	lin. ft.	605	aggregate drains for springs, as per plan				

SCALE: **HOWARD, NEEDLES, TAMMEN & BERGENOFF**
 MADE *NNB* DATE *5-9-72* CONSULTING ENGINEERS
 TRCD. *NNB* DATE *5-9-72*
 CKD. *I.M.* DATE *5-23-72* KANSAS CITY CLEVELAND NEW YORK

GENERAL SUMMARY

TYPE CODE 7221

(UNLESS OTHERWISE SHOWN)

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

36
390

CUYAHOGA COUNTY
CUY. 480-21.40

SHEET NUMBER												COST			PARTICIPATION			TOTAL QUANT.	UNIT	ITEM	DESCRIPTION
98	19	21	22	24	85	86	89	91	93	96		* CRSD	II CRSD	I	II	III					
III	III CRSD	CRSD			CRSD							725%	175%								
																					EROSION CONTROL - TYPE CODE Y005
						33		10		6			-	-	49	49	sq. yds.	601		riprap using 6" reinforced concrete slab	
		50			21		5	611		84			4	-	773	777	cu. yds.	601		rock channel protection, Type B	
							206						-	-	456	456	lin. ft.	601		paved gutter, Standard Type 1-2	
					201,641								18,032	29,494	154,115	201,641	sq. yds.	659		seeding and mulching	
		7.48			19.48								1.71	2.66	22.59	26.96	tons	659		commercial fertilizer (12-12-12)	
					447.30								39.20	61.20	346.90	447.30	tons	659		agricultural liming, as per plan	
								21	120	7			7	-	141	148	sq. yds.	660		sodding	
						100		688		44			-	-	832	832	sq. yds.	660		sodding for special berm and slope protection, as per plan	
						3,601		4,104		2,473			947	125	12,794	13,866	sq. yds.	667		seeding and jute matting	
					40,306								-	-	40,306	40,306	sq. yds.	207		temporary seeding and mulching	
					87								-	-	87	87	M. gals.	207		water	
					860								-	-	860	860	lin. ft.	207		temporary slope drains	
					541								-	-	541	541	cu. yds.	207		temporary benches, dikes, dams and sediment basin	
					10,076								-	-	10,076	10,076	sq. yds.	659		repair seeding and mulching	
					45								-	-	45	45	M sq. ft.	207		mowing	
																					SANITARY - TYPE CODE Y060
								3	2	2	1		-	-	8	8	each	202		manhole abandoned	
										0.7			-	-	0.7	0.7	cu. yd.	602		concrete masonry	
											120		-	-	120	120	lin. ft.	603		6" conduit, Type B, 706.08 with 706.12 joints, as per plan	
	167						285					62	-	-	452	514	lin. ft.	603		8" conduit, Type B, 706.08 with 706.12 joints	
	800											27	-	-	800	827	lin. ft.	603		36" conduit, Type B, 706.02 Class III, fully lined as per 706.05 and with joints as per 706.11	
		417											417	-	-	417	lin. ft.	603		48" conduit, Type B 706.02 Class III fully lined as per 706.05 and with joints as per 706.11	
		1484											1484	-	-	1484	lin. ft.	603		48" Conduit, Type B 706.02 Class IV fully lined as per 706.05, with joints as per 706.11	
	1									1			-	-	2	2	each	604		manhole adjusted to grade	
	2	4					1		1	1			4	-	5	9	each	604		Standard No. 1-A manhole with 706.11 joints, as per plan	
		1											1	-	-	1	each	604		Junction Chamber	
	7												-	-	7	7	each	Special		sanitary curb connection	
					420							420	-	-	420	420	lin. ft.	603		48" Conduit, Type B 706.02 Class I fully lined as per 706.05, with joints as per 706.11	
		144			64							64	144	-	-	208	lin. ft.	603		48" Conduit, Type B 706.02 Class III fully lined as per 706.05 and with joints as per 706.11, Radius Pipe	
																					GENERAL
													lump	lump	lump	lump	lump	lump	614		Maintaining Traffic
													lump	lump	lump	lump	lump	lump	619		Field Office
													lump	lump	lump	lump	lump	lump			Construction Layout Stakes
																					For WATERWORK Quantities see Sheet No. 37
																					For TRAFFIC CONTROL Quantities see Sheet No. 237
																					For TRAFFIC SIGNAL Quantities see Sheet No. 260
																					For LIGHTING Quantities see Sheet No. 268
																					Structures Over 20' Span
																					Bridge CUY 480-2140 For Quantities see Sheet No. 292
																					Bridge CUY 480-2154 For Quantities see Sheet No. 305
																					Bridge CUY 480-2169 For Quantities see Sheet No. 32E
																					Bridge Bedford Freeway Ramp B-OBS over relocated McCracken Road For Quantities see Sheet No. 337
																					Bridge Lane OBS-E-B over relocated McCracken Road For Quantities see Sheet No. 351

SCALE: **HOWARD, NEEDLES, TAMMEN & BERGENOFF**
 MADE N.N.B. DATE 5-15-72 CONSULTING ENGINEERS
 RECD. DATE _____
 CRD. I.M. DATE 5-26-72 KANSAS CITY CLEVELAND NEW YORK

* CRSD = Cleveland Regional Sewer District
100%

Rev. 1-9-74

GENERAL SUMMARY

GENERAL SUMMARY

NOTE: Participation I - 100% State
Participation III - State - Federal

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

Quantity Calculations
Made By NNB Date 4-72
CUYAHOGA COUNTY
CUY. 480-21.40
Checked By IM Date 5-72

SHEET NUMBER											COST PARTICIPATION		TOTAL QUANT.	UNIT	ITEM	DESCRIPTION	
197 (III)	186 (III)	207 (III)	209 (III)	210 (III)	211 (III)	213 (III)	214 (I)	215 (III)	216 (III)		I	III					
		339	826									1,165	1,165	Lin.Ft.	Special	30" Prestressed Concrete Cylinder Pipe Fittings AWWA C301-64, All Tied Joints	
		3,672		81								3,753	3,753	Lin.Ft.	Special	12" Water Main ASA Class 25 C.I. Pipe C.I. Fittings Class "D", Cement Lined	
		18										18	18	Lin.Ft.	Special	12" Water Main A.S.A. Class 25 C.I. Pipe C.I. Fittings Class "D", Cement Lined, All Lead Joints	
		166		136								302	302	Lin.Ft.	Special	12" Water Main A.S.A. Class 6 Ductile Iron Pipe C.I. Fittings Class "D", Cement Lined	
		30		47								77	77	Lin.Ft.	Special	12" Water Main A.S.A. Class 25 C.I. Pipe C.I. Fittings Class "D", Cement Lined, with Boltless Restrained Push-On Joints	
		96		36								132	132	Lin.Ft.	Special	12" Water Main A.S.A. Class 6 Ductile Iron Pipe C.I. Fittings Class "D", Cement Lined, with Boltless Restrained Push-On Joints	
		122		319	270	773						1,484	1,484	Lin.Ft.	Special	8" Water Main A.S.A. Class 25 C.I. Pipe C.I. Fittings Class "D", Cement Lined	
				36								36	36	Lin.Ft.	Special	8" Water Main A.S.A. Class 25 C.I. Pipe C.I. Fittings Class "D", Cement Lined, All Lead Joints	
		102		7		18	17					17	127	144	Lin.Ft.	Special	6" Water Main A.S.A. Class 25 C.I. Pipe C.I. Fittings Class "D", Cement Lined, All Lead Joints
		6					10					10	6	16	Lin.Ft.	Special	4" Water Main A.S.A. Class 25 C.I. Pipe C.I. Fittings Class "D", Cement Lined, All Lead Joints
		1	2									3	3	Each	Special	Prestressed Concrete Cylinder Pipe to Riveted Steel Pipe Joint - Concrete Pipe Joint Adapter A.W.W.A. C-301, 30"	
		1										1	1	Each	Special	Prestressed Concrete Cylinder Pipe to Plain End Pipe - Concrete Pipe Joint Adapter A.W.W.A. C-301 to Mechanical Compression Sleeve Joint with Harness Tie Bolts and Plate Lugs, 30"	
		280					600				600	280	880	Lin.Ft.	Special	1 1/2" New Service Pipe	
		1				64						64	64	Lin.Ft.	Special	8" Water Main Ductile Iron A.S.A. Class 8 Extra-heavy River Crossing Pipe, Cement Lined	
							1					1	1	Each	Special	8"x4" Tapping Sleeve and 4" Valve	
												1	1	Each	Special	6"x4" Tapping Sleeve and 4" Valve	
		2	2									4	4	Each	Special	30" Tied Closure Piece	
		339			1							339	339	Lin.Ft.	Special	Tied Distance (30" Pipe) Per Detail "Y" or Clamp Type Harness Joint	
						1						1	1	Each	Special	8"x8" Tapping Sleeve and 8" Valve	
		1	1			1						1	1	Each	Special	6"x6" Tapping Sleeve and 6" Valve	
		9		1								2	2	Each	Special	24" Victaulic Valve	
		1		1	2	2						10	10	Each	Special	12" Hub Valve	
		1										6	6	Each	Special	8" Hub Valve	
		1										1	1	Each	Special	8" Flanged Valve	
		1										1	1	Each	Special	8" Cutting-In Valve Complete	
		12		1		3						16	16	Each	Special	6" Hub Valve	
		1										1	1	Each	Special	4" Hub Valve	
		2	2									4	4	Each	Special	4" Drain Complete	
		3	2									5	5	Each	Special	2" Air Cock Complete	
		2					2					2	2	Each	Special	Adjust Curb Cock Valve Box to Grade	
		2		1			4					4	3	Each	Special	Adjust Valve Box to Grade	
		3				5	3	1	9			3	22	25	Each	Special	Remove Abandoned Curb Cock Valve Box
		4					1					1	4	5	Each	Special	Remove Abandoned Valve Box (8")
		12										15	15	Each	Special	Furnishing and Setting 6" Fire Hydrant	
		1					3					1	1	Each	Special	6" Fire Hydrant Relocated	
		1		1								2	2	Each	Special	Remove and Reset 4" Fire Hydrant Complete	
		1						1				1	2	Each	Special	4" Fire Hydrant Relocated	
		1					1					1	1	Each	Special	Removed Abandoned Valve Box (2")	
		3					2					2	3	5	Each	Special	Service Connection: Relocated (3/4"-1 1/2")
		7										8	8	Each	Special	Relocate, Retap and Reconnect Service Connection (3/4"-1 1/2")	
		1										1	1	Each	Special	Temporary Service Connection (3/4")	
		3					2					2	3	5	Each	202	Meter Vault Removed (Under 1 1/2")
		7,379	3,950	545	366	895	164				164	13,135	13,299	Lbs.	Special	Miscellaneous Metal Work	
							1					1	1	Each	Special	Plugging Existing Water Mains and Branches (4")	
		7			5		3	1	9			3	22	25	Each	Special	Plugging Service Connections (3/4"-2")
		1		1								2	2	Each	Special	Plugging Water Mains and Branches (8") Existing	
		3					2					2	3	5	Each	Special	Water Meter Relocated (3/4"-1 1/2")
			2									2	2	Each	202	Access Manhole and Anchorage Type "A" Abandoned	
		1	1									2	2	Each	Special	Valve Chamber	
		1	1									2	2	Each	Special	Drain Vault	
		2										2	2	Each	Special	Access Manhole and Anchorage Type "A"	
			2									2	2	Each	Special	Access Manhole and Anchorage Type "B"	
							2					2	2	Each	604	Meter Vault Adjusted to Grade	
												1	1	Each	202	Meter Vault Removed (2")	
			1									1	1	Each	202	Valve Chamber Abandoned	
		80										80	80	Lin.Ft.	202	30" Steel Water Main Pipe Removed	
		100										100	100	Lin.Ft.	202	8" Water Main Pipe Removed	
			2									2	2	M.B.M.	Special	Sheeting Left in Place	
		4										4	4	Each	Special	Furnish and Install Flush Pipe including Fittings and Valves (2")	

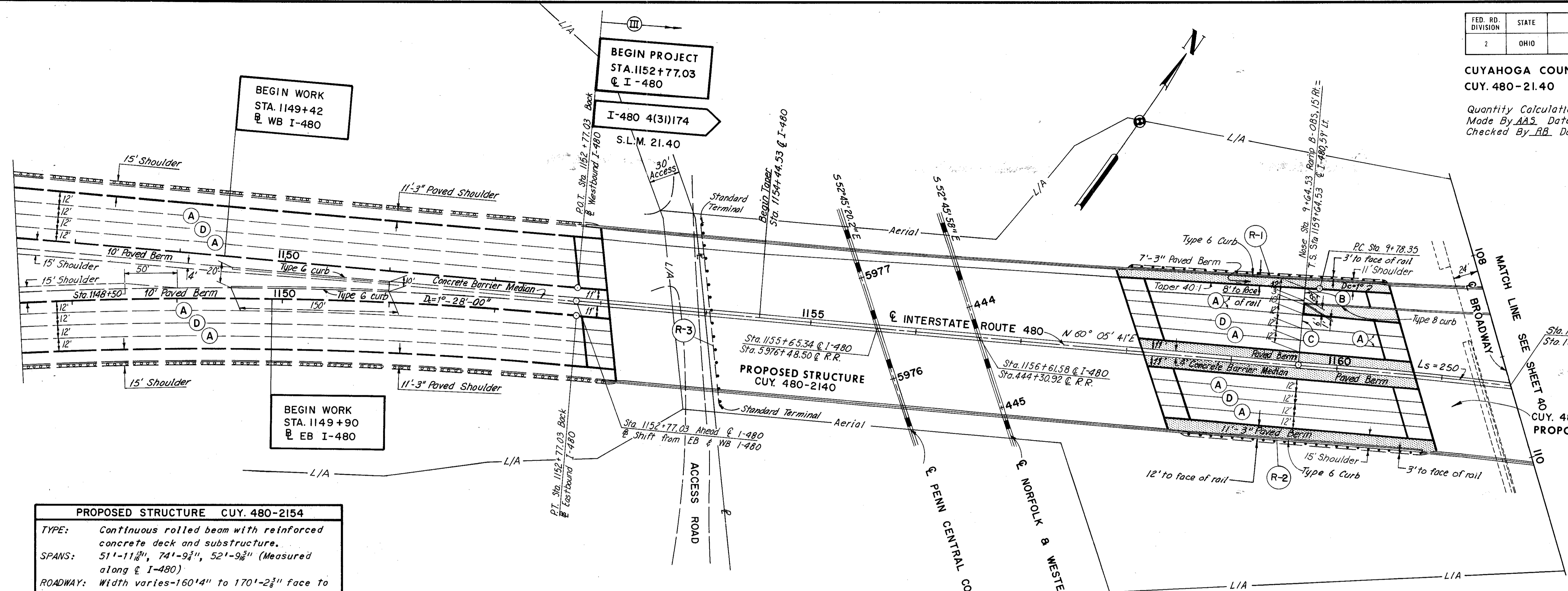
SCALE: E.R.H. DATE 5-15-72
MADE G.E.S. DATE 5-16-72
TRCD E.R.H. DATE 5-17-72
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

Revised 31 Oct. 73 E.R.H.

GENERAL SUMMARY

CUYAHOGA COUNTY
CUY. 480-21.40

Quantity Calculations
Made By AAS Date 9/67
Checked By RB Date 11-67



PROPOSED STRUCTURE CUY. 480-2154

TYPE: Continuous rolled beam with reinforced concrete deck and substructure.

SPANS: 51'-11¹/₂"', 74'-9³/₈"', 52'-9³/₈"' (Measured along I-480)

ROADWAY: Width varies-160'4" to 170'-2³/₈" face to face of parapets, with Concrete Barrier Median.

DESIGN LOAD: HS20-44 and Interstate Alternate Loading

SKEW: 22°44'03" Right Forward

WEARING SURFACE: 2¹/₂" Asphalt Concrete

APPROACH SLABS: AS-1-67 (25 feet long)

ALIGNMENT: Spiral, 2°00'00" Right

SUPERELEVATION: I-480 Varies .0156 ft. per ft. to .047 ft. per ft. Ramp B-OBS .0156 ft. per ft.

PROPOSED STRUCTURE CUY.480-2140

TYPE: Continuous steel girder with reinforced concrete deck and substructure.

SPANS: 96'-6", 100'-0", 110'-2³/₈"', 110'-2³/₈"', 87'-0"

ROADWAY: Width Varies 146'-0" to 150'-5¹/₂" face to face of parapets, with Concrete Barrier Median.

LOAD FREQUENCY: HS20-44 and Interstate Alternate Loading.

SKEW: Varies

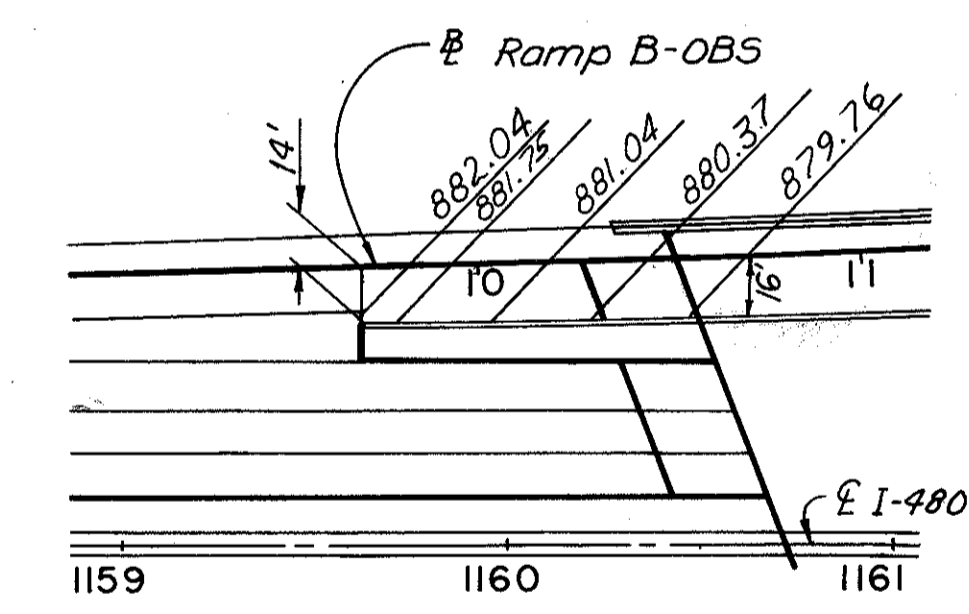
WEARING SURFACE: 2¹/₂" Asphalt Concrete

APPROACH SLABS: AS-1-67 (25 feet long)

ALIGNMENT: Tangent

SUPERELEVATION: Varies, .0156 ft. per ft. to 0.00 ft. per ft.

GUARD RAIL					
Ref. No.	Station	Side	606		Type 5 Deep Beam Rail
			Type A Bridge Terminal Assembly	Type 4 Bridge Terminal Assembly	
	From	To	Lin. Ft.	Each	
R-1	1158+03	1160+27.2	LT	224.2	2
R-2	1158+70.5	1160+89.2	RT	218.7	2
R-3	1154+05	Q		175.0	
Total Part III				617.9	4



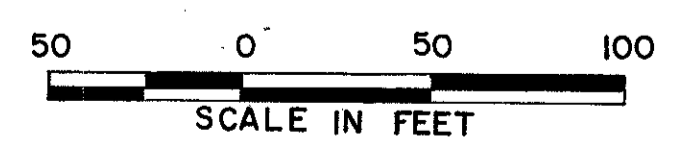
NOSE DETAIL WITH SHOULDER ELEVATIONS

Note: Ramp B-OBS, Transition Pavement Width from 14' at Nose to 16' in 100' Length. See Bridge Plans for Additional Information.

JOINT LEGEND

- (A) Standard Longitudinal Joint
- (B) Standard Expansion Joint
- (C) Standard Contraction Joint
- (D) Key Joint without Tiebars

Note: All work shown on this sheet is in Participation III



DATE	BY	CHECKED

DATE	BY	CHECKED

DATE	BY	CHECKED

SCALE 1"=50'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
MADE A.A.S. DATE 9-67
TRCD P.R. DATE 10-67
CKD R.B. DATE 11-67

CUYAHOGA COUNTY
CUY. 480-21.40

Quantity Calculations
Made By AAS, Date 9-67
Checked By RB, Date 11-67

PROPOSED STRUCTURE - LANE OBS-E-B OVER RELOCATED McCracken Road

TYPE: Continuous steel girders with reinforced concrete deck and substructure.

SPAN: 61'-8 $\frac{1}{2}$ ", 95'-1 $\frac{1}{2}$ ", 66'-5" (Measured along @ Lane OBS-E-B)

ROADWAY: 42'-0" f.f. of parapets (Initial)

DESIGN LOAD: HS20-44

SKEW: 46°51'13" Left Forward

WEARING SURFACE: 2 $\frac{1}{2}$ " Asphalt Concrete

APPROACH SLABS: AS-1-67 (20 feet long)

ALIGNMENT: Spiral, 6°30'00" Left

SUPERELEVATION: .083 ft. per ft.

PROPOSED STRUCTURE CUY. 480-2154

TYPE: Continuous rolled beam with reinforced concrete deck and substructure.

SPANS: 51'-11 $\frac{1}{2}$ ", 74'-9 $\frac{3}{4}$ ", 52'-9 $\frac{3}{4}$ " (Measured along @ I-480)

ROADWAY: Width varies-160'-4" to 170'-2 $\frac{3}{4}$ " face to face parapets, with Concrete Barrier Median

DESIGN LOAD: HS20-44 and Interstate Alternate Loading

SKEW: 22°44'03" Right Forward

WEARING SURFACE: 2 $\frac{1}{2}$ " Asphalt Concrete

APPROACH SLABS: AS-1-67 (25 feet long)

ALIGNMENT: Spiral, 2°00'00" Right

SUPERELEVATION: I-480 Varies .0156 ft. per ft. to .047 ft. per ft. Ramp B-OBS .0156 ft. per ft.

PROPOSED STRUCTURE CUY. 480-2169

TYPE: Continuous steel girder with reinforced concrete deck and substructure.

SPANS: 92'-2 $\frac{3}{4}$ ", 120'-9 $\frac{3}{4}$ " (Measured along @ Bedford Expressway)

ROADWAY: 76'-0" face to face of parapet with concrete barrier median

DESIGN LOAD: HS20-44

SKEW: 16°57'137" Left. Forward to Local Tangent

WEARING SURFACE: 1 $\frac{1}{2}$ " Asphalt Concrete

APPROACH SLABS: AS-1-67 (25 feet long)

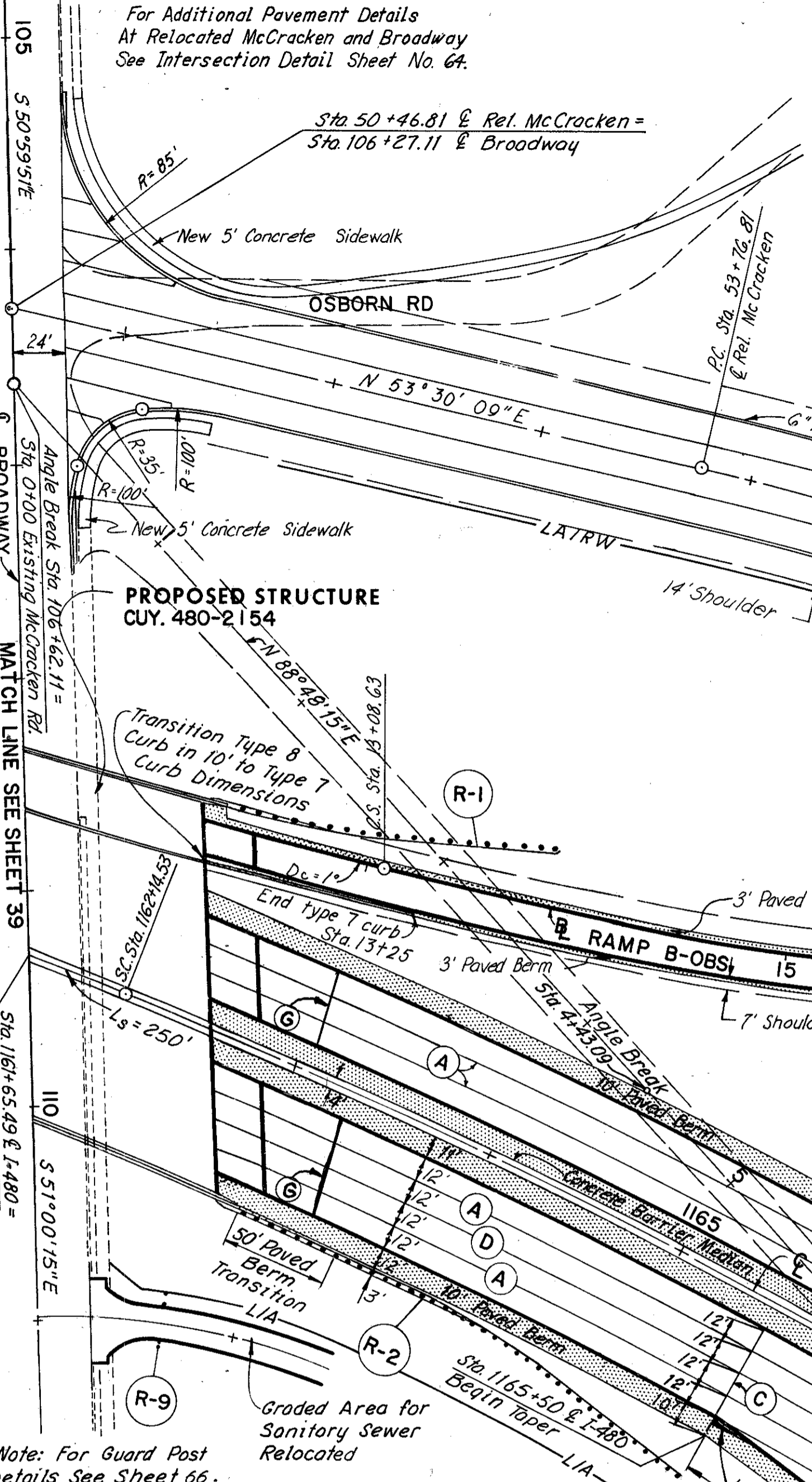
ALIGNMENT: Spiral, 8°00'00" Left

SUPERELEVATION: Varies .0156 ft. per ft. to .083 ft. per ft.

DRIVES AND APPROACHES

Ref No	Station	Type	Side	Width	203	203	304	404	452	Profile Sheet No.
					Rdwy Exc.	Rdwy Emb.	Aggr. Base	Asph. Con. 2"	P. C. C. For Drives 7"	
1	7+25	Res.	Lt.	9	465		17.42	7.10	10.85	79
2	9+77.96	Res.	Lt.	6	1	4			21.67	79
3	10+10	Res.	Rt.	9.5	6		3.37	1.38		79
4	10+15.89	Res.	Lt.	9	6				23.33	79
7	10+73.38	Res.	Lt.	5.6	3				16.02	81
Total: Part III					481	4	21	8	72	

See Sheet No. 67 for Miscellaneous Driveway Details.



PROPOSED STRUCTURES-BEDFORD FREEWAY AND RAMP B-OBS OVER RELOCATED McCracken Road

TYPE: Continuous rolled beams with reinforced concrete deck and substructure.

SPANS: Br 13L 38'-9", 64'-3", 40'-3"
Br 13R 48'-9 $\frac{3}{4}$ ", 69'-3 $\frac{1}{4}$ ", 48'-7 $\frac{3}{8}$ " (Measured along @ Ramp B-OBS)

ROADWAYS: Br 13L 76'-0" f.f. of parapet with concrete barrier median
Br 13R 28'-0" f.f. of parapet

DESIGN LOAD: HS20-44

SKEWS: Br 13L -07°45'02" Left forward to local tangent
Br 13R -23°50'55" Right forward to local tangent

WEARING SURFACE: 1 $\frac{1}{2}$ " Asphalt Concrete on 13R, 2 $\frac{1}{2}$ " on 13L

APPROACH SLABS: AS-1-67 (20 feet long)

ALIGNMENT: Br 13L-Tangent
Br 13R-13°30'00" Left, Spiral

SUPERELEVATION: Br 13L-Varies .0156 ft. per ft. to 0.0 ft. per ft.
Br 13R-Varies .042 ft. per ft. to .083 ft. per ft.

JOINT LEGEND

- (A) Standard Longitudinal Joint
- (B) Standard Expansion Joint
- (C) Standard Contraction Joint
- (D) Key Joint without Tiebars
- (E) Pressure relief joint See Sheet No. 72A

GUARD RAIL

Ref. No.	Station	Side	606		606	
			Type 5 Deep Beam Rail	Anchor Assem. bly	Bridge Ter- minals Assem. bly	606 Guard Posts as per plan
R-1	12+31	Lt	125	1	1	
R-2	1163+06.5	Rt	243.75	1	1	
R-3	63+60.31	Rt	201.26		2	
R-4	63+66.80	Lt	199.47		2	
R-5	68+16.5	Rt	85		1	
R-6	68+50.8	Lt	42		1	
R-7	70+68.75	Lt.	125	1	1	
R-8	70+09.60	Rt	358		1	
R-9	0+65.00	Graded Area				4
Total: Part. III			1379.48	3	10	4

SCALE IN FEET

50 0 50 100

SCALE 1" = 50'

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

MADE A.A.S. DATE 9-67
TRCD. P.R. DATE 10-67
CKD. R.B. DATE 11-67

Note: All work shown on this Sheet is in Participation III

CUYAHOGA COUNTY
CUY. 480-21.40

Quantity Calculation
Made By JNL Date 9-67
Checked By RB Date 11-67

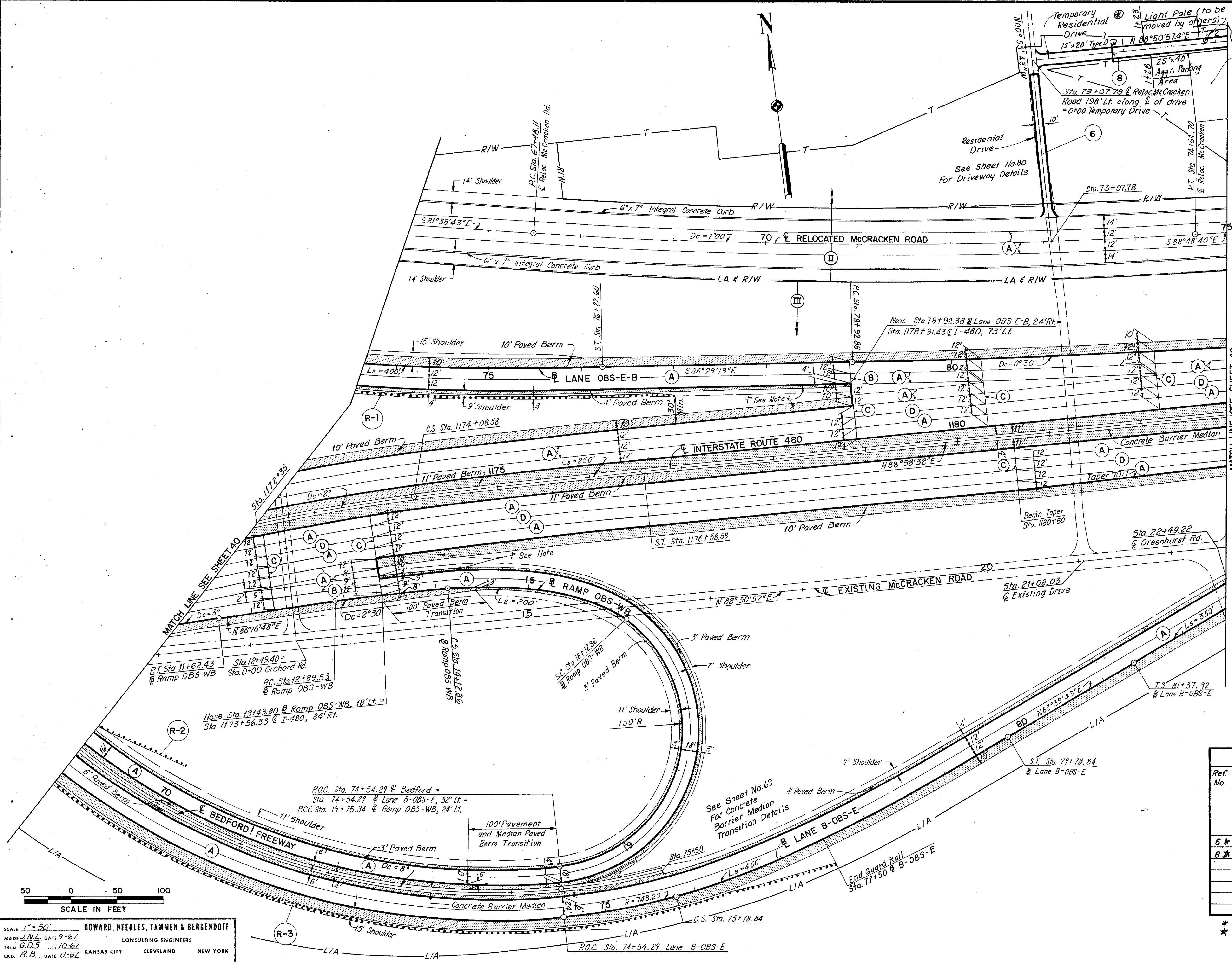
- JOINT LEGEND**
- (A) Standard Longitudinal Joint
 - (B) Standard Expansion Joint
 - (C) Standard Contraction Joint
 - (D) Key Joint without Tiebars

NOTE
Temporary drive from Sta. 0+06.25 to Sta. 1+25.00 shall be abandoned following the completion of work on proposed drive at Sta. 73+07.78 of Reloc. McCracken Rd. This area shall be filled with embankment material and restored to original condition. 100 cu. yds. of embankment has been included in quantities for this purpose.

ALIGNMENT CHECKED	BY	DATE
RIGHT OF WAY		
GRADES		
STRUCTURE NOTATIONS		

DRAWN BY	DATE
CHECKED BY	
QUANTITIES CHECKED	

BY	DATE
CHECKED	

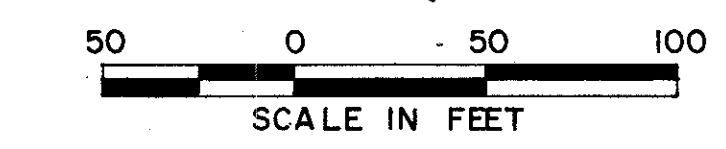


GUARD RAIL				
Ref. No.	Station	Side	606	
			Type 5 Deep Beam Rail	Anchor Assembly
	From	To	Lin. Ft.	Each
R-1	73+57	77+00	Rt. 323.25	1
R-2	68+97	70+10	Lt. 83	1
R-3	68+97	77+50	Rt. 865	1
Total Participation III			1271.25	3

Note:
The Paved Berm Slope shall be Transitioned Smoothly from Typical Berm Slope to Nose Pavement Slope in 100'

DRIVES AND APPROACHES										
Ref. No.	Station	Type	Side	Width	203	203	304	404	452	603
					Rdway Exc.	Rdway Emb.	Aggr. Base	Asph. Con. 2"	P.C.C. For Drives 7"	15" Type D
				Lin. Ft.	Cu. Yds.	Cu. Yds.	Cu. Yds.	Cu. Yds.	Sq. Yds.	Lin. Ft.
6*	73+07.78	Res.	Lt.	10	2	3	23	9.21	18.35	
8*	198' Lt. of Rel. McCr	Res.	Rt.	10	114	128	116			20
Total: Participation III					116	131	139	9	18	20

* Profile Sht. No. 80
* Profile Sht. No. 81



SCALE 1" = 50'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

Quantity Calculations
 Made By JML Date 9-67
 Checked By RB Date 11-67

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

42
390

CUYAHOGA COUNTY
 CUY.480-21.40

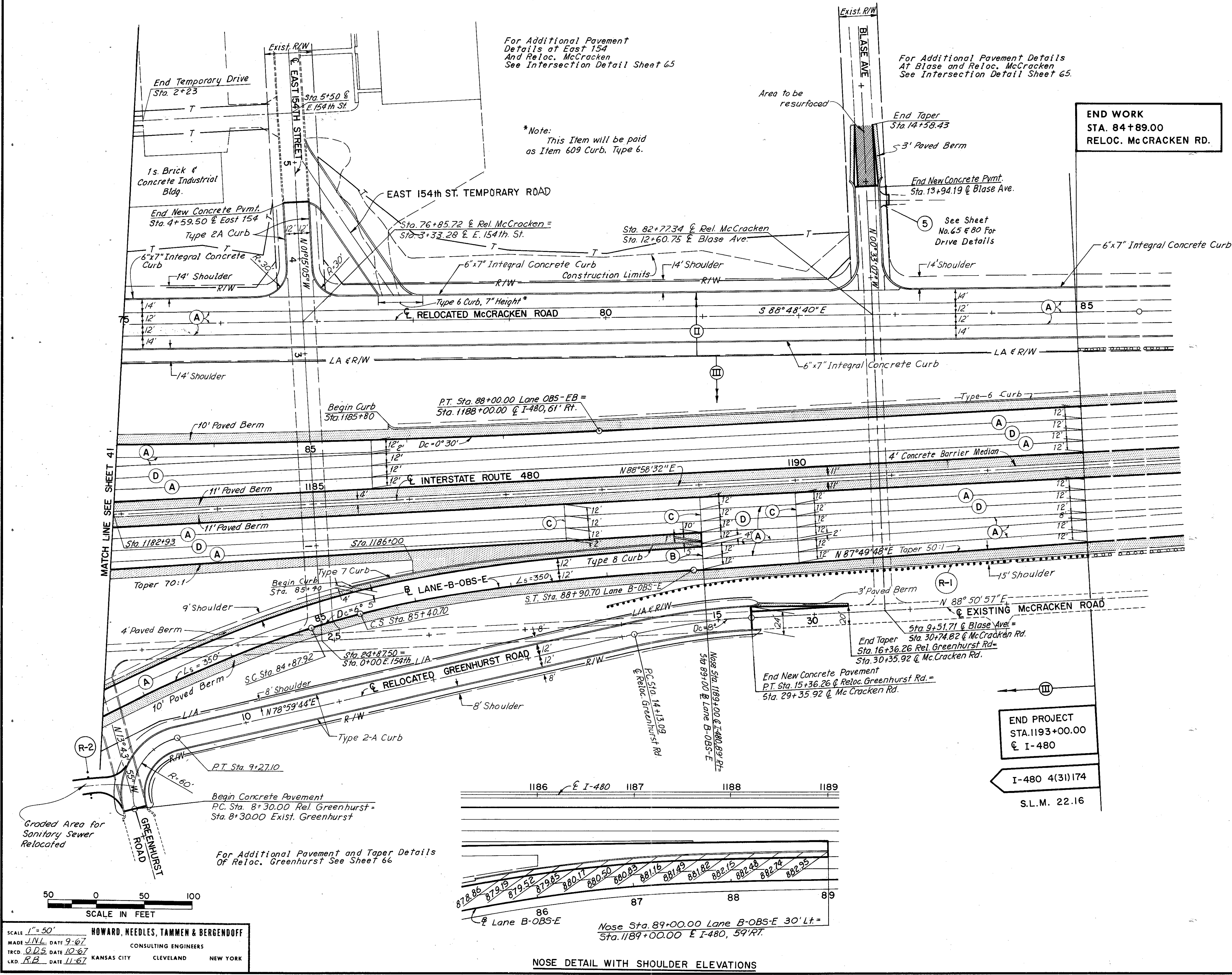
- JOINT LEGEND**
- (A) Standard Longitudinal Joint
 - (B) Standard Expansion Joint
 - (C) Standard Contraction Joint
 - (D) Key Joint without Tiebars

DATE	BY	CHECKED

ALIGNMENT	CHECKED
RIGHT OF WAY	
GRADES	
B. M.	
SYMBOLS	NOTATIONS

DATE	BY	CHECKED

DRAWN	TRACED	CHECKED

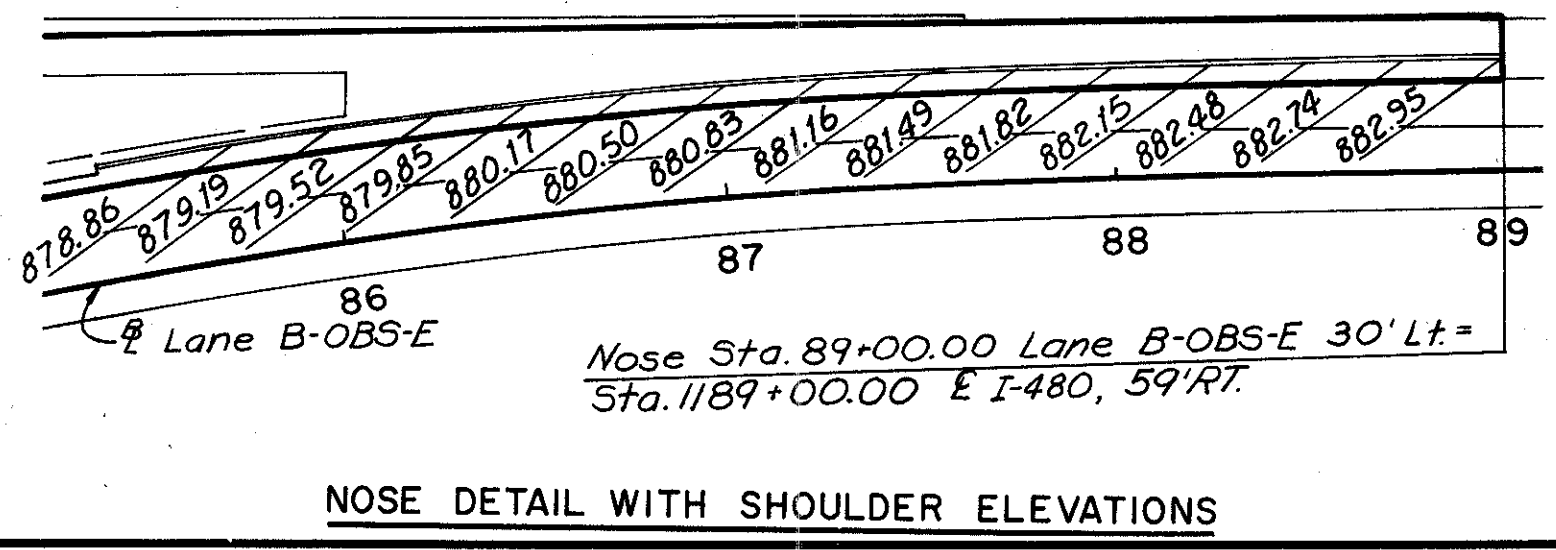


GUARD RAIL

Ref. No.	Station	Side	606			
			Type 5 Deep Beam Rail	Anchor Assembly	Guard Posts as per plan	
	From	To	Lin. Ft.	Each	Each	
R-1	88+00	1193+00	Rt.	475	1	4
R-2	20+75	Graded Area				4
Total Participation III			475	1	4	

DRIVES AND APPROACHES

Ref. No.	Station	Type	Side	Width	203				404		Profile Sheet No.
					203 Rwy Exc.	203 Rwy Emb.	304 Aggr. Base	404 Asph. Con. 2"	452 P.C.C. For Drives 7"		
				Lin. Ft.	Cu. Yds.	Cu. Yds.	Cu. Yds.	Cu. Yds.	Sq. Yds.		
5	13+80.70	Res. Rt.		10	2		1.16	0.48	11.68	80	
Total: Participation III					2		1	0.5	12		



SCALE 1" = 50'
 HOWARD, NEEDLES, TAMMEN & BERGENOFF
 CONSULTING ENGINEERS
 MADE JML DATE 9-67
 TRCD Q.D.S. DATE 10-67
 LKD R.B. DATE 11-67
 KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY
CUY. 480-21.40

See Sheet No. 80
for Drive Details and
Sheet No. 44 for Quantities.

**PROPOSED STRUCTURES—BEDFORD FREEWAY
AND RAMP B-OBS OVER RELOCATED McCRACKEN ROAD**

TYPE: Continuous rolled beams with reinforced concrete deck and substructure.

SPANS: Br 13L 38'-9", 64'-3", 40'-3"
Br 13R 48'-9", 69'-3", 48'-7" (Measured along @ Ramp B-OBS)

ROADWAYS: Br 13L 76'-0" f.f. of parapet with Concrete Barrier median
Br 13R 28'-0" f.f. of parapet

DESIGN LOAD: HS20-44

SKEWS: Br 13L -07°46'02" Left forward to local tangent
Br 13R -23°50'55" Right forward to local tangent

WEARING SURFACE: 1 1/2" Asphalt Concrete on 13R, 2 1/2" on 13L

APPROACH SLABS: AS-1-67 (20 feet long)

ALIGNMENT: Br 13L-Tangent
Br 13R-13°30'00" Left, Spiral

SUPERELEVATION: Br 13L-Varies .0156 ft. per ft. to 0.0 ft. per ft.
Br 13R-Varies .042 ft. per ft. to .083 ft. per ft.

**PROPOSED STRUCTURE -LANE OBS-E-B
OVER RELOCATED McCRACKEN ROAD**

TYPE: Continuous steel girders with reinforced concrete deck and substructures

SPAN: 61'-0", 95'-1", 66'-5" (Measured along @ Lane OBS-E-B)

ROADWAY: 42'-0" f.f. of parapets (Initial)

DESIGN LOAD: HS20-44

SKEW: 46°51'13" Left Forward

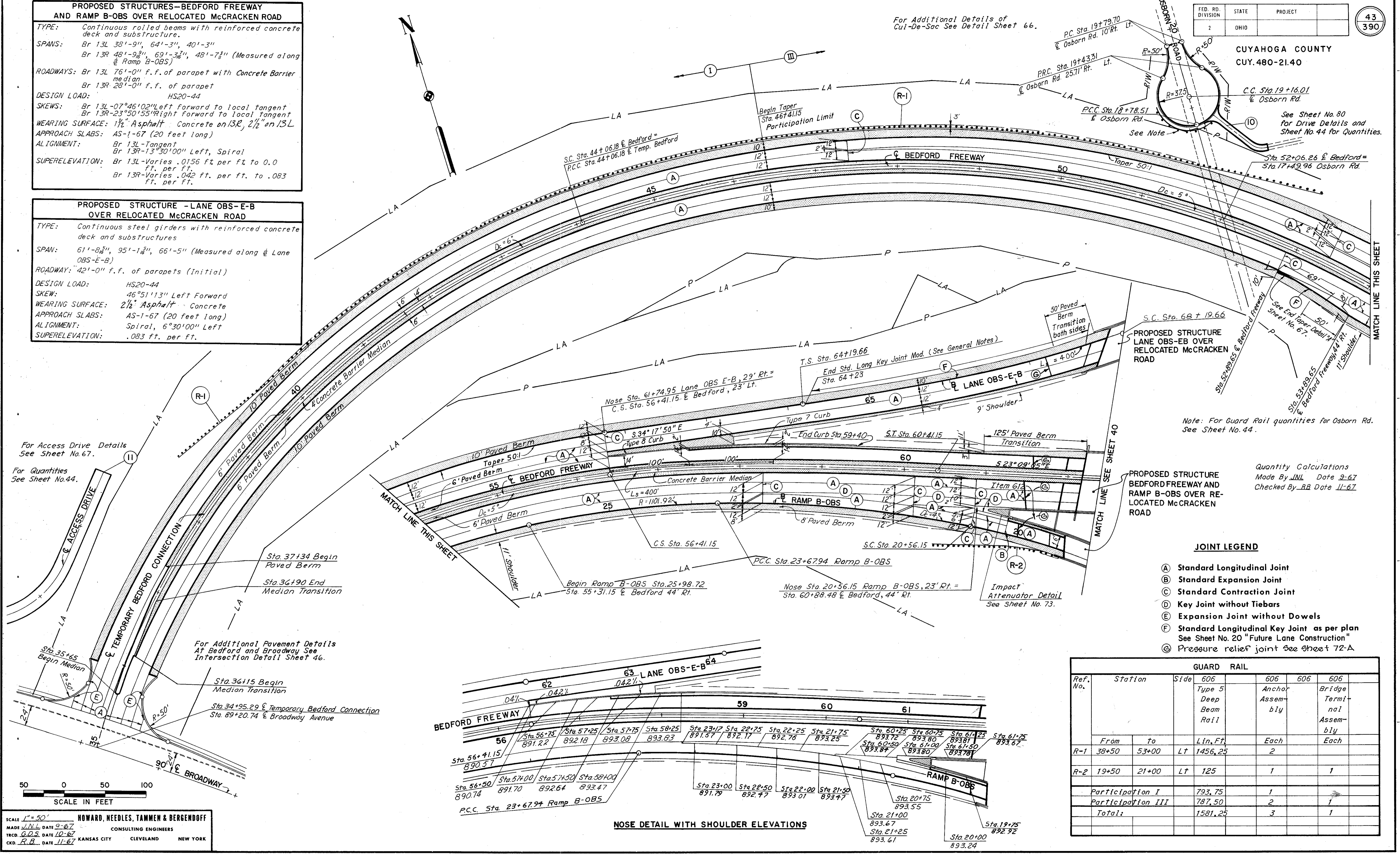
WEARING SURFACE: 2 1/2" Asphalt Concrete

APPROACH SLABS: AS-1-67 (20 feet long)

ALIGNMENT: Spiral, 6°30'00" Left

SUPERELEVATION: .083 ft. per ft.

For Additional Details of
Cul-De-Sac See Detail Sheet 66.



For Access Drive Details
See Sheet No. 67.

For Quantities
See Sheet No. 44.

For Additional Pavement Details
At Bedford and Broadway See
Intersection Detail Sheet 46.

Note: For Guard Rail quantities for Osborn Rd.
See Sheet No. 44.

Quantity Calculations
Made By JNL Date 9-67
Checked By RB Date 11-67

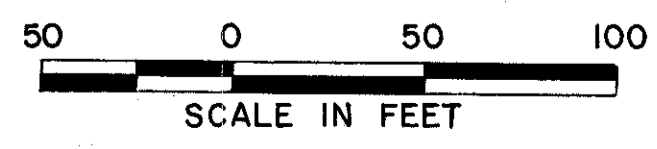
- JOINT LEGEND**
- (A) Standard Longitudinal Joint
 - (B) Standard Expansion Joint
 - (C) Standard Contraction Joint
 - (D) Key Joint without Tiebars
 - (E) Expansion Joint without Dowels
 - (F) Standard Longitudinal Key Joint as per plan See Sheet No. 20 "Future Lane Construction"
 - (G) Pressure relief joint See Sheet 72-A

NOSE DETAIL WITH SHOULDER ELEVATIONS

Station	Elevation	Station	Elevation	Station	Elevation	Station	Elevation	Station	Elevation
Sta. 56+41.15	890.57	Sta. 57+25	892.18	Sta. 58+25	893.63	Sta. 59+17	891.57	Sta. 60+25	893.72
Sta. 56+50	890.74	Sta. 57+50	892.64	Sta. 58+00	893.47	Sta. 59+25	892.76	Sta. 60+50	893.80
Sta. 57+00	891.70	Sta. 58+00	892.64	Sta. 59+00	893.47	Sta. 60+00	892.76	Sta. 61+00	893.80
Sta. 57+50	892.64	Sta. 58+50	893.47	Sta. 59+50	893.47	Sta. 60+50	893.80	Sta. 61+50	893.78
Sta. 58+00	893.47	Sta. 59+00	893.47	Sta. 60+00	893.80	Sta. 61+00	893.80	Sta. 62+00	893.24

GUARD RAIL

Ref. No.	Station	Side	606			
			Type 5 Deep Beam Rail	Anchor Assembly	Bridge Terminal Assembly	
R-1	38+50	53+00	LT	1456.25	2	
R-2	19+50	21+00	LT	125	1	1
Participation I				793.75	1	
Participation III				787.50	2	1
Total:				1581.25	3	1



SCALE 1" = 50'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
MADE IN U.S.A. DATE 9-67
TRCD. G.D.S. DATE 10-67
CKD. R.B. DATE 11-67
KANSAS CITY CLEVELAND NEW YORK

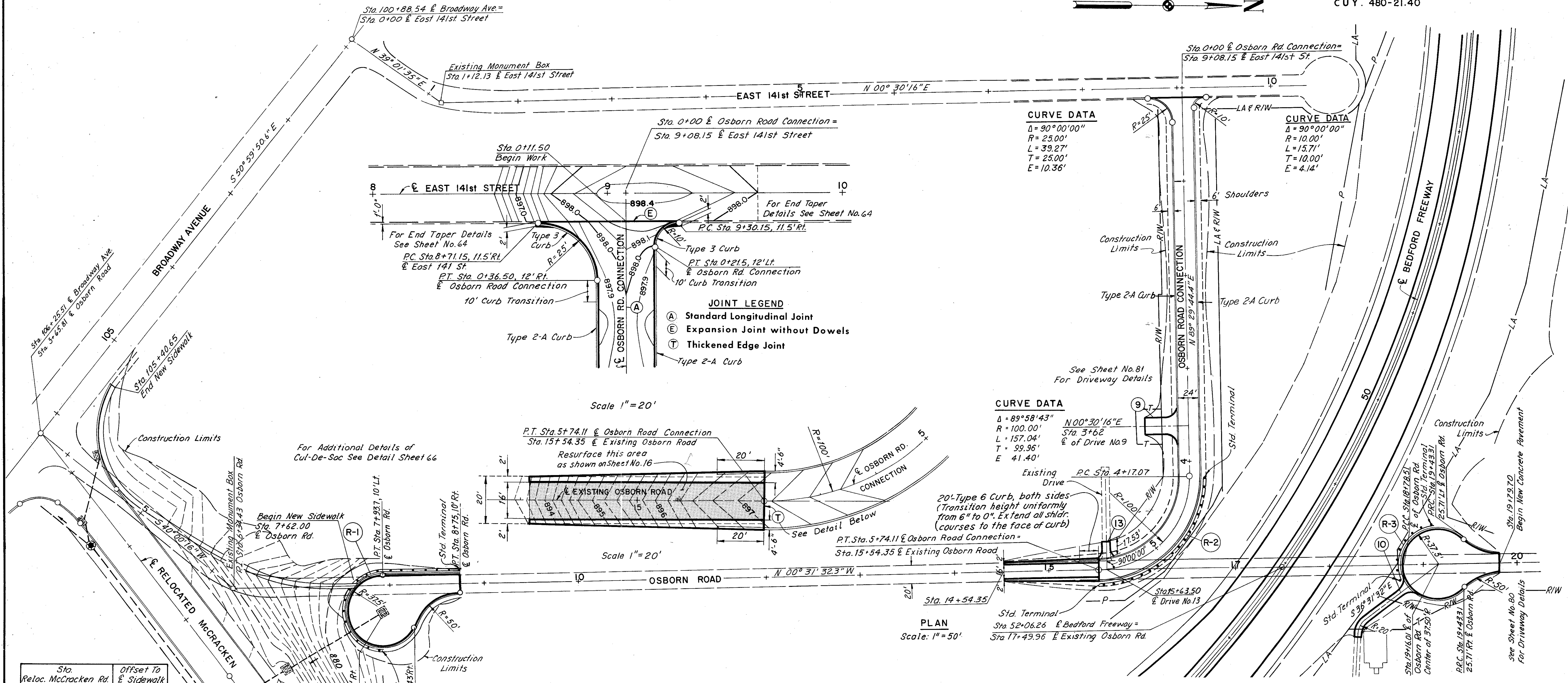
OSBORN ROAD CONNECTION

Quantity Calculations
 Made By ERA Date 3-68
 Checked By IM Date 4-70

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

44
390

CUYAHOGA COUNTY
 CUY. 480-21.40



CURVE DATA

Δ = 90°00'00"
R = 25.00'
L = 39.27'
T = 25.00'
E = 10.36'

CURVE DATA

Δ = 90°00'00"
R = 10.00'
L = 15.71'
T = 10.00'
E = 4.14'

CURVE DATA

Δ = 89°58'43"
R = 100.00'
L = 157.04'
T = 99.96'
E = 41.40'

CURVE DATA

Δ = 248°11'47"
R = 37.50'
L = 162.44'

- JOINT LEGEND**
- (A) Standard Longitudinal Joint
 - (E) Expansion Joint without Dowels
 - (T) Thickened Edge Joint

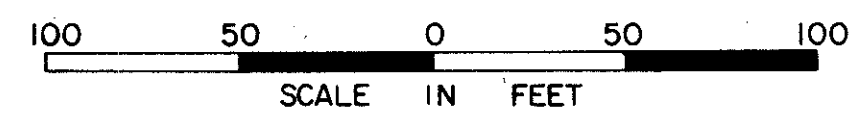
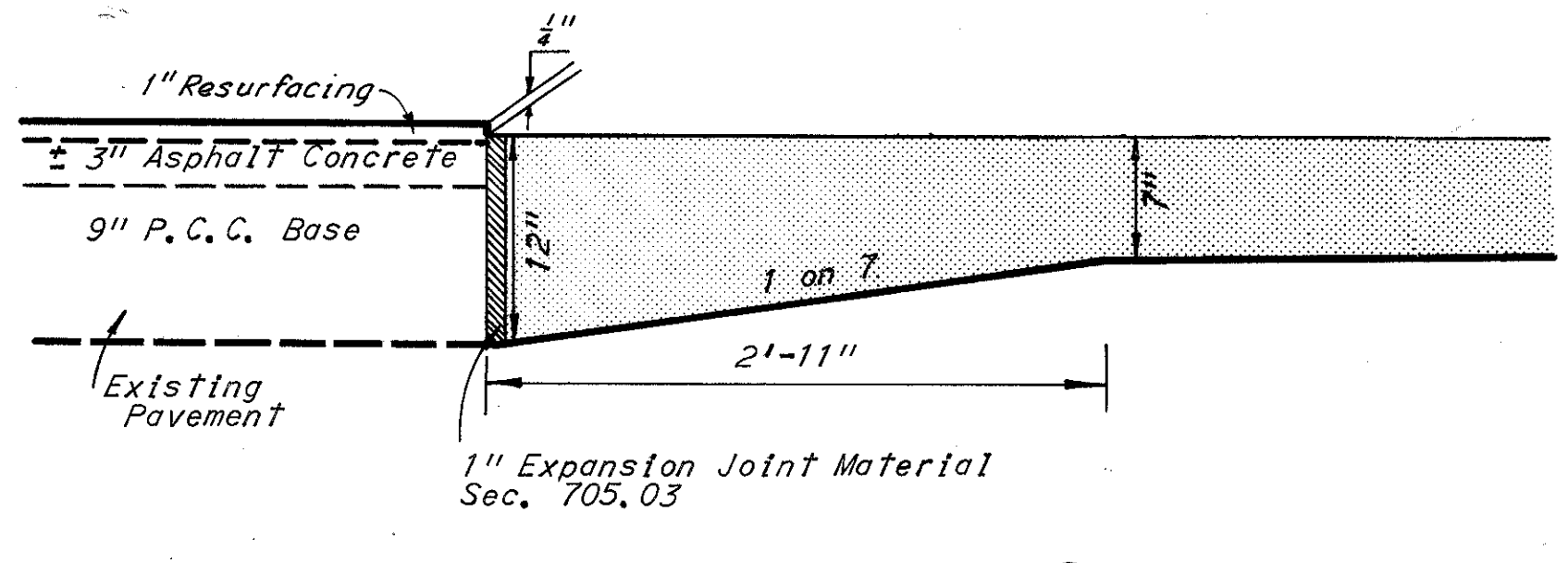
Sta. Reloc. McCracken Rd.	Offset To Sidewalk
52+00	46'
52+50	66'
53+00	87.5'
53+50	123.5'

GUARD RAIL

Ref. No.	Station	Side	606	Type 5 Guard Rail
R-1	8+75	7+93.76	Both	200
R-2	4+17	5+74	Lt.	175
R-3	18+78.51	19+12	Lt.	87.5
Total Participation III				462.5

DRIVES AND APPROACHES

Ref.	Station	Type	Side	Width	Participation					Profile Sheet No.
					203 Rdway Exc.	203 Rdway Emb.	304 Aggr. Base	404 Asp. Conc. 2"	452 P.C.C. For Drives 7"	
9	3+62	Res.	Rt.	18	7	2	5.39	2.16	36.55	81
10	19+16.01	Res.	Rt.	8	83		8.77	3.51	12.24	80
11	87+09.66	Comm.	Lt.	20	63	286	148.22	41.89	233.5	82
13	15+63.50	Res.	Rt.	10					22.9	82
Total Participation III					153	288	162	48	95	



SCALE 1/50' as shown HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE ERA DATE 3-16-68 CONSULTING ENGINEERS
 TRCD ERA DATE 3-16-68
 CKD IM DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

Note: All work shown on this sheet is in Participation III

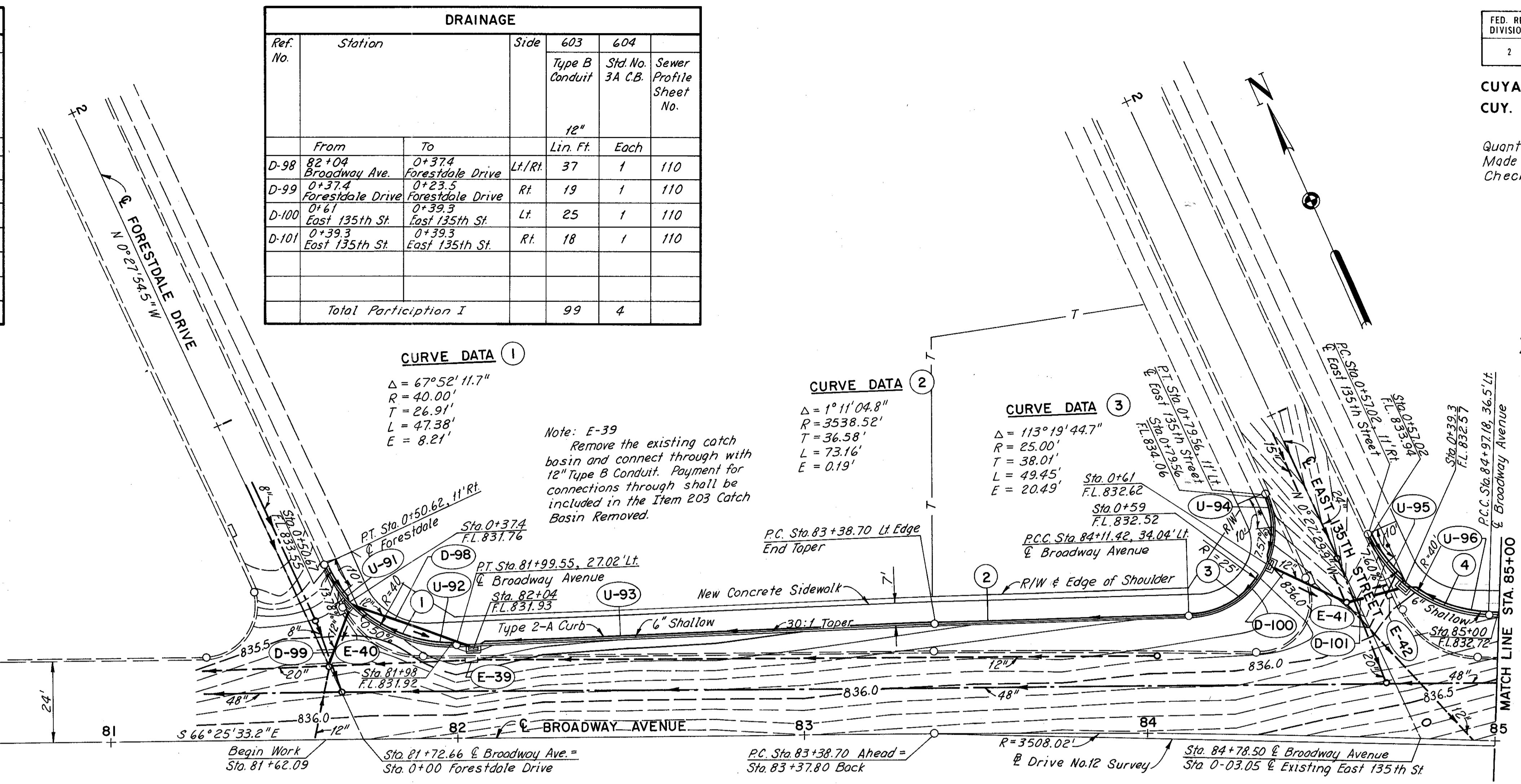
CUYAHOGA COUNTY
CUY. 480-21.40

Quantity Calculations
Made By JMC, Date 3-27-72
Checked By EH, Date 3-27-72

ROADWAY					
Ref. No.	Station	Side	202	202	202
			Catch Basin Abandoned	Catch Basin Removed	Pipe Removed Under 15"
From	To		Each	Each	Lin. Ft.
E-39	82+04 Broadway Ave.	Lt.		1	
E-40	0+374 Forestdale Drive	Rt.	1		
E-41	0+51.2 East 135th St. to 0+41.5 East 135th St.	Lt.		1	11
E-42	0+39.3 East 135th St.	Rt.	1		
Total Participation I			2	2	11

DRAINAGE					
Ref. No.	Station	Side	603	604	Sewer Profile Sheet No.
			Type B Conduit	Std. No. 3A C.B.	
From	To		Lin. Ft.	Each	
D-98	82+04 Broadway Ave. to 0+374 Forestdale Drive	Lt/Rt	37	1	110
D-99	0+374 Forestdale Drive to 0+23.5 Forestdale Drive	Rt.	19	1	110
D-100	0+61 East 135th St. to 0+39.3 East 135th St.	Lt.	25	1	110
D-101	0+39.3 East 135th St. to 0+39.3 East 135th St.	Rt.	18	1	110
Total Participation I			99	4	

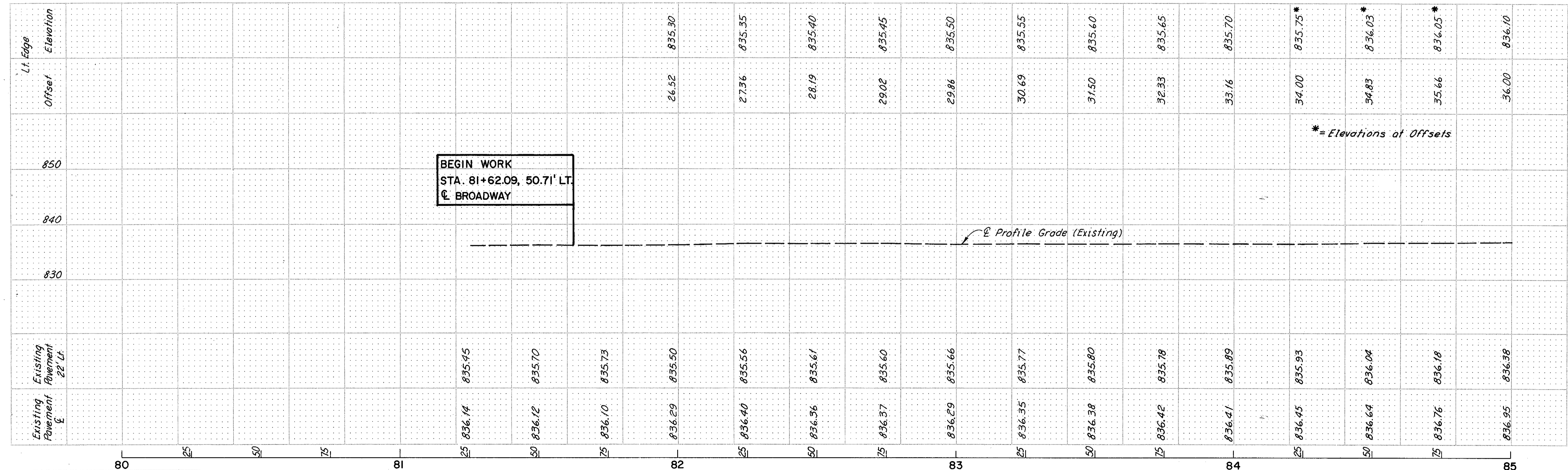
UNDERDRAINS					
Ref. No.	Station	Side	603	605	
			Type "F" Conduit	Shallow U.D.	
From	To		Lin. Ft.	Lin. Ft.	
U-91	0+50.62 Forestdale Dr. to 0+374 Forestdale Dr.	Rt.	10	3	
U-92	81+98 Broadway Ave. to 0+374 Forestdale Dr.	Lt/Rt	10	21	
U-93	0+59 East 135th St. to 82+04 Broadway Ave.	Lt.	10	221	
U-94	0+79.56 East 135th St. to 0+61 East 135th St.	Lt.	10	9	
U-95	0+57.02 East 135th St. to 0+39.3 East 135th St.	Rt.	10	8	
U-96	85+00 Broadway Ave. to 0+39.3 East 135th St.	Lt/Rt	10	18	
Total Participation I			60	280	



CURVE DATA 4

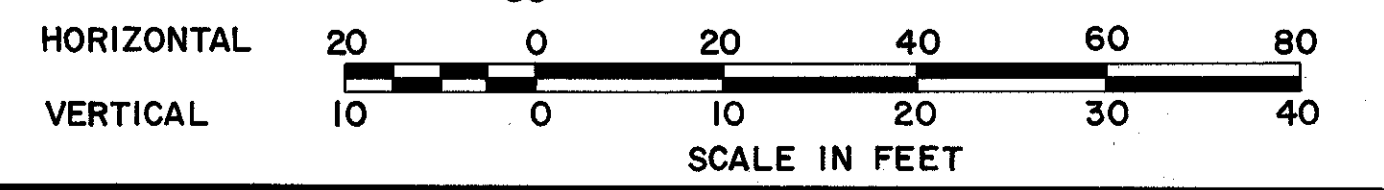
$\Delta = 63^\circ 22' 45.1''$
 $R = 40.00'$
 $T = 24.69'$
 $L = 44.25'$
 $E = 7.01'$

Note:
*Transition Type 2-A Curb to meet curb and gutter section.



EARTHWORK	
EXC.	338
EMB.	0

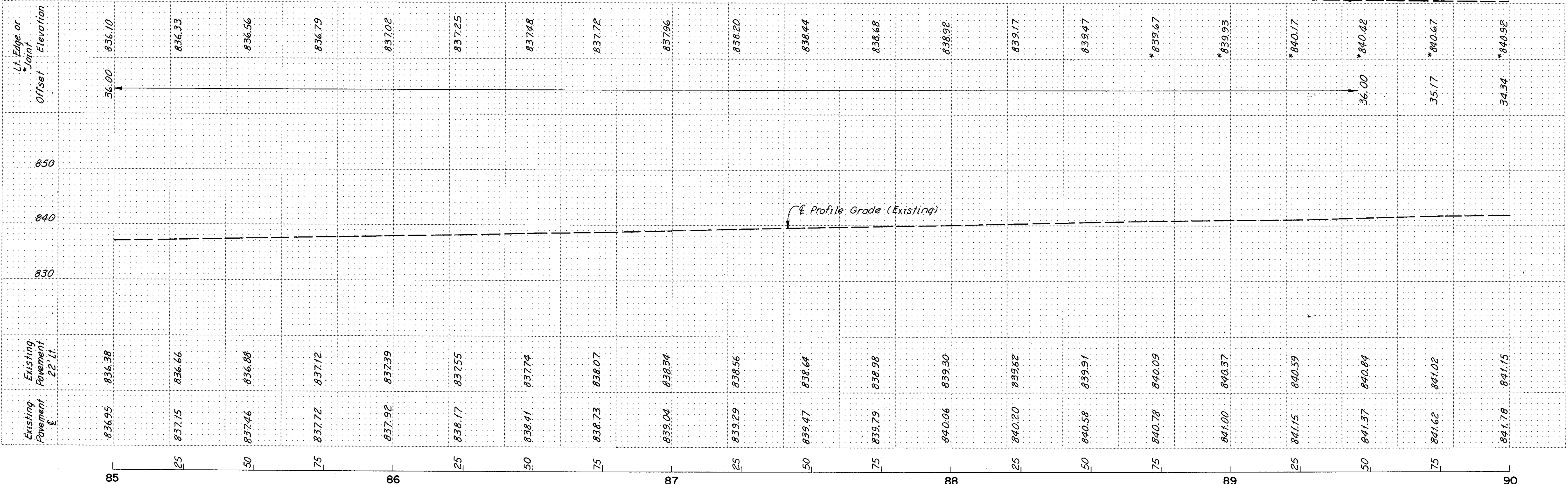
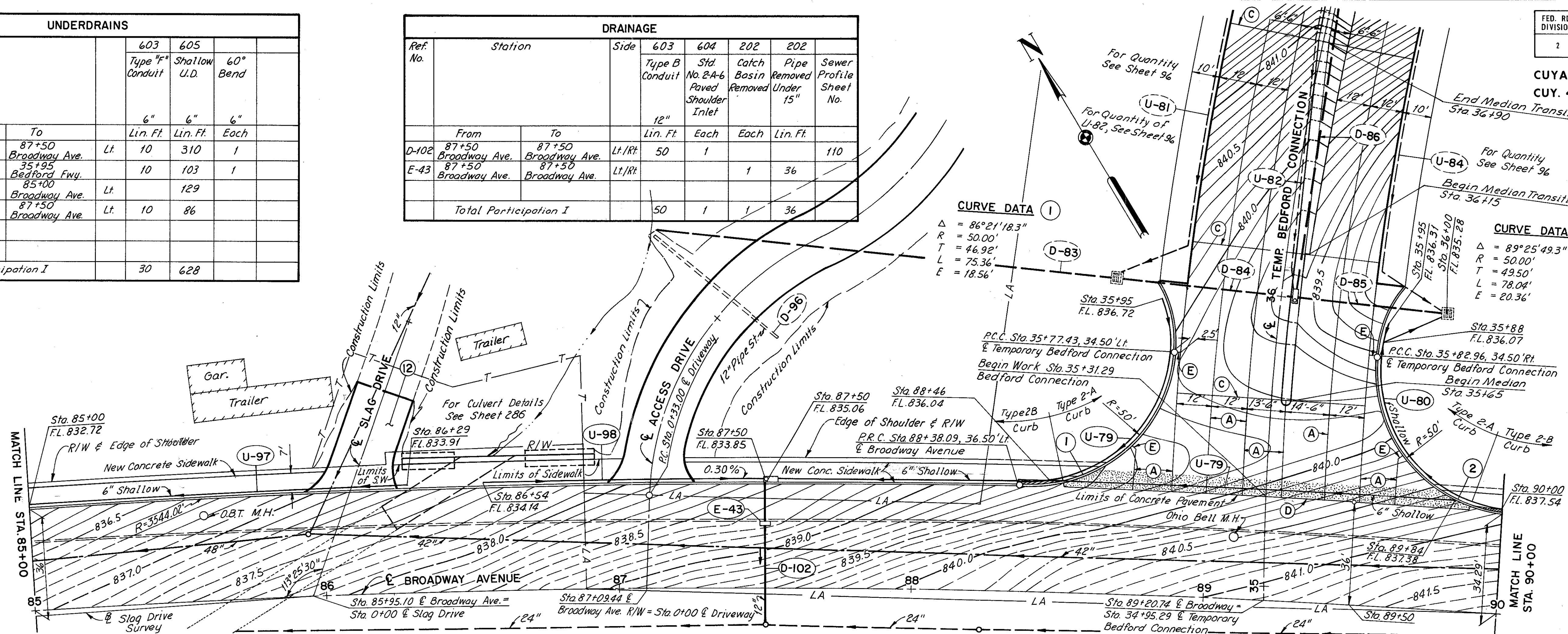
PROFILE



Quantity Calculations
Made By J.M.C. Date 3-72
Checked By E.H. Date 3-72

UNDERDRAINS					
From	To	Type "F" Conduit	603	605	60° Bend
			Lin. Ft.	Shallow U.D.	
U-79	35+95 Bedford Fwy. to 87+50 Broadway Ave.	Lt.	10	310	1
U-80	90+00 Broadway Ave. to 35+95 Bedford Fwy.	Lt.	10	103	1
U-97	86+29 Broadway Ave. to 85+00 Broadway Ave.	Lt.		129	
U-98	86+54 Broadway Ave. to 87+50 Broadway Ave.	Lt.	10	86	
Total Participation I			30	628	

DRAINAGE						
Ref. No.	Station	Side	603	604	202	202
			Type B Conduit	Std. No. 2-A-6 Paved Shoulder Inlet	Catch Basin Removed	Pipe Removed Under 15"
	From	To	Lin. Ft.	Each	Each	Lin. Ft.
D-102	87+50 Broadway Ave.	87+50 Broadway Ave.	Lt/Rt	50	1	110
E-43	87+50 Broadway Ave.	87+50 Broadway Ave.	Lt/Rt		1	36
Total Participation I			50	1	1	36



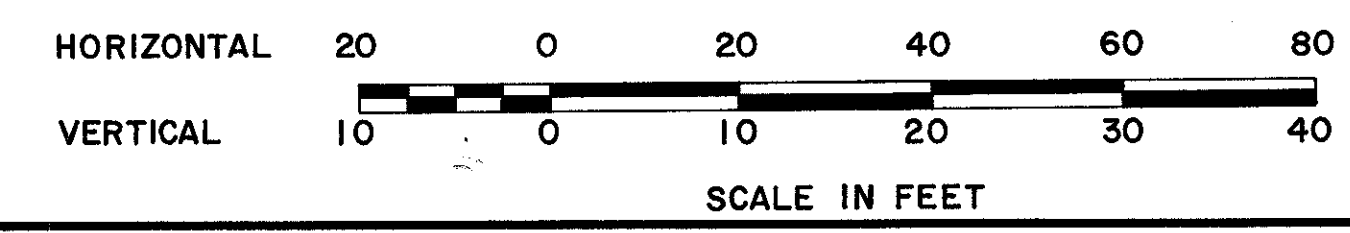
Ref. Station No.	DRIVES AND APPROACHES				Type	Side	Width	Type	Exc.	Cu. Yds.	Sp. Yds.	Profile Sheet No.
	203	304	404	452								
12												

- JOINT LEGEND**
- (A) Standard Longitudinal Joint
 - (D) Key Joint without Tiebars
 - (E) Expansion Joint without Dowels

EARTHWORK	
EXC.	630
EMB.	166

VERT. 1"=10'
HORIZ. 1"=20'
SCALE J.M.C. DATE 3-72
TRCD J.M.C. DATE 3-72
CKD E.H. DATE 3-72
HOWARD, NEEDLES, TAMMEN & BERGENOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PROFILE



Quantity Calculations
 Made By J.M.C. Date 3-72
 Checked By E.H. Date 3-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

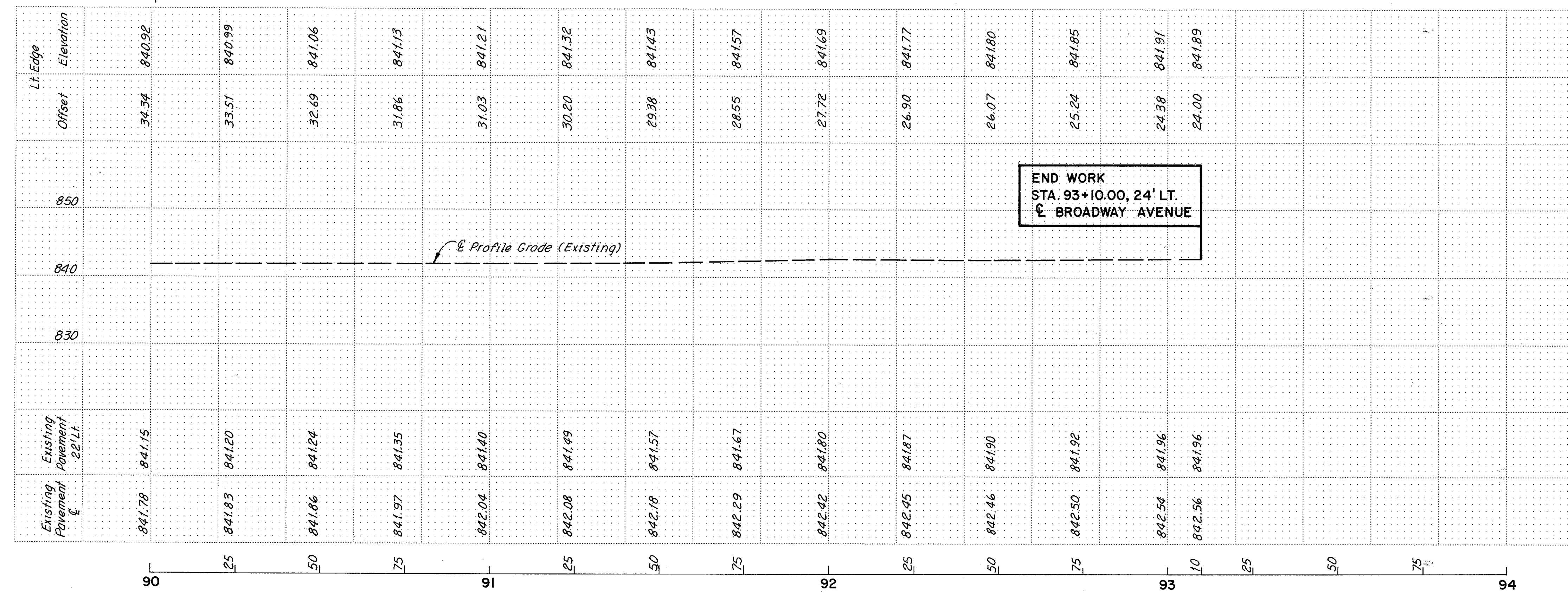
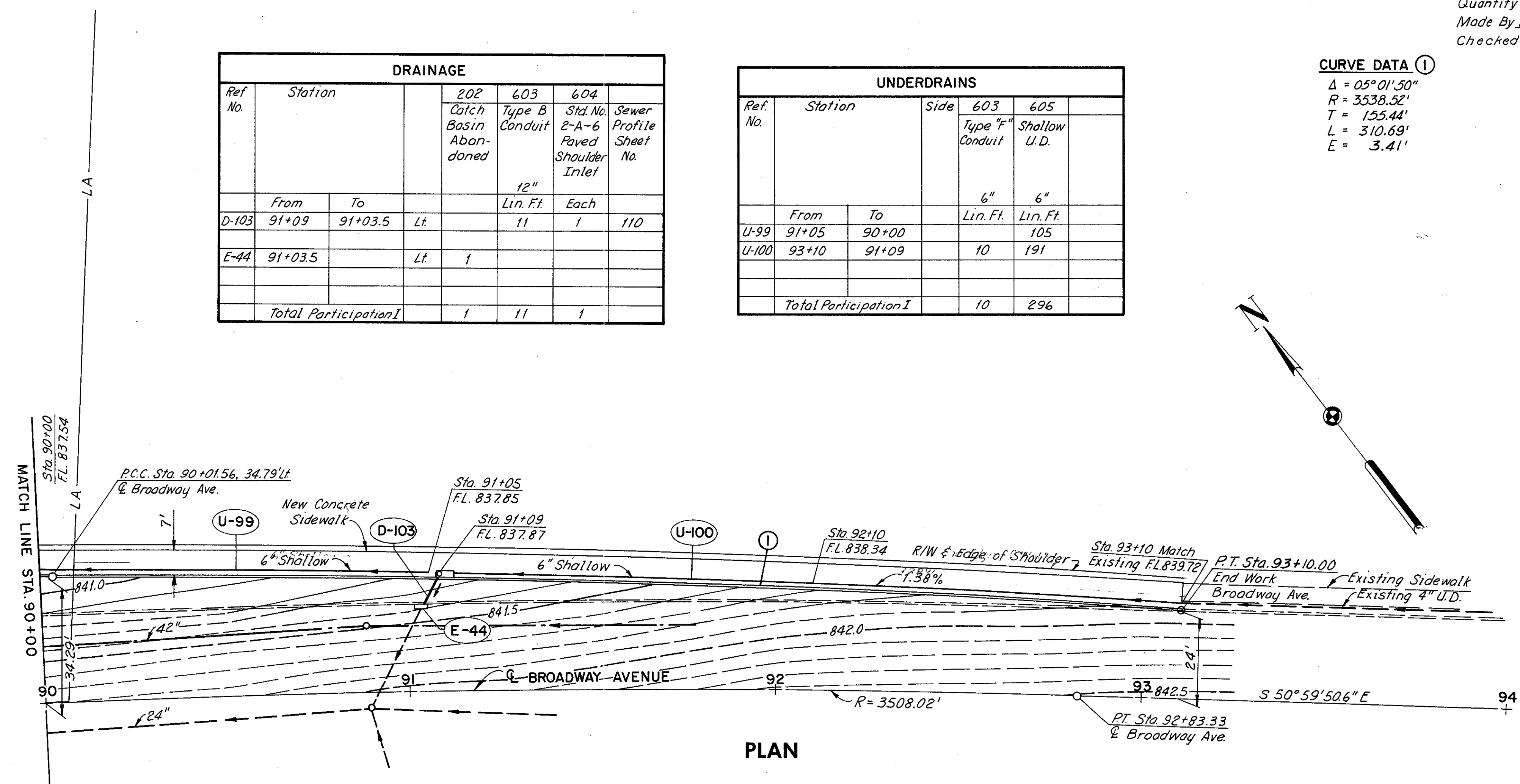
47
390

CUYAHOGA COUNTY
 CUY. 480-21.40

DRAINAGE						
Ref. No.	Station		202 Catch Basin Abandoned	603 Type B Conduit	604 Std. No. E-A-6 Paved Shoulder Inlet	Sewer Profile Sheet No.
	From	To				
D-103	91+09	91+03.5	Lt.	12" Lin. Ft.	11	110
E-44	91+03.5		Lt.	1		
Total Participation I				1	11	1

UNDERDRAINS					
Ref. No.	Station		Side	603 Type "F" Conduit	605 Shallow U.D.
	From	To			
U-99	91+05	90+00		6"	6"
U-100	93+10	91+09		10	191
Total Participation I				10	296

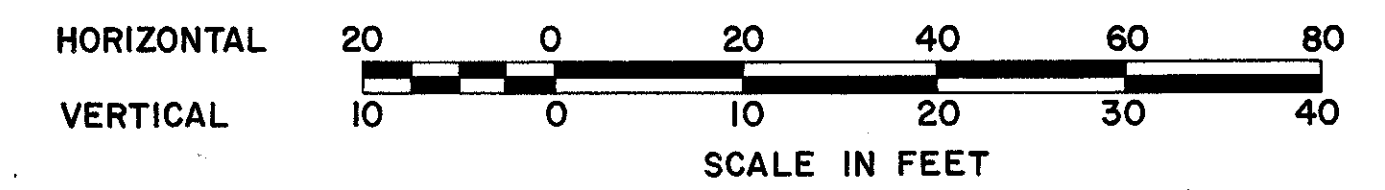
CURVE DATA ①
 $\Delta = 05^{\circ}01'50''$
 $R = 3538.52'$
 $T = 155.44'$
 $L = 310.69'$
 $E = 3.41'$



END WORK
 STA. 93+10.00, 24' LT.
 ☉ BROADWAY AVENUE

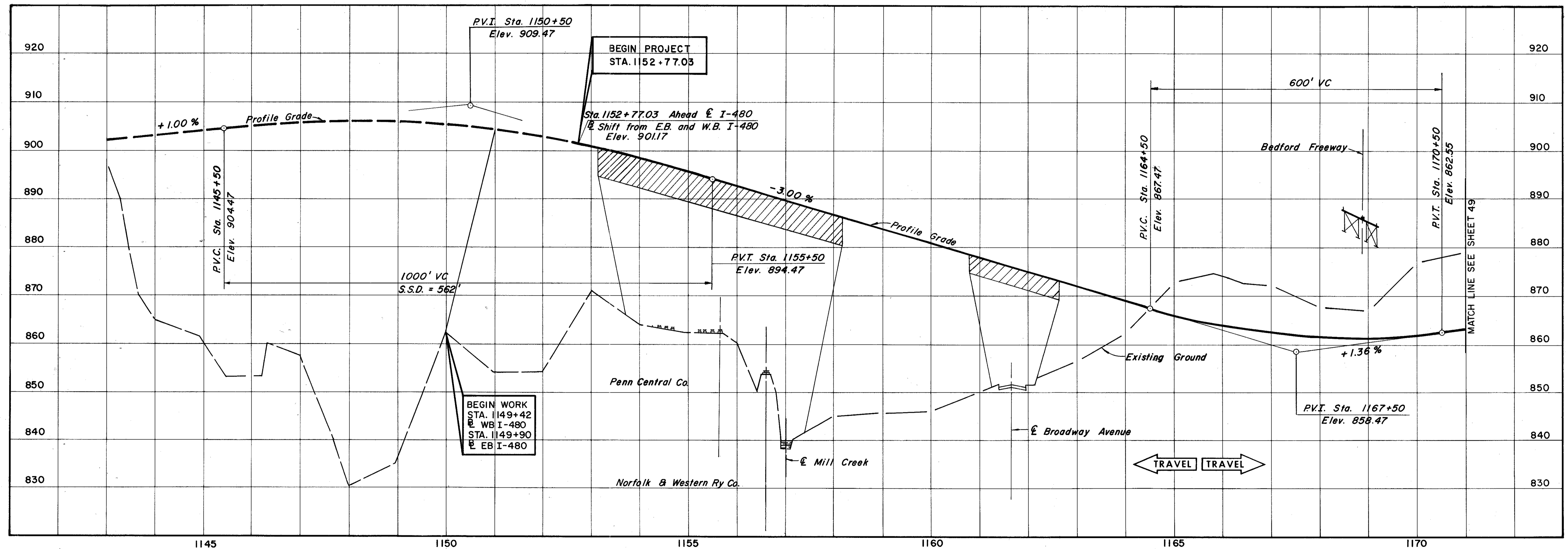
EARTHWORK	
EXC.	213
EMB.	2

VERT. 1"=10'
 SCALE HORZ. 1"=20'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE J.M.C. DATE 3-72 CONSULTING ENGINEERS
 TRCD J.M.C. DATE 3-72 KANSAS CITY CLEVELAND NEW YORK
 CKD. E.H. DATE 3-72



CUYAHOGA COUNTY
CUY. 480-21.40

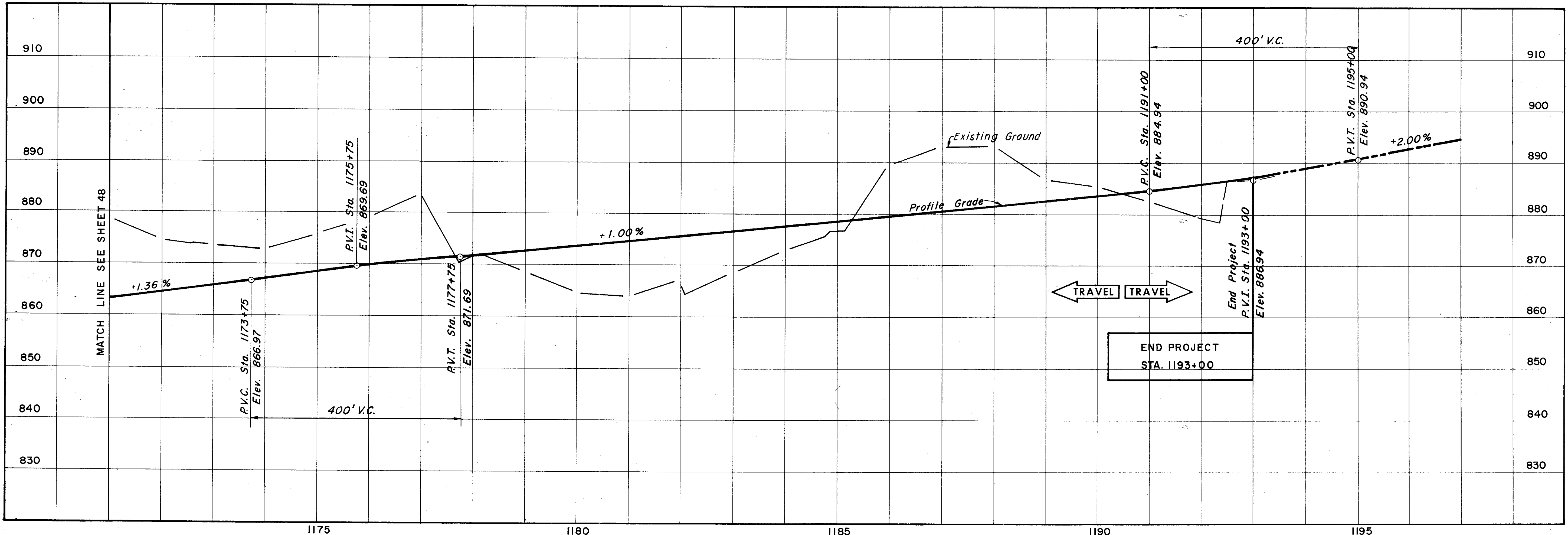
W.B. I-480	24' to Left Edge 0' to 24'				Normal Crown 0.0156 ft./ft.		Super. Trans. +0.0156			Superelevation Lt. +0.047 ft./ft.	24' to Lt. EP	W.B. I-480
E.B. I-480	0' to 24'				Normal Crown 0.0156 ft./ft.		Super. Trans. -0.0156 ft./ft.			Superelevation Rt. -0.047 ft./ft.	0' to 24'	E.B. I-480
	24' to Right Edge										24' to Rt. EP	I-480
LEFT EDGE												LEFT EDGE
PROFILE GRADE										See Table Sheet No. 59,60&61		PROFILE GRADE
RIGHT EDGE										See Table Sheet No. 59,60&61		RIGHT EDGE



INTERSTATE ROUTE 480

SCALE: Vert. 1"=10', Hor. 1"=100'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 MADE BY: P.B. DATE: 10-6-67
 TRCD: J.C.H. DATE: 10-6-67
 CHK: J.C.H. DATE: 10-6-67
 KANSAS CITY CLEVELAND NEW YORK

WB I-480	24' to Lt.E.P. 0' to 24'	Superelevated Lt. + 0.047 ft./ft.	Super. Trans.	Normal Crown 0.0156 ft./ft.	24' to Lt.E.P. 0' to 24'	WB I-480
E.B. I-480	0' to 24'	Superelevated Rt. - 0.047 ft./ft.	Super. Trans. +0.0156 Superelevation Transition Super. Trans. -0.0156 ft./ft.	Normal Crown 0.0156 ft./ft.	0' to 24'	E.B. I-480
LEFT EDGE	See Table Sheet No. 61					LEFT EDGE
PROFILE GRADE	<p>863.57 863.91 864.25 864.59 864.93 865.27 865.61 865.95 866.29 866.63 866.97 867.31 867.64 867.96 868.28 868.60 868.91 869.21 869.51 869.80 870.09 870.37 870.64 870.92 871.18 871.44 871.69 871.94 872.19 872.44 872.69 872.94 873.19 873.44 873.69 873.94 874.19 874.44 874.69 874.94 875.19 875.44 875.69 875.94 876.19 876.44 876.69 876.94 877.19 877.44 877.69 877.94 878.19 878.44 878.69 878.94 879.19 879.44 879.69 879.94 880.19 880.44 880.69 880.94 881.19 881.44 881.69 881.94 882.19 882.44 882.69 882.94 883.19 883.44 883.69 883.94 884.19 884.44 884.69 884.94 885.19 885.47 885.76 886.07 886.39 886.72 887.07 887.44 887.82 888.22 888.64 889.07 889.51 889.97 890.44 890.94</p>					PROFILE GRADE
RIGHT EDGE	See Table Sheet No. 61					RIGHT EDGE
	25					

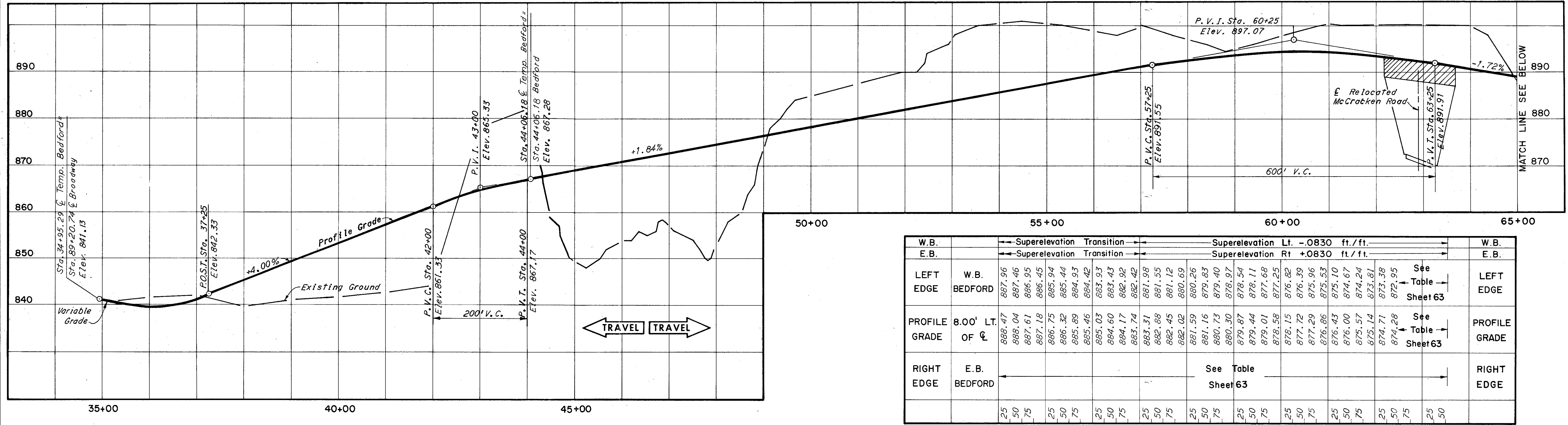


INTERSTATE ROUTE 480

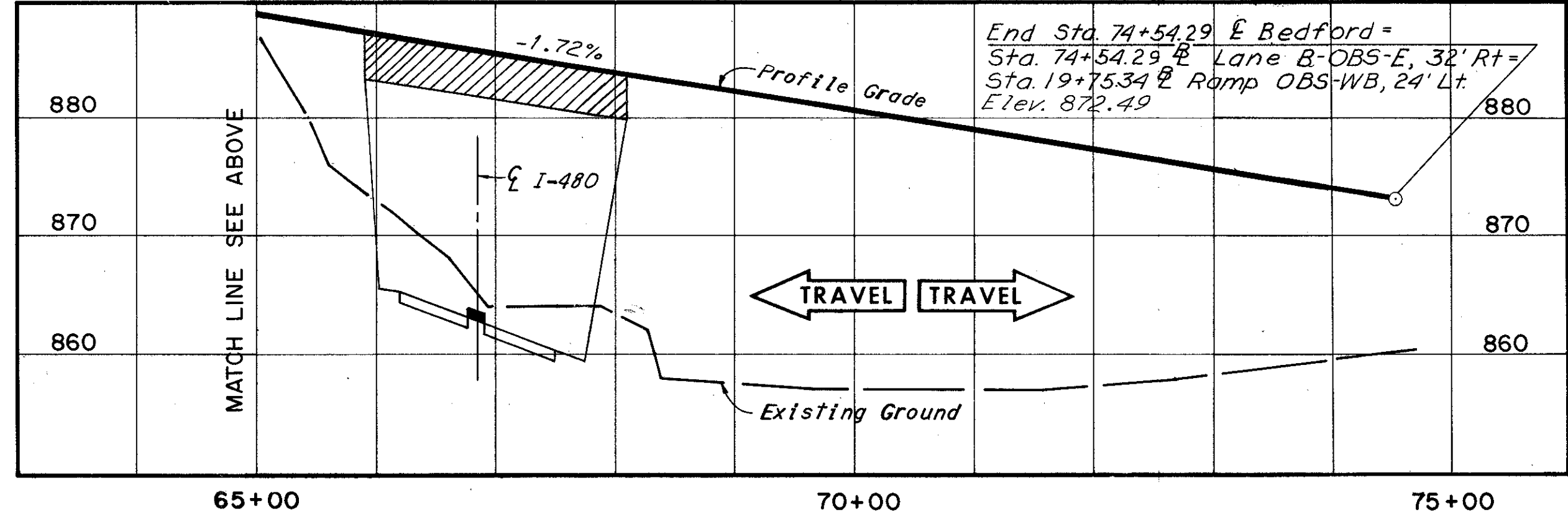
SCALE: Hor. 1"=100'
HOWARD, NEEDLES, TAMMEN & BERGENOFF
 MADE BY: DATE 10-6-67
 TRCD: DATE 10-6-67
 CKD: DATE 10-6-67
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY
CUY. 480-21.40

W.B. BEDFORD	CR. to Lt. E.P. 0' to Crown	+0.0156	Superelevation Transition	Superelevation +0.0820 ft./ft.	Super. Trans.	Super. +0.040 ft./ft.	Super. Trans.	-0.0156 ft./ft.	W.B. BEDFORD
E.B. BEDFORD	CR. to Rt. E.P.	-0.0156	Superelevation Transition	Superelevation -0.0820 ft./ft.	Super. Trans.	Super. +0.040 ft./ft.	Super. Trans.	+0.0156 ft./ft.	E.B. BEDFORD
LEFT EDGE	W.B. BEDFORD	See Inter-Section Detail			See Table Sheet No. 62 & 63				LEFT EDGE
PROFILE GRADE	8.00' LT. OF C	See Inter-Section Detail							PROFILE GRADE
RIGHT EDGE	E.B. BEDFORD	See Intersection Detail			See Table Sheet No. 62 & 63				RIGHT EDGE

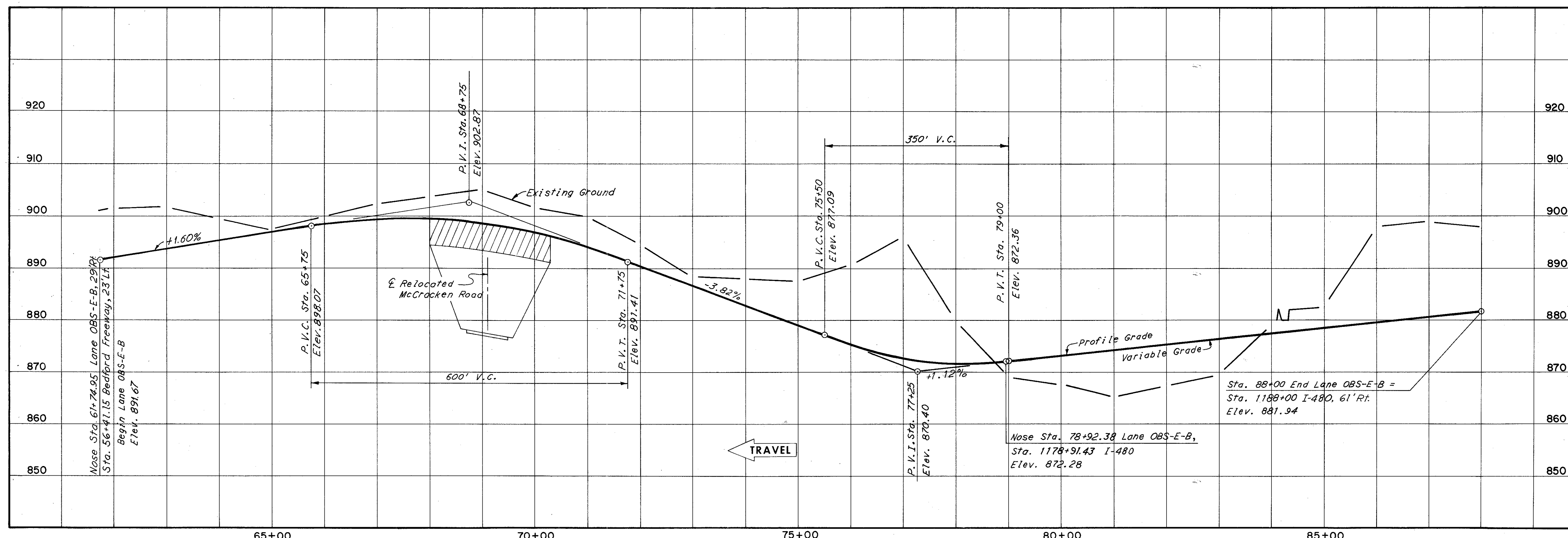


W.B. BEDFORD	Superelevation Transition	Superelevation Lt. -0830 ft./ft.	W.B. BEDFORD
E.B. BEDFORD	Superelevation Transition	Superelevation Rt. +0830 ft./ft.	E.B. BEDFORD
LEFT EDGE	W.B. BEDFORD	See Table Sheet 63	LEFT EDGE
PROFILE GRADE	8.00' LT. OF C	See Table Sheet 63	PROFILE GRADE
RIGHT EDGE	E.B. BEDFORD	See Table Sheet 63	RIGHT EDGE



Scale: 1" = 10'
 SCALE: 1" = 100'
 MADE BY: H.N.B. DATE: 10-6-67
 TRCD: J.H.C.H. DATE: 10-6-67
 CKD: J.H.C.H. DATE: 10-6-67
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

PROFILE GRADE	Superelevation Transition															Super. Rt. + .0830 ft./ft.															Super. Trans.															Superelevation Rt. + 0.0156 ft./ft.															PROFILE GRADE																																																																	
	RIGHT EDGE (24.00')	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	RIGHT EDGE (24.00')																																																																														
	891.67	891.67	891.67	892.47	892.47	892.47	892.87	892.87	892.87	893.27	893.27	893.67	894.07	894.07	894.47	894.47	894.87	895.27	895.27	895.67	896.07	896.07	896.47	896.87	897.27	897.27	897.67	898.07	898.44	898.44	898.76	899.02	899.02	899.22	899.36	899.36	899.45	899.49	899.49	899.47	899.38	899.25	899.14	898.98	898.80	898.51	898.14	897.72	897.25	896.78	896.21	895.54	894.78	893.86	893.03	892.34	891.41	890.46	889.50	888.55	887.59	886.64	885.68	884.73	883.77	882.82	881.86	880.91	879.95	879.00	878.04	877.09	876.17	875.36	874.62	873.98	873.41	872.95	872.56	872.27	872.06	871.95	871.92	871.98	872.12	872.36	872.65	873.02	873.31	873.94	873.23	873.51	873.51	873.79	874.07	874.34	874.61	874.88	875.15	875.42	875.69	875.96	876.23	876.50	876.77	877.03	877.30	877.56	877.83	878.09	878.35	878.61	878.87	879.13	879.39	879.65	879.91	880.17	880.42	880.67	880.93	881.18	881.43	881.69	881.94	

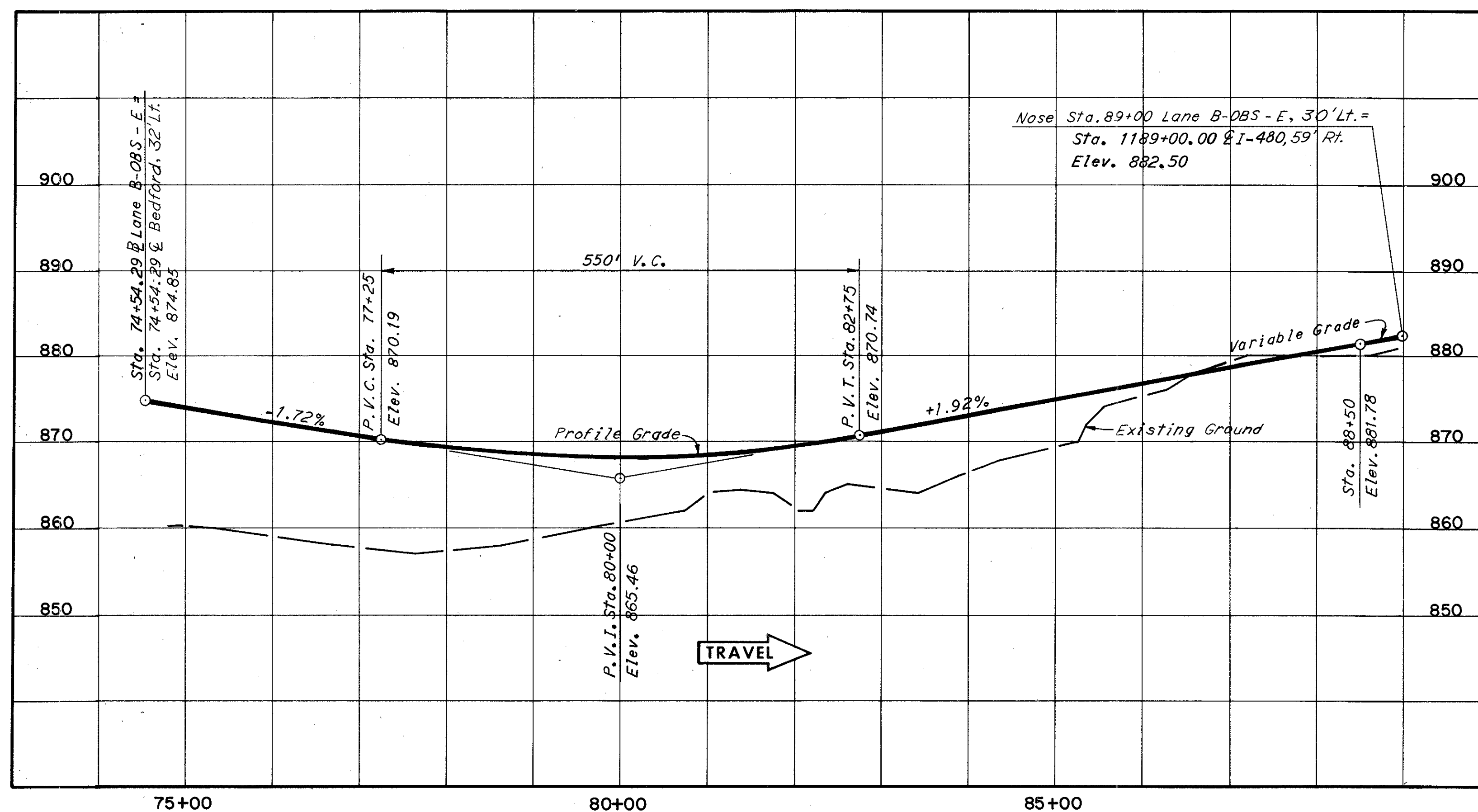


LANE OBS-E-B

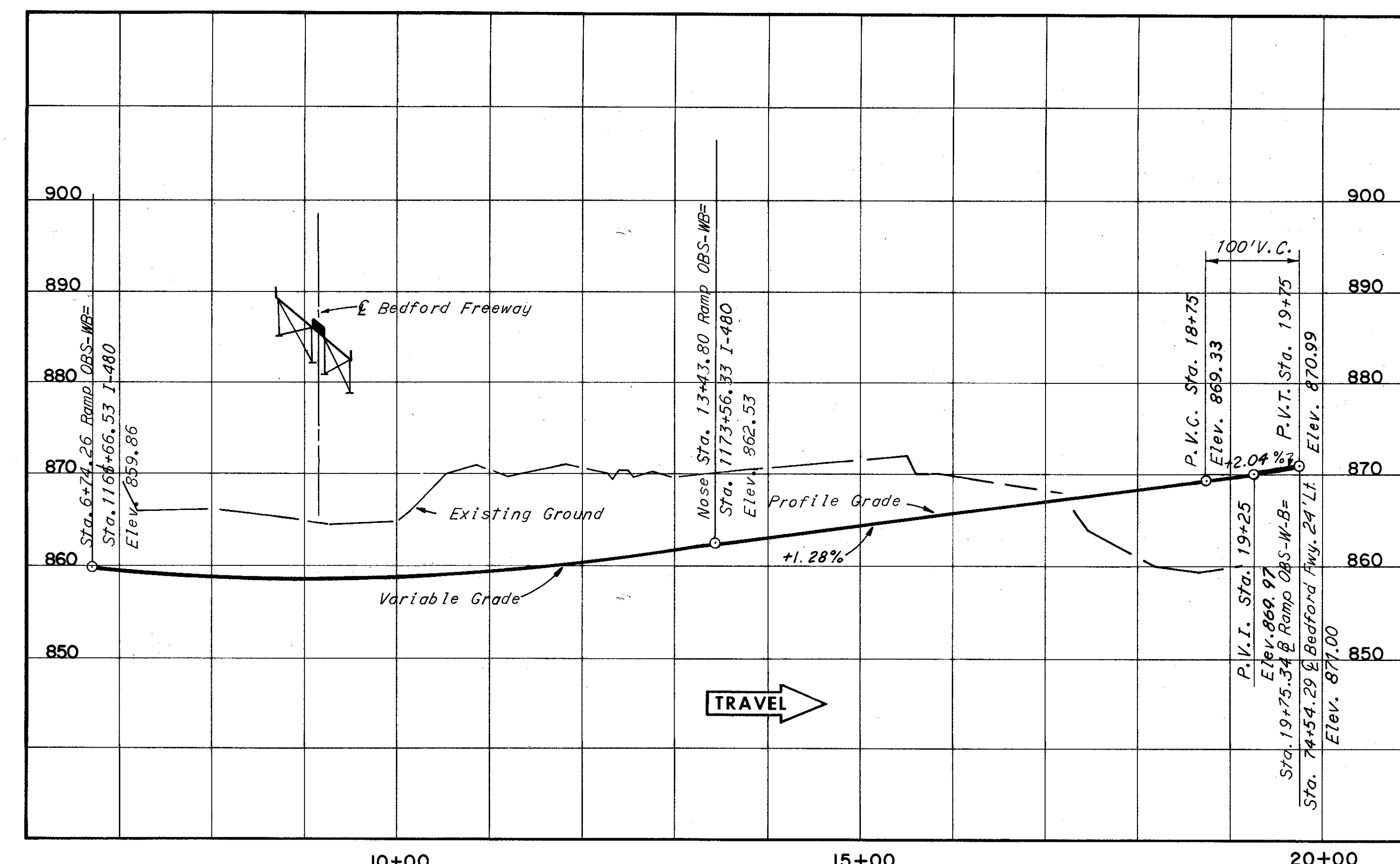
SCALE: HORIZ. 1"=100'
VERT. 1"=100'
MADE BY: H.C.H. DATE: 10-6-67
TRCD. BY: H.C.H. DATE: 10-6-67
HOWARD, NEEDLES, TAMMEN & BERGENOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

	-.0830		Superelevation Transition										+.0830		Superelevation Transition			
LEFT EDGE (24.00')	872.50	872.07														875.43	875.00	LEFT EDGE (24.00')
PROFILE GRADE	874.49	874.06														877.05	876.62	PROFILE GRADE
	75	25	50	50	50	50	50	50	50	50	50	50	50	50	25	75		

	Superelevation Lt. + .0470 ft./ft.										Transition		Super. Lt. + .0830 ft./ft.				
LEFT EDGE (18.00')															871.16	871.56	LEFT EDGE (18.00')
PROFILE GRADE															870.99	870.50	PROFILE GRADE
	75	25	50	50	50	50	50	50	50	50	25	75	25	75	25	75	



LANE B-OBS-E

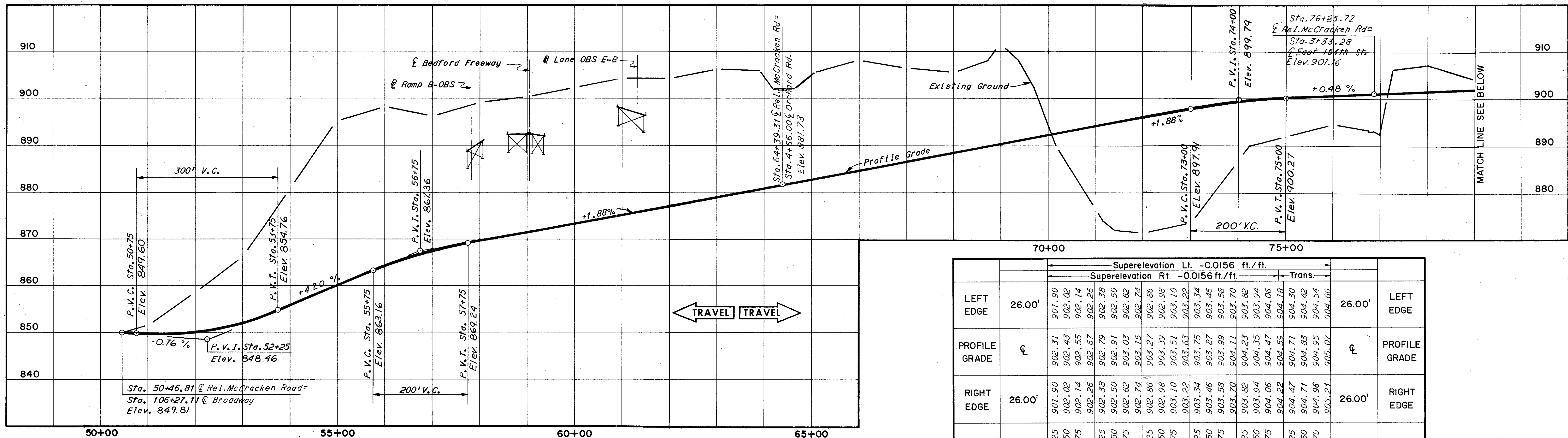


RAMP OBS-W-B

SCALE: HORIZ. 1" = 100'
VERT. 1" = 100'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
MADE BY P.B. DATE 10-6-67
TRCD. DATE 10-6-67
KANSAS CITY CLEVELAND NEW YORK
CKD. J.H.C.H. DATE 10-6-67

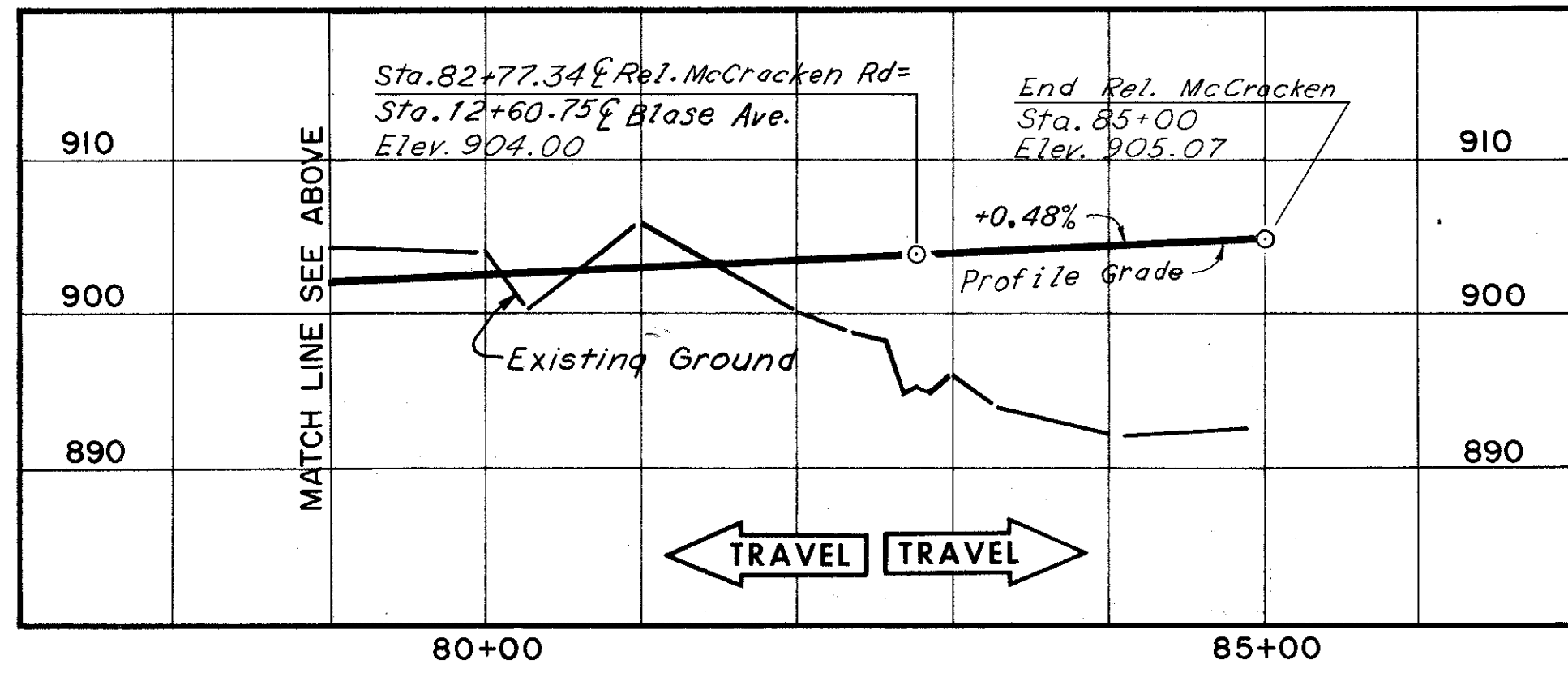
CUYAHOGA COUNTY CUY. 480-21.40

Profile data table with columns: LEFT EDGE, PROFILE GRADE, RIGHT EDGE. Sub-headers include Super. Trans., Superelevation Lt. +0.0510 ft./ft., Superelevation Rt. -0.0510 ft./ft., etc.



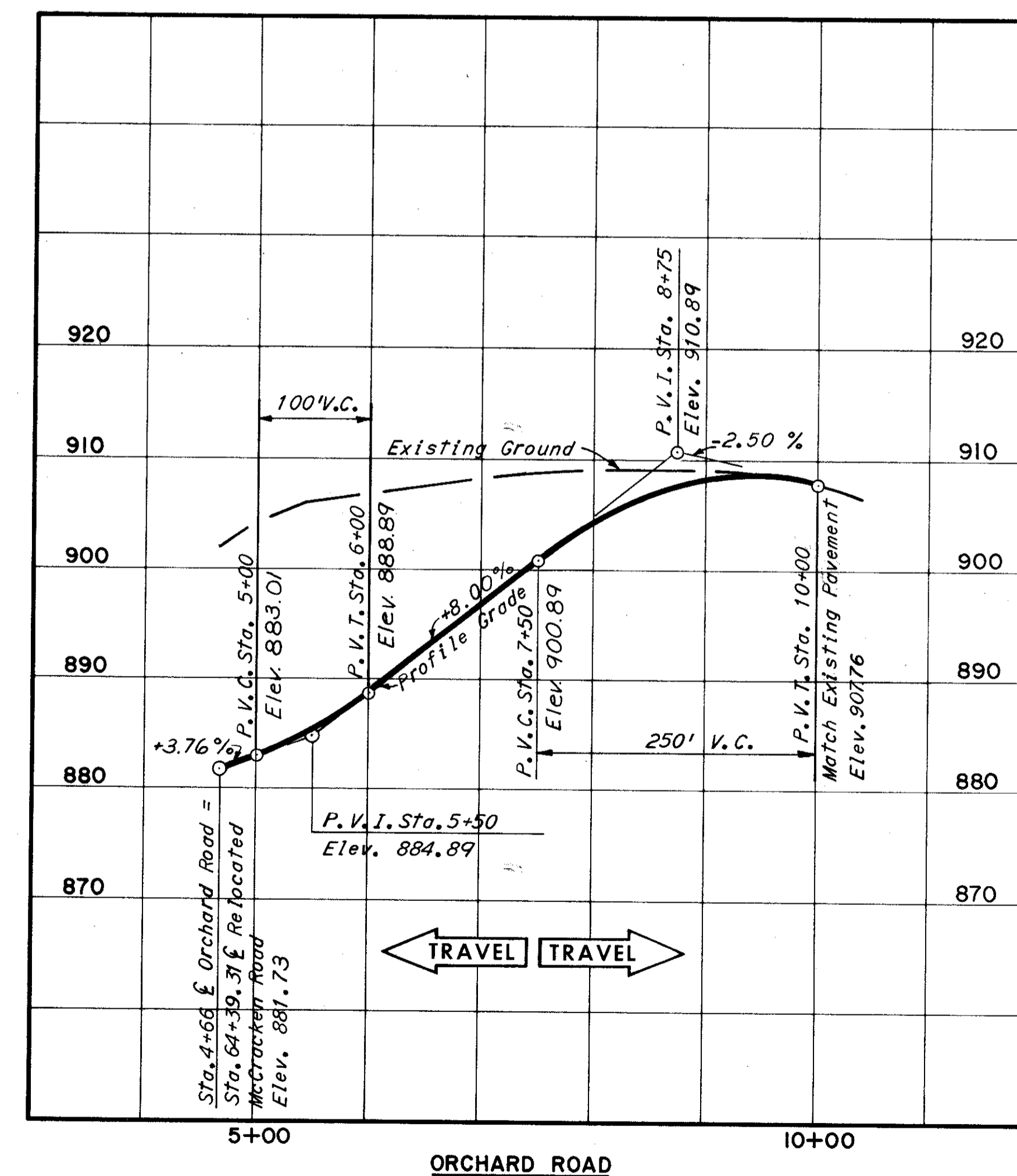
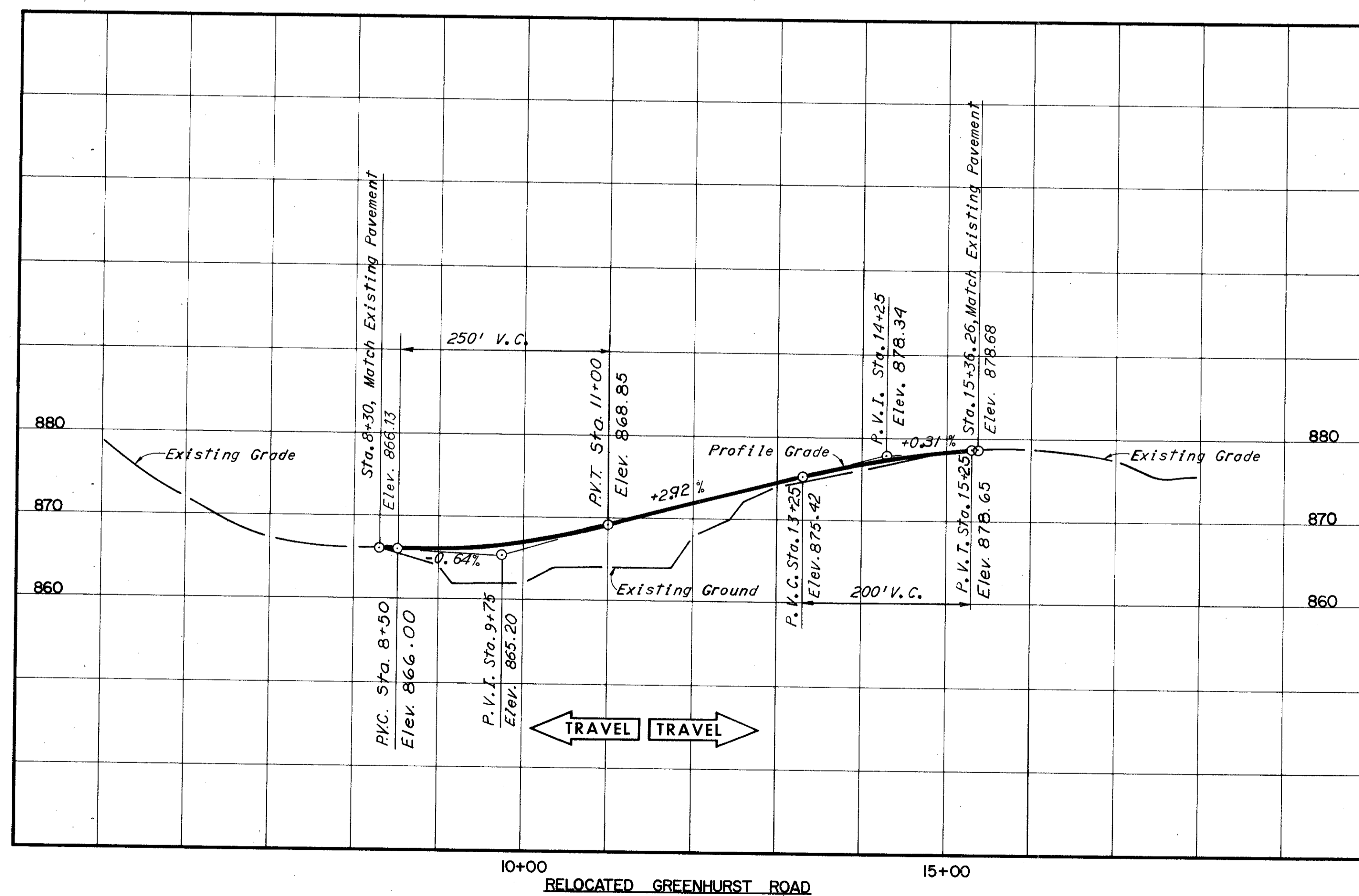
Vertical Scale: 1" = 10' Horizontal Scale: 1" = 100' HOWARD, NEEDLES, TAMMEN & BERGENOFF CONSULTING ENGINEERS MADE R.B. DATE 10-6-67 TRCD J.B. DATE 10-6-67 C.H.C.H. DATE 10-6-67 KANSAS CITY CLEVELAND NEW YORK

Profile data table for stations 70+00 to 75+00, including Superelevation and Trans. details.



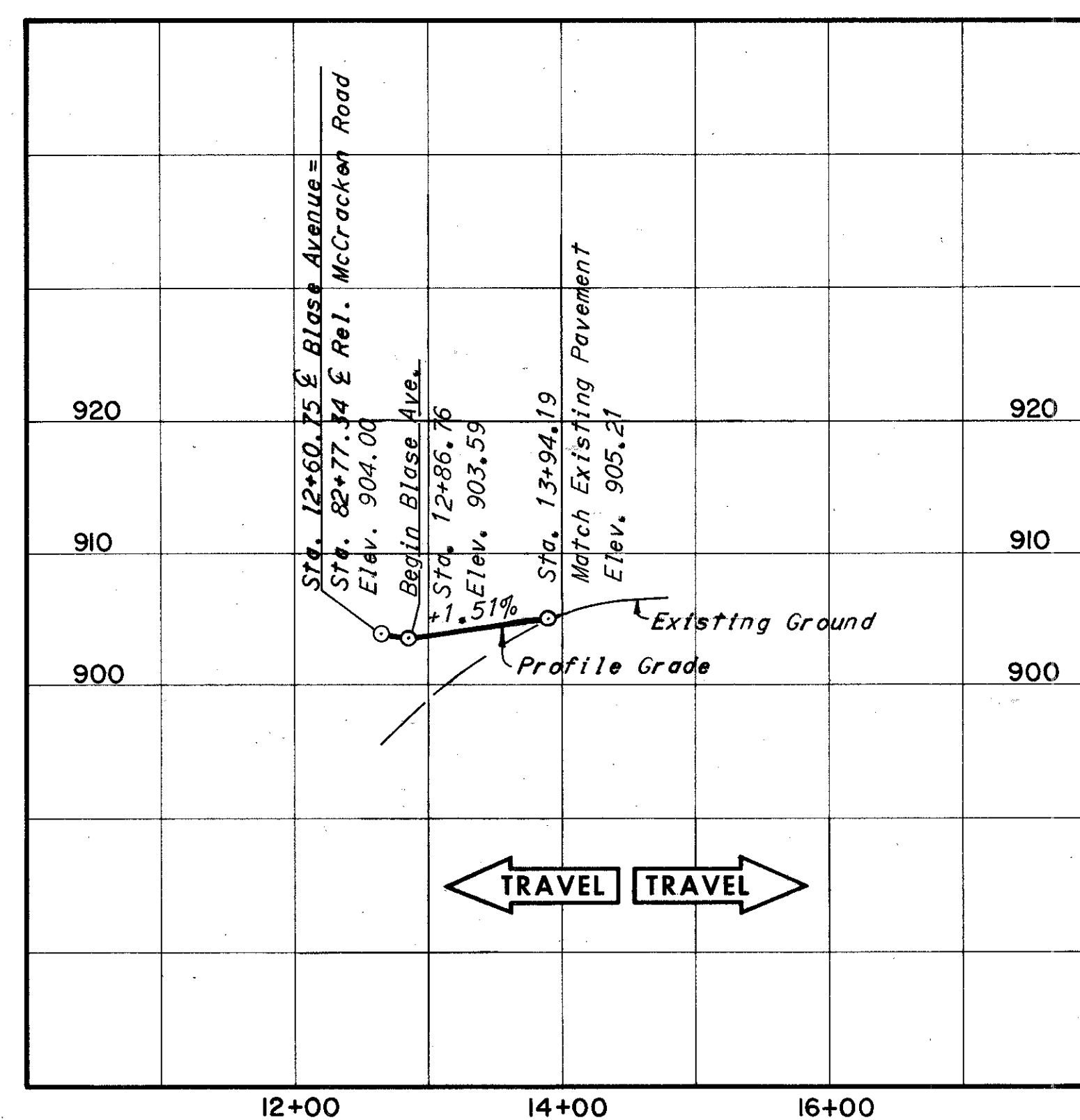
		Superelevation Lt. -0.0156 ft./ft.																												
		Superelevation Rt. -0.0156 ft./ft.																												
		Trans.																												
LEFT EDGE	12.00'	See Inter-section Detail															12.00'	LEFT EDGE												
PROFILE GRADE	ℱ	866.00	865.88	865.92	866.07	866.31	866.12	866.64	866.87	867.36	867.97	868.66	869.39	870.12	870.85	871.58	872.31	873.04	873.77	874.50	875.23	875.92	876.53	877.24	877.99	878.66	878.15	878.65	ℱ	PROFILE GRADE
RIGHT EDGE	12.00'	Same as Left Edge															12.00'	RIGHT EDGE												
		50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25		

		Superelevation Lt. -0.0156 ft./ft.																														
		Super. Rt. -0.0156 ft./ft.																														
		Trans.																														
LEFT EDGE	12.00'	See Inter-section Detail															12.00'	LEFT EDGE														
PROFILE GRADE	ℱ	883.01	884.08	885.42	887.02	886.83	888.70	888.89	890.70	890.70	892.70	894.70	896.89	896.70	898.89	898.70	900.70	900.70	902.57	904.36	904.17	905.52	906.60	907.42	907.97	908.27	908.30	908.49	908.26	907.76	ℱ	PROFILE GRADE
RIGHT EDGE	12.00'	See Inter-section Detail															12.00'	RIGHT EDGE														
		25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25			

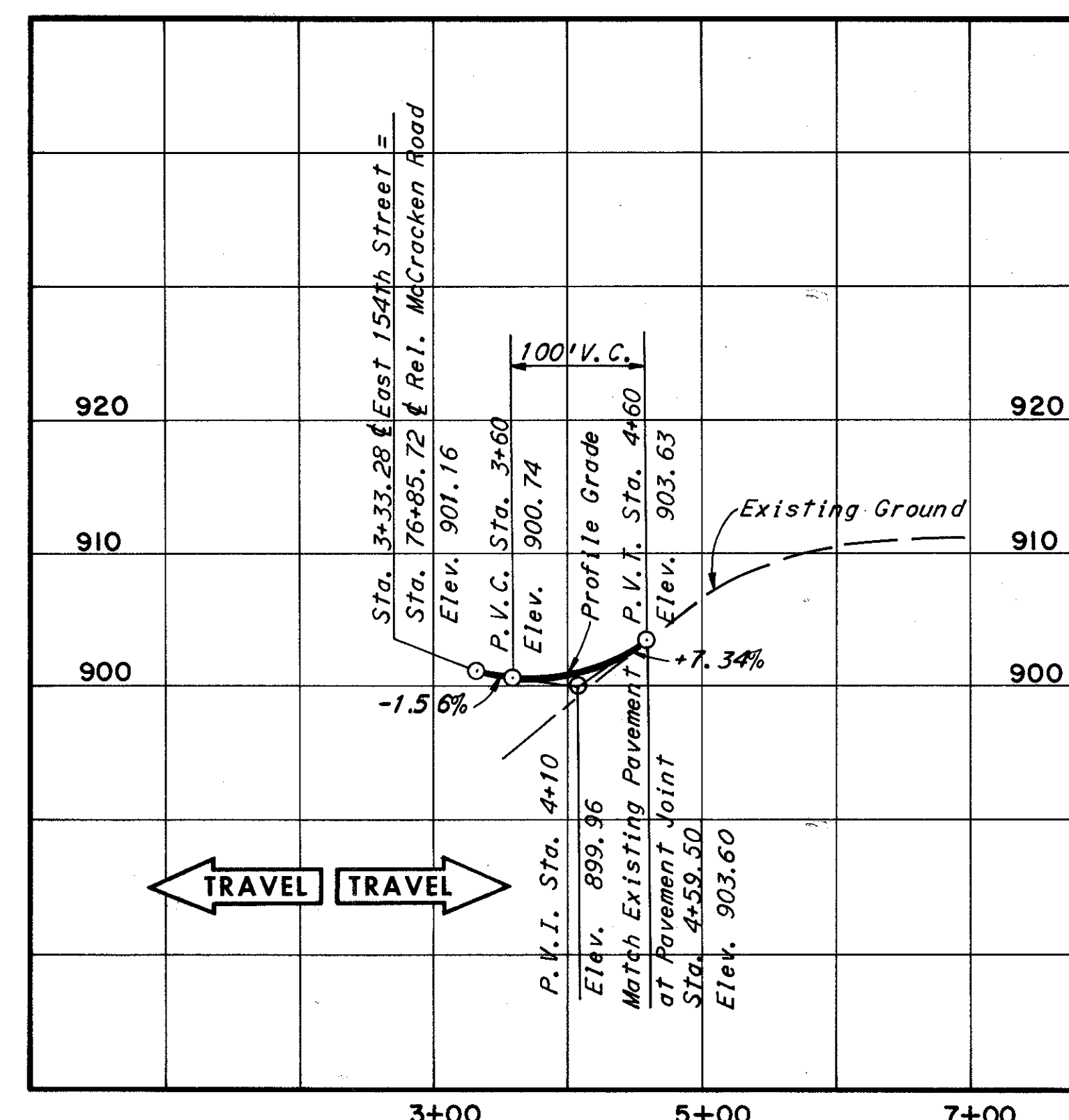


		Lt. -0.0156		Rt. +0.0156		
LEFT EDGE		See Inter-section Details				LEFT EDGE
PROFILE GRADE	ƒ	903.79	904.17	904.54	904.92	ƒ
RIGHT EDGE		See Inter-section Details				RIGHT EDGE
		25	50	75	25	50
		75	25	50	75	

		Super. Lt. .0156 ft. per ft.		Rt. .0156 ft. per ft.		
LEFT EDGE	12.00'	See Inter-section Details				LEFT EDGE
PROFILE GRADE	€	900.90	900.61	900.83	901.61	€
RIGHT EDGE	12.00'	See Inter-section Details		See Inter-section Details		RIGHT EDGE
		50	75	25	50	
		75	25	50	75	



BLASE AVENUE

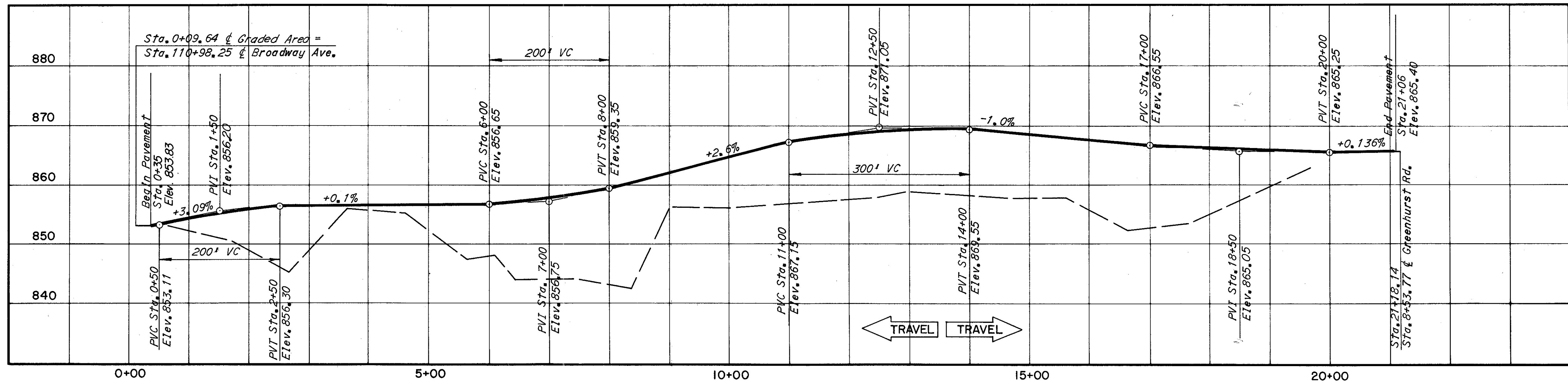


EAST 154th STREET

CUYAHOGA COUNTY
CUY. 480-21.40

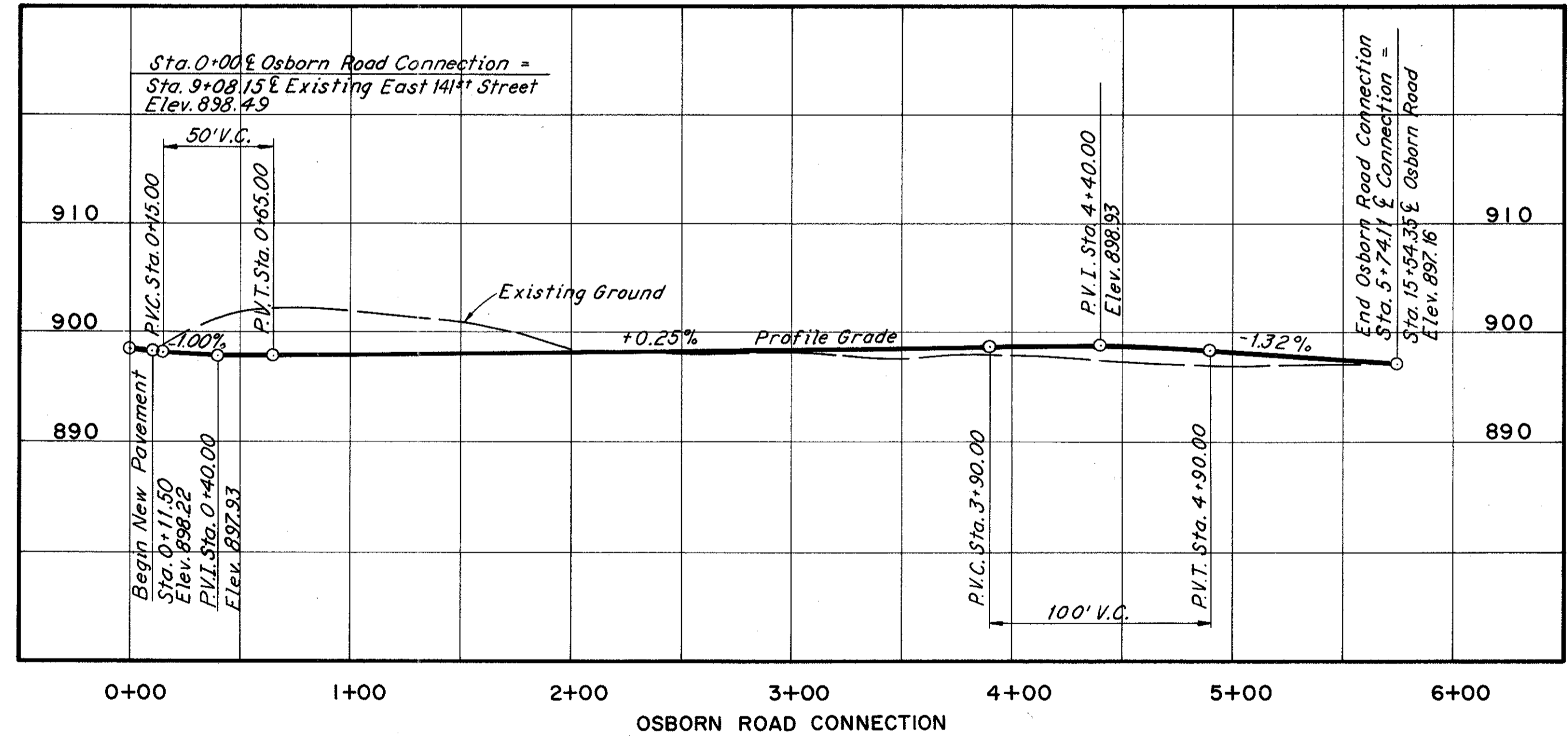
WEST BOUND	EAST BOUND	WEST BOUND	EAST BOUND			
		+ 0.0156 ft/ft				
		- 0.0156 ft/ft				
LEFT EDGE	* 853.23 853.96 854.59 855.13 855.57 855.92 855.18 856.35 856.42 856.44 856.47 856.49 856.52 856.54 856.57 856.59 856.62 856.64 856.67 856.69 856.72 856.74 856.77 856.83 856.86 857.07 857.19 857.49 857.92 858.33 858.86 859.47	PROFILE GRADE	* 853.11 853.84 854.47 855.01 855.45 855.80 855.06 856.23 856.30 856.32 856.44 856.47 856.49 856.52 856.54 856.57 856.59 856.62 856.64 856.67 856.69 856.72 856.74 856.77 856.83 856.86 857.07 857.19 857.49 857.92 858.33 858.86 859.47	RIGHT EDGE	* 852.99 853.72 854.35 854.89 855.33 855.68 855.94 856.11 856.18 856.20 856.23 856.25 856.28 856.30 856.32 856.35 856.37 856.40 856.42 856.44 856.45 856.47 856.49 856.50 856.52 856.55 856.57 856.59 856.60 856.62 856.64 856.67 856.69 856.70 856.72 856.74 856.77 856.83 856.86 857.07 857.19 857.49 857.92 858.33 858.86 859.47	RIGHT EDGE

* See Intersection Details Sheet No.66



Vert. 1" = 10'
SCALE Hor. 1" = 100'
MADE FOR THE DATE 1-10-68
TRCD JMC DATE 3-5-69
CKD JM DATE 4-1-70
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK

		← Superelevation Lt. -0.0156 ft./ft. →																							
		← Superelevation Rt. -0.0156 ft./ft. →																							
LEFT EDGE	See Inter-section Details	897.83	897.89	897.95	898.02	898.08	898.14	898.20	898.27	898.33	898.39	898.45	898.51	898.58	898.63	898.60	898.48	898.26	897.95	897.62	897.29	12.00'	LEFT EDGE		
PROFILE GRADE		898.49	897.99	898.02	898.08	898.14	898.21	898.27	898.33	898.39	898.46	898.52	898.58	898.64	898.70	898.77	898.82	898.79	898.67	898.45	898.14	897.81	897.48	ƒ	PROFILE GRADE
RIGHT EDGE	See Inter-section Details	897.83	897.89	897.95	898.02	898.08	898.14	898.20	898.27	898.33	898.39	898.45	898.51	898.58	898.63	898.60	898.48	898.26	897.95	897.62	897.29	12.00'	RIGHT EDGE		
		25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50	75	25	50				

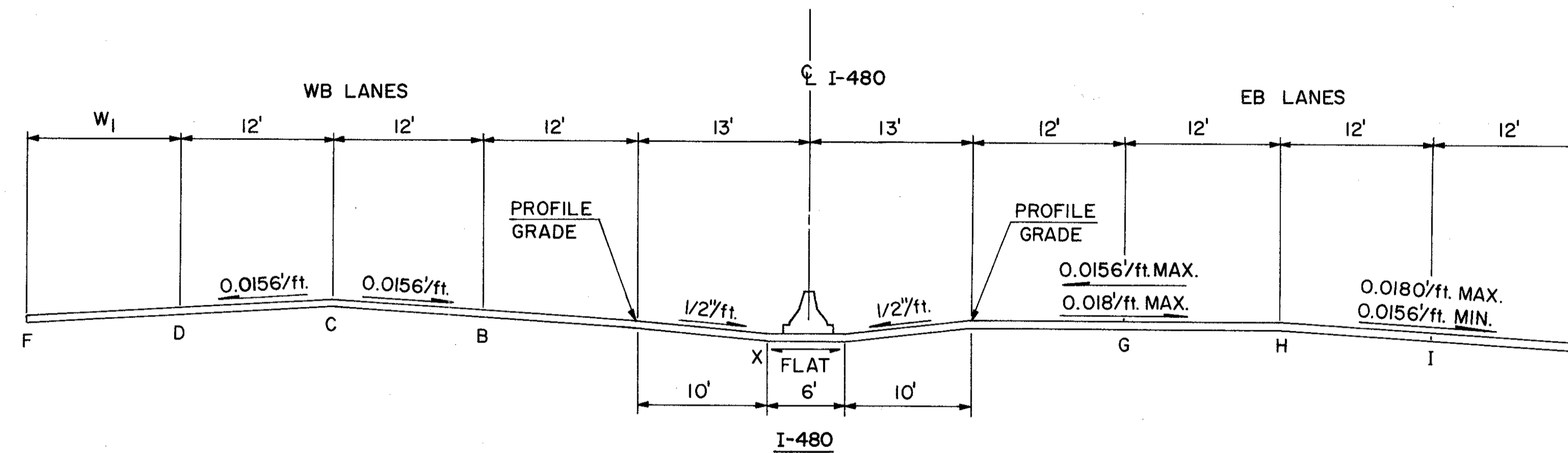


SUPERELEVATION TABLES

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
C.U.Y. 480-21.40



STA. 1152+77.03 TO STA. 1159+64.53

STATION	W ₁	F	D	C	B	X	PROFILE GRADE	G	H	I	J		
1152+77.03	12.00	Same As Profile Grade	Same As B	901.54	901.36	900.75	901.17	900.95	900.74	900.52	900.31		
1153+00				901.09	900.91	900.30	900.72	900.56	900.40	900.21	900.03		
1153+25				900.58	900.40	899.79	900.21	900.11	900.02	899.83	899.64		
1153+50				900.04	899.86	899.25	899.67	899.64	899.60	899.41	899.23		
1153+75				899.48	899.30	898.69	899.11	899.12	899.14	898.95	898.77		
1154+00				898.89	898.71	898.10	898.52	898.57	898.61	898.42	898.24		
1154+25				898.28	898.10	897.49	897.91	897.99	898.06	897.87	897.69		
1154+44.53	12.00					897.78	897.60	896.99	897.41	897.51	897.61	897.42	897.24
1154+50	12.14			897.26		897.64	897.46	897.85	897.27	897.38	897.49	897.30	897.12
1154+75	12.76			896.59		896.98	896.80	896.19	896.61	896.75	896.89	896.70	896.52
1155+00	13.39	895.89		896.29	896.11	895.50	895.92	896.09	896.26	896.07	895.89		
1155+25	14.01	895.17		895.58	895.40	894.79	895.21	895.40	895.58	895.39	895.21		
1155+50	14.64	894.42		894.84	894.66	894.05	894.47	894.66	894.84	894.65	894.47		
1155+75	15.26	893.66		894.09	893.91	893.30	893.72	893.91	894.09	893.90	893.72		
1156+00	15.89	892.90		893.34	893.16	892.55	892.97	893.16	893.34	893.15	892.97		
1156+25	16.51	892.15		892.59	892.41	891.80	892.22	892.41	892.59	892.40	892.22		
1156+50	17.14	891.39		891.84	891.66	891.05	891.47	891.66	891.84	891.65	891.47		
1156+75	17.76	890.63		891.09	890.91	890.30	890.72	890.91	891.09	890.90	890.72		
1157+00	18.39	889.87		890.34	890.16	889.55	889.97	890.16	890.34	890.15	889.97		
1157+25	19.01	889.11		889.59	889.41	888.80	889.22	889.41	889.59	889.40	889.22		
1157+50	19.64	888.35		888.84	888.66	888.05	888.47	888.66	888.84	888.65	888.47		
1157+75	20.26	887.59		888.09	887.91	887.30	887.72	887.91	888.09	887.90	887.72		
1158+00	20.89	886.83		887.34	887.16	886.55	886.97	887.16	887.34	887.15	886.97		
1158+25	21.51	886.07		886.59	886.41	885.80	886.22	886.39	886.57	886.38	886.20		
1158+50	22.14	885.31		885.84	885.66	885.05	885.47	885.61	885.76	885.56	885.39		
1158+75	22.76	884.55		885.09	884.91	884.30	884.72	884.83	884.94	884.75	884.57		
1159+00	23.39	883.79		884.34	884.16	883.55	883.97	884.05	884.13	883.94	883.76		
1159+25	24.01	883.03		883.59	883.41	882.80	883.22	883.27	883.32	883.13	882.95		
1159+50	24.64	882.27		882.84	882.66	882.05	882.47	882.49	882.51	882.32	882.14		
1159+64.53	25.00	881.82		882.40	882.22	881.61	882.03	882.03	882.03	881.84	881.66		

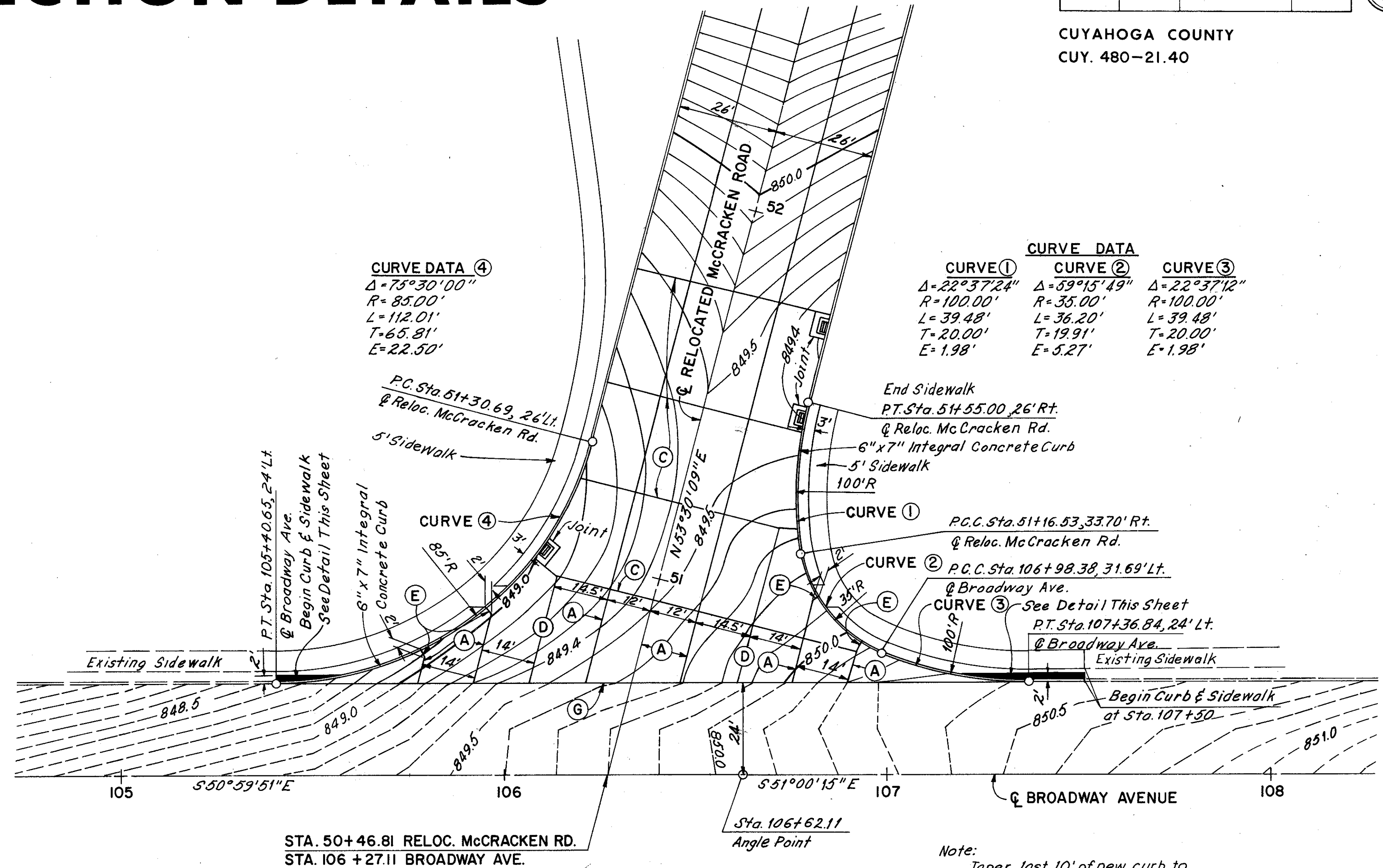
SCALE None HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE RHA DATE 4-2-68 CONSULTING ENGINEERS
 TRCD. RHA DATE 4-2-68
 CKD. JM DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

INTERSECTION DETAILS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

64
390

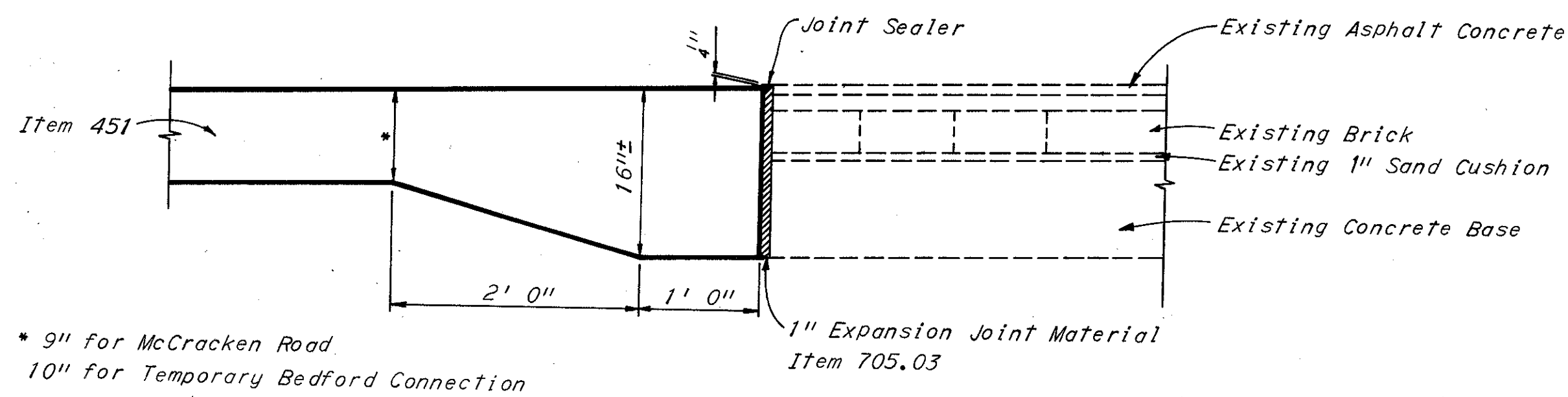
CUYAHOGA COUNTY
CUY. 480-21.40



Note:
Taper last 10' of new curb to match Broadway existing curb.

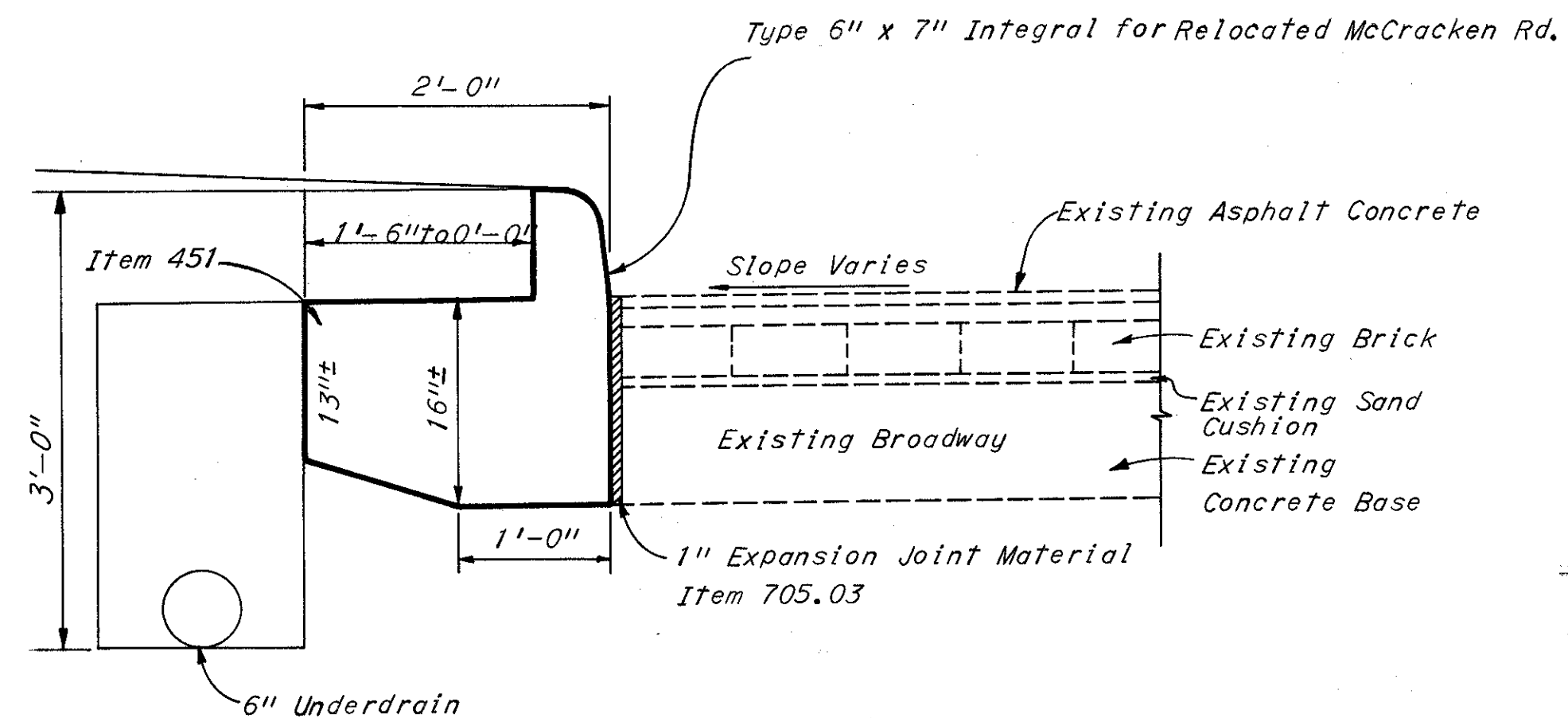
RELOCATED McCracken Road

Scale 1"=20'



THICKENED-EDGE JOINT ⑥

Scale 1"=1'



SPECIAL DETAIL AT BEGINNING OF TAPER

Scale 1"=1'

JOINT LEGEND

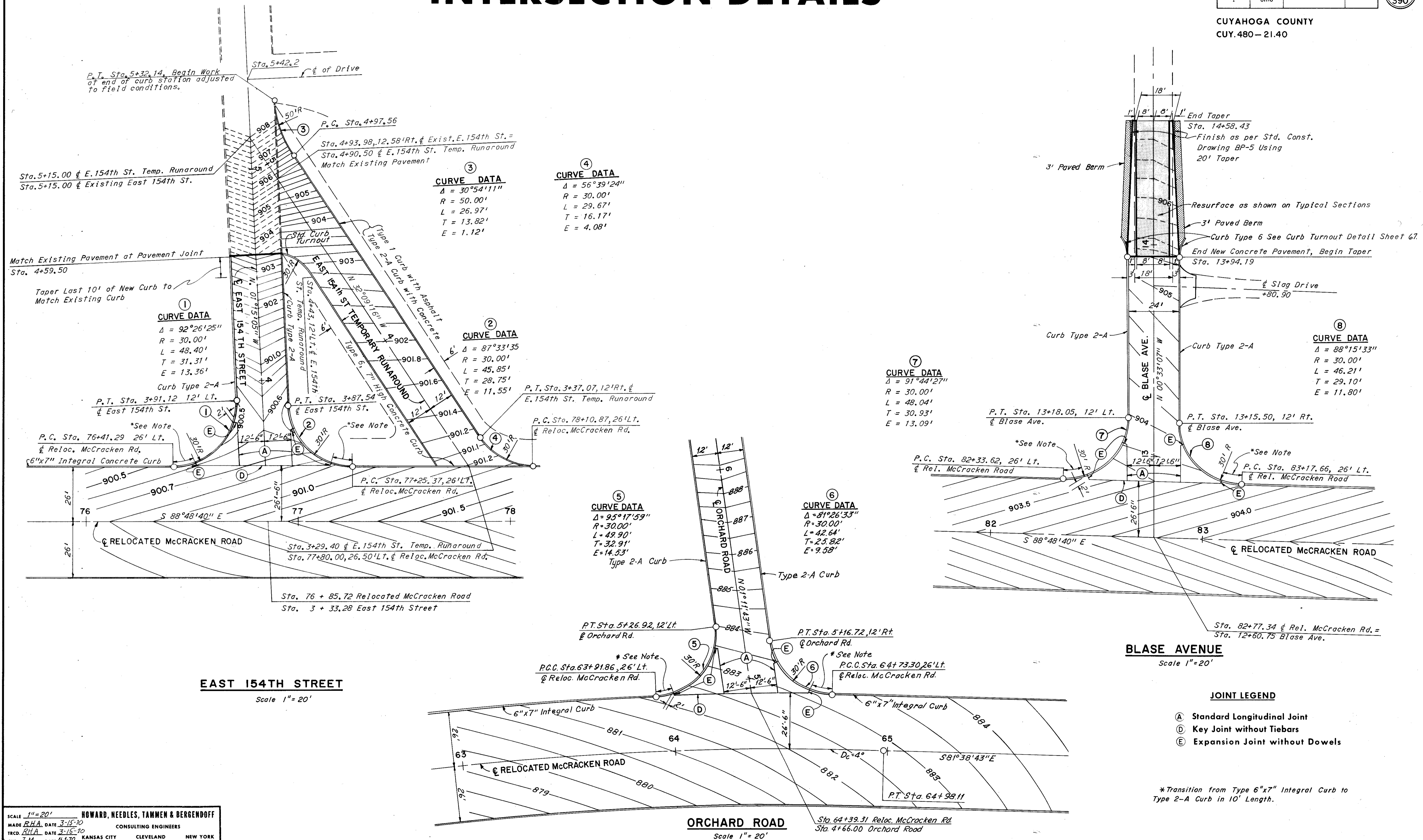
- Ⓐ Standard Longitudinal Joint
- Ⓒ Standard Contraction Joint
- Ⓓ Key Joint without Tiebars
- Ⓔ Expansion Joint without Dowels
- Ⓖ Thickened Edge Joint

SCALE As Shown
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE R.H.A. DATE 5-1-68 CONSULTING ENGINEERS
 TRCD. H.L.D. DATE 5-1-68
 CKD. J.M. DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

INTERSECTION DETAILS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
CUY.480-21.40



③ CURVE DATA
 $\Delta = 30^{\circ}54'11''$
 $R = 50.00'$
 $L = 26.97'$
 $T = 13.82'$
 $E = 1.12'$

④ CURVE DATA
 $\Delta = 56^{\circ}39'24''$
 $R = 30.00'$
 $L = 29.67'$
 $T = 16.17'$
 $E = 4.08'$

① CURVE DATA
 $\Delta = 92^{\circ}26'25''$
 $R = 30.00'$
 $L = 48.40'$
 $T = 31.31'$
 $E = 13.36'$

② CURVE DATA
 $\Delta = 87^{\circ}33'35''$
 $R = 30.00'$
 $L = 45.85'$
 $T = 28.75'$
 $E = 11.55'$

⑦ CURVE DATA
 $\Delta = 91^{\circ}44'27''$
 $R = 30.00'$
 $L = 48.04'$
 $T = 30.93'$
 $E = 13.09'$

⑧ CURVE DATA
 $\Delta = 88^{\circ}15'33''$
 $R = 30.00'$
 $L = 46.21'$
 $T = 29.10'$
 $E = 11.80'$

⑤ CURVE DATA
 $\Delta = 95^{\circ}17'59''$
 $R = 30.00'$
 $L = 49.90'$
 $T = 32.91'$
 $E = 14.53'$

⑥ CURVE DATA
 $\Delta = 81^{\circ}26'33''$
 $R = 30.00'$
 $L = 42.64'$
 $T = 25.82'$
 $E = 9.58'$

EAST 154TH STREET
Scale 1" = 20'

BLASE AVENUE
Scale 1" = 20'

ORCHARD ROAD
Scale 1" = 20'

- JOINT LEGEND**
- (A) Standard Longitudinal Joint
 - (D) Key Joint without Tiebars
 - (E) Expansion Joint without Dowels

*Transition from Type 6"x7" Integral Curb to Type 2-A Curb in 10' Length.

SCALE 1" = 20'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE R.H.A. DATE 3-15-70 CONSULTING ENGINEERS
 TRCD. R.H.A. DATE 3-15-70 KANSAS CITY CLEVELAND NEW YORK
 CKD. J.M. DATE 4-1-70

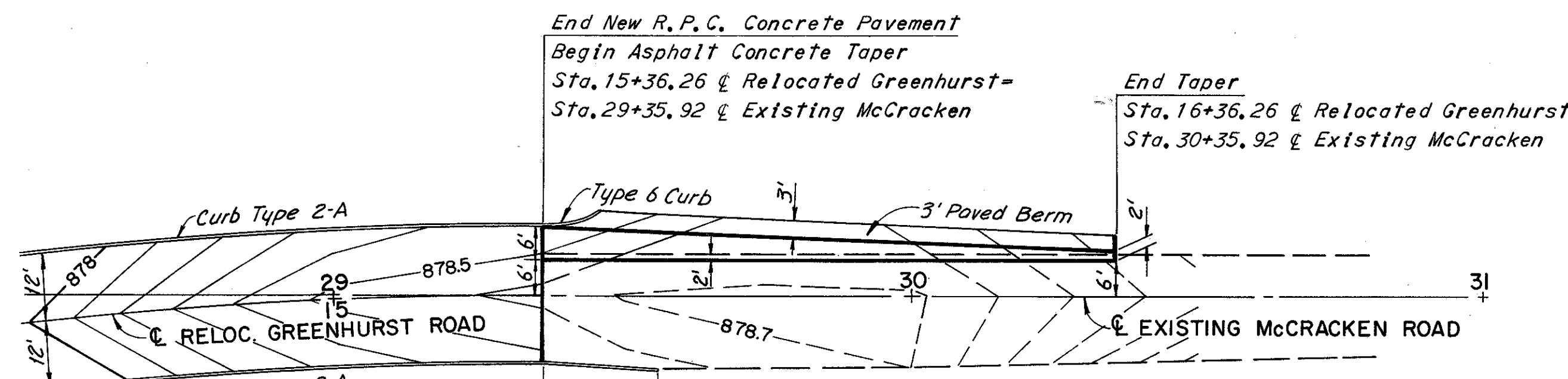
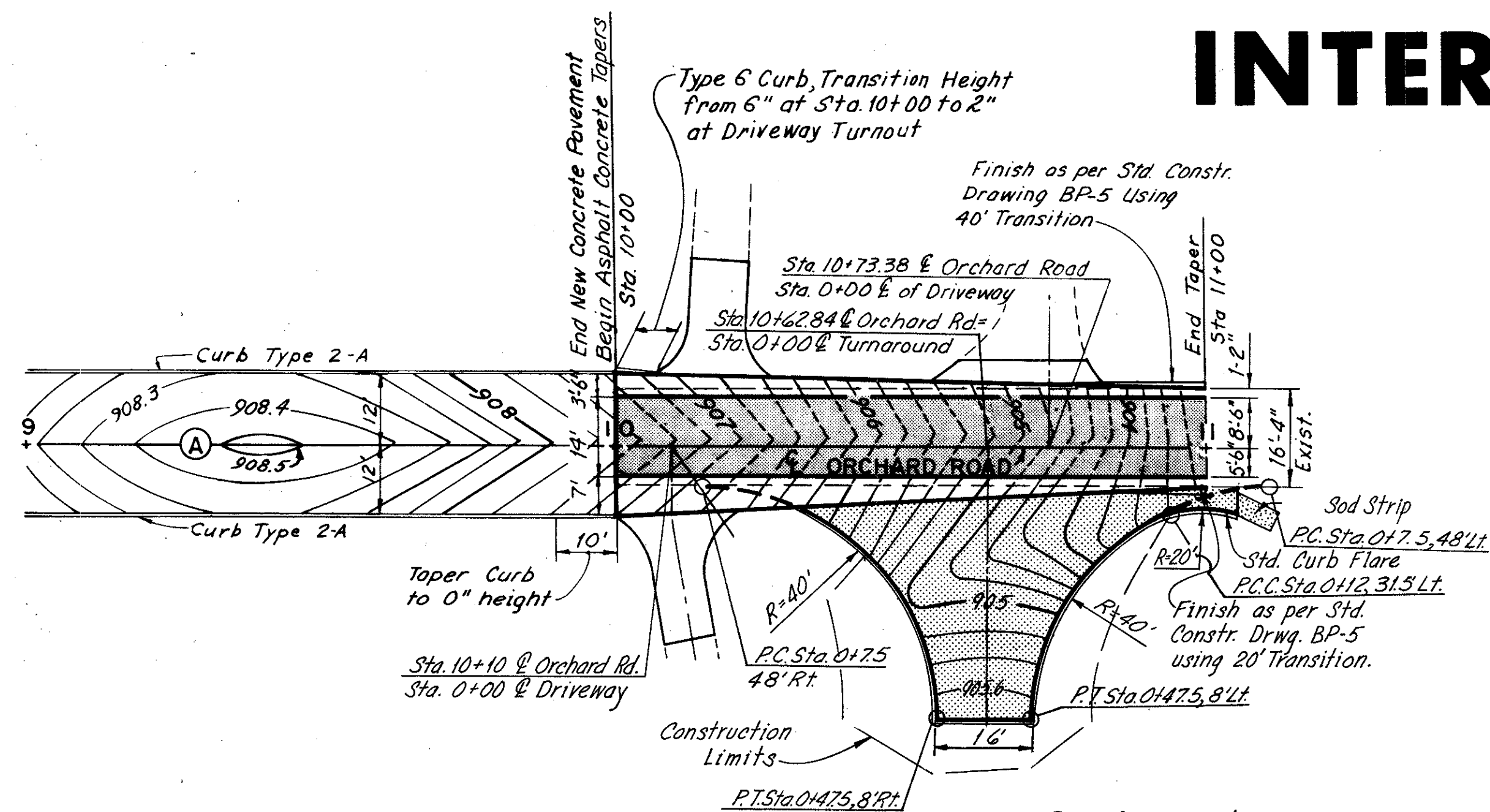
INTERSECTION DETAILS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY
CUY 480-21.40

Finish as per Standard Construction Drawing BP-5 using 22' Transition



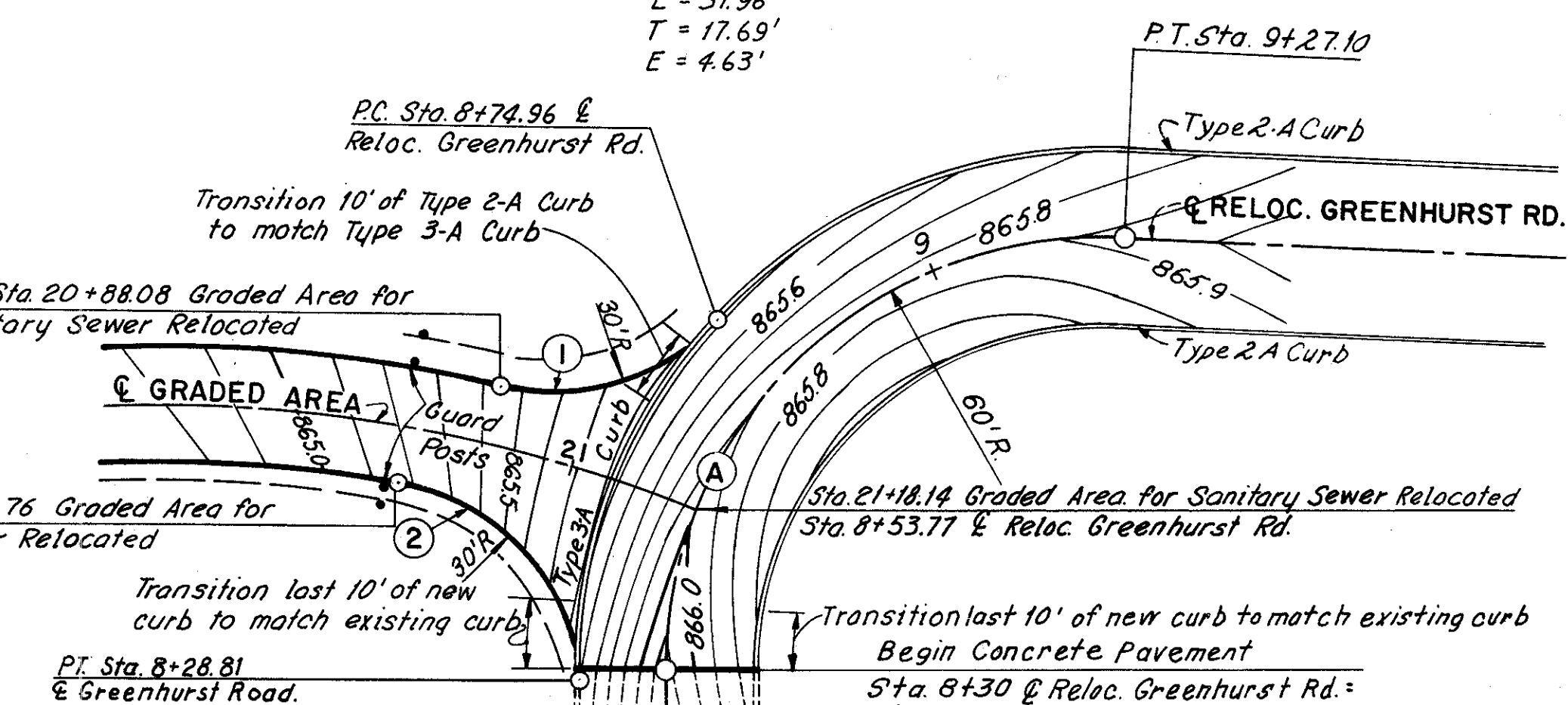
- JOINT LEGEND**
- (A) Standard Longitudinal Joint
 - (C) Standard Contraction Joint
 - (E) Expansion Joint without Dowels

CURVE DATA (1)
 $\Delta = 61^{\circ}02'43''$
 $R = 30.00'$
 $L = 31.96'$
 $T = 17.69'$
 $E = 4.63'$

CURVE DATA (1)
 $\Delta = 68^{\circ}11'47''$
 $R = 50.00'$
 $L = 59.51'$

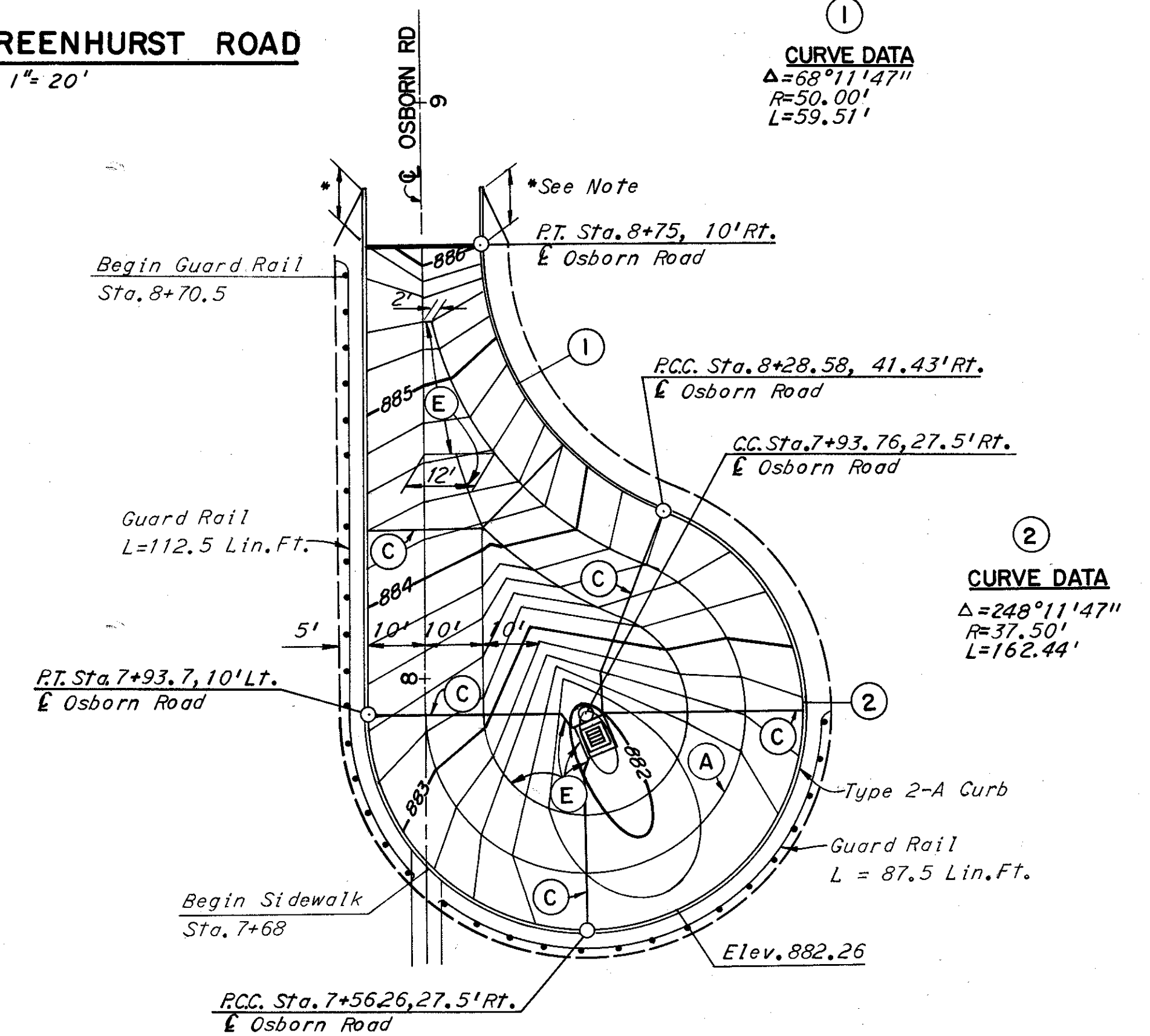
ORCHARD ROAD
Scale 1"=20'

Resurface as shown on Typical Sections
 Class A Temporary Pavement, as per plan

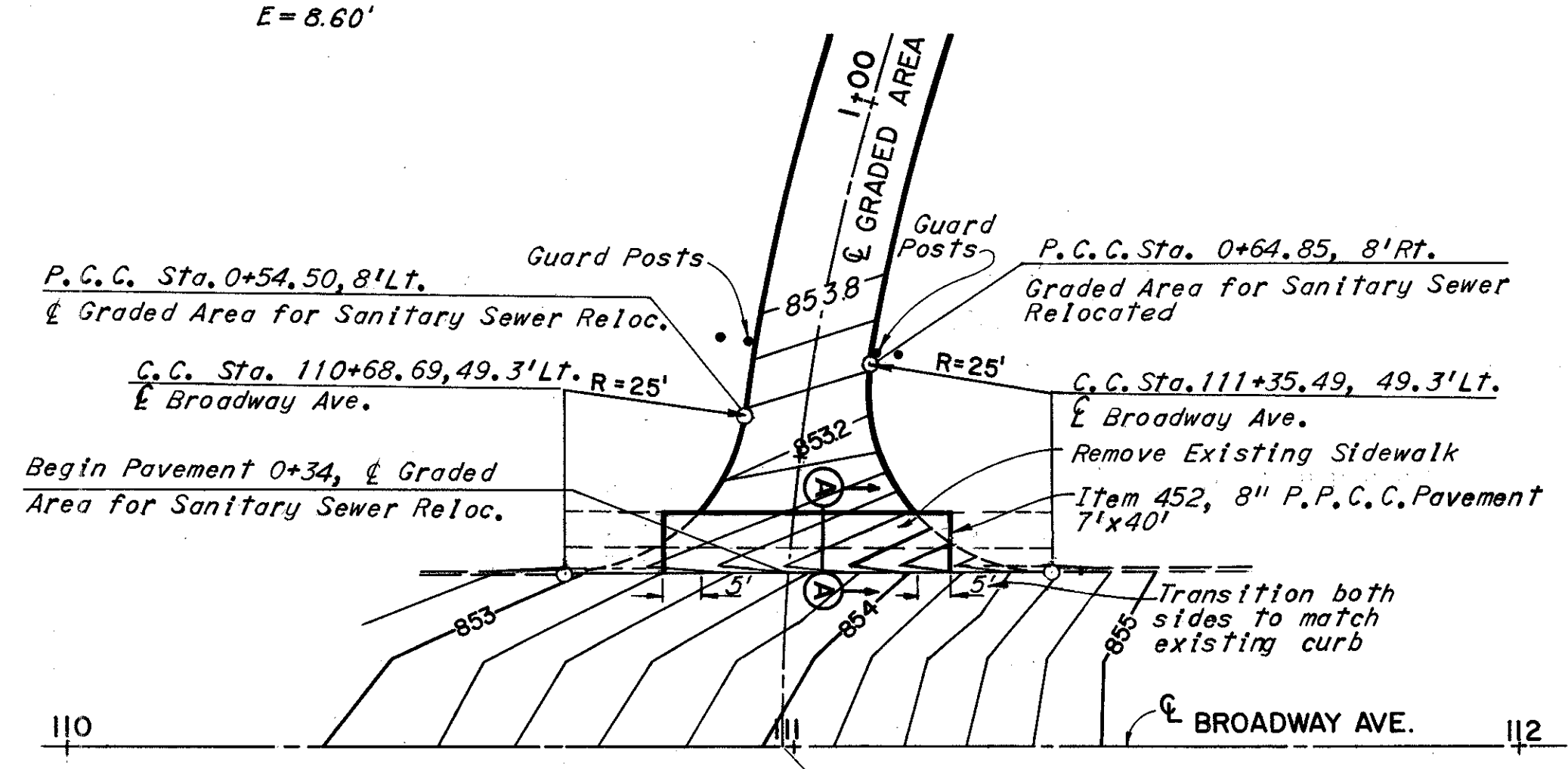
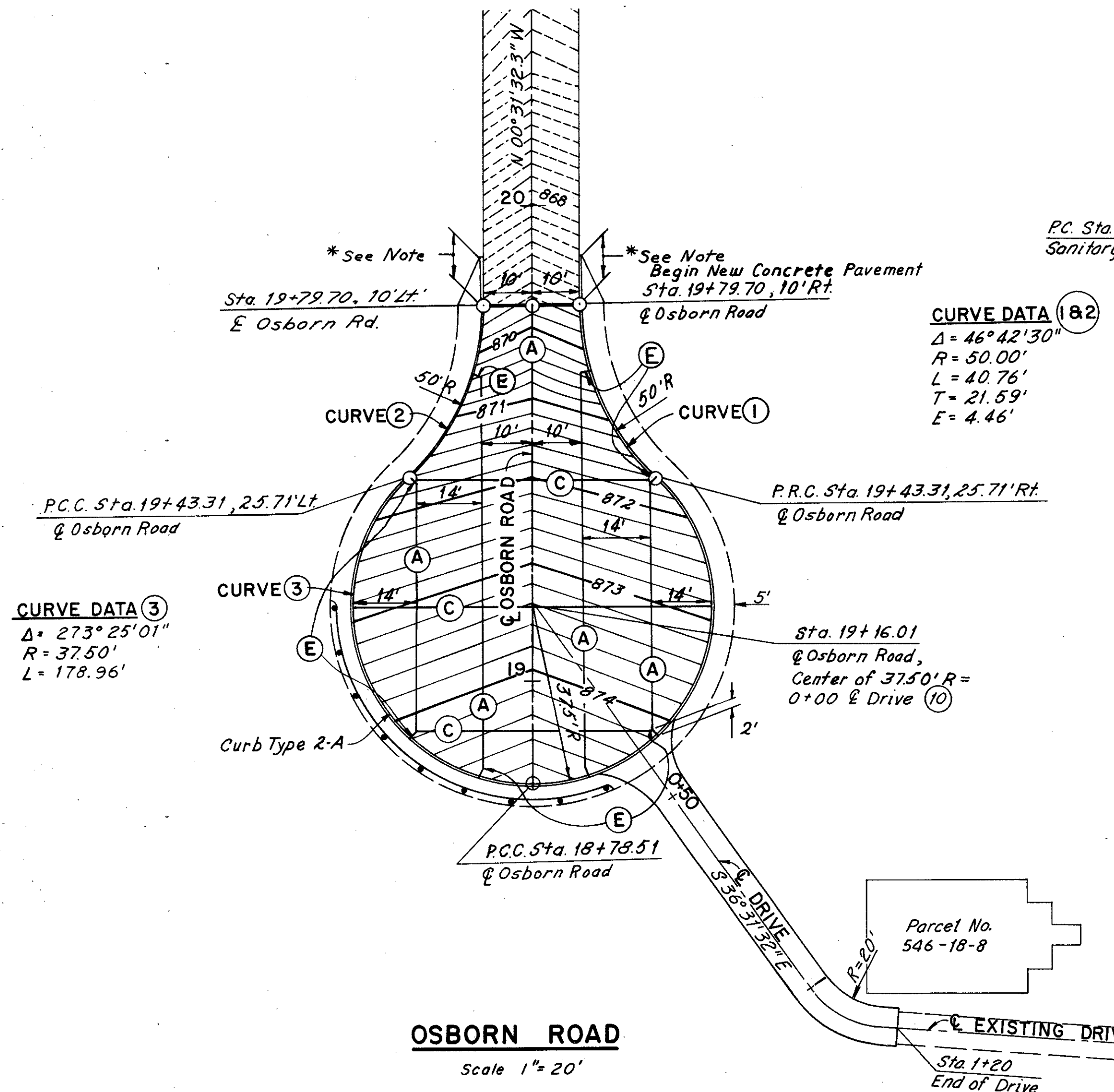


CURVE DATA (82)
 $\Delta = 46^{\circ}42'30''$
 $R = 50.00'$
 $L = 40.76'$
 $T = 21.59'$
 $E = 4.46'$

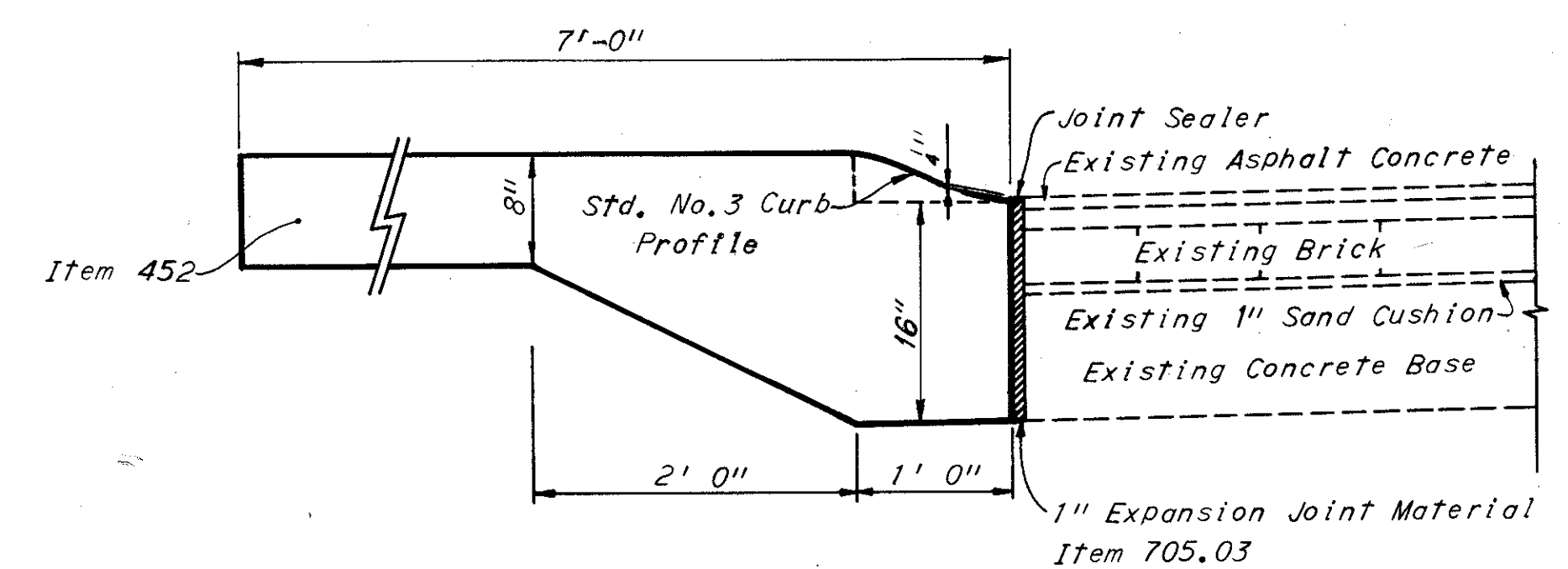
CURVE DATA (2)
 $\Delta = 77^{\circ}59'44''$
 $R = 30.00'$
 $L = 40.84'$
 $T = 24.29'$
 $E = 8.60'$



CURVE DATA (2)
 $\Delta = 248^{\circ}11'47''$
 $R = 37.50'$
 $L = 162.44'$



GRADED AREA FOR SANITARY SEWER RELOCATED
Scale 1"=20'



* Note
Type 6 Curb, Transition Height Uniformly from 6" to 0" in 20' Length.

SCALE 1"=20' HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE RHA DATE 3-15-70 CONSULTING ENGINEERS
 TRCD RHA DATE 3-15-70
 CKD IM DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

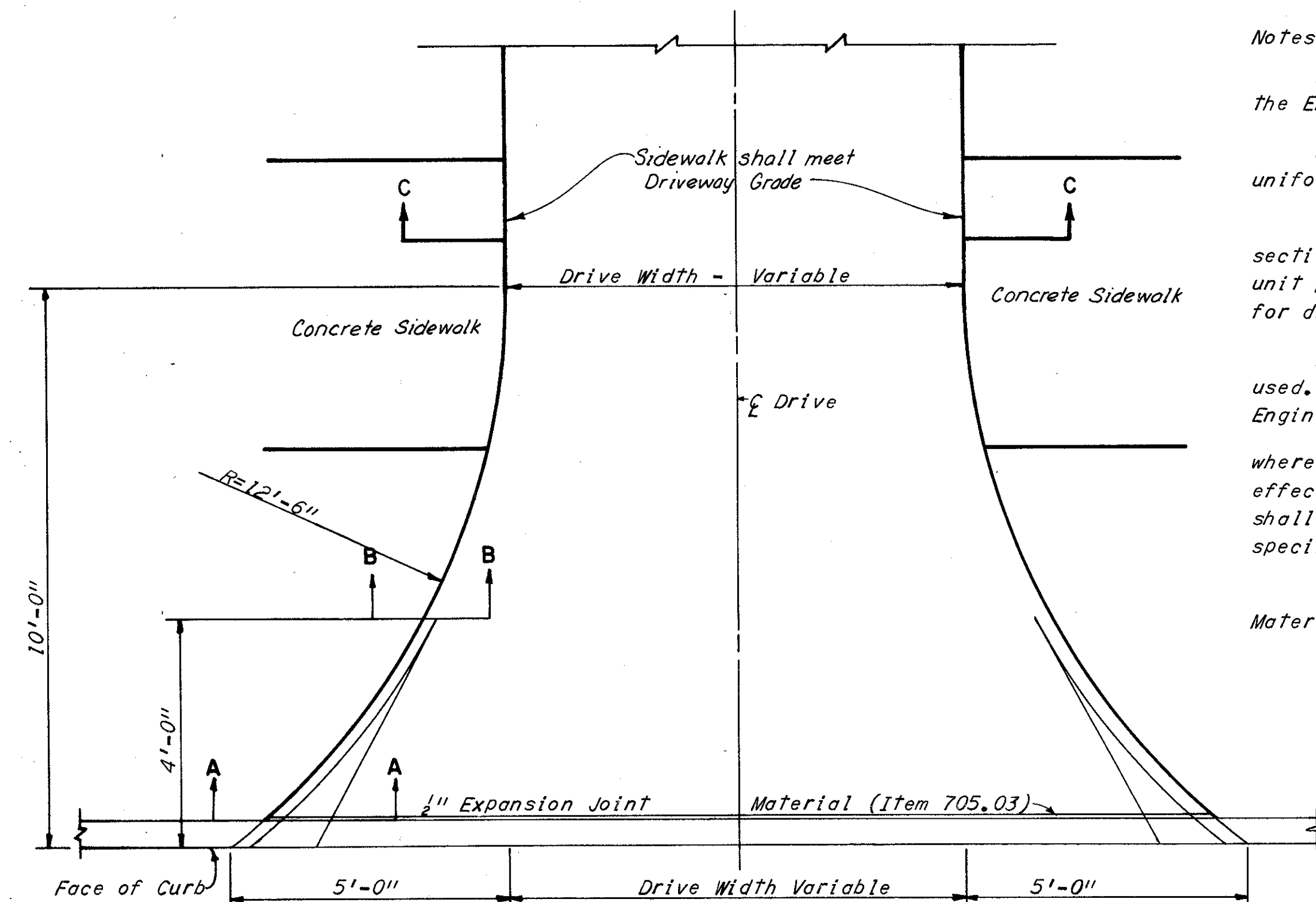


MISCELLANEOUS DETAILS

FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY
CUY. 480-21.40



CONCRETE APRON DETAIL
No Scale:

Notes:

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

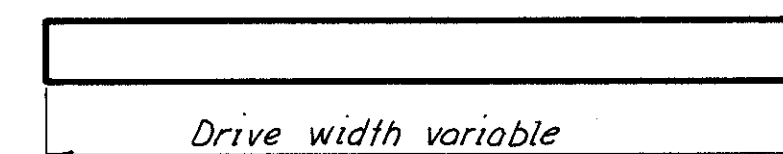
Form drive apron curb Sect. "A-A" behind curb line and taper out uniformly to no curb 4'-0" behind gutter line, as shown.

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 452, 7" Portland Cement Concrete for drives.

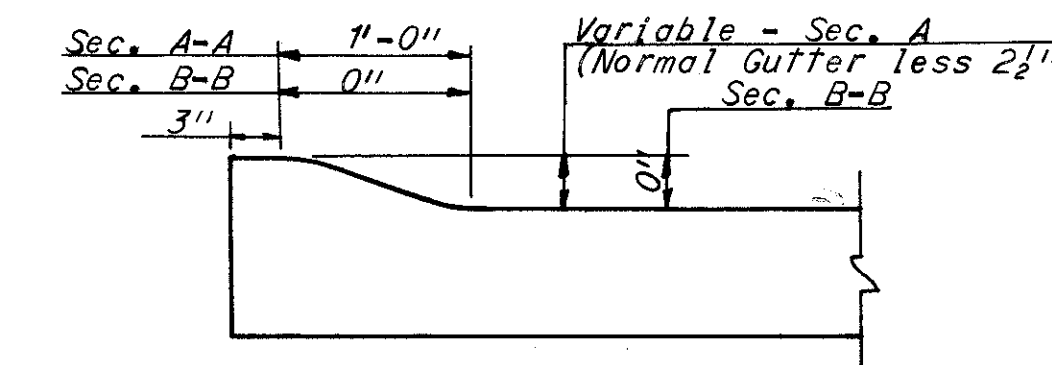
For Asphaltic Concrete and Slag drives, The plan view shown, shall be used. Shape drive section to provide for proper drainage as directed by the Engineer.

Curb shall be dropped to provide a 1/4" 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 1/4" 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 (Item 705.03) shall be provided.



SECTION C-C

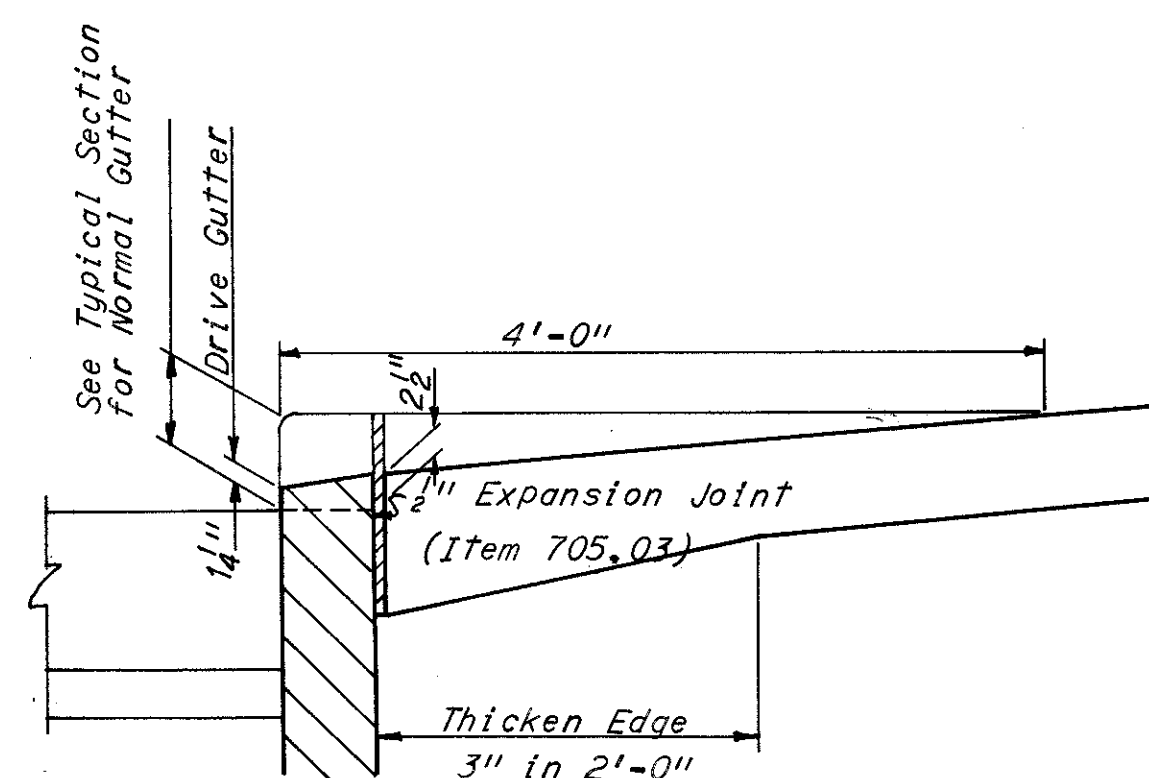


APRON CURB DETAIL
SECTION A-A & B-B

Notes:

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 7" Plain Portland Cement Concrete (Item 452) or with two 1" courses of Asphaltic Concrete (Item 404) on 5" of Item 304 Aggregate.



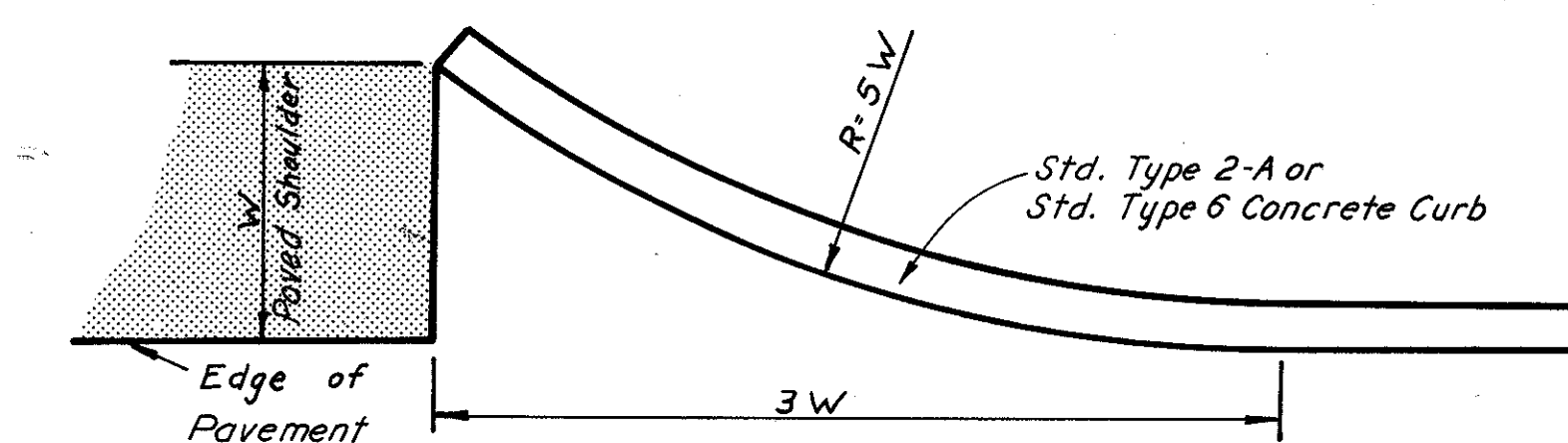
See Typical Section for Curb Specified
When drive abuts at pavement with no curb, the drive apron curb section shall be omitted.

APRON CURB TRANSITION
Scale: 1"=1'-0"

Notes:

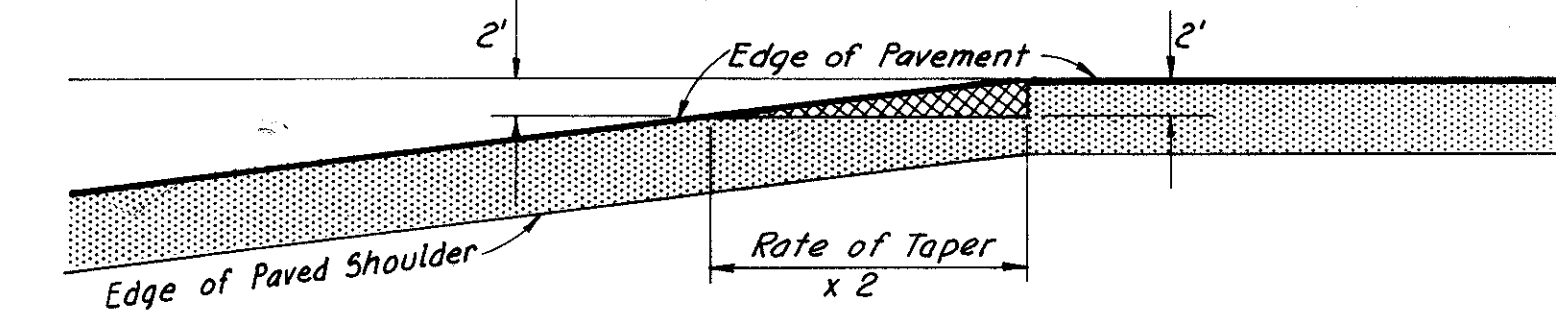
Residence drives having an existing hard surface or existing aggregate surface shall be replaced with a pavement of a similar type insofar as practicable, using one of the following designs for the portion beyond the flared apron:

- (a) 7" Plain Portland Cement Concrete, Item 452
- (b) 5" Item 304 surfaced with two 1" courses of Asphaltic Concrete, Item 404
- (c) 8" Item 304 Aggregate, stabilized with calcium chloride



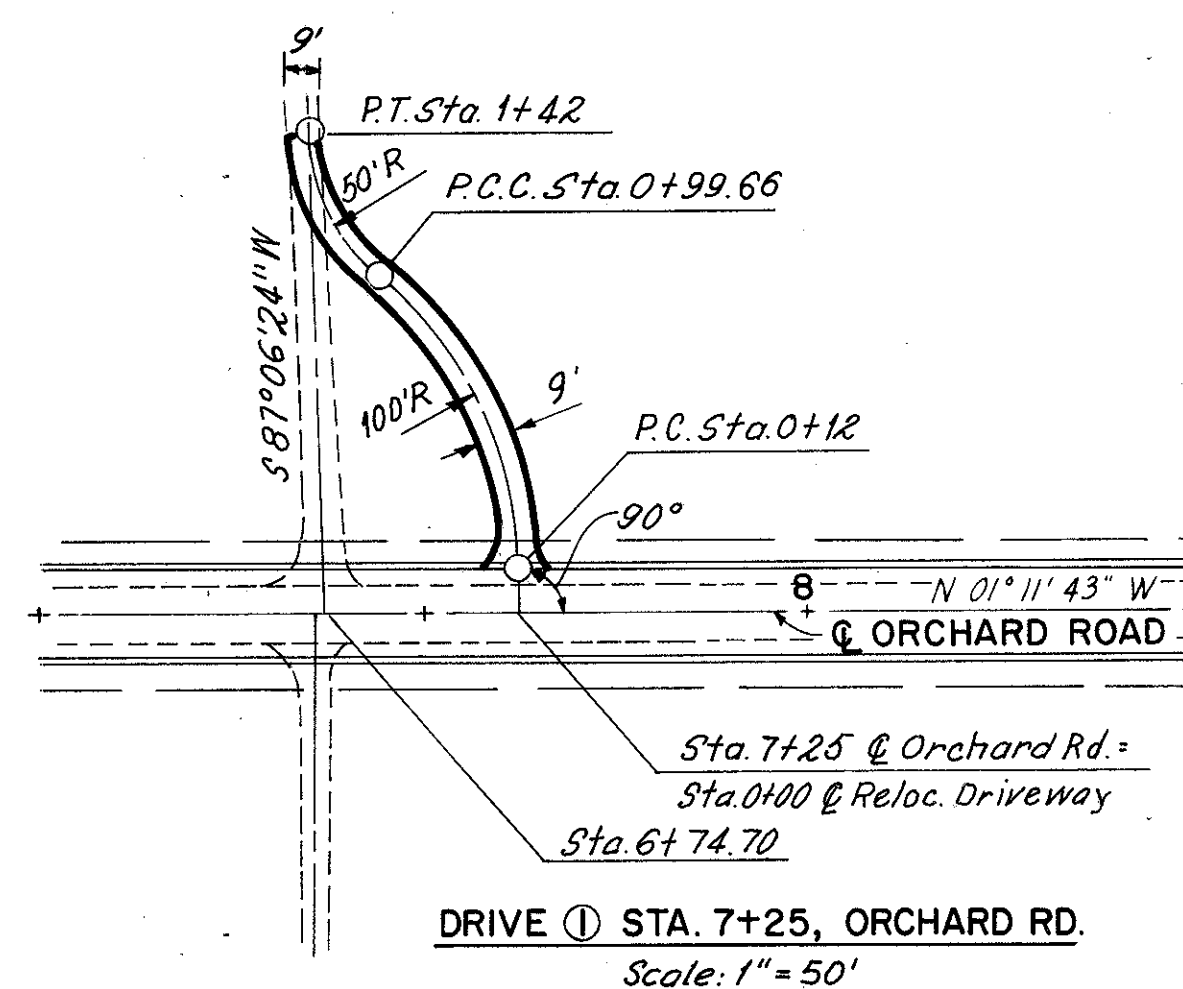
CURB TURNOUT DETAIL

Note:
Transition curb height at the rate of 1" per 5 Lin. Ft. to reach zero at the end of the turnout.

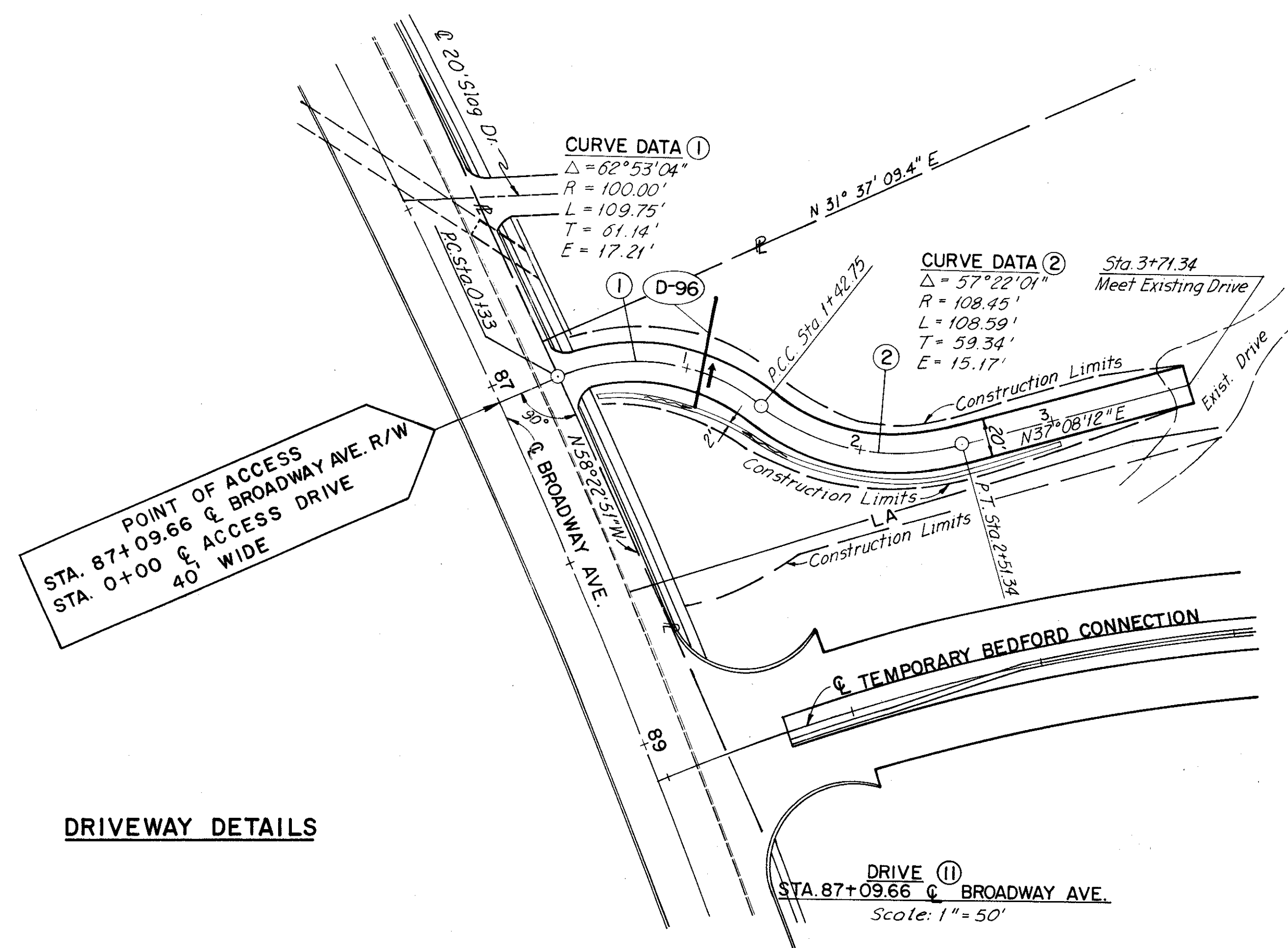


DETAIL "A"
Scale 1"=10"

The shaded area shall be constructed of concrete pavement to an elevation 2 inches lower than the adjacent pavement and surfaced with Item 301, paid for as Item 301. The concrete pavement shall be paid for as full depth 451.



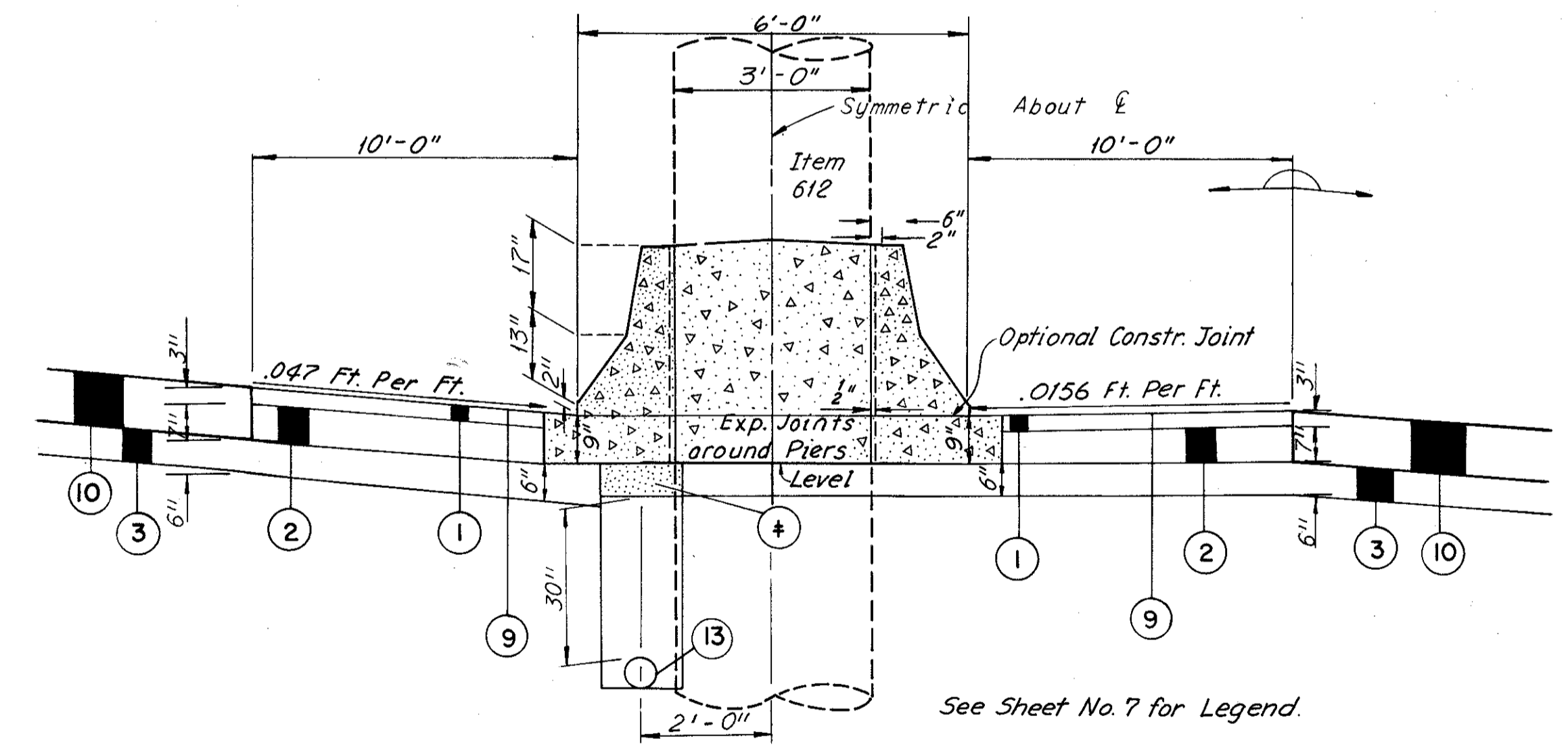
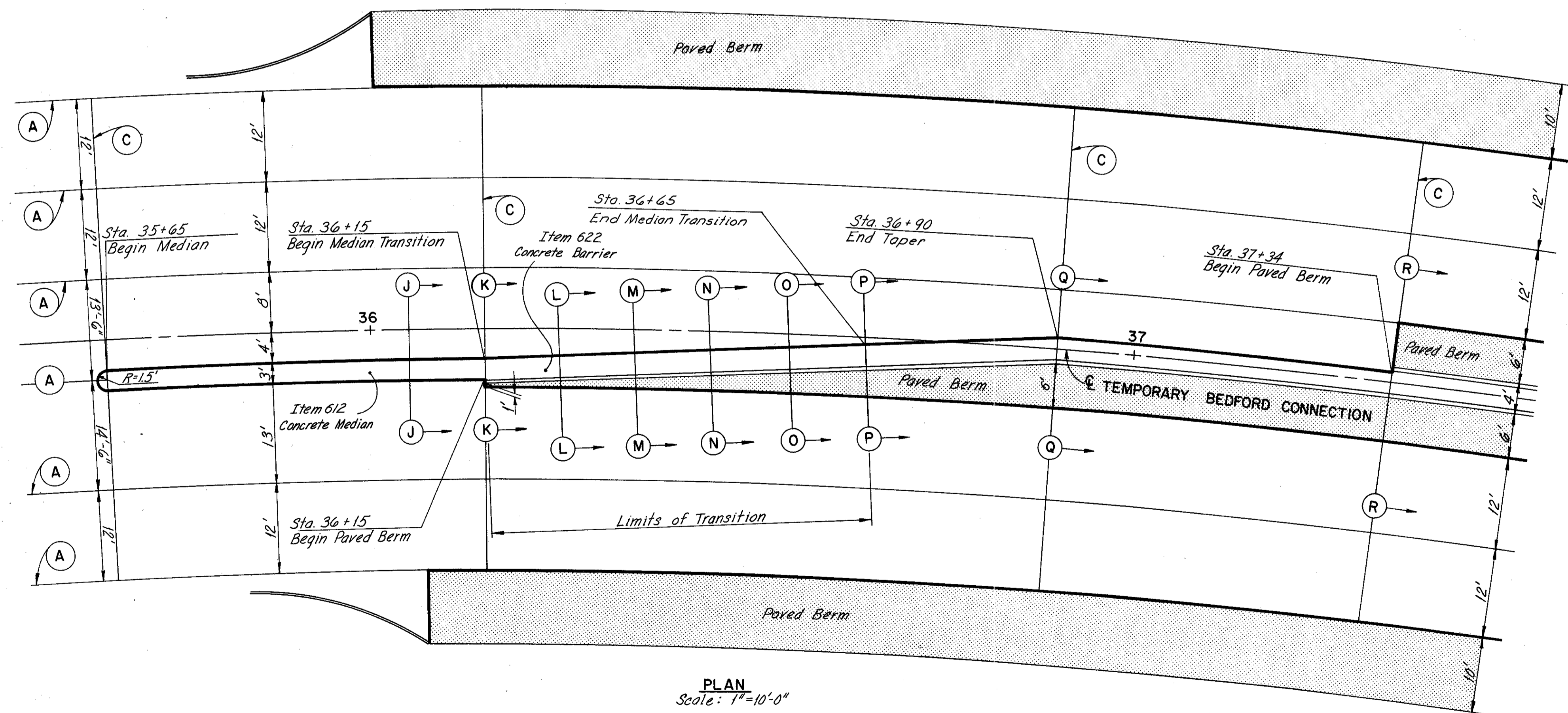
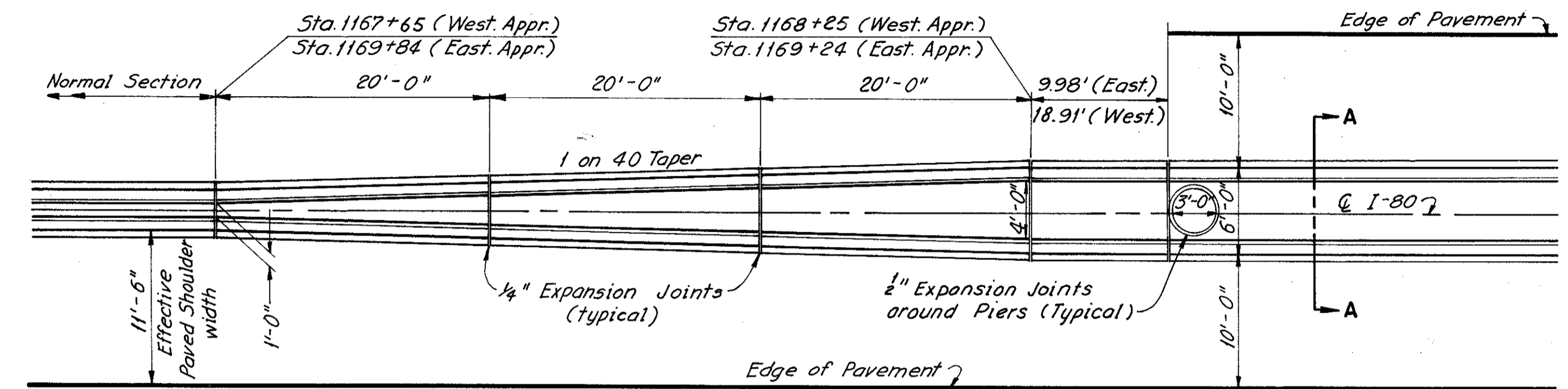
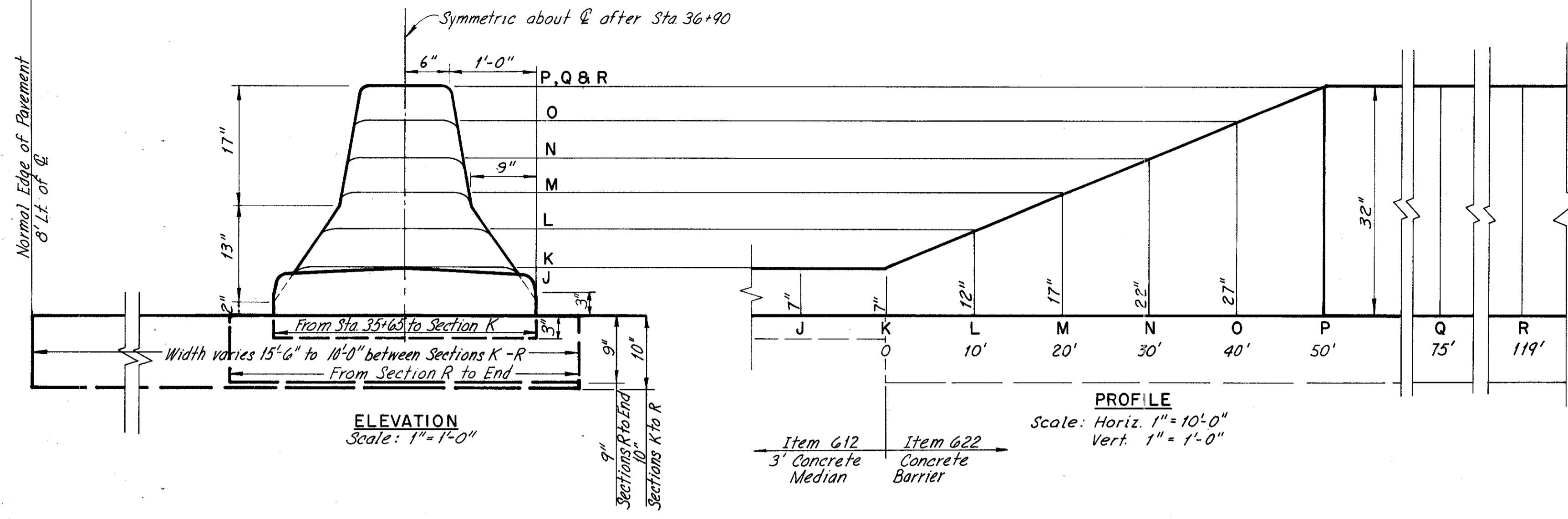
DRIVE 1 STA. 7+25, ORCHARD RD.
Scale: 1"=50'



DRIVEWAY DETAILS

DRIVE 11
STA. 87+09.66 & BROADWAY AVE.
Scale: 1"=50'

SCALE: As Shown
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE: JEN DATE: 12-22-65 CONSULTING ENGINEERS
TRCD: JEN DATE: 12-22-65
CKD: R.P.R. DATE: 4-27-66 KANSAS CITY CLEVELAND NEW YORK



BRIDGE PIER APPROACH FLARE

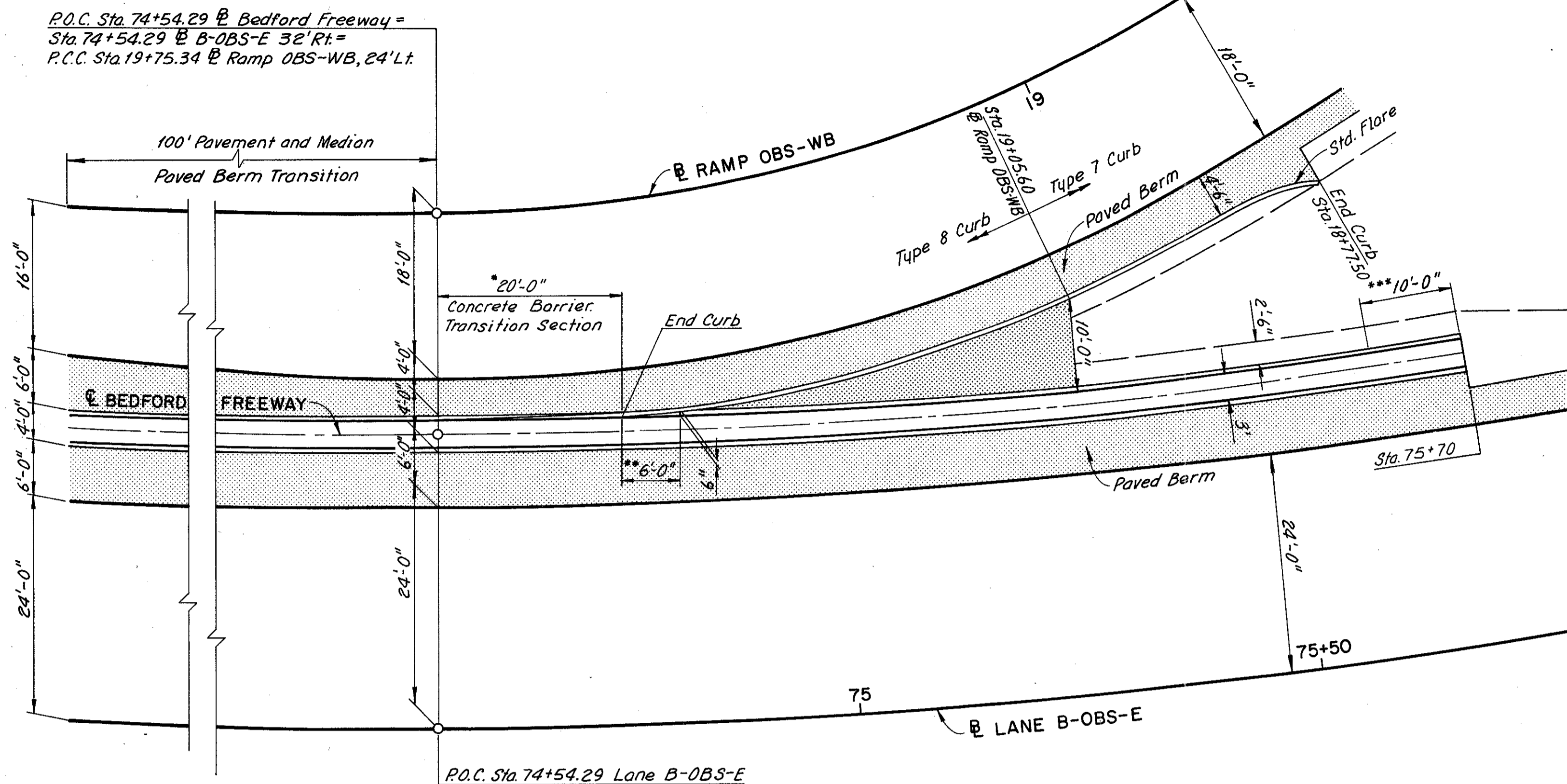
TERMINAL TREATMENT
TEMPORARY BEDFORD CONNECTION

JOINT LEGEND
 (A) Standard Longitudinal Joint
 (C) Standard Contraction Joint

FED. RD. DIVISION	STATE	PROJECT	
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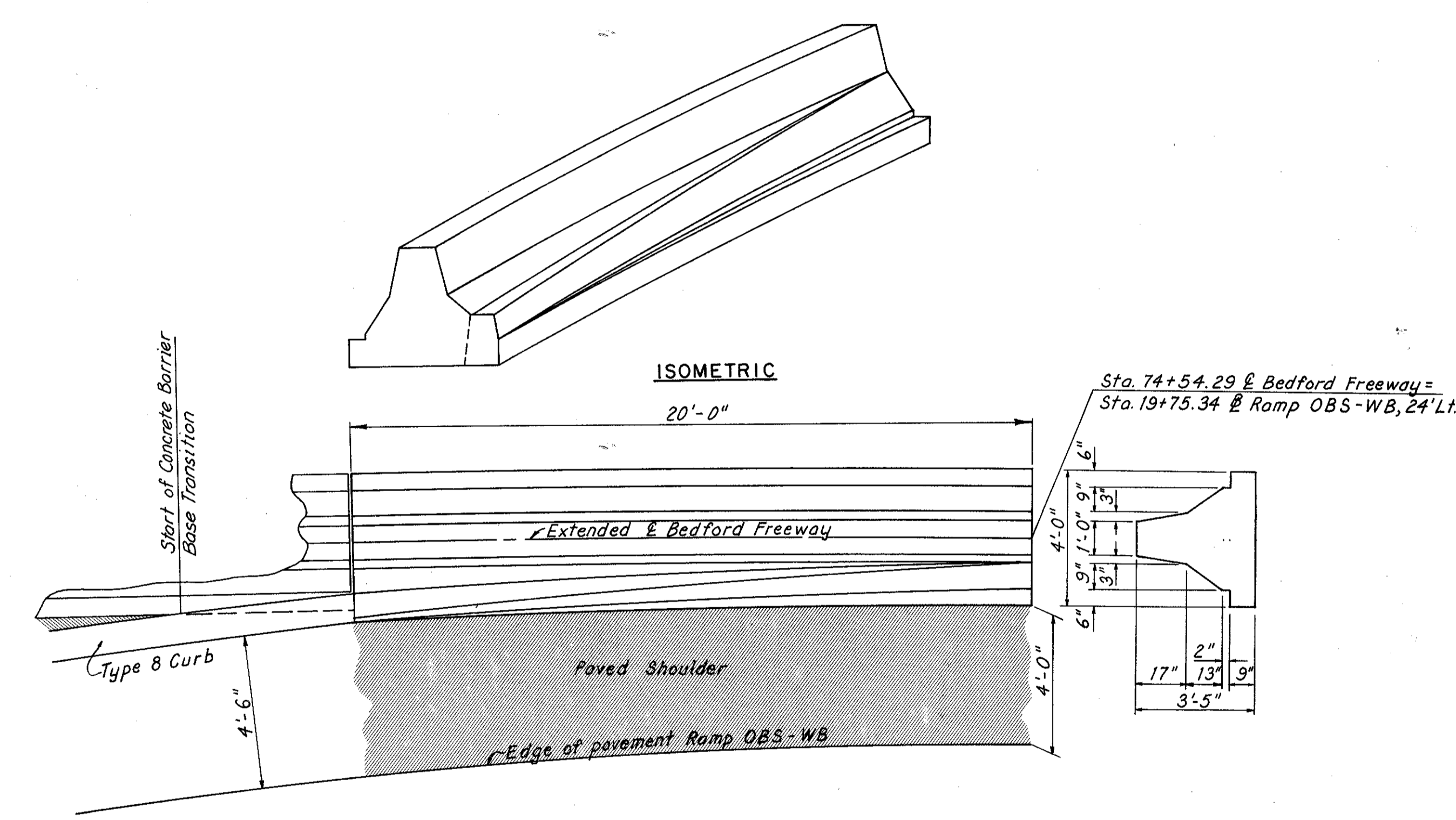
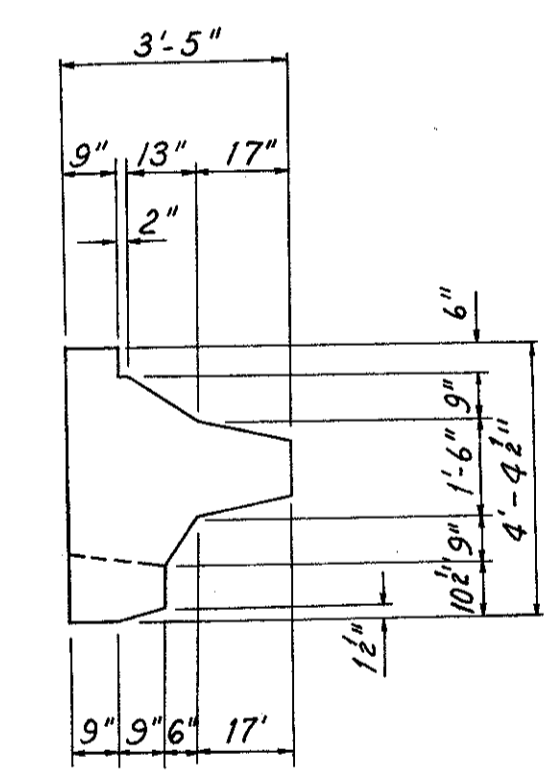
CUYAHOGA COUNTY
CUY. 480-21.40



PLAN
Scale: 1"=10'-0"

TERMINAL TREATMENT
BEDFORD FREEWAY

- Notes:
- *Transition Concrete Barrier in 20' to meet Type 8 Curb. Cost of transition to be included in the unit price bid for Item Concrete Barrier, as per plan.
 - **Transition Concrete Barrier base facing the ramp by reducing the 6" lip to 0" in 6' to accommodate Type 8 Curb.
 - ***Transition Concrete Barrier height from 32" to 0" in 10'.

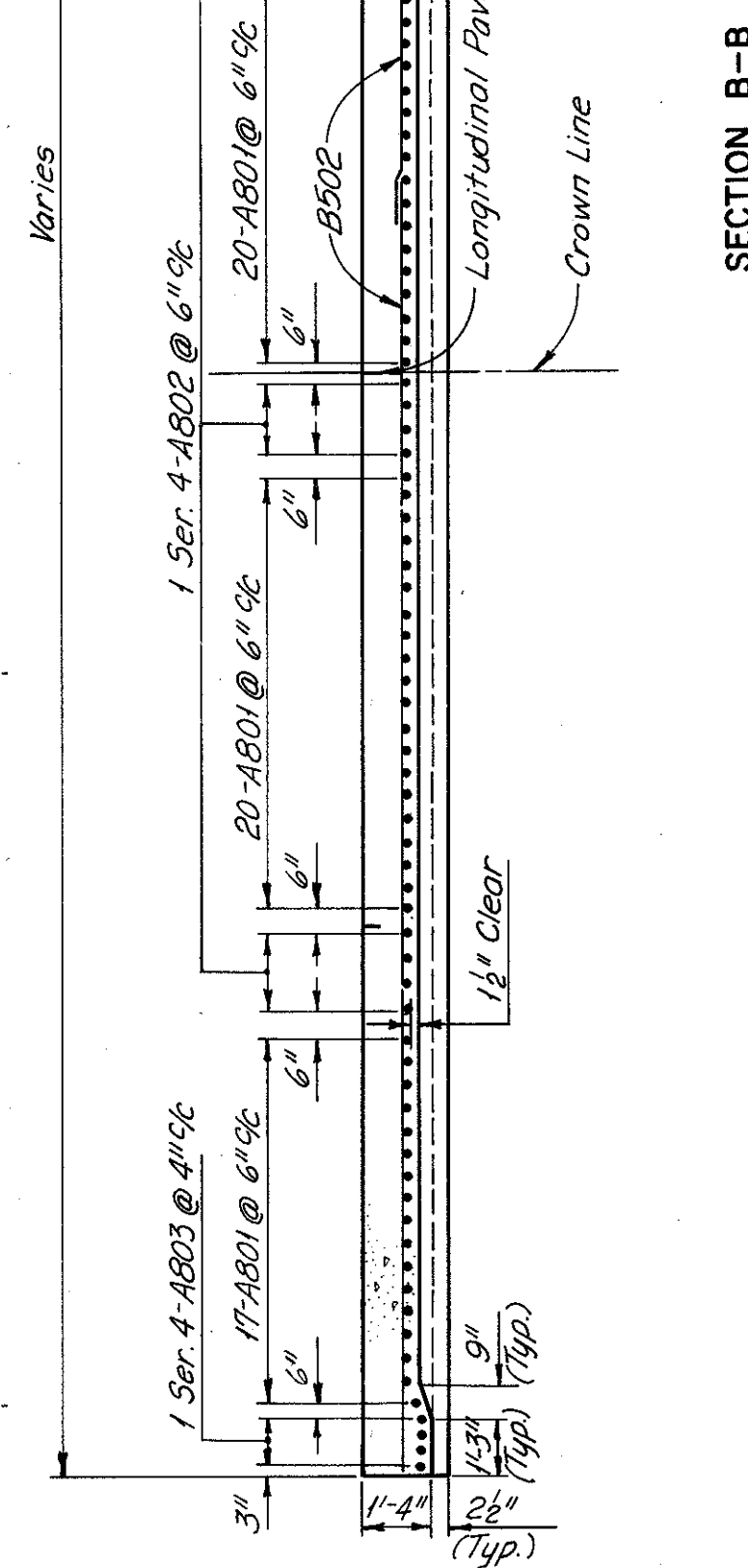
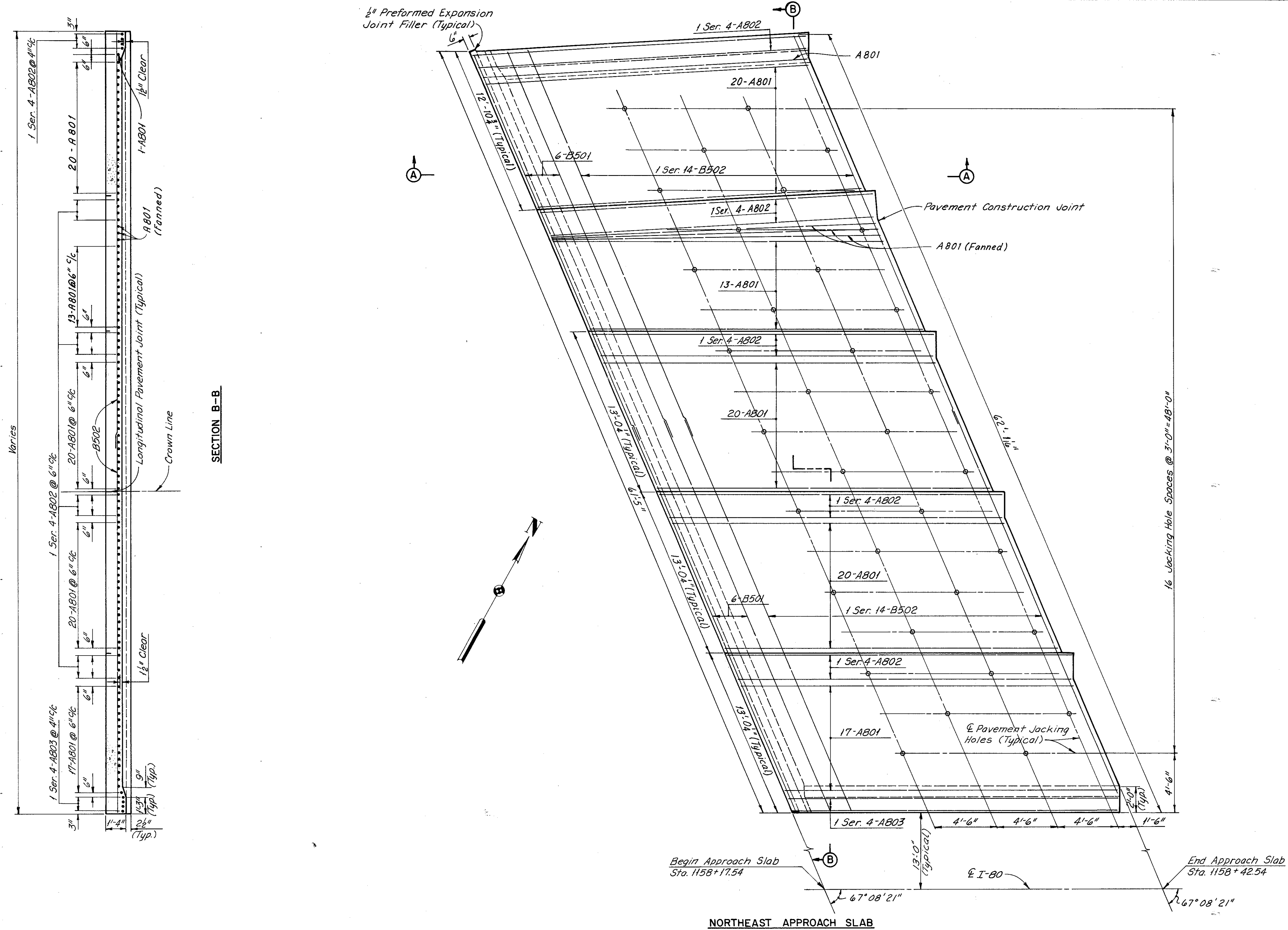


PLAN

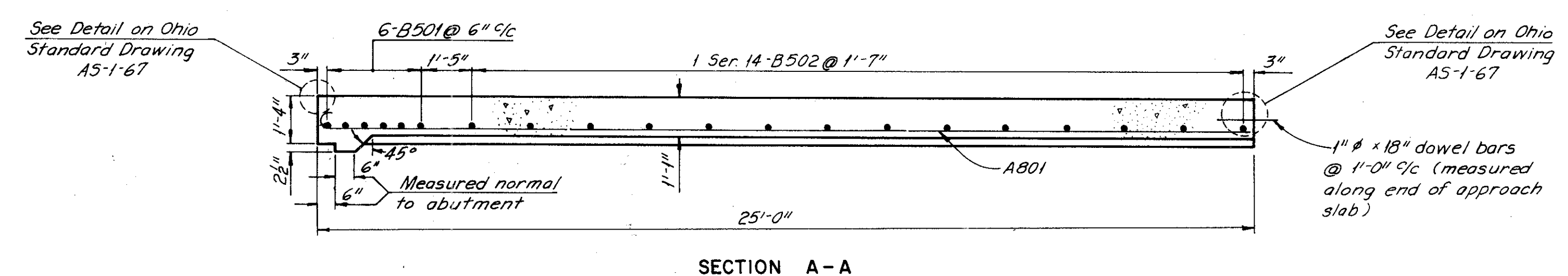
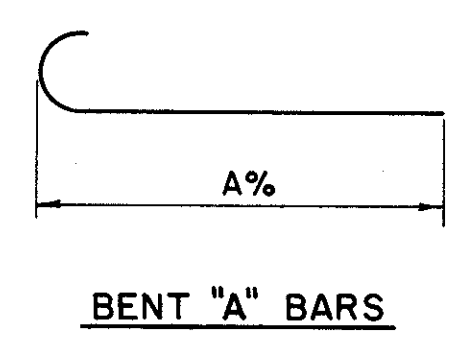
ELEVATION
Scale 1"=3'

CONCRETE BARRIER TRANSITION

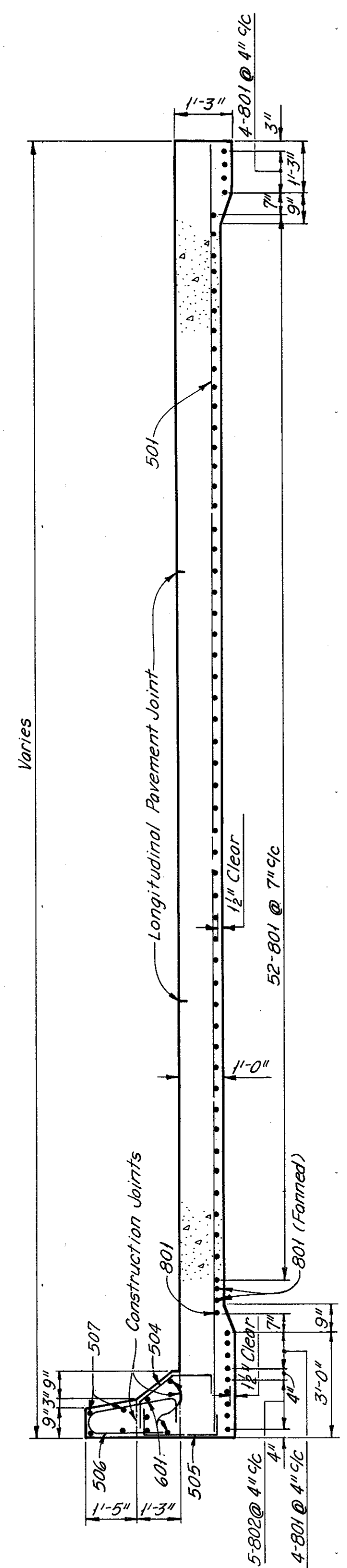
SCALE: As shown
HOWARD, NEEDLES, TAMMEN & BERGEMDOFF
CONSULTING ENGINEERS
MADE: N.N.B. DATE 9-10-71
TRCD: J.M.C. DATE 12-10-71
CRD: I.M. DATE 12-10-71
KANSAS CITY CLEVELAND NEW YORK



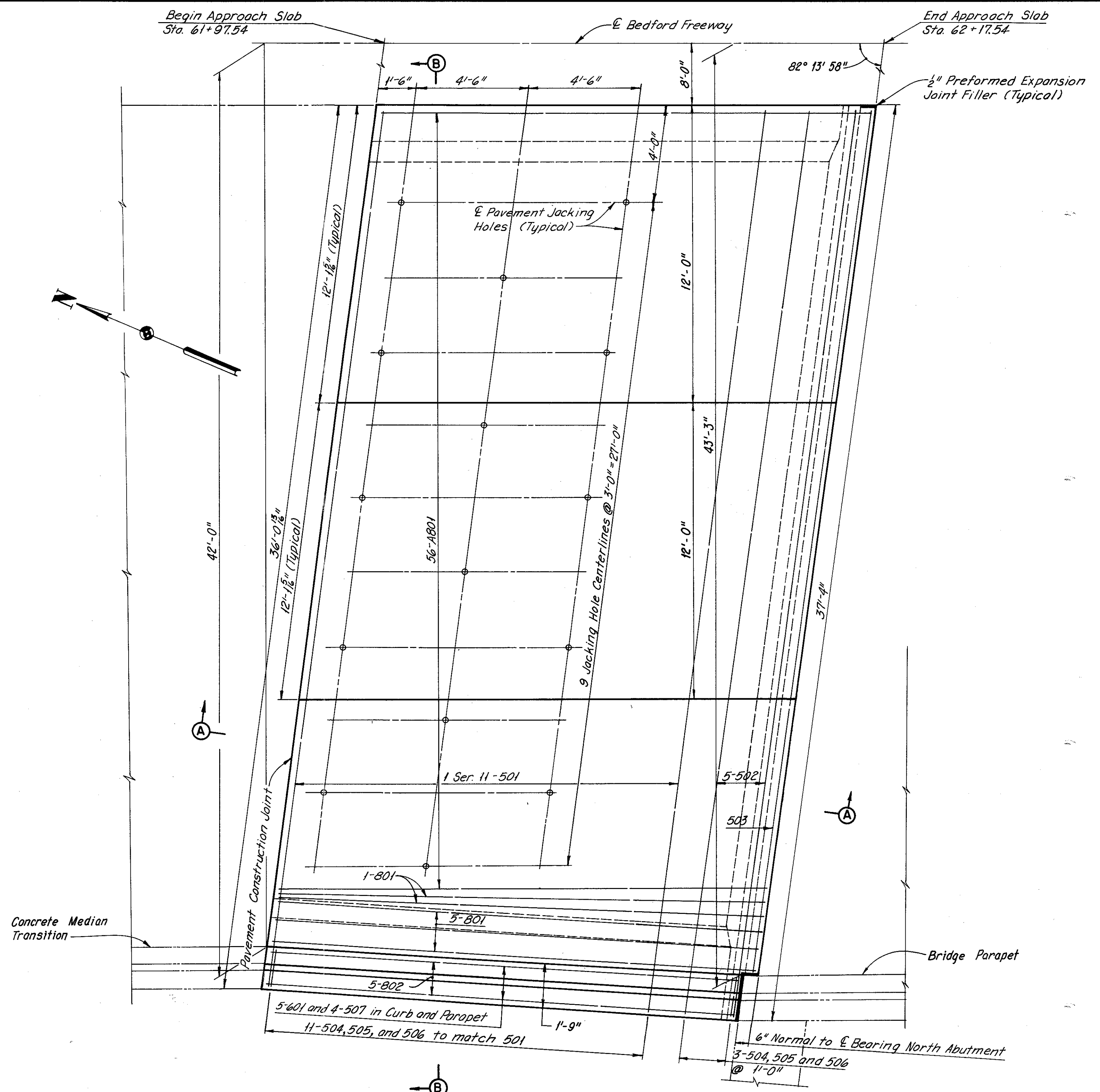
REINFORCEMENT SCHEDULE					
TYPE	LENGTH "A"	LENGTH BAR	NUMBER REQUIRED	SHAPE	SERIES INCR.
A801	24'-6"	25'-7"	94	Bent	
A802	25'-3"	24'-6"	26'-4"	25'-7"	5 Ser. 4 Bent 3"
A803	24'-3"	28'-9"	25'-4"	24'-10"	1 Ser. 4 Bent 2"
B501		31'-3"	12	Str.	
B502		31'-3"	31'-6"	2 Ser. 14 Str.	4"



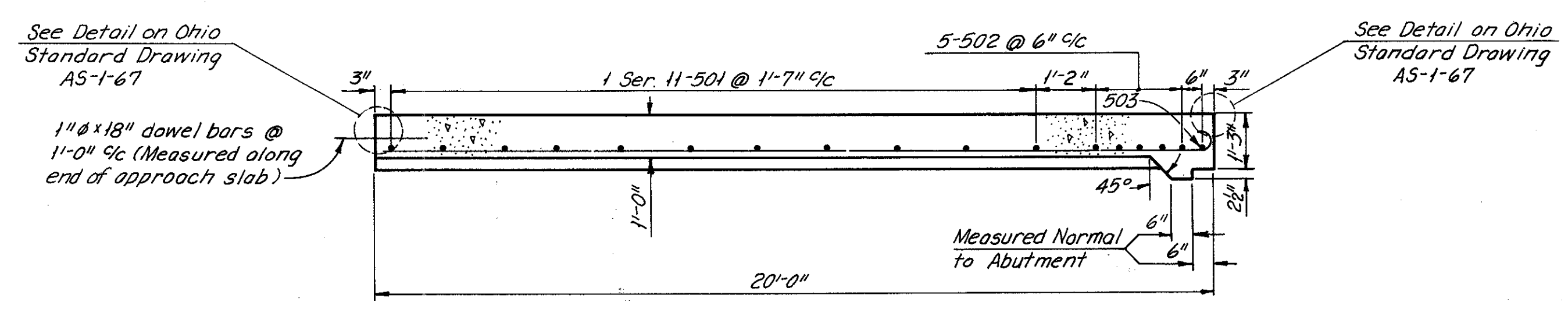
Notes:
 For Pavement Jacking Hole Detail and for notes, see Standard Drawing AS-1-67.
 All other Approach Slabs for BR. NO. CUY-480-2140 are standard.
 For asphalt wearing surface, see approach slab table on Sht. No. 30.



SECTION B-B

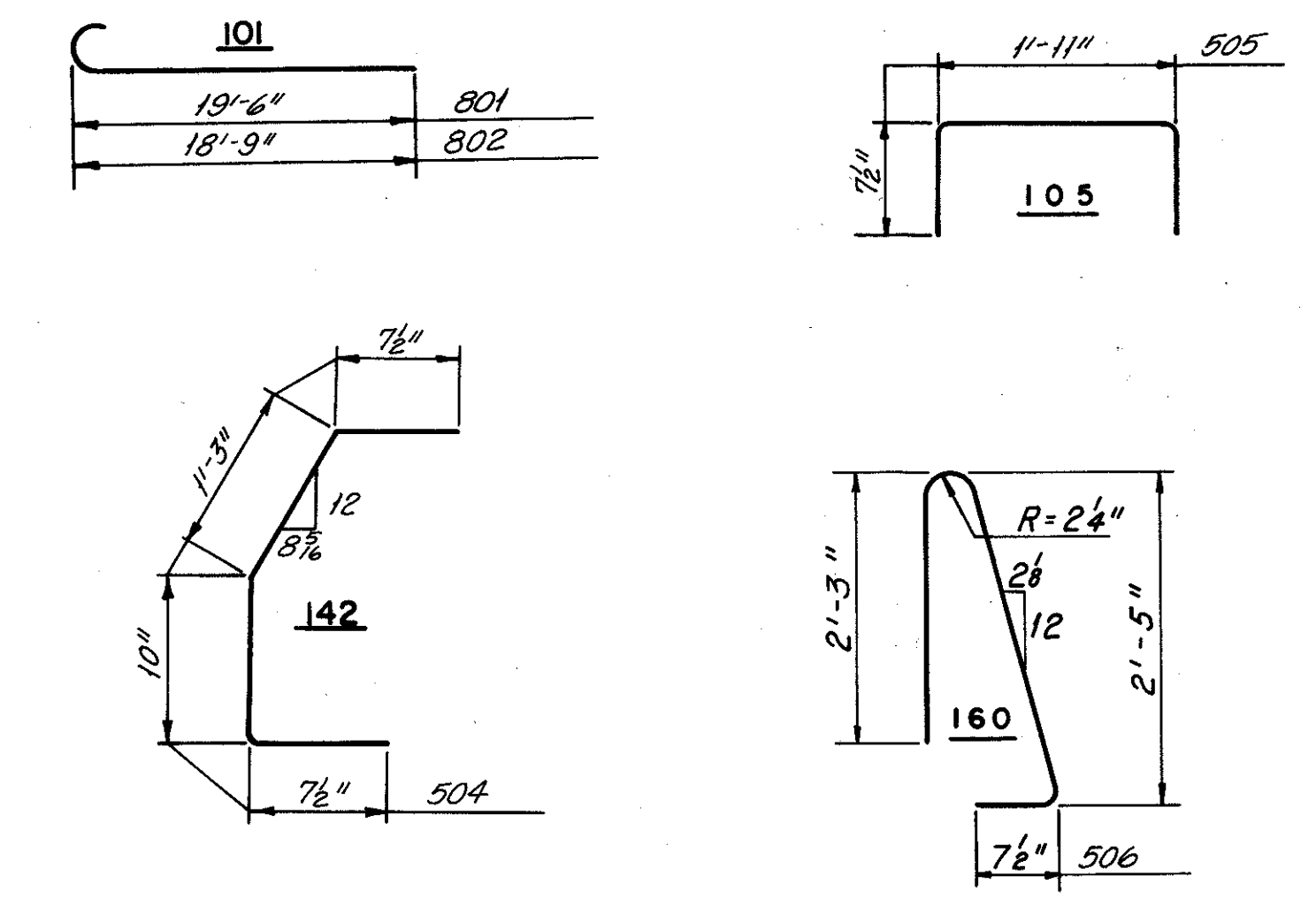


NORTHWEST APPROACH SLAB



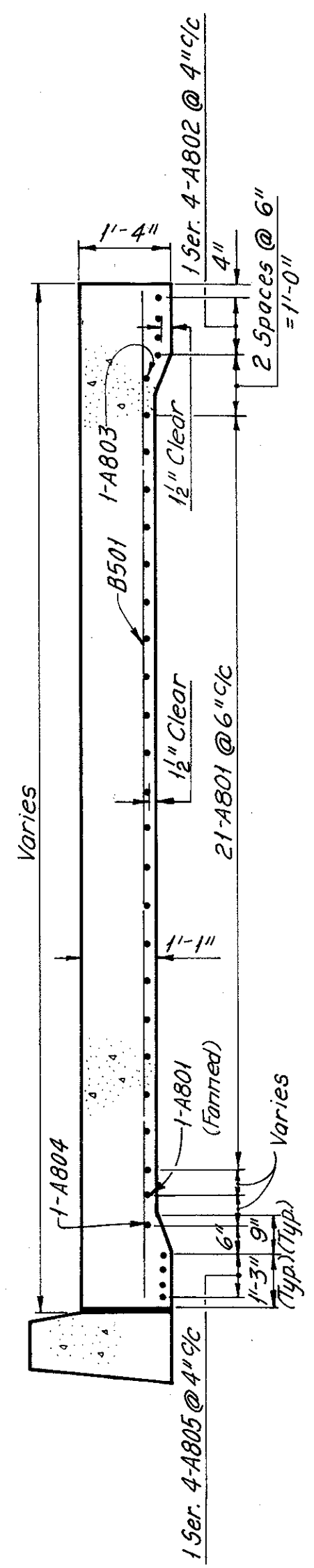
SECTION A-A

REINFORCEMENT SCHEDULE				
Type	Length Bar	Number Required	Shape	Series Increment
501	35'-9"	1 Ser. 11	Str.	1/2"
502	36'-9"	5	Str.	
503	35'-0"	1	Str.	
504	3'-2"	14	142	
505	2'-11"	14	105	
506	3'-2"	14	160	
507	18'-9"	4	Str.	
601	18'-9"	5	Str.	
801	20'-7"	63	101	
802	19'-10"	5	101	

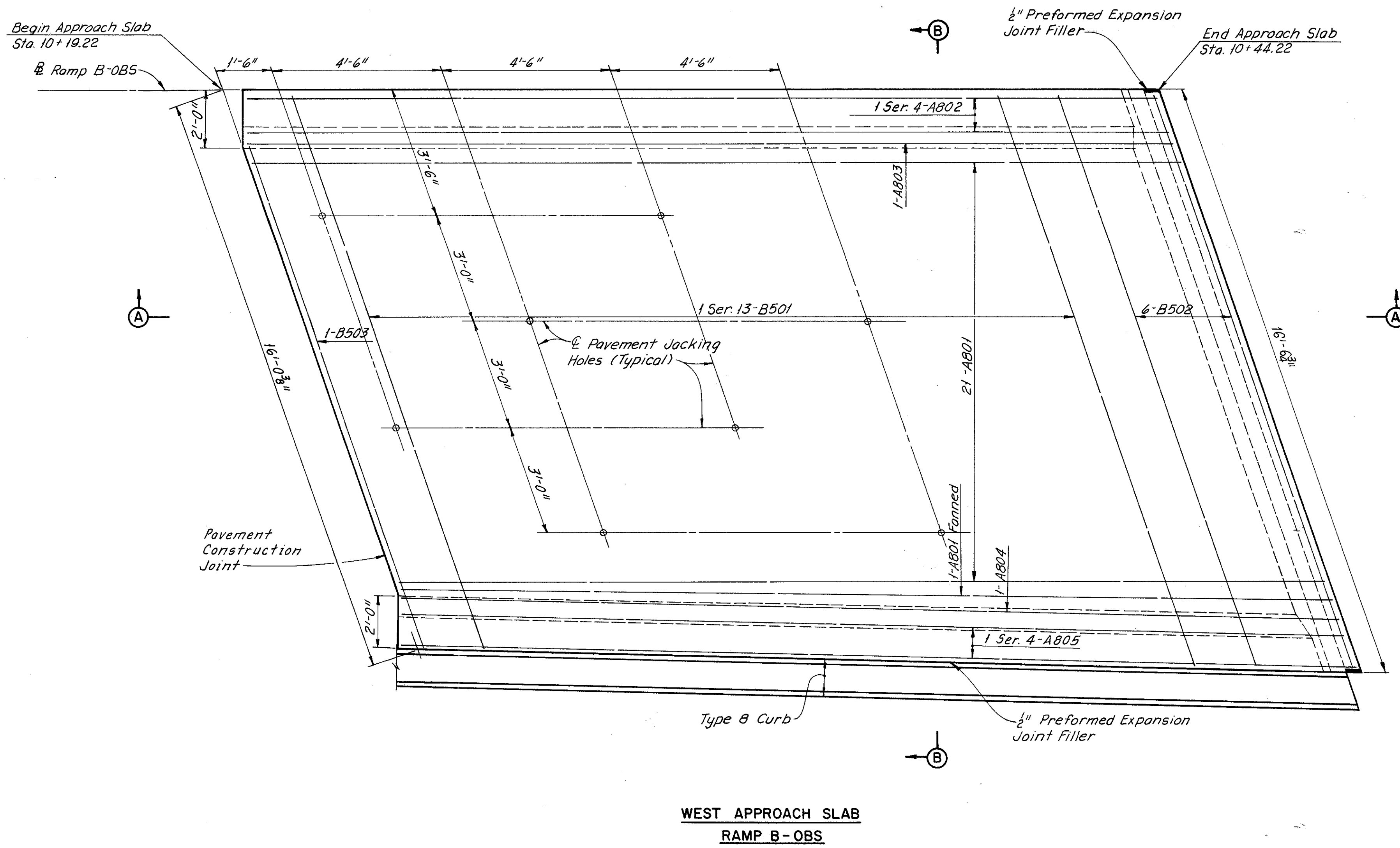


BENDING DIAGRAMS

Notes:
 For Pavement Jacking Hole Detail and for notes, see Standard Drawing AS-1-67.
 All other Approach Slabs for Bedford Freeway and Ramp B, QBS over relocated McCracken Road are standard.
 For asphalt wearing surface, see approach slab table on Sht. No. 30.

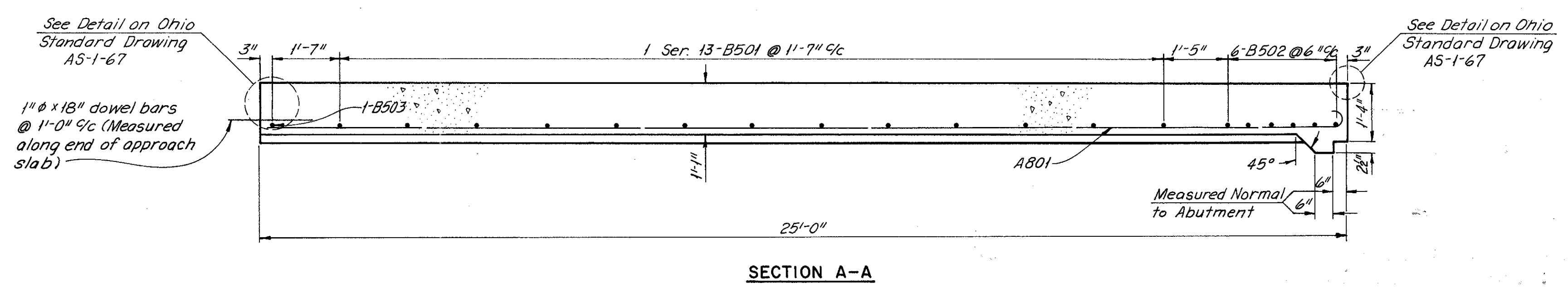


SECTION B-B

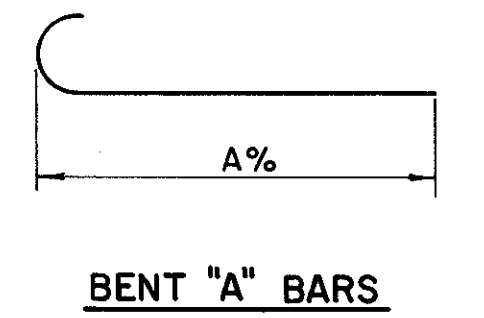


WEST APPROACH SLAB
RAMP B-OBS

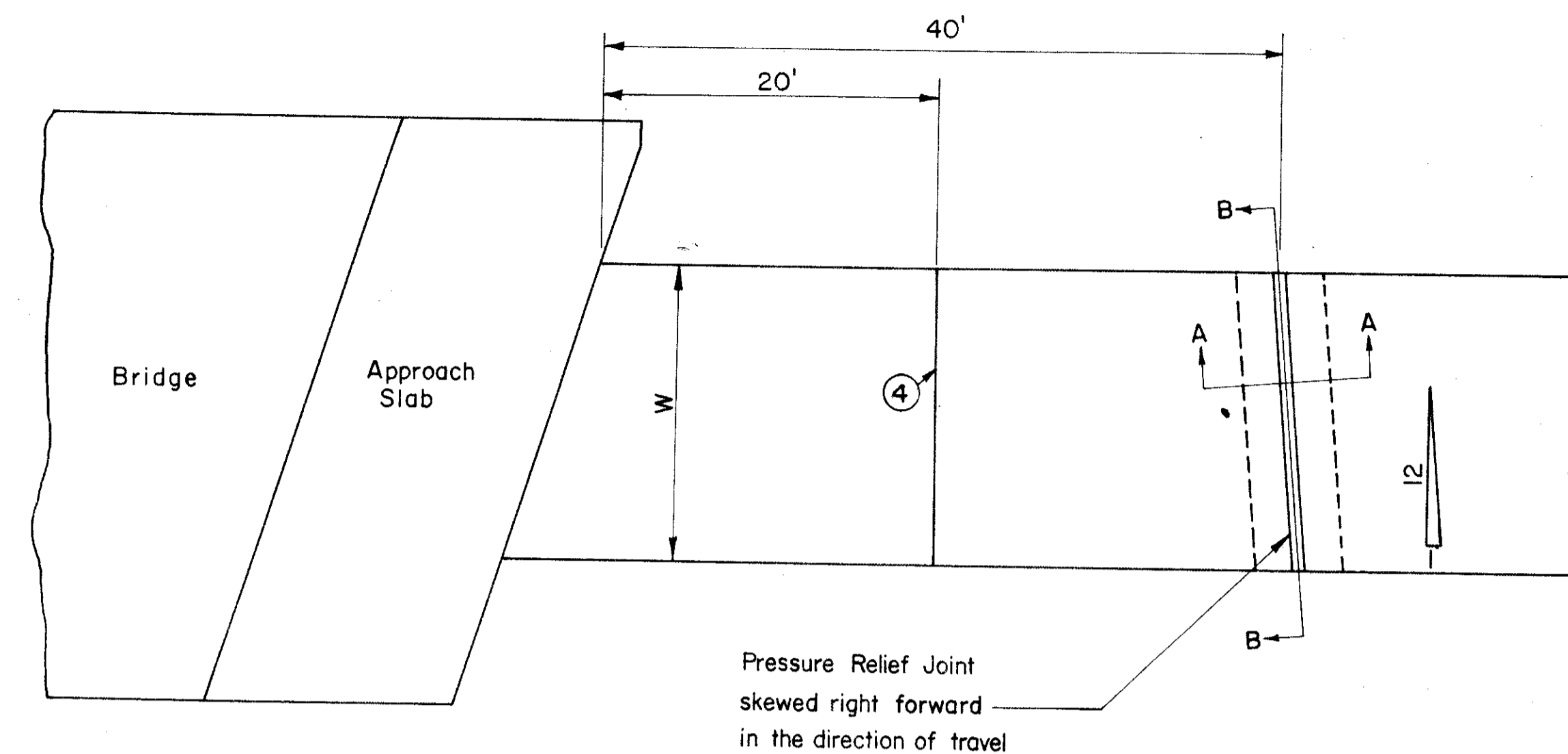
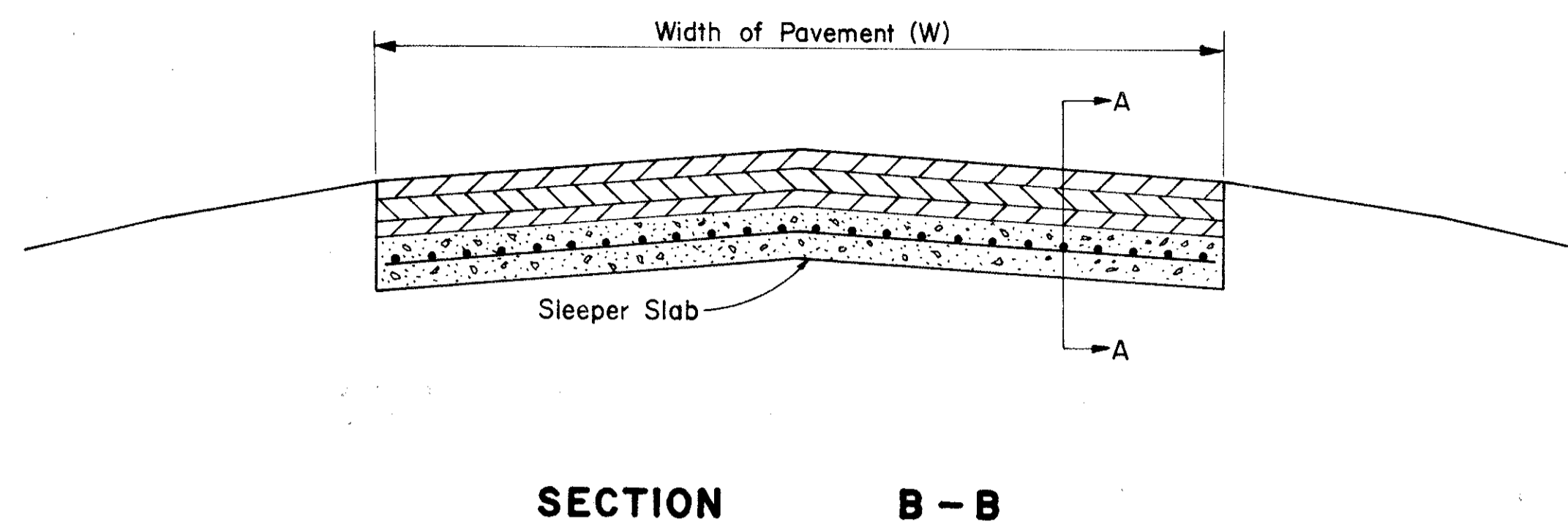
REINFORCEMENT SCHEDULE					
TYPE	LENGTH "A"	LENGTH BAR	NO. REQ.	SHAPE	SER. INCR.
A801	24'-6"	25'-7"	22	Bent	
A802	23'-4"	24'-3"	1 Ser. 4	Bent	1/8"
A803	24'-5"	25'-6"	1	Bent	
A804	24'-7"	25'-8"	1	Bent	
A805	24'-9"	25'-10"	1 Ser. 4	Bent	1/8"
B501		15'-9"	1 Ser. 13	Str.	1/4"
B502		16'-0"	6	Str.	
B503		14'-0"	1	Str.	



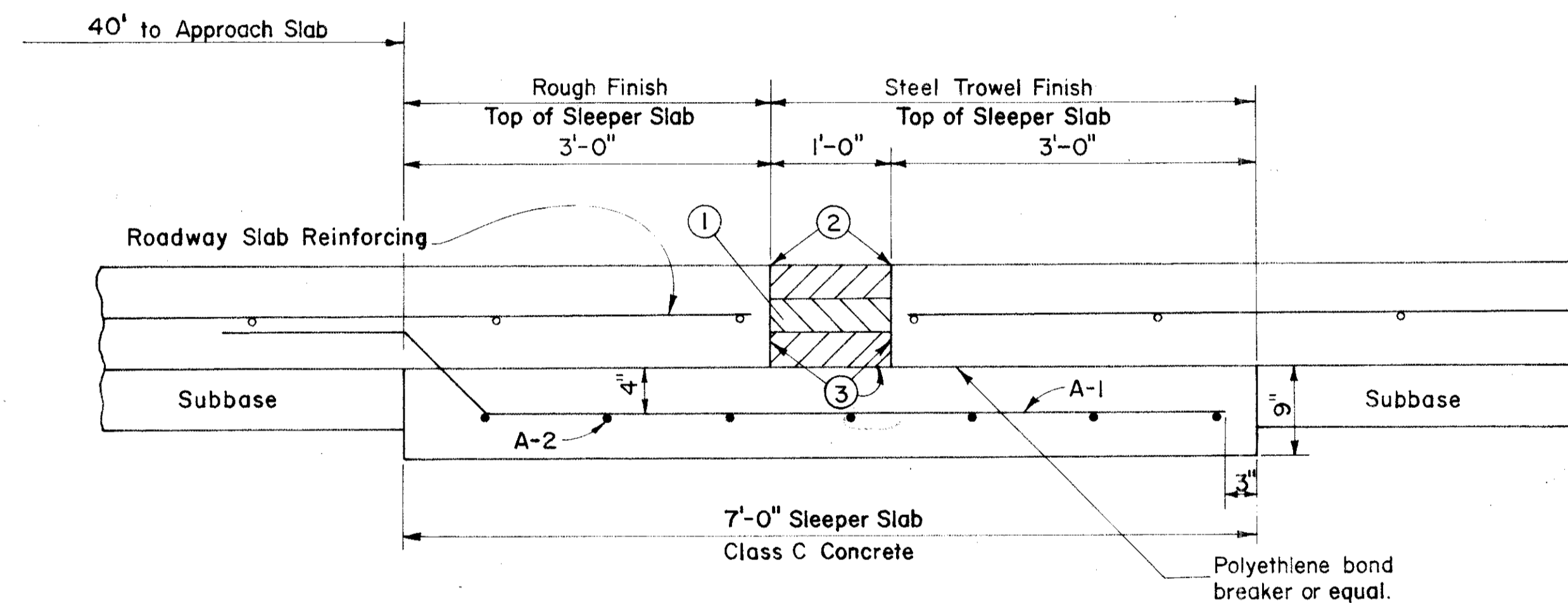
SECTION A-A



Notes:
For Pavement Jacking Hole Detail and for additional notes, see Standard Drawing AS-1-67.
All other approach slabs for BR. NO. CUY-480-2154 are standard. See Standard Drawing AS-1-67 for details.
For asphalt wearing surface, see approach slab table on Sht. No. 30.



PLAN



SECTION A-A

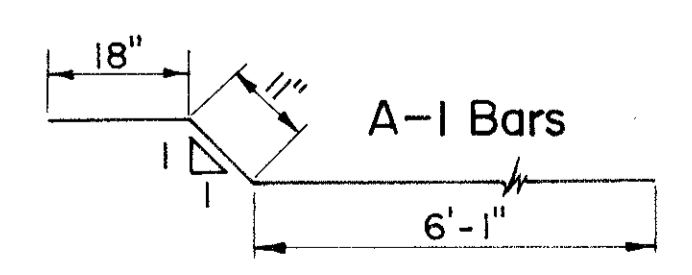
NOTES

Asphalt concrete shall be placed in the joint in three equal courses and compacted with equipment as approved by the Engineer.
 The expansion joint approximately 60' from the bridge approach slab, as specified under 451.08 (c) shall be eliminated.
 Barricades in accordance with 614, shall be provided during construction until the joint has been filled with asphalt.
 Pressure Relief Joints will be measured by the linear foot along the centerline of the joint from edge to edge of pavement.
 Payment for the work shall be made per linear foot under "Item Special, Pressure Relief Joint", which price and payment shall constitute full compensation for furnishing and placing of all concrete, asphalt, reinforcing steel, tack coat and all other materials, labor, tools and equipment, and incidentals necessary to complete this item.

LEGEND

- ① Asphalt Concrete placed in three equal courses shall be in accordance with 404
- ② The 451 pavement shall have a 1/2" rounding and the joint shall be sealed in accordance with 705.01.
- ③ Tack Coat: 702.04, MS-2 or RS-1; or 702.02, RC-70 or RC-250 in accordance with 407.
- ④ Expansion Joint

SCHEDULE OF REINFORCING STEEL					
Mark	Bar Size	Spa c/c	Length	No. Req'd	Shape
A-1	5	12"	8'-6"	24 for 24' Pmnt.	Bent
A-2	4	12"	W minus 6"	7	Straight



PRESSURE RELIEF JOINTS		
LOCATION	LENGTH	SHEET No.
Br. No. CUY-480-2154 Fwd. App.	32.1' - 48.2'	40
Lane OBS-E-B over M ^c Cra. Fwd. App.	24.1'	40
Rear App.	24.1'	43
Ramp B-OBS over M ^c Cra. Rear App.	16'	43
Bedford Freeway over M ^c Cra. Rear App.	14' - 36.1'	43
Br. No. CUY-480-2169 Fwd. App.	16' - 24.1'	40
Total	238.7'	
TOTAL III to GENERAL SUMMARY 239 LIN. FT.		

MODULAR CRASH CUSHION

FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY
CUY. 480-21.40

ITEM SPECIAL MODULAR CRASH CUSHION IMPACT ATTENUATOR

The work for this item consists of building the Modular Crash Cushion as shown in details in these plans including its back-up wall.

Payment for this item constitutes full compensation for all materials, labor and incidentals necessary to complete this work according to specifications and details shown.

ITEM 612 4" CONCRETE MEDIAN, AS PER PLAN

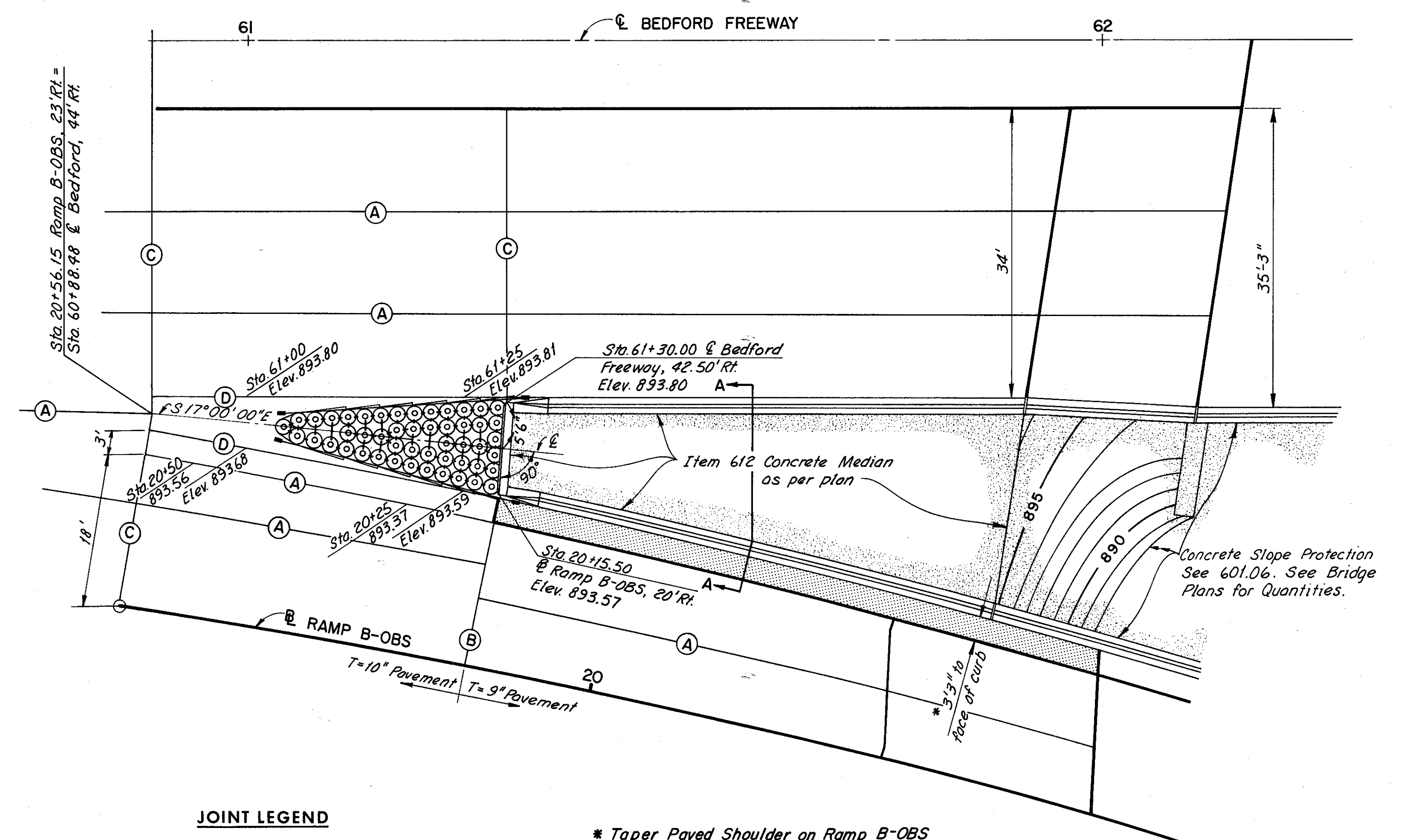
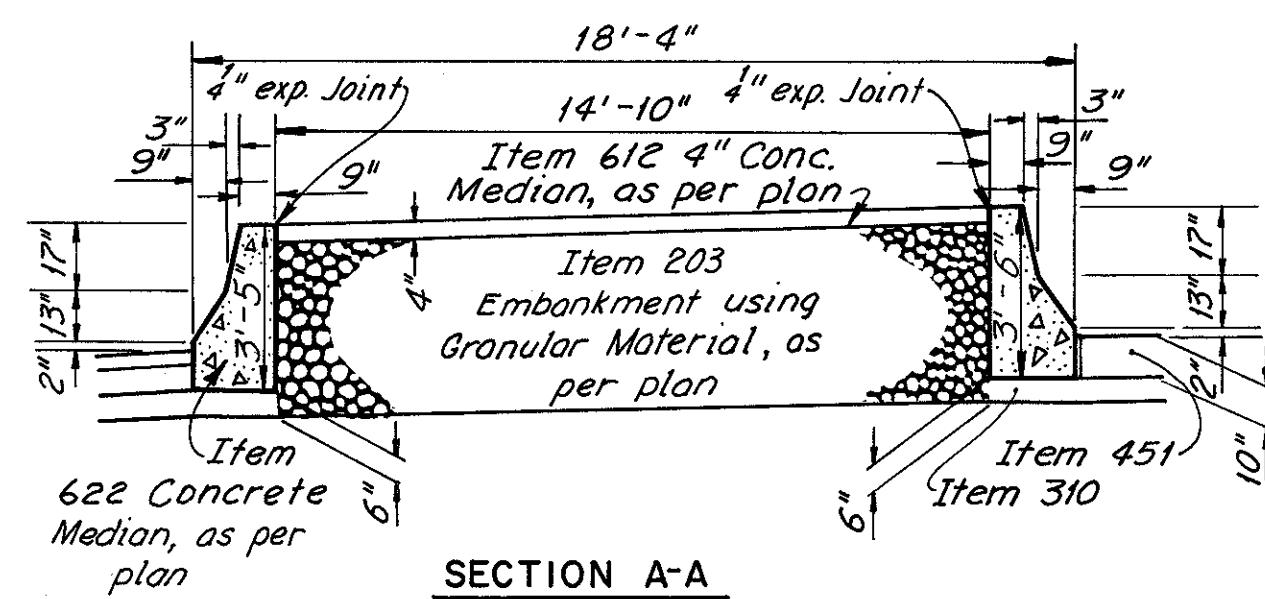
The entire subgrade area under the 4" slab shall be covered with white polyethylene sheeting prior to placing the concrete median. Polyethylene sheeting shall be as described in Sec. 705.06.

Joints: 1/4 inch Expansion Joints shall be constructed at 20ft. intervals both ways. Metal separator plates or templets shall be used if necessary to hold the joint material in accurate position during the placing of the concrete.

Separator plates or templets, if used, shall be removed as soon as the concrete is in place to insure the accurate retention of the joint material.

Expansion joint material shall meet the requirements of 705.03.

In addition to the 1/4 inch expansion joints, contraction joints, consisting of 1 1/2 inch minimum depth impressed joint formed and sealed as per Standard Drawing BP-3, shall be placed in the concrete median at intervals not to exceed 10 feet both ways.



JOINT LEGEND

- (A) Standard Longitudinal Joint
- (B) Standard Expansion Joint
- (C) Standard Contraction Joint
- (D) Key Joint without Tiebars

* Taper Paved Shoulder on Ramp B-OBS from 3' at nose to 3'3" at the End of Bridge Parapet.

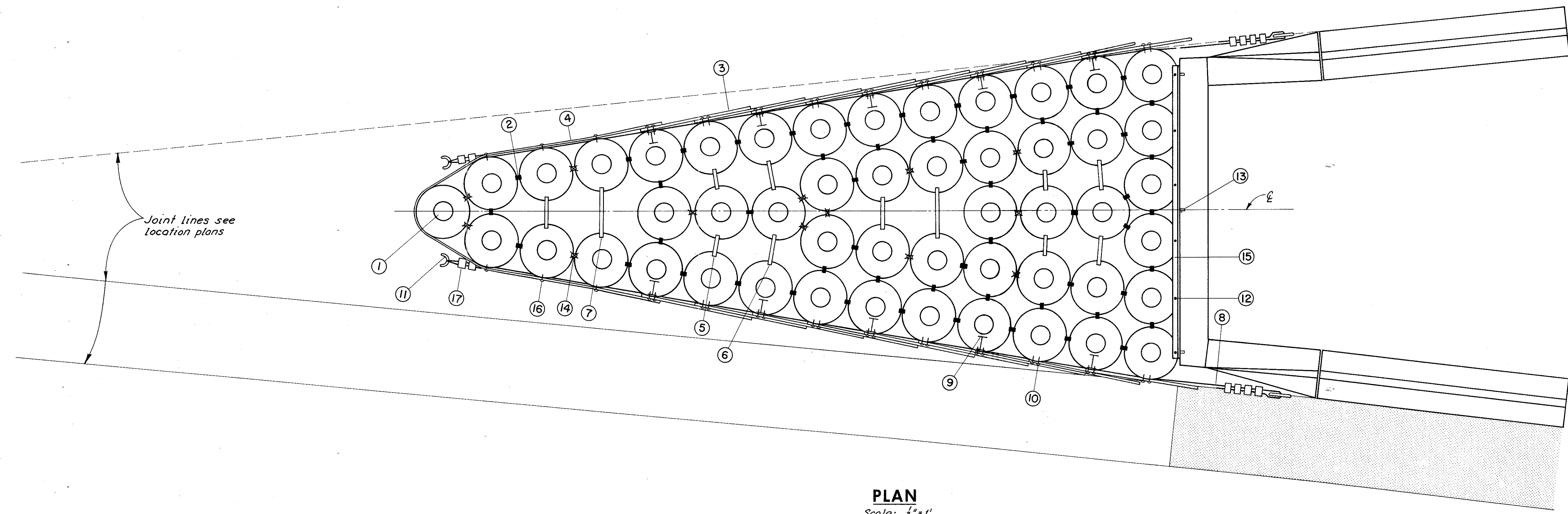
MODULAR CRASH CUSHION

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

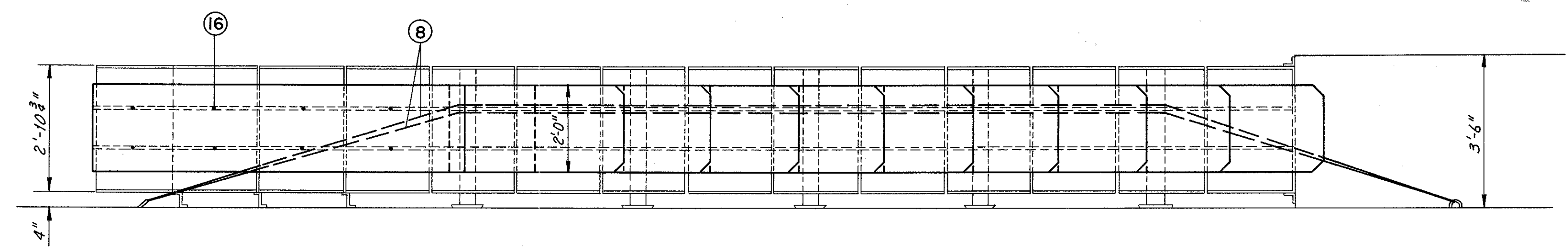
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CUYAHOGA COUNTY
CUY. 480-21.40

Quantity Calculations
Made By JMC Date 10-71
Checked By SMB ; 11-71



PLAN
Scale: 1/2" = 1'

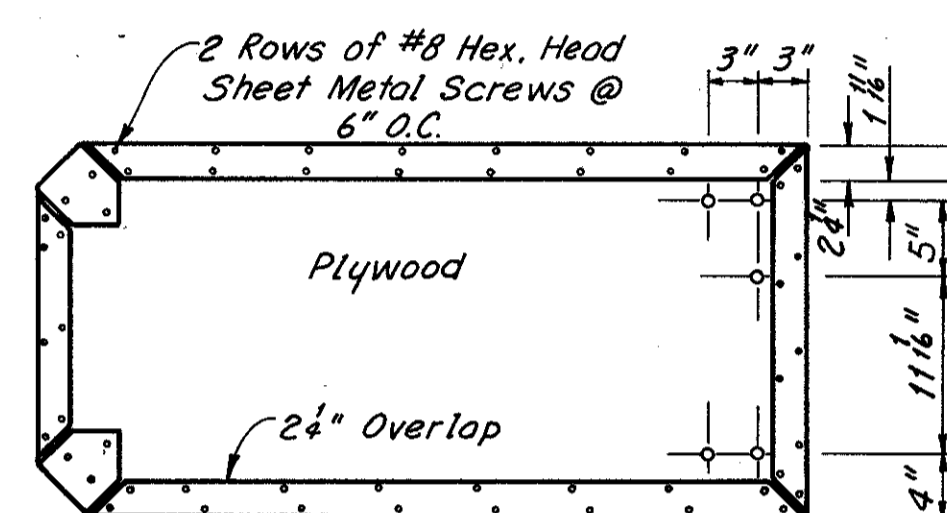
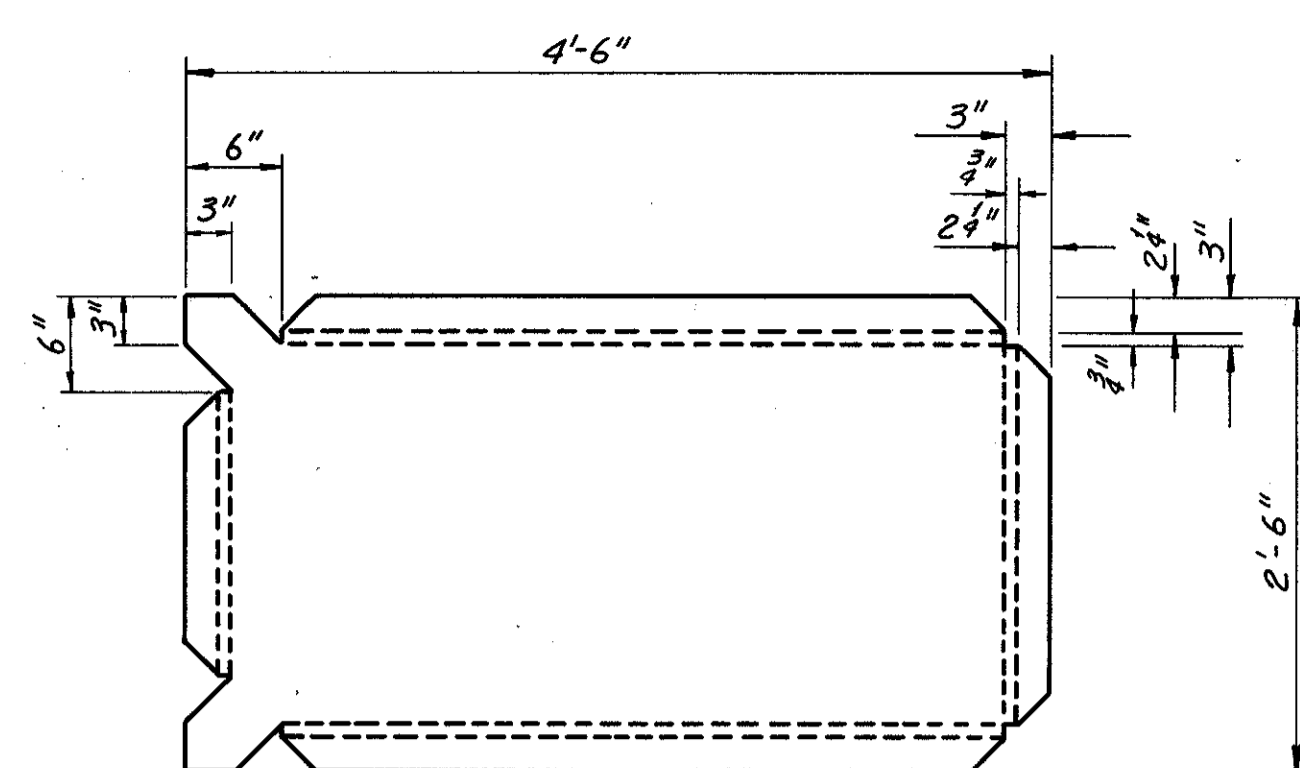


ELEVATION
Scale: 1/2" = 1'

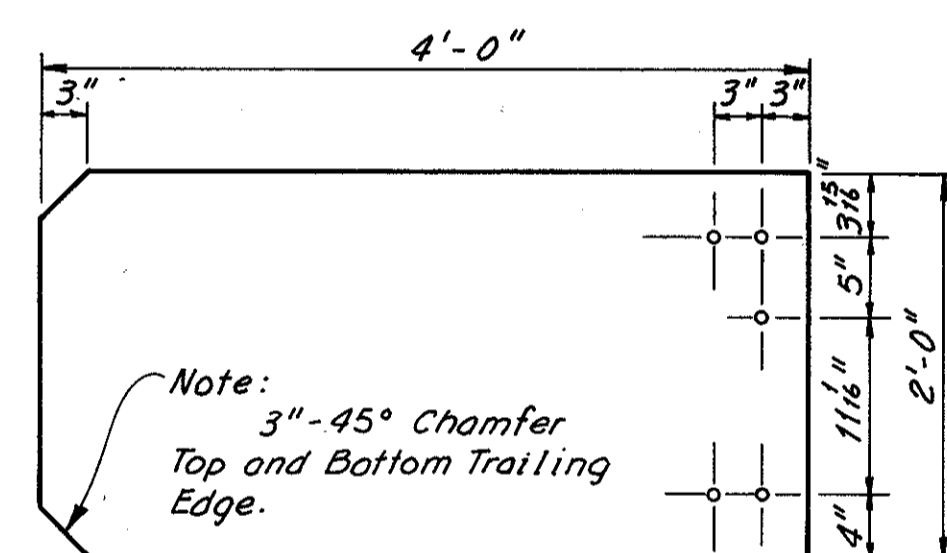
ESTIMATED QUANTITIES		
Ref. No.	Quantity	Description
1	49	55 Gal. Drums
2	138	Drum Connectors (Denoted by: ■)
3	18	4' Fish Scales
4	1	26 Gage Sheet Metal Nose 20'x3'
5	4	4 1/2" - 7 1/2" Spacers
6	6	7 1/2" - 13 1/2" Spacers
7	2	13 1/2" - 25" Spacers
8	4	3/4" Wire Rope
9	10	W6x8.5 Junior Beam with Skidplate
10	100	1/2" Buttonhead Hex. Socket Cap Screws
11	4	Anchor Stirrups
12	6	1/2" Attachment Rods
13	6	1/2" Expansion Shields with 1/2" Hex. Head Bolts
14	13	1 1/2" Chairs (Denoted by: ✕)
15	2	L3 x 3 x 1/4 10'-6" Sections
16	1314	Sheet Metal Screws
17	24	Wire Rope Clips

SCALE 1/2" = 1'-0"
MADE BY J.M.C. DATE 10-28-71
TRCD BY J.M.C. DATE 11-3-71
CKD BY S.M.B. DATE 11-3-71
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY
CUY. 480-21.40



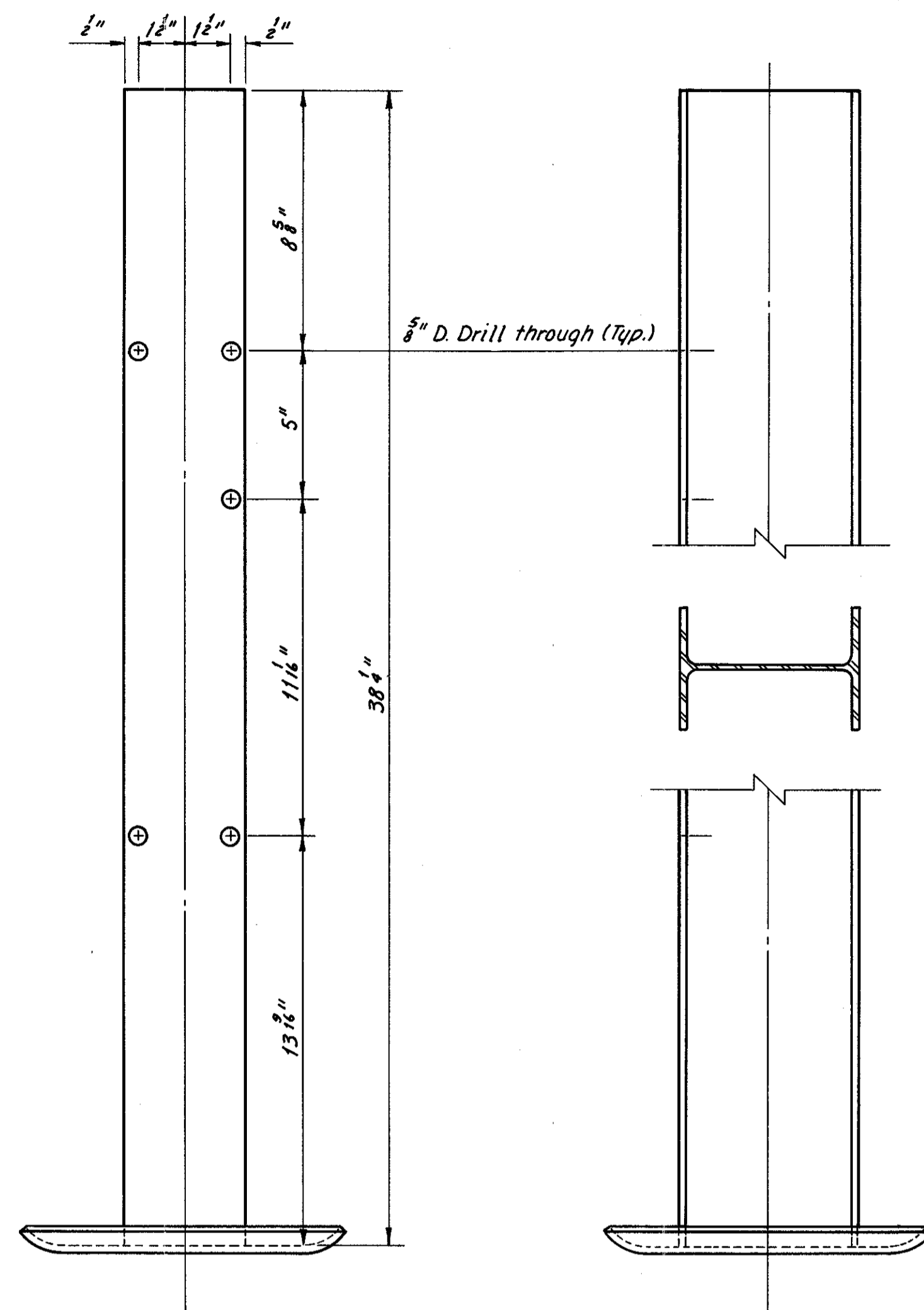
BACK VIEW



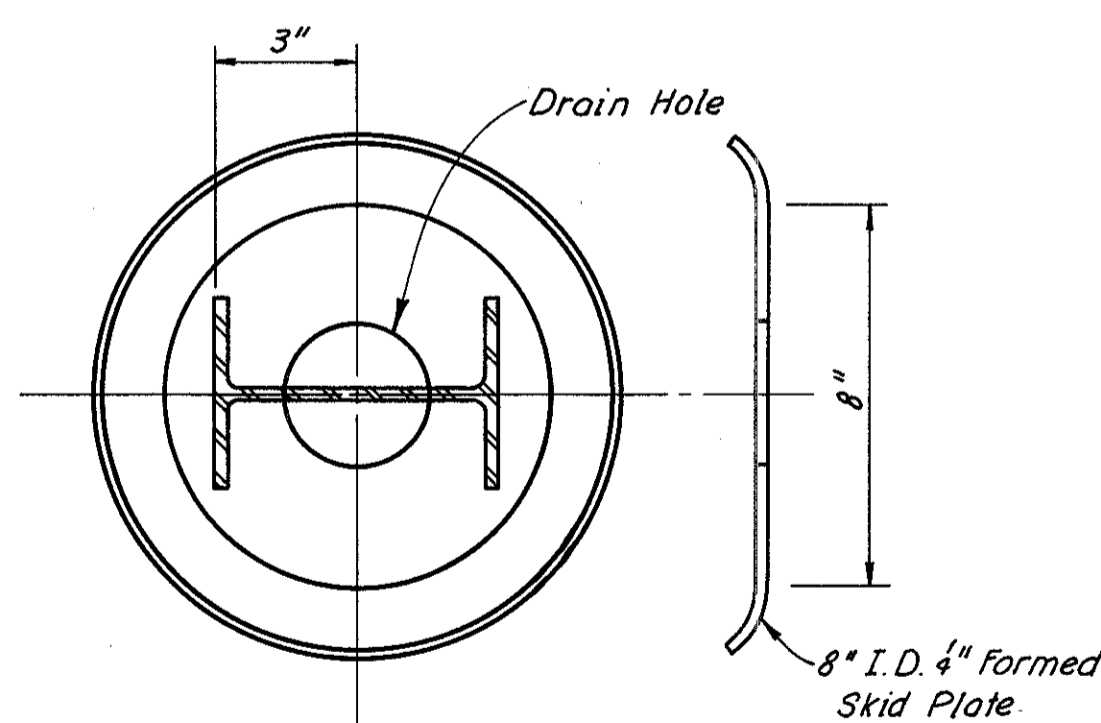
FISH SCALES
Scale: 1" = 1'-0"

FISH SCALES

- (1) Fish scales shall be constructed of 3/4 inch plywood covered with 26-gage steel sheet of the sizes and configuration shown.
 - (2) The plywood shall be 5 ply exterior blue and conform to "American Plywood Product Standard PS 1-66 for 3/4 inch B-B EXT-DFPA(4)."
 - (3) The steel sheets shall be 26-gage galvanized steel sheet or coil conforming to ASTM Standard A 446-69 (Commercial Class) with 1.25 ounces of zinc per square foot.
 - (4) Fasteners shall be #8 Hex Head galvanized screws.
 - (5) The steel sheets and/or coils shall be coated on the exposed face with a 2 mil minimum thickness thermal setting coating applied in accordance with the coating manufacturer's recommendations. The color shall be off white as shown on color cards available through the Ohio Dept. of Highways; Division of Operations; Bureau of Traffic; Columbus, Ohio.
 - (6) The plywood shall be primed and given a second coat of paint or suitable coating conforming to Federal Specification TT-P-81d.
- Optional: Galvanized Industrial weight staples may be used in lieu of #8 Hex Head Screws.



ELEVATION

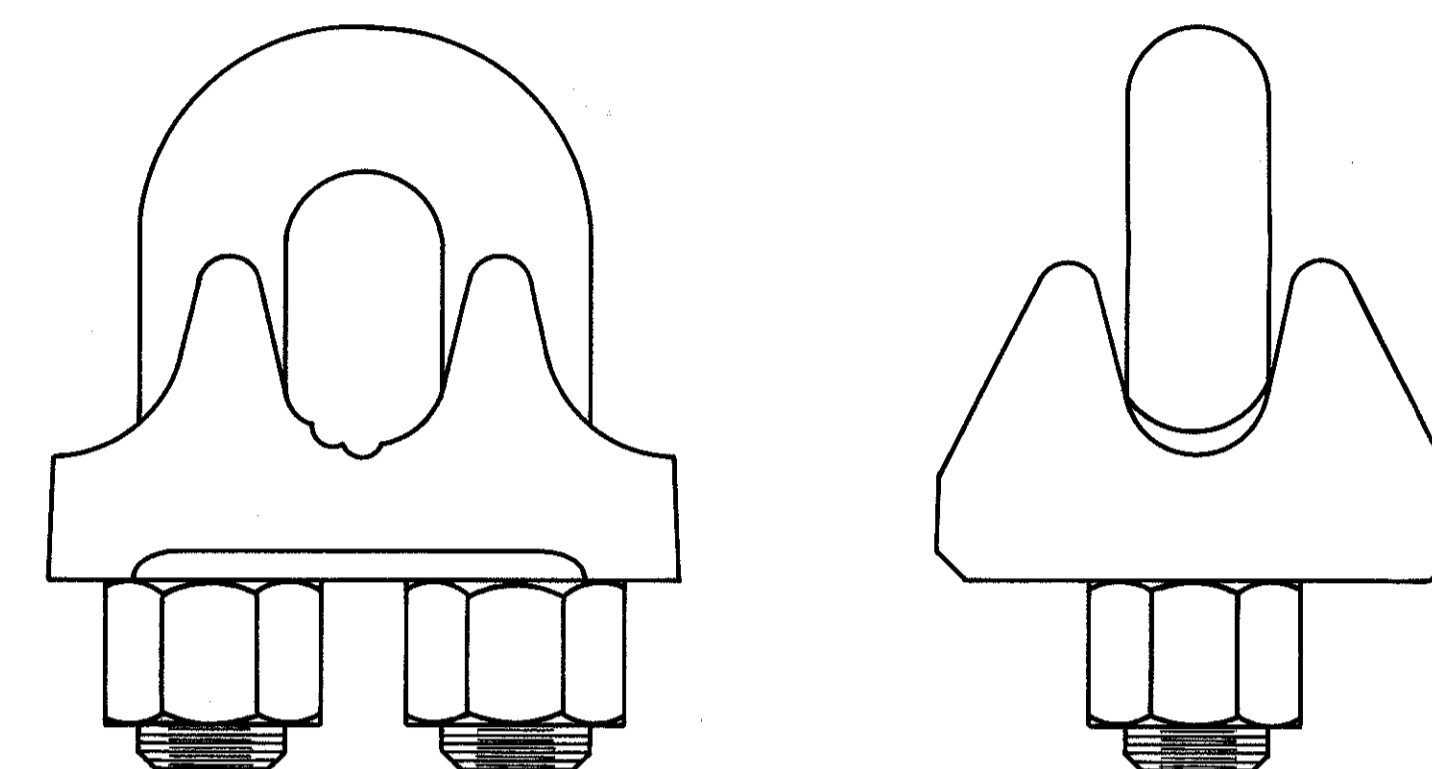


PLAN

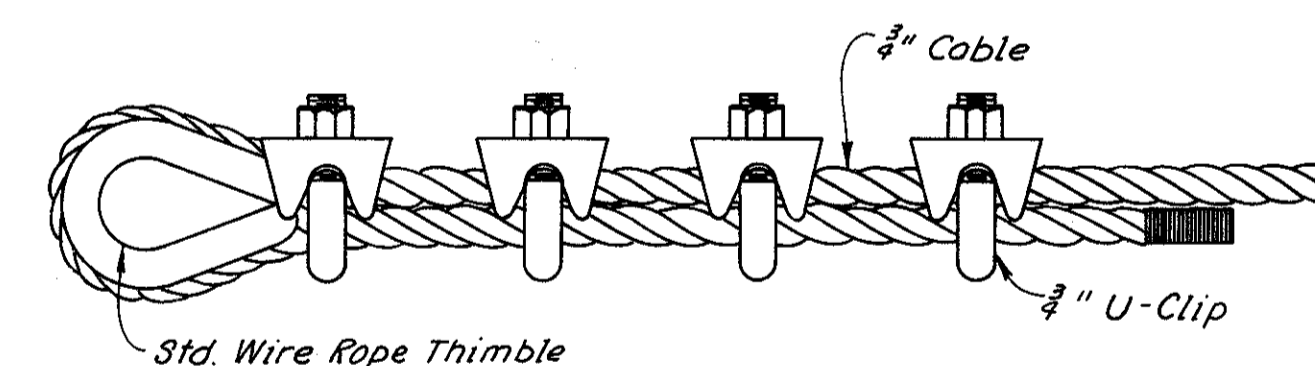
6B 8.5 BEAM AND SKID PLATE
DRUM SUPPORT SKID BASE (6B 8.5)
Scale: 3" = 1'-0"

DRUM SUPPORT SKID BASE

- (1) All rolled sections shall conform to the applicable requirements of the AISC Steel Construction Manual. Material shall conform to the requirements for ASTM Standard A 36-63.
- (2) Welding shall conform to Section 513.17.
- (3) All parts shall be galvanized after fabrication in accordance with ASTM Standard A 123-69 (Commercial Class).



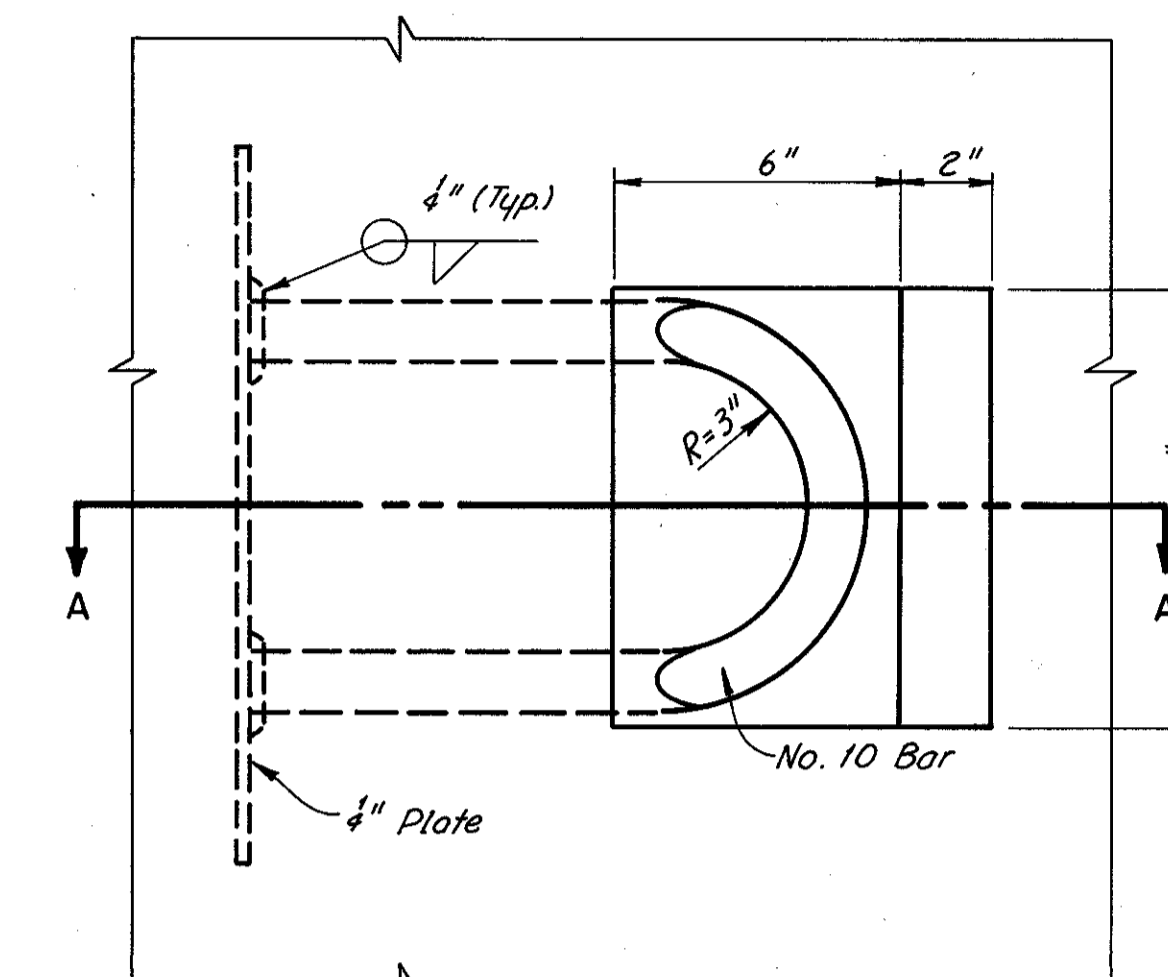
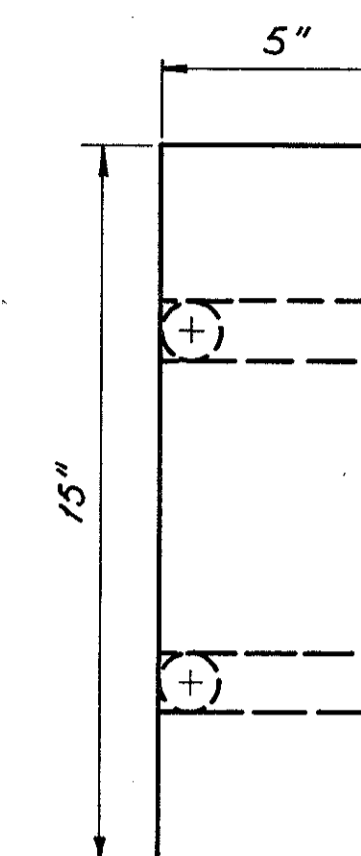
3/4" WIRE ROPE CLIP
Scale: Full Size



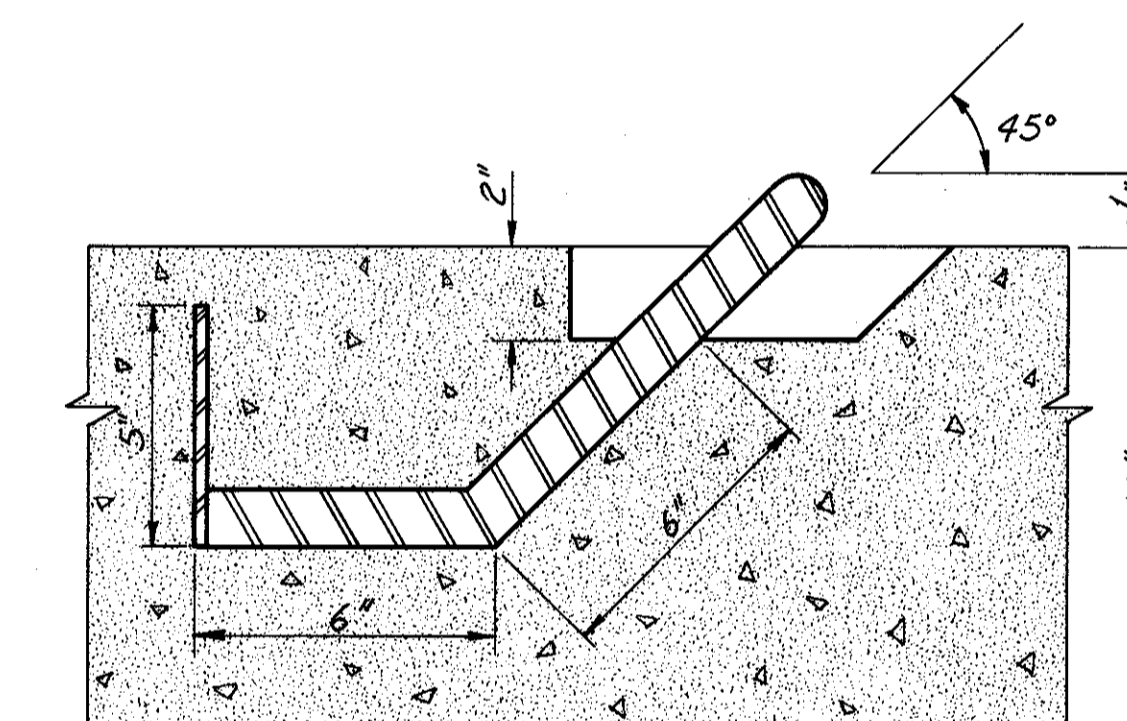
CABLE CONNECTION
Scale: 3" = 1'-0"

CABLE CONNECTION

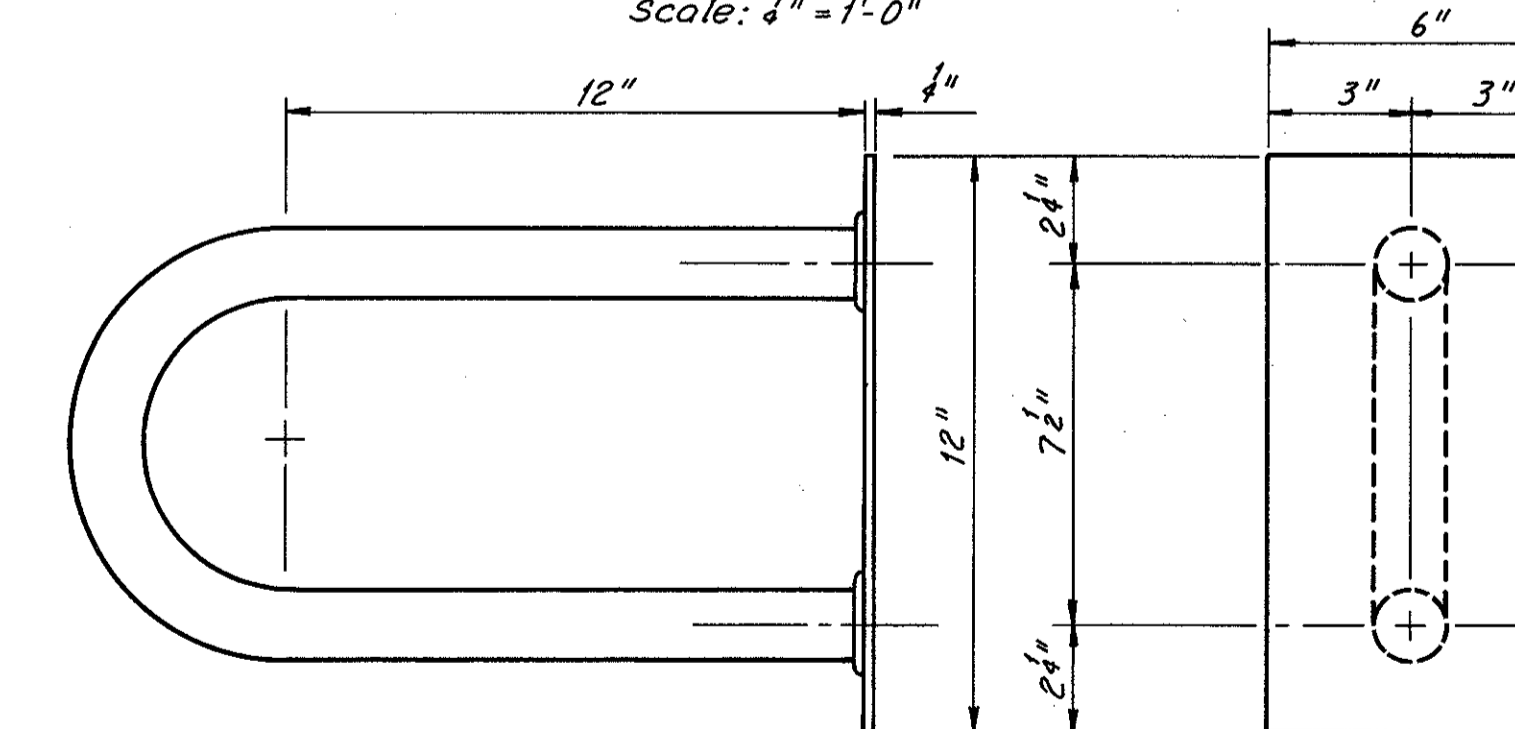
Wire rope clips shall conform to the applicable provisions of ASTM Standards A 307-68 and A 48-64 and shall be galvanized after fabrication. Galvanizing shall conform to ASTM Standard A 153-67.



PLAN



SECTION A-A
TYPE A ANCHOR
Scale: 4" = 1'-0"

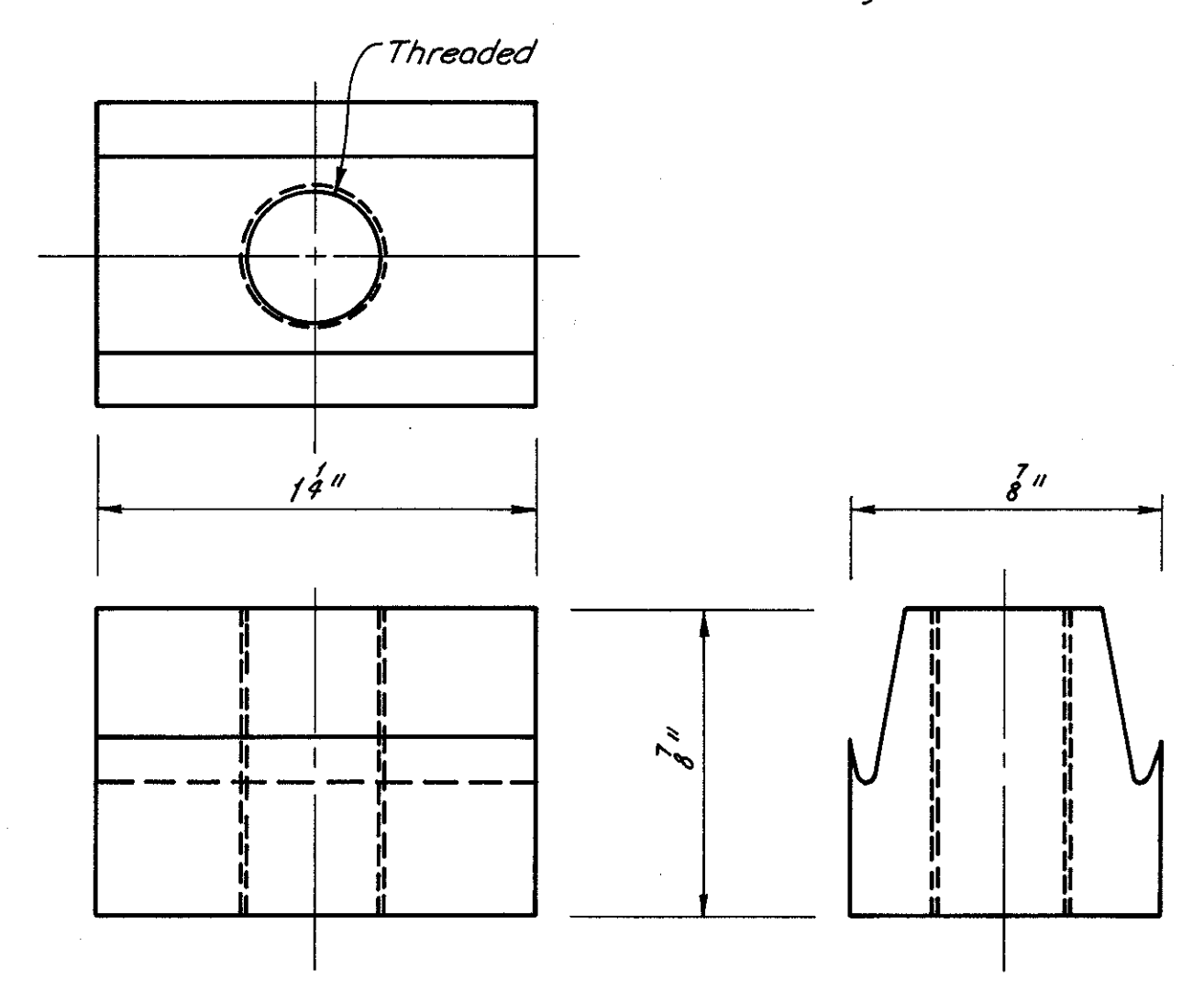
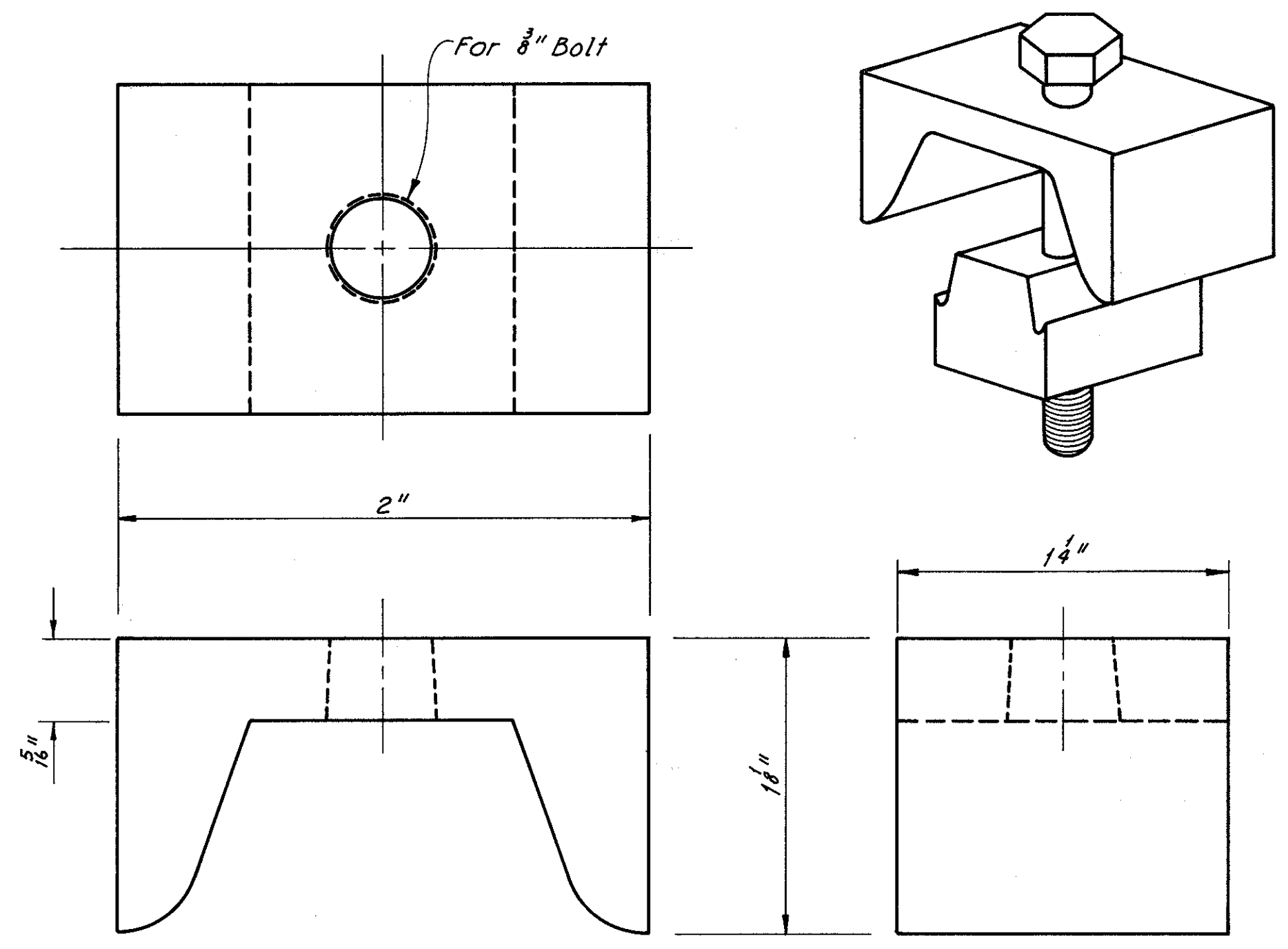
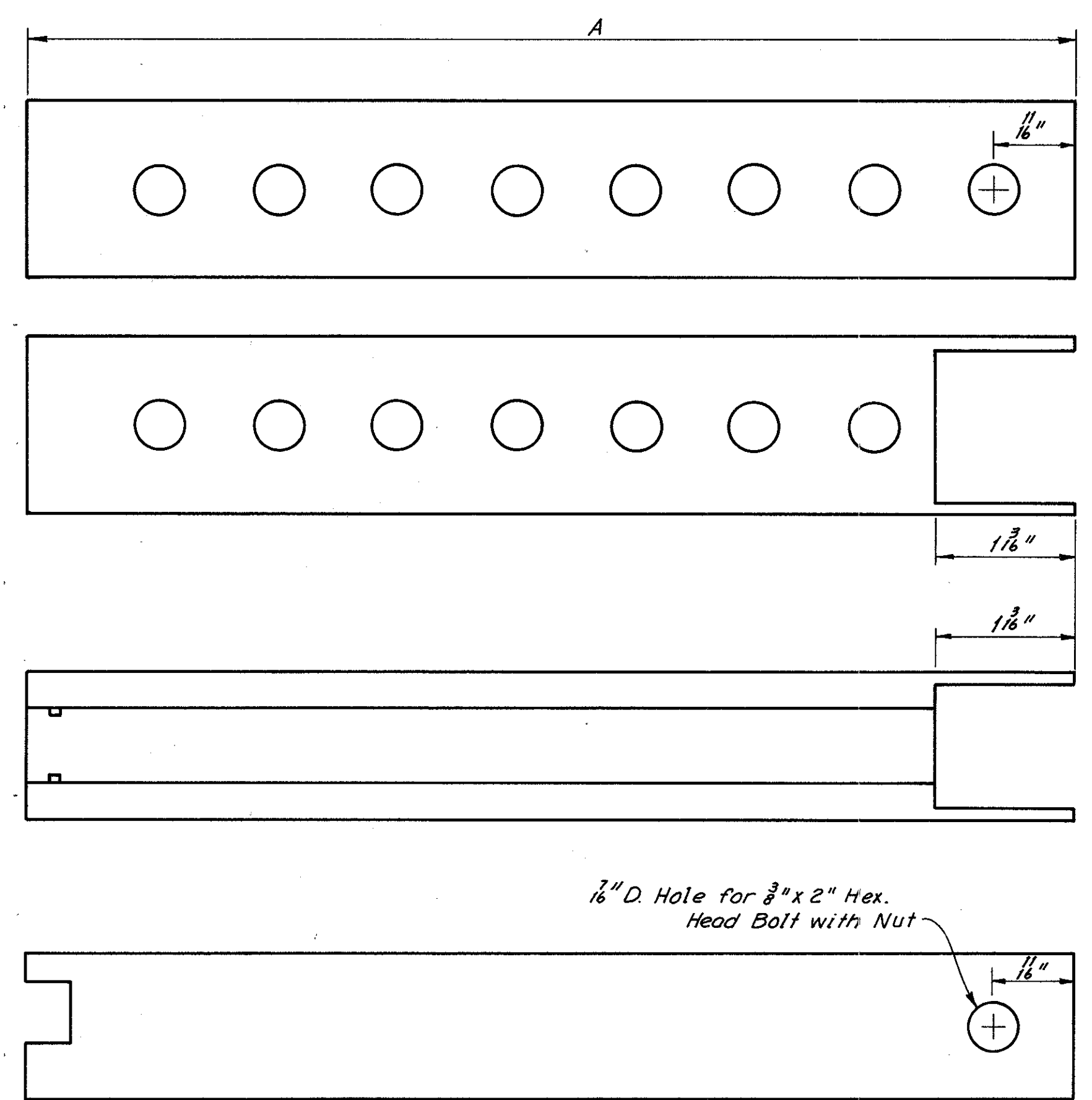


TYPE B ANCHOR
Scale: 3" = 1'-0"

ANCHOR STIRRUP DETAILS

ANCHOR STIRRUP

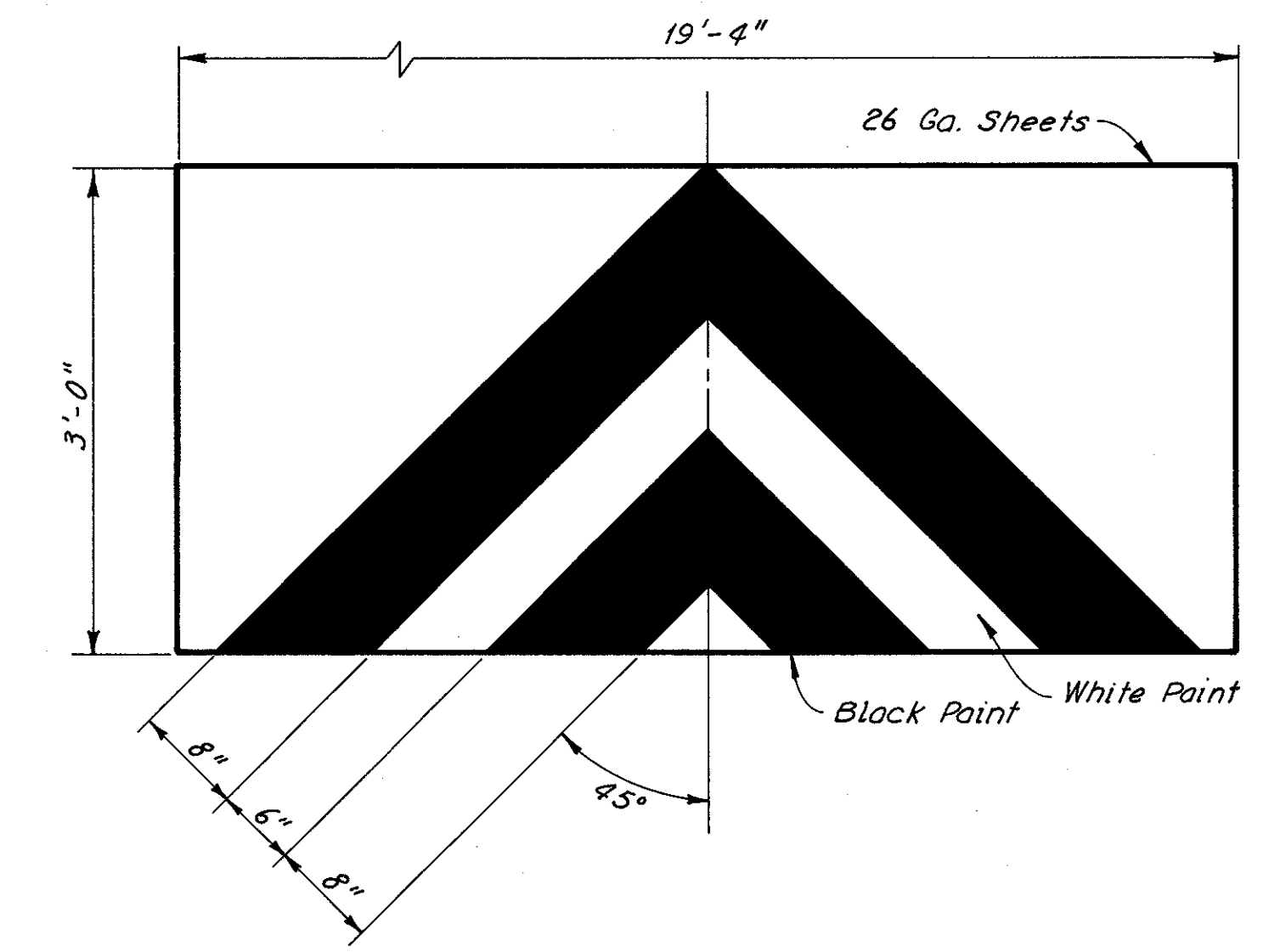
- (1) The anchor stirrup shall conform to ASTM Standard A 615-68 Grade 60. The bar shall conform to ASTM Standard A 283-67.
- (2) Welding shall conform to Section 513.17.
- (3) The anchor stirrup shall be galvanized after fabrication in accordance with ASTM Standard 123-69 (Commercial Class).



DRUM CONNECTOR DETAILS
Scale: 2" = 1"

DRUM CONNECTOR

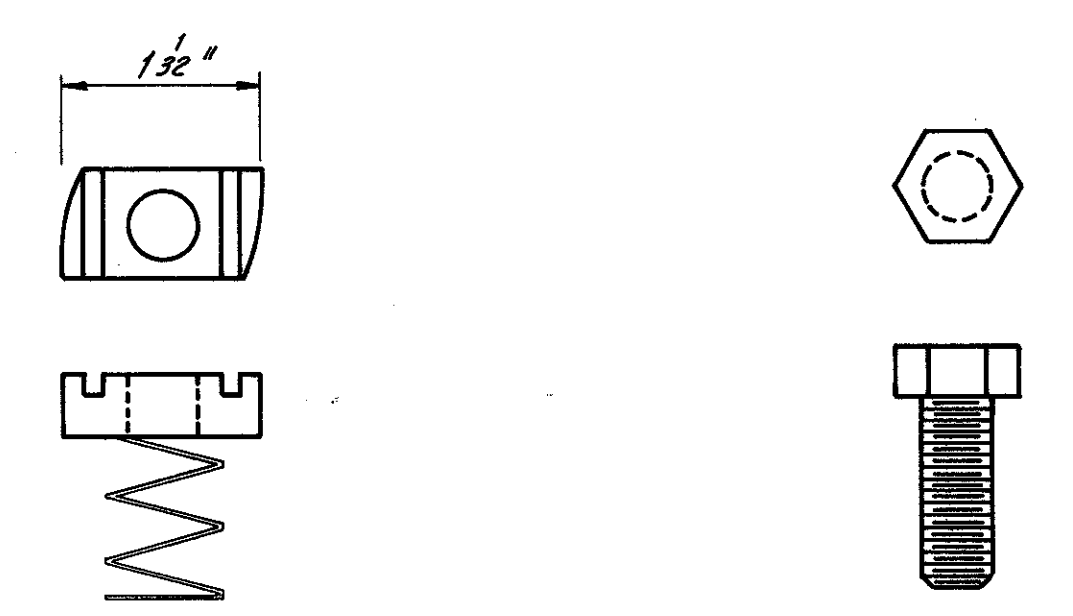
- (1) The saddle shall be manufactured in accordance with ASTM Standard Specifications A 47-68, "Malleable Iron Castings".
- (2) The block shall be manufactured in accordance with ASTM Standard Specification A 48-64, "Gray Iron Castings".
- (3) After the block has been cast, burrs shall be removed by grinding to provide an assembly which will be compatible with the saddle and the lip of the drums.
- (4) Bolts, nuts and washers shall conform to ASTM Standard Specification A 76-64.
- (5) After fabrication all components shall be galvanized in accordance with ASTM Standard A 123-69 Commercial Class.



NOSE SHEET DETAIL
Scale: 1" = 1'-0"

NOSE SHEET

- (1) The nose sheet shall be formed from 26-gage galvanized steel sheet or coil conforming to ASTM Standard A 446-69 (Commercial Class) 1.25 ounces of zinc per square foot.
- (2) Fasteners used to fasten the nose sheet to the drums shall be #8 Hex Head galvanized self tapping metal screws.
- (3) The steel sheets and/or coils shall be coated on the exposed face with a 2 mil minimum thickness thermal setting coating applied in accordance with the coating manufacturer's specifications. The color shall be off white as shown on color cards available through the Ohio Dept. of Highways; Division of Operations; Bureau of Traffic; Columbus, Ohio.
- (4) Markings shall conform in size and color to Ohio Manual on Uniform Traffic Control Devices for Streets and Highways, Part V.

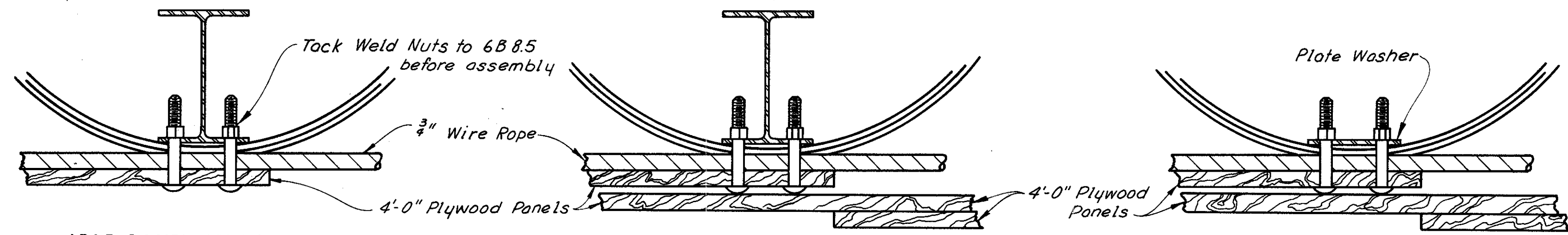


DRUM SPACER DETAILS
Scale: Full Size

SPACER DETAIL

- (1) Box sections and channels shall be of pregalvanized sheet with prepunched holes to 1.25 ounce coating to conform to ASTM Specification A-525.
- (2) Tubing shall be 12 gage thickness (.105 U.S.S. Gage) cold rolled steel C-1010.

DESCRIPTION	A
3 1/2" to 4 1/2"	4 13/16"
4 1/2" to 7 1/2"	5 15/16"
7 1/2" to 13 1/2"	8 13/16"
13 1/2" to 25"	14 7/16"



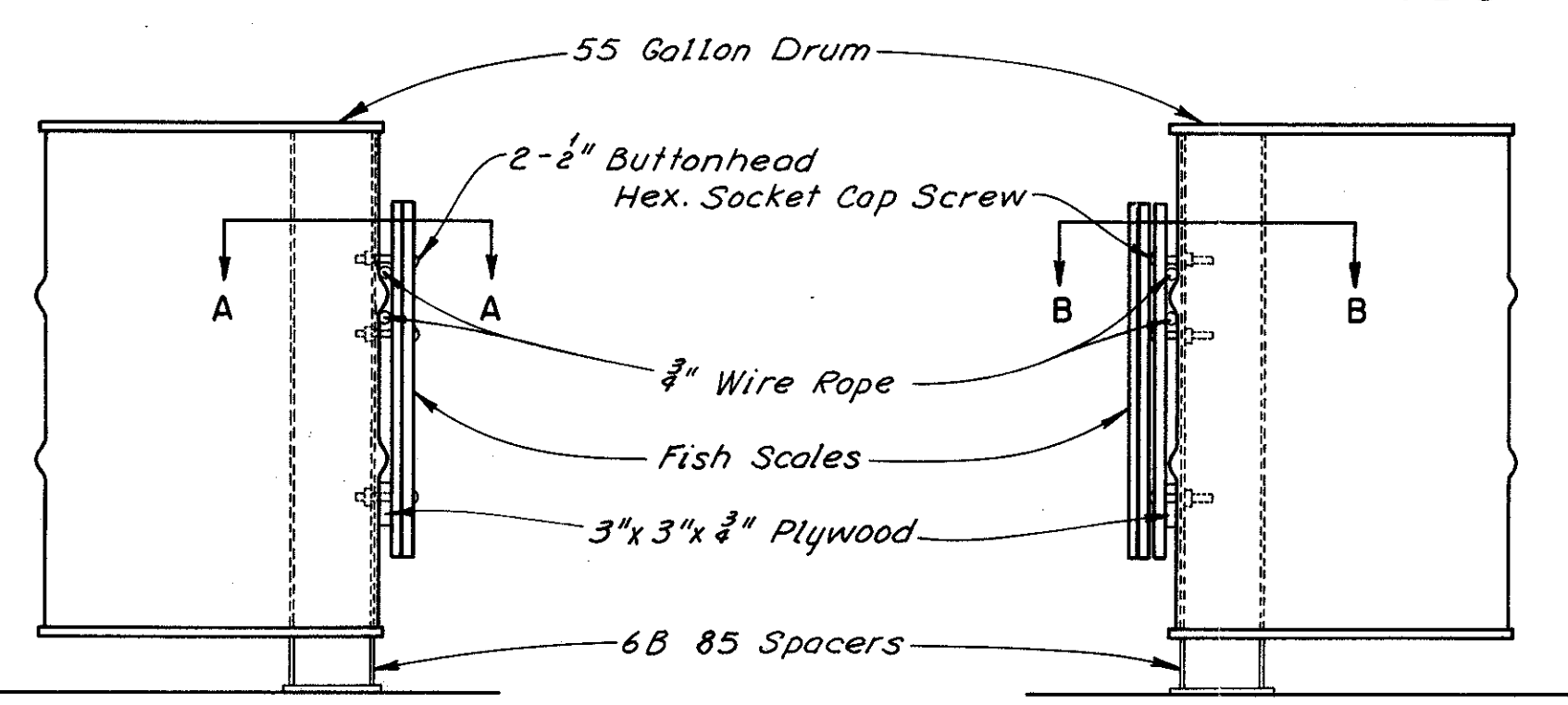
LEAD PANEL ATTACHMENTS

INTERMEDIATE AND FINAL PANEL ATTACHMENTS

PLATE WASHER-FOR USE BETWEEN POST SUPPORTS

SECTION A-A

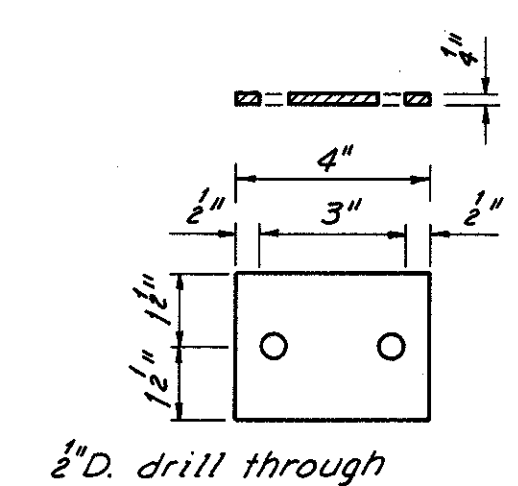
SECTION B-B



ELEVATION

ASSEMBLY DETAILS

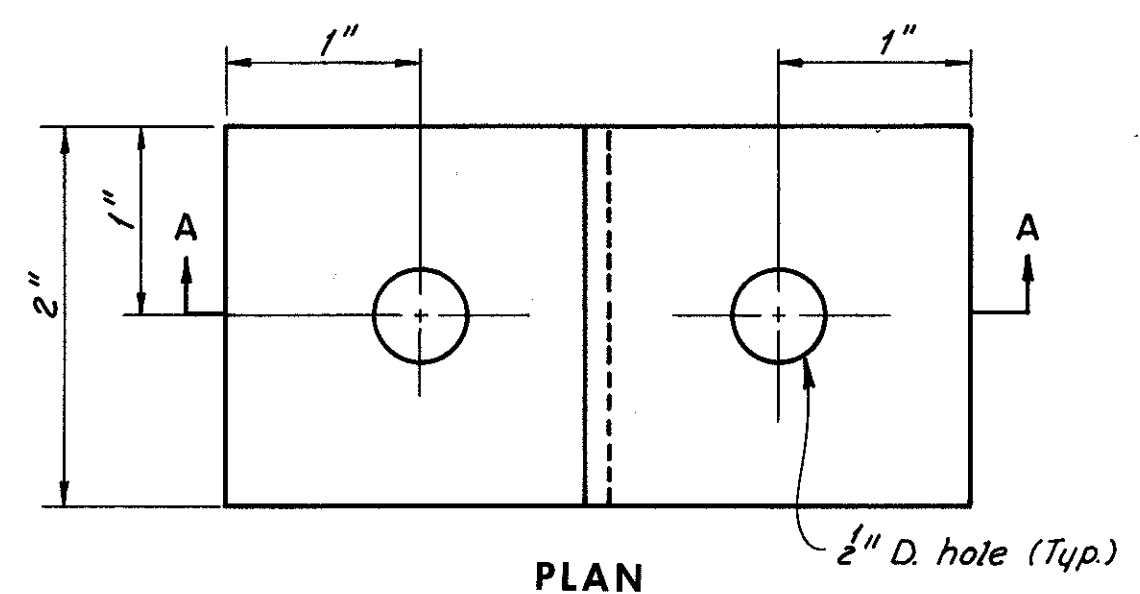
Scale: 3"=1'-0"



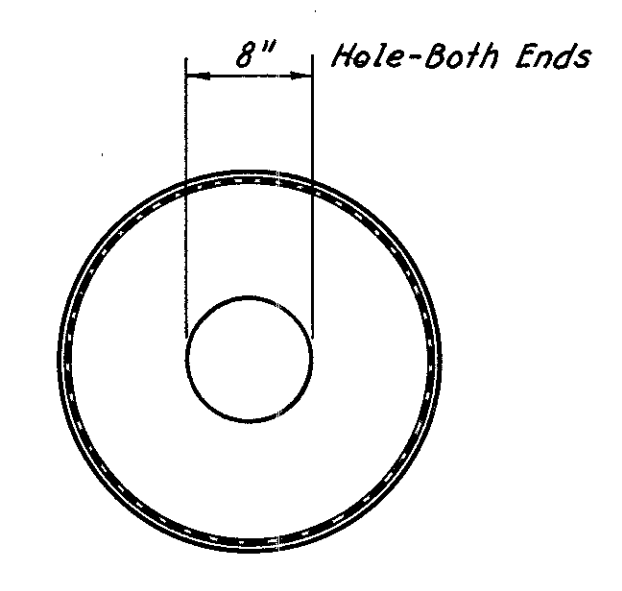
DRUMS

Drums shall be new, 55-gallon capacity conforming to the applicable parts of Federal Specification PPP-D-729C dated August 16, 1969, for Type II, "straight side, with rolled or expanded hoops, cylindrical drum; double seamed without chime reinforcement," except as modified herein.

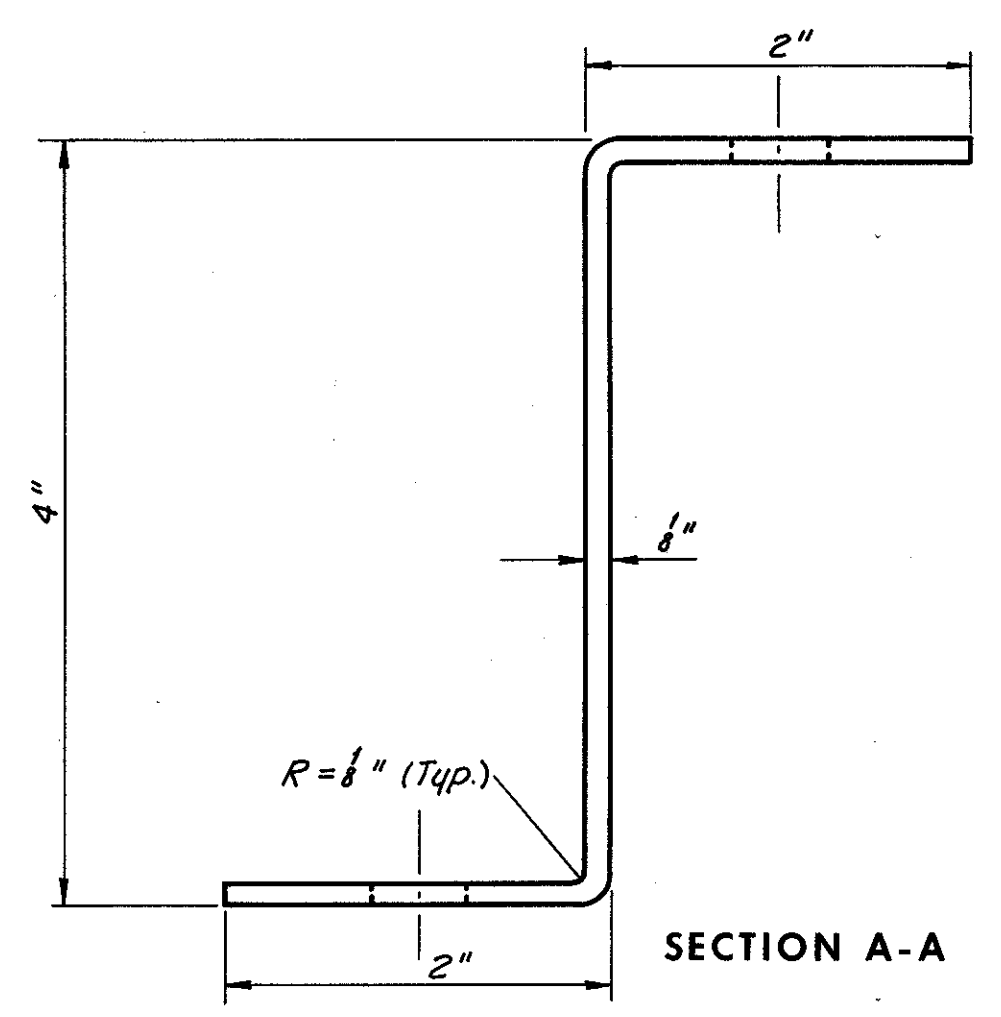
- The drums shall be constructed of 20 gage steel for the head, bottom, and body. The head and bottom shall be hot dipped galvanized with 1.25 ounces of zinc per square foot in accordance with ASTM Standard A 446-69 (Commercial Class).
- The average diametrical crushing strength per drums shall be 6,000 pounds; with the maximum variation for any single drum $\pm 1,000$ pounds; and the maximum average variation for 10 tests shall be 400 pounds.
- The configuration of the drums shall be as shown in these plans with the only penetrations being the 8 inch diameter holes in the center of the top and bottom.
- The body of the drum shall be painted inside and outside after fabrication with one (1) coat of primer Section 708.15 and two (2) coats of finish paint in accordance with the requirements of Ohio Specification 514. The primer and finish coats may be applied by spray coating or brushing however each coat must be allowed to dry thoroughly (minimum 18 hours) prior to application of the next coat of paint. The two finish coats of paint shall be yellow automotive enamels, conforming to National Bureau of Standards Color No. 33538 of Federal Standard 595, within 5.0 N.B.S. units. Color chips showing tolerance limits are available at the Bureau of Traffic, 450 East Town St., Columbus 15, Ohio. The quality of paint shall be as listed below or equal:
 - DuPont - Dulux 93-65334
 - Sherwin Williams - Ken Transport
 - Marten Senour - Synthol Series 80
 - Ditzler - Series DQE
 - Acme - Series 22
- Paragraph 6.1, "Intended use", of PPP-D-729c shall be deleted and replaced by the following: "The steel drums covered by this specification are intended primarily to be used in Modular Crash Cushions."
- Tolerances:
 - On overall diameter: $\pm 1/16$ "
 - On overall height, inside height, rolling hoop spring: $\pm 1/8$ "
 - On other dimensions: $\pm 1/8$ "



PLAN



PLAN

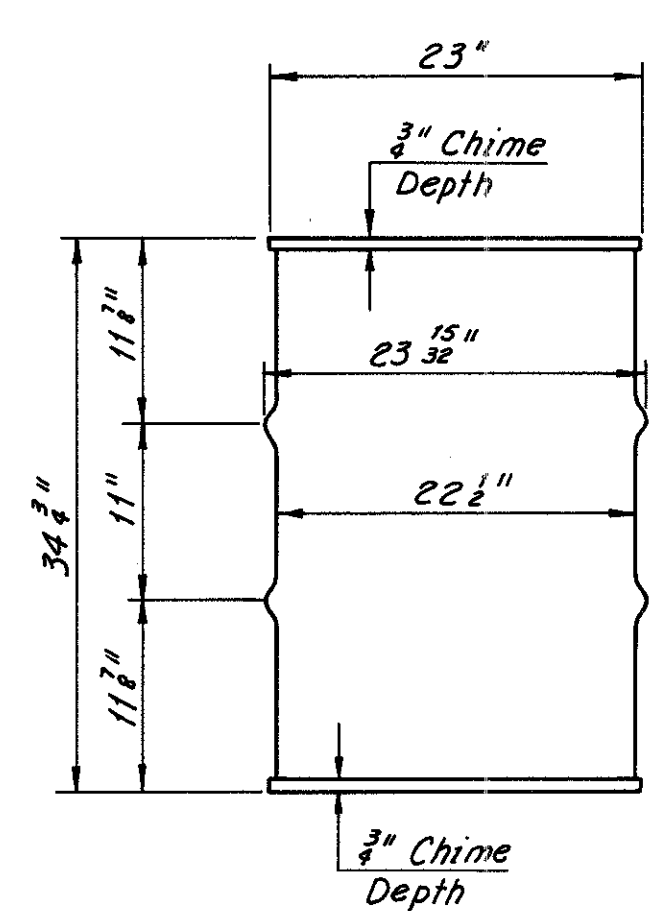


Z CHAIRS

Scale: Full Size

1/2" CHAIRS

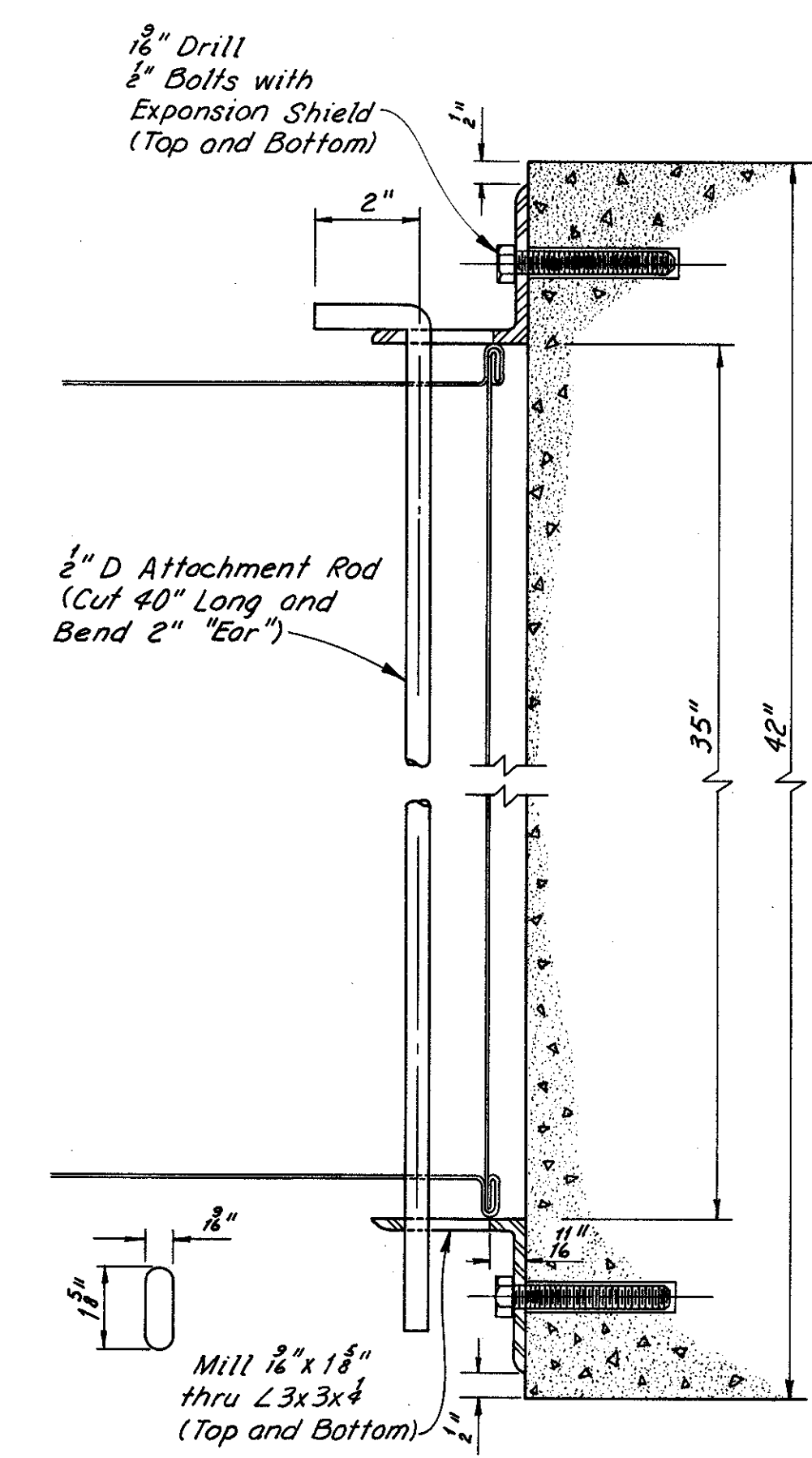
"1/2" chairs shall be formed from steel plates or strip conforming to ASTM Standard A 283-67 and shall be galvanized after fabrication. Galvanizing shall conform to ASTM Standard A 123-69 (Commercial Class).



ELEVATION

DRUM DESIGN

Scale: 1"=1'-0"



ANGLE ANGLE CONNECTION DETAILS

SUPPORTS AT BACKUP WALL

Scale: 1"=3"

SUPPORTS AT BACKUP WALL

- Rolled sections shall conform to ASTM Standard A 36-63.
- Nuts, bolts, and washers shall conform to ASTM Standard A 307-68 and shall be galvanized in accordance with ASTM Standard A 153-67.
- Individual components except nuts, bolts, and washers, shall be galvanized after fabrication in accordance with ASTM Standard A 123-69 Commercial Class.

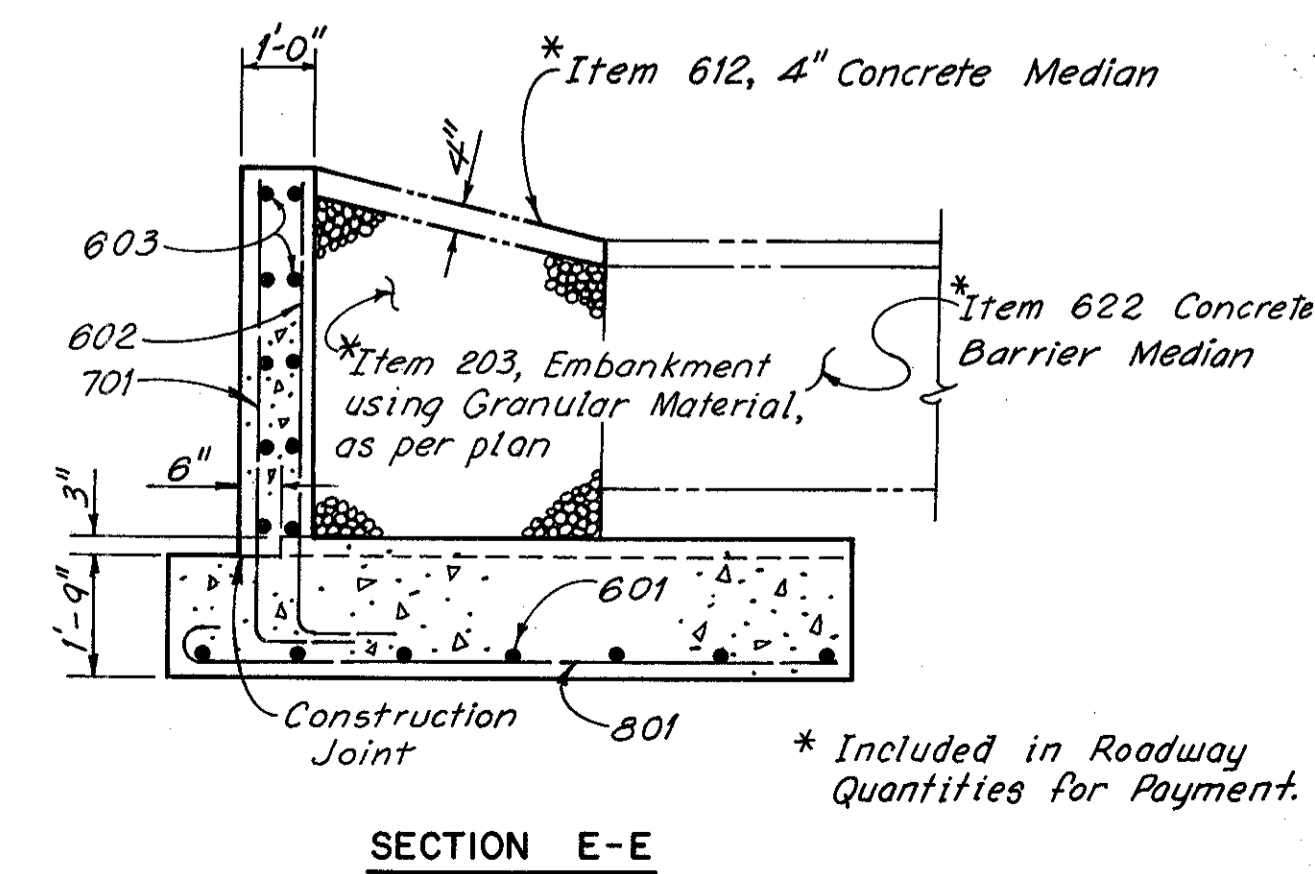
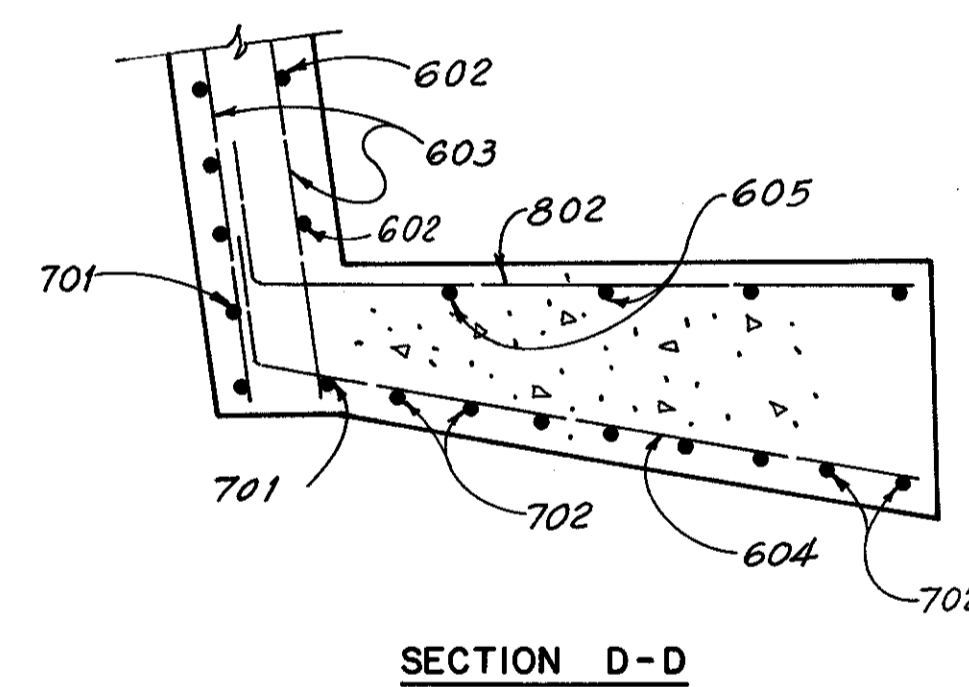
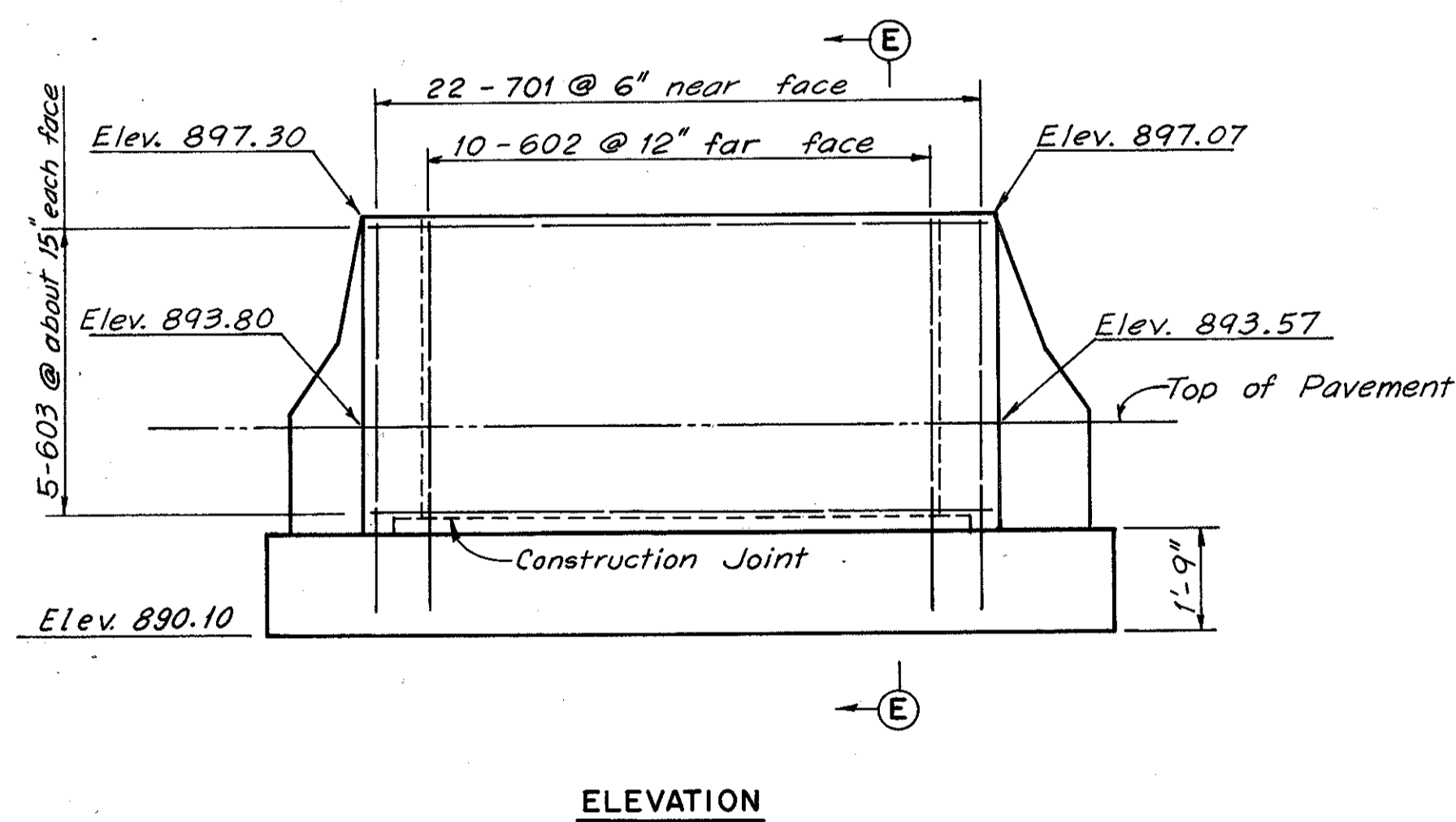
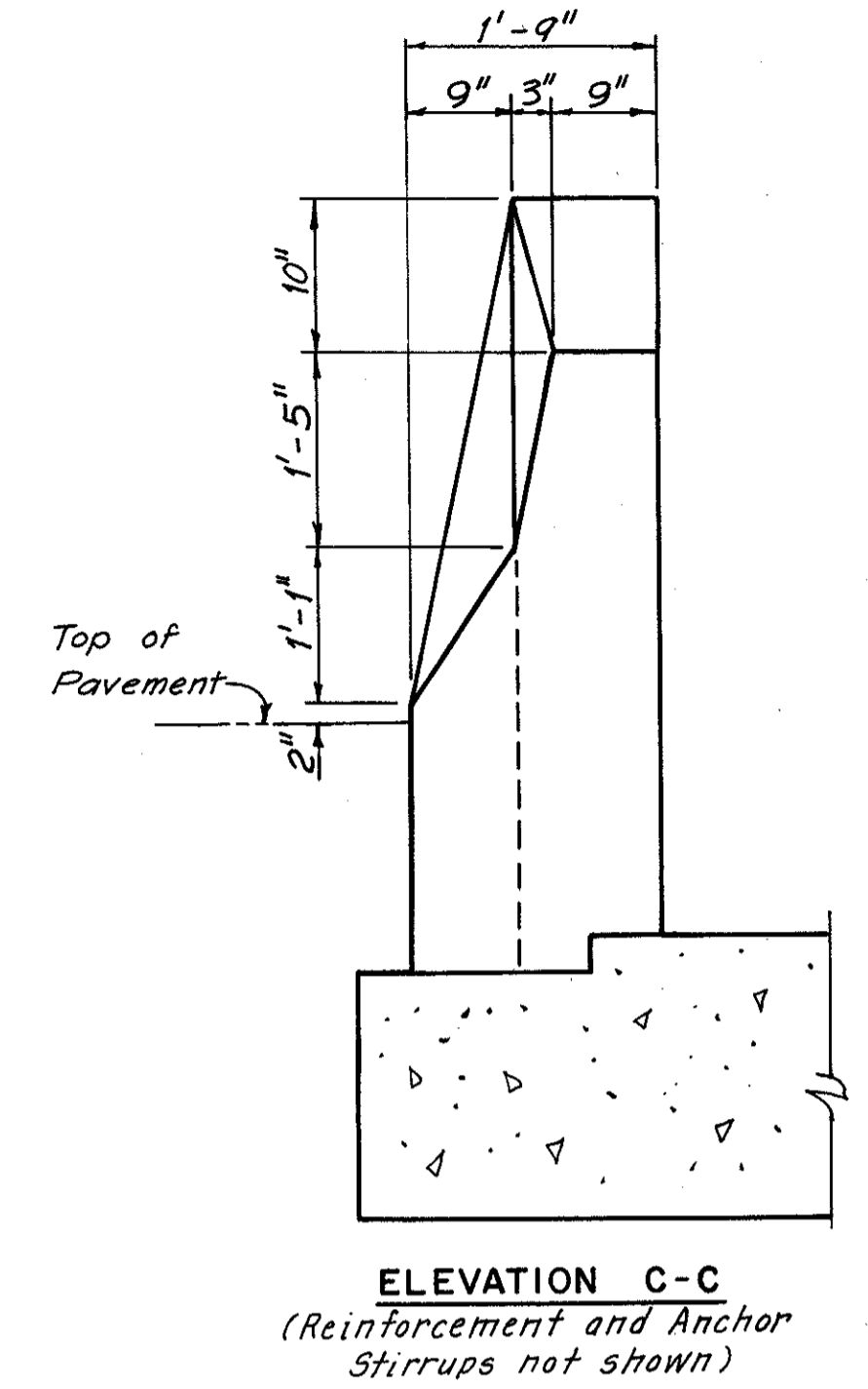
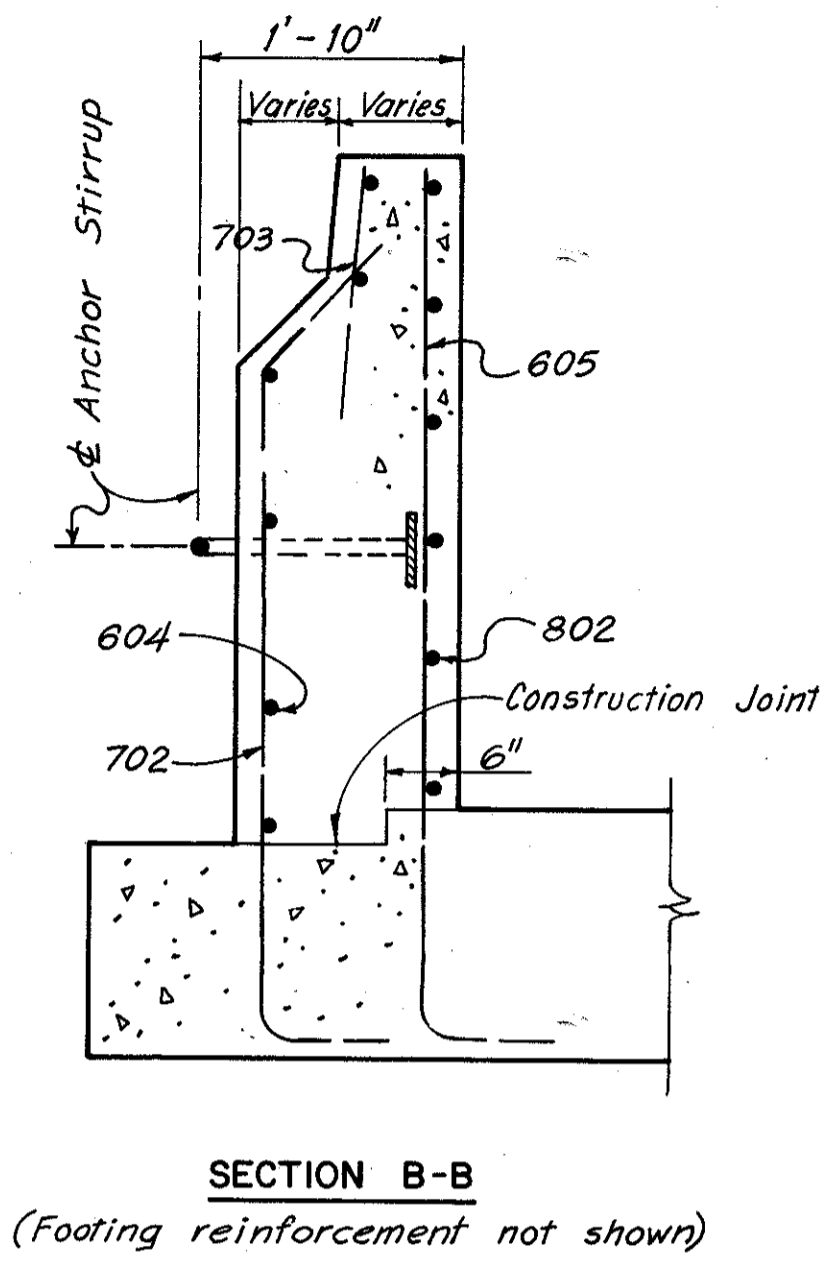
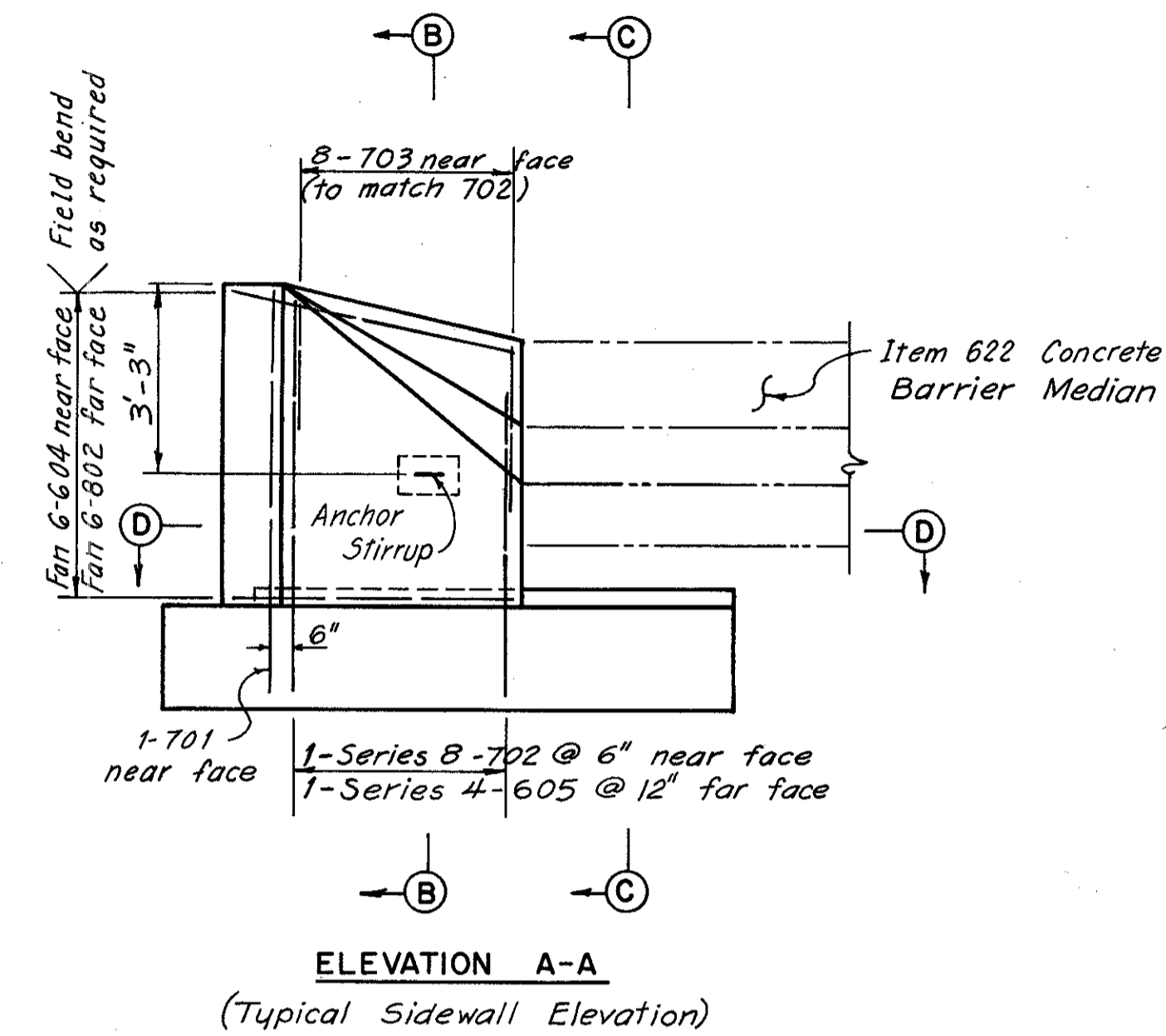
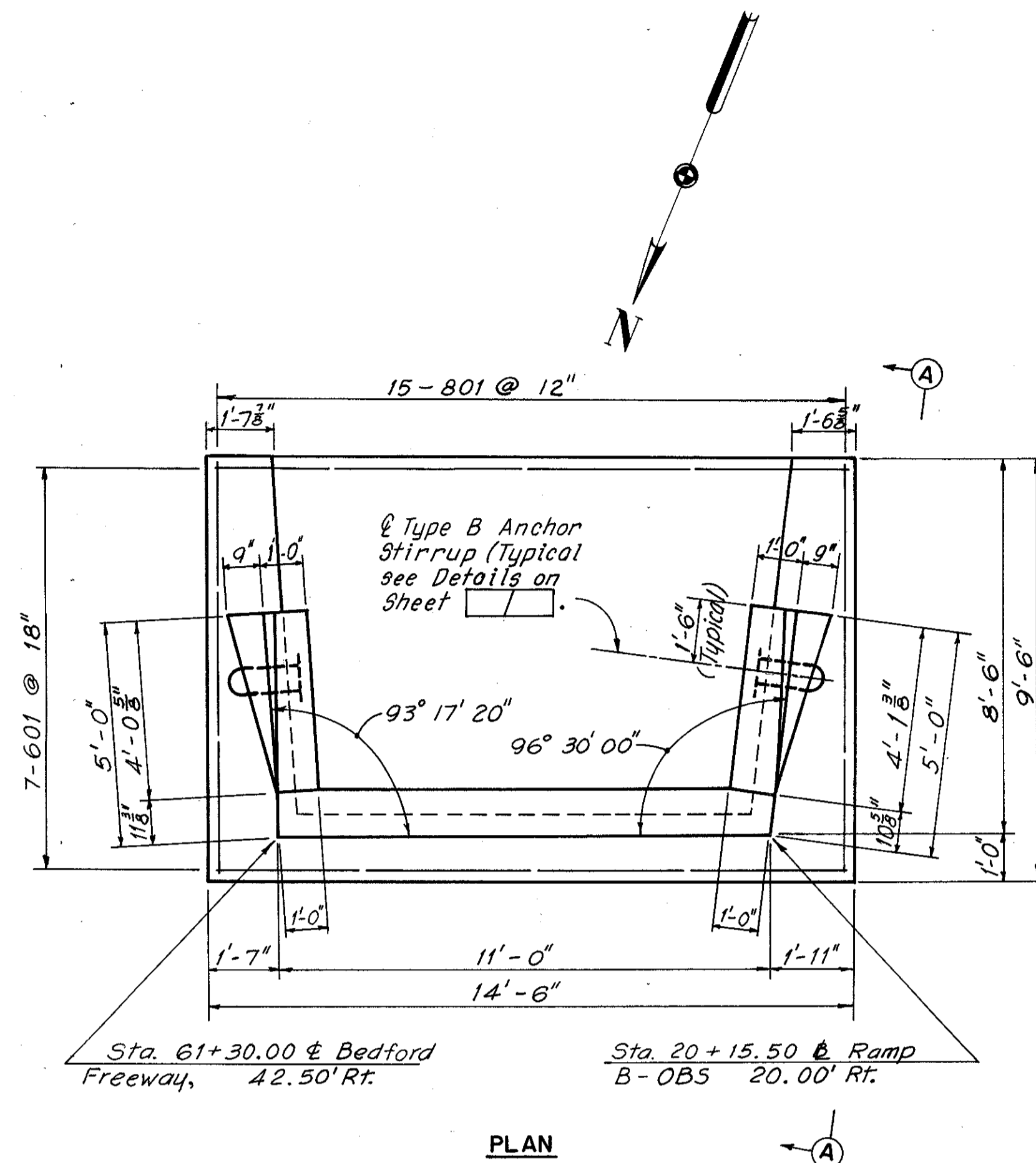
BACKUP WALL DETAILS

Quantity Calculations
 Made By Lee Date 4-72
 Checked By SMR Date 4-72

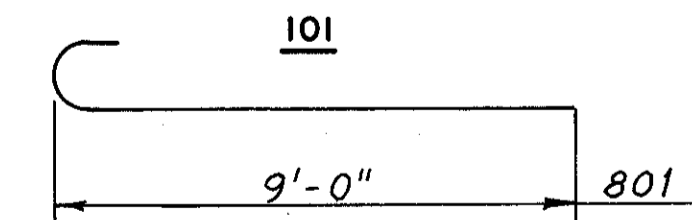
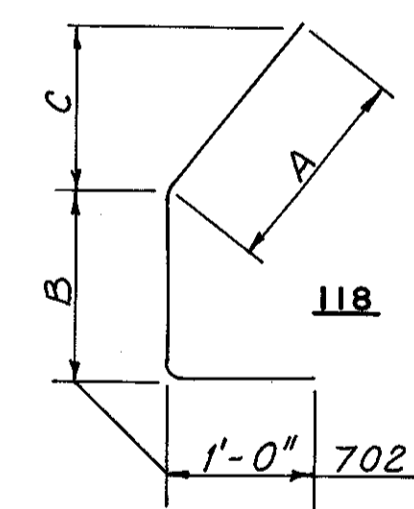
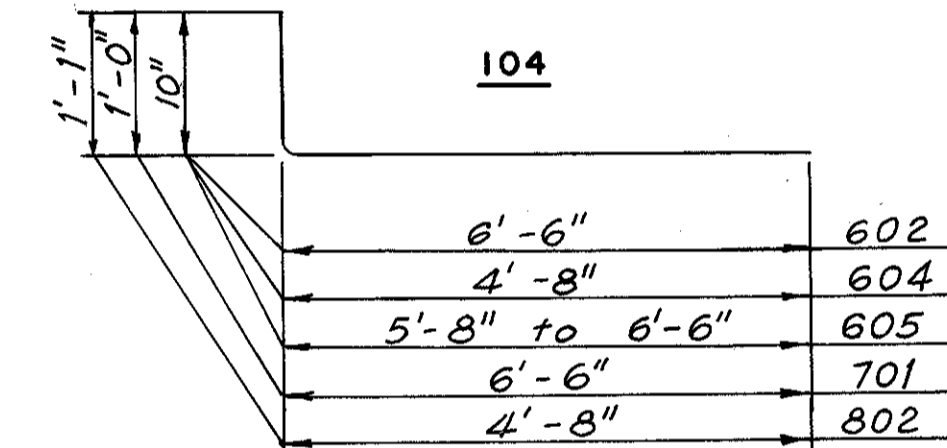
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY
 CUY-480-21.40



REINFORCEMENT SCHEDULE AND BENDING DIAGRAMS						
MARK	NO.	LENGTH	TYPE	SERIES INC.	WEIGHT	REMARKS
601	7	14'-0"	str.		147	
602	10	7'-2"	104		114	
603	10	10'-9"	str.		161	
604	12	5'-4"	104		96	
605	2 Ser. 4	7'-2" / 6'-4"	104	3 3/8"	81	
701	24	7'-4"	104		360	
702	2 Ser. 8	5'-10" / 7'-3"	118	2 3/8"	214	
703	16	3'-3"	str.		106	
801	15	10'-1"	101		404	
802	12	5'-7"	104		179	
					Total	1862

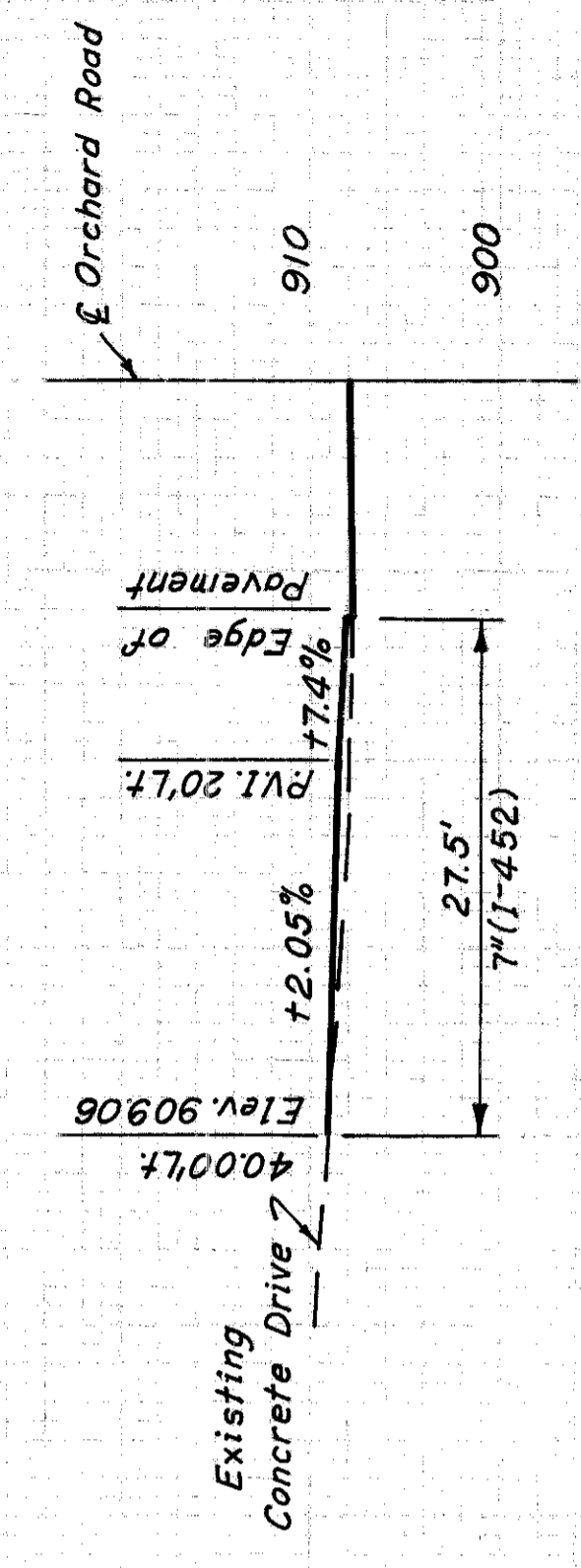
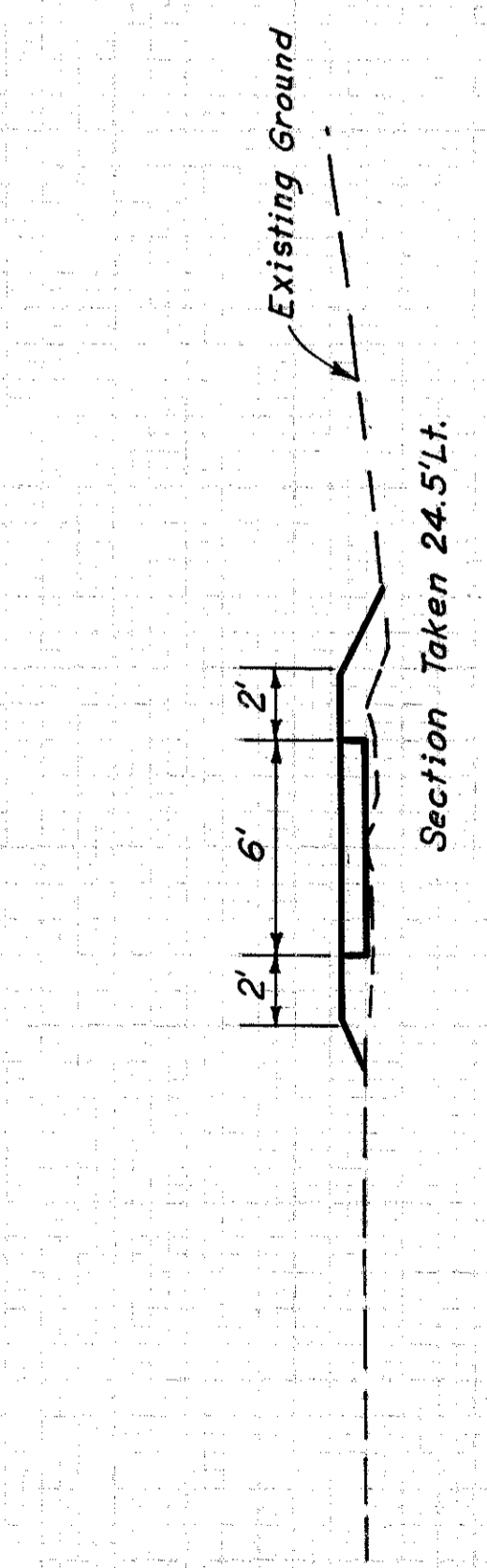
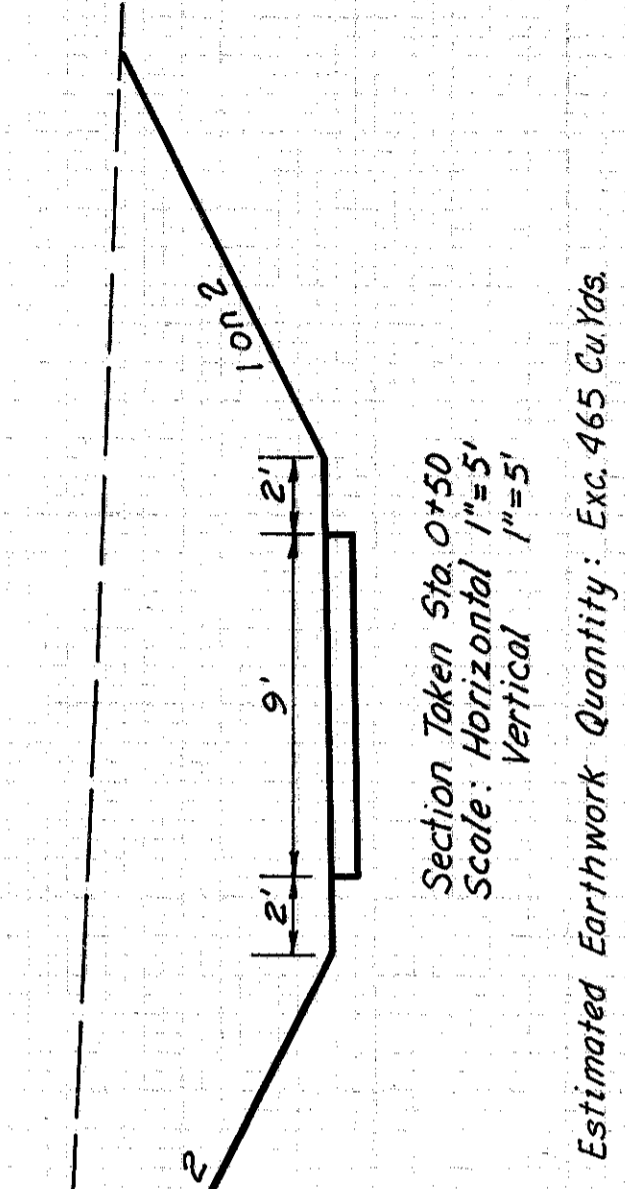
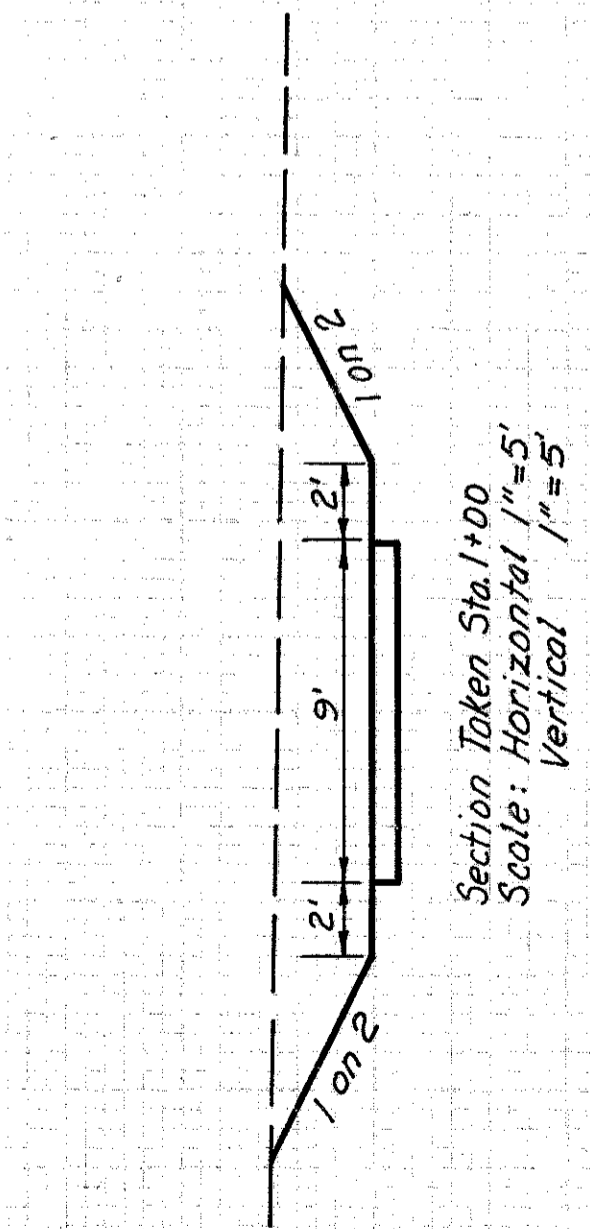
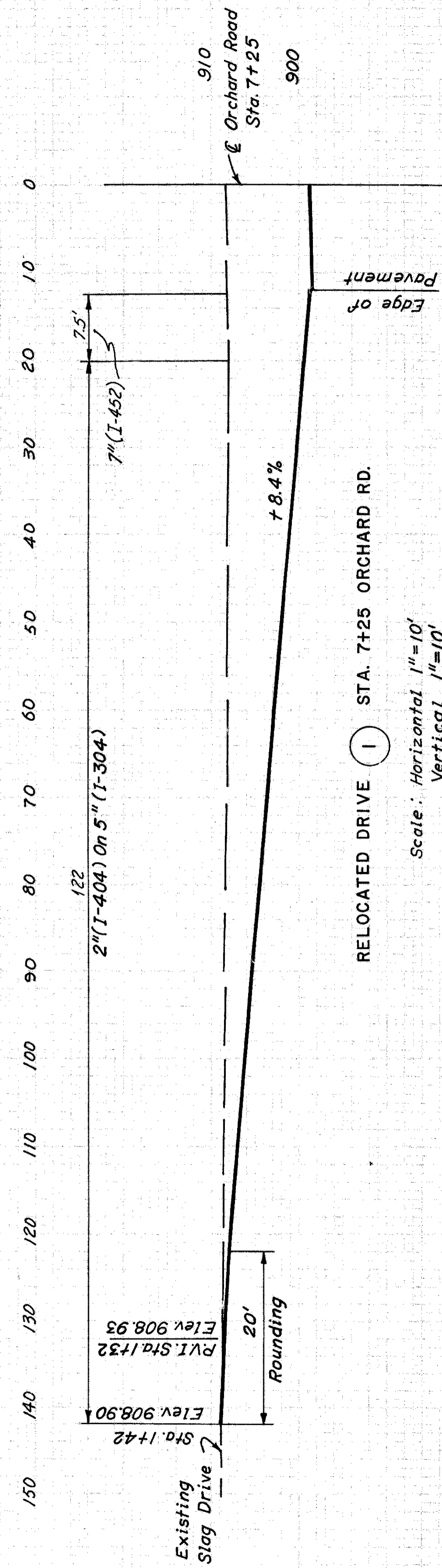


	LENGTH	SERIES INC.
A	1'-7" to 3"	2 1/2"
B	3'-6" to 6'-2"	4 3/8"
C	1'-4" to 3"	1 3/8"

ESTIMATED QUANTITIES		
TOTAL	UNIT	DESCRIPTION
22	Cu. Yds.	Unclassified Excavation
1862	Pounds	Reinforcing Steel
14	Cu. Yds.	Class C Concrete

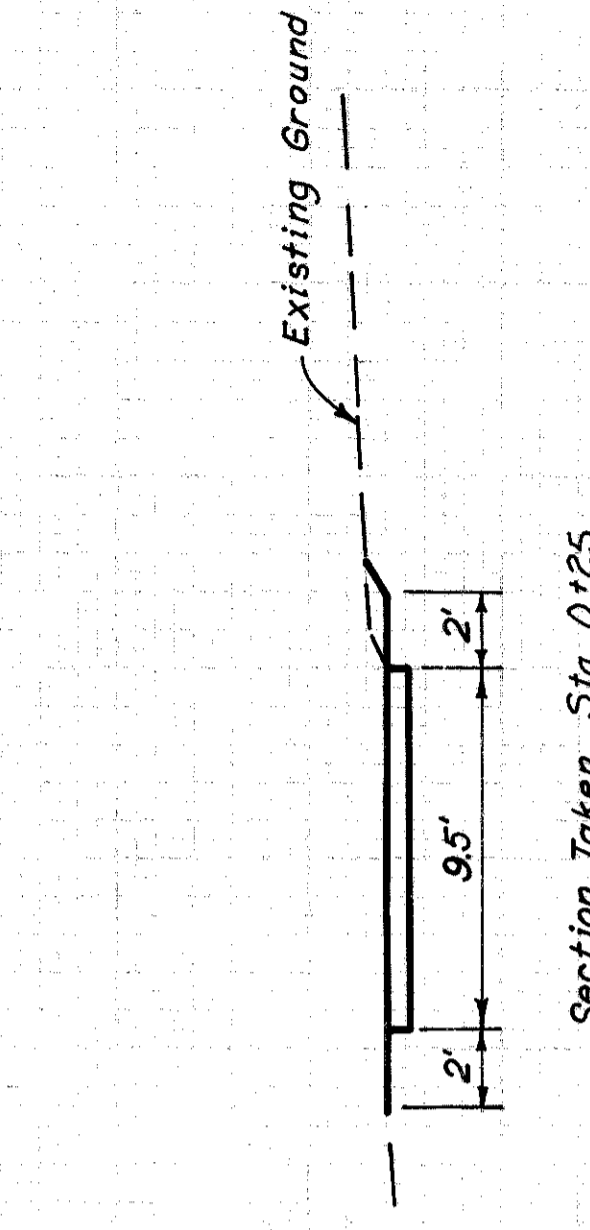
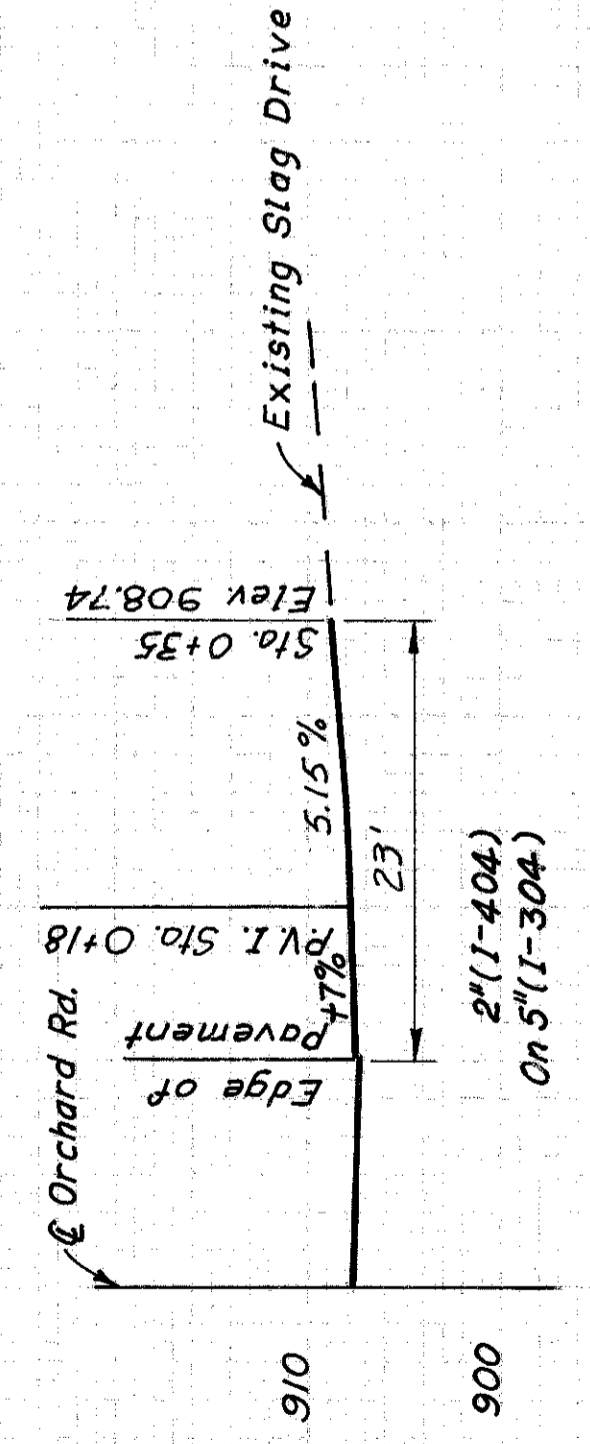
SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE Lee DATE 4-3-72 CONSULTING ENGINEERS
 TRCD Lee DATE 4-13-72
 CKD SMR DATE 4-18-72 KANSAS CITY CLEVELAND NEW YORK

Scale: As shown
 Checked: R.H.A. 2-10-68
 I.M. 4-1-70



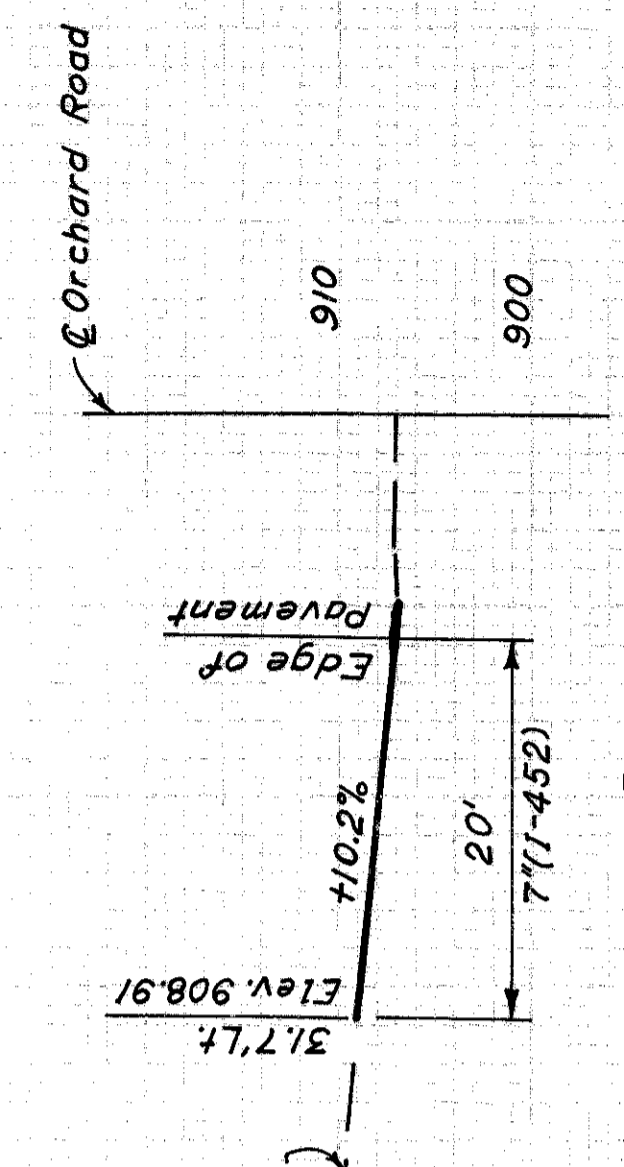
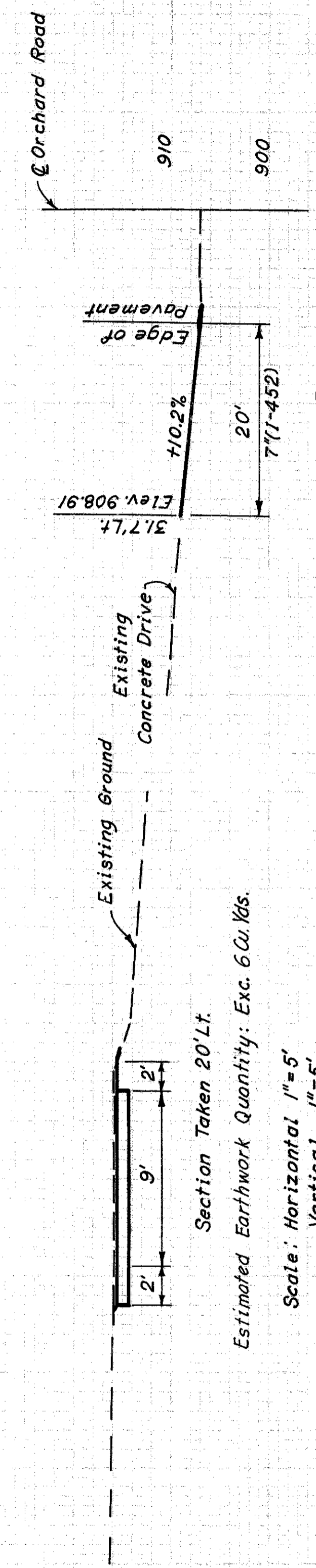
DRIVE (3) STA. 10+10 RT. ORCHARD RD.
 Scale: Horizontal 1"=10', Vertical 1"=10'
 Section Taken 20'Lt.
 Estimated Earthwork Quantity: Exc. 6 Cu. Yds.

DRIVE (2) STA. 9+7.796 ORCHARD RD. LT.
 Scale: Horizontal 1"=10', Vertical 1"=10'
 Section Taken Sta. 0+25
 Estimated Earthwork Quantity: Exc. 6 Cu. Yds.



DRIVE (4) STA. 10+15.89 LT. ORCHARD RD.
 Scale: Horizontal 1"=10', Vertical 1"=10'
 Section Taken 20'Lt.
 Estimated Earthwork Quantity: Exc. 6 Cu. Yds.

DRIVE (1) STA. 7+25 ORCHARD RD.
 Scale: Horizontal 1"=10', Vertical 1"=10'
 Section Taken 20'Lt.
 Estimated Earthwork Quantity: Exc. 6 Cu. Yds.



Quantity Calculations
 Made By RHA Date 2-68
 Checked By IM Date 4-70

FED. RD. DIVISION	STATE	PROJECT	
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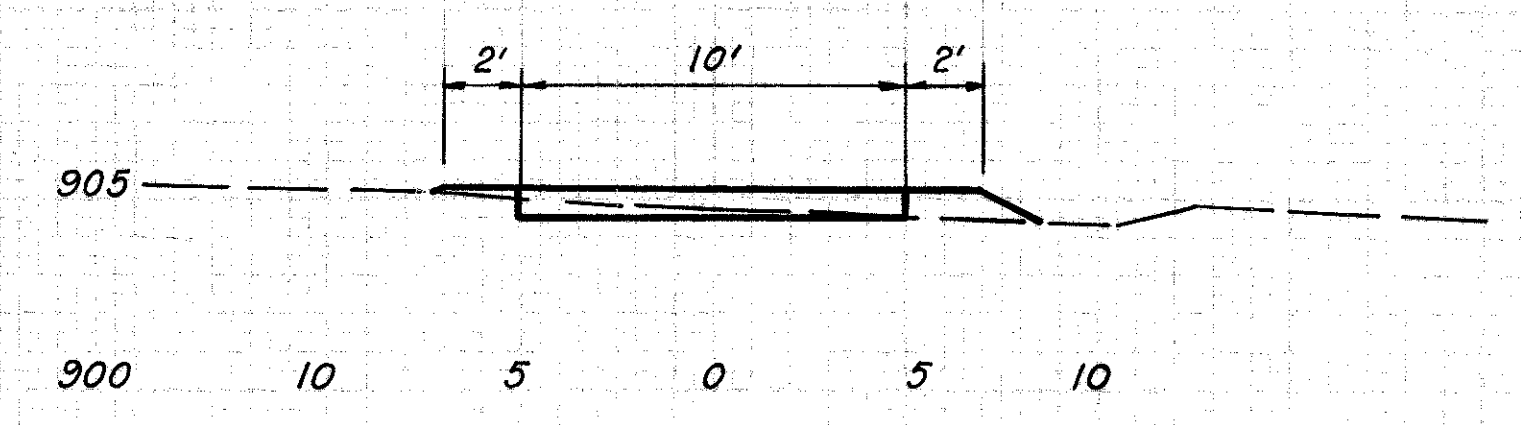
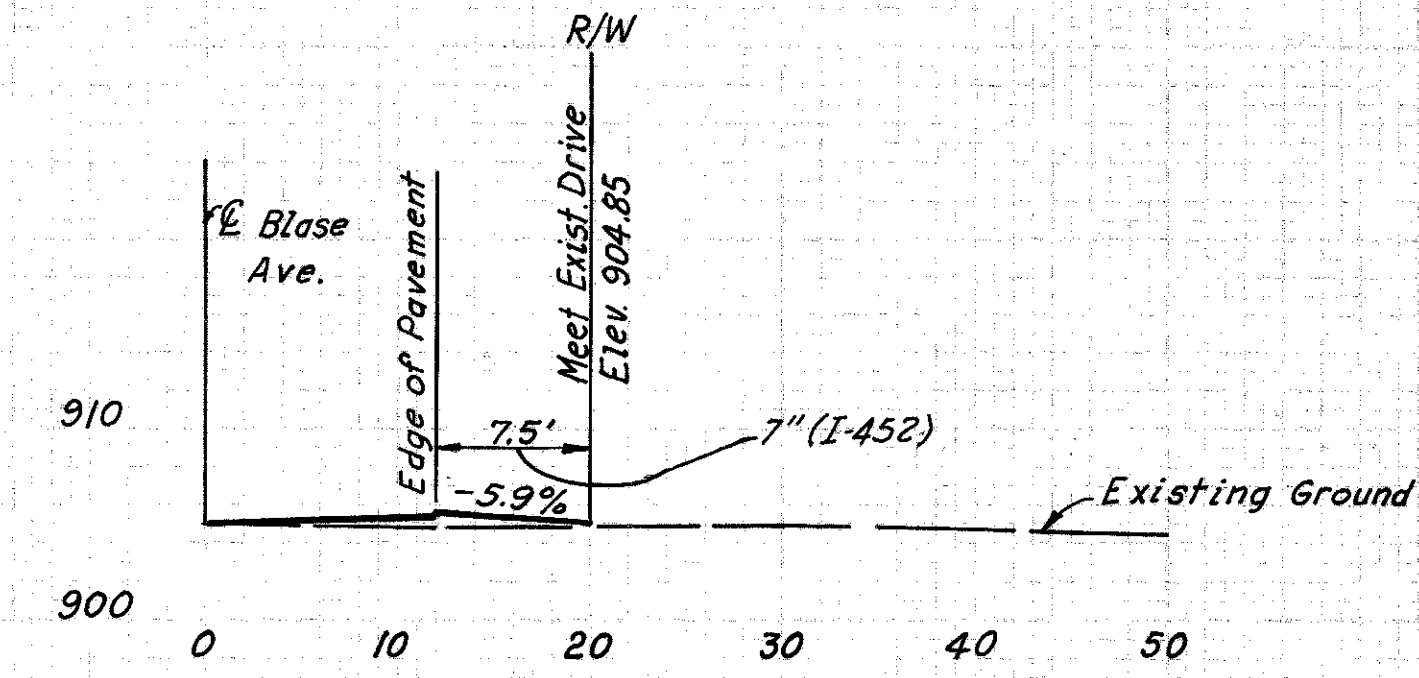
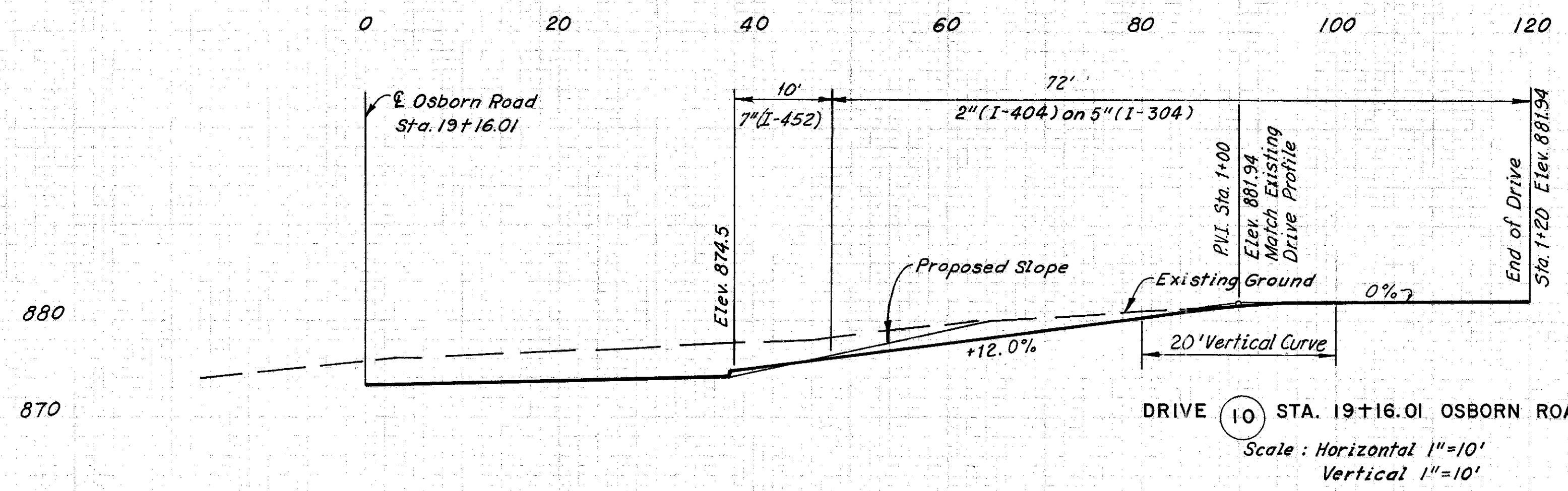
79
 390

Quantity Calculations
 Made By RHA Date 2-68
 Checked By IM Date 4-70

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

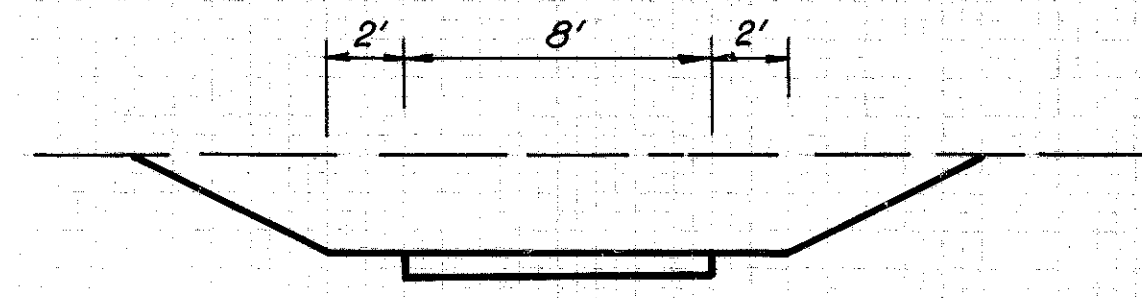
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CUYAHOGA COUNTY
 CUY. 480-21.40



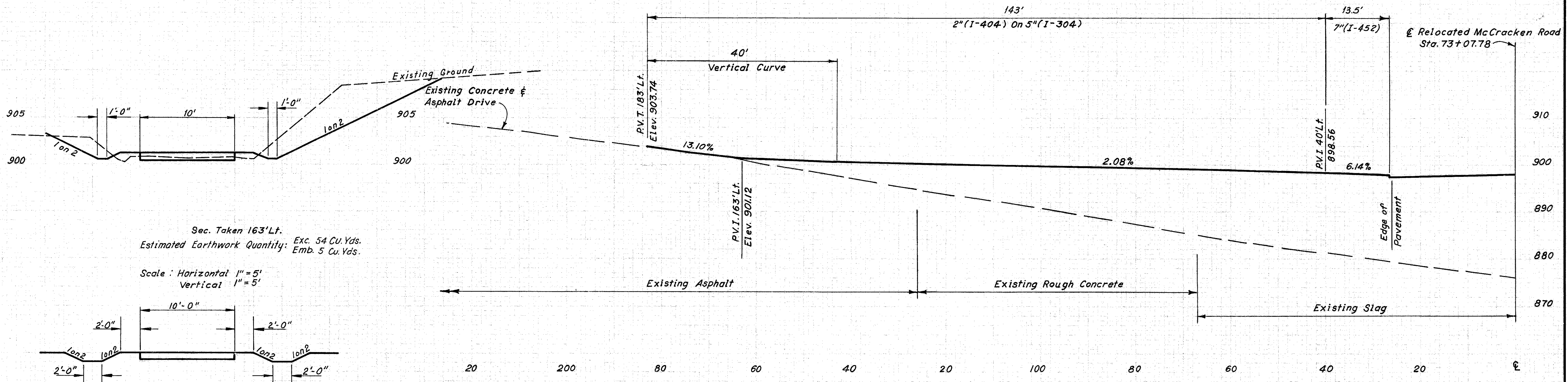
DRIVE 5 STA. 13+80.70 BLASE AVE.
 Scale: Horizontal 1"=10'
 Vertical 1"=10'

Sec. Taken 15' Rt.
 Estimated Earthwork Quantity: Exc. 2 Cu. Yds.
 Scale: Horizontal 1"=5'
 Vertical 1"=5'



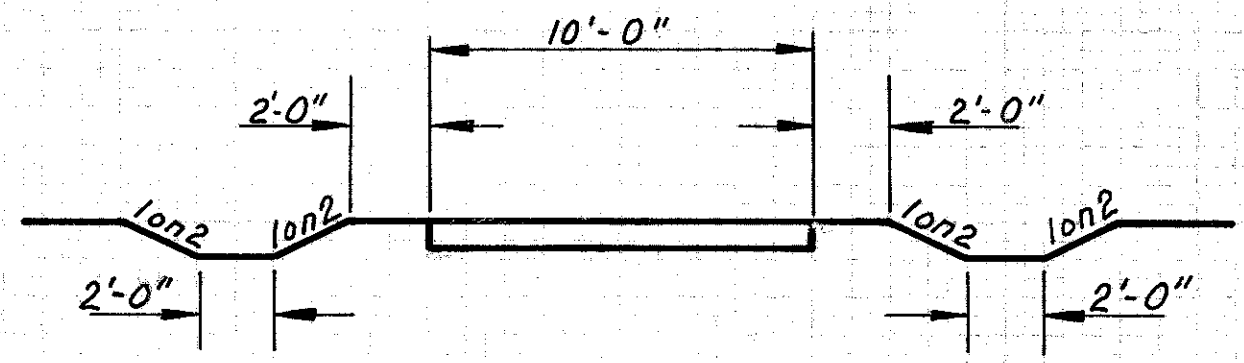
Sec. Taken Sta. 0+65 @ Drive (37.8' Rt. @ Osborn Road)
 Estimated Earthwork Quantity: Exc. 83 Cu. Yds.

Scale: Horizontal 1"=5'
 Vertical 1"=5'



Sec. Taken 163' Lt.
 Estimated Earthwork Quantity: Exc. 54 Cu. Yds.
 Emb. 5 Cu. Yds.

Scale: Horizontal 1"=5'
 Vertical 1"=5'



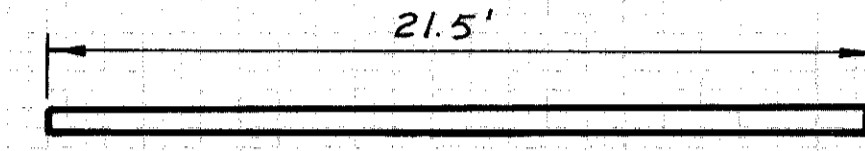
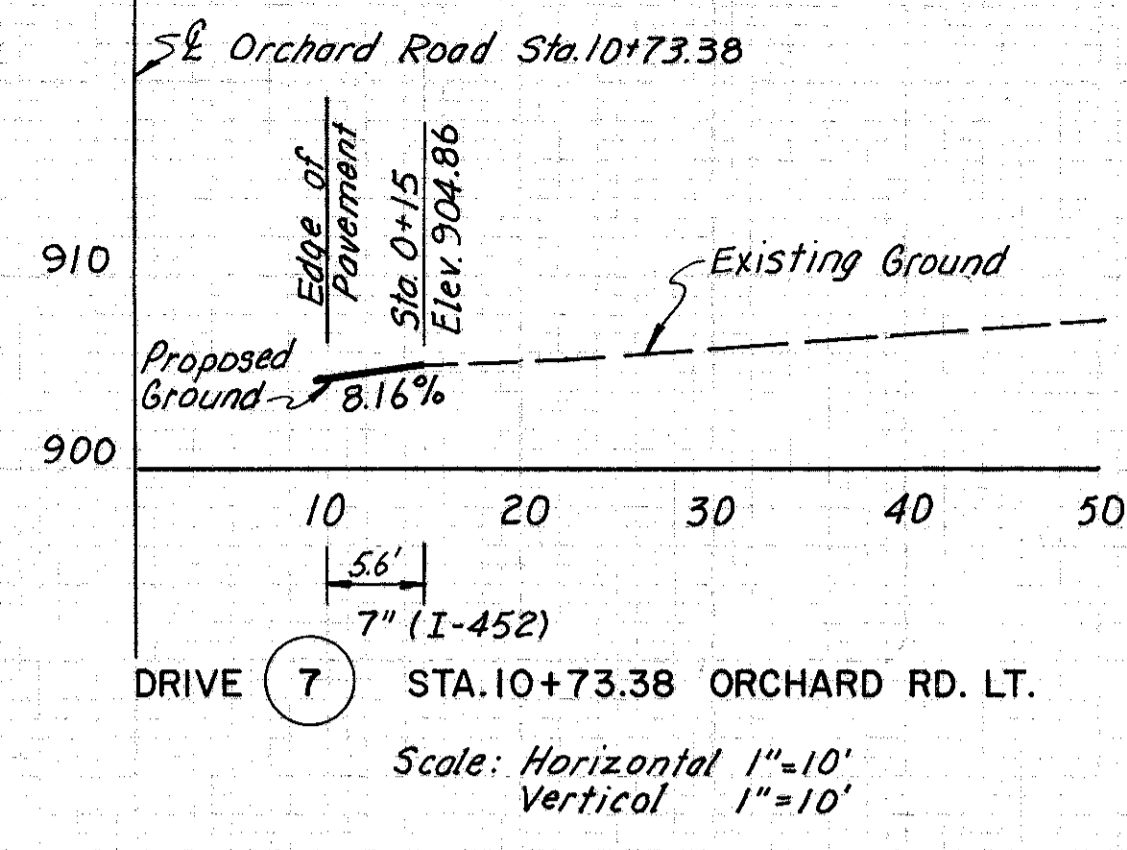
DRIVE 6 STA. 73+07.78 RELOC. McCracken Road
 Scale: Horizontal 1"=10'
 Vertical 1"=10'

Quantity Calculations
 Made By RHA Date 2-68
 Checked By IM Date 4-70

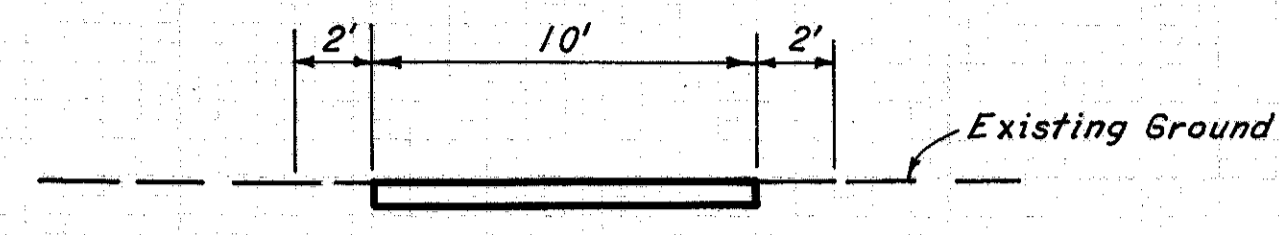
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY
 CUY. 480-21.40

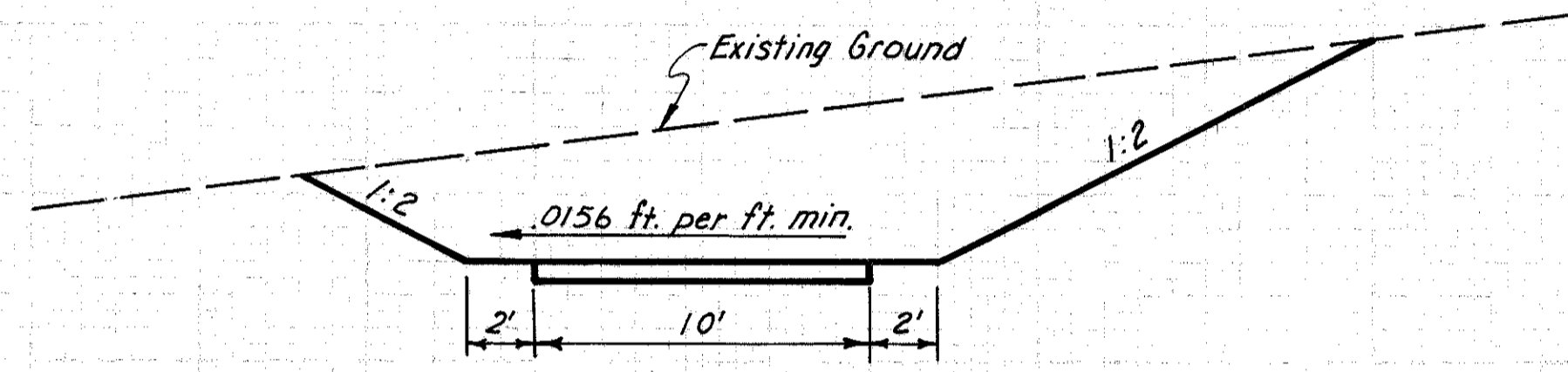


Section Taken Sta. 0+15
 Estimated Earthwork Quantity: Exc. 3 Cu.Yds.
 Scale: Horizontal 1"=5'
 Vertical 1"=5'



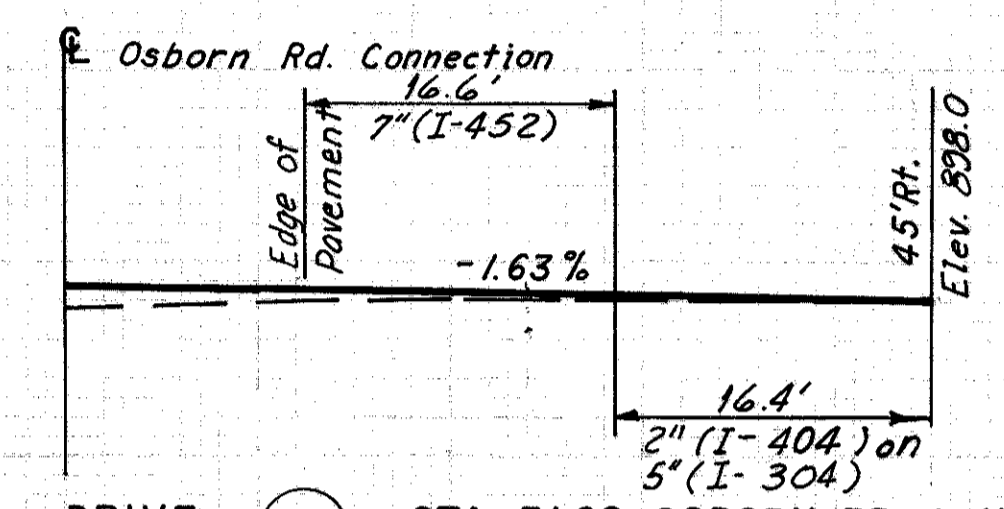
Section Taken Sta. 1+80
 Scale: Horizontal 1"=5'
 Vertical 1"=5'

DRIVE 8

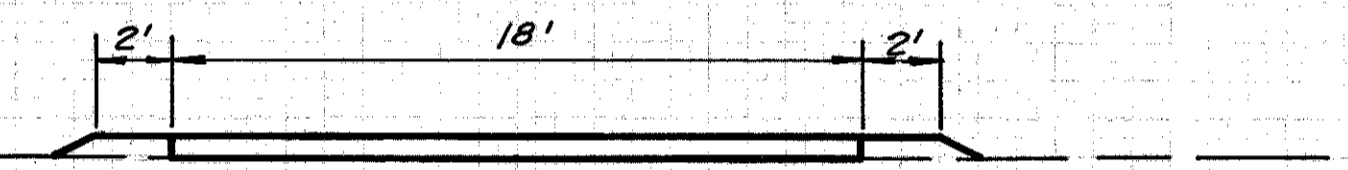


Section Taken 0+30
 Estimated Earthwork Quantity: Exc. 114 Cu.Yds.
 Emb. 128 Cu.Yds.
 Scale: Horizontal 1"=5'
 Vertical 1"=5'

DRIVE 8

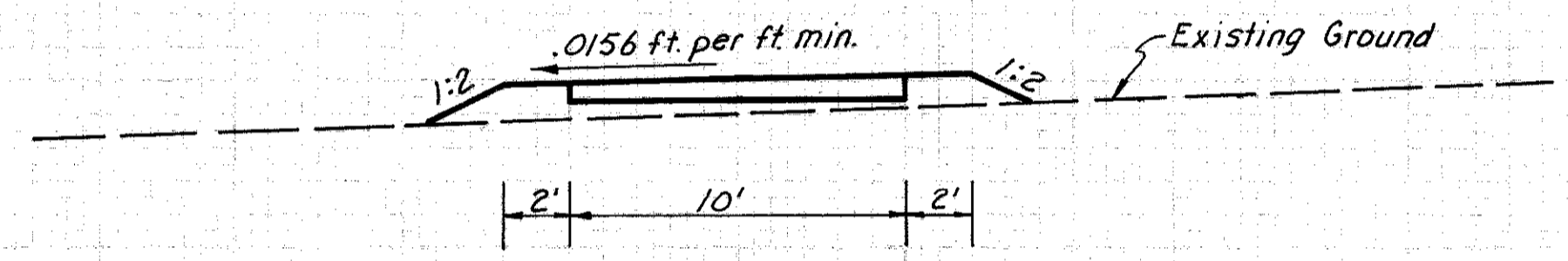


DRIVE 9 STA. 3+62 OSBORN RD. CONNECTION
 Scale: Horizontal 1"=10'
 Vertical 1"=10'

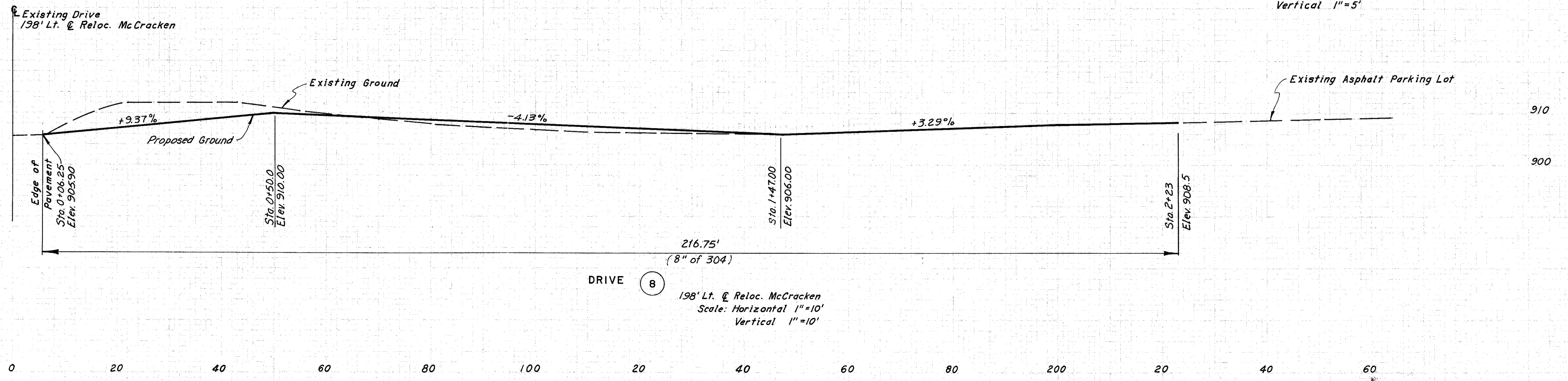


Section Taken 10' Rt.
 Estimated Earthwork Quantity: Exc. 7 Cu.Yds.
 Emb. 2 Cu.Yds.

Scale: Horizontal 1"=5'
 Vertical 1"=5'



DRIVE 8 Section Taken Sta. 1+10
 Scale: Horizontal 1"=5'
 Vertical 1"=5'

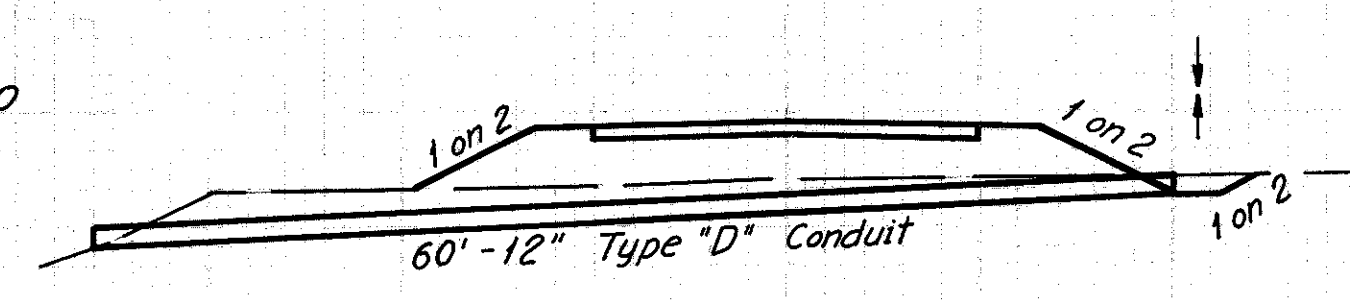
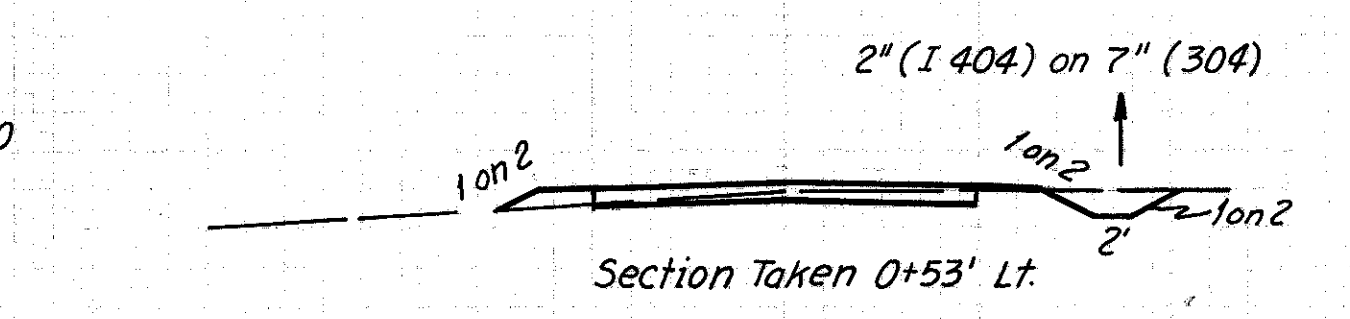
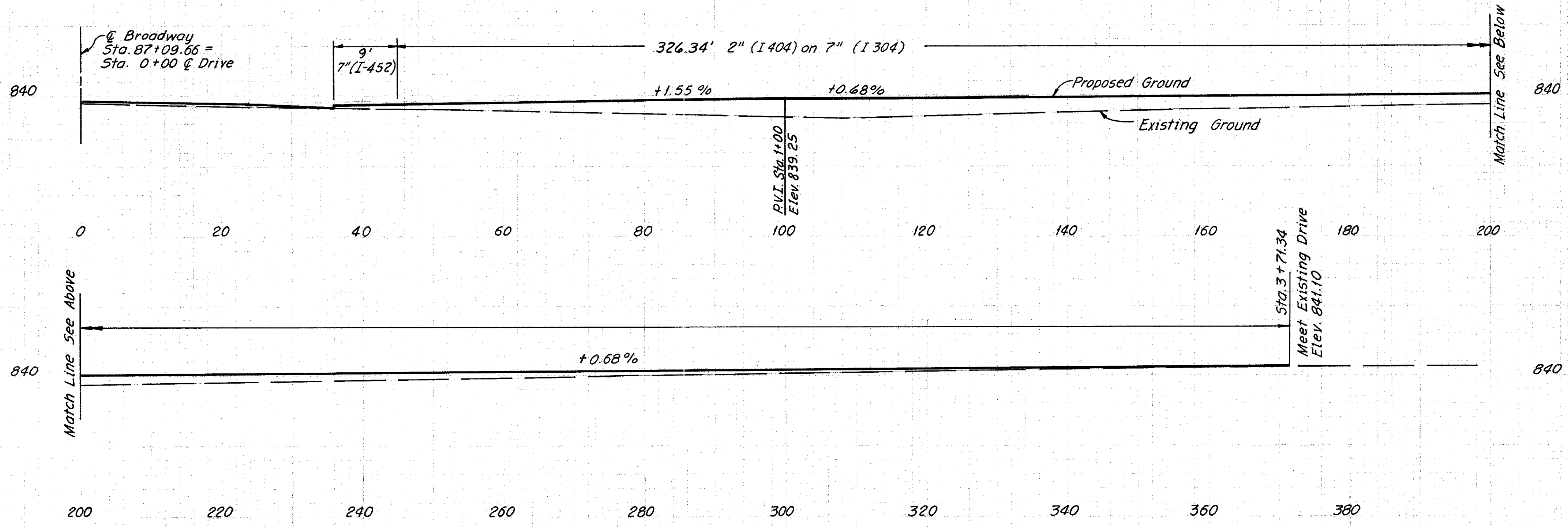


As shown R.T.M.
 Scale: Checked
 2-10-68
 4-1-70

Quantity Calculations
Made By *MNB* Date *2-70*
Checked By *IM* Date *4-70*

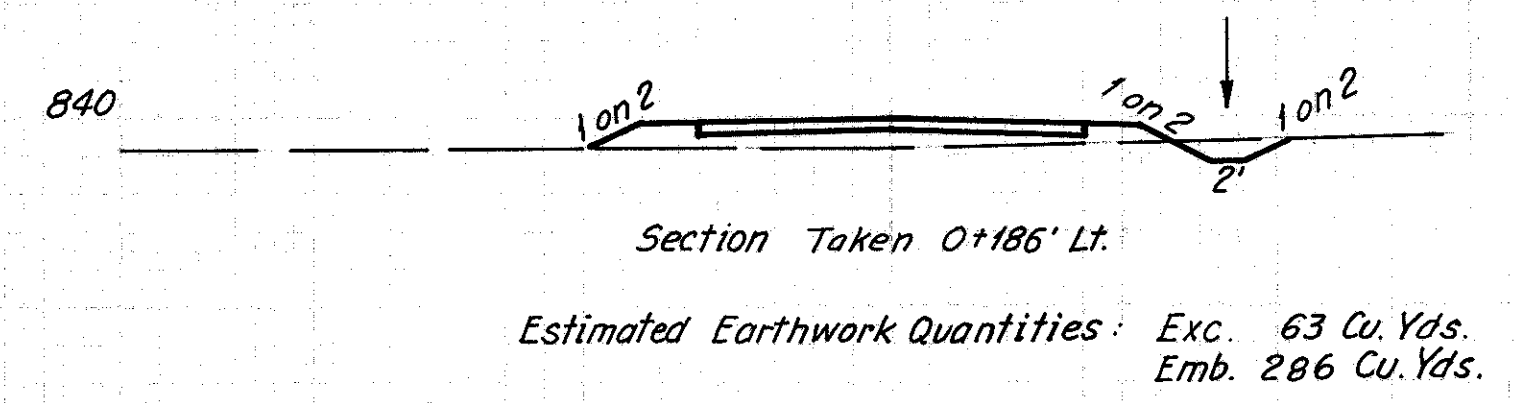
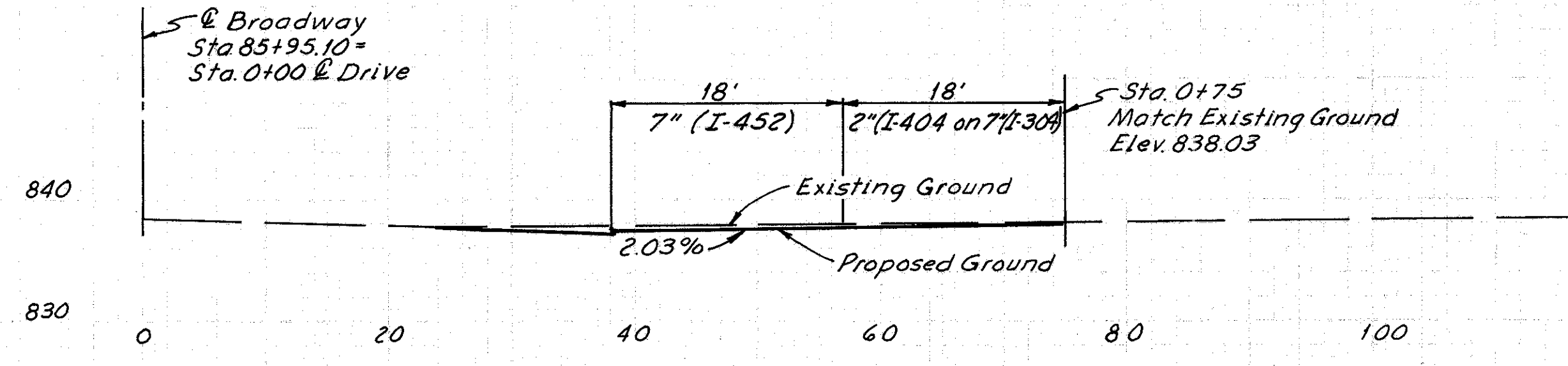
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY 480-21.40



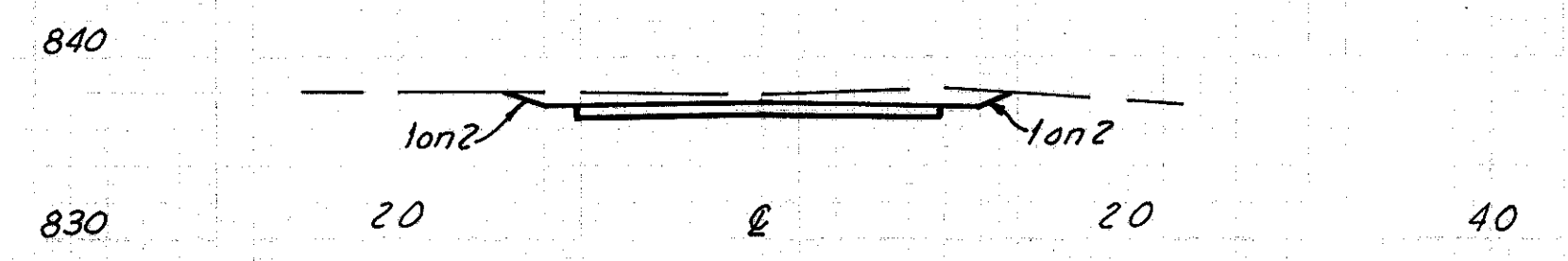
Section Taken 0+108' Lt.
(D-96)

DRIVE (1) STA. 87+09.66 @ BROADWAY AVE.
Scale: Horizontal & Vertical 1"=10'

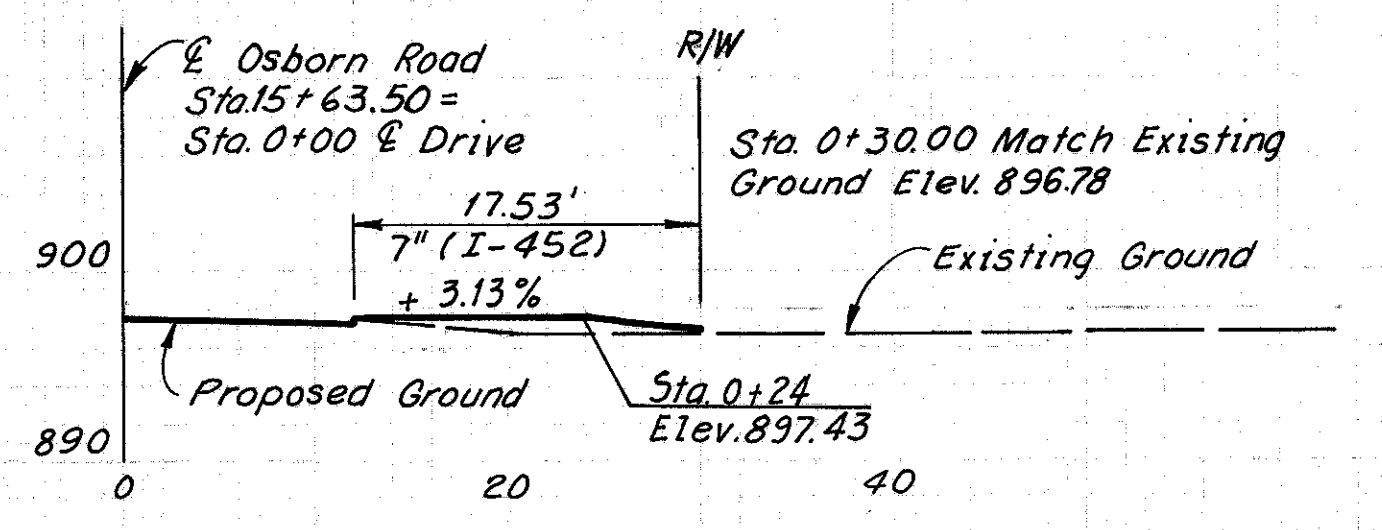


Section Taken 0+186' Lt.
Estimated Earthwork Quantities: Exc. 63 Cu. Yds.
Emb. 286 Cu. Yds.

DRIVE (2) STA. 85+95.10 @ BROADWAY AVE.
Scale: Horizontal & Vertical 1"=10'



Section Taken 0+50 Lt.
Estimated Earthwork Quantities: Exc. = 34 C.Y.



DRIVE (3) STA 15+63.50 @ OSBORN ROAD CONNECTION
Scale: Horizontal & Vertical 1"=10'

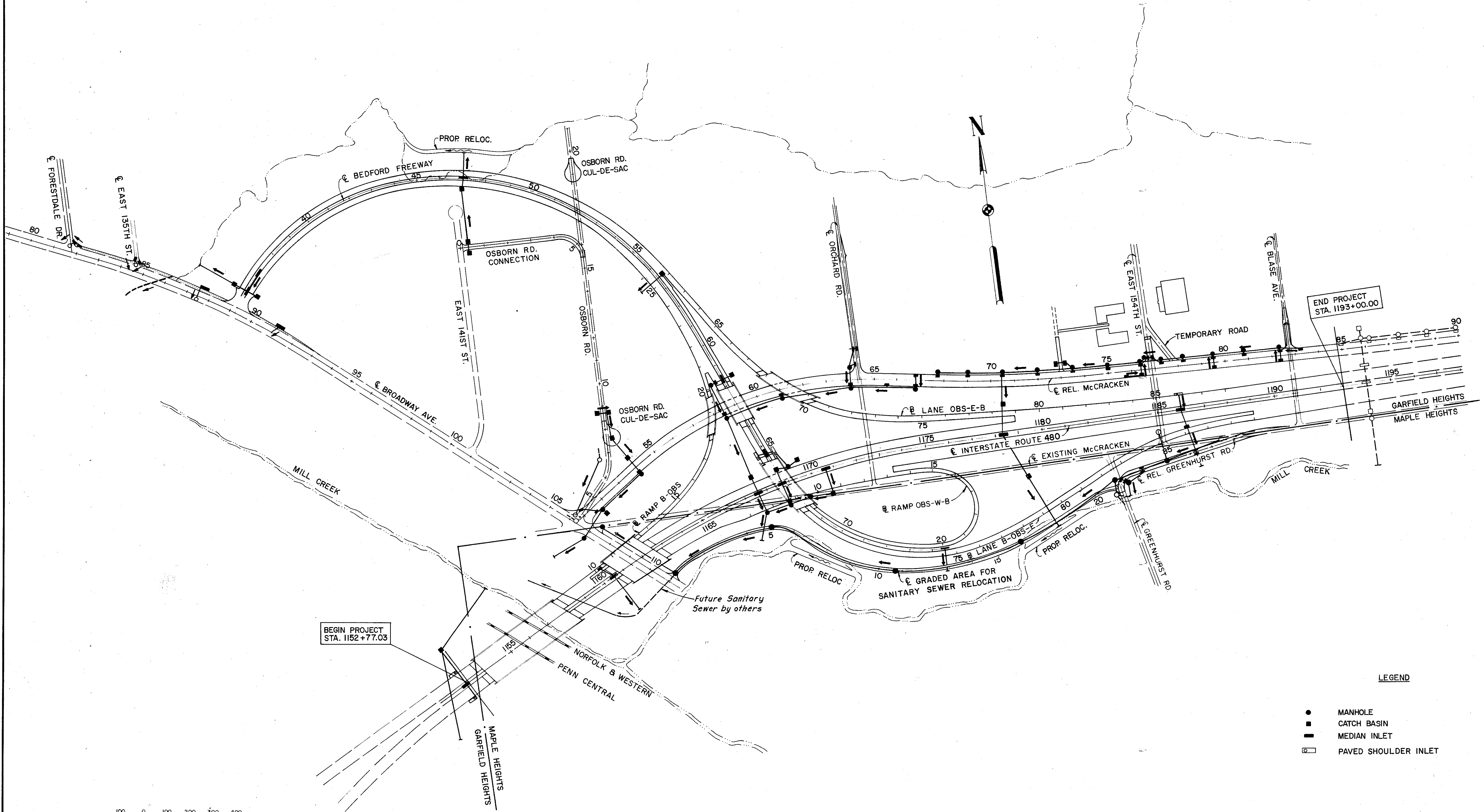
Scale: As shown
2-3-70
4-1-70
N. V. B.
I. M.
Checked

SCHEMATIC DRAINAGE PLAN

FED. RD. DIVISION: STATE PROJECT
 2 OHIO

83
 390

CUYAHOGA COUNTY
 CUY. 480-21.40

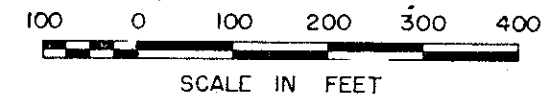


BEGIN PROJECT
 STA. 1152+77.03

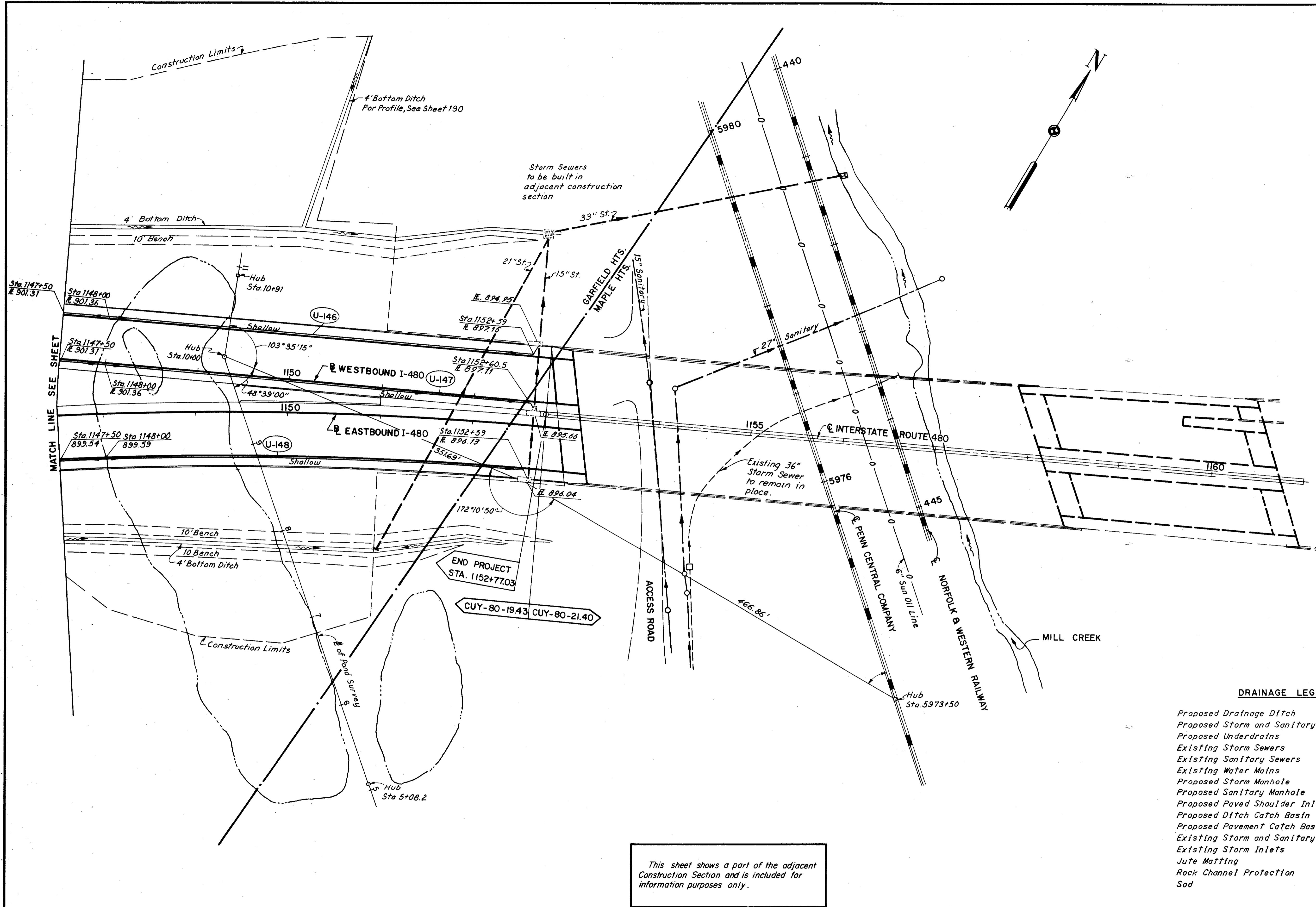
END PROJECT
 STA. 1193+00.00

LEGEND

- MANHOLE
- CATCH BASIN
- MEDIAN INLET
- ▭ PAVED SHOULDER INLET

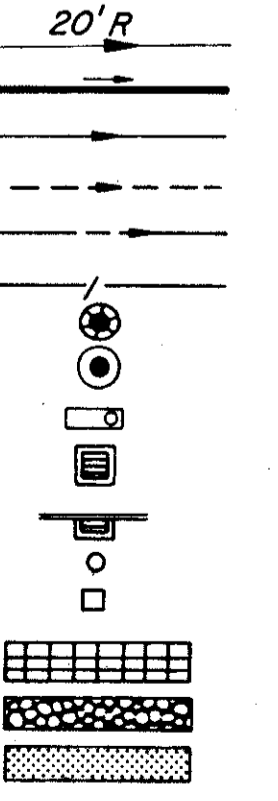


SCALE 1"=200'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE E.R.A. DATE 3-15-68 CONSULTING ENGINEERS
 F.R.D. DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK
 CKD I.M.



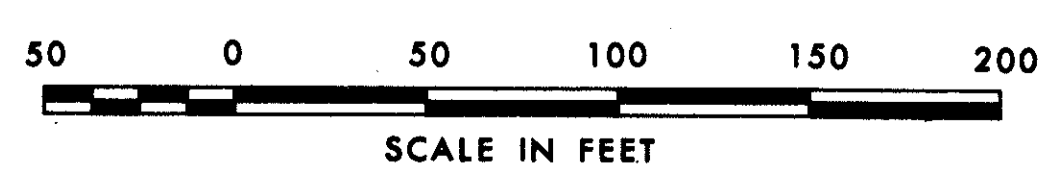
DRAINAGE LEGEND

- Proposed Drainage Ditch
- Proposed Storm and Sanitary Sewers
- Proposed Underdrains
- Existing Storm Sewers
- Existing Sanitary Sewers
- Existing Water Mains
- Proposed Storm Manhole
- Proposed Sanitary Manhole
- Proposed Paved Shoulder Inlet
- Proposed Ditch Catch Basin
- Proposed Pavement Catch Basin
- Existing Storm and Sanitary Manholes
- Existing Storm Inlets
- Jute Matting
- Rock Channel Protection
- Sod

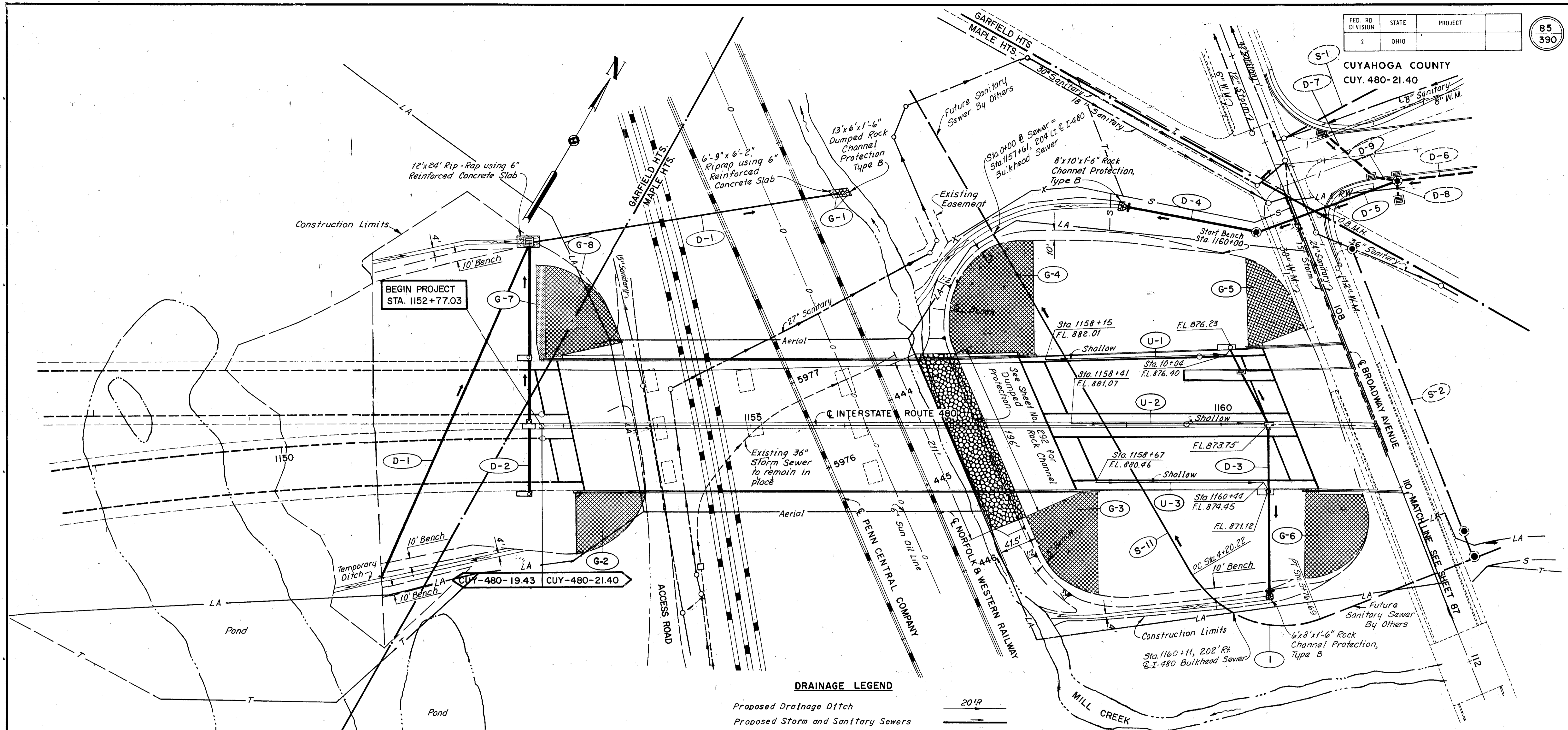


This sheet shows a part of the adjacent Construction Section and is included for information purposes only.

SCALE 1"=50'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE BY DATE 11/29/63
 TRCD BY DATE 11/21/63 CONSULTING ENGINEERS
 CKD RAE DATE 12/30/63 KANSAS CITY CLEVELAND NEW YORK



CUYAHOGA COUNTY
CUY. 480-21.40



DRAINAGE LEGEND

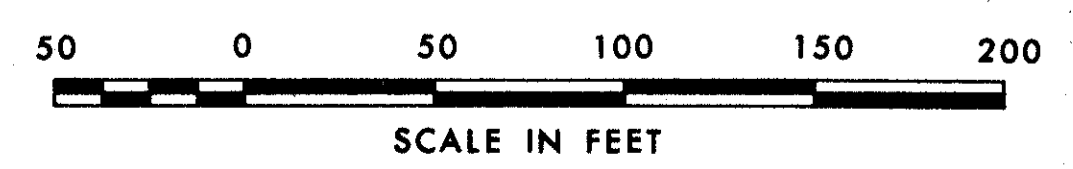
- Proposed Drainage Ditch
- Proposed Storm and Sanitary Sewers
- Proposed Underdrains
- Existing Storm Sewers
- Existing Sanitary Sewers
- Existing Water Mains
- Proposed Storm Manhole
- Proposed Sanitary Manhole
- Proposed Median Inlet
- Proposed Paved Shoulder Inlet
- Proposed Ditch Catch Basin
- Proposed Pavement Catch Basin
- Existing Storm and Sanitary Manholes
- Existing Storm Inlets
- Jute Matting
- Rock Channel Protection
- Sod
- Paved Gutter

Curve 1
P.I. Sta. 110+98.25, 227' Rt. E Broadway =
Sta. 5+15.00 E Sewer
 $\Delta = 81^{\circ}30'00''$
 $R = 110.00'$
 $T = 94.78'$
 $L = 156.47'$

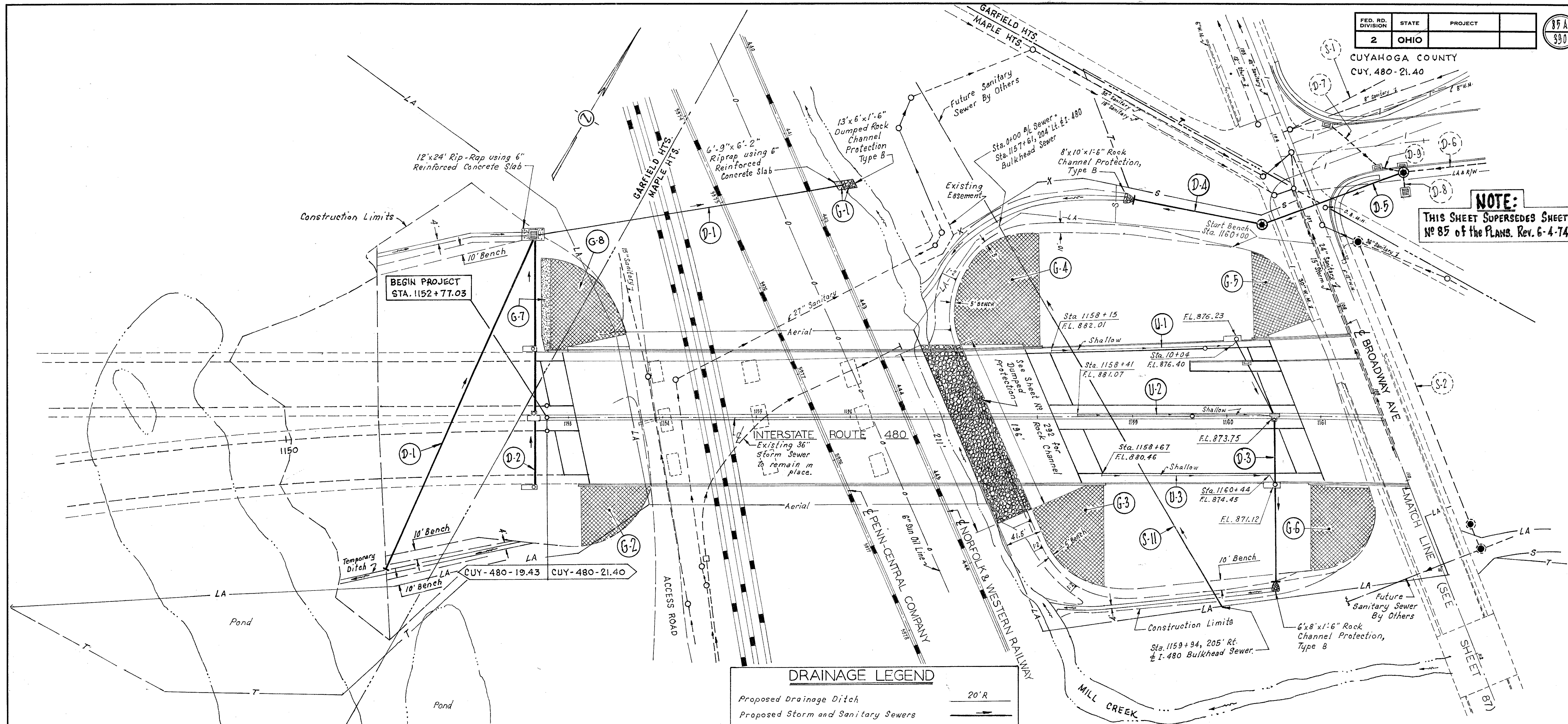
SANITARY (100% CLEVELAND REGIONAL SEWER DISTRICT)					
Ref. No.	Station	Side	Sewer Profile Sheet No.	603	603
				Type B	Type B
				706.02 C.I. II	706.02 C.I. III
				Fully Lined	Fully Lined
				as per 706.05	as per 706.05
				706.11 Joints	706.11 Joints
				48"	48"
				110'R. 48"	110'R. 48"
	From	To		Lin. Ft.	Lin. Ft.
S-11	157+61	160+11 Lt. & Rt.	120 A	420	64
Totals				420	64

For drainage quantities see sheet no. 86

SCALE 1"=50'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE E.R.A. DATE 3-20-68 CONSULTING ENGINEERS
TRCD. DATE KANSAS CITY CLEVELAND NEW YORK
CKD. I.M. DATE 4-1-70



NOTE:
THIS SHEET SUPERSEDES SHEET
NO 85 OF THE PLANS. REV. 6-4-74



DRAINAGE LEGEND

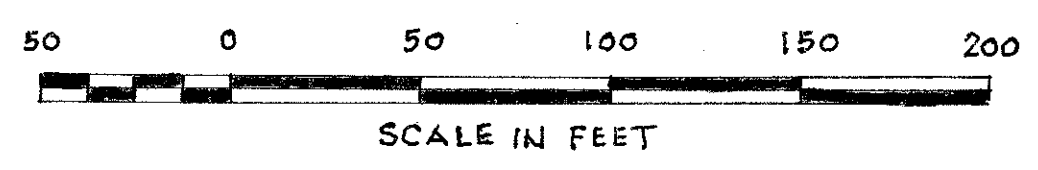
Proposed Drainage Ditch	20'R
Proposed Storm and Sanitary Sewers	—
Proposed Underdrains	—
Existing Storm Sewers	- - -
Existing Sanitary Sewers	- - -
Existing Water Mains	- - -
Proposed Storm Manhole	⊙
Proposed Sanitary Manhole	⊙
Proposed Median Inlet	⊙
Proposed Paved Shoulder Inlet	⊙
Proposed Ditch Catch Basin	⊙
Proposed Pavement Catch Basin	⊙
Existing Storm and Sanitary Manholes	○
Existing Storm Inlets	□
Jute Matting	▨
Rock Channel Protection	▨
Sod	▨
Paved Gutter	▨

***NOTE:** The 48" pipe shall have joints as per 706.11, and 1/3 (invert) vitrified clay lined as per 706.05. The remaining 2/3 shall be coated as per Coating Note on Sheet No 120 B.

SANITARY (100% CLEVELAND REGIONAL SEWER DISTRICT)

REF. NO.	Station		SIDE R or L	SEWER PROFILE Sheet No.	603	
	FROM	TO			TYPE B	706.02 Cl. I 1/3 Lined* as per 706.05 706.11 Joints 48"
S-11	157+61	159+94	R-L	120 B	472	
TOTALS					472	

For drainage quantities see sheet No 86



Quantity Calculations
 Made By J.M. Date 2-68
 Checked By M.N.B. Date 4-70

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

86
390

CUYAHOGA COUNTY
 CUY. 480-21.40

DRAINAGE																						
Ref. No.	Station		Side	Sewer Profile Sheet No.	602	603	603	603	603	603	603	603	604	604	604	604	604	604	604	604	603	
	From	To			Concrete Masonry	Type B	Type F	Type F 707.05	Type B 707.05	Type B	Type C 706.02 or 706.08 E.S. 707.13	Type B 706.02 Cl. Cl. III V	Std. No. 1-3B Median Inlet	Std. No. 2-A-6 Paved Shoulder Inlet	Std. No. 2-A-12 Paved Shoulder Inlet	Std. No. 2-A-14 Paved Shoulder Inlet	Std. No. 1 M.H.	Cuy. County No. 1 M.H.	Std. No. 4 C.B. Modified as per plan	Std. No. 6 C.B. as per plan	Type F Bend 15°30'	Type F Bend 17°30'
					Cu. Yds.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	33" Lin. Ft.
D-1	1150+00	I-480	Lt.Rt.	109	0.99			393			110 202						1					22
D-2	1152+65	I-480	Lt.Rt.	110		147		123				1		1	1							1
D-3	10+09.5	1160+50	Lt.Rt.	26-127	0.26	166	114					1	2					1	1	1		
D-4	106+98.86	Broadway	Rt.	111	0.47					140						1						
D-5	51+75	106+89.86	Lt.Rt.	111						67												
D-5	51+75	106+89.86	Lt.Rt.	111						93*						1*						
Totals: Participation III					1.7	313	114	123	393	67	140	110 202	2	2	1	1	1	1	1			22
Participation II*										93							1					-
Grand Total:					1.7	313	114	123	393	160	140	110 202	2	2	1	1	1	1	1			22

EROSION CONTROL							
Ref. No.	Station		Side	601	601	660	667
	From	To		Rip-Rap using 6" Reinf. Concrete Slab	Rock Channel Protect. Type B	Sodding Special Berm and Slope Protect.	Seeding and Jute Matting
				Sq. Yds.	Cu. Yds.	Sq. Yds.	Sq. Yds.
G-1	441+75			4	5.8		
G-2	1153+12	I-480	Rt.				292
G-3	1158+69.50	I-480	Rt.				616
G-4	1158+02	I-480	Lt.				1077
G-5	10+29	B-OBS					436
G-6	1160+90.2	I-480	Rt.				572
G-7	1152+77.03	I-480	Lt.			100	
G-8	1152+80.03	I-480	Lt.				608
D-1	1150+00	I-480	Lt.	29	5.3		
D-3	1160+50	I-480	Rt.		5.9		
D-4	106+98.86	Broadway	Rt.		3.6		
Totals: Participation III				33	21	100	3,601

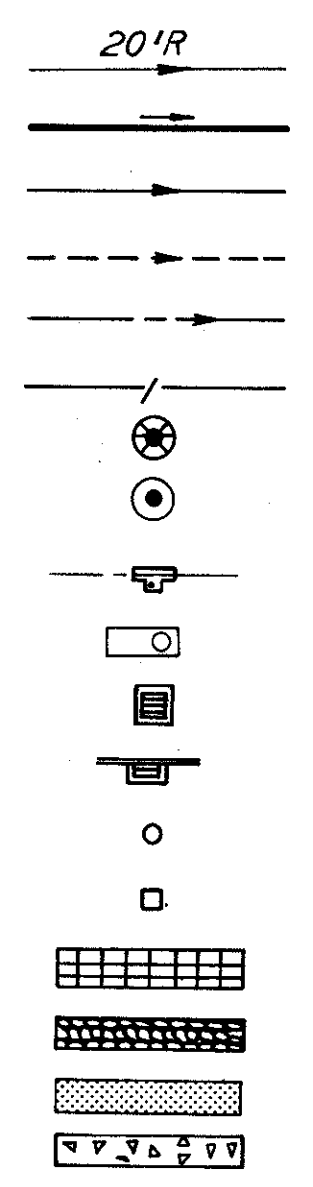
UNDERDRAINS						
Ref. No.	Station		Side	603	605	
	From	To		Type F 6"	Shallow 6"	60° Bend 6"
				Lin. Ft.	Lin. Ft.	Each
U-1	1158+15	1160+28	Lt.	10	185	1
U-2	1158+41	1160+50	Lt.	10	200	
U-3	1158+67	1160+50	Rt.	10	180	
Totals: Participation III				30	565	

Note: Each pipe run shows only the upstream drainage structures for quantities.
 For Drainage Structure Locations, See Sheet No. 85.

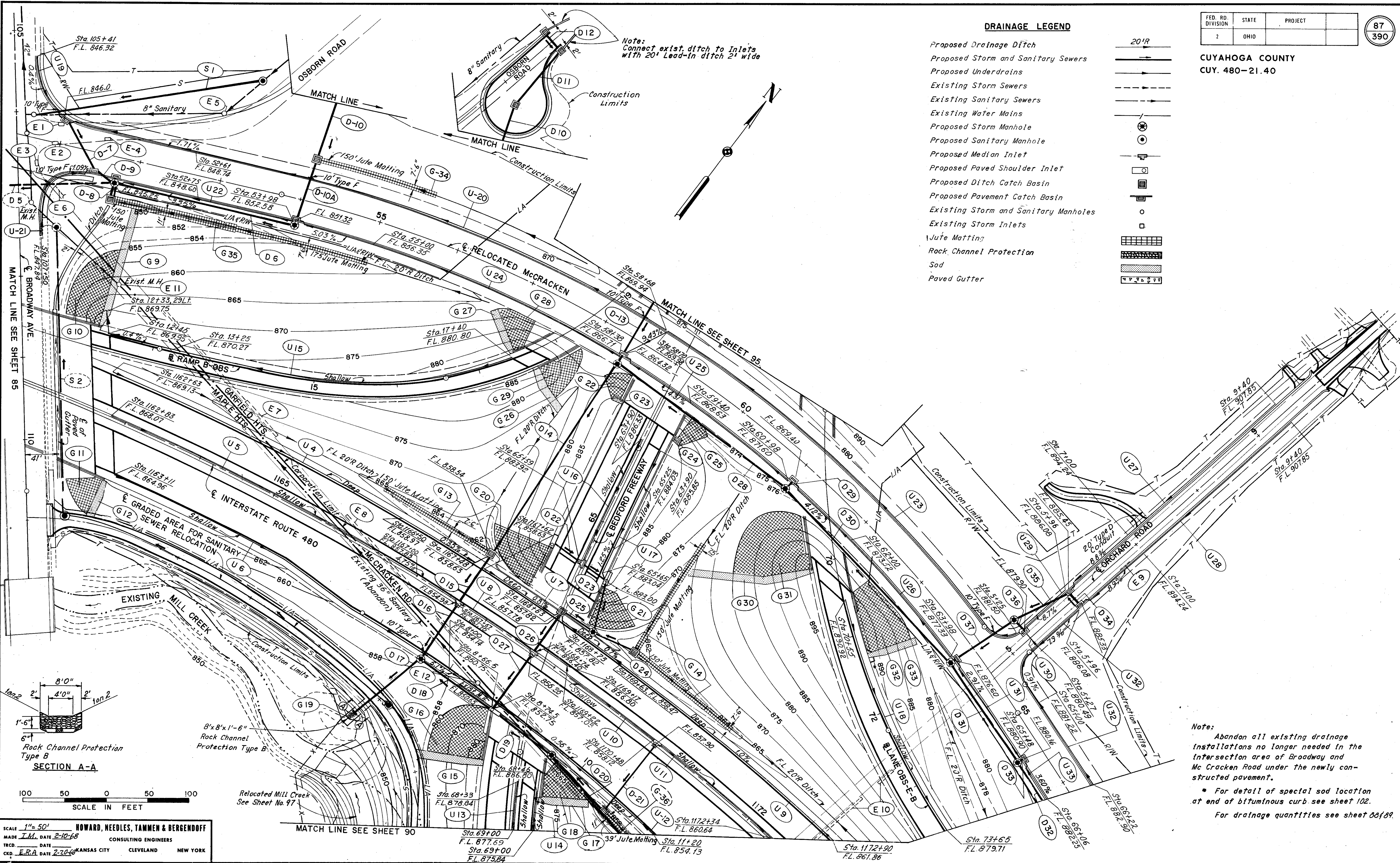
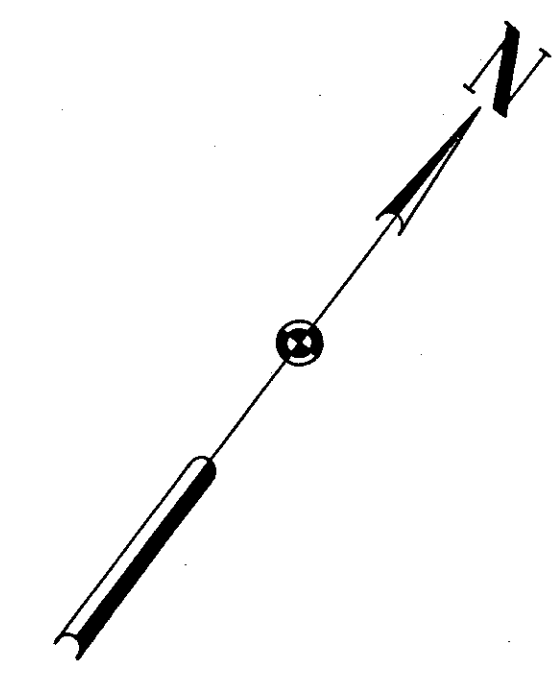
SCALE: _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE J.M. DATE 2-10-68 CONSULTING ENGINEERS
 TRCD. J.M.C. DATE 1-8-70
 CKD. M.N.B. DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

DRAINAGE LEGEND

- Proposed Drainage Ditch
- Proposed Storm and Sanitary Sewers
- Proposed Underdrains
- Existing Storm Sewers
- Existing Sanitary Sewers
- Existing Water Mains
- Proposed Storm Manhole
- Proposed Sanitary Manhole
- Proposed Median Inlet
- Proposed Paved Shoulder Inlet
- Proposed Ditch Catch Basin
- Proposed Pavement Catch Basin
- Existing Storm and Sanitary Manholes
- Existing Storm Inlets
- Jute Matting
- Rock Channel Protection
- Sod
- Paved Gutter



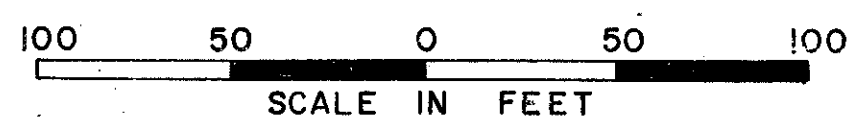
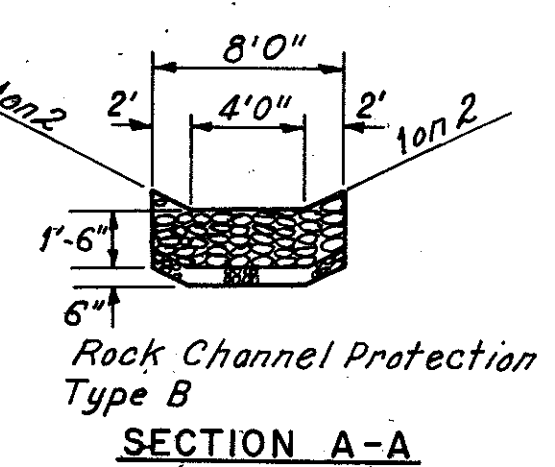
Note: Connect exist. ditch to inlets with 20' Lead-in ditch 2' wide



ALIGNMENT CHECKED	DATE
RIGHT OF WAY	
GRADES	
CONSTRUCTION NOTATIONS	

DRAWN BY	DATE
CHECKED	
QUANTITIES CHECKED	

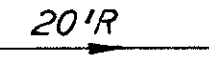
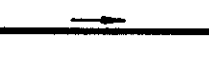
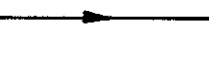

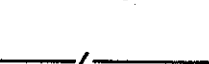


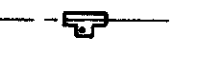






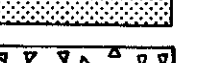



DRAWN BY	DATE
CHECKED	
QUANTITIES CHECKED	



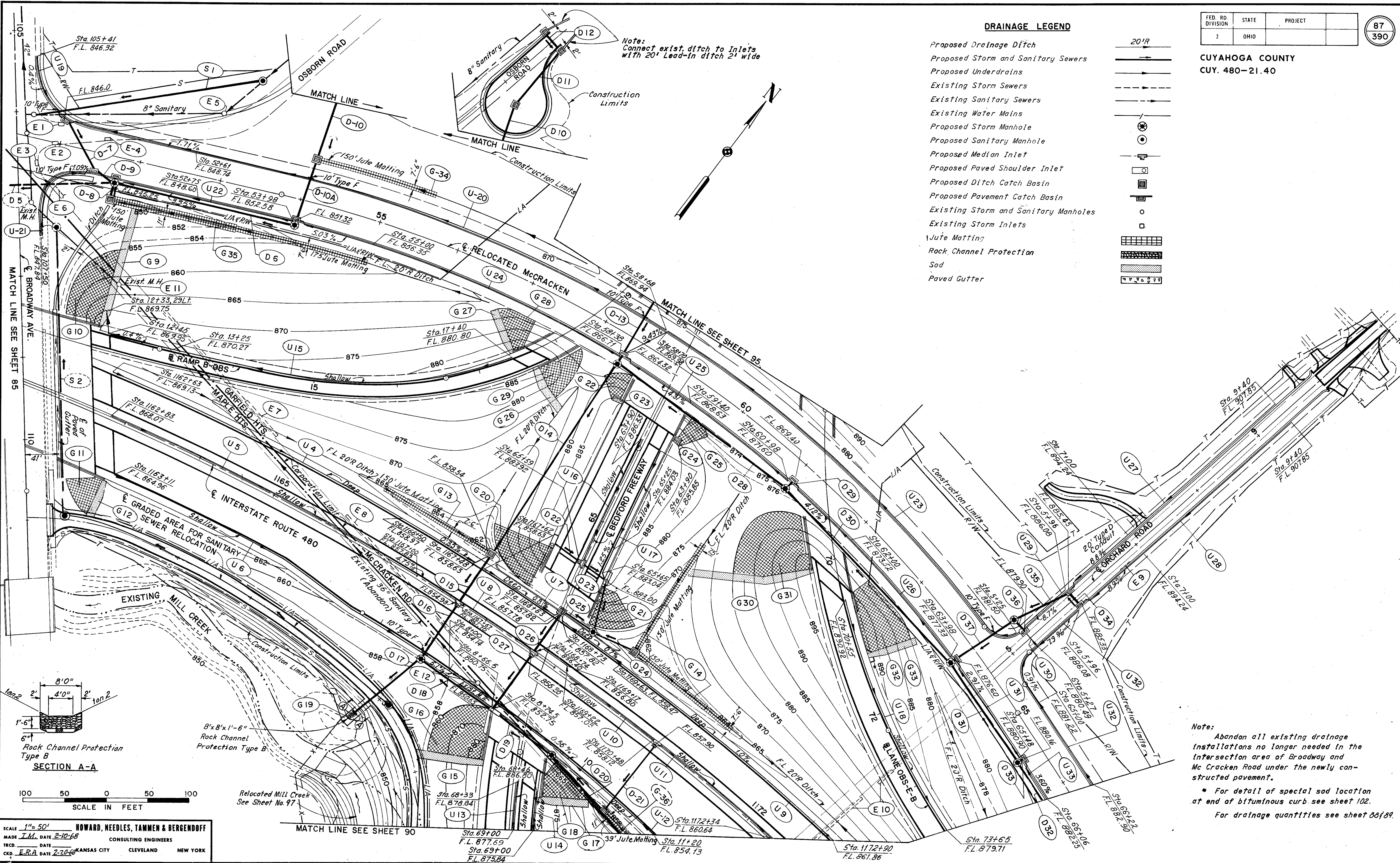
SCALE 1" = 50'
HOWARD, NEEDLES, TAMMEN & BERGENOFF
 MADE T.M. DATE 2-10-68 CONSULTING ENGINEERS
 TRCD. DATE
 CKD. E.R.A. DATE 2-20-68 KANSAS CITY CLEVELAND NEW YORK

Note: Abandon all existing drainage installations no longer needed in the intersection area of Broadway and McCracken Road under the newly constructed pavement.
 * For detail of special sod location at end of bituminous curb see sheet 102.
 For drainage quantities see sheet 0069.

DRAINAGE LEGEND

- Proposed Drainage Ditch 
- Proposed Storm and Sanitary Sewers 
- Proposed Underdrains 
- Existing Storm Sewers 
- Existing Sanitary Sewers 
- Existing Water Mains 
- Proposed Storm Manhole 
- Proposed Sanitary Manhole 
- Proposed Median Inlet 
- Proposed Paved Shoulder Inlet 
- Proposed Ditch Catch Basin 
- Proposed Pavement Catch Basin 
- Existing Storm and Sanitary Manholes 
- Existing Storm Inlets 
- Jute Matting 
- Rock Channel Protection 
- Sod 
- Paved Gutter 

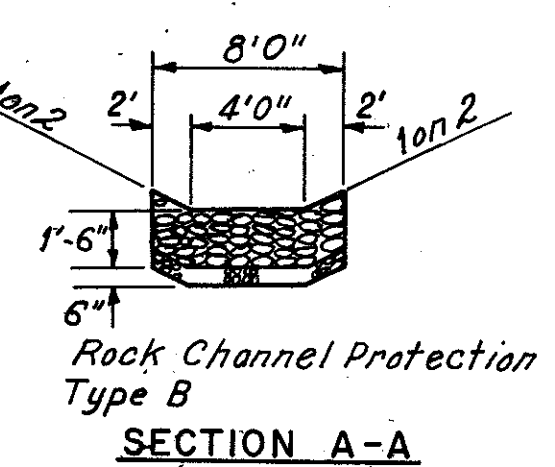
Note: Connect exist ditch to Inlets with 20' Lead-in ditch 2' wide



ALIGNMENT CHECKED	DATE
RIGHT OF WAY	
GRADES	
CONSTRUCTION NOTATIONS	

DRAWN BY	DATE
CHECKED	
QUANTITIES CHECKED	

DRAWN BY	DATE
CHECKED	
QUANTITIES CHECKED	



SCALE IN FEET
100 50 0 50 100

SCALE 1" = 50'
HOWARD, NEEDLES, TAMMEN & BERGENOFF
MADE I.M. DATE 2-10-68 CONSULTING ENGINEERS
TRCD. DATE
CKD. E.R.A. DATE 2-20-68 KANSAS CITY CLEVELAND NEW YORK

Note: Abandon all existing drainage installations no longer needed in the intersection area of Broadway and McCracken Road under the newly constructed pavement.
* For detail of special sod location at end of bituminous curb see sheet 102.
For drainage quantities see sheet 0069.

CUYAHOGA COUNTY
CUY.480-21.40

UNDERDRAINS												
Ref. No.	Station	Side	603	603	603	605	605	603	605	60° Bend	Tee	
			Type B 6"	Type D 6"	Type F 6"	Shallow 6"	Deep 6"	Type B 706.08 with Class C Bedding	706.08 Perf. as plan 6"			
			Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	6" Lin. Ft.	Lin. Ft.			Each
	From	To										
U-4	1162+63	1167+60	Lt.			10			497		1	
U-5	1162+83	1167+60	Lt.			10	467					
U-6	1163+11	8+70.50	Rt.			20	536				1	
U-7	1167+62	1168+68	Lt.			10		100			1	
U-8	1167+67	1168+68	Lt.			10	91					
U-9	1172+90	1168+68	Lt.			10		424			1	
U-10	1170+48	1168+68	Lt.			10	181				3	
U-11	1172+34	1170+55	Lt.			10	169					
U-12	11+20	1168+68	Rt.			10		242			1	
U-13	68+33	69+00	Lt.				67					
U-14	68+46	69+00	Lt.				54					
U-15	12+45	17+40	Lt.			10	515				1	
U-16	63+90	65+59	Rt.			10	159					
U-17	63+90	65+69	Lt.			10	169				1	
U-18	70+53	73+85	Lt.				310					
U-19	105+41	51+00	Lt.			20*				60*		
U-20	58+68	51+00	Lt.			30*				774*		
U-21	107+50	51+50	Lt.			10*				113*		
U-22	53+98	51+75	Rt.			10*				213*		
U-23	5+25	58+70	Lt.			10*			60*	560*	1	
U-24	58+38	54+00	Rt.			10*				428*		
U-25	60+98	58+40	Rt.			10*				248*		
U-26	63+98	61+00	Rt.			10*				288*		
U-27	9+40	8+00	Lt.		20	10	310					
U-28	9+40	6+00	Rt.			10	330					
U-29	5+96	5+27	Lt.			10	59					
U-30	5+27	Orchard	Lt.	25								
U-31	65+48	64+00	Rt.			10*				138*		
U-32	5+96	66+22	Lt.							261*		1*
U-33	66+06	65+50	Rt.			10*				46*		
Participation III				25	20	160	3,417	1,263				
Participation II*						130			60*	3,129		
Grand Total				25	20	290	3,417	1,263	60	3,129	11	

EROSION CONTROL								
Ref. No.	Station	Side	601	680	687	601	Tee	
			Rock Channel Protection Type B	Sodding Spec. Berm and Slope Protec.	Seeding and Jute Matting	Std. Type 1-2 Paved Gutter		
			Cu. Yds.	Sq. Yds.	Sq. Yds.	Lin. Ft.		
	From	To						
G-9	1162+28.5	I-80	Lt.		153			
G-10	1162+28.5	I-80	Lt.			370		
G-11	1163+06	I-80	Rt.			156		
G-12	1163+08	I-80	Rt.		48			
G-13	1166+10	1167+80	Lt.			125		
G-14	1169+63	1171+15	Lt.			250		
G-15	68+20	Bedford	Rt.		80			
G-16	68+20	Bedford	Rt.			445		
G-17	68+56	Bedford	Lt.		63			
G-18	68+56	Bedford	Lt.			175		
G-19	1167+25	I-80	Rt.	4.8				
G-20	65+52	Bedford	Rt.			314		
G-21	65+71	Bedford	Lt.			195		
G-22	63+57	Bedford	Rt.			75		
G-23	63+57	Bedford	Rt.		9			
G-24	63+68	Bedford	Lt.		9			
G-25	63+68	Bedford	Lt.			83		
G-26	17+64	B-OBS	Rt.		60			
G-27	17+45	B-OBS	Lt.		54			
G-28	17+45	B-OBS	Lt.			190		
G-29	17+64	B-OBS	Rt.			230		
G-30	70+11	OBS-EB	Rt.		150			
G-31	70+11	OBS-EB	Rt.			660		
G-32	71+27	OBS-EB	Rt.			380		
G-33	71+27	OBS-EB	Rt.		60			
G-34	54+08	55+58	Lt.			125*		
G-35	51+75	55+00	Rt.			329		
G-41	108+42	110+	Lt.				206	
Participation III				5.0	688	3,979	206	
Participation II*						125		
Grand Total				5.0	688	4,104	206	

DRAINAGE								
Ref. No.	Station	Side	202	202	202	202		
			Pipe Removed (15' and Under)	Gutter Removed	Manhole Abandoned	Catch Basin Removed	Struct. Removed	
			Lin. Ft.	Lin. Ft.	Each	Each	Lump Sum	
	From	To						
E-1	50+96	Rel. McCracken	Lt.				1*	
E-2	50+93	"	Rt.				1*	
E-3	50+78	"	Rt.				1*	
E-4	51+56	"	Lt.				1*	
E-5	52+88	"	Lt.			1*		
E-6	51+00	"	Rt.	15*				1*
E-7	13+00	14+63		50	150			
E-8	1165+90	1169+25			348			
E-9	6+65	6+80	Rt.	15				
E-10	1172+75	I-80	Lt.	15	135			1
E-11	1+97.19	McCracken	Rt.			1*		
E-12	8+45.59	McCracken	Rt.			1*		
Participation III				80	633			1
Participation II*				15			4	1
Sanitary						3		
Grand Total				95	633	3	4	2
*Denotes Sanitary								

SANITARY						
Ref. No.	Station	Side	Sewer Profile Sheet No.	603	604	
				Type B 706.08 ES with 706.12 Joints as per plan	Std. No. I-A.M.H. with 706.11 Joints as per plan	
	From	To				
S-1	106+04.5	7+00	Lt.	119	285	1
Totals					285	1

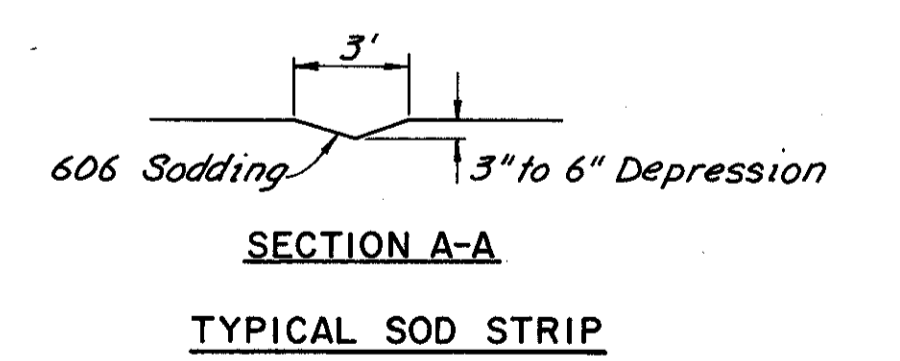
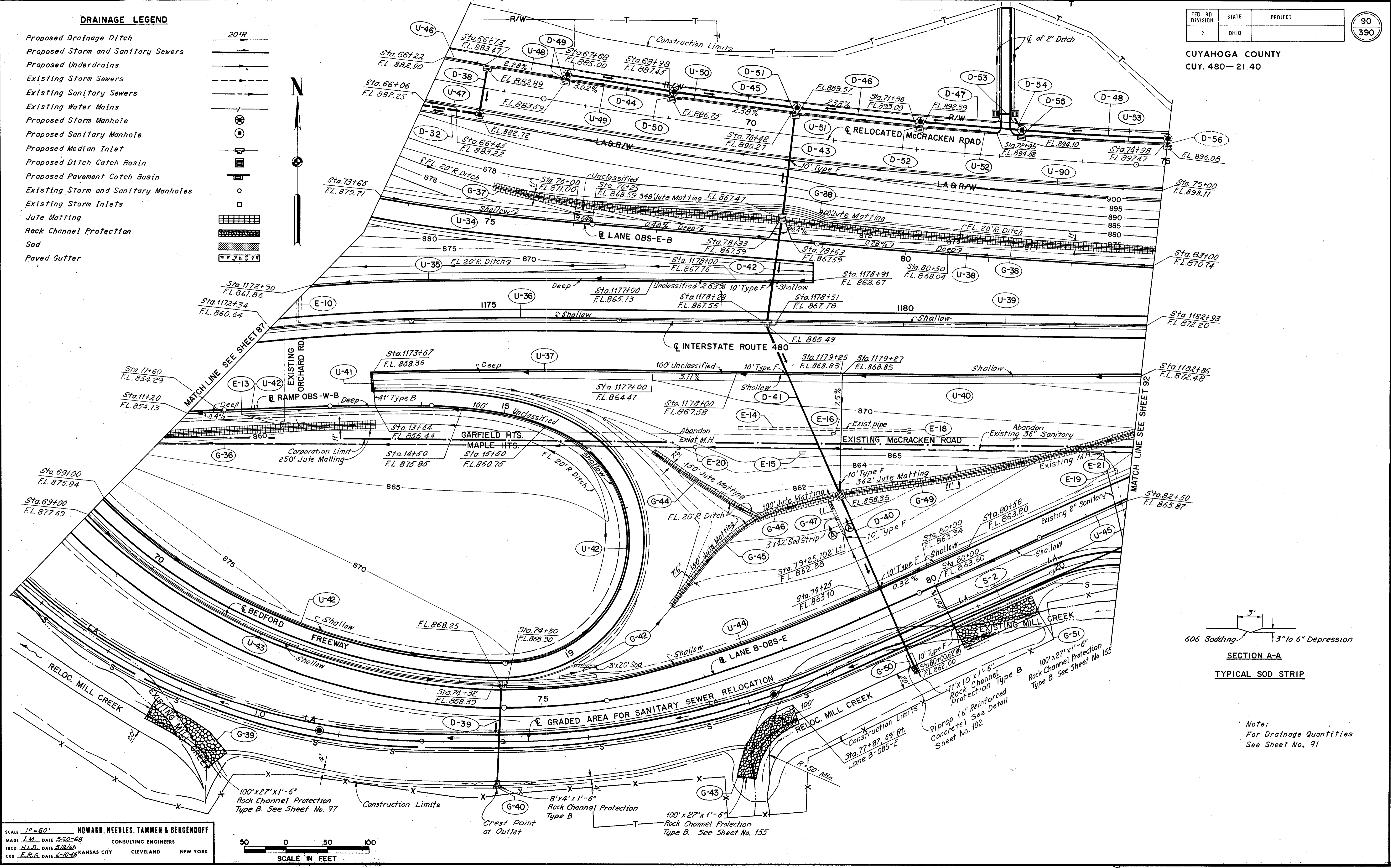
SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE J.M. DATE 2-10-68 CONSULTING ENGINEERS
 TRCD J.M.C. DATE 1-8-70
 CKD N.N.B. DATE 4-1-70 KANSAS CITY CLEVELAND NEW YORK

For Drainage Structure Locations, See Sheet No. 87
 *Denotes Participation II

CUYAHOGA COUNTY
CUY. 480-21.40

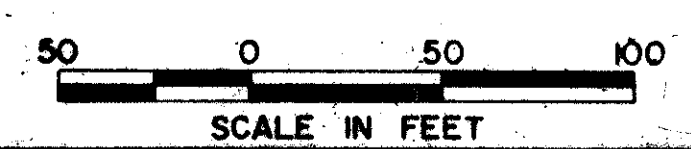
DRAINAGE LEGEND

- Proposed Drainage Ditch
- Proposed Storm and Sanitary Sewers
- Proposed Underdrains
- Existing Storm Sewers
- Existing Sanitary Sewers
- Existing Water Mains
- Proposed Storm Manhole
- Proposed Sanitary Manhole
- Proposed Median Inlet
- Proposed Ditch Catch Basin
- Proposed Pavement Catch Basin
- Existing Storm and Sanitary Manholes
- Existing Storm Inlets
- Jute Matting
- Rock Channel Protection
- Sod
- Paved Gutter



Note:
For Drainage Quantities
See Sheet No. 91

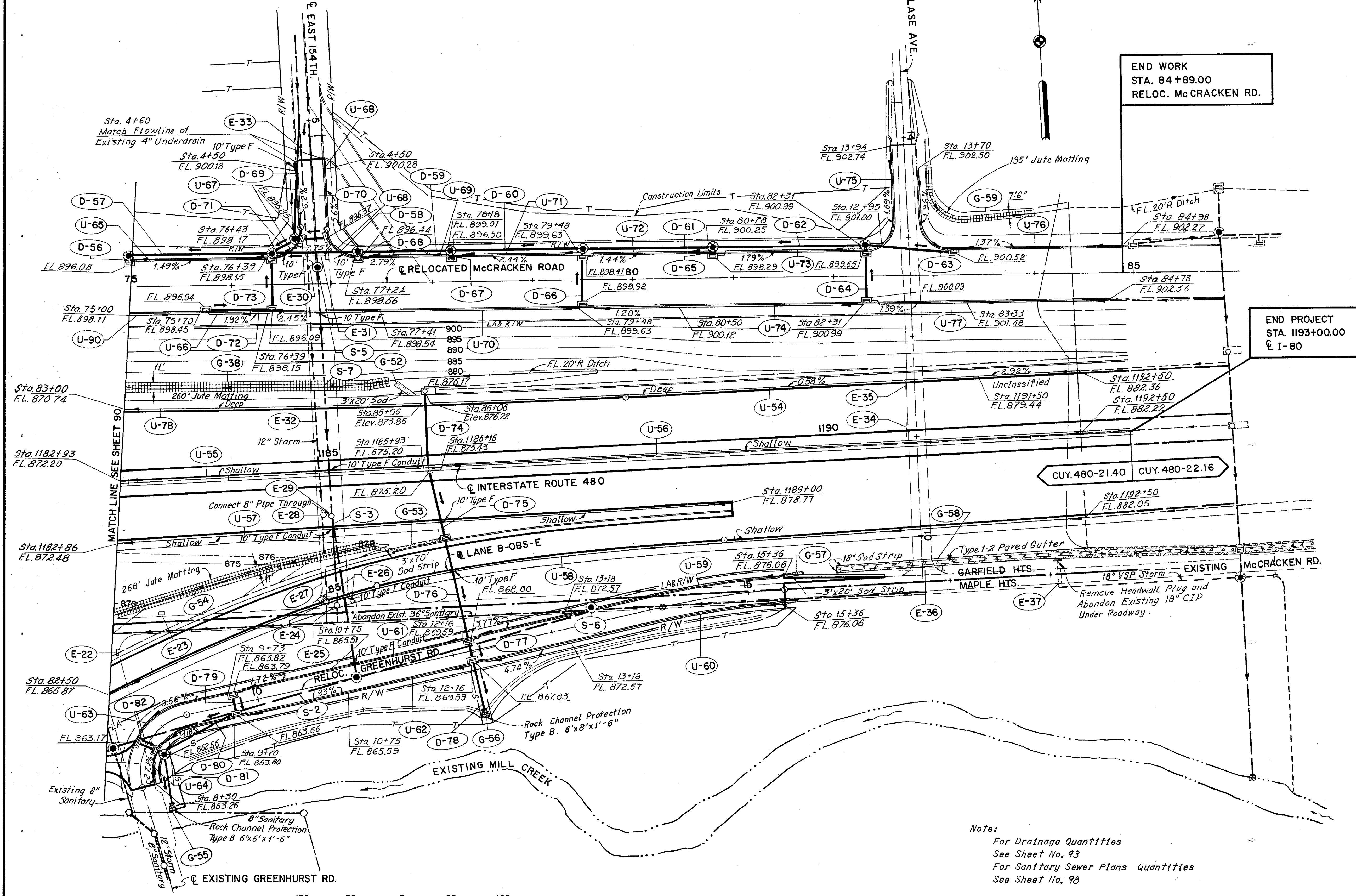
SCALE 1"=50'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE I.M. DATE 5-20-68 CONSULTING ENGINEERS
TRCD H.L.D. DATE 5/2/68
CKD E.R.B. DATE 6-10-68 KANSAS CITY CLEVELAND NEW YORK



CUYAHOGA COUNTY
CUY. 480-21.40

DRAINAGE LEGEND

- Proposed Drainage Ditch 20'R
- Proposed Storm and Sanitary Sewers
- Proposed Underdrains
- Existing Storm Sewers
- Existing Sanitary Sewers
- Existing Water Mains
- Proposed Storm Manhole
- Proposed Sanitary Manhole
- Proposed Median Inlet
- Proposed Paved Shoulder Inlet
- Proposed Ditch Catch Basin
- Proposed Pavement Catch Basin
- Existing Storm and Sanitary Manholes
- Existing Storm Inlets
- Jute Matting
- Rock Channel Protection
- Sod
- Paved Gutter



END WORK
STA. 84+89.00
RELOC. McCRACKEN RD.

END PROJECT
STA. 1193+00.00
I-80

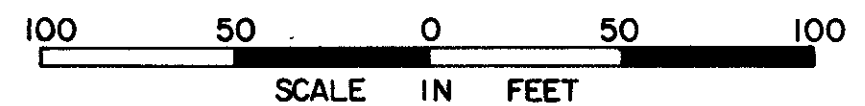
Note:
For Drainage Quantities
See Sheet No. 93
For Sanitary Sewer Plans Quantities
See Sheet No. 90

DATE	BY	CHECKED

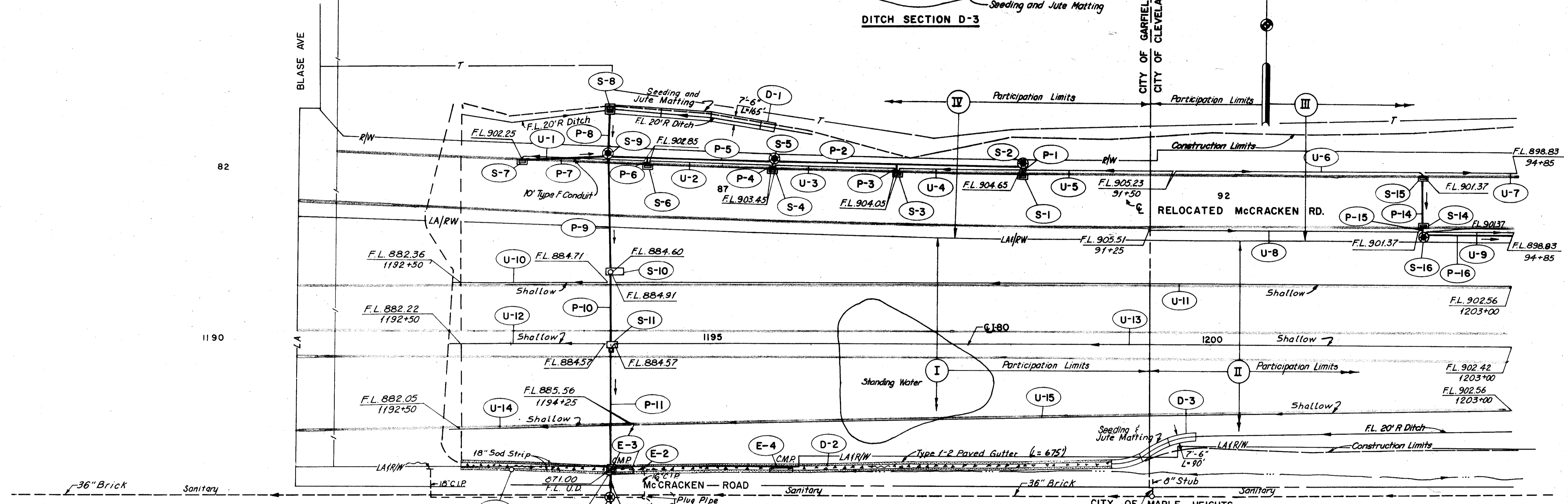
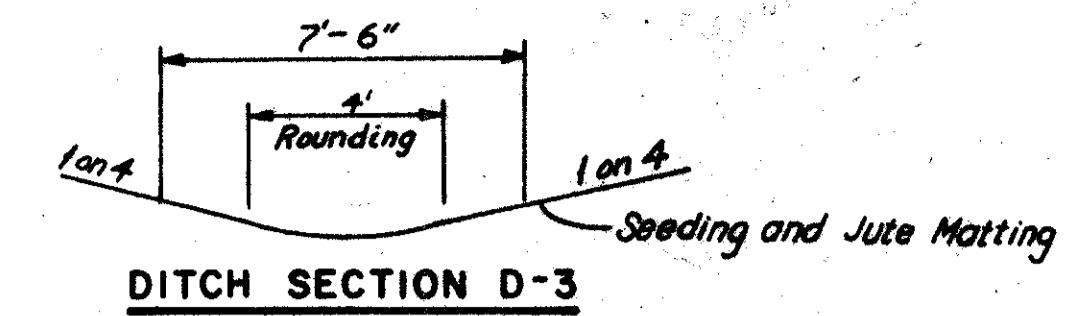
ALIGNMENT CHECKED	BY	DATE
GRADES		
STRUCTURE NOTATIONS		

DATE	BY	CHECKED

SCALE 1"=50'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE I.M. DATE 4-2-68
TRCD I.W. DATE 2-2-68
CKD E.R.A. DATE 4-10-68
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK



Note:
Do not disturb existing water pipe, under this Contract.



DRAINAGE LEGEND

- Proposed Storm and Sanitary Sewers
- Existing Storm Sewer and Sanitary Sewer
- Proposed Storm Manhole
- Proposed Sanitary Manhole
- Proposed Paved Shoulder Inlet
- Proposed Paved Shoulder Inlet Manhole
- Proposed Ditch Catch Basin
- Proposed Pavement Catch Basin
- Existing Storm and Sanitary Manhole
- Existing Storm Inlet
- Seeding and Jute Matting
- Paved Gutter
- Sodding
- Top of Cut Slope
- Toe of Fill Slope



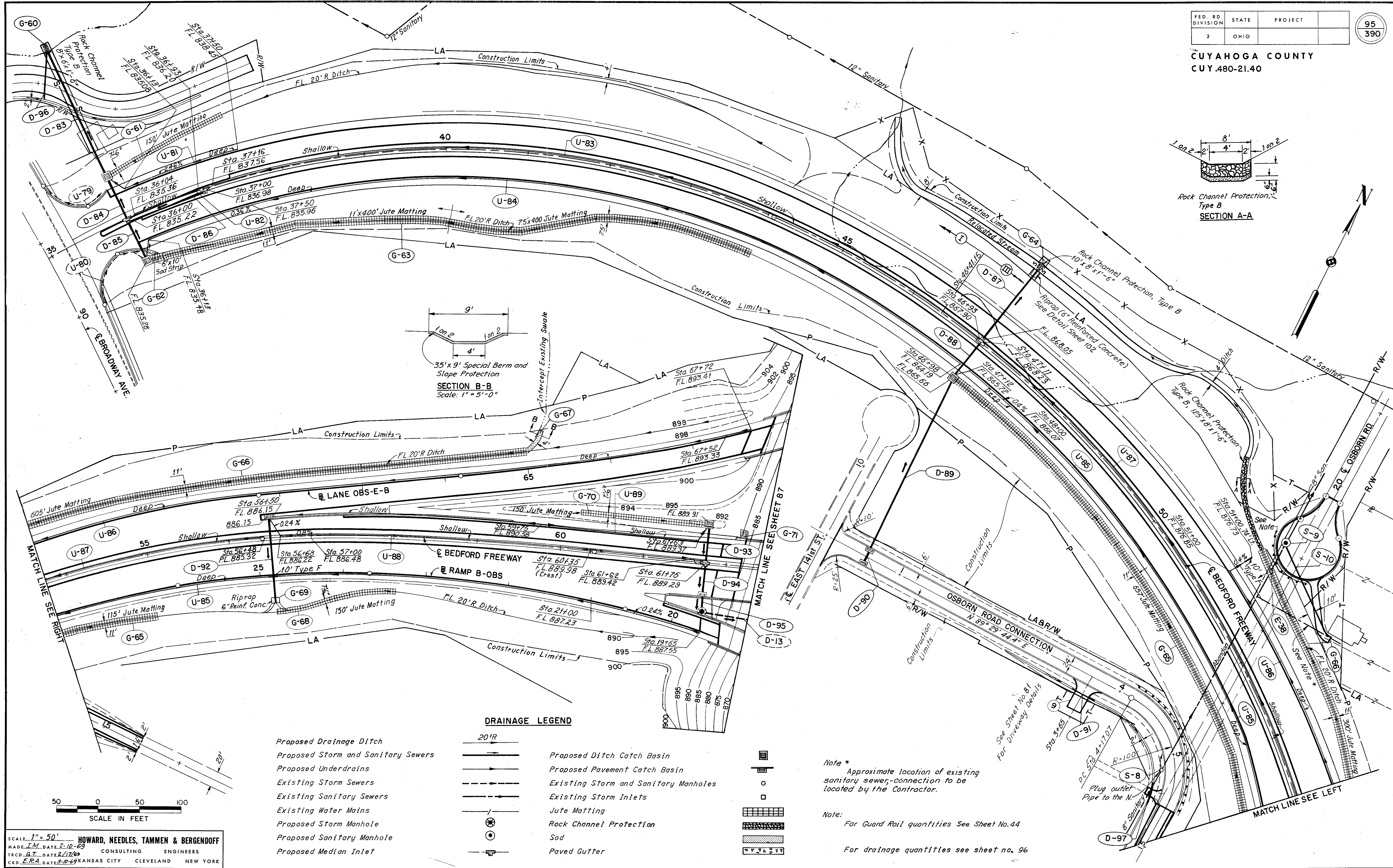
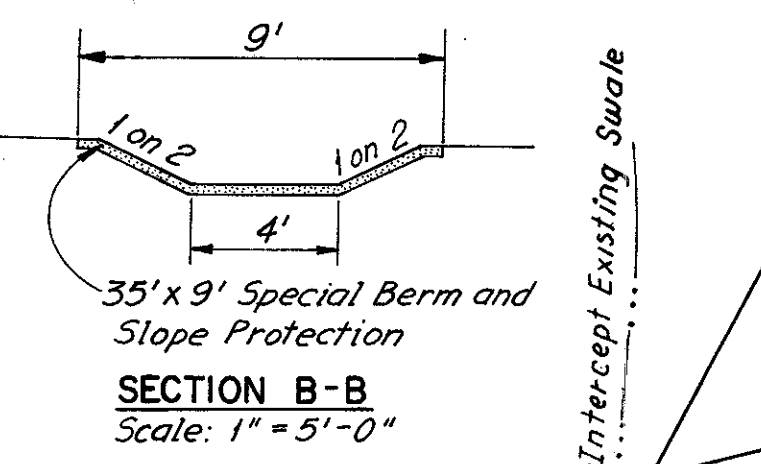
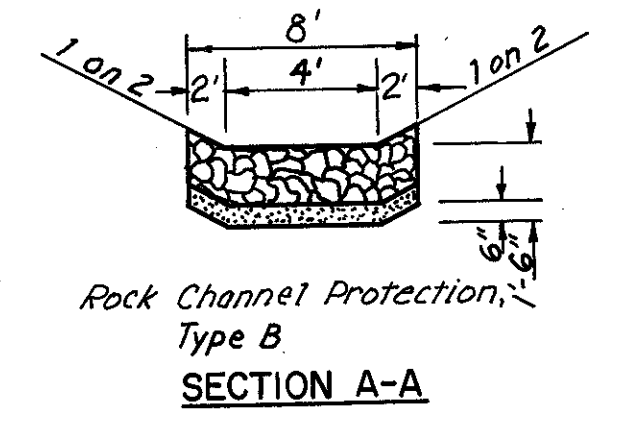
SCALE 1"=50'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE D.D.S. DATE 4-2-60 CONSULTING ENGINEERS
TRCD D.D.S. DATE 4-3-68
CKD D.C.F. DATE 8-21-67 KANSAS CITY CLEVELAND NEW YORK

Plug with Class "E" concrete. Payment to be included in 203 Excavation

This sheet shows a part of the adjacent Construction Section and is included for information purposes only.

Note: All existing sewer pipes are storm sewers unless otherwise stated.

Note:
See Sheet 74 for Drainage Quantities.
See Sheet 79 for Drainage Quantities D-1, D-2, D-3, D-33 & R-12

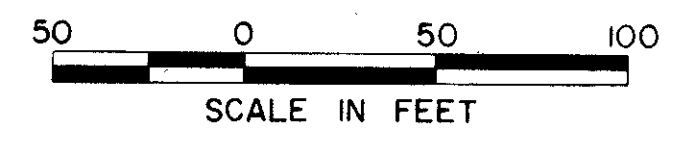


DRAINAGE LEGEND

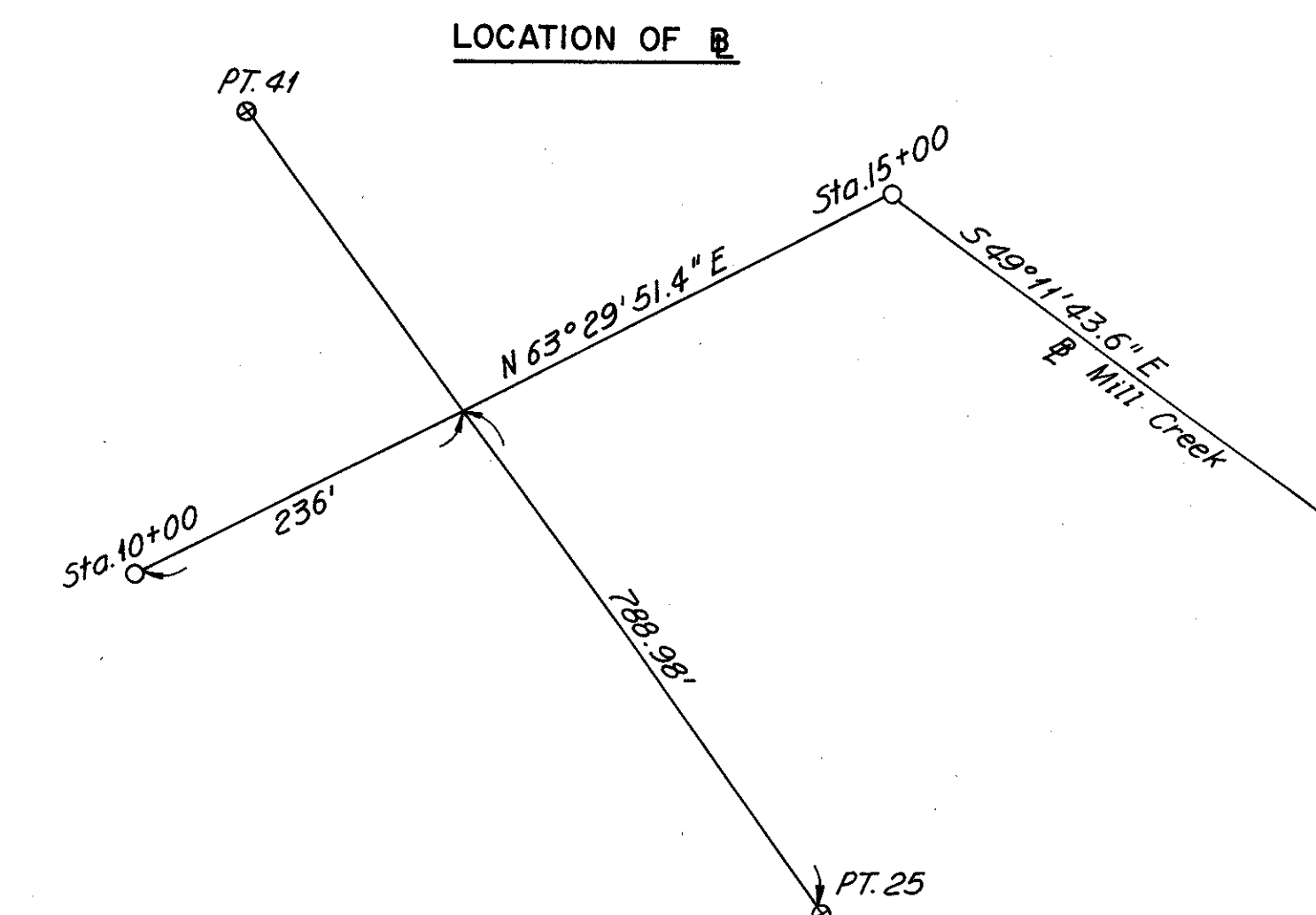
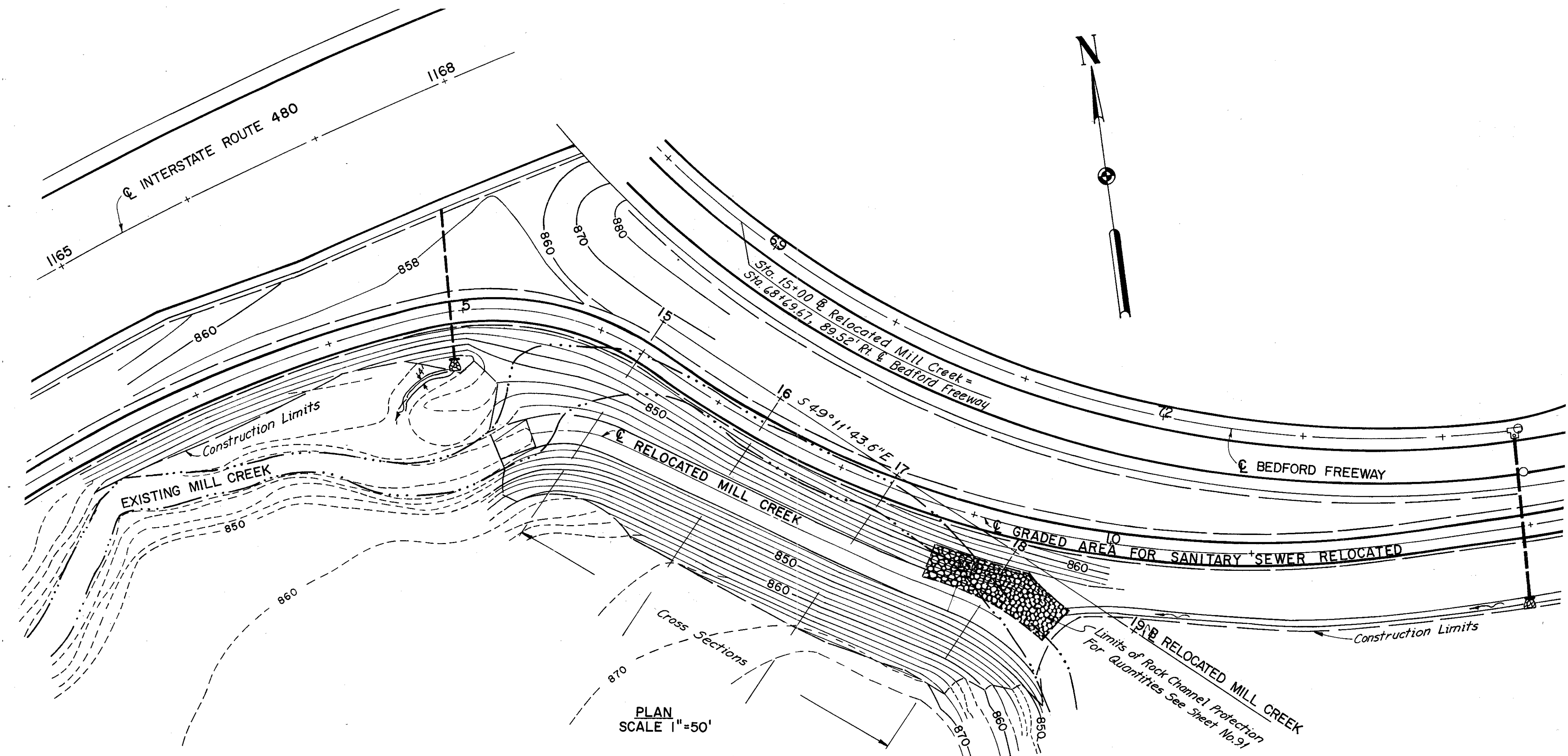
- | | | | |
|------------------------------------|------|--------------------------------------|--|
| Proposed Drainage Ditch | 20'R | Proposed Ditch Catch Basin | |
| Proposed Storm and Sanitary Sewers | | Proposed Pavement Catch Basin | |
| Proposed Underdrains | | Existing Storm and Sanitary Manholes | |
| Existing Storm Sewers | | Existing Storm Inlets | |
| Existing Sanitary Sewers | | Jute Matting | |
| Existing Water Mains | | Rock Channel Protection | |
| Proposed Storm Manhole | | Sod | |
| Proposed Sanitary Manhole | | Paved Gutter | |
| Proposed Median Inlet | | | |

Note *
Approximate location of existing sanitary sewer connection to be located by the Contractor.

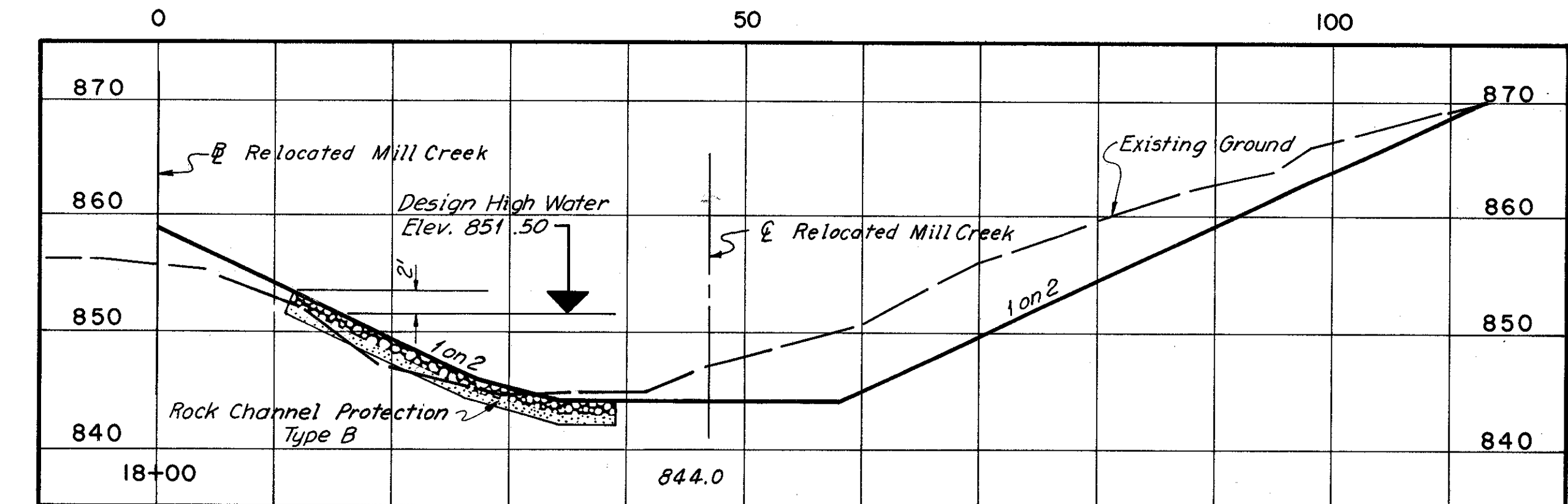
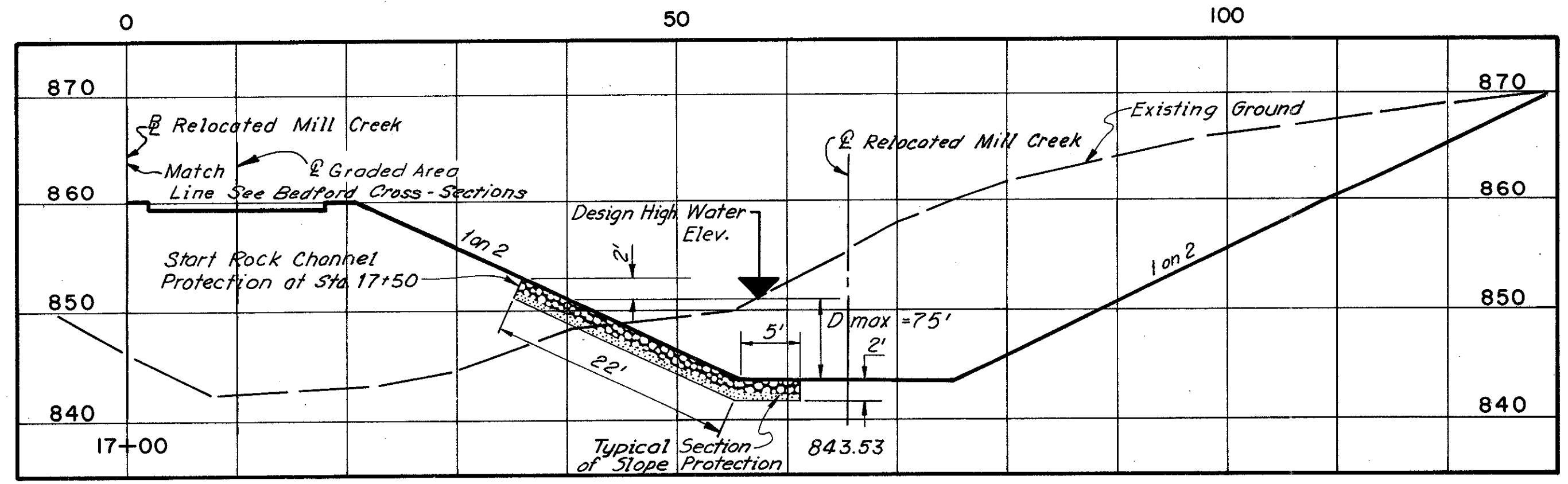
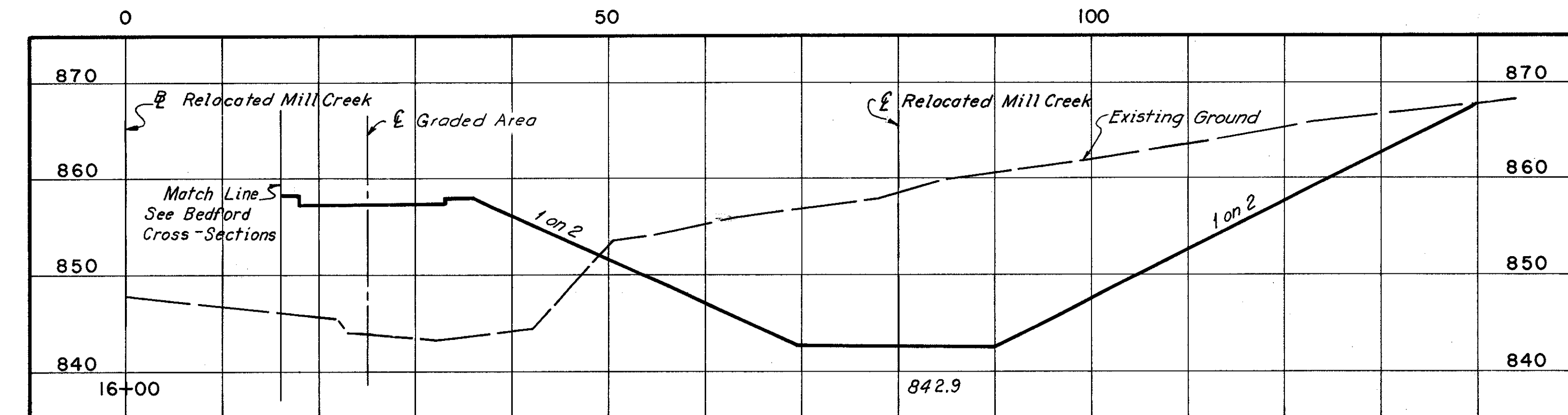
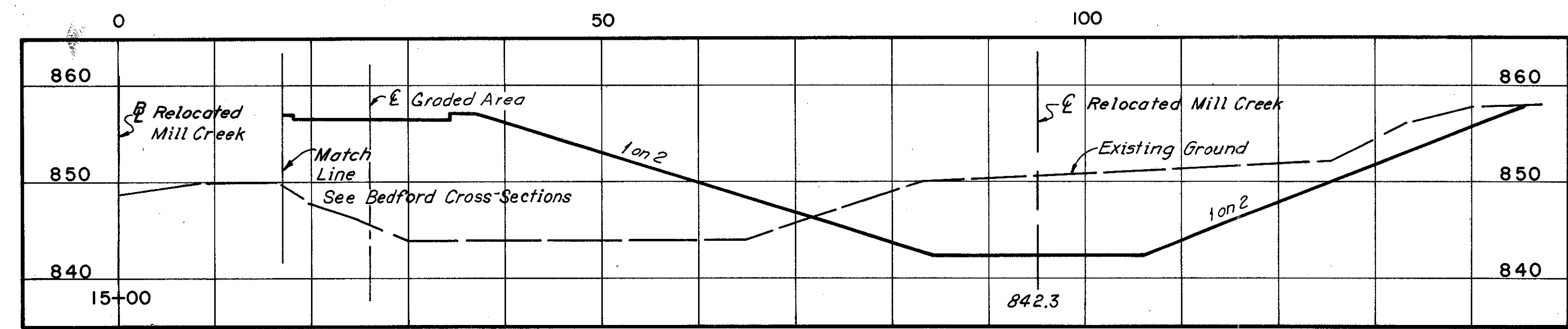
Note:
For Guard Rail quantities See Sheet No.44
For drainage quantities see sheet no. 96



SCALE 1" = 50'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE I.M. DATE 2-10-69 CONSULTING ENGINEERS
TRCD. G.T. DATE 2/17/69
CKD. E.R.A. DATE 2-10-69 KANSAS CITY CLEVELAND NEW YORK



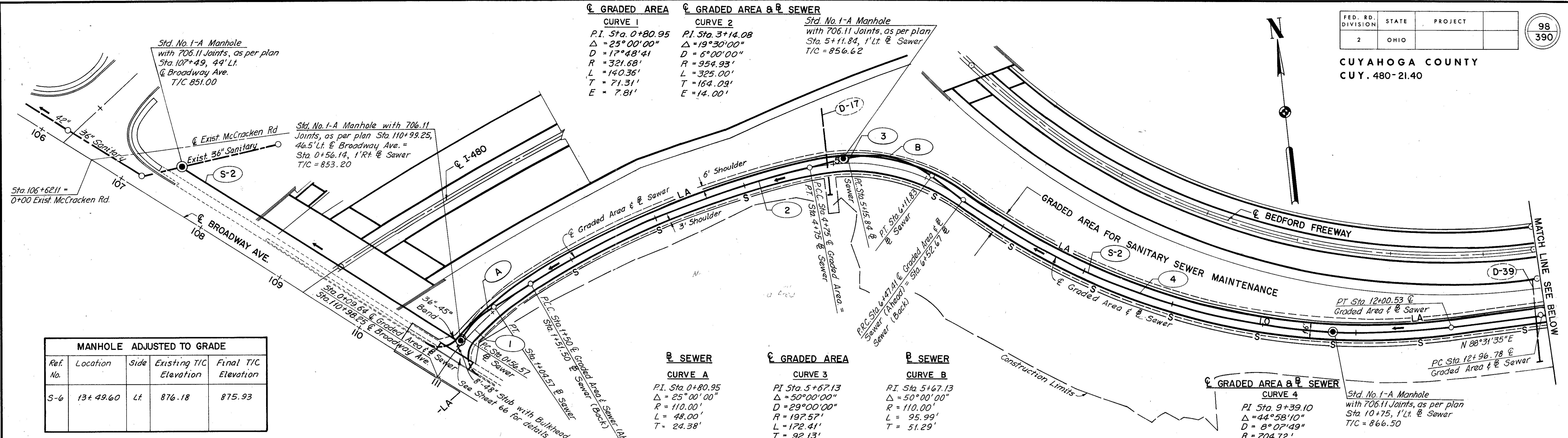
Note:
For Drainage Quantities
See Sheet No. 91, Ref. G-39



CHANNEL CROSS-SECTIONS
SCALE HORIZONTAL 1"=10'
VERTICAL 1"=10'

SCALE As shown HOWARD, NEEDLES, TAMMEN & BERGENOFF
MADE I.M. DATE 7-2-68 CONSULTING ENGINEERS
TRCD C.M.D. DATE 7-30-68 KANSAS CITY CLEVELAND NEW YORK
CED. E.R.A. DATE 10-3-68

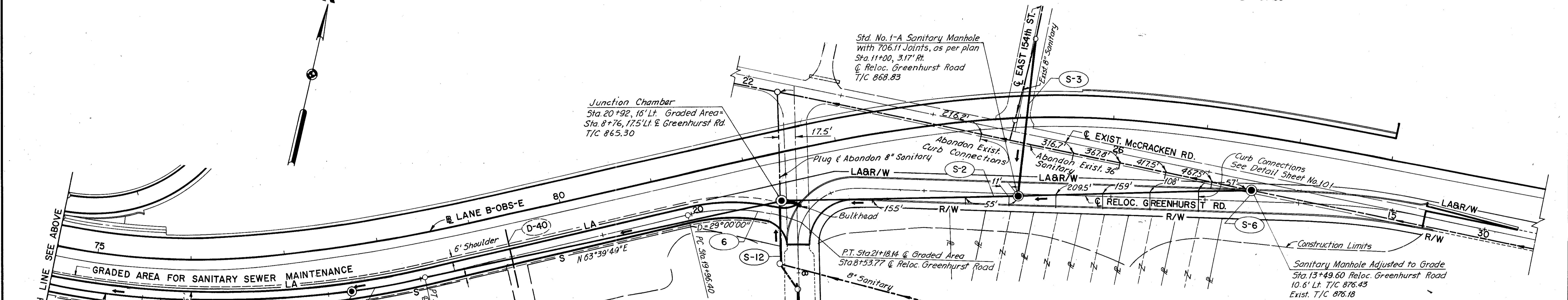
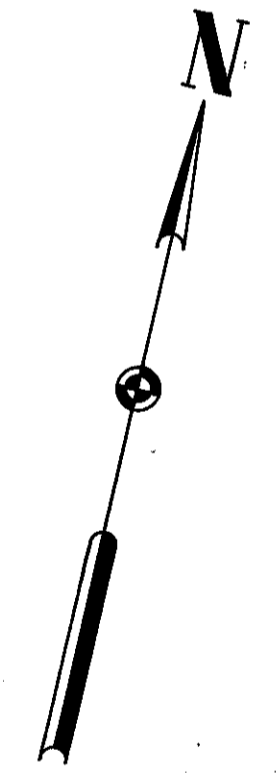
EARTHWORK
EXC. 7,877 CU. YDS.
EMB. 4,968 CU. YDS.



Ref. No.	Location	Side	Existing TIC Elevation	Final TIC Elevation
S-6	13+49.60	Lt.	876.18	875.93

SEWER	GRADED AREA	SEWER
CURVE A	CURVE 3	CURVE B
PI Sta. 0+80.95	PI Sta. 5+67.13	PI Sta. 5+67.13
$\Delta = 25^{\circ}00'00''$	$\Delta = 50^{\circ}00'00''$	$\Delta = 50^{\circ}00'00''$
R = 110.00'	R = 197.57'	R = 110.00'
L = 48.00'	L = 172.41'	L = 95.99'
T = 24.38'	T = 92.13'	T = 51.29'
E = 7.81'	E = 20.42'	E = 5.29'

GRADED AREA & SEWER
CURVE 4
PI Sta. 9+39.10
$\Delta = 44^{\circ}58'10''$
D = 8^{\circ}07'49''
R = 704.72'
L = 553.11'
T = 291.68'
E = 57.99'



GRADED AREA
CURVE 6
PI Sta. 20+59.27
$\Delta = 35^{\circ}18'16''$
D = 29^{\circ}00'00''
R = 197.57'
L = 121.74'
T = 62.87'
E = 9.76'

GRADED AREA & SEWER
CURVE 5
PI Sta. 15+04.17
$\Delta = 24^{\circ}51'46''$
D = 6^{\circ}05'24''
R = 940.82'
L = 408.25'
T = 207.39'
E = 22.59'

Notes: Profiles of Graded Area and Sewers are shown on sheets as follows:
 Graded Area Profile: Sheet No. 57
 S-2 Sanitary Sewer: Sheet No. 120
 S-3 Sanitary Sewer: Sheet No. 119
 Graded Area Intersection Details are on Sheet No. 66.

Ref. No.	Station	Side	Sewer Profile Sheet No.	SANITARY									
				603 Type B 706.02 Cl. III Fully Lined as per 706.05 706.11 Joints	603 Type B 706.02 Cl. III Fully Lined as per 706.05 706.11 Joints	603 Type B 706.02 Cl. III Fully Lined as per 706.05 706.11 Joints	603 Type B 706.02 Cl. III Fully Lined as per 706.05 706.11 Joints	603 Type B 706.02 Cl. III Fully Lined as per 706.05 706.11 Joints	604 Junction Chamber	604 Manhole Adjusted to Grade	604 Std. No. 1-A Manhole 706.11 Joints as per plan	Special Curb Connections	
From	To			Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Each	Each	Each	Each	
S-2	107+49	13+49.60	Lt. & Rt.	120	827	417	1484	144		1		6	7
S-3	1+01	11+00	Rt.	119				167					
S-6	13+49.60		Lt.	120						1			
S-12	8+08	8+76	Lt.	120A									
Sub-totals (III)					800					167		2	7
Sub-totals (100% CRSD)					27					62			
Sub-totals (III-CRSD)							1484	144			4		
Totals					827	417	1484	144	229	1	1	6	7

SCALE 1" = 50'
 HOWARD, NEEDLES, TAMMEN & BERGENOFF
 MADE E.R.A. DATE 12-6-69 CONSULTING ENGINEERS
 TRCD. IV DATE 1-9-69
 CKD. I.M. DATE 2-10-69 KANSAS CITY CLEVELAND NEW YORK

NOTE: THIS SHEET SUPERSEDES SHEET No 98 OF THE PLANS. REVISED 6-4-74

CURVE DATA

CURVE 1	CURVE 2
P.I. Sta. 0+80.95	P.I. Sta. 3+14.08
$\Delta = 25^{\circ}00'00''$	$\Delta = 19^{\circ}30'00''$
$D = 17^{\circ}48'41''$	$D = 6^{\circ}00'00''$
$R = 321.68'$	$R = 954.93'$
$L = 140.36'$	$L = 325.00'$
$T = 71.31'$	$T = 164.09'$
$E = 7.81'$	$E = 14.00'$

Std. No 1-A Manhole with 706.11 Joints, as per plan. Sta. 5+40, 8' Lt. T/C = 856.75 F.L. = 840.63

Std. No 1-A Manhole with 706.11 Joints, as per plan Sta. 110+99.25, 46.5' Lt. \pm Broadway Ave. = Sta. 0+56.14, 1' Rt. T.C. = 853.20

Std. No 1-A Manhole with 706.11 Joints, as per plan. Sta. 2+50, 10' Lt. T/C = 856.50 F.L. = 839.46

Std. No 1-A Manhole with 706.11 Joints, as per plan. Sta. 8+50, 8' Rt. T/C = 860.53 F.L. = 842.36

Std. No 1-A Manhole with 706.11 Joints, as per plan. Sta. 12+00, 8' Rt. T/C = 869.03 F.L. = 844.46

MANHOLE ADJUSTED TO GRADE

REF. NO.	LOCATION	SIDE	Existing TIC Elevation	Final TIC Elevation
S-6	13+49.60	Lt.	876.18	875.93

CURVE DATA CURVE 3

P.I. Sta. 5+67.13
$\Delta = 50^{\circ}00'00''$
$D = 29^{\circ}00'00''$
$R = 197.57'$
$L = 172.41'$
$T = 92.13'$
$E = 20.42'$

CURVE DATA CURVE 4

P.I. Sta. 9+39.10
$\Delta = 44^{\circ}58'10''$
$D = 8^{\circ}07'49''$
$R = 704.72'$
$L = 553.11'$
$T = 291.68'$
$E = 57.98'$

***NOTE:** The 36" and 48" pipes shall have joints as per 706.11, and 1/3 (invert) vitrified clay lined as per 706.05. The remaining 2/3 shall be coated as per Coating Note on Sheet 120 B.

Junction Chamber Sta. 20+92, 16' Lt. Sta. 8+76, 17.5' Lt. \pm Greenhurst Rd. T/C = 866.05 F.L. = 848.83

Std. No 1-A Sanitary Manhole with 706.11 Joints, as per plan. Sta. 11+00, 3.17' Rt. \pm Reloc. Greenhurst Road T/C = 868.83

Sanitary Manhole Adjusted to Grade Sta. 13+49.60 Reloc. Greenhurst Road 10.6' Lt. T/C = 876.43 Exist. T/C = 876.18

CURVE DATA CURVE 6

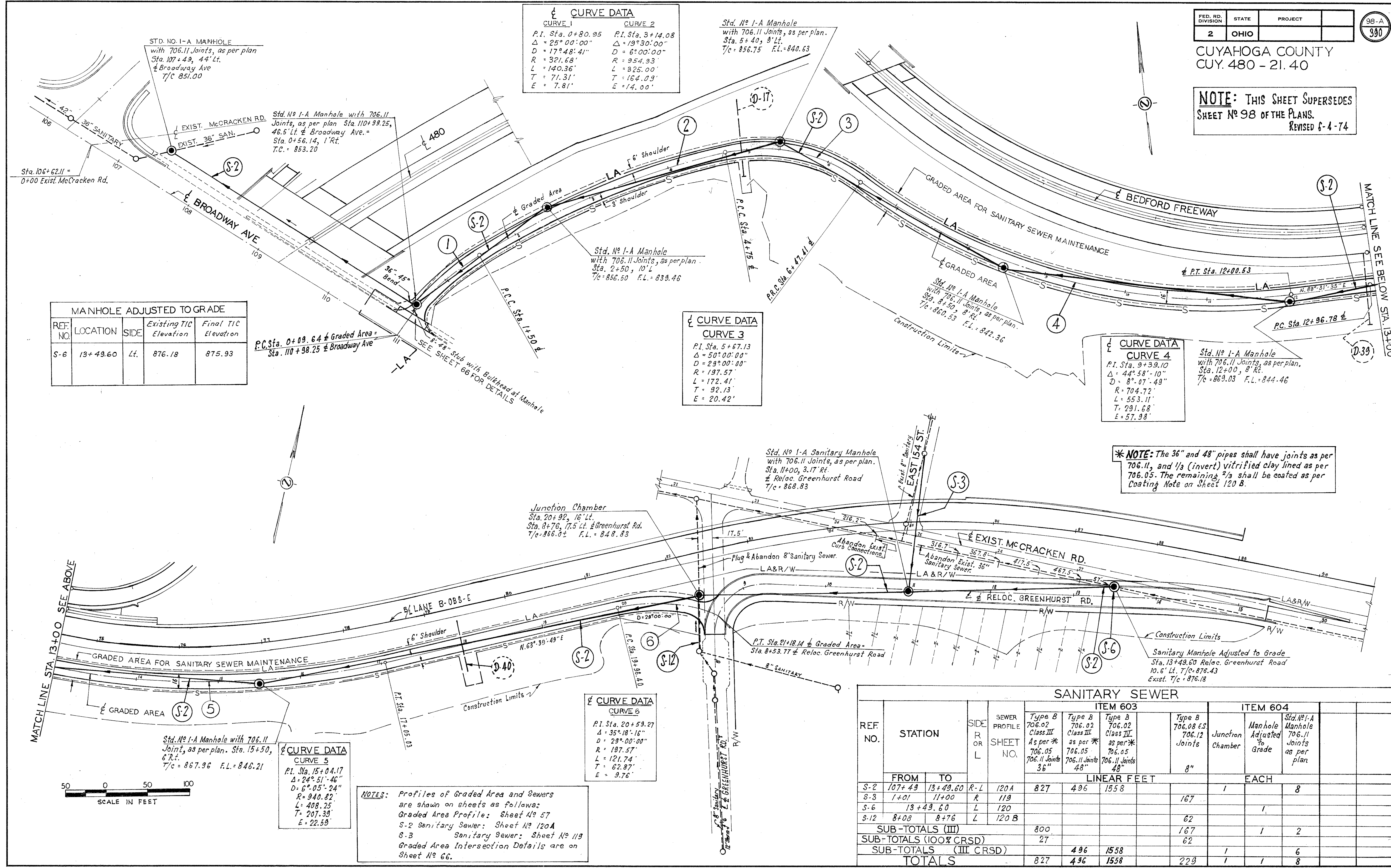
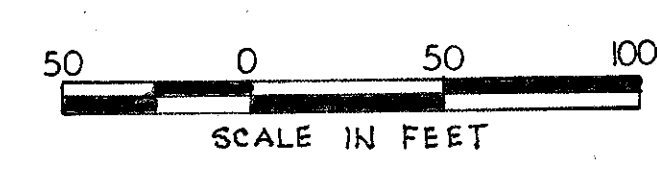
P.I. Sta. 20+59.27
$\Delta = 35^{\circ}18'16''$
$D = 29^{\circ}00'00''$
$R = 197.57'$
$L = 121.74'$
$T = 62.87'$
$E = 9.76'$

CURVE DATA CURVE 5

P.I. Sta. 15+04.17
$\Delta = 24^{\circ}31'46''$
$D = 6^{\circ}05'24''$
$R = 940.82'$
$L = 408.25'$
$T = 207.39'$
$E = 22.59'$

NOTES: Profiles of Graded Area and Sewers are shown on sheets as follows:
Graded Area Profile: Sheet No 57
S-2 Sanitary Sewer: Sheet No 120A
S-3 Sanitary Sewer: Sheet No 118
Graded Area Intersection Details are on Sheet No 66.

REF. NO.	STATION	SIDE R OR L	SEWER PROFILE SHEET NO.	ITEM 603				ITEM 604		
				Type B 706.02 Class III As per * 706.05 36"	Type B 706.02 Class III as per * 706.05 48"	Type B 706.02 Class II as per * 706.05 48"	Type B 706.08 & S 706.12 Joints 8"	Junction Chamber	Manhole Adjusted to Grade	Std. No 1-A Manhole 706.11 Joints as per plan
				LINEAR FEET				EACH		
S-2	107+49	13+49.60	R-L 120A	827	496	1558		1	8	
S-3	1+01	11+00	R 119				167			
S-6	13+49.60		L 120						1	
S-12	8+08	8+76	L 120 B					62		
SUB-TOTALS (III)				800						
SUB-TOTALS (100% CRSD)				27			167		2	
SUB-TOTALS (III CRSD)					496	1558	62		6	
TOTALS				827	496	1558	229	1	8	

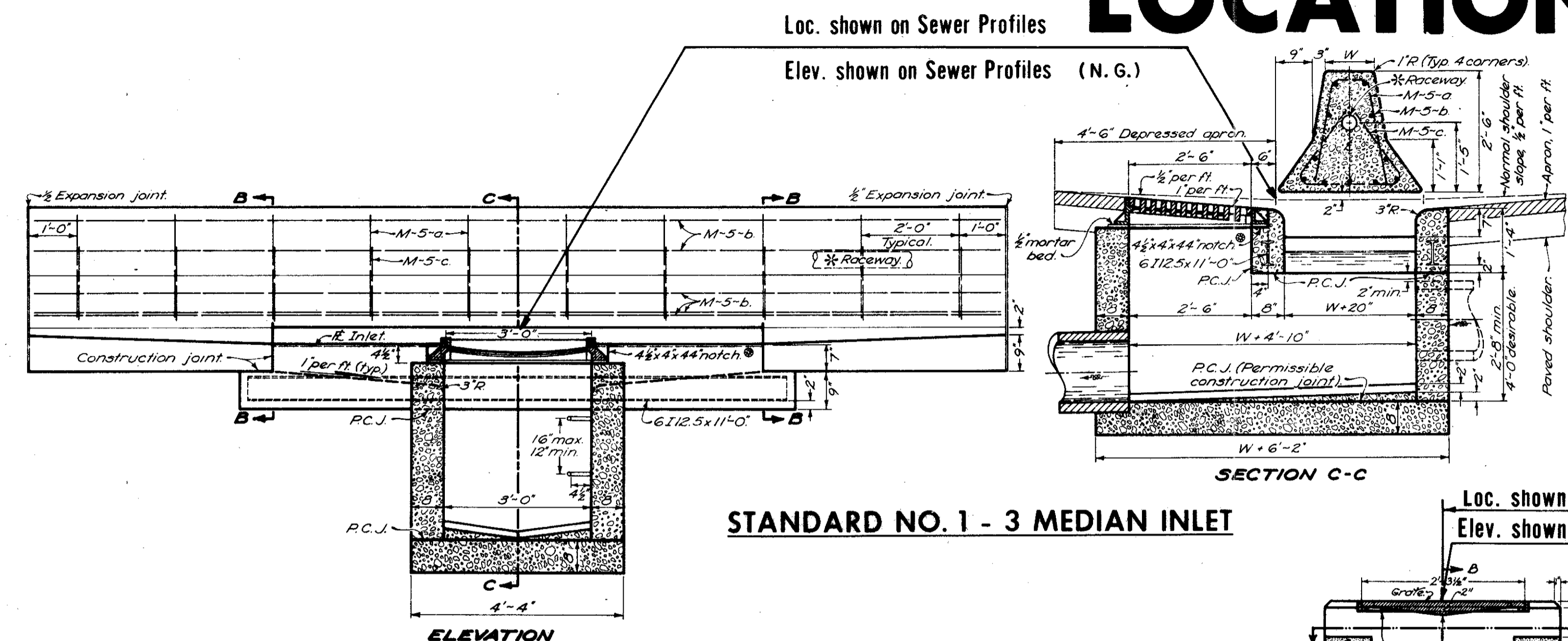


DRAINAGE STRUCTURE DETAILS

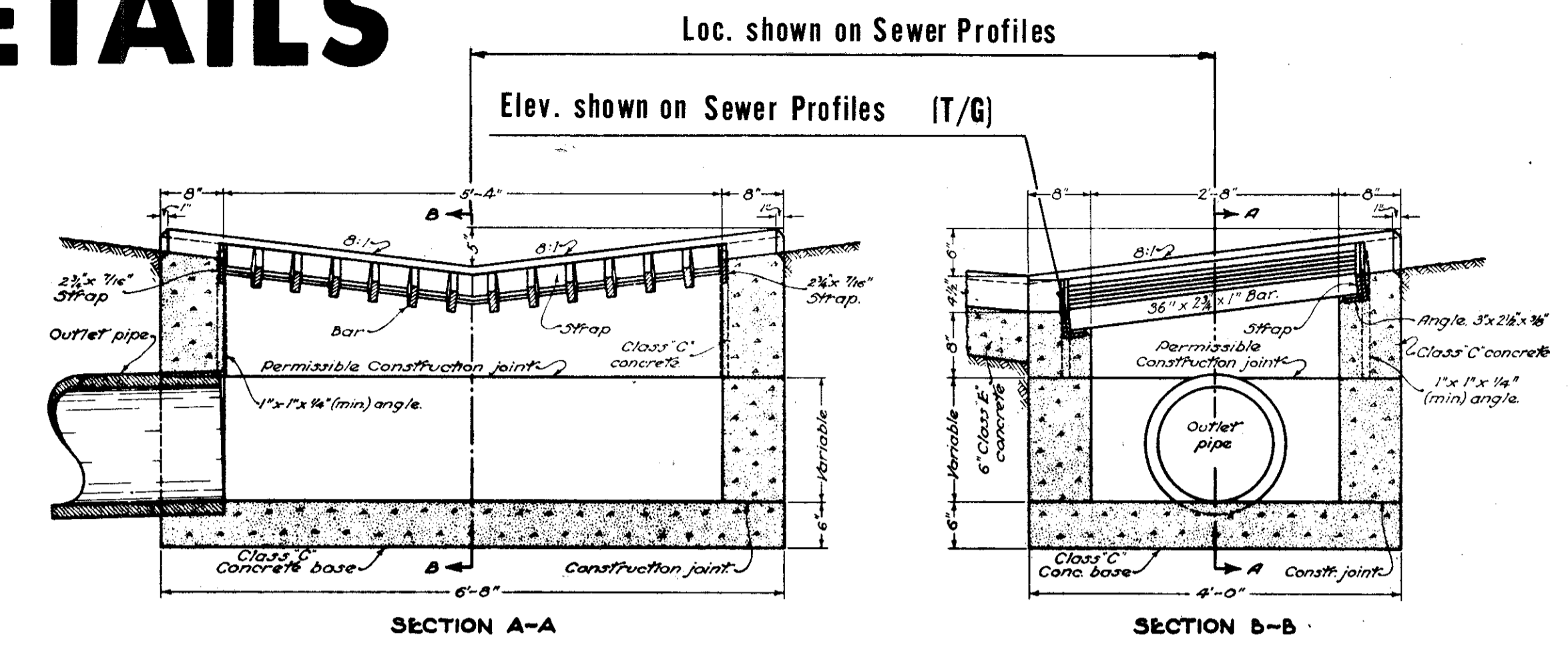
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

99
390

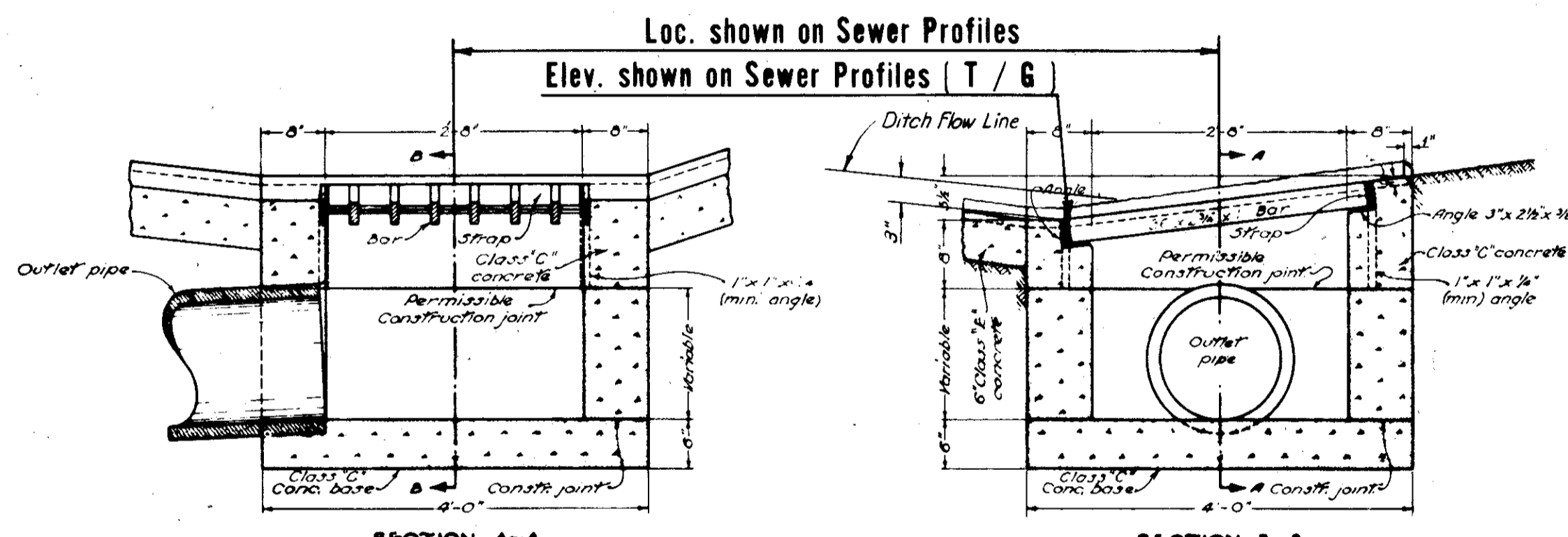
CUYAHOGA COUNTY
CUY. 480-21.40



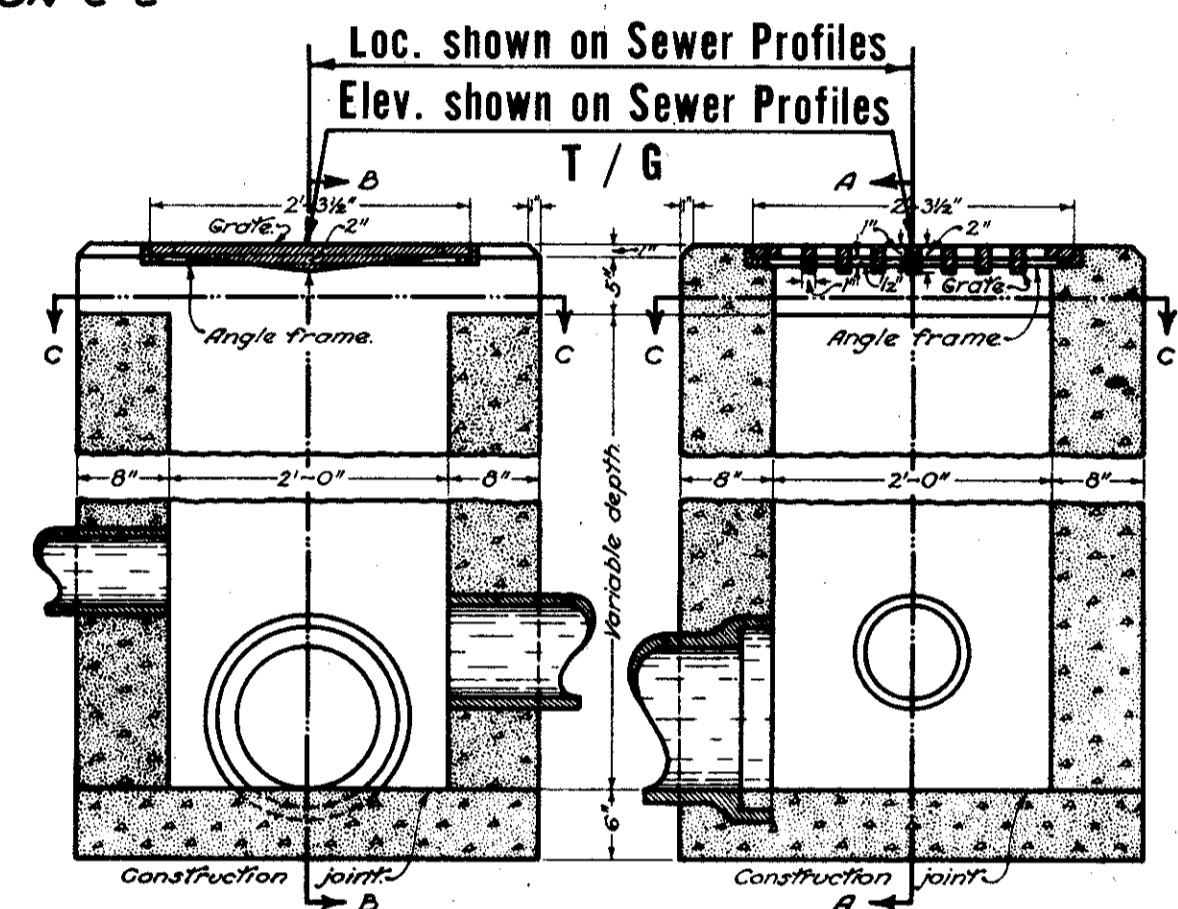
STANDARD No. 1 - 3 MEDIAN INLET



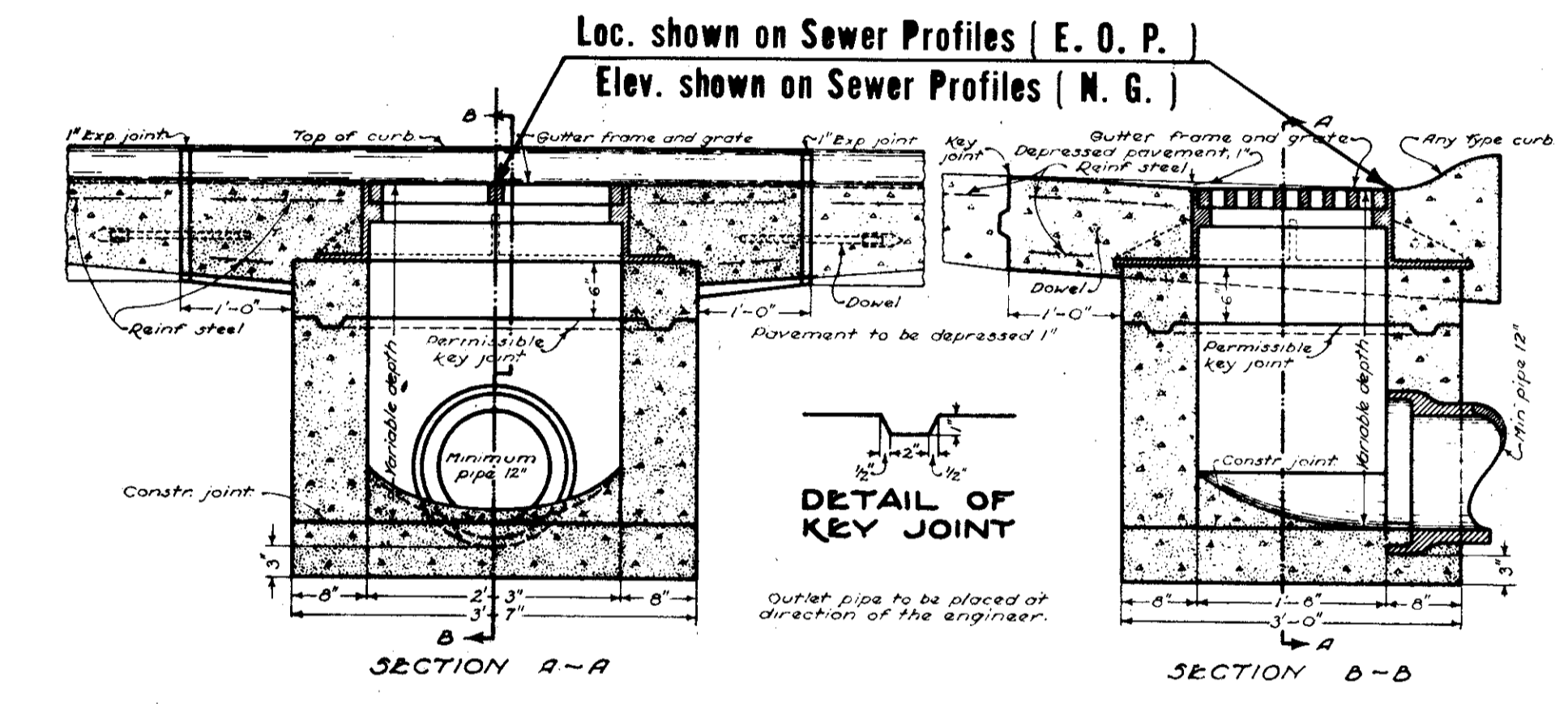
STANDARD No. 4 CATCH BASIN



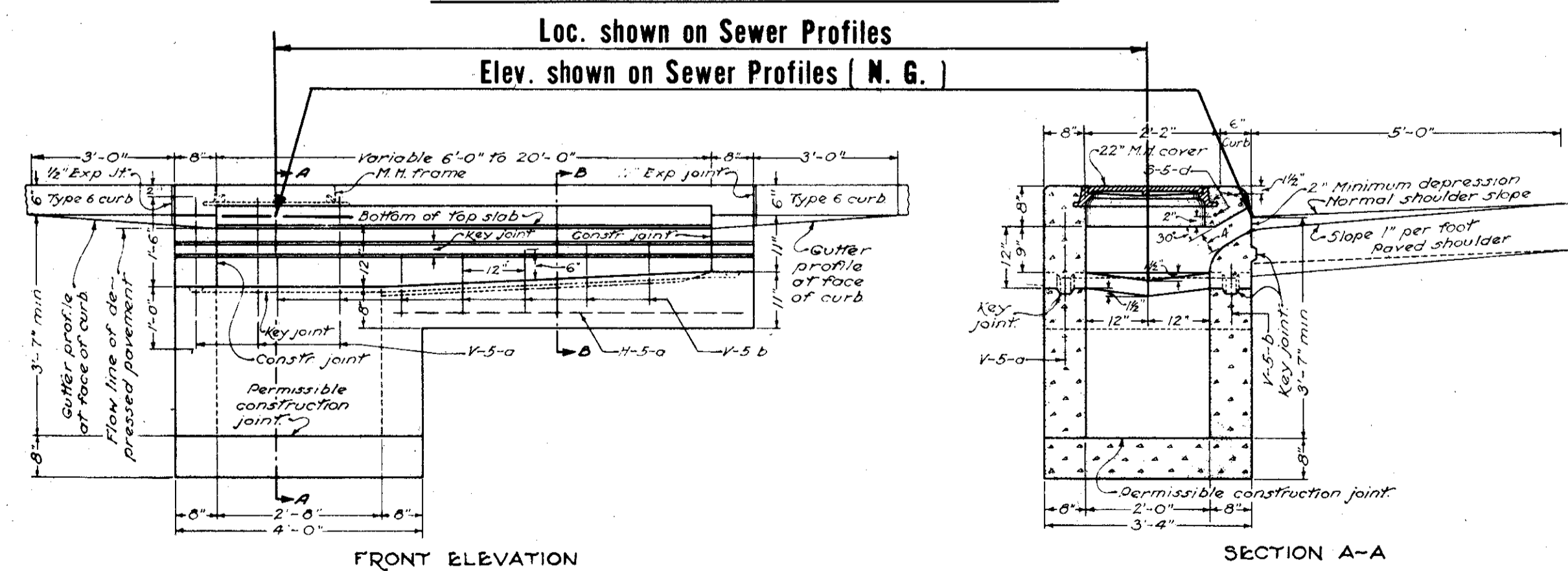
STANDARD No. 5 CATCH BASIN



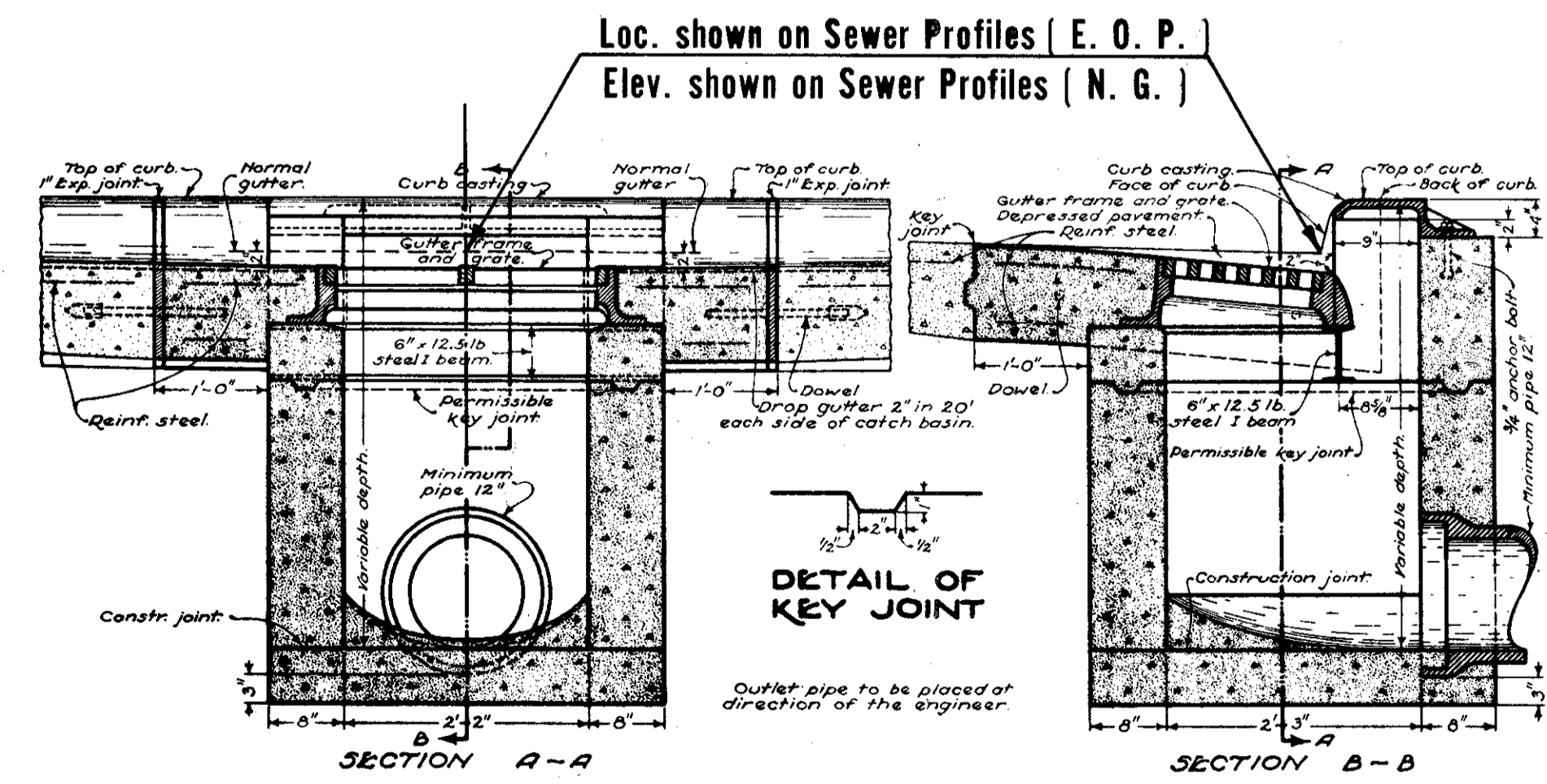
STANDARD No. 2-2-A CATCH BASIN



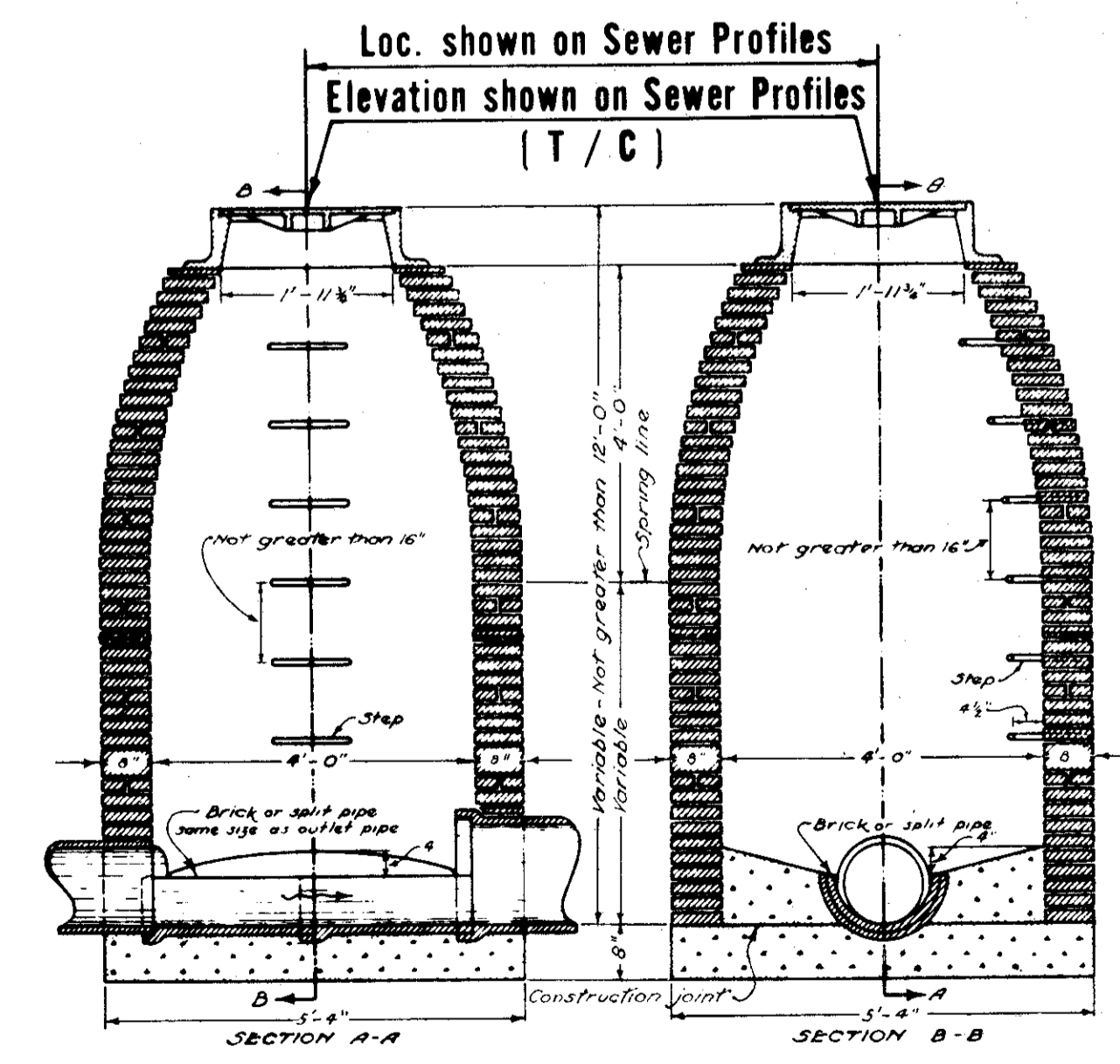
STANDARD No. 6 CATCH BASIN



STANDARD No. 2-A PAVED SHOULDER INLETS



STANDARD No. 3-A CATCH BASIN



STANDARD MANHOLE

Note: This sheet is to be used for clarification of the location and elevation as shown on the sewer profiles. Use the Standard Construction Drawings for details regarding the construction of the drainage structures.

LEGEND

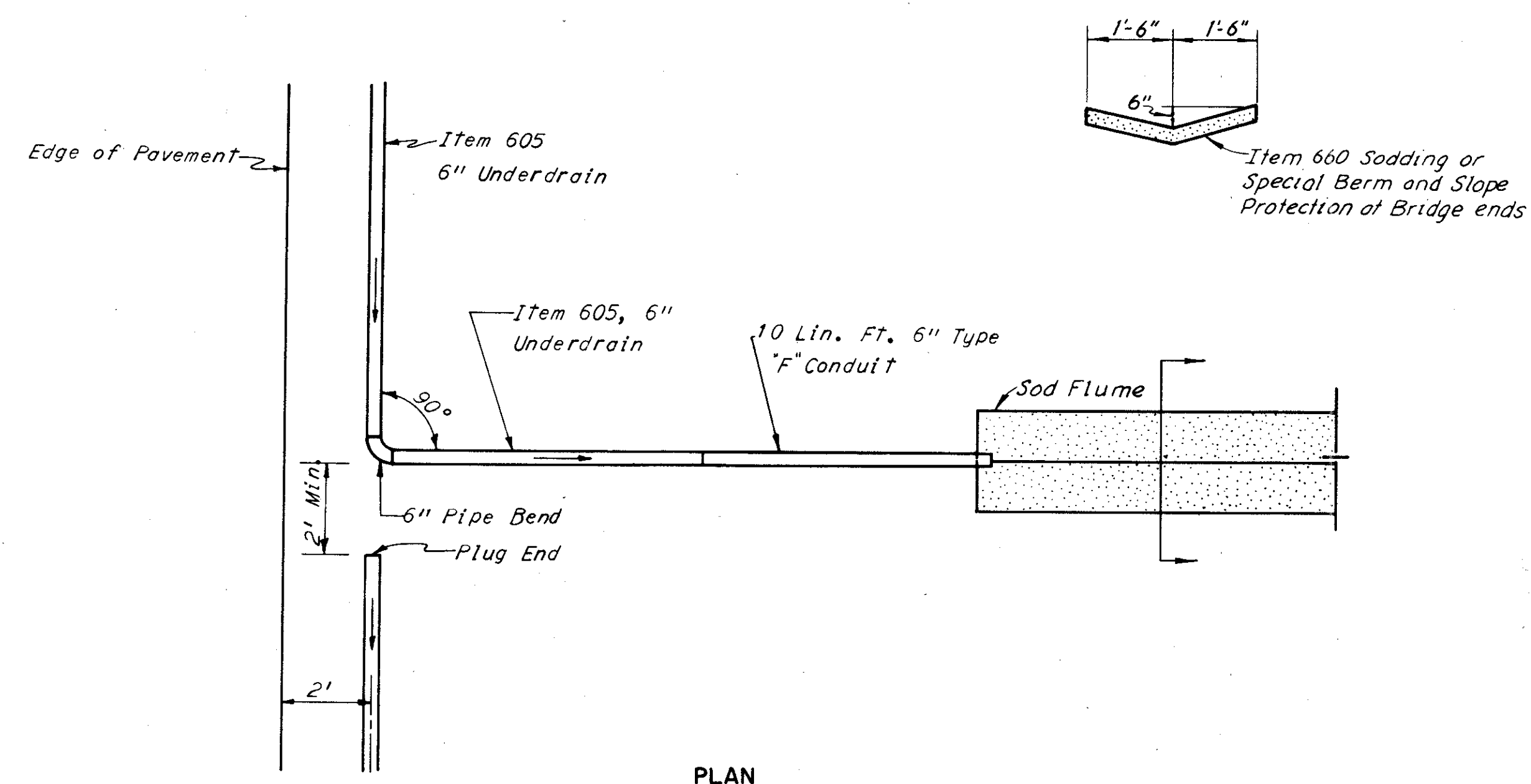
- E.O.P.-Edge of Pavement or Paved Shoulder
- N.G.-Normal Gutter Elevation at Face of Curb
- T/G-Top of Catch Basin Grate Elevation
- T/C-Top of Manhole Cover Elevation

SCALE: No scale
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE I.M. DATE 4-5-69
TRCD I.M. DATE 4-5-69
CKD E.R.A. DATE 4-10-69
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

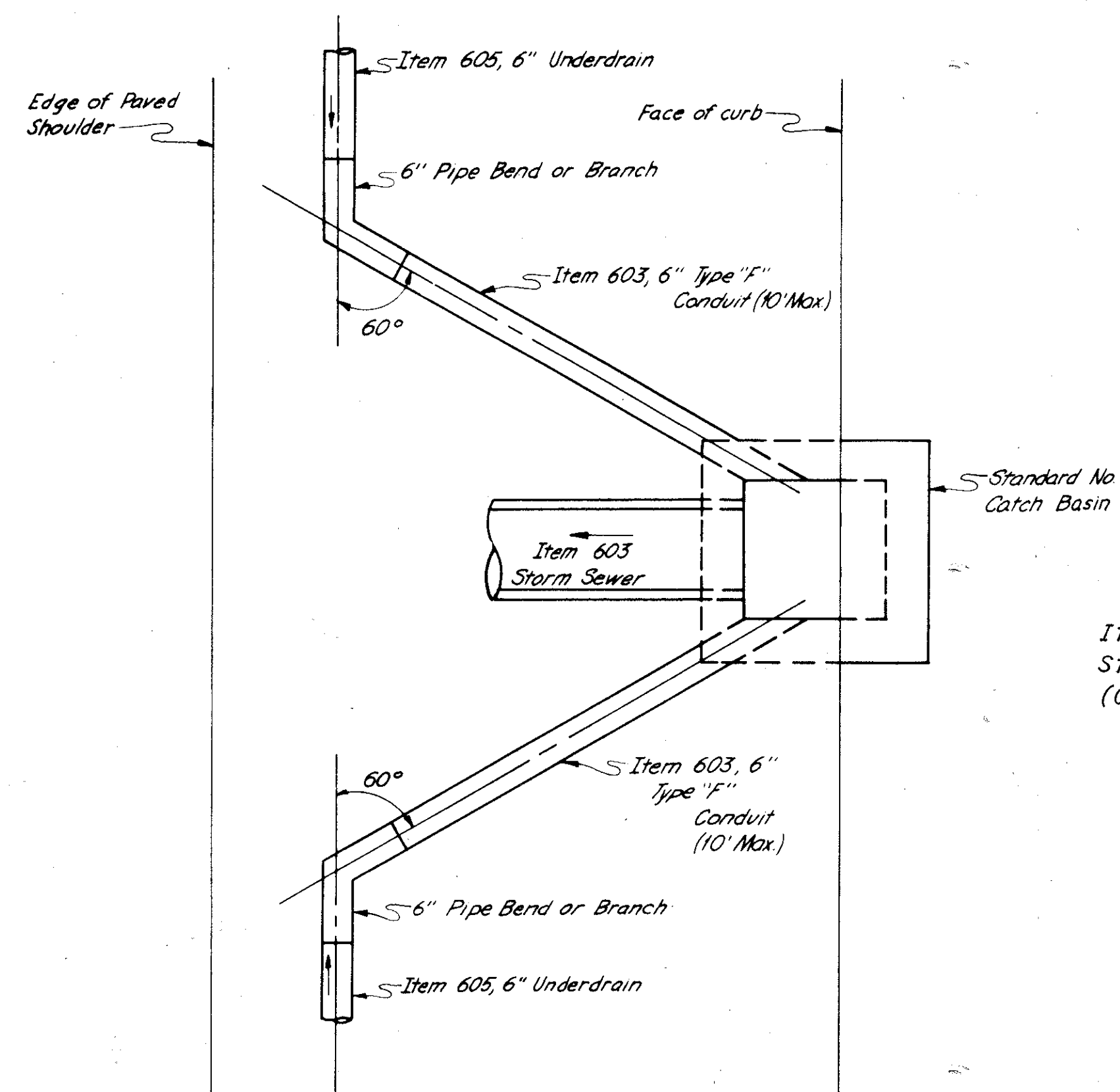
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390

CUYAHOGA COUNTY
CUY. 480-21.40

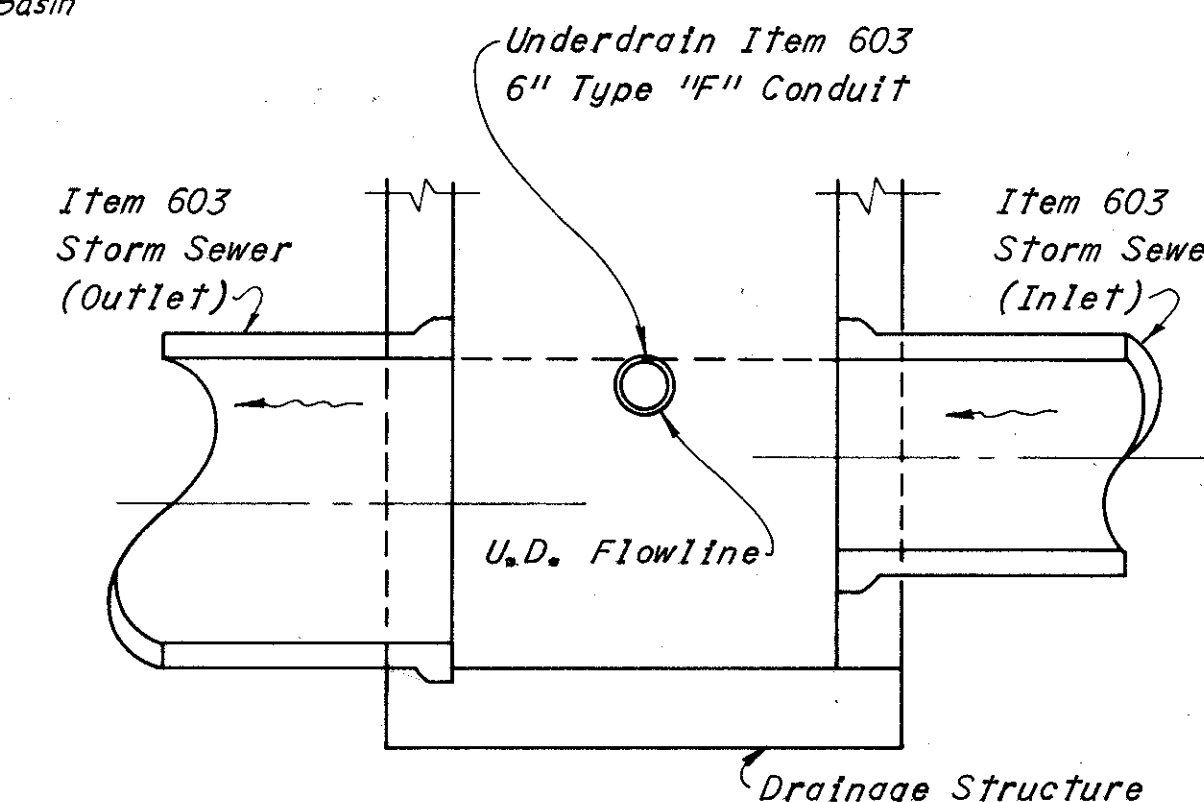


PLAN

UNDERDRAIN OUTLET IN FILL

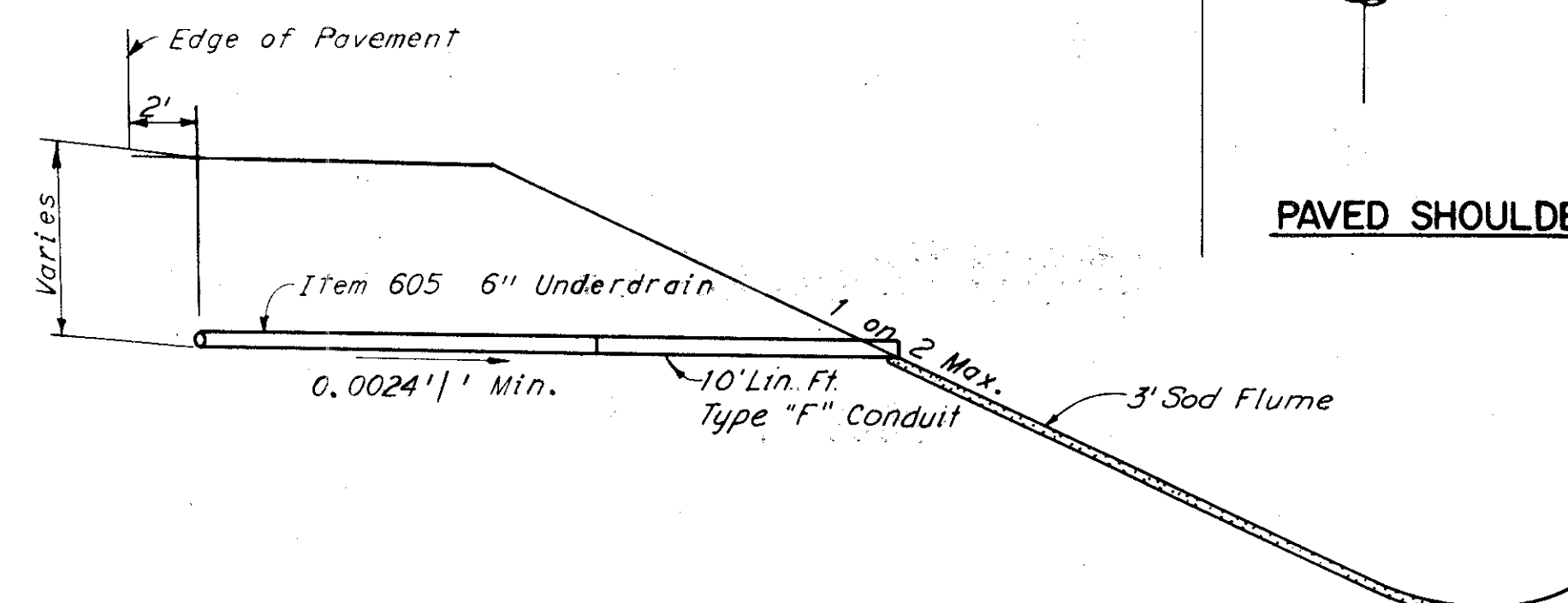


PAVED SHOULDER LOW POINT



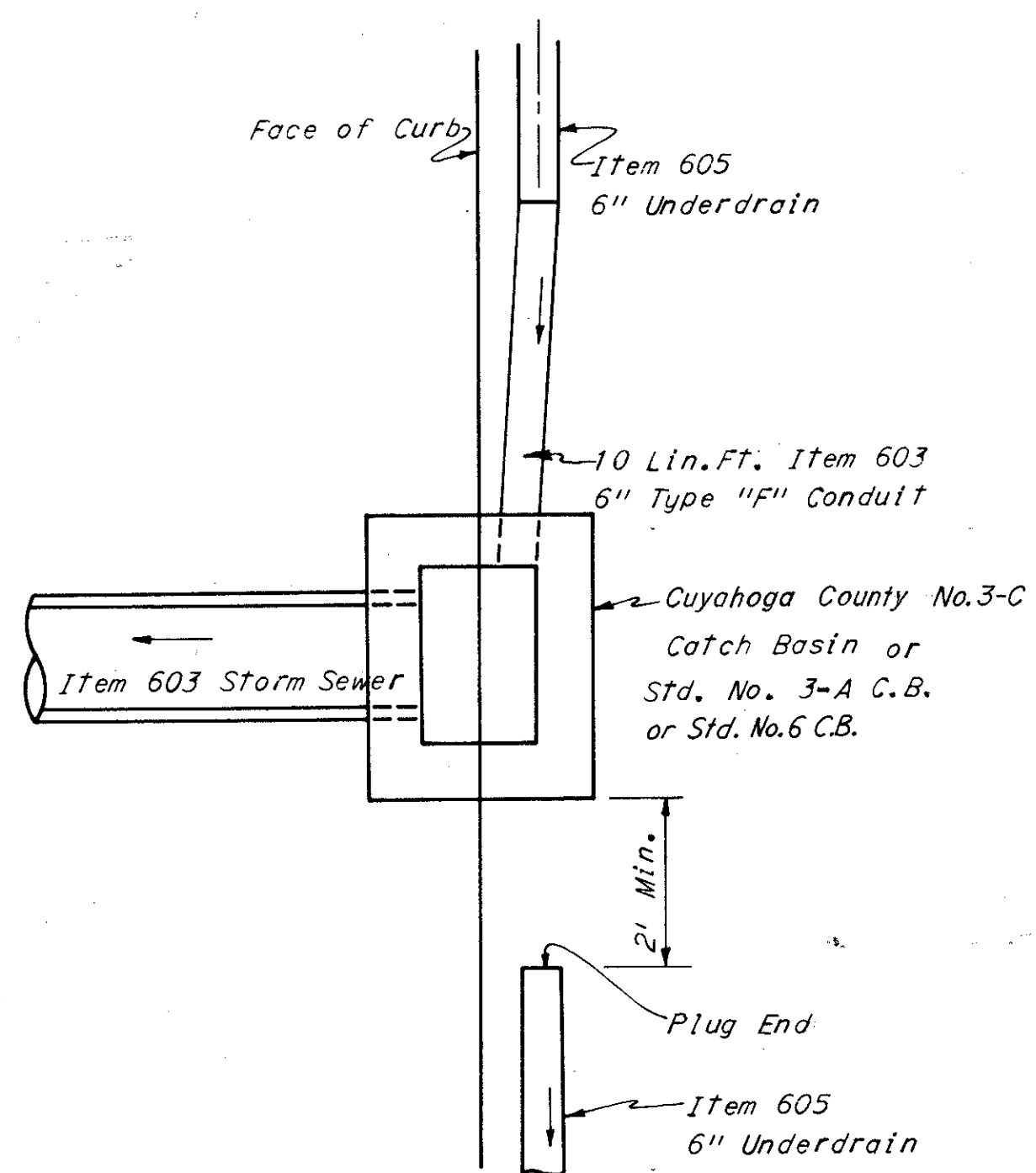
ELEVATION

FLOWLINES AT STRUCTURES (TYPICAL)

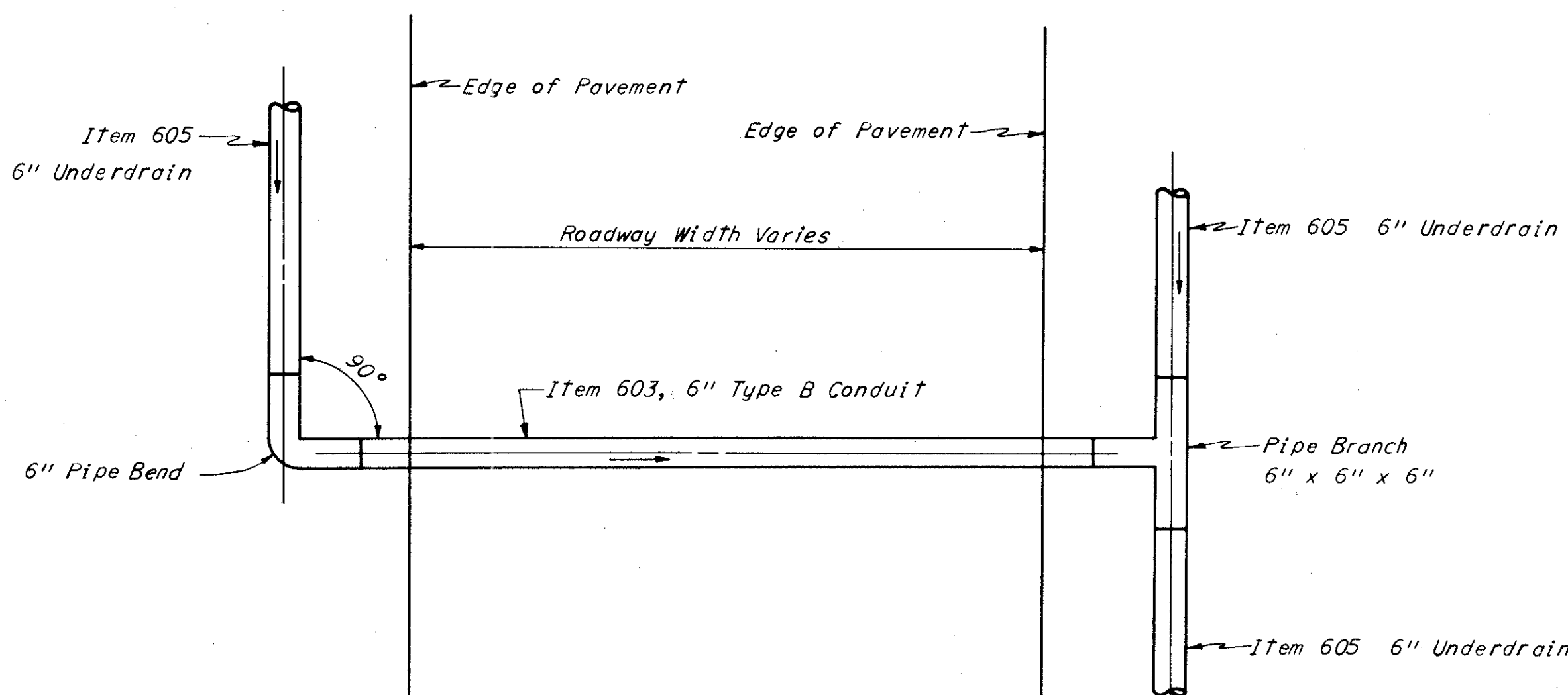


ELEVATION

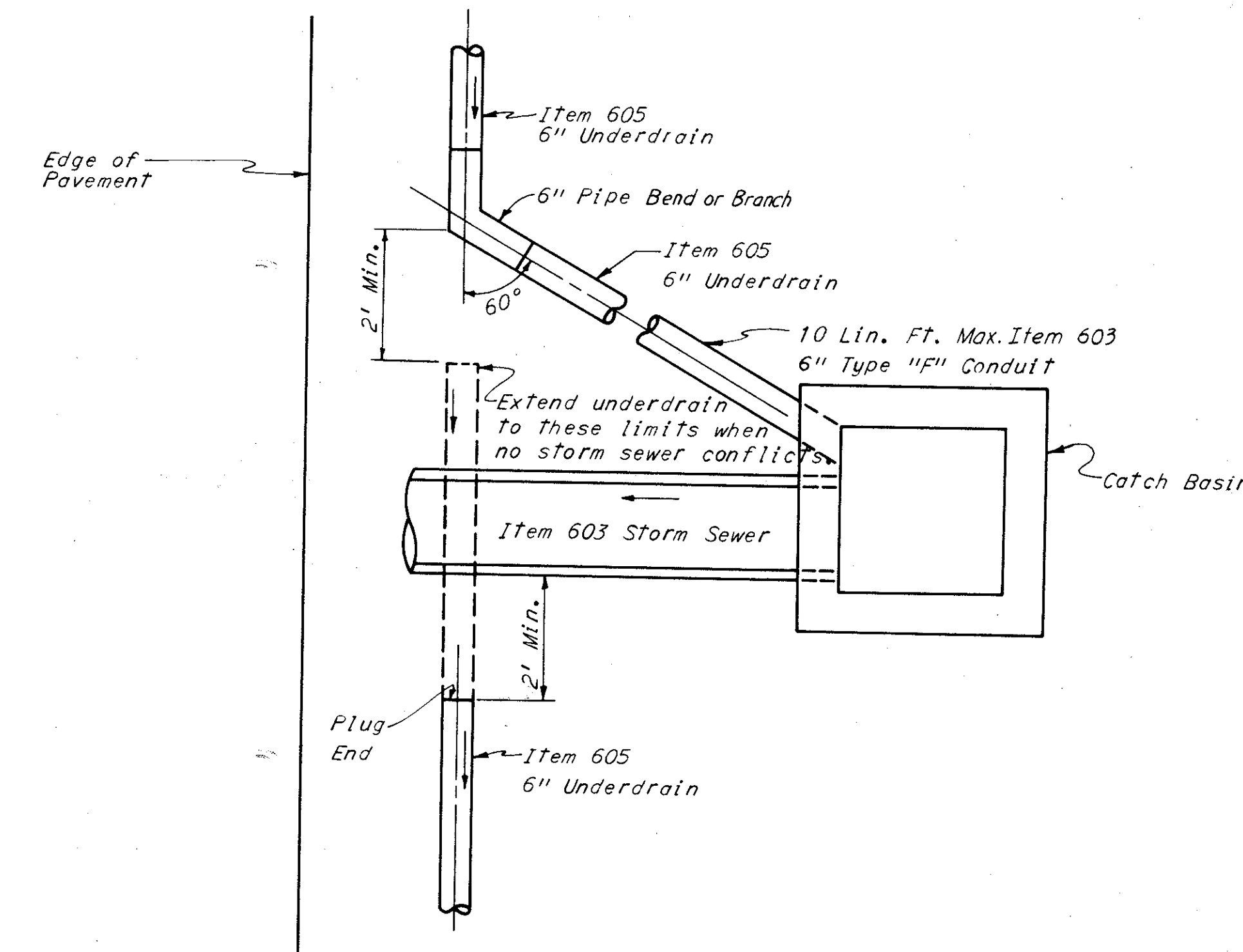
UNDERDRAIN OUTLET IN FILL



UNDERDRAIN TO CATCH BASIN AT CURB

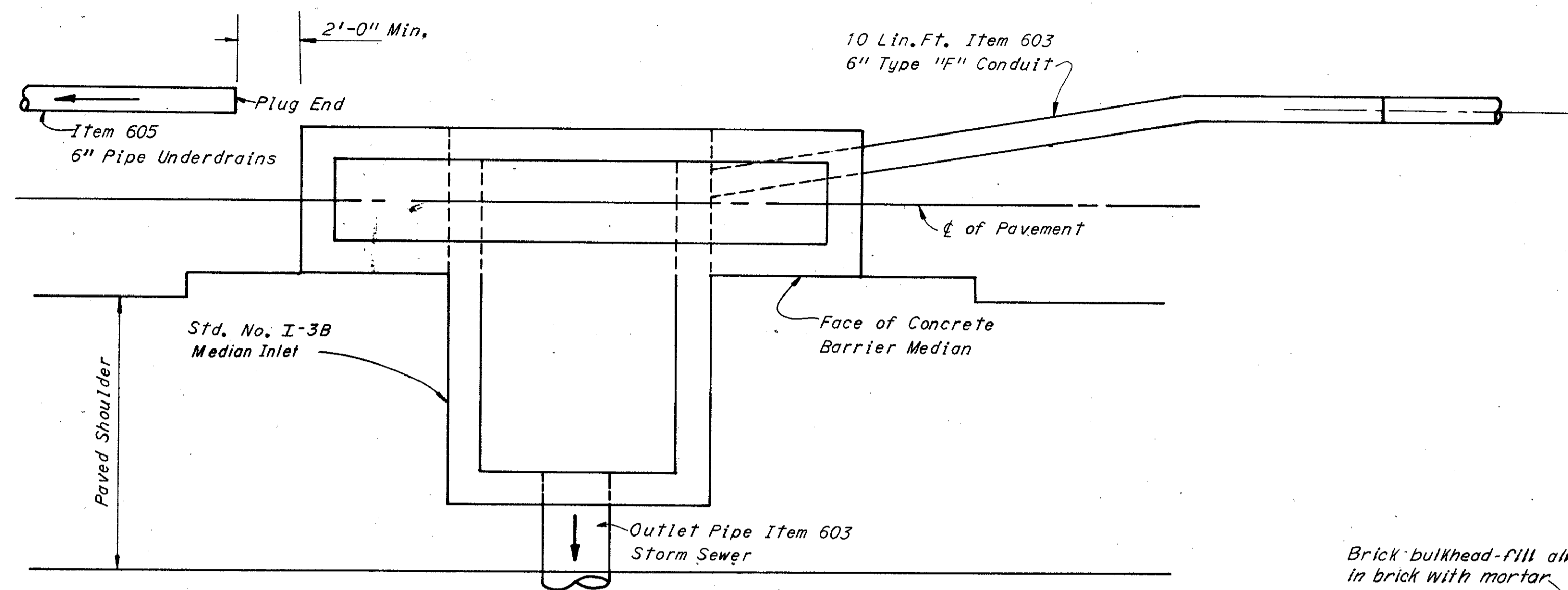


UNDERDRAIN CROSSING ROADWAY

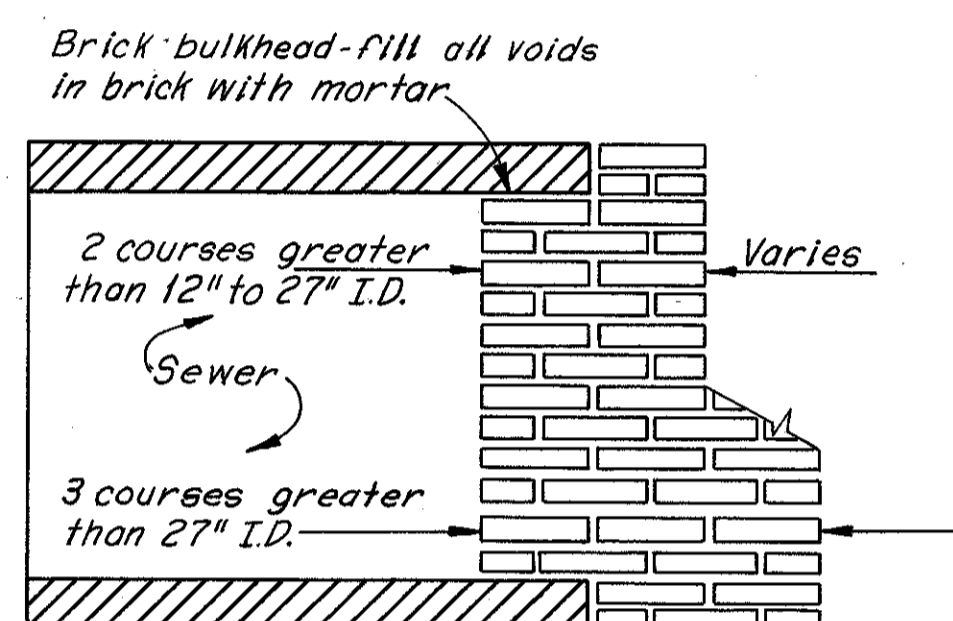


UNDERDRAIN TO DRAINAGE STRUCTURES

SCALE *Not to Scale* HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE I.M. DATE 6-2-69 CONSULTING ENGINEERS
TRCD I.M. DATE 6-3-69
CND. F.R.A. DATE 8-10-69 KANSAS CITY CLEVELAND NEW YORK

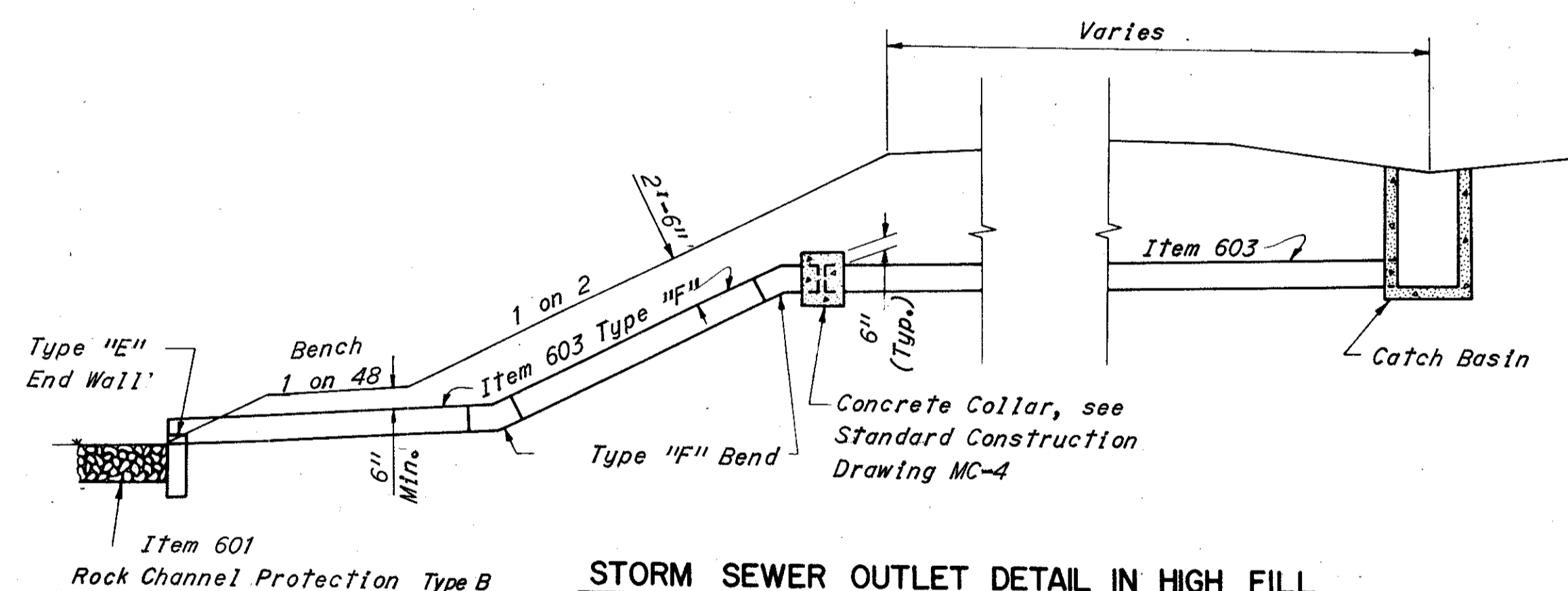


MEDIAN INLET ON GRADE

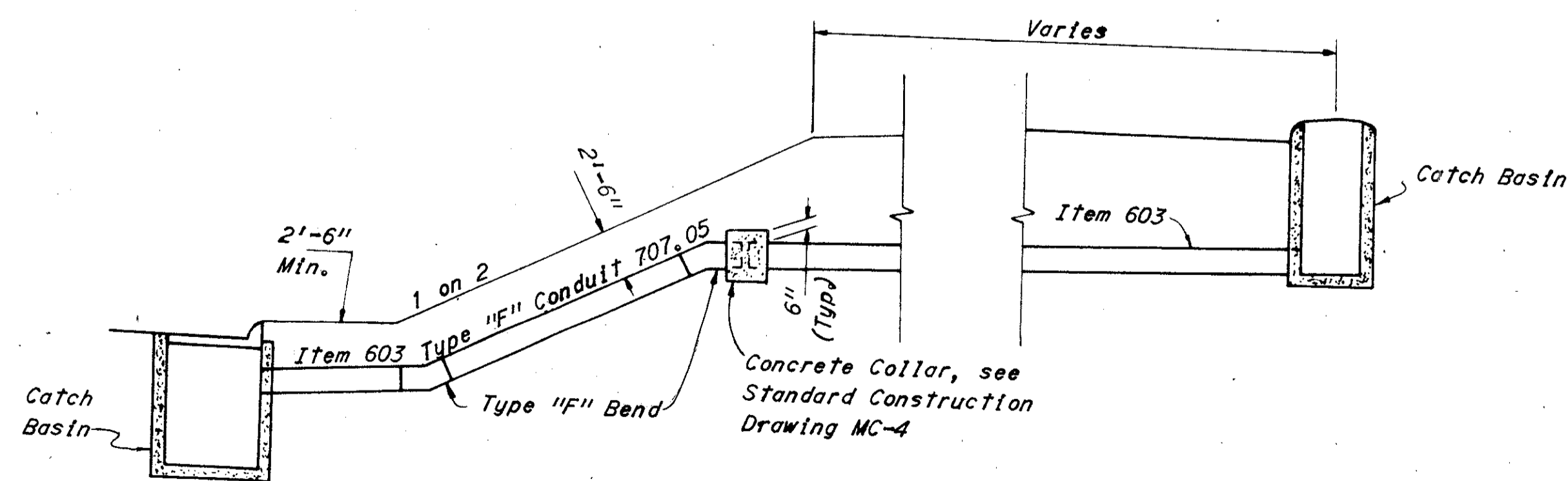


Payment for pipe bulkhead shall be included in pertinent 603 Item

PIPE BULKHEADS

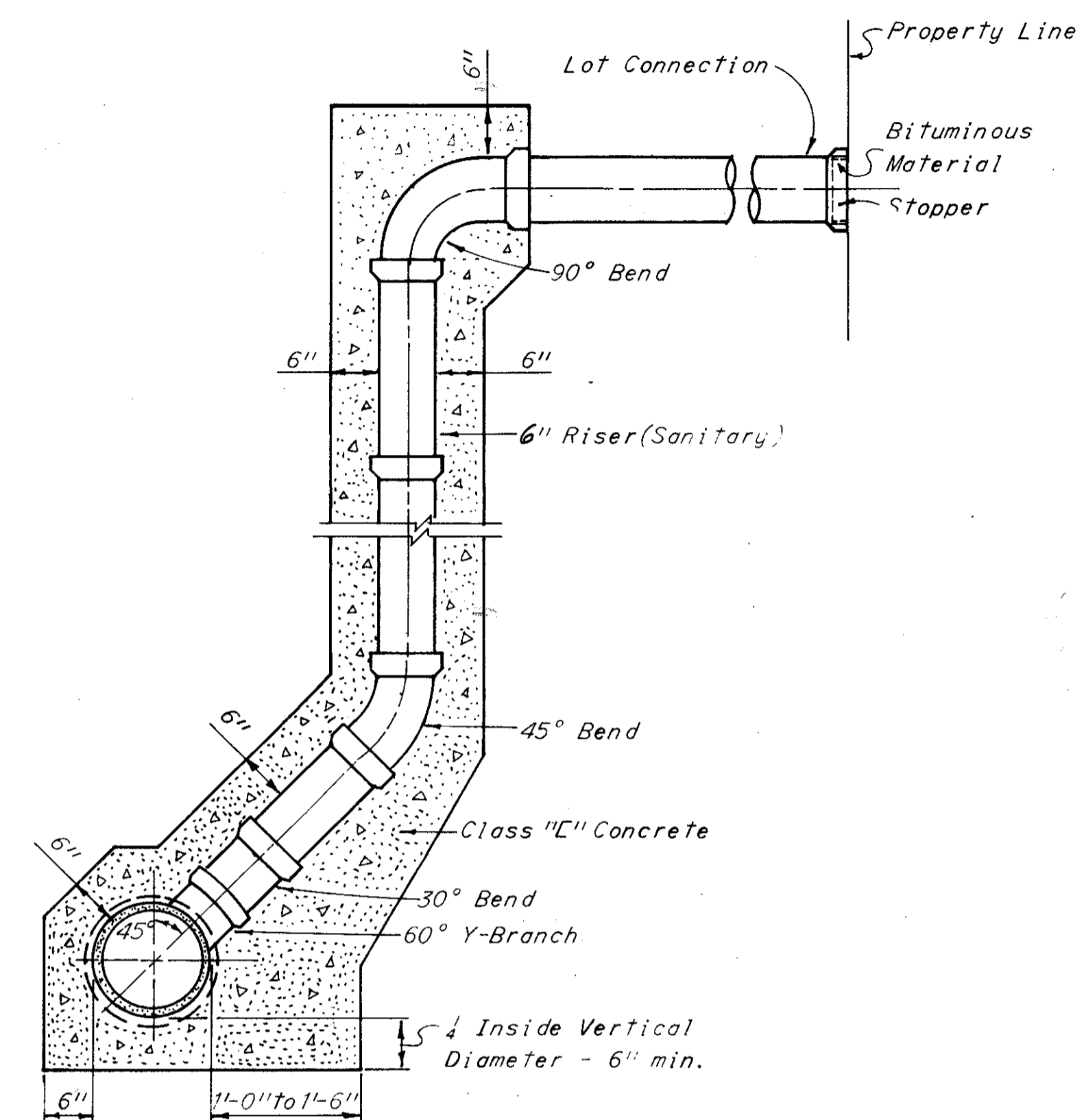


STORM SEWER OUTLET DETAIL IN HIGH FILL



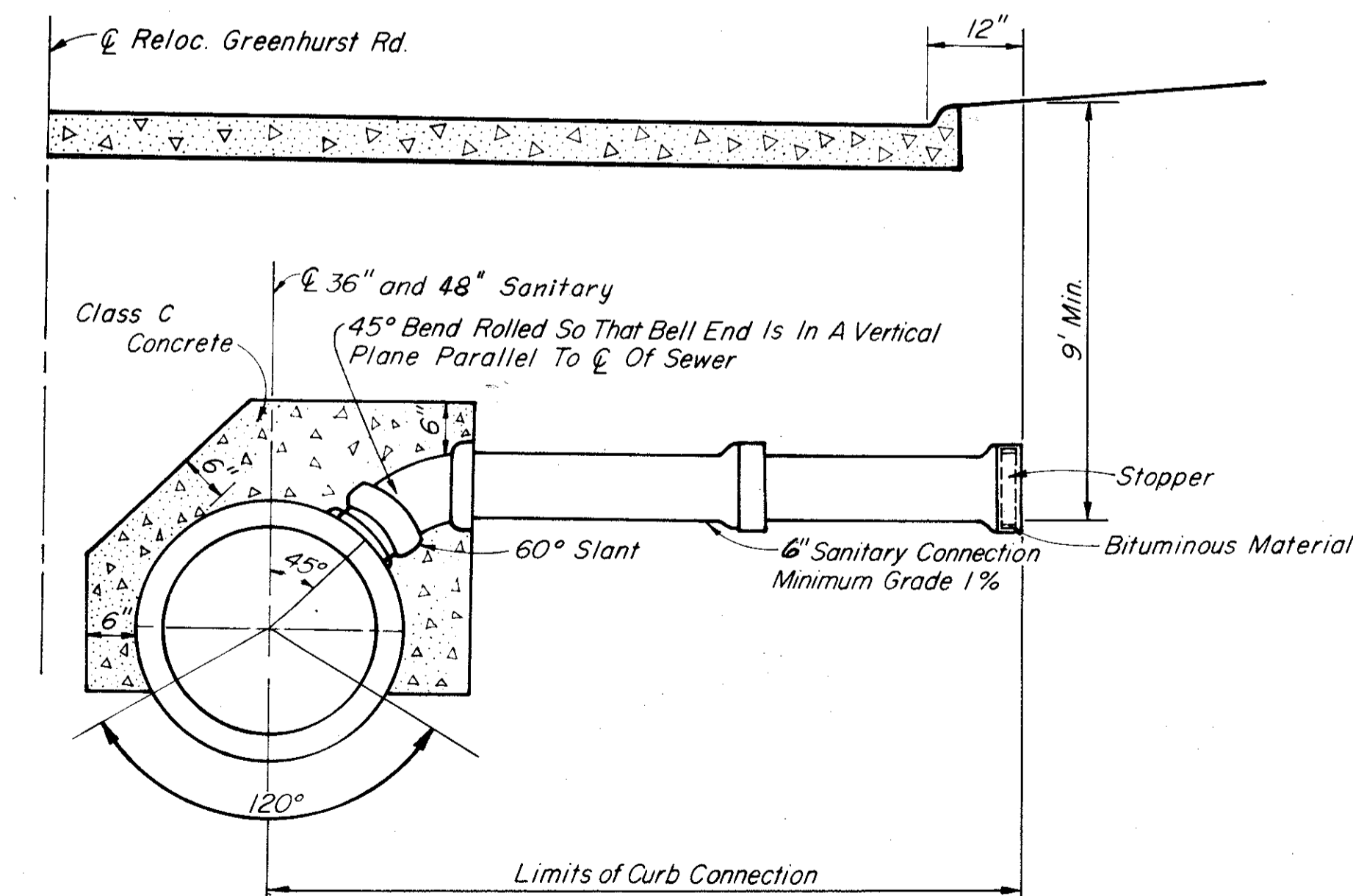
STORM SEWER DETAIL CLOSED SYSTEM HIGH FILL OUTLET

No Scale



TYPICAL Y-BRANCH AND RISER DETAIL

Scale: 3/4" = 1'-0"



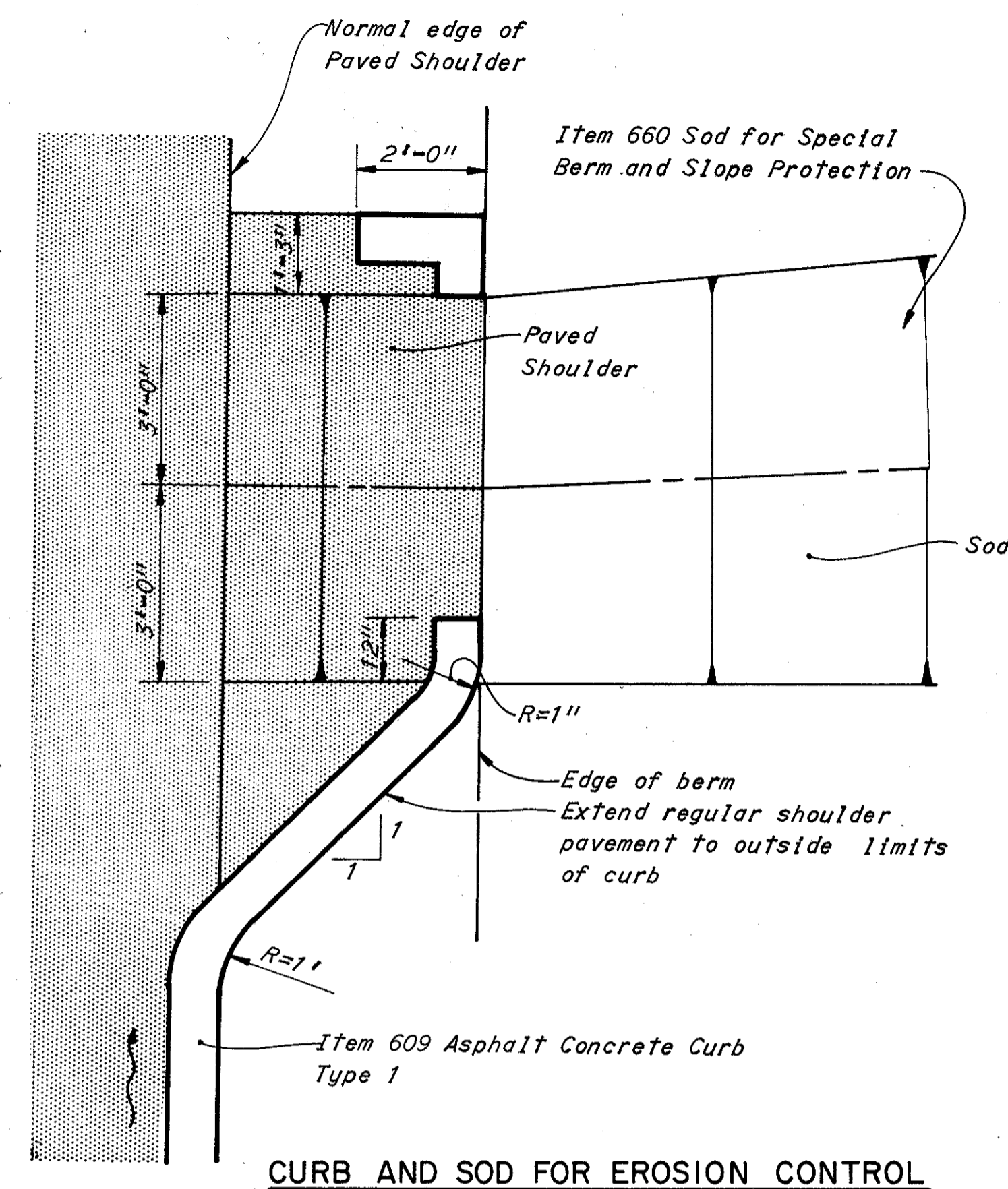
DETAIL OF CURB CONNECTIONS TO 36" AND 48" SANITARY SEWER
RELOCATED GREENHURST ROAD

Note: 6" Class 200 Cast Iron Water Main pipe is required for all bored sewer service connections including slip-on rubber joints with an A.S.A. thickness classification No. 25.

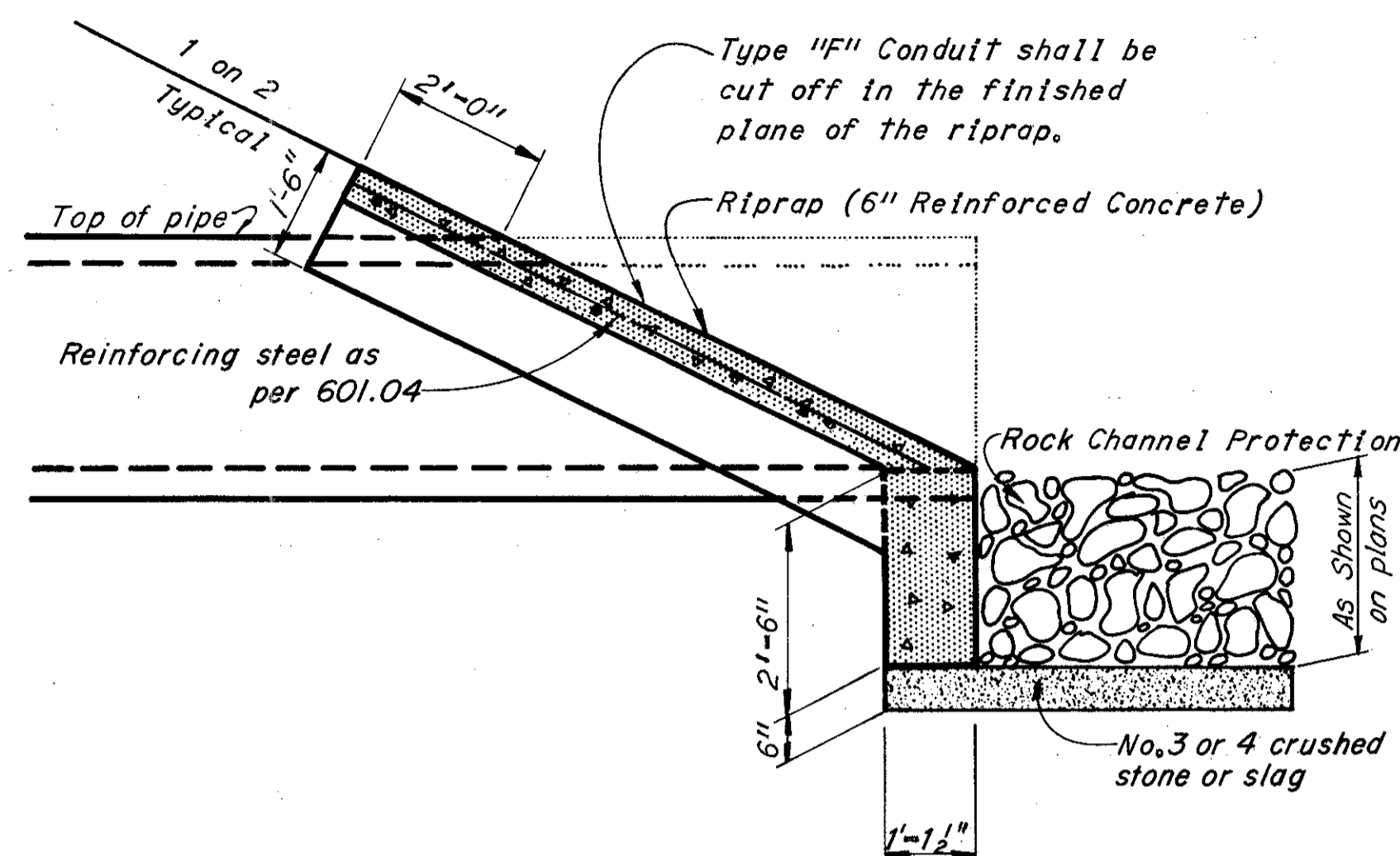
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
CUY.480-21.40

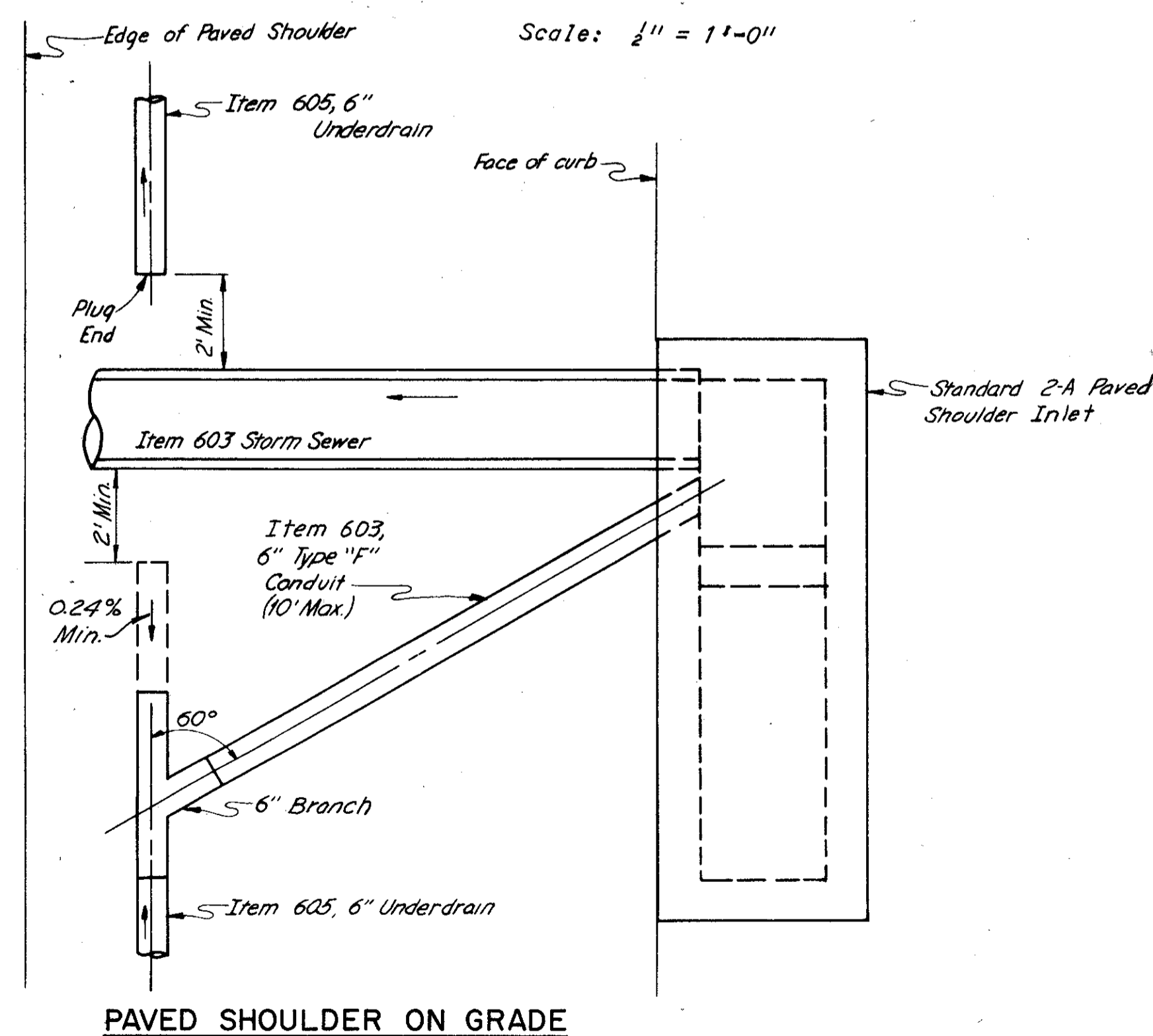
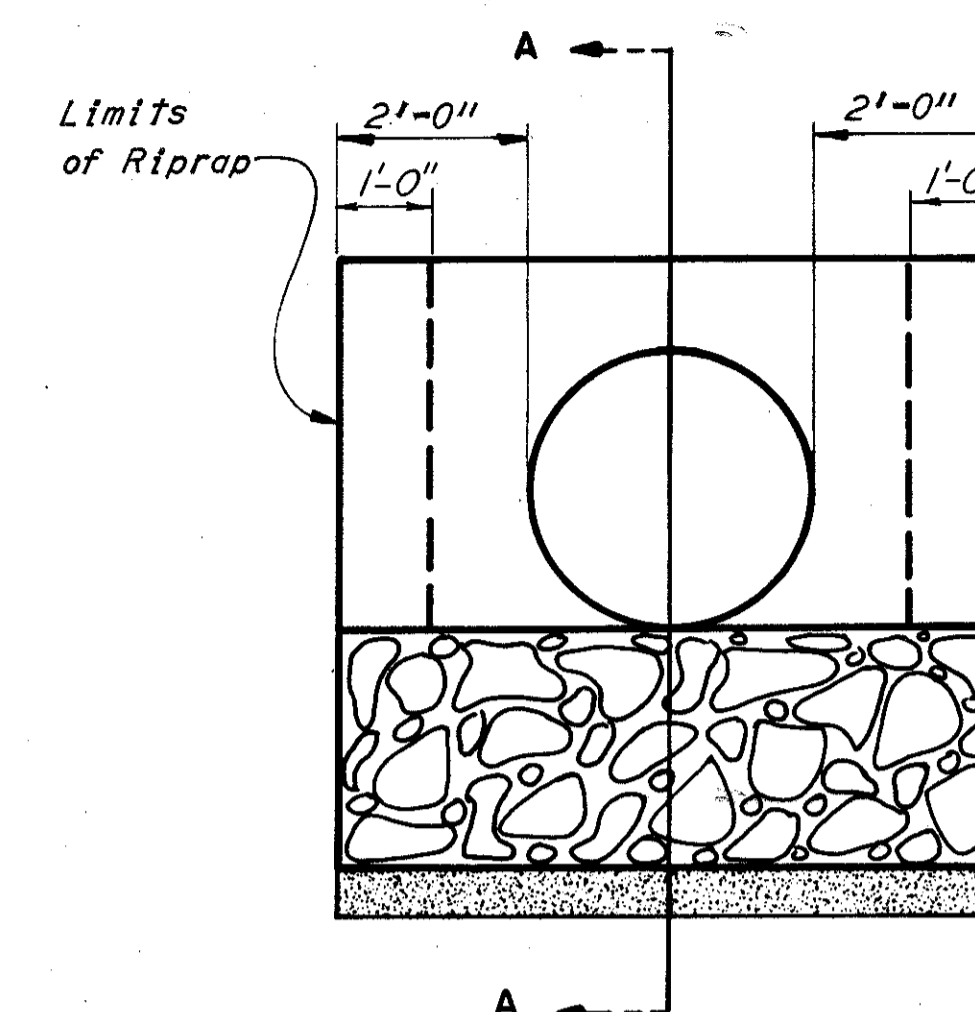


CURB AND SOD FOR EROSION CONTROL

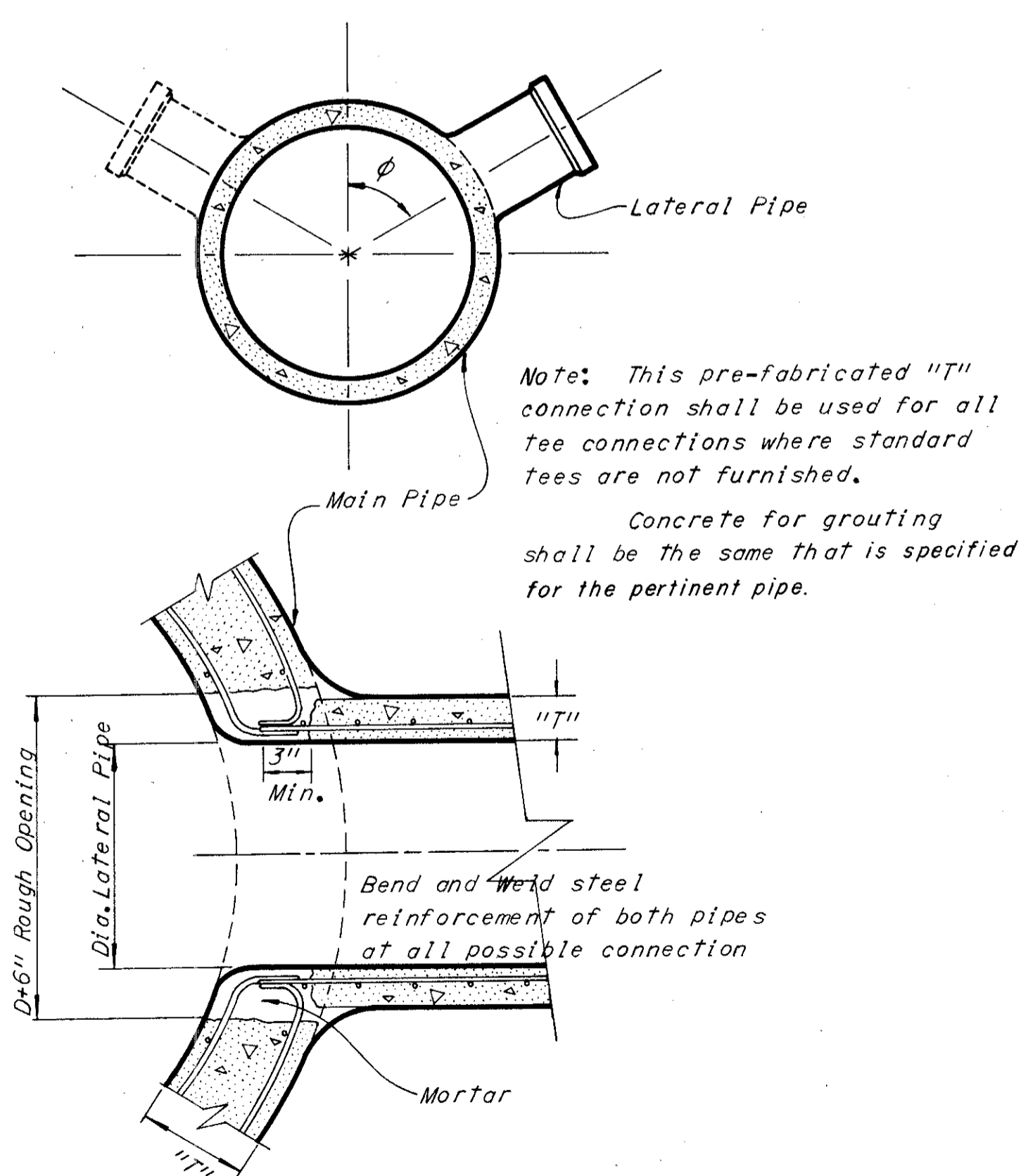


SECTION A-A

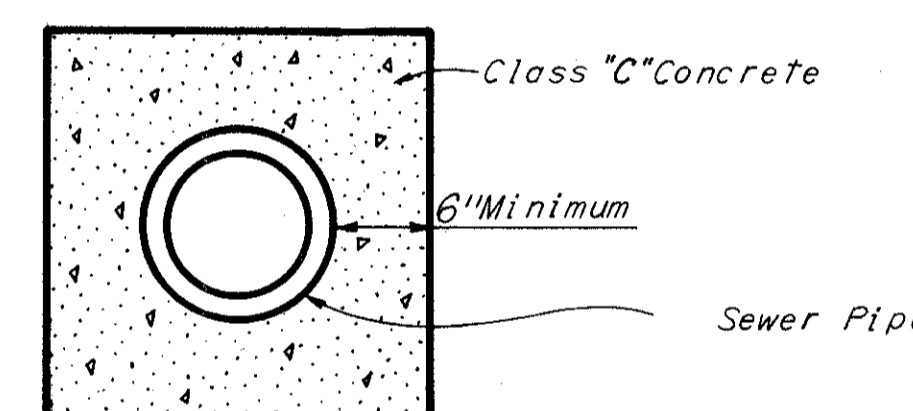
STORM SEWER OUTLET DETAIL
Scale: 1/2" = 1'



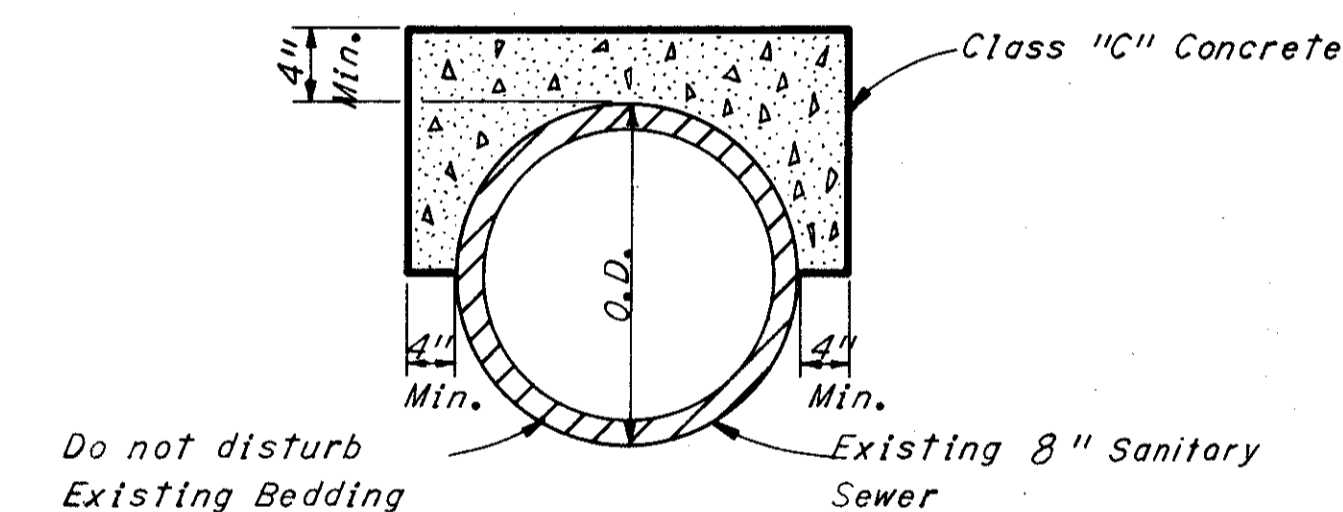
PAVED SHOULDER ON GRADE



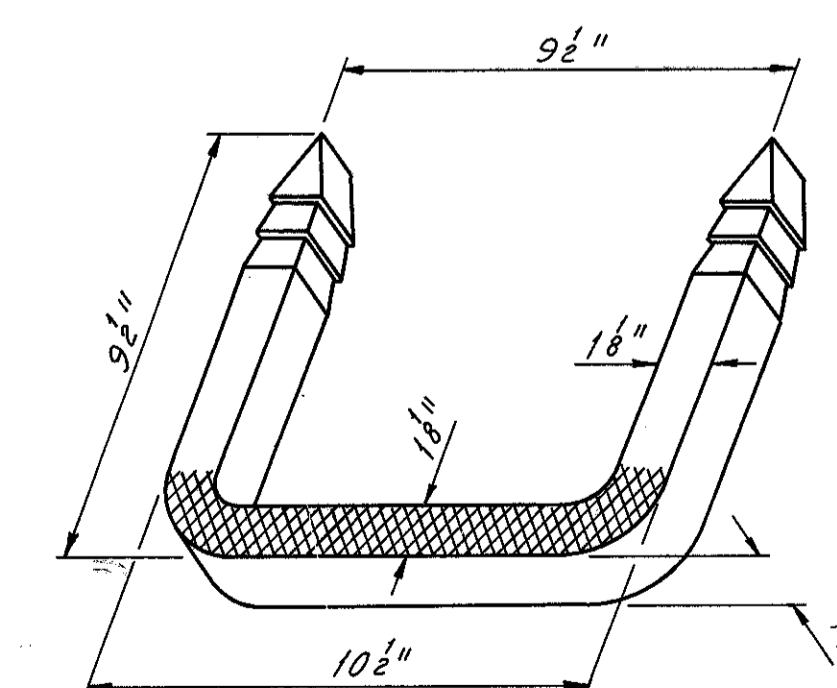
PRE-FABRICATED "T" CONNECTION



SEWER PIPE ENCASEMENT

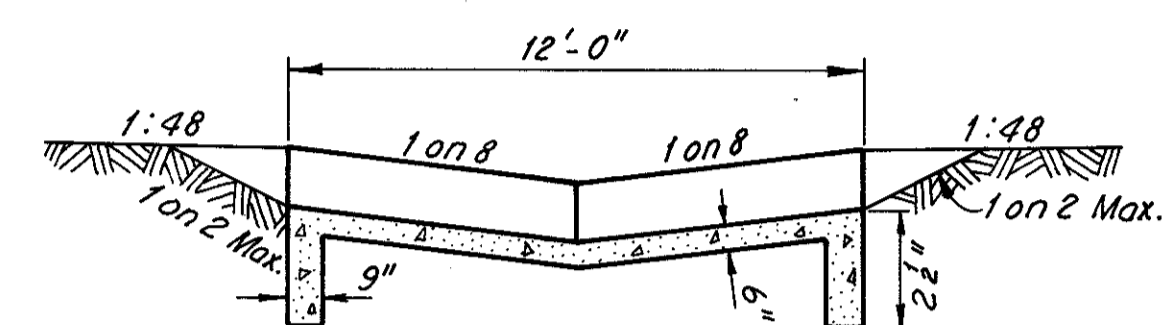


ARCH ENCASEMENT DETAIL (S-7)

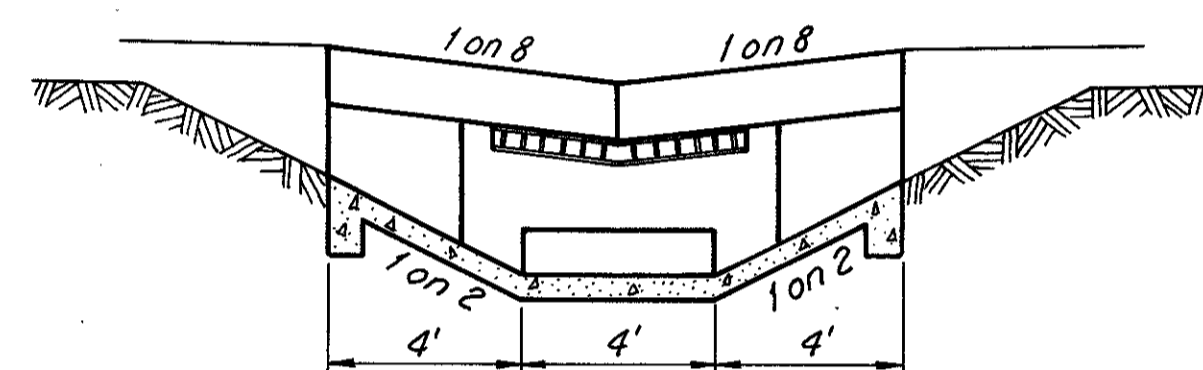


CAST IRON MANHOLE STEP
Scale: 3" = 1'-0"

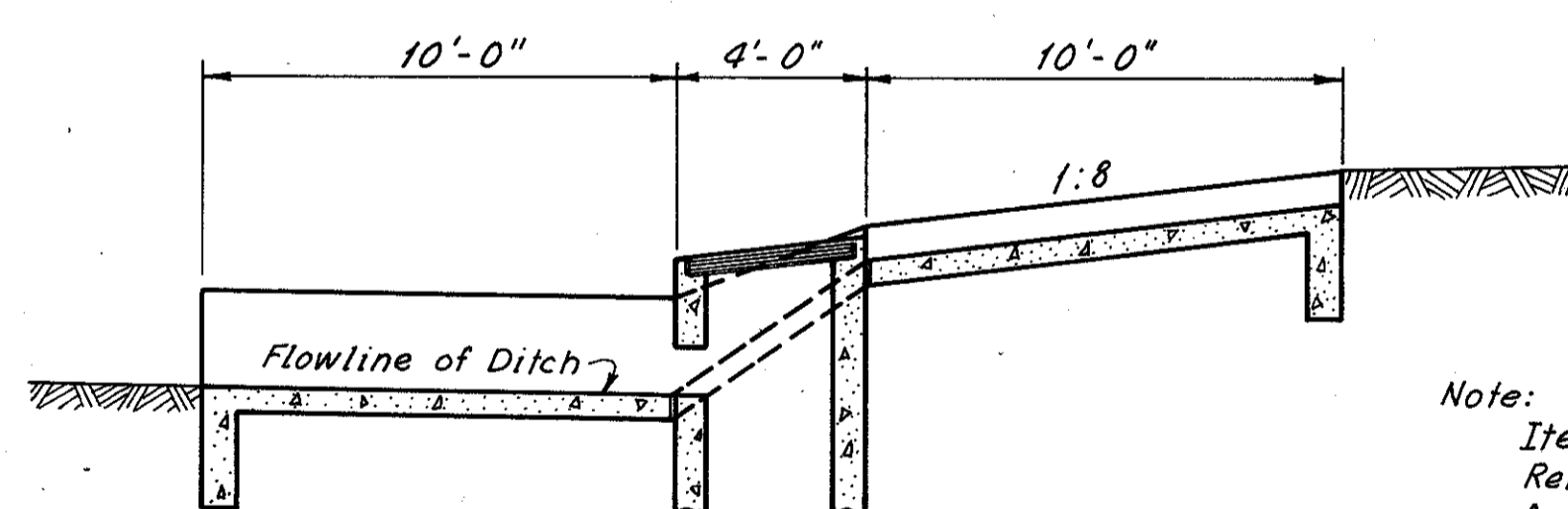
SCALE: Not to scale
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE: I.M. DATE 6-2-69
TRCD: I.M. DATE 6-2-69
CKD: E.R.A. DATE 6-10-69
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK



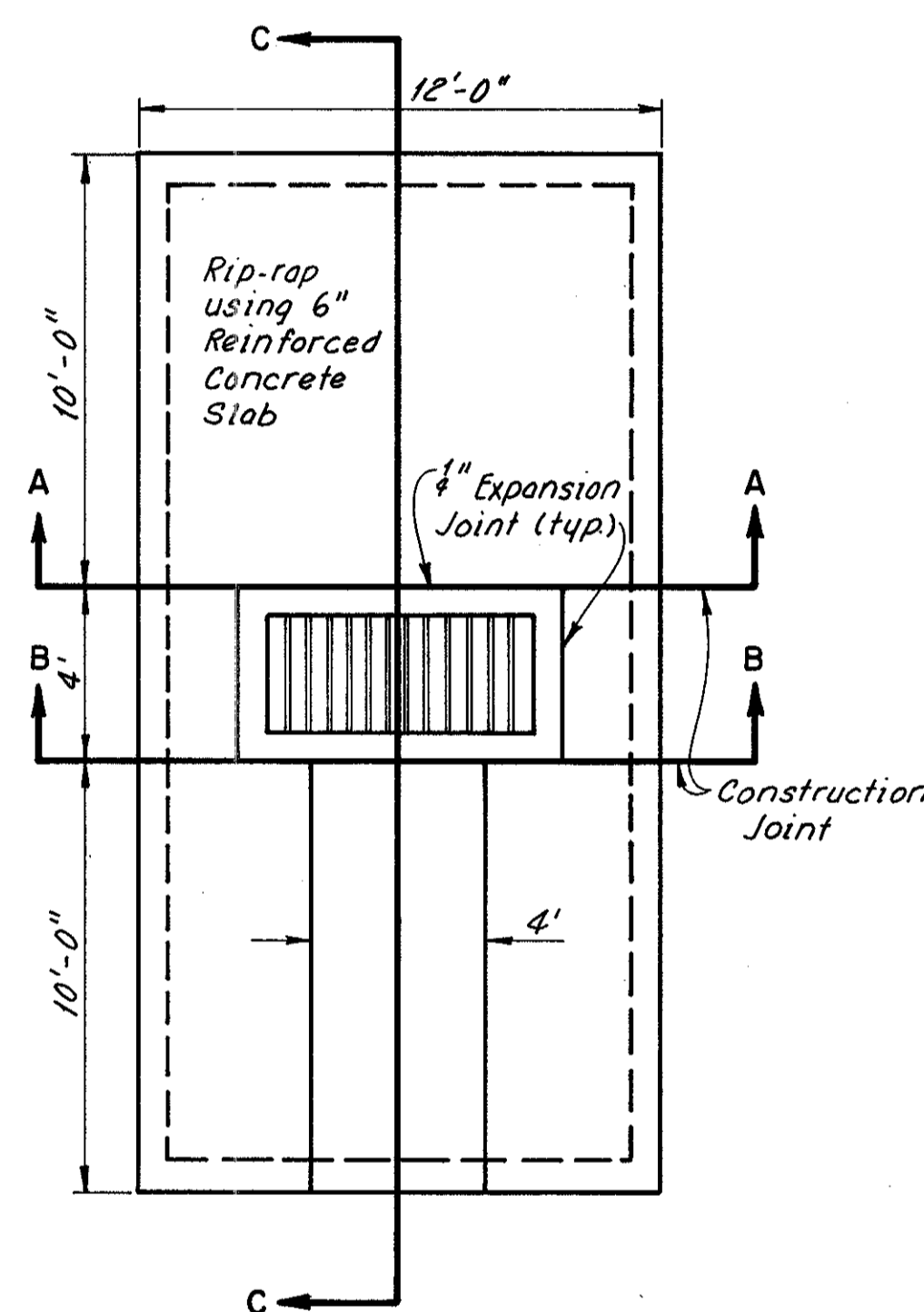
SECTION A-A



SECTION B-B

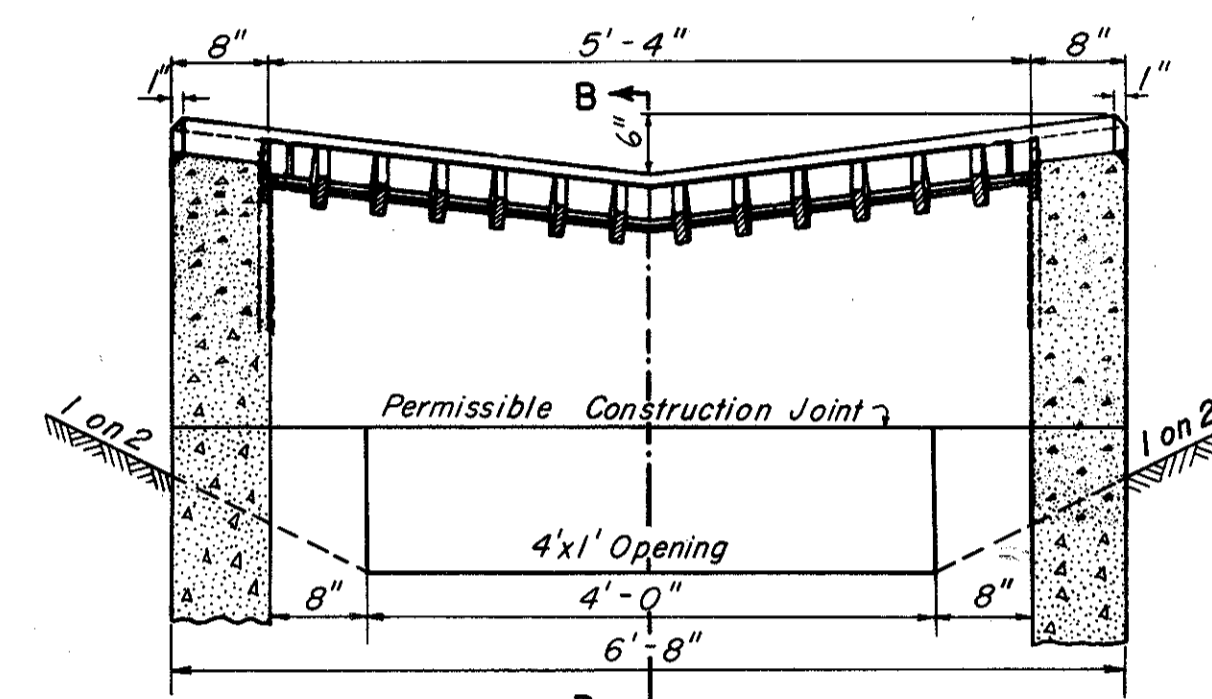


SECTION C-C

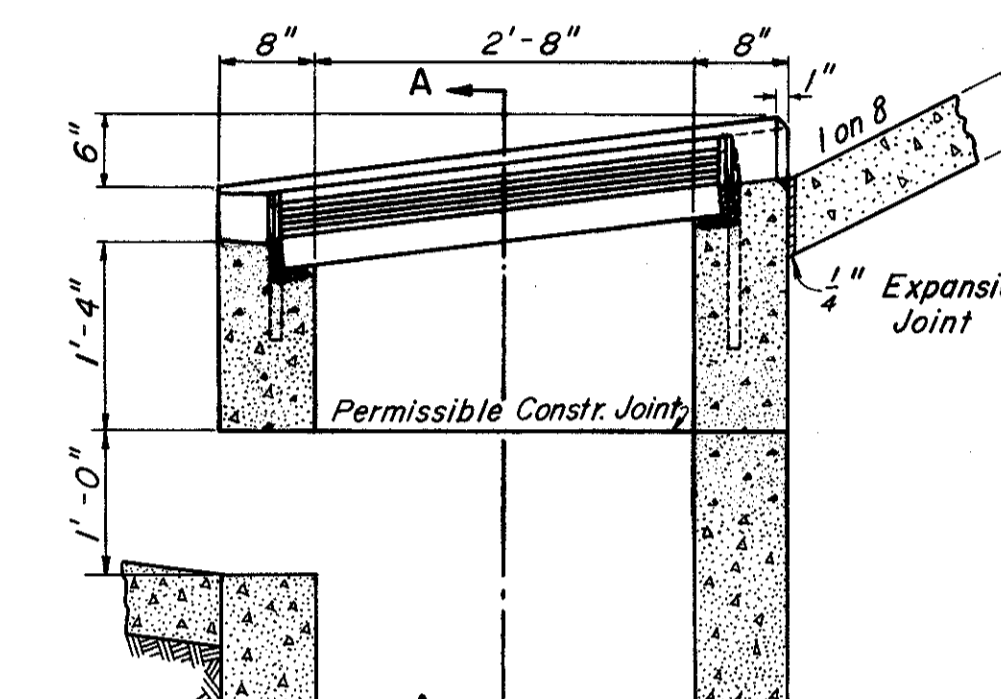


PLAN
Scale: 1/4" = 1'-0"

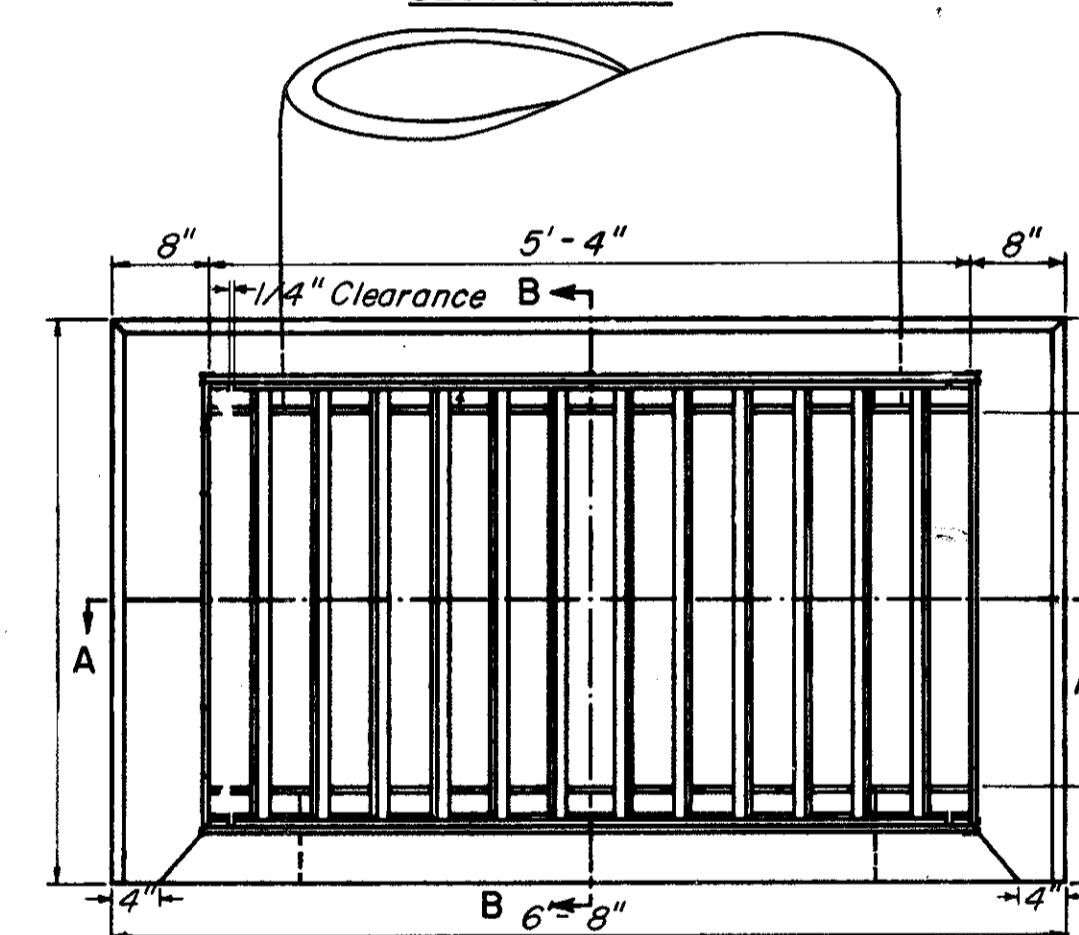
Note:
Item 601 Rip-rap using 6"
Reinforced Concrete Slab
Area = (24x12) - (4x6.66) = 29 Sq. Yds.



SECTION A-A



SECTION B-B



PLAN OF CATCH BASIN

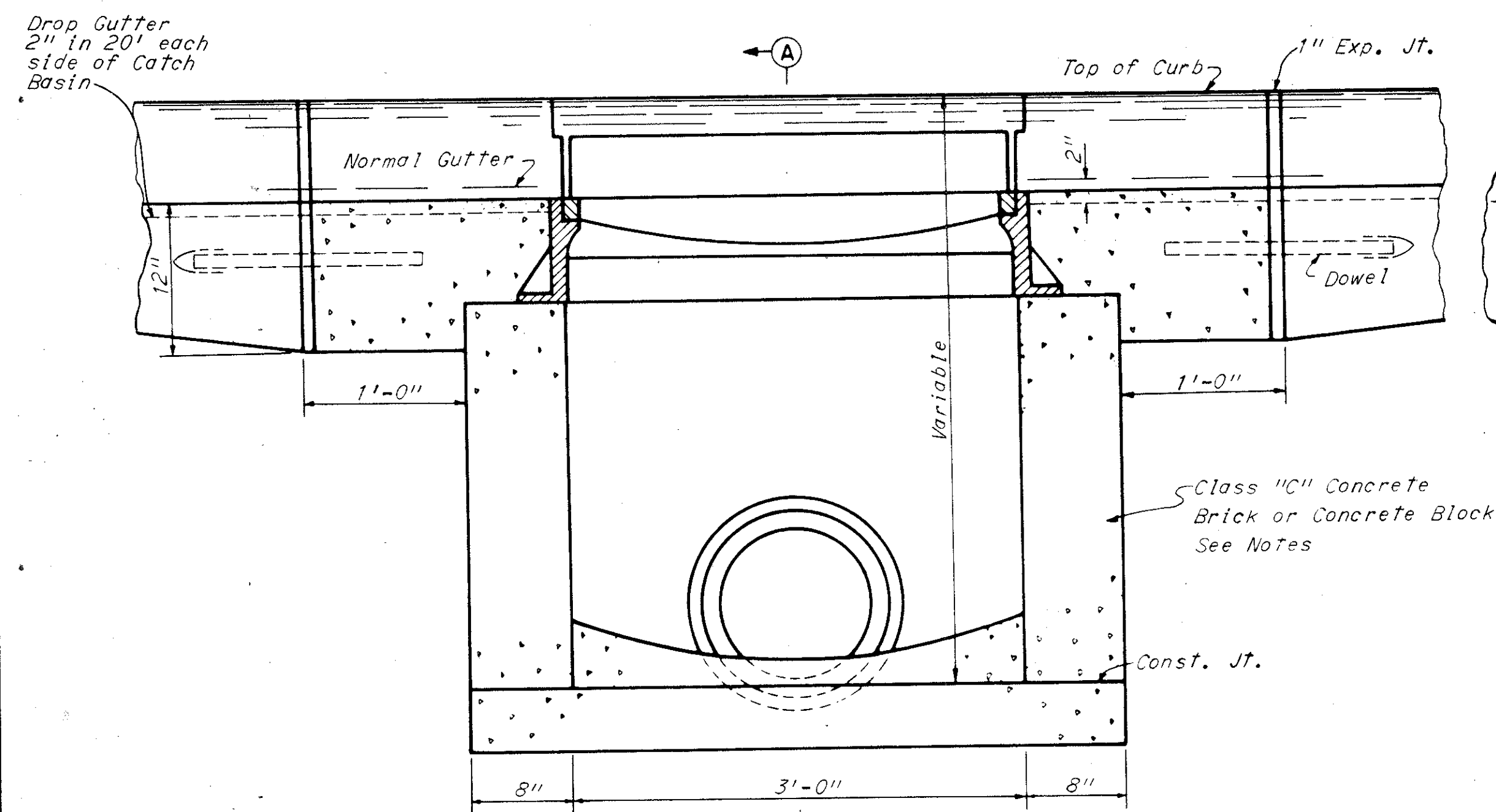
Notes:
Ditch grading and lining shall be in accordance with the details shown on sheet.
Brick or Concrete Block may be used in wall construction between the concrete base and the flowline of the window.
All other notes and details shall be in accordance with Standard Construction Drawing CB-4.

STANDARD NO. 4 CATCH BASIN MODIFIED AS PER PLAN

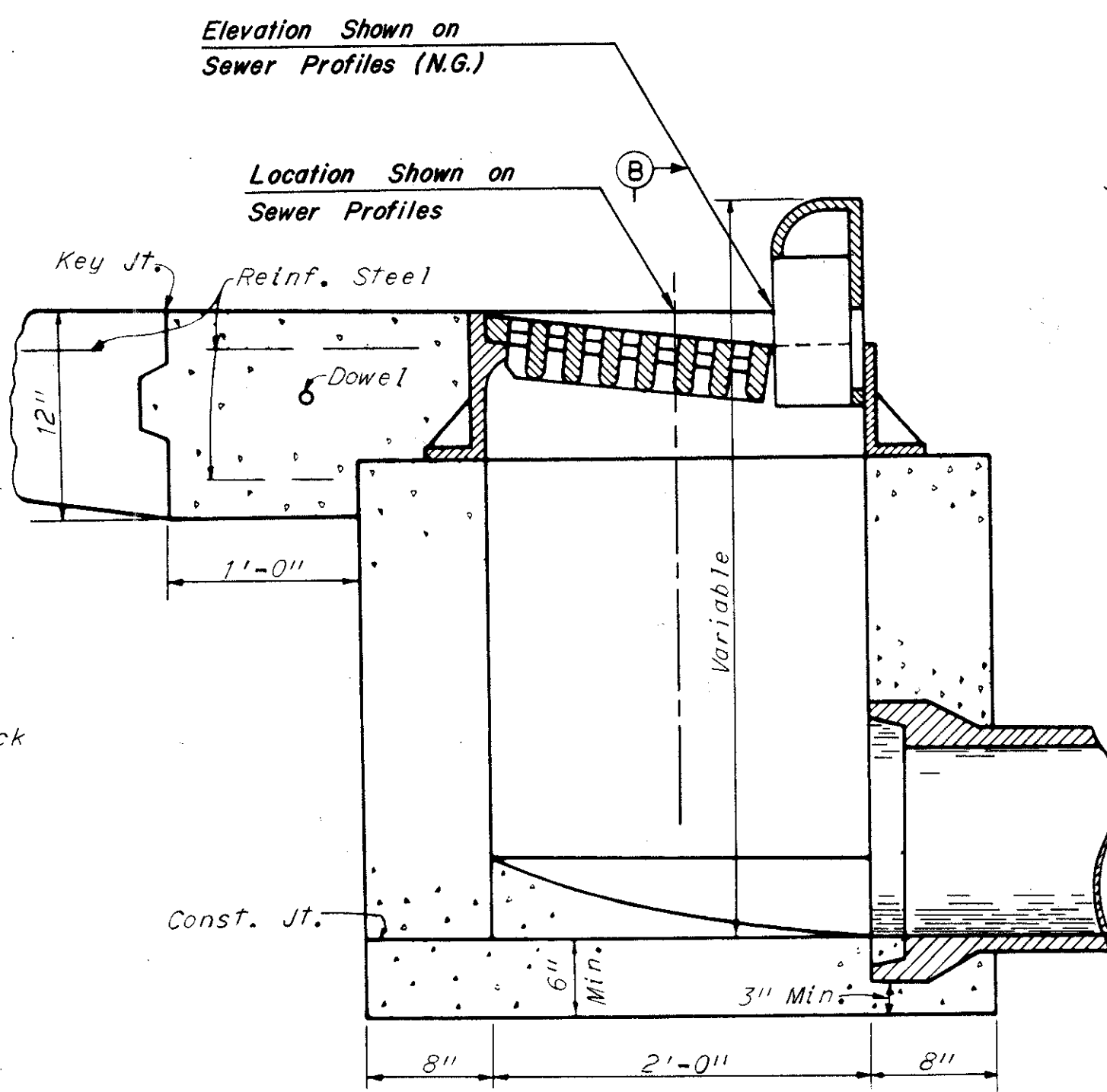
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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390

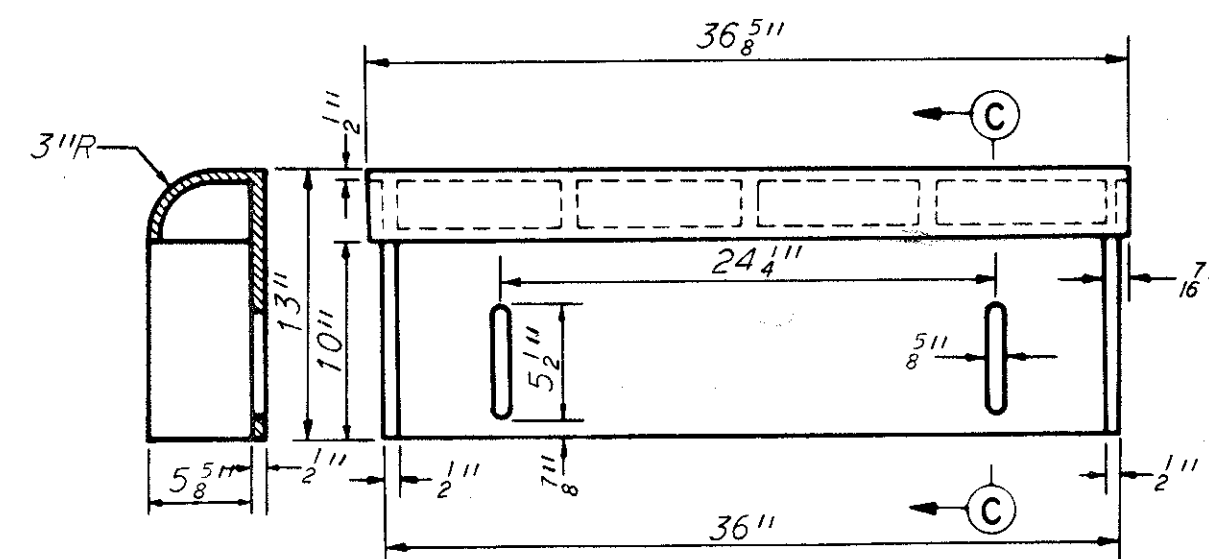
CUYAHOGA COUNTY
CUY. 480-21.40



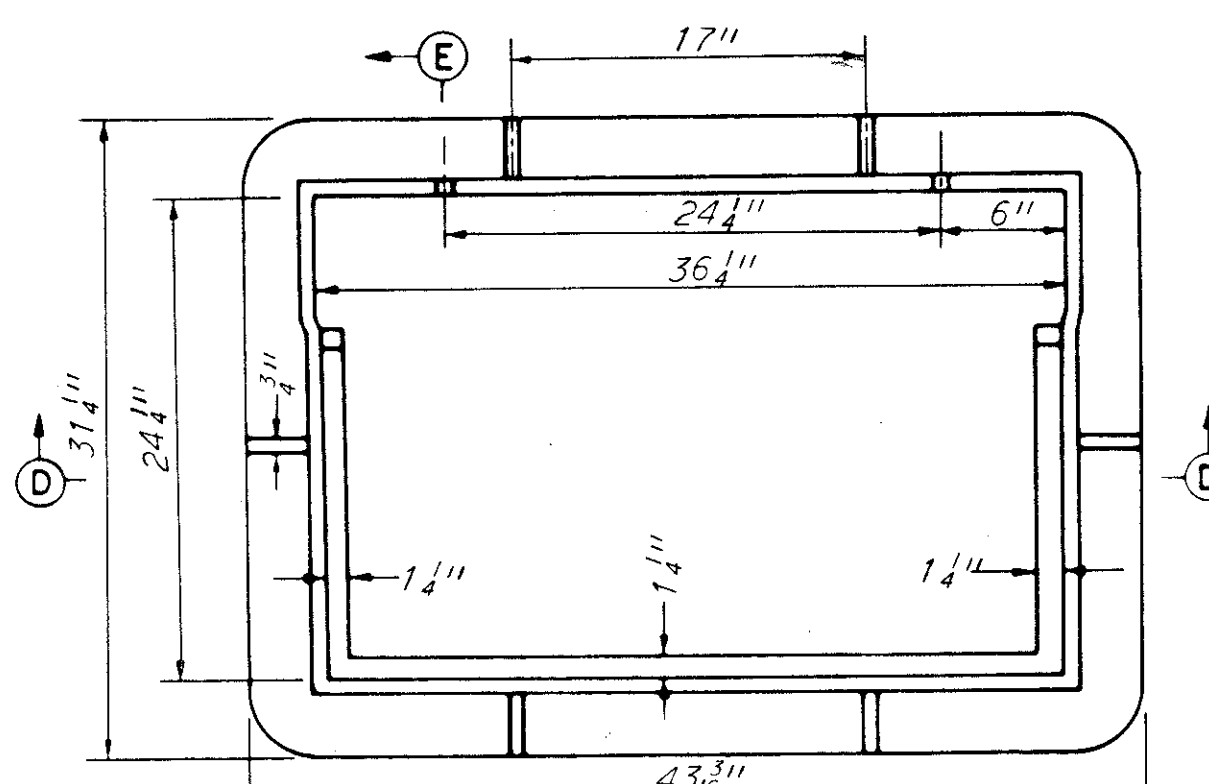
SECTION B-B



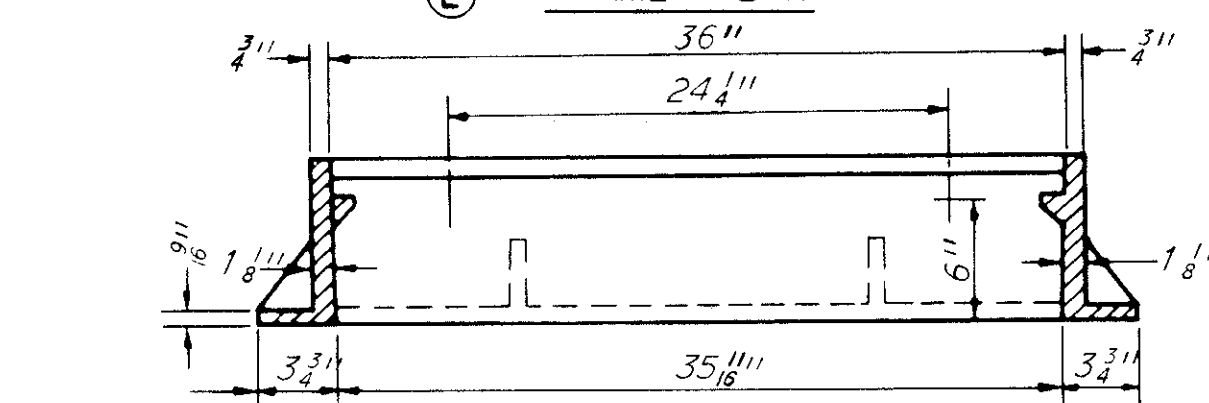
SECTION A-A



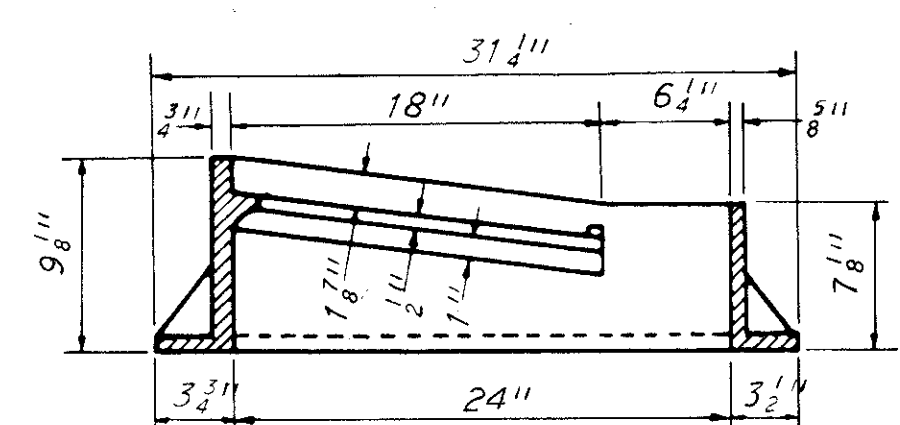
SECTION C-C
ELEVATION
RADIUS CURB BOX



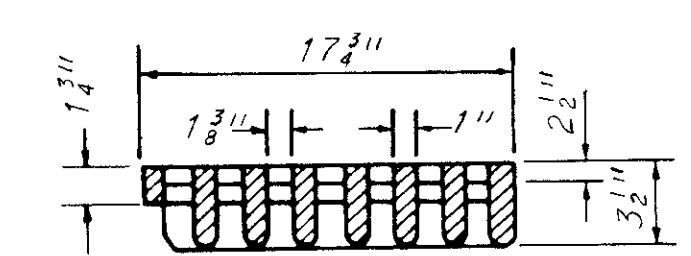
FRAME PLAN



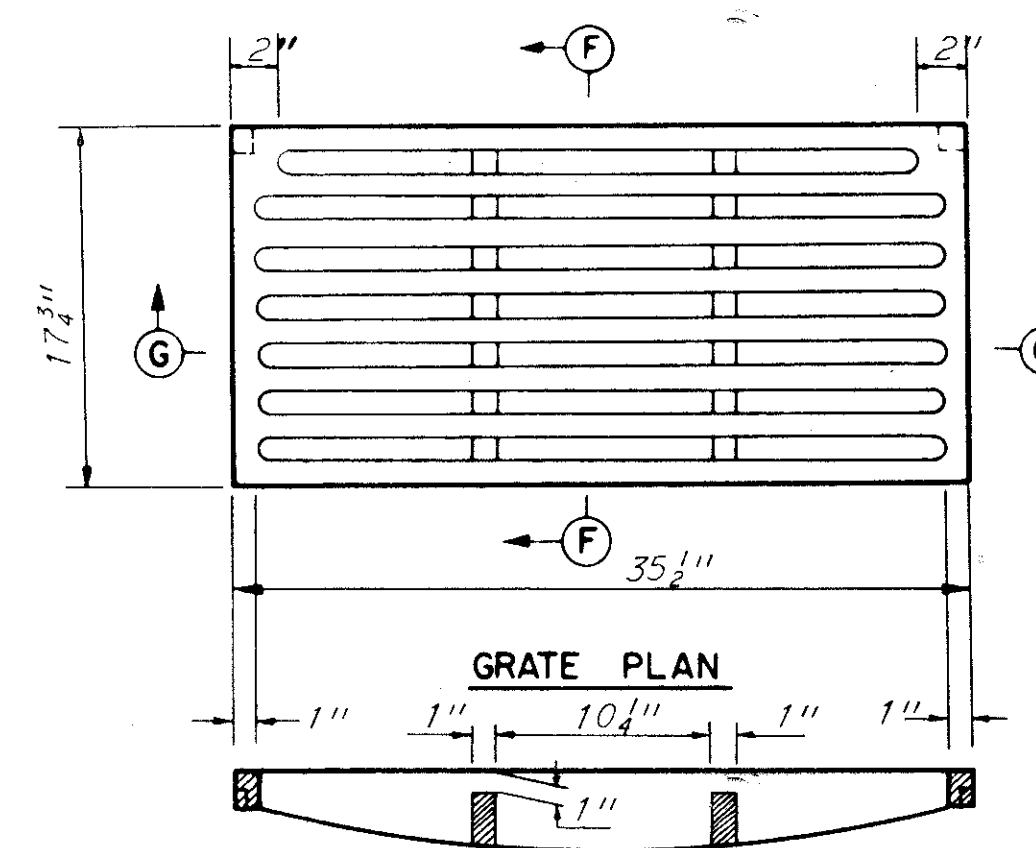
SECTION D-D



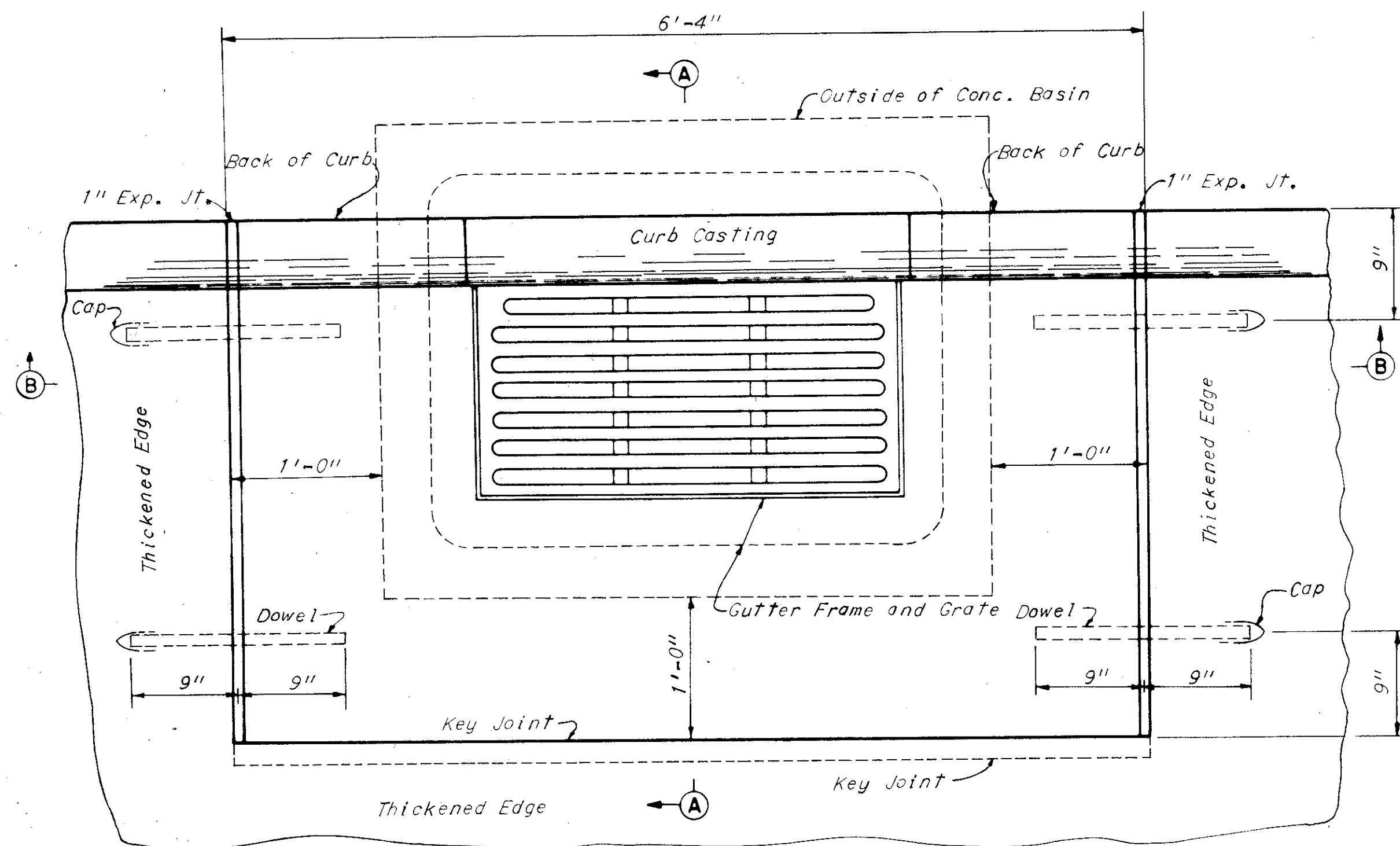
SECTION E-E



SECTION F-F



SECTION G-G



PLAN OF CATCH BASIN &
PAVEMENT JOINTS

Castings shall meet the requirements of Item 604. The design shall be essentially the same and equally as strong as those shown hereon.

Weights, minimum
Curb casting 100 pounds
Gutter grate 200 pounds
Gutter frame 300 pounds

Bearing Areas of frame and grate shall be so fitted and finished as to provide a firm and even seat for all portions of the grate in the frame. No projections shall exist on bearing areas of either casting and the grate shall sit in its frame without rocking. Frame and grate shall be fitted, matched and marked before delivery to the project.

Dowels to be 1 inch round, smooth bars 18 inches long spaced as shown hereon and greased.

Concrete cast in place to be Class 11C. Brick or Concrete Block side walls, when used in place of concrete, shall be 8 inches minimum in thickness.

Pavement: The portion blocked out of the pavement shall be placed after the casting has been set but shall be paid for as part of the pavement.

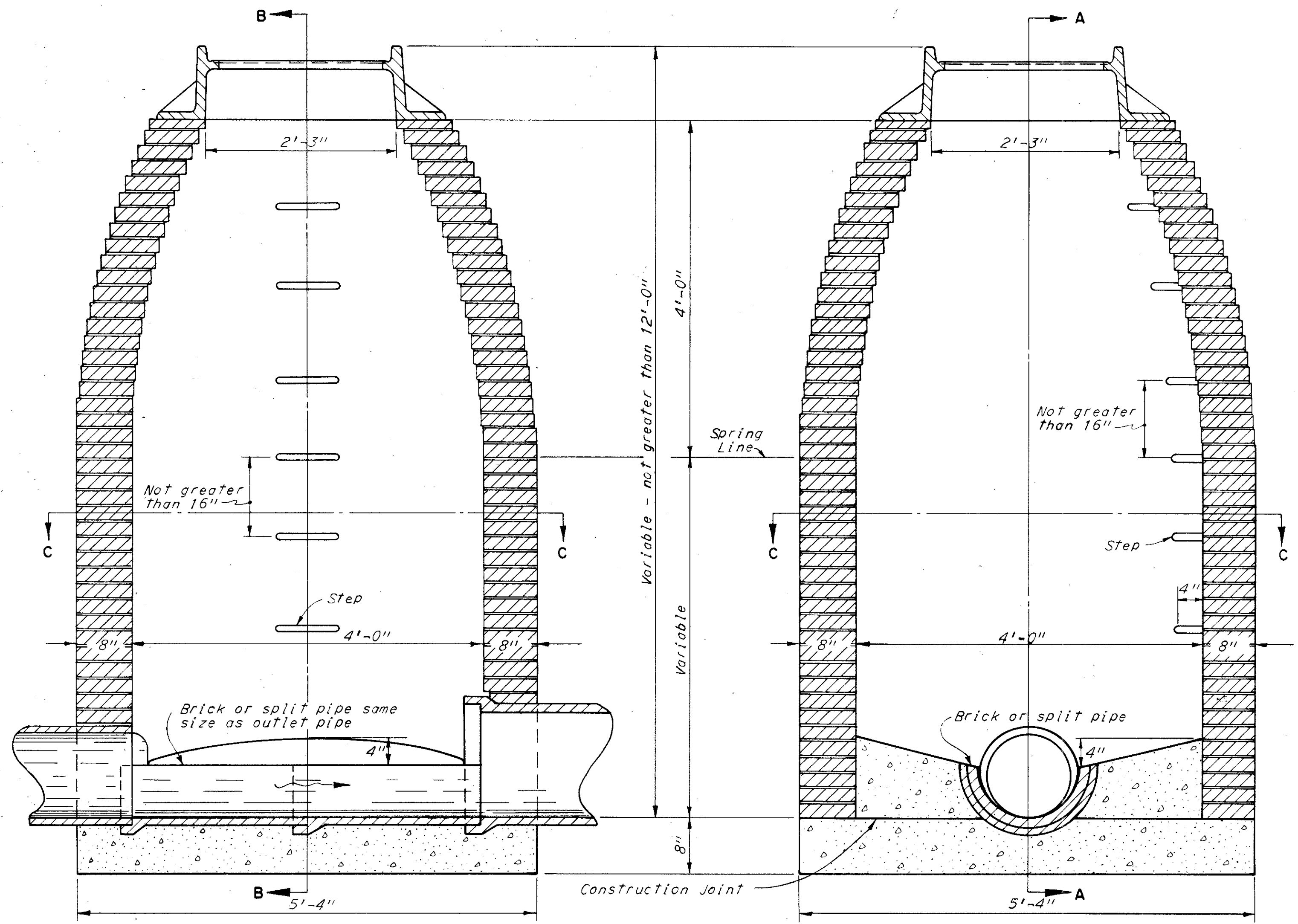
Expansion Joint: The 1 inch Expansion Material shall be omitted when Asphaltic Concrete Surface is part of the Pavement.

Note: This catch basin is identical with the Cuyahoga County Standard No. 3-C Catch Basin.

MADE RJK DATE 12-30-59 TRACED DATE
CHECKED I.M. DATE 11-7-68 SCALE

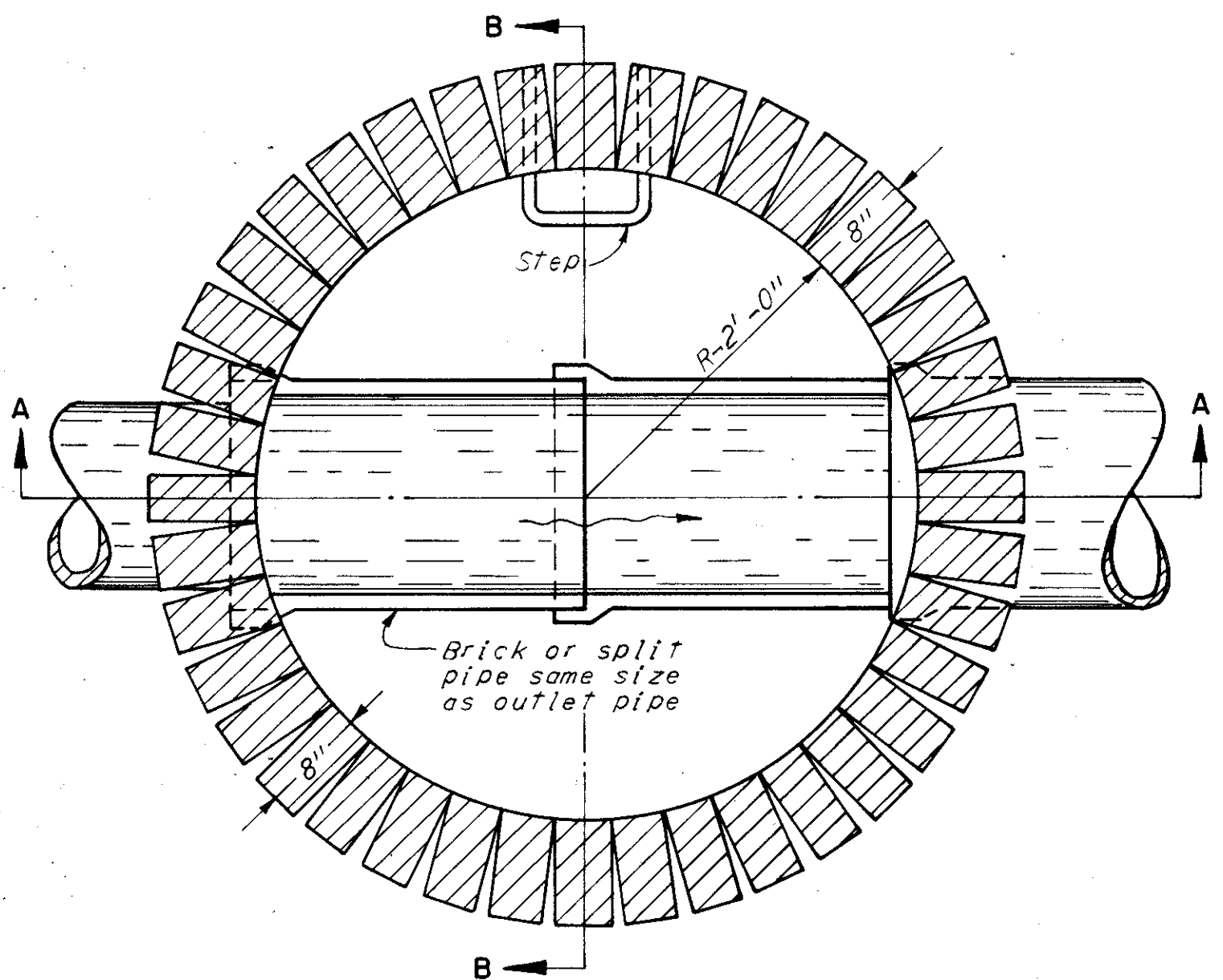
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
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CUY-480-21.40

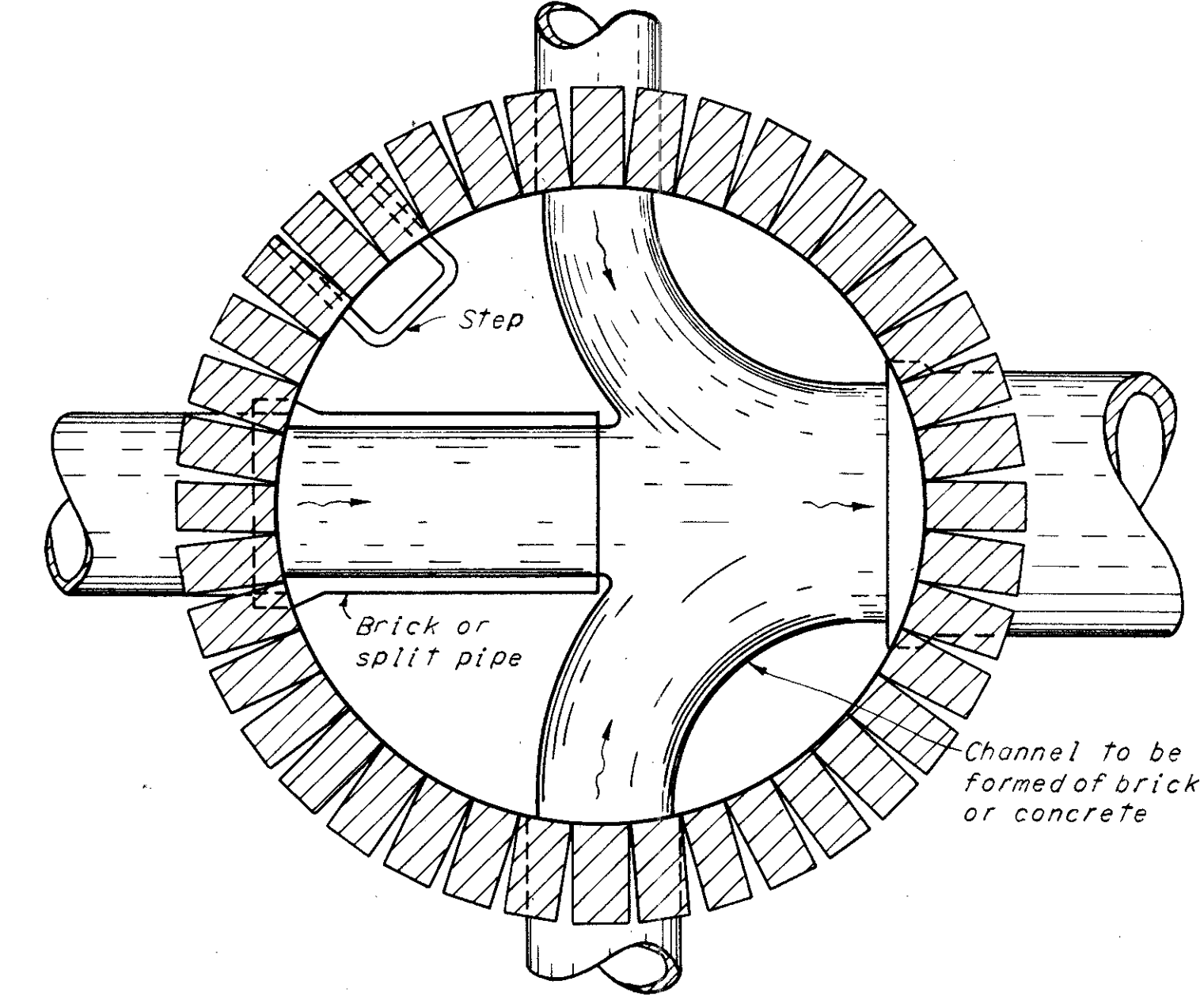


SECTION A-A
Scale: 1"=1'-0"

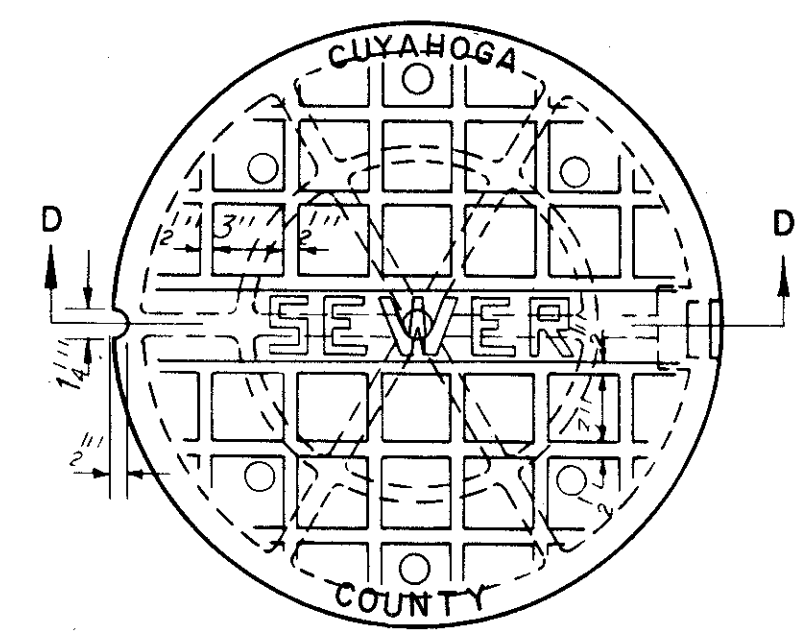
SECTION B-B
Scale: 1"=1'-0"



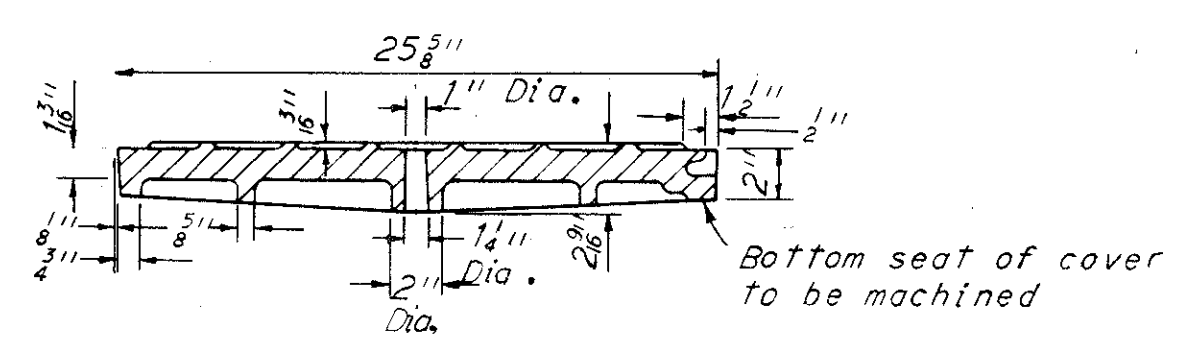
SECTION C-C



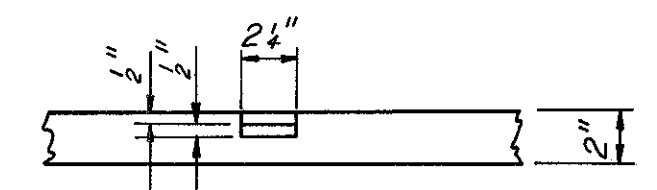
SECTION BELOW SPRING LINE SHOWING METHOD OF TURNING SIDE DRAINS



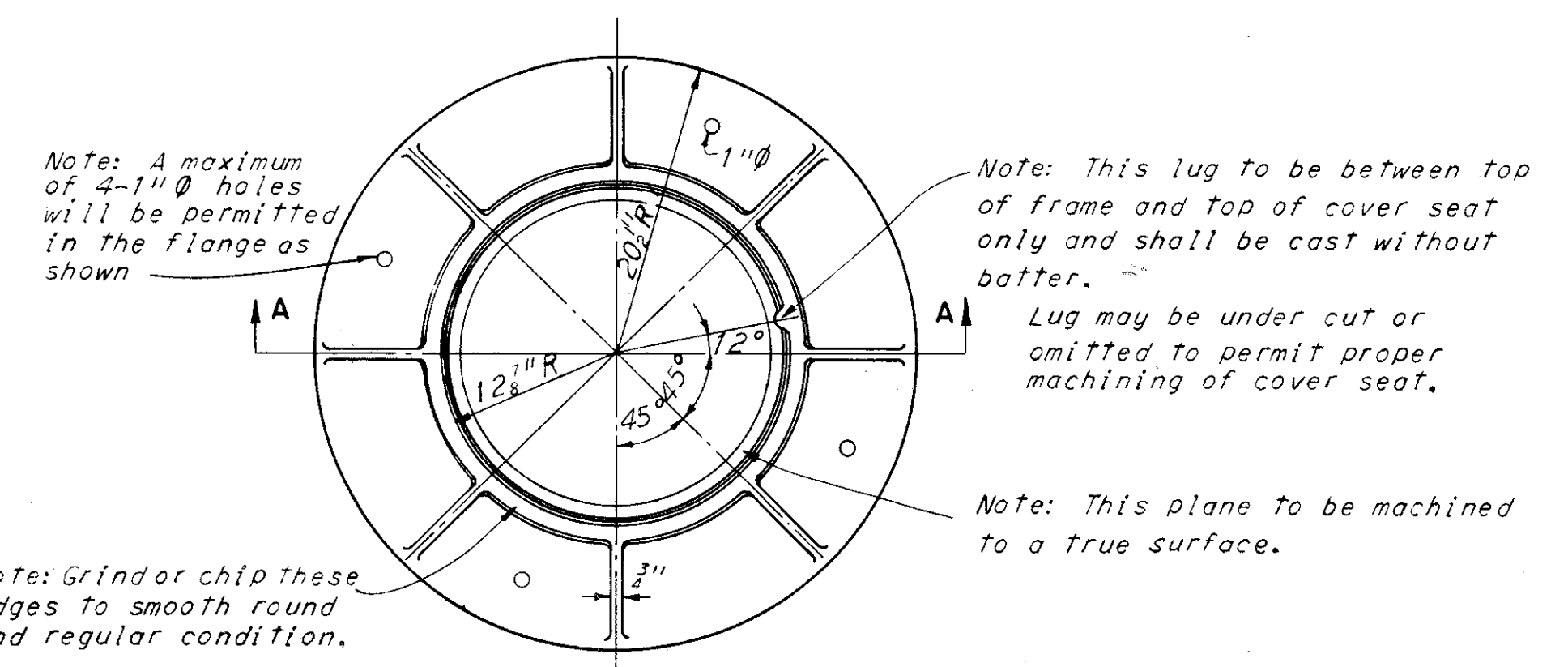
PLAN OF COVER



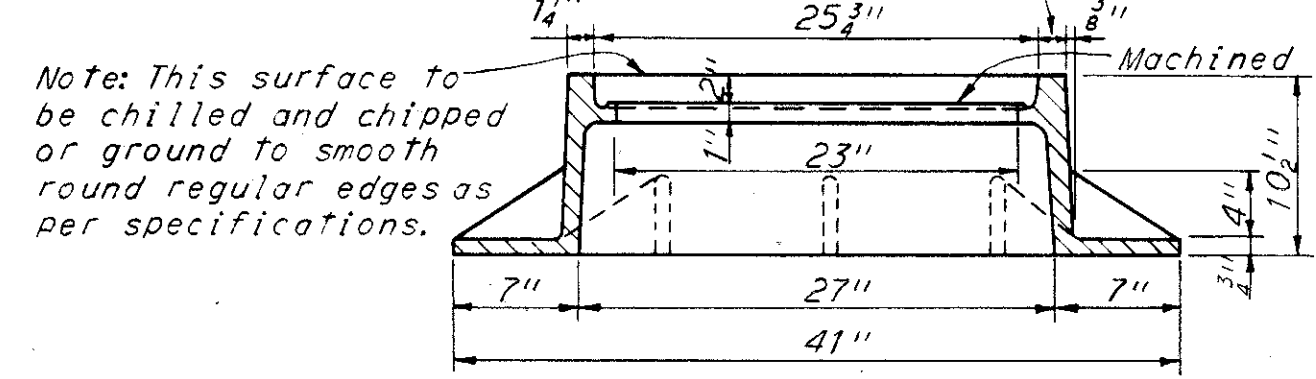
SECTION D-D
Scale: 1 1/2"=1'-0"



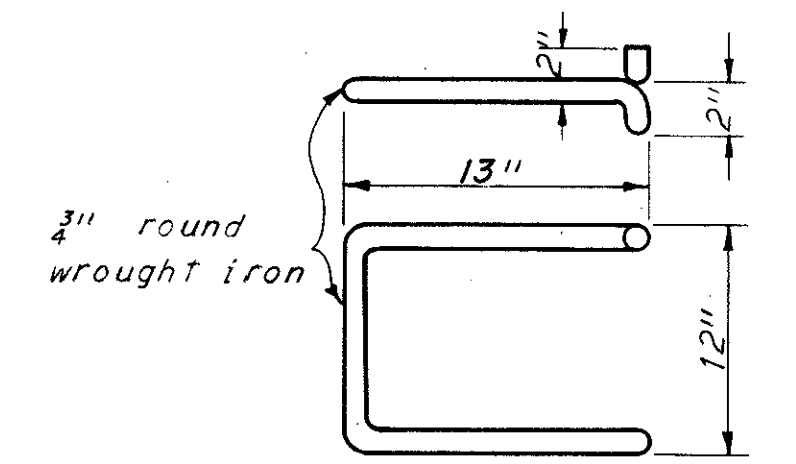
NOTCH DETAIL



PLAN OF FRAME



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



DETAIL OF MANHOLE STEP
Not to Scale

- NOTES -

GENERAL - The design shown hereon is for brick construction. If precast solid concrete blocks, or cast in place concrete are used, the design shall be modified to fit the dimensions of the material used, except that the thickness of the wall shall not be less than 6 inches for precast solid concrete blocks or cast in place concrete construction.

BEARING AREAS of frame and cover shall be so fitted and finished as to provide a firm and even seat for all portions of the cover in the frame. No projections shall exist on bearing areas of either casting, and each cover shall seat in its frame without rocking. Frames and covers shall be fitted, matched and marked before delivery to the project.

SETTING OF CASTING - The base of the frame shall be set in a full bed of Portland cement mortar, and so adjusted to conform to the finished pavement grade.

CASTING - Minimum weight of frame and cover 615 pounds. Casting shall meet the requirements of 604. The design shall be essentially the same and equally as strong as those shown hereon, and shall be given one coat of paint as per specifications.

STEPS shall be wrought iron or nodular iron meeting the requirements of 604.

CONSTRUCTION - Manholes shall be built of brick, precast solid concrete blocks, or cast in place concrete. When manholes are constructed of brick, every sixth course shall be a stretcher course.

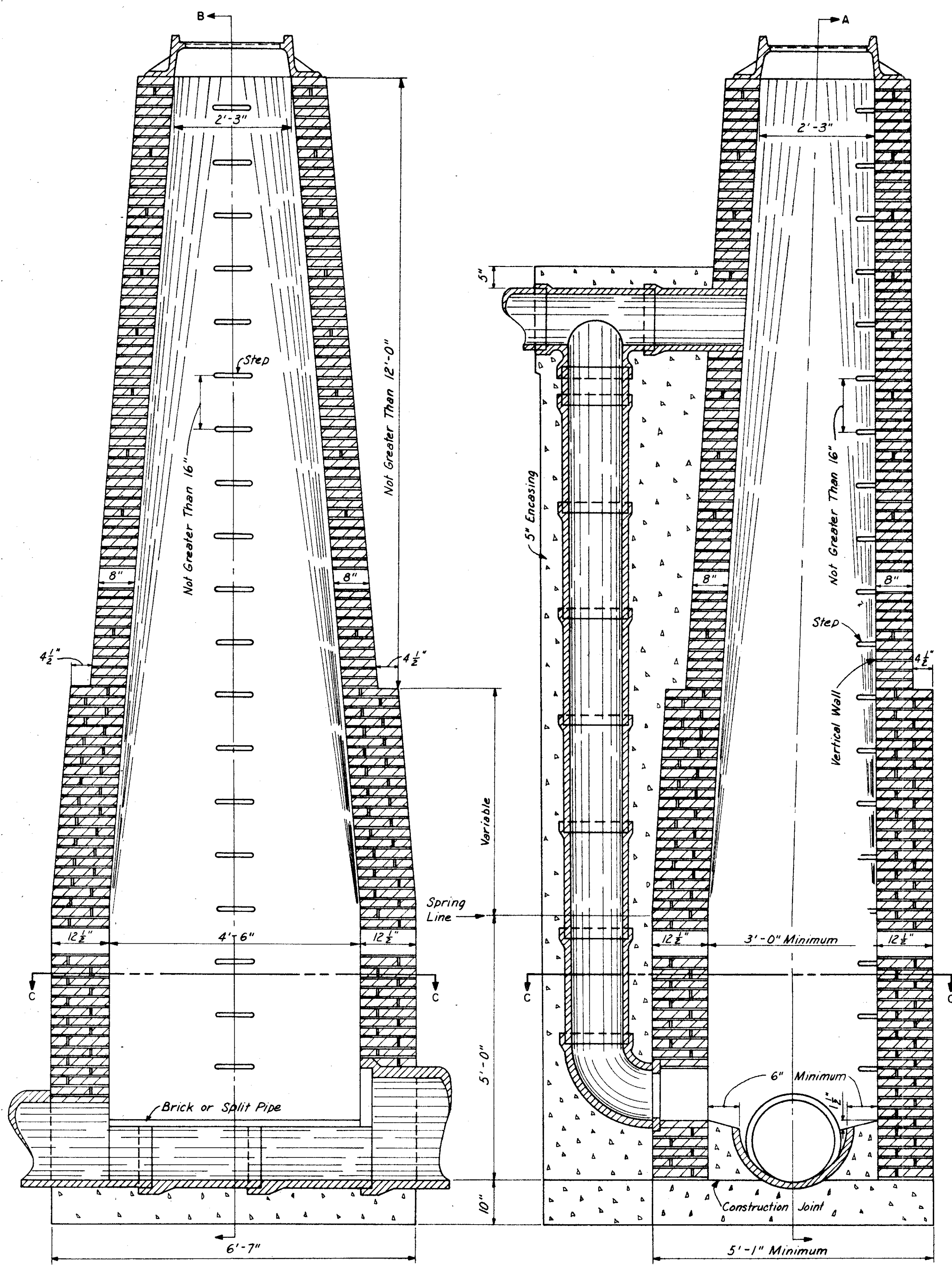
Bottom of manhole shall be Class "C" concrete.

Channel sections in the manhole shall be constructed of split pipe or brick except curved sections which may be built by forming a channel in the concrete.

MADE I.M. DATE 6-2-69 TRACED DATE
CHECKED E.R.A. DATE 6-10-69 SCALE As Shown

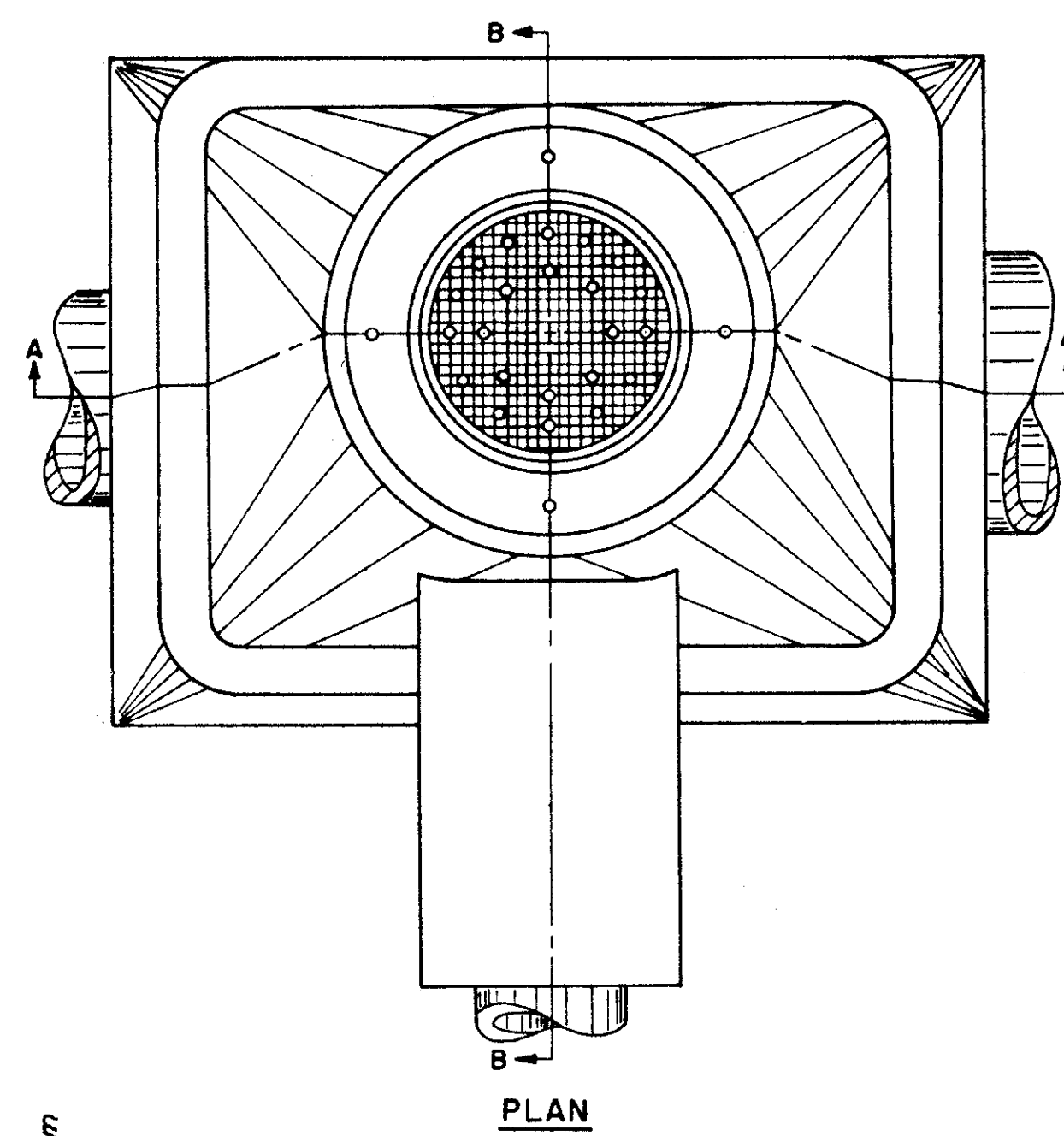
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY
CUY. 480-21.40

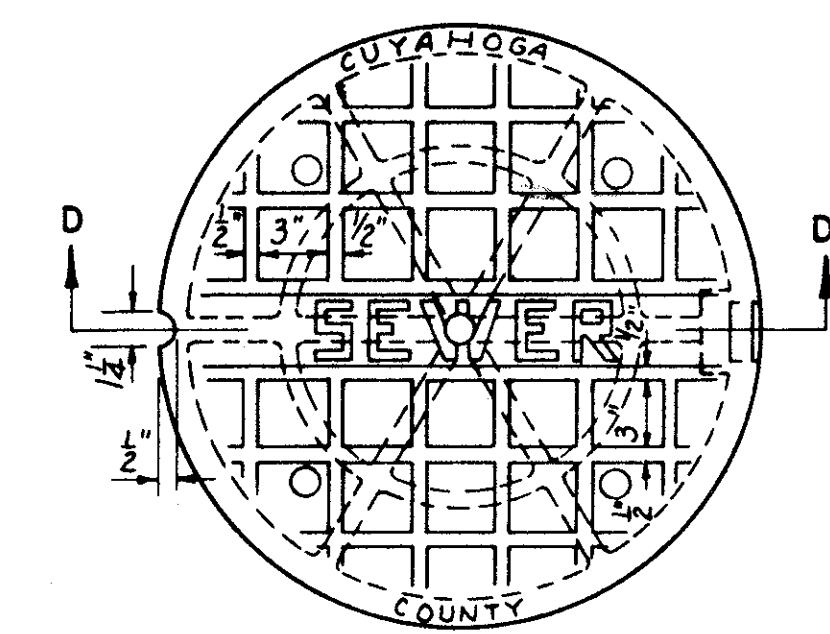


SECTION A-A

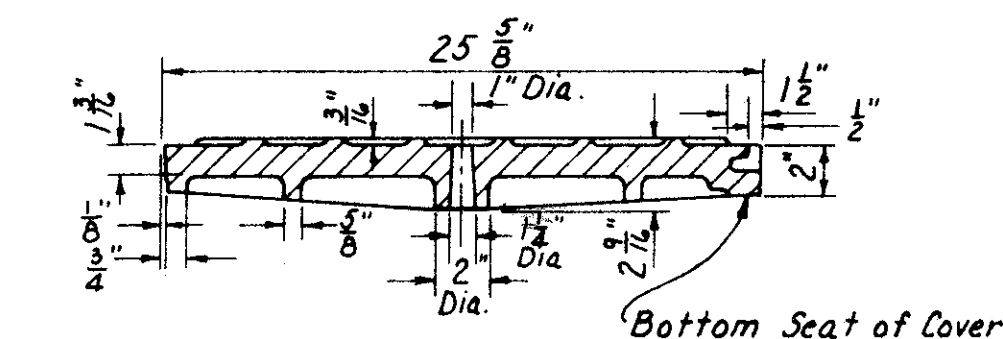
SECTION B-B



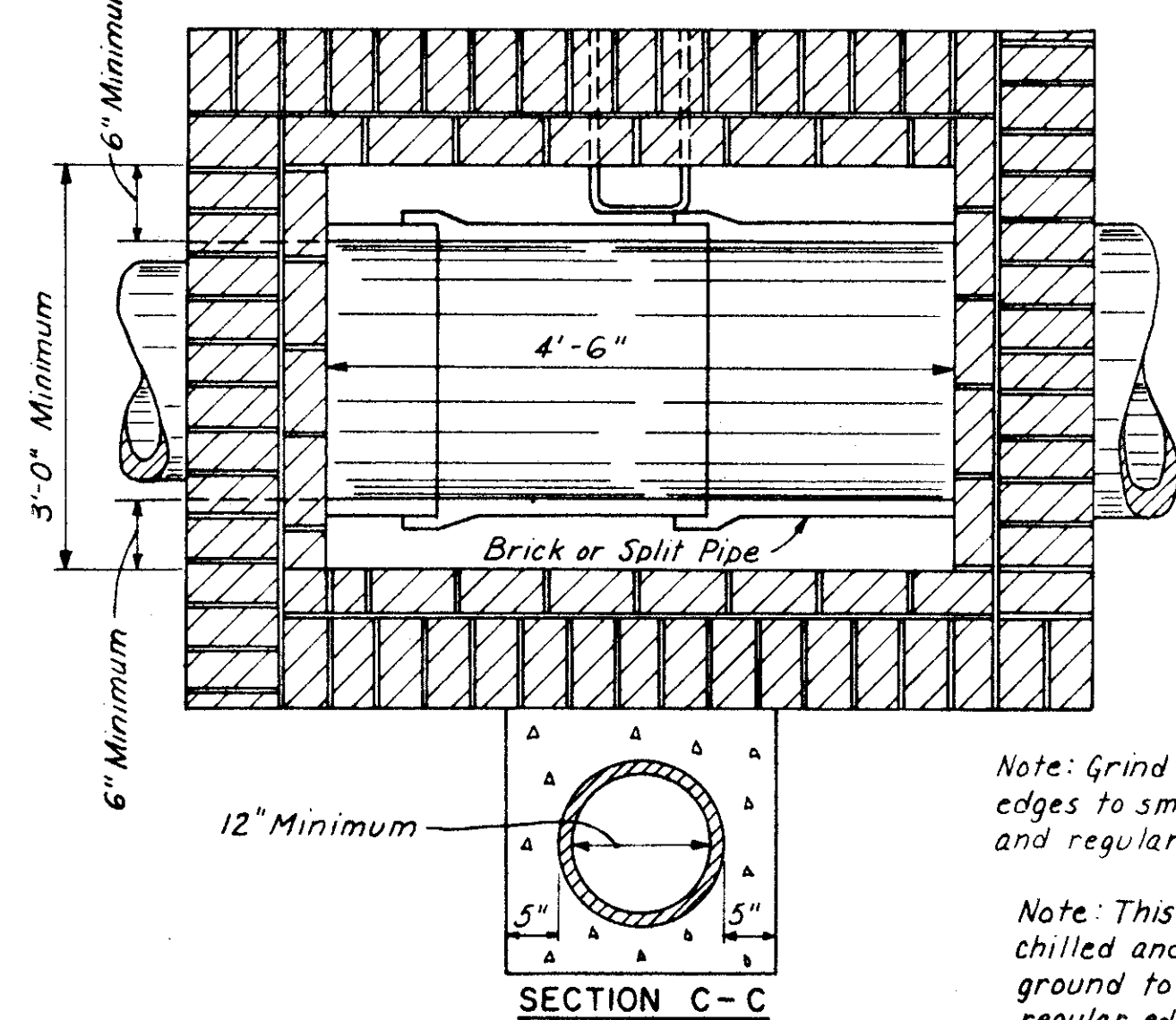
PLAN



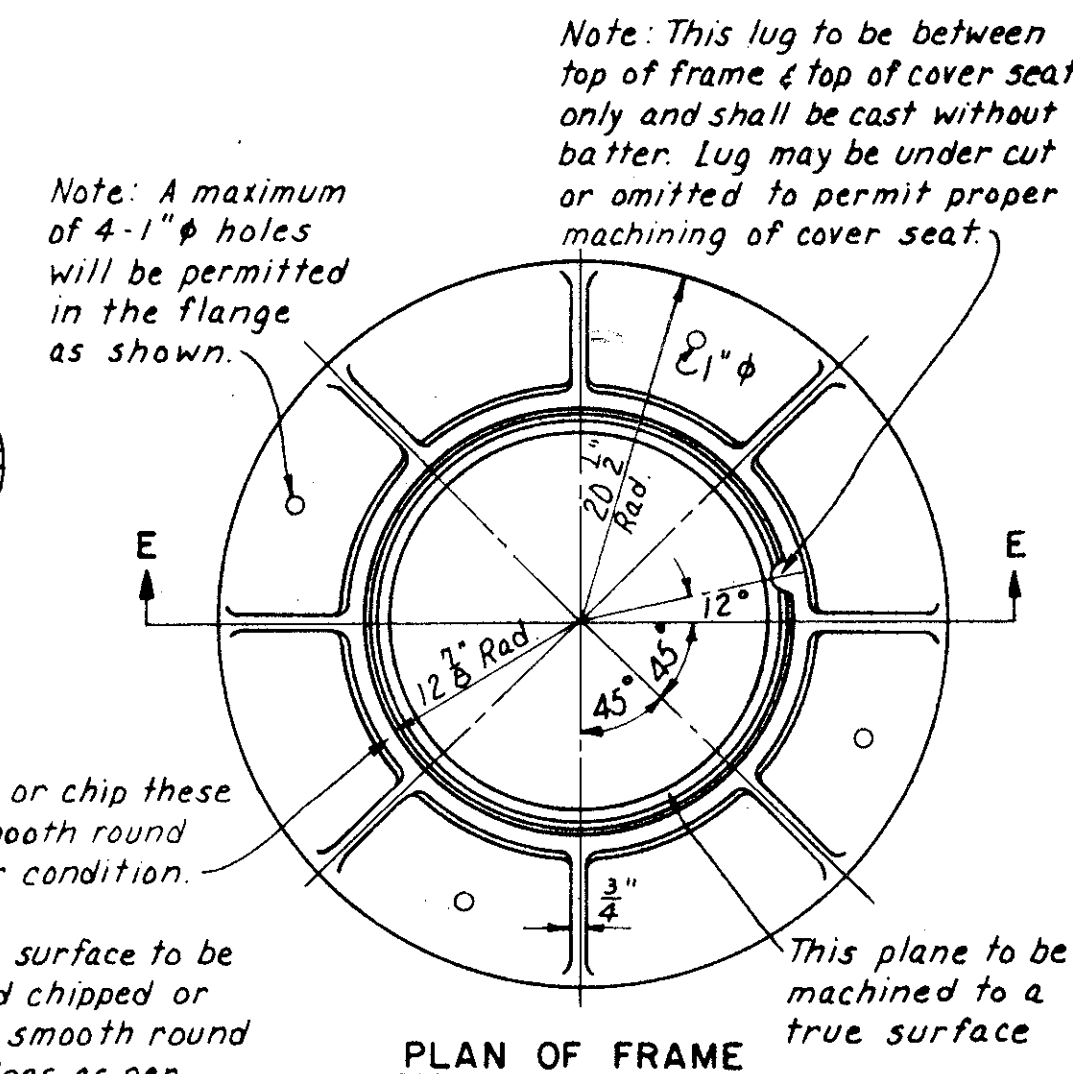
PLAN OF COVER



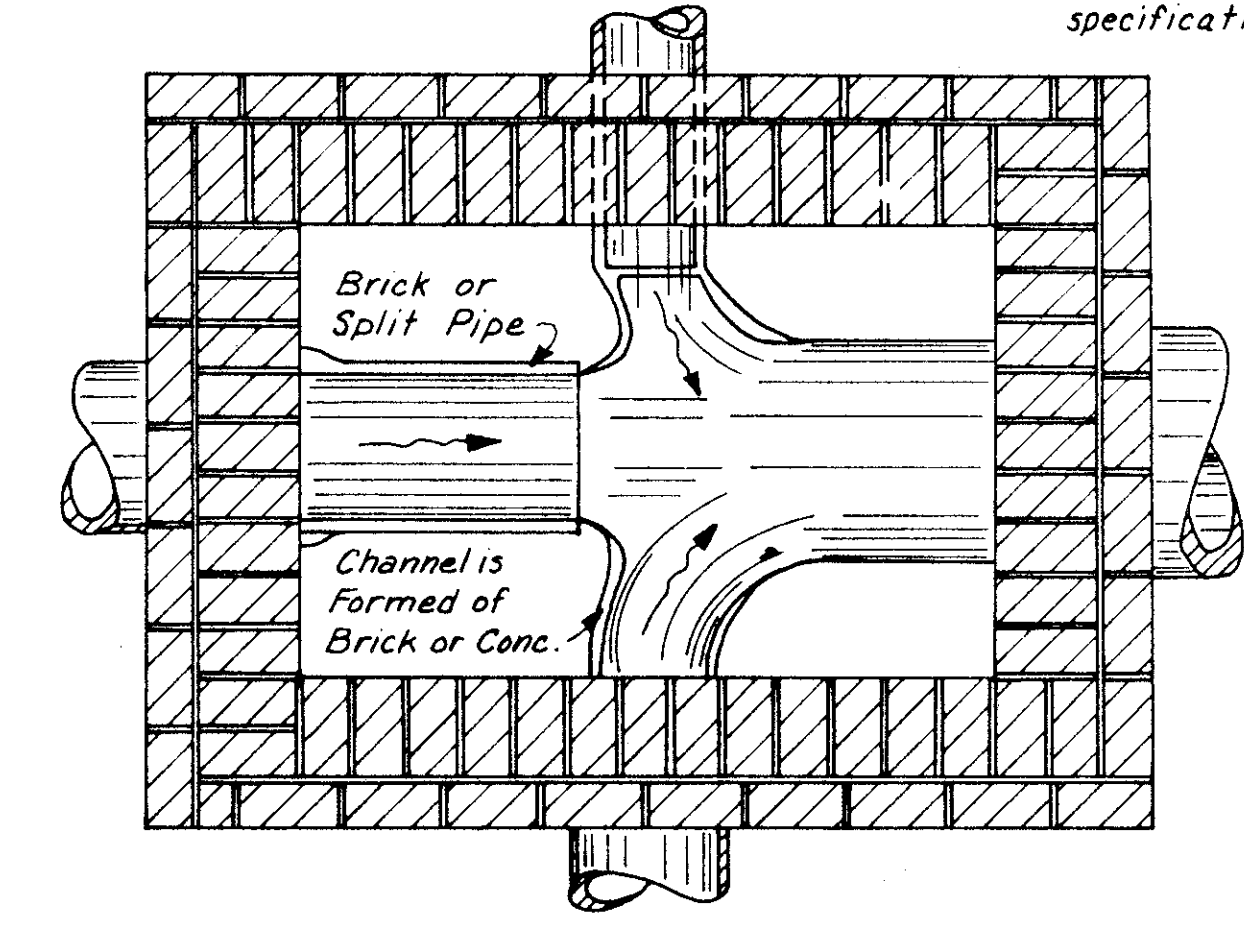
SECTION D-D
Scale: 1/8" = 1'-0"



SECTION C-C

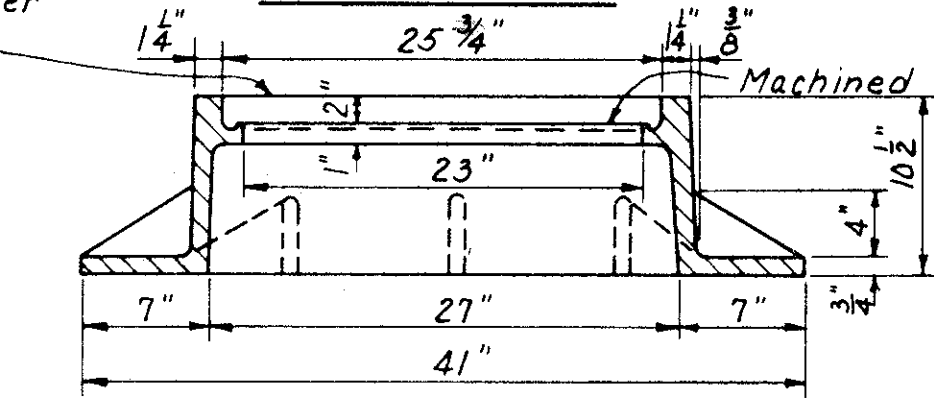


PLAN OF FRAME

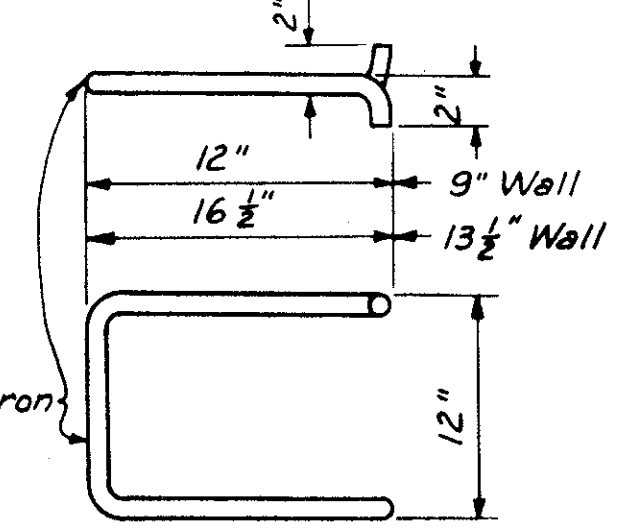


SECTION BELOW SPRINGING LINE

Showing method of turning side drain which enter the manhole of the flow line.



SECTION E-E
Scale: 3/32" = 1'-0"



DETAIL OF STEPS

NOTES:
BEARING AREAS of frame and cover shall be so fitted and finished as to provide a firm and even seat for all portions of the cover in the frame. No projections shall exist on bearing areas of either casting and each cover shall seat in its frame without rocking. Frames and covers shall be fitted, matched and marked before delivery to the project.

SETTING OF CASTING - The base of the frame shall be set in a full bed of Portland cement mortar, and so adjusted to conform to the finished pavement grade.

CASTINGS - Minimum weight of frame and cover 615 pounds. Castings shall meet the requirements of Item 604. The design shall be essentially the same and equally as strong as those shown hereon and shall be given one coat of paint as per specifications.

STEPS shall be wrought iron or nodular iron meeting the requirements of Item 604.

CONSTRUCTION - Manholes shall be built of brick, precast solid concrete block, or cast in place concrete. When manholes are constructed of brick, every sixth course shall be a stretcher course.

Bottom of manhole shall be class "C" concrete. Channel sections in the manhole shall be constructed of split pipe or brick except curved sections which may be built by forming a channel in the concrete.

DROP PIPES for all drains which cannot be connected to manhole at the flow line shall be 12 inches minimum diameter with class "C" concrete encasing.

Note: This manhole is identical to Cuyahoga County Standard No. 2 Manhole.

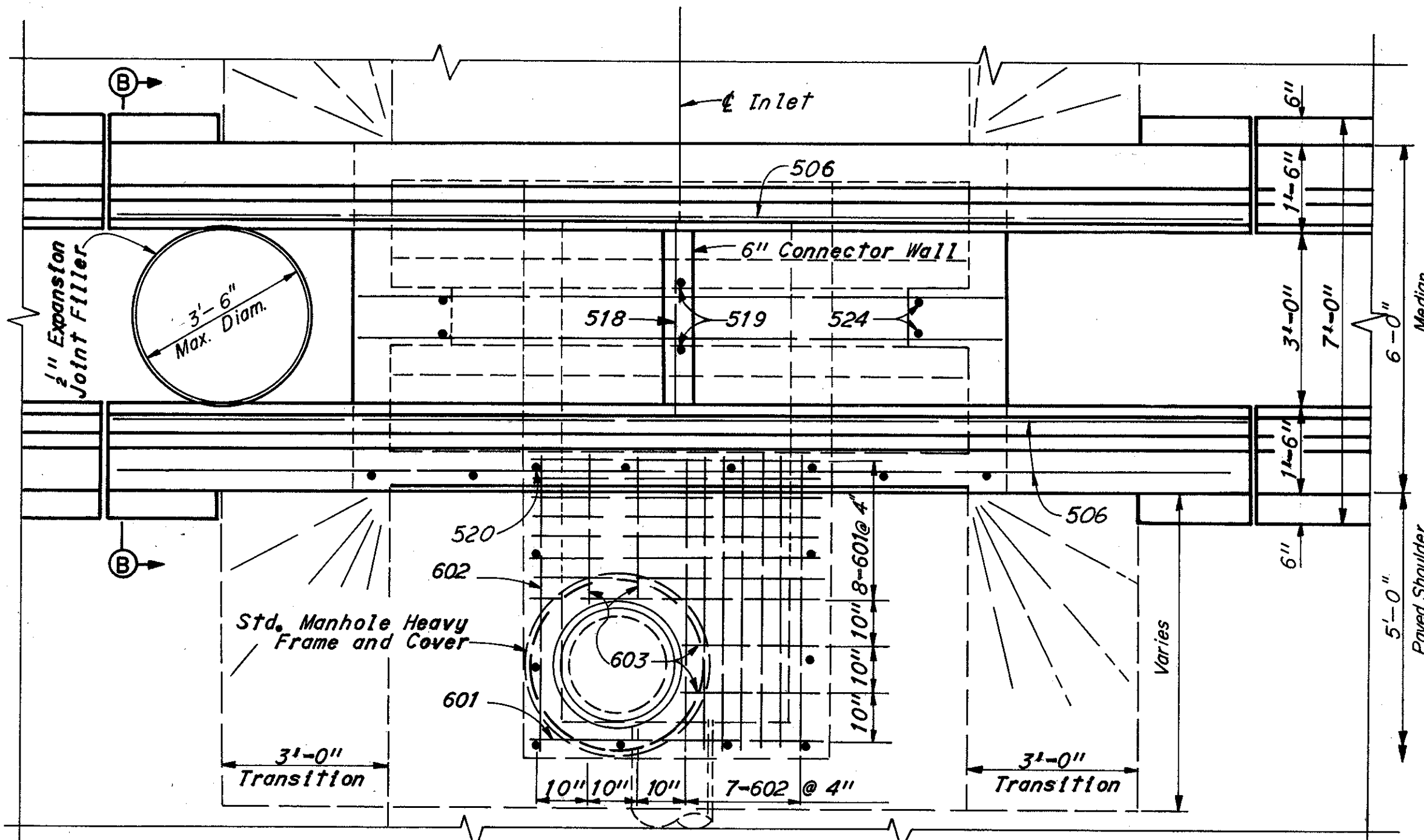
MEDIAN INLET

Quantity Calculations
 Made By LJD Date 3-28-69
 Checked By DDS Date 4-26-69

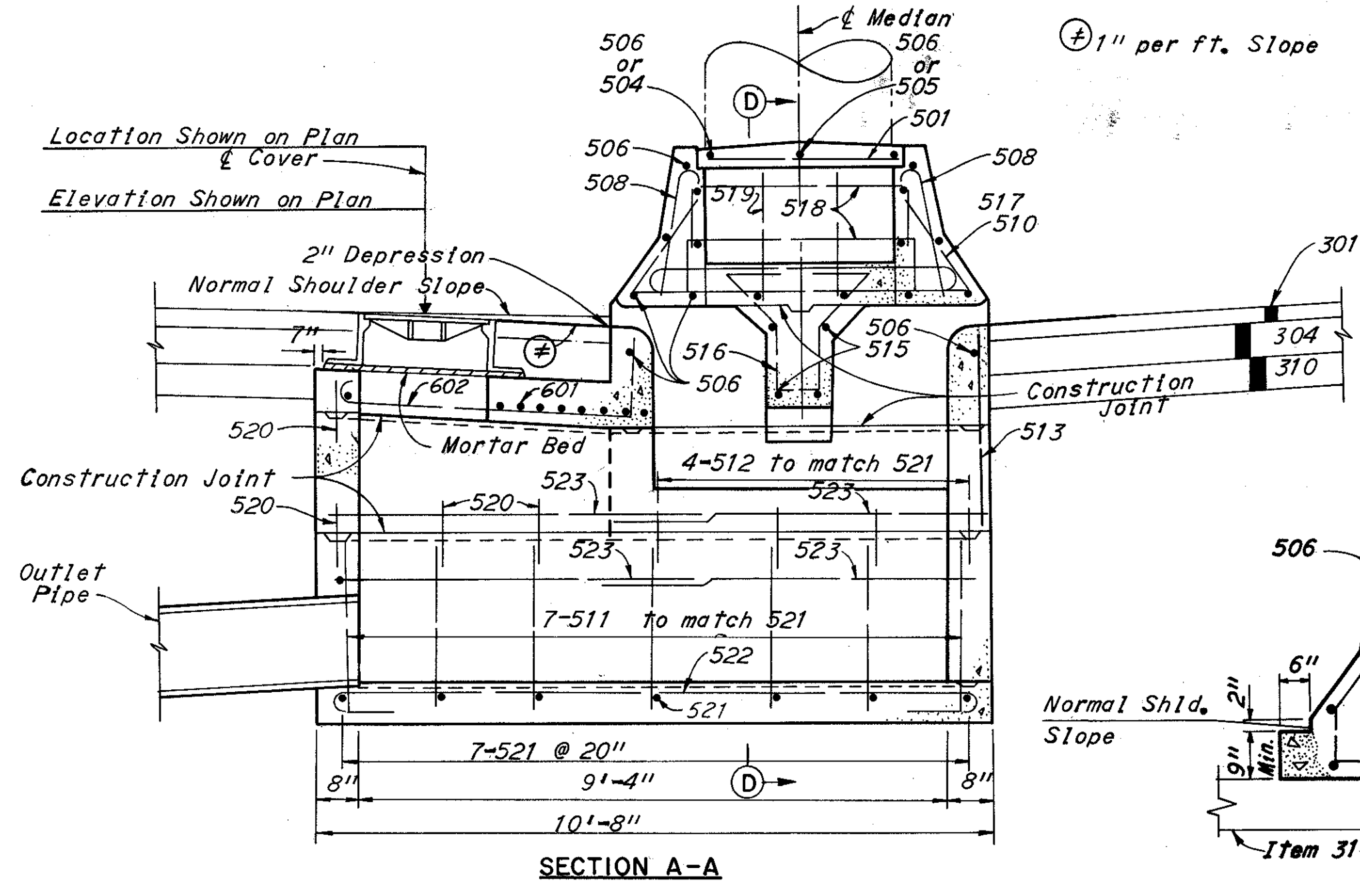
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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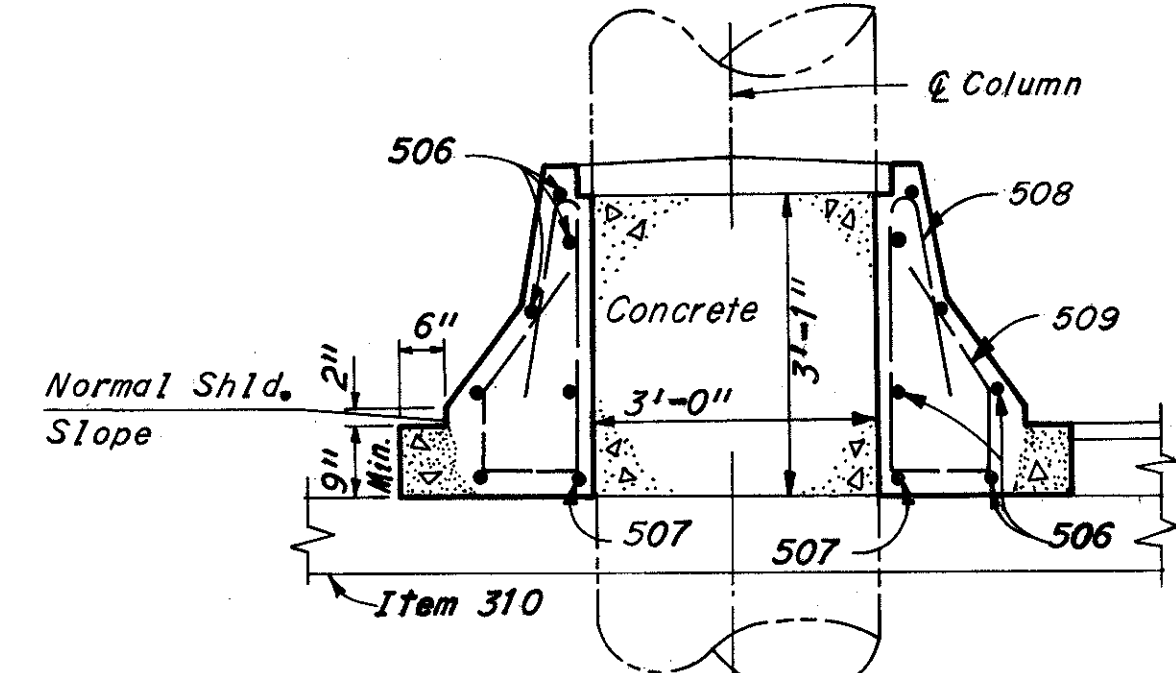
CUYAHOGA COUNTY
 CUY. 480-21.40



PLAN
(Without Concrete Cover)

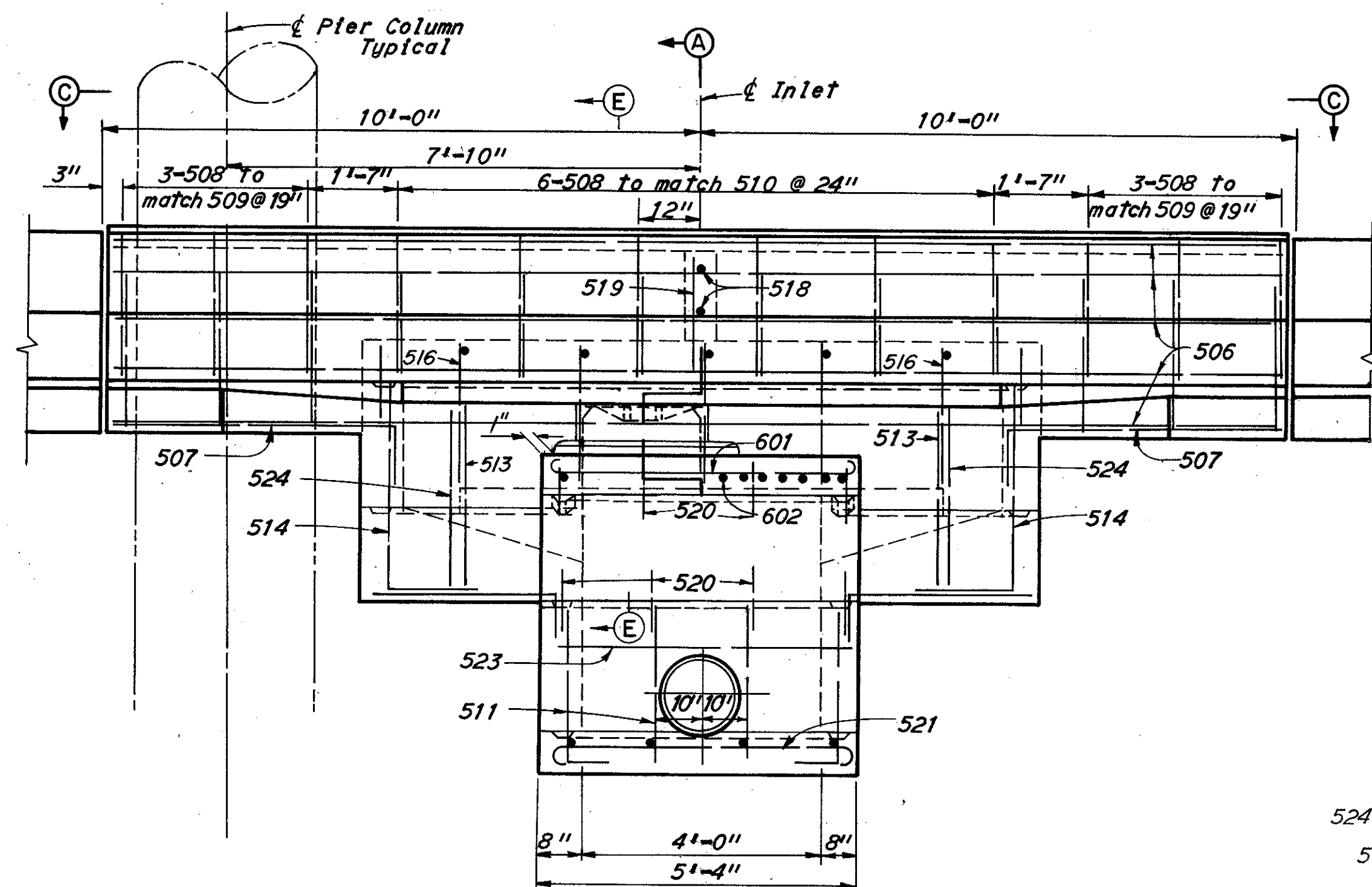


SECTION A-A

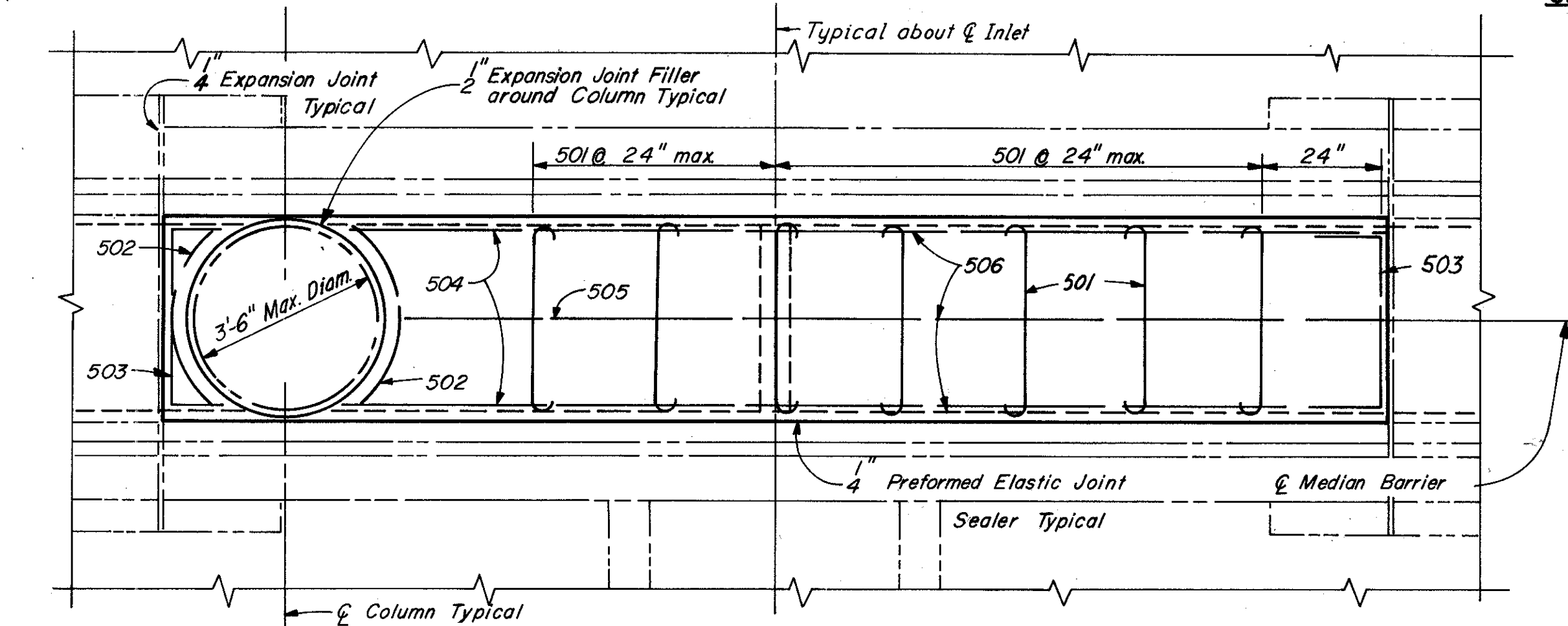


SECTION B-B

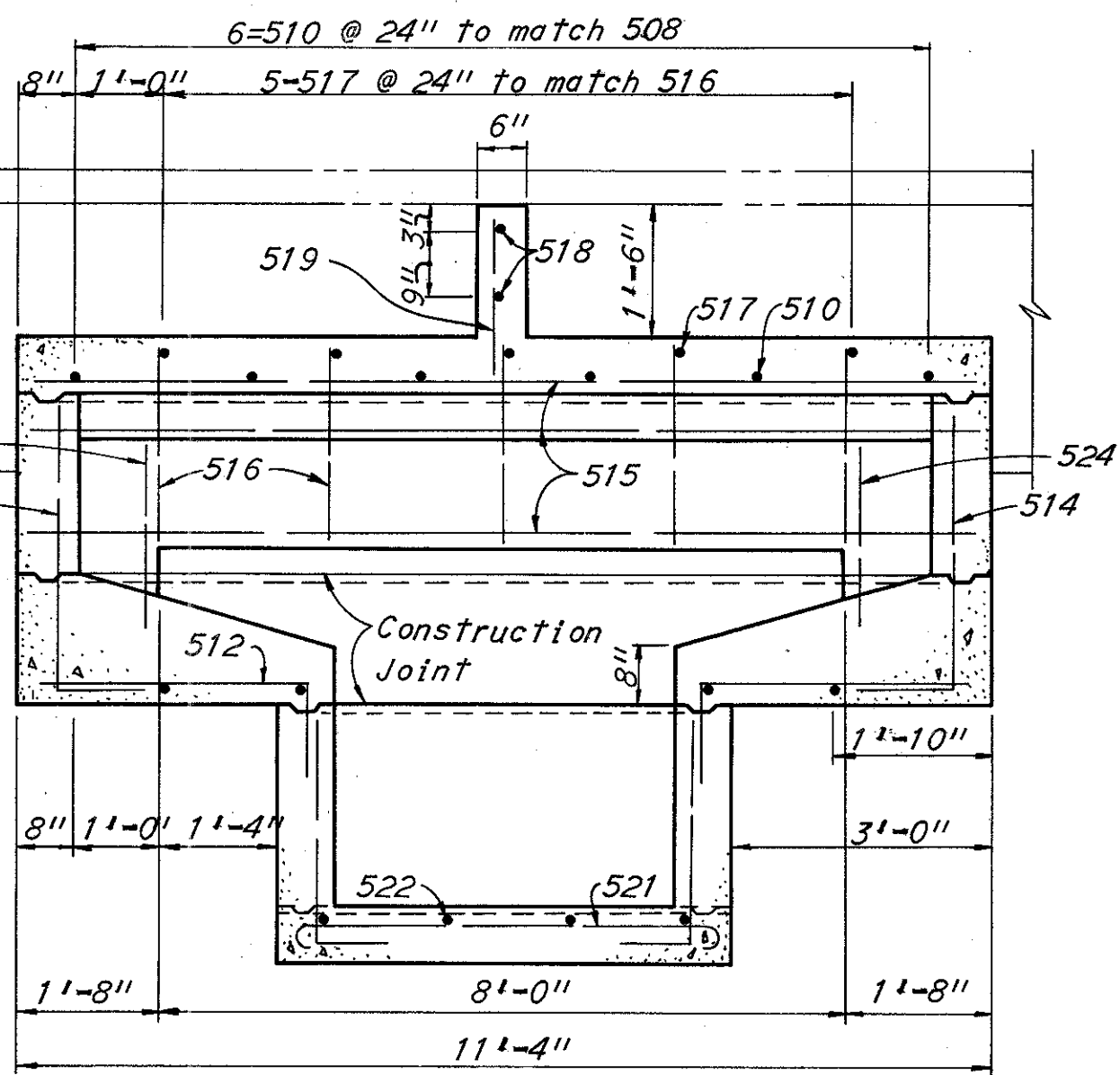
Castings shall meet the requirements of 604. The design shall be essentially the same and equally as strong as those shown on standard construction drawing MH-1 for Heavy Frame and Cover. Bearing areas of frame and cover shall be so fitted and finished as to provide a firm and even seat for the entire cover in the frame. No projections shall exist on bearing seat in its frame without rocking. Frames and covers shall be fitted, matched and marked before delivery to the project. Minimum weight of frame and cover 475 lbs. Setting of Castings: The base of the frame shall be set in a full bed of Portland cement mortar, and so adjusted to conform to the finished pavement grade. Reinforcing Steel, shall be round bars in accordance with steel details shown hereon and conforming to 509 of the Construction Materials Specifications. Cost of furnishing and placing reinforcing steel shall be included in 604 for payment. Quantities of concrete median, pavement, depressed apron and within the limits of the inlet shall be deducted from the project quantities.



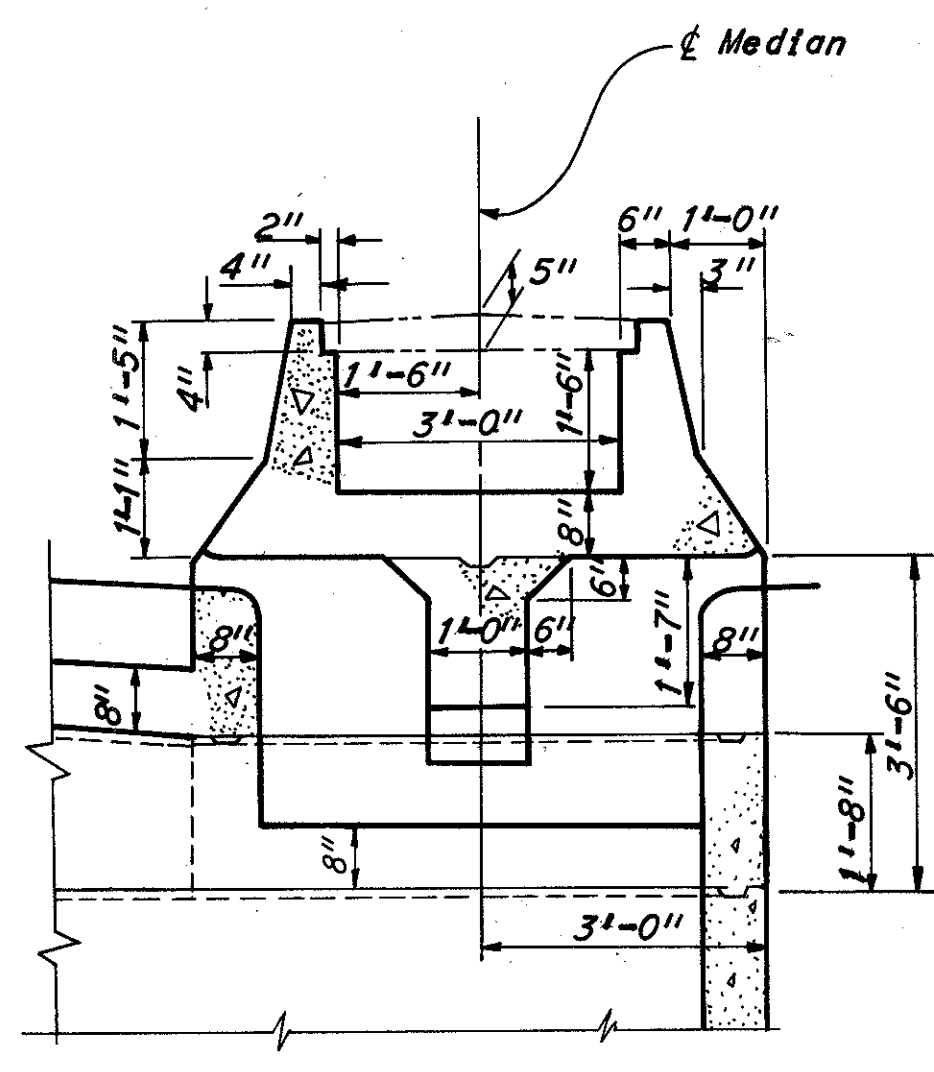
ELEVATION



VIEW C-C



SECTION D-D



SECTION E-E

CONCRETE AND REINFORCING STEEL QUANTITIES				
MARK	NO.	LENGTH	SHAPE	WEIGHT
501	5	4'-2"	1	22
502	4	3'-7"	2	15
503	2	5'-1"	3	11
504	2	13'-9"	Str.	29
505	1	12'-3"	Str.	13
506	14	19'-6"	Str.	285
507	4	5'-0"	4	21
508	24	2'-7"	5	65
509	12	5'-11"	6	74
510	6	8'-5"	7	53
511	18	3'-2"	4	59
512	8	4'-9"	4	40
513	7	2'-9"	Str.	20
514	8	5'-0"	4	42
515	6	11'-0"	Str.	69
516	5	6'-2"	8	32
517	5	5'-11"	1	31
518	2	5'-3"	3	11
519	2	2'-0"	Str.	4
520	18	1'-0"	Str.	19
521	7	6'-2"	1	45
522	4	11'-6"	1	48
523	4	16'-8"	3	70
524	4	2'-3"	Str.	9
601	9	6'-4"	1	86
602	8	6'-4"	9	76
603	4	3'-5"	1	21

TOTAL REINFORCING STEEL 1270 lbs.
 TOTAL CLASS "C" CONCRETE 11 cu. yds.

† Varies M.H. depth

Note: The above table of quantities is included with this drawing for estimating purposes only. The cost of furnishing and placing all concrete, reinforcing steel, casting, etc., shall be included in 604 for payment.

SCALE 1/2" = 1'
 HOWARD, NEEDLES, TAMMEN & BERGENOFF
 MADE LJD DATE 3/28/69 CONSULTING ENGINEERS
 TRCD. MAG DATE 4/4/69
 CKD. DDS DATE 4/3/69 KANSAS CITY CLEVELAND NEW YORK

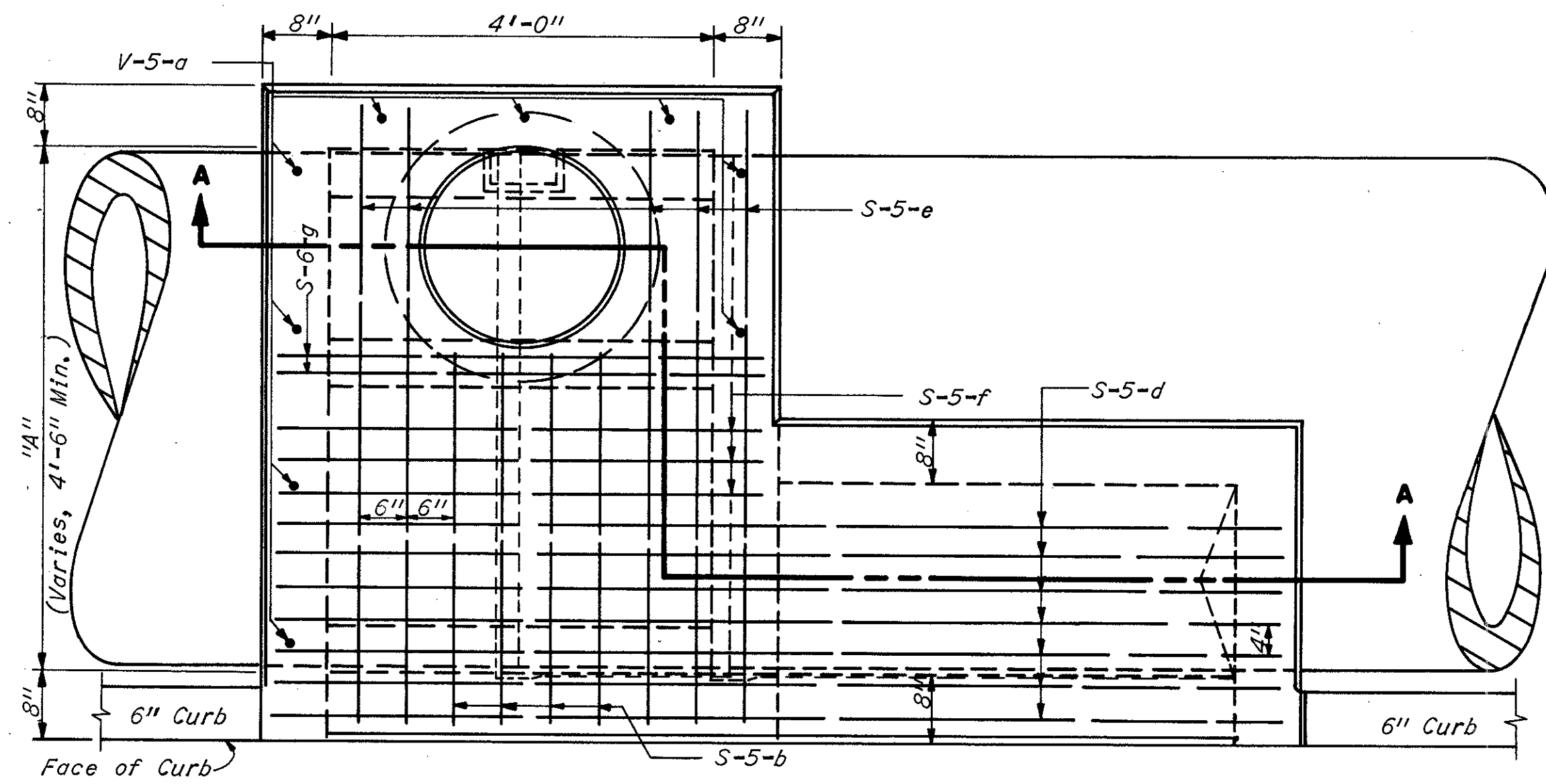
STD NO 2-A-6 TO 2-A-20 PAVED SHOULDER INLET MODIFIED AS PER PLAN

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

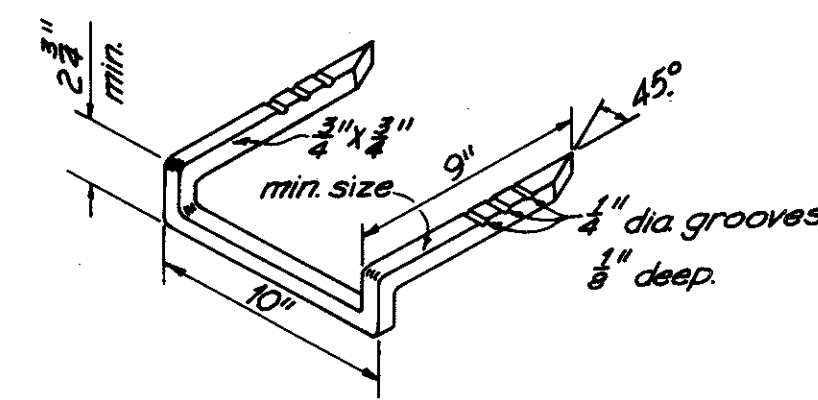
108
360

CUYAHOGA COUNTY
CUY. 480-21.40

Quantity Calculations
Made By CHD Date 10-68
Checked By DDS Date 10-68



PLAN



STEP DETAIL

REINFORCING BARS COMMON TO ALL PIPE DIAMETERS	REINFORCING STEEL													
	Length	S-6-a		S-5-d		S-5-f		S-6-g		H-5-a		V-5-b		
	Ft.	No.	Lin. Ft.	No.	Lin. Ft.	No.	Lin. Ft.	No.	Lin. Ft.	No.	Lin. Ft.	No.	Lin. Ft.	
6	2	8'-10"	7	7'-0"	3	5'-0"	2	5'-0"	4	2'-4"	2	1'-0"		
8	6	8'-10"	7	9'-0"	3	5'-0"	2	5'-0"	4	4'-4"	2	1'-0"		
10	10	8'-10"	7	11'-0"	3	5'-0"	2	5'-0"	4	6'-4"	2	1'-0"		
12	14	8'-10"	7	13'-0"	3	5'-0"	2	5'-0"	4	8'-4"	2	1'-0"		
14	18	8'-10"	7	15'-0"	3	5'-0"	2	5'-0"	4	10'-4"	2	1'-0"		
16	22	8'-10"	7	17'-0"	3	5'-0"	2	5'-0"	4	12'-4"	2	1'-0"		
18	26	8'-10"	7	19'-0"	3	5'-0"	2	5'-0"	4	14'-4"	2	1'-0"		
20	30	8'-10"	7	21'-0"	3	5'-0"	2	5'-0"	4	16'-4"	2	1'-0"		

Pipe Diameter	A	S-5-b	S-5-e	V-5-a			
Ft.	No.	Lin. Ft.	No.	Lin. Ft.			
Under 48"	4'-6"	4	2'-11"	5	5'-6"	9	2'-6"
48"	4'-10"	4	3'-3"	5	5'-10"	9	2'-6"
54"	5'-5"	4	3'-10"	5	6'-5"	11	2'-6"
60"	6'-0"	4	4'-5"	5	7'-0"	11	2'-6"
66"	6'-7"	4	5'-0"	5	7'-7"	13	2'-6"
72"	7'-2"	4	5'-7"	5	8'-2"	13	2'-6"

NOTES

GENERAL -- The design shown hereon shall not be used for inlets having a depth (top of manhole cover to top of floor) greater than 30 feet. If split pipe is used to form the inlet bottom it shall be split concrete pipe only. Otherwise, the inlet bottom shall be formed in Class "E" concrete.

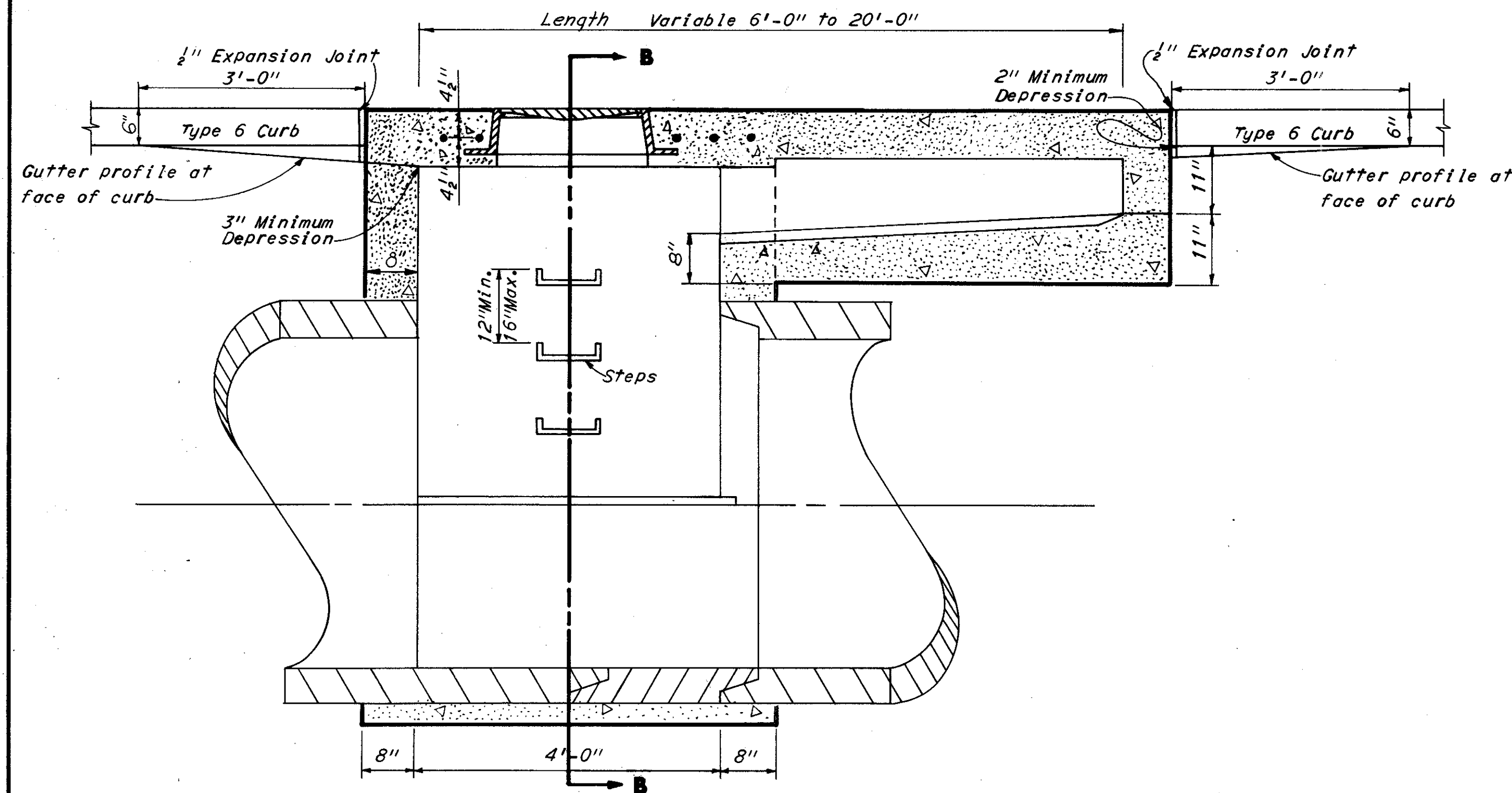
Manholes over 12 feet in depth shall be built of reinforced Class "C" concrete. Manholes for pipes under 60" in diameter shall be reinforced by placing 3/4" diameter bars 12" center to center vertically and 3/4" diameter bars 9" center to center horizontally. Manholes for pipes over 48" in diameter shall be reinforced by placing 1" diameter bars 12" center to center vertically and 1" diameter bars at 9" center to center horizontally. Bars shall be placed with a 2" clearance from the inside face of the wall. Payment for furnishing and placing the reinforcing steel shall be included in the price bid for Item 604, Special Paved Shoulder Inlet Manhole.

For Notes and Details not shown see Standard Construction Drawing I-2A.

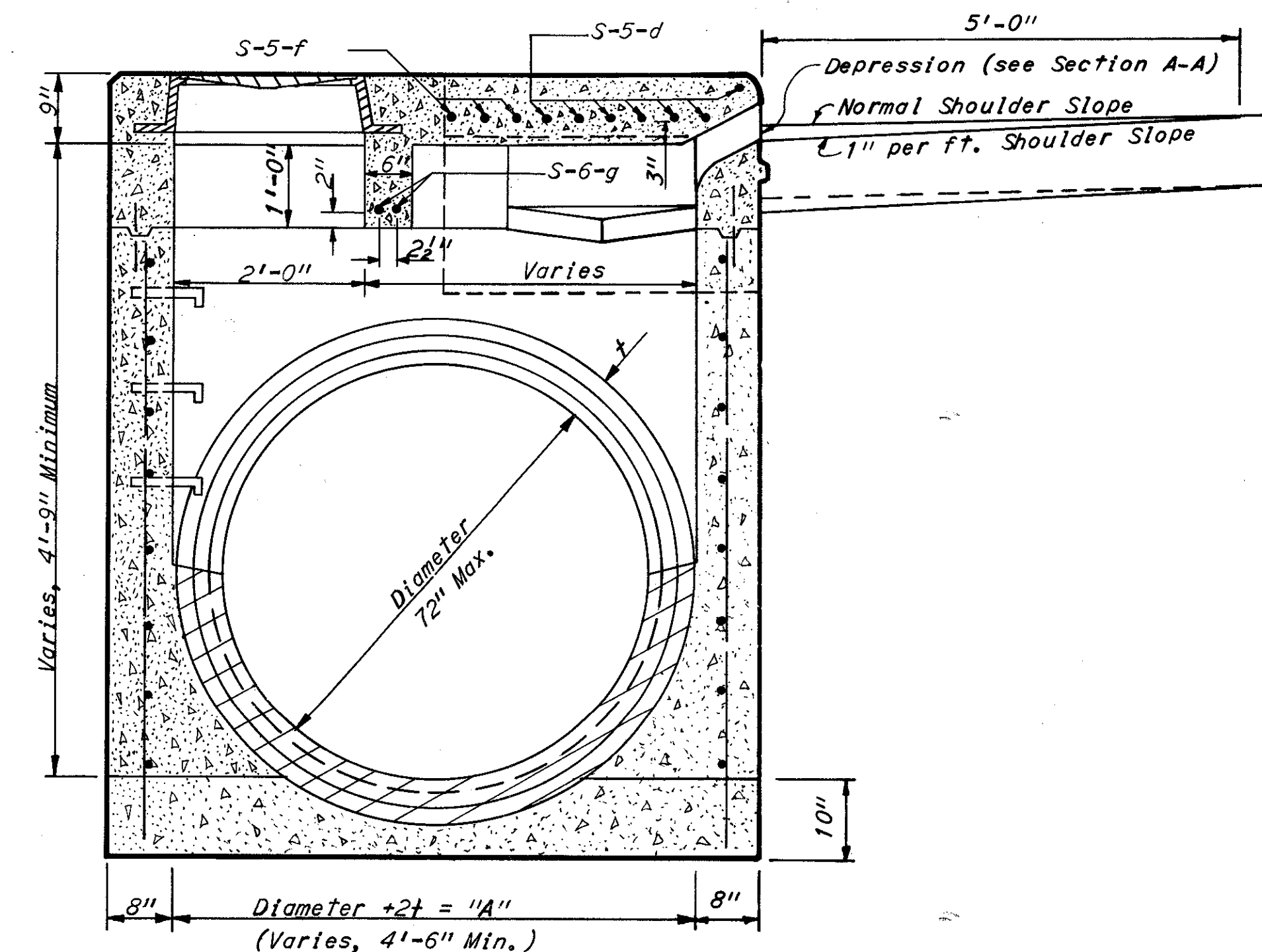
FRAME AND COVER -- The frame and cover shall be the light frame and cover detailed on Standard Construction Drawing MH-1.

STEPS -- shall meet the requirements of 604.

REINFORCING STEEL -- Bars S-6-a and S-6-f shall be 3/4" round. All other bars shall be 5/8" round. For location of bars not shown on the drawing, see Standard Construction Drawing I-2A.



SECTION A-A



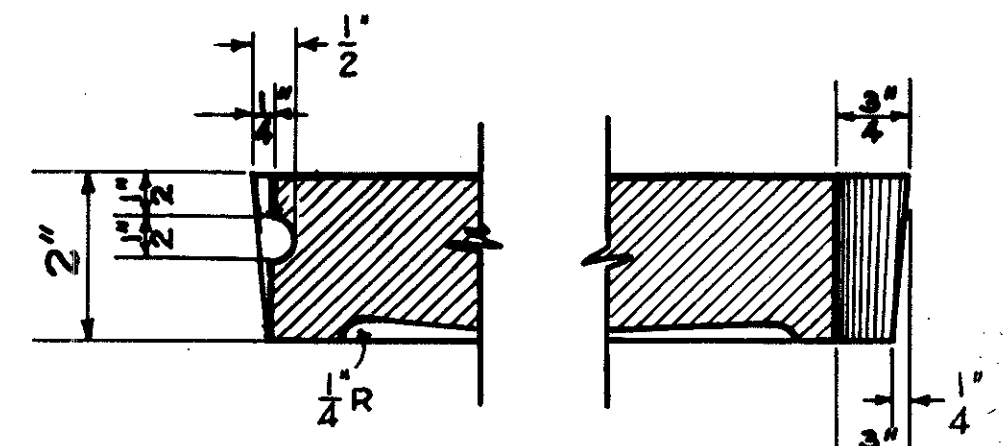
SECTION B-B

SCALE: _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE CHD DATE 10-8-68 CONSULTING ENGINEERS
TRCD CHD DATE 10-8-68
CKD DDS DATE 10-23-68 KANSAS CITY CLEVELAND NEW YORK

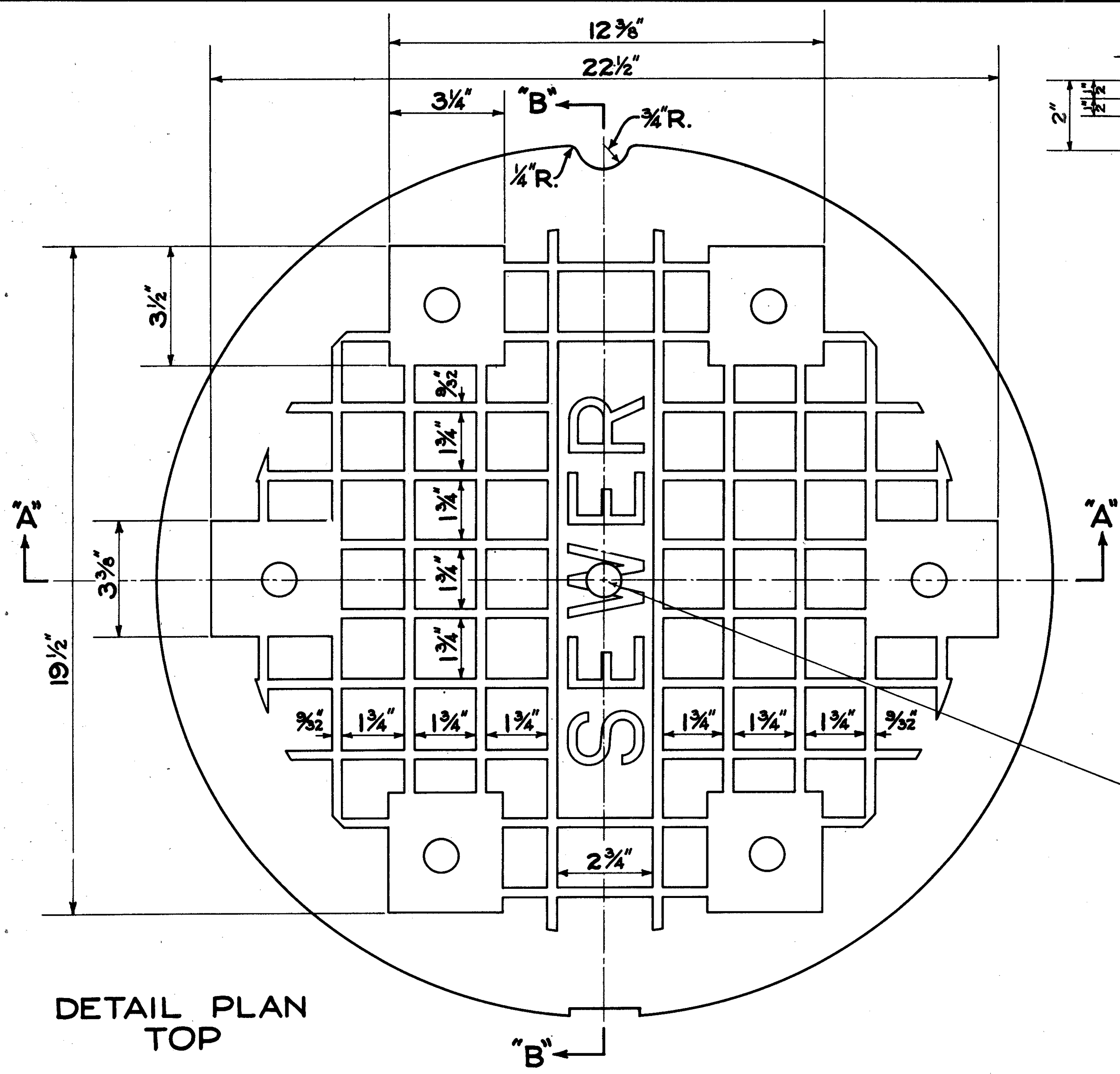
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

108A
390

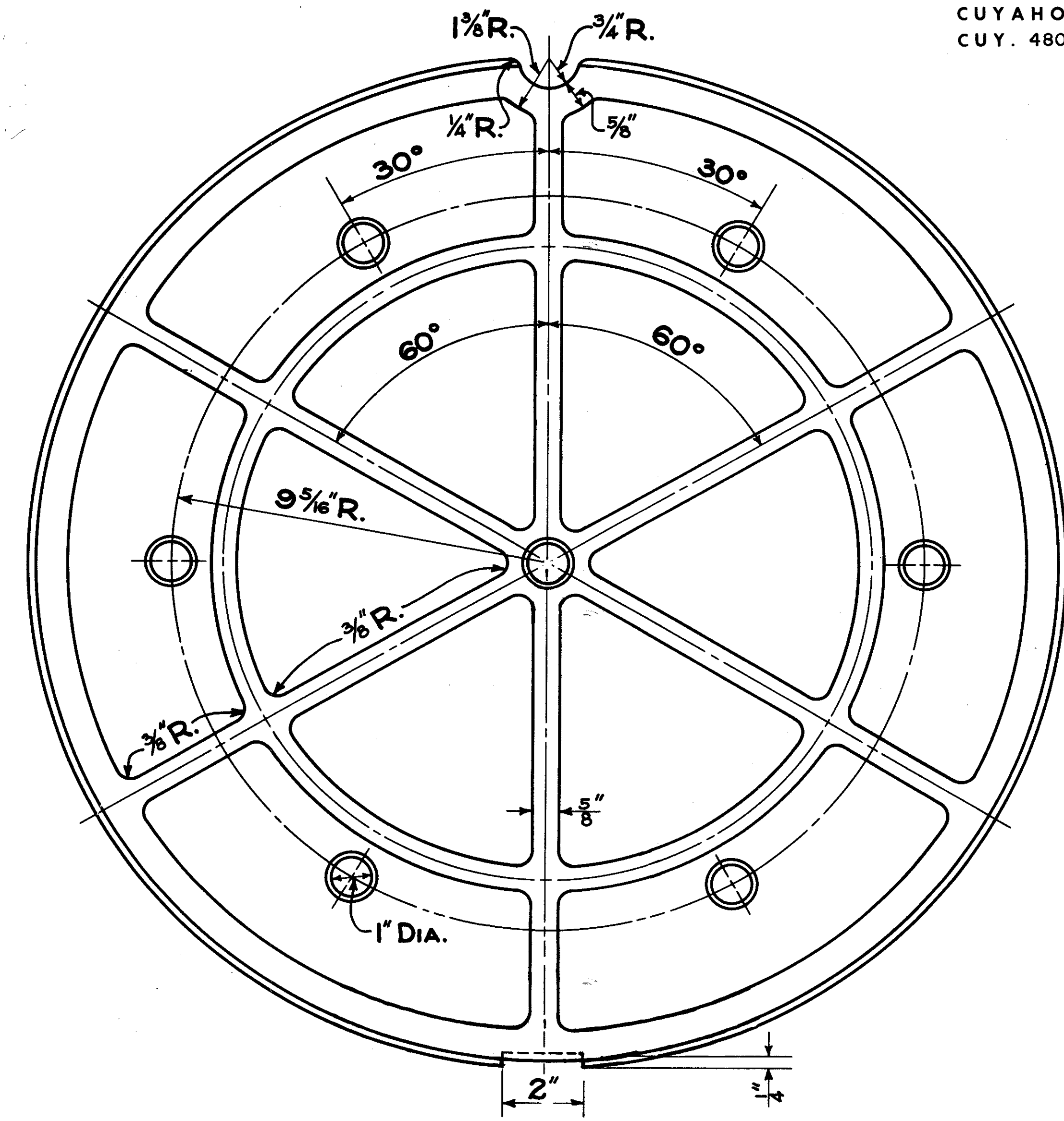
CUYAHOGA COUNTY
CUY. 480-21.40



SECTION "B-B"

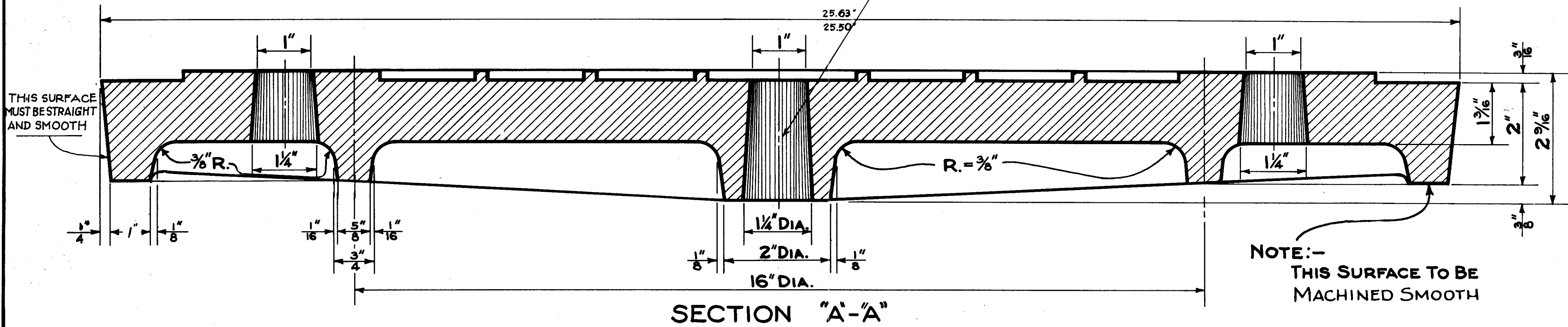


DETAIL PLAN TOP



DETAIL PLAN BOTTOM

OPTION -
CENTER HOLE
MAY BE OMITTED



SECTION "A-A"

NOTE:-
THIS SURFACE TO BE
MACHINED SMOOTH

SCALE None HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE TPM DATE 9-12-68 CONSULTING ENGINEERS
TRCD. DATE 9-13-68 KANSAS CITY CLEVELAND NEW YORK
CKD. DDS. DATE 9-13-68

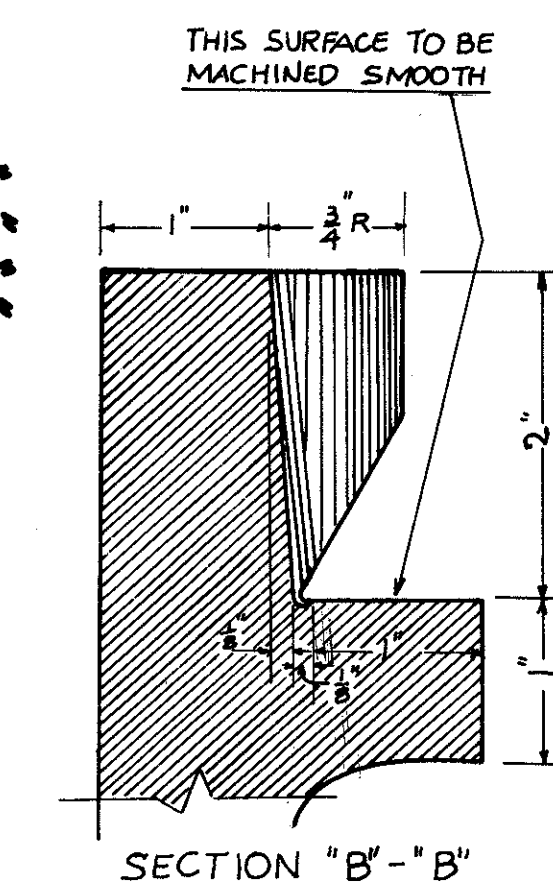
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
CUY. 480-21.40

TAPERED SURFACE MUST BE STRAIGHT SMOOTH AND FREE FROM IRREGULARITIES.
OPTION - TAPER MAY BE MACHINE FINISHED TO OR BELOW MACHINED SEAT.

SECTION THRU A-A



SECTION "B"- "B"

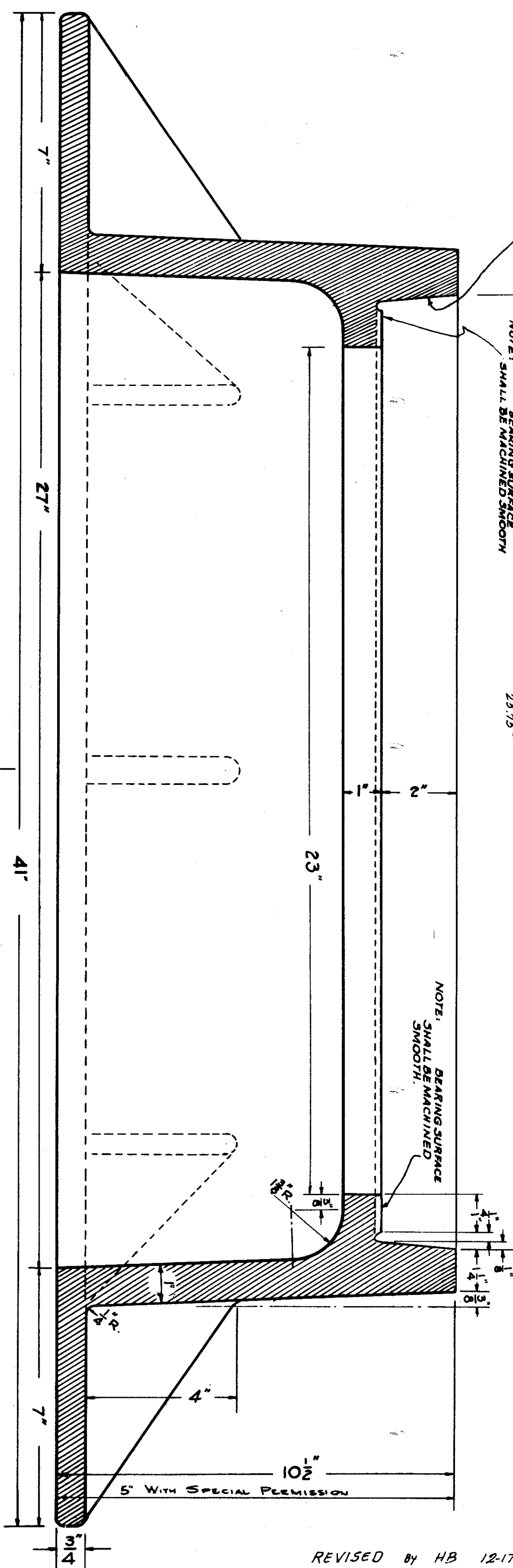
NOTE: SHALL BE MACHINED SMOOTH

25.97"

25.75"

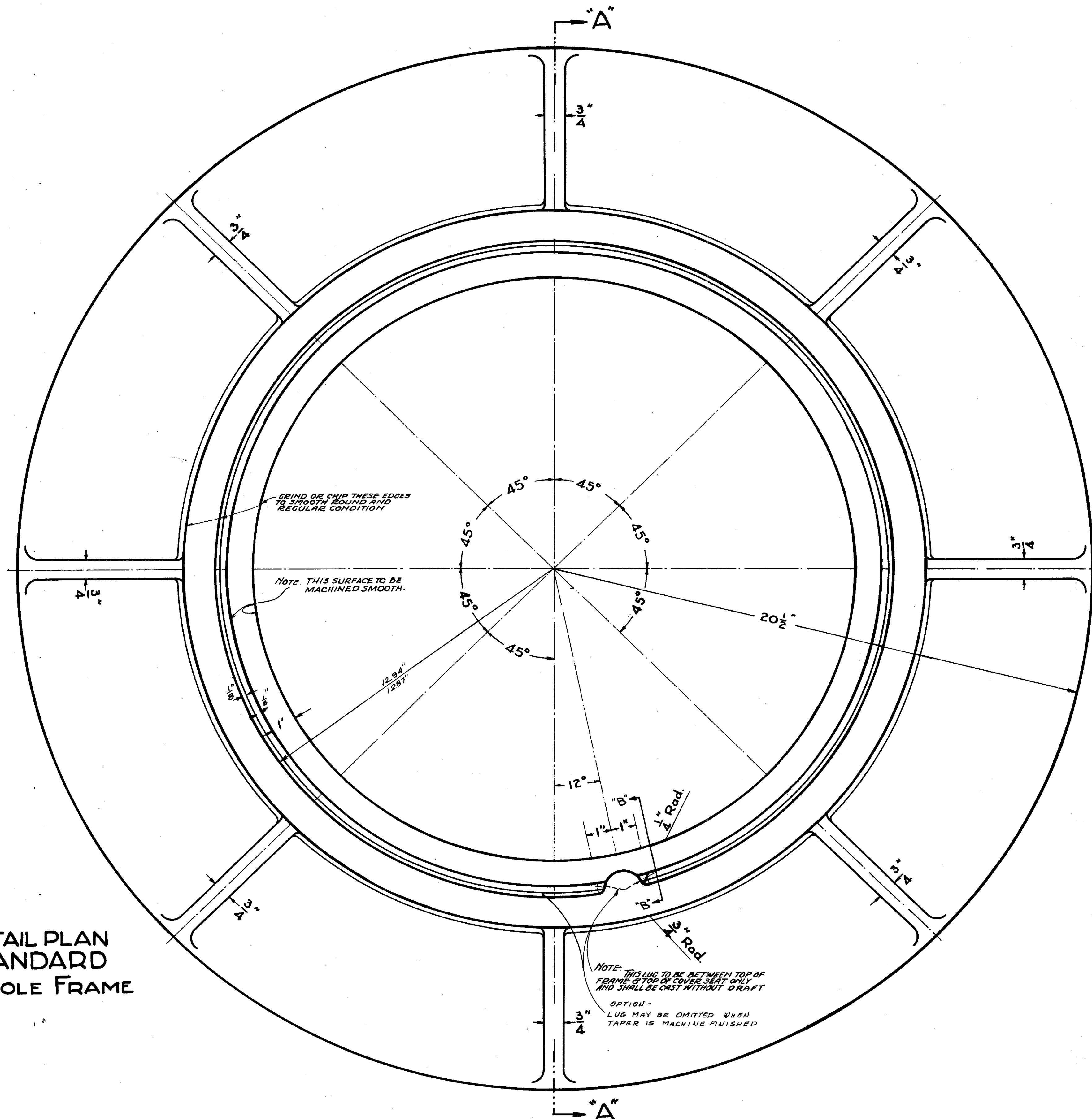
NOTE: BEARING SURFACE SHALL BE MACHINED SMOOTH

23"



REVISED BY HB 12-17-65
REVISED BY W.J.Y 11-25-66

DETAIL PLAN
STANDARD
MANHOLE FRAME



NOTE: THIS LUG TO BE BETWEEN TOP OF FRAME & TOP OF COVER SEAT ONLY AND SHALL BE CAST WITHOUT DRAFT
OPTION - LUG MAY BE OMITTED WHEN TAPER IS MACHINE FINISHED

EXCEPT WHERE LIMITS ARE NOTED - A CASTING VARIATION OF 1/8" PER FOOT PERMITTED.

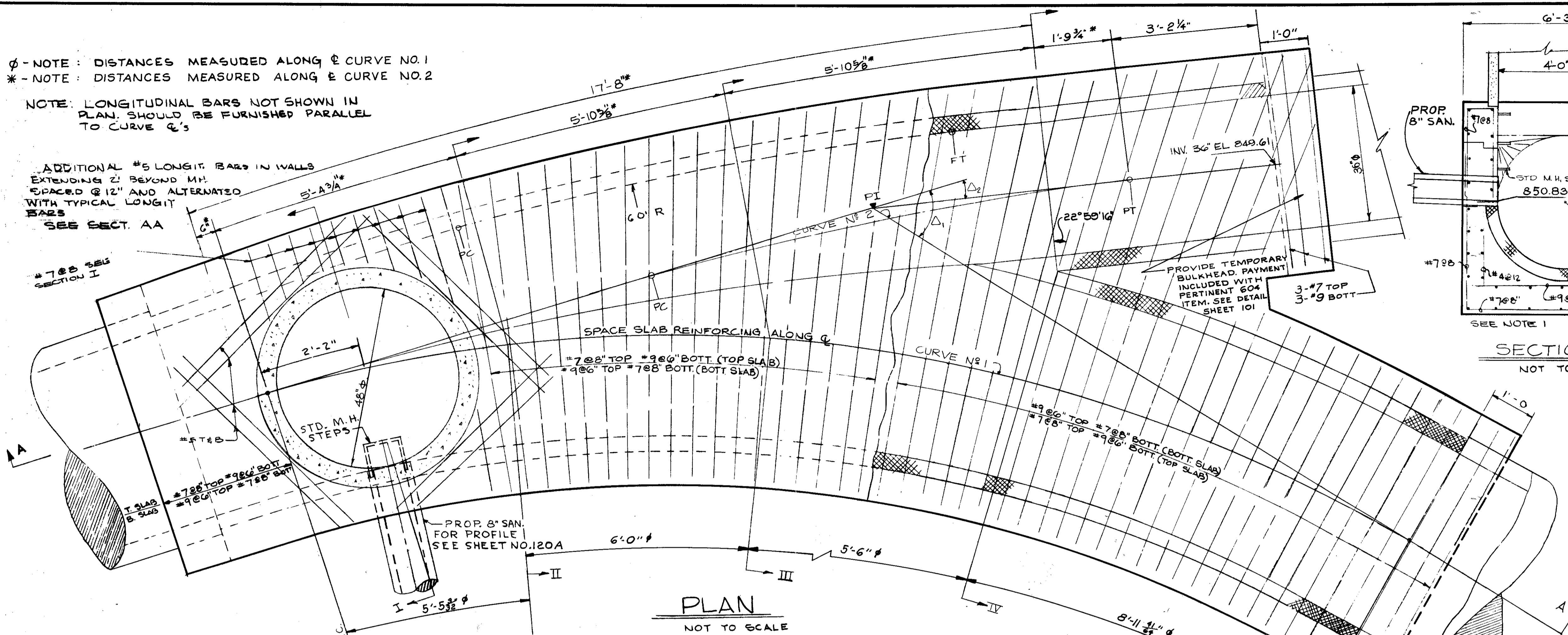
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MADE FROM DATE 9-13-60 CONSULTING ENGINEERS
TRCD DATE KANSAS CITY CLEVELAND NEW YORK
CKD D.D.S. DATE 9-16-60

CUYAHOGA COUNTY
CUY. 480-21.40

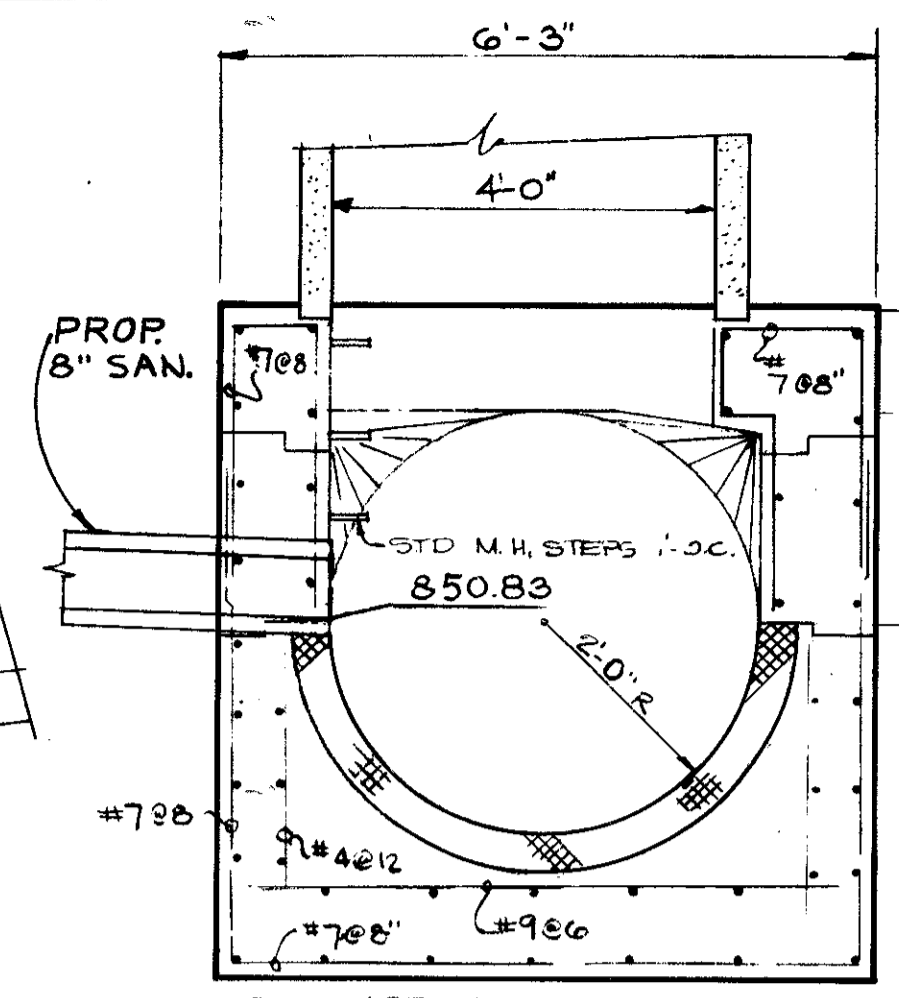
Ø - NOTE: DISTANCES MEASURED ALONG C CURVE NO. 1
* - NOTE: DISTANCES MEASURED ALONG C CURVE NO. 2
NOTE: LONGITUDINAL BARS NOT SHOWN IN PLAN, SHOULD BE FURNISHED PARALLEL TO CURVE C'S

ADDITIONAL #5 LONGIT. BARS IN WALLS EXTENDING 2' BEYOND M.H. SPACED @ 12" AND ALTERNATED WITH TYPICAL LONGIT. BARS SEE SECT. AA

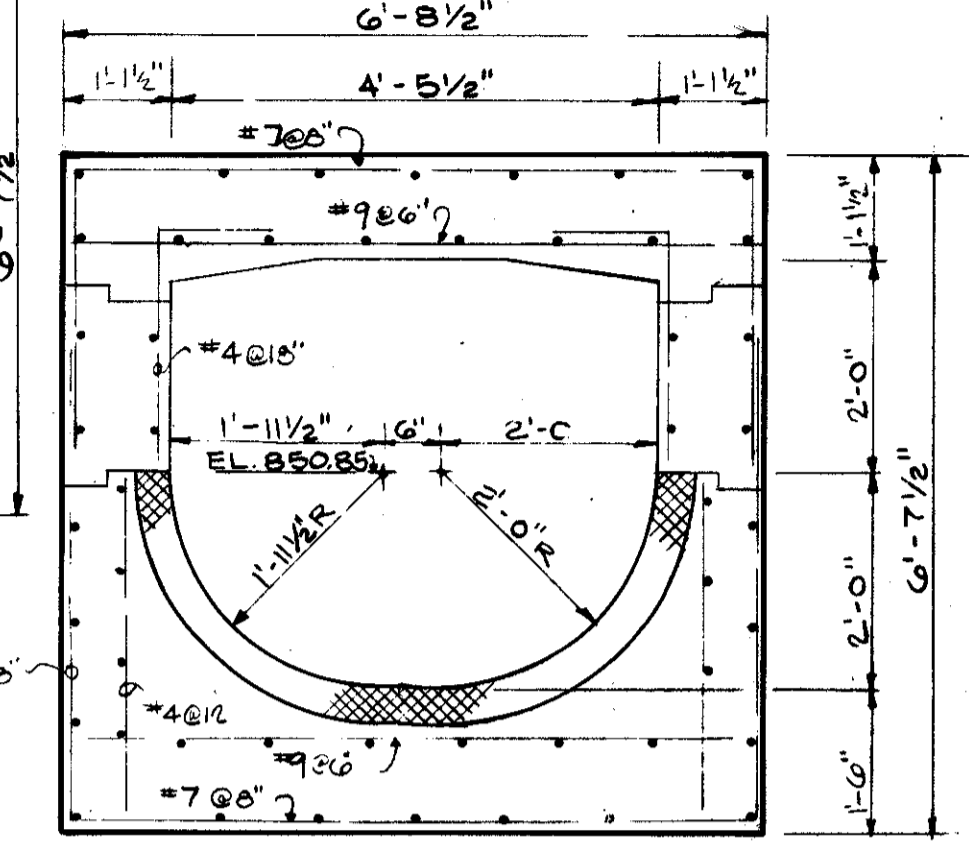
#7 @ 8" SECTION I



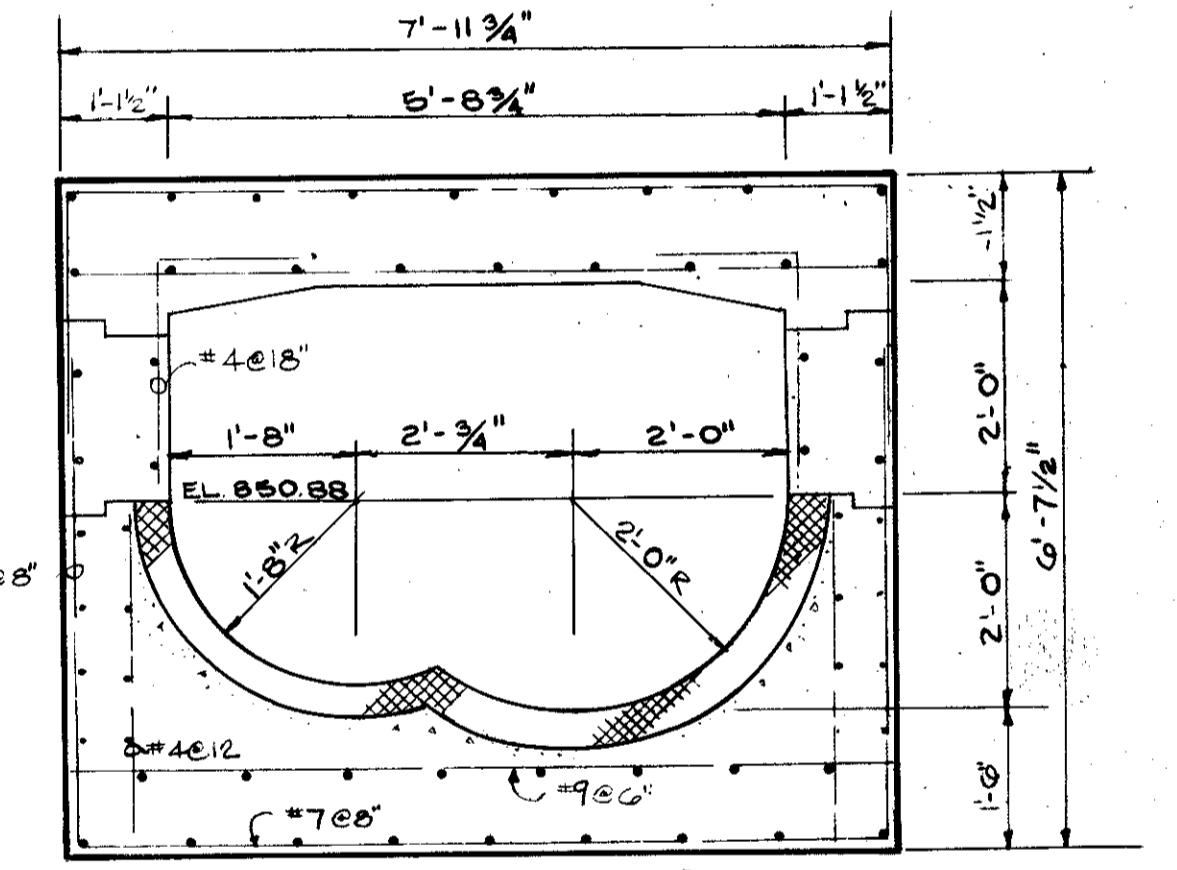
PLAN
NOT TO SCALE



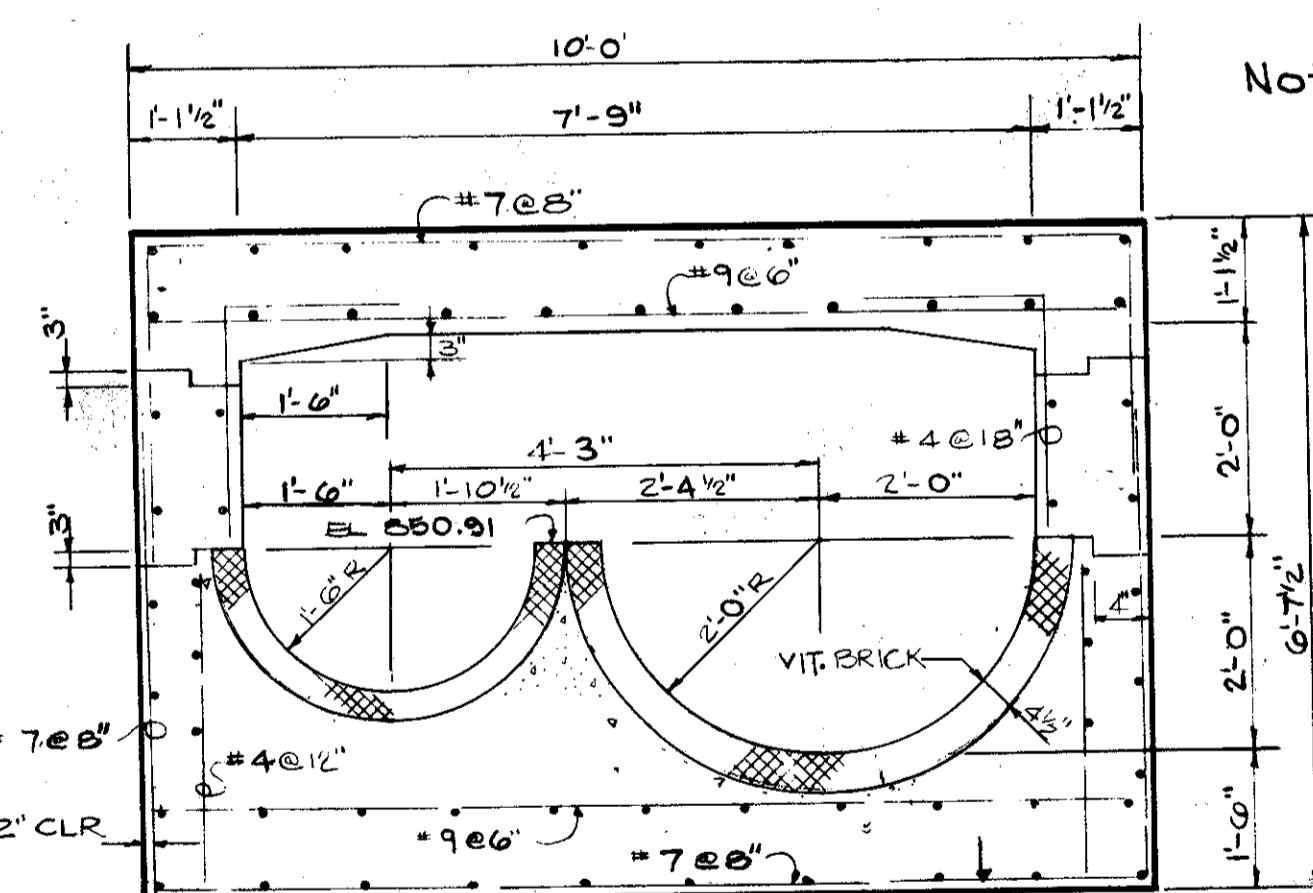
SECTION I
NOT TO SCALE



SECTION II
NOT TO SCALE

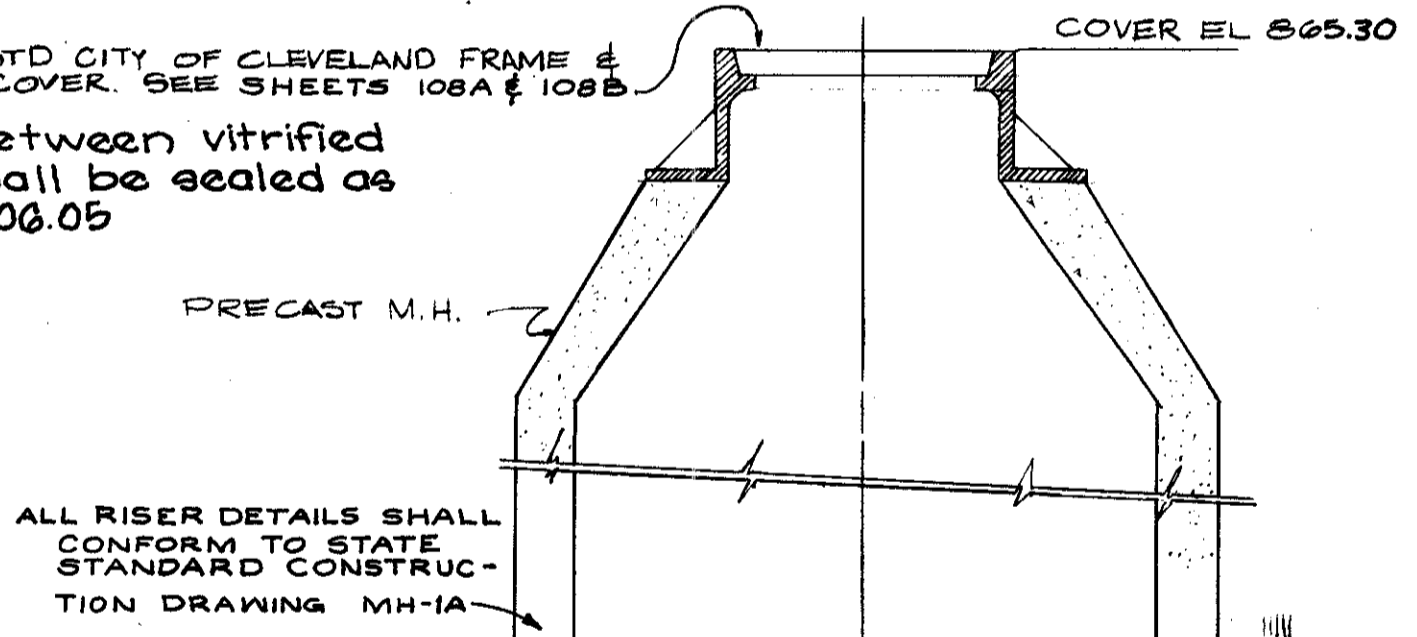


SECTION III
NOT TO SCALE

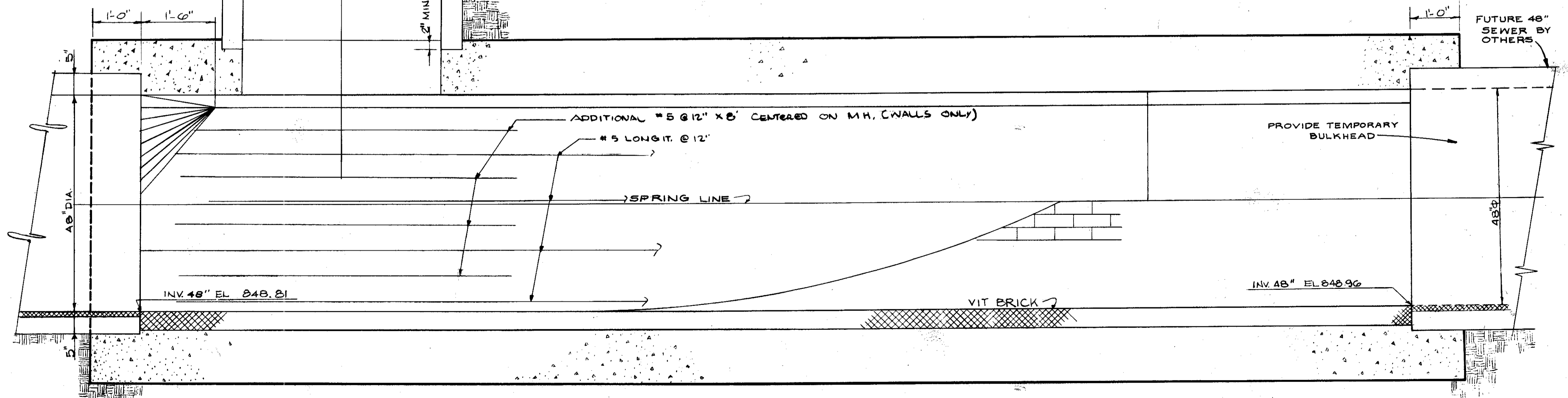


SECTION IV
NOT TO SCALE

Note: Joints between vitrified bricks shall be sealed as per Sec. 706.05



Ø CURVE DATA CURVE NO. 1 (48")	Ø CURVE DATA CURVE NO. 2 (36")
Δ = 49° 29' 39"	Δ = 11° 20' 35"
R = 30'	R = 60'
T = 13.83'	T = 5.96'
L = 25.92'	L = 11.88'



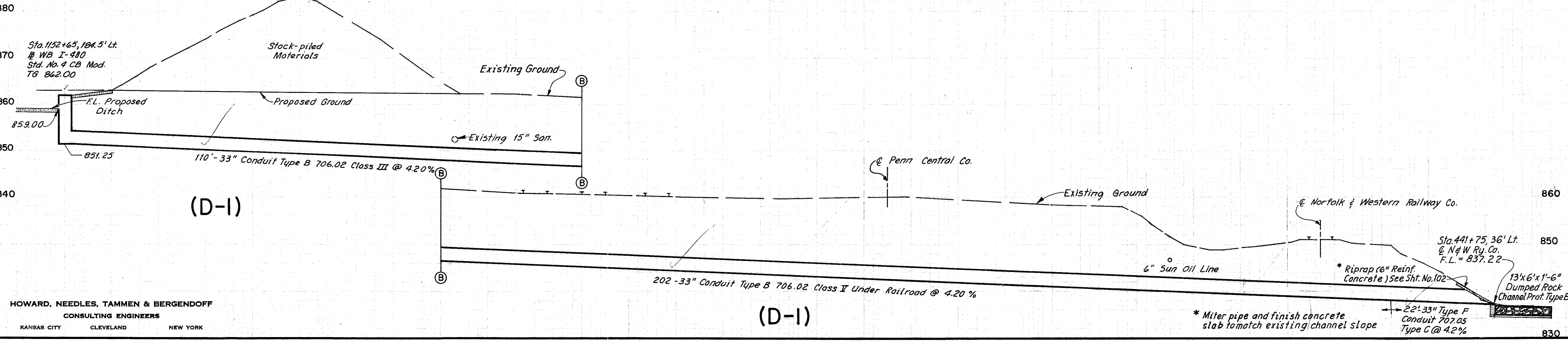
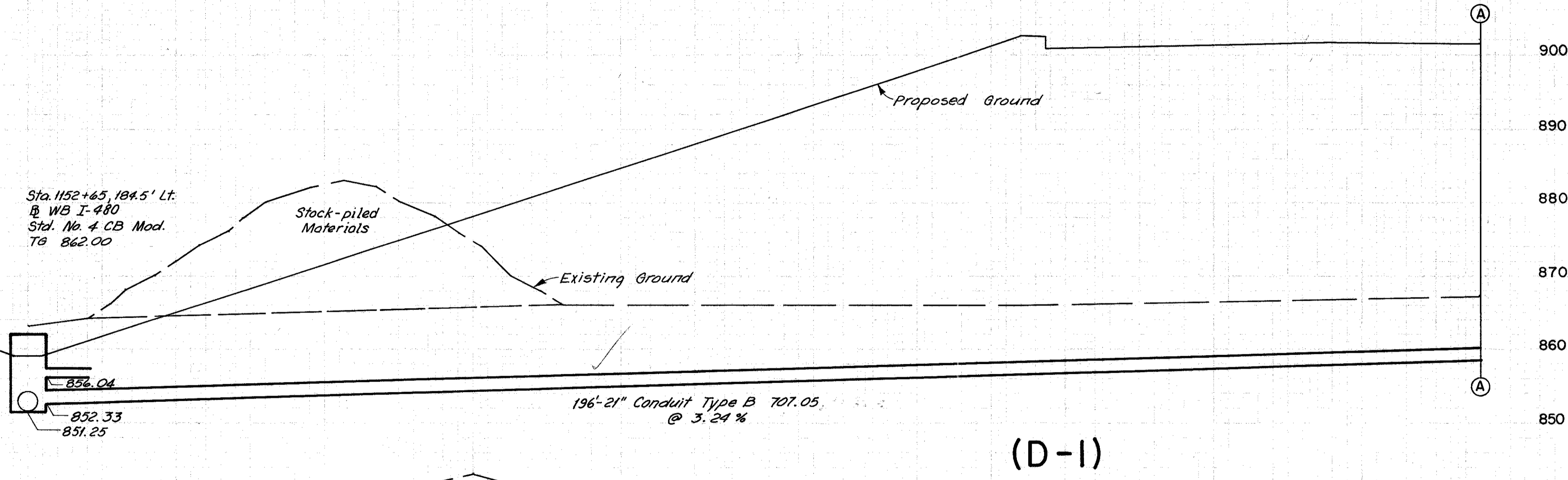
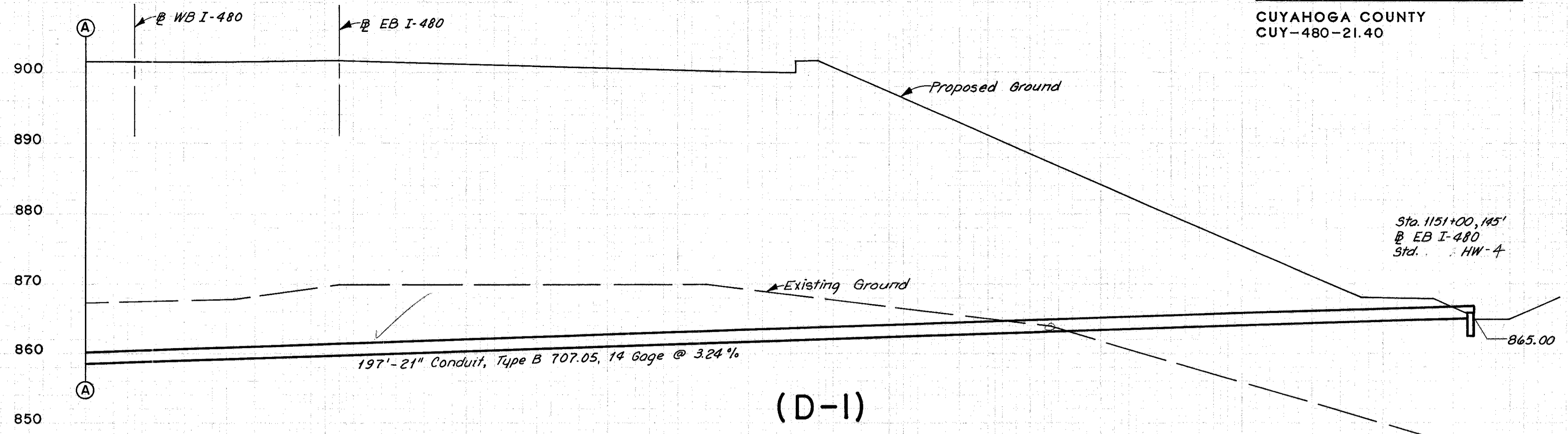
SECTION A-A
NOT TO SCALE

GENERAL NOTES
FOUNDATION MATERIAL OF APPROXIMATELY UNIFORM BEARING CAPACITY IS CONTEMPLATED. SPOTS OF SOFT EARTH SHALL BE REMOVED AND BE REPLACED WITH THOROUGHLY COMPACTED GRANULAR MATERIAL.
EMBANKMENT SHALL BE PLACED SYMMETRICALLY ON BOTH SIDES OF THE CHAMBER AFTER THE TOP SLAB IS IN PLACE. EMBANKMENT OVER THE BARREL SHALL BE PLACED IN HORIZONTAL LAYERS SIMULTANEOUSLY, WITH THAT ON EACH SIDE OF CHAMBER.
CONCRETE SHALL BE CLASS "C".
REINFORCING - ALL REINFORCING STEEL TO HAVE A 2" MINIMUM COVER EXCEPT WHERE OTHERWISE NOTED.
DESIGN SPECIFICATIONS - THIS STRUCTURE CONFORMS TO THE REQUIREMENTS OF DESIGN SPECIFICATIONS FOR HIGHWAY STRUCTURE OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

109
390

CUYAHOGA COUNTY
CUY-480-21.40



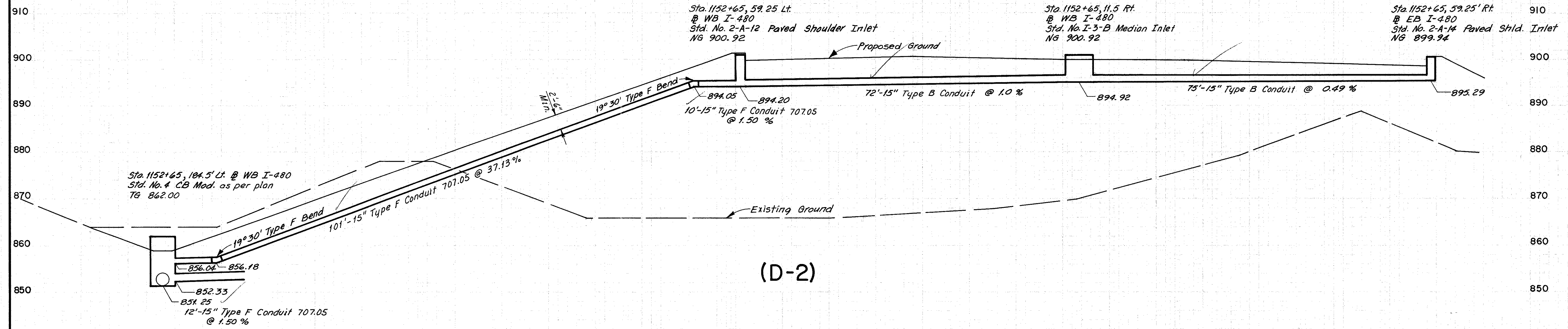
F.P.A. 3-28-71
 R.A.M. 3-30-71
 I.M. 4-8-71

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

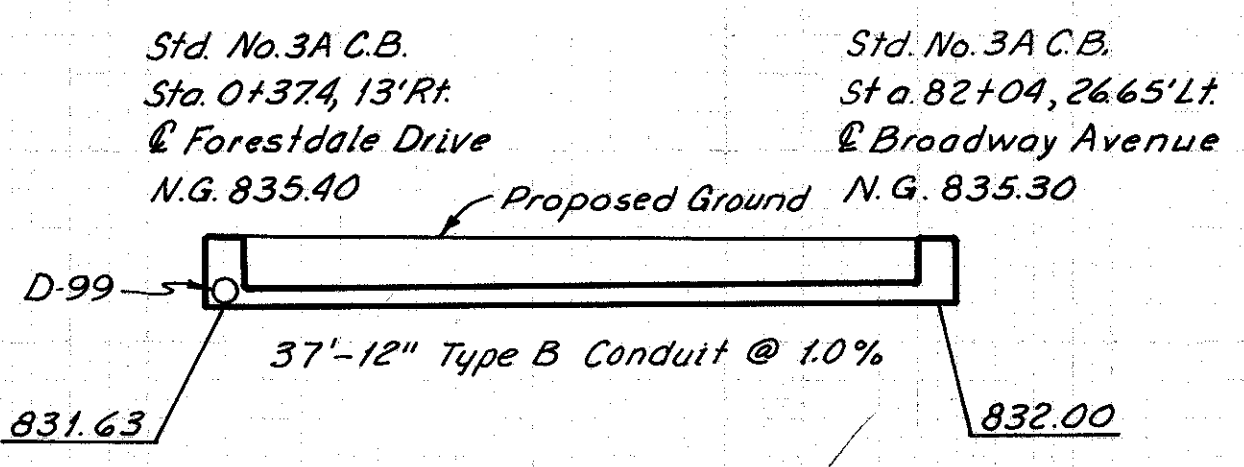
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

110
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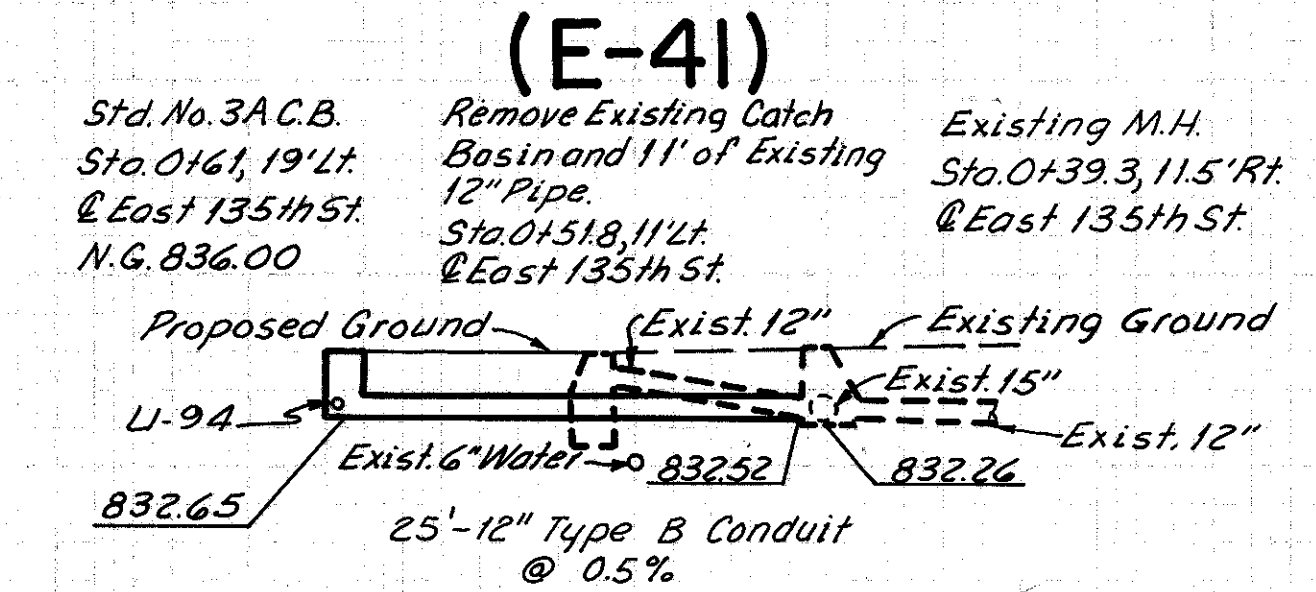
CUYAHOGA COUNTY
CUY-480-21.40



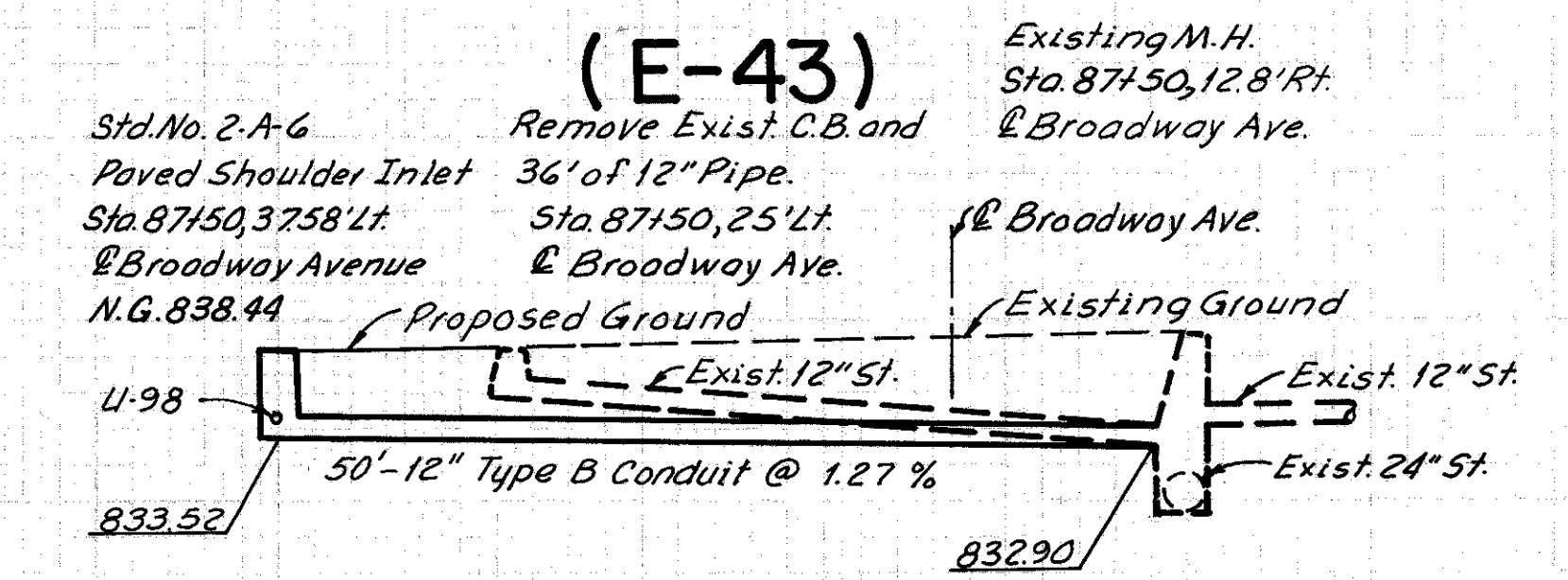
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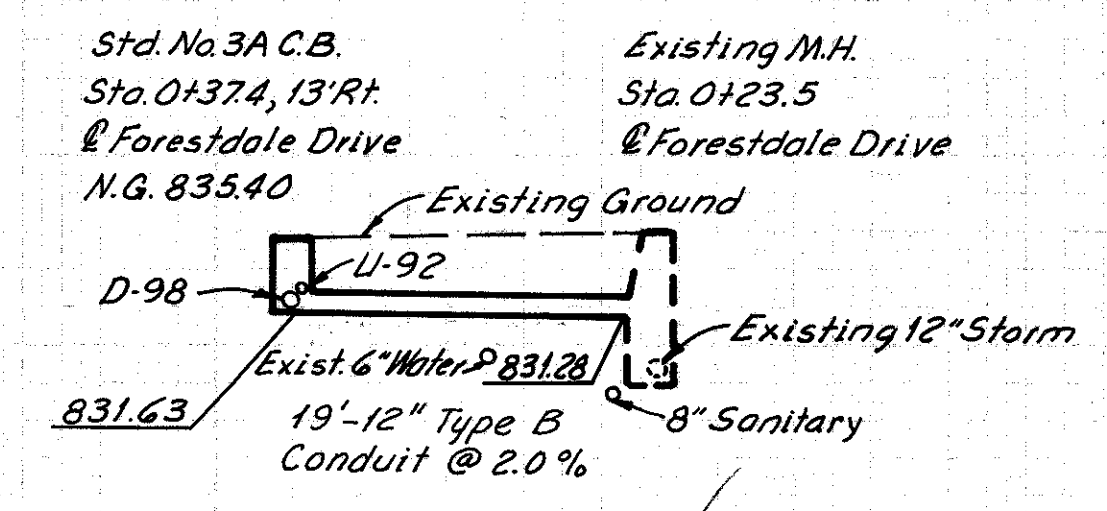
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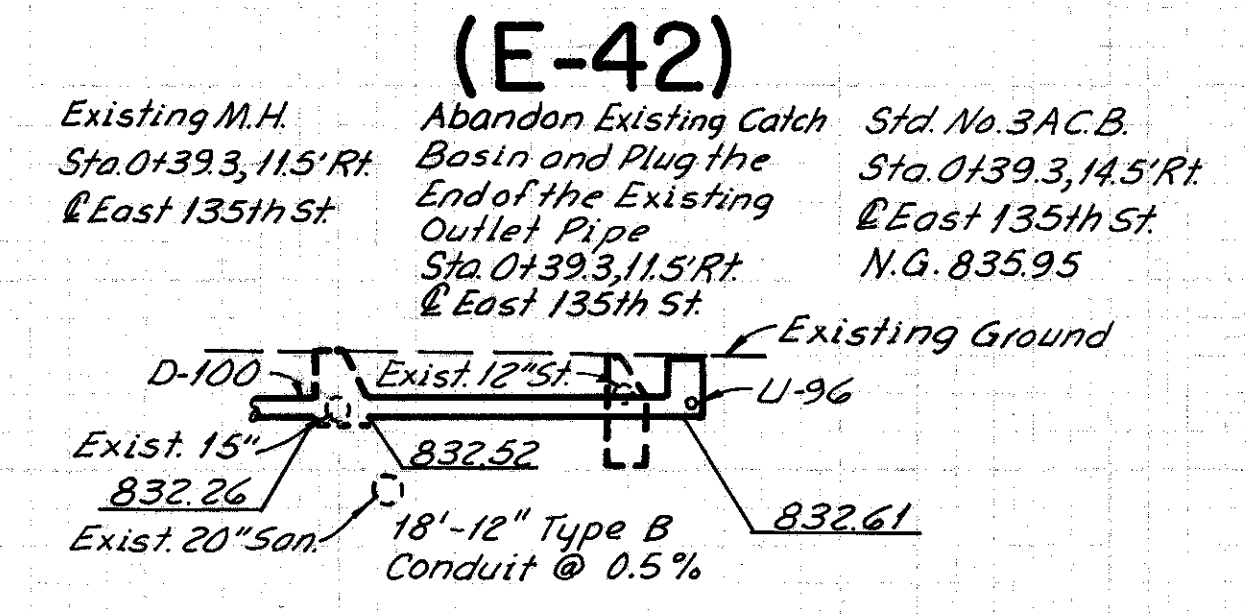
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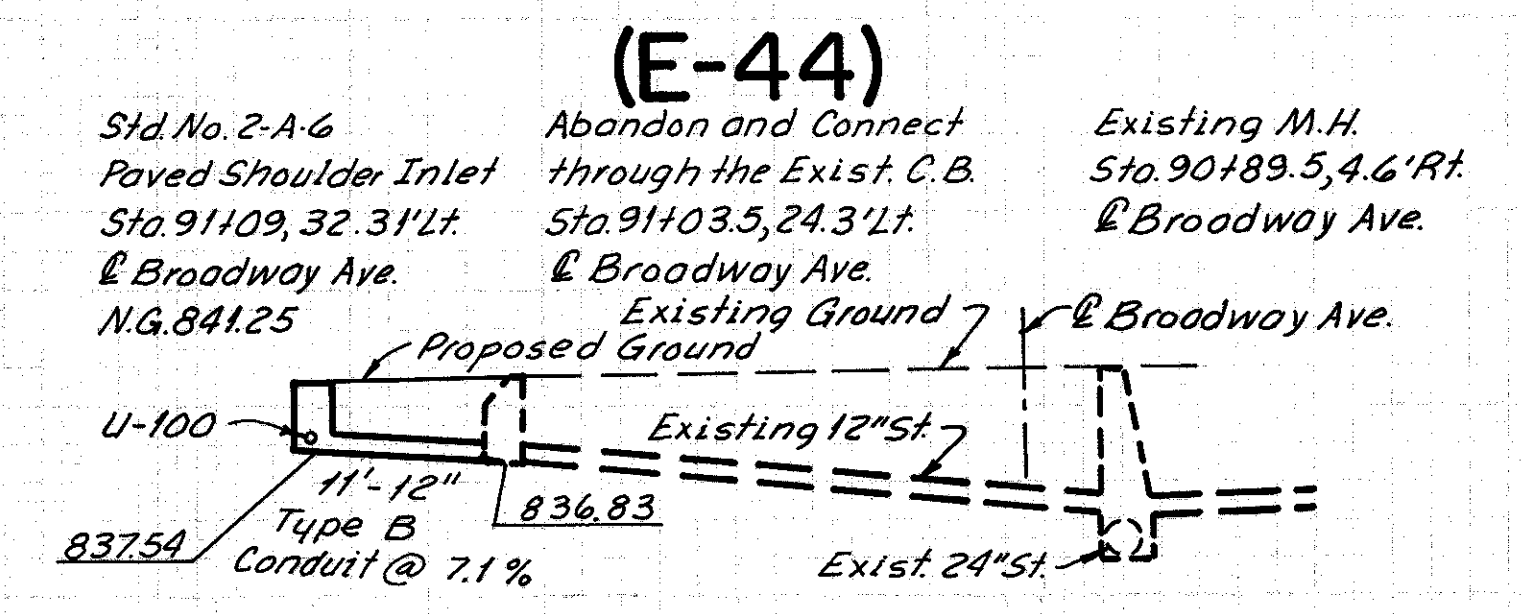
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(D-99)



(D-101)



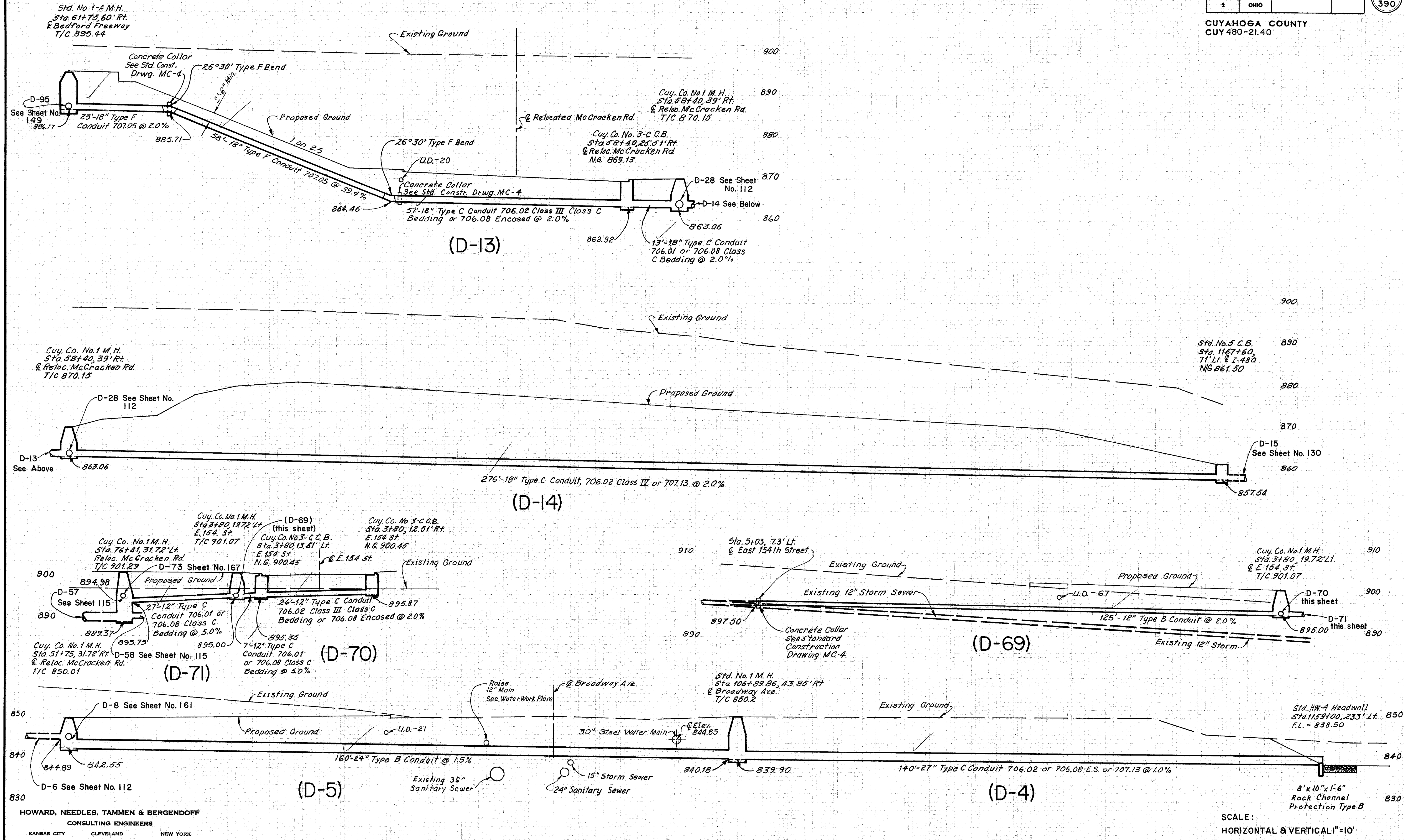
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8-26-71
 3-5-71
 4-8-71
 E.P.A.
 R.A.W.
 I.M.

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

390

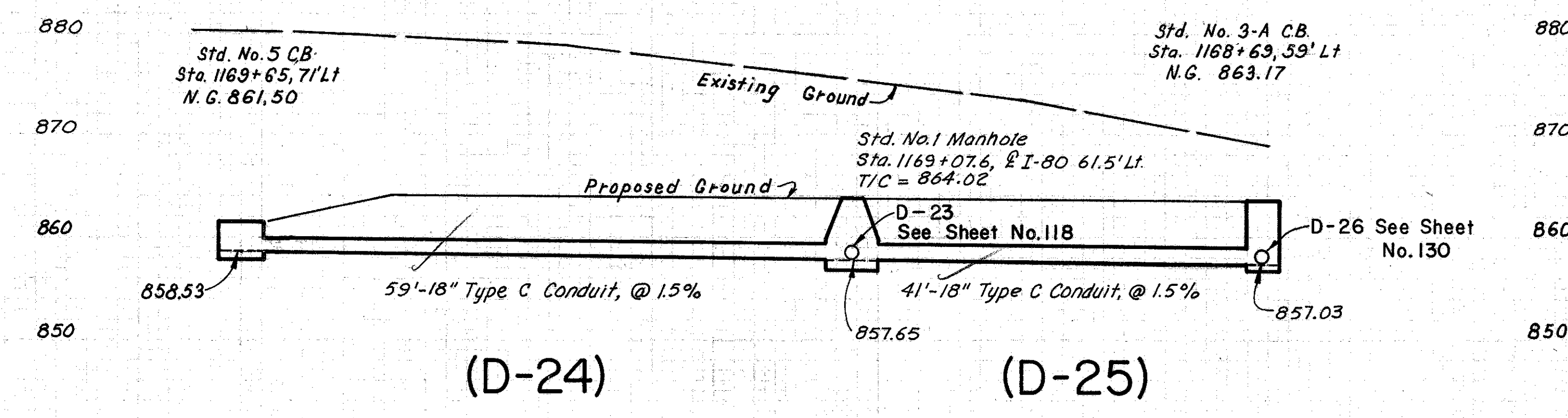
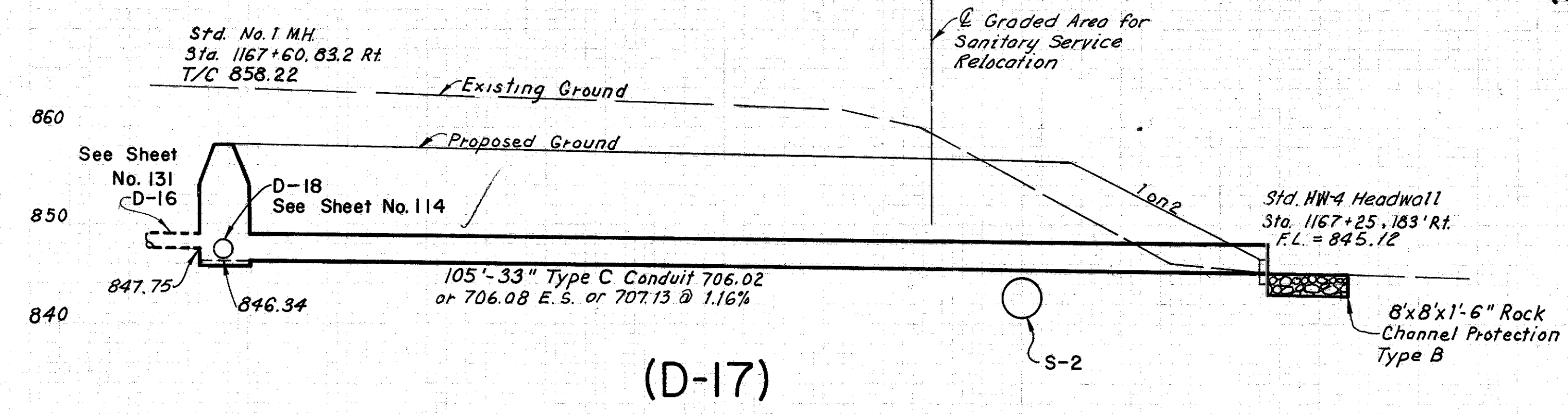
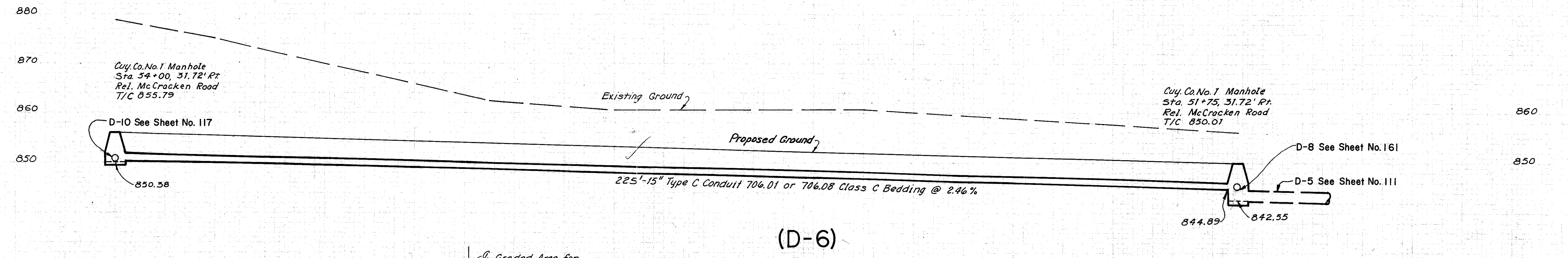
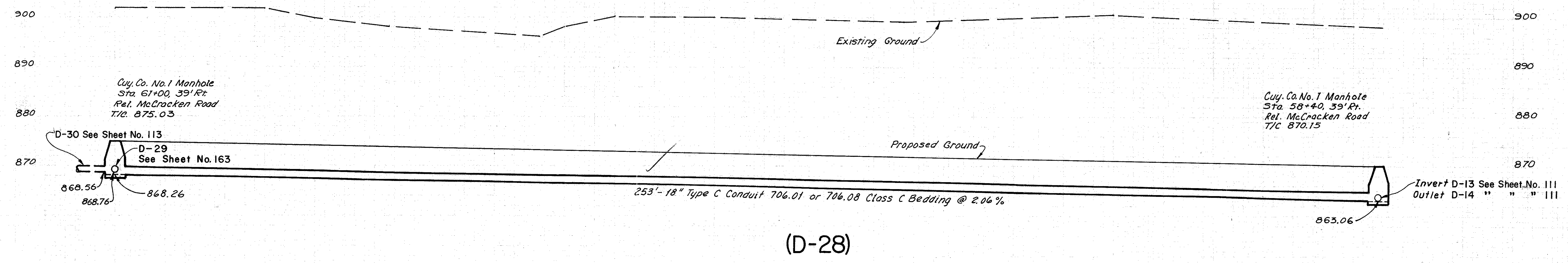
CUYAHOGA COUNTY
CUY 480-21.40



31069
 I.M.
 E.R.A.
 Made
 Checked

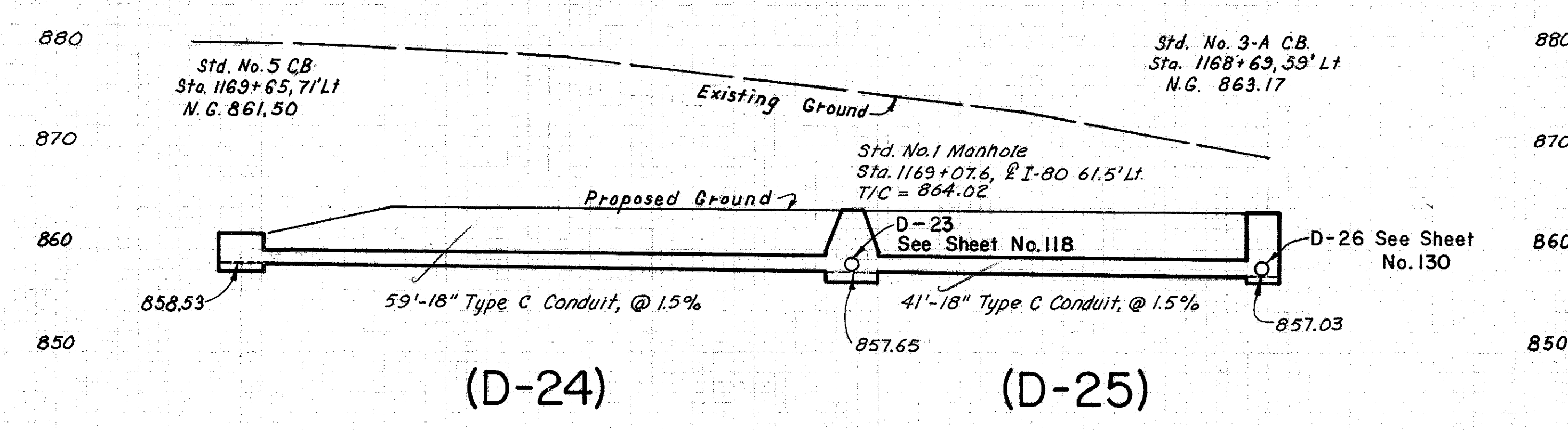
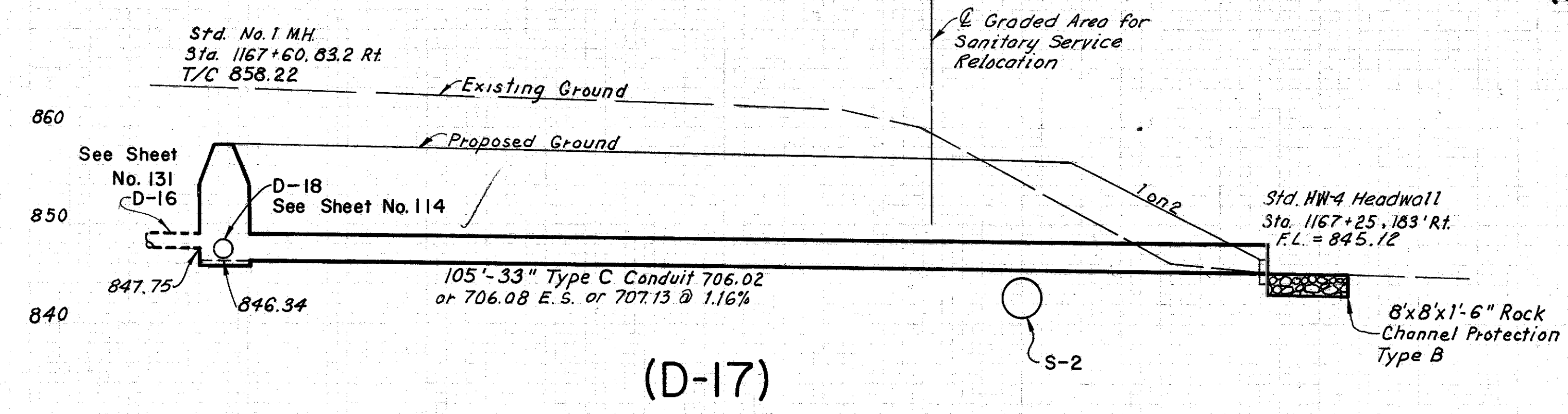
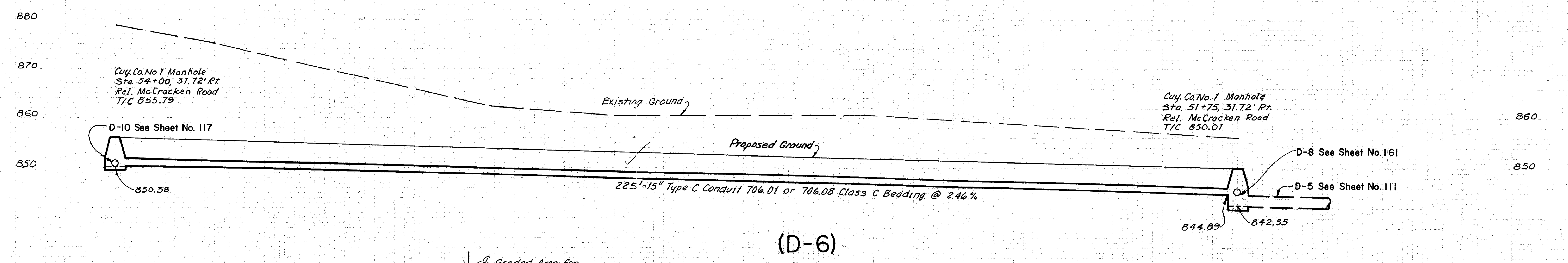
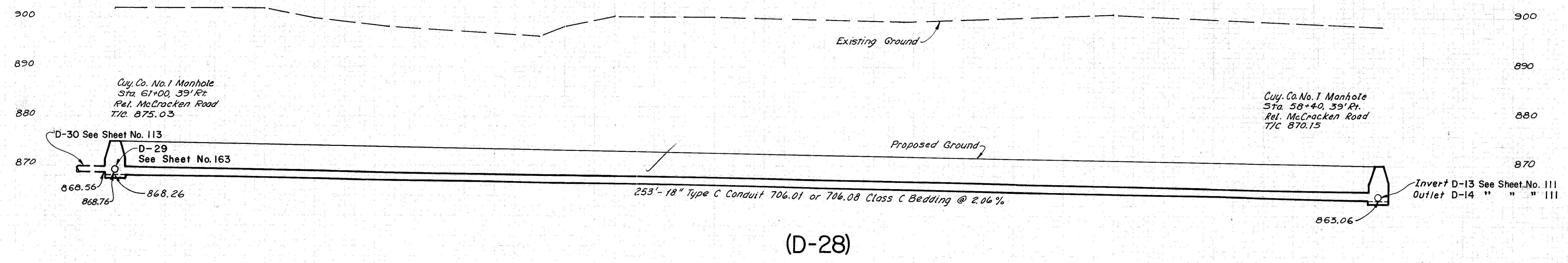
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

SCALE:
 HORIZONTAL & VERTICAL 1"=10'



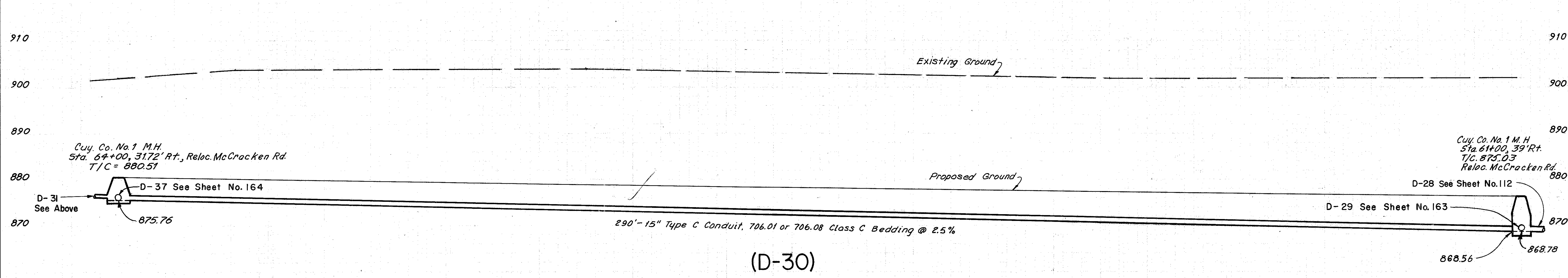
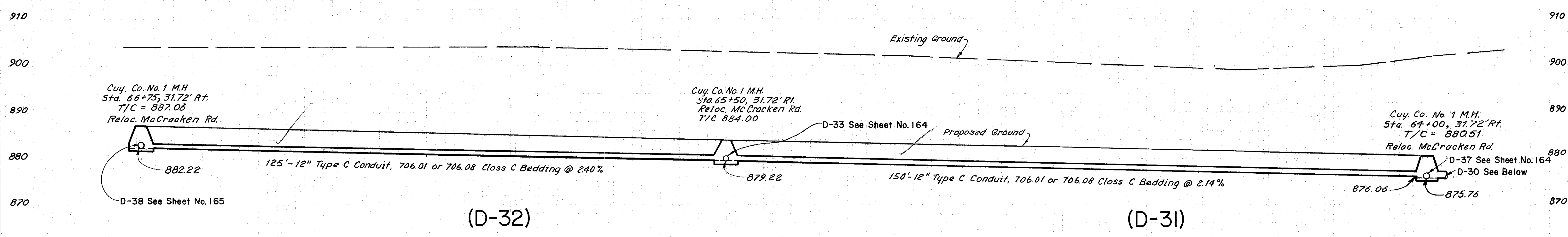
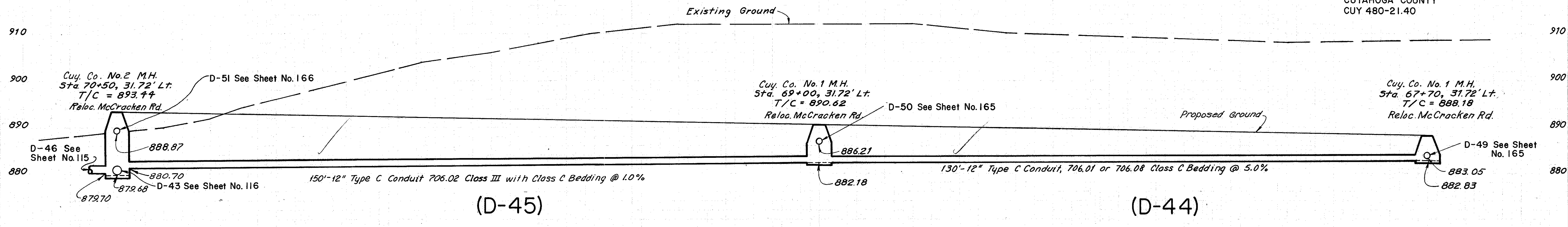
3/10/69
I.M.
E.R.A.
Made:
Checked:

CUYAHOGA COUNTY
CUY 480-21.40



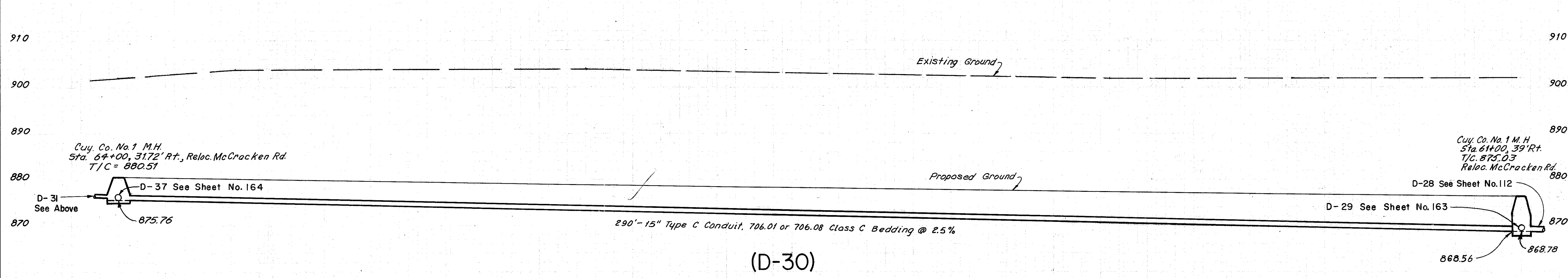
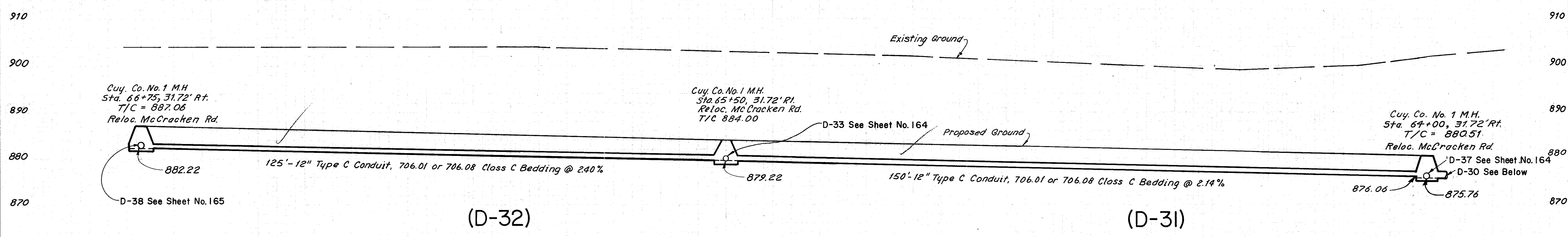
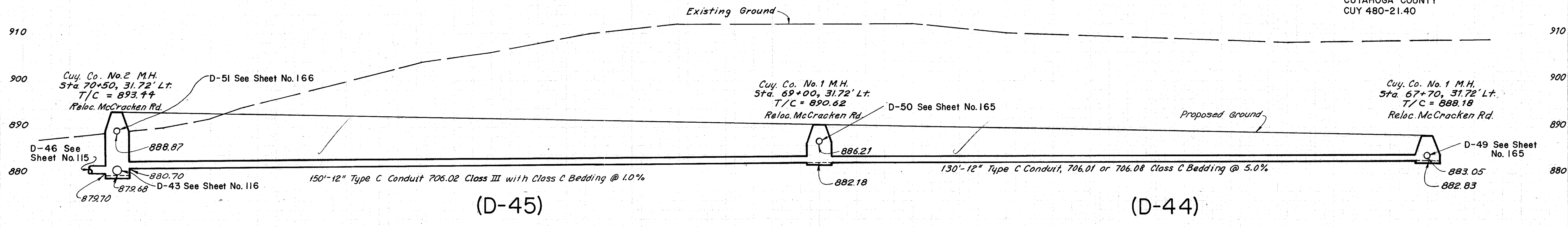
3/10/69
I.M.
E.R.A.
Made:
Checked:

CUYAHOGA COUNTY
CUY 480-21.40

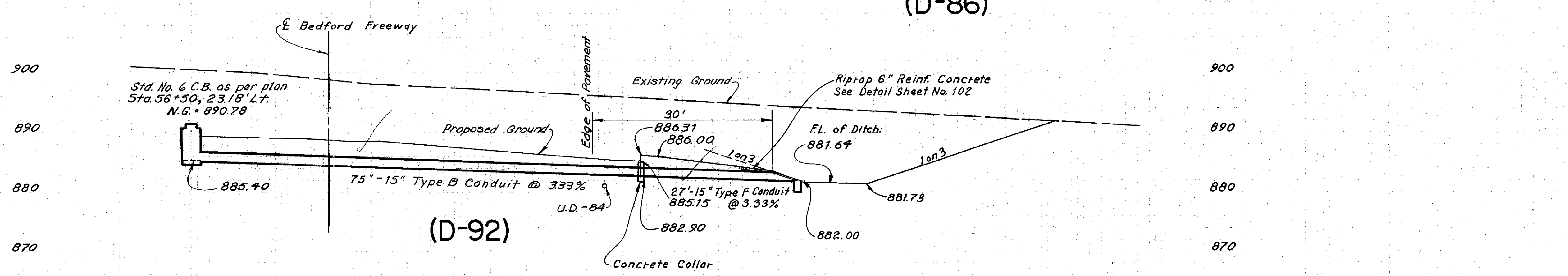
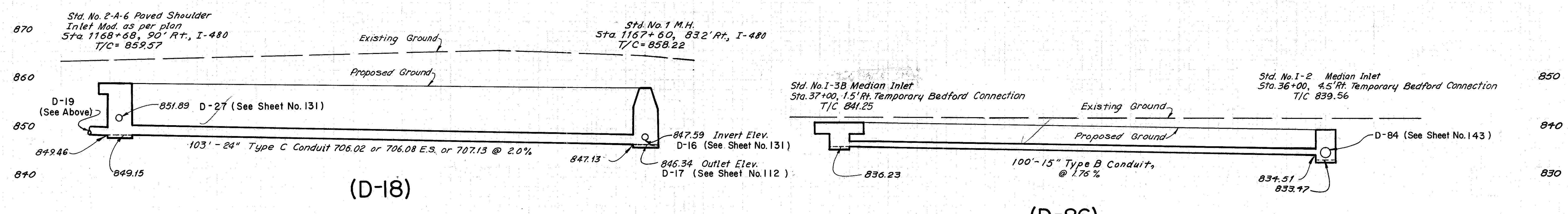
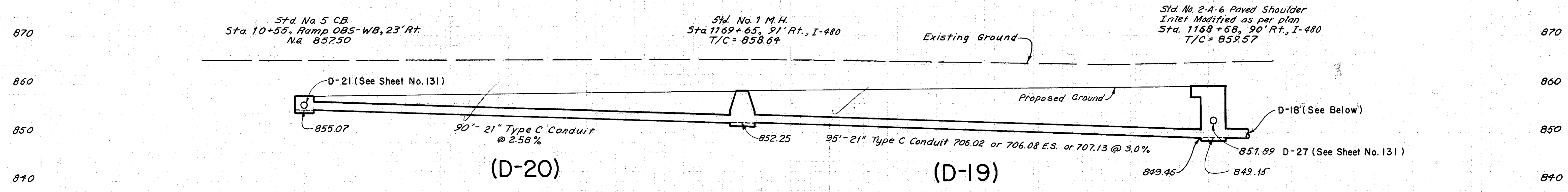


Made: 3-10-69
 Checked: 3-20-69
 I.M.
 E.R.A.

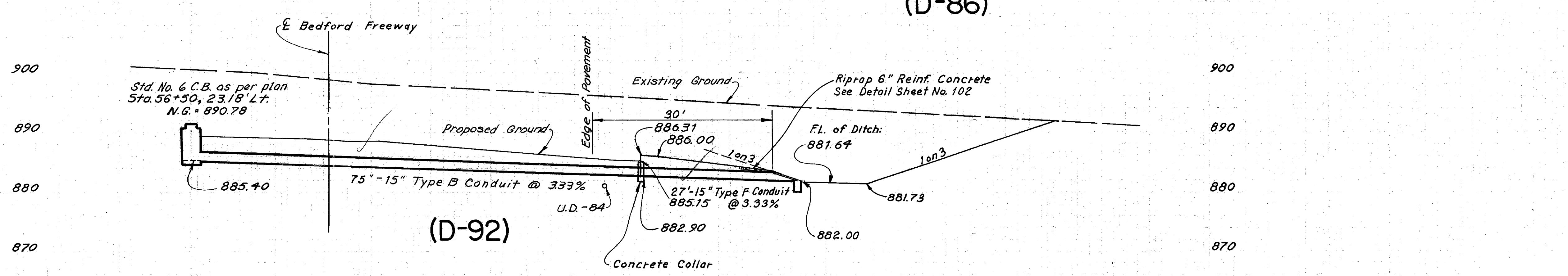
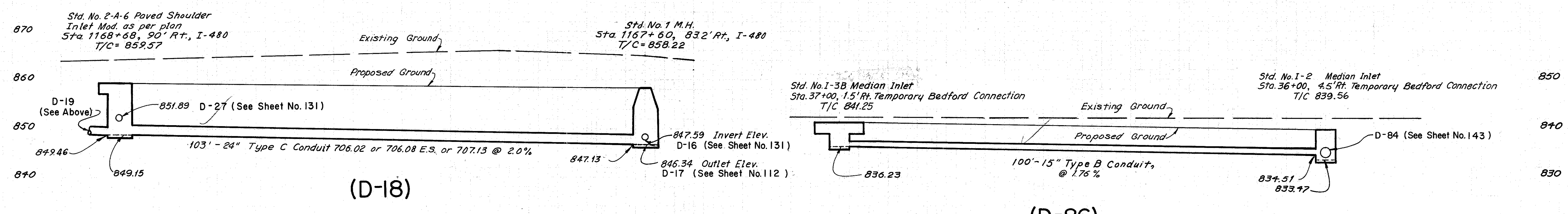
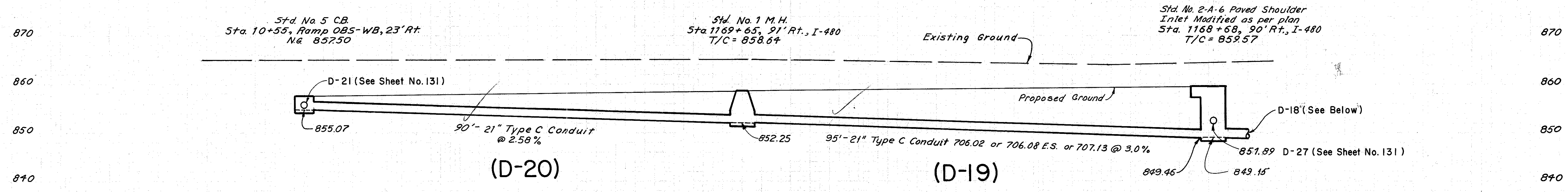
CUYAHOGA COUNTY
CUY 480-21.40



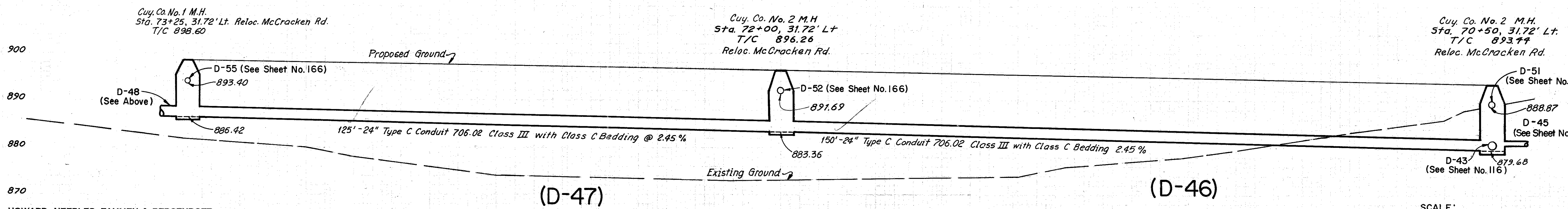
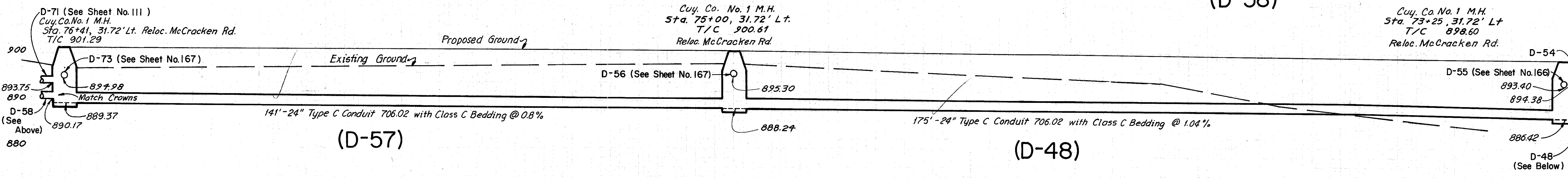
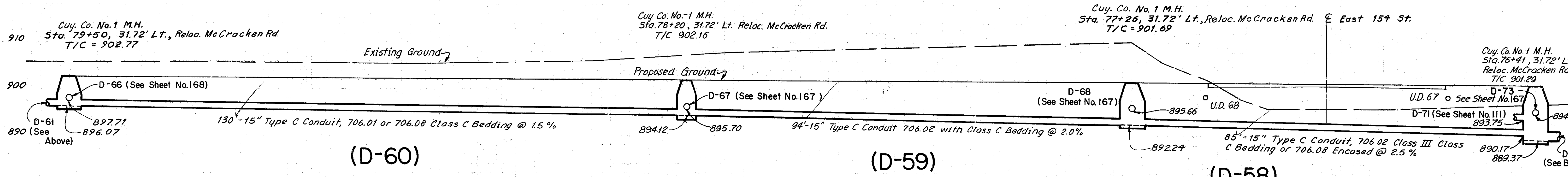
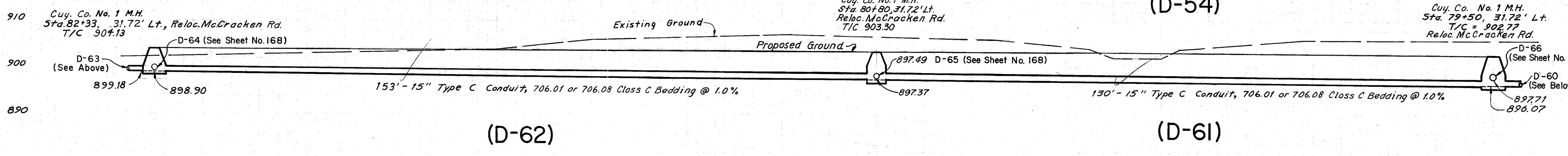
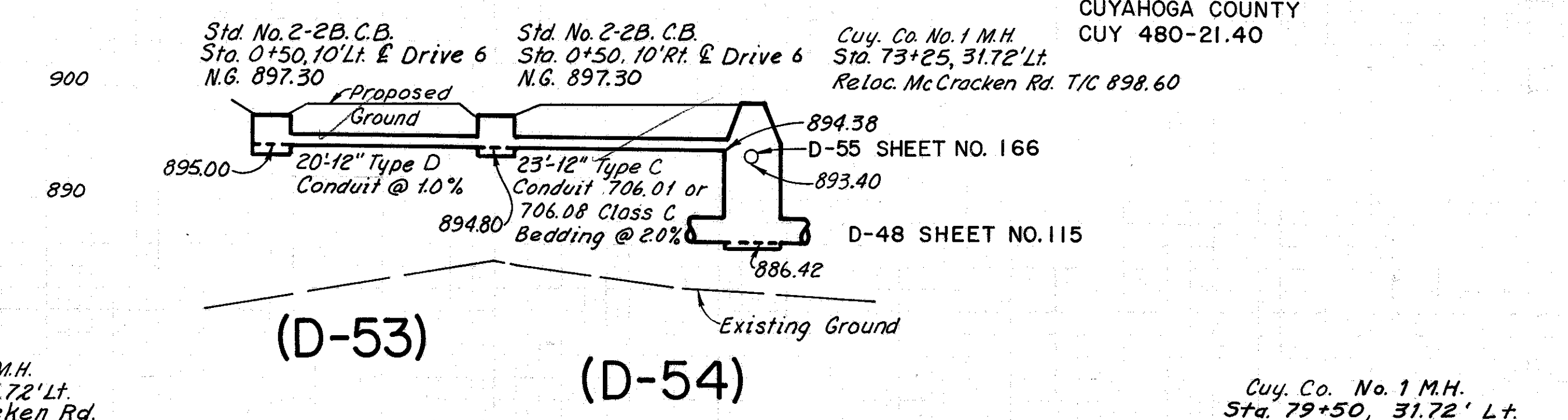
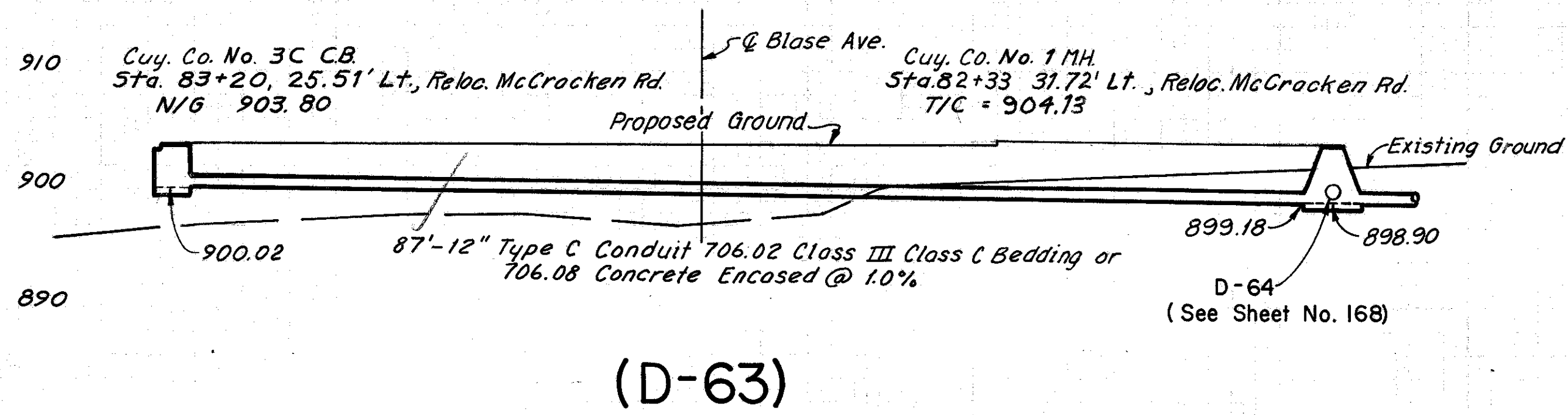
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3-10-69
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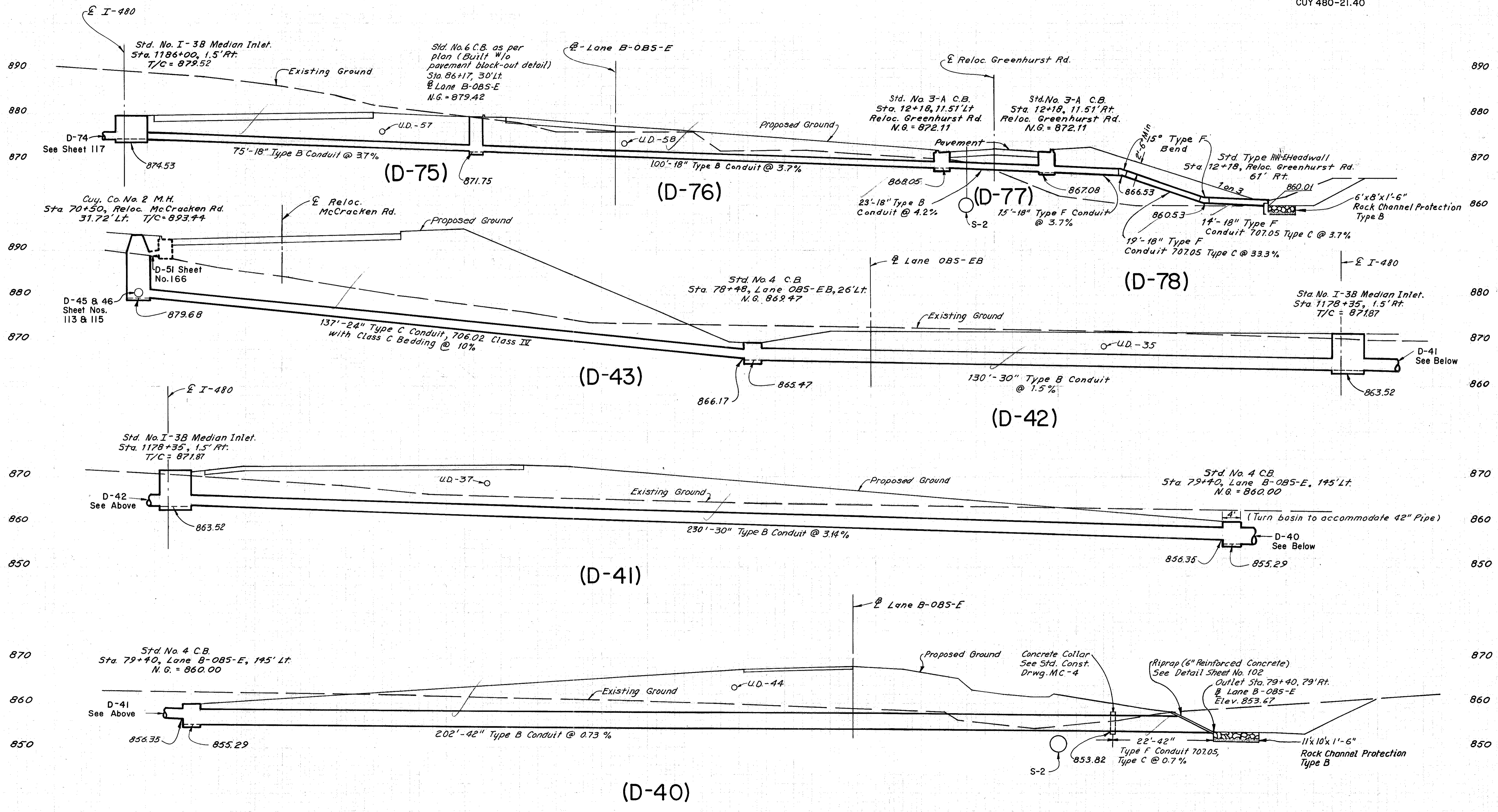


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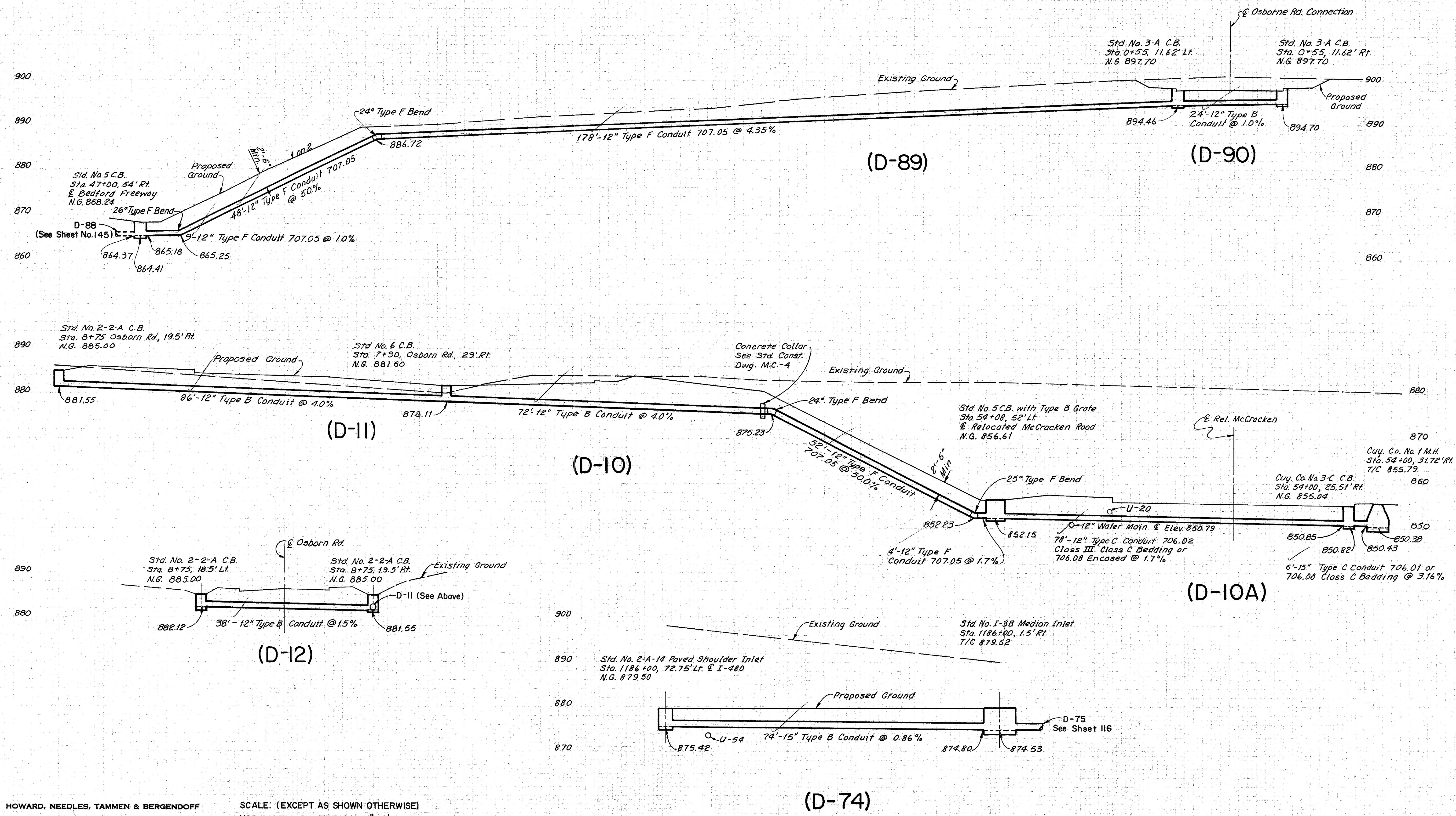


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 I.M.
 E.R.A.
 Made: Checked

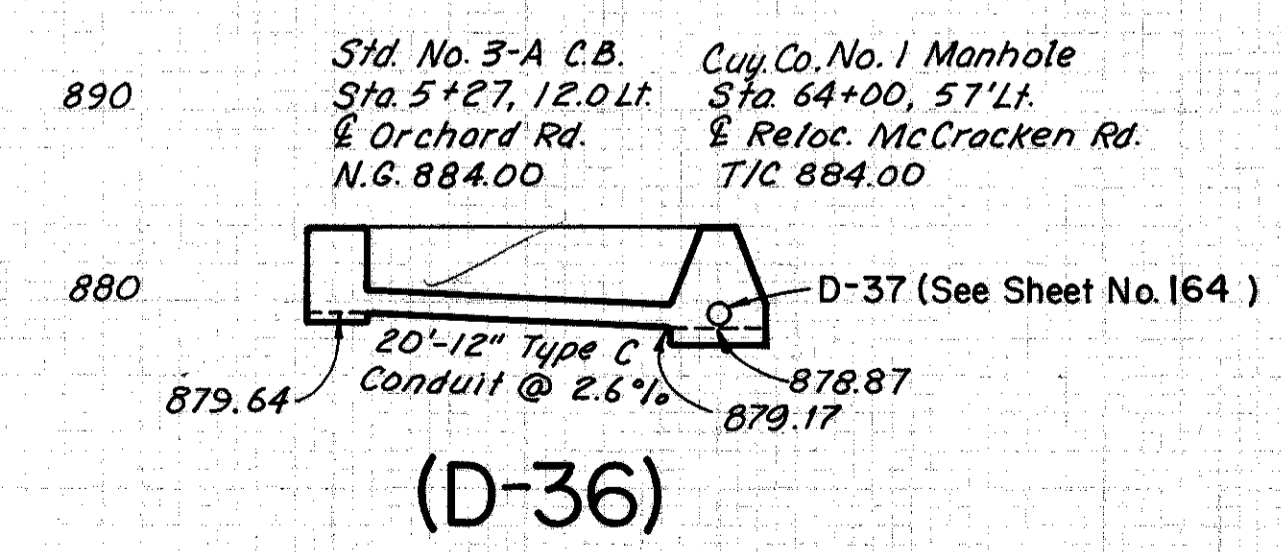
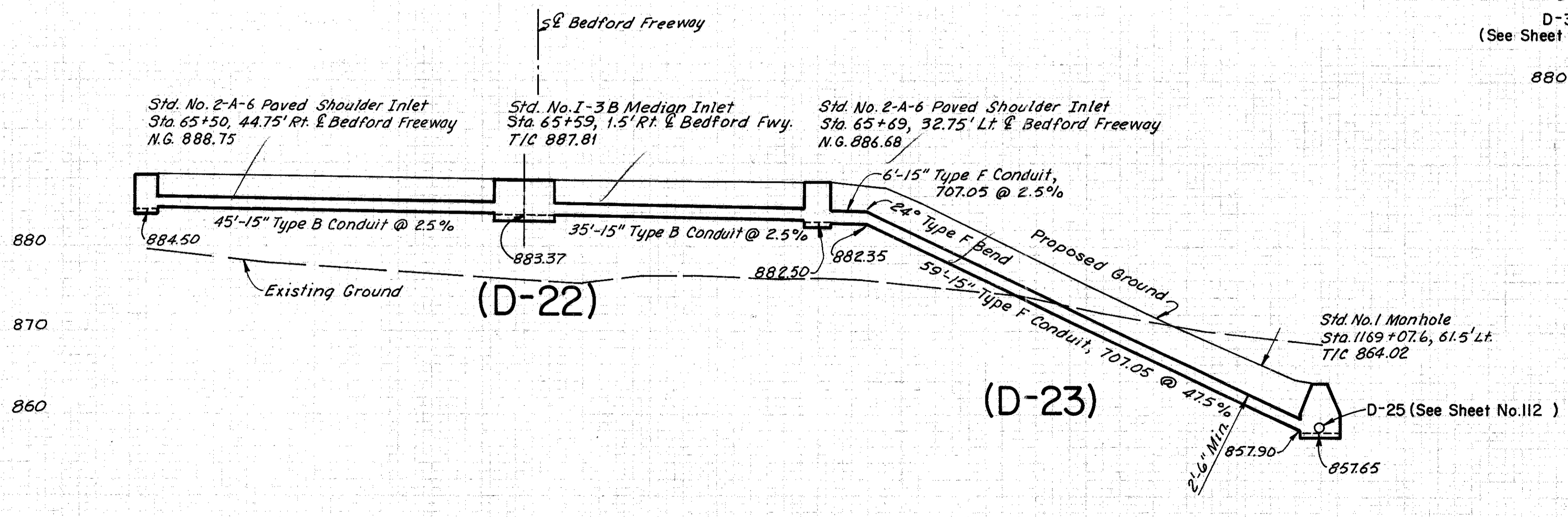
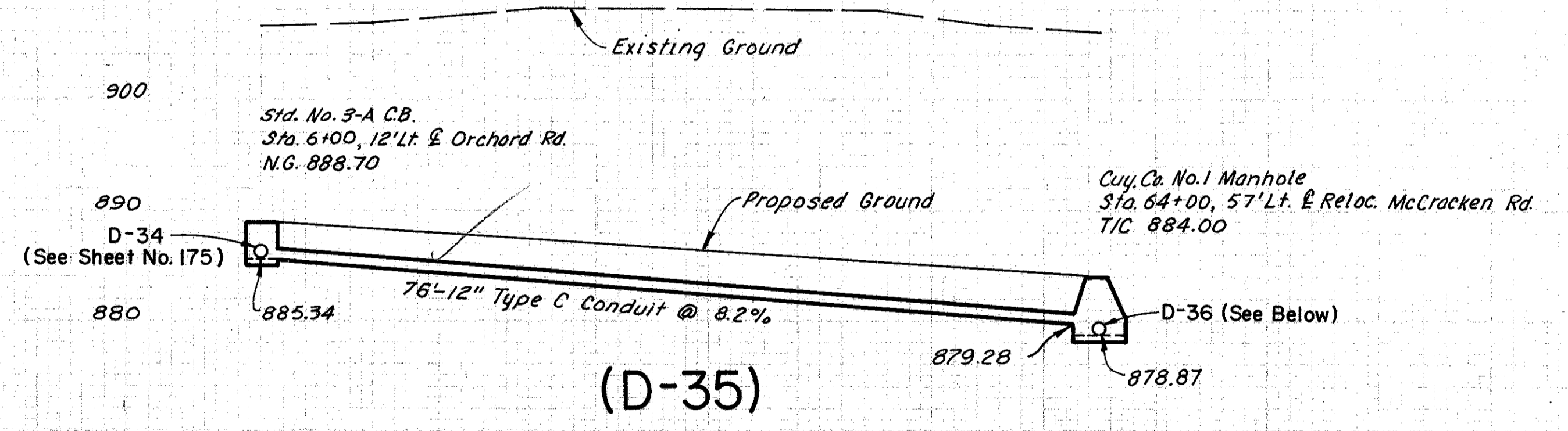
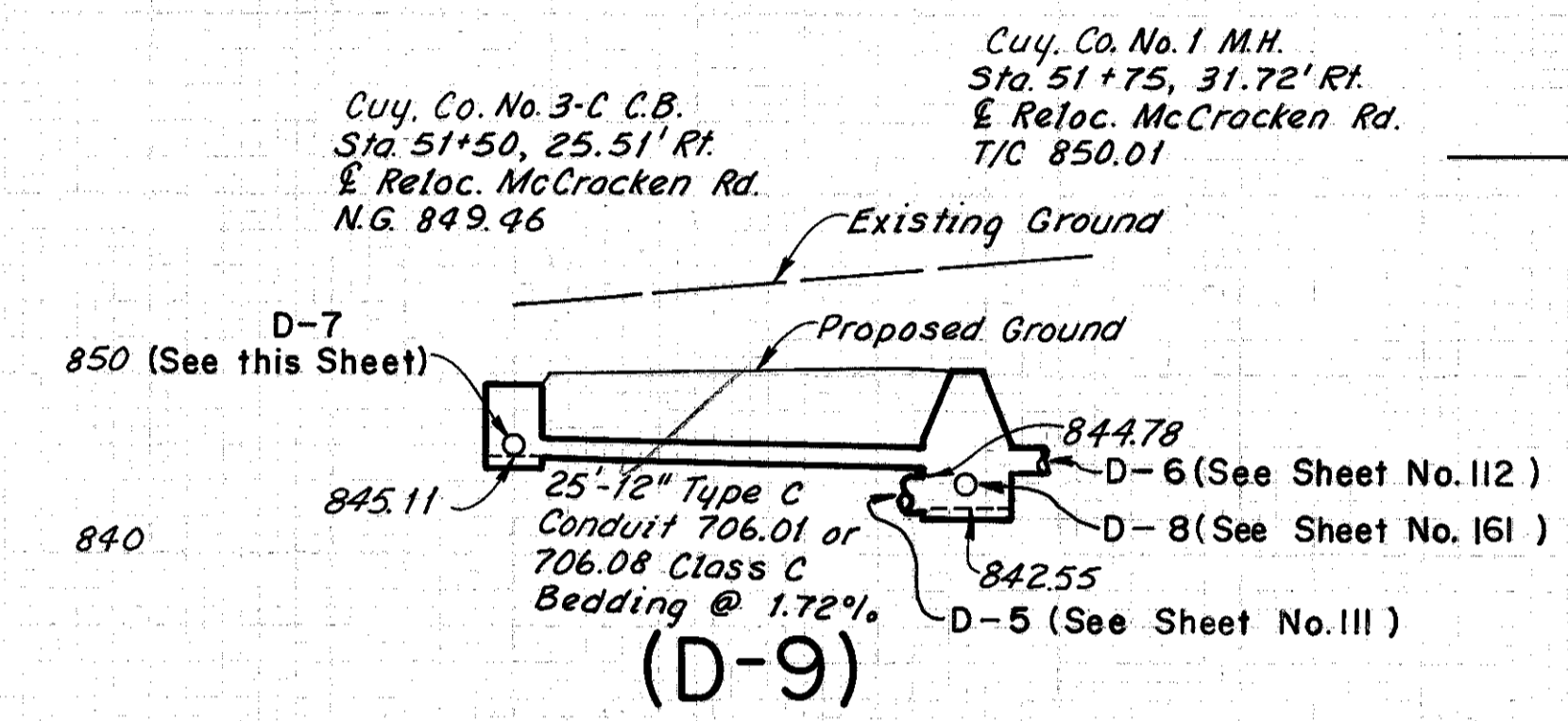
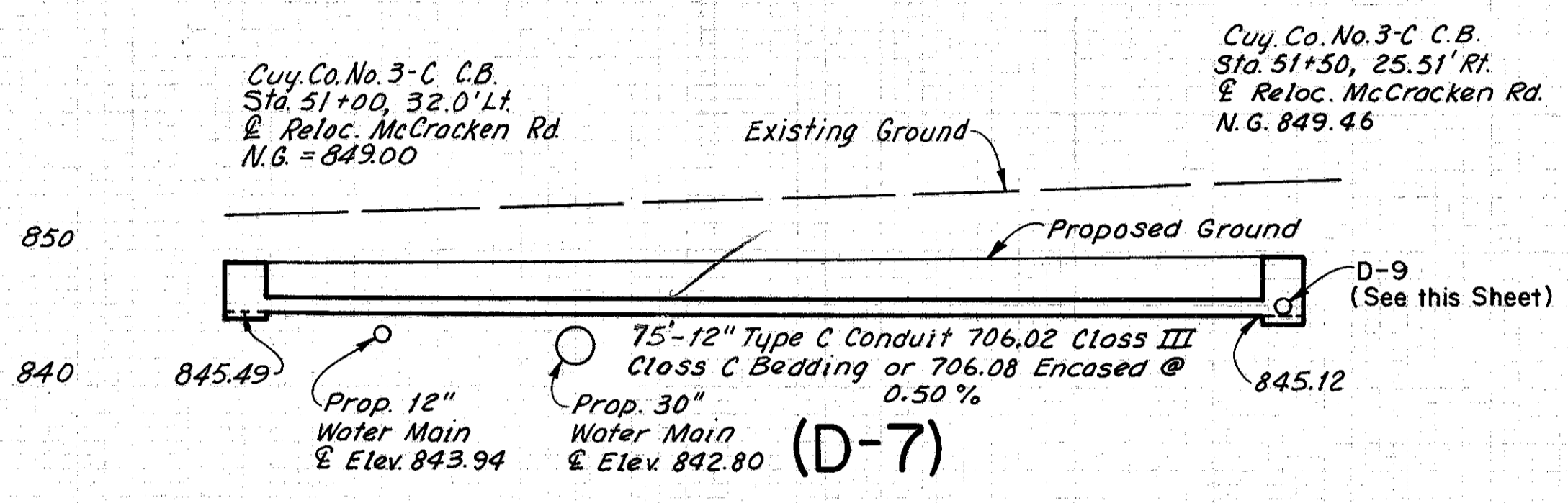
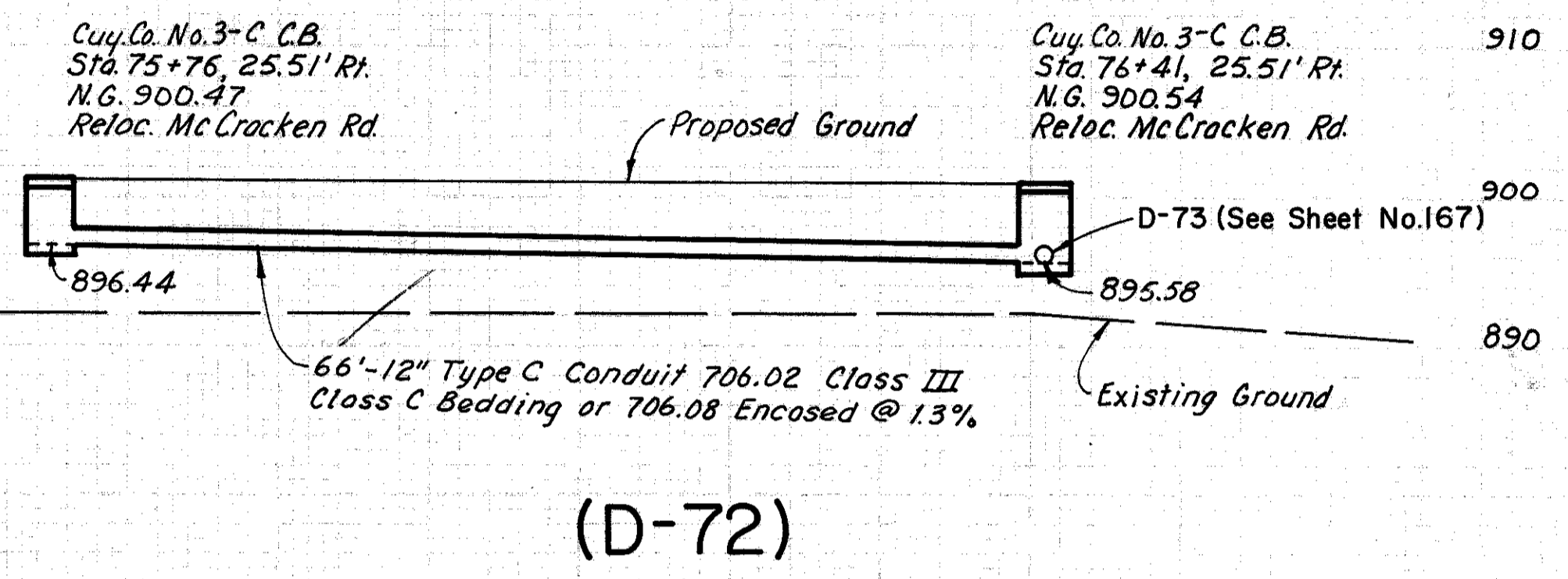
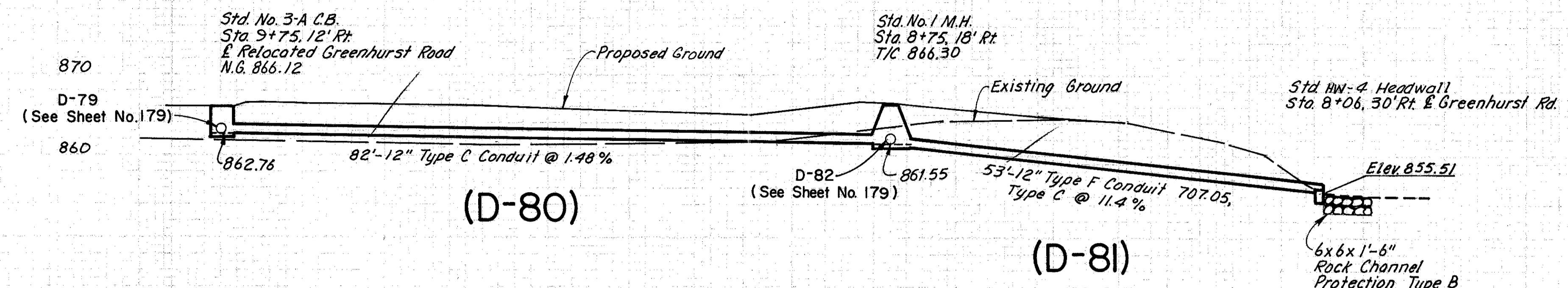
CUYAHOGA COUNTY
CUY 480-21.40



3-10-68
 3-20-68
 I.M.
 E.R.A.
 Made
 Checked



5-10-69
 J.M.
 E.P.A.
 Checked:

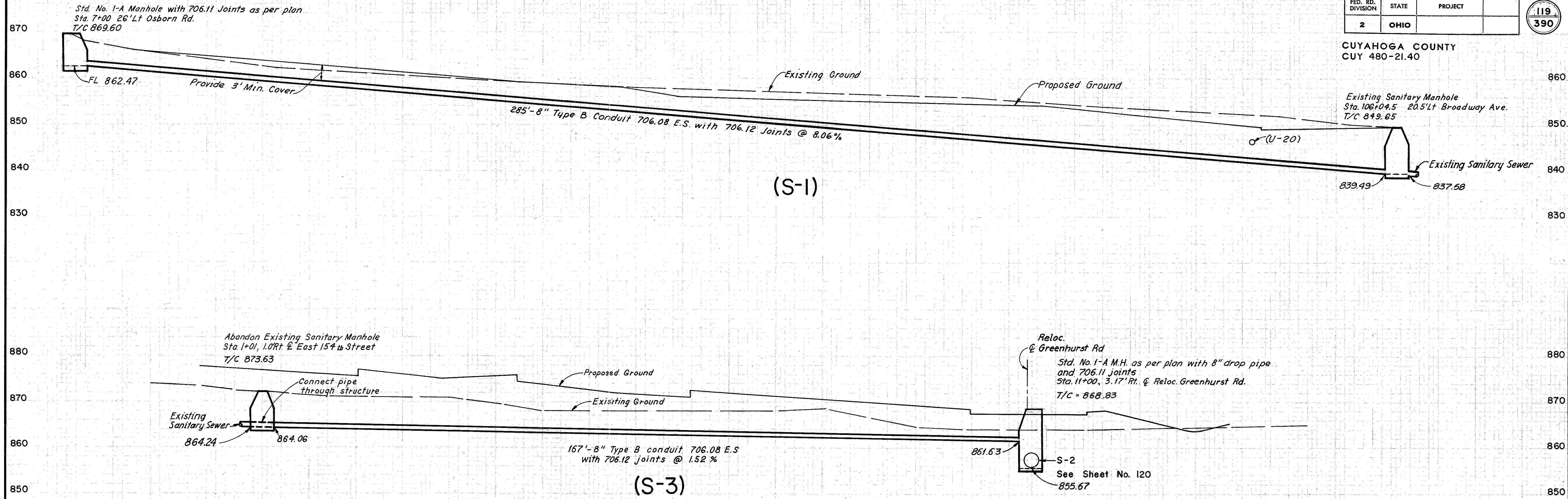


3/10/89
3/20/89
I.M.
E.R.A.
Made
Checked

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

119
390

CUYAHOGA COUNTY
CUY 480-21.40

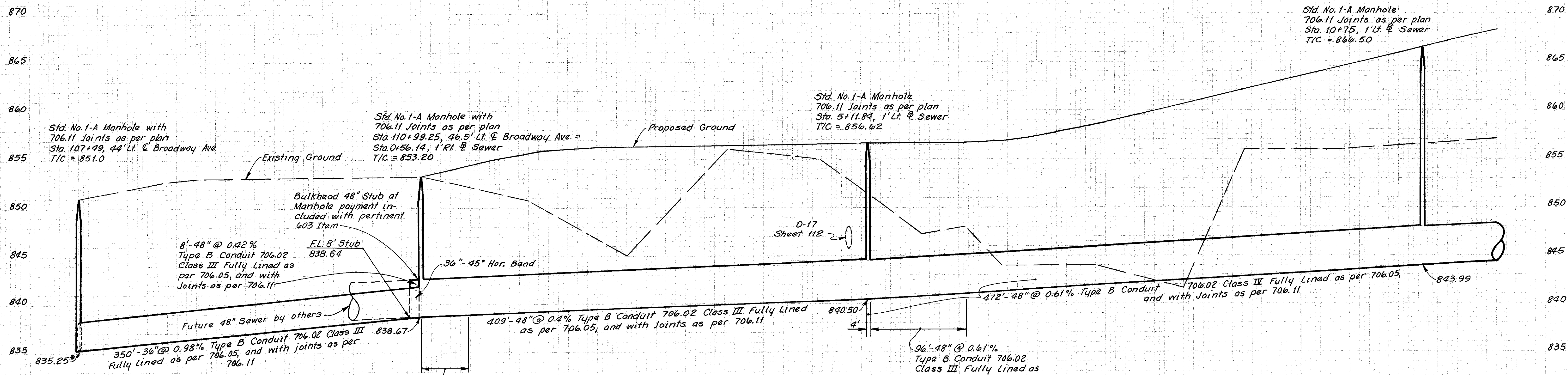


3-10-69
 3-20-69
 J.M.
 E.R.A.
 Made
 Checked:

FHWA REGION	STATE	PROJECT	
5	OHIO		

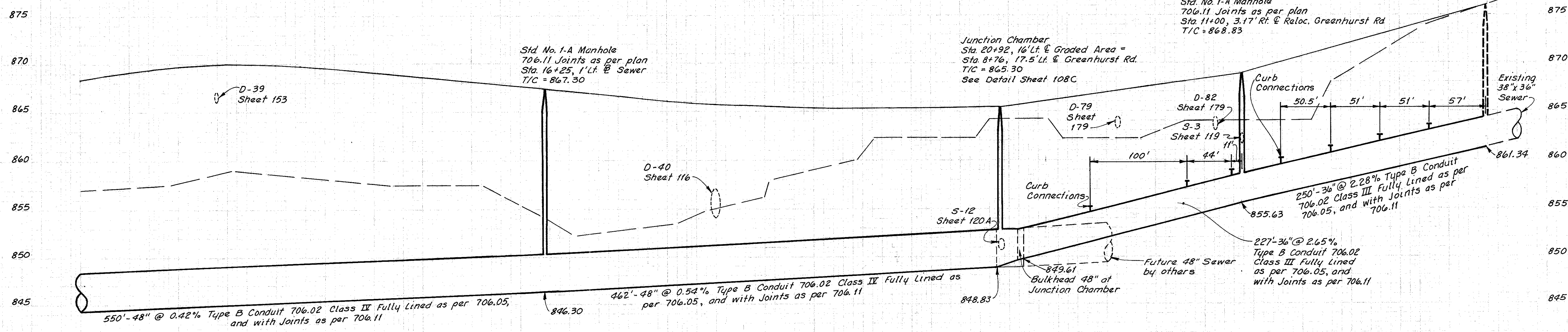
120
390

CUYAHOGA COUNTY
CUY 480-21.40



* Verify in field and adjust grade as required

S-2



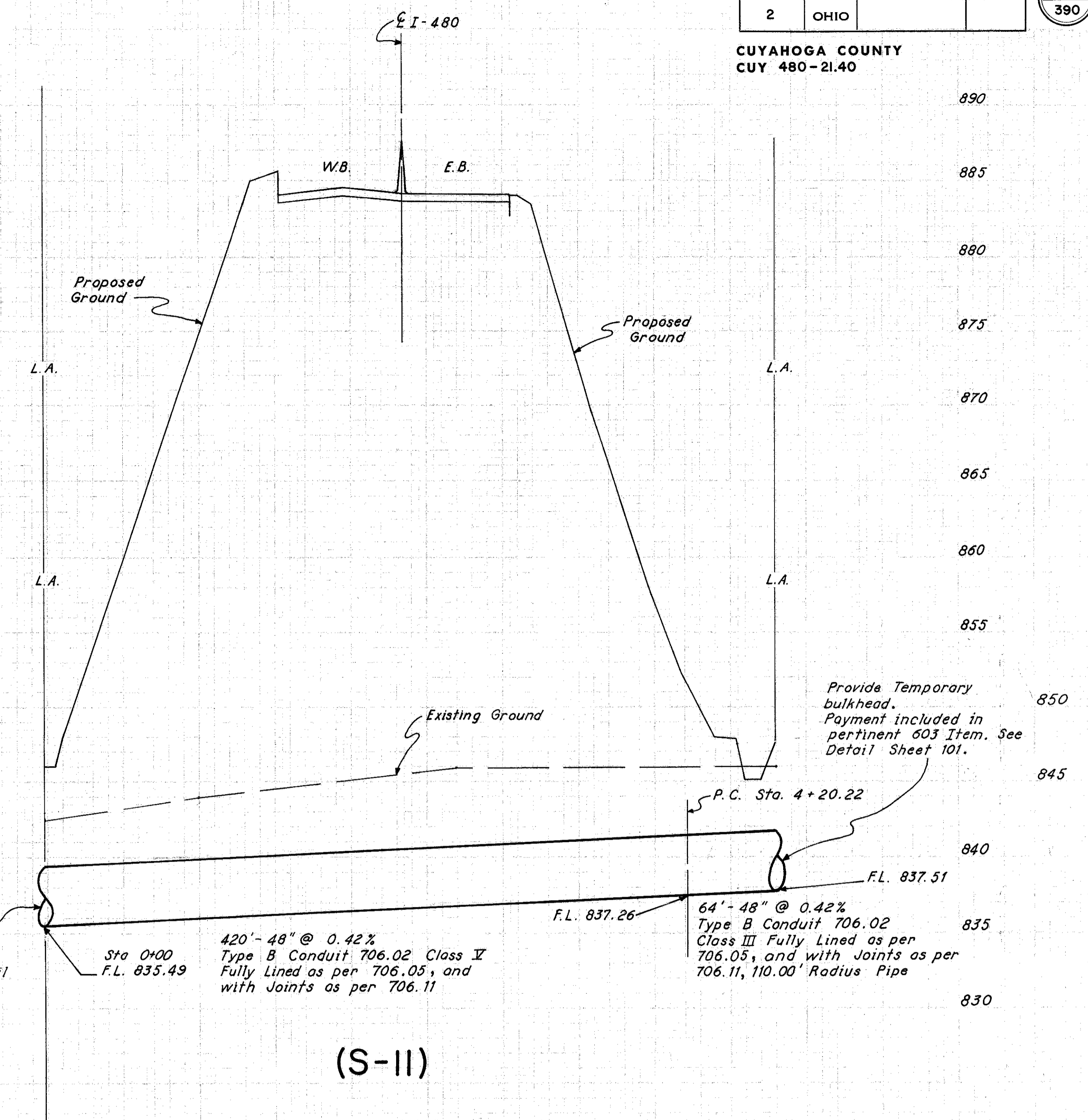
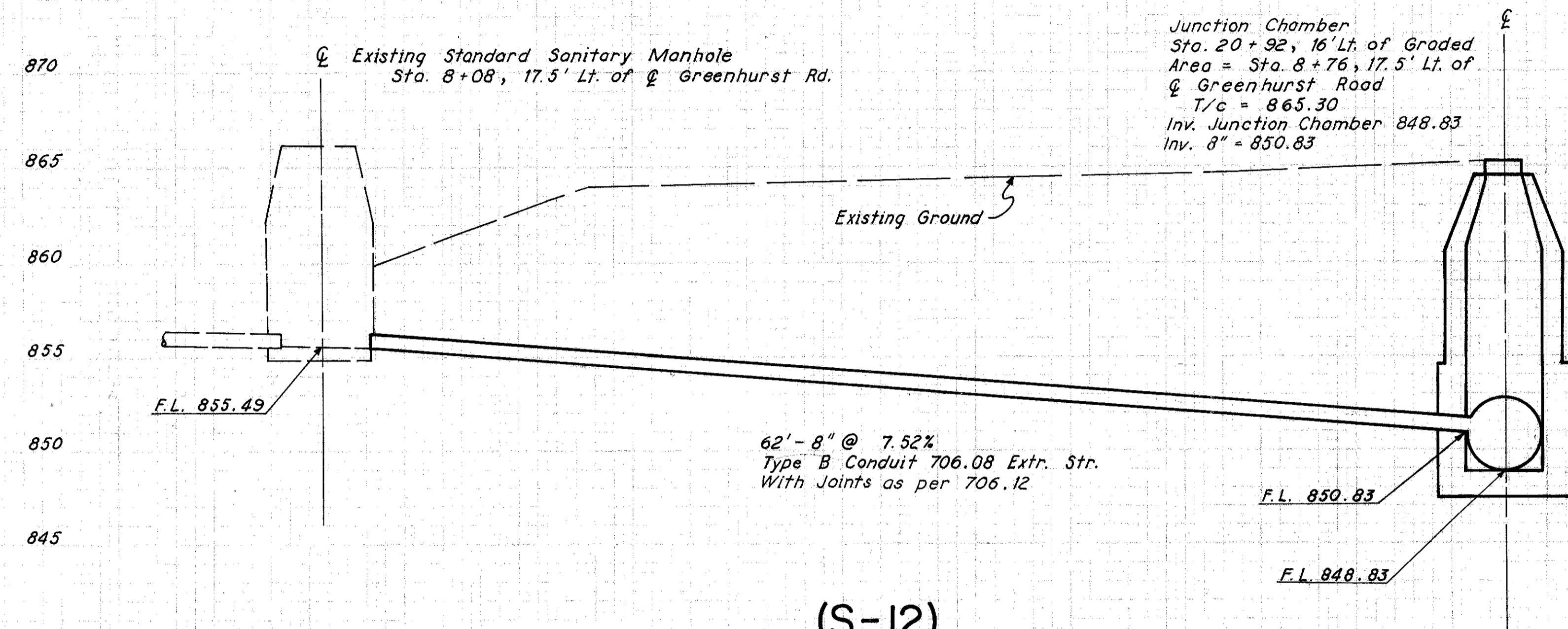
S-2

Scale: 1" = 50' Horizontal
1" = 5' Vertical

FHWA REGION	STATE	PROJECT	
2	OHIO		

120A
390

CUYAHOGA COUNTY
CUY 480-21.40



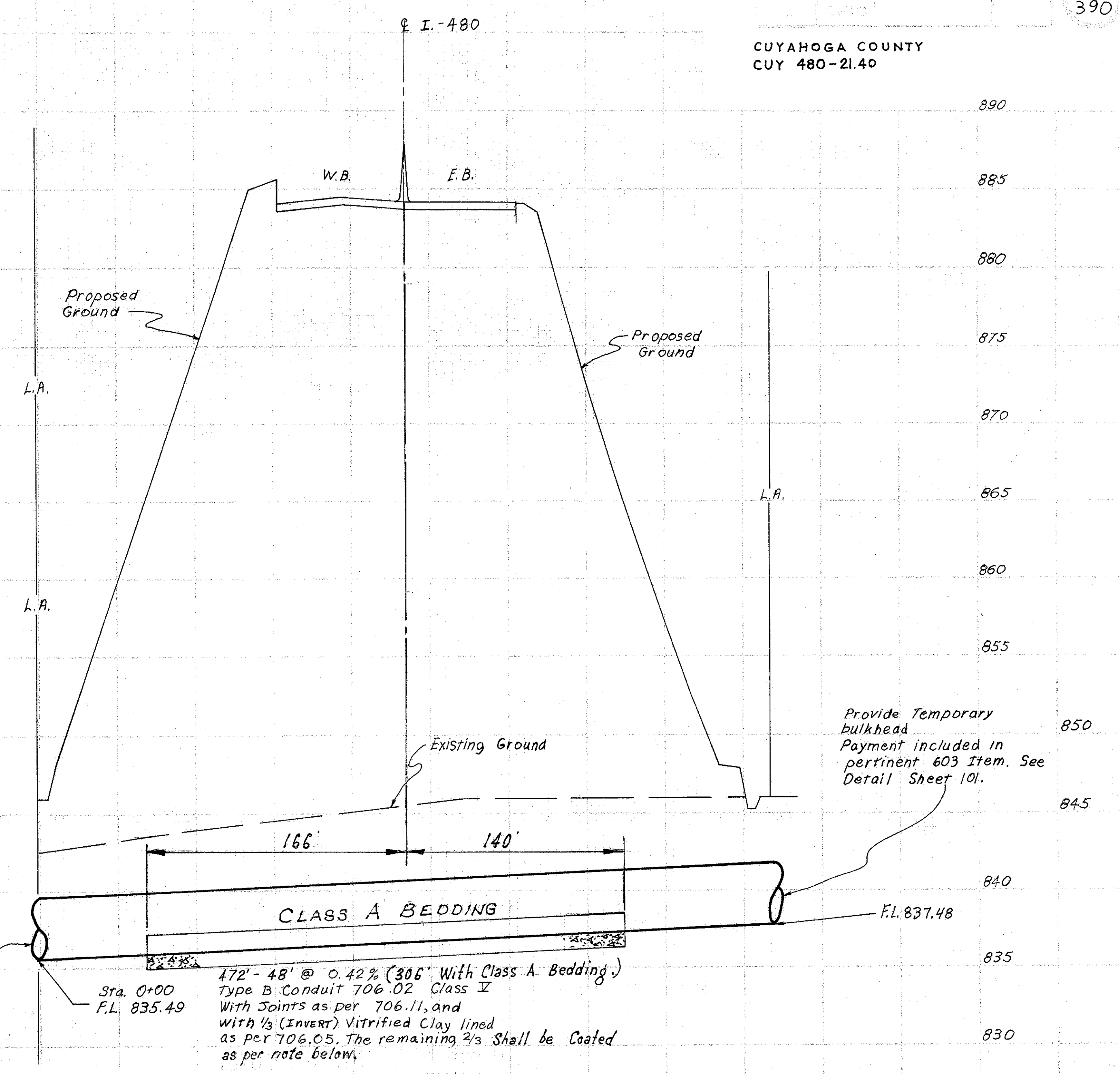
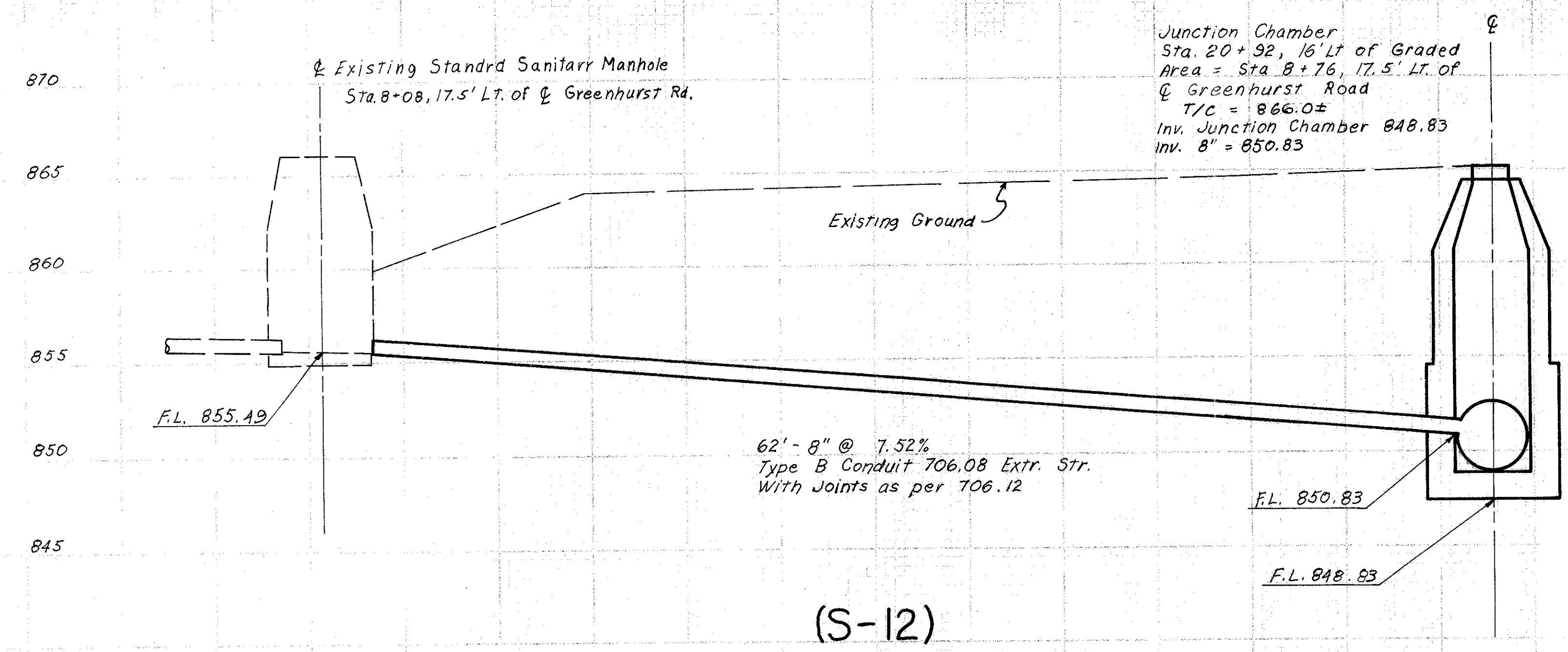
Scale
Horizontal 1" = 5'
Vertical 1" = 5'

Scale
Horizontal 1" = 50'
Vertical 1" = 5'

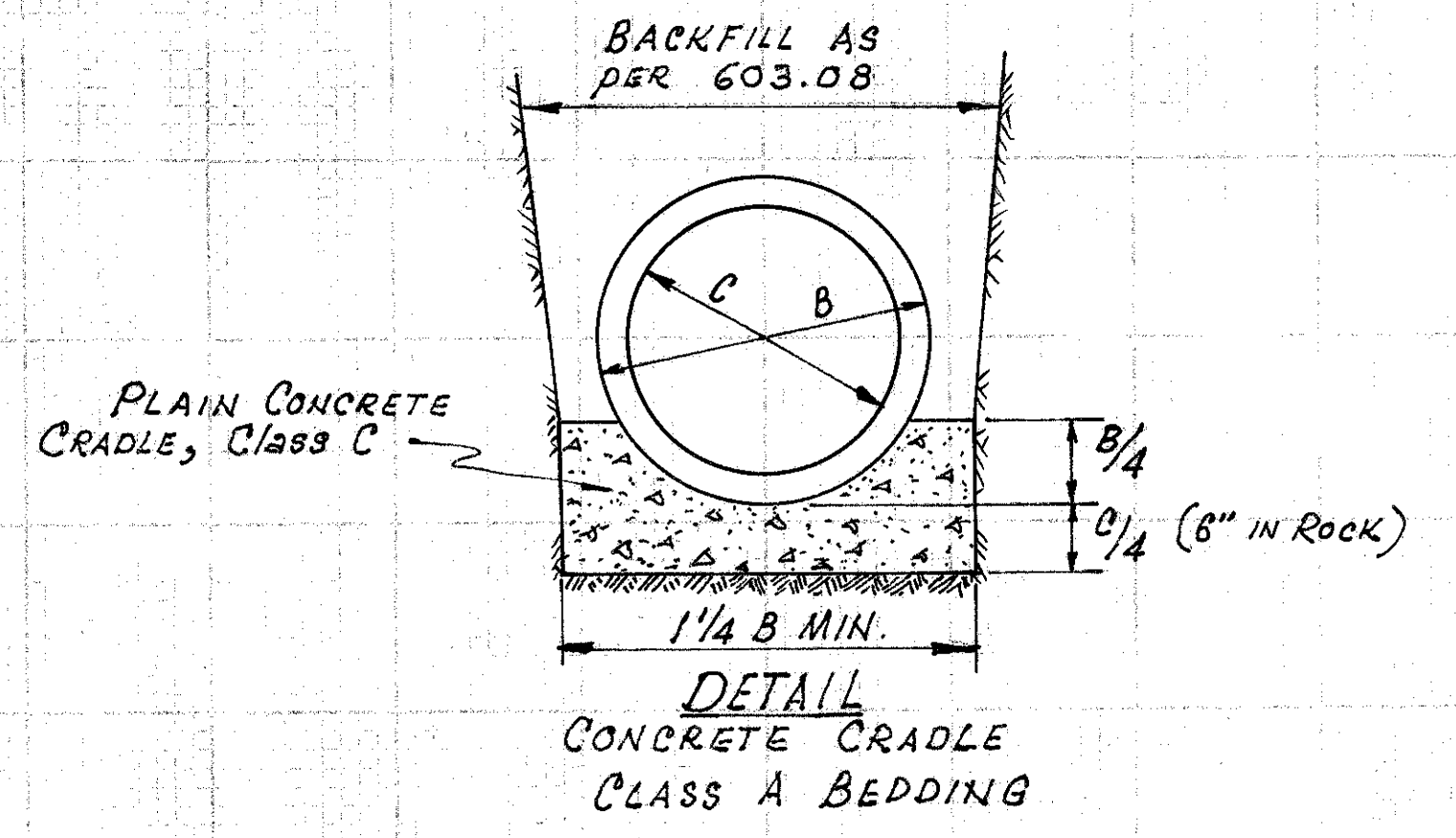
9-26-71
9-28-71
10-4-71

DESIGNED BY
CHECKED BY
DATE
SCALE

ORIGINAL SURVEY PLATS
NOTE BOOK AREAS CHECKED



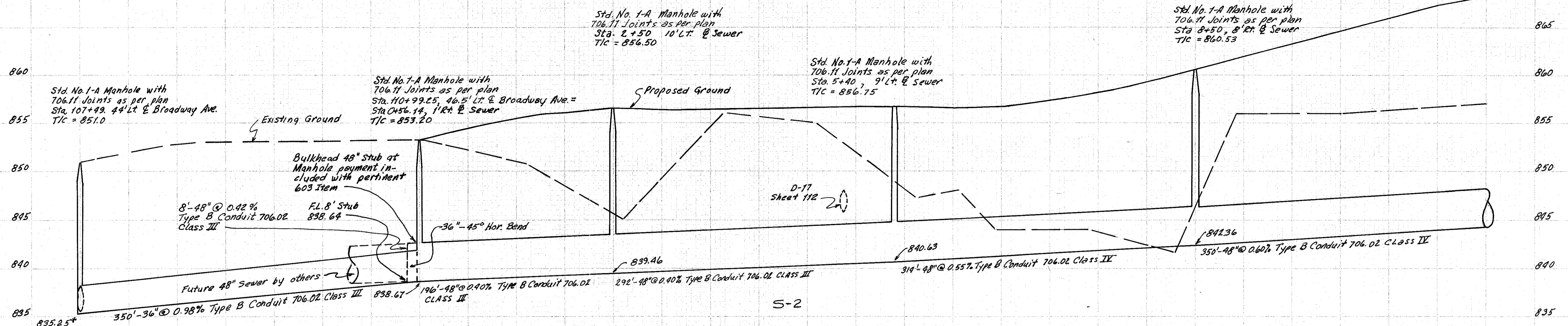
Scale
 Horizontal 1" = 5'
 Vertical 1" = 5'



NOTE: Coating Concrete Pipe for Sanitary Sewers:
 Pipe shall be coated inside with Two (2) Coats of Coal
 Tar Pitch Paint at a rate of not more than 180 Square
 Feet per Gallon per Coat. Waterproofing Material shall
 consist of "INTERTOL STANDARD THICK", "KAPPERS SUPER
 SERVICE", "PITT.-CHEM 103" or an Approved Equal.
 Payment to be included in Pertinent 603 ITEM.

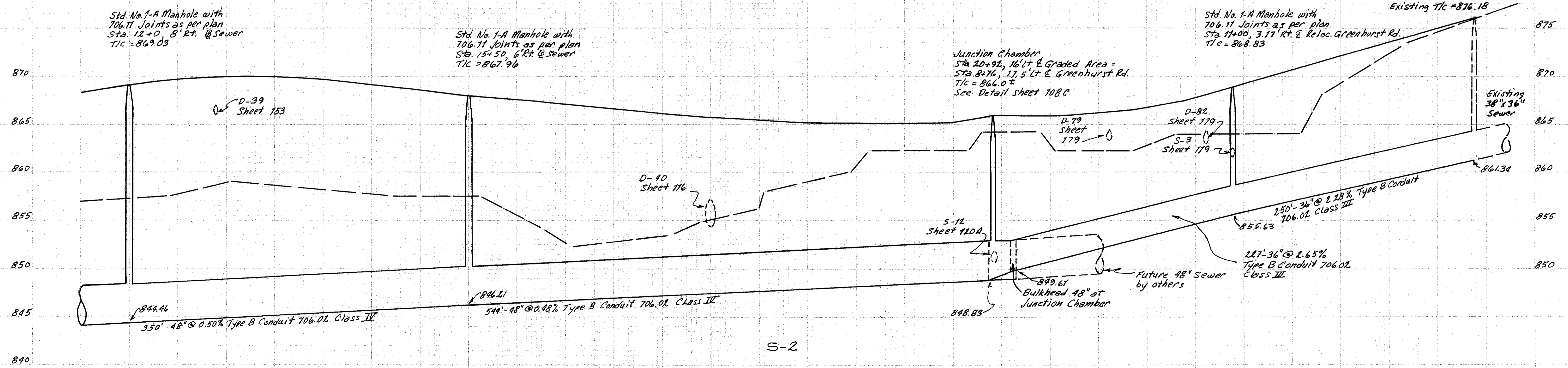
Scale
 Horizontal 1" = 50'
 Vertical 1" = 5'

THIS SHEET SUPERSEDES
 SHEET No. 120A
 SEE SHEET 85A FOR
 REVISED ALIGNMENT.
 Rev. 6-3-74



NOTE: The 36" and 48" pipes shall have joints as per 706.11, and 1/3 (invert) vitrified clay lined as per 706.05. The remaining 2/3 shall be coated as per Coating Note on Sheet No. 120 B.

* Verify in field and adjust grade as required



Scale: 1" = 50' Horizontal
1" = 5' Vertical

Note:
This sheet supersedes Sheet No. 120 Rev. 5-91-74

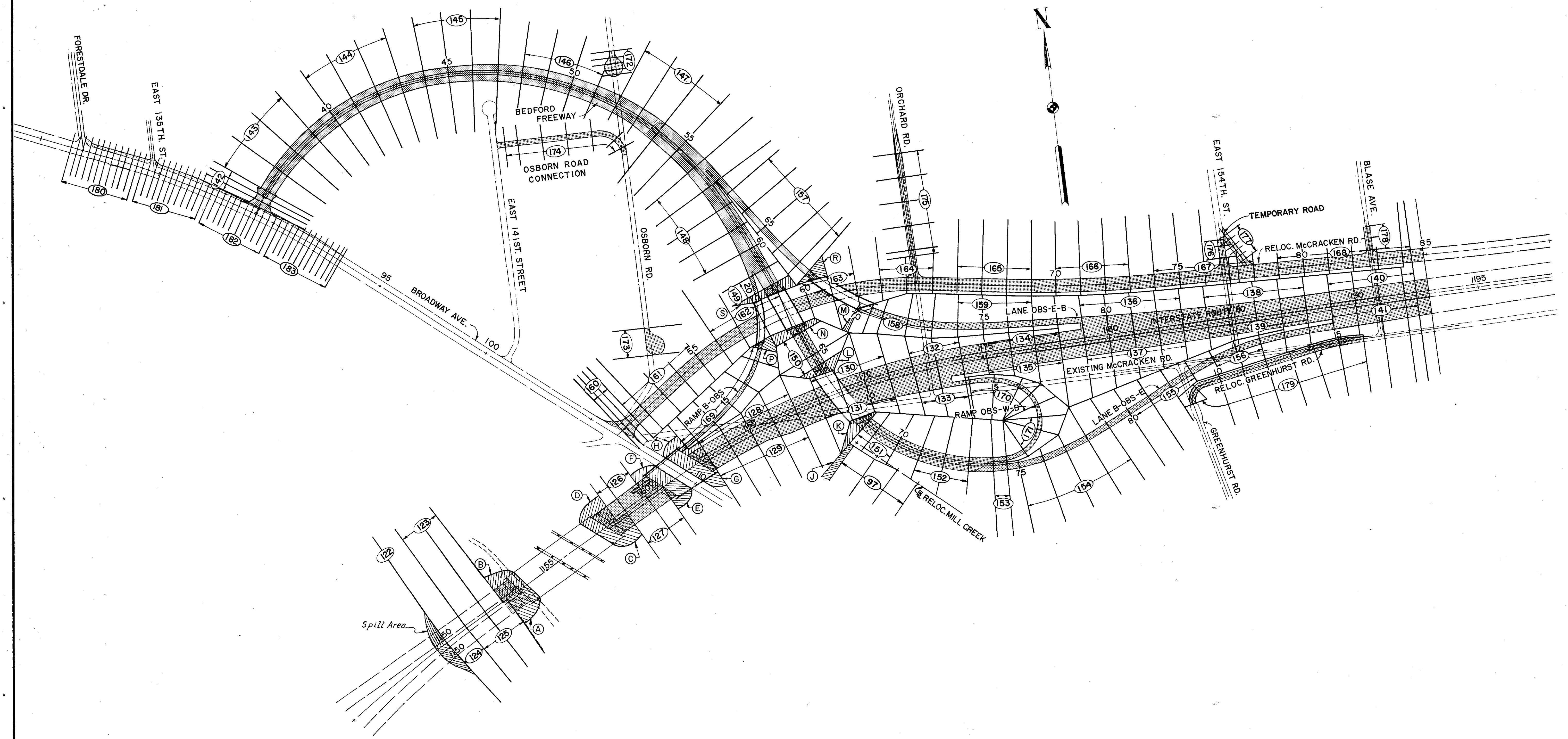
9-7

U-6

CROSS SECTION LAYOUT SHEET

FED. RD. DIVISION	STATE	PROJECT	121 390
2	OHIO		

CUYAHOGA COUNTY
CUY. 480-21.40



SCALE 1" = 200'
 MADE I.E.N. DATE 5-4-67
 TRCD. R.D. DATE 6-6-67
 CKD. R.H.A. DATE 9-67

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

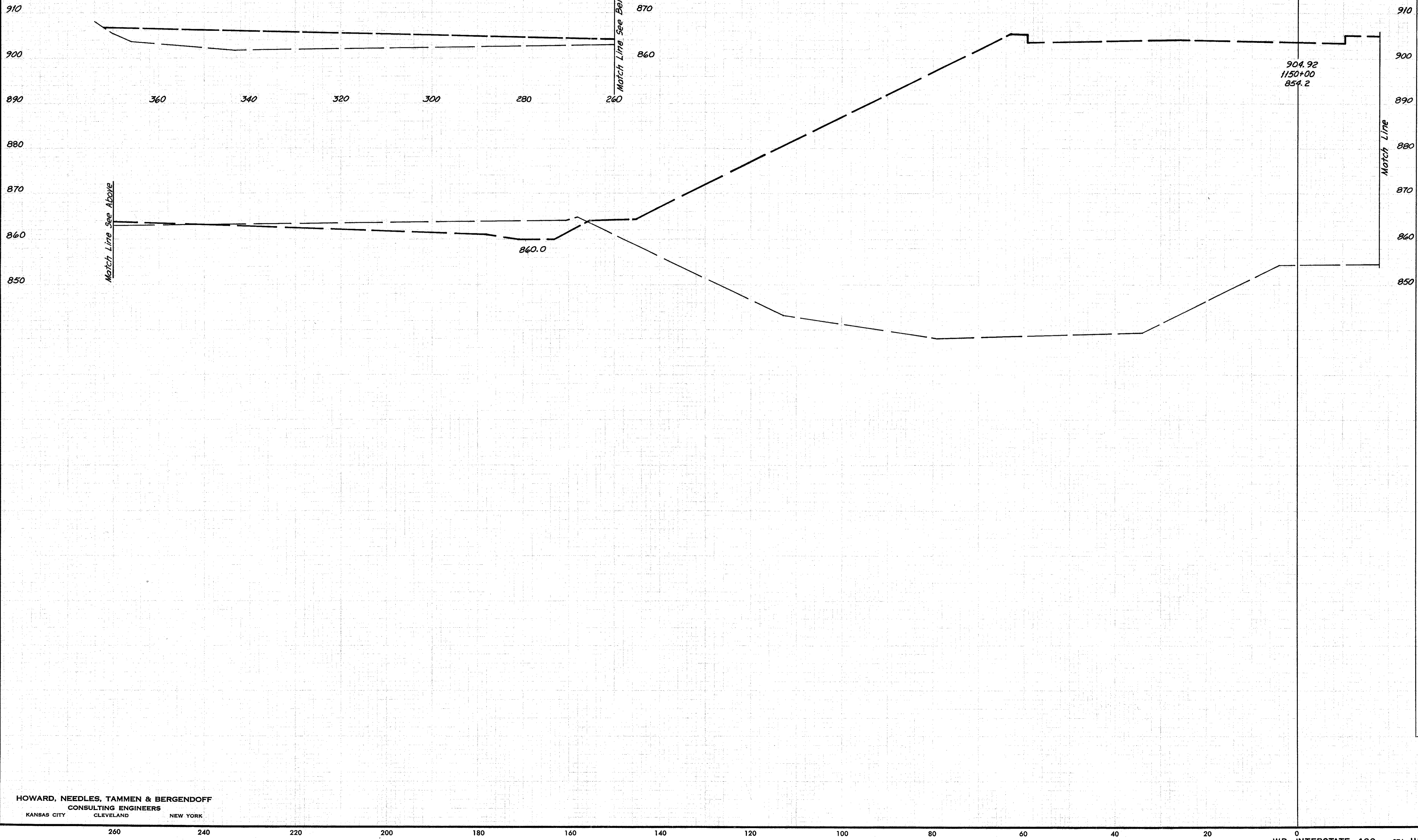
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

122
390

CUYAHOGA COUNTY
CUY-480-21.40

EARTHWORK

END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.



Match Line See Above

Match Line See Below

Match Line

360 340 320 300 280 260

860.0

904.92
1150+00
854.2

3-30-71
3-30-71
3-30-71
3-30-71
K.M.C.
K.A.M.
K.M.C.

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

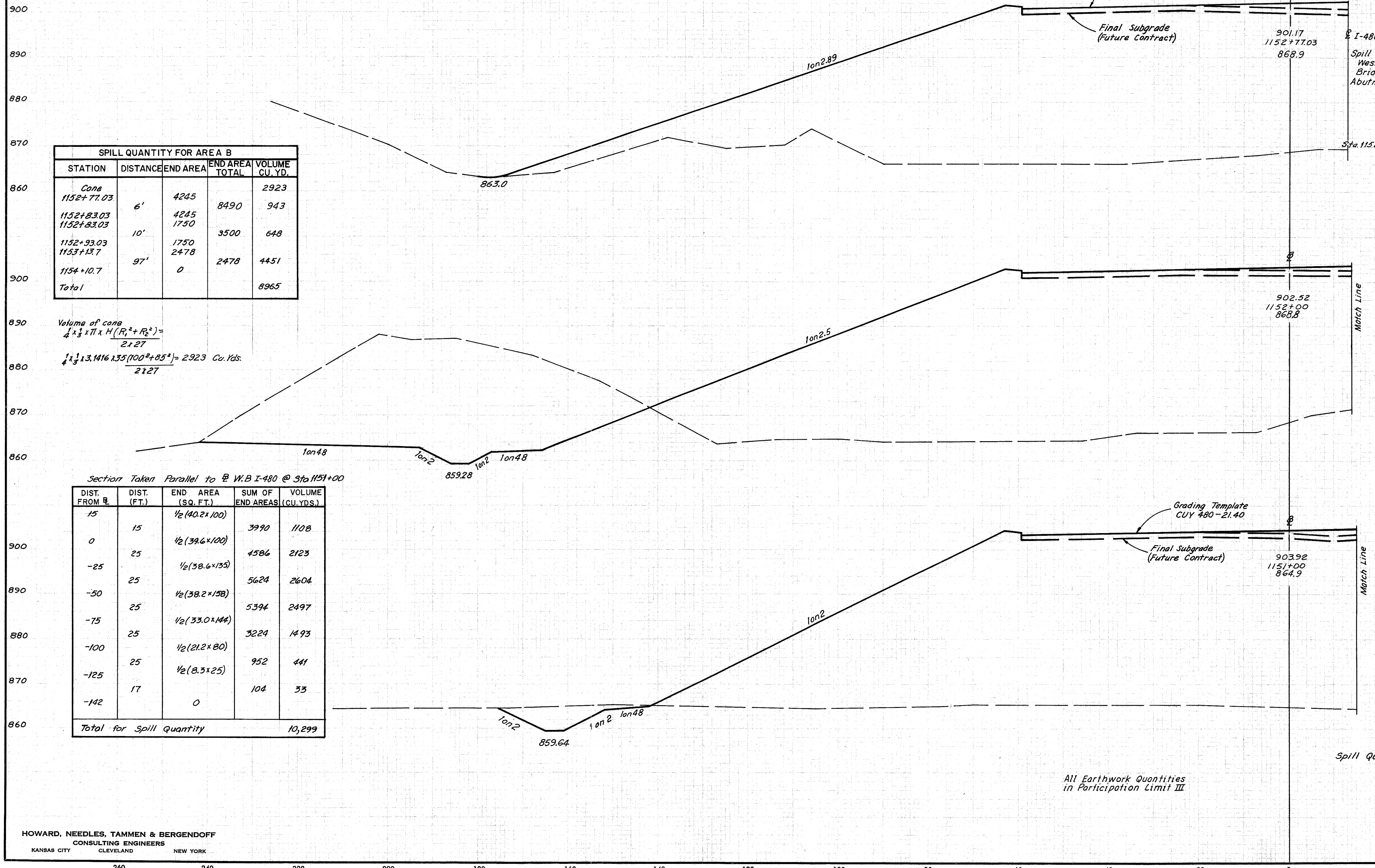
WB INTERSTATE 480 STA. 1150+00 LEFT HALF TO STA.

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

123
390

CUYAHOGA COUNTY
 CUY 480-21.40



STATION	DISTANCE	END AREA	END AREA TOTAL	VOLUME CU. YD.
Cone				2923
1152+77.03	6'	4245	8490	943
1152+83.03		4245	1750	
1152+83.03	10'	1750	3500	648
1152+93.03		1750	2478	
1153+13.7	97'	0	2478	4451
1154+10.7				
Total				8965

Volume of cone
 $\frac{1}{4} \times \frac{3}{2} \times \pi \times H (R_1^2 + R_2^2) = \frac{2 \times 27}{2 \times 27}$
 $\frac{1}{4} \times \frac{3}{2} \times 3.1416 \times 135 (100^2 + 85^2) = 2923 \text{ Cu. Yds.}$

Section Taken Parallel to W.B I-480 @ Sta 1151+00

DIST. FROM R	DIST. (FT.)	END AREA (SQ. FT.)	SUM OF END AREAS (CU. YDS.)	VOLUME (CU. YDS.)
15	15	1/2 (40.2 x 100)	3990	1108
0	25	1/2 (39.6 x 100)	4586	2123
-25	25	1/2 (38.6 x 135)	5624	2604
-50	25	1/2 (38.2 x 138)	5394	2497
-75	25	1/2 (33.0 x 144)	3224	1493
-100	25	1/2 (21.2 x 80)	952	441
-125	17	1/2 (8.3 x 25)	104	33
-142		0		
Total for Spill Quantity				10,299

END	EARTHWORK		VOLUME
	EXC.	EMB.	
880			0 8965
860	0	4245	2352 12559
890			1649 4559
860			3209 16869
890	84	4550	
860			21 10,299

All Earthwork Quantities in Participation Limit III

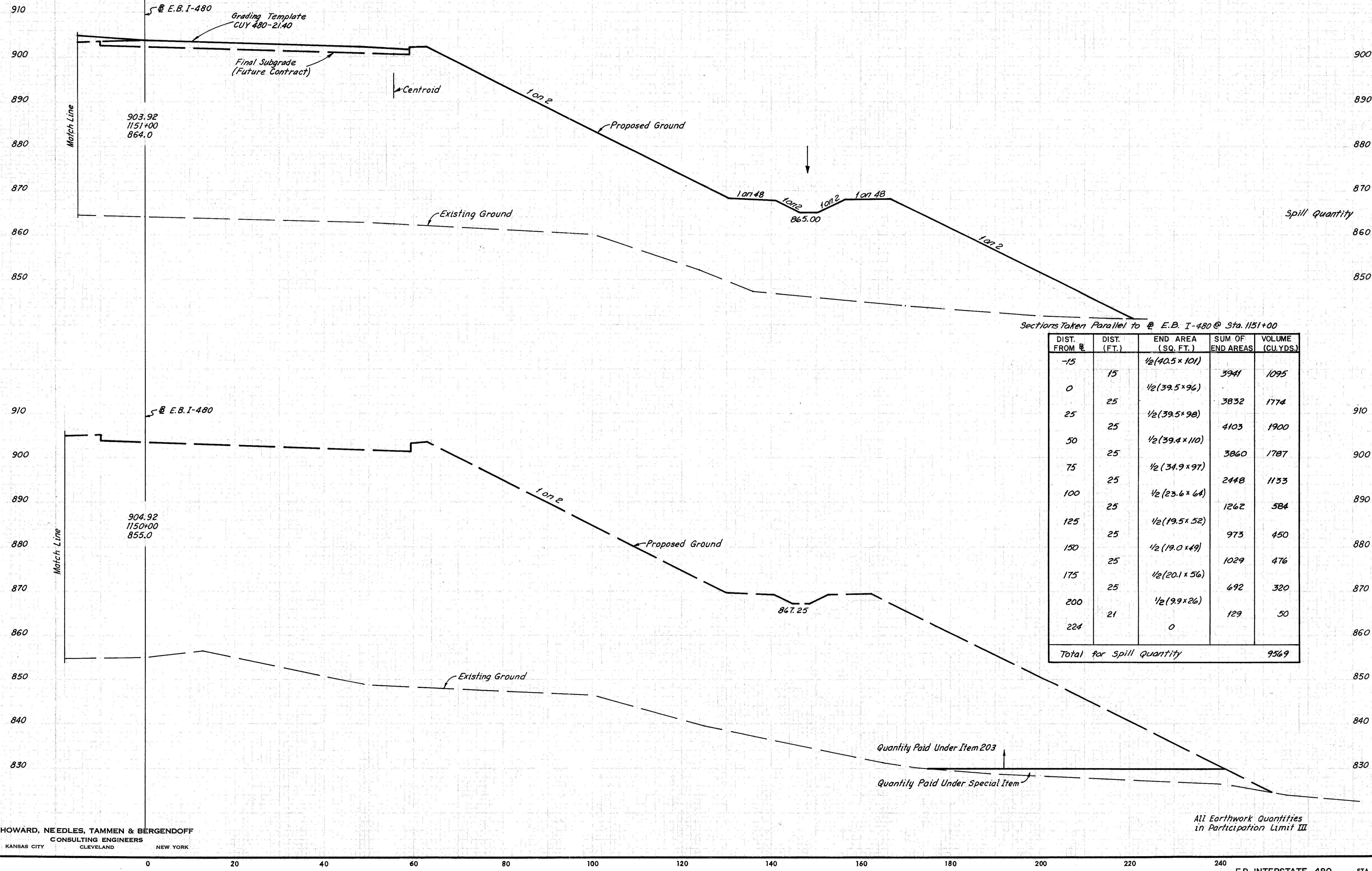
330.69
330.70
330.72
L.M.C.
K.A.M.

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

124
390

CUYAHOGA COUNTY
 CUY-480-21.40



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
0	6634		
		0	9569

Sections Taken Parallel to E.B. I-480 @ Sta. 1151+00

DIST. FROM #	DIST. (FT.)	END AREA (SQ. FT.)	SUM OF END AREAS	VOLUME (CU. YDS.)
-15	15	1/2(40.5 x 101)	3941	1095
0	25	1/2(39.5 x 96)	3832	1774
25	25	1/2(39.5 x 98)	4103	1900
50	25	1/2(39.4 x 110)	3860	1787
75	25	1/2(34.9 x 97)	2448	1133
100	25	1/2(23.6 x 64)	1262	584
125	25	1/2(19.5 x 52)	973	450
150	25	1/2(19.0 x 49)	1029	476
175	25	1/2(20.1 x 56)	692	320
200	21	1/2(9.9 x 26)	129	50
224		0		
Total for Spill Quantity				9569

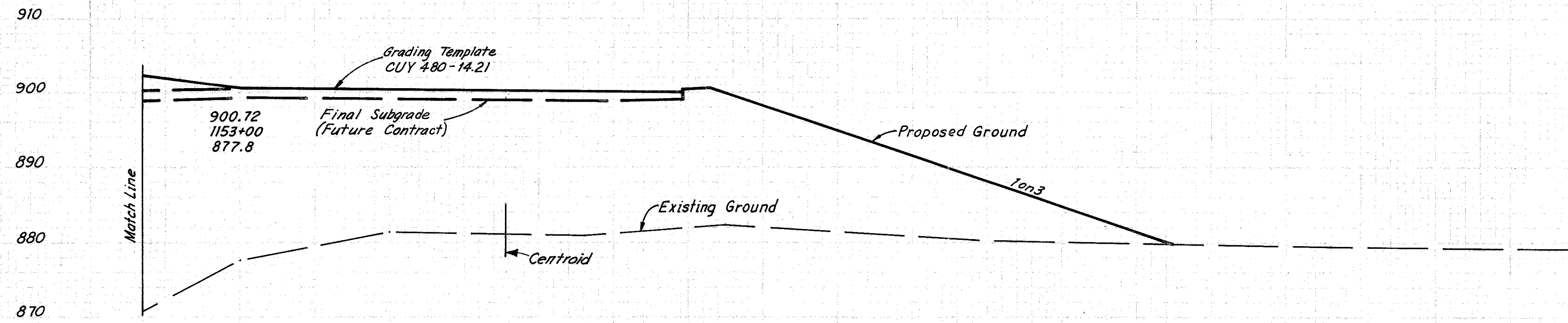
J.M.C.
4-3-70
J.E.M.
6-72

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

125
390

CUYAHOGA COUNTY
 CUY-480-21.40

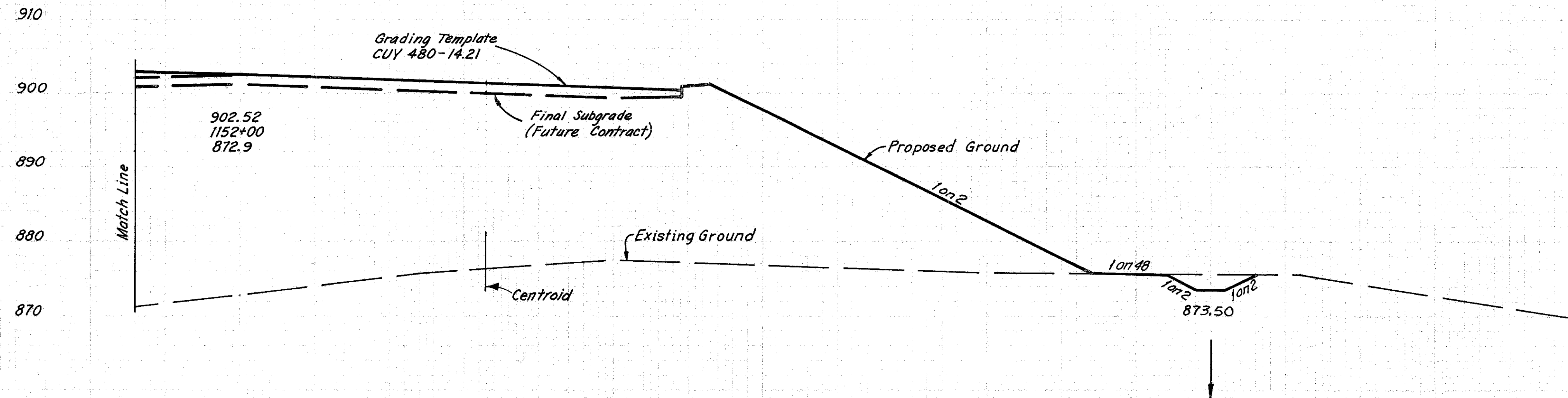


Station	Distance	End Area	End Area Total	Volume Cu. Yds.
1153+00		2152	4304	1196
1153+15	15	2152	4304	1196
1153+85	70	0	1514	1963
Total				4018

Volume of Cone:
 $\frac{1}{4} \times \frac{1}{3} \times \pi \times \frac{(65^2 + 75^2)}{2} \times 18 = 859 \text{ Cu. Yds.}$

Spill Quantity West End
 Bridge Abutment

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
			4018
			28 8838
			27 16995
			6634



$(3906.5 - 34.4) 100 = 99.1'$
3906.5

$(3906.5 - 49.0) 100 = 98.7'$
3906.5

All Earthwork Quantities
 in Participation Limit III

Sta. 1151+00

J.M.C.
 J.E.N.
 3/4 68
 3/9 70
 6-72

Quantity Calculations
 Made By JEM Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT	126 390
2	OHIO		

CUYAHOGA COUNTY
 CUY 480-21.40

SPILL QUANTITY FOR AREA "F"

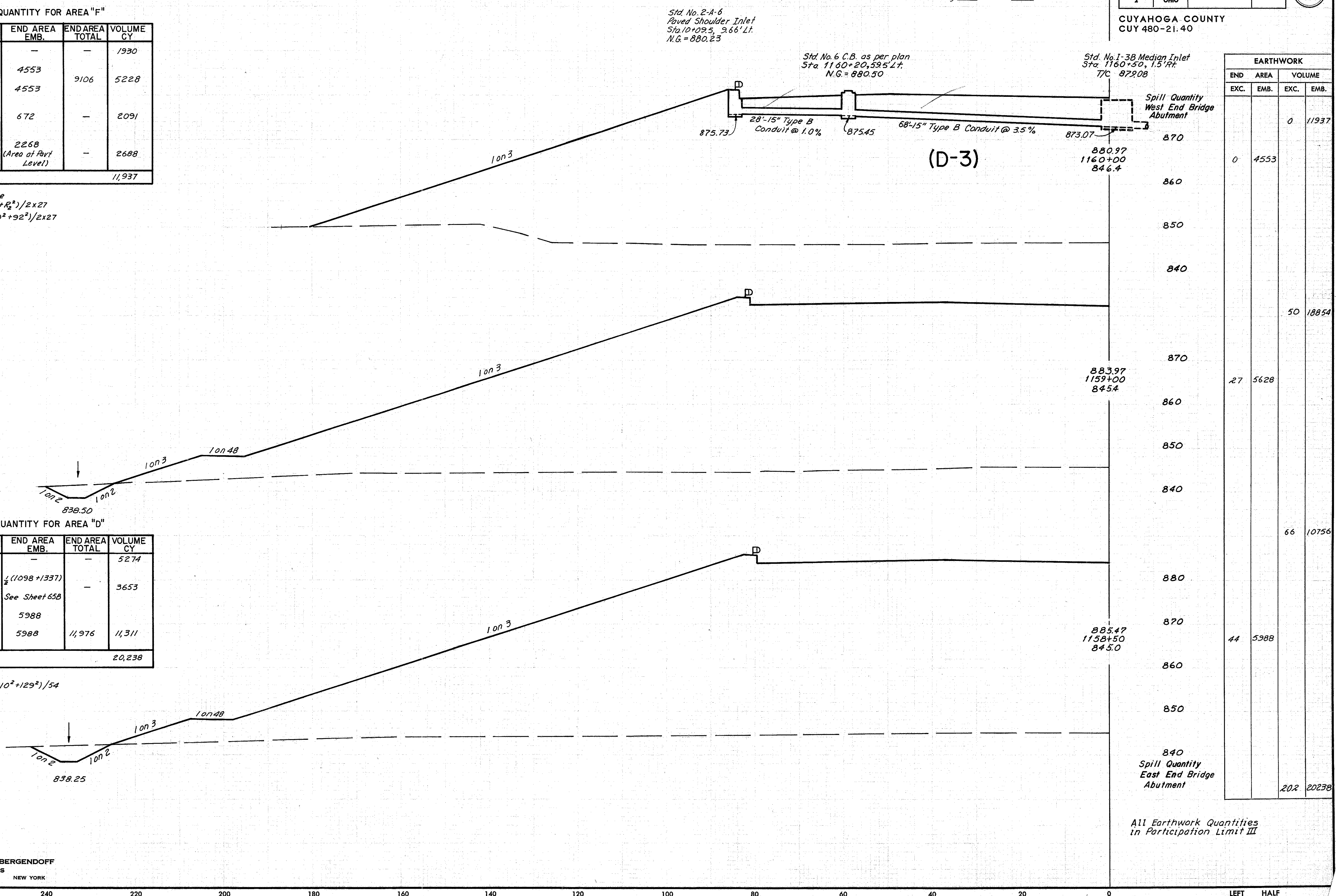
STA.	DIST.	END AREA EMB.	END AREA TOTAL	VOLUME CY
Cone	-	-	-	1930
1160+00	31	4553	9106	5228
1160+31		4553		
1160+57 (84' Wide)	47	672	-	2091
1161+04				
1160+31	32' (Ave. Ht.)	2268 (Area at Part Level)	-	2688
1160+74				
Total				11,937

Volume of Cone
 $V = \frac{1}{4} \times \frac{1}{3} \times \pi \times H (R_1^2 + R_2^2) / 2 \times 27$
 $= \frac{1}{4} \times \frac{1}{3} \times \pi \times 33 (60^2 + 92^2) / 2 \times 27$
 $= 1929.86$

SPILL QUANTITY FOR AREA "D"

STA.	DIST.	END AREA EMB.	END AREA TOTAL	VOLUME CY
Cone	-	-	-	5274
1157+26 (81' Wide)	73	$\frac{1}{2} (1098 + 1337)$	-	3653
1157+99		See Sheet 65B		
1157+99	51	5988		
1158+50		5988	11,976	11,311
Total				20,238

Volume of Cone
 $V = \frac{1}{4} \times \frac{1}{3} \times \pi \times 40.5 (110^2 + 129^2) / 54$
 $= 5274.34$



EARTHWORK			
END STA.	AREA EMB.	VOLUME	
		EXC.	EMB.
870		0	11937
860	4553	0	
850			
840			
870			50
860	5628	27	
850			
840			
880			66
870	5988	44	
860			
850			
840			
840		202	20238

All Earthwork Quantities in Participation Limit III

J.M.C.
 J.E.M.
 3848
 3848
 6-70
 6-72

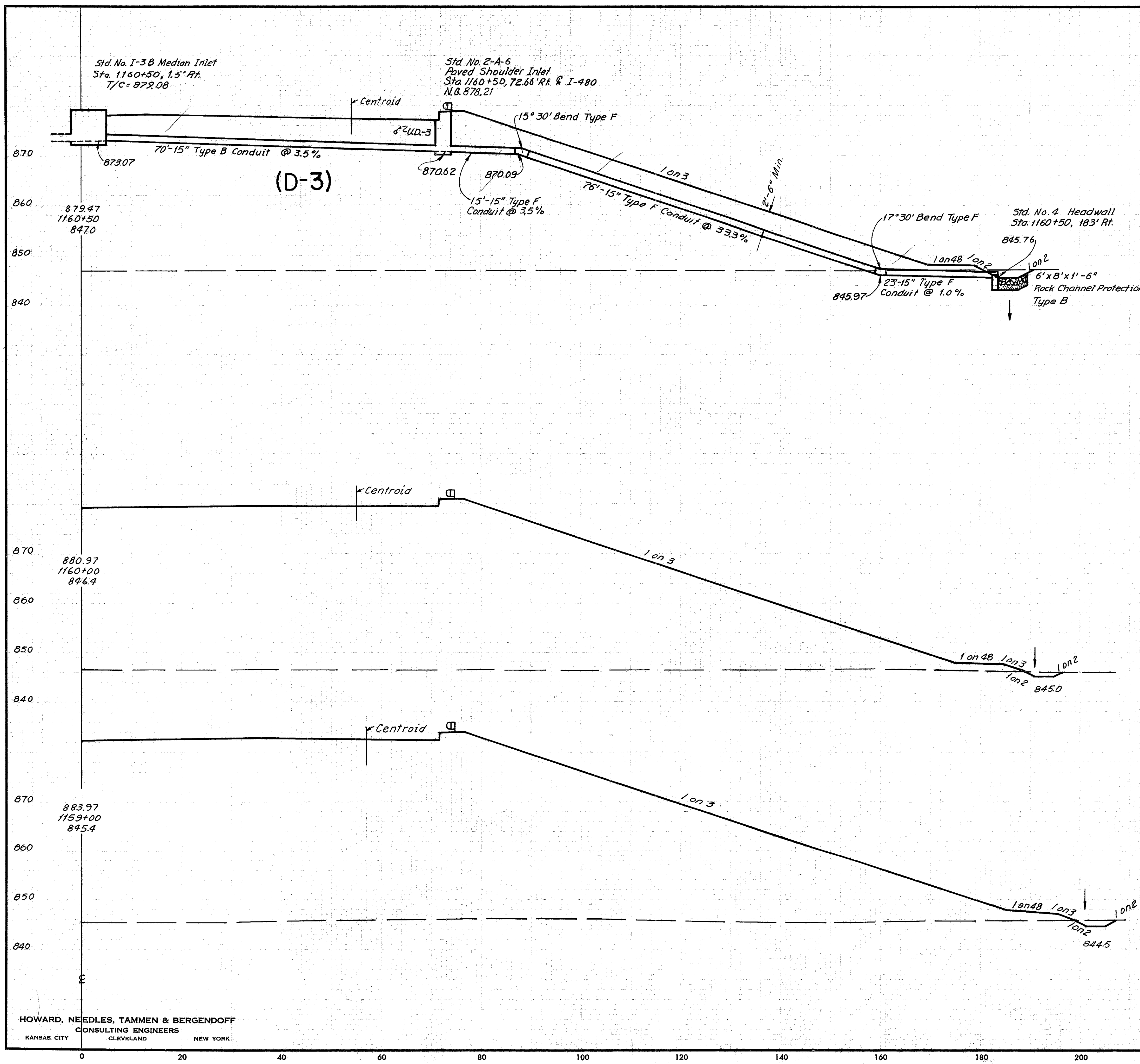
Quantity Calculations
 Made By JEN Date 6-72
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

127
390

CUYAHOGA COUNTY
 CUY 480 - 21.40

B.67
 9.67
 6-72
 CPW
 W.L.L.
 J.E.N.
 I.M.



SPILL QUANTITY FOR AREA "E"

STA.	DIST.	END AREA EMB.	END AREA TOTAL	VOLUME CY
Cone	-	-	-	1878
1160+50	40	3902	7804	5781
1160+90		3902		
1160+90	(76' Wide)	672	-	1892
1161+30	40			
Total				9,556

Volume of Cone

$$= \frac{1}{4} \times \frac{1}{3} \times \pi \times H \times (R_1^2 + R_2^2) / 2 \times 27$$

$$= \frac{1}{4} \times \frac{1}{3} \times \pi \times 31 \times (62^2 + 93^2) / 2 \times 27$$

$$= 1878$$

SPILL QUANTITY FOR AREA "C"

STA.	DIST.	END AREA EMB.	END AREA TOTAL	VOLUME CY
Cone	-	-	-	4917
1158+16	(76' Wide)	$\frac{1}{2}(1098 + 1337)$ See Sheet 65B	2435	3427
1158+16	39'	$\frac{1}{2} \times 76 \times (20 + 50.5)$ Area at Perv Level	-	3870
1158+66.5	(Ave. Ht.)	5047	10,094	6262
1159+00	33.5'	5047		
Total				18,476

Volume of Cone

$$V = \frac{1}{4} \times \frac{1}{3} \times \pi \times H \times (R_1^2 + R_2^2) / 2 \times 27$$

$$= \frac{1}{4} \times \frac{1}{3} \times \pi \times 39.0 \times (111^2 + 117^2) / 2 \times 27 = 4917.29$$

END STA.	AREA		VOLUME	
	EXC.	EMB.	EXC.	EMB.
870				
860			0	9556
850				
840				
870	6	4322		
860				
850				
840			30	17350
870				
860				
850				
840				
870	10	5047		
860				
850				
840			54	18,476

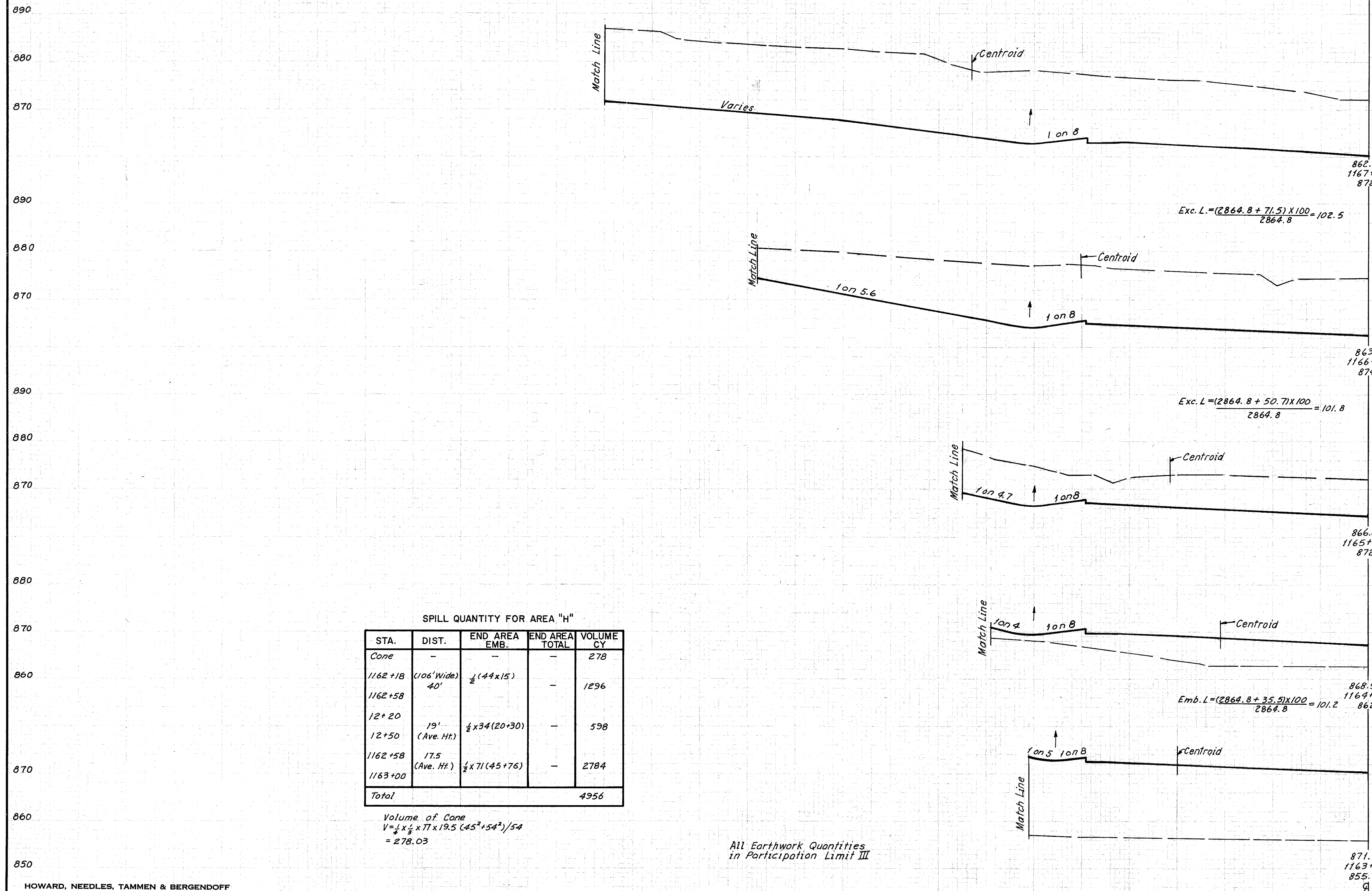
All Earthwork Quantities
 in Participation Limit III

Quantity Calculations
 Made By JEN Date 6-70
 Checked By J.M. Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

128
390

CUYAHOGA COUNTY
 CUY 480-21.40



SPILL QUANTITY FOR AREA "H"

STA.	DIST.	END AREA EMB.	END AREA TOTAL	VOLUME CY
Cone	-	-	-	278
1162+18	(106' Wide)	$\frac{1}{2}(44 \times 15)$	-	1296
1162+58	40'	-	-	-
12+20	19' (Ave. Ht.)	$\frac{1}{2} \times 34(20+30)$	-	598
1162+58	17.5 (Ave. Ht.)	$\frac{1}{2} \times 71(45+76)$	-	2784
1163+00				
Total				4956

Volume of Cone
 $V = \frac{1}{4} \times \frac{1}{3} \times \pi \times 19.5(45^2 + 54^2) / 54$
 = 278.03

All Earthwork Quantities
 in Participation Limit III

END STA.	EARTHWORK			
	AREA		VOLUME	
	EXC.	EMB.	EXC.	EMB.
1167+00	2255	0		
1166+00			6919	0
1166+00	1390	0		
1166+00			3765	0
1165+00	607	0		
1165+00			787	0
Sta. 1164+30	0	0		
1164+00			0	187
1164+00	0	337		
1164+00			0	2682
1163+00	0	1094		
1163+00			0	4956

Spill Quantity
 East Abutment

8-67
9-67
6-72
R.F.T.
W.L.L.
J.E.H.
J.M.

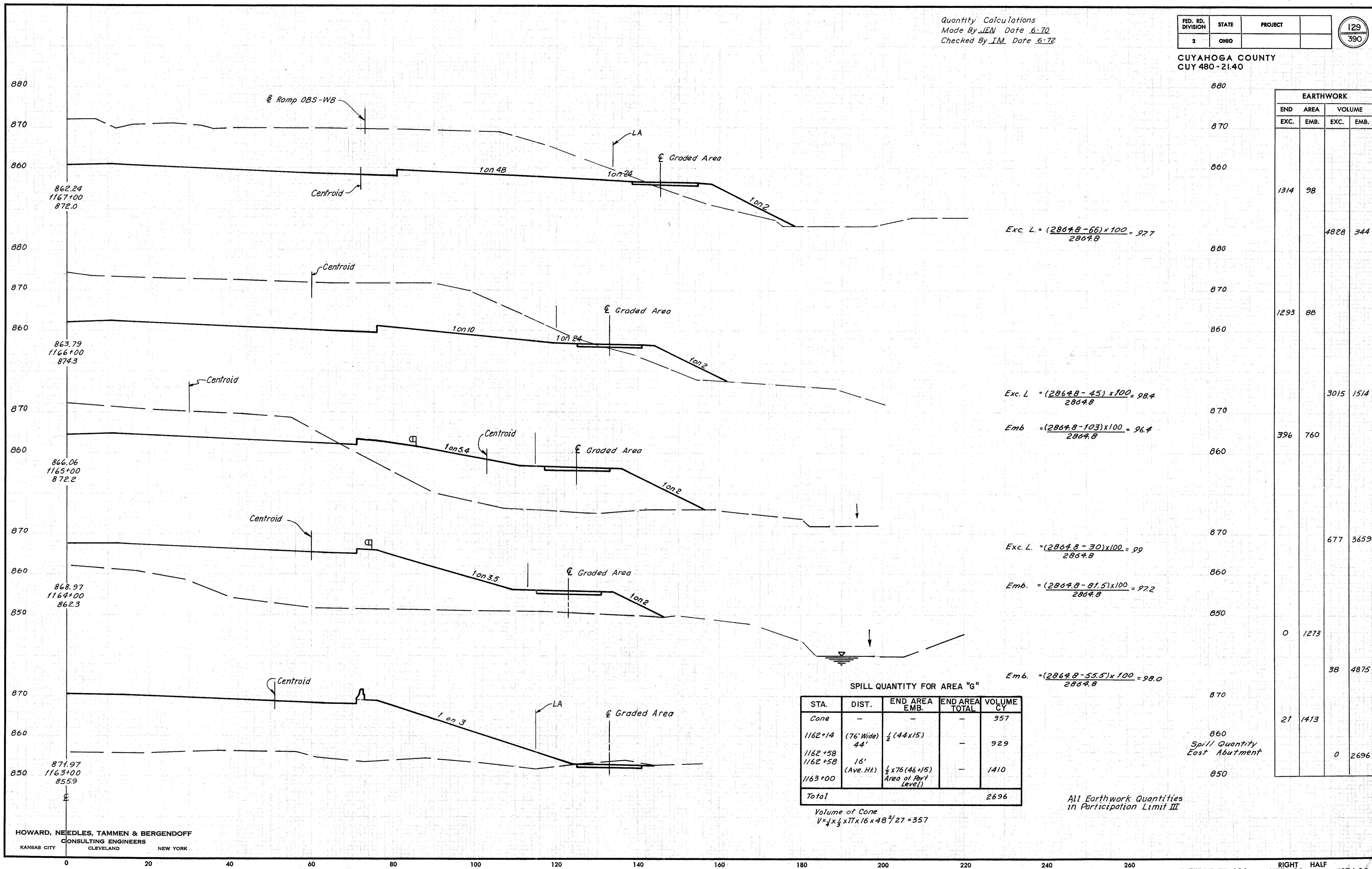
Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

129
390

CUYAHOGA COUNTY
 CUY 480-21.40

8-67
 9-67
 6-70
 6-72
 CPW
 WLL
 JEN
 IM



$$\text{Exc. L.} = \frac{(2864.8 - 66) \times 100}{2864.8} = 97.7$$

$$\text{Exc. L.} = \frac{(2864.8 - 45) \times 100}{2864.8} = 98.4$$

$$\text{Emb.} = \frac{(2864.8 - 103) \times 100}{2864.8} = 96.4$$

$$\text{Exc. L.} = \frac{(2864.8 - 30) \times 100}{2864.8} = 99$$

$$\text{Emb.} = \frac{(2864.8 - 81.5) \times 100}{2864.8} = 97.2$$

$$\text{Emb.} = \frac{(2864.8 - 55.5) \times 100}{2864.8} = 98.0$$

SPILL QUANTITY FOR AREA "G"

STA.	DIST.	END AREA EMB.	END AREA TOTAL	VOLUME CY
Cone	-	-	-	357
1162+14	(76' Wide) 44'	$\frac{1}{2}(44 \times 15)$	-	929
1162+58	16'	(Ave. Ht)	-	1410
1163+00		$\frac{1}{2} \times 76(46+15)$ Area of Part Level	-	
Total				2696

Volume of Cone
 $V = \frac{1}{3} \times \frac{1}{2} \times \pi \times 16 \times 48^2 / 27 = 357$

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
1314	98		
		4828	344
1293	88		
		3015	1514
396	760		
		677	3659
0	1273		
		38	4875
21	1473		
		0	2696

All Earthwork Quantities
 in Participation Limit III

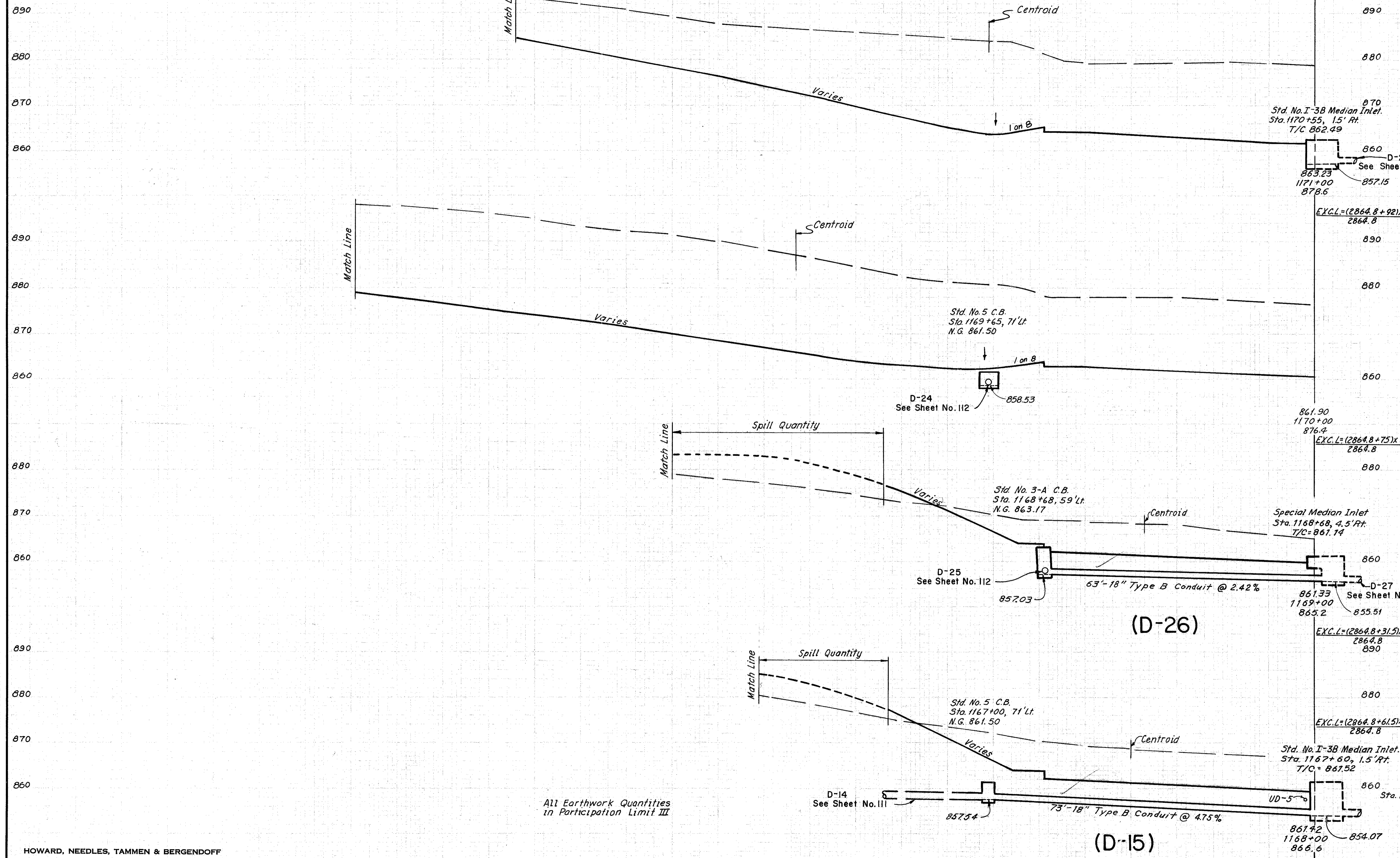
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

130
390

CUYAHOGA COUNTY
 CUY 480-21.40



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
		2599	0
		12516	0
		3950	0
		8396	28
		469	15
		1938	37
		566	5
		5334	9
		2255	0

All Earthwork Quantities
 in Participation Limit III

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

INTERSTATE 480 STA. 1168+00 LEFT HALF TO STA. 1171+00

8-67
 9-67
 6-72
 6-72
 R.F.T.
 W.L.L.
 J.E.N.
 I.M.

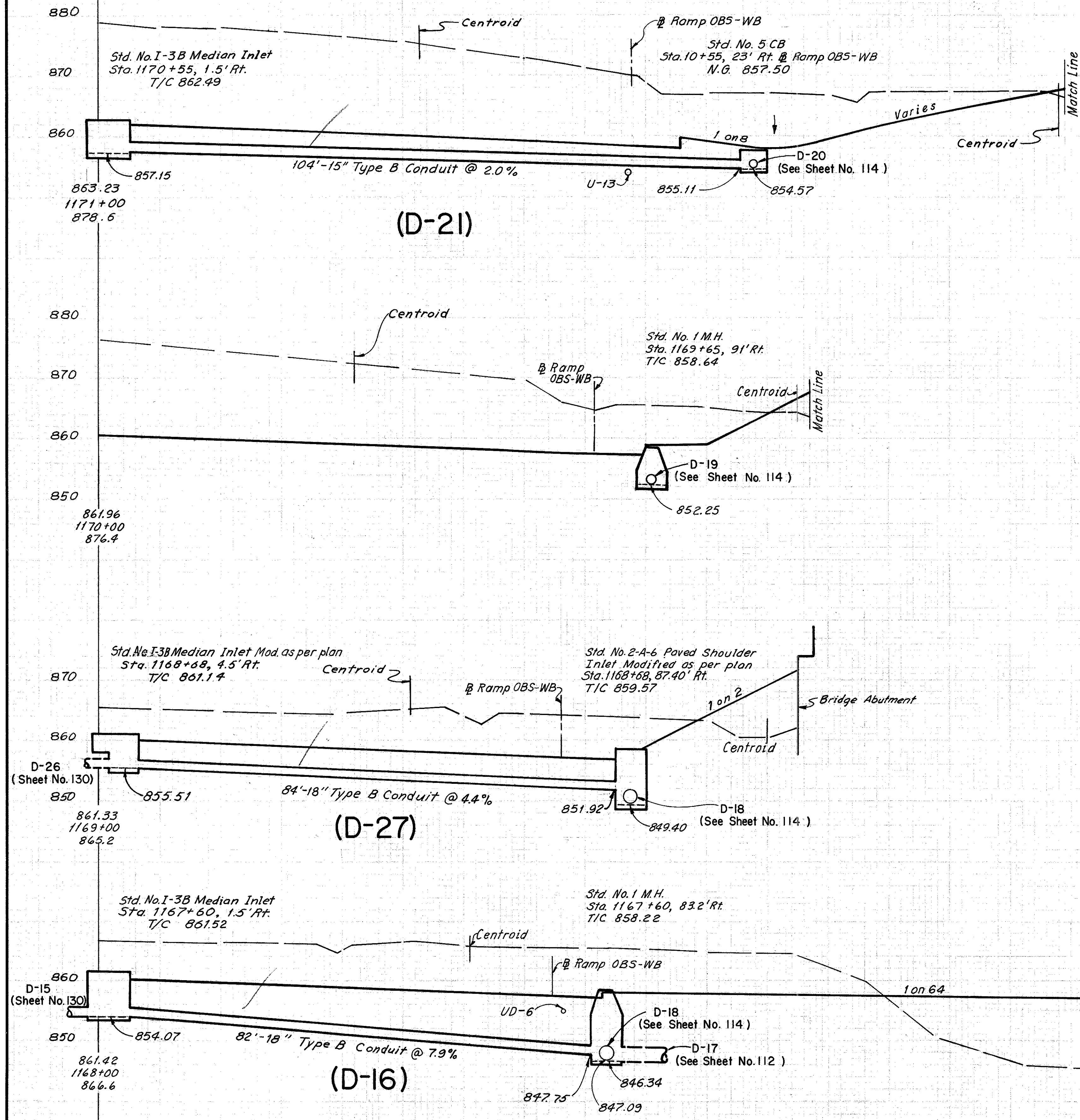
Quantity Calculations
 Made By JEM Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

131
390

CUYAHOGA COUNTY
 CUY 480-21.40

8-67
9-52
6-72
CPM
W.L.
J.E.M.
I.M.



880			
870			
860			
Exc. L. = $\frac{(2864.8 - 47.7) \times 100}{2864.8} = 98.3$			
Emb. L. = $\frac{(2864.8 - 139.5) \times 100}{2864.8} = 95.2$			
880			
870			
860			
850			
Exc. L. = $\frac{(2864.8 - 46.8) \times 100}{2864.8} = 98.4$			
Emb. L. = $\frac{(2864.8 - 113) \times 100}{2864.8} = 96.1$			
870			
860			
850			
Emb. = $\frac{(2864.8 - 121) \times 100}{2864.8} = 95.8$			
Exc. = $\frac{(2864.8 - 56) \times 100}{2864.8} = 98.0$			
860			
Exc. = $\frac{(2864.8 - 66.5) \times 100}{2864.8} = 97.7$			
850			

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
	1750	2	
		5436	21
	1236	10	
		3306	203
	578	104	
		2668	1771
	892	872	
		4353	1755
	1314	98	

All Earthwork Quantities
 in Participation Limit III

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

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

132
390

CUYAHOGA COUNTY
 CUY 480 - 21.40



$$Exc. L = \frac{(2864.8 + 49.5) \times 100}{2864.8} = 101.7$$

$$Exc. L = \frac{(2864.8 + 58) \times 100}{2864.8} = 102.0$$

$$Exc. L = \frac{2864.8 + 67.8}{2864.8} \times 100 = 102.4$$

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
671	0		
		3083	0
966	0		
		4601	0
1470	0		
		7716	0
Sta. 1171+00	2599	0	

All Earthwork Quantities
 in Participation Limit III

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

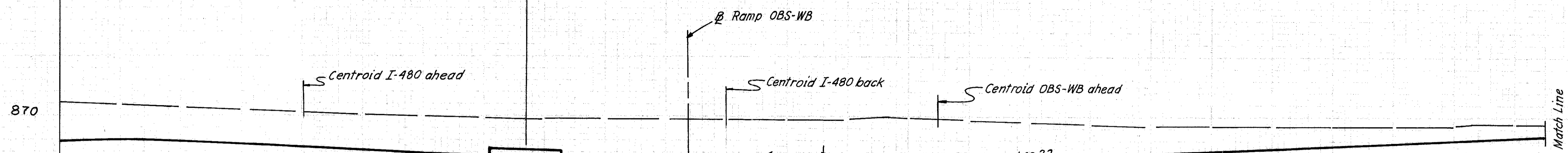
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

133
390

CUYAHOGA COUNTY
 CUY 480-21.40

Ahead to I-480 Ahead to Ramp OBS-WB
 Back to I-480 Back to I-480

8-67
 8-67
 6-70
 6-72
 H.D.
 P.H.
 J.E.N.
 I.M.

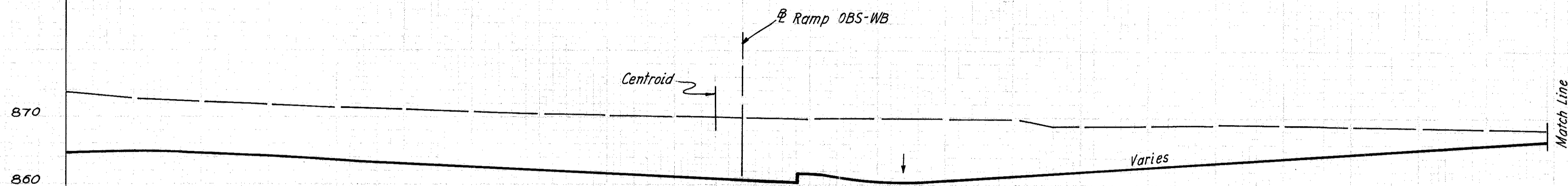


867.31
 1174+00
 872.1

870
 Sta. 1174+00 Ahead 449 0
 Sta. 1174+00 Back 1375 0
 860

$$Exc. L = \frac{(2864.8 - 103) \times 100}{2864.8} = 96.4$$

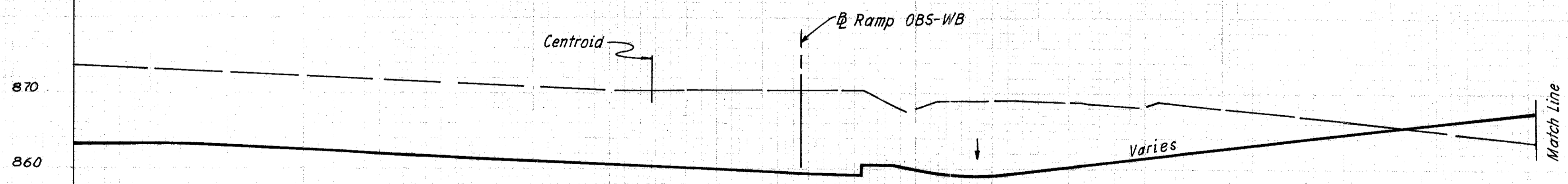
EARTHWORK			
END	AREA	VOLUME	
		EXC.	EMB.
870			
860			
		5257	0
870			
860			
	1570	0	
		5418	60
870			
860			
	1491	35	
		5870	64
	1750	2	



865.95
 1173+00
 873.3

$$Exc. L = \frac{(2864.8 - 85.8) \times 100}{2864.8} = 97.0$$

$$Emb. L = \frac{(2864.8 - 211) \times 100}{2864.8} = 92.6$$



864.59
 1172+00
 873.8

$$Exc. L = \frac{(2864.8 - 64.2) \times 100}{2864.8} = 97.8$$

$$Emb. L = \frac{(2864.8 - 172.7) \times 100}{2864.8} = 94.0$$

All Earthwork Quantities
 in Participation Limit III

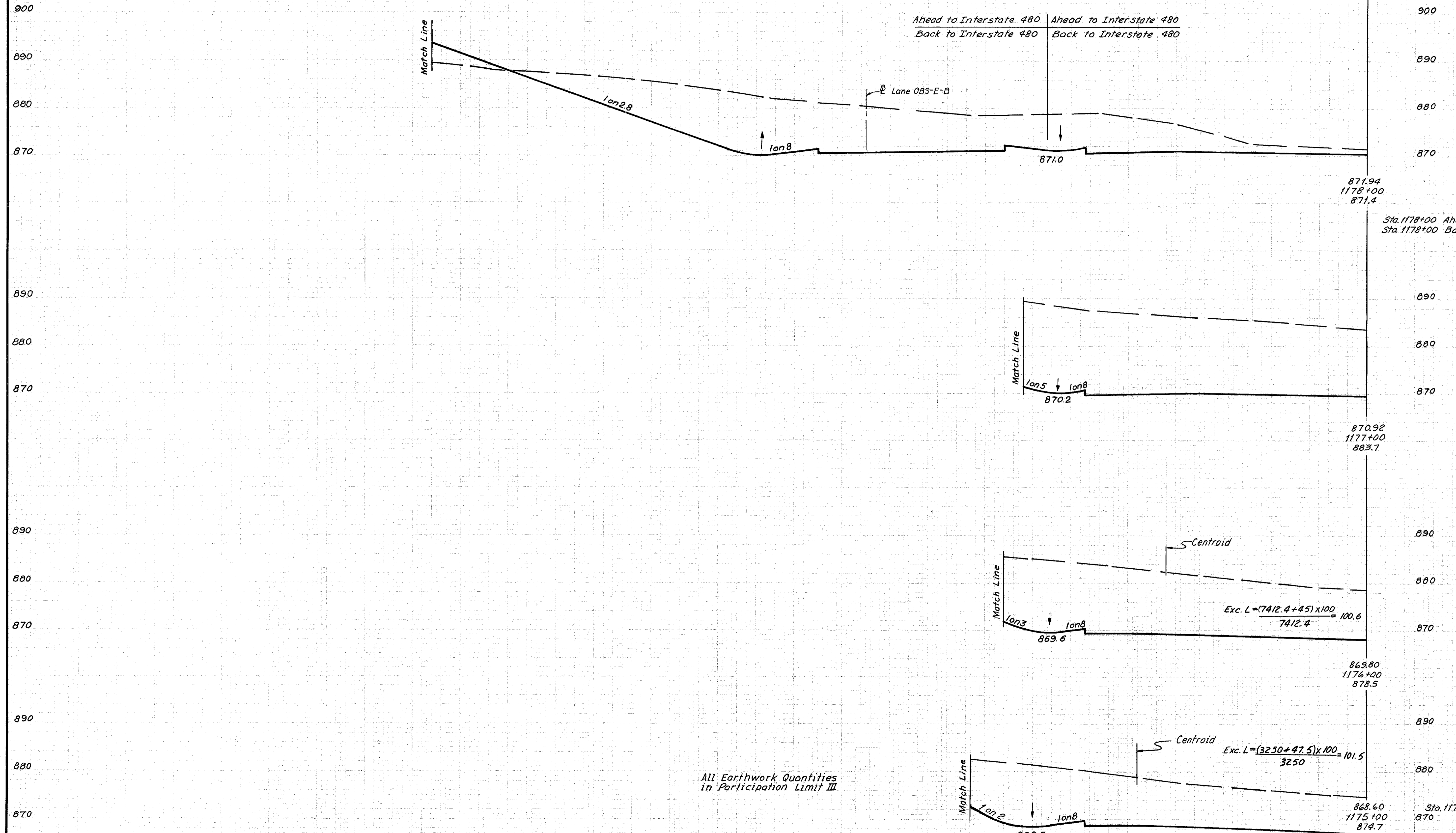
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

Quantity Calculations
 Made By JEN Date 6-70
 Checked IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY 480-21.40



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
1223	32		
292	0		
		2713	0
1173	0		
		3994	0
984	0		
		3366	0
823	0		
		2808	0
671	0		

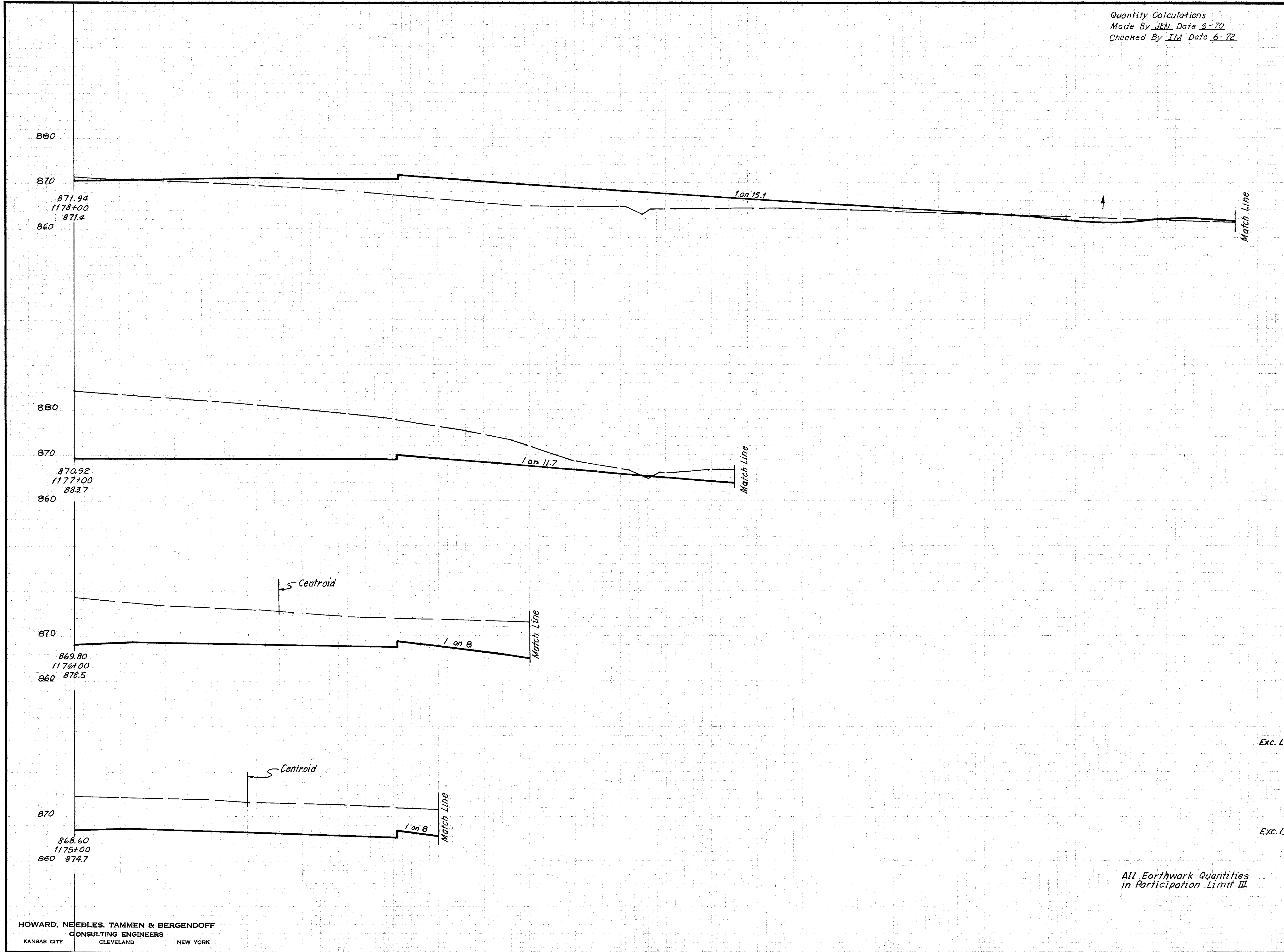
8-67
 9-67
 6-70
 6-72
 C.P.W.
 R.F.T.
 J.E.N.
 I.M.

Quantity Calculations
Made By JEN. Date 6-70
Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

135
390

CUYAHOGA COUNTY
CUY 480-21.40



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
870	18	481	
860		5	89
Sta. 1177+90	9	0	
880		1882	0
870	1120	0	
860		3480	0
880			2402
870	759	0	
860			1820
870		546	0
Exc. L = $\frac{(7412.45 - 45) \times 100}{7412.45} = 99.4$		449	0
860		449	0
Exc. L = $\frac{(3250 - 39) \times 100}{3250} = 32.50$			1820
Ahead Sta. 1174+00			

$$\text{Exc. L} = \frac{(7412.45 - 45) \times 100}{7412.45} = 99.4$$

$$\text{Exc. L} = \frac{(3250 - 39) \times 100}{3250} = 32.50$$

Ahead Sta. 1174+00

All Earthwork Quantities in Participation Limit III

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

INTERSTATE 480 STA. 1175+00 RIGHT HALF TO STA. 1178+00

8-67
9-67
6-72
HLD.
R.F.A.
J.E.N.
I.M.

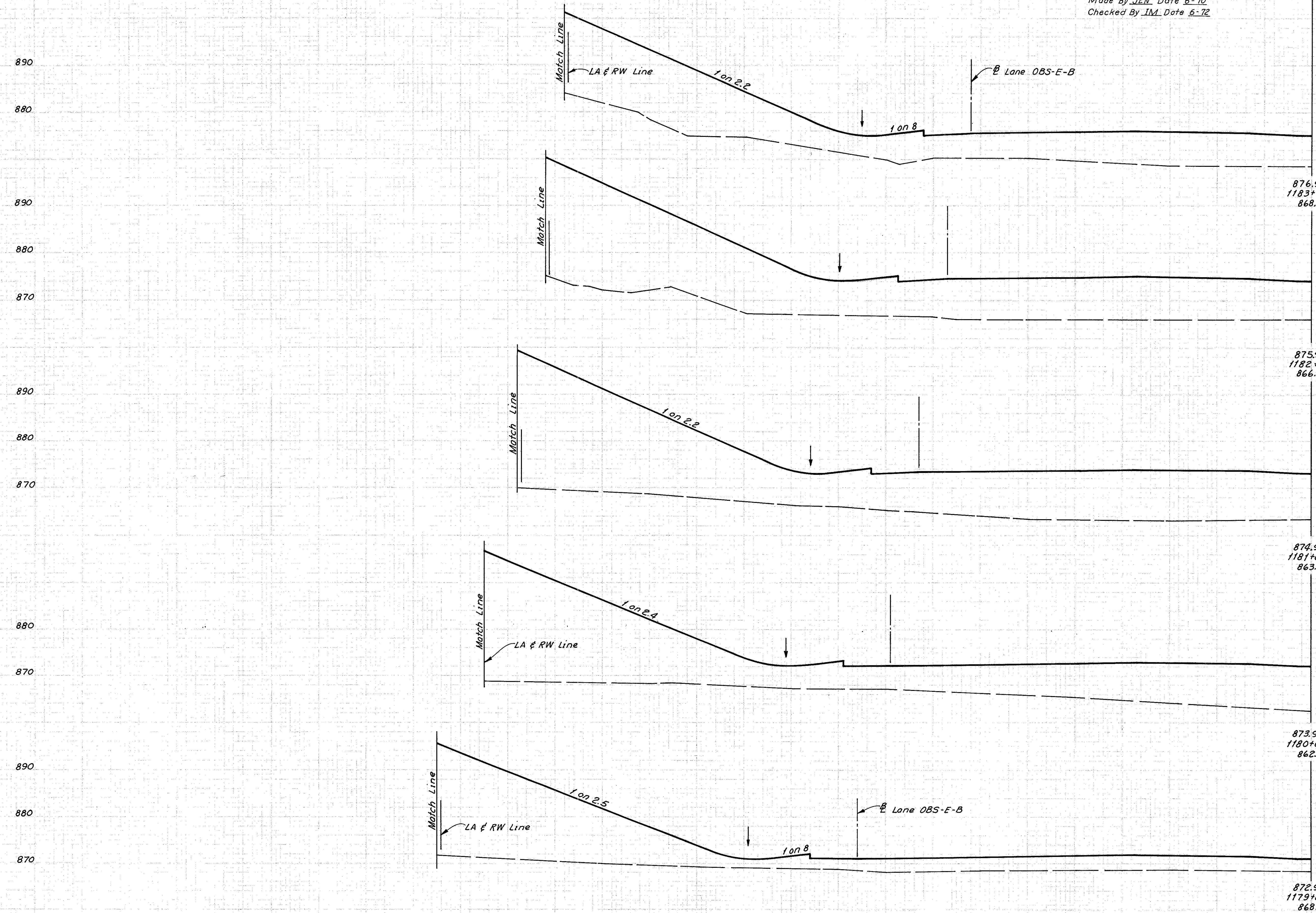
Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY 480-21.40

8-67
9-67
9-72
C.P.W.
J.E.N.
I.M.



ELEVATION	EARTHWORK			
	END EXC.	AREA EMB.	VOLUME EXC.	VOLUME EMB.
880				
870	0	1318		
880				0 5915
870	0	1876		
880				0 7382
870				
860	0	2110		
880				0 7154
870				
860	0	1753		
880				0 5285
870				
880	0	1101		
870	1223	32	2265	2098

872.94
1179+00
868.2

Sta. 1178+00 Ahead
870

All Earthwork Quantities
in Participation Limit III

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

INTERSTATE 480 STA. 1179+00 LEFT HALF TO STA. 1183+00

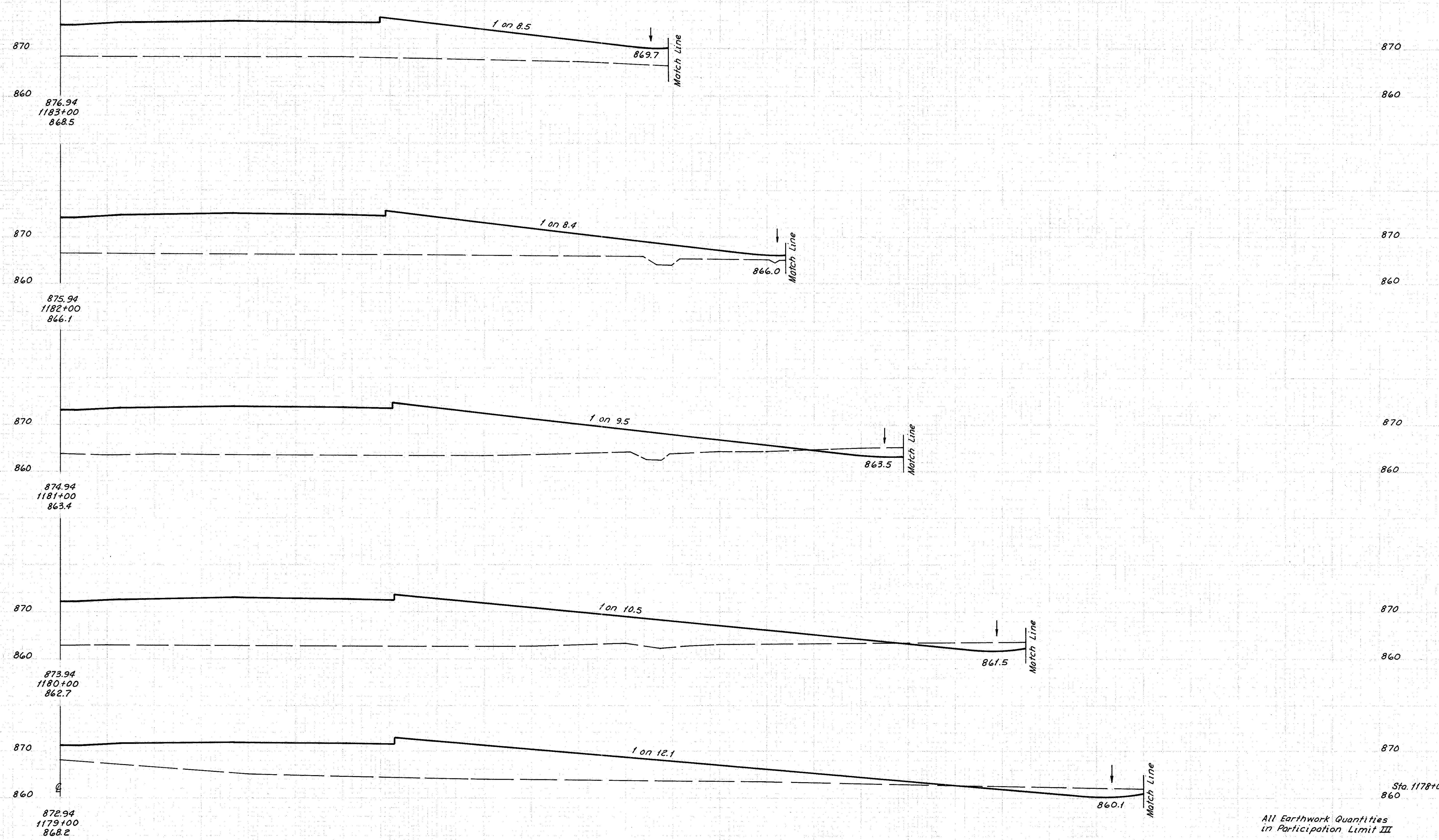
Quantity Calculations
 Made By JEM Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY 480-21.40

8-67
9-67
6-72
CPM
J.M.



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
870			
860	0	840	
			0
			3417
870			
860	0	1005	
			39
			4191
870			
860	21	1258	
			113
			4752
870			
860	40	1308	
			156
			4130
870			
860	44	922	
			156
			4130
Sta. 1178+00	18	481	115
860			2598

All Earthwork Quantities
 in Participation Limit III

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

Quantity Calculation
 Made By JEN Date 6-70
 Checked By IM Date 6-72

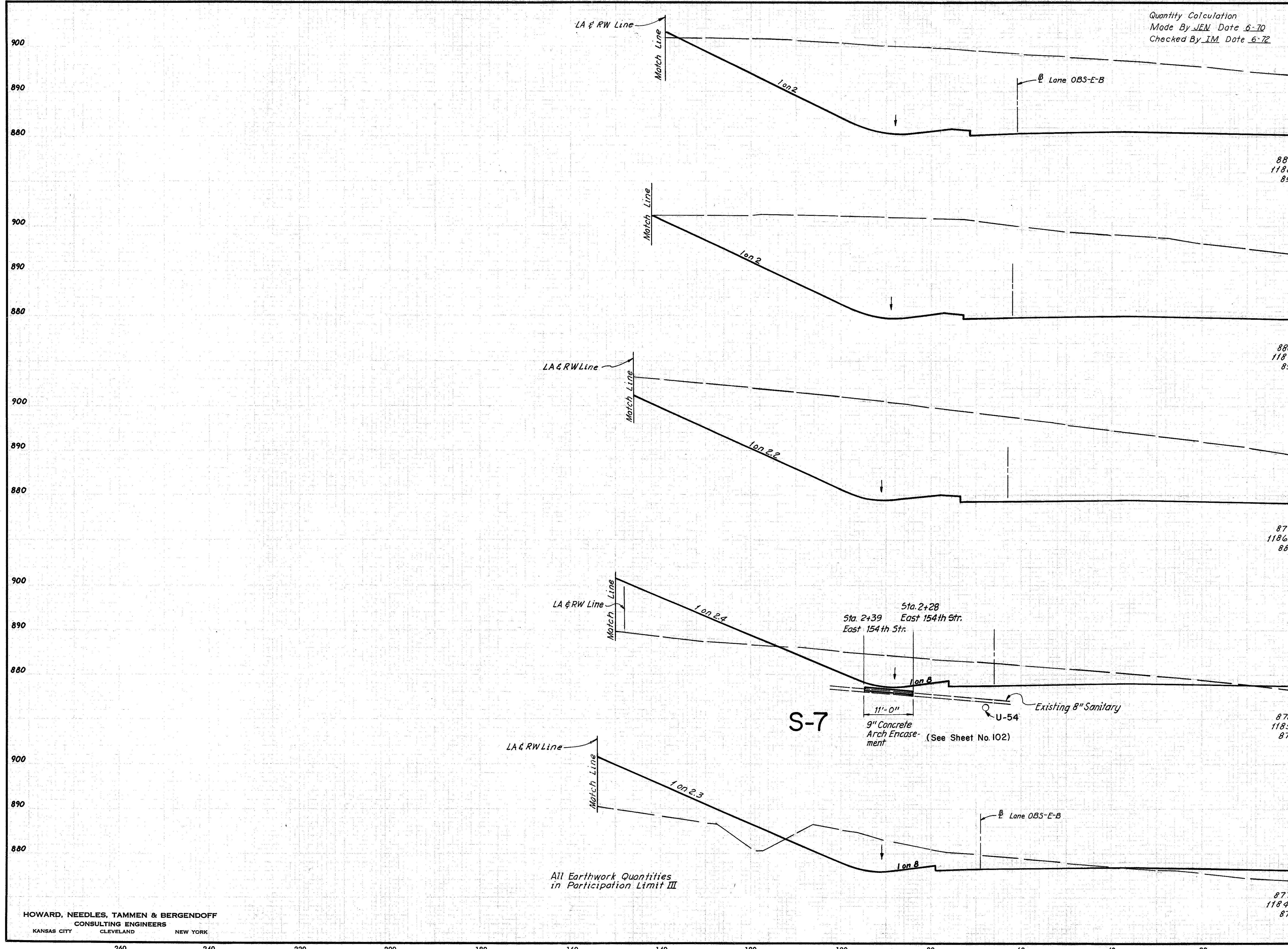
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY. 480-21.40

8-67
9-67
6-70
6-72

R.F.T.
J.E.N.
I.M.



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
1984	1		
		7963	2
2318	0		
		8520	0
2283	0		
		4957	4/3
394	223		
		1267	963
290	297		
		537	2991
0	1318		

All Earthwork Quantities
 in Participation Limit III

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

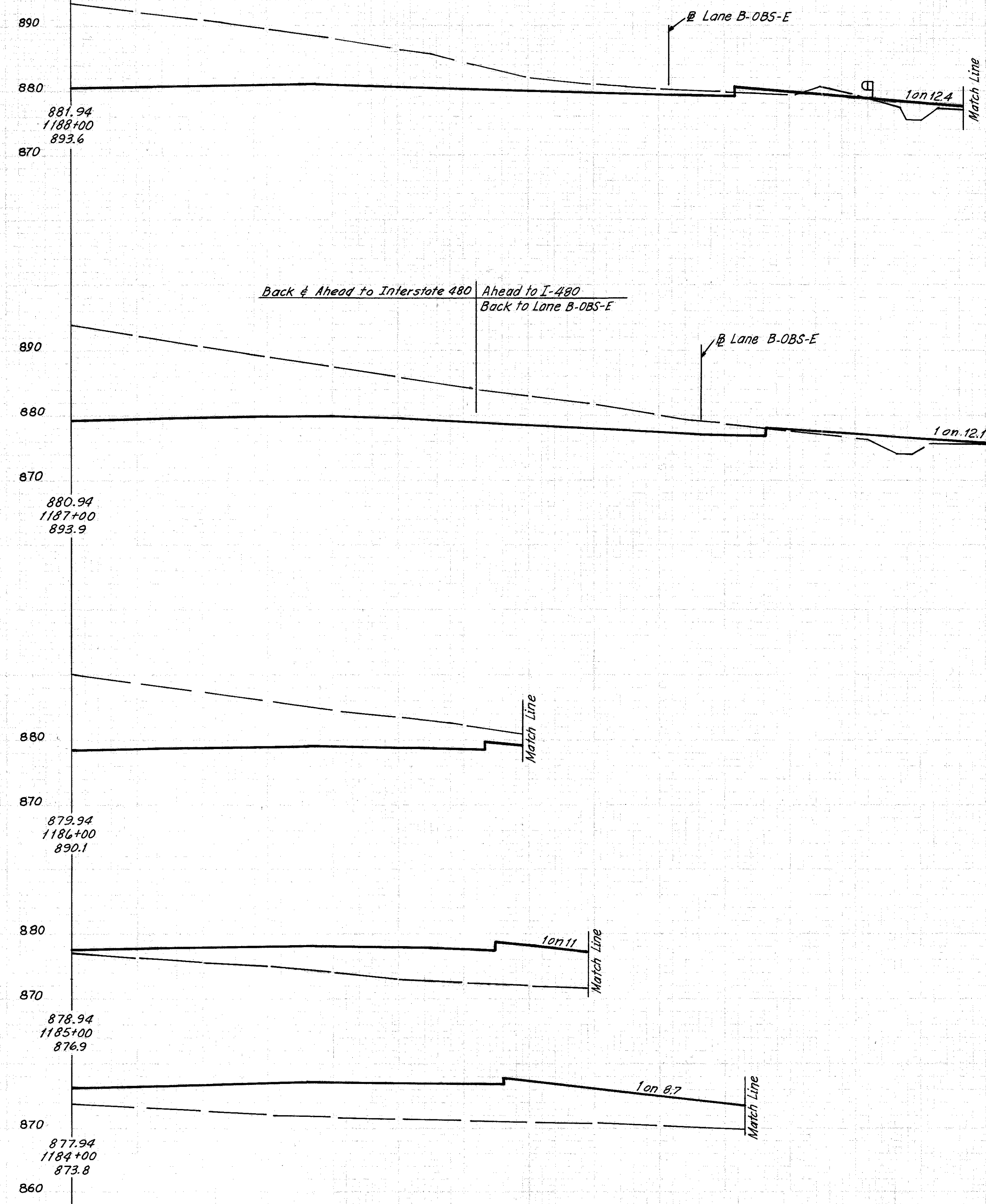
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

139
390

CUYAHOGA COUNTY
 CUY 480-21.40

8-67
9-67
5-70
6-72

H.L.D.
R.H.A.
J.E.N.
I.M.



Back & Ahead to Interstate 480
 Ahead to I-480
 Back to Lane B-OBS-E

ELEVATION	EARTHWORK			
	END EXC.	AREA EMB.	VOLUME EXC.	VOLUME EMB.
890				
880				
870	587	27		
			2415	107
890				
880				
870				
Sta. 1187+00 Ahead	717	31		
Sta. 1187+00 Back	577	0		
			1909	0
880				
870				
Sta. 1185+37	0	0	0	212
880	454	0		
870			530	0
880	0	310		
870			0	1502
870	0	501		
Sta. 1183+00	0	840	0	2483
870				
860				

All Earthwork Quantities
 in Participation Limit III

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

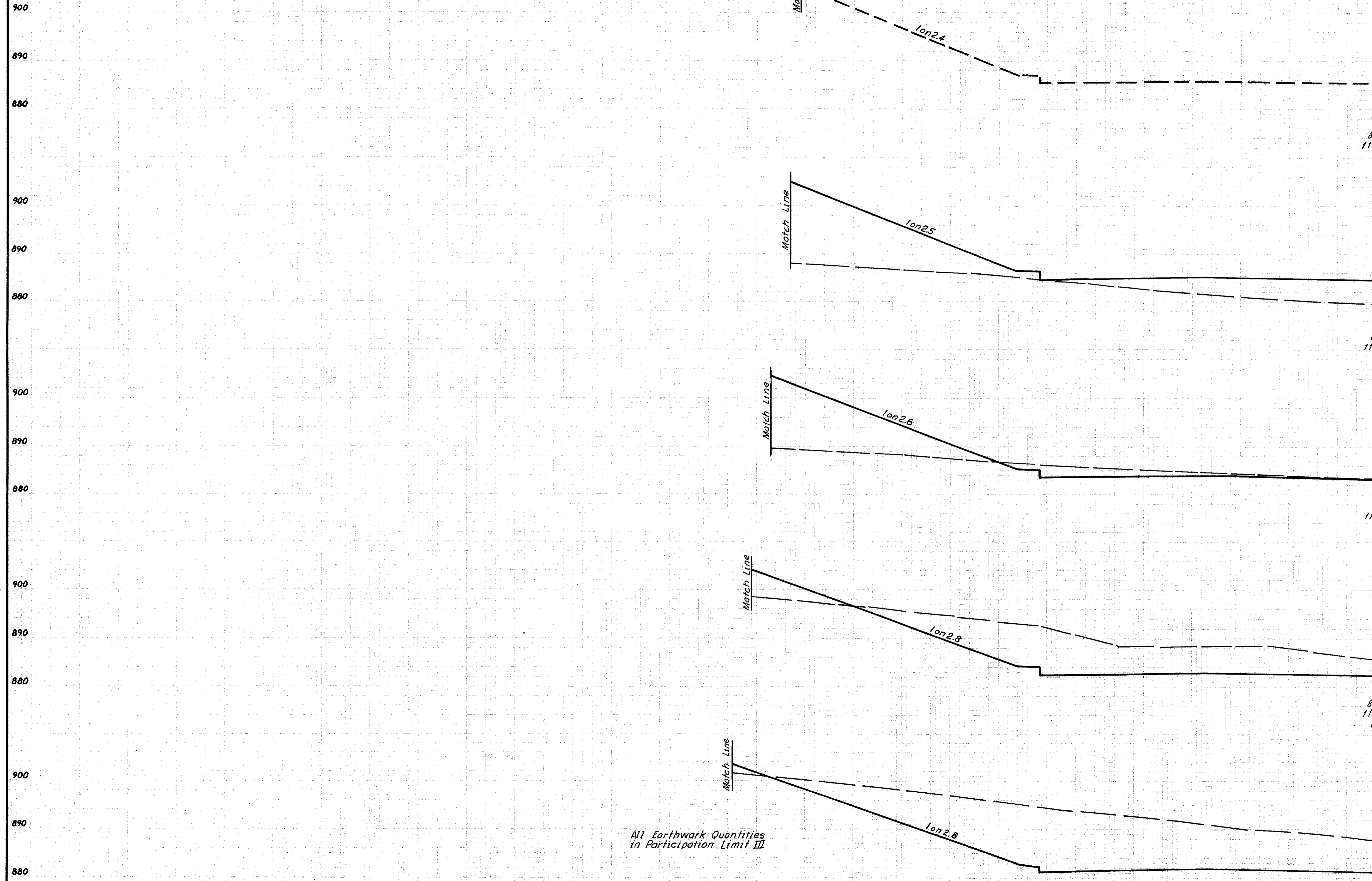
INTERSTATE 480 STA. 1184+00 RIGHT HALF TO STA. 1188+00

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

140
390

CUYAHOGA COUNTY
 CUY 480-21.40



900
890
880
Sta. 1192+50 End Areas Taken From Adjacent Project

886.72
1192+50
323 Cu. Yds. of Embankment Deducted For Adjacent Project Earthwork

886.07
1192+00
879.2

884.94
1191+00
883.3

883.94
1190+00
885.4

882.94
1189+00
887.6

EARTHWORK				
END STA.	AREA		VOLUME	
	EXC.	EMB.	EXC.	EMB.
1192+50	0	1050		
1192+50			0	1258
1192+00	0	657		
1192+00			139	1857
1191+00	75	346		
1191+00				1250
1190+00	600	63		
1190+00				3080
1189+00	1063	4		
1189+00				5565
1188+00	1942	0		
1188+00				9

All Earthwork Quantities in Participation Limit III

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

INTERSTATE 480 STA. 1189+00 LEFT TO STA. 1192+50

8-67
9-67
6-70
6-72

R.F.T.
J.E.M.
J.L.M.

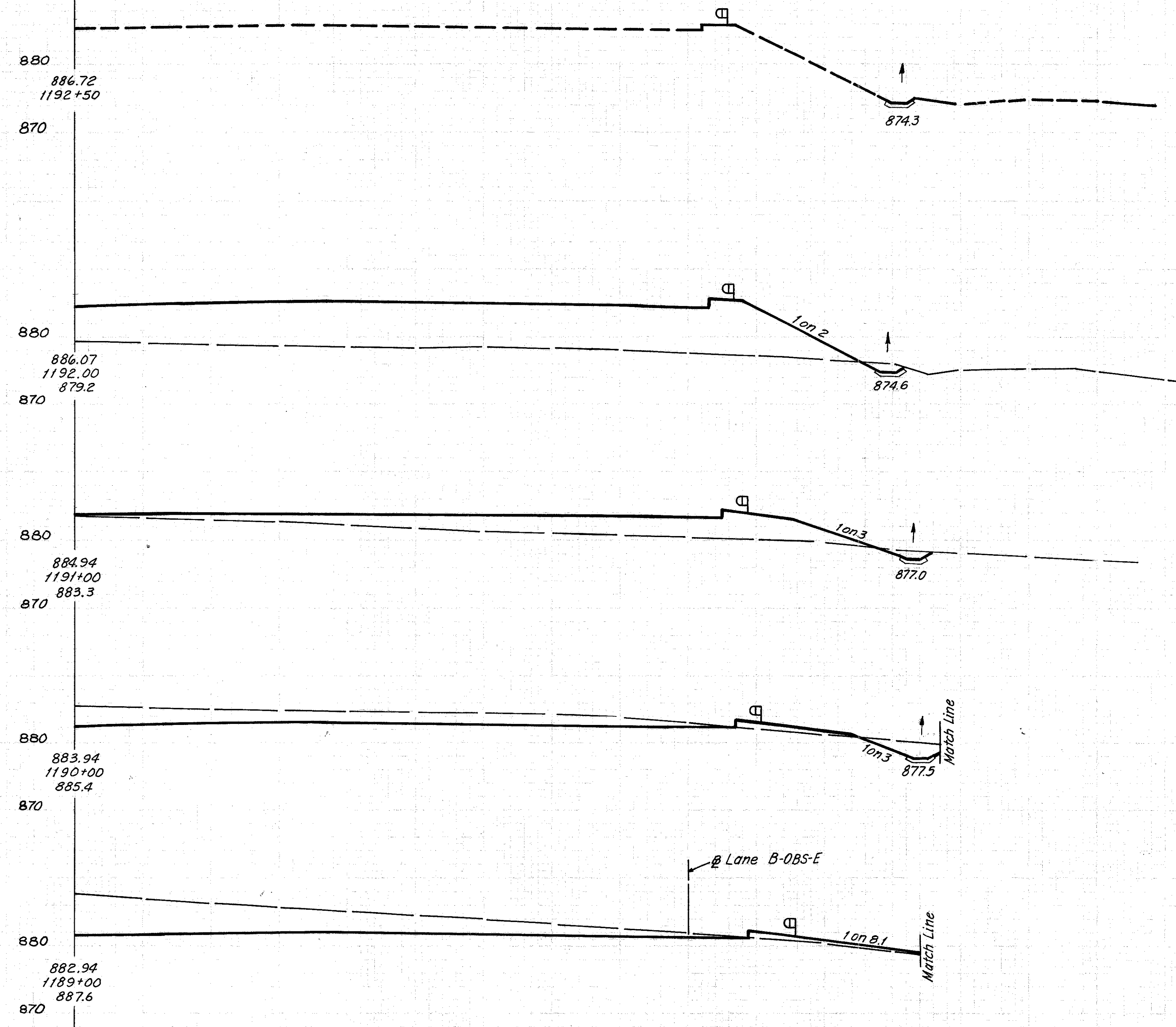
Quantity Calculations
 Made By JEM Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY. 480-21.40

8-67
 9-67
 6-70
 6-72
 H.P.
 R.H.A.
 J.E.M.
 I.M.



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
880			
STA. 1192+50 End Area Taken from Adjacent Project	3	1070	
306 Cu. Yds. of Embankment Deducted for Adjacent Project Earthwork			7 1346
880			
870	5	715	
880			19 1763
870	5	237	
			8 154
Sta. 1190+65	8	0	
			247 16
870	197	13	
			896 46
880	287	12	
Sta. 1188+00	587	27	1619 72
870			

All Earthwork Quantities in Participation Limit III

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

RIGHT HALF INTERSTATE 480 STA. 1189+00 TO STA. 1192+50

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

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

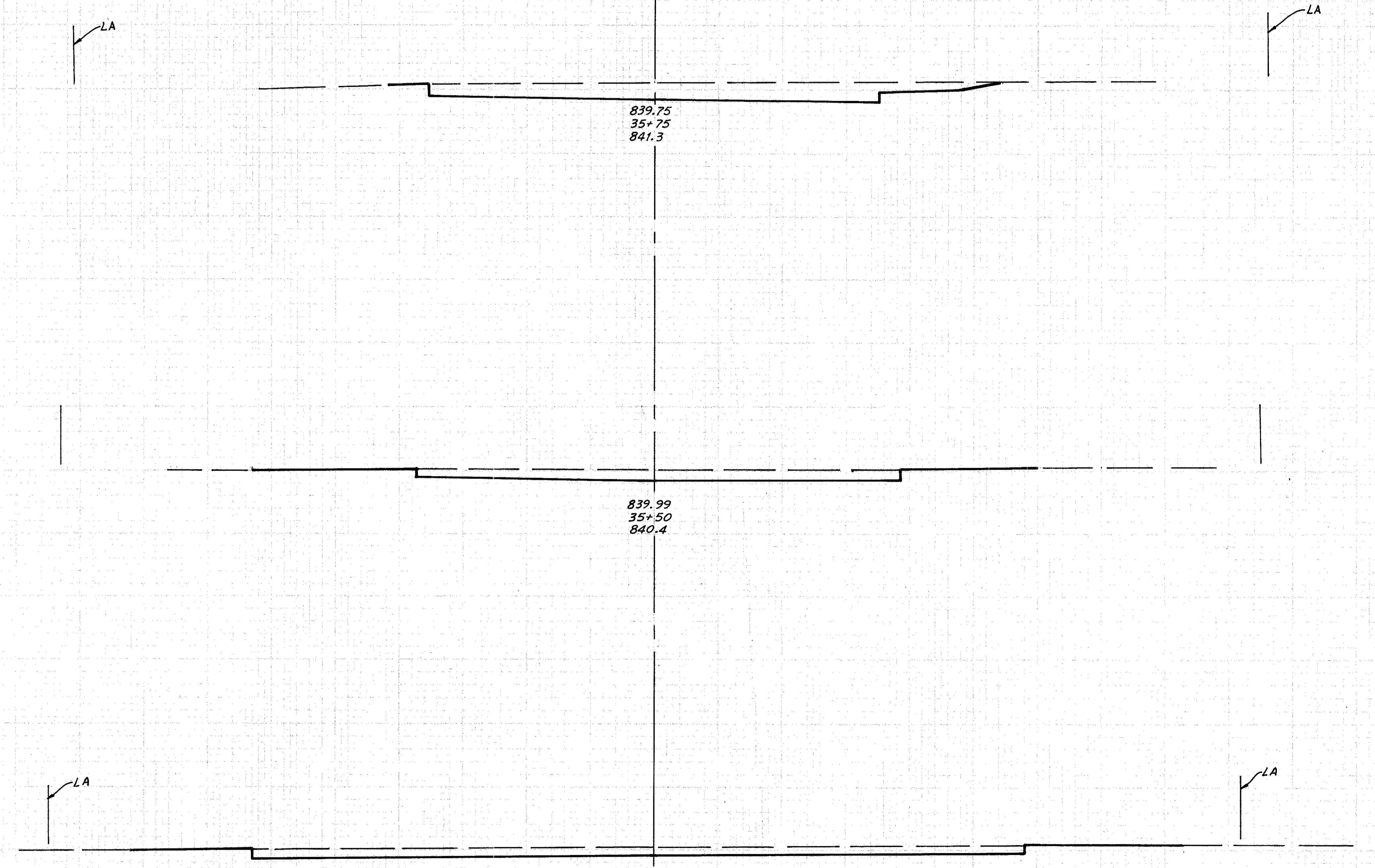
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY 480-21.40

8-67
 3-68
 5-70
 6-72
 H.L.D.
 R.H.A.
 J.E.N.
 I.M.

850
 840
 830
 850
 840
 830
 850
 840
 830



839.75
 35+75
 841.3

839.99
 35+50
 840.4

840.41
 35+25
 840.3

END	EARTHWORK		VOLUME	
	EXC.	EMB.	EXC.	EMB.
202	0			
		154	0	
130	0			
		138	0	
168	0			
		43	0	
220	0			

All Earthwork Quantities
 in Participation Limit I

$$\frac{(168 + 220) \cdot 6}{2 \times 27} = 43$$

Sta. 35+19

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

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

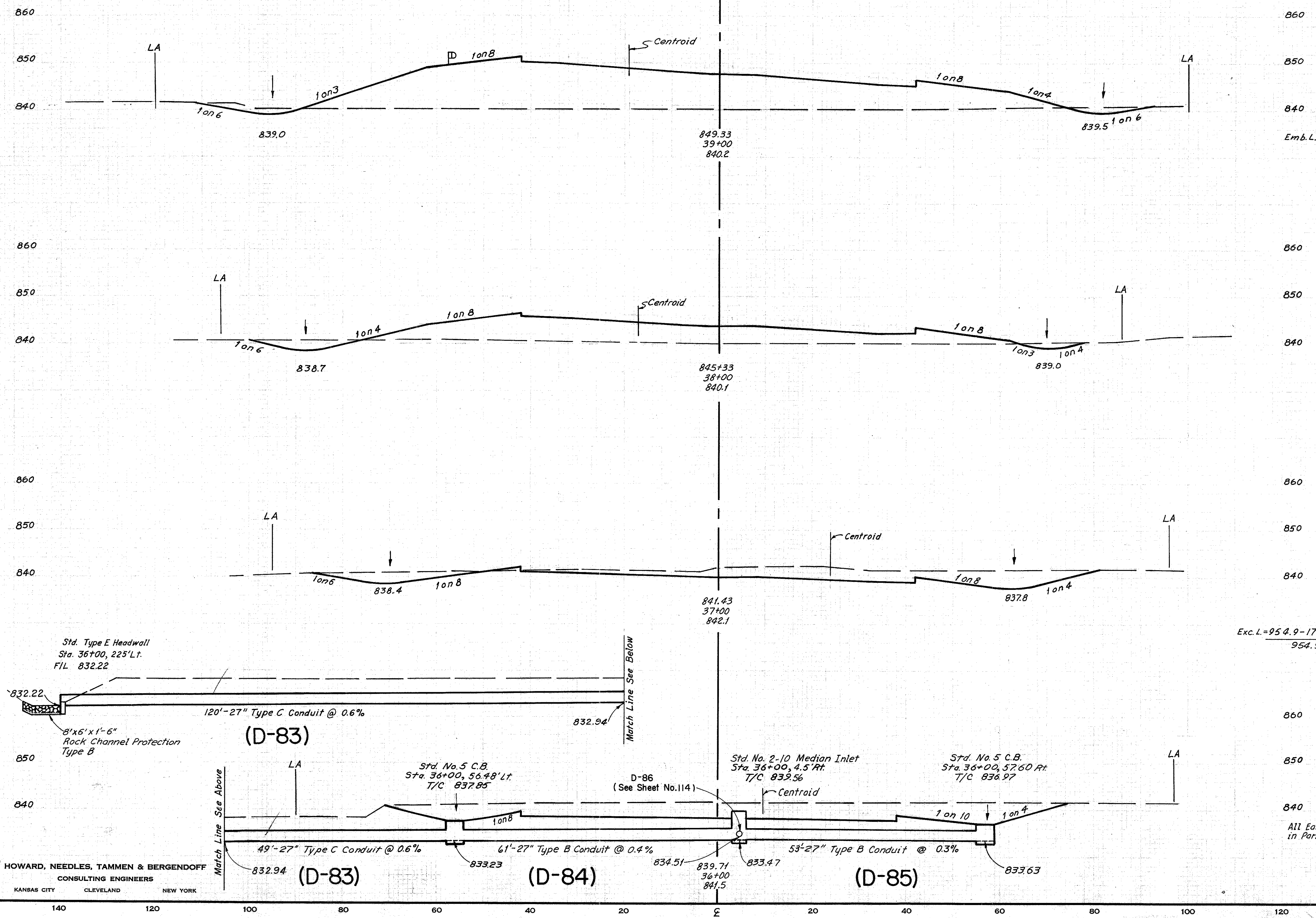
BEDFORD FREEWAY STA. 35+25 TO STA. 35+75

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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390

CUYAHOGA COUNTY
 CUY 480-21.40



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
38	1072		
$Emb. L. = \frac{(954.9 + 18) \times 100}{954.9} = 101.9$			
		124	2885
29	457		
		591	850
290	2		
$Exc. L. = \frac{954.9 - 17}{954.9} = 98.2$			
		1328	4
440	0		
All Earthwork Quantities in Participation Limit I			
202	0	297	0

8-67
 9-67
 6-70
 6-72
 W.F.T.
 J.E.N.
 I.M.

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

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

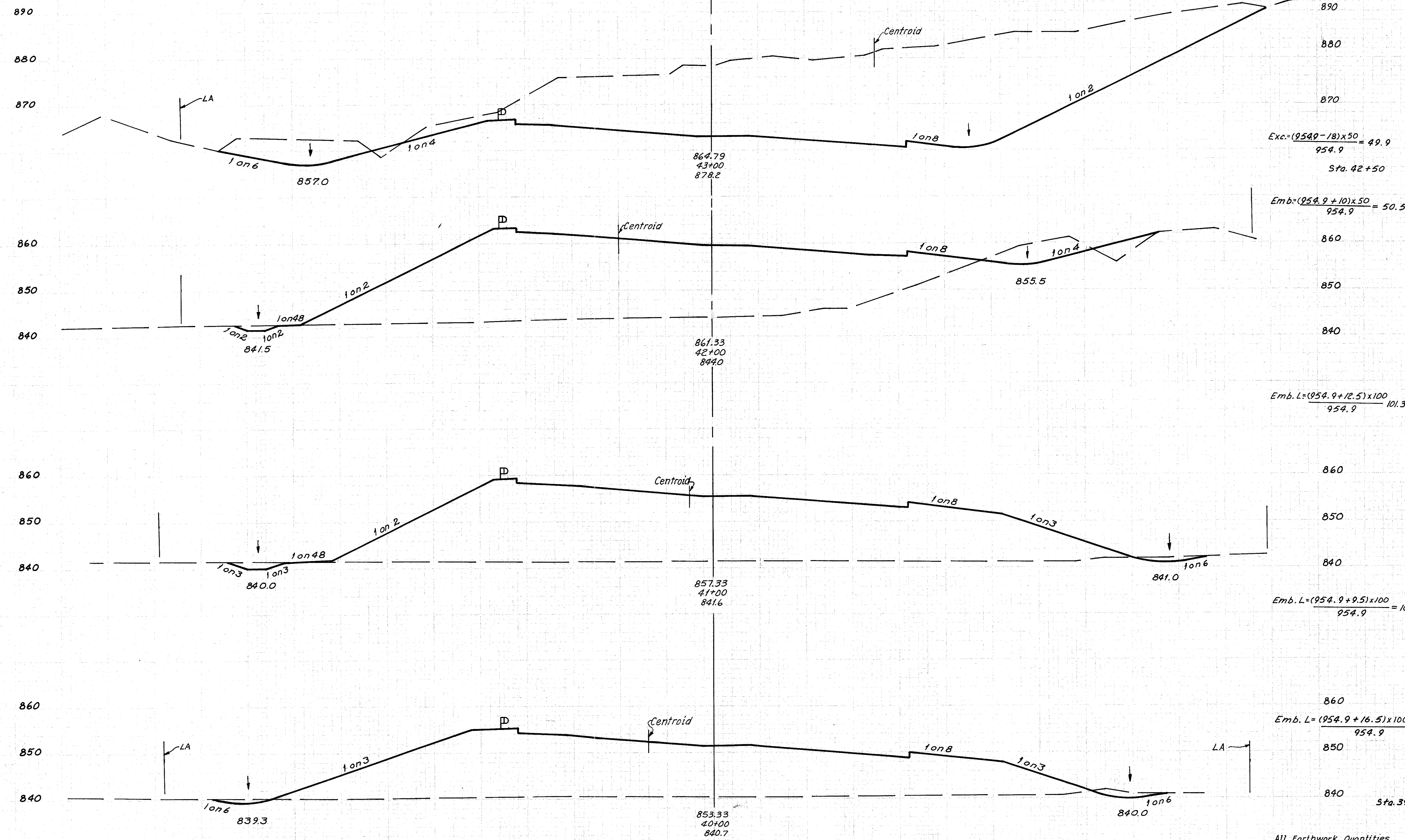
Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY 480-21.40

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



$$\text{Exc.} = \frac{(954.9 - 18) \times 50}{954.9} = 49.9$$

Sta. 42+50

$$\text{Emb.} = \frac{(954.9 + 10) \times 50}{954.9} = 50.5$$

$$\text{Emb. L} = \frac{(954.9 + 12.5) \times 100}{954.9} = 101.3$$

$$\text{Emb. L} = \frac{(954.9 + 9.5) \times 100}{954.9} = 101.0$$

$$\text{Emb. L} = \frac{(954.9 + 16.5) \times 100}{954.9} = 107.1$$

2551	7		
0	0	2357	6
		78	1724
84	1843		
		196	7202
22	1996		
		72	6838
17	1660		
		102	5145
38	1072		

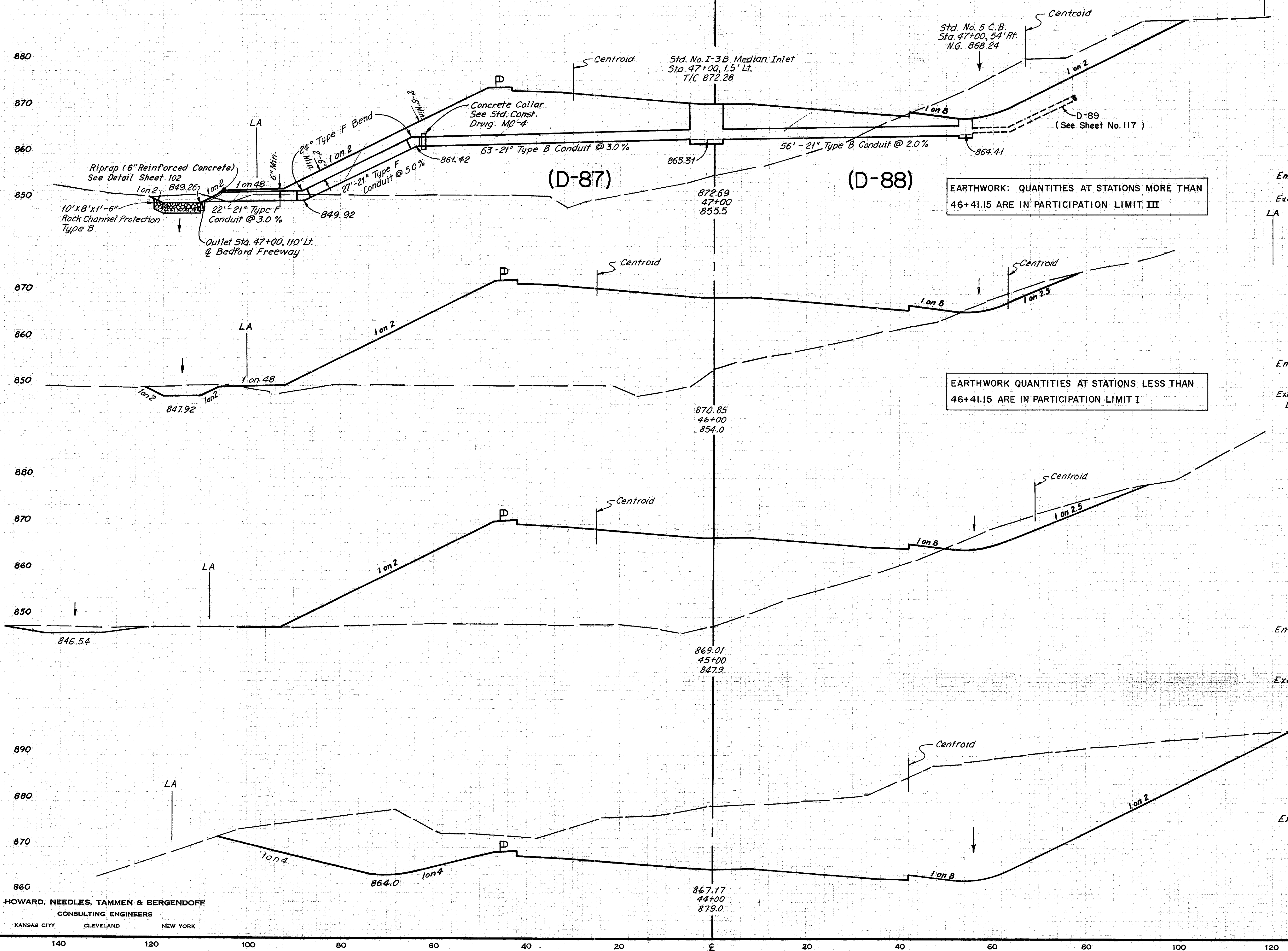
All Earthwork Quantities
 in Participation Limit 1

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

8-57
 R.H.A.
 J.E.N.
 6-72

CUYAHOGA COUNTY
CUY 480 - 21.40

Quantity Calculations
Made By JEN Date 6-70
Checked By JM Date 6-72



EARTHWORK: QUANTITIES AT STATIONS MORE THAN
46+41.15 ARE IN PARTICIPATION LIMIT III

EARTHWORK QUANTITIES AT STATIONS LESS THAN
46+41.15 ARE IN PARTICIPATION LIMIT I

END	EARTHWORK AREA		VOLUME	
	EXC.	EMB.	EXC.	EMB.
880				
870				
860				
850				
840	329	1980		
LA				
880				
870	60	1982		
860				
850				
840	60	1982		
830				
820				
810				
800				
790				
780				
770				
760				
750				
740				
730				
720	122	2024		
710				
700				
690				
680				
670				
660				
650				
640				
630				
620				
610				
600				
590				
580				
570				
560				
550				
540				
530				
520				
510				
500				
490				
480				
470				
460				
450				
440				
430	2551	7		
420				
410				
400				
390				
380				
370				
360				
350				
340				
330				
320				
310				
300				
290				
280				
270				
260				
250				
240				
230				
220				
210				
200				
190				
180				
170				
160				
150				
140				
130				
120				
110				
100				
90				
80				
70				
60				
50				
40				
30				
20				
10				
0				
-10				
-20				
-30				
-40				
-50				
-60				
-70				
-80				
-90				
-100				
-110				
-120				
-130				
-140				

Emb. L = $\frac{(1145.9 + 27.5) \times 58.85}{1145.9} = 60.26$

Exc. L = $\frac{(1145.9 - 65) \times 58.85}{1145.9} = 55.51$

STA. 46+41.15

L = $\frac{(1145.9 + 25) \times 41.15}{1145.9} = 42.05$

870 L = $\frac{(1145.9 - 63) \times 41.15}{1145.9} = 38.89$

Emb. L = $\frac{(1145.9 + 25) \times 100}{1145.9} = 102.0$

Exc. L = $\frac{(1145.9 - 66.0) \times 100}{1145.9} = 94.3$

Emb. L = $\frac{(1145.9 + 12.5) \times 55}{1145.9} = 55.5$

Sta. 44+45

Exc. L = $\frac{(1145.9 - 21) \times 4.5}{1145.9} = 4.2$

Exc. L = $\frac{(1145.9 - 38.5) \times 100}{1145.9} = 96.6$

8-67
9-67
6-70
6-72

W.L.L.
J.E.N.
I.M.

120 100 80 60 40 20 0 20 40 60 80 100 120

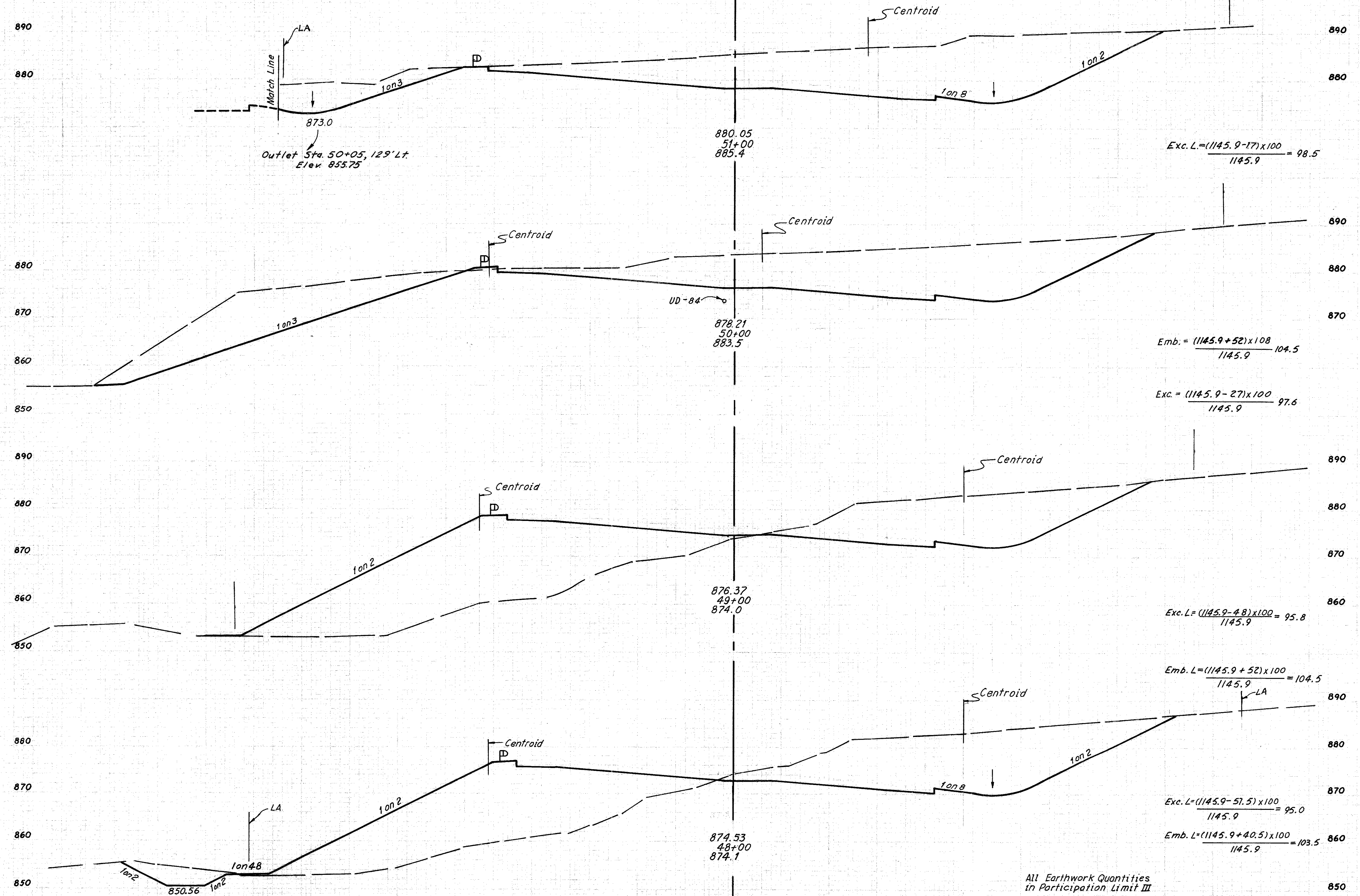
Quantity Calculations
 Made By JEN Date 6-70
 Checked By JM Date 6-72

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
 CUY. 480-21.40

8-87
 9-87
 6-70
 6-72
 F.C.W.
 R.F.T.
 J.E.M.
 J.M.



$$\text{Exc. L} = \frac{(1145.9 - 17) \times 100}{1145.9} = 98.5$$

$$\text{Emb.} = \frac{(1145.9 + 52) \times 108}{1145.9} = 104.5$$

$$\text{Exc.} = \frac{(1145.9 - 27) \times 100}{1145.9} = 97.6$$

$$\text{Exc. L} = \frac{(1145.9 - 48) \times 100}{1145.9} = 95.8$$

$$\text{Emb. L} = \frac{(1145.9 + 52) \times 100}{1145.9} = 104.5$$

$$\text{Exc. L} = \frac{(1145.9 - 57.5) \times 100}{1145.9} = 95.0$$

$$\text{Emb. L} = \frac{(1145.9 + 40.5) \times 100}{1145.9} = 103.5$$

All Earthwork Quantities
 in Participation Limit III

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
1170	7		
		4660	22
1385	5		
		3535	2135
571	1098		
		2540	3853
861	893		
		2004	5507
Sta. 47+00	329	1980	

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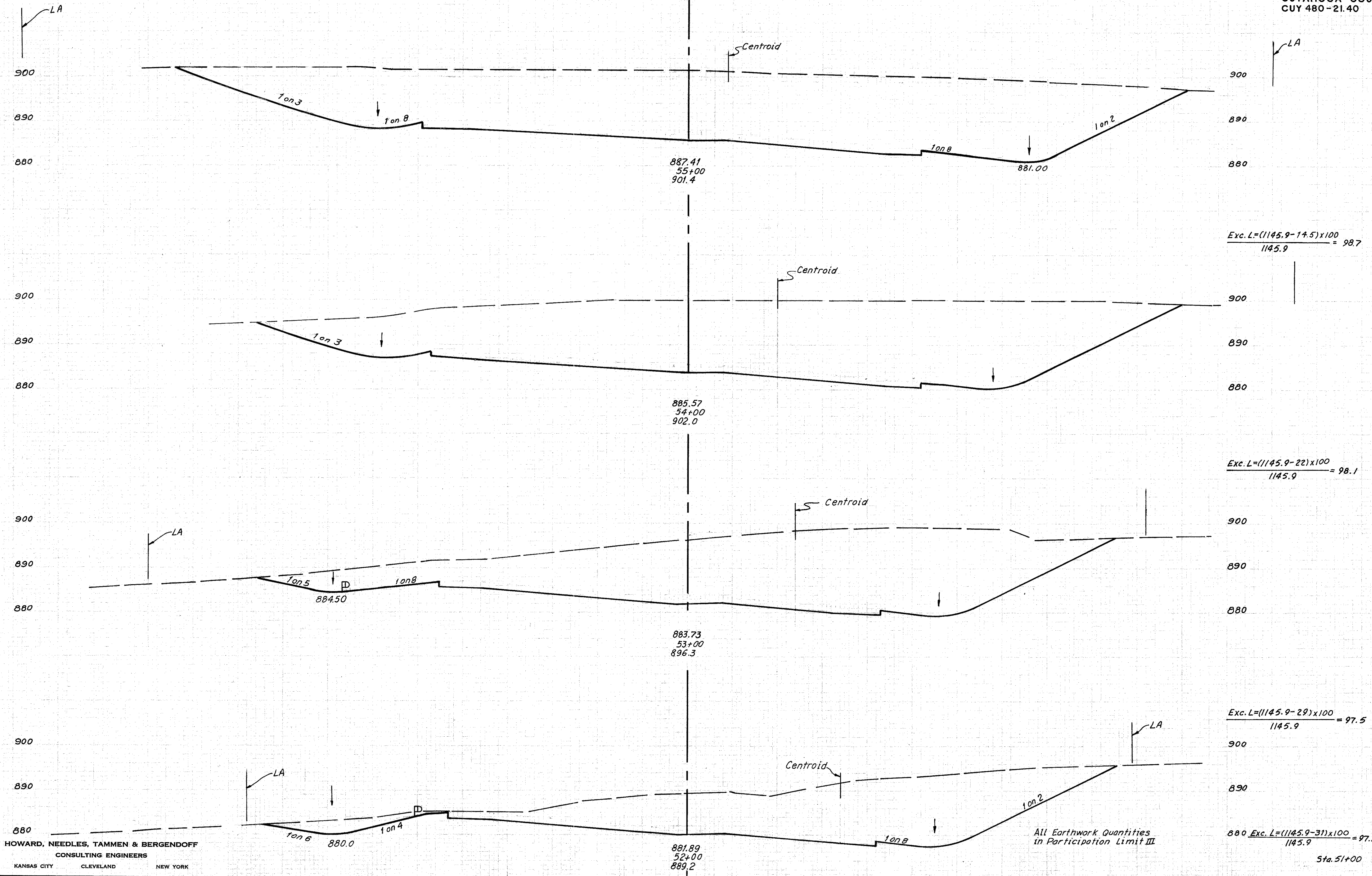
120 100 80 60 40 20 0 20 40 60 80 100 120

Quantity Calculations
 Made By JEN Date 6-72
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT	147 390
2	OHIO		

CUYAHOGA COUNTY
 CUY 480-21.40

8-67
 8-67
 6-72
 6-72
 W.L.L.
 R.F.M.
 J.E.M.
 I.M.



END	EARTHWORK	
	EXC.	EMB.
2945	0	10336
2710	0	8747
2105	0	6274
1370	0	4577
1170	7	

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
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BEDFORD FREEWAY STA. 52+00 TO STA. 55+00

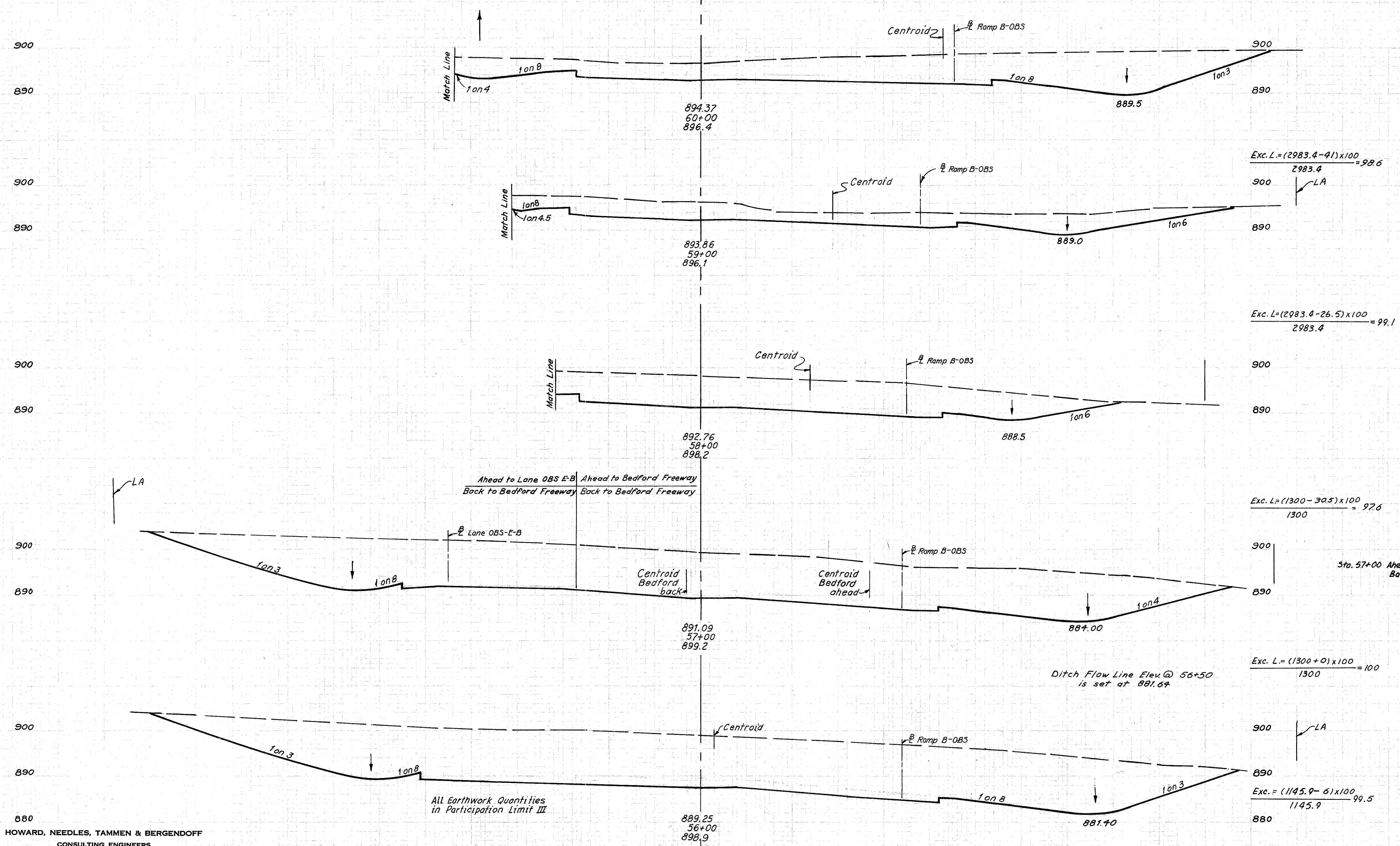
Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY480-21.40

8-67
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6-72
FCW
R.F.T.
J.E.M.
L.M.



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
920	0		
		2589	0
498	0		
		2288	0
749	0		
		3685	0
1290	0		
2070	0		
		8250	0
2385	0		
		9821	0
2945	0		

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

All Earthwork Quantities
 in Participation Limit III

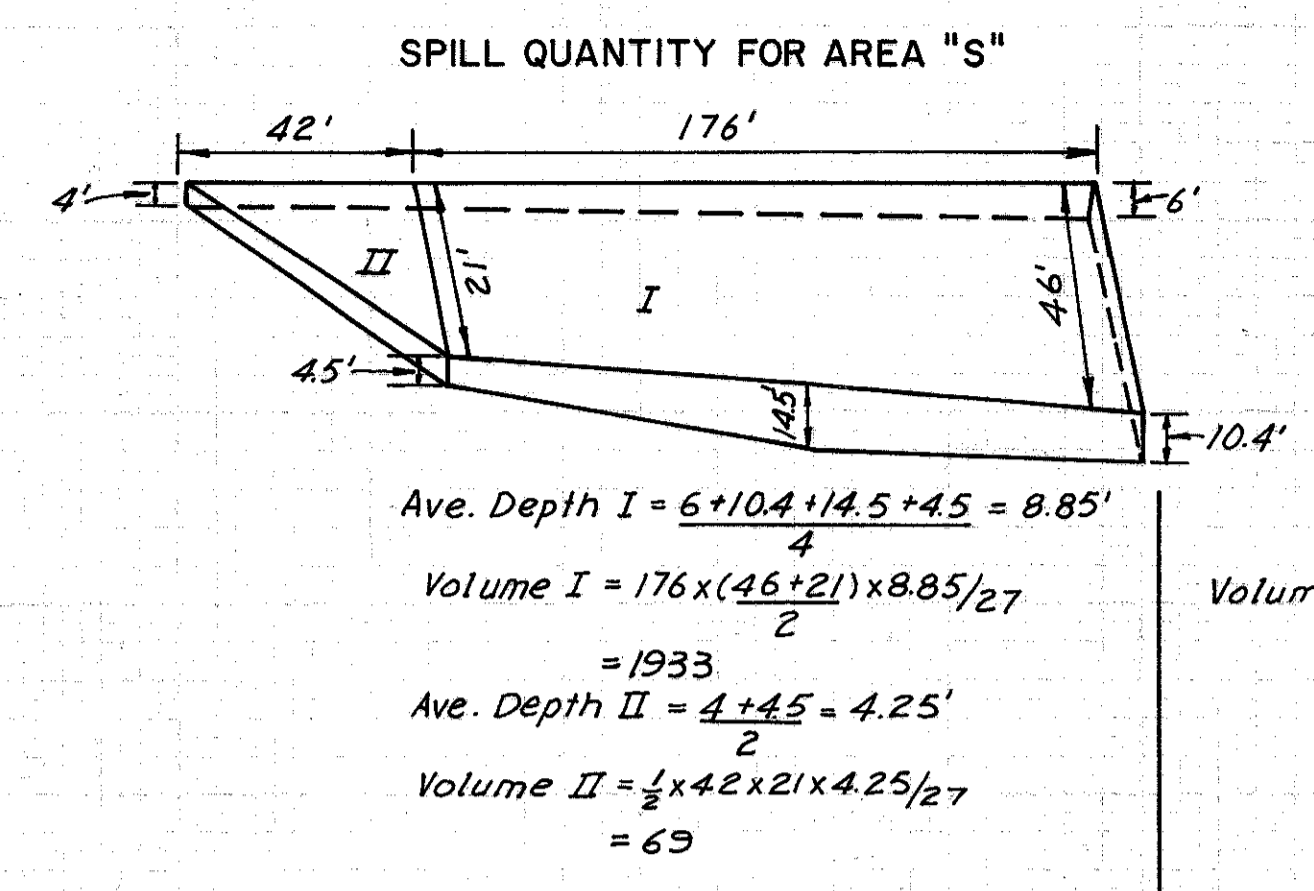
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Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

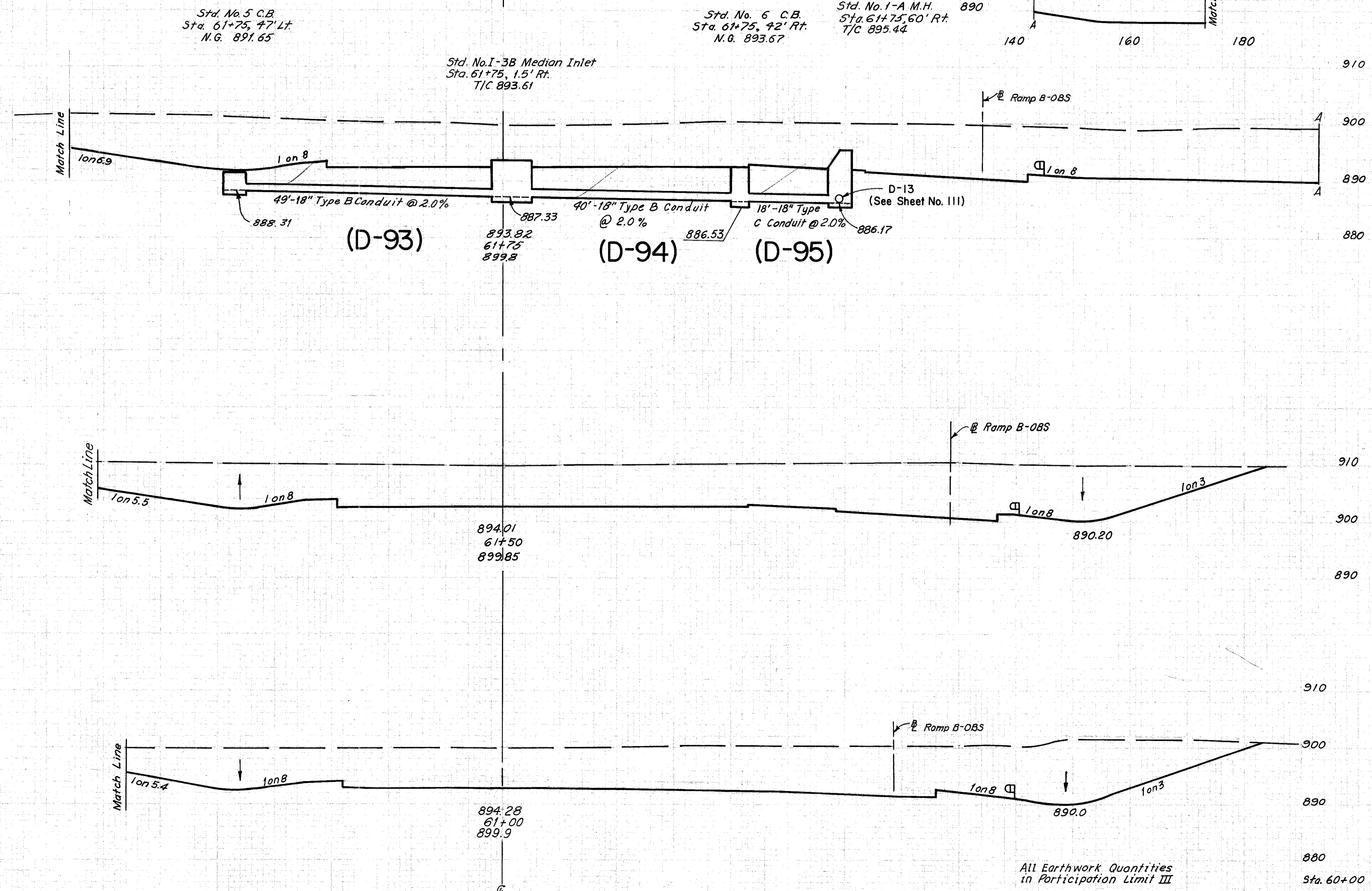
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY 480-21.40



8-67
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 W.L.L.
 R.F.F.
 J.E.M.
 I.M.



END	EARTHWORK		VOLUME
	EXC.	EMB.	
910			2002 0
900	1651	0	
890			
880			
910			4335 0
900			
890			
910			
900	1470	0	
890			
880			4426 0
880	920	0	

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

All Earthwork Quantities
 in Participation Limit III

140
 BEDFORD FREEWAY STA. 61+00 TO STA. 61+75

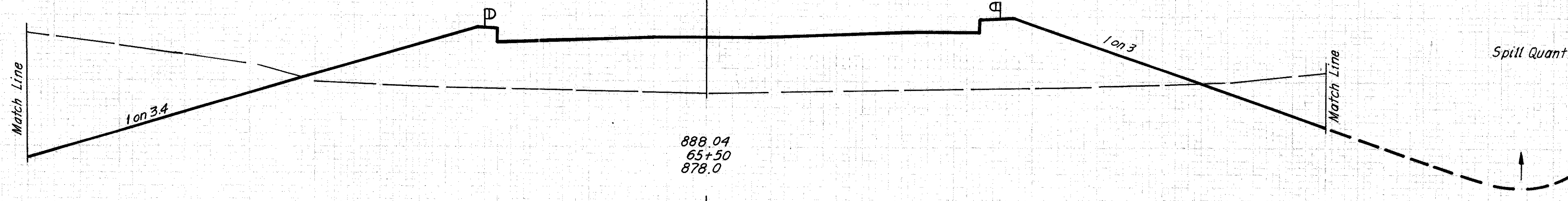
Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

150
390

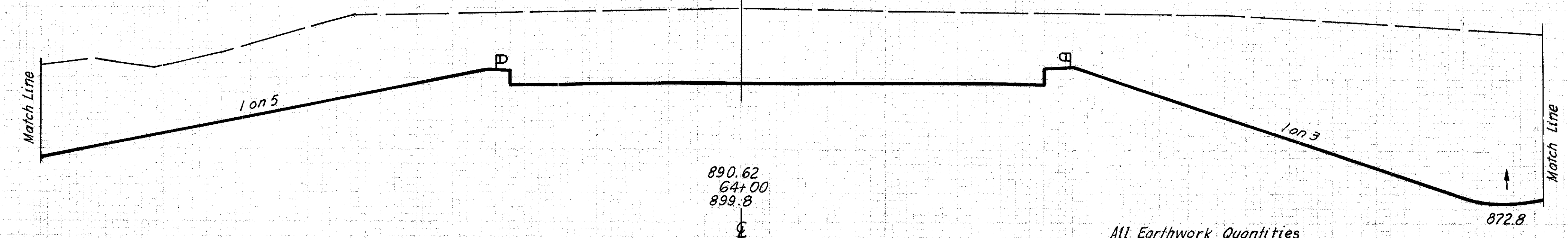
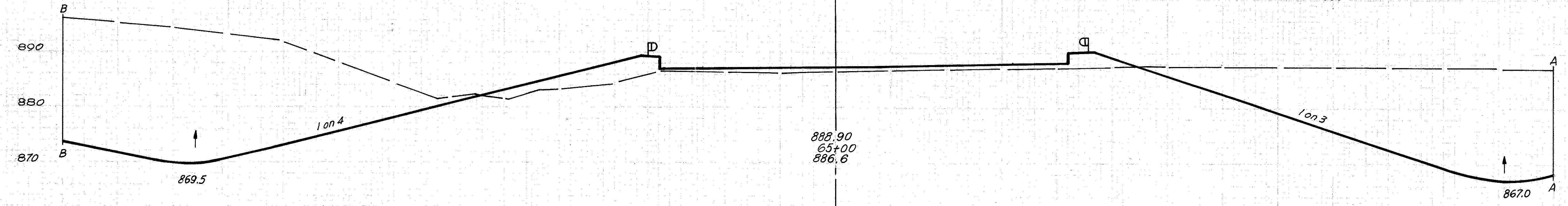
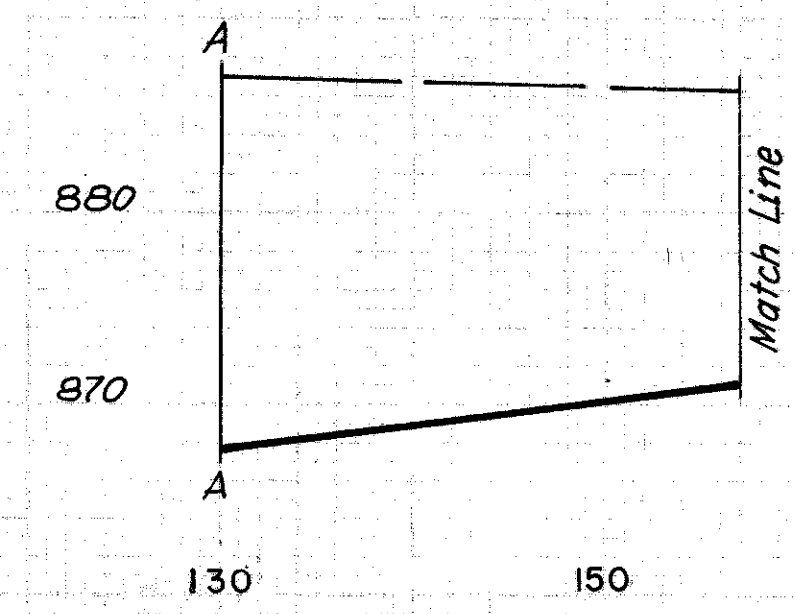
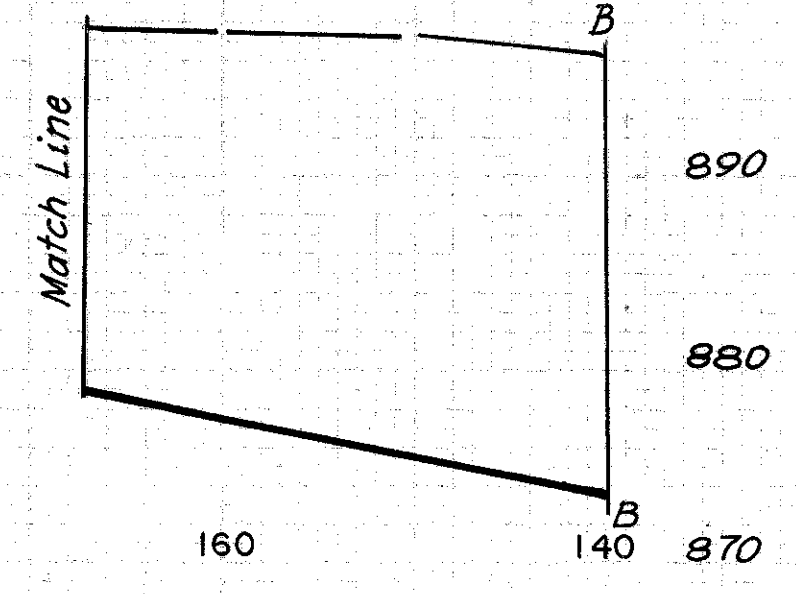
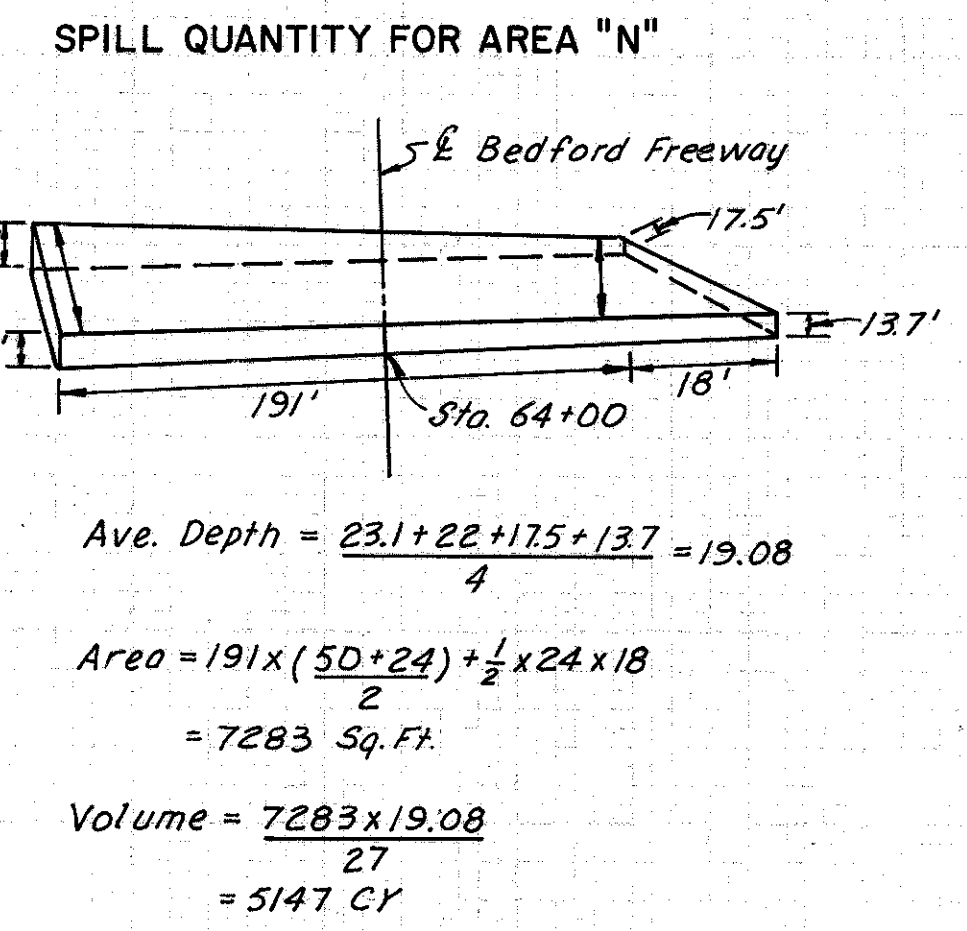
CUYAHOGA COUNTY
 CUY 480-21.40

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 J.E.N.
 I.M.



SPILL QUANTITY FOR AREA "L"

STA.	DIST.	END AREA	END AREA TOTAL	VOLUME CY
65+50		994	1283	922 (Emb)
65+88.8	38.8	289		
65+50		97	97	36 (Exc)
65+88.8	20' (Ave. Ht)	-		
65+50		420	420	194 (Exc)
65+88.8	25' (Ave. Ht)	-		



END STA.	AREA		VOLUME	
	EXC.	EMB.	EXC.	EMB.
890				
880	302	994	230	922
870				
860				
			3365	1072
			3132	164
			10646	304
			2617	0
			5147	0

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

All Earthwork Quantities
 in Participation Limit III

Spill Quantity S. Abutment

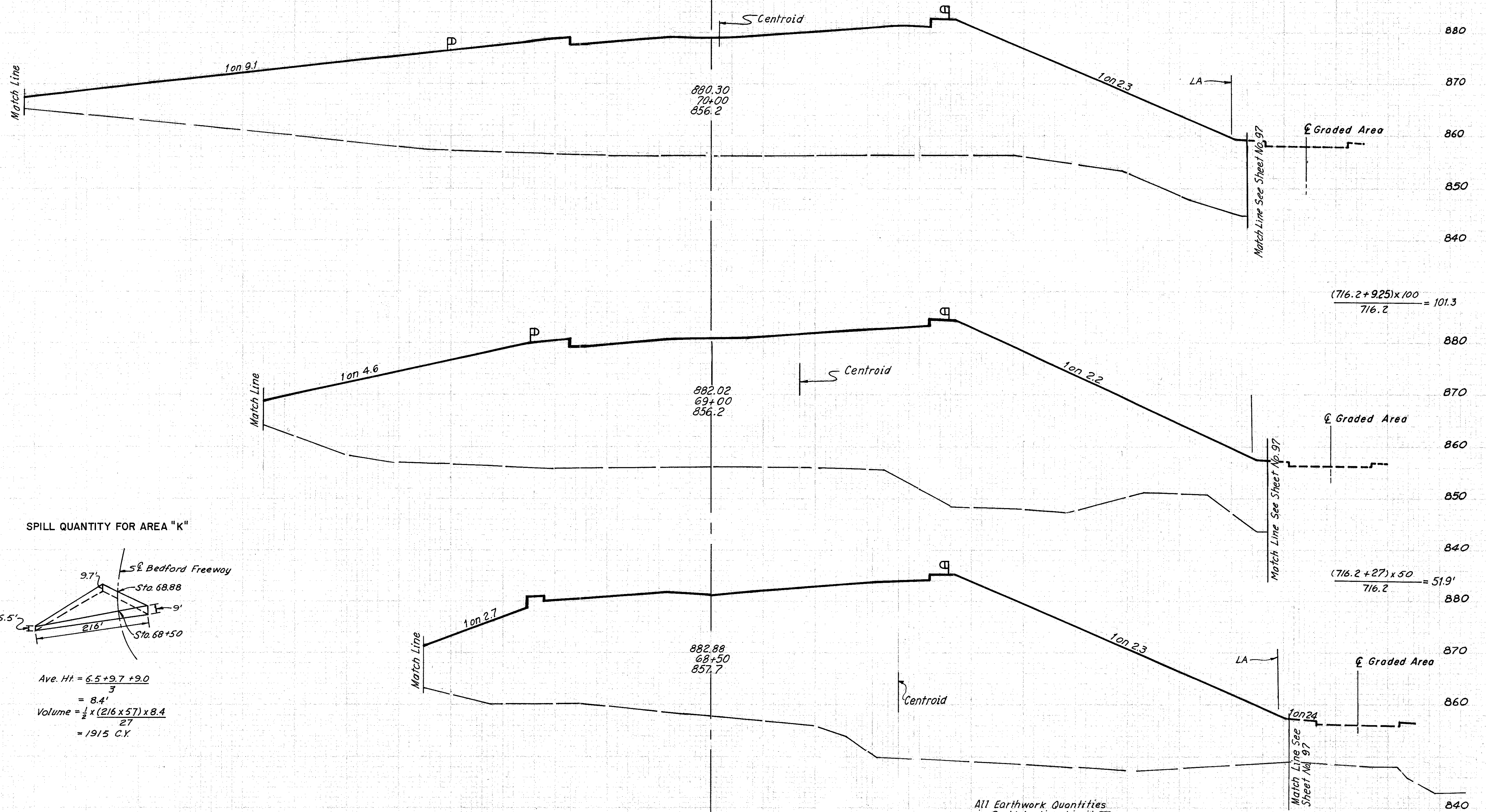
Quantity Calculations
 Made By JEM Date 6-70
 Checked By JM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

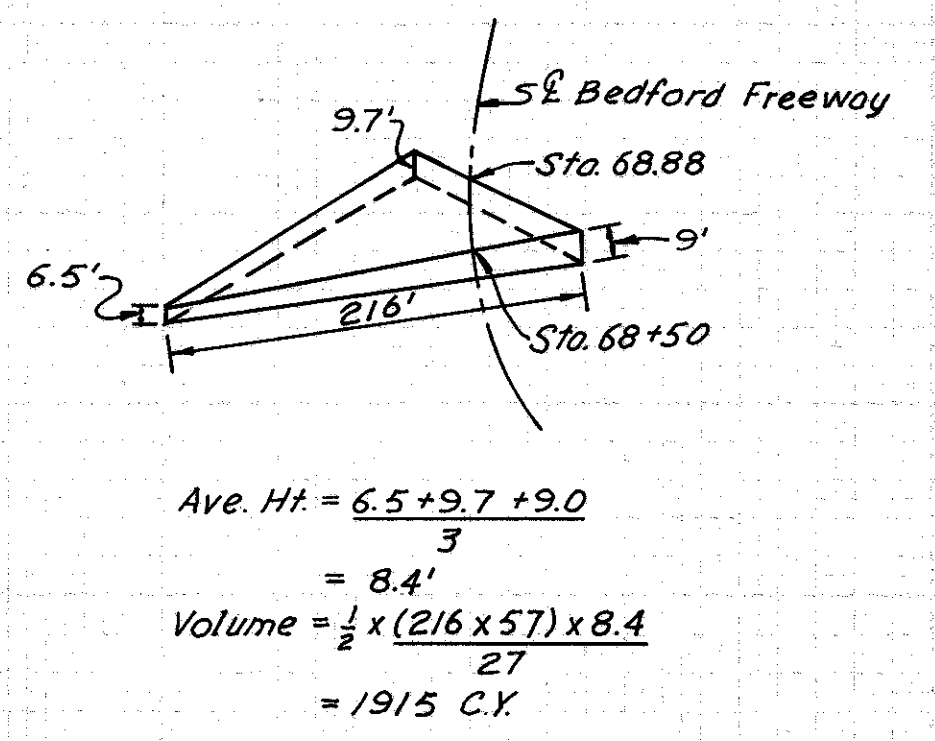
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390

CUYAHOGA COUNTY
 CUY 480-21.40

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 H.P.A.
 J.E.M.
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SPILL QUANTITY FOR AREA "K"



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
0	4057		
		0	15490
0	4200		
		0	7785
0	3900		
		0	1915

$$\frac{(716.2 + 9.25) \times 100}{716.2} = 101.3$$

$$\frac{(716.2 + 27) \times 50}{716.2} = 51.9'$$

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

All Earthwork Quantities
 in Participation Limit III

Spill Quantity S. Abutment

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

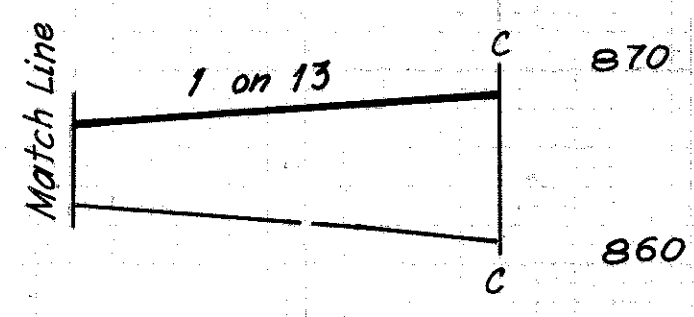
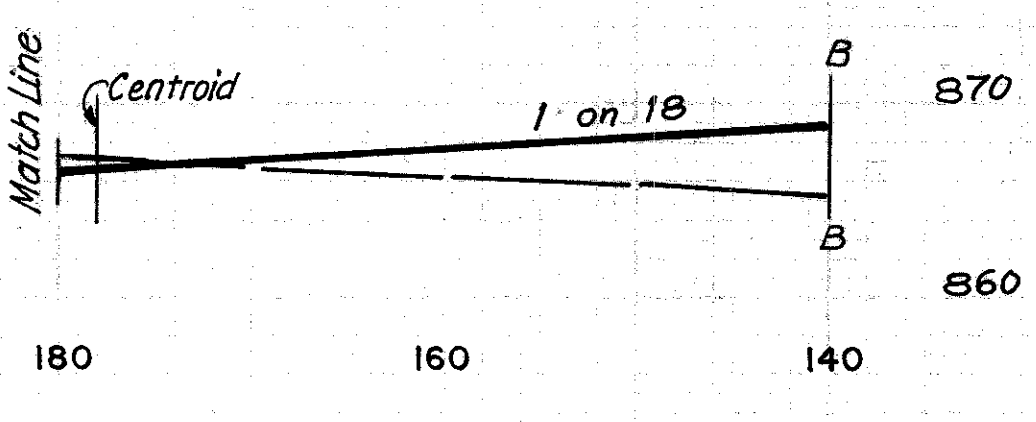
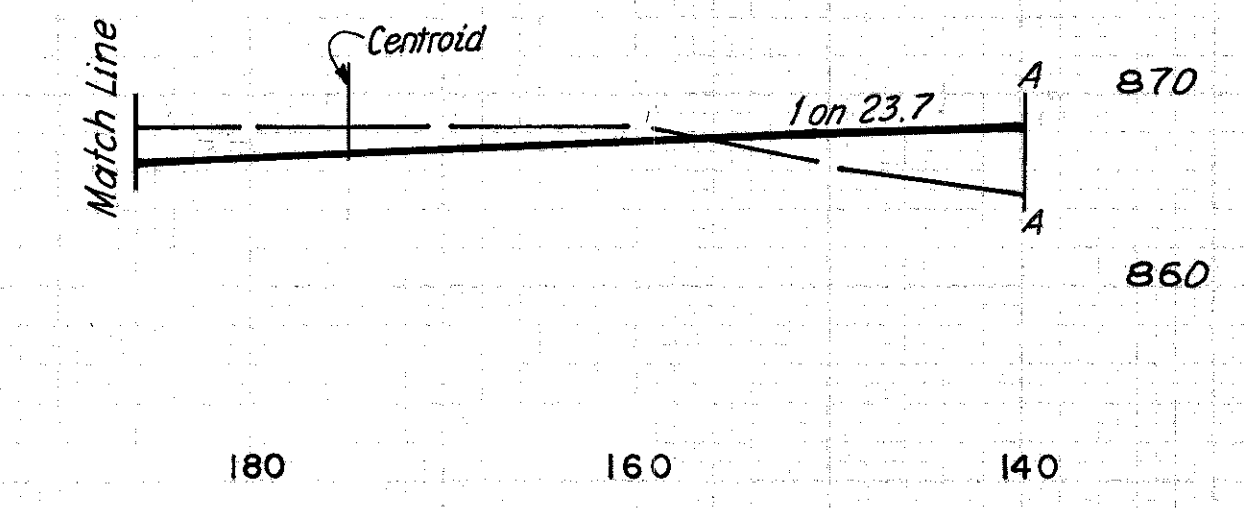
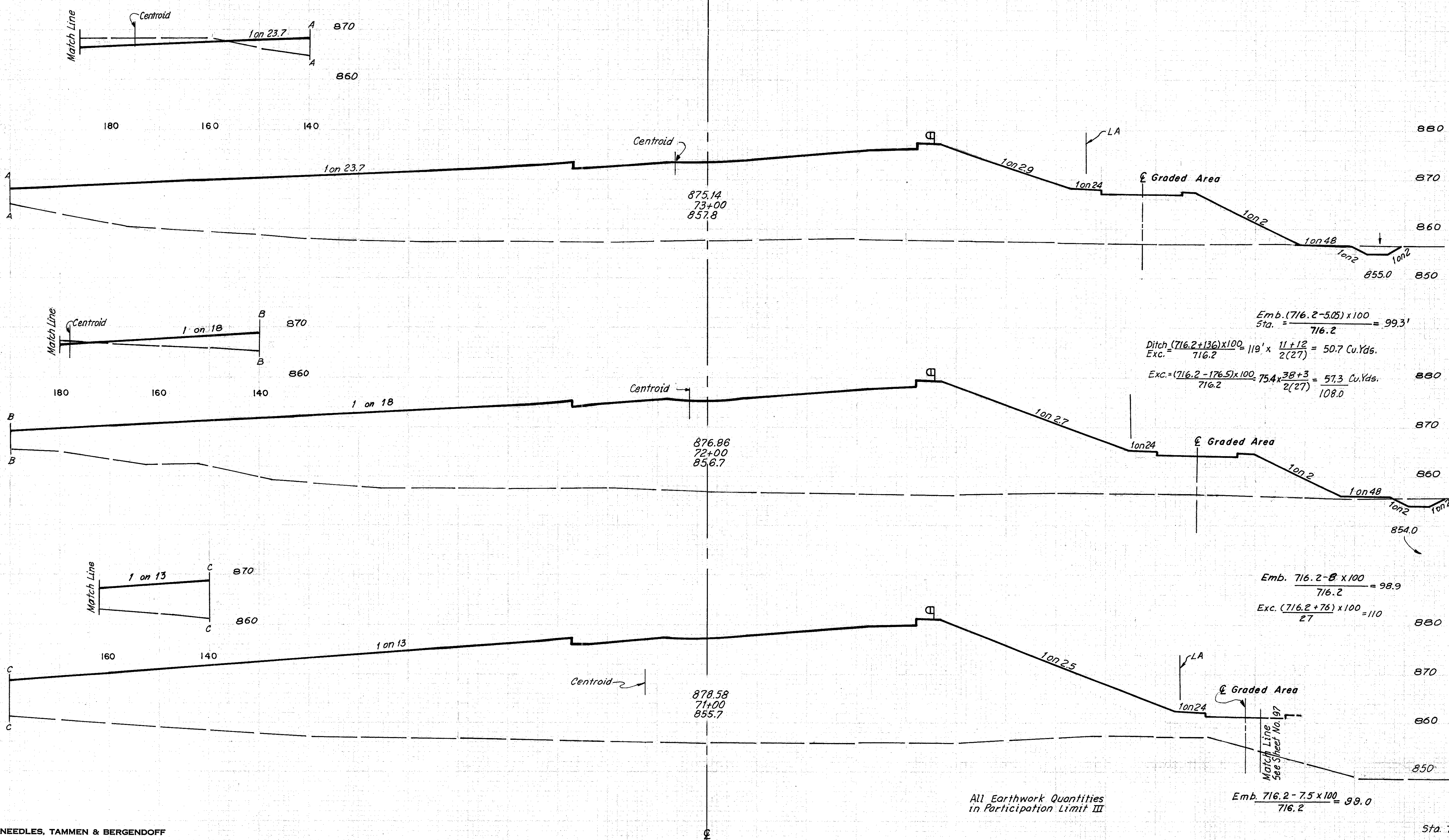
Quantity Calculations
 Made By JEN Date 6-70
 Checked By JM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY
 CUY 480-21.40

8-67
 9-67
 6-72
 H.L.D.
 R.H.A.
 J.E.V.
 J.M.



875.14
 73+00
 857.8

876.86
 72+00
 856.7

878.58
 71+00
 855.7

$$\text{Emb.} = \frac{(716.2 - 5.05) \times 100}{716.2} = 99.3'$$

$$\text{Ditch} = \frac{(716.2 + 136) \times 100}{716.2} = 119' \times \frac{11 + 12}{2(27)} = 50.7 \text{ Cu. Yds.}$$

$$\text{Exc.} = \frac{(716.2 - 176.5) \times 100}{716.2} = 75.4 \times \frac{38 + 3}{2(27)} = 57.3 \text{ Cu. Yds.}$$

$$\text{Emb.} = \frac{716.2 - 8}{716.2} \times 100 = 98.9$$

$$\text{Exc.} = \frac{(716.2 + 76) \times 100}{27} = 110$$

$$\text{Emb.} = \frac{716.2 - 7.5 \times 100}{716.2} = 99.0$$

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
50	3340		
		108	13,058
14	3761		
		29	14,366
0	4285		
		0	15,294
Sta. 70+00	0	4057	

All Earthwork Quantities
 in Participation Limit III

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

140 120 100 80 60 40 20 20 40 60 80 100 120 BEDFORD FREEWAY STA. 71+00 TO STA. 73+00

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

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

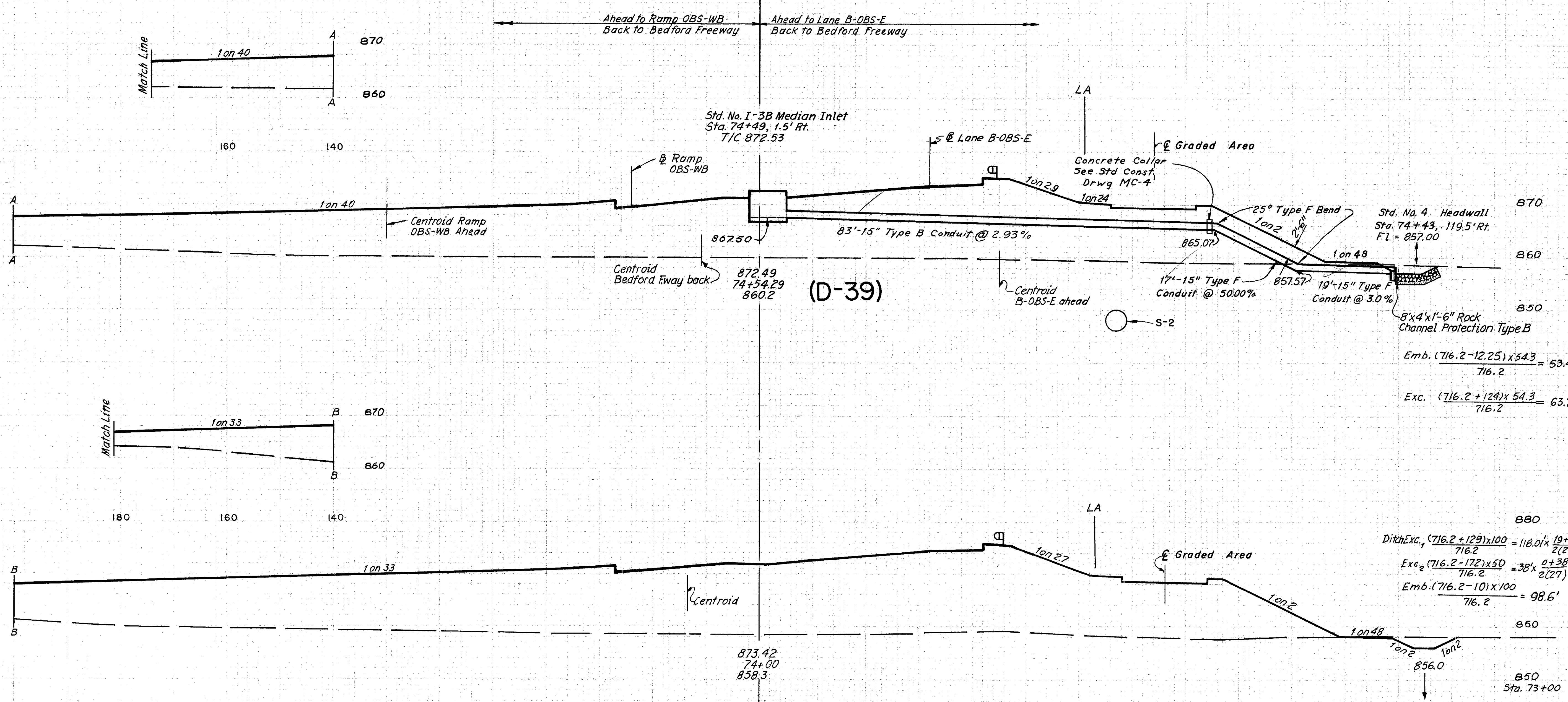
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CUYAHOGA COUNTY
 CUY 480-21.40

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 H/A
 J.E.V.
 J.M.

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

Ahead to Lane B-OBS-E Emb. 1157
 Exc. 11
 Ahead to Ramp OBS-WB Emb. 1393



Emb. $\frac{(716.2 - 12.25) \times 54.3}{716.2} = 53.4'$
 Exc. $\frac{(716.2 + 124) \times 54.3}{716.2} = 63.7'$

Ditch Exc. $\frac{(716.2 + 129) \times 100}{716.2} = 118.0' \times \frac{19 + 12}{2(27)} = 67.75 \text{ Cu Yds.}$
 Exc. $\frac{(716.2 - 172) \times 50}{716.2} = 38' \times \frac{0 + 38}{2(27)} = 26.75 \text{ Cu Yds.}$
 Emb. $\frac{(716.2 - 10) \times 100}{716.2} = 98.6'$

All Earthwork Quantities
 in Participation Limit III

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

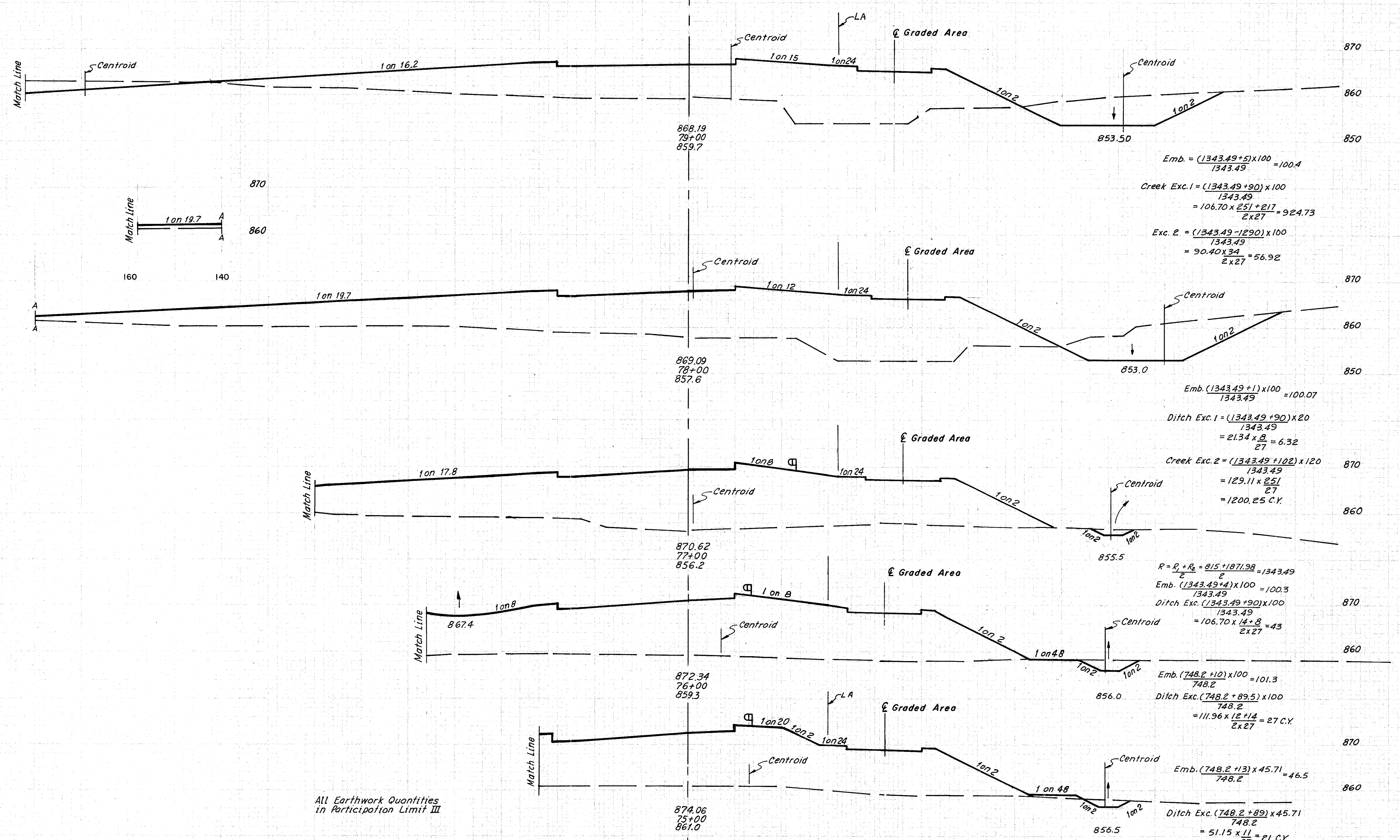
Quantity Calculations
 Made By JEM Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY
 CUY 480-21.40

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 H.F.A.
 J.E.M.
 I.M.



EARTHWORK	
END	VOLUME
EXC.	EMB.
251	1154
251	1648
8	1502
14	1277
12	1034
19	1896
11	1168

Emb. = $\frac{(1343.49+5) \times 100}{1343.49} = 100.4$	
Creek Exc. 1 = $\frac{(1343.49+90) \times 100}{1343.49} = 106.70 \times \frac{251+217}{2 \times 27} = 924.73$	
Exc. 2 = $\frac{(1343.49-1290) \times 100}{1343.49} = 90.40 \times \frac{34}{2 \times 27} = 56.92$	982 5210
Emb. $\frac{(1343.49+1) \times 100}{1343.49} = 100.07$	
Ditch Exc. 1 = $\frac{(1343.49+90) \times 20}{1343.49} = 21.34 \times \frac{8}{27} = 6.32$	1207 5837
Creek Exc. 2 = $\frac{(1343.49+102) \times 120}{1343.49} = 129.11 \times \frac{251}{27} = 1200.25 \text{ C.Y.}$	8 1502
$R = \frac{R_1 + R_2}{2} = \frac{815 + 1871.98}{2} = 1343.49$	
Emb. $\frac{(1343.49+4) \times 100}{1343.49} = 100.3$	41 5162
Ditch Exc. $\frac{(1343.49+90) \times 100}{1343.49} = 106.70 \times \frac{14+8}{2 \times 27} = 43$	
Emb. $\frac{(748.2+10) \times 100}{748.2} = 101.3$	14 1277
Ditch Exc. $\frac{(748.2+89.5) \times 100}{748.2} = 111.96 \times \frac{12+14}{2 \times 27} = 27 \text{ C.Y.}$	48 4335
Emb. $\frac{(748.2+13) \times 45.71}{748.2} = 46.5$	12 1034
Ditch Exc. $\frac{(748.2+89) \times 45.71}{748.2} = 51.15 \times \frac{11}{27} = 21 \text{ C.Y.}$	19 1896
From Bedford Sta. 74+54.29 Ahead Lane B-OBS-E	11 1168

All Earthwork Quantities
 in Participation Limit III

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

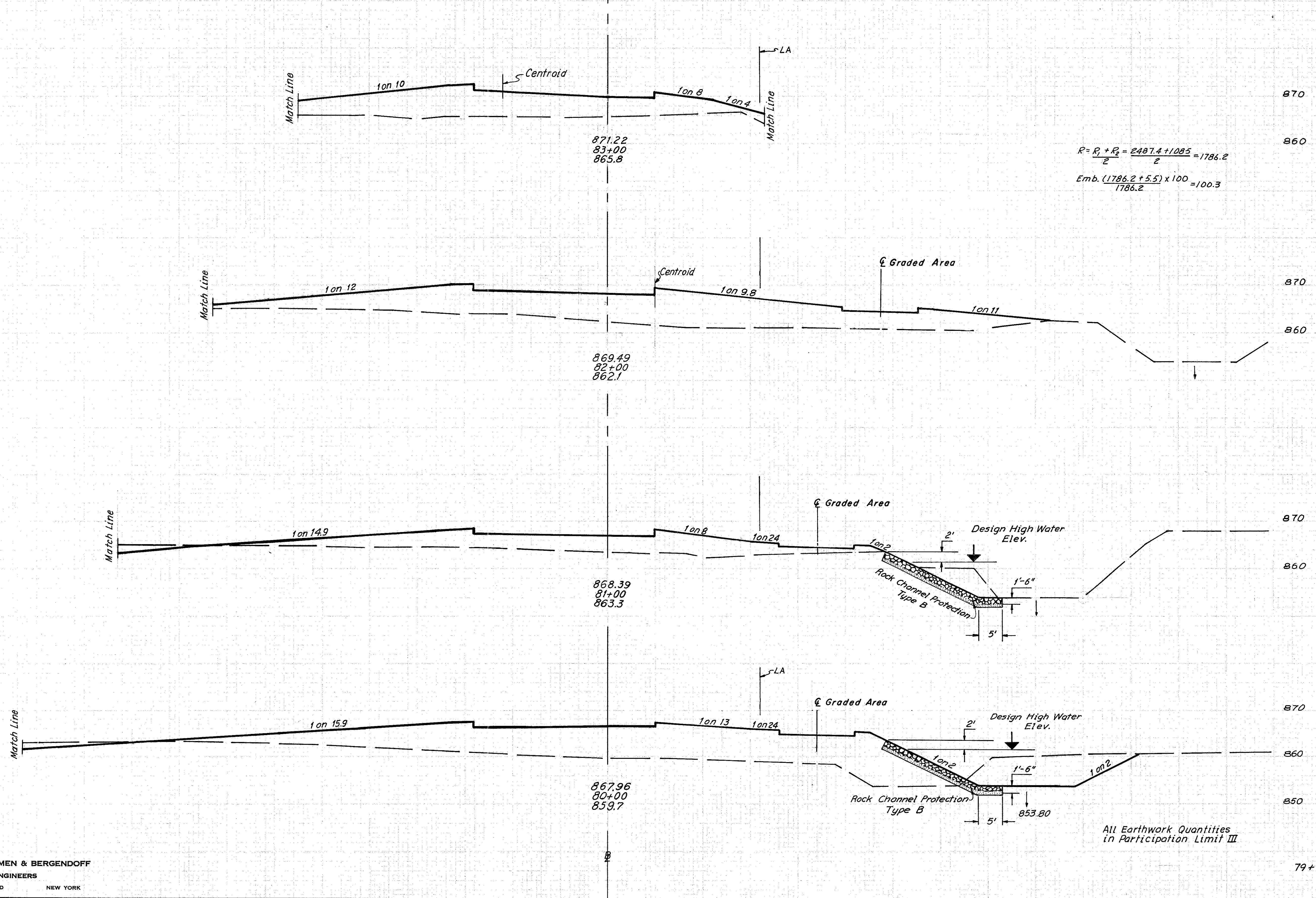
Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY
 CUY 480-21.40

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 H.L.A.
 J.E.N.
 J.M.



$$R = \frac{R_1 + R_2}{2} = \frac{2487.4 + 1085}{2} = 1786.2$$

$$\text{Emb.} = \frac{(1786.2 + 5.5) \times 100}{1786.2} = 100.3$$

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
0	426		
		0	2251
		117	2144
		480	2396
		196	923
		828	3846
		251	1154

All Earthwork Quantities
 in Participation Limit III

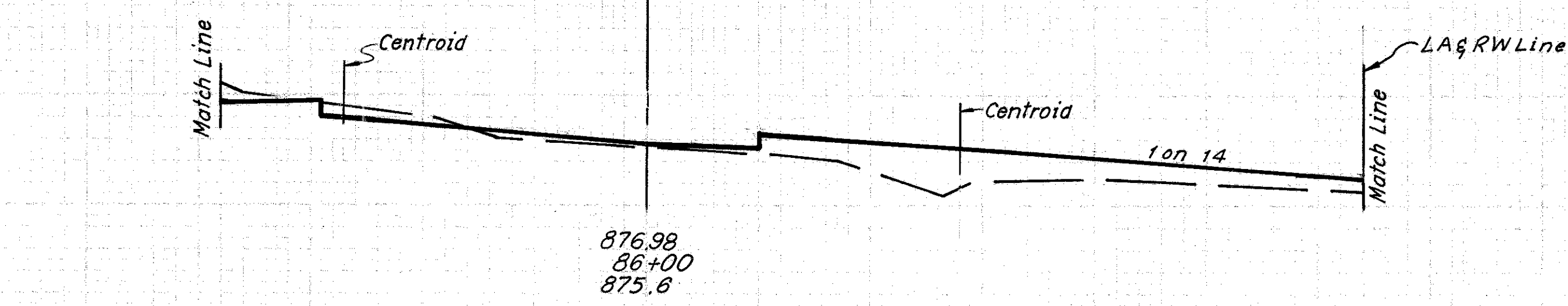
Quantity Calculations
 Made By JEN Date 6-70
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FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY
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 H.L.D.
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 I.M.



$$\text{Emb.} = \frac{(1085 - 26) \times 100}{1085} = 97.6$$

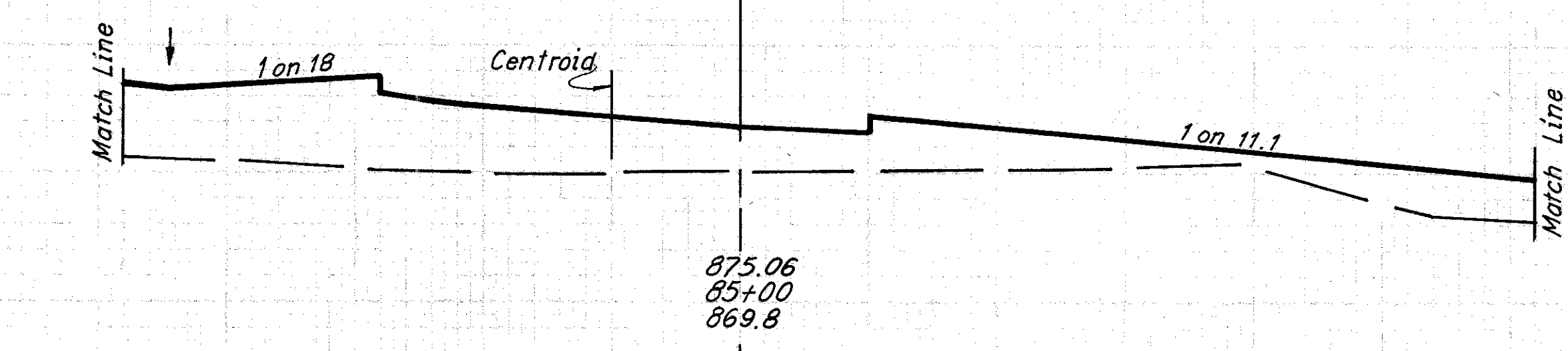
880

$$\text{Exc.} = \frac{(1085 + 25) \times 100}{1085} = 102.3$$

870

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

150	31		
		303	298
10	134		



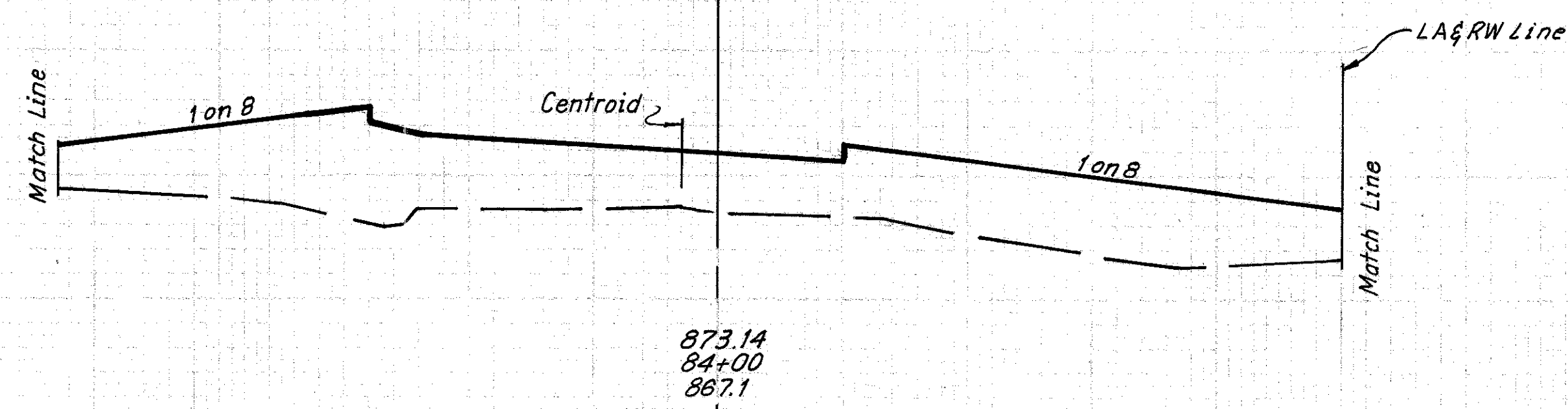
$$\frac{(954.9 - 9) \times 100}{954.9} = 99.1$$

880

870

		19	1042
--	--	----	------

		0	434
--	--	---	-----



$$\frac{(1786.2 + 6) \times 100}{1786.2} = 100.3$$

870

860

$$\frac{(1786.2 + 12) \times 100}{1786.2} = 100.7$$

Sta. 83+00

		0	1896
--	--	---	------

		0	587
--	--	---	-----

		0	1891
		0	426

All Earthwork Quantities
 in Participation Limit III

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

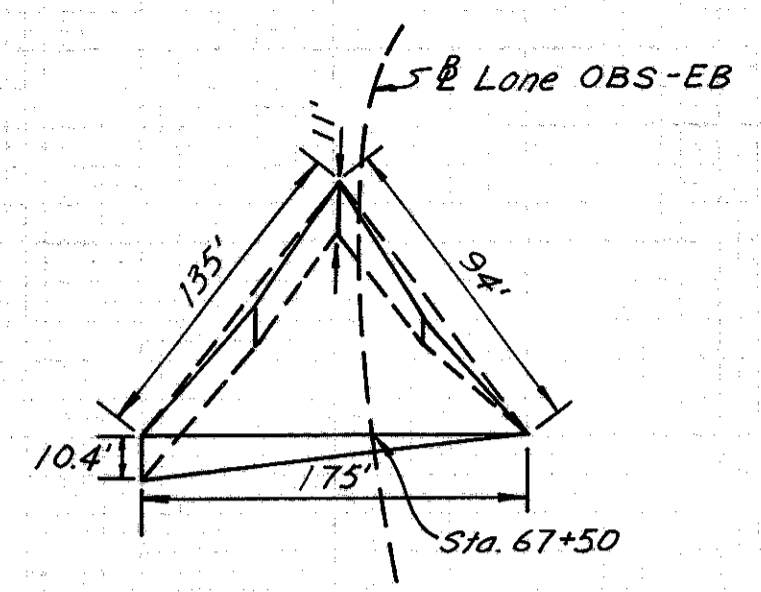
Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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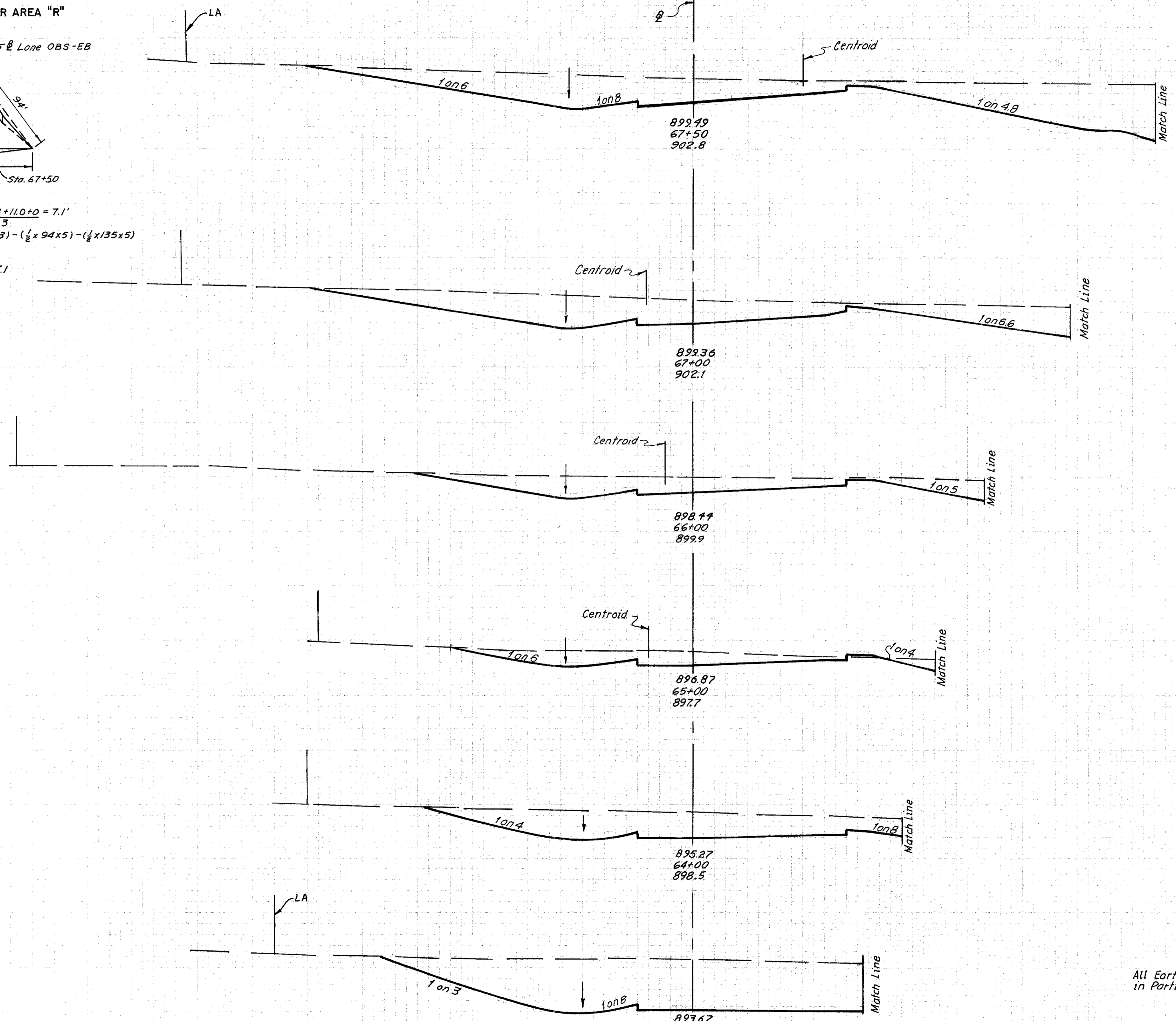
CUYAHOGA COUNTY
 CUY 480-21.40

SPILL QUANTITY FOR AREA "R"



Ave. Depth = $\frac{10.4 + 11.0 + 0}{3} = 7.1'$
 Area = $(\frac{1}{2} \times 175 \times 7.1) - (\frac{1}{2} \times 94 \times 5) - (\frac{1}{2} \times 135 \times 5)$
 = 5815
 Volume = $\frac{5815 \times 7.1}{27}$
 = 1529

H.L.D.
 R.H.A.
 J.E.N.
 I.M.



900
 Spill Quantity
 N. End Abut.
 890

$\frac{(1000+6) \times 50}{1000} = 50.3$

$Exc. = \frac{(2294.9 - 6.5) \times 100}{2294.9} = 99.7$

$Exc. = \frac{(2294.9 - 6.5) \times 100}{2294.9} = 99.7$

$Emb. = \frac{(2294.9 + 30) \times 100}{2294.9} = 101.3$

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
		1529	0
651	0		
		1039	0
464	0		
		1283	0
231	0		
		667	6
130	3		
		889	6
350	0		
		1917	0
685	0		
		1736	0
780	0		

All Earthwork Quantities
 in Participation Limit III

890
 Sta. 62+36
 See Sheet
 (Bedford Sta. 57+00)

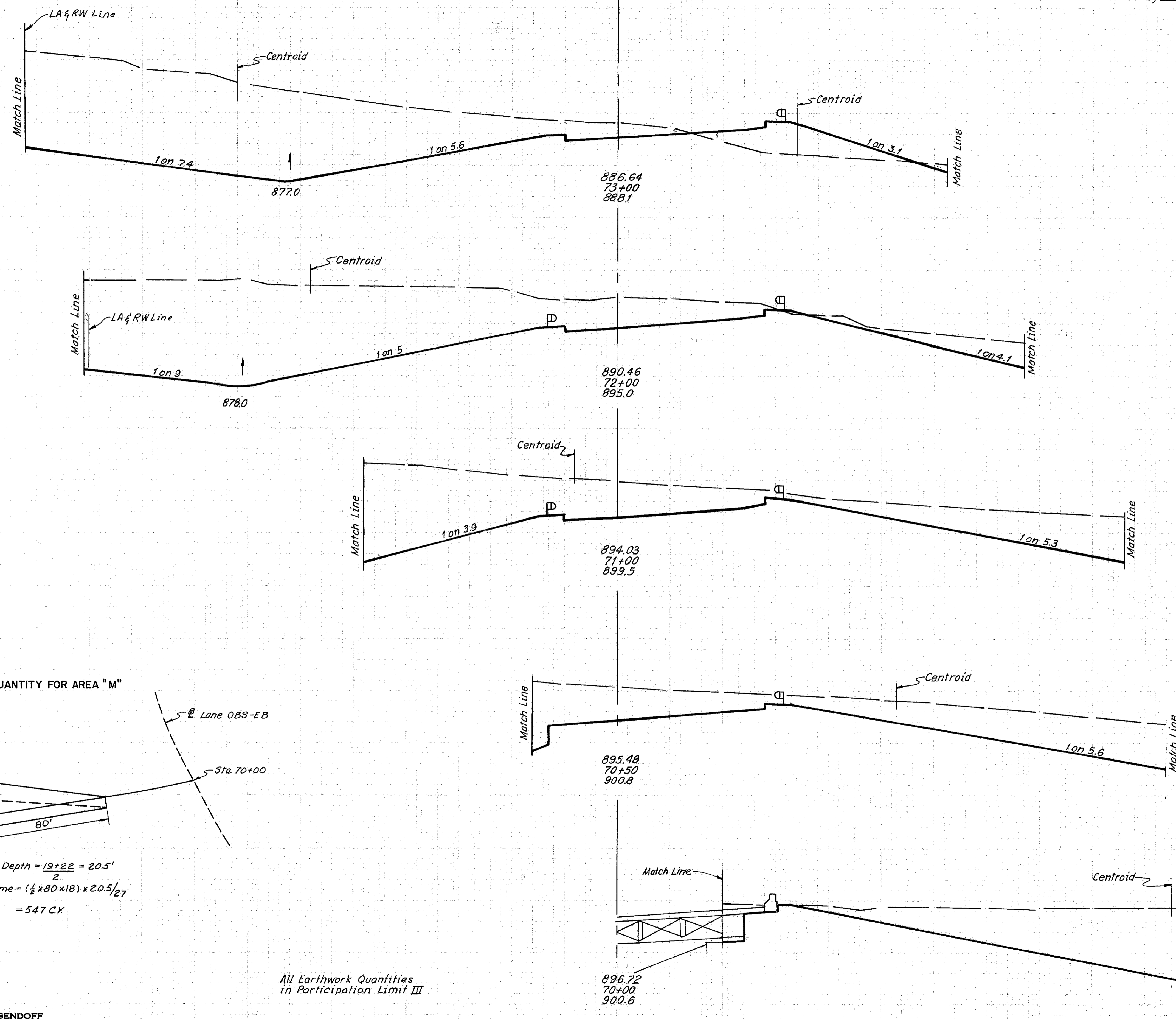
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
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 KANSAS CITY CLEVELAND NEW YORK

Quantity Calculations
 Made By JEN Date 6-70
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900				
890				
880	1463	134		
900				
890	1584	1		
880				
900				
890	974	0		
880				
900				
890	660	0		
880				
900				
890	964	0		
880				

$$Exc. = \frac{(1000 - 65) \times 100}{1000} = 93.5$$

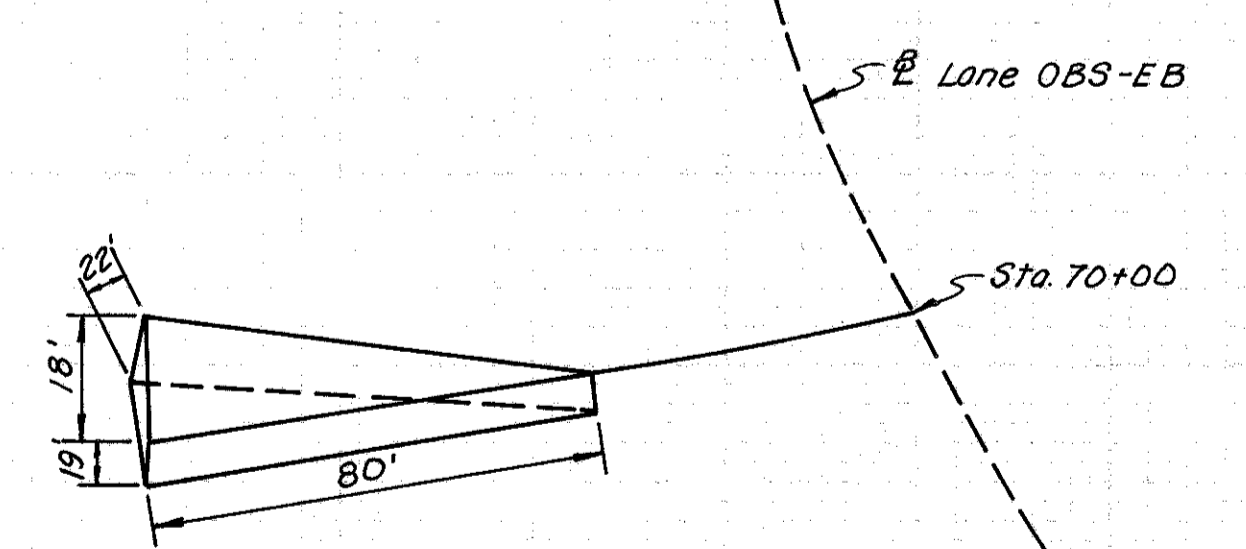
$$Emb. = \frac{(1000 + 33) \times 100}{1000} = 103.3$$

$$\frac{(881.5 - 33) \times 100}{881.5} = 96.3$$

$$\frac{(881.5 + 22.5) \times 50}{881.5} = 51.3$$

$$\frac{(881.5 + 79) \times 50}{881.5} = 54.5$$

SPILL QUANTITY FOR AREA "M"



Ave. Depth = $\frac{19+22}{2} = 20.5'$
 Volume = $(\frac{1}{2} \times 80 \times 18) \times 20.5 / 27$
 = 547 C.Y.

All Earthwork Quantities
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Spill Quantity
 S. Abutment

547 0

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 H.L.D.
 R.H.A.
 JEN
 IM

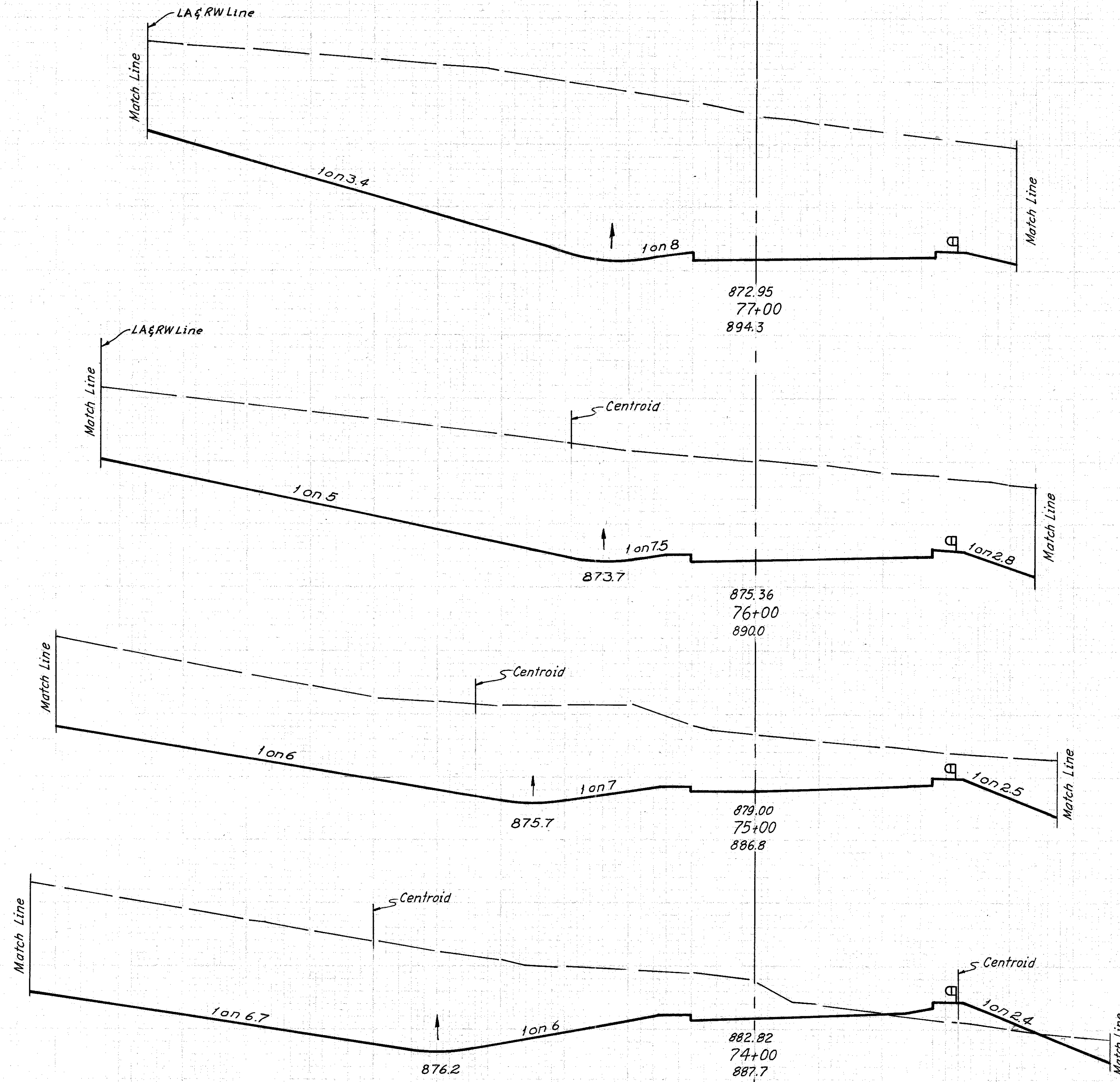
Quantity Calculations
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CUYAHOGA COUNTY
 CUY 480-21.40

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 9-67
 6-72
 HLD
 RHA
 JEM



Back From EB-I-480
 Sta. 77+99
 See Sheet No 127
 (I-80 1178+00)

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
931	32		
		7152	59
890			
2970	0		
880			
870		9567	0
872.95 77+00 894.3			
890			
2196	0		
880			
870			
875.36 76+00 890.0			
890			
		7251	0
		$\frac{(2294.9 - 36.5) \times 100}{2294.9} = 98.4$	
880			
1783	0		
870			
879.00 75+00 886.8			
890			
		6155	71
		$\frac{(2294.9 - 52) \times 100}{2294.9} = 97.7$	
880			
		$\text{Emb. } \frac{(2294.9 + 32) \times 100}{2294.9} = 101.4$	
890			
		1619	38
		$\frac{(1000 - 66) \times 100}{1000} = 93.4$	
880			
		5331	327
		$\text{Emb. } \frac{(1000 + 26) \times 100}{1000} = 102.6$	
870			
882.82 74+00 887.7			
890			
		1143	134
		3082	122

All Earthwork Quantities
 in Participation Limit III

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

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

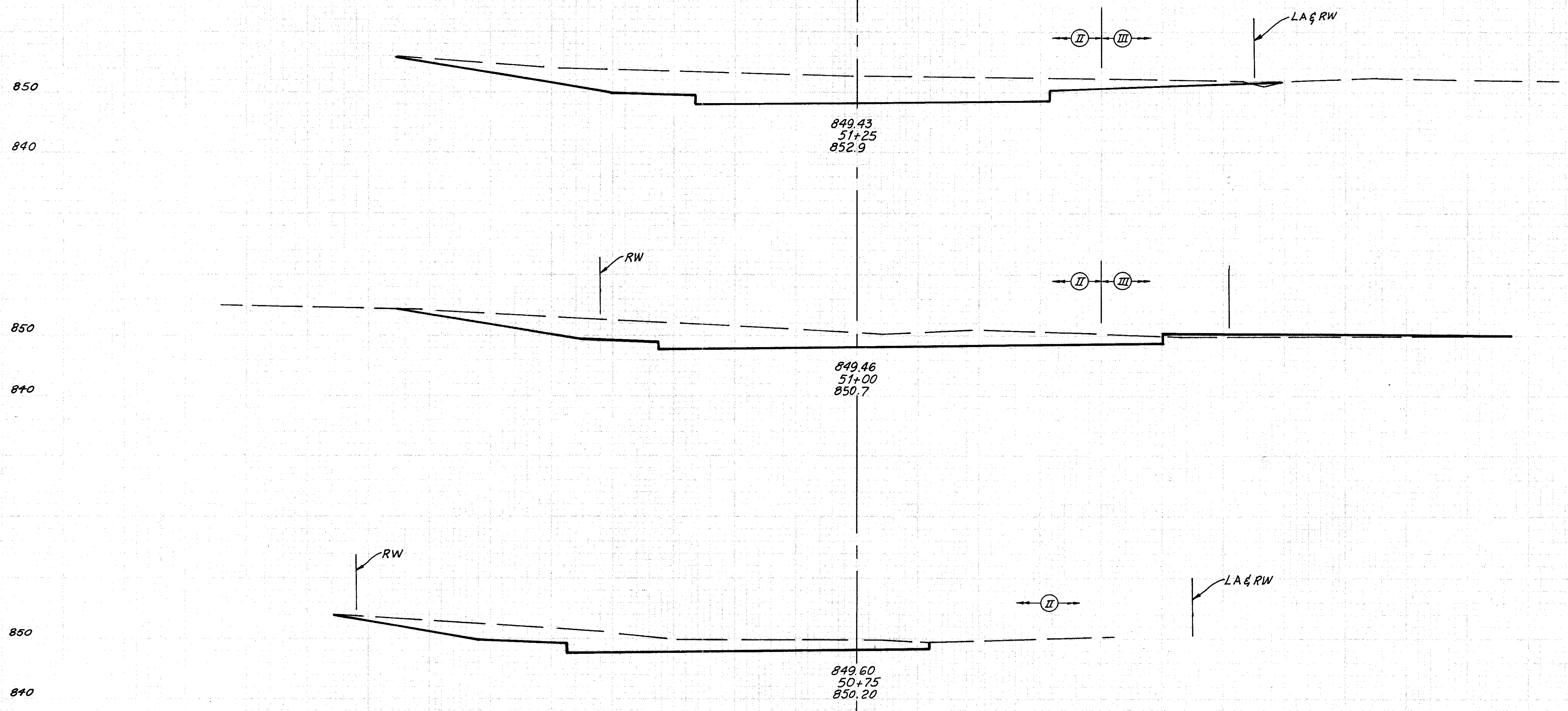
Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

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CUYAHOGA COUNTY
 CUY-480-21.40

8-63
 9-63
 6-72
 H.D.
 J.E.V.
 J.M.



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
399 24	0 0		
		322 17	0 9
296 15	0 20		
		231 7	0 9
204 0	0		
		35 0	0 0
261 0			

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

Sta 50+70.81
 Participation Area II 000
 Participation Area III 000

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

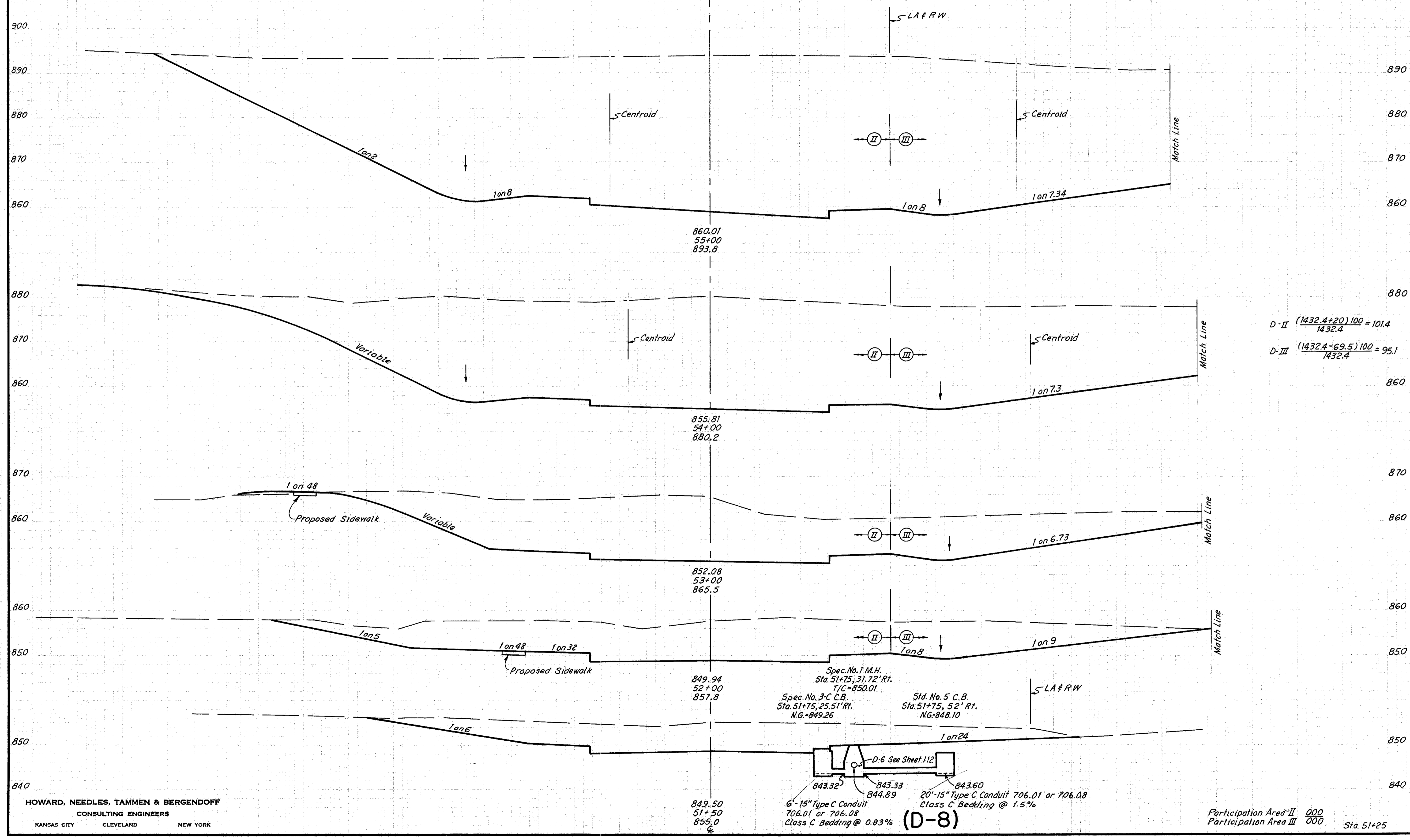
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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390

CUYAHOGA COUNTY
 CUY - 480 - 21.40

EARTHWORK

END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.



$$D-II \frac{(1432.4+20)100}{1432.4} = 101.4$$

$$D-III \frac{(1432.4-69.5)100}{1432.4} = 95.1$$

890					
880					
870					
860					
	4309	0			
	1917	0			
880					
870					
860					
				13494	0
				5775	0
860					
	2877	0			
	1362	0			
870					
860					
				7628	0
				3400	0
870					
860					
	1242	0			
	474	0			
860					
				3981	0
				1530	0
850					
	908	0			
	352	0			
850					
				1399	0
				434	0
850					
	603	0			
	117	0			
840					
				464	0
				65	0
				399	0
				24	0

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

Participation Area II 000
 Participation Area III 000

REL. MC CRACKEN RD. STA. 51+25 TO STA. 55+00

120 100 80 60 40 20 0 20 40 60 80 100 120

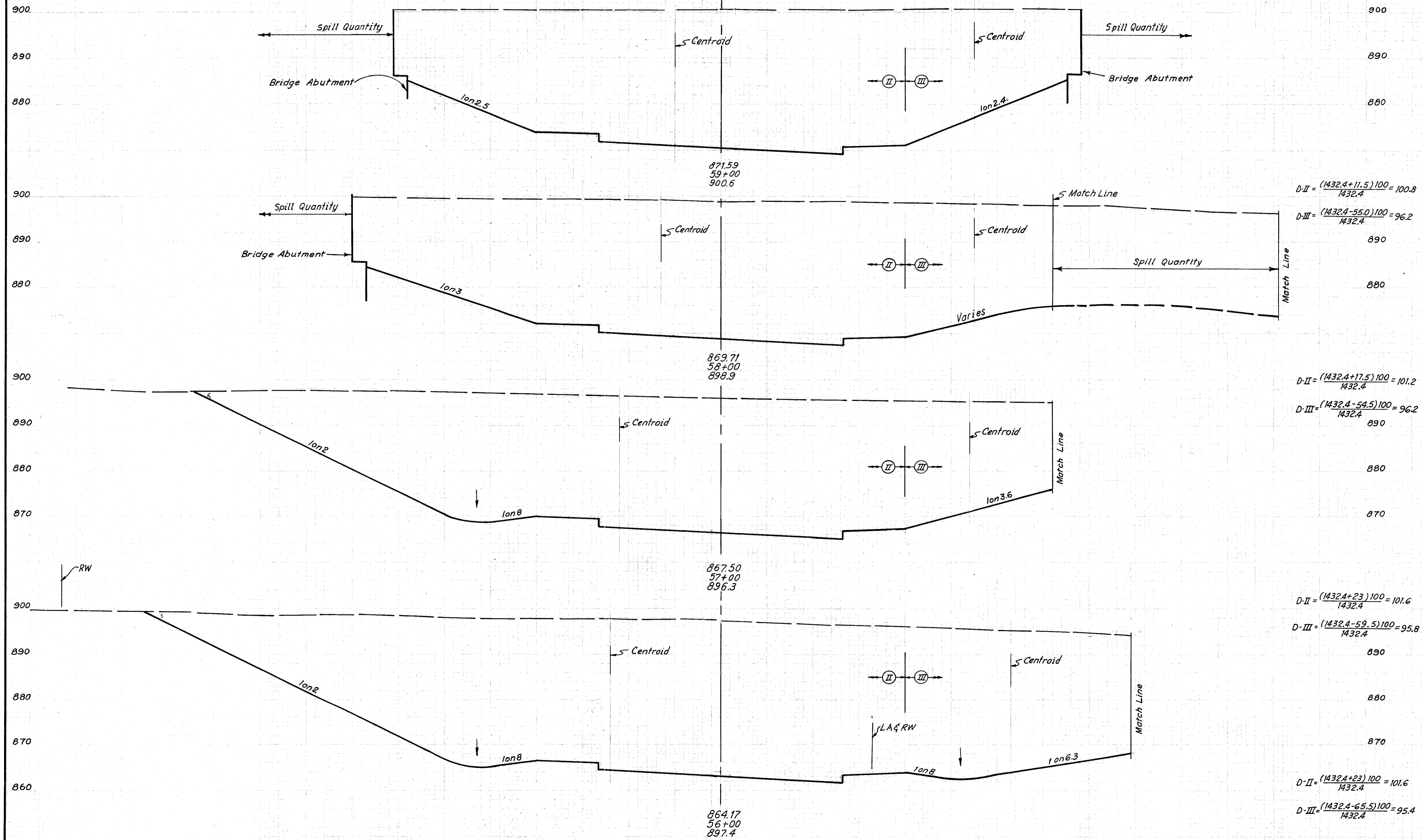
Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY-480-21.40

W.L.L.
 R.F.T.
 J.E.W.
 8-67
 9-67
 6-72



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
2996	0		
838	0		
		11609	0
		2934	0
		3223	0
		809	0
		12845	0
		2781	0
		3631	0
		752	0
		15022	0
		3995	0
		4353	0
		1500	0
		16297	0
		6037	0
		4309	0
		1917	0

$$D-II = \frac{(1432.4 + 11.5)100}{1432.4} = 100.8$$

$$D-III = \frac{(1432.4 - 55.0)100}{1432.4} = 96.2$$

$$D-II = \frac{(1432.4 + 17.5)100}{1432.4} = 101.2$$

$$D-III = \frac{(1432.4 - 54.5)100}{1432.4} = 96.2$$

$$D-II = \frac{(1432.4 + 23)100}{1432.4} = 101.6$$

$$D-III = \frac{(1432.4 - 59.5)100}{1432.4} = 95.8$$

$$D-II = \frac{(1432.4 + 23)100}{1432.4} = 101.6$$

$$D-III = \frac{(1432.4 - 65.5)100}{1432.4} = 95.4$$

Participation Area II 000 Sta. 55+00 4309 0
 Participation Area III 000 1917 0

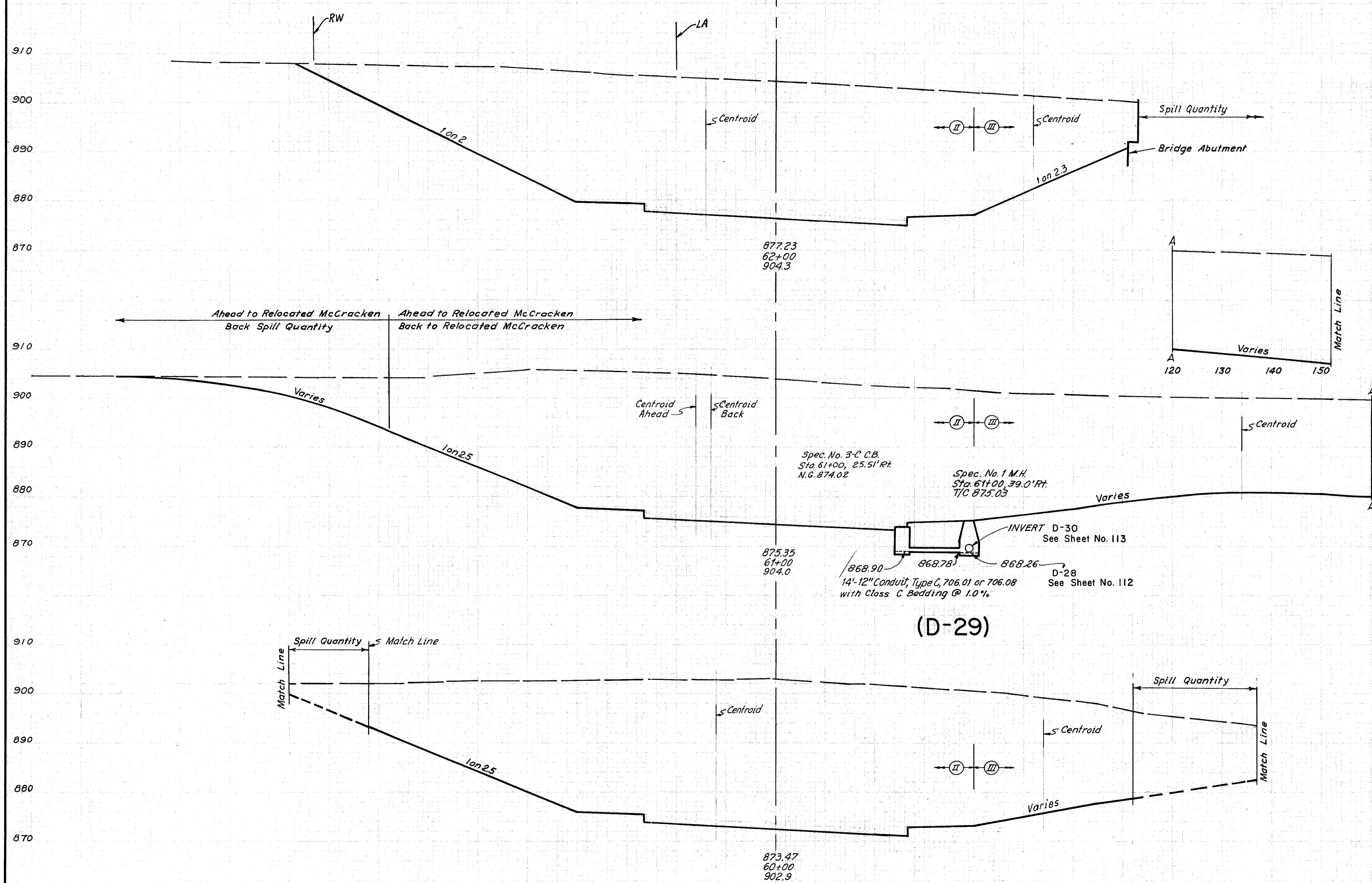
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

Quantity Calculations
 Made By *JEN* Date 6-70
 Checked By *IM* Date 6-72

FED. RD. DIVISION 2	STATE OHIO	PROJECT 163 390
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CUYAHOGA COUNTY
 CUY-480-21.40

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 9-67
 6-72
 FCW
 RFL
 JEM



REL. M.C. CRACKEN STA.	EARTHWORK		TO STA.
	END EXC.	AREA EMB.	
910			
900			
890			
880			
870			
910	2965	0	
890	552	0	
880			
910			
880	$D_{II} = \frac{(1432.4 + 15.0)100}{1432.4} = 101.0$		
900	$D_{III} = \frac{(1432.4 - 73.0)100}{1432.4} = 94.9$		
890			
880			
870	3234	0	
Ahead	2362	0	
Back	3049	0	
870	2362	0	
910			
890			
880			
870			
910			
890	$D_{II} = \frac{(1432.4 + 12.5)100}{1432.4} = 100.9$		
880	$D_{III} = \frac{(1432.4 - 74.0)100}{1432.4} = 94.8$		
870			
910	3096	0	
870	729	0	
870	$D_{II} = \frac{(1432.4 + 11.0)100}{1432.4} = 100.8$		
880	$D_{III} = \frac{(1432.4 - 54.5)100}{1432.4} = 96.2$		
870			
910			
870	2996	0	
838	838	0	
Participation Area II 000			
Participation Area III 000			

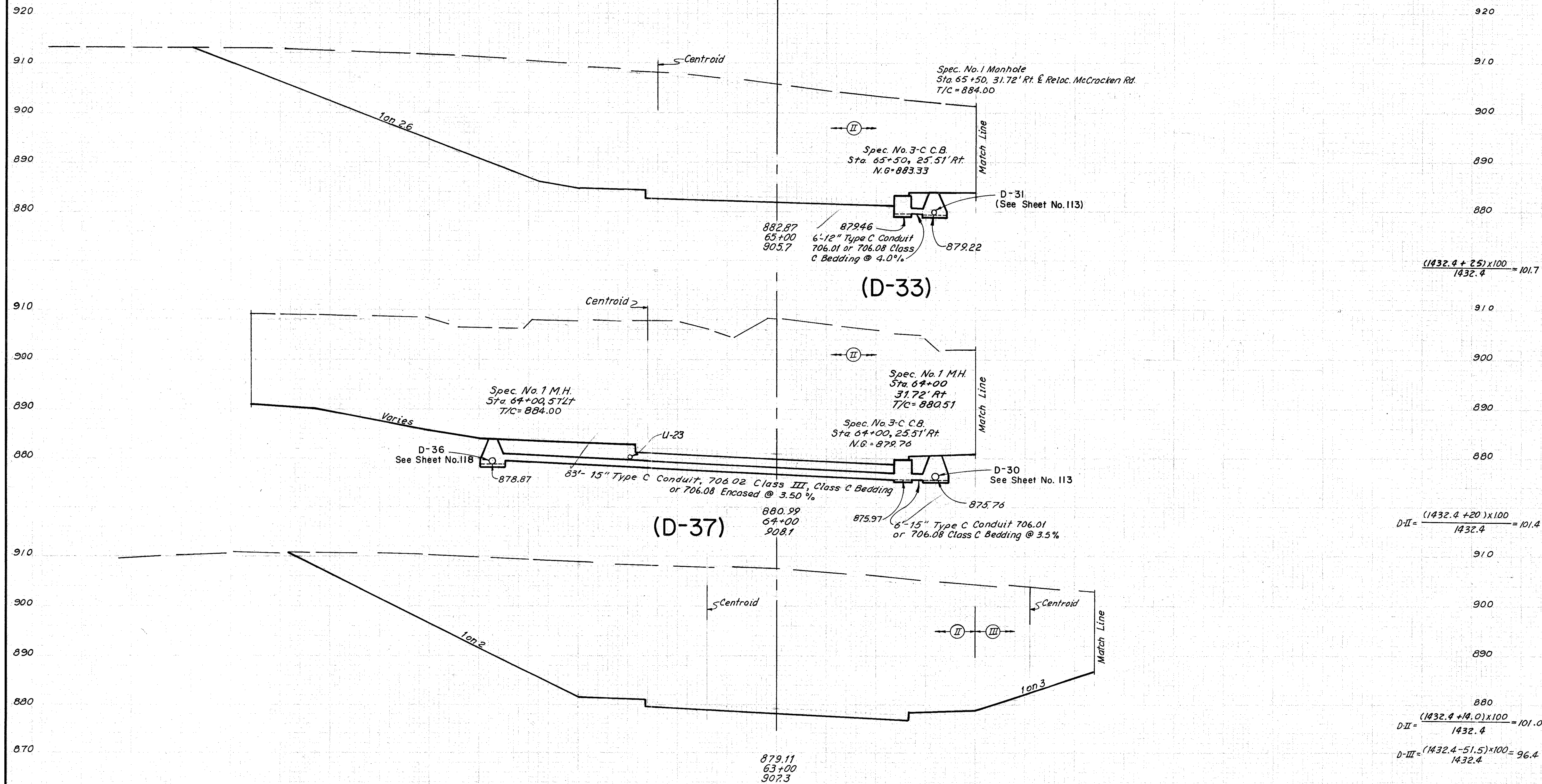
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY
 CUY-480-21.40



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
2921	0		
0	0		

$$\frac{(1432.4 + 25) \times 100}{1432.4} = 101.7$$

$$D-II = \frac{(1432.4 + 20) \times 100}{1432.4} = 101.4$$

$$D-II = \frac{(1432.4 + 14.0) \times 100}{1432.4} = 101.0$$

$$D-III = \frac{(1432.4 - 51.5) \times 100}{1432.4} = 96.4$$

12,002 0 0

12,266 926 0

11,306 1,878 0

2,965 552 0

8-67
9-67
6-70
J.E.N.
I.M.

120

100

80

60

40

20

0

20

40

60

80

100

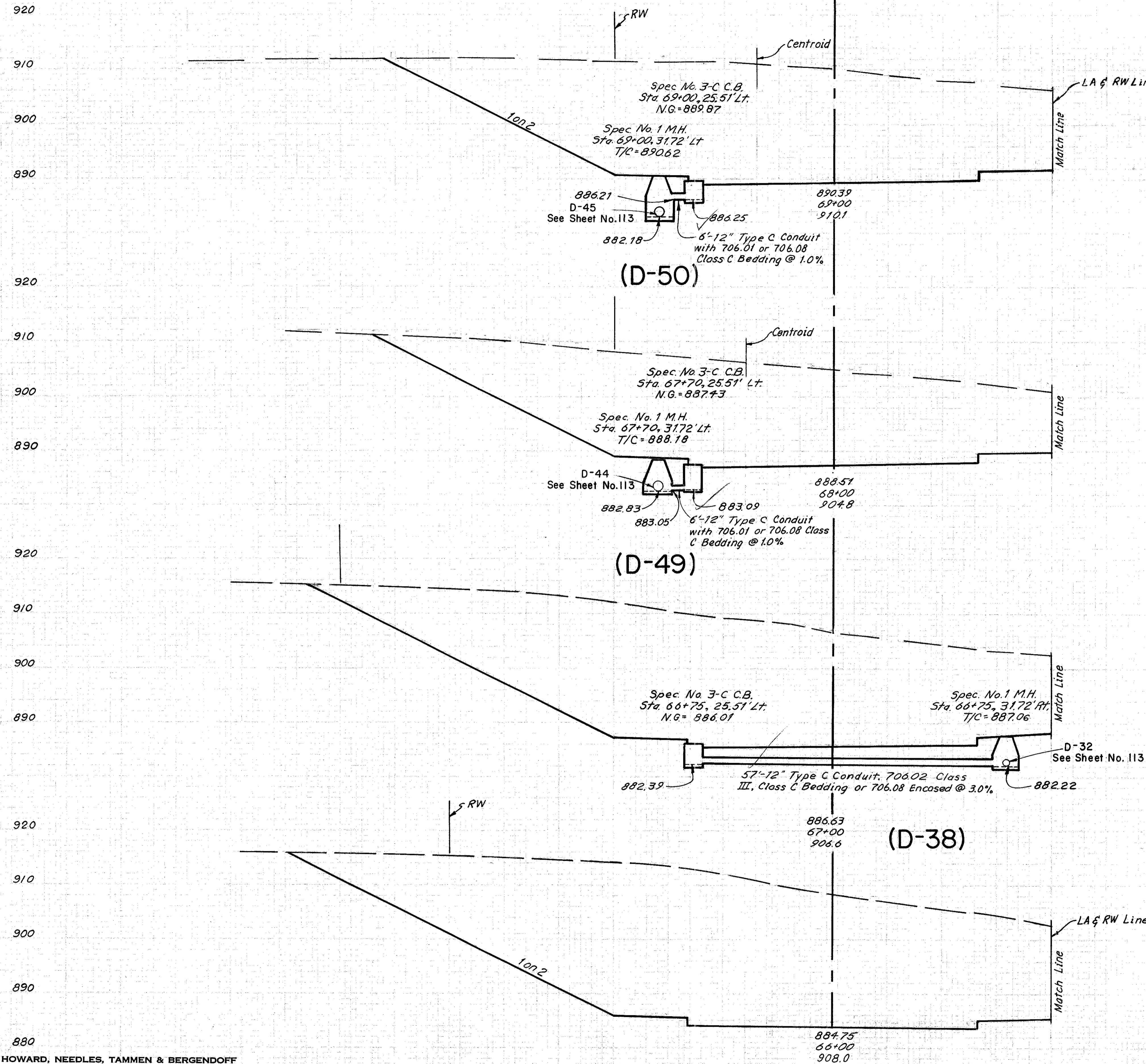
120

Quantity Calculations
 Made By JEM Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

165
390

CUYAHOGA COUNTY
 CUY-480-21.40



END	EARTHWORK		
	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
2039	0		
		7084	0
1798	0		
		7731	0
2377	0		
		9591	0
2802	0		
		10,598	0
2921	0		

$$\frac{(5729.6-15) \times 100}{5729.6} = 99.7$$

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FCM
RFT
JEM

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

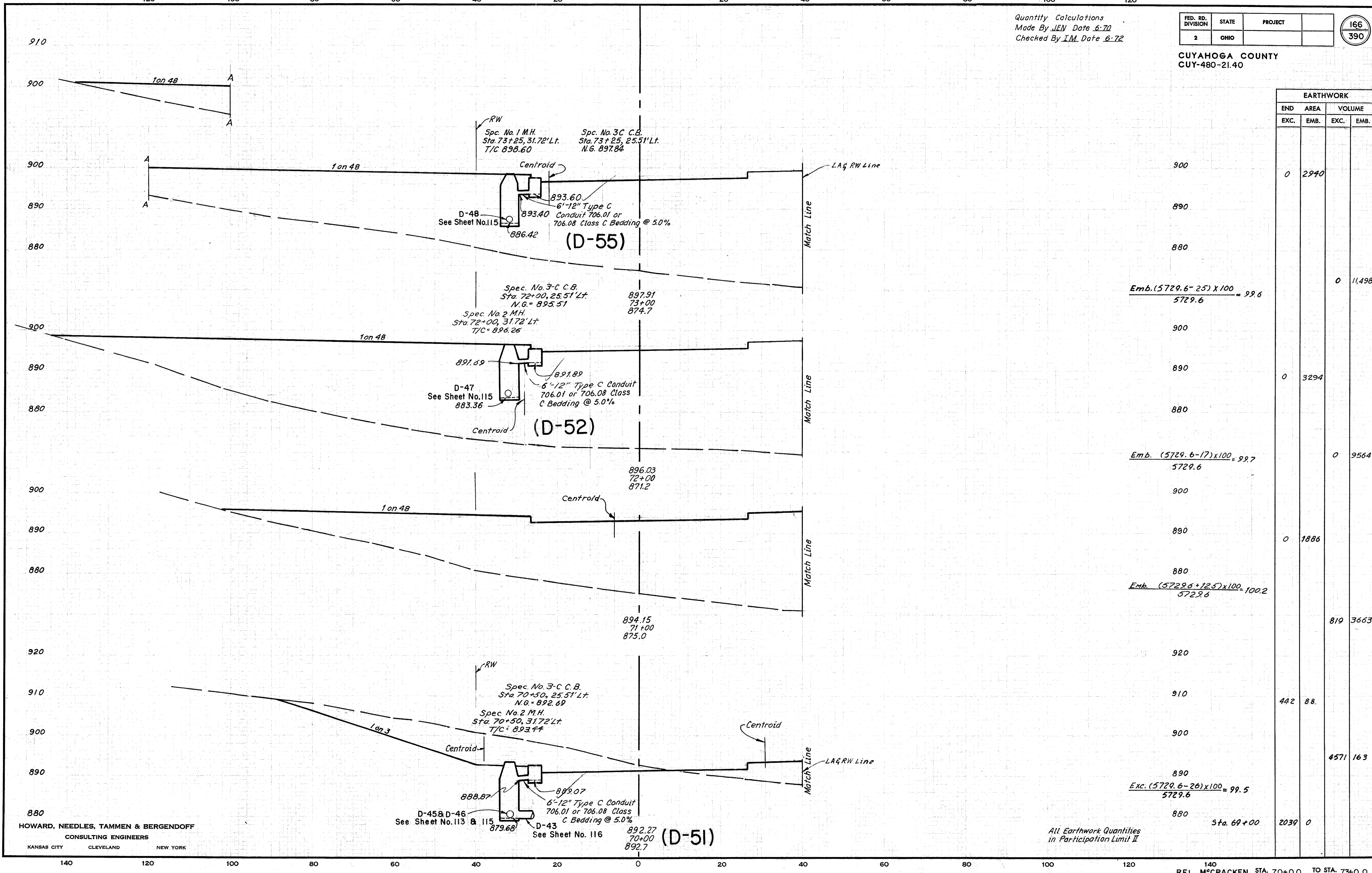
Sta. 65+00
 All Earthwork Quantities
 in Participation Limit II

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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390

CUYAHOGA COUNTY
 CUY-480-21.40



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
	0	2940	
			0 11,498
			$\frac{Emb. (5729.6 - 25) \times 100}{5729.6} = 99.6$
	0	3294	
			0 9564
			$\frac{Emb. (5729.6 - 17) \times 100}{5729.6} = 99.7$
	0	1886	
			819 3663
			$\frac{Emb. (5729.6 + 125) \times 100}{5729.6} = 100.2$
	442	88	
			4571 163
			$\frac{Exc. (5729.6 - 26) \times 100}{5729.6} = 99.5$
	2039	0	
			Sta. 69+00

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 6-72
 W.L.L.
 P.F.W.
 J.E.W.

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

All Earthwork Quantities
 in Participation Limit II

REL. MCCRACKEN STA. 70+00 TO STA. 73+00

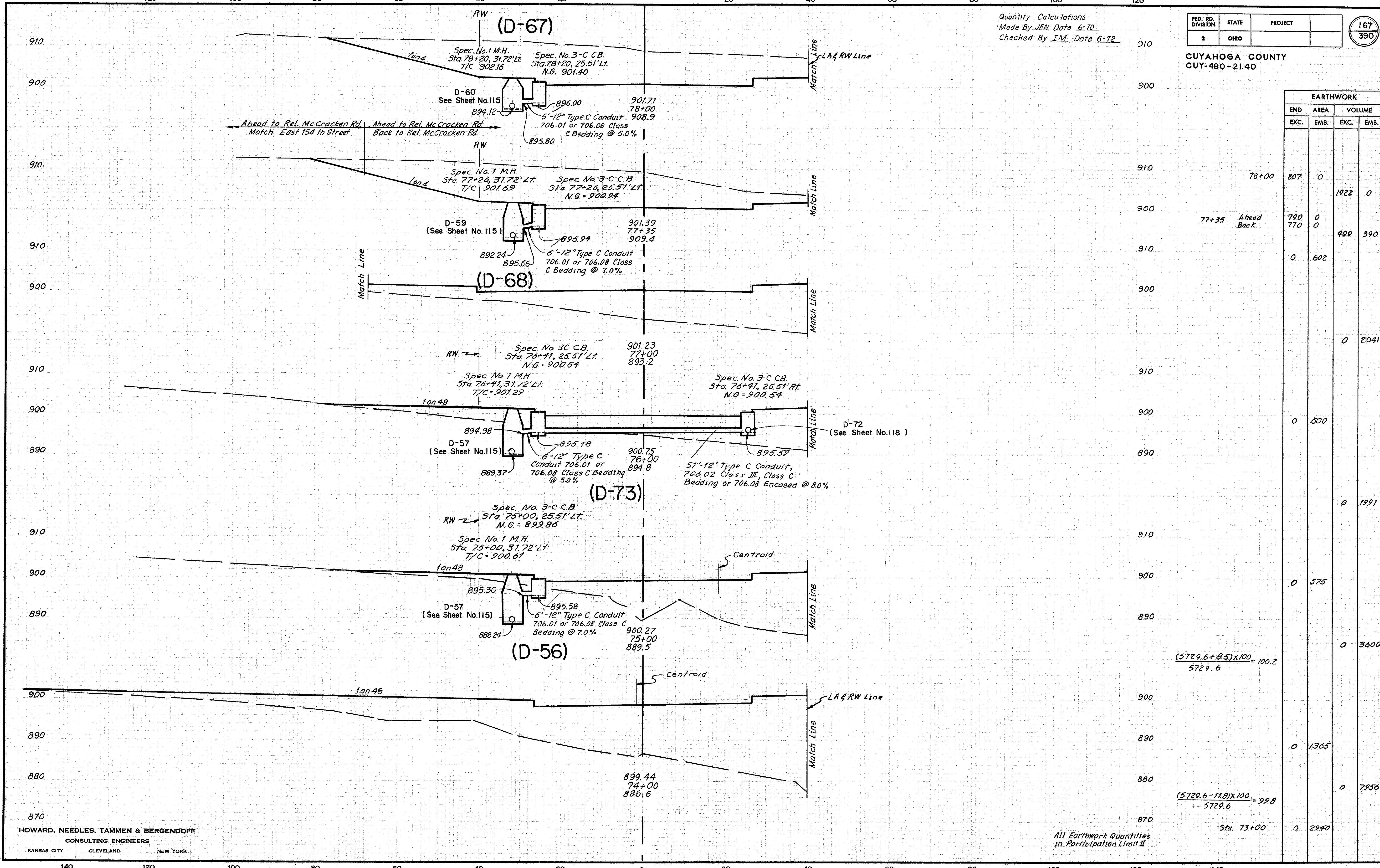
120 100 80 60 40 20 20 40 60 80 100 120

Quantity Calculations
 Made By JEM Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT	167 390
2	OHIO		

CUYAHOGA COUNTY
 CUY-480-21.40

B-67
 9-67
 6-72
 F.C.W.
 R.F.T.
 J.E.N.
 I.M.



END	EARTHWORK			
	AREA		VOLUME	
	EXC.	EMB.	EXC.	EMB.
78+00	807	0	1922	0
77+35	790	0	499	390
770	0	602		
			0	2041
				0
			0	1991
				0
			0	3600
				0
			0	1365
				0
			0	7956
				0
			0	2940

$$\frac{(5729.6 + 8.5) \times 100}{5729.6} = 100.2$$

$$\frac{(5729.6 - 11.8) \times 100}{5729.6} = 99.8$$

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

All Earthwork Quantities
 in Participation Limit II

Quantity Calculations
 Made By JEN Date 6-72
 Checked By IM Date 6-72

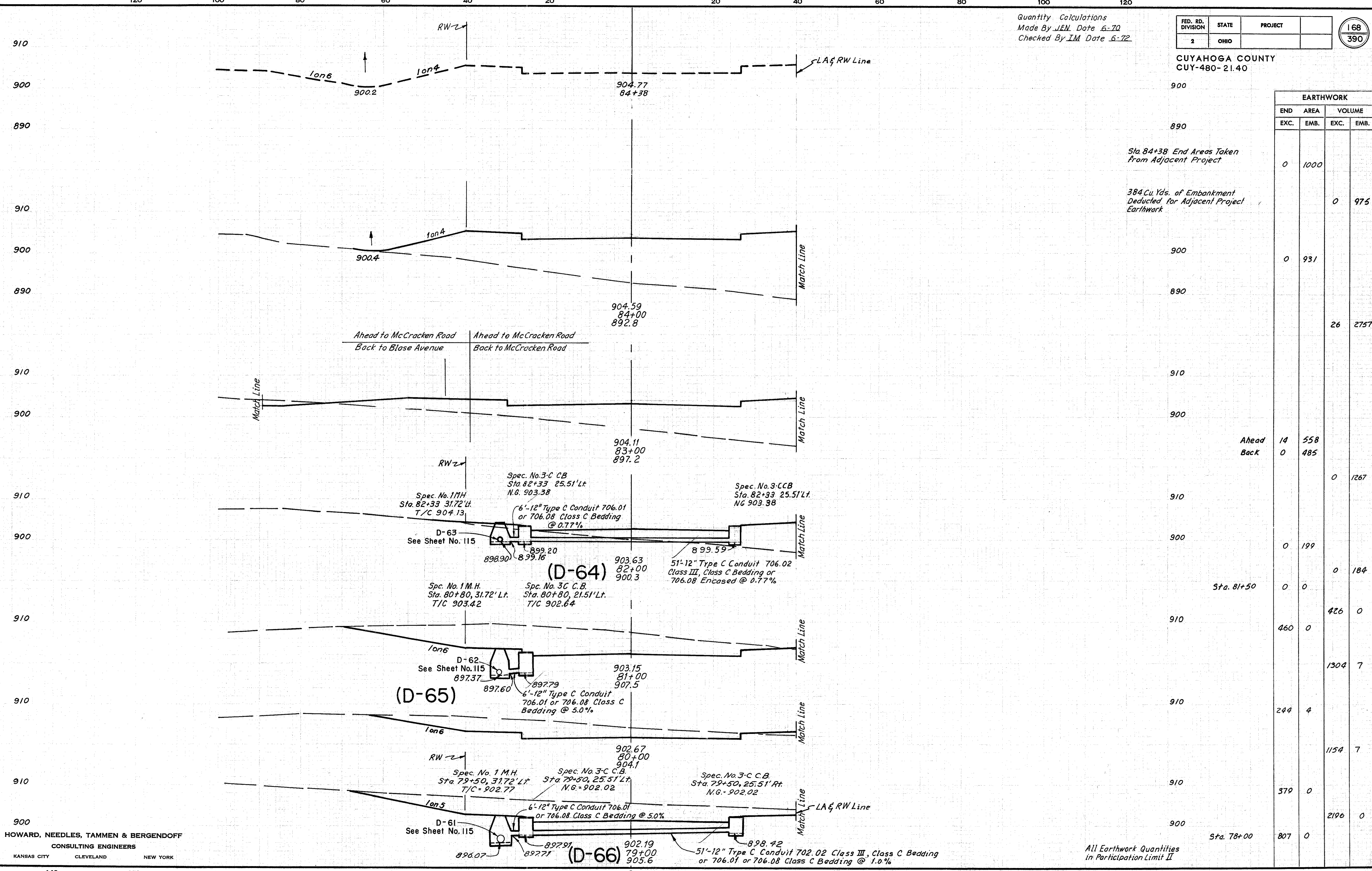
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY-480-21.40

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9-67
6-72
6-72

W.L.L.
R.F.N.
J.E.N.
I.M.



END	EARTHWORK		END	EARTHWORK	
	EXC.	EMB.		EXC.	EMB.
900	0	1000	900	0	975
890	0	931	890	26	2757
910	Ahead 14	558	910	0	1267
900	Back 0	485	900	0	184
910			910	0	426
900			900	460	0
910			910	244	4
900			900	1154	7
910			910	379	0
900			900	2196	0
900			900	807	0

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

All Earthwork Quantities
 in Participation Limit II

REL. McCracken STA. 79+00 TO STA. 84+50

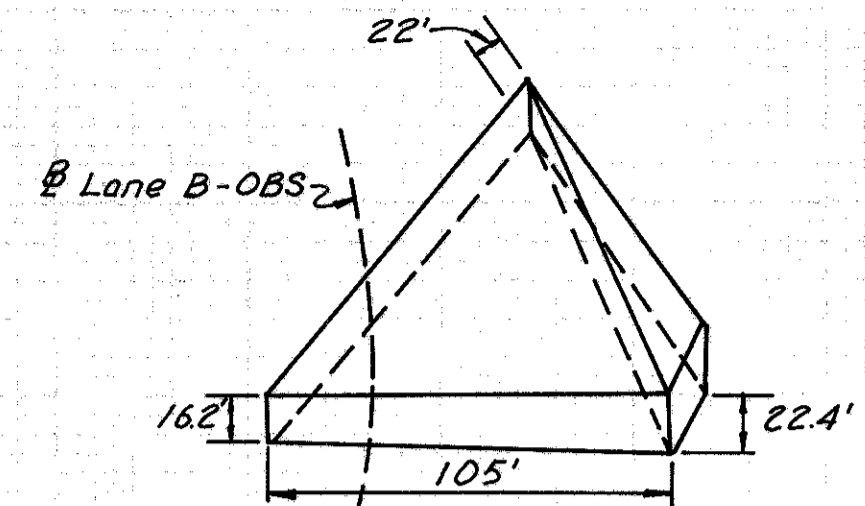
Quantity Calculations
 Made By J.E.N. Date 6-72
 Checked By I.M. Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

169
390

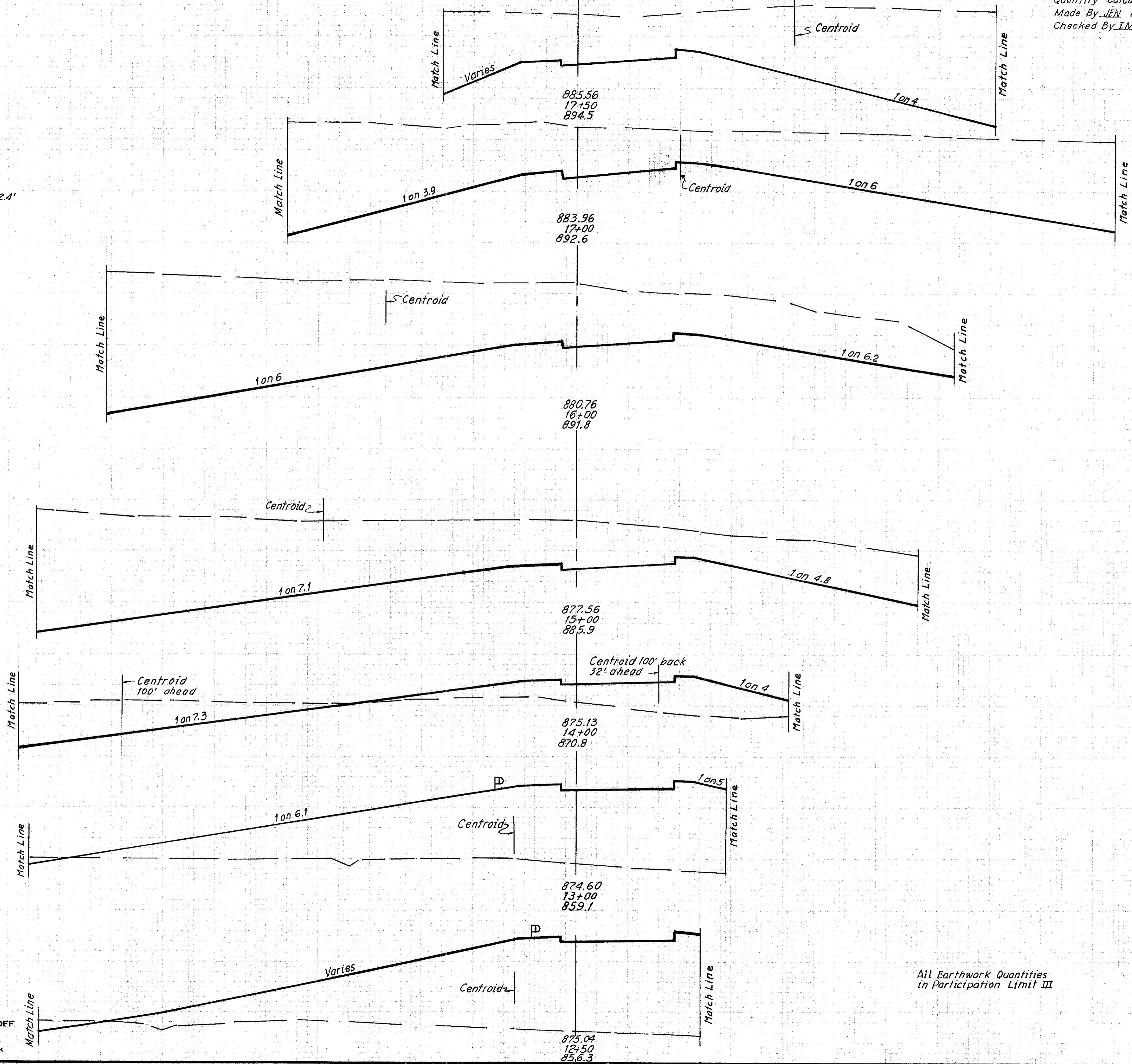
CUYAHOGA COUNTY
 CUY 480-21.40

SPILL QUANTITY FOR AREA "P"



Ave. Depth = $\frac{16.2 + 22 + 22.4}{3} = 20.2'$
 Area = $(\frac{1}{2} \times 105 \times 60) + (\frac{1}{2} \times 70 \times 6)$
 = 3360 Sq. Ft.
 Volume = $\frac{3360 \times 20.2}{27}$
 = 2514 C.Y.

6-67
 6-67
 6-72
 H.L.D.
 J.E.N.
 I.M.



Spill Quantity S. Abutment

Sta. 17+50
 880

Exc. L = $\frac{(424.4 + 31) \times 50}{424.4} = 50.1$
 870

Exc. L = $\frac{(424.4 - 9) \times 100}{424.4} = 97.9$

Exc. L = $\frac{(424.41 - 43.5) \times 100}{424.41} = 89.8$

Exc. L = $\frac{(5729.6 - 68.5) \times 100}{5729.6} = 98.80$

Emb. L = $\frac{(5729.6 + 16) \times 32}{5729.6} = 32.1$

Emb. L = $\frac{(5729.6 + 2) \times 100}{5729.6} = 100$

Exc. L = $\frac{(5729.6 - 96) \times 100}{5729.6} = 98.3$

Emb. L = $\frac{(5729.6 - 12) \times 50}{5729.6} = 49.90$

END	AREA	EARTHWORK	
		EXC.	EMB.
880			
880			
880			
870			
860			
880			
870			
880			
870			
880			
870			
880			
870			
860			
870			
860			
870			
860			
870			
860			

All Earthwork Quantities
 in Participation Limit III

For Spill Quantity See I480Lt half

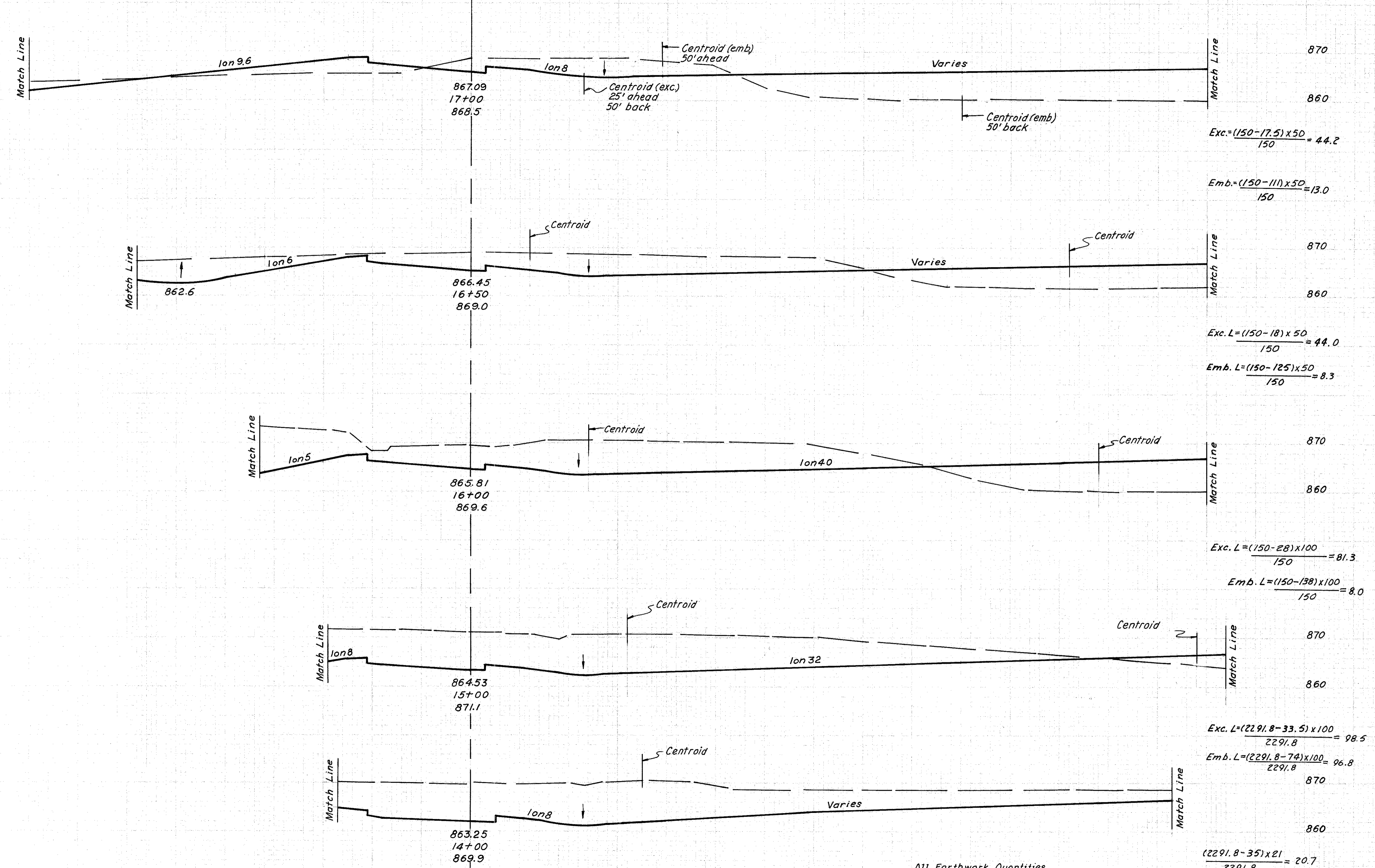
Quantity Calculations
 Made By JEN. Date 6-70
 Checked By JM. Date 6-72

FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY
 CUY480-21.40

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8-67
6-72
H.L.D.
R.H.A.
J.E.M.
J.M.



EARTHWORK			
END STA.	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
870			
180	610		
		533	213
870			
471	274		
		956	87
870			
702	290		
		2397	47
870			
890	30		
		3325	54
870			
933	0		
		713	0
870			
926	0		

All Earthwork Quantities
 in Participation Limit III

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

Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY 480-21.40

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 8-67
 6-72
 H.O.
 R.H.A.
 J.E.N.
 I.M.

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
0	1393	0	2871
0	1560	0	4517
0	1608	0	1865
0	954	180	610
180	610	71	1066

Centroid 46' R.
 Sta. 19+75.34
 See Sheet 110
 (Bedford Sta. 74+54)

$$L = \frac{(150 - 45.5) \times 75.34}{150} = 52.5$$

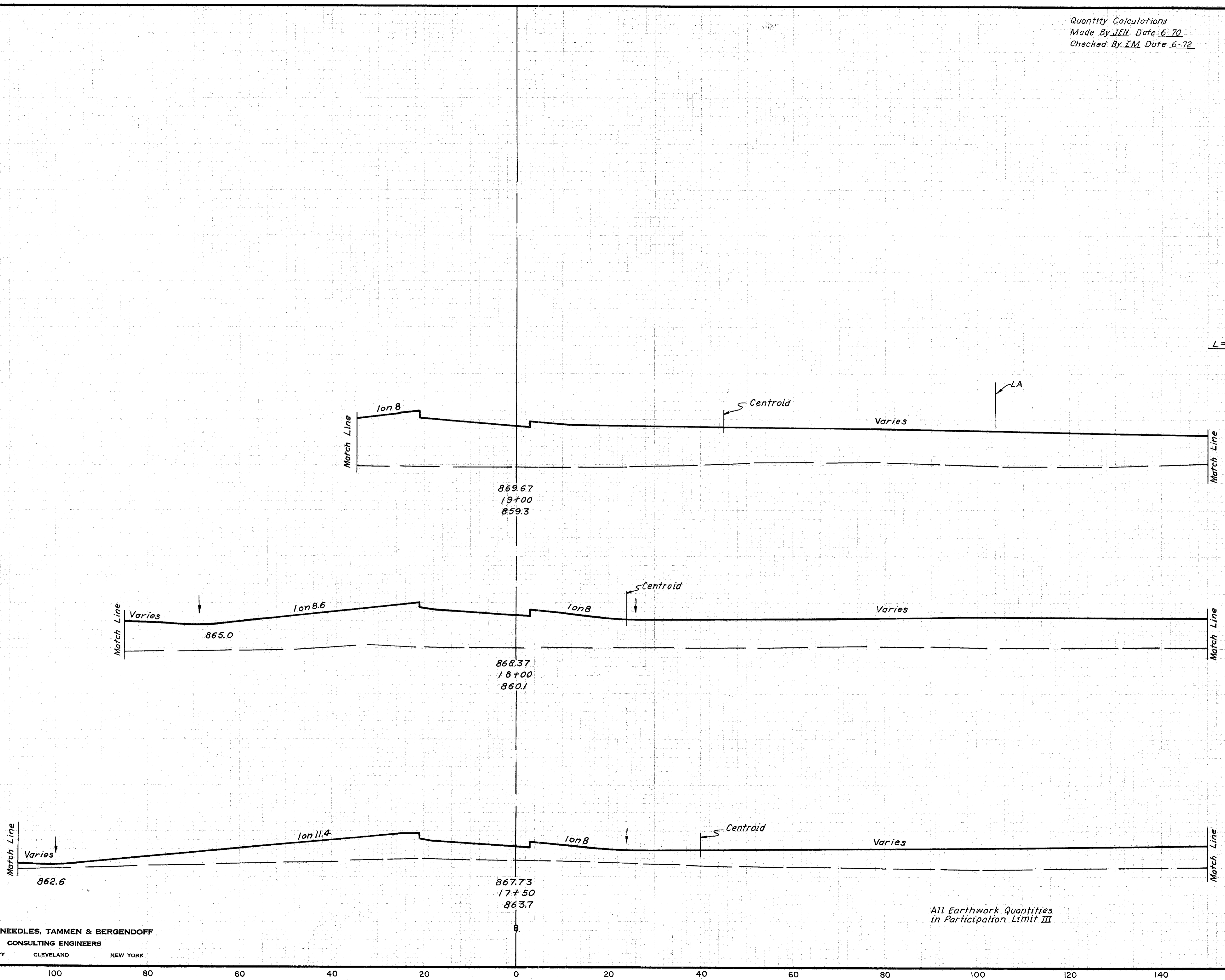
$$L = \frac{(150 - 34.5) \times 100}{150} = 77.00$$

$$L = \frac{(150 - 32) \times 50}{150} = 39.3$$

$$\text{Emb. } L = \frac{(150 - 39.5) \times 50}{150} = 36.83$$

$$\text{Exc. } L = \frac{(150 - 23) \times 25}{150} = 21.17$$

RAMP OBS-WB STA. 17+50 TO STA. 19+00



869.67
 19+00
 859.3

868.37
 18+00
 860.1

867.73
 17+50
 863.7

All Earthwork Quantities
 in Participation Limit III

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

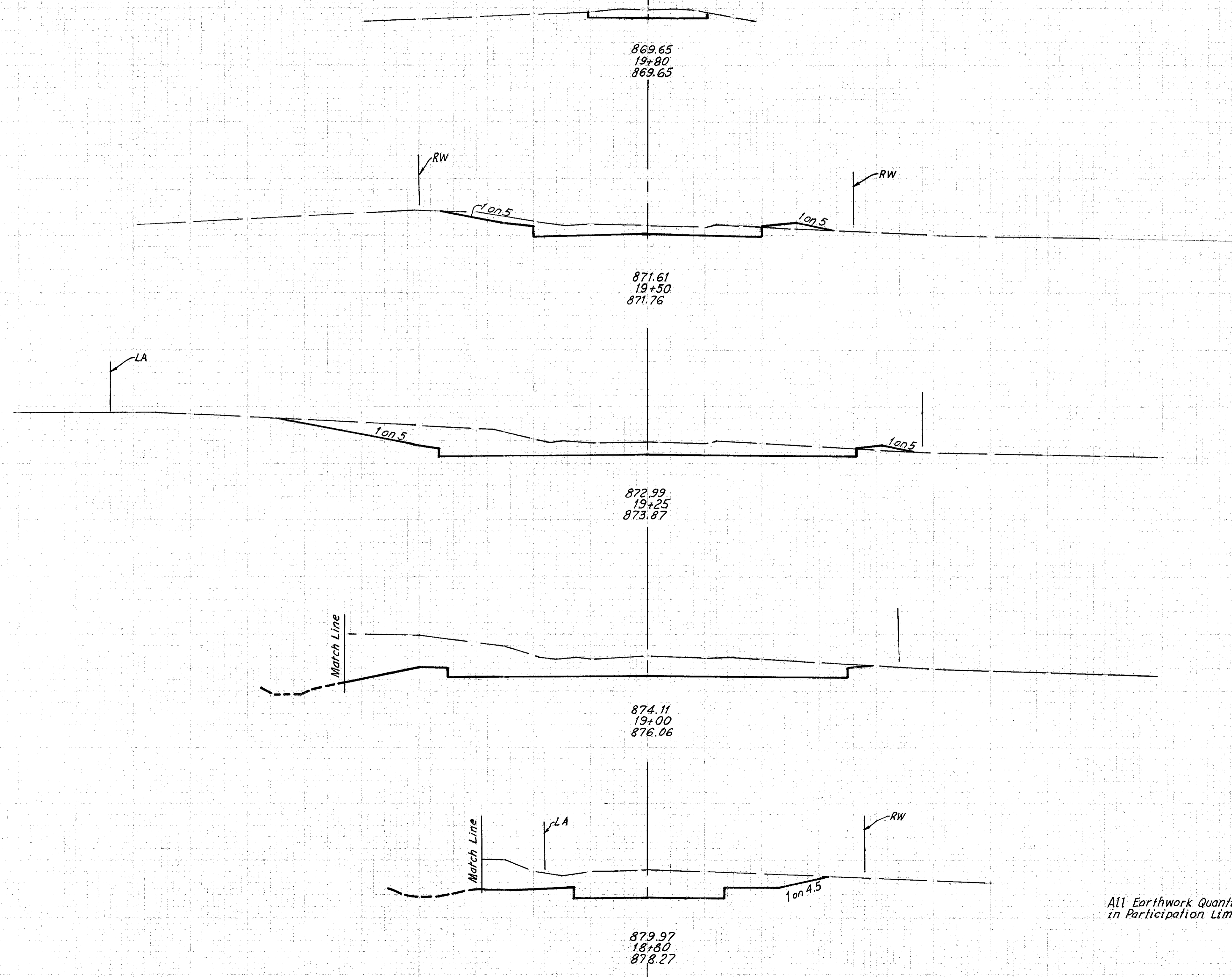
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Quantity Calculations
 Made By JEN Date 6-70
 Checked By JM Date 6-72

FED. RD. DIVISION	STATE	PROJECT	172 390
2	OHIO		

CUYAHOGA COUNTY
 CUY 480-21.40

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 H.L.D.
 J.E.N.
 J.M.

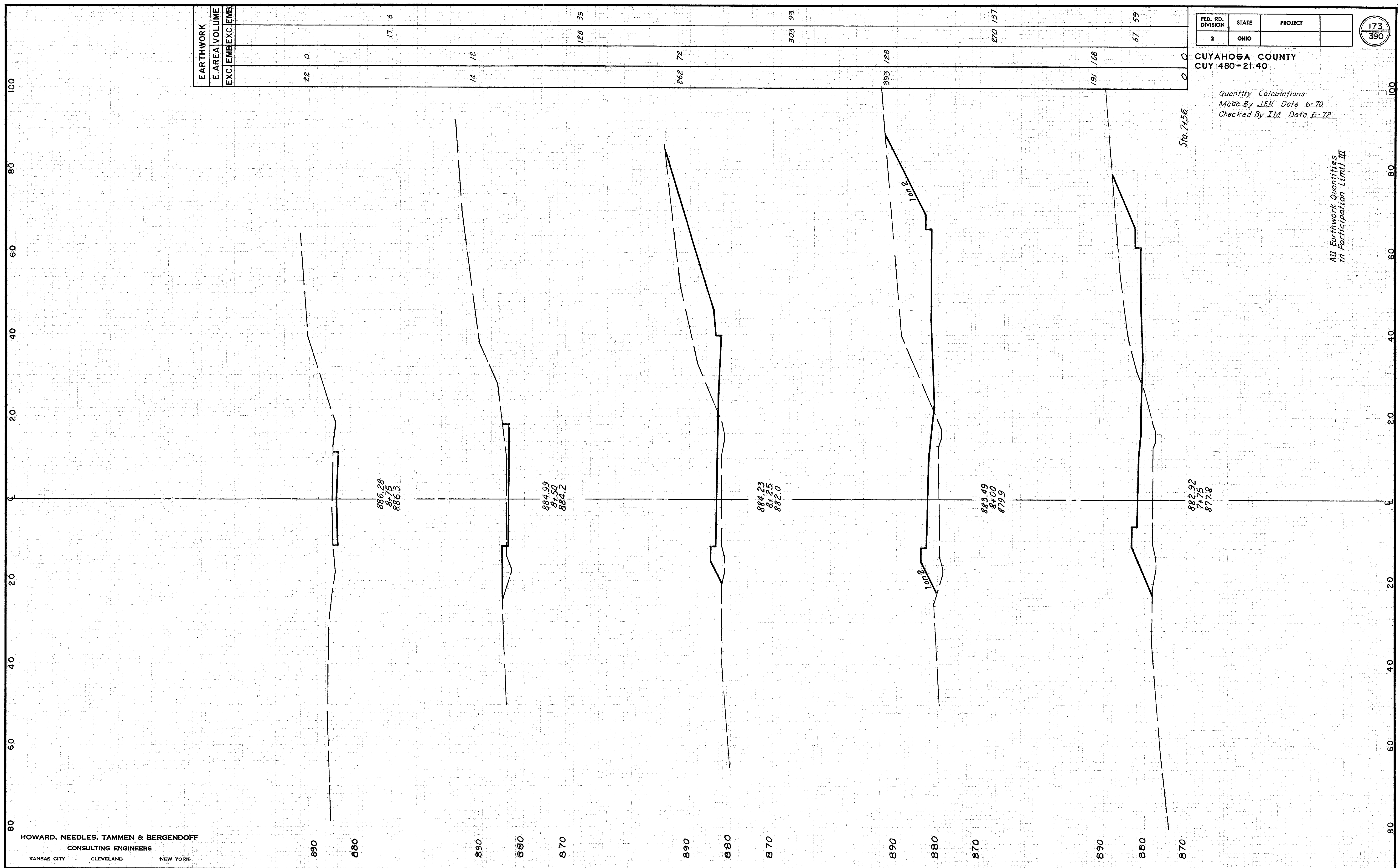


ELEVATION	EARTHWORK			
	END EXC.	AREA EMB.	VOLUME EXC.	VOLUME EMB.
880				
870				
860	32	0		
880			64	3
870	84	6		
860			159	5
880				
870	260	5		
860			273	2
880	330	0		
870				
860			200	0
880				
870	210	0		
860				

All Earthwork Quantities
 in Participation Limit III

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

H.A.
J.E.M.
6-67
8-67
6-70
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HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

6-67
H.D.
J.E.N.
6-72

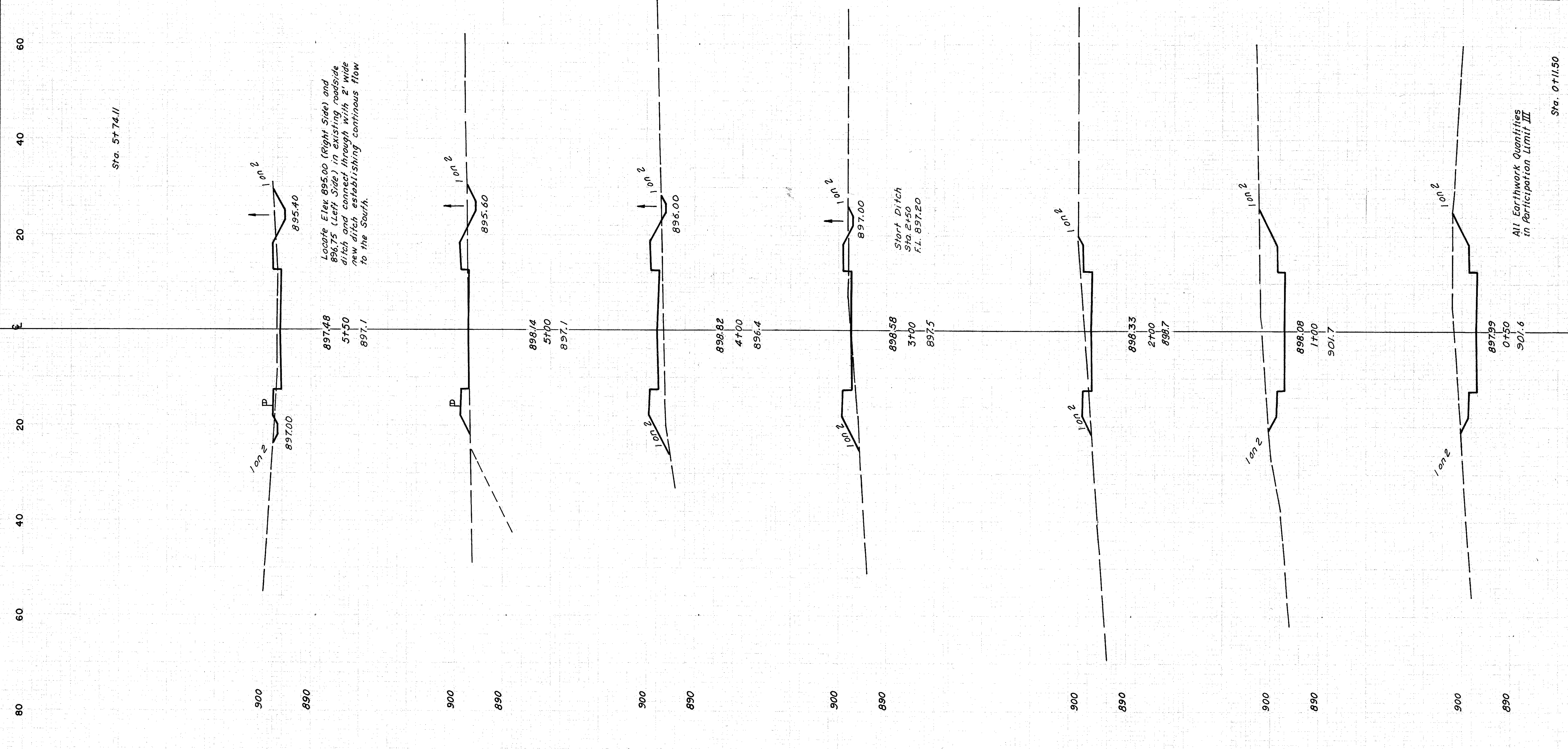
Quantity Calculations
Made By JEN. Date 6-70
Checked By I.M. Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
CUY. 480-21.40

EARTHWORK	
E. AREA	VOLUME
EXC.	EMB.
32	0
29	4
33	8
9	25
4	78
11	39
37	10
169	0
64	0
24	191
28	217
89	91
381	19
218	0
164	0



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

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

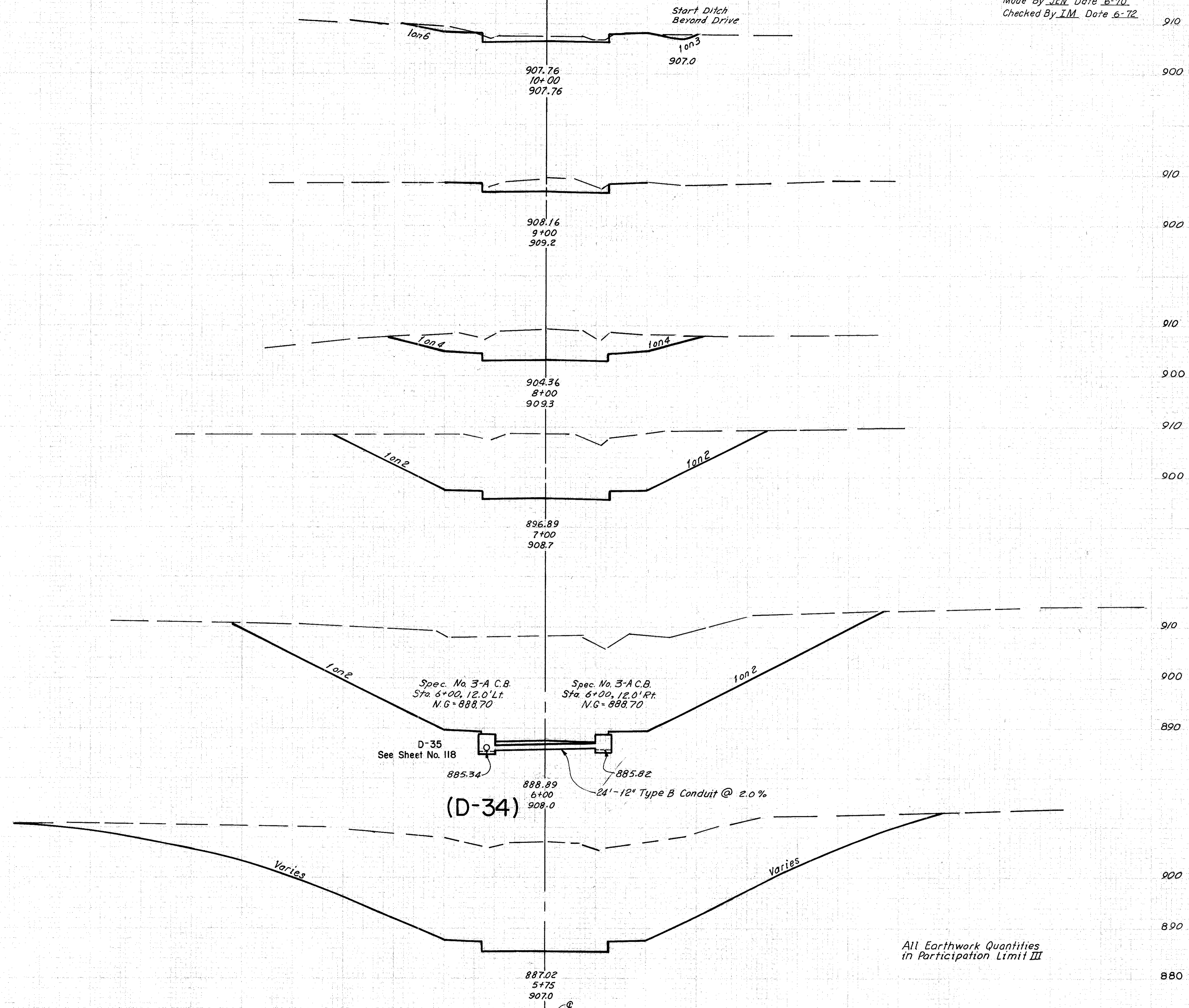
Quantity Calculations
 Made By JEN Date 6-70
 Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY 480-21.40

21-9
 20-9
 19-9
 18-9
 HLD
 RJA
 JEM



END STA.	EARTHWORK			
	AREA		VOLUME	
	EXC.	EMB.	EXC.	EMB.
Sta. 11+00	0	0	70	0
Sta. 10+00	38	0	170	0
	40	0		
	52	0	520	0
			229	0
				1781
			733	0
				4489
			1691	0
				1747
			2083	0

All Earthwork Quantities
 in Participation Limit III

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

Quantity Calculations
 Made By JEN Date 8-70
 Checked By JM Date 8-70

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY 480-21.40

6-67
 RFA
 JEM
 8-52
 8-70

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
		22	5
			7 2
		20	5
			131 102
		122	105

910

900

910

900

910

900

910

900

5+00
906.8

903.55
4+59.50
903.55

902.94
4+50
902.9

900.83
4+00
898.8

1 on 8

1 on 4.5

Match line

All Earthwork Quantities
 in Participation Limit III

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

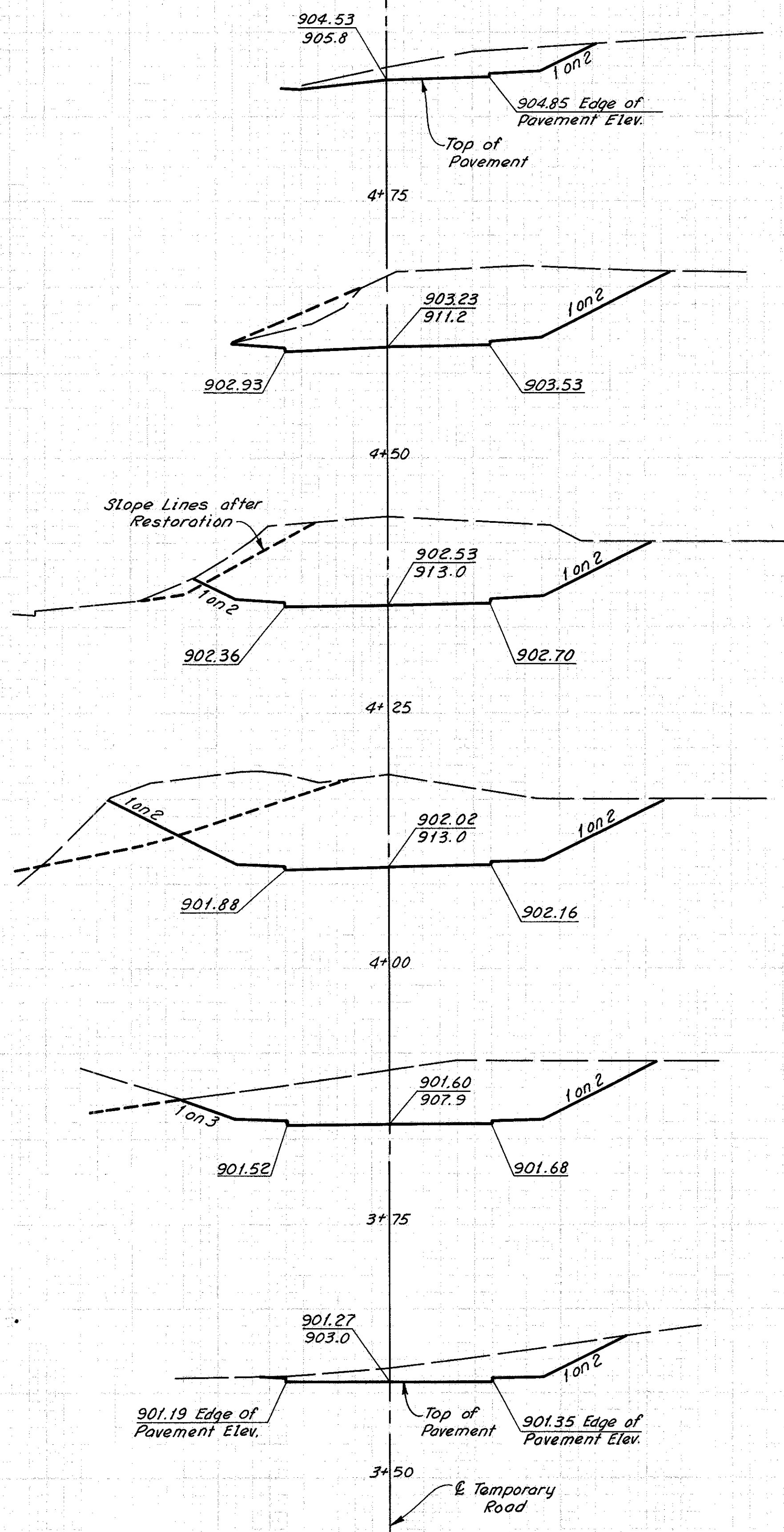
Quantity Calculations
 Made By NMB Date 6-71
 Checked By IM Date 6-71

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY 480-21.40

6-71
6-71
6-71
7/4
NMB
IM



INITIAL CONSTRUCTION	AREAS	
	EXC.*	EMB.
	END AREA SQ. FT.	END AREA SQ. FT.
	95	95
	278	290
	408	386
	500	405
	270	270
	80	80

LEGEND

000.00 Profile Grade Elev.
 000.0 Existing Ground Elev.

Note:
 Existing ground as shown here assumes that proposed earthwork is completed from Sta. 77+35, Lt. side Reloc. McCracken Road.

Note: *
 Excavation for pavement thickness not included.

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

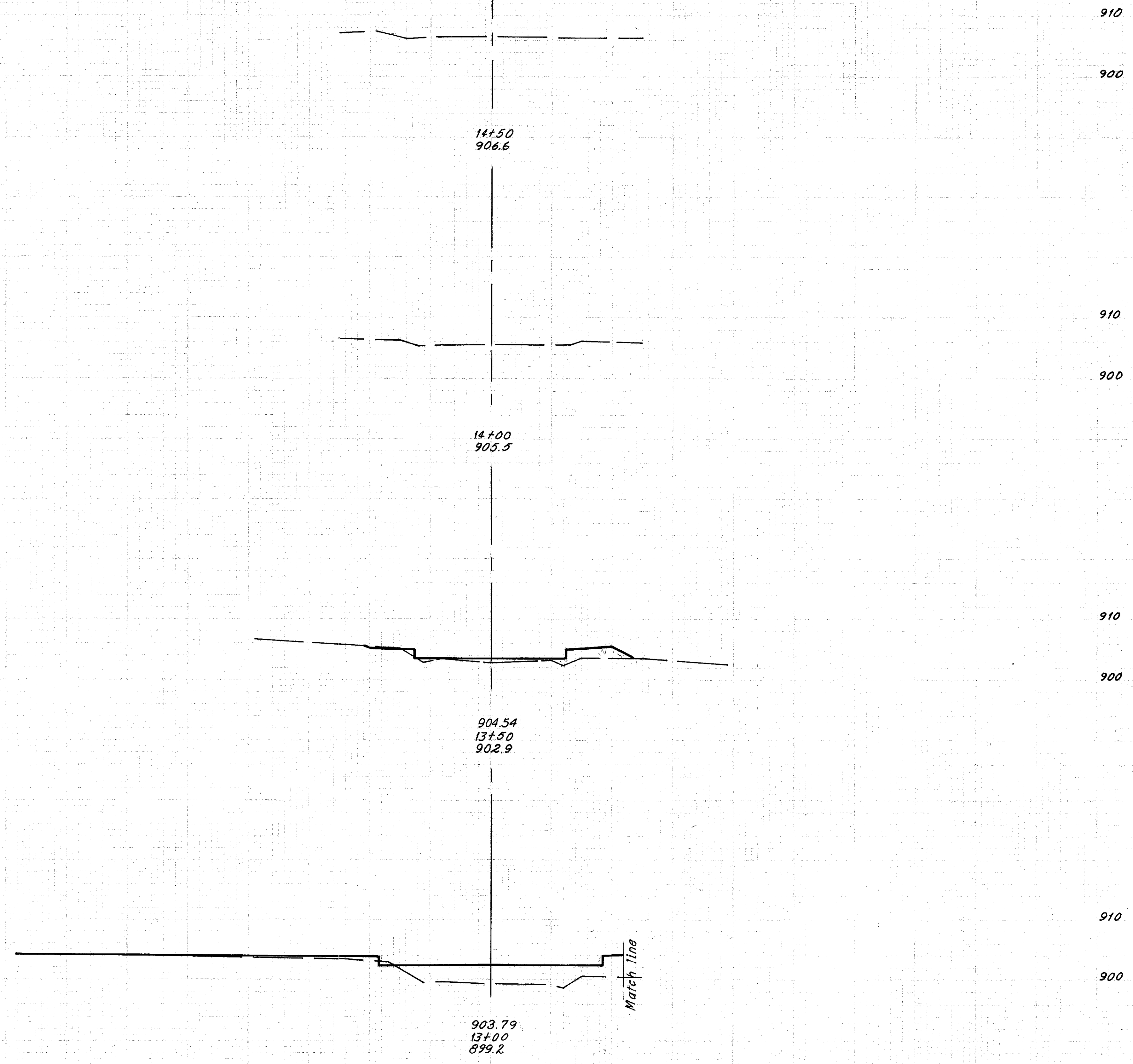
Quantity Calculations
 Made By JEN Date 6-70
 Checked By LM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
 CUY 480-21.40

6-67
 8-67
 6-72
 HLD
 RJA
 JEN
 LW



910
900
Sta. 14+58.43
 Ave. Taper Area = $\frac{(4 \times 1) + (1 \times 1)}{2} = 2.5 \text{ Sq. Ft.}$

910
900
Sta. 13+94.19

910
900
904.54
13+50
902.9

910
900
903.79
13+00
899.2
Match Line

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
3	0		
		43	0
33	0		
		27	17
0	21		
		1	108
1	96		

All Earthwork Quantities
 in Participation Limit III

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

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

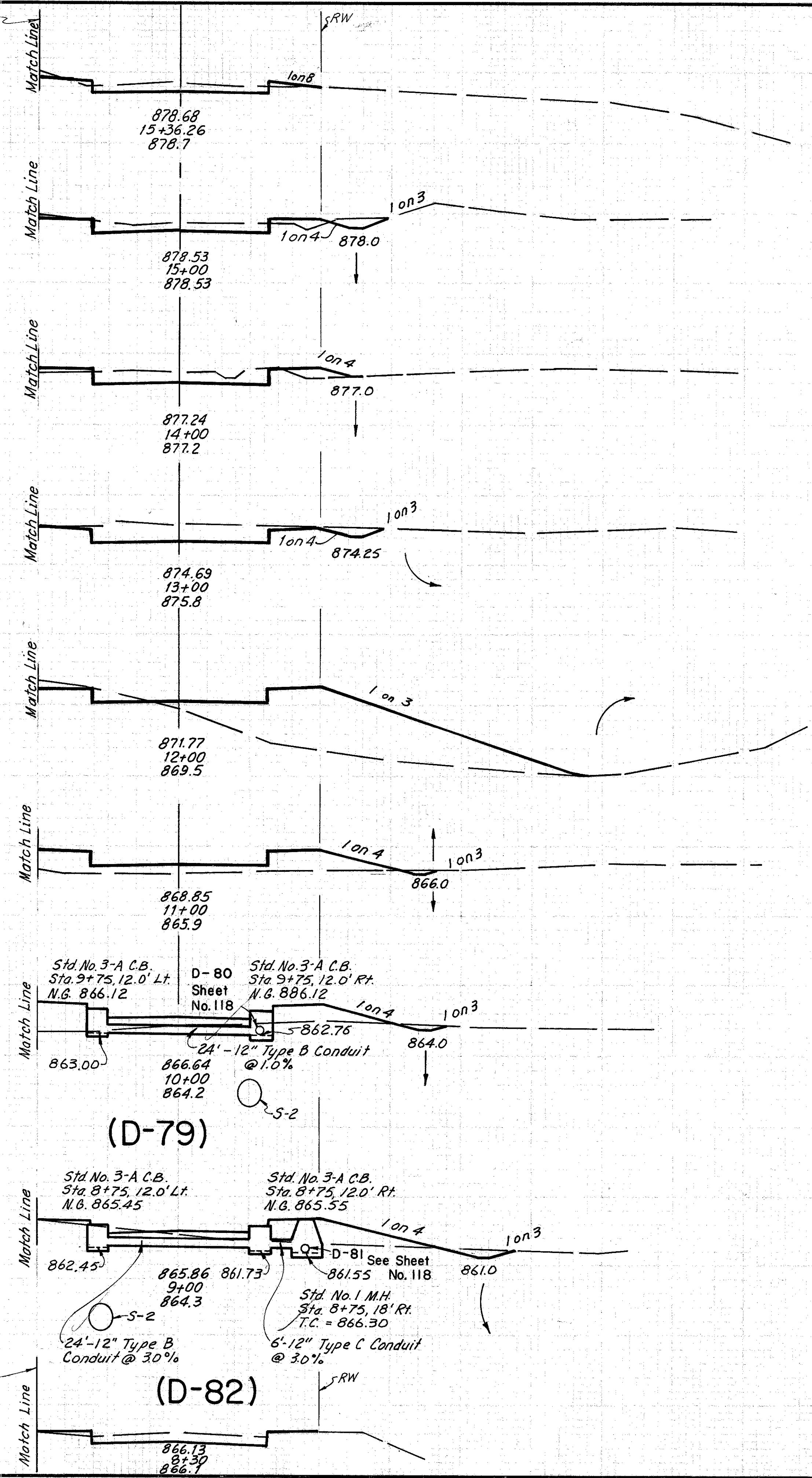
Quantity Calculations
 Made By JEN Date 6-70
 Checked By I.M. Date 7-72

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

179
390

CUYAHOGA COUNTY
 CUY 480-21.40

8-67
 9-67
 10-72
 H.P.
 J.E.N.



Sta. 16+36.26
 Sta. 15+36.26 Ahead
 Sta. 15+36.26 Back

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
0	0	15	7
8	4		
27	5		
		45	7
40	6		
		157	37
45	14		
		213	26
70	0		
		152	519
12	280		
		26	704
2	100		
		9	376
3	103		
		19	341
7	81		
		48	108
30	2		

All Earthwork Quantities
 in Participation Limit III

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

140 120 100 80 60 40 20 20 40 60 80 100 120 GREENHURST RD. STA. 8+30 TO STA. 15+36.26

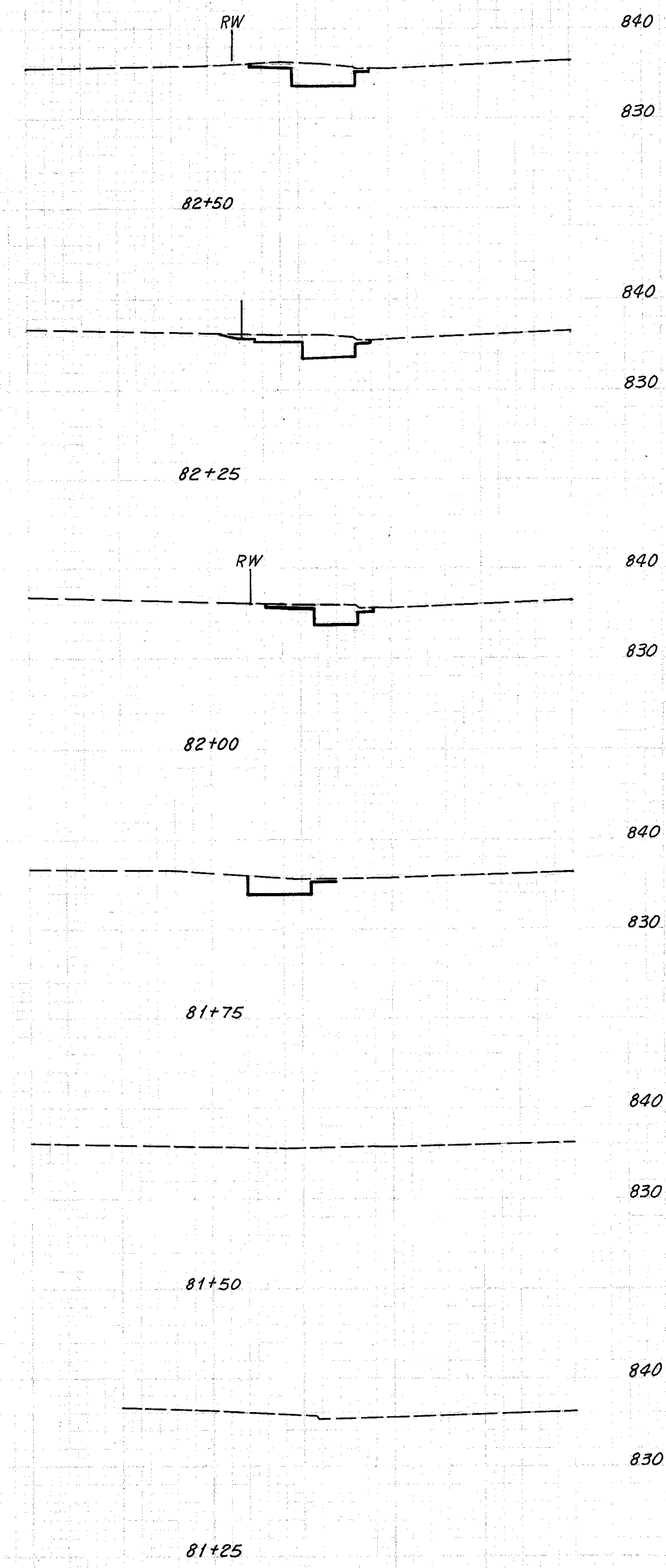
Quantity Calculations
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 Checked By *I.M.* Date *6-72*

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

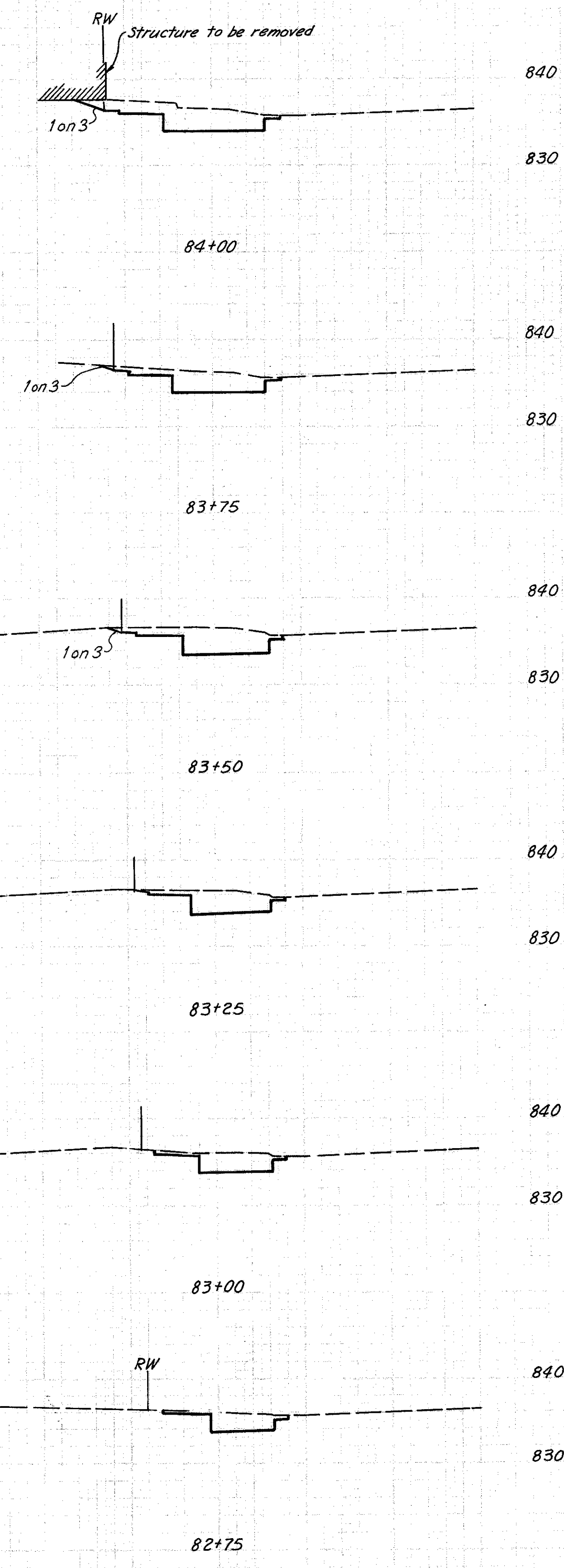
180
390

CUYAHOGA COUNTY
 CUY 480-21.40

6-72
 6-72
 6-72
 6-72
 JCM
 R.A.E.
 R.D.L.
 I.M.



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
19	0	18	0
19	0	15	0
14	0	13	0
15	0	7	0
0	0	0	0
0	0	0	0



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
43	0	33	0
30	0	29	0
33	0	28	0
27	0	22	0
21	0	18	0
18	0	17	0
Sta. 82+50	19	0	0

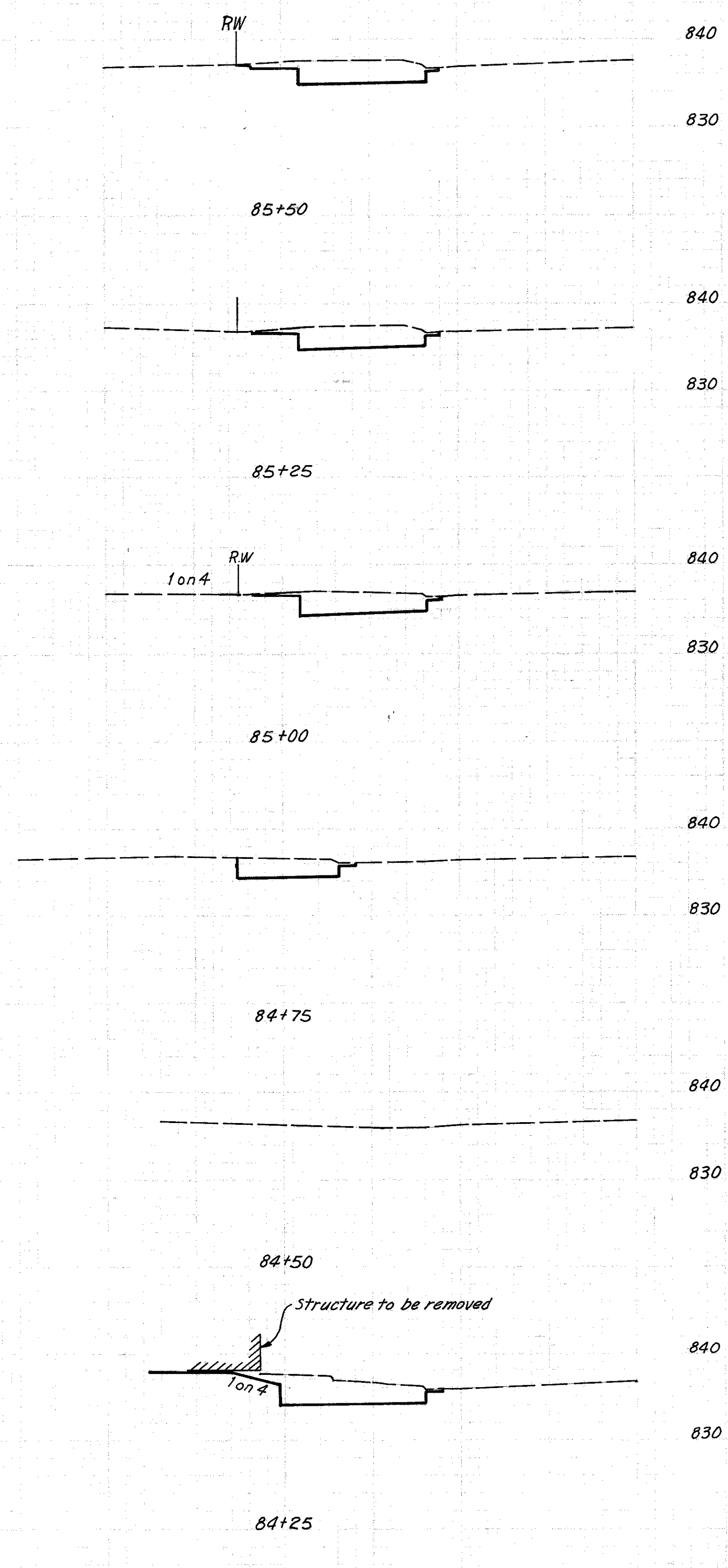
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

181
390

CUYAHOGA COUNTY
CUY 480-21.40

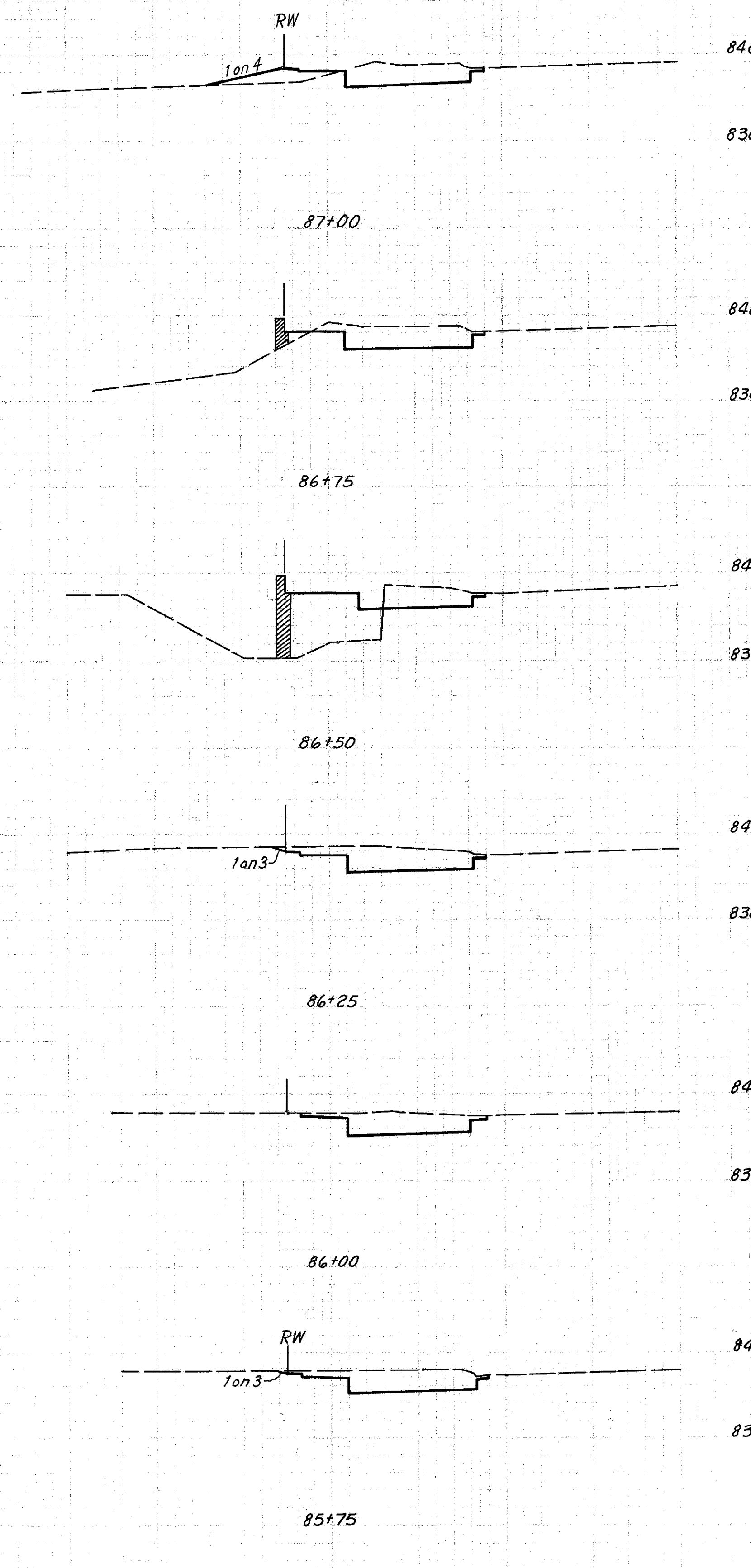
6-72
6-72
6-72
J.C.M.
R.A.E.
R.D.J.
I.M.



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
36	0	32	0
33	0	31	0
34	0	27	0
24	0	31	0
43	0	39	0
41	0	39	0
43	0	39	0

Spill Quantity

Sta. 84+00



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
31	11	33	6
40	2	39	28
23	58	40	27
43	0	41	0
39	0	39	0
39	0	35	0
36	0		

Sta. 85+50

Quantity Calculations
Made By R.D.J. Date 6-72
Checked By I.M. Date 9-72

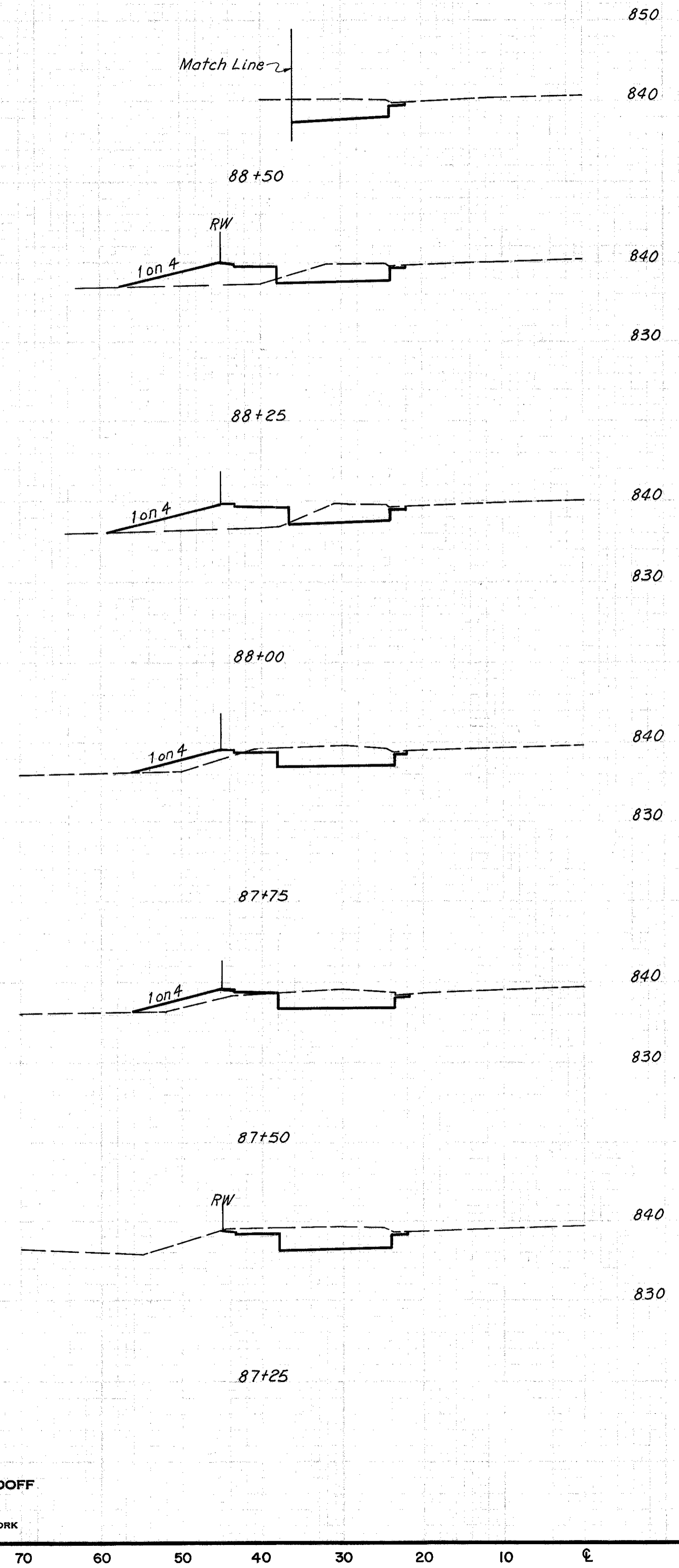
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

70 60 50 40 30 20 10 0

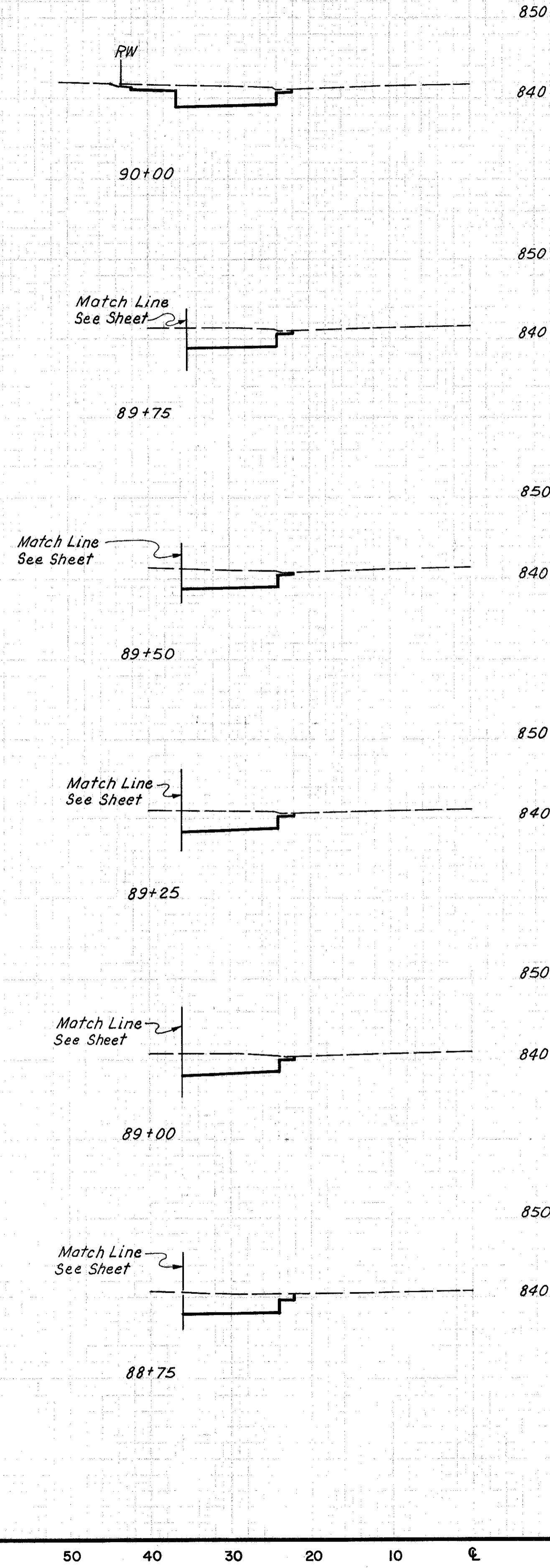
70 60 50 40 30 20 10 0

BROADWAY AVE. STA. 84+25 TO STA. 87+00

6-72
6-72
6-72
6-72
R.A.E.
R.O.C.
I.M.



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
30	0		
		27	16
29	34		
		23	39
20	50		
		26	28
36	11		
		30	11
28	12		
		32	6
42	0		
		34	5
31	11		



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
37	0		
			30
28	0		
			25
26	0		
			26
31	0		
			29
35	0		
			29
32	0		
			29
30	0		

Quantity Calculations
Made By BDJ Date 6-72
Checked By IM Date 6-72

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

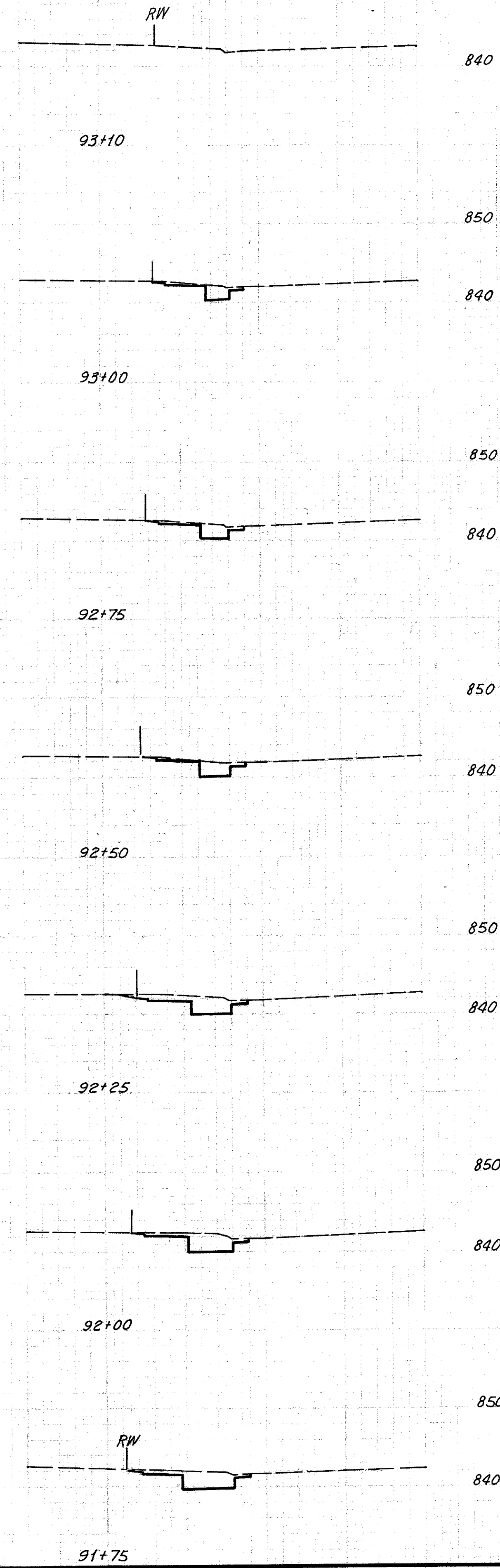
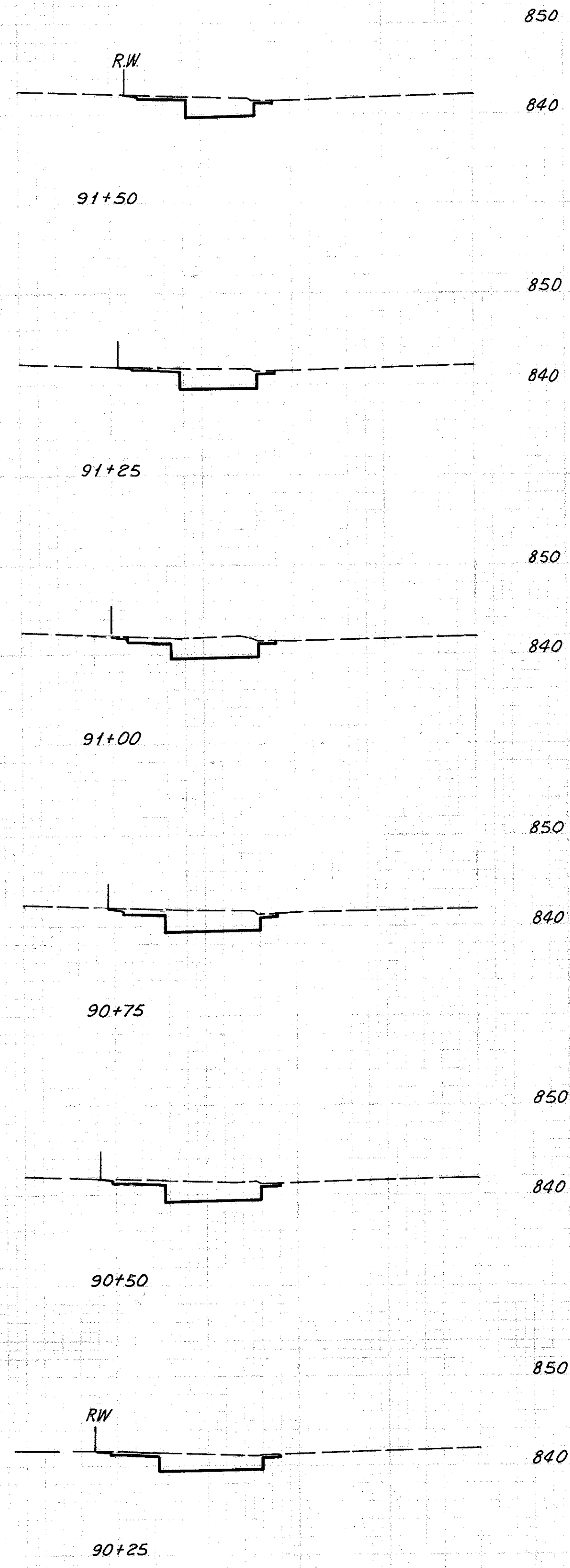
183
390

CUYAHOGA COUNTY
CUY 480-21.40

DATE
6-72
6-72
6-72
6-72

BY
R.D.J.
I.M.

ORIGINAL SURVEY
NOTED
DATE
APPROX. DATED



EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
17	0		
		17	0
20	0		
		21	0
25	0		
		24	0
29	0		
		26	0
28	0		
		24	0
24	0		

EARTHWORK			
END	AREA	VOLUME	
EXC.	EMB.	EXC.	EMB.
0	0		
			1
7	1		
			7
9	1		
			9
10	1		
			12
15	0		
			14
15	0		
			14
16	0		
			15
17	0		

Quantity Calculations
Made By R.D.J. Date 6-72
Checked By I.M. Date 6-72

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

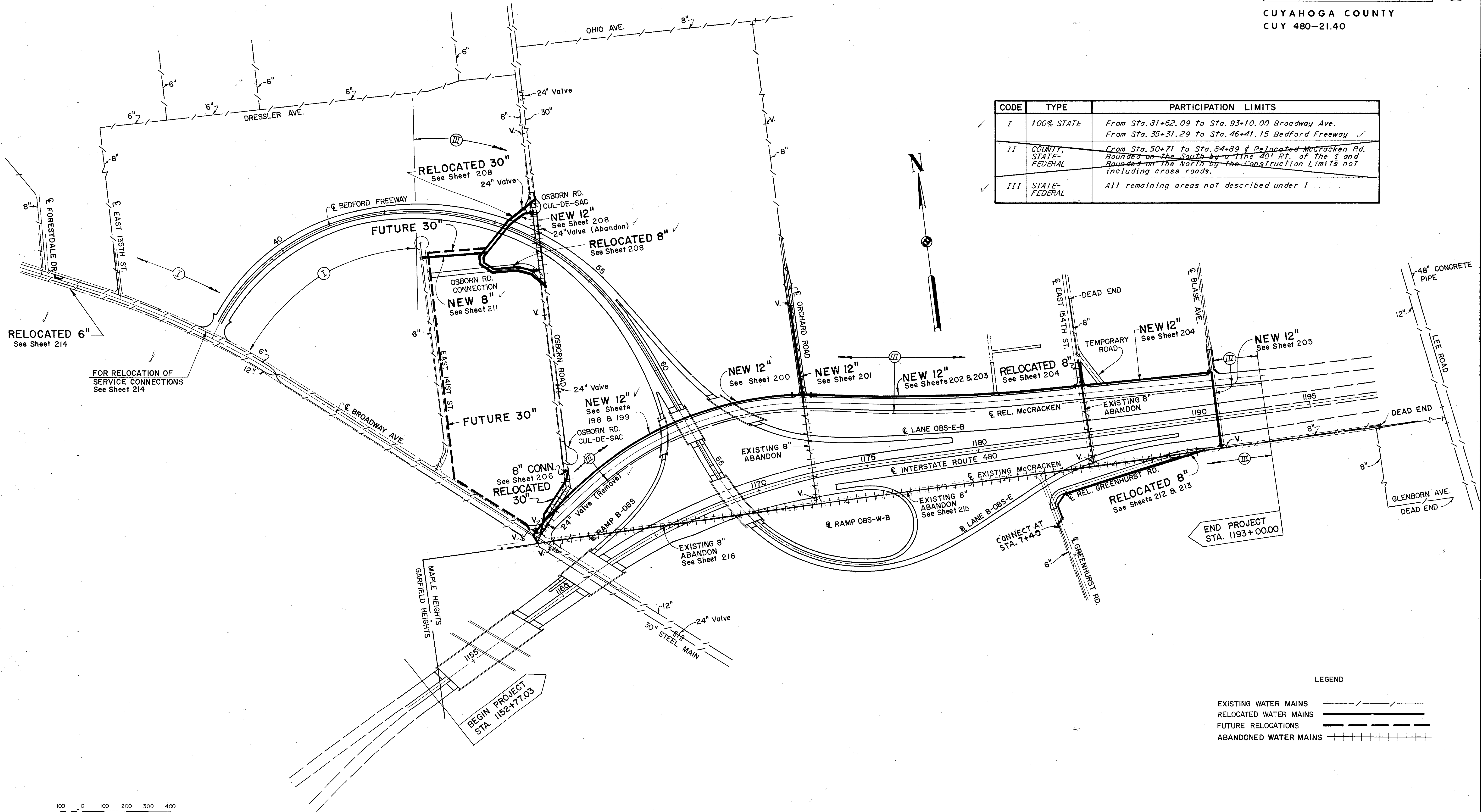
SCHEMATIC WATER WORK PLAN

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

184
390

CUYAHOGA COUNTY
CUY 480-21.40

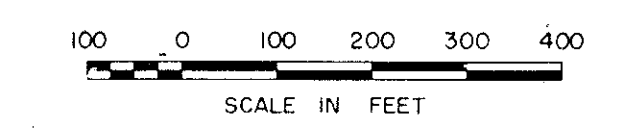
CODE	TYPE	PARTICIPATION LIMITS
I	100% STATE	From Sta. 81+62.09 to Sta. 93+10.00 Broadway Ave. From Sta. 35+31.29 to Sta. 46+41.15 Bedford Freeway
II	COUNTY, STATE-FEDERAL	From Sta. 50+71 to Sta. 84+89 & Relocated McCracken Rd. Bounded on the South by Line 401 R.R. of the & Bounded on the North by the Construction Limits not including cross roads.
III	STATE-FEDERAL	All remaining areas not described under I



FOR RELOCATION OF SERVICE CONNECTIONS See Sheet 214

END PROJECT STA. 1193+00.00

BEGIN PROJECT STA. 1152+77.03



LEGEND

EXISTING WATER MAINS	———/———
RELOCATED WATER MAINS	—————
FUTURE RELOCATIONS	-----
ABANDONED WATER MAINS	+ + + + +

SCALE 1"=200'
 MADE I.T. DATE 3-6-70
 TRCD J.M.C. DATE 4-3-70
 CKD E.R.H. DATE 5-17-72
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

Revised 31 Oct. 73 ERH

SCHEMATIC WATER WORK PLAN

WATERWORK NOTES

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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390

CUYAHOGA COUNTY
CUY.480-21.40

GENERAL

SCOPE OF WORK

The work contemplated under this contract comprises the furnishing and installing, complete with valves and other appurtenances, the following water main relocations and performing other incidental work necessary to abandon existing water facilities.

1. 8" and 12" Cast Iron and 30" Concrete Water Main Relocations in Osborn Rd. at Proposed Bedford Freeway and at Broadway Ave.
2. 12" Cast Iron Water Main in Relocated McCracken Rd. from Broadway Ave. to Blase Ave.
3. 12" Cast Iron Water Main in Orchard Rd. from Relocated McCracken Rd. northerly.
4. 8" Cast Iron Water Main in E. 154 St. from Relocated McCracken Rd. northerly.
5. 8" Cast Iron Water Main in Relocated Greenhurst Rd. from Existing Greenhurst Rd. to Existing McCracken Rd. near Blase Ave.
6. 12" Cast Iron Water Main under I-480 from Existing to Relocated McCracken Rd. at Blase Ave.
7. 2-14" New Service Pipe, Galvanized Iron Service Connections in Access Rd. from Broadway Ave. Northerly.
8. 6" Cast Iron Water Main Relocation in Broadway Ave. near Forestdale Dr.
9. Abandon Existing Water Mains and Service Connections in McCracken Rd., Broadway Ave., Osborn Rd., Orchard Rd. and E.154 St.

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 in accordance with the contract drawings.

THE STATE

The State is the State of Ohio acting through its authorized representative.

ENGINEER

The Engineer is the District Deputy Director or District Engineer, the District Construction Engineer or the District Maintenance Engineer, or the Project Engineer assigned to administer the contract.

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 are authorized to inspect all work done and materials furnished. Such inspection may extend to all or any part of the waterwork, and to the preparation or manufacture of the materials to be used in the waterwork. The city inspector as designated by the Director of Public Utilities will 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 normally specified and indicated by the contract drawings, notice thereof must be given to the Engineer by the Contractor within ten (10) days after 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 the 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.

(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 main 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. No charge will be assessed the Contractor for any material, labor, tools, equipment and incidentals furnished by the City of Cleveland, Division of Water. The Contractor shall furnish the necessary labor for excavation and backfilling which will be required for the installation of taps for injecting the chlorine solution, operating pumps and flushing mains.

(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

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:

- (A) Perform all necessary excavation, including bell holes exposing the existing main sufficiently for the operation of the pipe saw by the City.
- (B) Remove the cap or plug from the end of the new main.
- (C) 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.
- (D) 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.
- (E) 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. The temporary protection shall apply particularly to the valve boxes and covers, manhole rings and covers, ladders and ladder rungs 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.

(E) - All of this work shall be included in the price bid for the particular item requiring the painting.

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. In the case of any item not specifically mentioned in the "Waterwork Notes", the State of Ohio, Department of Transportation "Construction and Material Specifications" shall govern.

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.

APPROVED _____ DATE JUNE 15, 1972

Frank R. Melone
ENGINEER, CITY OF GARFIELD HEIGHTS
Richard J. Stalder
ENGINEER, CITY OF MAPLE HEIGHTS
Raymond Rudickson
DIRECTOR OF PUBLIC UTILITIES
William A. Stalder
COMMISSIONER OF WATER AND HEAT
William A. Stalder
COMMISSIONER, DIVISION OF UTILITIES ENGINEERING
David J. Phillips
ENGINEER OF CONSTRUCTION AND SURVEYS
William A. Stalder
ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: **WATERWORK FOR THE CITY OF GARFIELD HEIGHTS
AND THE CITY OF MAPLE HEIGHTS**

SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE E.R.H. DATE 3/10/70 CONSULTING ENGINEERS
TRCD. E.R.H. DATE 3/12/70
CKD. E.R.H. DATE 5-17-72 KANSAS CITY CLEVELAND NEW YORK

WATERWORK NOTES

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY
CUY.480-21.40

GENERAL

(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 MAINS

(A) - Wherever it becomes necessary in the opinion of the Engineer to change the location of house connections between water main and curb cock, 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 and all other changes required 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.

(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. No charge will be assessed the Contractor for any of the labor or materials furnished by the City.

(B) - 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
8"	\$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 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, drainage, 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 and unforeseen or encountered in the work of this contract.

(B) Trenches shall in every case be of sufficient width to permit solid packing of backfill 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 unshaded 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 backfilled 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 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 back-filled 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 proper jointing pipe laid in rock shall be provided at bell holes.

(K) - The use of excavating machinery will be permitted except in places where its operation 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 sheeting and bracing, 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. No payment will be made for wasted ends.

A quantity of 2 M.B.M. has been provided in the General Summary for Item Special, Sheeting Left in place.

(B) - Whenever the excavations for the work described herein 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 injury or damage the same.

(C) - If the Engineer is of the opinion that at any point sufficient or proper supports, sheeting, or bracing 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

(A) - All surplus material and such other material as the Engineer may deem unfit for use as backfill shall be disposed of by the Contractor so as to give a minimum of inconvenience to the public. In case of settlement after backfill, the Contractor shall supply sufficient material satisfactory to the Engineer to make up for the deficiency.

(B) - In the storing of excavated material, which is to be used as a backfill, the Contractor shall exercise care so as to avoid inconveniencing the public. If, in the opinion of the Engineer, it is necessary to remove this excavated material from the streets or lots, the Contractor shall be required to do so.

(C) - Any material which may spill or drip from vehicles by hauling in the streets, shall be removed and the streets cleaned by the Contractor, to the satisfaction of the Director of Public Service of the City of Cleveland or the proper officials of the municipality or township in which the work is being done.

(D) - When so directed by the Engineer, the Contractor shall immediately remove all excavated materials from the site.

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 is discovered while pipe is suspended or after being laid, a new piece shall be furnished and installed by the Contractor.

(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.

APPROVED DATE JUNE 15, 1972

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Richard J. ...
ENGINEER, CITY OF MAPLE HEIGHTS

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2 ND HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS
AND THE CITY OF MAPLE HEIGHTS

SCALE: HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE E.P.H. DATE 3/10/70 CONSULTING ENGINEERS
TRCD 460 DATE 4/2/70
CKD E.P.H. DATE 5-17-72 KANSAS CITY CLEVELAND NEW YORK

WATERWORK NOTES

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GENERAL

✓ LAYING PIPE (CONTINUED)

(F) - Before laying concrete pipe, the pipe ends shall be made smooth with emery cloth, file or other approved means, wire brushed and wiped until clean and dry. Pipe ends shall be kept clean until joints are made. After cleaning and drying, all contact surfaces of the gaskets and steel joint rings shall be coated with an approved flax soap before entering the spigot end into the socket. Immediately after the joint is pulled together, the pipe shall be blocked with wood blocking. A surcingle shall be installed around the joint and the pipe shall be secured with earth or sand as required, carefully tamped under and on each side up to the spring line of the pipe, including the bell holes. All blocking shall be removed when backfill has reached the spring line of the pipe.

✓ 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 backfill 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 the main. In case the drains are connected to valve or drain vaults, then the Contractor, within a reasonable time after the test has been completed, shall pump all water out of the vaults.

(E) - In cold weather immediately after testing a section of the water main, the Contractor shall 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 the water main and appurtenances due to freezing.

(F) - As an alternate for testing concrete and steel mains other than by the preceding method, the Contractor may choose the following procedure:

The water main shall be tested under the same hydrostatic pressure as previously noted. The test pressure shall be maintained for a period of two (2) hours by pumping additional water into the main, if necessary. The quantity of water thus pumped into the main multiplied by twelve (12) shall be taken as the leakage per twenty-four (24) hours.

(G) - The permitted leakage shall not exceed a rate of seventy-five (75) gallons per twenty-four (24) hours per mile of pipe per inch of nominal diameter.

(H) - In calculating leakage, the Engineer will make allowance for any leakage at the valves, the removable bulkheads, etc.

(I) - In using this method of testing, the Contractor may backfill the pipe except at lead joints, flanged joints, victaulic couplings, and drain connections immediately following the laying and before the actual test has been made. In case the leakage exceeds the permissible amount mentioned above, the Contractor shall find the leak and make the joints tight. The Contractor shall furnish suitable means for determining the quantity of water lost by leakage during the test.

(J) - In order to be able to make proper allowances for leakage at valves, etc., previously noted, only such sections of water main may be selected for test as will have such valves, removable bulk-heads, etc., accessible.

(K) - The evaluation of actual leakage to standard pressure (150 lbs.) leakage is calculated by the application of the ratio determined from the square root of respective pressures, other factors being equal.

✓ CLOSING VALVES

The closing of all gate valves on water mains for making connections, tests, or for any other cause, will 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 Contractor, on all mains constructed by him and on existing water mains where indicated in the contract drawings. Concrete piers shall be placed when called for on the contract drawings, or ordered by the Engineer. The cost of furnishing and installing the plugs in new water mains shall be included in the per linear foot price bid for the various sizes of new water mains. The cost of furnishing and installing the plug in existing water main shall be included in the unit price bid for each item, "Plugging Existing Water Mains and Branches", classified as to size as shown elsewhere in these plans.

✓ 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, sidewalks and driveways within the limits of the work shall be temporarily surfaced, maintained and finally replaced or repaved as set forth under "Road Surfaces, Sidewalks, Driveways and Curbing."

(B) - Backfill, unless otherwise specified, may be made with material excavated from trenches, providing it 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 at 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.

(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 during compaction. 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 $\frac{3}{4}$ inch sieve. Not more than 5 per cent shall remain on a No. 4 sieve.

(J) - Special treatment of the trench will be required where cinder excavation exceeding one foot measured from the top surface is encountered. Before laying the pipe, the bottom of the trench shall be dug below grade and then brought to the grade of the pipe in the following manner, a four (4) inch layer of crushed limestone shall be placed on the entire width of the bottom of the trench followed by a filler of hydrated lime and a layer of three (3) inches of sand. The crushed limestone shall be well graded from fine to coarse and free from slag, cinders, ashes, rubbish or other objectionable material. All limestone must be capable of being passed through a $\frac{3}{4}$ inch sieve. On top of this layer of crushed stone, hydrated lime shall be supplied in the amount of $\frac{1}{2}$ of a pound per square foot of trench. This bed of crushed limestone shall be thoroughly tamped before the 3" layer of sand is placed. The backfill around and to the depth of 3" above the top of the pipe shall be made with sand. The Contractor must use special care in placing this portion of the backfill so as to avoid injuring or moving the pipe when compacting same. On top of the sand the Contractor shall place another layer of crushed limestone five (5) inches thick on the entire width of the trench. On top of the compacted layer of limestone hydrated lime shall then be applied in the amount of $\frac{1}{2}$ of a pound per square foot of trench. The remaining backfill shall be made with sand, carefully placed and compacted by tamping, puddling, or rolling. All precautions shall be taken to eliminate future settlement. The treatment of the trench bottom, previously described, may be omitted where the cinder depth, measured from the top surface does not exceed 2' - 6".

✓ ROAD SURFACES, SIDEWALKS, DRIVEWAYS, AND CURBING

(A) - The Contractor shall remove all pavements and road surfaces within the lines of excavation. After the pipe has been laid, all appurtenant work constructed and backfill completed, he shall furnish, place and maintain, wherever the pavement 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) - When only a portion of the street is paved and the lines of excavation are in the unpaved portion, the Contractor shall use the utmost care in preventing injury to the pavement. If, in making the excavation or for any other cause the pavement is removed or injured by the Contractor, he shall furnish, place and maintain a temporary pavement wherever the pavement has been removed or damaged, so as to provide a safe and passable roadway until such time as the final pavement is completed.

APPROVED _____ DATE JUNE 15, 1972

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2ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: **WATERWORK FOR THE CITY OF GARFIELD HEIGHTS
AND THE CITY OF MAPLE HEIGHTS**

SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE ERH DATE 3/10/70 CONSULTING ENGINEERS
TRCD ERH DATE 3/17/72 KANSAS CITY CLEVELAND NEW YORK
CKD ERH DATE 5-17-72

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ROAD SURFACED, SIDEWALKS, DRIVEWAYS, AND CURBING (CONTINUED)

(C) - All final paving of road surfaces, if so noted on the contract drawings shall be done by the Contractor to the satisfaction of the Engineer and in conformity with the City of Cleveland "Standard Specifications for Construction of Pavements, Sidewalks and Sewers," dated November, 1966. The Contractor shall bear the entire cost of the work. At locations not specifically mentioned, the Contractor shall restore the same type of pavement as encountered.

(D) - All damaged or displaced curb shall be renewed or reset to the satisfaction of the Engineer. No faulty curb or curb less than 30" long will be permitted for reuse.

(E) - If prior to the expiration of this contract, any of the pavements or road surfaces within the lines of excavation or adjacent thereto, shall have been damaged or injured, due to undermining, or for any other cause which may be attributed to the work which is being done by the Contractor, then the Contractor shall remove such damaged or injured pavements or road surfaces, backfill with sand properly rammed and replace the final pavement or road surface.

(F) - If any sidewalks, driveways or curbs are removed or injured by the Contractor in the course of making excavation or handling materials, or for any other reason which may be attributed to work which has been done by the Contractor, then he shall relay same after all work, including backfilling, has been completed. If any stone sidewalks, driveways or curbs which have been removed or injured, are unfit to be relaid, then the Contractor shall furnish and relay new material. All concrete or cement sidewalks, driveways or curbs, which are removed or injured by the Contractor shall be broken up by him and he shall furnish all labor and materials and construct new sidewalks, driveways or curbs, to replace those removed or injured. At intersecting walks, drives, etc., additional concrete slabs beyond the excavation limits shall be removed and replaced with new material, in order to avoid having more joints than in the original work. All slabs replaced shall be of full width. The Contractor shall furnish, place and maintain, wherever the sidewalk has been removed or damaged by him, a temporary sidewalk so as to provide a safe and passable sidewalk until such time as the final sidewalk is completed.

(G) - 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.

(H) - All work which the Contractor may do in connection with the opening up or replacing of pavements, road surfaces, sidewalks, driveways, or curbs, as well as the final repaving, shall be done at his expense, in accordance with the rules and requirements of the Street or Sidewalk Departments of the City of Cleveland and in accordance with the additional requirements of these specifications. And the Contractor shall furnish evidence to the Engineer that the work has been completed to their satisfaction.

(I) - 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 C concrete, rammed in place.

(J) - The Contractor shall make all pavement cuts by channeling machine, hand-operated pneumatic tools or by such other methods as will furnish a clean cut in the pavement and pavement base without undue shattering. The use of ball or weight to break the pavement will not be permitted.

(K) - 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 as per 104.04 and 107.10, State of Ohio, Dept. of Highways specification.

LIST AND INVOICES

The Contractor shall furnish the Engineer with a 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.

CAST IRON AND DUCTILE IRON PIPE AND FITTINGS

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) - 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 of 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. A21.51 or Federal Specification WWP-421B. All ductile iron fittings shall be manufactured in accordance with A.S.A. A21.10 or AWWA C 100-55. 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. The thickness of the centrifugally cast ductile iron pipe and cast iron pipe shall conform to the following:

CAST IRON PIPE				DUCTILE IRON PIPE			
SIZE	WORKING PRESSURE	STANDARD THICKNESS	CLASS	SIZE	WORKING PRESSURE	STANDARD THICKNESS	CLASS
4"	250 psi	.44"	25	6"	350 psi	.43"	6
6"	250 psi	.48"	26	8"	350 psi	.45"	6
8"	250 psi	.52"	26	10"	350 psi	.47"	6
10"	250 psi	.56"	26	12"	350 psi	.49"	6
12"	200 psi	.56"	26	16"	350 psi	.52"	6
14"	250 psi	.60"	26				
16"	200 psi	.68"	26				
16"	250 psi	.73"	26				

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.

(C) - 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.

(D) - Gaskets shall be of rubber or other equally effective protection against uneven distortion of the gasket.

(E) - Where fittings are shown which are not covered by the above specifications, they 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.

(F) - Wherever changes in line and grade 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. Pipe to be installed with air cocks or drains shall be cast with bosses thereon, drilled and tapped for two (2) inch connections and plugged in the shop with cast iron threaded plugs before shipment.

(G) - 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.

(H) - Closure pieces shall be accurately measured and cut in the field and installed using solid type pattern sleeves as shown or as required.

(I) - Tests, inspection, reports and analyses of tests of samples for all materials shall be furnished as set forth elsewhere in these notes.

(J) - 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 21.4-1964 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 damaged 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.

APPROVED _____ DATE JUNE 15, 1972

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2ND HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

Subject: **WATERWORK FOR THE CITY OF GARFIELD HEIGHTS AND THE CITY OF MAPLE HEIGHTS**

SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE ERH DATE 3/10/72 CONSULTING ENGINEERS
TRCD WLD DATE 3/17/72
CKD ERH DATE 3/17/72 KANSAS CITY CLEVELAND NEW YORK

WATERWORK NOTES

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CAST IRON AND DUCTILE IRON PIPE AND FITTINGS

VALVES

LAYING (CONTINUED)

(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.

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 two and one-half (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 approved equal.

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 linear feet of cast iron pipe and ductile iron pipe and connections to be paid for shall be the actual number of linear 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.

PAYMENT

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, placing, cutting into and connecting the pipe, pipe bends, plug and clamps at dead ends, concrete piers, sheeting and bracing, sand backfill, water used for compaction, incidental concrete, the removal of all surplus excavation and discarded material, repaving, and for all labor, equipment, tools materials and incidentals necessary to complete this item, except for the items specifically listed as separate pay items.

The chlorination of the newly laid water mains by the City of Cleveland, Division of Water, which is described under "General - Additional Work - (C) Chlorination", will be at no expense to the Contractor.

WORK INCLUDED

The Contractor shall furnish all 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, gate and inserting valves of the various sizes and types specified or ordered, all as required for the proper completion of the work included under this contract. Inserting valves shall be installed by the Inserting Valve Supplier. The Contractor shall pay all costs and charges for the insertion. The work shall be under the supervision of The Division of Water and Heat, and shall meet the requirements of Items "Testing Mains", "Lead Joints," and "Detailed Drawings" of these specifications.

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 Vent Valve No. W-4695 as manufactured by the Farnan Brass Works.

GATE VALVES AND INSERTING 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 inches in diameter shall conform to those for Class D pressure fittings, as required by AWWA C100. On valves 30 inches 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 end gate valves shall conform in dimensions and drilling to the "American 125 pound Cast Iron Flange 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 inches 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 (2) "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
(DIMENSIONS IN INCHES)

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

SIDE WEDGE						
VALVE SIZE	FACE	DEPTH	THICKNESS AT BASE OF THREADS	FACE THICKNESS	FACE THICKNESS	DEPTH
3"	13/32	1/2	3/16	3/16	ALL BRONZE DISC	
4"	7/16	9/16	3/16	3/16	1/2	21/64
6"	1/2	11/16	9/32	1/4	5/8	21/64
8"	17/32	11/16	9/32	1/4	11/16	21/64
10"	5/8	13/16	3/8	5/16	13/16	21/64
12"	5/8	13/16	3/8	5/16	13/16	21/64
16"	3/4	1	15/32	3/8	7/8	13/32
20"	7/8	1-5/16	17/32	7/16	1	17/32
24"	1-1/16	1-3/8	21/32	1/2	1-3/16	19/32
30"	1-5/16	1-1/2	25/32	1/2	1-7/16	19/32

SCALE: 1"=10'
 MADE: E.H. DATE: 3/10/72
 TRCD: H.C. DATE: 3/10/72
 CKD: E.R.H. DATE: 5-17-72

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

APPROVED: _____ DATE: JUNE 15, 1972

Franklin R. Melena
 ENGINEER, CITY OF GARFIELD HEIGHTS

Raymond G. Gudek
 ENGINEER, CITY OF MAPLE HEIGHTS

J. C. Stellworth
 DIRECTOR OF PUBLIC UTILITIES

Richard A. Salter
 COMMISSIONER OF WATER AND HEAT

David D. Plummer
 COMMISSIONER OF UTILITIES ENGINEERING

William J. Sweeney
 ENGINEER OF CONSTRUCTION AND SURVEYS

William J. Sweeney
 ENGINEER OF DESIGN

2 ND HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO

Subject: **WATERWORK FOR THE CITY OF GARFIELD HEIGHTS AND THE CITY OF MAPLE HEIGHTS**

WATERWORK NOTES

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY
CUY.480-21.40

VALVES

GATE VALVES AND INSERTING VALVES (CONTINUED)

(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 are to open clockwise except those 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 are 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.

(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 inch of Grade One Bronze, or stainless steel ASTM A 276-55, Type 302, satisfactory to the Engineer, securely fastened and planed 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 watertight 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 be also 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 no 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 made 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 silicon 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 must be 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, wells, 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 requested 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 of 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.

APPROVED _____ DATE JUNE 15, 1972

Frank R. Needles
ENGINEER, CITY OF GARFIELD HEIGHTS
Richard P. Stalworth
ENGINEER, CITY OF MAPLE HEIGHTS
Richard P. Stalworth
DIRECTOR OF PUBLIC UTILITIES
Richard P. Stalworth
COMMISSIONER OF WATER AND HEAT
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COMMISSIONER DIVISION OF UTILITIES ENGINEERING
Richard P. Stalworth
ENGINEER OF CONSTRUCTION AND SURVEYS
William J. ...
ENGINEER OF DESIGN

2 ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS AND THE CITY OF MAPLE HEIGHTS

SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE *ERH* DATE *3/10/70* CONSULTING ENGINEERS
TRCD *HLB* DATE *3/11/70*
CKD *ERH* DATE *5/17/72* KANSAS CITY CLEVELAND NEW YORK

WATERWORK NOTES

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CUY. 480-21.40

VALVES

MATERIALS SPECIFICATIONS (CONTINUED)

(K) - 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 dove-tailed 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 shall conform to A.S.T.M. Specifications B-98, Alloy A.

Stainless Steel shall conform to A.S.T.M. Specifications A-276, Type 302.

Cast Iron shall conform to A.S.T.M. Specifications A-126, Class B.

(L) - 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 kinds, and subject to inspection, tests, and approval by the Engineer.

(M) - Chemical Analysis: Chemical analysis of the material used shall be furnished by the Contractor whenever required by the Engineer.

(N) - 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.

(O) - 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 or 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.

(P) - 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.

VALVES

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 six (6) inch Fire Hydrants," and "2-Inch Galvanized Black 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 "General - Testing Mains"; 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 approved paint.

(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 using Inertol 66 or Koppers Bitumastic 50 or approved equal.

INSPECTION

The Engineer or his authorized designate will inspect the material and work done, as the interests of the City or State may require. He 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 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 (14) prints, six of which shall be furnished to the Director of Public Utilities of the City of Cleveland. No work shall be done in the shop until after the drawings have been finally approved.

PAYMENT

The Unit Price stipulated for each "Item Special - Valves" classified as to size and type, shall include the furnishing, placing, testing and painting of the air cock, drain, gate, check and inserting valves, including by-pass valves, operating nuts and other accessories and appurtenances and the furnishing of all materials, labor, tools, and appliances necessary to complete the work as specified or as shown.

NOTE:

Air Cock is included for payment in "Item Special - 2" Air Cock Complete."
Drain Valve is included for payment in "Item Special - 2" Drain Complete."
Drain Valve is included for payment in "Item Special - 4" Drain Complete."

BRICK AND PLAIN CONCRETE MASONRY

WORK INCLUDED

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, 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, forming, scaffolding, sheeting and bracing, grouting, plastering, curing, etc., all as specified, required or shown on the contract drawings.

BRICK AND MASONRY MATERIAL

The material furnished by the Contractor for the various kinds of masonry construction to be constructed shall conform to the following specifications:

(A) - All brick furnished and used shall be No. 2 shale brick and shall comply with the requirements for "Grade SA" ASTM C 32.

(B) - Portland cement shall conform to the requirements of 701.04 (ASTM C 150 Type 1) State of Ohio, Dept. of Transportation Construction and Material Specifications.

APPROVED DATE JUNE 15, 1972

Franklin R. Melone
ENGINEER, CITY OF GARFIELD HEIGHTS

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William J. Sweeney
ENGINEER OF DESIGN

2 ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS AND THE CITY OF MAPLE HEIGHTS

SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE *E.P.H.* DATE *3/10/70*
TRCD. *H.P.* DATE *3/11/70*
CKD. *E.R.H.* DATE *5-17-72*
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

WATERWORK NOTES

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BRICK AND PLAIN CONCRETE MASONRY

BRICK AND MASONRY MATERIAL (CONTINUED)

(D) - Fine Aggregate for Mortar or Grout shall conform to the requirements of 703.03 State of Ohio, Dept. of Transportation Construction and Material Specifications.

(E) - Aggregate for Portland Cement Concrete shall conform to the requirements of 703.02 State of Ohio, Dept. of Transportation Construction and Material Specifications.

(F) - All water shall be clean and accurately measured for each batch of concrete.

(G) - All plain concrete shall be State of Ohio, Dept. of Transportation Construction and Material Specification 499 Class "C".

(H) - 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 man-holes which shall be 1 to 2 mix.

MANHOLE CONSTRUCTION FOR VALVE CHAMBERS AND DRAIN VAULTS

(A) - All brick manholes, brick necks and extensions, and temporary 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 thirteen (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 ($\frac{3}{8}$) inches 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 the manhole shall be built 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 ($\frac{1}{2}$) inch thick.

MANHOLE CONSTRUCTION FOR ACCESS MANHOLES AND ANCHORAGES, METER AND PITOMETER VAULTS

(A) - All plain concrete masonry construction shall be built in accordance with the contract drawings.

(B) - Temporary brick masonry extension for Access Manhole and Anchorage Type "A" shall be built in accordance with the contract drawings.

PAYMENT

Payment shall be made at the contract unit price bid per each "Item Special" - "Meter Vault", "Drain Vault", "Pitometer Vault", "Access and Anchorage Manhole Type A", "Access Manhole Type B", "Valve Chamber" and "Temporary Manhole Extension" complete and accepted in place. Payment for brick or plain concrete masonry is to be included in the unit price bid for the item in which it is used.

Payment for concrete anchors and piers is to be included in the unit price bid for "Item Special - Water Main".

Payment for concrete anchors and piers is to be included in the unit price bid for "Item Special - Water Main", or "Item Special - Plugging Water Mains and Branches".

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 man-hole 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 Item 604 of the State of Ohio, Dept. of Transportation Construction and Material Specifications, except that the cast iron shall be Class No. 30B. All structural steel shall meet the requirements of the ASTM Specifications A 7-46. All bronze bolts and nuts shall conform to the U. S. Standard sizes, and shall be clean cut and have well fitted threads. All bronze bolts and nuts shall be of Tobin 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 made to comply with Federal Specification 77-V-51a or Joint Army-Navy Specification JAN-P-450. Other methods of coating and types of coating material 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 representative, 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.

STEPS AND LADDERS

Ductile 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 established by the Engineer.

VALVE BOXES AND COVERS

The Contractor shall furnish and install, over each vertically set valve at 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, using Inertol 50 or Bitumastic 50, or approved equal.

MEASUREMENT

The weight of miscellaneous metal work to be paid for shall be the number of pounds of metal work actually furnished placed in accordance with these specifications and the detailed drawings approved by the Engineer. In computing the weights, if not determined by weighing, one (1) cubic foot of cast iron shall be assumed to weigh four hundred and fifty (450) pounds and one (1) cubic foot of steel shall be assumed to weigh four hundred and ninety (490) pounds.

PAYMENT

The unit price stipulated per pound for "Item Special - Miscellaneous Metal Work", shall include the furnishing, erecting, machining, fitting, adjusting, bolting, cleaning and painting of all miscellaneous metal work, and the furnishing of all labor, materials, tools and appliances necessary to complete the work as specified or as shown.

SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE E.R.H. DATE 3/10/70 CONSULTING ENGINEERS
TRCD. H.W. DATE 3/11/70
CKD. E.R.H. DATE 5-17-72 KANSAS CITY CLEVELAND NEW YORK

APPROVED _____ DATE JUNE 15, 1972

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ENGINEER, CITY OF MAPLE HEIGHTS
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ENGINEER OF DESIGN

2 ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS
AND THE CITY OF MAPLE HEIGHTS

WATERWORK NOTES

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY
CUY. 480-21.40

FIRE HYDRANTS

ITEM SPECIAL - FURNISHING AND SETTING 6" FIRE HYDRANT

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" hydrant details shown in the plans is a City of Cleveland Standard and shall conform to the City's specifications on file at 1201 Lakeside Avenue, Cleveland, Ohio, 44114.

SETTING

(A) - General Location: The 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.

(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 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.

(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 and the 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 a similar foundation and the base of the hydrant and the hydrant tee shall be 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.

PAYMENT

(A) - The unit price stipulated to be paid for each "Item Special - Furnishing and Setting 6" Fire Hydrant" shall include furnishing hydrant, setting, testing, painting, excavating, sheeting and shoring, backfilling, and the furnishing of all labor, material, tools and appliances necessary to complete the work as specified or as shown.

(B) - The cast iron pipe will be paid for under "Cast Iron Pipe and Fittings".

(C) - The valves will be paid for under "Valves".

(D) - The valve boxes will be paid for under "Miscellaneous Metal Work".

ITEM SPECIAL - FIRE HYDRANT RELOCATED

WORK INCLUDED

The Contractor shall remove the hydrant 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, furnishing and installing cast iron pipe and fittings, gate valve, and valve box, backfilling, testing, seeding and sodding, and repaving required for the proper completion of the work.

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 Special - Furnishing and Setting 6" Fire Hydrant" as set forth elsewhere in these notes.

PAYMENT

(A) - The unit price stipulated to be paid for each "Item Special - Fire Hydrant Relocated" shall include removing, setting, reconnecting, testing, painting, excavating, sheeting and shoring, backfilling, seeding and sodding and repaving, and furnishing of all labor, material, tools, and appliances necessary to complete the work as specified or as shown.

(B) - The cast iron pipe will be paid for under "Cast Iron Pipe and Fittings".

(C) - The Valves will be paid for under "Valves".

(D) - The Valve Boxes will be paid for under "Miscellaneous Metal Work".

ITEM SPECIAL - REMOVE AND RESET FIRE HYDRANT COMPLETE

WORK INCLUDED

The Contractor shall remove the hydrant, extend the existing or furnish new hydrant branch pipe and reset and connect the hydrant at the locations shown on the drawing or as directed by the Engineer. This shall include all excavating, cast iron pipe and fittings furnished and installed, removing and resetting and connecting the fire hydrant, backfilling, testing, seeding and sodding and pavement restoration required for the proper completion of the work.

MATERIALS

All hydrants to be reset 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 Special - Furnishing and Setting 6" Fire Hydrant" as set forth elsewhere in these notes.

PAYMENT

The work included in the Item shall be paid for at the contract unit price bid for each "Item Special - Remove and Reset Fire Hydrant Complete", classified as to size which price and payment shall constitute full compensation for the completion of this work in accordance with the provisions of these specifications and the furnishing of all labor, material, equipment, tools and appliances.

FIRE HYDRANT 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. The cost of such disposal shall be included in the price for Item 203 Excavation not including Embankment Construction, as per plan.

REMOVED ITEMS

All materials consisting of pipe and fittings, valves, fire hydrants, valve boxes, and vault covers which are indicated for removal by the Contractor shall be come the property of the Contractor and be removed and disposed of by him.

SCALE: 1" = 10'
MADE BY: E.R.H. DATE: 3-11-70
TRCD BY: H.L.D. DATE: 3-12-70
CKD BY: E.R.H. DATE: 5-17-70
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

APPROVED: DATE: JUNE 15, 1972

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2 ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS
AND THE CITY OF MAPLE HEIGHTS

PRESTRESSED CONCRETE CYLINDER PIPE

WATERWORK NOTES

Table with columns: FED. RD. DIVISION, STATE, PROJECT, and a circular stamp with '194' and '390'.

CUYAHOGA COUNTY
CUY. 480-21.40

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...

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 AND FITTINGS.

(A) All pipe to be furnished under this item shall be manufactured to conform in all respects to the American Water Works Specifications, Designation C301-64, for prestressed concrete cylinder pipe, except as herein noted.

(B) The prestressed concrete cylinder straight pipe shall, in general, be sixteen (16) or twenty (20) feet in length but bends, tees and other fittings and closure pieces may be made in shorter lengths.

Table with columns: Nominal I.D., Core Thickness, Minimum Mortar Coating Over Wire. Lists values for pipe diameters from 16" to 48".

The prestressed concrete cylinder pipe shall consist of a core formed by a continuous arc-welded steel cylinder with steel joint rings welded to its ends, lined with concrete, wrapped under tension with a wire of high tensile strength and coated with a dense covering of cement mortar.

(C) The pipe shall be reinforced with a steel cylinder. The steel for cylinders shall meet the requirements of Sec. 2.6 of A.W.W.A. Standard C301-64 except that the minimum yield point shall be 30,000 p.s.i., and cylinders shall be not less than 16 gauge, U.S. Standard.

repaired and the cylinder shall be retested. The finished cylinder with joint rings attached shall be water tight under the required test pressure.

(D) The high tensile wire used for circumferential reinforcement shall be of high tensile properties either cold drawn or high carbon MB basis, untempered according to the diameter of the pipe and the pressure for which it is designed.

Table with columns: ASTM Designation, Title, Min. Ultimate Strength, Min. Elastic Limit. Lists specifications for Cold-Drawn Steel Wire and Hard-Drawn Steel Spring Wire.

The circumferential reinforcement properties may be increased by the manufacturer upon approval by the Engineer. Test reports will be required before approval. The average gross wrapping stress of the high tensile wire shall not exceed seventy-five (75) percent of the minimum ultimate tensile strength of the wire...

(E) Each length of pipe shall be provided with bell and spigot ends formed by steel joint rings securely welded to the steel cylinder. The spigot ring shall be lined by the concrete of the core and the bell ring shall be protected on its exterior surface by the cement mortar coating.

(F) The gasket shall be made of rubber of special composition meeting the requirements of Sec. 3.4 of A.W.W.A. Specification C 301-64 and having a texture to assure a water-tight and permanent seal.

(G) Fittings or specials conforming to Type B requirements of Sec. 4.3 of A.W.W.A. Standard C 301-64 shall be furnished and installed as shown on the drawings or as required, and shall include specials with bell end, spigot end, flanged end, and victaulic end outlets...

(H) 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.

(I) The openings in the special may be formed by steel rings or castings of suitable design securely welded to the cylinder and reinforcing cage.

special pieces shall be provided with joint rings corresponding to those in the straight pipe. All bends, flanged pipe and reducers shall be constructed with steel cylinders having 1/4" minimum plate thickness.

(J) On vertical and horizontal bends and straight pipe within tied joints, the thickness of the cylinder shall be such that the resultant of the longitudinal and circumferential stress shall be not more than sixteen thousand (16,000) p.s.i. at the test pressure, or twelve thousand five hundred (12,500) p.s.i. at the working pressure.

(K) 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 two (2") inch malleable iron plugs.

(L) Closure pieces of follower ring type which can be cut in the field to fit required measurements shall be provided as are necessary for the proper construction of the water main. Closure pieces are to be avoided where possible within "tied distances" but when so required they shall be fitted with locking devices equivalent to those provided for regular pipe and fittings within "tied distances".

(M) All forged or rolled steel pipe flanges shall conform to "Standard Specifications for Forged or Rolled Steel Pipe Flanges, Forged Fittings, and Valves and Parts for General Service", A.S.T.M. Designation A181-61T, Grade I.

(N) 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", A.S.T.M. Designation A27-62.

(O) All steel forgings shall conform to "Standard Specifications for Carbon-Steel Forgings, A.S.T.M. Designation A235-62T, Class C".

(P) All structural steel shall conform to "Tentative Specifications for Steel For Bridges and Buildings", A.S.T.M. Designation A7-61T, or to "Specifications for Low and Intermediate Tensile Strength Carbon Steel Plates of Structural Quality", A.S.T.M. Designation A283-58, Grade C.

(Q) All cast iron pipe and fittings shall conform to the requirements of the section "Cast Iron and Ductile Iron Pipe and Fittings" of these specifications.

(R) Iron castings must be smooth and free from blowholes and other defects and the material shall conform to "Standard Specifications for Gray Iron Castings", A.S.T.M. Designation A48-62 Class 30B.

(S) Test, inspection, reports and analyses of test of samples for all materials shall be furnished in accordance with the section "Test, Inspection and Reports" of these specifications.

(T) Manufacturer's design calculations will be required.

(U) A detailed, tabulated laying schedule along with a plan and profile layout will be required.

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.

TYPICAL FIELD JOINTS FOR CONCRETE PIPE

The Contractor shall make all typical field joints and welded tied joints, and/or clamp type flexible tied joint marked "Y" 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.

APPROVED DATE JUNE 15, 1972

Dr. Donald R. Mielone
ENGINEER, CITY OF GARFIELD HEIGHTS

Raymond Kudubek
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COMMISSIONER DIVISION OF UTILITIES ENGINEERING
William J. Sweeney
ENGINEER OF DESIGN

2 ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS

WATERWORK NOTES

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

195
390

CUYAHOGA COUNTY
CUY. 480-21.40

PRESTRESSED CONCRETE CYLINDER PIPE

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 machined fabricated steel plates welded to pipe cylinder with two (2) 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 A.S.A. one hundred twenty-five (125) pound Standard. Each blind flange shall be cast iron and shall have bosses tapped at top and bottom for two (2) inch standard pipe and furnished with plugs. All bolts for flanges and for other types of bolting shall conform to the "Tentative Specifications for Low Carbon Steel Externally and Internally Threaded Standard Fasteners, A.S.T.M. Designation A307-63T, Grade A, except where one or both flanges are cast iron, in which case bolts shall be Grade B.

(B) All bolts used in the finished work for flanges and tied joints for concrete pipe shall be of medium open hearth or electric furnace steel. The ends of all bolts must be finished to a standard radius in an acceptable manner. All screw threads shall be American Standard Coarse Thread (N.C.). Stud bolts 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, electric furnace or Bessemer process steel. All dimensions shall be according to American Standard Heavy. Bolts and nuts shall be galvanized before shipment and not primed. Gaskets for flanged pipe shall be full faced rubber one-sixteenth (1/16) inch thick 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 A.W.W.A. C206-62 "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.

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 the following depth:

Size of Pipe	Depth of Lead
4 - 20 (Both Inclusive)	2 1/2 inches
24	2 3/4 inches
30 - 36	3 1/4 inches
Sleeves	Solid

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.

VICTAULIC PIPE 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 or steel pipe reducers. Steel pipe ends shall be fabricated and grooved as indicated on the drawings. The couplings shall be adapted for installation on shouldered end cast iron pipe and fittings and 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 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", A.S.T.M. Designation A47-61. Bolts shall be manufactured by the coupling manufacturer and shall comply in material with the requirements of bolts for flanged joints specified above. Bolts and nuts shall be galvanized or cadmium plated.

(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 furnishes the coatings as specified under "Coating".

SHOP COATING AND PAINTING

(A) The exposed surfaces 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 A.W.W.A. Specification C203-62. 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) Galvanized pipe ends for rubber gasket joints are not to be coated.

(C) The grooved steel bands at the ends of the prestressed concrete cylinder pipe to receive victaulic type couplings shall be coated with white lead and tallow. The coating must be removed just prior to installation of the coupling.

(D) All finished surfaces shall be coated with white lead and tallow and not primed.

(E) After erection, all exposed or damaged coatings on surfaces buried underground and all bolts on flanges and victaulic couplings shall be cleaned and painted with three (3) field coats of coal tar pitch paint equal to Inertol 66 or Koppers 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 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 Engineer.

(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:

1. Name of Pipe Manufacturer and Location of Plant
2. Name of Coupling Manufacturer and Location of Plant
3. Pipe Coating and Lining Data

DRAWINGS

(A) The Contractor shall submit to the Engineer 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 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 seventeen (17) additional prints, sixteen (16) on paper and one (1) mylar or reproducible cloth tracing 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 Engineer 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 Engineer 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 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

The unit price stipulated to be paid for each linear foot of water main "Item Special - Water Main" classified to size 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 the furnishing of all labor, materials, tools, appliances and equipment to complete the work as specified or as 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 Engineer.

(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 "Item Special - Extra Concrete Pressure Pipe Fittings" classified as to size and type shall be in full compensation for the furnishing and installing of such extra fittings as are ordered by the Engineer 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 Engineer.

APPROVED _____ DATE JUNE 15, 1972

Franklin R. Mylon
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2 ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES DIVISION OF WATER AND HEAT CLEVELAND, OHIO
Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS

MADE ECF DATE 4-8-68 TRACED HLD DATE 3/12/70
CHECKED ERH DATE 3/30/70 SCALE _____

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

WATERWORK NOTES

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

196
390

CUYAHOGA COUNTY
CUY. 480-21.40

MISCELLANEOUS ITEMS

ITEM SPECIAL - SERVICE CONNECTION EXTENDED

WORK INCLUDED

The City of Cleveland, Division of Water, will relocate curb boxes and extend connections at no cost to the Contractor from existing curb box location to new curb box location. All other connection work and material shall be by the Contractor.

The Contractor shall do all the necessary excavation, backfilling, seeding, sodding and repaving required in making these service connections and alterations and costs thereof shall be included in the unit price bid for "Service Connection Extended". The curb boxes shall be relocated by the City and set to final grade by the Contractor. Water Meter Vaults for connections 1 1/2" and over shall be constructed by the Contractor and paid for at contract unit price for each "Item Special - Meter Vault." (Brick and Concrete Masonry, See Sheets 191 and 192.)

MEASUREMENT

The service connection extended to be paid for shall be the actual number of each listed and estimated separately, completed and accepted.

BASIS OF PAYMENT

The unit price stipulated for each "Item Special - Service Connection Extended" under this item shall include the excavation, backfilling, seeding and sodding and repaving and the furnishing of all labor, materials, tools and appliances necessary to complete the work as specified or as shown.

ITEM SPECIAL - TEMPORARY SERVICE CONNECTION

WORK INCLUDED

The City shall disconnect the existing service connection from the water main that is to be taken temporarily out of service. A tap is to be made on a temporary by-pass or a water main that will remain in service, and the service connection shall be temporarily connected. After service is restored to the water main, the service connection shall be reconnected to the original or relocated main. The City will furnish the piping materials, and make all changes necessary to service connection box only. The Contractor shall do all excavation, backfilling, repaving and all other work.

PAYMENT

The actual number of each "Item Special - Temporary Service Connection", shall be paid at the contract unit price. This price and payment shall constitute full compensation for performing all of the requirements of this item, including furnishing all necessary materials, labor, tools, equipment supplies and incidentals. The materials, labor, tools, equipment and incidentals furnished by the City of Cleveland, Division of Water, will be at no expense to the Contractor.

ITEM SPECIAL - SERVICE CONNECTION RELOCATED ITEM SPECIAL - WATER METER RELOCATED

WORK INCLUDED

The City will furnish the piping material for and make all changes required in the relocation of existing house connections and meters from the corporation cock to the curb cock only. The Contractor shall do all the necessary excavation, backfilling, and repaving required and all other connections, labor and material.

Materials furnished by the City include piping, corporation cock, curb cock, and water meter vault. Water Meter Vault for connections 1 1/2" and over shall be constructed by the Contractor and paid for at contract unit price for each, "Item Special - Meter Vault." (Brick and Concrete Masonry, See Sheets 191 and 192.)

PAYMENT

The actual number of each "Item Special - Service Connection Relocated" and each "Item Special - Water Meter Relocated" shall be paid for at the contract unit price bid and payment shall constitute full compensation for performing all the requirements of this item, including furnishing all necessary materials, labor, tools, equipment, supplies and incidentals. The materials, labor, tools, equipment and incidentals furnished by the City of Cleveland, Division of Water, will be at no expense to the Contractor.

ITEM SPECIAL - RELOCATE, RETAP AND RECONNECT SERVICE CONNECTION

WORK INCLUDED

The Contractor shall remove the existing service connection from the existing water main which is to be abandoned. A tap is to be made on the new water main and the existing service piping shall be connected to the new water main. The City will furnish the piping materials and make all changes necessary to re-connect, but the Contractor shall do all excavation, backfilling and repaving.

PAYMENT

The actual number of each "Item Special - Relocate, Retap and Reconnect Service Connection", shall be paid for at the contract unit price. This price and payment shall constitute full compensation for performing all of the requirements of this item, including furnishing all necessary materials, labor, tools, equipment, supplies and incidentals. The materials, labor, tools, equipment and incidentals furnished by the City of Cleveland, Division of Water, will be at no expense to the Contractor.

ITEM SPECIAL - 2" AIR COCK COMPLETE

WORK INCLUDED

The Contractor shall furnish pipe with a 2" air cock connection and furnish and install the 2" air cock complete as shown in the "Water Work Details" at the locations shown in the plans.

PAYMENT

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - 2" Air Cock Complete" which price and payment shall constitute full payment for furnishing and installing all materials, labor, equipment, tools, and appliances necessary to complete this item. The valve box will be paid for separately under the item "Miscellaneous Metal Work".

ITEM SPECIAL - 4" DRAIN COMPLETE

WORK INCLUDED

The Contractor shall furnish pipe of the sizes shown with a 4" Tangent Outlet at the locations shown on the plans and shall furnish and install the 4" pipe, and valve as shown in the "Water Work Details".

PAYMENT

(A) - The work included in this item shall be paid for at the contract unit price bid for each "Item Special - 4" Drain Complete" which price and payment shall constitute full payment for furnishing and installing all materials, labor, equipment, tools and appliances necessary to complete this item.

(B) - The Drain Vault will be paid for under each "Item Special - Drain Vault".

(C) - The Valve Box will be paid for under "Item Special - Miscellaneous Metal Work".

ITEM SPECIAL - ADJUST CURB COCK VALVE BOX TO GRADE

ITEM SPECIAL - ADJUST VALVE BOX TO GRADE

WORK INCLUDED

The Contractor shall raise or lower the existing valve box to fit the revised grade by excavating under or tamping backfill under the valve box to insure that the box has a firm footing.

PAYMENT

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - Adjust Valve Box To Grade", and "Item Special - Adjust Curb Cock Valve Box To Grade", which price and payment shall constitute full compensation for adjusting the valve box, excavation, tamping earth under valve box, backfill, seeding and for all labor, equipment, tools and incidentals necessary to complete this item.

ITEM SPECIAL - REMOVE ABANDONED VALVE BOX

ITEM SPECIAL - REMOVE ABANDONED CURB COCK VALVE BOX

WORK INCLUDED

The Contractor shall either remove or leave in place the abandoned curb cock, or gate valve. The valve box shall either be removed or broken off at least 1' below the ground surface and backfilled. If the valve box is in a paved area, the area shall be restored to match the existing pavement.

PAYMENT

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - Remove Abandoned Curb Cock Valve Box" and "Item Special - Remove Abandoned Valve Box" which price and payment shall constitute full compensation for abandoning the valve and removing the valve box, backfilling, seeding, repaving, and for all labor, equipment, tools and incidentals necessary to complete this item.

APPROVED _____ DATE JUNE 15, 1972

Frank R. Spelona
ENGINEER, CITY OF GARFIELD HEIGHTS

Robert J. Miller
ENGINEER, CITY OF MAPLE HEIGHTS

Raymond J. ...
DIRECTOR OF PUBLIC UTILITIES

J. E. ...
COMMISSIONER OF WATER AND HEAT

Richard A. ...
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

David J. ...
ENGINEER OF CONSTRUCTION AND SURVEYS

William J. ...
ENGINEER OF DESIGN

2 ND HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS
AND THE CITY OF MAPLE HEIGHTS

SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE ERH DATE 3/20/70 CONSULTING ENGINEERS
TRCD HLD DATE 3/26/70
CKD TLT DATE 5-8-70 KANSAS CITY CLEVELAND NEW YORK

WATERWORK NOTES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

197
390

CUYAHOGA COUNTY
CUY. 480-21.40

MISCELLANEOUS ITEMS

2-INCH GALVANIZED BLACK 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 strong galvanized black 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 BLACK IRON PIPE AND FITTINGS

All galvanized black iron pipe, nipples and couplings shall be extra strong black iron pipe A.S.T.M. Designation A 120. The fittings shall be beaded, of malleable iron, extra heavy weight. All pipe and fittings shall be hot dipped, zinc coated 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.

PAYMENT

The work included in this item shall be paid for at the contract unit price bid for each "Item Special - Furnish and Install Flush Pipe including Fittings and Valve", 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 furnishing all labor, material, equipment, tools, and incidentals necessary to complete this item.

A quantity of 4-Each Item Special-Furnish and Install Flush Pipe including Fittings and Valve has been provided in the General Summary for use as directed by the Engineer.

ITEM SPECIAL-1/2" NEW SERVICE PIPE

WORK INCLUDED:

The applicable items of work for new "Water Mains" shall apply using 1/2" Extra-Strong Galvanized Black Iron Pipe A.S.T.M. A-120 with Galvanized Malleable Iron Extra-Heavy weight screwed fittings. Only new pipe is to be used in the temporary Service Pipe on Orchard Road, Sta. 9+05 Lt. to Sta. 6+55 Lt. The Specifications for laying, backfilling, testing, etc. are shown elsewhere in the "Water Work Notes".

PAYMENT:

The work included in this Item shall be paid for at the contract unit price bid per Linear Foot for "Item Special-1/2" New Service Pipe" which price and payment shall constitute full compensation for excavation, furnishing and installing the pipe and fittings, backfilling, testing, surface restoration and the furnishing of all labor, materials, small tools and equipment necessary to complete the work as shown on the plans.

The chlorination of the 1/2" New Service Pipe by the City of Cleveland Division of Water will be at no expense to the Contractor.

ITEM SPECIAL - TAPPING SLEEVE AND VALVE

WORK INCLUDED

The Contractor shall furnish and install the Tapping Sleeve and Valve at the location shown in these plans or as directed by the Engineer. The Contractor shall do all necessary excavating, backfilling, repaving, furnishing and installing the Tapping Sleeve and Valve and all other work that is necessary for the proper completion of this work.

Where the Tapping Sleeve and Valve is to be installed and a tap is to be made in prestressed concrete cylinder pipe, the Contractor shall arrange for the work with the pipe fabricator or valve supplier.

Complete shop drawings and procedures to be followed shall be approved by the Division of Water and Heat before proceeding with the work.

The work shall be performed under the supervision of the Division of Water and Heat.

QUALITY OF VALVES AND SLEEVES

The valves shall be A.P. Smith Manufacturing Co. or approved equal and shall comply with the requirements of the Item "Valves" of these specifications, insofar as they apply, including the provisions of sections (V) and (W).

The sleeves shall be of the class and size as shown and shall conform to the requirements of the Item "Cast Iron Pipe and Fittings" of these specifications, insofar as they apply.

PAYMENT

The work included in these items will be paid for at contract unit price bid for Each "Item Special-Tapping Sleeve and Valve" classified as to size, which price and payment shall constitute full compensation for furnishing and installing the Tapping Sleeve and Valve and performing the excavating, sheeting and shoring, backfilling and sand backfilling, seeding and sodding and repaving--if required, and for furnishing all labor, materials, equipment, tools and incidentals necessary to complete the work as specified or as shown.

Valve Box will be paid for separately under "Item Special-Miscellaneous Metal Work".

ITEM SPECIAL - CUTTING-IN VALVE COMPLETE

WORK INCLUDED

The Division of Water will set the time of installation and the Contractor will do all pipe cutting and installing under the supervision of the Division of Water and Heat. The Contractor shall furnish and haul to the proper location the Hub Valve, Standard No. 38 Dresser Coupling or Smith Blair Coupling or approved equal, cast iron pipe and lead for the installation. The Contractor shall excavate, provide sheeting and bracing as necessary, backfill and repave as necessary.

PAYMENT

The work included in this item shall be paid for at the unit price bid for each "Item Special - Cutting-in Valve Complete", classified as to size. The price and payment shall constitute full compensation for performing all excavation, sheeting, bracing, backfilling, repaving, furnishing and installing the Cutting-in Valve and the furnishing of all labor, materials, labor, small tools and equipment required to complete this item of work in place.

Valve Box will be paid for separately under "Item Special-Miscellaneous Metal Work".

EXISTING WATER MAINS AND BRANCHES PLUGGING SERVICE CONNECTIONS

WORK INCLUDED

The work included under these items shall consist of the plugging of existing water mains and branches, and the plugging of service connections at the locations shown on the drawings or as ordered, including cast iron plugs or caps with clamps and concrete piers, all excavating, sheeting and bracing, concrete, sand backfill, backfill, temporary repaving and permanent repaving, all as required for the proper completion of the work.

(A) - Plugging Mains and Branches: When indicated on the plans or as ordered the Contractor shall make pipe cuts, remove pipe and fittings and shall plug or cap mains, tees or crossed, plug connections at mains or branches, shall do all the excavating, backfilling and repaving, all as required.

(B) - Plugging Service Connections: The Contractor shall do all necessary excavating, sheeting and bracing, sand backfilling, backfilling and repaving required for this item, but the Cleveland Water Department will plug the service connection. The Contractor shall arrange with the Cleveland Water Department for the necessary work under this item.

MEASUREMENT

The existing water mains and branches plugged or service connections plugged to be paid for shall be the actual number of each listed and estimated separately, completed and accepted.

PAYMENT

The unit price stipulated for each (A) "Item Special - Plugging Existing Water Mains and Branches" classified as to size shall constitute full compensation for performing all the requirements of this item including furnishing all necessary materials, labor, tools, equipment and incidentals to make this a complete item of work.

The unit price stipulated for each (B) "Item Special - Plugging Service Connections" shall constitute full compensation for performing all the requirements of this item including furnishing all necessary materials, labor, tools, equipment and incidentals to make this a complete item of work.

The materials, labor, tools, equipment and incidentals furnished by the City of Cleveland, Division of Water, will be at no expense to the Contractor. The work performed by the City of Cleveland applies to (B) "Plugging Service Connections".

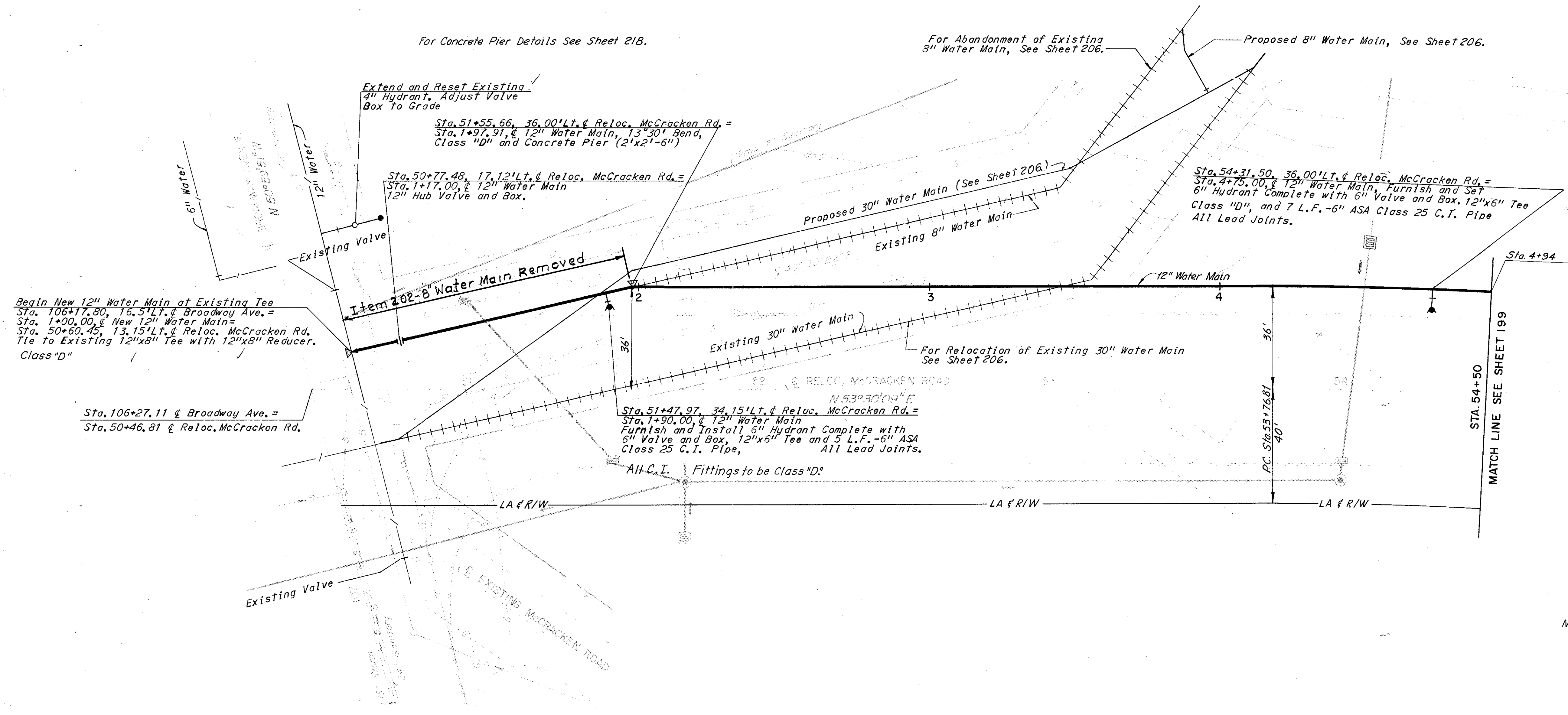
BOLTLESS RESTRAINED PUSH-ON JOINTS

Boltless restrained pipe joints shall be provided conforming to Clow Corp. Super-lock F-128, U.S. Pipe and Foundry LoK-Tyton or approved equal.

SCALE: **HOWARD, NEEDLES, TAMMEN & BERGENDOFF**
 MADE ERH DATE 3/19/72 CONSULTING ENGINEERS
 TRCD. WHD DATE 2/26/72
 CKD. ERH DATE 5-17-72 KANSAS CITY CLEVELAND NEW YORK

APPROVED _____ DATE JUNE 15, 1972
Franklin R. Meloni
 ENGINEER, CITY OF GARFIELD HEIGHTS
Richard R. Fisher
 ENGINEER, CITY OF MAPLE HEIGHTS
Raymond Rudekew
 DIRECTOR OF PUBLIC UTILITIES
J. J. Sullivan
 COMMISSIONER OF WATER AND HEAT
Richard A. Fisher
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING
David J. Fisher
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William J. Murney
 ENGINEER OF DESIGN

2 ND HIGH SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO
 Subject: **WATERWORK FOR THE CITY OF GARFIELD HEIGHTS AND THE CITY OF MAPLE HEIGHTS**



For Concrete Pier Details See Sheet 218.

For Abandonment of Existing 8" Water Main, See Sheet 206.

Begin New 12" Water Main at Existing Tee
Sta. 106+17.80, 16.51' Lt. & Broadway Ave. =
Sta. 1+00.00, 4' New 12" Water Main =
Sta. 50+60.45, 13.15' Lt. & Reloc. McCracken Rd.
Tie to Existing 12"x8" Tee with 12"x8" Reducer.
Class "D"

Sta. 106+27.11 & Broadway Ave. =
Sta. 50+46.81 & Reloc. McCracken Rd.

Extend and Reset Existing 4" Hydrant, Adjust Valve Box to Grade
Sta. 51+55.66, 36.00' Lt. & Reloc. McCracken Rd. =
Sta. 1+97.91, 12" Water Main, 13°30' Bend, Class "D" and Concrete Pier (2'x2'-6")

Sta. 50+77.48, 17.12' Lt. & Reloc. McCracken Rd. =
Sta. 1+17.00, 12" Water Main 12" Hub Valve and Box.

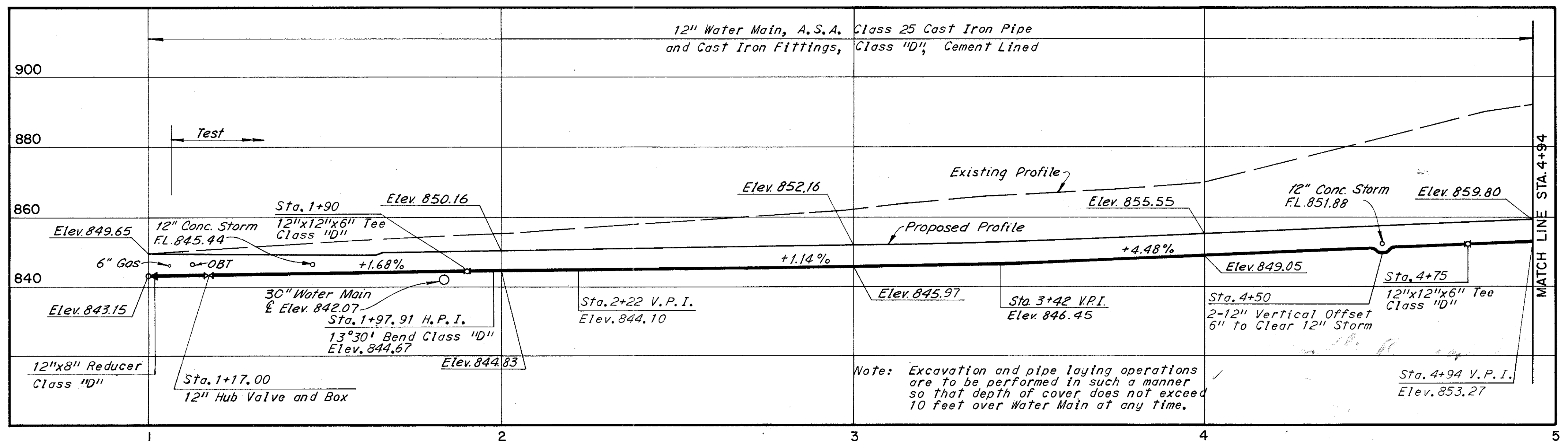
Proposed 30" Water Main (See Sheet 206)
Existing 8" Water Main

Sta. 54+31.50, 36.00' Lt. & Reloc. McCracken Rd. =
Sta. 4+75.00, 12" Water Main, Furnish and Set 6" Hydrant Complete with 6" Valve and Box, 12"x6" Tee Class "D", and 7 L.F. -6" ASA Class 25 C.I. Pipe All Lead Joints.

Sta. 51+47.97, 34.15' Lt. & Reloc. McCracken Rd. =
Sta. 1+90.00, 12" Water Main
Furnish and Install 6" Hydrant Complete with 6" Valve and Box, 12"x6" Tee and 5 L.F. -6" ASA Class 25 C.I. Pipe, All Lead Joints.
All C.I. Fittings to be Class "D"

For Relocation of Existing 30" Water Main See Sheet 206.

Notes:
Waterwork on New 12" Water Main shall not be done until 30" Water Main Relocation is installed and in service. See Sheet 206.
Existing 8" Water Main to be removed from Sta. 1+00 to Sta. 2+00, including 8" Valve at Sta. 1+16.50.
For Waterwork Quantities See Sheet 207.



Note: Excavation and pipe laying operations are to be performed in such a manner so that depth of cover does not exceed 10 feet over Water Main at any time.

APPROVED _____ DATE JUNE 15, 1972
Donald R. McLean
ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond A. Anderson
DIRECTOR OF PUBLIC UTILITIES
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COMMISSIONER OF WATER AND HEAT
David J. Griffin
COMMISSIONER DIVISION OF UTILITIES ENGINEERING
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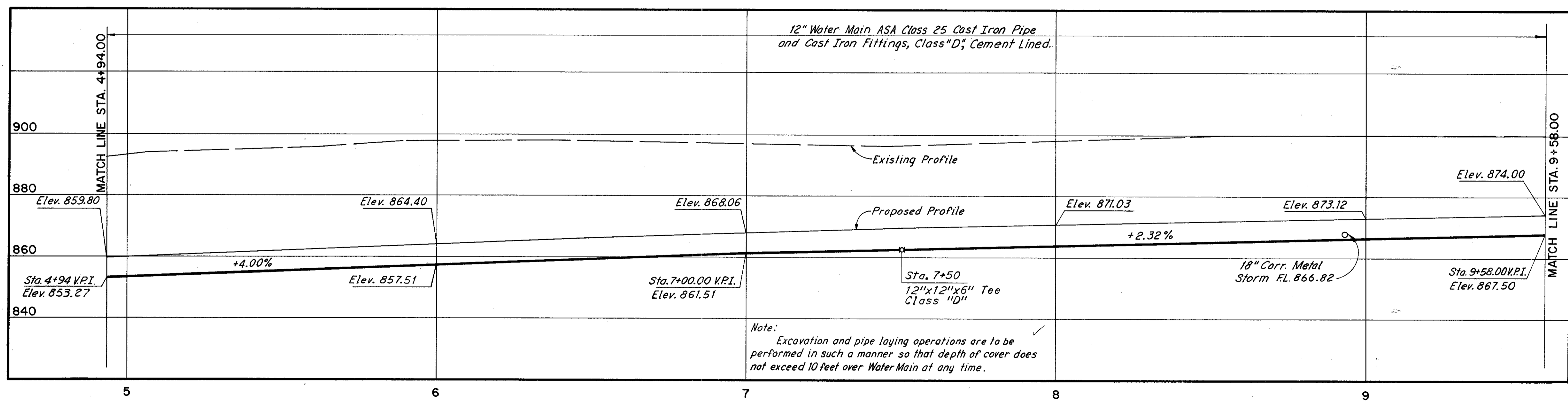
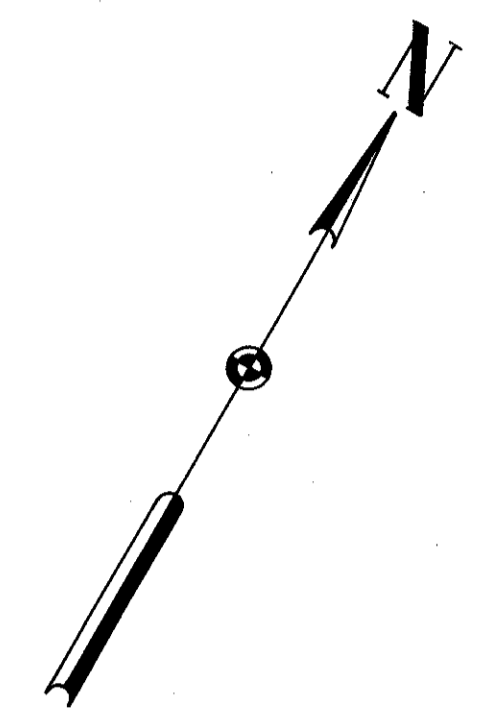
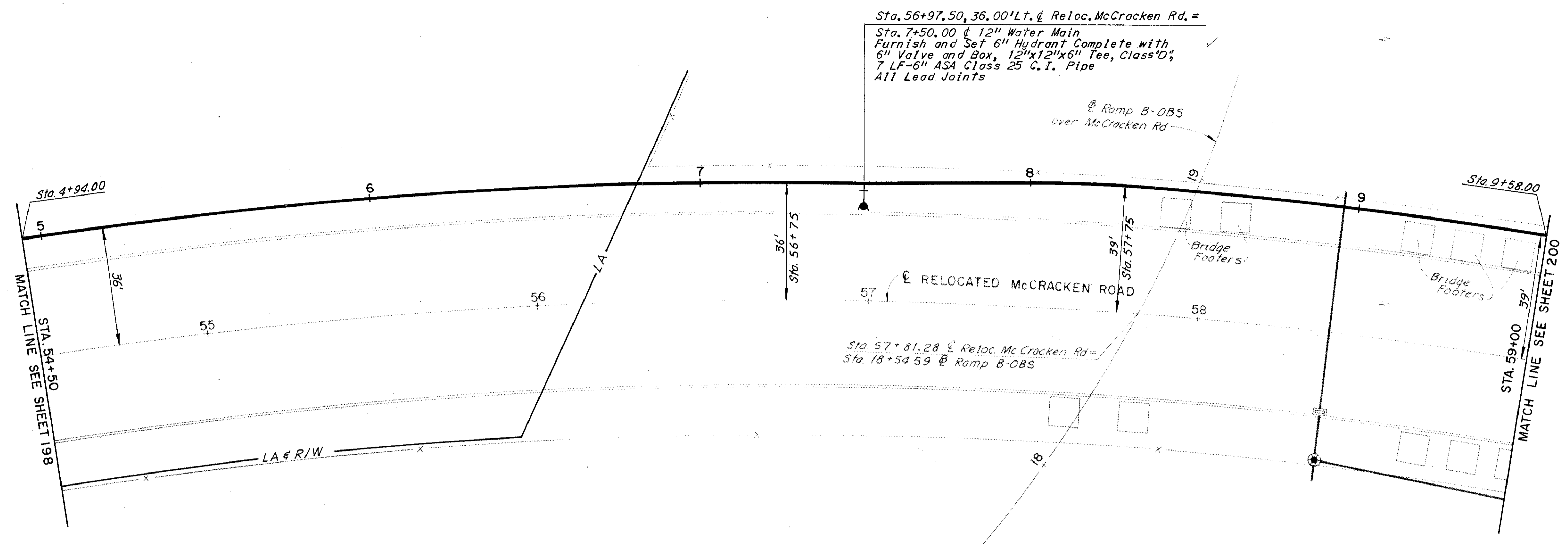
2ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: **WATERWORK FOR THE CITY OF GARFIELD HEIGHTS**

SCALE 1" = 20'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE T.J.T. DATE 3-12-71 CONSULTING ENGINEERS
TRCD J.M.C. DATE 3-31-71
CKD E.R.H. DATE 5-17-72 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

199
390

CUYAHOGA COUNTY
CUY. 480-21.40

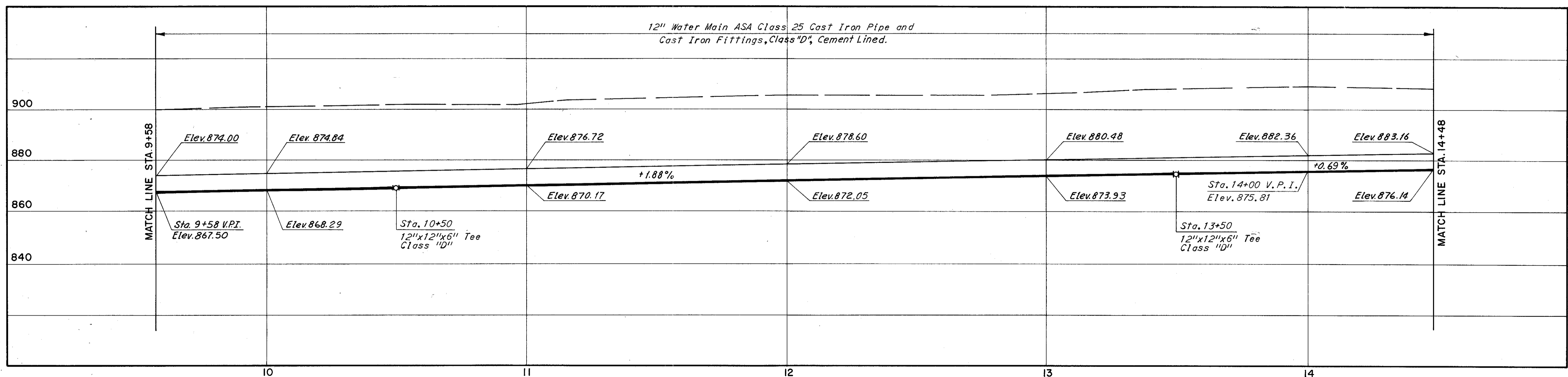
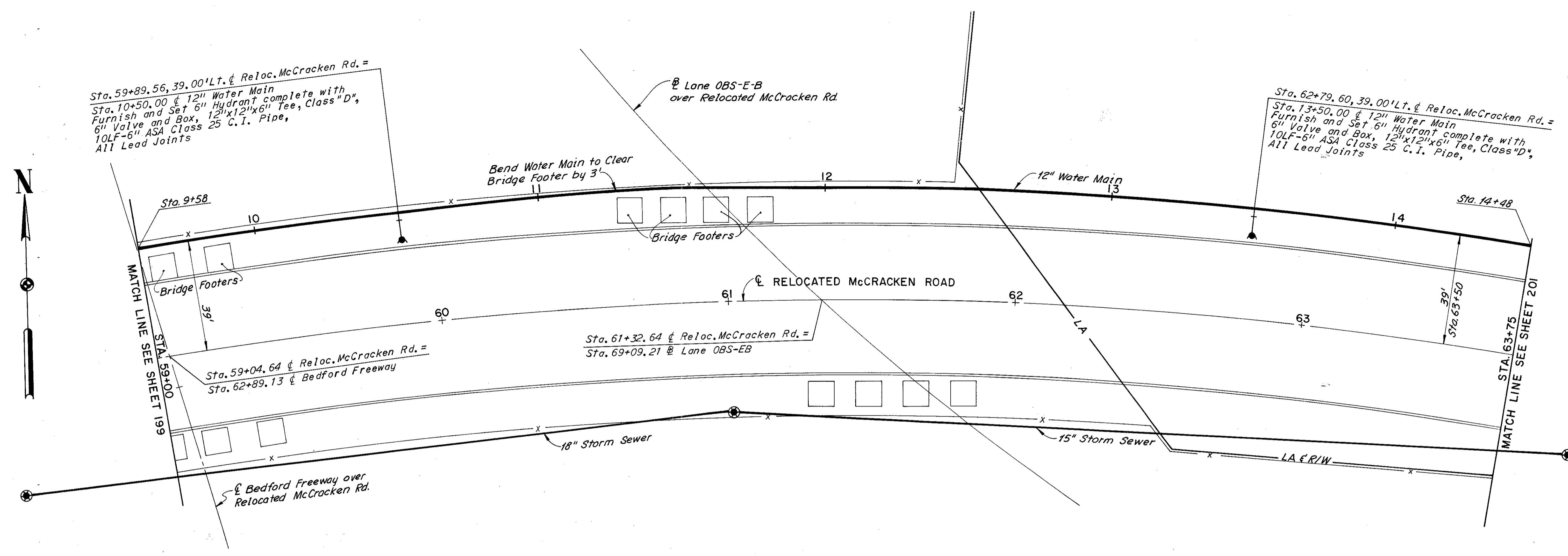


Notes:
For Waterwork Quantities See Sheet 207.
Bridge Footers shall be in place before 12" Water Main is installed.

SCALE 1" = 20'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
MADE P.L.T. DATE 3-12-71
TRCD J.M.C. DATE 3-31-71
CKD E.R.H. DATE 5-17-72
KANSAS CITY CLEVELAND NEW YORK

APPROVED DATE JUNE 15, 1972
Grant R. Napolitano
 ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond Kukulski
 DIRECTOR OF PUBLIC UTILITIES
Richard A. Fisher
 COMMISSIONER OF WATER AND HEAT
David A. Pfeiffer
 ENGINEER OF CONSTRUCTION AND SURVEYS
William J. Sweeney
 ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO
 Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS



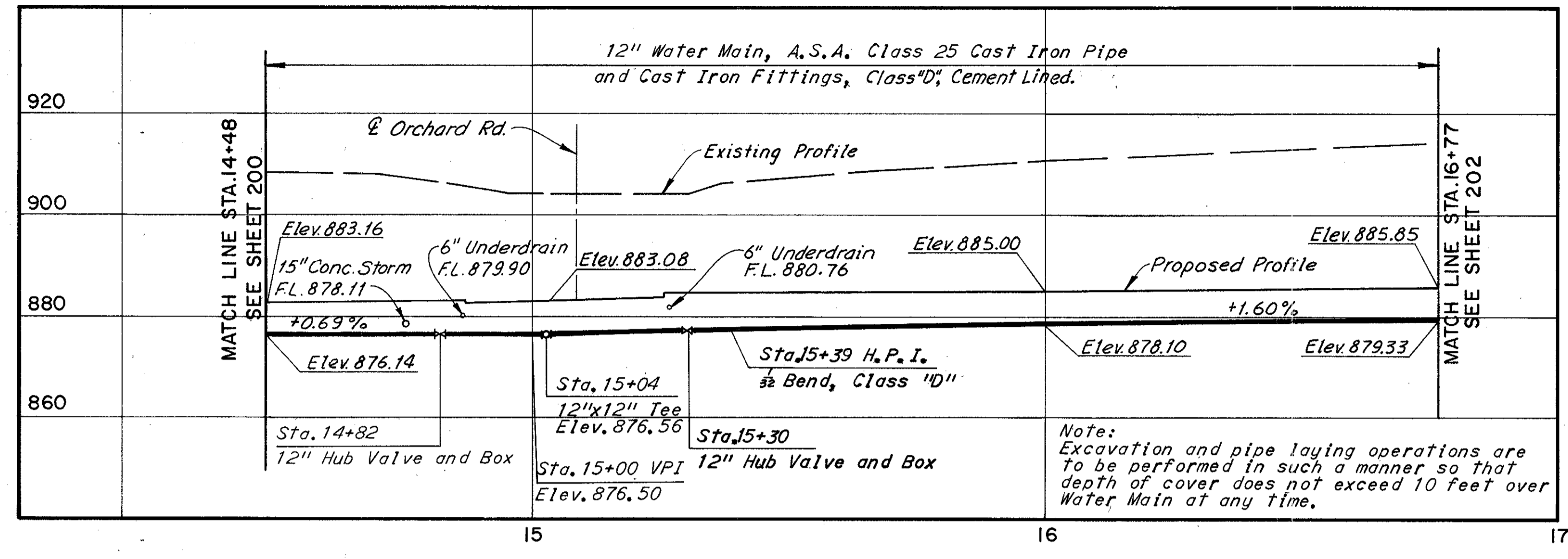
Notes:
 For Waterwork Quantities See Sheet 207.
 Bridge Footers shall be in place before 12" Water Main is installed.
 Excavation and pipe laying operations are to be performed so that depth of cover does not exceed 10 feet over Water Main at any time.

APPROVED DATE JUNE 15, 1972
Franklin R. M... ..
 ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond
 DIRECTOR OF PUBLIC UTILITIES
Richard A.
 COMMISSIONER OF WATER AND HEAT
David D.
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING
William J.
 ENGINEER OF CONSTRUCTION AND SURVEYS
William J.
 ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO
 Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS

SCALE 1" = 20'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE I.T. DATE 3-3-71 CONSULTING ENGINEERS
 TRCD J.M.C. DATE 3-11-71
 C.K.D. E.R.H. DATE 5-17-72 KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY
CUY. 480-21.40



12" WATER MAIN-RELOCATED McCracken Road



Note:
For Waterwork Quantities See Sheet 207.
*Work to be done by Contractor
†Temporary Service not required, House Removed

Note: Concrete Pier details are shown on sheet 218.

Provide Temporary 8" C.I. Plug at Hydrant Tee Clamps and Concrete Pier (3'-0"x4'-0") (Include in cost of 12" Water Main)

Sta. 8+79.00, 6.00' Lt. Orchard Rd. = Sta. 1+27.66 12" Water Main & Bend, Class "D" and Concrete Pier (3'-0"x3'-6")

Sta. 9+05.00, 10.00' Lt. Orchard Rd. = Sta. 1+00.00 Existing 8" Water Main Install Temporary 2" New Service Pipe Install Plug when Disconnected and Remove Curb Cock Valve Box

Sta. 8+98.60, 10.00' Lt. Orchard Rd. = Sta. 1+06.40 Existing 8" Water Main Existing 8" Hub Valve Reset Valve Box to Grade

Sta. 8+83.00, 10.00' Lt. Orchard Rd. = Sta. 1+22.00 12" Water Main & Bend Class "D" and Concrete Pier (3'-0"x3'-6")

Begin 12" Water Main at Existing Hydrant Tee Sta. 8+85.20, 10.00' Lt. Orchard Rd. = Sta. 1+19.80 Existing 8" Water Main 12"x8" Reducer Class "D" Reset Valve Box to Grade

Install Temporary New Service Pipe 280 L.F. 1 1/2" Extra Heavy Galv. Black Iron Pipe, ASTM A-120 with Galv. Malleable Iron Screwed Fittings. To be laid with minimum 5 1/2" cover. Abandon in place when disconnected.

Temporary 1 1/2" New Service Pipe to be Installed at Proper Elevation to Clear Proposed Drive

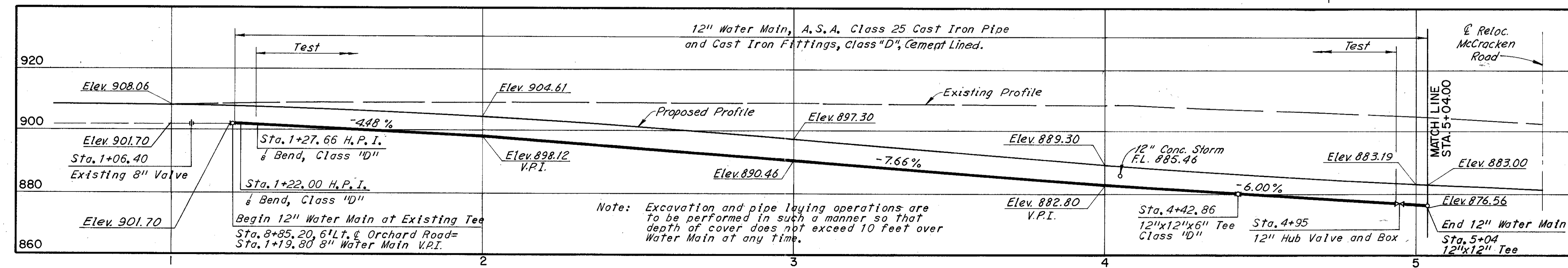
Sta. 5+63.80, 6.00' Lt. Orchard Rd. = Sta. 4+42.86 12" Water Main Abandon Existing 4" Hydrant Furnish and Set 6" Hydrant Complete with 6" Valve and Box, 12"x12"x6" Tee, Class "D", 10 LF-6" ASA Class 25 C.I. Pipe All Lead Joints

Sta. 64+54.11, 36.00' Lt. Reloc. McCracken Rd. = Sta. 15+30.00 12" Water Main 12" Hub Valve and Box

Sta. 5+11.66, 6.00' Lt. Orchard Rd. = Sta. 4+95.00 12" Water Main 12" Hub Valve and Box

Sta. 64+08.00, 36.00' Lt. Reloc. McCracken Rd. = Sta. 14+82.00 12" Water Main 12" Hub Valve and Box

Sta. 15+04.00 12" Water Main (McCracken Rd.) = Sta. 64+28.74, 36.00' Lt. Reloc. McCracken Rd. = Sta. 5+04.00 12" Water Main (Orchard Rd.) = Sta. 5+02.66, 6.00' Lt. Orchard Rd. 12"x12" Tee, Class "D" and Bend to Fit Concrete Pier (4'x5')



12" WATER MAIN-ORCHARD ROAD

Note: Excavation and pipe laying operations are to be performed in such a manner so that depth of cover does not exceed 10 feet over Water Main at any time.

APPROVED DATE JUNE 15, 1972

Franklin Melson
ENGINEER, CITY OF GARFIELD HEIGHTS

Raymond Redeker
DIRECTOR OF PUBLIC UTILITIES

(S. Stallworth)
COMMISSIONER OF WATER AND HEAT

David J. Quillen
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

William J. Swenson
ENGINEER OF CONSTRUCTION AND SURVEYS

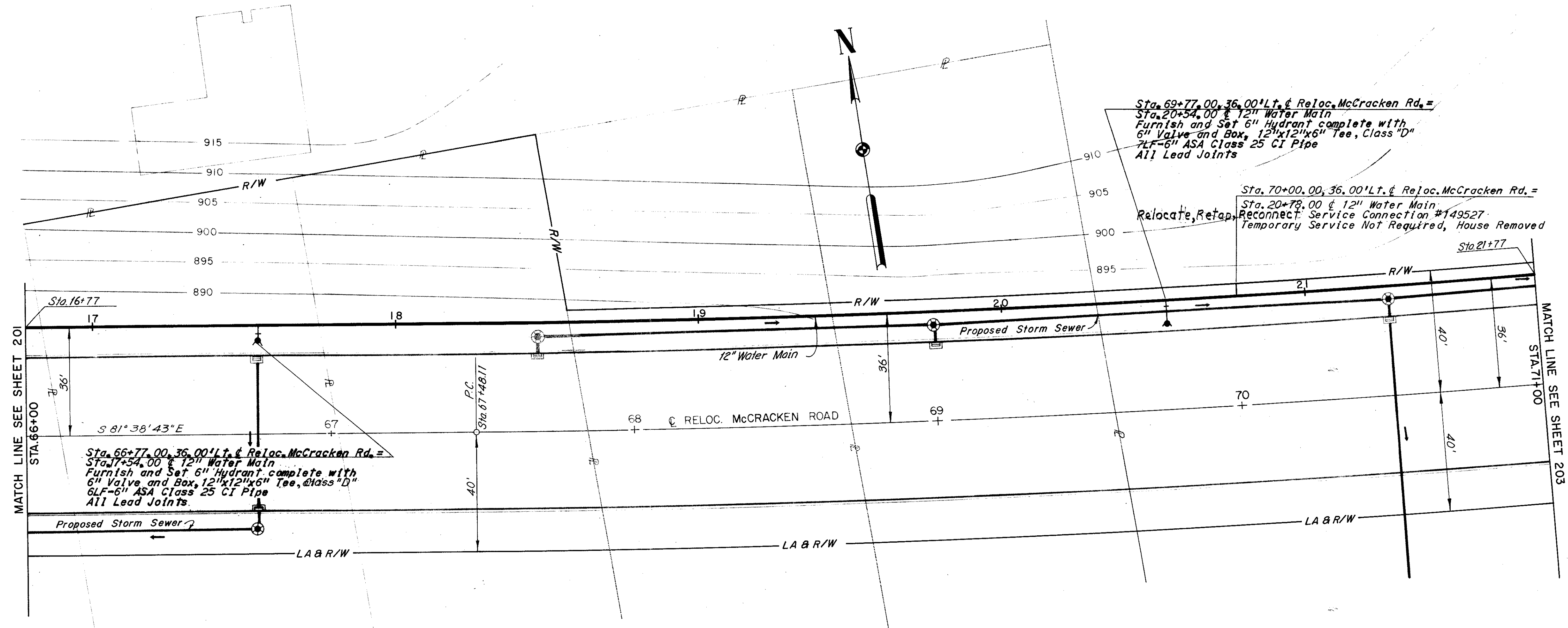
William J. Swenson
ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS

SCALE 1"=20' Hor. & Vert. HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE T.J.T. DATE 3-1-71 CONSULTING ENGINEERS
TRCD J.M.C. DATE 3-26-71
CKD E.R.H. DATE 5-17-72 KANSAS CITY CLEVELAND NEW YORK



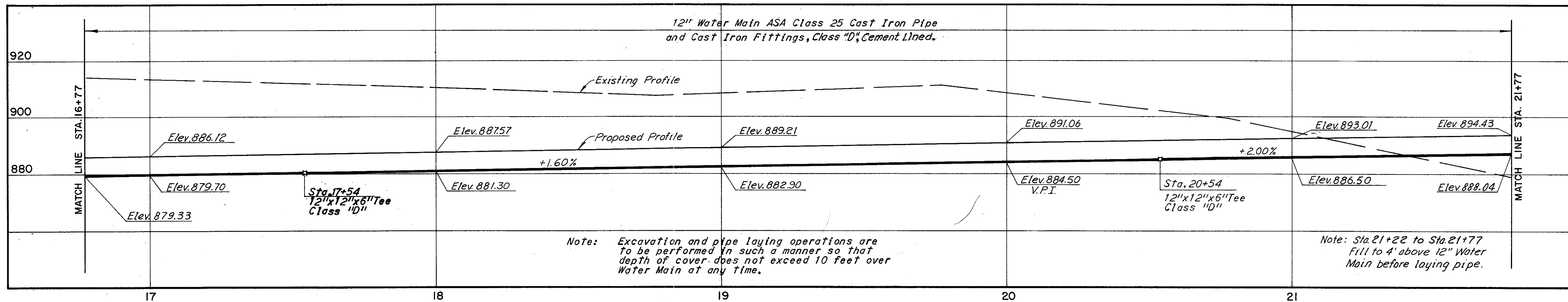
Sta. 66+77.00, 36.00' Lt. & Reloc. McCracken Rd. =
Sta. 17+54.00 & 12" Water Main
Furnish and Set 6" Hydrant complete with
6" Valve and Box, 12"x12"x6" Tee, Class "D"
6LF-6" ASA Class 25 CI Pipe
All Lead Joints

Sta. 69+77.00, 36.00' Lt. & Reloc. McCracken Rd. =
Sta. 20+54.00 & 12" Water Main
Furnish and Set 6" Hydrant complete with
6" Valve and Box, 12"x12"x6" Tee, Class "D"
7LF-6" ASA Class 25 CI Pipe
All Lead Joints

Sta. 70+00.00, 36.00' Lt. & Reloc. McCracken Rd. =
Sta. 20+78.00 & 12" Water Main
Relocate, Retap, Reconnect Service Connection #149527
Temporary Service Not Required, House Removed

MATCH LINE SEE SHEET 201
STA. 16+00

MATCH LINE SEE SHEET 203
STA. 21+00



SCALE Hor. & Vert. 1" = 20'
MADE I.N.T. DATE 3-6-70
TRCD U.M.C. DATE 4-3-70
CKD E.R.H. DATE 5-17-72
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

Note: For Waterwork Quantities See Sheet 207.

APPROVED DATE JUNE 15, 1972

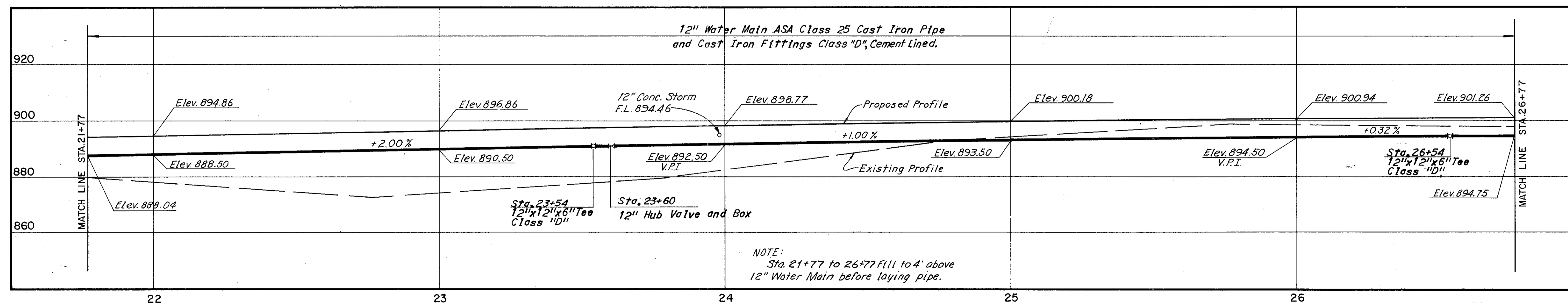
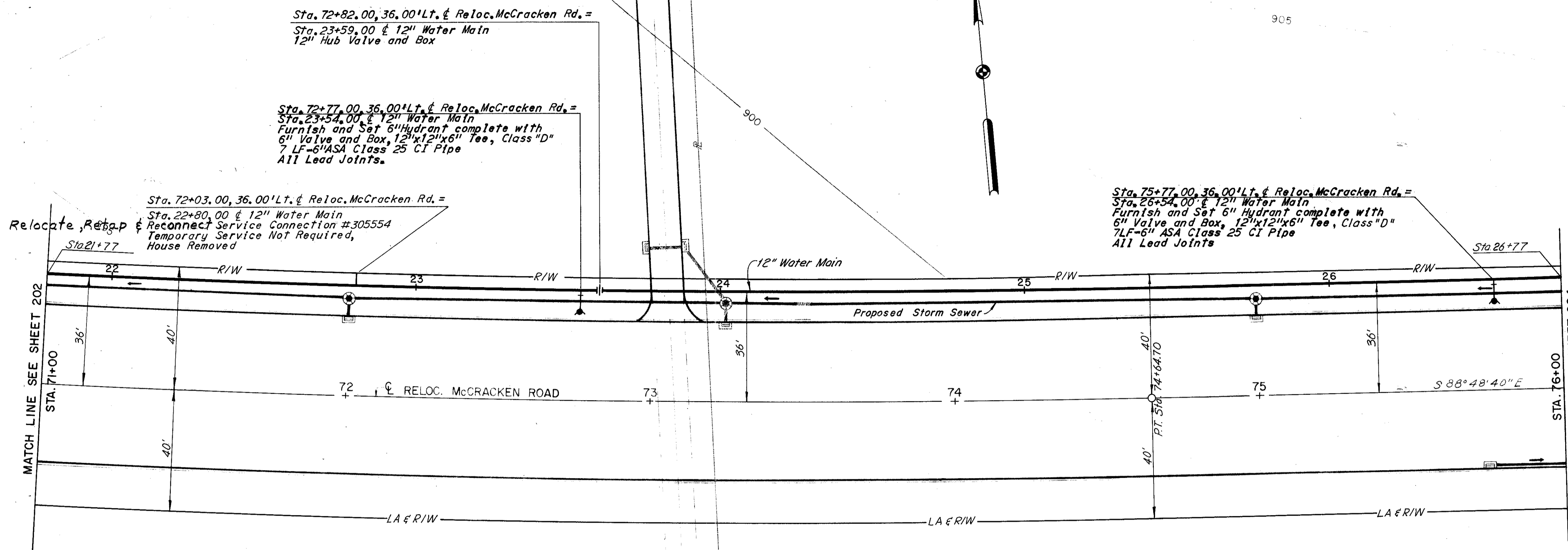
Franklin R. Muelena
ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond Raduech
DIRECTOR OF PUBLIC UTILITIES
W. Stalworth
COMMISSIONER OF WATER AND HEAT
David O. Glavin
ENGINEER OF CONSTRUCTION AND SURVEYS
William J. Sweeney
ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

203
390

CUYAHOGA COUNTY
CUY. 480-21.40



NOTE:
Sta. 21+77 to 26+77 Fill to 4' above 12" Water Main before laying pipe.

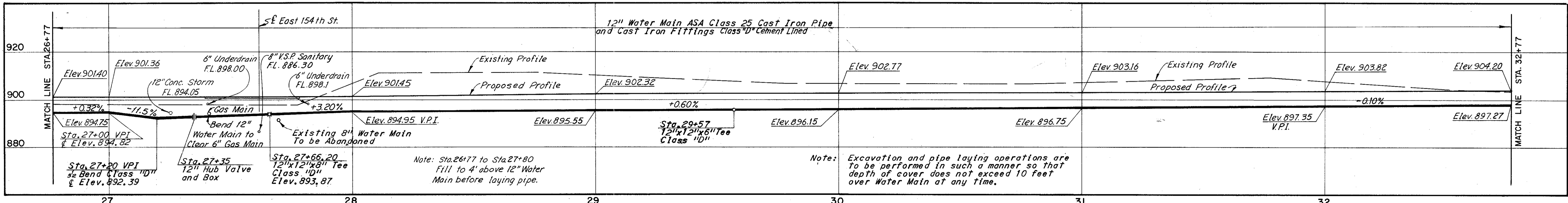
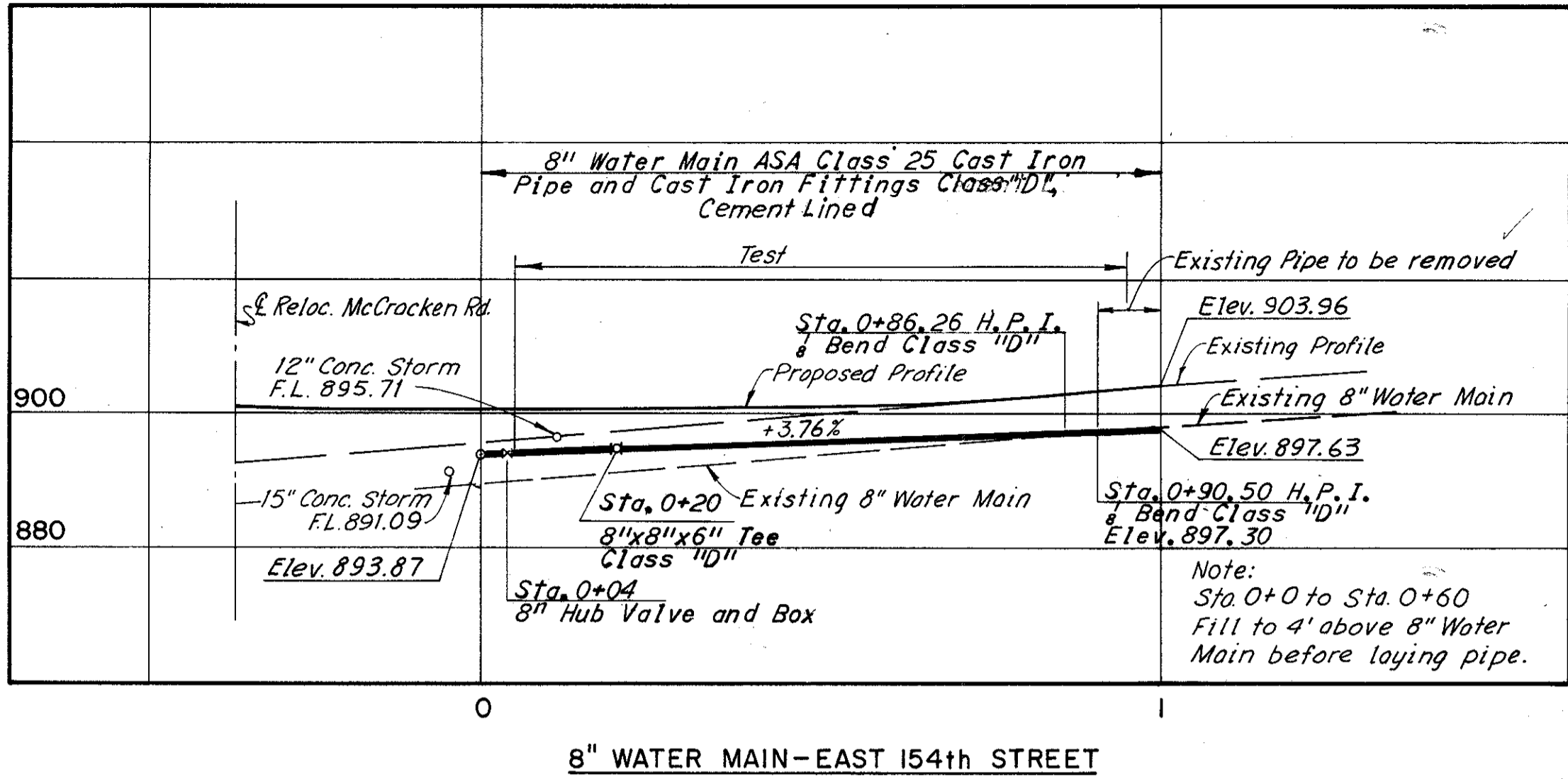
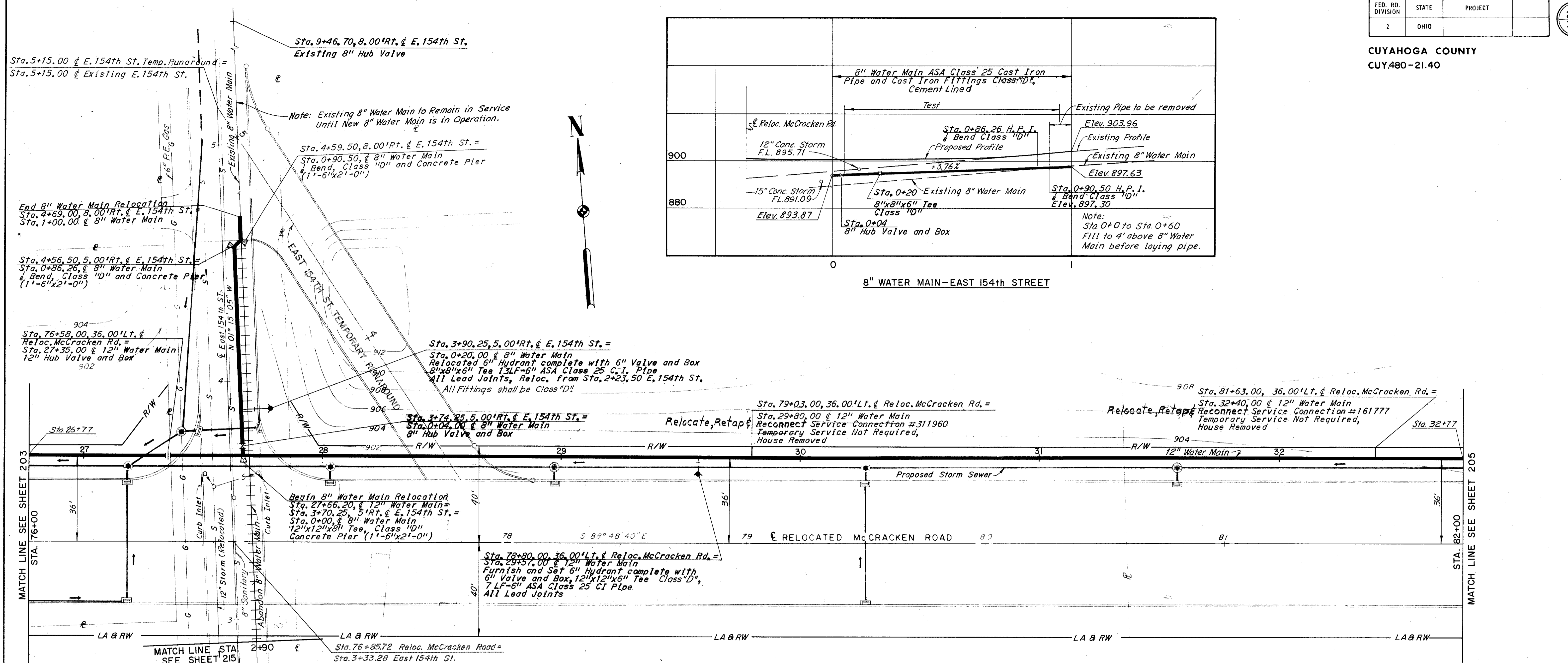
APPROVED DATE JUNE 15, 1972

Franklin R. Spelena
ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond Kudachuk
DIRECTOR OF PUBLIC UTILITIES
William J. Sweeney
COMMISSIONER OF WATER AND HEAT
COMMISSIONER DIVISION OF UTILITIES ENGINEERING
David D. Huber
ENGINEER OF CONSTRUCTION AND SURVEYS
ENGINEER OF DESIGN

SCALE Hor & Vert 1"=20'
MADE J.J.T. DATE 3-6-70
TRCD. J.M.C. DATE 4-3-70
CKD. E.R.H. DATE 5-17-72
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

Note: For Waterwork Quantities See Sheet 207.

2ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS



12" WATER MAIN RELOCATED McCracken RD.

Notes: For Waterwork Quantities in Relocated McCracken Road and E. 154th St. See Sheet 207.

SCALE: Hor. & Vert. 1" = 20'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE I.T. DATE 3-6-70 CONSULTING ENGINEERS
 TRCD. J.M.C. DATE 2-3-70
 CKD. E.R.H. DATE 2-17-70 KANSAS CITY CLEVELAND NEW YORK

APPROVED _____ DATE JUNE 15, 1972

 ENGINEER, CITY OF GARFIELD HEIGHTS

Raymond Kudskov
 DIRECTOR OF PUBLIC UTILITIES

 COMMISSIONER OF WATER AND HEAT

 COMMISSIONER DIVISION OF UTILITIES ENGINEERING

 ENGINEER OF CONSTRUCTION AND SURVEYS

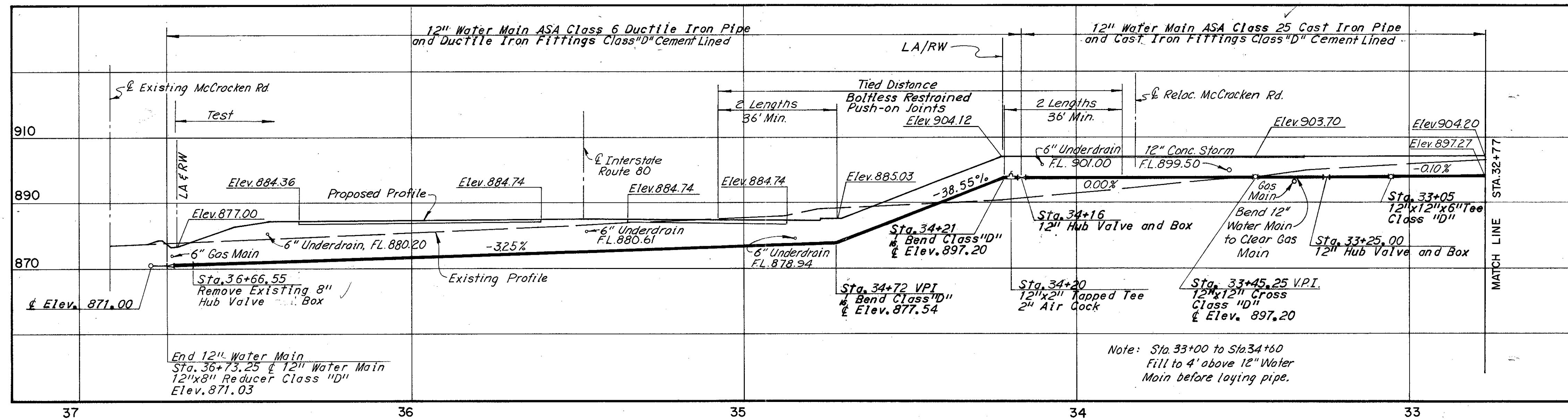
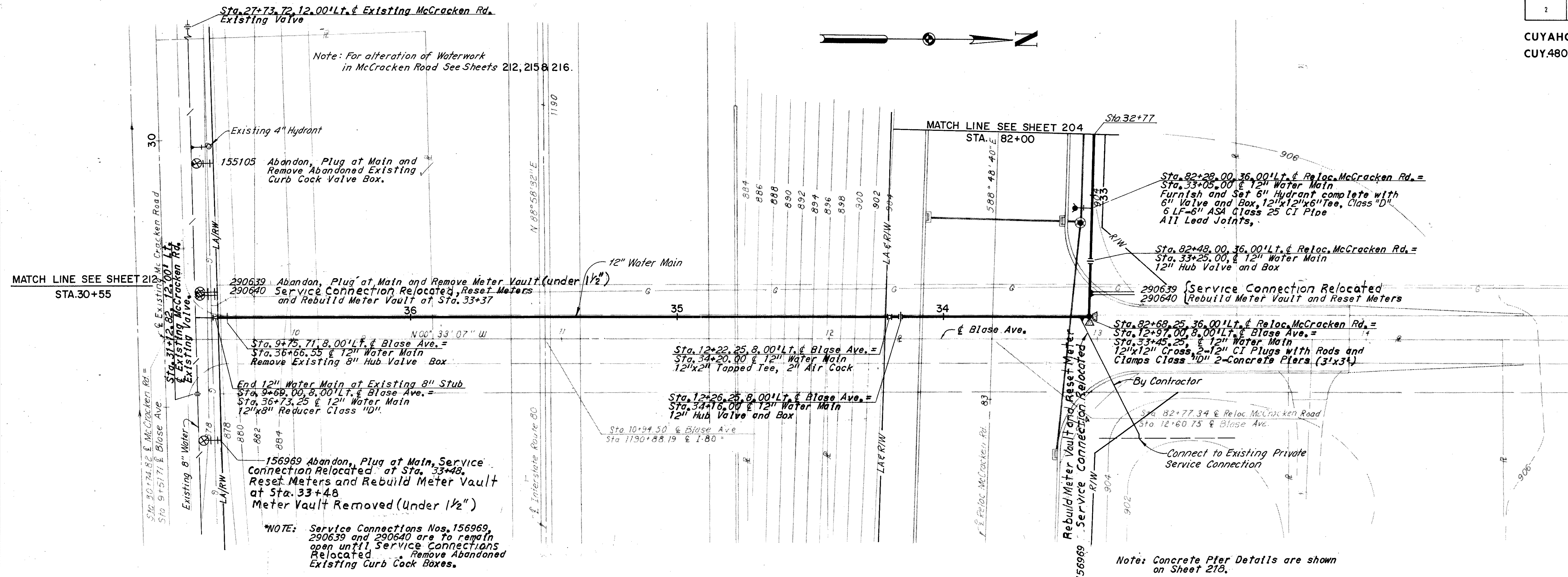
 ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO
 Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

205
390

CUYAHOGA COUNTY
CUY.480-21.40



Note: For Waterwork Quantities See Sheet 207.

APPROVED DATE JUNE 15, 1972
 [Signature] ENGINEER, CITY OF GARFIELD HEIGHTS
 [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

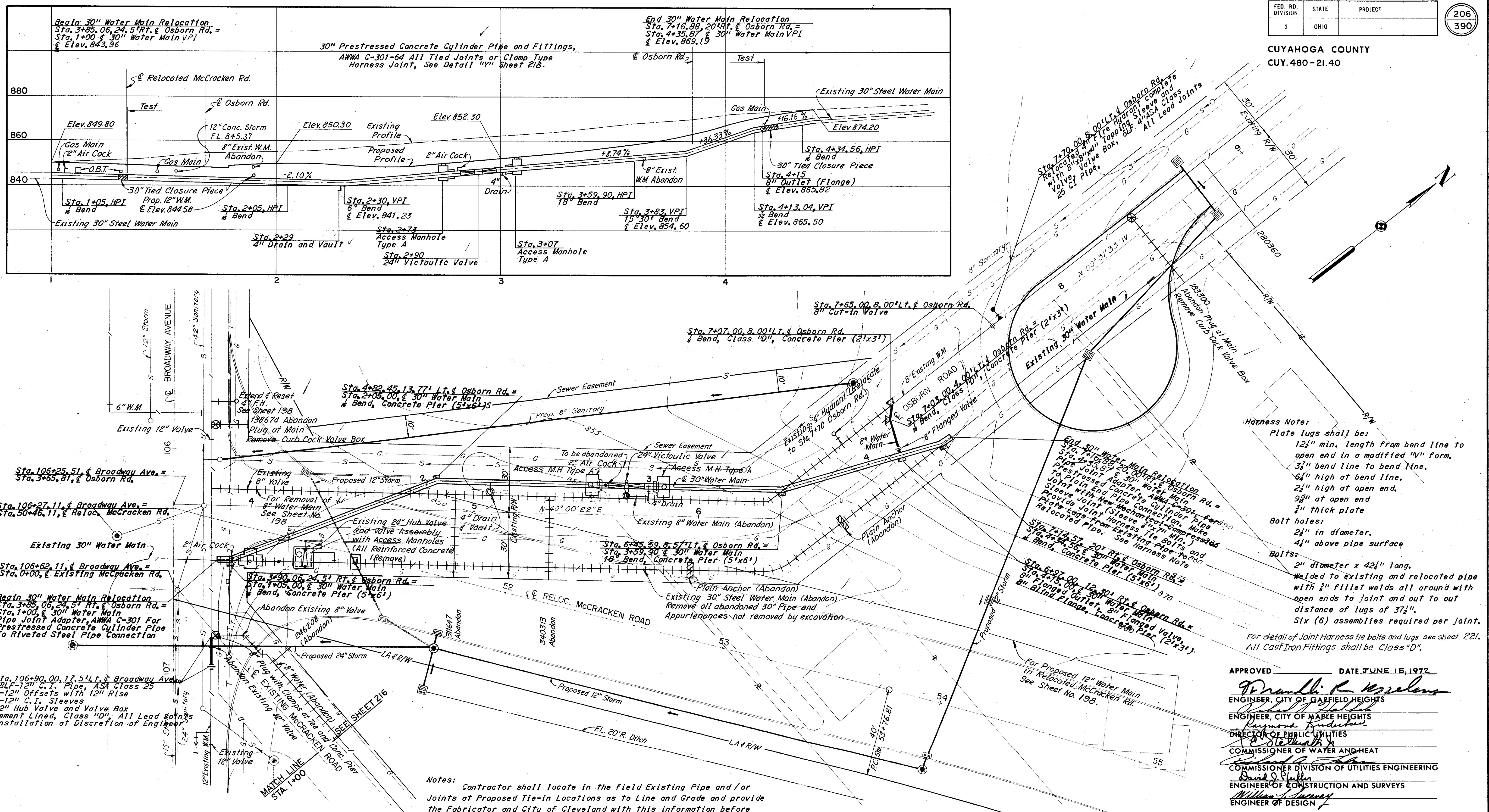
2ND HIGH SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO
 Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS

SCALE Hor & Vert. 1"=20'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE I.V.E. DATE 8-6-70 CONSULTING ENGINEERS
 TRCD I.M.C. DATE 4-3-70
 CKD E.R.H. DATE 5-17-70 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

206
390

CUYAHOGA COUNTY
CUY. 480-21.40



Harness Note:
Plate lugs shall be:
12 1/2" min. length from bend line to open end in a modified "V" form.
3/4" bend line to bend line.
6 1/2" high at bend line.
2 1/2" high at open end.
9/16" at open end
3/4" thick plate
Bolt holes:
2 1/2" in diameter.
4 1/2" above pipe surface
Bolts:
2" diameter x 42" long.
Welded to existing and relocated pipe with 3" fillet welds all around with open ends to joint and out to out distance of lugs of 3 1/2".
Six (6) assemblies required per joint.
For detail of Joint Harness tie bolts and lugs see sheet 221.
All Cast Iron Fittings shall be Class "D".

APPROVED DATE JUNE 15, 1972
Donald R. Kessel
ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond P. ...
ENGINEER, CITY OF MAPLE HEIGHTS
Raymond P. ...
DIRECTOR OF PUBLIC UTILITIES
William J. ...
COMMISSIONER OF WATER AND HEAT
David S. ...
COMMISSIONER DIVISION OF UTILITIES ENGINEERING
William J. ...
ENGINEER OF CONSTRUCTION AND SURVEYS
William J. ...
ENGINEER OF DESIGN

Notes:
Contractor shall locate in the field Existing Pipe and/or Joints at Proposed Tie-in Locations as to Line and Grade and provide the Fabricator and City of Cleveland with this information before Contractor will be permitted to make any connections.

See Concrete Pier Details on Sheet 218.

For Water Work Quantities, 8" Water Main and 30" Water Main in Relocated McCracken Road and 12" Water Main in Broadway Ave., See Sheet 207.

For Construction Procedure See Sheet 207.

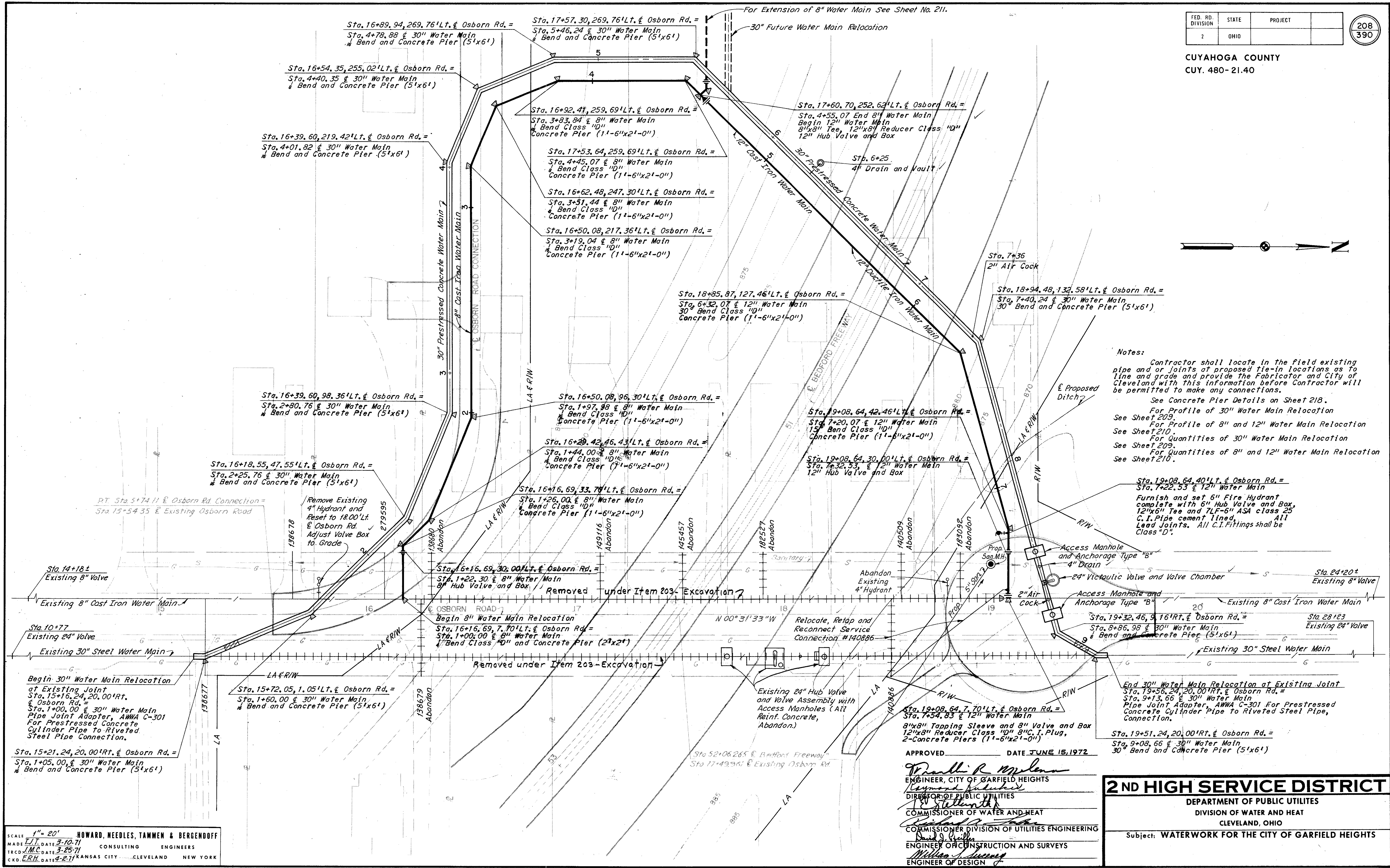
SCALE: Hor. & Vert. 1"=20'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE IN U.S.A. DATE 3-6-70
TRCD. J.M.C. DATE 4-3-70 CONSULTING ENGINEERS
CKD. E.R.H. DATE 5-17-72 KANSAS CITY CLEVELAND NEW YORK

2ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS AND THE CITY OF MAPLE HEIGHTS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

208
390

CUYAHOGA COUNTY
CUY. 480-21.40



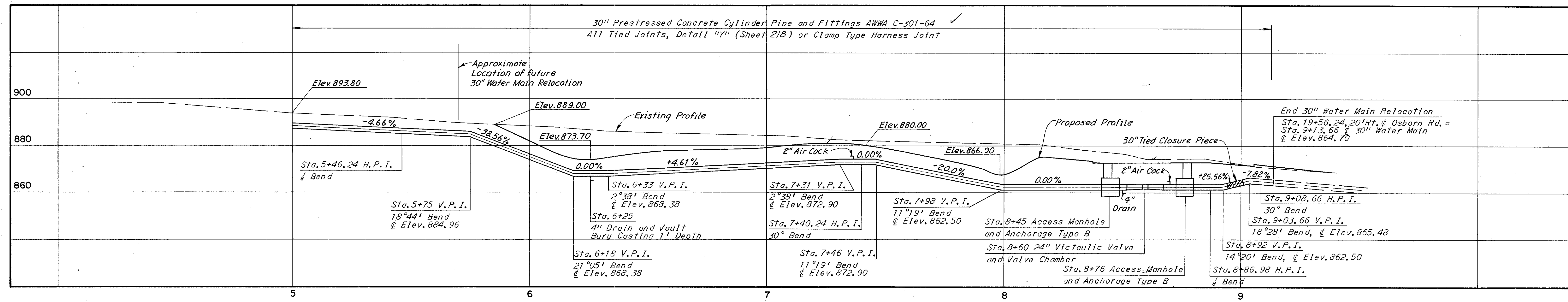
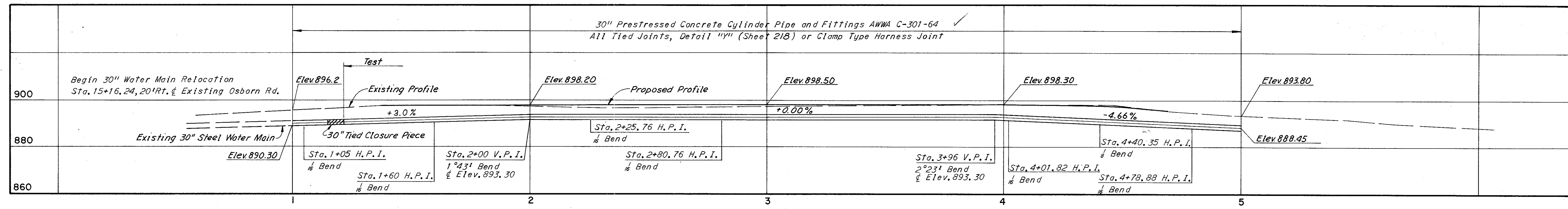
Notes:
 Contractor shall locate in the field existing pipe and or joints at proposed tie-in locations as to line and grade and provide The Fabricator and City of Cleveland with this information before Contractor will be permitted to make any connections.
 See Concrete Pier Details on Sheet 218.
 For Profile of 30" Water Main Relocation See Sheet 209.
 For Profile of 8" and 12" Water Main Relocation See Sheet 210.
 For Quantities of 30" Water Main Relocation See Sheet 209.
 For Quantities of 8" and 12" Water Main Relocation See Sheet 210.

APPROVED DATE JUNE 15, 1972

Frank R. Mullen
 ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond Pulver
 DIRECTOR OF PUBLIC UTILITIES
David J. Sullivan
 COMMISSIONER OF WATER AND HEAT
Richard J. ...
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING
David J. ...
 ENGINEER OR CONSTRUCTION AND SURVEYS
William J. ...
 ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO
 Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS

SCALE 1" = 20'
 MADE I.T. DATE 3-10-71 HOWARD, NEEDLES, TAMMEN & BERGENDOFF ENGINEERS
 TRCD J.M.C. DATE 3-25-71 CONSULTING ENGINEERS
 CKD, E.R.H. DATE 4-21-71 KANSAS CITY CLEVELAND NEW YORK



ESTIMATED QUANTITIES		CODE TYPE Y060	
ITEM	DESCRIPTION	QUANTITY	UNIT
Special	30" Pre-stressed Concrete Cylinder Pipe and Fittings AWWA C-301-64 (All Tied Joints)	826	Lin. Ft.
Special	Pre-stressed Concrete Cylinder Pipe to Riveted Steel Pipe Joint Concrete Pipe Joint Adapter AWWA C-301-30	2	Each
Special	4" Drain - Complete	2	Each
Special	2" AirCock - Complete	2	Each
Special	24" Victaulic Valve	1	Each
Special	Valve Chamber-	1	Each
Special	Access Manhole and Anchorage Type "B"	2	Each
202	Valve Chamber Abandoned	1	Each
Special	Miscellaneous Metal Work	3950	Lbs.
Special	30" Tied Closure Piece	2	Each
Special	Drain Vault	1	Each
202	Access Manhole and Anchorage Type "A" Abandoned	2	Each

Note: For Plan of 30" Water Main See Sheet 208.

Quantity Calculations
Made By JLI Date 3-16-71
Checked By ERH Date 4-2-71

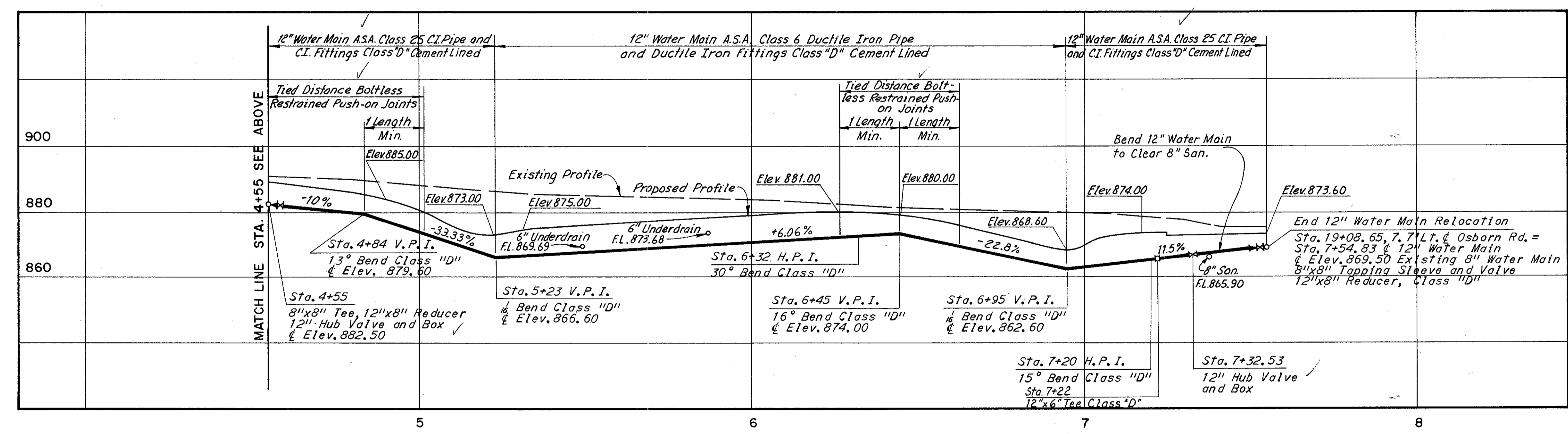
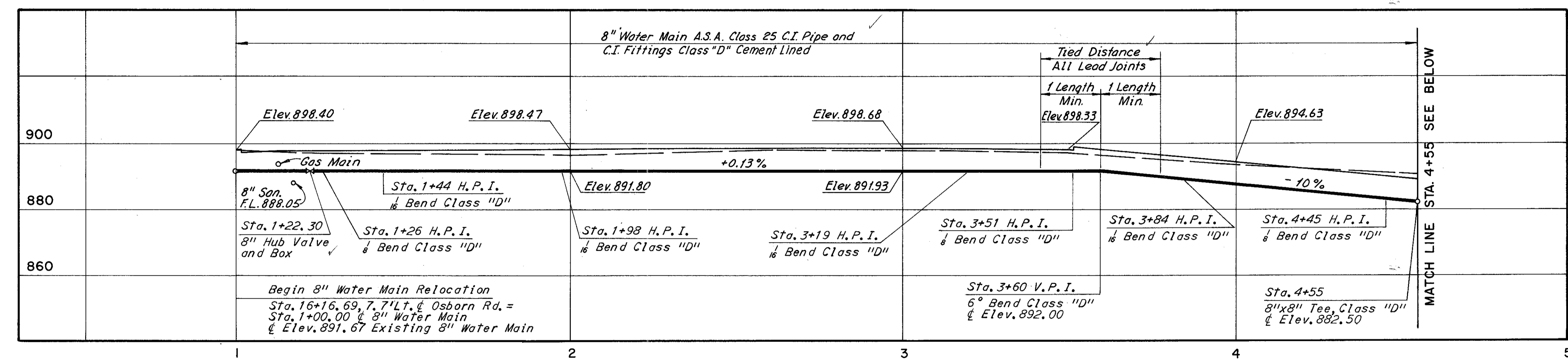
SCALE 1"=20'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE T.J.I. DATE 3-16-71 CONSULTING ENGINEERS
TRCD J.M.C. DATE 3-30-71
CKD E.R.H. DATE 4-2-71 KANSAS CITY CLEVELAND NEW YORK

APPROVED DATE JUNE 15, 1972
Franklin R. ...
ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond ...
DIRECTOR OF PUBLIC UTILITIES
Stallworth
COMMISSIONER OF WATER AND HEAT
David J. ...
COMMISSIONER DIVISION OF UTILITIES ENGINEERING
William J. ...
ENGINEER OF CONSTRUCTION AND SURVEYS
ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS

CUYAHOGA COUNTY
CUY. 480-21.40

Quantity Calculations
Made By I.I.I. Date 3-2-71
Checked By E.R.H. Date 5-18-72



ESTIMATED QUANTITIES		CODE TYPE Y060	
ITEM	DESCRIPTION	QUANTITY	UNIT
Special	12" Water Main A.S.A. Class 25 C.I. Pipe and C.I. Fittings Class "D" Cement Lined	81	Lin. Ft.
Special	12" Water Main A.S.A. Class 6 Ductile Iron Pipe and D.I. Fittings Class "D" Cement Lined	136	Lin. Ft.
Special	8" Water Main A.S.A. Class 25 C.I. Pipe and C.I. Fittings Class "D" Cement Lined	319	Lin. Ft.
Special	12" Water Main A.S.A. Class 6 Ductile Iron Pipe and D.I. Fittings Class "D" Cement Lined Boltless Restrained Push-On Joints	36	Lin. Ft.
Special	8" Water Main A.S.A. Class 25 C.I. Pipe and C.I. Fittings Class "D" Cement Lined All Lead Joints	36	Lin. Ft.
Special	12" Water Main A.S.A. Class 25 C.I. Pipe and C.I. Fittings Class "D" Cement Lined Boltless Restrained Push-On Joints	47	Lin. Ft.

ESTIMATED QUANTITIES		CODE TYPE Y060	
ITEM	DESCRIPTION	QUANTITY	UNIT
Special	12" Hub Valve	2	Each
Special	8" Hub Valve	1	Each
Special	Adjust Valve Box to Grade	1	Each
Special	6" Hub Valve	1	Each
Special	Remove and Reset 4" Fire Hydrant Complete	1	Each
Special	8" x 8" Tapping Sleeve and 8" Tapping Valve Complete	1	Each
Special	Service Connection - Relocate, Retap and Reconnect	1	Each
Special	Miscellaneous Metal Work	545	Lbs.
Special	6" Water Main ASA Class 25 C.I. Pipe and C.I. Fittings Class "D" Cement Lined All Leads Joints	7	Lin. Ft.
Special	Plugging Existing Water Mains and Branches	1	Each

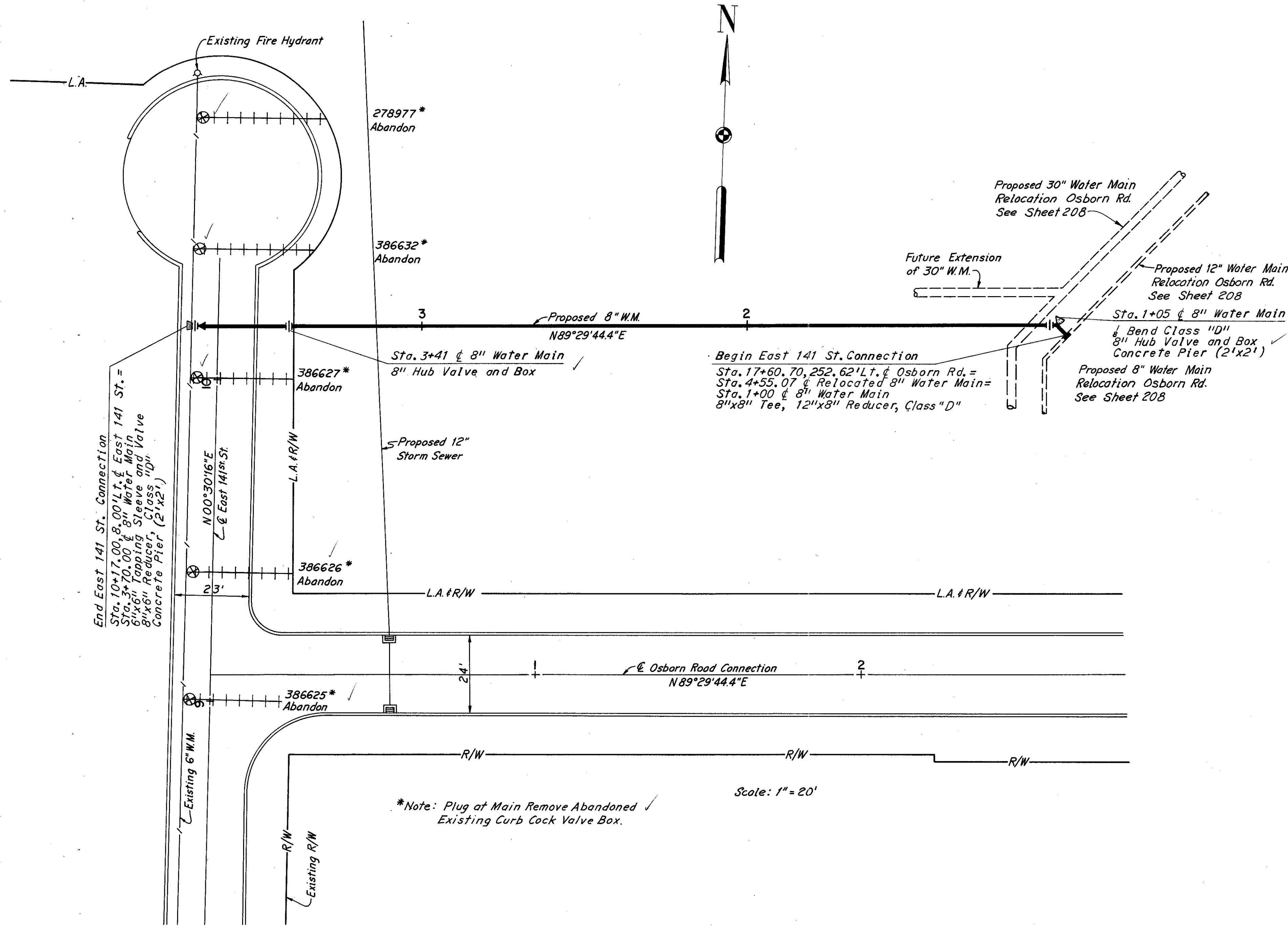
APPROVED DATE JUNE 15, 1972
Franklin R. McLean
 ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond J. Anderson
 DIRECTOR OF PUBLIC UTILITIES
Richard C. ...
 COMMISSIONER OF WATER AND HEAT
David J. ...
 ENGINEER OF CONSTRUCTION AND SURVEYS
William J. ...
 ENGINEER OF DESIGN

2 ND HIGH SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO
 Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS

SCALE 1" = 20'
 HOWARD, NEEDLES, TAMMEN & BERGENOFF
 MADE I.I.I. DATE 3-2-71 CONSULTING ENGINEERS
 TRCD J.M.C. DATE 3-23-71
 CKD E.R.H. DATE 5-18-72 KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY
CUY. 480-21.40

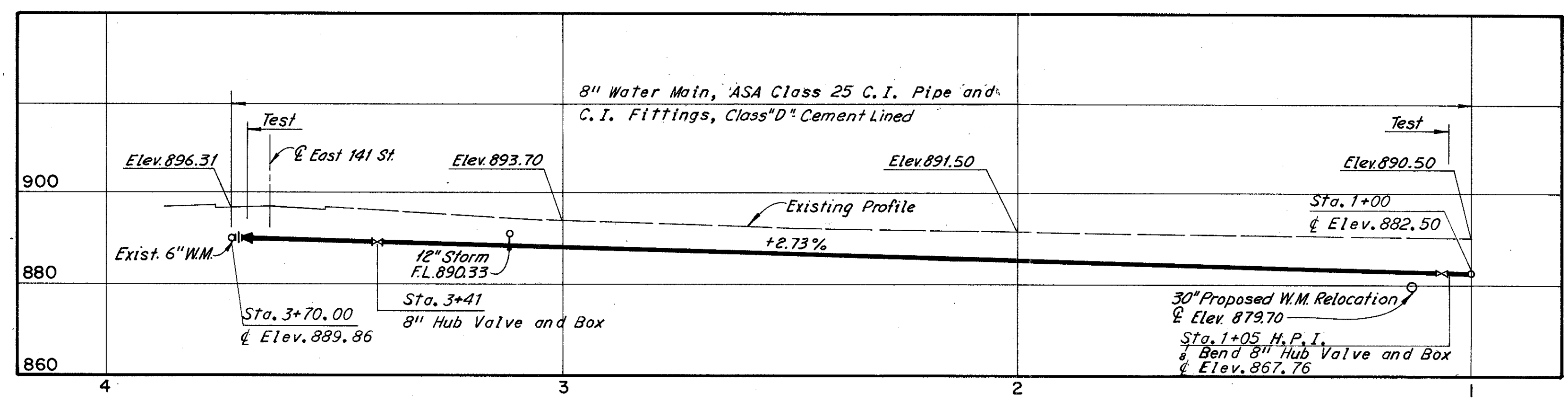
Quantity Calculations
Made By J.T. Date 3-6-70
Checked By ERH Date 5-18-72



*Note: Plug at Main Remove Abandoned Existing Curb Cock Valve Box.

Scale: 1" = 20'

ESTIMATED QUANTITIES		CODE TYPE Y060	
ITEM	DESCRIPTION	QUANTITY	UNIT
Special	8" Water Main A.S.A. Class 25 C.I. Pipe and C.I. Fittings Class "D" Cement Lined	270	Lin. Ft.
Special	8" Hub Valve	2	Each
Special	6"x6" Tapping Sleeve and 6" Tapping Valve Complete	1	Each
Special	Miscellaneous Metal Work	366	Lbs.
Special	Plugging Service Connections (3/4" - 2")	5	Each
Special	Remove Abandoned Curb Cock Valve Box	5	Each



Scale: Hor. & Vert. 1" = 20'

SCALE: As Shown
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
MADE BY J.T. DATE 3-6-70
TRCD. J.M.C. DATE 4-3-70
CKD. ERH DATE 5-18-72
KANSAS CITY CLEVELAND NEW YORK

APPROVED: DATE JUNE 15, 1972
Franklin R. ...
ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond ...
DIRECTOR OF PUBLIC UTILITIES
...
COMMISSIONER OF WATER AND HEAT
...
COMMISSIONER DIVISION OF UTILITIES ENGINEERING
...
ENGINEER OF CONSTRUCTION AND SURVEYS
...
ENGINEER OF DESIGN

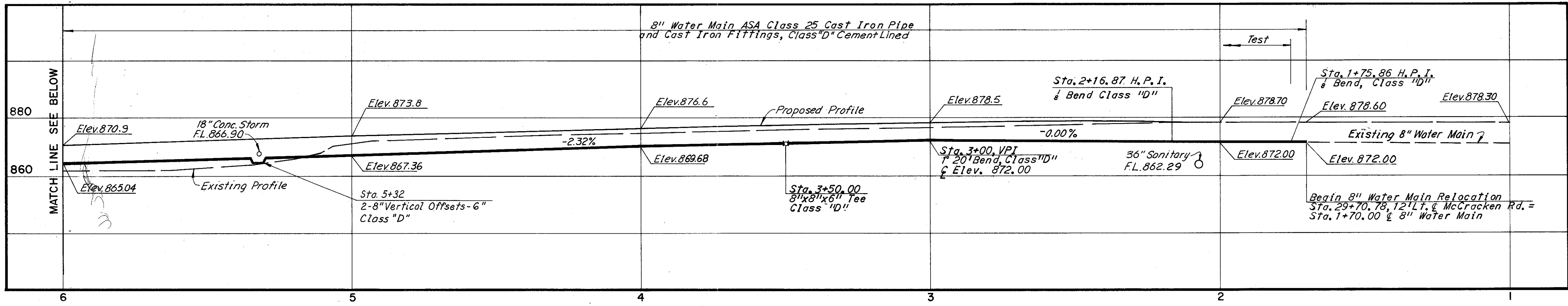
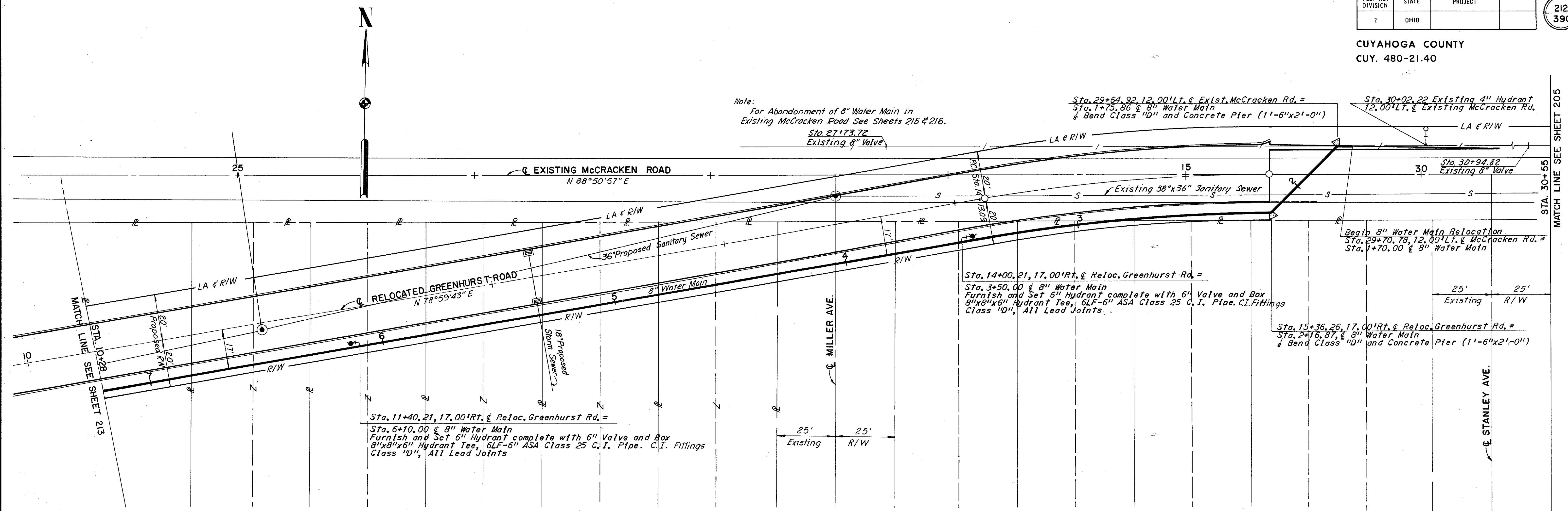
2ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: **WATERWORK FOR THE CITY OF GARFIELD HEIGHTS**

CUYAHOGA COUNTY
CUY. 480-21.40

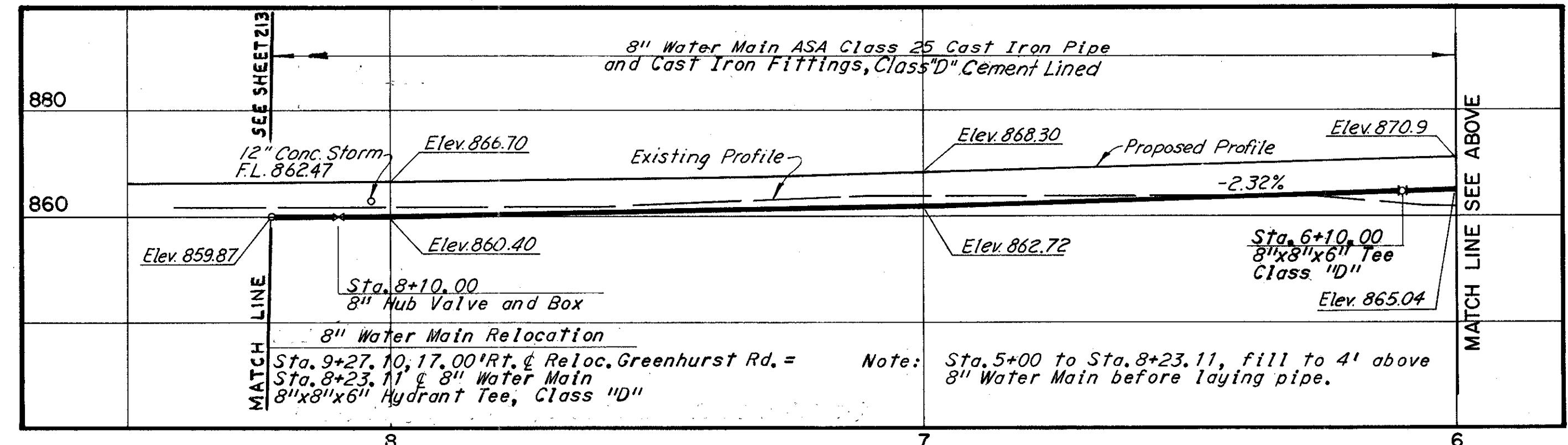
Note:
For Abandonment of 8" Water Main in
Existing McCracken Road See Sheets 215 & 216.
Sta. 27+73.72
Existing 8" Valve

Sta. 29+64.92, 12.00' Lt. & Exist. McCracken Rd. =
Sta. 1+75.86 & 8" Water Main
& Bend Class "D" and Concrete Pier (11'-6"x2'-0")

Sta. 30+02.22 Existing 4" Hydrant
12.00' Lt. & Existing McCracken Rd.
LA & R/W



Note: For Quantities See Sheet 213.



APPROVED _____ DATE _____

Franklin R. McElm
ENGINEER, CITY OF GARFIELD HEIGHTS

Richard A. Walker
ENGINEER, CITY OF MAPLE HEIGHTS

Raymond P. Rudolph
DIRECTOR OF PUBLIC UTILITIES

W. Stallworth
COMMISSIONER OF WATER AND HEAT

William J. Sherry
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

David J. Pfeiffer
ENGINEER OF CONSTRUCTION AND SURVEYS

William J. Sherry
ENGINEER OF DESIGN

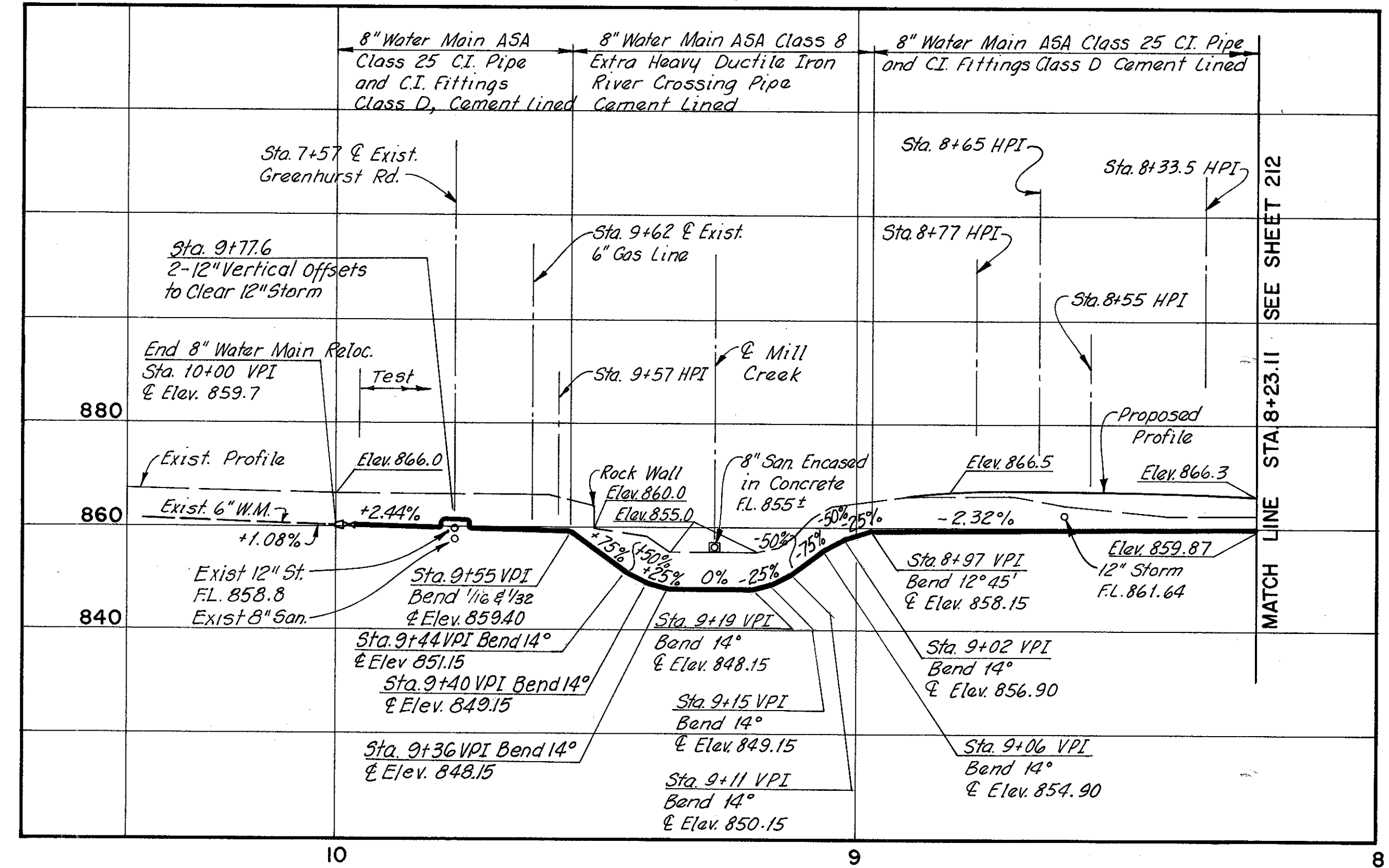
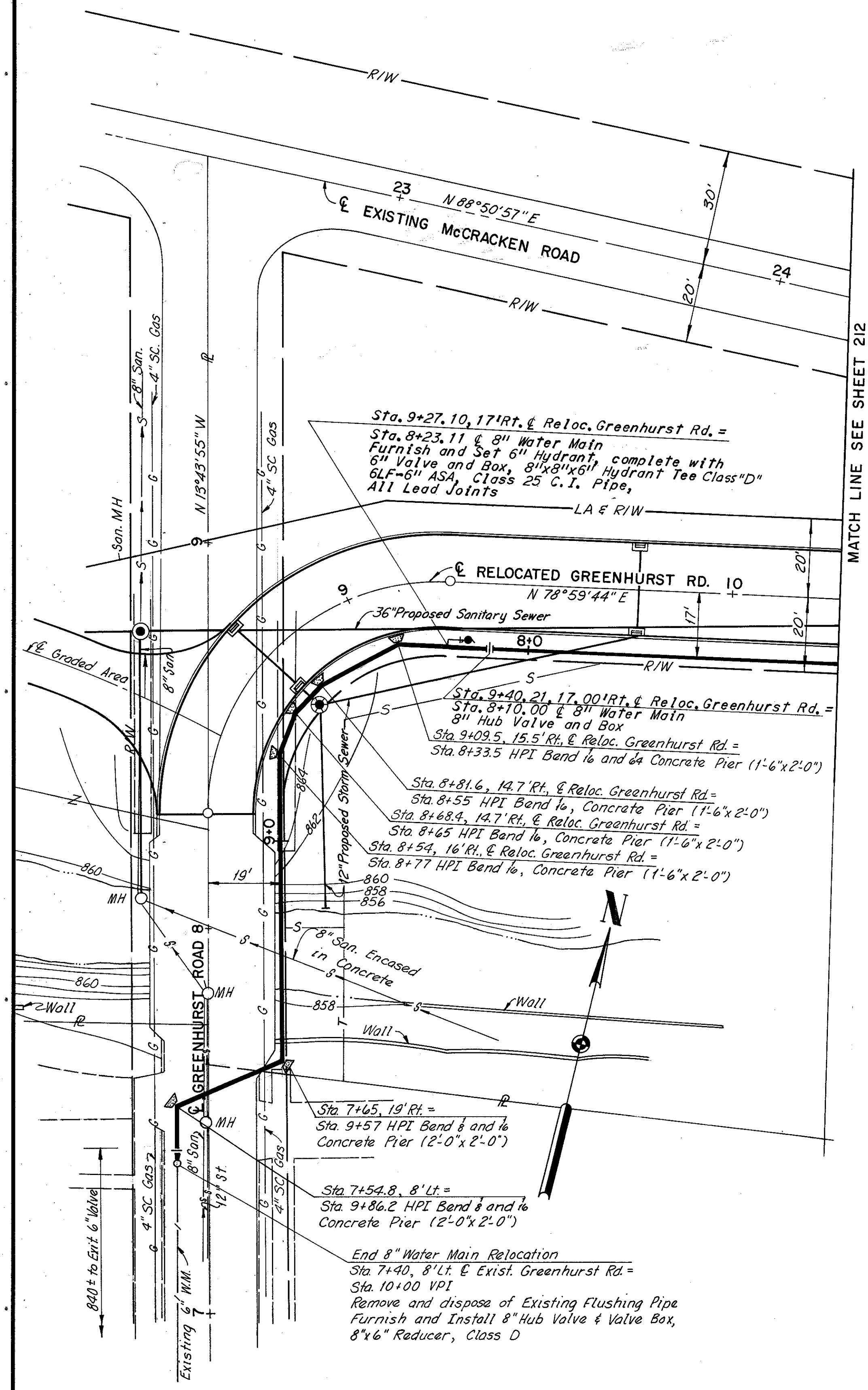
2ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

Subject: **WATERWORK FOR THE CITY OF GARFIELD HEIGHTS
AND THE CITY OF MAPLE HEIGHTS**

SCALE Hor. & Vert. 1"=20'
MADE I.T. DATE 3-6-70
TRCD J.M.C. DATE 4-3-70
CKD E.R.H. DATE 5-18-70

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

Revised 31 Oct. 73 ERH



ESTIMATED QUANTITIES			
ITEM	DESCRIPTION	QUANTITY	UNIT
Special	8" Water Main A, S, A, Class 25 C. I. Pipe and C. I. Fittings Class "D" Cement Lined	773	Lin. Ft.
Special	6" Water Main A, S, A, Class 25 C. I. Pipe and C. I. Fittings Class "D" Cement Lined	18	Lin. Ft.
Special	8" Hub Valve	2	Each
Special	6" Hub Valve	3	Each
Special	Furnishing and Setting 6" Fire Hydrant	3	Each
Special	Miscellaneous Metal Work	895	Lbs.
Special	8" Water Main ASA Class 8 Extra Heavy Ductile Iron River Crossing Pipe Cement Lined	64	Lin. Ft.

Note: For Profile of New 8" Water Main in Relocated Greenhurst Rd. See Sheet 212. (Sta. 1+70 to Sta. 8+23.11)

APPROVED _____ DATE _____

ENGINEER, CITY OF MAPLE HEIGHTS
 DIRECTOR OF PUBLIC UTILITIES
 COMMISSIONER OF WATER AND HEAT
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING
 ENGINEER OF CONSTRUCTION AND SURVEYS
 ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO
 Subject: WATERWORK FOR THE CITY OF MAPLE HEIGHTS

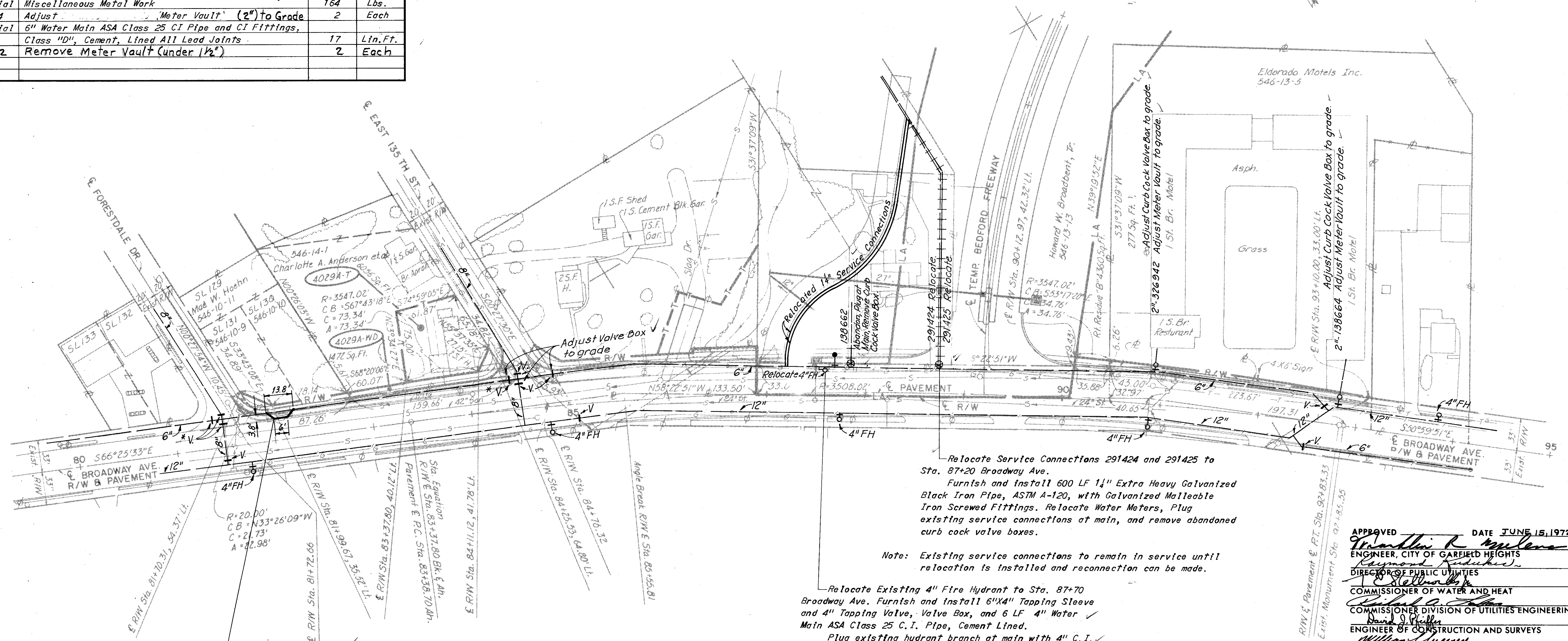
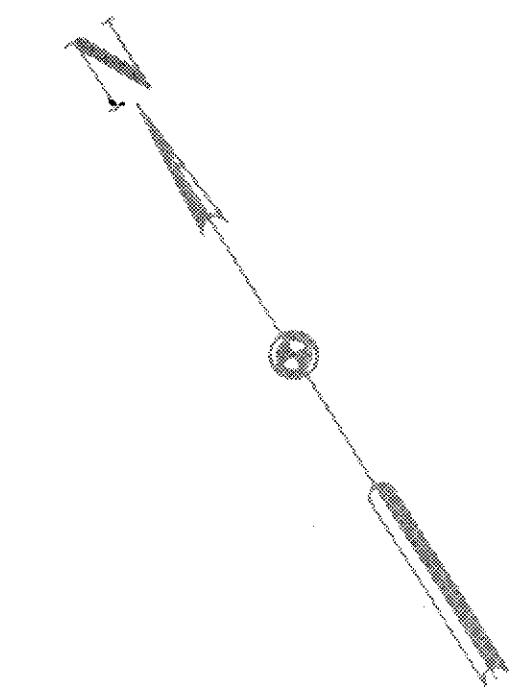
SCALE 1" = 20'
 HOWARD, NEEDLES, TAMMEN & BERGENOFF
 MADE L.J.T. DATE 3-6-70
 TRCD J.M.C. DATE 4-3-70
 CKD E.R.H. DATE 5-18-72 KANSAS CITY CLEVELAND NEW YORK
 CONSULTING ENGINEERS

Revised E.R.H. 30 Oct 73
 Traced J.M.C. 31 Oct 73
 Checked E.R.H. 31 Oct 73

CUYAHOGA COUNTY
CUY.480-21.40

Quantity Calculations
Made By ERH Date 5-72
Checked By JMC Date 5-72

ESTIMATED QUANTITIES		CODE TYPE Y060	
ITEM	DESCRIPTION	QUANTITY	UNIT
Special	4" Water Main ASA Class 25 CI Pipe and CI Fittings Class D, Cement Lined, All Lead Joints	10	Lin.Ft.
Special	1 1/4" New Water Pipe	600	Lin.Ft.
Special	6"x4" Tapping Sleeve and 4" Tapping Valve Complete	1	Each
Special	4" Fire Hydrant Relocated	1	Each
Special	Adjust Curb Cock Valve Box to Grade	2	Each
Special	Adjust Valve Box to Grade	4	Each
Special	Remove Abandoned Valve Box	1	Each
Special	Remove Abandoned Curb Cock Valve Box	3	Each
Special	Service Connection Relocated (3/4"-1 1/4")	2	Each
Special	Water Meter Relocated (3/4"-1 1/4")	2	Each
Special	Plugging Service Connections (3/4"-2")	3	Each
Special	Plugging Water Mains and Branches (4") Existing	1	Each
Special	Miscellaneous Metal Work	164	Lbs.
604	Adjust "Meter Vault" (2") to Grade	2	Each
Special	6" Water Main ASA Class 25 CI Pipe and CI Fittings, Class "D", Cement Lined All Lead Joints	17	Lin.Ft.
202	Remove Meter Vault (under 1 1/2")	2	Each



Relocate Service Connections 291424 and 291425 to Sta. 87+20 Broadway Ave.
Furnish and install 600 LF 1 1/4" Extra Heavy Galvanized Black Iron Pipe, ASTM A-120, with Galvanized Malleable Iron Screwed Fittings. Relocate Water Meters, Plug existing service connections at main, and remove abandoned curb cock valve boxes.

Note: Existing service connections to remain in service until relocation is installed and reconnection can be made.

Relocate Existing 4" Fire Hydrant to Sta. 87+70 Broadway Ave. Furnish and install 6"x4" Tapping Sleeve and 4" Tapping Valve, Valve Box, and 6 LF 4" Water Main ASA Class 25 C.I. Pipe, Cement Lined.
Plug existing hydrant branch at main with 4" C.I. Plug and Rods and Clamps.
Remove abandoned Valve Box. ✓

Sta. 82+04 29' Lt. E Broadway Ave. Relocate 6" Water Main to 25.2' Lt. E Broadway Ave. Furnish and install 4-1/2 Bends Class "D" and 17 LF 6" Water Main ASA Class 25 C.I. Pipe, All Cement Lined and Lead Joints.

The Division of Water Personnel shall operate all valves. The Contractor shall notify the Utilities Engineering Office three (3) weeks prior to starting work. Telephone 964-3125.

Valves marked: *V, in Broadway at Forestdale Dr. and at E.131 St., are to be closed when connecting relocated pipe to existing pipe.

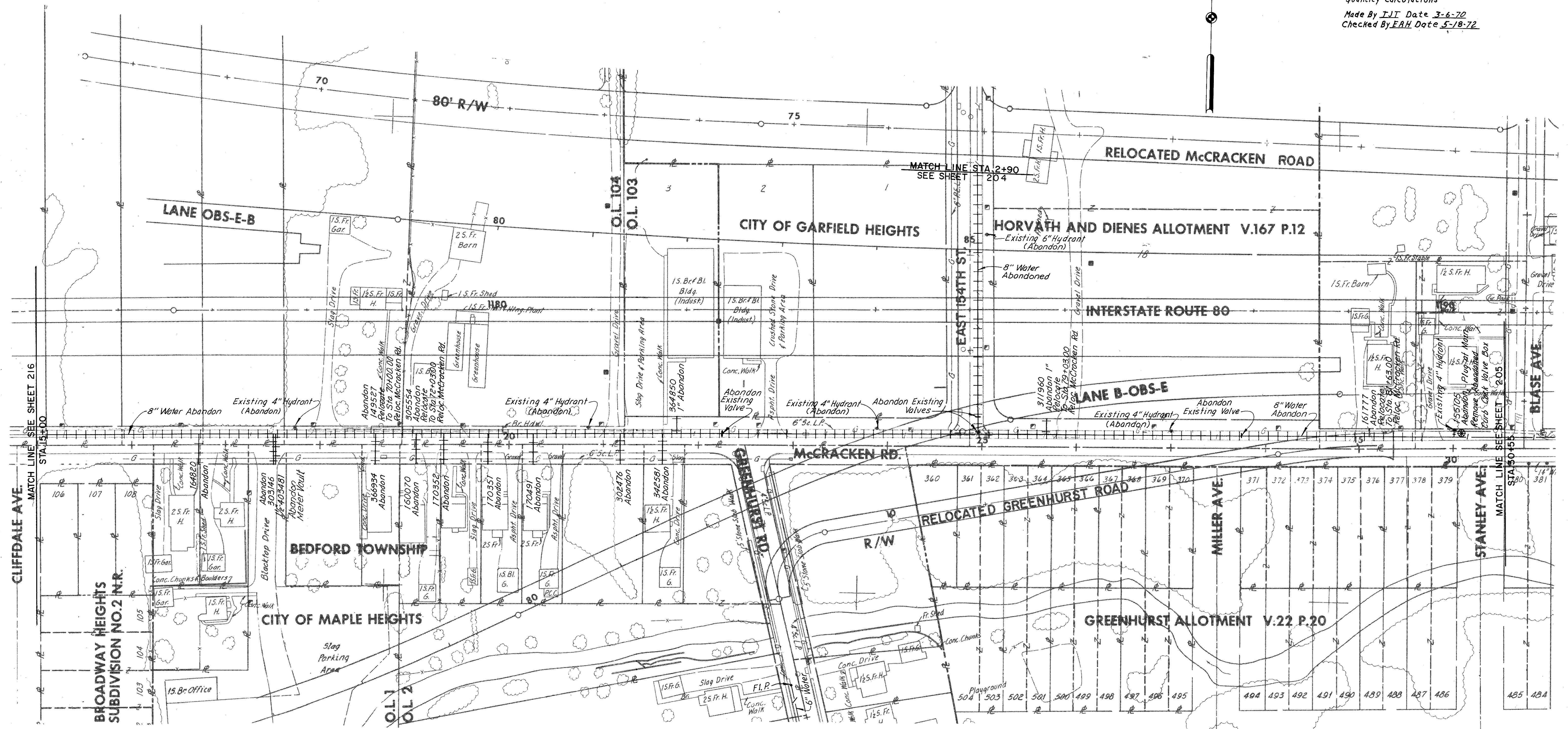
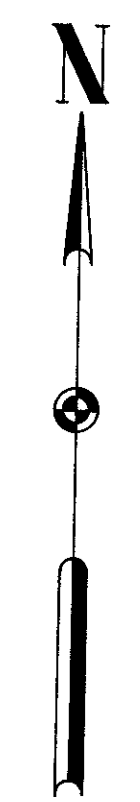
The existing catch basin shall be removed and 12" Type B Conduit connected through. Item E-39 Sheet 45 General Plans.

APPROVED _____ DATE JUNE 15, 1972
William R. Anderson
ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond Rudolfs
DIRECTOR OF PUBLIC UTILITIES
William R. Anderson
COMMISSIONER OF WATER AND HEAT
David J. Phillips
COMMISSIONER DIVISION OF UTILITIES ENGINEERING
William R. Anderson
ENGINEER OF CONSTRUCTION AND SURVEYS
William R. Anderson
ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: **WATERWORK FOR THE CITY OF GARFIELD HEIGHTS**

SCALE 1"=50'
MADE BY ERH DATE 5-11-72
TRCD BY JMC DATE 5-18-72
CHECKED BY ERH DATE 5-18-72
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY
 CUY.480-21.40
 Quantity Calculations
 Made By T.J.T. Date 3-6-70
 Checked By E.R.H. Date 5-18-72



SCALE 1" = 50'
 MADE T.J.T. DATE 3-6-70
 TRCD J.M.C. DATE 4-3-70
 CKD E.R.H. DATE 5-18-72
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

ESTIMATED QUANTITIES		CODE TYPE Y060	
ITEM	DESCRIPTION	QUANTITY	UNIT
Special	Remove Abandoned Curb Cock Valve Box	1	Each
Special	Plugging Service Connection (3/4"-2")	1	Each

APPROVED DATE JUNE 15, 1972
Franklin R. Melkus
 ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond A. Kulek
 ENGINEER, CITY OF MAPLE HEIGHTS
 DIRECTOR OF PUBLIC UTILITIES
Ed. Stalling
 COMMISSIONER OF WATER AND HEAT
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING
David P. Pfeiffer
 ENGINEER OF CONSTRUCTION AND SURVEYS
William J. Sweeney
 ENGINEER OF DESIGN

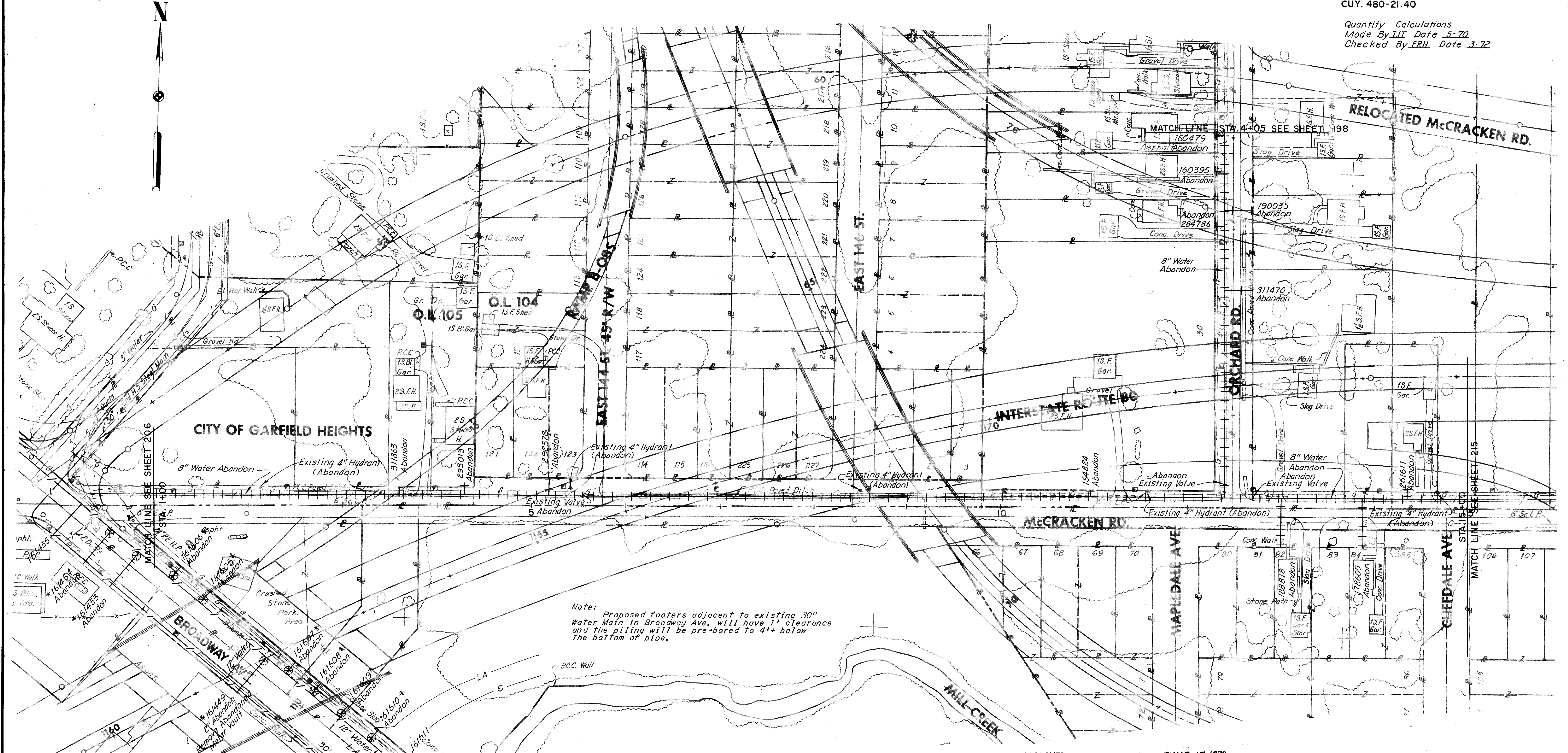
2ND HIGH SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO
 Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS
 AND THE CITY OF MAPLE HEIGHTS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

216
390

CUYAHOGA COUNTY
CUY. 480-21.40

Quantity Calculations
Made By ILL Date 5-70
Checked By ERH Date 3-72



Note: Proposed footers adjacent to existing 30" Water Main in Broadway Ave. will have 1' clearance and the piling will be pre-bored to 4'+ below the bottom of pipe.

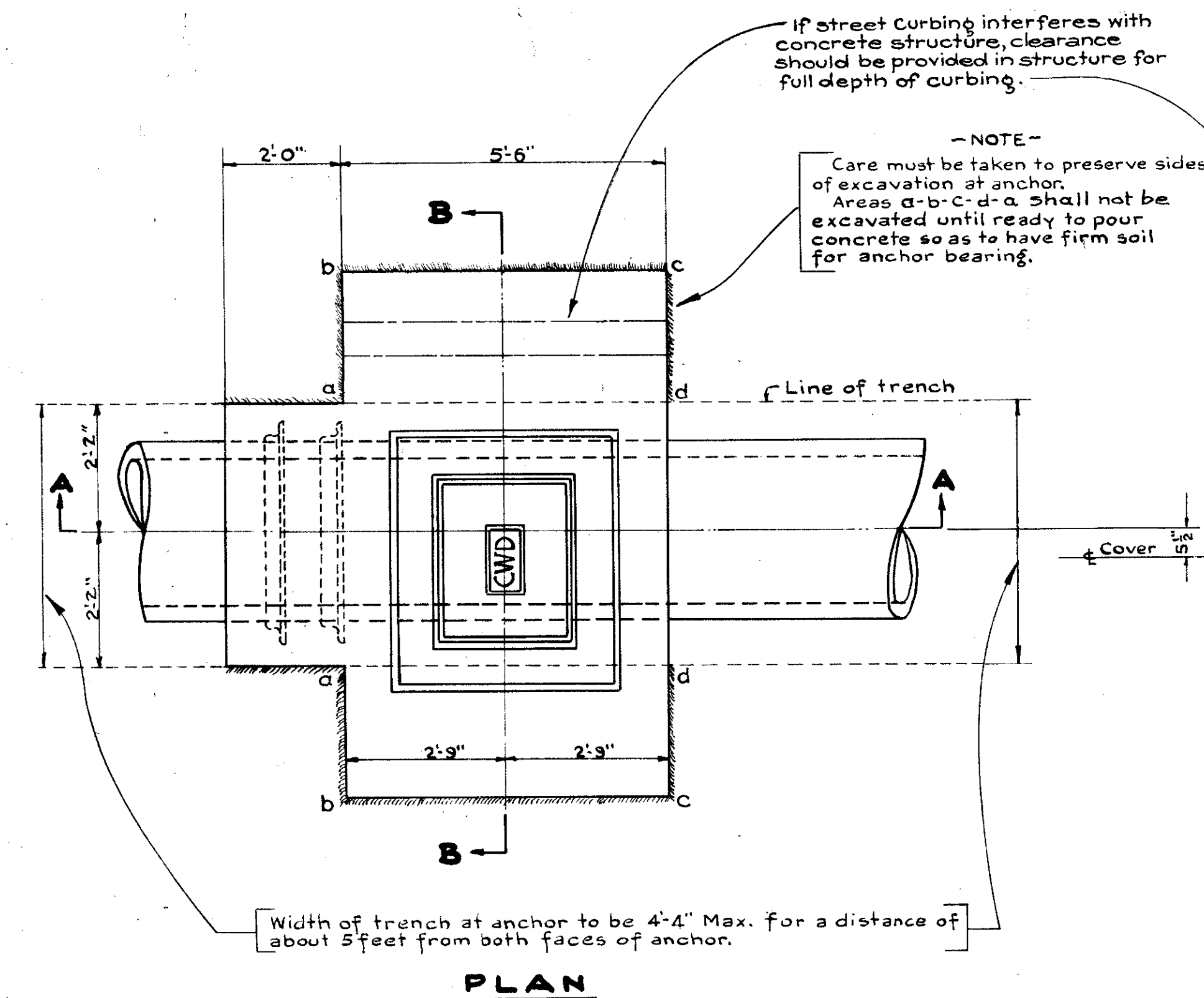
ESTIMATED QUANTITIES		CODE TYPE Y060	
ITEM	DESCRIPTION	QUANTITY	UNIT
Special	Remove Abandoned Curb Cock Valve Box	9	Each
Special	Plugging Service Connections	9	Each
202	Removed (Meter Vault) 2"	1	Each

APPROVED DATE JUNE 15, 1972
Orville R. Melan
 ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond R. Kubicki
 ENGINEER, CITY OF MAPLE HEIGHTS
 DIRECTOR OF PUBLIC UTILITIES
William J. Lawrence
 COMMISSIONER OF WATER AND HEAT
 COMMISSIONER, DIVISION OF UTILITIES ENGINEERING
David D. Phillips
 ENGINEER OF CONSTRUCTION AND SURVEYS
William J. Lawrence
 ENGINEER OF DESIGN

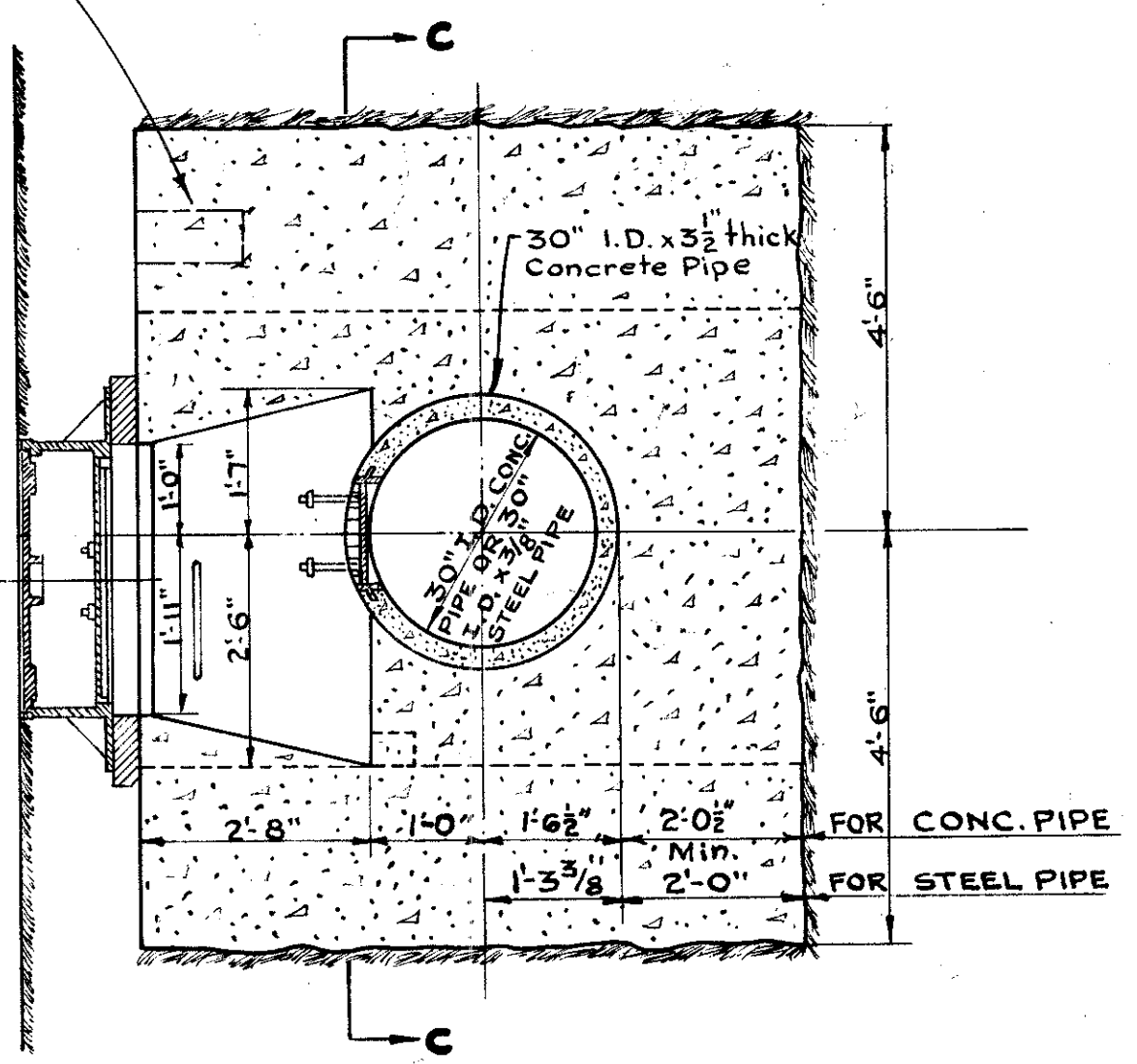
2ND HIGH SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO
 Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS AND THE CITY OF MAPLE HEIGHTS

SCALE 1" = 50'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 MADE I.L.T. DATE 3-6-70
 TRCD J.M.C. DATE 4-3-70
 CKD E.R.H. DATE 5-18-72 KANSAS CITY CLEVELAND NEW YORK

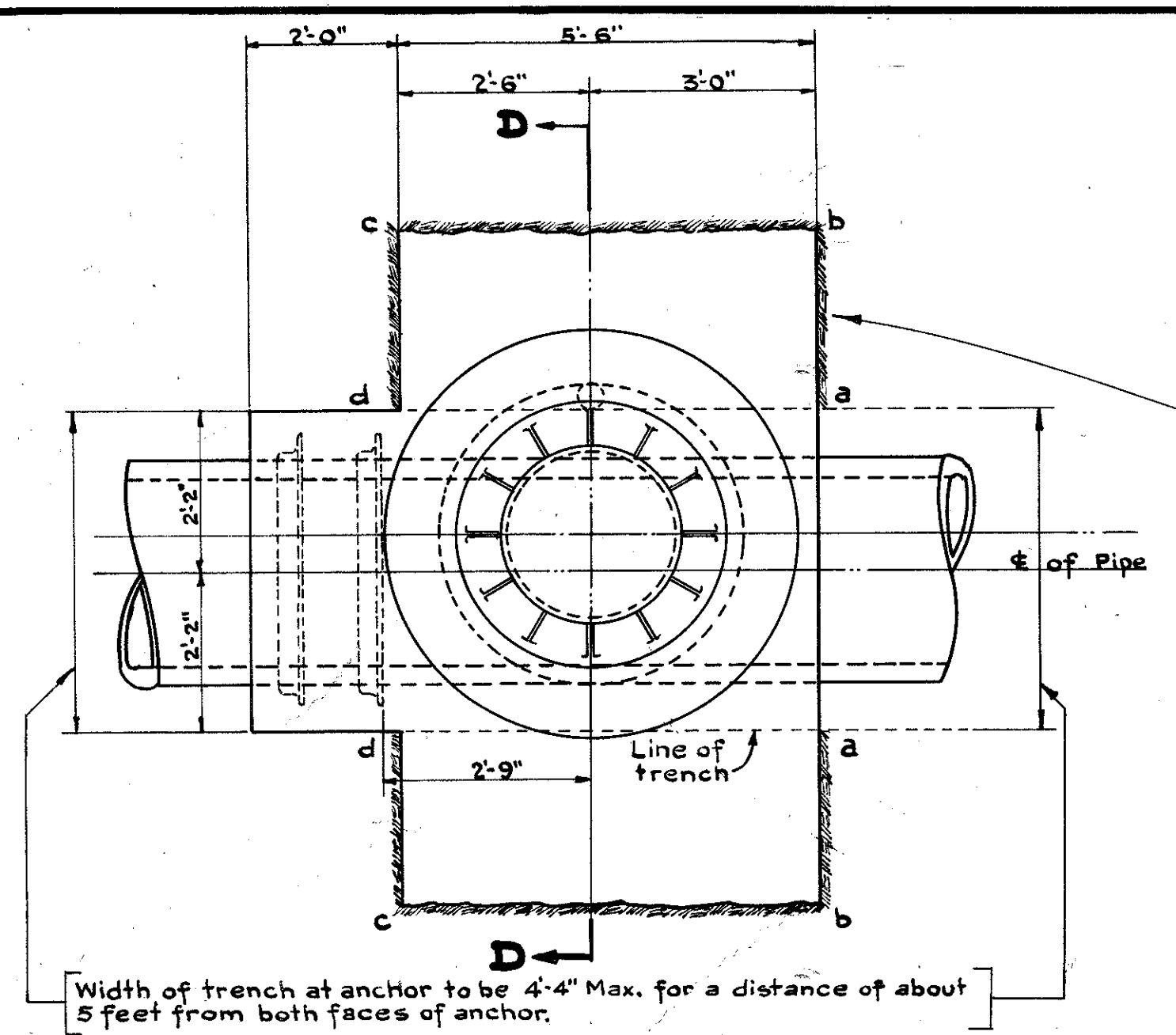
* Plug at Main and Remove Abandoned Existing Curb Cock Valve Box.



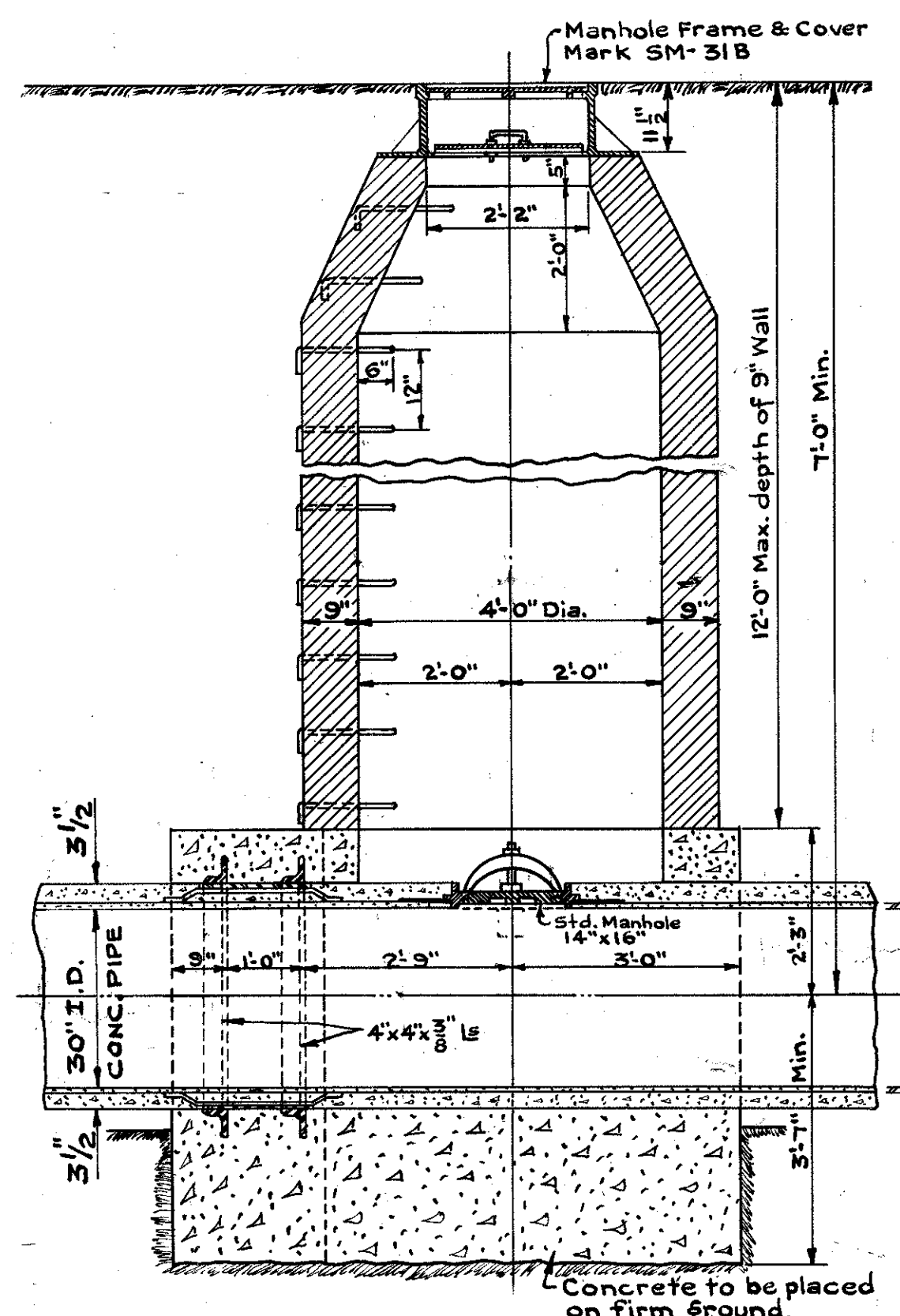
PLAN



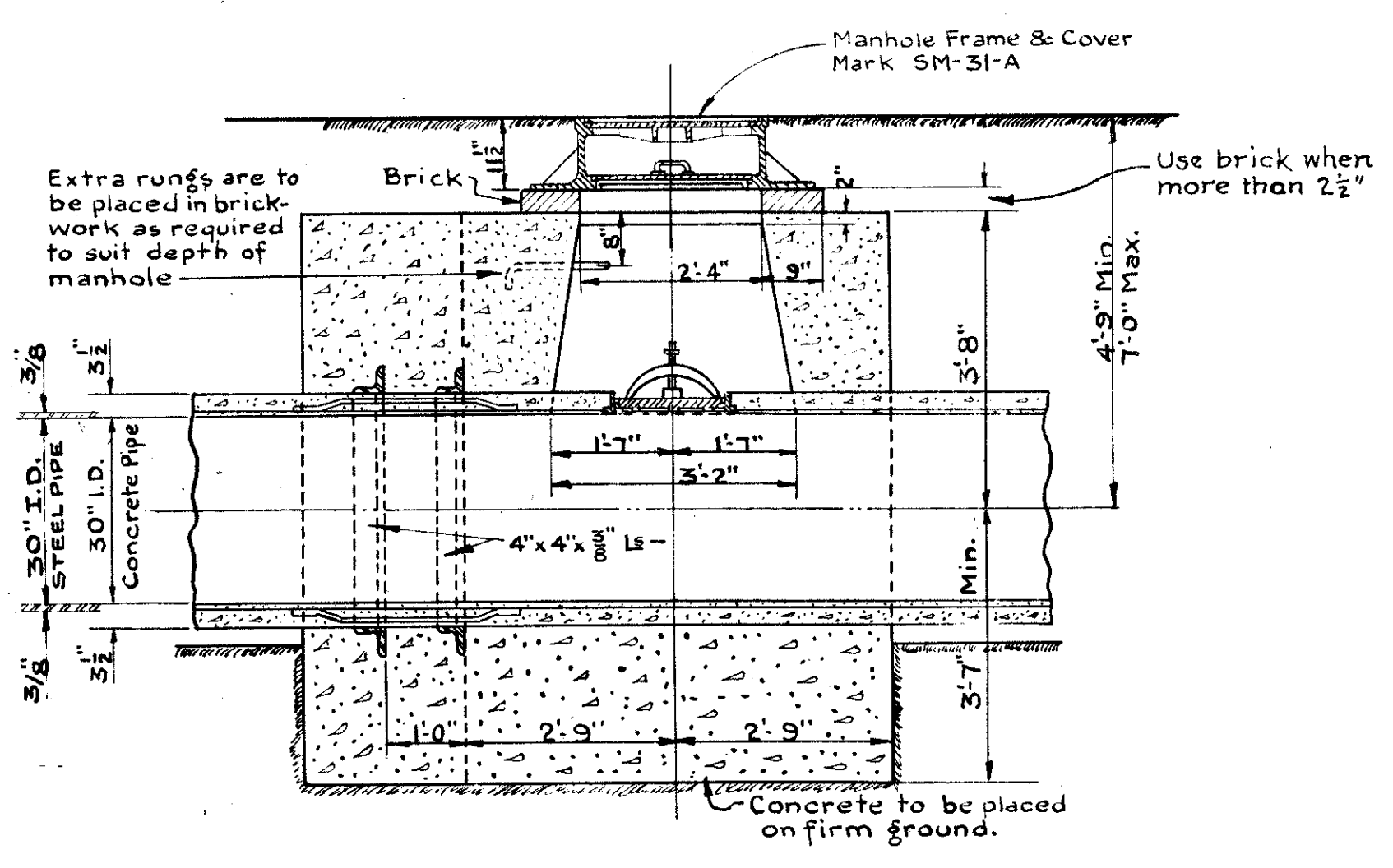
SECTION B-B



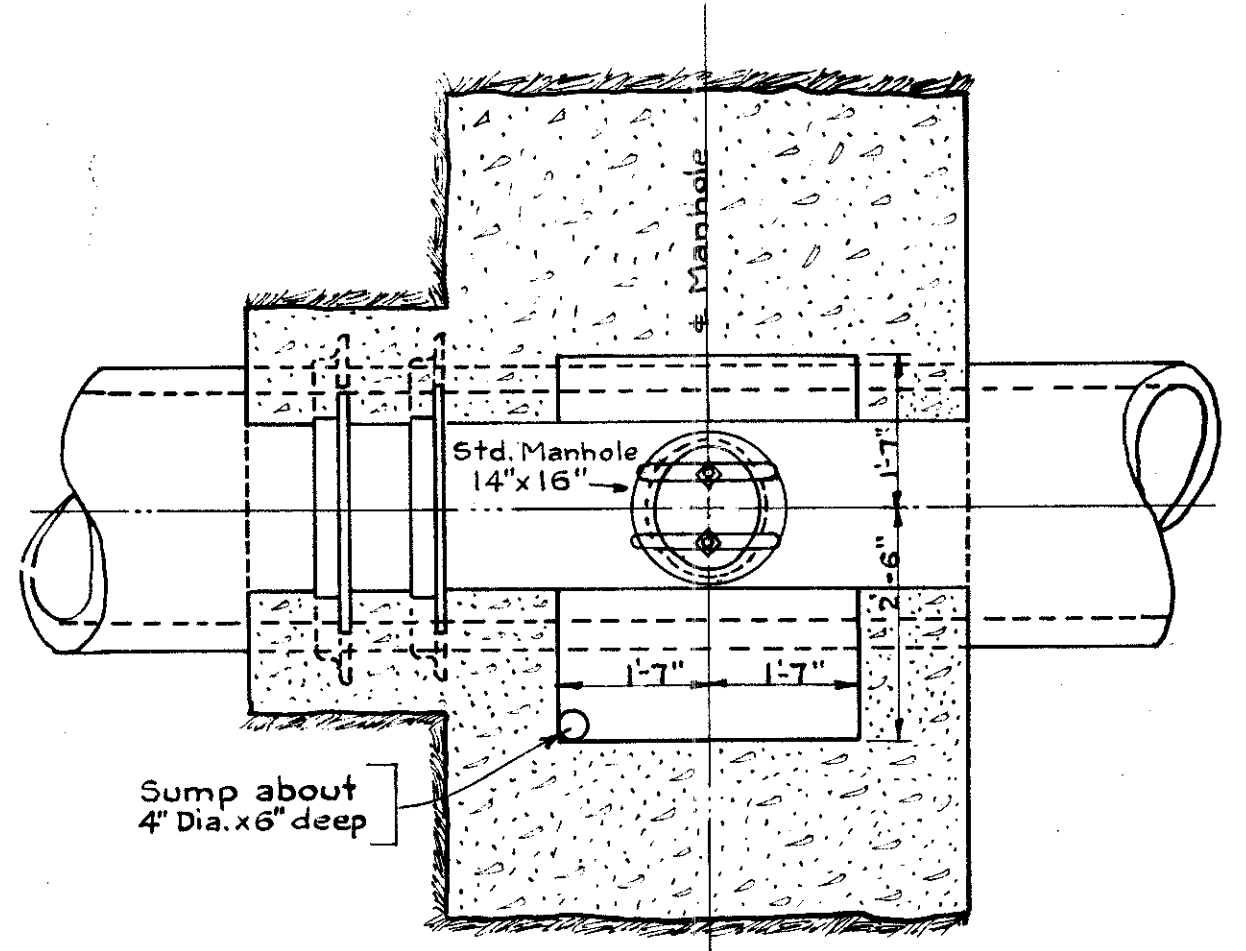
PLAN



SECTION E-E



SECTION A-A



SECTION C-C

**ACCESS MANHOLE AND ANCHORAGE
TYPE "A"**
Scale: 1/2" = 1'-0"

For Anchorage details see sheet 218.
For Manhole Frame and Cover details see sheets 218 & 219.

APPROVED DATE JUNE 15, 1972
Donald R. Melone
ENGINEER, CITY OF GARFIELD HEIGHTS

Raymond Kudrinski
DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER AND HEAT
Edward P. Johnson
COMMISSIONER DIVISION OF UTILITIES ENGINEERING
David J. Quillen
ENGINEER OF CONSTRUCTION AND SURVEYS
William J. Sweeney
ENGINEER OF DESIGN

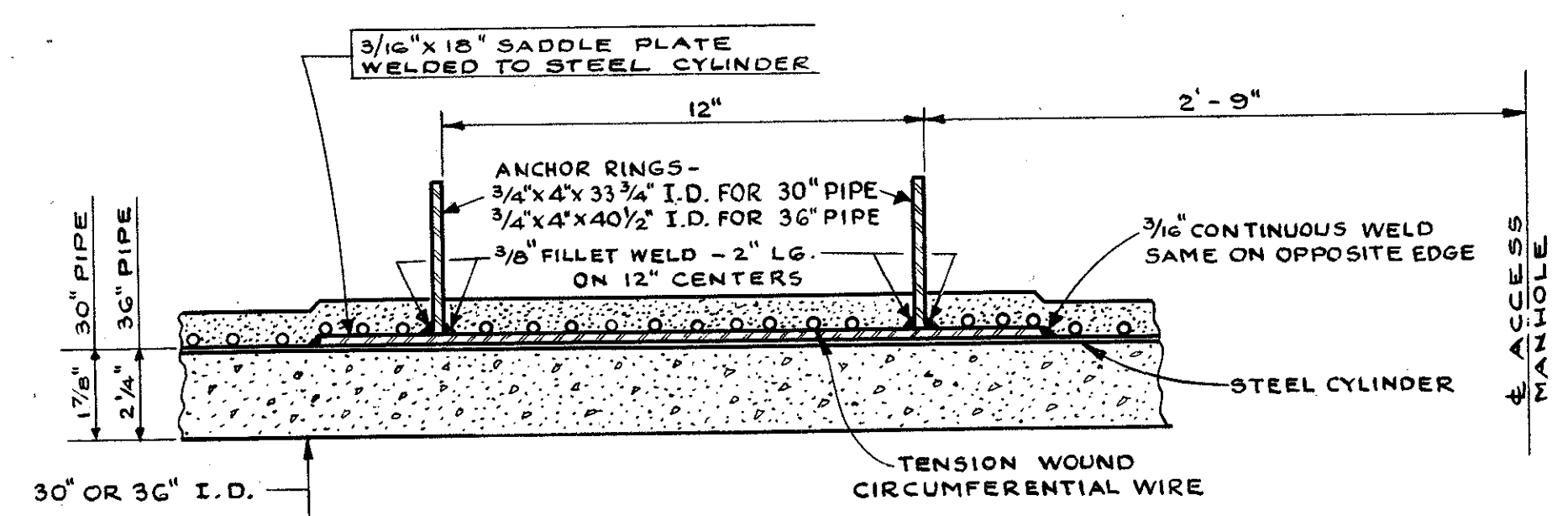
2ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS

SCALE As Shown
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE DATE CONSULTING ENGINEERS
TRCD DATE
CKD ERH DATE 5-10-72 KANSAS CITY CLEVELAND NEW YORK

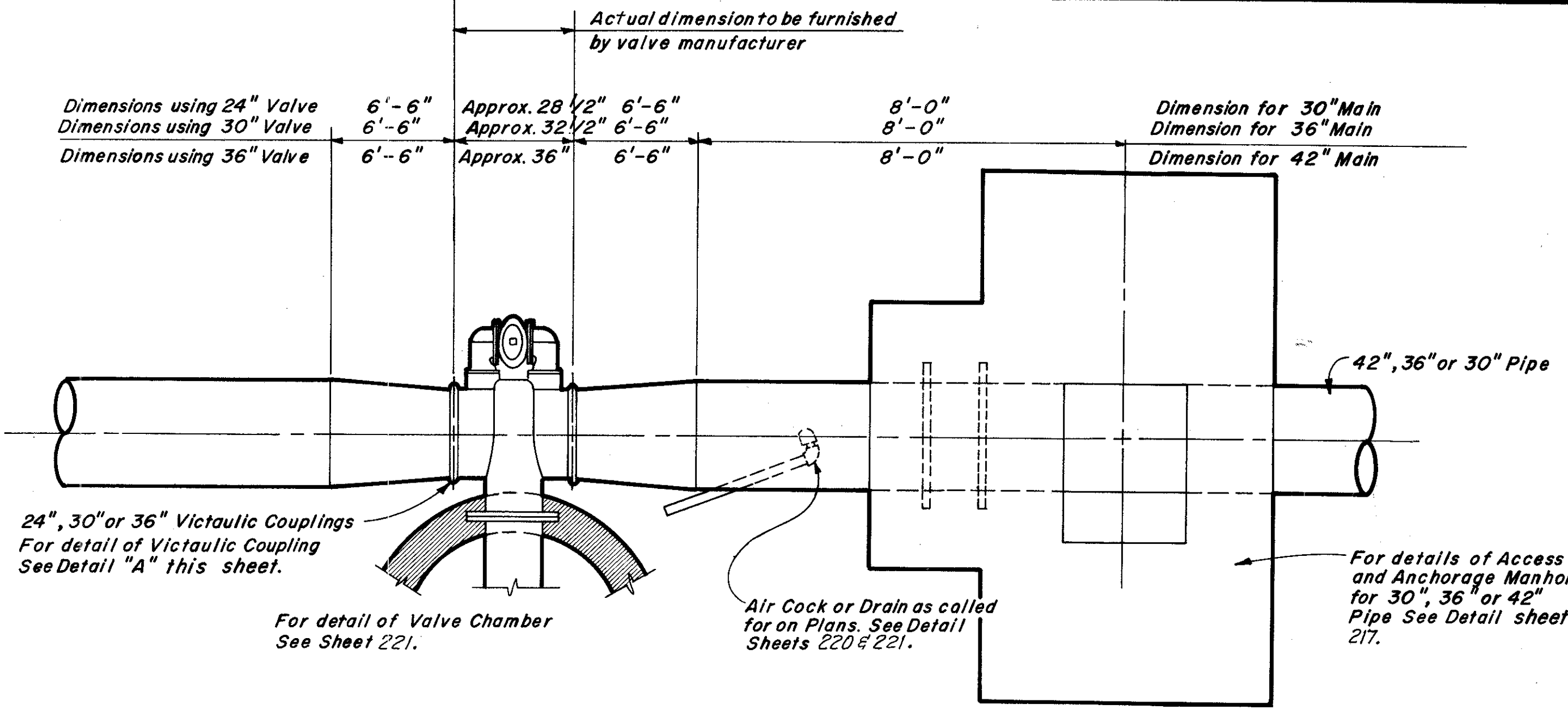
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

218
390

CUYAHOGA COUNTY
CUY.480-21.40

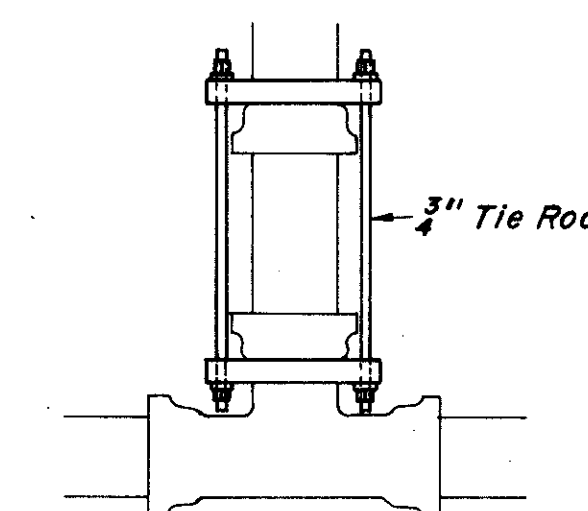


ANCHORAGE DETAILS FOR 30" AND 36" FOR PRESTRESSED CONCRETE CYLINDER PIPE FOR MANHOLE TYPE "A" AND "B"



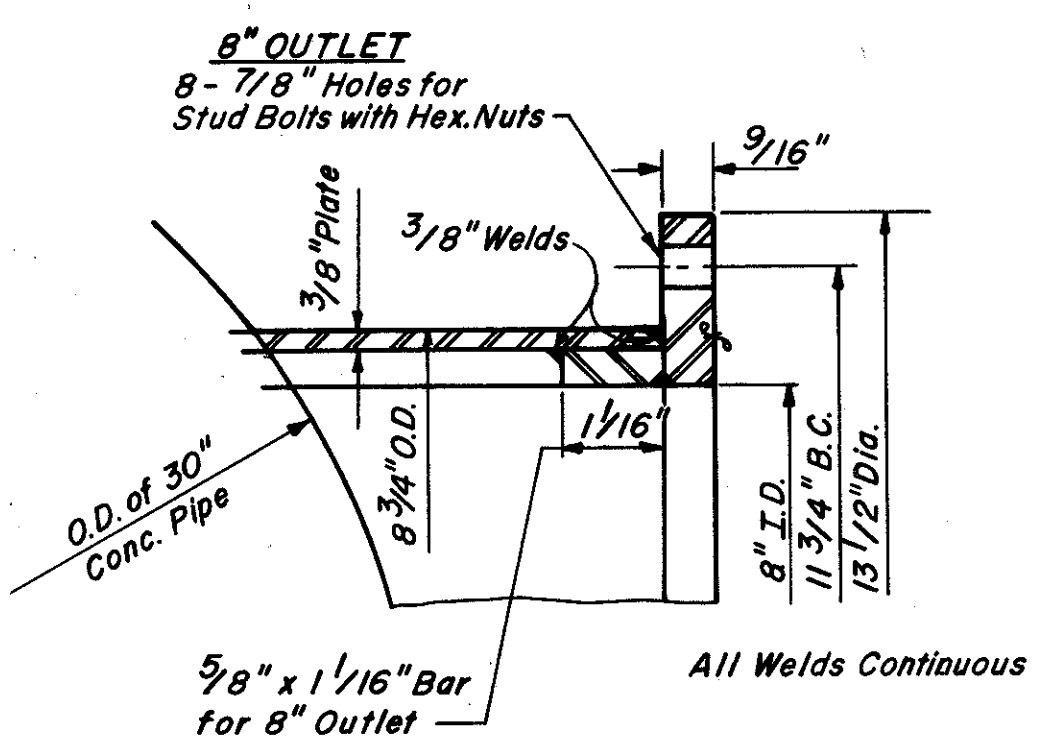
TYPICAL VALVE ASSEMBLY

NO SCALE



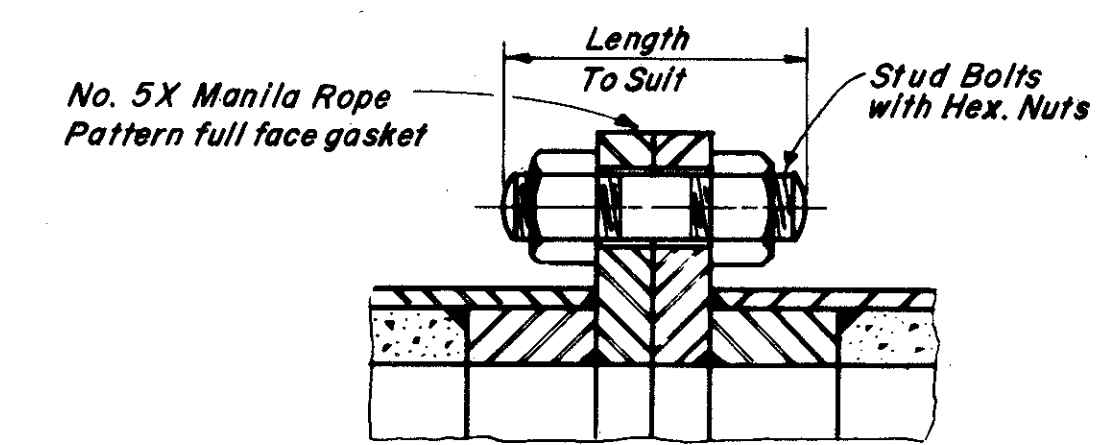
SOCKET CLAMPS WITH TIE RODS

NO SCALE

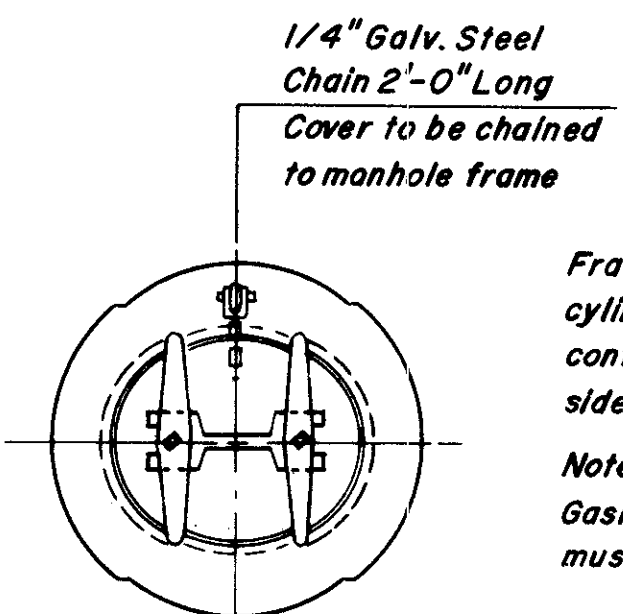


8" FLANGE OUTLET ON 30" PIPE

NO SCALE

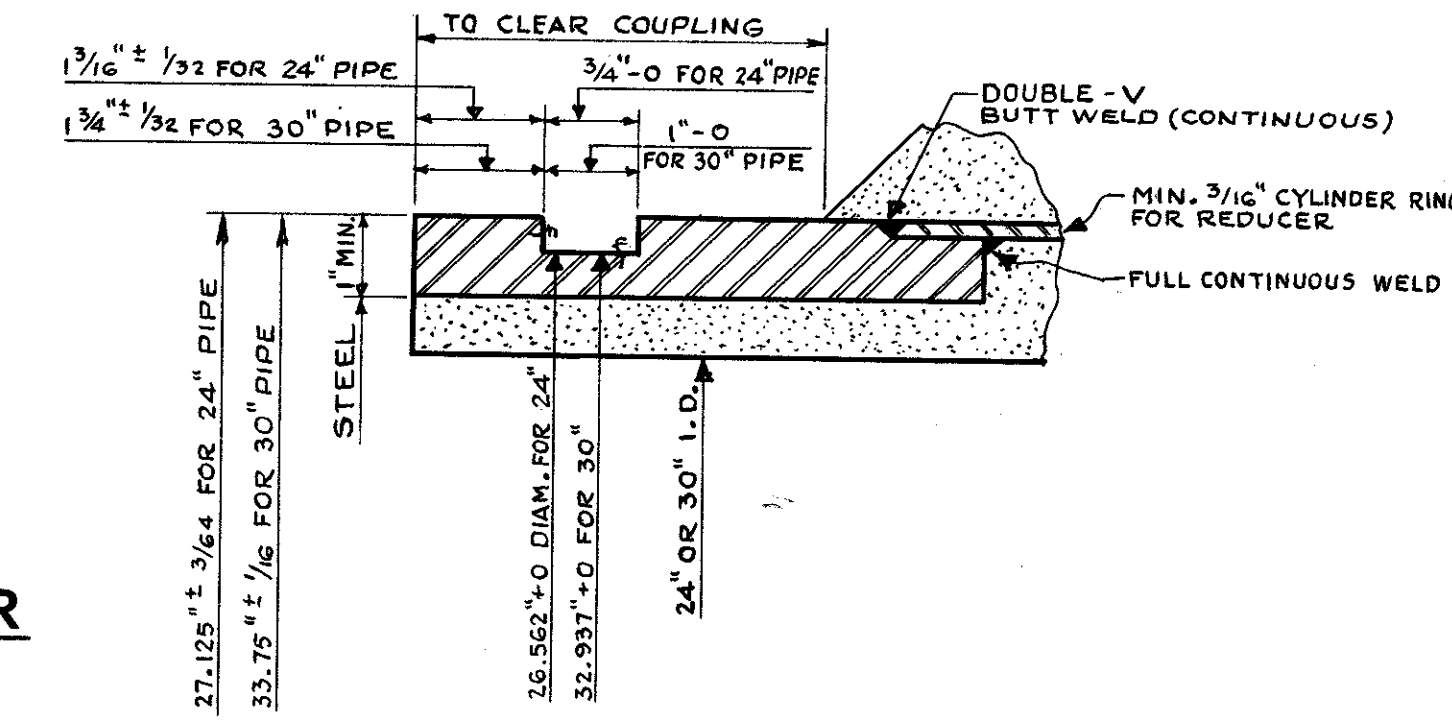


SECTION THROUGH C SHOWING TYPICAL DETAIL OF FLANGE CONNECTIONS



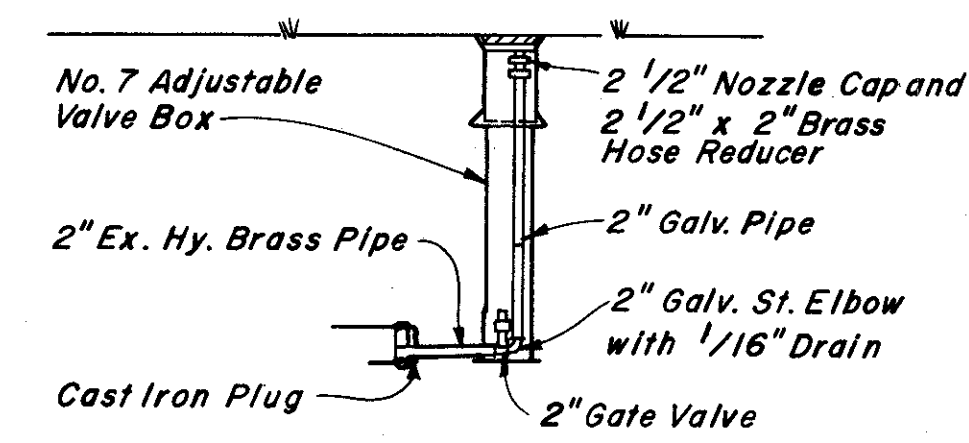
14" X 16" STANDARD MANHOLE FRAME AND COVER

(FRAME, COVER AND YOKES TO BE CAST STEEL)

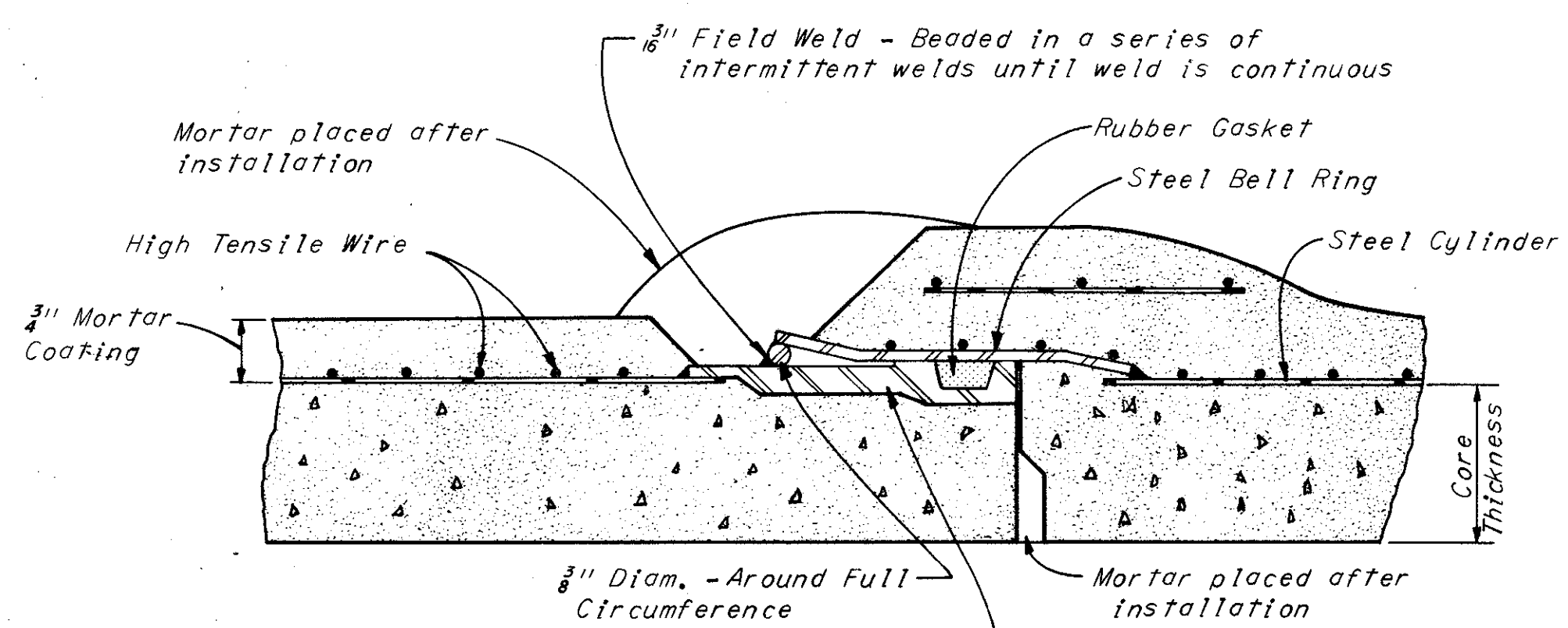


DETAIL "A"

FOR 24" OR 30" VICTAULIC COUPLINGS

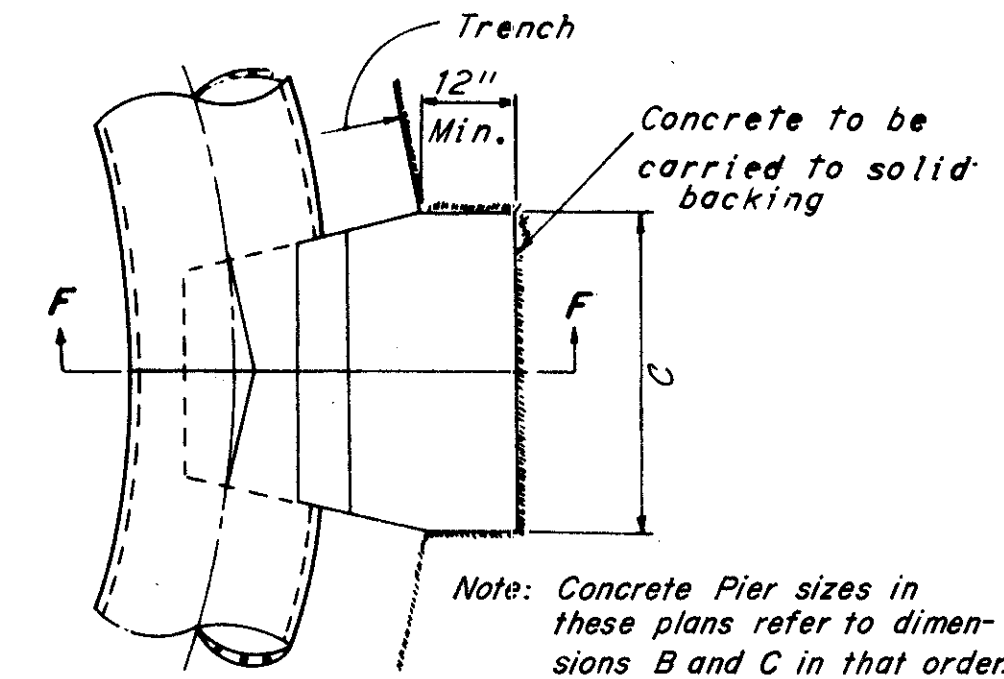


FLUSHING PIPE

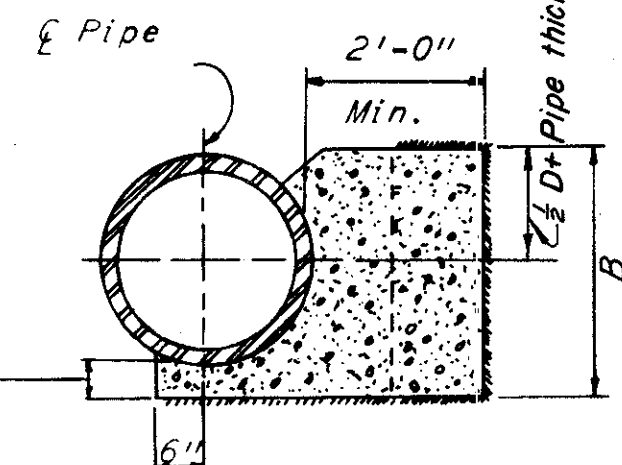


DETAIL "Y"

Prestressed Concrete Cylinder Pipe with rubber and steel joint showing welded type tied joint. (Same type of weld for Reinforced Concrete Cylinder Pipe)



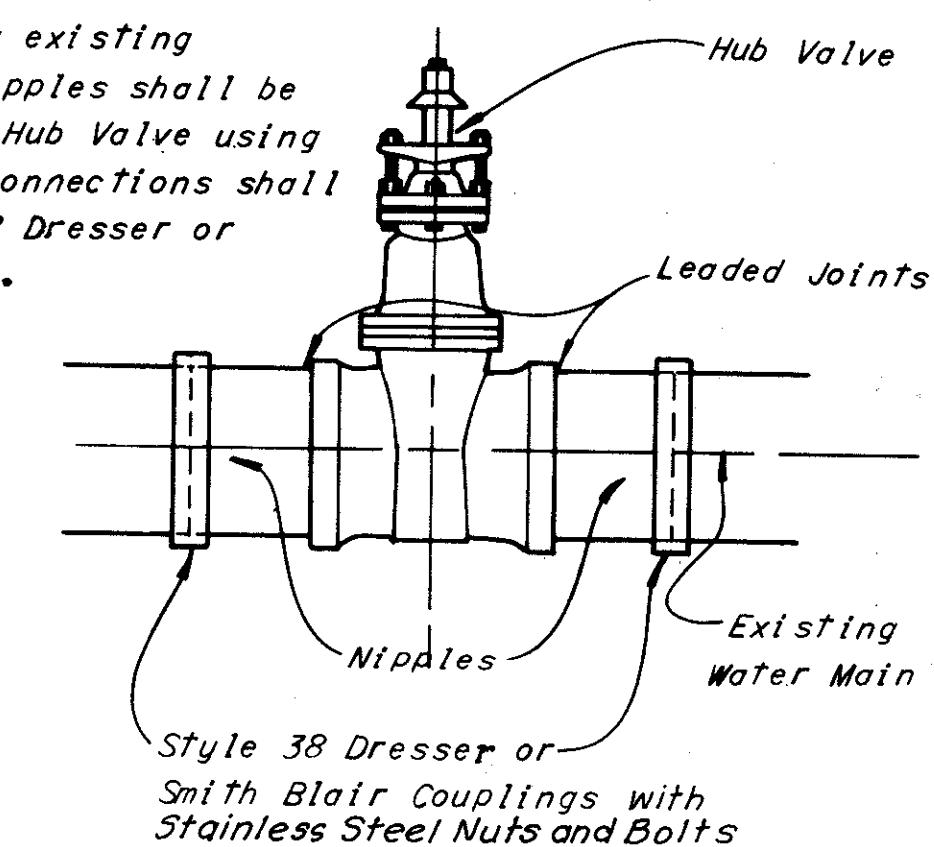
PLAN



SECTION F-F

CONCRETE PIER FOR BENDS

Note: Before cutting existing Water Main the two nipples shall be connected to the Hub Valve using lead joints. Final connections shall be made with Style 38 Dresser or Smith Blair Couplings.



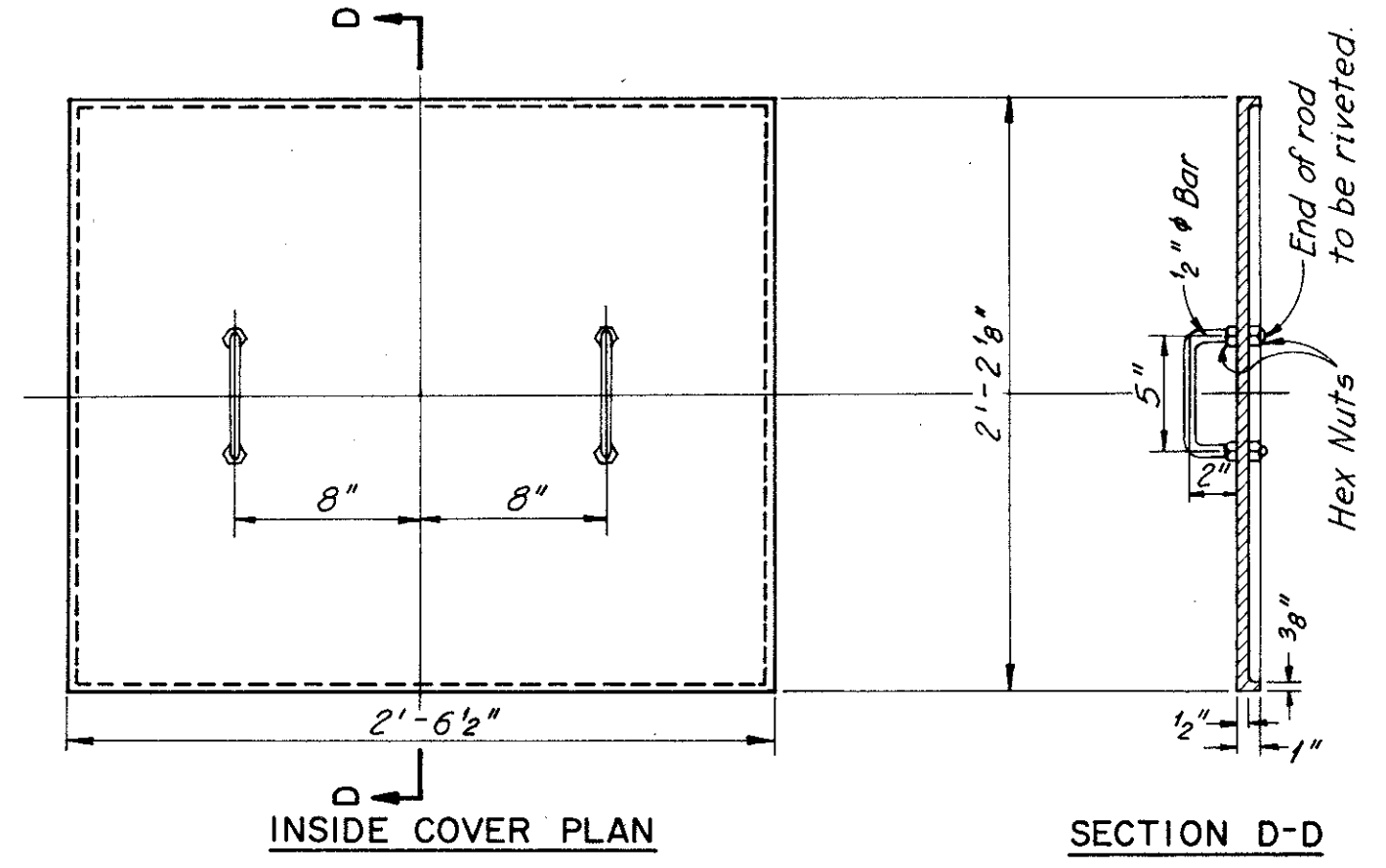
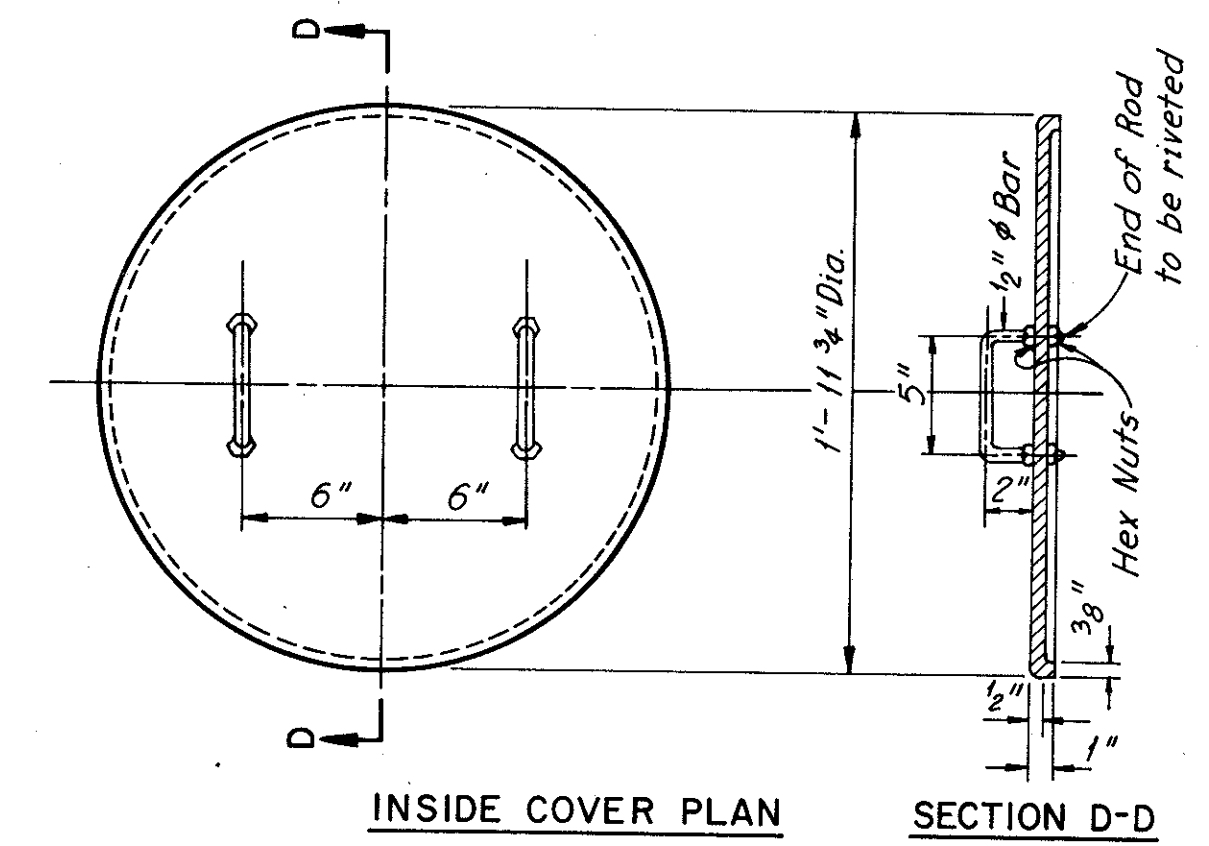
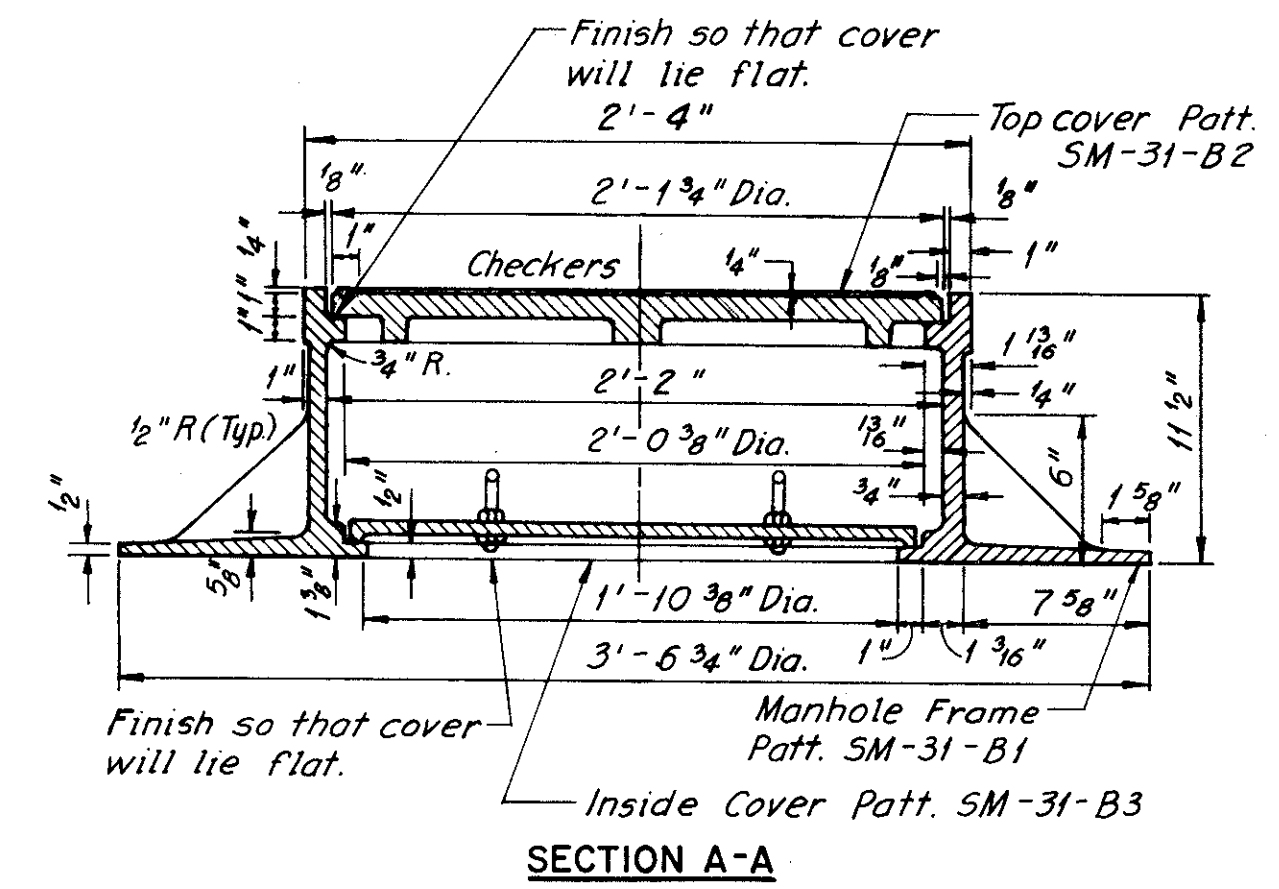
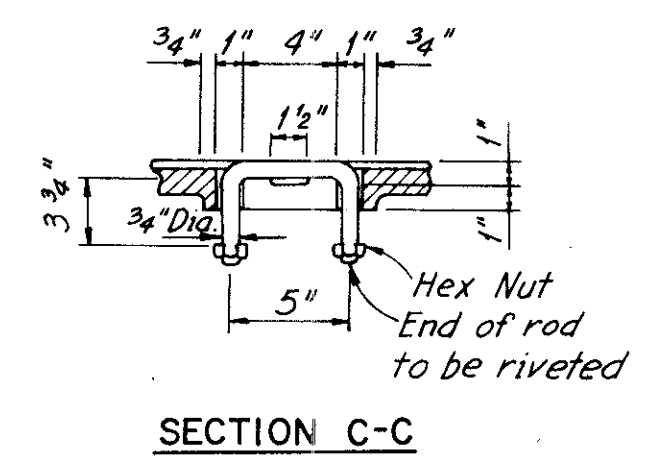
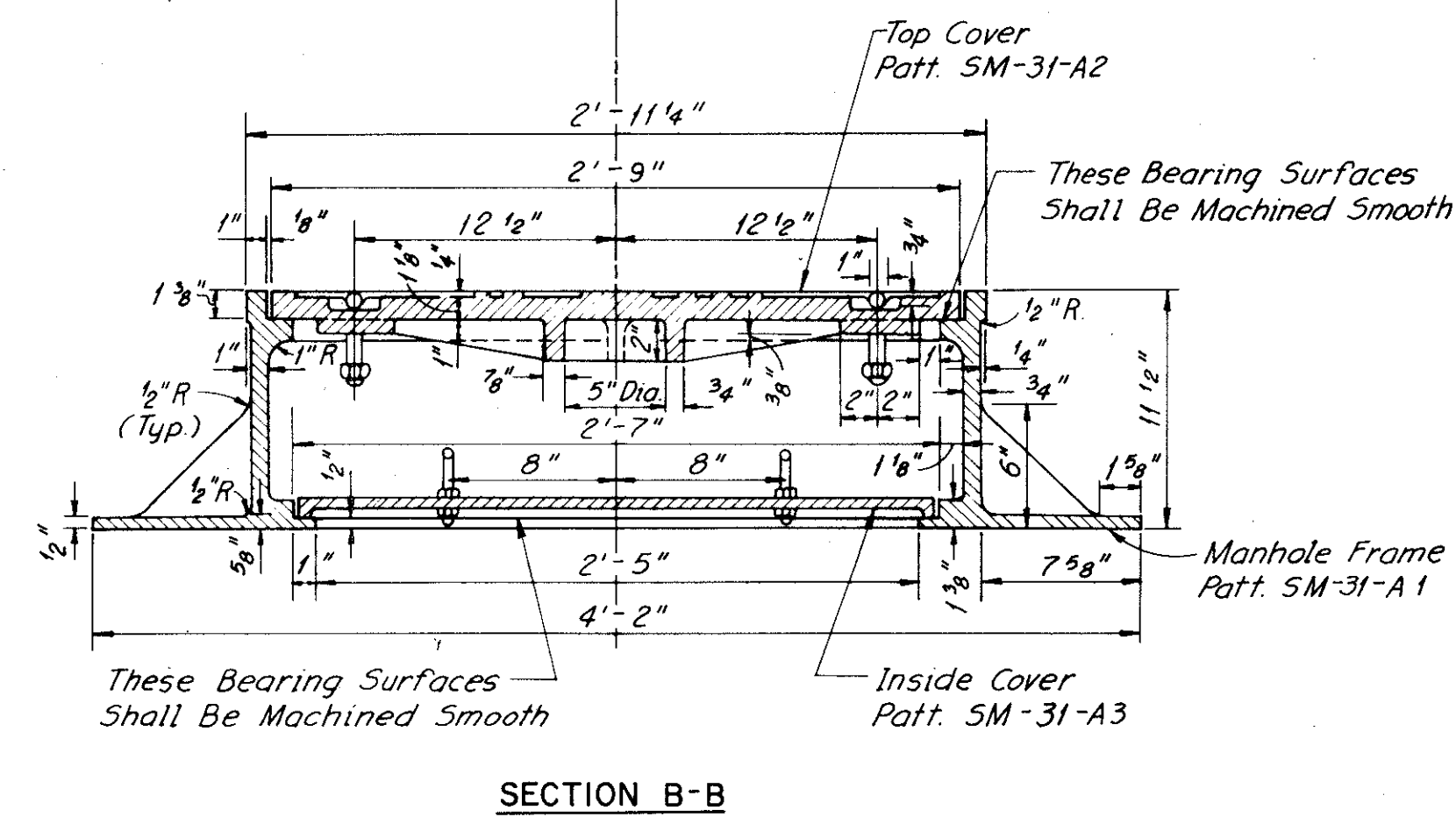
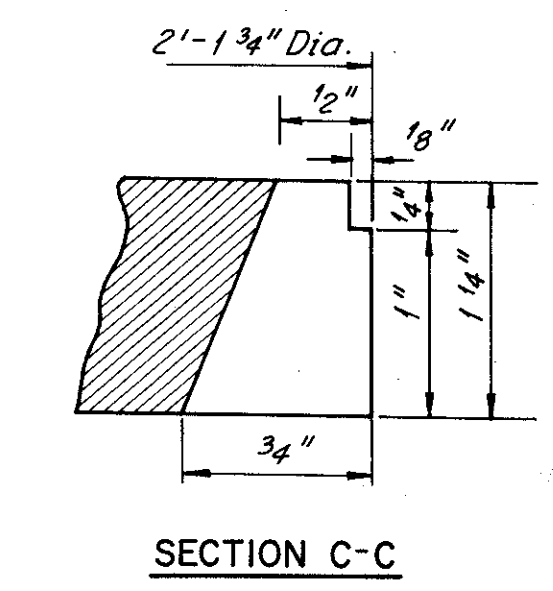
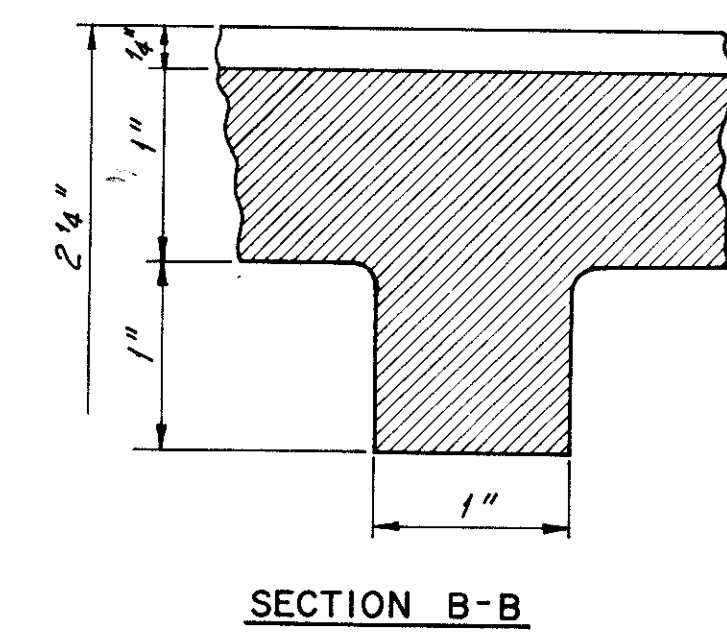
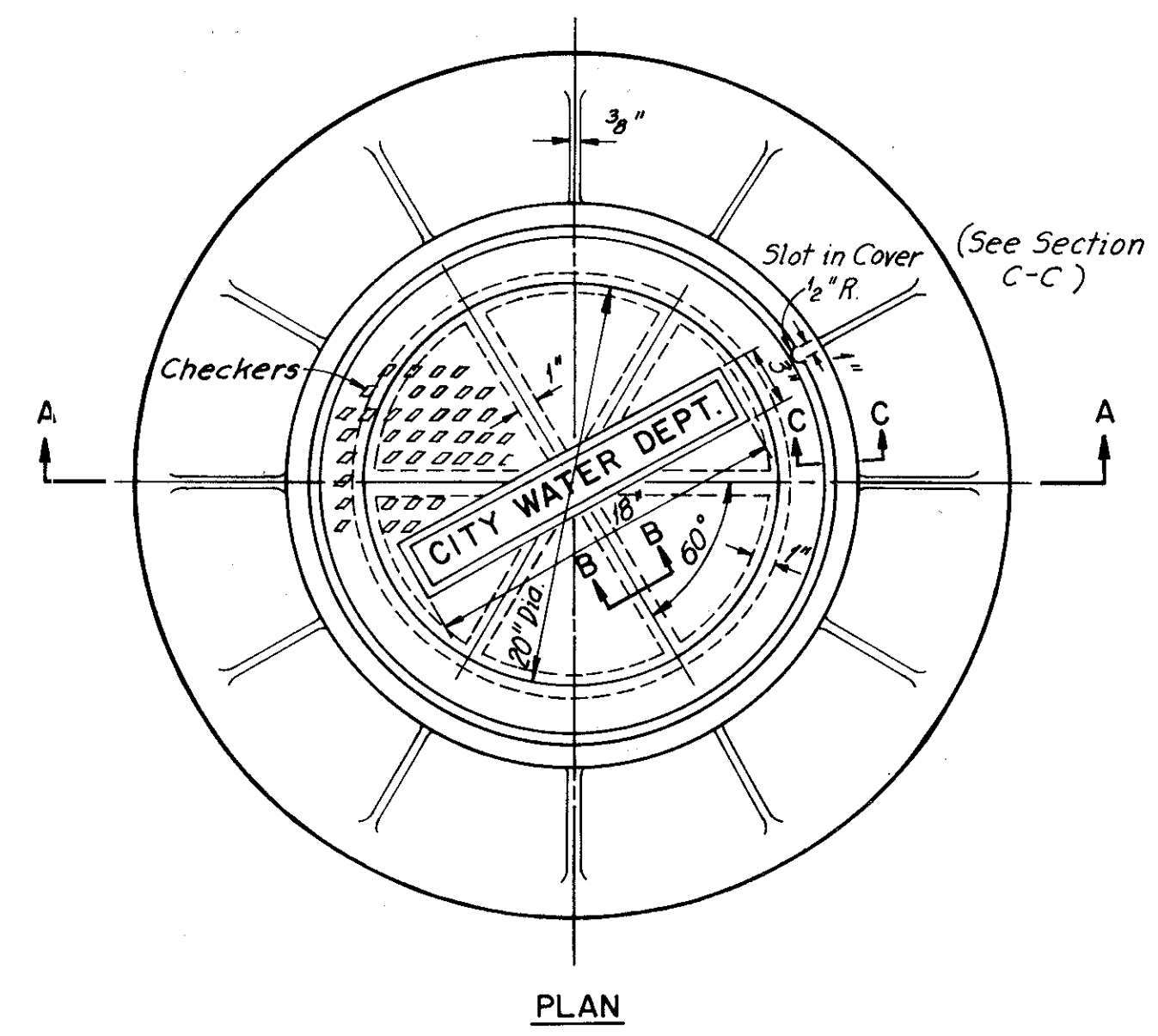
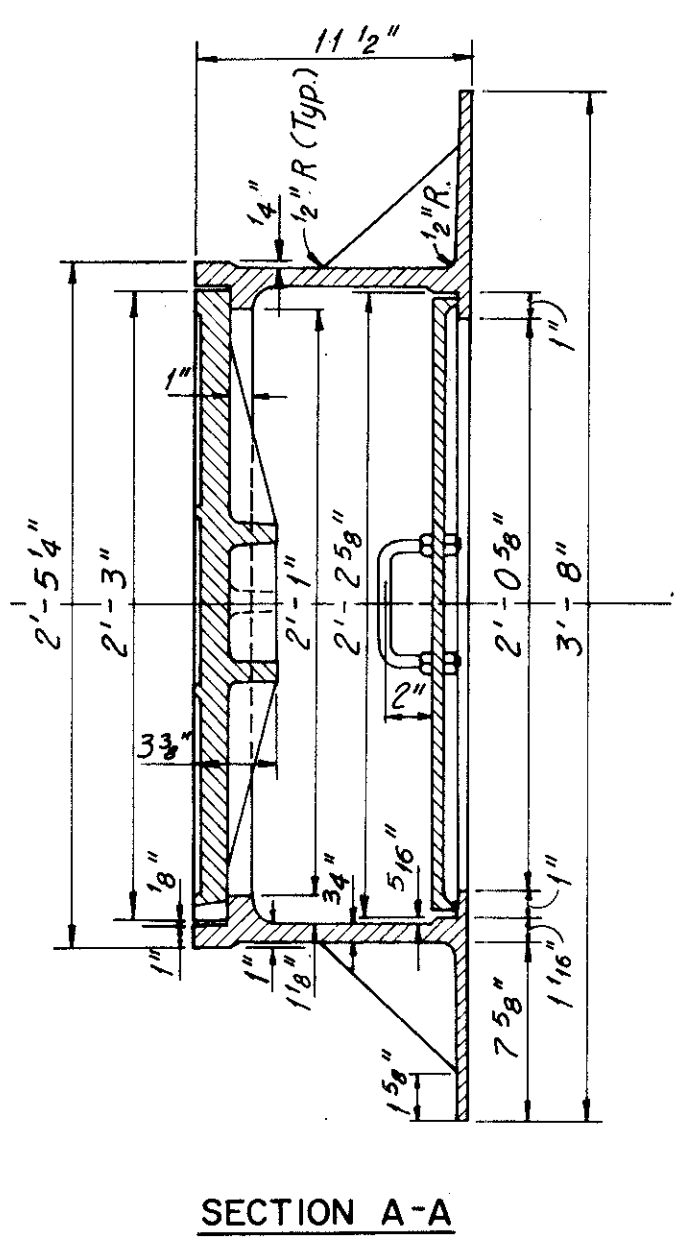
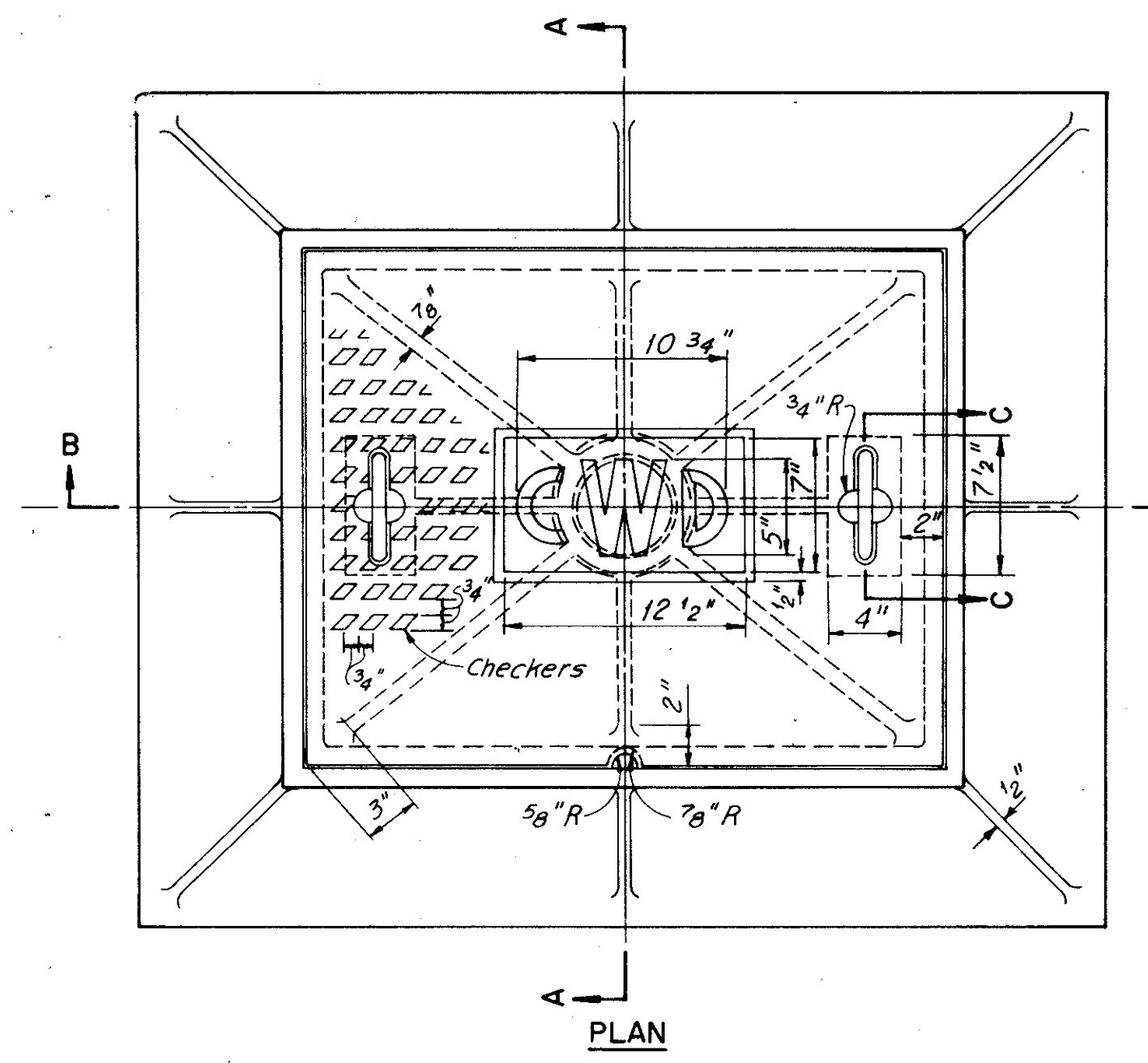
DETAIL OF CUTTING IN VALVE

APPROVED DATE JUNE 15, 1972
Frank R. Melan
 ENGINEER, CITY OF GARFIELD HEIGHTS
Robert J. Balth
 ENGINEER, CITY OF MAPLE HEIGHTS
Raymond Rudwick
 DIRECTOR OF PUBLIC UTILITIES
Richard J. Sullivan
 COMMISSIONER OF WATER AND HEAT
Richard J. Sullivan
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING
David J. Pliska
 ENGINEER OF CONSTRUCTION AND SURVEYS
William J. Sweeney
 ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO
 Subject: **WATERWORK FOR THE CITY OF GARFIELD HEIGHTS AND THE CITY OF MAPLE HEIGHTS**

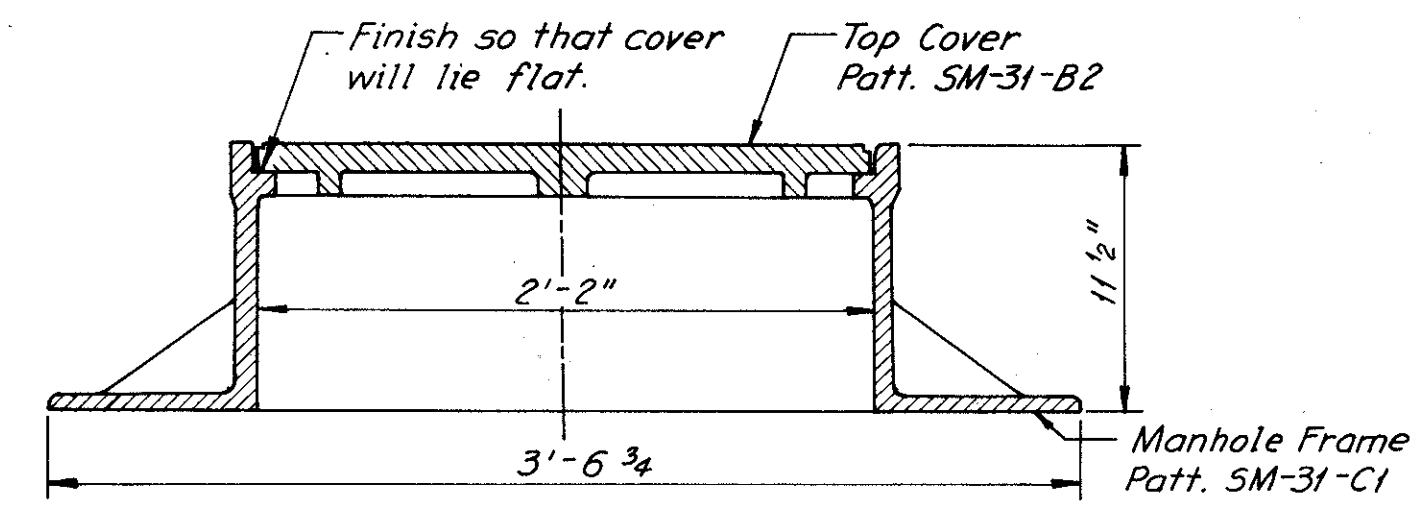
SCALE: No Scale
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE HLD DATE: 5/11/71 CONSULTING ENGINEERS
 TRCD HLD DATE: 5/11/71
 CKD E.R.H. DATE: 5-11-72 KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY
CUY480-21.40



MANHOLE FRAME AND COVERS MARK SM-31-B

Consisting of { C.I. Manhole Frame Patt. SM-31-B1
C.I. Top Cover Patt. SM-31-B2
C.I. Inside Cover Patt. SM-31-B3
Approximate Weight = 765 #



MANHOLE FRAME AND COVER MARK NO. 3

Consisting of { C.I. Manhole Frame Patt. SM-31-C1
C.I. Top Cover Patt. SM-31-B2
(Dimensions not given are the same as those shown for Manhole Frame Patt. Mark SM-31-B)
Approximate Weight = 602 #

MANHOLE FRAME AND COVERS MARK SM-31-A

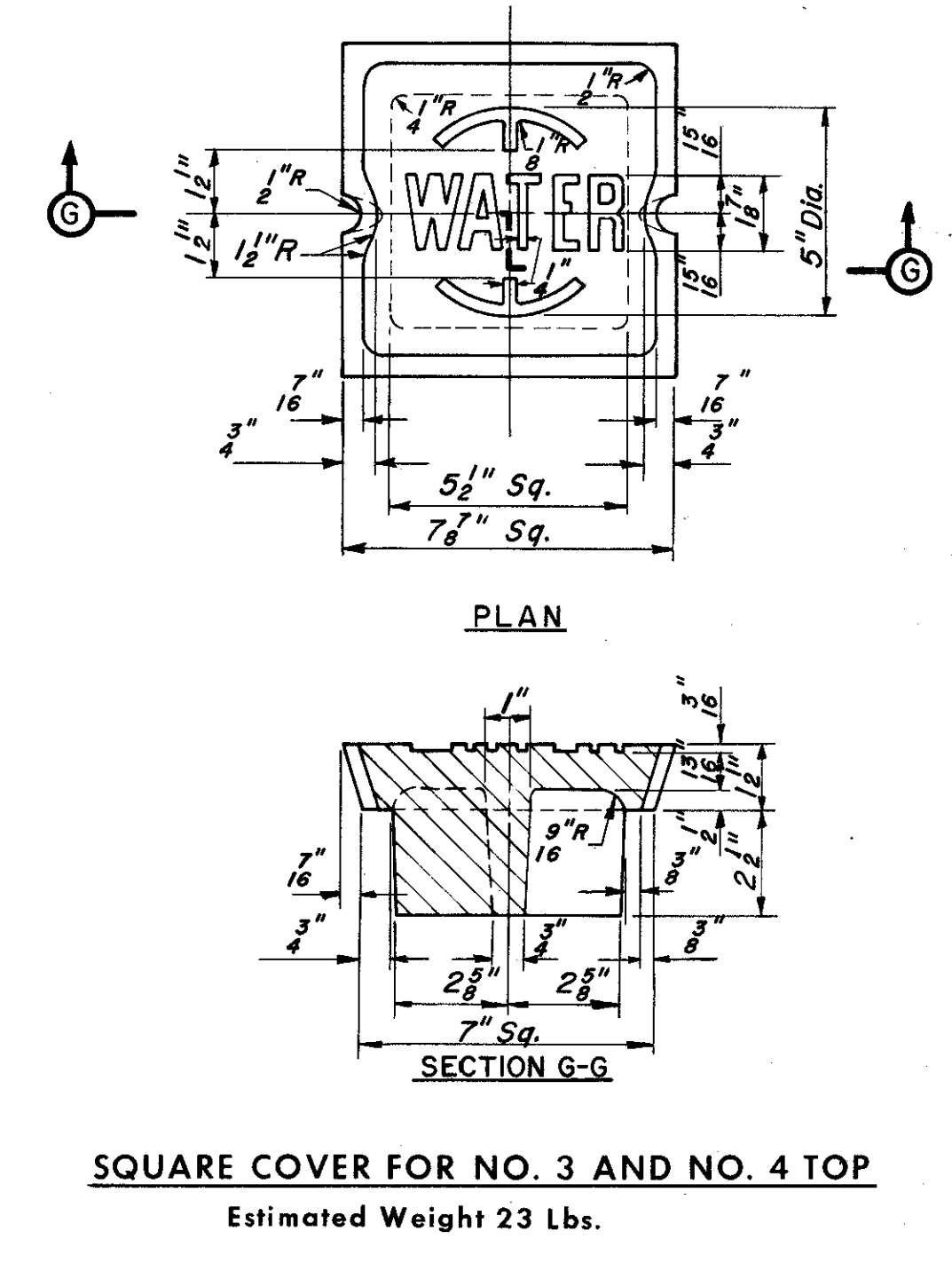
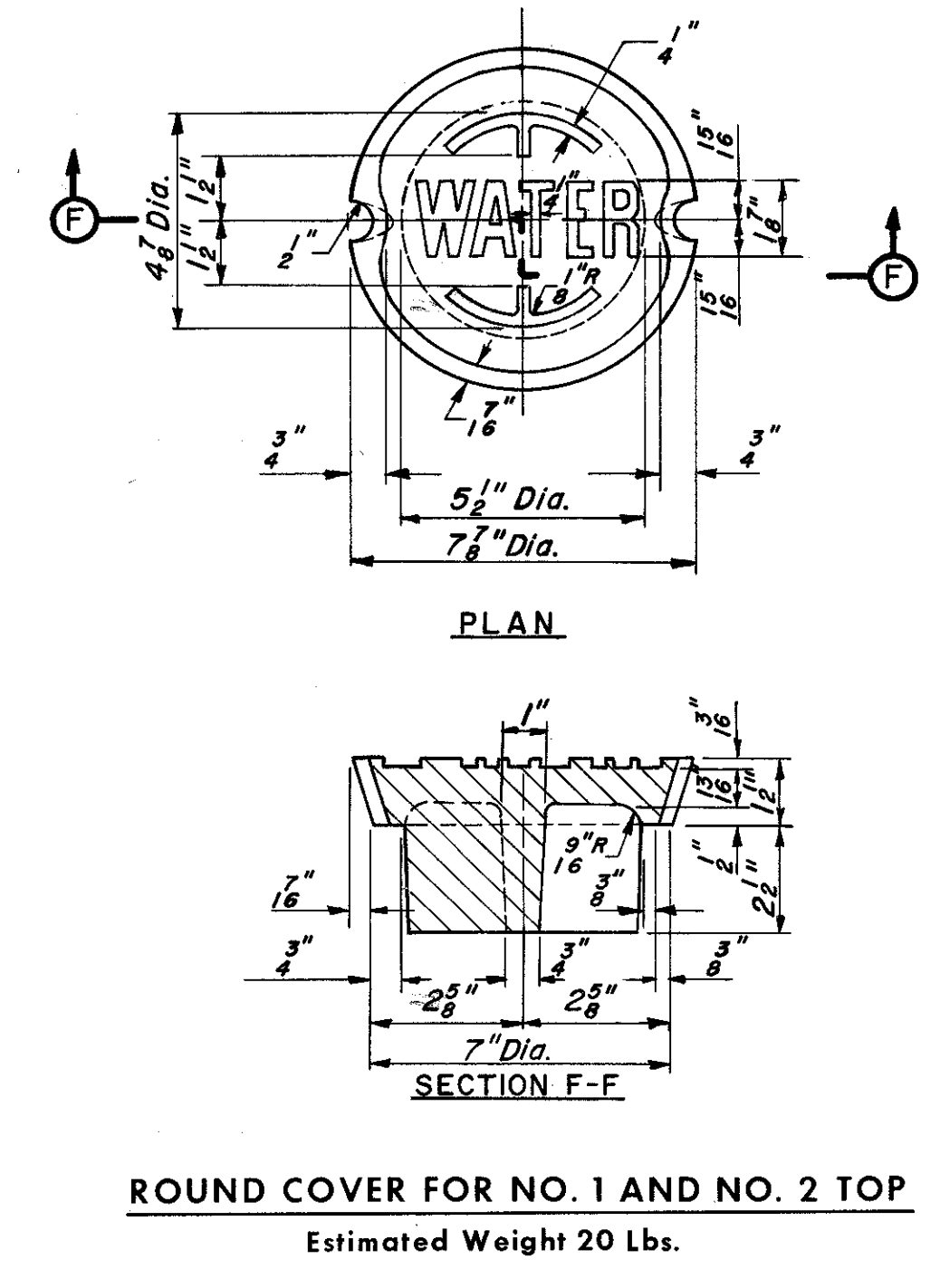
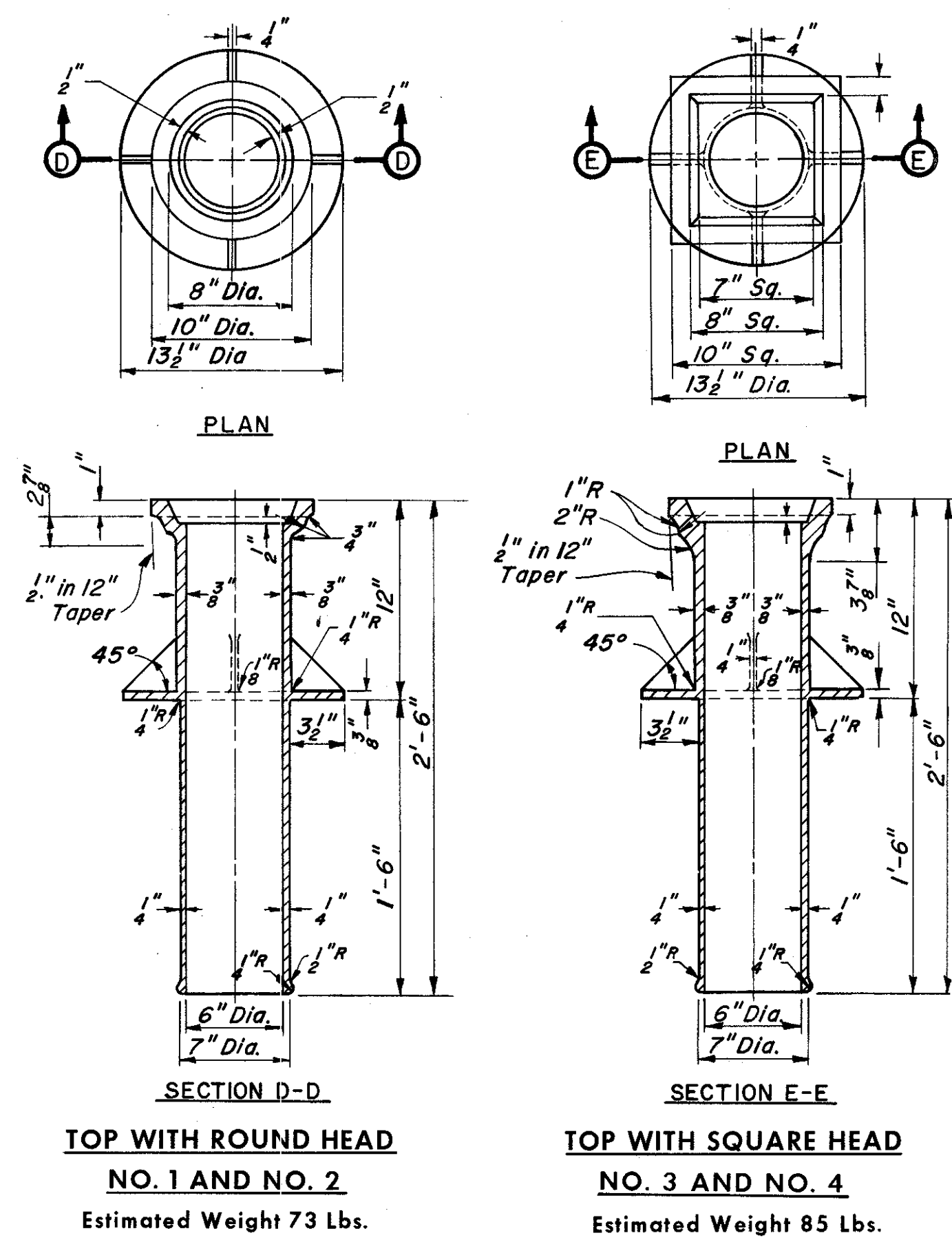
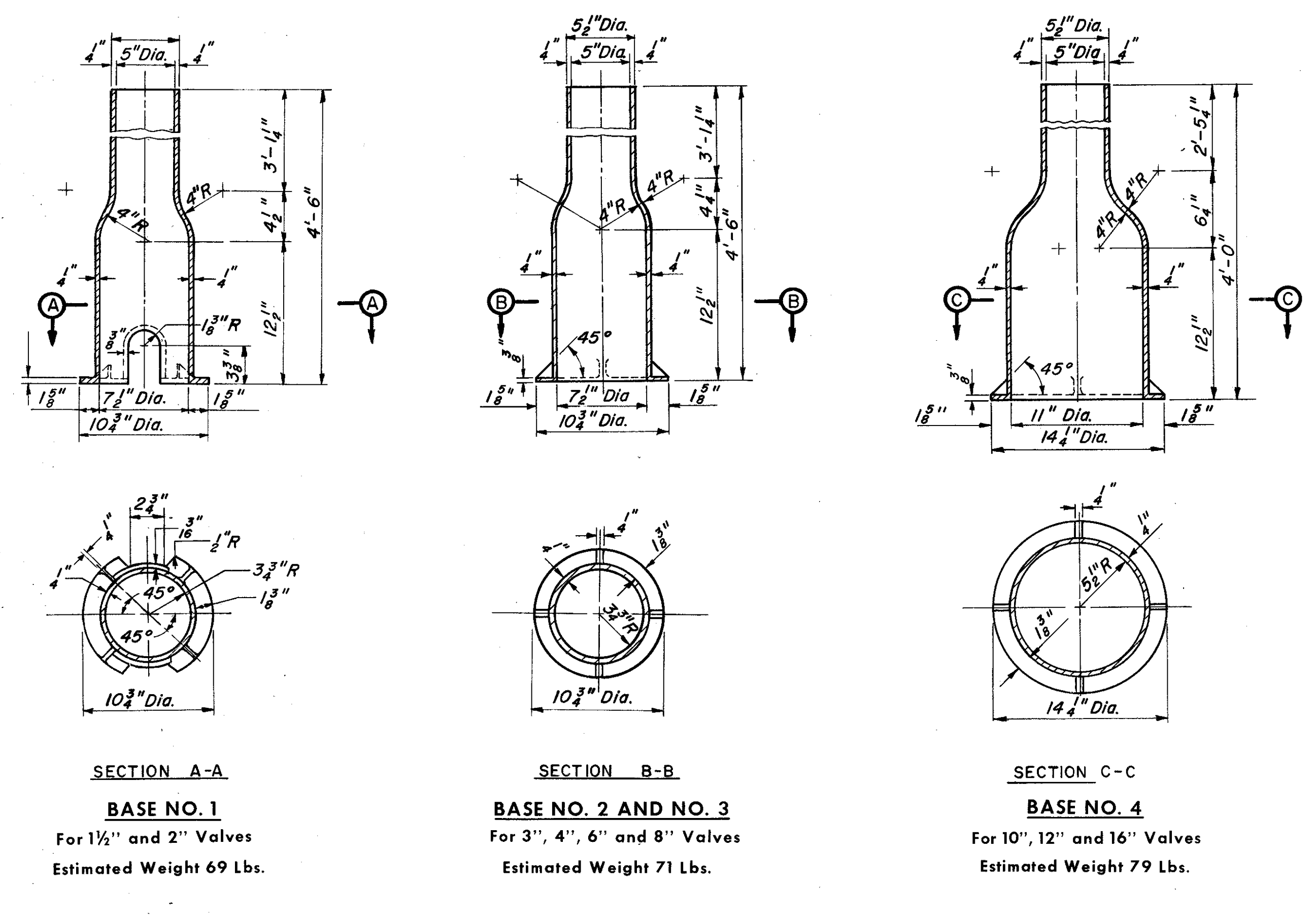
Consisting of { C.I. Manhole Frame Patt. SM-31-A1
C.I. Top Cover Patt. SM-31-A2
C.I. Inside Cover Patt. SM-31-A3

APPROVED _____ DATE JUNE 15, 1972
Frank R. Melton
ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond Kudekew
DIRECTOR OF PUBLIC UTILITIES
J. B. Stettin
COMMISSIONER OF WATER AND HEAT
Edward A. Suter
COMMISSIONER DIVISION OF UTILITIES ENGINEERING
Dan O. ...
ENGINEER OF CONSTRUCTION AND SURVEYS
William J. Sweeney
ENGINEER OF DESIGN

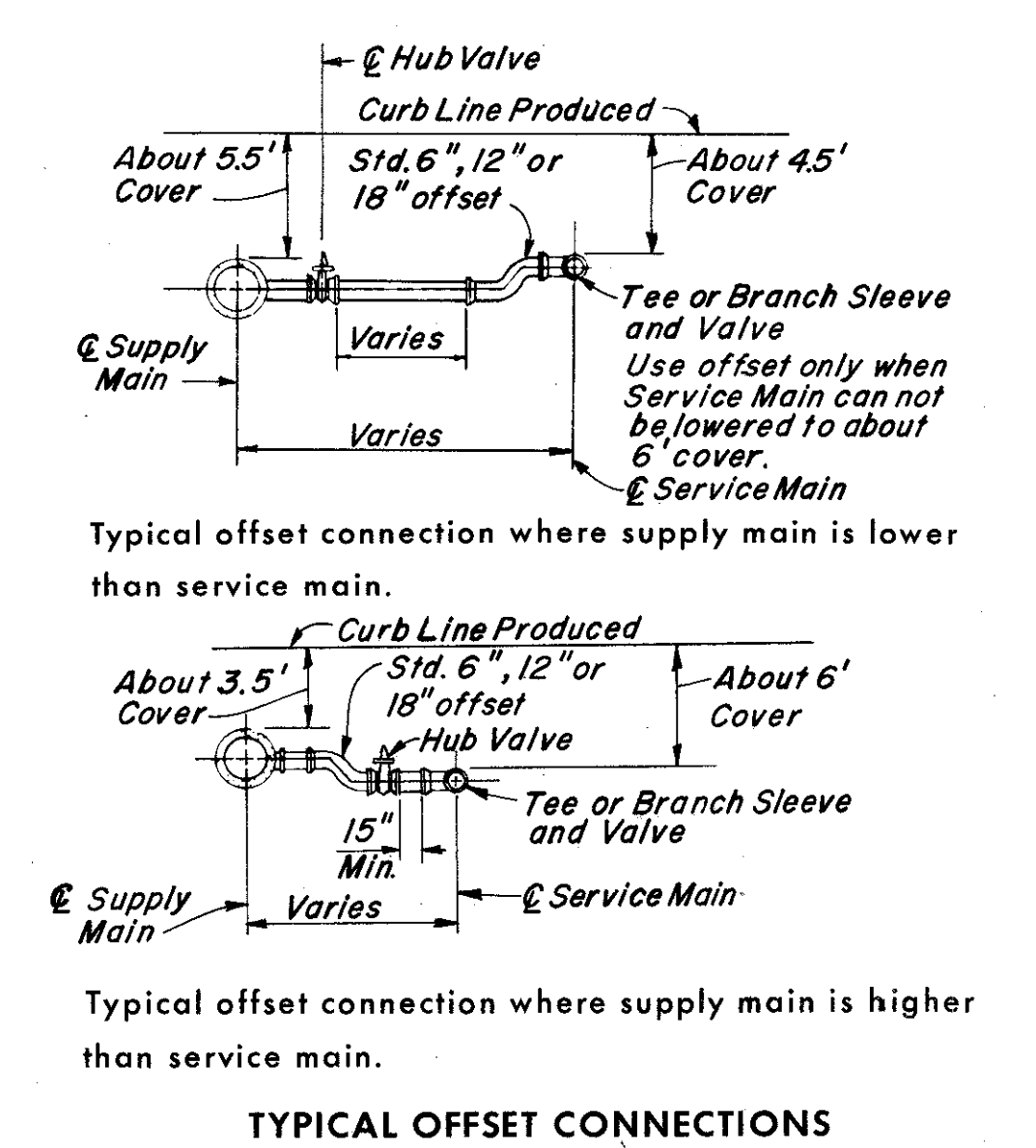
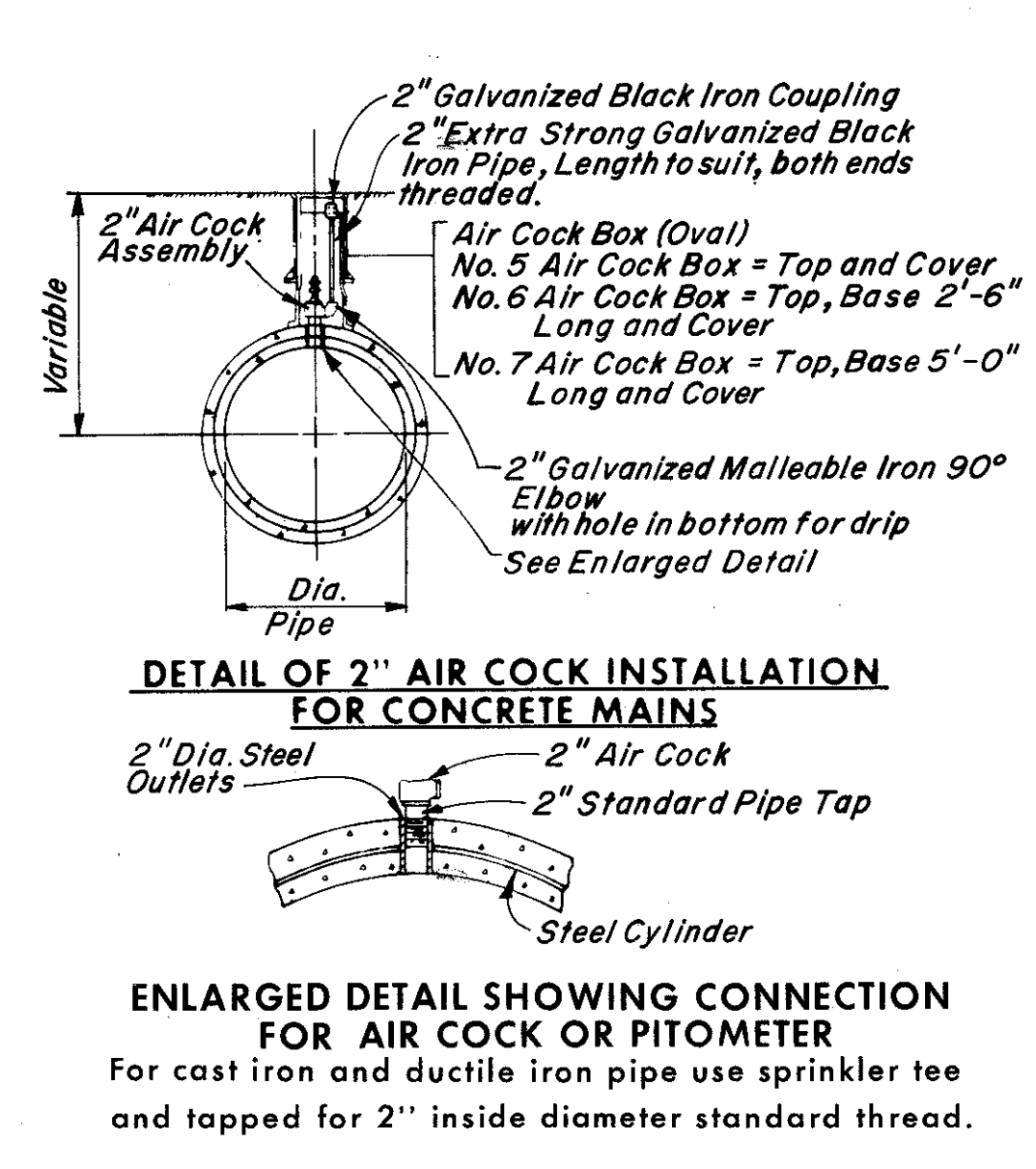
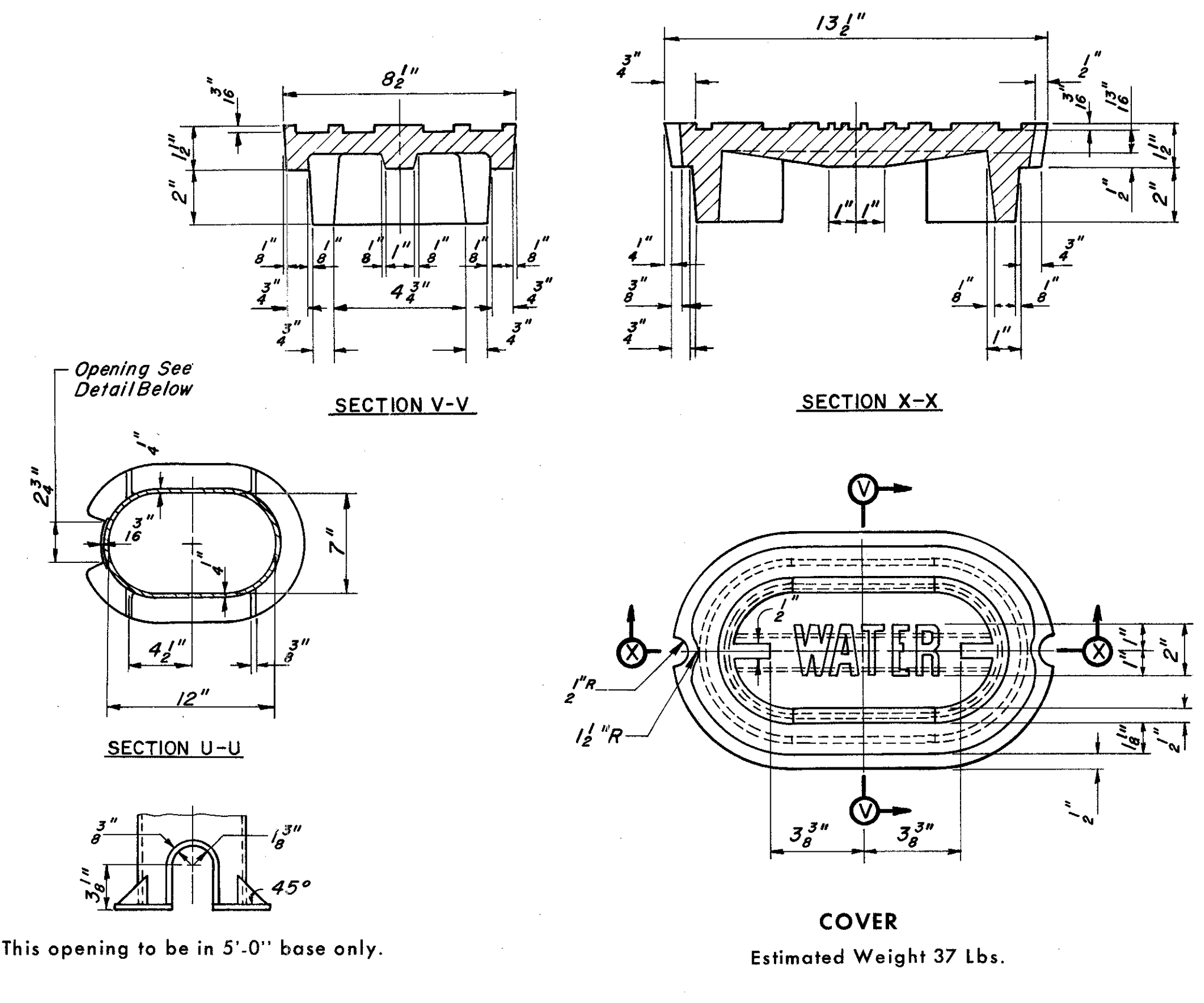
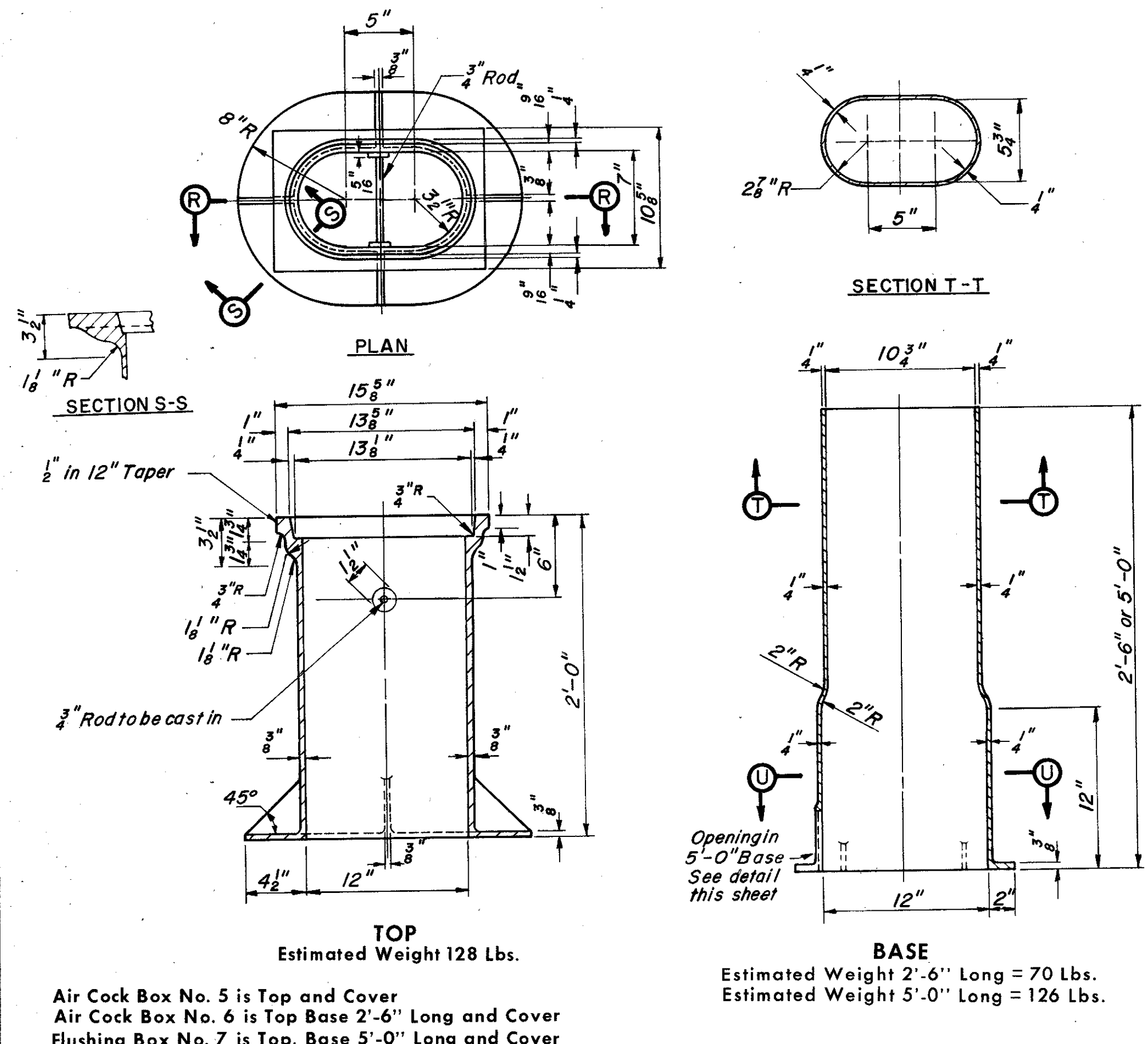
2ND HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
Subject: **WATERWORK FOR THE CITY OF GARFIELD HEIGHTS**

SCALE None
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE ERH DATE 6-2-70 CONSULTING ENGINEERS
TRCD IN DATE 6-12-70
CKD ERH DATE 5-11-72 KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY
CUY. -480-21.40



STANDARD DETAILS- VALVE BOXES



STANDARD DETAILS- AIR COCK BOXES

STANDARD DETAILS- AIR COCK AND CONNECTIONS FOR VARIOUS PIPE

APPROVED _____ DATE _____

Franklin R. Mylona
ENGINEER, CITY OF GARFIELD HEIGHTS

Richard J. Hall
ENGINEER, CITY OF MAPLE HEIGHTS

Raymond Rudick
DIRECTOR OF PUBLIC UTILITIES

Walter A. ...
COMMISSIONER OF WATER AND HEAT

Richard P. ...
COMMISSIONER DIVISION OF UTILITIES ENGINEERING

David D. ...
ENGINEER OF CONSTRUCTION AND SURVEYS

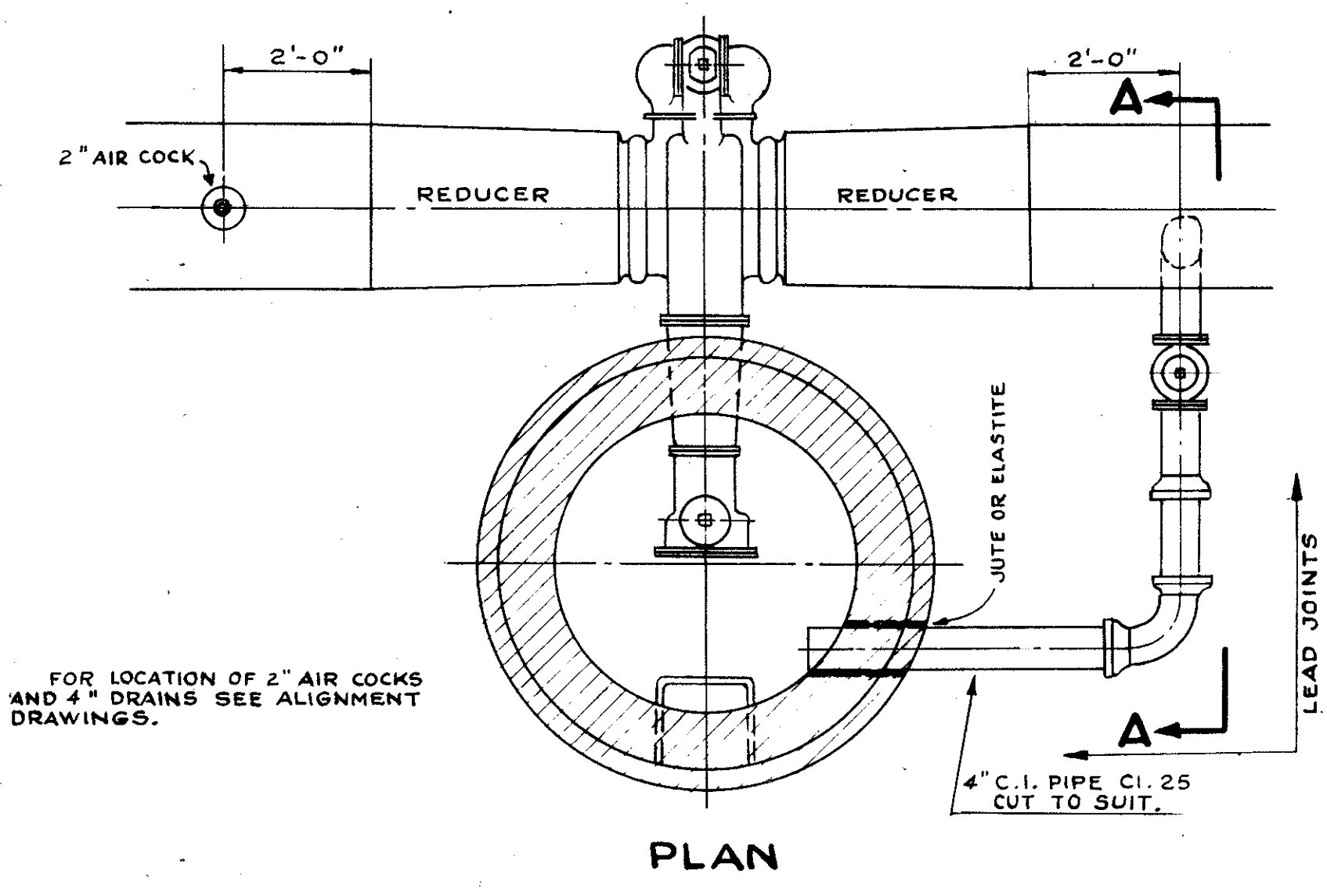
William A. ...
ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

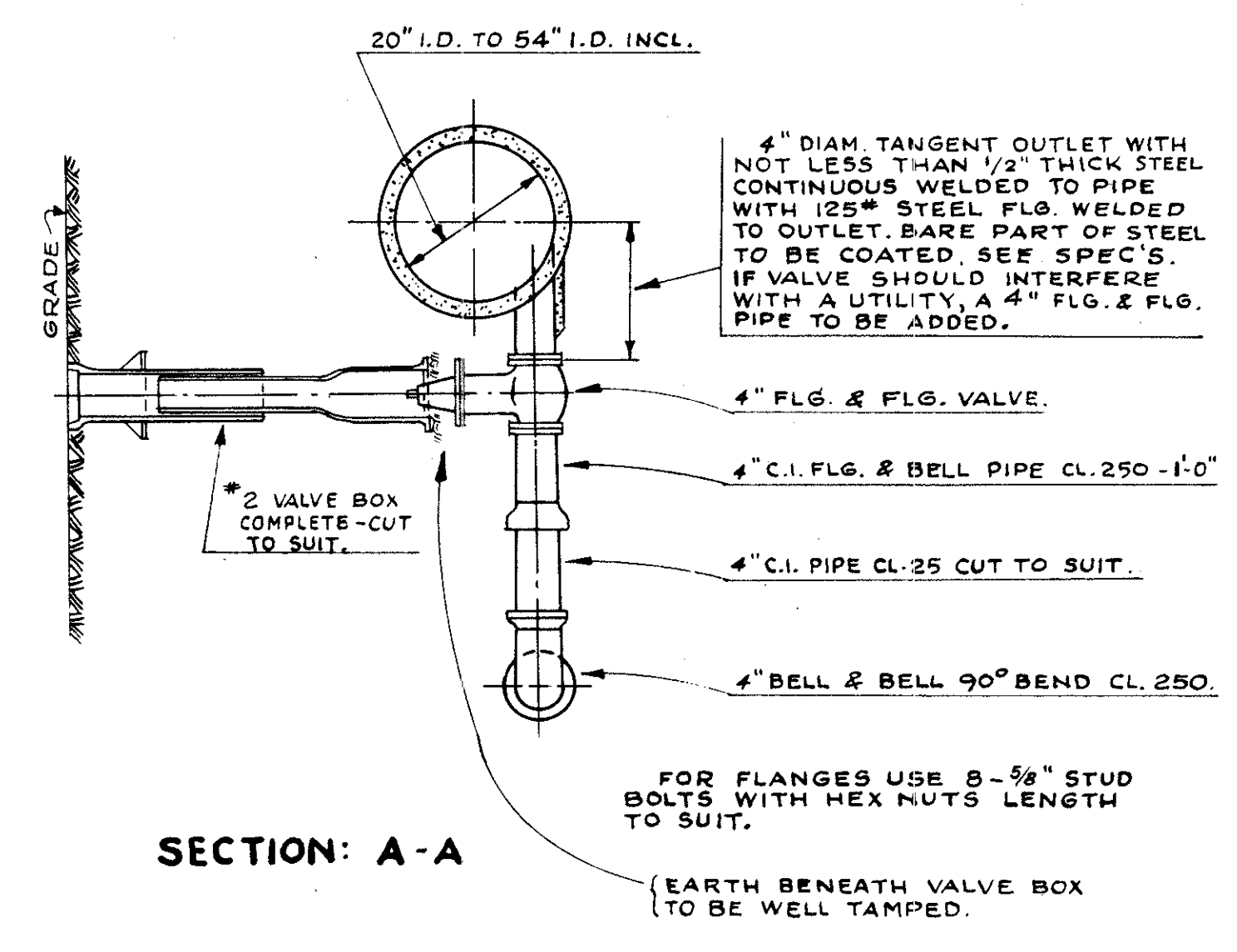
Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS AND THE CITY OF MAPLE HEIGHTS

SCALE *No Scale* HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE *ERH* DATE *3-19-71* CONSULTING ENGINEERS
TRCD *FLD* DATE *5-10-71*
CKD *ERH* DATE *5-10-71* KANSAS CITY CLEVELAND NEW YORK



FOR LOCATION OF 2" AIR COCKS AND 4" DRAINS SEE ALIGNMENT DRAWINGS.

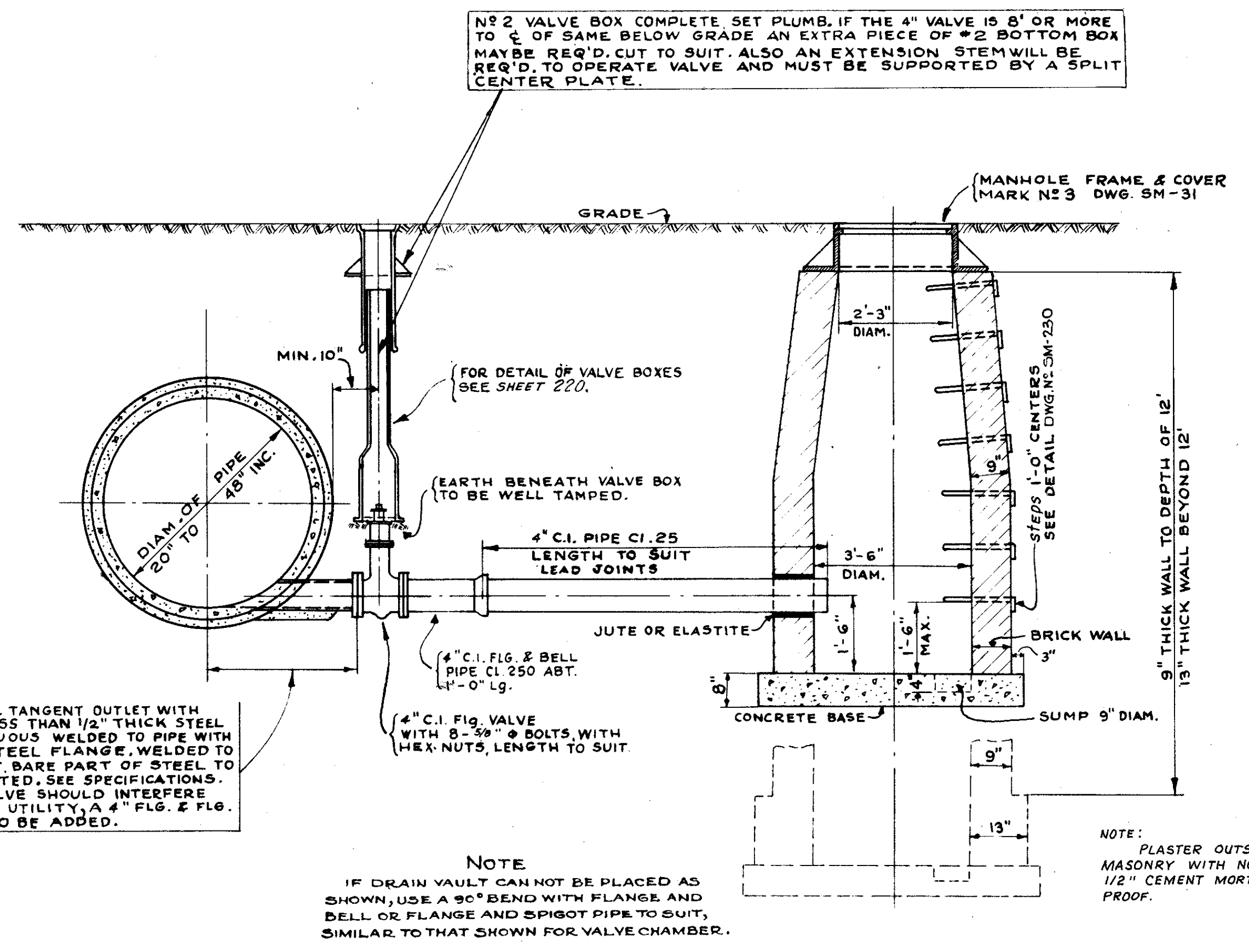
PLAN



SECTION: A-A

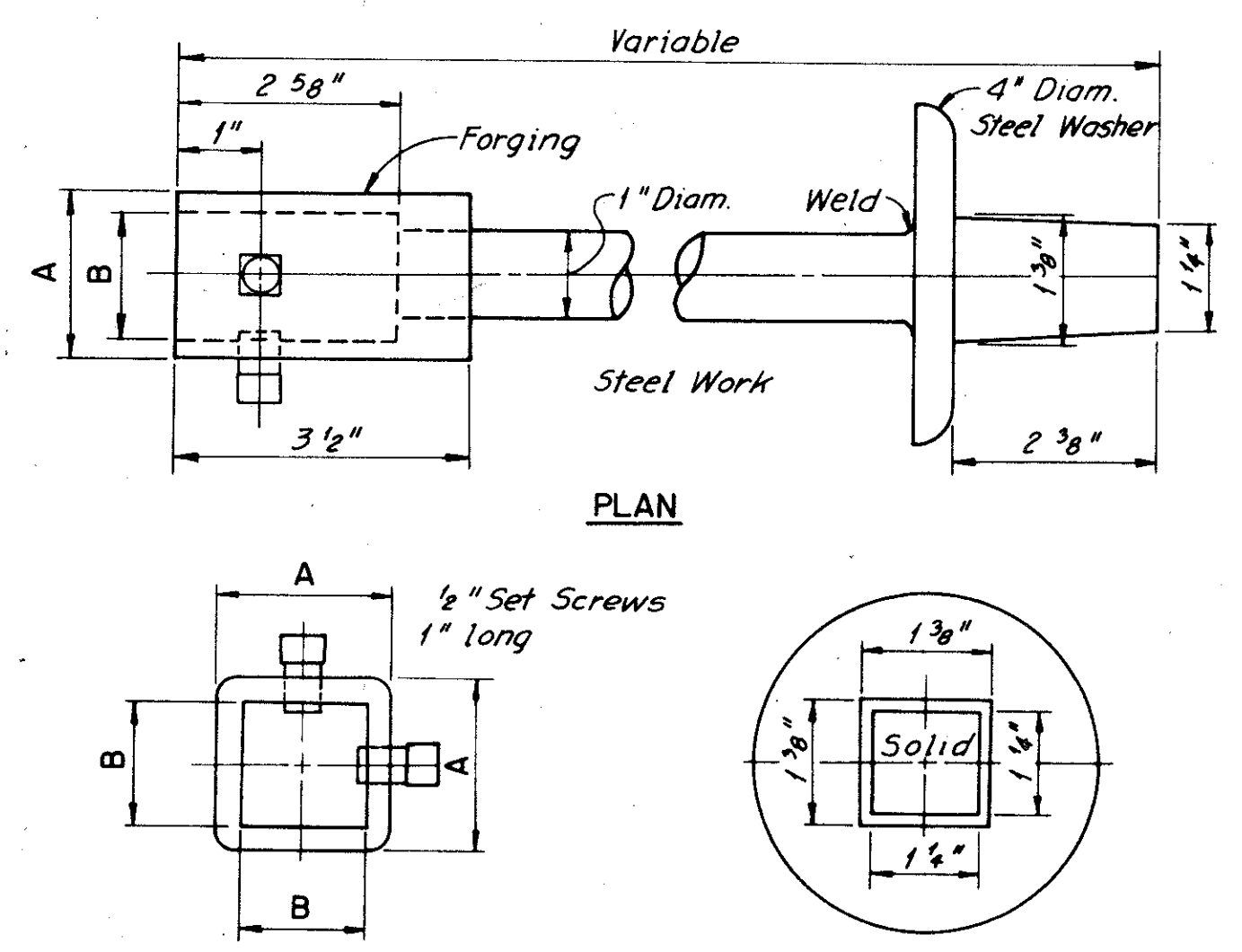
TYPICAL DETAIL SHOWING 4" DRAIN FROM WATER MAIN TO VALVE CHAMBER

SCALE: 1/2" = 1 FT.



TYPICAL DETAIL OF 4" DRAIN AND VAULT

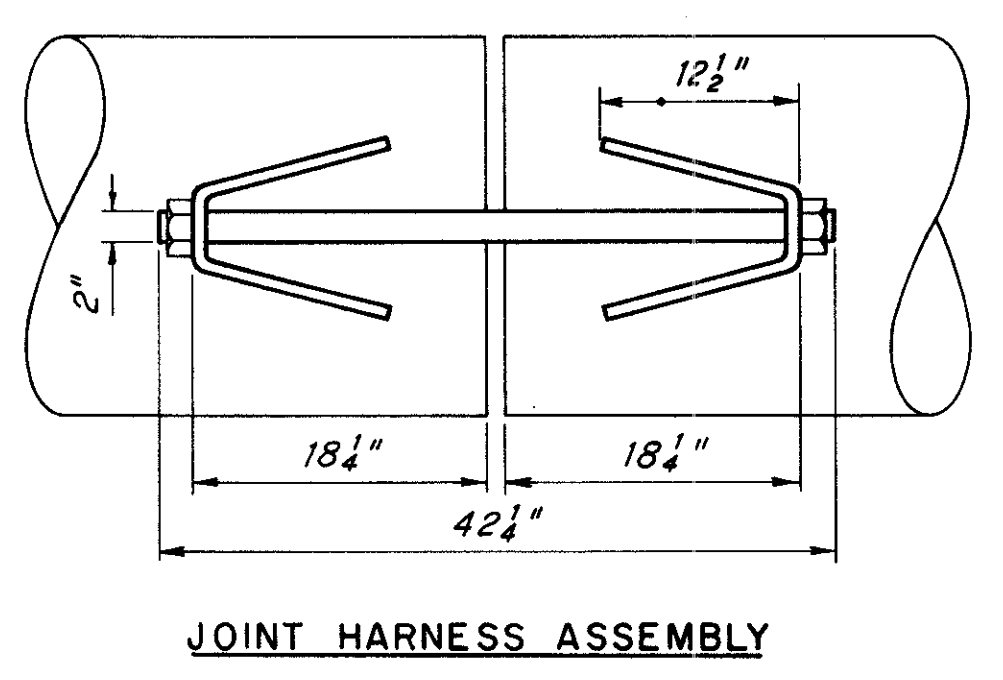
SCALE: 1/2" = 1 FT.



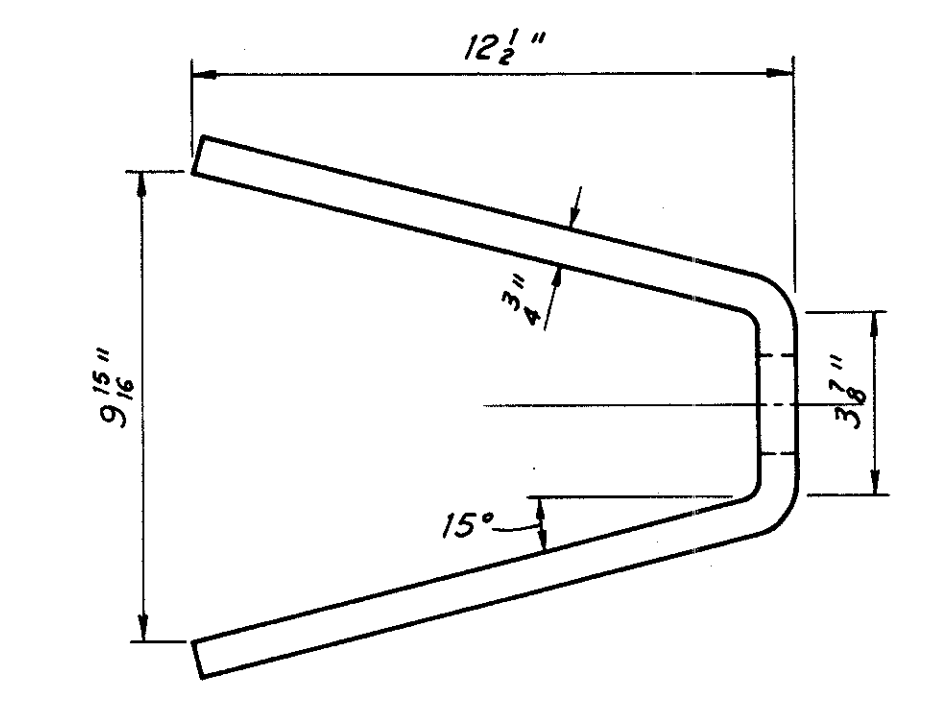
Bottom View
Top View
Note: Valve Nuts to be Countersunk 1/8" to receive Set Screws.

VALVE SIZE	A	B
2" and smaller	2"	1 1/2"
4" to 20"	2 1/2"	2"

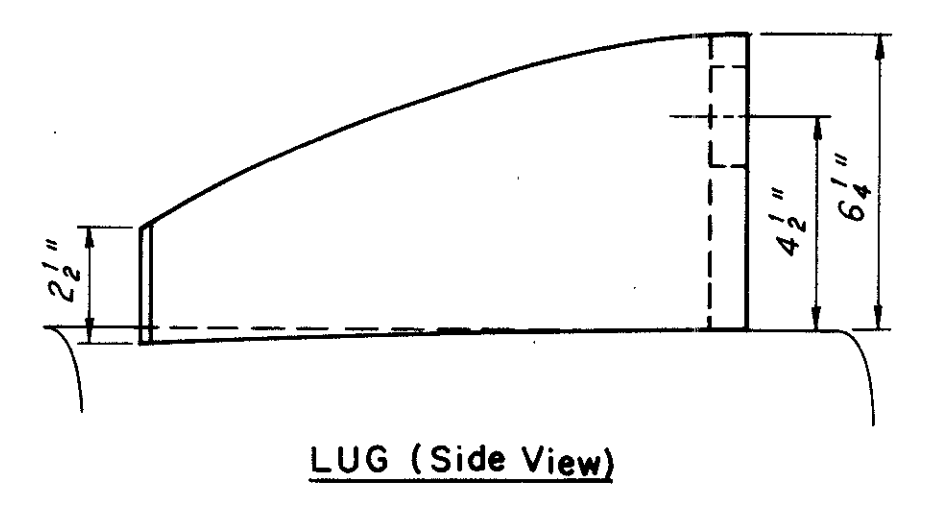
VALVE EXTENSION STEM



JOINT HARNESS ASSEMBLY

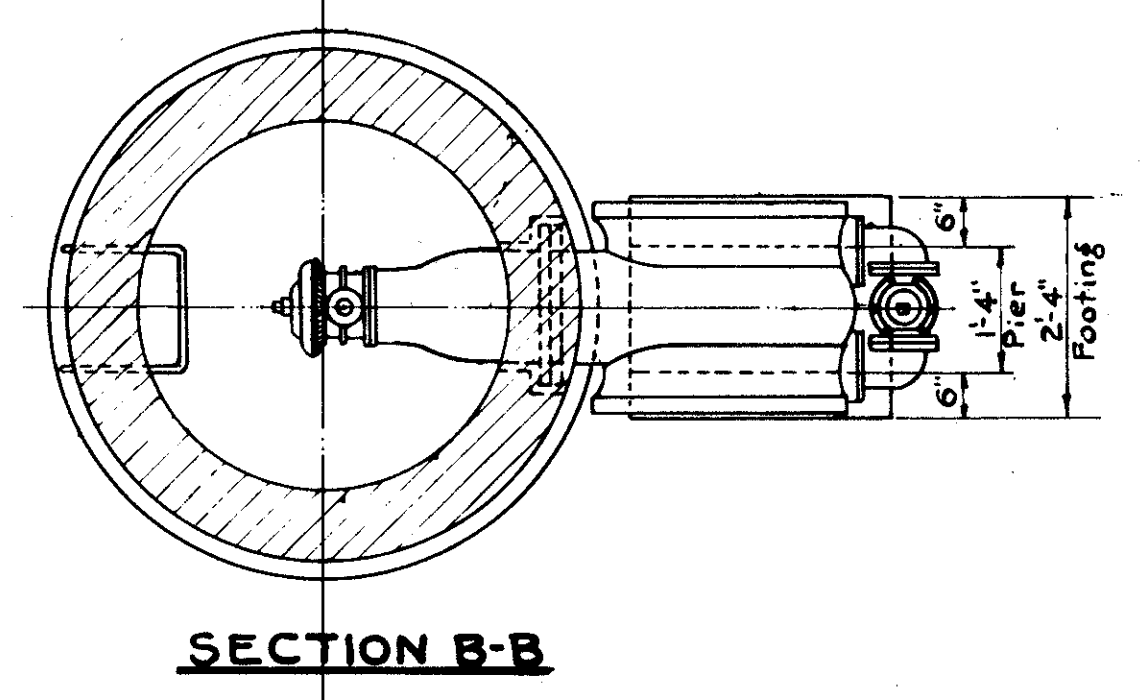


LUG (Top View)

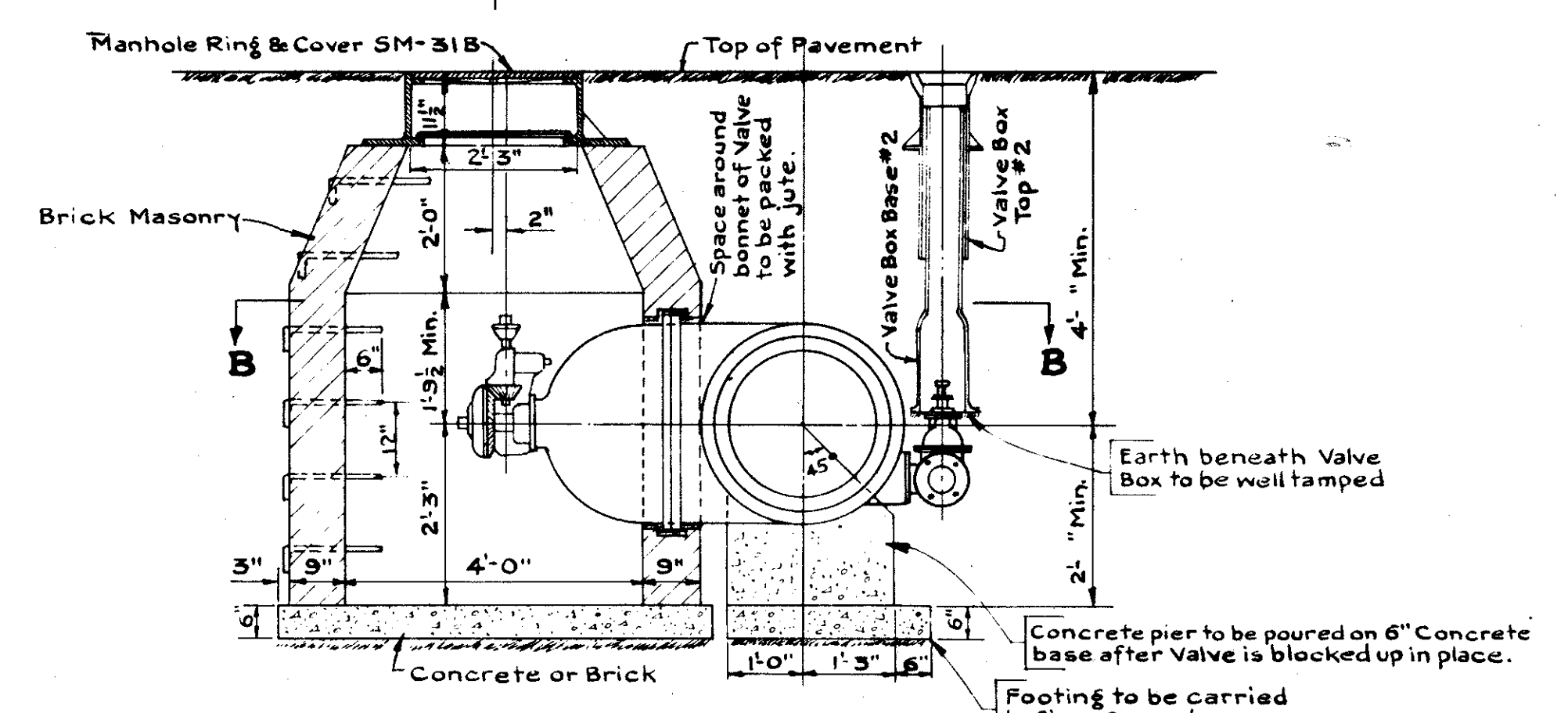


LUG (Side View)

DETAILS OF JOINT HARNESS TIE BOLTS AND LUGS
NO SCALE



SECTION B-B



CHAMBER FOR 24" VALVE
Scale: 1/2" = 1 FT.

As Shown
SCALE: E.R.H. DATE 3-6-70
MADE H.L.D. DATE 4-3-70
TRCD H.L.D. DATE 4-3-70
CKD H.L.D. DATE 4-2-71
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

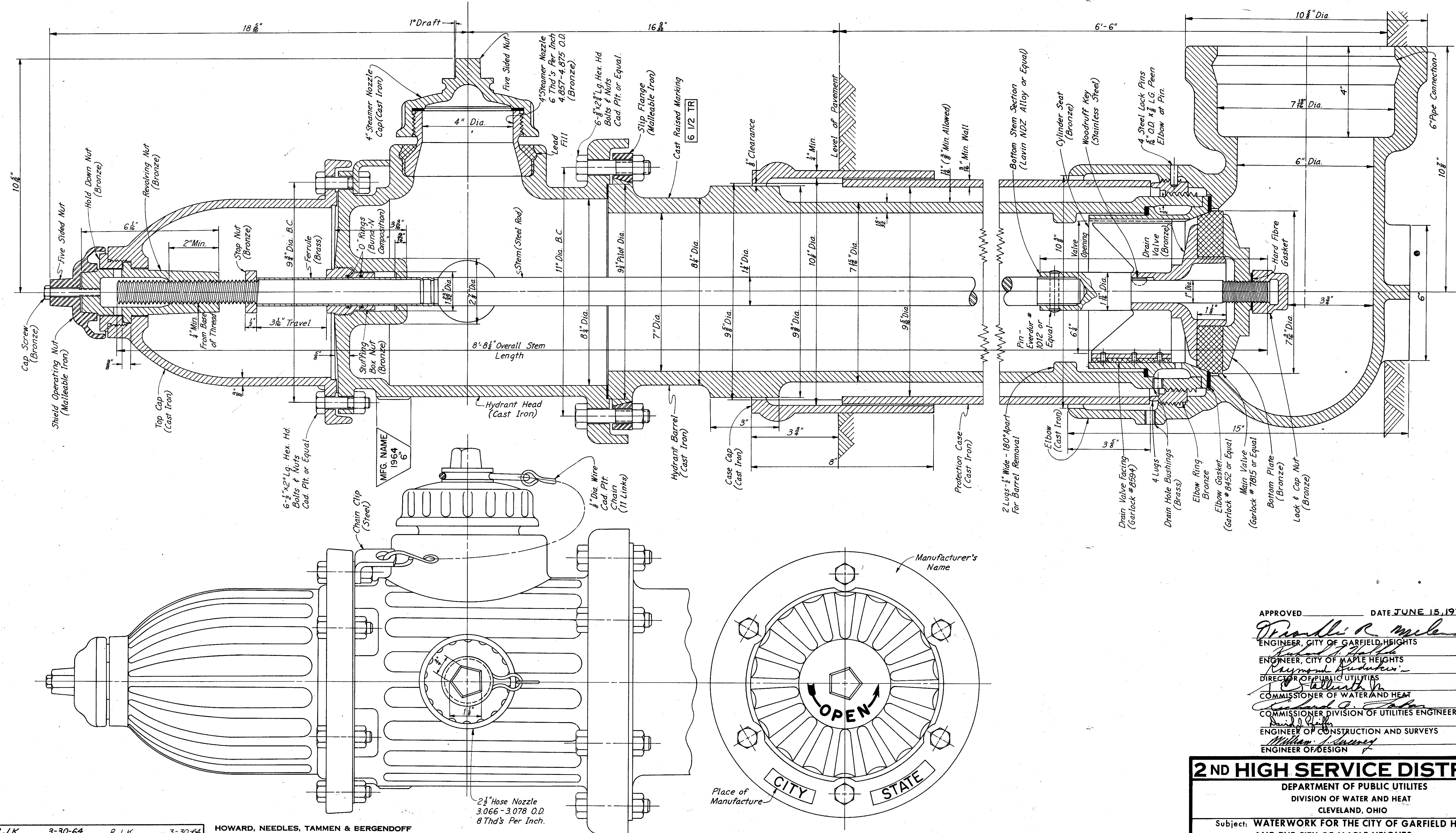
APPROVED DATE JUNE 15, 1972
Donald B. Meland
 ENGINEER, CITY OF GARFIELD HEIGHTS
Raymond K. Kucharski
 DIRECTOR OF PUBLIC UTILITIES
David J. Platten
 COMMISSIONER OF WATER AND HEAT
Edward J. Fisher
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING
William J. Sawyer
 ENGINEER OF CONSTRUCTION AND SURVEYS
 ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO
 Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

222
390

CUYAHOGA COUNTY
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APPROVED DATE JUNE 15, 1972
Donald R. Miele
 ENGINEER, CITY OF GARFIELD HEIGHTS
Robert A. Hark
 ENGINEER, CITY OF MAPLE HEIGHTS
Raymond Budzinski
 DIRECTOR OF PUBLIC UTILITIES
 COMMISSIONER OF WATER AND HEAT
Richard A. Tolson
 COMMISSIONER DIVISION OF UTILITIES ENGINEERING
David J. Smith
 ENGINEER OF CONSTRUCTION AND SURVEYS
William J. Sweeney
 ENGINEER OF DESIGN

2ND HIGH SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 DIVISION OF WATER AND HEAT
 CLEVELAND, OHIO
 Subject: WATERWORK FOR THE CITY OF GARFIELD HEIGHTS
 AND THE CITY OF MAPLE HEIGHTS

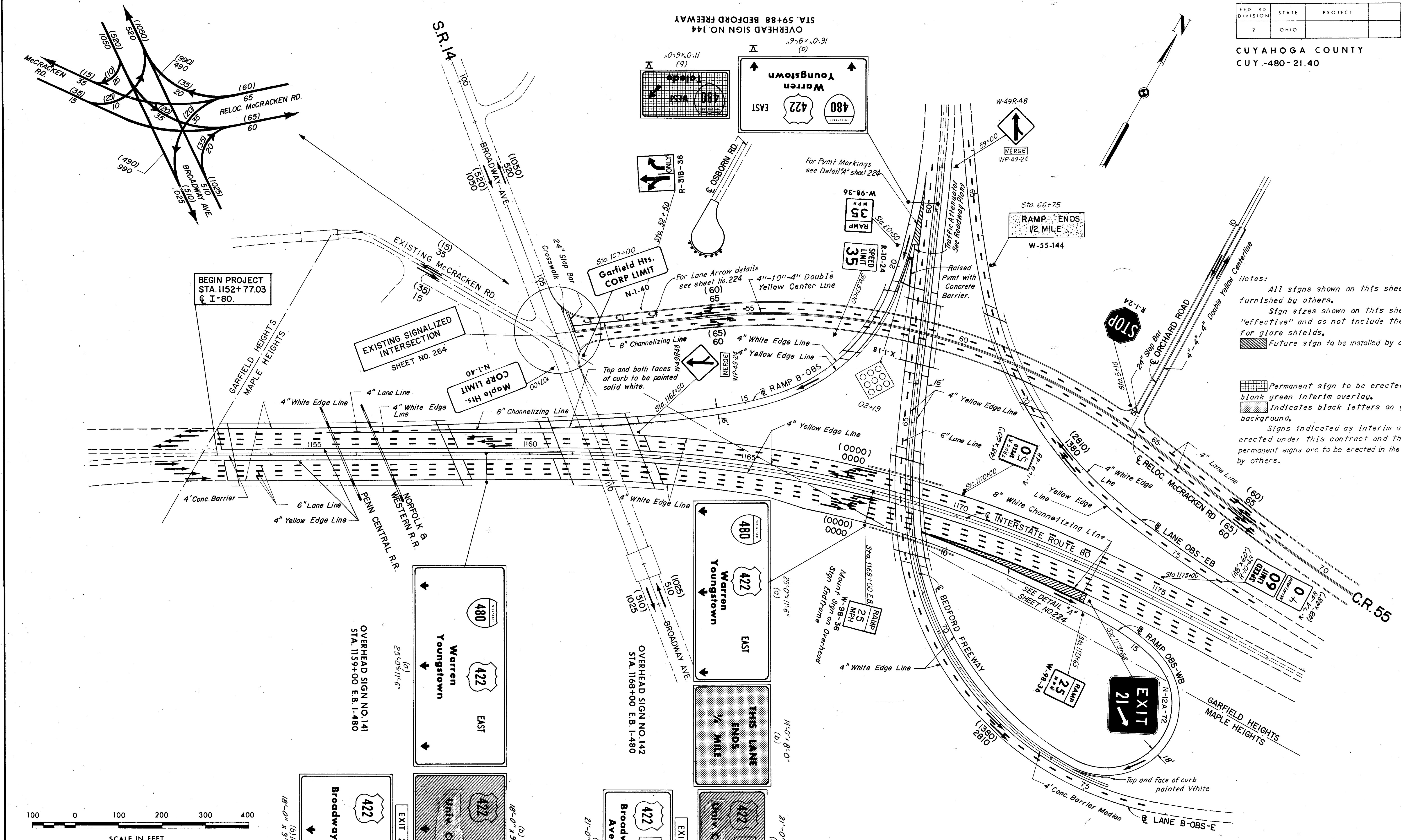
MADE R.J.K. DATE 3-30-64 TRACED R.J.K. DATE 3-30-64
 CHECKED E.P.H. DATE 4-2-71 SCALE

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

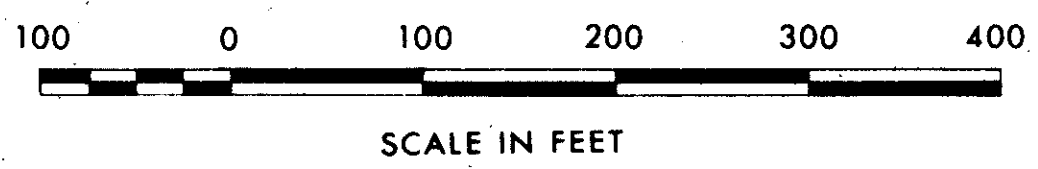
L-7 U-7

FED. RD. DIVISION	STATE	PROJECT	223
2	OHIO		390

CUYAHOGA COUNTY
CUY.-480-21.40



Notes:
 All signs shown on this sheet will be furnished by others.
 Sign sizes shown on this sheet are "effective" and do not include the 1'-0" for glare shields.
 [Symbol] Future sign to be installed by others.
 [Symbol] Permanent sign to be erected with blank green interim overlay.
 [Symbol] Indicates black letters on yellow background.
 Signs indicated as interim are to be erected under this contract and the permanent signs are to be erected in the future by others.



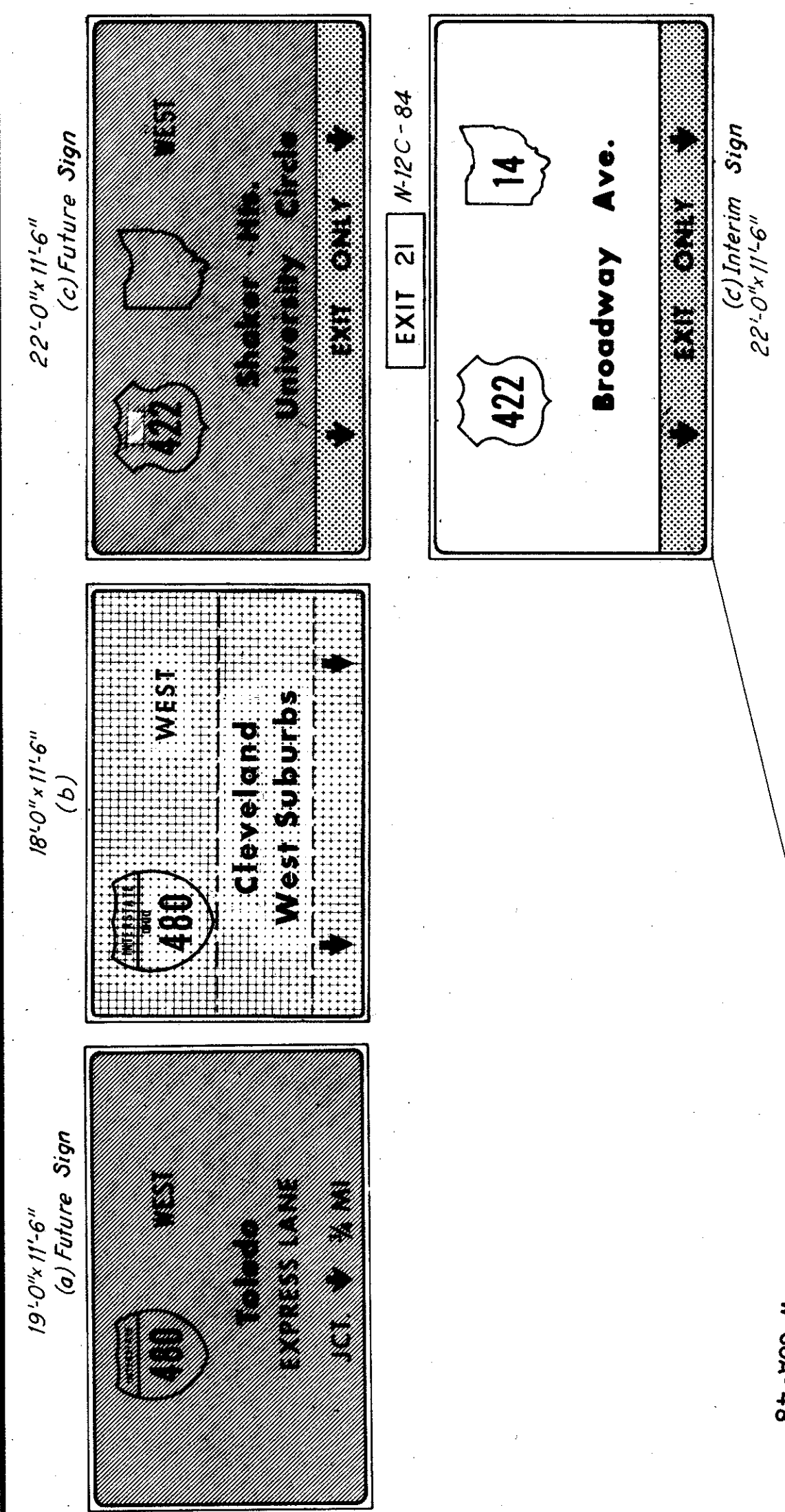
SCALE: 1" = 100'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE I.M. DATE 7-24-69 CONSULTING ENGINEERS
 TRCD. L.N. DATE 7-25-69 KANSAS CITY CLEVELAND NEW YORK
 CRD. J.C.V. DATE 8-10-72

DESIGN YEAR: 1992
 DESIGN SPEED: 60 MPH
 DIRECTIONAL DESIGN HOURLY VOLUME (DDHV): (000)=A.M. PEAK
 000 = P.M. PEAK

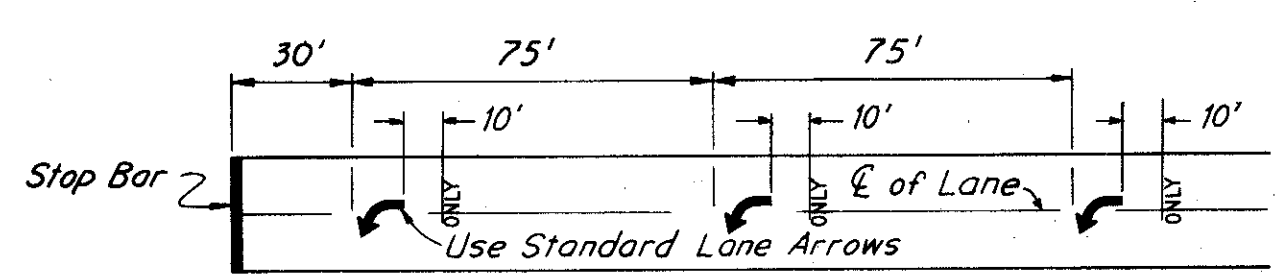
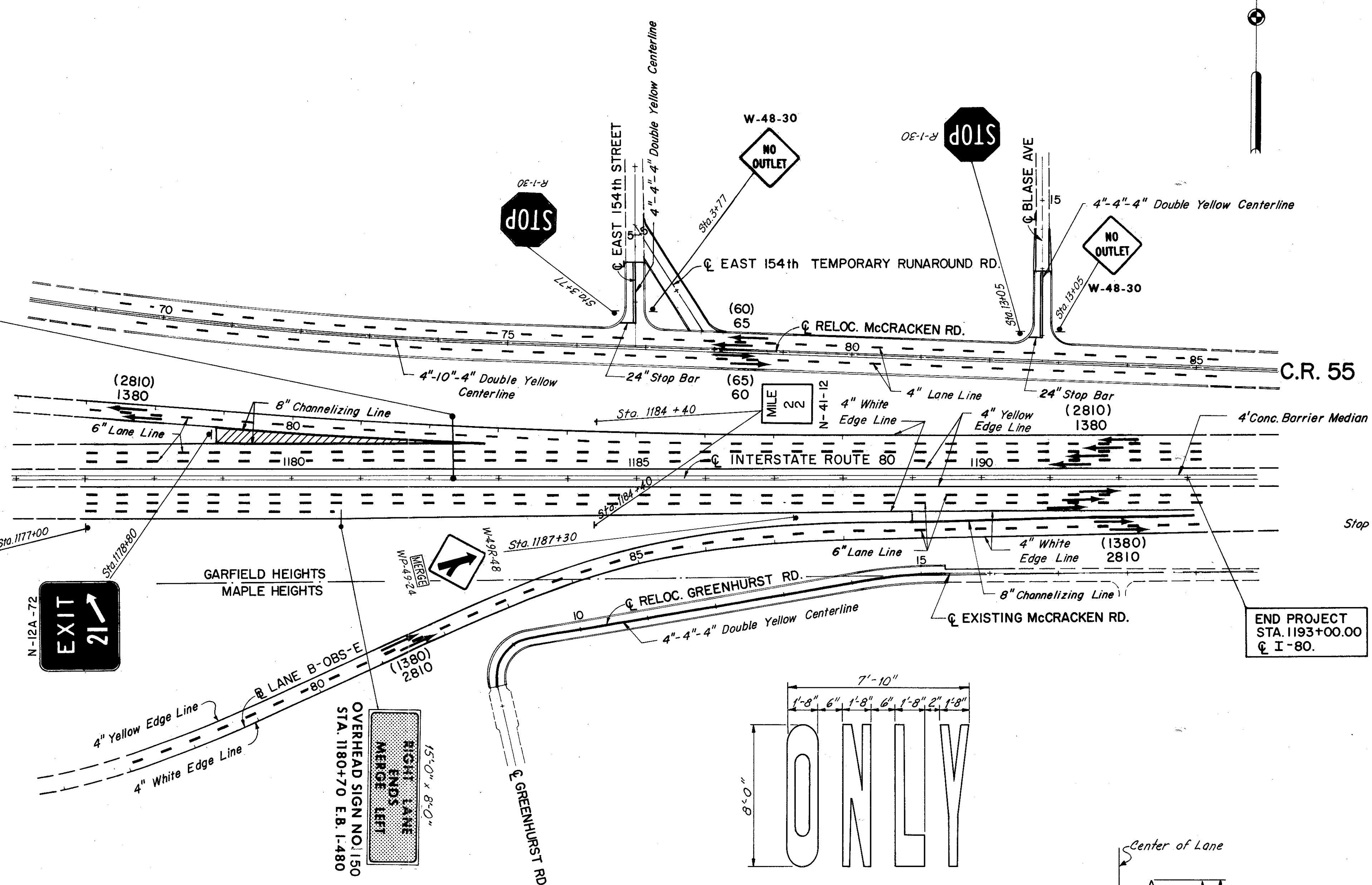
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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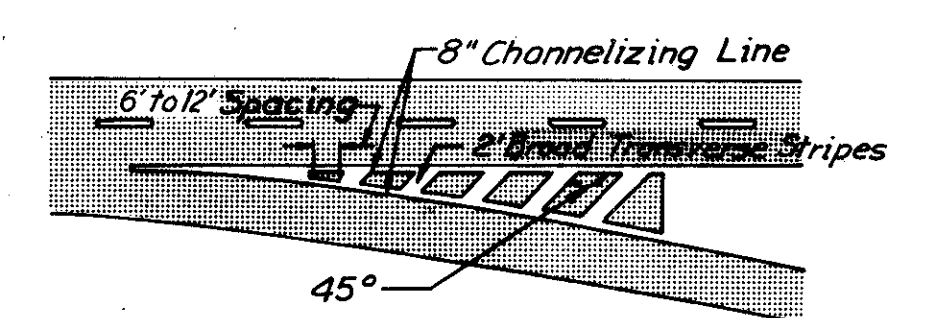
CUYAHOGA COUNTY
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OVERHEAD SIGN NO. 143
STA. 1182+33 W.B. I-480



TYPICAL LOCATION OF LANE ARROWS

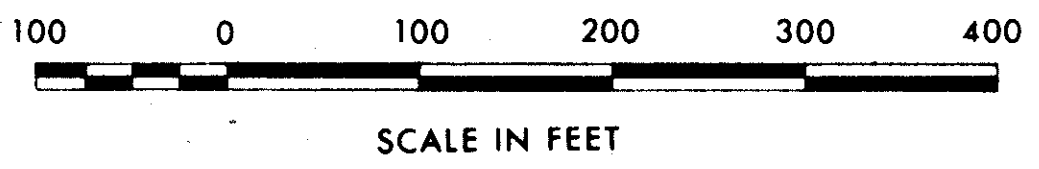


DETAIL "A"
Not to Scale

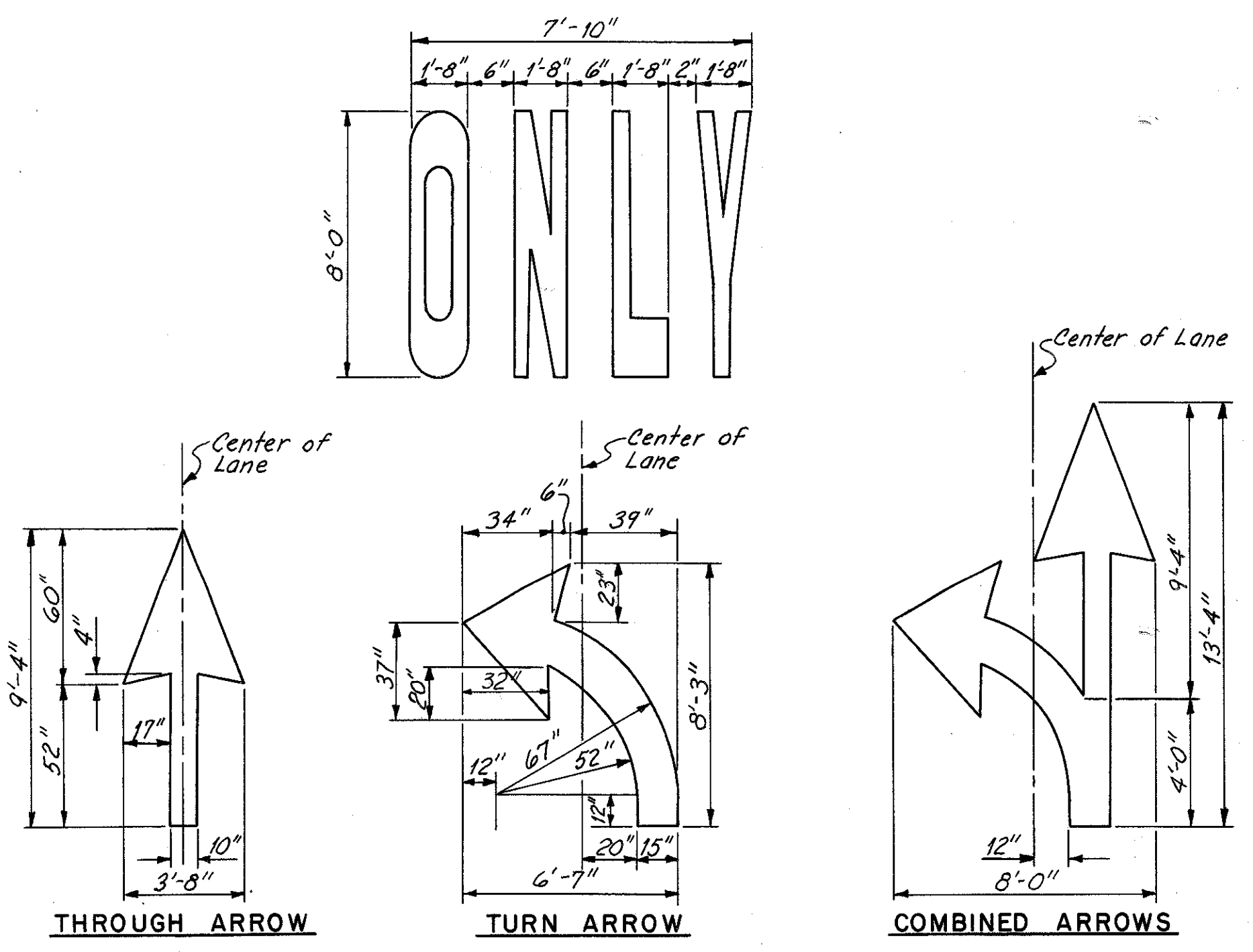
Notes:
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Sign sizes shown on this sheet are "effective" and do not include the 1'-0" for glare shields.
Future sign to be installed by others.

Permanent sign to be erected with blank green interim overlay.
Indicates black letters on yellow background.

Signs indicated as interim are to be erected under this contract and the permanent signs are to be erected in the future by others.



SCALE IN FEET



PAVEMENT MARKING DETAILS

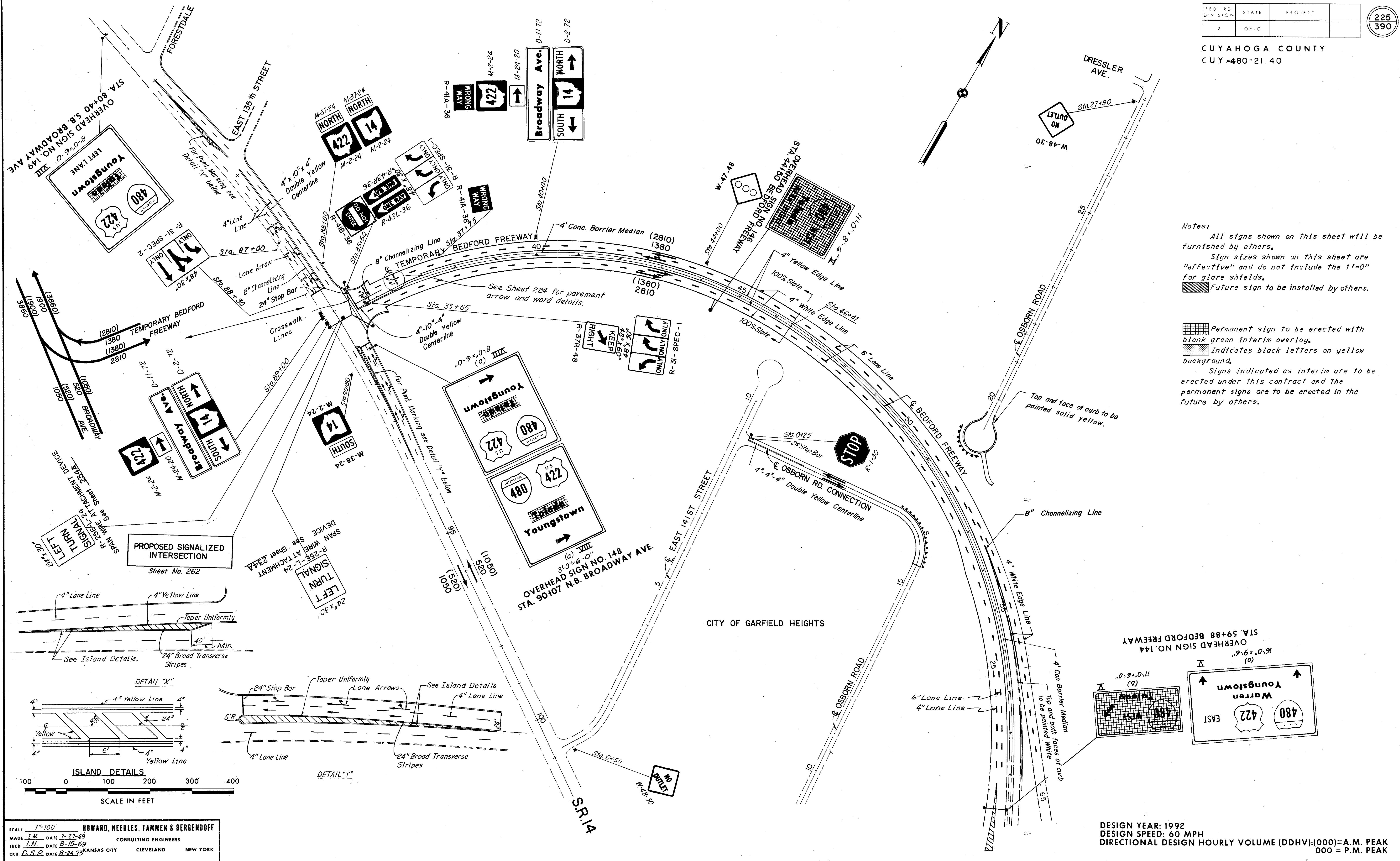
DESIGN YEAR: 1992
DESIGN SPEED: 60 MPH
DIRECTIONAL DESIGN HOURLY VOLUME (DDHV): (000)=A.M. PEAK
000 = P.M. PEAK

SCALE 1"=100'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE I.M. DATE 8-2-69 CONSULTING ENGINEERS
TRCD. J.N. DATE 8-4-69
CKD. JEN. DATE 4-10-72 KANSAS CITY CLEVELAND NEW YORK

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CUY-480-21.40



Notes:
 All signs shown on this sheet will be furnished by others.
 Sign sizes shown on this sheet are "effective" and do not include the 1'-0" for glare shields.
 [Symbol] Future sign to be installed by others.
 [Symbol] Permanent sign to be erected with blank green interim overlay.
 [Symbol] Indicates black letters on yellow background.
 Signs indicated as interim are to be erected under this contract and the permanent signs are to be erected in the future by others.

DESIGN YEAR: 1992
 DESIGN SPEED: 60 MPH
 DIRECTIONAL DESIGN HOURLY VOLUME (DDHV): (000)=A.M. PEAK
 (000)=P.M. PEAK

SCALE 1"=100'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE I.M. DATE 7-27-69 CONSULTING ENGINEERS
 TRCD. I.N. DATE 8-15-69
 CKD. D.S.R. DATE 8-24-73 KANSAS CITY CLEVELAND NEW YORK

SIGNING NOTES

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816 STRUCTURAL SUPPORTS, STEEL BEAM (TYPE)

The Structural Steel Beam Supports including 6 pound beams, 4 and 2 pound drive post and hardware shall be galvanized in accordance with ASTM A-123 and A-153 respectively. All fabrication shall be completed prior to galvanizing.

Quantities for Item 816 "Structural Supports, Steel Beam (Type)", appearing in the quantity tables are approximate. The Contractor shall be responsible for determining exact support lengths prior to fabrication and galvanizing of supports. Payment shall be at the contract unit price bid per lin. ft. which price and payment shall include all costs in connection with the embedment of the supports.

816 OVERHEAD SIGN SUPPORT, BY TYPE

All component parts of the Overhead Sign Supports shall be steel, except for the truss and components for the Number 7 series which shall be aluminum. For specific details and materials, see sheet numbers 240 through 244

Cost of furnishing and installing the sign brackets and the fixture support arm, length "G", with mounting holes and hardware shall be included in the contract unit price bid for Overhead Sign Supports.

Modifying Supplemental Specification 816 Switch Enclosure Mounting Brackets including mounting bolts and drilled holes shall be furnished and installed under payment for 816 Overhead Sign Support Structures at the contract price per Overhead Sign Support, by Type.

Payment for this item shall be made at the contract unit price bid for each Overhead Sign Support, by Type, installed in place and accepted, which price shall be full compensation for furnishing all anchor bolts 2" and 3/4" EMT conduit ells (for installation under 816 Concrete for Overhead Sign Support Foundations), and for furnishing and installing each Overhead Sign Support Structure shown on sheets 238 through 239 including fixture support arms, switch enclosure mounting bracket, sign brackets and all component parts necessary to make a complete workable installation ready for sign erection, installation of disconnect switch and enclosure, ground rod and wire connections and sign wiring.

Erection of these supports shall be accomplished in a manner meeting the requirements of Supplemental Specification 816.

816 CONCRETE FOUNDATIONS, FOR SIGN SUPPORTS

Payment for this item shall be based on plan dimensions (or dimensions as modified by the Engineer in lieu of plan quantities) as required in Supplemental Specification 816.

Payment for reinforcing steel and installation only of 2" and 3/4" conduit ells shall be included in the cost of Concrete Foundations for Overhead Sign Supports. Concrete shall be Class "C".

Basis of payment shall be as follows:

1. Concrete Foundations for Overhead Sign Supports, per cubic yard.
2. Concrete for Ground Mounted Sign Support Foundations, per cubic yard.

816 SPAN WIRE MOUNTED SIGN ATTACHMENT, AS PER PLAN

This item of work shall consist of the furnishing and installation of a steel angle, span wire mounting bracket, and hardware as detailed on Sheet 234 A.

Basis of payment shall be at the contract bid price per each "Span Wire Mounted Sign Attachment, As Per Plan", which price shall include all labor, material, equipment and incidentals necessary to perform the required item of work.

816 POLE MOUNTED SIGN ATTACHMENT, AS PER PLAN

This item of work shall consist of the furnishing and installation of stainless steel straps, mounting brackets, and hardware as detailed on Sheet 234 A.

Basis of payment shall be at the contract bid price per each "Pole Mounted Sign Attachment, As Per Plan", which price shall include all labor, material, equipment and incidentals necessary to perform the required item of work.

816 STRUCTURAL SUPPORTS, 6 LB. BEAM, AS PER PLAN, DRIVEN

This item shall consist of the furnishing, assembly, and installation of two (2) 3/4" per foot drive posts (6 lb. beam) in combination with a square welded or seamless galvanized tubular posts extension spliced to the top of the 6 lb. beam. Details are shown on sheet 251 A.

Square tubular post material shall conform to ASTM A-570 Grade "B" after fabrication.

Work shall include all labor, materials, equipment, tools, and hardware necessary to perform the required item of work.

Basis of payment shall be for Structural Supports, 6 lb. Beam, As Per Plan, Driven per linear foot measured by total length of combination beam from end to end.

621 WORD ON PAVEMENT, AS PER PLAN

The Contractor shall furnish and apply beaded white pavement words, as shown, located and detailed, in the plans.

Materials, pavement preparation, and application shall be in accordance with the Construction and Material Specifications, Item 621- Pavement Markings. Paint for pavement words shall be applied at the rate of 1 gallon per 100 square feet, and glass beads shall be applied at the rate specified in 621.05.

Basis of payment shall be at the Contract bid price, per each, Item 621 "Word on Pavement, As per Plan" completed, in place, measured, and accepted. Price and payment shall constitute full compensation for providing materials, surface preparation, placing, protecting all applied items, and for all labor, tools, materials equipment and incidentals necessary to lay out and complete the item of work.

MILE MARKER LOCATION

The Bureau of Planning Survey will locate the longitudinal position of mile markers by a paint blotch on the completed pavement edge.

On divided highways only one pavement edge will be marked. Markers for the opposite direction will be set "across" from those on the marked edge.

The Contractor will notify the Project Engineer thirty (30) days in advance of the planned marker installation. The Project Engineer will then immediately notify the Bureau of Planning Survey by letter of the planned marker installation.

Any delineator that is within fifty (50) feet of a mile marker shall be removed.

ELECTRICAL - GENERAL

This item shall consist of furnishing all necessary material, labor and facilities required to complete the electrical installation in accordance with the designs, dimensions and details shown in the plans and described in the Specifications.

All material, workmanship and construction methods, except as modified herein, shall conform to the general requirements of the State of Ohio, Department of Highways, Construction and Materials Specifications, January 1, 1971.

625 SIGN SERVICE

This item shall consist of the completion of the electrical system and components connecting the connectors in the pull box (included within the roadway lighting quantities) with the primary side of the disconnecting switch.

Work will include the furnishing and installing (including trenching and backfilling) of the 2 inch galvanized steel conduit and couplings from the pull box to the conduit ell in the sign support foundation.

This item will also include the furnishing and installing No. 4 or 6 AWG 600 volt distribution circuit cable, as per 713.02 from the connectors to the disconnect switch.

Basis of payment for this item shall be at contract unit price per each, which shall include all labor, material, and equipment required to complete this item of work.

625 WIRE AND CABLE

Wire and cable installation shall conform to Section 625.14 of the Construction and Materials Specifications and shall be of the sizes and types shown on the plans.

Wire or cable installed in conduit on or with sign structures shall be No. 10 RHH, 600 volt standard copper wire (pole and bracket cable).

Cable installed underground leading from the pullbox to the disconnect switch shall be No. 4 or 6 single conductor circuit cable.

625 INSPECTION AND TESTING OF SIGN LIGHTING

Electrical tests of sign lighting circuits shall conform to the requirements of Section 625.22 with the following additions:

1. A voltage and amperage measurement shall be made at the sign support switch.
2. Where a low voltage tap transformer is used, the voltage shall be measured to determine the applicable tap.
3. During the performance test period, adjustments to fixture aiming angles shall be made to obtain maximum uniformity as directed by the engineer.

The above measurements and voltage tap selection notations shall be included in the test reports furnished to the Engineer.

CERTIFICATION AND APPROVAL OF SIGN SUPPORT AND SIGN LIGHTING ITEMS

The Contractor shall submit through proper channels the drawings, information, and samples as required below:

- A. 8 Copies of shop drawings and material lists for approval:
 1. Overhead sign supports
 2. Sign lighting layout plan and details for wiring, conduit size and placement from disconnect switch to fixture.
- B. 8 Copies of catalog cuts descriptions of samples of fabricators standard items as shown in the plans or their equals for approval of their use.
- C. Certifications and/or samples for all material which have been approved above under "A" and "B".
- D. Approval of items under "A" and "B" shall be in the hand of the Contractor prior to any purchase of installation.
- E. Certifications of samples under "C" must be in hand and approved prior to contract completion.

ERECTOR OF OVERHEAD SPAN TYPE SIGN SUPPORTS (7 SERIES)

In all cases, span type overhead sign supports and signs shall be erected concurrently. At no time shall the box trusses be erected without the sign being in place within eight (8) hours.

LIGHTING NOTES

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625 MERCURY VAPOR SIGN LIGHTING LUMINAIRE, WITH BALLAST AND LAMP, BY RATING

This item of work shall consist of furnishing mercury vapor sign lighting luminaires with lamp and integral ballast as specified below.

The luminaire shall be no more than 8½" high overall by 16" wide by 18½" deep including the ballast enclosure. These measurements shall be checked when the luminaire is resting on a horizontal table top with the lens up.

The outer housing of the luminaire, the frame for the lens, and the ballast housing shall be of cast aluminum with a finish of gray baked acrylic base enamel.

The lamp housing body shall have 3-5/16" diameter holes drilled according to the mounting plate design shown on Sheet 248. The centerline of two of the boltholes shall be 1 3/8" away from and parallel with the projection of the lamp centerline on the base of the lamp housing.

The reflector shall be made of a single piece of aluminum, die formed to shape and processed to distribute the light evenly over the sign area. A heavy duty mogul base lampholder shall be securely fastened to the reflector and the reflector shall be securely fastened to the lamp housing.

The luminaire shall have a borosilicate glass lens capable of withstanding thermal shock and impact of freezing rain and hail. The lens shall be either clear or have a mild diffusion pattern molded into its inner surface. A permanent, flexible, waterproof sealer shall be used to seal the lens into its frame. A continuous water proof gasket shall be provided to seal the lens and frame unit to the lamp housing. This gasket shall be so designed to stay in the proper position for at least 10 years regardless of the number of times the lens unit is opened for service or adjustment.

The lens unit shall be hinged on one edge and fastened on the other edge with spring loaded latches that require no tools to open. The hinges, latches and all other external fasteners shall be of stainless steel.

The luminaire shall be provided with an integral ballast of at least 90% power factor, and of the constant wattage autotransformer type to provide plus or minus 5% lamp watt variation for a plus or minus 10% line voltage variation. Primary supply voltage shall be 60 hertz and 120, 208, 240, 277 or 480 volts as specified in the plans. The luminaire shall operate satisfactorily over any expected outdoor temperatures down to -20 degrees F. Self-ballasted mercury vapor lamp type luminaires are not acceptable.

Basis of payment for this item shall be at contract unit price per each "625 Mercury Vapor Sign Lighting Luminaire With Ballast and Lamp, By Rating" furnished to the job for installation under item 625 Mercury Vapor Lighted Sign Wired Complete.

625 MERCURY VAPOR LIGHTED SIGN, WIRED COMPLETE:

This item shall consist of the installation of the mercury vapor luminaires furnished under "625 Mercury Vapor Sign Lighting Luminaire, with Lamp By Rating". It will also include furnishing and installation of the electrical components and hardware from the disconnect switch to the luminaire including furnishing and installing the 2.16#/ft. aluminum channel and fixture mounting plate with "J" bolts. These items will be mounted on the "G" Support arm which is included with Item 816 Overhead Sign Support By Type.

Luminaires shall be mounted as shown on Sheet 248. Wiring shall be not less than #12 THW in 3/4" dia. conduit. The wires should be continuous from a junction box on the top chord of the sign support or on structure mounted conduit to the first fixture, and then continuous to the second, third and fourth fixtures on a single sign. On multiple sign installations each sign shall have a separate junction box so that, if maintenance is needed, the sign and all electrical devices attached to it can be disconnected as a unit from the support by disconnecting only two wires and the U bolts attaching it to the support.

Conduit for the mercury vapor sign lighting shall be as follows:

1. A screw-on-cover, 1½" double hub junction box shall be fastened to a 1½" coupling welded to the top truss chord of the sign support arm with a short 1½" nipple. On structure mounted signs the junction box shall be attached to the conduit mounted on structure.
2. A length of 3/4" P.V.C. covered flexible waterproof conduit shall connect the junction box through a 1½"x3/4" bushing to a 3/4" LR or LL conduit on the sign bracket nearest the pole on which the switch enclosure is mounted.
3. 3/4" rigid conduit shall connect the LR or LL conduit to a 3/4" LB conduit so arranged to line up the short end with the 1 1/8" dia. holes in the sign bracket and fixture support arm. This rigid conduit shall be fastened to the sign bracket with not less than 2 conduit clamps placed within 3" of the conduit fittings and not more than 24" c/c.
4. 3/4" rigid conduit shall connect the above LB conduit to the short end of another LB conduit fitting at the other end of the fixture support arm. This conduit shall be run through both 1 1/8" dia. holes in the fixture support arm, be jogged out of the way of the fasteners on the diagonal bracing rods, when required, be fastened near each end at not less than 24" c/c, and be made to a length that, when screwed into both conduit fittings, the rear conduit shall be approximately centered on the sign bracket web and the front conduit shall fit snugly against the outer plate of the fixture support arm. The long end of the front conduit shall be angled downward approximately 30 degrees, when viewed from the front of the sign, to allow the next piece of conduit to be jogged easily to lay along the centerline and approximately 3/8" in front of flange of the channel that supports the lighting fixtures.
5. A 3/4" type "T" conduit fitting shall be located within approximately 18" of the near edge of each fixture on the sign. 3/4" rigid conduit shall be connected from the LB conduit fitting described above to the first "T" conduit. Straight lengths of conduit shall connect as many "T" condulets as are required for the number of luminaires specified for the sign. A threaded plug shall be used to close the opening in the last "T" conduit used on each sign installation. Suitable conduit clamps shall be used on 24" centers to hold the entire run of conduit on the centerline of the channel flange as listed under Item 4 above. The Type "T" condulets shall be so oriented that the third tapped opening shall be perpendicular to the face of the sign.

6. A length of 2/4" P.V.C. covered waterproof flexible conduit shall connect each fixture to each corresponding "T" conduit. The length of this conduit shall be so arranged to make a neat and gradual curve into the fixture without either sharp bends or drooping appearance. Wiring for mercury vapor sign lighting shall be sized and installed according to the National Electrical Code but shall be not less than No. 12 THW and shall be spliced only in junction boxes or in the wiring enclosure of the luminaire. All wiring shall be in conduit, inside structural chords and poles, or in electrical boxes and fixtures. Solderless connectors, of the proper size and type, may be used where splices and junctions are allowed above ground level. However, when used, they shall be securely taped with water resistant electrical tape to form a waterproof joint. When solderless connectors are not used, all splices and junctions above ground shall be soldered and double taped to make a waterproof electrical joint.

Payment for this item shall be at the contract unit price bid for the following:

1. 625 Mercury Vapor Lighted Sign, Wired Complete.
2. 625 Mercury Vapor Lighted Sign, Wired Complete (Structure Mounted).

Payment shall include all labor and materials to connect all luminaires on one sign into the disconnect switch enclosure, including conduit on structure for structure mounted signs. When more than one sign is mounted on an installation, each sign shall be considered as a separate pay item.

DISCONNECT SWITCH WITH ENCLOSURE

This item shall include furnishing of a 30 amp. 600 volt fused disconnect switch in a NEMA 4 stainless steel enclosure attached to each sign support by means of mounting brackets as described in detail on sheet 249.

The disconnect switch shall be a 3 pole, solid neutral type meeting the requirements of 713.19, 10.

The enclosure shall meet the requirements of 713.20 with the following exceptions.

- 1) The stenciled legend or plate shall read "sign lighting".
- 2) A chase nipple shall be furnished and installed in the back of the enclosure.
- 3) Factory installed hubs shall not be provided on the top.
- 4) A screened ventilation opening shall not be provided.
- 5) Mounting poles, slots and chase nipple location shall match those provided on the switch enclosure bracket and sign support.

Each switch enclosure shall be furnished with one padlock. Padlocks shall have a brass body and wrought iron shackle equal to Russwin No. 2882 KA or Master No. KA or approved equal. Padlocks shall be all keyed alike with Master Key 3476.

Basis of payment for this item shall be per each at contract unit price, which shall include all labor, material, and equipment to complete this item of work.

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816 ALTERNATE DESIGNS FOR OVERHEAD SIGN SUPPORTS

If the Contractor desires to furnish an alternate design for overhead sign supports, the alternate designs must be submitted to the State at least 21 days prior to opening of bids. The Bidder will be notified as to acceptance or rejection of alternate design at least 7 days before bids are to be opened. Alternate designs must utilize tubular structural members. Submissions shall be made to Ohio Department of Highways, Bureau of Design Services, 25 South Front Street, Columbus, Ohio, 43215.

202 EXISTING INTERIM OVERLAY REMOVED AND DISPOSED OF

This work shall consist of removal of the rivets in the interim overlay and the disposal of the interim overlay to the satisfaction of the Engineer.

All rivets to be removed shall be drilled out and the overlay removed in such a way as not to harm the surface of the sign. All the remaining rivets in the sign shall be checked, any loose or damaged rivets shall be replaced.

The quantity removed and disposed of will be paid for at the price bid per square foot which price shall be full compensation for removal of rivets, removal and disposal of the interim overlay, replacement rivets and all necessary labor and equipment.

202 INTERIM GUARDRAIL, REMOVE AND DISPOSED OF, AS PER PLAN

This work shall consist of the removal of existing temporary guardrail, barrels, signs, delineators and posts.

To assure maintenance of adequate traffic control at all times, no items are to be removed without the approval of the Engineer.

The quantity removed and disposed of will be paid for at the price bid per linear foot which price shall be full compensation for removal and disposal of guardrail, barrels, signs delineators, posts and cleaning of site including all necessary labor and equipment.

620 DELINEATORS, AS PER PLAN

The Contractor shall install delineator posts in accordance with details of sheet 253.

Posts may be trimmed on the embedded ends to adjust for grade and required delineator mounting height.

The Contractor shall be responsible for damage to underground utilities or cable during performance of this item of work.

The quantity furnished and installed shall be paid for at the price bid per each which price shall be full compensation for each installation.

202 REMOVAL OF EXISTING SIGN INSTALLATIONS, AS PER PLAN

This work shall consist of the removal of all existing sign installations on main roadway, ramps and approach roadways within work limits of this project.

Work shall also include removal of sign supports and foundations as required in Section 202.

All signs, supports and accessories removed shall be stored neatly within the limits of the project at locations approved by the Engineer for removal by State forces. This work shall include disposal of all waste material.

To assure maintenance of adequate traffic control at all times, no signs are to be removed without the approval of the Engineer.

Payment for removal of existing signs shall include all necessary labor and equipment required to perform the required work as indicated above.

1. Basis of payment shall be as follows for signs forty (40) square feet or greater:

REMOVAL OF EXISTING MAJOR SIGN INSTALLATIONS AS PER PLAN at the contract price per each.

2. Basis of payment shall be as follows for all other signs:

REMOVAL OF EXISTING SIGN INSTALLATIONS AS PER PLAN at the contract lump sum price.

621 EXISTING INTERIM PAVEMENT MARKINGS REMOVED

This item shall consist of the removal or obliteration of interim pavement markings on the pavement.

The markings may be removed by applying heat or a solvent (Pull-up Tape) or by any other method approved by the Engineer except that the method shall not be injurious to the appearance, texture or strength of the pavement. Upon removal of all pull-up tape, the primer stains shall be removed by use of kerosine, gasoline or other approved solvent.

Payment for Item 621 EXISTING INTERIM PAVEMENT MARKINGS REMOVED shall be made at the contract unit price per linear foot and shall constitute full compensation for all work, including materials, equipment, labor, incidentals and disposal of surplus materials.

EXISTING SIGNS

Existing signs located within the roadwork areas which are necessary for Interim or Permanent Traffic Control shall be removed and re-erected in locations indicated by the plans or as approved by the Engineer. Stop signs will be maintained at all times while traffic is maintained. The cost of removal, re-erection and subsequent removal if required shall be considered a subsidiary work item. The cost of which shall be included in the price bid for the roadway work items. The signs which are to be re-erected on the berms shall be located with the center line of support on the P.I. of the shoulder.

CAPPING OF CONDUIT

All conduit in foundations which will not have wire or cable pulled into it during construction shall have the ends closed with capped bushings or otherwise sealed in an approved manner to completely keep all moisture and foreign matter out of the conduit.

SIGN LOCATIONS

All signs shall be placed normal to the roadway on which they are stationed unless otherwise noted on the Plans.

815 SIGN ERECTION, EXTRUSHEET OR FLAT SHEET TYPE

The Contractor shall erect sign panels as indicated on the Traffic Control Plan Sheet numbers 223-225. The panels will be furnished by others and shall be mounted on the brackets or beam supports provided in the plans.

All sign material and accessories will be furnished and transported by others to a delivery point designated by the Contractor on or near the subject project. The Contractor shall be responsible for the handling, protection and storage of the sign panels and accessories from the time of unloading by others at the delivery point.

Large guide signs (over 8 feet in height) may be delivered unassembled. Work shall also consist of assembly of these panels including attachment of demountable sign legend, where necessary, and erection of signs in conformance with the Schematic Sign Plan.

The Contractor shall submit, in three copies, a schedule for sign erection to the Engineer at least 120 calendar days prior to the start of any scheduled erection work. The schedule shall include proposed dates, sign numbers, and delivery point. The Engineer will furnish copies of the schedule to the Division Traffic Engineer and to the Engineer of Design Services, 25 South Front Street, Columbus, Ohio, 43215.

The price bid per square foot for "Item 815, Sign Erection, by Type", shall include payment for all necessary equipment, labor, and tools to store, assemble, and erect the signs as specified.

815 INTERIM COVERING FOR SIGNS

This item shall consist of furnishing and installing an interim cover and attachment materials for signs so indicated in the Plans or as directed by the engineer. This item shall also include the subsequent removal of covers when directed by the engineer.

Material for covering shall be plastic coated burlap blankets in conformance with 705.06.

The engineer shall approve the method proposed for attaching interim covers to signs prior to installation of covers.

Work shall include all necessary material, hardware, labor, and equipment required to perform the required item of work.

Basis of payment shall be INTERIM COVERING FOR SIGNS, per square foot.

In addition to the 393 sq. ft. referred to in the plans, an additional quantity of 200 sq. ft. for Item 815, Interim covering for signs, have been included to cover signs as directed by the engineer.

816 CONSTRUCTION LAYOUT STAKES FOR SIGNS AND TRAFFIC SIGNALS

The Contractor shall stake out all sign and traffic signal supports in accordance with Supplemental Specification 816 prior to installation of any foundations or supports.

After stakeout the Contractor shall notify the Engineer a minimum of (7) seven days in advance of scheduled work. Support locations for each support will be field checked and approved by the Engineer who shall coordinate with the Division Traffic Engineer and or City Traffic Engineer prior to proceeding with construction work required.

If both major and minor type supports are included within the project it will be permissible to perform the construction stakeout and field inspection in two (2) stages, one for major supports and one for minor supports.

Cost for this item of work will be incidental to Item 623.

816 SIGN SUPPORT IDENTIFICATION DECALS

Each sign support installation shall be identified by a combination of letters and numbers which will indicate the County, Route, and Straight Line Mileage (Samples: LAK-2-0.02, CUY-90-17.58).

Identifying numbers shall be as indicated on sheet 255 in these plans or as specified by the maintaining agency.

Identification shall be by adhesive type decals with silver white reflective characters on a reflective interstate green background in accordance with Military Specifications Mil-R-13689A.

The top legend of the decal shall be located approximately 8 feet above the ground line, on the quadrant of the surface of the sign support that faces oncoming traffic.

Two identification decals shall be furnished for sign support installation spanning opposing directions of traffic.

The cost of furnishing and attaching the sign support decals shall be an incidental item to the various sign support items.

816 OVERHEAD SIGN AND TRAFFIC SIGNAL SUPPORT FABRICATION

In lieu of Plan details the following are fabrication requirements for supports in this project:

All handholes fabricated for supports shall be 4" X 8" in size with face flush with pole exterior at the required locations described in Plans.

The electrical service entry through each vertical sign support pole shall be provided by means of a two inch (2") half-coupling centered at a height of 5'-0" above the bottom of the base plate.

The type "Y" disconnect switch enclosure shall be mounted in such a manner that the bottom of the enclosure will be 4'-9 1/2" (2 1/4") above bottom of base plate.

Payment for the fabrication requirement specified above shall be incidental to the cost of each support structure.

625 GROUND RODS

This item of work shall consist of furnishing and installing ground rod and cable as detailed and specified on Sheet 249.

Basis of payment for this item shall be at contract unit price per each, which shall include all labor, materials and equipment required to complete this item of work.

816 ROCK EXCAVATION

Where solid rock is encountered in excavation for sign support foundations, the depth to be excavated below rock surface may be decreased as directed by the Engineer to a maximum of thirty-five (35) percent of depth specified in the Plans.

SIGNING NOTES

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY
CUY. 480-21.40

THERMO-PLASTIC PAVEMENT MARKING, AS PER PLAN

General

This work shall consist of furnishing and installing all thermo-plastic pavement markings, as shown on the plans,

This work shall also include all service, labor, materials, equipment, and incidentals necessary for the required surface cleaning, preparation and construction of thermo-plastic pavement markings under traffic-maintained-by-Contractor operation conditions.

A. Maintenance of Traffic

In the event of an emergency, the Highway Department reserves the right to stop work in order to relieve traffic congestion. No work shall be done during the rush hours as determined by the Engineer. Any marking may be omitted by the Engineer where there is pending construction. No lane of traffic shall be closed for more than ten (10) minutes in the application of the lane line marking.

B. Thermo-Plastic Pavement Marking Materials

This pavement marking material shall be reflectorized "Permaline" thermo-plastic compounds as manufactured by Permaline Corp. of America or reflectorized "Catatherm" thermo-plastic compound as manufactured by Cataphote Corporation, or approved equal and in addition the thermo-plastic materials furnished on this contract shall meet the following specifications:

Glass beads meeting Ohio Specifications No. 712.05 shall be uniformly mixed throughout the material at the rate of not less than 250 lbs. of beads per 1,000 lbs. of thermo-plastic material. Immediate reflectorization shall be accomplished by an application of beads to the surface of the compound at the time the thermo-plastic material is applied. A glass bead dispenser of approved design shall be used for a uniform surface application of beads at a rate of not less than two (2) pounds of beads per 33 square feet of line.

The material shall withstand temperature variation from minus 20 degrees F. to plus 120 degrees F., without deformation or discoloration, and shall maintain its original dimension and placement, free from tack, chipping or spalling. White thermo plastic material shall be free of dirt or tint.

C. Samples

The Contractor shall furnish a 10 lb. material sample of white thermo-plastic compounds he proposes to furnish and also white typical samples of line four inches wide by ten inches long.

Materials installed on the road on this contract in accordance with the Contractor's standard practice shall be compared with the original samples at least 90 days after construction and shall show no darkening or discoloration. The material shall harden sufficiently within 15 minutes after application to allow traffic over the line without pickup or impression.

D. Construction Details

Thermo-plastic material shall be used and extruded to the pavement to a uniform minimum thickness of $\frac{1}{4}$ inch for rumble strips and $\frac{1}{8}$ inch for all other pavement marking by a single application and shall be straight and true.

The contractor shall prepare all pavement surface to insure adhesion. Where thermo-plastic rumble strips exist they shall be removed completely to insure proper bonding for the new rumble strips. All thermo-plastic pavement markings shall be placed over an epoxy resin primer.

For Concrete Application

The primer shall be a two component solventless epoxy adhesive compound of spraying consistency especially compounded for traffic marking. Resin and hardener shall be mixed in the exact proportion recommended by the manufacturer. Mixing and proportioning shall be accomplished immediately before the spray nozzle by an automatic metering and mixing device.

For Asphalt Application

The primer shall be a two component solvent epoxy adhesive compound of spraying consistency especially compounded for traffic marking. Resin and hardener shall be mixed in the exact proportion recommended by the manufacturer.

The primer shall be applied with a minimum tolerance of 1-inch on each side of all pavement markings, except for the rumble strips. The primer for the rumble strips shall be applied to the whole pad instead of priming each individual strip. All thermo-plastic rumble strips placed on concrete shall have an epoxy spray applied.

Placement of all pavement markings shall be in accordance with the plan, subject to any adjustments as directed by the Project Engineer.

The air temperature at the time of application shall not be less than 50 degrees F., the temperature of the compound during application shall never fall below 375 degrees F.

E. Method of Measurement

The length paid for shall be the number of lineal feet or miles of the several types of lines installed and accepted, measured in place. Measurements shall be made by a representative of the Contractor and the Engineer. The length of lines to be paid for shall be the actual number of miles, exclusive of gaps, measured in place, completed and accepted. Pavement arrows shall be measured per each.

F. Basis of Payment

These items shall be paid for in accordance with Item 621.

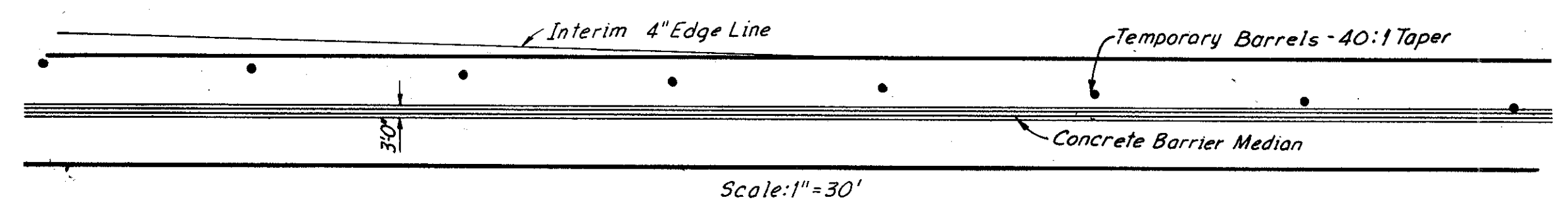
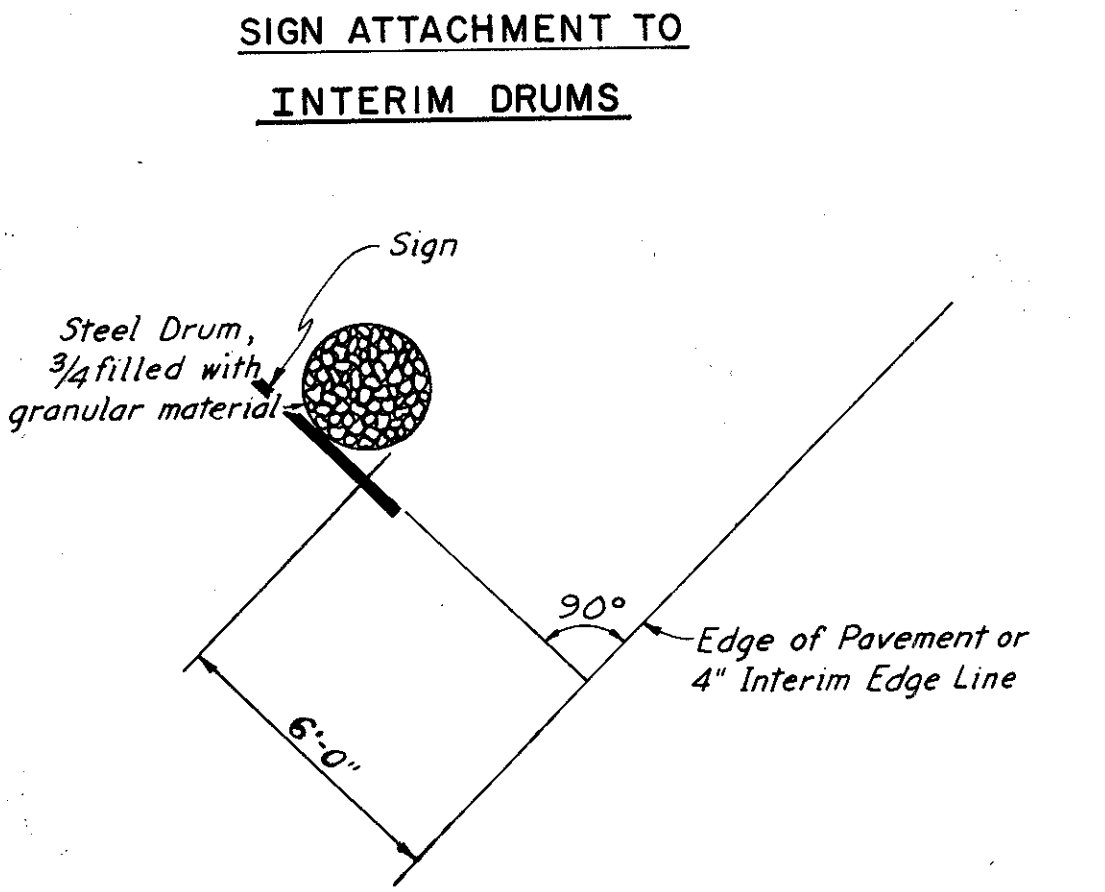
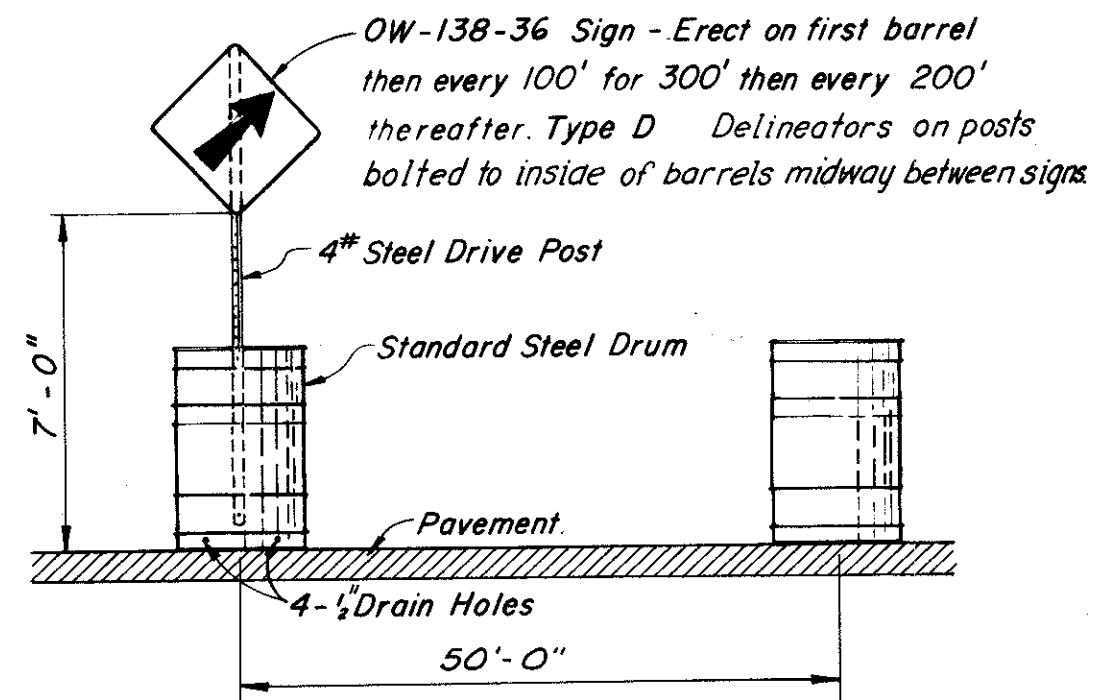
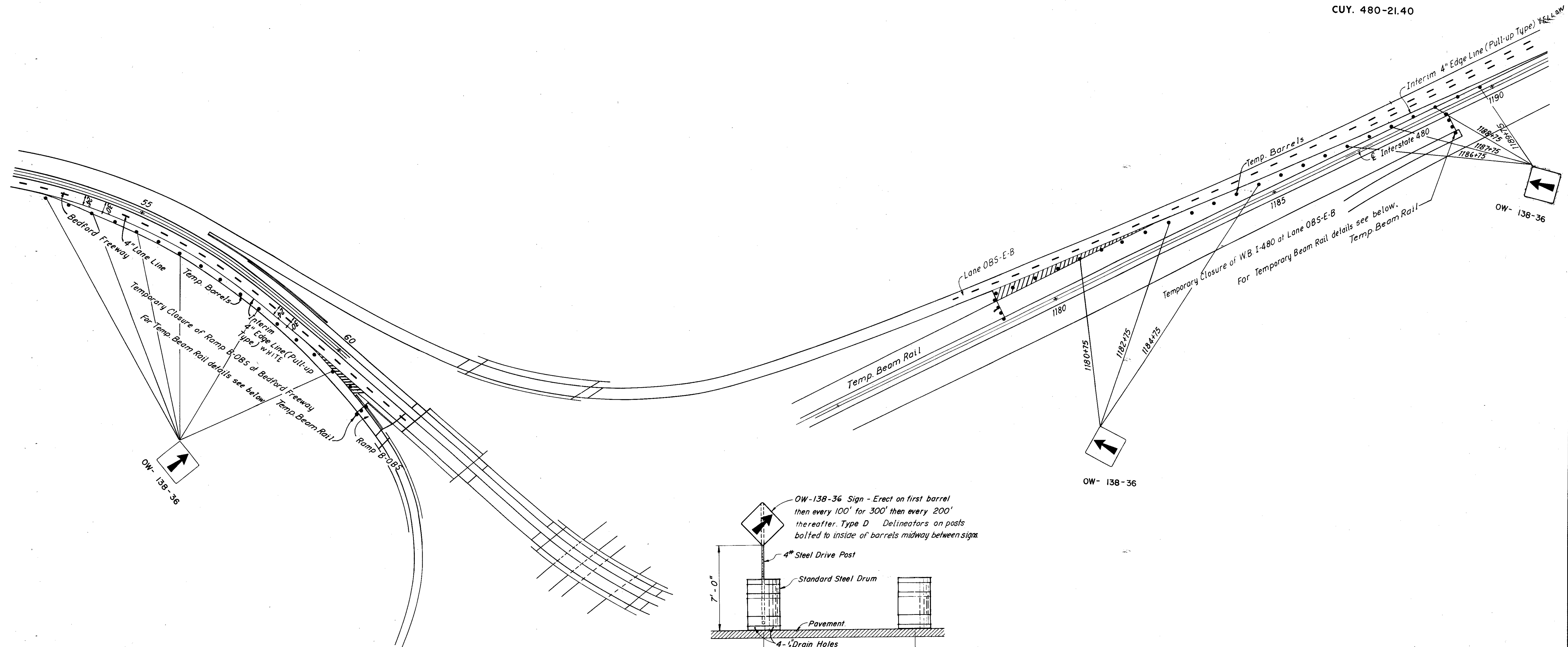
SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE VEN. DATE 4-26-72 CONSULTING ENGINEERS
TRCD. TPM. DATE 4-28-72
CKD. VEN. DATE 4-28-72 KANSAS CITY CLEVELAND NEW YORK

TERMINAL TREATMENT

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY. 480-21.40



SCALE
MADE JEN DATE 2-9-70
TRCD JEN DATE 2-5-70
CKD RJK DATE 2-20-70

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

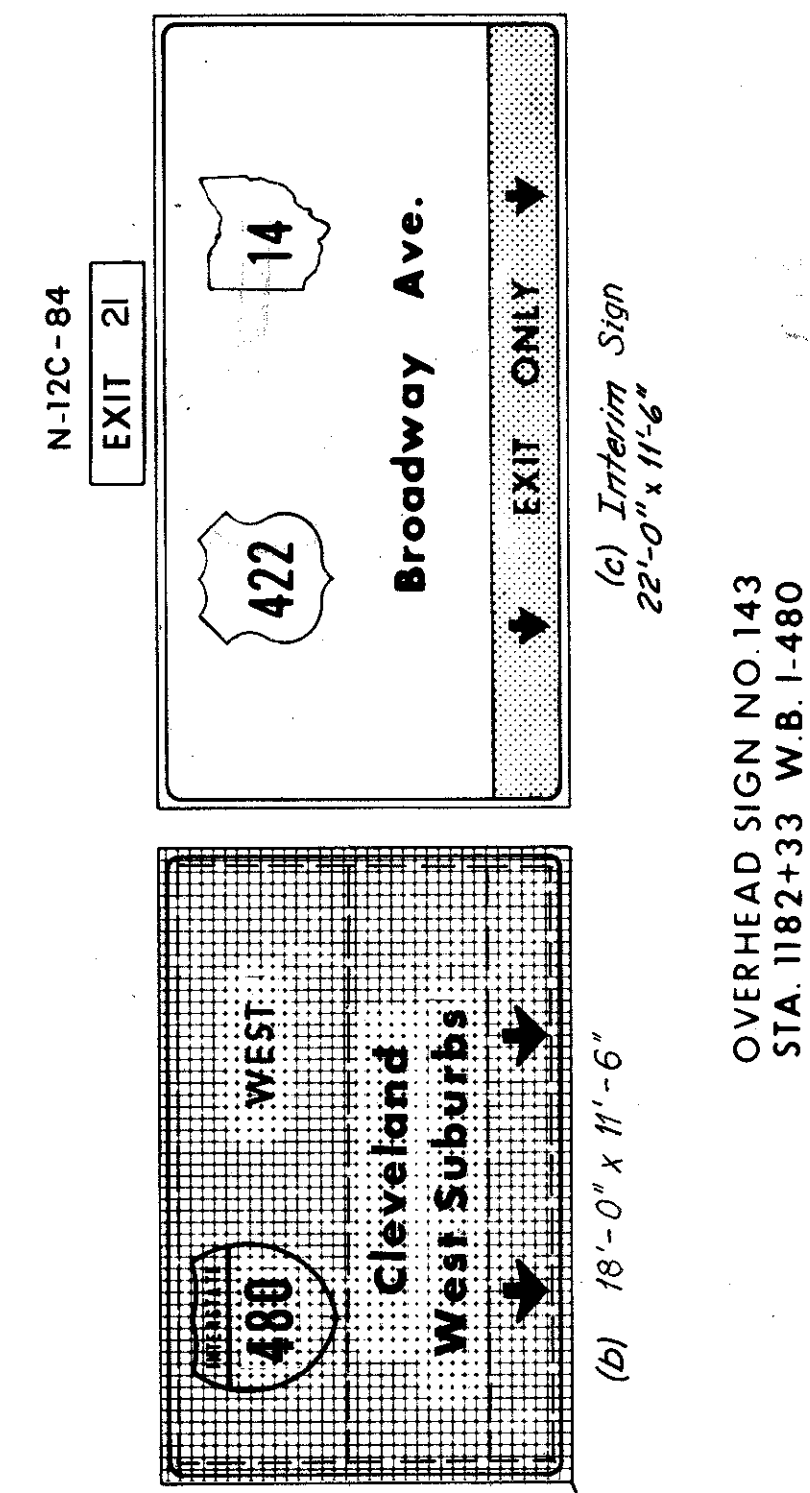
TERMINAL

TREATMENT

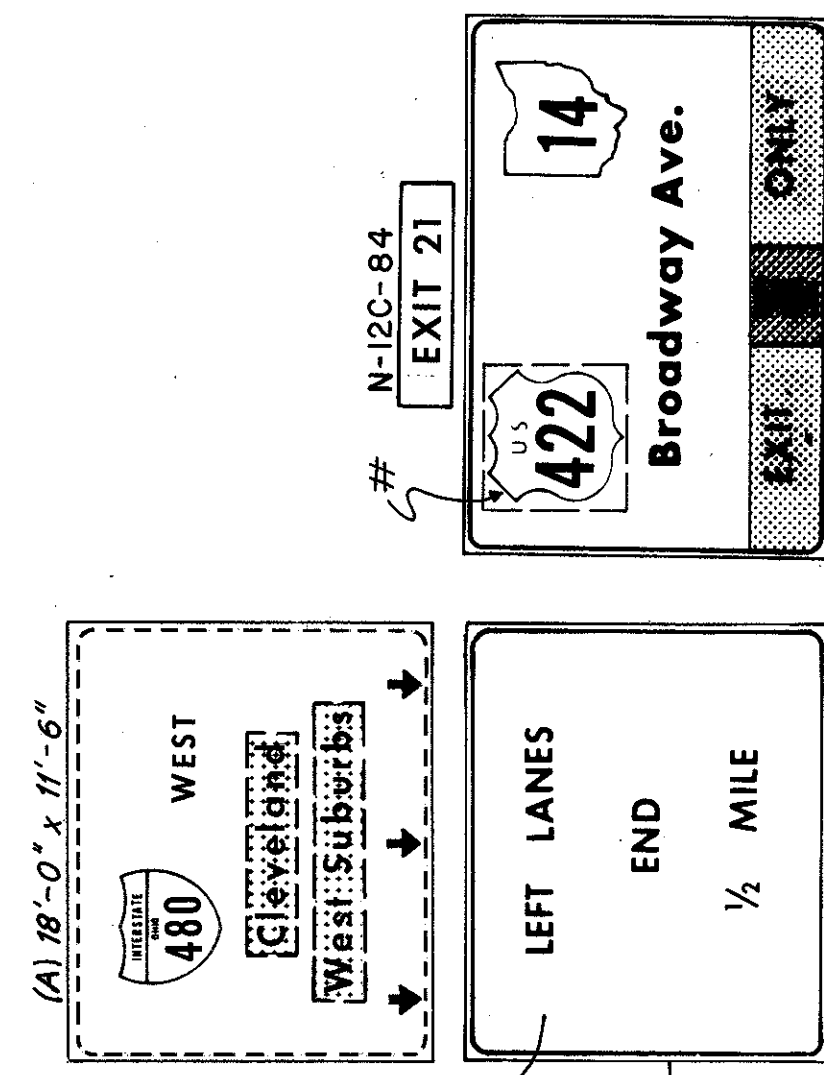
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY
CUY. 480-21.40

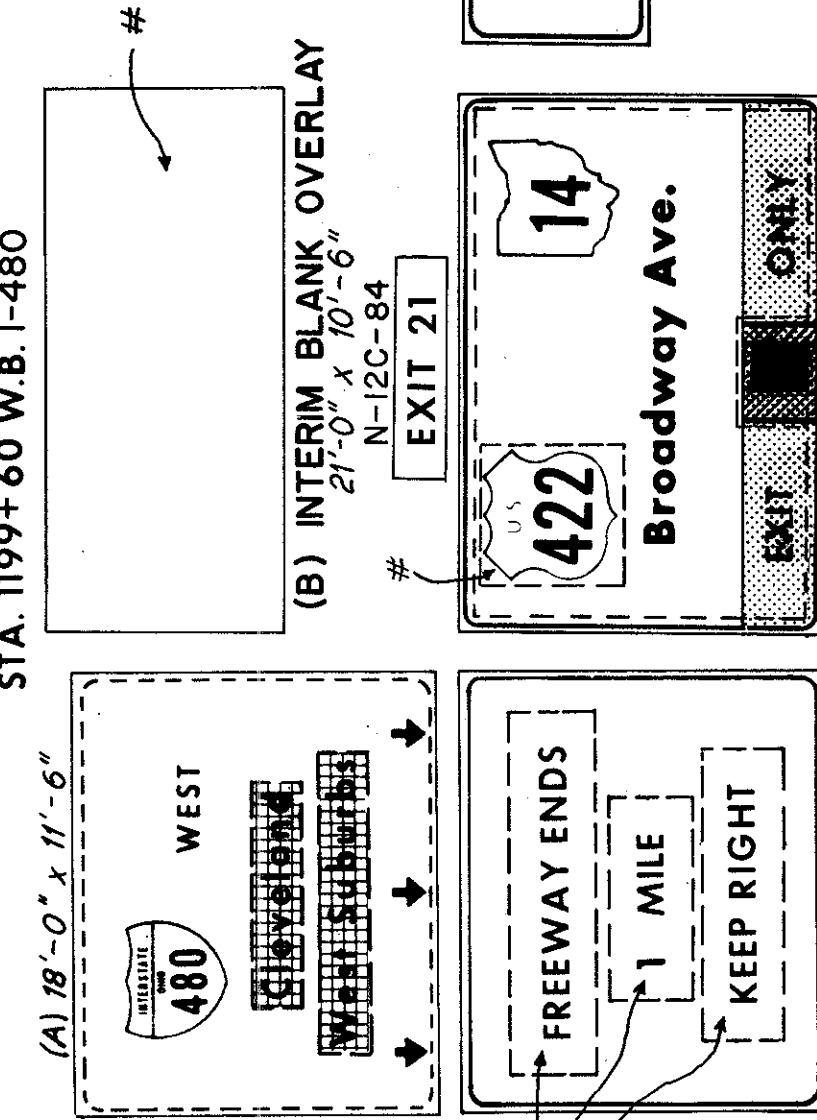


OVERHEAD SIGN NO. 143
STA. 1182+33 W.B. I-480



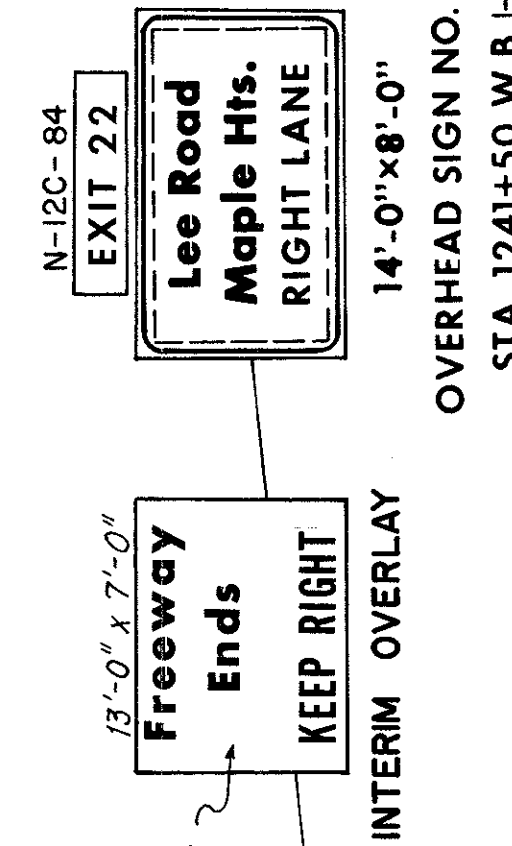
(A) INTERIM OVERLAY
18'-0" x 11'-6"
OVERHEAD SIGN NO. 199
STA. 1199+60 W.B. I-480

(B) INTERIM SIGN
22'-0" x 11'-6"
OVERHEAD SIGN NO. 199
STA. 1199+60 W.B. I-480

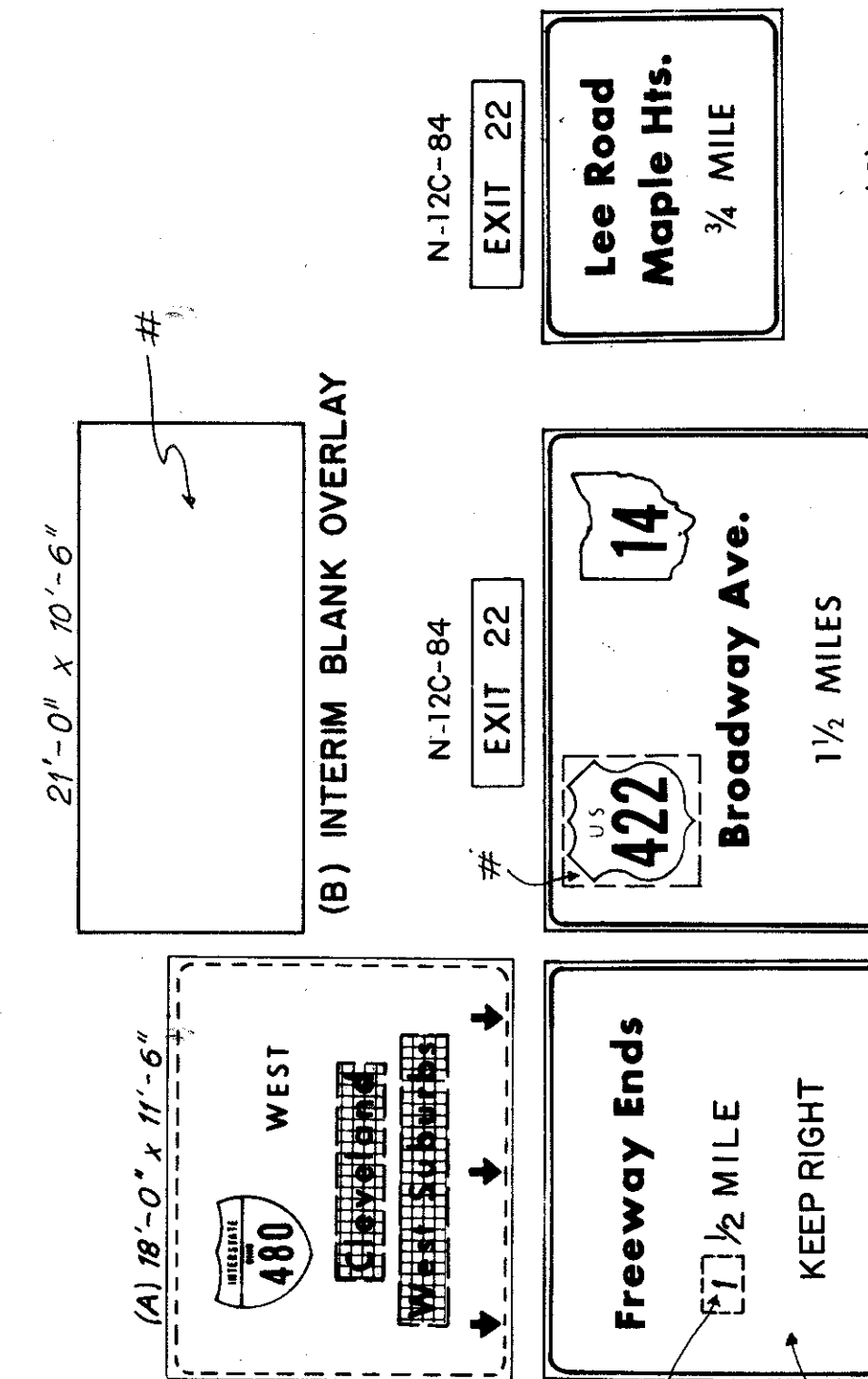


(A) INTERIM OVERLAY
18'-0" x 11'-6"
OVERHEAD SIGN NO. 201
STA. 1221+75 W.B. I-480

(B) INTERIM SIGN
22'-0" x 11'-6"
OVERHEAD SIGN NO. 201
STA. 1221+75 W.B. I-480

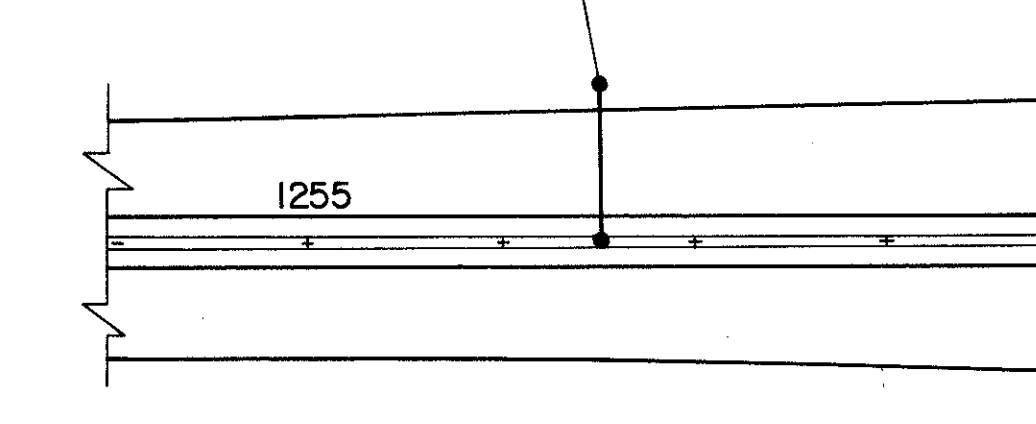
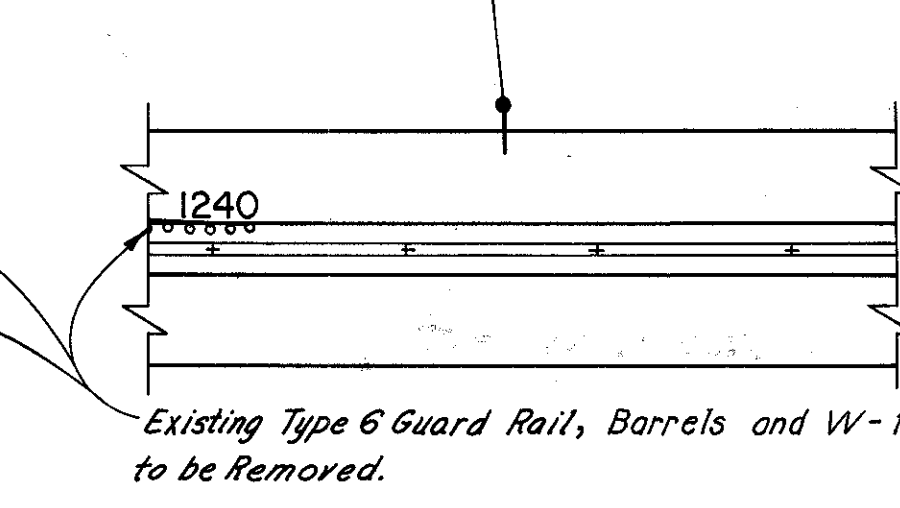
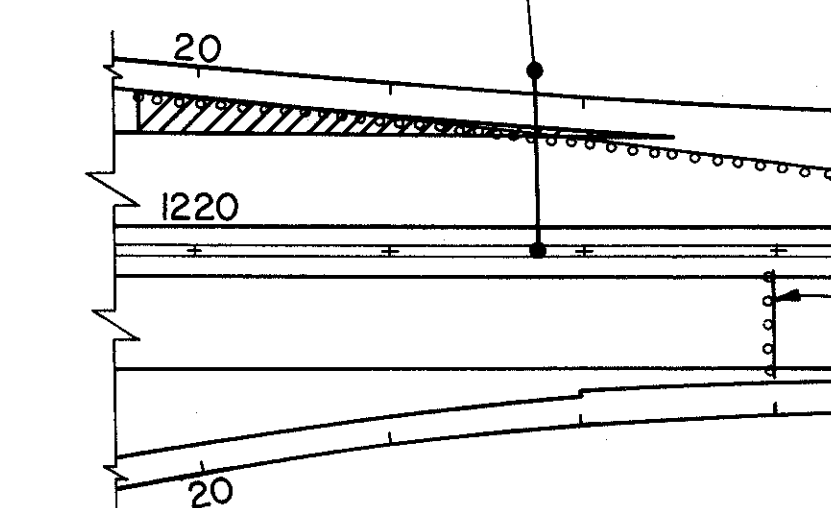
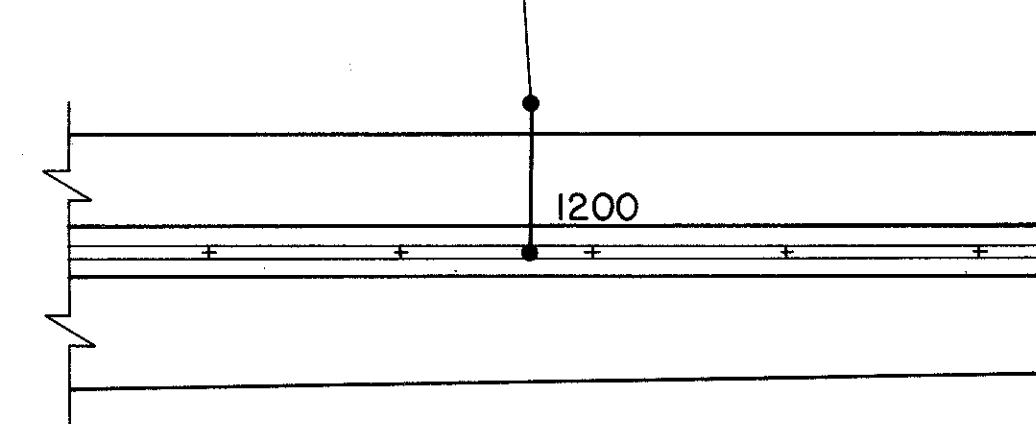
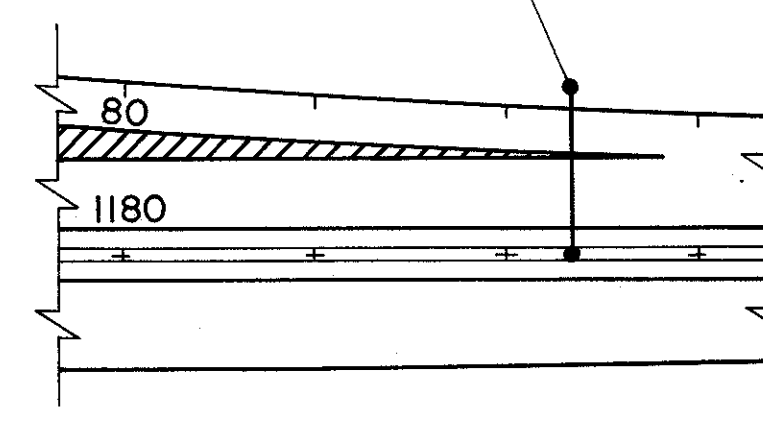


OVERHEAD SIGN NO. 203
STA. 1241+50 W.B. I-480



(A) INTERIM OVERLAY
18'-0" x 11'-6"
OVERHEAD SIGN NO. 205
STA. 1256+50 W.B. I-480

(B) INTERIM SIGN
22'-0" x 11'-6"
OVERHEAD SIGN NO. 205
STA. 1256+50 W.B. I-480



Existing Type 6 Guard Rail, Barrels and W-138-36 Signs to be Removed.

- Notes:
- Sign sizes shown on this sheet are "effective" and do not include the 1'-0" for glare shields.
 - ## - Existing interim overlay to be removed when existing Type 6 guard rail is removed.
 - @ - Existing overlay to remain after Type 6 guard rail removal.
 - [Grid Pattern] Permanent sign to be erected with blank green overlay.
 - [Yellow Background] Indicates black letters on yellow background.

TERMINAL TREATMENT NOTES

FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY
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816 INTERIM STEEL DRIVE POSTS, 4 LBS. PER FOOT, AS PER PLAN

This work shall consist of furnishing and installing 4 pound per linear foot steel drive posts as specified for interim lane width transitions.

This item shall include 4 pounds per foot steel drive posts 11'-0" long bolted to the inside of interim barrels furnished under 606 using a minimum of three 5/16" steel bolts spaced on 12" centers.

Post flanges shall be 90 degrees to interim edge lines facing approaching traffic. Steel bearing plates 3" x 2" shall be used at each bolt outside the barrel to prevent pull through. Mounting of signs on the drive posts with the bottom of the signs 7' above the pavement shall be included in Item 815.

The quantity furnished and installed will be paid for at the price bid per Lin.Ft. which price shall be full compensation for furnishing and installing drive posts including necessary hardware, labor and equipment.

620 INTERIM DELINEATORS, AS PER PLAN

This work shall consist of furnishing and installing interim delineators as specified on plan sheets.

This item shall include 2 pounds per foot steel drive posts 4'-0" long bolted to inside of interim barrels furnished under 606 using a minimum of three 5/16" steel bolts spaced on 12" centers. Post flanges shall be 90 degrees to interim edge lines facing approaching traffic. Type D delineator shall be mounted on the drive post flanges with the top of the delineator 4' above the pavement.

The quantity furnished and installed will be paid for at the price bid per each which price shall be full compensation for furnishing and installing drive posts and delineators including necessary hardware, labor and equipment.

606 INTERIM BARRELS, AS PER PLAN

This work shall consist of furnishing and placement of 55 gallon barrels as specified on Plan Sheets.

The barrels shall be painted Orange and $\frac{3}{4}$ filled with granular material. In addition to painting requirements, two 4"-6" wide bands of white reflectorized sheeting, Type E, shall be provided around the circumference of each barrel at the top and bottom. Reflectorization and application of the sheeting shall be in accordance with supplemental specification 815.

For drainage of steel drums, 4 each one-half inch ($\frac{1}{2}$ ") diameter holes shall be provided on the circular surface near the bottom of each drum.

The quantity furnished and installed will be paid for at the price bid per each which price shall be full compensation for furnishing and installing barrels including painting, reflectorized sheeting, granular material and necessary labor and equipment.

621 INTERIM PAVEMENT MARKING, AS PER PLAN

This work shall consist of the furnishing and installation of interim removable markings as specified herein and shown on the plans.

1. MATERIAL

Material shall consist of a backing coated with a pressure-sensitive adhesive and a weather and traffic resistant reflective white or yellow-colored surface and additional requirements as follows:

- A. REFLECTION - The white and yellow striping material shall be reflex-reflective, reflecting white or yellow respectively and shall be readily visible when viewed with automobile headlights at night.

- B. ADHESIVE - The striping material shall have a precoated pressure-sensitive adhesive which shall not require a liner for protection from contamination, preadhesion, or blocking within the roll as delivered.

- C. CONFORMITY - The striping material shall be thin, flexible, formable, and following application, shall remain conformed to the texture of the pavement surface.

The average thickness of the material, as determined by five micrometer readings shall not be less than 20 mils nor more than 30 mils.

- D. REMOVABILITY - The striping material backing shall permit removal without requiring sandblast, solvent, or grinding methods.

- E. DURABILITY - The striping material applied in accordance with recommended procedures shall be weather resistant and show no appreciable fading, lifting or shrinkage, prior to completion of this project.

- F. GENERAL - The striping material as supplied shall be of good appearance, free from cracks and edges shall be true, straight, and unbroken. The striping material shall be supplied in rolls and there shall be no more than 3 splices per 60 yards of length.

The striping material shall be prepared for delivery in standard commercial containers so constructed as to insure acceptance by the carrier and prevent damage during proper shipment and storage.

The Contractor shall store the material in a cool, dry location where temperature will not exceed 100° prior to application of marking on roadway surfaces.

2. APPLICATION

ROAD SURFACE PREPARATION - The road surface must be clean and dry, free of oils and grease, dust and dirt. All surfaces must be primed. Concrete pavement shall be surface treated in accordance with Section 621.04. Surfaces shall be generously flushed with clean water and allowed to dry thoroughly prior to application of primer and interim markings.

3. PRIMING

Method of priming shall be as approved by the Engineer. The Contractor shall submit a proposal for type of priming to be used as required in the General Notes. Cost for priming surfaces shall be included in the cost of the various items included in Item 615, Temporary Roads, as per plan.

4. APPLICATION

Interim lines shall be applied to the road surface with a roller type applicator and rolled immediately afterwards by rubber-tired roller with approximately single wheel load between one Thousand (1000) and two Thousand (2000) pounds.

5. SPECIAL PLAN DETAILS

Details for location of interim markings are shown on Sign location plan sheets.

6. BASIS OF PAYMENT

- 4" INTERIM EDGE LINES, AS PER PLAN, per linear foot. (White or Yellow)
- 4" INTERIM CHANNELIZATION LINES, WHITE, AS PER PLAN, per linear foot.
- 4" or 16" TRANSVERSE (Diagonal) STRIPES, per lin.ft. of actual line length, in place. Work shall include all material, labor, tools, and equipment necessary to perform the various items of work within contract bid prices for interim markings.

TERMINAL TREATMENT QUANTITIES

FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY
CUY.480-21.40
Quantity Calculations

Made By JEN Date 2-2-70
Checked By RJK Date 2-19-70

Station		Side	Space	D Barrel Mounted Each
From	To			
Westbound I-480				
1179+75	1185+75	Lt.	200	4
1187+25	1189+25	Lt.	100	3
Bedford Freeway				
53+50	55+50	Rt.	100	3
57+08	59+08	Rt.	200	2
Total				12

Station		Side	Calculations	Lin. Ft.
From	To			
Westbound I-480				
1182+00	1187+40	Lt.	1 x 540	540
1184+40	1192+25	Lt.	1 x 745	745
TOTAL				1285
				1285 ÷ 5280 = 0.243 Miles

Sign Location	Sign Code No. and Size					Total Sign Area Flat Sheet Type Sq. Ft.	Standard 4 Lb. Drive Post Lin. Ft.	
	1	2	3	4	5			
Sta. 1180+75 W.B. I-480	1					9.0	11	
Sta. 1182+75 W.B. I-480	1					9.0	11	
Sta. 1184+75 W.B. I-480	1					9.0	11	
Sta. 1186+75 W.B. I-480	1					9.0	11	
Sta. 1187+75 W.B. I-480	1					9.0	11	
Sta. 1188+75 W.B. I-480	1					9.0	11	
Sta. 1189+75 W.B. I-480	1					9.0	11	
Sta. 53+00 Bedford Freeway	1					9.0	11	
Sta. 54+00 Bedford	1					9.0	11	
Sta. 55+00 Bedford	1					9.0	11	
Sta. 56+03 Bedford	1					9.0	11	
Sta. 58+13 Bedford	1					9.0	11	
Sta. 60+20 Bedford	1					9.0	11	
TOTAL							117.0	143

Station		Side	Calculation	Each
From	To			
Westbound I-480				
1179+00	1190+00	Lt.	1x23	23
Bedford Freeway				
53+00	60+70	Rt.	1x16	16
TOTAL				39

Station		Side	Calculations	Lin. Ft.
From	To			
Westbound I-480				
1178+90		Lt.	1x38	38
Eastbound I-480				
1189+00		Rt.	1x38	38
Ramp B-OBS				
20+56			1x25	25
TOTAL				101

Station		Side	Calculation	Lin. Ft.
From	To			
Westbound I-480				
1219+70	1240+20	Lt.	1x2050	2050
Eastbound I-480				
1223+00	-	Rt.	1x50	50
TOTAL				3000

Station		Side	Calculation	Lin. Ft.
From	To			
Westbound I-480				
1219+70	1240+20	Lt.	1x2050	2050
TOTAL				2050

Station		Side	Calculations	Lin. Ft.
From	To			
Westbound I-480				
1182+65	1192+25	Lt.	1 x 960	960 *
Bedford Freeway				
52+90	59+12	Rt.	1 x 662	662 #
TOTAL				1582

* YELLOW
WHITE

143	NUMBERED SIGNS					UNNUMBERED SIGNS	INTERIM TRAFFIC CONTROL DEVICES	100% STATE COST PART.	TOTAL	UNIT	ITEM	DESCRIPTION
	144	146	147	148	149							
						117.0	117.0	117.0	Sq. Ft.	815	Sign Erection Flat Sheet Type	
	66	6	85	12	6			175	Sq. Ft.	815	+ Interim Flat Sheet Overlay Type	
						143.0	143.0	143.0	Lin. Ft.	816	Interim Steel Drive Post, 4 Lbs. per Ft., as per plan	
							12	12	Each	620	Interim Delineators, as per plan	
								2050	Lin. Ft.	621	Existing Interim Pavement Marking Removed	
								1582	Lin. Ft.	621	Interim 4" Edge Line (Pull-up-Type), as per plan (YELLOW or WHITE)	
								39	Each	606	Interim Barrels, as per plan	
								101	Lin. Ft.	606	Guardrail, Type 6	
								3000	Lin. Ft.	202	Interim Guard Rail, Removed and Disposed of, as per plan	

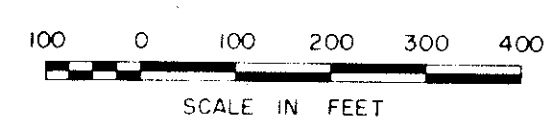
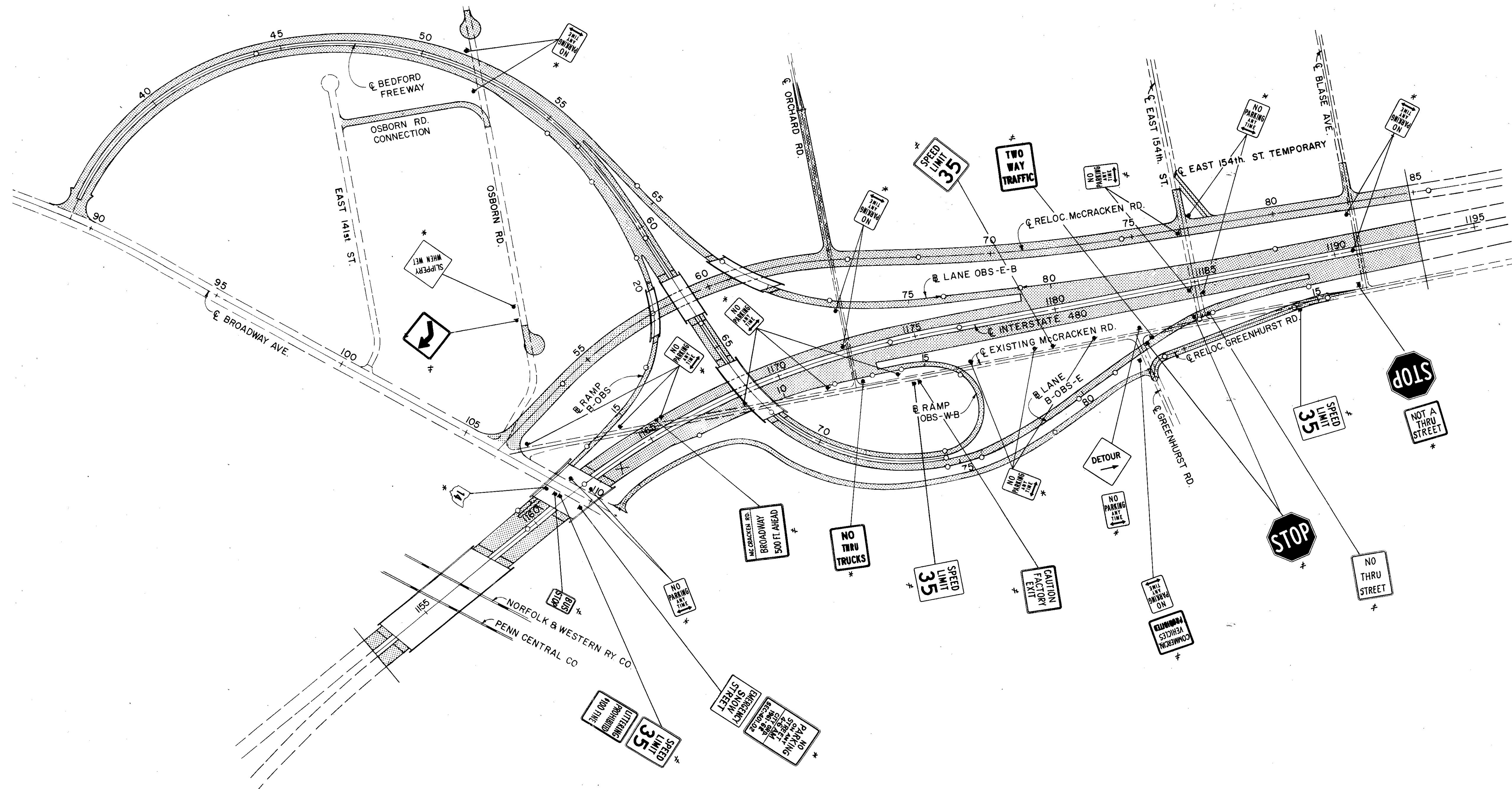
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MADE JEN DATE 2-2-70 CONSULTING ENGINEERS
TRCD. RJK DATE 2-3-70
CRD. RJK DATE 2-19-70 KANSAS CITY CLEVELAND NEW YORK

* For information purposes only.

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY
CUY.-480-21.40

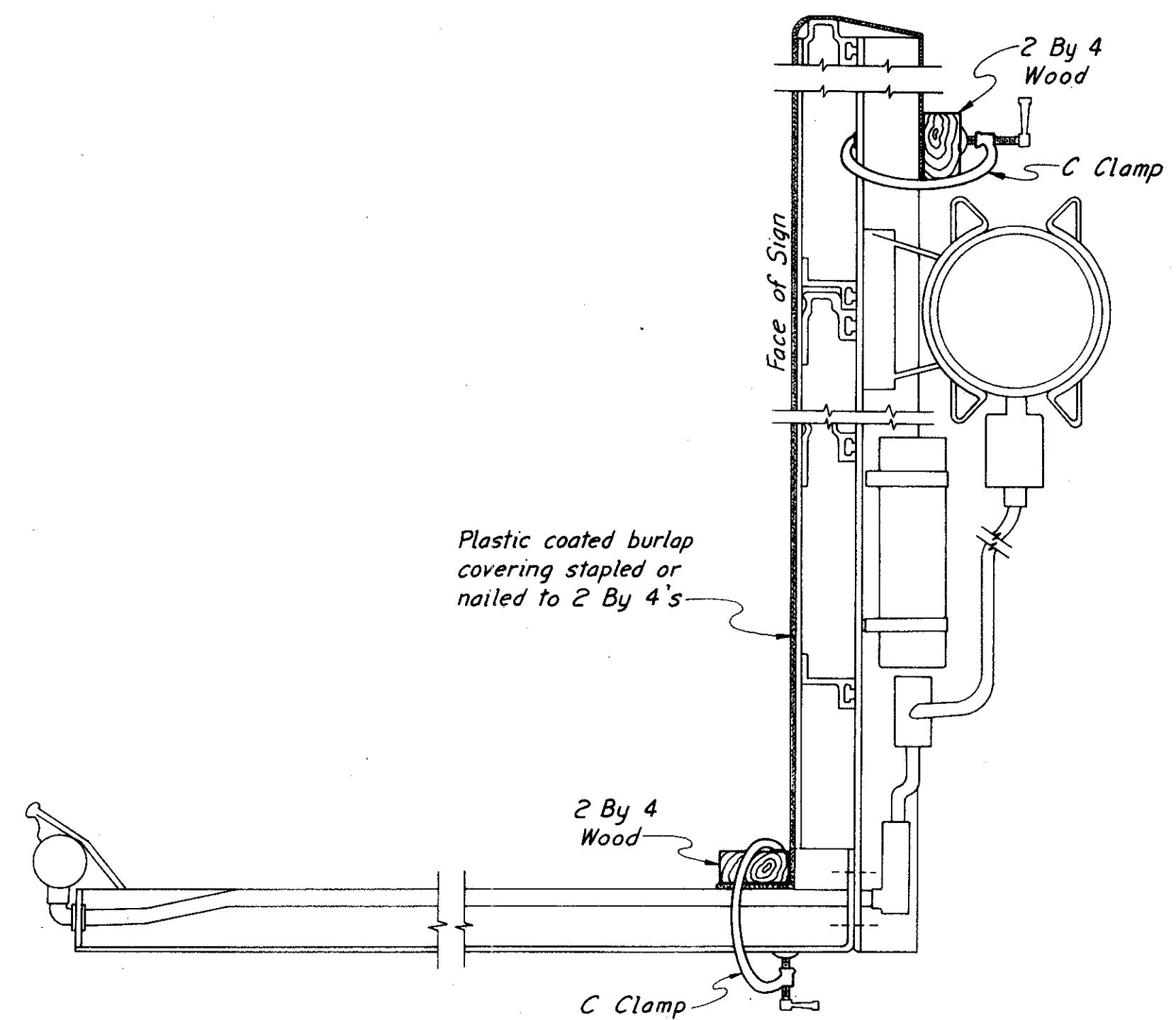
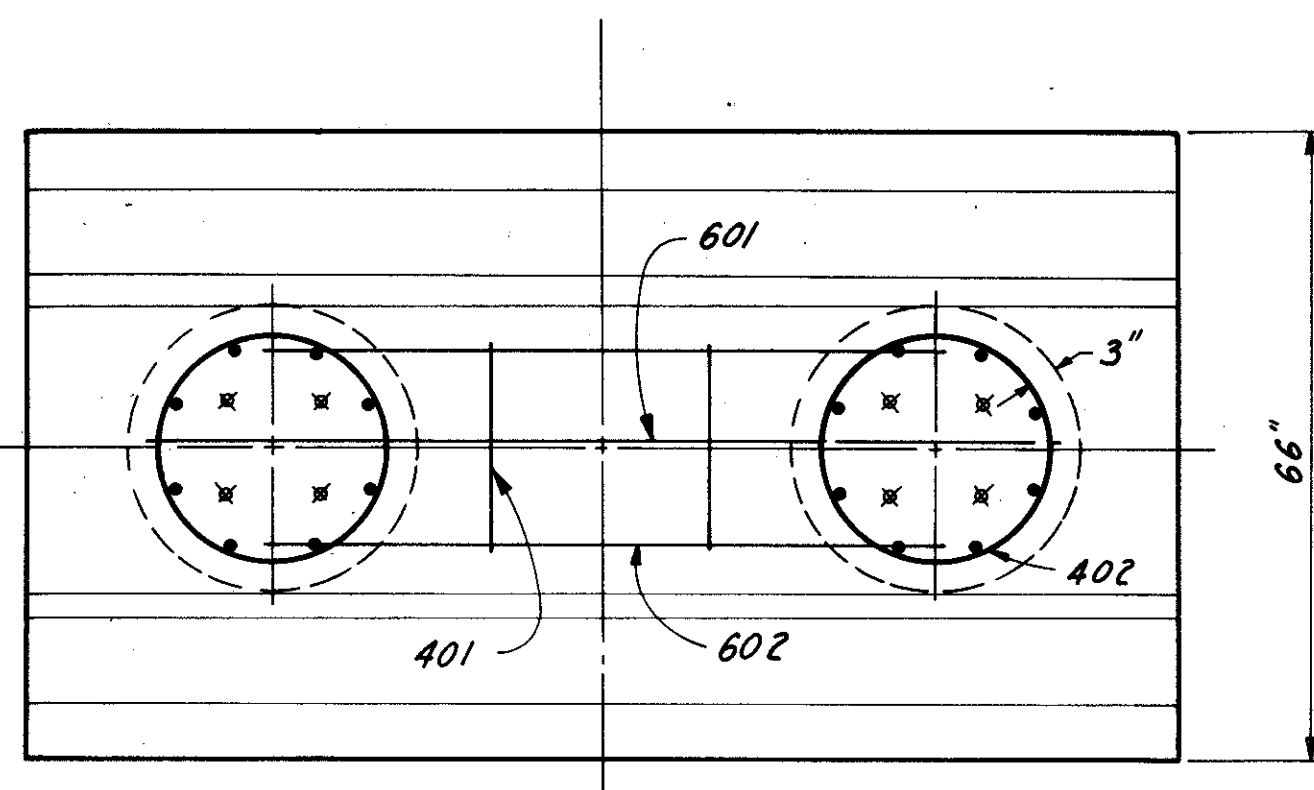
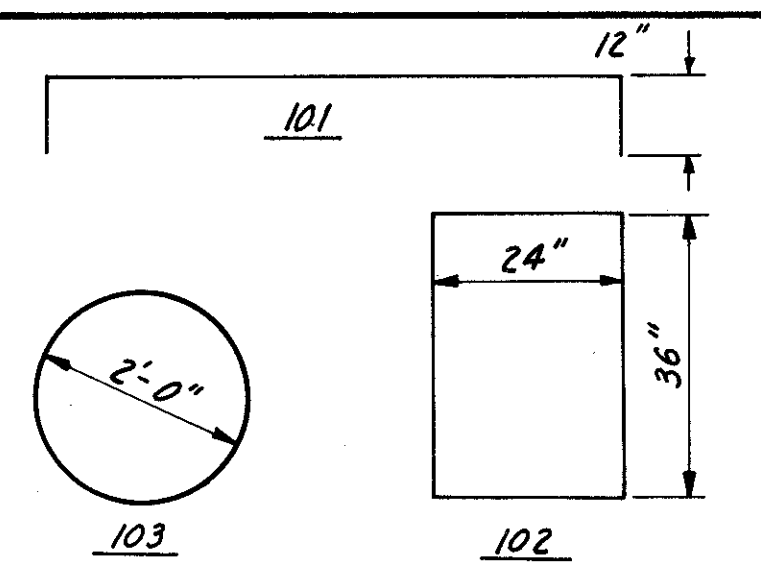


* Indicates pole mounted Signs to be removed and disposed.
Indicates Signs and their respective Supports to be removed and disposed.

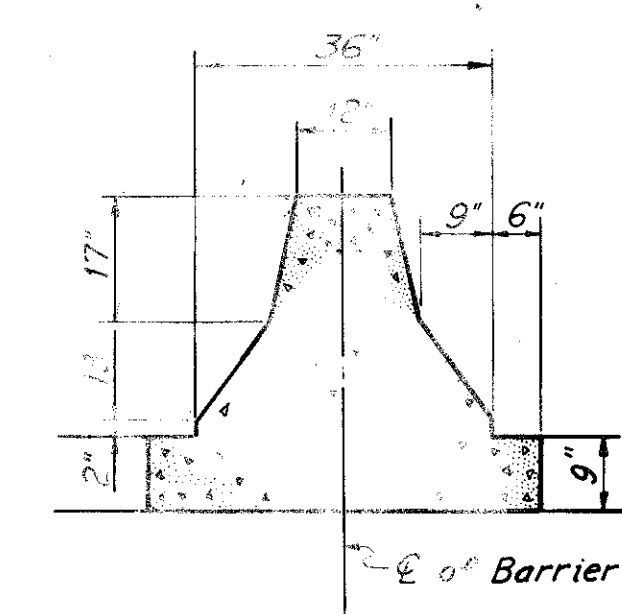
SCALE 1"=200'
HOWARD, NEEDLES, TAMMEN & BERGENOFF
 CONSULTING ENGINEERS
 MADE *JSH* DATE 12-16-70
 TRCD. *JSH* DATE 12-16-70
 CKD. *IM* DATE 12-22-70
 KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY
C.U.Y. - 480-21.40

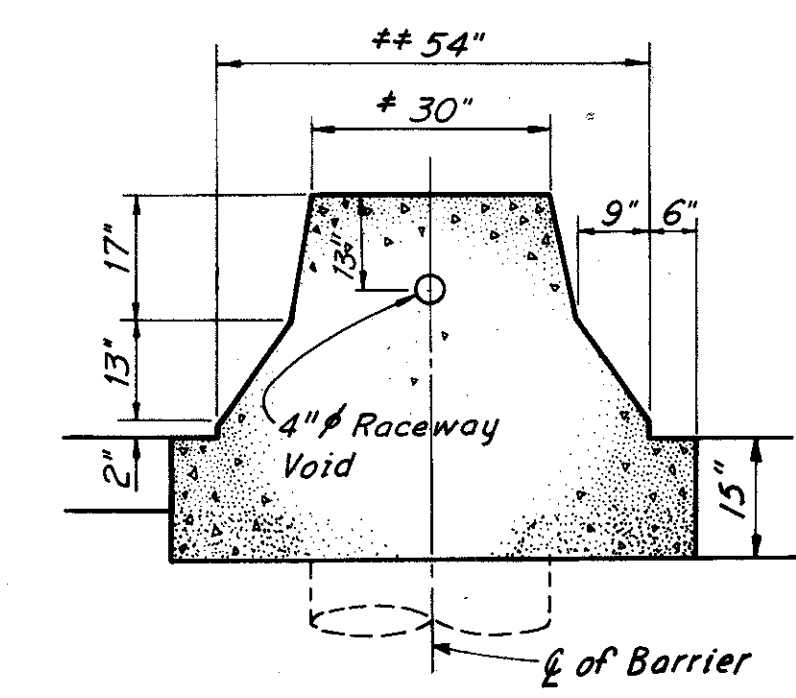
REINFORCEMENT SCHEDULE			
MARK	NO.	LENGTH	TYPE
401	12" x 6"	10'-6"	102
402	12" x 6"	7'-6"	103
601	3	D+48"	101
602	6	D+24"	101
603	16	Dmin+38"	Str.



ATTACHMENT OF INTERIM COVERING DETAIL



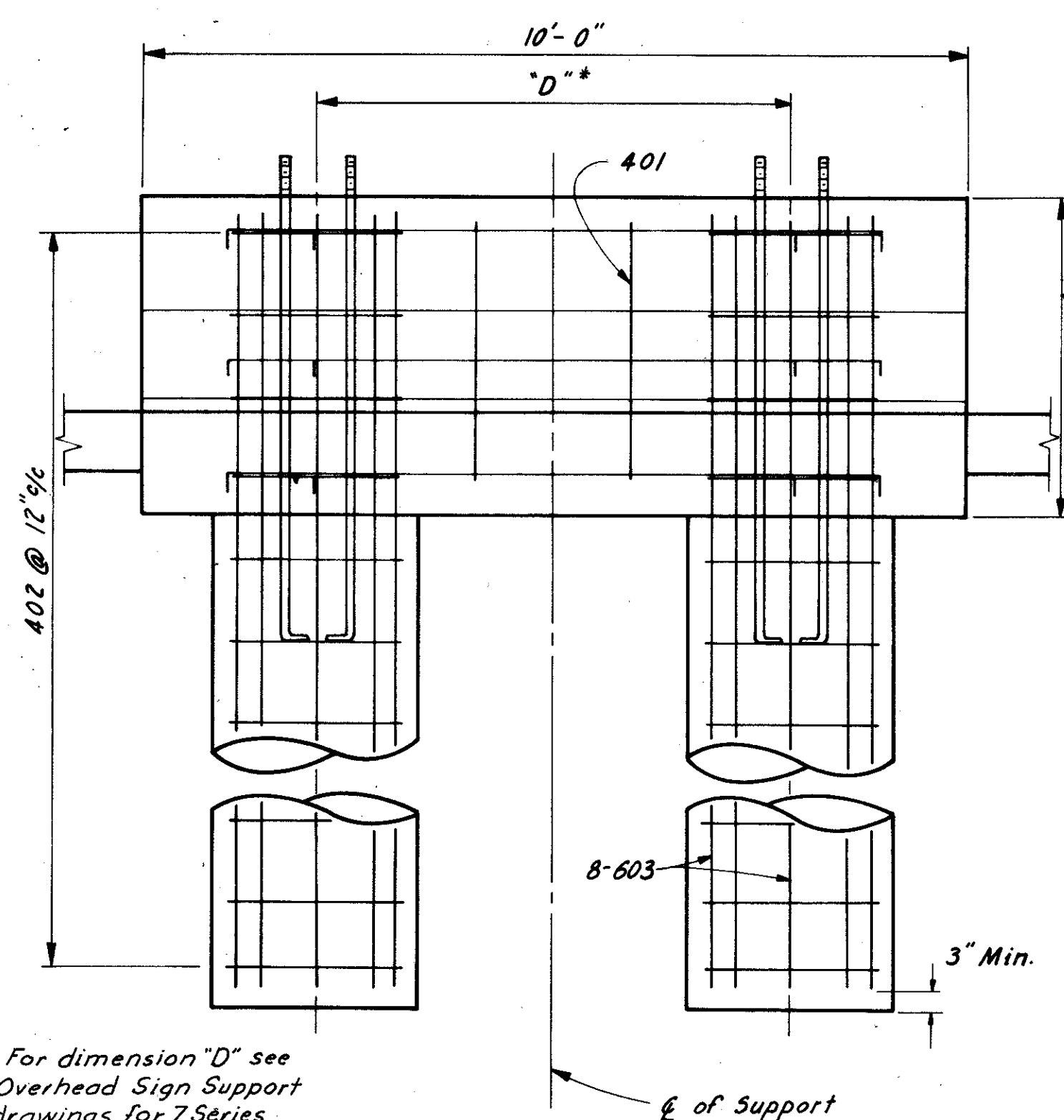
TYPICAL SECTION



SECTION A - A

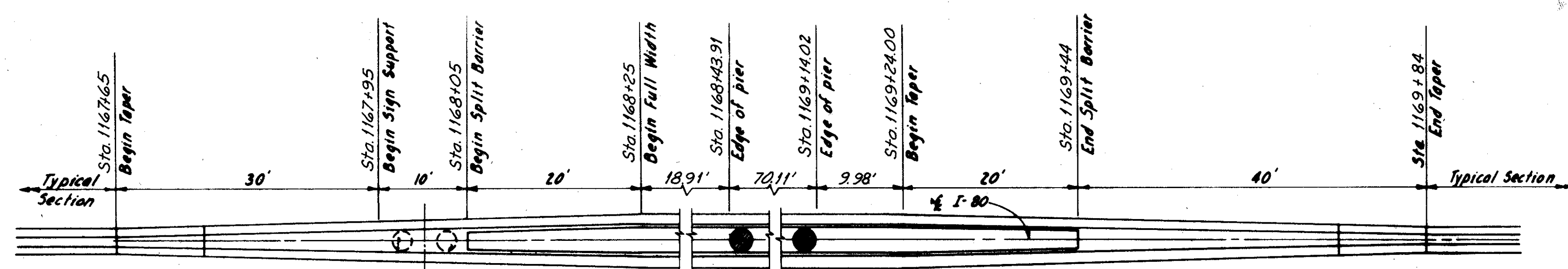
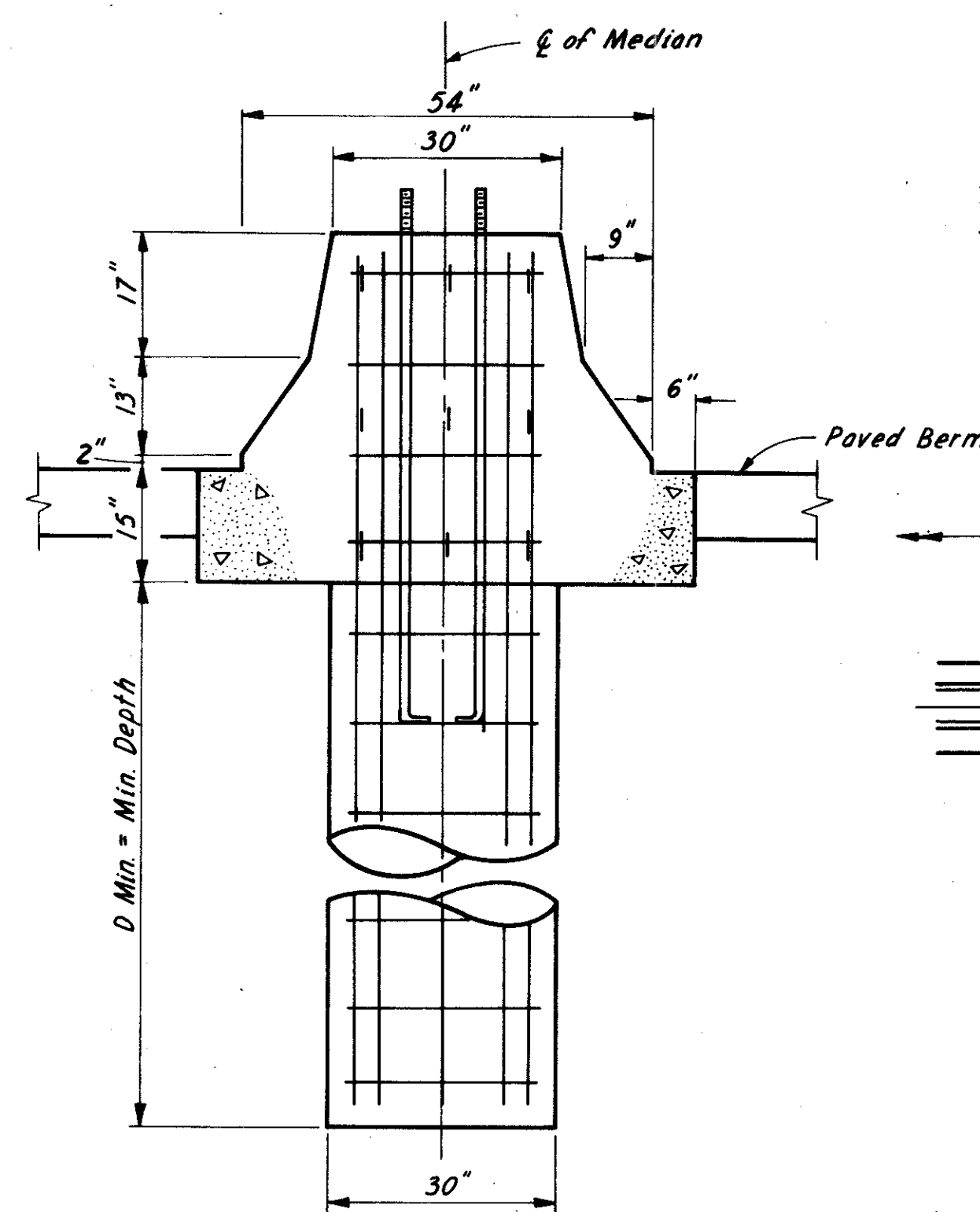
* Width is 33" for Overhead Sign No. 142
 ** Width is 57" for Overhead Sign No. 142

CONCRETE BARRIER MEDIAN DETAILS
 AT SIGN NOS. 141, 142, 143, 144 & 145

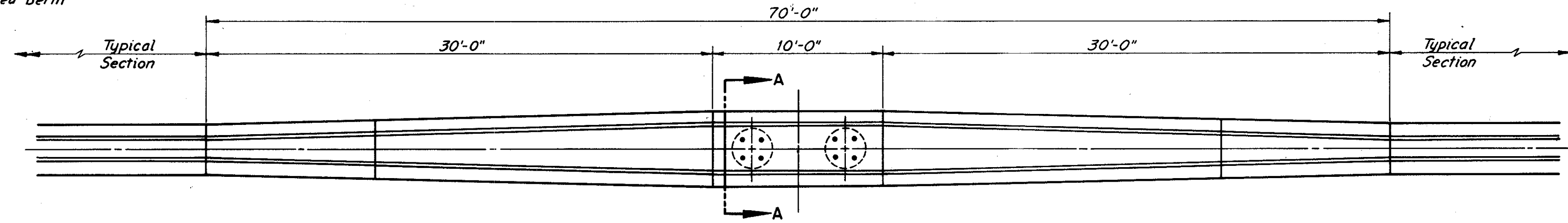


* For dimension "D" see Overhead Sign Support drawings for 7 Series and for 15.8 Series.

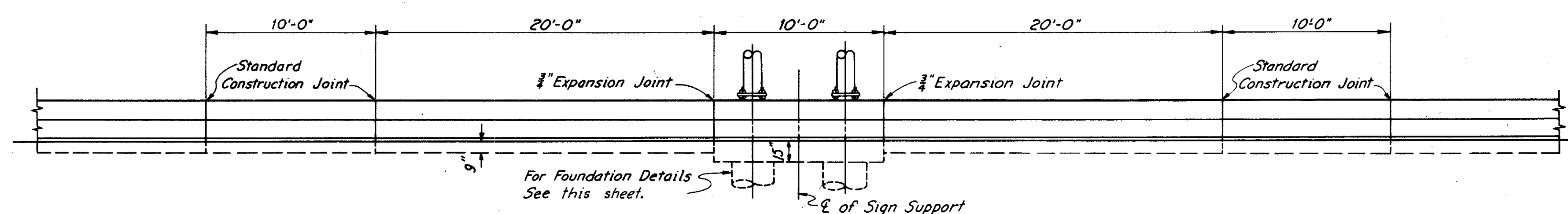
SIGN SUPPORT FOUNDATION DETAILS FOR CONCRETE MEDIAN BARRIER



BRIDGE PIER APPROACH FLARE
 I-480 AND BEDFORD FREEWAY
 (Flare shall be 40:1 taper)



STANDARD MEDIAN BARRIER FLARE
 (Flare shall be 40:1 taper)

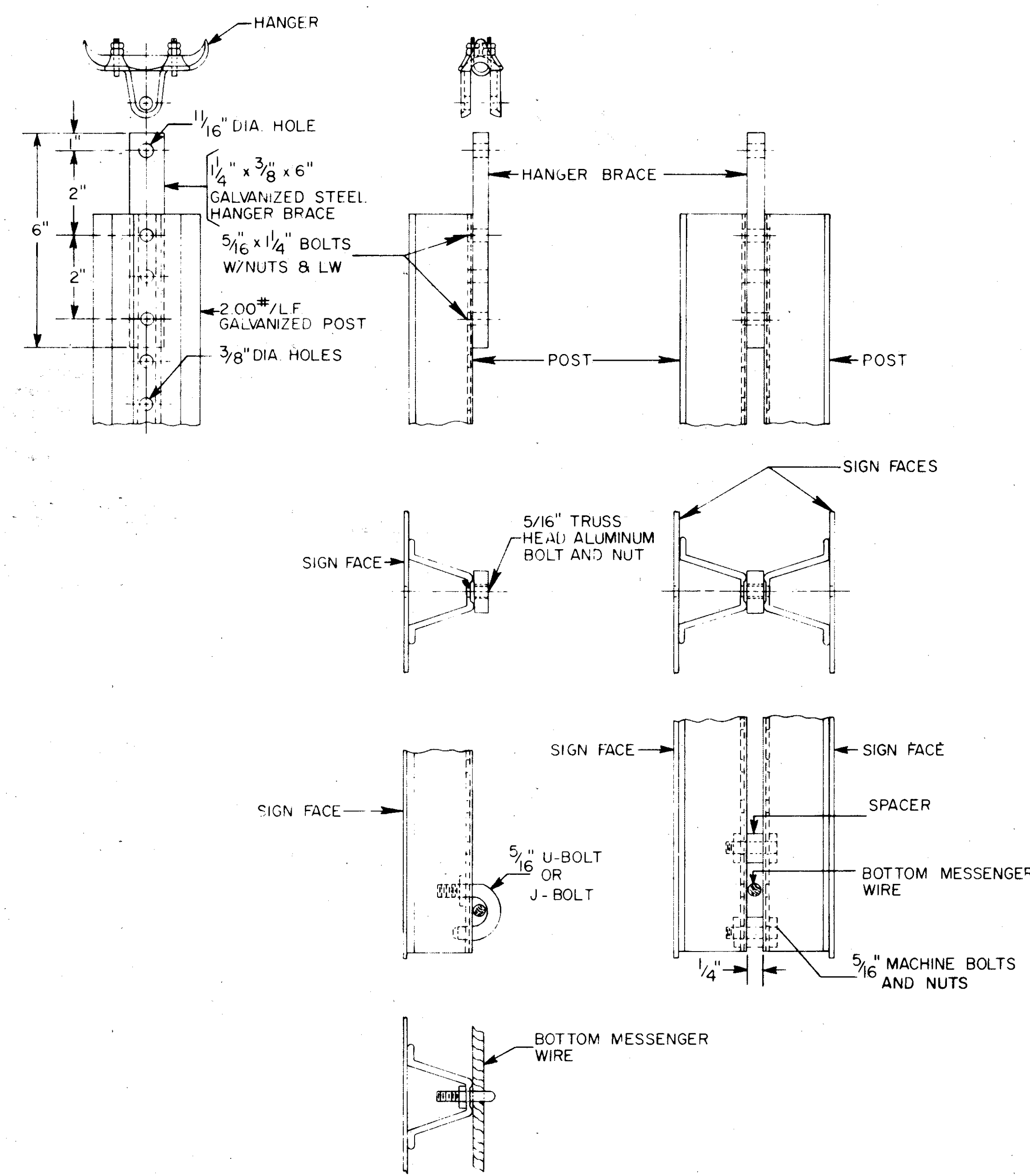


CONSTRUCTION JOINT LOCATIONS

Note: Payment for the ten (10) foot foundation section of the barrier median will be included in the item "Concrete for Overhead Sign Support Foundations." The flare sections will be included in the regular roadway quantities for the barrier median.

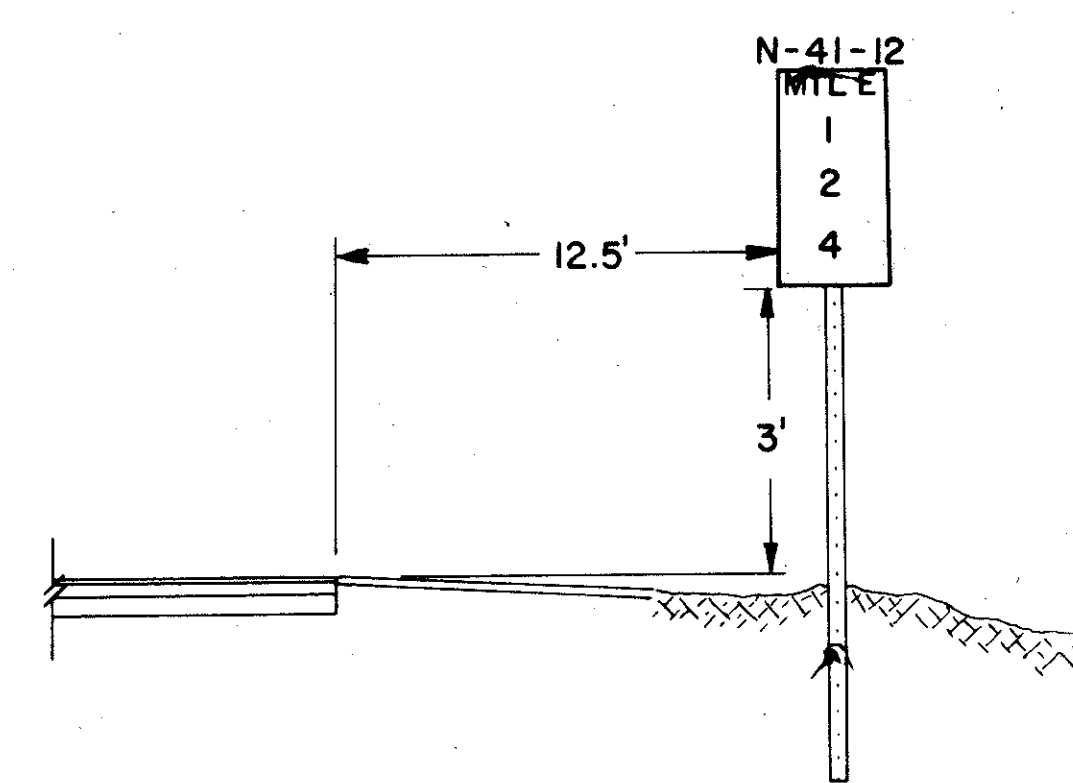
CUYAHOGA COUNTY
CUY.-480-21.40

QUANTITY CALCULATIONS
MADE BY KJK DATE 8-22-73
CHECKED BY D.S.P DATE 8-23-73



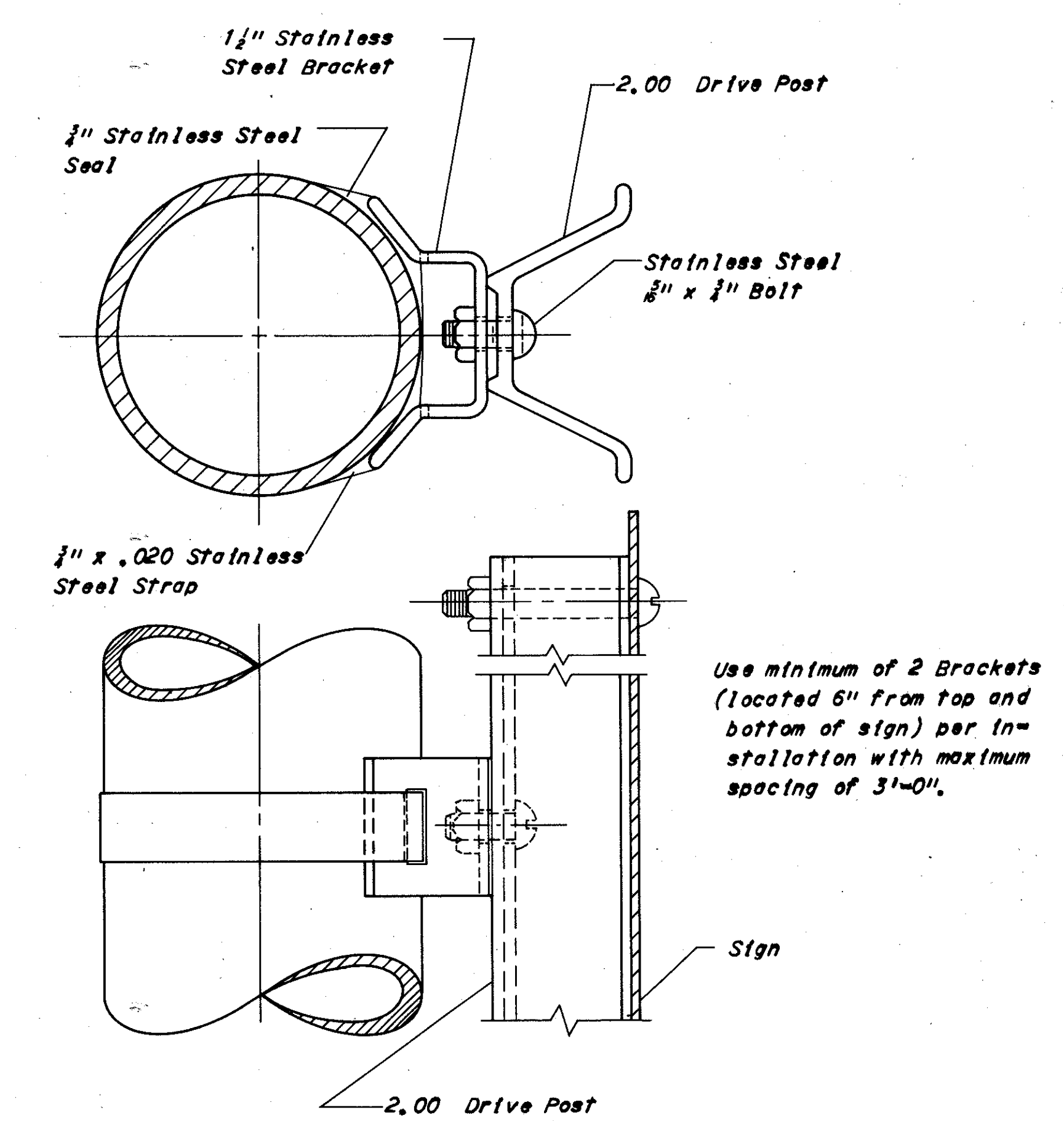
SPAN WIRE SIGN ATTACHMENT DETAILS

12' POST - 3 Digit
11' POST - 2 Digit
10' POST - 1 Digit



MILE MARKER PLACEMENT

Mile No.	Station I-480	MILE MARKER		QUANTITIES	
		Side	Side	N-41-12 1' x 3' Flat Sheet	Item 816 Steel Driven Post 2 lb/ft.
22	1184 + 44	Lt	Rt	Sq. Ft. 6	Lin. Ft. 22
Totals				6	22



POLE MOUNTED SIGNS ATTACHMENT DETAIL

(No Scale)

COMPUTATIONS AND SUB-SUMMARIES

CUYAHOGA COUNTY
Quantity Calculations
CUY. 480-21.40
Made By JEM Date 7-31-70
Checked By ALK Date 7-31-70

Item 621 4" Lane Line				
Station	Side	Calculations	Lin. Ft.	
From	To			
Ramp OBS-W-B				
7+95	9+55	Rt.	1 x 160	160 *
Ramp B-OBS				
5+25	7+65	Lt.	1 x 240	240 *
Rel. McCracken Road				
51+02	52+52	Rt.	1 x 150	150
52+52	84+89	Rt.&Lt.	2 x 3237	6474
Bedford Freeway				
56+62	59+12	Rt.	1 x 250	250 *
TOTAL			1.38 Miles	7274

Item 621 4" Edge Line						
Station		Side	Calculations	Lin. Ft.		
From	To			White	Yellow	
Eastbound I-480						
1152+77	1189+00	Rt.&Lt.	2-1 x 3623	3623	3623	
1189+00	1193+00	Rt.&Lt.	2-1 x 400	400	400	
1189+00	1193+00	Rt.	1 x 400	400 *		
Westbound I-480						
1152+77	1155+25	Rt.&Lt.	2-1 x 248	248	248	
1155+25	1159+65	Rt.&Lt.	3-1 x 440	880 *	440 *	
1159+65	1193+00	Rt.&Lt.	2-1 x 3335	3335	3335	
Bedford Freeway						
35+65	36+08	Rt.	1 x 43		43	
36+08	74+54	Rt.&Lt.	2-1 x 3846	3846	3846	
35+65	36+02	Lt.	1 x 37		37	
36+02	53+41	Rt.&Lt.	2-1 x 1739	1739	1739	
53+41	56+41	Rt.&Lt.	2-1 x 300	300	300	
53+41	56+41	Lt.	1 x 300	300 *		
56+41	57+41	Lt.	1 x 100		100	
57+41	74+54	Rt.&Lt.	2-1 x 1713	1713	1713	
Lane OBS-E-B						
61+75	78+92	Rt.&Lt.	2-1 x 717	1434		
Ramp B-OBS						
9+65	12+25	Rt.	1 x 260	260		
12+25	20+56	Rt.&Lt.	2-1 x 831	831	831	
Lane B-OBS-E						
74+54	89+00	Rt.&Lt.	2-1 x 1446	1446	1446	
Ramp OBS-W-B						
13+44	19+75		2-1 x 631	631	631	
TOTAL			4.05 mi. (White) + 3.56 mi. (Yellow) = 7.60 Mi.	21,386	18,732	

Item 621 6" Lane Line						
Station		Side	Calculations	Lin. Ft.		
From	To			White	Yellow	
Eastbound I-480						
1152+77	1180+60	Rt.	3 x 2783		8349 *	
1180+60	1189+00	Rt.	2 x 840		1680 *	
1189+00	1193+00	Rt.	3 x 400		1200 *	
Westbound I-480						
1152+77	1155+25	Lt.	3 x 248		744 *	
1155+25	1178+91	Lt.	2 x 2366		4732 *	
1178+91	1193+00	Lt.	3 x 1409		4227 *	
Bedford Freeway						
35+30	46+41	Rt.	1 x 1111		1111 **	
46+41	74+54	Rt.	1 x 2813		2813 *	
35+46	46+41	Lt.	1 x 1095		1095 **	
46+41	53+41	Lt.	1 x 700		700 *	
53+41	56+41	Lt.	2 x 300		600 *	
Lane OBS-E-B						
56+41	78+92	Lt.	1 x 2251		2251 *	
Lane B-OBS-E						
74+54	89+00	Rt.	1 x 1446		1446 *	
TOTAL			5.44 Miles		28,742	
TOTAL 100% STATE			0.42 Miles		2206 **	

DELINEATOR LOCATIONS AND ESTIMATED QUANTITIES							
Location		Side	Space	No. of Delineators			
From	To			Type D		Type B	
Post	Bracket						
I-480 Eastbound							
1165+50	1166+50	Rt.	100	2			
1189+25	1192+25	Rt.	100	4			
I-480 Westbound							
1154+10	1159+10	Lt.	100	2		4	
Bedford Freeway							
46+41	56+21	Lt.	70	15			
58+30	65+30	Lt.	100	6		2	
66+11	74+11	Lt.	50	12		5	
52+90	54+90	Rt.	100	3			
61+85	65+85	Rt.	100	1		4	
66+85	74+15	Rt.	50	12		4	
Lane B-OBS-E							
74+65	77+65	Rt.	50	7			
78+45	82+45	Rt.	100	4			
82+45	85+45	Lt.	60	6			
85+45	87+25	Rt.	60	4			
88+25	-	Rt.	-	1			
Lane OBS-E-B							
62+55	64+55	Lt.	100	3			
64+55	65+55	Rt.	100	2			
66+15	74+15	Rt.	60	11		4	
75+55	76+15	Rt.	100	2			
76+55	87+55	Lt.	100	12			
Ramp OBS-W-B							
7+58	13+58	Rt.	100	7			
13+58	14+58	Lt.	100	2			
15+18	19+38	Lt.	30	15			
Ramp B-OBS							
10+10	13+10	Lt.	100	2		2	
13+10	14+10	Rt.	100	2			
14+80	19+60	Rt.	40	8		5	
19+60	22+80	Lt.	80	5			
TOTAL			150	30			

Item 621 Word "Only"				
Station	Side	Calculations	Each	
From	To			
Bedford Freeway				
35+89	36+64	Lt.	2 x 2+1	5 **
Rel. McCracken Road				
51+45	52+95	Lt.	3	3
TOTAL				3
TOTAL 100% STATE				5 **

Item 621 Lane Arrows				
Station	Side	Calculations	Each	
From	To			
Rel. McCracken Road				
51+27	52+77		Turn Arrow	3
Bedford Freeway				
35+71	36+46		Turn Arrow	4
35+71			Turn Arrow	1
TOTAL				8

Item 621 Crosswalk Lines (White)					
Station		Side	Calculations	Lin. Ft.	
From	To			White	Yellow
Rel. McCracken Road					
50+92	50+98	Rt.&Lt.	89+79		168
Bedford Freeway					
35+36	35+42	Rt.&Lt.	120+110		230 **
TOTAL					168
TOTAL 100% STATE					230 **

Item 621 24" Broad Transverse Stripes (White)				
Station	Side	Calculations	Lin. Ft.	
From	To			
Eastbound I-480				
1169+55	1173+56	Rt.	1 x 830	830 *
Westbound I-480				
1178+91	1182+33	Lt.	1 x 695	695 *
Bedford Freeway				
59+12	60+88	Rt.	1 x 216	216 *
TOTAL				1741

Item 621 8" Channelizing Line (White)					
Station		Side	Calculations	Lin. Ft.	
From	To			White	Yellow
Eastbound I-480					
1169+55	1173+56	Rt.	2 x 401		802 *
1189+00	1193+00	Rt.	1 x 400		400 *
Westbound I-480					
1157+65	1159+65	Lt.	1 x 200		200 *
1178+91	1182+65	Lt.	2 x 374		748 *
Bedford Freeway					
35+46	36+16	Lt.	1 x 70		70 **
53+41	56+41	Lt.	1 x 300		300 *
59+12	60+88	Rt.	2 x 176		352 *
60+88	61+88	Rt.	1 x 100		100 *
Rel. McCracken Road					
51+02	52+52	Lt.	1 x 150		150
TOTAL					3052
TOTAL 100% STATE					70 **

Item 621 Island Markings (White)				
Station	Side	Calculations	Sq. Ft.	
From	To			
Bedford Freeway				
60+88	61+06	Rt.	(4+10) x 2 x 18	125
TOTAL				125

Item 621 4" Double Yellow Centerline						
Station		Side	Calculations	Lin. Ft.		
From	To			White	Yellow	
Bedford Freeway						
35+30	35+71	℄	1 x 41		41 **	
Rel. McCracken Road						
50+98	64+00	℄	1 x 1302		1302	
64+60	76+60	℄	1 x 1200		1200	
77+10	82+55	℄	1 x 545		545	
83+00	84+89	℄	1 x 189		189	
E. 154th St						
3+75	4+60	℄	1 x 85		85	
Blase Ave.						
13+00	13+94	℄	1 x 94		94	
Orchard Road						
5+00	11+00	℄	1 x 600		600	
Osborne Road						
0+20	5+74	℄	1 x 554		554	
Rel. Greenhurst Road						
8+30	15+36	℄	1 x 706		706	
TOTAL					1.00 Miles	5275
TOTAL 100% STATE					0.01 Miles	41 **

Item 621 24" Stop Bar (White)				
Station		Side	Calculations	Lin. Ft.
From	To			
Orchard Road				
5+00			1 x 23	23
Rel. McCracken Road				
51+02			1 x 36	36
E. 154th St.				
3+75			1 x 18	18
Blase Ave.				
13+00			1 x 18	18
Bedford Freeway				
35+46			1 x 50	50 **
Osborne Road Conn.				
0+20			1 x 10	10
TOTAL				105
TOTAL 100% STATE				50 **

Item 621 Curb Markings (Yellow)				
From	To	Side	Calculations	Lin. Ft.
Osborn Road				
18+60	19+70	Cul-de-Sac	263	263
TOTAL				263

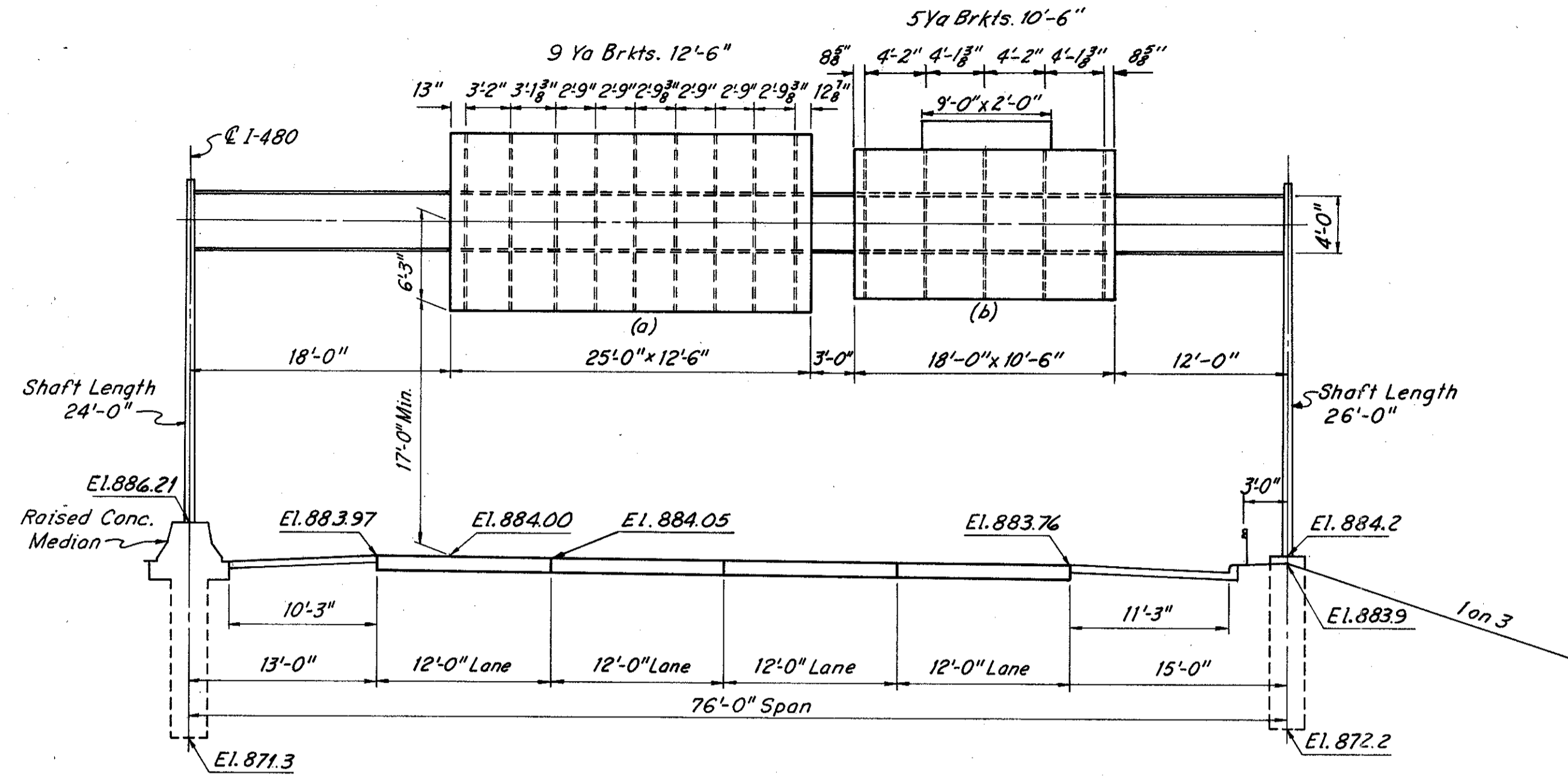
** 100% State
* Temporary Painting At Project Participation With Thermoplastic; Markings To Be Provided Later By A Stage Construction Pavement Marking Contract.

SIGN SUPPORT DETAILS

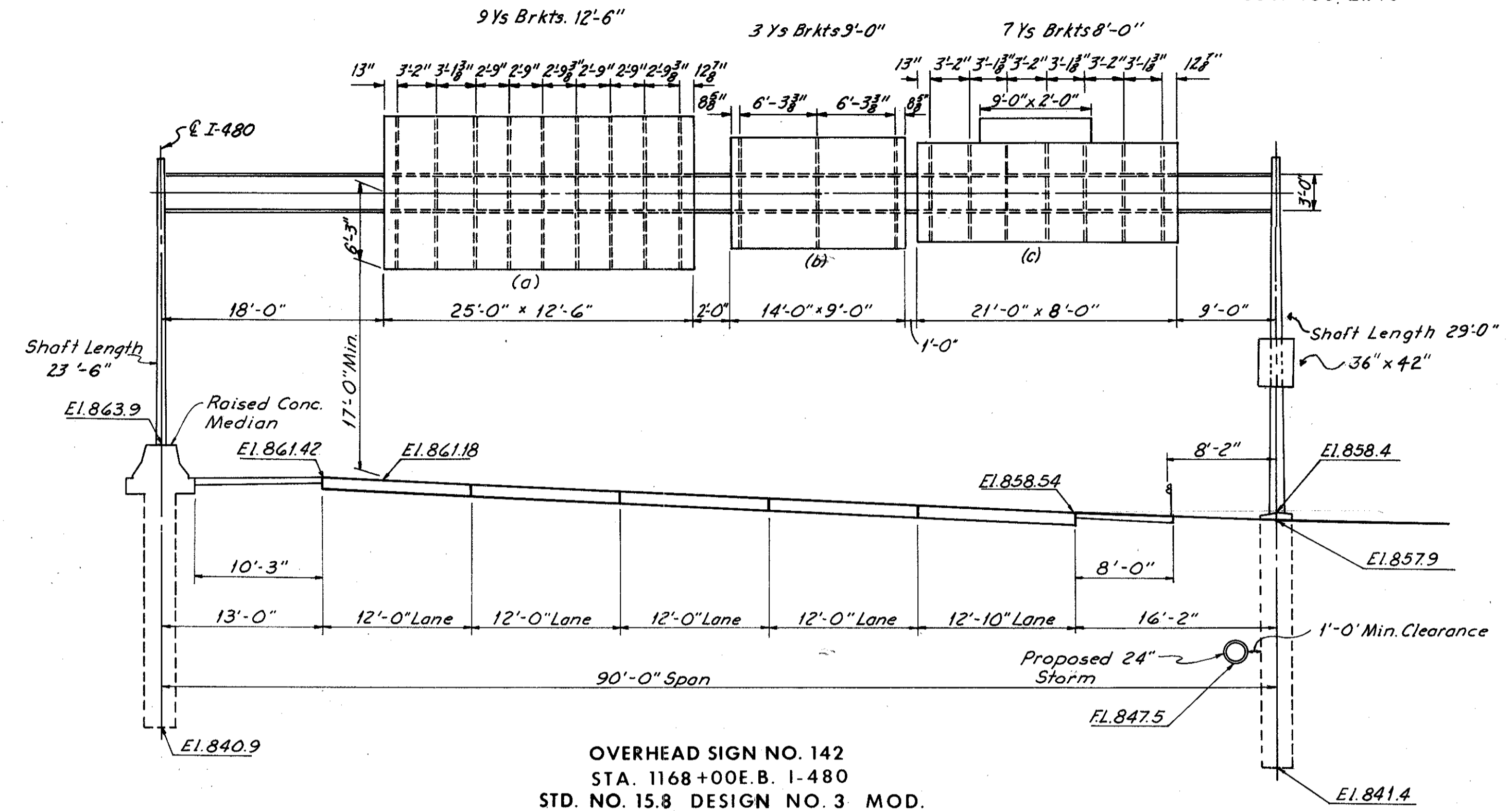
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

238
390

CUYAHOGA COUNTY
CUY. 480-21.40

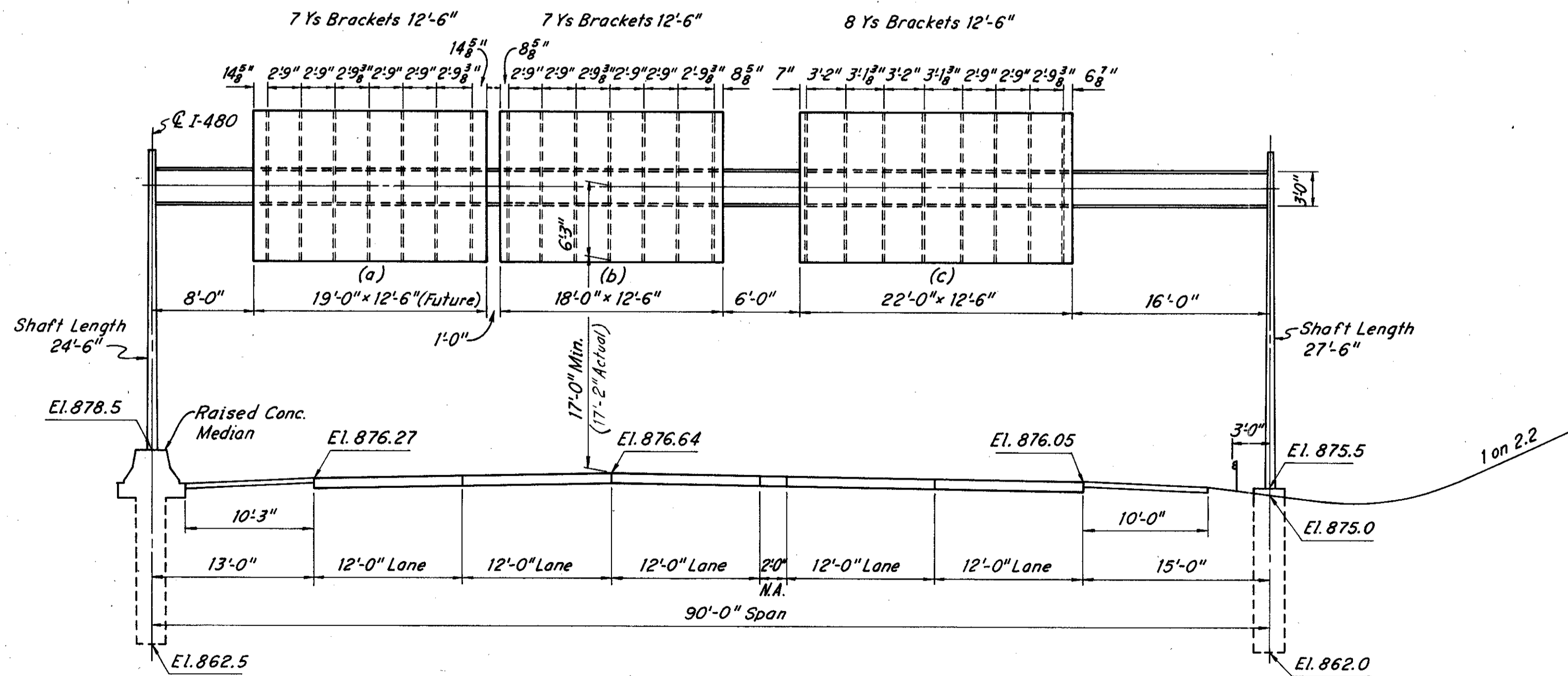


OVERHEAD SIGN NO. 141
STA. 1159+00 E.B. I-480
STD. NO. 7.6 DESIGN NO. 3 MOD.
76' - 0" SPAN

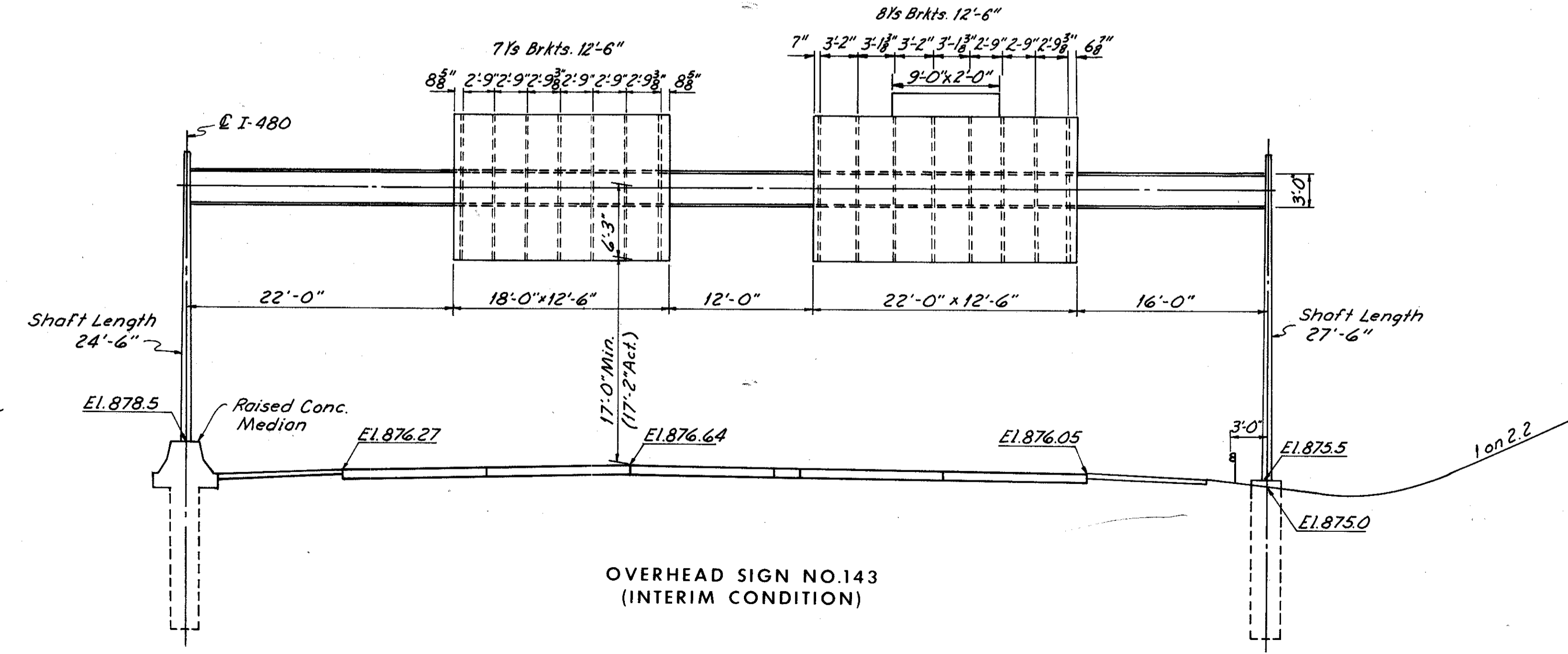


OVERHEAD SIGN NO. 142
STA. 1168+00 E.B. I-480
STD. NO. 15.8 DESIGN NO. 3 MOD.
90' - 0" SPAN

Foundations are located in Sandy Silt.
Increase "D" Min. by 50%.



OVERHEAD SIGN NO. 143
STA. 1182+33 W.B. I-480
STD. NO. 15.8-DESIGN NO. 3 MOD.
90' - 0" SPAN



OVERHEAD SIGN NO. 143
(INTERIM CONDITION)

SCALE 1/4" = 1'-0"
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

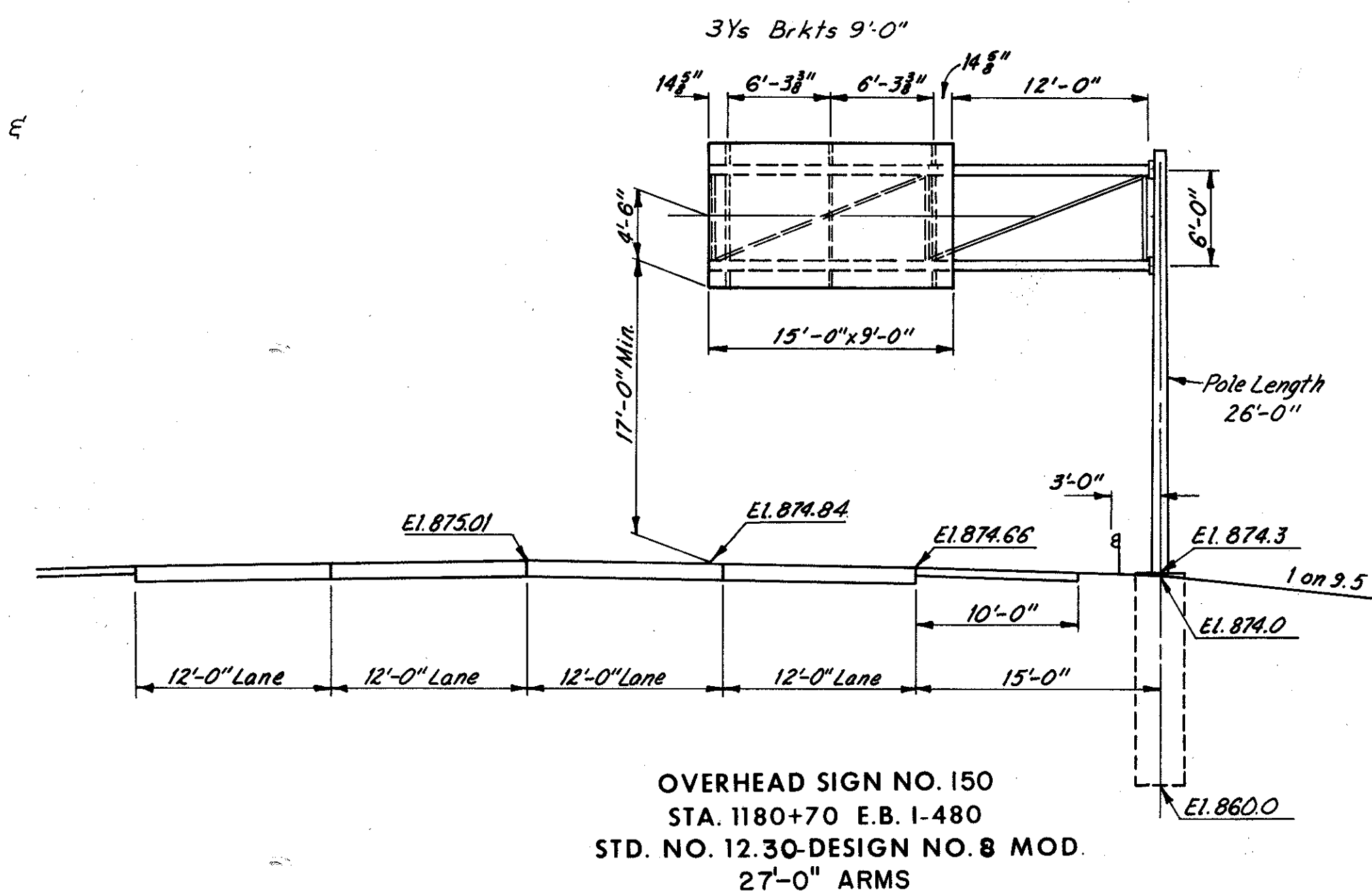
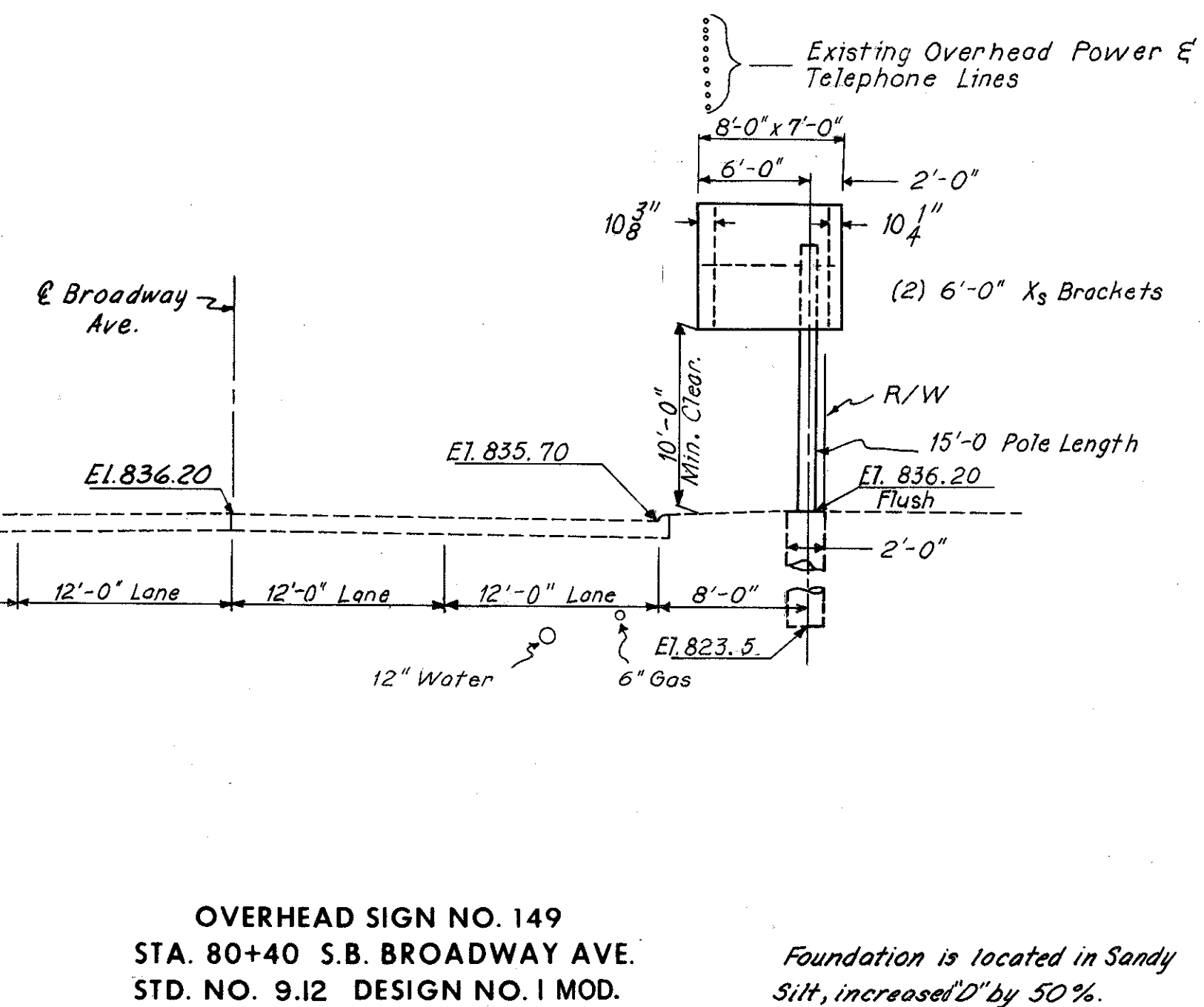
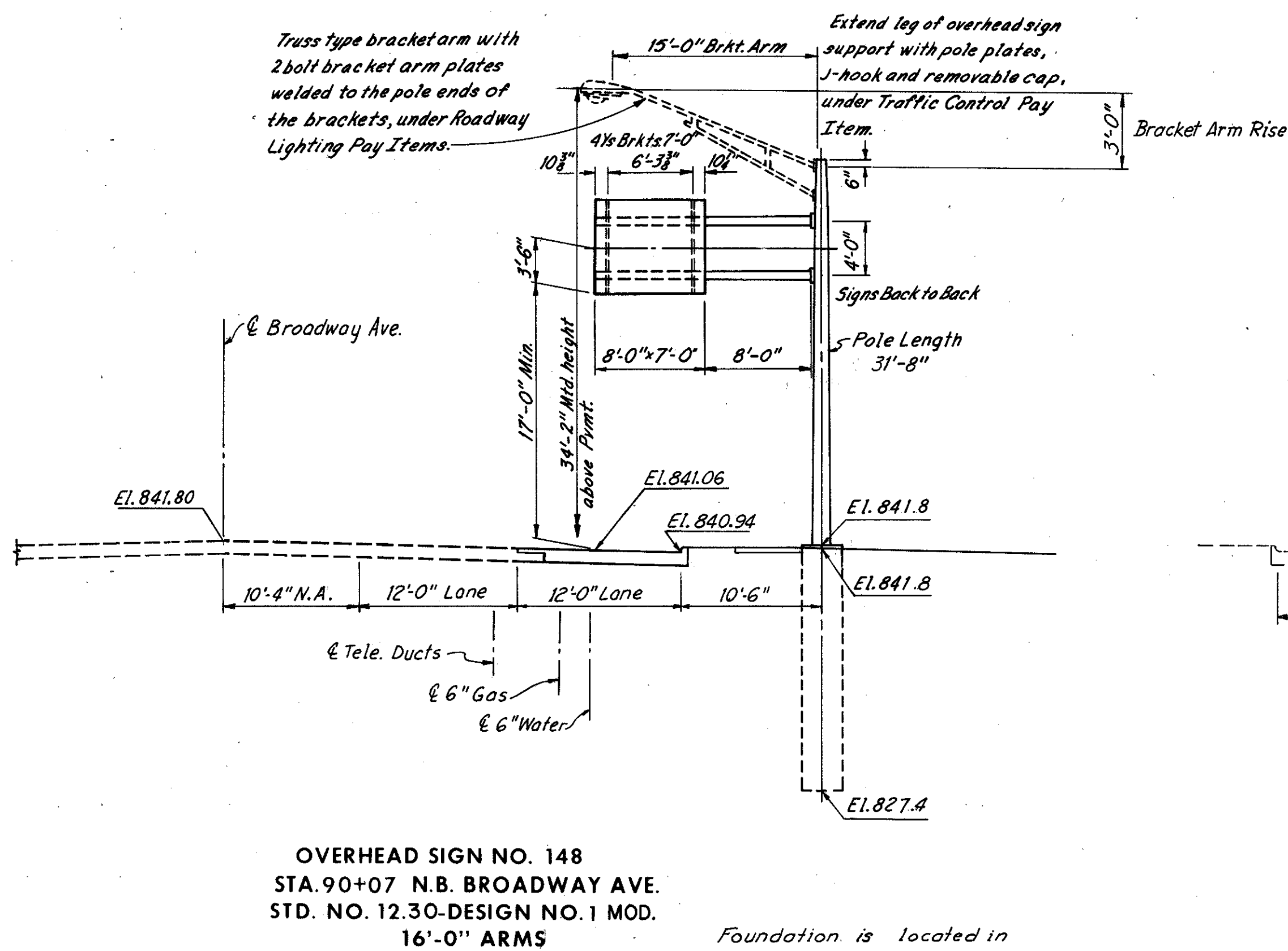
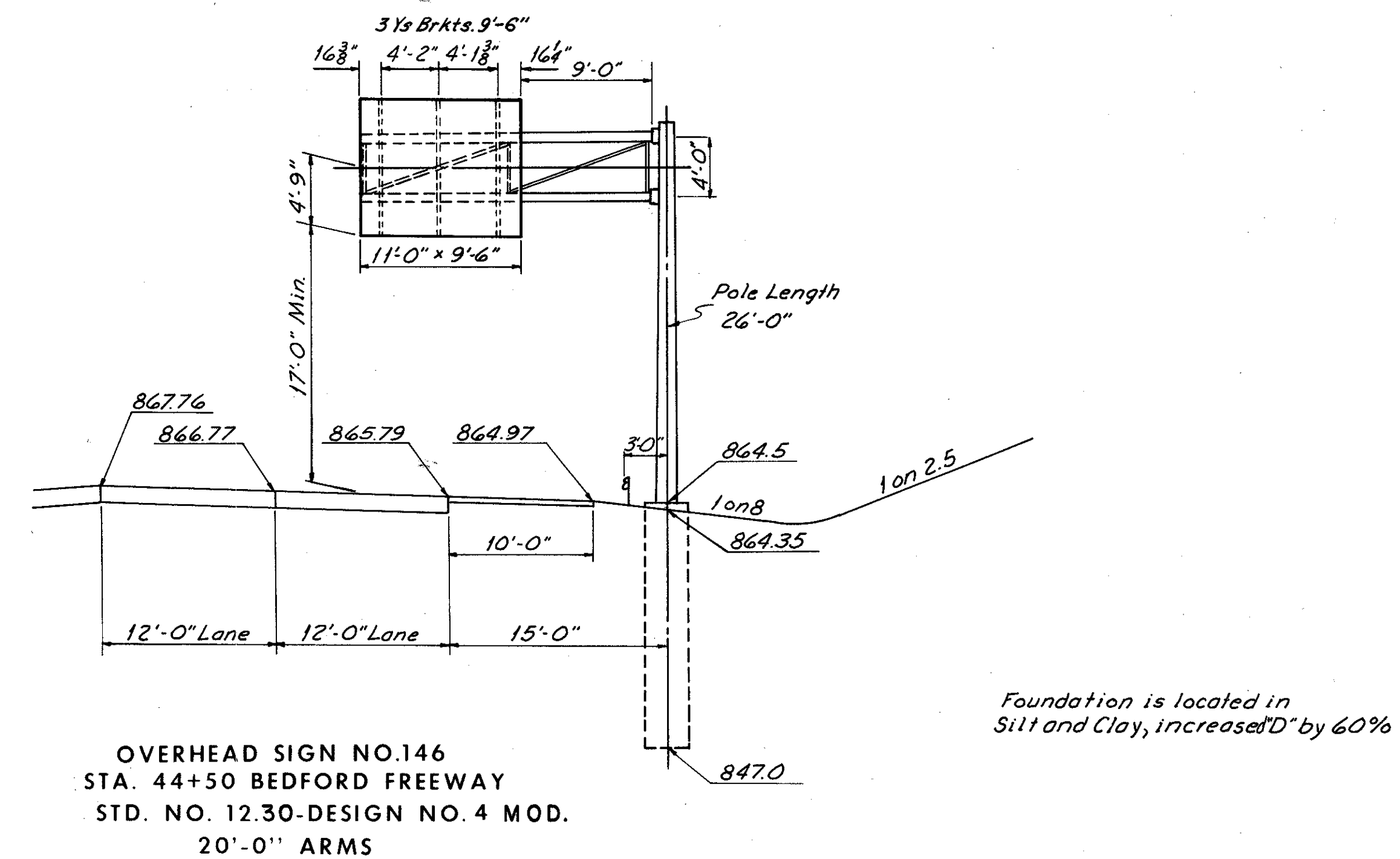
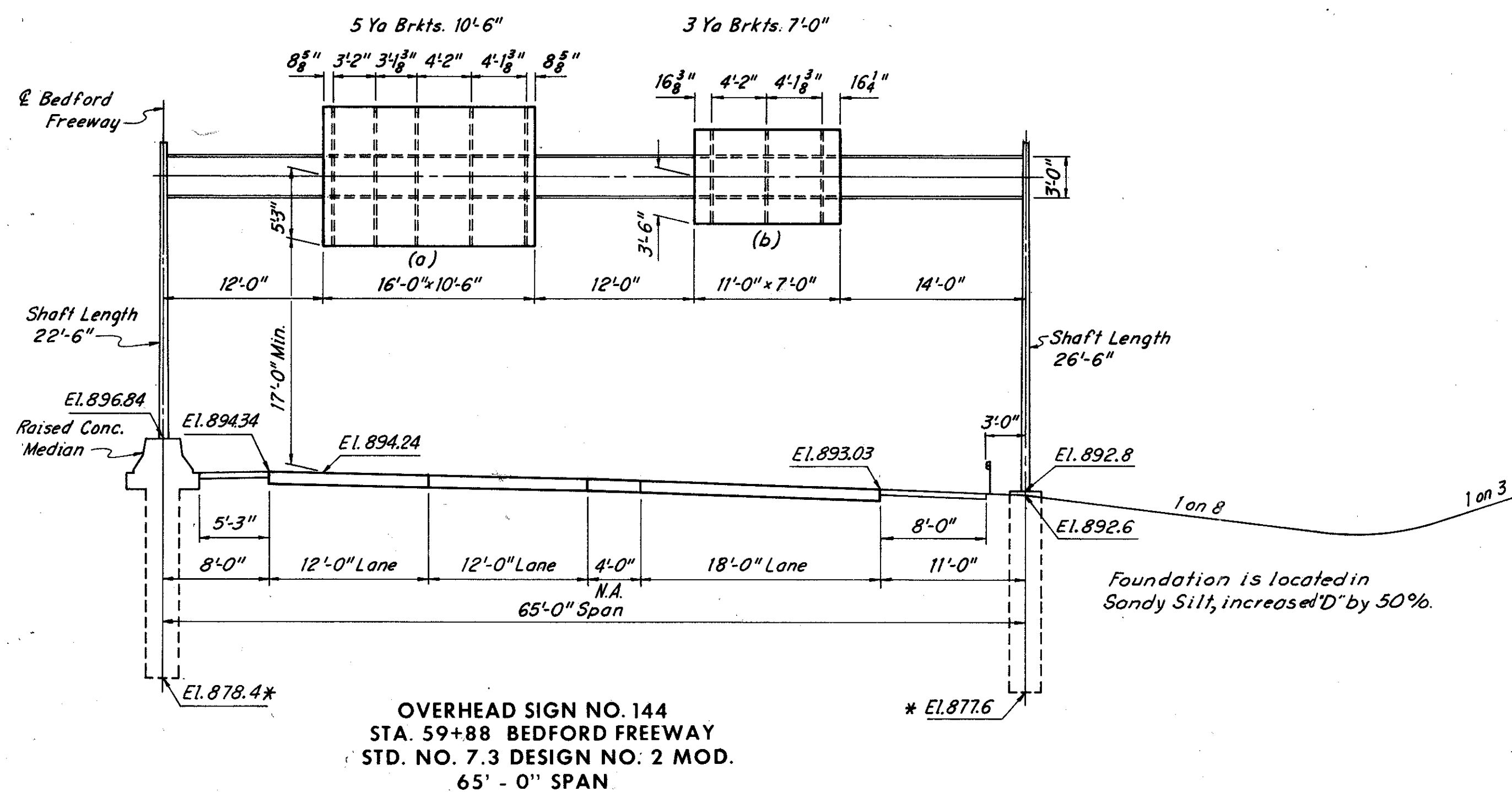
Note:
Sign sizes shown on this sheet are actual
and include the added 1'-0" for glare shields.
Signs shown on this sheet are those which
will be a part of the permanent installation.

SIGN SUPPORT DETAILS

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

239
390

CUYAHOGA COUNTY
C.U.Y. 480-21.40



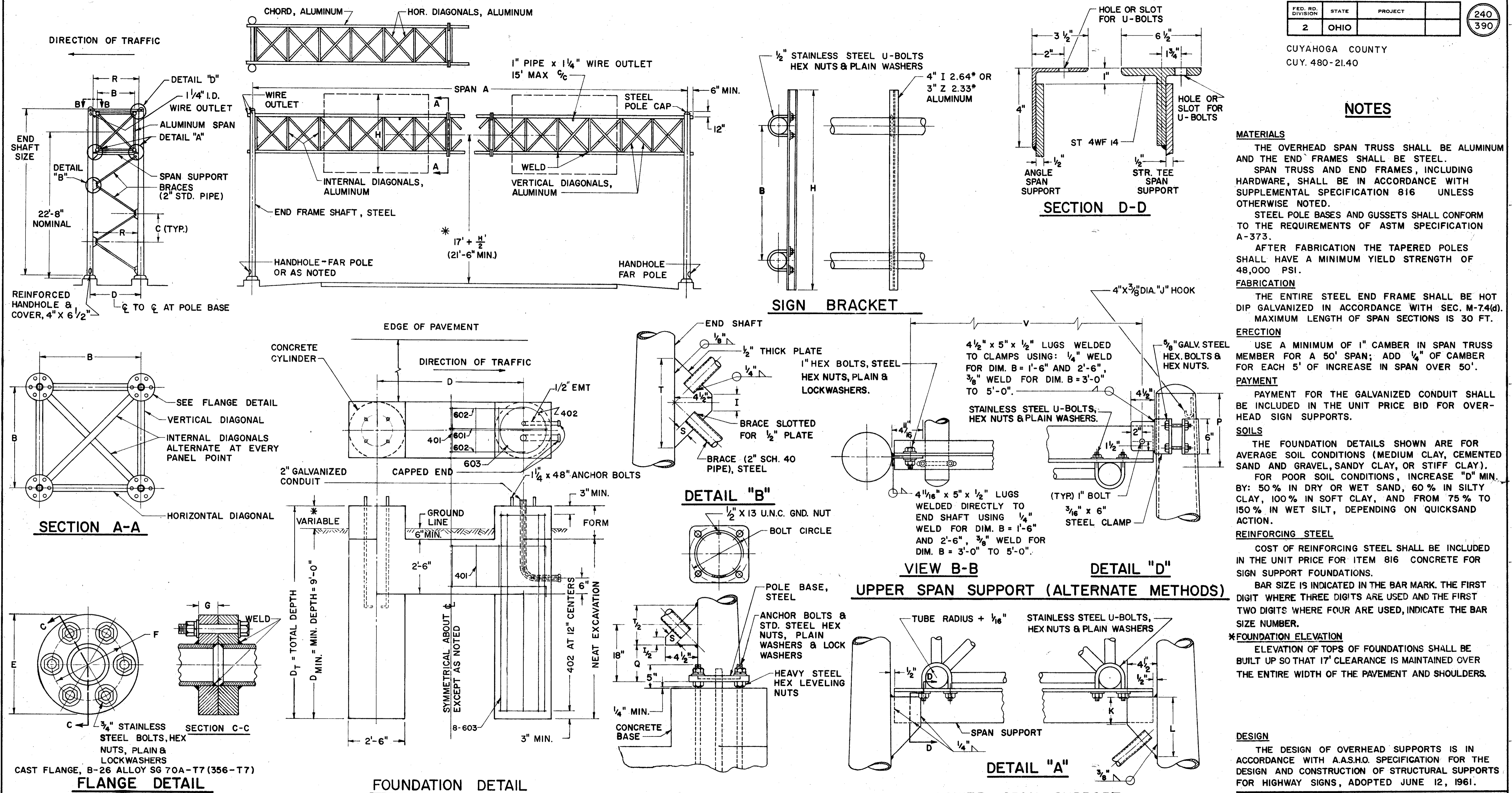
SCALE 1/4" = 1'-0"
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

Note:
Sign sizes shown on this sheet are actual and include the added 1'-0" for glare shields.
Signs shown on this sheet are those which will be a part of the permanent installation.

CUYAHOGA COUNTY
CUY. 480-21.40

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 816 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-74(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 816 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.
- 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.



(RIGHT HAND SHOWN - LEFT HAND OPPOSITE)

POLE BASE DETAIL

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 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"	101 2-0" 2-0" 102 2-0"
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"	102 2-0"
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"	601 4 D+ 4'-0" 101 602 8 D+ 2'-0" 101 603 32 D _T -6" STR.
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"	103 2'-0"

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

OVERHEAD SIGN SUPPORTS	816 No. 7.3	DATE 7-25-62 5-5-64
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APPROVED *Robert E. Lower*
ENGINEER OF TRAFFIC

CUYAHOGA COUNTY
CUY. 480-2140

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 816 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. 711.02. 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.

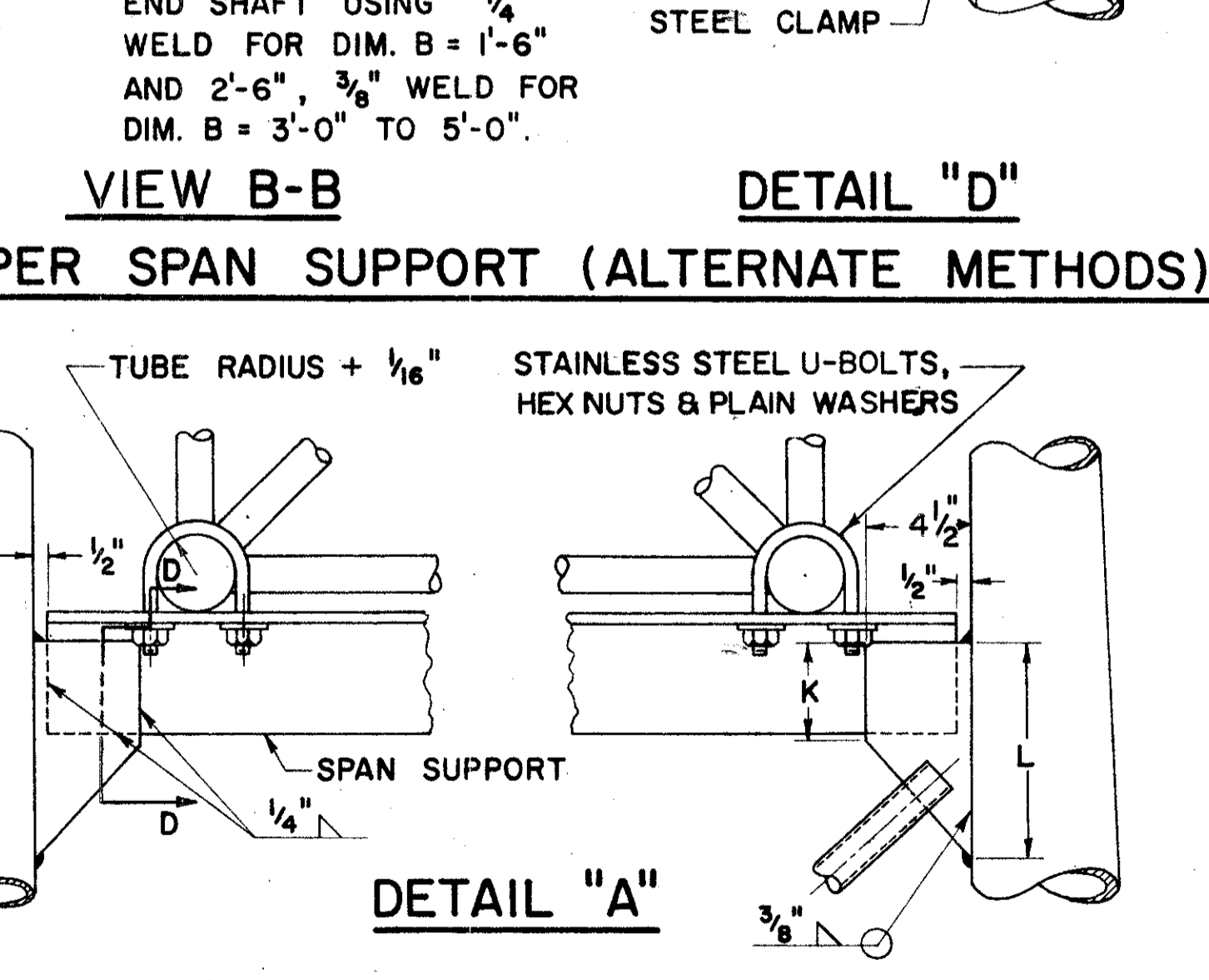
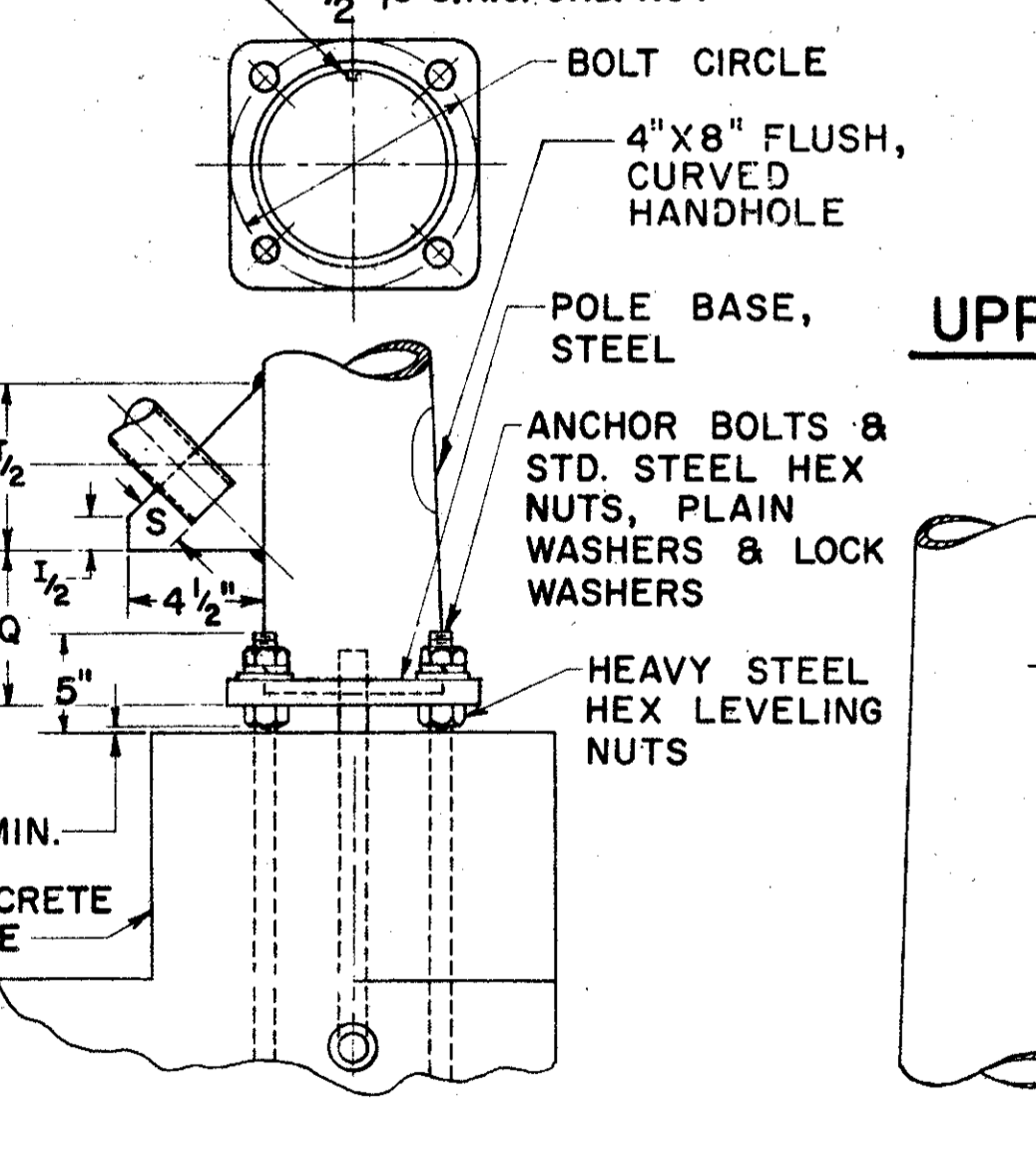
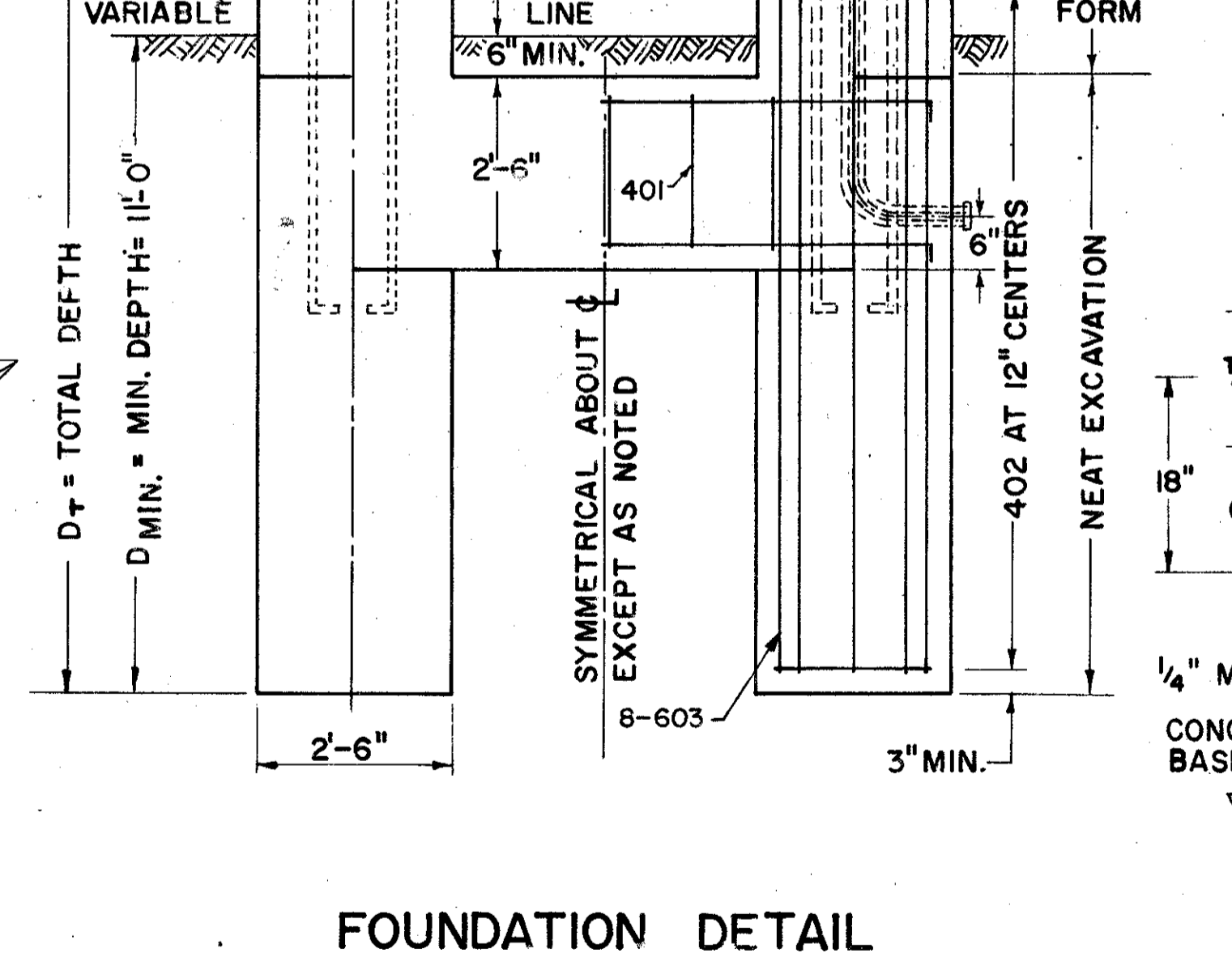
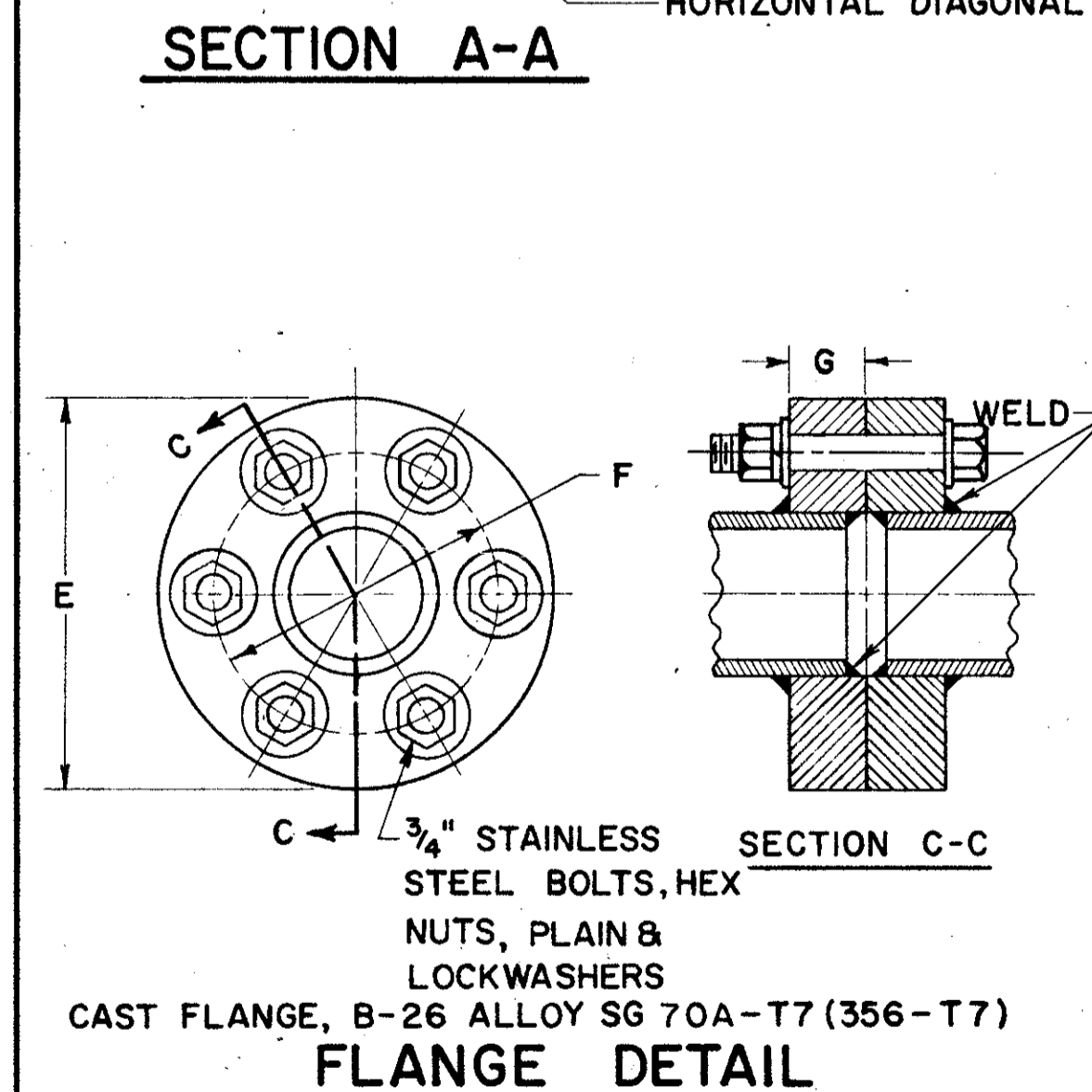
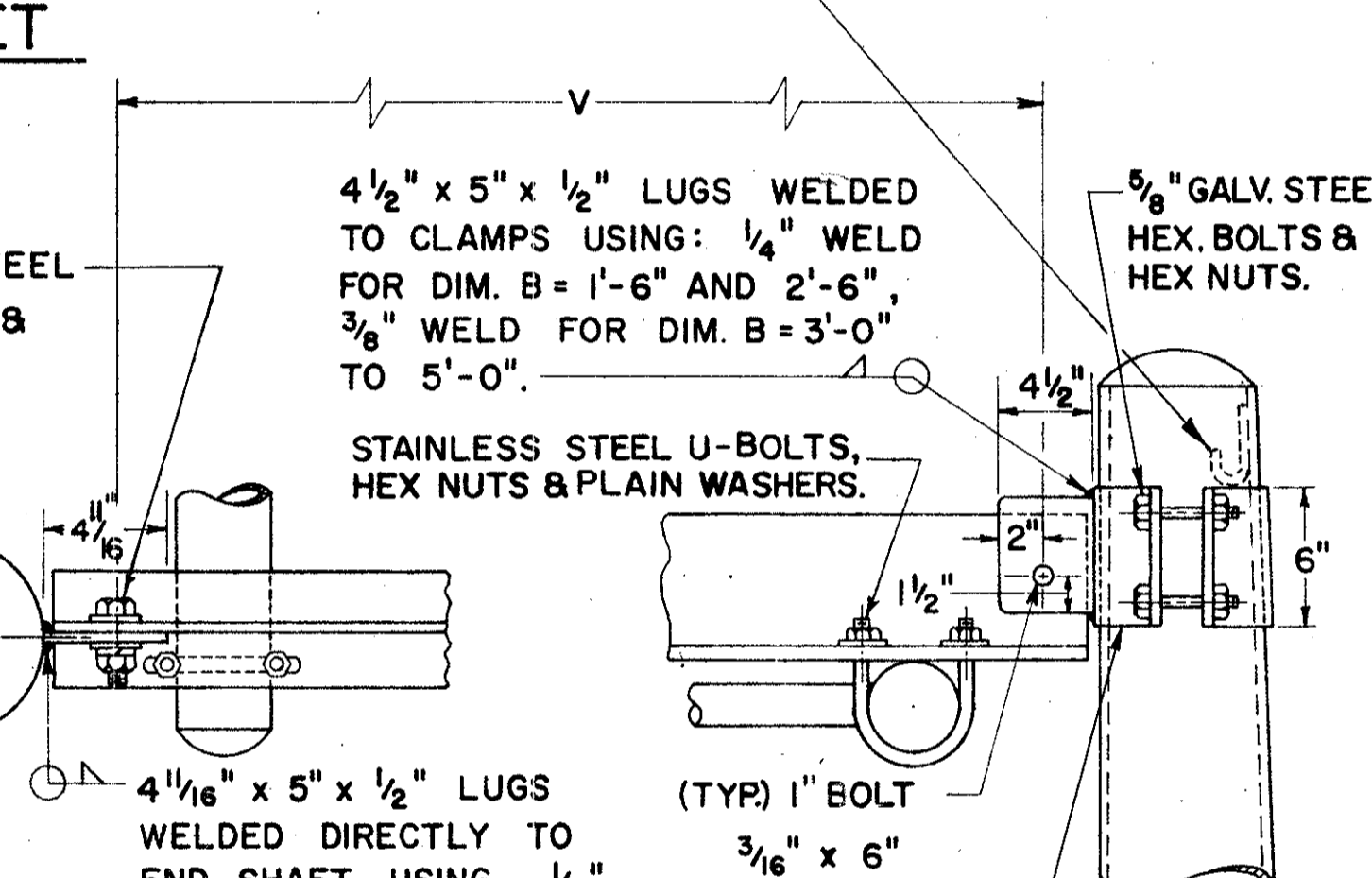
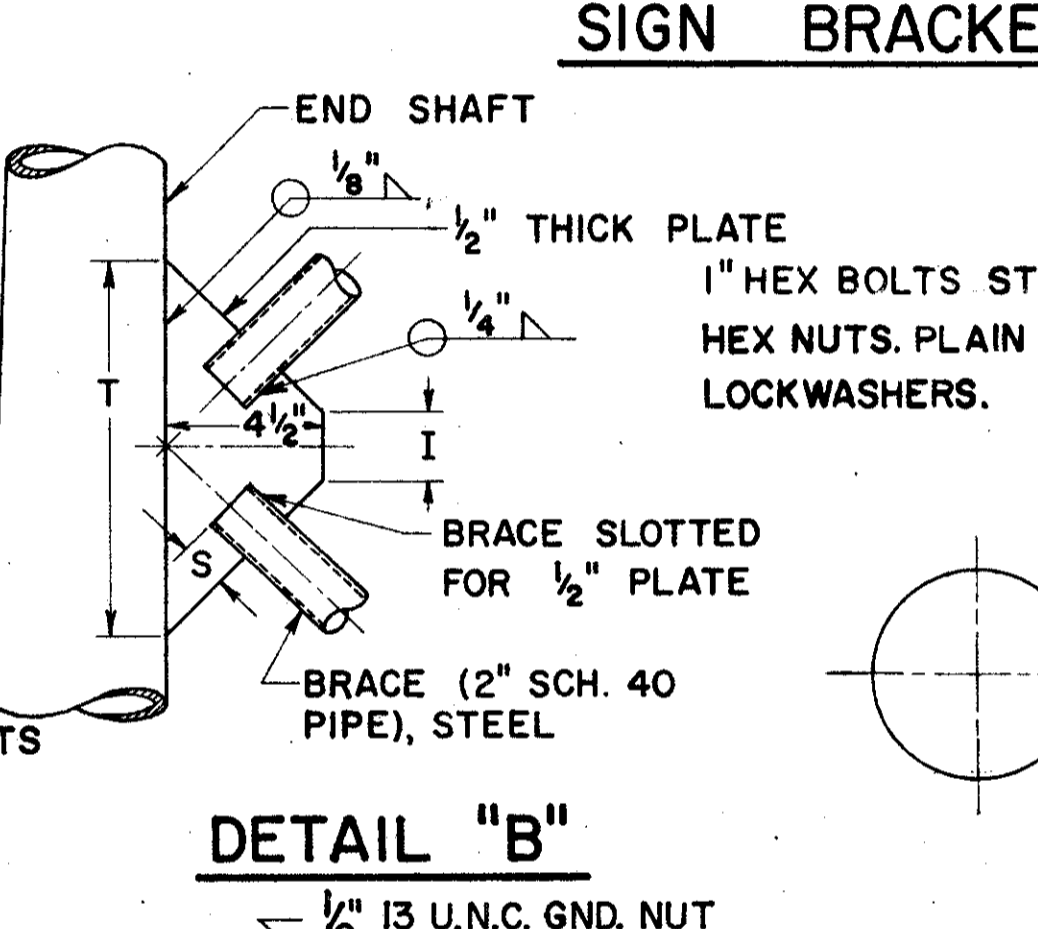
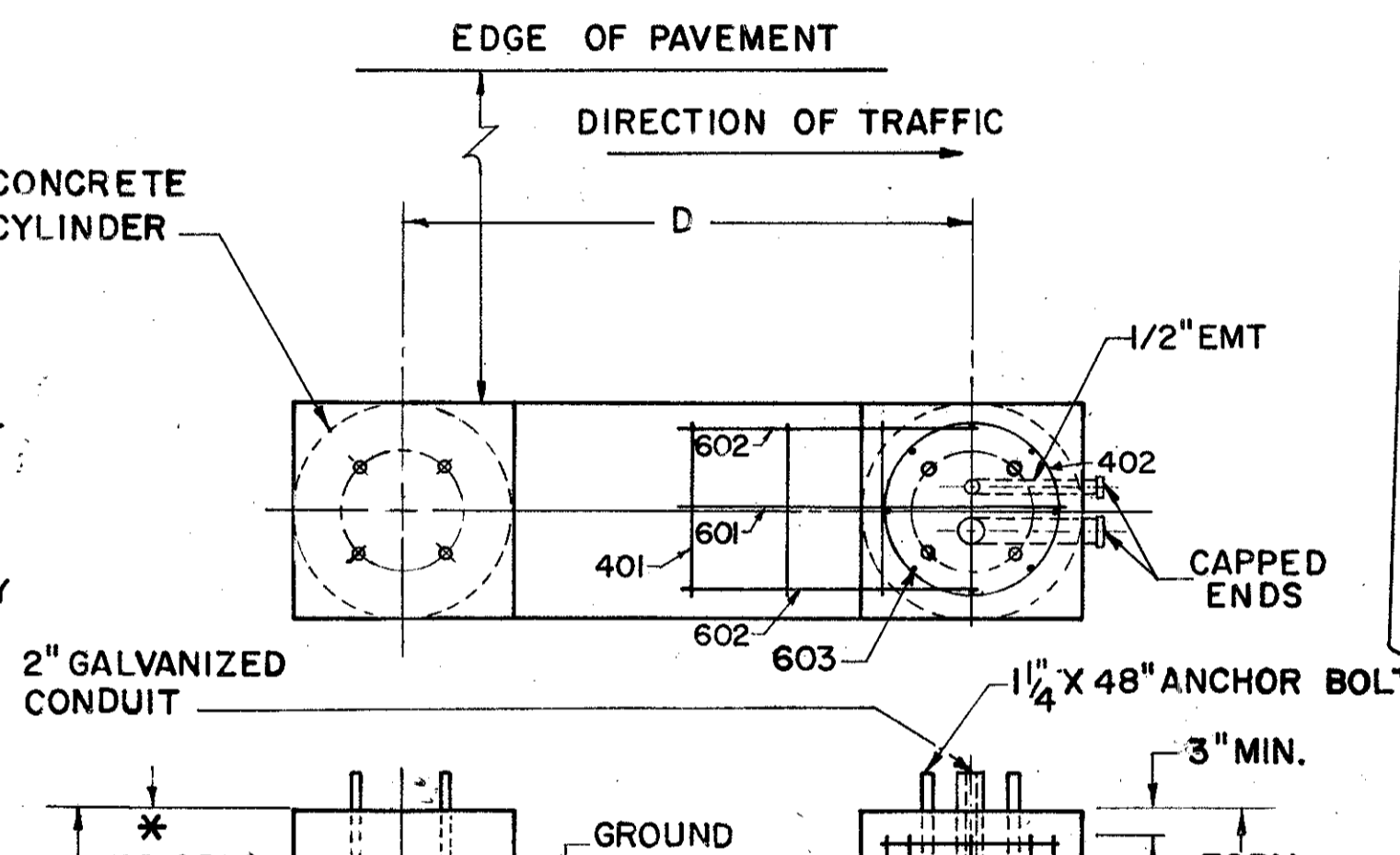
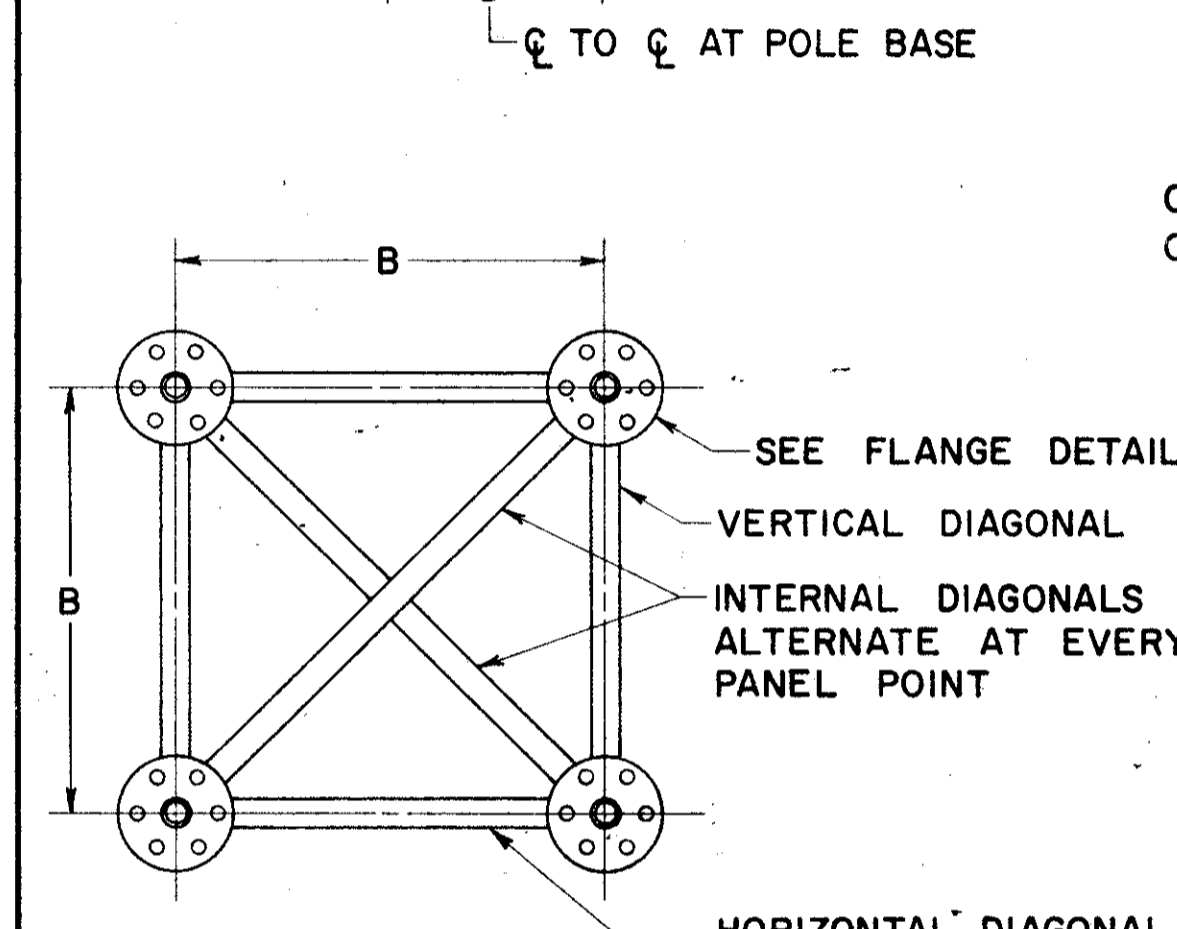
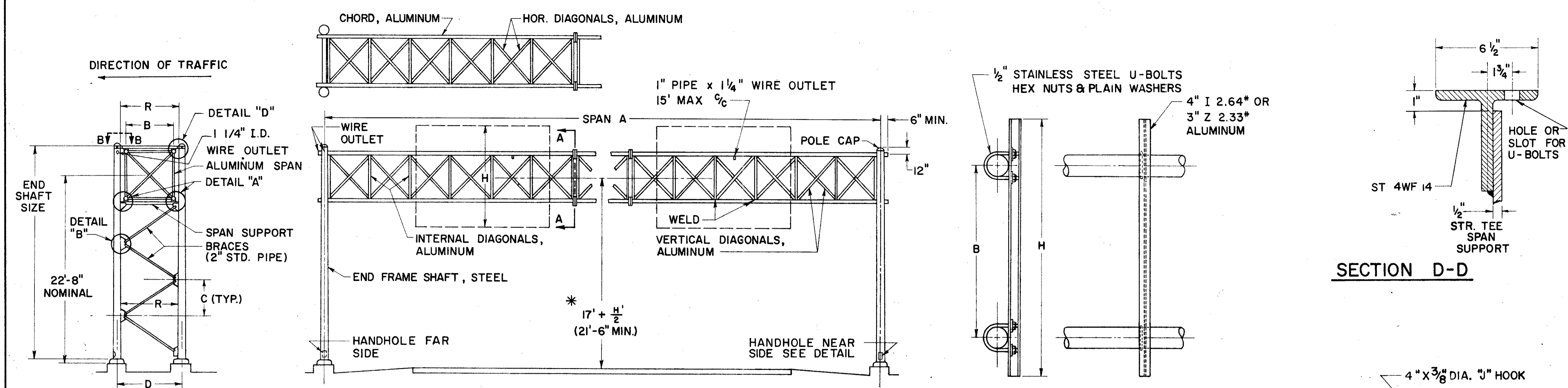
SOILS
THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND AND GRAVEL, SANDY CLAY, OR STIFF CLAY). FOR POOR SOIL CONDITIONS, INCREASE "D" MIN. BY: 50% IN DRY OR WET SAND, 60% IN SILTY CLAY, 100% IN SOFT CLAY, AND FROM 75% TO 150% IN WET SILT, DEPENDING ON QUICKSAND ACTION.

REINFORCING STEEL
COST OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM 816 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.

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			
																									MARK	NO.	LENGTH	TYPE
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 13/16"	7 1/16"	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"	401	12" C/C	8'-6"	102
2.	70' thru 75'	4'-0"	4'-10 1/4"	5'-7"	9 1/4"	8" X 6.22 X 25'-6", 3GA	6'-7 7/8"	7 1/16"	3 3/8"	5 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"	11"	Split Tee 4'-10"	4 3/4" X .188"	2" X .188"	1.900" X .145"	402	12" C/C	7'-6"	103
3.	76' thru 80'	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 5/8"	11"	Split Tee 4'-10"	5 1/2" X .250	2 1/2" X .188"	1.900" X .145"	601	4	D+4'-0"	101
4.	81' 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"	11"	Split Tee 5'-10"	5 1/2" X .250	2 1/2" X .188	2 1/2" X .188	602	8	D+2'-0"	101
																									603	32	D+6'-6"	STR.

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

OVERHEAD SIGN SUPPORTS 816 No.7.6

DATE: 5-6 64, 5-5 64, 6-20-60

APPROVED: _____ ENGINEER OF TRAFFIC

NOTES

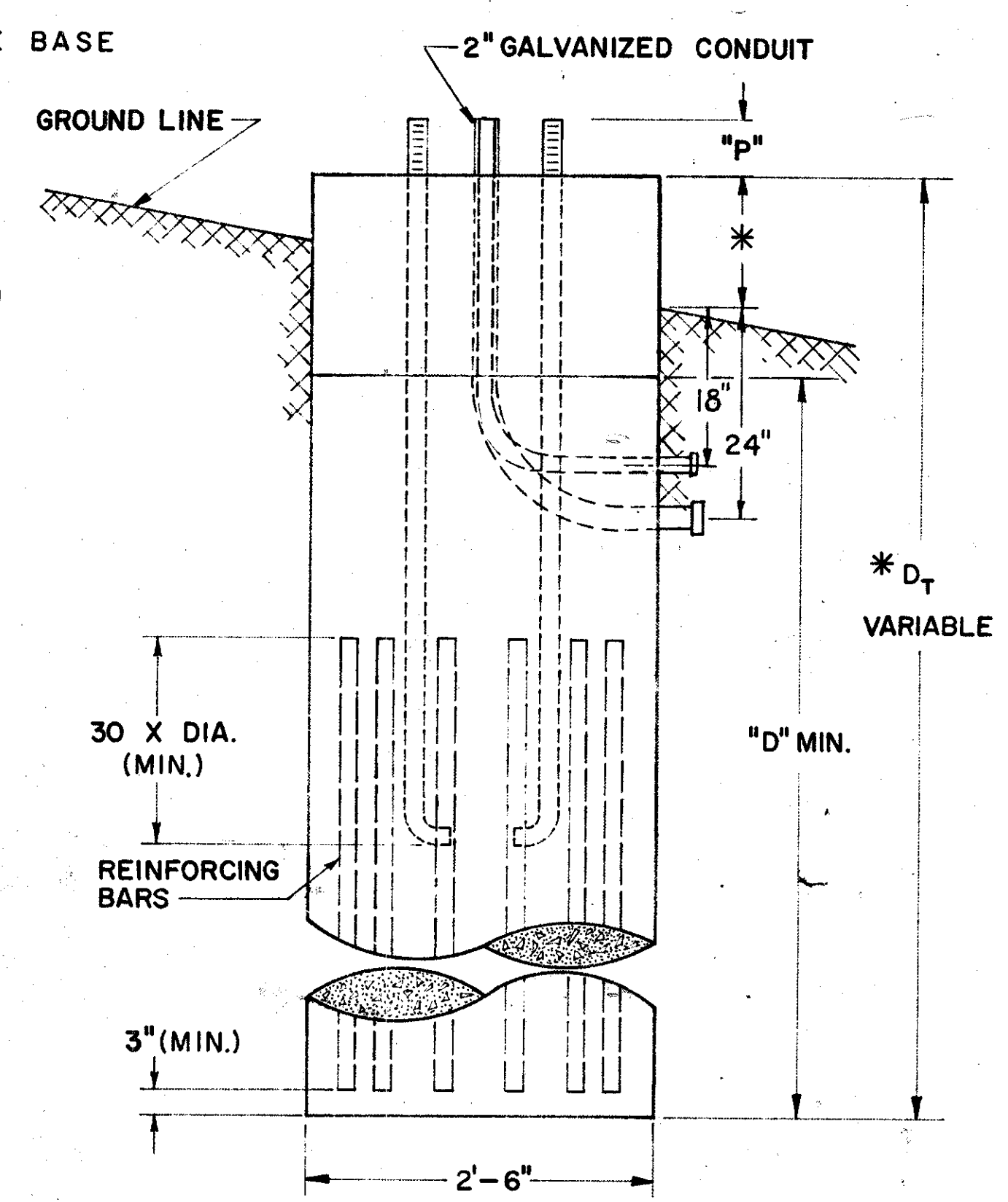
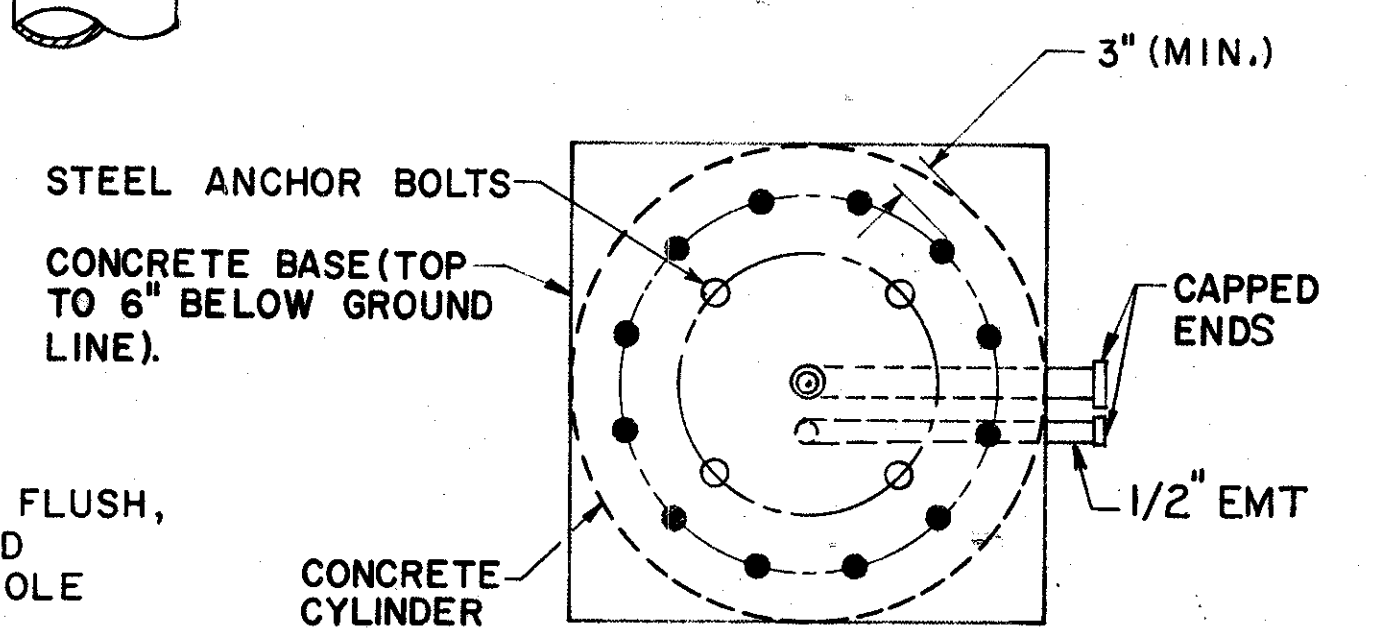
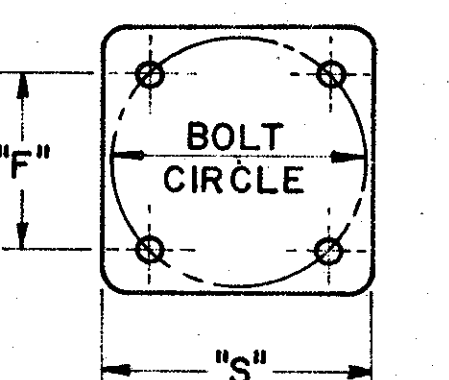
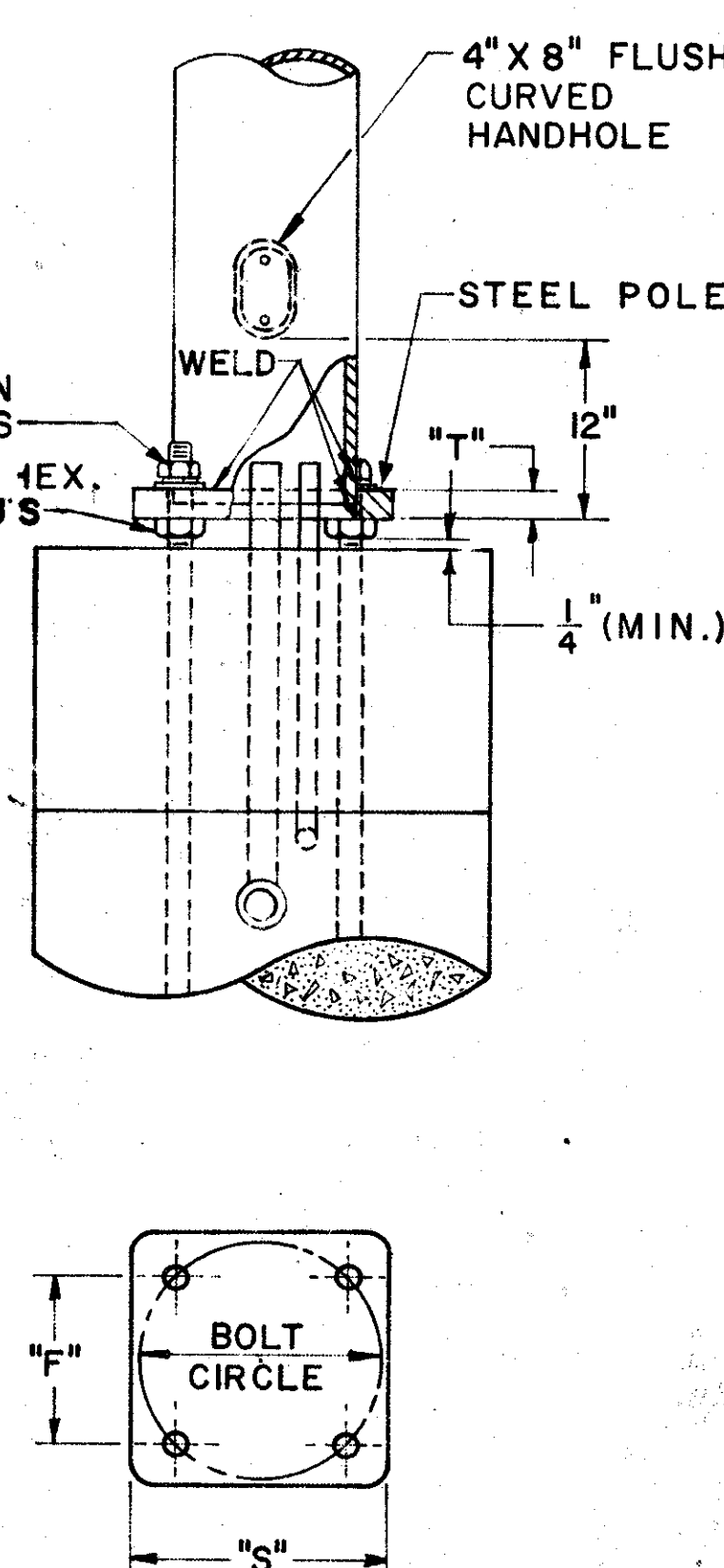
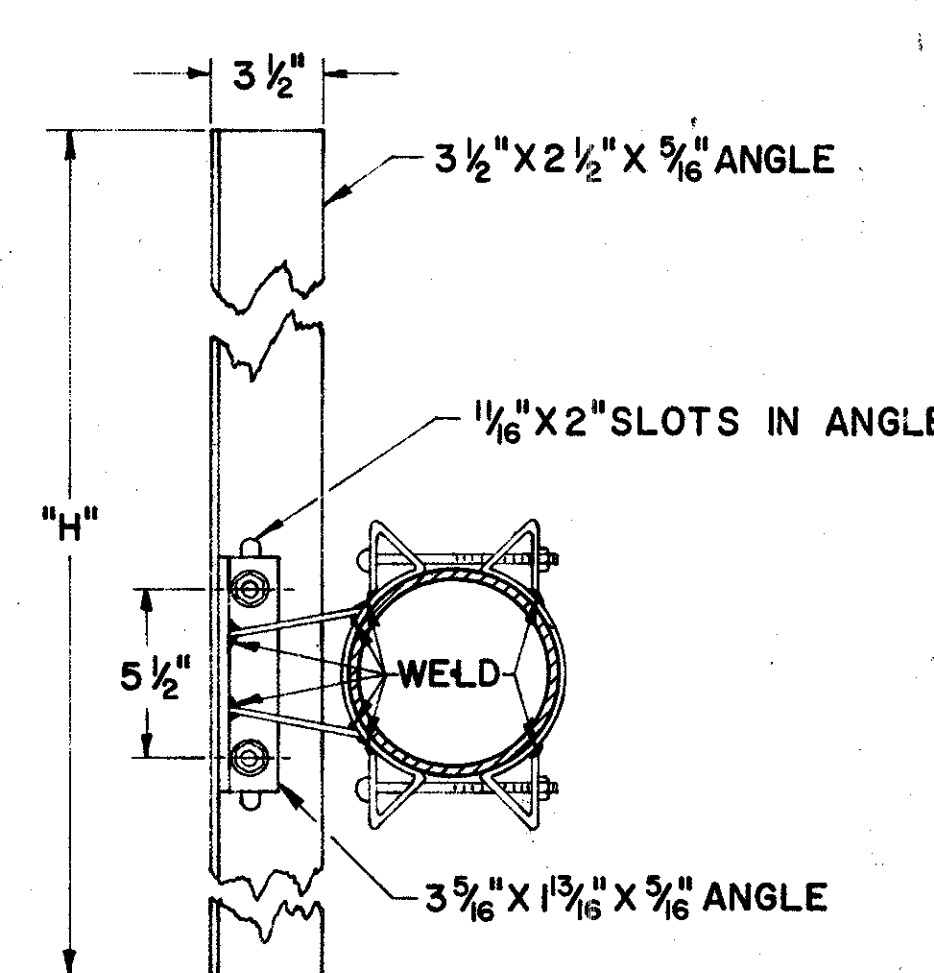
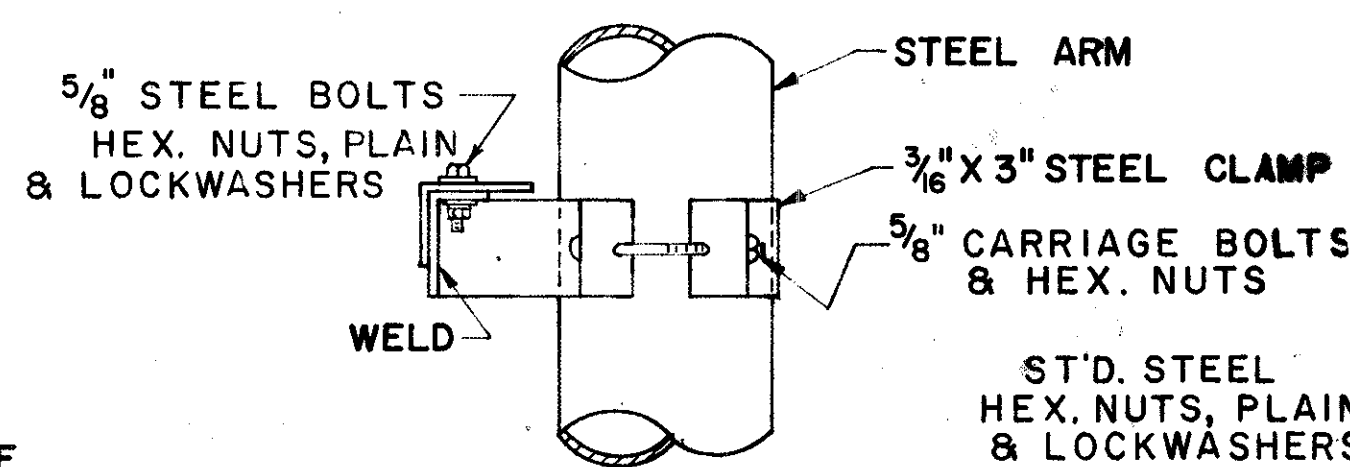
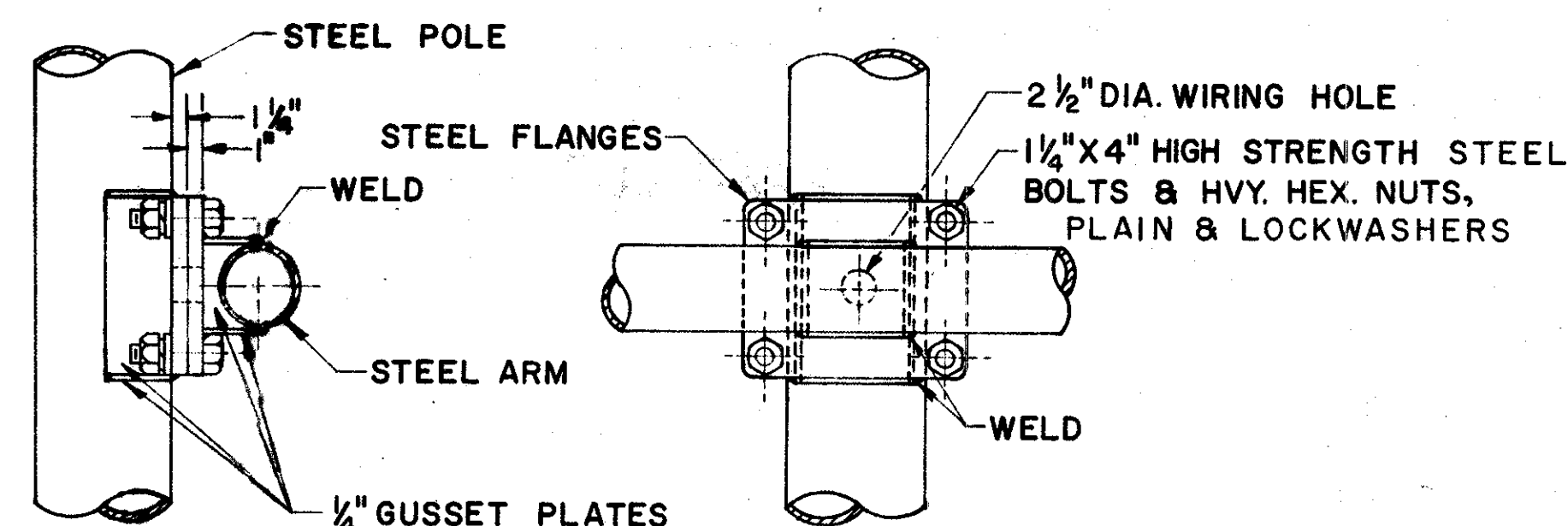
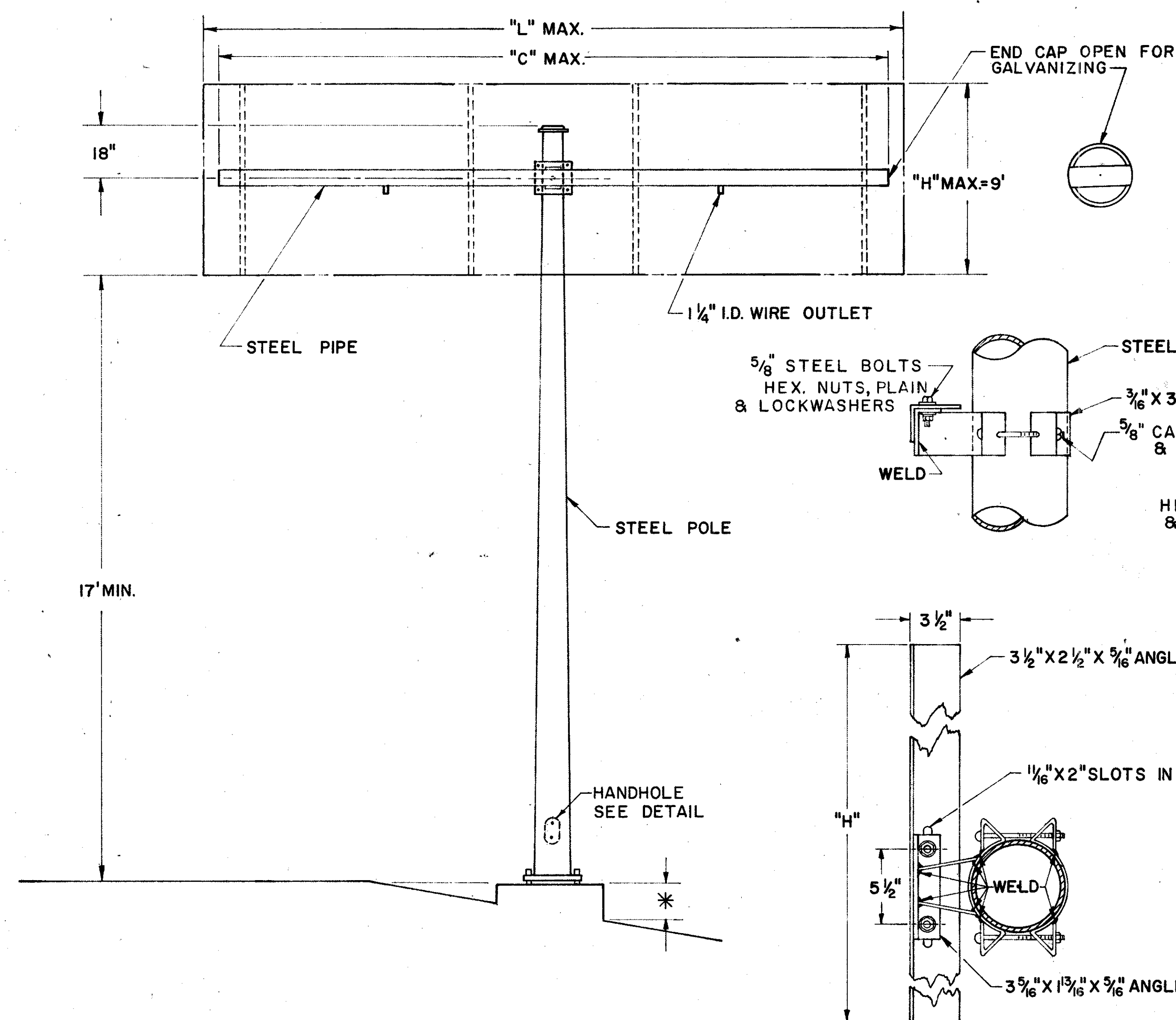
FABRICATION—ALL PORTIONS OF THE SIGN SUPPORT, INCLUDING SIGN ATTACHMENTS, SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF A.S.T.M. DESIGNATIONS A-123 AND A-153. THE CONDUIT SHALL BE GALVANIZED IN ACCORDANCE WITH SEC. 625.13 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OVERHEAD SIGN 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.

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 A 193 GRADE B7. AFTER FABRICATION TAPERED POLES 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_T" 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 816 CONCRETE FOR SIGN SUPPORT FOUNDATION.



SIGN ATTACHMENT DETAIL

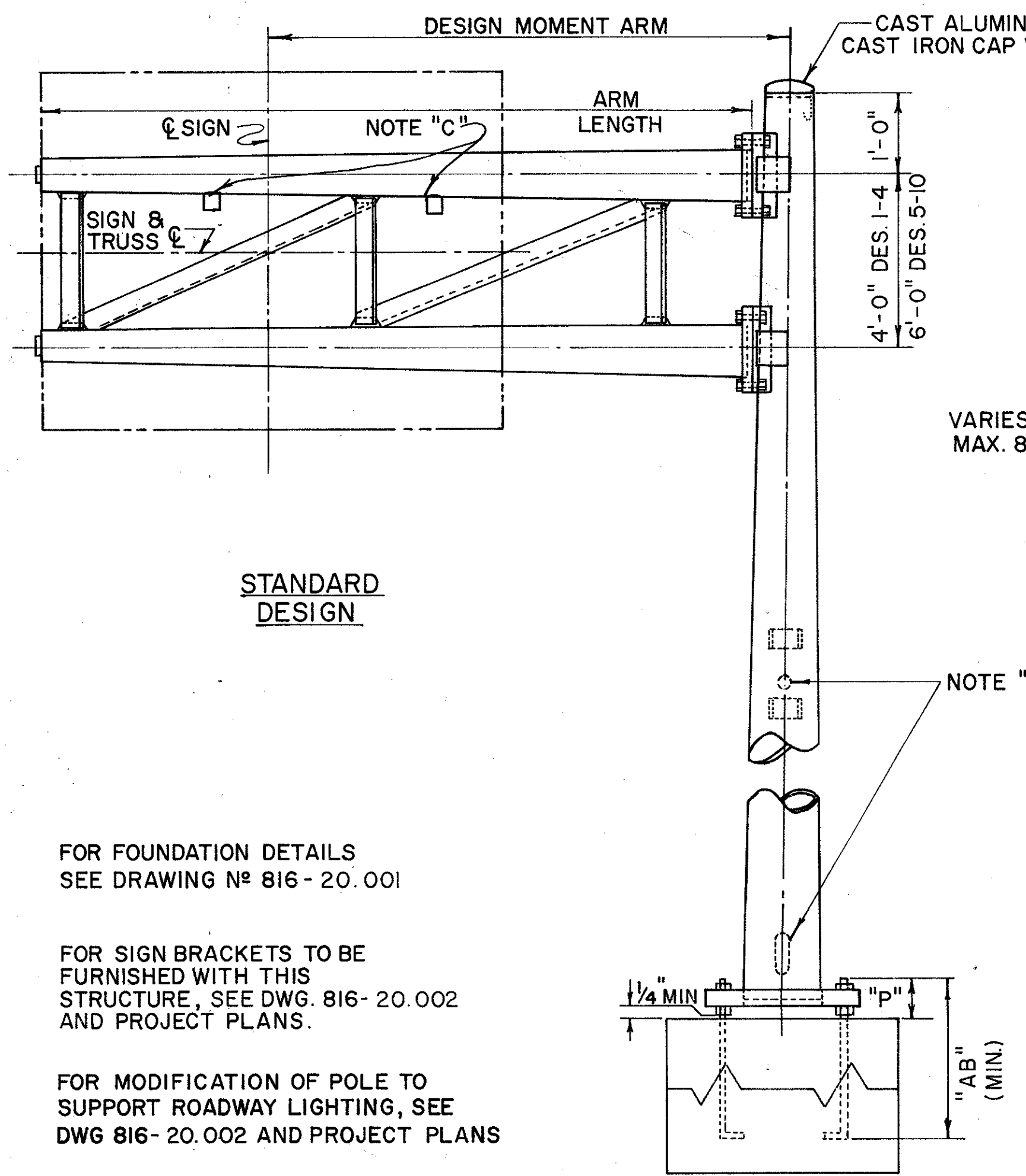
POLE DETAIL

FOUNDATION DETAIL

DESIGN NO.	POLE SIZE	PIPE SIZE	DIM C	DIM F	DIM P	DIM S	DIM T	BOLT CIRCLE	ANCHOR BOLT SIZE	MAX SIGN AREA	MAX. "L" WITH MAX. SIGN AREA	"D" MIN.	REINF. BARS	
													TYPE	NO.
1	7ga, 11" X 7.99 X 21'-6"	4" SCH. 40 GRADE A	18'	10 5/8"	6 1/2"	15 5/8"	1 1/2"	15"	1 1/2" X 60"	60	24'-9"	7'-0"	#6	8
2	3ga, 13" X 9.99 X 21'-6"	4" SCH. 80 GRADE A	14'	12 3/4"	7 3/4"	18 1/2"	2"	18"	3/4" X 90"	120	16'-9"	8'-6"	#7	12
3	3ga, 13" X 9.99 X 21'-6"	6" SCH. 40 GRADE A	20'	12 3/4"	7 3/4"	18 1/2"	2"	18"	3/4" X 90"	120	24'-0"	9'-0"	#7	12
1 MOD.	3ga, 8" X 5.9 X 15'-0"	4" SCH. 40 GRADE A	18'	7 3/4"	5 1/4"	11 1/2"	1 1/2"	11"	1/4" X 48"	60	20'-0"	8'-0"	#4	8

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.

BUREAU OF TRAFFIC OHIO DEPARTMENT OF HIGHWAYS		DATE 1-19-62 3-30-62
OVERHEAD SIGN SUPPORT	816 No.912	
APPROVED <i>Robert E. Linn</i> ENGINEER OF TRAFFIC		

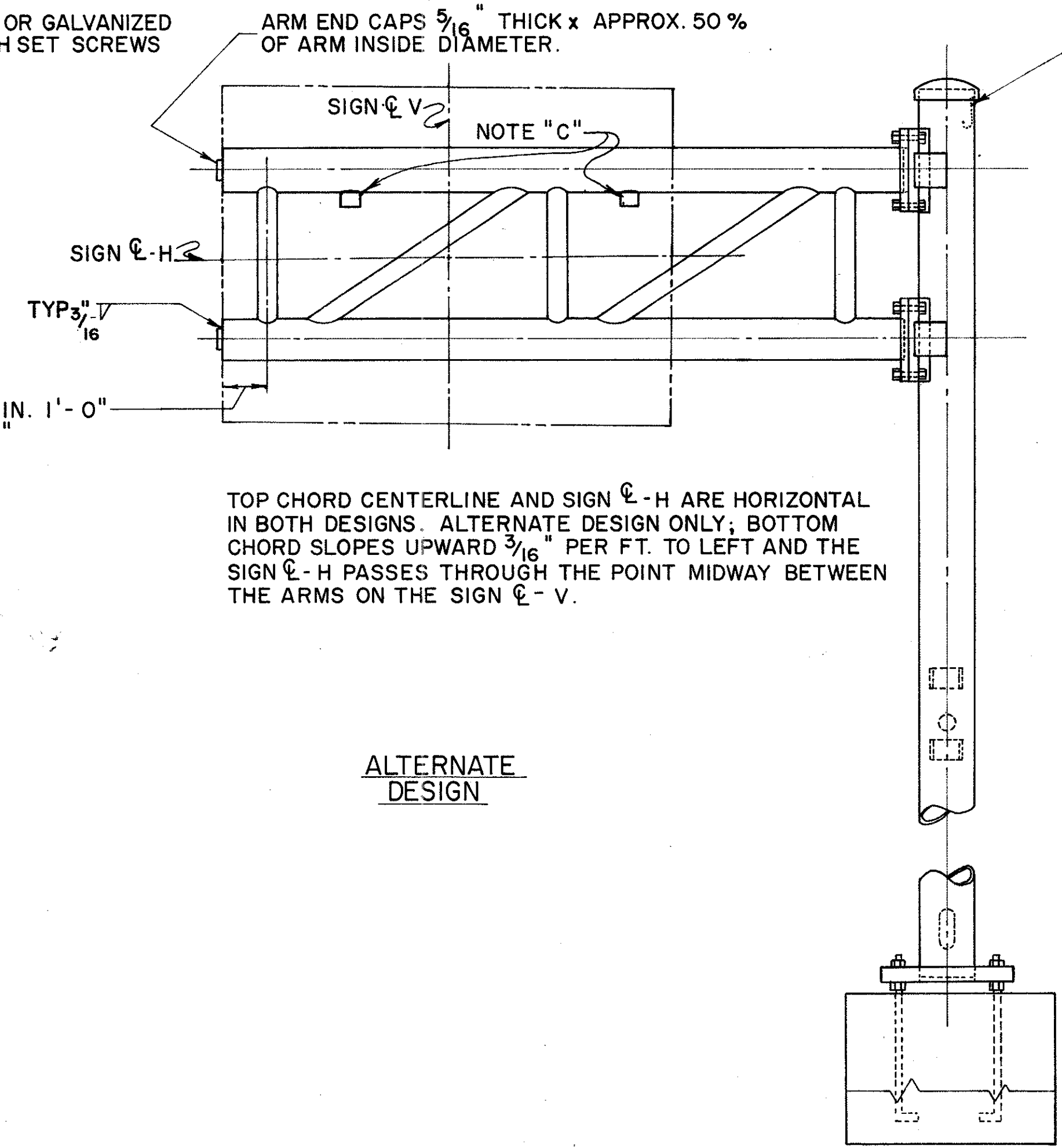


STANDARD DESIGN

FOR FOUNDATION DETAILS
SEE DRAWING NO 816-20.001

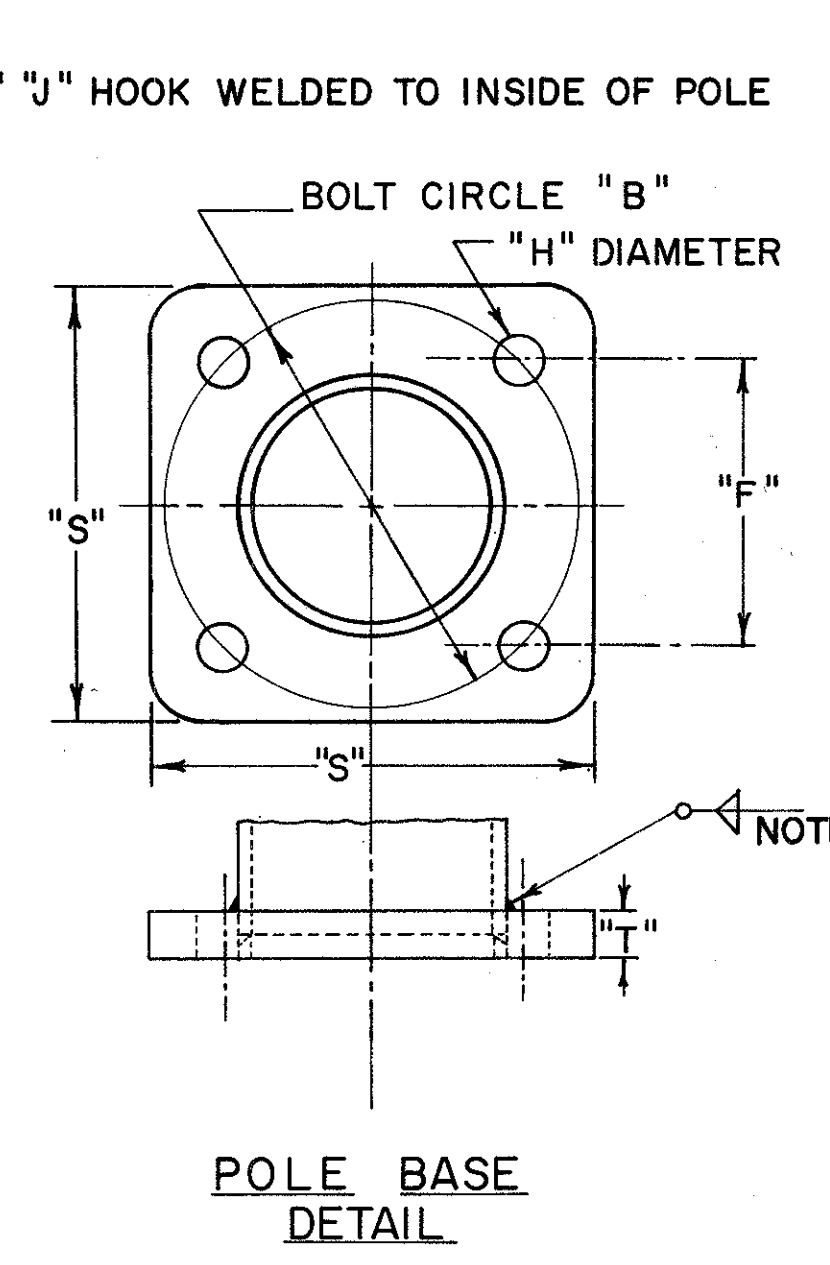
FOR SIGN BRACKETS TO BE
FURNISHED WITH THIS
STRUCTURE, SEE DWG. 816-20.002
AND PROJECT PLANS.

FOR MODIFICATION OF POLE TO
SUPPORT ROADWAY LIGHTING, SEE
DWG 816-20.002 AND PROJECT PLANS

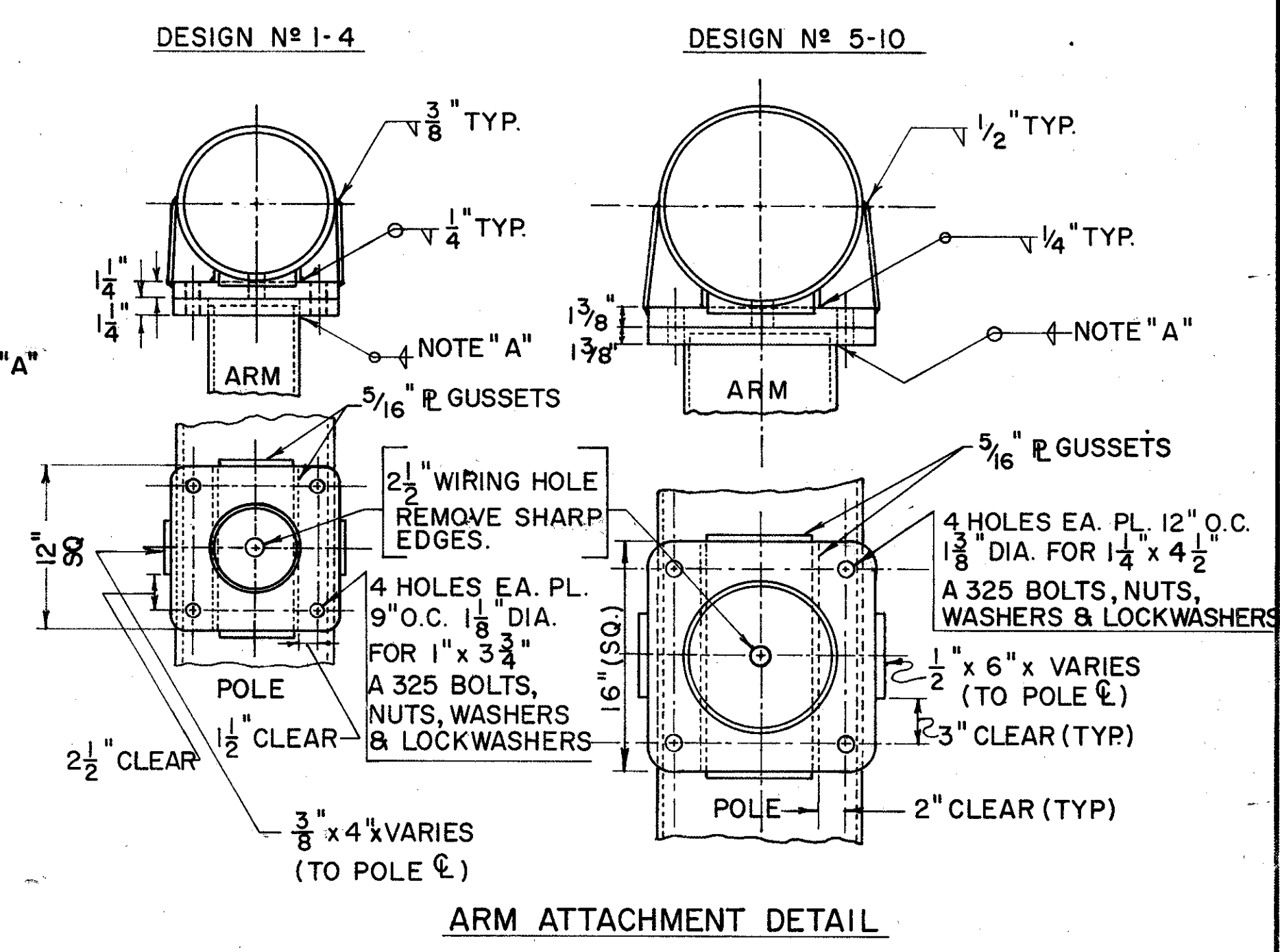


ALTERNATE DESIGN

TOP CHORD CENTERLINE AND SIGN C-H ARE HORIZONTAL IN BOTH DESIGNS. ALTERNATE DESIGN ONLY; BOTTOM CHORD SLOPES UPWARD 3/16" PER FT. TO LEFT AND THE SIGN C-H PASSES THROUGH THE POINT MIDWAY BETWEEN THE ARMS ON THE SIGN C-V.



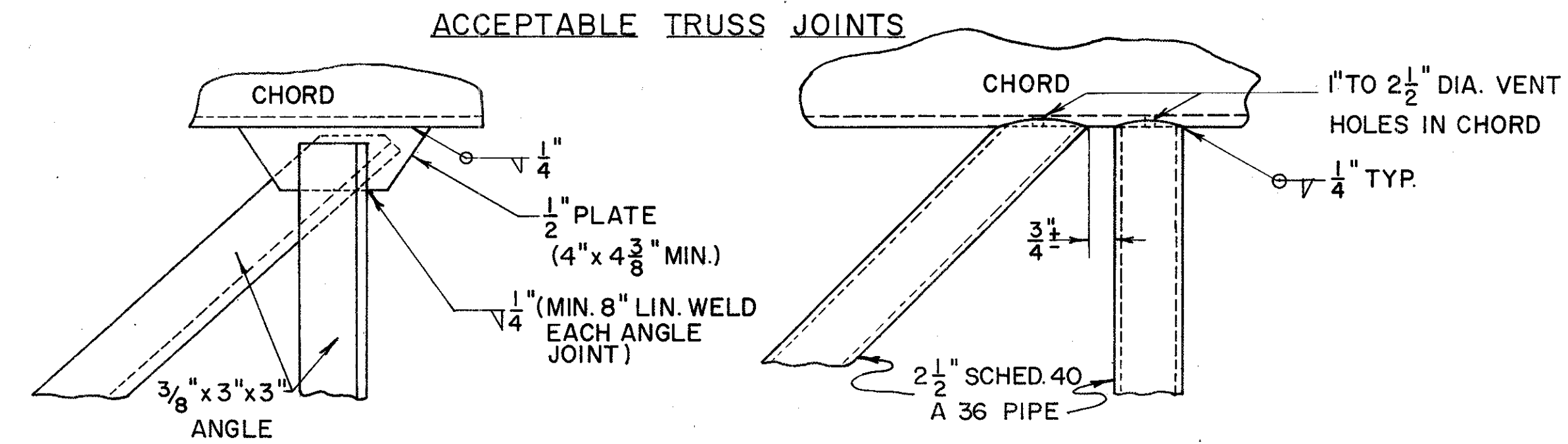
POLE BASE DETAIL



ARM ATTACHMENT DETAIL

- NOTE "A"**
POLE BASE AND ARM ATTACHMENT PLATE TO BE WELDED INSIDE AND OUTSIDE WITH FILLET WELDS. EACH FILLET WELD SHALL BE EQUAL TO THE WALL THICKNESS OF THE RESPECTIVE TUBING.
- NOTE "B"**
CONSTRUCTION DETAILS AND LOCATION OF HANDHOLE AND SWITCH GEAR MOUNTING BRACKETS ARE SHOWN ON DRAWING 816-20.002
- NOTE "C"**
SIGNS UNDER 20'-0" LONG, ONE 1 1/2" PIPE COUPLING WELDED TO THE TOP CHORD APPROXIMATELY 12" OUTBOARD OF FIRST SIGN BRACKET. FOR SIGNS 20'-0" OR OVER, A SECOND 1 1/2" PIPE COUPLING IS REQUIRED APPROXIMATELY 12" OUTBOARD OF THE SECOND SIGN BRACKET. ALL SHARP EDGES INSIDE THE CHORD AND PIPE COUPLING MUST BE REMOVED.

- UNLESS OTHERWISE NOTED, DIMENSIONS AND INSTRUCTIONS APPLY TO BOTH THE STANDARD DESIGN AND ALTERNATE DESIGN.
- SIGN SUPPORT ARMS UNDER 18'-0" LONG DO NOT REQUIRE TRUSSING.
- THE DESIGN OF THESE OVERHEAD SIGN SUPPORTS IS IN ACCORDANCE WITH THE AASHO SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS AS REVISED IN 1968.



ACCEPTABLE TRUSS JOINTS

DESIGN NUMBER	POLE SIZE	ARM SIZE
	OUTSIDE DIAMETERS	OUTSIDE DIAMETERS
1	2 PLY. 7 GA. 10" x 6.50" x 25'-0"	7 GA. 6" x 3.76" x 16'-0"
1ALT	8 5/8" x .500" WALL x 25'-0"	5 9/16" x .258" WALL x 16'-0"
2	2 PLY. 7 GA. 10" x 6.50" x 25'-0"	3 GA. 6" x 4.60" x 20'-0"
2ALT	8 5/8" x .562" WALL x 25'-0"	5 9/16" x .344" WALL x 20'-0"
3	0 GA. 13" x 9.22" x 27'-0"	7 GA. 8" x 5.76" x 16'-0"
3ALT	10 3/4" x .438" WALL x 27'-0"	6 5/8" x .250" WALL x 16'-0"
4	0 GA. 13" x 9.22" x 27'-0"	7 GA. 9" x 6.20" x 20'-0"
4ALT	10 3/4" x .500" WALL x 27'-0"	6 5/8" x .344" WALL x 20'-0"
5	0 GA. 15" x 11.08" x 28'-0"	7 GA. 9.5" x 6.42" x 22'-0"
5ALT	12 3/4" x .500" WALL x 28'-0"	8 5/8" x .250" WALL x 22'-0"
6	2 PLY. 7 GA. 15" x 11.08" x 28'-0"	3 GA. 10" x 6.36" x 26'-0"
6ALT	12 3/4" x .562" WALL x 28'-0"	8 5/8" x .322" WALL x 26'-0"
7	2 PLY. 7 GA. 16.5" x 12.58" x 28'-0"	3 GA. 10" x 6.64" x 24'-0"
7ALT	14" x .562" WALL x 28'-0"	8 5/8" x .322" WALL x 24'-0"
8	2 PLY. 3 GA. 16.5" x 12.58" x 28'-0"	3 GA. 11" x 7.08" x 28'-0"
8ALT	14" x .594" WALL x 28'-0"	10 3/4" x .279" WALL x 28'-0"
9	2 PLY. 3 GA. 16.5" x 12.30" x 30'-0"	3 GA. 11" x 7.36" x 26'-0"
9ALT	14" x .688" WALL x 30'-0"	10 3/4" x .279" WALL 26'-0"
10	2 PLY. 3 GA. 18" x 13.80" x 30'-0"	3 GA. 13" x 8.80" x 30'-0"
10ALT	16" x .656" WALL x 30'-0"	10 3/4" x .438" WALL x 30'-0"

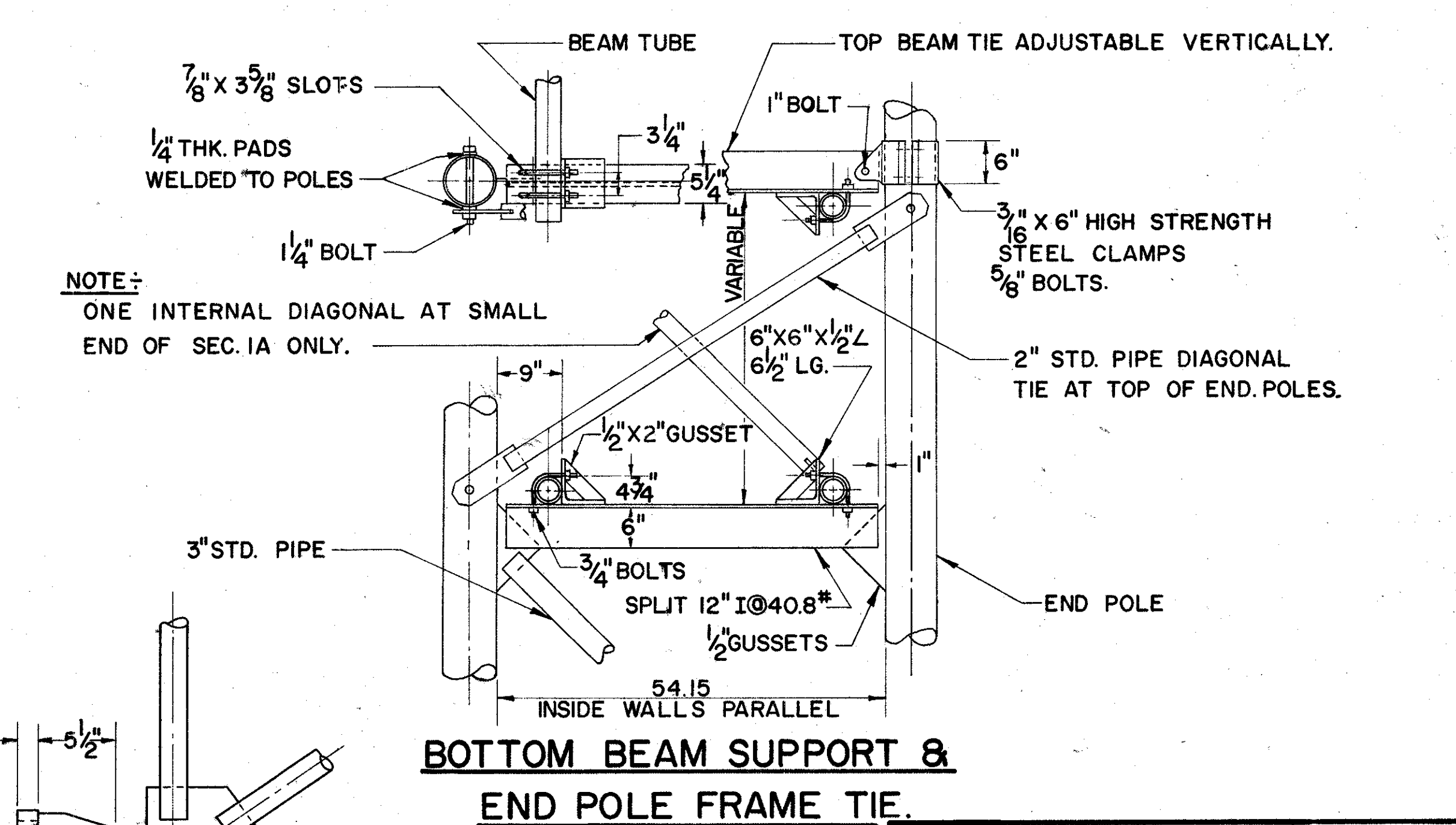
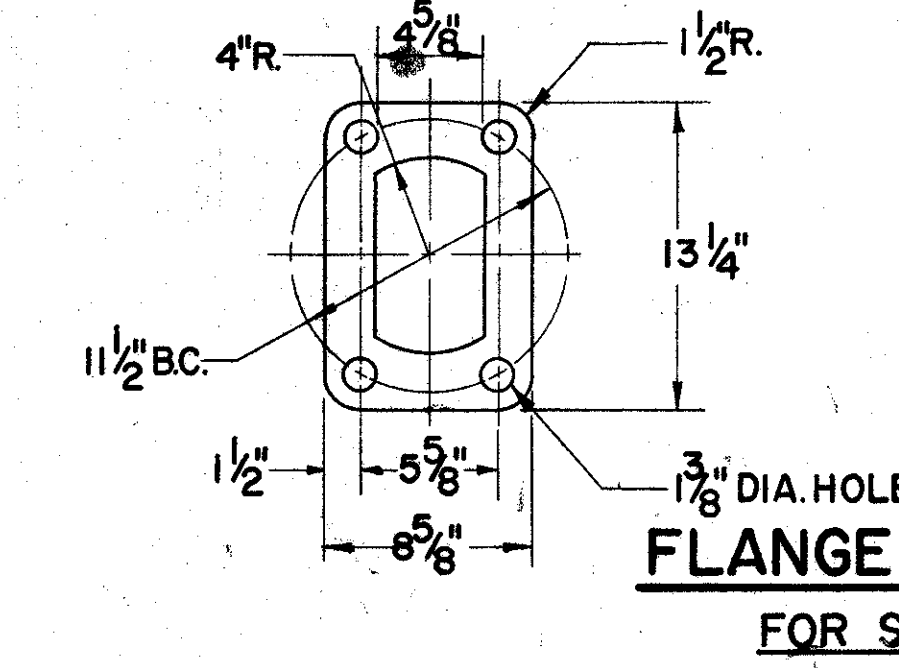
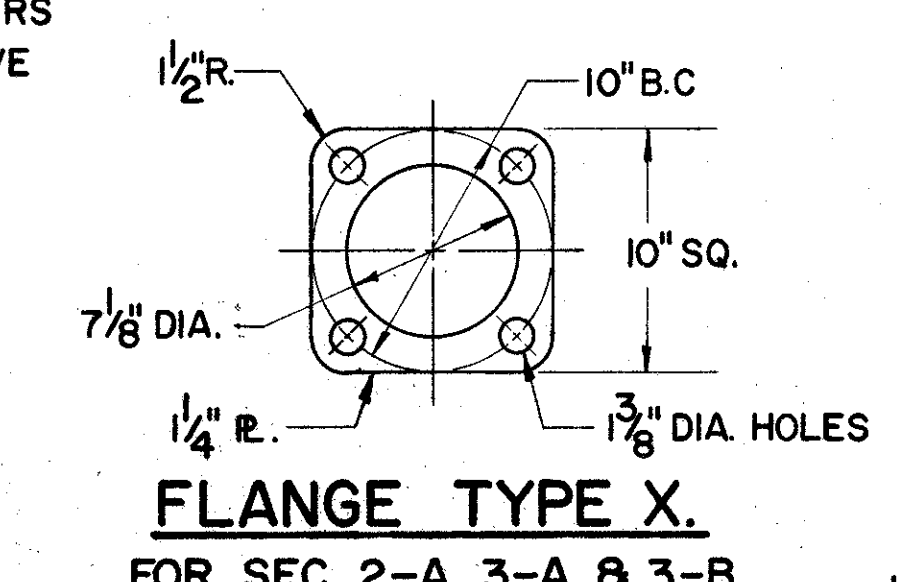
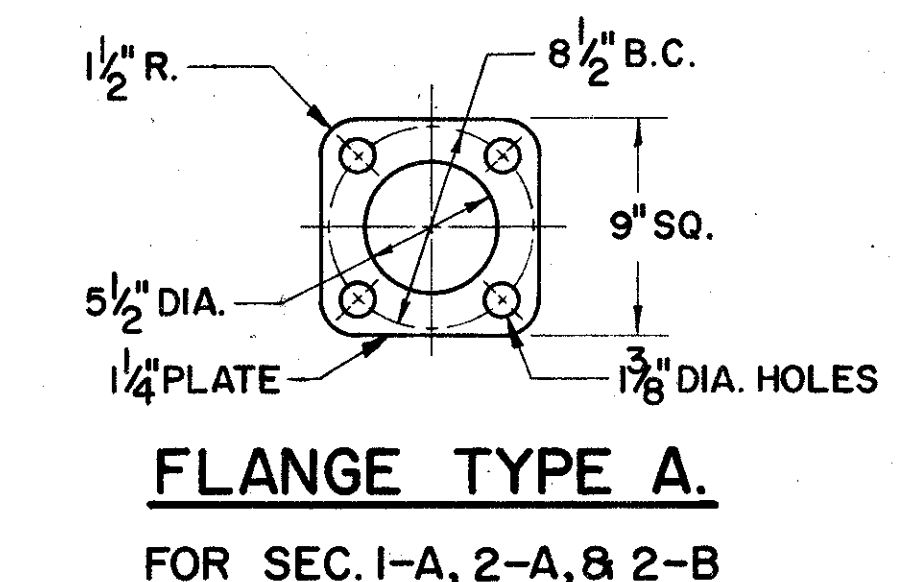
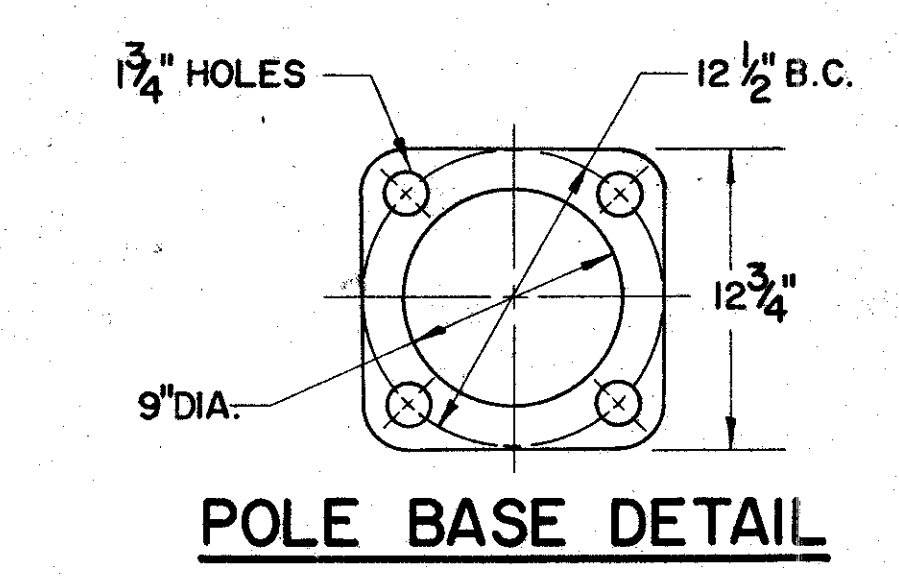
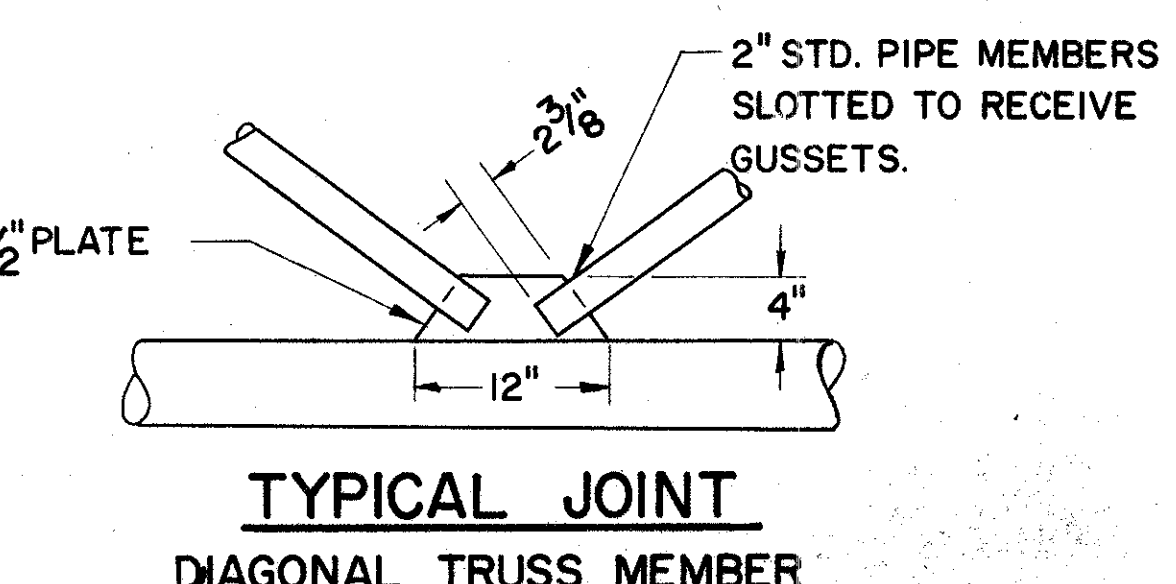
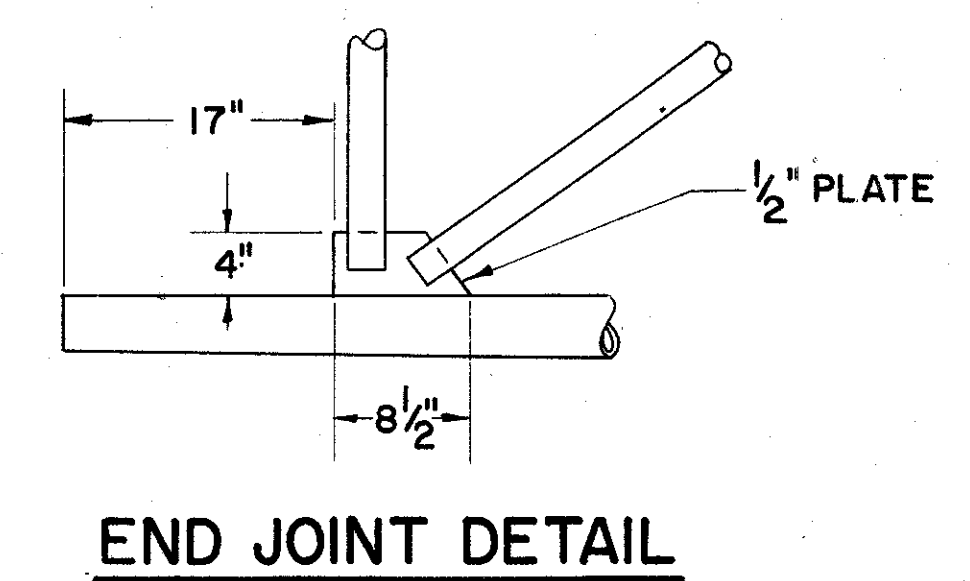
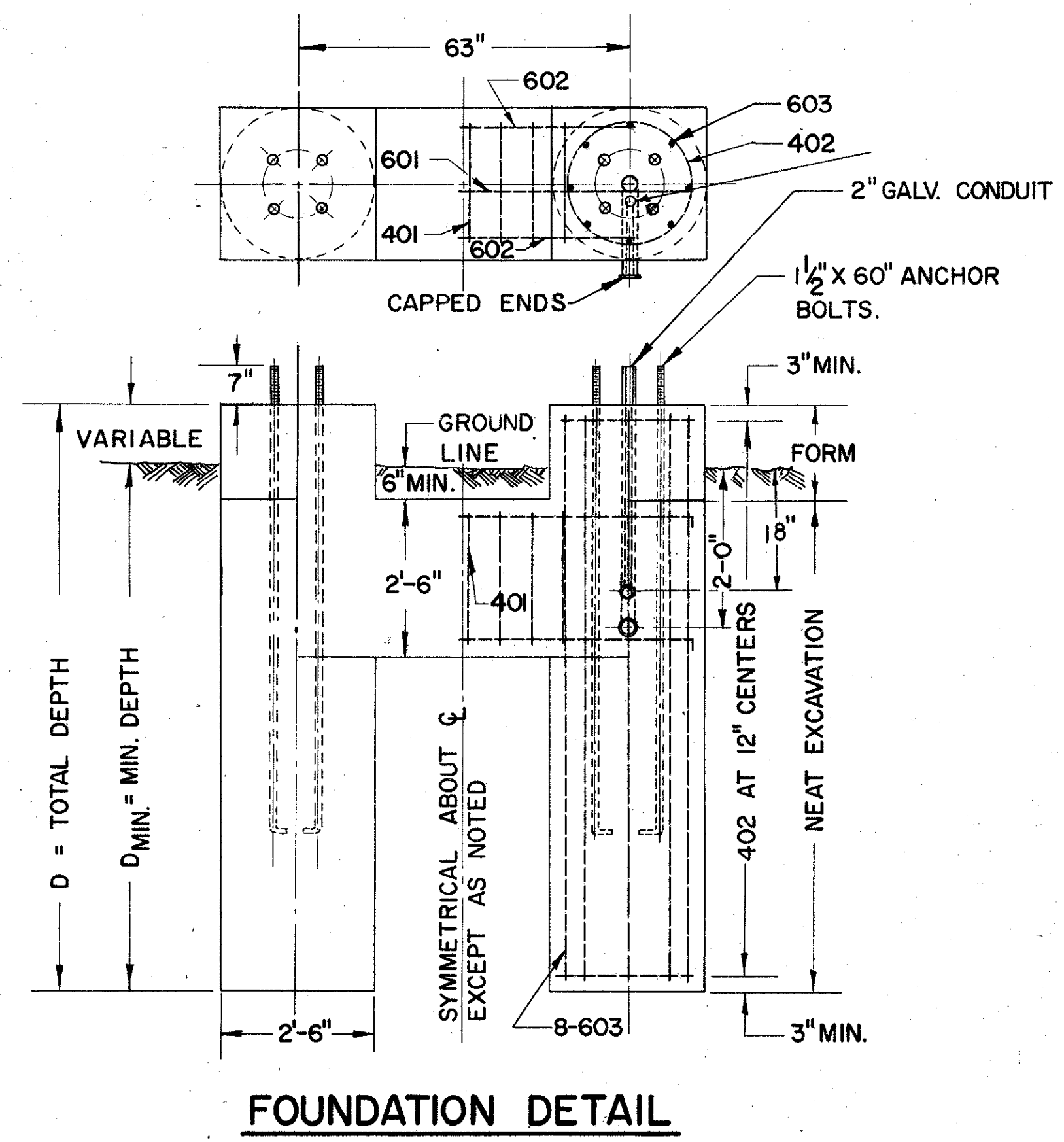
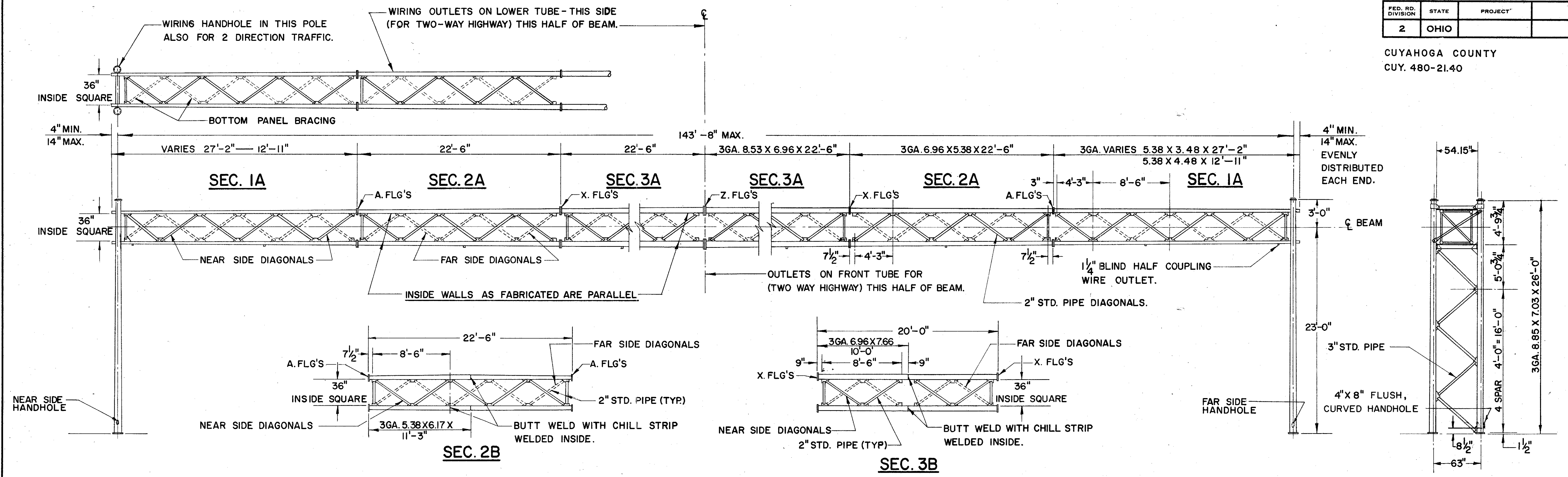
DESIGN NUMBER	DESIGN SIZE (SQ. FT.)	DESIGN MOMENT ARM (FT.)	DIM. "F" (IN.)	DIM. "P" (IN.)	DIM. "S" (IN.)	DIM. "T" (IN.)	BOLT CIRCLE "B" (IN.)	ANCHOR BOLTS "AB" (IN.)	DIM. "H" (IN.)
1	80	12	10 5/8	7 3/4	15 5/8	2	15	3/4 x 84	2 1/8
2	80	16	10 5/8	7 3/4	15 5/8	2	15	3/4 x 84	2 1/8
3	120	12	12 3/4	8 1/2	18 1/2	2	18	2 x 90	2 7/8
4	120	16	12 3/4	8 1/2	18 1/2	2	18	2 x 90	2 7/8
5	180	14	15 1/2	8 1/2	23	2	22	2 x 90	2 7/8
6	180	18	15 1/2	8 1/2	23	2	22	2 x 90	2 7/8
7	240	14	16 5/8	9 3/4	24 1/2	2 1/2	23 1/2	2 1/2 x 114	2 7/8
8	240	18	16 5/8	9 3/4	24 1/2	2 1/2	23 1/2	2 1/2 x 114	2 7/8
9	300	15 1/2	16 5/8	9 3/4	24 1/2	2 1/2	23 1/2	2 1/2 x 114	2 7/8
10	300	19 1/2	18	9 3/4	26 1/2	2 1/2	25 1/2	2 1/2 x 114	2 7/8

MATERIAL SPECIFICATIONS

POLE & ARMS: ANY STEEL WITH MIN. 52,000 P.S.I. YIELD STRESS AFTER ERECTION.
TRUSS MEMBERS: ASTM A-36
BASE & OTHER PLATE STOCK: ASTM A-36
ANCHOR BOLTS: MIN. 54,000 P.S.I. YIELD STRESS AS ERECTED.
ARM ATTACHMENT BOLTS: ASTM A-325
MISC. BOLTS & NUTS: ASTM A-307 (GALVANIZED PER ASTM A-153)
WELDING: SECTION 513.17, OHIO CONST. & MAT. SPECIFICATIONS
GALVANIZING AFTER FABRICATION, ALL STRUCTURAL PARTS: ASTM A-123

GALVANIZE ONLY TOP 16" OF ALL ANCHOR BOLTS PER ASTM A-123

BUREAU OF DESIGN SERVICES OHIO DEPARTMENT OF HIGHWAYS		Date
OVERHEAD SIGN SUPPORT		3-23-72
STANDARD CONSTRUCTION DRAWING	816-12.30	
APPROVED	<i>M. J. Cunningham</i> ENGINEER OF DESIGN SERVICES	



BUREAU OF TRAFFIC OHIO DEPARTMENT OF HIGHWAYS		
OVERHEAD SIGN SUPPORT	816 15.8	DATE 6-24-64 7-1-66
APPROVED _____ ENGINEER OF TRAFFIC		

QUANTITY CALCULATIONS
 Made By JEN Date 7-13-70
 Checked By NNB Date 7-24-70

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

244
390

CUYAHOGA COUNTY
 CUY. 480-21.40

SUPPORT						ACTUAL SIGN AREA	SIGN AREA SPREAD	ALLOWABLE DESIGN SIGN AREA	ACTUAL MAX. SIGN HEIGHT	END SECTION				INTERNAL SECTION				CENTER SECTION				END OVER-HANG	LEFT END FRAME				RIGHT END FRAME			
NO.	STATION	LOCATION	TYPE	DESIGN	SPAN					NO.	GA.	SIZE	LENGTH	NO.	GA.	SIZE	LENGTH	NO.	GA.	SIZE	LENGTH		NO.	GA.	SIZE	LENGTH	NO.	GA.	SIZE	LENGTH
142	1168+00	E.B.I-480	15.8	3 Mod.	90'0"	624.5	63'0"	743	12'6"	2	3	5.38 x 3.74	23'6"	2	3	6.96 x 5.38	22'6"					1'-0"	1	3	8.85 x 7.21	23'6"	1	3	8.85 x 6.82	29'-0"
143	1182+33	W.B.I-480	15.8	3 Mod.	90'0"	737.5	66'0"	751	12'6"	2	3	5.38 x 3.74	23'6"	2	3	6.96 x 5.38	22'6"					1'-0"	1	3	8.85 x 7.13	24'6"	1	3	8.85 x 6.93	27'6"

NOTES

DESIGN
 THE DESIGN OF OVERHEAD SUPPORTS SHALL BE IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 13, 1961.

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.

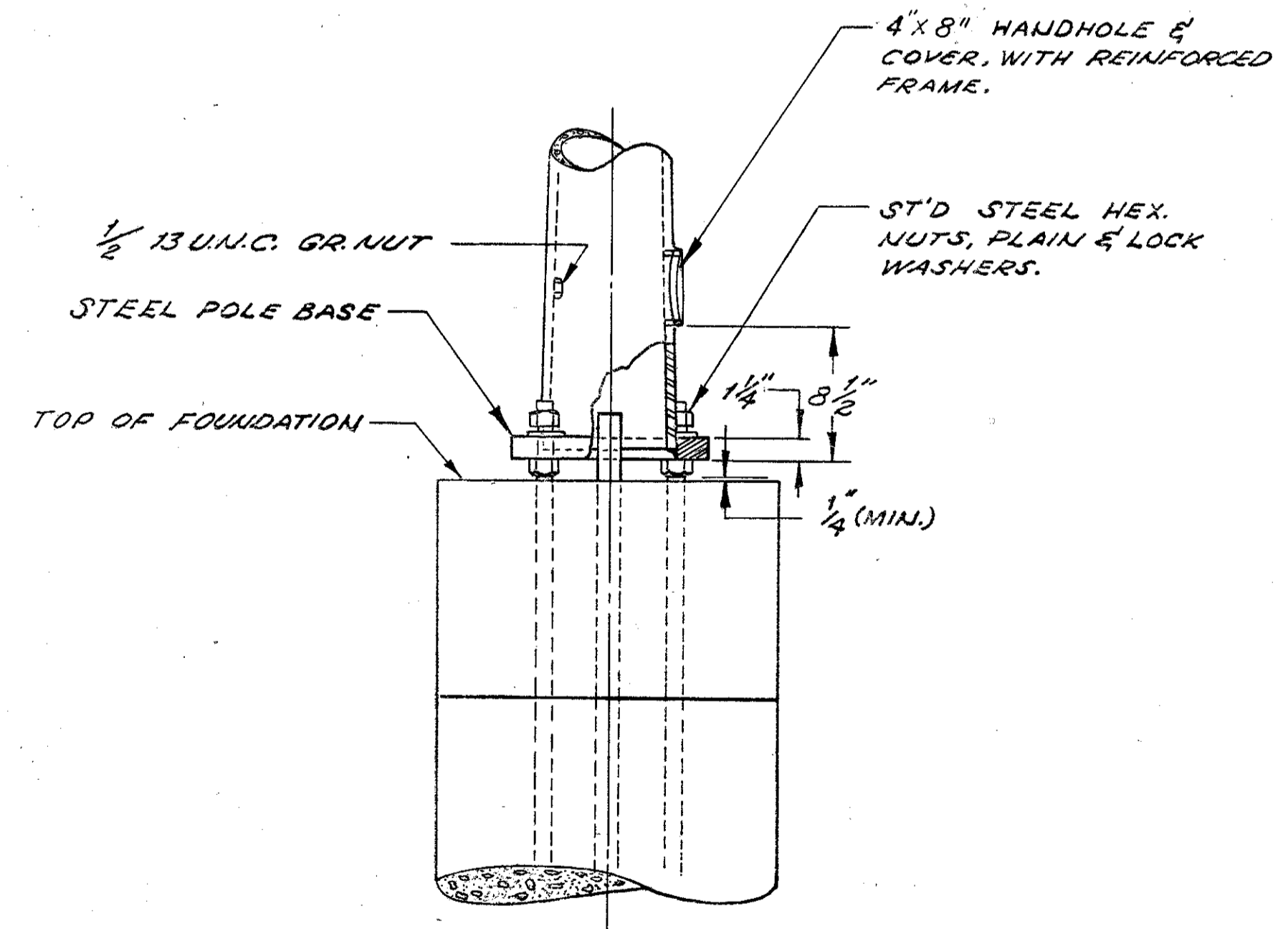
SOILS
 THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND AND GRAVEL, SANDY CLAY OR STIFF CLAY). FOR POOR SOIL CONDITIONS, INCREASE "D" MIN. BY: 50% IN DRY OR WET SAND, 60% IN SILTY CLAY, 100% IN SOFT CLAY, AND FROM 75% TO 150% IN WET SILT, DEPENDING ON QUICKSAND ACTION.

FINISH
 ALL STRUCTURAL PORTIONS OF THE SIGN SUPPORTS, SIGN BRACKETS, HARDWARE AND CONDUIT SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH S.S. 816.02 (EXCEPT AS OTHERWISE SHOWN).

MATERIALS
 ALL MATERIALS TO BE FURNISHED SHALL BE IN ACCORDANCE WITH S.S. 816.02 WITH THE FOLLOWING ADDITIONS:
 TAPERED TUBES SHALL BE STEEL, SAE 1015 AND COLD ROLLED TO OBTAIN A MINIMUM YIELD STRENGTH OF 48,000 PSI.
 STEEL PIPE: 4" DIAMETER AND UNDER SHALL BE STEEL-ASTM-A102 OVER 4" DIAMETER SHALL BE ASTM-A53, GRADE B.
 ANCHOR BOLTS SHALL BE HIGH STRENGTH STEEL-ASTM-A107, GRADE C-1035.
 HIGH STRENGTH CLAMPS SHALL BE STEEL ASTM-A242.

REINFORCING STEEL
 COST OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM 816 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.

PAYMENT FOR CONDUIT
 PAYMENT FOR THE GALVANIZED CONDUIT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OVERHEAD SIGN SUPPORTS.



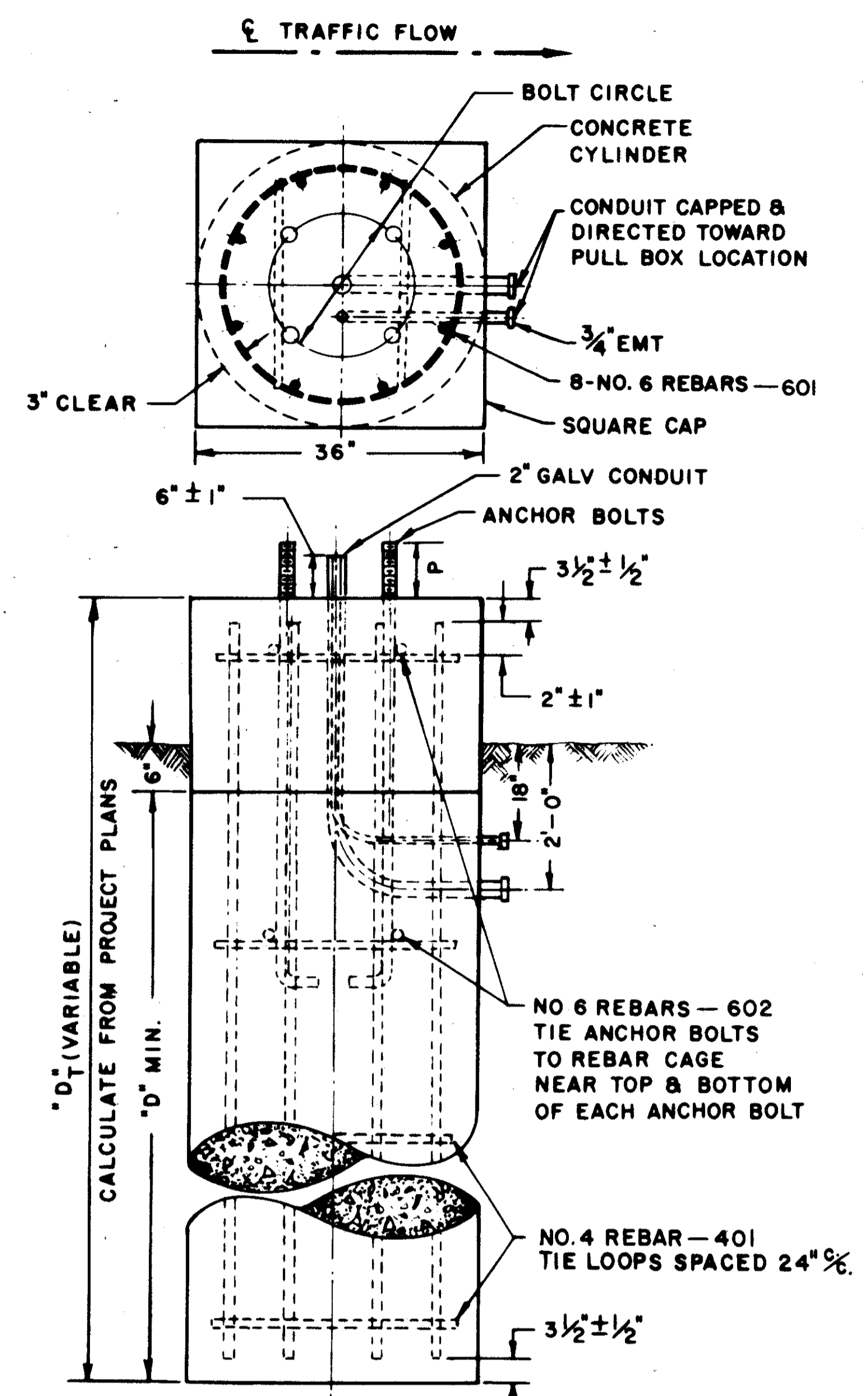
MARK	NO.	LENGTH	TYPE
401	12' 9/16"	8'-6"	102
402	12' 9/16"	7'-6"	103
601	4	D+4'-0"	101
602	8	D+2'-0"	101
603	32	D+6"	STR.

BUREAU OF TRAFFIC
 OHIO DEPARTMENT OF HIGHWAYS

OVERHEAD SIGN SUPPORT NOTES **816**
15.8

APPROVED _____
 ENGINEER OF TRAFFIC

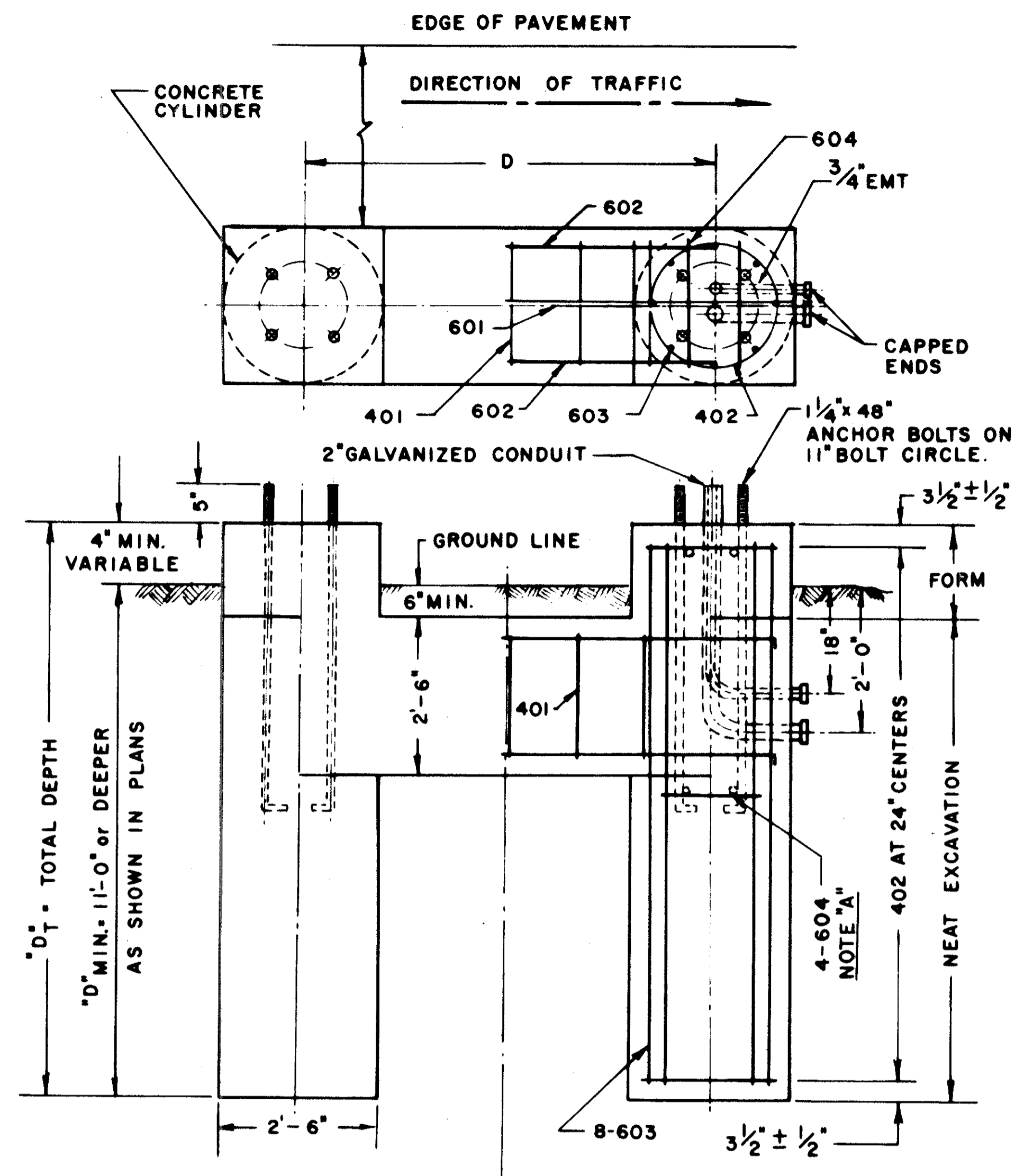
DATE
 6-24-64
 7-1-66



816-12.30 FOUNDATIONS

DESIGN NUMBERS	ANCHOR BOLTS (in.)	BOLT CIRCLE (in.)	"P" (in.)	"D" (ft.)
1 & 2	1 3/4 x 84	15	7 3/4	9
3 & 4	2 x 90	18	8 1/2	11
5 & 6	2 x 90	22	8 1/2	11
7, 8 & 9	2 1/2 x 114	23 1/2	9 3/4	15
10	2 1/2 x 114	25 1/2	9 3/4	17

REINFORCEMENT SCHEDULE				
MARK	NO.	LENGTH	TYPE	
401	24 5/8	8'-6"	401	
601	8	D _T 6"	STR.	
602	4	2'-5"	STR.	

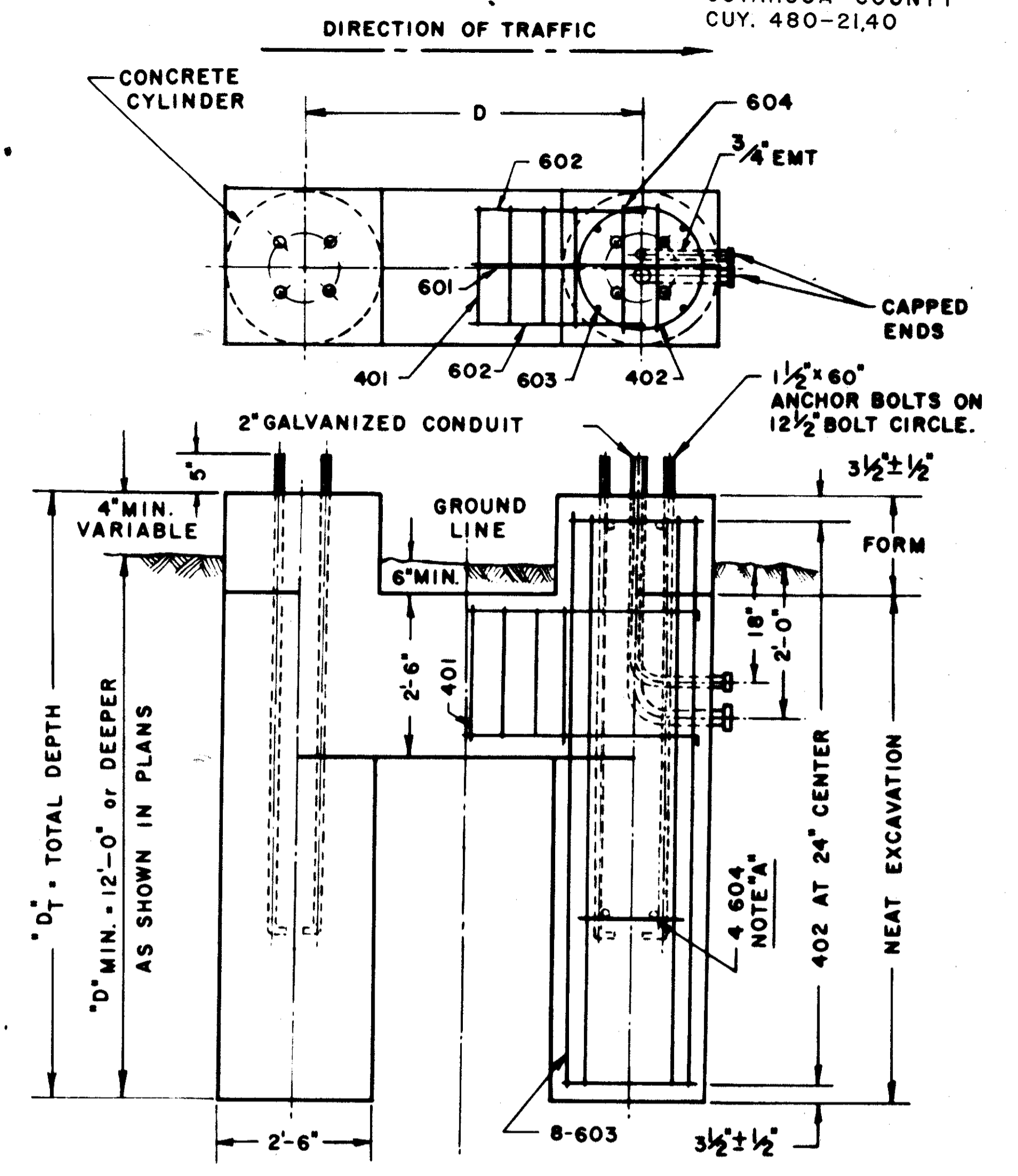


816-7. x x FOUNDATIONS
(RIGHT HAND SHOWN - LEFT HAND OPPOSITE)

NOTE "A" TIE ANCHOR BOLTS TO REBAR CAGE NEAR TOP & BOTTOM OF ANCHOR BOLTS.

ALUMINUM TRUSS BOX SIZE	"D"
3'-0"	4'-5"
4'-0"	5'-7"
5'-0"	6'-7"

REINFORCEMENT SCHEDULE FOR ALUMINUM TRUSS FOUNDATIONS				
MARK	NO.	LENGTH	TYPE	
401	12 5/8	8'-6"	401	
402	24 5/8	7'-6"	402	
601	4	D=4'-0"	601	
602	8	D=2'-0"	602	
603	32	D=0'-6"	STR.	
604	16	2'-0"	STR.	



816-15. x x FOUNDATIONS
(RIGHT HAND SHOWN - LEFT HAND OPPOSITE)

STEEL TRUSS BOX SIZE	"D"
3'-4" ±	5'-3"
5'-0"	6'-7"

REINFORCEMENT SCHEDULE FOR STEEL TRUSS FOUNDATIONS				
MARK	NO.	LENGTH	TYPE	
401	12 5/8	8'-6"	401	
402	24 5/8	7'-6"	402	
601	4	D±4'-0"	601	
602	8	D±2'-0"	602	
603	32	D±0'-6"	STR.	
604	16	2'-0"	STR.	

NOTE "A" TIE ANCHOR BOLTS TO REBAR CAGE NEAR TOP & BOTTOM OF ANCHOR BOLTS

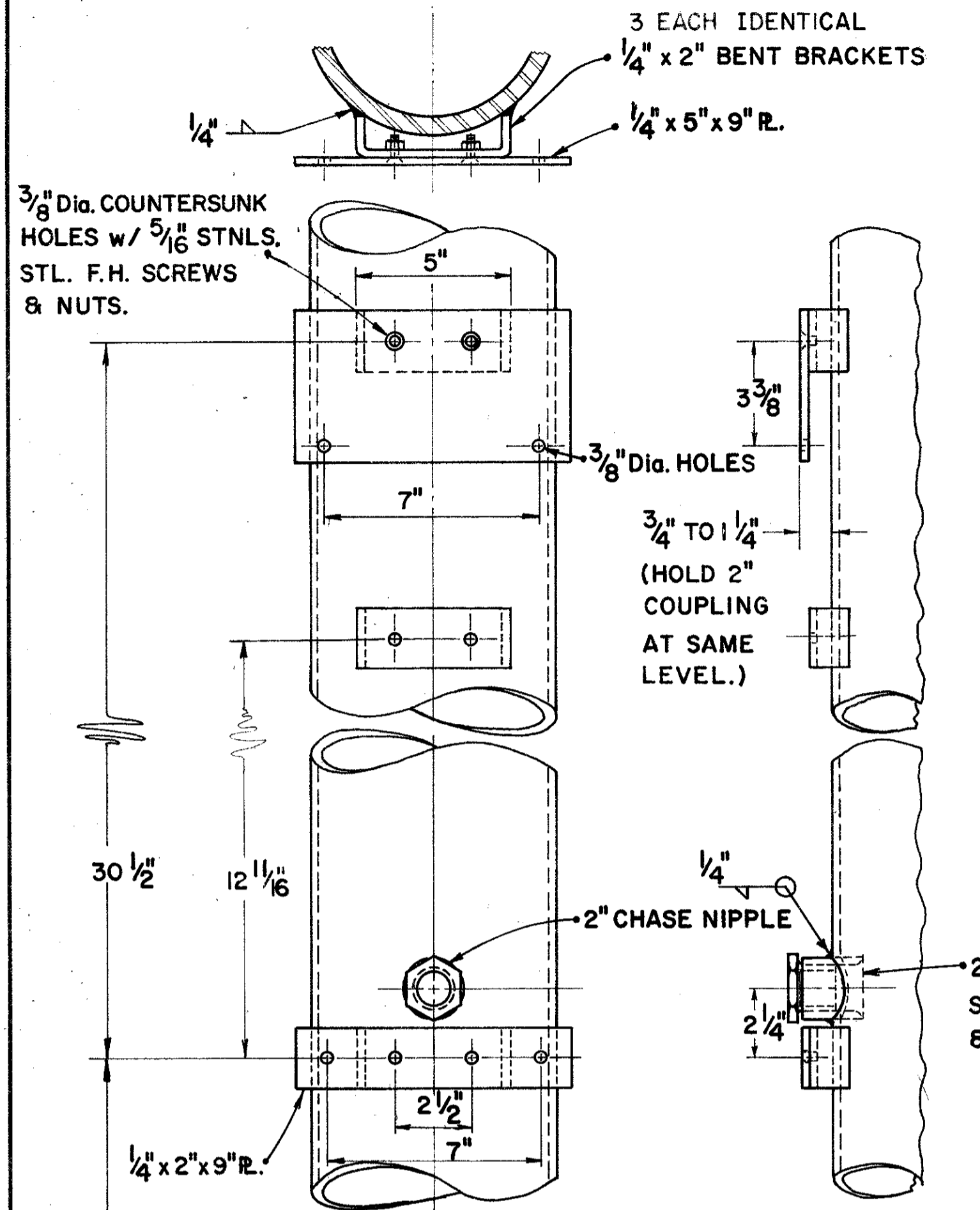
BUREAU OF DESIGN SERVICES
OHIO DEPARTMENT OF HIGHWAYS

SIGN SUPPORT FOUNDATIONS

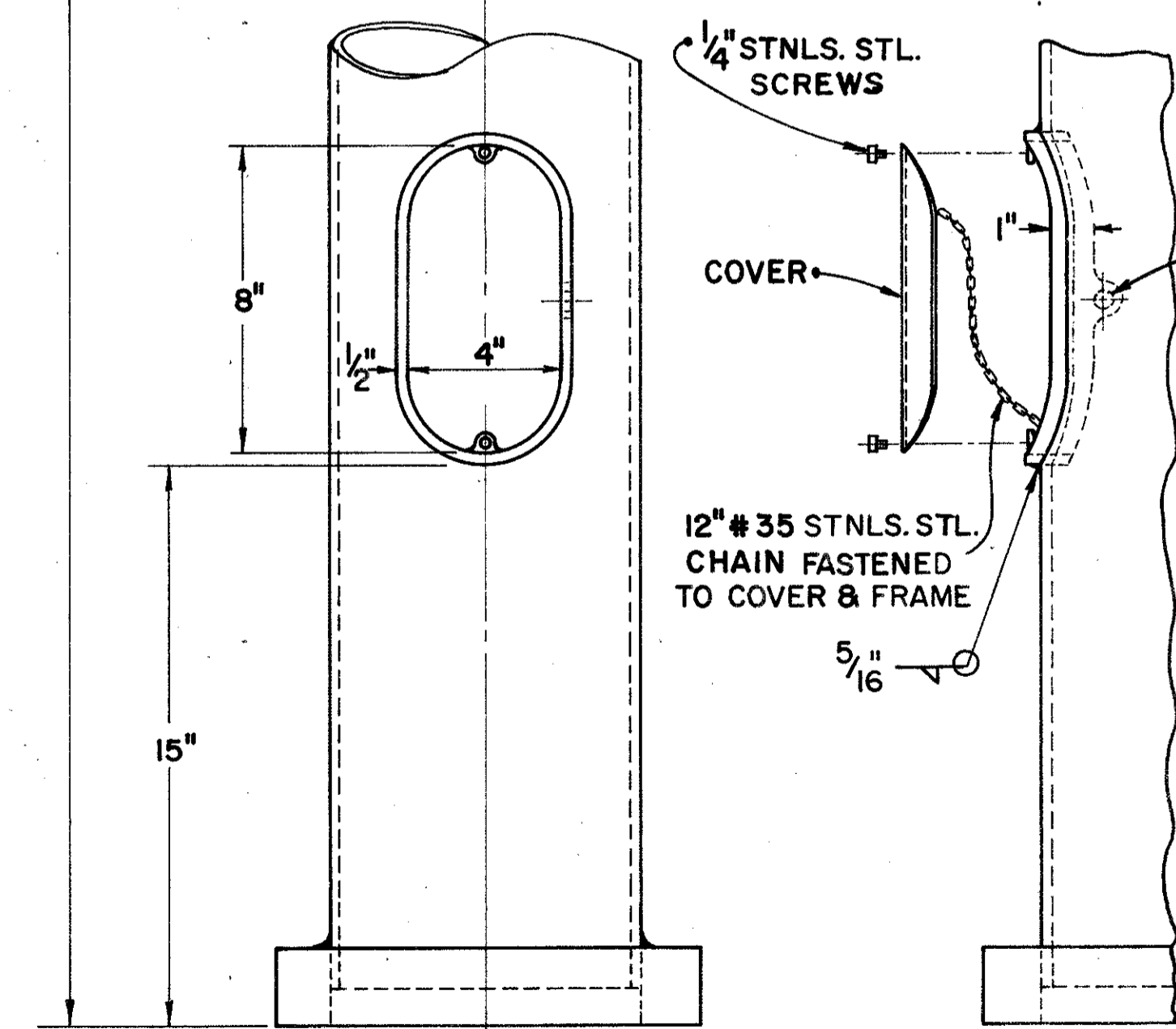
STANDARD CONSTRUCTION **816-20.001**
DRAWING

APPROVED *M. J. Cunningham*
ENGINEER OF DESIGN SERVICES

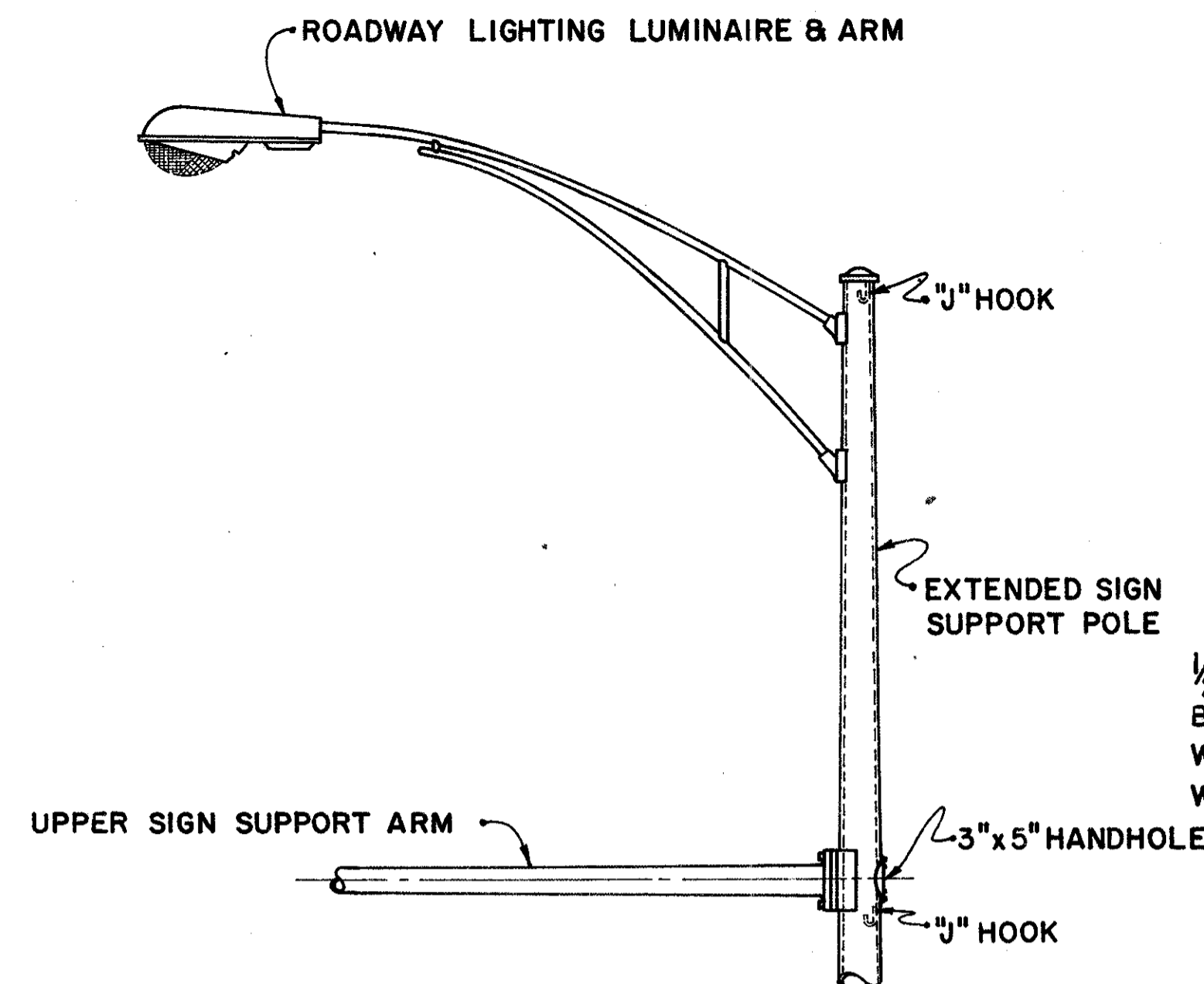
DATE
3-23-72



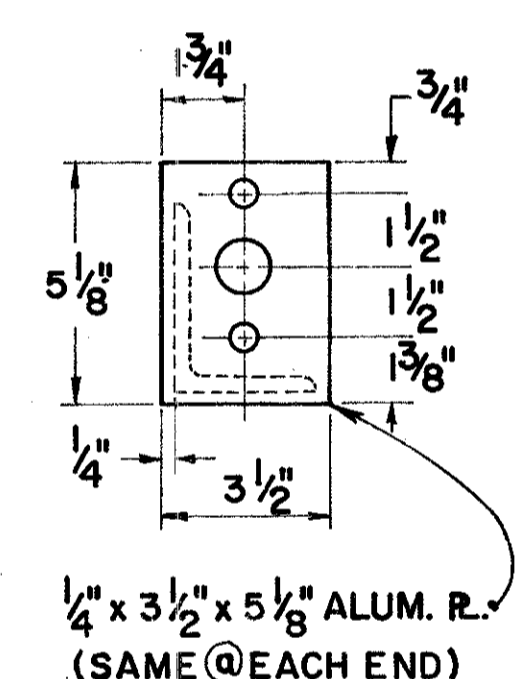
SWITCH ENCLOSURE BRACKET



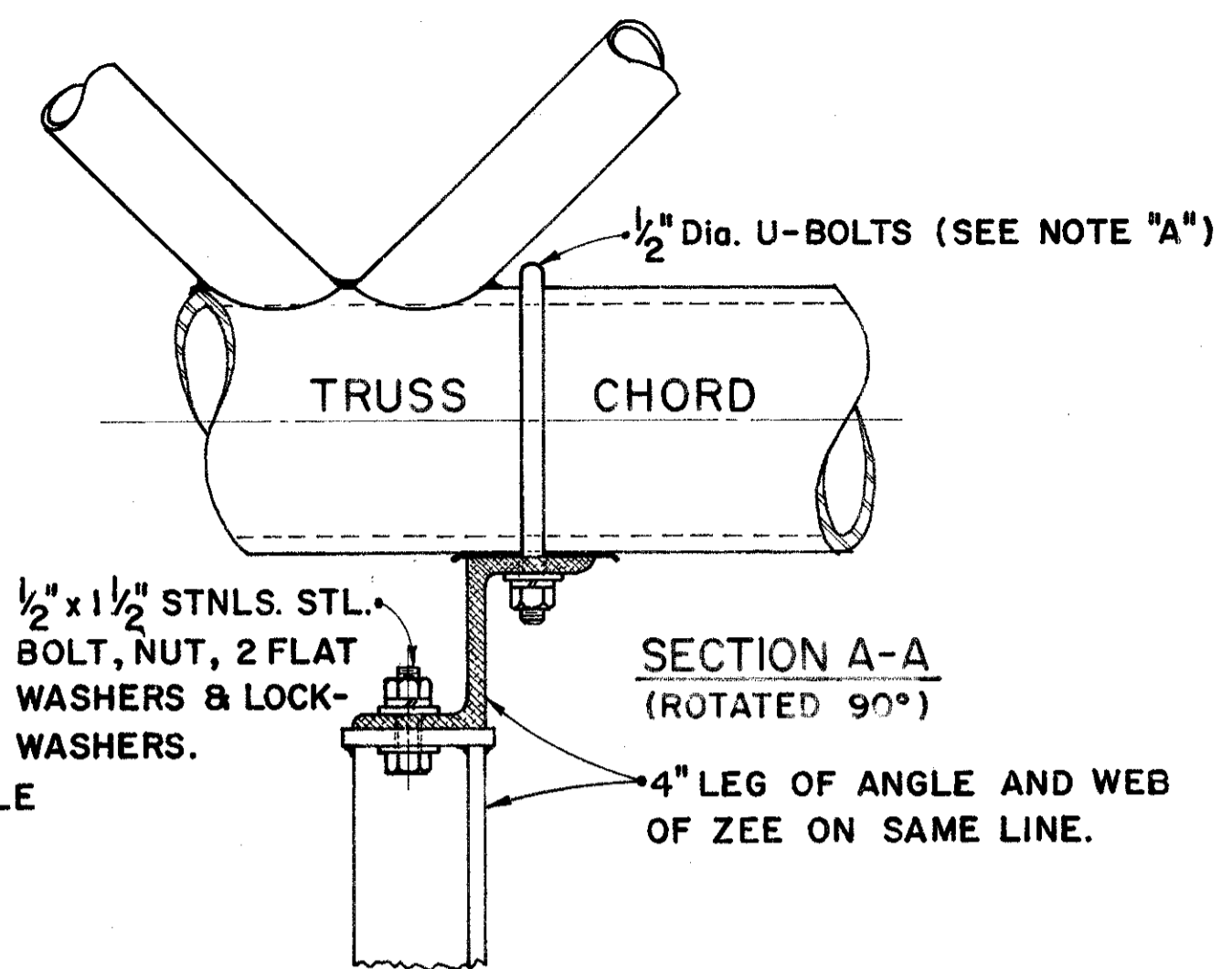
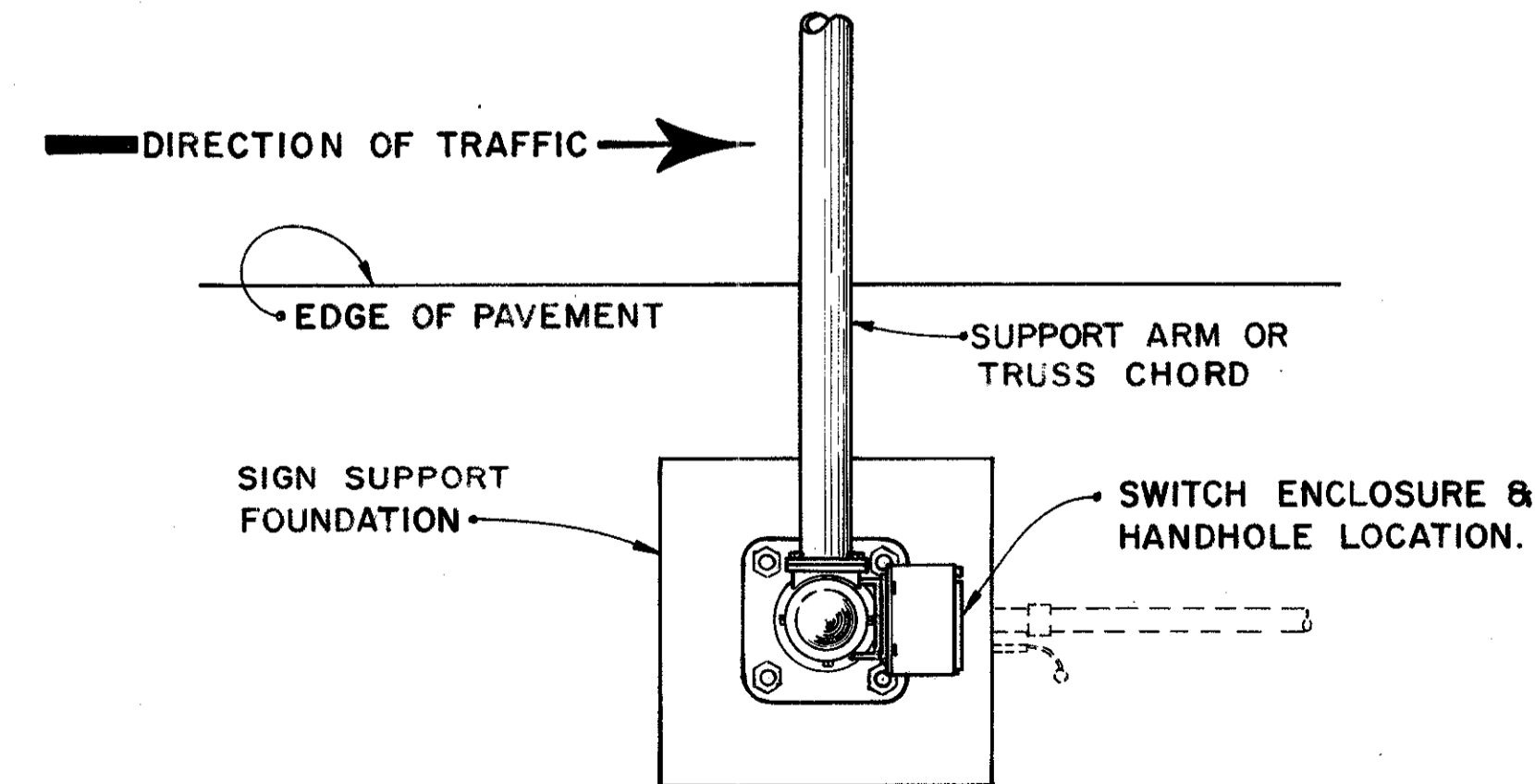
4" x 8" CURVED HANDHOLE.



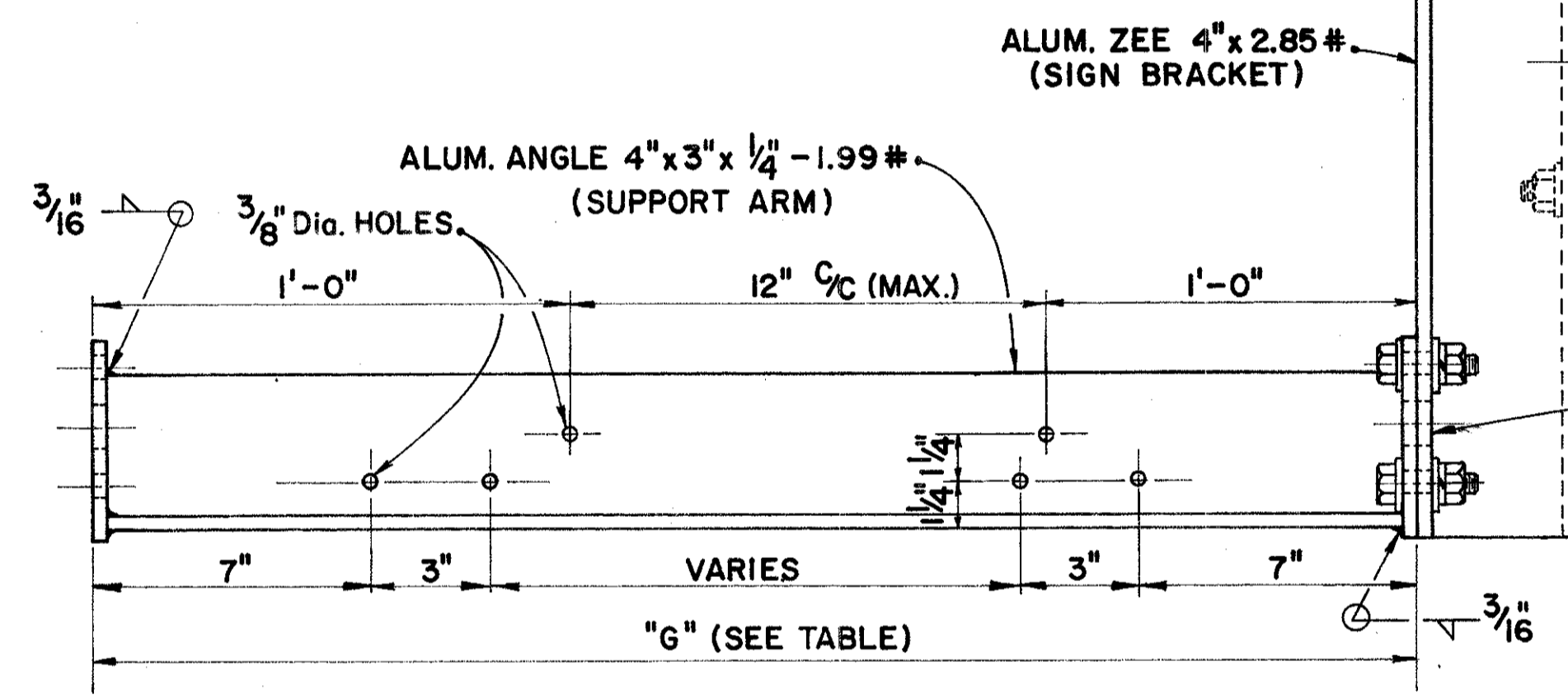
POLE EXTENSION FOR LIGHTING LUMINAIRE



SWITCH ENCLOSURE & HANDHOLE ORIENTATION



SIGN ATTACHMENT FOR BOX TRUSS



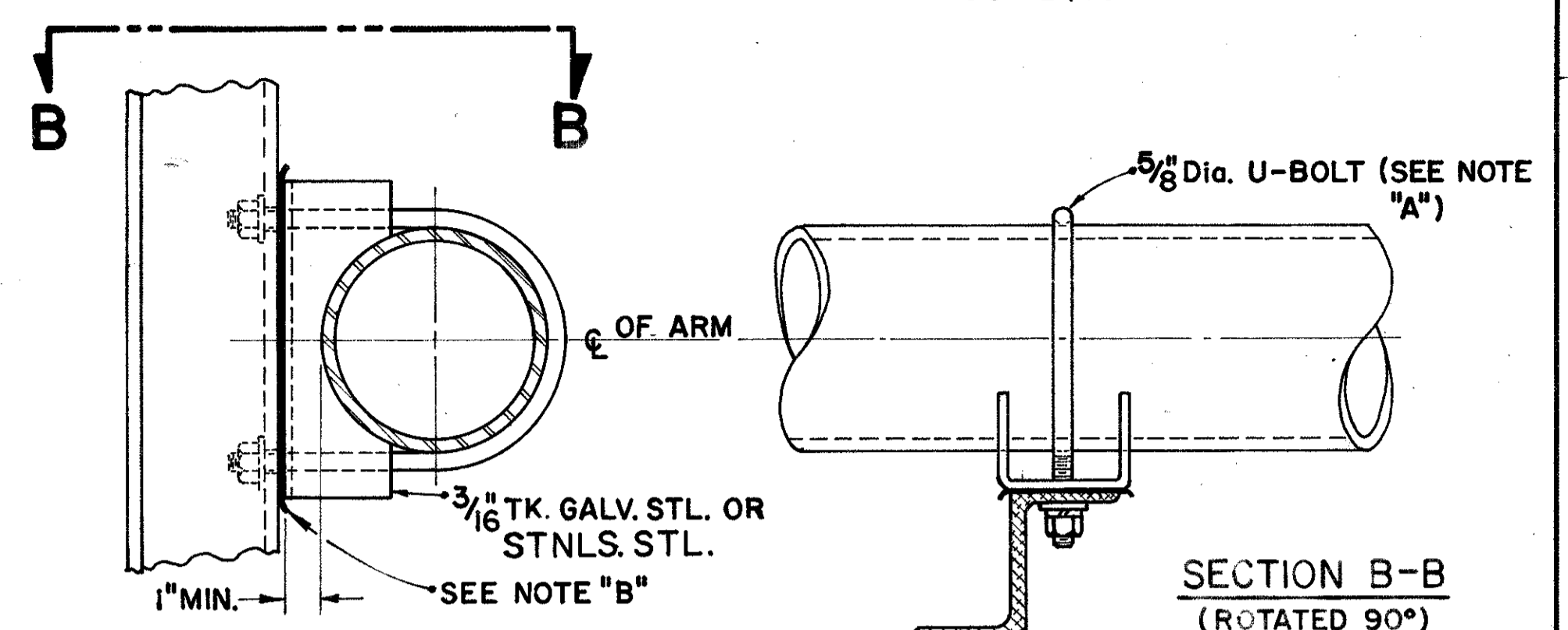
SUPPORT ARM & SIGN BRACKET
(MAKE AS LEFTS & RIGHTS FOR EACH SIGN)

SIGN HEIGHT	SUPPORT ARM LENGTH "G"	BRACING ROD REQUIRED
4'-0" to 6'-0"	2'-9"	NO
6'-6" to 7'-6"	3'-3"	NO
8'-0" to 11'-0"	4'-3"	YES
11'-6" to 14'-0"	5'-9"	YES

NOTE "A"
U-BOLTS, NUTS & WASHERS SHALL BE STAINLESS STEEL FOR USE WITH ALUMINUM TRUSS CHORDS. WHEN USED WITH GALVANIZED CHORDS, THE U-BOLT ONLY MAY BE GALVANIZED STEEL.

NOTE "B"
CONTACT BETWEEN ALUMINUM AND GALVANIZED PARTS MUST BE PREVENTED WITH A MIN. 1/16" THICK NEOPRENE GASKET OR APPROVED SUBSTITUTE. NO GASKET IS REQUIRED BETWEEN STAINLESS STEEL AND ALUMINUM.

NOTE:
ALL STL. PARTS (EXCEPT STNLS.) SHALL BE GALVANIZED AFTER FABRICATION PER ASTM A-123.



SIGN ATTACHMENT FOR SINGLE CHORDS

BRACING ROD ARRANGEMENT

WHEN ONLY TWO SUPPORT ARMS REQ'D PER SIGN, USE TWO BRACING RODS TO FORM "X" BRACING.

NOTE:
FOR LENGTH AND QUANTITY OF SIGN BRACKETS SEE PROJECT PLAN.
UNLESS OTHERWISE NOTED, MIDPOINT OF SIGN BRACKETS AND TRUSS CENTER-LINE SHALL BE AT THE SAME ELEVATION.

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MISCELLANEOUS OVERHEAD SIGN SUPPORT DETAILS

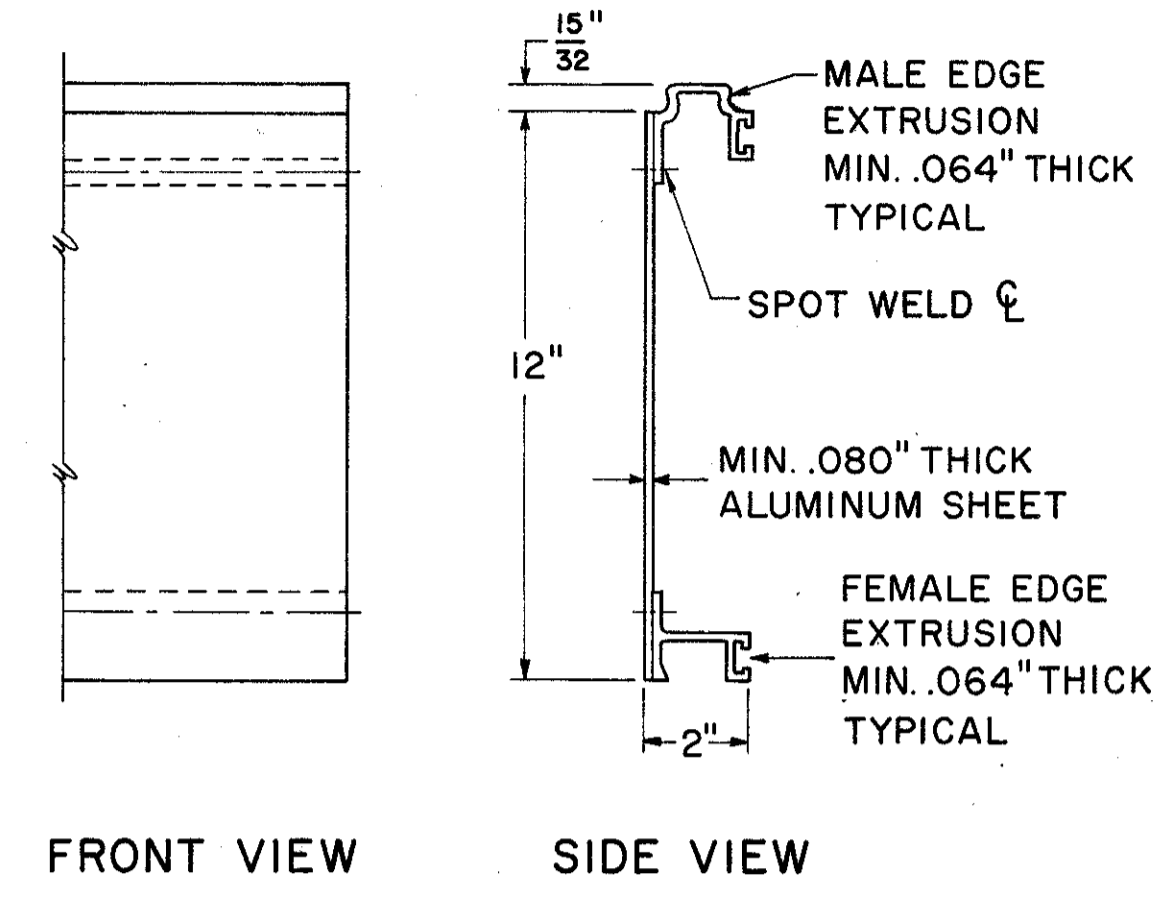
STANDARD CONSTRUCTION 816-20.002
DRAWING

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ENGINEER OF DESIGN SERVICES

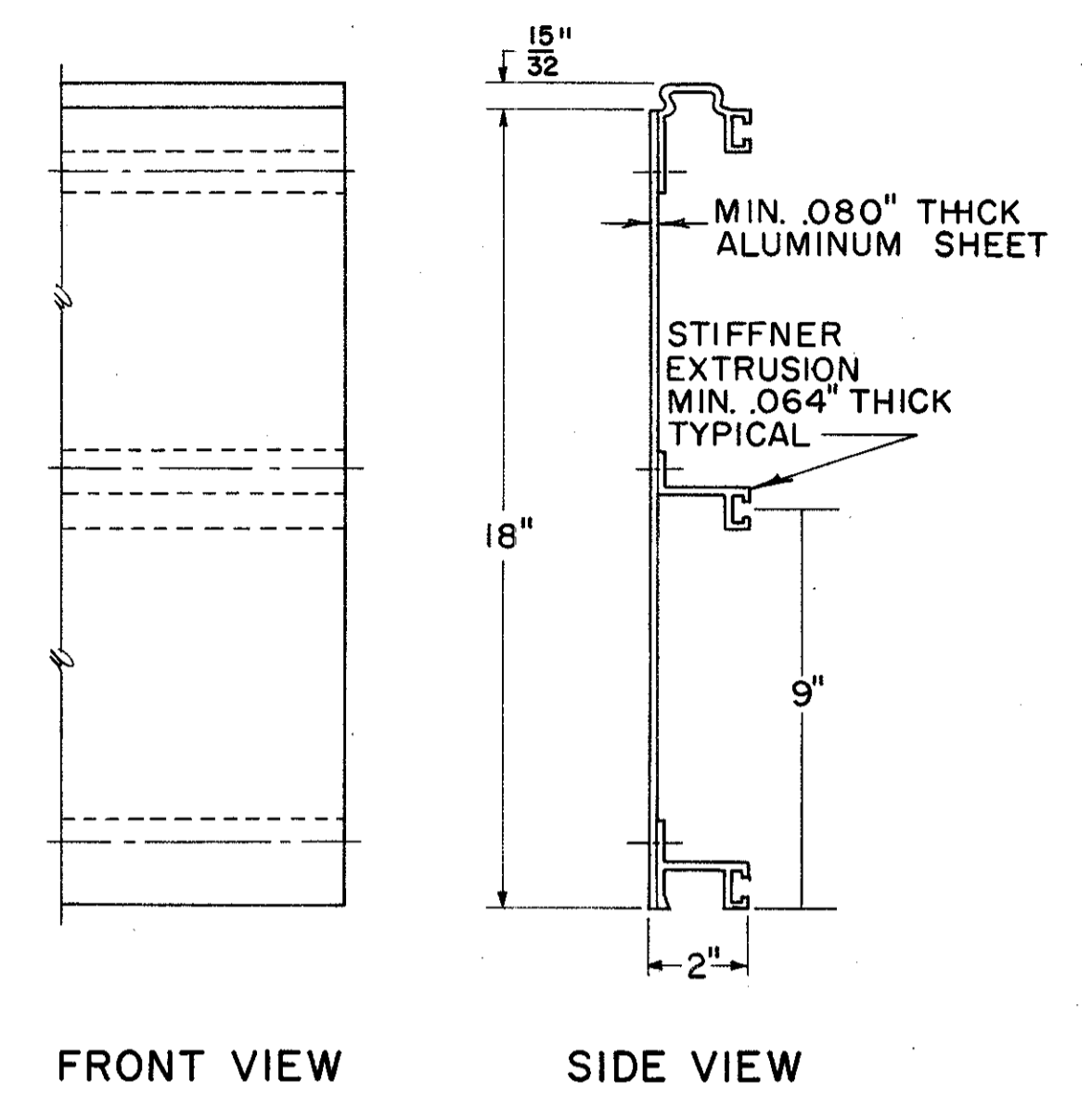
DATE 3-23-72

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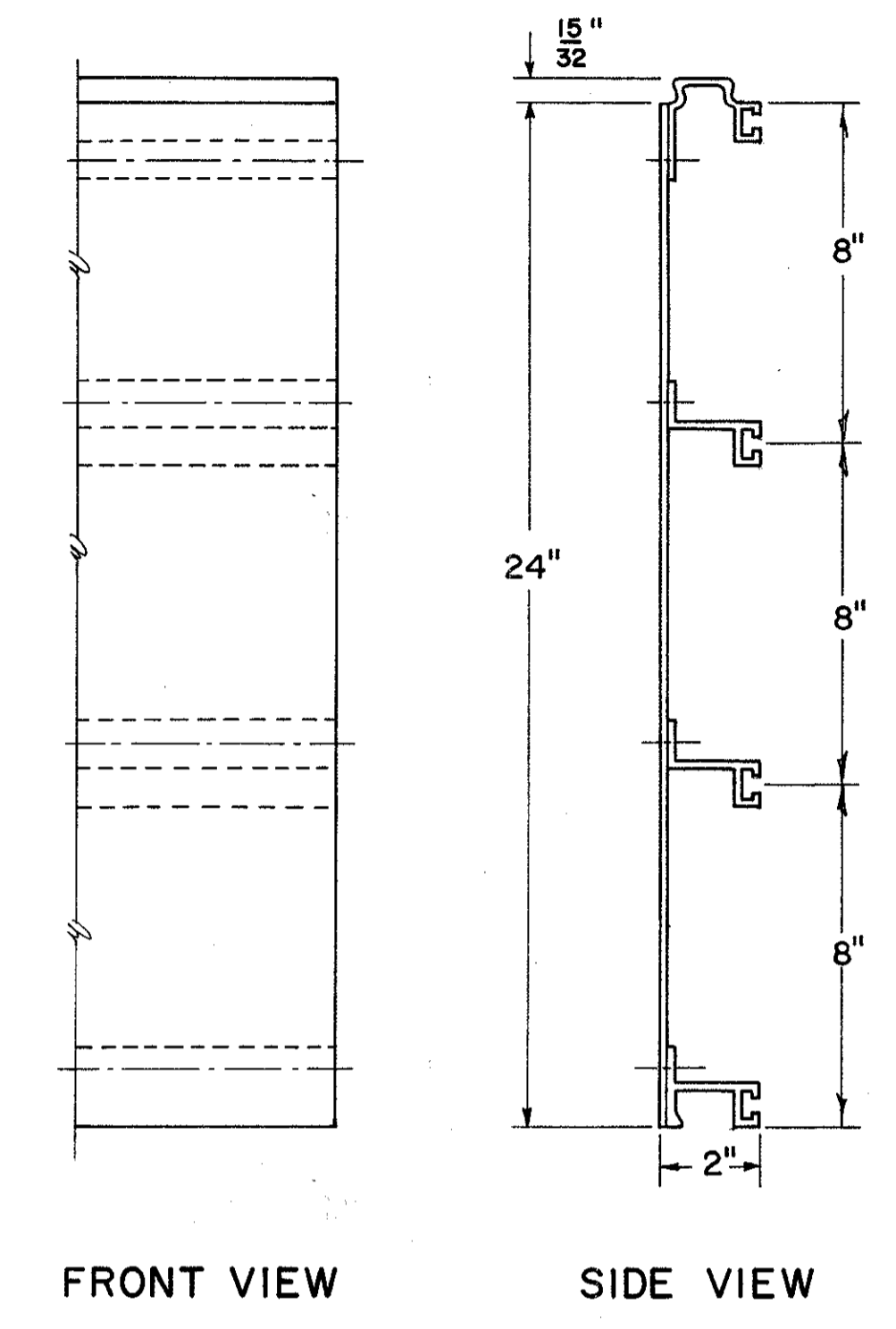
12" EXTRUSHEET PANEL



18" EXTRUSHEET PANEL

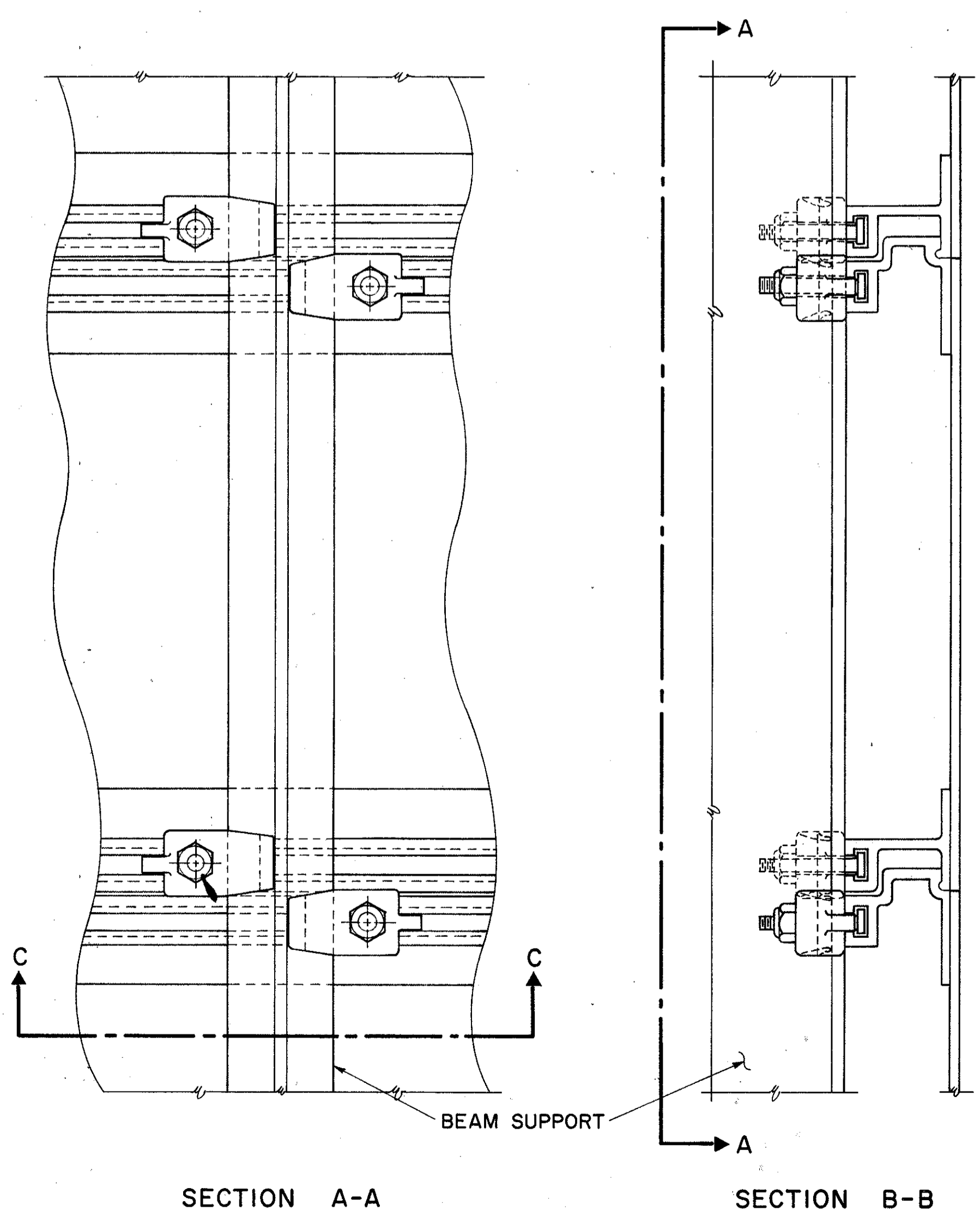


24" EXTRUSHEET PANEL

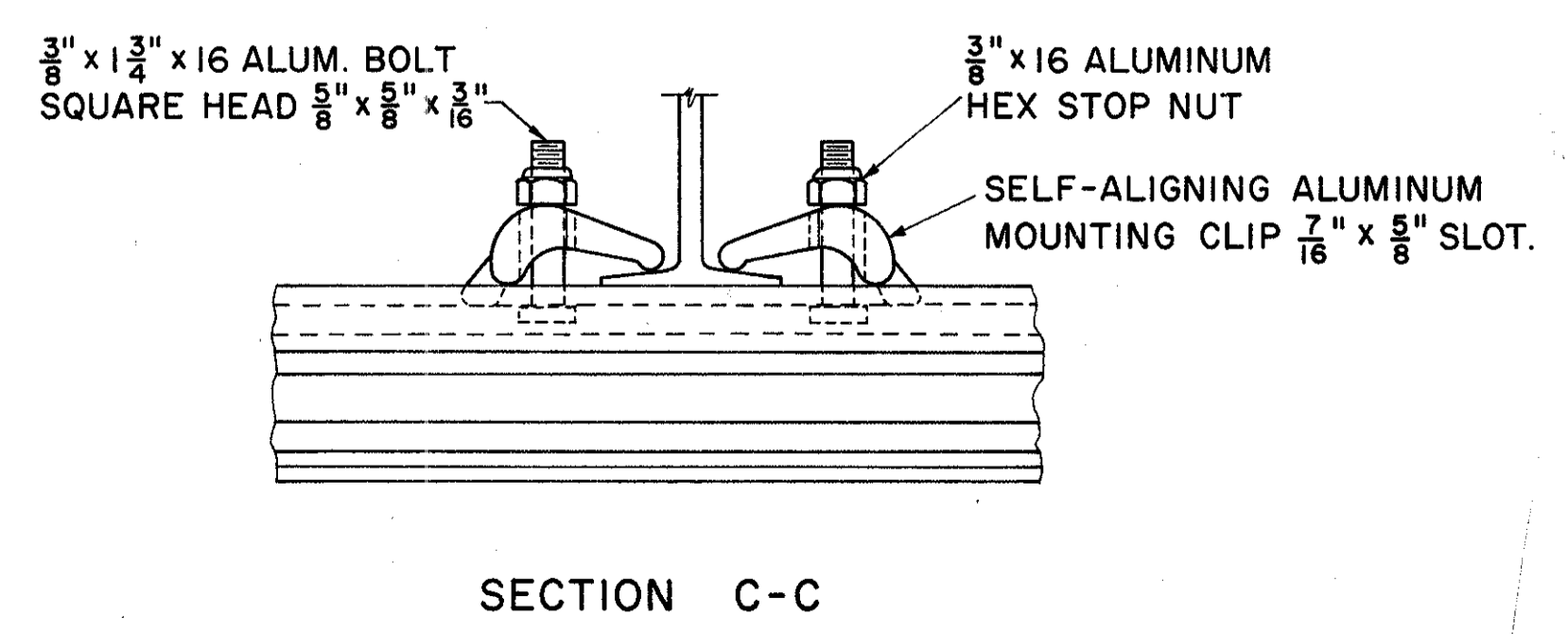
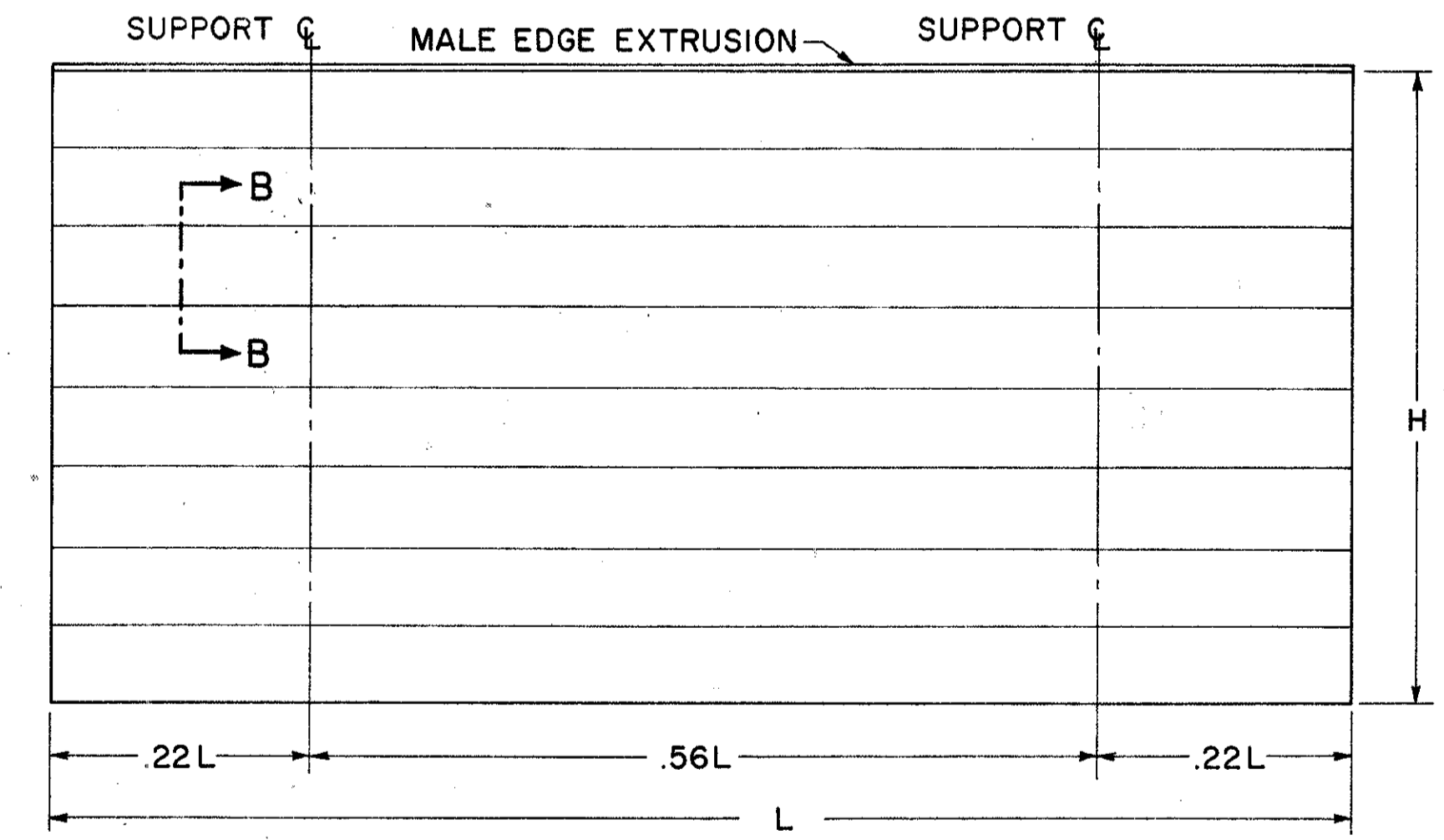


NOTES:

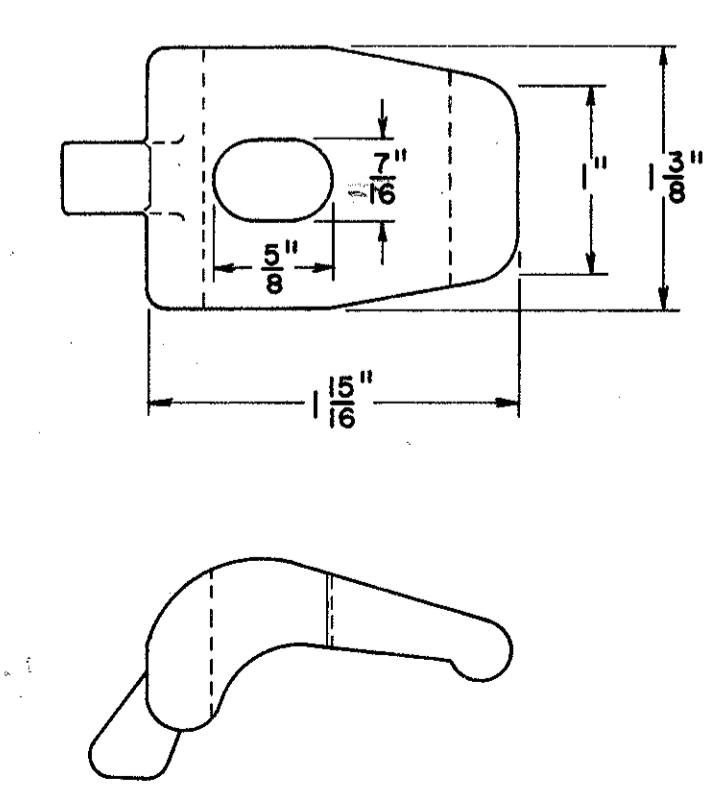
- EXTRUSHEET PANELS SHALL BE ALUMINUM; SPOT WELDING AND ALL MATERIALS SHALL CONFORM WITH SUPPLEMENTAL SPECIFICATION 815.
- COMBINATIONS OF 12", 18", AND 24" PANELS ARE USED TO ATTAIN REQUIRED SIGN HEIGHT.
- INDIVIDUAL PANELS SHALL BE THE SAME LENGTH AS THE HORIZONTAL LENGTH OF SIGN WITH NO SPLICES.
- PANELS SHALL BE INTERLOCKED AND ERECTED WITH THE MALE EXTRUSION LOCATED AT THE TOP EDGE OF THE SIGN.
- EXTRUSHEET PANELS SHALL BE FASTENED TO EACH VERTICAL SUPPORT MEMBER WITH MOUNTING CLIPS; ALTERNATELY AT EACH HORIZONTAL EXTRUSION; BOTH SIDES AT EACH JOINT, AND ON BOTH SIDES AT TOP AND BOTTOM EDGE OF SIGN.
- THE PANELS SHALL BE DESIGNED TO WITHSTAND A WIND LOAD OF 35 POUNDS PER SQUARE FOOT, IN ACCORDANCE WITH THE A.A.S.H.O. SPECIFICATION FOR DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS.
- THE MAXIMUM SIGN LENGTH FOR TWO SUPPORTS IS 19'-0".
- THE MAXIMUM SIGN LENGTH FOR THREE SUPPORTS IS 29'-0".



GENERAL ARRANGEMENT



CLIP DETAIL



SPOT WELDS

PANEL SIZE	MAXIMUM SPOT WELD SPACING CENTER TO CENTER	BETWN ROWS
12 INCH	4 INCH	10 INCH
18 & 24 INCH	4 INCH	8 INCH

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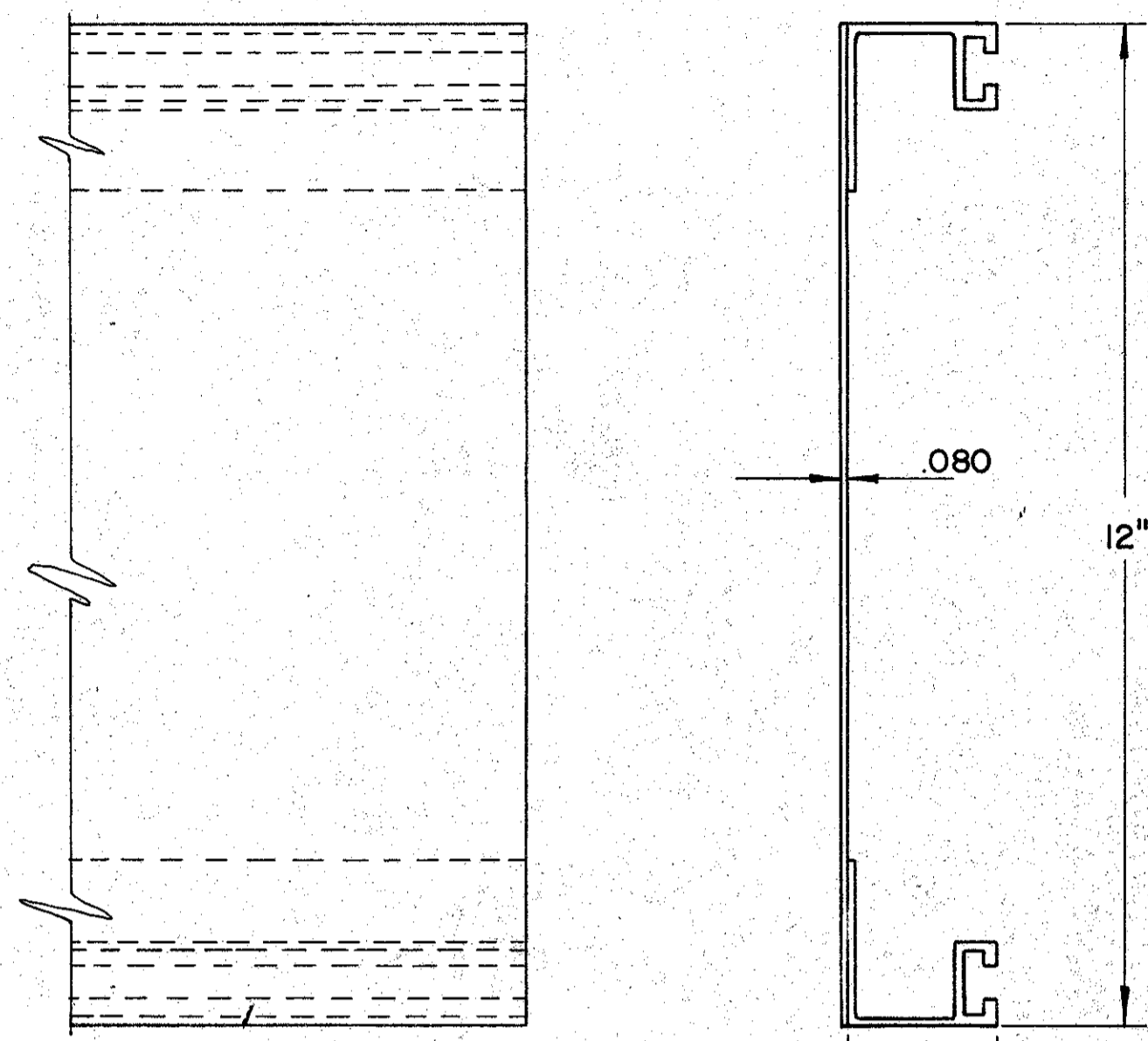
ALUMINUM EXTRUSHEET PANEL SIGN

APPROVED *Fred C. Galley*
ENGINEER OF TRAFFIC

DATE
9-25-63
5-19-64
10-21-65
5-24-67

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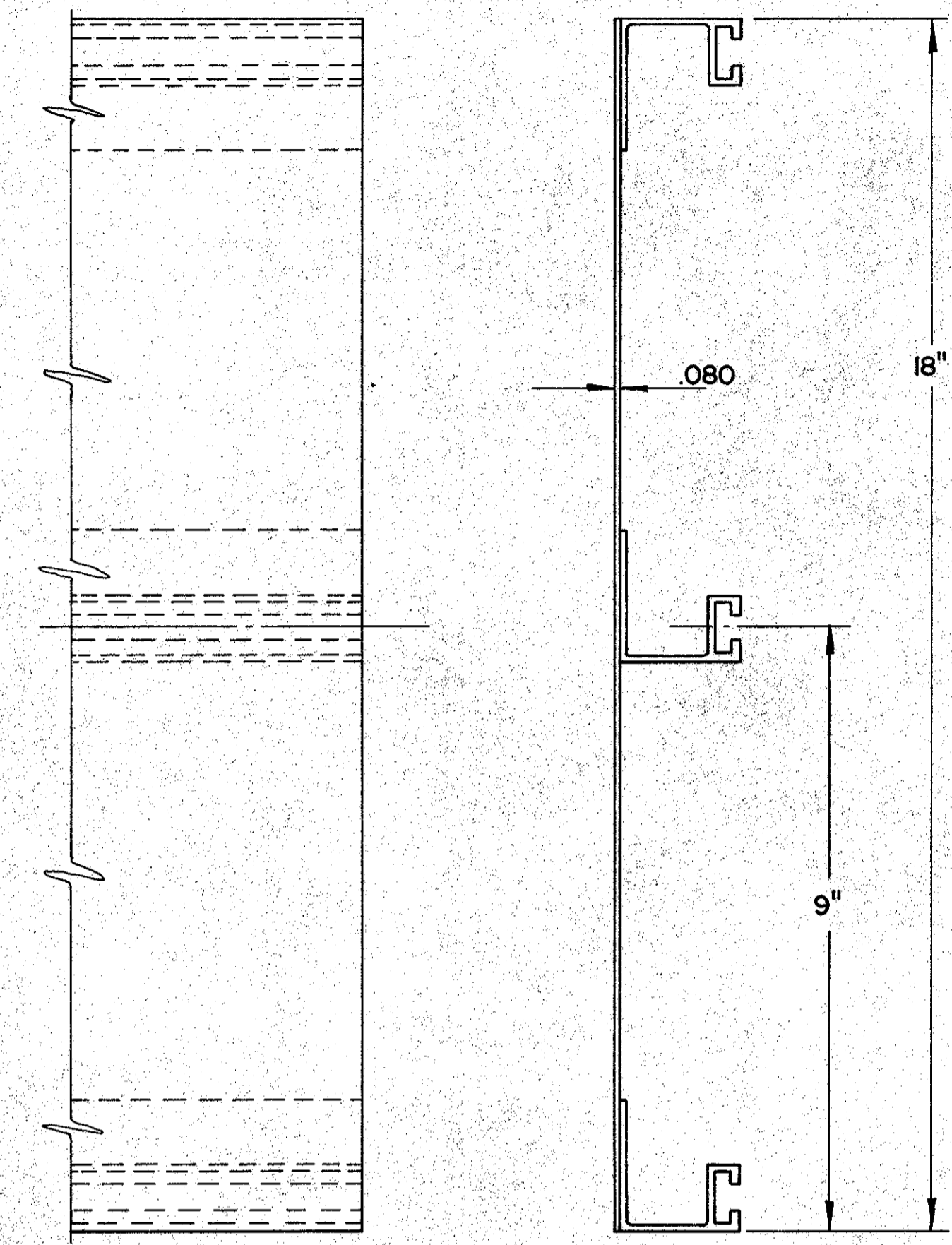
12" BOLTED-EXTRUSHEET PANEL



FRONT VIEW

SIDE VIEW

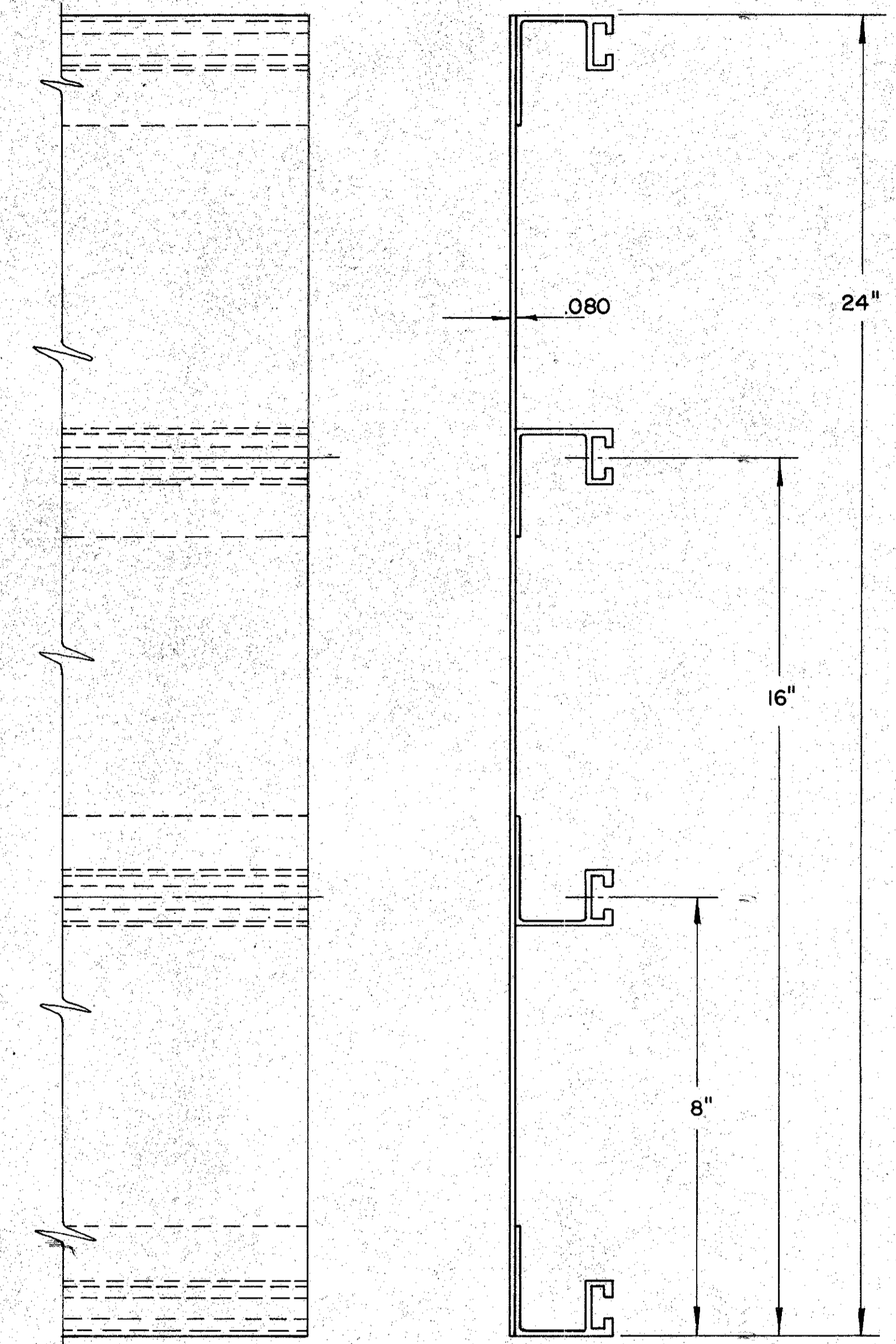
18" BOLTED-EXTRUSHEET PANEL



FRONT VIEW

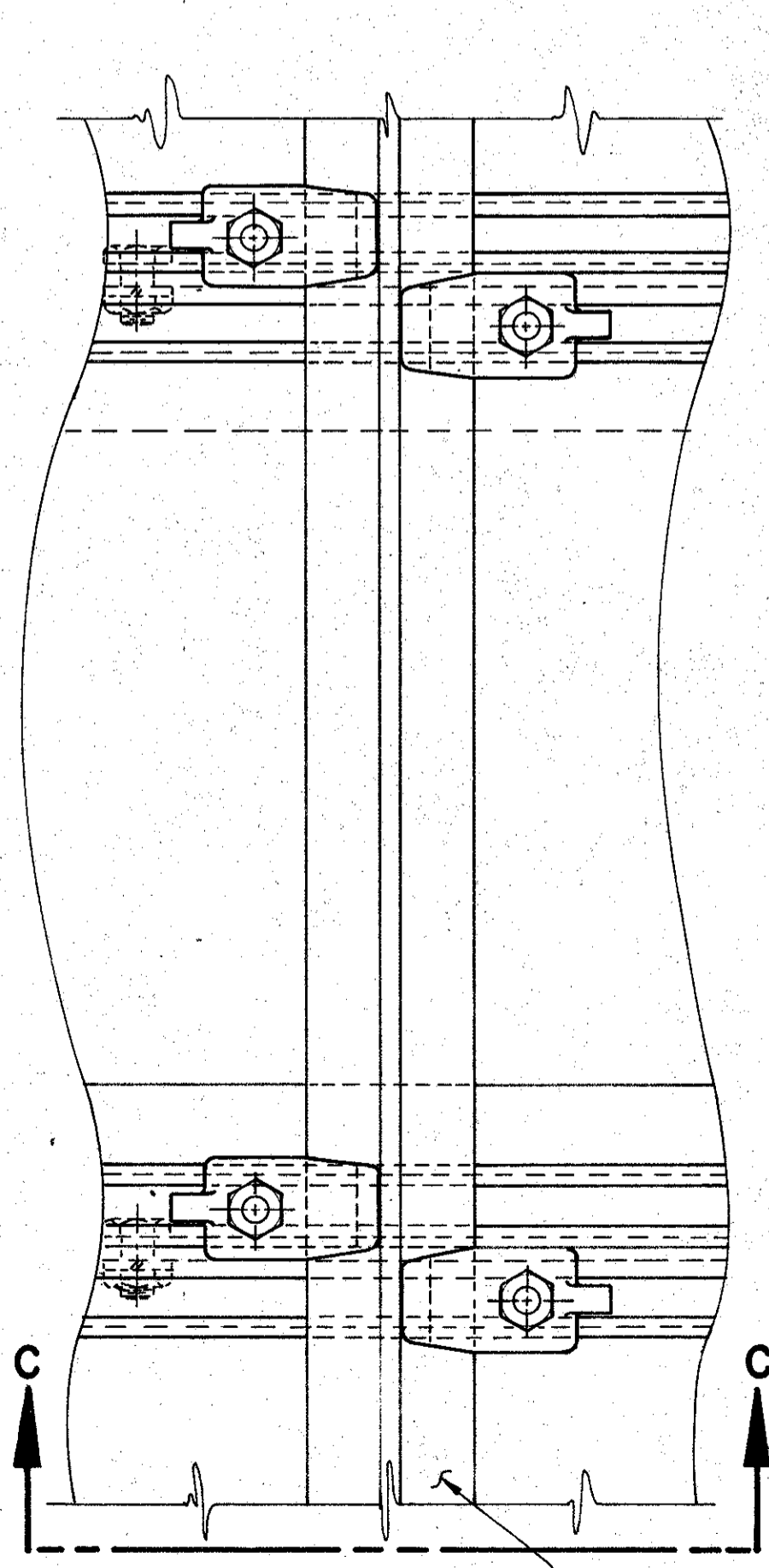
SIDE VIEW

24" BOLTED-EXTRUSHEET PANEL



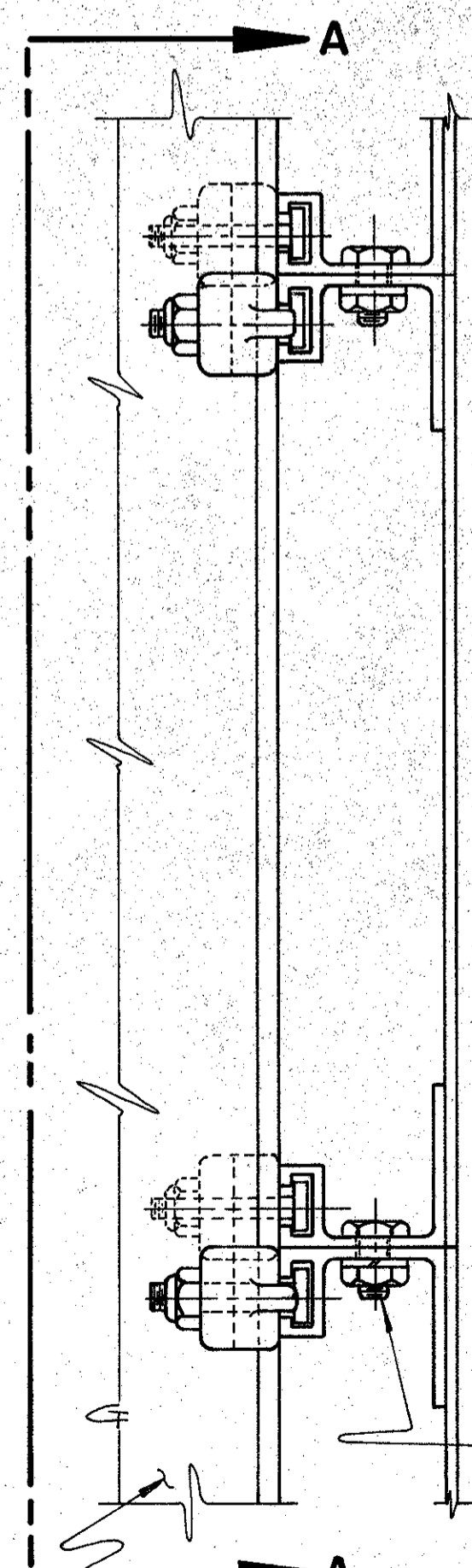
FRONT VIEW

SIDE VIEW

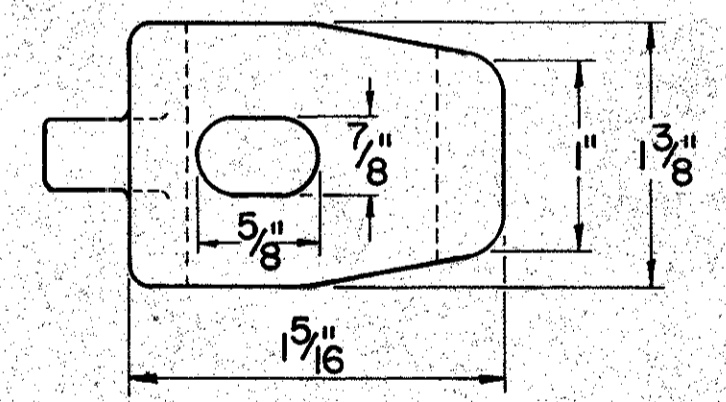


SECTION A-A

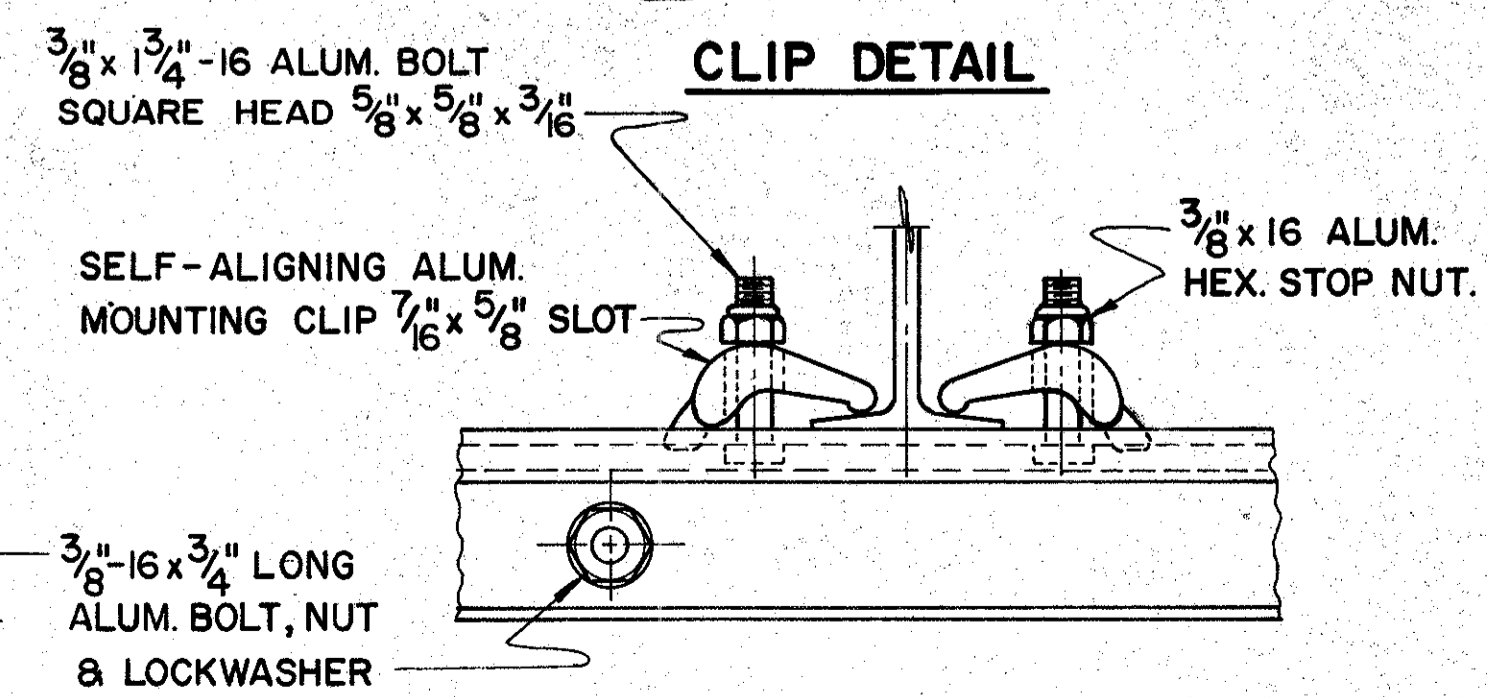
BEAM SUPPORT



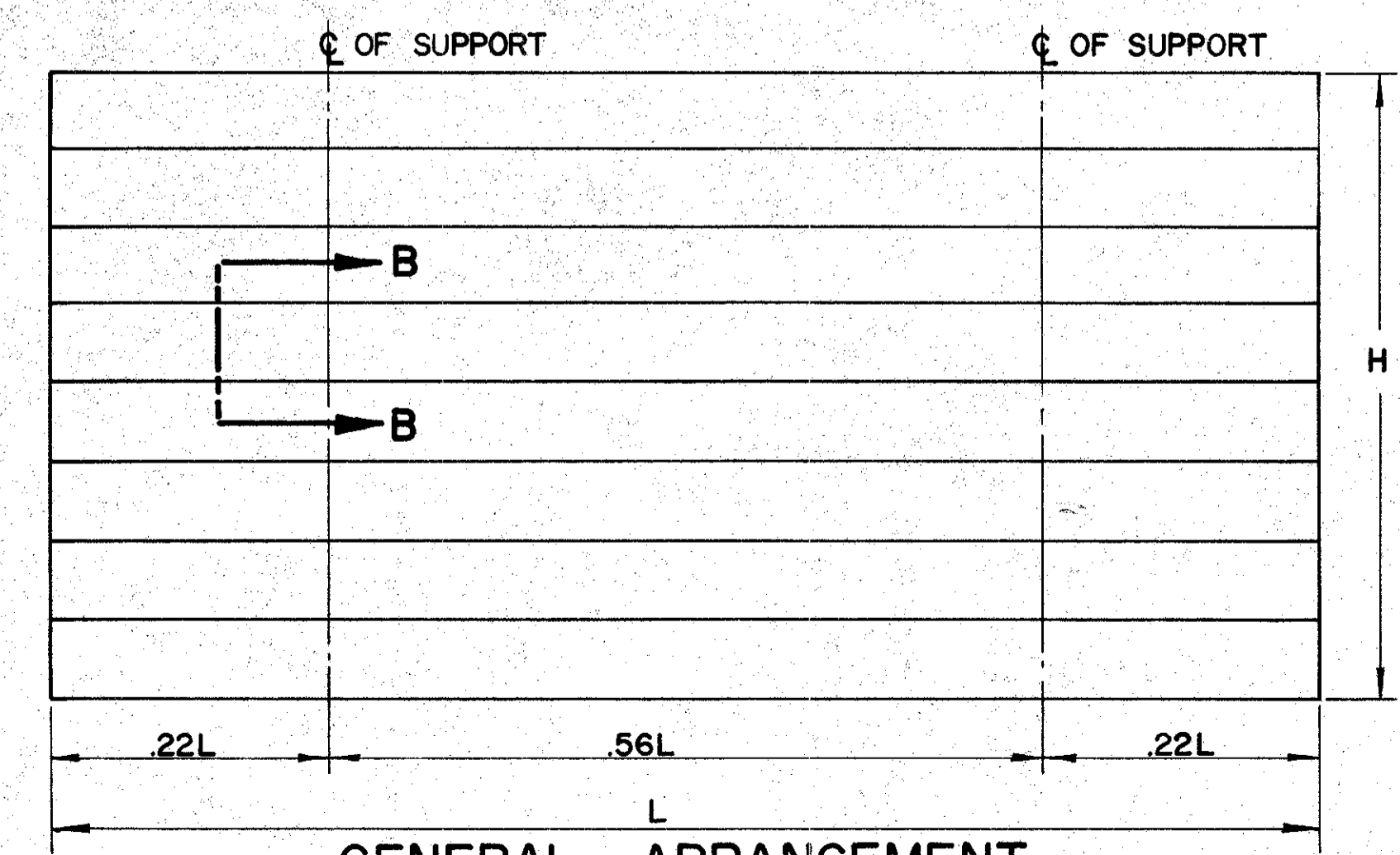
SECTION B-B



CLIP DETAIL



SECTION C-C



GENERAL ARRANGEMENT

NOTES

- EXTRU-SHEET PANELS SHALL BE ALUMINUM; SPOT WELDING, MATERIALS AND HARDWARE SHALL CONFORM WITH SPECIFICATION NO. 815
- COMBINATIONS OF 12", 18" AND 24" PANELS ARE TO BE USED TO ATTAIN REQUIRED SIGN HEIGHT.
- INDIVIDUAL PANELS SHALL BE THE SAME LENGTH AS THE HORIZONTAL LENGTH OF SIGN, WITH NO SPLICES.
- THE PANELS SHALL BE ERECTED HORIZONTALLY AND BOLTED ON 24" CENTERS.
- THE PANELS SHALL BE FASTENED TO EACH VERTICAL SUPPORT MEMBER WITH MOUNTING CLIPS; ALTERNATELY AT EACH HORIZONTAL EXTRUSION; BOTH SIDES AT EACH JOINT, AND BOTH SIDES AT TOP AND BOTTOM EDGES OF SIGN.
- THE PANELS SHALL BE DESIGNED IN ACCORDANCE WITH THE A.A.S.H.O SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, BASE ON A WIND LOAD OF 35#/SQ.FT.
- THE MAXIMUM SIGN LENGTH FOR TWO SUPPORTS IS 19'-0". THE MAXIMUM SIGN LENGTH FOR THREE SUPPORTS IS 29'-0".

SPOT WELDS

PANEL SIZE	MAXIMUM SPOT WELD SPACING CENTER TO CENTER BETWEEN ROWS	
12 INCH	4 INCH	10 INCH
18 & 24 INCH	4 INCH	8 INCH

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ALUMINUM BOLTED EXTRUSHEET PANEL SIGN

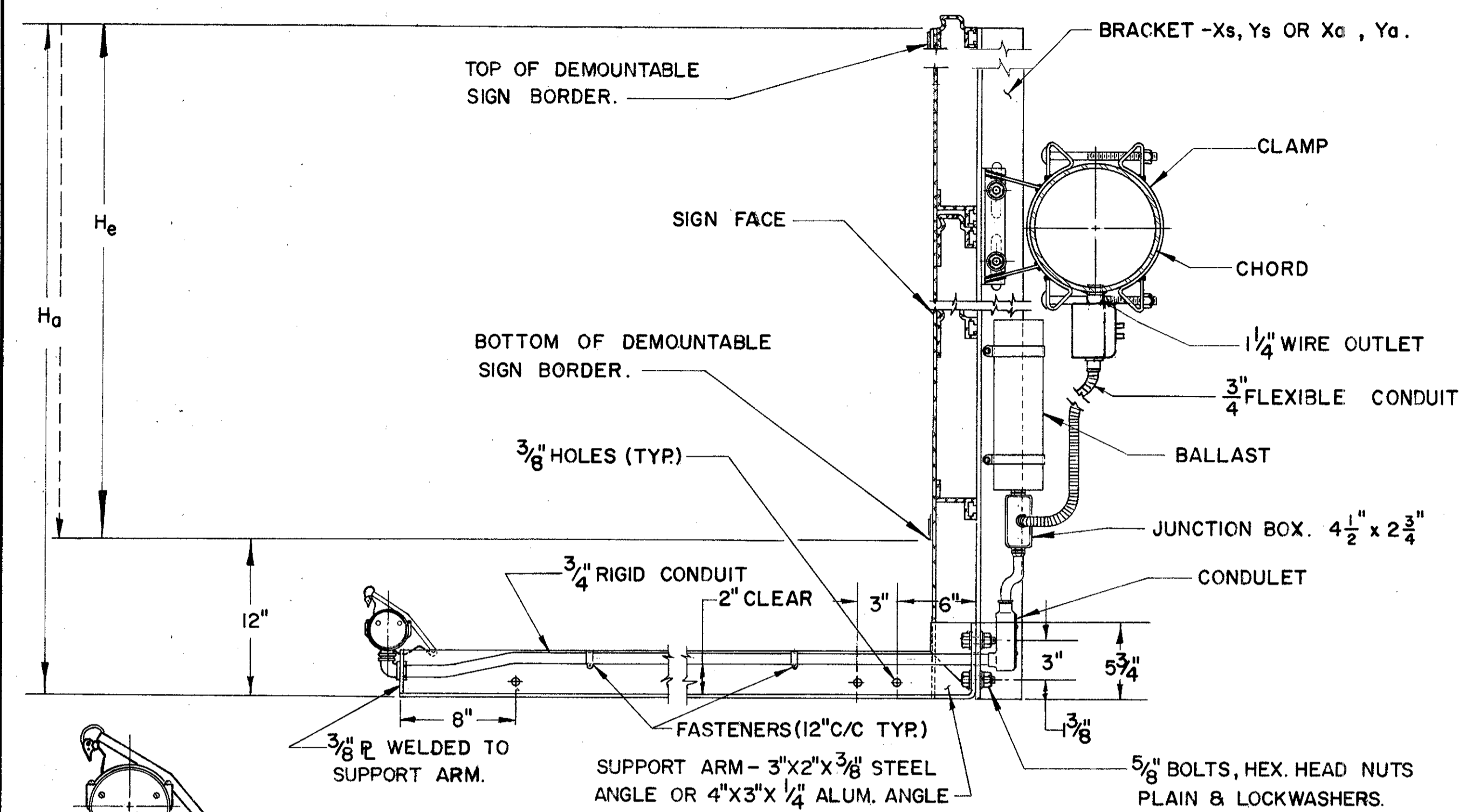
APPROVED *Fred C. Taylor*
ENGINEER OF TRAFFIC

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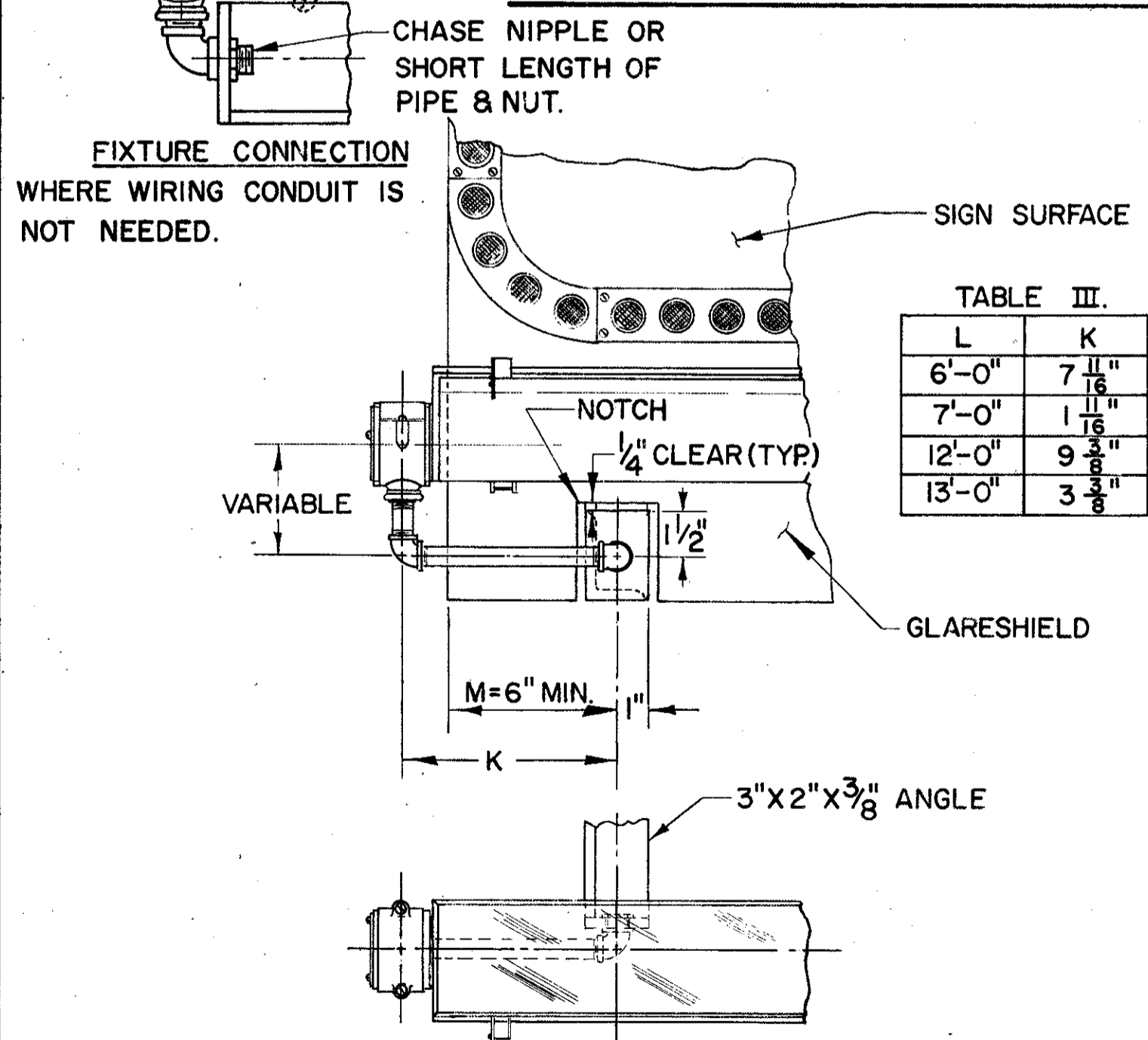
DATE
10-14-65

ALUMINUM BOLTED-EXTRUSHEET PANEL SIGN

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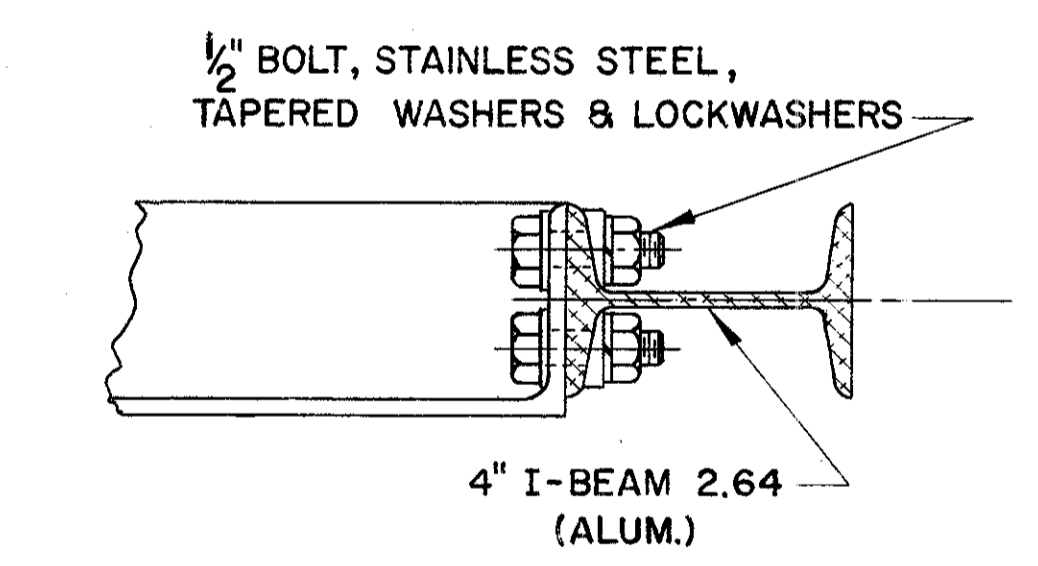
STANDARD FIXTURE LOCATION (BELOW)



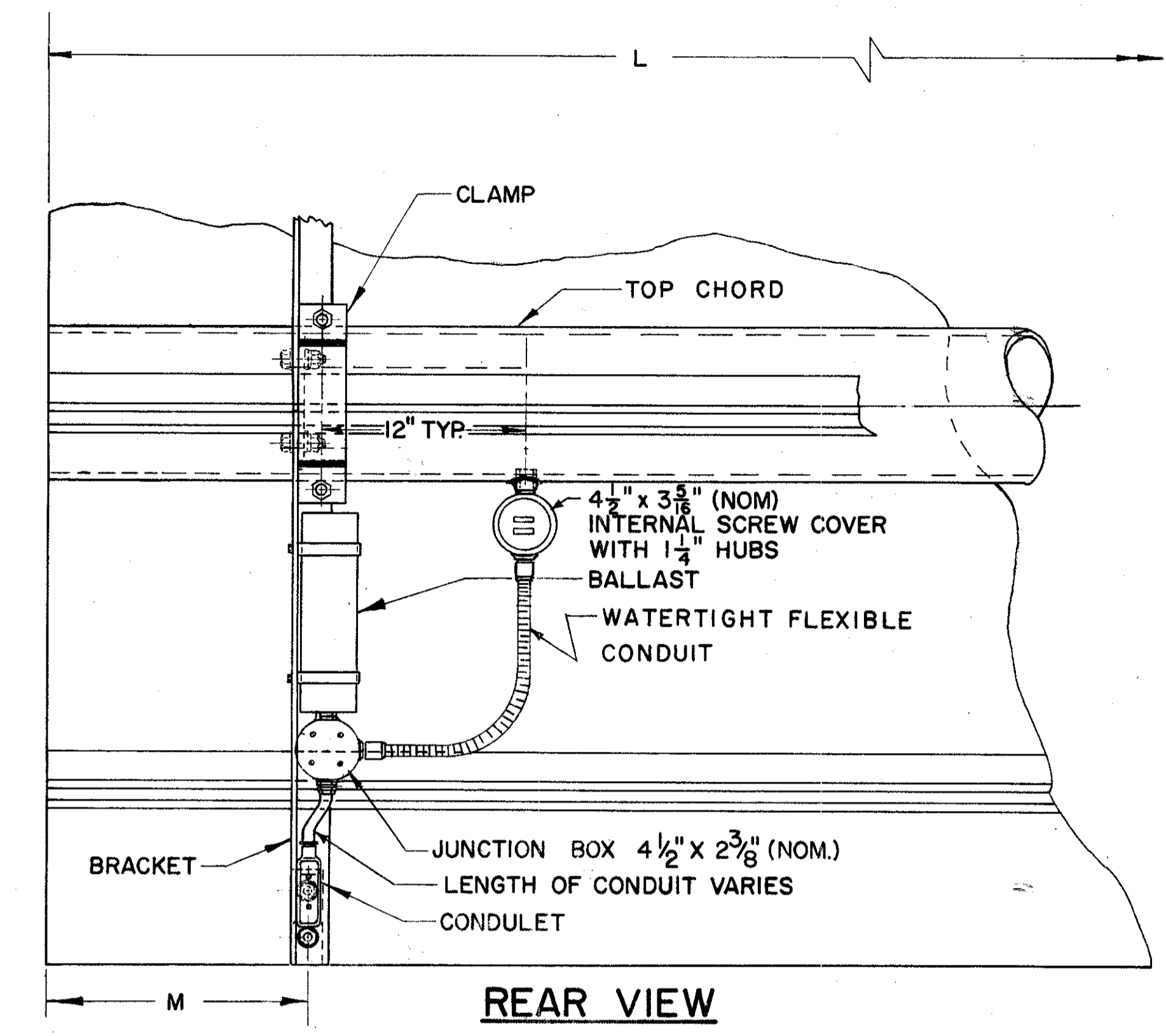
DETAIL A.

TABLE III.

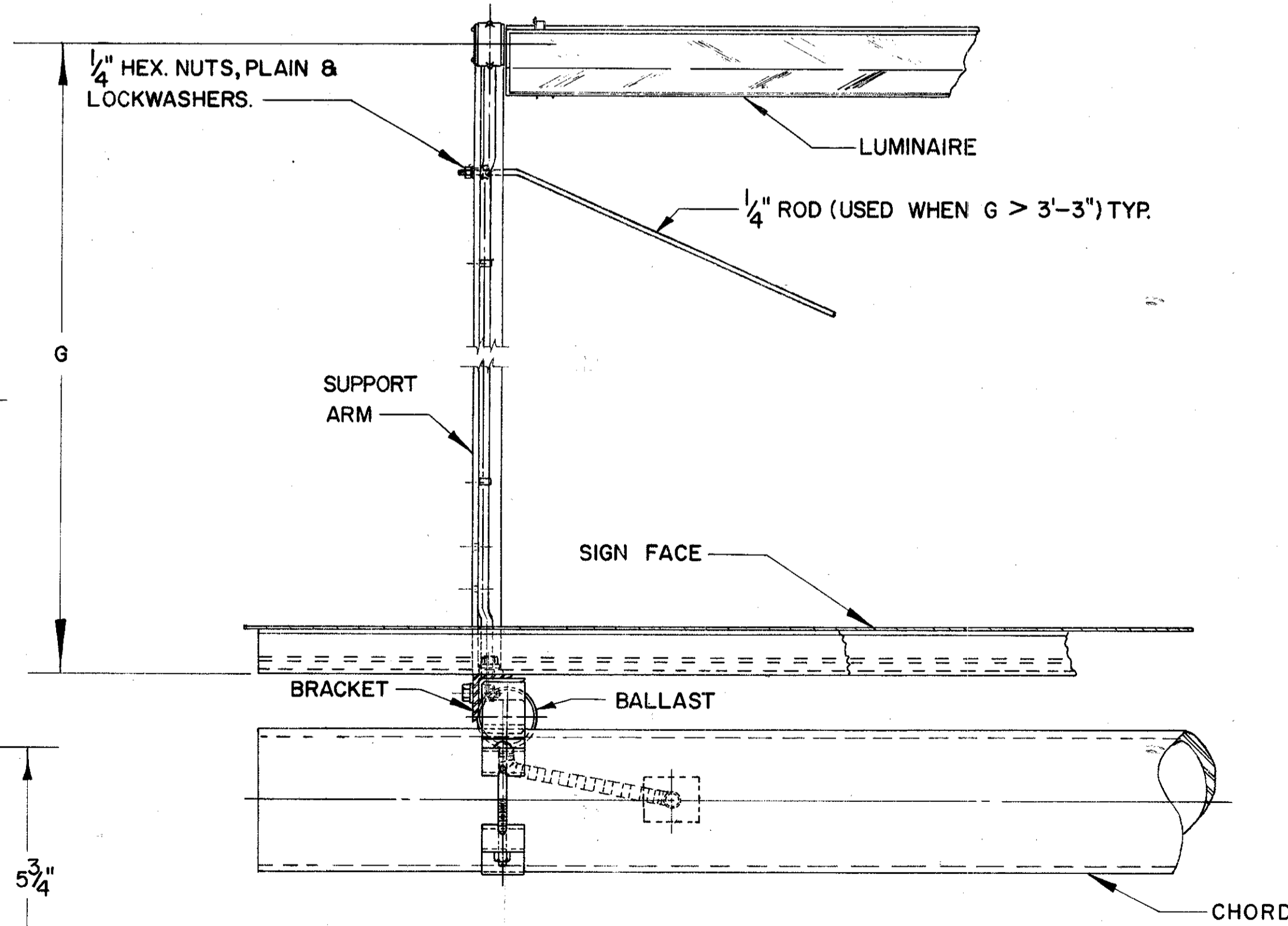
L	K
6'-0"	7 11/16"
7'-0"	1 11/16"
12'-0"	9 3/8"
13'-0"	3 3/8"



DETAIL B.



REAR VIEW



TOP VIEW

FABRICATION— ALL STRUCTURAL COMPONENTS SHOWN ON THIS SHEET SHALL CONFORM TO SUPPLEMENT SPECIFICATIONS 816.
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.

SIGN LENGTH	"L" A	"L" B	FIXTURES OF	"M" EDGE DISTANCE				NO. BALLAST
				LT.	RT.	LT.	RT.	
6'-0"	7'-0"	1	75, 99, 93	6"	6"	6"	6"	1
8'-0"	9'-0"	1	10 3/8"	10 1/4"	16 3/8"	16 1/4"	1	1
10'-0"	11'-0"	1	10 3/8"	10 1/4"	16 3/8"	16 1/4"	1	1
12'-0"	13'-0"	2	8 5/8"	6"	6"	6"	6"	1
14'-0"	15'-0"	2	8 5/8"	8 5/8"	14 5/8"	14 5/8"	1	1
16'-0"	17'-0"	1	8 5/8"	8 5/8"	14 5/8"	14 5/8"	1	1
18'-0"	19'-0"	2	8 5/8"	8 5/8"	14 5/8"	14 5/8"	1	1
20'-0"	21'-0"	3	7"	6 7/8"	13"	12 7/8"	2	2
22'-0"	23'-0"	2	1	7"	6 7/8"	13"	12 7/8"	2
24'-0"	25'-0"	1	2	7"	6 7/8"	13"	12 7/8"	2
26'-0"	27'-0"	3	7"	6 7/8"	13"	12 7/8"	2	2

Sn = Nominal Fixture Length, 72" & 96" respectively.
Sa = Actual Fixture Length, for mounting purposes, 75 3/8" and 99 3/8" respectively. (Slight variation for different manufacturers.)
M = Distance from edge of sign to C 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	
	SINGLE TUBE	DOUBLE TUBE	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 Y	8'-4" with X 8'-4" with Y	8'-4" with X 8'-4" with Y
5'-6" to 8'-0"	6'-4" with Y	4'-2" with X 6'-4" with Y	6'-4" with X 6'-4" with Y	8'-4" with X 8'-4" with Y
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 1/8" x 1/4" - Z @ 8.2 LB. STEEL } 12.24, 14.5 & 15.8
Xa = 3" x 2 1/16" x 1/4" - Z @ 2.33 LB. ALUM. } 7.2 Thru 7.6
Ya = 4" x 2 2/32" 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" X 3" X 1/4" ANGLE. SEE DETAIL B. BOLTS AND ACCESSORIES SHALL BE STAINLESS STEEL.

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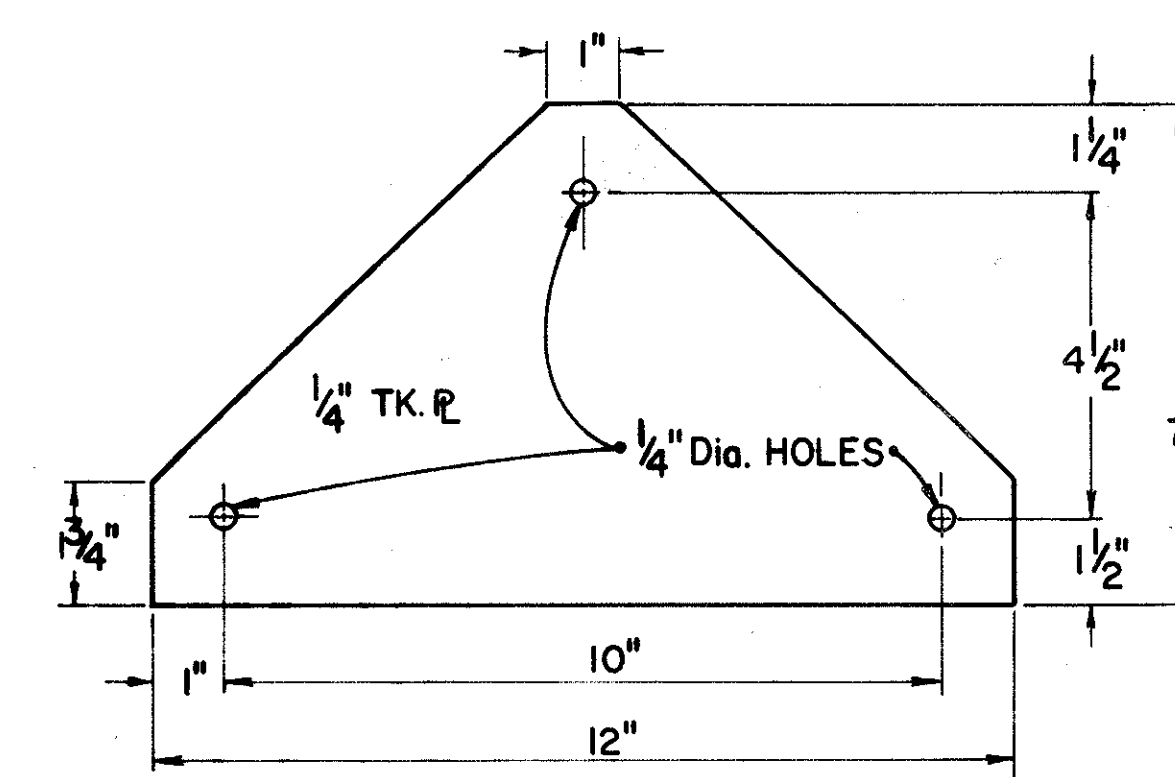
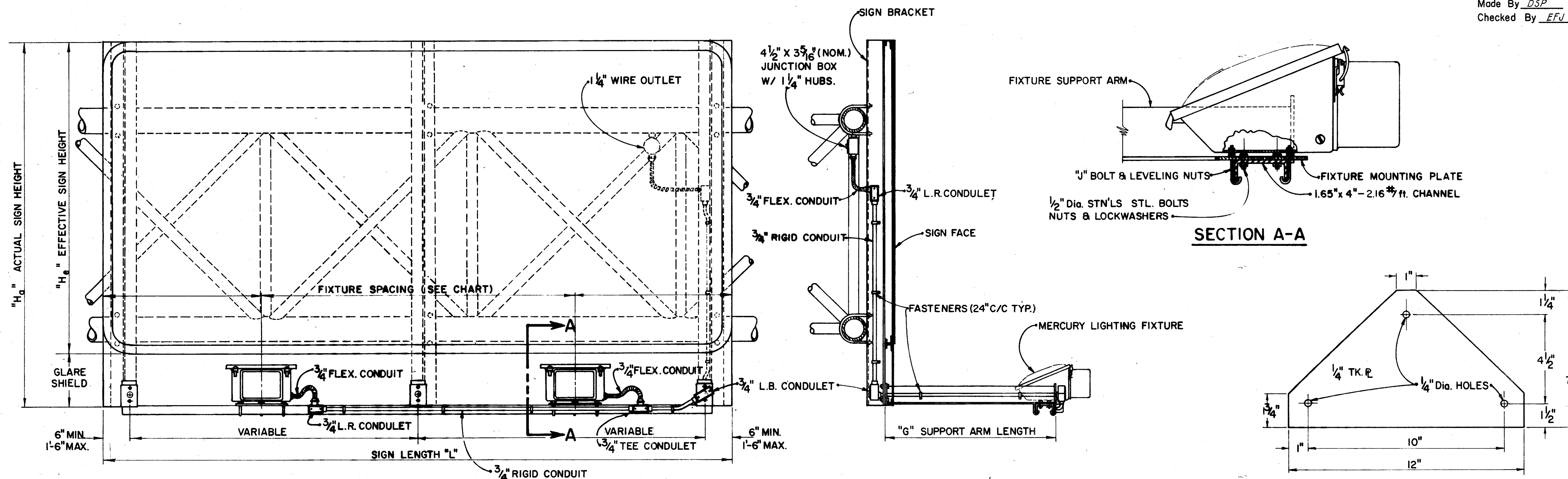
STRUCTURAL DETAILS FOR EXTERNALLY ILLUMINATED SIGNS

DATE: 10-16-63
5-6-64
10-29-64
6-21-66
3-29-67

APPROVED: *John C. Taylor*
ENGINEER OF TRAFFIC

CUYAHOGA COUNTY
CUY. 480-21.40

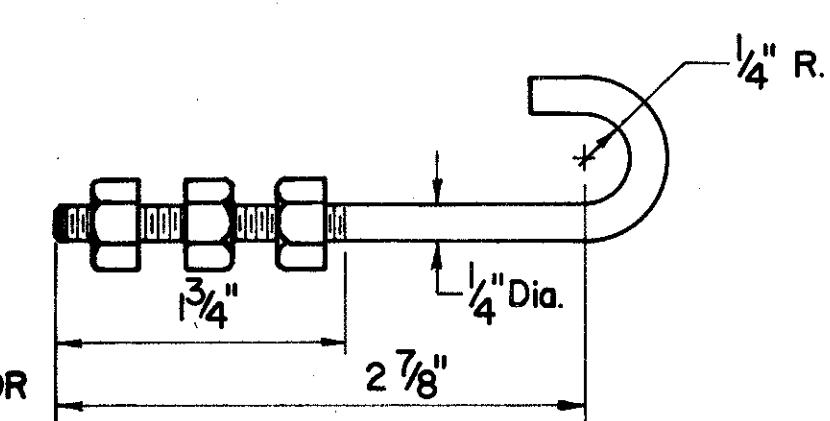
QUANTITY CALCULATIONS
Made By DSP Date 8-27-73
Checked By EFJ Date 9-4-73



EFFECTIVE SIGN HEIGHT "H"	SUPPORT ARM LENGTH "G"	APPROX. AIMING ANGLE	LAMP WATTS	ANSI LAMP CODE	BALLAST TYPE
3'-0" to 5'-0"	2'-9"	0°	100	H38-4HT	CMRI-100-(a)
5'-1" to 6'-6"	3'-3"	0°	175	H39-22KB	CMRI-175-(a)
6'-7" to 10'-0"	4'-3"	2°	175	H39-22KB	CMRI-175-(a)
10'-1" to 13'-0"	5'-9"	8°	250	H37-5KB	CMRI-250-(a)
13'-1" to 15'-0"	7'-3"	8°	250	H37-5KB	CMRI-250-(a)

(a) = OPERATING VOLTAGE (120V, 208V, 240V, 277V, OR 480V.)

FIXTURE MOUNTING PLATE (ALUMINUM)



"J" BOLT (STAINLESS STEEL BOLT, NUTS & LOCKWASHERS)

SIGN LENGTH "L"	NO. OF FIXTURES	LIGHT FIXTURE SPACING				SUPPORT ARM SPACING				NO. OF SIGN BRACKETS	
		2'-0"	2'-0"	3'-0"	3'-0"	6"	36"	6"	6"		
4'-0"	1	2'-0"	2'-0"			6"	36"	6"		2	
5'-0"	1	2'-6"	2'-6"			6"	48"	6"		2	
6'-0"	1	3'-0"	3'-0"			6"	60"	6"		2	
7'-0"	1	3'-6"	3'-6"			6"	72"	6"		2	
8'-0"	1	4'-0"	4'-0"			10 3/8"	75 3/8"	10 1/4"		2	
9'-0"	1	4'-6"	4'-6"			16 3/8"	75 3/8"	16 1/4"		2	
10'-0"	1	5'-0"	5'-0"			10 3/8"	99 3/8"	10 1/4"		2	
11'-0"	1	5'-6"	5'-6"			16 3/8"	99 3/8"	16 1/4"		2	
12'-0"	2	3'-0"	6'-0"	3'-0"		6"	66"	66"	6"	3	
13'-0"	2	3'-6"	6'-0"	3'-6"		6"	72"	72"	6"	3	
14'-0"	2	4'-0"	6'-0"	4'-0"		8 5/8"	75 3/8"	75 3/8"	8 5/8"	3	
15'-0"	2	4'-6"	6'-0"	4'-6"		14 5/8"	75 3/8"	75 3/8"	14 5/8"	3	
16'-0"	2	4'-0"	8'-0"	4'-0"		8 5/8"	75 3/8"	99 3/8"	8 5/8"	3	
17'-0"	2	4'-6"	8'-0"	4'-6"		14 5/8"	75 3/8"	99 3/8"	14 5/8"	3	
18'-0"	2	4'-0"	10'-0"	4'-0"		8 5/8"	99 3/8"	99 3/8"	8 5/8"	3	
19'-0"	2	4'-6"	10'-0"	4'-6"		14 5/8"	99 3/8"	99 3/8"	14 5/8"	3	
20'-0"	3	4'-0"	6'-0"	6'-0"	4'-0"	7"	75 3/8"	75 3/8"	75 3/8"	6 7/8"	4
21'-0"	3	4'-6"	6'-0"	6'-0"	4'-6"	13"	75 3/8"	75 3/8"	75 3/8"	12 1/8"	4
22'-0"	3	4'-0"	7'-0"	7'-0"	4'-0"	7"	75 3/8"	75 3/8"	99 3/8"	6 7/8"	4
23'-0"	3	4'-6"	7'-0"	7'-0"	4'-6"	13"	75 3/8"	75 3/8"	99 3/8"	12 1/8"	4
24'-0"	3	4'-0"	8'-0"	8'-0"	4'-0"	7"	75 3/8"	99 3/8"	99 3/8"	6 7/8"	4
25'-0"	3	4'-6"	8'-0"	8'-0"	4'-6"	13"	75 3/8"	99 3/8"	99 3/8"	12 1/8"	4
26'-0"	4	4'-0"	6'-0"	6'-0"	6'-0"	7"	99 3/8"	99 3/8"	99 3/8"	6 7/8"	4
27'-0"	4	4'-6"	6'-0"	6'-0"	4'-6"	13"	99 3/8"	99 3/8"	99 3/8"	12 1/8"	4

Sign Numbers	Roadway	Reference	Station	Effective Sign Size	Fixtures With Lamps AN-51 Lamp 6000	Watts Per Sign		Sign Switch	Sign Panel/ Wire Complete	Sign Service Complete	Ground Rod	
						Ea.	Ea.					
141	I-480	A	1159+00 E.B.	25'-0" x 11'-6"	3	250	3	1	1	1	1	
		B		18'-0" x 9'-6"	2	175	2	1	1	1	1	
142	I-480	A	1168+00 E.B.	25'-0" x 11'-6"	3	250	3	1	1	1	1	
		B		14'-0" x 8'-0"	2	175	2	1	1	1	1	
		C		21'-0" x 7'-0"	3	175	3	1	1	1	1	
143	I-480	B	1182+33 W.B.	18'-0" x 11'-6"	2	250	2	1	1	1	1	
		C		22'-0" x 11'-6"	3	250	3	1	1	1	1	
144	Bedford Frwy.	A	59+88	16'-0" x 9'-6"	2	175	2	1	1	1	1	
		B		11'-0" x 6'-0"	1	175	1	1	1	1	1	
146	Bedford Ave.	A	44+50	11'-0" x 8'-6"	1	175	1	1	1	1	1	
148	Broadway	A	90+07 N.B.	8'-0" x 6'-0"	1	175	1	1	1	1	1	
		B		8'-0" x 6'-0"	1	175	1	1	1	1	1	
149	Broadway	B	80+40 S.B.	8'-0" x 6'-0"	1	175	1	1	1	1	1	
150	I-480	A	1180+70 E.B.	15'-0" x 8'-0"	2	175	2	1	1	1	1	
TOTAL						11	16	11	16	8	14	8

BUREAU OF DESIGN SERVICES
OHIO DEPARTMENT OF HIGHWAYS

MERCURY VAPOR SIGN LIGHTING DETAILS

STANDARD CONSTRUCTION DRAWING

APPROVED _____
ENGINEER OF DESIGN SERVICES

DATE
4-13-72

CUYAHOGA COUNTY
CUY. 480-21.40

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, PANELS INCORPORATED-CLASS 9400, OR APPROVED EQUAL.

TRANSFORMER

THE TRANSFORMER SHALL BE DRY TYPE SINGLE PHASE 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

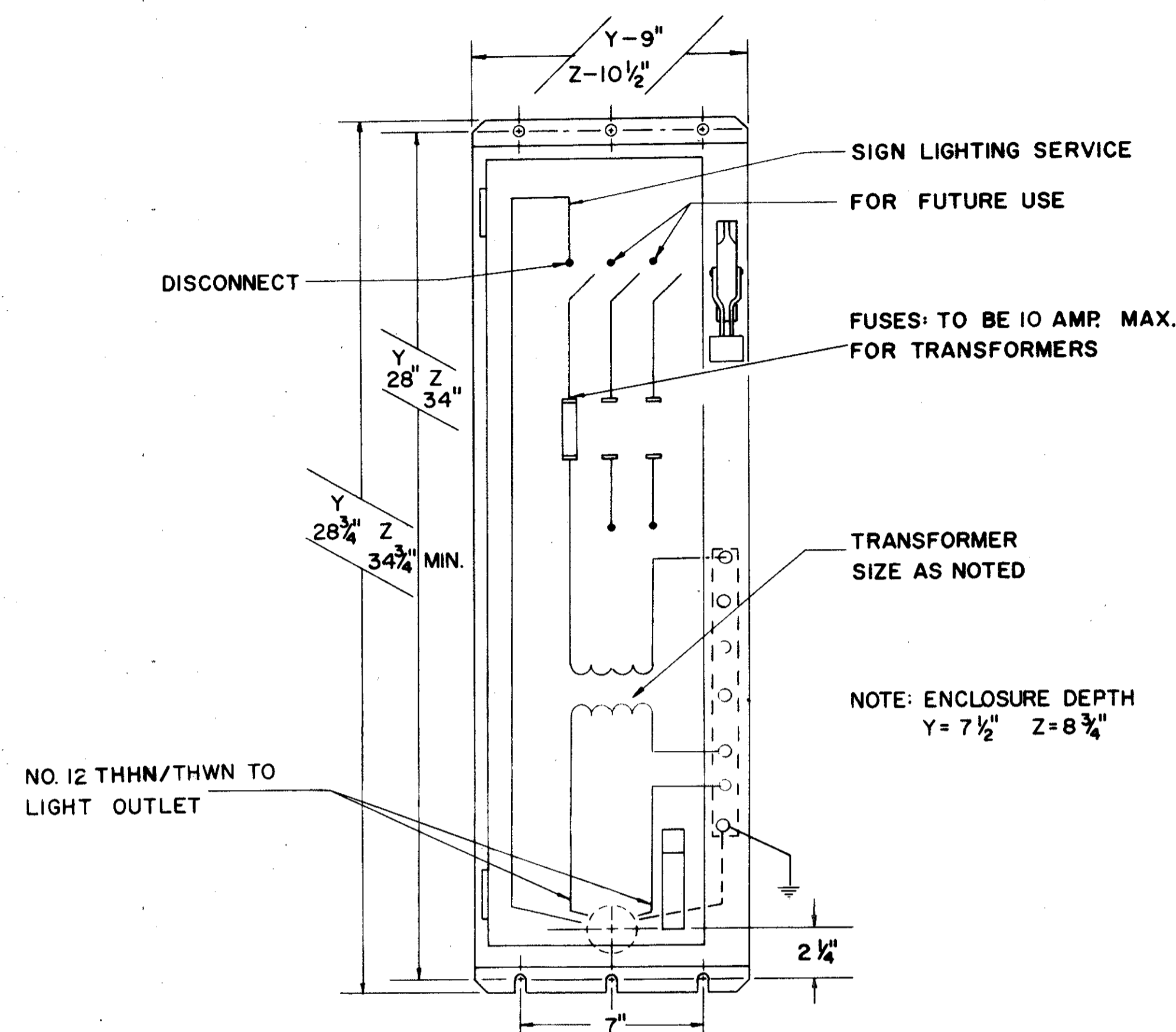
ALL WIRE AND CABLE SHALL BE 600 VOLT AND CONFORM TO SECTION 713.02

GROUNDING

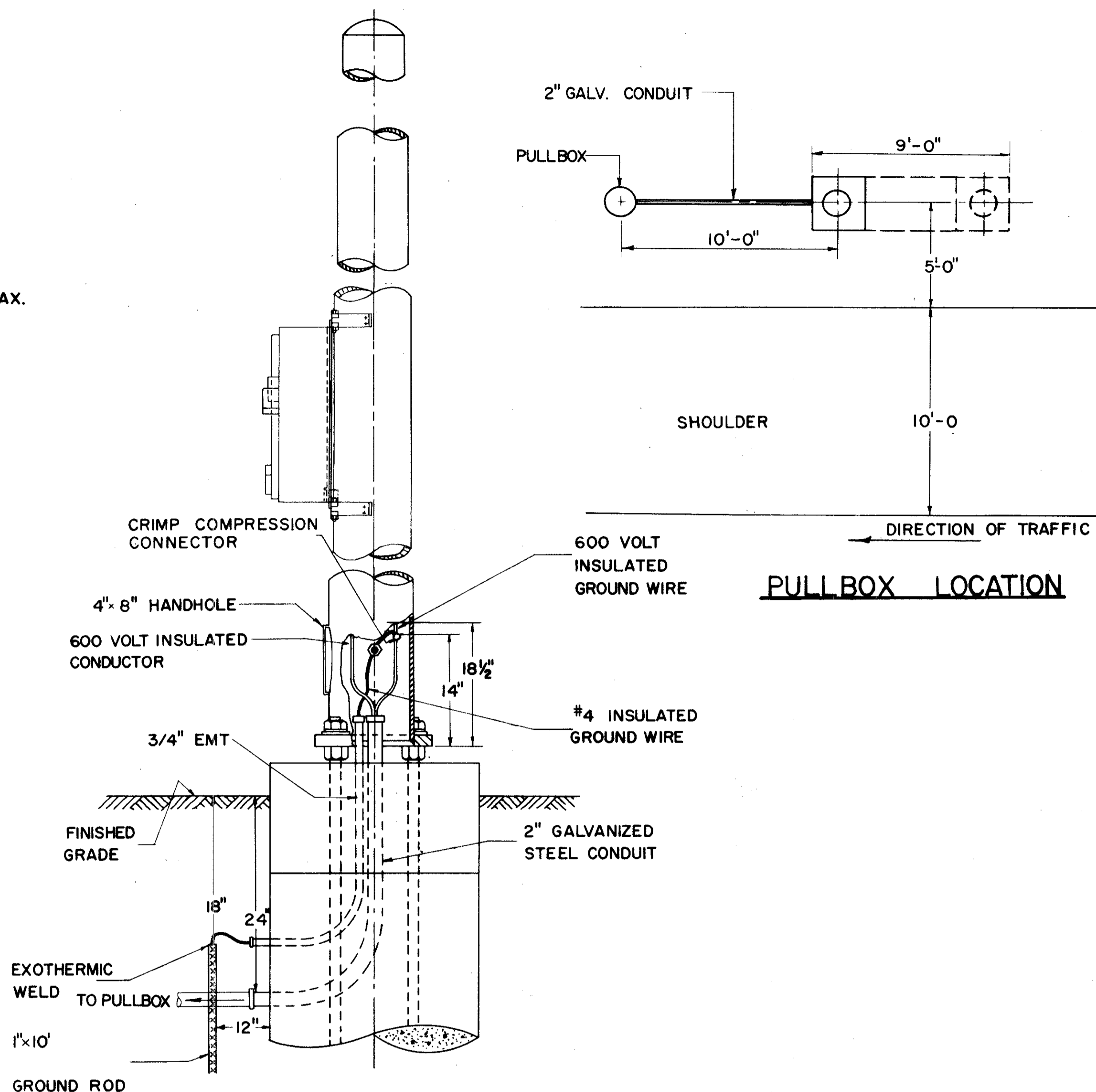
EACH SIGN SUPPORT OR STRUCTURE SHALL BE GROUNDED WITH A #4 INSULATED CONDUCTOR. THE GROUNDING

CONDUCTOR SHALL BE CONNECTED TO THE SWITCH THEN TO THE COMPRESSION CONNECTOR IN THE SIGN SUPPORT THEN TO A 1"x10" GROUND ROD. GROUND CONDUCTOR SHALL BE

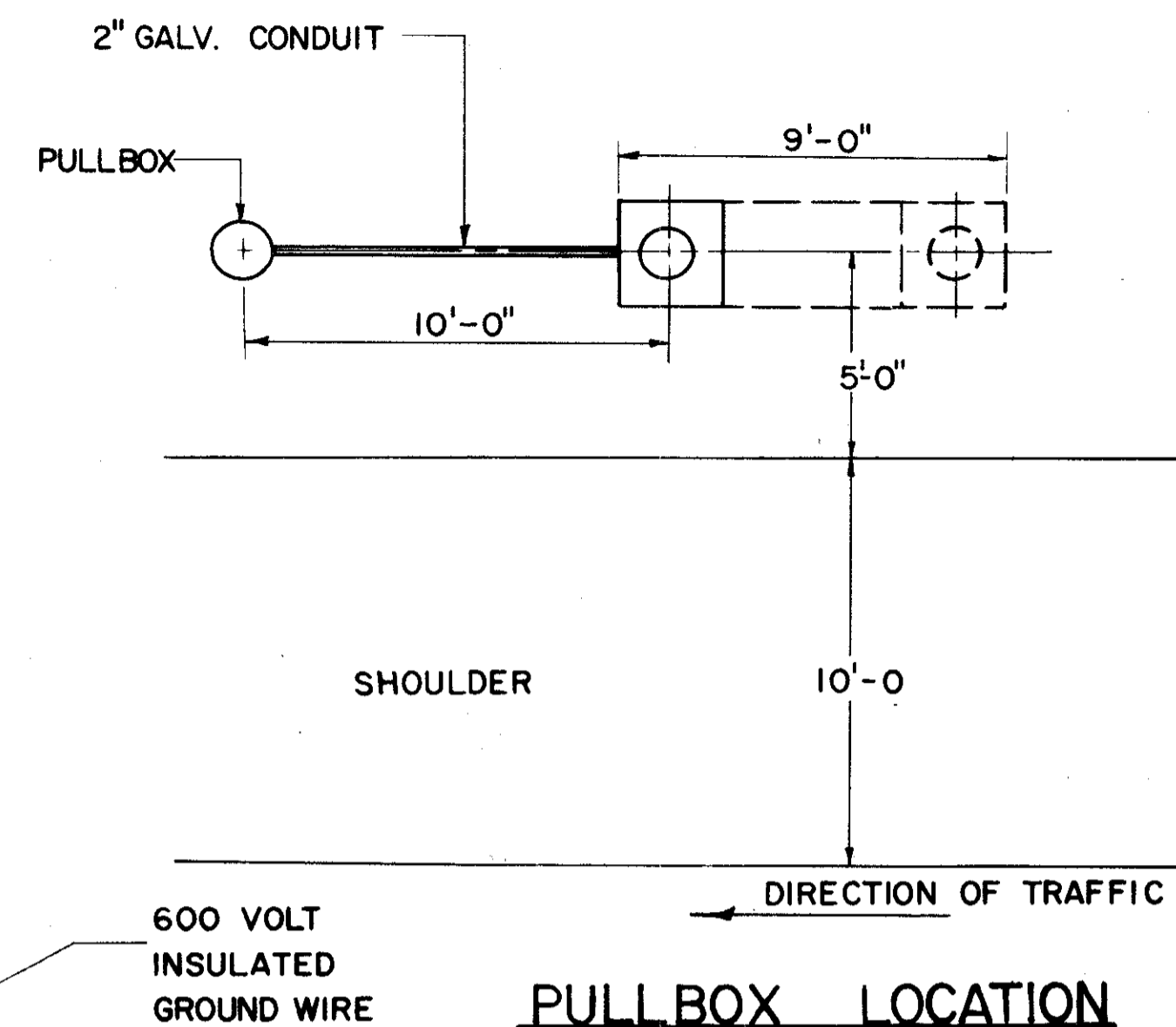
EXOTHERMICALLY WELDED TO GROUND ROD AND THEN TAPED WITH PLASTIC ELECTRICAL TAPE AT EACH EXPOSED PORTION OF CONDUCTOR. THE WELDED CONNECTION AND TAPED PORTION SHALL BE PAINTED 2 COATS OF INSULATING ENAMEL.



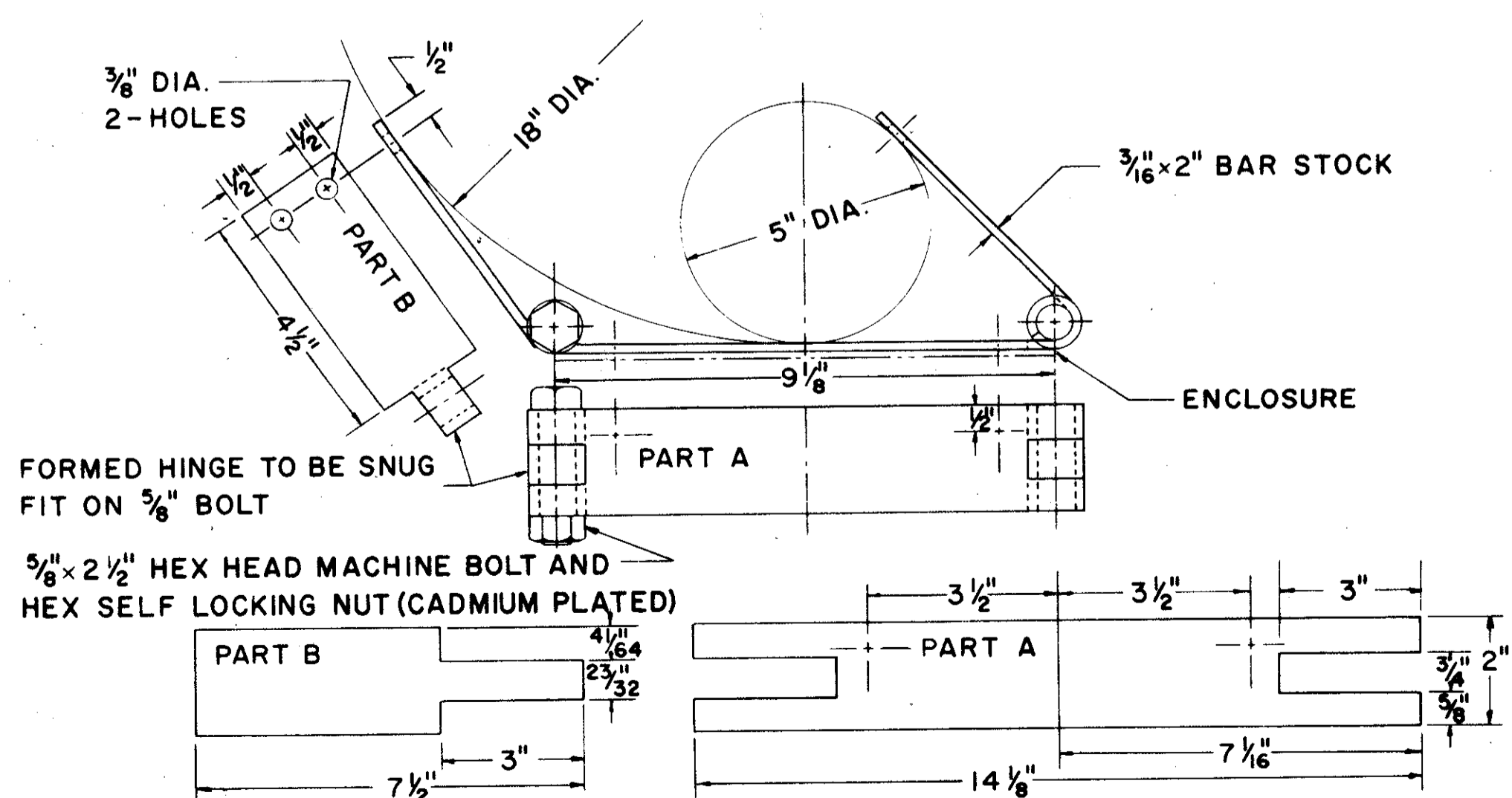
TYPICAL ENCLOSURE DETAIL
480 VOLT SIGN LIGHTING SERVICE



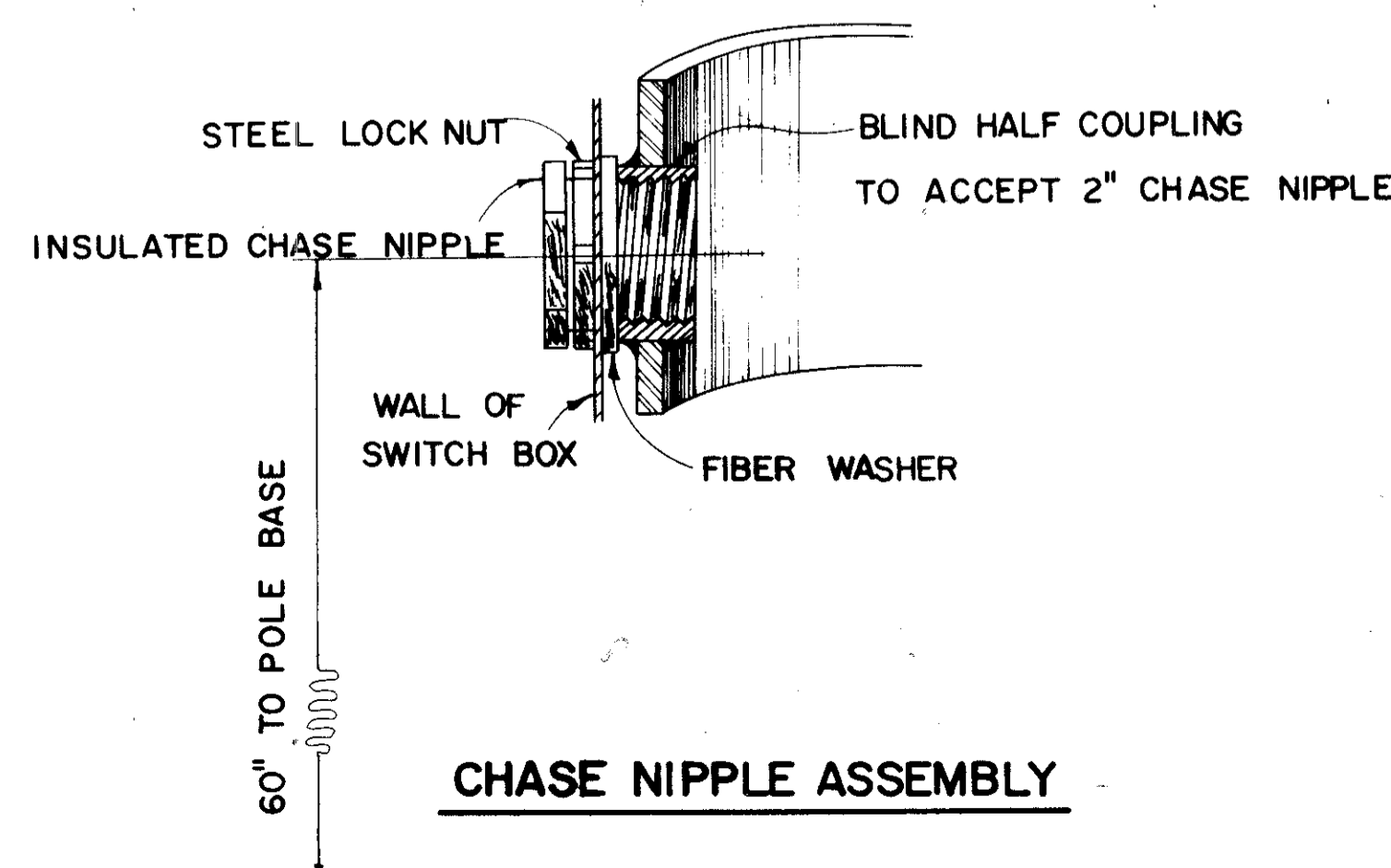
SIGN SUPPORT DETAIL FOR ILLUMINATED SIGNS



PULL BOX LOCATION



ENCLOSURE MOUNTING BRACKET



CHASE NIPPLE ASSEMBLY

TRANSFORMERS

TYPE	MANUFACTURERS G.E.	JEFFERSON	OUTPUT K.V.A.	SWITCH TRANSFORMER ENCLOSURE
I	9T51Y7	211-041	.25	Y
II	9T51Y8	211-051	.50	Y
III	9T51Y9	211-061	.75	Y
IV	9T51Y10	211-071	1.00	Z
V	9T51Y11	211-081	1.50	Z
VI	9T51Y12	211-091	2.00	Z
VII	9T51Y13	211-2102	3.00	Z

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

ELECTRICAL SIGN
SERVICE DETAILS
480 VOLT SYSTEM

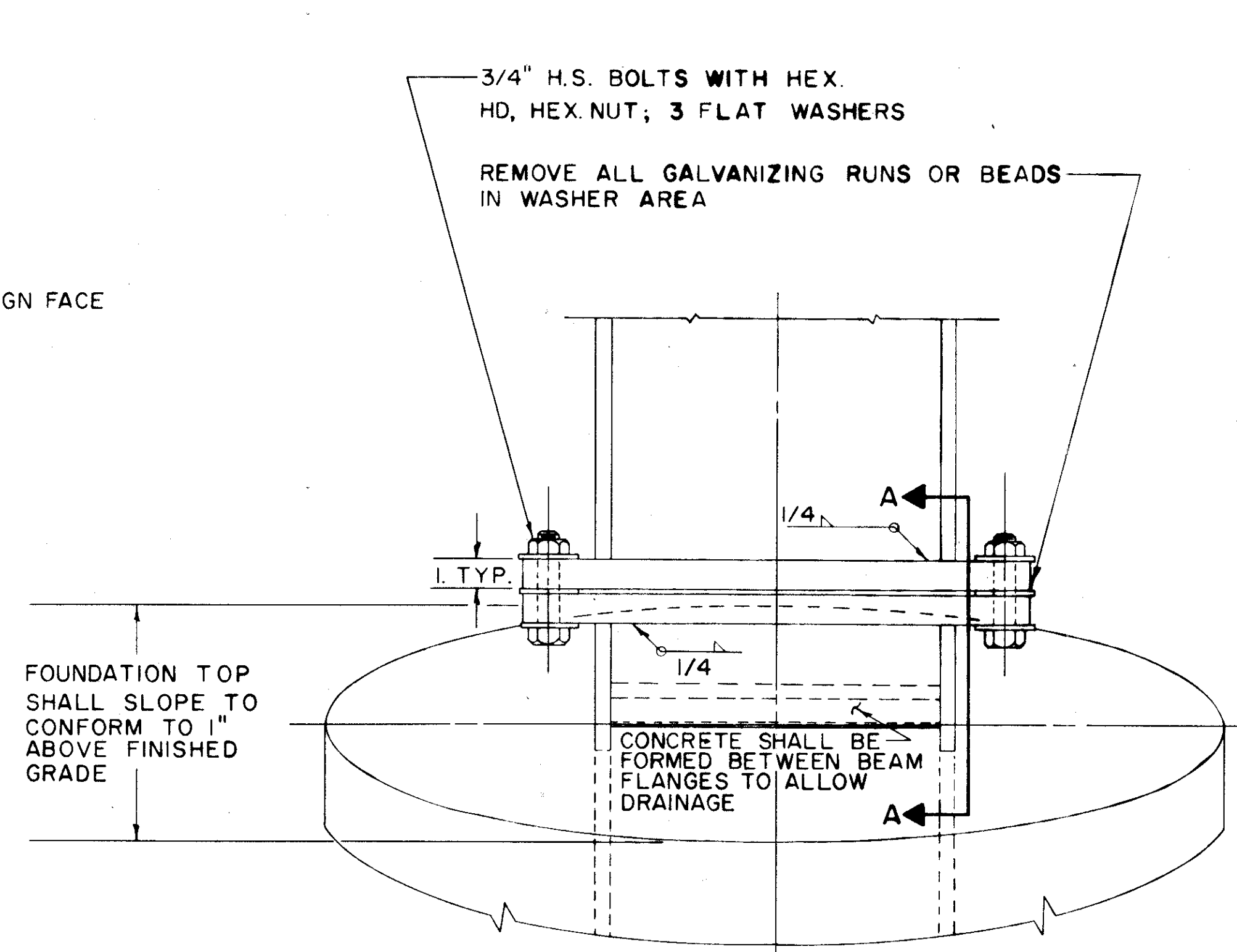
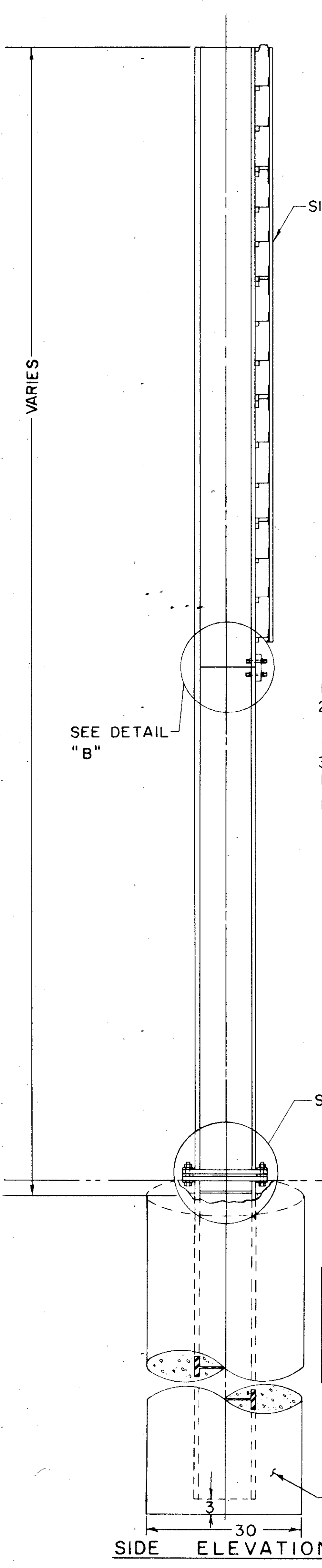
DATE
6-18-64
9-15
7-31-70
2-03-72

APPROVED _____
ENGINEER OF TRAFFIC

L-1

FED. RD. DIVISION	STATE	PROJECT	250
2	OHIO		390

CUYAHOGA COUNTY
CUY. 480-21.40

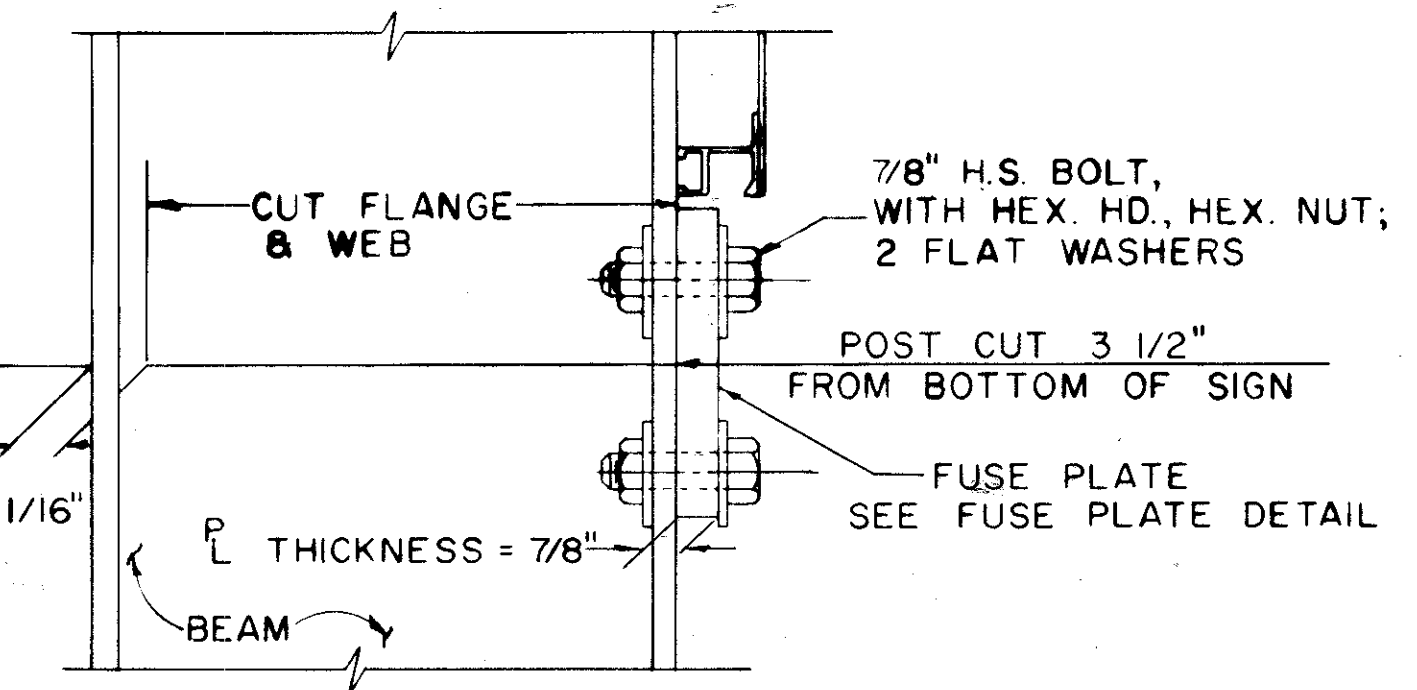
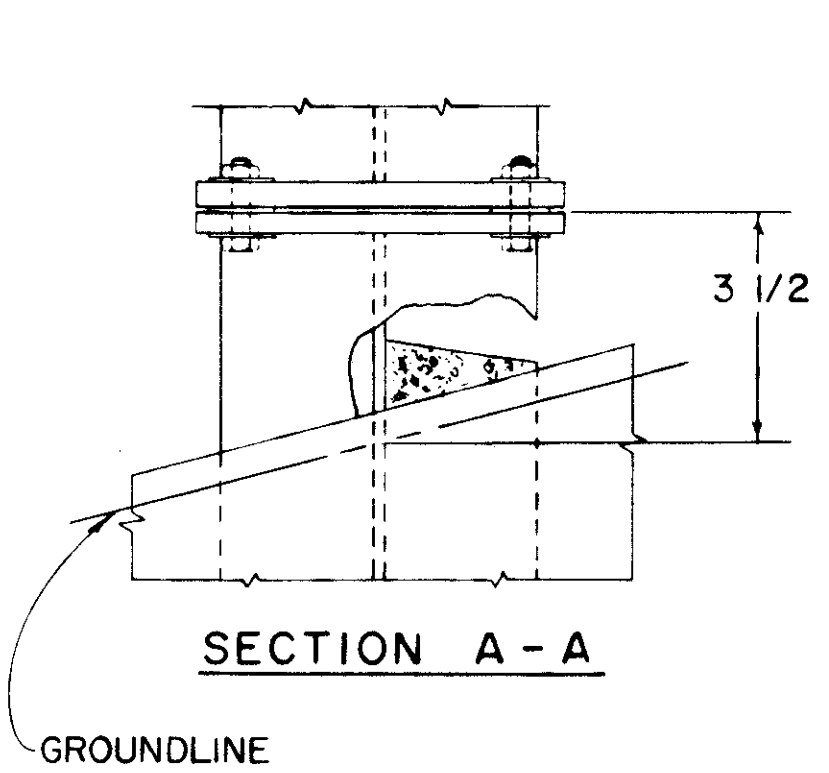


BOLTING PROCEDURE

1. ASSEMBLE POST TO STUB W/BOLTS & ONE FLAT WASHER ON EACH BOLT BETWEEN PLATES.
2. TIGHTEN ALL BOLTS THE MAXIMUM POSSIBLE W/12" TO 15" WRENCH TO BED & TO CLEAN BOLT THREADS. LOOSEN EACH BOLT IN TURN & RETIGHTEN BOLTS IN A SYSTEMATIC ORDER TO THE PRESCRIBED TORQUE OF 750 IN. LBS.
3. BURR THREADS AT JUNCTION W/NUT USING A CENTER PUNCH TO PREVENT NUT LOOSENING.

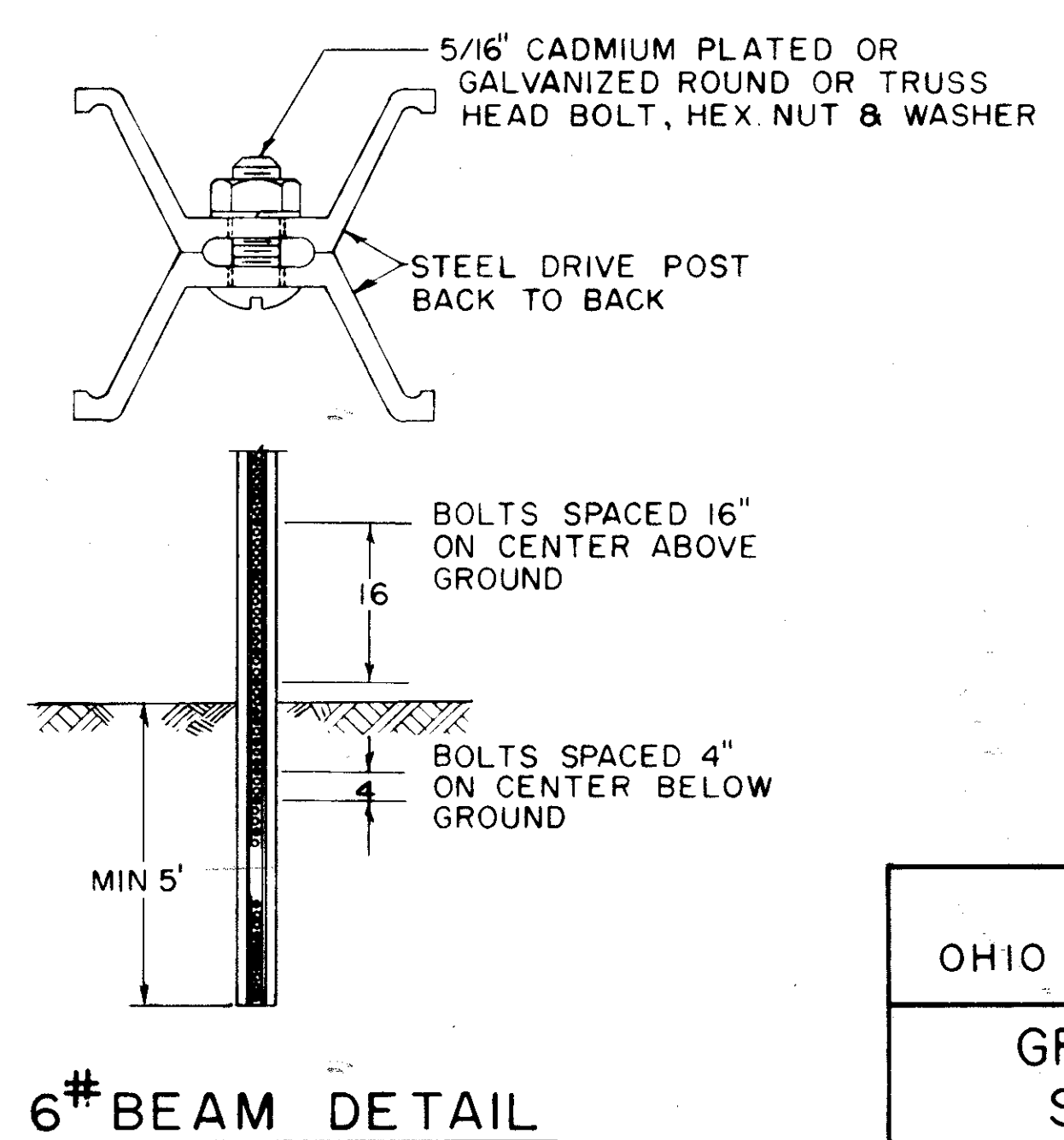
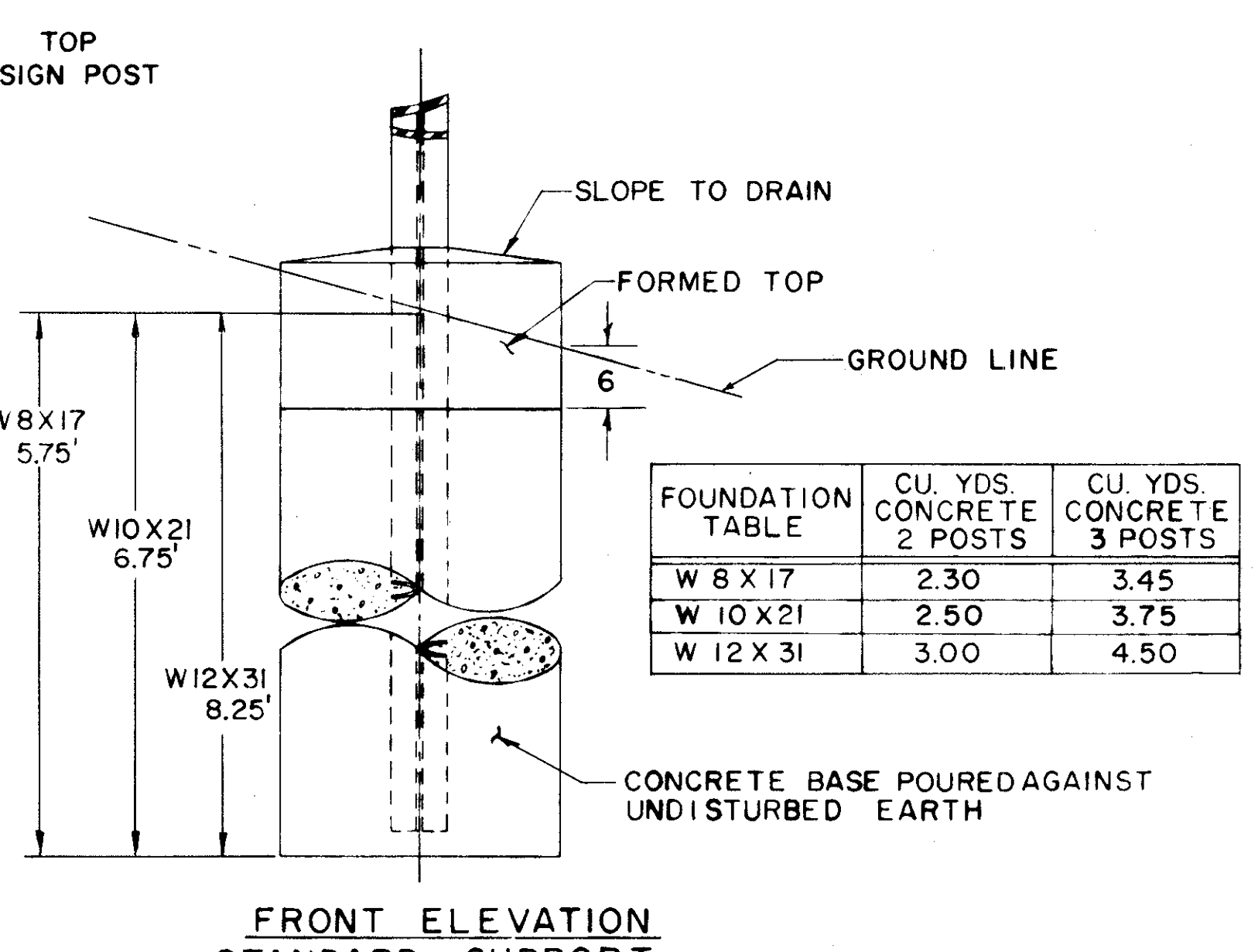
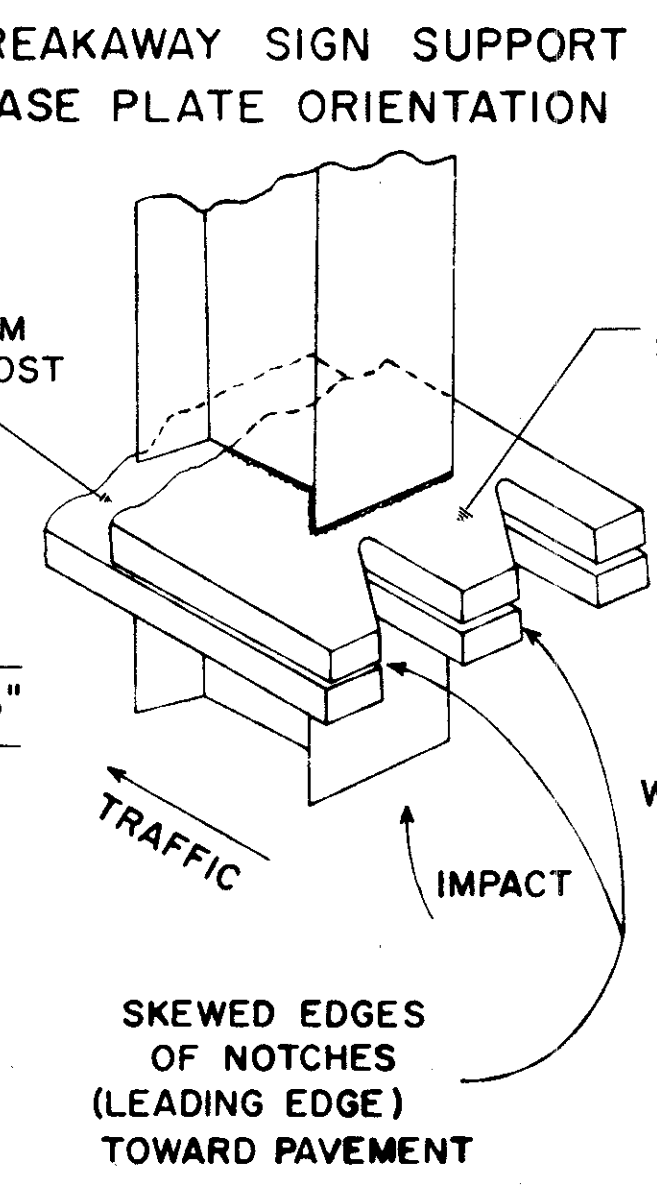
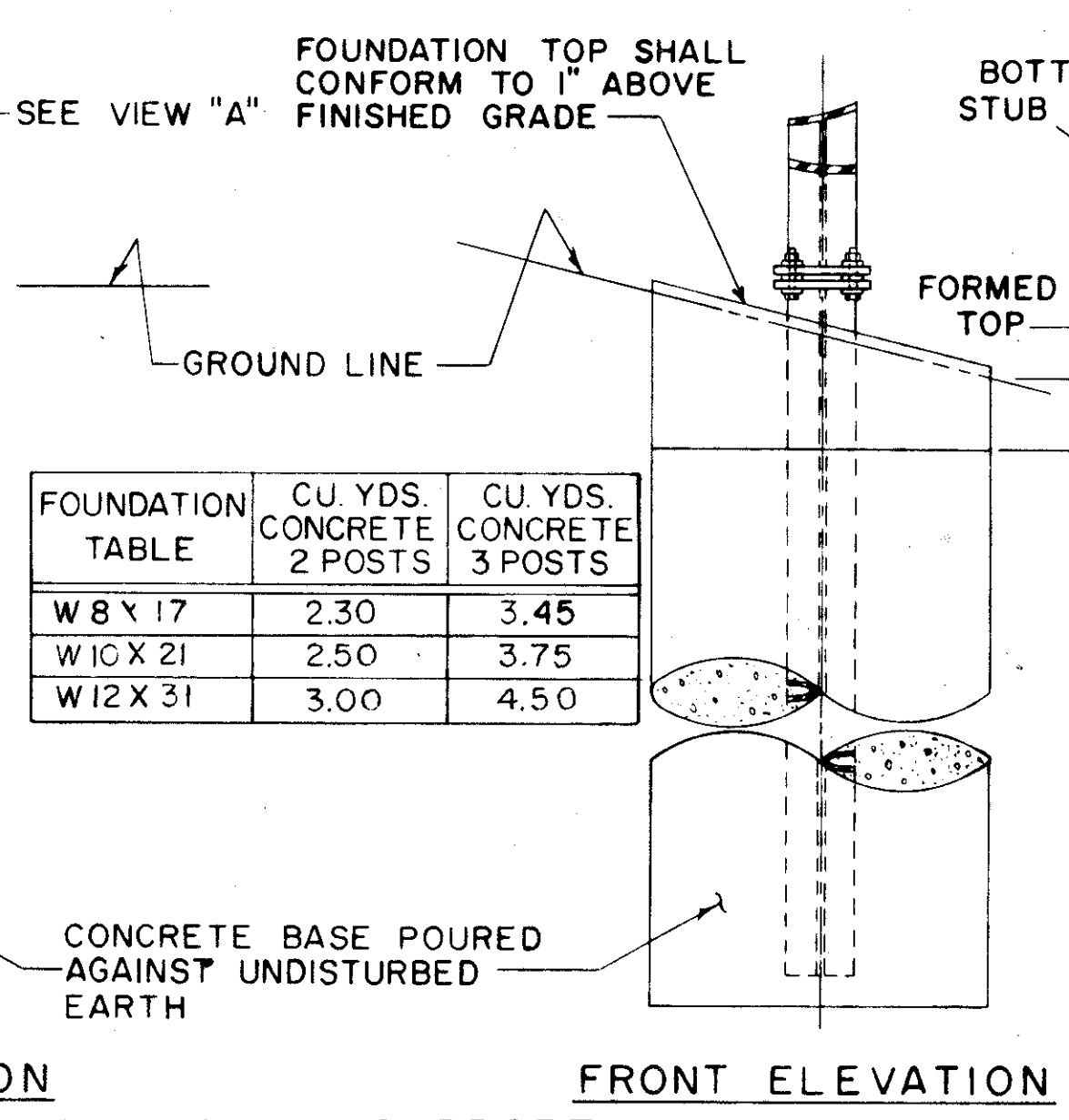
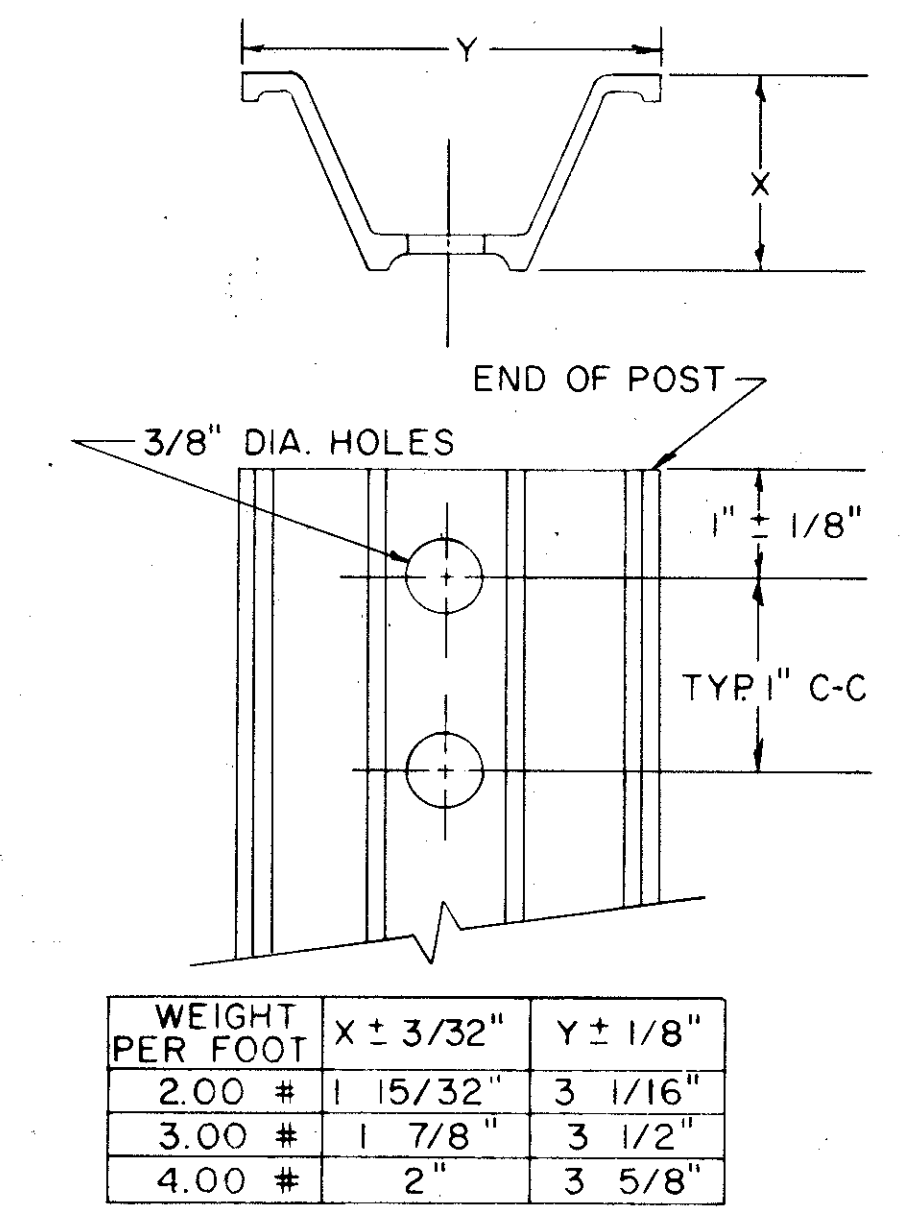
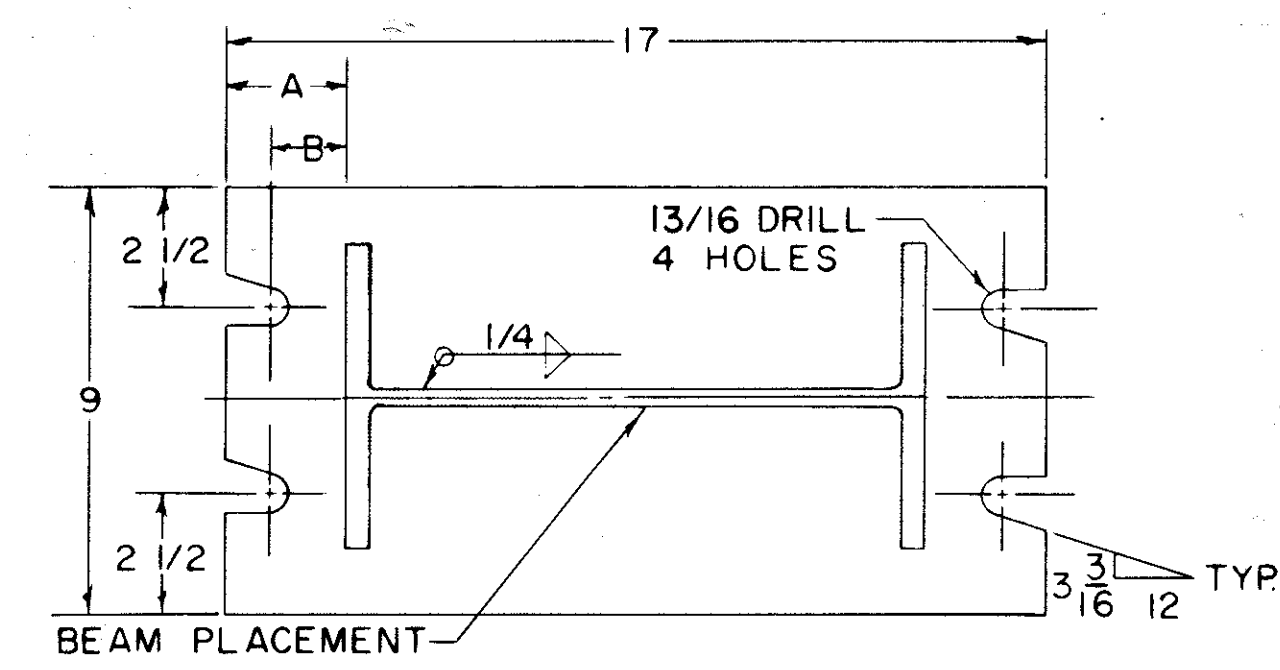
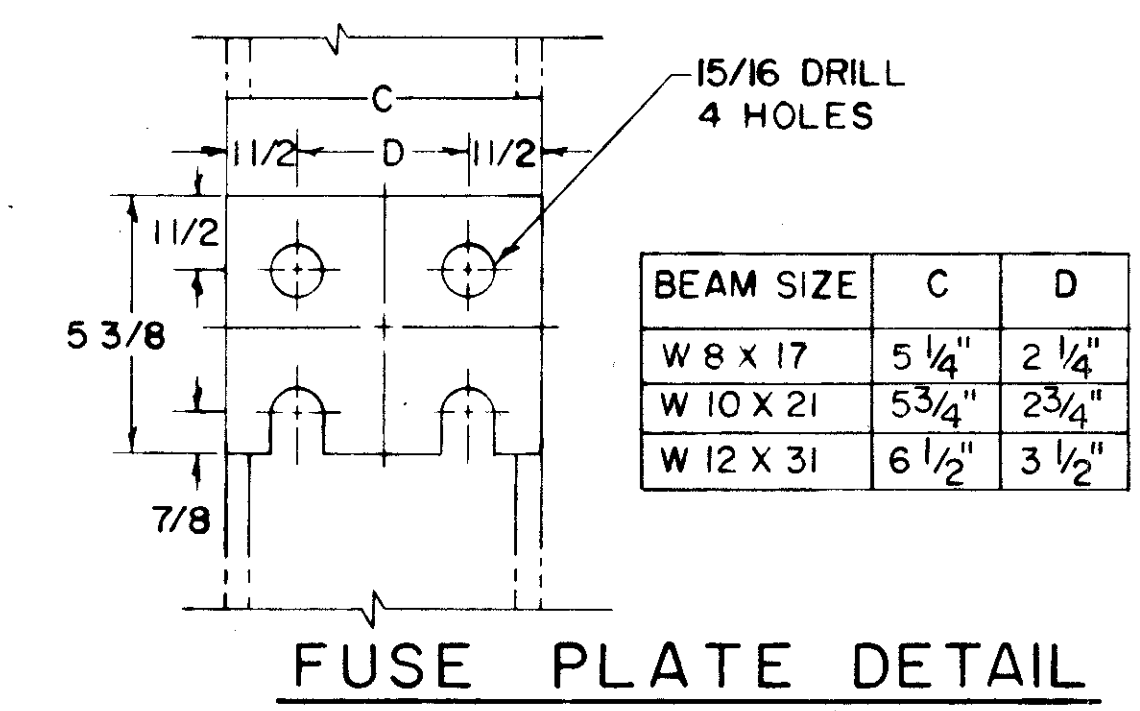
NOTE: TIGHTEN THE H.S. BOLTS IN THE BASE CONNECTION ONLY TO GIVEN TORQUE DO NOT OVER TIGHTEN

VIEW "A" ROTATED 180°



FABRICATOR NOTE: ALL FRICTION FUSE BOLTS SHALL BE TIGHTENED IN THE SHOP FOLLOWING A METHOD APPROVED BY THE ENGINEER. TIGHTENING SHALL BE TO SUCH A DEGREE AS TO OBTAIN MINIMUM RESIDUAL TENSION IN EACH BOLT OF 36,050 LBS.

NOTE: INSTALL FUSE PLATE WITH NOTCHES TOWARD BASE



NOTES: ALL MATERIALS SHALL CONFORM TO THE STATE OF OHIO, CONSTRUCTION & MATERIALS SPECIFICATIONS OR AS OTHERWISE SPECIFIED

- 1) 5# FOUNDATIONS
- 2) 7# 01 STRUCTURAL STEEL SHAPES & PLATES
- 3) 7# 09 H.S. STEEL BOLTS, NUTS & WASHERS

ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SHOWN

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

GROUND MOUNTED SIGN SUPPORTS

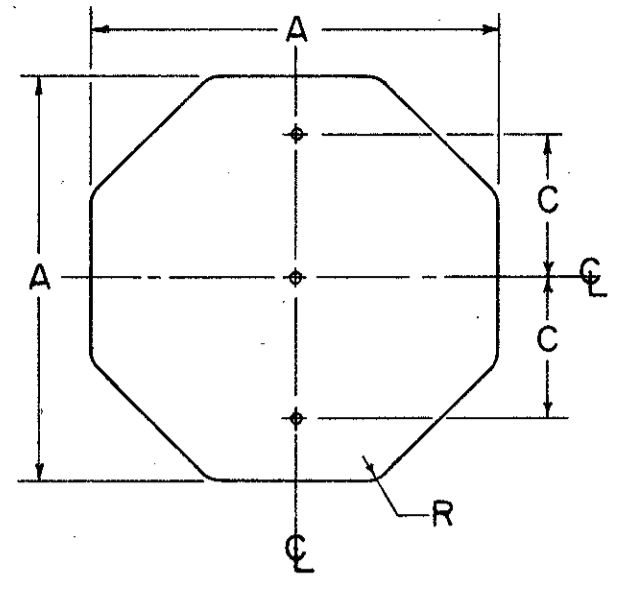
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5-10-68
7-12-68
5-23-69
9-16-69
12-20-71

APPROVED _____ ENGINEER OF TRAFFIC

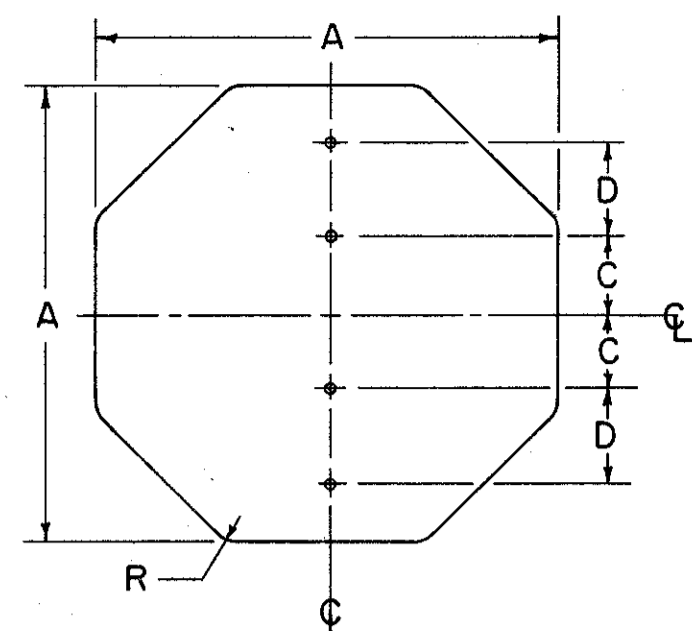
GMSS

STRUCTURAL SUPPORTS

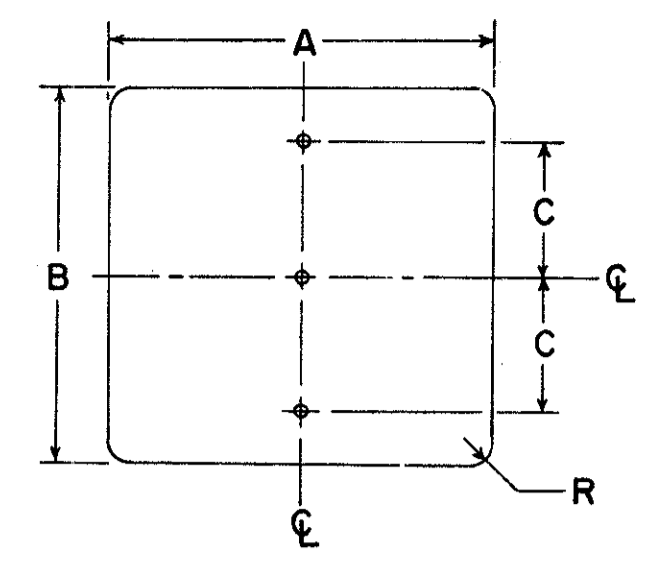
CUYAHOGA COUNTY
CUY. 480-21.40



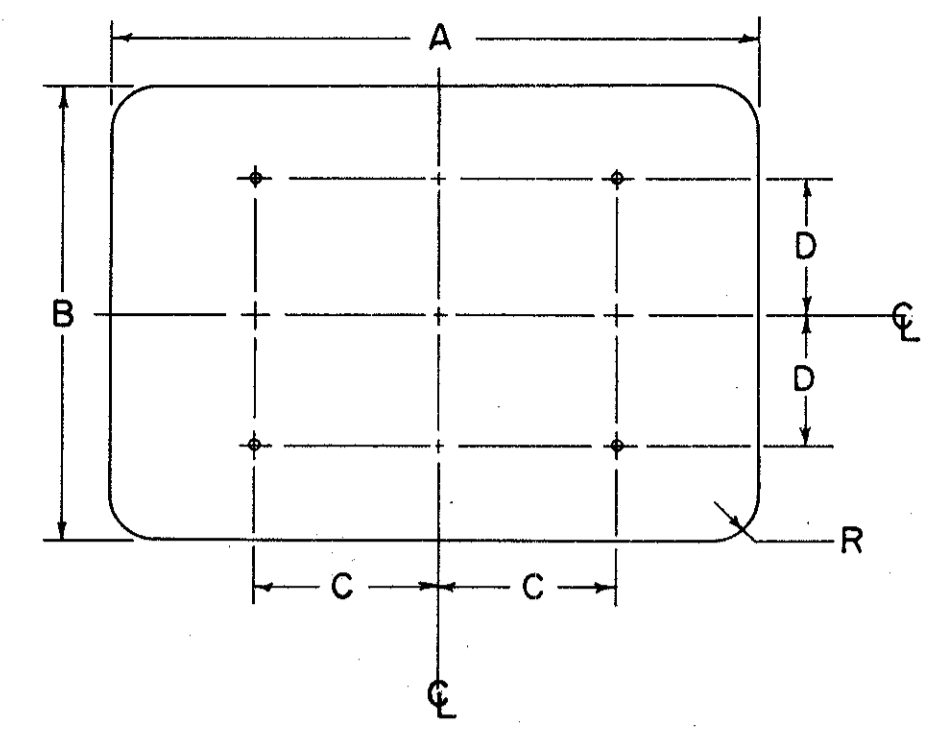
A	C	R	GAUGE
30	8	1 1/2	.080
36	8	1 1/2	.080



A	C	D	R	GAUGE
48	8	10	1 1/2	.100

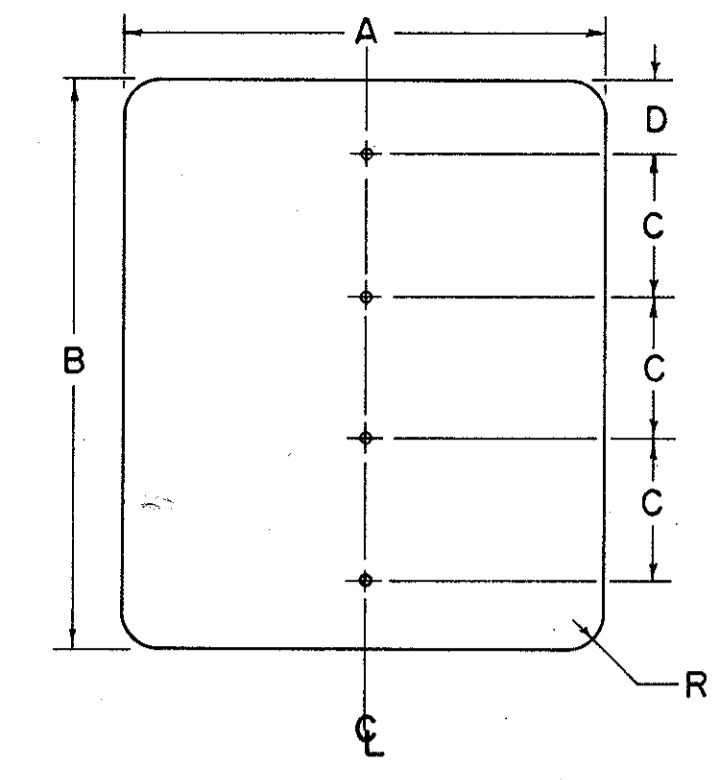


A	B	C	R	GAUGE
24	30	8	1 1/2	.063
24	48	15	1 1/2	.100
30	36	11	1 1/2	.080
30	42	12	1 1/2	.080
36	36	11	1 1/2	.080
36	42	15	1 1/2	.080
36	48	15	1 1/2	.080
48	24	10	3	.100
48	36	13	3	.100

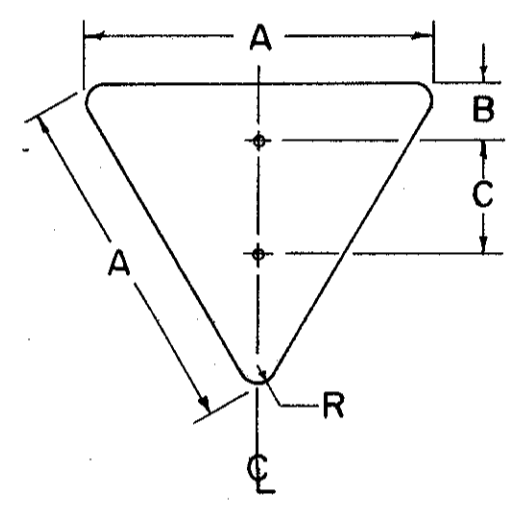


A	B	C	D	R	GAUGE
48	48	22	16	3	.100
48	60	22	22	3	.100

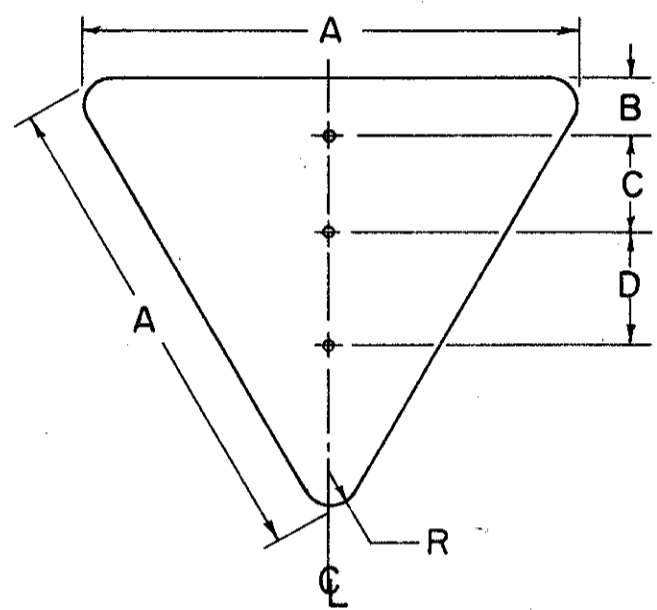
SPEED LIMIT SIGNS ON TWO SUPPORTS



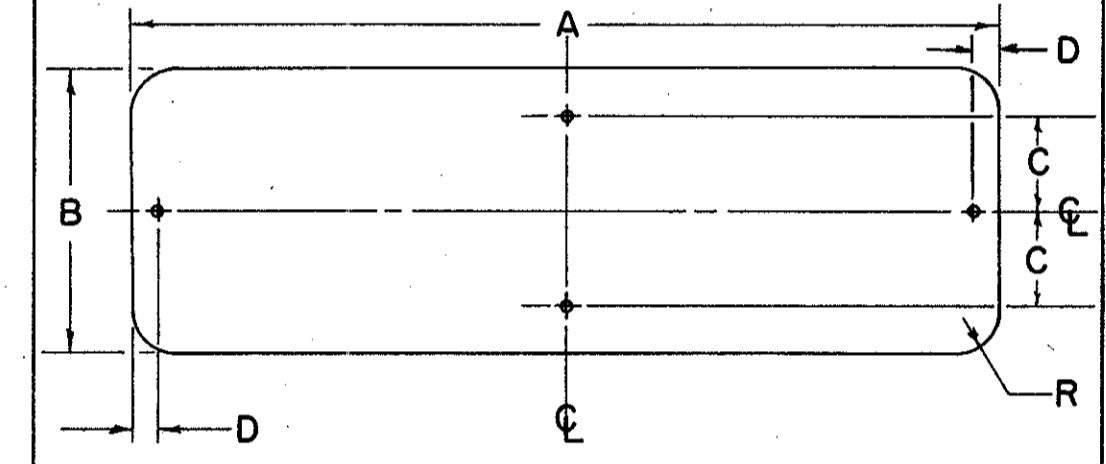
A	B	C	D	R	GAUGE
48	48	12	6	3	.100
48	60	15	7 1/2	3	.100



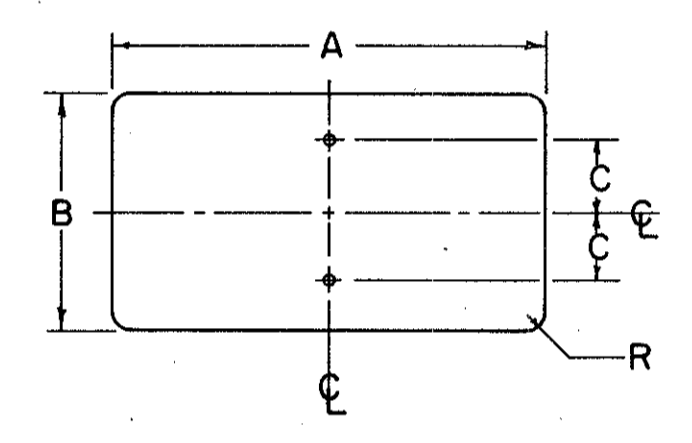
A	B	C	R	GAUGE
36	3	16	2 1/2	.080



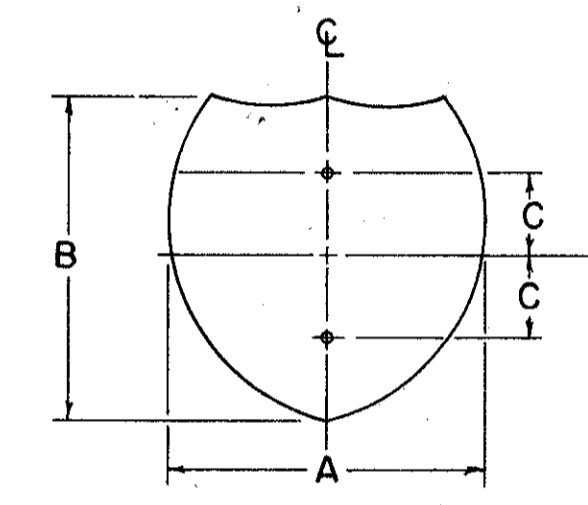
A	B	C	D	R	GAUGE
48	4	10	15	3	.100
60	5	10	15	4	.100



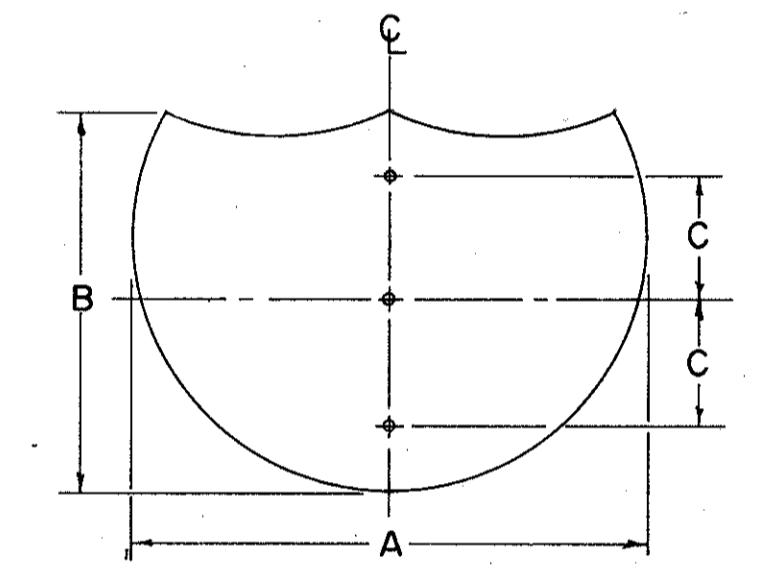
A	B	C	D	R	GAUGE
36	12	4	1	1 1/2	.080
72	12	-	16	1 1/2	.100
60	12	-	13	1 1/2	.100



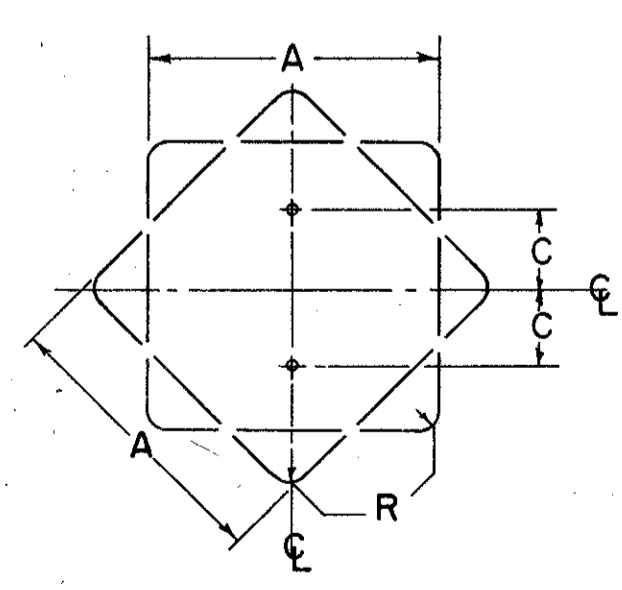
A	B	C	R	GAUGE
12	6	1 1/2	1 1/2	.063
20	15	6	1 1/2	.063
24	12	4 1/2	1 1/2	.063
24	18	7 1/2	1 1/2	.063
8	26	8	1	.063
36	18	7 1/2	1 1/2	.080



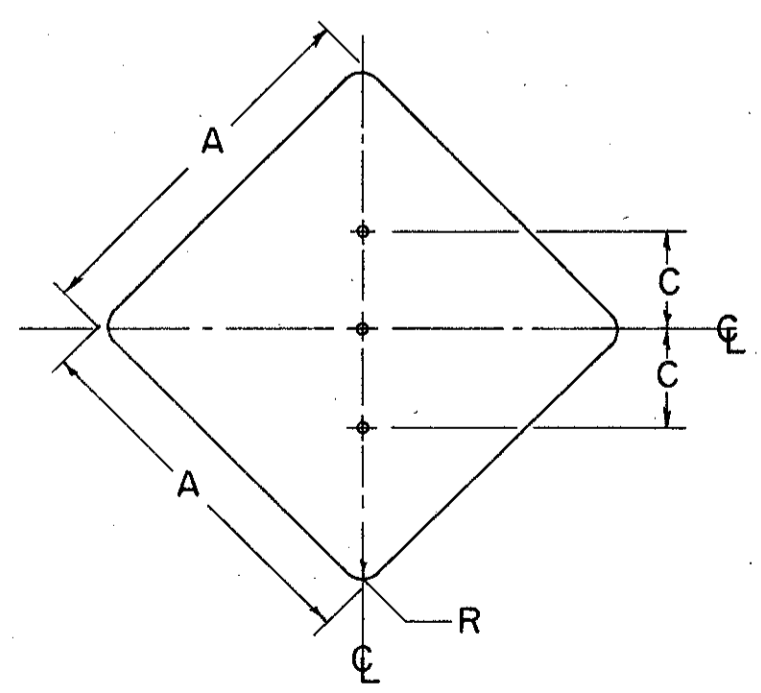
A	B	C	GAUGE
24	24	8	.063
30	24	8	.080



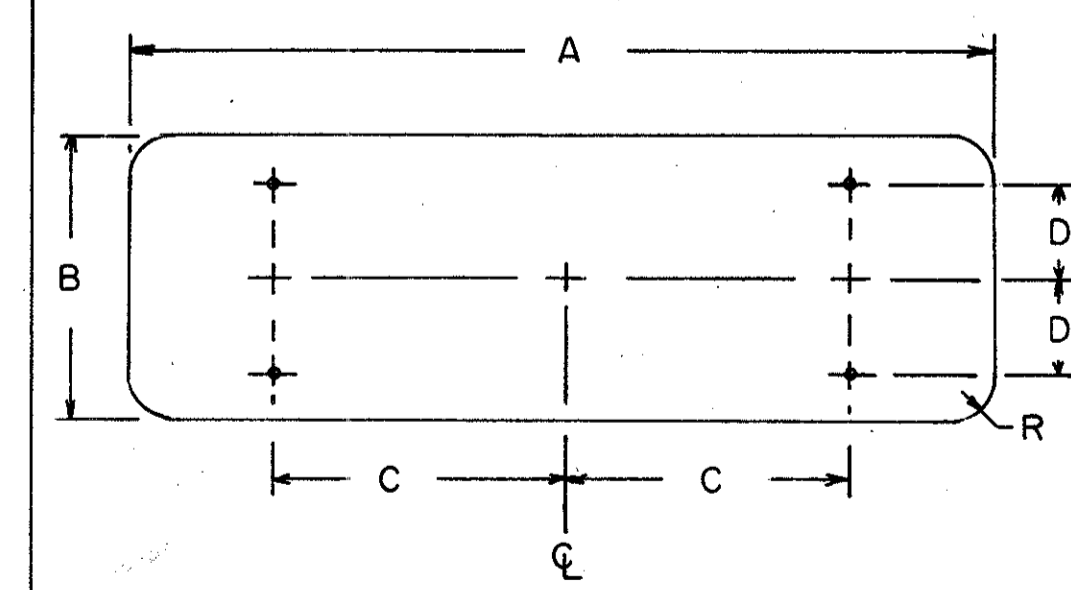
A	B	C	GAUGE
36	36	11	.080
48	36	11	.100



A	C	R	GAUGE
18	7 1/2	1 1/2	.063
24	8	1 1/2	.063
30	8	1 1/2	.080

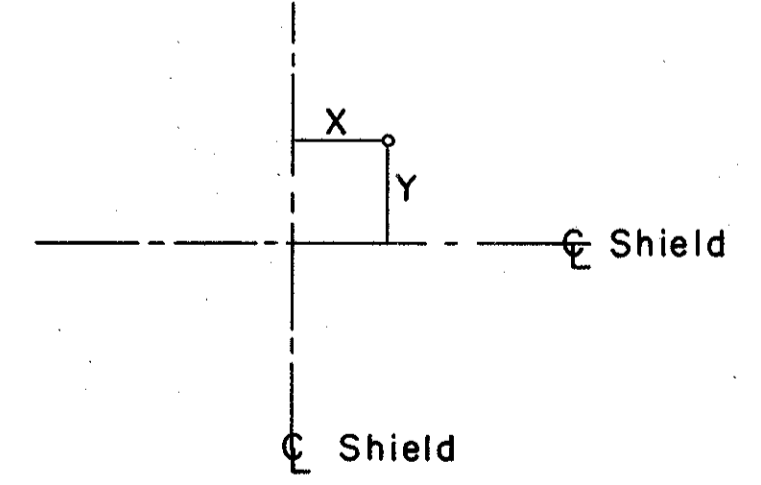


A	C	R	GAUGE
36	12	1 1/2	.080
48	14	3	.100



A	B	C	D	R	GAUGE
72	18	20	6	1 1/2	.100
72	24	20	8	1 1/2	.100
60	30	17	10	1 1/2	.100
96	18	27	6	1 1/2	.100

Location of holes on "Demountable Shields" (attached to guide signs)



SIZE	NO. HOLES	X	Y
(26) 24X24	4	7	7
30X24	4	8	8
(39) 36X36	4	10	10
		0	10
48X36	6	15	10

For notes on fastening see drawing for miscellaneous "Signing Items" sheet.

NOTES:

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SHOWN.

MATERIAL

FLAT SIGN BLANKS SHALL BE FURNISHED IN ALUMINUM ALLOY 6061-T6, (ASTM-B209, GS11A-T6) WITH MILL FINISH.

BOLT HOLES

THE BOLT HOLES SHALL BE 3/8" IN DIAMETER, AND MAY BE DRILLED, BLANKED OR PUNCHED TO FINISHED SIZE. Additional Bolt Hole Patterns will be supplied by the Engineer as needed.

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

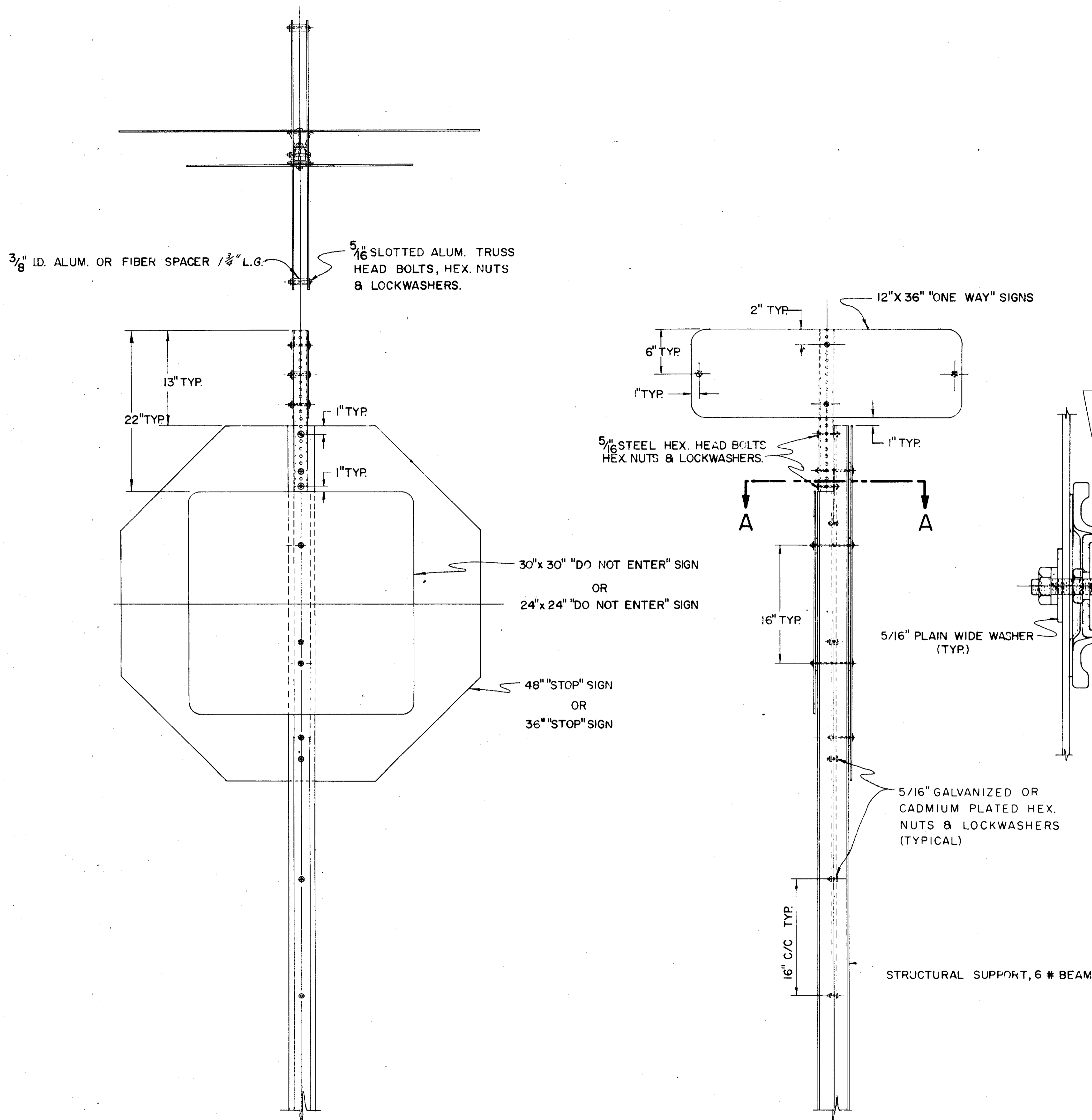
SIGN BLANK DETAILS SBD

APPROVED _____
ENGINEER OF TRAFFIC

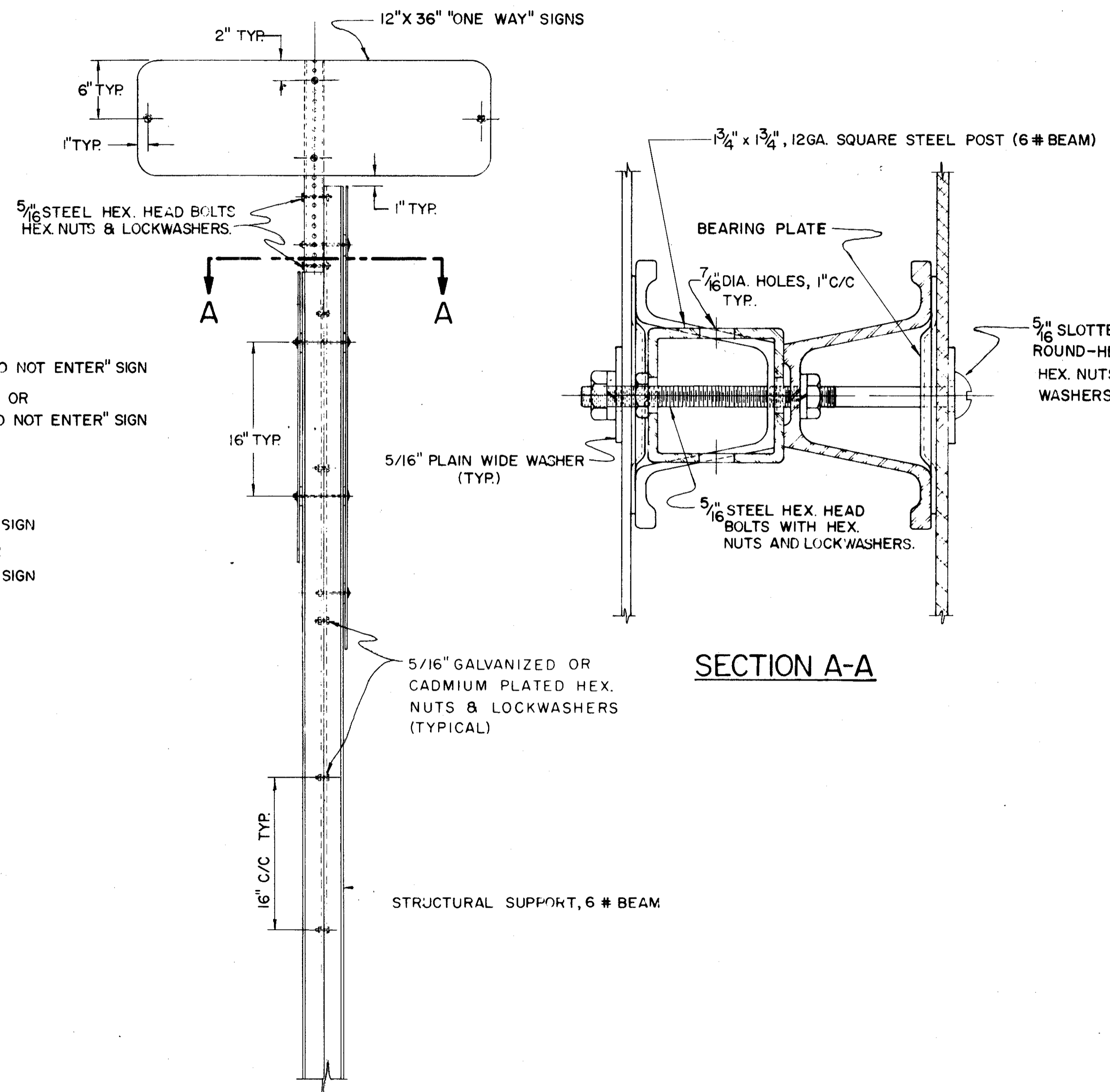
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10-3-73

NOTES

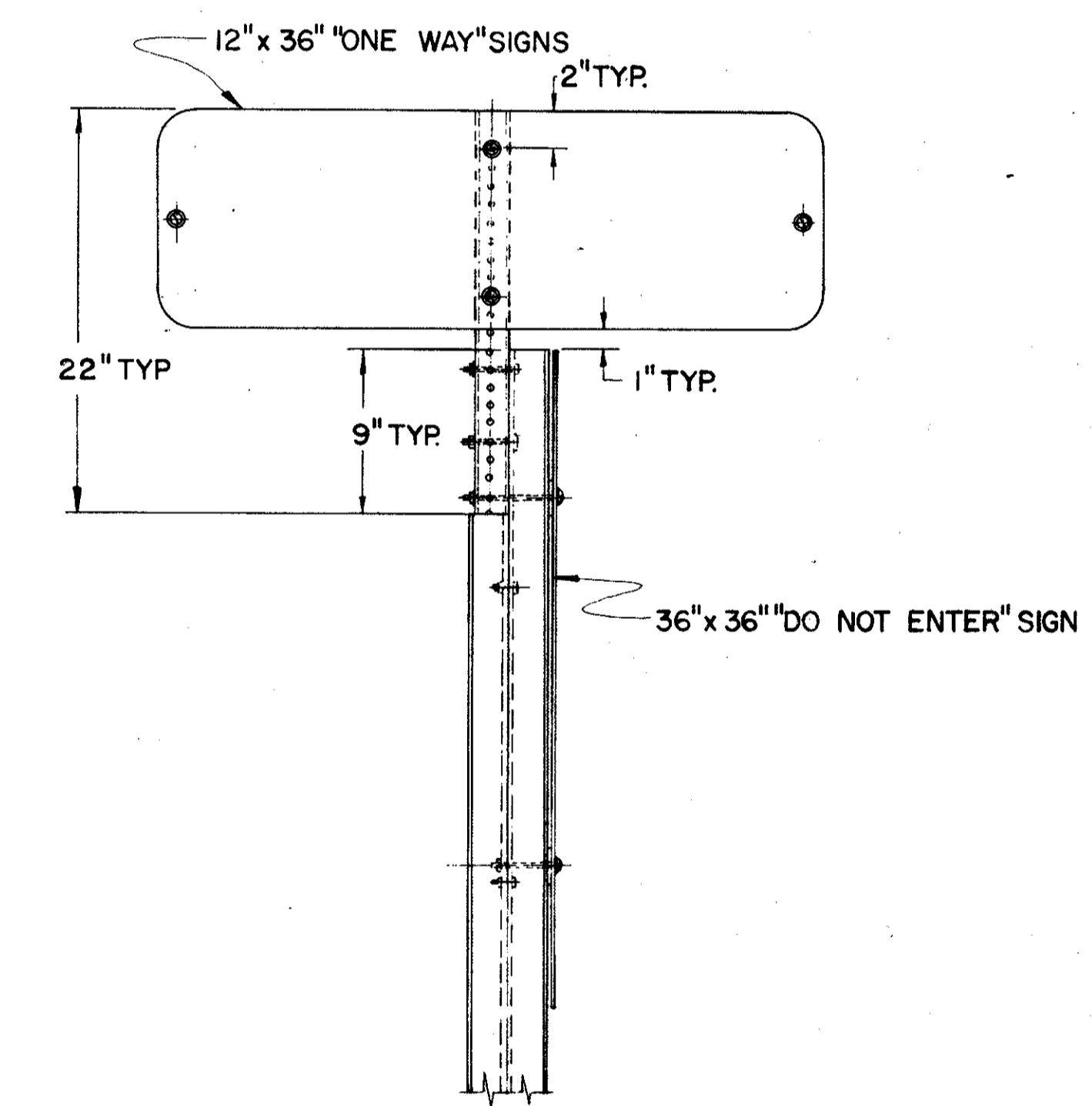
MATERIALS
ALL SIGN MATERIALS SHALL BE IN ACCORDANCE WITH SUPPLEMENT SPECIFICATION 815.
ALL STRUCTURAL MATERIALS SHALL BE IN ACCORDANCE WITH SUPPLEMENT SPECIFICATION 816.
FOR SPECIFICATIONS FOR THE 1 3/4" SQUARE STEEL POST SEE GENERAL NOTES, SHEET NO. 5.



**"ONE WAY", "STOP", "DO NOT ENTER",
SIGN INSTALLATION.**



SECTION A-A



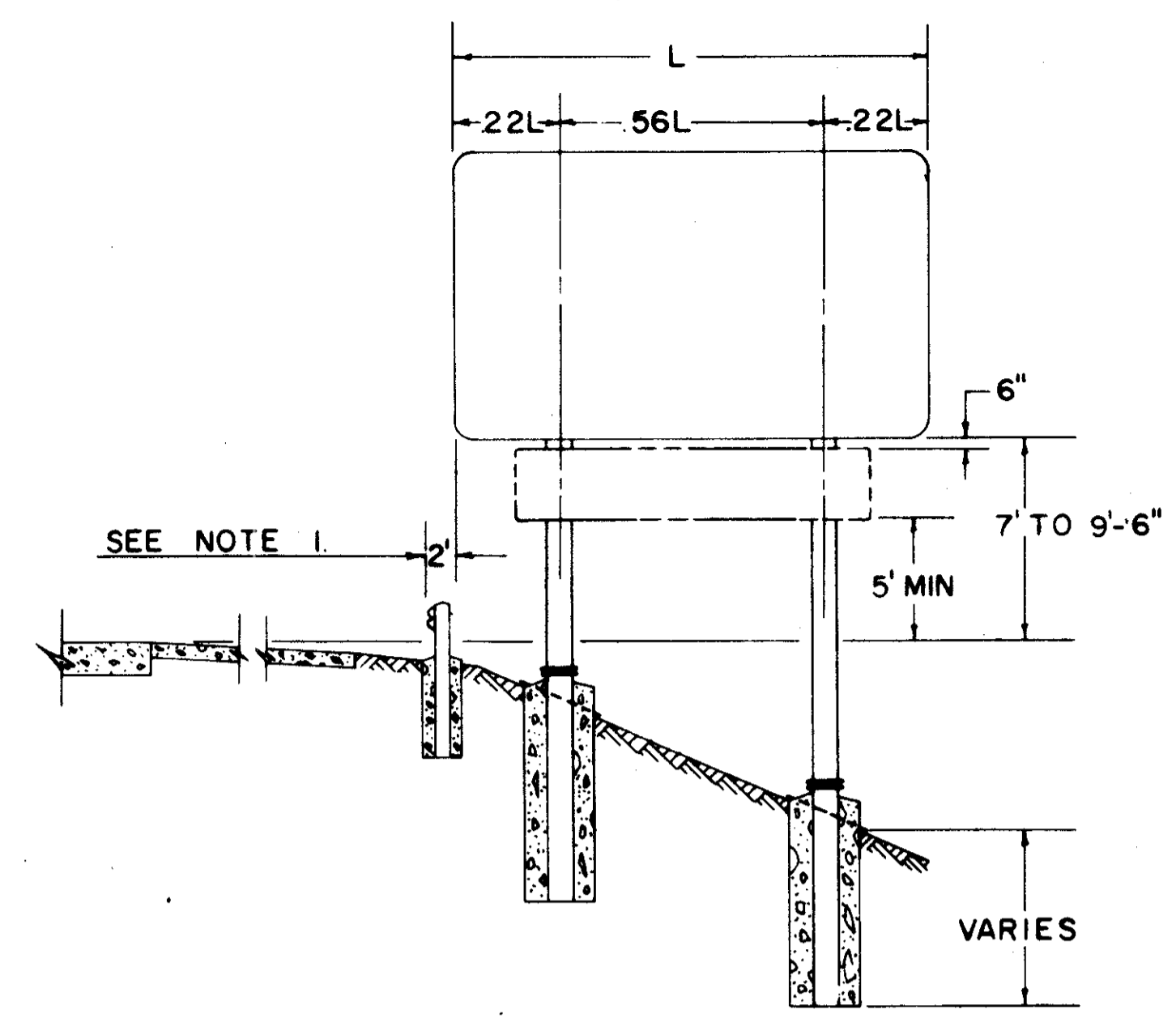
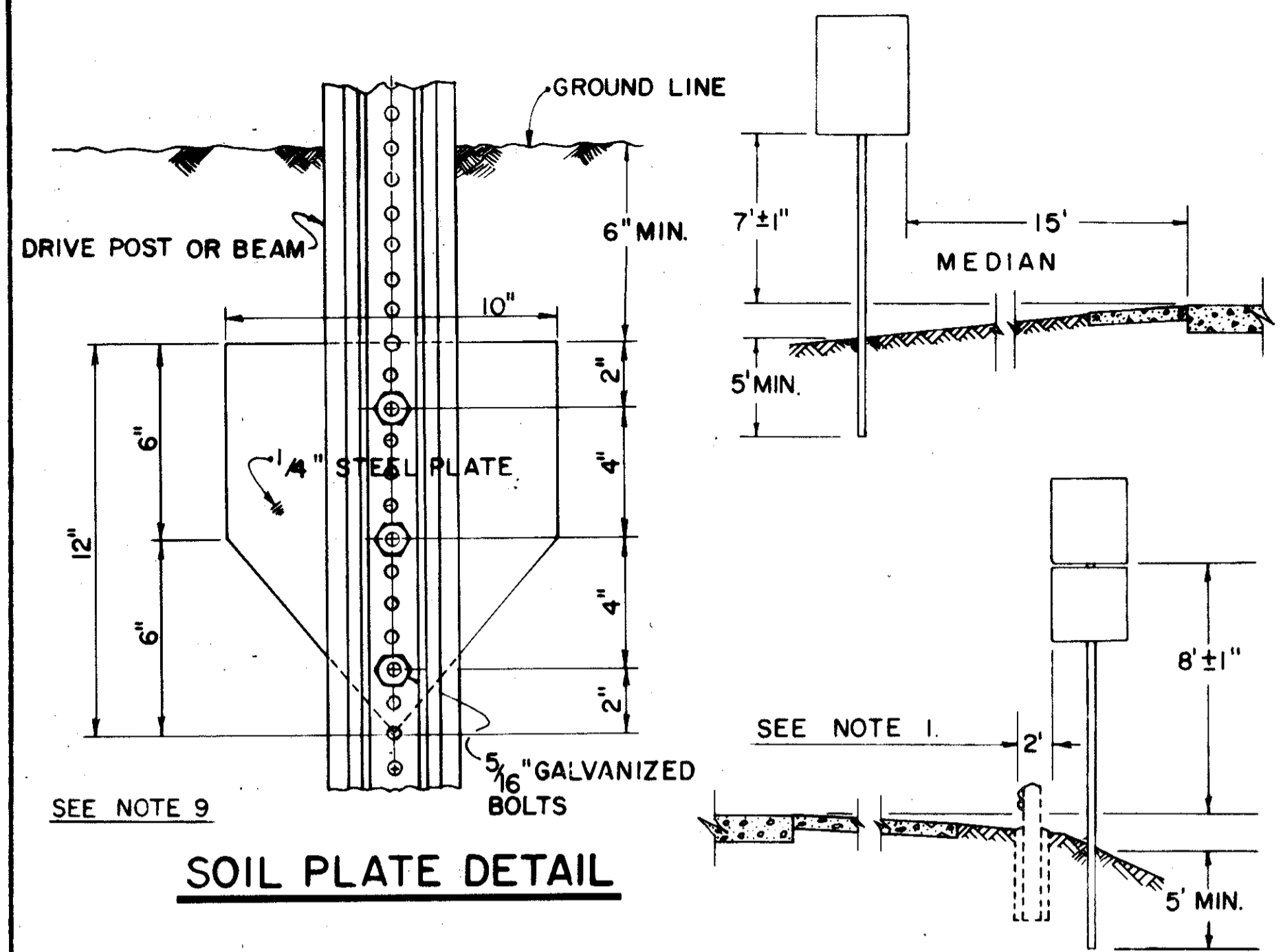
**"ONE WAY", "DO NOT ENTER"
SIGN INSTALLATION**

BUREAU OF TRAFFIC OHIO DEPARTMENT OF HIGHWAYS	
SPECIAL "ONE WAY" SIGN SUPPORT DETAILS	DATE 2-7-66 4-18-67
APPROVED _____ ENGINEER OF TRAFFIC	

CUYAHOGA COUNTY
CUY. 480-21.40

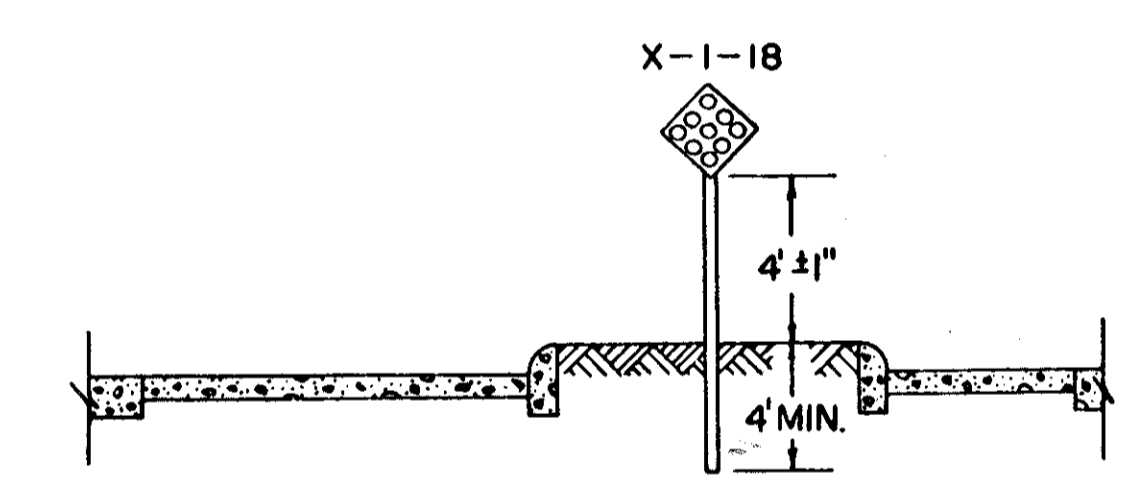
NOTES

- THE NEAR EDGE OF ALL MAIN LINE SIGNS, EXCEPT GORE INSTALLATIONS, SHALL BE LOCATED TWO FEET (2') BACK OF GUARD RAIL FACE. THIS DIMENSION SHALL BE DETERMINED BY ROADWAY TYPICAL SECTION B USED WHETHER OR NOT GUARD RAIL IS PRESENT.
ON RAMP THE NEAR EDGE OF SIGNS SHALL BE LOCATED TWO FEET (2') BACK OF GUARD RAIL FACE. THIS DIMENSION WILL BE DETERMINED AND USED AS FOR MAIN LINE ABOVE.
ON APPROACHES THE NEAR EDGE OF SIGNS SHALL BE
(A) TWO FOOT (2') BEHIND EXISTING GUARD RAIL
(B) TWO FEET (2') FROM THE EDGE OF PAVED OR TRAVELED SHOULDER WITH A MINIMUM OF 6' FROM EDGE OF ROADWAY PAVEMENT.
- POSTS PLACED IN CONCRETE MEDIANS SHALL BE INSTALLED BY DRIVING THROUGH A 6" SLEEVE OR CORE DRILLED HOLE. THE HOLE SHALL BE FILLED WITH ASPHALTIC CONCRETE AFTER THE POST IS IN THE PROPER POSITION.
- HORIZONTAL BACK BRACING SHALL ALWAYS BE MOUNTED ON THE FRONT FLANGE OF THE SUPPORT EXCEPT WHERE SIGNS ARE MOUNTED BACK TO BACK. BACK BRACING SHALL NEVER EXTEND ABOVE TOP EDGE OF UPPERMOST SIGN PLATE AND SHALL BE ATTACHED TO SUPPORTS USING 5/16" GALVANIZED STEEL BOLTS.
- SCREWS, NUTS, AND WASHERS FOR SIGN ERECTION SHALL BE ALUMINUM EXCEPT AS NOTED ABOVE. 5/16" TRUSS HEAD SLOTTED MACHINE SCREWS WITH HEX. NUTS PLAIN AND LOCKWASHERS SHALL BE USED. PLAIN WASHERS SHALL BE 5/16" WIDE, USED ON SIGN FACE ONLY.
- SIGN INSTALLATIONS SHALL BE PLACED SO THAT SUPPORTS ARE NOT PLACED IN DRAINAGE DITCHES.
- HORIZONTAL CLEARANCES SHOWN PERTAIN TO NON-CURBED SECTIONS. SECTIONS WITH UNMOUNTABLE CURB SHALL HAVE A HORIZONTAL CLEARANCE OF 2'-0" MINIMUM FROM THE CURB FACE TO THE SIGN EDGE.
- VERTICAL AND HORIZONTAL CLEARANCE BETWEEN SIGNS ON ONE ASSEMBLY SHALL BE A MAXIMUM OF 2" AND A MINIMUM OF 1".
- GALVANIZED STEEL BEARING PLATES SHALL BE INCLUDED BETWEEN ALL SHEET ALUMINUM SIGNS ATTACHED TO VERTICAL SUPPORTS AT EACH SIGN BOLT LOCATION.
- SOIL PLATES SHALL BE ATTACHED TO ALL 6 LB. BEAMS BETWEEN POSTS AS DETAILED ON THIS SHEET, EXCEPT WHERE BEAMS ARE PLACED IN CONCRETE MEDIANS AS COVERED IN NOTE 2.



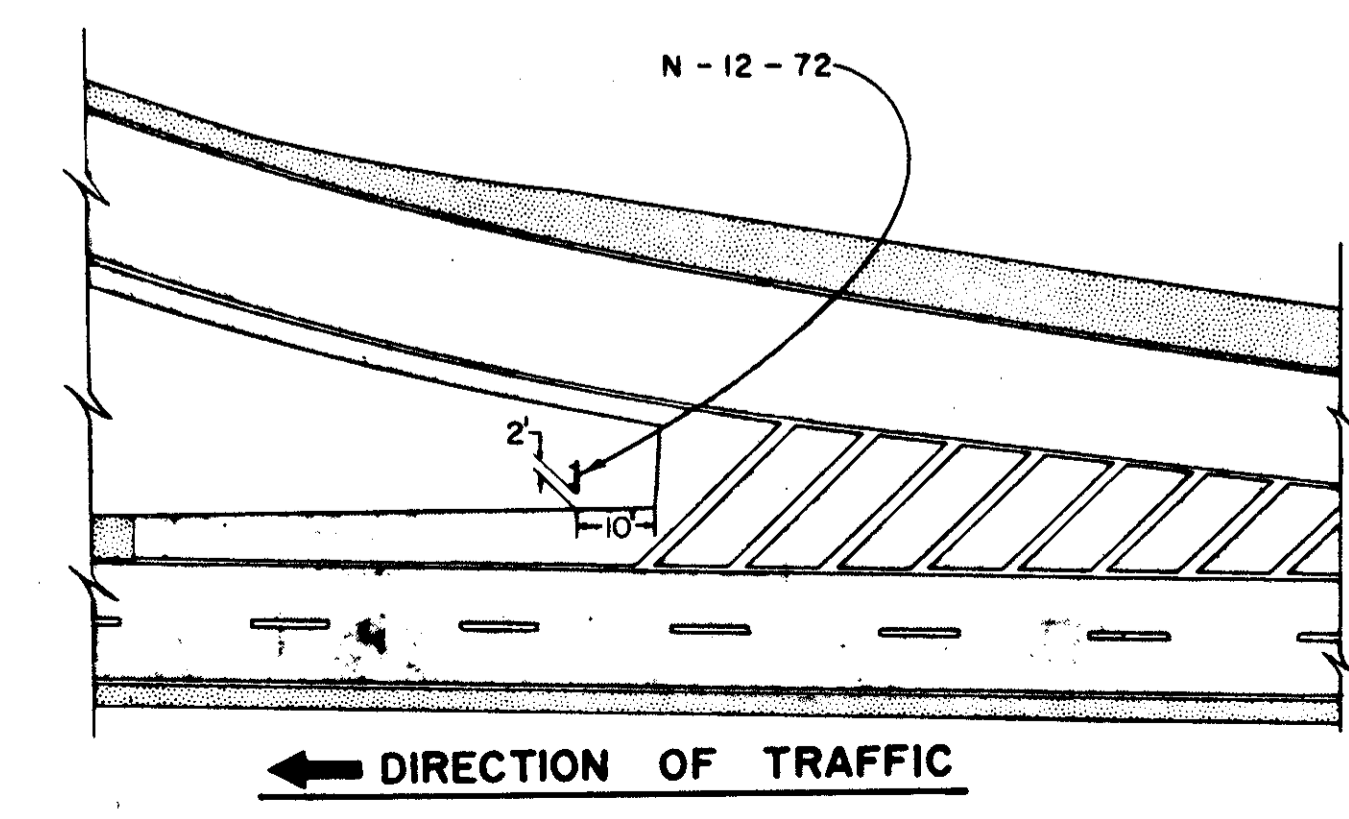
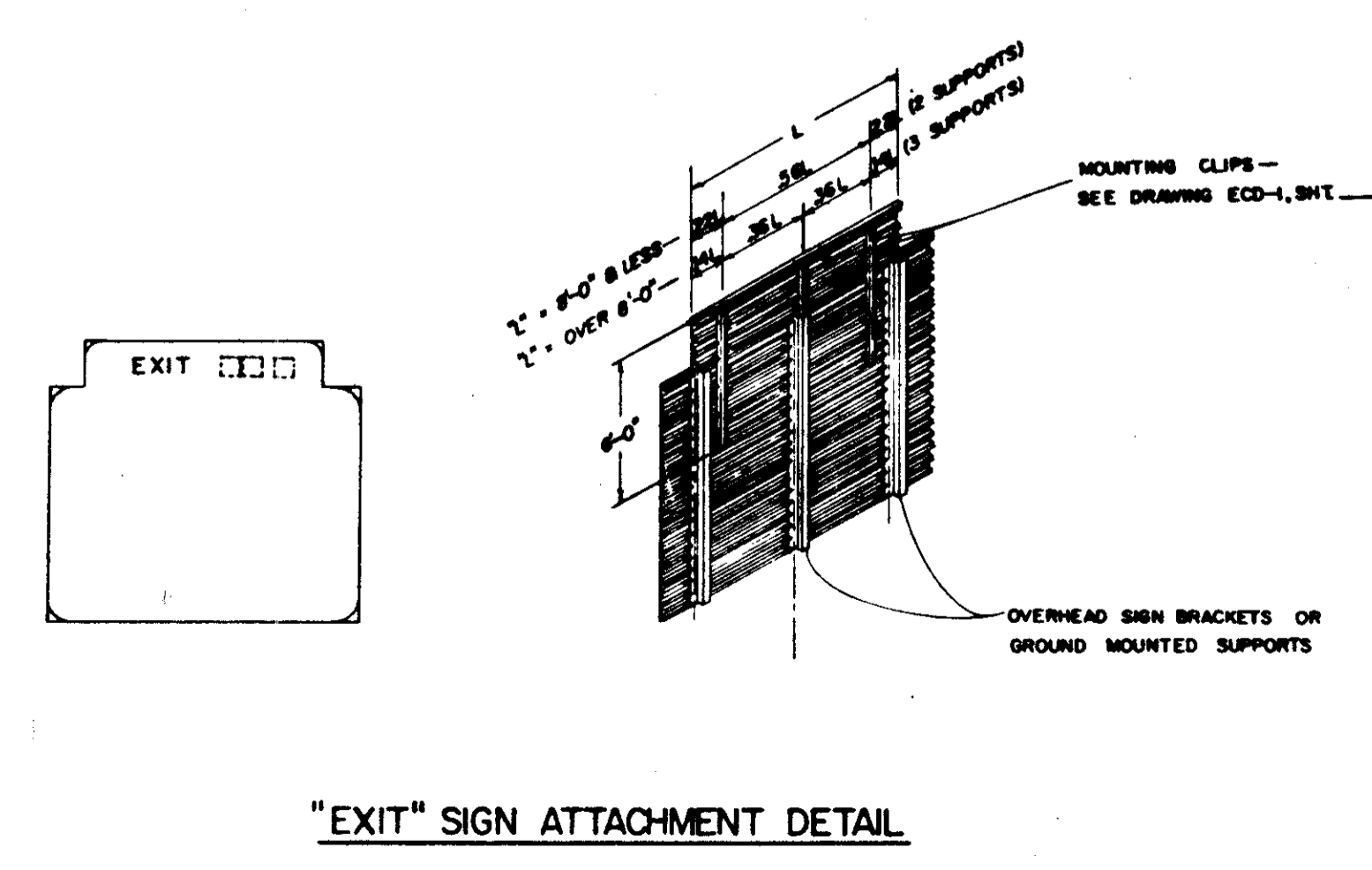
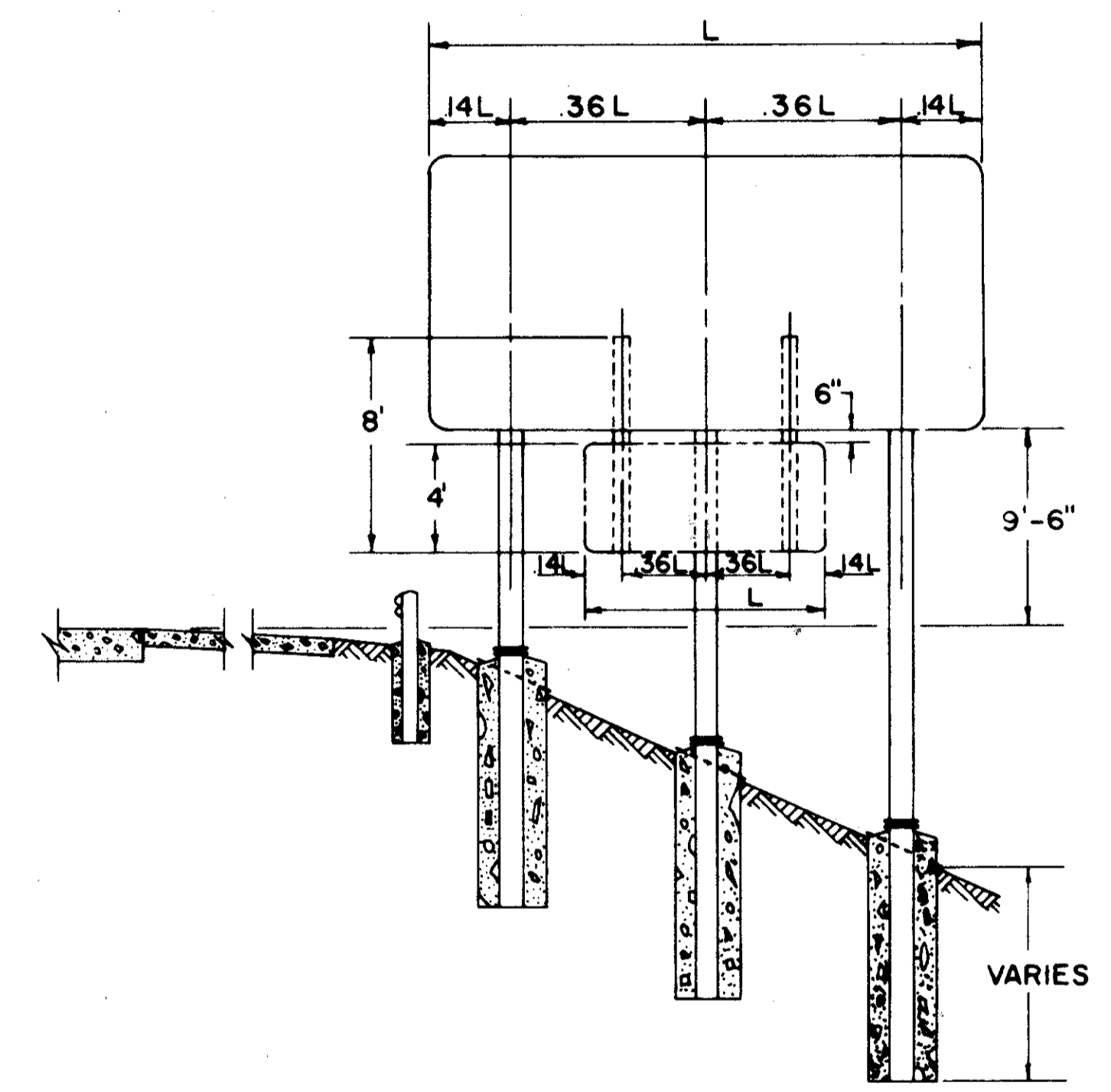
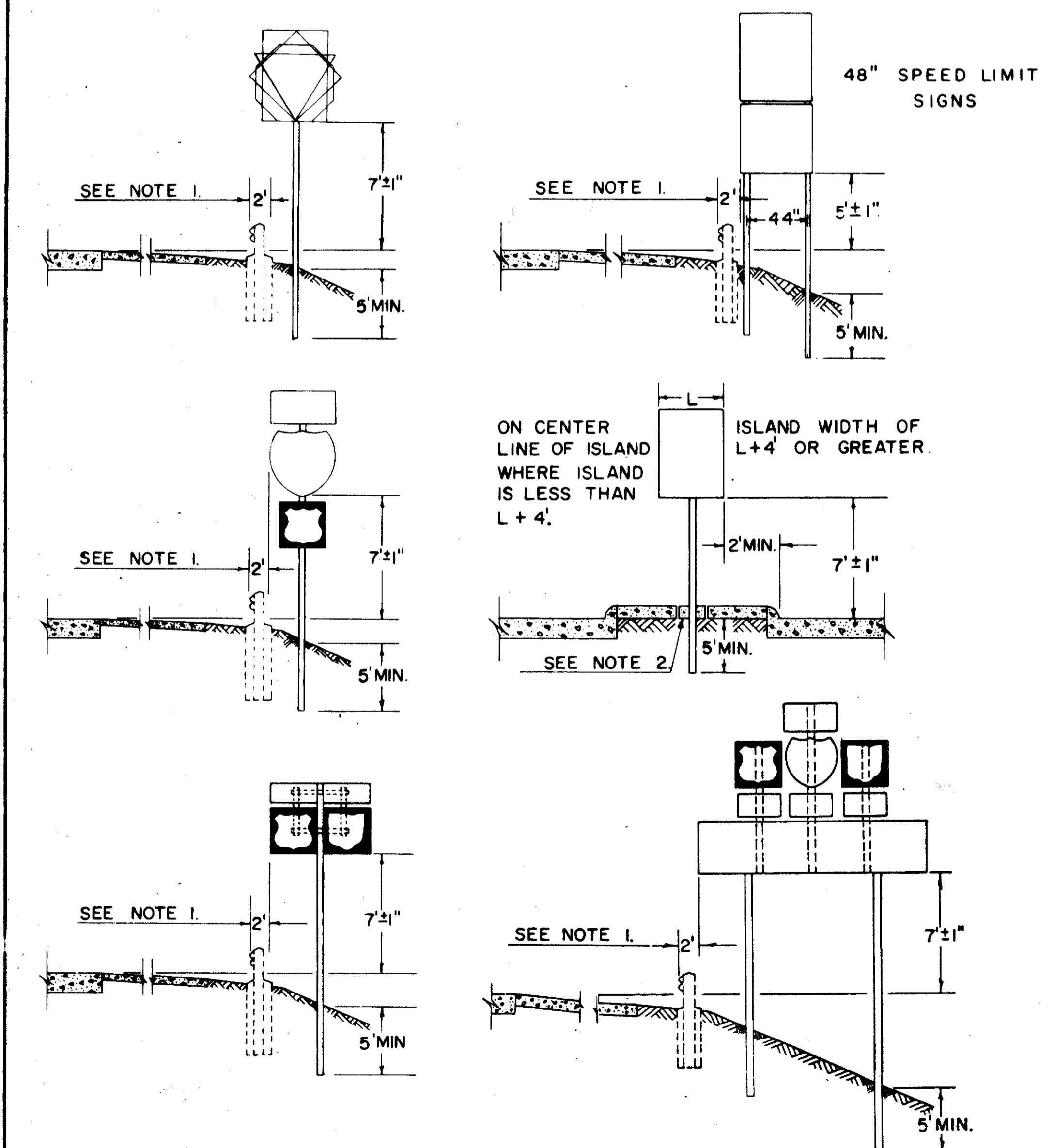
NOTE: THE PLATE IS SYMMETRICAL ABOUT EITHER CENTERLINE. METAL SHALL BE 16 GAUGE STEEL. ALL DIMENSIONS ARE IN INCHES.

BEARING PLATE DETAIL



SIGN SUPPORT SPACING

L+FT	2 SUPPORTS		3 SUPPORTS		L+FT	2 SUPPORTS		3 SUPPORTS	
	.22	.56	.14	.36		.22	.56	.14	.36
5.0	1.10	2.80	0.70	1.80	17.0	3.74	9.52	2.38	6.12
6.0	1.32	3.36	0.84	2.16	18.0	3.96	10.08	2.52	6.48
7.0	1.54	3.92	0.98	2.52	19.0	4.18	10.64	2.66	6.84
8.0	1.76	4.48	1.12	2.88	20.0			2.80	7.20
9.0	1.98	5.04	1.26	3.24	21.0			2.94	7.56
10.0	2.20	5.60	1.40	3.60	22.0			3.08	7.92
11.0	2.42	6.16	1.54	3.96	23.0			3.22	8.28
12.0	2.64	6.72	1.68	4.32	24.0			3.36	8.64
13.0	2.86	7.28	1.82	4.68	25.0			3.50	9.00
14.0	3.08	7.84	1.96	5.04	26.0			3.64	9.36
15.0	3.30	8.40	2.10	5.40	27.0			3.78	9.72
16.0	3.52	8.96	2.24	5.76	28.0			3.92	10.08



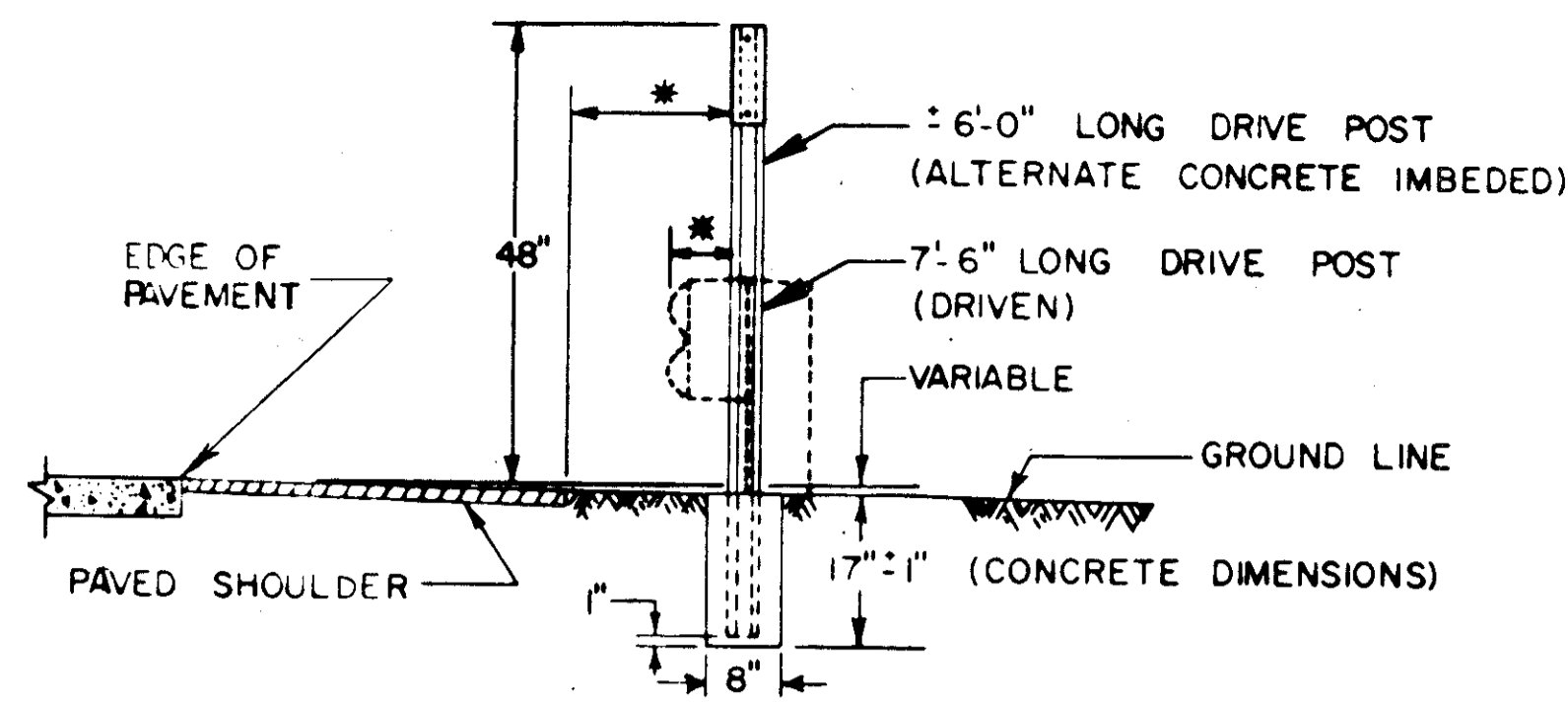
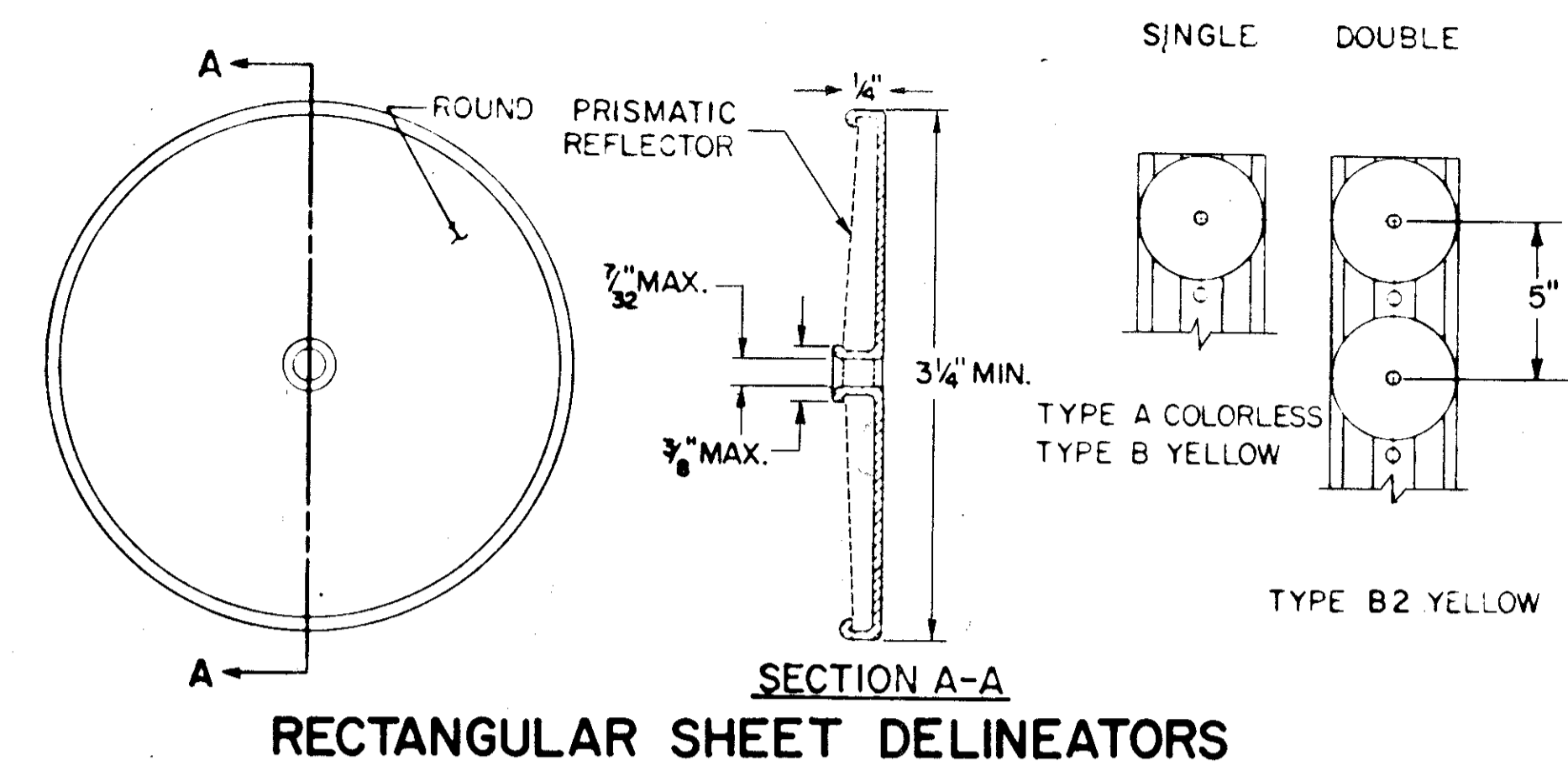
BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

TYPICAL PLACEMENT OF SIGNS

DATE: 9-27-67, 7-12-68, 5-13-69, 3-5-71, 12-21-71, 3-7-72

APPROVED: _____ ENGINEER OF TRAFFIC

ROUND DELINEATORS

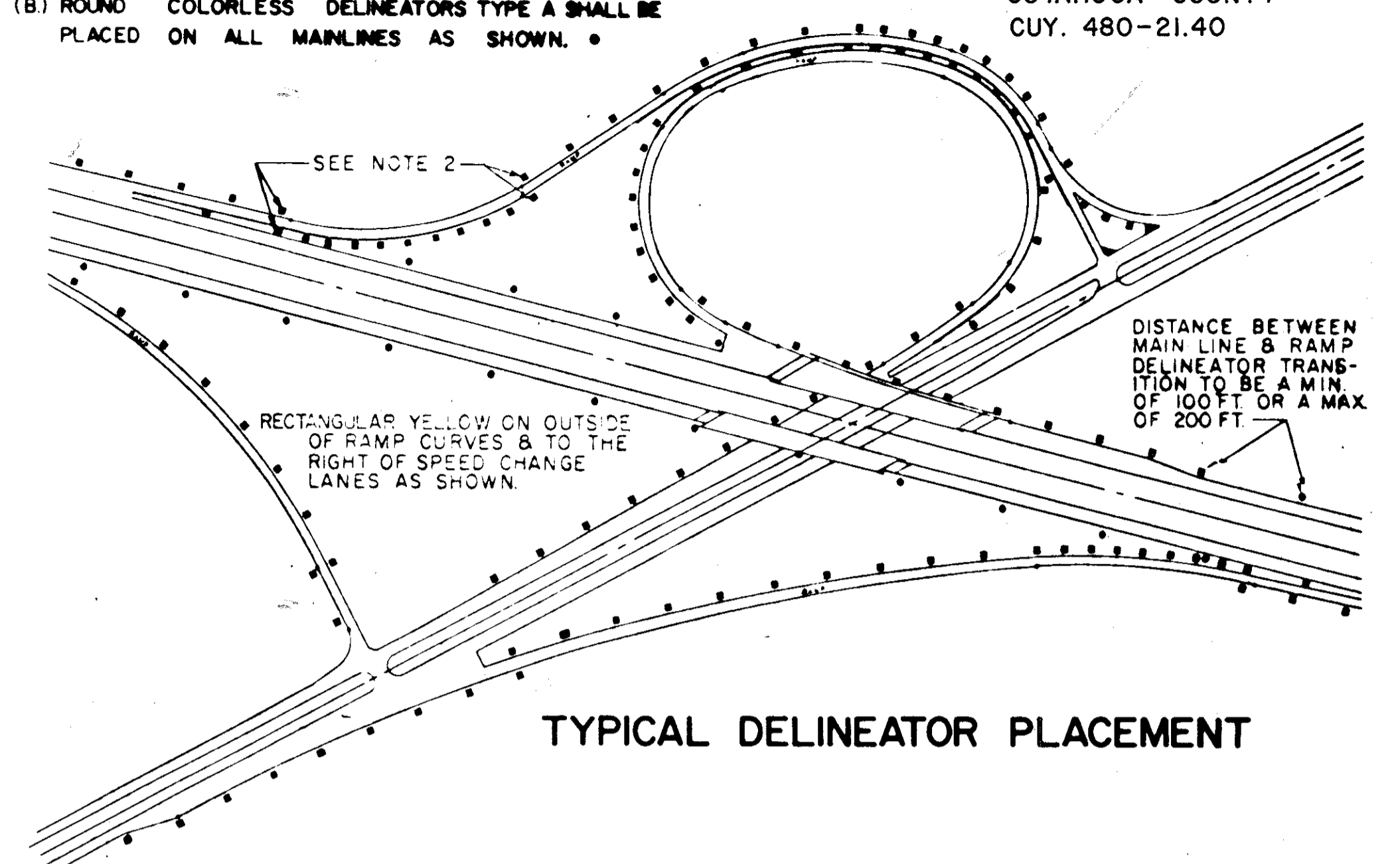


LATERAL PLACEMENT OF DELINEATORS

* DELINEATORS SHALL BE 6" BEHIND FACE OF TYPICAL GUARDRAIL LOCATION BUT WITH A MINIMUM DISTANCE OF 2'-6" FROM EDGE OF PAVED SHOULDER WHERE GUARDRAIL IS NOT PRESENT.

NOTE:
 (A) RECTANGULAR YELLOW DELINEATORS TYPE D SHALL BE PLACED ON ALL RAMPS AS SHOWN.
 (B) ROUND COLORLESS DELINEATORS TYPE A SHALL BE PLACED ON ALL MAINLINES AS SHOWN.

CUYAHOGA COUNTY
 CUY. 480-21.40

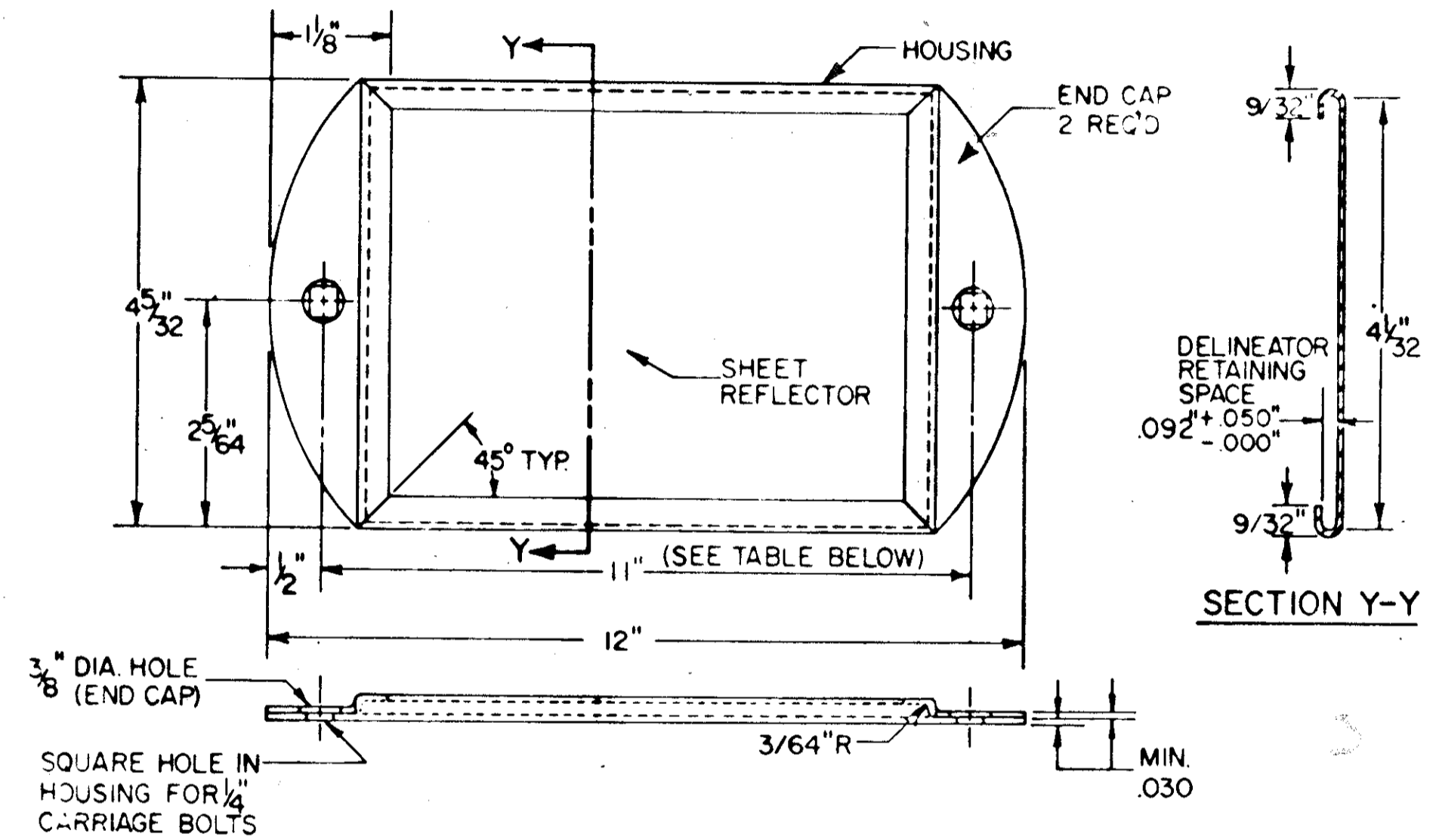


TYPICAL DELINEATOR PLACEMENT

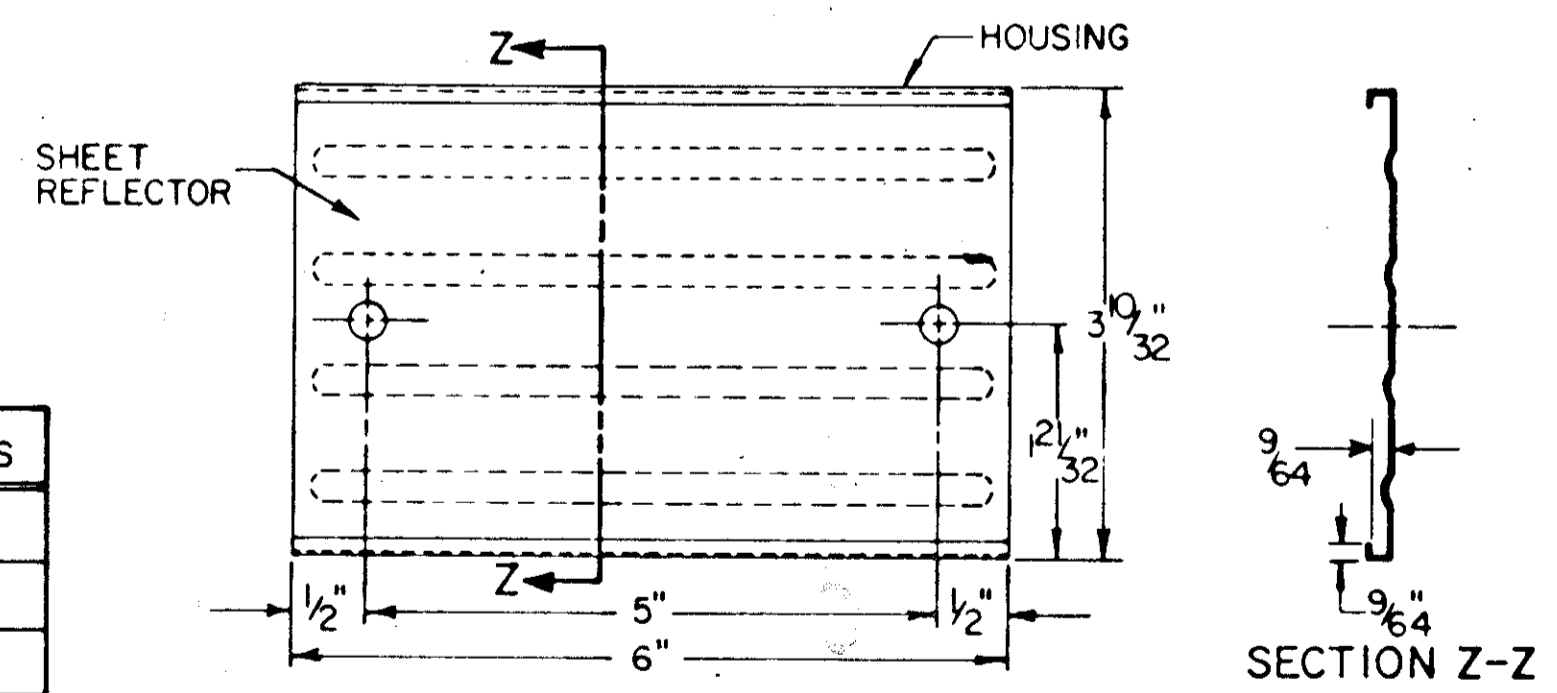
NOTES

- TYPE A DELINEATORS ON THE RIGHT OF THE THROUGH ROADWAY ARE TO BE SPACED AT 200 FT. INTERVALS THROUGHOUT, REGARDLESS OF CURVES.
- WHEN CROSSING FROM LEFT TO RIGHT OR FROM RIGHT TO LEFT ON THE RAMPS THE DELINEATORS AT THE POINT OF CROSSOVER ARE TO BE AT THE SAME STATION ON EACH SIDE.
- NO DELINEATORS ARE TO BE PLACED IN PAVED BERM.
- WHEN RADII OF CURVE ON RAMPS REQUIRE 100' SPACING THE DELINEATORS SHALL BE PLACED ON THE RIGHT IN RELATION TO THE FLOW OF TRAFFIC.
- IN ADDITION TO MATERIALS LISTED IN 620.02, RECTANGULAR SHEET REFLECTORS MAY CONSIST OF REFLECTIVE SHEETING COMPOSED OF GLASS SPHERES IMBEDDED IN A WEATHER PROOF SYNTHETIC RESIN SHEET, THE REFLECTIVE FACE OF WHICH SHALL BE PLACED BEHIND AND SEALED TO A WEATHERPROOF RIGID PLASTIC FACE OF METHYL METHACRYLATE OF 0.060 INCHES MINIMUM THICKNESS.
- SUPPLEMENTING THE DRIVE POST DETAILS SHOWN, ALTERNATE POST SECTIONS MAY BE FURNISHED. ANY ALTERNATE SECTION FURNISHED SHALL MEET ALL THE MATERIAL REQUIREMENTS OF 620, HAVE A SHAPE APPROXIMATELY AS DETAILED, AND HAVE A MOMENT OF INERTIA EQUAL TO OR GREATER THAN THE SECTION DETAILED. THE REQUIREMENTS OF 712.20 RELATIVE TO MAXIMUM WEIGHT TOLERANCE ARE HEREBY WAIVED. NO ALTERNATE SECTION FURNISHED SHALL EXCEED THE WEIGHT OF THE CORRESPONDING SECTION BY MORE THAN 10 PERCENT.

EMBEDDED GLASS SPHERE REFLECTOR

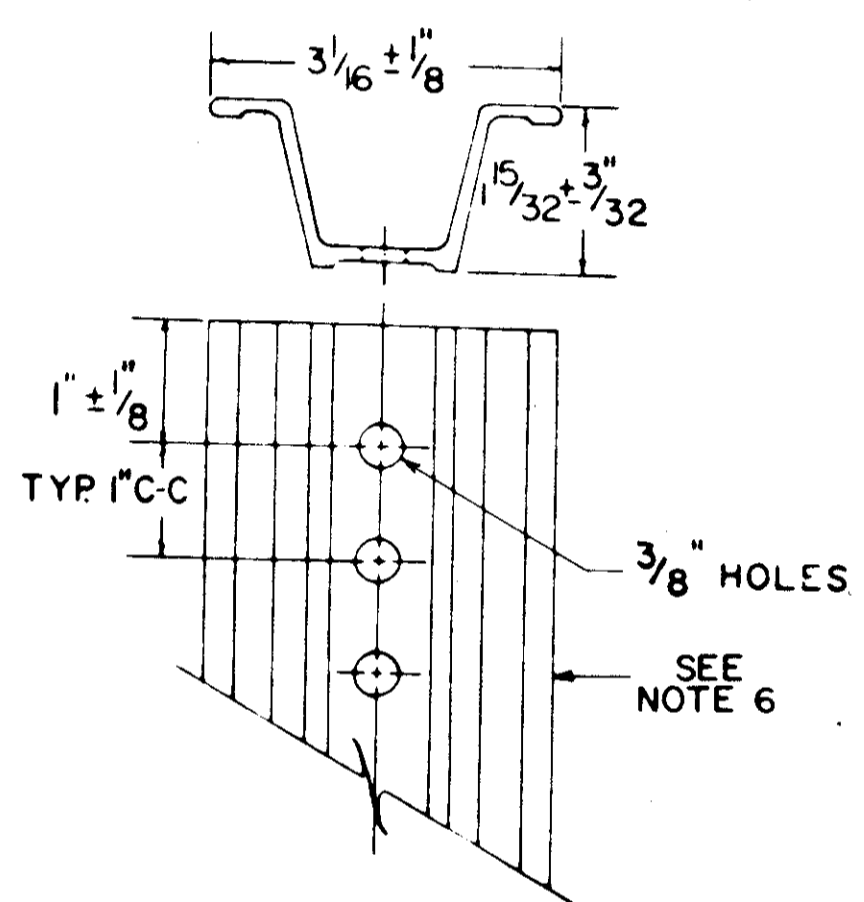
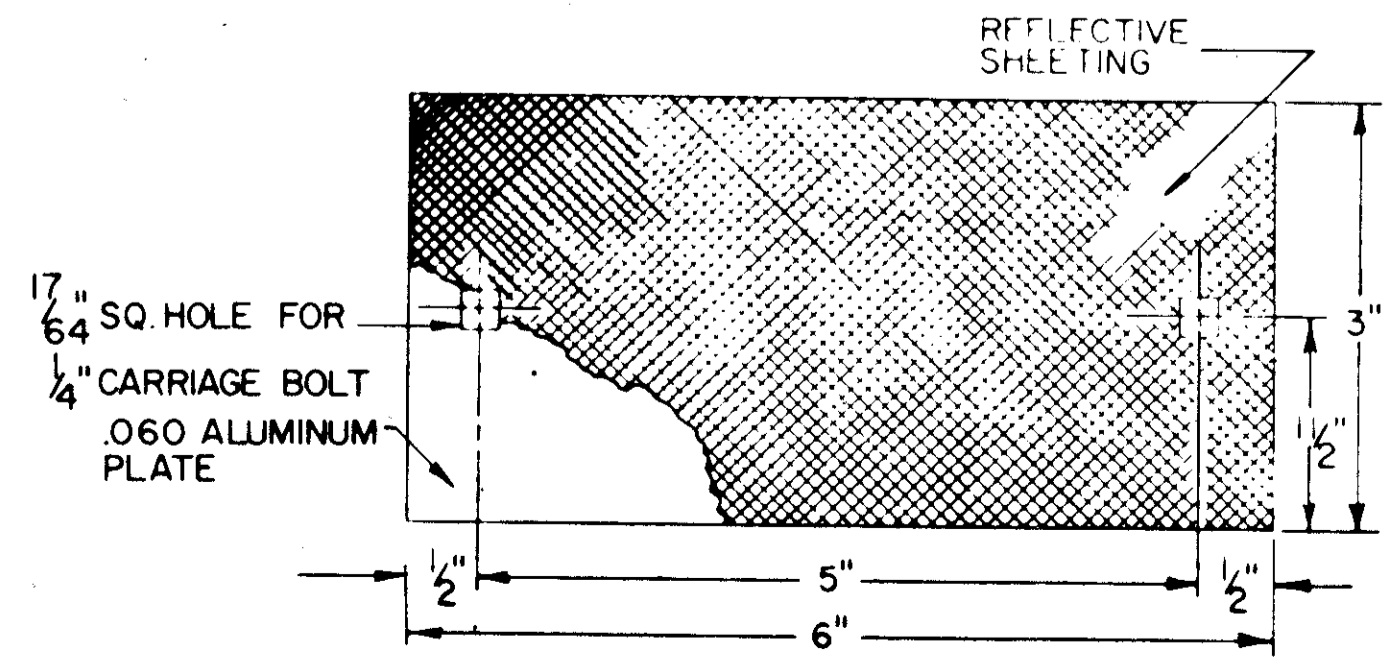


ACRYLIC PLASTIC PRISMATIC REFLECTOR

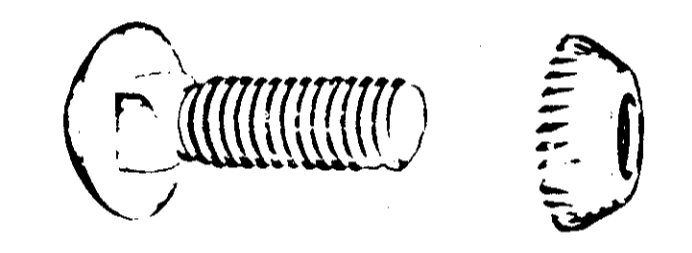


RECTANGULAR TYPES
C - COLORLESS
D - YELLOW
E - RED

REFLECTIVE SHEETING REFLECTOR

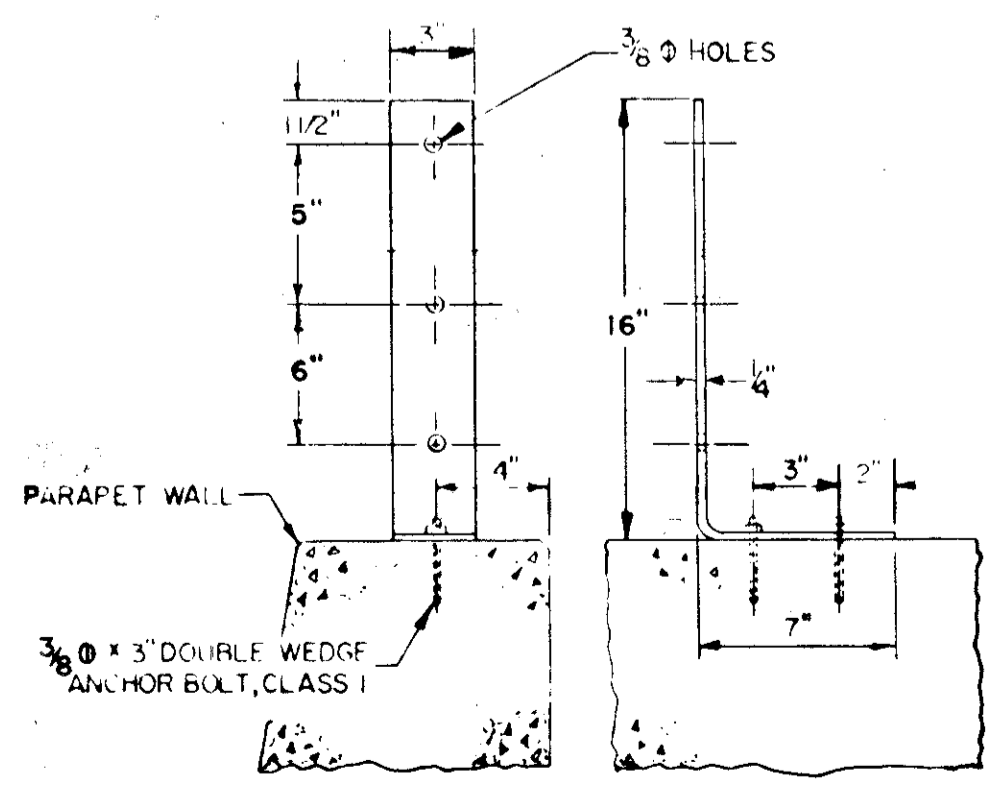


2 LB./FT. DELINEATOR DRIVE POST

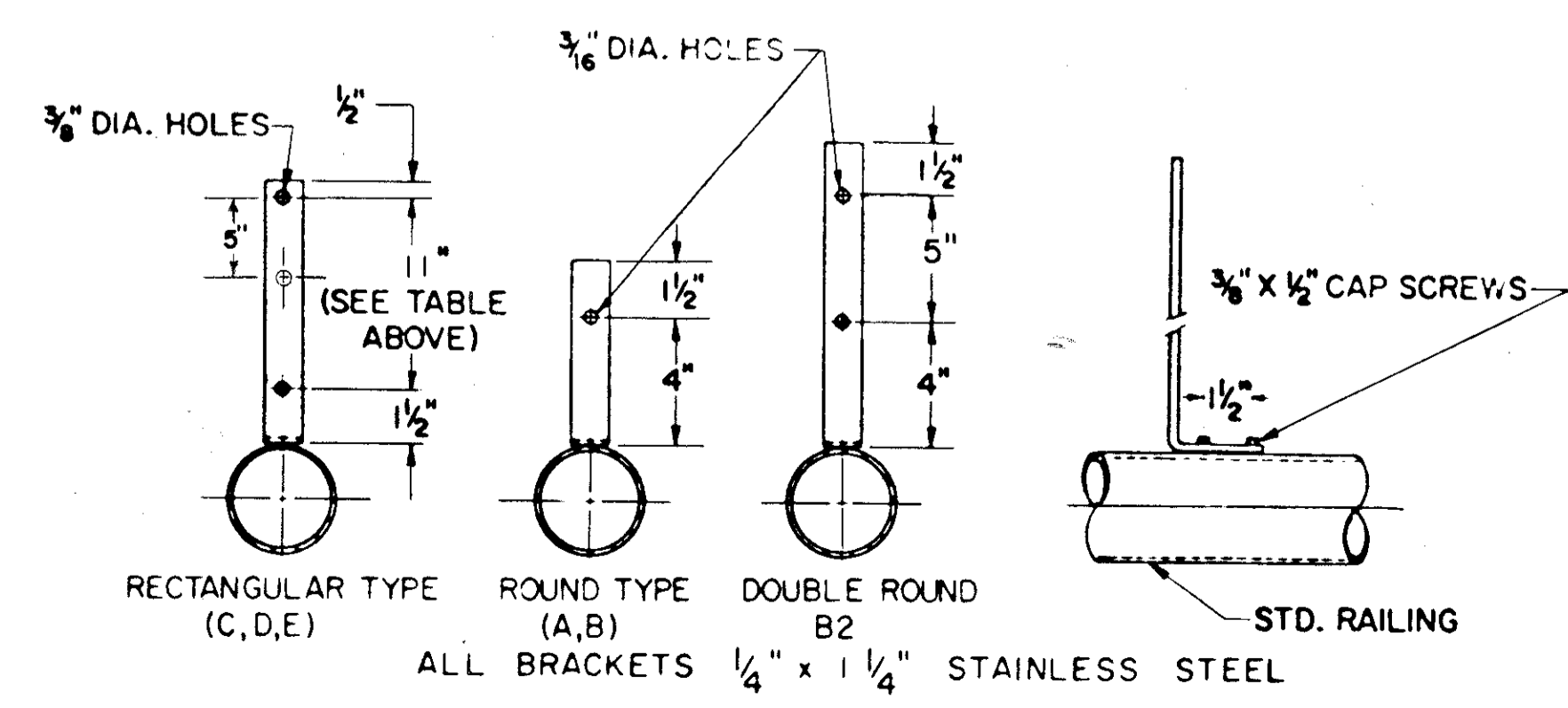


TAMPER RESISTANT FASTENERS SHALL BE USED TO FASTEN DELINEATORS TO POST AS/OR SIMILAR TO ONE SHOWN ABOVE.

TAMPER RESISTANT FASTENERS



BRIDGE PARAPET BRACKET



BRIDGE RAIL BRACKET

DELINEATOR SPACING ON RAMP HORIZONTAL CURVES

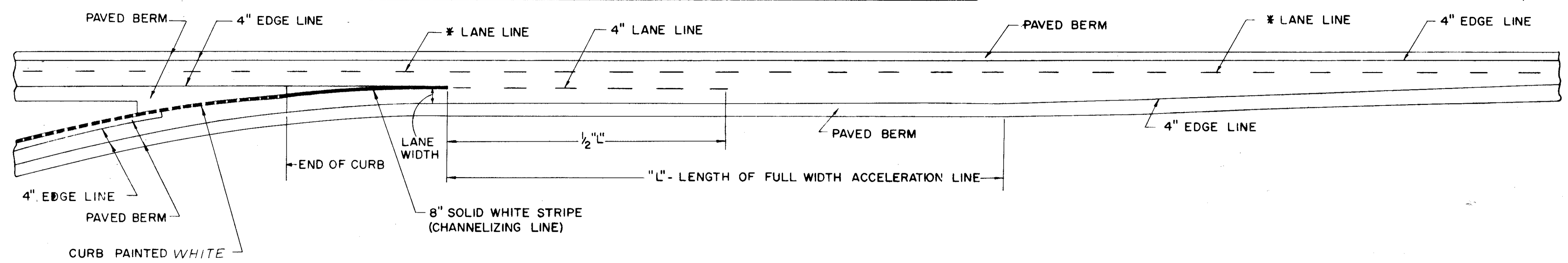
RADI, FT.		SPACING ON CURVE	* TRANSITION SPACING	
FROM	TO			
TANGENT	1,801	100'	100'	100'
1,800	1,401	80'	100'	100'
1,400	1,001	70'	100'	100'
1,000	751	60'	100'	100'
750	551	50'	80'	100'
550	326	40'	70'	100'
325		30'	60'	100'

* SUCH AS 40' TO 70' TO 100' OR 100' TO 80' TO 50' OR ANY OTHER COMBINATION SHOWN ABOVE.

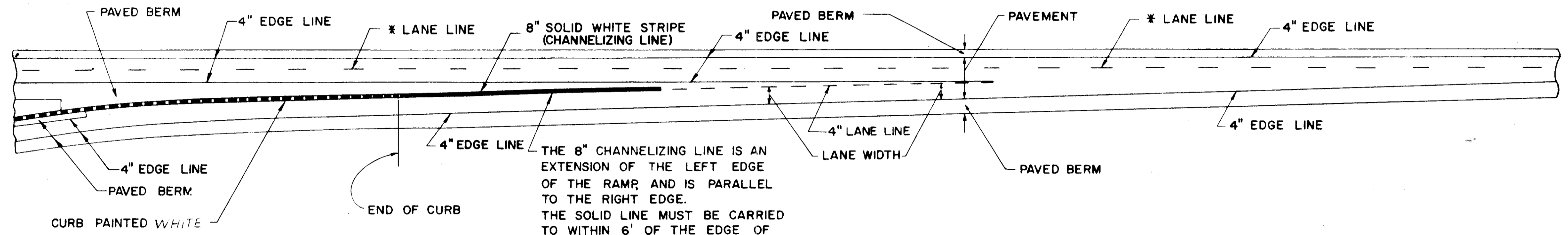
BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
DELINEATOR DETAILS	
DATE 1/1/73 3/12/73	
APPROVED _____ ENGINEER OF DESIGN SERVICES	

CUYAHOGA COUNTY
CUY. 480-21.40

ENTRANCE TERMINAL - PARALLEL ACCELERATION LANE

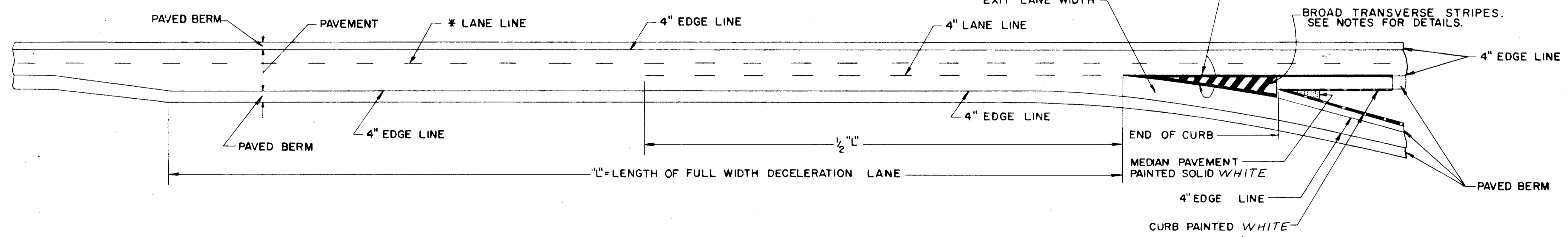


ENTRANCE TERMINAL - TAPERED ACCELERATION LANE

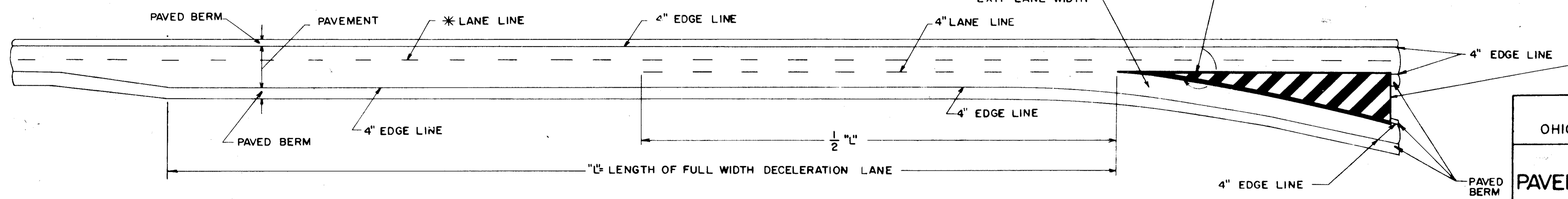


THE 8" CHANNELIZING LINE IS AN EXTENSION OF THE LEFT EDGE OF THE RAMP AND IS PARALLEL TO THE RIGHT EDGE. THE SOLID LINE MUST BE CARRIED TO WITHIN 6' OF THE EDGE OF THE THROUGH LANE, OR TO THE END OF THE RAMP CURVE IF CLOSER. THE 4" DASHED LINE SHOULD CONTINUE TO THE EDGE OF THE THROUGH LANE.

CURBED EXIT TERMINAL - PARALLEL DECELERATION LANE



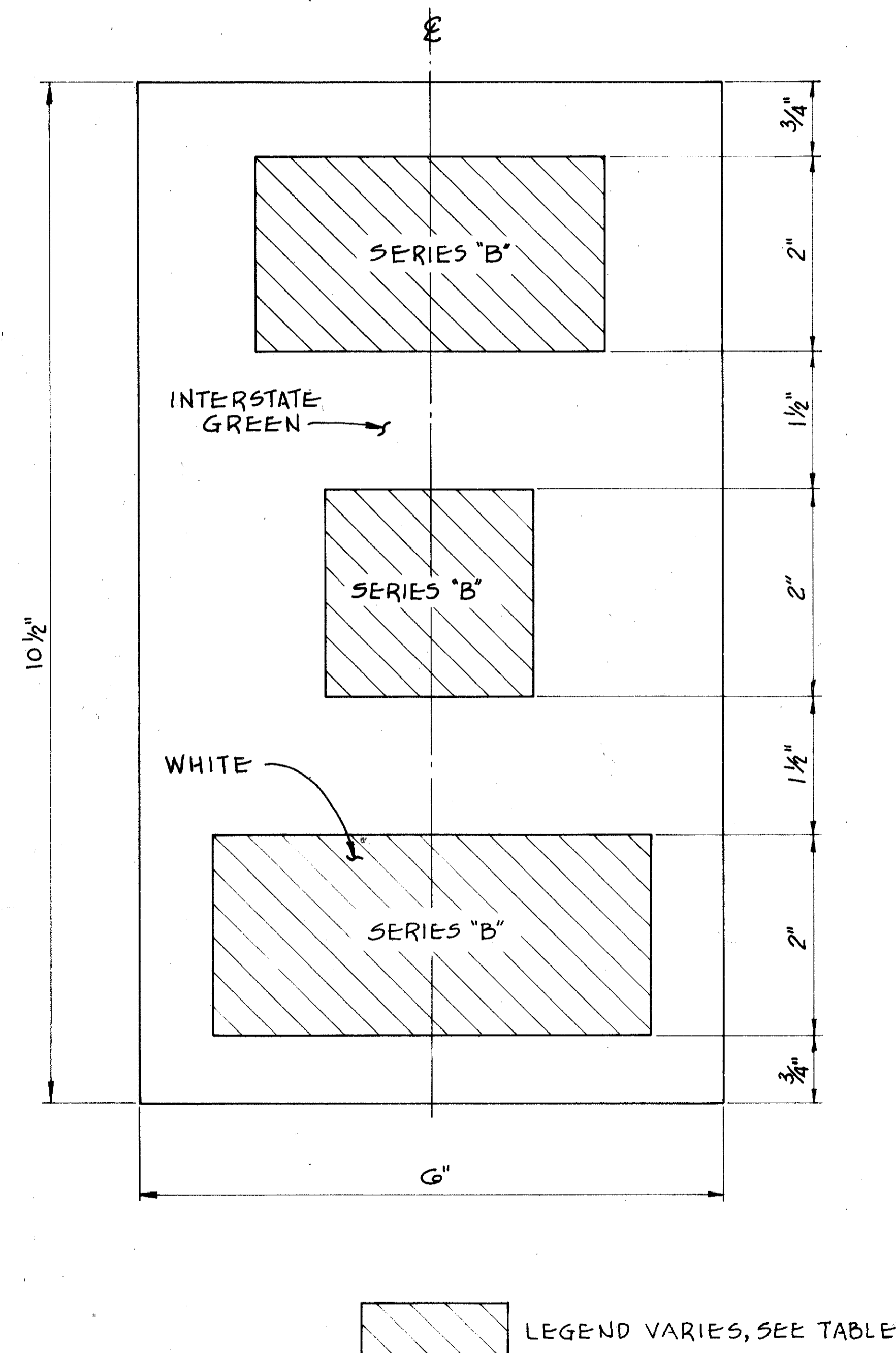
UNCURBED EXIT TERMINAL - PARALLEL DECELERATION LANE



NOTES

- DIAGONAL STRIPES AT EXIT RAMP SHALL BE 24" BROAD TRANSVERSE STRIPES, 621.11, WITH A 6' SPACE BETWEEN STRIPES.
- * 6" LANE LINE ON INTERSTATE HIGHWAYS ONLY.
- 4" LANE LINE ON ALL OTHER HIGHWAYS.

BUREAU OF TRAFFIC OHIO DEPARTMENT OF HIGHWAYS	
PAVEMENT MARKING 621	DATE 7-17-61 4-6-62 5-24-65 9-2-67 4-17-68 1-11-72
APPROVED <i>Robert E. Lower</i> ENGINEER OF TRAFFIC	



CUY
90
0.04

EXAMPLE

SUPPORT NO.	STATION	LOCATION	DIRECTION	DECAL LEGENDS		
				COUNTY	RT	MILEAGE
141	1159+00	I-480	E.B.	Cuy.	480	21.51
142	1168+00	I-480	E.B.	Cuy.	480	21.67
143	1182+33	I-480	W.B.	Cuy.	480	21.96
150	1180+70	I-480	E.B.	Cuy.	480	21.93
144	59+88	Bedford Freeway		Cuy.	422	0.28
146	44+50	Bedford Freeway		Cuy.	422	0.57
148	89+80	Broadway Ave.	N.B.	Cuy.	14	0.19
149	80+40	Broadway Ave.	S.B.	Cuy.	14	0.01

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

SIGN SUPPORT IDENTIFICATION DECALS

APPROVED _____
ENGINEER OF TRAFFIC

GENERAL TRAFFIC SIGNAL NOTES

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUY. -480-21.40

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SCOPE

The contractor shall install traffic signals at the interesections of Broadway Avenue-Relocated McCracken Road and Broadway-Temporary Bedford Freeway as shown in the plans. The contractor shall furnish all labor, materials, and equipment necessary so that the traffic signals will be complete, accepted and ready for service.

GENERAL

Any items of labor, materials, and equipment required, but not shown as a separate pay item in the proposal shall be furnished and installed as incidental to the contract.

The reference to any name, make and model number is intended to be descriptive and not restrictive and is to indicate to bidders the design that will be acceptable. Bids on other names, makes and numbers will be considered. Before any equipment is ordered or installation of a traffic signal system is begun, a complete schedule of materials and equipment shall be submitted to and approved by the Engineer. The schedule shall include fourteen (14) sets (3 sets each to be sent to the Mayor's office, City of Garfield Heights and the Mayor's office, City of Maple Heights) of catalog cuts, diagrams, drawings, brochures, data sheets, manufacturer's certificates of compliance or other descriptive data as may be required and shall include complete descriptive data on the signals, wiring diagrams, complete cable descriptions, test data, make and capacity of all apparatus. The contractor shall identify the item on each sheet and shall mark all prints "record drawing". One copy will be returned marked "Approved", if found satisfactory. 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.

All materials and equipment furnished under these specifications shall be new, first quality, of the latest design, and free from defects and poor workmanship. The contractor shall be responsible not to scratch or damage the paint or galvanized finish of any material or equipment being installed. Minor scratches shall be touched up with two coats of the final paint color. Deep scratches on galvanized finish on poles or other equipment will not be acceptable.

All major items of equipment such as controllers, signals, detectors, poles, specific types of cables, etc. shall be of the same manufacture and same type in order to assure uniformity, interchangeability of components, single responsibility and most satisfactory service.

INSTALLATION

- The contractor shall conform to all applicable requirements of the National Electric Code, the Ohio Manual of Uniform Traffic Control Devices for streets and highways, 1963 edition with latest revisions, and the State of Ohio's Construction and Material Specifications dated January 1, 1973, the Institute of Traffic Engineers, and the Standards of EEI-NEMA and the Underwriter's Laboratories in performing contract work and in the equipment furnished. He shall observe the regulations of utilities in the area of their equipment and exercise due caution in construction work near their facilities.
- Prior to beginning construction, the contractor shall contact all utilities having installations in the area to secure and affirm data on utility locations. These agencies and utilities shall be notified at least 24 hours prior to any excavation in areas containing their installations.

- The contractor shall install the power to the controller cabinet and provide 120/240 volts, 30 amp service as required. The contractor shall be responsible for arranging and providing the power in the manner shown in the plans through the Cleveland Electric Illuminating Company. The cost of obtaining the power shall be included in the bid price for "Underground Power Cable".
- Traffic signal cable shall enter the controller cabinets and run continuously from signal head to signal head without splices. Pressure type connectors will be used to make connections inside the controller cabinet. Cable entrances shall be protected by a suitable weather head and drip loop when entering traffic fixtures.
- All wires in the controller cabinet shall be labeled, neatly lashed and fastened to the cabinet with clamps. This shall include wires to signal heads, and all miscellaneous equipment.
- All splices in pull boxes shall be of the weather-proof poured type.
- All current carrying wires shall be copper unless otherwise specified.
- No splices shall be permitted in any electrical conductor.

EQUIPMENT

All equipment shall be furnished with two wiring diagrams, service manual and instructions on installation and maintenance. To facilitate later maintenance, the contractor shall provide the City of Garfield Heights and the City of Maple Heights with a complete list of the replacement parts for all equipment installed.

MARKING OF CABLE

All cables shall be marked or tagged at all pull boxes, signal supports, and controllers with tag, so as to be individually identified.

The tag shall be not less than 0.031" thick copper, brass or plastic, and shall be embossed or engraved with letters or numbers of not less than 1/4" high. It shall be securely attached with an AWG 14 copper wire. Markings shall consist of the following or variations thereof: Ground, Grd.; Phase A; ϕ A; Common, Com; power, ac+ or ac-; etc.

Payment for this work shall be incidental to the installation of the various cables.

TESTING OF TRAFFIC SIGNALS

The contractor shall furnish all personnel, equipment and appliances required to successfully test the completed installations.

The contractor shall test and demonstrate to the satisfaction of the engineer or his authorized representative, that the circuits are properly connected, continuous and free from short circuits, crosses and unspecified grounds, and that they are connected in accordance with the wiring instructions and that each circuit is operating correctly and independently of any other circuit.

The contractor shall test each ungrounded circuit and spare wires terminating at the traffic controller cabinet for resistance to ground. This resistance to ground shall be not less than ten (10) megohms. The contractor shall furnish a complete report of all megohm readings of each circuit and spare conductors in cable appearing at the controller base. The ground rod at the traffic controller shall have a resistance of not more than 25 OHMS to ground.

After all circuits and spare conductors have been tested, the contractor will install the traffic controller and connect the field wiring to the terminal contacts of the traffic controller. The completed installation shall operate continuously for a period of one week without interruption or failure attributable to poor workmanship or defective material prior to acceptance and after any defective parts have been replaced and all faults corrected.

The contractor shall have the responsibility of correcting malfunctions of the installation. Power for the test will be furnished from the service installed as a part of this contract. The cost of the power to conduct the test will be borne by the contractor. Costs of conducting tests by the contractor shall be included in the bid price for the item tested.

METHOD OF MEASUREMENT

Supplementing item 625.24, linear measurements for payment of various traffic signal bid items shall be made as follows:

- Signal Cable, Power Cable, Interconnect Cable, Loop Detector Lead in Cable, Service Cable.

The length measured horizontally from center to center of pullboxes, poles, foundations, or signal heads, plus the following:

- Five feet per each pullbox, pole, or termination at controller or signal head to allow for slack and splicing of leads.
 - The length measured vertically from trench bottom to pole outlet or span wire attachment on vertical runs.
- Multipliers as contained in 625.24 paragraph (c) and (e) shall not be used for multi conductor cables covered in this note.

- Loop Detector Wire

Measured horizontally from center line of pullbox to pavement edge, to loop through sawslots for the number of turns required and thence returning to the pullbox, plus five feet at each end to allow for slack and splices.

- Loop Detector Pavement Cutting

Measured along the sawcut from outside edge of pavement or curb, to loop and around the loop, using the rectangular perimeter dimensions shown on the plans or directed by the engineer but not including chamfer cuts at loop corners.

- Messenger Wire With Accessories

Measured horizontally from center to center of pole to pole; or bullring (aerial corner) to pole; or bullring to bullring; but not including any additional messenger required for attachment of messenger to poles, bullrings or strain insulators by wrapping or bending.

CERTIFICATION AND APPROVAL OF TRAFFIC SIGNAL MATERIALS

The Contractor shall submit through proper channels the drawings, information and samples as required below:

- 8 copies of shop drawings and material lists for approval
- 8 copies of catalog cuts descriptions of samples of fabricators standard items as shown in the plans or their equals for approval of their use.
- Certifications and or samples for all material which have been approved above under 1, a and b.
- Approval of items under 1, a and b shall be in the hand of the Contractor prior to any purchase of installation.
- Certifications of samples under 3 must be in hand and approved prior to contract completion.

GENERAL TRAFFIC SIGNAL NOTES

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625 TRAFFIC SIGNAL HEADS, BY TYPE

This work shall consist of furnishing and installing vehicular traffic signal heads of the type and size shown on the plans and installing them as shown on the detail sheet and as herein specified.

All traffic signals shall meet the latest ITE (Institute of Traffic Engineers) standards for "Adjustable Face Traffic Control Signal Head Standards". The traffic signals shall also meet the following requirements:

- Twelve (12") traffic signal sections shall be installed with a combination tunnel type hood twelve (12") long, with an open slot at the bottom of the hood.
- Reflectors shall be highly polished, specular aluminum type.
- All traffic signals shall be arranged for span wire mounting.
- Glass lenses, number and size, shall be as indicated on the intersection drawing. These lenses shall meet the latest ITE standards for lenses.
- All signal optical units shall produce standard (ITE definition) light distributions.
- All traffic signals and signal service entrance fixtures shall be painted in accordance with the following.

A. Finish on body of signal, outside of hood, doors and service entrance fixture - Federal Yellow, Standard 595 Color 13655-two coats.

Finish on inside of hood - Flat Black.

B. Paint Requirements:

1st coat (all surfaces) - Epon oxide baking primer, Federal Spec. TT-P-636.

2nd coat (all surfaces) - Medium gray alkyd urea exterior baking enamel, Federal Spec. TT-E-489B

3rd coat (yellow surfaces) - Federal Yellow alkyd urea exterior baking enamel, Federal Spec. TT-E-489B, color 13538

3rd coat (Flat Black surfaces) - Alkyd urea black synthetic, heat-resisting glyceryl phthalate type 4, instrument black, military spec E-5557

- Stainless steel latching devices shall not be painted.
- Balance adjustors shall be installed if necessary to maintain the traffic signals in a vertical position.
- Traffic Signal Head, 3 Section, 12" Lens, One Way-A-completed one way, three section signal assembly shall consist of the following component parts for span wire mounting:
 - Galvanized span wire hanger for 3/8" messenger
 - Balance adjustor
 - 1-1/2" service entrance head with galvanized nipple
 - 1-1/2" galvanized lock nuts
 - 1-1/2" diameter top bracket assembly
 - One, twelve inch three-section traffic signal including red, yellow, and green lens with all required components to lock the signals in place and provide a water and dust tight installation.
 - All other incidentals necessary to make the assembly complete.

B. Traffic Signal Head, 4 Section, 12" lens. One way w/arrow-A completed one way four section signal assembly shall consist of the following component parts for span wire mounting.

- Galvanized span wire hanger for 3/8" messenger wire.
- Balance adjustor
- 1-1/2" service entrance head with galvanized nipple
- 1-1/2" galvanized lock nuts
- 1-1/2" diameter top bracket assembly
- One twelve inch, four section traffic signal including red, yellow, green and green arrow lenses with all required components to lock the signals in place and provide a water and dust tight installation.
- All other incidentals necessary to make the assembly complete.

C. Traffic Signal Head, 3 Section 12" Lense, Two-Way-A completed two-way three-section traffic signal assembly shall consist of the following component parts for span wire mounting:

- Galvanized span wire hanger for 3/8" messenger wire
- Balance adjustor
- 1-1/2" service entrance head with galvanized nipple
- 1-1/2" galvanized lock nuts
- 1-1/2" diameter top bracket assembly
- Bottom bracket assembly
- Two, twelve inch, three-section traffic signal including red, yellow and green lenses with all required components to lock the signals in place and provide a water and dust tight installation.
- All other incidentals necessary to make the assembly complete.

10. The contractor shall furnish and install a traffic signal lamp in each traffic signal section. Signal lamps shall conform to the requirements of "A Standard for Traffic Signal Lamps" as approved by the Institute of Traffic Engineers (ITE) Board of Direction on December 26, 1967, with the following exceptions and qualifications:

- Brass screw bases shall be required.
- Lamp sizes shall be as follows:

	watts	rated life hours	light center length
(1) 12" diameter red, green, green arrow	150	6000	3"
(2) 12" diameter yellow, yellow arrow	69	6000	3"

Lamps shall be installed with the open portion of the filament in the upward position.

Cost of furnishing and installing lamps shall be included in the bid price of each item requiring lamps.

11. Signals shall be installed such that the lowest point of the signal is sixteen (16) to seventeen (17) feet above the pavement surface except where noted in plans.

Payment for Item 625 "Traffic Signals" will be made at the contract unit price for each signal assembly (by type) mounted in place, tested and accepted.

625 SIGNAL CONTROLLER, 3 PHASE SEMI-ACTUATED WITH INTERCONNECT AND CABINET (CROUSE-HINDS)

The Contractor shall furnish and install a semi-actuated, three-phase, solid state traffic signal controller. It shall be capable of providing the basic signal sequence in accordance with signal operation drawings.

The controller shall have the following features, as manufactured by CROUSE-HINDS:

- All red clearance on all phases
- Overlap capability
- Local flashing for all approaches
- Voltage supply surge protection
- Capable of coordinated operation
- Base mounted cabinet meeting the requirements shown in the plans including police door, ventilating plan, an extra shelf, and a duplex utility outlet.
- Necessary solid state load switches and green monitor.
- Local Coordinating Unit which provides the background cycle and offset shown. The unit shall be of the expansible type capable of providing up to three dials with three offsets per dial by means of mechanically and electrically jack-mounted dial units. As furnished it shall have one dial.

Payment for Item 625 "Signal Controller 3-Phase Semi-Actuated w/interconnect & cabinet (Crouse-Hinds)" will be made at the contract price for each controller in place, including prewired cabinet, all connections and testing.

625 SIGNAL CONTROLLER, 3 PHASE SEMI-ACTUATED WITH INTERCONNECT AND CABINET (ALTERNATE BID)

The Contractor shall furnish and install a semi-actuated, three-phase, solid state traffic signal controller. Continuously rotating dials are not acceptable. It shall be capable of providing the basic signal sequence and operation in accordance with signal operation drawings.

The Controller shall be manufactured by Crouse-Hinds Company or Eagle Signal Company or approved functional equal.

The Controller shall be furnished with all of the appurtenances and features described in the specific brand name bid for this item.

Payment for Item 625 "Signal Controller 3-Phase, Semi-actuated, w/interconnect and cabinet (Alternate Bid)" will be made at the contract price for each controller complete and in place, including prewired cabinet, all connections and testing.

625 MASTER SIGNAL CONTROLLER, 3 PHASE SEMI-ACTUATED WITH INTERCONNECT AND CABINET (CROUSE-HINDS BRAND)

The Contractor shall furnish and install a semi-actuated phase, solid state traffic signal controller. Continuously relating dials are not acceptable. It shall be capable of providing the basic signal sequence in accordance with signal operation drawings:

The Controller shall be manufactured by Crouse Hinds Company.

The Controller shall have the following features:

- All red clearance on all phases
- Overlap capability
- Local flashing for all approaches
- Voltage supply surge protection
- Capable of coordinated operation
- Base mounted cabinet meeting the requirements shown in the plans including police door, ventilating plan, an extra shelf, and a duplex utility outlet.
- Necessary solid state load switches and green monitor.
- Local Coordinating Unit which provides the background cycle and offset shown. The unit shall be the expansible type capable of providing up to three dials with three offsets per dial by means of mechanically and electrically jack mounted dial units. As furnished it shall have one dial.
- In addition a master controller which is capable of supervising local units of the type described above shall be provided.

Payment for Item 625 "Master Signal Controller, 3-Phase, Semi-Actuated w/interconnect cabinet (Crouse-Hinds)" will be made at the contract price for each controller in place, including prewired cabinet, all connections and testing.

625 MASTER SIGNAL CONTROLLER, 3 PHASE SEMI-ACTUATED WITH INTERCONNECT AND CABINET (ALTERNATE BID)

The Contractor shall furnish and install a semi-actuated, three-phase, solid state traffic signal controller. Continuously rotating dials are not acceptable. It shall be capable of providing the basic signal sequence and operation in accordance with signal operation drawings.

The Controller shall be manufactured by Crouse Hinds Company or Eagle Signal Company or approved functional equal.

The Controller shall be furnished with all of the appurtenances and features described in the specific brand name bid for this item.

Payment for Item 625 "Signal Controller 3-Phase, semi-actuated, w/interconnect and cabinet (Alternate Bid)" will be made at the contract price for each controller complete and in place, including prewired cabinet, all connections and testing.

SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE L.W.C. DATE 2-9-72 CONSULTING ENGINEERS
TRCD J.M.C. DATE 9-12-72
CKD E.F.J. DATE 8-20-72 KANSAS CITY CLEVELAND NEW YORK

GENERAL TRAFFIC SIGNAL NOTES

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625 SIGNAL CABLE, 1-5/C OR 1-7/C NO. 12 AWG, IMSA 19-1-67

Traffic signal cable shall be weatherproof and shall consist of the number of conductors as specified on the plans. All conductors shall be AWG No. 12. Cables shall be insulated, jacketed, rated 600 volts for use in underground conduit. It shall be color coded and in every respect follow the International Municipal Signal Association Specification No. 19-1-1967. Wires may be solid or stranded.

Payment for Item 625 "Signal Cable, 1-5/C or 1-7/C No. 12 AWG, IMSA 19-1-67" shall be made at the contract unit price per linear foot, by type, in place, completed and accepted, including wiring, terminals, connections, testing, and all incidentals necessary. Cable lengths shown in the plans are for estimating purposes only; the Contractor shall determine for himself the exact quantity required.

625 INTERCONNECT CABLE 7/C #14 AWG, IMSA 19-1-67

Interconnect cable shall be weatherproof and shall consist of the number of conductors as specified on the plans. All conductors shall be A.W.G. #14. Cables shall be insulated, jacketed, rated at 600 volts for use in underground conduit or as aerial cable supported by a messenger. It shall be color coded and in every respect follow the International Municipal Signal Association Specification 19-1-67. Conductors may be solid or stranded.

Payment for Item 625 "Interconnect Cable, 7/C #14 AWG" will be made at the linear price bid per linear foot, in place, completed, and accepted including wiring, terminals, connections, splicing, testing and all incidentals necessary.

624 LOOP DETECTOR AMPLIFIER

The loop detector amplifier is an electronic device that will detect the presence or motion of a mass of metal. This detection is accomplished by the passage of a car over a wire loop imbedded in the roadway.

The amplifier shall conform to the following:

1. The detector shall operate satisfactory at any temperature between -30°F. and +165°F.
2. The operating voltage shall be 115 volt, 60 cycle.
3. The internal circuitry shall be incorporated into printed circuit board assemblies.
4. The detector design shall include a fixed frequency crystal which will generate a sine wave form of signal.
5. No external equipment shall be necessary for installation, tuning, or sensitivity adjustments.
6. Various types of outputs shall be available including pulse and presence. These outputs shall be available by switching from one to the other without changing any internal parts.
7. All transistors, crystals, and relays shall be of the plug-in type to facilitate replacement.
8. The amplifier and power supply shall be capable of driving several loops from the one source. The amplifier shall be capable of detecting vehicles in a total area of up to 400 sq. ft. and shall properly function with lead-in lengths totaling up to 750 feet.

Payment for Item 624 "Loop Detector Amplifier" will be made at the contract unit price for each detector amplifier, completely wired and installed in controller cabinet.

625 LOOP DETECTOR WIRE AND LEAD-IN CABLE

Loop detector wire shall consist of single conductor, insulated, No. 14 AWG, RHW or RHW type, 600 V. stranded copper wire, and be installed in accordance with the typical loop detector detail. Each wire loop shall consist of the number of turns as required by the manufacturer of the loop detector. The loop wire shall run continuously to the adjacent pull box where it shall be spliced to the loop detector lead-in cable.

Payment for Item 625 "Loop Detector Wire" will be made at the contract unit price per linear foot in place for #14 AWG wire and shall include detector wire, installation, jacket, conduit from roadway edge to pullbox splice and all incidentals necessary to complete the installation. The estimated quantities of loop detector wire shown on the plans is based on an anticipated required number of turns. Payment will be based on the actual linear feet installed as controlled by the detector manufacturer's requirements for loops.

Payment for Item 625 "Loop Detector Lead-in Cable" will be made at the contract unit price per linear foot in place for #14 AWG, 2-cond., polyethylene insulated, twisted pair, shielded and jacketed cable, including soldered, water-proof poured splice.

625 LOOP DETECTOR PAVEMENT CUTTING

Loop detector pavement cutting shall consist of a 1-1/4 inch or 2 inch x 1/4 inch wide saw cut in accordance with typical loop detector installation detail. The saw cut shall be filled with a joint sealer after the wire has been installed. The joint sealer shall be as specified in the plans on Sheet 12.

Payment for Item 625 "Loop Detector Pavement Cutting" will be made at the contract unit price per linear foot for saw cutting and treatment including joint sealer.

625 POWER CABLE, 3/C #8 AWG, 600 V RHW, STRANDED

Power cable shall be weatherproof and shall be 3 conductor AWG No. 8, 600V RHW or RHW-type stranded copper. Power cable shall be installed from the controller cabinet through the appropriate conduit, signal pole, and weatherhead. It shall be attached by the Cleveland Electric Illuminating Company to the service cable with pressure connectors covered with mastic insulation. Three single conductor No. 8 RHW wires may be substituted; however, payment will be based upon the equivalent length of 3-conductor cable.

Payment for Item 625 Power Cable, 3/C #8 AWG " will be made at the contract unit price per linear foot, in place, complete and accepted, including wiring, terminals, connections, testing, and all incidentals necessary and shall also include any costs incurred to arrange the service installation by the Cleveland Electric Illuminating Company.

625 CABLE SUPPORT ASSEMBLY

A cable support assembly shall be installed for each group of cables passing through each wire outlet near the top of pole, it shall be attached to the "U" hook as shown in the plans and shall consist of the following major items:

1. One bronze or stainless steel cable grip with single "U" eye bale.
2. All other miscellaneous items that may be necessary to make the assembly complete.

The cable grip shall have a single "U" eye bale. The grips shall be of the proper size to fit the cable and shall have a minimum rated breaking strength of 250 lbs.

The grip shall be either the "closed", or "split with rod" type.

When a signal support will also support a luminaire bracket arm, the following additional items shall be included:

3. One piece of three-strand copper-clad messenger, length as required.
4. Two hot-dipped galvanized thimbles.
5. Two No. 6 split bolt connectors.

The messenger shall be 0.164 inches in diameter consisting of three strands of 0.075 inch copper covered steel wires twisted in the form of a cable. Guy thimble shall be grooved to fit the guy strand and bent to the proper radius to prevent the strand from being sharply bent.

Payment for Item 625 Cable Support Assembly will be made at the contract unit price each, completely assembled in place and accepted.

625 CAPPING OF CONDUIT

All conduit in foundations which will not have wire or cable pulled into it during construction shall have the ends closed with capped bushings or otherwise sealed in an approved manner to completely keep all moisture and foreign matter out of the conduit.

625 COVERING OF TRAFFIC SIGNAL HEADS

All traffic signal heads, both vehicular and pedestrian, erected at locations where traffic will be maintained prior to energizing of the signal, shall be covered.

The covering shall be plastic coated burlap blankets as per Item 705.06. They shall be firmly attached and completely cover the signal head without damage to the head. The covering shall be maintained in place at all times while traffic is using the area and the signal is not in operation.

Payment shall be at the unit price bid per each for Item 625 "Covering of Traffic Signal Heads" which shall be full compensation for all labor, materials and equipment required to erect, maintain and remove the covering.

GENERAL TRAFFIC SIGNAL NOTES

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816 CONSTRUCTION LAYOUT STAKES FOR TRAFFIC SIGNALS

The contractor shall stake out all traffic signal supports in accordance with Supplemental Specification 816 prior to installation of any foundations or supports.

After stakeout the contractor shall notify the engineer a minimum of seven (7) days in advance of scheduled work. Support locations for each support will be field checked and approved by the Engineer who shall coordinate with the District and/or City Engineer prior to proceeding with construction work required.

Cost for this item of work will be incidental to the various 816 items of work contained in the project.

816 MESSENGER WIRE 7-STRAND (BY SIZE) WITH ACCESSORIES

Messenger wire shall be utility grade galvanized steel as per ASTM A-475 Class B. It shall consist of seven strand ($\frac{3}{8}$ " nominal diameter with a breaking load of 11,500 lbs.) Galvanized steel lashing rods shall be used to suspend the signal cable from the messenger wire, tightly secured. Wet-porcelain strain insulators (600 volt), guy clamps, and Galvanized performed guy grip dead ends, thimbles, and bull rings (when required) with a rated loading strength equal to or greater than the breaking load of the messenger wire shall be installed as shown on the plans and as specified by the Engineer. The messenger wire shall be installed so that the entire load of the signal equipment will not cause sag to exceed a maximum of 5% or a minimum of 3% of the span.

Payment for Item 625 "Messenger Wire (By Size) 7-Strand, with Accessories" will be made at the contract unit price per linear foot (measured to center of pole or aerial corners) completely assembled in accordance with the typical signal installation details and shall include messenger wire, lashing rods, strain insulators, performed guy grips, thimbles, guy clamps, and aerial corner bull rings, as described above and shown on the details on sheets 8 & 10.

816 SIGNAL STRAIN POLE (BY SIZE)

This item of work shall consist of furnishing and erection of poles as shown and specified in the plans.

Shafts shall be tapered tubes.

Each pole shall be galvanized and include the furnishing of anchor bolts, Type III rigid ferrous metal 3" conduit ell and a $\frac{3}{4}$ " electrical metallic tubing ell for grounding lead for installation in foundations plus handhole with cover, "U" hook, pole clamp, and cable service entrance with blind half-coupling for each pole in accordance with details as shown in the plans.

The poles shall be installed and adjusted to the proper rake so that the weight of the signal installation will not cause the poles to be off vertical alignment by more than 1%.

Basis of payment shall be at the contract bid price per each 816 "Signal Strain Pole, (by size)," including all labor, material, equipment and incidentals related to this item of work.

COVER BASES

Cover bases shall be provided for all overhead signal support foundations that are located in sidewalks, tree lawns or in traffic islands used as walks. Payment for cover bases and all tools, materials, and labor necessary to erect the cover bases shall be included in the price bid for "Item 816 Signal Strain Pole."

816 CONCRETE FOR SIGNAL AND COMBINATION SUPPORT POLE FOUNDATIONS

Traffic signal pole foundations shall be constructed as shown in the plans. The contractor shall stake the longitudinal and lateral location and the elevation of the top of each foundation subject to the approval of the Engineer. The contractor shall be responsible for the proper elevation, offset and level of each foundation. Excavations shall be made to the dimensions shown on the plans and shall be performed by means of an earth auger of the specified diameter unless otherwise directed by the Engineer. Where sub-surface obstructions are encountered, the Engineer may require the Contractor to remove the obstruction or to replace the excavated material and relocate the foundation. If caving of the foundation occurs, the Contractor shall excavate to the specified depth, maintaining the sidewalls as nearly vertical as possible. No payment shall be made for any excavation, concrete or reinforcing steel used in excess of the planned quantities. Portland cement concrete shall be used and shall conform with class "C" of the current Construction and Material Specifications by the Department of Transportation of the State of Ohio.

The concrete shall be placed against undisturbed soil or compacted embankment. The foundation shall have anchor bolts and conduit accurately held in position with a template when concrete is poured. Forms shall be used for the upper portion of all foundations and no backfilling shall be permitted from the bottom to within 6 inches below ground level. No grouting of concrete shall be permitted between the foundation and the steel pole.

One (1) or more, 2 or 3 inch, 90 degree Type III conduit elbows with 24 inch radius shall be installed from the bottom of the pole through each base as detailed in the plans.

Payment for Item 816 "Concrete for Signal and Combination Support Pole Foundations" shall be made per cubic yard for each foundation constructed in accordance with the typical foundation details and shall include concrete, reinforcing steel, excavation, backfill and all incidentals.

816 CONCRETE FOR SIGNAL CONTROLLER AND PEDESTAL FOUNDATION

Controller and pedestal foundations shall be constructed as shown in the plans. The contractor shall stake the longitudinal and lateral location and elevation of the top of each foundation subject to the approval of the Engineer. The contractor shall be responsible for the proper elevation, offset and level of each foundation. Excavations shall be made to the dimensions shown on the plans. Where sub-surface obstructions are encountered, the Engineer may require the contractor to remove the obstruction or to replace the excavated material and relocate the foundation. If caving of the excavation occurs, the contractor shall excavate to the specified depth, maintaining the sidewalls as nearly vertical as possible. No payment shall be made for any excavation or concrete used in excess of the planned quantities.

Portland cement concrete shall be used and shall conform with Class "C" of the current Construction and Material Specifications prepared by the Department of Transportation of the State of Ohio. The concrete shall be placed against undisturbed soil or compacted embankment. The foundation shall have anchor bolts and conduit accurately held in position with a template when concrete is poured. Forms shall be used for the upper portion of all foundations and no backfilling shall be permitted from the bottom to within 6 inches below ground level.

Concrete for service step in front of controller as shown in detail in the plans will be included in the above described concrete.

Payment for Item 816 "Concrete for Signal Controller and Pedestal Foundation" shall be made per cubic yard for each foundation constructed in accordance with the typical foundation details and shall include concrete, excavation, and backfill.

625 MAINTENANCE OF EXISTING SIGNAL INSTALLATION

The existing traffic signal shall be kept in operation until the new signal is operational. If existing items are to be incorporated into the new signal, such items shall not be reinstalled until all other new work which can be done prior to the relocation work is completed. At this time, the existing signal may be turned off. When not in operation, signal heads shall be bagged. When no signal is in operation at the location, traffic shall be maintained through the use of police officers provided by the Contractor.

Signal control of the intersection shall not be interrupted during the hours of 7 AM to 9 AM and 3 PM to 6 PM on weekdays. Signals shall be inoperative no longer than six hours.

Payment will be included in the lump sum price bid for "Item 625, Maintaining Traffic."

202 REMOVAL OF EXISTING SIGNAL INSTALLATION

In accordance with standard Specification 202, this item shall include the removal of the signal heads, controller, strain poles, pole foundations cables, messenger wires, and all other portions of the existing traffic signal which are not to be reused in the new installation.

With the exception of items to be relocated and incorporated into the new installations or whose removal is otherwise necessary to permit the installation of the new signal equipment, no item shall be removed until the new installation is in full operation unless otherwise directed by the Engineer.

Payment for "Item 202, Removal of Existing Signal Installation" will be made at the unit price bid per each intersection wherein existing signal equipment is to be removed.

ESTIMATED QUANTITIES

QUANTITY CALCULATIONS

MADE BY MEE DATE 8-22-73
 CHECKED BY EFJ DATE 8-23-73
 TYPE CODE 7221

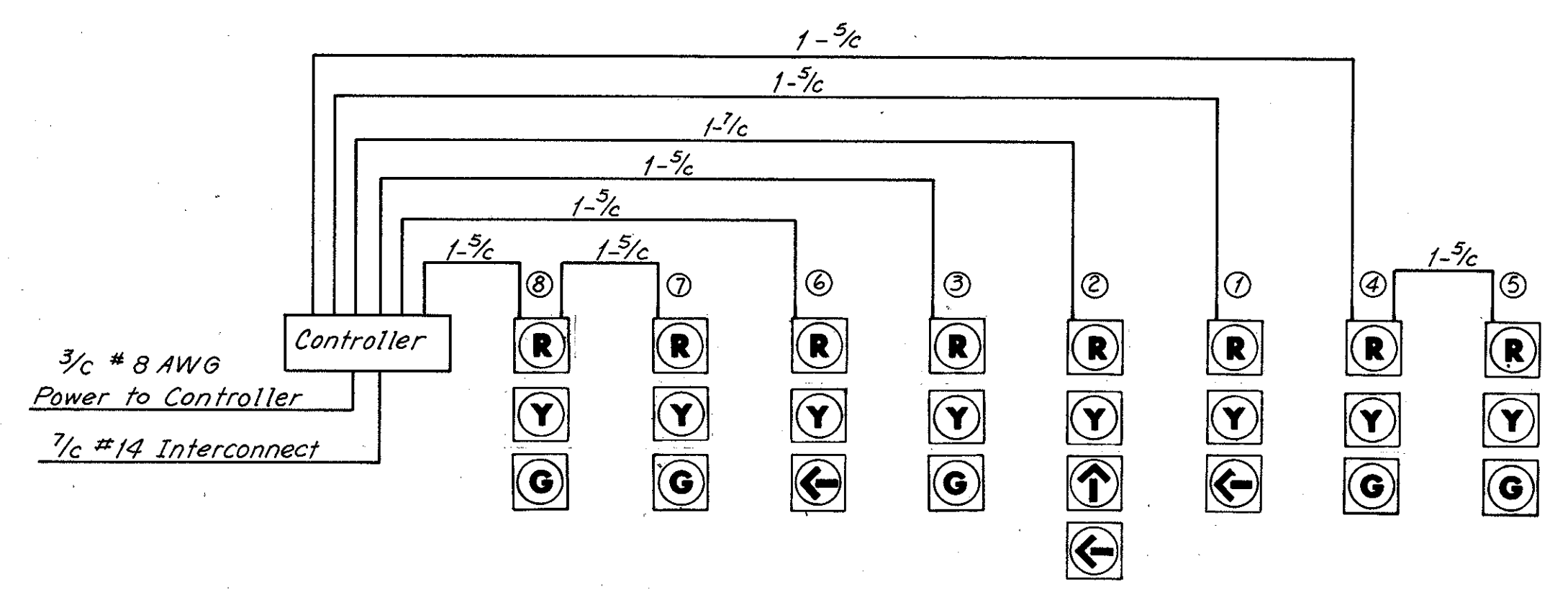
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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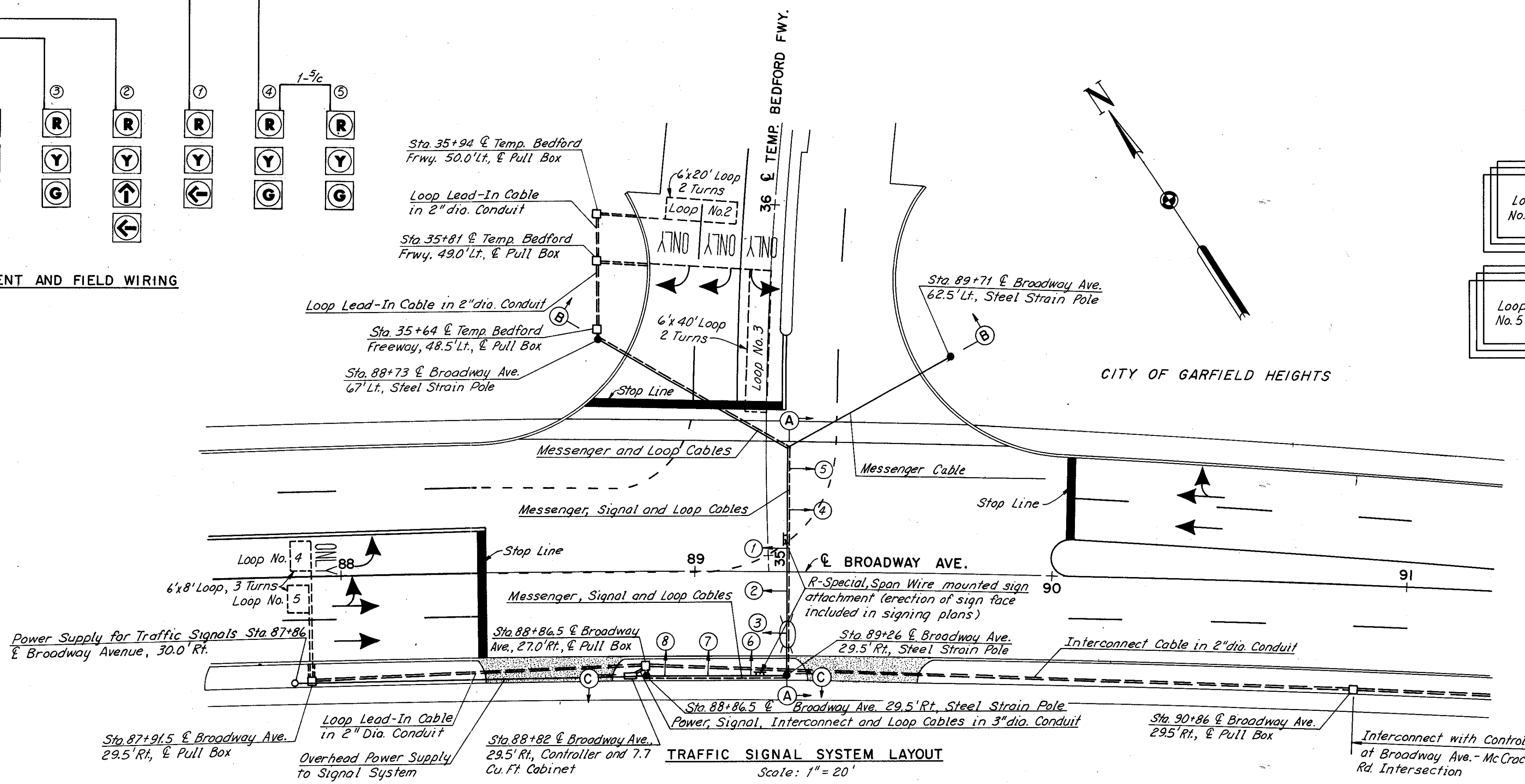
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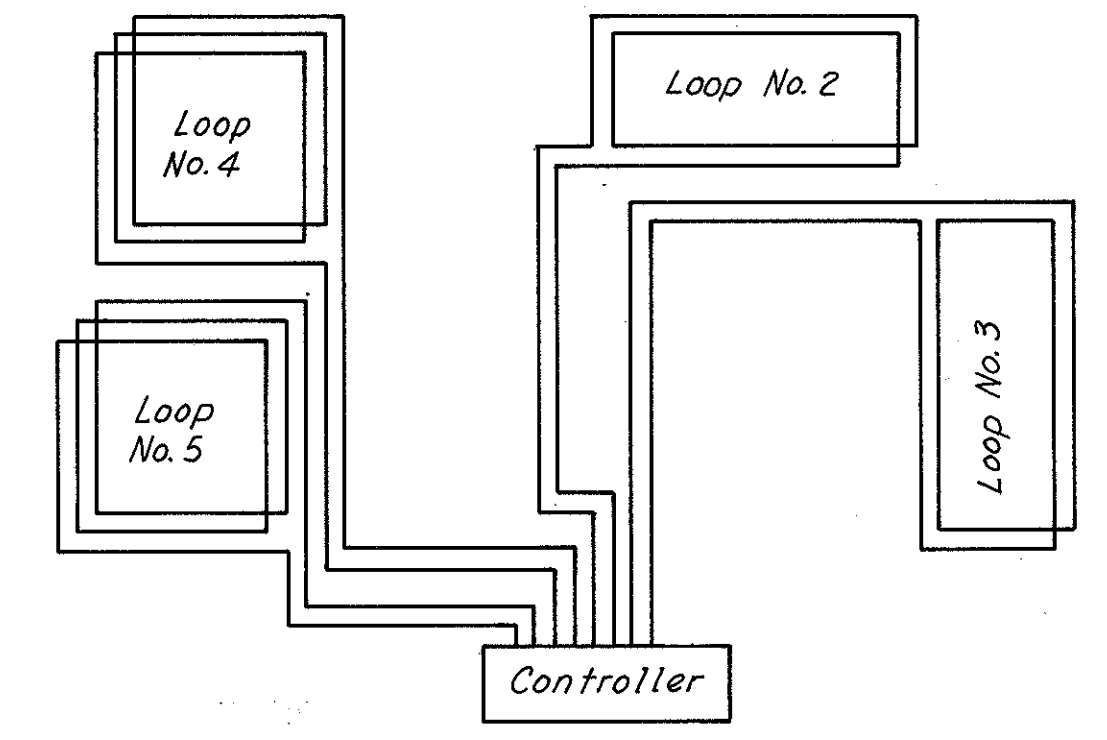
SHEET NUMBER										COST PARTICIPATION		TOTAL	UNIT	ITEM NO.	DESCRIPTION
										NORMAL	100%				
										III	STATE				
6															
										1	1		Each	202	Removal of Existing Signal Installation
										2	1	1	Each	625	Maintenance of existing signal installation
										12	7	5	Each	625	Traffic Signal Head, 3 Section, 12" Lens, Oneway
										2	2	2	Each	625	Traffic Signal Head, 3 Section, 12" Lens, Oneway with Arrow
										1	1	1	Each	625	Traffic Signal Head, 4 Section, 12" Lens, Oneway with Arrows
										1	1	1	Each	625	Traffic Signal Head, Tway, 4 Section, 12" Lens, with Arrow
															3 Section, 12" Lens
										1366	756	610	Lin. Ft.	625	Signal Cable, 5/C #12 AWG, IMSA 19-1-67
										328	197	131	Lin. Ft.	625	Signal Cable, 7/C #12 AWG, IMSA 19-1-67
										8	4	4	Each	625	Cable Support Assembly
										488	210	278	Lin. Ft.	625	Loop Detector Pavement Cutting
										1232	508	724	Lin. Ft.	625	Loop Detector Wire, Stranded, 1/C #14 AWG, RHW Type
										1248	356	892	Lin. Ft.	625	Loop Detector Lead-in Cable, Stranded, 2/C #14 AWG, Twisted Pair Shielded
										118	12	106	Lin. Ft.	625	Power Cable, 3/C, No. 8 AWG, 600 Volt RHW or RHW Type, Stranded
										2	1	1	Each	625	Power Service
										1786	1786	1786	Lin. Ft.	625	Interconnect Cable, 7/C #14 AWG, 600 Volt, IMSA 19-1-67
										12	6	6	Each	625	Ground Rod
										1984		1984	Lin. Ft.	625	Trench
										1968		1968	Lin. Ft.	625	Conduit, 2", 713.04, Type III
										16	16	16	Lin. Ft.	625	Conduit, 3", 713.04, Type III
										17	5	12	Each	625	Pull Box, 24" X 24", Concrete, as per plan
										2	2	2	Each	625	Covering of Traffic Signal Heads
										1		1	Each	625	Signal Controller, 3 Phase, Semi-actuated with Interconnect Cabinet (Crouse-Hinds)
										1		1	Each	625	Signal Controller, 3 Phase, Semi-actuated with Interconnect Cabinet (Alternate Bid)
										1	0.8	0.2	Each	625	Master Signal Controller, 3 Phase, Semi-actuated with Interconnect Cabinet (Crouse-Hinds)
										1	0.8	0.2	Each	625	Master Signal Controller, 3 Phase, Semi-actuated with Interconnect Cabinet (Alternate)
										7	3	4	Each	625	Loop Detector Amplifier
										2	1	1	Each	816	Signal Strain Pole, 3 Ga. 12" X 7.94" X 29'-0"
										1		1	Each	816	Signal Strain Pole, 3 Ga. 10" X 5.80" X 30'-0"
										1		1	Each	816	Signal Strain Pole, 3 Ga. 12" X 7.80" X 30'-0"
										1		1	Each	816	Signal Strain Pole, 3 Ga. 14" X 9.80" X 34'-0" as per plan
										1	1		Each	816	Signal Strain Pole, 3 Ga. 11" X 6.24" X 34'-0"
										1	1		Each	816	Signal Strain Pole, 3 Ga. 13" X 7.96" X 36'-0"
										1	1		Each	816	Signal Strain Pole, 3 Ga. 11" X 5.68" X 38'-0"
										570	351	219	Lin. Ft.	816	Messenger Wire, 7 Stranded (3") with Accessories
										28.8	16.2	12.6	Cu. Yd.	816	Concrete for Signal and Combination Support Pole Foundation
										1.9	1.0	0.9	Cu. Yd.	816	Concrete for Controller and Pedestal Foundation



SIGNAL HEAD ARRANGEMENT AND FIELD WIRING



TRAFFIC SIGNAL SYSTEM LAYOUT
Scale: 1" = 20'



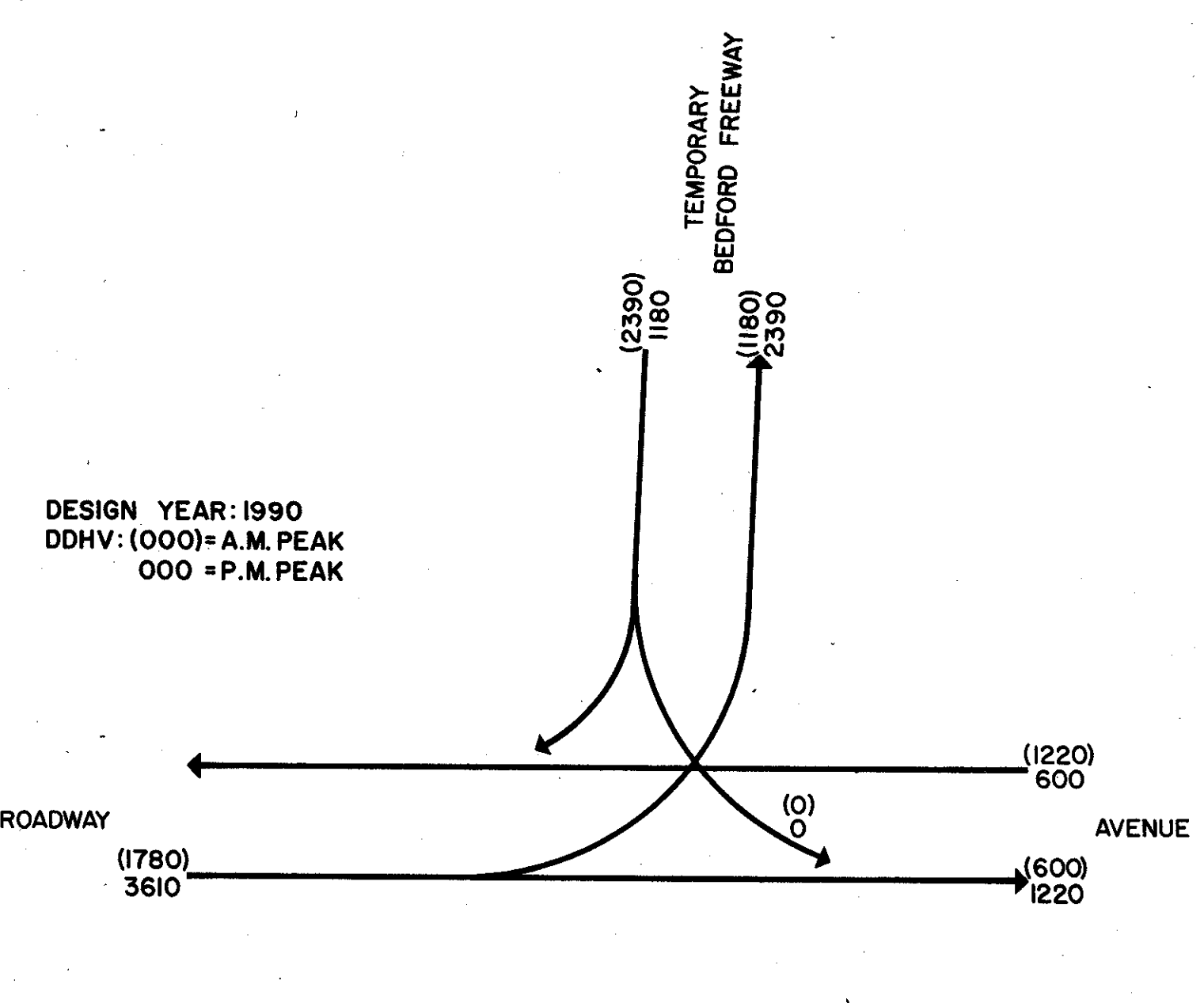
DETECTION LOOPS FIELD WIRING

LOOP DETECTOR AMPLIFIERS

Phase	Wired to Operate
I	—
II	Loops 2 & 4
III	Loop 3

Note: Loop 5 is for future use. After installation and testing, lead shall be marked, disconnected and taped off.

Note: Existing underground utilities are not shown, see Utility Plans. The Contractor is responsible for making his own determinations as to the type and location of underground utilities as may be necessary to avoid damage thereto.



TRAFFIC SIGNAL PHASING

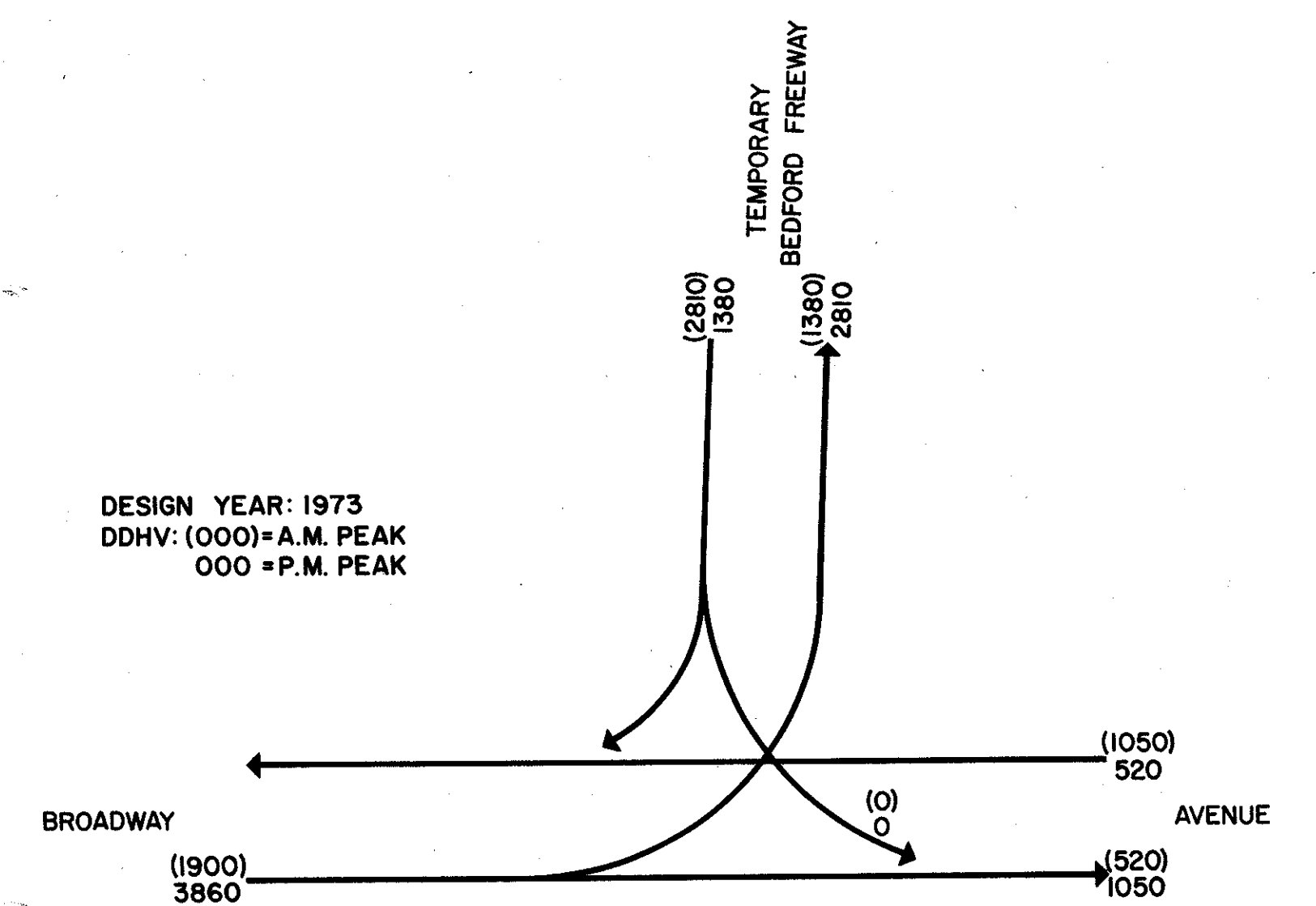
SIGNAL TIMING

Phase	I	II	III
Minimum	28	—	—
Initial	—	15	4
Vehicle	—	3	1
Maximum	—	45	5
Clear	4	4	4

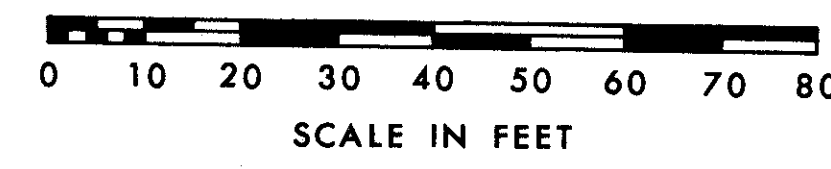
SIGNAL DISPLAY CHART

Signal Number	φ I		φ II		φ III	
	R/W	Clear	R/W	Clear	R/W	Clear
1	R	R	G←	Y	R	R
2	G↑	G↑	G←	Y	R	R
3	G	G*	G	Y	R	R
4	G	Y	R	R	R	R
5	G	Y	R	R	R	R
6	R	R	R	R	G←	Y
7	R	R	G	G*	G	Y
8	R	R	G	G*	G	Y

* Becomes if φ II is skipped
 * Becomes if φ III is skipped
 Note: Time intervals shown are estimates only and may be changed as directed by the Engineer.
 The controller is to have full phase skipability and, in absence of a call, dwell in Phase I.
 Coordination: Begin Phase I green at 55 sec. of a 90 sec. background dial.



TRAFFIC SIGNAL LAYOUT



DESIGN YEAR: 1990
 DDHV: (000)=A.M. PEAK
 000=P.M. PEAK

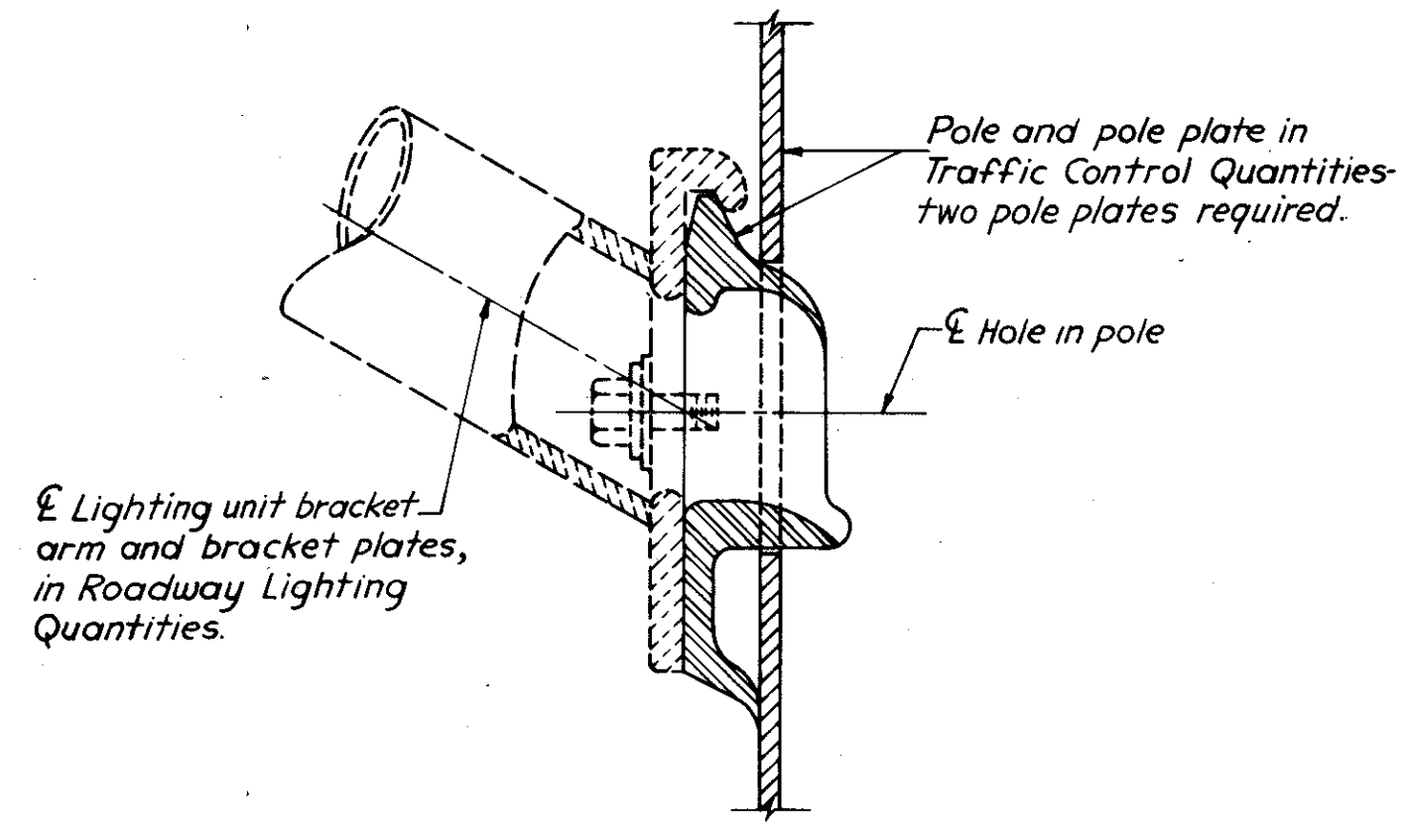
DESIGN YEAR: 1973
 DDHV: (000)=A.M. PEAK
 000=P.M. PEAK

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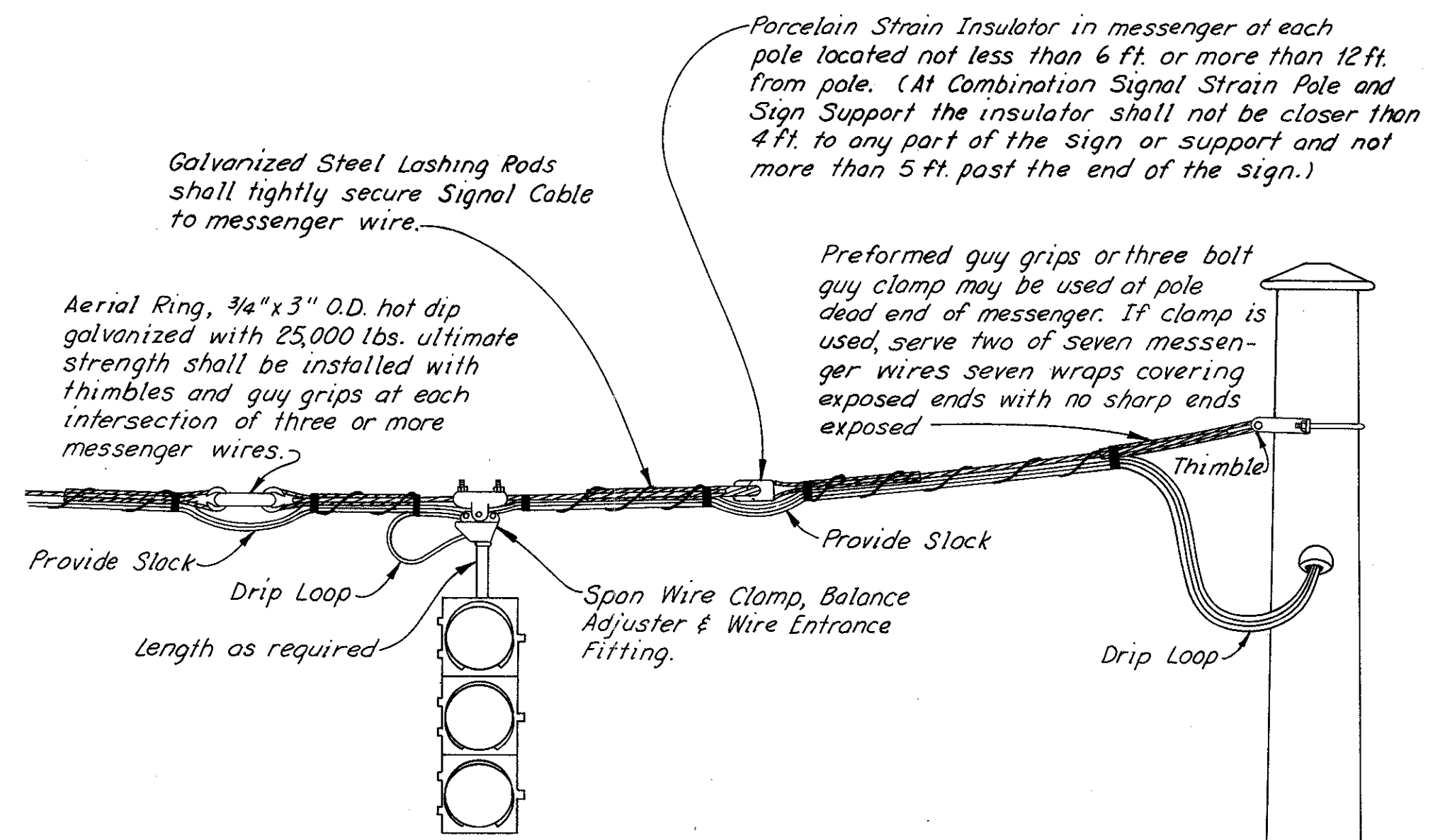
CUYAHOGA COUNTY
CUY. 480-21.40

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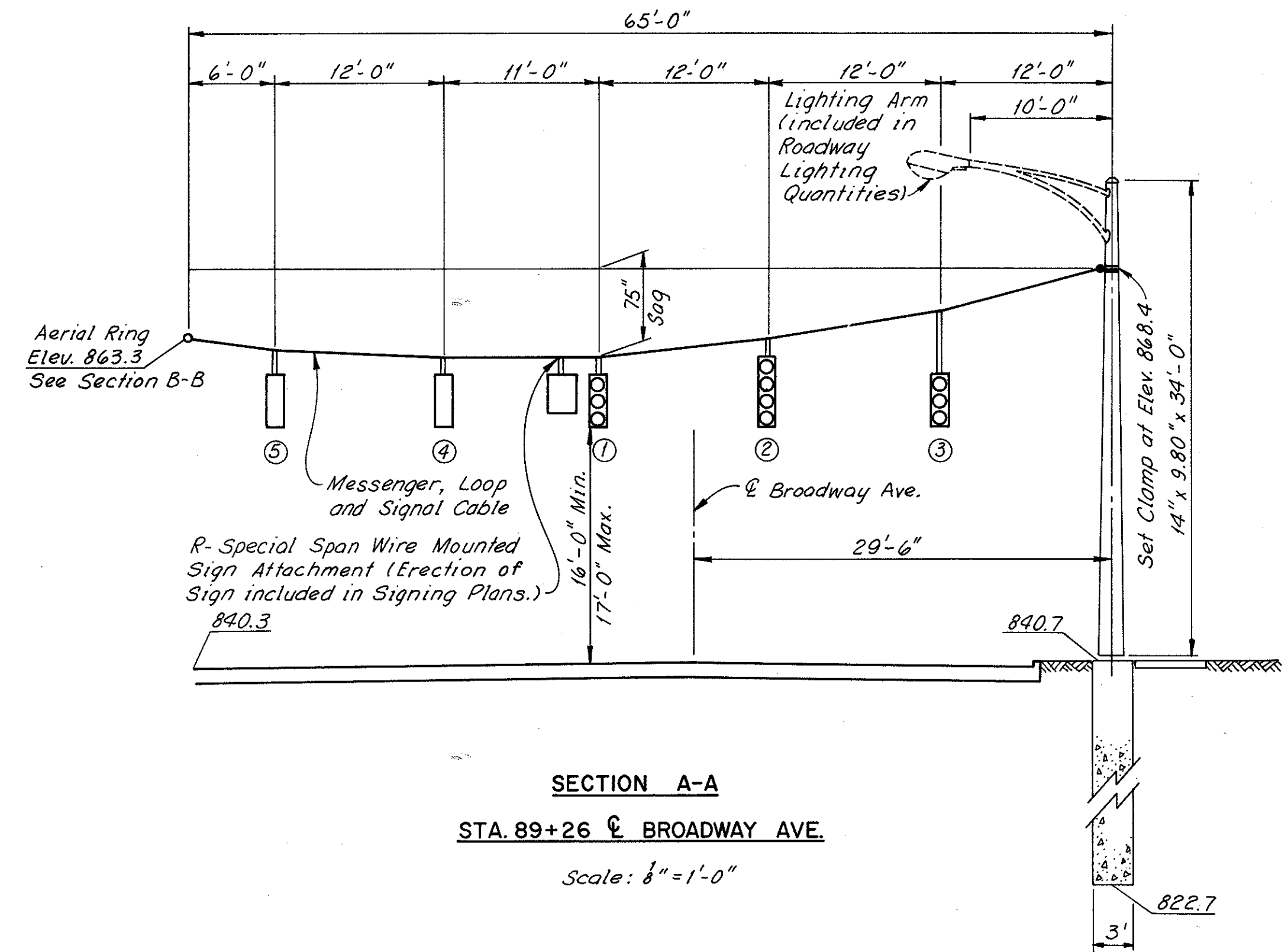


SECTION A-A

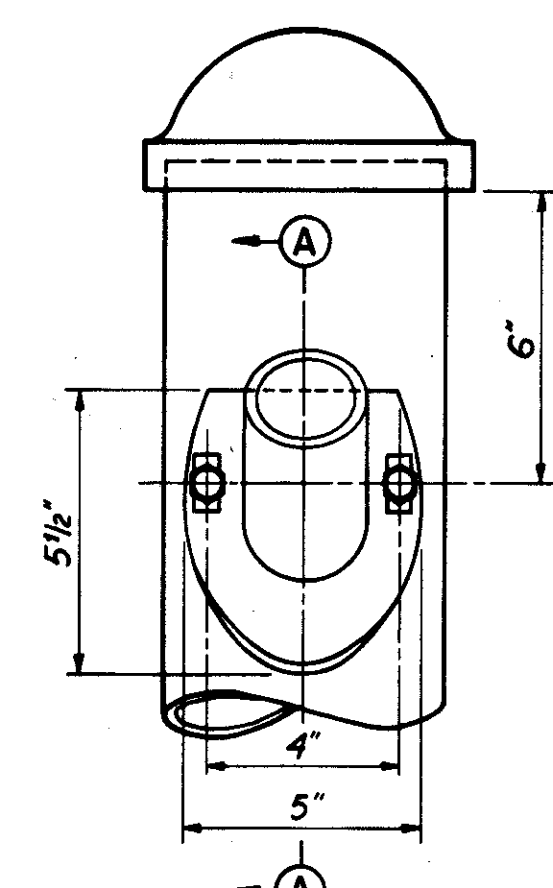
Lighting unit bracket arm and bracket plates, in Roadway Lighting Quantities.



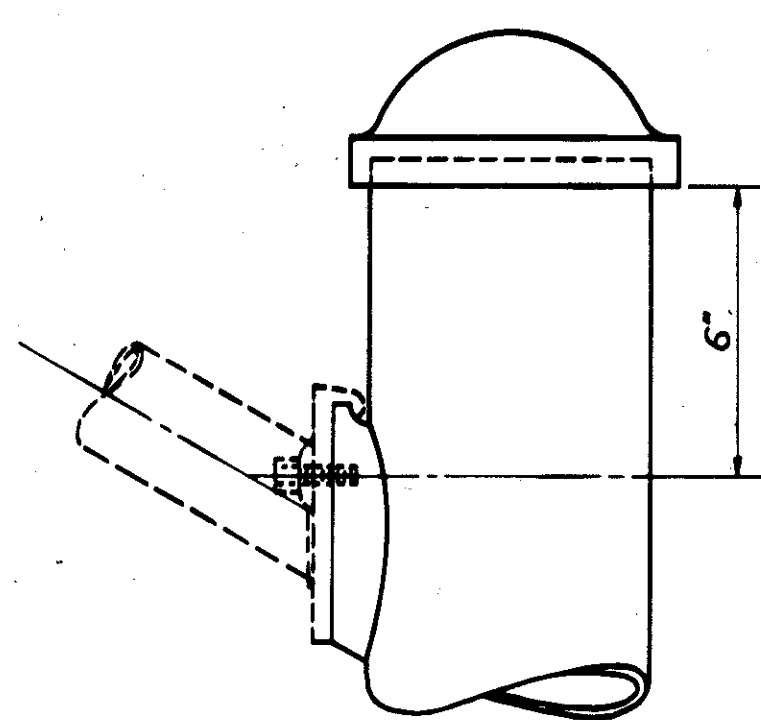
TYPICAL MESSENGER WIRE DETAILS



SECTION A-A
STA. 89+26 @ BROADWAY AVE.
Scale: 1/8" = 1'-0"

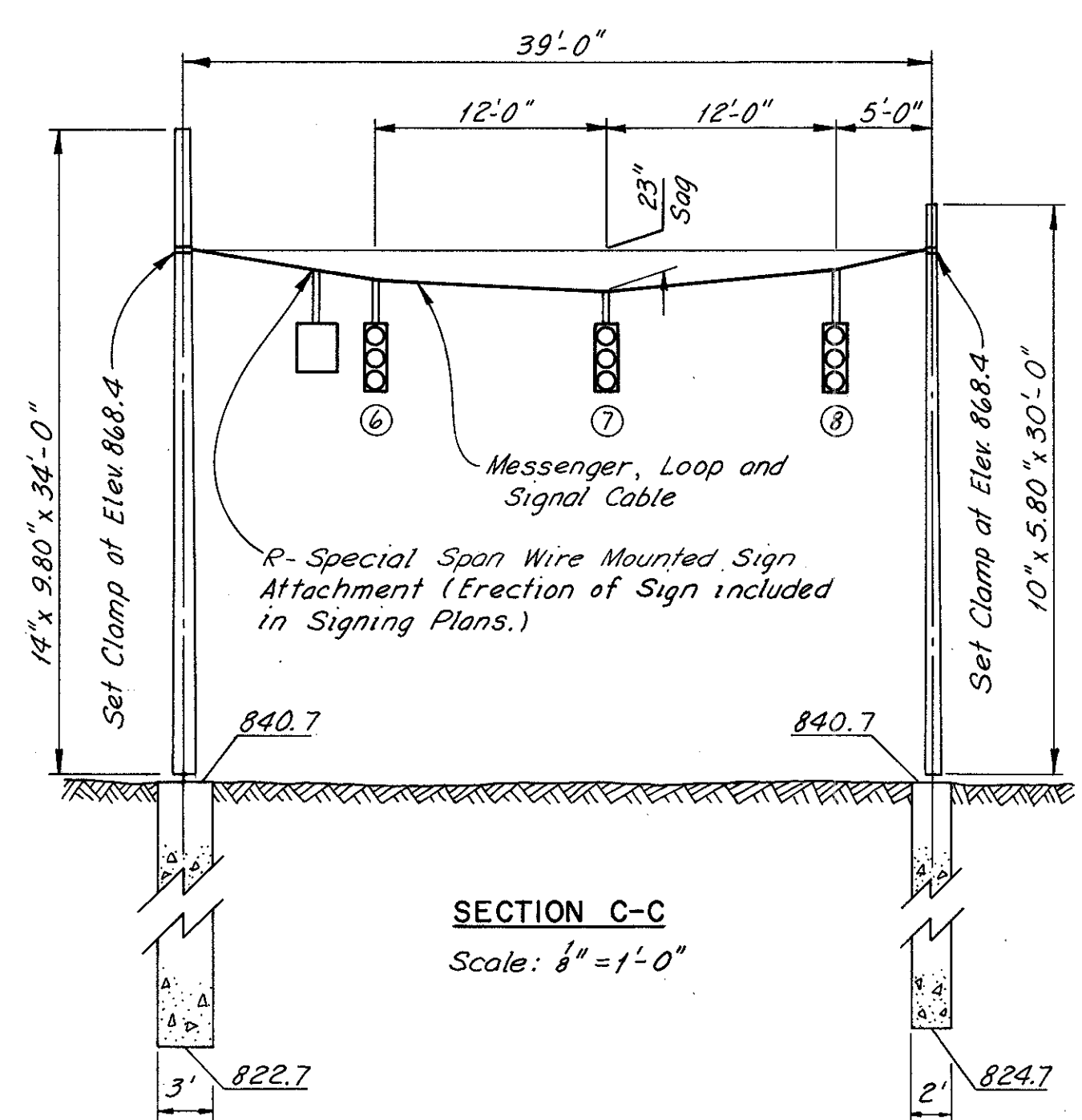


FRONT ELEVATION

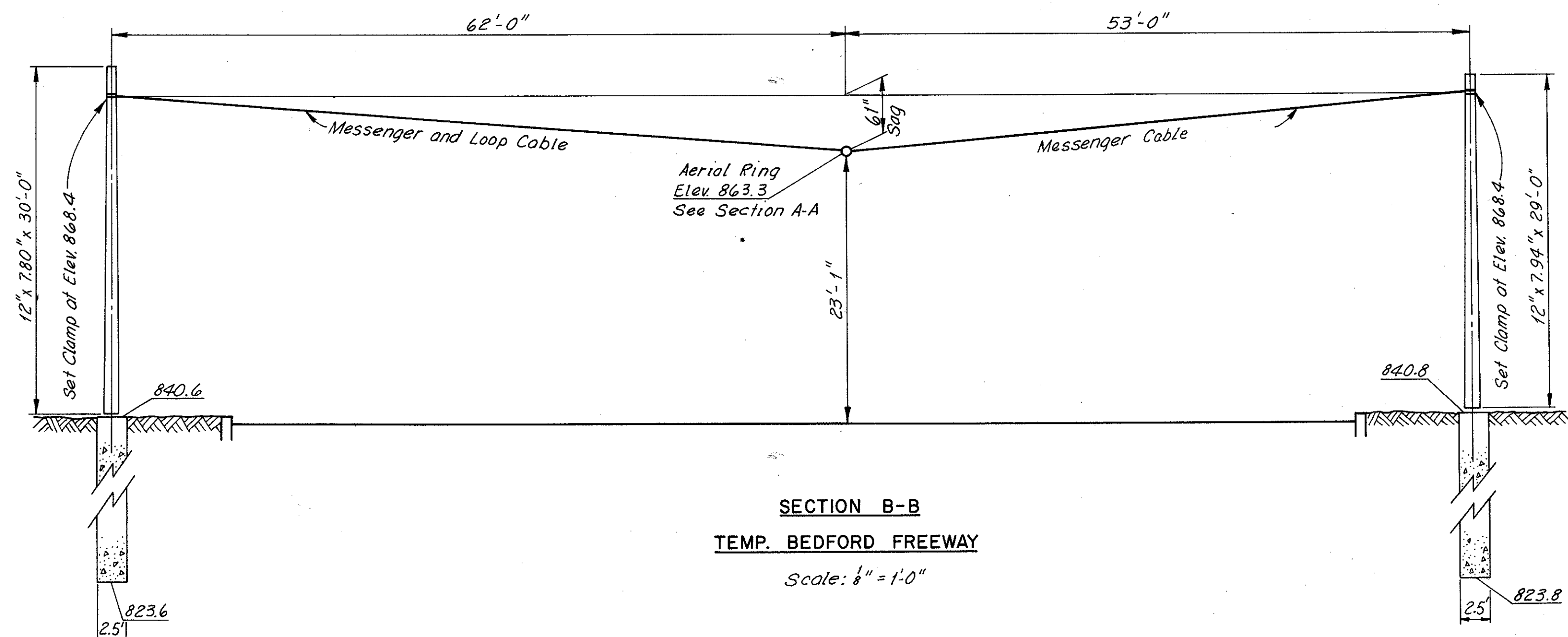


SIDE ELEVATION

LIGHTING UNIT BRACKET ARM ATTACHMENT TO TRAFFIC SIGNAL POLE
Scale: 3" = 1'-0"

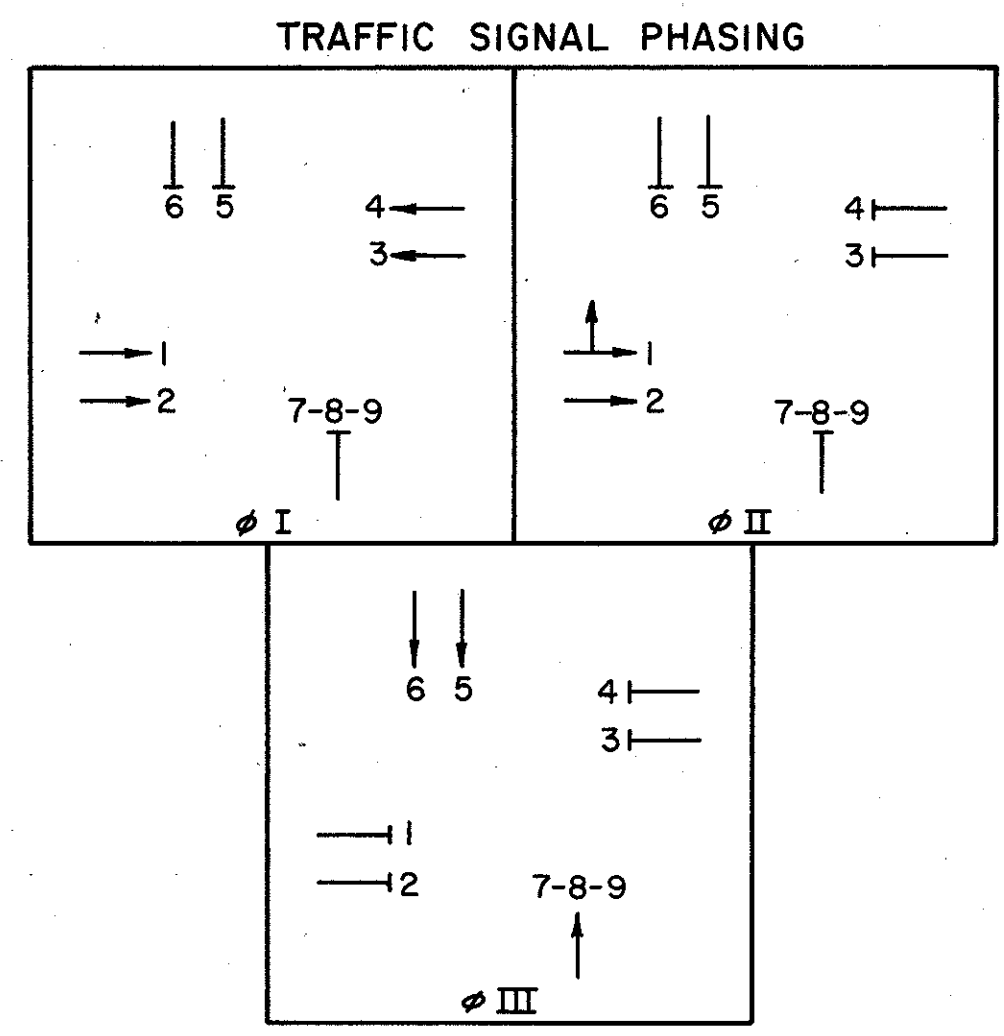


SECTION C-C
Scale: 1/8" = 1'-0"



SECTION B-B
TEMP. BEDFORD FREEWAY
Scale: 1/8" = 1'-0"

SCALE: As Noted
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE L.M.C. DATE 12-10-72
TRCD L.M.C. DATE 12-11-72
CKD E.F.U. DATE 8-20-73
KANSAS CITY CLEVELAND NEW YORK



SIGNAL TIMING

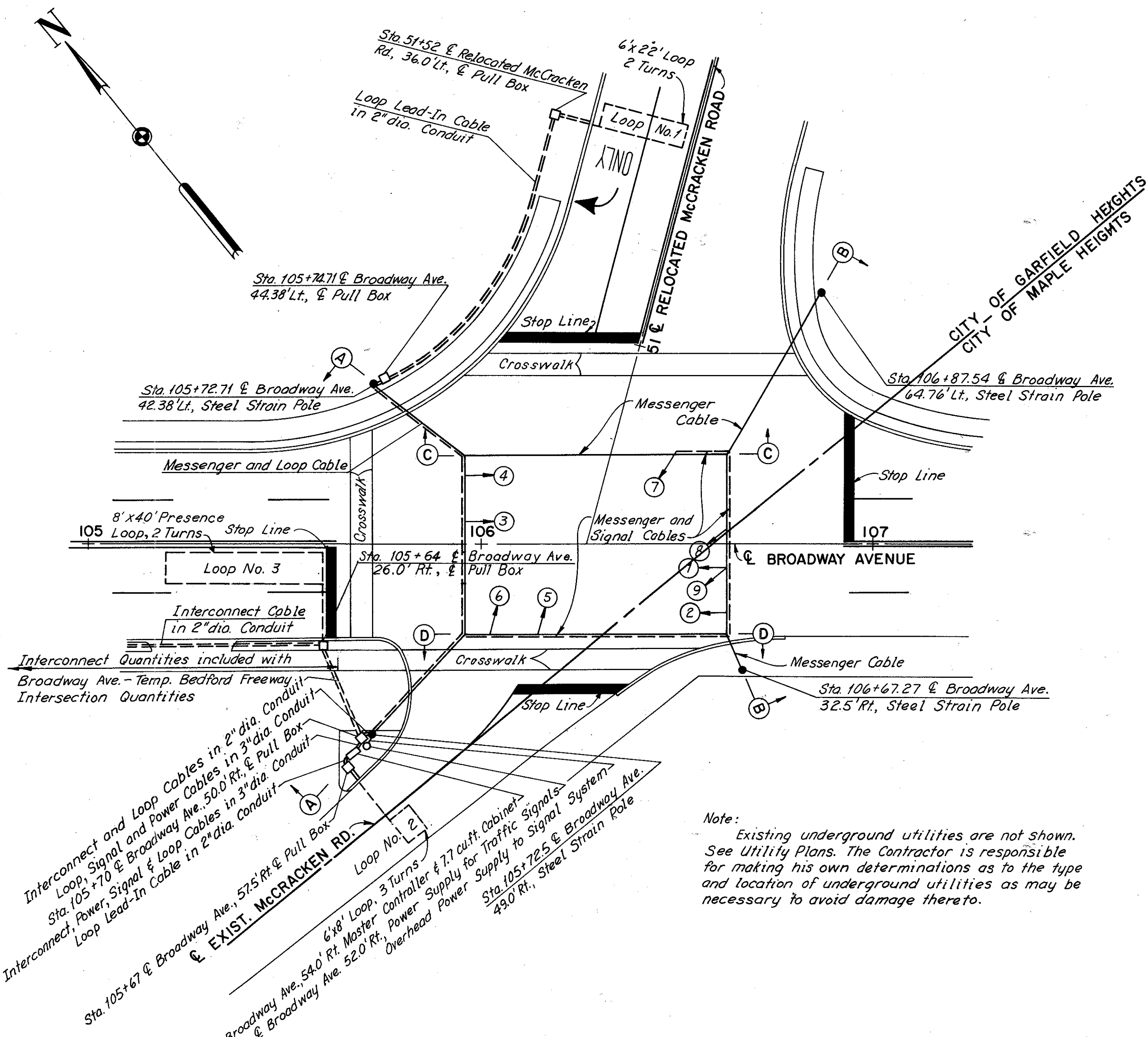
Phase	I	II	III
Minimum	45	-	-
Initial	-	6	13
Vehicle	-	2	4
Maximum	-	8	35
Clear	4	4	4

SIGNAL DISPLAY CHART

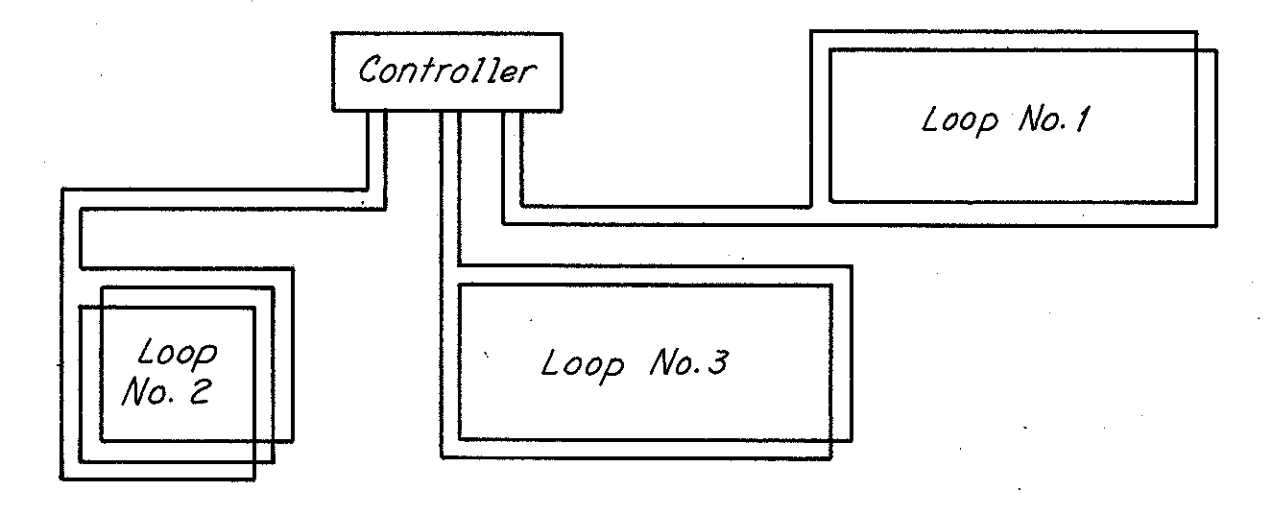
Signal Number	R/W	Clear	φ I	φ II	φ III
1	G	G	G	Y	R
2	G	G	G	Y	R
3	G	Y	R	R	R
4	G	Y	R	R	R
5	R	R	R	R	G
6	R	R	R	R	G
7	R	R	R	R	G
8	R	R	R	R	G
9	R	R	R	R	G

* Becomes if φ II is skipped

Note: In absence of call, dwell in Phase I. Enter Phase II only on call.
 Coordination: Phase I green to begin at 0 sec. on 90 sec. background dial.
 Time intervals shown are estimates only and may be changed as directed by the Engineer.

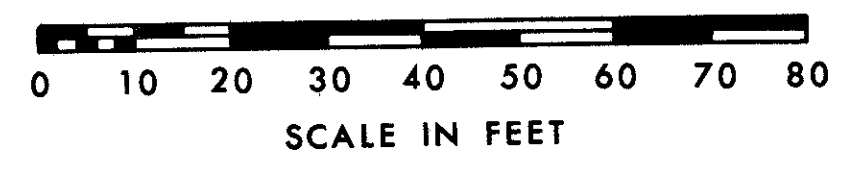
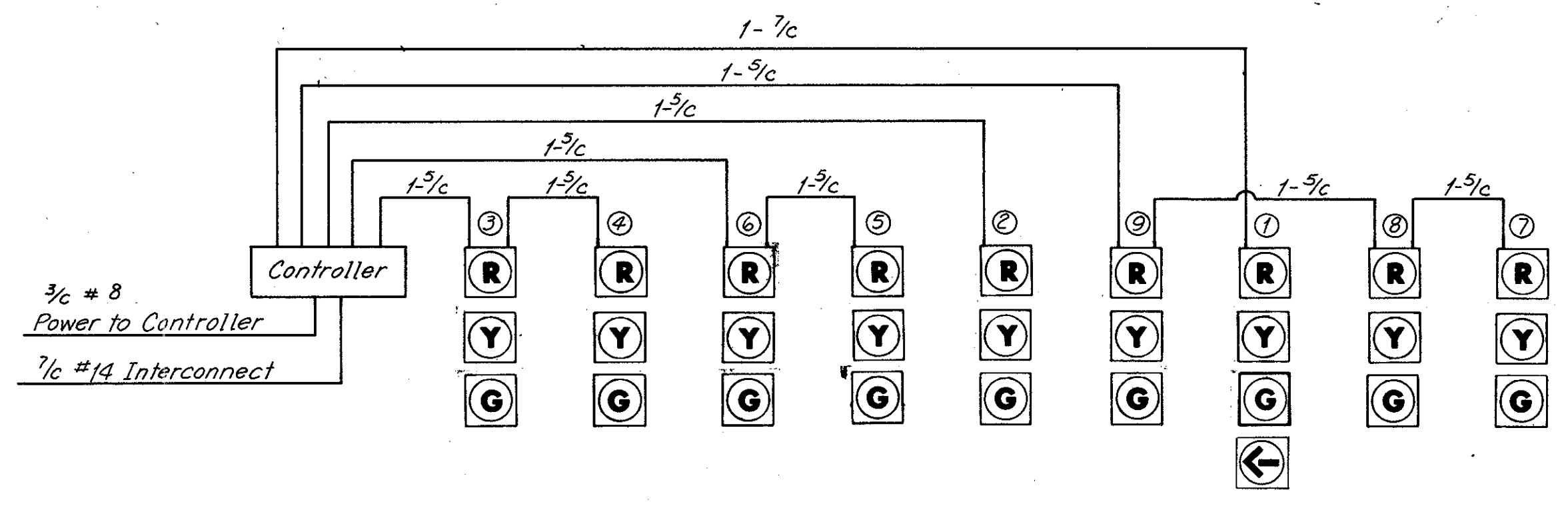
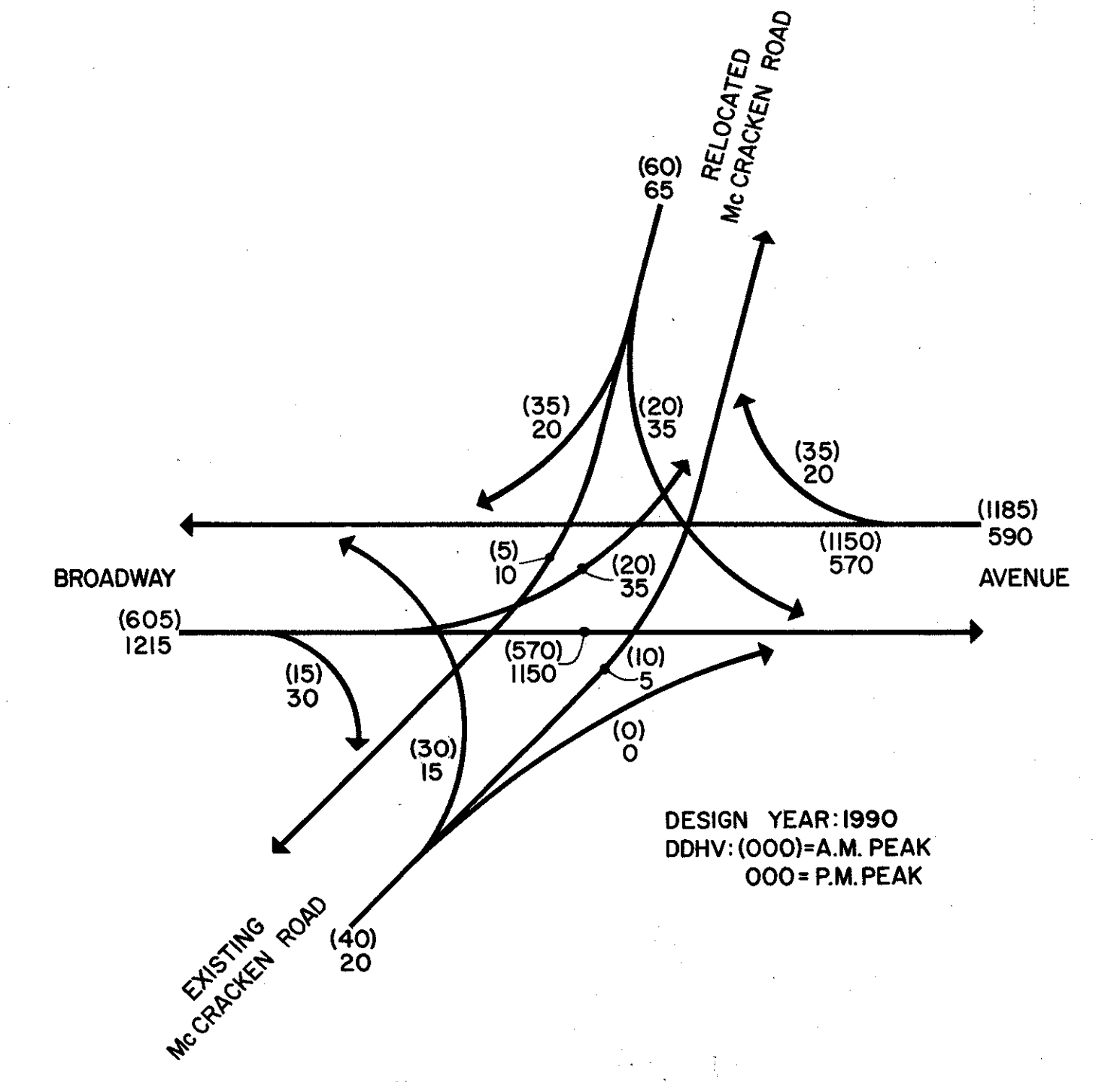
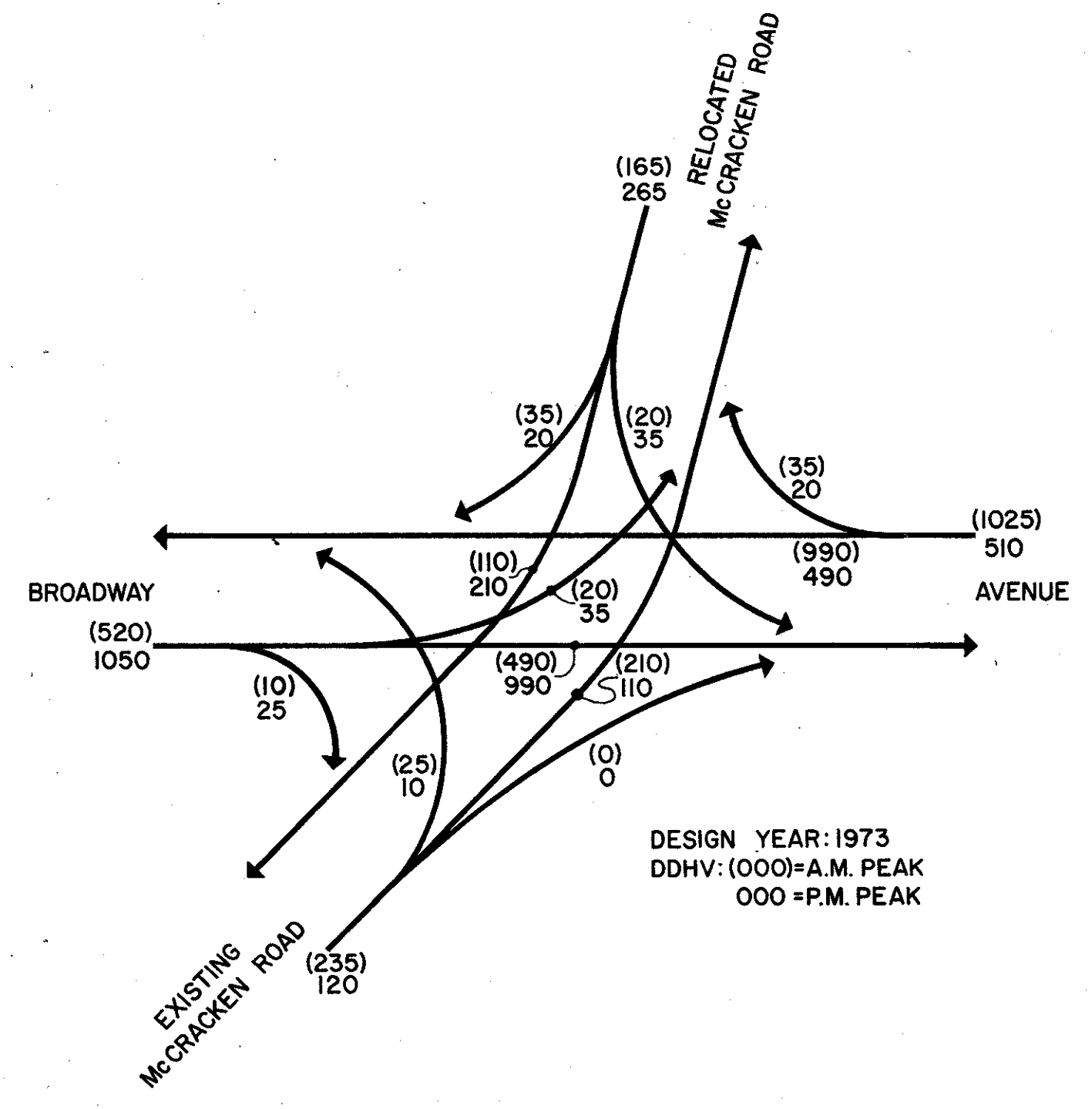


Note: Existing underground utilities are not shown. See Utility Plans. The Contractor is responsible for making his own determinations as to the type and location of underground utilities as may be necessary to avoid damage thereto.



LOOP DETECTOR AMPLIFIERS

Phase	Wired to Operate
I	Loop 3
II	Loops 1 and 2
III	Loops 1 and 2

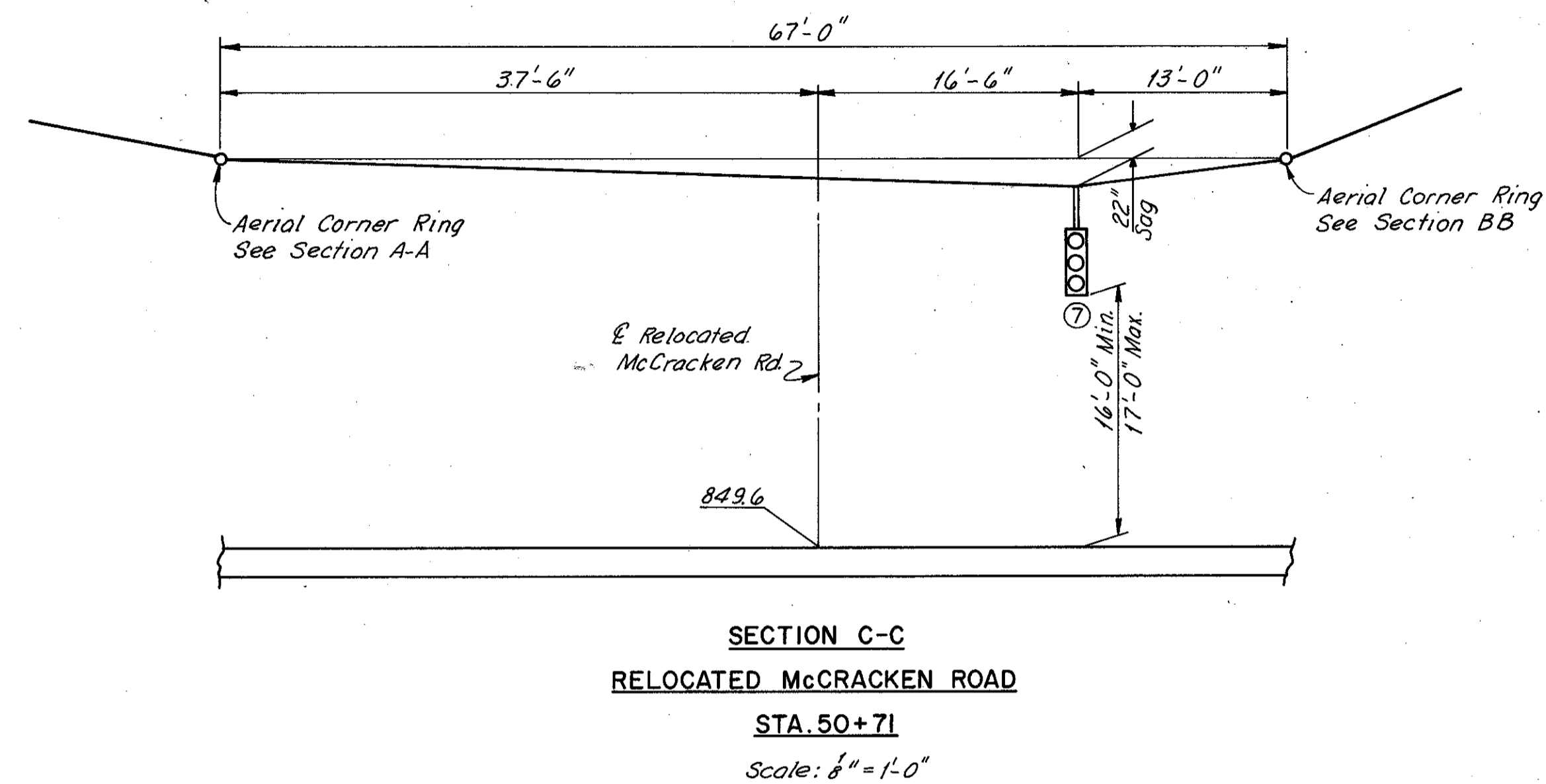
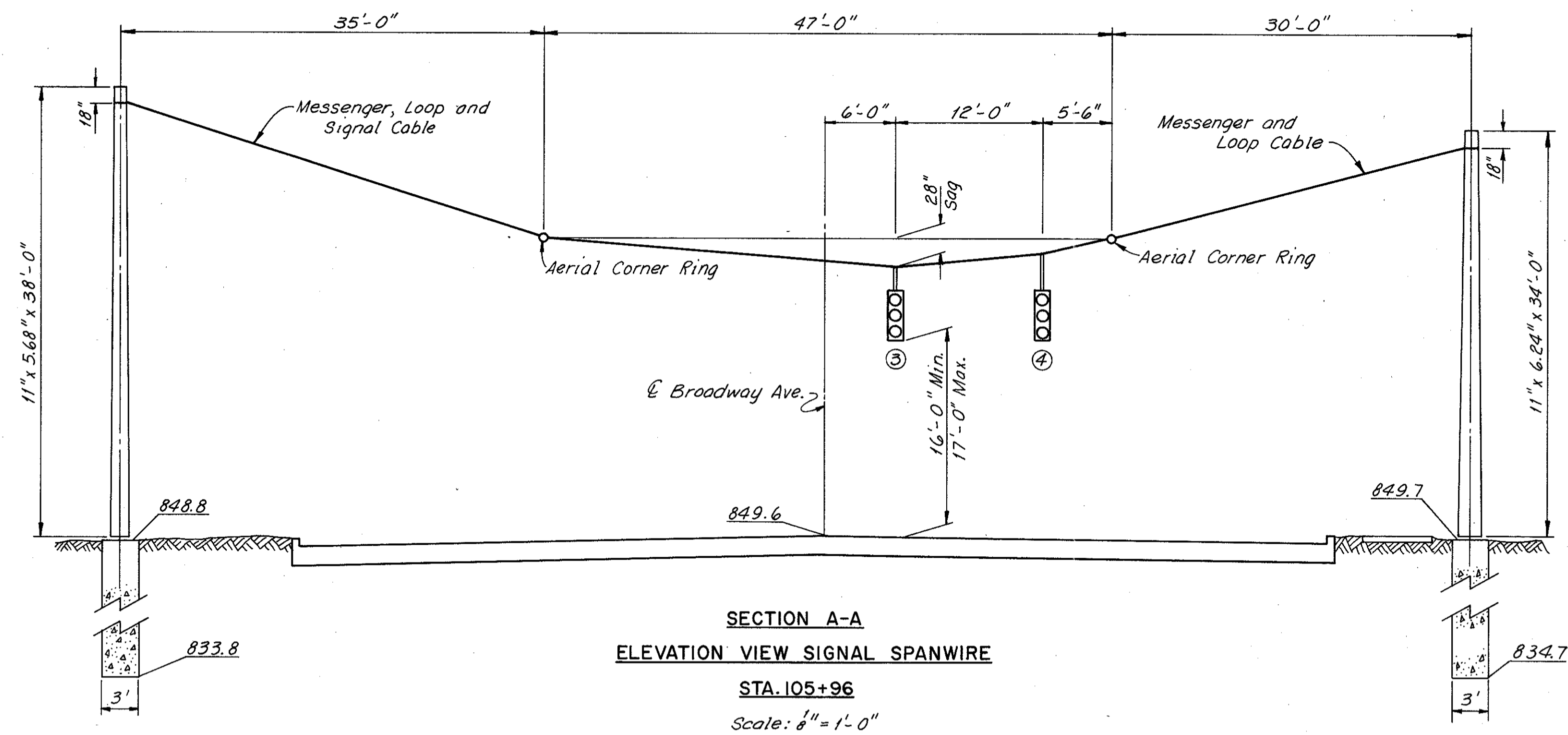


FED. RD. DIVISION	STATE	PROJECT
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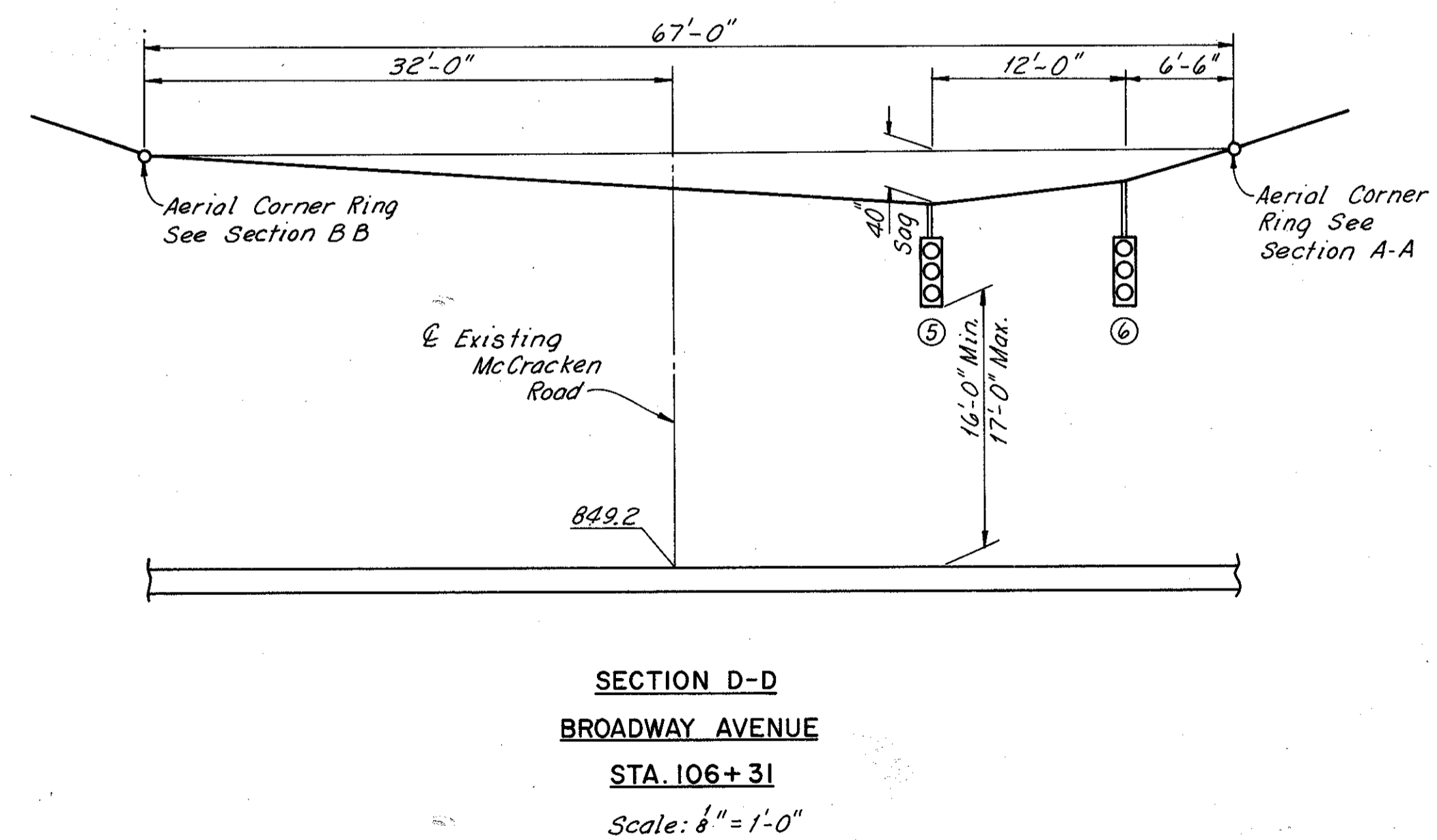
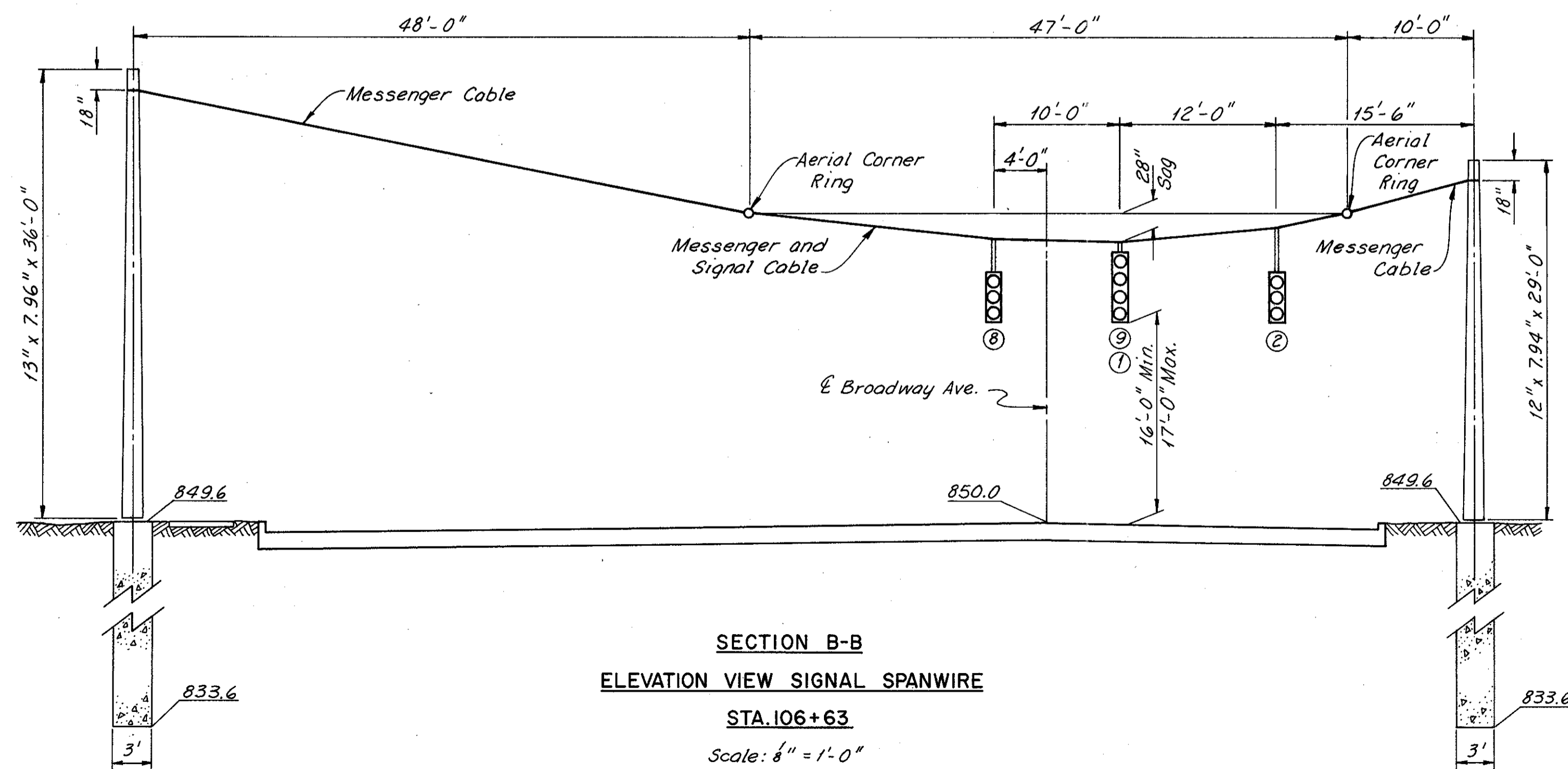
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CUYAHOGA COUNTY
CUY. 480-21.40

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Note:
The bottom of all signal heads shall
be within 3 inches of level.



SCALE
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE J.M.C. DATE 12-14-72 CONSULTING ENGINEERS
TRCD J.M.C. DATE 12-15-72
CKD. E.F.V. DATE 8-22-72 KANSAS CITY CLEVELAND NEW YORK

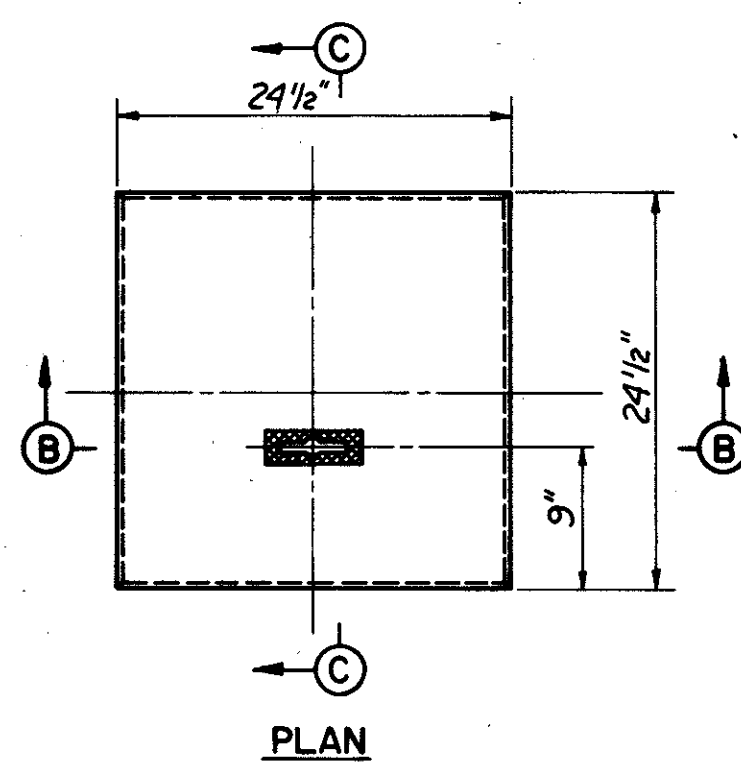
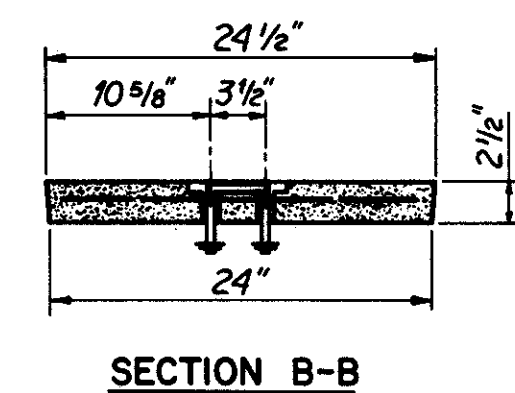
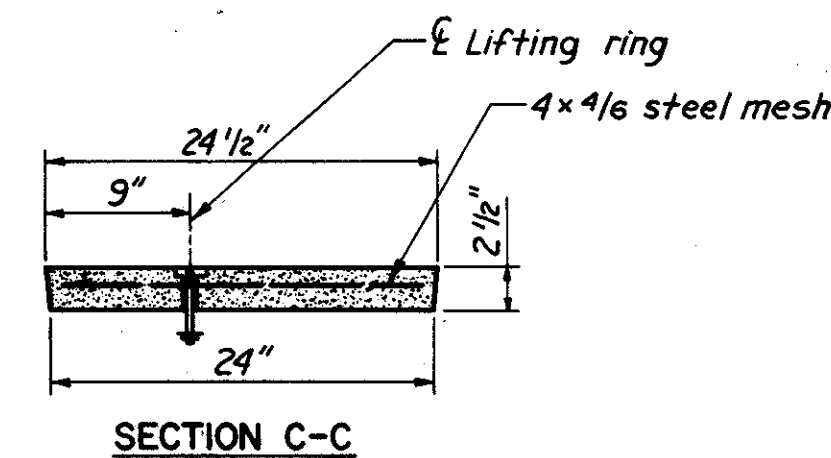
MISCELLANEOUS DETAILS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

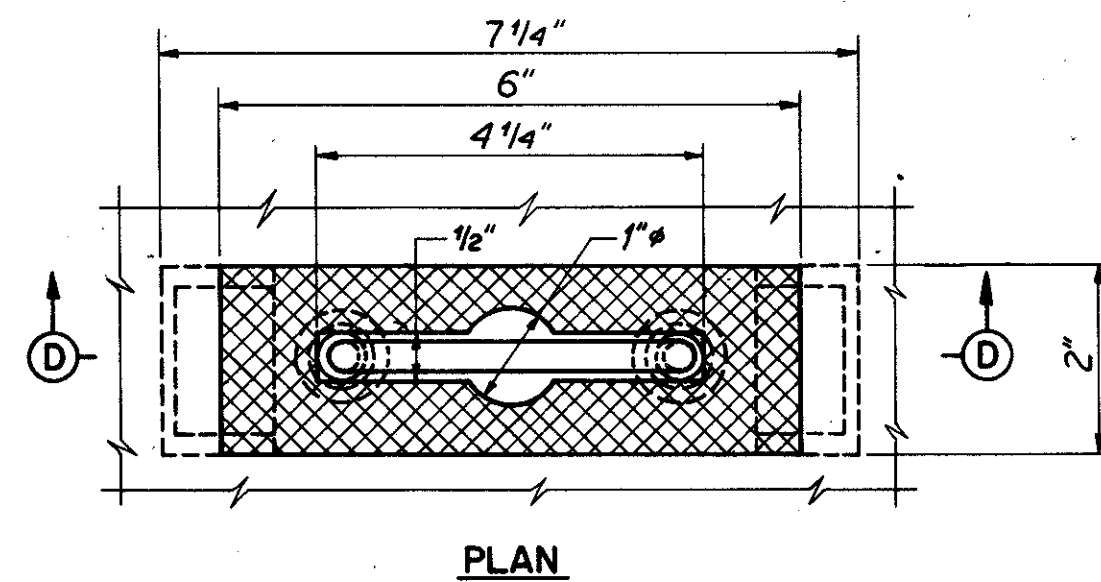
265 A
390

11
13

CUYAHOGA COUNTY
CUY. -480-21.40

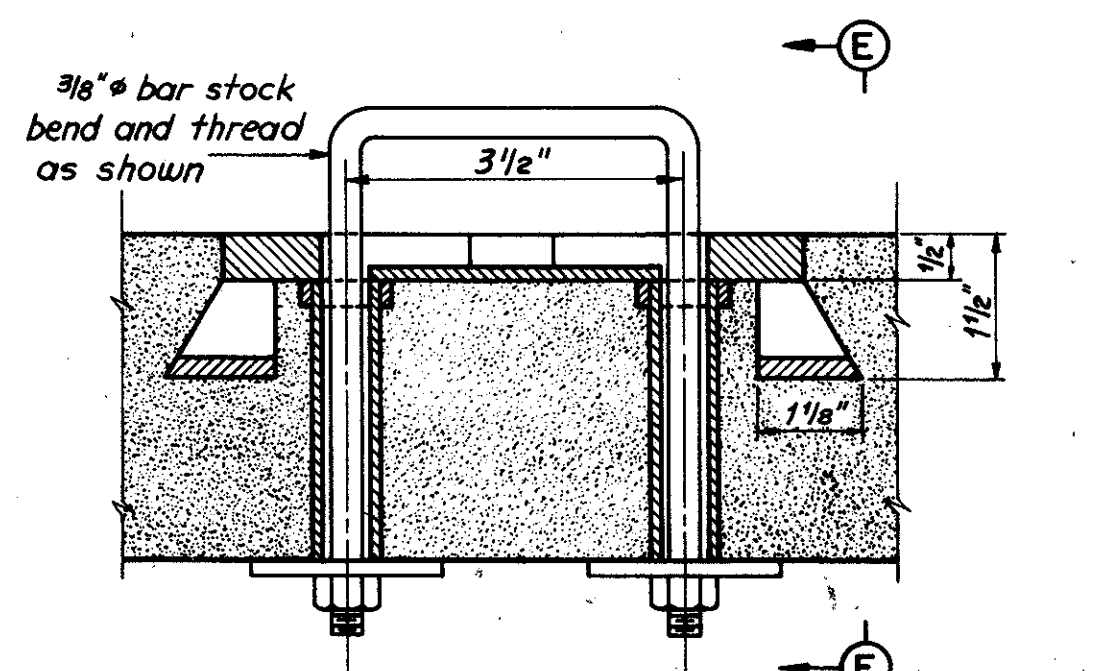


COVER DETAIL
Scale 1" = 1'-0"

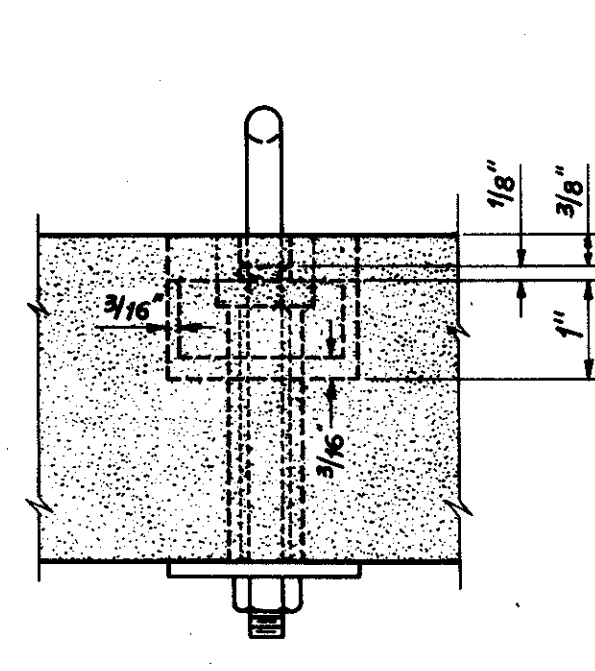


Note:
4x4/16 steel mesh reinforcing to be used in box and cover. All reinforcing to be covered by a minimum of 1" of concrete. All conduit entrance holes shall be oval shaped.

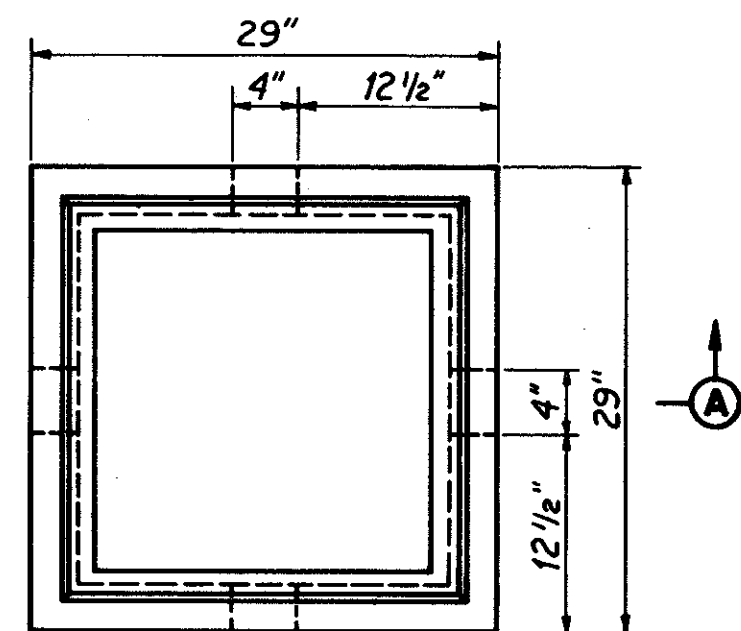
TRAFFIC SIGNAL PULL BOX DETAIL
Scale 1" = 1'-0"



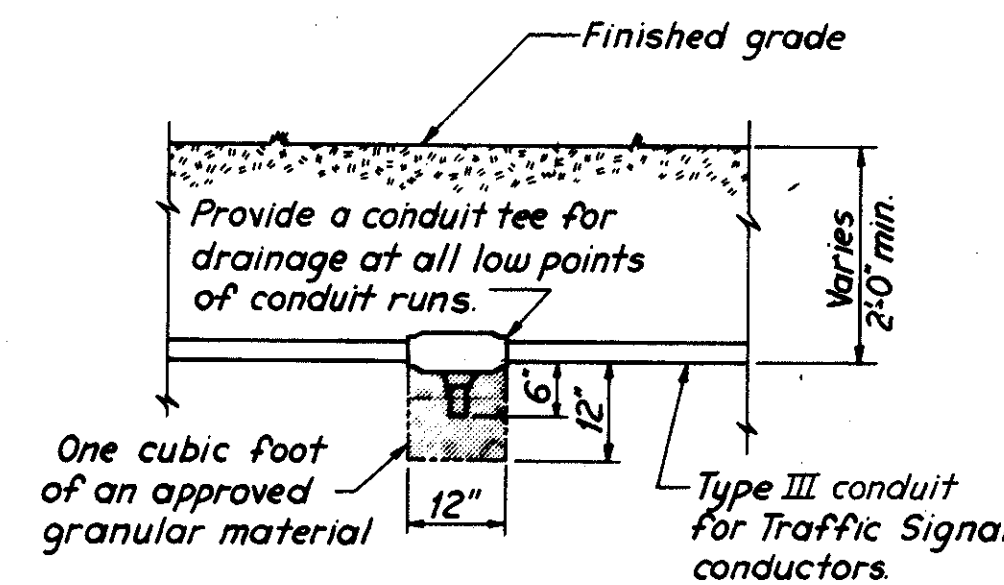
SECTION D-D
PULL BOX COVER
LIFTING RING DETAIL
Scale: 1/2" = 1'-0"



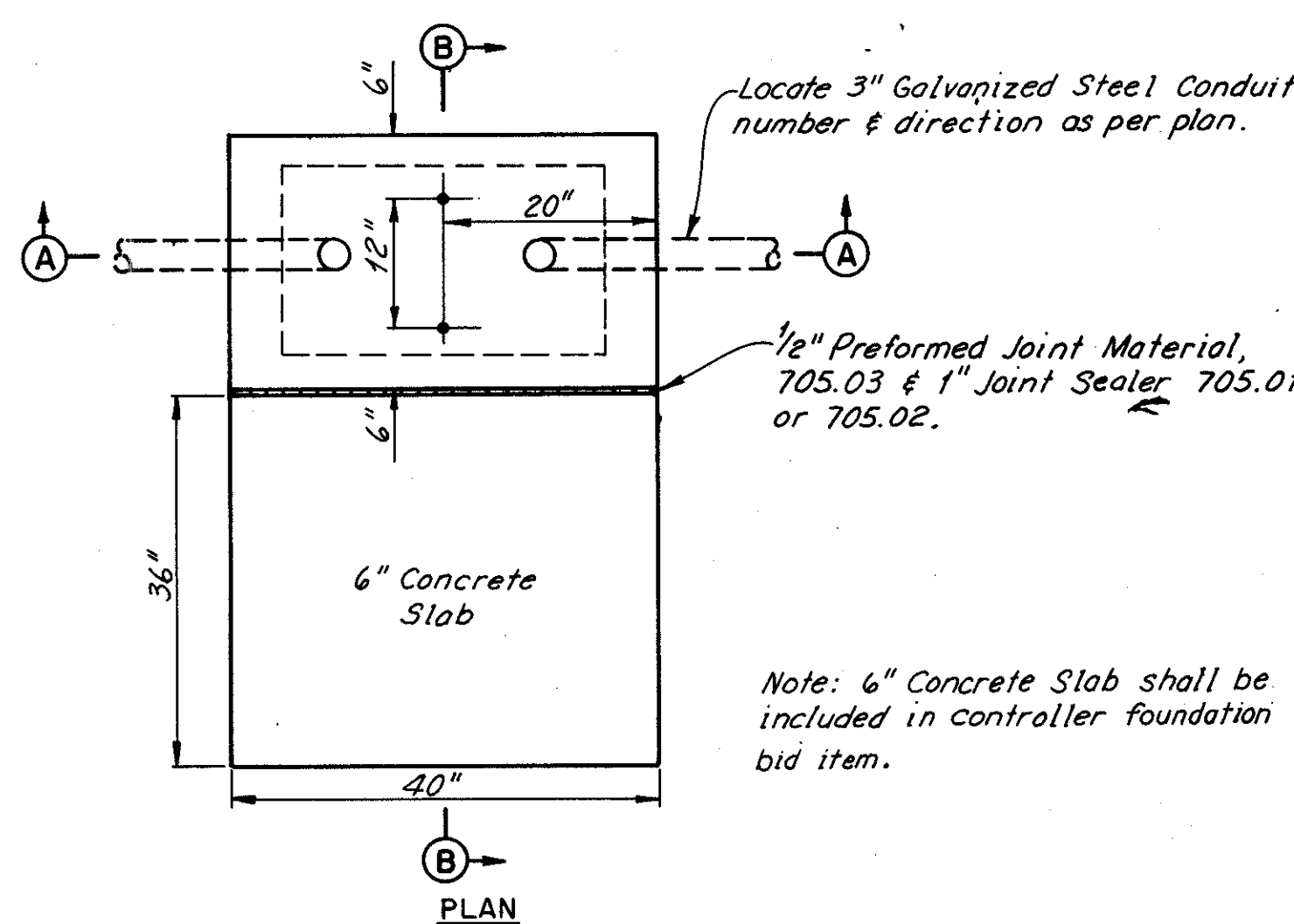
SECTION E-E



PLAN

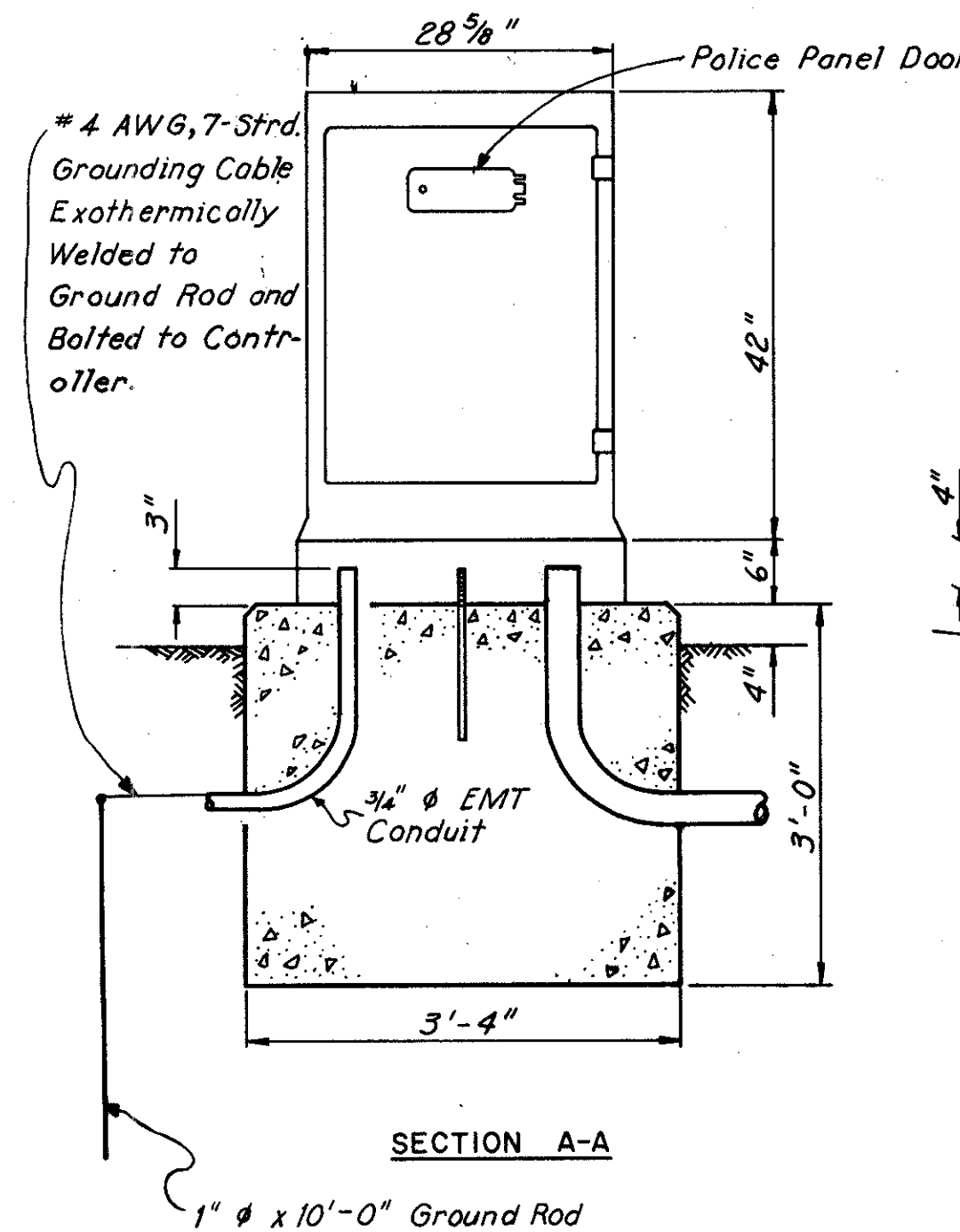


CONDUIT DRAIN FOR TRAFFIC SIGNAL CONDUIT
No scale

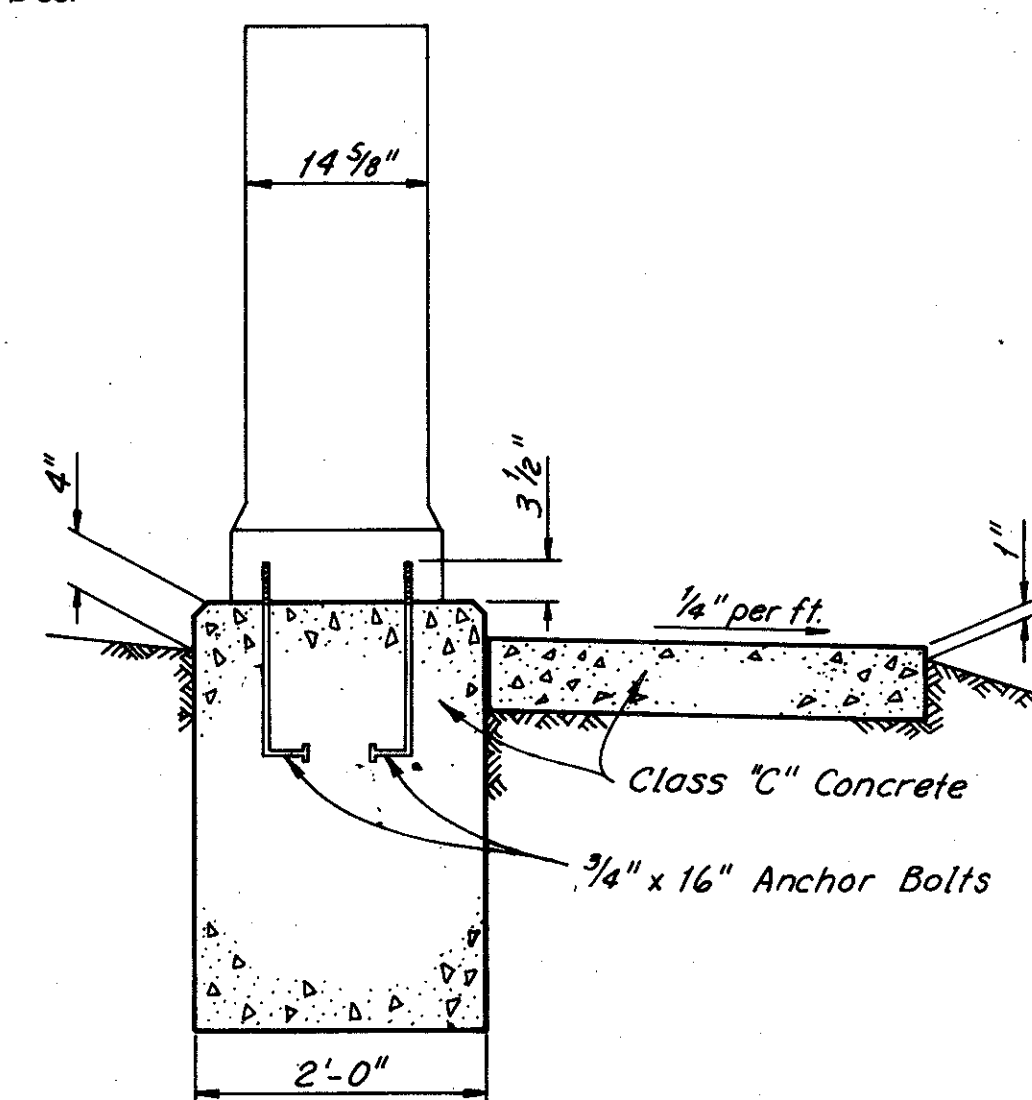


PLAN

Note: 6" Concrete Slab shall be included in controller foundation bid item.

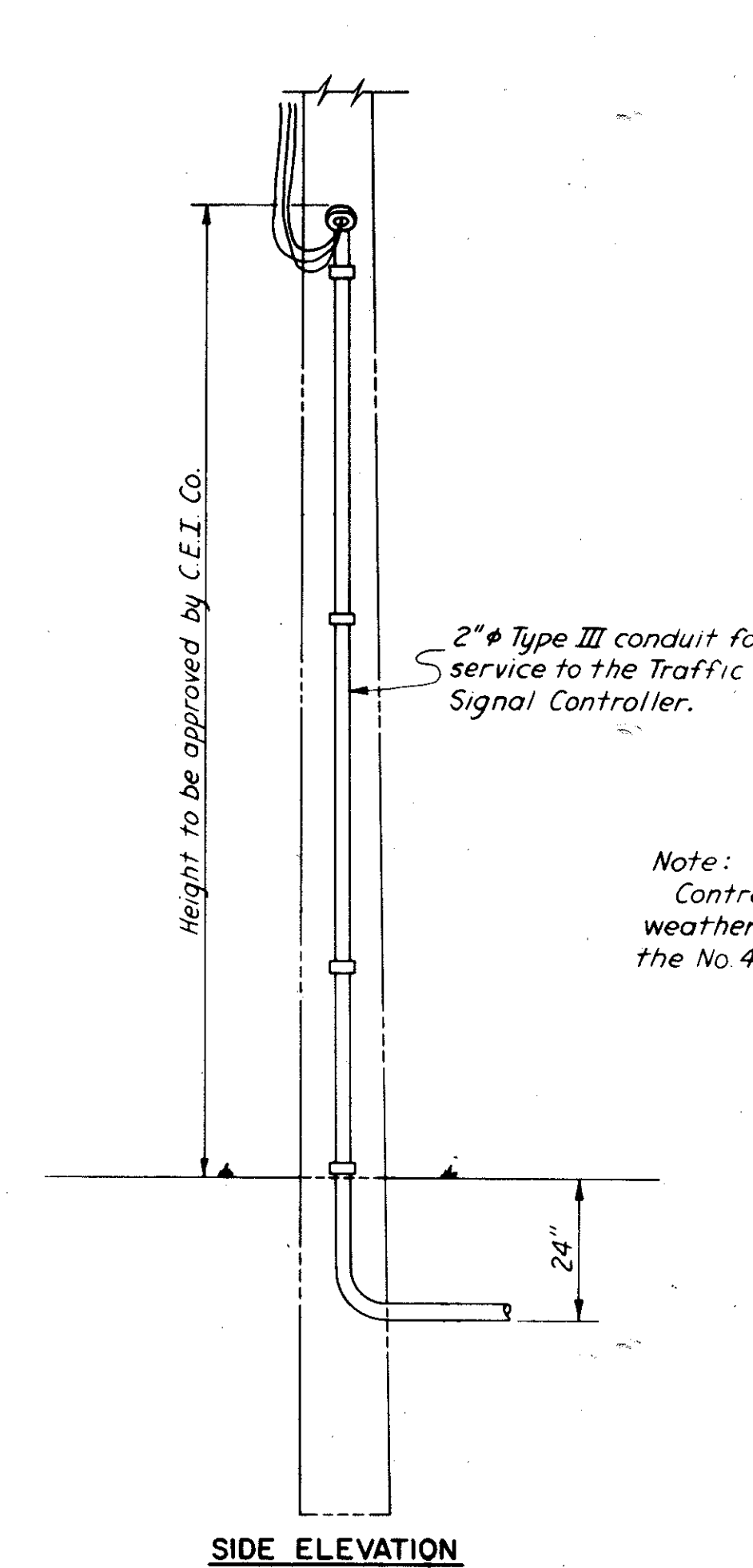


SECTION A-A



SECTION B-B

TYPICAL BASE FOR 7.7 CONTROLLER HOUSING

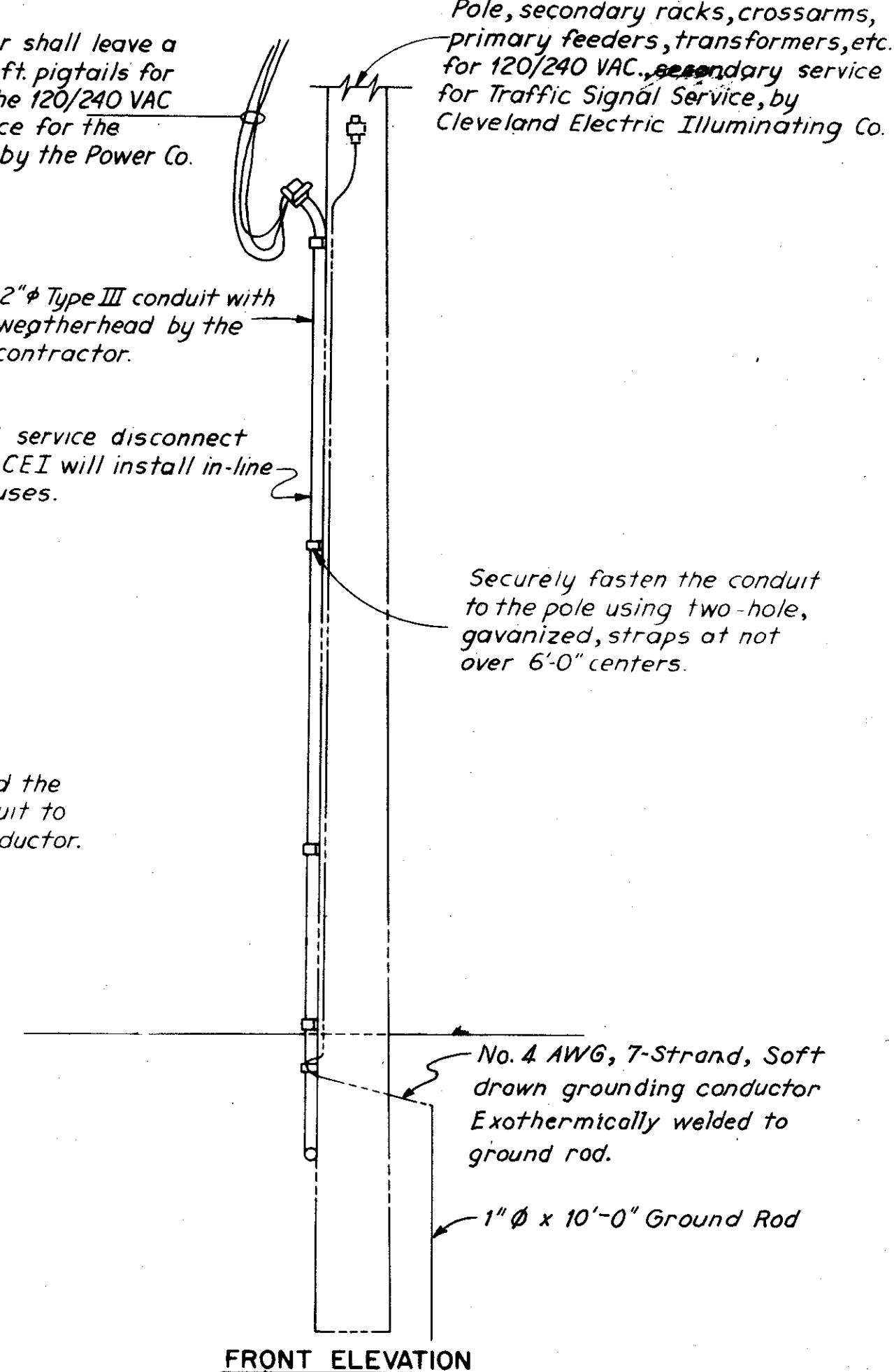


SIDE ELEVATION

The contractor shall leave a minimum of 10-ft. pigtails for connections to the 120/240 VAC secondary service for the traffic signals by the Power Co.

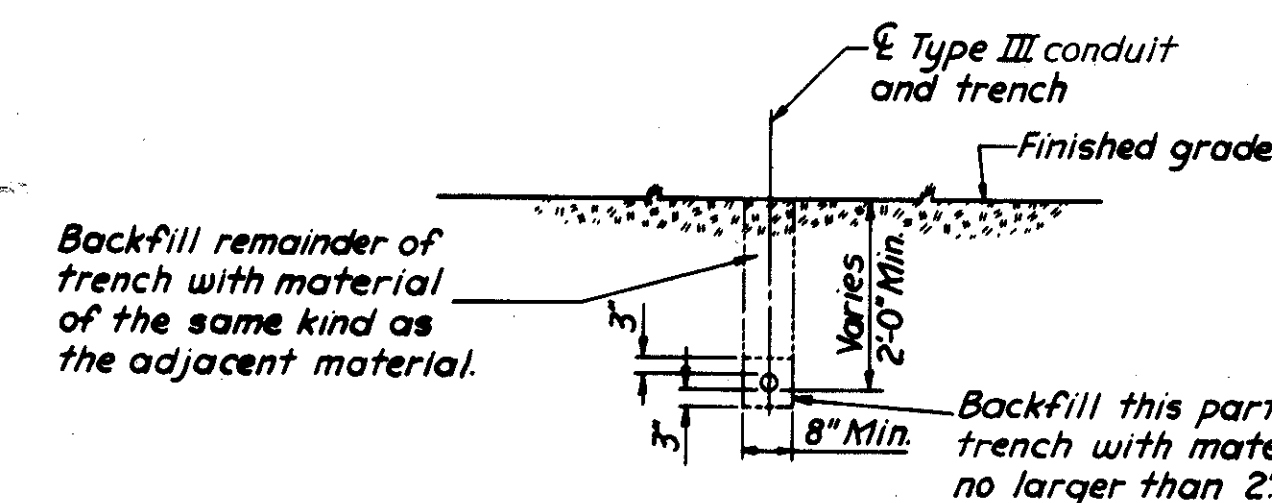
2" Type III conduit with weatherhead by the contractor.
Meter and service disconnect not required, CEI will install in-line secondary fuses.

Note:
Contractor shall bond the weatherhead and conduit to the No. 4 AWG ground conductor.



FRONT ELEVATION

120/240 VAC TRAFFIC SIGNAL POWER SERVICE
Scale 3/8" = 1'-0"



TRAFFIC SIGNAL CONDUIT TRENCH
Scale: 3/8" = 1'-0"

Note:
All circuit cables shall extend a minimum of 10ft. beyond top of concrete foundation and be suitably protected.
The contractor shall place the conduits in the controller foundation as shown on the Traffic Signal Layout Sheet.
Conduits shall be 2" or 3", Type III, as shown on the Traffic Signal Layout Sheet.

SCALE: As Noted
HOWARD, NEEDLES, TAMMEN & BERGENOFF
MADE LUG DATE 11-22-71 CONSULTING ENGINEERS
TRCD LFL DATE 11-23-71
CKD EFV DATE 8-20-73 KANSAS CITY CLEVELAND NEW YORK

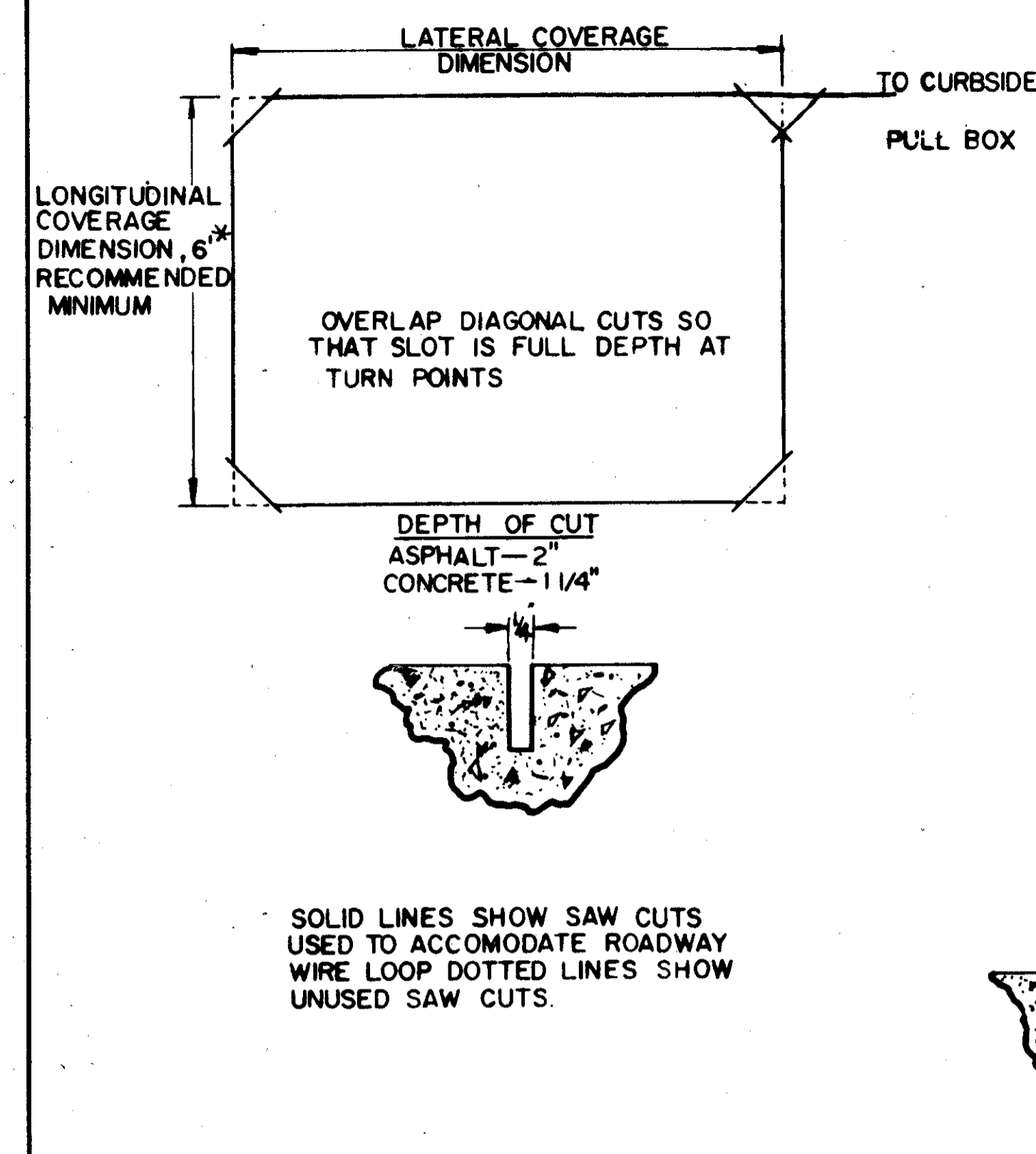


FIGURE 1
TYPICAL LOOP SLOT CONSTRUCTION

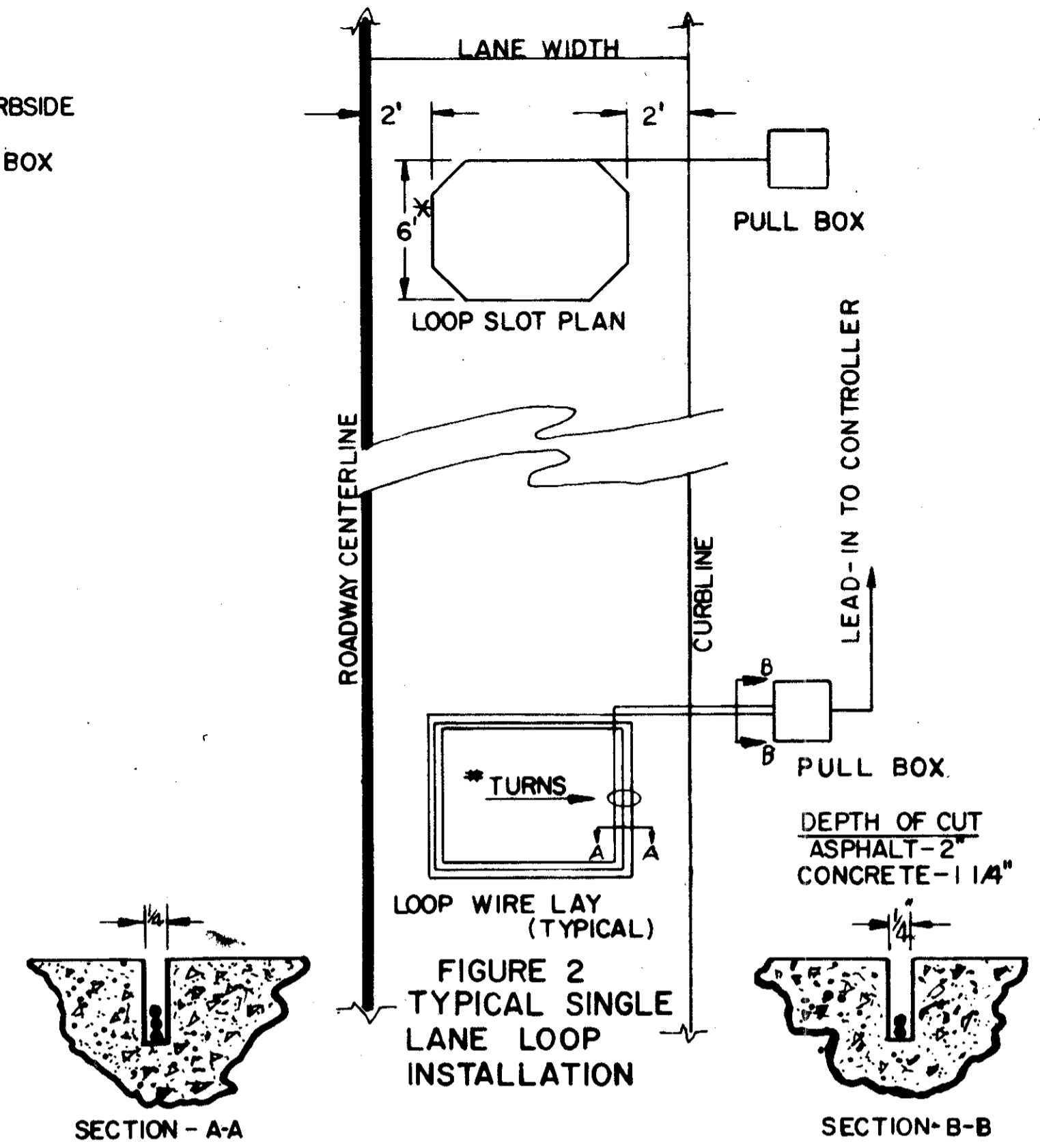


FIGURE 2
TYPICAL SINGLE LANE LOOP INSTALLATION

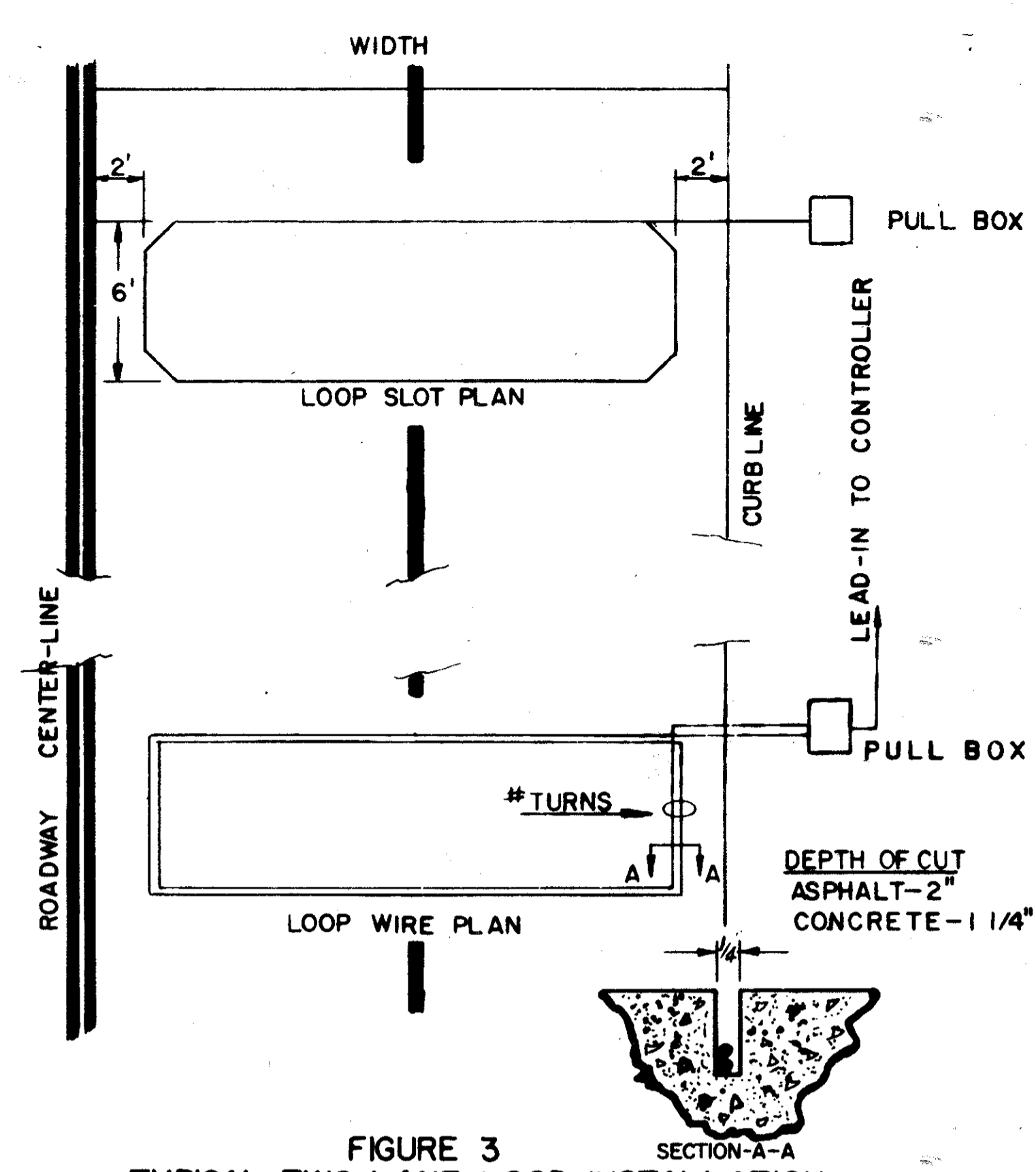


FIGURE 3
TYPICAL TWO LANE LOOP INSTALLATION

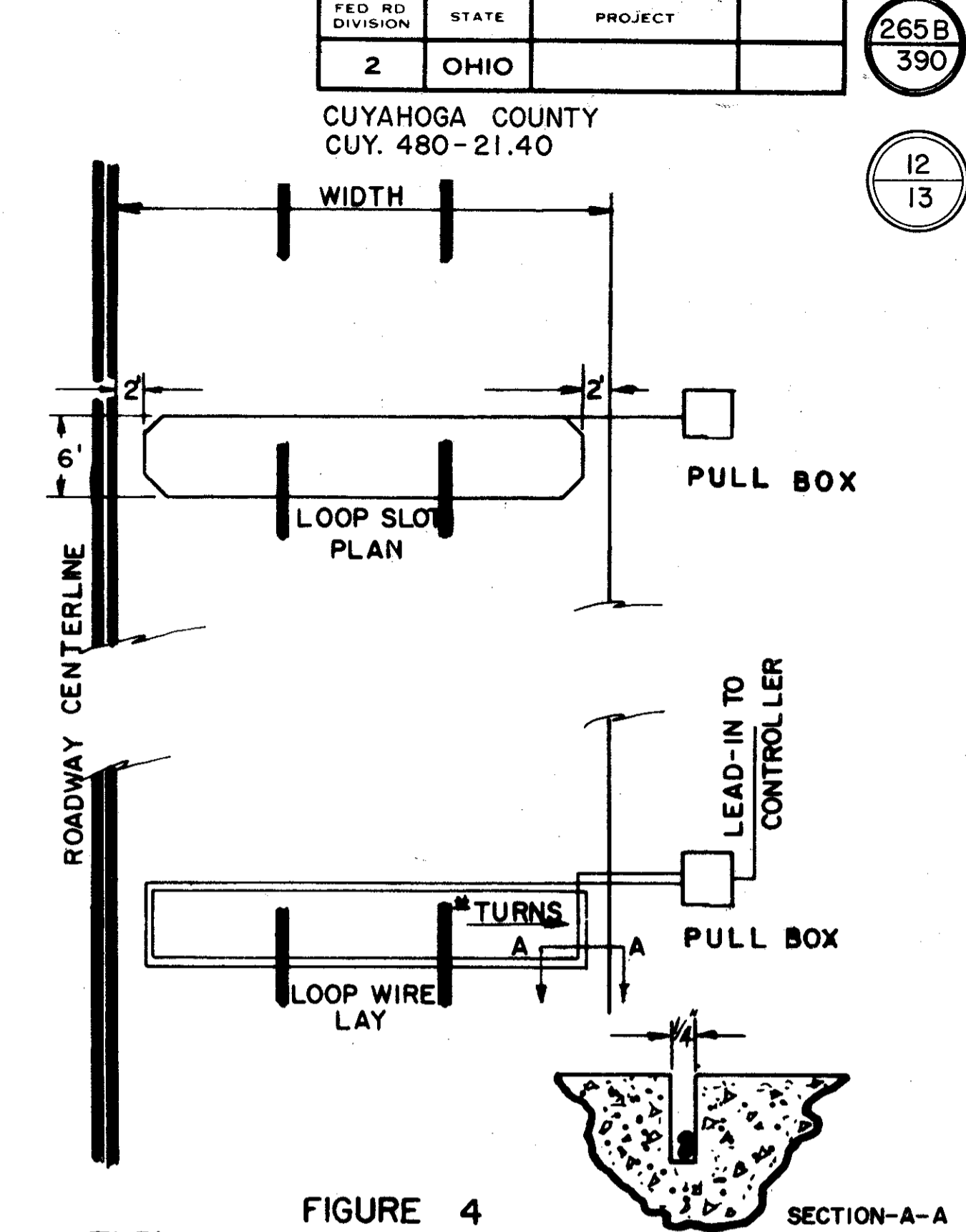


FIGURE 4
TYPICAL THREE LANE LOOP INSTALLATION

LOOP PERIMETER	NO. OF TURNS
UP TO 40 FEET	3
40 TO 160 FEET	2
160 AND UP	1

MAINTAIN 6' MINIMUM DIMENSION IN DIRECTION OF TRAVEL.

WHERE PAVEMENT EDGE HAS CURB SECTION, THE CONDUIT SHALL BE PLACED BEFORE CURB SECTION IS POURED OR CAREFULLY DRILLED THROUGH CURB

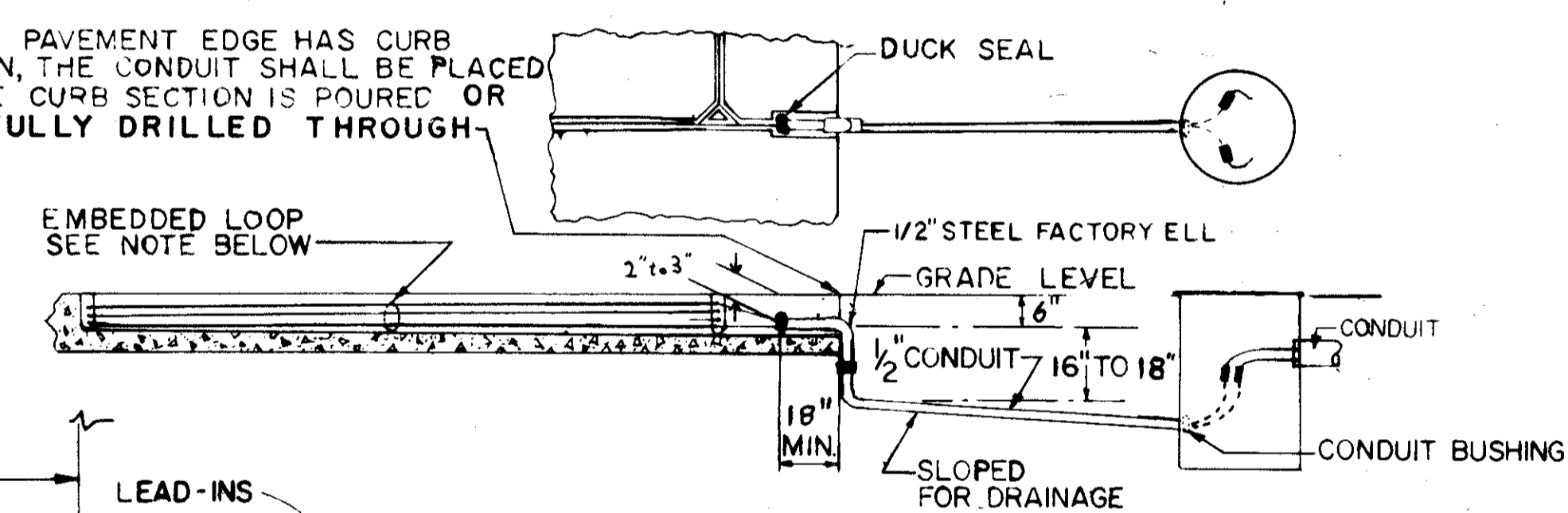


FIGURE 8
INTERFACE BETWEEN EMBEDDED LOOP AND ROAD SIDE PULL BOX

ROADWAY LOOP INSTALLATION

THE ROADWAY WIRE LOOP IS POSITIONED IN THE PAVEMENT IN A SAWED SLOT THAT OUTLINES THE REQUIRED DETECTION AREA. THE SLOT SHALL BE 1/4" WIDE AND FROM 1/4" OR 2" DEEP. RIGHT ANGLE TURNS SHALL BE CHAMFERED TO PREVENT SHARP BENDS OF WIRE (SEE FIG. 1). THE SLOT MUST BE BRUSHED AND BLOWN CLEAN OF ALL LOOSE MATERIAL. THE LOOP WIRE MUST BE CAREFULLY PUSHED INTO THE SLOT WITH A BLUNT STICK TO AVOID DAMAGING ITS INSULATION. RESISTANCE OF THE WIRE LOOP TO GROUND SHOULD BE CHECKED AFTER THE WIRE IS PLACED IN THE SLOT, BOTH BEFORE AND AFTER THE SLOT IS SEALED. THIS IS ESPECIALLY IMPORTANT IF THE ROADWAY WIRE LOOP IS SPLICED TO LEAD-IN CABLE AT CURBSIDE JUNCTION BOX. A RESISTANCE OF LESS THAN 10 MEGOHMS INDICATES A FAULTY SPlice OR WIRE INSTALLATION WHICH MUST BE CORRECTED BEFORE THE ROADWAY LOOP IS SEALED IN PLACE. INSTALLATIONS IN NEW ASPHALT PAVEMENT SHALL BE MADE IN THE SUBBASE PRIOR TO PLACING THE TOP COURSE.

SEALING

A FLEXIBLE EMBEDDING SEALANT NO. 491-HR MANUFACTURED BY EUCLID CHEMICAL CO. OF CLEVELAND, OHIO OR E-702 MANUFACTURED BY THE BOND CO. OF NORTHFORD, CONNECTICUT OR EQUIVALENT, SHALL BE MIXED ACCORDING TO DIRECTIONS, POURED INTO THE SAW SLOTS AND LEFT UNDISTURBED UNTIL CURED INTO A SOLID MASS.

*** DIMENSIONS**

IN CASES WHERE THE LATERAL DIMENSION WOULD BE LESS THAN EIGHT (8) FEET, THE LONGITUDINAL DIMENSION SHALL BE INCREASED TO OBTAIN A MINIMUM AREA OF 48 S.F.

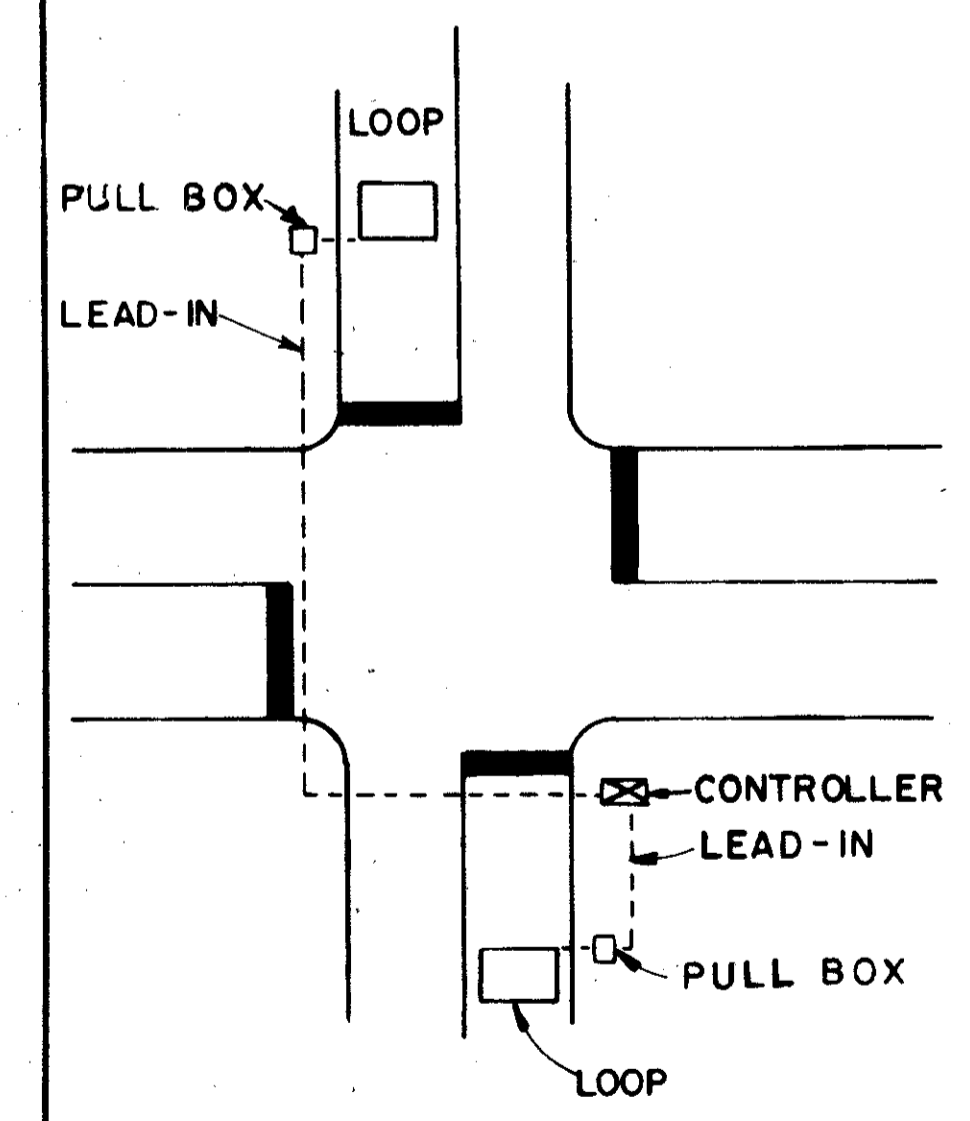


FIGURE 5
TYPICAL LEAD-IN DETAIL

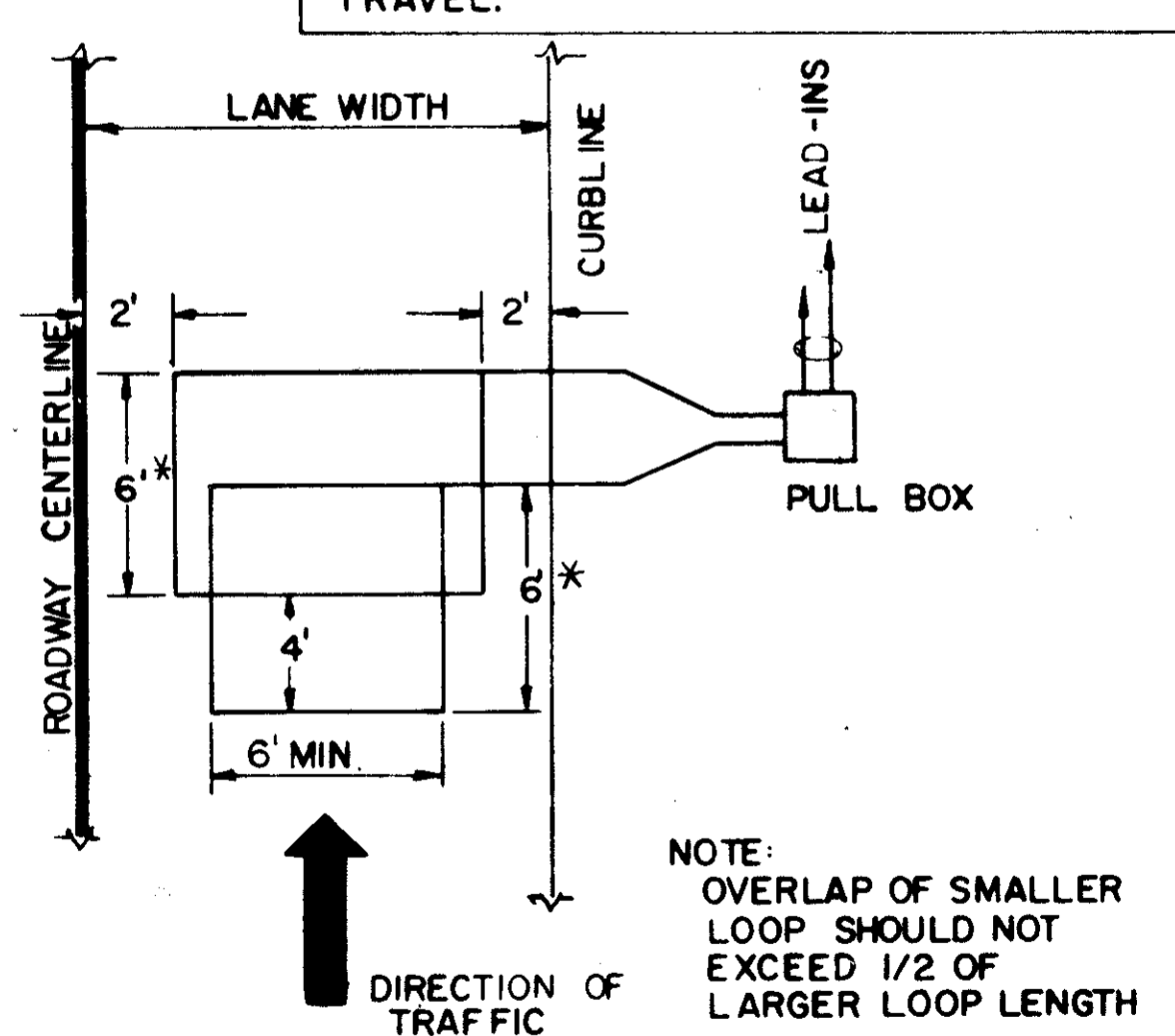


FIGURE 6
TYPICAL DIRECTIONAL DETECTION LOOP INSTALLATION (OVERLAPPED)

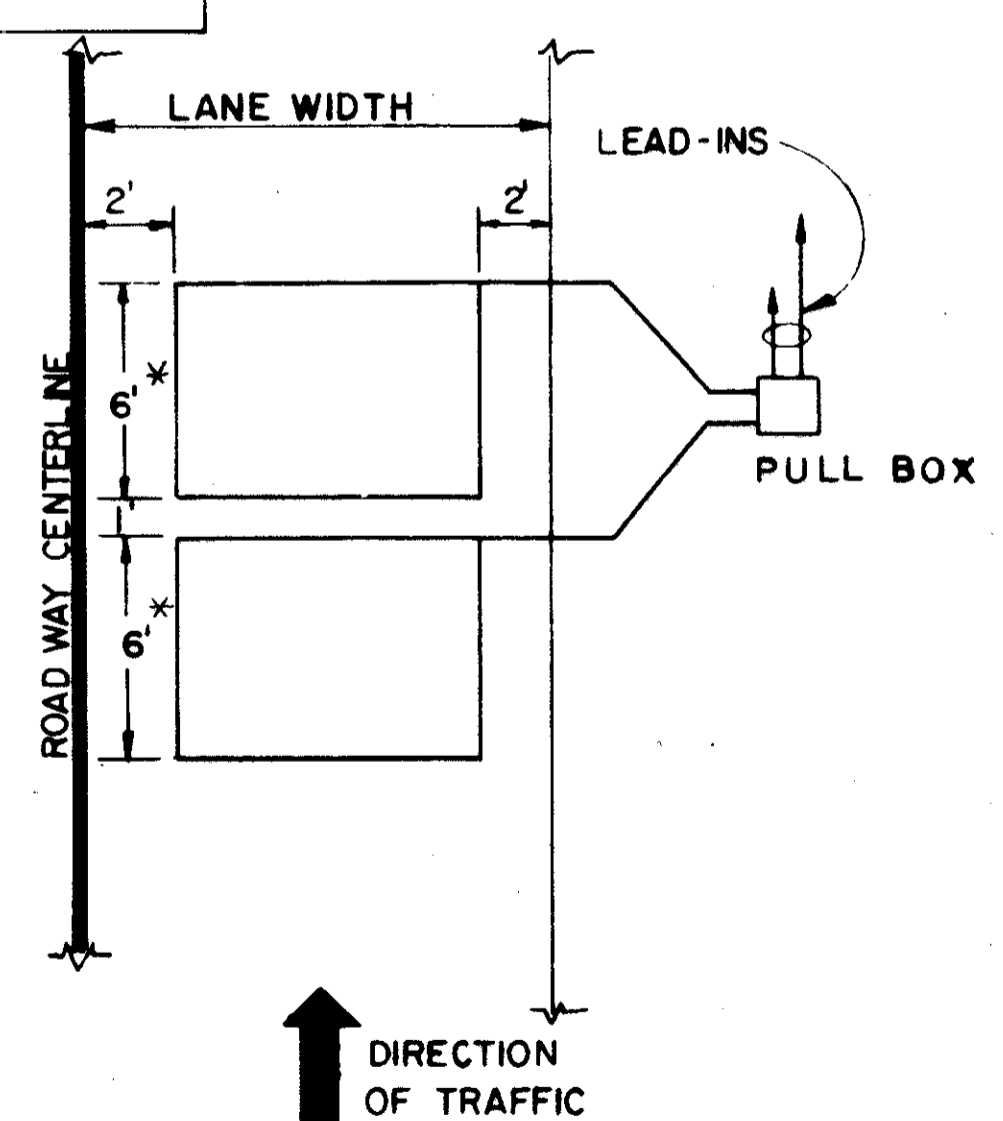


FIGURE 7
TYPICAL DIRECTIONAL DETECTION LOOP INSTALLATION (ADJACENT)

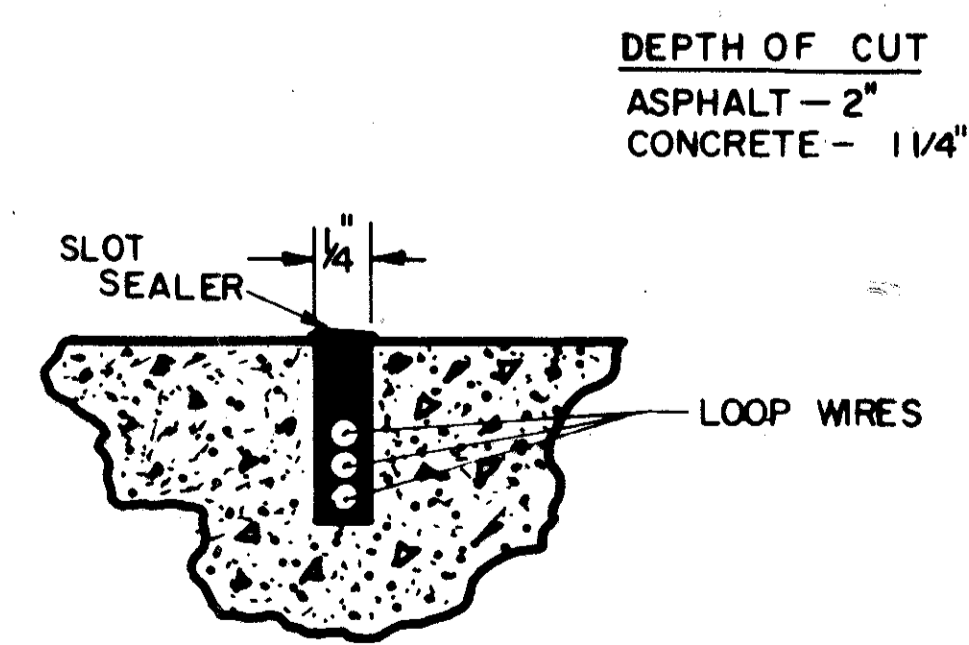


FIGURE 9
TYPICAL SLOT SEALING DETAIL

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

EMBEDDED VEHICLE
DETECTOR LOOP DETAILS

APPROVED _____
ENGINEER OF TRAFFIC

Rev 11-3-67
Rev 6-1-71
Rev 2-3-72

- NOTES:**
- MATERIAL SPECIFICATIONS**
- TAPERED TUBES (S.A.E.-1020 STEEL PROCESSED TO MINIMUM YIELD STRESS OF 55,000 P.S.I.)
 - CAST ANCHOR BASE & HANDHOLE FRAME - ASTM-A27- GRADE 65-35
 - HANDHOLE COVER PLATE - 11 GA. STEEL SAE-1015
 - CAST ALUMINUM POLE TOP - ALUMINUM ALLOY 43
 - SPAN WIRE CLAMP - LOW ALLOY, HIGH STRENGTH STEEL ASTM-A242 - OR 375, LOAD PRODUCING DISTORTION 12,500 LBS. DIRECT TENSION
 - ALL BOLTS & NUTS LESS THAN 5/8" DIA. PASSIVATED STAINLESS STEEL AISI-300 SERIES - COMMERCIAL GRADE.
 - ALL OTHER NUTS & BOLTS 5/8" DIA. & OVER - ASTM-A307 AND GALVANIZED IN ACCORDANCE WITH ASTM-A153
 - ANCHOR BASE & U-BOLTS - HIGH STRENGTH STEEL - MINIMUM YIELD STRESS 55,000 LBS. SQ. IN. - MIN. ULTIMATE 90,000 P.S.I.
 - WELDING ROD - ASTM-A233 - CLASS E60XX OR 70XX.
 - GALVANIZING - WHEN SPECIFIED ASTM-A123.

TRAFFIC SIGNAL POLE FOUNDATIONS

THE CONTRACTOR SHALL STAKE THE LONGITUDINAL AND LATERAL LOCATION, AND THE ELEVATION OF THE TOP OF EACH FOUNDATION SUBJECT TO THE APPROVAL OF THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER ELEVATION, OFFSET, AND LEVEL OF EACH FOUNDATION. THE FOUNDATION LOCATIONS MAY BE CHANGED AS DIRECTED BY THE ENGINEER, IN CASE OF SLOPE OR SUBSURFACE DIFFICULTIES. EXCAVATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 503. EXCAVATION SHALL BE TO THE DIMENSIONS SHOWN ON THE PLANS, AND SHALL BE PERFORMED BY MEANS OF AN EARTH AUGER OF THE SPECIFIED DIA. UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

WHERE SUBSURFACE OBSTRUCTIONS ARE ENCOUNTERED, THE ENGINEER MAY REQUIRE THE CONTRACTOR TO REMOVE THE OBSTRUCTION OR TO REPLACE THE EXCAVATED MATERIAL AND RELOCATE THE FOUNDATION. IF CAVING OF THE EXCAVATION OCCURS, THE CONTRACTOR SHALL EXCAVATE THE SPECIFIED DEPTH MAINTAINING THE SIDES AS NEARLY VERTICAL AS POSSIBLE. NO PAYMENT SHALL BE MADE FOR ANY EXCAVATION, CONCRETE, OR REINFORCING STEEL USED IN EXCESS OF THE PLAN QUANTITIES.

CONCRETE, CLASS C, SHALL BE PLACED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 511, AND SHALL BE PLACED AGAINST UNDISTURBED SOIL OR COMPACTED EMBANKMENT. STEEL REINFORCEMENT BARS, WHERE REQUIRED, SHALL BE POSITIONED AS SHOWN ON THE PLANS AND PLACED IN ACCORDANCE WITH ITEM 509.

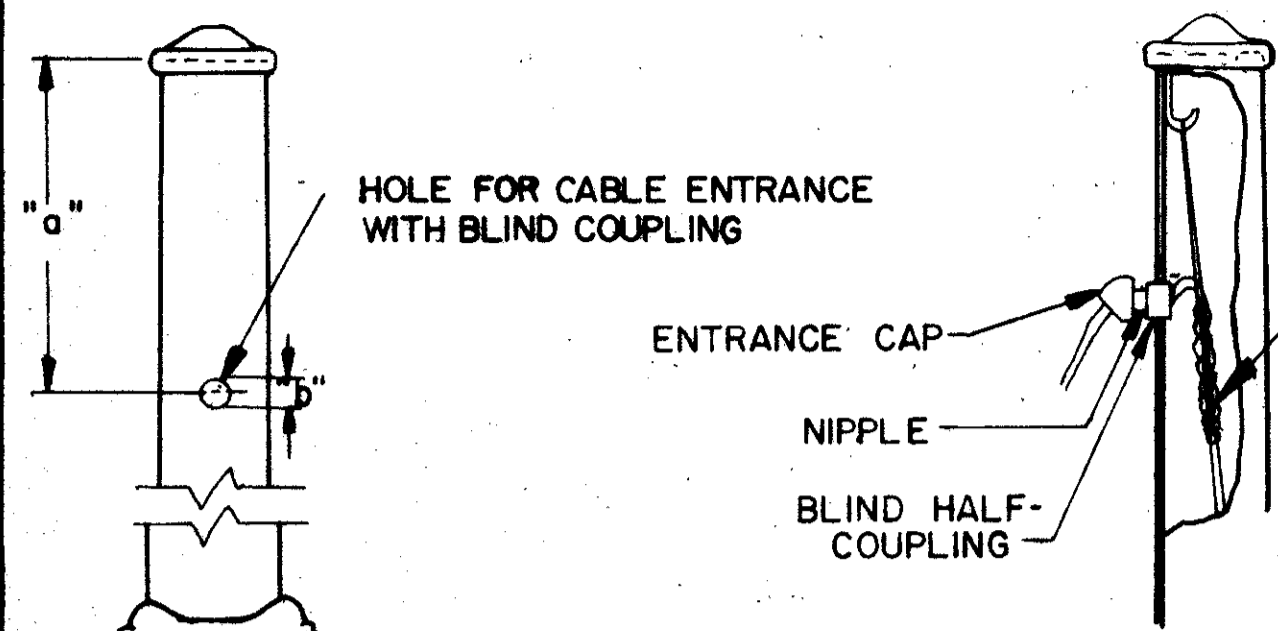
CYLINDRICAL ANCHOR BASE TYPE FOUNDATIONS FOR TRAFFIC SIGNAL POLES SHALL HAVE ANCHOR BOLTS AND CONDUIT ACCURATELY HELD IN POSITION WITH A TEMPLAT WHILE CONCRETE IS PLACED. FORMS SHALL BE USED FOR THE UPPER PORTIONS OF ALL FOUNDATIONS AND NO BACKFILLING SHALL BE PERMITTED FROM THE BOTTOM TO SIX INCHES BELOW THE GRADE LEVEL. NO GROUTING OF CONCRETE SHALL BE PERMITTED BETWEEN THE FOUNDATION TOP AND THE POLE BASE.

TRAFFIC SIGNAL POLE

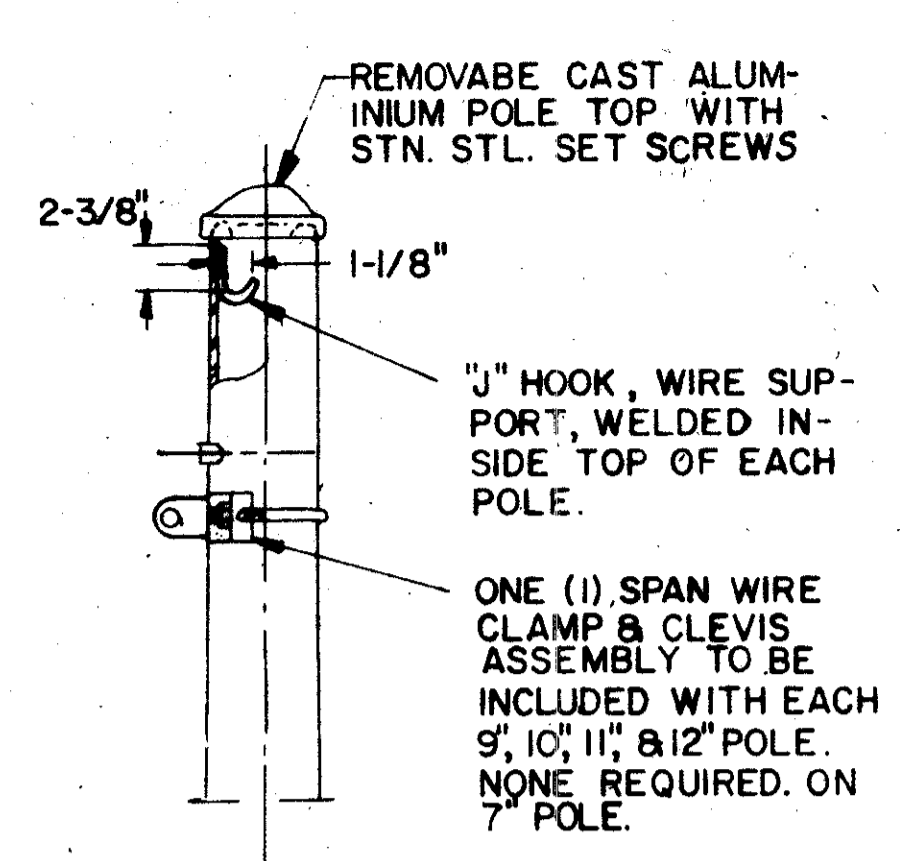
WHERE A WIRE ENTRANCE IS REQUIRED, THE SERVICE ENTRANCE HEAD SHALL BE LOCATED APPROXIMATELY 12" BELOW SPAN WIRE CLAMP.

GROUND ROD

GROUND ROD SHALL BE IN ACCORDANCE WITH TYPICAL GROUND ROD DETAIL AND TESTED IN ACCORDANCE WITH 625.22 CONSTRUCTION AND MATERIAL SPECIFICATIONS.



TYPICAL CABLE STRAIN RELIEF & ENTRANCE CAP DETAILS



POLE TOP DETAILS

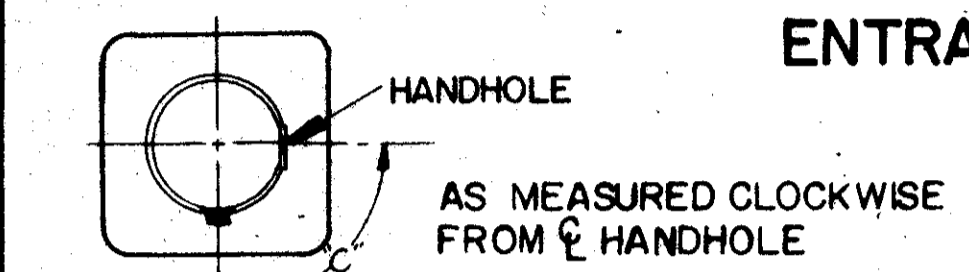
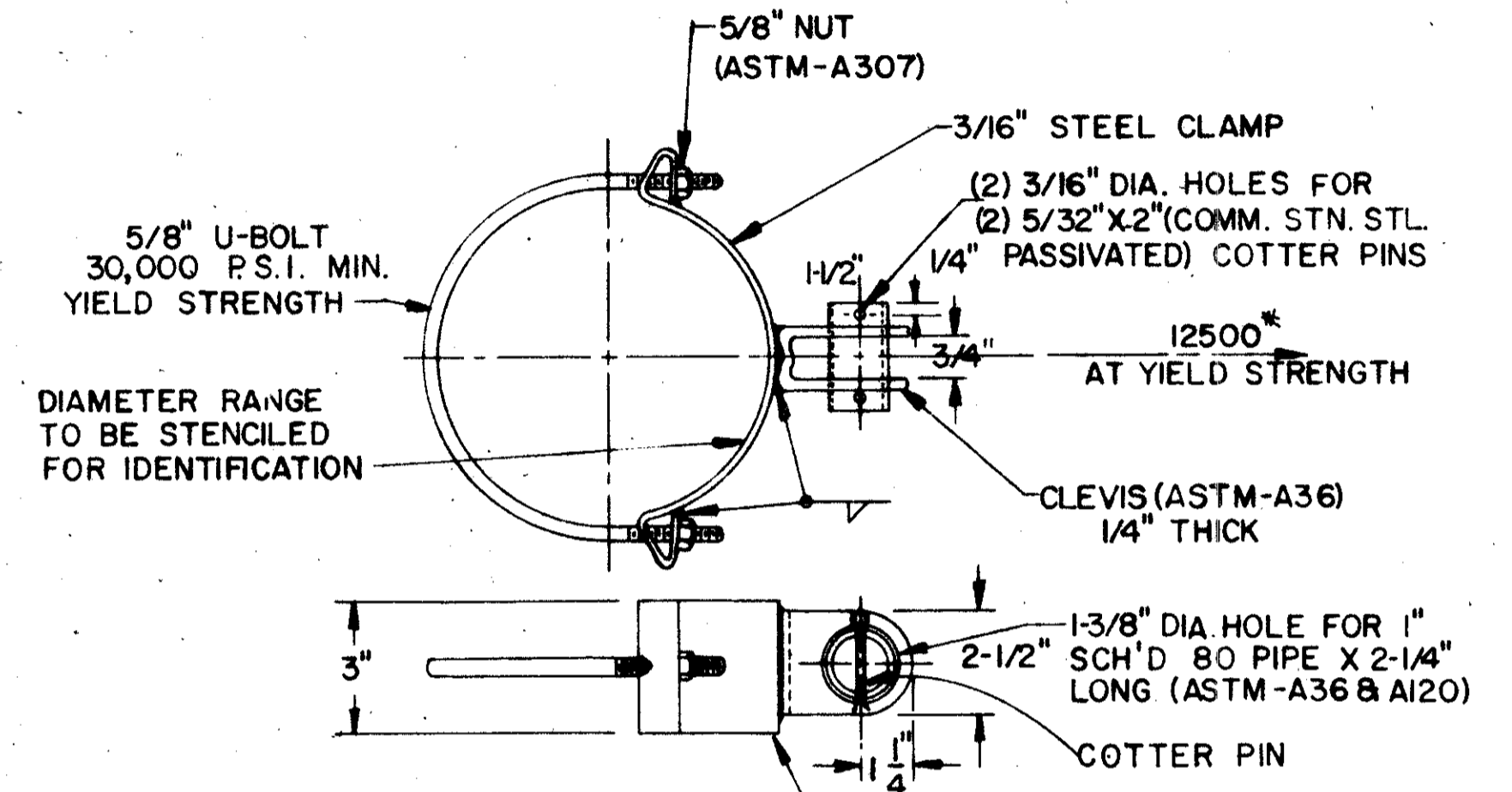


TABLE 2

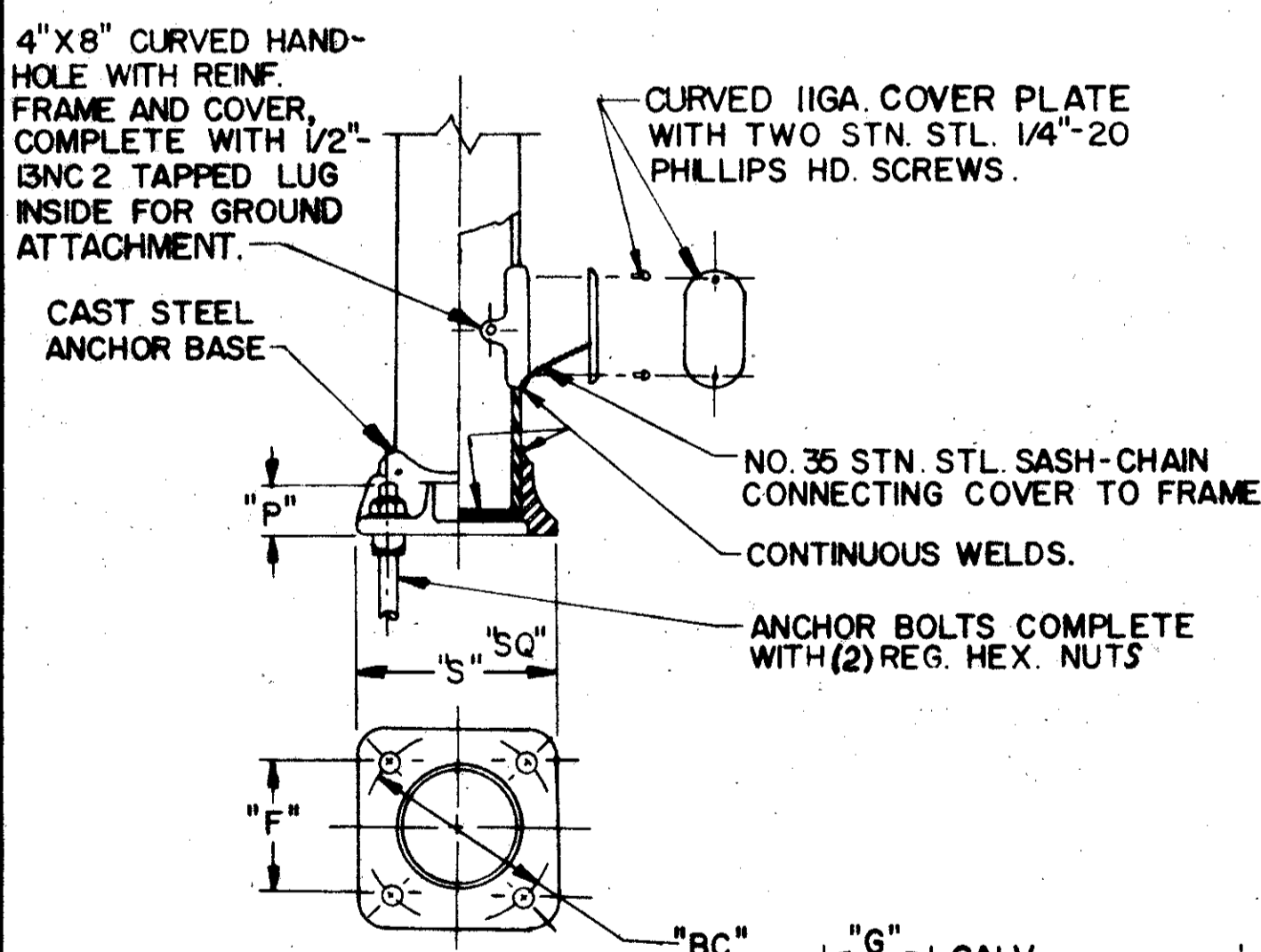
CONFIG.	"a"	"b"	"c"
A	30"	2"	90°
B	30"	2"	180°
C	30"	2"	270°
D	48"	2"	90°
E	48"	2"	180°
F	48"	2"	270°
G	NO HOLE REQUIRED		

CABLE ENTRANCE LOCATION DETAIL



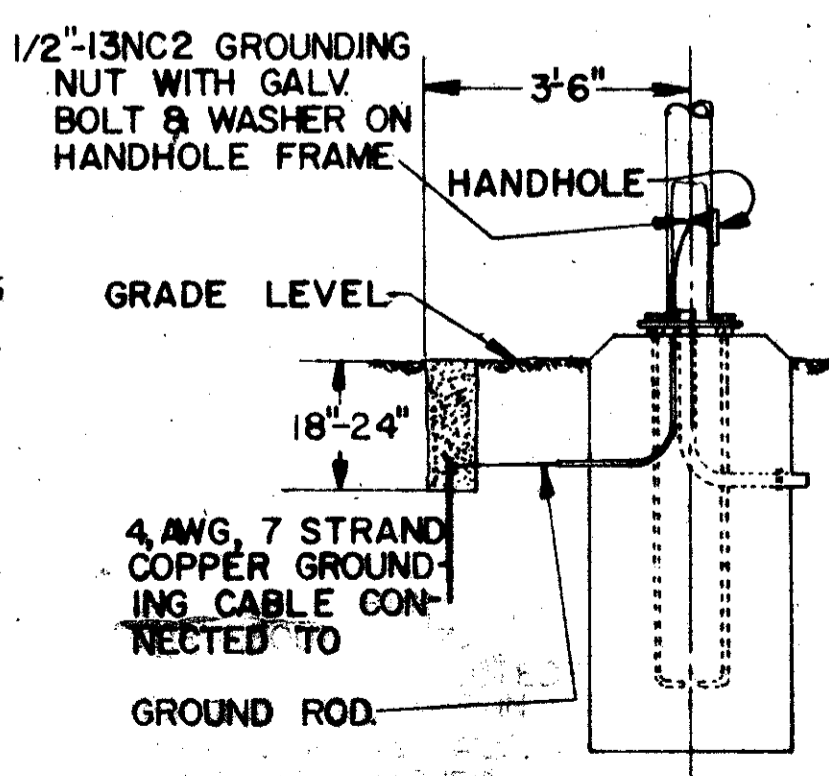
TYPE	CLAMP RANGE MIN.	CLAMP RANGE MAX.
I	3.1"	3.6"
II	3.6"	4.4"
III	4.4"	5.2"
IV	5.2"	5.8"
V	5.8"	6.8"
VI	6.8"	7.9"
VII	7.9"	9.0"
VIII	9.0"	10.1"
IX	10.1"	11.3"
X	11.3"	12.1"
XI	12.1"	13.4"
XII	13.4"	14.5"
XIII	14.5"	15.5"
XIV	15.5"	16.5"

SPAN WIRE CLAMP DETAILS

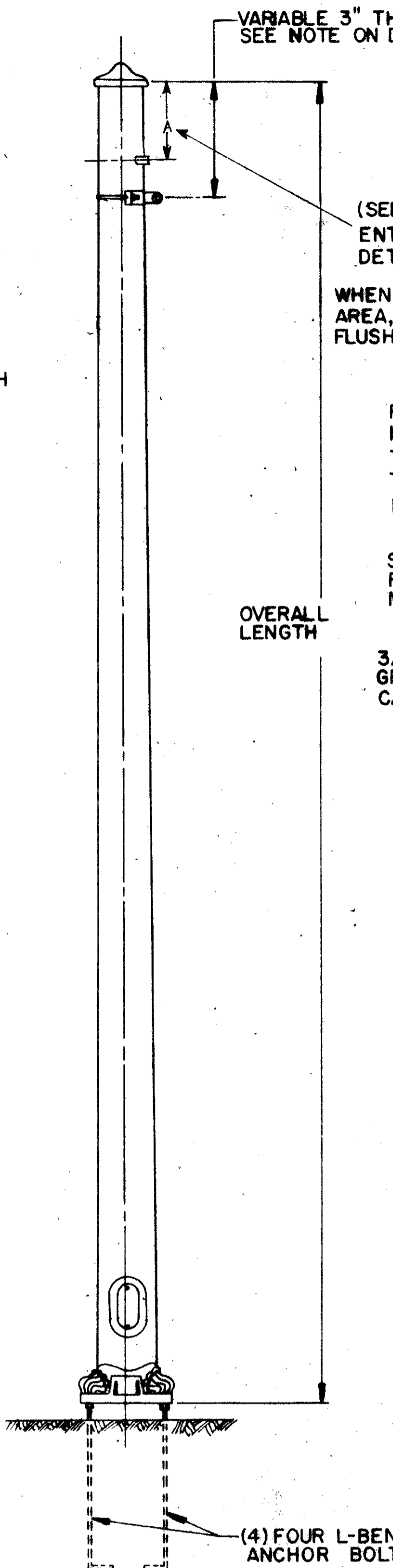


ANCHOR BASE DATA						ANCHOR BOLT DATA			
POLE DIA.	"BC"	"F"	"S"	"P"	"A"	SIZE	"L"	"T"	"G"
7"	10"	7 1/16"	10 1/2"	2 1/4"	1 1/4"	X 48"	40"	8"	10"
9"	12 1/2"	8 7/8"	12 3/4"	3"	1 1/2"	X 60"	54"	9"	11"
10"	13 1/2"	9 9/16"	14 1/8"	3 3/8"	1 1/2"	X 60"	54"	9"	11"
11"	15"	10 5/8"	15 5/8"	3 5/8"	1 3/4"	X 90"	84"	9"	11"
12"	16"	11 5/16"	17"	4"	1 3/4"	X 90"	84"	9"	11"

TYPICAL HANDHOLE, ANCHOR BASE & ANCHOR BOLT DETAILS



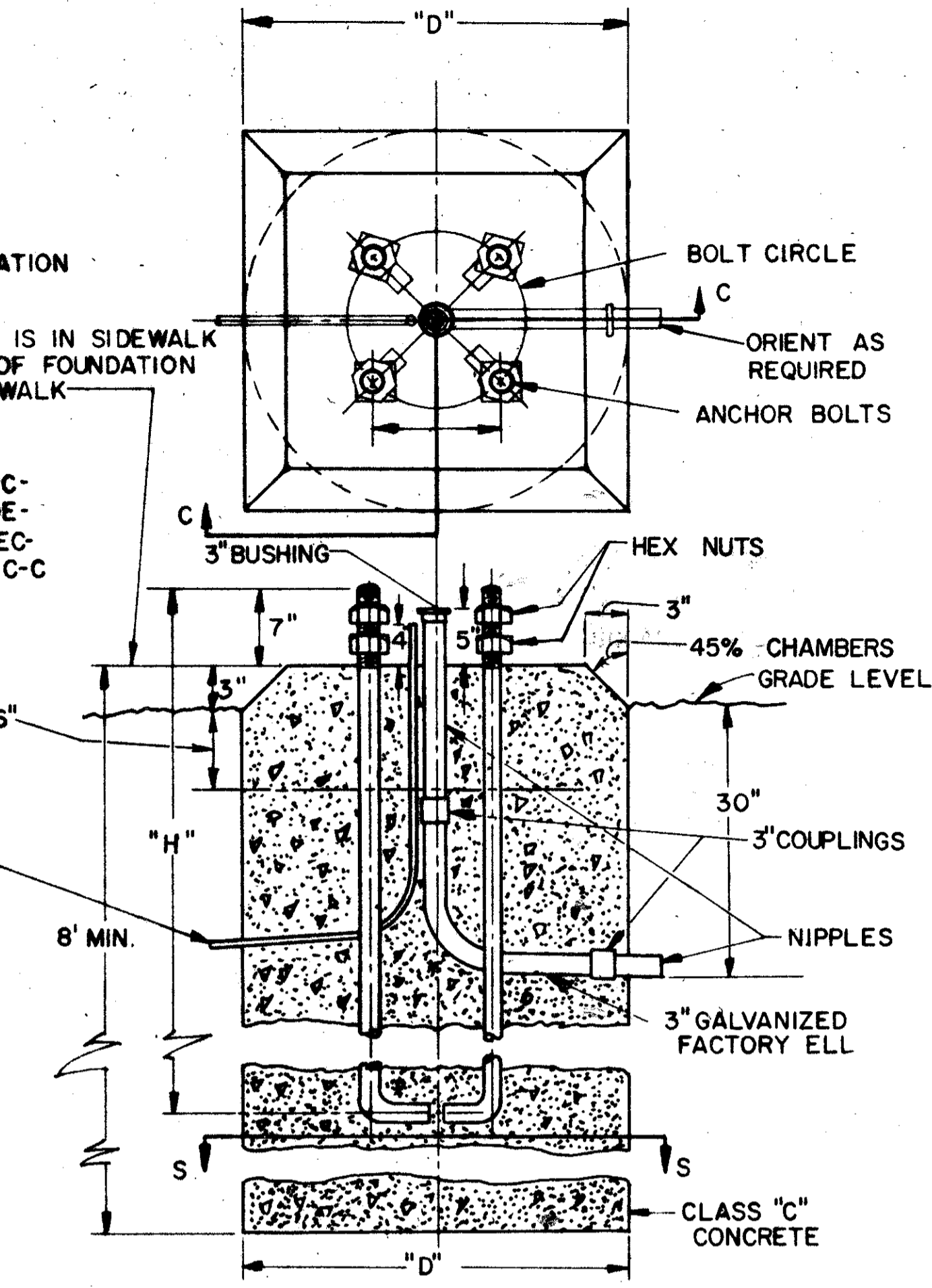
TYPICAL GROUND ROD DETAIL



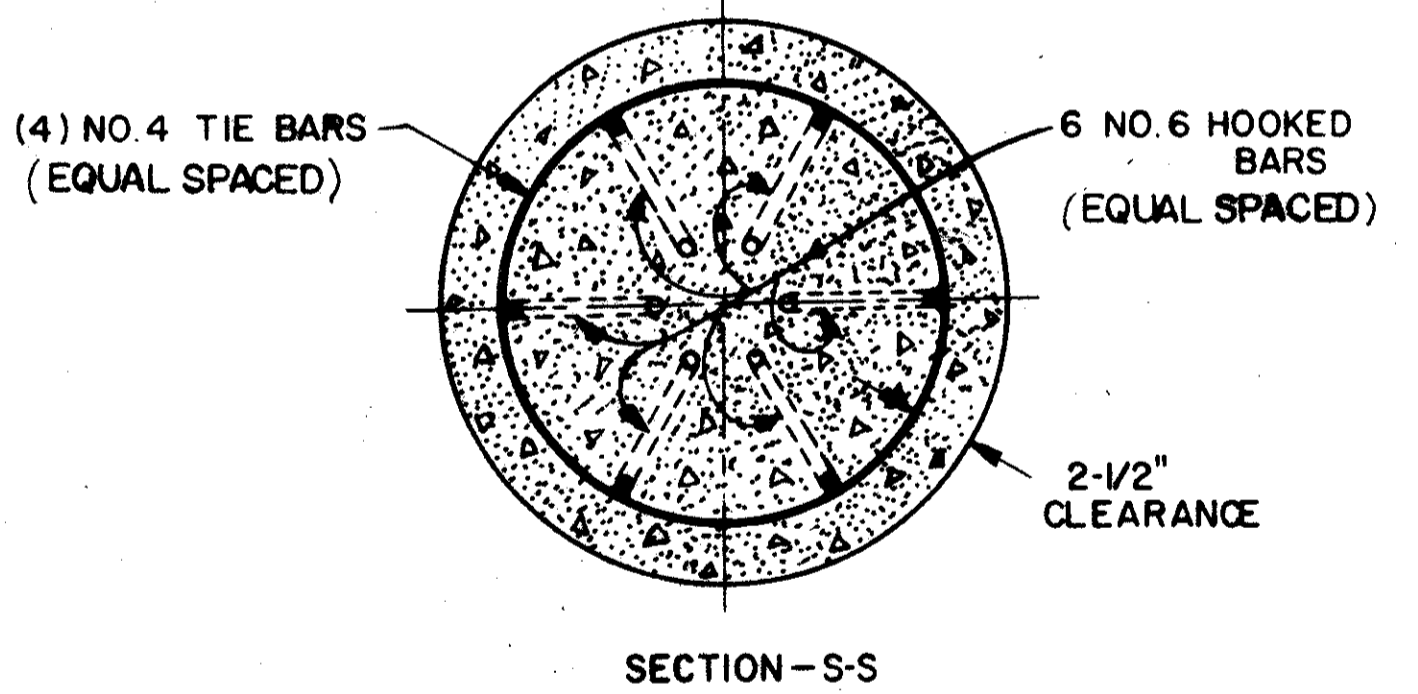
STEEL STRAIN POLE

TYPE	BASE DIA.	TOP DIA.	OVERALL LENGTH	WALL THICKNESS	DESIGN DATA FOR TRANSVERSE LOAD AT 18\"/>			
					RATE	ELAST. DEFL. LD. AT YIELD STRENGTH		
1	7.0"	4.20"	20.0'	(3 GA.) .250"	59"/100"	2135"	42"	24"
2	9.0"	5.36"	26.0'		64"/100"	2730"	54"	24"
3	10.0"	6.36"			44"/100"	3400"	54"	24"
4	11.0"	7.36"	28.0'		32"/100"	440"	84"	30"
5	12.0"	8.36"			24"/100"	4960"	84"	36"
6	9.0"	5.08"	30.0'		84"/100"	2520"	54"	24"
7	10.0"	6.08"			54"/100"	3140"	54"	24"
8	11.0"	7.08"	30.0'		41"/100"	3680"	84"	30"
9	12.0"	8.08"			31"/100"	4590"	84"	36"
10	9.0"	4.80"	30.0'		110"/100"	2350"	54"	24"
11	10.0"	5.80"			74"/100"	2920"	54"	24"
12	11.0"	6.80"	30.0'		53"/100"	3560"	84"	30"
13	12.0"	7.80"		39"/100"	4260"	84"	36"	

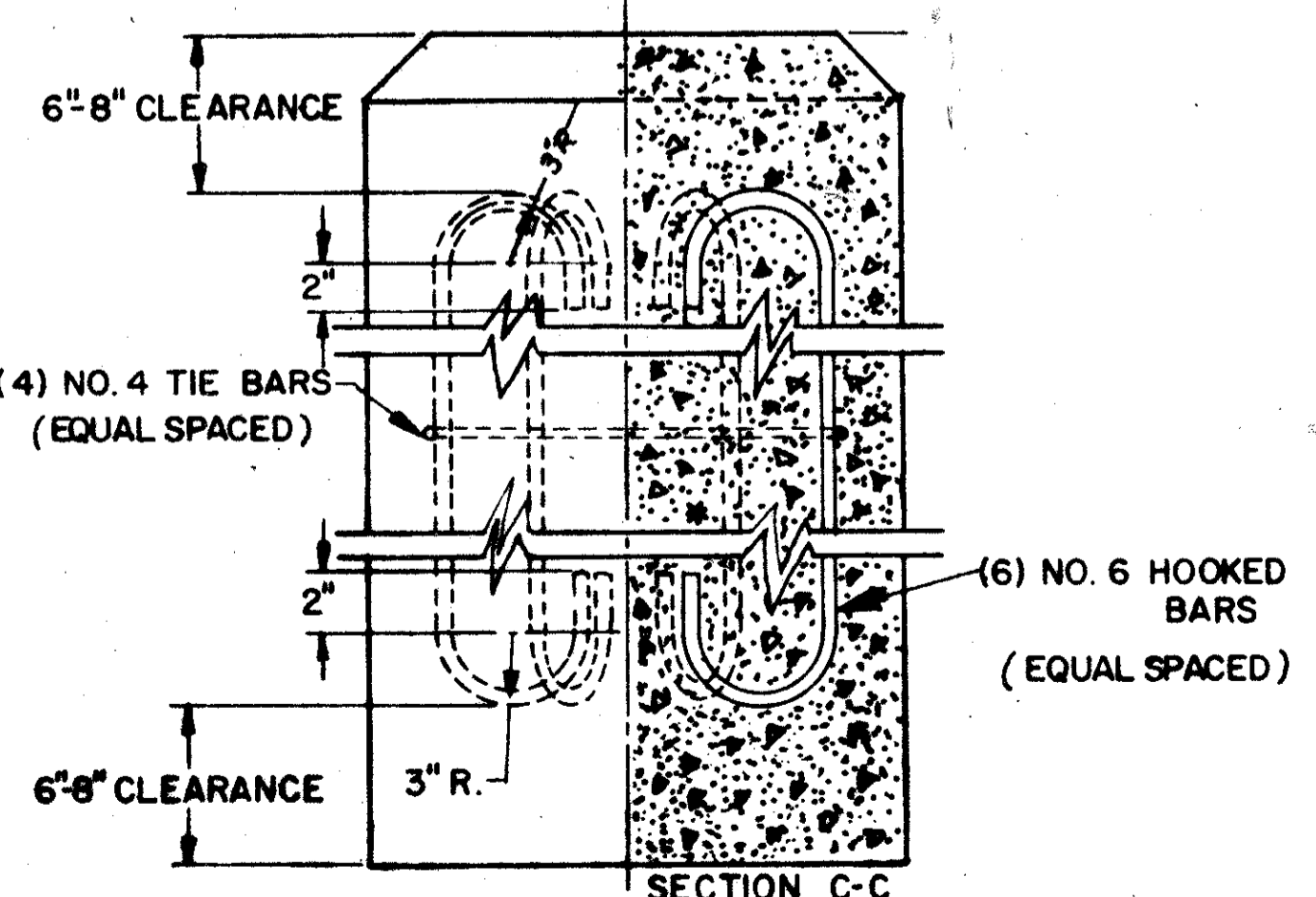
STRAIN POLE TYPES



TYPICAL STRAIN POLE FOUNDATION



SECTION - S-S



TYPICAL REINFORCING STEEL SECTIONS

BUREAU OF TRAFFIC
 OHIO DEPARTMENT OF HIGHWAYS

STEEL STRAIN POLE & FOUNDATION DETAILS

APPROVED _____
 ENGINEER OF TRAFFIC

NOTES:

- MATERIAL SPECIFICATIONS**
- TAPERED TUBES (S.A.E.-1020 STEEL PROCESSED TO MINIMUM YIELD STRESS OF 55,000 P.S.I.)
 - CAST ANCHOR BASE & HANDHOLE FRAME - ASTM-A27- GRADE 65-35.
 - HANDHOLE COVER PLATE - 11 GA. STEEL SAE-1015
 - CAST ALUMINUM POLE TOP - ALUMINUM ALLOY 43
 - SPAN WIRE CLAMP - LOW ALLOY, HIGH STRENGTH STEEL ASTM-A242 - OR 375, LOAD PRODUCING DISTORTION 12,500 LBS. DIRECT TENSION
 - ALL BOLTS & NUTS LESS THAN 5/8" DIA. PASSIVATED STAINLESS STEEL AISI-300 SERIES - COMMERCIAL GRADE.
 - ALL OTHER NUTS & BOLTS 5/8" DIA. & OVER - ASTM-A307 AND GALVANIZED IN ACCORDANCE WITH-ASTM-A153
 - ANCHOR BASE & U-BOLTS - HIGH STRENGTH STEEL - MINIMUM YIELD STRESS 55,000 LBS. SQ. IN. - MIN. ULTIMATE 90,000 P.S.I.
 - WELDING ROD - ASTM-A233 - CLASS E60XX OR 70XX.
 - GALVANIZING - WHEN SPECIFIED ASTM-A123.

TRAFFIC SIGNAL POLE FOUNDATIONS

THE CONTRACTOR SHALL STAKE THE LONGITUDINAL AND LATERAL LOCATION, AND THE ELEVATION OF THE TOP OF EACH FOUNDATION SUBJECT TO THE APPROVAL OF THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER ELEVATION, OFFSET, AND LEVEL OF EACH FOUNDATION. THE FOUNDATION LOCATIONS MAY BE CHANGED AS DIRECTED BY THE ENGINEER, IN CASE OF SLOPE OR SUBSURFACE DIFFICULTIES. EXCAVATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 503. EXCAVATION SHALL BE TO THE DIMENSIONS SHOWN ON THE PLANS, AND SHALL BE PERFORMED BY MEANS OF AN EARTH AUGER OF THE SPECIFIED DIA. UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

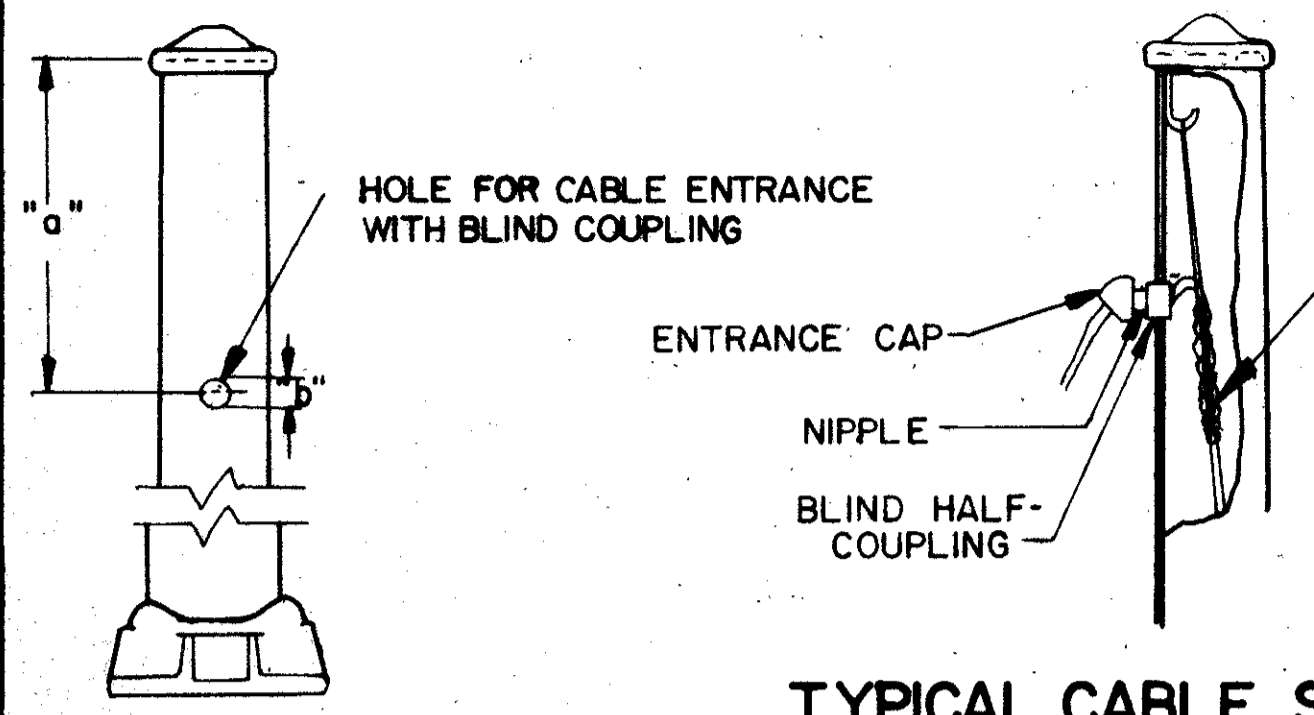
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CONCRETE, CLASS C, SHALL BE PLACED IN ACCORDANCE WITH THE REQUIREMENTS OF ITEM 511, AND SHALL BE PLACED AGAINST UNDISTURBED SOIL OR COMPACTED EMBANKMENT. STEEL REINFORCEMENT BARS, WHERE REQUIRED, SHALL BE POSITIONED AS SHOWN ON THE PLANS AND PLACED IN ACCORDANCE WITH ITEM 509.

CYLINDRICAL ANCHOR BASE TYPE FOUNDATIONS FOR TRAFFIC SIGNAL POLES SHALL HAVE ANCHOR BOLTS AND CONDUIT ACCURATELY HELD IN POSITION WITH A TEMPLAT WHILE CONCRETE IS PLACED. FORMS SHALL BE USED FOR THE UPPER PORTIONS OF ALL FOUNDATIONS AND NO BACKFILLING SHALL BE PERMITTED FROM THE BOTTOM TO SIX INCHES BELOW THE GRADE LEVEL. NO GROUTING OF CONCRETE SHALL BE PERMITTED BETWEEN THE FOUNDATION TOP AND THE POLE BASE.

TRAFFIC SIGNAL POLE

WHERE A WIRE ENTRANCE IS REQUIRED, THE SERVICE ENTRANCE HEAD SHALL BE LOCATED APPROXIMATELY 12" BELOW SPAN WIRE CLAMP.



TYPICAL CABLE STRAIN RELIEF & ENTRANCE CAP DETAILS

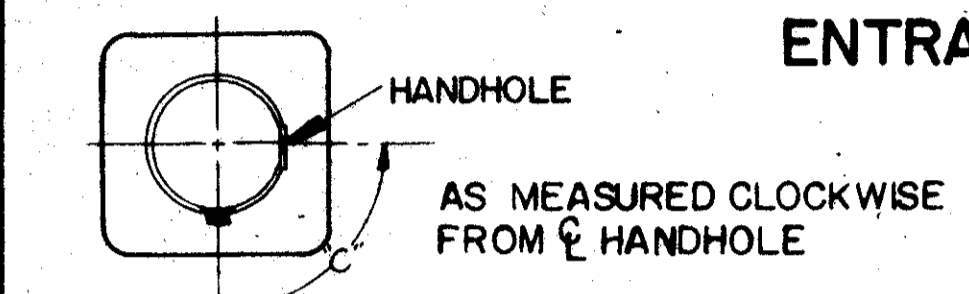
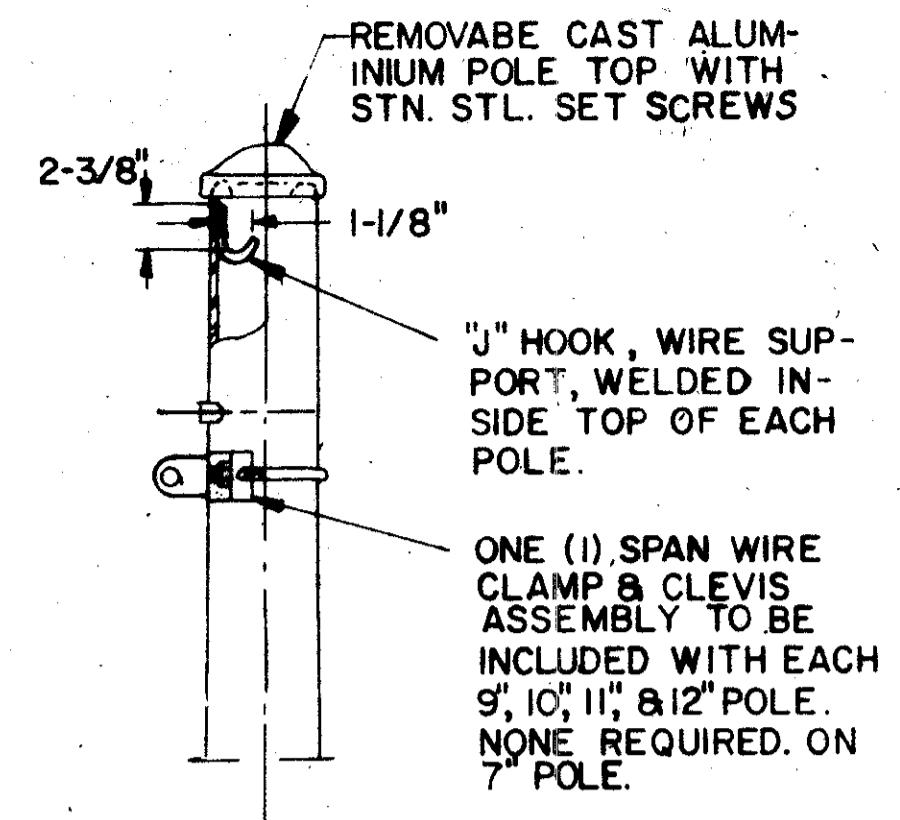


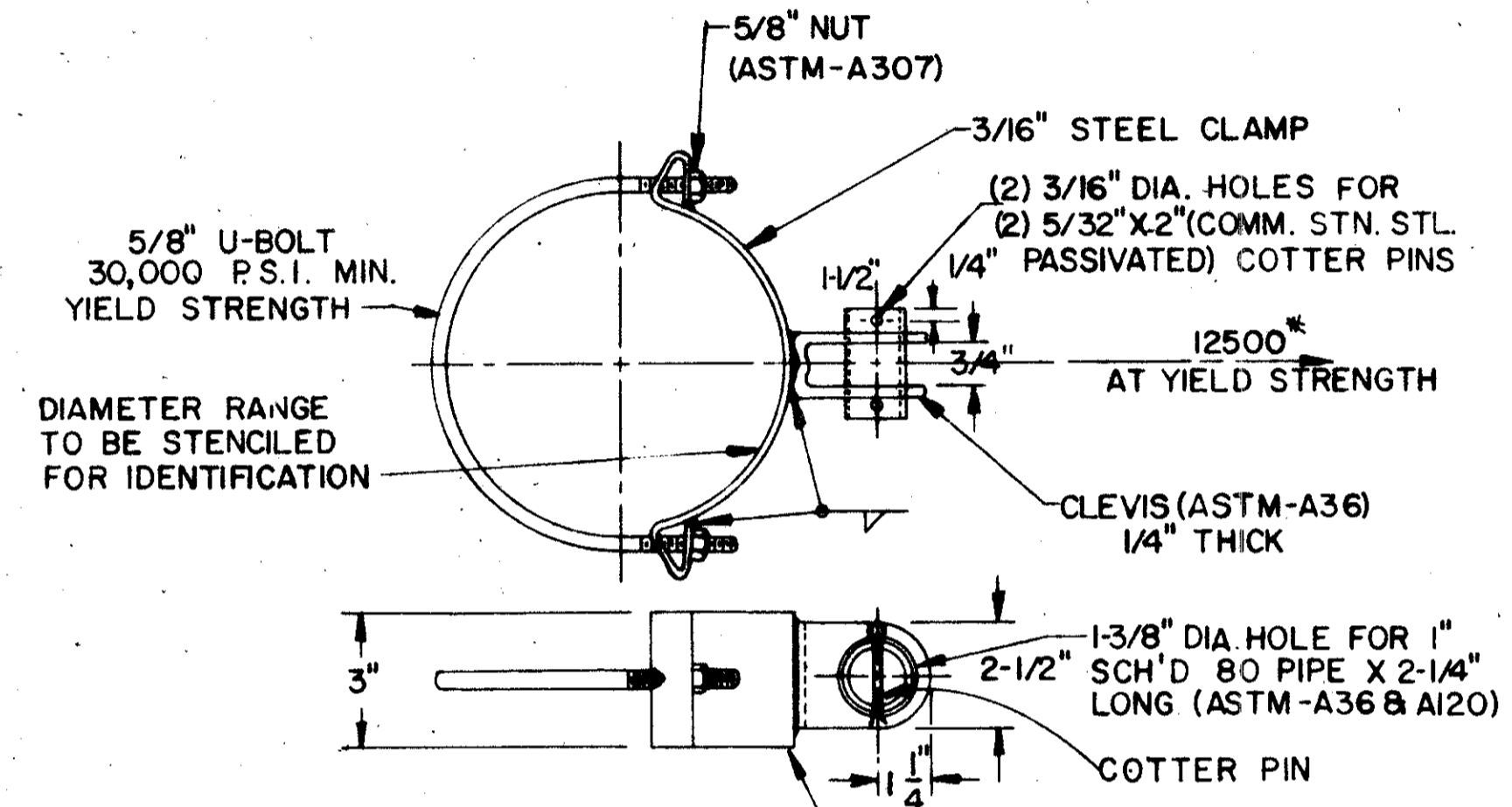
TABLE 2

CONFIG.	"a"	"b"	"c"
A	30"	2"	90°
B	30"	2"	180°
C	30"	2"	270°
D	48"	2"	90°
E	48"	2"	180°
F	48"	2"	270°
G	NO HOLE REQUIRED		

CABLE ENTRANCE LOCATION DETAIL

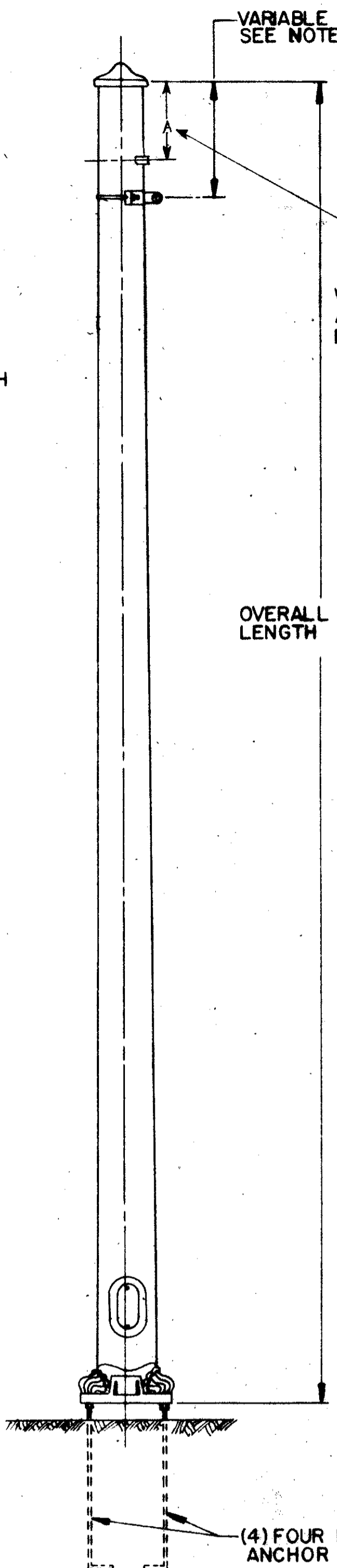


POLE TOP DETAILS



TYPE	CLAMP RANGE MIN.	CLAMP RANGE MAX.
I	3.1"	3.6"
II	3.6"	4.4"
III	4.4"	5.2"
IV	5.2"	5.8"
V	5.8"	6.8"
VI	6.8"	7.9"
VII	7.9"	9.0"
VIII	9.0"	10.1"
IX	10.1"	11.3"
X	11.3"	12.1"
XI	12.1"	13.4"
XII	13.4"	14.5"
XIII	14.5"	15.5"
XIV	15.5"	16.5"

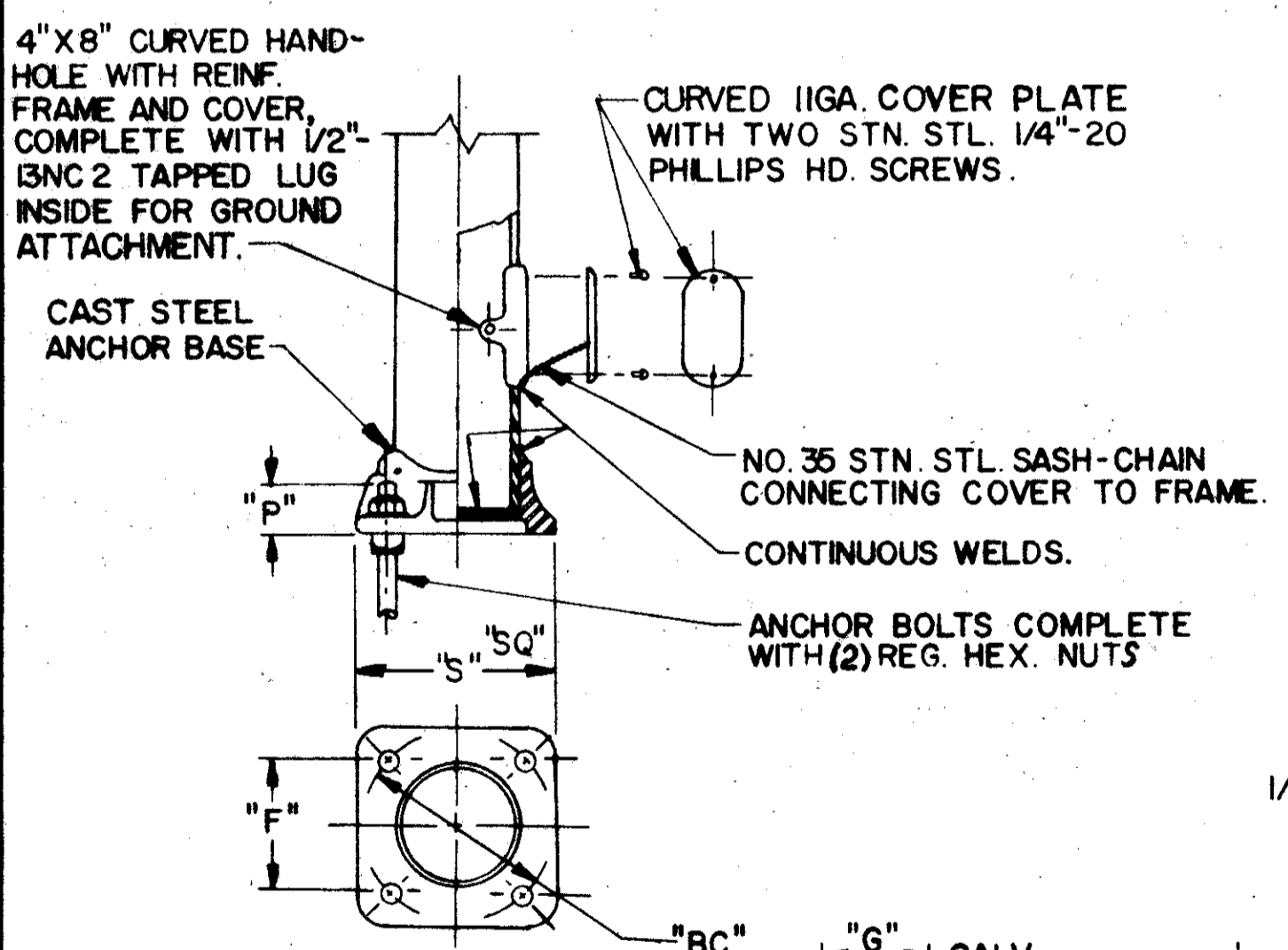
SPAN WIRE CLAMP DETAILS



STEEL STRAIN POLE

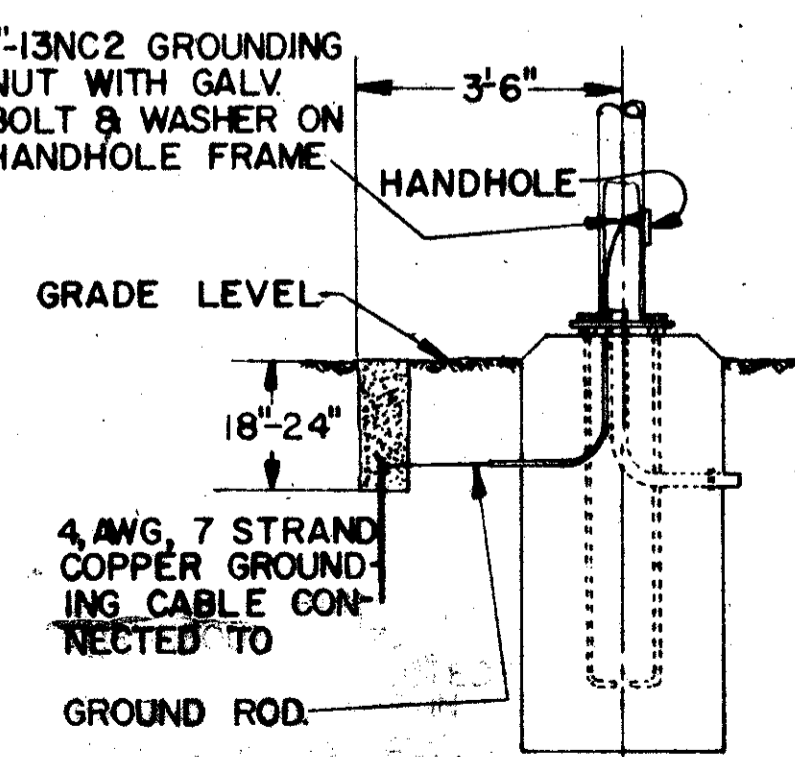
BASE TYPE	BASE DIA.	TOP DIA.	OVERALL LENGTH	WALL THICKNESS	DESIGN DATA FOR TRANSVERSE LOAD AT 18" DOWN FROM TOP	"H"	"D"
					RATE OF ELAST. DEFL. LD. AT YIELD STRENGTH		
1	7.0"	4.20"	20.0'	(3 GA.) .250"	59"/100"	2135"	42" 24"
2	9.0"	5.36"	26.0'		64"/100"	2730"	54" 24"
3	10.0"	6.36"			44"/100"	3400"	54" 24"
4	11.0"	7.36"	28.0'		32"/100"	4140"	84" 30"
5	12.0"	8.36"			24"/100"	4960"	84" 36"
6	9.0"	5.08"	30.0'		84"/100"	2520"	54" 24"
7	10.0"	6.08"			54"/100"	3140"	54" 24"
8	11.0"	7.08"	30.0'		41"/100"	3650"	84" 30"
9	12.0"	8.08"			31"/100"	4590"	84" 36"
10	9.0"	4.80"	30.0'		110"/100"	2350"	54" 24"
11	10.0"	5.80"			74"/100"	2920"	54" 24"
12	11.0"	6.80"	30.0'		53"/100"	3560"	84" 30"
13	12.0"	7.80"		39"/100"	4260"	84" 36"	

STRAIN POLE TYPES

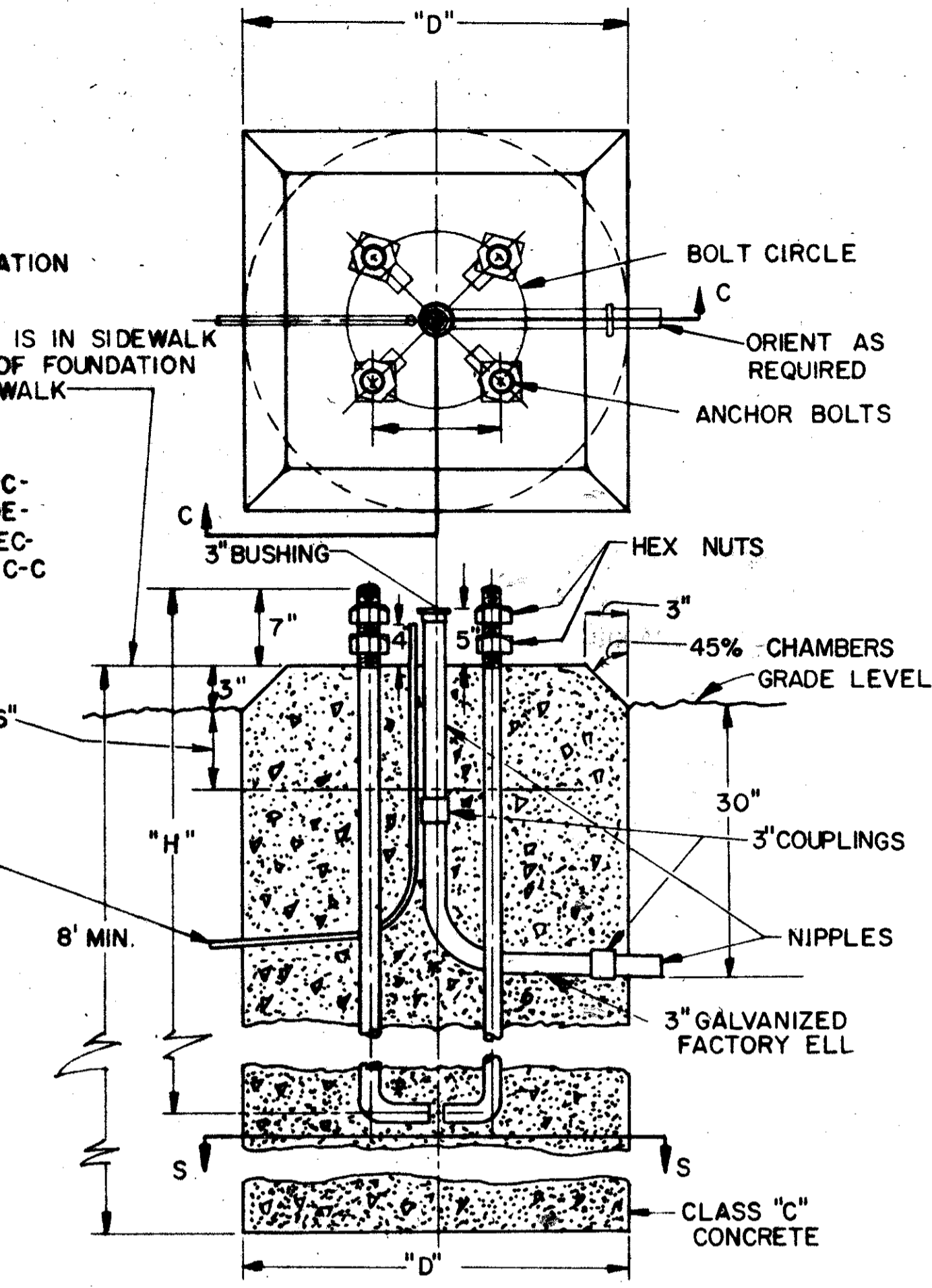


ANCHOR BASE DATA					ANCHOR BOLT DATA		
POLE DIA.	"BC"	"F"	"S"	"P"	SIZE	"L"	"G"
7"	10"	7 1/16"	10 1/2"	2 1/4"	1/4" X 48"	40"	8"
9"	12 1/2"	8 7/8"	12 3/4"	3"	1/2" X 60"	54"	9"
10"	13 1/2"	9 9/16"	14 1/8"	3 3/8"	1/2" X 60"	54"	9"
11"	15"	10 5/8"	15 5/8"	3 5/8"	3/4" X 90"	84"	9"
12"	16"	11 5/16"	17"	4"	3/4" X 90"	84"	9"

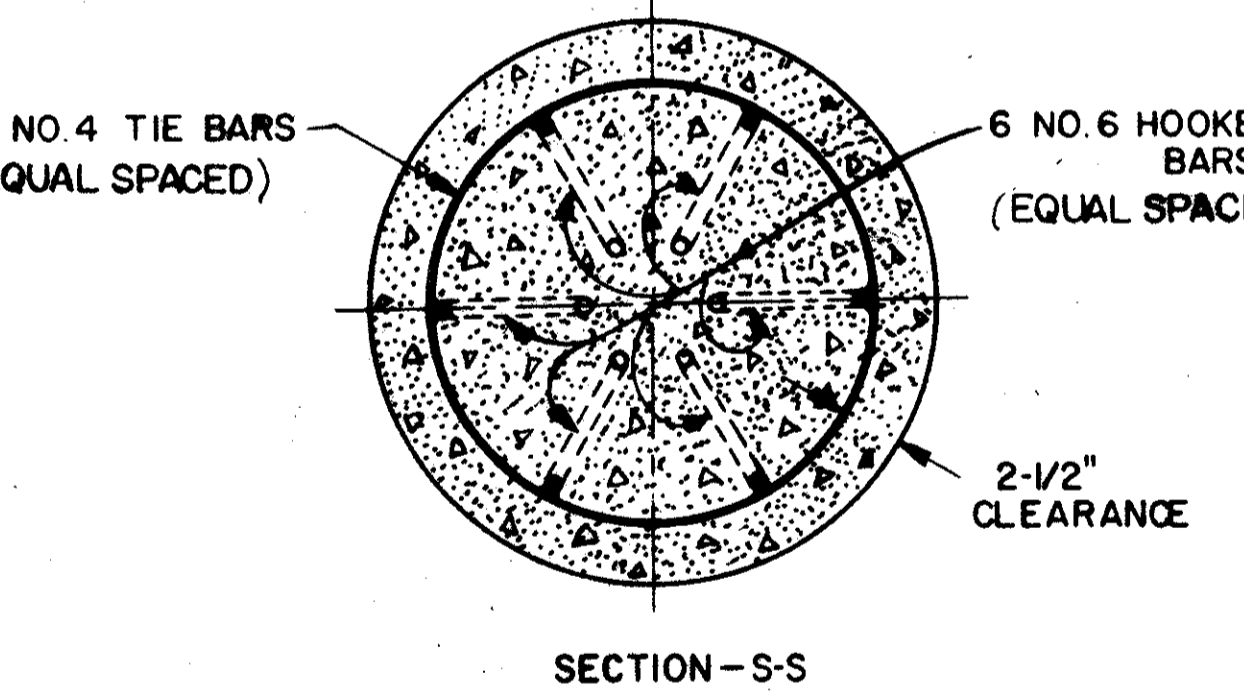
TYPICAL HANDHOLE, ANCHOR BASE & ANCHOR BOLT DETAILS



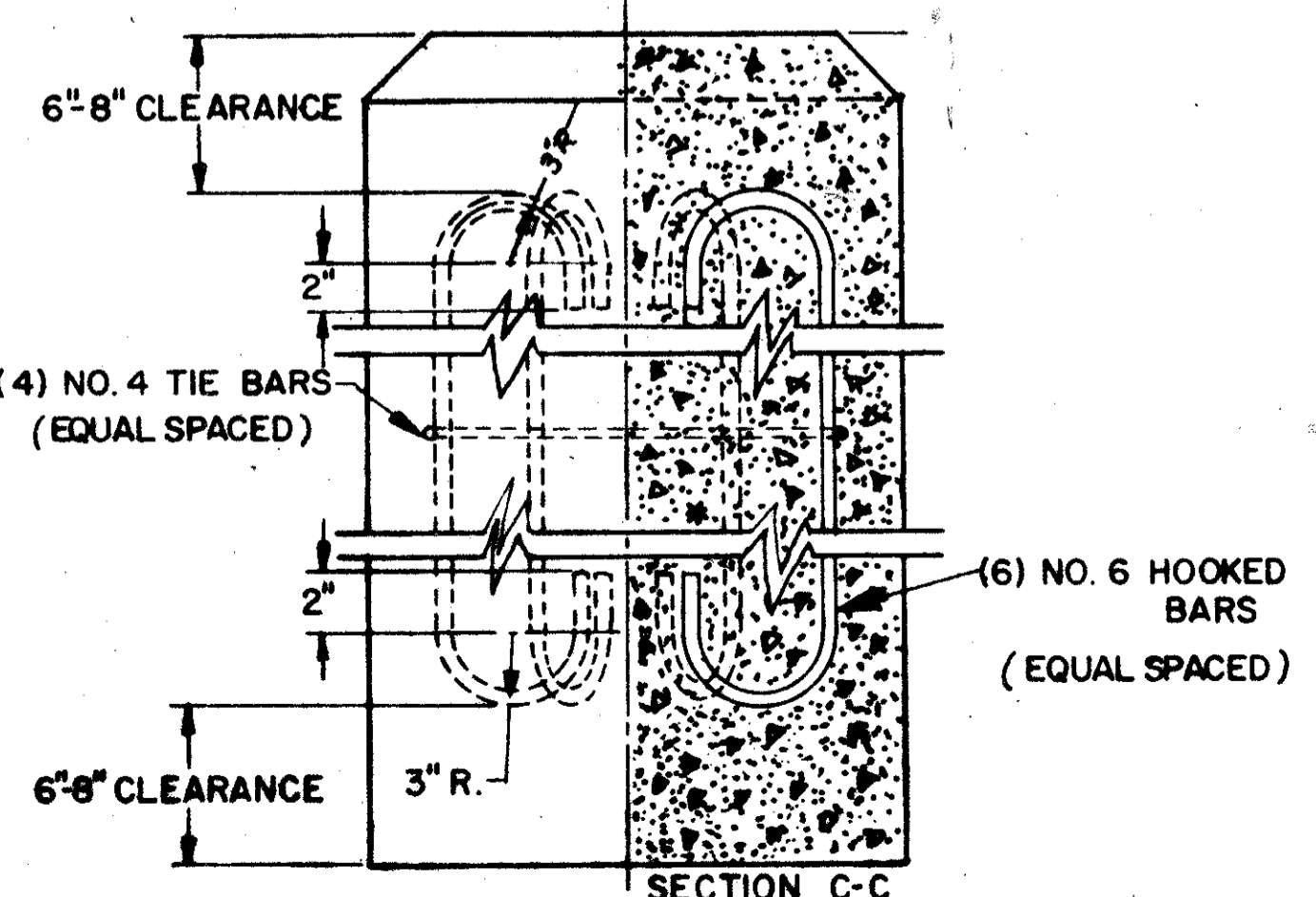
TYPICAL GROUND ROD DETAIL



TYPICAL STRAIN POLE FOUNDATION



SECTION - S-S



TYPICAL REINFORCING STEEL SECTIONS

GROUND ROD

GROUND ROD SHALL BE IN ACCORDANCE WITH TYPICAL GROUND ROD DETAIL AND TESTED IN ACCORDANCE WITH 625.22 CONSTRUCTION AND MATERIAL SPECIFICATIONS.

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

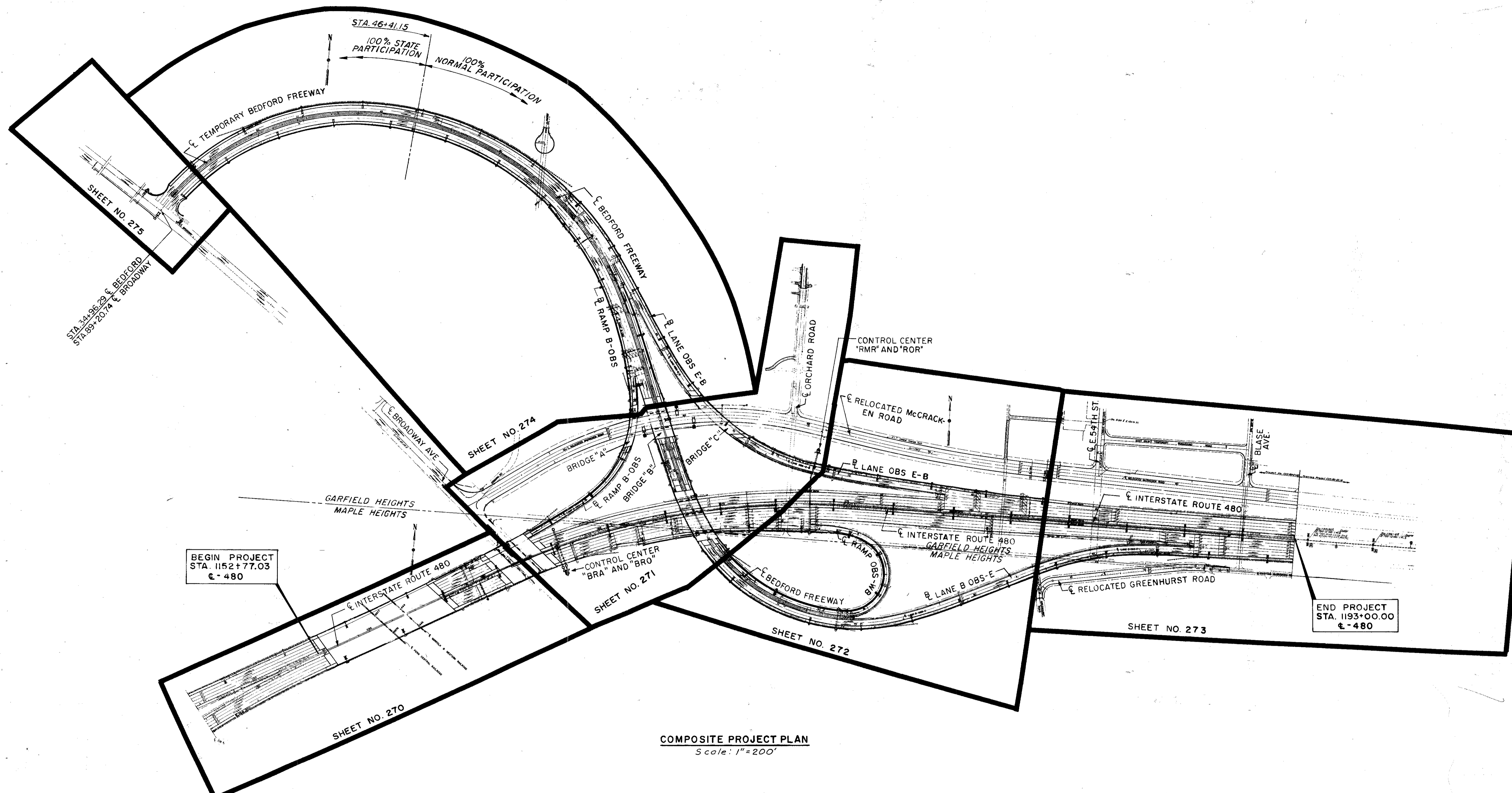
STEEL STRAIN POLE & FOUNDATION DETAILS

APPROVED _____ ENGINEER OF TRAFFIC

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

266
390

CUYAHOGA COUNTY
CUY-480-21.40



COMPOSITE PROJECT PLAN
Scale: 1"=200'

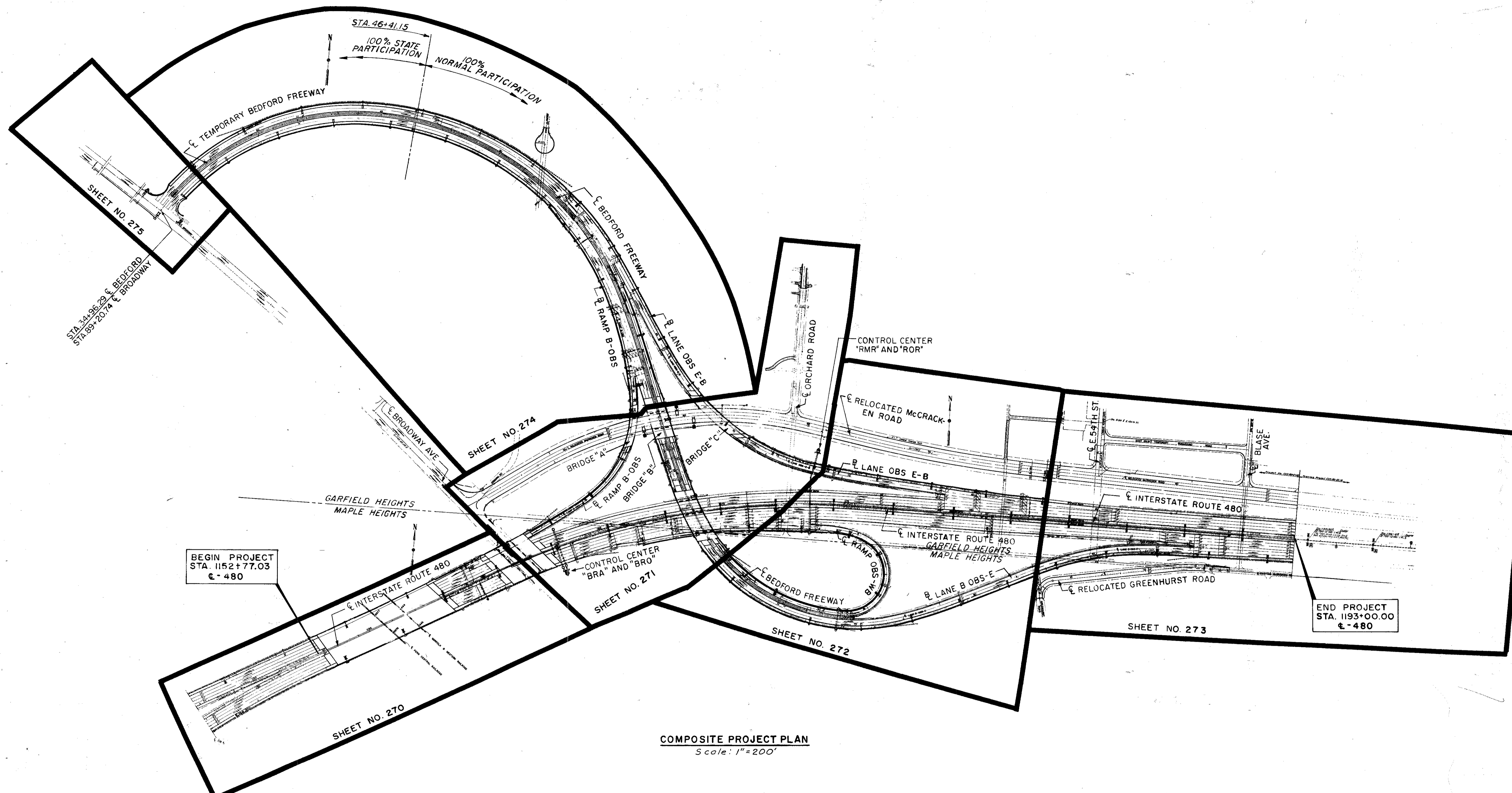
SCALE 1"=200'
HOWARD, NEEDLES, TAMMEN & BERGENOFF
MADE LWL DATE 5-6-70 CONSULTING ENGINEERS
TRCD LWL DATE 5-6-70
CKD GJC DATE 9-6-72 KANSAS CITY CLEVELAND NEW YORK

SCHMATIC LIGHTING PLAN LAYOUT

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

266
390

CUYAHOGA COUNTY
CUY-480-21.40



COMPOSITE PROJECT PLAN
Scale: 1"=200'

SCALE 1"=200'
HOWARD, NEEDLES, TAMMEN & BERGENOFF
MADE LWL DATE 5-6-70 CONSULTING ENGINEERS
TRCD LWL DATE 5-6-70
CKD GJC DATE 9-6-72 KANSAS CITY CLEVELAND NEW YORK

SCHMATIC LIGHTING PLAN LAYOUT

LIGHTING NOTES

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

267
390

CUYAHOGA COUNTY
CUY-480-21.40

GENERAL - 625.03

All construction methods, materials and workmanship shall conform to Items 625 and 713, except as modified or supplemented herein or on the drawings, of the State of Ohio Department of Highways' Construction and Material Specifications dated January 1, 1971.

Reference shall be made to Standard Construction Drawings

The Contractor shall cooperate with the Cleveland Electric Illuminating Company whose address is:
Cleveland Electric Illuminating Company
Illuminating Building
Public Square
Cleveland, Ohio

mailing address
Post Office Box 5000
Cleveland, Ohio 44101

The Contractor will not be required to furnish or install the primary distribution lines, transformers, transformer poles, primary controllers, metering equipment or housings for the same. The Contractor shall provide connections to branch circuits and grounds as hereinafter specified.

The project has been designed on the basis of 5% maximum voltage drop permissible on branch circuits. The project will receive 480-volt controlled secondary service from C.E.I. Co. This project has been designed on the basis of 1.2 Ft. C. initial with a maximum uniformity ratio of 4.0 to 1.0.

LIGHT POLE - 625.05 and 713.01

Reference Letter	Light Pole		Foundation Anchor Bolts		Gauge	Size	Bolt Circle Diameter	Inch	Transformer Base Style	Foundation Size
	* Design Number	Sheet Size	Size	Bolt Circle Diameter						
A	A12BB39.0D	9" x 5.80" x 32'-0"	1 1/2" x 42"	Rect. 8"x8"					Med	4' x 14' x 7'-5"
B	AT15B41.7	9" x 5.65" x 33'-6"	1" x 40"	15"					AFA	24" x 8'-0"
C	T15B41.7	9" x 5.65" x 33'-6"	1" x 40"	15"					AFA	24" x 8'-0"
D	T15B36.7	8 1/2" x 5.65" x 28'-6"	1" x 40"	15"					AFA	24" x 6'-0"
E	AT15B36.7	8 1/2" x 5.65" x 28'-6"	1" x 40"	15"					AFA	24" x 6'-0"
F	AT15B34.2	9" x 4.87" x 29'-6"	1" x 40"	15"					AFA	24" x 6'-0"
G	AT10B34.2	8" x 3.87" x 29'-6"	1" x 40"	15"					AFA	24" x 6'-0"
H	A15B40	9" x 5.65" x 33'-6"	1 1/2" x 85" U-bolts	12 1/2"					None	Bridge
I	A15B35	9" x 5.01" x 28'-6"	1 1/2" x 85" U-bolts	12 1/2"					None	Bridge
J	A10B32.5	8" x 3.87" x 29'-6"	1 1/2" x 85" U-bolts	11"					None	Bridge
K	T25B36.7	9" x 6.15" x 28'-6"	1" x 40"	15"					AT-A	24" x 8'-0"
L	T25B34.2	9" x 6.3" x 27'-0"	1" x 40"	15"					AT-A	24" x 8'-0"
M	AT15B26.7	8" x 4.92" x 22'-0"	1" x 40"	15"					AT-A	24" x 6'-0"
N	AT25B41.7	9 1/2" x 6.15" x 33'-6"	1" x 40"	15"					AT-A	24" x 8'-0"

ESTIMATED QUANTITIES

An estimated quantity of "14 Each of 625 Markers" is provided in the lighting general summary for use as directed by the Engineer in providing ground surface indication of the location of underground circuits. The markers shall be located directly over the centerline of the cable or duct. It is intended that a marker shall be provided at a point midway between adjacent side-mounted light units where the distance between units exceeds 300 feet but does not exceed 450 feet, and at intervals of approximately 200 feet on all other circuit sections located outside of paved areas.

An estimated quantity of "120 lin. ft. of 605, 4-inch shallow pipe underdrains" is provided in the lighting general summary for use as directed by the Engineer in providing positive drainage for pull boxes in fill areas. It is intended that all pull boxes in these areas be provided with such drainage, provided the length of underdrain necessary to obtain a satisfactory outfall does not exceed 20 feet approximately. A perforated PVC pipe or conduit material approved by the Engineer may be used in the construction of this item.

STANDARD CONSTRUCTION DRAWING HL-3

Pole base details shown on this drawing are essentially for galvanized steel poles. For aluminum designs, or other permitted steel material design, variations from these details will be acceptable, as approved by the Engineer.

STANDARD CONSTRUCTION DRAWING HL-15

Weephole diameters of 1/8 inch shown on this drawing shall be increased to 1/4 inch.

LIGHT POLE FOUNDATIONS - 625.06

Where 3" crossover conduit terminates in a light pole foundation it shall continue into the foundation as a 3" conduit. The light pole concrete foundations shall be constructed to the depth as shown on the detail sheets unless so directed by the Engineer. If any caving is encountered, the Contractor shall drive a steel casing, of sufficient weight and strength, and remove the soil from within by an auger. The steel casing may be reused if pulling is coordinated with the pouring of concrete.

LUMINAIRES - 625.07 and 713.11

400-Watt luminaires shall have dual rated 240/480-volt (120/240-volt for C.E.I. servicing), integral, regulator ballasts, Type II-M-C or III-M-C distribution, and shall be General Electric M400, Westinghouse OV-25, McGraw-Edison "Unistyle", or equal approved by the Engineer. 700-Watt luminaires shall have single rated 480-volt, 700-watt, integral regulator ballasts, Type III-M-C distribution and shall be General Electric M-1000, Westinghouse OV-50, McGraw-Edison "Unistyle" or equal approved by the Engineer.

UNDERDECK LUMINAIRES - 625.07 - 713.13

250-Watt underdeck luminaires shall have dual rated 240/480V (120/240V for C.E.I. integral, regulator ballasts and shall be Holophane "Underpass Wallpack", Westinghouse, McGraw-Edison underpass unit approved by the Engineer, and shall be furnished with an integral fuse holder and fuse.

LAMPS - 625.08 and 713.14

Mercury lamps shall be General Electric's "Bonus Line", Westinghouse's "Life-guard", Sylvania's "Rough Service", or equal approved by the Engineer.

CONDUIT, 3-INCH, 713.04 TYPE III, JACKED UNDER PAVEMENT, AS PER PLAN

This item shall consist of installing conduit of the 3" diameter size under the existing pavement and contiguous shoulders by an approved method such as "drilling" or "jacking".

The Contractor shall place the conduit with the least amount of disturbance to the existing pavement, subbase, berm pavement, or shoulders of the roadway. All push pits or any necessary excavations shall be backfilled and restored in accordance with 625.01.

CONDUIT - 625.13 and 713.04

Expansion fittings for conduit in structures shall be OZ Type AX, Spring City Type AF, Appleton Type XJ, or equal approved by the Engineer, and shall be included for payment with conduit in structures.

SERVICE TO UNDERDECK LIGHTING, AS PER PLAN - 625

This item shall consist of providing complete electrical service, except for luminaires, lamps and grounding systems, for underdeck lighting system on Bridge No. CUY-480-2154 over Broadway and Bridge No. CUY-480-2169 over I-480. The installation work shall include conduits, mounting all items required to be mounted, fittings, junction boxes, cables, and all incidentals necessary to complete, ready for use, the service as detailed.

The underdeck lighting service for Bridge C over Relocated McCracken Road, shall include installation of the underdeck units on 120 V. system, pull box, conduit, weatherhead, conductors from pull box up to connection on C.E.I. pole and all incidentals necessary to complete, ready for use, the service as detailed.

The underdeck lighting service for Bridge A and B over Relocated McCracken Road shall be installed as detailed in plan on 120 V. system, and shall include all items from pull box to lighting units, mounting conduit, conductors, fittings and all incidentals necessary to complete, ready for use.

The lump sum price bid for "Item 625 - "Service to Underdeck Lighting", as per plan, shall include payment for all equipment, labor, and materials necessary to complete the work as specified. Component parts not specifically mentioned but required for satisfactory operation of this item shall be furnished and considered paid for as part of this item.

Payment for the 120 Volt service on Relocated McCracken Road shall be included in the lump sum price bid for "Service to Underdeck Lighting Bridge C".

HIGH VOLTAGE DIRECT CURRENT TESTS

A High Voltage Test, as described in Supplemental Specification 839, shall be performed on all distribution cable and duct cable systems to be installed on this project, after all construction is completed, including guardrail, fences, delineator posts, signs, etc.

Basis of payment for this testing item shall be at the contract lump price bid, which shall include all labor, recording the data from control center to the disconnect switch at each sign, materials and equipment required to complete this item of work.

CONTROL CENTERS - 625.19 and 713.20

The Contractor shall furnish and install all control centers, located as per the plans, to serve the roadway and sign circuits. The control centers shall include the control equipment, located and mounted as shown on the Lighting Layout and Control Center Detail Sheets, and as specified below. The Contractor shall install the secondary distribution panels in the Control Center enclosure furnished and installed by the Contractor for Control Centers "BRA", "BRO", "RRM" and "RRP". The Contractor shall provide all incidentals required for the 480-volt, secondary, branch circuits for roadway and sign lighting at the locations where indicated on the plans.

Each switch enclosure shall be furnished with one padlock. Padlocks shall have a brass body and wrought iron shackle equal to Russwin No. 2882 KA or Master No. 4KA or approved equal. Padlocks shall be all keyed alike with master key 3476.

POLYVINYL CHLORIDE PLASTIC CONDUIT

1. Scope. This specification covers polyvinyl chloride conduit for encasement in concrete and shall be of the size and type specified.

2. Detail Requirements. Conduit furnished under this specification shall comply with one of the following:

(a) Conduit conforming to NEMA Standards Publication No. TC 1 with the exception that conduit and conduit fittings composed of styrene polymers or copolymers shall not be acceptable and (2) the physical requirements TC1-3.03 and TC1-3.04, and the test methods TC1-4.05 and TC1-4.06 shall not be required.

(b) Conduit conforming to NEMA Standards Publication No. TC 6 with the exception that conduit and conduit fittings composed of acrylonitrile-butadiene-styrene (ABS) shall not be acceptable.

(c) Conduit conforming to the requirements of (a), above, with the additional exceptions that where 4 inch nominal size conduit is to be encased in concrete it shall be permissible to use conduit having a minimum wall thickness of 0.075 inch and an outside diameter of 4.202 to 4.360 inches instead of those specified in NEMA Standards Publication No. TC 1.

For any given installation the mixed use of the conduits described in (a) and (b) shall be prohibited.

When the conduit described in (c) is used, all such conduit used in a given installation shall be the product of a single manufacturer.

CABLE CONNECTORS AND CONNECTOR KITS 625.17 - 713.15

In lieu of the fuse amperage rating shown elsewhere, the following shall apply to this project:

No. of Lamps Served	Lamp Rating (Watts)	Fuse Rating (Amps)
1	250	10
1	400	10
1	700	10
2	700	15

SCALE: No Scale HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE M.A.C. DATE 6-12-72 CONSULTING ENGINEERS
TRCB MAC DATE 6-12-72
CRD GJC DATE 9-5-72 KANSAS CITY CLEVELAND NEW YORK

REV. 1-9-74
REV. 12-7-73
LIGHTING NOTES

LIGHTING NOTES

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

267
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CUYAHOGA COUNTY
CUY-480-21.40

GENERAL - 625.03

All construction methods, materials and workmanship shall conform to Items 625 and 713, except as modified or supplemented herein or on the drawings, of the State of Ohio Department of Highways' Construction and Material Specifications dated January 1, 1971.

Reference shall be made to Standard Construction Drawings

The Contractor shall cooperate with the Cleveland Electric Illuminating Company whose address is:
Cleveland Electric Illuminating Company
Illuminating Building
Public Square
Cleveland, Ohio

mailing address
Post Office Box 5000
Cleveland, Ohio 44101

The Contractor will not be required to furnish or install the primary distribution lines, transformers, transformer poles, primary controllers, metering equipment or housings for the same. The Contractor shall provide connections to branch circuits and grounds as hereinafter specified.

The project has been designed on the basis of 5% maximum voltage drop permissible on branch circuits. The project will receive 480-volt controlled secondary service from C.E.I. Co. This project has been designed on the basis of 1.2 Ft. C. initial with a maximum uniformity ratio of 4.0 to 1.0.

LIGHT POLE - 625.05 and 713.01

Reference Letter	Light Pole		Foundation Anchor Bolts		Gauge	Size	Bolt Circle Diameter	Inch	Transformer Base Style	Foundation Size
	* Design Number	Sheet Size	Size	Bolt Circle Diameter						
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B	AT15B41.7	9"x5.65" x 33'-6"	1" x 40"	15"					AFA	24"x 8'-0"
C	T15B41.7	9"x5.65" x 33'-6"	1" x 40"	15"					AFA	24"x 8'-0"
D	T15B36.7	8 1/2"x5.65" x 28'-6"	1" x 40"	15"					AFA	24"x 6'-0"
E	AT15B36.7	8 1/2"x5.65" x 28'-6"	1" x 40"	15"					AFA	24"x 6'-0"
F	AT15B34.2	9"x4.87" x 29'-6"	1" x 40"	15"					AFA	24"x 6'-0"
G	AT10B34.2	8"x3.87" x 29'-6"	1" x 40"	15"					AFA	24"x 6'-0"
H	A15B40	9"x5.65" x 33'-6"	1 1/2"x85" U-bolts	12 1/2"					None	Bridge
I	A15B35	9"x5.01" x 28'-6"	1 1/2"x85" U-bolts	12 1/2"					None	Bridge
J	A10B32.5	8"x3.87" x 29'-6"	1 1/2"x83 1/2" U-bolts	11"					None	Bridge
K	T25B36.7	9"x6.15" x 28'-6"	1" x 40"	15"					AT-A	24"x 8'-0"
L	T25B34.2	9"x6.3" x 27'-0"	1" x 40"	15"					AT-A	24"x 8'-0"
M	AT15B26.7	8"x4.92" x 22'-0"	1" x 40"	15"					AT-A	24"x 6'-0"
N	AT25B41.7	9 1/2"x6.15" x 33'-6"	1" x 40"	15"					AT-A	24"x 8'-0"

ESTIMATED QUANTITIES

An estimated quantity of "14 Each of 625 Markers" is provided in the lighting general summary for use as directed by the Engineer in providing ground surface indication of the location of underground circuits. The markers shall be located directly over the centerline of the cable or duct. It is intended that a marker shall be provided at a point midway between adjacent side-mounted light units where the distance between units exceeds 300 feet but does not exceed 450 feet, and at intervals of approximately 200 feet on all other circuit sections located outside of paved areas.

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STANDARD CONSTRUCTION DRAWING HL-3

Pole base details shown on this drawing are essentially for galvanized steel poles. For aluminum designs, or other permitted steel material design, variations from these details will be acceptable, as approved by the Engineer.

STANDARD CONSTRUCTION DRAWING HL-15

Weephole diameters of 1/8 inch shown on this drawing shall be increased to 1/4 inch.

LIGHT POLE FOUNDATIONS - 625.06

Where 3" crossover conduit terminates in a light pole foundation it shall continue into the foundation as a 3" conduit. The light pole concrete foundations shall be constructed to the depth as shown on the detail sheets unless so directed by the Engineer. If any caving is encountered, the Contractor shall drive a steel casing, of sufficient weight and strength, and remove the soil from within by an auger. The steel casing may be reused if pulling is coordinated with the pouring of concrete.

LUMINAIRES - 625.07 and 713.11

400-Watt luminaires shall have dual rated 240/480-volt (120/240-volt for C.E.I. servicing), integral, regulator ballasts, Type II-M-C or III-M-C distribution, and shall be General Electric M400, Westinghouse OV-25, McGraw-Edison "Unistyle", or equal approved by the Engineer. 700-Watt luminaires shall have single rated 480-volt, 700-watt, integral regulator ballasts, Type III-M-C distribution and shall be General Electric M-1000, Westinghouse OV-50, McGraw-Edison "Unistyle" or equal approved by the Engineer.

UNDERDECK LUMINAIRES - 625.07 - 713.13

250-Watt underdeck luminaires shall have dual rated 240/480V (120/240V for C.E.I. integral, regulator ballasts and shall be Holophane "Underpass Wallpack", Westinghouse, McGraw-Edison underpass unit approved by the Engineer, and shall be furnished with an integral fuse holder and fuse.

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Mercury lamps shall be General Electric's "Bonus Line", Westinghouse's "Life-guard", Sylvania's "Rough Service", or equal approved by the Engineer.

CONDUIT, 3-INCH, 713.04 TYPE III, JACKED UNDER PAVEMENT, AS PER PLAN

This item shall consist of installing conduit of the 3" diameter size under the existing pavement and contiguous shoulders by an approved method such as "drilling" or "jacking".

The Contractor shall place the conduit with the least amount of disturbance to the existing pavement, subbase, berm pavement, or shoulders of the roadway. All push pits or any necessary excavations shall be backfilled and restored in accordance with 625.01.

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Expansion fittings for conduit in structures shall be OZ Type AX, Spring City Type AF, Appleton Type XJ, or equal approved by the Engineer, and shall be included for payment with conduit in structures.

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The underdeck lighting service for Bridge C over Relocated McCracken Road, shall include installation of the underdeck units on 120 V. system, pull box, conduit, weatherhead, conductors from pull box up to connection on C.E.I. pole and all incidentals necessary to complete, ready for use, the service as detailed.

The underdeck lighting service for Bridge A and B over Relocated McCracken Road shall be installed as detailed in plan on 120 V. system, and shall include all items from pull box to lighting units, mounting conduit, conductors, fittings and all incidentals necessary to complete, ready for use.

The lump sum price bid for "Item 625 - "Service to Underdeck Lighting", as per plan, shall include payment for all equipment, labor, and materials necessary to complete the work as specified. Component parts not specifically mentioned but required for satisfactory operation of this item shall be furnished and considered paid for as part of this item.

Payment for the 120 Volt service on Relocated McCracken Road shall be included in the lump sum price bid for "Service to Underdeck Lighting Bridge C".

HIGH VOLTAGE DIRECT CURRENT TESTS

A High Voltage Test, as described in Supplemental Specification 839, shall be performed on all distribution cable and duct cable systems to be installed on this project, after all construction is completed, including guardrail, fences, delineator posts, signs, etc.

Basis of payment for this testing item shall be at the contract lump price bid, which shall include all labor, recording the data from control center to the disconnect switch at each sign, materials and equipment required to complete this item of work.

CONTROL CENTERS - 625.19 and 713.20

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Each switch enclosure shall be furnished with one padlock. Padlocks shall have a brass body and wrought iron shackle equal to Russwin No. 2882 KA or Master No. 4KA or approved equal. Padlocks shall be all keyed alike with master key 3476.

POLYVINYL CHLORIDE PLASTIC CONDUIT

1. Scope. This specification covers polyvinyl chloride conduit for encasement in concrete and shall be of the size and type specified.

2. Detail Requirements. Conduit furnished under this specification shall comply with one of the following:

(a) Conduit conforming to NEMA Standards Publication No. TC 1 with the exception that the conduit and conduit fittings composed of styrene polymers or copolymers shall not be acceptable and (2) the physical requirements TC1-3.03 and TC1-3.04, and the test methods TC1-4.05 and TC1-4.06 shall not be required.

(b) Conduit conforming to NEMA Standards Publication No. TC 6 with the exception that conduit and conduit fittings composed of acrylonitrile-butadiene-styrene (ABS) shall not be acceptable.

(c) Conduit conforming to the requirements of (a), above, with the additional exceptions that where 4 inch nominal size conduit is to be encased in concrete it shall be permissible to use conduit having a minimum wall thickness of 0.075 inch and an outside diameter of 4.202 to 4.360 inches instead of those specified in NEMA Standards Publication No. TC 1.

For any given installation the mixed use of the conduits described in (a) and (b) shall be prohibited.

When the conduit described in (c) is used, all such conduit used in a given installation shall be the product of a single manufacturer.

CABLE CONNECTORS AND CONNECTOR KITS 625.17 - 713.15

In lieu of the fuse amperage rating shown elsewhere, the following shall apply to this project:

No. of Lamps Served	Lamp Rating (Watts)	Fuse Rating (Amps)
1	250	10
1	400	10
1	700	10
2	700	15

SCALE: No Scale HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE M.A.C. DATE 6-12-72 CONSULTING ENGINEERS
TRCB MAC DATE 6-12-72
CRD GJC DATE 9-5-72 KANSAS CITY CLEVELAND NEW YORK

REV. 1-9-74
REV. 12-7-73
LIGHTING NOTES

GENERAL SUMMARY LIGHTING QUANTITIES

FED. RD. DIVISION	STATE	PROJECT
5	OHIO	CUYAHOGA COUNTY

268
390

LIGHTING NOTES-CONTINUED

* Normal Participation, these quantities are included in Total column under Roadway Normal Participation

Quantity Calculations
 Made By LWL Date 6-12-72
 Checked By J.R.K. Date 7-7-72
CUYAHOGA COUNTY
 CUY-480-21.40
 TYPE CODE 7221

LIGHT POLE ANCHOR BOLTS FOR BRIDGES AND RETAINING WALLS - 713.01

Anchor bolts for mounting light poles on bridges and retaining walls shall conform to the requirements of 713.01 and details shown on the plans and standard drawings or the approved shop drawings, for the respective poles to be placed thereon. Payment shall be made at the unit price bid for each set of bolts of the size required and necessary to install one pole, and this payment shall constitute full compensation for furnishing and placing the bolts.

ELECTRICAL SERVICE FOR ILLUMINATED SIGNS

The pay items in the Lighting General Summary include the pull box, adjacent to each lighted sign, and the connector kits, in the pull box, of type indicated on the plan sheets. Quantities for electrical service from the connector kits in the pull box to the sign are included in the Traffic Control General Summary.

LINE NO.	STRUCTURES												ROADWAY								GRAND TOTAL	ITEM	UNIT	DESCRIPTION	REFERENCE LETTER	LINE NO.	
	BRIDGE "C"			BRIDGE "B"			BRIDGE "A"			100% STATE PARTICIPATION		NORMAL PARTICIPATION						TOTAL	SHEET NO.								
	* 274		* 271		* 274		* 271		* 274		*	*	*	*	*	*	*			*							
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX								
1													4	4	5	2	15	15	625	Each	Light Pole Design No. A12BB39.0 D	A	1				
2														3		1	4	4	625	Each	Light Pole Design No. A715B41.7	B	2				
3													2		2		4	4	625	Each	Light Pole Design No. T15B41.7	C	3				
4														3	2		5	5	625	Each	Light Pole Design No. T15B36.7	D	4				
5													1	7	8	15	3	6	625	Each	Light Pole Design No. A715B36.7	E	5				
6															1		2	3	625	Each	Light Pole Design No. A715B34.2	F	6				
7														4	2		6	6	625	Each	Light Pole Design No. A710B34.2	G	7				
8																	5	5	625	Each	Light Pole Design No. A15B40, Bridge Mounted	H	8				
9		1	1	1				2									5	5	625	Each	Light Pole Design No. A15B35, Bridge Mounted	I	9				
10																	1	1	625	Each	Light Pole Design No. A10B32.5, Bridge Mounted	J	10				
11													1			1	2	3	625	Each	Light Pole Design No. T25B36.7	K	11				
12																	1	1	625	Each	Light Pole Design No. T25B34.2	L	12				
13																	1	1	625	Each	Light Pole Design No. A715B26.7	M	13				
14													1				1	1	625	Each	Light Pole Design No. AT25B41.7	N	14				
15																	1	1	625	Each	Bracket Arm 10'-0" Truss		15				
16																	1	1	625	Each	Bracket Arm 15'-0" Truss		16				
17													4	4	5	2	15	15	625	Each	Special 14 Foot Concrete Barrier Section for Light Pole Foundation		17				
18												1	1	1	2	4	1	12	13	625	Each	Light Pole Foundation 24"φ x 8'-0"		18			
19												2	7	9	15	3	13	7	38	47	625	Each	Light Pole Foundation 24"φ x 6'-0"		19		
20														1	10	11	12	5	44	44	625	Each	Luminaire, Type III, M-C, 700W, 713.11, 480V.		20		
21			1	1				2					4	8	12	13	4	2	23	35	625	Each	Luminaire, Type III, M-C, 400W, 713.11, 480V.		21		
22																		3	3	625	Each	Luminaire, Type III, M-C, 400W, 713.11, 120V.		22			
23			1					1					2	3	10	4		21	21	625	Each	Luminaire, Type II, M-C, 400W, 713.11, 480V.		23			
24								9	5	5							19	19	625	Each	Luminaire, Underdeck, 250W, 713.13, 480V.		24				
25					6			2										8	8	625	Each	Luminaire, Underdeck, 250W, 713.13, 120V.		25			
26													1	10	11	12	5	44	44	625	Ea.	Lamp, 700 Watt, Clear Mercury, 713.14		26			
27			1	1	1			1	2				4	8	12	15	3	14	9	47	59	625	Ea.	Lamp, 400 Watt, Clear Mercury, 713.14		27	
28								6	2	9	5	5						27	27	625	Ea.	Lamp, 250 Watt, Clear Mercury, 713.14		28			
29																		4	4	625	Ea.	Glare Shield, 700 W, 713.11, as per plan		29			
30																		3	3	625	Ea.	Glare Shield, 400W, 713.11, as per plan		30			
31													4	8	12	16	9	21	16	3	65	77	625	Ea.	Ground Rod		31
32													3	1	4	4		19	6	29	33	625	Ea.	Pull Box, 18-inch Circular, 713.09		32	
33													1265	1925	3190	3490	990	3840	3045	455	11,820	15,010	625	Lin.Ft.	Trench, 24-inch Deep		33
34																			100	100	625	Lin.Ft.	Conduit 2-inch, 713.04, Concrete Encased		34		
35													10	10				390	430	625	Lin.Ft.	Conduit, 3-inch, 713.04, As per Plan		35			
36													65	65							625	Lin.Ft.	Conduit, 3-inch, 713.04, Jacked Under Pavement as per Plan		36		
37	40	240	45	245	40	155	535	220	210	1105								829	50	3744	3744	625	Lin.Ft.	Conduit, 2-inch, 713.04, As per Plan		37	
38																				120	120	605	Lin.Ft.	4-inch Shallow Pipe Underdrains		38	
39	90	490	110	510	90	310	1070	650	615	2230	160		180	60	1640	2960	5550	620	16,995	17,155	625	Lin.Ft.	1 No. 4 AWG, 600V. Distribution Cable		39		
40		100	100	100		90	200	110	440	400	820	1220	1630	1120	2310	1920	420	8,540	9,760	625	Lin.Ft.	1 No. 10 AWG, 600V. Pole and Bracket Cable. Type RHH-RHW		40			
41													1305	1990	3295	3620	1030	3915	1815	420	10,800	14,095	625	Lin.Ft.	1/2" φ Duct Cable, 2-1/2 No. 4 AWG, 600V. Cables		41
42													2	2	3	1	4		12	14	625	Ea.	Markers		42		
43													2	2	6		2	40	10	58	60	625	Ea.	Connector Kit, Type I As Per Plan		43	
44		1	1	1									4	8	12	16	9	21	16	3	76	88	625	Ea.	Connector Kit, Type II As Per Plan		44
45		1	1	1									4	8	12	16	9	21	16	3	76	88	625	Ea.	Connector Kit, Type III As Per Plan		45
46													12	4	4			12	16	2	52	56	625	Ea.	Connector Kit, Type VIII-B As Per Plan		46
47																							625	Lu.	Control Center "BRA" and "BRO", 713.20 As Per Plan		47
48																							625	Lu.	Control Center "RMR" and "ROR", 713.20 As Per Plan		48
49																	2	1			3	3	625	Ea.	Special Median Barrier Pull Box, as per plan		49
50		1	1	1									8	3	2	4			6		27	27	625	Ea.	Junction Box, 18" x 8" x 6"		50
51																							625	Lu.	Service to Underdeck Lighting, Br. No. CUY-480-2154		51
52																							625	Lu.	Service to Underdeck Lighting, Br. No. CUY-480-2169		52
53																							625	Lu.	Service to Underdeck Lighting, Bridge A.		53
54																							625	Lu.	Service to Underdeck Lighting, Bridge B.		54
55																							625	Lu.	Service to Underdeck Lighting, Bridge C.		55
56																							625	Lu.	High Voltage Test		56
57		1	1	1																			625	Set	Light Pole Anchor Bolts		57
58																							625	Lu.	Struct. Grounding System, Br. No. CUY-480-2140		58
59																							625	Lu.	Struct. Grounding System, Br. No. CUY-480-2154		59
60																							625	Lu.	Struct. Grounding System, Br. No. CUY-480-2169		60
61																							625	Lu.	Struct. Grounding System - Bridge "A"		61
62																							625	Lu.	Struct. Grounding System - Bridge "B"		62
63																							625	Lu.	Struct. Grounding System - Bridge "C"		63
64																							625	Lu.			64
65																							625	Lu.			65

SCALE: No Scale
 HOWARD, NEEDLES, TAMMEN & BERGENOFF
 CONSULTING ENGINEERS
 MADE BY: LWL DATE: 6-12-72
 TRCD: LWL DATE: 6-12-72
 CKD: J.R.K. DATE: 7-17-72

GENERAL SUMMARY LIGHTING QUANTITIES

LIGHTING NOTES-CONTINUED

LIGHT POLE ANCHOR BOLTS FOR BRIDGES AND RETAINING WALLS - 713.01

Anchor bolts for mounting light poles on bridges and retaining walls shall conform to the requirements of 713.01 and details shown on the plans and standard drawings or the approved shop drawings, for the respective poles to be placed thereon. Payment shall be made at the unit price bid for each set of bolts of the size required and necessary to install one pole, and this payment shall constitute full compensation for furnishing and placing the bolts.

ELECTRICAL SERVICE FOR ILLUMINATED SIGNS

The pay items in the Lighting General Summary include the pull box, adjacent to each lighted sign, and the connector kits, in the pull box, of type indicated on the plan sheets. Quantities for electrical service from the connector kits in the pull box to the sign are included in the Traffic Control General Summary.

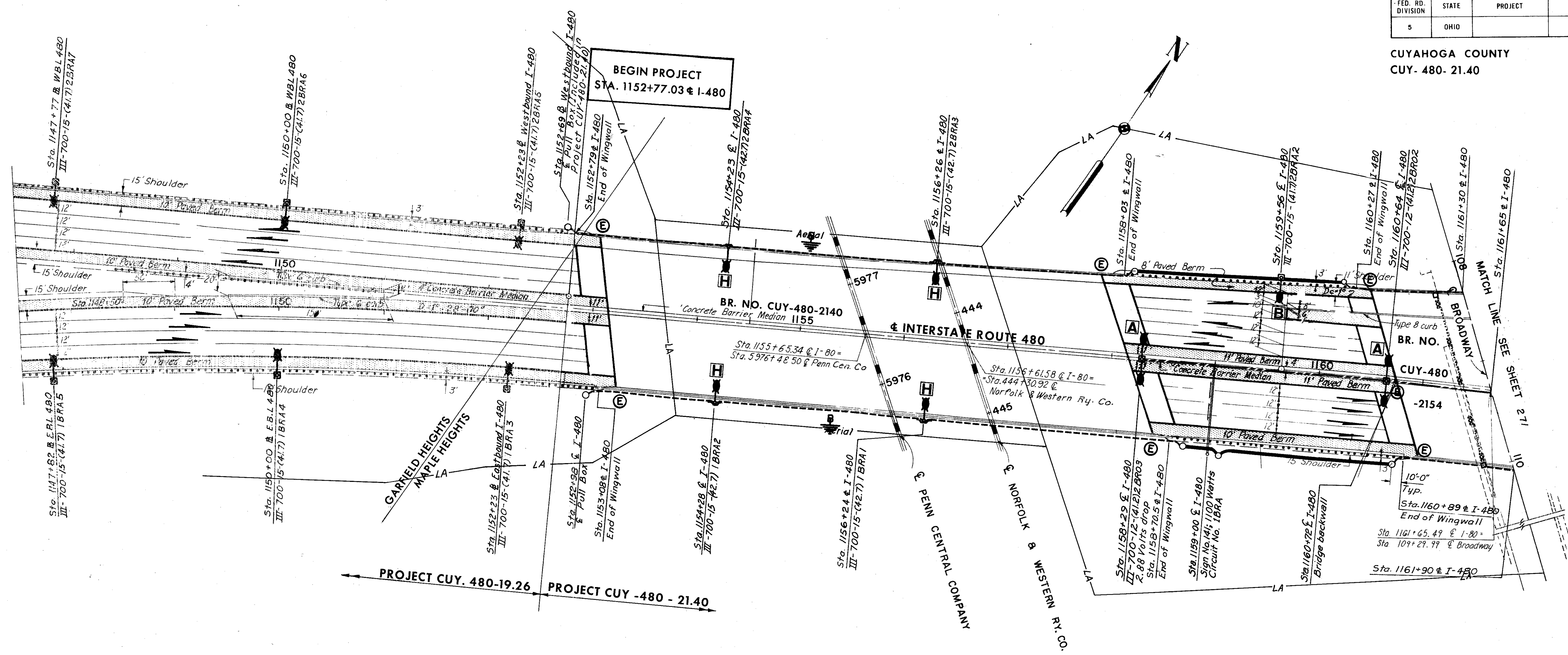
* Normal Participation, these quantities are included in Total column under Roadway Normal Participation

Quantity Calculations
Made By LWL Date 6-12-72
Checked By JRK Date 7-7-72
CUYAHOGA COUNTY
CUY-480-2140
TYPE CODE 7221

LINE NO.	STRUCTURES										ROADWAY										GRAND TOTAL	ITEM	UNIT	DESCRIPTION	REFERENCE LETTER	LINE NO.	
	BRIDGE "C"		BRIDGE "B"		BRIDGE "A"		CUY-480-2169	CUY-480-2154	CUY-480-2140	100% STATE PARTICIPATION			NORMAL PARTICIPATION							TOTAL							
	274	271	274	271	274	271	271	271	270	275	274	I	274	273	272	271	270	III	SHEET NO.								
1													4	4	5	2	15	15	625	Each	Light Pole Design No. A12BB39.0 D	A	1				
2														3		1	4	4	625	Each	Light Pole Design No. A715B41.7	B	2				
3													2		2		4	4	625	Each	Light Pole Design No. T15B41.7	C	3				
4														3	2		5	5	625	Each	Light Pole Design No. T15B36.7	D	4				
5									1	7	8	15	3	6			24	32	625	Each	Light Pole Design No. A715B36.7	E	5				
6									1	1					2		2	3	625	Each	Light Pole Design No. A715B34.2	F	6				
7													4	2			6	6	625	Each	Light Pole Design No. A710B34.2	G	7				
8								1									5	5	625	Each	Light Pole Design No. A15B40, Bridge Mounted	H	8				
9	1	1	1				2										5	5	625	Each	Light Pole Design No. A15B35, Bridge Mounted	I	9				
10								1									1	1	625	Each	Light Pole Design No. A10B32.5, Bridge Mounted	J	10				
11									1	1				1	1		2	3	625	Each	Light Pole Design No. T25B36.7	K	11				
12															1		1	1	625	Each	Light Pole Design No. T25B34.2	L	12				
13																	1	1	625	Each	Light Pole Design No. A715B26.7	M	13				
14												1					1	1	625	Each	Light Pole Design No. AT25B41.7	N	14				
15									1	1							1	1	625	Each	Bracket Arm 10'-0" Truss		15				
16									1	1							1	1	625	Each	Bracket Arm 15'-0" Truss		16				
17												4	4	5	2	15	15	625	Each	Special 14 Root Concrete Barrier Section for Light Pole Foundation		17					
18									1	1	1	2	4	4	1	12	13	625	Each	Light Pole Foundation 24"φ x 8'-0"		18					
19									2	7	9	15	3	13	7	38	47	625	Each	Light Pole Foundation 24"φ x 6'-0"		19					
20								1				4		1	10	11	12	5	44	625	Each	Luminaire, Type III, M-C, 700W, 713.11, 480V.		20			
21		1	1				2		4	8	12	13		4	2		23	35	625	Each	Luminaire, Type III, M-C, 400W, 713.11, 480V.		21				
22															3		3	3	625	Each	Luminaire, Type III, M-C, 400W, 713.11, 120V.		22				
23	1						1					2	3	10	4		21	21	625	Each	Luminaire, Type II, M-C, 400W, 713.11, 480V.		23				
24			6				2		9	5	5						19	19	625	Each	Luminaire, Underdeck, 250W, 713.13, 480V.		24				
25																	8	8	625	Each	Luminaire, Underdeck, 250W, 713.13, 120V.		25				
26									1		4		1	10	11	12	5	44	44	625	Ea.	Lamp, 700Watt, Clear Mercury, 713.14		26			
27	1	1	1				1	2			4	8	12	15	3	14	9	47	59	625	Ea.	Lamp, 400Watt, Clear Mercury, 713.14		27			
28			6				2	9	5	5							27	27	625	Ea.	Lamp, 250Watt, Clear Mercury, 713.14		28				
29																4		4	4	625	Ea.	Glare Shield, 700 W, 713.11, as per plan		29			
30																3		3	3	625	Ea.	Glare Shield, 400W, 713.11, as per plan		30			
31									4	8	12	16	9	21	16	3	65	77	625	Ea.	Ground Rod		31				
32									3	1	4	4			19	6	29	33	625	Ea.	Pull Box, 18-inch Circular, 713.09		32				
33									1265	1925	3190	3490	990	3840	3045	455	11,820	15,010	625	Lin.Ft.	Trench, 24-inch Deep		33				
34																100	100	100	625	Lin.Ft.	Conduit 2-inch, 713.04, Concrete Encased		34				
35									10	10					390	430		830	625	Lin.Ft.	Conduit, 3-inch, 713.04, As per Plan		35				
36									65	65							65	65	625	Lin.Ft.	Conduit, 3-inch, 713.04, Jacked Under Pavement as per Plan		36				
37	40	240	45	245	40	155	535	220	210	1105						829	50	3744	3744	625	Lin.Ft.	Conduit, 2-inch, 713.04, As per Plan		37			
38																	120	120	605	Lin.Ft.	4-inch Shallow Pipe Underdrains		38				
39	90	490	110	510	90	310	1070	650	615	2230	160	180	60	1640	2960	5550	620	16,995	17,155	625	Lin.Ft.	1 No. 4 AWG, 600V. Distribution Cable		39			
40		100	100	100		90	200	110	440	400	820	1220	1630	1120	2310	1920	420	8,540	9,760	625	Lin.Ft.	1 No. 10 AWG, 600V. Pole and Bracket Cable Type RHH-RHW		40			
41											1305	1990	3295	3620	1030	3915	1815	420	10,808	14,095	625	Lin.Ft.	1/2"φ Duct Cable, 2-1/2 No. 4 AWG, 600V. Cables		41		
42											2	2	3	1	4		12	14	625	Ea.	Markers		42				
43											2	2	6		2	40	10	58	60	625	Ea.	Connector Kit, Type I As Per Plan		43			
44	1	1	1				1	2	1		4	4	8	12	16	9	21	16	3	76	88	625	Ea.	Connector Kit, Type II As Per Plan		44	
45	1	1	1				1	2	1		4	4	8	12	16	9	21	16	3	76	88	625	Ea.	Connector Kit, Type III As Per Plan		45	
46								12	4	4		2	2	4	2		12	16	2	52	56	625	Ea.	Connector Kit, Type VIII-B As Per Plan		46	
47																							625	Lu.	Control Center "BRA" and "BRO", 713.20 As Per Plan		47
48																							625	Lu.	Control Center "RMR" and "ROR", 713.20 As Per Plan		48
49															2	1		3	3	625	Ea.	Special Median Barrier Pull Box, as per plan		49			
50	1	1	1				1	8	3	2	4					6		27	27	625	Ea.	Junction Box, 18"x8"x6"		50			
51																							625	Lu.	Service to Underdeck Lighting, Br. No. CUY-480-2154		51
52																							625	Lu.	Service to Underdeck Lighting, Br. No. CUY-480-2169		52
53																							625	Lu.	Service to Underdeck Lighting, Bridge A.		53
54																							625	Lu.	Service to Underdeck Lighting, Bridge B.		54
55																							625	Lu.	Service to Underdeck Lighting, Bridge C.		55
56																							839	Lu	High Voltage Test		56
57	1	1	1				1	2	1		4												625	Set	Light Pole Anchor Bolts		57
58																							625	Lu.	Struct. Grounding System, Br. No. CUY-480-2140		58
59																							625	Lu.	Struct. Grounding System, Br. No. CUY-480-2154		59
60																							625	Lu.	Struct. Grounding System, Br. No. CUY-480-2169		60
61																							625	Lu.	Struct. Grounding System - Bridge "A"		61
62																							625	Lu.	Struct. Grounding System - Bridge "B"		62
63																							625	Lu.	Struct. Grounding System - Bridge "C"		63
64																										64	
65																										65	

SCALE: No Scale
HOWARD, NEEDLES, TAMMEN & BERGENOFF
CONSULTING ENGINEERS
MADE BY LWL DATE 6-12-72
TRCD BY LWL DATE 6-12-72
CKD BY JRK DATE 7-17-72
KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY
CUY-480-21.40



LIGHTING KEY

- Typical Concrete Pole Base; with pole, on Transformer base.
- Typical Pole Base on Structure; with pole
- Typical Pole Base on Barrier Median; with pole
- Typical Lighting Unit; 1000 Watt luminaire with clear, 700 Watt, mercury vapor lamp, ANSI-IES Type III, with bracket arm, on pole base of Type shown.
- Typical Lighting Unit; 400 Watt luminaire with clear, 400 Watt, mercury vapor lamp, ANSI-IES Type III, with bracket arm, on pole base of Type shown.
- Typical Lighting Unit; 400 Watt luminaire with clear, 400 Watt, mercury vapor lamp, ANSI-IES Type II, with bracket arm, on pole base of Type shown.
- Typical Underdeck Lighting Unit; units installed on pier caps, 480 Volts, Type A mounting.
- Typical Underdeck Lighting Unit; units installed between girders, 480 Volts, Type B mounting.
- Typical Underdeck Lighting Unit; units installed between girders, 120 Volts, Type C mounting.

- Typical Light Pole Reference Letter, for type and size see "Lighting Notes".
- Glare Shield
- Duct Cable, directly buried, 24-inches deep.
- Circuit Cables in 2-inch diam. 713.04 Type III, conduit buried in the ground (or in Structures to the nearest pull box off structures).
- Circuit Cables in 3-inch diam. 713.04 Type III, conduit under paved areas.
- Circuit Cables in the 4-inch raceway void in the barrier median.
- Conduit in Structures, (size as per plan).
- Circuit Cables, pole and bracket cable, in 1 1/4-inch diam. 713.04 Type III, conduit in structures for underpass lighting units.

- Pull Box, 18-inch diameter.
- Junction Box, in structures, 18" x 8" x 6"
- Pull Box in barrier median.
- Control Center
- Typical Light Pole Identification; II is ANSI-IES Type; 400 is the lamp wattage; 10 is the bracket length; (34.2) is the luminaire mounting height; 1 is the circuit number, RMT is the control center, and 3 is the pole number in the circuit.
- Bridge Ground
- Expansion Joint in the conduit in Structures.
- Conduit Marker

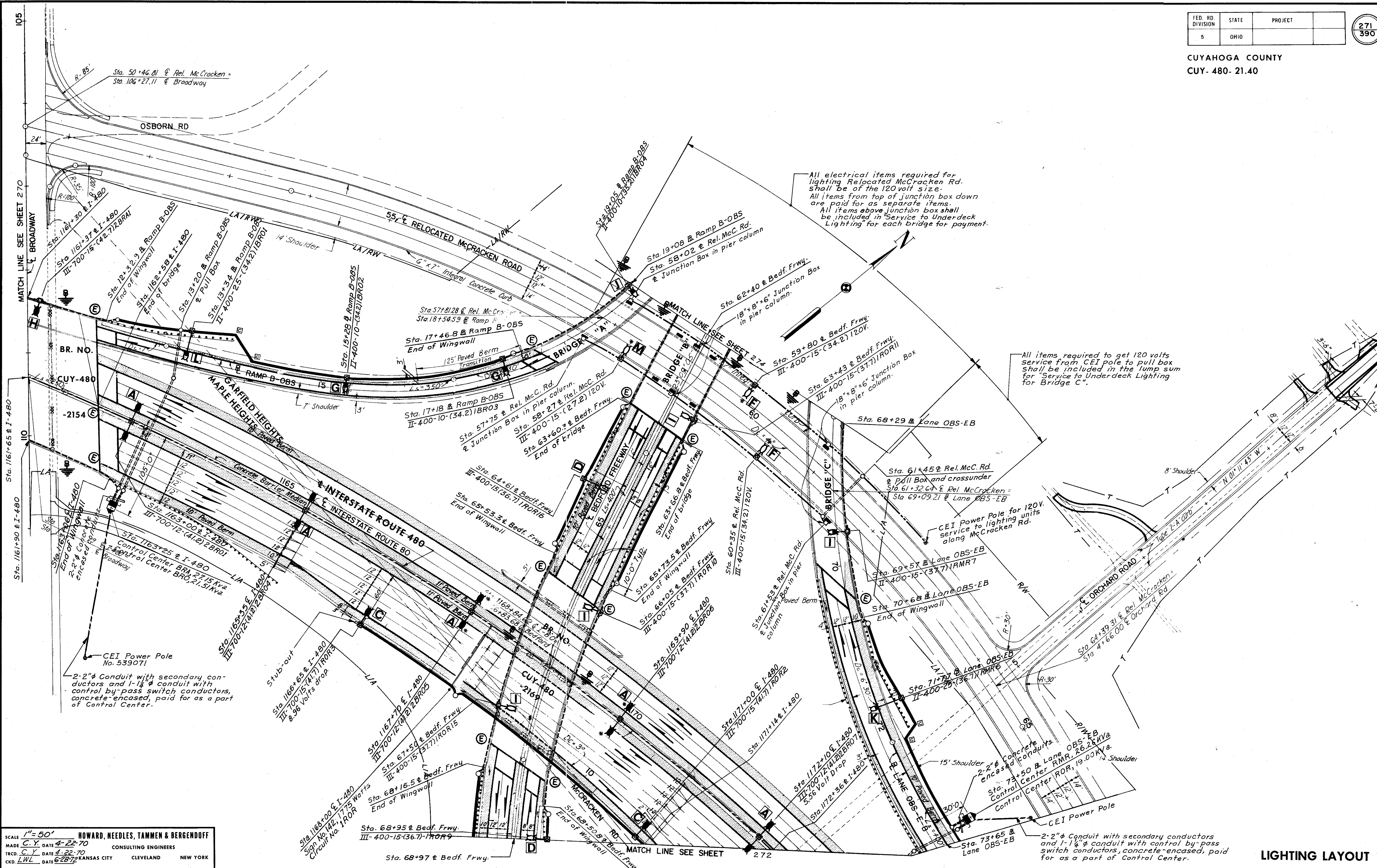
Note: The Bridge Grounds and Expansion Joints indicated on the plans should not be considered to be accurate in location or correct in quantity.

SCALE 1" = 50'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE LWL DATE 6-2-72 CONSULTING ENGINEERS
 TRCD LWL DATE 6-2-72
 CKD GJC DATE 9-7-72 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
5	OHIO	

271
390

CUYAHOGA COUNTY
CUY-480-21.40



All electrical items required for lighting Relocated McCracken Rd. shall be of the 120 volt size. All items from top of junction box down are paid for as separate items. All items above junction box shall be included in "Service to Underdeck Lighting" for each bridge for payment.

All items required to get 120 volts service from CEI pole to pull box shall be included in the lump sum for "Service to Underdeck Lighting for Bridge C".

2-2" Conduit with secondary conductors and 1-1/2" conduit with control by-pass switch conductors, concrete-encased, paid for as a part of Control Center.

2-2" Conduit with secondary conductors and 1-1/2" conduit with control by-pass switch conductors, concrete-encased, paid for as a part of Control Center.

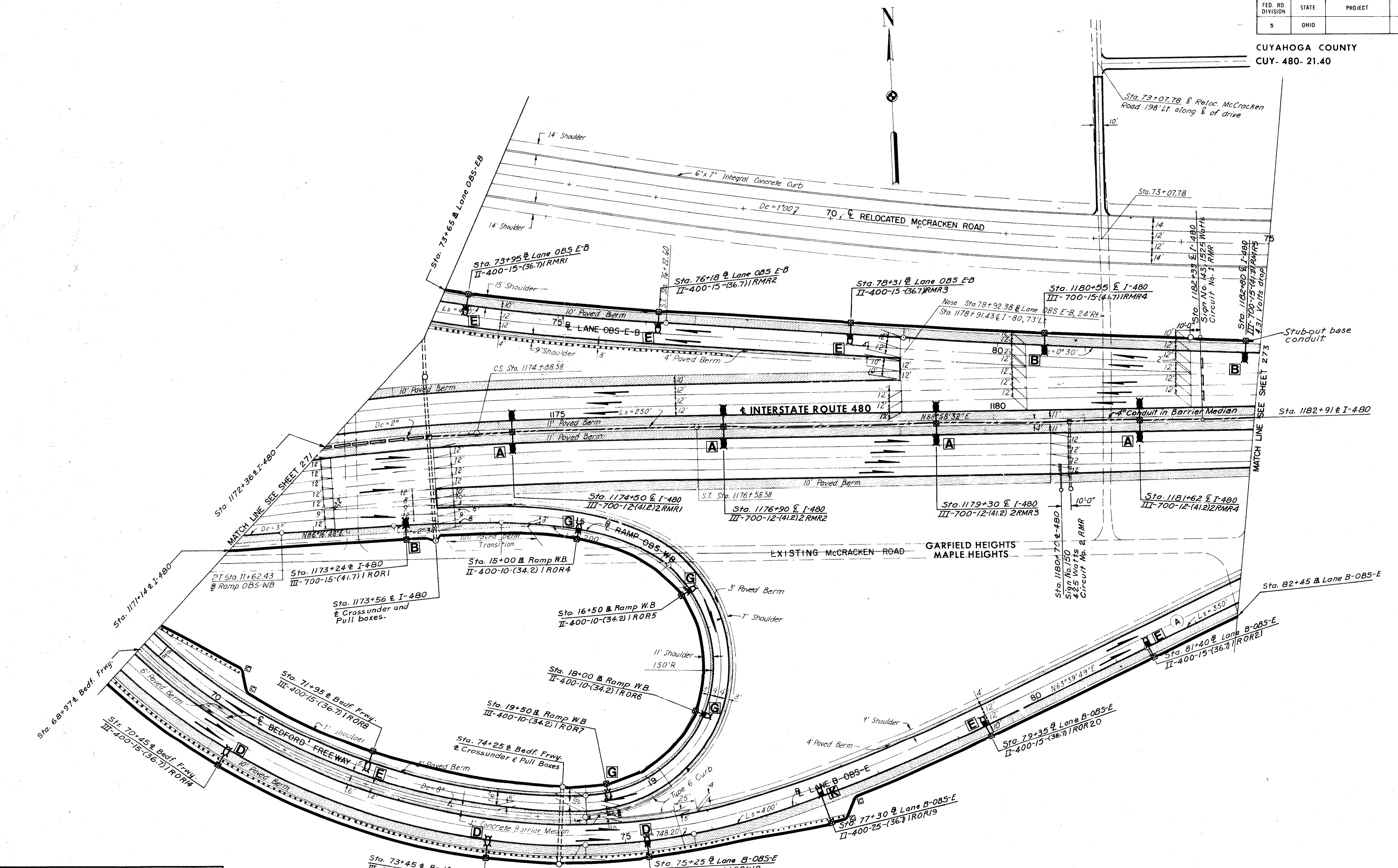
SCALE 1" = 50'
 MADE C.Y. DATE 4-22-70
 TRCD C.Y. DATE 4-22-70
 CKD L.W.L. DATE 6-28-72
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

LIGHTING LAYOUT

FED. RD. DIVISION	STATE	PROJECT
5	OHIO	

272
390

CUYAHOGA COUNTY
CUY- 480- 21.40



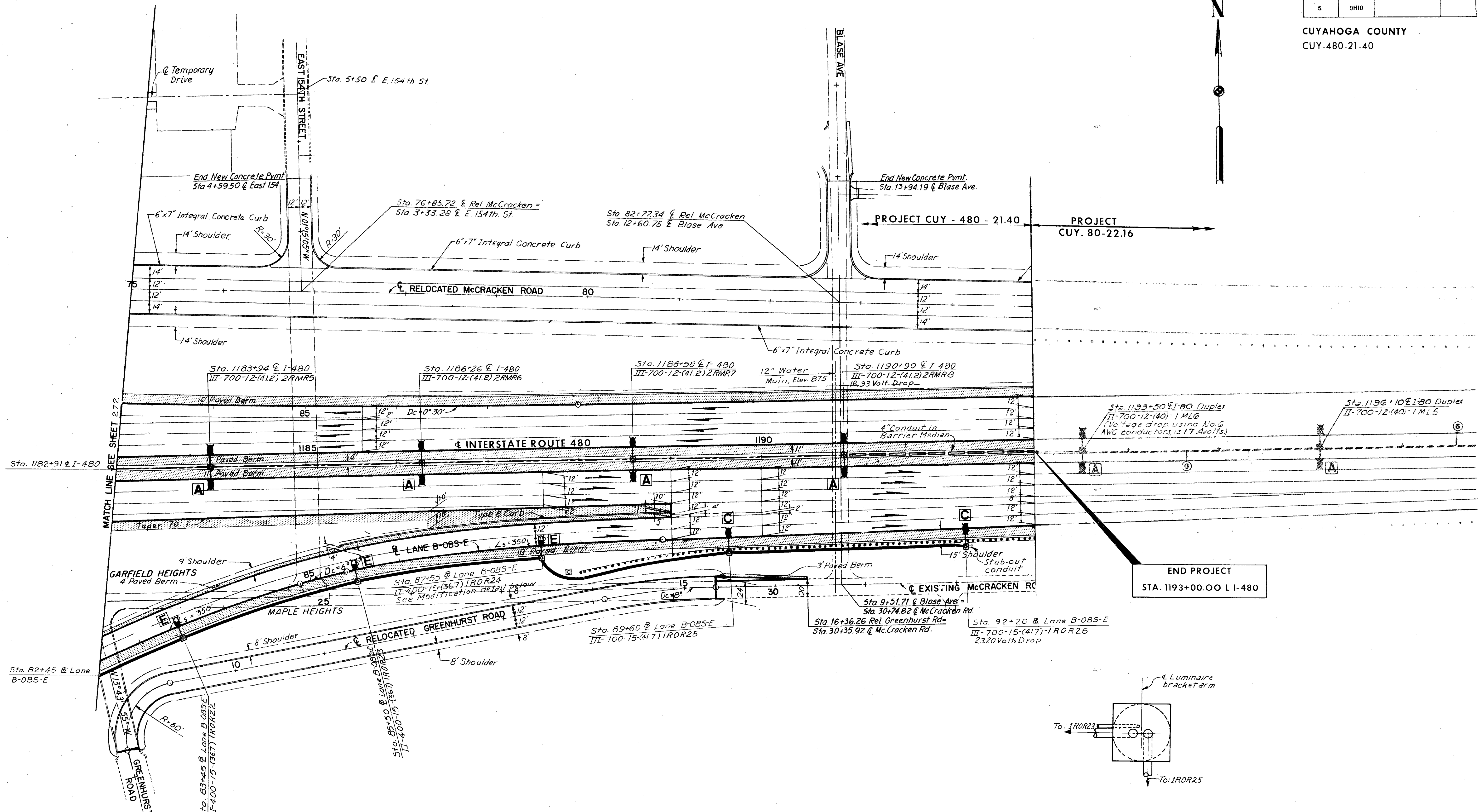
SCALE 1"=50'
 MADE C.Y. DATE 4-17-70
 TRCD. C.Y. DATE 4-17-70
 CKD. LWL DATE 6-27-72
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

LIGHTING LAYOUT

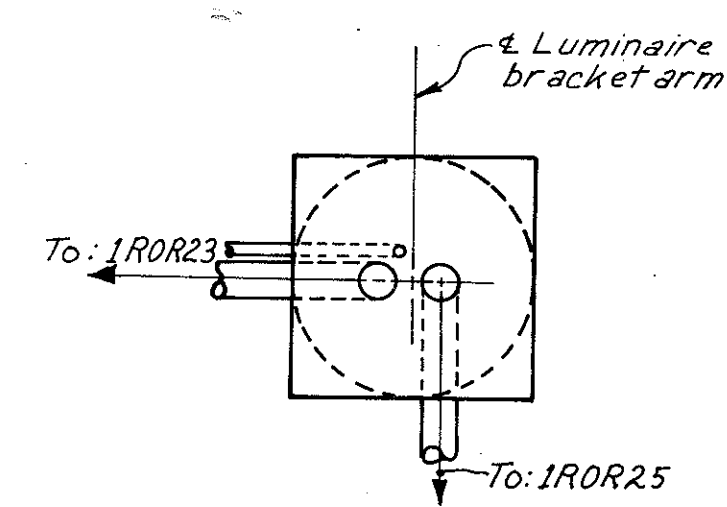
FED. RD. DIVISION	STATE	PROJECT
5	OHIO	

273
390

CUYAHOGA COUNTY
CUY. 480-21-40



END PROJECT
STA. 1193+00.00 I-480



MODIFICATION OF POLE FOUNDATION
STA. 87+55 LANE B-OBS-E
No Scale

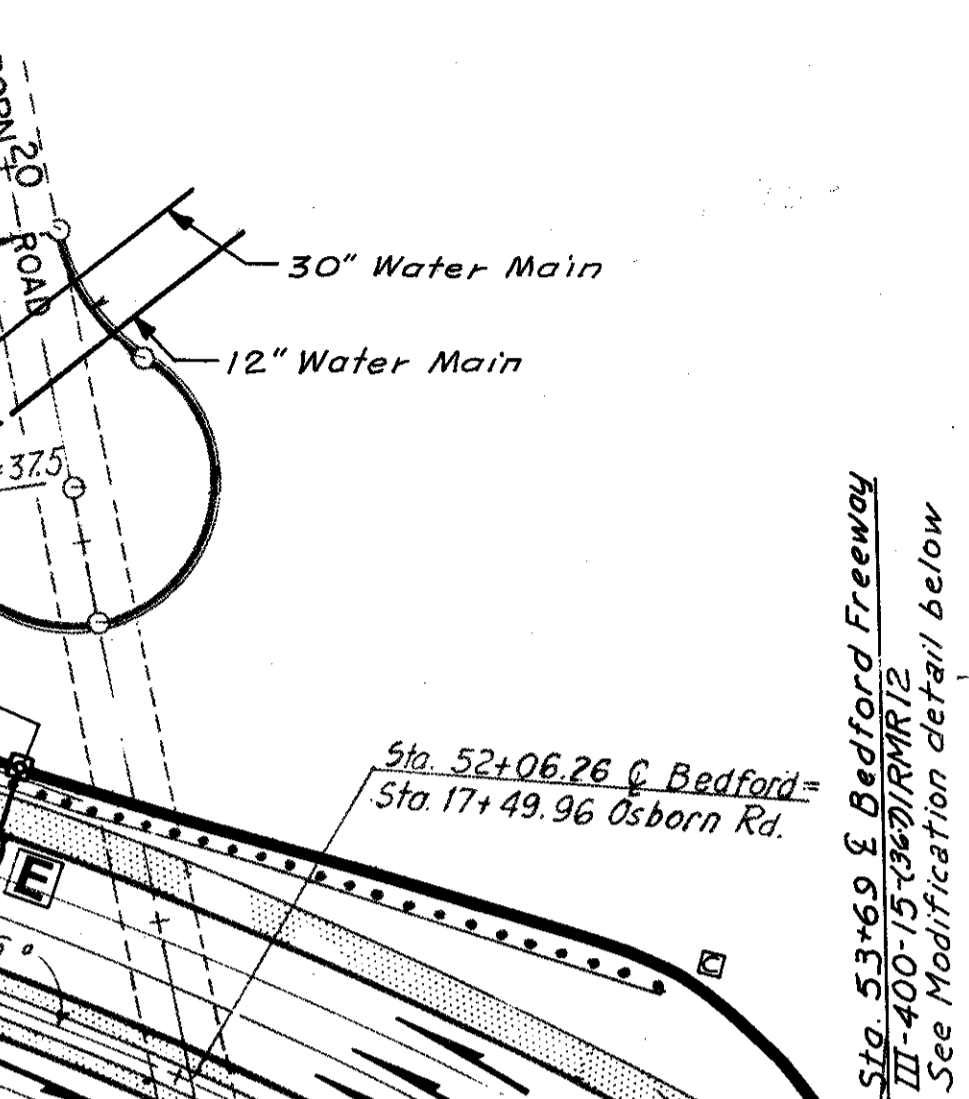
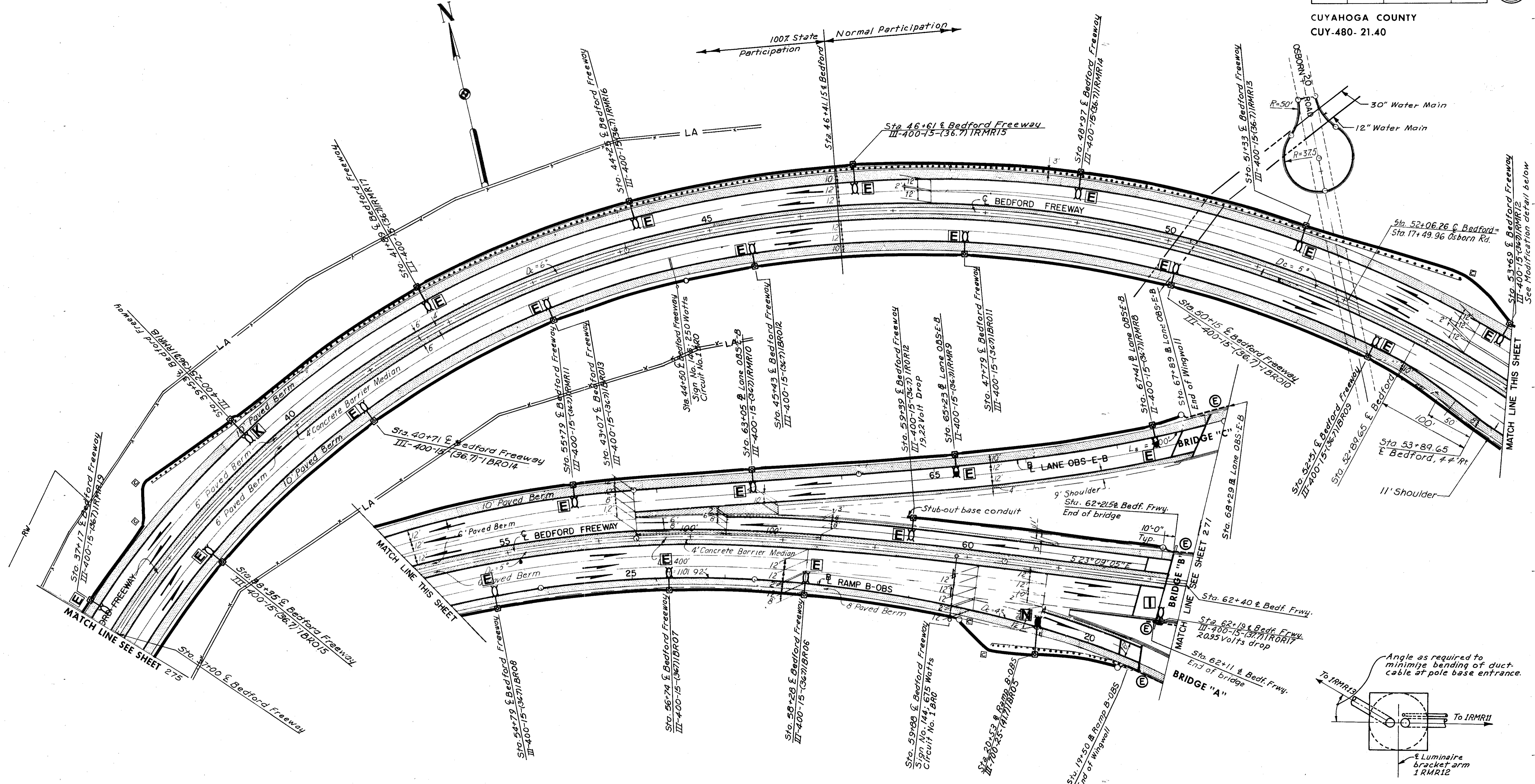
SCALE 1"=50'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
MADE C.Y. DATE 4-16-70
TRCD C.Y. DATE 4-16-70
CKD LWL DATE 6-26-72
KANSAS CITY CLEVELAND NEW YORK

LIGHTING LAYOUT

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

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390

CUYAHOGA COUNTY
CUY-480- 21.40



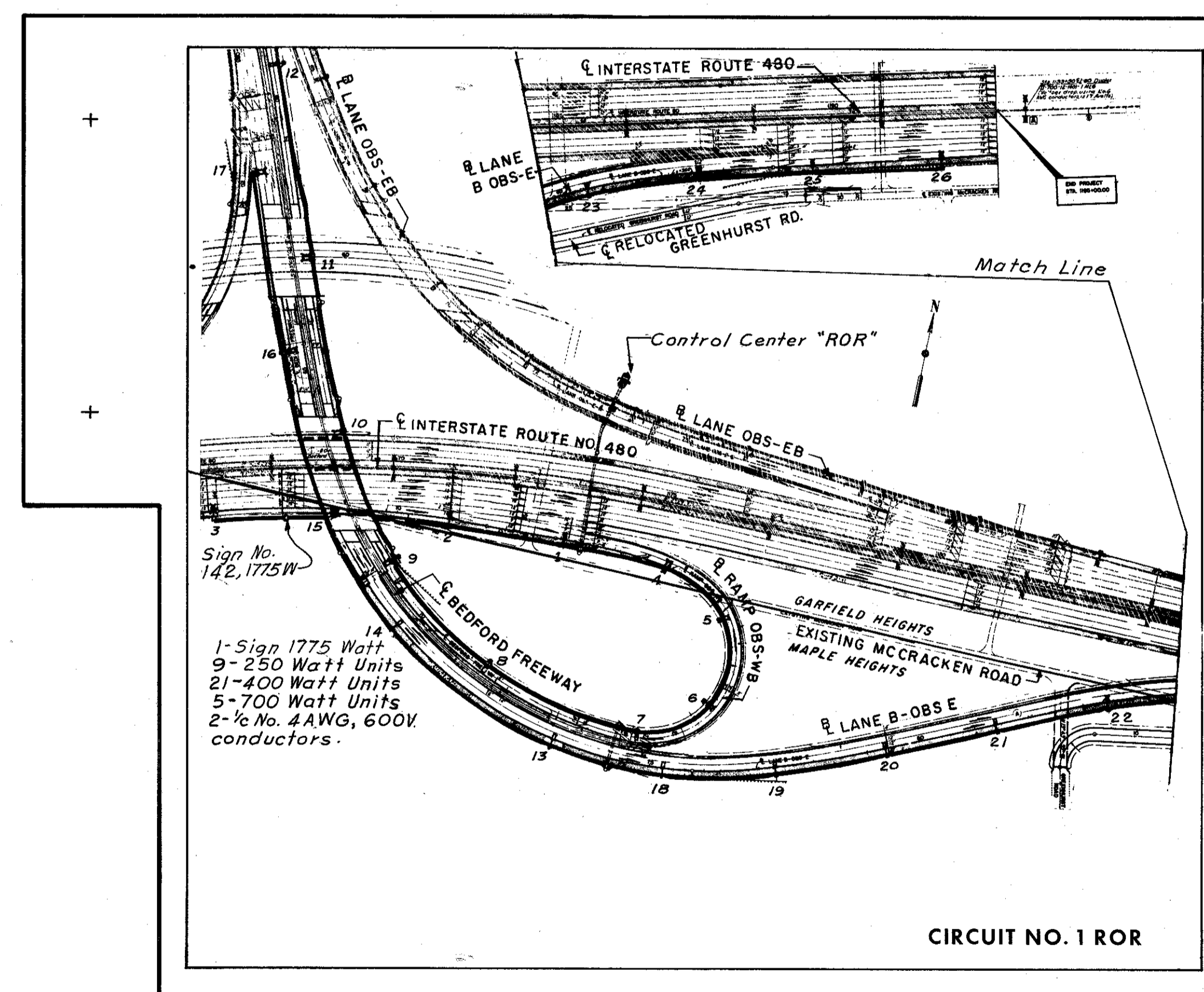
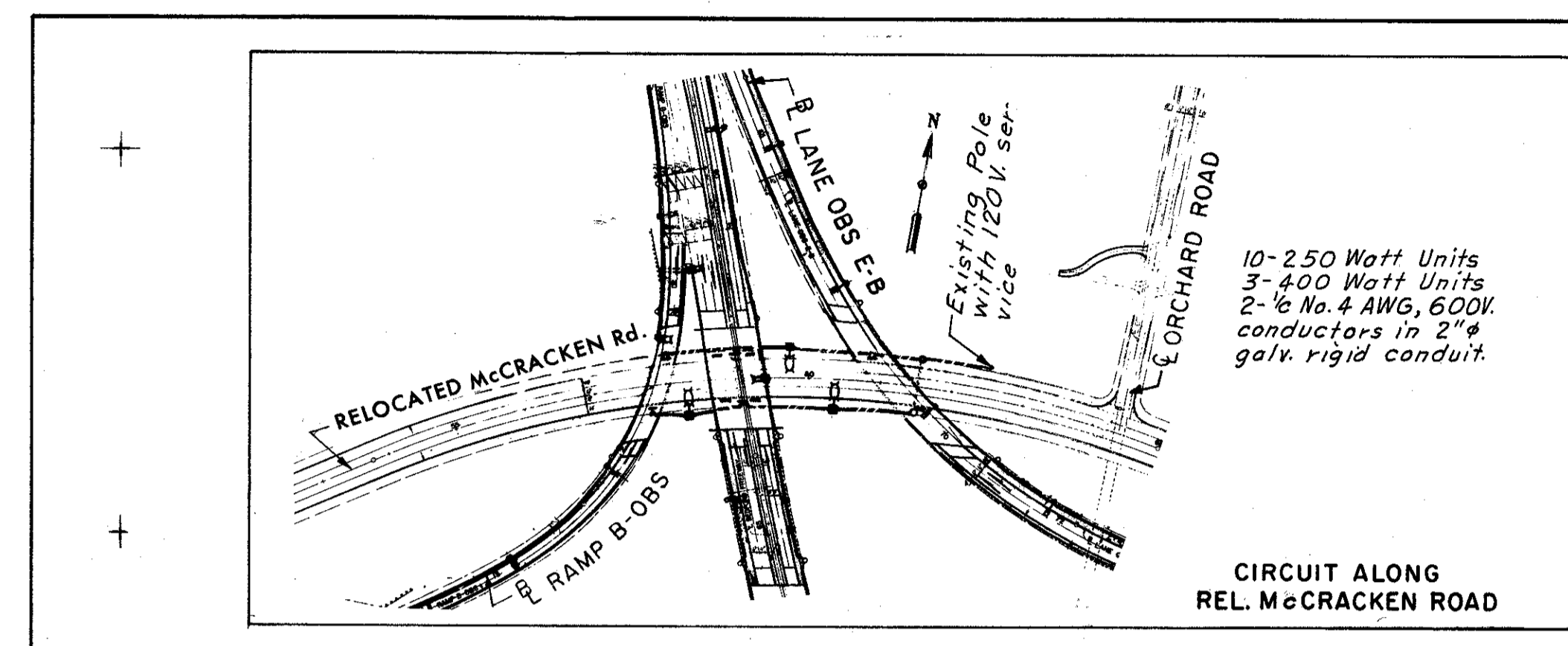
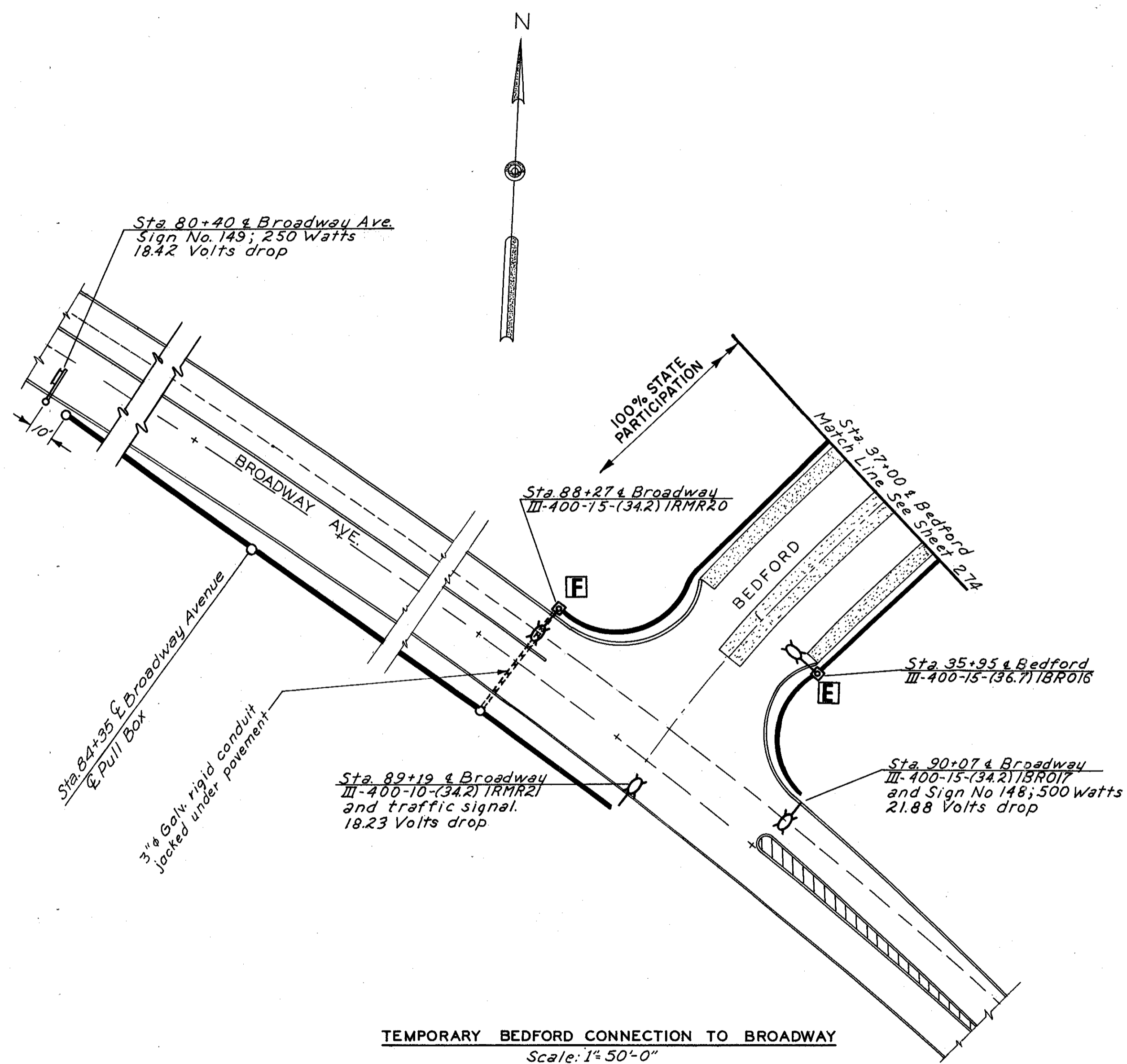
SCALE 1"=50'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE C.Y. DATE 4-23-70 CONSULTING ENGINEERS
 TRCD. C.Y. DATE 4-23-70
 CKD. LWL DATE 5-16-70 KANSAS CITY CLEVELAND NEW YORK

LIGHTING LAYOUT

FED. RD. DIVISION	STATE	PROJECT
5	OHIO	

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390

CUYAHOGA COUNTY
CUY - 480 - 21.40



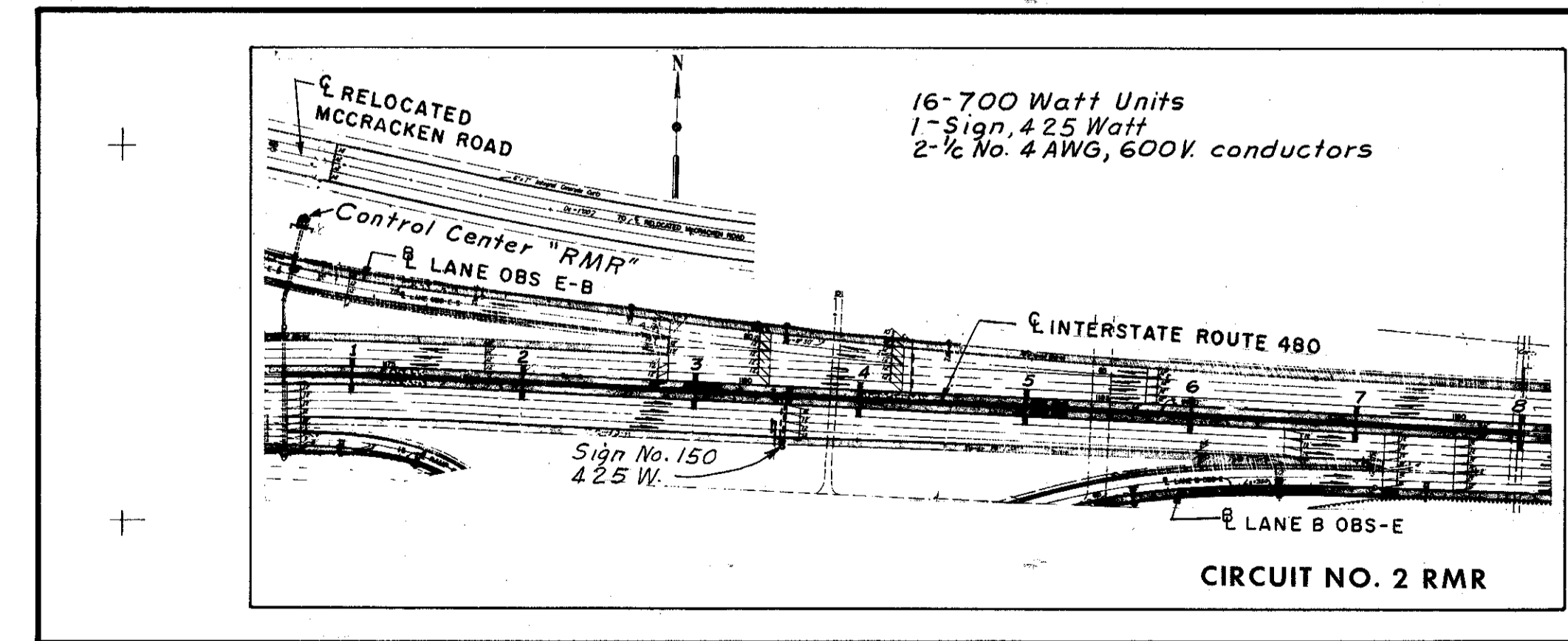
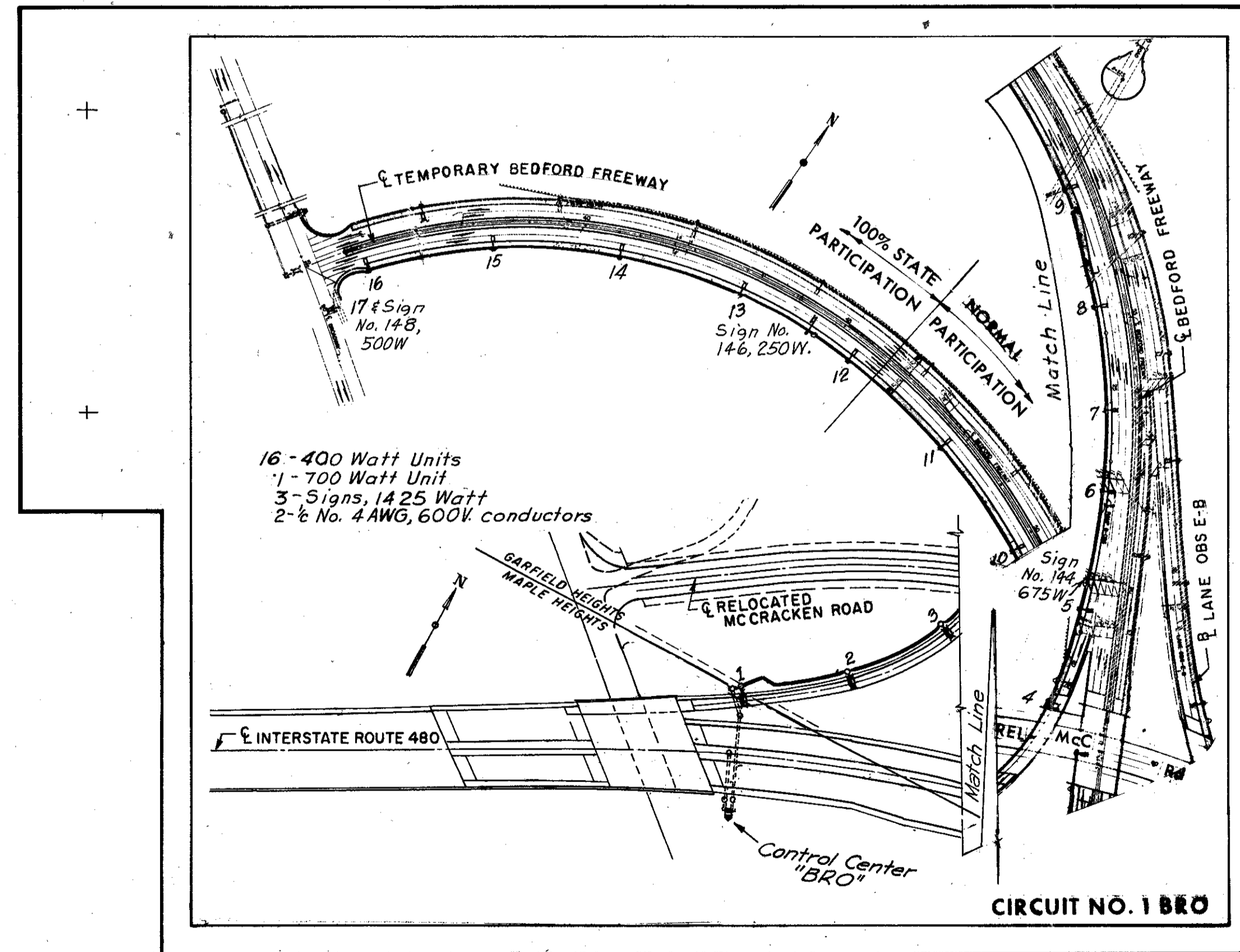
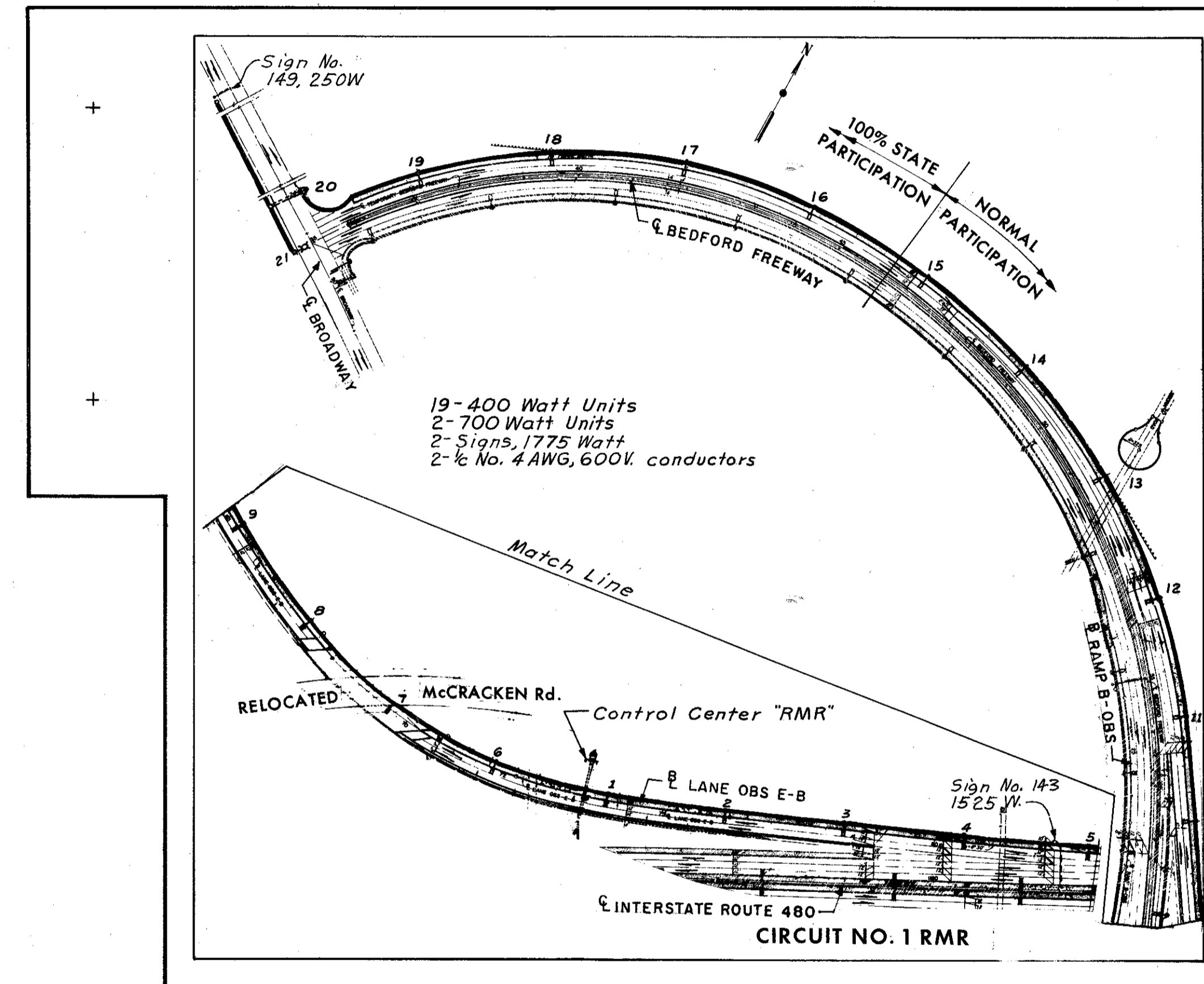
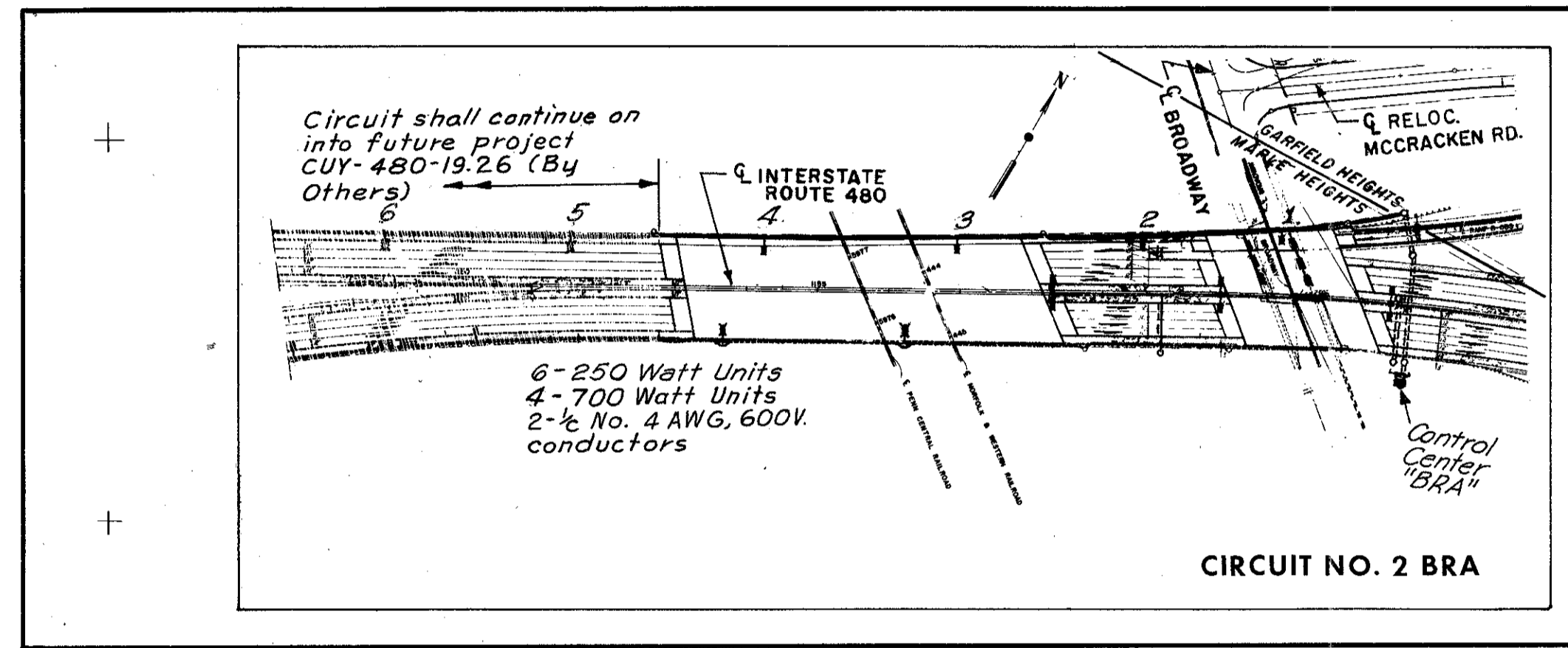
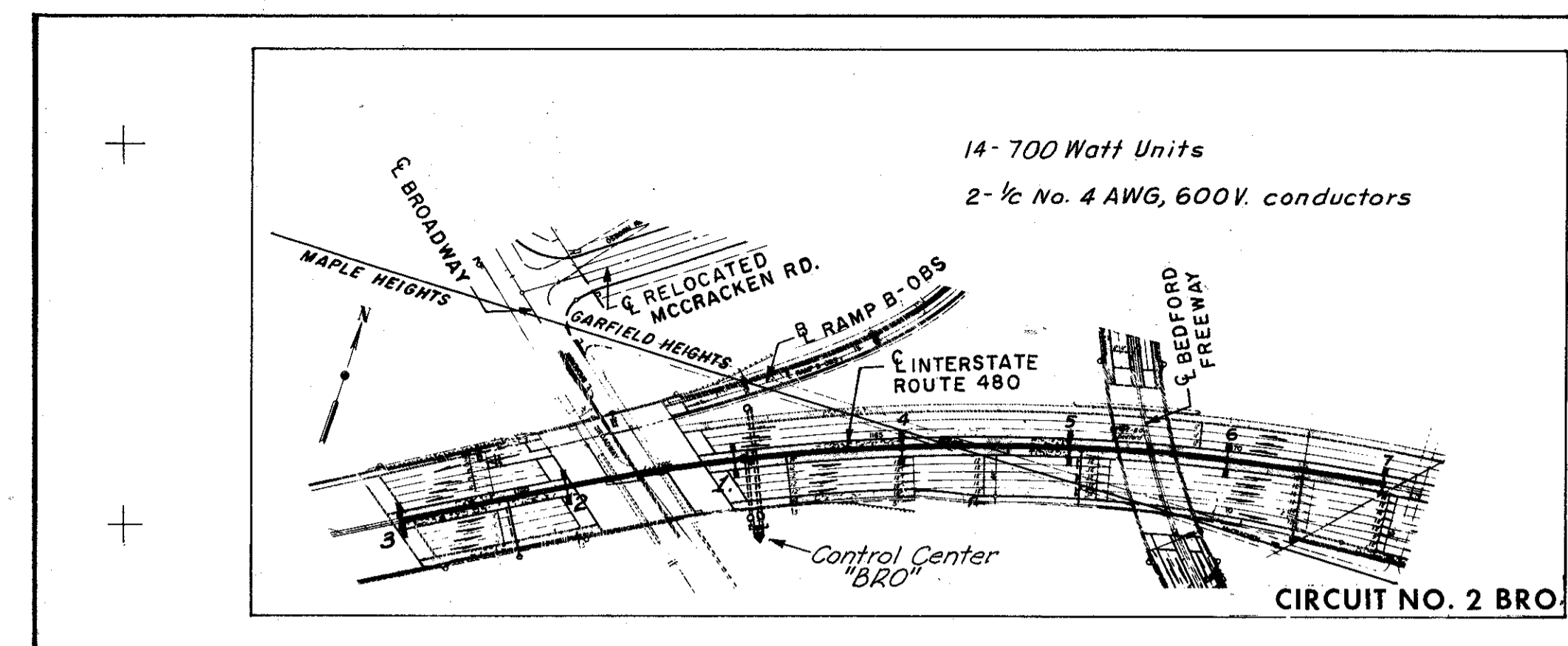
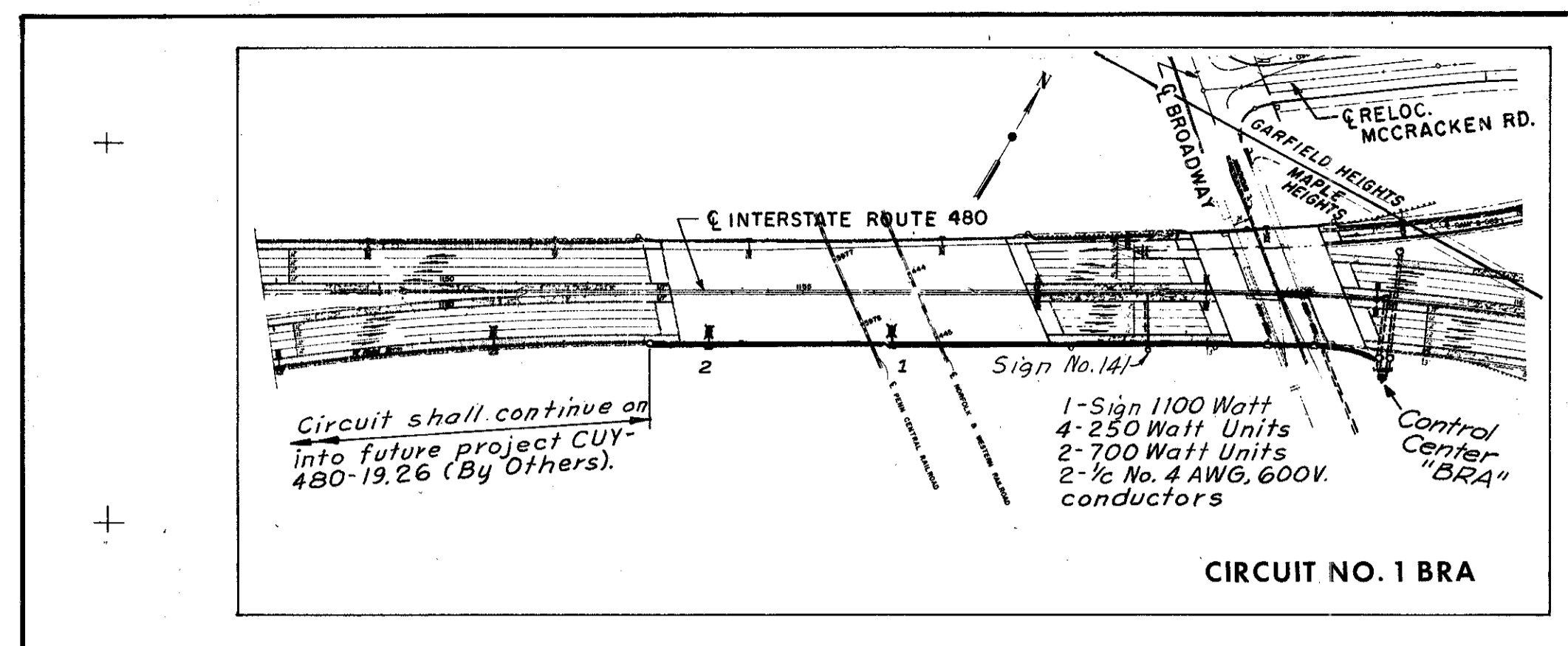
SCALE 1" = 50'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE LWL DATE 6-18-72 CONSULTING ENGINEERS
TRCD LWL DATE 6-18-72
CKD GJC DATE 9-6-72 KANSAS CITY CLEVELAND NEW YORK

LIGHTING LAYOUT

FED. RD. DIVISION	STATE	PROJECT
5	OHIO	

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CUYAHOGA COUNTY
CUY- 480- 21.40



SCALE 1" = 200'
MADE LWL DATE 6-15-72
TRCD LWL DATE 6-15-72
CKD GJC DATE 9-7-72

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

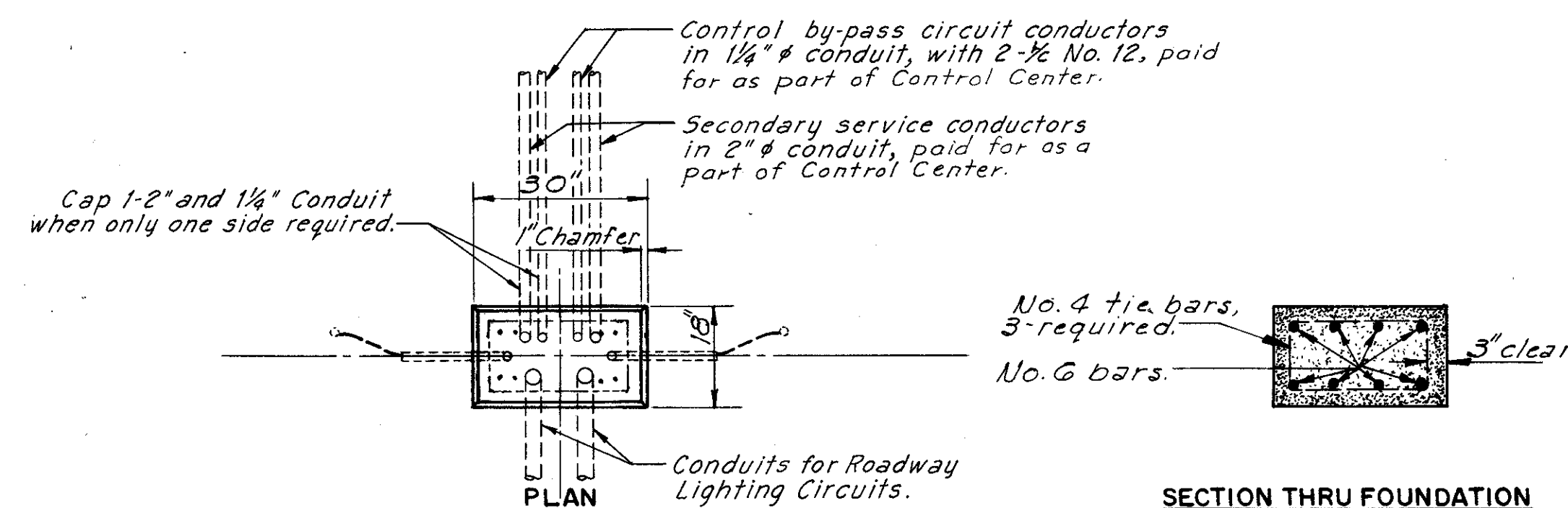
CUYAHOGA COUNTY
CUY. 480-21.40

CONTROL CENTER DATA

CONTROL CENTER	LOCATION		CONNECTED LOAD KVA	SERVICE CONDUCTORS SIZE	SAFETY SWITCH AMP	CIRCUIT NO.	FIXTURE				CIRCUIT CONDUCTORS SIZE	CIRCUIT FUSE AMP
	STA.	SIDE					700 WATTS	400 WATTS	250 WATTS	SIGN WATTS		
BRA	1163+25 I480	105'-0" Rt.	27.15*	2-1/2 No. 4	60	1BRA	2		4	1100	2-1/2 No. 4	40
						2BRA	4		6		2-1/2 No. 4	40
BRO			21.51	2-1/2 No. 4	60	1BRO	1	16		1425	2-1/2 No. 4	30
						2BRO	14				2-1/2 No. 4	30
RMR	73+50 B Lane OBS-EB	55'-0" Lt.	26.26	2-1/2 No. 4	60	1RMR	2	19		1775	2-1/2 No. 4	40
						2RMR	16			425	2-1/2 No. 4	40
ROR			19.00	2-1/2 No. 4	60	1ROR	5	21	9	1775	2-1/2 No. 4	50

*Note: Load shown for Circuit "BRA" is ultimate connected load. Only luminaires shown are installed in this contract, remainder of load is utilized in adjacent contract

Note: Safety switch shall be equal to Square D Company's Catalog No. W999FA 231, Columbus Electric Works Catalog No. CEW10ISS 4660



Notes: See "Lighting Layout" sheets for direction and placement of conduits out of foundation. Spacing and placement of anchor bolts in foundation is dependent upon the enclosure manufacturer's dimensions. Enclosure dimensions are inside measurements.

All conduits shall conform to the requirements of Section 713.04 of the Ohio Construction and Material Specifications and shall be Type III.

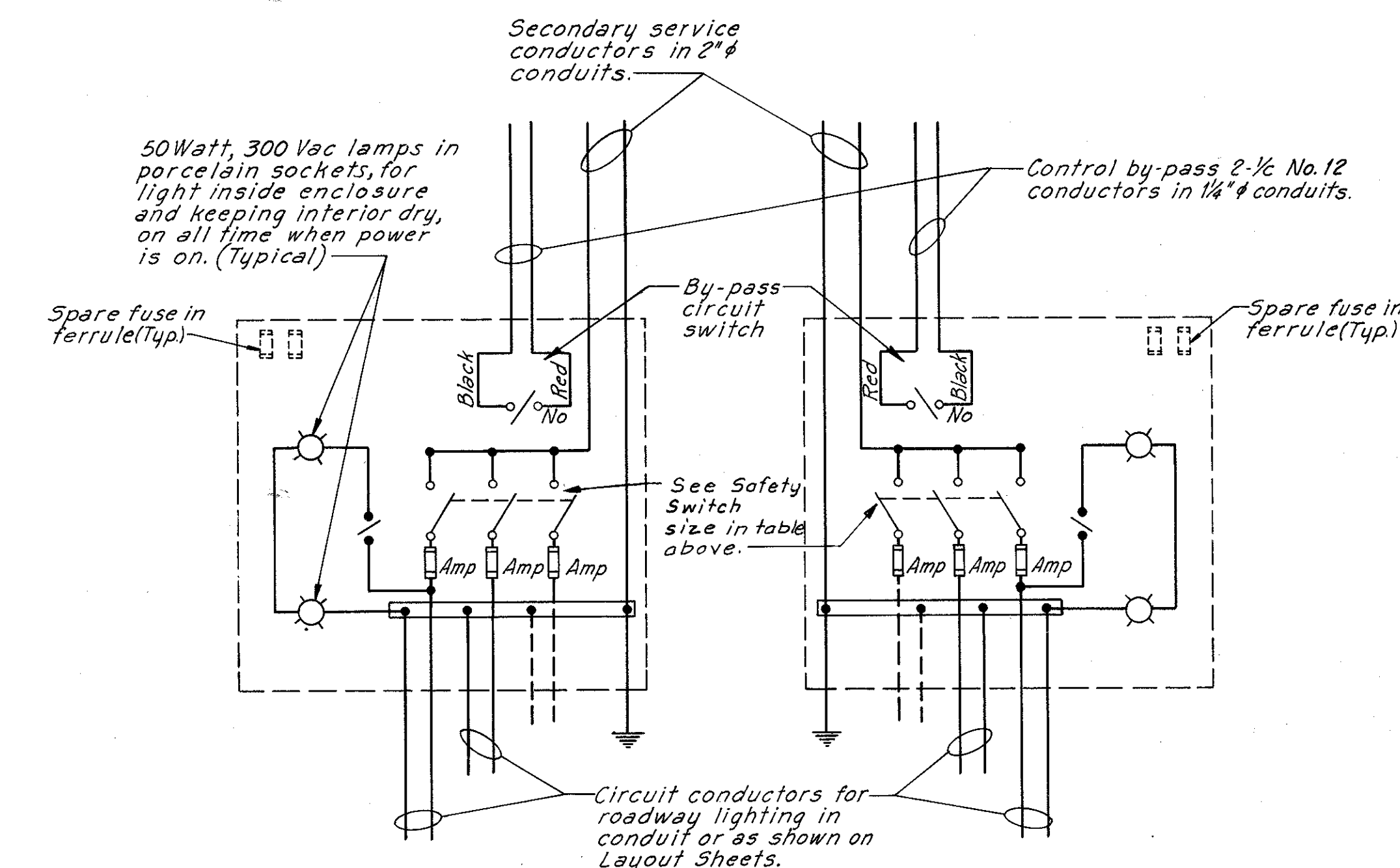
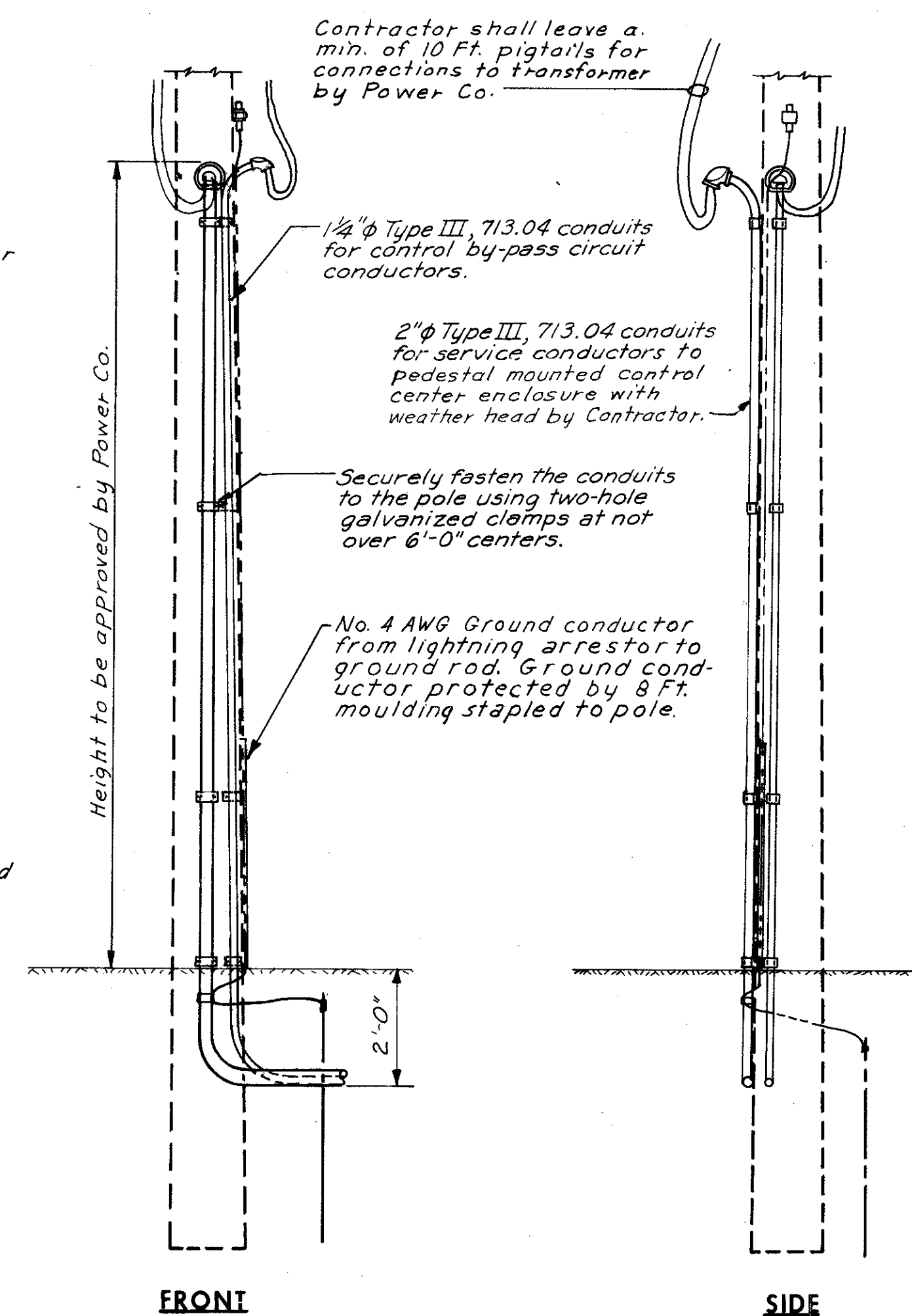
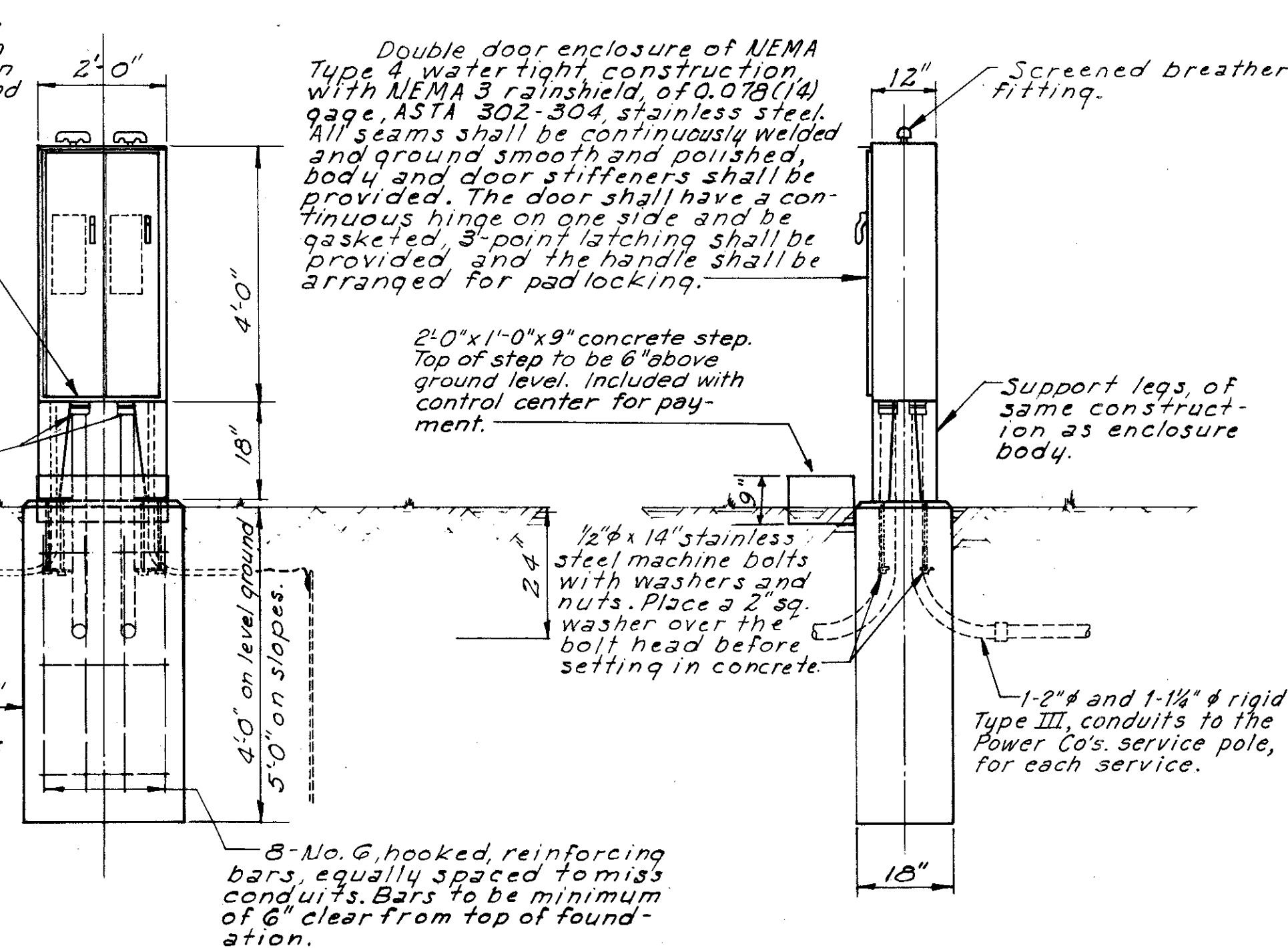
Stainless steel enclosure shall conform with requirements of 713.20 with exception that bottom shall be reinforced with 2 layers of 14 ga. material.

Conduits shall enter the enclosure body by means of water tight, rigid, factory installed conduit hubs.

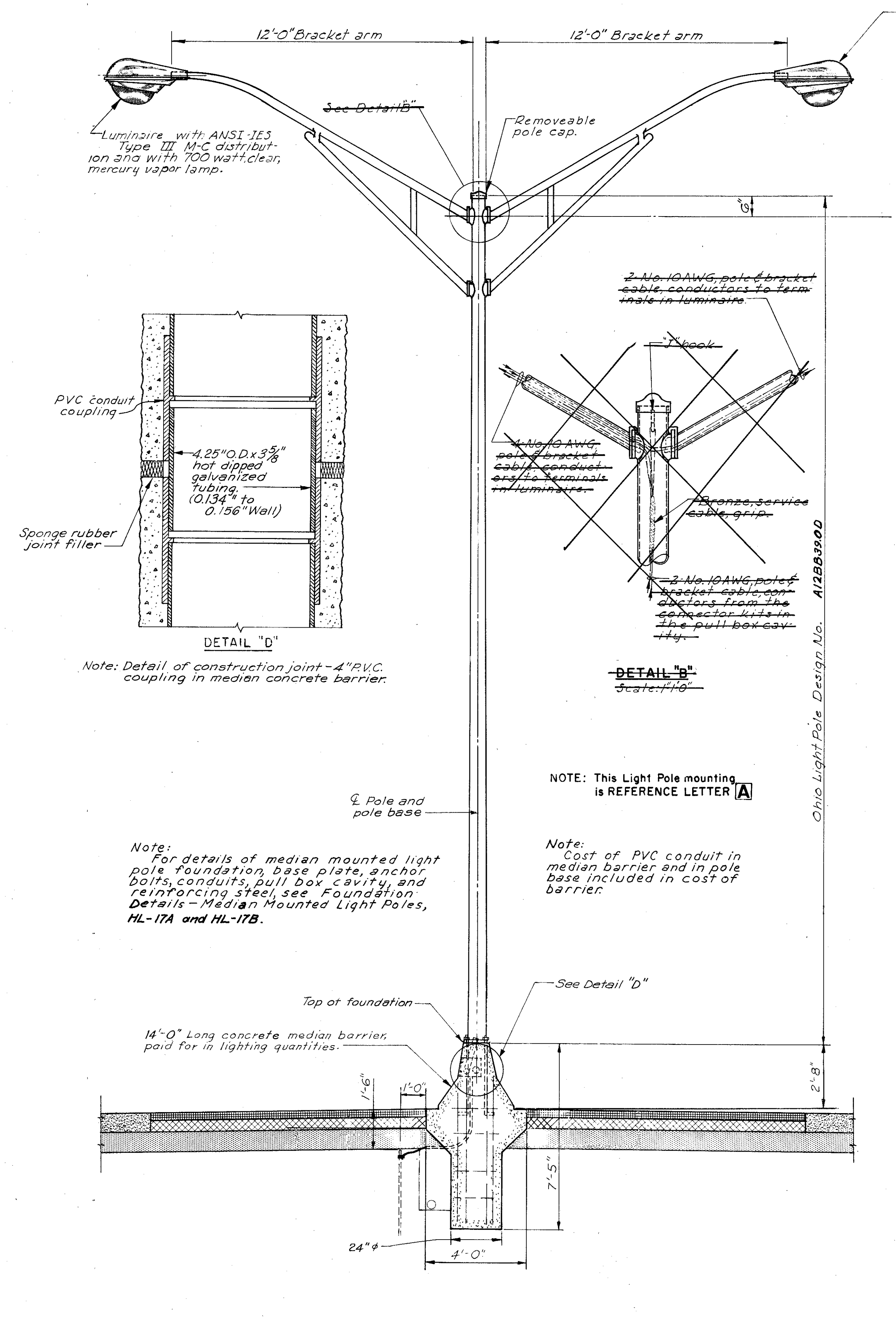
3/4" EMT conduit for ground wire entrance into enclosure.

Conduits 12" out from foundation shall be paid for as a part of Control Center.

Provide ground rod(s), as required for maximum of 25 ohms resistance to ground. Exothermic weld the No. 4 AWG ground conductor to the ground rod(s) and brush on two coats of an insulating varnish on the welded area.



CUYAHOGA COUNTY
CUY-480-21.40



Note: Detail of construction joint - 4" PVC coupling in median concrete barrier.

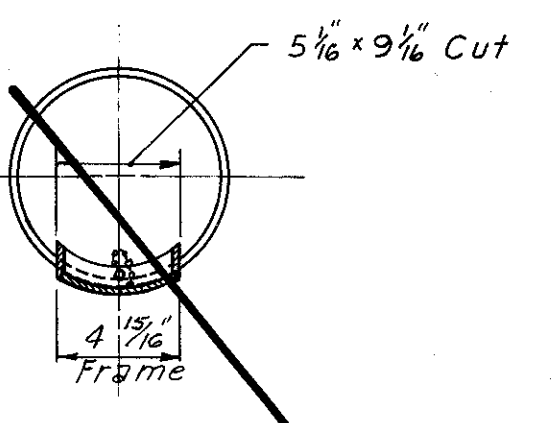
Note: For details of median mounted light pole foundation, base plate, anchor bolts, conduits, pull box cavity, and reinforcing steel, see Foundation Details - Median Mounted Light Poles, HL-17A and HL-17B.

NOTE: This Light Pole mounting is REFERENCE LETTER **A**

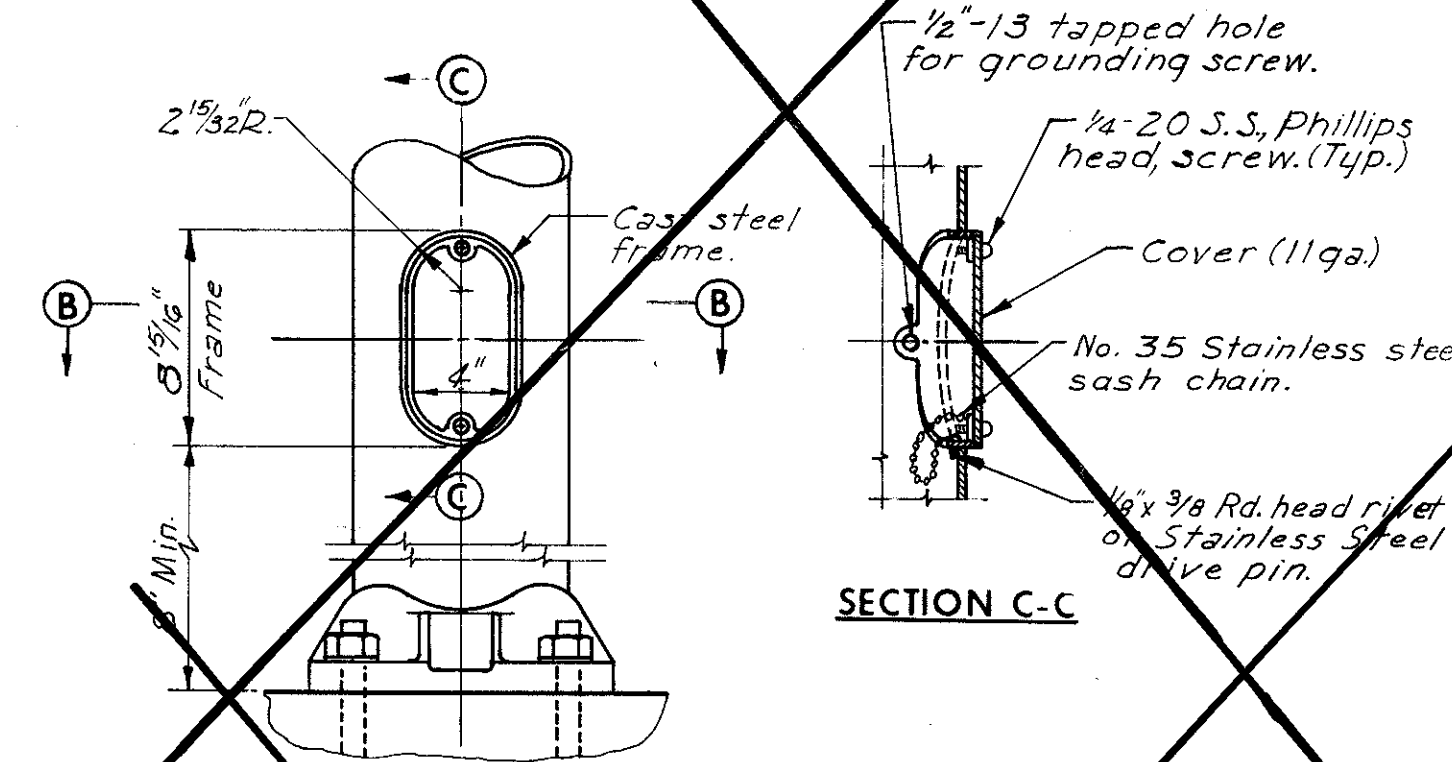
Note: Cost of PVC conduit in median barrier and in pole base included in cost of barrier.

MEDIAN BARRIER POLE MOUNTING
Scale: 3/8" = 1'-0"

1000 Watt size luminaire with integral ballast for 700 Watt, clear, mercury vapor lamp. (Typical)



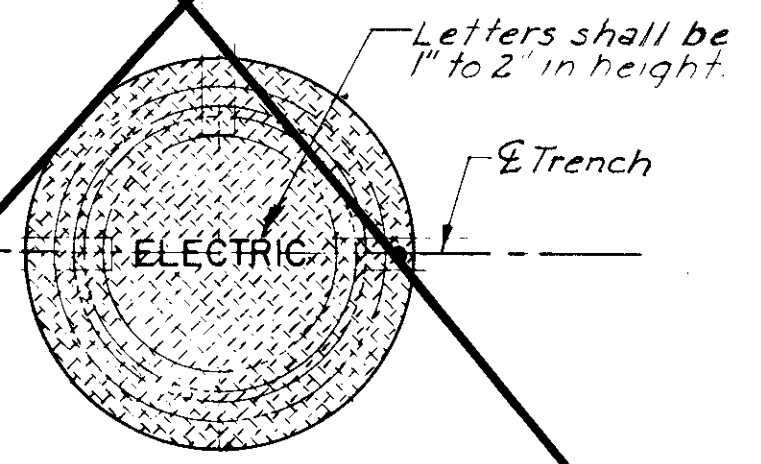
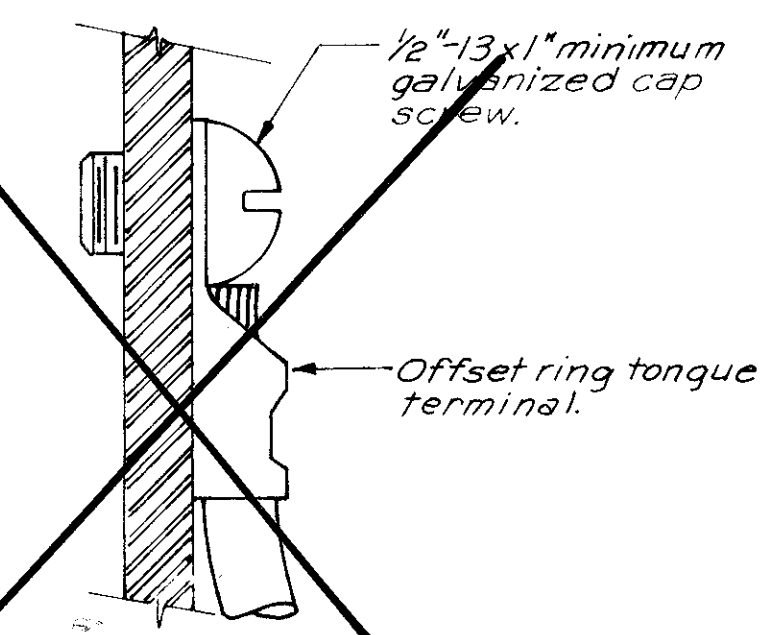
SECTION B-B



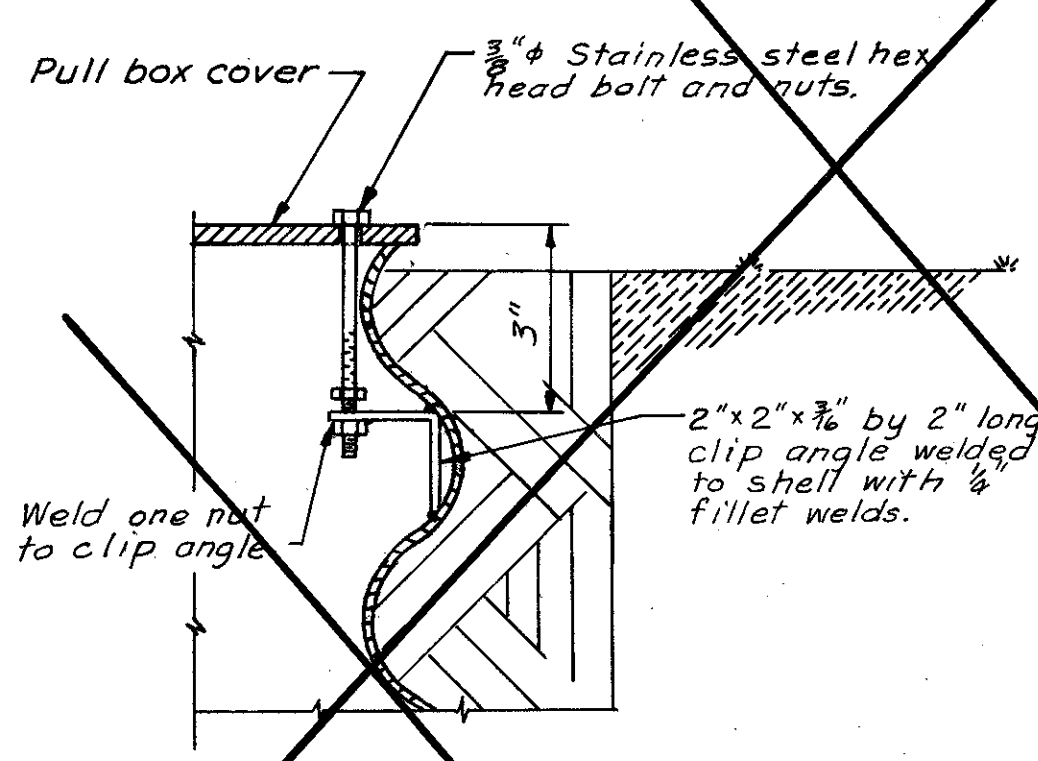
SECTION C-C

ALTERNATE HANDHOLE DETAIL
4"x4" CURVED HANDHOLE FRAME AND COVER
Scale: 1/2" = 1'-0"

GROUND WIRE TERMINALS
Full Size



PLAN



PULL BOX COVER ATTACHMENT
No Scale

Selected original earth material to be hand tamped in 6" layers around pipe. Do not use frozen fill, sod, cinders or stone.

Polyethylene air bell, 16 3/4" diam. by 20 1/2" high.

Polypropylene rope for air bell restraint or other approved fastening.

See "PULL BOX COVER ATTACHMENT" detail on this sheet.

Finished grade.

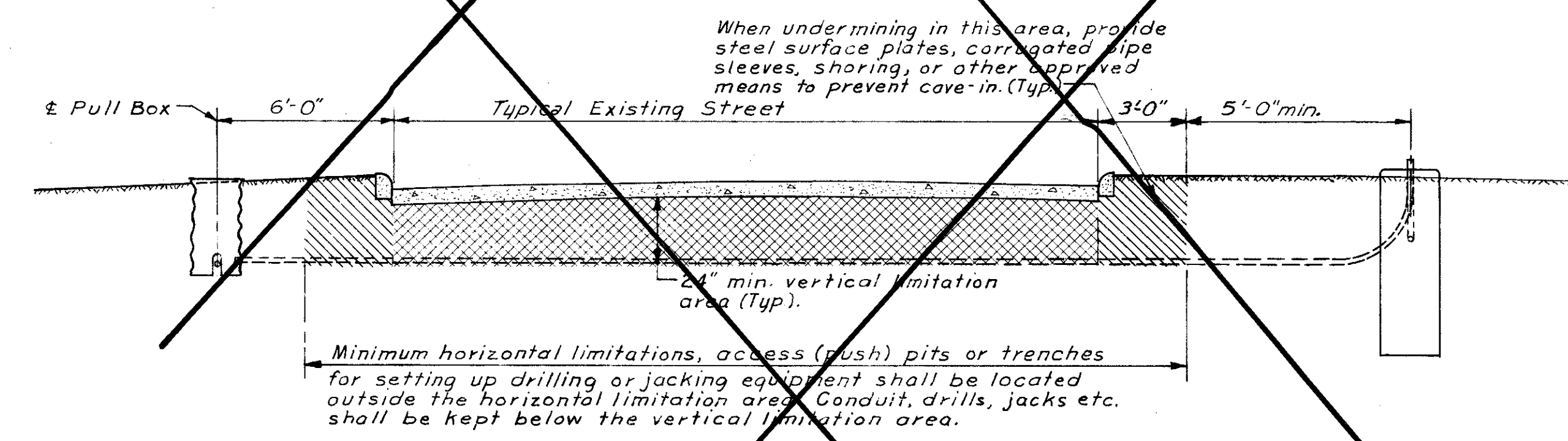
Attach connector kits to a metal pin by taping. Per 625.11

4"x10" slot cut in the sides of the pipe for each cable duct entrance. No more than 3 in each pull box.

No. 7 or 8 aggregate, under pull box for French type drain.

SECTION THRU CORRUGATED BOX

PULL BOX DETAILS
Scale: 1" = 1'-0"

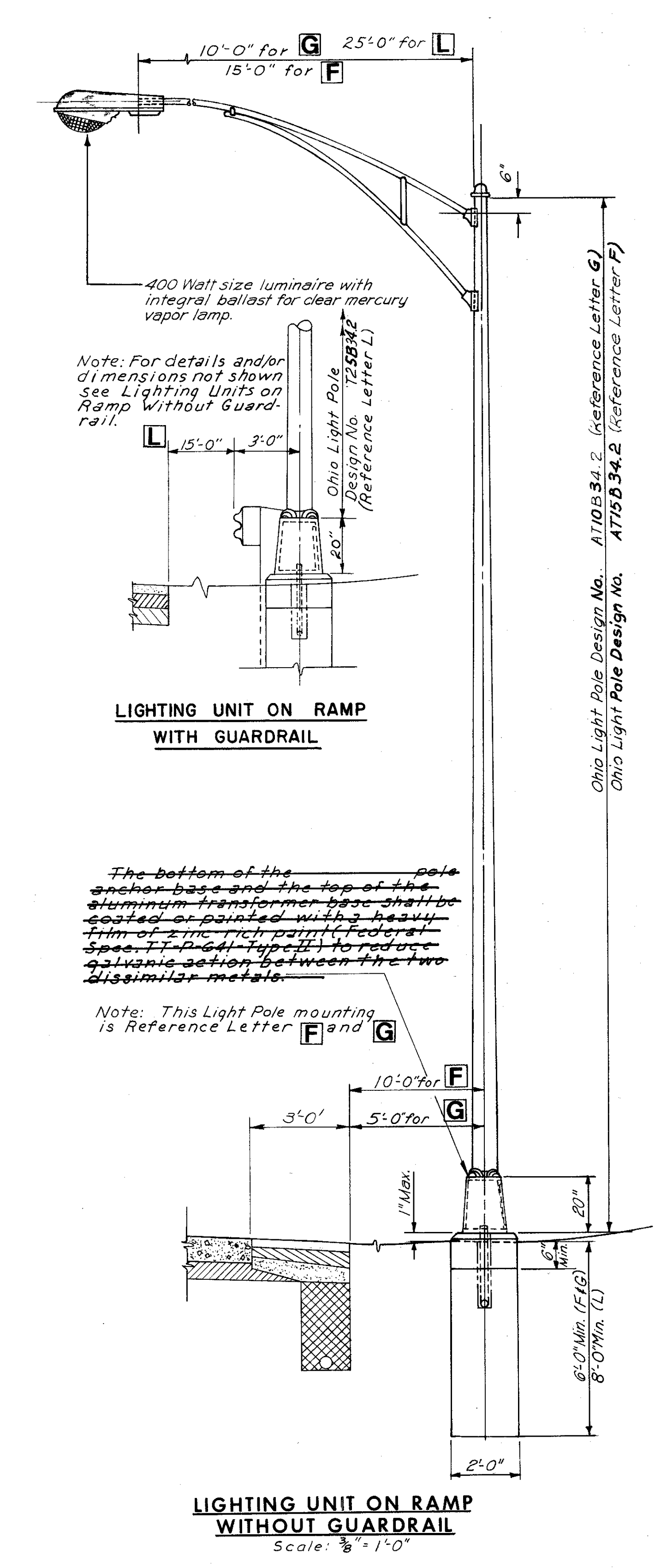
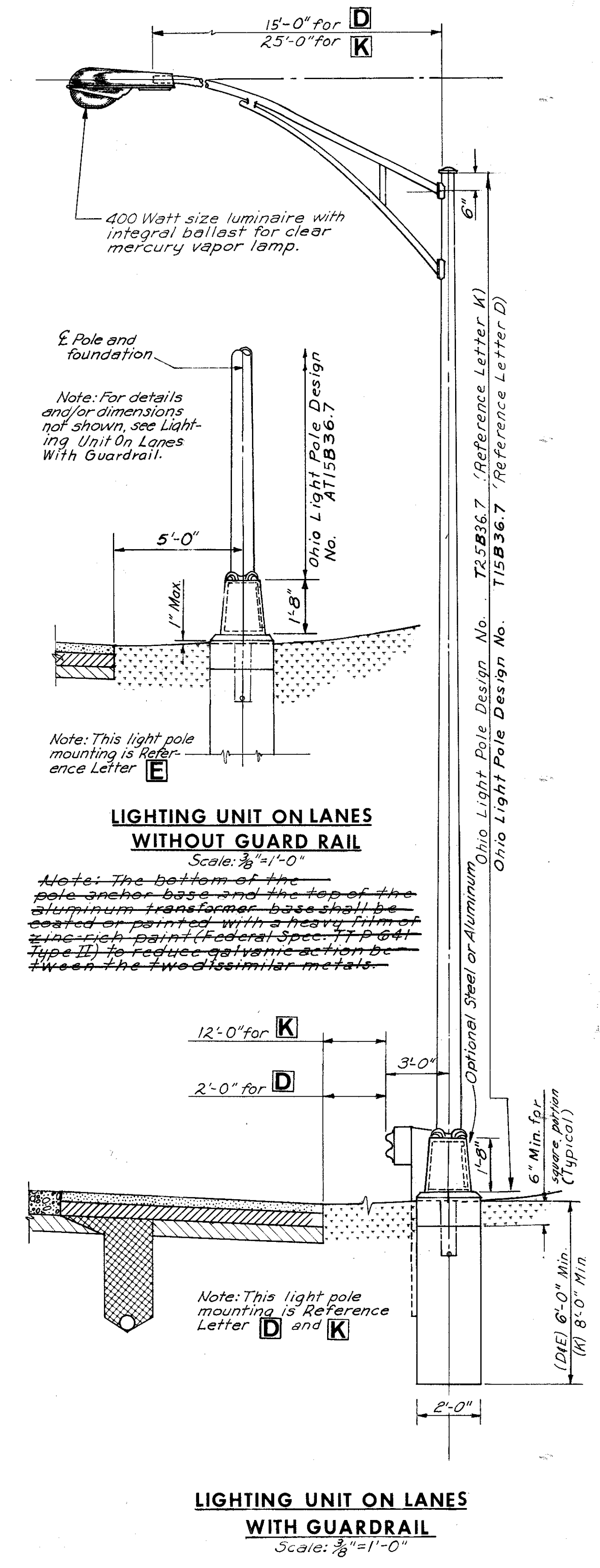
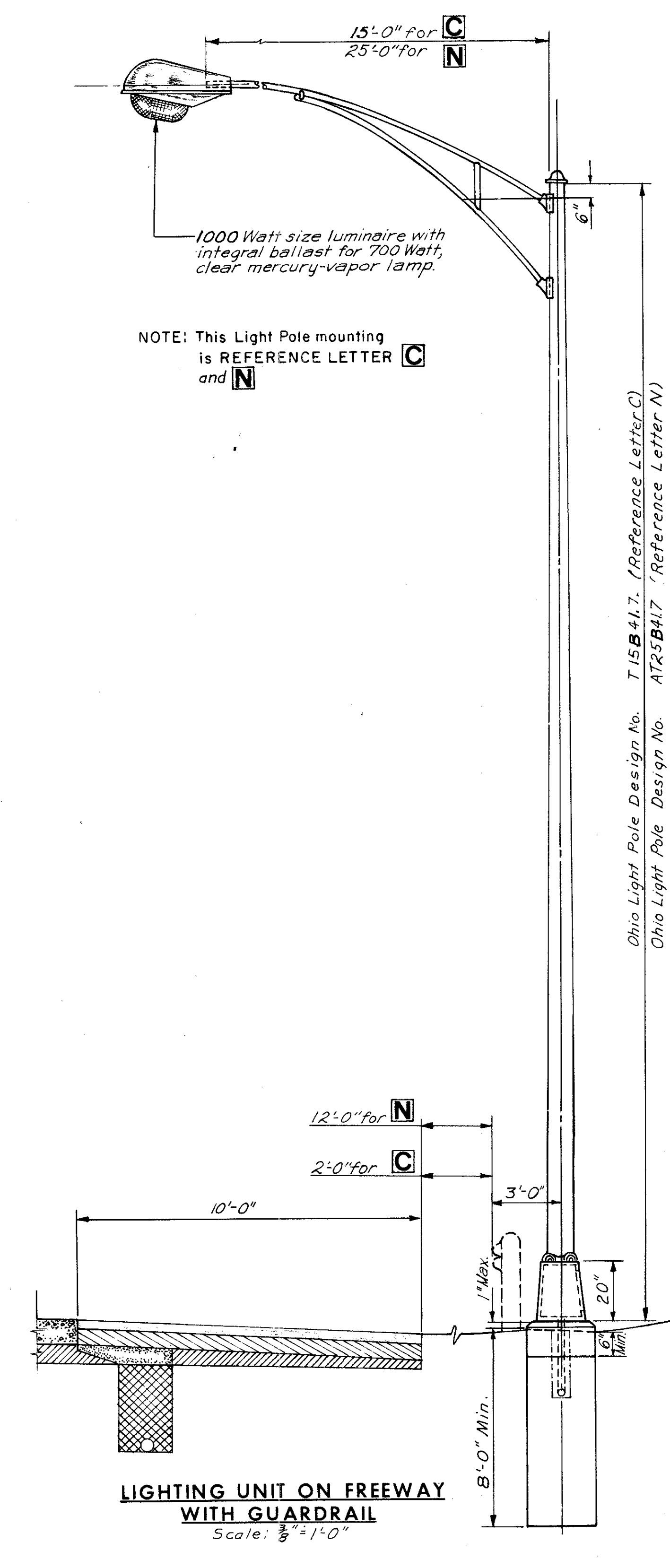
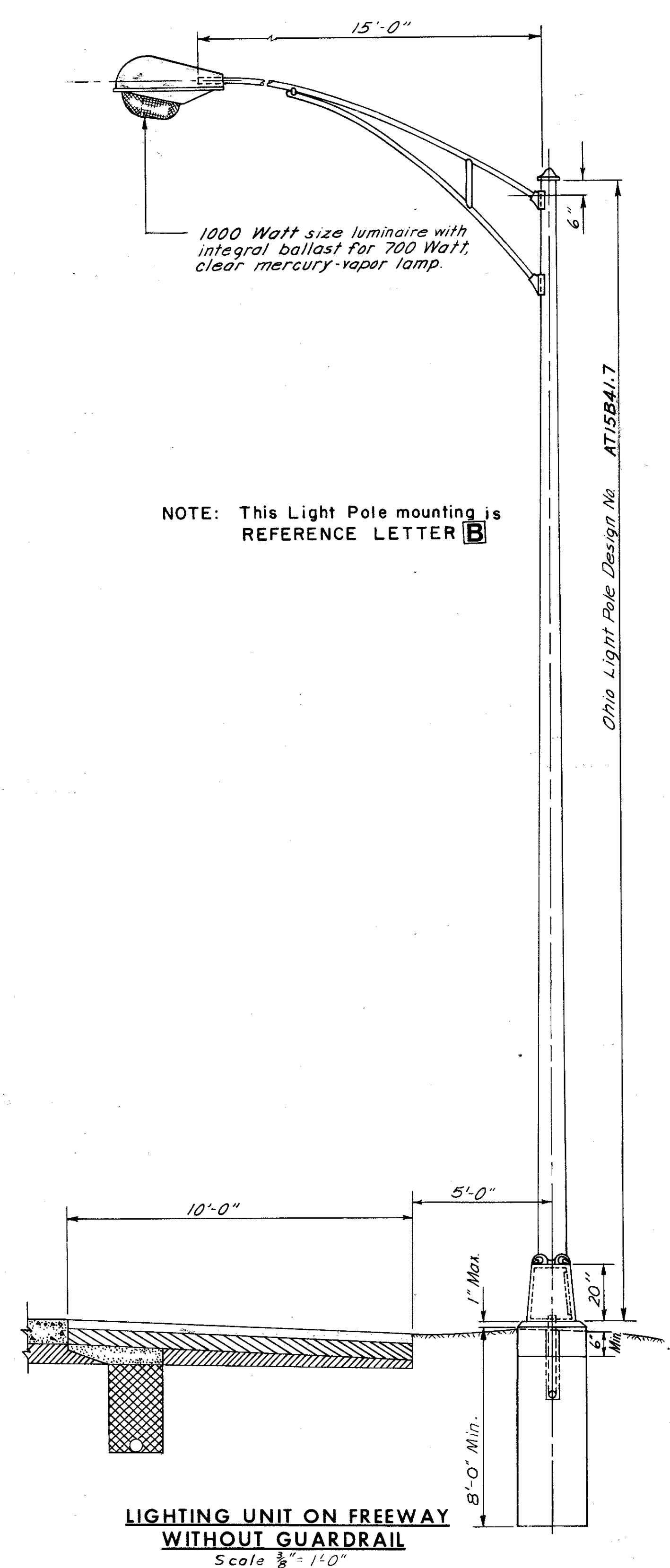


CONDUIT CROSSUNDER EXISTING STREET
Scale: 1/4" = 1'-0"

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CUY. 480. 21.40



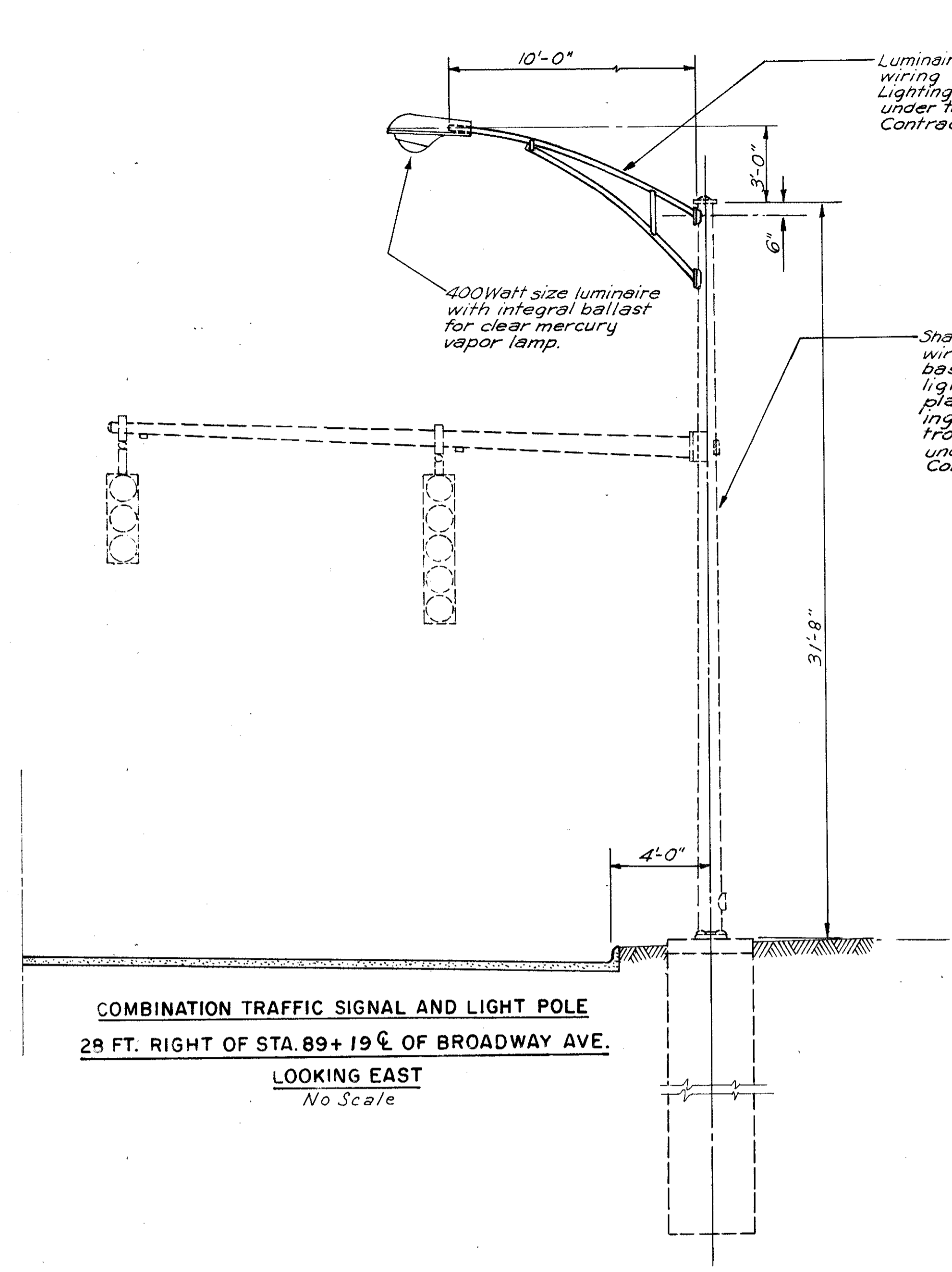
SCALE As Noted HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE C.Y. DATE 4-28-70 CONSULTING ENGINEERS
TRCD C.Y. DATE 4-28-70
CKD LWL DATE 6-22-72 KANSAS CITY CLEVELAND NEW YORK

GROUND MOUNT LIGHTING UNITS
Rev. 1-9-74

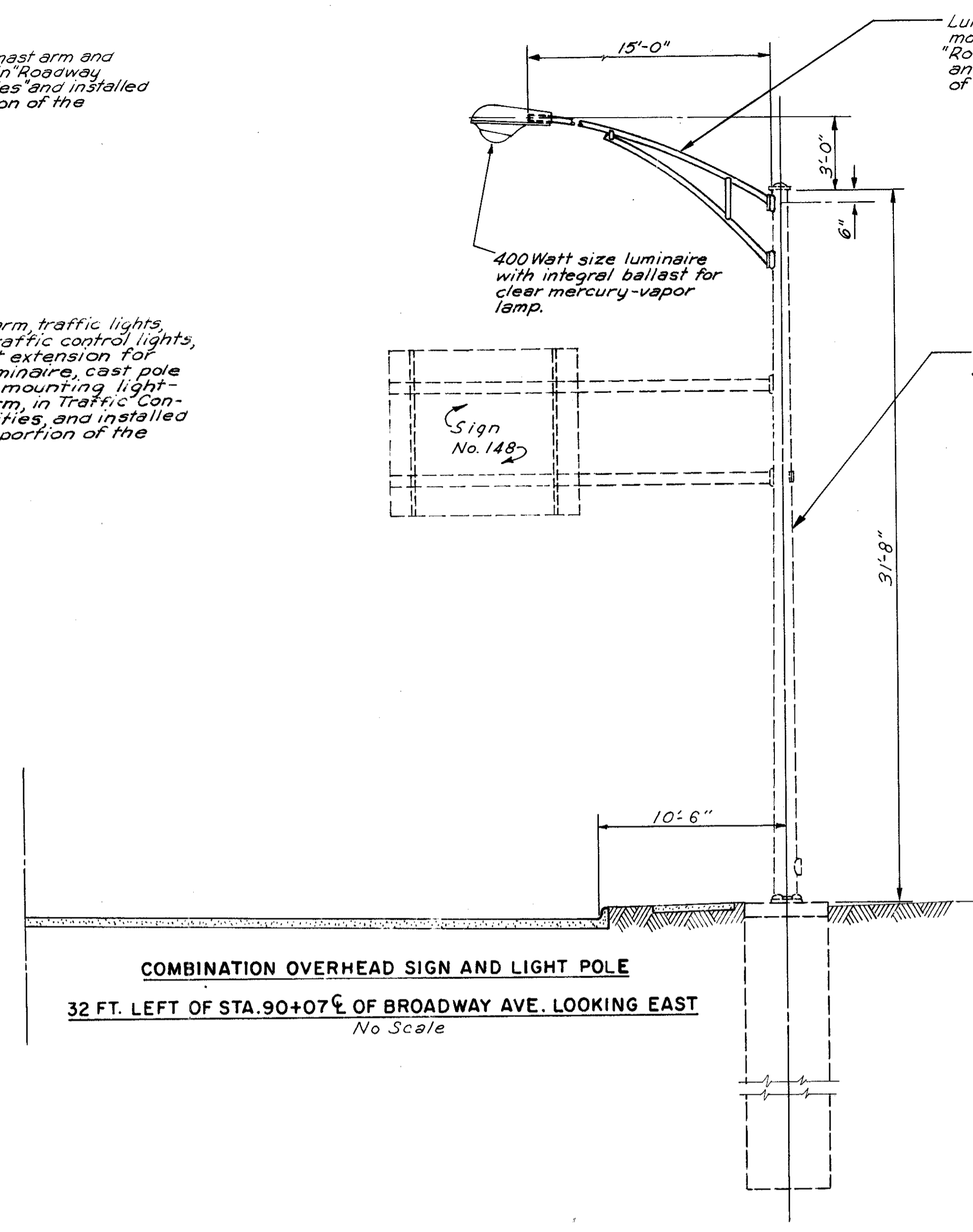
FED. RD. DIVISION	STATE	PROJECT
5	OHIO	

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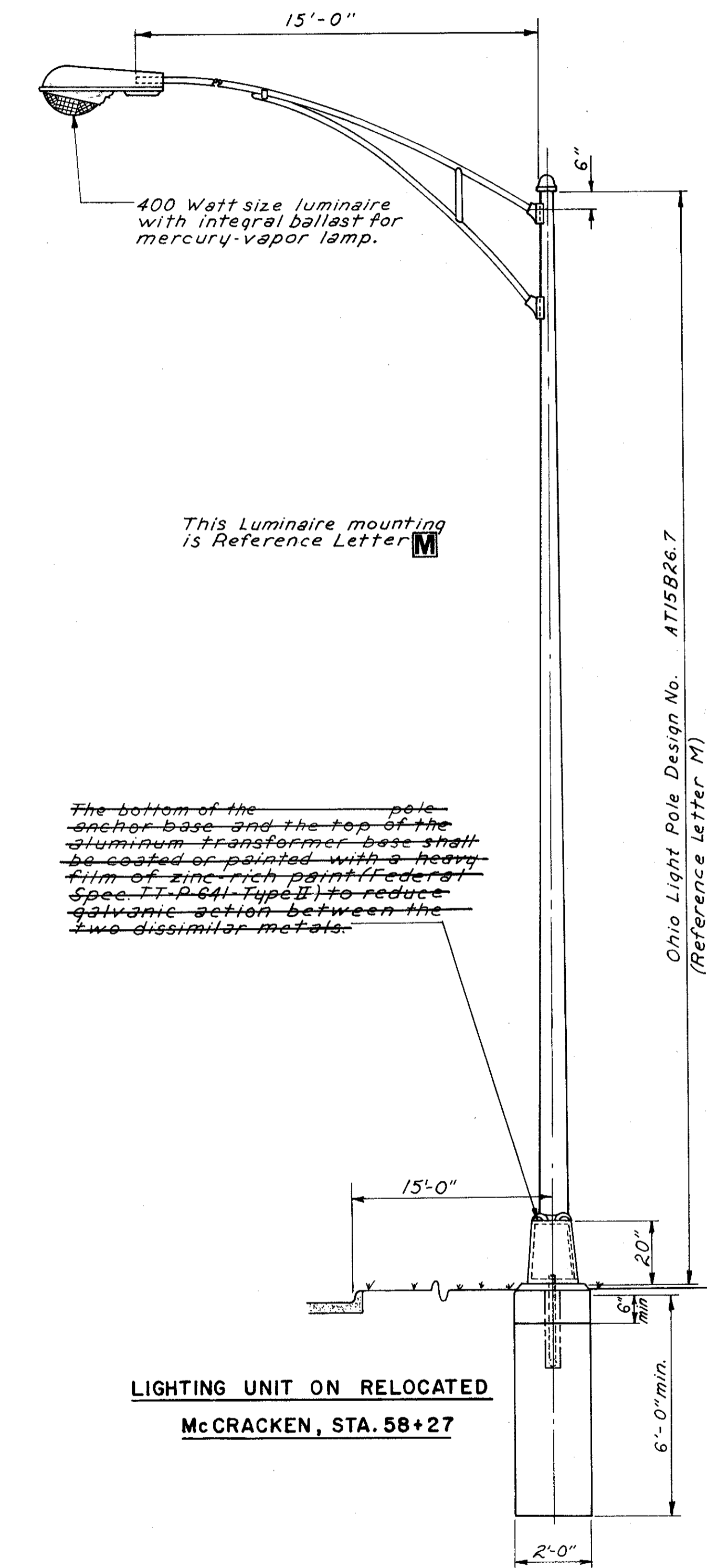
CUYAHOGA COUNTY
CUY-480-21.40



COMBINATION TRAFFIC SIGNAL AND LIGHT POLE
28 FT. RIGHT OF STA. 89+19 C OF BROADWAY AVE.
LOOKING EAST
No Scale



COMBINATION OVERHEAD SIGN AND LIGHT POLE
32 FT. LEFT OF STA. 90+07 C OF BROADWAY AVE. LOOKING EAST
No Scale



LIGHTING UNIT ON RELOCATED
McCRACKEN, STA. 58+27

COMBINATION POLE DETAILS
AND GROUND MOUNT LIGHTING UNIT
Rev. 1-9-74

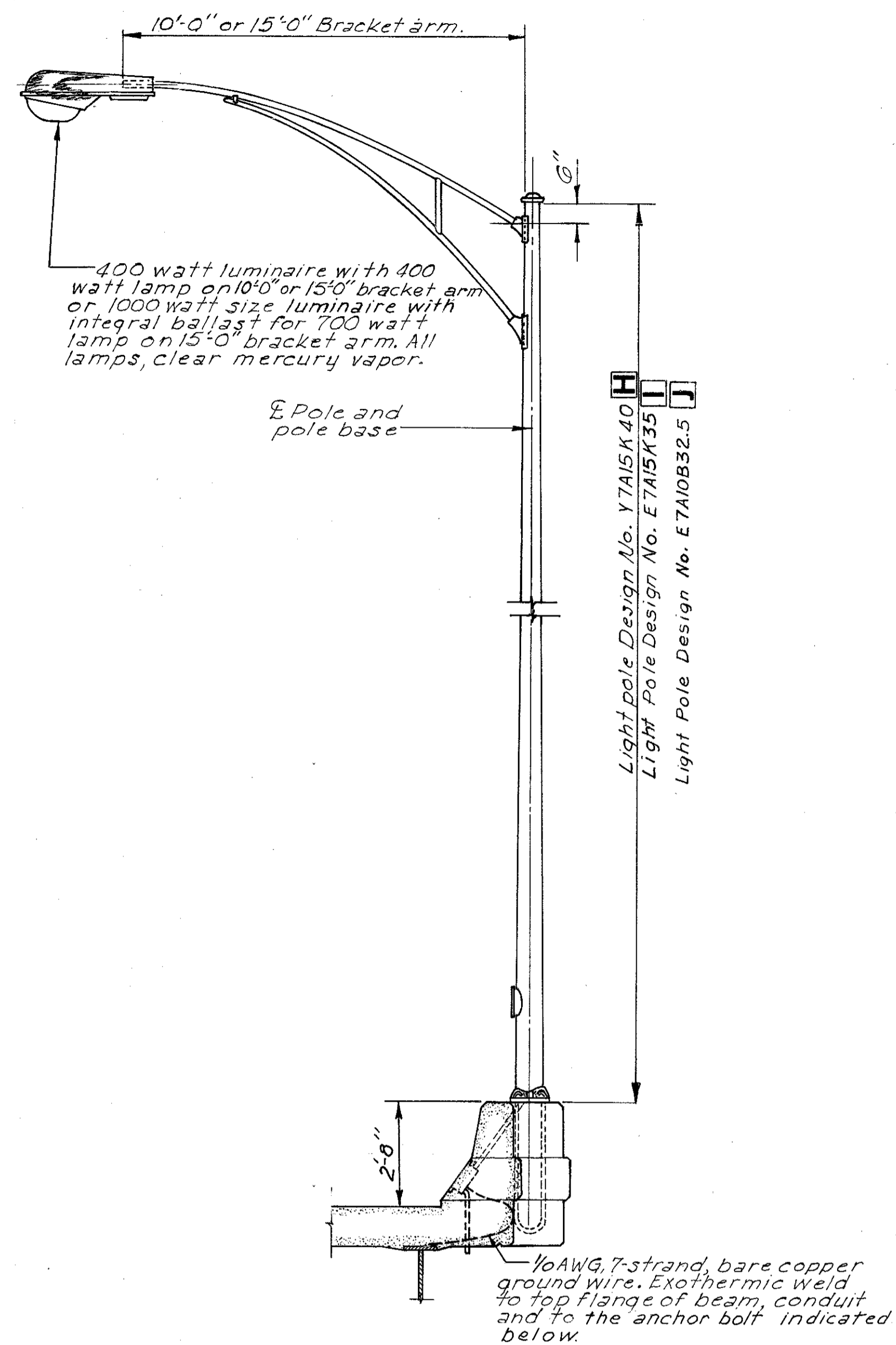
SCALE As Noted
MADE M.A.C. DATE 9-22-71
TRCD M.A.C. DATE 9-22-71
CKD L.W.L. DATE 8-17-72

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

FED. RD. DIVISION	STATE	PROJECT
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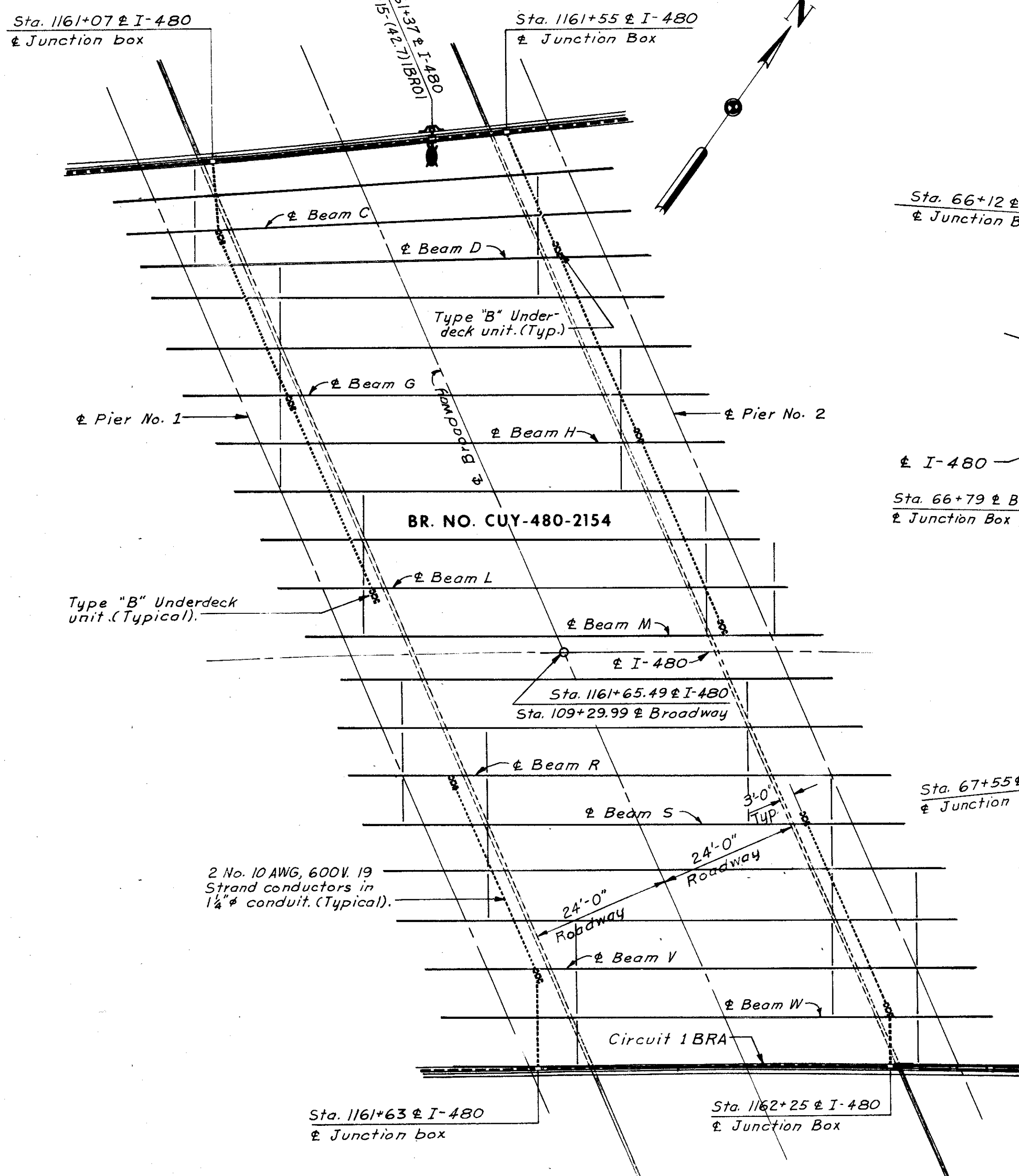
CUYAHOGA COUNTY
CUY- 480- 21.40



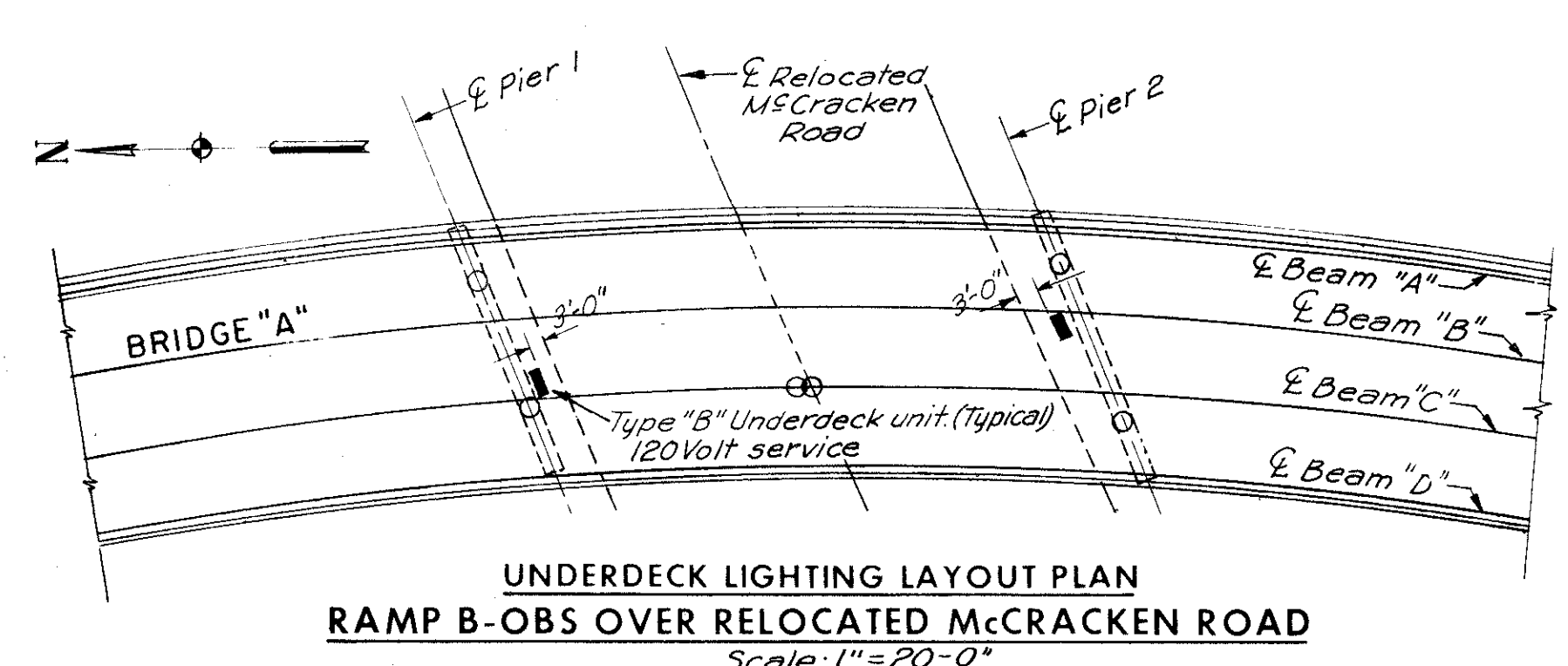
LIGHTING UNIT ON STRUCTURES
Scale: 3/8" = 1'-0"

SCALE *As Noted* HOWARD, NEEDLES, TAMMEN & BERGENOFF
 MADE *C.Y.* DATE *4-27-70* CONSULTING ENGINEERS
 TRCD *C.Y.* DATE *4-27-70*
 CKD *LWL* DATE *6-19-70* KANSAS CITY CLEVELAND NEW YORK

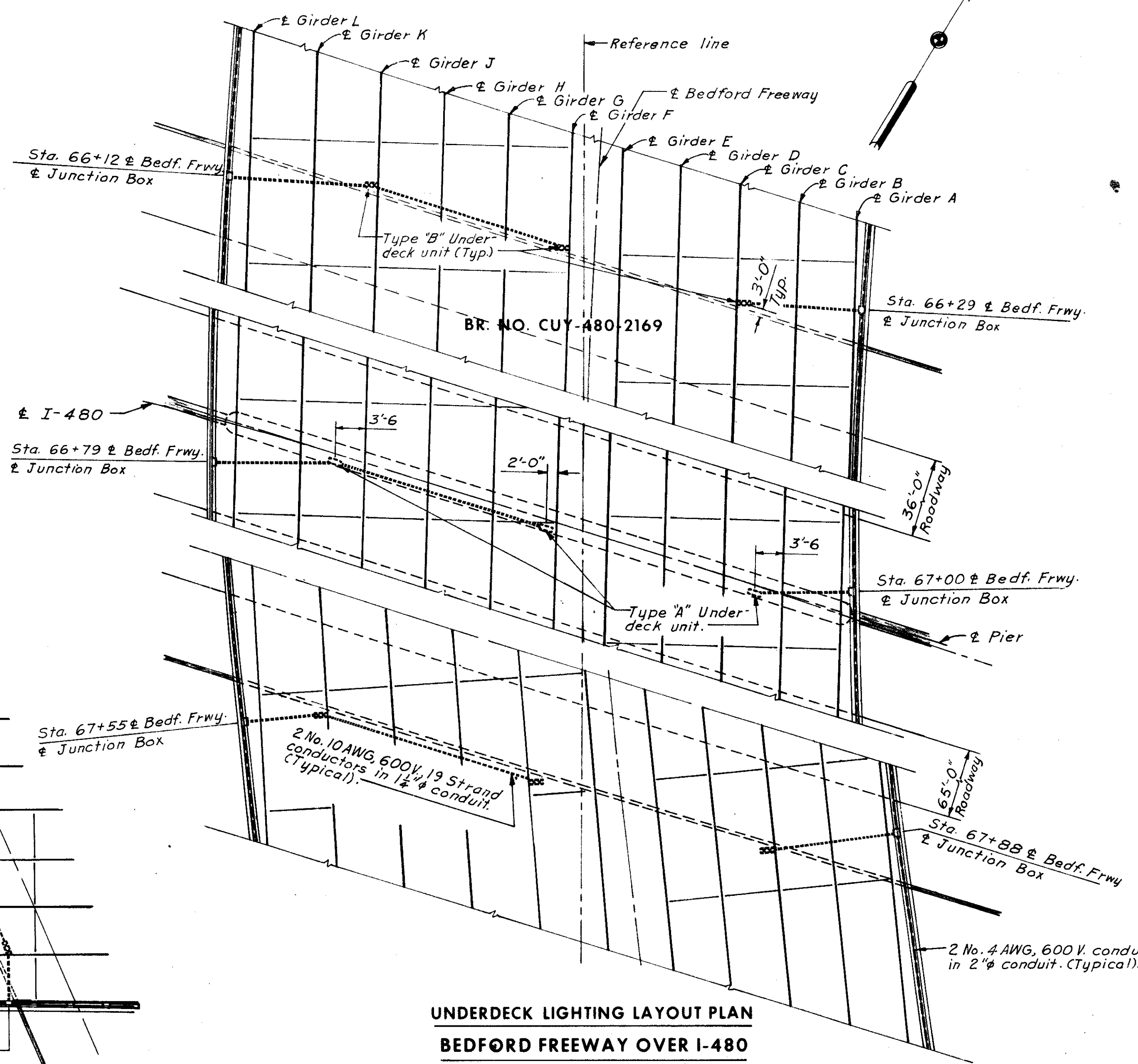
CUYAHOGA COUNTY
CUY-480-21.40



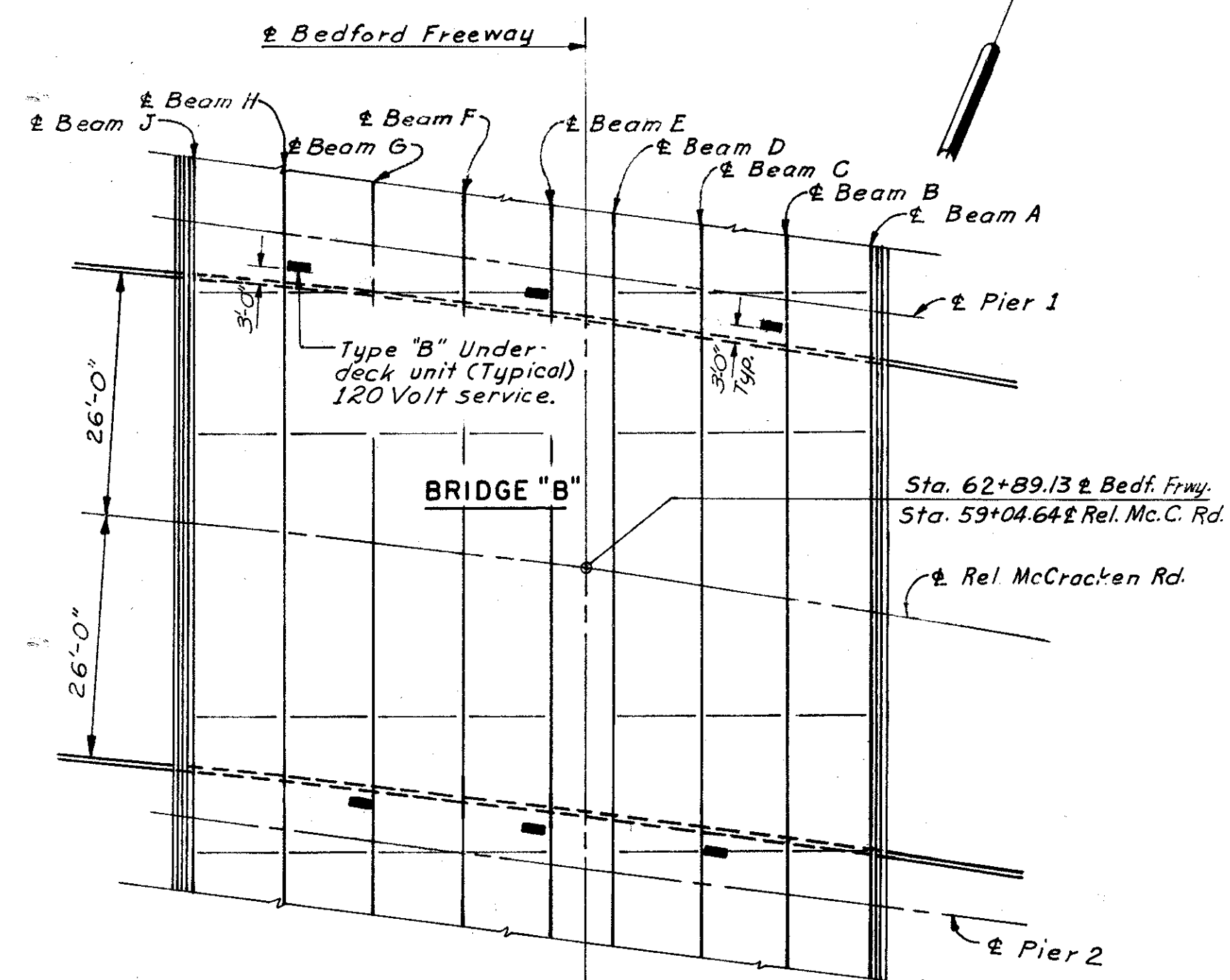
UNDERDECK LIGHTING LAYOUT PLAN
I-480 OVER BROADWAY
No Scale



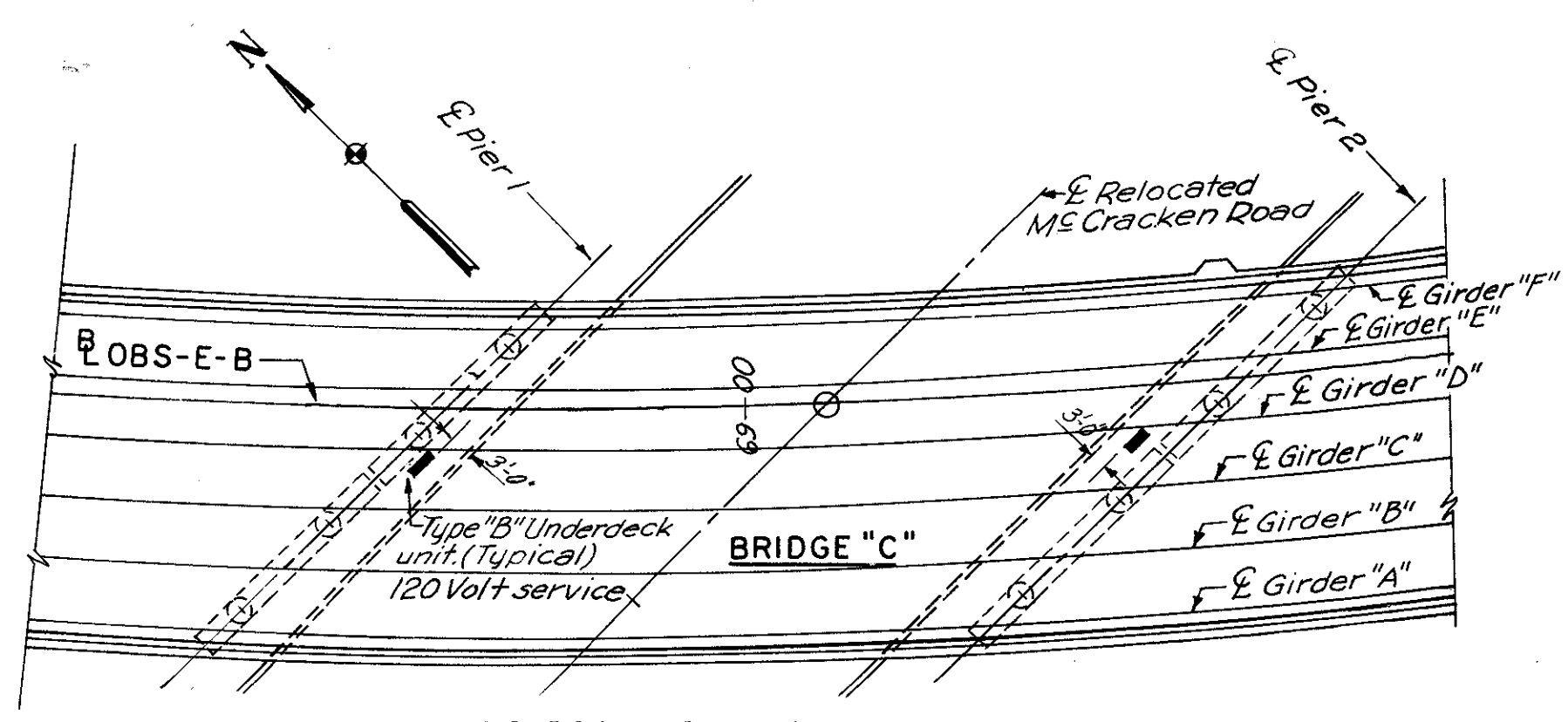
UNDERDECK LIGHTING LAYOUT PLAN
RAMP B-OBS OVER RELOCATED McCRACKEN ROAD
Scale: 1" = 20'-0"



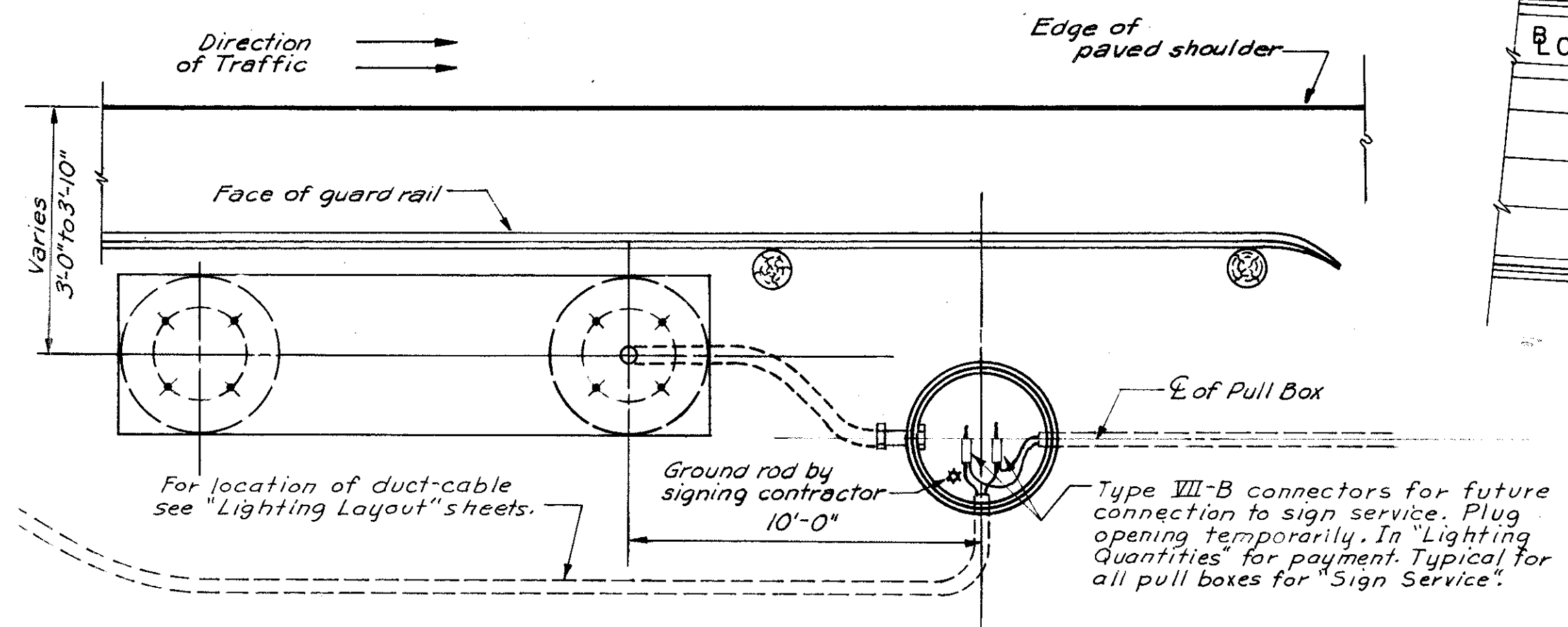
UNDERDECK LIGHTING LAYOUT PLAN
BEDFORD FREEWAY OVER I-480
No Scale



UNDERDECK LIGHTING LAYOUT PLAN
BEDFORD FREEWAY OVER RELOCATED McCRACKEN ROAD
No Scale



UNDERDECK LIGHTING LAYOUT PLAN
LANE OBS-E-B OVER RELOCATED McCRACKEN ROAD
Scale: 1" = 20'-0"



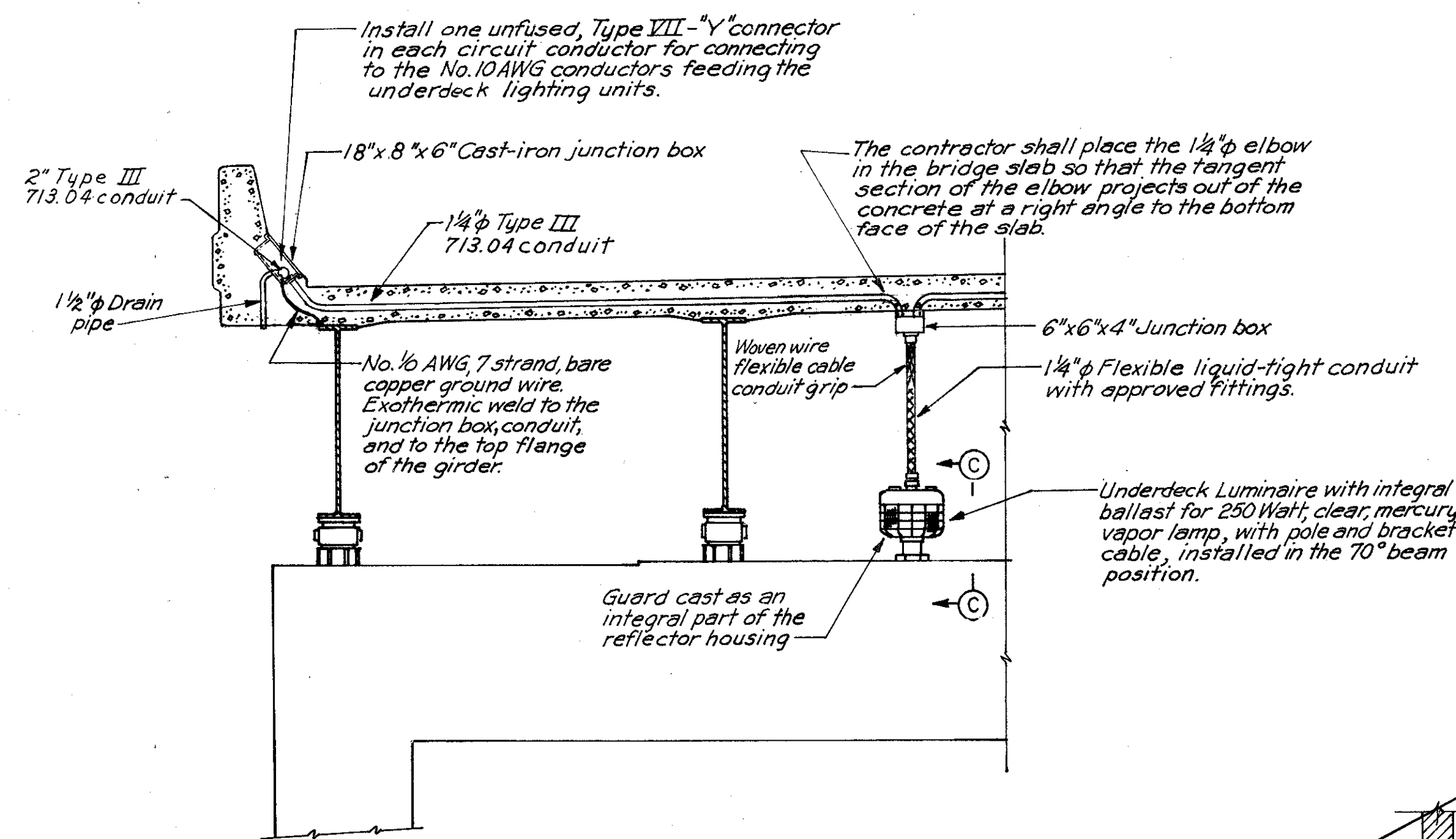
OVERHEAD SIGN BASE AND FEEDER SERVICE DETAILS
No Scale

Note: Underdeck lighting units on Bridge "A" "B" and "C" are on 120V circuit running along Relocated McCracken Road. See Sheet 271

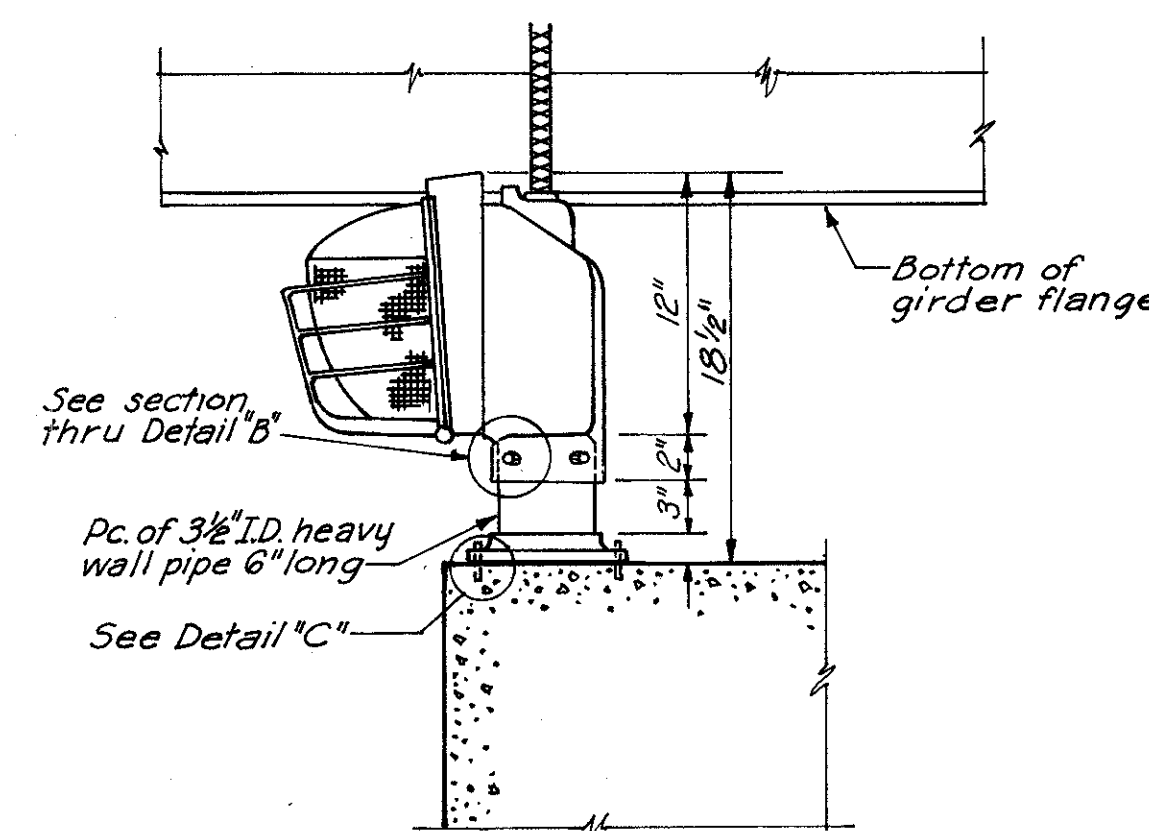
FED. RD. DIVISION	STATE	PROJECT
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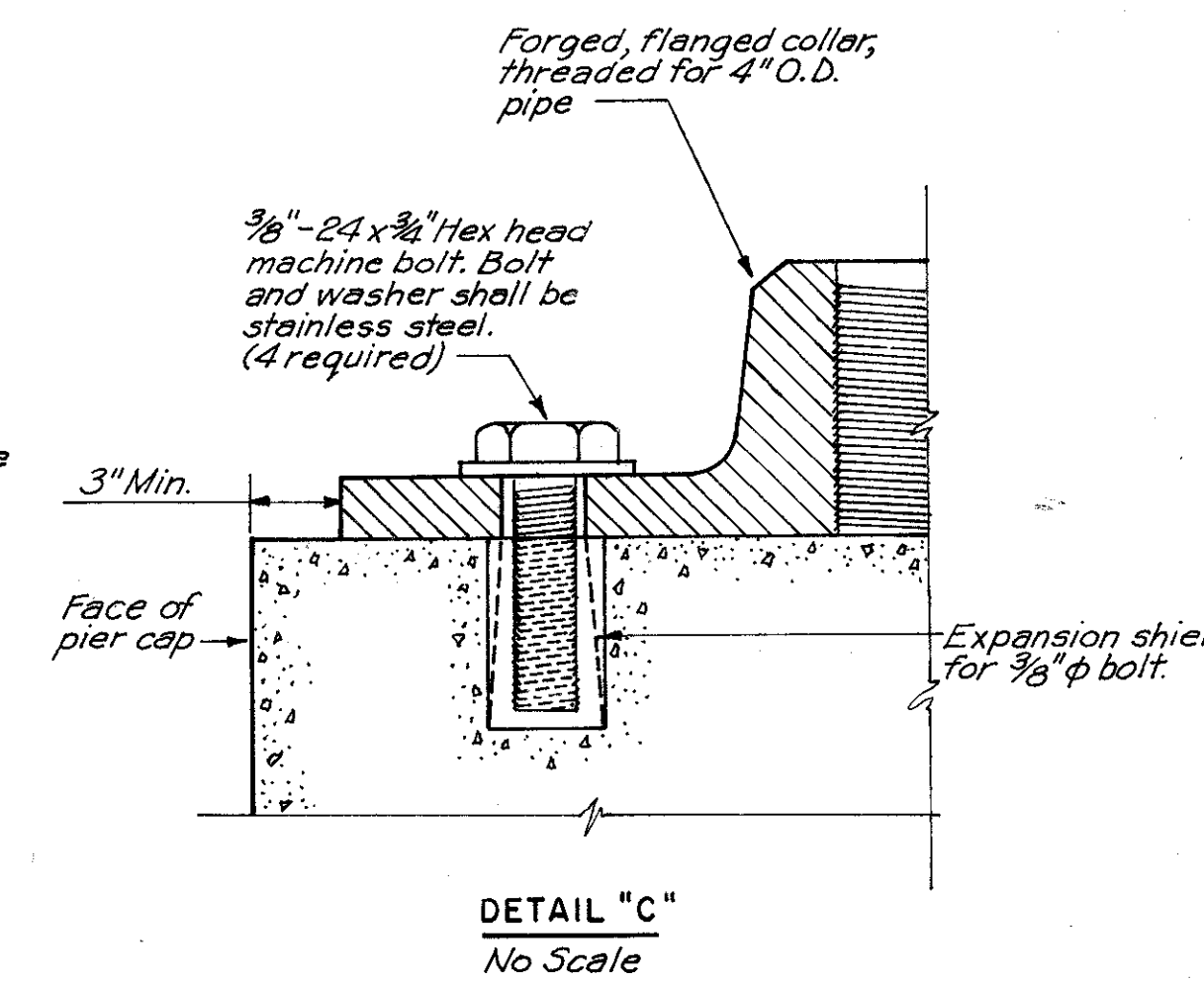
CUYAHOGA COUNTY
CUY-480-21.40



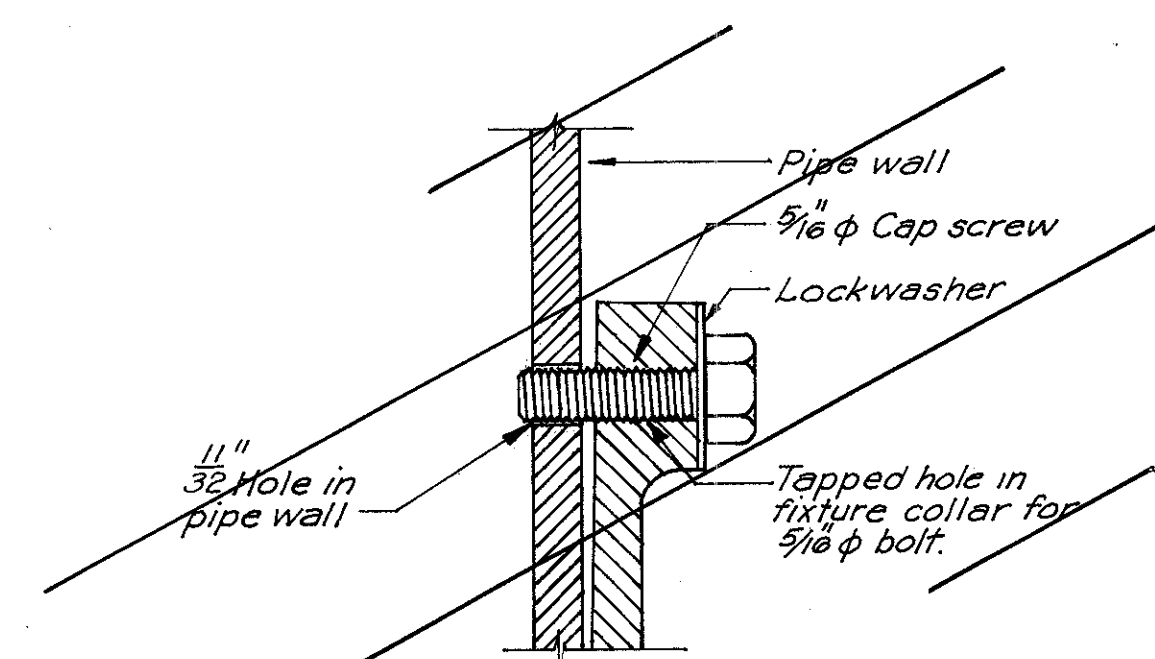
UNDERDECK LIGHTING UNIT ON PIER CAP, TYPE "A" MOUNTING
Scale: 3/8"=1'-0"



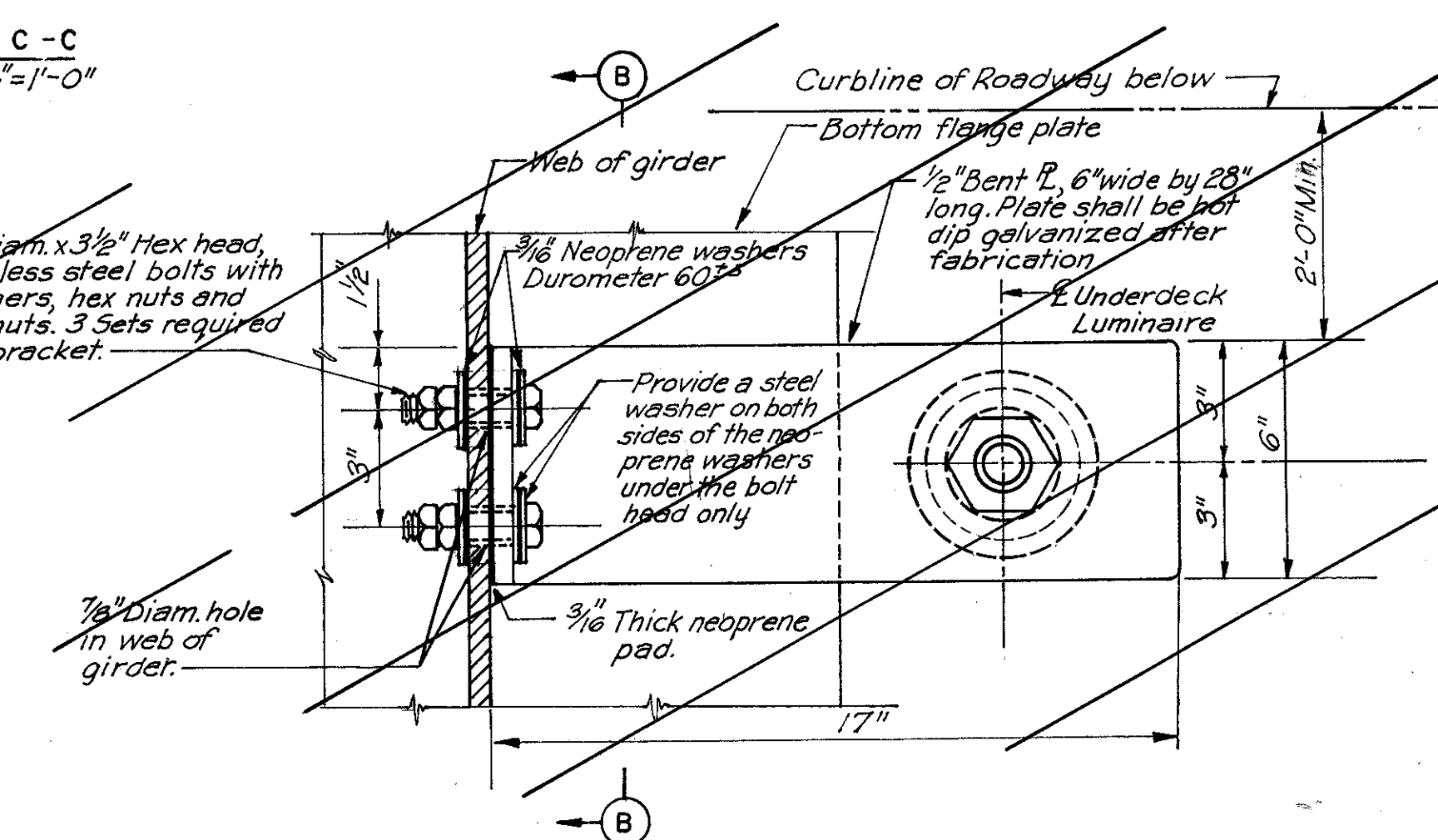
SECTION C-C
Scale: 3/4"=1'-0"



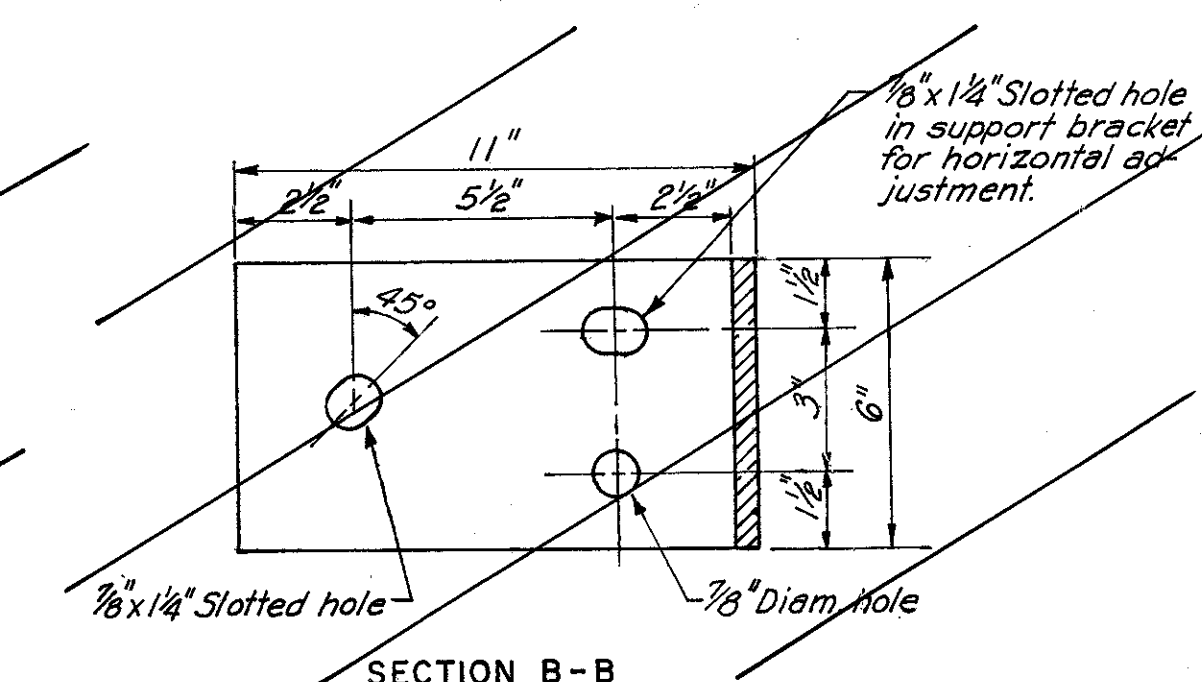
DETAIL "C"
No Scale



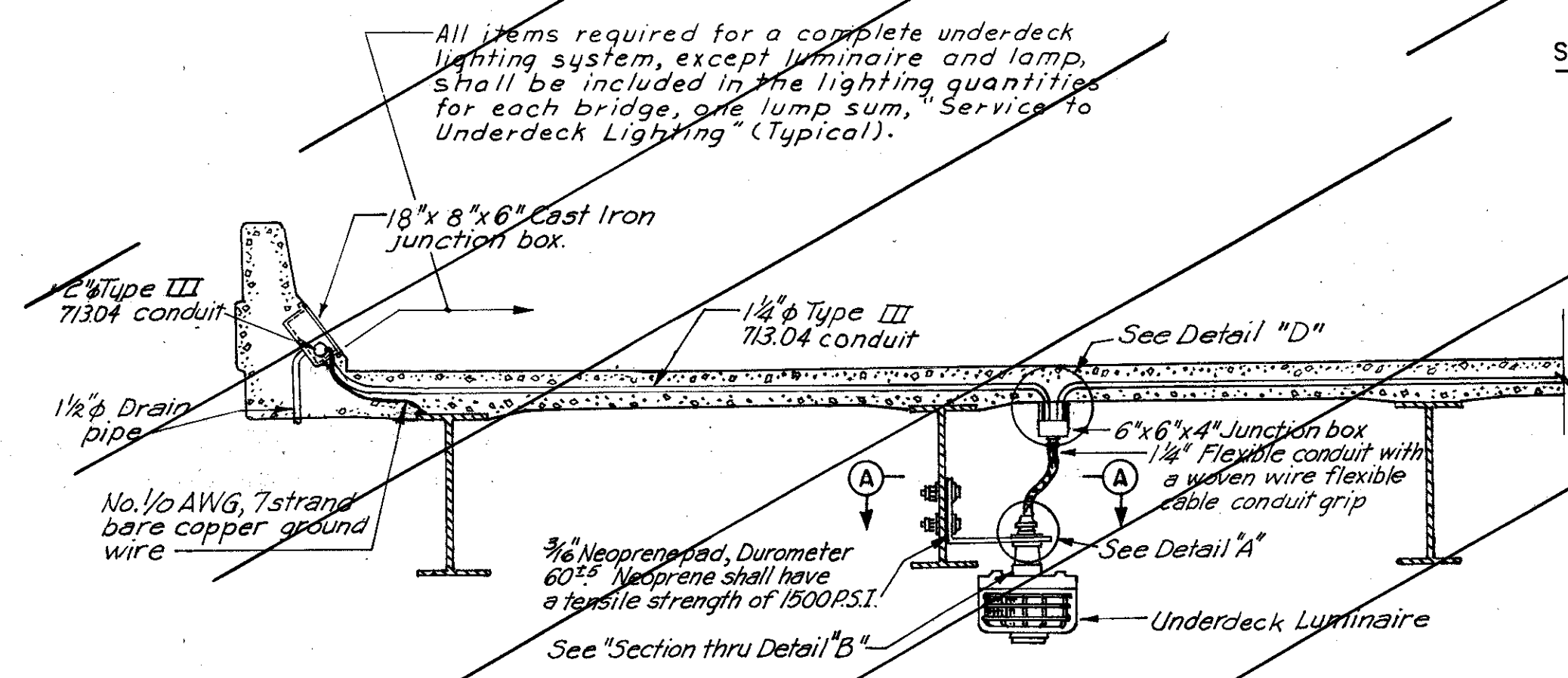
SECTION THRU DETAIL "B"
Full Scale



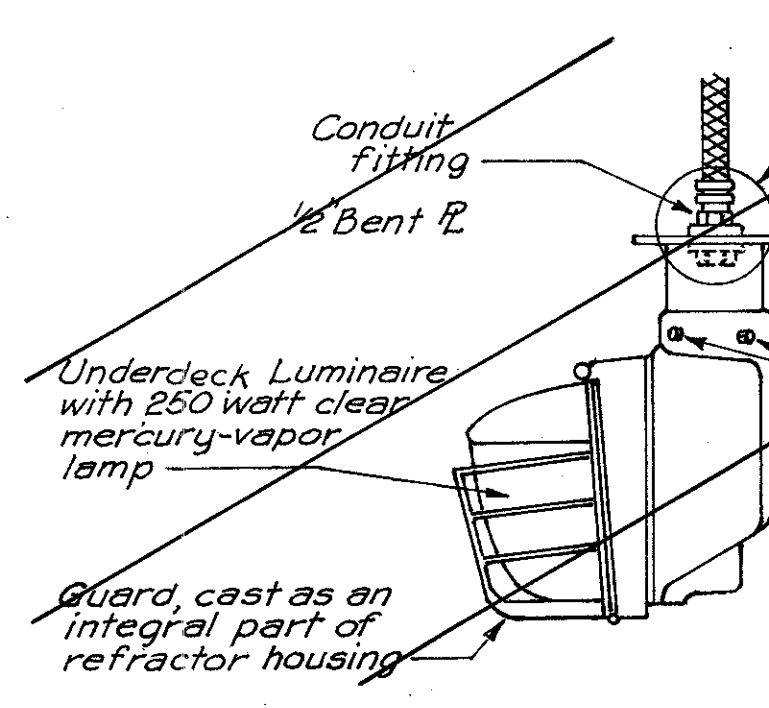
SECTION A-A
No Scale



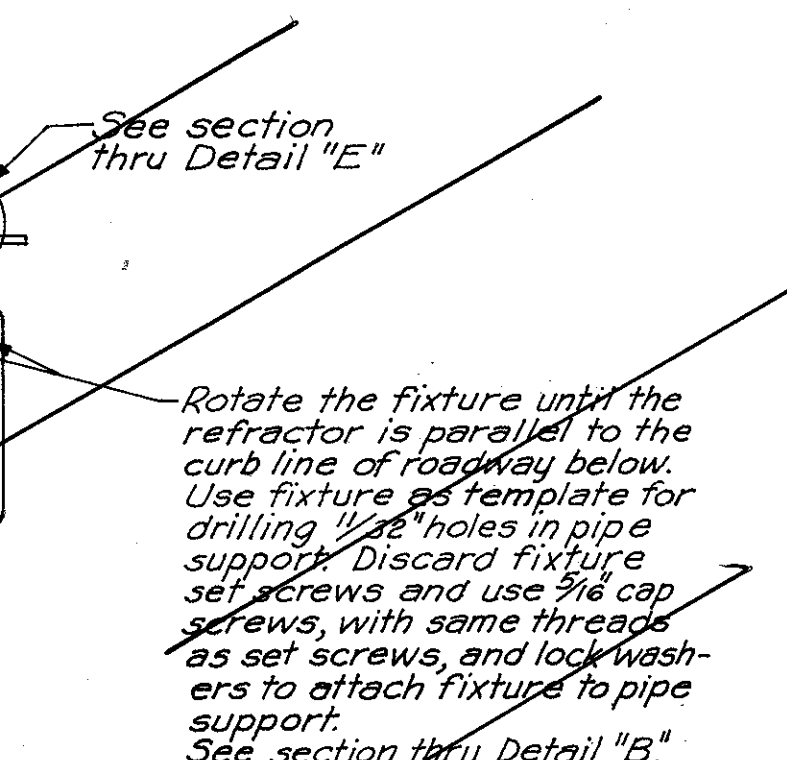
SECTION B-B



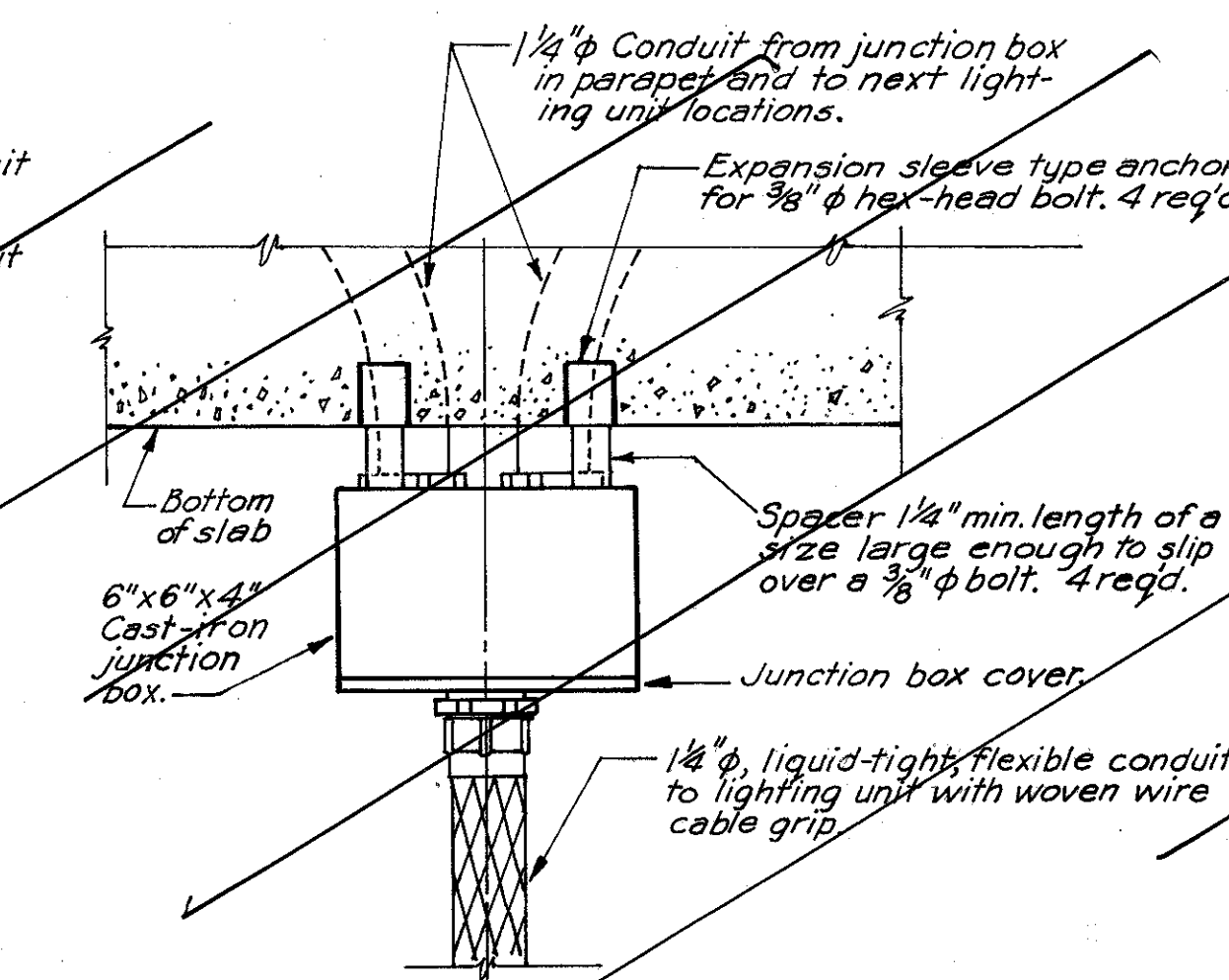
UNDERDECK LIGHTING UNIT - TYPE "B" MOUNTING
Scale: 3/8"=1'-0"



DETAIL "A"
No Scale



SECTION THRU DETAIL "E"
No Scale



DETAIL "D"
Scale: 3/8"=1'-0"

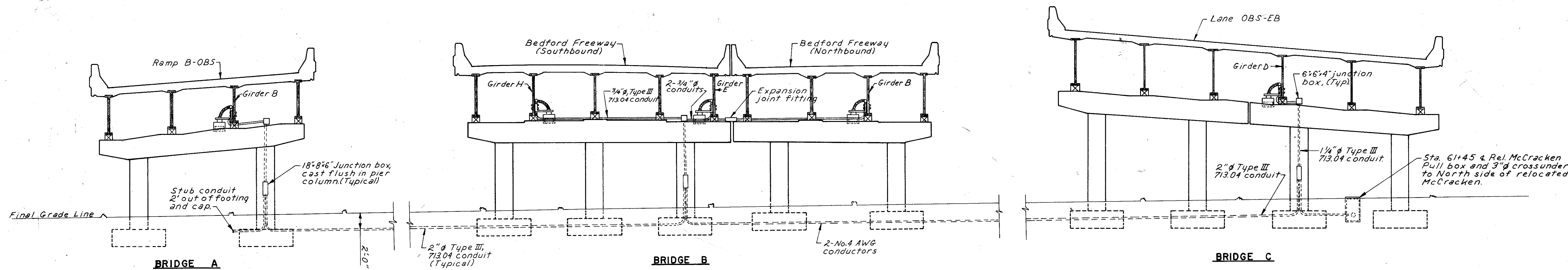
SCALE As Noted
MADE C.Y. DATE 4-30-70
TRCD. C.Y. DATE 4-30-70
CKD. L.W.L. DATE 6-13-72
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
CLEVELAND NEW YORK

UNDERDECK LIGHTING DETAILS
Rev. 1-9-74

FED. RD. DIVISION	STATE	PROJECT
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CUYAHOGA COUNTY
CUY-480-21.40



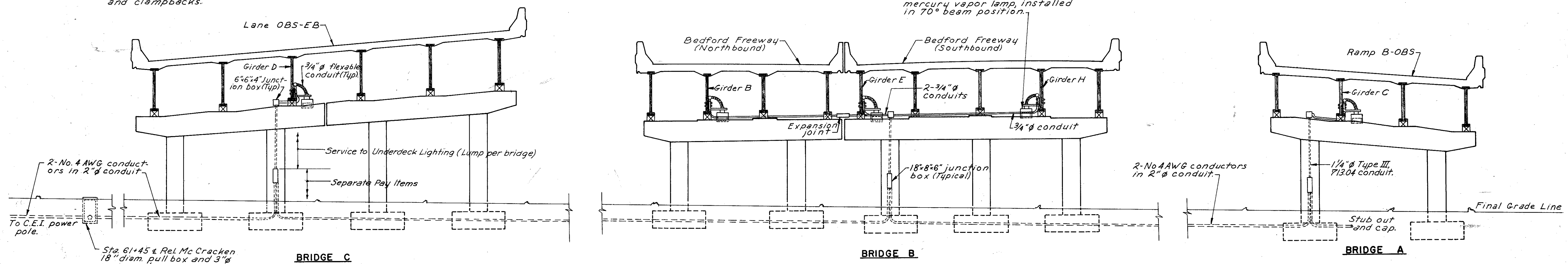
SOUTH OF PIER 2 - LOOKING NORTH

Note:
Flexible conduit to be 3/4" liquid tight, with a woven wire flexible cable conduit grip and approved connectors.
All rigid conduit on pier caps and/or girders to be supported at 6'-0" min. centers with approved J-hole clamps and clampsbacks.

Note:
Install one Type VIII, unfused connector in each conductor at the pier column junction box. No 10 AWG conductors from pier column junction box to underdeck luminaires.

Note:
Underdeck luminaires to be 3'-0" outside of roadway and minimum of 15'-0" above edge of roadway. Luminaire to be positioned so beam is perpendicular to centerline of roadway being illuminated.

Typical Underdeck Luminaire over Rel. McCracken, with Integral 120 Volt ballast for 250 Watt clear mercury vapor lamp, installed in 70° beam position.



NORTH OF PIER 1 - LOOKING SOUTH

UNDERDECK LIGHTING FOR RELOCATED McCRACKEN ROAD

Note:
All underdeck luminaires over Relocated McCracken at Bridges A, B, & C are to be ballasted for 120 Volt operation.
Mounting of luminaires to bridge girder shall be identical with Type B mounting except that electrical service conduits will be run along the top of the pier caps and/or along the girders.

SCALE None
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE C.C.G. DATE 7-1-72
CONSULTING ENGINEERS
TRCD. C.C.G. DATE 7-1-72
KANSAS CITY CLEVELAND NEW YORK
CKD. LWL. DATE 8-4-72

UNDERDECK LIGHTING LAYOUT

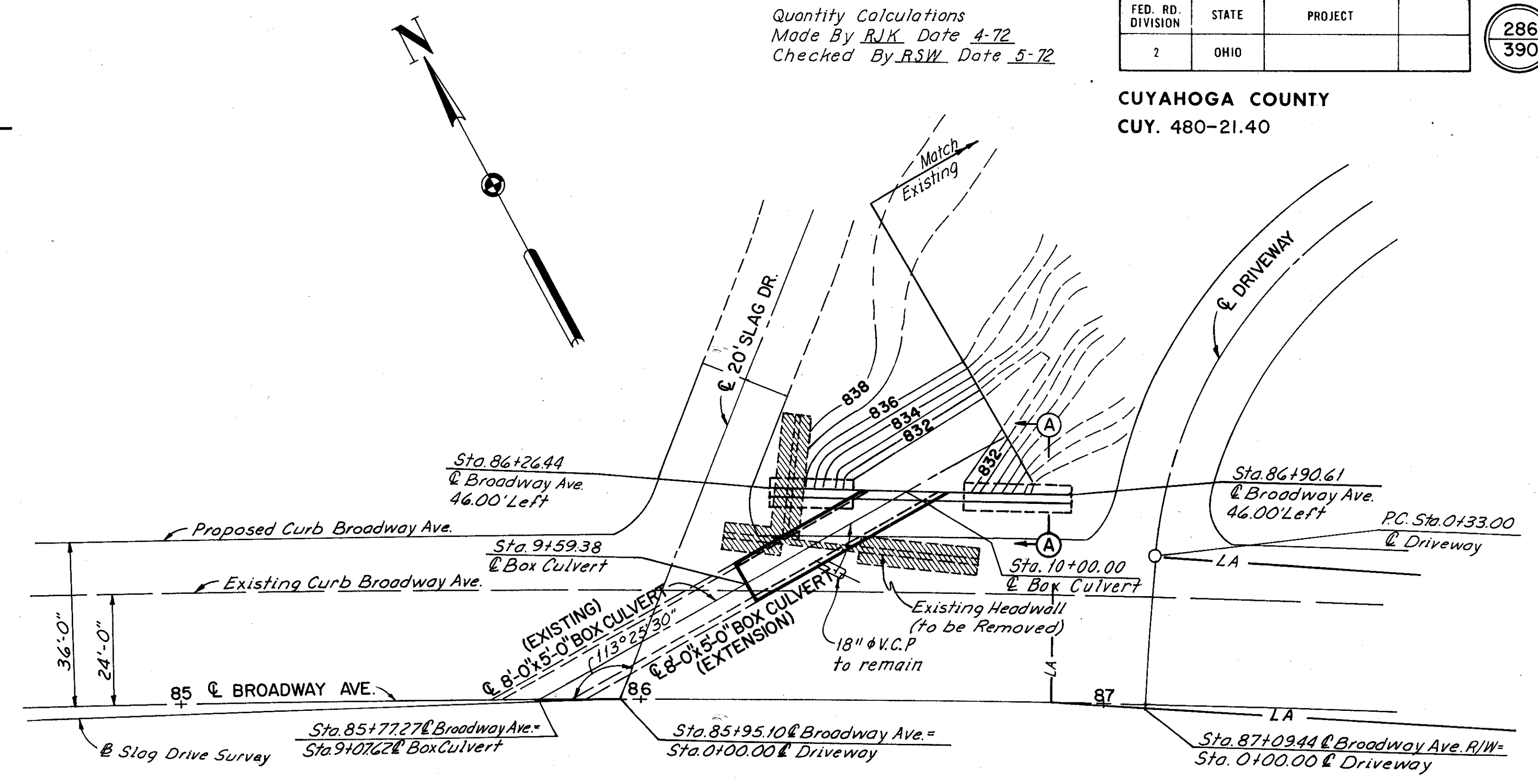
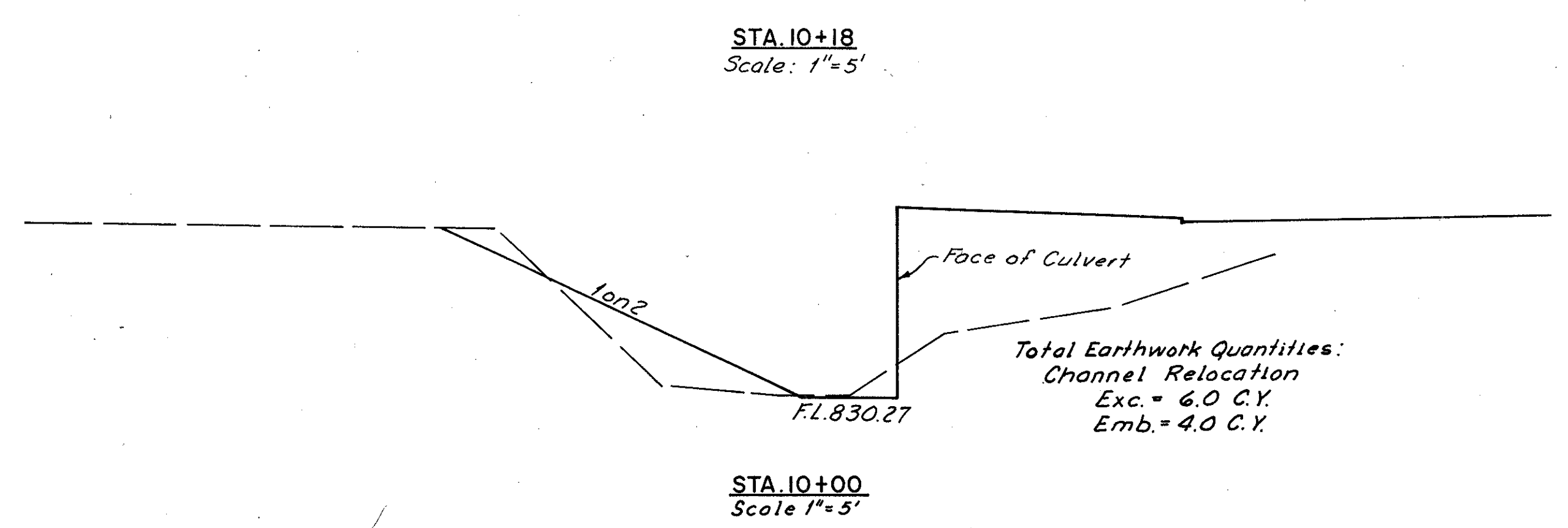
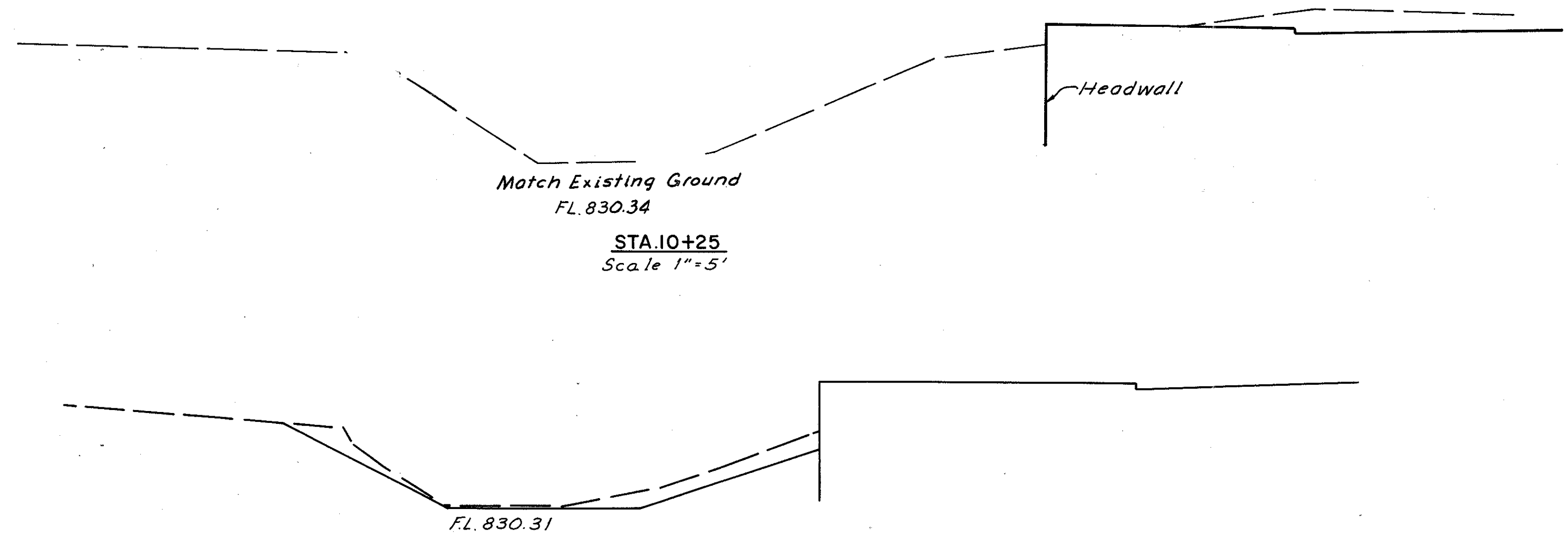
U-7
L-7

Quantity Calculations
Made By RJK Date 4-72
Checked By RSW Date 5-72

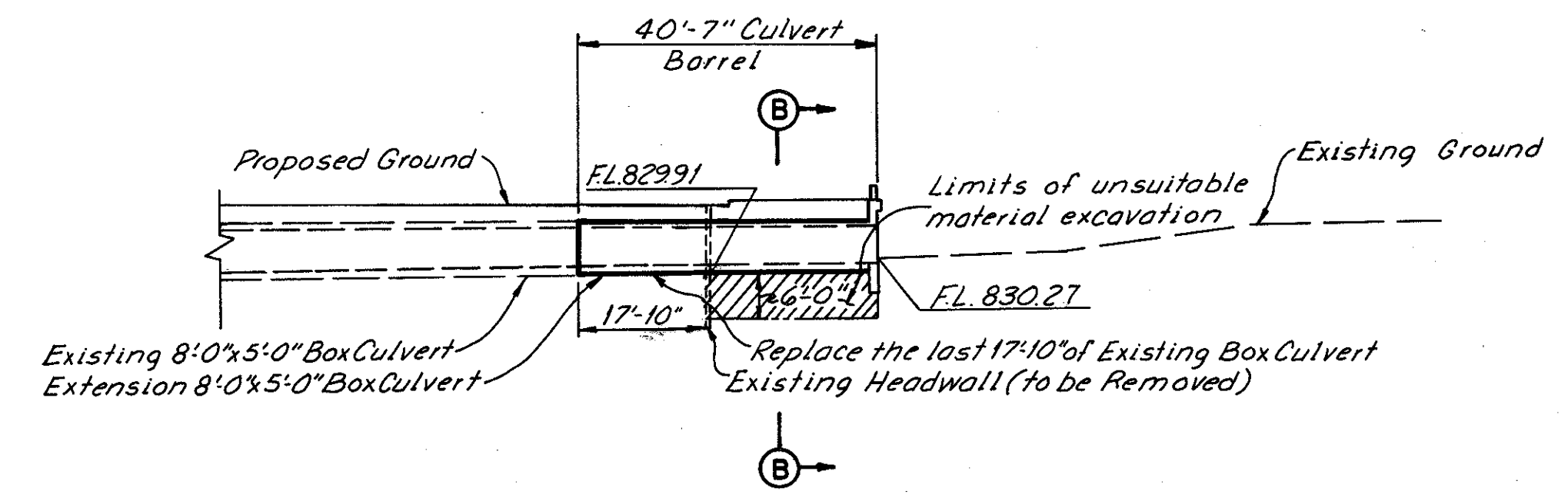
FED. RD. DIVISION	STATE	PROJECT
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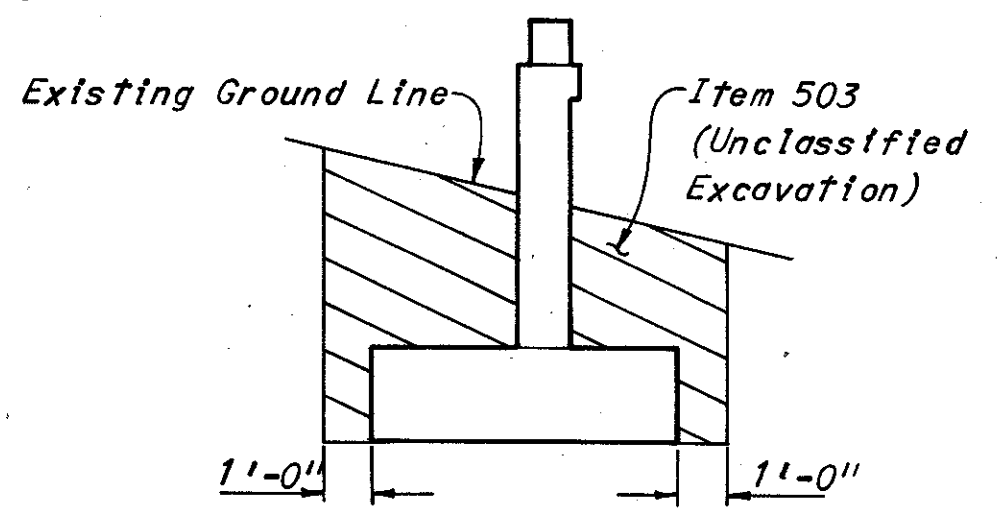
CUYAHOGA COUNTY
CUY. 480-21.40



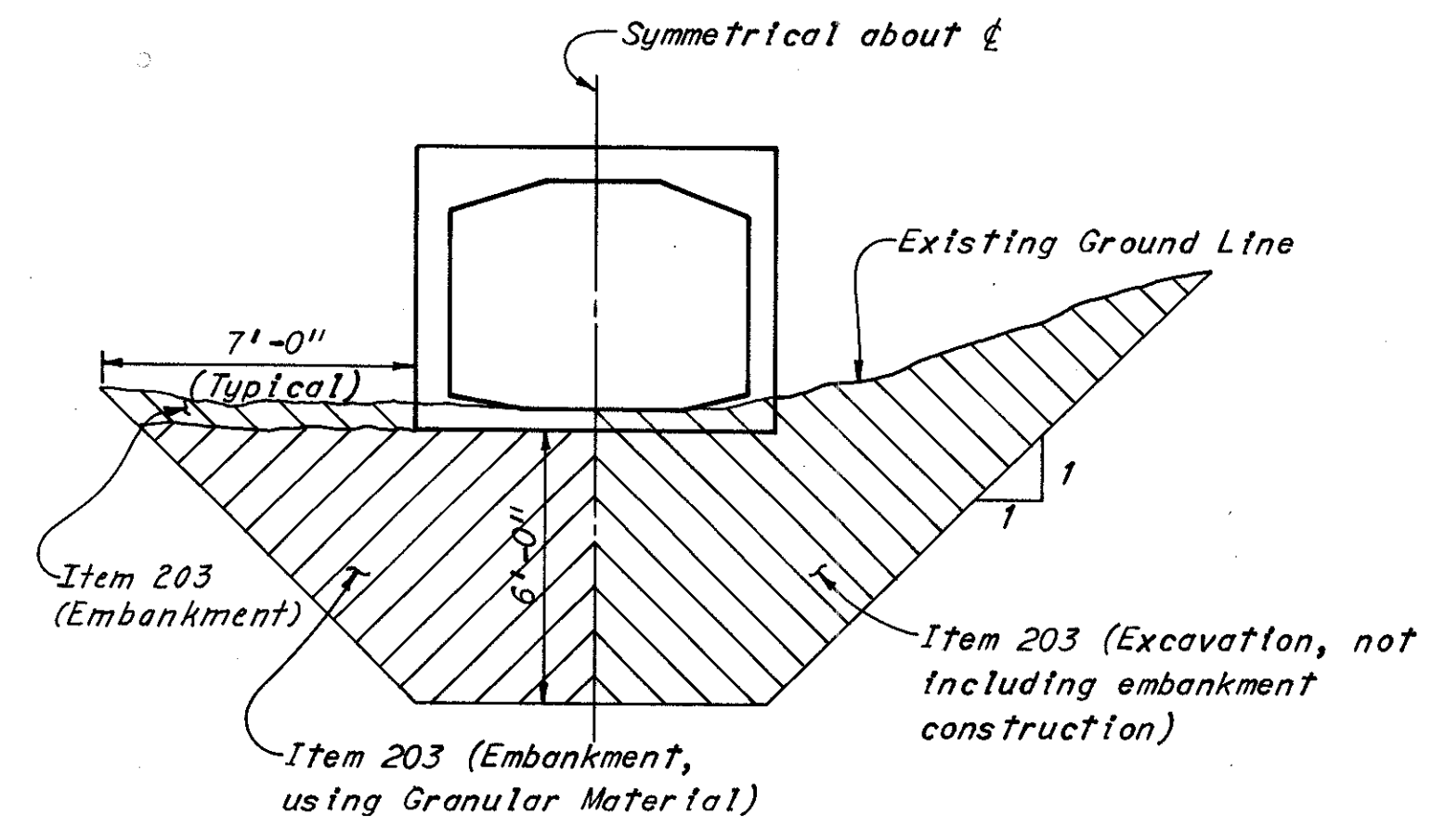
PLAN
Scale: 1"=20'



ELEVATION
Scale 1"=20'



SECTION A-A
No Scale



SECTION B-B
No Scale

After the above excavation is completed, backfill to the level of the bottom of the culvert with well compacted "Granular Material" as defined in Section 203.02.

ESTIMATED QUANTITIES			
ITEM	TOTAL	UNIT	DESCRIPTION
202	Lump	Lump	Portion of Structures Removed
203	87	Cu. Yd.	Excavation, not including embankment construction
203	23	Cu. Yd.	Embankment
203	81	Cu. Yd.	Embankment, using Granular Material as per plan
503	113	Cu. Yd.	Unclassified Excavation
509	14,809	Pounds	Reinforcing Steel
511	100	Cu. Yd.	Class "C" Concrete
512	20	Lin. Ft.	Premolded Sealing Strip
517	65	Lin. Ft.	Railing (Bridge Sidewalk)
Special	Lump	Lump	Cleanout and Repair to Existing Box Culvert

Quantity Calculations
Made By RJK Date 4-21-72
Checked By RSW Date 5-1-72

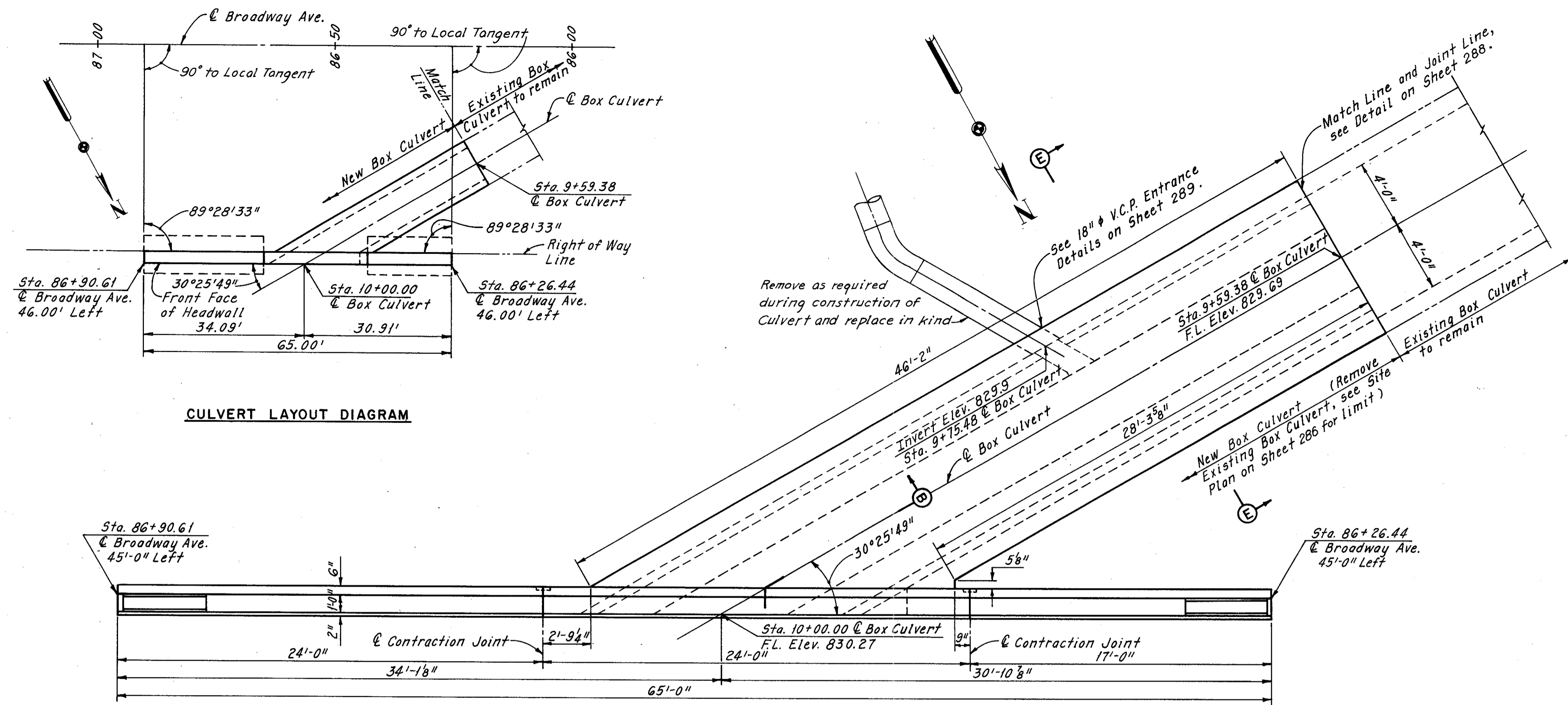
Notes:
Item 202 includes 62 cu. yds. of concrete and 108 ft. of 2 1/2" Galvanized Wrought Iron Pipe Handrail Removal.
The Class "C" Concrete shall have a unit stress of 1333 psi.
The embankment above existing ground at headwalls and culvert is included with roadway embankment for payment.
The Item Special, Cleanout and Repair to Existing Box Culvert includes the removal and disposal of all sediment from the bottom slab; the removal of the overlaying material at top slab joints, sealing the joint with Type A Waterproofing in accordance with 512.05 and replacing the overlaying material in kind; and the repair to honeycombed areas of the existing culvert walls and top slab with pneumatically placed mortar in accordance with 520.
All work shown on this sheet is in Participation I.

SCALE: 1"=20'
MADE BY RJK DATE 04-21-72 CONSULTING ENGINEERS
TRCD BY RJK DATE 4-21-72 ANSAS CITY CLEVELAND NEW YORK
CHKD BY RSW DATE 05-01-72

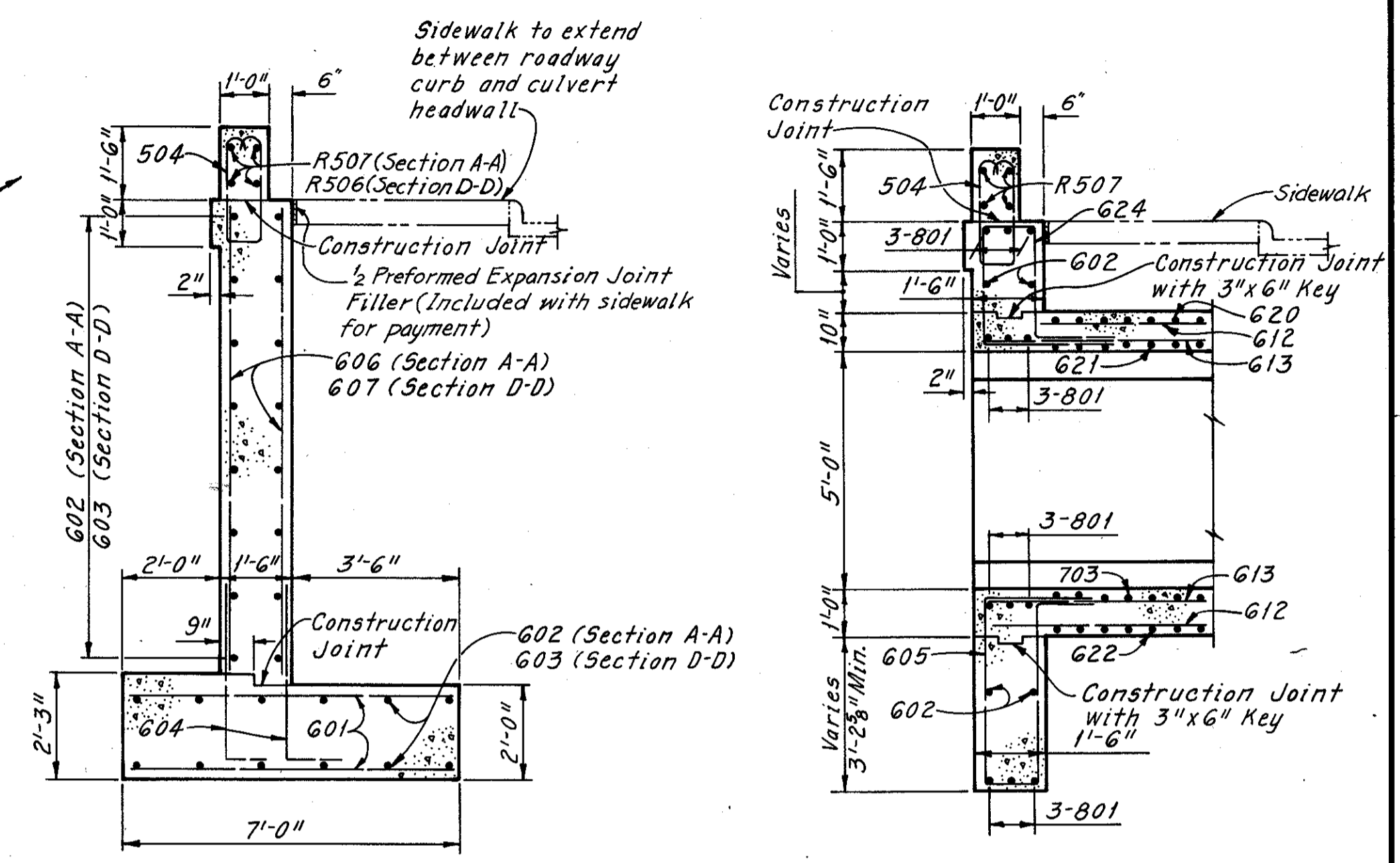
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

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CUYAHOGA COUNTY
CUY-480-21.40



CULVERT LAYOUT DIAGRAM

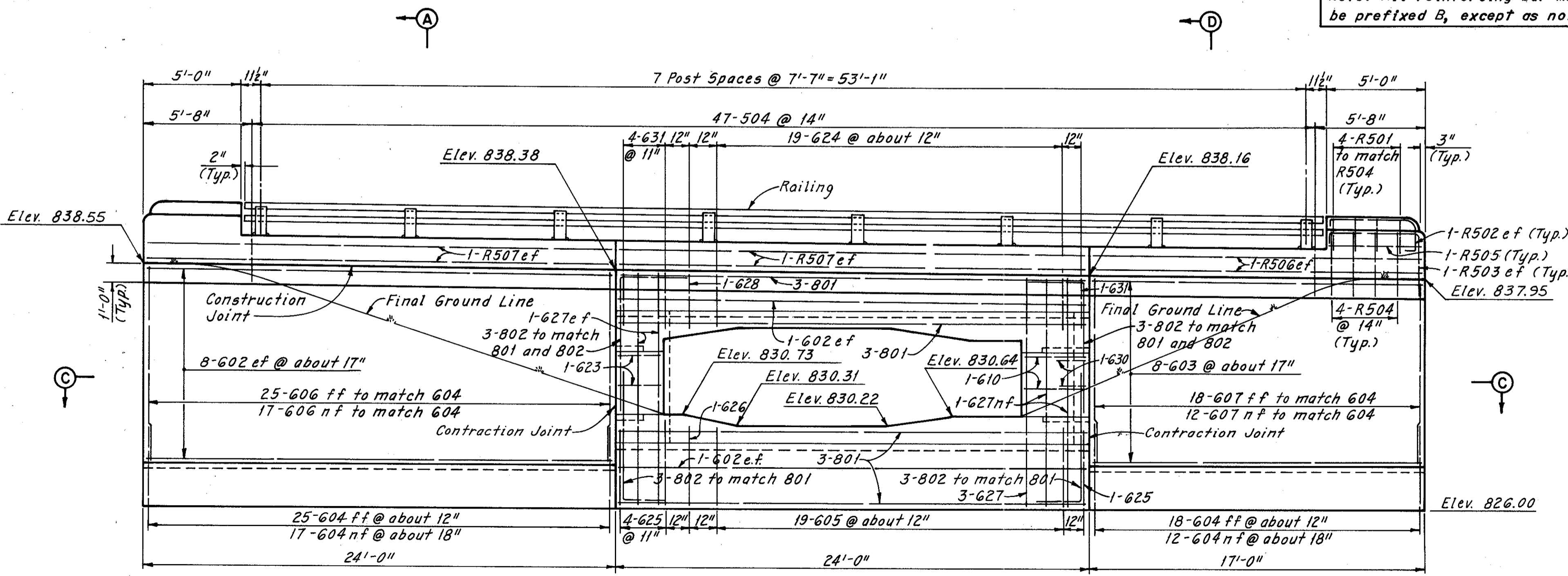


SECTION A-A
(SECTION D-D similar, except as noted)
(Railing not shown)

PART SECTION B-B
(Railing not shown)

PLAN
(Railing and Footings under
sidewalls not shown)

Note: All reinforcing bar marks shall be prefixed B, except as noted.



ELEVATION

FOUNDATION NOTE:
Foundation material of approximately uniform bearing capacity is contemplated. Spots of soft earth shall be removed and be replaced with thoroughly compacted granular material.

RAILING NOTES:
Railing shall be fabricated in lengths not less than three panels 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 517". 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, longitudinal reinforcing steel, and end post reinforcing steel in the parapets shall be included with "Item 517" for payment. All other reinforcing steel in the parapets shall be included with "Item 509" for payment.
For additional Railing, Parapet and End Post Details and Notes, see Ohio Standard Drawing BR-2-67, Revision 10-15-71. Guard rail anchor bolts are not required at either end. For Railing Reinforcement Schedule see Sheet 289.

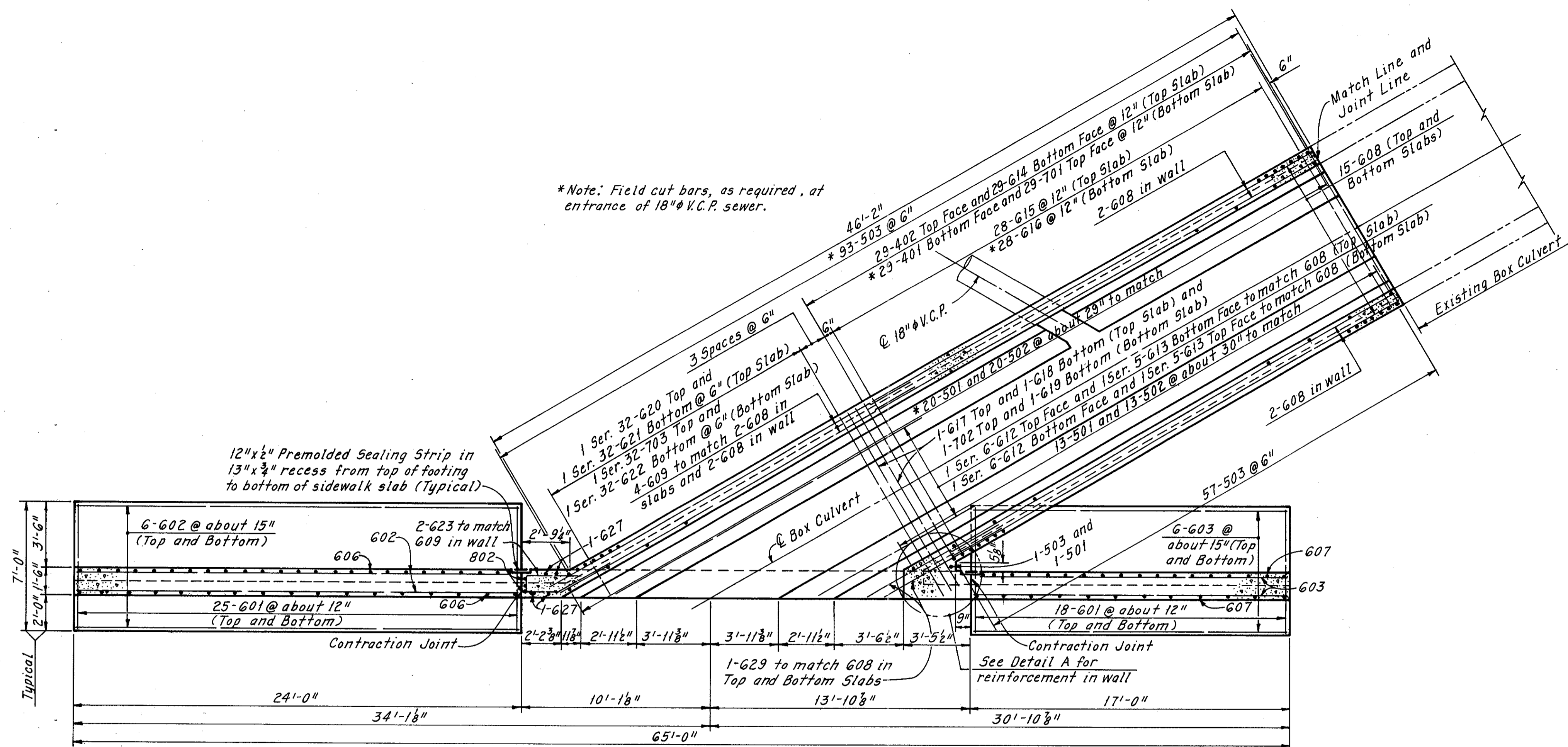
Notes:
Embankment shall be placed symmetrically on both sides of the culvert after the top slab is in place. Embankment over the barrel shall be placed in horizontal layers simultaneously with that on each side of the culvert.
For Sections C-C and E-E see Sheet 288.
For Existing 18" Sewer Entrance Details and Reinforcement Schedule, see Sheet 289.
The following abbreviations are used:
ef = each face
nf = near face
ff = far face

SCALE: 1"=10'-0"
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE 5/15/72 DATE 4-17-72 CONSULTING ENGINEERS
TRCD. WB. DATE 4-19-72
CKD. DHS. DATE 4-25-72 KANSAS CITY CLEVELAND NEW YORK

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

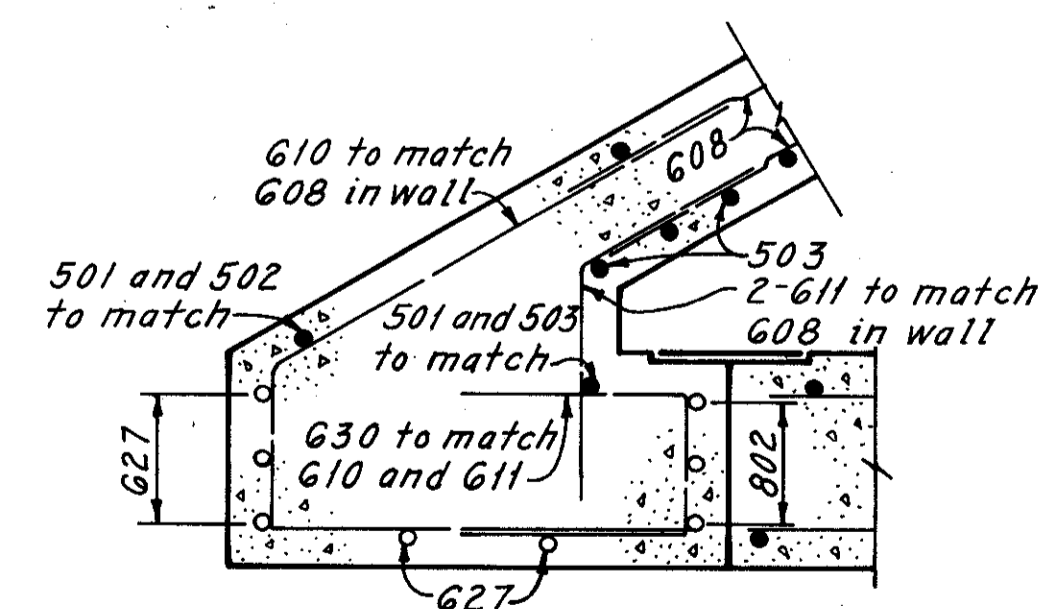
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CUYAHOGA COUNTY
CUY.-480-21.40

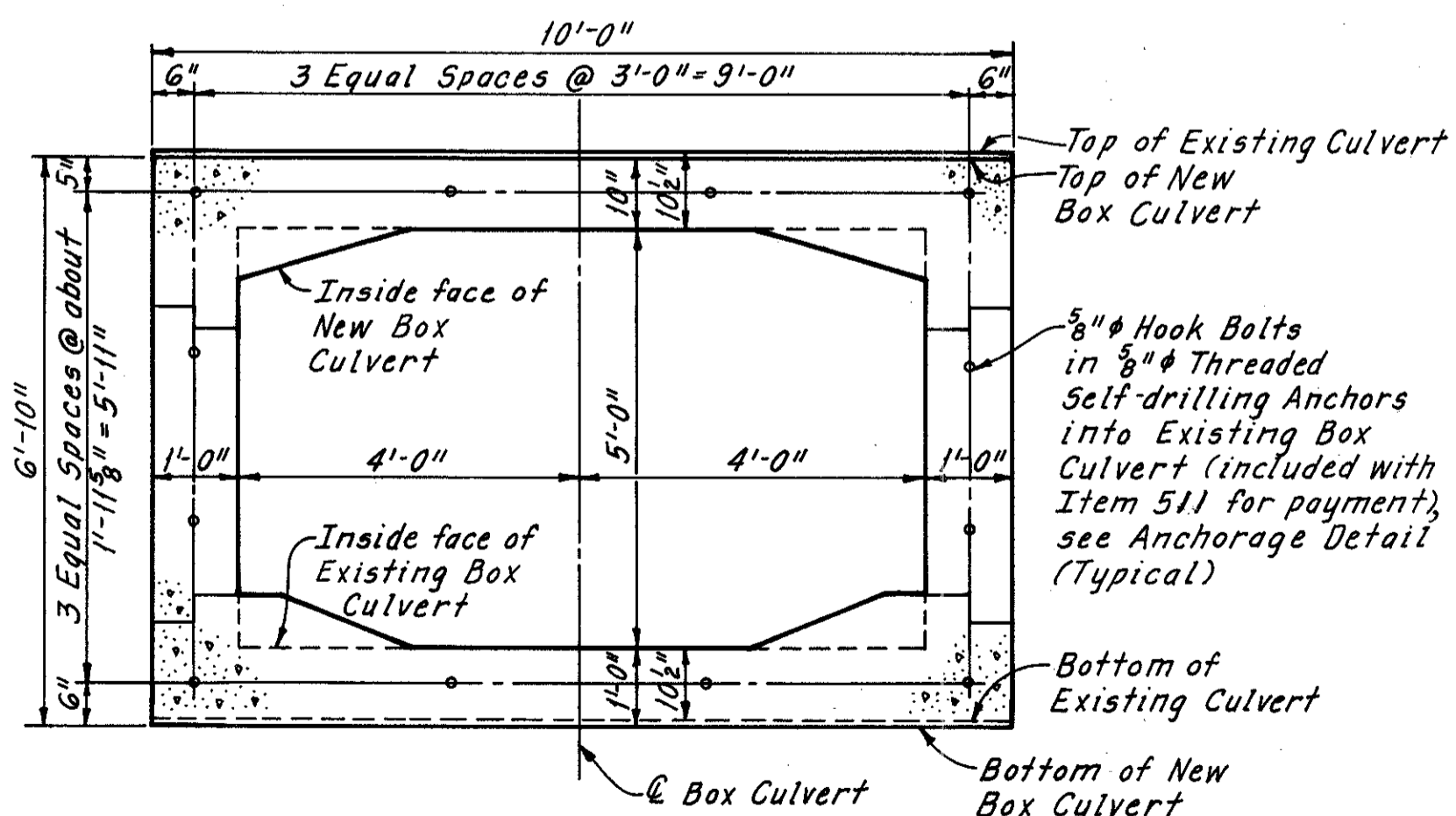


SECTION C-C AND FOOTING PLAN

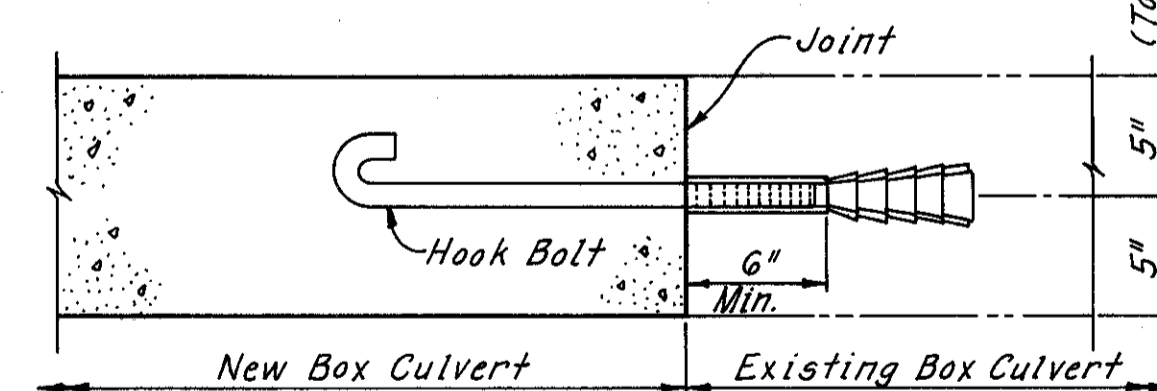
Note: All reinforcing bar marks shall be prefixed B, except as noted.



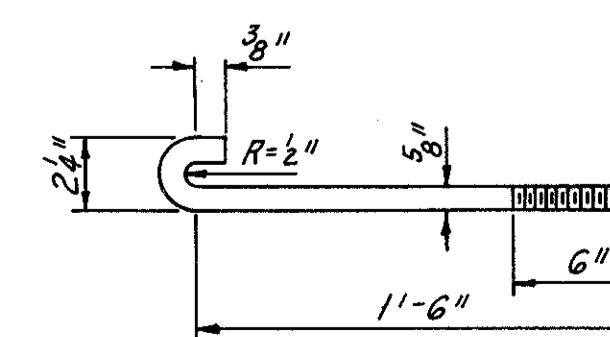
DETAIL A



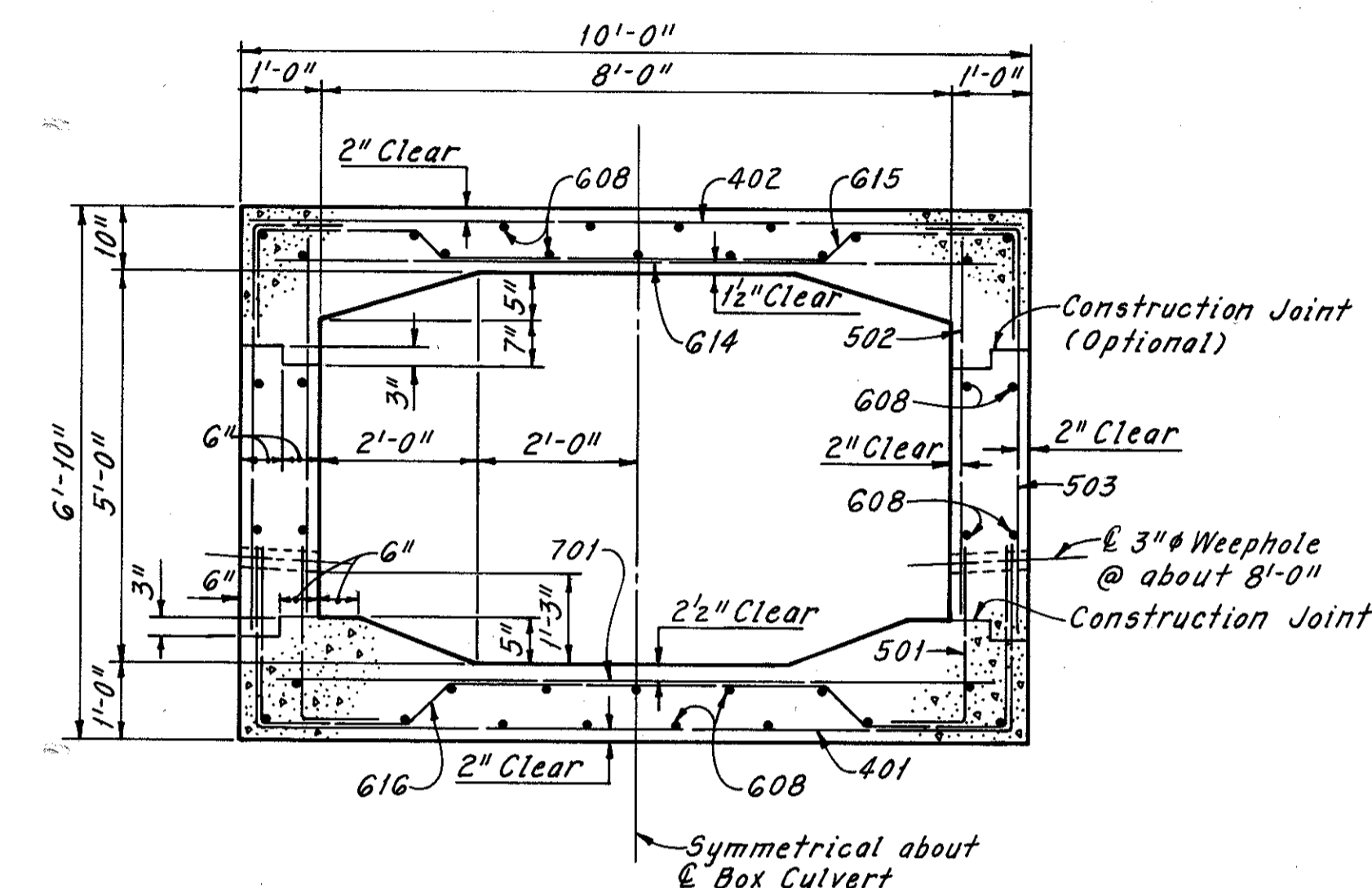
CULVERT DETAIL AT JOINT
(BETWEEN EXISTING AND NEW CULVERT)



ANCHORAGE DETAIL
(Anchorage between Existing and New Box Culvert)



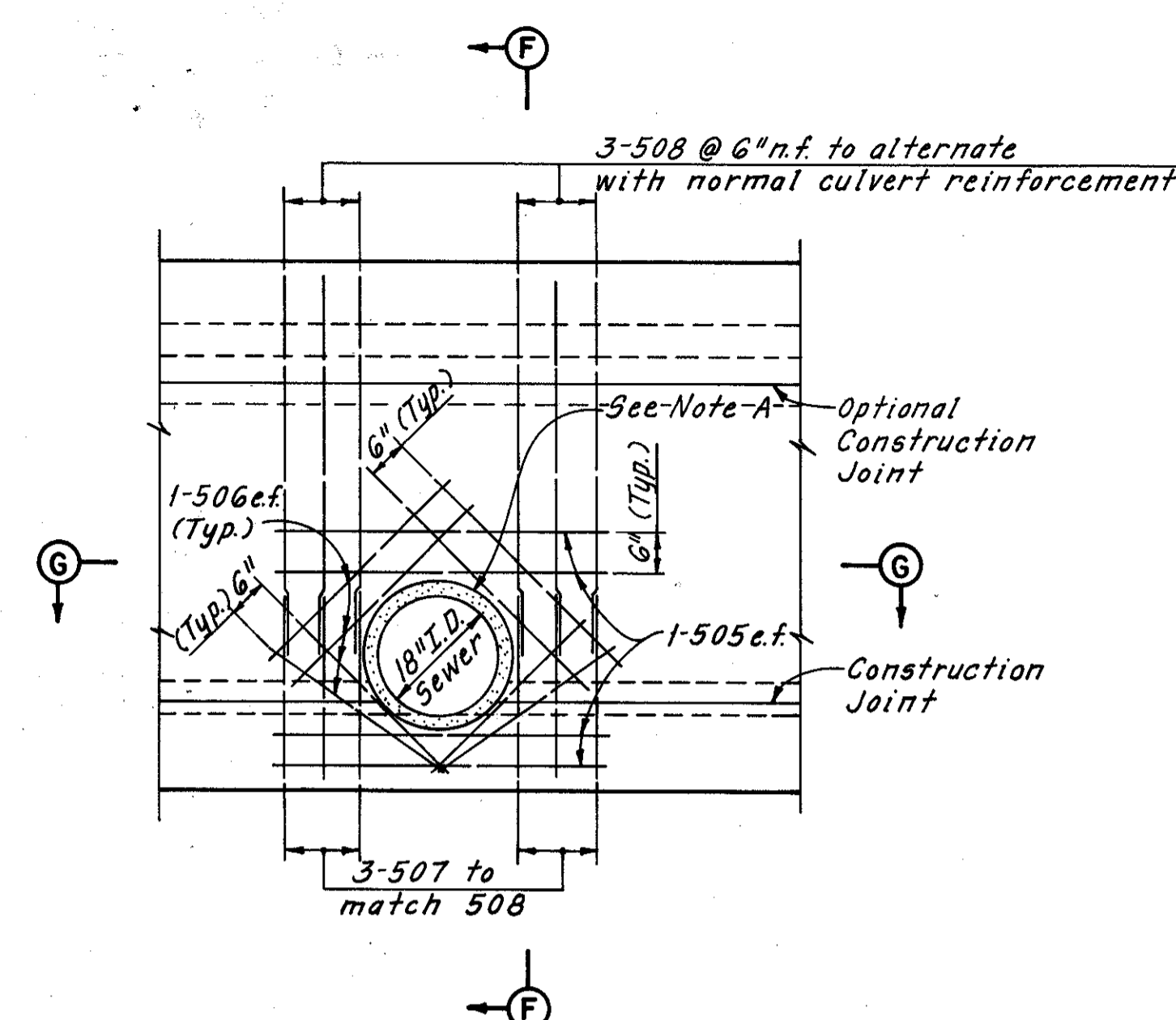
HOOK BOLT DETAIL



SECTION E-E

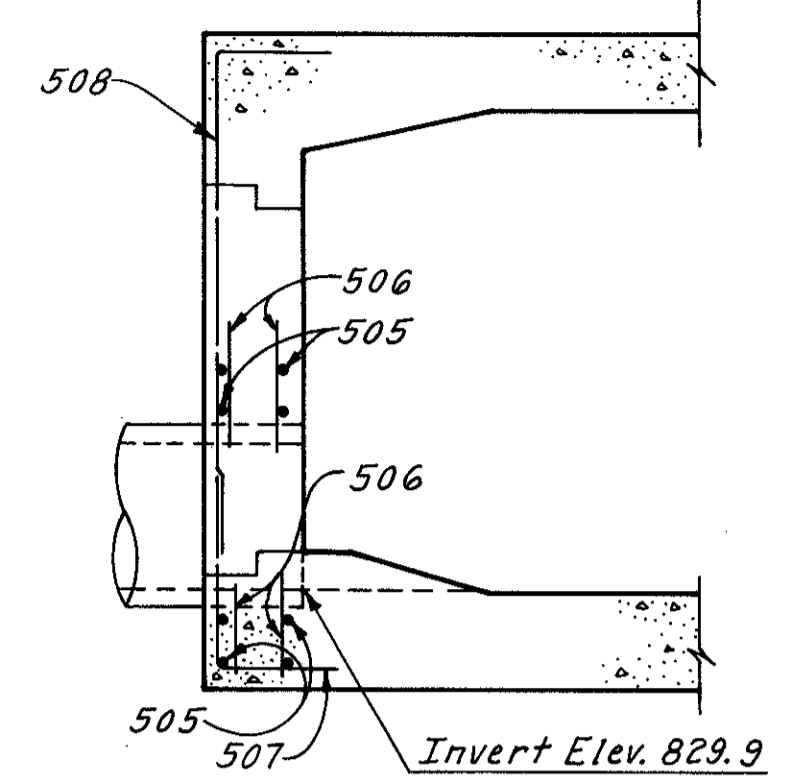
Note: For location of Sections C-C and E-E and for Notes, see Sheet 287.

CUYAHOGA COUNTY
CUY.-480-21.40



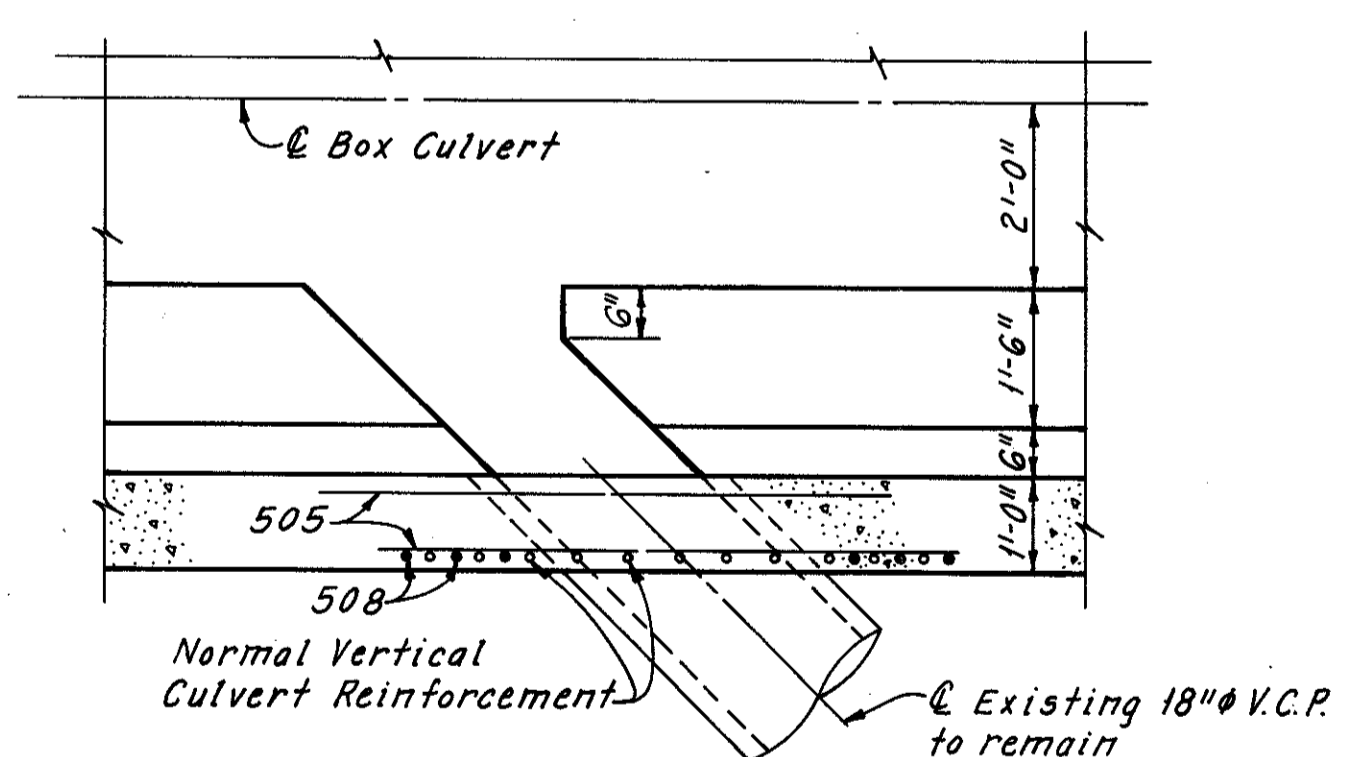
ELEVATION

Note A: Provide 2- $\frac{3}{4}$ " layers (full thickness of wall) of Item 705.03, Preformed Filler material (Included with concrete for payment).



SECTION F-F
(Normal Box Culvert Reinforcement not shown)

Note: All reinforcing bar marks shall be prefixed B, except as noted.



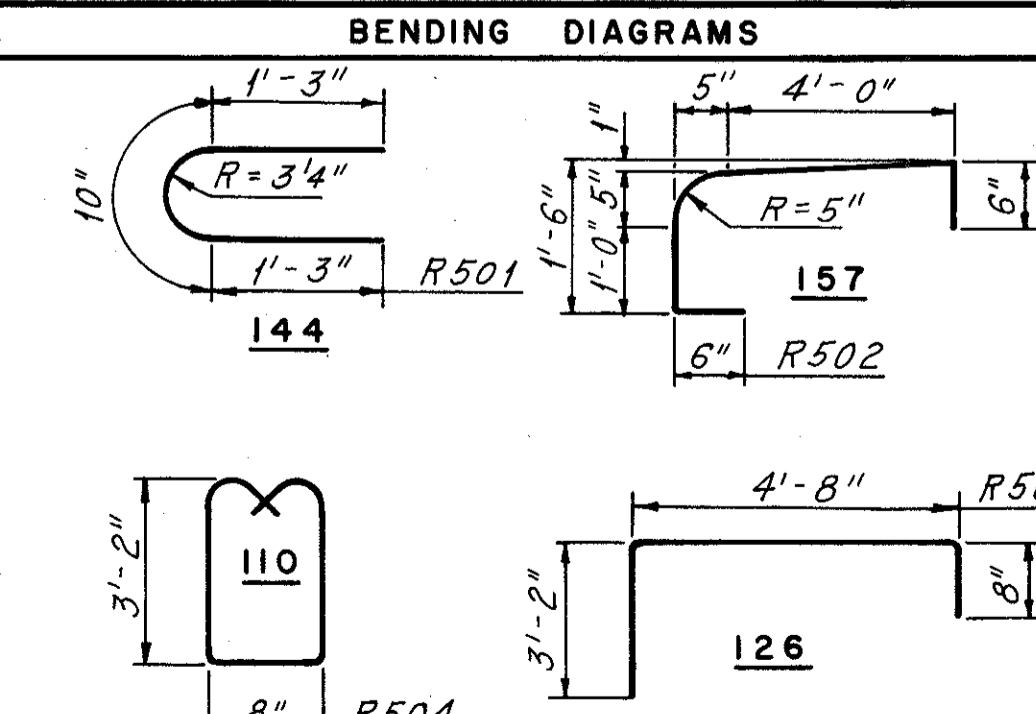
SECTION G-G
(506 bars not shown)

EXISTING 18" SEWER ENTRANCE DETAILS

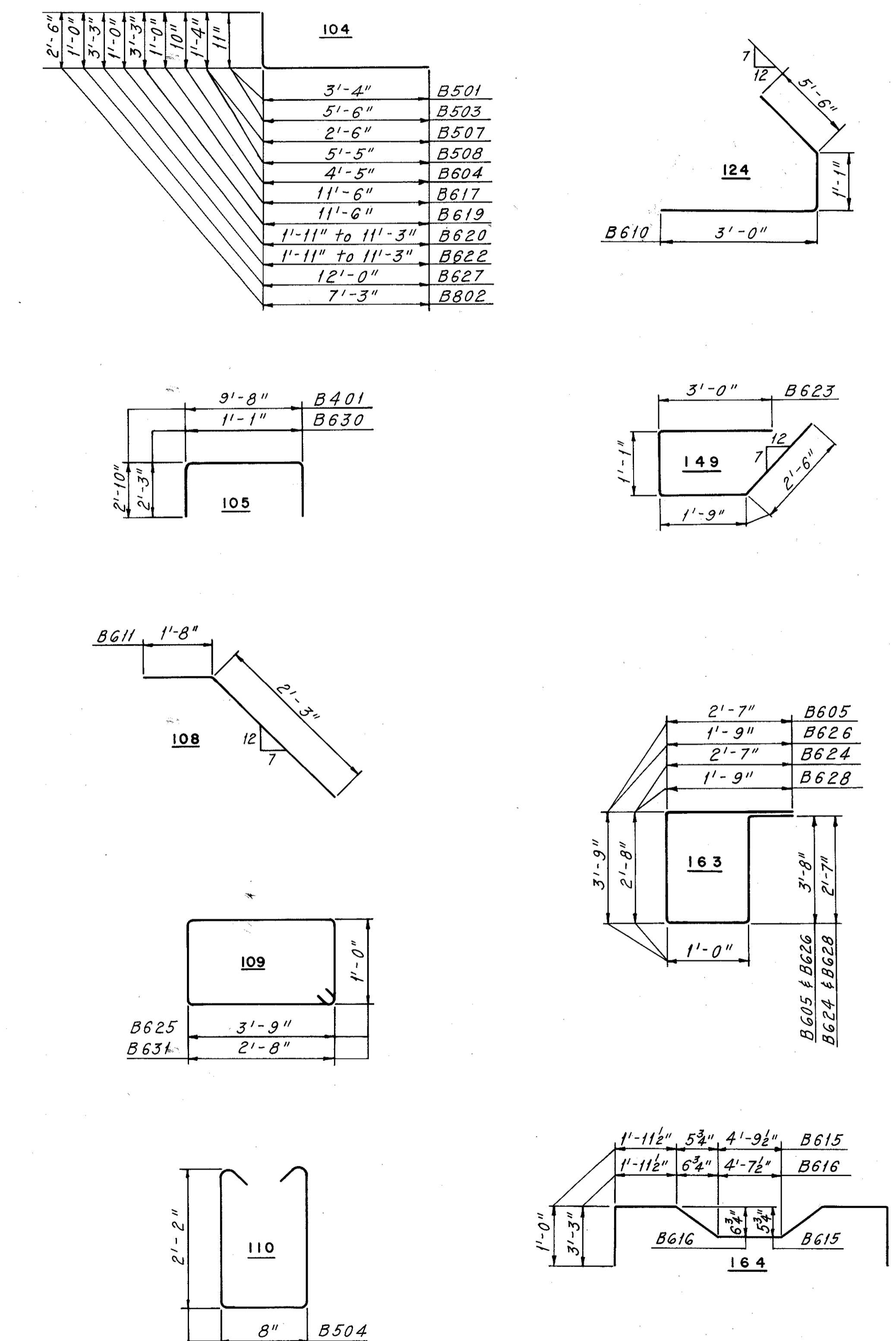
REINFORCEMENT SCHEDULE					
MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS)
B401	29	15'-1"	105		292
B402	29	9'-6"	Str.		184
B501	34	4'-1"	104		145
B502	33	5'-0"	Str.		172
B503	151	6'-4"	104		997
B504	47	5'-7"	110		274
B505	8	4'-6"	Str.		38
B506	16	3'-3"	Str.		54
B507	6	3'-9"	104		23
B508	6	6'-8"	104		42
B601	86	6'-6"	Str.		840
B602	32	23'-6"	Str.		1,130
B603	28	16'-6"	Str.		694
B604	72	5'-1"	104		550
B605	19	12'-0"	163		342
B606	42	10'-0"	Str.		631
B607	30	9'-9"	Str.		439
B608	38	28'-0"	Str.		1,598
B609	8	22'-6"	Str.		270
B610	2	9'-4"	124		28
B611	2	3'-10"	108		12
B612	2 Ser. 6	9'-6" 18'-6"	Str. 1'-9"		252
B613	2 Ser. 5	10'-0" 18'-0"	Str. 2'-0"		210
B614	29	9'-6"	Str.		414
B615	28	11'-5"	164		480
B616	28	16'-0"	164		673
B617	2	12'-4"	104		37
B618	2	11'-3"	Str.		34
B619	2	14'-7"	104		44
B620	1 Ser. 32	2'-9" 12'-1"	104 3 $\frac{5}{8}$ "		356
B621	1 Ser. 32	1'-9" 11'-0"	Str. 3 $\frac{5}{8}$ "		306
B622	1 Ser. 32	5'-0" 14'-4"	104 3 $\frac{5}{8}$ "		465
B623	2	7'-11"	149		24
B624	19	9'-10"	163		281
B625	5	10'-3"	109		77
B626	1	10'-4"	163		16
B627	9	12'-10"	104		173
B628	1	8'-2"	163		12
B629	4	7'-0"	Str.		42
B630	2	5'-3"	105		16
B631	5	8'-1"	109		61
B701	29	9'-6"	Str.		563
B702	2	10'-0"	Str.		41
B703	1 Ser. 32	1'-9" 11'-0"	Str. 3 $\frac{5}{8}$ "		417
B801	12	23'-6"	Str.		753
B802	12	9'-7"	104		307
TOTAL WEIGHT =					14,809

REPLACEMENT BAR SCHEDULE			
Size	No.	Length	Type
4	1	6'-3"	Str.
5	1	6'-9"	Str.
6	1	7'-0"	Str.
7	1	7'-3"	Str.
8	1	7'-5"	Str.

RAILING REINFORCING STEEL				
MARK	NO.	LENGTH	WEIGHT	SHAPE
R501	8	3'-3"	144	
R502	4	6'-7"	157	
R503	4	8'-3"	126	
R504	8	7'-7"	110	
R505	4	4'-8"	Str.	
R506	4	16'-6"	Str.	
R507	8	23'-6"	Str.	



BENDING DIAGRAMS



1. DESIGN SPECIFICATIONS

These structures conform to "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway Officials, 1969, including the 1970 Interim Specifications and the Ohio "Supplement" to these specifications. The design loadings are HS 20-44 and the Interstate Alternate Loading for Bridges No. 6 and 7 and HS 20-44 for Bridges No. 8, 13L & R and 14.

The class of concrete and the grades of structural steel and reinforcing steel, together with the working stresses for each are as follows:

- Concrete, Class C - Superstructure - basic unit stress 1,200 p.s.i.
- Concrete, Class C - Abutments, Piers and Footings - basic unit stress 1,333 p.s.i.
- Structural Steel (Bridge No. 6) - ASTM A588 Unpainted - basic unit stress 27,000 p.s.i.
- Structural Steel (Bridges No. 7, 8, 13L and R and 14) - ASTM A36 - basic unit stress 20,000 p.s.i.
- Reinforcing Steel - ASTM A615, A616 or A617 - unit stress 20,000 p.s.i..
If bars in accordance with ASTM A616 are provided they shall be subject to bend tests as per AASHTO Designation M42-70.
Spiral reinforcement may be plain bars ASTM A82, A306, A499 or A615.

2. SUPPLEMENTAL SPECIFICATIONS

Reference shall be made to Supplemental Specifications No. 808, Chemical Admixture for Concrete, Type A, B or D, dated 1-1-71, No. 836, Concrete Curing and Protective Membrane, dated 1-1-71, and to No. 838, Special Pile Tests, dated 3-18-70

3. REFERENCE DRAWINGS

Reference shall be made to Standard Drawings RB-1-55 revised 2-2-59, BR-1-67, Revised 10-15-71 (Sheet 1 of 3), SD-1-69 dated 6-12-69 (Sheets 1 thru 4 of 4), and to AS-1-67 revised 6-12-69.

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 unless otherwise noted on the plans. All expenses involved in relocating the affected utility lines shall be borne by the Owner. The Contractor and Owner are requested to cooperate by arranging their work in such a manner that inconvenience to either would be held to a minimum.

6. CONCRETE DECK

- (a) The steel beams and girders 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 and superelevation of the roadway. The theoretical deflections are tabulated on the plans.
- (b) The final surface of the roadway shall conform 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. The theoretical top of pavement elevations at the gutter lines before the deflections from the concrete have occurred are tabulated on the plans.

(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 design dimension. The quantity of deck concrete to be paid for shall be based upon this dimension, even though deviation from it may be necessary because the top flange of the beam or girder may not have the exact camber or conformation required to place it parallel to the finished grade. Deduction shall be made for the volume of encased steel plates as per Section 511.18.
(e) Texturing of the deck surface as provided in 451.09 shall not be done.

7. 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" in footings, 2 1/2" at bar mats under shoes and 2" elsewhere unless otherwise shown on the plans.

8. CONSTRUCTION ADJACENT TO RAILROAD TRACKS (BRIDGE NO. 6)

Construction clearance of 20'-0" vertically above the top of the railroad rails and 8'-0" horizontally from the center of tracks shall be maintained at all times.

Railroad aerial lines will be relocated by the Railroad. The Contractor shall use all precautions necessary to see that the lines are not disturbed during the construction stage and shall cooperate with the Railroad in the relocation of these lines. The cost of the relocation shall be included in the railroad force account work.

9. ITEMS NOT INCLUDED IN BRIDGE PLANS

The following items are not included in the bridge plans. See Roadway Plans for details.

- (1) Grading and approach pavements and slabs.
- (2) Curb transition at end of wingwalls.
- (3) Relocation or removal of existing utilities.
- (4) Lighting.

10. APPROACH SLAB JACKING HOLES shown on Standard Drawing AS-1-67 need not be provided.

H. N. T. B. BR. NO.	STATE BR. NO.	DESCRIPTION
6	CUY-80-2140	I-80 Over Penn-Central Railroad, Norfolk Western Railway and Mill Creek
7	CUY-80-2154	I-80 and Ramp B-OBS Over Broadway (S.R. 14)
8 13L & 13R	CUY-80-2169	I-80 Under Bedford Freeway Bedford Freeway and Ramp B-OBS Over Relocated McCracken Road
14	-	Lane OBS-E-B Over Relocated McCracken Road

H.N.T.B. BR. NOS. 6, 7, 8, 13L & R and 14

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

GENERAL NOTES

CUYAHOGA COUNTY
CUY-80-21.40

PROPOSED STRUCTURE

TYPE: Continuous steel girder with reinforced concrete deck and substructure.

SPAN: 96'-6", 100'-0", 110'-2 1/2", 110'-2 1/2", 87'-0" (All spans are measured along @ I-80).

ROADWAY: Width varies - 146'-0" to 150'-5 1/2" face to face of parapets with Concrete Barrier.

LOADING: HS 20-44 and Interstate Alternate Loading.

SKEW: Varies (See Plan).

WEARING SURFACE: 2 1/2" Asphalt concrete

APPROACH SLABS: AS-1-67 (25 feet long).

ALIGNMENT: Tangent.

SUPERELEVATION: 0.0156 ft. per ft. and varies.

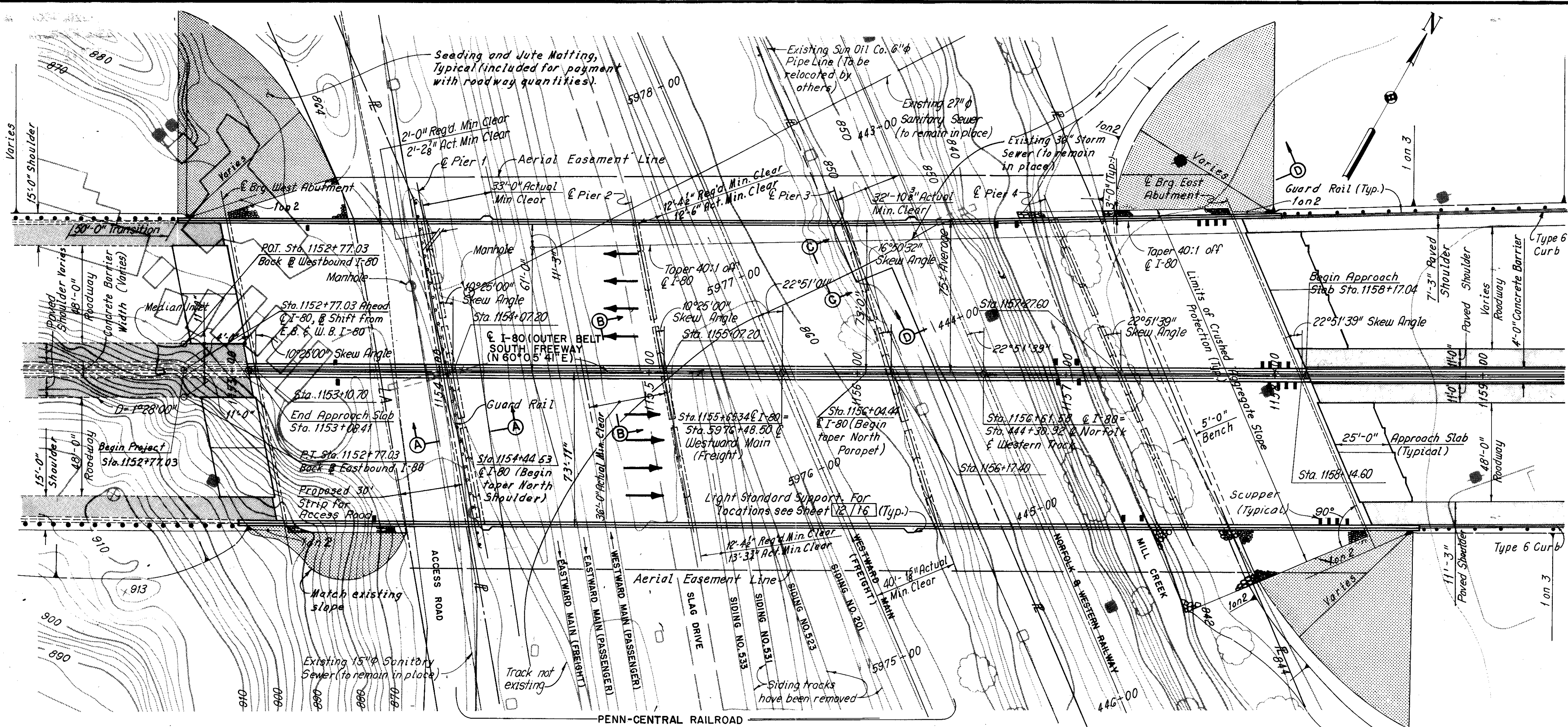
TRAFFIC DATA
1991: 60,364 A.D.T.
3,320 D.D.H.V.

MAINTENANCE OF TRAFFIC - ACCESS ROAD
Two lanes of traffic with a minimum horizontal width of 20'-0" and a minimum vertical clearance of 13'-6" shall be maintained on the access road at all times.

CURVE DATA

@ EASTBOUND I-80

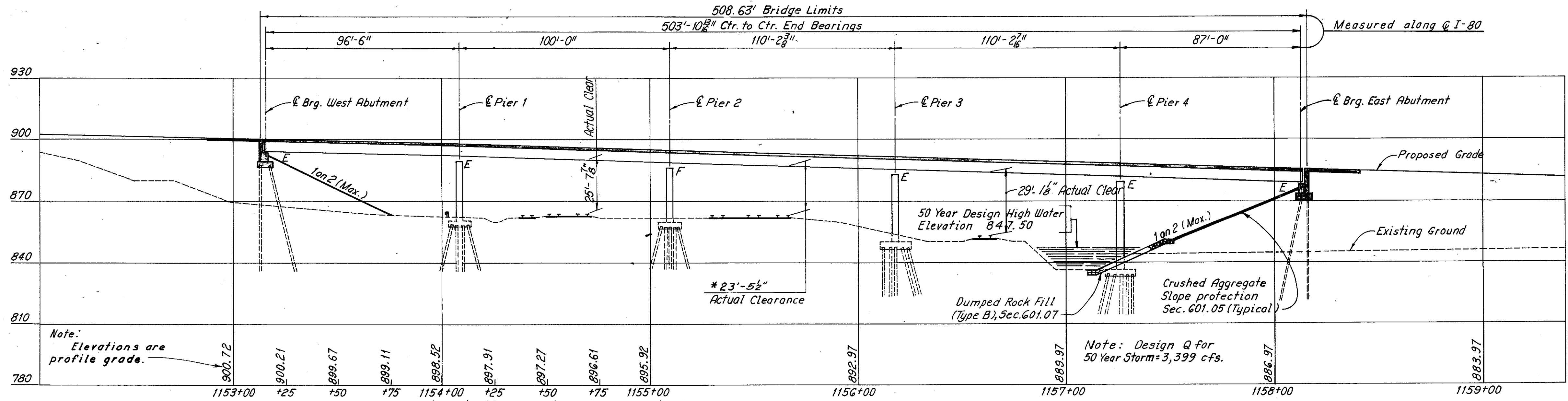
P. I. Sta.	= 1149+00.85
Δ	= 11°04'08"
D	= 1°28'00" Right
R	= 3,906.53'
T	= 378.53'
L	= 754.71'
E	= 18.30'



PLAN
Scale: 1" = 30'-0"

Note: Earthwork limits shown are schematic. Actual slopes shall conform to plan cross-sections.

MICROFILMED
DEC 21 1982



ELEVATION
Scale: Horiz. 1" = 30'-0"
Vert. 1" = 30'-0"

*Note: 23'-0" is the required minimum vertical clearance. Minimum vertical clearance occurs at the north rail of Westward main freight track and the outside edge of south exterior girder.

Notes: The embankments shall be constructed to the finish spill-thru slopes and to the level of the subgrades for a minimum distance of 200 feet back of the abutments before excavating or driving piles for the abutments and Pier 4. All piles except at Pier 4 are 12" Ø cast-in-place reinforced concrete. All piles at Pier 4 are HP 12x53. Piles at the abutments shall be driven to a minimum bearing capacity of 35 tons per pile and piles at the piers shall be driven to a minimum bearing capacity of 40 tons per pile. The estimated average pay length of the piles are as follows:

West Abutment	= 53 feet
Pier 1 and Pier 2	= 23 feet
Pier 3 (North)	= 20 feet
Pier 3 (Middle)	= 23 feet
Pier 3 (South)	= 25 feet
Pier 4	= 20 feet
East Abutment	= 48 feet

For Section A-A thru D-D see Sheet 2/16.

H.N.T.B. BR. NO. 6

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

SITE PLAN

I-80 OVER PENN-CENTRAL RAILROAD,
NORFOLK & WESTERN RAILWAY
AND MILL CREEK

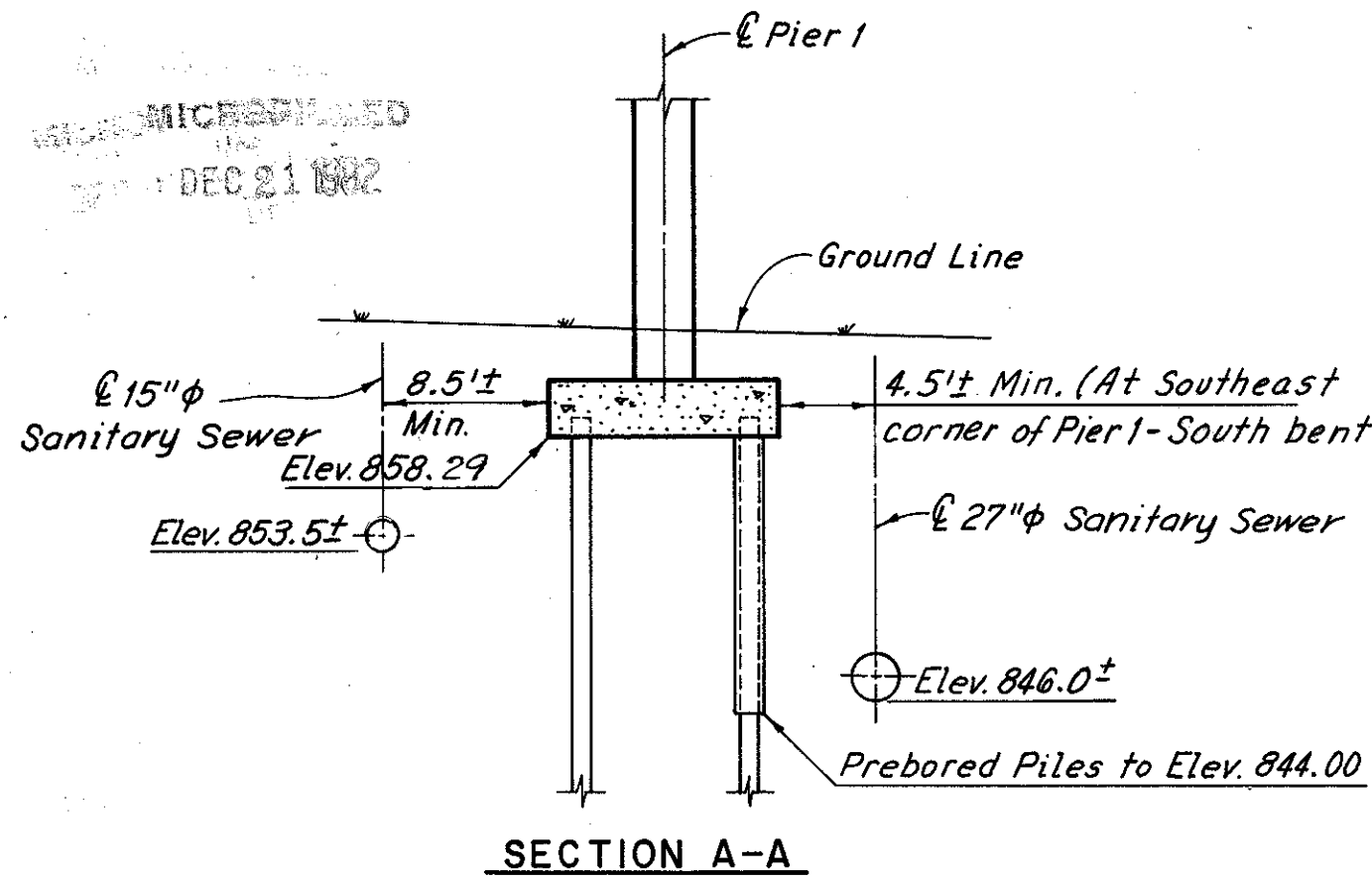
BR. NO. CUY-80-21.40 STA. 1153+08.41 TO STA. 1158+17.04

CUYAHOGA COUNTY OHIO

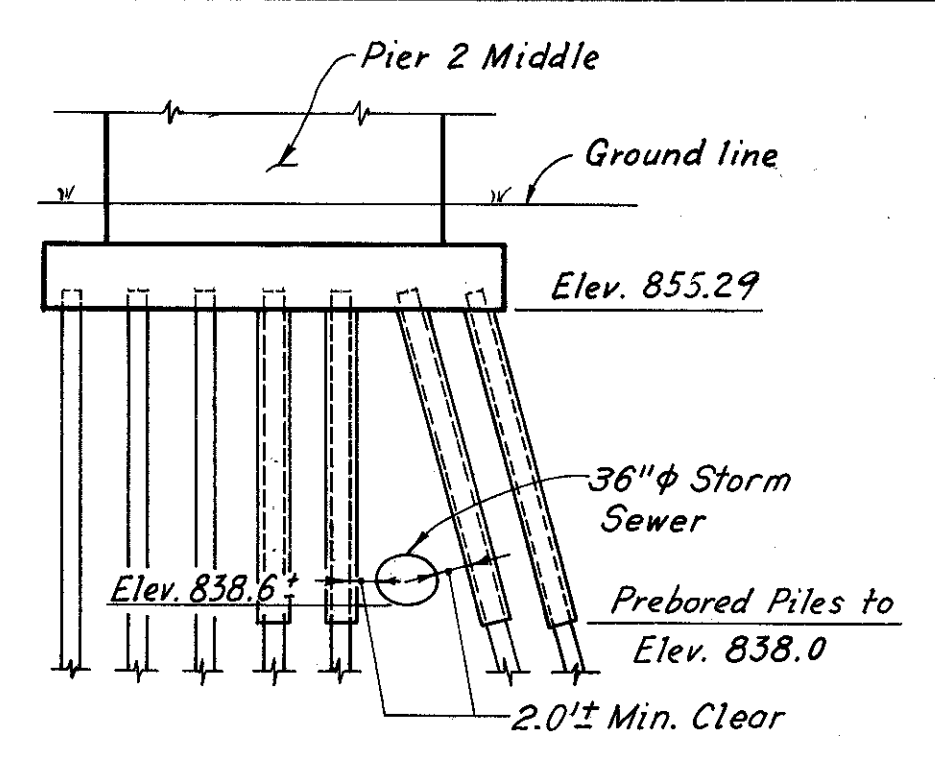
DATE 8-21-67	DATE 8-30-67	DATE 5-22-70	DATE
TRACED DLR	CHECKED D.H.S.	REVIEWED	REVISED

SHEET 1/16

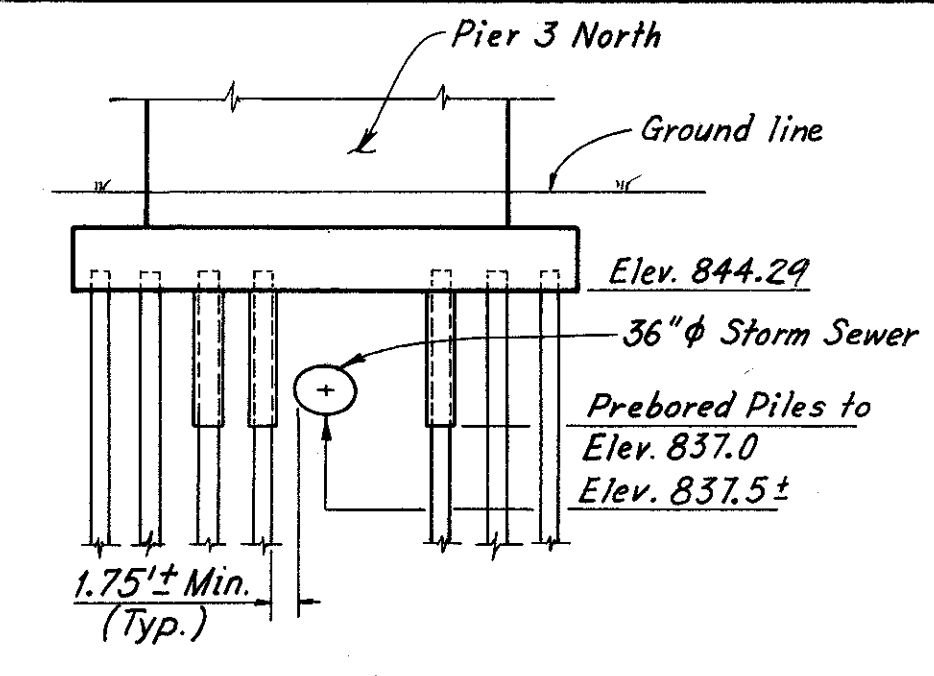
MICROFILMED
DEC 21 1982



SECTION A-A



SECTION B-B
South row of piles shown.



SECTION C-C
South row of piles shown

Notes:
For location of Sections A-A
thru D-D see Sheet 7/16.
See Sheet 7/16 for pile
locations and batter.

Quantity Calculations
Made By CAR Date 8-67
Checked By DHS Date 5-70

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
CUY-80-21.40

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ESTIMATED QUANTITIES				H.N.T.B. Bridge No. 6			
ITEM	TOTAL	UNIT	DESCRIPTION	ABUT- MENTS	PIERS	SUPER- STRUCTURE	GENERAL
503	2,014	Cu. Yd.	Unclassified Excavation	819	1,195		
503	Lump	Lump	Cofferdams, cribs and sheeting		Lump		
505	Lump	Lump	Test Pile				Lump
506	Lump	Lump	Pile Test Load				Lump
506	One	Each	Subsequent Pile Test Load				One
507	12,450	Lin. Ft.	12" C. J. P. Reinforced Concrete Piles	5,600	6,850		
507	2,320	Lin. Ft.	Steel Piles, HP 12x53		2,320		
507	533	Lin. Ft.	Prebored Holes		533		
509	981,402	Pounds	Reinforcing Steel	44,075	240,988	691,339	
511	2,321	Cu. Yd.	Class "C" Concrete, Superstructure			2,321	
511	1,184	Cu. Yd.	Class "C" Concrete, Piers Above Footing		1,184		
511	394	Cu. Yd.	Class "C" Concrete, Abutments Above Footing	394			
511	771	Cu. Yd.	Class "C" Concrete, Footings	241	530		
512	72	Lin. Ft.	Premolded Sealing Strip	72			
513	1,997,200	Pounds	Structural Steel, ASTM A 588 Unpainted			1,997,200	
516	72	Sq. Ft.	1" Preformed Expansion Joint Filler	72			
518	2020	Lin. Ft.	Subdrainage for wearing course, as per plan			2,020	
518	238	Cu. Yd.	Porous Backfill	238			
518	298	Lin. Ft.	6" Perforated, Helical C.M.P., 707.01	298			
518	146	Lin. Ft.	6" Non-Perforated Helical C.M.P., including specials, 707.01	146			
518	28	Each	Scuppers Including Supports			28	
601	2,500	Sq. Yd.	Crushed Aggregate Slope Protection				2,500
601	469	Cu. Yd.	Dumped Rock Fill, Type B				469
808	2321	Units	Chemical Admixture for Concrete, Type A, B or D			2321	
Spec.	3238	Sq. Yd.	Protective coating of concrete surfaces (see Note A)	364	2874		
404	444	Cu. Yd.	Asphalt concrete (70-85 or AC-20)			444	
Spec.	111	Cu. Yd.	Sand Asphalt (see Proposal Note)			111	
Spec.	8043	Sq. Yd.	Membrane Waterproofing, sheet type (see Proposal Note)			8043	

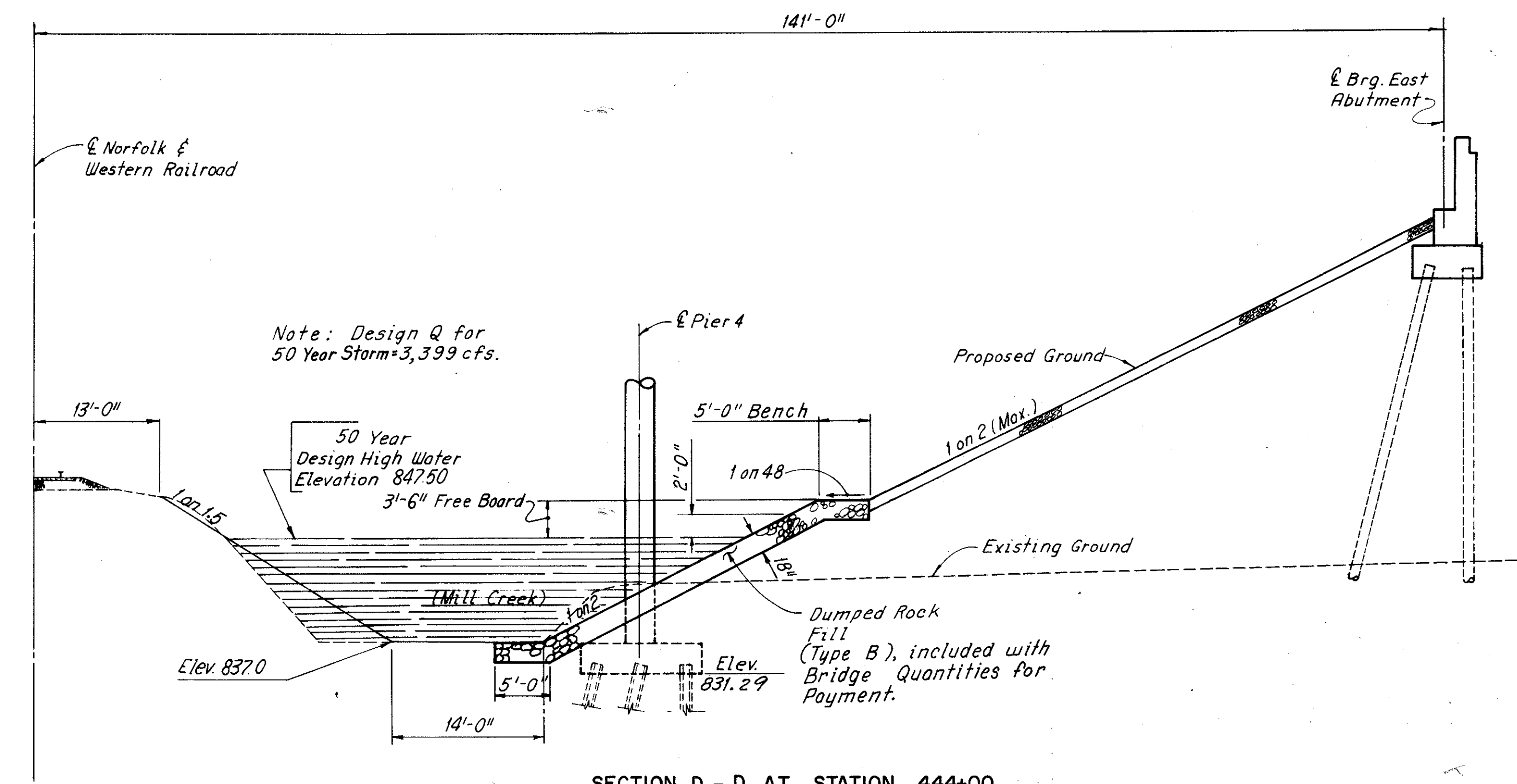
Note A:
All surfaces of the piers above footings and visible surfaces of the abutments which will be exposed to rust-laden water from corrosion resistant steel during initial weathering shall receive a clear vinyl resin coating to protect against absorptive staining. The coating shall be applied after the concrete has received a final surface finish including any grout cleaning or rubbing and before the erection of the structural steel.

Waterproof membrane curing compound and concrete curing and protective membrane, Supplemental Specification 836, shall not be used on the surfaces coated with clear protective coating. Such surfaces shall be water cured or, at the Contractor's option, two full coats of clear protective coating, each approximately 1-1/3 mils dry film thickness, may be applied to act as a combination curing compound and anti-staining agent.

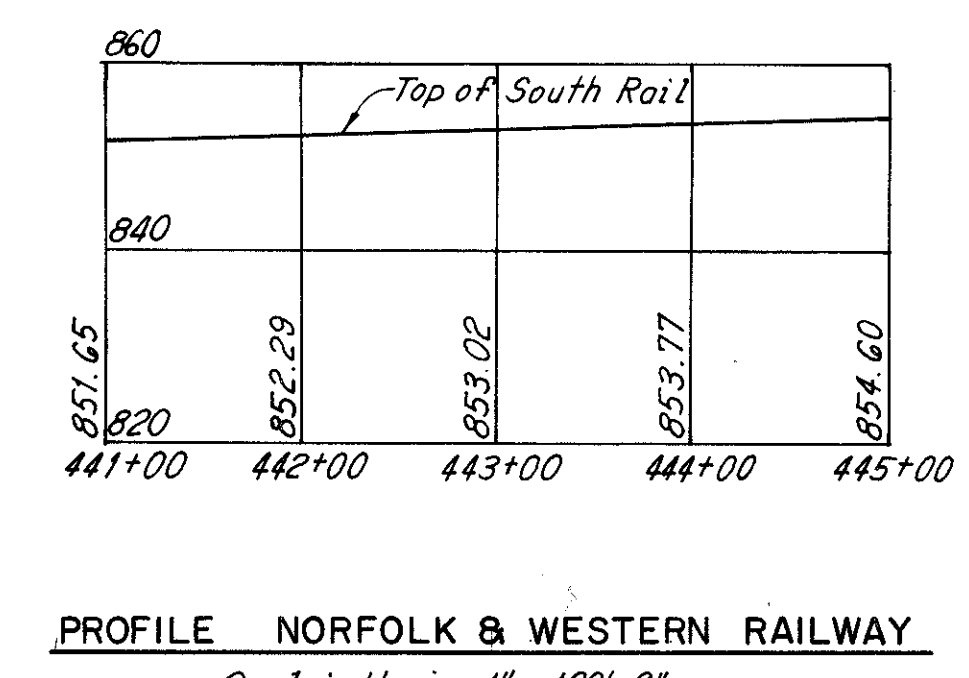
The agent shall be applied by brush or roller, or by spraying, so that the surface of the concrete is completely and uniformly coated at the rate of one gallon per 200 square feet. This rate of application will provide a dry film thickness of 1-1/3 mils. If running or sagging occurs, the material shall be applied in two or more coats of approximately equal thickness. Not less than 10 minutes shall elapse between applications. When applied by spraying, the coating material may be thinned with not more than 10 percent toluene.

The composition of the clear protective coating shall be as follows:

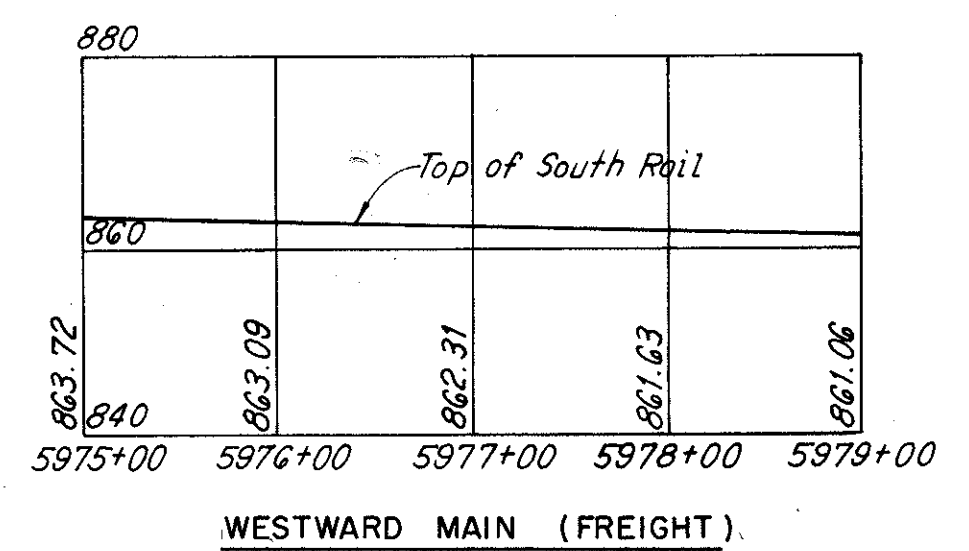
Vinyl Resin*	Percent by Weight	25.0 min.
Methyl Ethyl Ketone Solvent		37.0 min.
Toluene Solvent		37.0 min.
*The resin shall be a vinyl chloride-acetate copolymer containing 86 percent vinyl chloride and 14 percent vinyl acetate. The viscosity of a 22 percent by weight solution of resin in a solvent, consisting of equal parts of Methyl Isobutyl Ketone and Toluene, shall be 250-500 centipoises at 77° F. The resin shall be Union Carbide's VYHH grade, or approved equal.		
Coating Properties:	Weight per gallon at 77° F, lb.	7.6 min.
	Consistency, Viscosity at 77° F, KU	60-70
	Color	Clear and Colorless
	Drying Time, hr.	1/2 max.



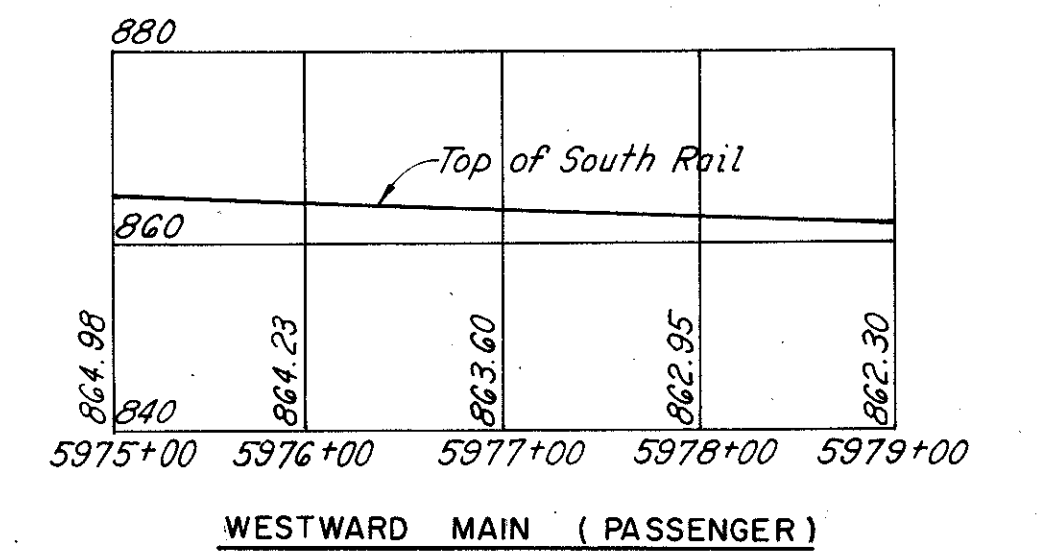
SECTION D - D AT STATION 444+00



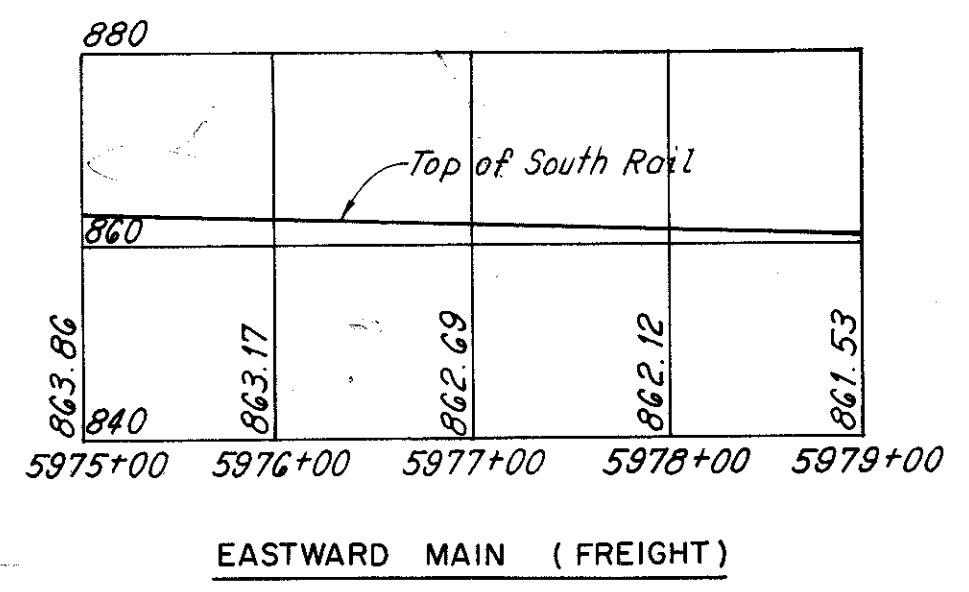
PROFILE NORFOLK & WESTERN RAILWAY
Scale: Horiz. 1" = 100'-0"
Vert. 1" = 20'-0"



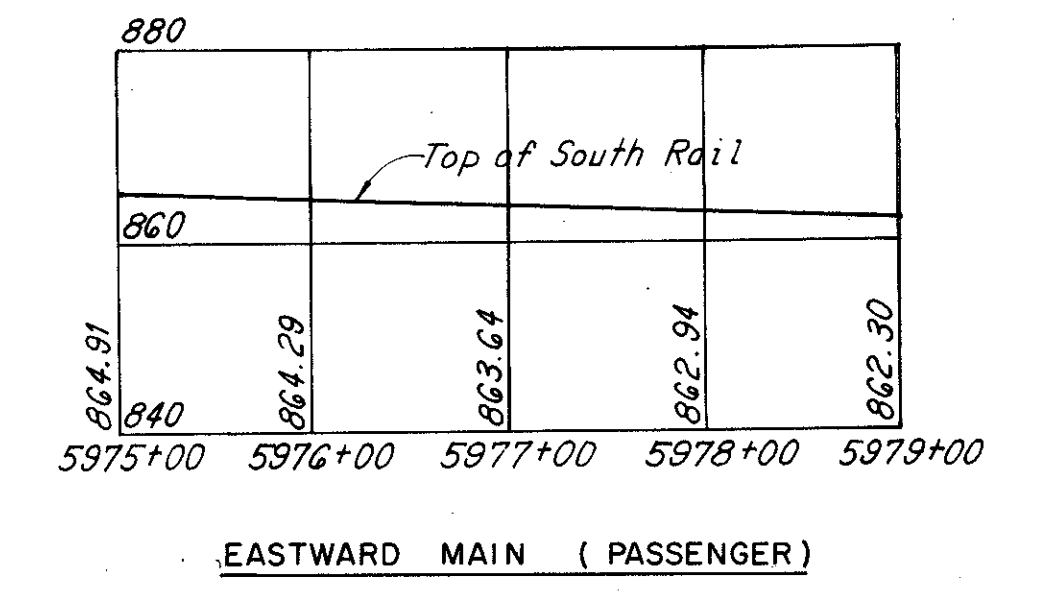
WESTWARD MAIN (FREIGHT)



WESTWARD MAIN (PASSENGER)



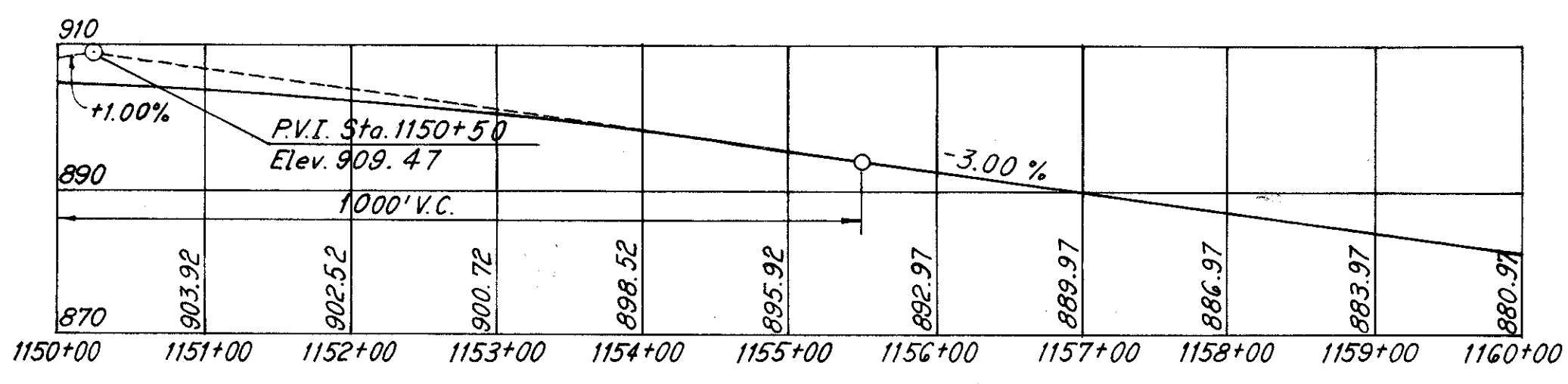
EASTWARD MAIN (FREIGHT)



EASTWARD MAIN (PASSENGER)

PROFILES - PENN-CENTRAL RAILROAD

Scale: Horiz. 1" = 100'-0"
Vert. 1" = 20'-0"



PROFILE I-80

H.N.T.B. BR. NO. 6
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

ESTIMATED QUANTITIES AND PROFILES
I-80 OVER PENN-CENTRAL RAILWAY
NORFOLK & WESTERN RAILWAY
AND MILL CREEK

BR. NO. CUY-80-21.40 STA. 1153+08.41 TO STA. 1158+17.04

CUYAHOGA COUNTY OHIO

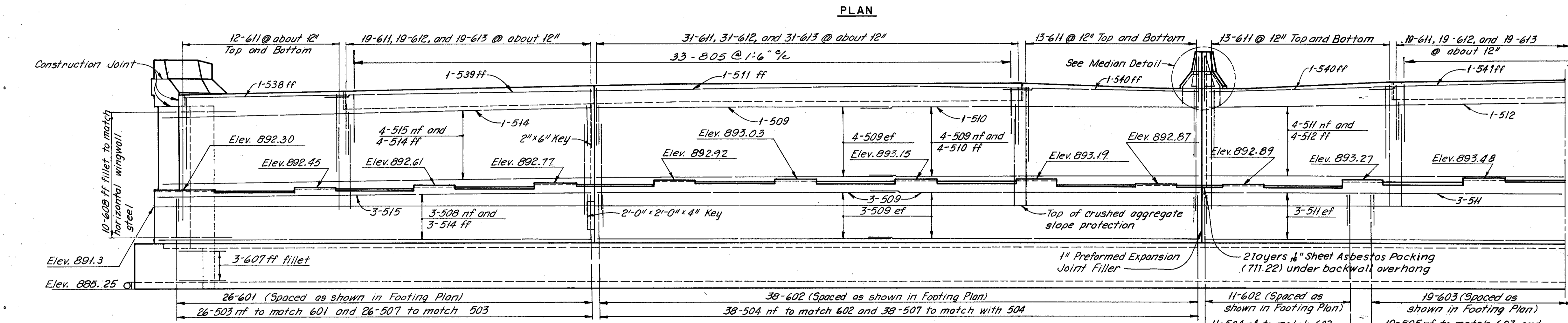
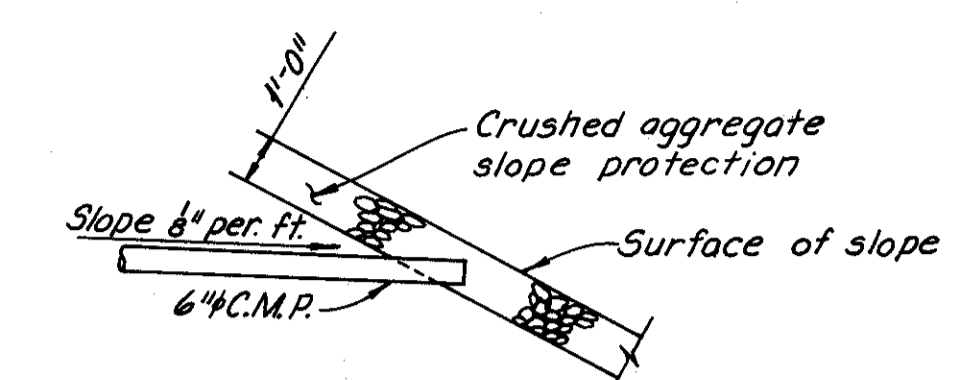
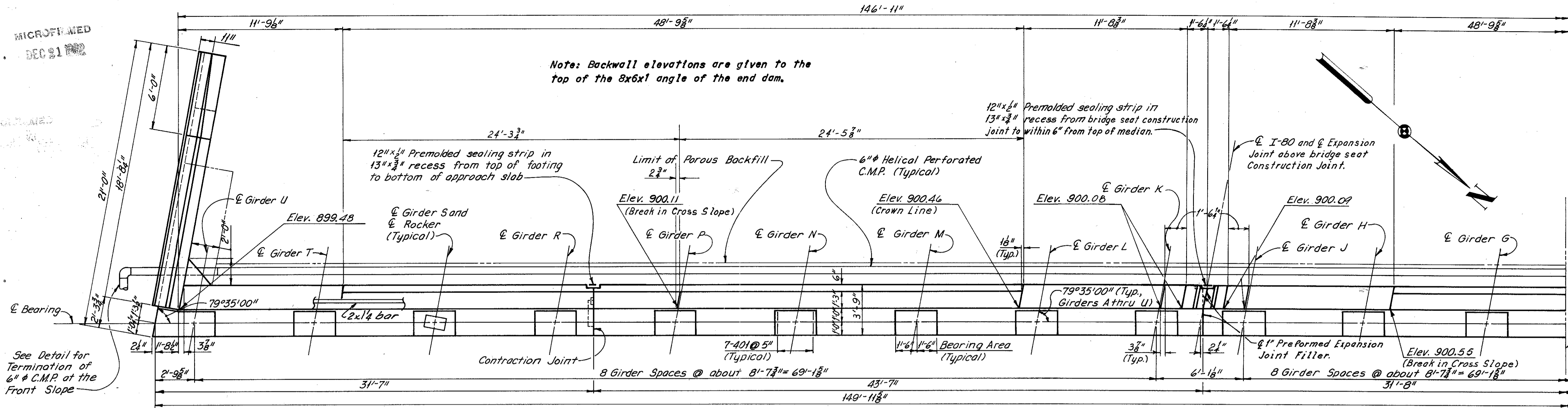
DRAWN	TRACED	CHECKED	REVIEWED	REVISION
DATE 8-21-67	DATE 8-30-67	DATE 5-22-70	DATE	DATE

SHEET 2/16

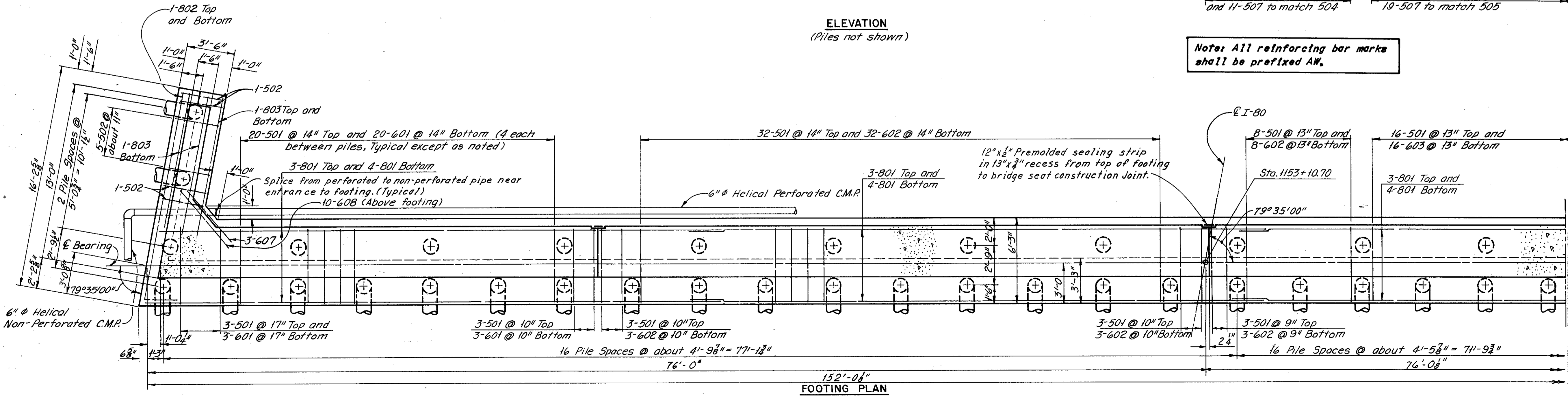
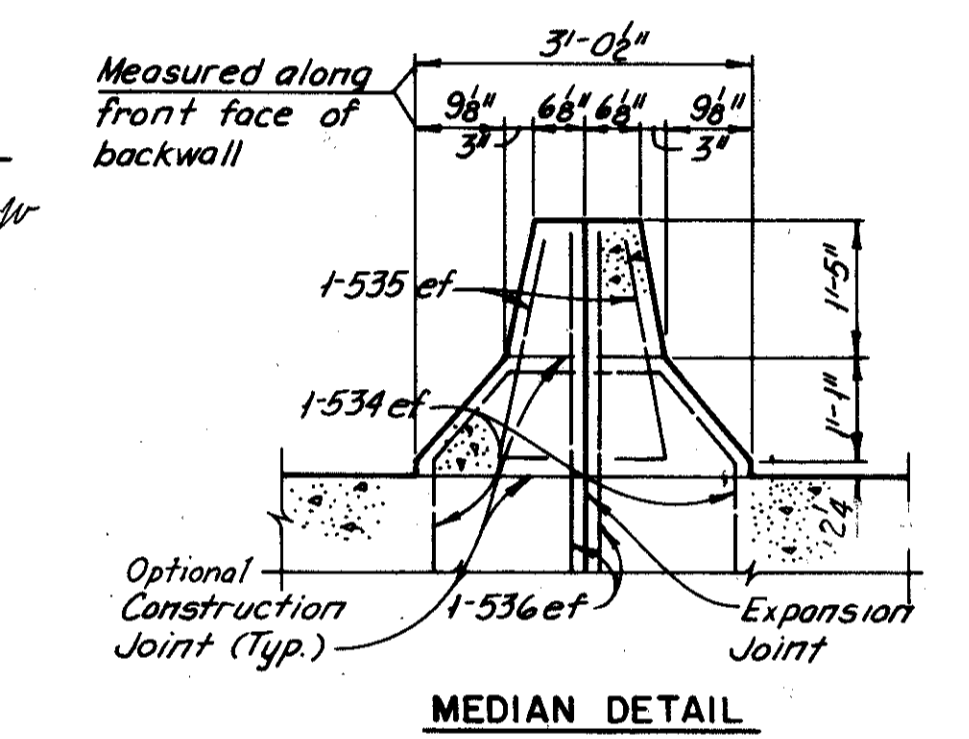
MICROFILMED
DEC 21 1982

FED. RD. DIVISION	STATE	PROJECT	293 390
2	OHIO		

CUYAHOGA COUNTY
CUY-80-21.40



Match Line (Typical, for continuation see Sheet 4/16)



Note: All reinforcing bar marks shall be prefixed AW.

Notes:

All piles are 12" ϕ C.I.P. reinforced concrete.

All battered piles shall be inclined 3 in 12 in the direction shown.

For roadway and dam and curb plate details see Ohio Standard Drawing SD-1-69, sheets 1 and 2 of 4 and Sheet 9/16.

The 2 Layers of 1/8" Sheet Asbestos Packing (711.22) shall be included for payment with Class "C" Concrete, Abutments Above Footings.

The following abbreviations are used:

nf = near face

ff = far face

ef = each face

H.N.T.B. BR. NO. 6

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

WEST ABUTMENT
I-80 OVER PENN-CENTRAL RAILROAD,
NORFOLK & WESTERN RAILWAY
AND MILL CREEK

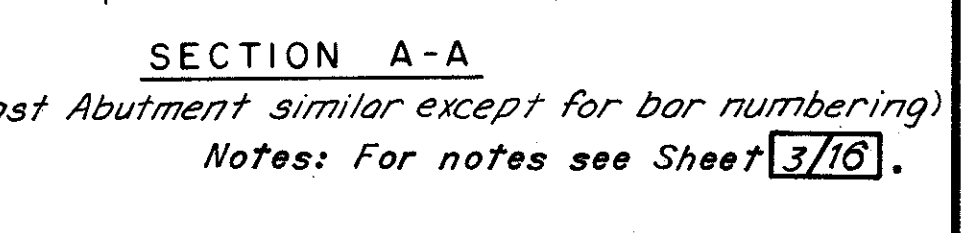
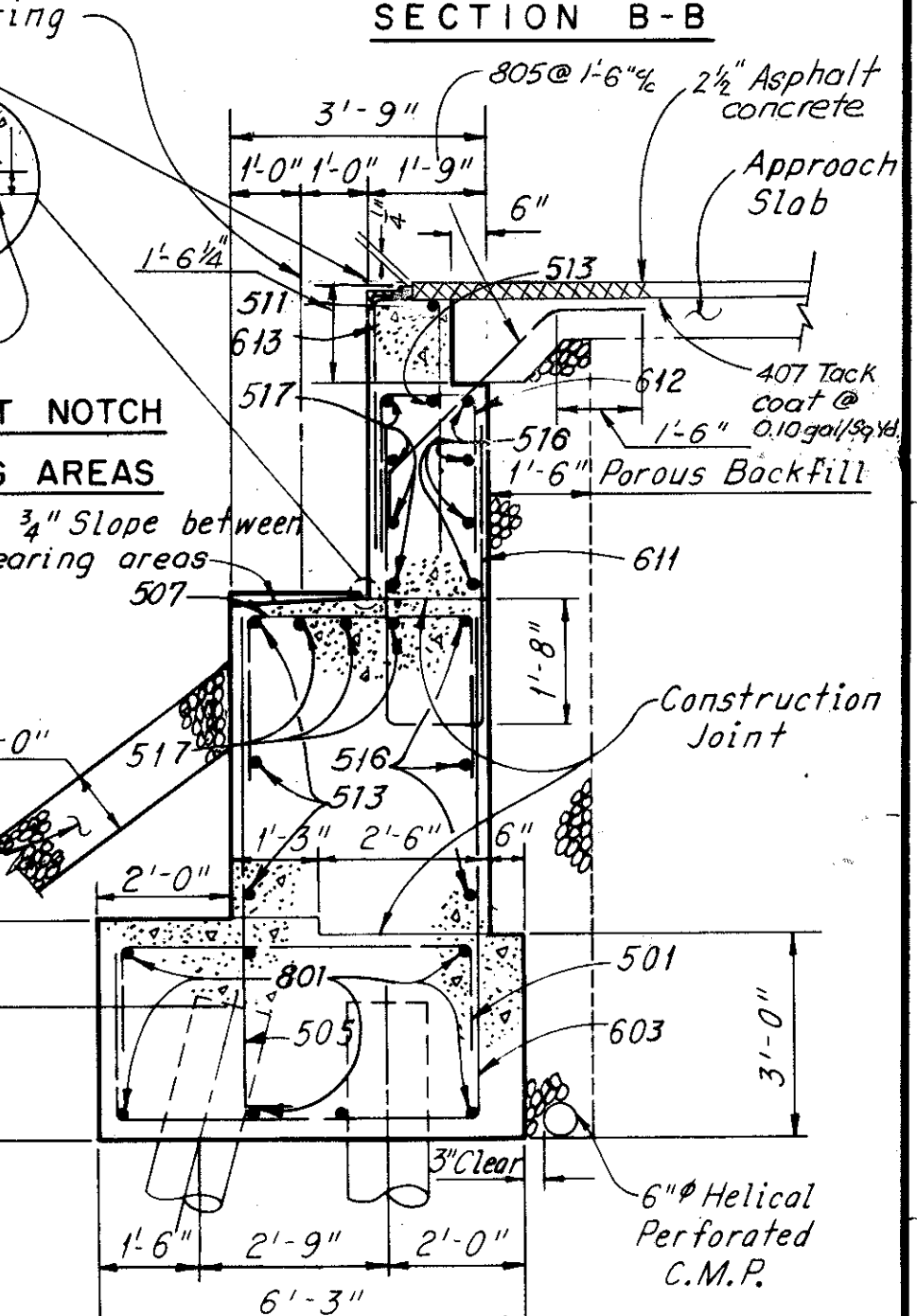
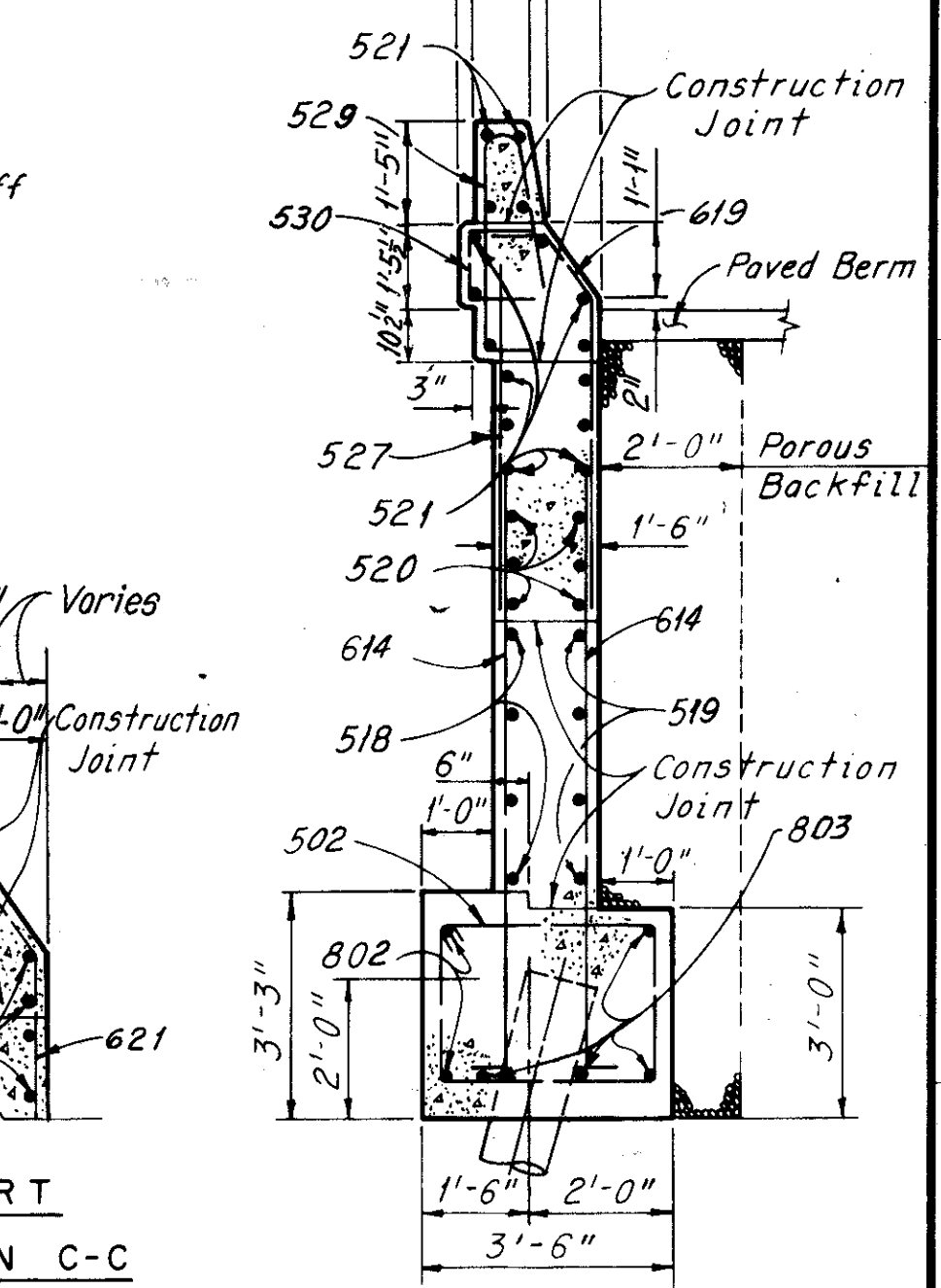
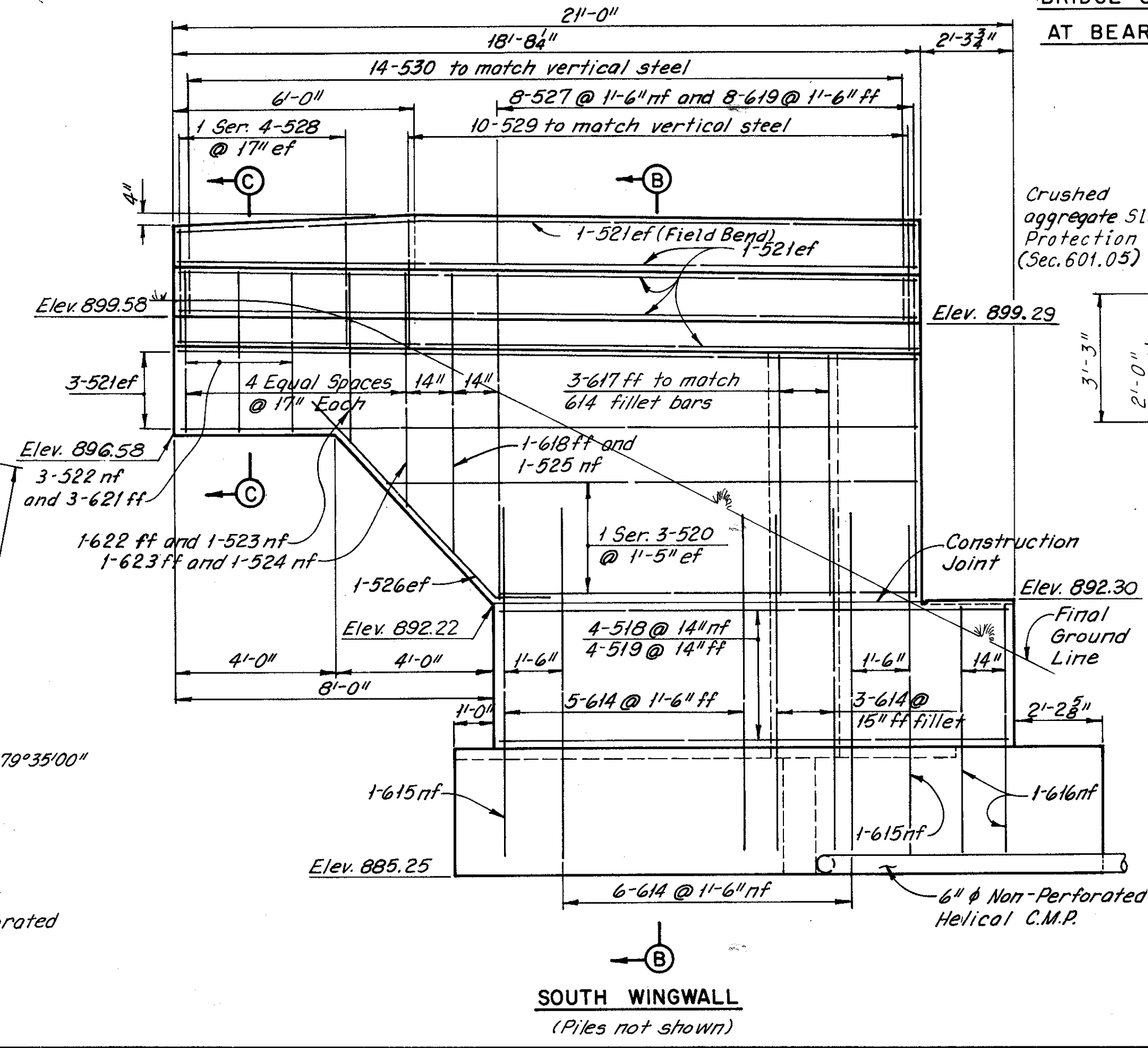
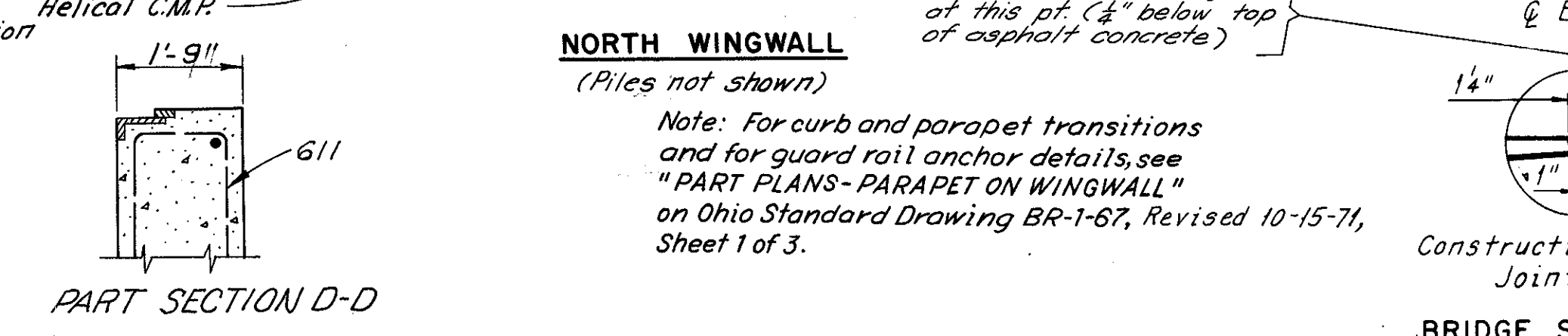
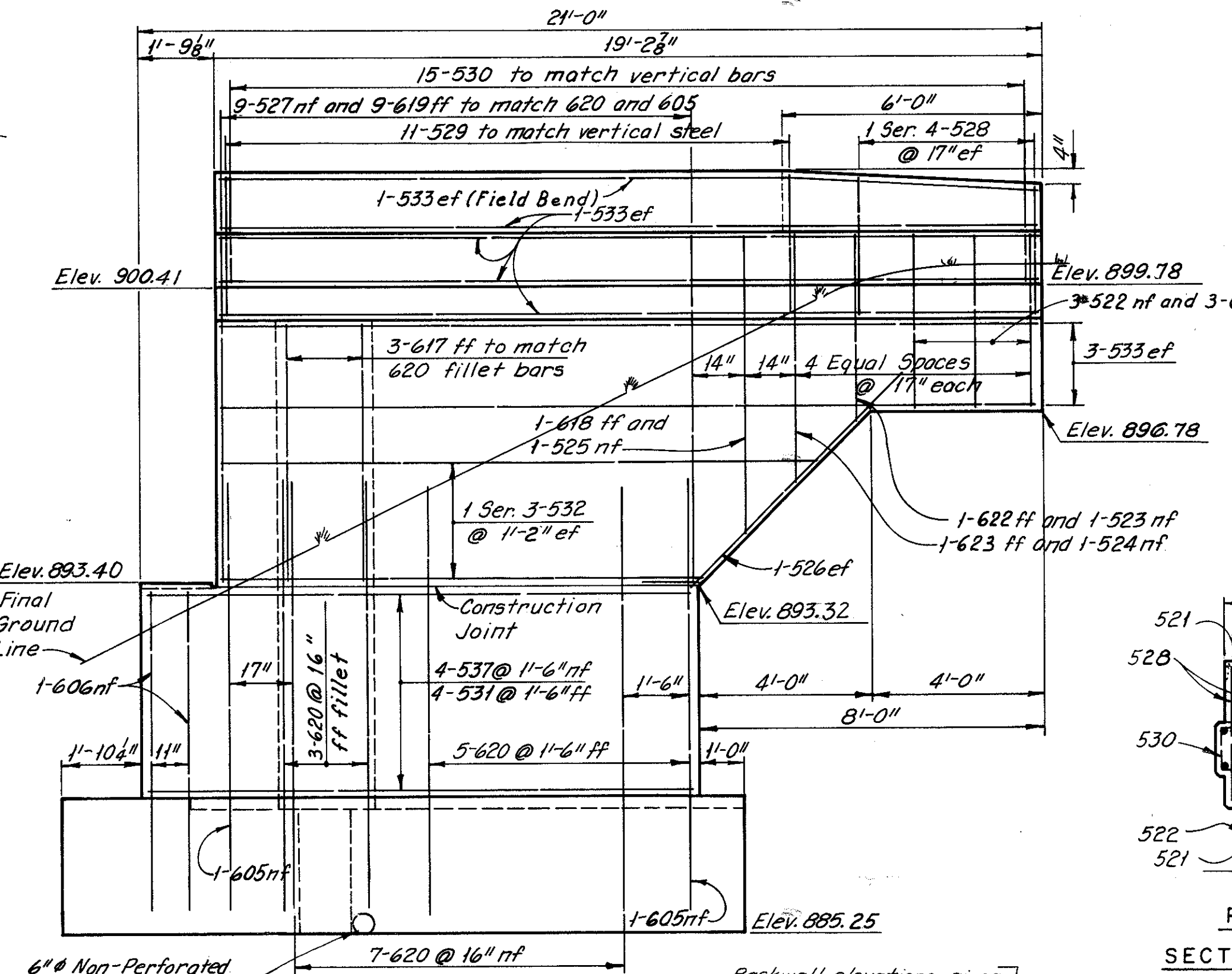
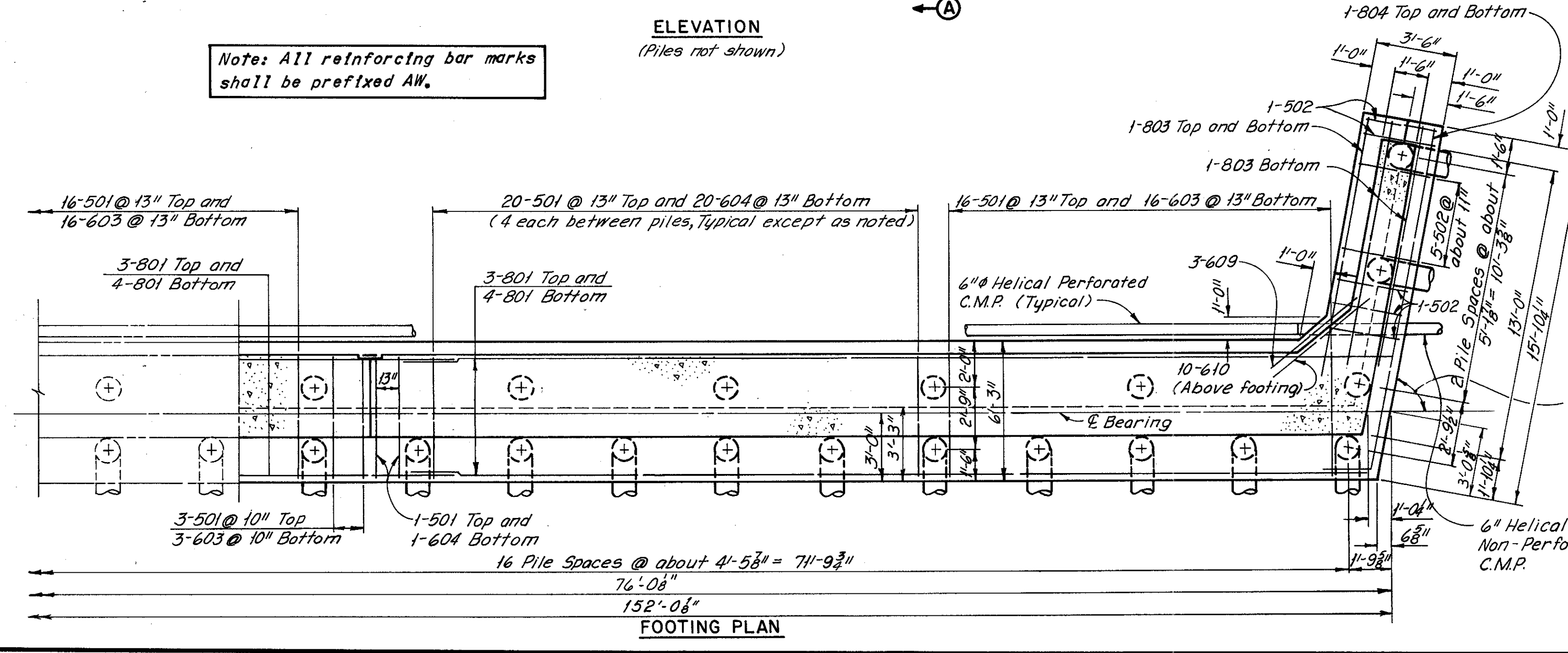
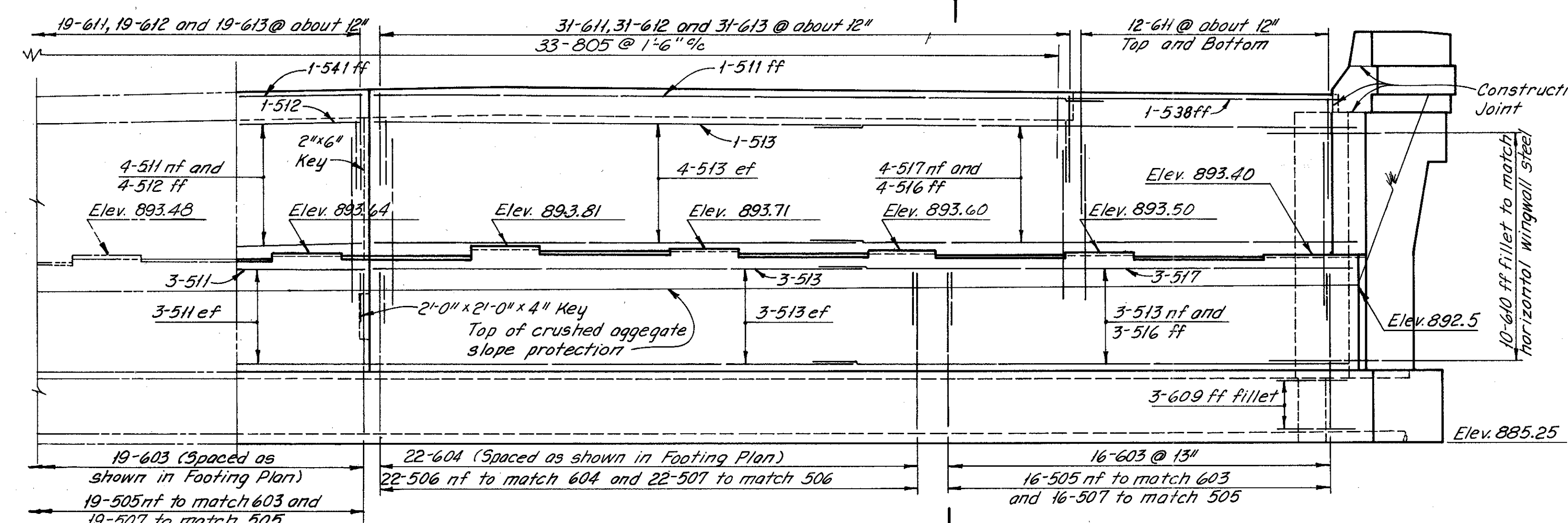
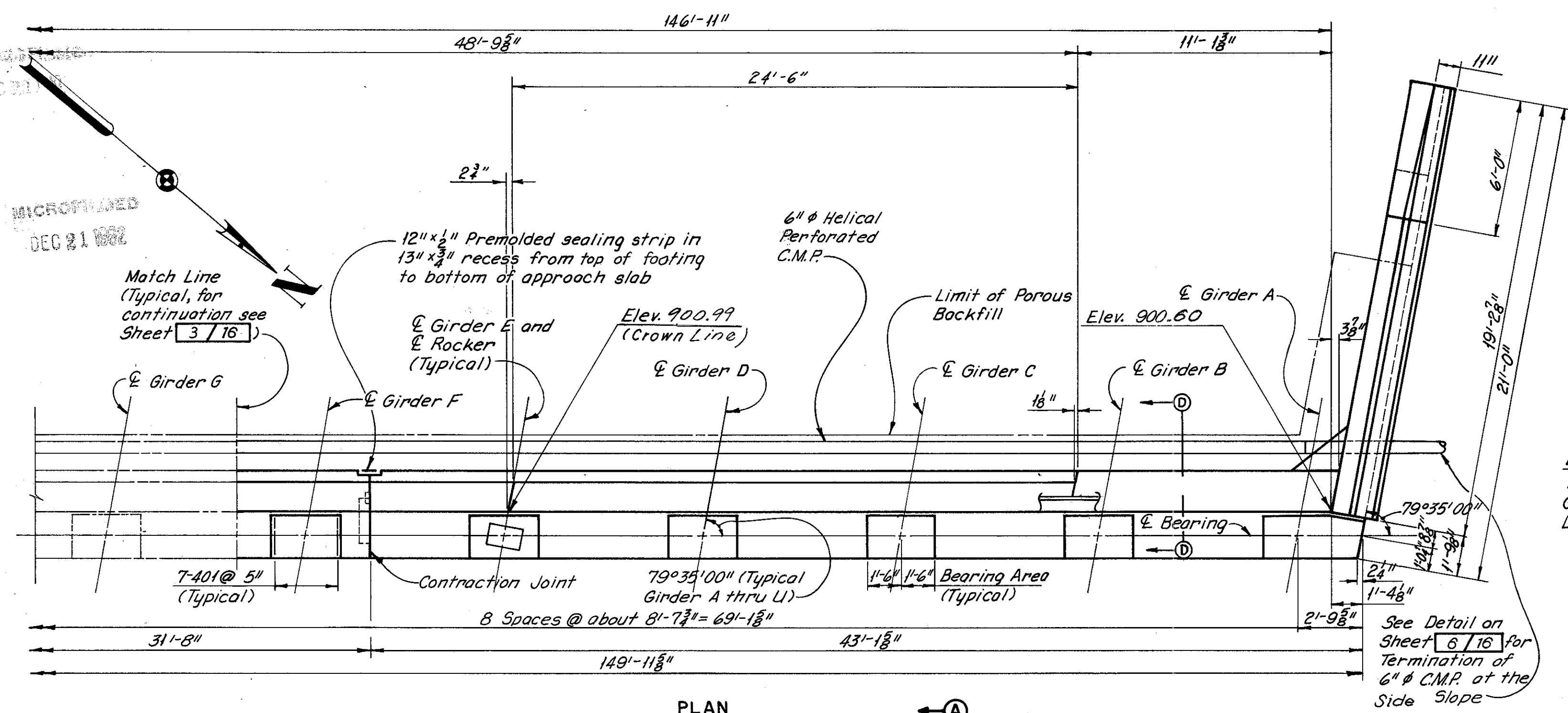
BR. NO. CUY-80-2140 STA. 1153+08.41 TO STA. 1158+17.04

CLEVELAND CUYAHOGA COUNTY OHIO

DATE 4-13-70 TRACED 11/81 CHECKED 11/83 REVIEWED 11/83

DATE 5-1-70 DATE 5-1-70 DATE 5-1-70

SHEET 3/16



H.N.T.B. BR. NO. 6

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

WEST ABUTMENT
 I-80 OVER PENN-CENTRAL RAILROAD,
 NORFOLK & WESTERN RAILWAY
 AND MILL CREEK

BR. NO. CUY-80-2140 STA. 1153+08.41 TO STA. 1158+17.04

CLEVELAND CUYAHOGA COUNTY OHIO

DATE 4-13-70 TRACED 1/81 CHECKED 4/3 REVIEWED REVISION

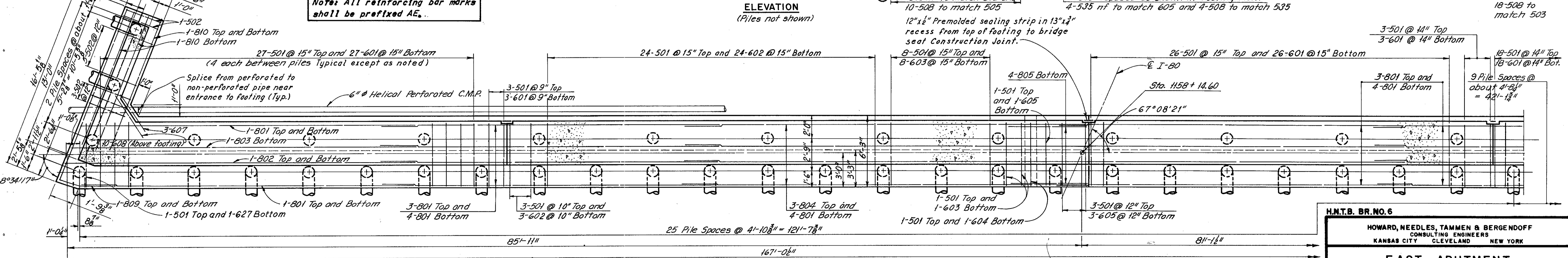
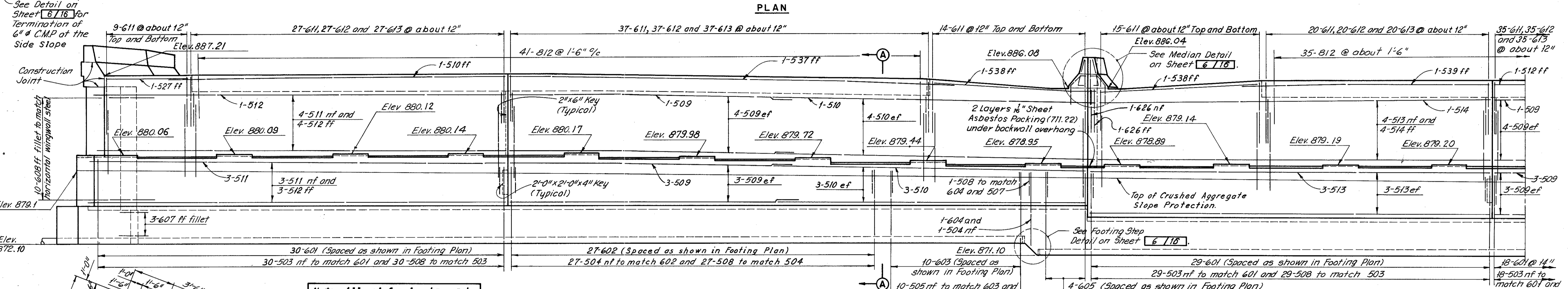
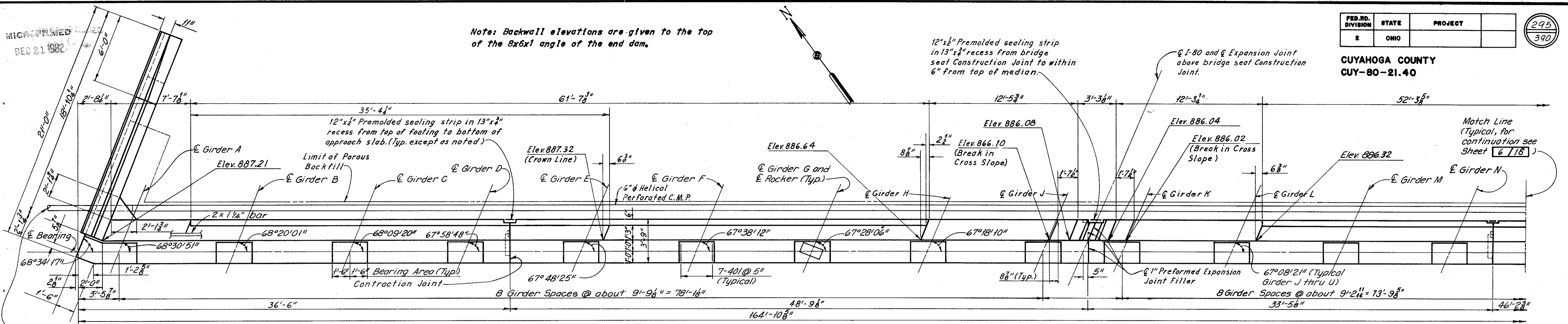
SHEET 4/16

MICROFILMED
DEC 21 1982

Note: Backwall elevations are given to the top of the 8x6x1 angle of the end dam.

FED. RD. DIVISION	STATE	PROJECT	295 390
2	OHIO		

CUYAHOGA COUNTY
CUY-80-21.40



Notes:
For notes see Sheet 3/16
For Section A-A see Sheet 4/16

H.N.T.B. BR. NO. 6

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

EAST ABUTMENT
I-80 OVER PENN-CENTRAL RAILROAD,
NORFOLK & WESTERN RAILWAY
AND MILL CREEK

BR. NO. CUY-80-2140 STA. 1153+08.41 TO
STA. 1158+17.04

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN 3/15	TRACED 1/12	CHECKED 1/12	REVIEWED	REVISOR
DATE 5-1-70	DATE 5-6-70	DATE 5-9-70	DATE	DATE

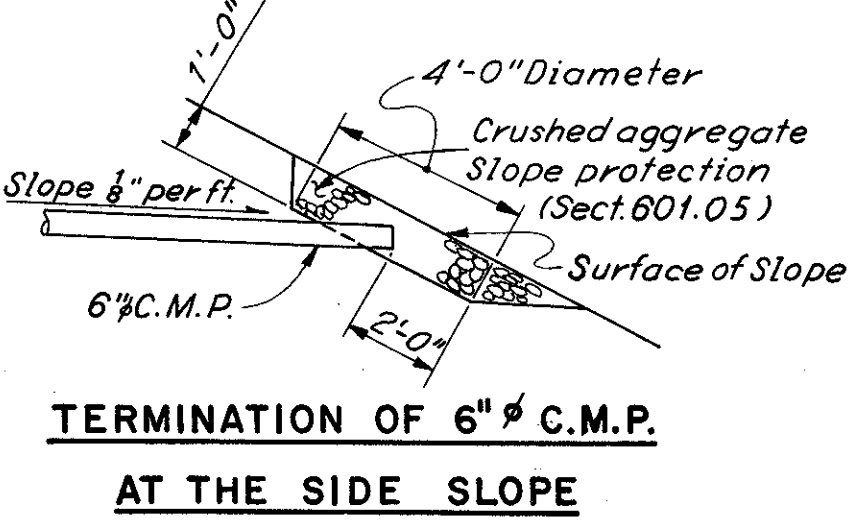
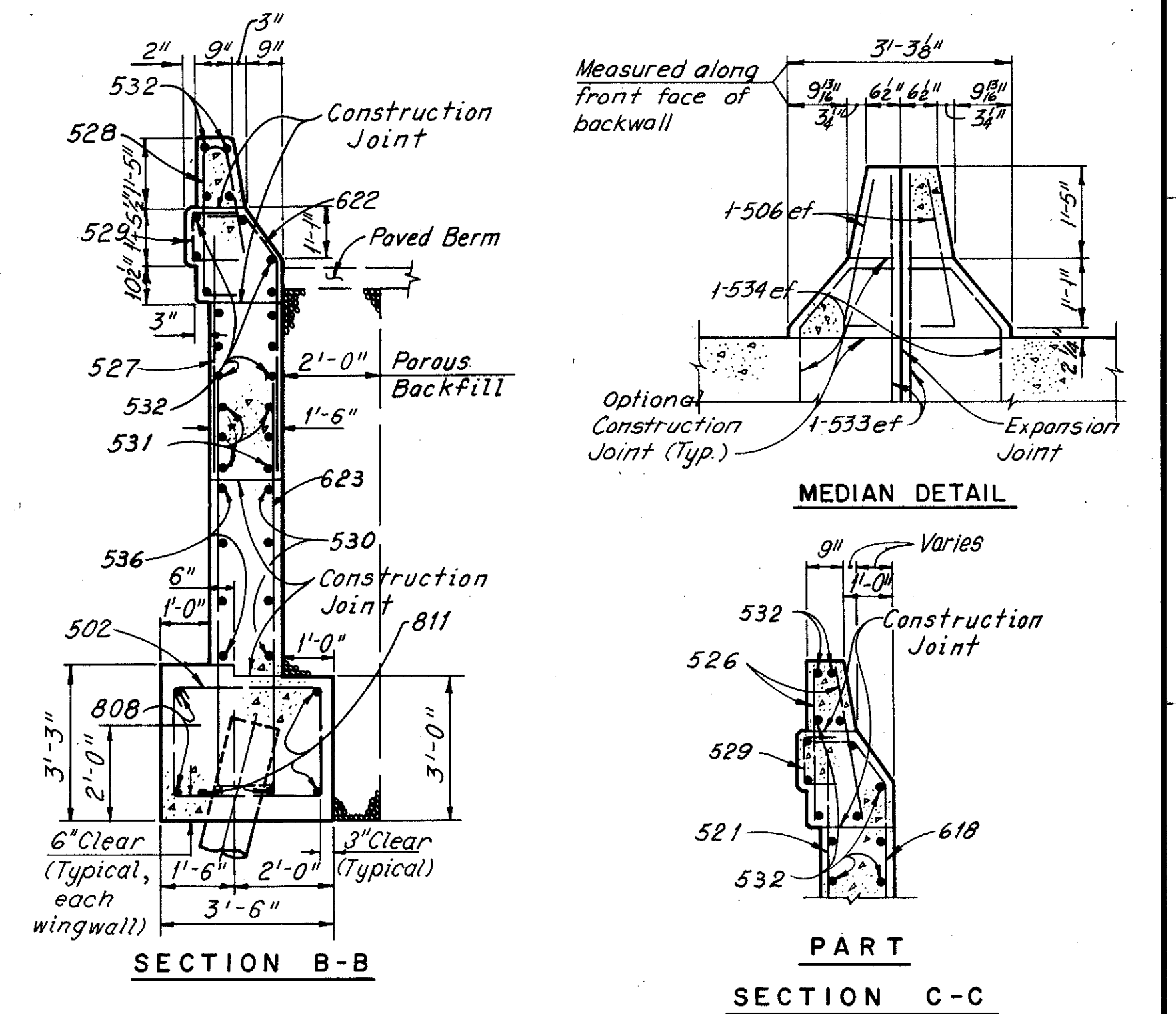
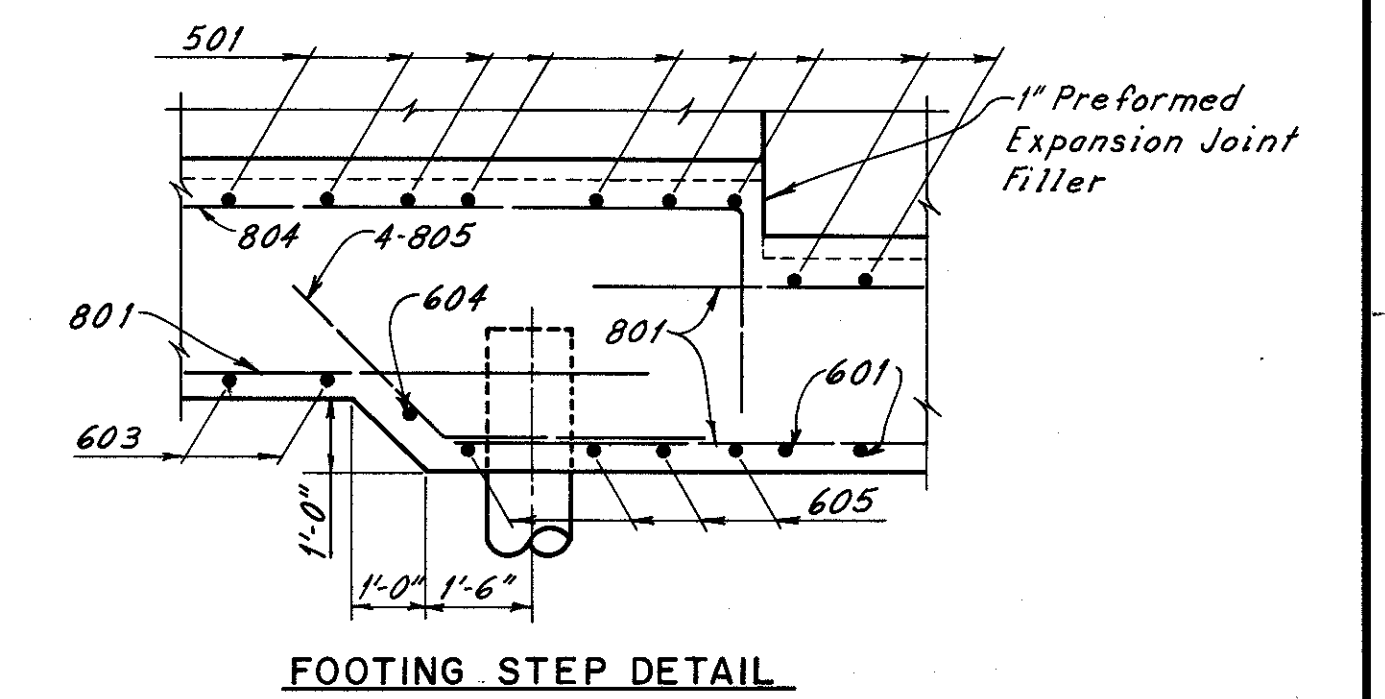
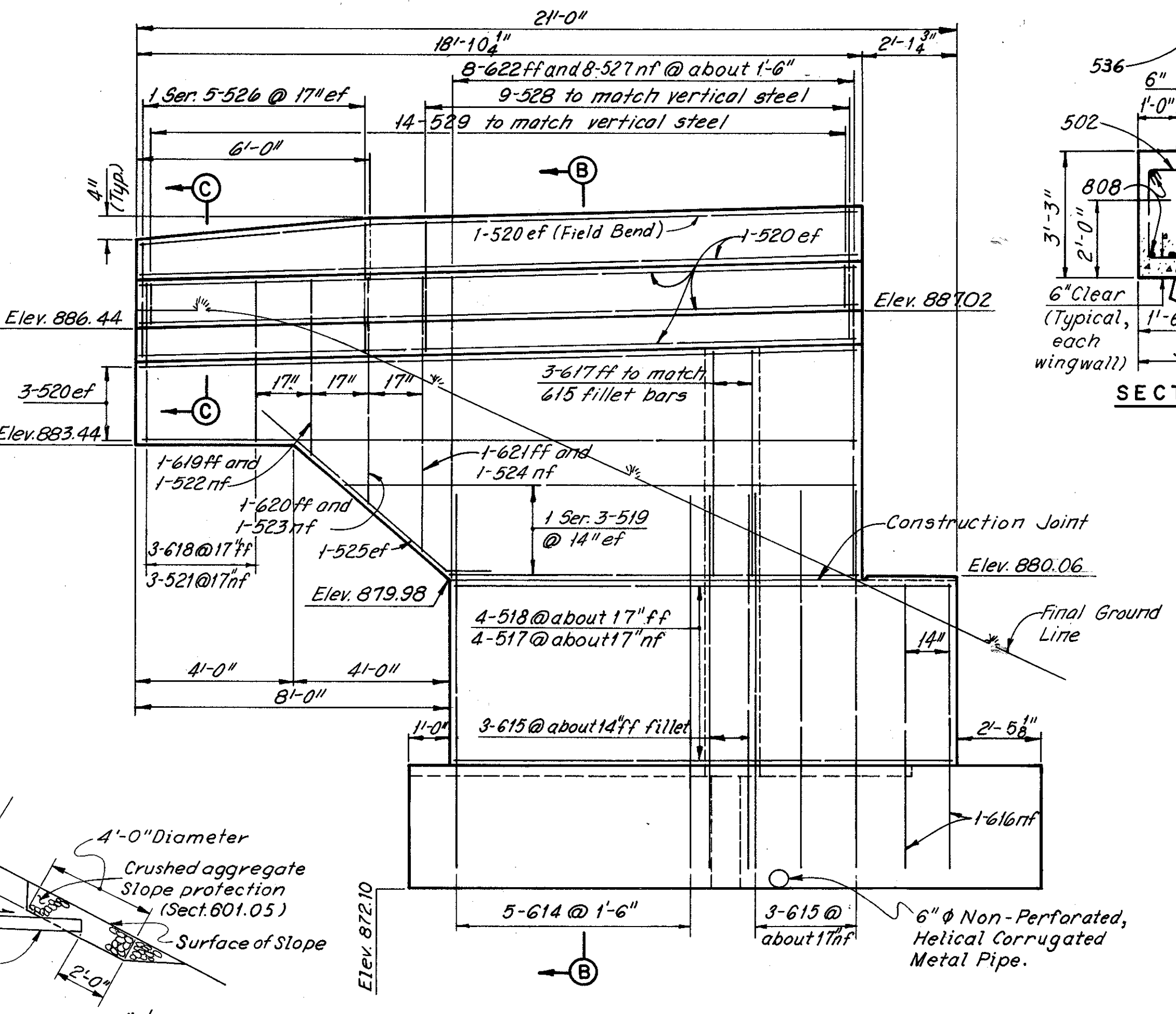
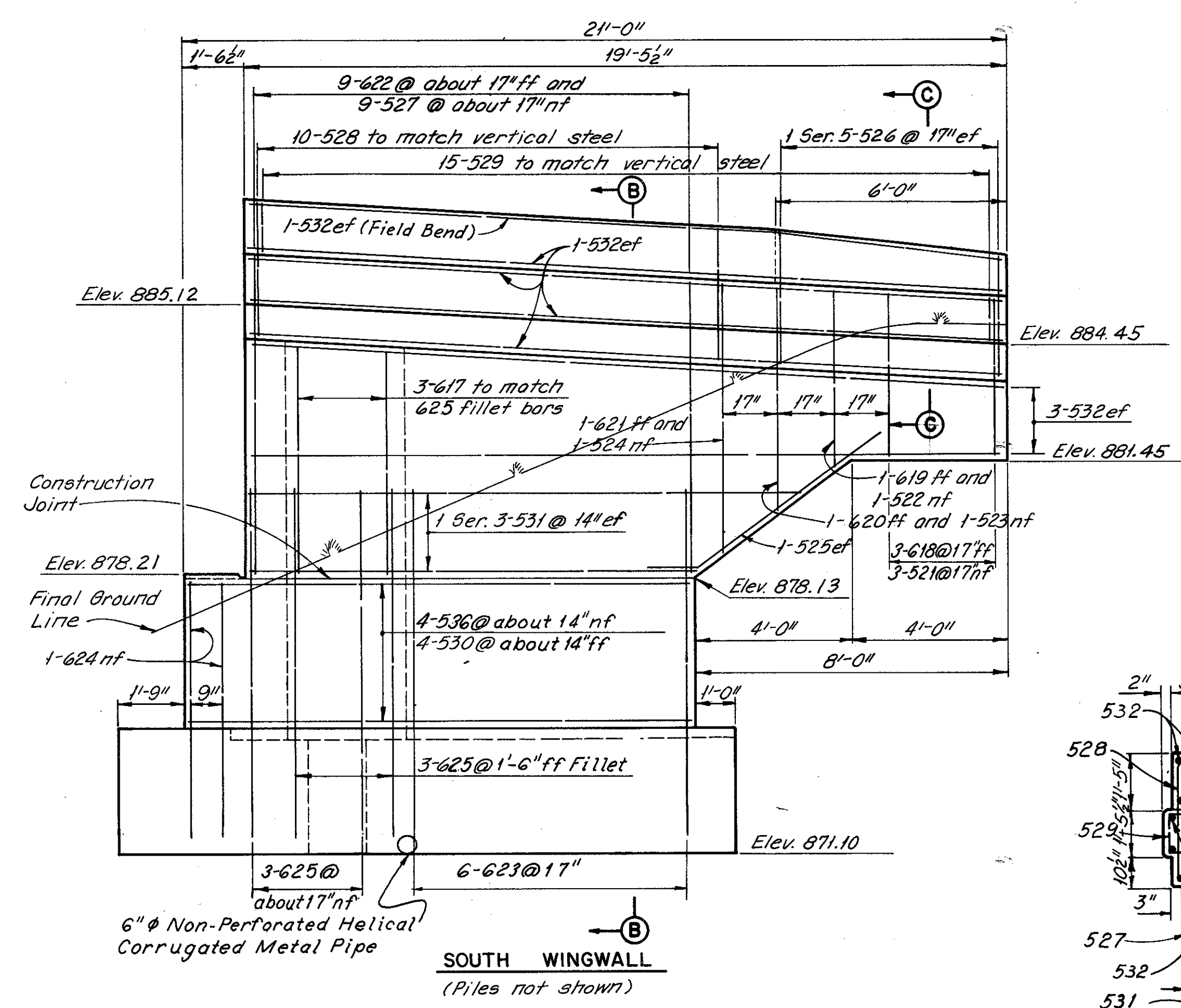
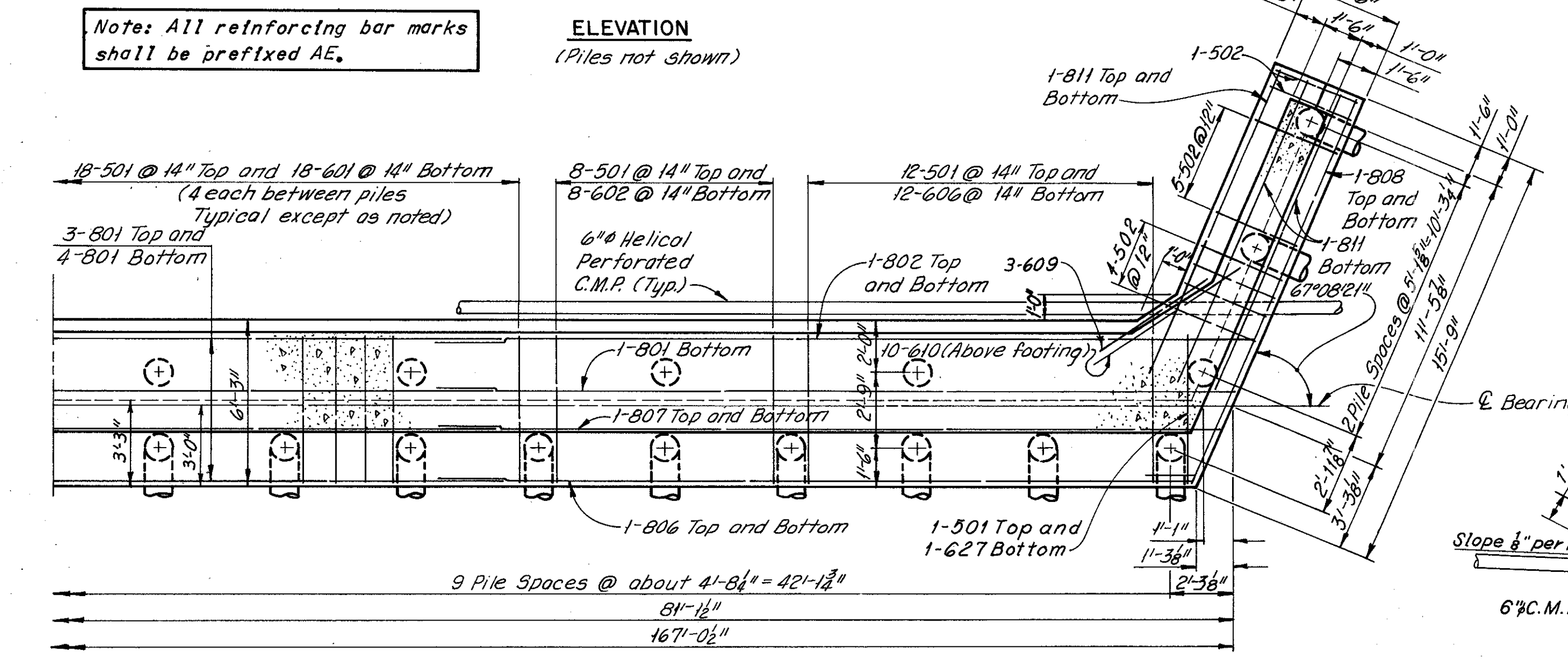
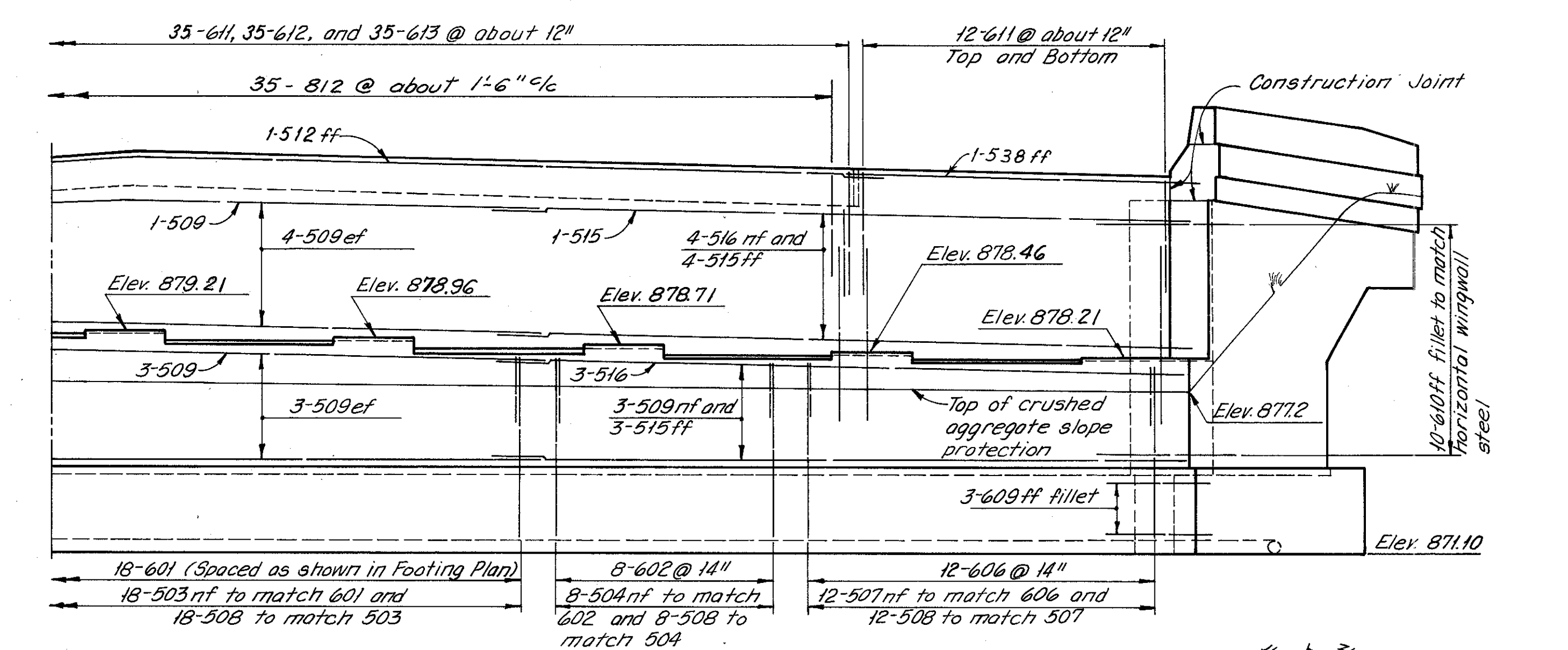
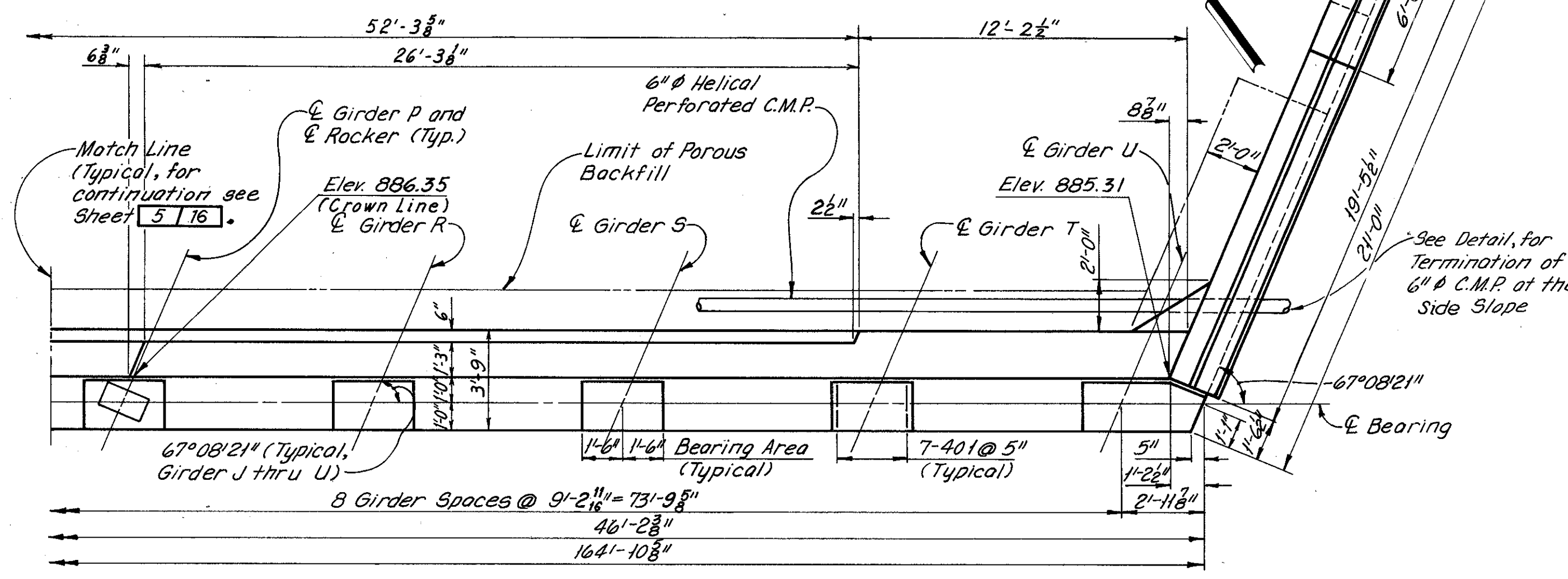
SHEET 5/16

DEC 21 1962

Note: Backwall elevations are given to the top of the 8x6x1 angle of the end dam.

FED. RD. DIVISION	STATE	PROJECT	296 390
2	OHIO		

CUYAHOGA COUNTY
CUI-80-21.40



Notes:
Sections B-B and C-C are shown for South Wingwall, North Wingwall similar except for bar marks.
For curb and parapet transitions and for guard rail anchor details, see "PART PLANS-PARAPET ON WINGWALL" on Ohio Standard Drawing BR-1-67, Revised 10-15-71, Sheet 1 of 3.
For additional notes see Sheet 3/16.

H.N.T.B. BR. NO. 6

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

EAST ABUTMENT
I-80 OVER PENN-CENTRAL RAILROAD,
NORFOLK & WESTERN RAILWAY
AND MILL CREEK

BR. NO. CUY-80-2140 STA. 1153+08.41 TO STA. 1158+17.04

CLEVELAND CUYAHOGA COUNTY OHIO

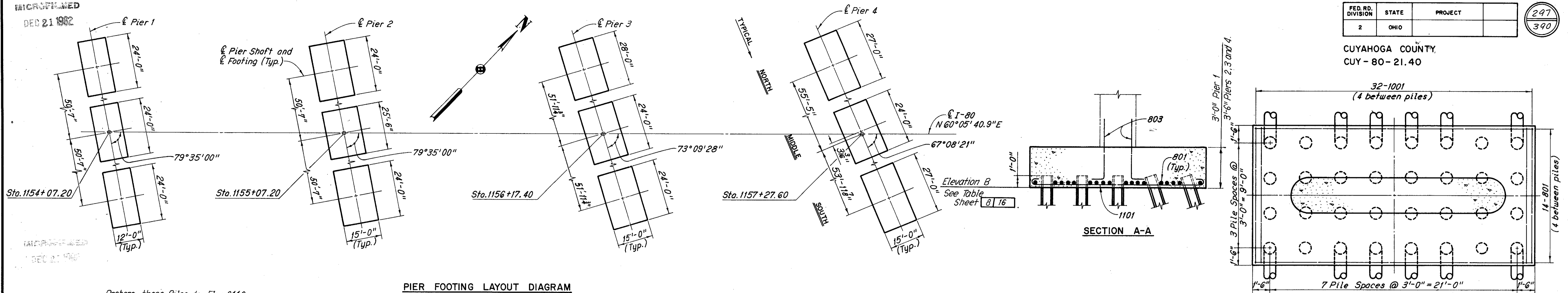
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DATE 5-1-70 DATE 5-14-70 DATE 5-9-70 DATE

SHEET 6/16

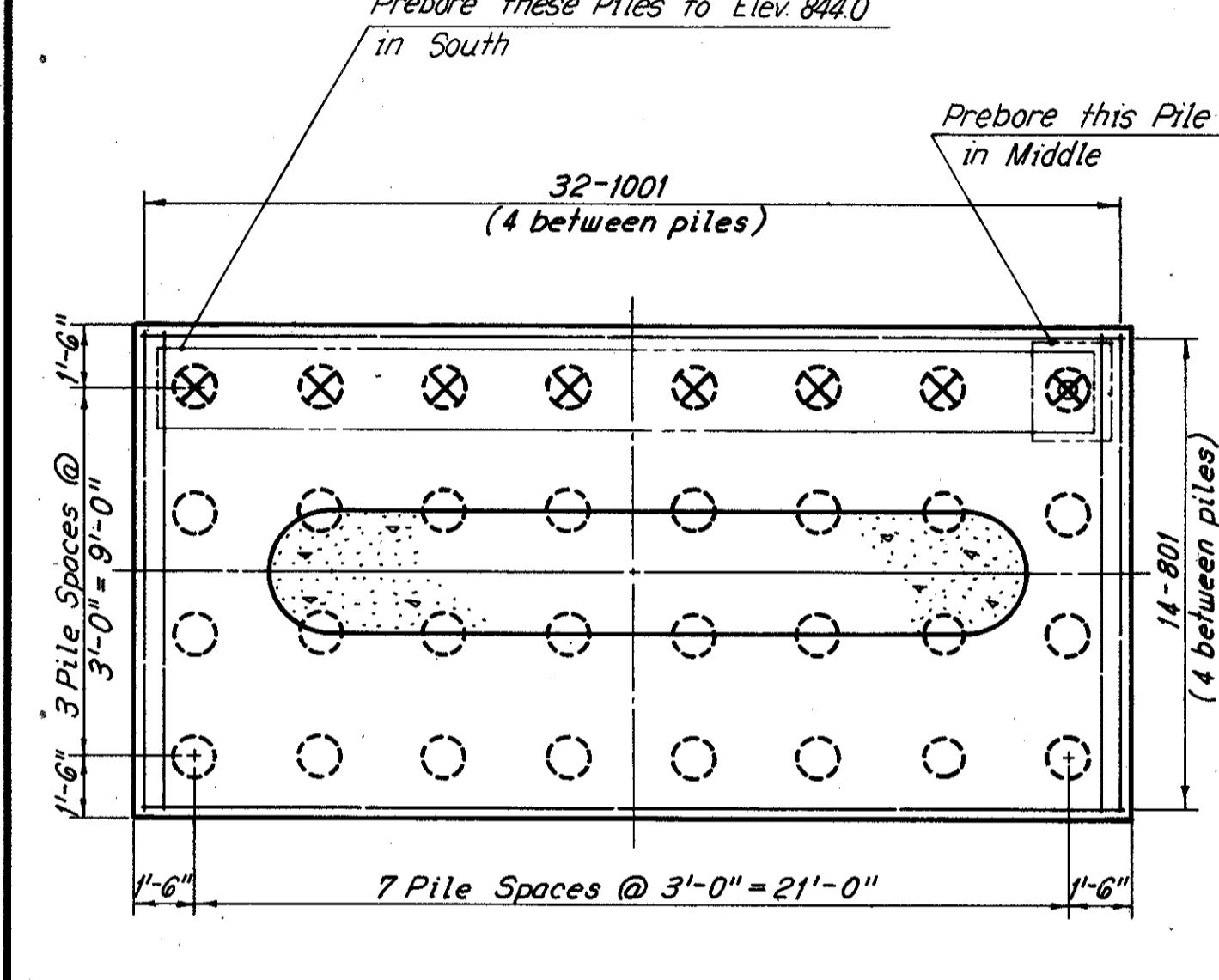
MICROFILMED
DEC 21 1982

FED. RD. DIVISION	STATE	PROJECT	297 390
2	OHIO		

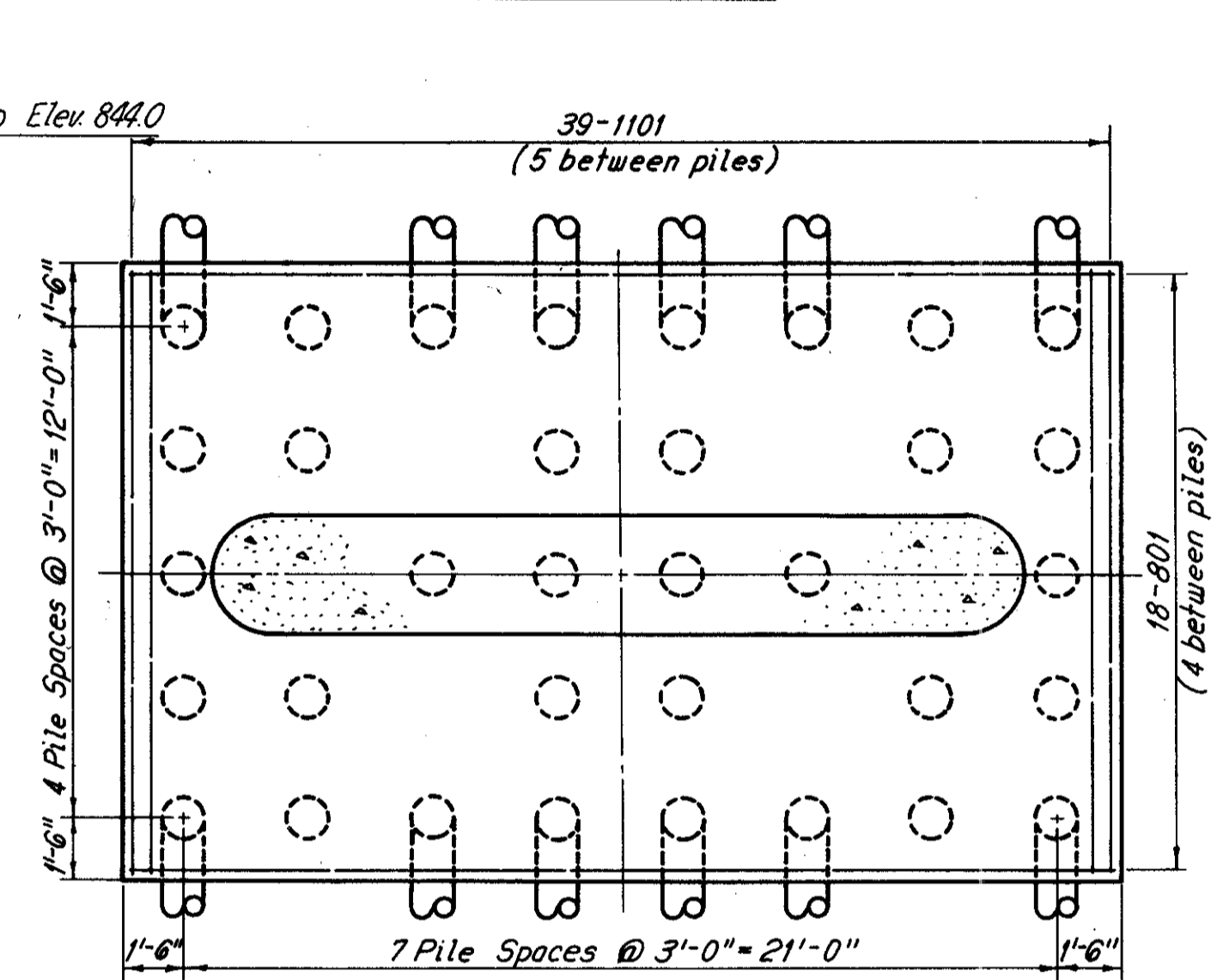
CUYAHOGA COUNTY
CUY-80-21.40



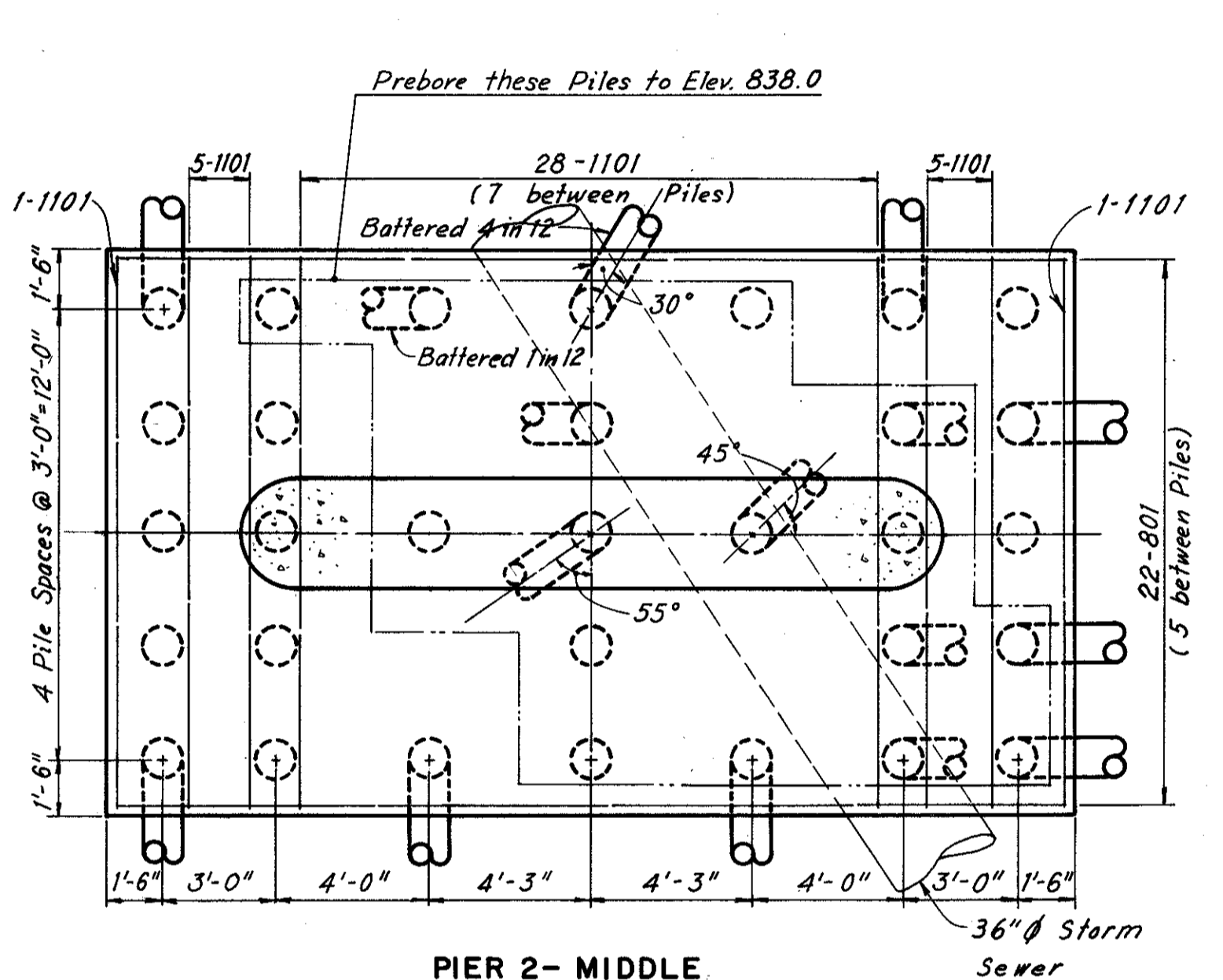
PIER FOOTING LAYOUT DIAGRAM



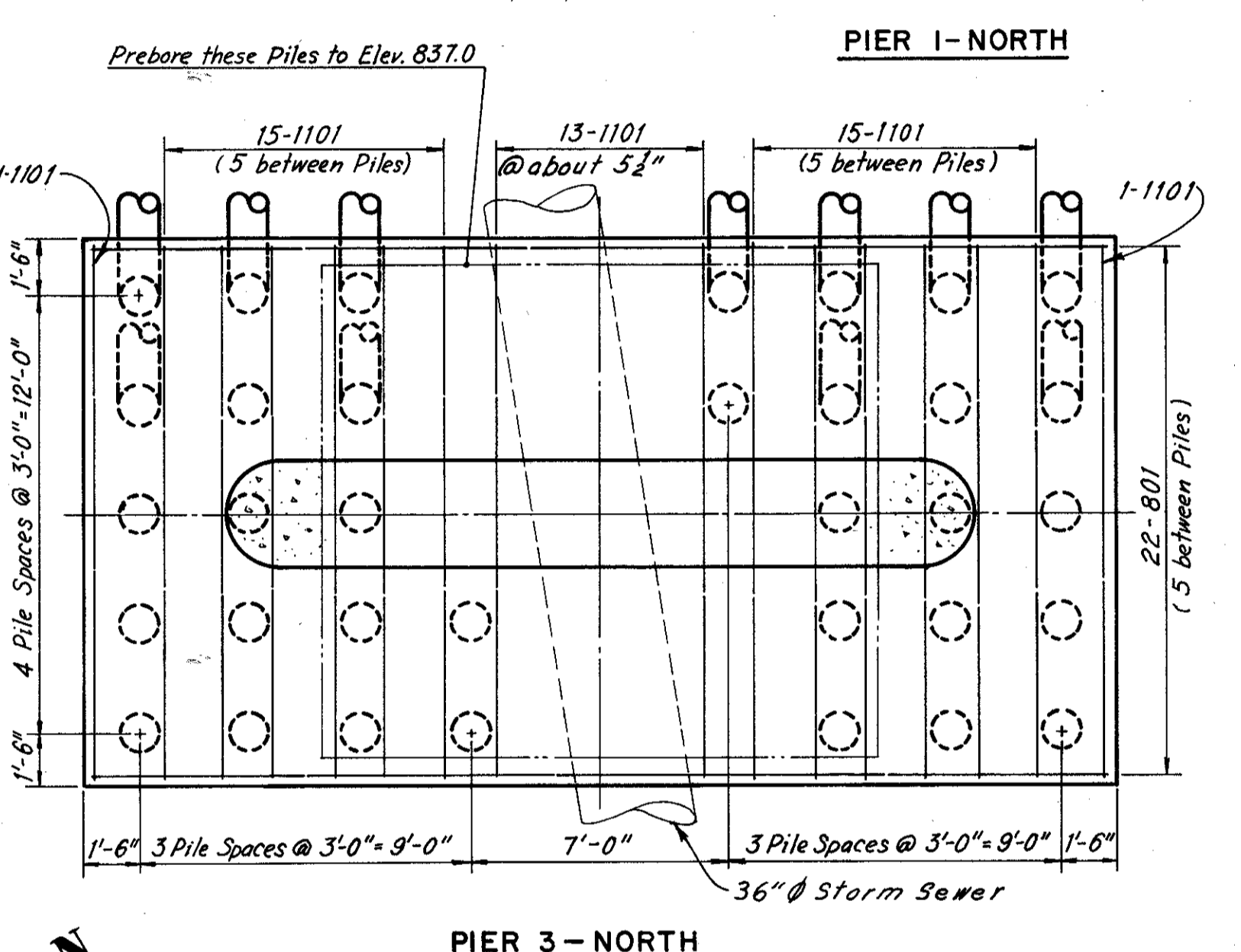
PIER 1-MIDDLE AND SOUTH



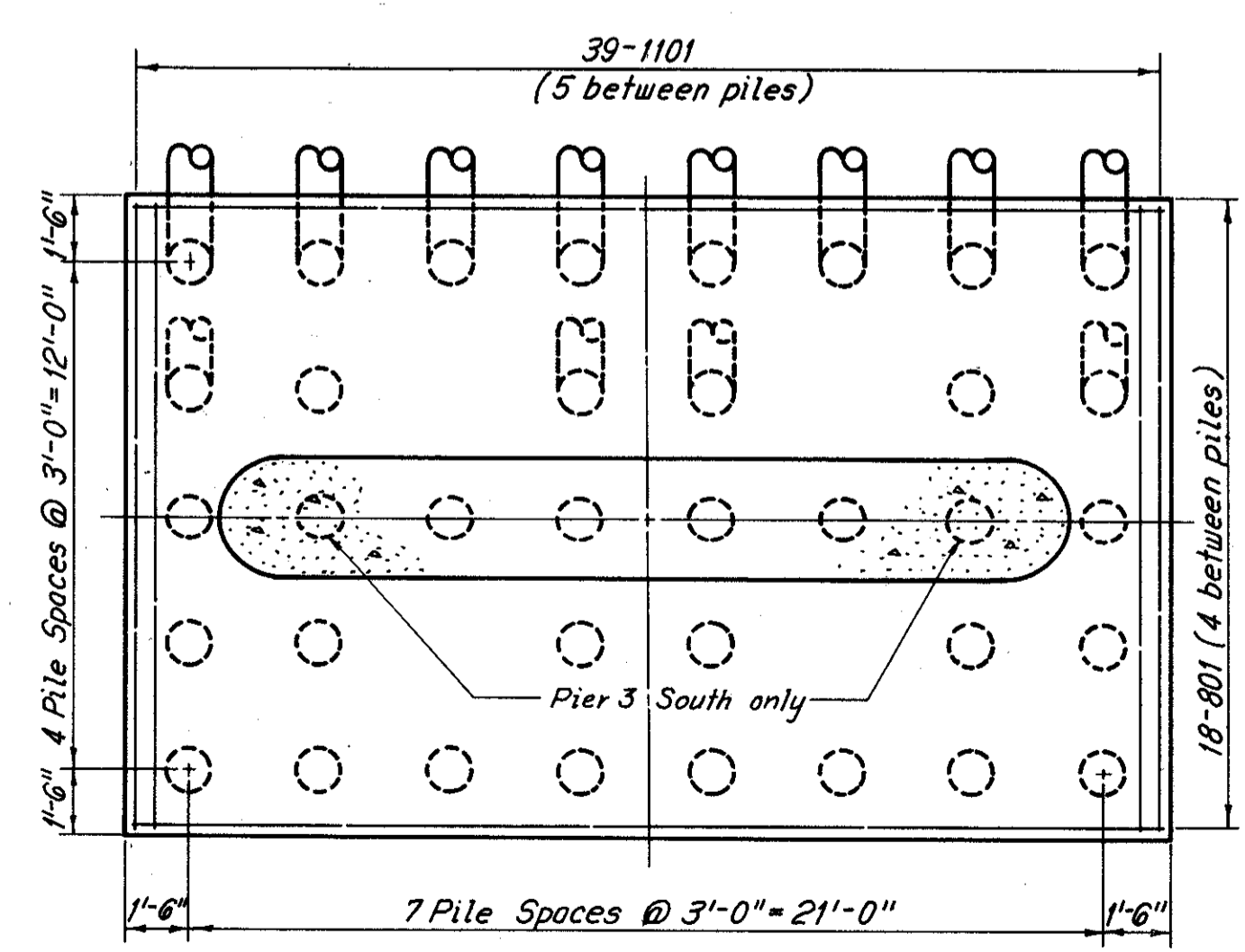
PIER 2-NORTH AND SOUTH



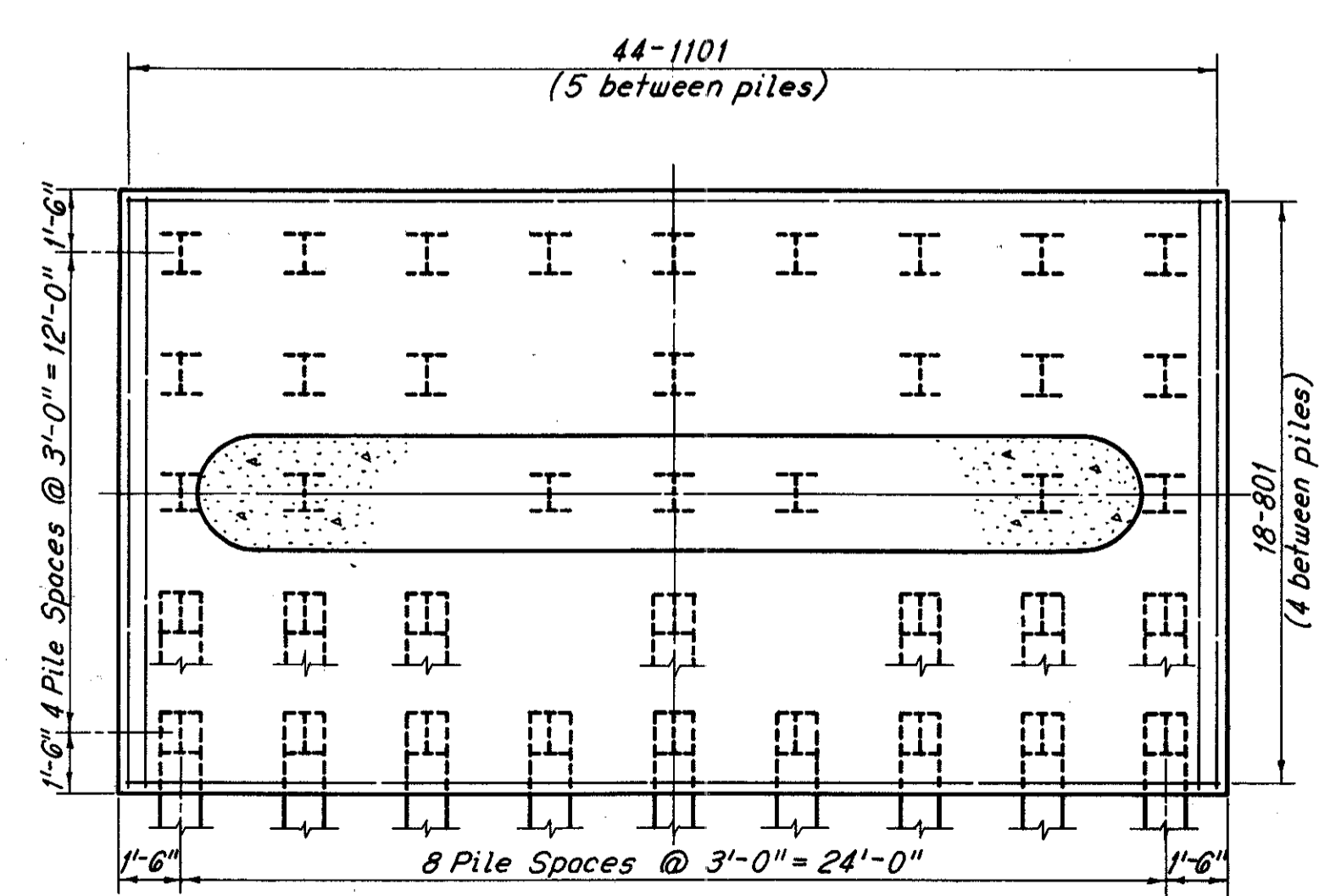
PIER 2-MIDDLE



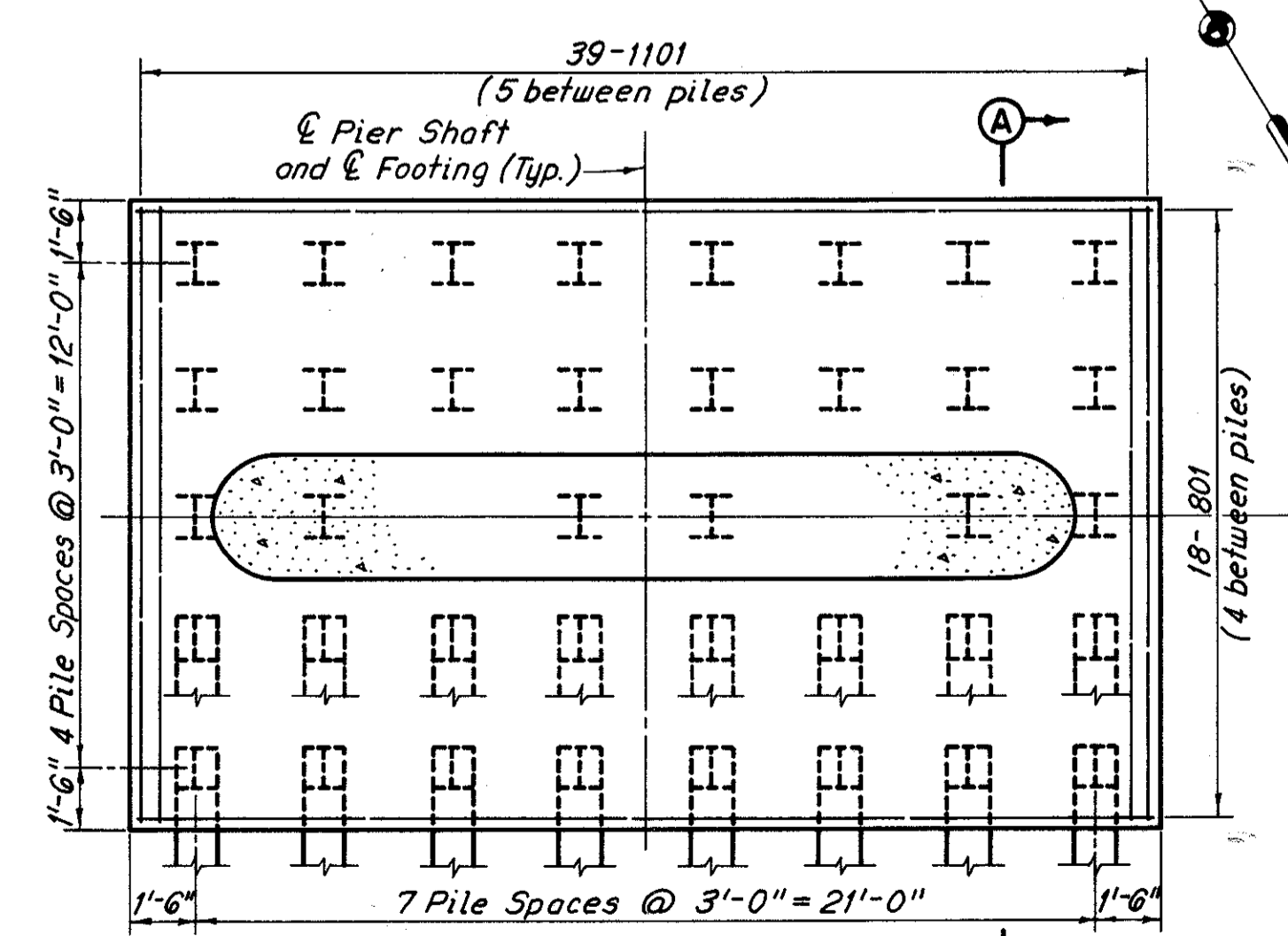
PIER 3-NORTH



PIER 3-MIDDLE AND SOUTH



PIER 4-NORTH AND SOUTH



PIER 4-MIDDLE

FOOTING PLANS

Notes:
The Contractor shall take all necessary precautions to insure against damage to 15" ϕ , 27" ϕ and 36" ϕ sewer lines. For location of sewer lines with respect to Piers 1, 2 and 3 see Sheet 2176 and Sections A-A, B-B and C-C on Sheet 2176.
All piles are 12" ϕ C.I.P. reinforced concrete for Piers 1, 2 and 3 and HP12x53 for Pier 4.
All battered piles shall be inclined 3 in 12 in the direction shown, except as otherwise noted.
Pile spacings are measured along bottom of footing.
For reinforcing bar mark prefixes see Notes on Sheet 2176.

H.N.T.B. BR. NO. 6
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
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KANSAS CITY CLEVELAND NEW YORK

PIER LAYOUT AND FOOTING DETAILS
I-80 OVER PENN-CENTRAL RAILROAD,
NORFOLK & WESTERN RAILWAY
AND MILL CREEK

BR. NO. CUY-80-2140 STA. 1153+08.41 TO
STA. 1156+17.04

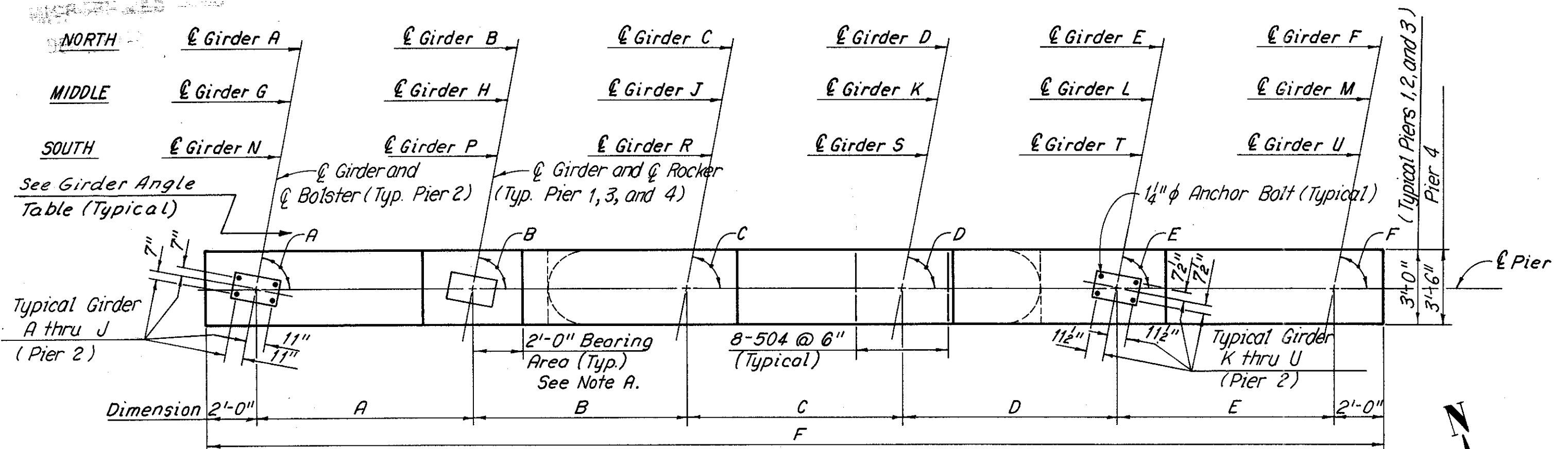
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN J.L.	TRACED L.L.A.	CHECKED J.L.	REVIEWED	REVISED
DATE 6-11-70	DATE 6-25-70	DATE 7-19-70	DATE	DATE

SHEET 7/16

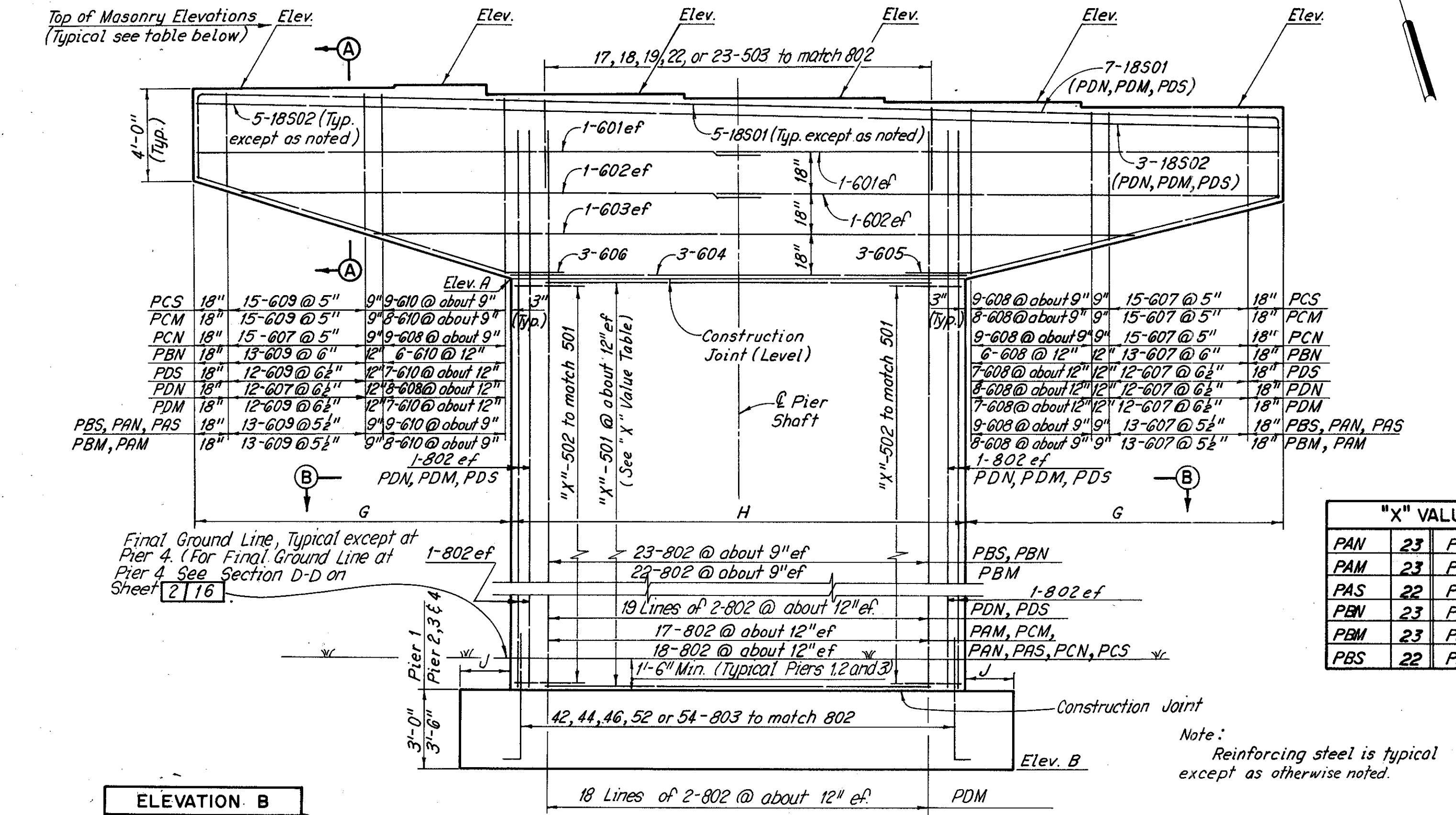
CUYAHOGA COUNTY
CUY-80-21.40

		A	B	C	D	E	F	G	H	J
Pier 1	North	8'-7 1/8"	8'-7 1/8"	8'-7 3/8"	8'-7 1/8"	8'-7 1/8"	47'-2 1/2"	13'-9"	19'-8 1/2"	21'-1 3/4"
	Middle	8'-7 1/8"	8'-7 1/8"	6'-1 1/4"	8'-7 1/8"	8'-7 1/8"	44'-8"	13'-0"	18'-8"	21'-8"
	South	8'-7 1/8"	8'-7 1/8"	8'-7 3/8"	8'-7 1/8"	8'-7 1/8"	47'-2 1/2"	13'-9"	19'-8 1/2"	21'-1 3/4"
Pier 2	North	8'-7 1/8"	8'-7 1/8"	8'-7 3/8"	8'-7 1/8"	8'-7 1/8"	47'-2 1/2"	13'-9"	19'-8 1/2"	21'-1 3/4"
	Middle	8'-7 1/8"	8'-7 1/8"	6'-1 1/4"	8'-7 1/8"	8'-7 1/8"	44'-8"	13'-0"	18'-8"	31'-5"
	South	8'-7 1/8"	8'-7 1/8"	8'-7 3/8"	8'-7 1/8"	8'-7 1/8"	47'-2 1/2"	13'-9"	19'-8 1/2"	21'-1 3/4"
Pier 3	North	8'-10 3/8"	8'-10 3/8"	8'-10 3/8"	8'-10 3/8"	8'-10 3/8"	48'-4 3/4"	14'-1"	20'-2 7/8"	31'-10 3/8"
	Middle	8'-10 3/8"	8'-10 3/8"	6'-3 1/4"	8'-10 3/8"	8'-10 3/8"	45'-9 1/2"	13'-4"	19'-1 1/2"	21'-5 1/4"
	South	8'-10 3/8"	8'-10 3/8"	8'-10 3/8"	8'-10 3/8"	8'-10 3/8"	48'-4 3/4"	14'-1"	20'-2 7/8"	11'-10 3/8"
Pier 4	North	9'-5 3/8"	9'-5 3/8"	9'-5 3/8"	9'-5 3/8"	9'-5 3/8"	51'-4 3/4"	15'-0"	21'-4 3/4"	21'-9 1/2"
	Middle	9'-5 3/8"	9'-5 3/8"	6'-6 1/4"	9'-2 1/8"	9'-2 1/8"	47'-11 3/8"	14'-0"	19'-11 3/8"	21'-0 3/8"
	South	9'-2 1/8"	9'-2 1/8"	9'-2 1/8"	9'-2 1/8"	9'-2 1/8"	50'-1 1/2"	14'-7"	20'-11 1/2"	31'-0 1/4"



Note A:
2'-0" measured in the direction of lower girder elevation. Cap beam steps of South caps shown.

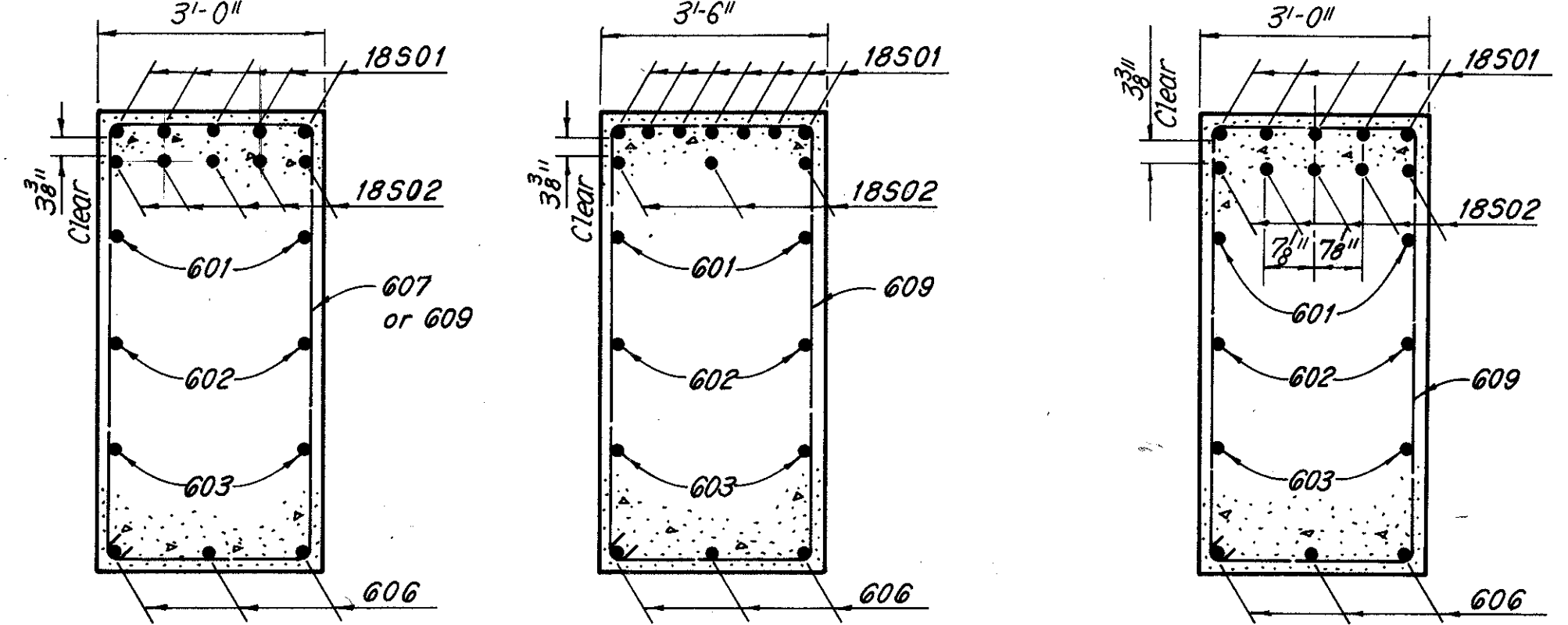
DEC 21 1982



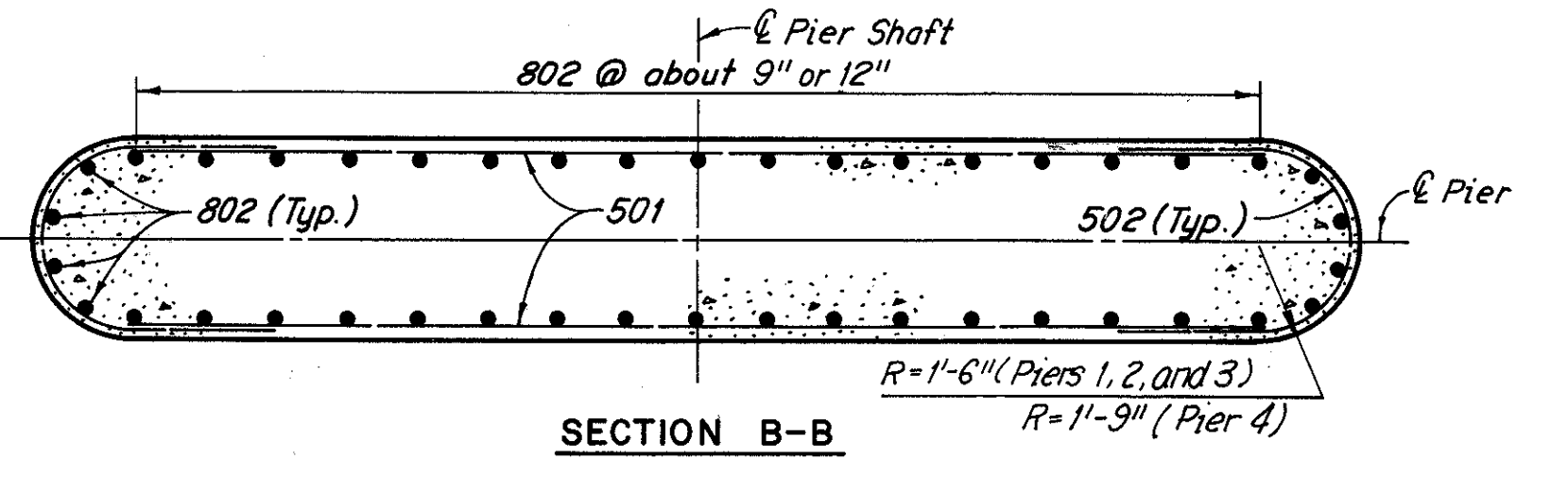
ELEVATION B	
PAN	858.29
PAM	858.29
PAS	858.29
PBN	855.29
PBM	855.29
PBS	855.29
PCN	844.29
PCM	846.29
PCS	847.99
PDN	831.29
PDM	831.29
PDS	831.29

	ELEVATION A		
	North	Middle	South
Pier 1	883.30	883.28	882.44
Pier 2	880.81	880.70	879.98
Pier 3	877.66	877.20	876.27
Pier 4	874.25	873.74	872.67

TOP OF MASONRY ELEVATIONS																		
Girder	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	U
Pier 1	890.74	890.84	890.93	891.03	891.12	890.95	890.78	890.57	890.18	890.15	890.47	890.53	890.53	890.54	890.38	890.21	890.04	889.88
Pier 2	888.25	888.34	888.43	888.51	888.59	888.42	888.24	888.03	887.63	887.52	887.83	887.95	888.04	888.12	887.95	887.77	887.59	887.42
Pier 3	885.18	885.24	885.30	885.34	885.40	885.19	884.97	884.72	884.29	884.16	884.44	884.53	884.57	884.63	884.42	884.21	884.00	883.79
Pier 4	882.13	882.15	882.18	882.19	882.22	882.00	881.76	881.48	881.00	880.92	881.17	881.24	881.26	881.29	881.04	880.80	880.56	880.32



SECTION A-A (Typ. PAN, PAM, PAS, PCN, PCM, PCS)
SECTION A-A (Typ. PDN, PDM, PDS)
SECTION A-A (Typ. PBN, PBM, PBS)



SECTION B-B
R=1'-6" (Piers 1, 2, and 3)
R=1'-9" (Pier 4)

"X" VALUE			
PAN	23	PCN	31
PAM	23	PCM	28
PAS	22	PCS	26
PBN	23	PDN	40
PBM	23	PDM	40
PBS	22	PDS	39

Notes:
The anchor bolts in Pier 2 shall be cast in place, by the use of a template for support, to insure against the reinforcing steel interfering with the anchor bolt setting. Extreme care shall be taken to assure agreement with plan dimensions. For anchor bolt details see Ohio Standard Drawing RB-1-55.

The following abbreviations are used:
PAN = Pier 1 North
PAM = Pier 1 Middle
PAS = Pier 1 South
PBN = Pier 2 North
PBM = Pier 2 Middle
PBS = Pier 2 South
PCN = Pier 3 North
PCM = Pier 3 Middle
PCS = Pier 3 South
PDN = Pier 4 North
PDM = Pier 4 Middle
PDS = Pier 4 South
ef = each face
The reinforcing bar marks shall be prefixed the same as above.
All cap stirrups shall be placed with the hook at the bottom of the cap.

GIRDER ANGLE TABLE								
		Angle	A	B	C	D	E	F
Pier 1	North		79°35'00"					79°35'00"
	Middle							
	South							
Pier 2	North							
	Middle							
	South		79°35'00"					79°35'00"
Pier 3	North		73°09'28"					73°09'28"
	Middle		73°09'28"					73°09'28"
	South		73°09'28"					73°09'28"
Pier 4	North		68°30'51"	68°20'01"	68°09'42"	67°58'48"	67°48'26"	67°38'12"
	Middle		67°28'06"	67°18'10"	67°08'12"			67°08'12"
	South		67°08'12"					67°08'12"

H.N.T.B. BR. NO. 6

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

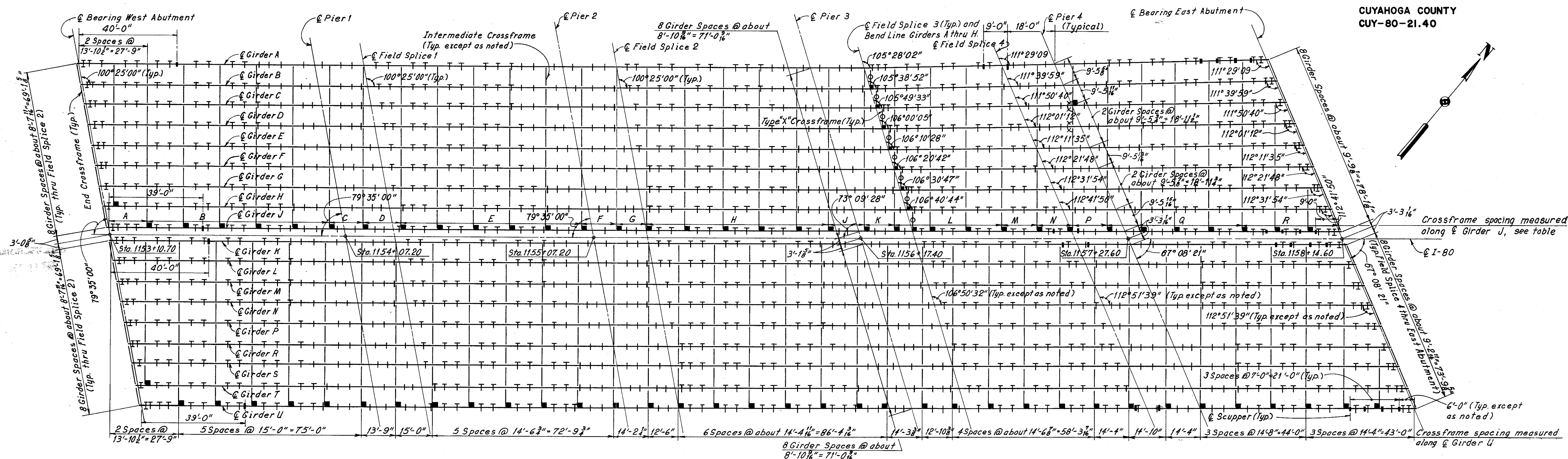
PIERS - SHAFTS AND CAPS
I-80 OVER PENN-CENTRAL RAILROAD,
NORFOLK & WESTERN RAILWAY
AND MILL CREEK

BR. NO. CUY-80-2140 STA. 1153+08.41 TO STA. 1158+17.04

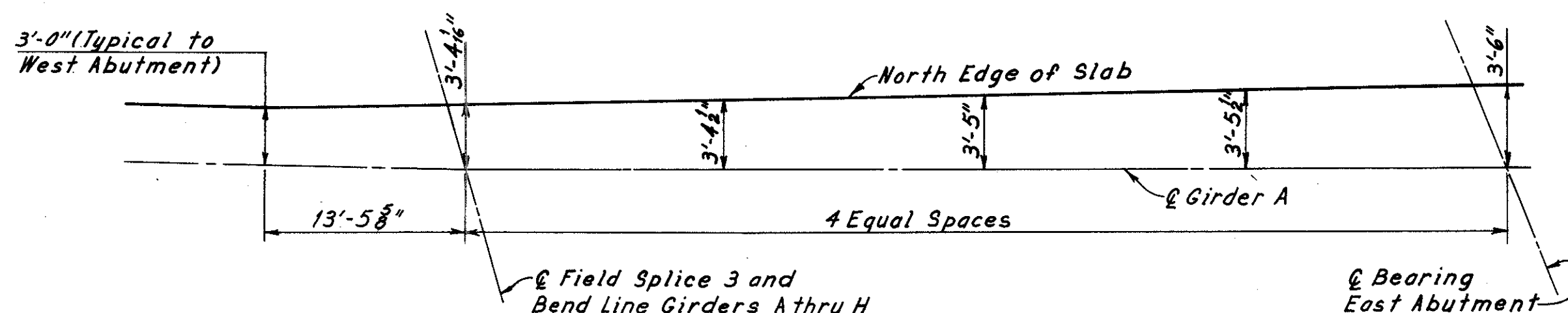
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN J.T. TRACED/L.A. CHECKED R.W. REVIEWED DATE 6/23/70 DATE 6/30/70 DATE 7/15/70 DATE

SHEET 8 / 16



FRAMING PLAN



HORIZONTAL OFFSETS TO NORTH EDGE OF SLAB

Note: Offsets are measured perpendicular to Girder.

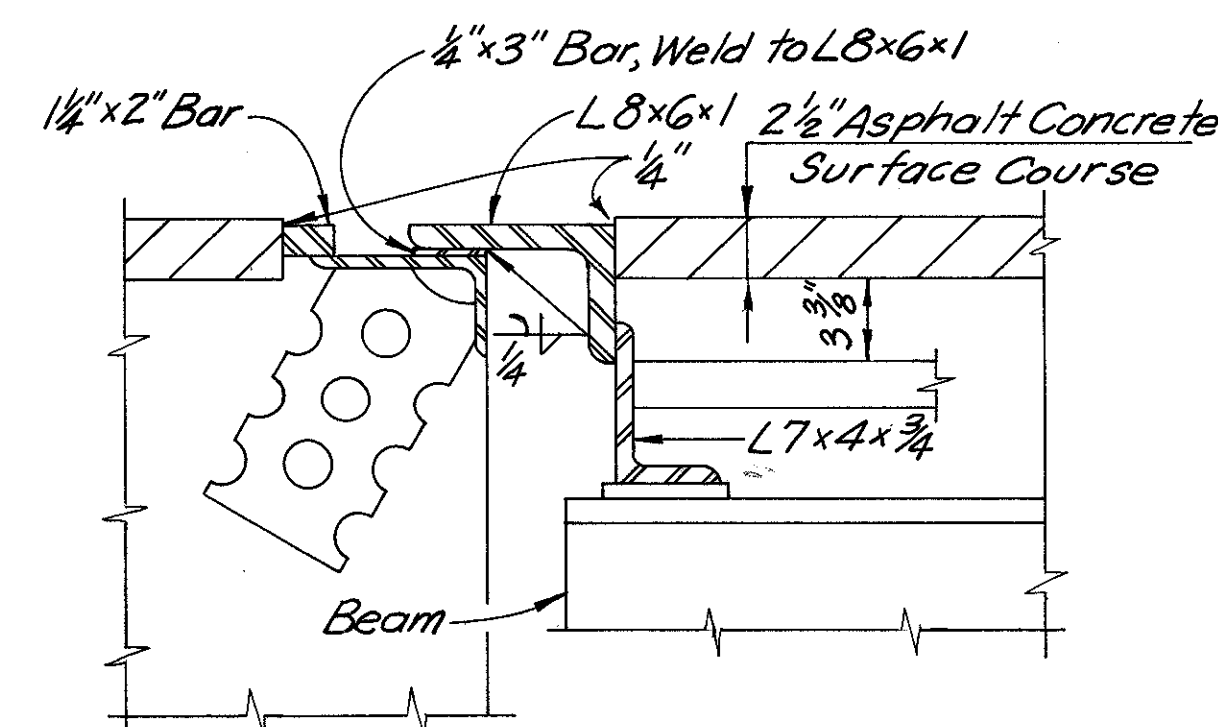
Notes:
Intermediate stiffeners located at crossframes are shown in the "Framing Plan" only if contact bearing with the flange changes adjacent to the crossframe.

FRAMING PLAN LEGEND

- ⊗ Indicates point at which crossframe changes direction.
- Indicates 90°
- + Indicates intermediate stiffeners having contact bearing with the bottom flange.
- ⊕ Indicates intermediate stiffeners having contact bearing with the top flange.
- ⊚ Indicates intermediate stiffeners at one-half normal stiffener spacing. (See Girder Notes Sheet 10/16 for stiffener spacing.)

Intermediate stiffeners shall have contact bearing with top and bottom flanges. Stiffeners shall be located at all crossframes.

Dimension	Line Description
A	15'-3"
B	5 Spaces @ 15'-0" = 75'-0"
C	13'-9"
D	15'-0"
E	5 Spaces @ 14'-6 3/4" = 72'-9 3/4"
F	14'-2 1/8"
G	12'-6"
H	5 Spaces @ about 15'-0" = 74'-11 3/8"
J	14'-3 3/8"
K	12'-10 3/8"
L	3 Spaces @ about 14'-9 1/4" = 44'-3 3/4"
M	14'-7 3/8"
N	14'-7 3/8"
P	14'-7 1/2"
Q	4 Spaces @ about 13'-9" = 55'-0"
R	3 Spaces @ 13'-1 1/2" = 39'-4 1/2"



For additional end dam details see Standard Drawing SD-1-69, Sheet 1 of 4.

END DAM DETAILS

Note:
For details of End Crossframes, Roadway End Dams and curb plates see Ohio Standard Drawing SD-1-69, Sheets 1 and 2 of 4.

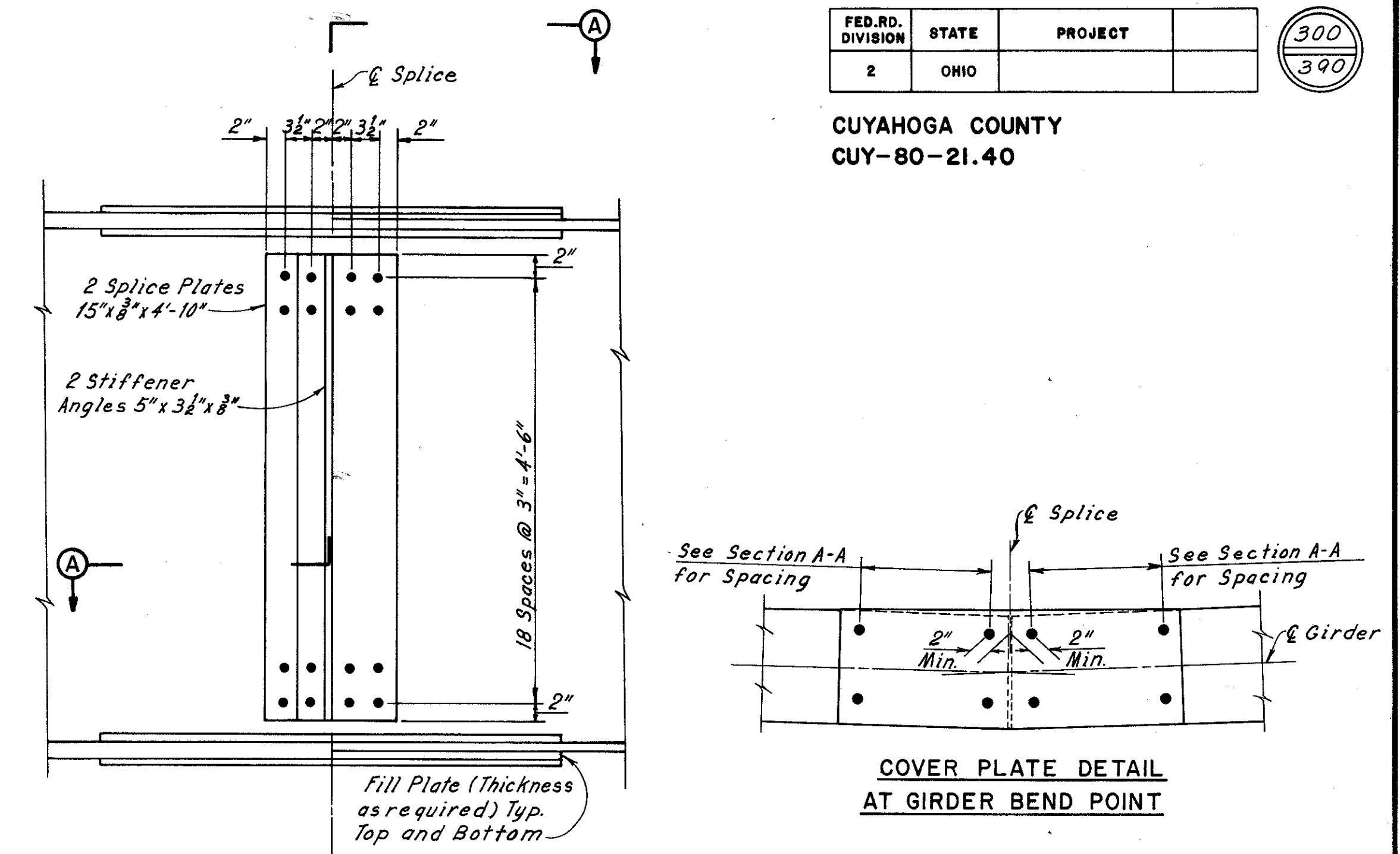
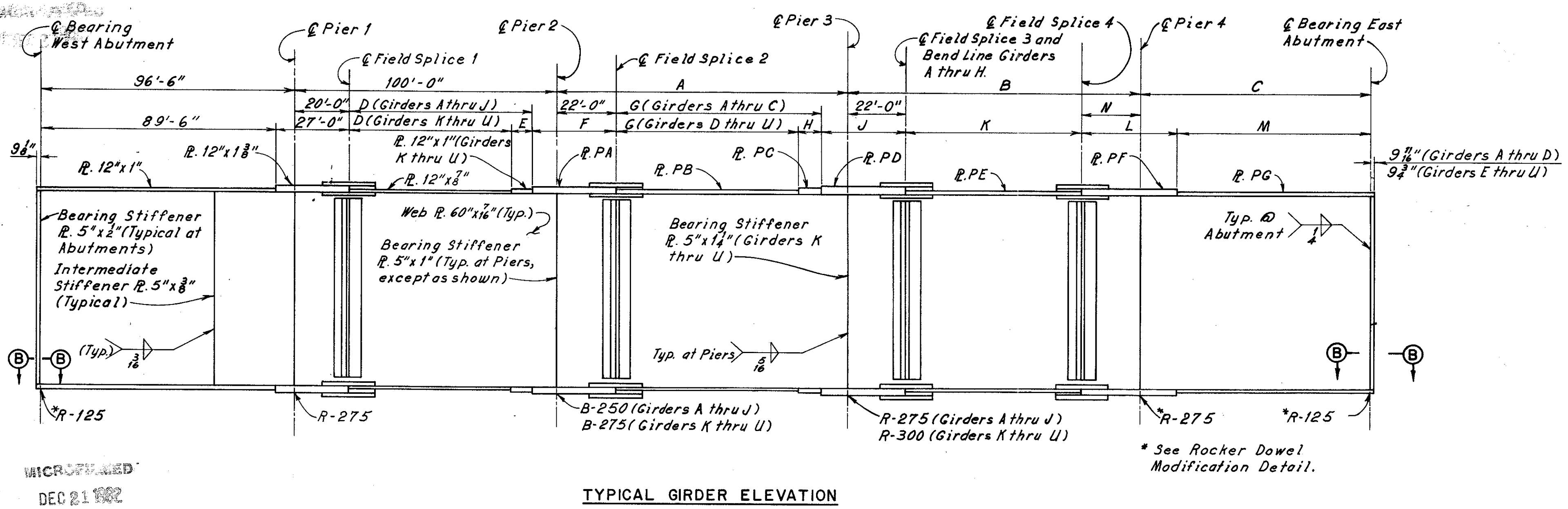
For Girder Notes see Sheet 10/16.
For details of Intermediate and Type "X" Crossframes and Drainage Details see Sheet C07 and C02.

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CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

FRAMING PLAN
I-80 OVER PENN-CENTRAL RAILROAD,
NORFOLK & WESTERN RAILWAY
AND MILL CREEK

BR. NO. CUY-80-2140 STA. 1153+08.41 TO STA. 1158+17.04
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN S.M.S. TRACED S.C. CHECKED J.S. REVIEWED []
DATE 5-7-70 DATE 5-13-70 DATE 6-30-70 DATE []
SHEET 9/16



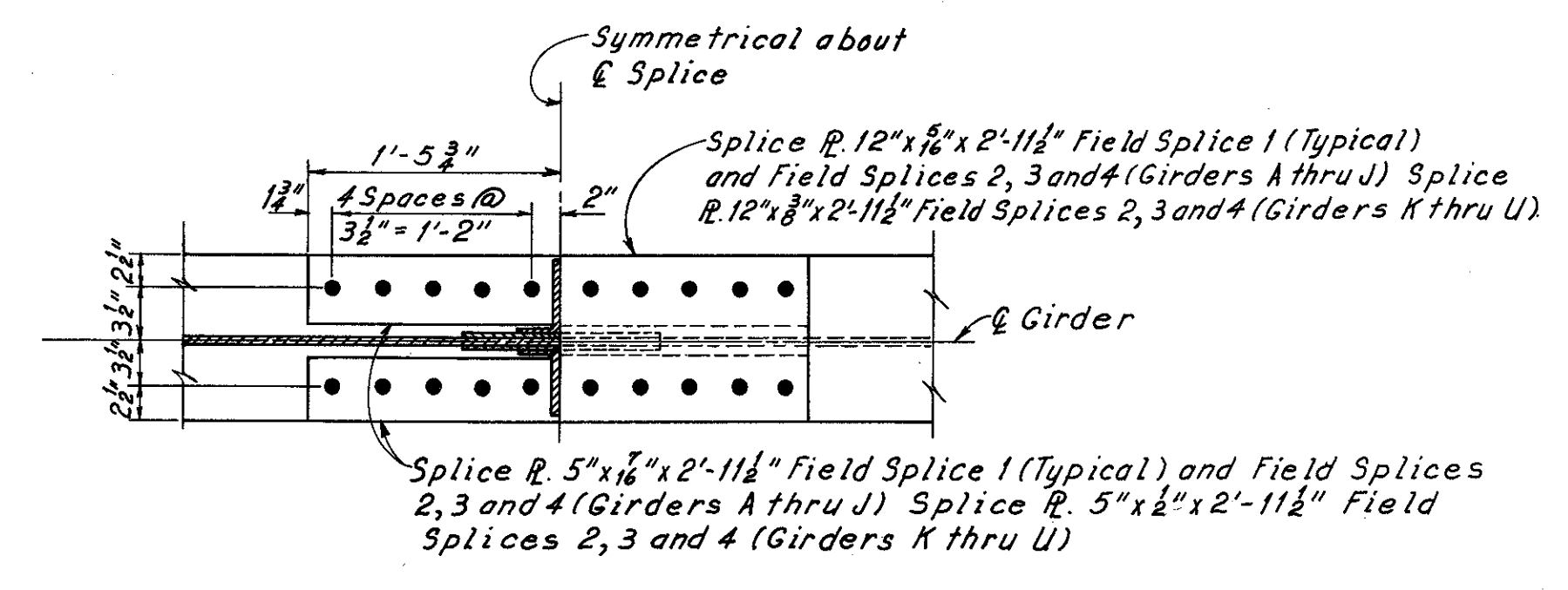
MICROFILMED
DEC 21 1982

* See Rocker Dowel Modification Detail.

TYPICAL GIRDER ELEVATION

GIRDERS	TABLE OF GIRDER DIMENSIONS																			
	A	B	C	D	E	F	G	H	J	K	L	M	N	R.P.A	R.P.B	R.P.C	R.P.D	R.P.E	R.P.F	R.P.G
A	101'-9 1/8"	100'-11 1/8"	86'-1 1/8"	69'-0"		33'-0"	66'-9 1/8"		35'-0"	57'-2 3/8"	29'-9 1/8"	78'-1 1/8"	21'-9 1/8"	12"x1 1/4"	12"x 3/8"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x 3/8"
B	102'-9 1/8"	102'-1 1/8"	86'-3 1/8"	69'-0"		33'-0"	67'-9 1/8"		35'-0"	58'-4 1/8"	29'-9 1/8"	78'-3 1/8"	21'-9 1/8"	12"x1 1/4"	12"x 3/8"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x 3/8"
C	103'-9 1/8"	103'-2 1/8"	86'-4 1/8"	69'-0"		33'-0"	68'-9 1/8"		35'-0"	59'-4 1/8"	29'-10 1/8"	78'-4 1/8"	21'-10 1/8"	12"x1 1/4"	12"x 3/8"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x 3/8"
D	104'-9 1/8"	104'-3 1/8"	86'-5 1/8"	67'-0"		35'-0"	67'-9 1/8"	7'-0"	30'-0"	60'-5 1/8"	29'-10 1/8"	78'-5 1/8"	21'-10 1/8"	12"x1 1/4"	12"x 3/8"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x 3/8"
E	105'-9 1/8"	105'-4 1/8"	86'-6 1/8"	67'-0"		35'-0"	68'-9 1/8"	7'-0"	30'-0"	61'-6"	29'-10 1/8"	78'-6 1/8"	21'-10 1/8"	12"x1 1/4"	12"x 3/8"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x 3/8"
F	106'-9 1/8"	106'-6 1/8"	86'-8 1/8"	66'-0"		36'-0"	67'-9 1/8"	8'-0"	31'-0"	62'-7"	30'-11 1/8"	77'-10 1/8"	21'-11 1/8"	12"x1 1/4"	12"x 3/8"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x 3/8"
G	107'-9 1/8"	107'-7 1/8"	86'-9 1/8"	66'-0"		36'-0"	68'-9 1/8"	8'-0"	31'-0"	63'-8"	30'-11 1/8"	77'-9 1/8"	21'-11 1/8"	12"x1 1/4"	12"x 3/8"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x 3/8"
H	108'-10"	108'-8 3/8"	86'-10 3/8"	66'-0"		36'-0"	69'-10"	8'-0"	31'-0"	64'-9 1/8"	30'-11 1/8"	77'-10 1/8"	21'-11 1/8"	12"x1 1/4"	12"x 3/8"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x 3/8"
J	109'-10 1/8"	109'-10 1/8"	87'-0"	66'-0"		36'-0"	70'-10 1/8"	8'-0"	31'-0"	65'-10 1/8"	31'-0"	78'-0"	22'-0"	12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x1 1/4"	12"x 3/8"	12"x 3/8"	12"x 3/8"
K	110'-6 1/8"	110'-6 1/8"	87'-0"	65'-0"	8'-0"	29'-0"	73'-6 1/8"	7'-0"	30'-0"	66'-6 1/8"	34'-0"	75'-0"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x1 1/4"	12"x 3/8"	12"x 3/8"	12"x 3/8"
L	111'-6 1/8"	111'-6 1/8"	87'-0"	64'-0"		30'-0"	72'-6 1/8"	8'-0"	31'-0"	67'-6 1/8"	35'-0"	74'-0"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x1 1/4"	12"x 3/8"	12"x 3/8"	12"x 3/8"
M	112'-6 1/8"	112'-6 1/8"	87'-0"	64'-0"		30'-0"	73'-6 1/8"	8'-0"	31'-0"	68'-6 1/8"	35'-0"	74'-0"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x1 1/4"	12"x 3/8"	12"x 3/8"	12"x 3/8"
N	113'-7 1/8"	113'-7 1/8"	87'-0"	64'-0"		30'-0"	74'-7 1/8"	8'-0"	31'-0"	69'-7 1/8"	35'-0"	74'-0"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x1 1/4"	12"x 3/8"	12"x 3/8"	12"x 3/8"
P	114'-7 1/8"	114'-7 1/8"	87'-0"	64'-0"	8'-0"		75'-7 1/8"	8'-0"	31'-0"	70'-7 1/8"	35'-0"	74'-0"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x1 1/4"	12"x 3/8"	12"x 3/8"	12"x 3/8"
R	115'-7 1/8"	115'-7 1/8"	87'-0"	63'-0"	9'-0"		74'-7 1/8"	9'-0"	32'-0"	71'-7 1/8"	36'-0"	73'-0"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x1 1/4"	12"x 3/8"	12"x 3/8"	12"x 3/8"
S	116'-7 1/8"	116'-7 1/8"	87'-0"	63'-0"	9'-0"		75'-7 1/8"	9'-0"	32'-0"	72'-7 1/8"	36'-0"	73'-0"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x1 1/4"	12"x 3/8"	12"x 3/8"	12"x 3/8"
T	117'-7 1/8"	117'-7 1/8"	87'-0"	63'-0"	9'-0"	30'-0"	76'-7 1/8"	8'-0"	33'-0"	73'-7 1/8"	36'-0"	73'-0"		12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x1 1/4"	12"x 3/8"	12"x 3/8"	12"x 3/8"
U	118'-7 1/8"	118'-7 1/8"	87'-0"	63'-0"	9'-0"	30'-0"	77'-7 1/8"	8'-0"	33'-0"	74'-7 1/8"	36'-0"	73'-0"	22'-0"	12"x1 1/4"	12"x 3/8"	12"x1 1/4"	12"x1 1/4"	12"x 3/8"	12"x 3/8"	12"x 3/8"

TYPICAL FIELD WEB SPlice



GIRDER NOTES:

The girders shall be fabricated to compensate for the effects of vertical curvature, superelevation and dead load deflections. The top of the girder webs shall parallel the profile of the roadway surface directly over the center line of girder.

Top and bottom flange plates are to be the same and shall be spliced at points shown on the girder elevation. The web plates may be shop spliced as required by available plate lengths. The locations 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 the Framing Plan equally spaced between crossframes, or crossframes and bearing stiffeners or crossframes and field splices, except the first two stiffener spaces from the abutments shall be one-half of this spacing. Stiffeners shall be placed in pairs and shall have contact bearing with both flanges.

Bearing stiffeners at piers and abutments shall be placed in pairs on all girders. Intermediate stiffeners and bearing stiffeners at the piers shall be normal to girder flange. Bearing stiffeners at abutments shall be vertical.

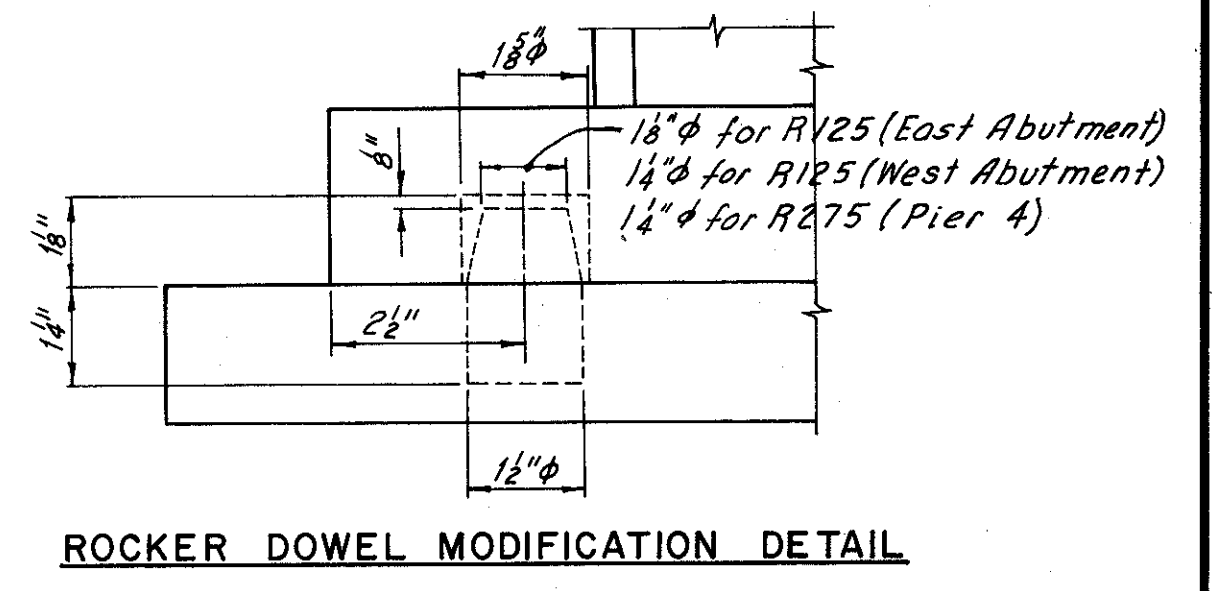
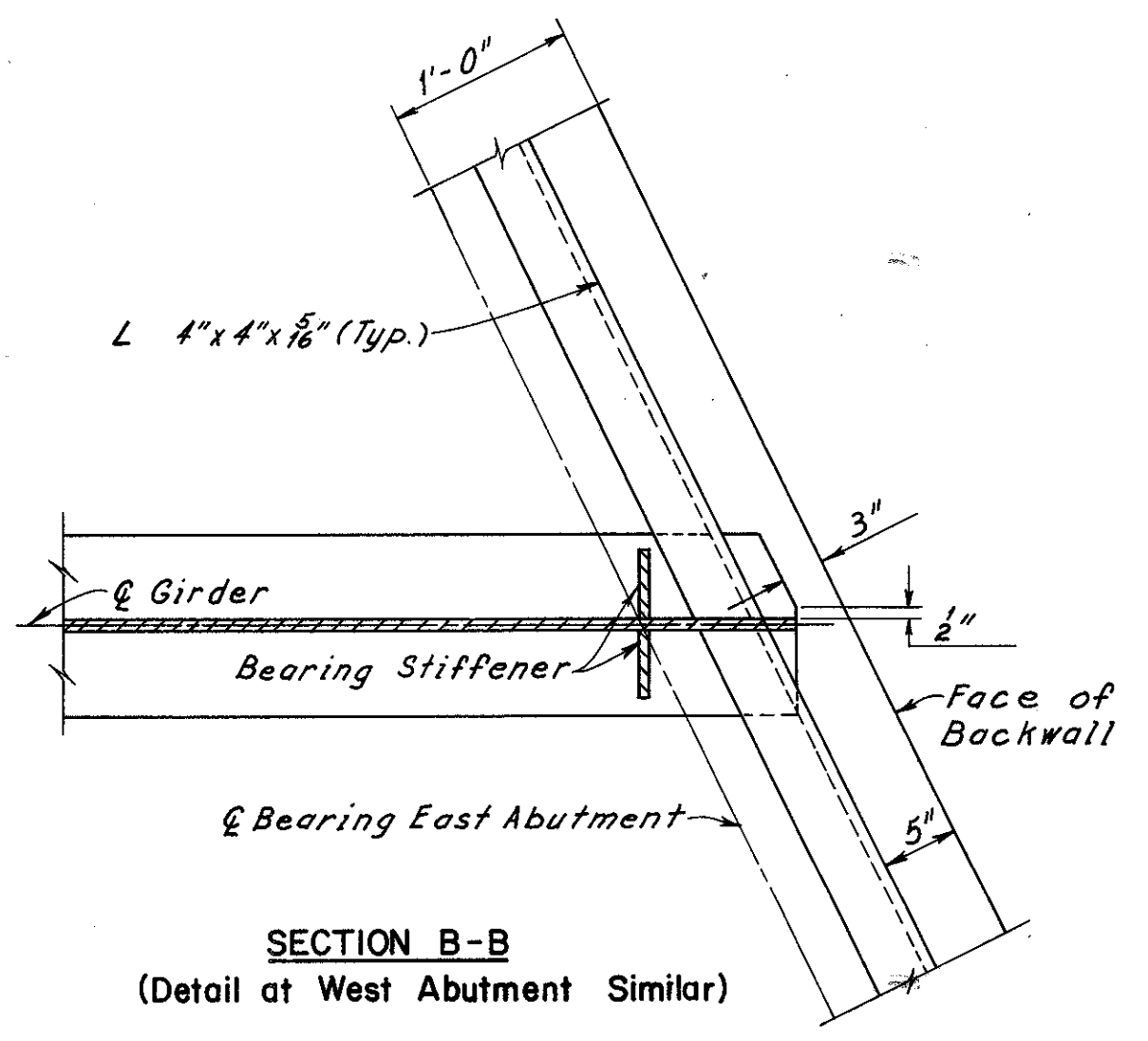
All girder field splices shall be made with 1" diameter high strength steel bolts. The bolts shall have the corrosion resistance and coloring characteristics of ASTM A588 steel and all the mechanical properties of ASTM A325 High Strength Steel Bolts. The bolts shall be placed with their heads on the outside face of the 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 Details of Rockers and Bolsters see Ohio Standard Drawing RB-1-55, and the Rocker Dowel Modification Detail on this sheet. The 1/2" side plates attached to the sole plates should be left off the bearings for Girders A, J, K and U at all substructure units.

WELD SIZE WEB TO FLANGE	
Flange R Thickness	Fillet Weld Size
7/8 to 1 1/2	5/8
1 5/8 and 1 3/4	3/4

FIELD SPlice DETAILS



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GIRDER ELEVATIONS AND FIELD SPlice DETAILS
I-80 OVER PENN-CENTRAL RAILROAD,
NORFOLK & WESTERN RAILWAY
AND MILL CREEK

BR. NO. CUY-80-2140 STA. 1153+08.41 TO STA. 1158+17.04

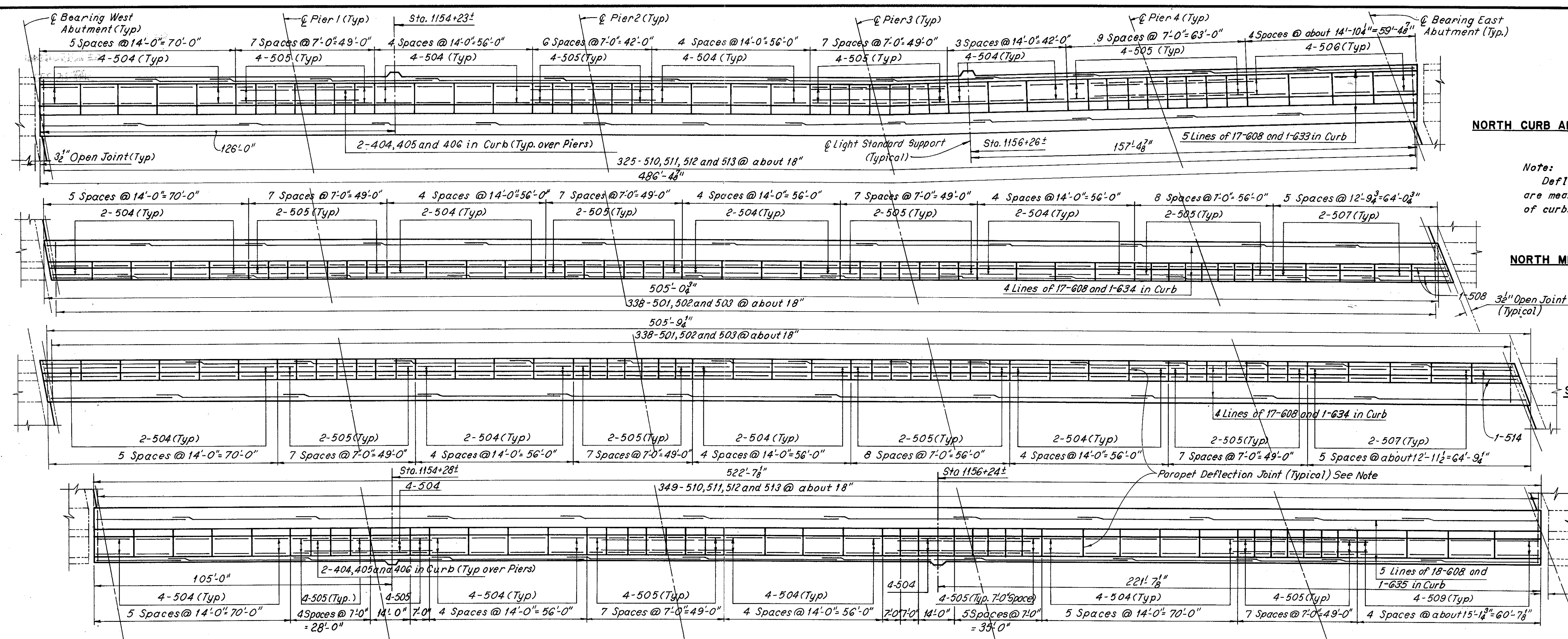
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN S.M.S. TRACER/S.C. CHECKED W.D.S. REVIEWED [] REVISION []
DATE 4-21-70 DATE 5-15-70 DATE 6-30-70 DATE [] SHEET 10/16

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

302
390

CUYAHOGA COUNTY
CUY-80-21.40



Note:
Deflection Joint Spacings
are measured along inside edge
of curbs.

NORTH CURB AND PARAPET

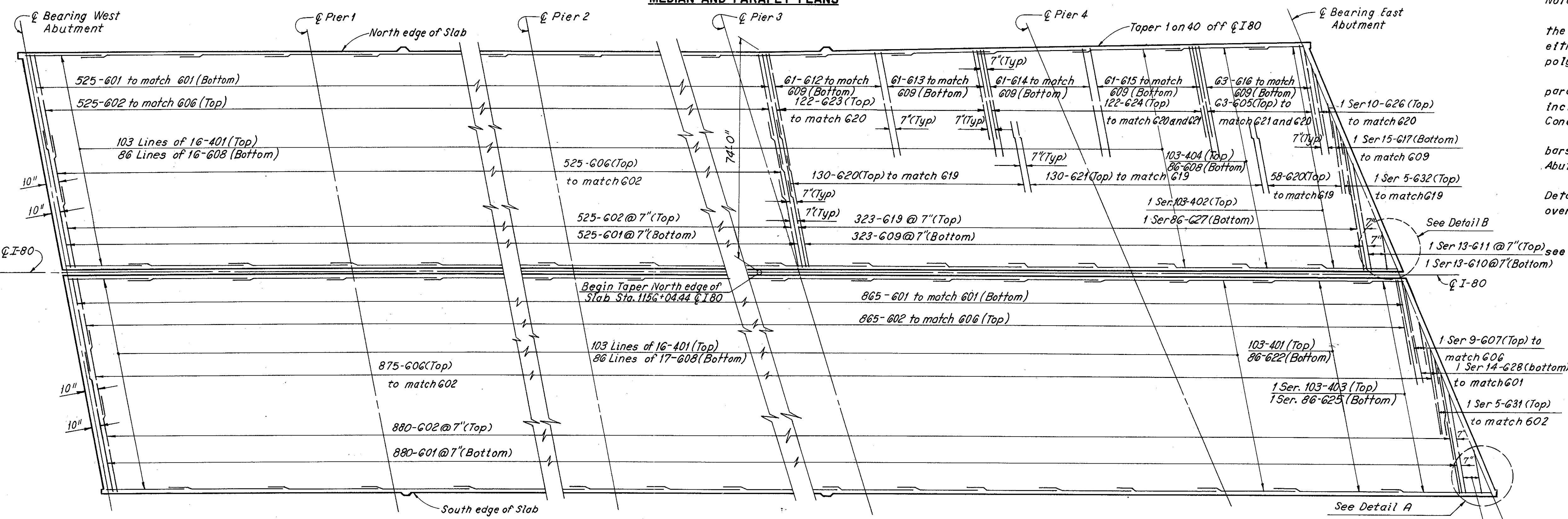
NORTH MEDIAN CURB AND PARAPET

SOUTH MEDIAN CURB AND PARAPET

Note:
All reinforcing bar marks
shall be prefixed S.

SOUTH CURB AND PARAPET

MEDIAN AND PARAPET PLANS



Notes:
The preformed expansion joint filler in the railing parapet deflection joints may be either 1/4" gray sponge rubber or 1/4" gray cellular polyvinyl chloride (PVC) sponge.
The deflection joint extends from top of parapet to first construction joint and is included for payment with Superstructure Concrete.
Transverse reinforcement except for fanned bars in corner is placed parallel to the West Abutment.
For placement of longitudinal reinforcement, Details A and B and for additional reinforcement over Piers see Sheet 13/16.

For Light Standard Support Details see Sheet CDT.

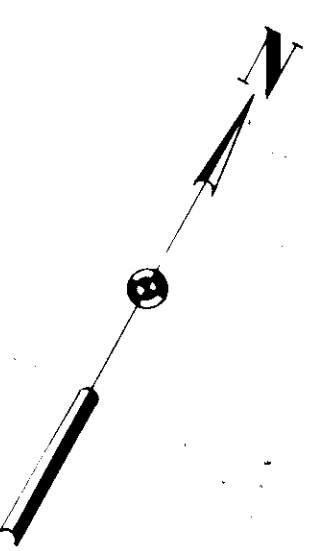
H.N.T.B. BR. NO. 6
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY, CLEVELAND, NEW YORK

SLAB PLAN
I-80 OVER PENN-CENTRAL RAILROAD,
NORFOLK & WESTERN RAILWAY
AND MILL CREEK

BR. NO. CUY-80-2140 STA. 1153+08.41 TO STA. 1158+17.04

CLEVELAND CUYAHOGA COUNTY OHIO
DRAWN JMS TRACED PCA CHECKED MZ REVIEWED
DATE 4-1-70 DATE 4-7-70 DATE 4-13-70 DATE
SHEET 12/16

REVISIONS
DEC 21 1982



SLAB PLAN

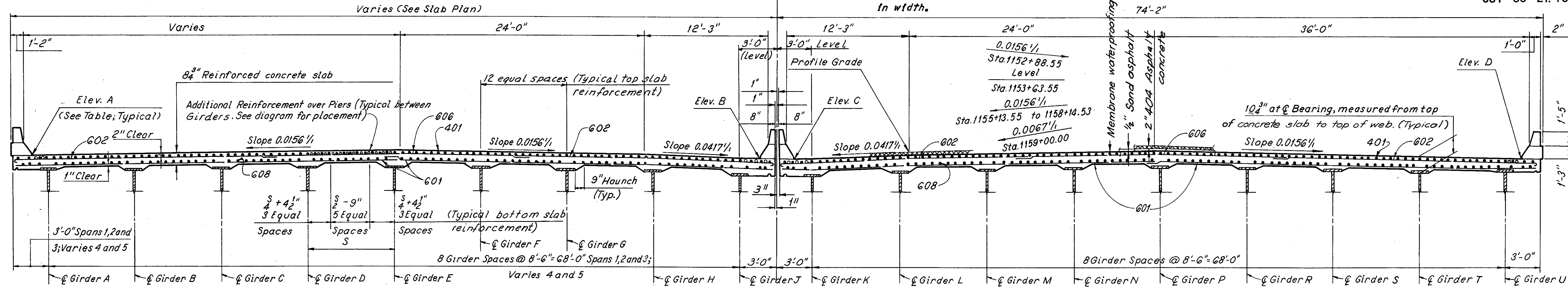
MICROFILMED
DEC 21 1982

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

303
390

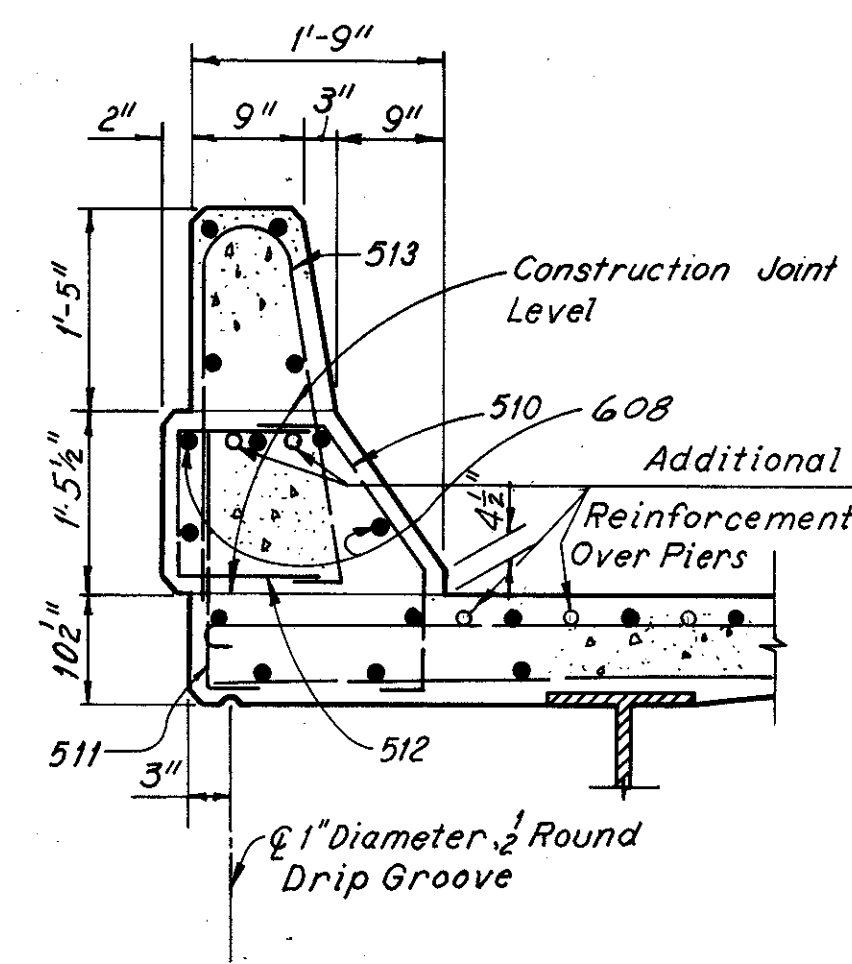
CUYAHOGA COUNTY
CUI-80-21.40

Note:
A typical haunch width of 9" shall be used for computing quantity of concrete. However, the haunch width may vary between 6" and 12" provided the slope shall be not more than 1:4 for a haunch less than 9" in width.

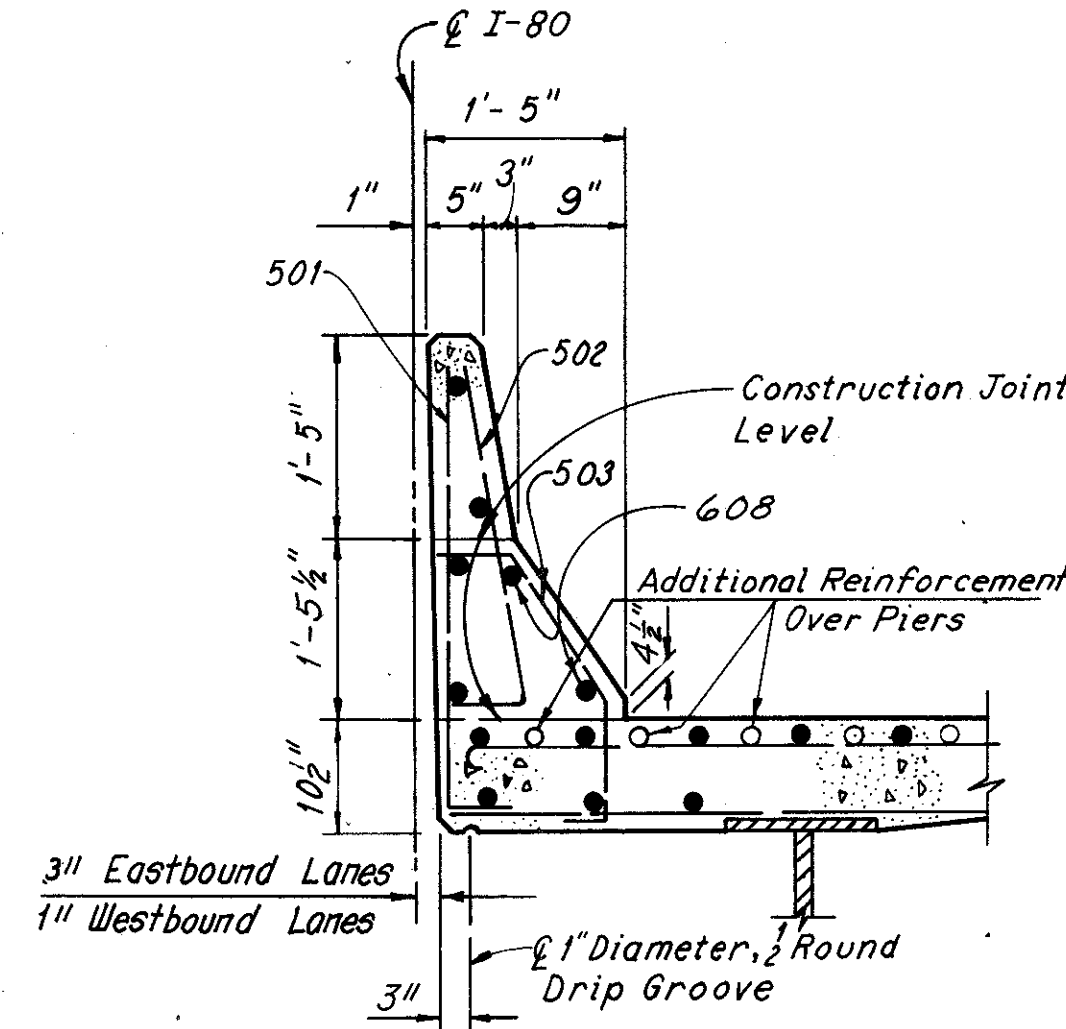


DECK REINFORCING BARS: At the Contractor's option, a portion (not to exceed 25%) of the upper longitudinal bars (S401) in the deck slab may be placed beneath the upper transverse bars for support of the top mat.

For subdrainage details see sheet CD2

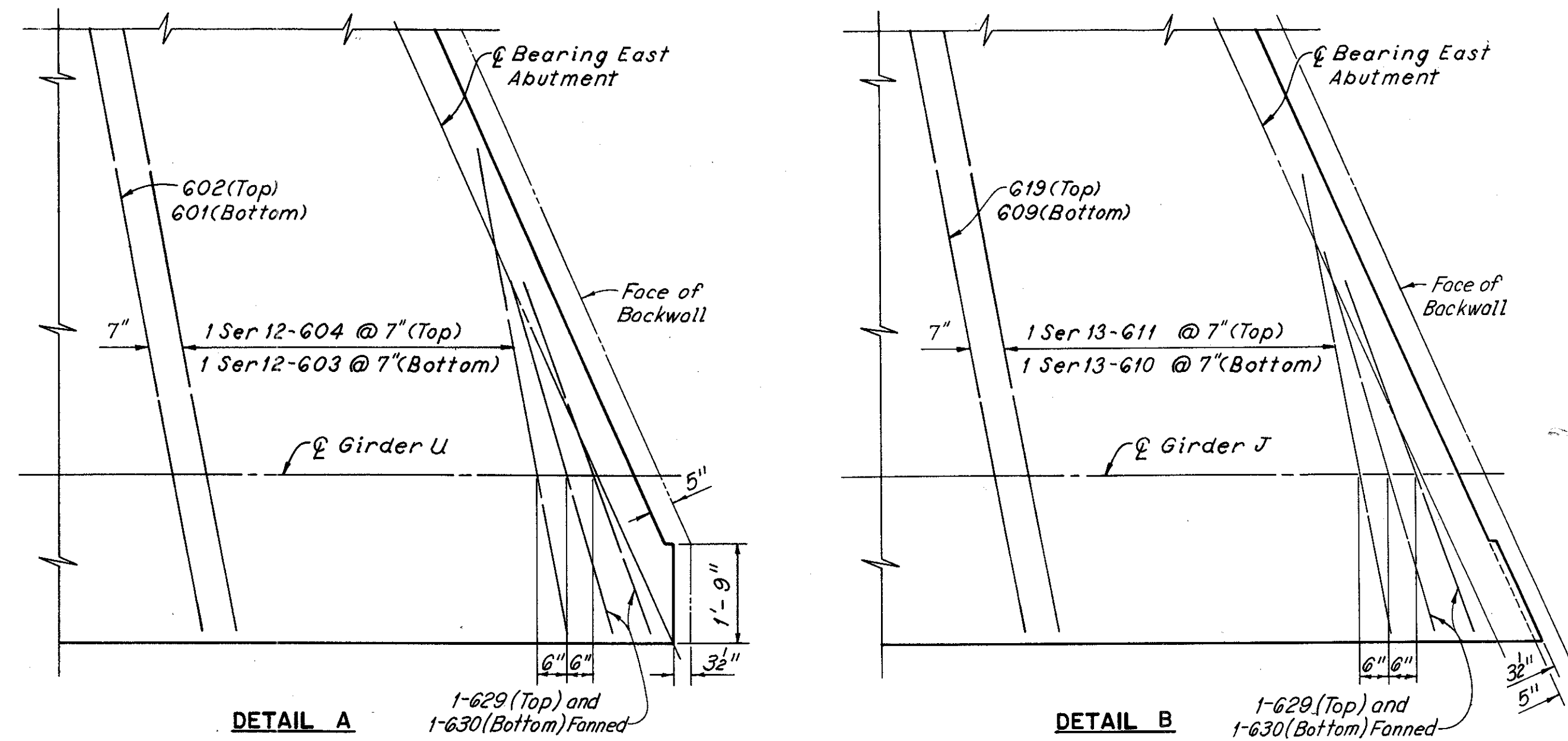


EXTERIOR CURB AND PARAPET DETAIL
(Wearing surface not shown)

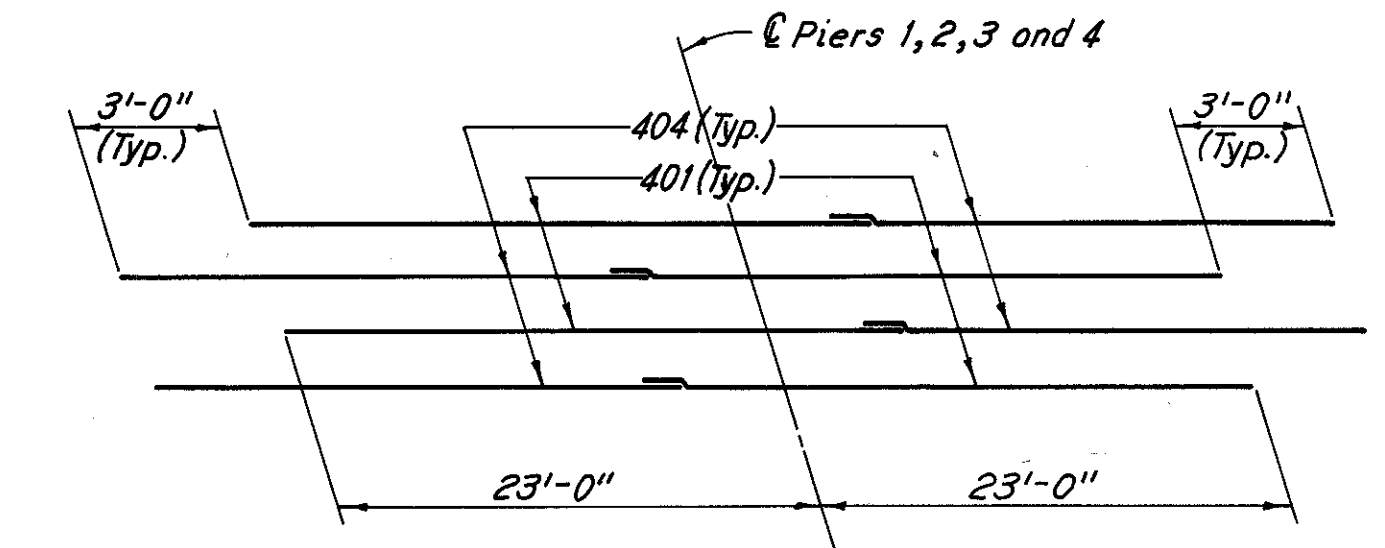


MEDIAN CURB AND PARAPET DETAIL
(Wearing surface not shown)

TYPICAL CROSS SECTION



Note:
All reinforcing bar marks shall be prefixed S.



ADDITIONAL REINFORCEMENT OVER PIERS

FACE OF CURB ELEVATIONS - TOP OF CONCRETE SLAB:

CURB ELEV.	WEST ABUTMENT	PIER 1								PIER 2								PIER 3								PIER 4								EAST ABUTMENT
		0.20	0.40	0.60	0.80	0.20	0.40	0.60	0.80	0.20	0.40	0.60	0.80	0.20	0.40	0.60	0.80	0.20	0.40	0.60	0.80													
Elev. A	900.39	900.05	899.67	899.23	898.76	898.28	897.80	897.32	896.81	896.26	895.70	895.16	894.60	893.99	893.35	892.73	892.13	891.55	890.94	890.30	889.68	889.17	888.68	888.16	887.62	887.06								
Elev. B	899.88	899.54	899.15	898.70	898.22	897.73	897.23	896.74	896.22	895.66	895.10	894.50	893.89	893.22	892.52	891.83	891.19	890.56	889.90	889.21	888.52	888.01	887.52	887.00	886.47	885.91								
Elev. C	899.87	899.52	899.13	898.69	898.21	897.71	897.22	896.72	896.20	895.64	895.08	894.48	893.86	893.19	892.50	891.81	891.17	890.54	889.88	889.19	888.51	888.00	887.50	886.99	886.45	885.90								
Elev. D	899.27	899.01	898.70	898.31	897.86	897.40	896.95	896.49	896.00	895.48	894.94	894.30	893.63	892.91	892.15	891.40	890.71	890.04	889.33	888.58	887.83	887.32	886.82	886.30	885.74	885.14								

Note:
The elevations shown at the face of curb are those which are required before concrete is placed. Proper allowance has been made for the dead load deflections caused by the weight of the concrete.

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TYPICAL CROSS SECTION
I-80 OVER PENN-CENTRAL RAILROAD,
NORFOLK & WESTERN RAILWAY
AND MILL CREEK

BR. NO. CUY-80-2140 STA. 1153+08.41 TO
STA. 1158+17.04

CLEVELAND CUYAHOGA COUNTY OHIO

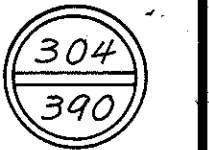
DRAWN MS	TRACED RZA	CHECKED MCA	REVIEWED	REVISED
DATE 4-1-70	DATE 4-9-70	DATE 4-10-70	DATE	SHEET 13/16

MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)
WEST ABUTMENT						EAST ABUTMENT						AE808	2	18'-1"	108	97	
AW401	126	3'-7"	105		302	AE401	126	3'-7"	105		302	AE809	2	20'-0"	124		107
AW501	132	8'-3"	105		1,136	AE501	141	8'-3"	105		1,213	AE810	4	12'-9"	Str.		136
AW502	19	10'-11"	109		216	AE502	21	11'-0"	109		239	AE811	4	12'-0"	Str.		128
AW503	26	7'-11"	104		215	AE503	77	7'-11"	104		638	AE812	76	5'-9"	163		1167
AW504	49	8'-5"	104		430	AE504	36	7'-7"	104		285	TOTAL WEIGHT = 25,787					
AW505	35	8'-10"	104		322	AE505	10	7'-2"	104		75						
AW506	22	9'-1"	104		208	AE506	4	2'-9"	148		11						
AW507	132	6'-10"	105		941	AE507	12	7'-5"	104		93						
AW508	3	31'-3"	Str.		98	AE508	139	7'-5"	105		1,075						
AW509	31	22'-6"	Str.		727	AE509	39	23'-9"	Str.		966						
AW510	5	22'-9"	Str.		119	AE510	18	27'-6"	Str.		516						
AW511	15	32'-3"	Str.		505	AE511	10	36'-0"	Str.		375						
AW512	5	32'-0"	Str.		167	AE512	9	35'-0"	Str.		329						
AW513	21	21'-9"	Str.		476	AE513	13	33'-0"	Str.		447						
AW514	8	30'-9"	Str.		257	AE514	5	32'-3"	Str.		168						
AW515	7	31'-0"	Str.		226	AE515	8	25'-3"	Str.		211						
AW516	8	22'-3"	Str.		186	AE516	7	24'-9"	Str.		181						
AW517	7	22'-0"	Str.		161	AE517	4	15'-6"	124		65						
AW518	4	13'-10"	148		58	AE518	4	8'-0"	Str.		33						
AW519	4	8'-0"	Str.		33	AE519	2 Ser. 3	10'-3"	13'-0"	Str.	144						
AW520	2 Ser. 3	10'-6"	13'-3"	Str.	114 1/2	AE520	16	18'-6"	Str.		309						
AW521	16	18'-3"	Str.		305	AE521	6	3'-3"	Str.		20						
AW522	6	3'-0"	Str.		19	AE522	2	3'-9"	Str.		8						
AW523	2	3'-3"	Str.		7	AE523	2	5'-0"	Str.		10						
AW524	2	4'-9"	Str.		10	AE524	2	6'-3"	Str.		13						
AW525	2	6'-0"	Str.		13	AE525	4	7'-9"	108		32						
AW526	4	8'-10"	108		37	AE526	20	3'-3"	Str.		68						
AW527	17	7'-3"	Str.		129	AE527	18	7'-3"	Str.		136						
AW528	4 Ser. 4	2'-9"	3'-0"	Str.	11	AE528	19	6'-1"	161		121						
AW529	21	6'-1"	161		133	AE529	29	2'-0"	105		60						
AW530	29	2'-5"	105		73	AE530	4	8'-9"	Str.		37						
AW531	4	9'-3"	Str.		39	AE531	2 Ser. 3	11'-3"	14'-0"	Str.	114 1/2						
AW532	2 Ser. 3	11'-0"	13'-9"	Str.	114 1/2	AE532	16	19'-3"	Str.		321						
AW533	16	19'-0"	Str.		317	AE533	4	4'-0"	Str.		17						
AW534	4	3'-1"	147		13	AE534	4	2'-11"	147		12						
AW535	4	3'-1"	148		13	AE535	4	8'-1"	104		34						
AW536	4	4'-0"	Str.		17	AE536	4	14'-5"	108		60						
AW537	4	13'-11"	108		58	AE537	1	37'-0"	Str.		39						
AW538	2	12'-0"	Str.		25	AE538	3	13'-0"	Str.		41						
AW539	1	19'-6"	Str.		20	AE539	1	20'-9"	Str.		22						
AW540	2	12'-6"	Str.		26												
AW541	1	20'-6"	Str.		21	AE601	77	15'-0"	126		1,735						
AW601	26	14'-5"	126		563	AE602	35	14'-9"	126		771						
AW602	49	14'-11"	126		1,098	AE603	10	14'-3"	126		214						
AW603	35	15'-4"	126		806	AE604	1	15'-4"	126		23						
AW604	22	15'-7"	126		515	AE605	4	16'-2"	126		97						
AW605	2	8'-11"	104		27	AE606	12	14'-6"	126		261						
AW606	2	8'-3"	104		25	AE607	3	5'-3"	Str.		24						
AW607	3	4'-6"	Str.		20	AE608	10	5'-6"	Str.		83						
AW608	10	5'-9"	Str.		86	AE609	3	6'-0"	Str.		27						
AW609	3	4'-9"	Str.		21	AE610	10	6'-9"	Str.		101						
AW610	10	6'-3"	Str.		94	AE611	218	11'-7"	105		3,793						
AW611	200	11'-7"	105		3,480	AE612	118	8'-11"	105		1,580						
AW612	100	8'-11"	105		1,339	AE613	118	11'-1"	105		1,964						
AW613	100	11'-1"	105		1,665	AE614	5	20'-2"	105		150						
AW614	14	9'-3"	104		195	AE615	6	10'-3"	104		92						
AW615	2	7'-9"	104		23	AE616	2	8'-2"	104		25						
AW616	4	7'-2"	104		43	AE617	6	6'-0"	Str.		54						
AW617	6	6'-0"	Str.		54	AE618	6	4'-9"	162		44						
AW618	2	7'-7"	162		24	AE619	2	5'-3"	162		16						
AW619	17	8'-7"	162		226	AE620	2	6'-7"	162		20						
AW620	15	10'-5"	104		235	AE621	2	7'-9"	162		24						
AW621	6	4'-9"	162		44	AE622	17	8'-4"	162		213						
AW622	2	5'-0"	162		15	AE623	6	18'-2"	105		164						
AW623	2	6'-7"	162		20	AE624	2	7'-4"	104		22						
						AE625	6	9'-4"	104		84						
						AE626	2	6'-6"	Str.		20						
AW801	28	40'-0"	Str.		2,990	AE627	2	10'-2"	105		31						
AW802	2	18'-6"	148		99	AE801	30	30'-0"	Str.		2,403						
AW803	8	10'-0"	Str.		214	AE802	4	31'-0"	Str.		331						
AW804	2	18'-1"	108		97	AE803	1	30'-6"	Str.		81						
AW805	66	5'-9"	163		1013	AE804	3	32'-11"	104		264						
						AE805	4	7'-8"	108		82						
						AE806	2	27'-9"	Str.		148						
						AE807	2	28'-9"	Str.		154						
						TOTAL WEIGHT											

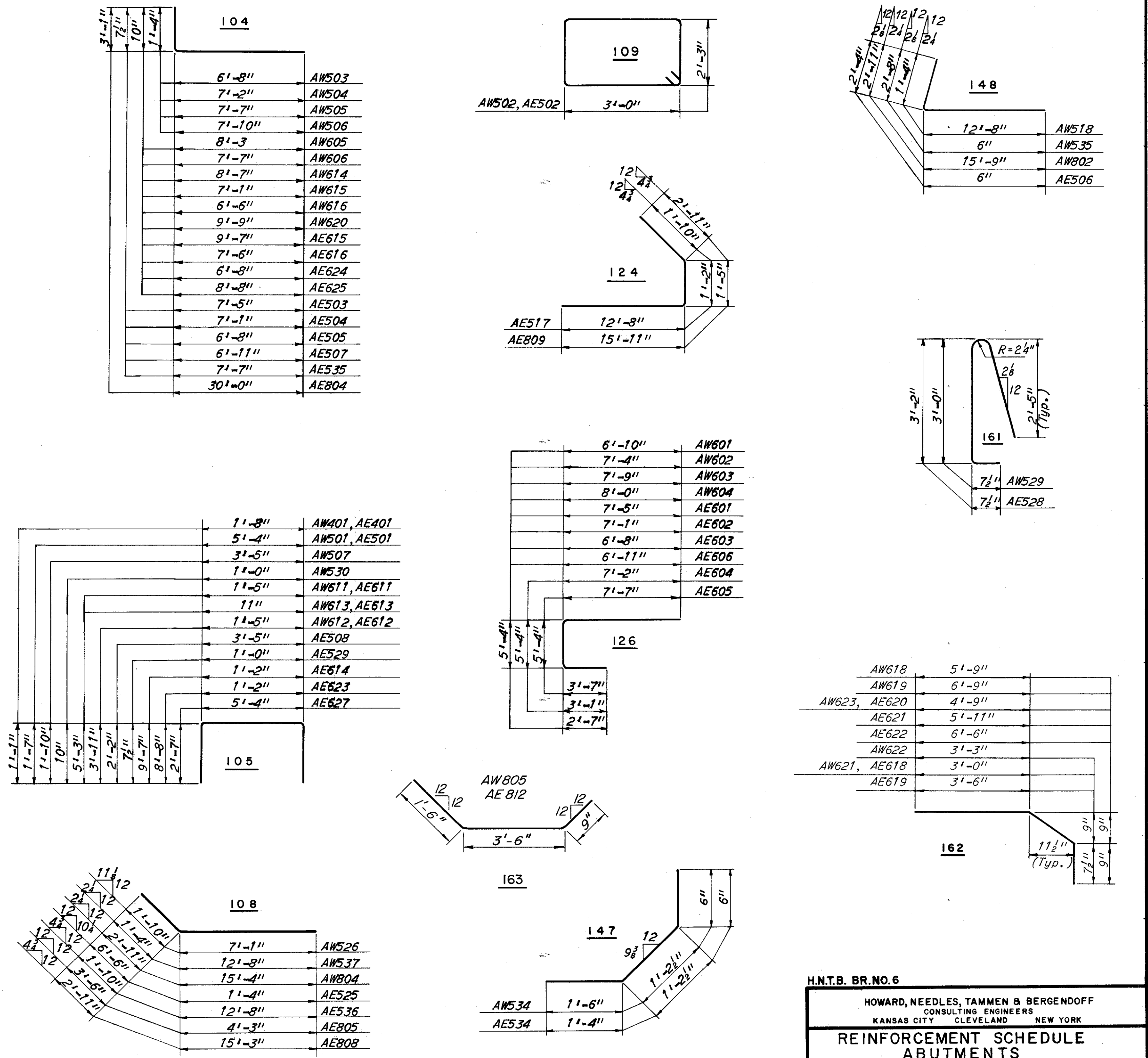
Quantity Calculations
Made By KRS Date 7-70
Checked By JWC Date 8-70

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
CUY-80-21.40



BENDING DIAGRAMS



Note:
For Replacement Bar Schedule see
Sheet 12/12 of BR. NO. CUY-80-2169.

H.N.T.B. BR. NO. 6

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

REINFORCEMENT SCHEDULE
ABUTMENTS
I-80 OVER PENN-CENTRAL RAILROAD,
NORFOLK & WESTERN RAILWAY
AND MILL CREEK

BR. NO. CUY-80-2140 STA. 1153+08.41 TO
STA. 1158+17.04

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN KRS TRACED MJC CHECKED JWC REVIEWED
DATE 7/10/70 DATE 8/5/70 DATE 8/10/70 DATE

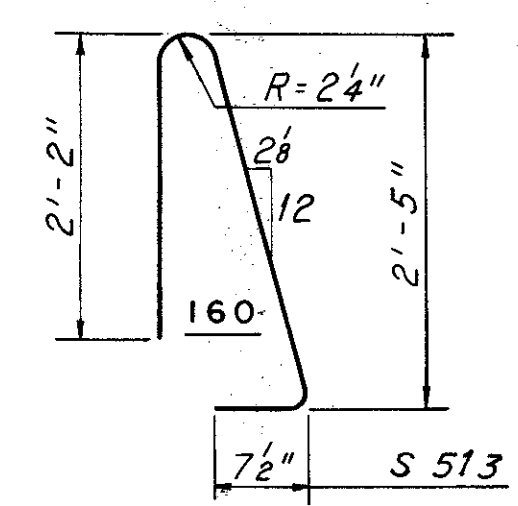
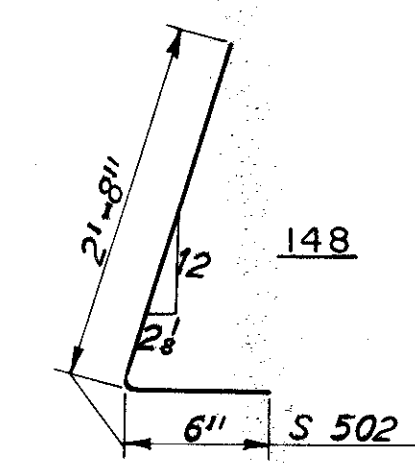
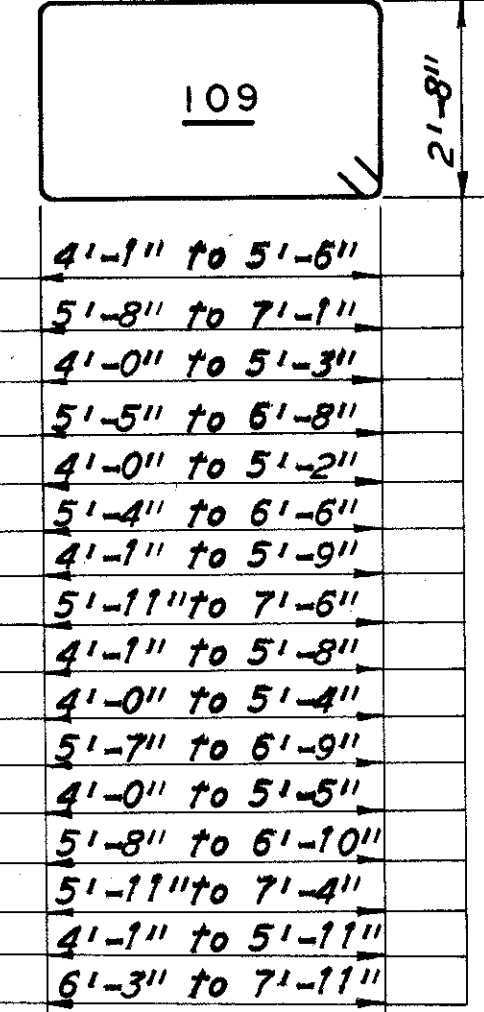
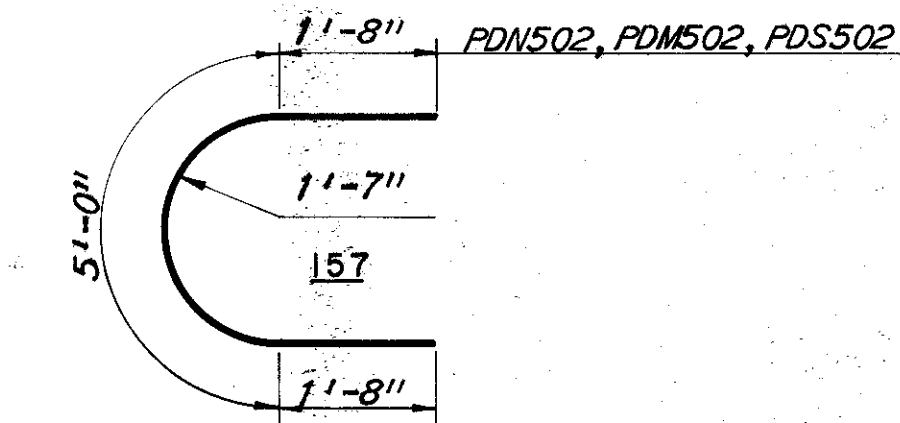
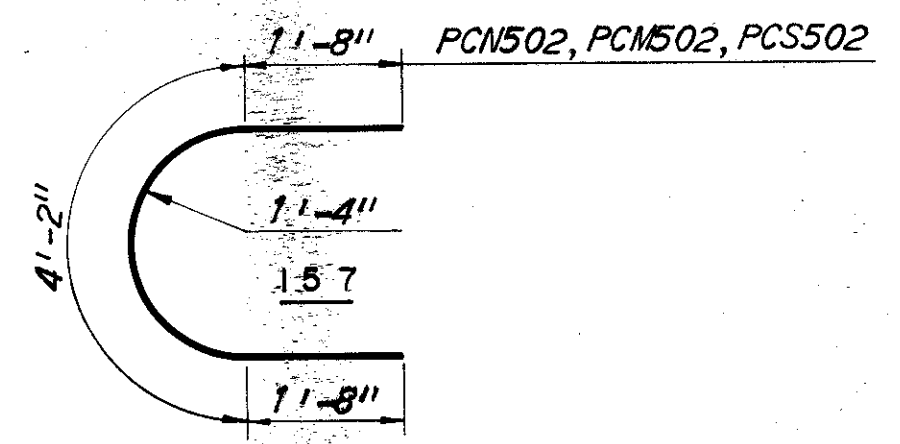
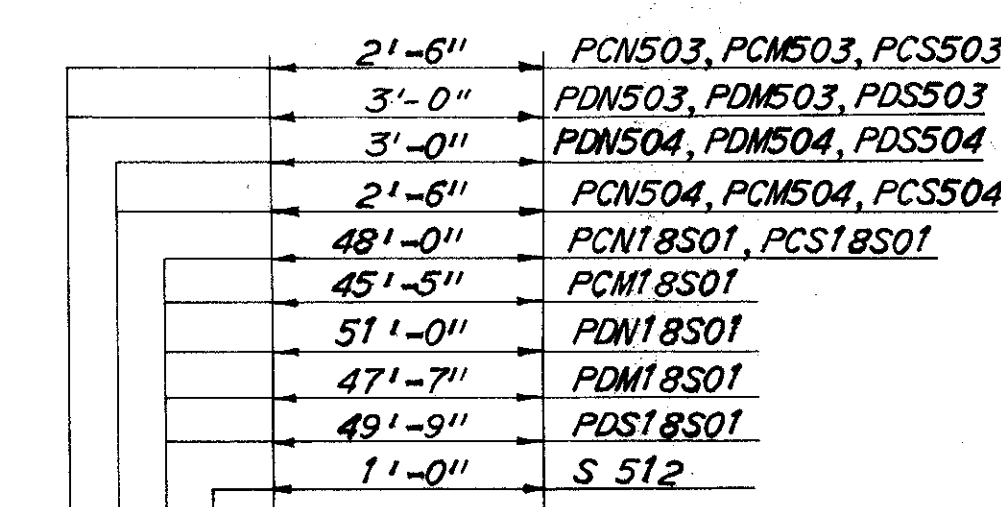
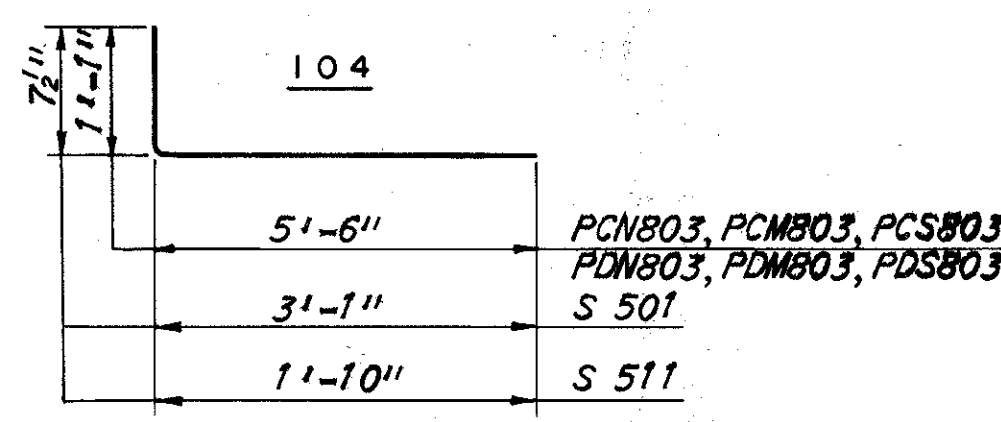
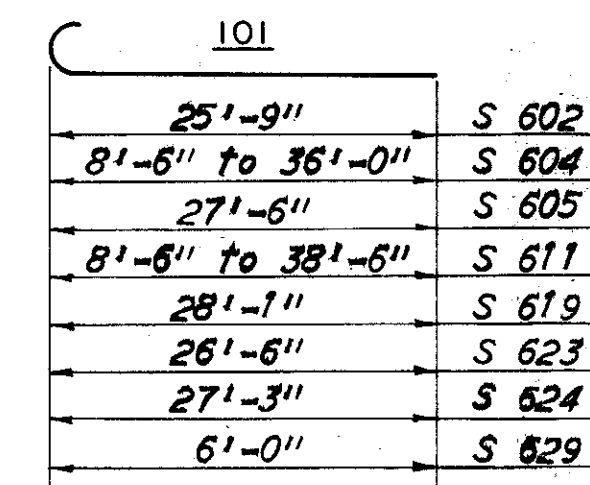
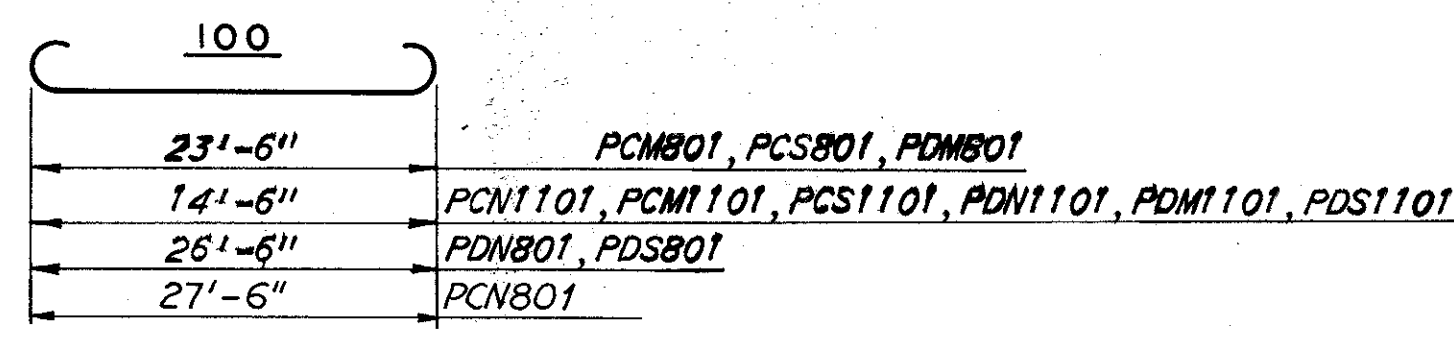
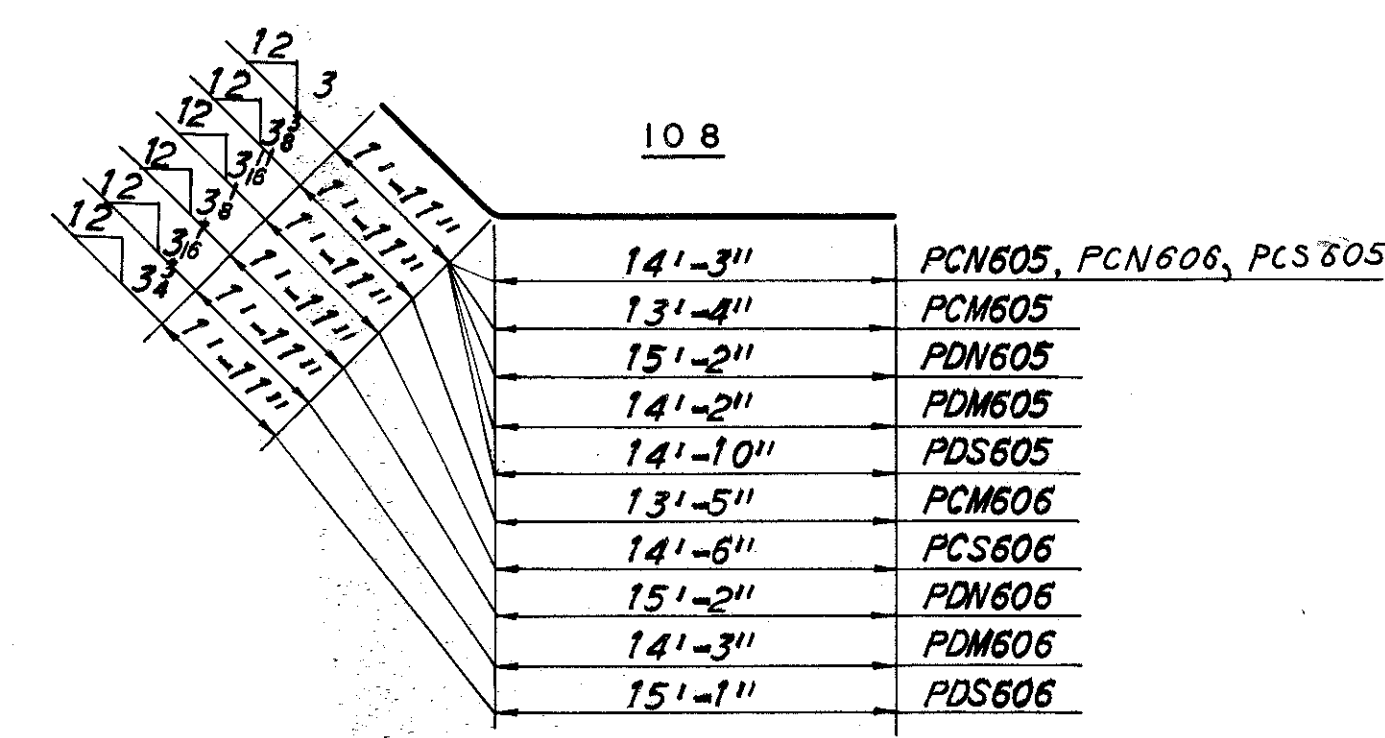
REVISION SHEET 14/16

BENDING DIAGRAMS

CUYAHOGA COUNTY
CUY-80-21.40

Quantity Calculations
Made By KRS Date 7-70
Checked By JWC Date 8-70

Table with columns: MARK, NO., LENGTH, TYPE, SER. INCR., WEIGHT (LBS.), MARK, NO., LENGTH, TYPE, SER. INCR., WEIGHT (LBS.). Rows are organized by pier (PIER 3 - NORTH BENT, PIER 4 - NORTH BENT, PIER 3 - MIDDLE BENT, PIER 4 - MIDDLE BENT, PIER 3 - SOUTH BENT, PIER 4 - SOUTH BENT) and bar type (PCN, PDM, PCS, PDS).

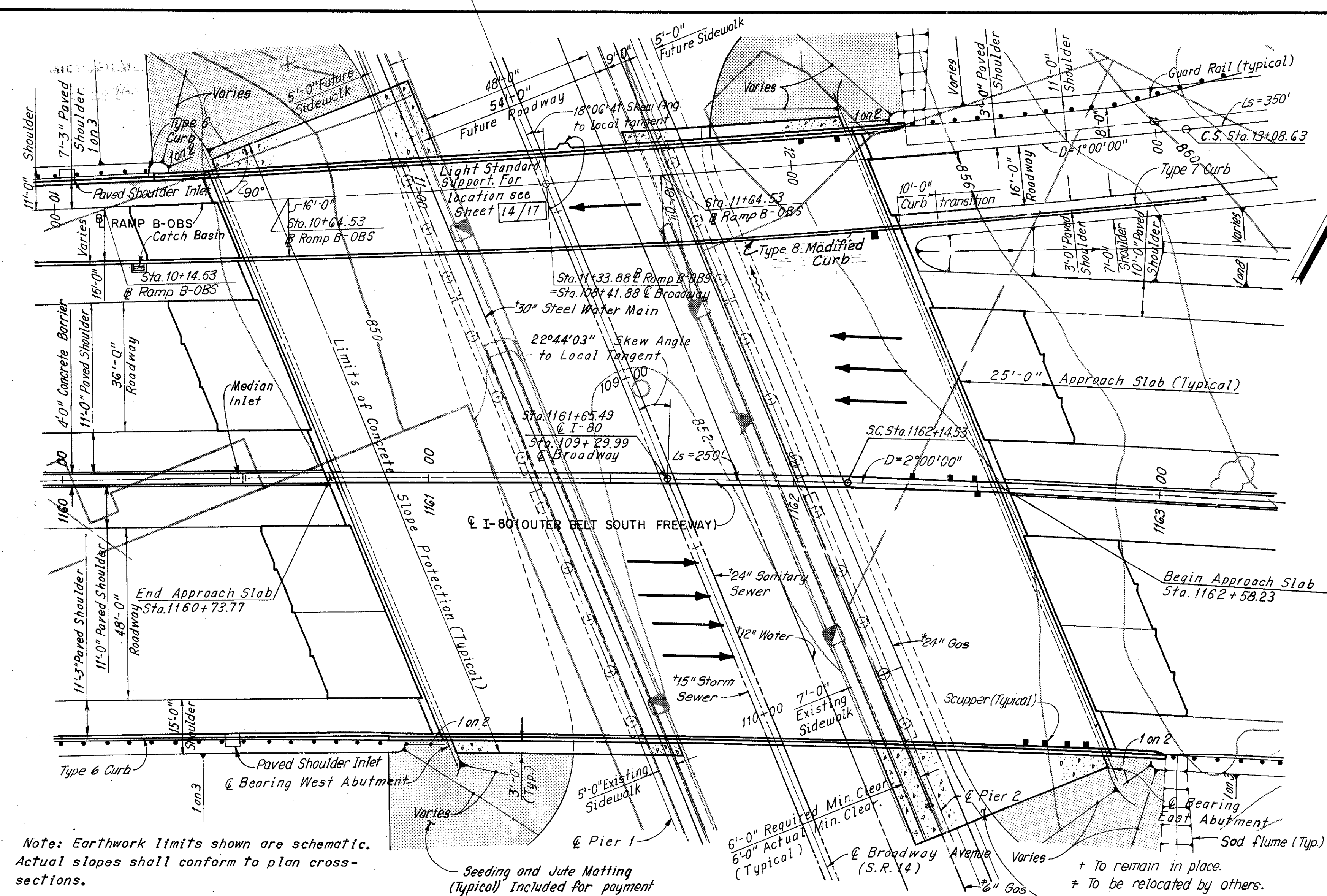


Notes:
For Replacement Bar Schedule see Sheet 12/12 of BR. NO. CUY-80-2169.
For Light Standard Support Reinforcement Schedule and Bending Diagrams see Sheet C D 1.

H.N.T.B. BR. NO. 6
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
REINFORCEMENT SCHEDULE
PIERS 3 AND 4 AND SUPERSTRUCTURE
I-80 OVER PENN-CENTRAL RAILROAD,
NORFOLK & WESTERN RAILWAY
AND MILL CREEK
BR. NO. CUY-80-2140 STA. 1153+08.41 TO 1158+17.04
CLEVELAND CUYAHOGA COUNTY OHIO
DRAWN KRS TRACED MJC CHECKED JWC REVIEWED JWC
DATE 7-30-70 DATE 8-16-70 DATE 8-21-70 DATE
SHEET 16/16

CUYAHOGA COUNTY
CUY-80-21.40

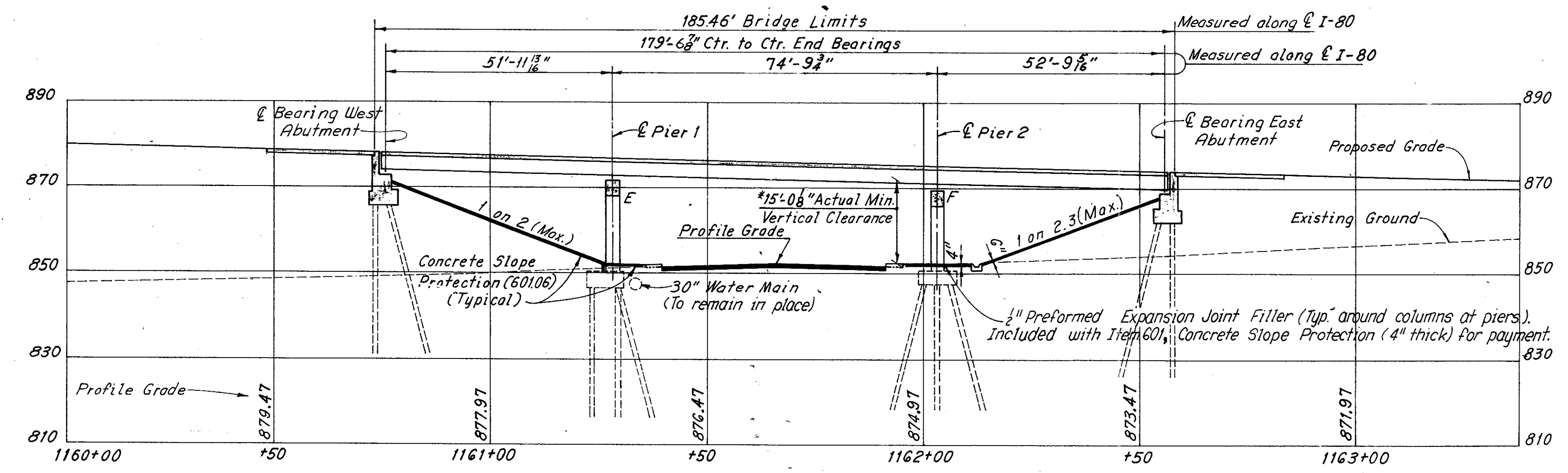
MICROFILMED
DEC 23 1982



Note: Earthwork limits shown are schematic. Actual slopes shall conform to plan cross-sections.

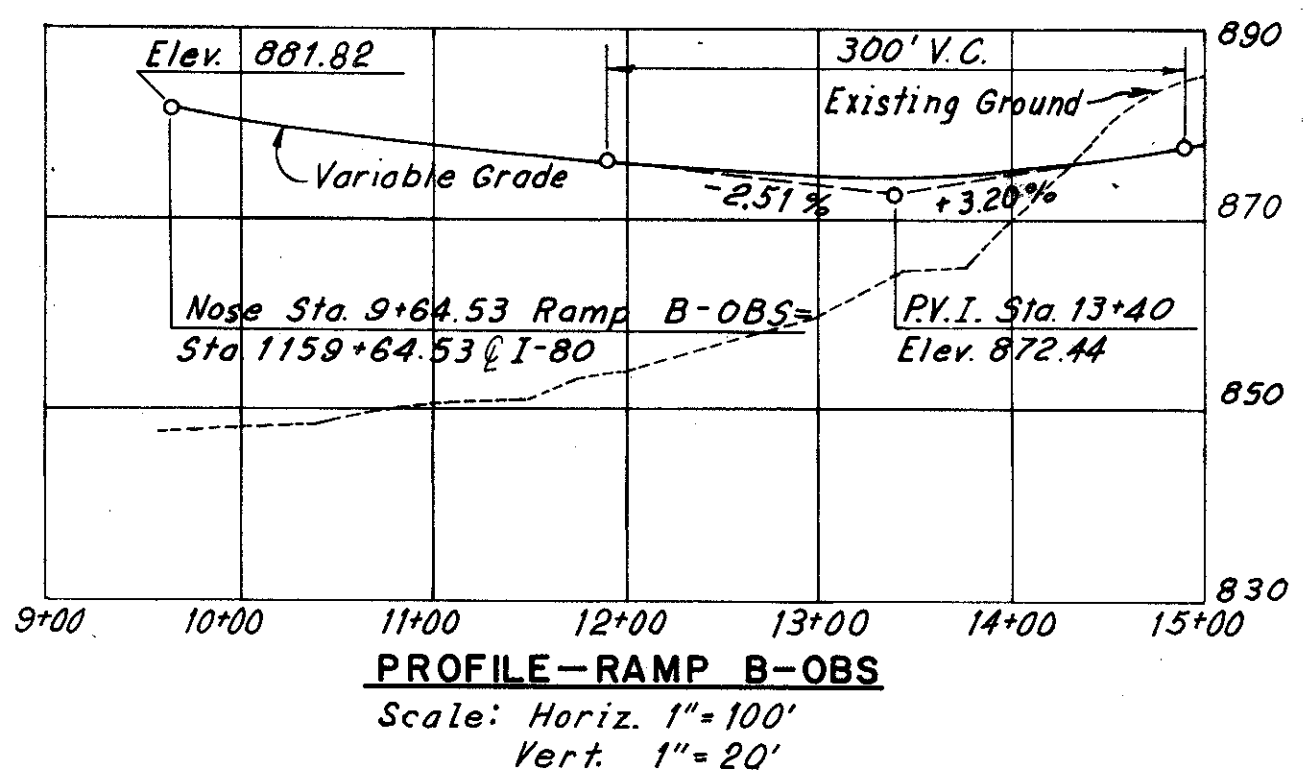
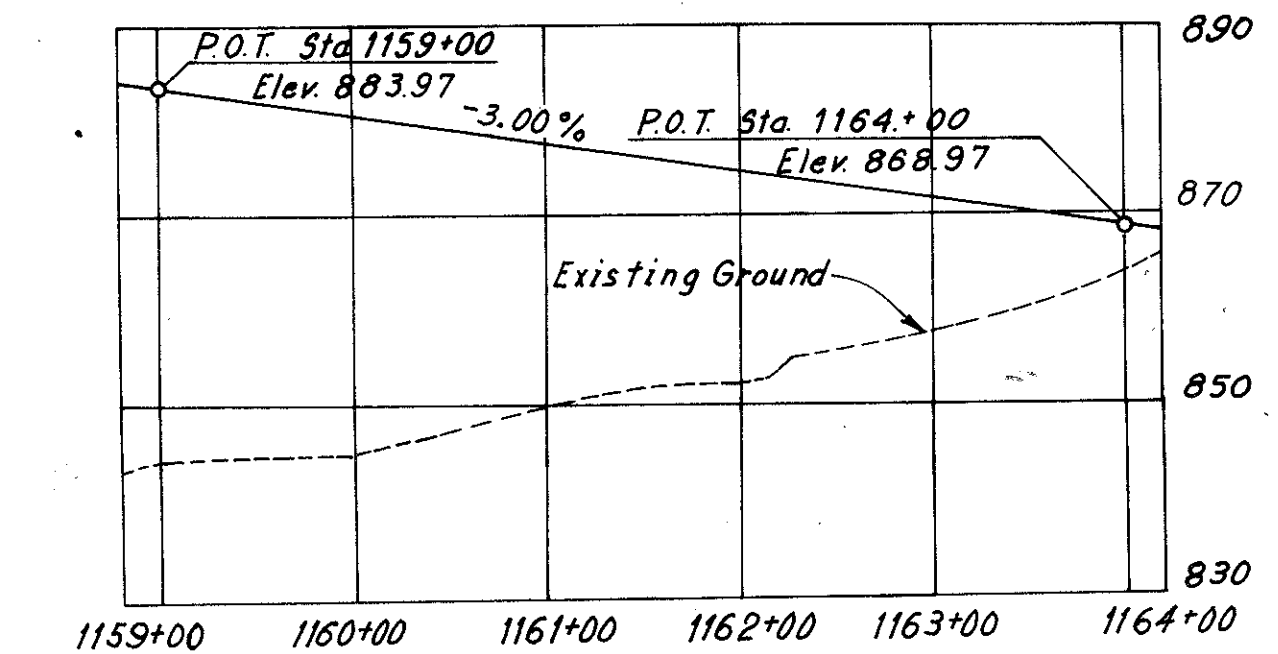
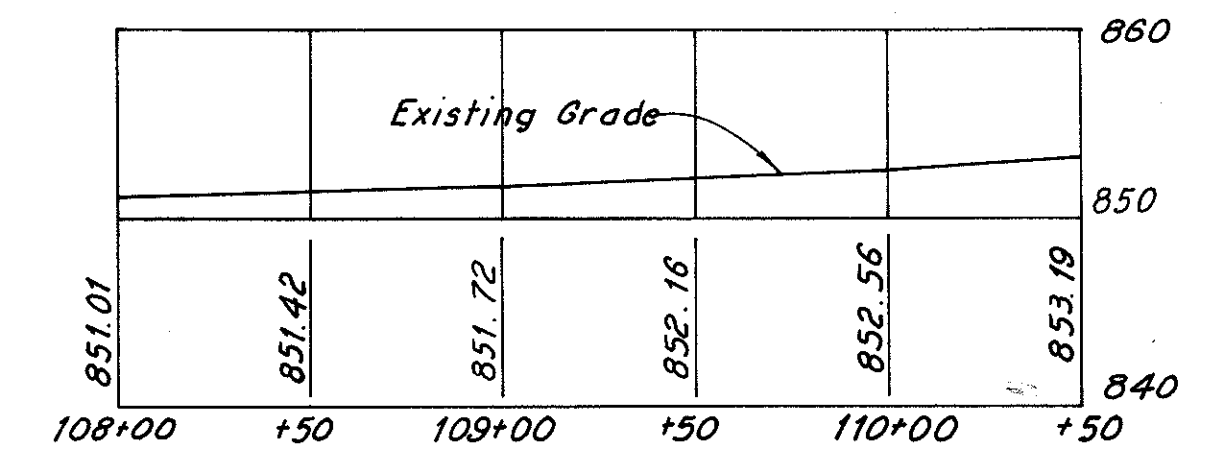
Seeding and Jute Matting (Typical) Included for payment with Roadway Quantities.

PLAN
Scale: 1" = 20'-0"



ELEVATION
Scale: Horiz. 1" = 20'
Vert. 1" = 20'

* Note:
15'-0" is required minimum vertical clearance. Minimum vertical clearance occurs at the east edge of the future pavement of Broadway and the outside edge of the south exterior beam.



CURVE DATA

@ I-80		@ RAMP B-OBS	
P.I. Sta. 1168+27.47	$\Delta = 28^{\circ}52'52''$	P.I. Sta. 11+43.54	$\Delta = 3^{\circ}18'10''$
D = 2'00'00" Right	Lc = 1194.05'	D = 1'00'00" Left	R = 5729.58'
Ts = 862.94'	$\theta_s = 2^{\circ}30'00''$	T = 165.19'	L = 330.28'
Ls = 250.0'		E = 2.38'	

Note:
Nose at Sta. 9+64.53 @ Ramp B-OBS = Sta. 1159+64.53 @ I-80, 74' Right.

PROPOSED STRUCTURE

TYPE: Continuous rolled beam with reinforced concrete deck and substructure.
SPANS: 51'-11 $\frac{1}{2}$ "", 74'-9 $\frac{3}{4}$ "", 52'-9 $\frac{3}{4}$ "".
ROADWAY: Width varies - 160'-4" to 170'-2 $\frac{3}{4}$ " face to face of parapets, with Concrete Barrier.
DESIGN LOAD: HS20-44 and Interstate Alternate Loading.
SKEW: 22 $^{\circ}$ 44'10.3" Right Forward
WEARING SURFACE: 2 $\frac{1}{2}$ " Asphalt Concrete
APPROACH SLABS: AS-1-67 (25 feet long)
ALIGNMENT: Spiral and 2'00'00" Curve Right (@ I-80)
SUPERELEVATION: I-80 - Varies .0156 ft. per ft. to .047 ft. per ft., Ramp B-OBS - .0156 ft. per ft.

TRAFFIC DATA

1991: 60,364 A.D.T.
3,320 D.D.H.V.

MAINTENANCE OF TRAFFIC

Four lanes of traffic with a minimum horizontal width of 48'-0" and a minimum vertical clearance of 13'-6" shall be maintained on Broadway Avenue (S.R.14) at all times.

Notes:
Embankment shall be placed and compacted to the finish spill-thru slopes and to the level of the subgrades for a minimum distance of 200 feet back of the abutments before excavating or driving piles for the abutments and piers.
All Abutments and Piers are founded on 12" ϕ C.I.P. Reinforced Concrete Piles with estimated average pay lengths as follows:
West Abutment 37'
Pier 1 and Pier 2 30'
East Abutment 36'

The piles at the abutments shall be driven to a minimum bearing capacity of 35 tons per pile. The piles at the piers shall be driven to a minimum bearing capacity of 40 tons per pile.
For underpass lighting details see Lighting Plans.

H.N.T.B. BR. NO. 7
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

SITE PLAN
I-80 AND RAMP B-OBS OVER BROADWAY (S.R.14)

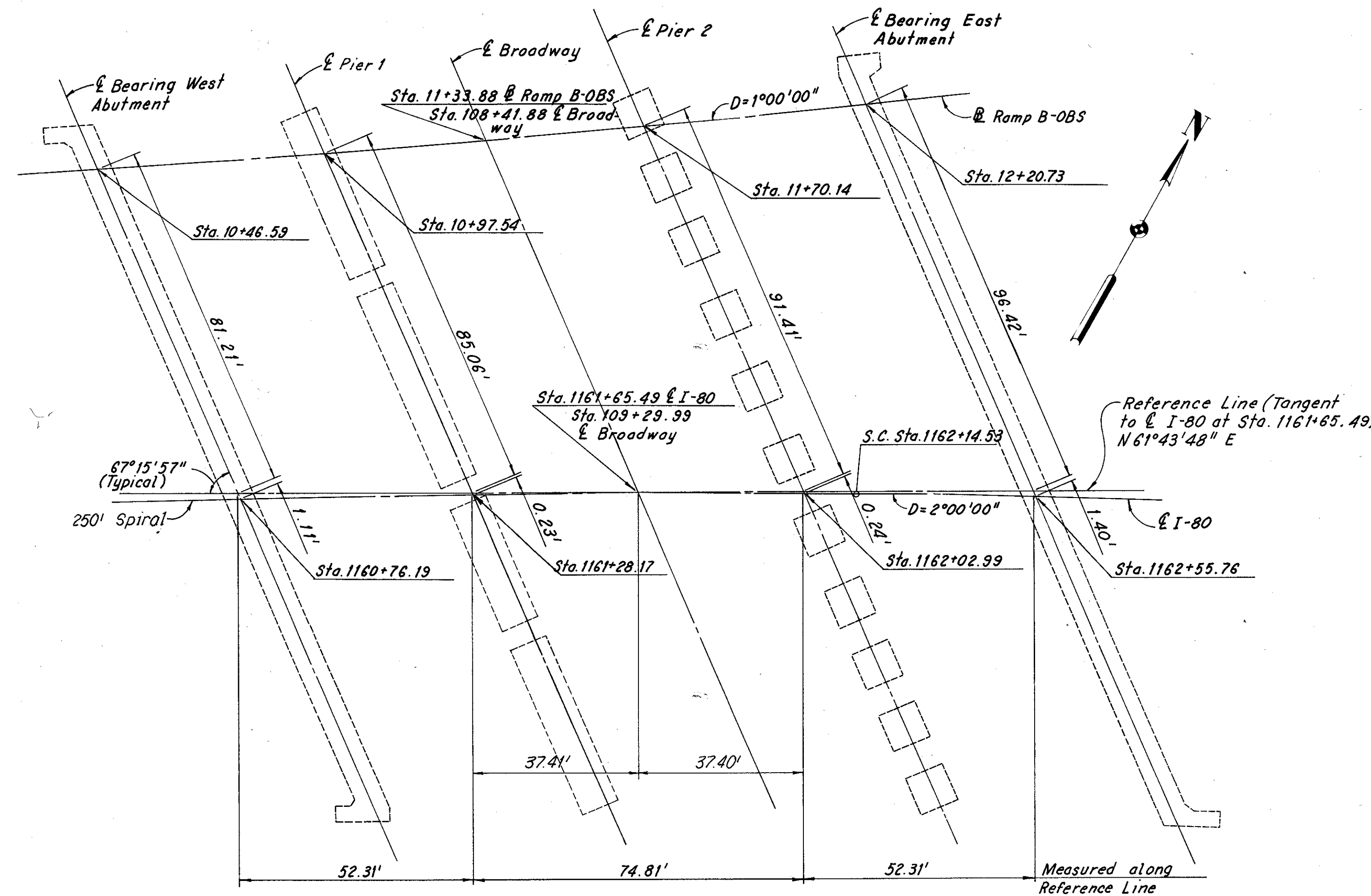
BR. NO. CUY-80-2154 STA. 1160+73.77 TO STA. 1162+58.23
CUYAHOGA COUNTY OHIO

DRAWN Lee	TRACED DLR	CHECKED YH	REVIEWED
DATE 6-22-67	DATE 8-17-67	DATE 6-12-69	DATE

SHEET 1/17

CUYAHOGA COUNTY
CUY-80-2140

Quantity Calculations
Made By KYH Date 6-69
Checked By MCB Date 2-70



BRIDGE LAYOUT DIAGRAM

ESTIMATED QUANTITIES				CUY-80-2154 H.N.T.B. BRIDGE NO. 7			
ITEM	TOTAL	UNIT	DESCRIPTION	ABUTMENTS	PIERS	SUPER-STRUCTURE	GENERAL
503	Lump	Lump	Cofferdams, Cribbs and Sheeting		Lump		
503	1,518	Cu. Yd.	Unclassified Excavation	945	573		
505	Lump	Lump	Test Pile				Lump
507	277	Lin. Ft.	Prebored Holes		277		
507	8,520	Lin. Ft.	12" ϕ C.I.P. Reinforced Concrete Piles	4,230	4,290		
509	453,077	Pounds	Reinforcing Steel	48,323	89,378	305,376	
511	895	Cu. Yd.	Class "C" Concrete, Superstructure			895	
511	250	Cu. Yd.	Class "C" Concrete, Pier Caps and Columns		250		
511	427	Cu. Yd.	Class "C" Concrete, Abutments Above Footing	427			
511	544	Cu. Yd.	Class "C" Concrete, Footings	271	273		
512	64	Lin. Ft.	Premolded Sealing Strip	64			
513	746,600	Pounds	Structural Steel			746,600	
514	746,600	Pounds	Field Painting of Structural Steel			746,600	
516	60	Sq. Ft.	1" Preformed Expansion Joint Filler	60			
518	245	Cu. Yd.	Porous Backfill	245			
518	196	Lin. Ft.	6" Non-perforated Helical C.M.P. Including Specials, 707.01	196			
518	346	Lin. Ft.	6" Perforated Helical C.M.P., 707.01	346			
518	11	Each	Scuppers, Including Supports			11	
601	207	Lin. Ft.	Paved Gutter (Type 1-2)				207
601	1,965	Sq. Yd.	Concrete Slope Protection (6" thick)				1,965
601	731	Sq. Yd.	Concrete Slope Protection (4" thick)				731
808	895	Units	Chemical Admixture for Concrete, Type A, B or D			895	
838	3	Hours	Special Pile Tests				3
404	178	Cu. Yd.	Asphalt concrete (70-85 or Ac-20)			178	
Special	44	Cu. Yd.	Sand-asphalt (See proposal Note)			44	
Special	3,232	Sq. Yd.	Membrane Water proofing sheet type (See Proposal Note)			3,232	
518	894	Lin. Ft.	Subdrainage for wearing course, as per plan			894	

H.N.T.B. BR. NO. 7

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

**BRIDGE LAYOUT DIAGRAM
AND ESTIMATED QUANTITIES**

I-80 AND RAMP B-OBS OVER BROADWAY

BR. NO. CUY-80-2154 STA. 1160+73.77 TO STA. 1162+58.23

CUYAHOGA COUNTY OHIO

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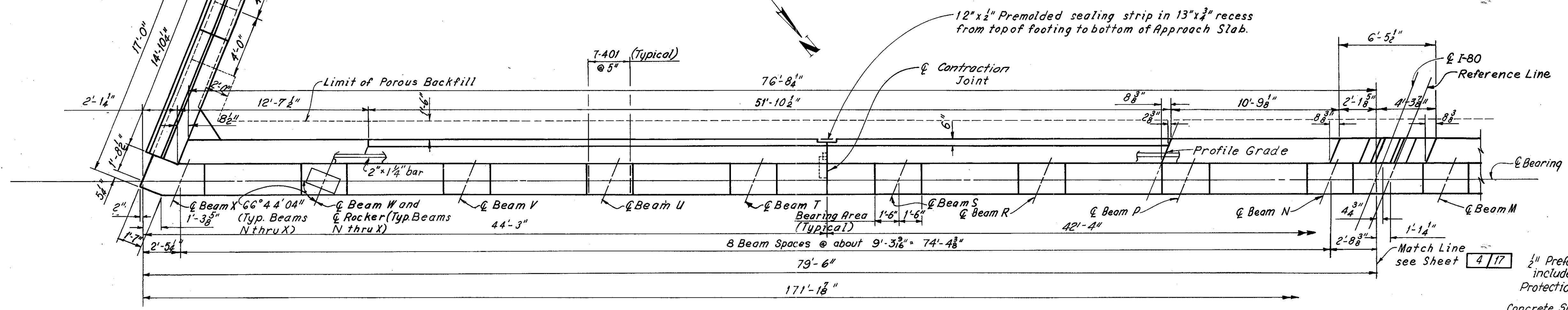
SHEET 2/17

MICROFILMED
DEC 22 1982

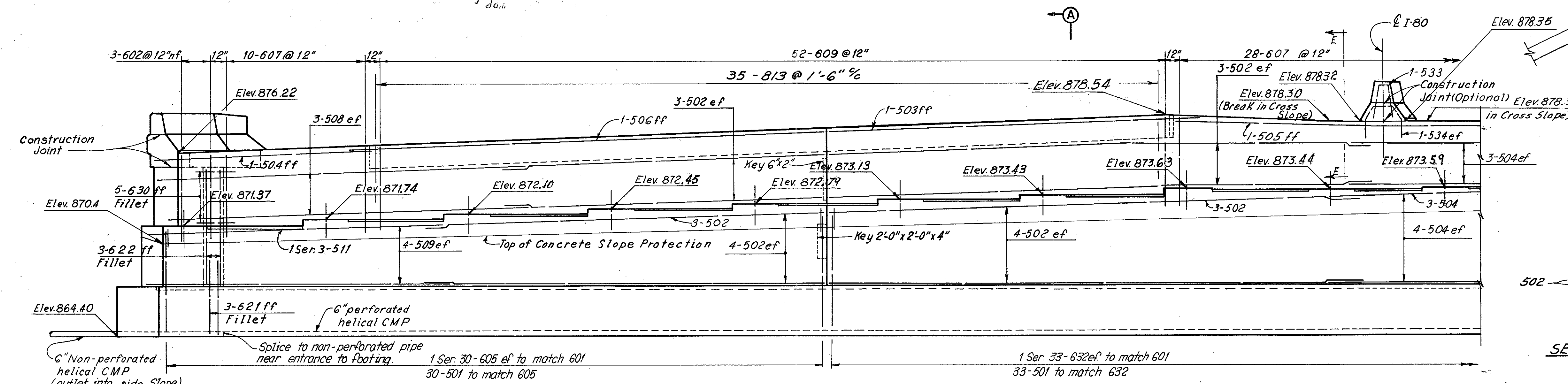
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

309
390

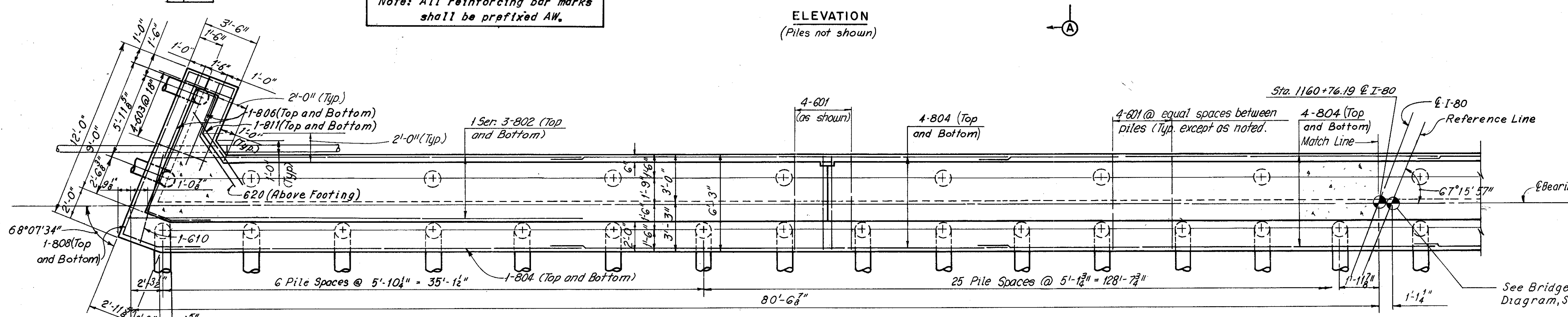
CUYAHOGA COUNTY
CUY-80-21.40



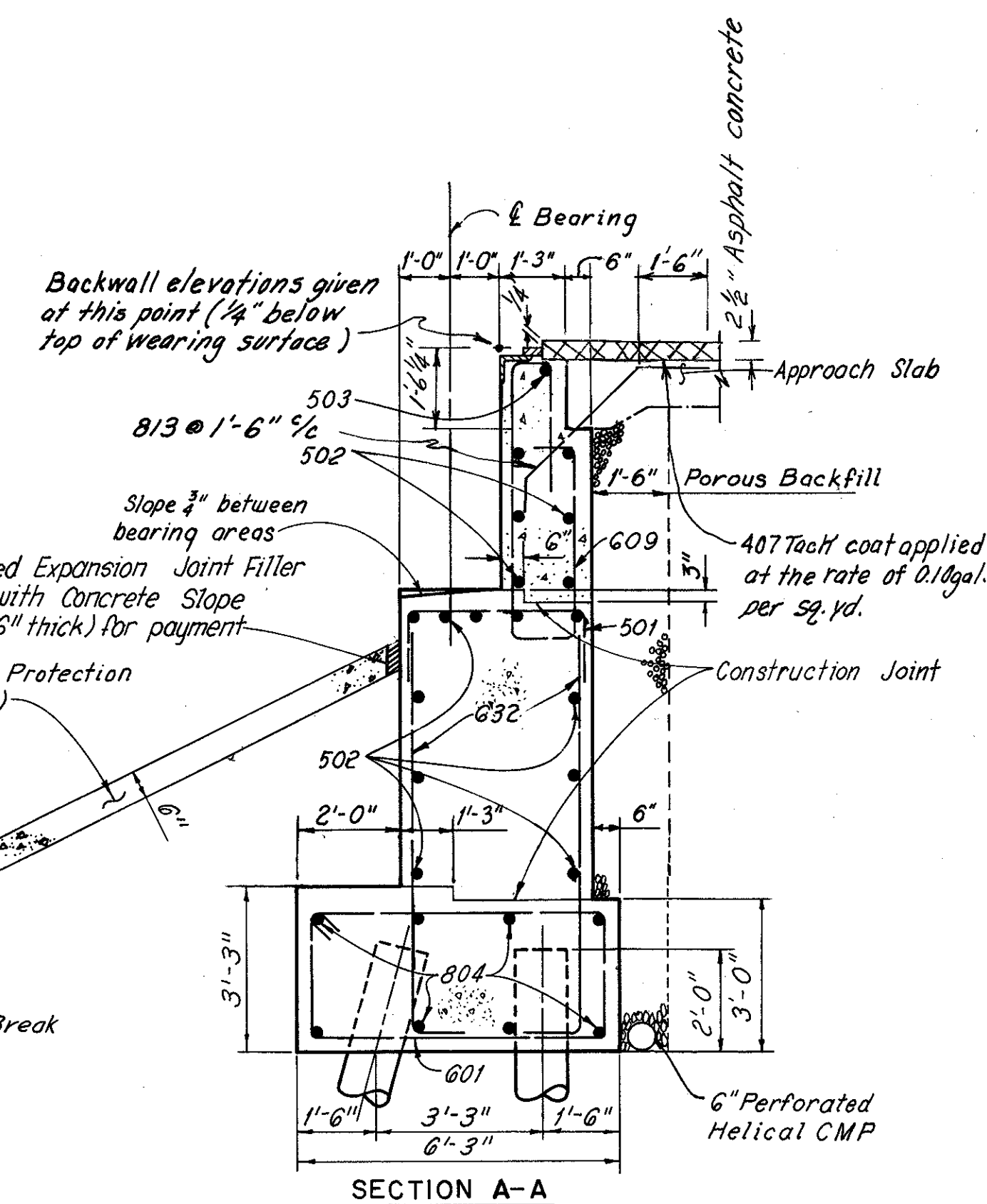
PLAN



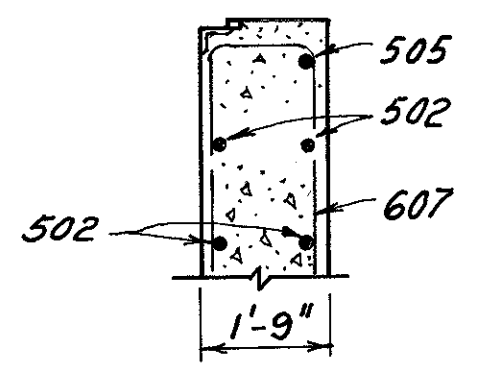
ELEVATION
(Piles not shown)



FOOTING PLAN



SECTION A-A



SECTION E-E

MEDIAN DETAIL
(Reinforcement not shown)

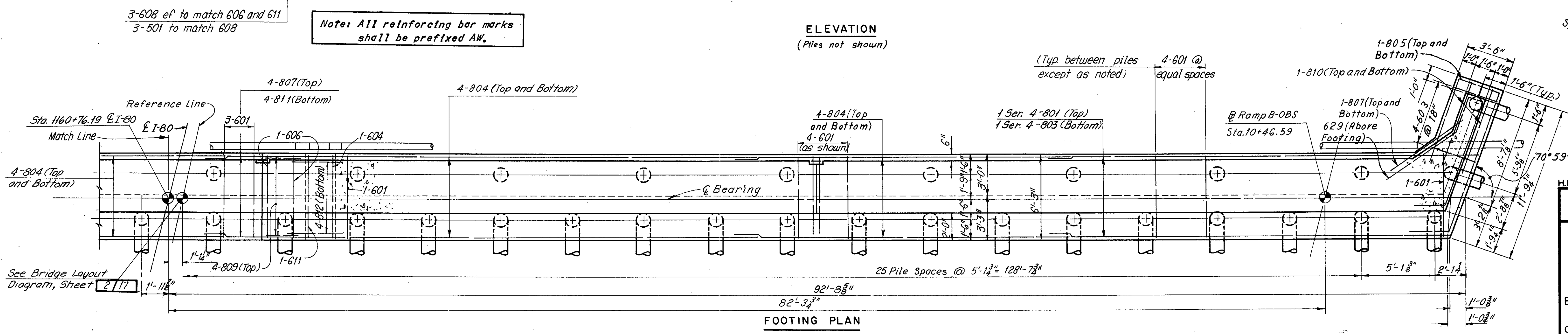
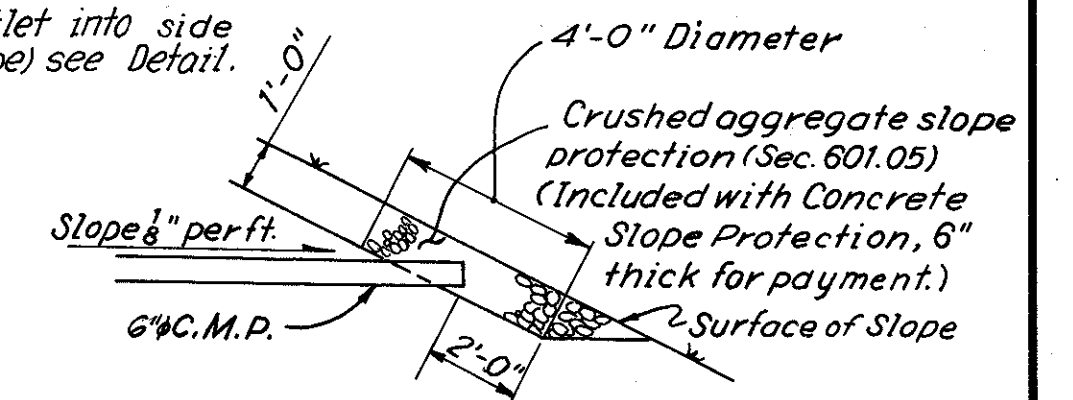
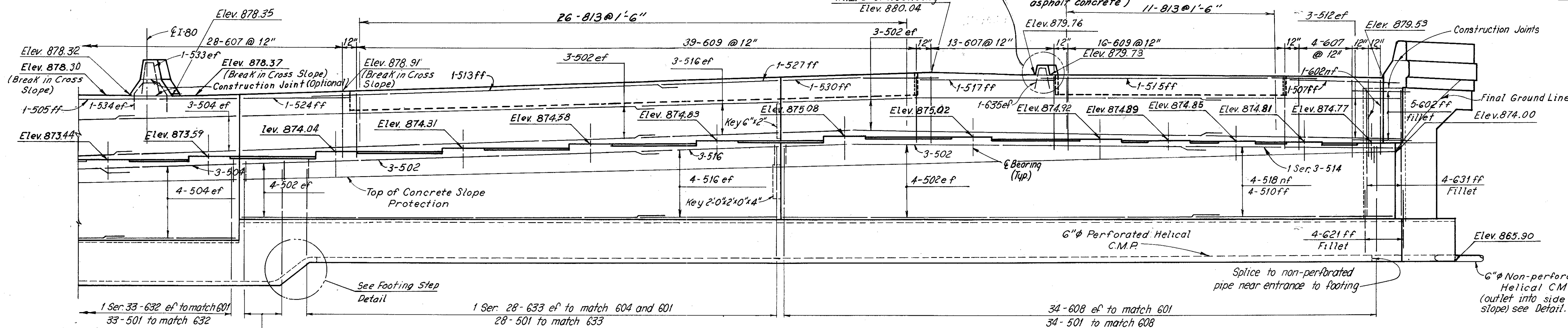
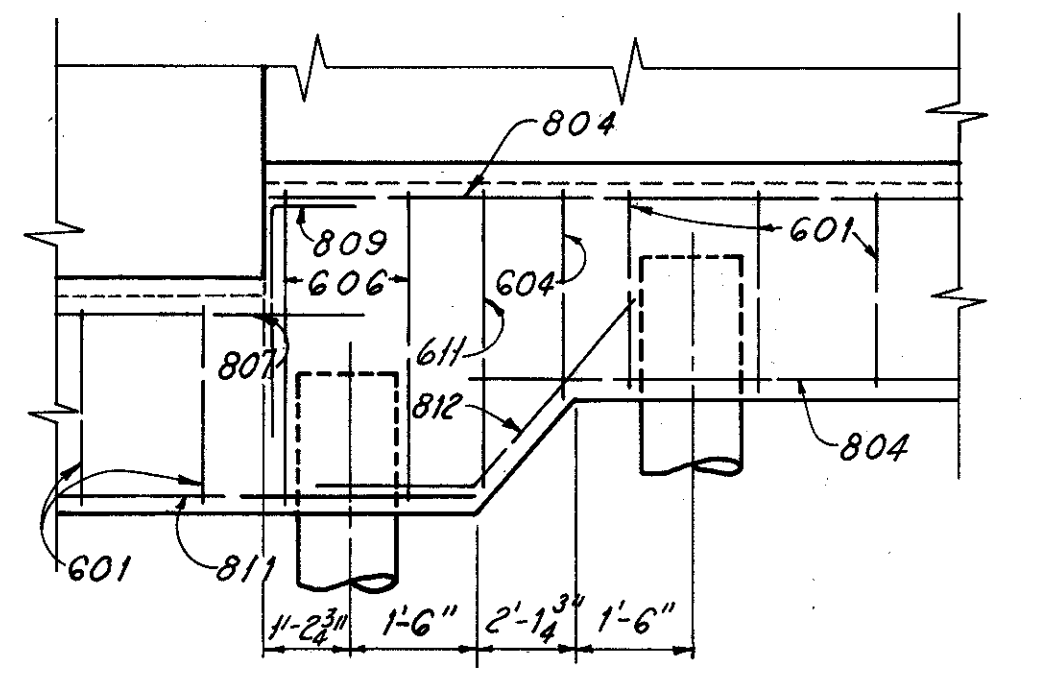
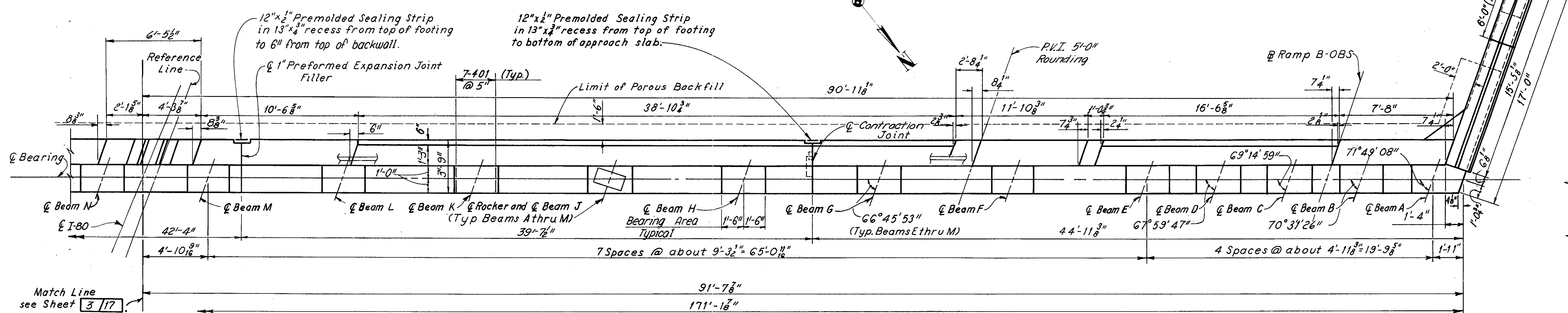
Note:
All piles are 12" ϕ C.I.P. reinforced concrete. All battered piles shall be inclined 3 in 12 in the direction shown.
For roadway end dam and curb plate details see Ohio Standard Drawing SD-1-69, Sheets 1 and 2 of 4 and Sheet 12/17.
The following abbreviations are used:
nf = near face
ff = far face
ef = each face

H.N.T.B. BR. NO. 7
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

WEST ABUTMENT
I-80 AND RAMP B-OBS OVER BROADWAY

BR. NO. CUY-80-2154 STA. 1160+73.77
CUYAHOGA COUNTY OHIO STA. 1162+58.23

DRAWN BY	TRACED BY	CHECKED BY	REVIEWED	REVISED
DATE 4-11-68	DATE 4-23-68	DATE 3-2-70	DATE	DATE



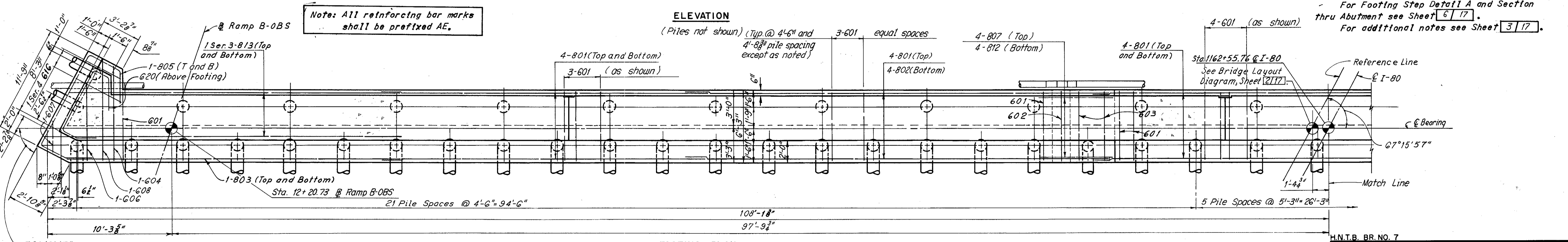
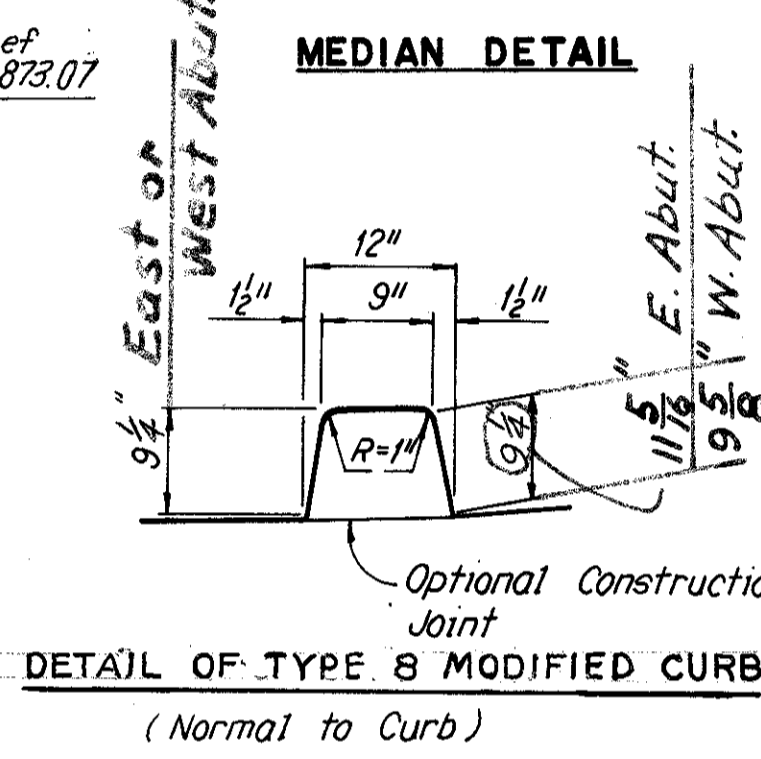
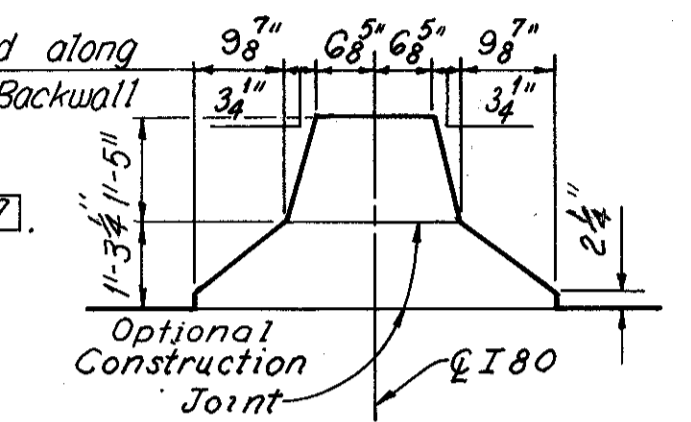
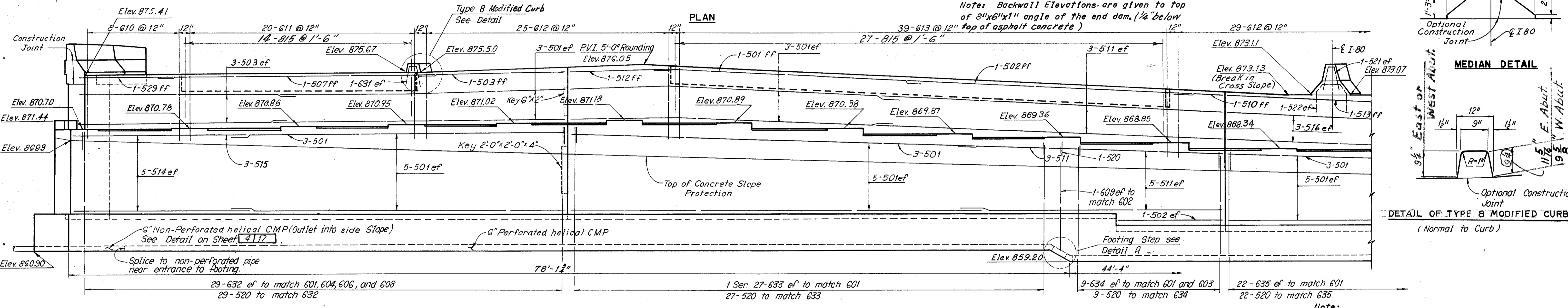
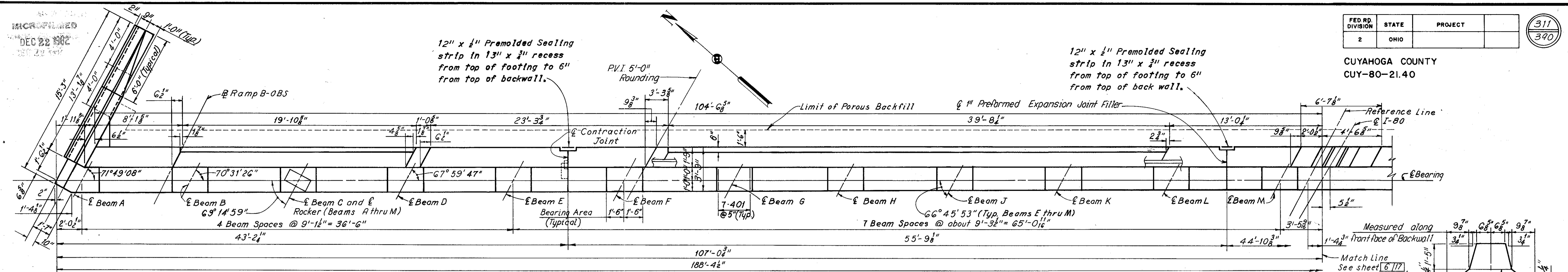
H.N.T.B. BR. NO. 7			
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
WEST ABUTMENT			
I-80 AND RAMP B-OBS OVER BROADWAY			
BR. NO. CUY-80-2154		STA. 1160+73.77 STA. 1162+58.23	
CUYAHOGA COUNTY		OHIO	
DRAWN BY DATE 4-11-68	TRACED BY DATE 4-23-68	CHECKED BY DATE 3-2-70	REVIEWED DATE
SHEET 4/17			REVISED

MICROFILMED
DEC 22 1962

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY-80-21.40

311
390



H.N.T.B. BR. NO. 7

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

EAST ABUTMENT
I-80 AND RAMP B-OBS OVER BROADWAY

BR. NO. CUY-80-2154 STA. 1160+73.77
STA. 1162+58.23

CUYAHOGA COUNTY OHIO

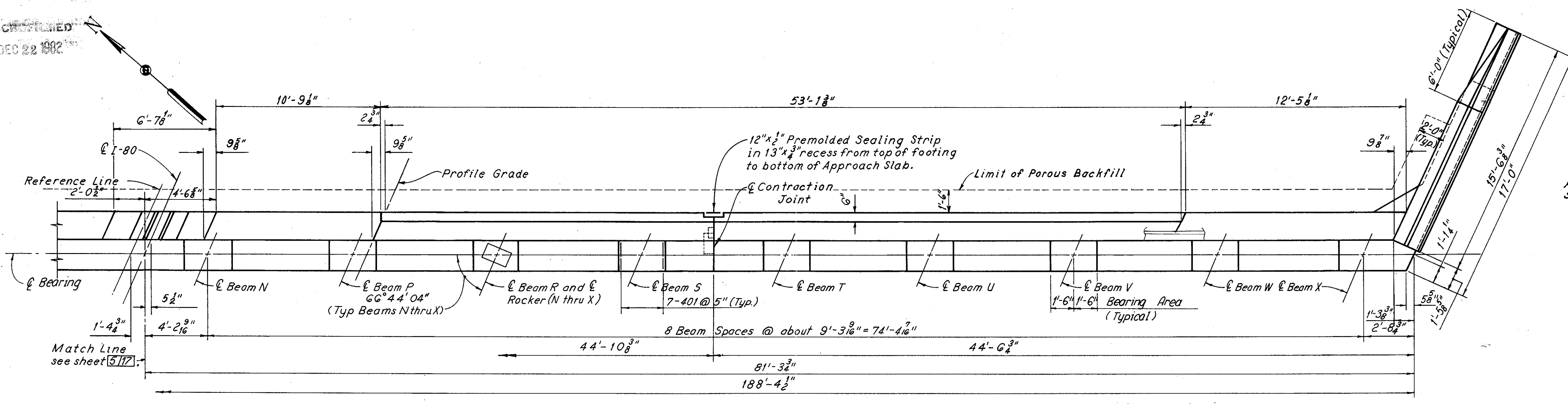
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SHEET 5/17

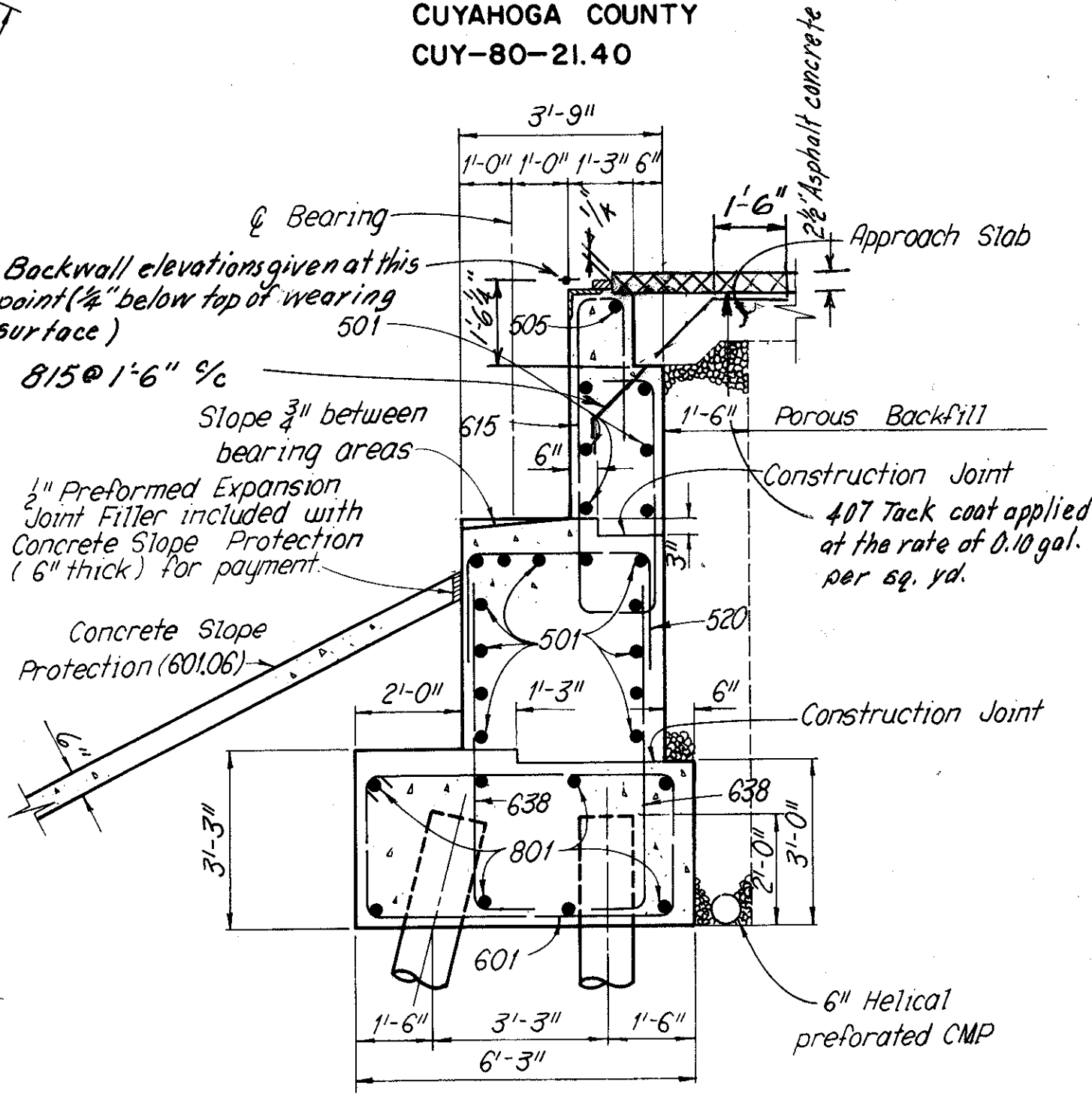
DEC 29 1962

FED. RD. DIVISION	STATE	PROJECT	312 390
2	OHIO		

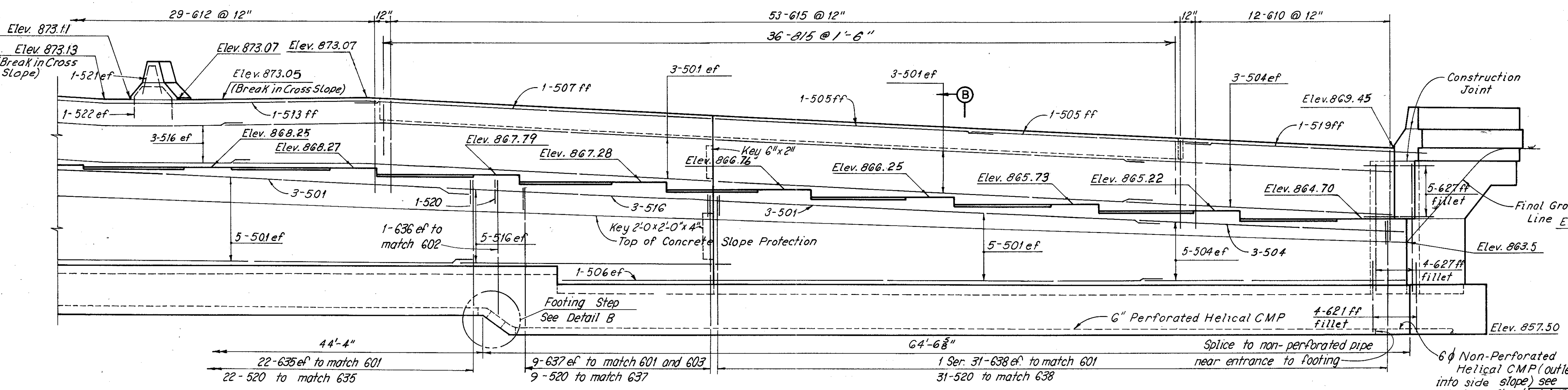
CUYAHOGA COUNTY
CUY-80-21.40



PLAN

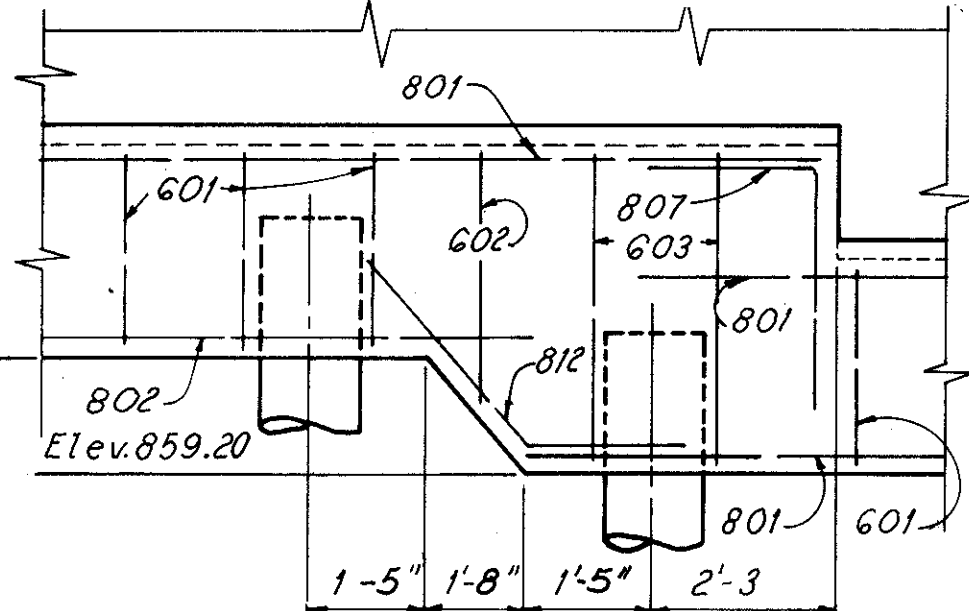


SECTION B-B

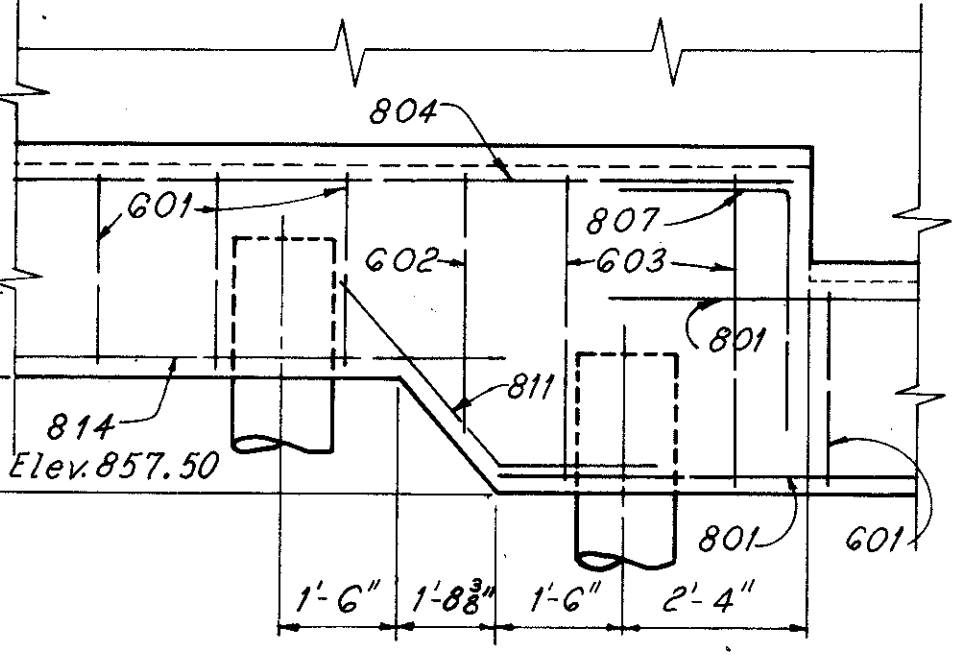


ELEVATION

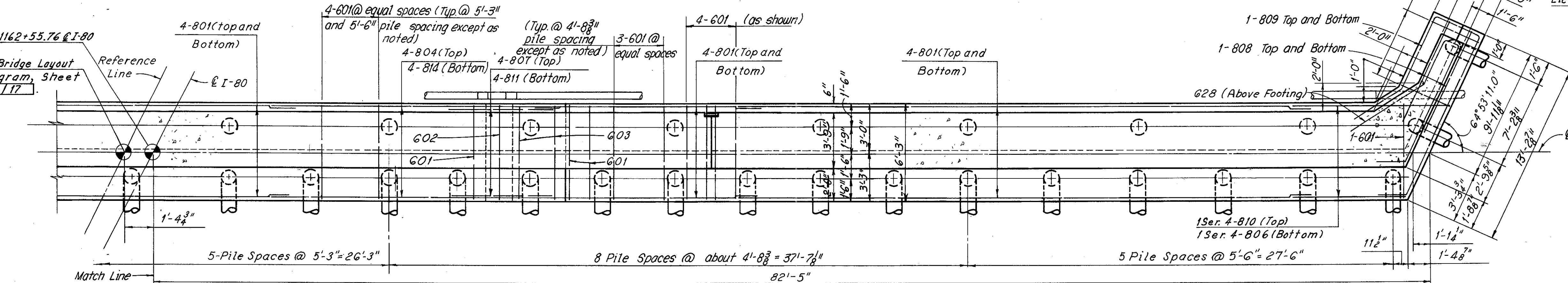
Note: All reinforcing bar marks shall be prefixed AE.



FOOTING STEP-DETAIL A



FOOTING STEP-DETAIL B



FOOTING PLAN

H.N.T.B. BR. NO. 7

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

EAST ABUTMENT
I-80 AND RAMP B-OBS OVER BROADWAY

BR. NO. CUY-80-2154 STA. 1160+73.77
CUYAHOGA COUNTY OHIO STA. 1162+58.23

DRAWN BY	TRACED BY	CHECKED BY	REVIEWED	REVISED
DATE 11-68	DATE 1-23-69	DATE 3-17-70	DATE	DATE

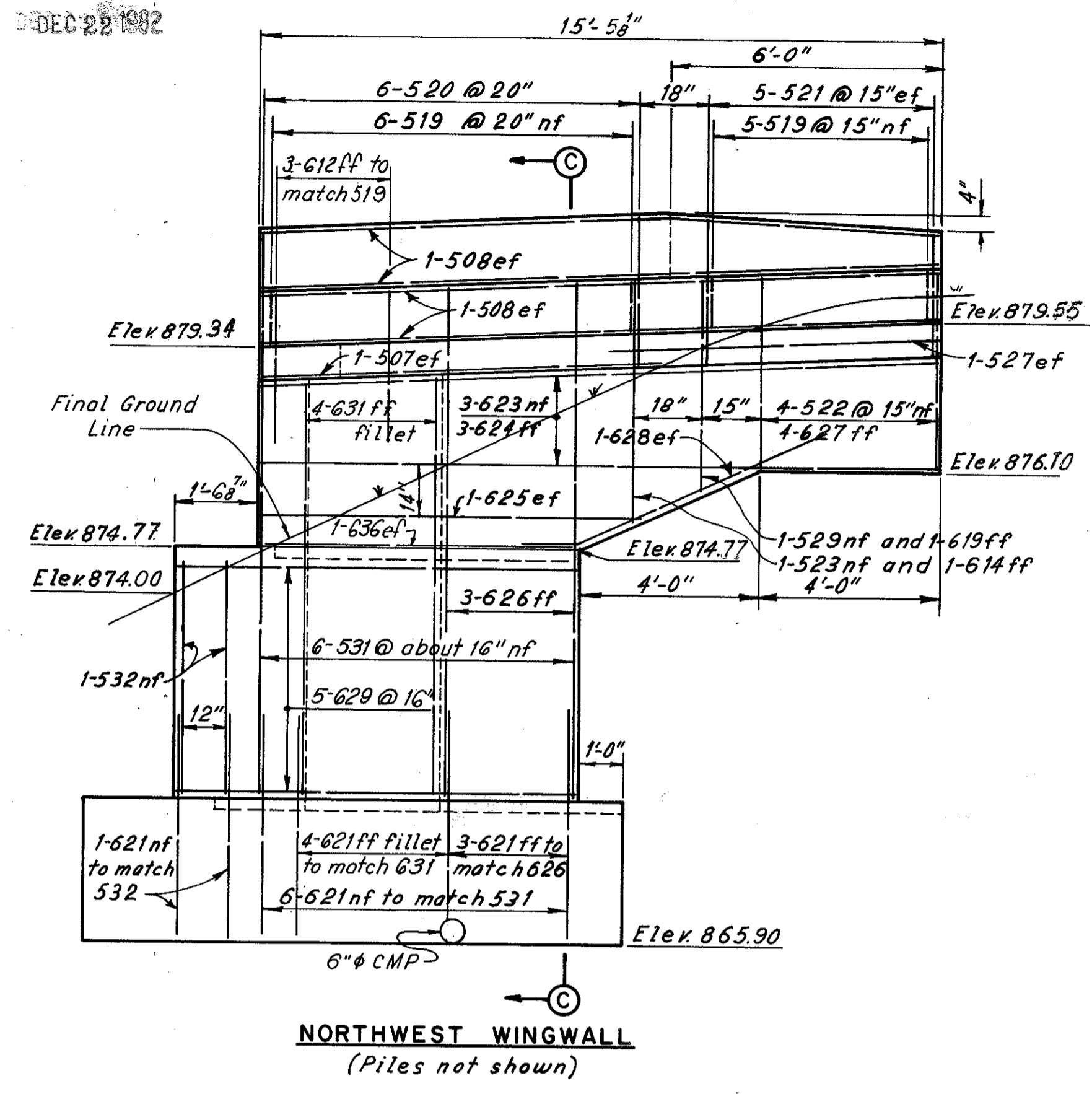
SHEET 6/17

INFORMED
DEC 22 1982

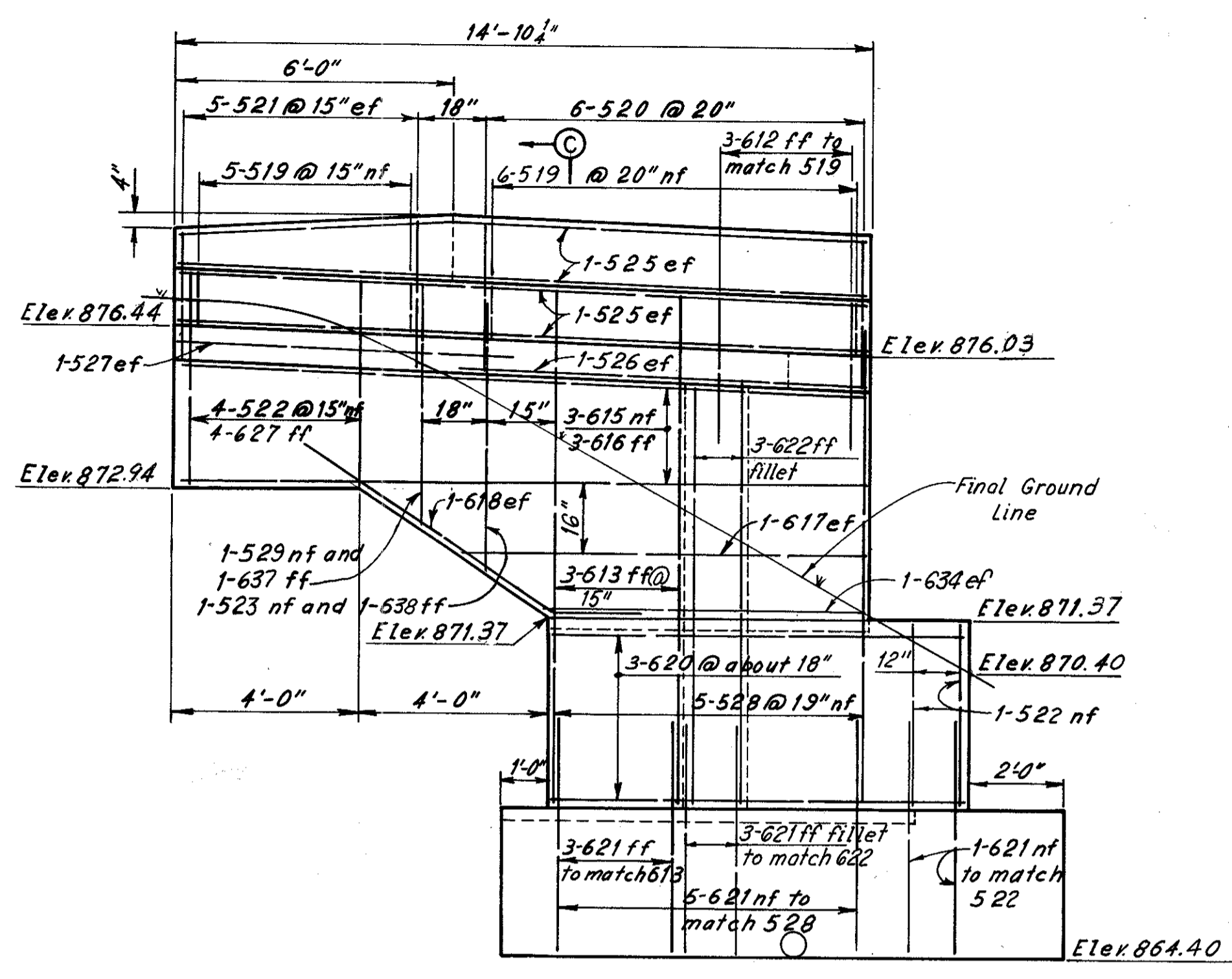
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

313
390

CUYAHOGA COUNTY
CUY-80-21.40

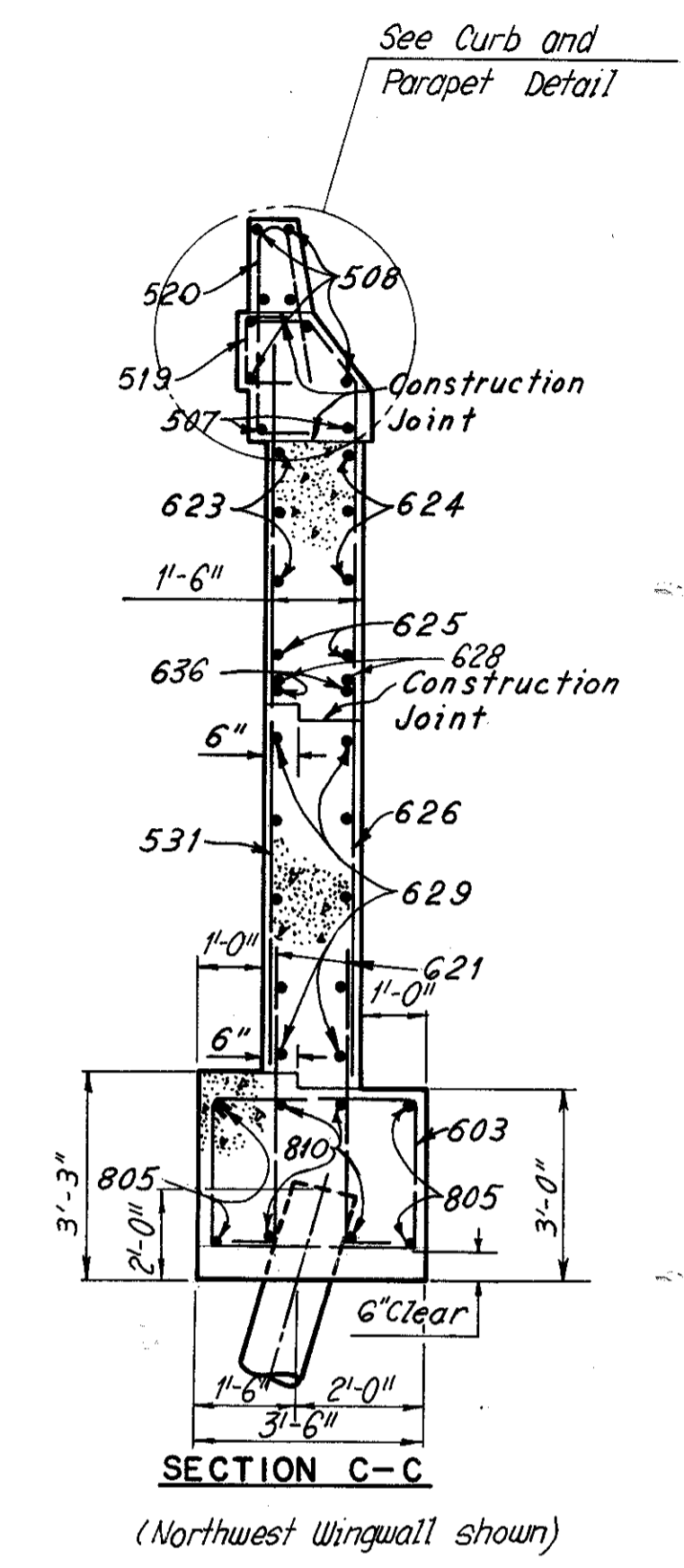


NORTHWEST WINGWALL
(Piles not shown)

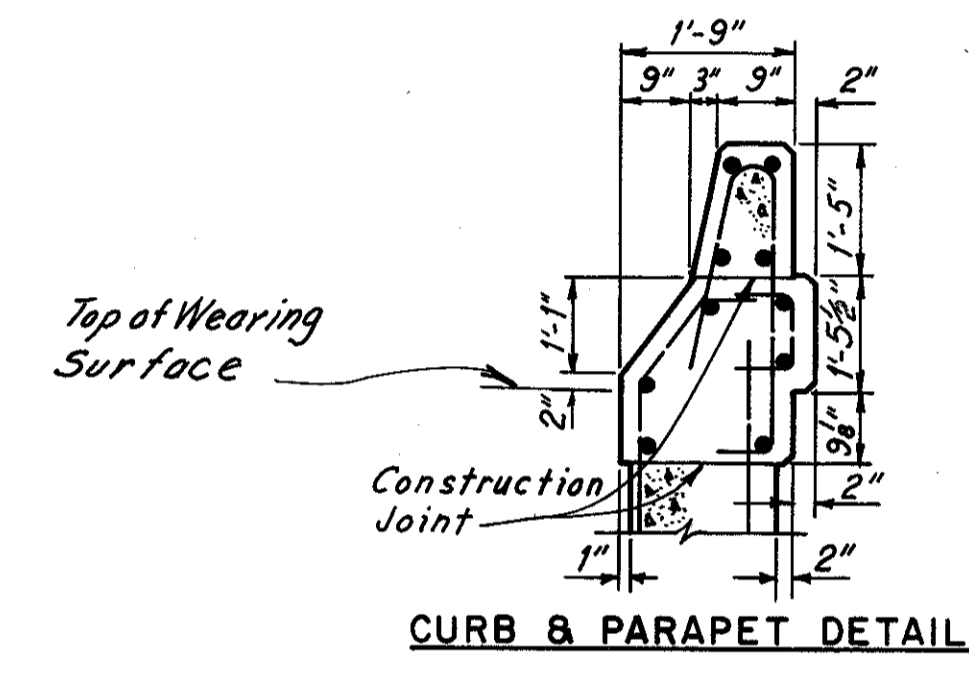


SOUTHWEST WINGWALL
(Piles not shown)

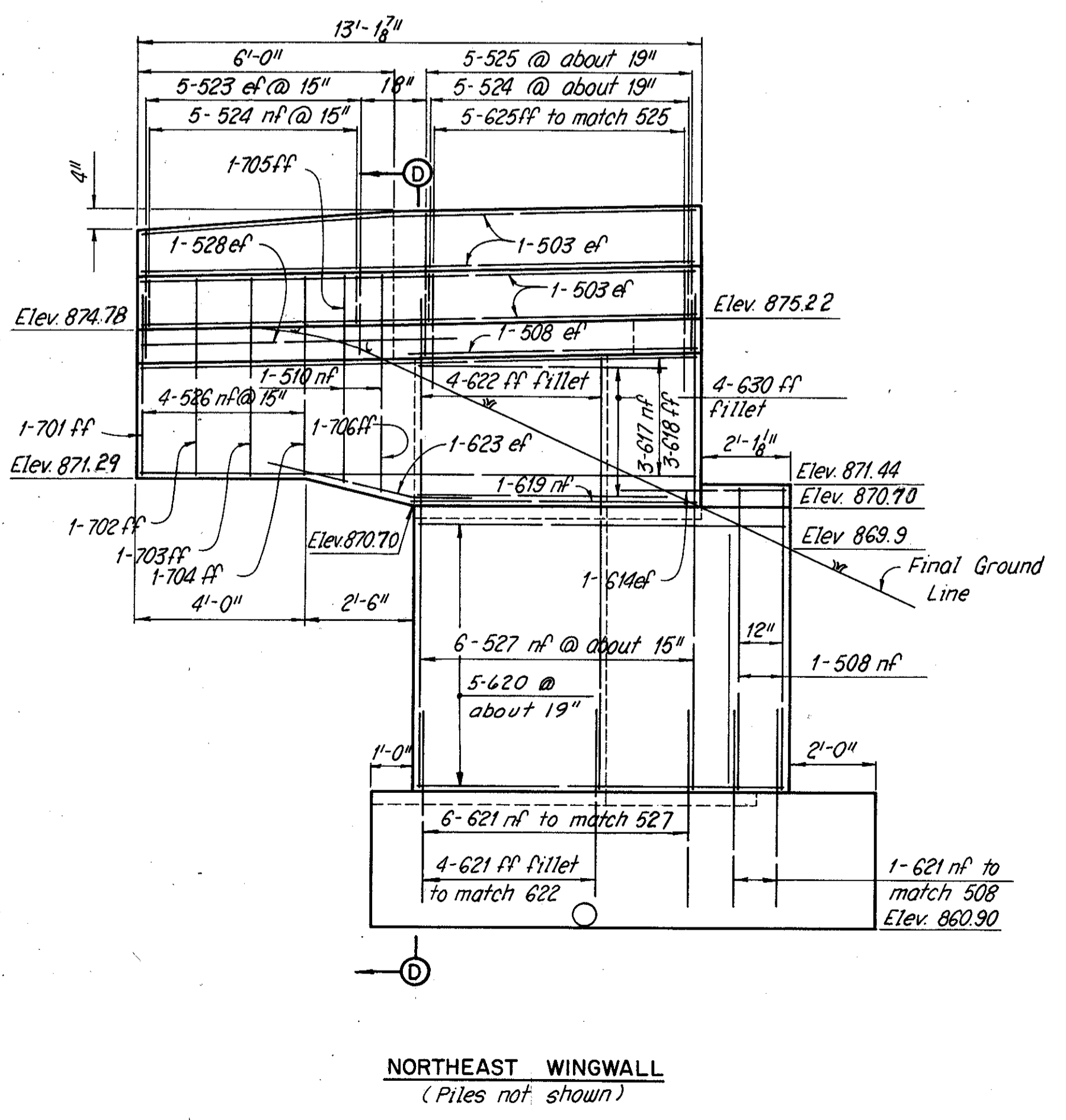
Note: Northwest and Southwest Wingwall Reinforcement shall be prefixed AW.



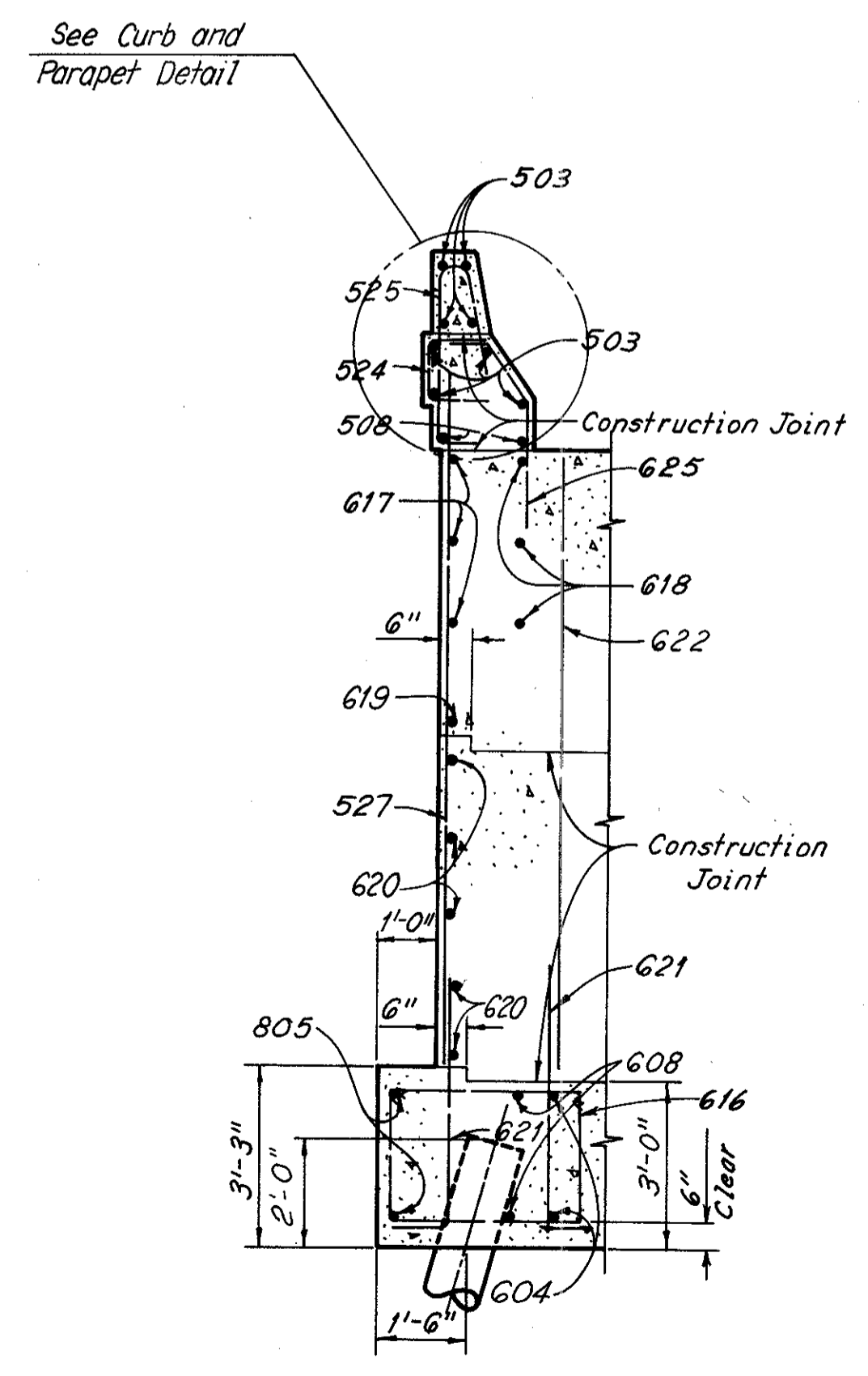
SECTION C-C
(Northwest Wingwall shown)



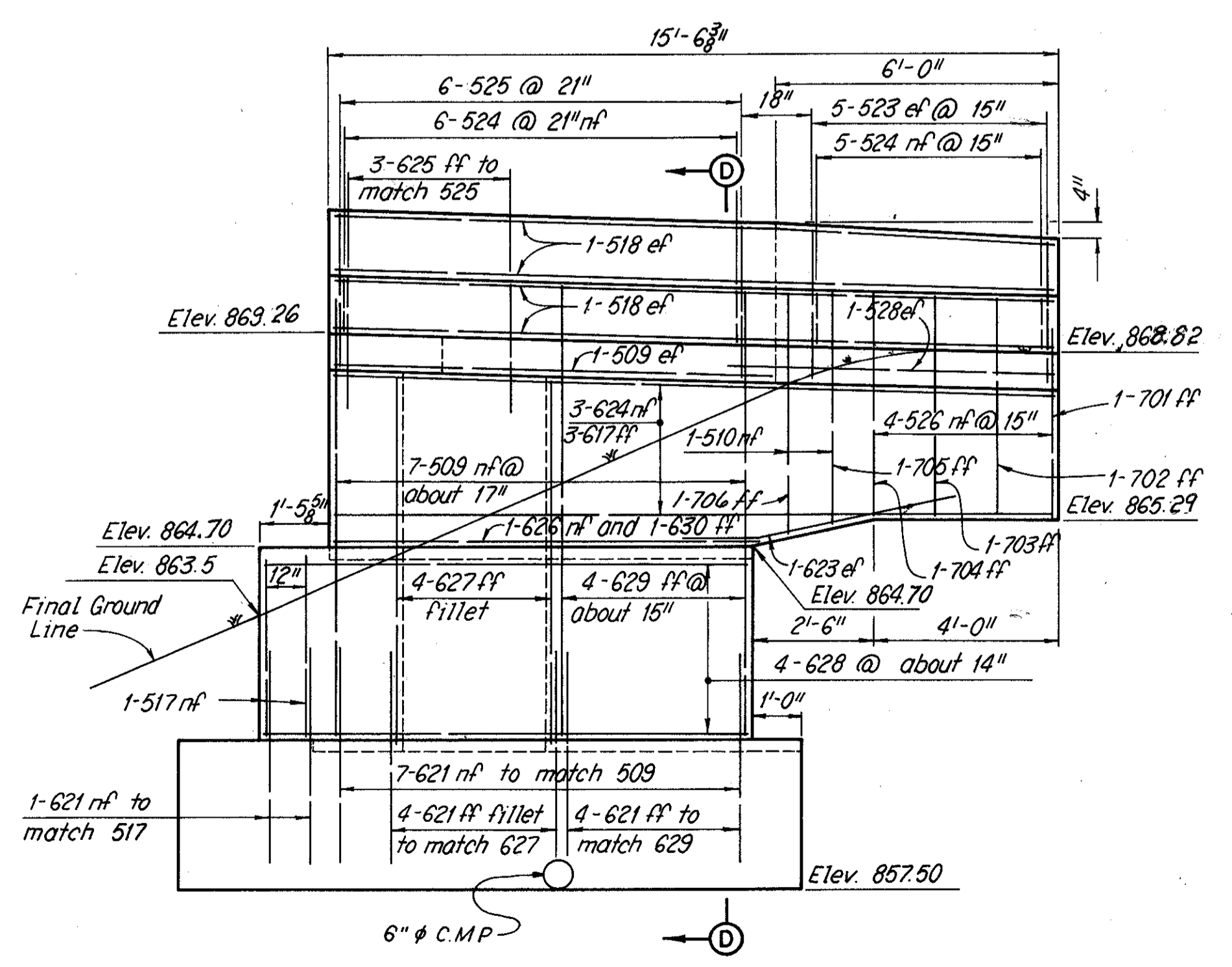
CURB & PARAPET DETAIL



NORTHEAST WINGWALL
(Piles not shown)



SECTION D-D
(Northeast Wingwall shown)



SOUTHEAST WINGWALL
(Piles not shown)

Note: Northeast and Southeast Wingwall reinforcement shall be prefixed AE.

Notes:
For curb and parapet transitions and for guard rail anchor details, see "PART PLANS - PARAPET ON WINGWALL" on Ohio Standard Drawing BR-1-67, Revised 10-15-71, Sheet 1 of 3.
For additional notes see Sheet 3/17.

H.N.T.B. BR. NO. 7

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

WINGWALLS

I-80 AND RAMP B-OBS OVER BROADWAY

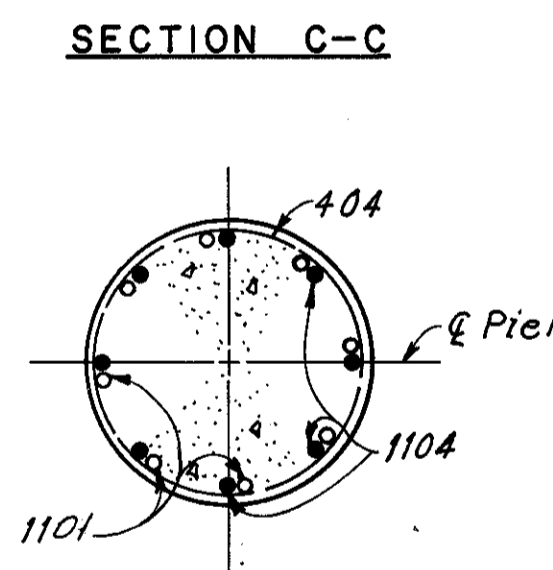
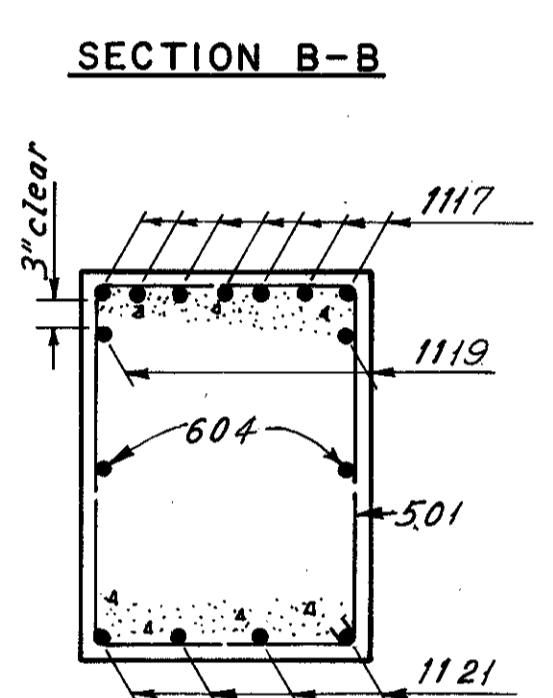
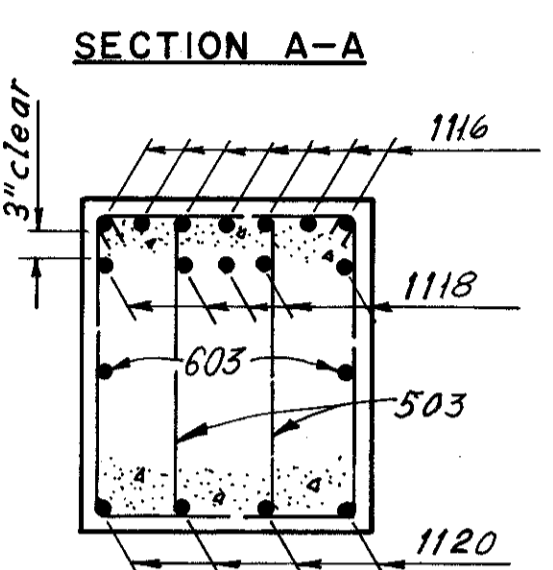
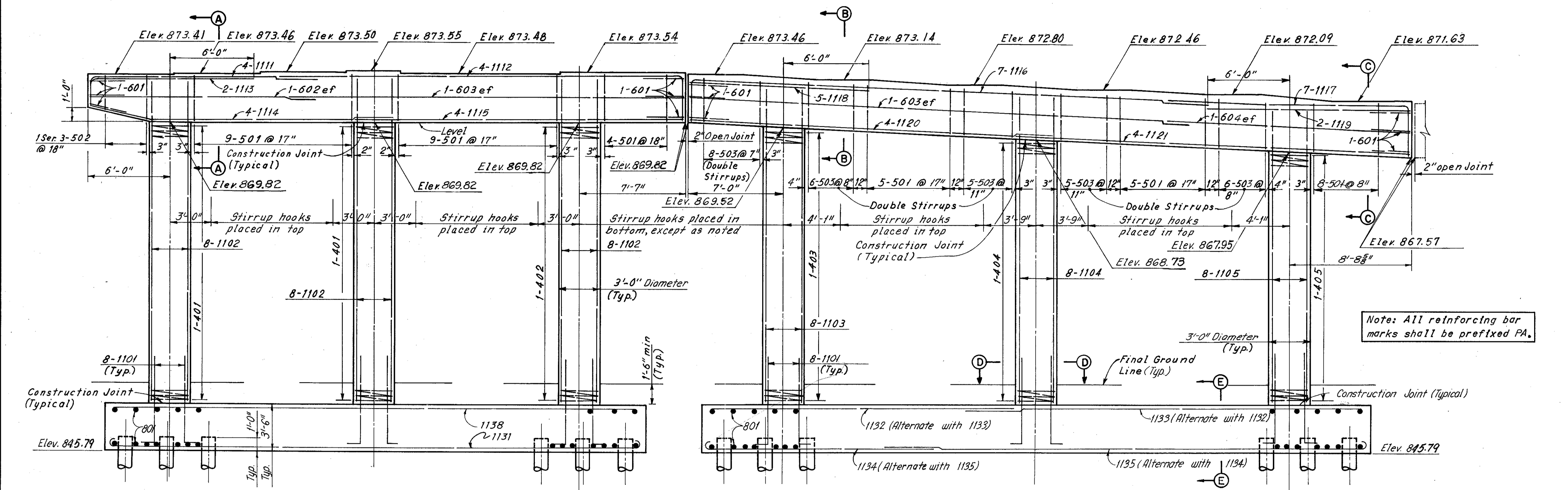
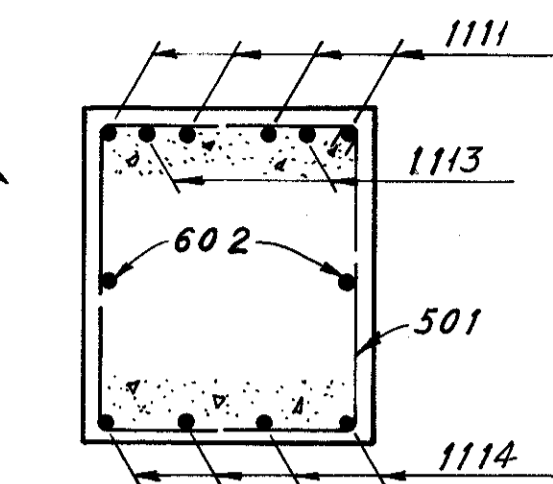
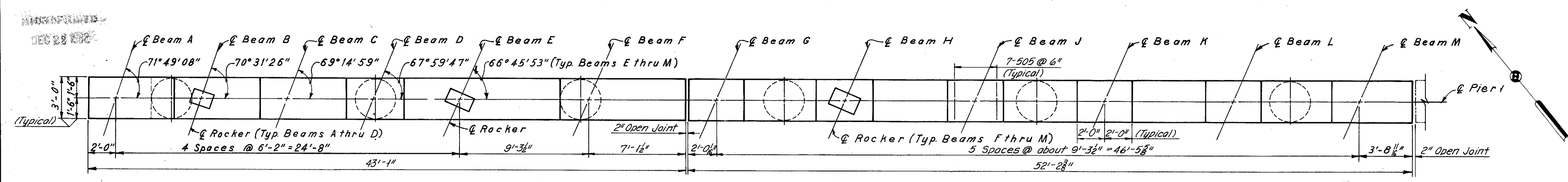
BR. NO. CUY-80-2154. STA. 1160+73.77
STA. 1162+58.23

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 2/11/83	DATE 2/23/83	DATE 3-17-83	DATE	DATE

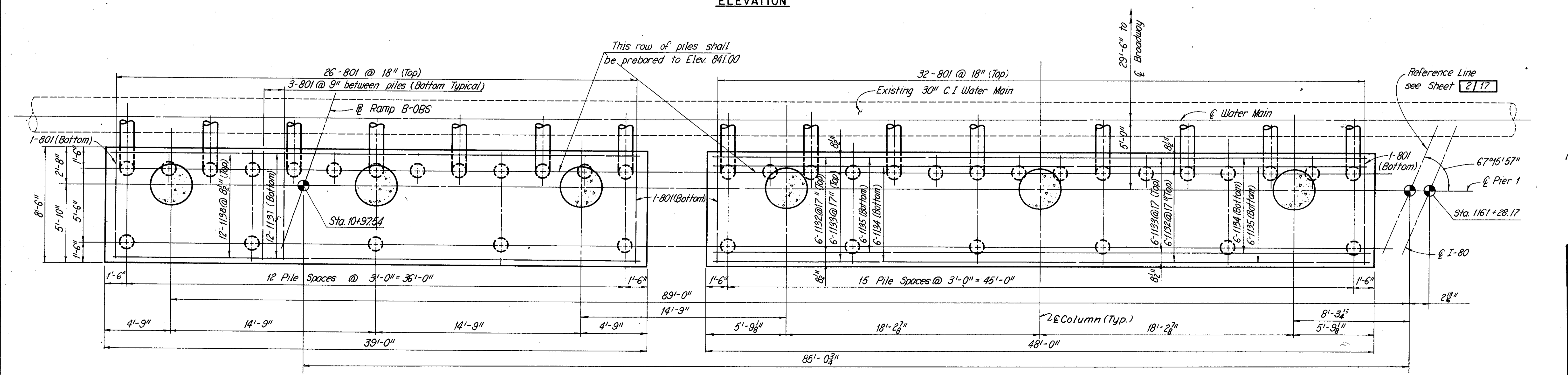
SHEET 7/17

CUYAHOGA COUNTY
CUY-80-21.40



Note: All reinforcing bar marks shall be prefixed PA.

Note: For Section E-E see Sheet 9/17. For Notes see Sheet 9/17.



H.N.T.B. BR. NO. 7

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

PIER I-NORTH HALF
I-80 AND RAMP B-OBS OVER BROADWAY

BR. NO. CUY-80-2154 STA. 1160+73.77
STA. 1162+58.23

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED
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DATE 5-7-69	DATE 5-23-69	DATE 7-2-69	DATE

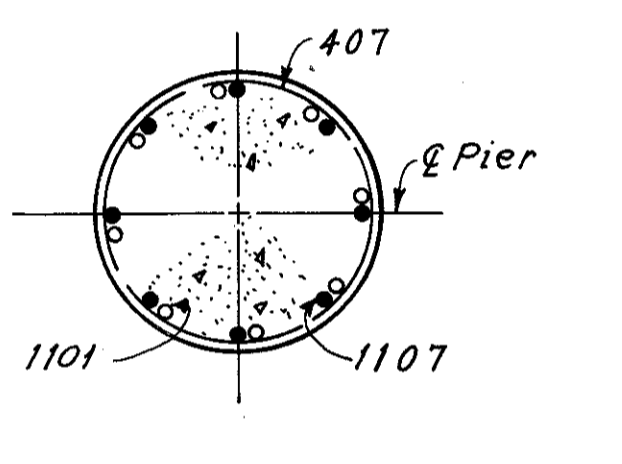
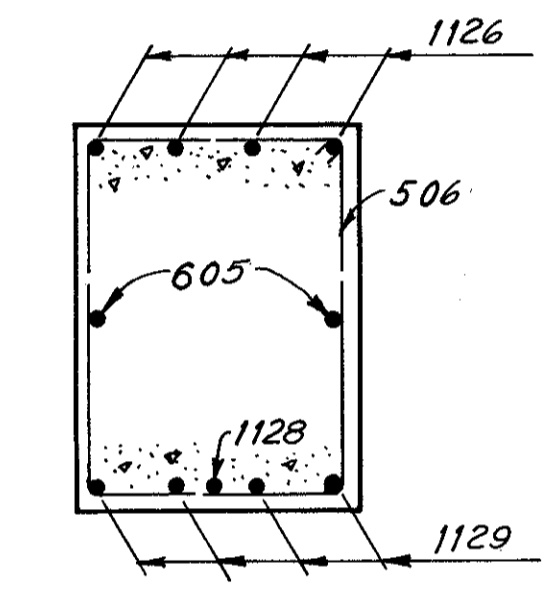
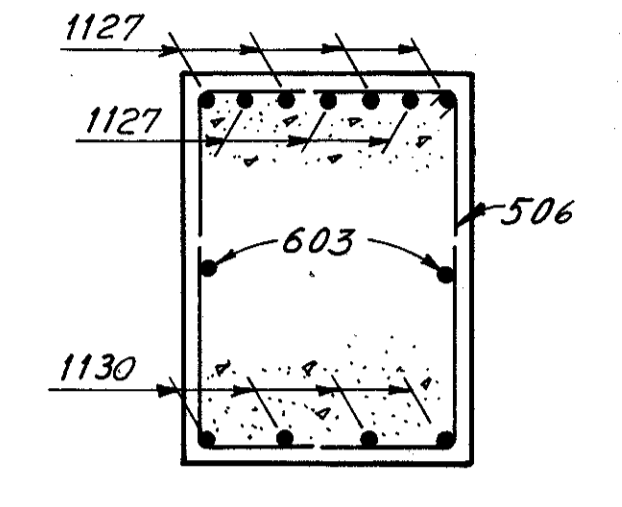
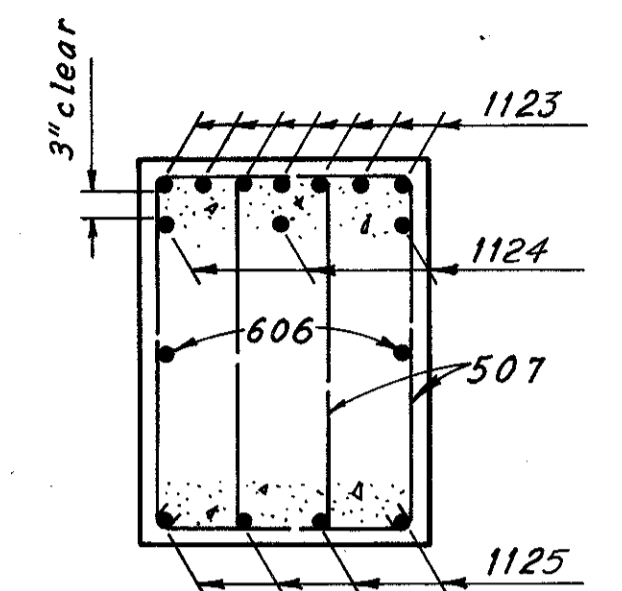
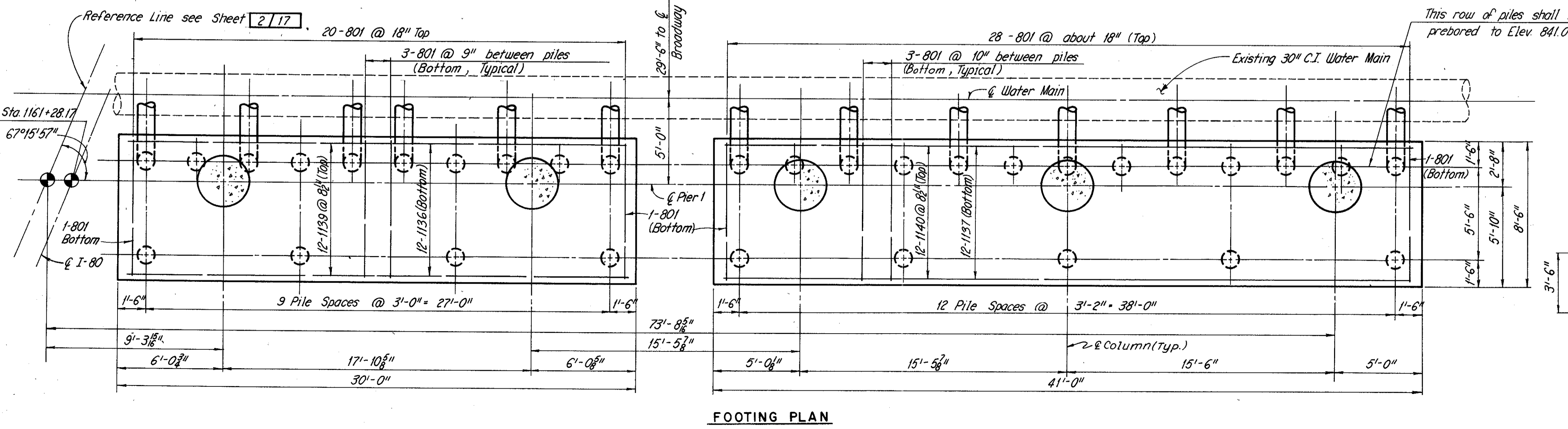
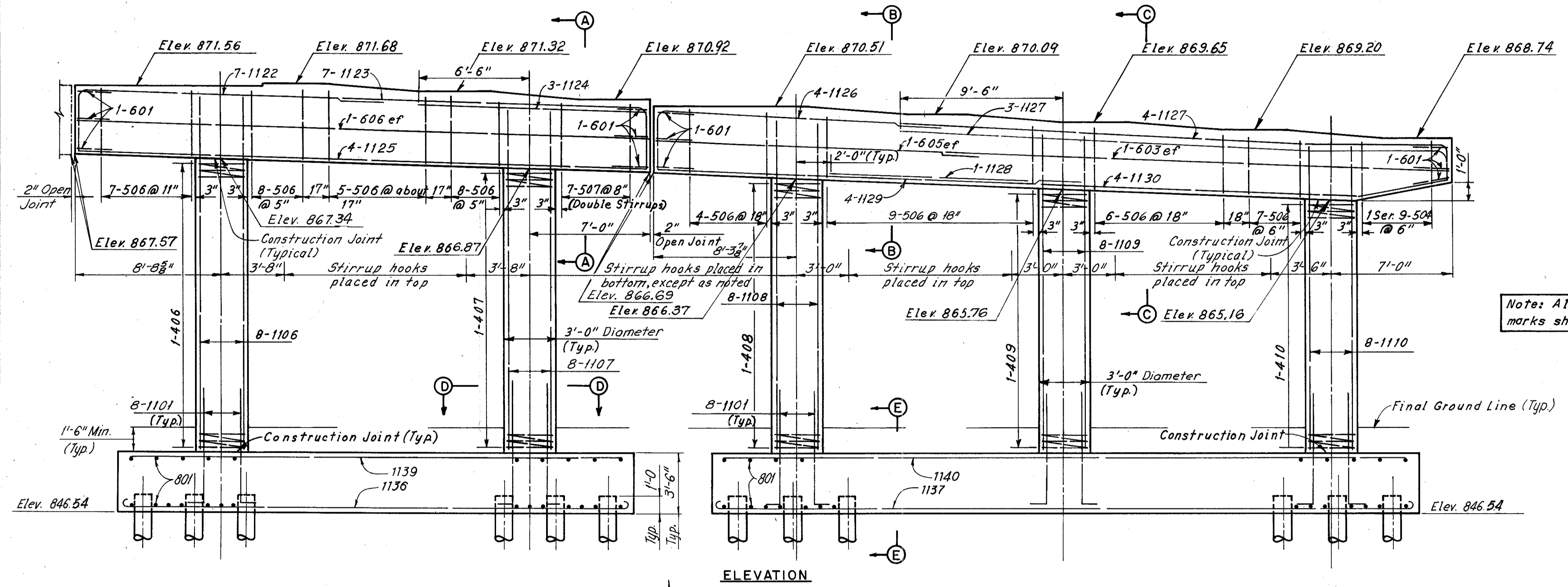
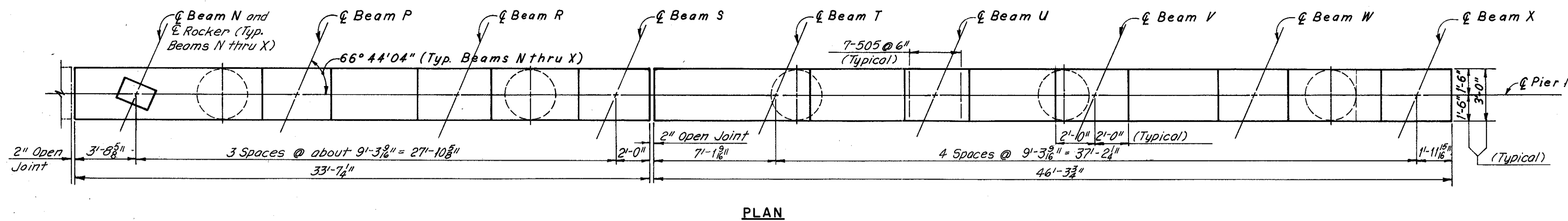
SHEET 8/17

REVISIONS
 DEC 22 1962

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

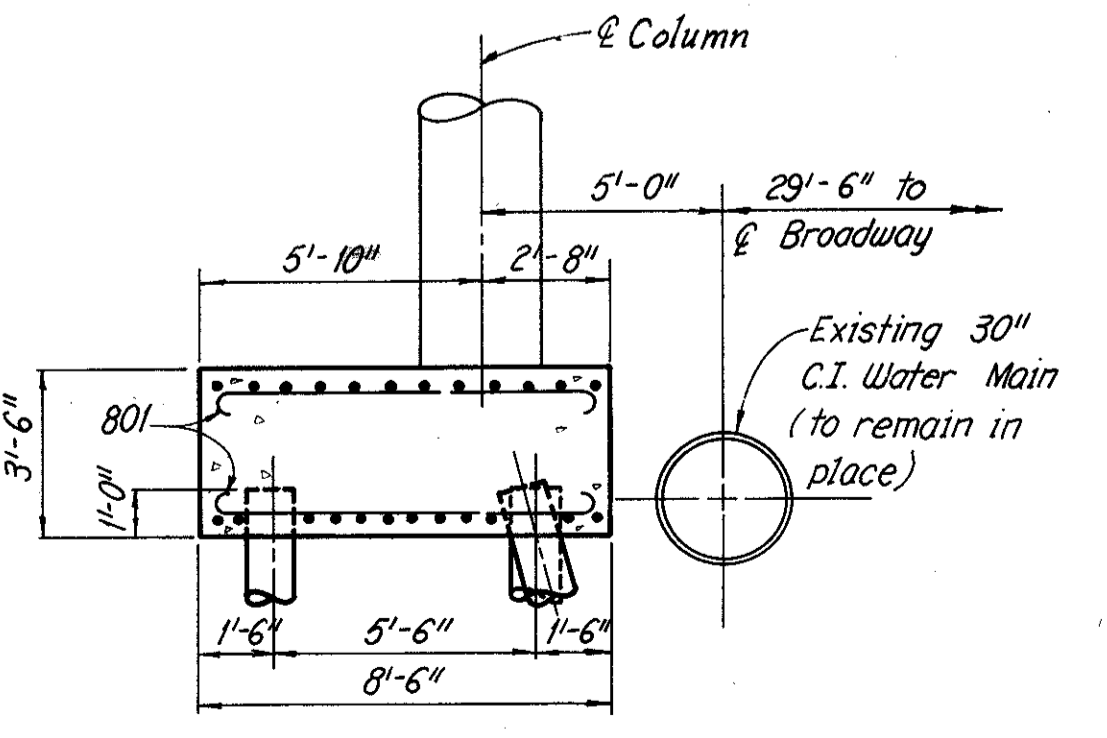
315
 390

CUYAHOGA COUNTY
 CUY-80-21.40



Note: All reinforcing bar marks shall be prefixed PA.

Notes:
 All piles are 12" 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 Contractor shall take all necessary precautions to insure against damage to the existing 30" water main.
 The following abbreviation is used:
 ef = each face



H.N.T.B. BR. NO. 7
 HOWARD, NEEDLES, TAMMEN, & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

PIER I-SOUTH HALF
 I-80 AND RAMP B-OBS OVER BROADWAY

BR. NO. CUY-80-2154 STA. 1160+73.77
 STA. 1162+58.23

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
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DATE	DATE	DATE	DATE	DATE
5-16-68	6-3-69	7-2-69		

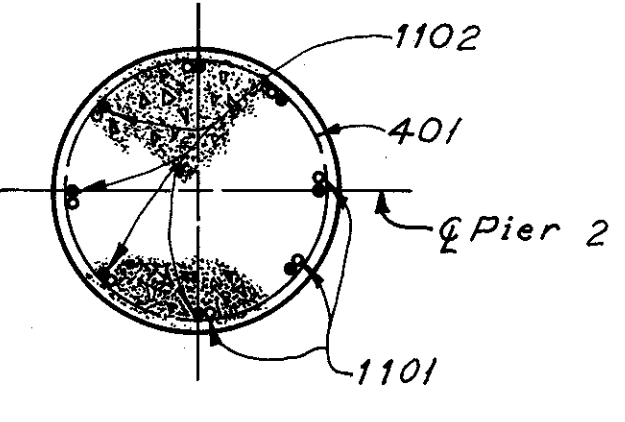
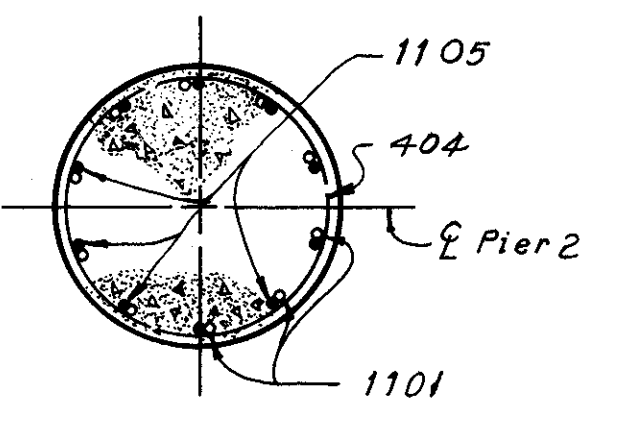
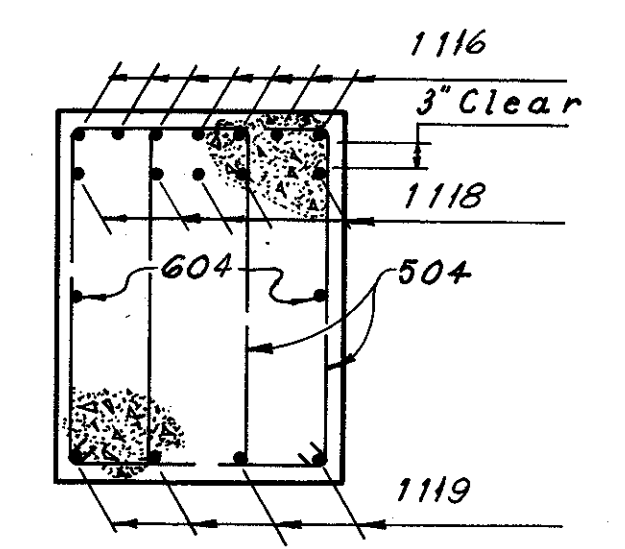
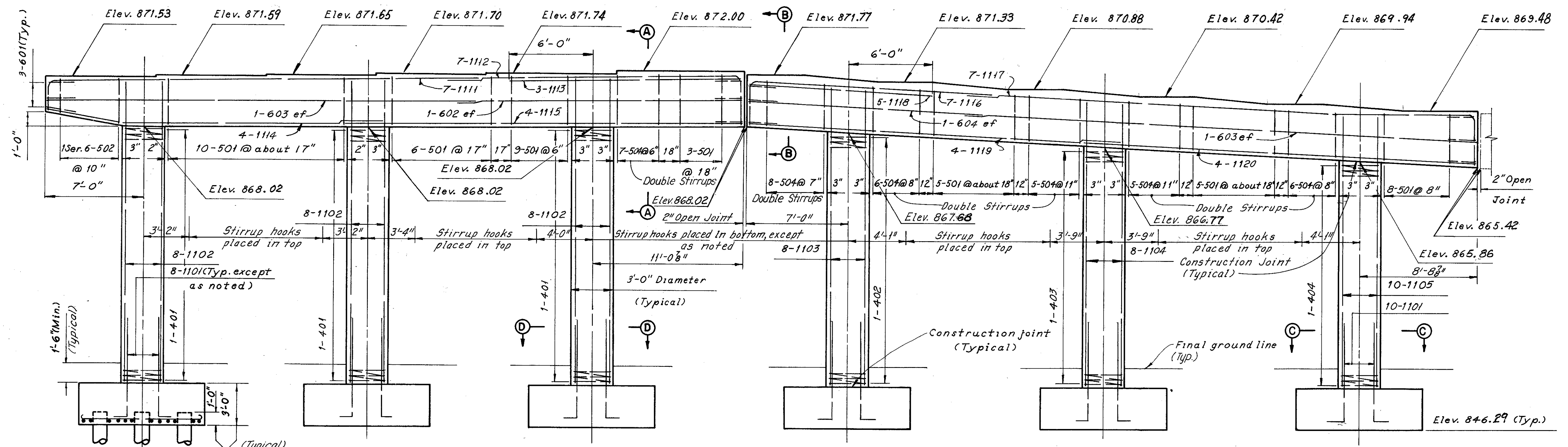
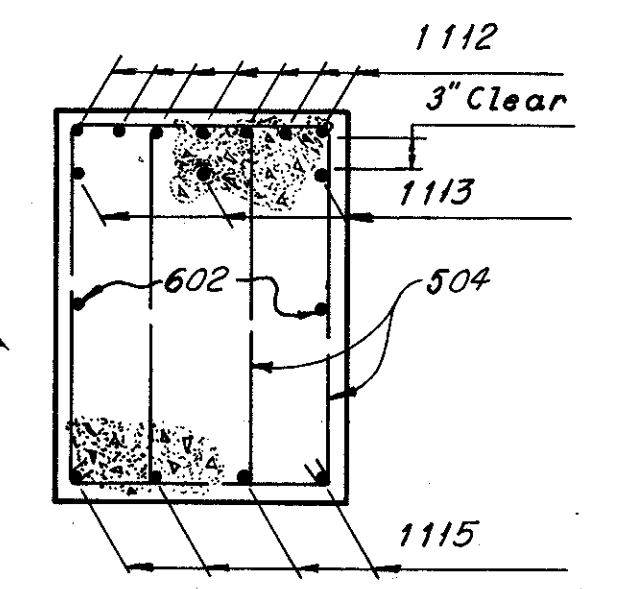
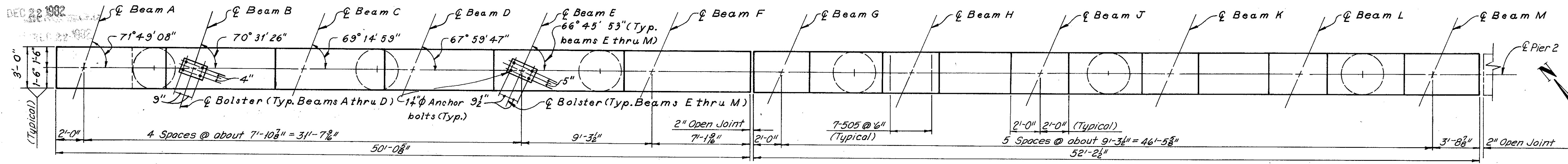
SHEET 9 / 17

INCH PLOTTED
DEC 22 1982

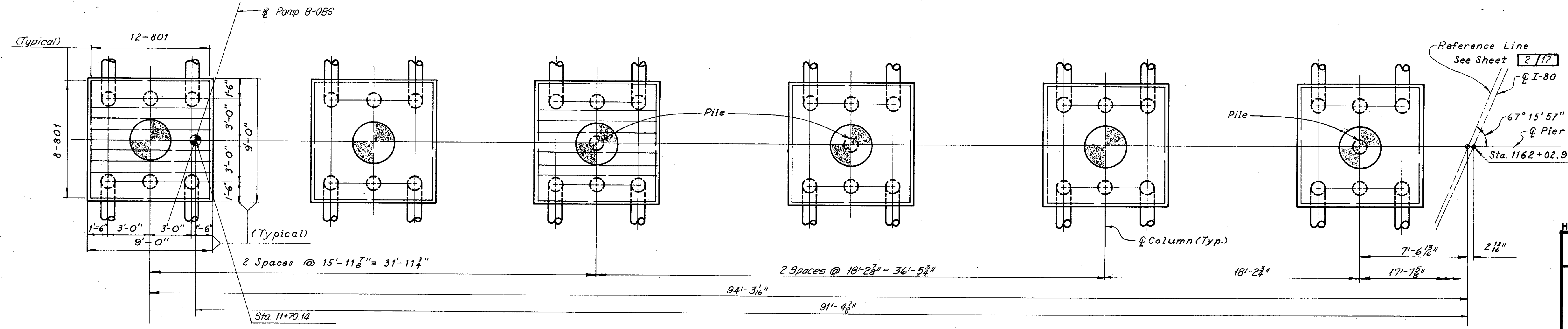
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

316
390

CUYAHOGA COUNTY
CUY.-80-21.40



Note: All reinforcing bar marks shall be prefixed PB.



Note: Special care shall be taken in placing reinforcing steel in the vicinity of the bridge seat so as to avoid interference with the drilling of anchor bolt holes. For anchor bolt details see Ohio Standard Drawing RB-1-55. For additional Notes see Sheet 9/17.

H.N.T.B. BR. NO. 7

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

PIER 2-NORTH HALF
I-80 AND RAMP B-OBS OVER BROADWAY

BR. NO. CUY-80-2154 STA. 1160+73.77
CUYAHOGA COUNTY OHIO STA. 1162+58.23

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
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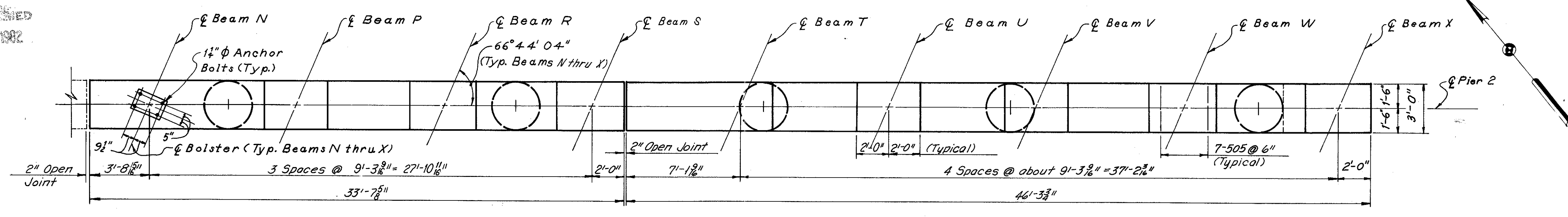
SHEET 10/17

MICROFILMED
DEC 22 1982

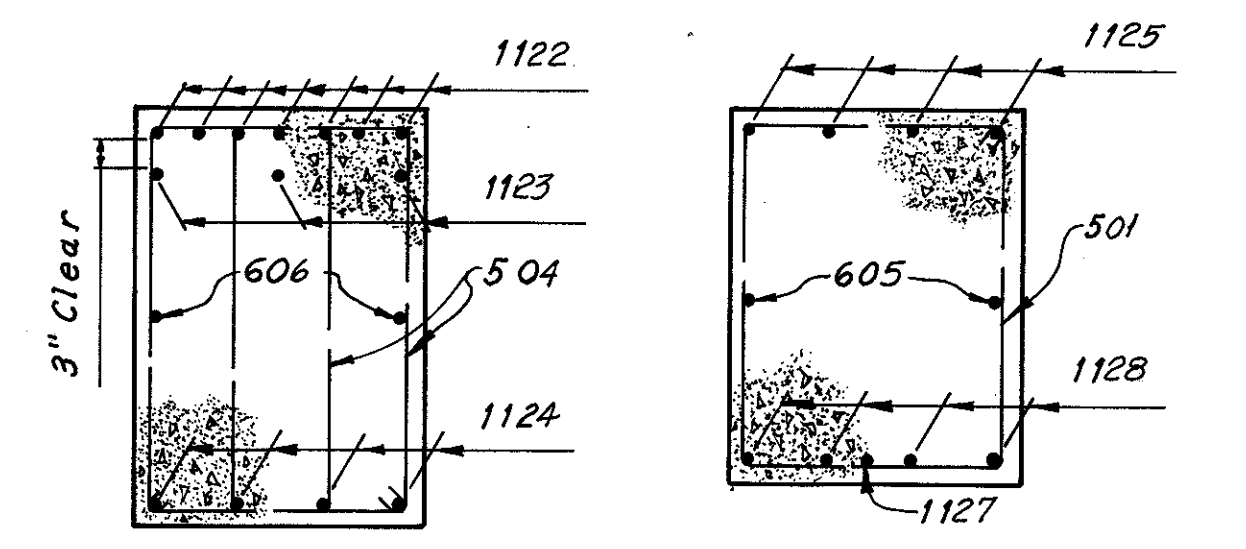
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

317
390

CUYAHOGA COUNTY
CUY.-80-21.40

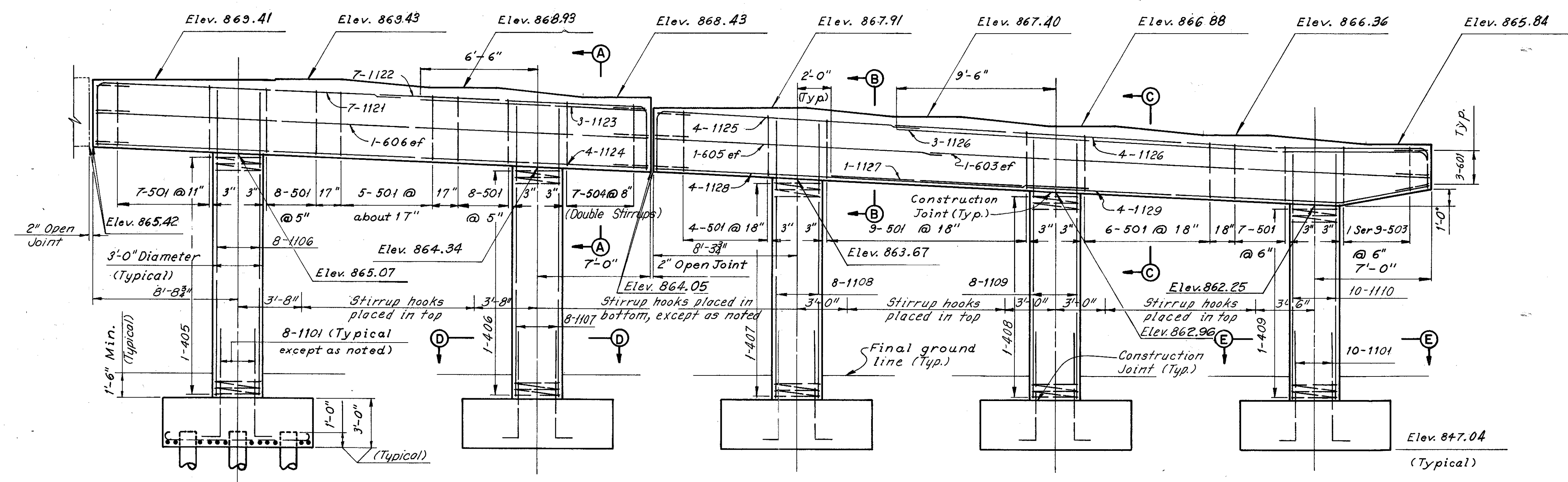


PLAN

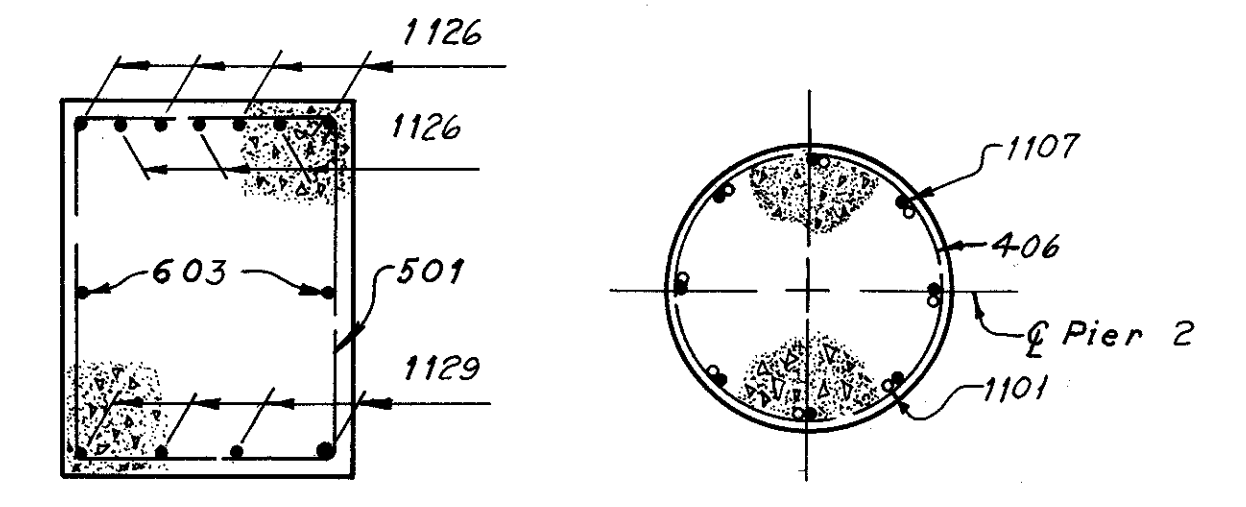


SECTION A-A

SECTION B-B

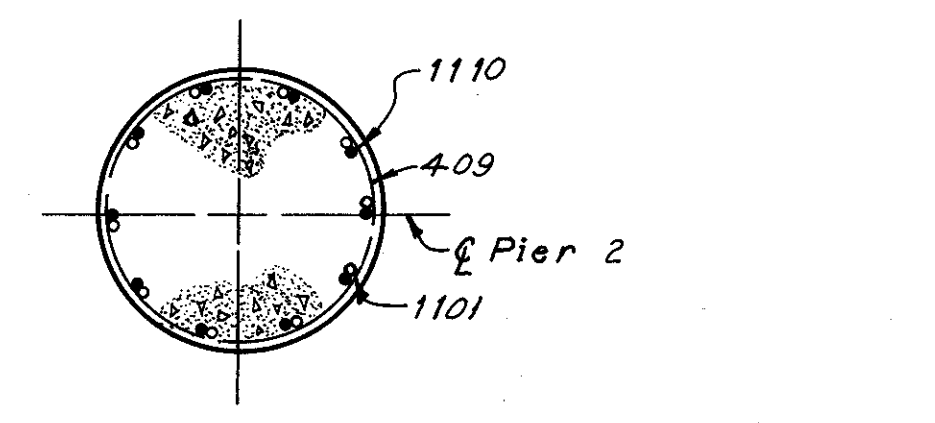


ELEVATION



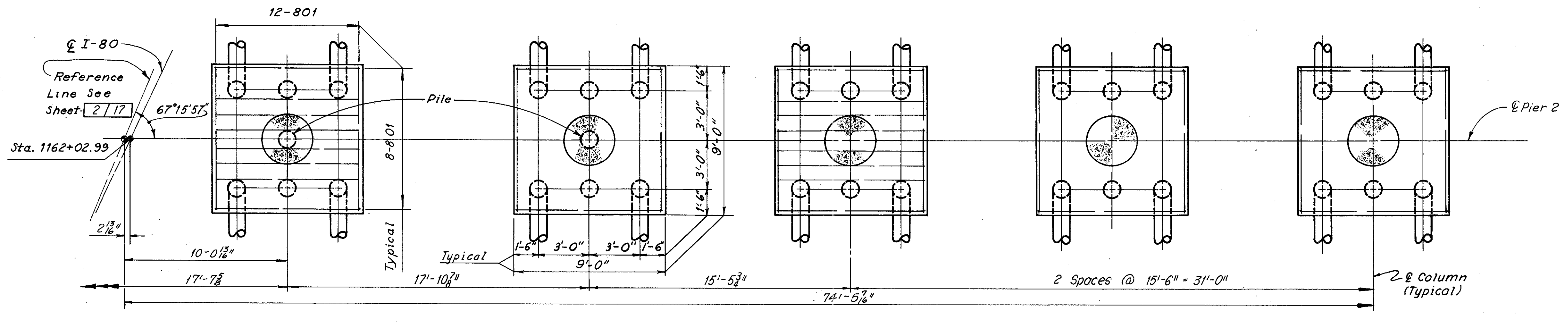
SECTION C-C

SECTION D-D



SECTION E-E

Note: All reinforcing bar marks shall be prefixed PB.



FOOTING PLAN

Note:
Special care shall be taken in placing reinforcing steel in the vicinity of the bridge seat so as to avoid interference with the drilling of anchor bolt holes.
For anchor bolt details see Ohio Standard Drawing RB-1-55.
For additional Notes see Sheet 9/17.

H.N.T.B. BR. NO. 7

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

PIER 2-SOUTH HALF
I-80 AND RAMP B-OBS OVER BROADWAY

BR. NO. CUY-80-2154 STA. 1160+73.77
STA. 1162+58.23

CUYAHOGA COUNTY OHIO

DRAWN BY: TRACER/CJ CHECKED BY: [] REVIEWED: []
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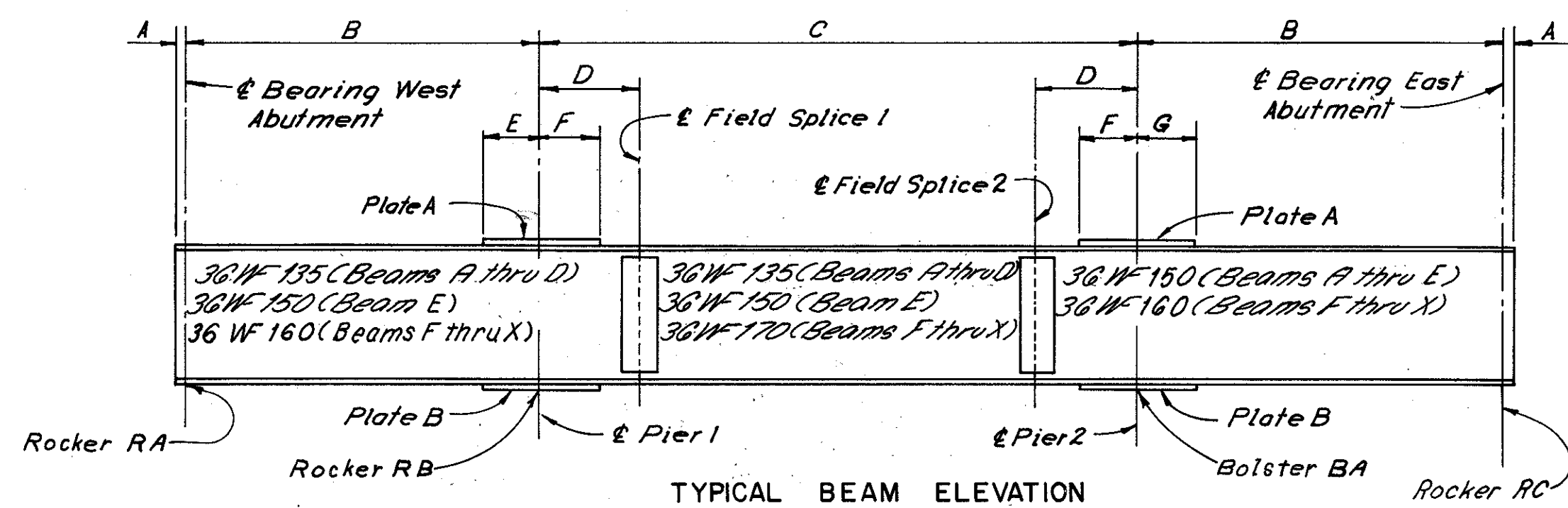
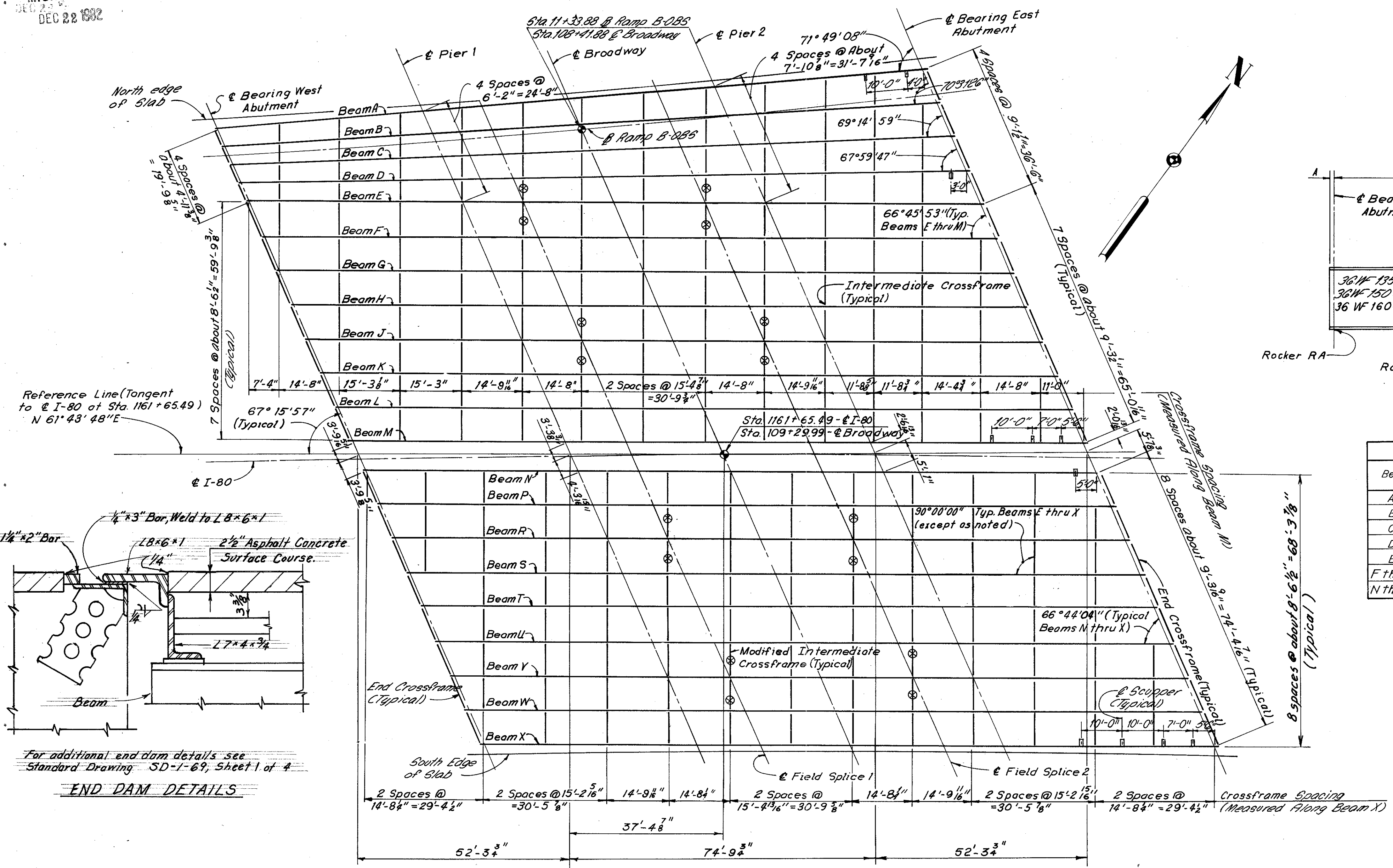
SHEET 11/17

MICROFILMED
DEC 22 1992

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

318
390

CUYAHOGA COUNTY
CUY-80-21.40



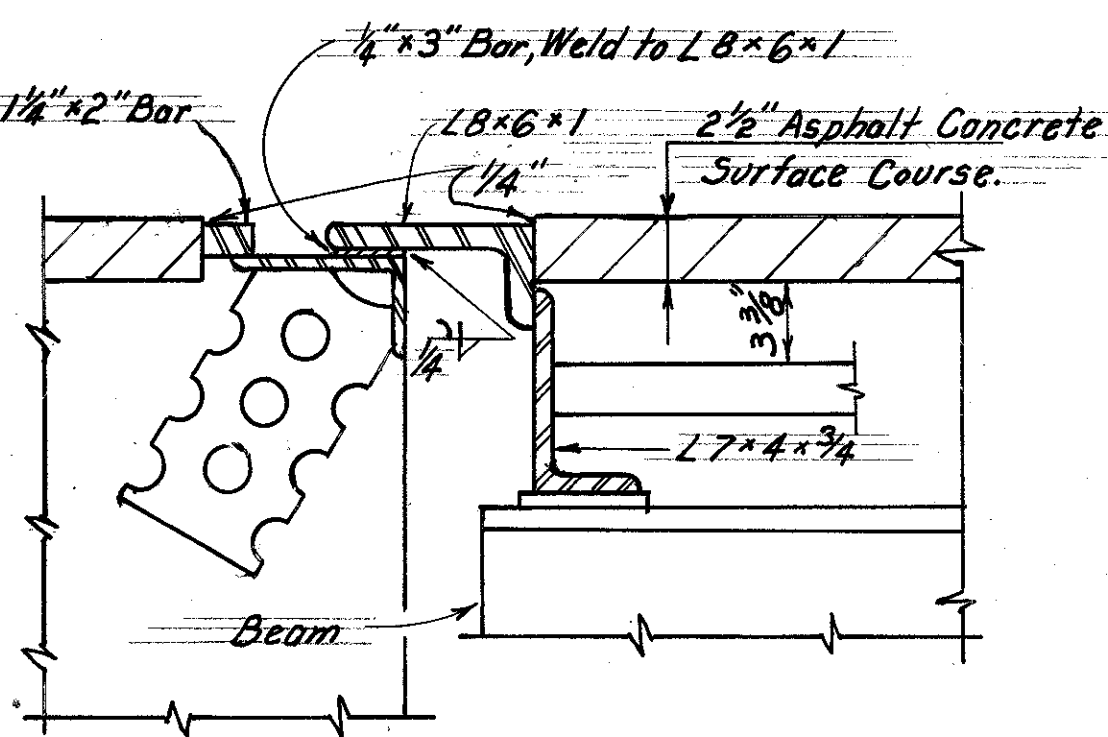
Note: Cover Plate lengths are typical top and bottom.

Beam	Dimensions							Plate Sizes	
	A	B	C	D	E	F	G	A	B
A	9 3/8"	50'-9 7/8"	72'-7 1/2"	14'-3 3/8"	7'-0"	7'-0"	7'-0"	10 1/2" x 7 1/8"	13 1/2" x 1 1/2"
B	9 7/8"	51'-2 1/4"	73'-2 1/4"	14'-5 5/8"	7'-0"	7'-0"	7'-0"	10 1/2" x 7 1/8"	13 1/2" x 1 1/2"
C	9 1/2"	51'-7 7/8"	73'-9 7/8"	14'-6 3/8"	7'-0"	7'-0"	7'-0"	10 1/2" x 7 1/8"	13 1/2" x 1 1/2"
D	9 3/8"	52'-0 1/2"	74'-5 1/4"	14'-8 1/4"	7'-0"	7'-0"	7'-0"	10 1/2" x 7 1/8"	13 1/2" x 1 1/2"
E	9 1/8"	52'-6 1/4"	75'-1 1/8"	14'-9 1/4"	7'-0"	7'-0"	7'-0"	10 1/2" x 7 1/8"	13 1/2" x 1 1/2"
F thru M	9 1/8"	52'-6 1/4"	75'-1 1/8"	14'-9 1/4"	7'-0"	7'-0"	7'-0"	10 1/2" x 7 1/8"	13 1/2" x 1 1/2"
N thru X	9 1/8"	52'-6 1/4"	75'-1 1/8"	14'-9 1/4"	7'-0"	7'-0"	7'-0"	10 1/2" x 7 1/8"	13 1/2" x 1 1/2"

Beam	SHOE SCHEDULE				
	Rocker RA	Rocker RB	Bolster BA	Rocker RC	
A thru D	R-75	R-125	B-150	R-75	
E	R-75	R-150	B-175	R-75	
F thru X	R100	R-175	B-175	R-100	

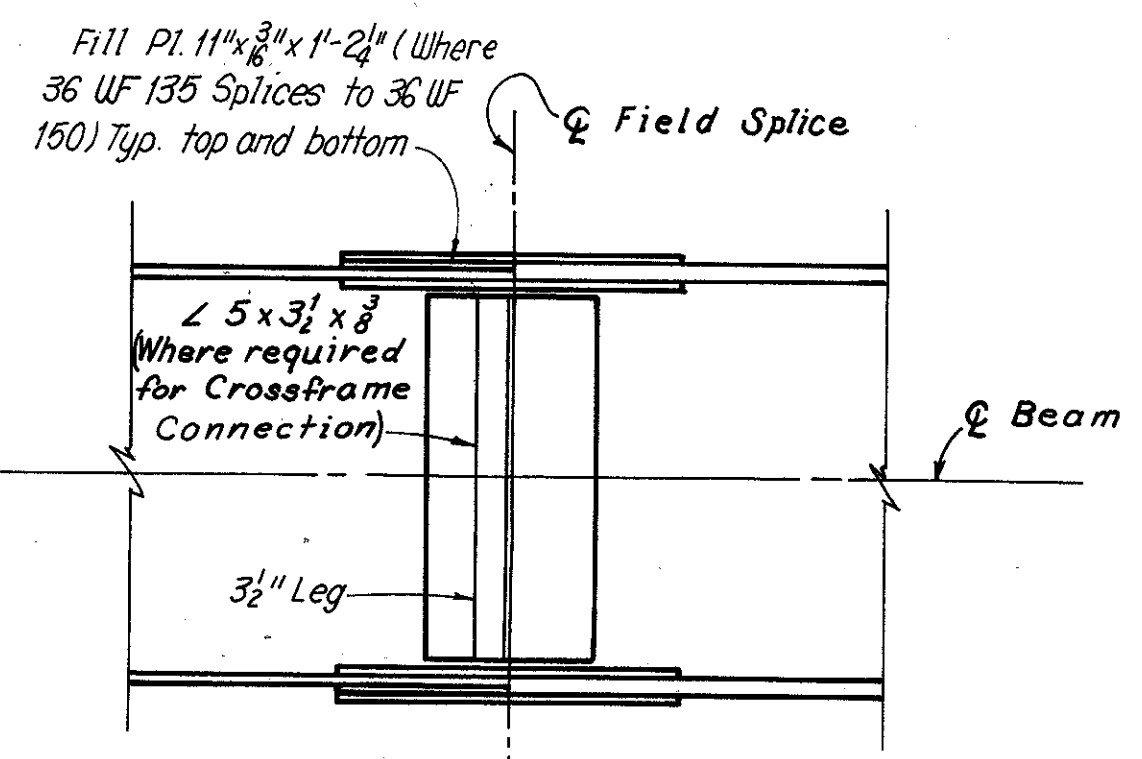
Note: Delete 1/2" side plates attached to both sides of sole plates for all rockers and bolsters on beams A, B, L, M, N and X.

Notes:
 For details of Rockers and bolsters see Ohio Standard Drawing RB-1-55.
 For additional details of end crossframes, roadway end dams and curb plates see Ohio Standard Drawing SD-1-69, Sheets 1 and 2 of 4. Curb plate details for the Type 8 Modified Curb shall be similar to the details shown for "Sidewalks, Safety Curbs and Raised Medians" on Sheet 2 of 4, except they shall be 6" high. The supporting angle (7x4x1/2) shall be continuous below the Type 8 Modified Curb.
 For moment plate welding details see Ohio Standard Drawing SD-1-69, Sheet 3 of 4.
 For drainage details see Sheets [CD1] & [CD2].
 For horizontal offsets from exterior beams to edges of slab see sheet [13] [17].
 For locations and details of underpass luminaire supports see Lighting Plans. The supports are included with the Lighting Quantities for payment.
 H.N.T.B. BR. NO. 7

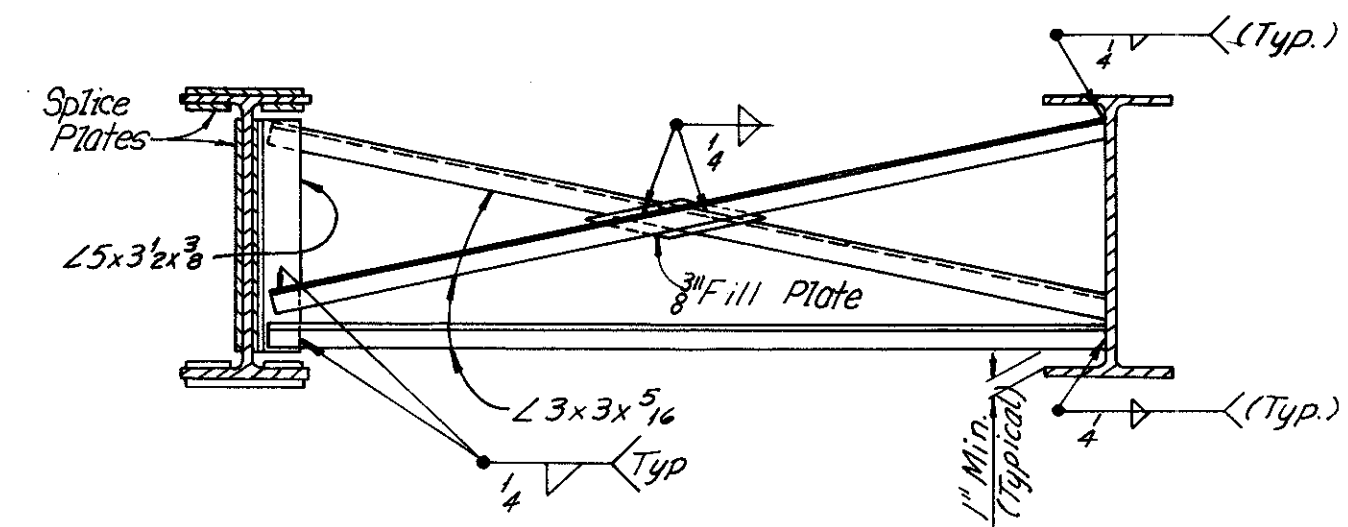


For additional end dam details see Standard Drawing SD-1-69, Sheet 1 of 4

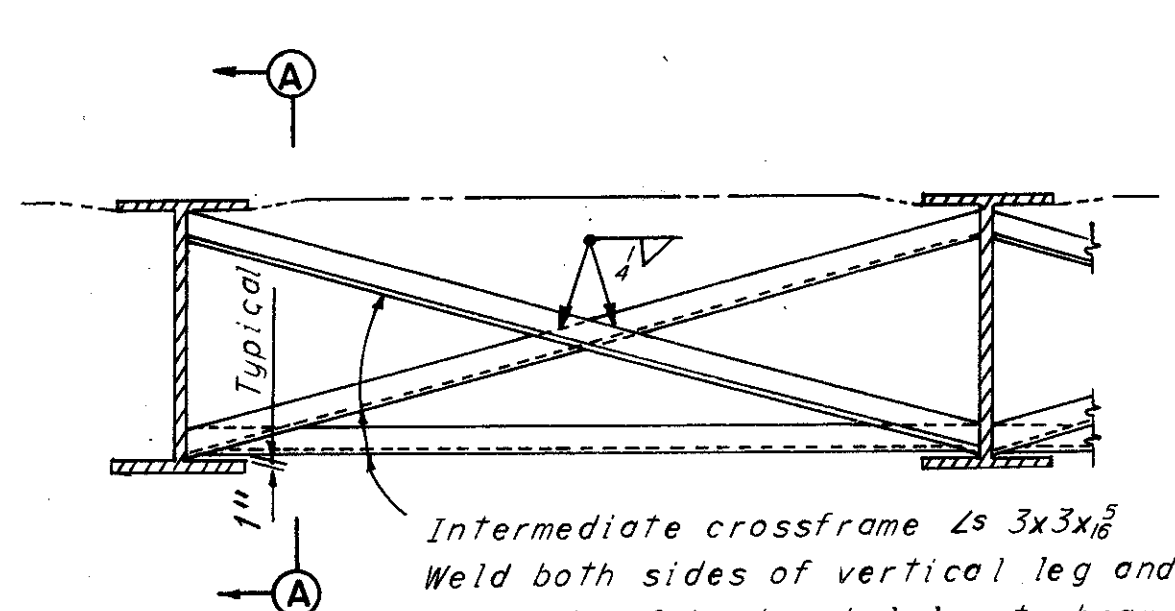
END DAM DETAILS



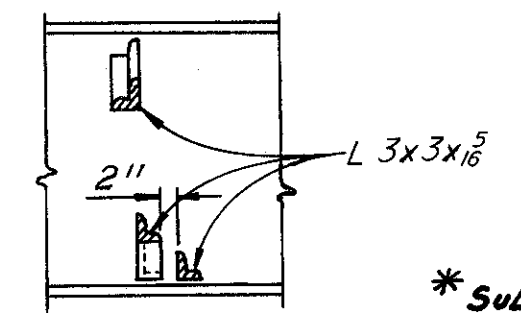
(For additional details see Ohio Standard Drawing SD-1-69, Sheet 4 of 4)



MODIFIED INTERMEDIATE CROSSFRAME



INTERMEDIATE CROSSFRAME



SECTION A-A

* Subdrainage as per Sheet [CD2] shall not be provided on the ramp side of Type 8 Modified curb.

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

FRAMING PLAN

I-80 AND RAMP B-OBS OVER BROADWAY (S.R. 14)

BR. NO. CUY-80-2154 STA. 1160+73.77
CUYAHOGA COUNTY OHIO STA. 1162+58.23

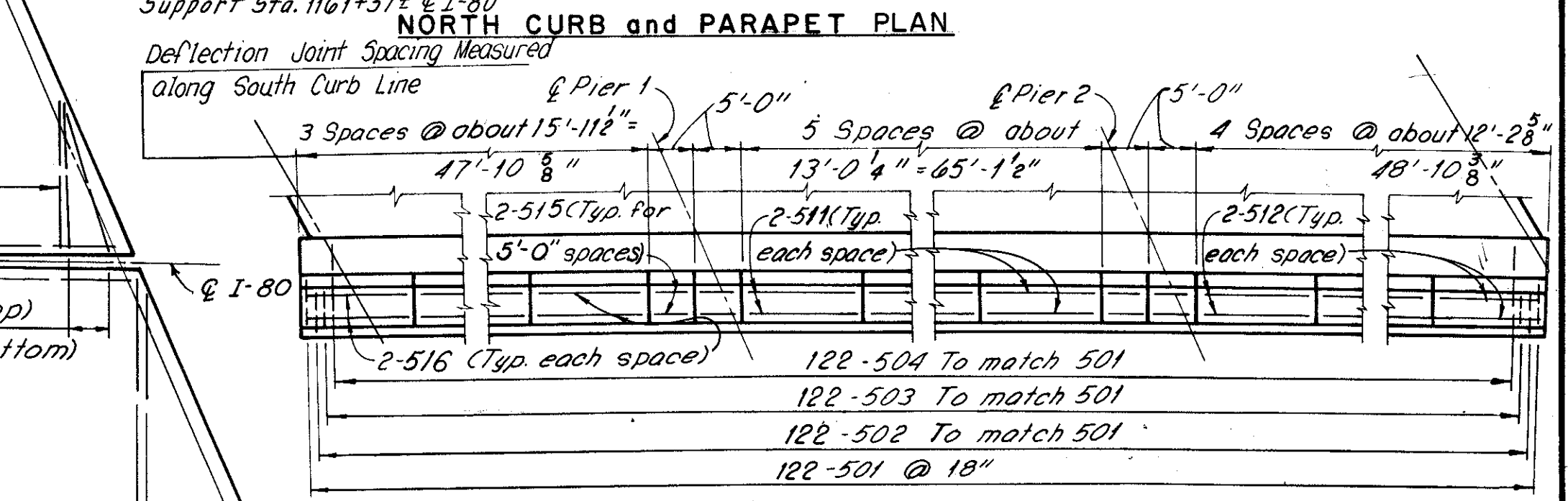
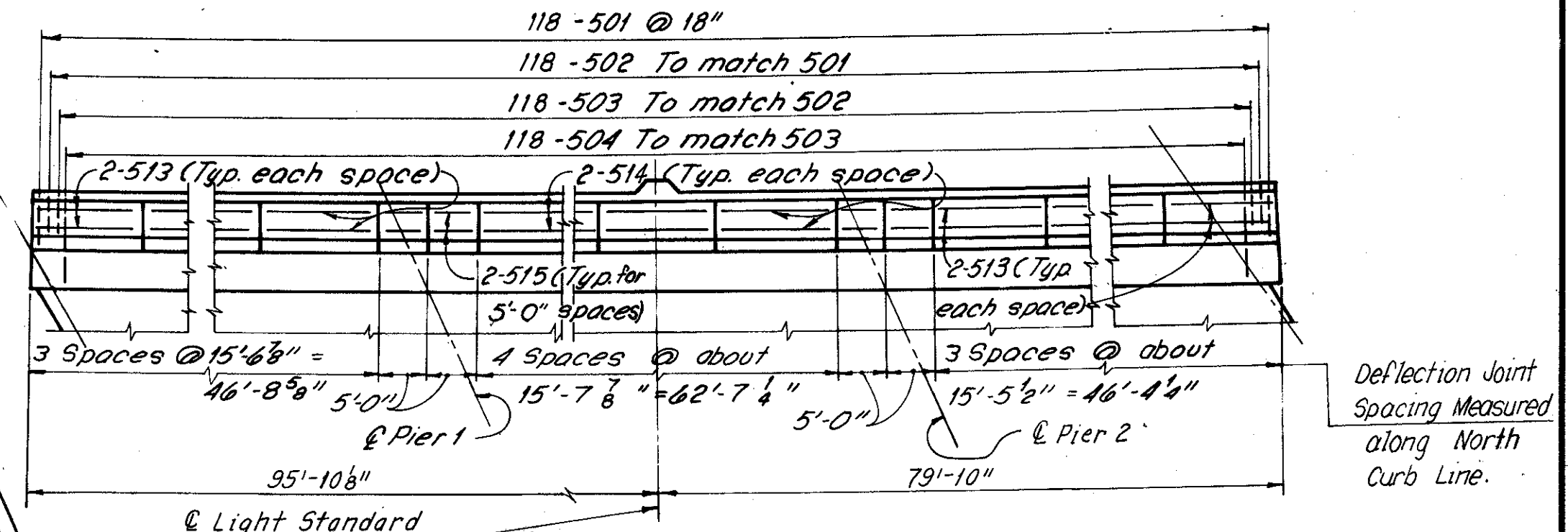
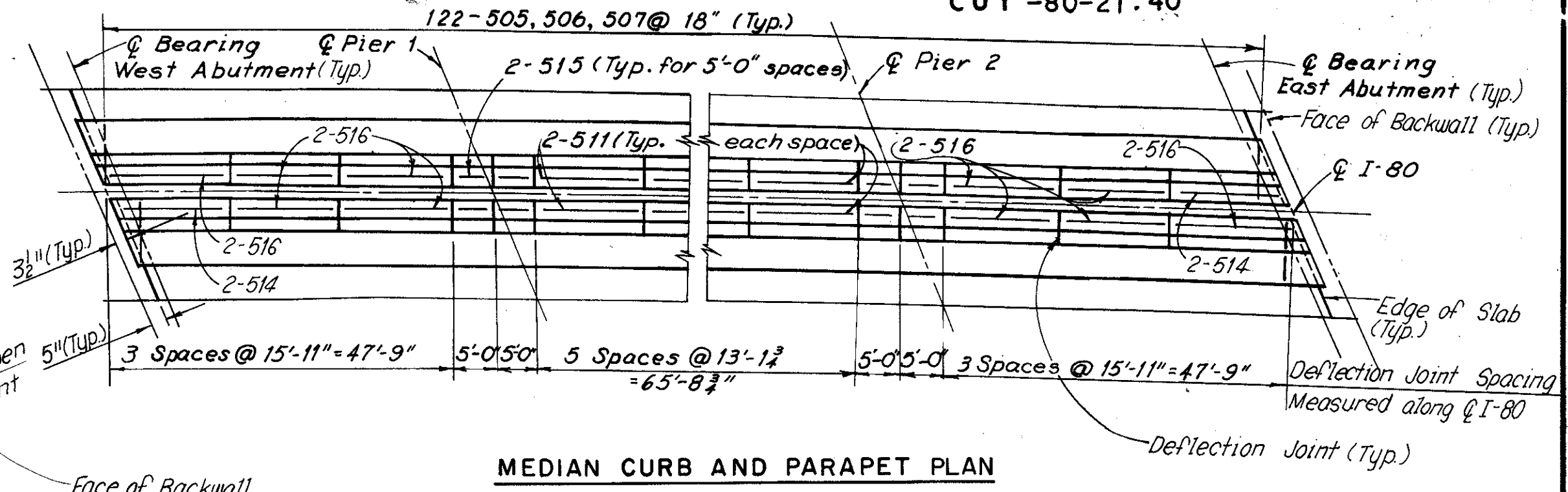
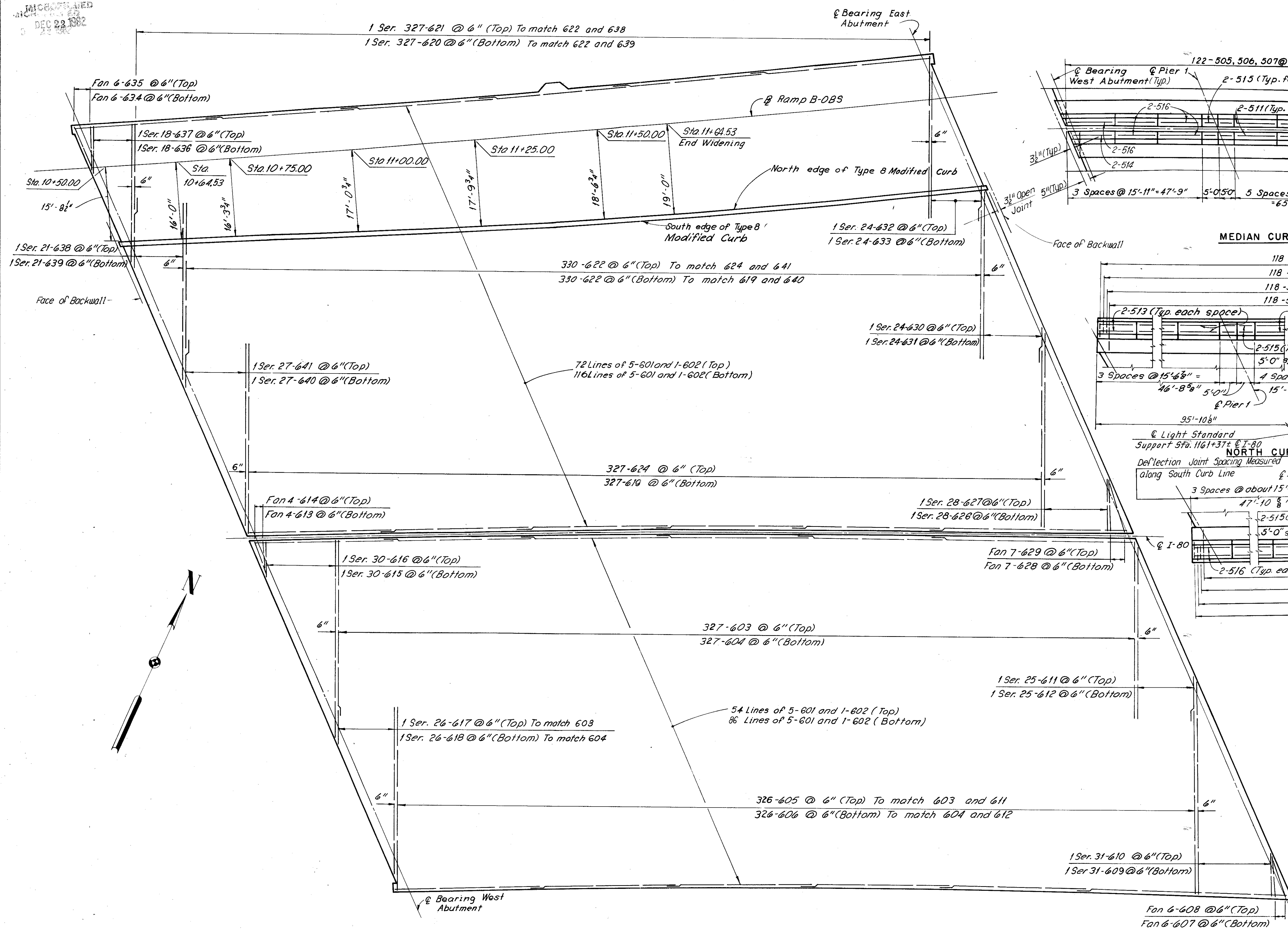
DRAWN J.S.	TRACED MS	CHECKED L.J.G.	REVIEWED	REVISED
DATE 5/14/68	DATE 6-3-68	DATE 7-23-68	DATE	DATE

MICROFILMED
DEC 22 1982

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

320
390

CUYAHOGA COUNTY
CUY-80-21.40



Notes: The preformed expansion joint filler in the railing parapet deflection joints may be either 1/4" gray sponge rubber or 1/4" gray cellular polyvinyl chloride (PVC) sponge.
 The deflection joint extends from top of parapet to first construction joint and is included for payment with Superstructure Concrete.
 All transverse reinforcement North of open joint is placed perpendicular to Beam M and all transverse reinforcement South of open joint is placed perpendicular to Beam N, except for the fanned bars in the corners.
 All reinforcing bar marks shall be prefixed S.
 For longitudinal reinforcement placement and additional reinforcement over piers and in curbs see Sheet 15/17.
 For additional Notes see Sheet 12/17.
 For Light Standard Support Details see Sheet CD 1.

DECK PLAN

H.N.T.B. BR. NO. 7

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

DECK PLAN
I-80 AND RAMP B-OBS OVER BROADWAY

BR. NO. CUY-80-2154 STA. 1160+73.77
STA. 1160+58.23

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
JJS	AW	LJG		
DATE 3-11-68	DATE 4-12-68	DATE 8-5-68	DATE	DATE

SHEET 14/17

MICROFILMED
DEC 22 1982

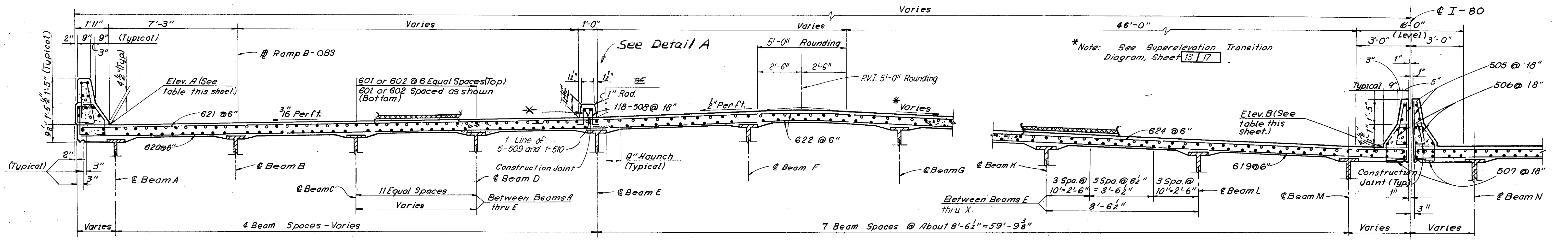
Note: A typical haunch width of 9" shall be used for computing quantity of concrete. However, the haunch width may vary between 6" and 12" provided that the slope shall be not more than 1:4 for a haunch less than 9" in width.

NOTES: * Field bend reinforcing steel as required under type B modified curb.

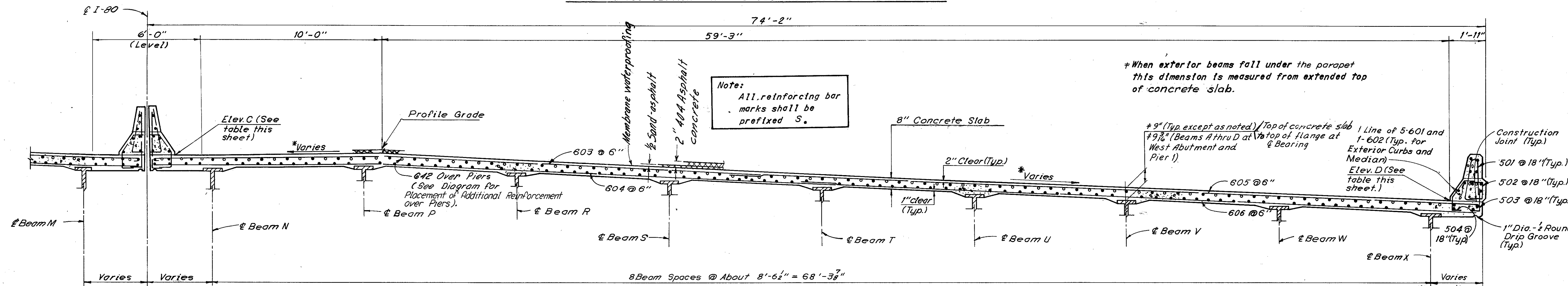
** When beams D or E fall under the Type B modified curb the elevation shown is to a horizontal line extending from the top of concrete slab at the curb line nearest the beam.

FED. RD. DIVISION	STATE	PROJECT	321
2	OHIO		390

CUYAHOGA COUNTY
CUY-80-21.40



TYPICAL CROSS SECTION - RAMP B-OBS AND WESTBOUND LANES I-80



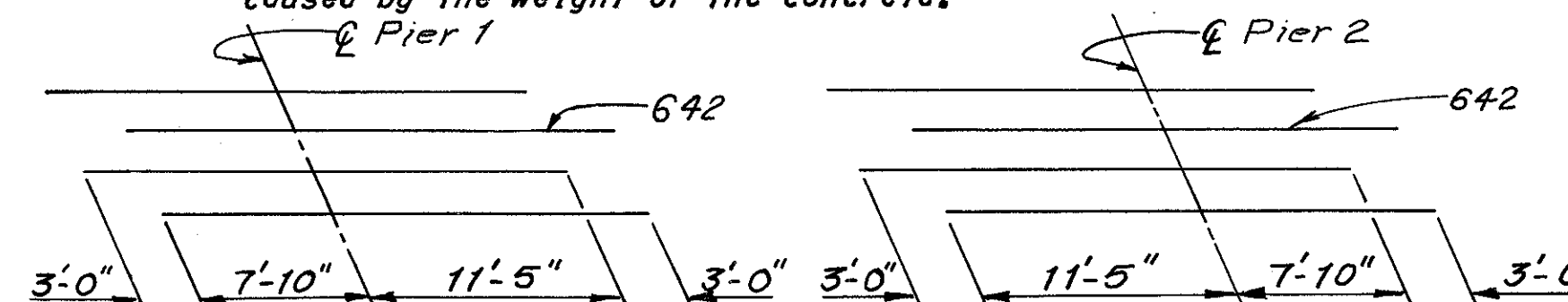
TYPICAL CROSS SECTION - EASTBOUND LANES I-80

Beam	Span 1				Span 2				Span 3				E. Abut.
	1/4 Point	1/2 Point	3/4 Point	1/4 Point	1/2 Point	3/4 Point	1/4 Point	1/2 Point	3/4 Point	1/4 Point	1/2 Point	3/4 Point	
A	879.31	879.04	878.77	878.49	878.20	877.78	877.34	876.89	876.44	876.12	875.80	875.51	875.25
B	879.35	879.08	878.81	878.53	878.25	877.82	877.39	876.95	876.49	876.18	875.87	875.58	875.33
C	879.39	879.13	878.85	878.58	878.29	877.87	877.44	877.00	876.55	876.24	875.93	875.66	875.42
D	879.43	879.17	878.90	878.62	878.34	877.92	877.49	877.05	876.61	876.30	876.00	875.74	875.50
E	879.47	879.21	878.94	878.67	878.38	877.97	877.54	877.12	876.79	876.52	876.24	875.92	875.57
F	879.67	879.40	879.13	878.87	878.61	878.23	877.85	877.46	877.07	876.80	876.51	876.18	875.82
G	879.72	879.42	879.13	878.83	878.53	878.11	877.68	877.26	876.83	876.55	876.24	875.90	875.54
H	879.48	879.16	878.84	878.53	878.21	877.75	877.30	876.85	876.39	876.09	875.75	875.40	875.03
J	879.22	878.89	878.55	878.21	877.87	877.39	876.90	876.42	875.94	875.61	875.26	874.90	874.52
K	878.96	878.60	878.24	877.89	877.53	877.01	876.50	875.99	875.48	875.13	874.76	874.39	874.01
L	878.68	878.30	877.92	877.54	877.16	876.61	876.08	875.54	875.01	874.64	874.26	873.88	873.49
M	878.23	877.85	877.48	877.08	876.70	876.25	875.79	875.31	874.85	874.45	874.04	873.62	873.21
N	878.09	877.72	877.35	876.99	876.63	876.10	875.57	875.03	874.48	874.08	873.69	873.29	872.89
P	878.28	877.90	877.52	877.13	876.75	876.19	875.63	875.07	874.50	874.10	873.71	873.31	872.91
R	878.08	877.66	877.24	876.82	876.39	875.79	875.19	874.59	874.00	873.60	873.21	872.82	872.44
S	877.76	877.32	876.88	876.44	875.99	875.36	874.72	874.10	873.49	873.09	872.69	872.31	871.92
T	877.43	876.97	876.51	876.04	875.58	874.91	874.25	873.60	872.98	872.57	872.18	871.79	871.41
U	877.09	876.61	876.13	875.64	875.15	874.46	873.77	873.09	872.47	872.06	871.67	871.28	870.89
V	876.75	876.24	875.74	875.23	874.72	873.99	873.27	872.58	871.95	871.54	871.15	870.76	870.38
W	876.38	875.86	875.33	874.80	874.27	873.51	872.76	872.06	871.43	871.03	870.64	870.25	869.86
X	876.01	875.47	874.92	874.36	873.81	873.02	872.24	871.53	870.91	870.51	870.12	869.73	869.35

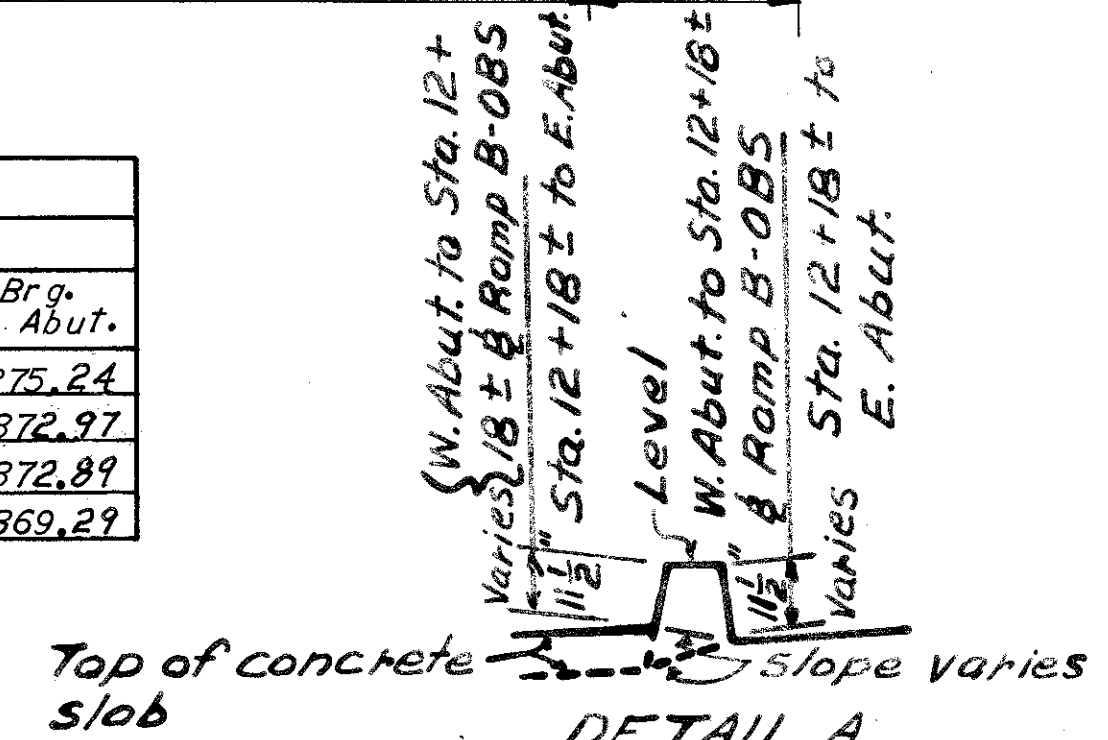
Note: When Beams A and X fall underneath the curb the elevation shown is to an extended top of concrete slab.

Elevation	Span 1				Span 2				Span 3				E. Abut.
	1/4 Point	1/2 Point	3/4 Point	1/4 Point	1/2 Point	3/4 Point	1/4 Point	1/2 Point	3/4 Point	1/4 Point	1/2 Point	3/4 Point	
A	879.31	879.05	878.78	878.49	878.20	877.80	877.37	876.92	876.44	876.13	875.81	875.52	875.24
B	878.15	877.80	877.44	877.06	876.68	876.18	875.67	875.12	874.55	874.16	873.77	873.39	872.97
C	878.08	877.73	877.36	876.98	876.62	876.11	875.60	875.04	874.41	874.08	873.69	873.30	872.89
D	875.98	875.46	874.92	874.37	873.83	873.07	872.30	871.58	870.93	870.51	870.12	869.71	869.29

Note: The elevations shown at the face of curb are those required before concrete is placed. Proper allowance has been made for the deadload deflections caused by the weight of the concrete.



PLACEMENT OF ADDITIONAL REINFORCEMENT OVER PIERS



H.N.T.B. BR. NO. 7
HOWARD, NEEDLES, TAMMEN & BERGENOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

TYPICAL CROSS SECTION
I-80 AND RAMP B-OBS OVER BROADWAY

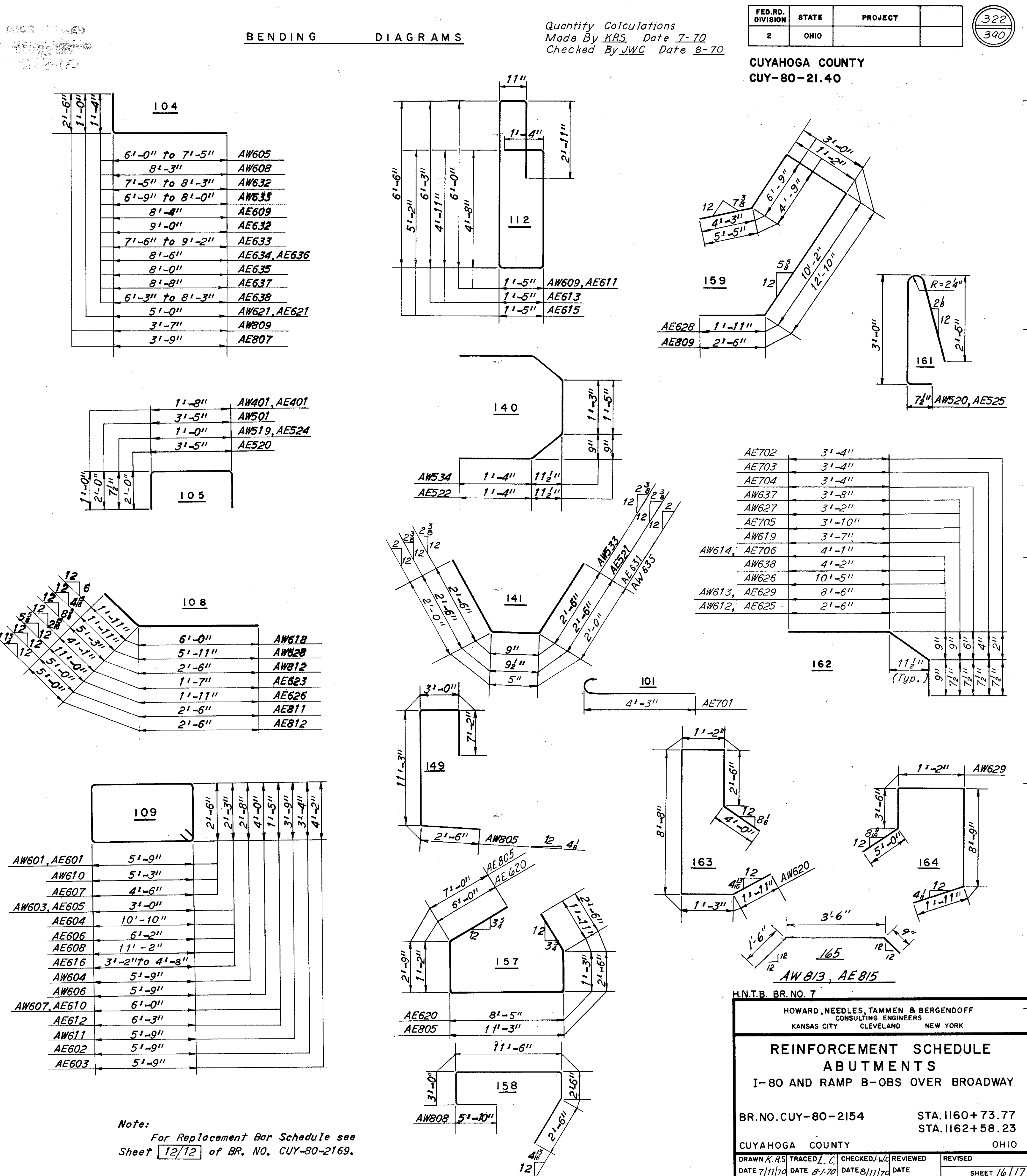
BR. NO. CUY-80-2154 STA. 1160+73.77
STA. 1162+58.23

CUYAHOGA COUNTY OHIO

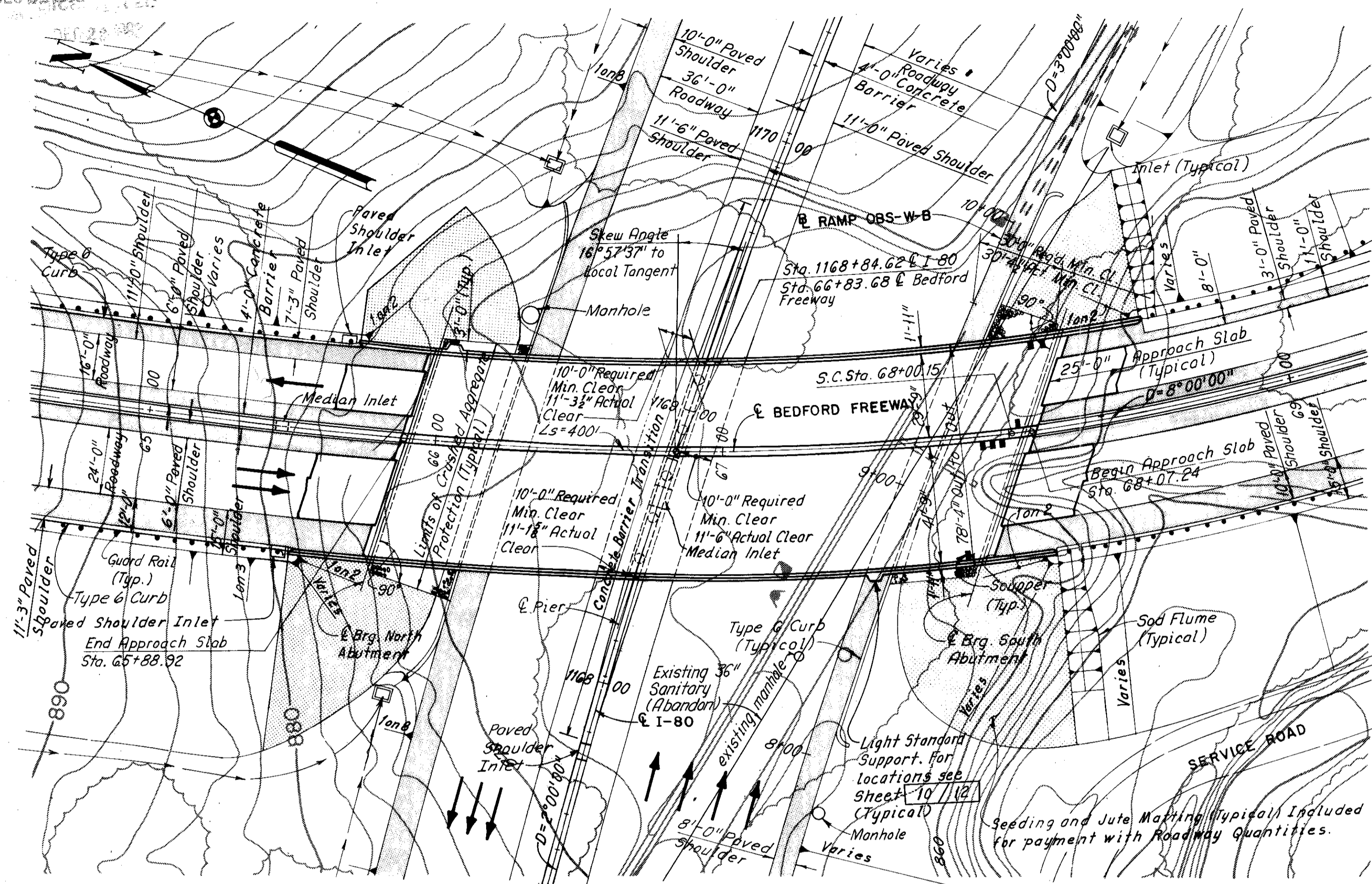
DRAWN J.S.	TRACED M.S.	CHECKED J.G.	REVIEWED
DATE 3-13-68	DATE 4-11-68	DATE 5-8-68	DATE

REVISED 12-27-74
SHEET 15/17

MARK	NO.	LENGTH	TYPE	SER INCR	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER INCR	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER INCR	WEIGHT (LBS.)	
WEST ABUTMENT																		
						AW801	1 Ser. 4	29'3" / 31'5"	Str.	8"	323	AE632	58	101'-2"	104		886	
						AW802	2 Ser. 3	30'4" / 32'0"	Str.	9"	501	AE633	2 Ser. 27	8'-8" / 10'-4"	104	3"	771	
AW401	147	31'-5"			336	AW803	1 Ser. 4	26'-10" / 28'-10"	Str.	8"	297	AE634	18	9'-8"	104		261	
						AW804	34	30'-0"	Str.		2,723	AE635	44	9'-2"	104		606	
AW501	128	7'-2"	105		957	AW805	2	23'-6"	149		125	AE636	2	9'-8"	104		29	
AW502	68	30'-0"	Str.		2,128	AW806	4	5'-9"	Str.		61	AE637	16	9'-10"	104		236	
AW503	1	25'-0"	Str.		26	AW807	6	6'-0"	Str.		96	AE638	2 Ser. 31	7'-5" / 9'-5"	104	1/8"	784	
AW504	18	13'-6"	Str.		253	AW808	2	24'-9"	158		132							
AW505	1	19'-6"	Str.		20	AW809	4	5'-10"	104		62	AE701	2	4'-10"	101		16	
AW506	1	31'-0"	Str.		32	AW810	4	7'-3"	Str.		77	AE702	2	4'-10"	162		20	
AW507	3	9'-0"	Str.		28	AW811	2	5'-6"	Str.		29	AE703	2	4'-11"	162		21	
AW508	14	15'-0"	Str.		219	AW812	4	7'-8"	108		82	AE704	2	5'-0"	162		21	
AW509	8	14'-6"	Str.		121	AW813	72	5'-9"	Str.		1,105	AE705	2	5'-7"	162		23	
AW510	4	17'-3"	Str.		72			TOTAL WEIGHT				AE706	2	5'-10"	162		24	
AW511	1 Ser. 3	15'-0" / 15'-6"	Str.	3"	48	EAST ABUTMENT												
AW512	6	17'-0"	Str.		106	AE801	36	30'-0"	Str.		2,884							
AW513	1	28'-3"	Str.		29	AE802	4	26'-9"	Str.		286							
AW514	1 Ser. 3	16'-0" / 17'-0"	Str.	6"	52	AE401	147	31'-5"	105		336	AE803	2	28'-6"	Str.		152	
AW515	1	19'-3"	Str.		20	AE501	77	30'-0"	Str.		2,409	AE804	4	19'-0"	Str.		203	
AW516	17	11'-0"	Str.		195	AE502	3	13'-9"	Str.		43	AE805	2	25'-5"	Str.		136	
AW517	1	12'-6"	Str.		13	AE503	17	12'-9"	Str.		226	AE806	1 Ser. 4	7'-6" / 10'-0"	Str.	10"	93	
AW518	4	16'-0"	Str.		67	AE504	19	15'-6"	Str.		307	AE807	8	6'-1"	104		130	
AW519	22	2'-0"	105		46	AE505	2	17'-0"	Str.		35	AE808	4	8'-0"	Str.		85	
AW520	12	5'-11"	161		74	AE506	2	14'-3"	Str.		30	AE809	2	28'-10"	159		154	
AW521	20	2'-9"	Str.		57	AE507	2	22'-9"	Str.		47	AE810	1 Ser. 4	6'-0" / 8'-6"	Str.	10"	77	
AW522	10	3'-9"	Str.		39	AE508	4	6'-9"	Str.		28	AE811	4	7'-5"	108		79	
AW523	2	5'-0"	Str.		10	AE509	9	9'-0"	Str.		84	AE812	4	7'-5"	108		79	
AW524	1	7'-6"	Str.		8	AE510	5	4'-6"	Str.		23	AE813	2 Ser. 3	29'-6" / 30'-9"	Str.	7 1/2"	483	
AW525	8	14'-6"	Str.		121	AE511	19	27'-0"	Str.		535	AE814	4	17'-3"	Str.		184	
AW526	2	8'-6"	Str.		18	AE512	1	11'-0"	Str.		11	AE815	77	5'-9"	165		1,182	
AW527	5	7'-3"	Str.		38	AE513	1	23'-0"	Str.		24							
AW528	5	9'-3"	Str.		48	AE514	10	13'-3"	Str.		138							
AW529	2	4'-6"	Str.		19	AE515	3	14'-6"	Str.		45							
AW530	1	8'-9"	Str.		9	AE516	19	16'-3"	Str.		322							
AW531	6	10'-9"	Str.		67	AE517	2	3'-9"	Str.		8							
AW532	2	5'-3"	Str.		11	AE518	8	15'-0"	Str.		125							
AW533	2	5'-6"	141		13	AE519	1	12'-3"	Str.		13							
AW534	2	6'-1"	140		13	AE520	129	7'-2"	105		964							
AW601	125	17'-3"	109		3,239	AE521	2	5'-6"	141		11							
AW602	5	6'-0"	Str.		45	AE522	2	6'-3"	140		13							
AW603	8	11'-3"	109		135	AE523	20	2'-9"	Str.		57							
AW604	1	17'-7"	109		26	AE524	21	2'-0"	105		44							
AW605	2 Ser. 30	7'-2" / 8'-7"	104	9/16"	710	AE525	11	5'-11"	161		68							
AW606	2	20'-3"	109		61	AE526	8	4'-0"	Str.		33							
AW607	55	15'-7"	109		1,287	AE527	6	11'-9"	Str.		74							
AW608	74	9'-5"	104		1,047	AE528	4	7'-3"	Str.		30							
AW609	107	16'-4"	112		2,625	AE529	1	8'-9"	Str.		9							
AW610	1	16'-3"	109		24	AE601	119	17'-3"	109		3,083							
AW611	1	19'-9"	109		30	AE602	2	18'-11"	109		57							
AW612	6	4'-4"	162		39	AE603	4	20'-7"	109		124							
AW613	3	10'-4"	162		47	AE604	1	28'-11"	109		40							
AW614	1	5'-11"	162		9	AE605	4	11'-3"	109		68							
AW615	3	14'-6"	Str.		65	AE606	1	17'-7"	109		26							
AW616	3	12'-3"	Str.		55	AE607	1	14'-9"	109		22							
AW617	2	8'-0"	Str.		24	AE608	1	27'-7"	109		41							
AW618	2	7'-10"	108		8	AE609	1	9'-8"	104		14							
AW619	1	5'-4"	162		8	AE610	20	15'-7"	109		468							
AW620	3	18'-10"	157		85	AE611	20	16'-5"	112		493							
AW621	28	5'-10"	104		245	AE612	54	16'-1"	109		1,304							
AW622	3	7'-6"	Str.		34	AE613	39	16'-11"	112		991							
AW623	3	15'-0"	Str.		68	AE614	2	3'-6"	Str.		11							
AW624	3	13'-3"	Str.		60	AE615	53	17'-5"	112		1,387							
AW625	2	9'-0"	Str.		27	AE616	1 Ser. 4	11'-7" / 14'-7"	109	110"	79							
AW626	3	12'-3"	162		55	AE617	6	12'-9"	Str.		115							
AW627	8	4'-11"	162		60	AE618	3	8'-0"	Str.		36							
AW628	2	7'-9"	108		23	AE619	1	6'-6"	Str.		10							
AW629	5	19'-11"	158		150	AE620	5	18'-3"	157		137							
AW630	4	5'-6"	Str.		33	AE621	29	5'-10"	104		254							
AW631	4	9'-3"	Str.		56	AE622	4	10'-3"	Str.		62							
AW632	2 Ser. 33	8'-7" / 9'-5"	104	1/8"	892	AE623	4	5'-7"	108		34							
AW633	2 Ser. 28	7'-11" / 9'-2"	104	1/8"	718	AE624	3	15'-0"	Str.		68							
AW634	2	6'-6"	Str.		20	AE625	8	4'-4"	162		52							
AW635	2	4'-2"	141		13	AE626	1	8'-9"	Str.		13							
AW636	2	7'-0"	Str.		8	AE627	8	7'-6"	Str.		90							
AW637	1	5'-5"	162		8	AE628	4	22'-11"	159		138							
AW638	1	6'-0"	162		9	AE629	4	10'-4"	162		62							
						AE630	5	5'-9"	Str.		43							
						AE631	2	4'-2"	141		13							

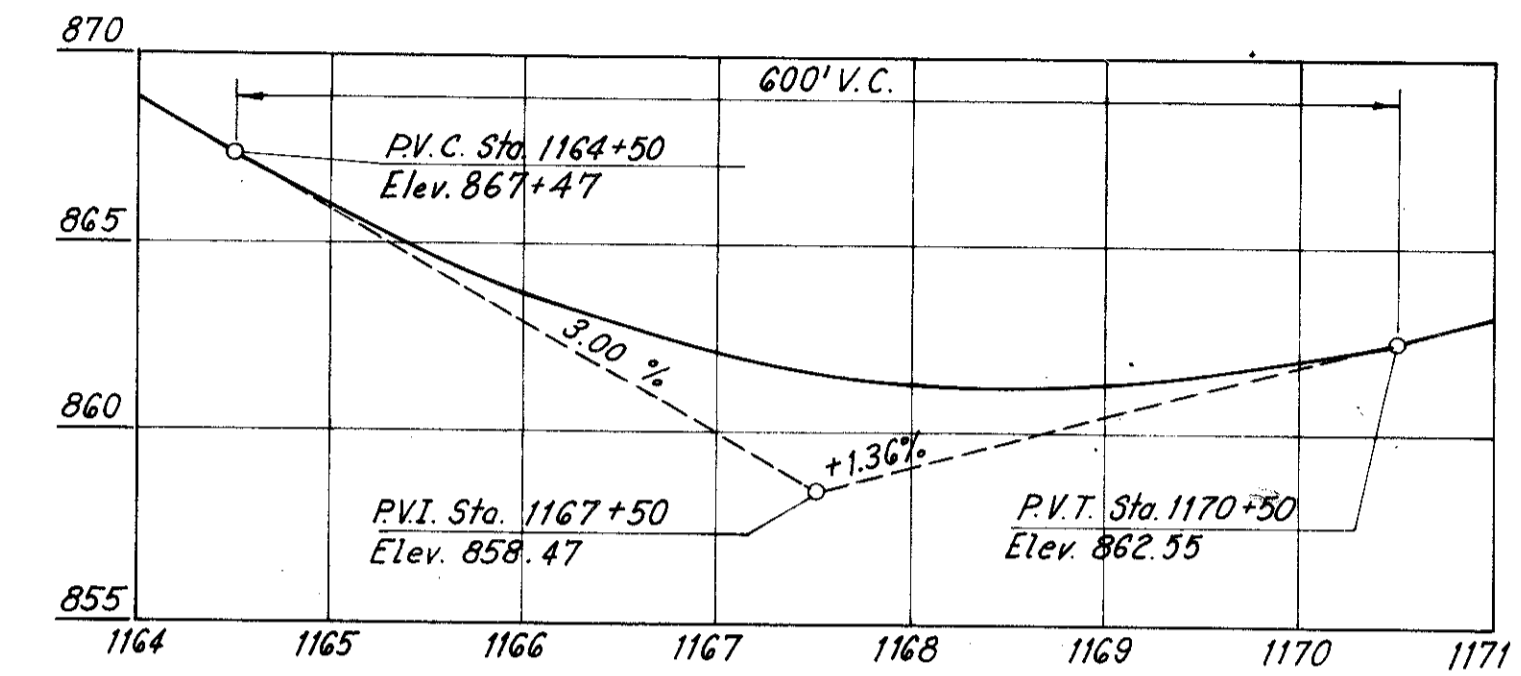


CUYAHOGA COUNTY
CUY-80-21.40

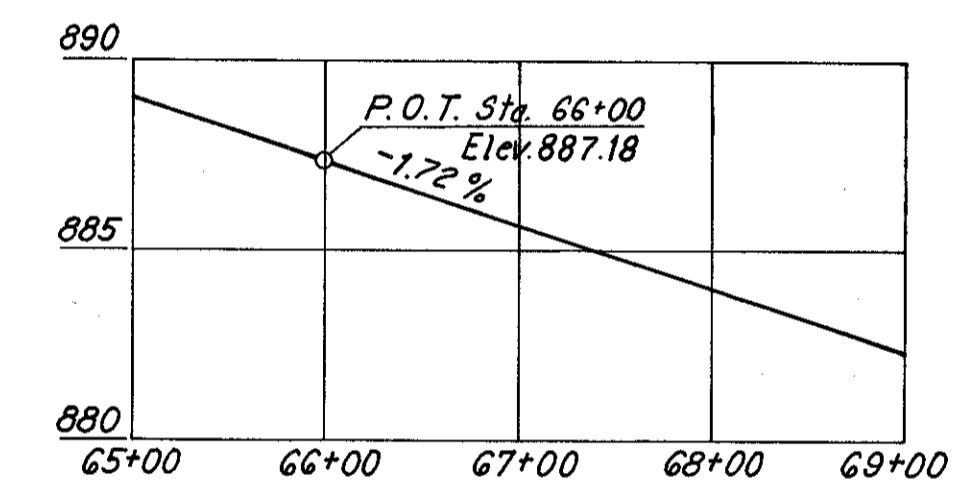


PLAN
Scale: 1"=30'

Note: Earthwork limits shown are schematic. Actual slopes shall conform to plan cross-sections.



PROFILE I-80
Scale: Horiz. 1"=100'
Vert. 1"=5'



PROFILE-BEDFORD FREEWAY
Scale: Horiz. 1"=100'
Vert. 1"=5'

PROPOSED STRUCTURE

TYPE: Continuous steel girder with reinforced concrete deck and substructure.

SPANS: 92'-2 3/8", 120'-9 3/8"

ROADWAY: 76'-0" face to face of parapet with Concrete Barrier

LOADING: HS20-44

SKEW: 16°57'37" Left. Forward to Local Tangent

WEARING SURFACE: 1 1/2" Asphalt Concrete

APPROACH SLABS: AS-1-67 (25 feet long)

ALIGNMENT: Spiral

SUPERELEVATION: Varies .0156 ft. per ft. to .083 ft. per ft.

TRAFFIC DATA

1991 26,854 A.D.T.
1,800 D.D.H.V.

Notes:

Roadway excavation in cut sections shall be completed and embankments shall be placed and compacted to the finish spill-thru slopes and to the level of the subgrades for a minimum distance of 200 feet back of the South Abutment and to the limits of the embankment behind the North Abutment before excavating and driving piles for the abutments.

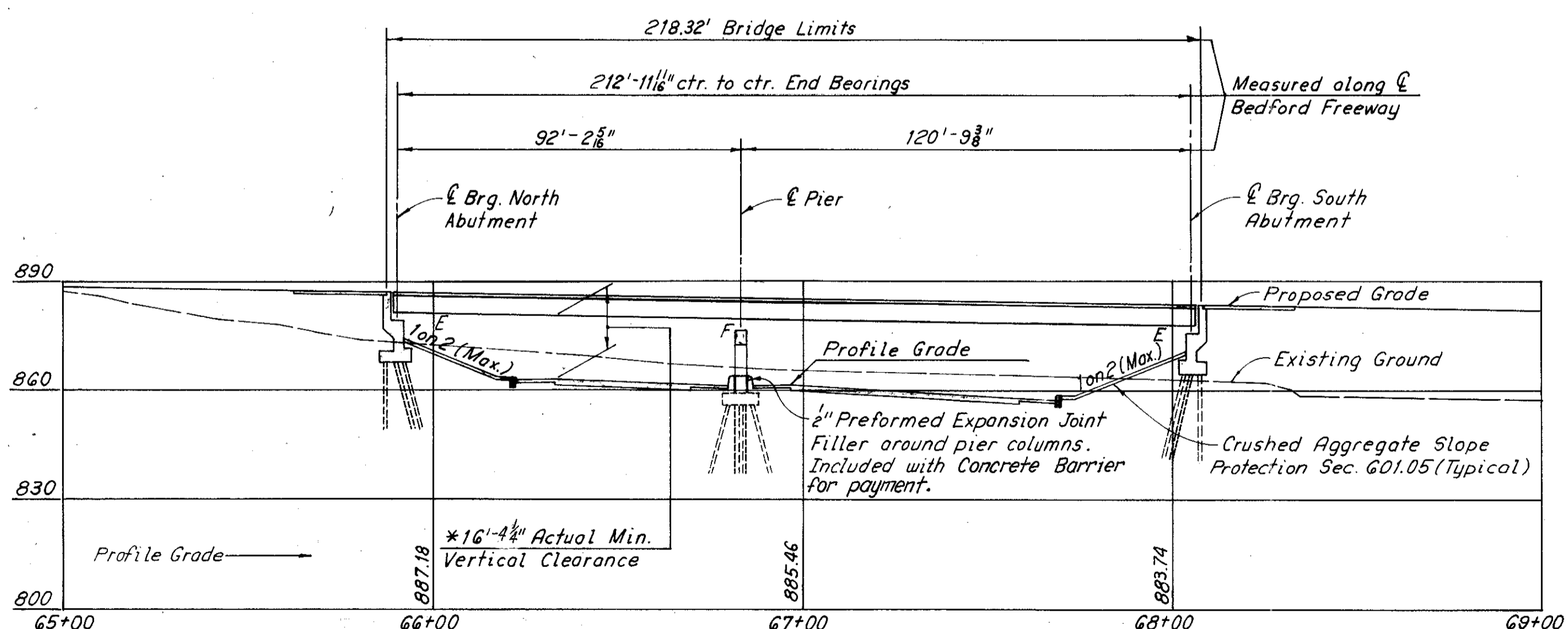
Roadway excavation shall be completed to the level of the subgrade before excavating and driving piles for the pier.

All piles are HP 12x53. The piles at the abutments shall be driven to a minimum bearing capacity of 35 tons per pile and the piles at the pier shall be driven to a minimum bearing capacity of 40 tons per pile.

The estimated average pay lengths of the piles are as follows:

- North Abutment - 20 feet
- Pier - 20 feet
- South Abutment - 25 feet

For underpass lighting details see Lighting Plans.



ELEVATION
Scale: Horiz. 1"=30'
Vert. 1"=30'

* Note:
16'-4" Required minimum vertical clearance. Minimum vertical clearance occurs at the north edge of pavement of the westbound lanes of I-80 and the outside edge of the east exterior girder of Bridge No. 8.

CURVE DATA		
☐ I-80	☐ BEDFORD FREEWAY	☐ RAMP OBS-W-B
P. I. Sta. 1168+27.47	P. I. Sta. 71+52.03	P. I. Sta. 9+19.68
Δ = 28°52'52"	Δ = 52°19'53"	Δ = 14°38'42"
Dc = 2°00'00" Right	Dc = 8°00'00" Left	D = 3°00'00" Right
Lc = 1194.05'	Lc = 654.14'	R = 1909.86'
Ts = 862.94'	T.S. = Sta. 64+00.15	T = 245.42'
Θs = 2°30'00"	Θs = 16°00'00"	L = 488.17'
Ls = 250.00'	Ls = 400.00'	E = 15.70'
Es = 94.40'	Es = 81.77'	

H.N.T.B. BR. NO. 8
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

SITE PLAN

I-80 UNDER BEDFORD FREEWAY

BR. NO. CUY-80-2169 STA. 65+88.92 TO STA. 68+07.24

CUYAHOGA COUNTY OHIO

DRAWN/LEE	TRACED/LLH	CHECKED/LLH	REVIEWED/LLH	REVISED
DATE 7-27-67	DATE 7-28-67	DATE 5-22-68	DATE	SHEET 1 / 12

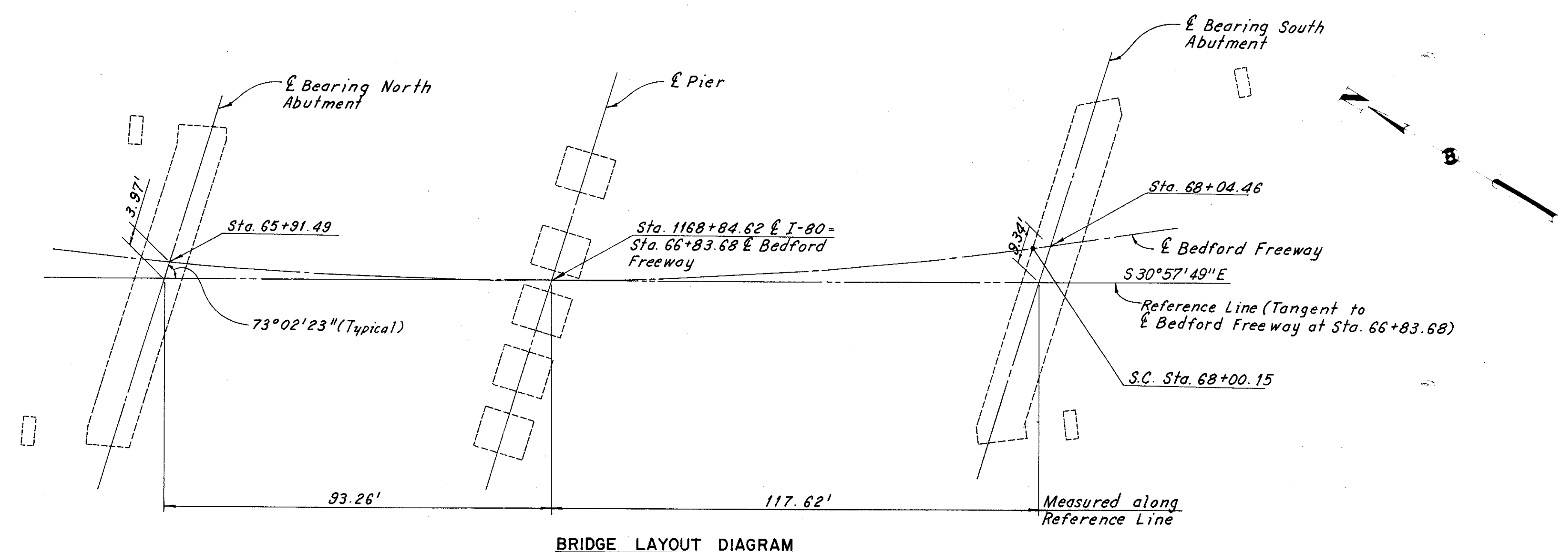
L-0

U-7

DEC 22 1969
 DEC 22 1969

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
 CUY-80-21.40
 Quantity Calculations
 Made By KYH Date 5-22-69
 Checked By M.C.B. Date 6-19-70



BRIDGE LAYOUT DIAGRAM

ESTIMATED QUANTITIES							
ITEM	TOTAL	UNIT	DESCRIPTION	CUY-80-2169 H.N.T.B. BRIDGE NO. 8			GENERAL
				ABUTMENTS	PIERS	SUPER-STRUCTURE	
503	1011	Cu. Yd.	Unclassified Excavation	756	255		
505	Lump	Lump	Test Pile				Lump
503	Lump		Cofferdams, cribs & sheeting				Lump
507	3430	Lin. Ft.	Steel Piles, HP 12 x 53	2,310	1,120		
509	235,378	Pounds	Reinforcing Steel	40,751	30,905	163,722	
511	517	Cu. Yd.	Class "C" Concrete, Superstructure				517
511	61	Cu. Yd.	Class "C" Concrete, Pier Caps and Columns		61		
511	328	Cu. Yd.	Class "C" Concrete Abutments Above Footings	328			
511	301	Cu. Yd.	Class "C" Concrete, Footings	223	78		
512	45	Lin. Ft.	Premolded Sealing Strip	45			
513	693,300	Pounds	Structural Steel			693,300	
514	693,300	Pounds	Field Painting of Structural Steel			693,300	
516	110	Sq. Ft.	1" Prefomed Expansion Joint Filler	110			
518	231	Cu. Yd.	Porous Backfill		231		
518	115	Lin. Ft.	6" Helical C.M.P. (Section 707.01) Non-Perforated*	115			
518	146	Lin. Ft.	6" Perforated, Helical C.M.P. (Section 707.01)	146			
518	70	Lin. Ft.	8" Perforated C.M.P., Including Specials (70% of)	70			
518	148	Each	Subdrainage for wearing surface, as per plan			148	
518	7	Each	Scuppers, Including Supports			7	
601	477	Sq. Yd.	Crushed Aggregate Slope Protection				477
808	517	Units	Chemical Admixture for Concrete Type AB or D			517	
404	48	Cu. Yd.	Asphalt Concrete (70-85 or AC-20)			48	
Special	24	Cu. Yd.	Sand-asphalt (see proposal note)			24	
Special	1740	Sq. Yd.	Membrane Waterproofing, sheet type (see proposal note)			1740	

*Including specials

H.N.T.B. BR. NO. 8

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 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

BRIDGE LAYOUT DIAGRAM
 AND ESTIMATED QUANTITIES

I-80 UNDER BEDFORD FREEWAY

BR. NO. CUY-80-2169 STA. 65+88.92 TO STA. 68+07.24

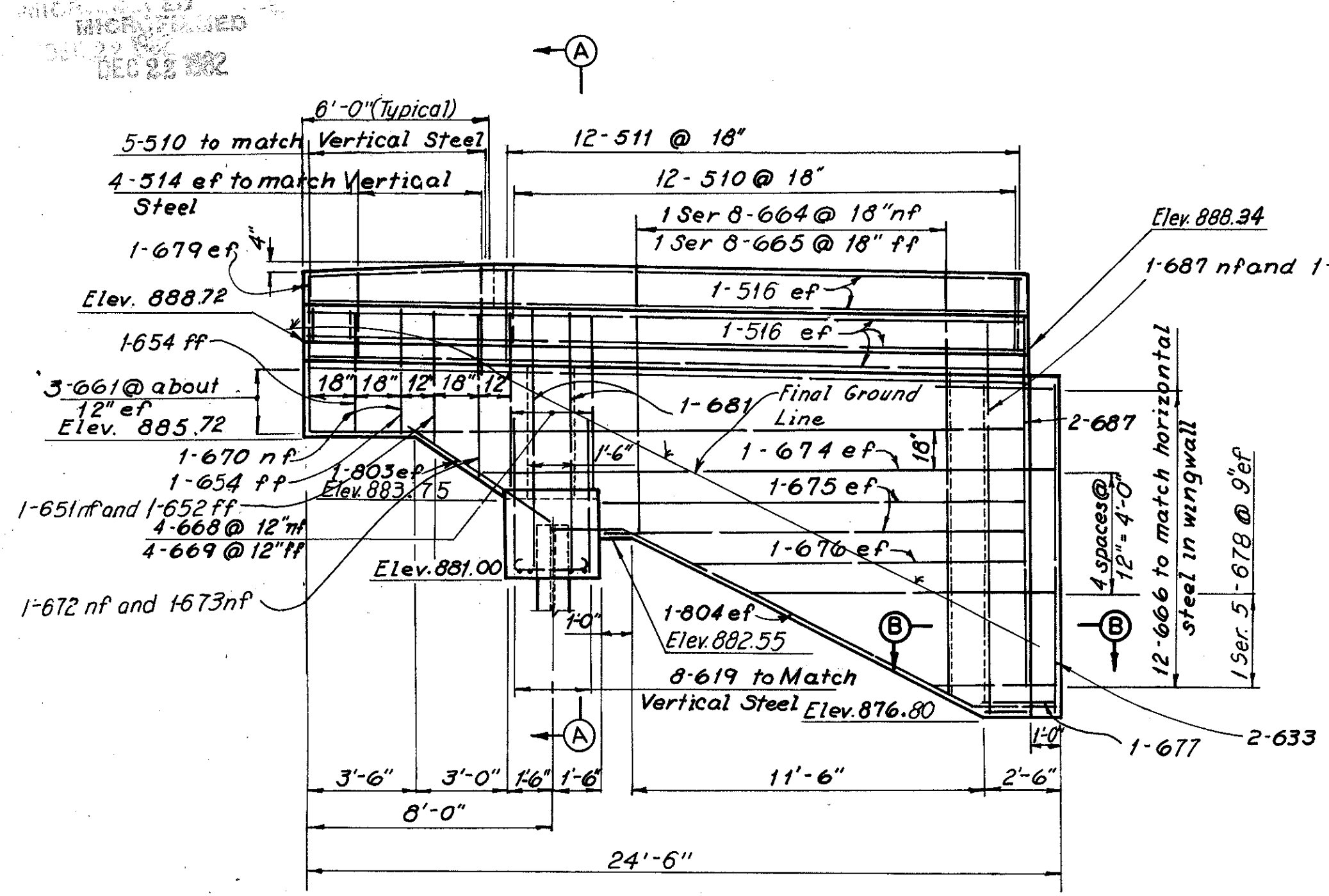
CUYAHOGA COUNTY OHIO

DRAWN BY: KYH	TRACED BY: JSC	CHECKED BY: MCB	REVIEWED BY:	REVISED BY:
DATE: 5-22-69	DATE: 6-1-70	DATE: 6-19-70	DATE:	DATE:

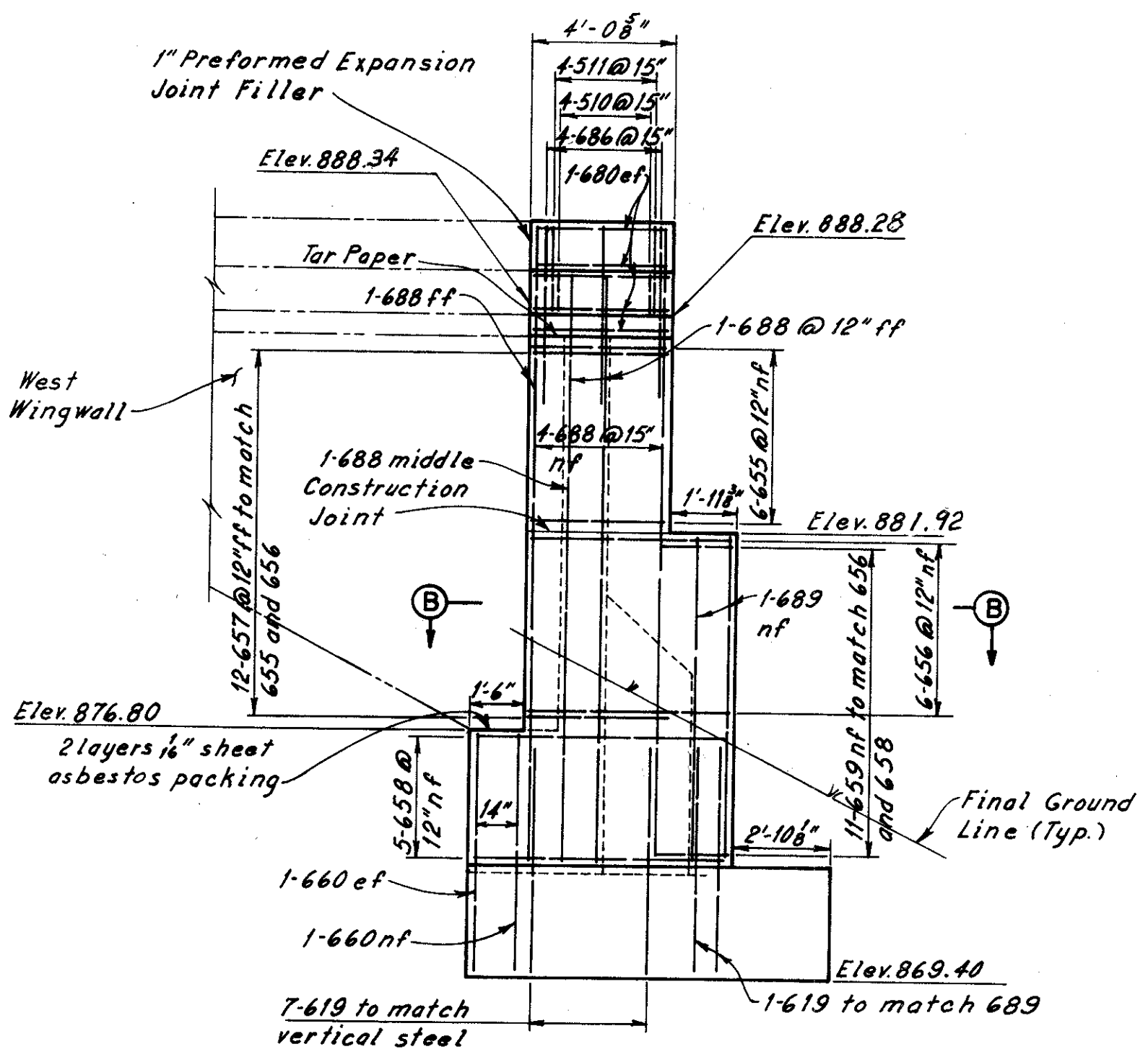
SHEET 2/12

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		327 390

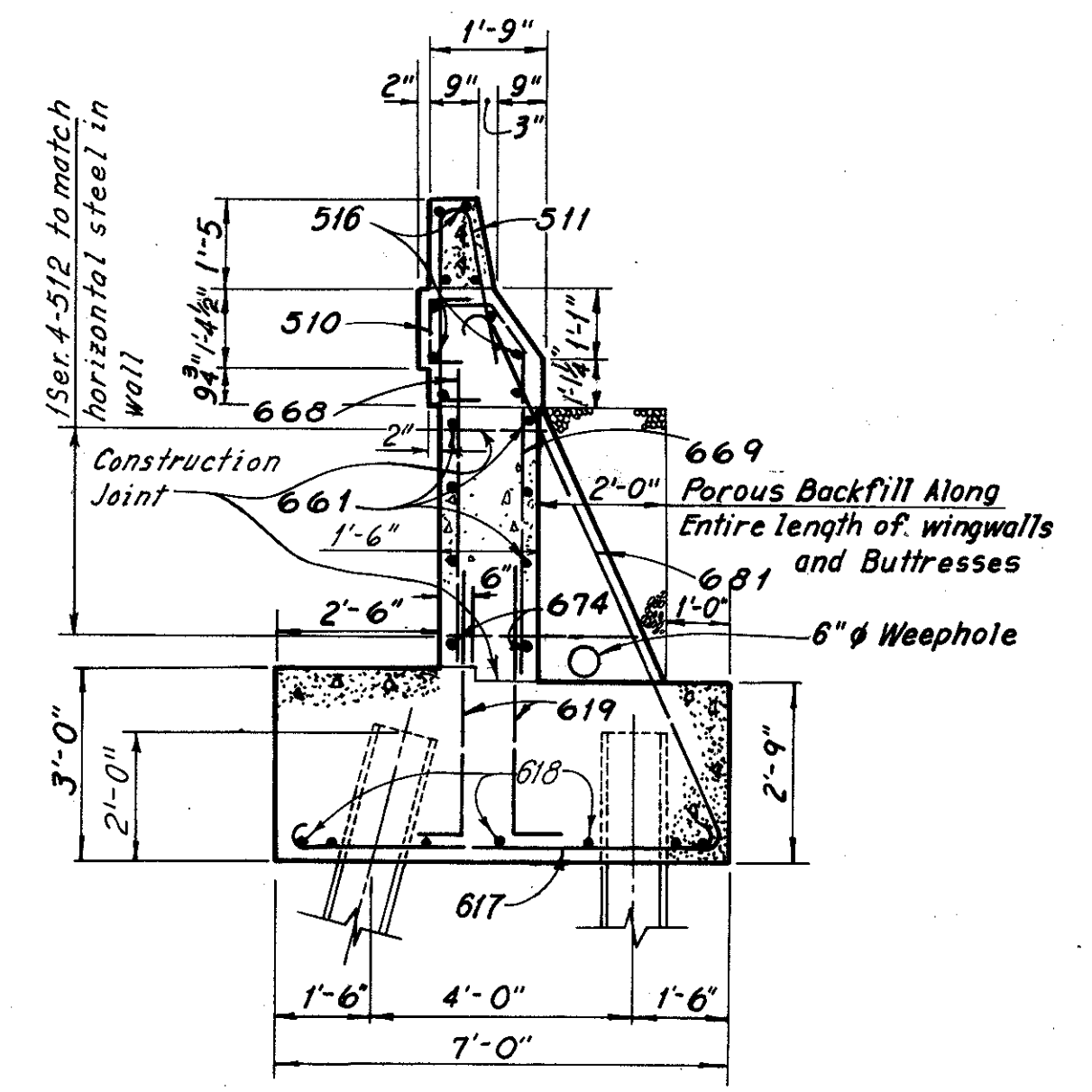
CUYAHOGA COUNTY
CUY-80-21.40



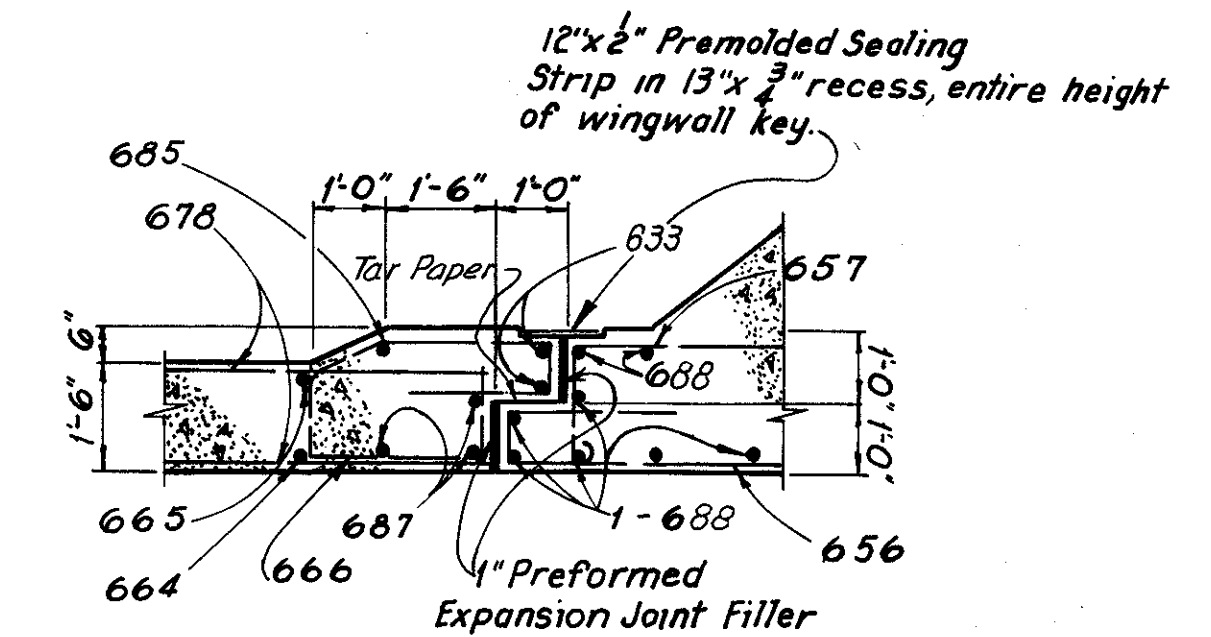
WEST WINGWALL



WEST BUTTRESS
(Piles not shown)

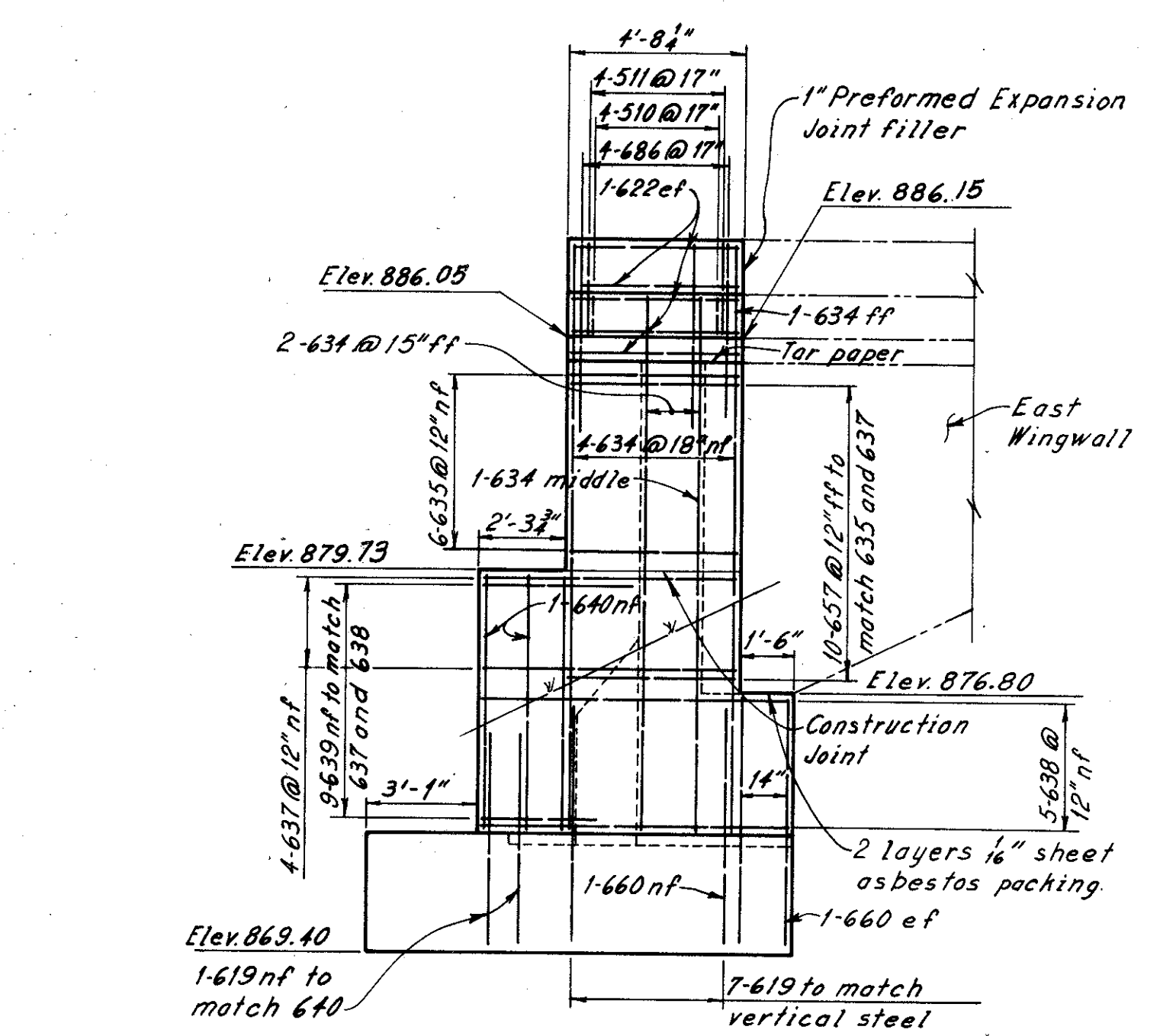


SECTION A-A
(East wingwall Section Similar)

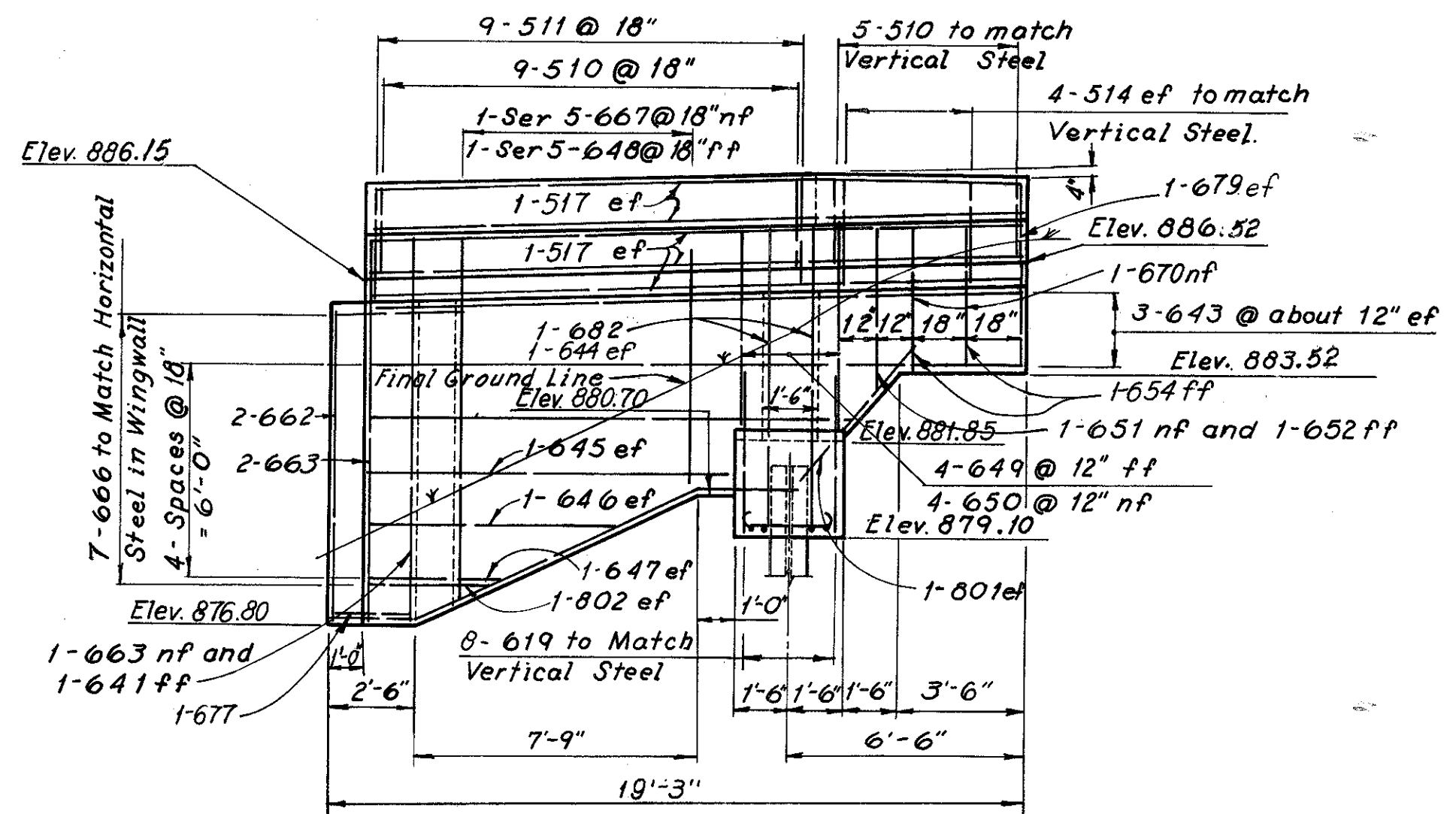


SECTION B-B
(East wingwall Section Similar)

Note: All reinforcing bar marks shall be prefixed AN.



EAST BUTTRESS
(Piles not shown)



EAST WINGWALL

Notes:
For curb and parapet transitions and for guard rail anchor details, see "Part Plans - Parapet on Wingwall (Curbs on Approaches)" on Ohio Standard Drawing BR-1-67, Revised 10-15-71, Sheet 1 of 3.
For additional notes see Sheet 3/12.

Note:
Sheet Asbestos Packing (711.22) and Tar Paper shall be included with "Item 511, Class C Concrete, Abutments (Above Footing) for payment."

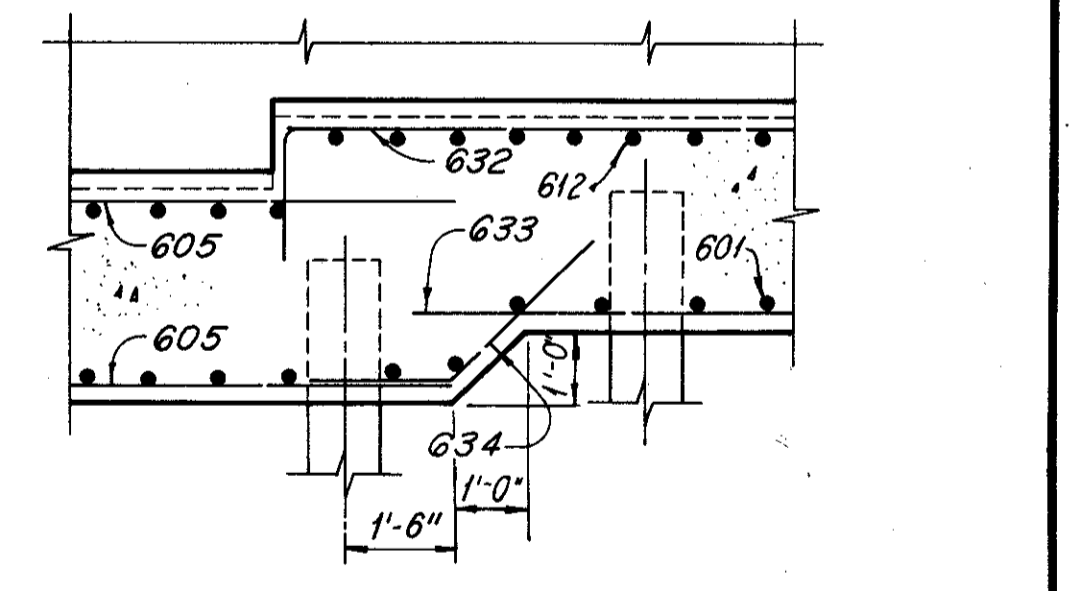
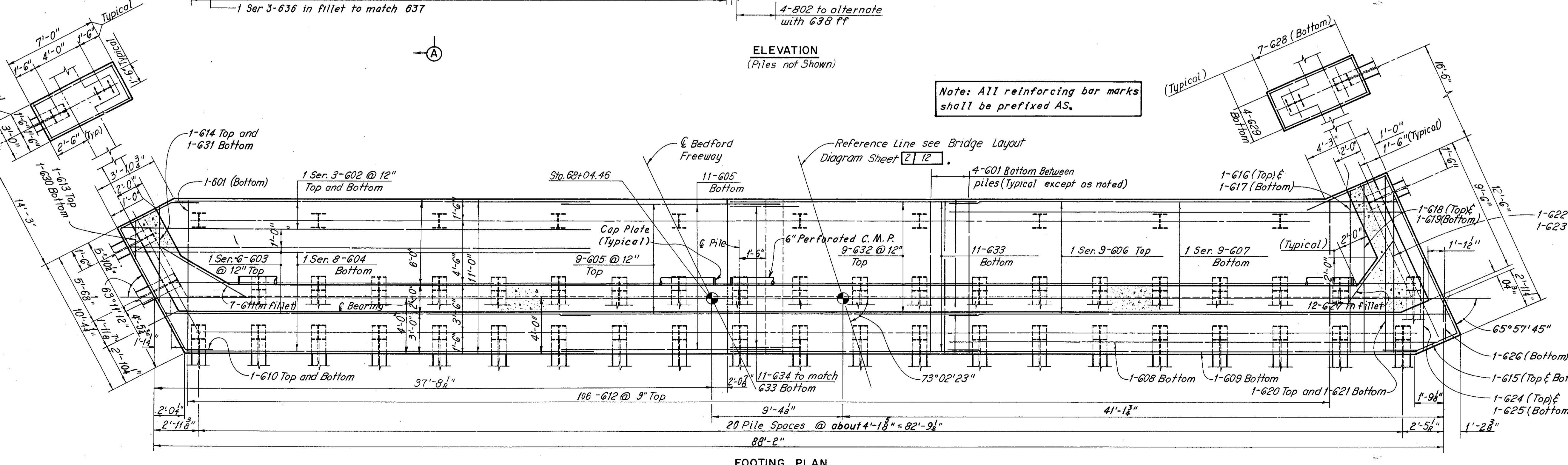
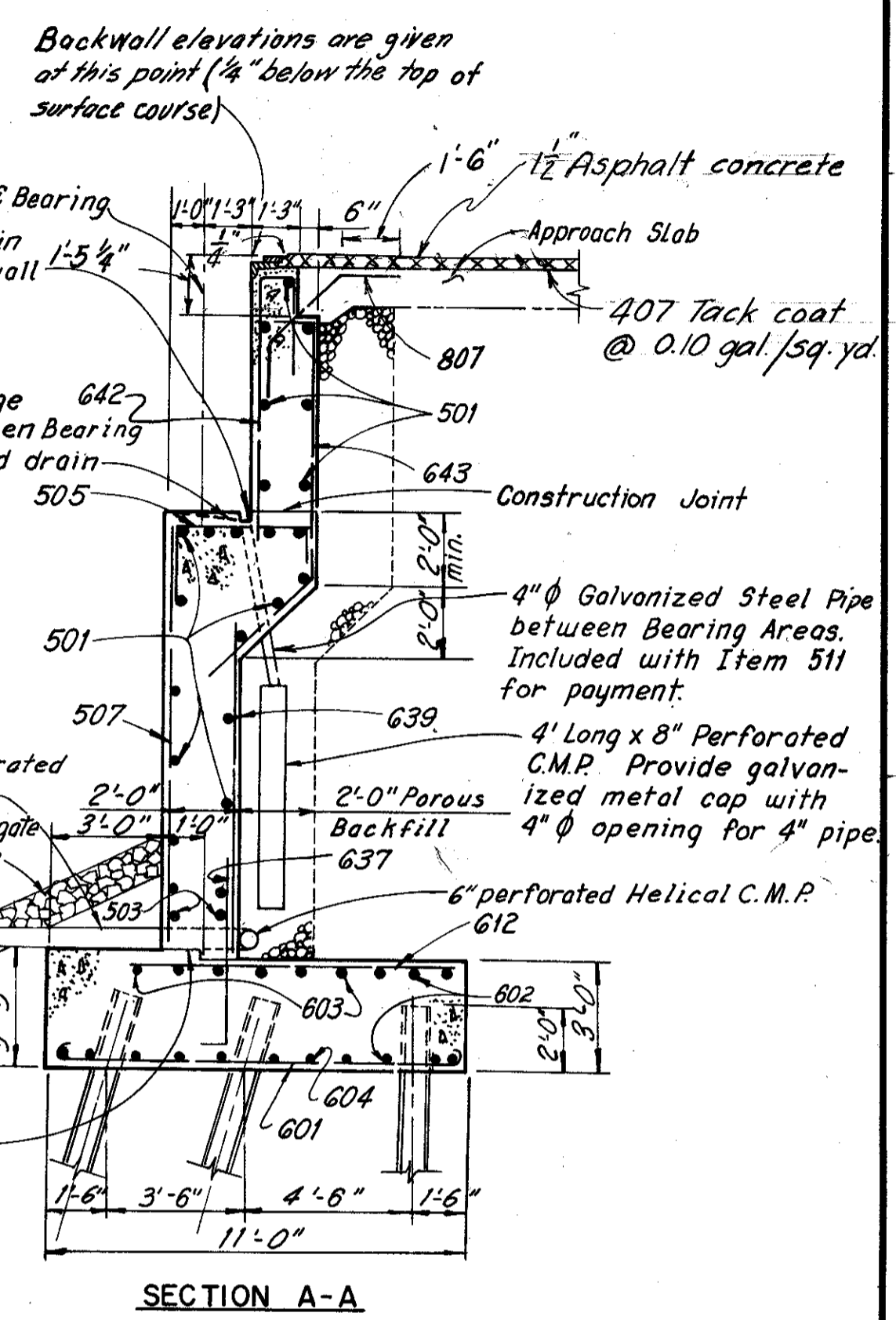
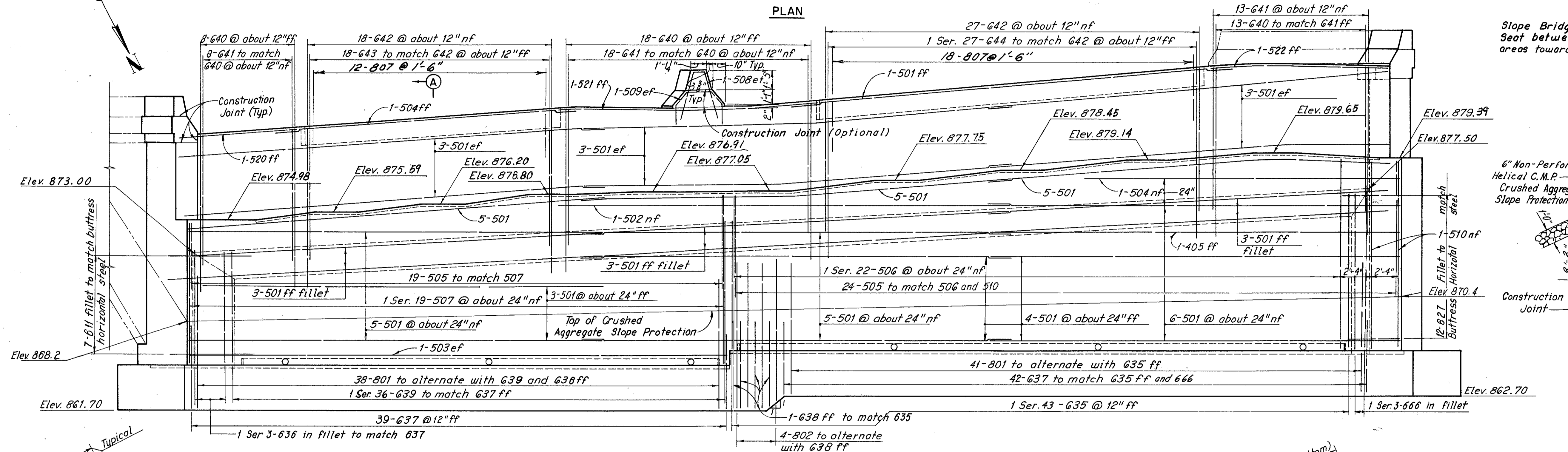
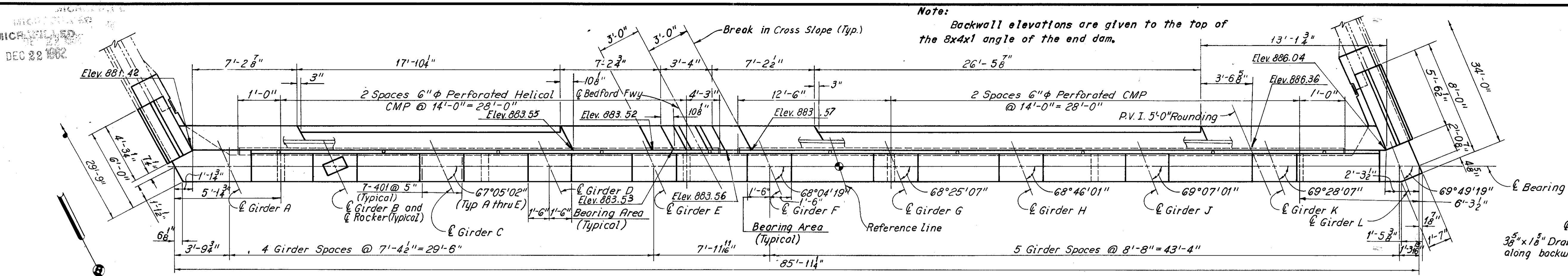
H.N.T.B. BR. NO. 8	
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK	
NORTH ABUTMENT WINGWALLS I-80 UNDER BEDFORD FREEWAY	
BR. NO. CUY-80-2169	STA. 65+88.92 TO STA. 67+07.24
CUYAHOGA COUNTY	OHIO
DRAWN DLR	TRACED HCH
CHECKED MCB	REVIEWED
DATE 8-2-69	DATE 8-7-69
DATE 2-12-70	DATE
	SHEET 4/12

MICHAEL BAKER
DEC 22 1962

FED. RD. DIVISION	STATE	PROJECT	328 390
2	OHIO		

CUYAHOGA COUNTY
CUI-80-21.40

Note: Backwall elevations are given to the top of the 8x4x1 angle of the end dam.



Note: All reinforcing bar marks shall be prefixed AS.

Notes:
For Notes see Sheet 3/12.

H.N.T.B. BR. NO. 8

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SOUTH ABUTMENT
I-80 UNDER BEDFORD FREEWAY

BR. NO. CUY-80-2169 STA. 65 + 88.92 TO
STA. 68 + 07.24

CUYAHOGA COUNTY OHIO

DRAWN D.L.R.	TRACED D.L.R.	CHECKED M.C.B.	REVIEWED
DATE 6-6-69	DATE 8-8-69	DATE 1-28-70	DATE

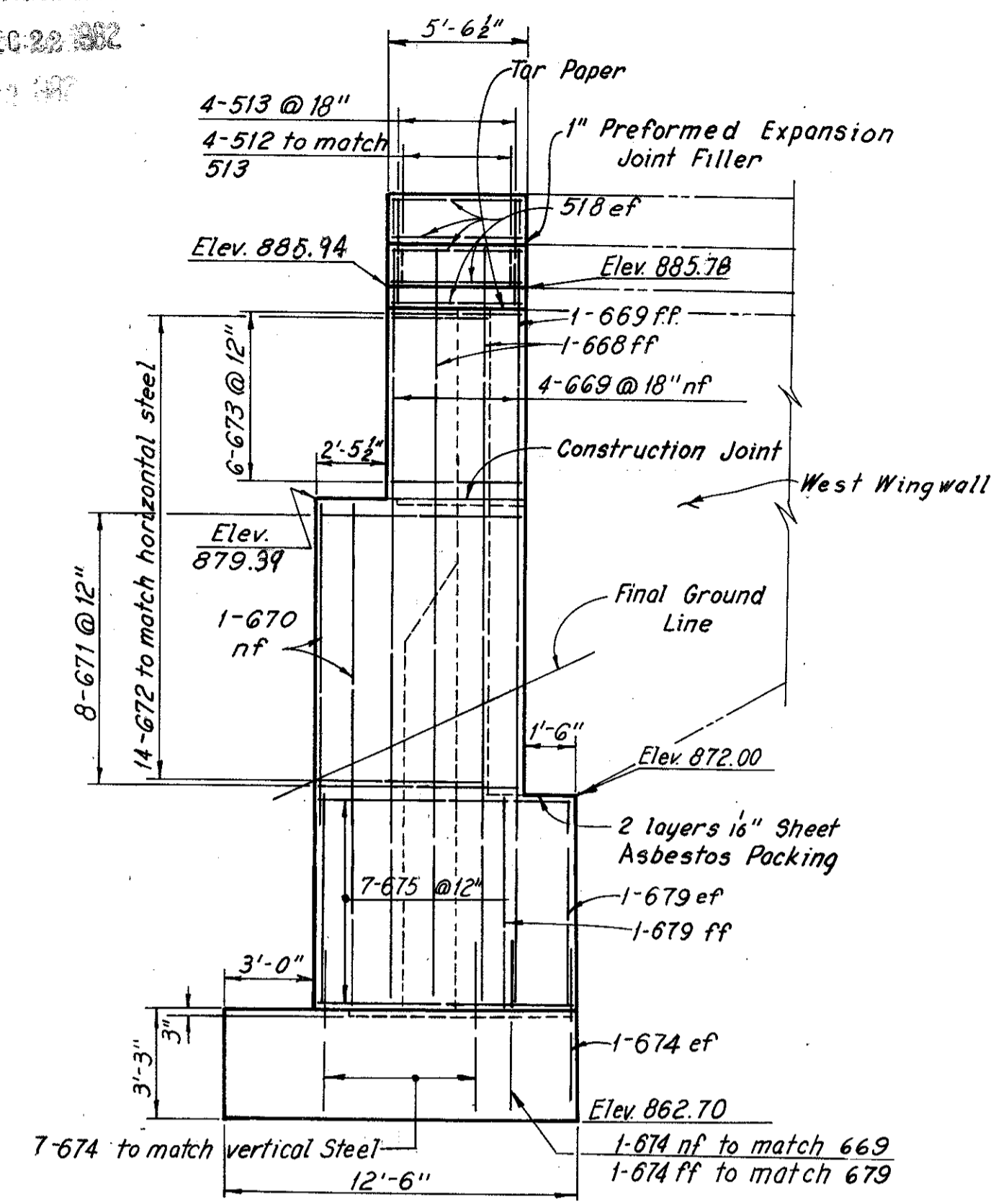
SHEET 5/12

RECORDED
DEC 22 1962

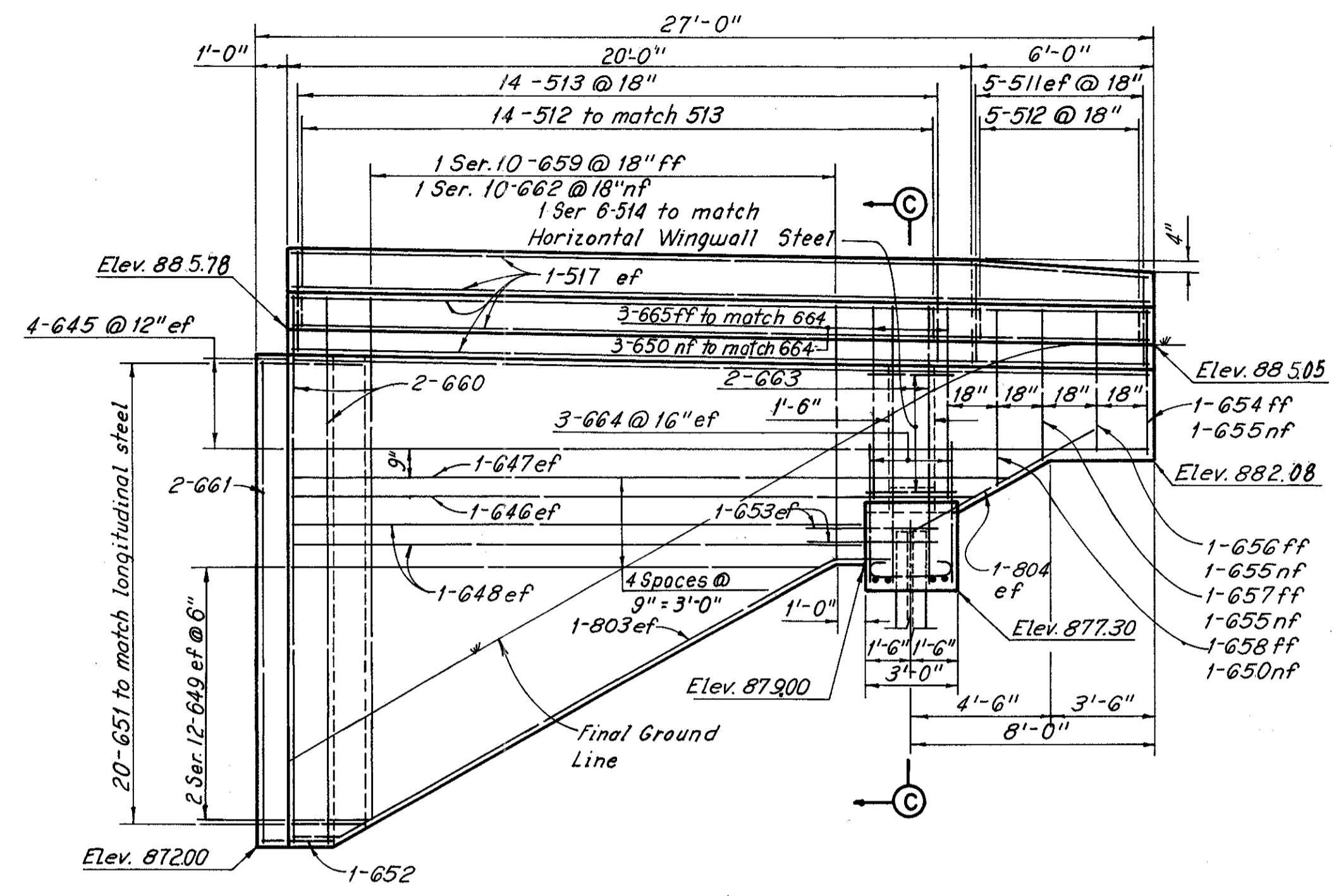
FED RD DIVISION	STATE	PROJECT	
2	OHIO		

329
390

CUYAHOGA COUNTY
CUY-80-21.40

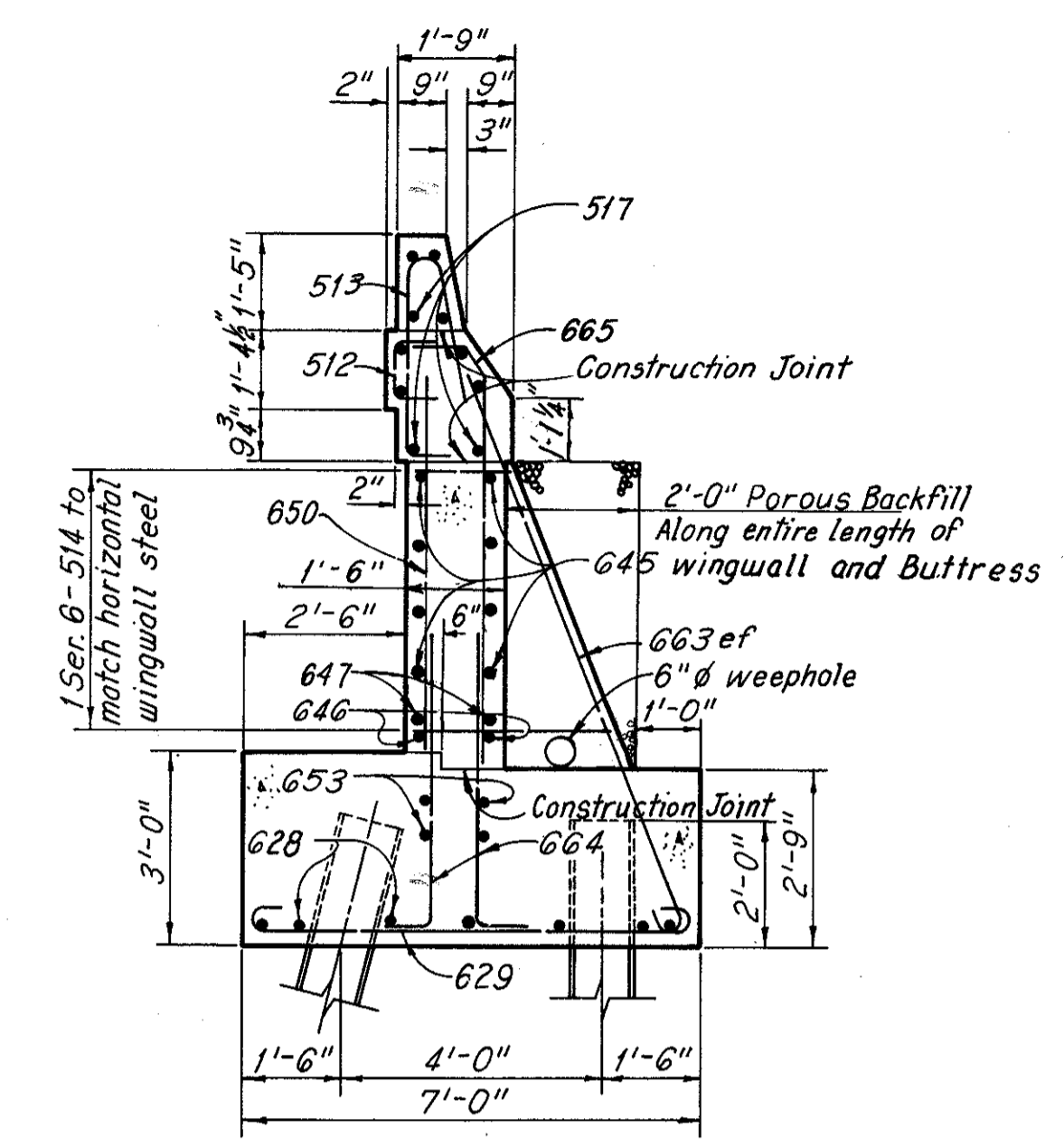


WEST BUTRESS
(Piles not shown)



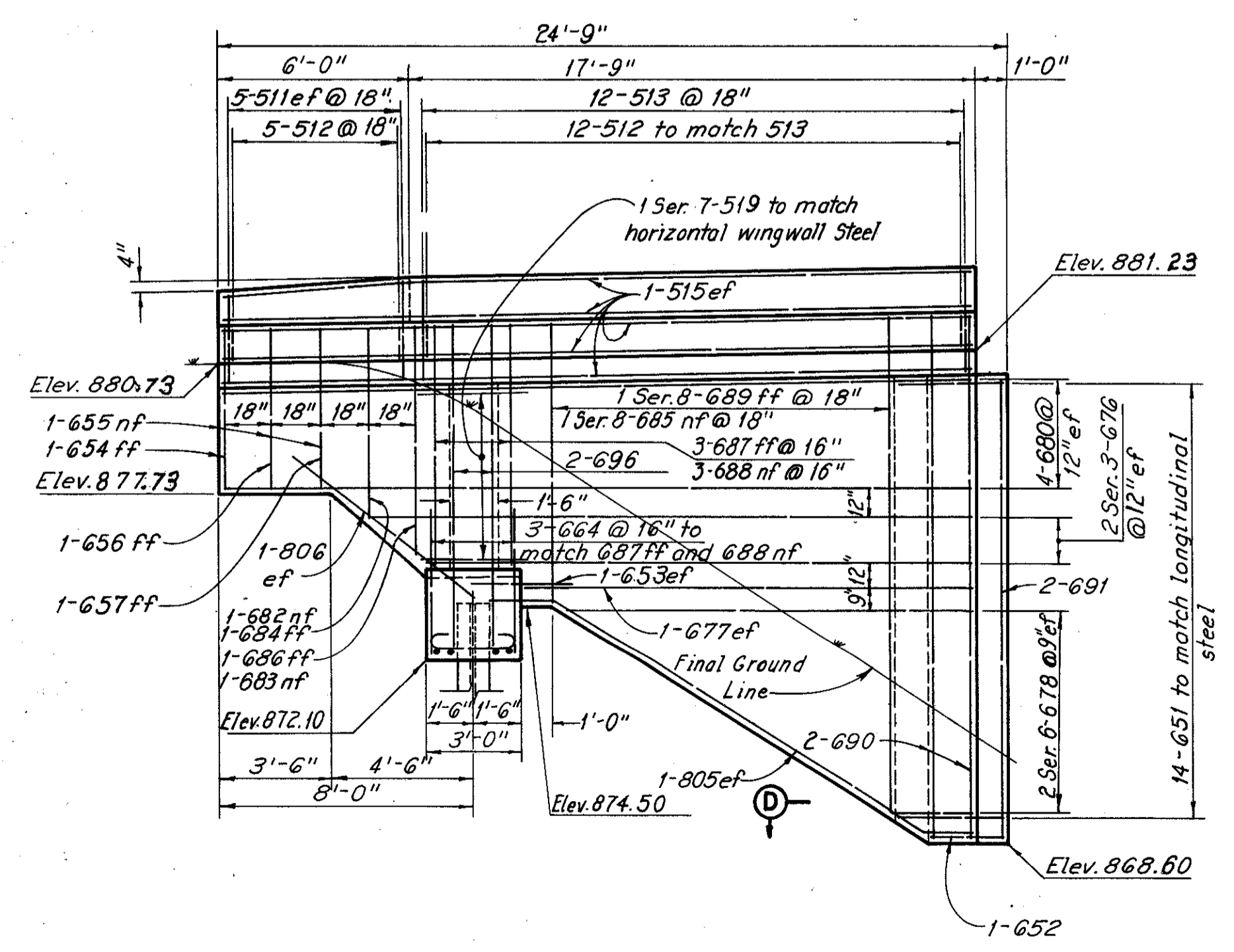
WEST WINGWALL

Note:
Sheet Asbestos Packing (711.22) and
Tar Paper shall be included with Item
511, Class C Concrete, Abutments Above
Footing for payment.

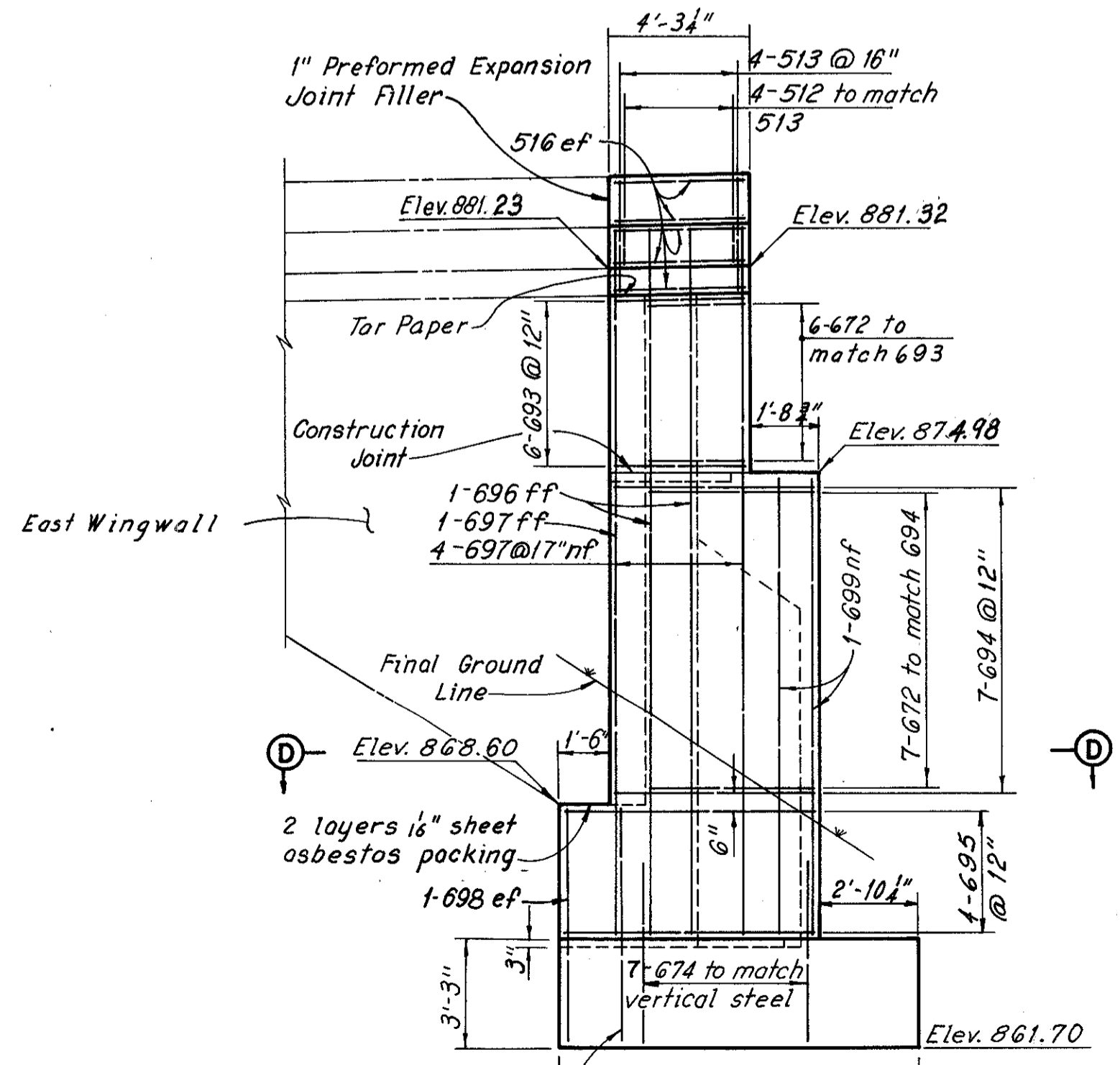


SECTION C-C
(Section shown thru West Wingwall,
East Wingwall is similar)

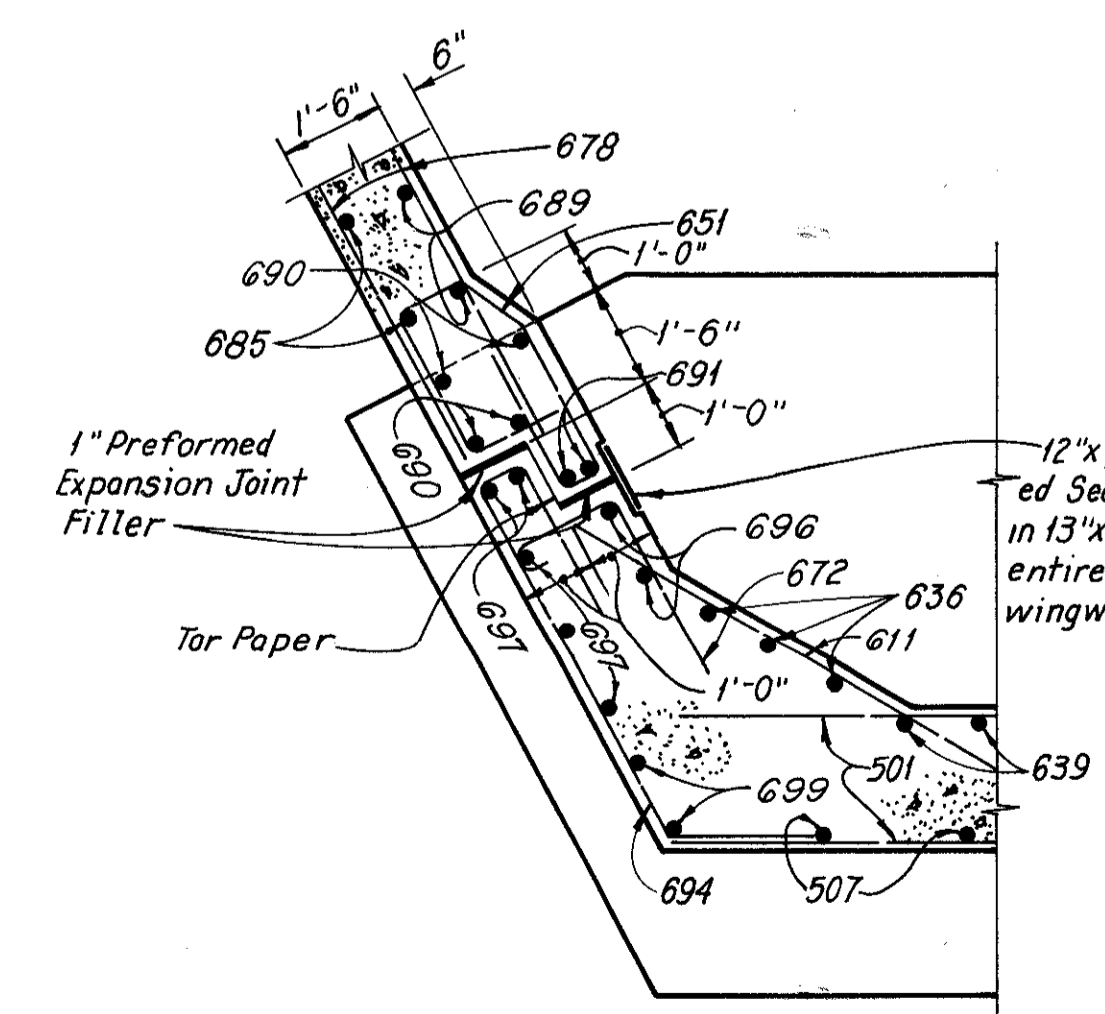
Note: All reinforcing bar marks
shall be prefixed AS.



EAST WINGWALL



EAST BUTRESS
(Piles not shown)



SECTION D-D
(Section shown thru East Wingwall and Buttress,
West Wingwall and Buttress is similar)

Notes:
For curb and parapet transitions and for guard
rail anchor details see "Part Plans - Parapet on
Wingwall (No Curb on Approaches)" on Ohio Standard
Drawing BR-1-67, Revised 10-15-71, Sheet 1 of 3.
For additional notes see Sheet 3/12.

H.N.T.B. BR. NO. 8

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

SOUTH ABUTMENT WINGWALLS
I-80 UNDER BEDFORD FREEWAY

BR. NO. CUY-80-2169 STA. 65 + 88.92
STA. 68 + 07.24

CUYAHOGA COUNTY OHIO

DRAWN/DLR	TRACED/DLR	CHECKED/MCB	REVIEWED	REVISED
DATE 2-2-70	DATE 2-3-70	DATE 2-5-70	DATE	DATE

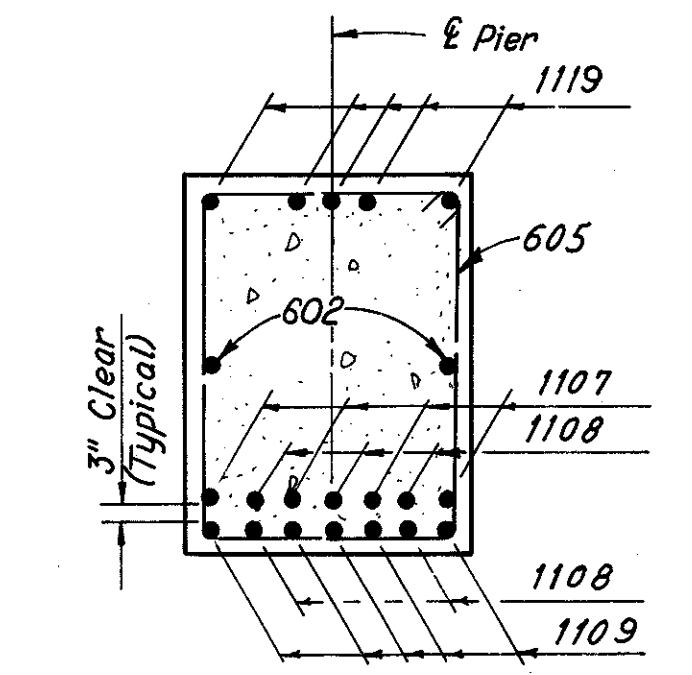
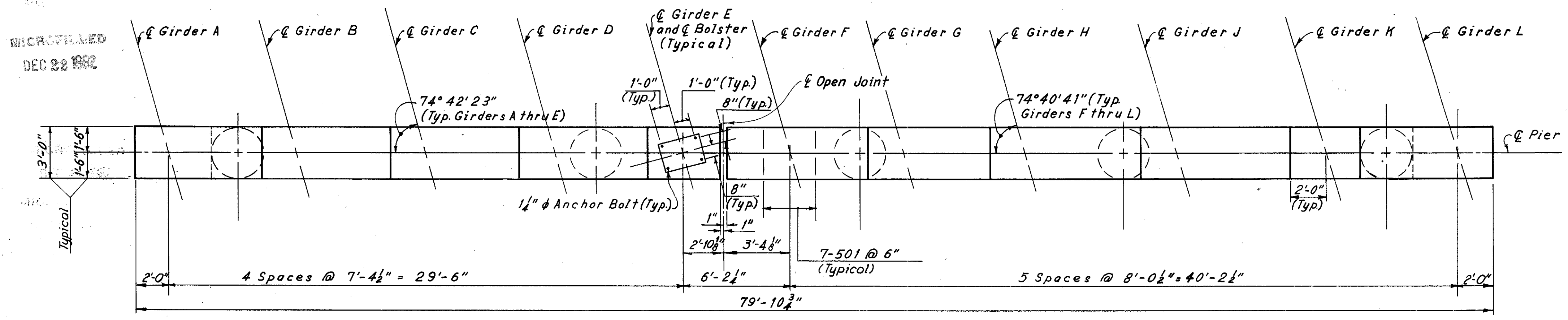
SHEET 6/12

RECORDED
DEC 22 1982

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

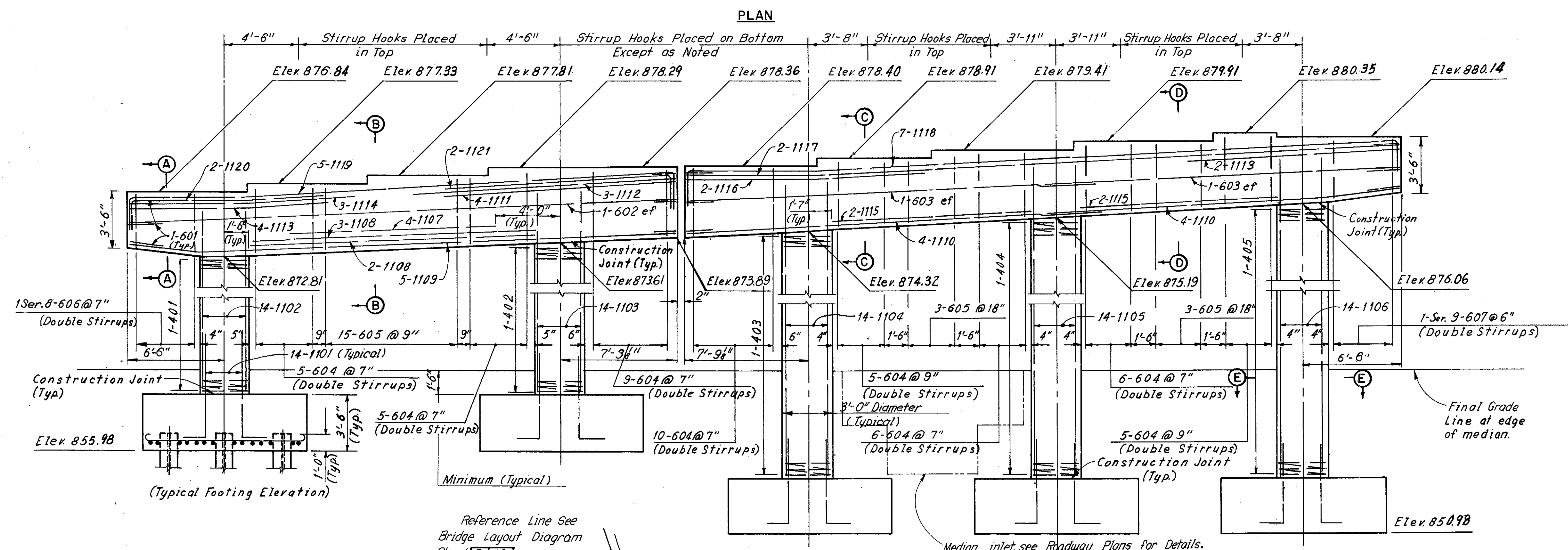
330
390

CUYAHOGA COUNTY
CUY.-80-21.40

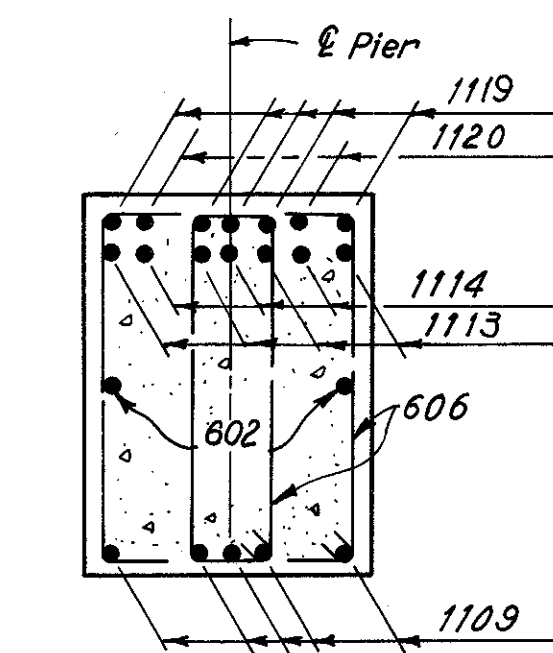


SECTION B-B

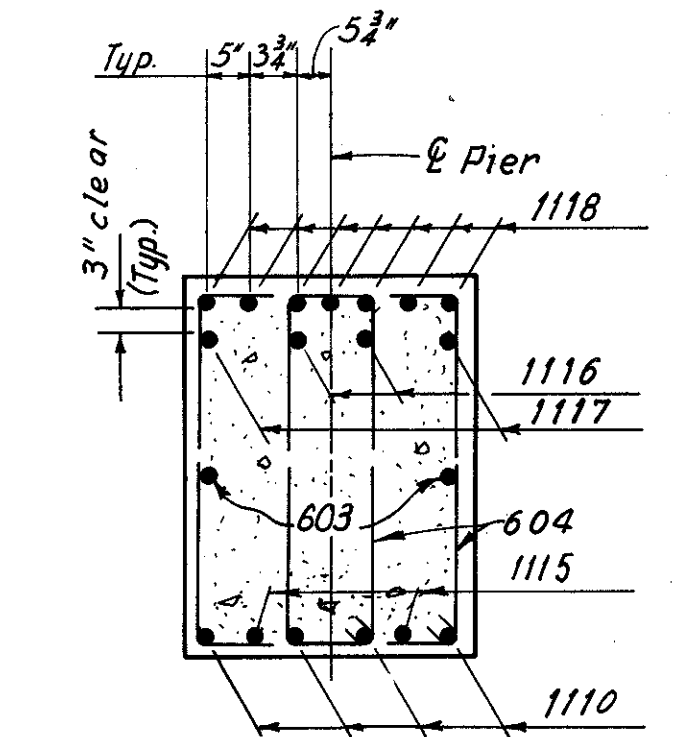
Notes:
All reinforcing bar marks shall be prefixed PA.



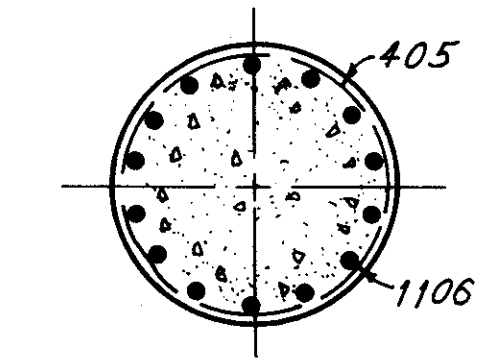
ELEVATION



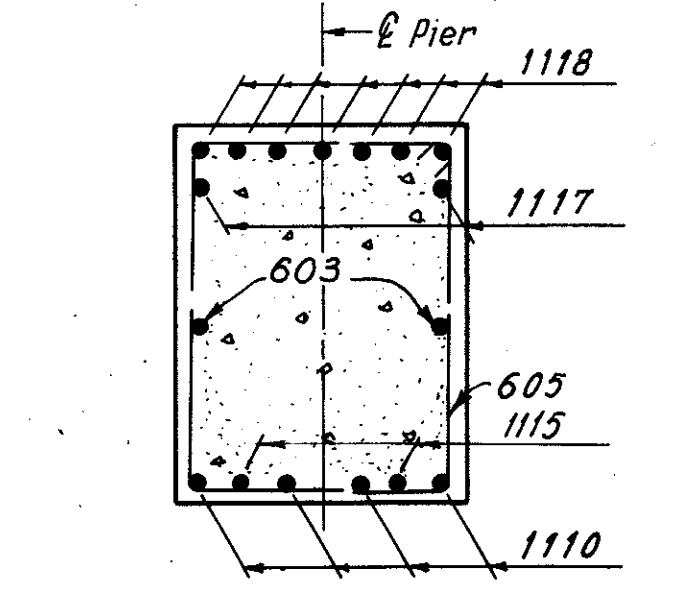
SECTION A-A



SECTION C-C

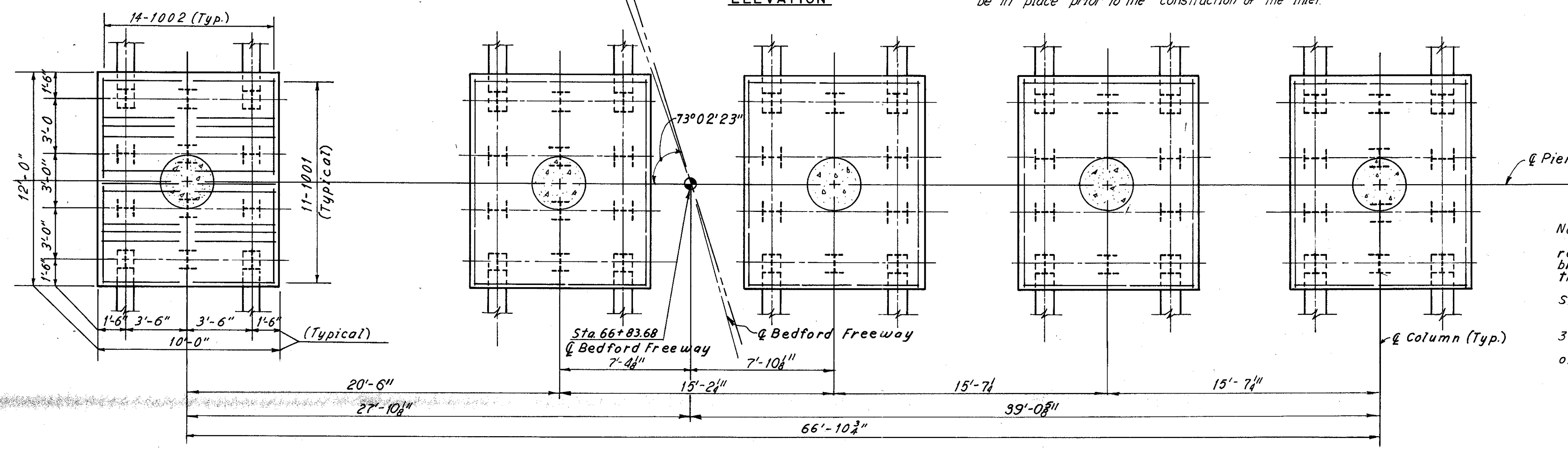


SECTION E-E



SECTION D-D

Median inlet, see Roadway Plans for Details.
The Pier footings adjacent to the inlet, shall be in place prior to the construction of the inlet.



FOOTING PLAN

Notes:
Special care shall be taken in placing reinforcing steel in the vicinity of the bridge seat so as to avoid interference with the drilling of anchor bolt holes.
For anchor bolt details see Ohio Standard Drawing RB-1-55.
All piles are HP 12 x 53.
All battered piles shall be inclined 3 in 12 in the direction shown.
Pile spacings are measured along bottom of footing.
The following abbreviation is used:
ef = each face

H.N.T.B. BR. NO. 8

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CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PIER
I-80 UNDER BEDFORD FREEWAY

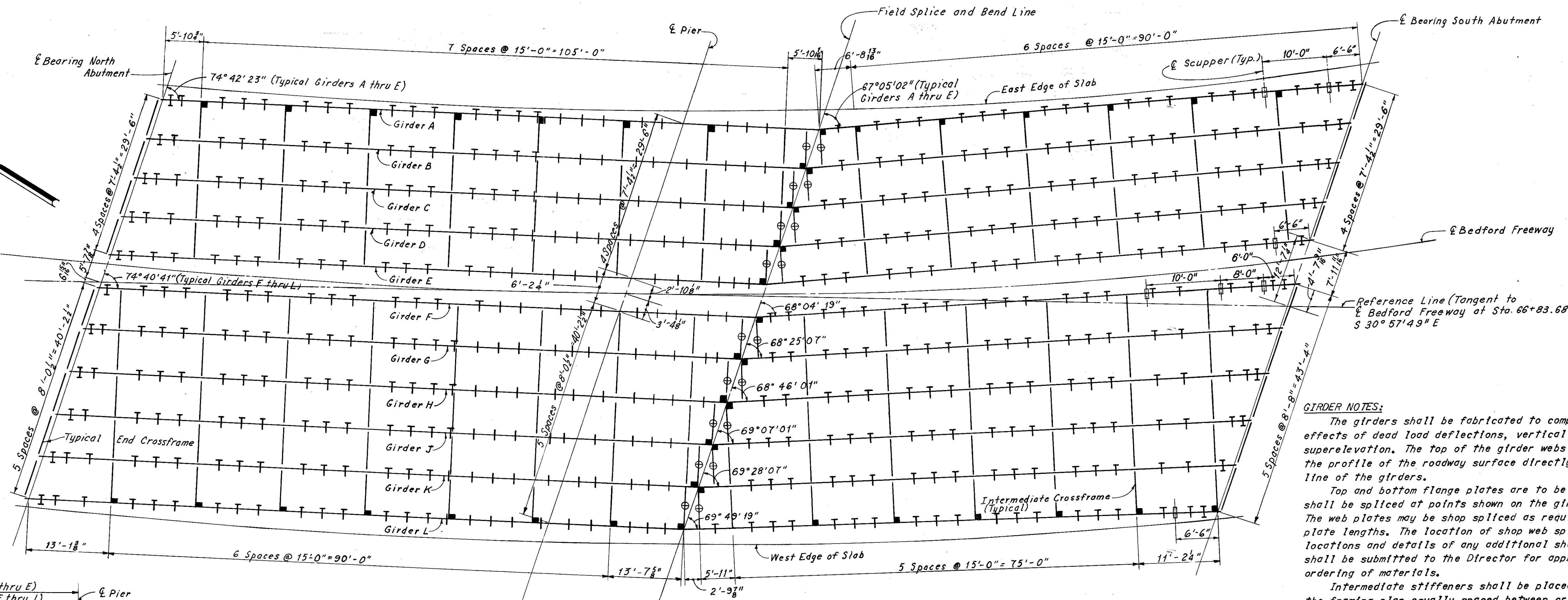
BR. NO. CUY-80-2169 STA. 65 + 23.94
CUYAHOGA COUNTY OHIO STA. 67 + 42.25

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 11-69	DATE 1-70	DATE 5-70	DATE	DATE

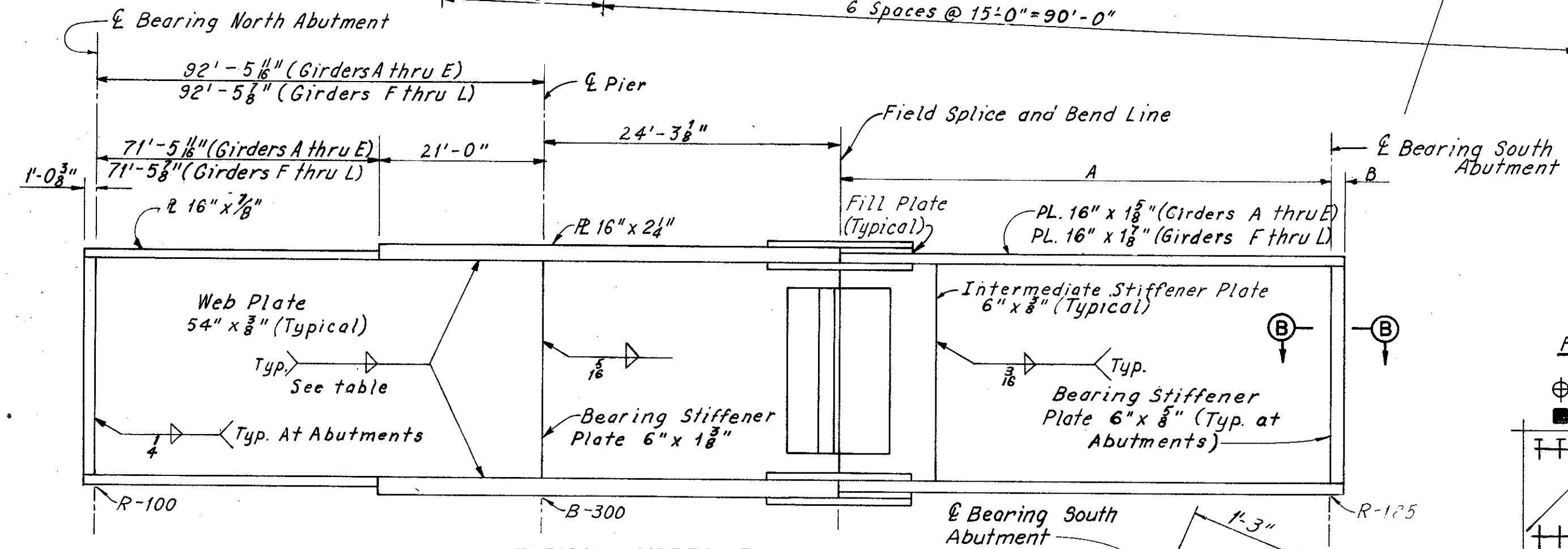
SHEET 7/12

Location	¢ Brg. N Abut.	¢	¢	¢	¢ Field Splice	¢	¢	¢	¢ Brg. S Abut.
¢ Girder A to East Edge of slab	2'-7 ¹ / ₂ "	1'-9 ³ / ₈ "	1'-5 ¹ / ₂ "	1'-11 ¹ / ₂ "	3'-6"	2'-4 ³ / ₈ "	2'-0 ¹ / ₂ "	2'-5"	3'-7"
¢ Girder E to East Edge of open joint	1'-6 ³ / ₈ "	2'-5 ³ / ₈ "	2'-11 ¹ / ₂ "	2'-9 ¹ / ₂ "	1'-6 ³ / ₈ "	2'-11 ¹ / ₂ "	3'-7 ³ / ₈ "	3'-7 ³ / ₈ "	2'-10 ³ / ₈ "
¢ Girder L to West Edge of slab	1'-4 ³ / ₈ "	2'-5 ³ / ₈ "	3'-1 ¹ / ₈ "	3'-3 ³ / ₈ "	2'-6 ³ / ₈ "	3'-3 ³ / ₈ "	3'-3 ³ / ₈ "	2'-7 ³ / ₈ "	1'-4 ¹ / ₂ "

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DEC 22 1982



GIRDER NOTES:
The girders shall be fabricated to compensate for the effects of dead load deflections, vertical curvature and superelevation. The top of the girder webs shall parallel the profile of the roadway surface directly over the center line of the girders.
Top and bottom flange plates are to be the same and shall be spliced at points shown on the girder elevation. The web plates 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 the framing plan equally spaced between crossframe, or crossframes and bearing stiffeners, or crossframes and field splices, except the first two stiffener spaces at the ends of simply supported girders shall be one-half of this spacing. Stiffeners shall be placed in pairs and shall have contact bearing with both flanges.
Bearing stiffeners at piers and abutments shall be placed in pairs on all girders. Intermediate stiffeners and bearing stiffeners at piers shall be normal to the top flange. Bearing stiffeners at abutments shall be vertical.
All girder field splices shall be made with 1¹/₄ high strength steel bolts. The bolts shall be placed with their heads on the outside face of the exterior girders and on the bottom of the flange plates.
The contractor shall submit to the Director for approval three prints showing his proposed erection procedure.



FRAMING PLAN

Framing Plan Legend

- ⊕ Indicates Type "X" Crossframe
- Indicates 90°
- ||| Indicates intermediate stiffeners having contact bearing with the top flange.
- ||| Indicates intermediate stiffeners having contact bearing with the bottom flange.
- ⊥ Indicates intermediate stiffeners at one-half normal stiffener spacing.

See girder notes for stiffener spacing.

Note: Intermediate stiffeners located at crossframes are shown in the "Framing Plan" only at places where contact bearing with the flange changes adjacent to the crossframe.

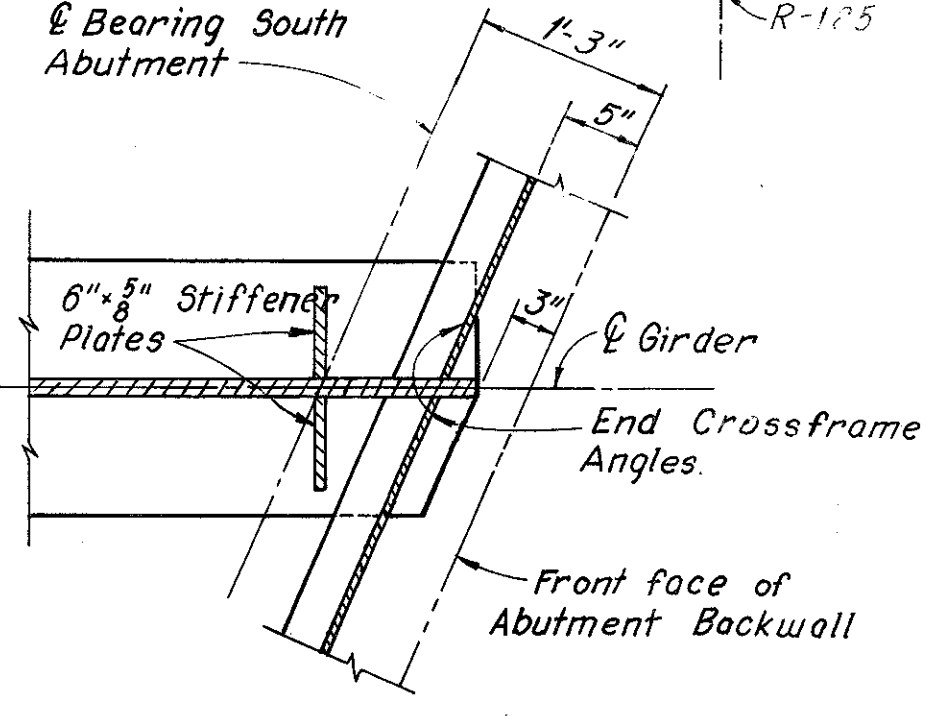
Notes:
For details of Rockers and Bolsters see Ohio Standard Drawing RB-1-55.
For details of end crossframes, roadway end dams and curb plates, see Ohio Standard Drawing SD-1-69, Sheets 1 and 2 of 4, and sheet 9/12

For Intermediate and Type "X" Crossframes and for Scupper details see Sheets CD1 and CD2
For locations and details of underpass luminaire supports see Lighting Plans. The supports are included with the Lighting Quantities for payment.

Intermediate stiffeners shall have contact bearing with top and bottom flanges.
Stiffeners shall be located at all crossframes.

Girder	Dimensions	
	A	B
A thru E	96'-3 ³ / ₈ "	1'-0 ¹ / ₈ "
F	96'-0 ³ / ₈ "	1'-0 ¹ / ₈ "
G	95'-9 ³ / ₈ "	1'-0 ¹ / ₈ "
H	95'-7 ¹ / ₂ "	1'-0 ¹ / ₈ "
J	95'-4 ³ / ₈ "	1'-0 ¹ / ₈ "
K	95'-1 ³ / ₈ "	1'-0 ¹ / ₈ "
L	94'-11 ¹ / ₈ "	1'-0 ¹ / ₈ "

FLANGE PLATE THICKNESS	FILLET WELD SIZE
7/8"	5/8"
1 ¹ / ₈ ", 1 ¹ / ₂ " and 2"	3/8"



SECTION B-B

H.N.T.B. BR. NO. 8
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KANSAS CITY CLEVELAND NEW YORK

FRAMING PLAN AND GIRDER ELEVATION

1-80 UNDER BEDFORD FREEWAY

BR. NO. CUY-80-2169 STA. 65+88.92 TO STA. 68+07.24

CUYAHOGA COUNTY OHIO

DRAWN J.T.	TRACED A.J.T.	CHECKED K.Y.H.	REVIEWED
DATE 5-4-69	DATE 6-17-69	DATE 5-14-69	DATE

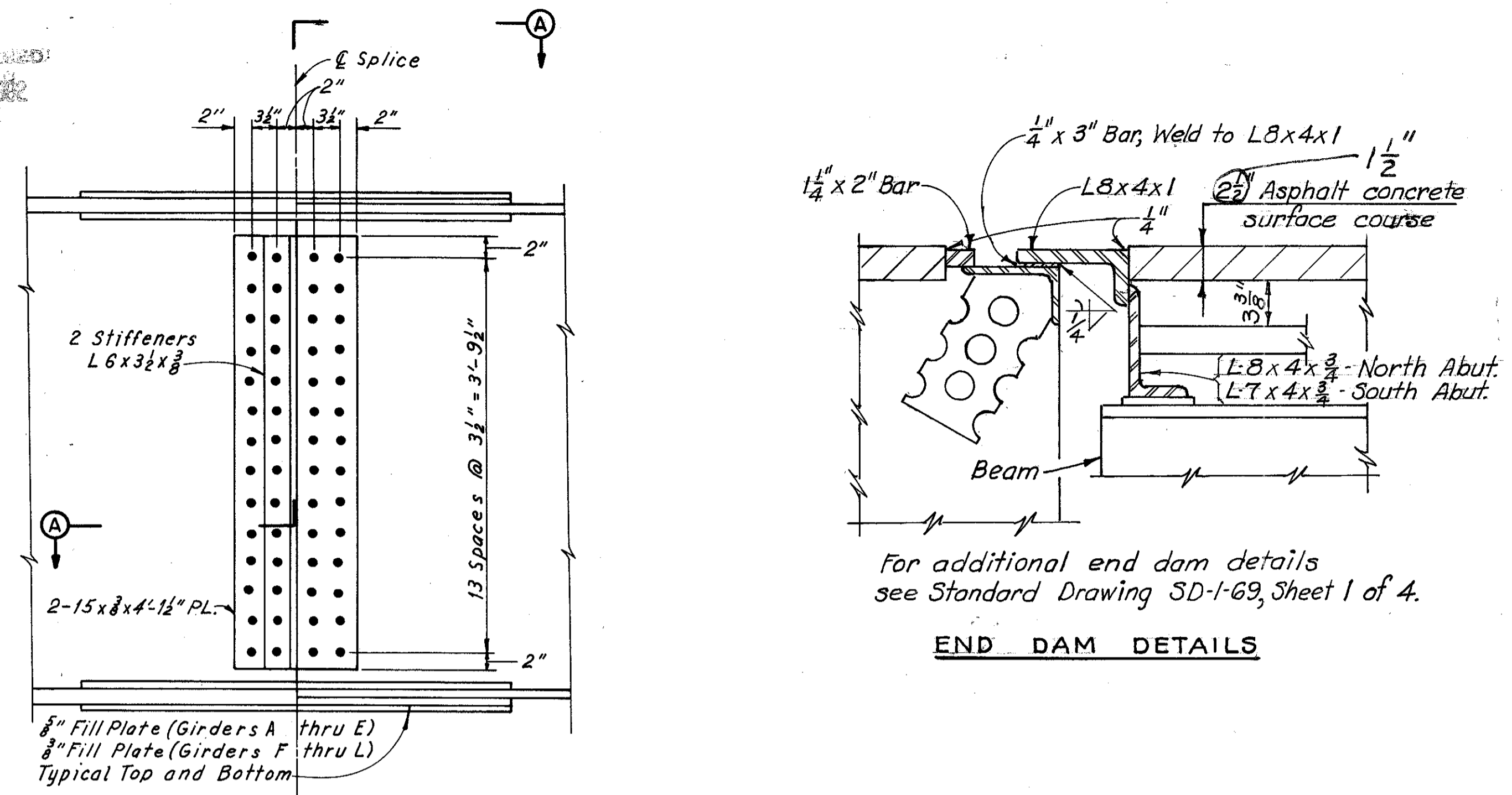
REVISED 9-27-74
SHEET 8/12

Girder	TOP OF REINFORCED CONCRETE DECK ELEVATIONS											
	SPAN 1						SPAN 2					
¢ Brg. N. Abut.	a	b	c	¢ Pier	a	b	c	¢ Brg. S. Abut.				
A	886.07	885.53	885.00	884.49	884.01	883.41	882.66	882.00	881.51			
B	886.43	885.92	885.43	884.95	884.50	883.94	883.23	882.60	882.12			
C	886.78	886.31	885.85	885.40	884.98	884.46	883.79	883.20	882.73			
D	887.13	886.70	886.26	885.85	885.46	884.98	884.35	883.79	883.33			
E	887.12	886.72	886.33	885.93	885.53	885.01	884.49	883.98	883.44			
F	887.21	886.78	886.36	885.96	885.57	885.11	884.53	884.02	883.60			
G	887.58	887.19	886.80	886.42	886.08	885.66	885.13	884.68	884.31			
H	887.95	887.59	887.24	886.89	886.58	886.20	885.73	885.33	885.00			
J	888.31	887.98	887.66	887.35	887.07	886.74	886.32	885.97	885.69			
K	888.55	888.30	888.05	887.77	887.52	887.20	886.86	886.53	886.20			
L	888.25	888.03	887.80	887.56	887.31	886.97	886.67	886.33	885.94			

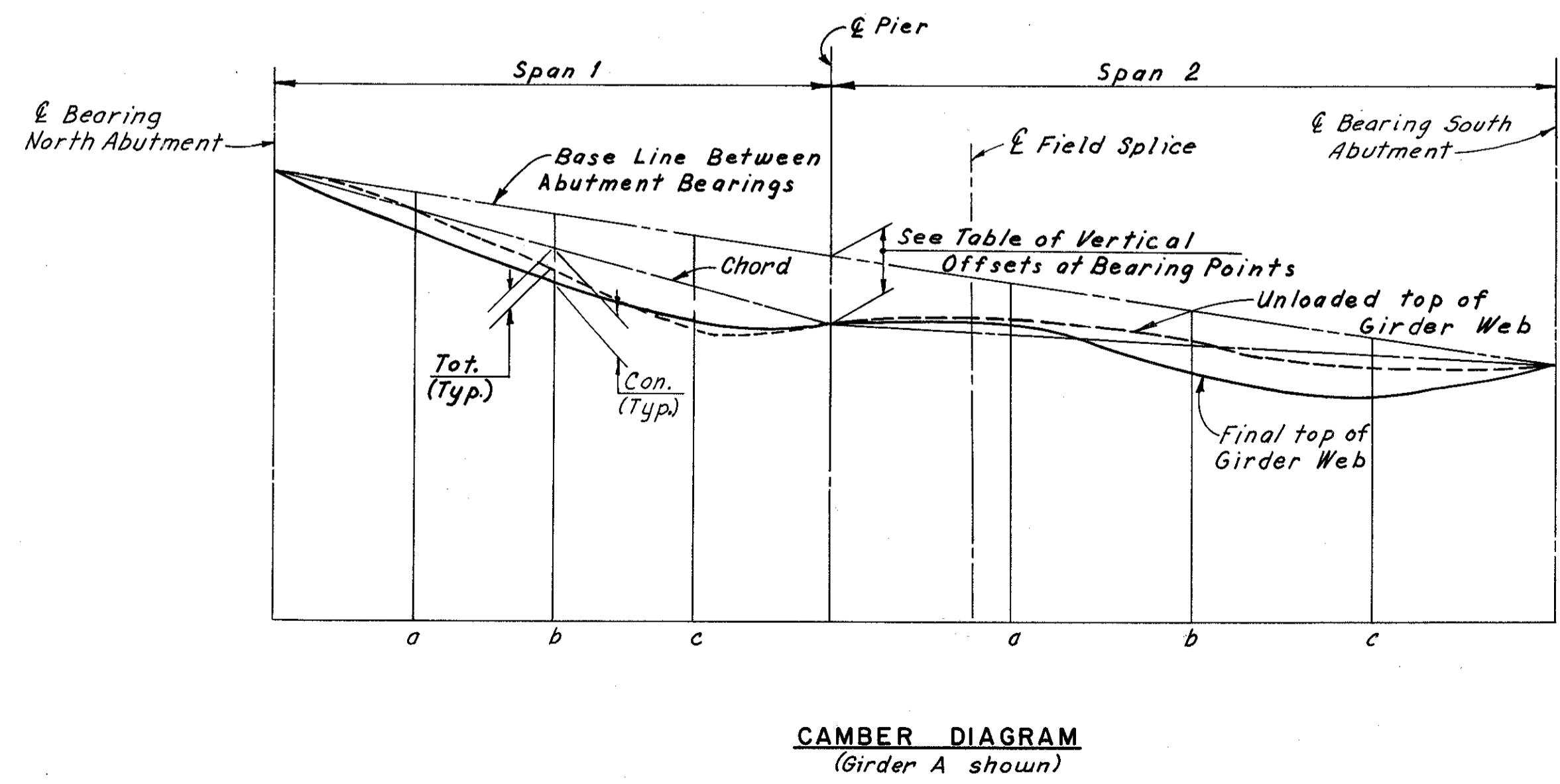
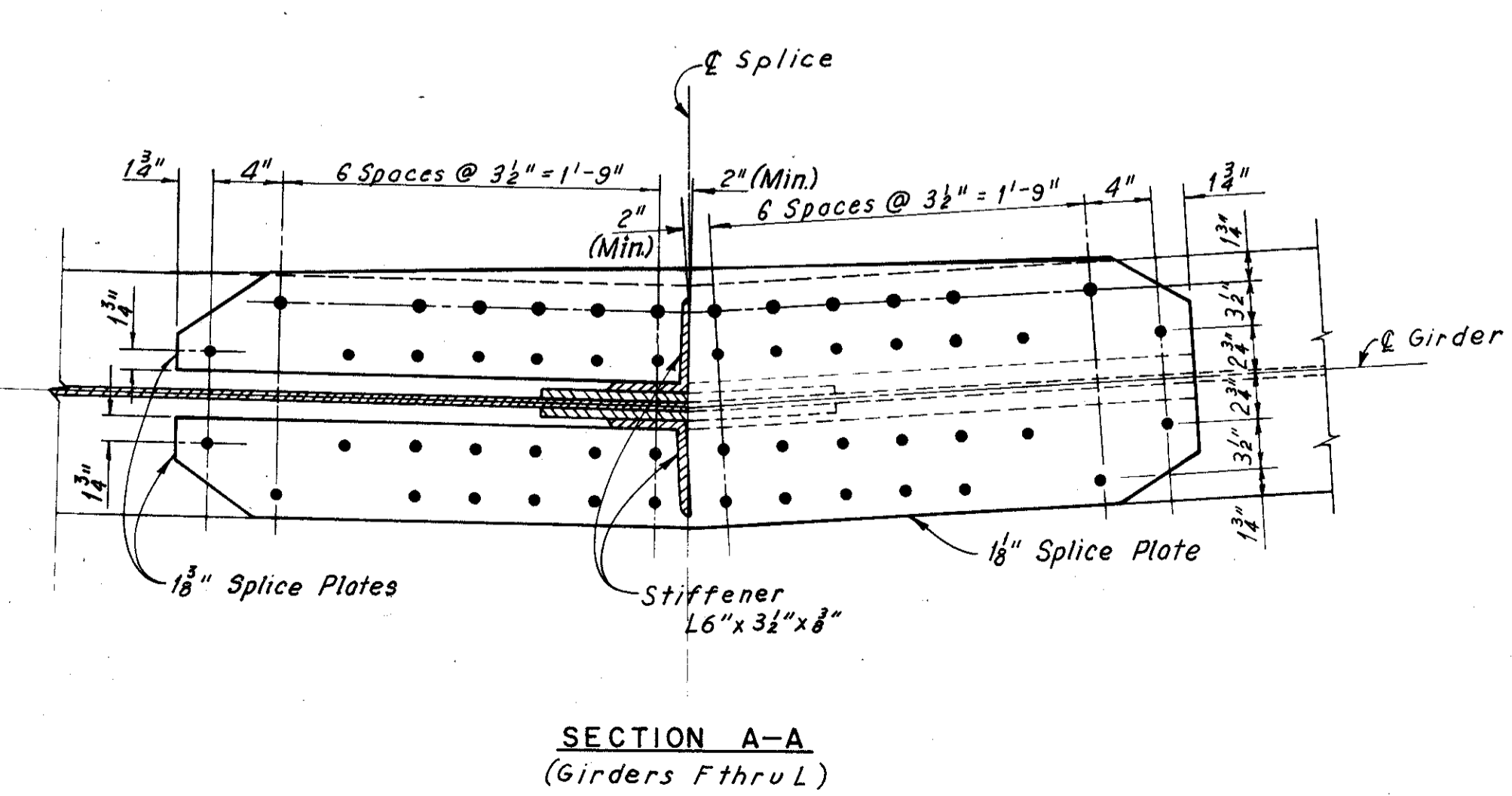
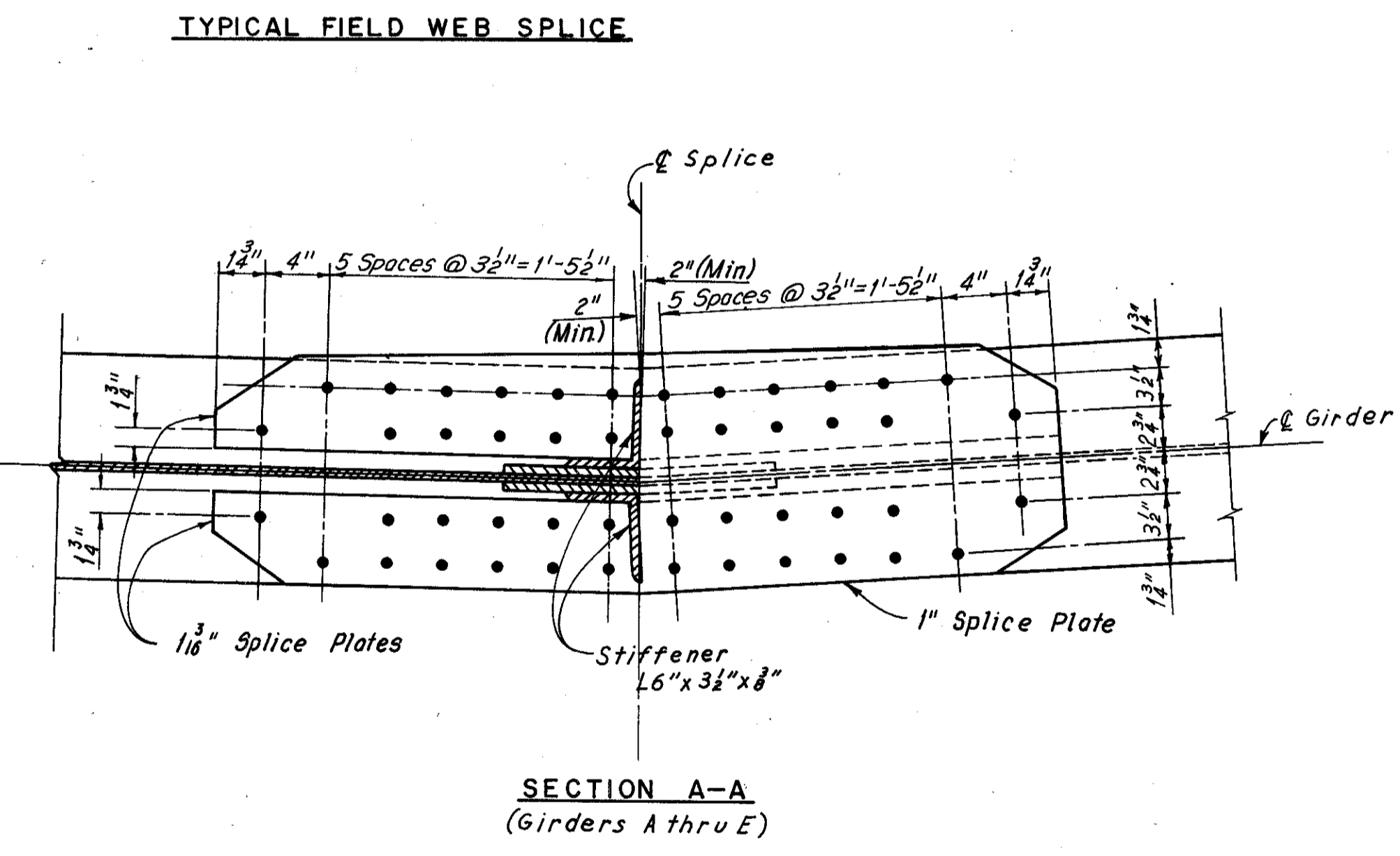
Note:
When Girders A and L are underneath the curb, the elevation shown is to an extended top of concrete deck.

Girder	Offset at ¢ Pier
A	-1 1/8"
B	-3/4"
C	-1 1/8"
D	-5/8"
E	0
F	-1 1/8"
G	-5/8"
H	-1 1/8"
J	-1 1/8"
K	-1 1/8"
L	-1 1/8"

Note:
Positive values of vertical offsets at bearing points indicates an offset above the base line.



Girder	DEAD LOAD DEFLECTION AND CAMBER																										
	Span 1												Span 2														
	a				b				c				¢ Field Splice				a				b				c		
Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.
A	1/16	1/16	-4	0	0	1/16	-3	-2	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	1/16	1/16	1/16	1/16	1/16	1/16
B	1/16	1/16	-4	1/16	1/16	1/16	-7	-10	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	1/16	1/16	1/16	1/16	1/16	1/16
C	1/16	1/16	-4	1/16	1/16	1/16	-7	-10	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	1/16	1/16	1/16	1/16	1/16	1/16
D	1/16	1/16	-4	1/16	1/16	1/16	-7	-10	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	1/16	1/16	1/16	1/16	1/16	1/16
E	1/16	1/16	0	1/16	1/16	1/16	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	1/16	1/16	1/16	1/16	1/16	1/16
F	1/16	1/16	-4	1/16	1/16	1/16	-7	-10	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	1/16	1/16	1/16	1/16	1/16	1/16
G	1/16	1/16	-4	1/16	1/16	1/16	-7	-10	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	1/16	1/16	1/16	1/16	1/16	1/16
H	1/16	1/16	-4	1/16	1/16	1/16	-7	-10	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	1/16	1/16	1/16	1/16	1/16	1/16
J	1/16	1/16	-4	1/16	1/16	1/16	-7	-10	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	1/16	1/16	1/16	1/16	1/16	1/16
K	1/16	1/16	-4	1/16	1/16	1/16	-7	-10	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	1/16	1/16	1/16	1/16	1/16	1/16
L	1/16	1/16	-4	1/16	1/16	1/16	-7	-10	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	1/16	1/16	1/16	1/16	1/16	1/16



Notes:
 Negative values for deflection indicate deflections above chord line.
 Negative values for convexity or concavity and total required camber indicate values below the chord line.
 Points a, b and c represent the 1/4, 1/2 and 3/4 points of the span respectively.
 Deflections and convexities or concavities are given to the nearest 1/16 inch.
 The following abbreviations are used:
 Stl. = Dead load deflection due to the weight of steel.
 Rem. D.L. = Remaining dead load deflection.
 Con. = Convexity or concavity.
 Tot. = Total required camber.

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FIELD SPLICE DETAILS AND CAMBER DIAGRAM

I-80 UNDER BEDFORD FREEWAY

BR. NO. CUY-80-2169 STA. 65+88.92 TO STA. 68+07.24

CUYAHOGA COUNTY OHIO

DRAWN J.T.	TRACED GEM	CHECKED R.P.H.	REVIEWED	REVISED 9-27-74
DATE 5-1-69	DATE 5-5-69	DATE 5-15-69	DATE	SHEET 9/12

MICROFILMED
DEC 22 1982

Note: A typical haunch width of 9" shall be used for computing quantity of concrete. However, the haunch width may vary between 6" and 12" provided that the slope shall be not more than 1:4 for a haunch less than 9" in width.

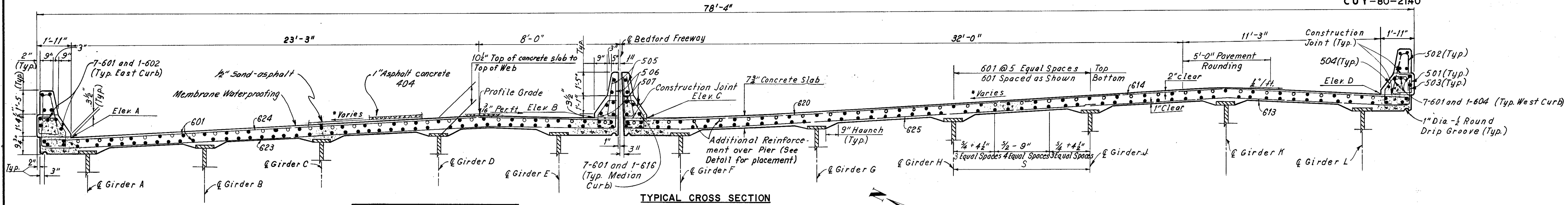
* See Superelevation Transition Diagram.

For Superstructure Drainage
Detail see sheet CDR

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

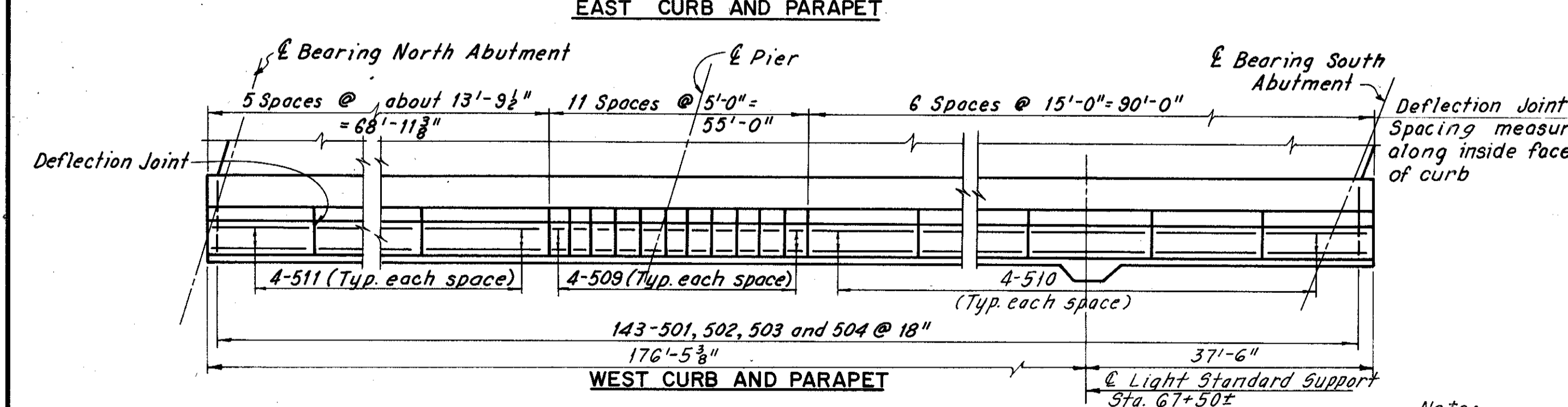
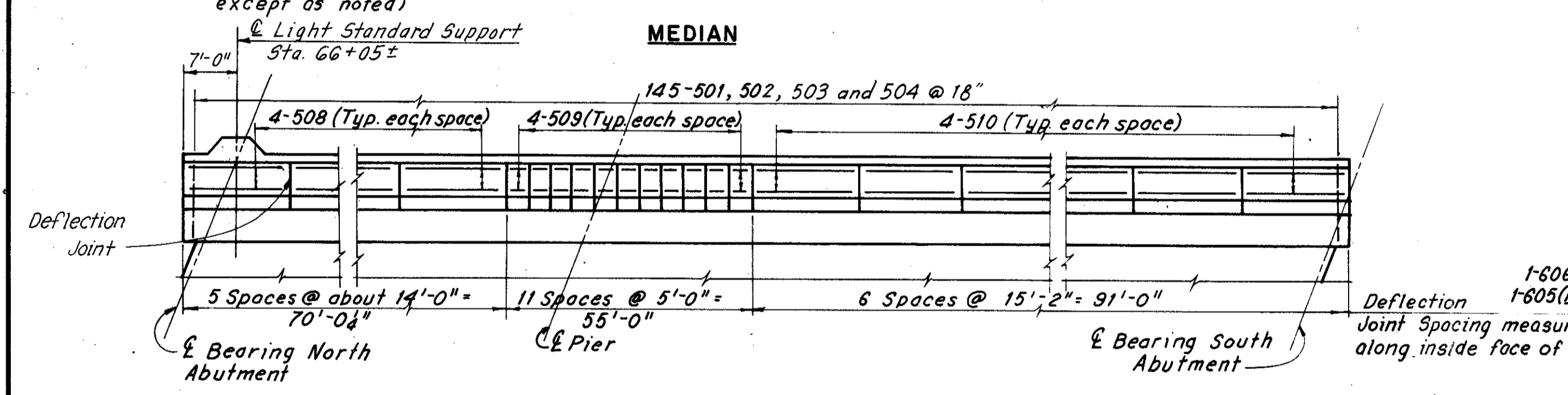
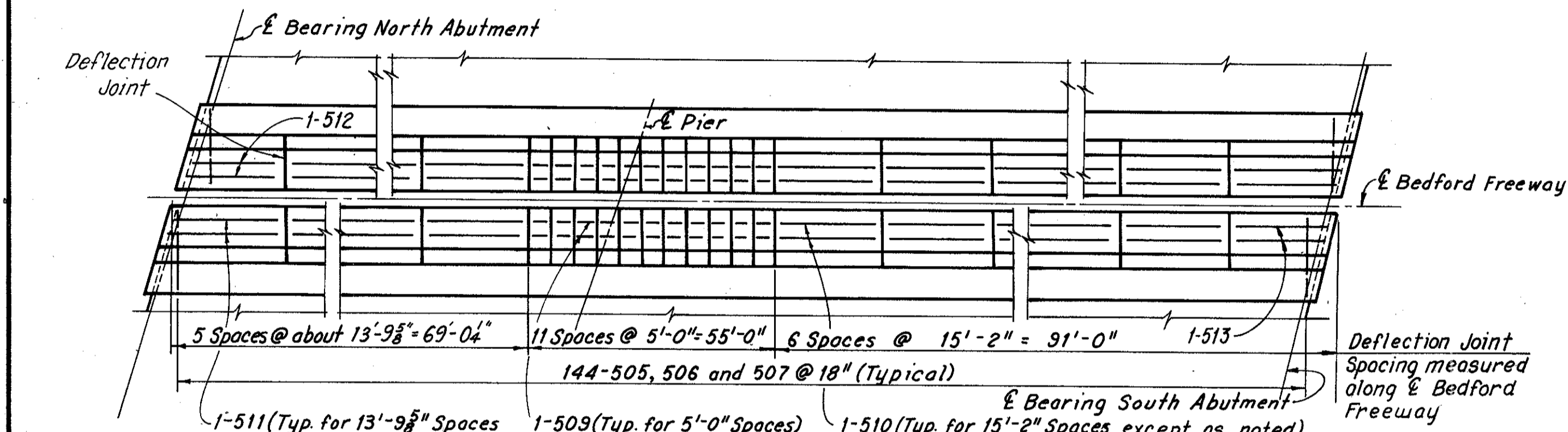
333
390

CUYAHOGA COUNTY
CUY-80-2140



Note:
All reinforcing bar marks shall be prefixed S.

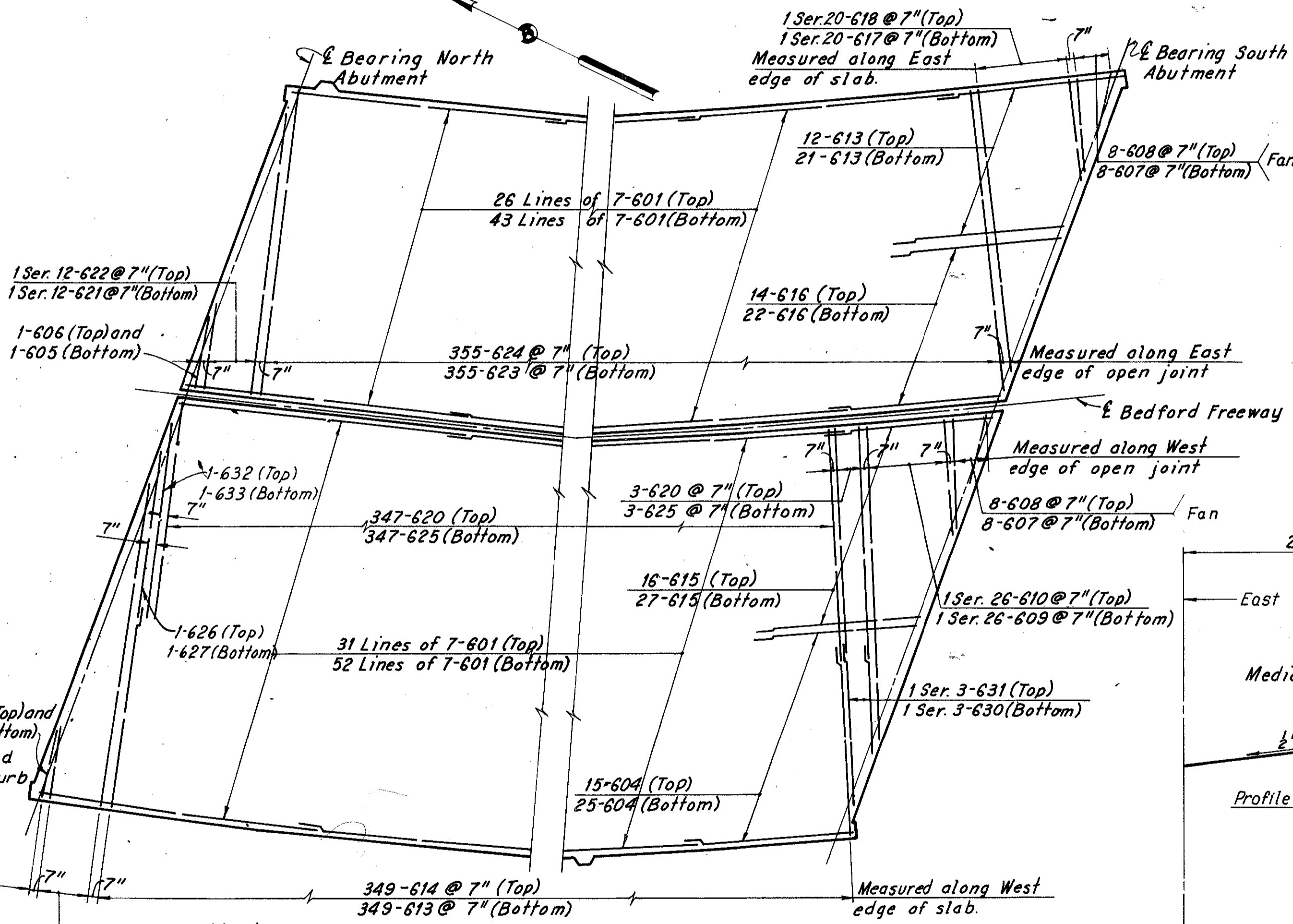
TYPICAL CROSS SECTION



FACE OF CURB ELEVATIONS - (Top of concrete slab)

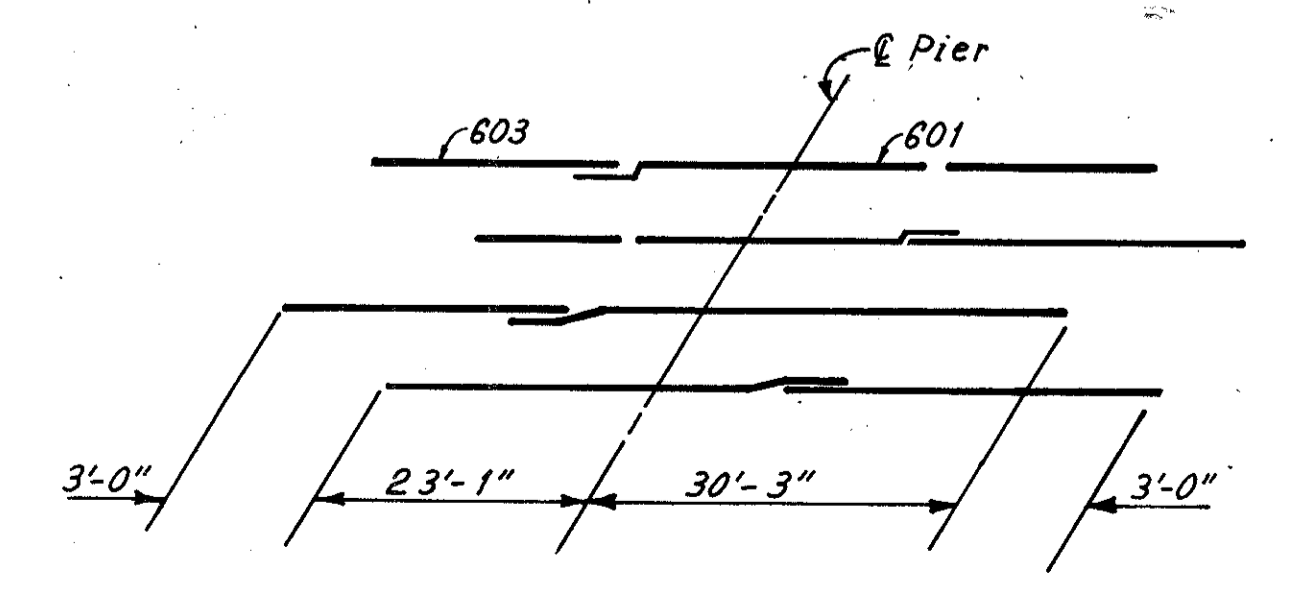
Elevation	Span 1					Span 2					E. Brg. S. Abut.
	1	2	3	4	5	1	2	3	4	5	
A	886.02	885.63	885.22	884.80	884.38	883.98	883.47	883.00	882.47	881.90	881.35
B	887.12	886.81	886.49	886.16	885.83	885.53	885.17	884.81	884.41	883.95	883.44
C	887.14	886.84	886.53	886.19	885.87	885.56	885.18	884.82	884.41	883.97	883.44
D	888.27	888.09	887.88	887.66	887.44	887.25	887.04	886.83	886.58	886.29	885.96

Note:
The elevations shown at the face of curb are those which are required before concrete is placed. Proper allowance has been made for the dead load deflections caused by the weight of the concrete.



SLAB PLAN

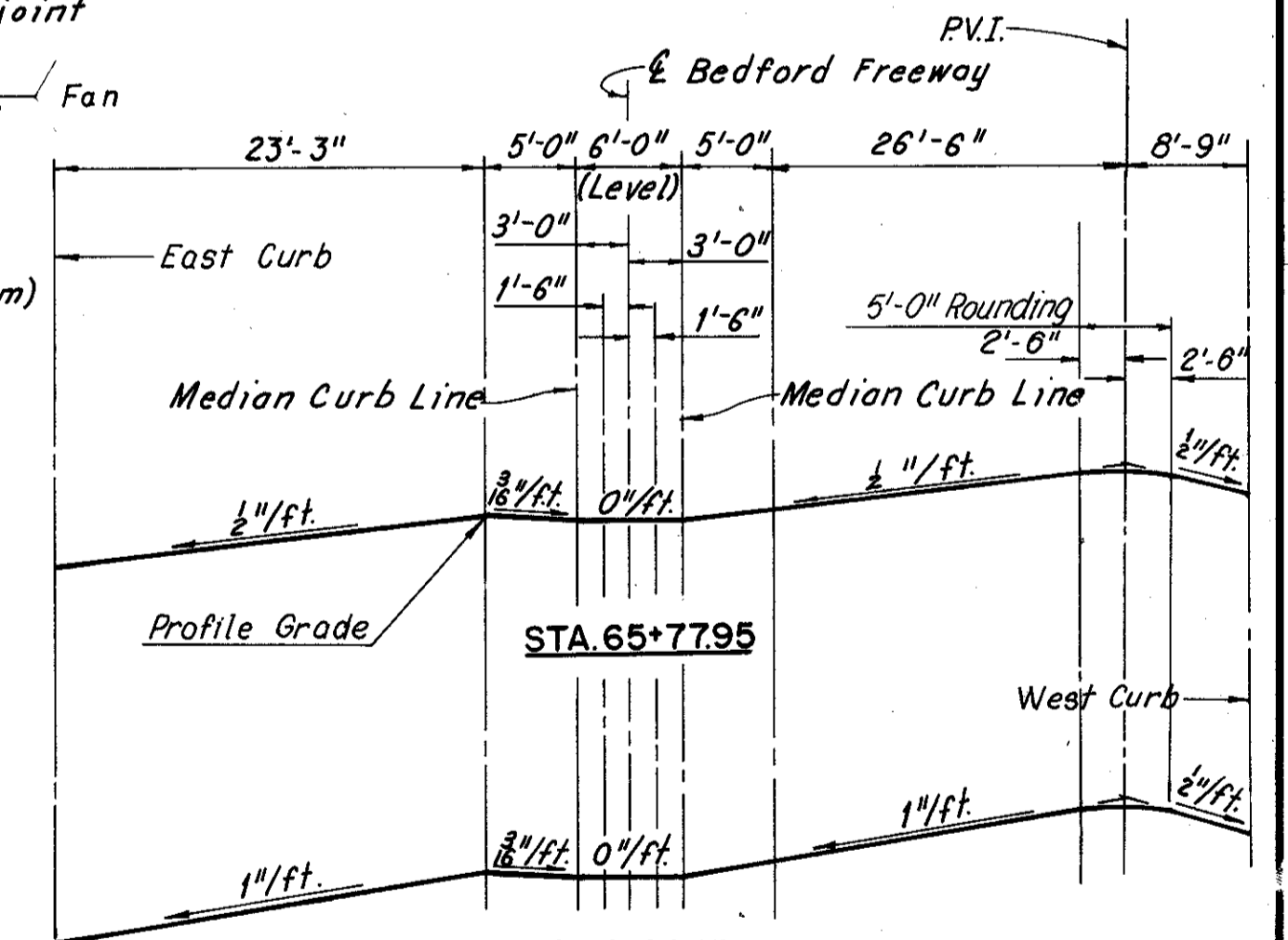
Note:
Transverse reinforcement shall be placed radially to the edges of slab.



PLACEMENT OF ADDITIONAL REINFORCEMENT OVER PIER

Note:
The preformed expansion joint filler in the railing parapet deflection joints may be either 1/4" gray sponge rubber or 1/4" gray cellular polyvinyl chloride (PVC) sponge. The deflection joint extends from top of parapet to first construction joint and is included for payment with Superstructure Concrete.

Notes:
For Notes see Sheet 8/12.
For Light Standard Support Details see Sheet CD 1.



SUPERELEVATION TRANSITION DIAGRAM

H.N.T.B. BR. NO. 8

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

SLAB PLAN AND
TYPICAL CROSS SECTION

1-80 UNDER BEDFORD FREEWAY

BR. NO. CUY-80-2169 STA. 65+88.92 TO
STA. 68+07.24

CUYAHOGA COUNTY OHIO

DRAWN J.T.	TRACED/SC	CHECKED	REVIEWED	REVISED
DATE 4-23-69	DATE 5-15-69	DATE 5-27-69	DATE	DATE

SHEET 10/12

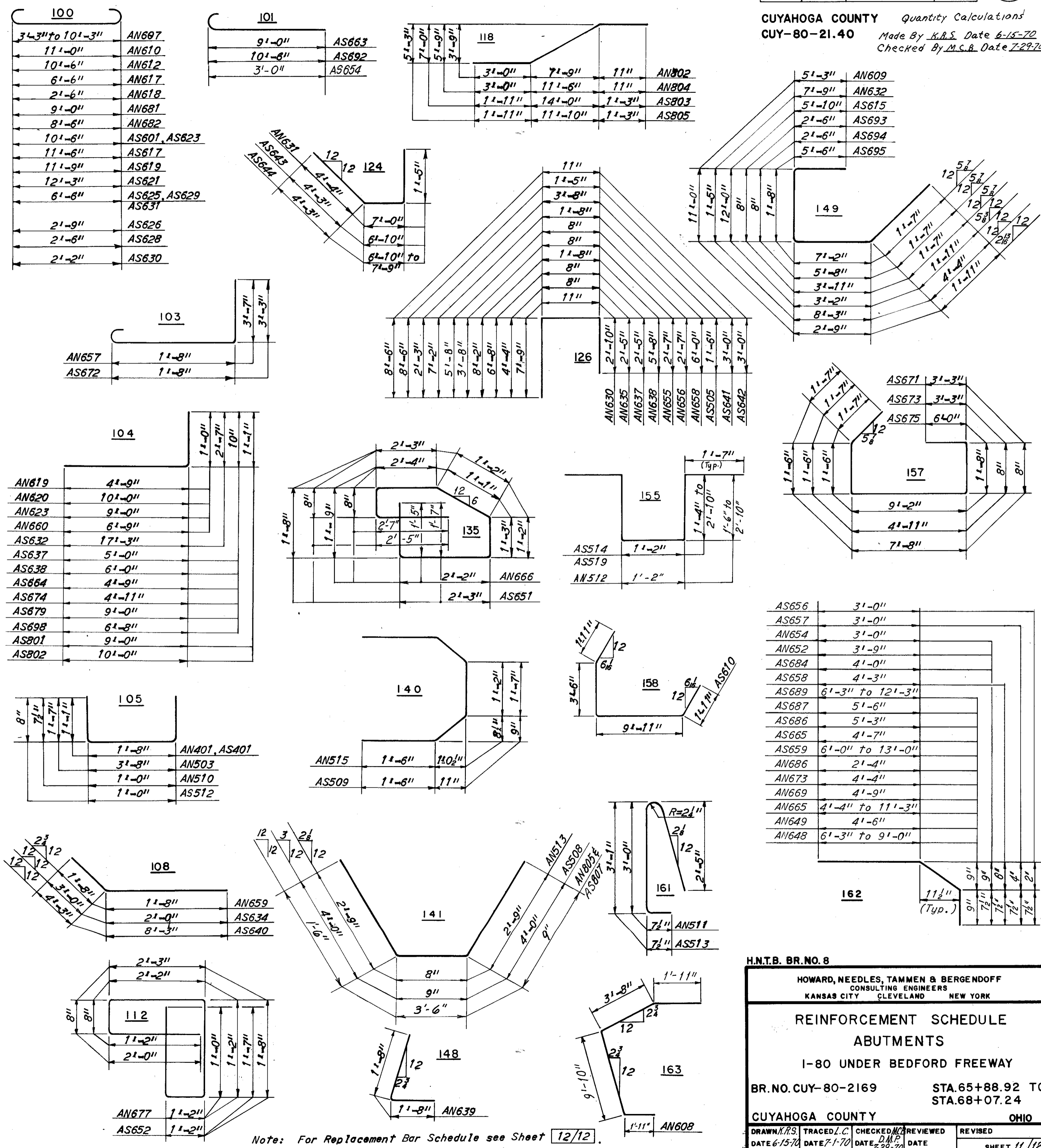
MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)				
NORTH ABUTMENT																					
						AN666	19	11'-11"	135		316	AS626	1	4'-11"	100		6				
						AN667	1 Ser. 5	10'-3" to 7'-3"	Str.	9"	66	AS627	12	5'-6"	Str.		99				
AN401	77	3'-7"			184	AN668	4	5'-9"	Str.		35	AS628	14	3'-10"	100		81				
ANS01	6	37'-6"	Str.		235	AN669	4	6'-9"	162		41	AS629	8	7'-10"	100		94				
ANS02	4	39'-9"	Str.		166	AN670	2	4'-0"	Str.		12	AS630	1	3'-6"	100		5				
ANS03	41	6'-6"	105		278	AN673	1	6'-6"	162		10	AS632	9	19'-8"	104		266				
ANS04	34	40'-9"	Str.		1,445	AN674	2	17'-6"	Str.		53	AS633	11	15'-3"	Str.		252				
ANS05	1	19'-0"	Str.		20	AN675	4	13'-6"	Str.		81	AS634	11	4'-11"	108		81				
ANS06	1	8'-9"	Str.		9	AN676	2	10'-9"	Str.		32	AS635	1 Ser. 4.3	9'-3" to 11'-6"	Str.	3"	670				
ANS07	1	16'-3"	Str.		17	AN677	2	6'-6"	112		20	AS636	1 Ser. 3	11'-6" to 13'-6"	Str.	1'-0"	56				
ANS08	1	27'-9"	Str.		28	AN678	1 Ser. 5	8'-9" to 2'-9"	Str.	1'-6"	43	AS637	81	5'-8"	104		689				
ANS09	1	12'-9"	Str.		13	AN679	4	5'-0"	Str.		30	AS638	3	6'-8"	104		30				
ANS10	39	2'-0"	105		81	AN680	10	3'-9"	Str.		56	AS639	1 Ser. 3.6	8'-0" to 10'-0"	Str.	3"	487				
ANS11	29	6'-11"	161		184	AN681	2	10'-4"	100		31	AS640	39	12'-5"	108		727				
ANS12	1 Ser. 4	9'-6" to 6'-10"	155	108"	34	AN682	2	9'-10"	100		30	AS641	39	12'-7"	126		737				
ANS13	2	6'-3"	141		13	AN685	1	11'-6"	Str.		17	AS642	45	12'-11"	126		817				
ANS14	16	3'-3"	Str.		54	AN686	8	4'-2"	162		50	AS643	18	12'-3"	124		331				
ANS15	2	6'-6"	140		14	AN687	3	12'-9"	Str.		57	AS644	1 Ser. 2.7	12'-3" to 13'-2"	124	16"	515				
ANS16	10	23'-0"	Str.		240	AN688	8	14'-0"	Str.		168	AS645	8	25'-6"	Str.		306				
ANS17	10	17'-9"	Str.		185	AN689	2	9'-3"	Str.		28	AS646	2	20'-0"	Str.		60				
ANS18	12	9'-0"	Str.		113							AS647	2	21'-0"	Str.		63				
ANS19	7	8'-3"	Str.		60	AN801	2	5'-6"	Str.		29	AS648	4	16'-3"	Str.		98				
ANS20	11	7'-9"	Str.		89	AN802	2	12'-6"	118		67	AS649	2 Ser. 1.2	2'-6" to 16'-0"	Str.	1'-1/2"	333				
ANS21	11	7'-0"	Str.		80	AN803	2	6'-9"	Str.		36	AS650	6	5'-6"	Str.		50				
						AN804	2	16'-9"	118		89	AS651	34	10'-8"	135		545				
						AN805	28	5'-9"	141		430	AS652	2	8'-6"	112		26				
AN601	29	41'-9"	Str.		1,811							AS653	6	3'-8"	Str.		32				
AN602	7	39'-9"	Str.		407							AS654	2	3'-8"	101		11				
AN603	3	40'-9"	Str.		184							AS655	6	4'-0"	Str.		36				
AN604	1	39'-9"	Str.		60	SOUTH ABUTMENT										AS656	2	4'-8"	162		14
AN607	1 Ser. 3	11'-6" to 4'-6"	100	316"	36	AS401	77	3'-7"	105		184	AS657	2	4'-7"	162		14				
AN608	2	17'-9"	163		52	AS501	70	30'-0"	Str.		2,190	AS658	1	5'-11"	162		9				
AN609	2	20'-8"	149		62	AS502	1	31'-0"	Str.		32	AS659	1 Ser. 1.0	8'-0" to 15'-0"	162	9 3/8"	173				
AN610	3	12'-4"	100		56	AS503	2	37'-0"	Str.		78	AS660	4	13'-3"	Str.		80				
AN612	69	11'-10"	100		1,226	AS504	3	22'-0"	Str.		69	AS661	2	12'-6"	Str.		38				
AN615	5	5'-3"	Str.		39	AS505	43	7'-2"	126		321	AS662	1 Ser. 1.0	6'-9" to 13'-9"	Str.	9 3/8"	154				
AN616	5	6'-3"	Str.		47	AS506	1 Ser. 2.8	11'-3" to 13'-6"	Str.	1 3/8"	284	AS663	2	9'-8"	101		29				
AN617	8	7'-10"	100		94	AS507	1 Ser. 1.9	10'-0" to 12'-3"	Str.	1 1/2"	220	AS664	12	5'-5"	104		98				
AN618	14	3'-10"	100		81	AS508	2	8'-6"	141		18	AS665	3	6'-7"	162		30				
AN619	34	5'-6"	104		281	AS509	2	6'-9"	140		14	AS666	1 Ser. 3	10'-0" to 8'-0"	Str.	1'-0"	41				
AN620	34	10'-10"	104		553	AS510	2	13'-6"	Str.		28	AS667	5	20'-6"	Str.		154				
AN622	10	4'-3"	Str.		64	AS511	20	2'-9"	Str.		57	AS668	2	13'-3"	Str.		40				
AN623	39	9'-10"	104		576	AS512	44	2'-11"	105		96	AS669	5	20'-6"	Str.		154				
AN629	81	8'-3"	Str.		1,004	AS513	34	6'-2"	161		219	AS670	2	13'-3"	Str.		40				
AN630	43	11'-2"	126		721	AS514	1 Ser. 6	6'-6" to 9'-6"	155	7 3/8"	50	AS671	8	14'-2"	157		170				
AN631	45	12'-6"	124		807	AS515	10	23'-3"	Str.		242	AS672	27	5'-5"	103		220				
AN632	37	21'-6"	149		1,195	AS516	10	3'-9"	Str.		39	AS673	6	11'-5"	157		98				
AN633	2	10'-9"	Str.		32	AS517	10	25'-6"	Str.		266	AS674	17	5'-7"	104		143				
AN634	4	13'-6"	Str.		162	AS518	10	5'-0"	Str.		52	AS675	7	19'-5"	157		204				
AN635	6	7'-11"	126		64	AS519	1 Ser. 7	6'-6" to 9'-6"	155	6"	58	AS676	2 Ser. 3	17'-0" to 19'-0"	Str.	12"	162				
AN637	4	9'-5"	126		57	AS520	1	7'-9"	Str.		8	AS677	2	13'-9"	Str.		41				
AN638	5	15'-2"	126		114	AS521	1	17'-3"	Str.		18	AS678	2 Ser. 6	2'-6" to 12'-0"	Str.	1'-10 1/2"	131				
AN639	9	3'-2"	148		43	AS522	1	12'-9"	Str.		13	AS679	3	9'-8"	104		44				
AN640	2	7'-0"	Str.		21							AS680	8	23'-6"	Str.		282				
AN641	1	9'-6"	Str.		14	AS601	77	11'-10"	100		1,369	AS681	1	5'-8"	162		9				
AN643	6	18'-0"	Str.		162	AS602	2 Ser. 3	23'-0" to 32'-6"	Str.	1'-9"	277	AS682	1 Ser. 8	13'-0" to 7'-6"	Str.	9 1/2"	126				
AN644	2	13'-3"	Str.		40	AS603	1 Ser. 6	29'-6" to 32'-0"	Str.	6"	277	AS683	1	8'-6"	162		11				
AN645	2	10'-0"	Str.		30	AS604	1 Ser. 8	28'-0" to 32'-0"	Str.	6 1/2"	360	AS684	3	9'-0"	162		35				
AN646	2	7'-0"	Str.		21	AS605	20	15'-0"	Str.		451	AS685	3	7'-3"	Str.		33				
AN647	2	3'-9"	Str.		11	AS606	1 Ser. 9	31'-6" to 35'-0"	Str.	5 1/4"	449	AS686	1	8'-6"	162		11				
AN648	1 Ser. 5	11'-0" to 8'-3"	162	8 1/2"	72	AS607	1 Ser. 9	31'-0" to 35'-0"	Str.	6"	446	AS687	3	9'-0"	162		35				
AN649	4	6'-6"	162		39	AS608	1	34'-0"	Str.		51	AS688	3	7'-3"	Str.		33				
AN650	4	5'-6"	Str.		33	AS609	1	32'-6"	Str.		49	AS689	1 Ser. 7	10'-3" to 17'-3"	162	1'-0"	135				
AN651	2	4'-6"	Str.		14	AS610	2	16'-11"	158		51	AS690	2	18'-0"	Str.		80				
AN652	2	5'-6"	162		17	AS611	7	7'-0"	Str.		74	AS691	2	12'-3"	Str.		35				
AN654	4	4'-9"	162		29	AS612	106	9'-0"	Str.		1,433	AS692	2	11'-8"	101		34				
AN655	6	6'-7"	126		59	AS613	1	2'-2"	Str.		3	AS693	6	8'-5"	149		76				
AN656	6	8'-7"	126		77	AS614	1	6'-6"	Str.		10	AS694	7	10'-0"	149		105				
AN657	22	5'-10"	103		193	AS615	2	22'-9"	149		68	AS695	4	15'-6"	149		93				
AN658	5	12'-6"	126		109	AS616	1	8'-9"	Str.		13	AS696	2	16'-0"	162		48				
AN659	11	3'-2"	108		52	AS617	1	12'-10"	100		19	AS697	5	17'-3"	Str.		130				
AN660	6	7'-7"	104		68	AS618	1	9'-0"	Str.		14	AS698	3	7'-4"	104		33				
AN661	6	23'-0"	Str.		207	AS619	1	13'-11"	100		20	AS699	2	10'-0"	Str.		30				
AN662	2	8'-9"	Str.		26	AS620	1	10'-6"	Str.		16	AS801	79	9'-11"	104		2,092				
AN663	2	10'-6"	Str.		32	AS621	1	13'-7"	100		20	AS802	4	10'-11"	104		117				
AN664	1 Ser. 8	12'-3" to 7'-3"	Str.	8 1/2"	117	AS622	1	8'-6"	Str.		13	AS803	2	18'-10"	118		101				
AN665	1 Ser. 6	13'-2" to 6'-2"	162	110"	116	AS623	1	11'-10"	100		18	AS804	2	7'-8"	Str.		40				
						AS624	1	4'-0"	Str.		6	AS805	2	16'-5"	118		88				
						AS625	1	7'-10"	100		12	AS806	2	7'-3"	Str.		39				
												AS807	30	5'-9"	141		461				
												TOTAL WEIGHT					23,987				

INCORPORATED
DEC 22 1962

BENDING DIAGRAMS

FED. RD. DIVISION	STATE	PROJECT	334 390
2	OHIO		

CUYAHOGA COUNTY
CUY-80-21.40
Quantity Calculations
Made By K.A.S. Date 6-15-70
Checked By M.C.B. Date 7-29-70



H.N.T.B. BR. NO. 8
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

REINFORCEMENT SCHEDULE
ABUTMENTS
I-80 UNDER BEDFORD FREEWAY

BR. NO. CUY-80-2169 STA. 65+88.92 TO STA. 68+07.24
CUYAHOGA COUNTY OHIO

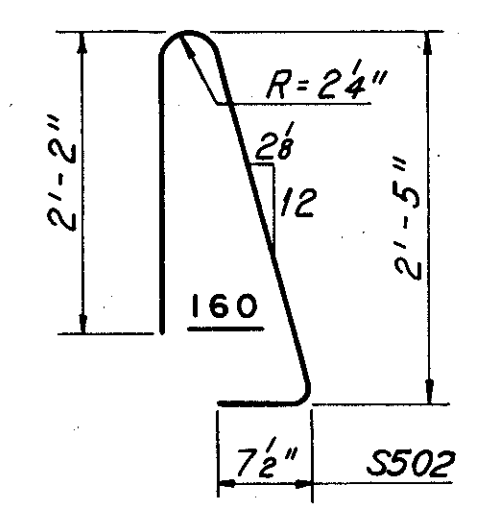
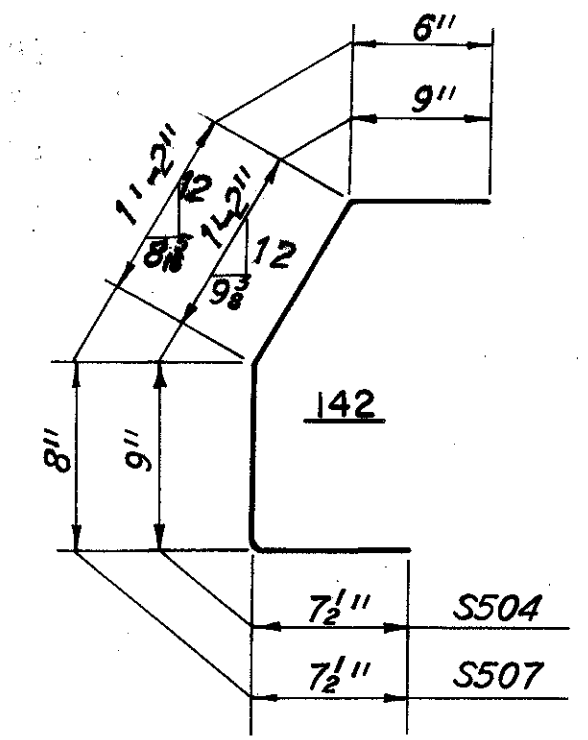
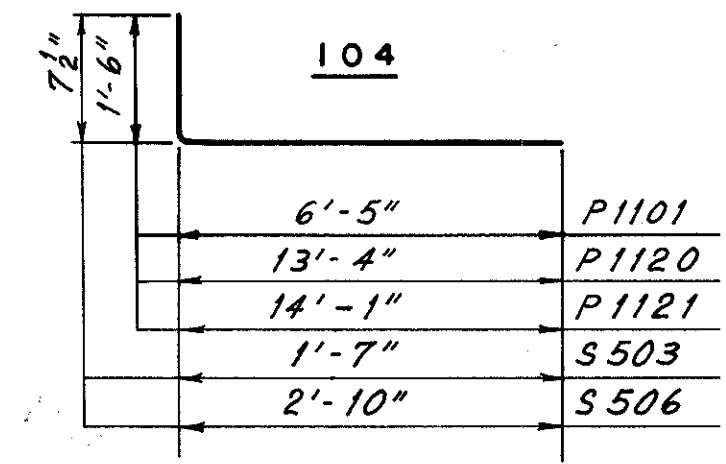
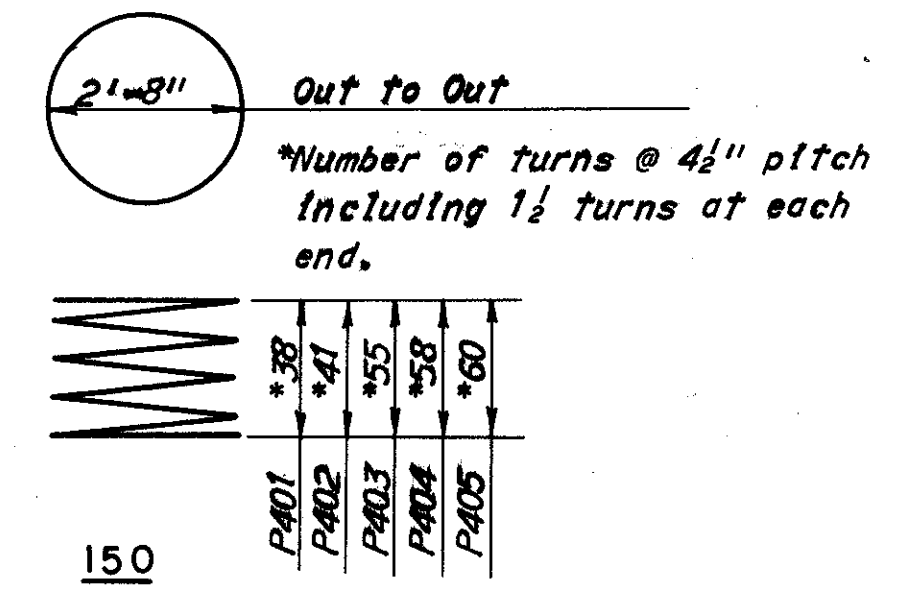
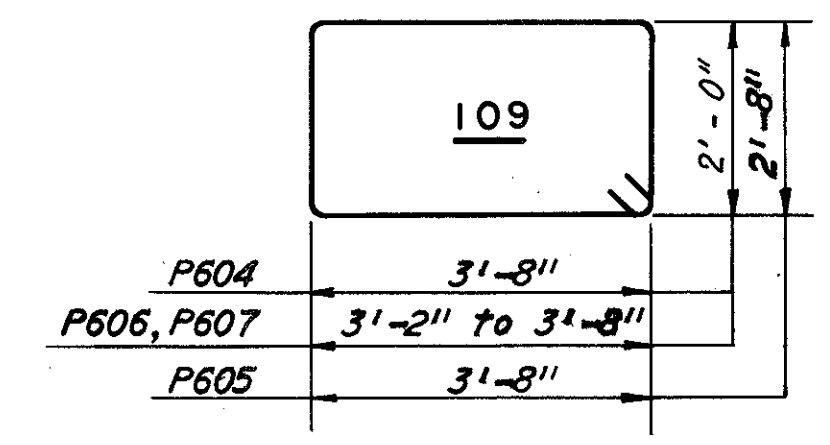
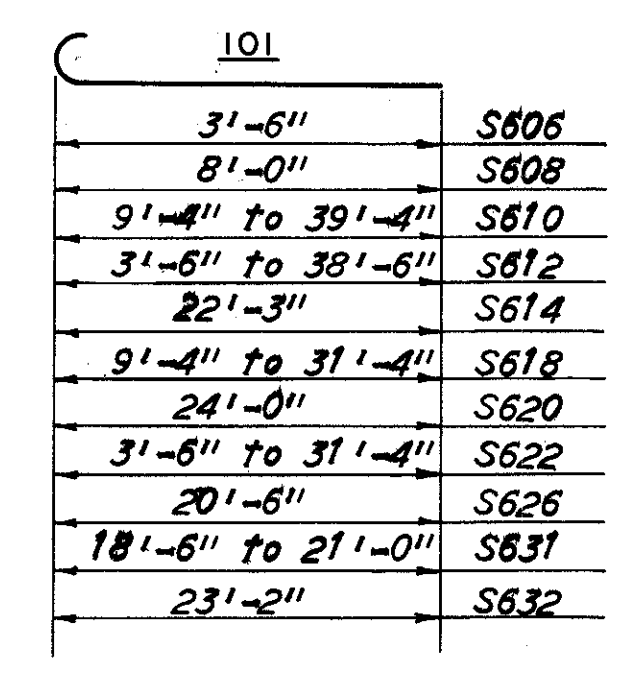
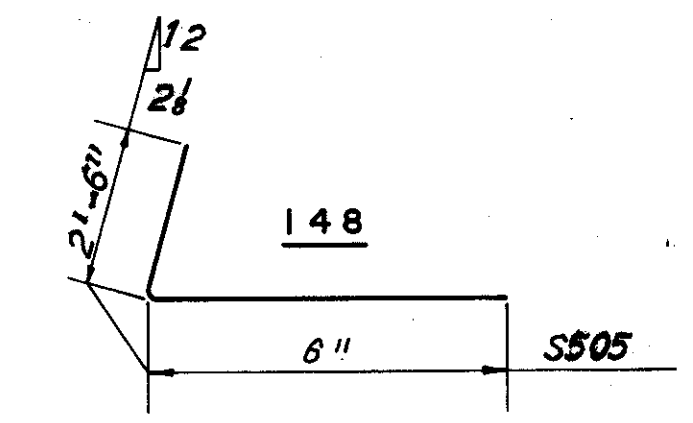
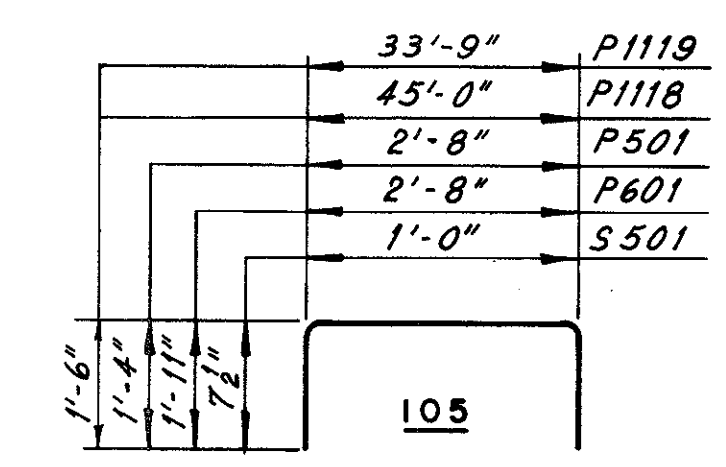
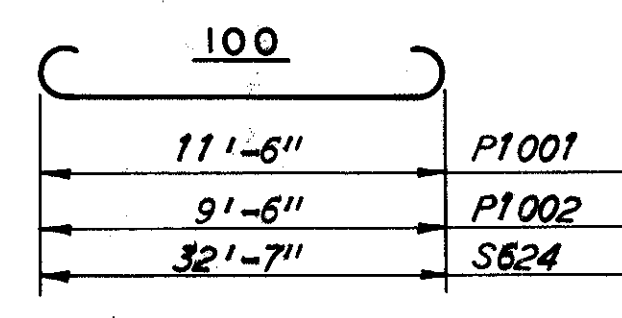
DRAWN/R.R.S.	TRACED/J.C.	CHECKED/M.C.B.	REVIEWED	REVISED
DATE 6-15-70	DATE 7-1-70	DATE 7-29-70		

SHEET 11/12

CUYAHOGA COUNTY
 CUY-80-2140
 Quantity Calculations
 Made By K.B.S. Date 7-13-70
 Checked By R.E.K. Date 8-17-70

BENDING DIAGRAMS

MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)
PIER						SUPERSTRUCTURE					
P401	1	13'-1"	150		251	S501	288	2'-0"	105		601
P402	1	14'-3"	150		272	S502	288	5'-4"	160		1602
P403	1	19'-7"	150		366	S503	288	2'-1"	104		626
P404	1	20'-6"	150		385	S504	288	3'-1"	142		926
P405	1	21'-4"	150		399	S505	288	2'-10"	148		851
P501	77	5'-1"	105		408	S506	288	3'-4"	104		1001
						S507	288	2'-9"	142		826
						S508	20	13'-9"	Str.		287
P601	12	6'-3"	105		113	S509	132	4'-9"	Str.		654
P602	2	34'-0"	Str.		102	S510	70	14'-9"	Str.		1077
P603	4	23'-6"	Str.		141	S511	38	13'-6"	Str.		535
P604	102	12'-1"	109		1851	S512	2	13'-3"	Str.		28
P605	21	13'-4"	109		421	S513	2	14'-6"	Str.		31
P606	1 Ser. 8	11'-1" to 12'-4"	109	1 1/2"	139						
P607	1 Ser. 9	11'-1" to 12'-4"	109	1 1/2"	157	S601	1245	30'-0"	Str.		56,100
						S602	5	19'-0"	Str.		143
P1001	55	14'-8"	100		3471	S603	55	28'-3"	Str.		2334
P1002	70	12'-8"	100		3815	S604	45	17'-0"	Str.		1149
						S605	2	3'-6"	Str.		11
P1101	70	7'-8"	104		2851	S606	2	4'-2"	101		13
P1102	14	16'-9"	Str.		1246	S607	16	8'-0"	Str.		192
P1103	14	17'-9"	Str.		1320	S608	16	8'-8"	101		208
P1104	14	23'-3"	Str.		1729	S609	1 Ser. 26	9'-3" to 39'-3"	Str.	142 1/2"	947
P1105	14	24'-0"	Str.		1785	S610	1 Ser. 26	10'-0" to 40'-0"	101	142 1/2"	976
P1106	14	25'-0"	Str.		1860	S611	1 Ser. 14	3'-6" to 38'-6"	Str.	2'-6"	442
P1107	8	12'-6"	Str.		532	S612	1 Ser. 14	4'-2" to 39'-2"	101	2'-6"	456
P1108	5	17'-6"	Str.		465	S613	382	18'-6"	Str.		10,615
P1109	5	34'-0"	Str.		903	S614	349	22'-11"	101		12,013
P1110	8	24'-3"	Str.		1031	S615	43	17'-6"	Str.		1131
P1111	4	14'-0"	Str.		298	S616	44	18'-0"	Str.		1190
P1112	3	16'-0"	Str.		255	S617	1 Ser. 20	9'-3" to 31'-3"	Str.	14 1/2"	608
P1113	6	13'-3"	Str.		422	S618	1 Ser. 20	10'-0" to 32'-0"	101	14 1/2"	631
P1114	3	15'-3"	Str.		243						
P1116	2	14'-6"	Str.		154	S620	350	24'-8"	101		12,967
P1117	2	45'-0"	Str.		478	S621	1 Ser. 12	3'-6" to 31'-3"	Str.	2'-6"	313
P1118	7	47'-5"	105		1763	S622	1 Ser. 12	4'-2" to 32'-0"	101	2'-6"	326
P1119	5	36'-2"	105		961	S623	355	32'-6"	Str.		17,329
P1120	2	17'-7"	104		155	S624	355	33'-11"	100		18,085
P1121	2	15'-4"	104		163	S625	350	28'-0"	Str.		14,720
						S626	1	21'-2"	101		32
						S627	1	24'-0"	Str.		36
						S630	1 Ser. 3	14'-6" to 17'-0"	Str.	14 3/4"	71
						S631	1 Ser. 3	19'-2" to 21'-8"	101	14 3/4"	92
						S632	1	23'-10"	101		36
						S633	1	27'-0"	Str.		41
						2 Light Standard Supports					1470
											TOTAL WEIGHT = 163,722



Size	No.	Length	Type
4	1	6'-3"	*Spiral Bar
4	6	6'-3"	Str.
5	8	6'-9"	Str.
6	65	7'-0"	Str.
7	1	7'-3"	Str.
8	7	7'-6"	Str.
10	1	8'-3"	Str.
11	9	8'-6"	Str.
18S	5	2'-6"	Str.

*Bent bar and bent to diameter of spiral.

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 channels, tee or angle spacers, weighing approximately 0.80 lbs. per 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 0.80 lbs. per foot will be paid for as reinforcing steel and is included in the tabulated quantity of spiral bars.
 Spiral reinforcement may be plain bars but shall in other respects conform to Item 509.

Notes:
 The 18S reinforcing bars shall be spliced with an approved positive mechanical method designed to develop 125% of the yield strength of the bar.
 For Light Standard Support Reinforcement Schedule and Bending Diagrams see Sheet CD 1.

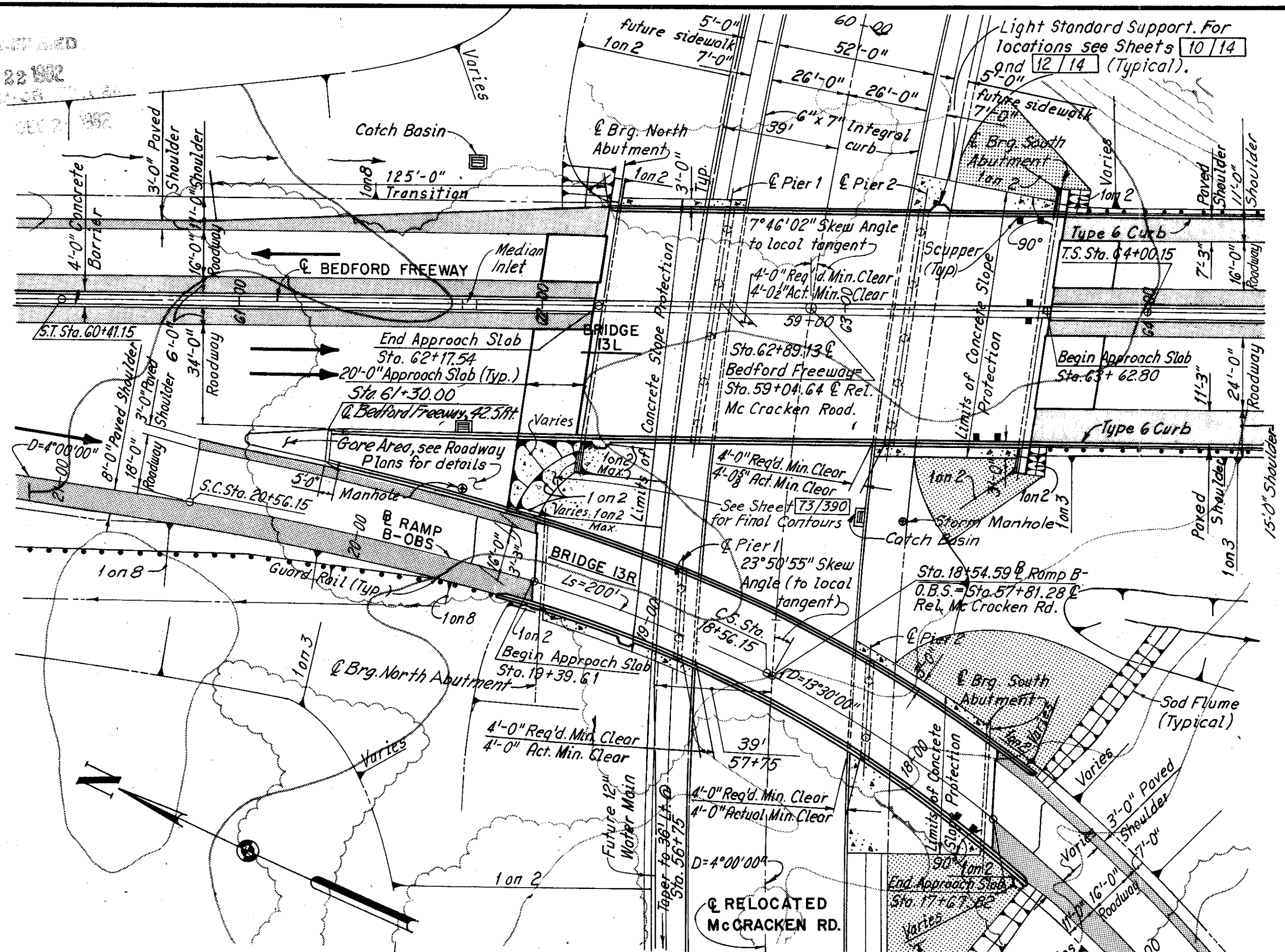
H.N.T.B. BR. NO. 8
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

REINFORCEMENT SCHEDULE
 PIER AND SUPERSTRUCTURE
 I-80 UNDER BEDFORD FREEWAY

BR. NO. CUY-80-2169 STA. 65+88.92 TO STA. 68+07.24
 CUYAHOGA COUNTY OHIO

DRAWN R.R.S.	TRACED M.C.	CHECKED R.C.A.	REVIEWED	REVISED
DATE 7-30-70	DATE 8-13-70	DATE 8-17-70	DATE	DATE

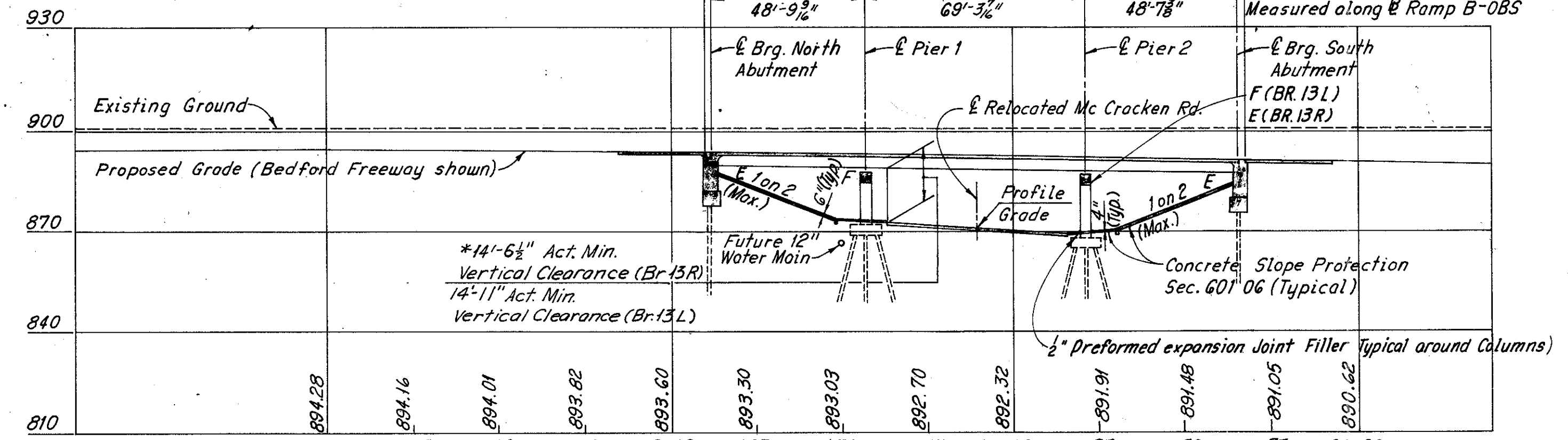
SHEET 12/12



PLAN
Scale: 1"=30'

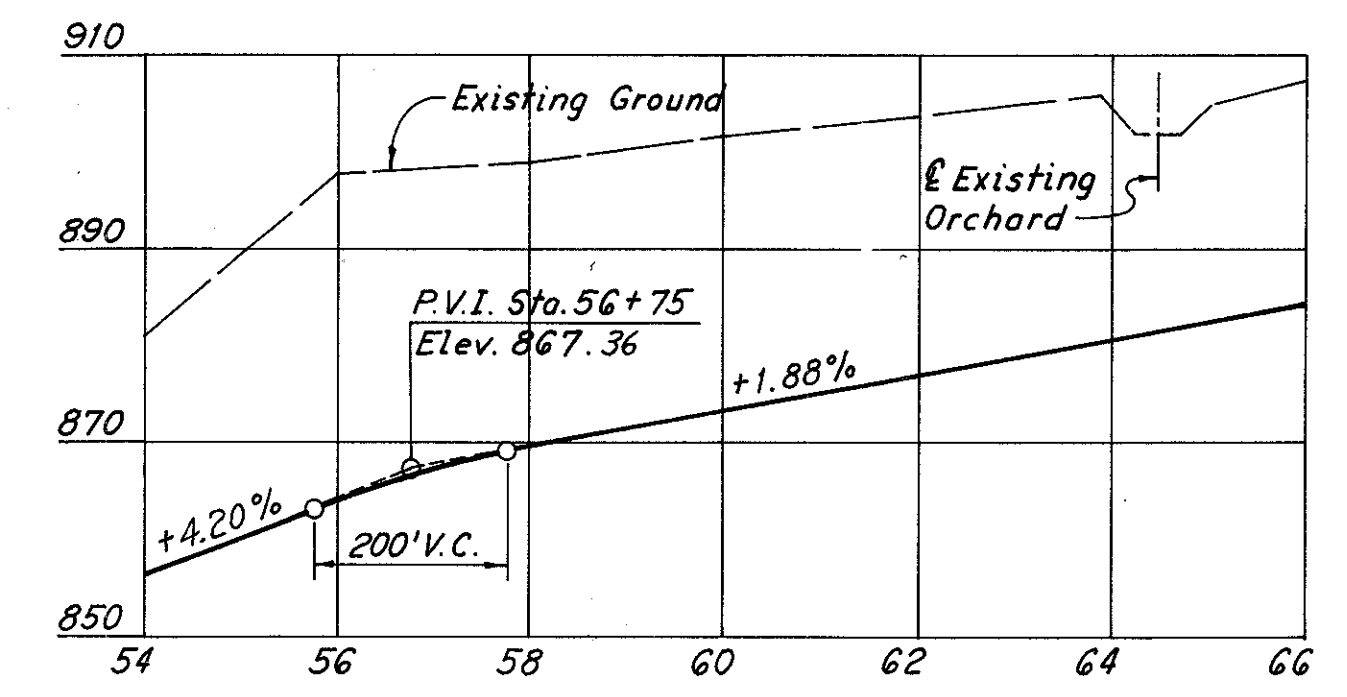
Notes: Earthwork limits shown are schematic. Actual slopes shall conform to plan cross-sections.
The 12" Water main north of Pier 1 shall be set in place after the construction of Pier 1 footings.

* Note:
14'-6" Required minimum vertical clearance. Minimum vertical clearance occurs at the north edge of pavement of Relocated McCracken Rd. and the outside edge of the west exterior beam of bridge No.13R.



ELEVATION
Scale: Horiz. 1"=30'
Vert. 1"=30'

Notes: BR.13L elevation shown. Stationing and Elevations are given for Bedford Freeway. Elevations shown are profile grade.



PROFILE - RELOCATED Mc CRACKEN ROAD
Scale: Horiz. 1"=200'
Vert. 1"=20'

CURVE DATA

RAMP B-OBS	
C.S. Sta.	18+56.15
S.C. Sta.	20+56.15
Δs	17°30'00"
R1	424.41'
R2	1432.39'
TS1	82.64'
TS2	118.93'
Ls	200.00'
P	2.76'

REL. Mc CRACKEN ROAD	
P.I. Sta.	59+67.96
Δ	44°51'07" Rt.
Dc	4°00'00"
R	1432.39'
T	591.15'
L	1121.30'
E	117.19'

RAMP B-OBS	
P.I. Sta.	17+59.21
Δ	26°39'53" Lt.
Dc	13°30'00"
R	424.41'
T	100.58'
L	197.52'
E	11.76'

TRAFFIC DATA

1991 Br. No. 13L	26,854 A.D.T.
	2902 D.D.H.V.
Br. No. 13R	5205 D.A.D.T.
	698 D.D.H.V.

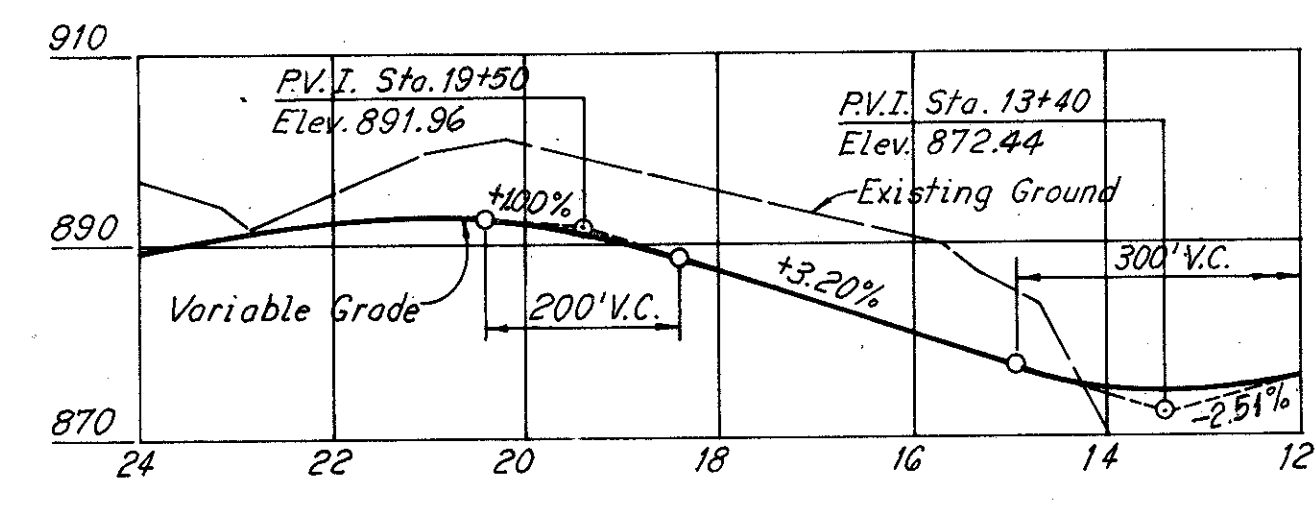
MAINTENANCE OF TRAFFIC

Two lanes of traffic with a minimum horizontal width of 26'-0" and a minimum vertical clearance of 13'-6" shall be maintained on Relocated McCracken Road at all times.

Notes:
Roadway excavation shall be completed to the finish spill-thru slopes and to the level of the subgrades before excavating and driving piles for the abutments and piers.
All piles are 12" φ C.I.P. Reinforced Concrete at the abutments and HP12x53 at the piers. The piles at the abutments shall be driven to a minimum bearing capacity of 35 tons per pile and piles at the piers shall be driven to a minimum bearing capacity of 40 tons per pile.
The estimated average pay lengths of the piles are as follows:

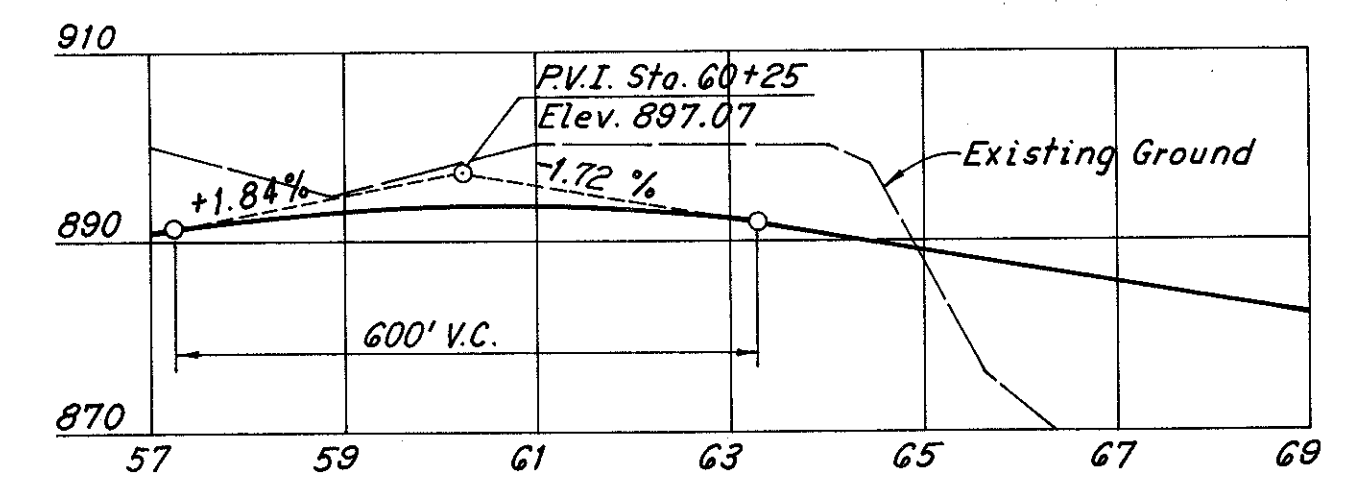
- North Abutment (BR13L) - 26 ft.
- North Abutment (BR13R) - 23 ft.
- Pier 1 (BR13L & R) - 20 ft.
- Pier 2 (BR13L & R) - 15 ft.
- South Abutment (BR13L) - 22 ft.
- South Abutment (BR13R) - 16 ft.

For underpass lighting details see Lighting Plans.



PROFILE - RAMP B-OBS
Scale: Horiz. 1"=200'
Vert. 1"=20'

Note:
The 1/2" preformed expansion joint filler around pier columns are included for payment with Concrete Slope Protection (4" thick).



PROFILE - BEDFORD FREEWAY
Scale: Horiz. 1"=200'
Vert. 1"=20'

H.N.T.B. BR. NO. 13L & 13R
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

SITE PLAN
BEDFORD FREEWAY AND RAMP B-OBS
OVER RELOCATED McCRACKEN ROAD

STA. 62+17.54
STA. 63+62.80
(BEDFORD FREEWAY)

REVISIONS
 DEC 22 1969
 DEC 22 1969

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

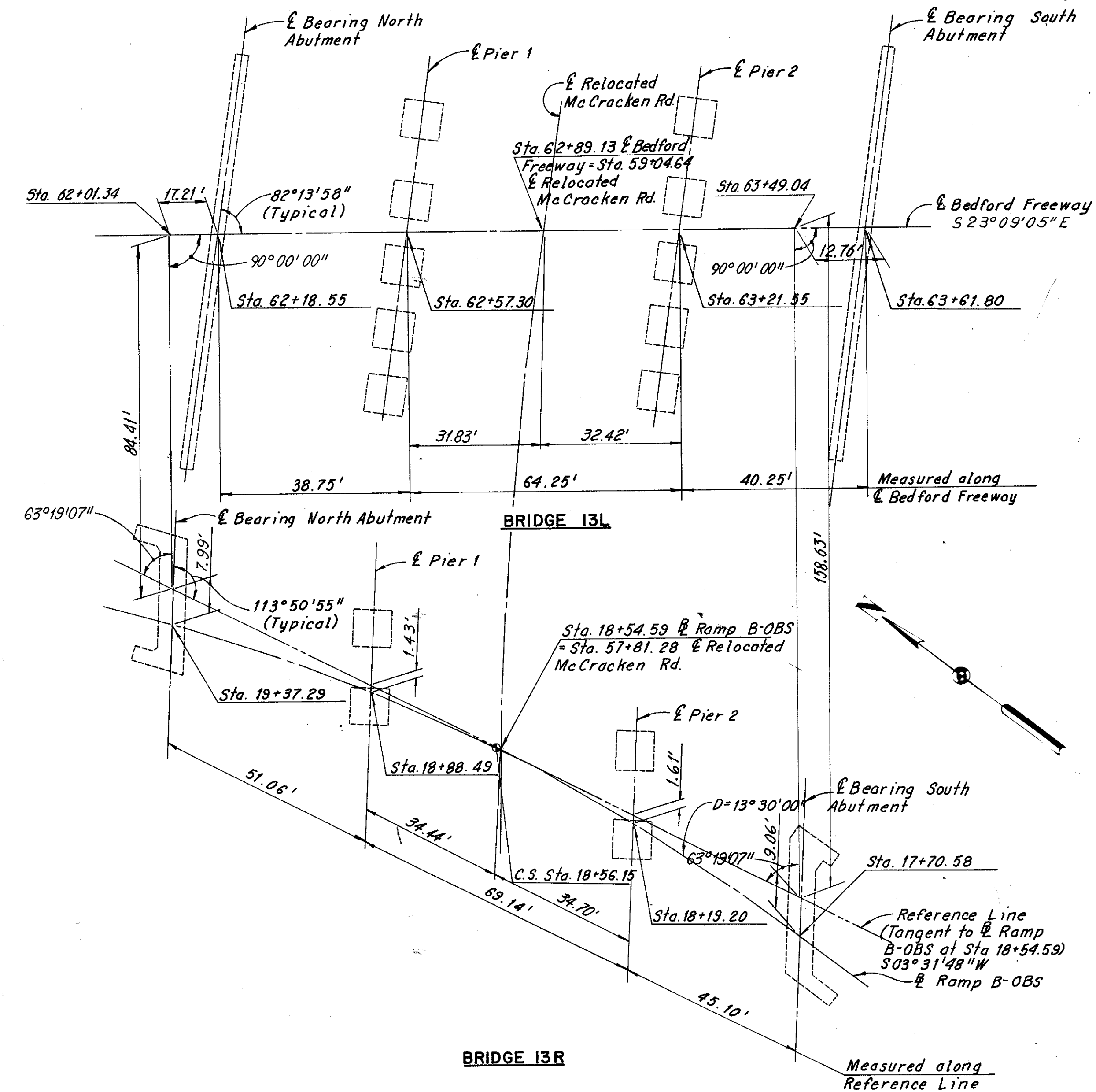
337
390

Quantity Calculations
 Made By KYH Date 6-69
 Checked By DHS Date 7-70

CUYAHOGA COUNTY
 CUY-80-21.40

ESTIMATED QUANTITIES											
ITEM	TOTAL	UNIT	DESCRIPTION	H.N.T.B. BRIDGE NO. 13L				H.N.T.B. BRIDGE NO. 13R			
				ABUTMENTS	PIERS	SUPER STRUCTURE	GENERAL	ABUTMENTS	PIERS	SUPER STRUCTURE	GENERAL
503	779	Cu. Yd.	Unclassified Excavation	236	227			224	92		
505	Lump	Lump	Test Pile								
503	Lump	Lump	Cofferdams, cribs & sheeting				Lump				Lump
507	1,240	Lin. Ft.	12" ϕ C.I.P. Reinforced Concrete Piles	770				470			
507	1,440	Lin. Ft.	Steel Piles, HP 12x53		1,020			420			
509	255,005	Pounds	Reinforcing Steel	14,917	32,908	124,683		12,462	13,500	56,535	
511	599	Cu. Yd.	Class "C" Concrete, Superstructure			424				175	
511	138	Cu. Yd.	Class "C" Concrete, Pier Caps and Columns		100				38		
511	172	Cu. Yd.	Class "C" Concrete, Abutments Above Footings	81				91			
511	249	Cu. Yd.	Class "C" Concrete, Footings	66	90			57	36		
512	184	Lin. Ft.	Premolded Sealing Strip	184							
513	354,200	Pounds	Structural Steel			224,700			129,500		
514	354,200	Pounds	Field Painting of Structural Steel			224,700			129,500		
516	18	Each	Elastomeric Bearing Pads		18						
516	160	Sq. Ft.	1" Preformed Expansion Joint Filler	160							
516	153	Sq. Ft.	1/2" Preformed Expansion Joint Filler	153							
516	67	Lin. Ft.	Preformed Elastic Joint Sealer and Lubricant Adhesive						67		
518	154	Cu. Yd.	Porous Backfill	107				47			
518	235	Lin. Ft.	6" Perforated Helical C.M.P. 707.01	186				49			
518	116	Lin. Ft.	6" Non-perforated Helical C.M.P. (Including Specials, 707.01)	60				56			
518	8	Each	Scuppers Including Supports		6				2		
518	585	Lin. Ft.	Subdrainage for wearing course, as per plan		585						
518	29	Each	Subdrainage for wearing course, as per plan						29		
601	1,245	Sq. Yds.	Concrete Slope Protection (6" Thick)	1,025				220			
601	490	Sq. Yds.	Concrete Slope Protection (4" Thick)	386				104			
808	599	Units	Chemical Admixture for Concrete, Type AB or D			424			175		
404	79	Cu. Yd.	Asphalt Concrete (70-85 or AC-20)			65			14		
Special	24	Cu. Yd.	Sand Asphalt (See Proposal Note)			16	1		7		
Special	1701	Sq. Yd.	Membrane Waterproofing, sheet type (See Proposal Note)			1174	20		507		

Test pile: Payment will be made for only one test pile. It may be driven for either the right or left bridge.



BRIDGE 13R
 BRIDGE LAYOUT DIAGRAMS

H.N.T.B. BR. NO. 13L & 13R

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**BRIDGE LAYOUT DIAGRAM
 AND ESTIMATED QUANTITIES
 BEDFORD FREEWAY AND RAMP B-OBS
 OVER RELOCATED MCCrackEN ROAD**

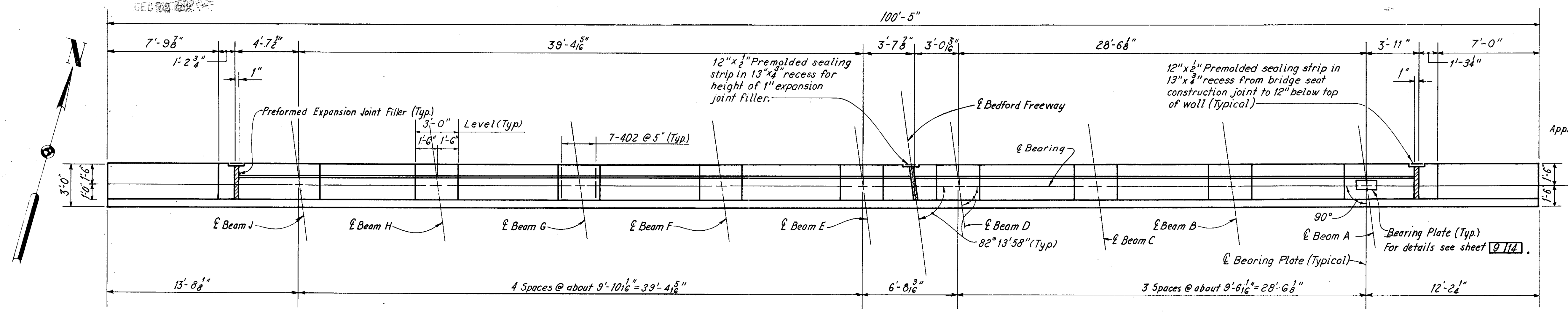
STA. 62+17.54 TO
 STA. 63+62.80
 (BEDFORD FREEWAY)

CUYAHOGA COUNTY OHIO

DRAWN BY KYH	TRACED BY GEM	CHECKED BY DHS	REVIEWED	REVISED
DATE 6-12-69	DATE 7-11-69	DATE 7-9-70	DATE	DATE

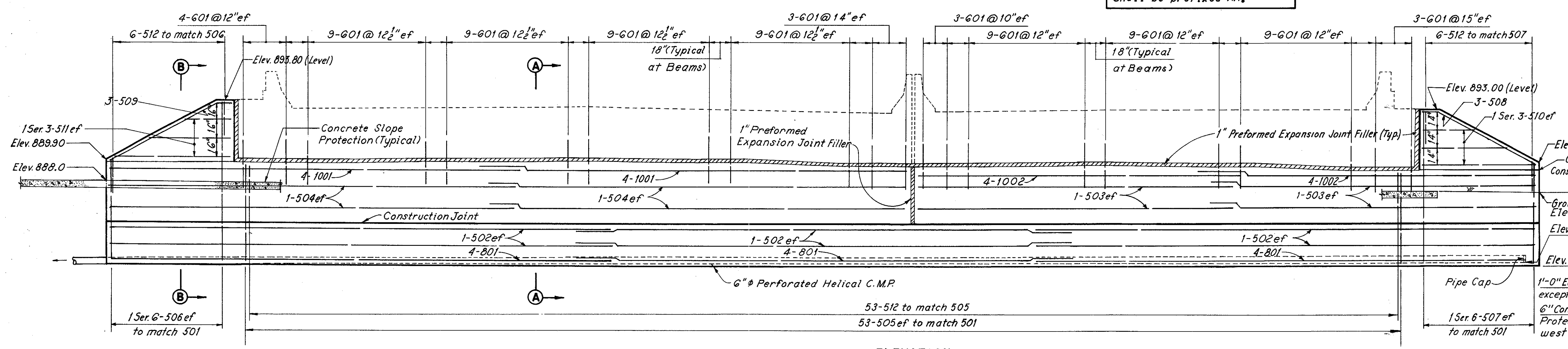
SHEET 2/14

CUYAHOGA COUNTY
CUY-80-21-40



PLAN

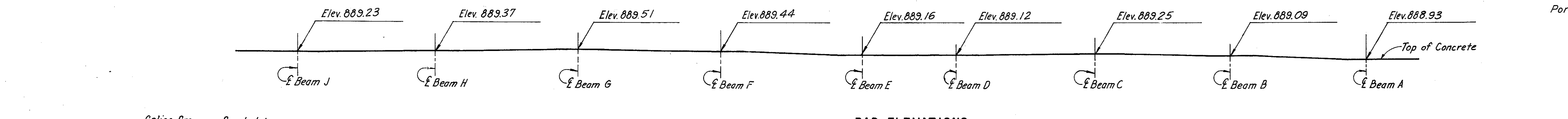
Note:
All reinforcing bar marks shall be prefixed AA.



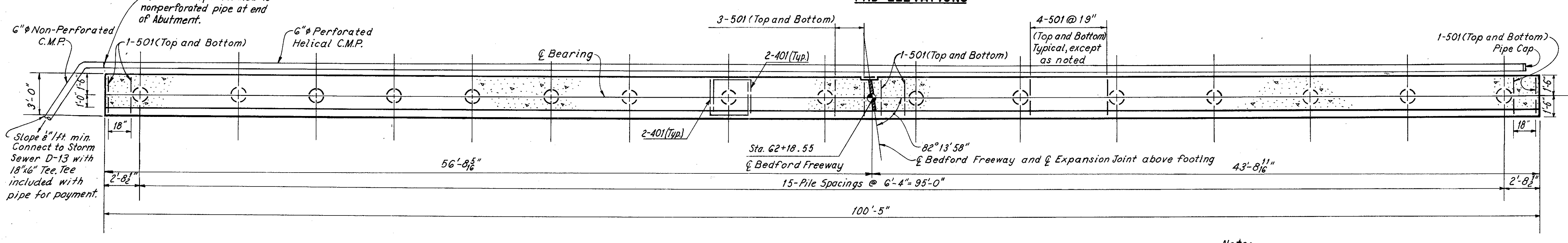
ELEVATION

SECTION A-A
North Abutment shown. South Abutment similar, except for bar marks.

Note:
Piles for abutment are 12" φ C.I.P. reinforced concrete. The following abbreviation is used:
ef = each face

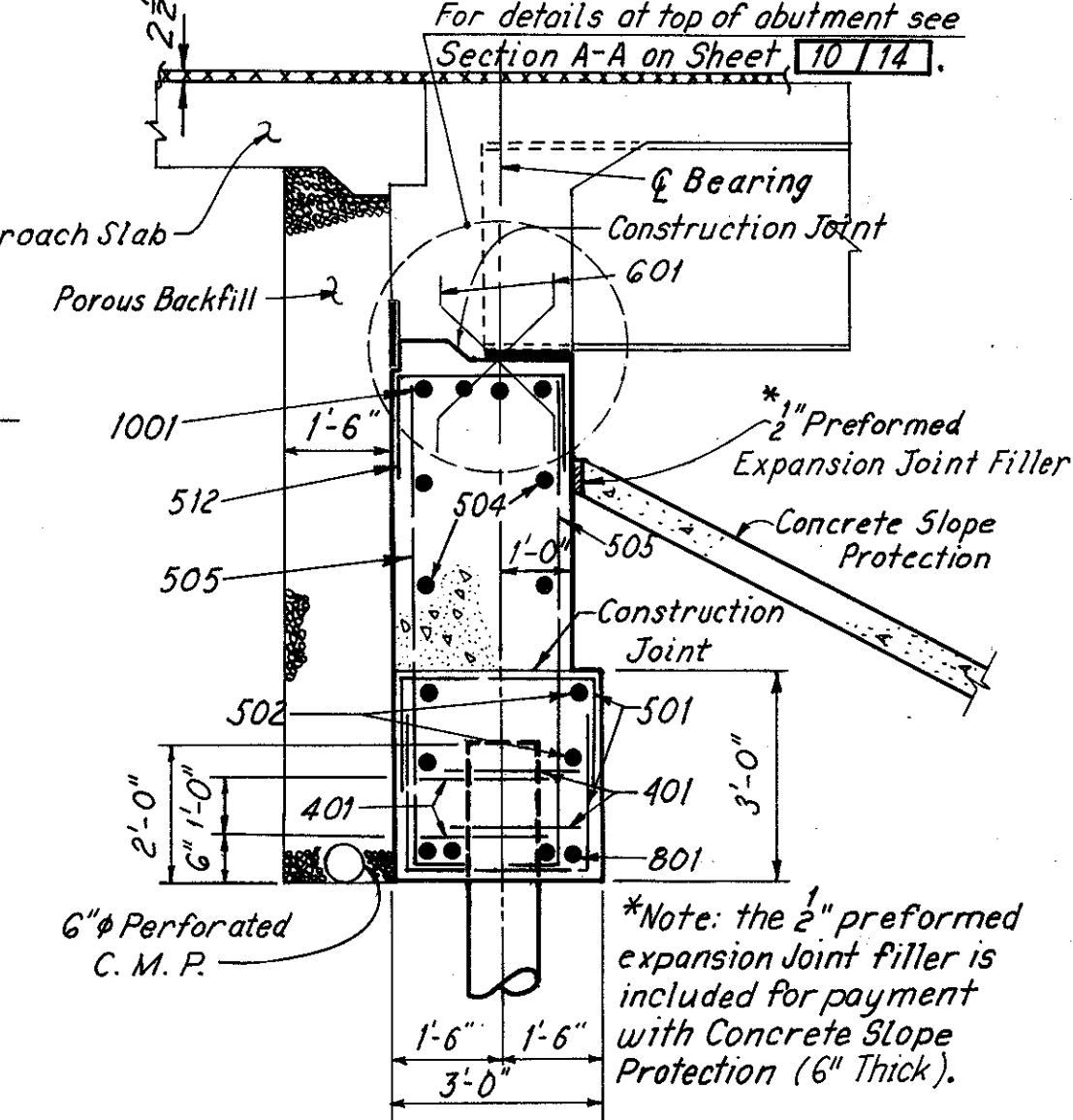


PAD ELEVATIONS

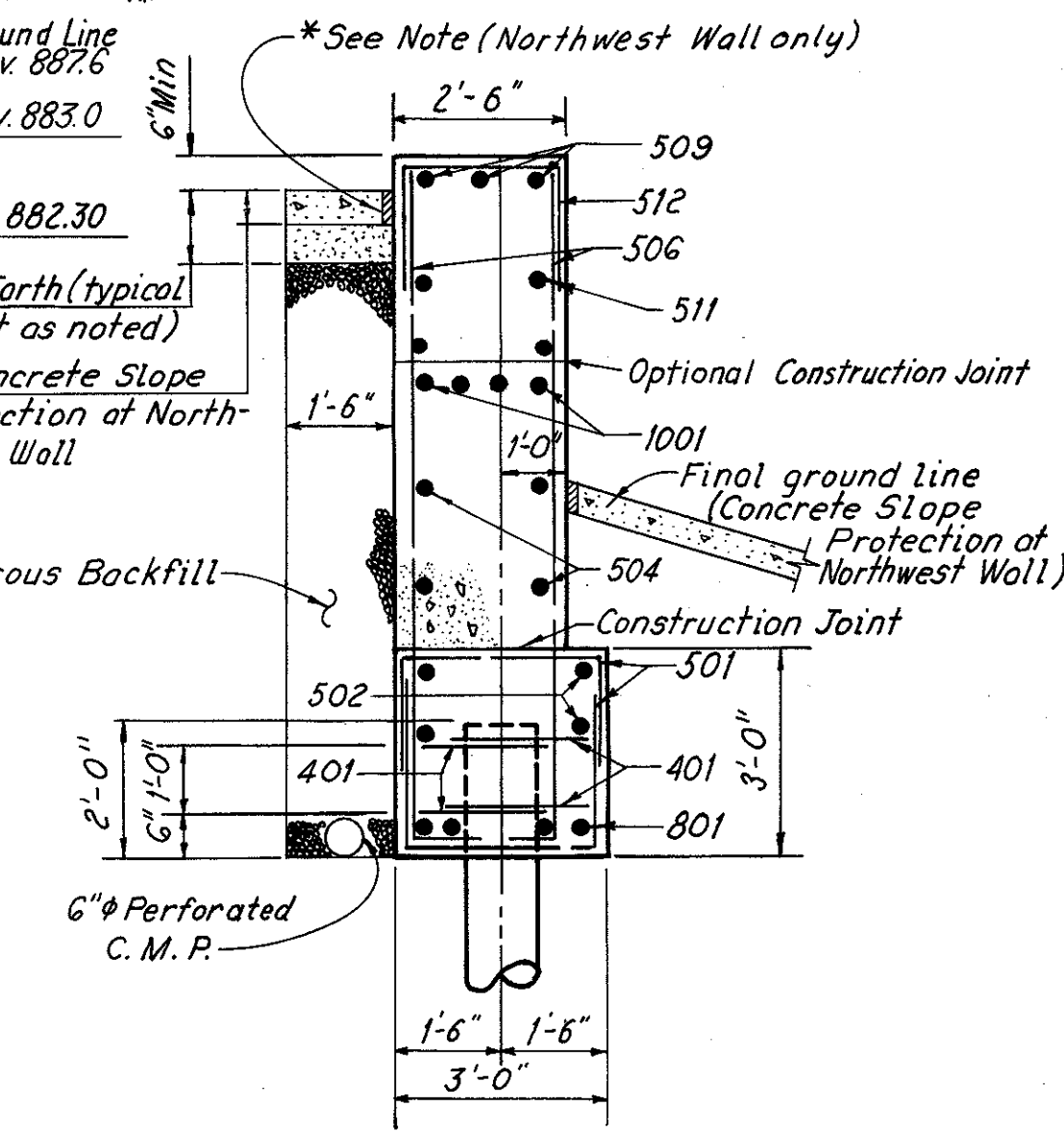


FOOTING PLAN

Note:
For Longitudinal Steel Reinforcement in Footing, See Elevation.



SECTION A-A
North Abutment shown. South Abutment similar, except for bar marks.



SECTION B-B
Northwest wingwall shown. Northeast, southwest and southeast wingwalls similar except for bar marks.

H.N.T.B. BR. NO. 13L & 13R

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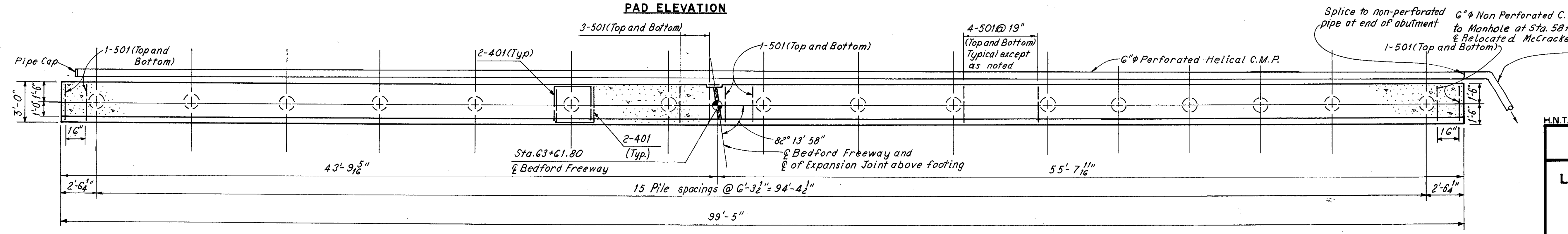
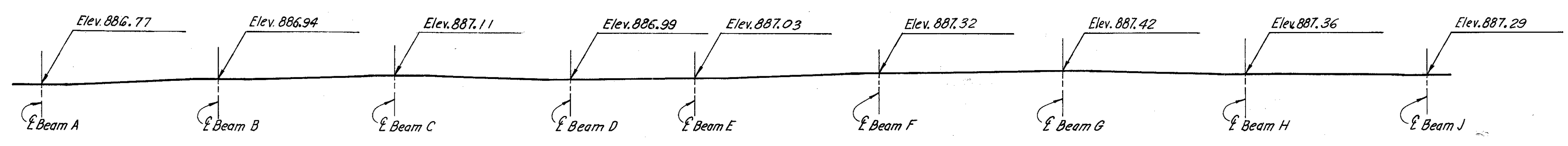
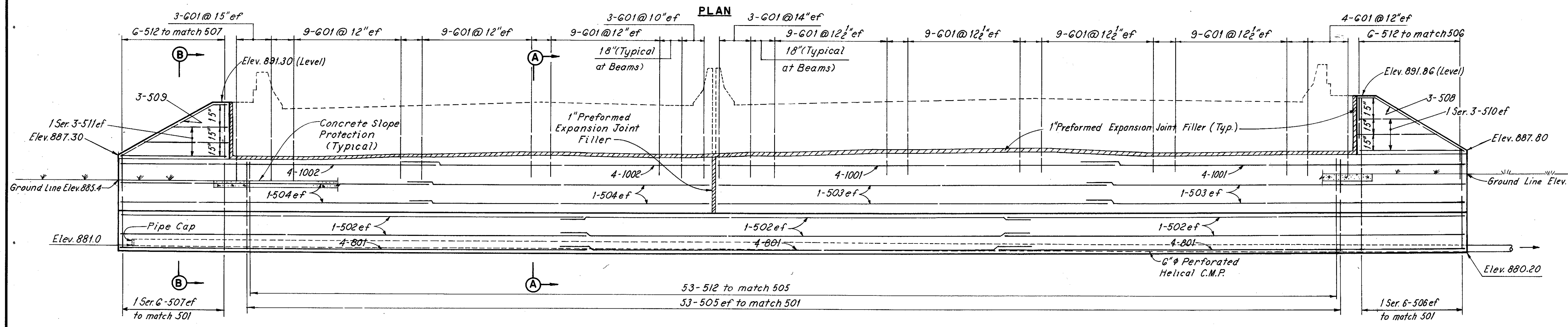
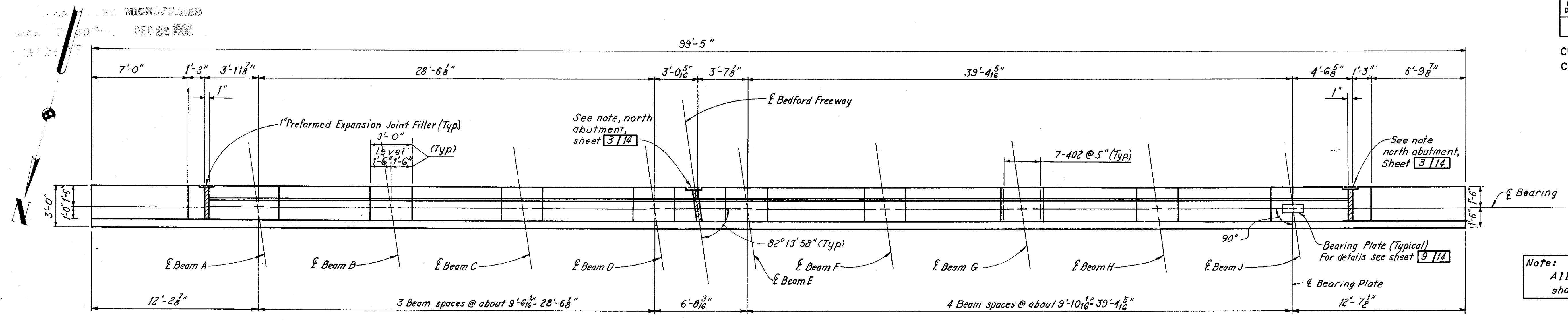
LEFT BRIDGE-NORTH ABUTMENT
BEDFORD FREEWAY AND RAMP B-OBS
OVER RELOCATED McCracken Road
STA. 62+17.54 TO
STA. 63+62.80
(ε BEDFORD FREEWAY)

CUYAHOGA COUNTY OHIO

DRAWN/EF	TRACED/EF	CHECKED/MS	REVIEWED	REVISED
DATE 6-10-08	DATE 6-23-08	DATE 2-20-10	DATE	DATE

SHEET 3/14

CUYAHOGA COUNTY
CUY-80-21.40



Notes:

Piles for abutment are 12" ϕ C. I. P. reinforced concrete.

For Sections A-A and B-B see sheet 3/14.

The following abbreviation is used:
ef = each face.

Note:

For Longitudinal Steel Reinforcement in Footing See Elevation.

H.N.T.B. BR. NO. 13L & 13R

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LEFT BRIDGE-SOUTH ABUTMENT

BEDFORD FREEWAY AND RAMP B-OBS
OVER RELOCATED MCCrackEN ROAD

STA. 62+17.54 TO
STA. 63+62.80
(ϕ BEDFORD FREEWAY)

CUYAHOGA COUNTY OHIO

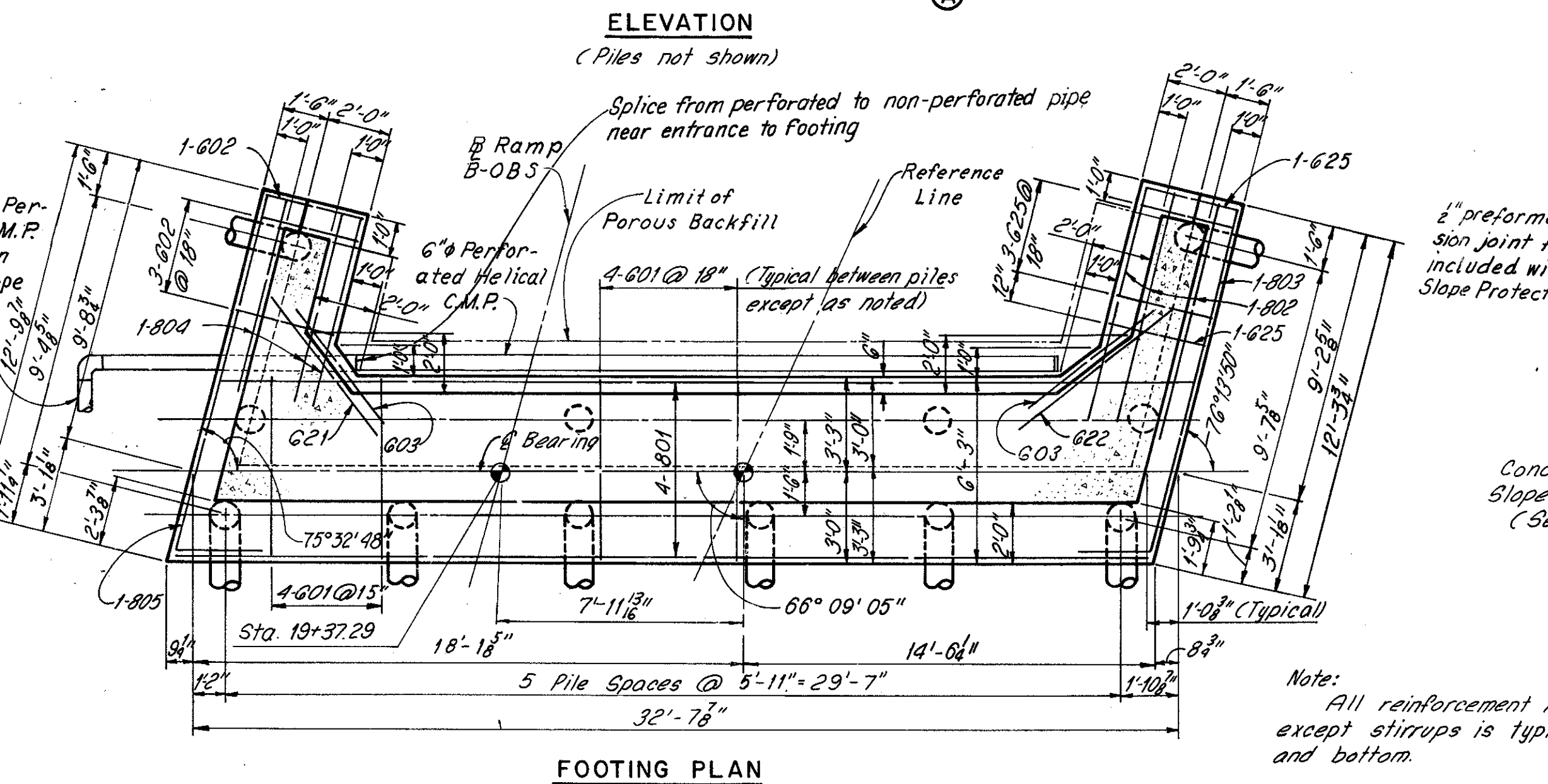
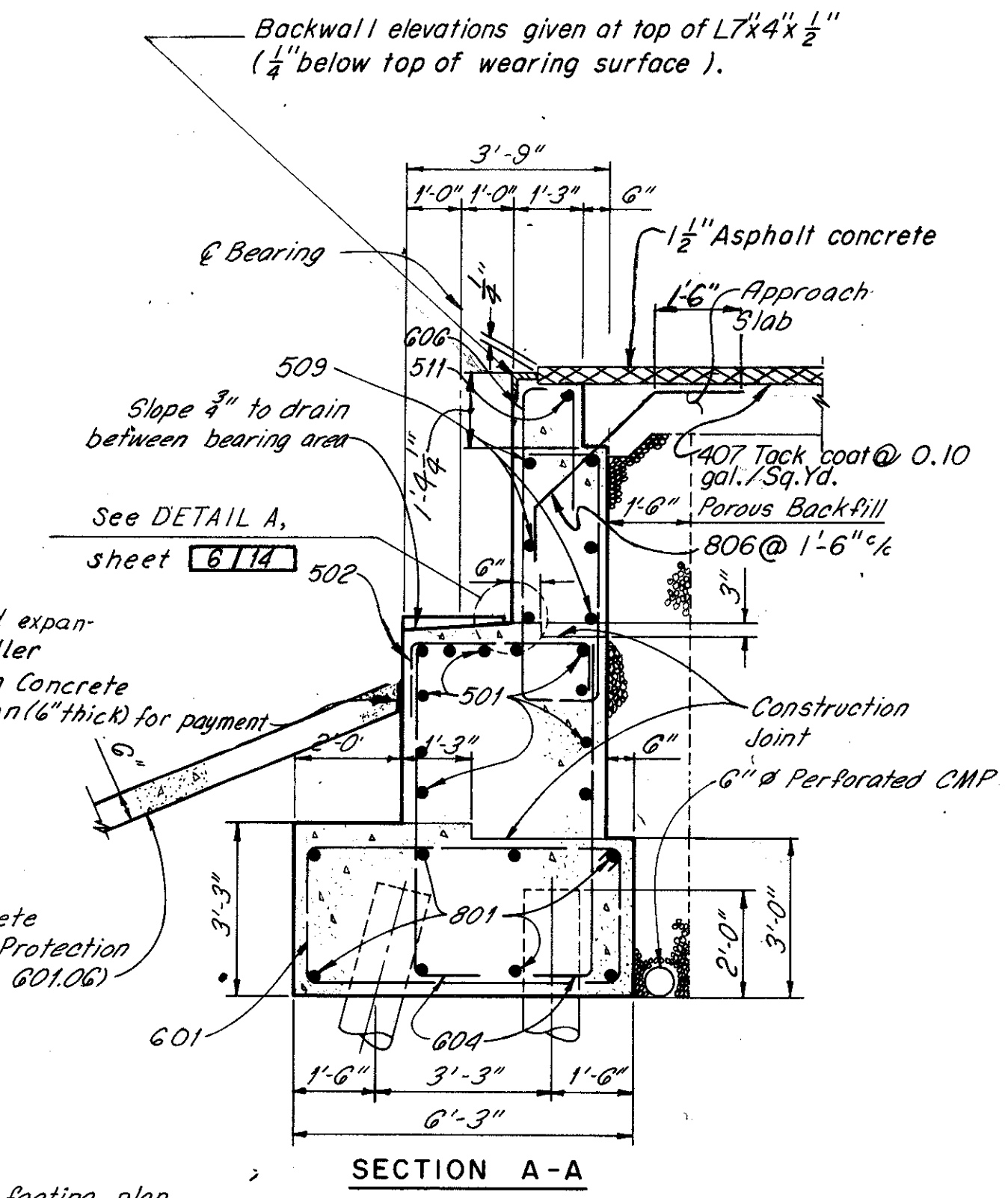
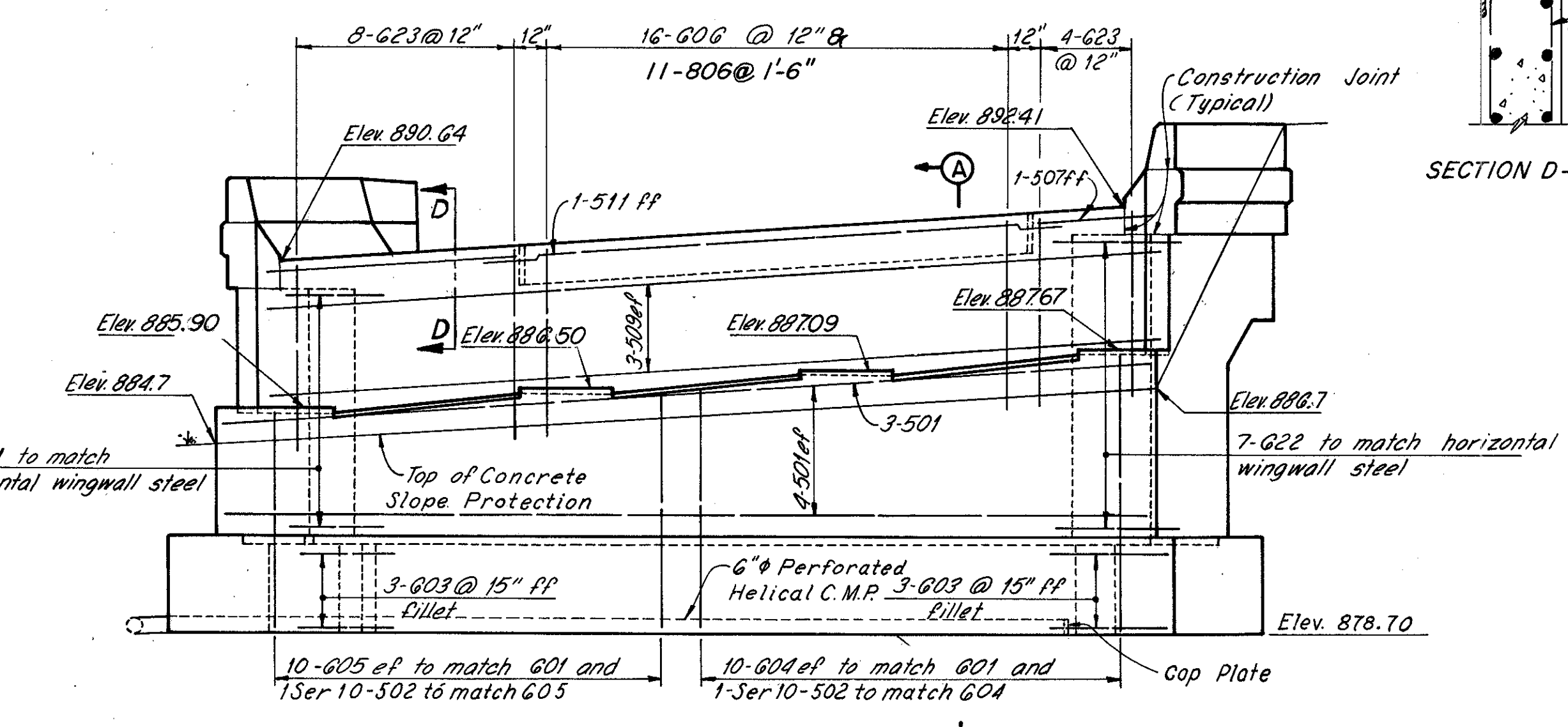
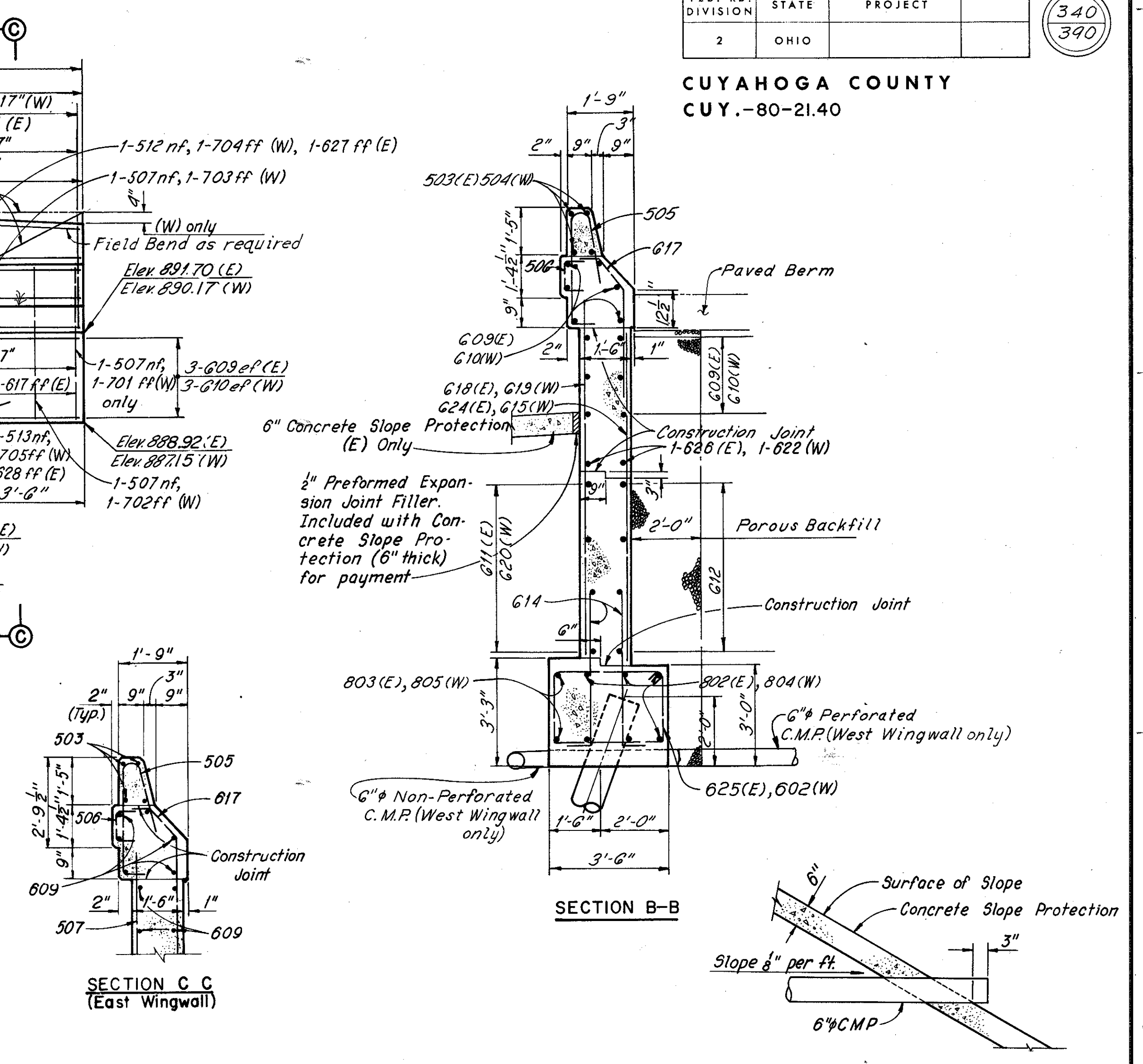
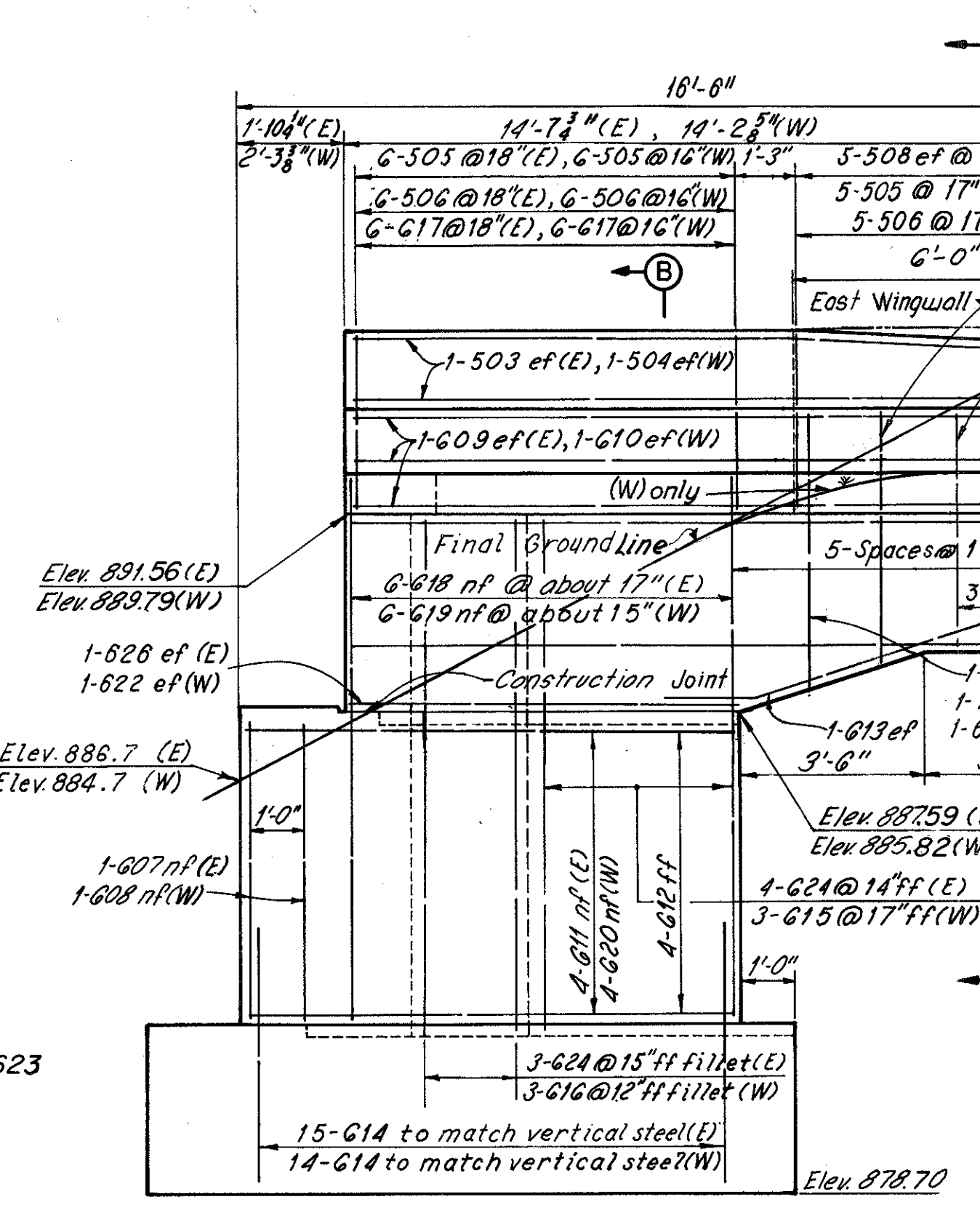
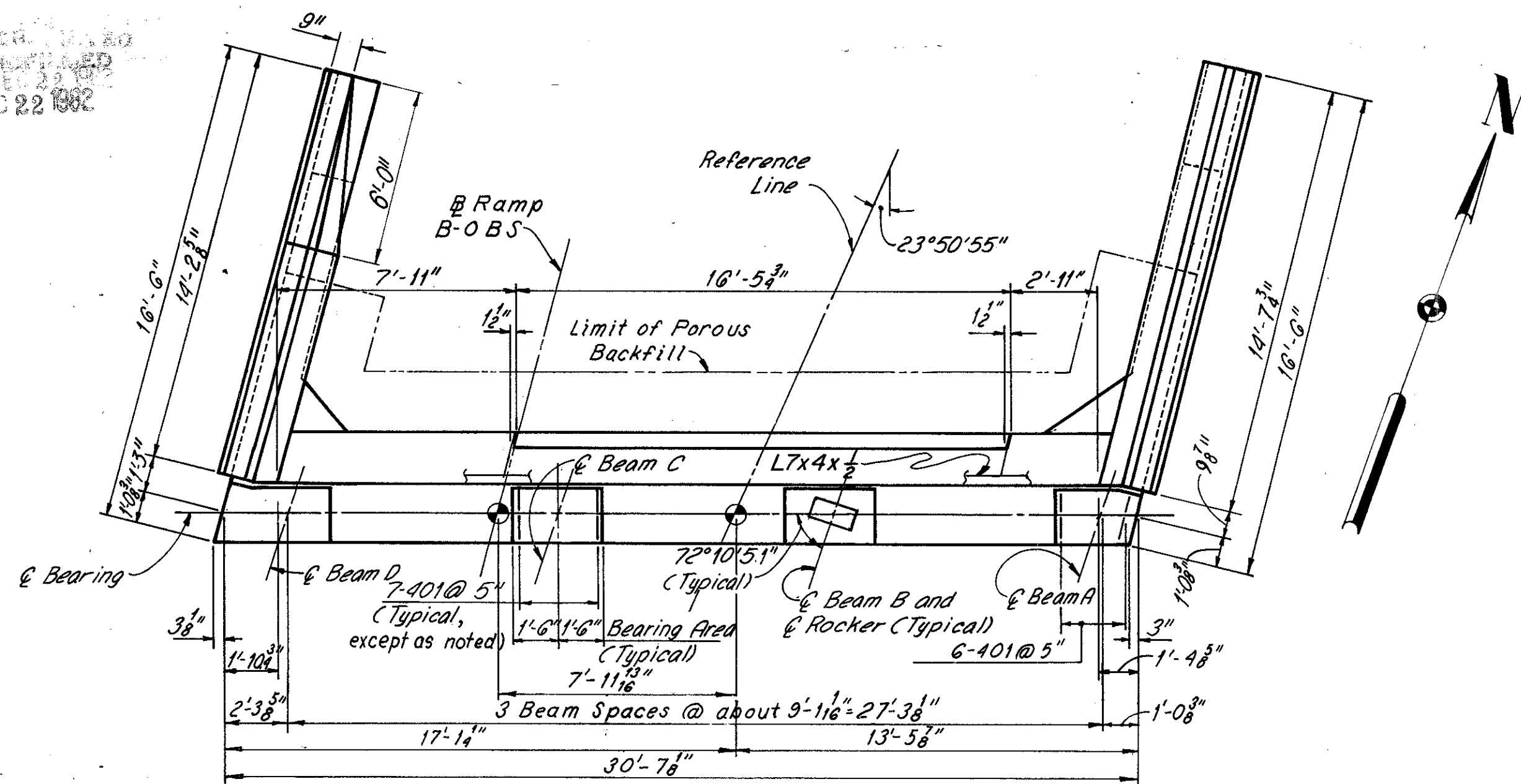
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DATE 6-10-68	DATE 6-24-68	DATE 7-20-70	DATE	DATE

SHEET 4/14

DEC 22 1962

FED. RD. DIVISION	STATE	PROJECT	340 390
2	OHIO		

CUYAHOGA COUNTY
CUY.-80-21.40



Notes:

For curb and parapet transitions and for guard rail anchor details at West Wingwall see "PART PLANS-PARAPET ON WINGWALL" on Ohio Standard Drawing BR.-1-67, Revised 10-1571, Sheet No. 1 of 3.

All piles are 12" ϕ C.I.P. reinforced concrete. All battered piles shall be inclined 3 in 12 in the direction shown.

For Roadway End Dam details see Sheet 12/14.

The following abbreviations are used:

nf = near face
ff = far face
ef = each face
E = East Wingwall
W = West Wingwall

Note:
All reinforcing bar marks shall be prefixed AC.

H.N.T.B. BR. NO. 13L & 13R

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KANSAS CITY CLEVELAND NEW YORK

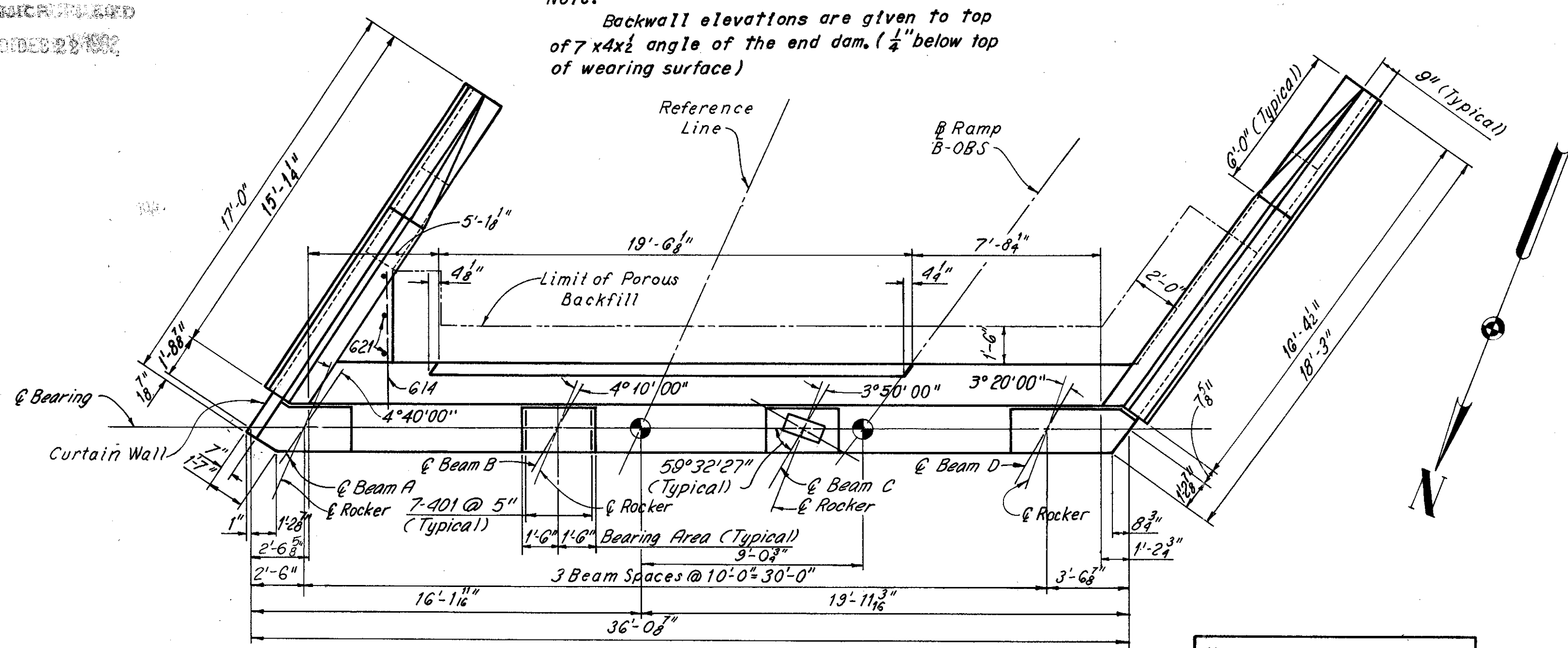
RIGHT BRIDGE-NORTH ABUTMENT
BEDFORD FREEWAY AND RAMP B-OBS
OVER RELOCATED McCRACKEN ROAD
STA. 62+17.54 TO
STA. 63+62.80
(ϕ BEDFORD FREEWAY)

CUYAHOGA COUNTY OHIO

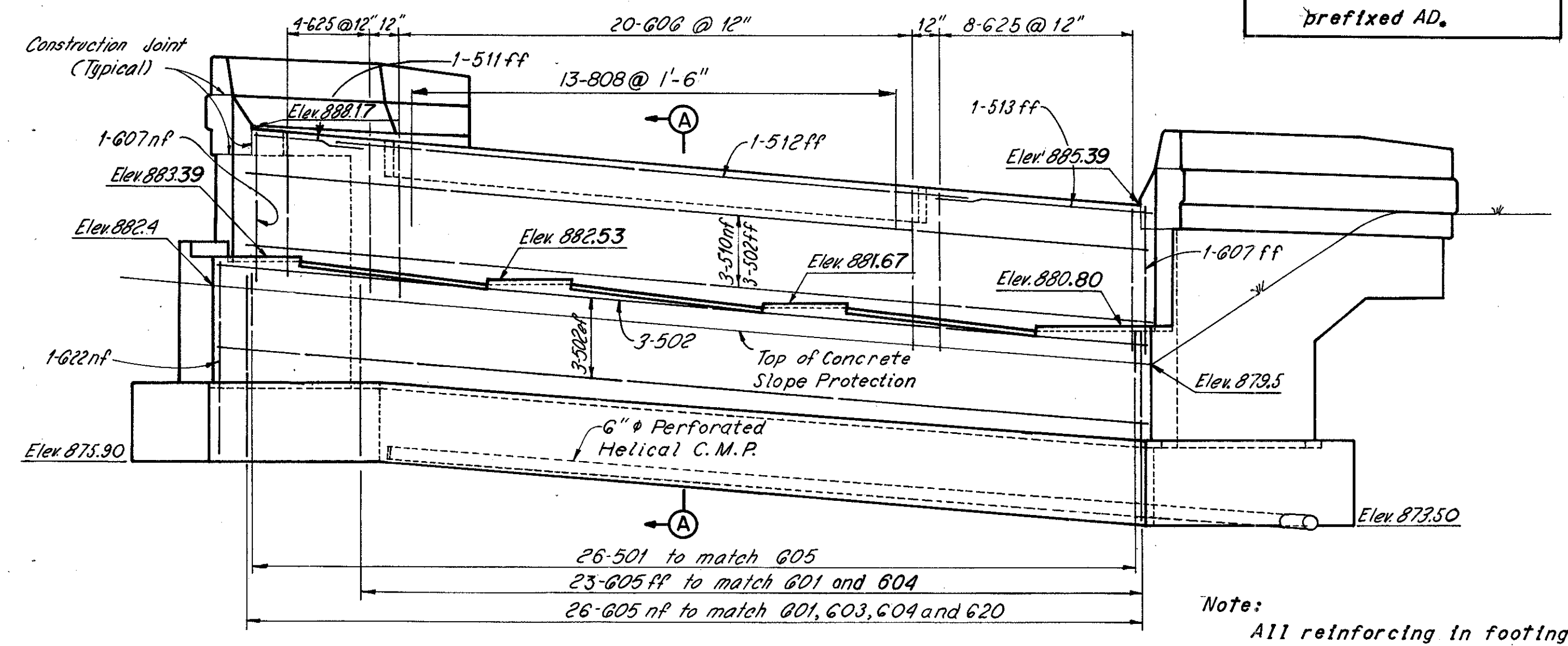
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DATE 9-3-62	DATE 10-11-62	DATE 2-26-63	DATE	DATE

SHEET 5/14

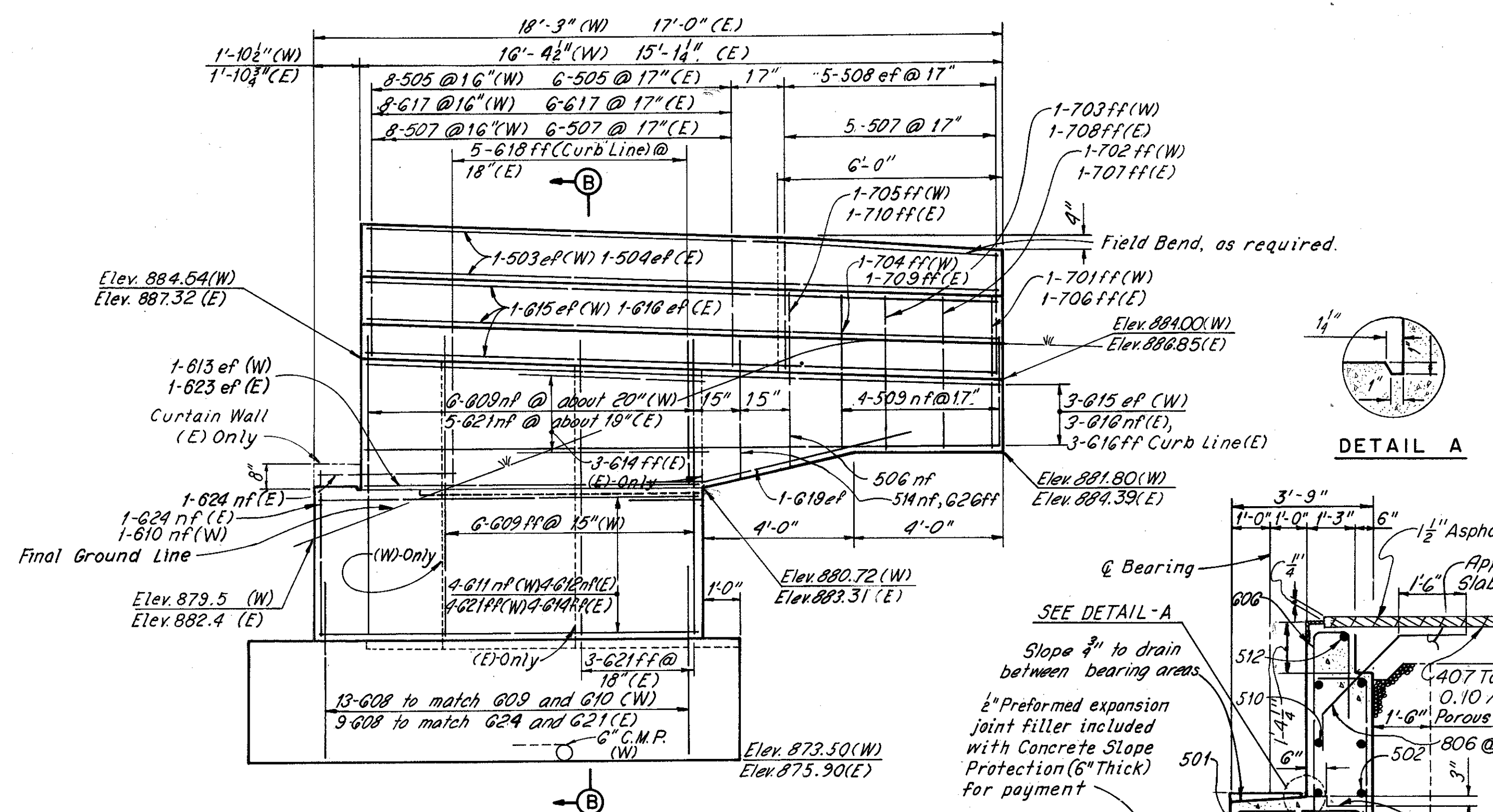
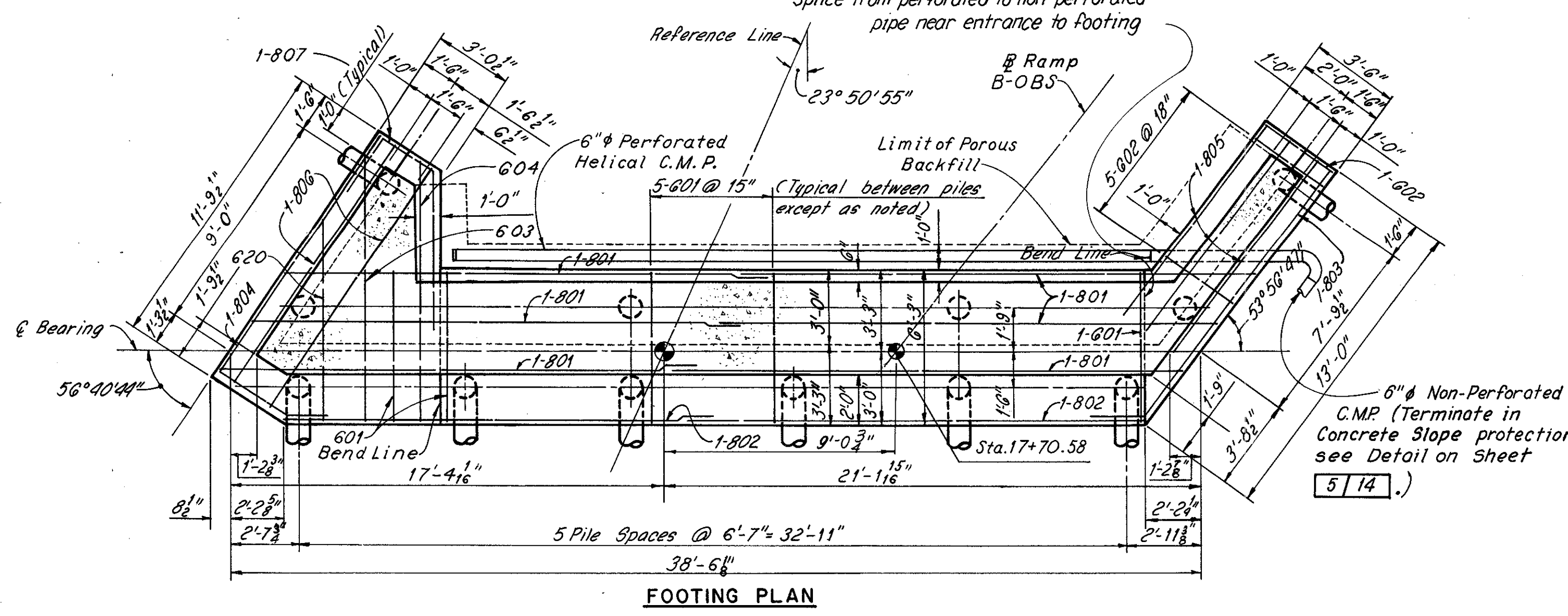
Note:
Backwall elevations are given to top of 7x4x1/2 angle of the end dam, (1/4" below top of wearing surface)



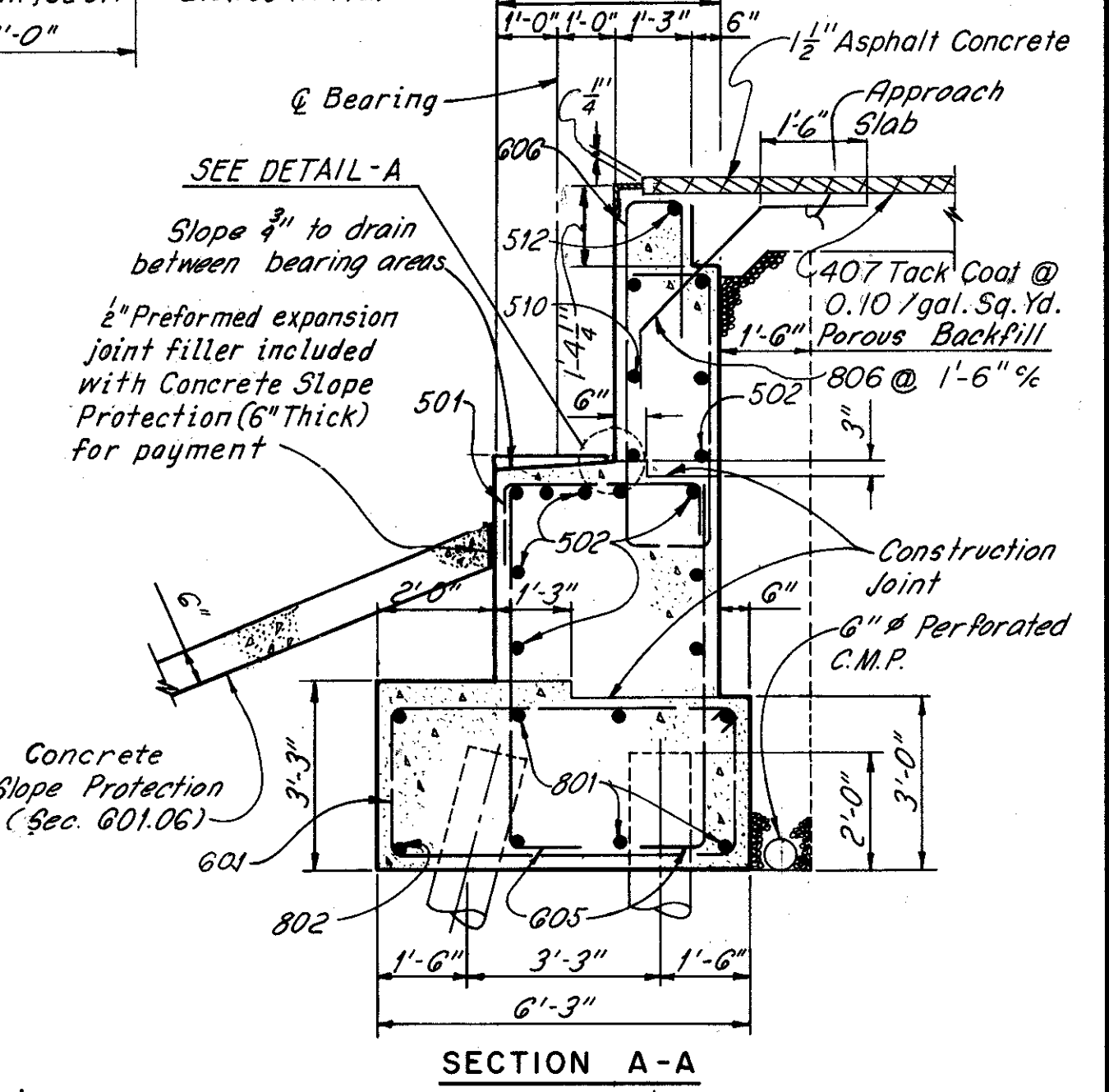
Note:
All reinforcing bars, marks shall be prefixed AD.



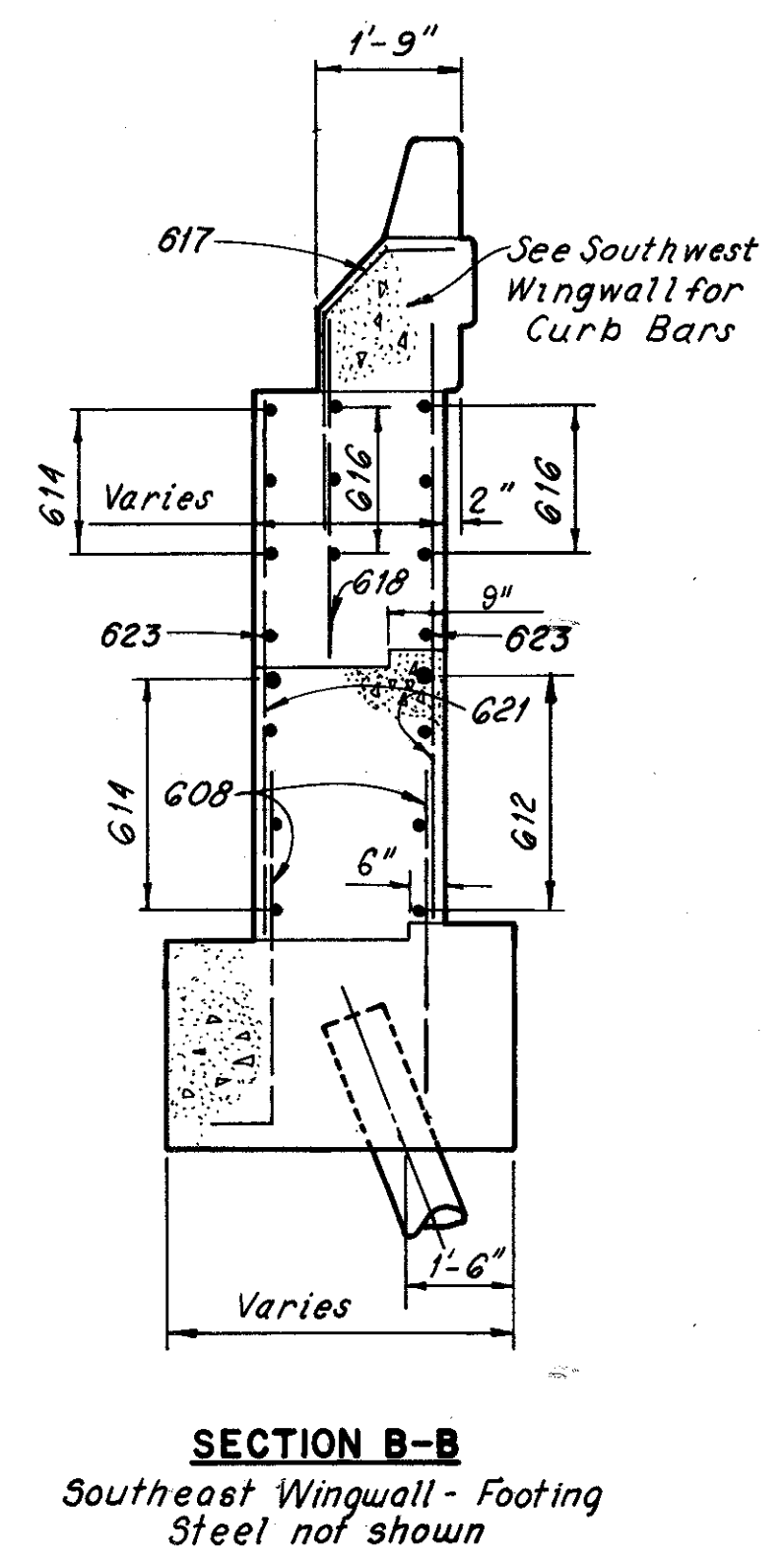
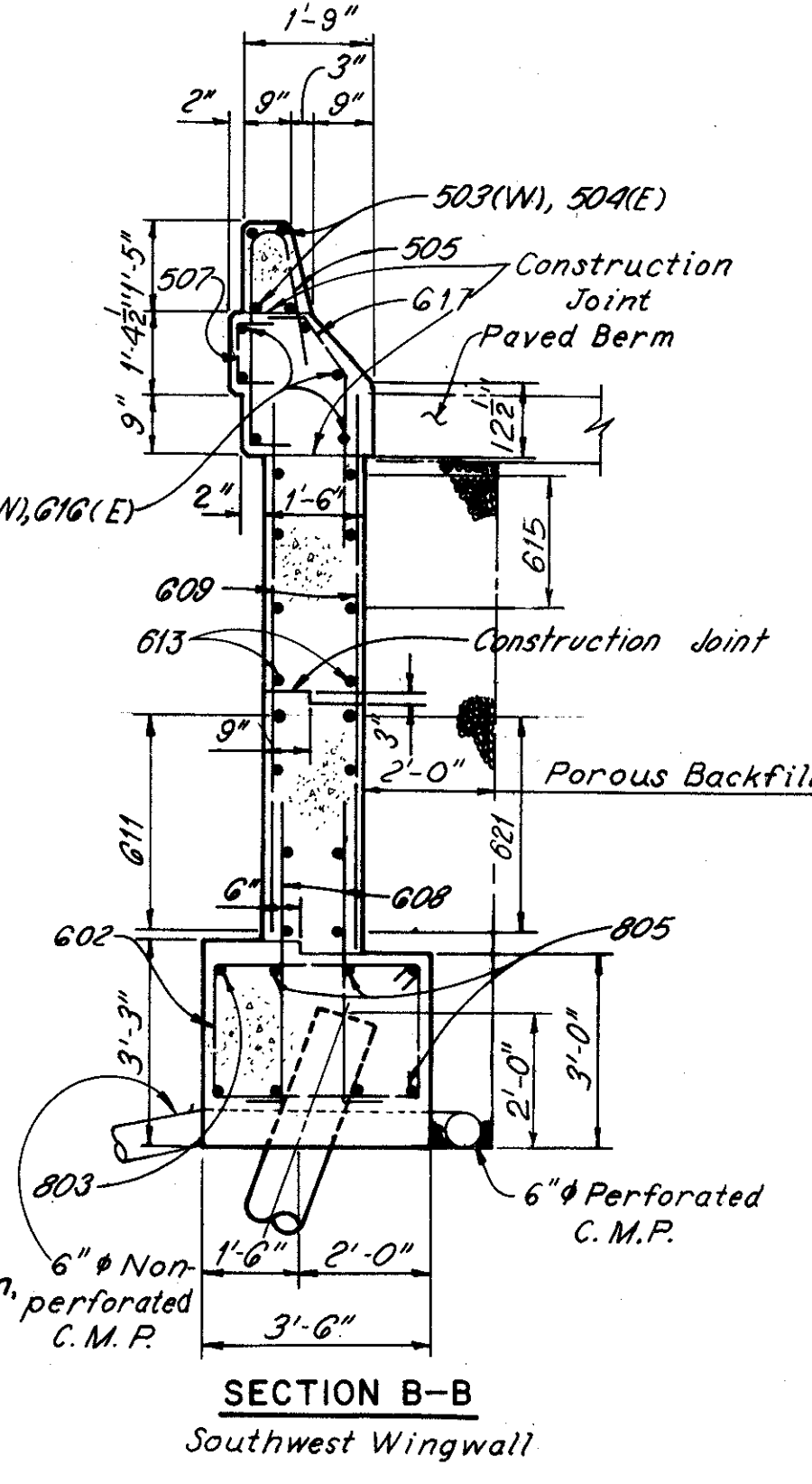
Note:
All reinforcing in footing plan, except stirrup bars, is typical for top and bottom.



DETAIL A



Notes:
For curb and parapet transitions see "PART PLANS-PARAPET ON WINGWALL" on Ohio Standard Drawing BR.-1-67, Revised 10-15-71, Sheet No. 1 of 3.
All piles are 12"Ø C.I.P. reinforced concrete.
All battered piles shall be inclined 3 in 12 in the direction shown.
For Roadway End Dam details see Sheet 12/14.
The following abbreviations are used:
nf = near face W = West Wingwall
ff = far face E = East Wingwall
ef = each face



H.N.T.B. BR. NO. 13L & 13R

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
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RIGHT BRIDGE—SOUTH ABUTMENT
BEDFORD FREEWAY AND RAMP B-OBS
OVER RELOCATED McCRACKEN ROAD
STA. 62+17.54 TO
STA. 63+62.80
(Ø BEDFORD FREEWAY)

CUYAHOGA COUNTY OHIO

DRAWN IN W	TRACED BY W	CHECKED BY MS	REVIEWED
DATE 3-3-68	DATE 10-28-68	DATE 2-26-70	DATE

SHEET 6/14

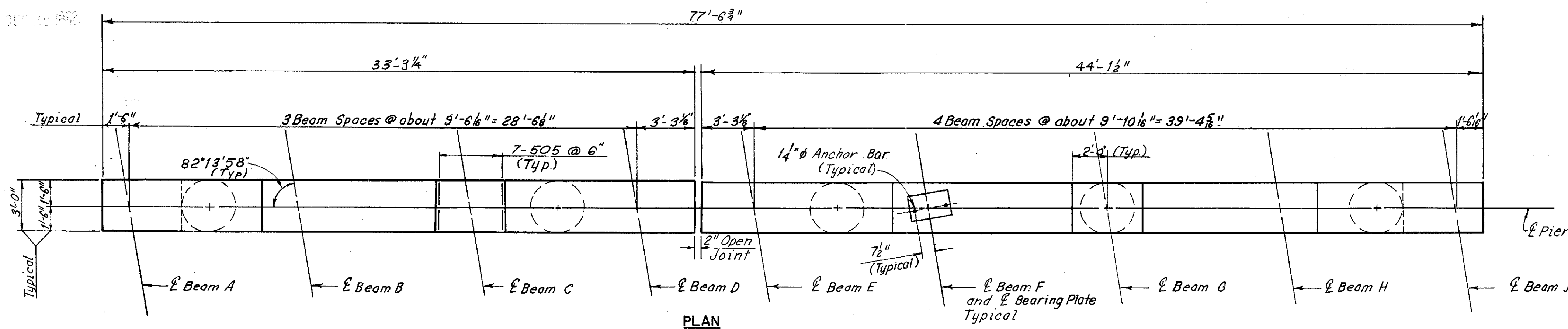
MICROFILMED
DEC 22 1982
MCP

Note: Special care shall be taken in placing reinforcing steel in the vicinity of the bridge seat so as to avoid interference with the drilling of anchor bar holes.

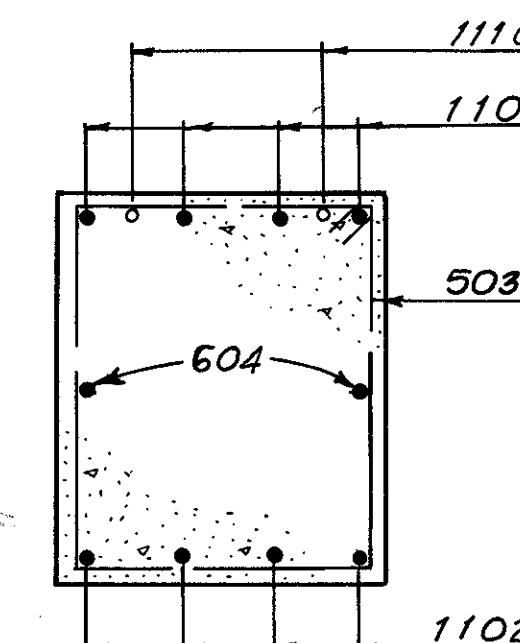
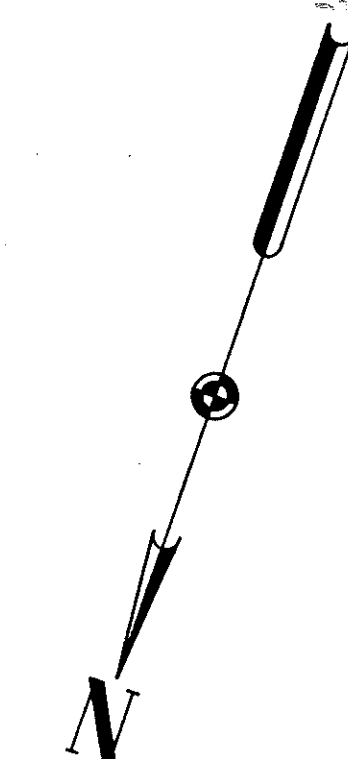
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

342
390

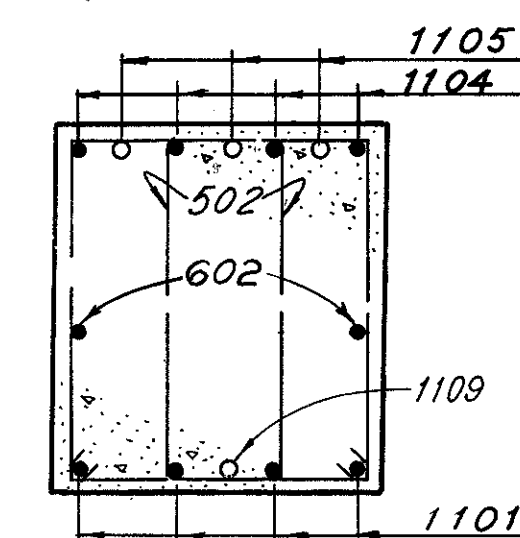
CUYAHOGA COUNTY
CUY-80-21.40



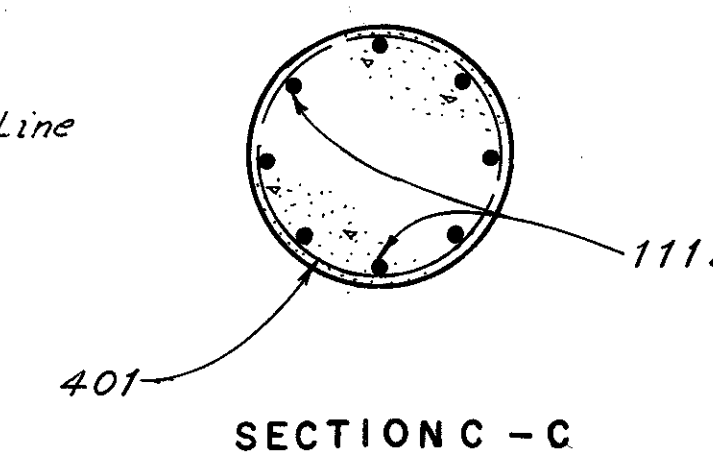
PLAN



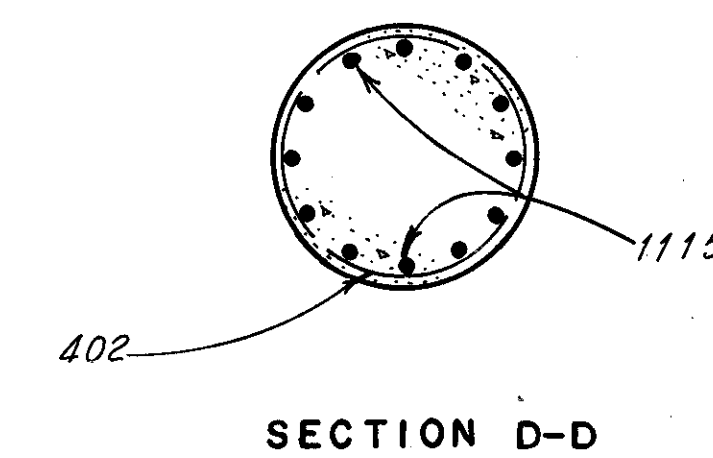
SECTION A-A



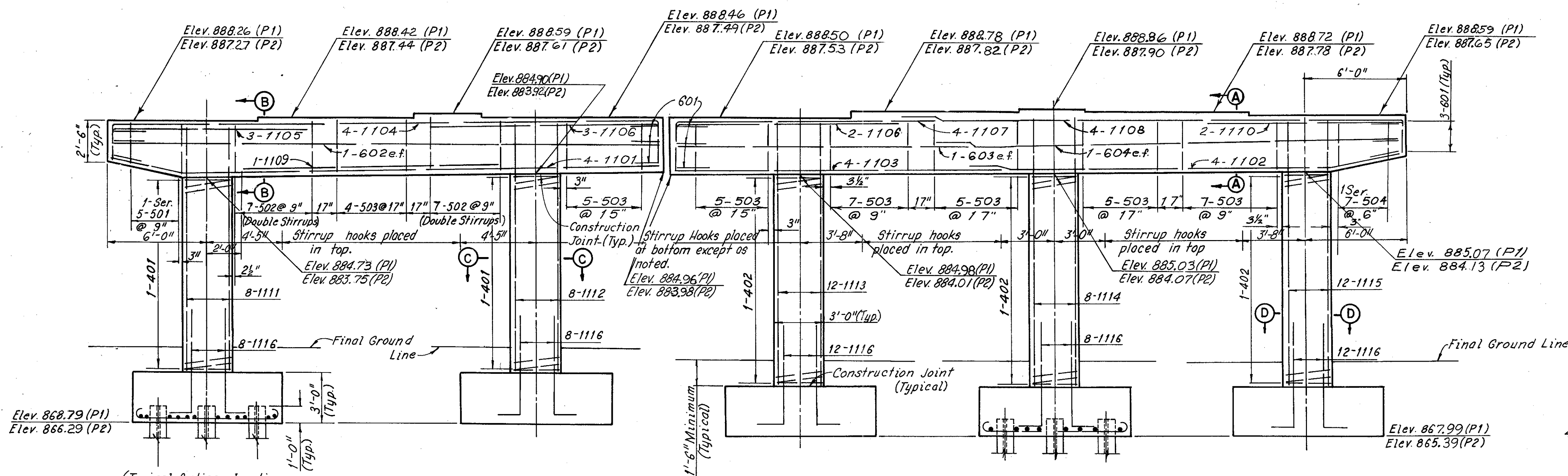
SECTION B-B



SECTION C-C



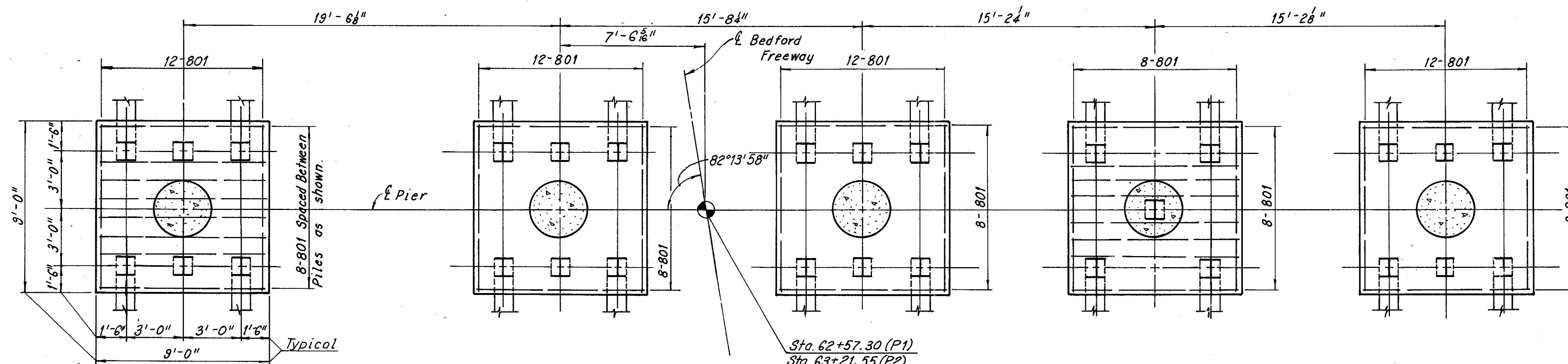
SECTION D-D



ELEVATION

Notes:
For anchor bar details see Pier Bearing Plate Detail on Sheet 9/14.
All piles are HP 12 x 53.
All battered piles shall be inclined 3 in 12 in the direction shown.
Pile layout dimensions are measured along the bottom of footing.
The following abbreviations are used:

- P1 = Pier 1
- P2 = Pier 2
- ef = each face



FOOTING PLAN

Note:
All Reinforcing Bars shall be prefixed as follows:
Pier 1 = PA
Pier 2 = PB

H.N.T.B. BR. NO. 13L & 13R
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

LEFT BRIDGE-PIERS 1 AND 2
BEDFORD FREEWAY AND RAMP B-OBS
OVER RELOCATED McCRACKEN ROAD
STA. 62+17.54 TO
STA. 63+62.80
(BEDFORD FREEWAY)

CUYAHOGA COUNTY OHIO

DRAWN R.J.M.	TRACED G.E.M.	CHECKED M.A.	REVIEWED	REVISED
DATE 8-10-68	DATE 8-30-68	DATE 3-11-70	DATE	DATE

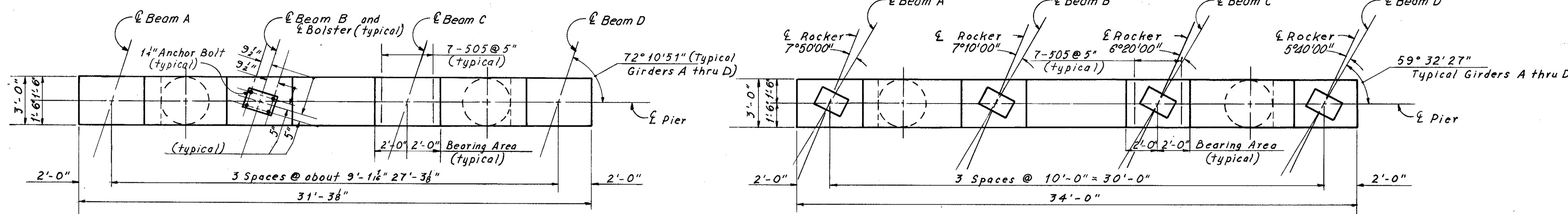
SHEET 7/14

RECORDED
MICROFILMED
DEC 22 1982

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

343
390

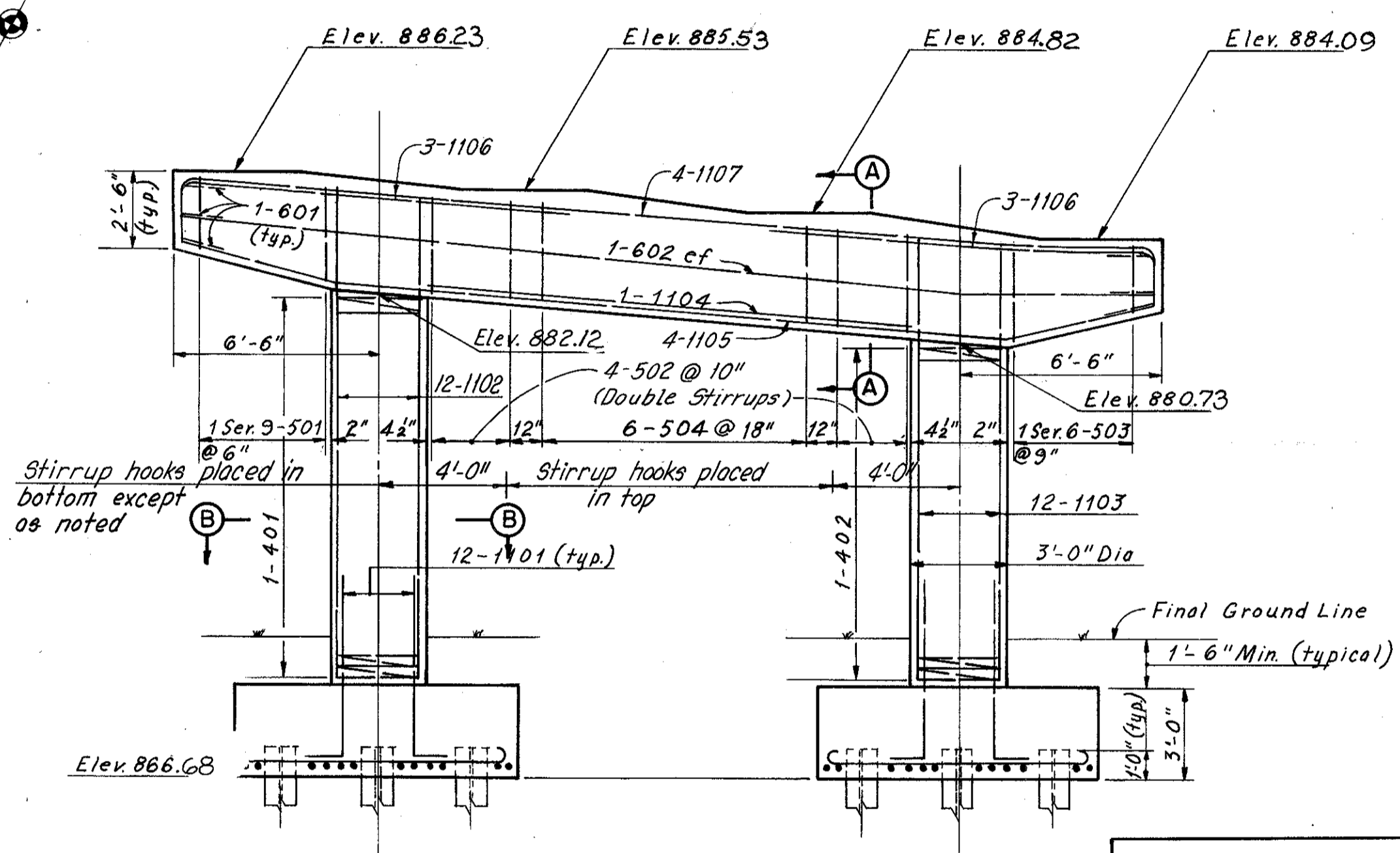
CUYAHOGA COUNTY
CUY. - 80 - 21.40



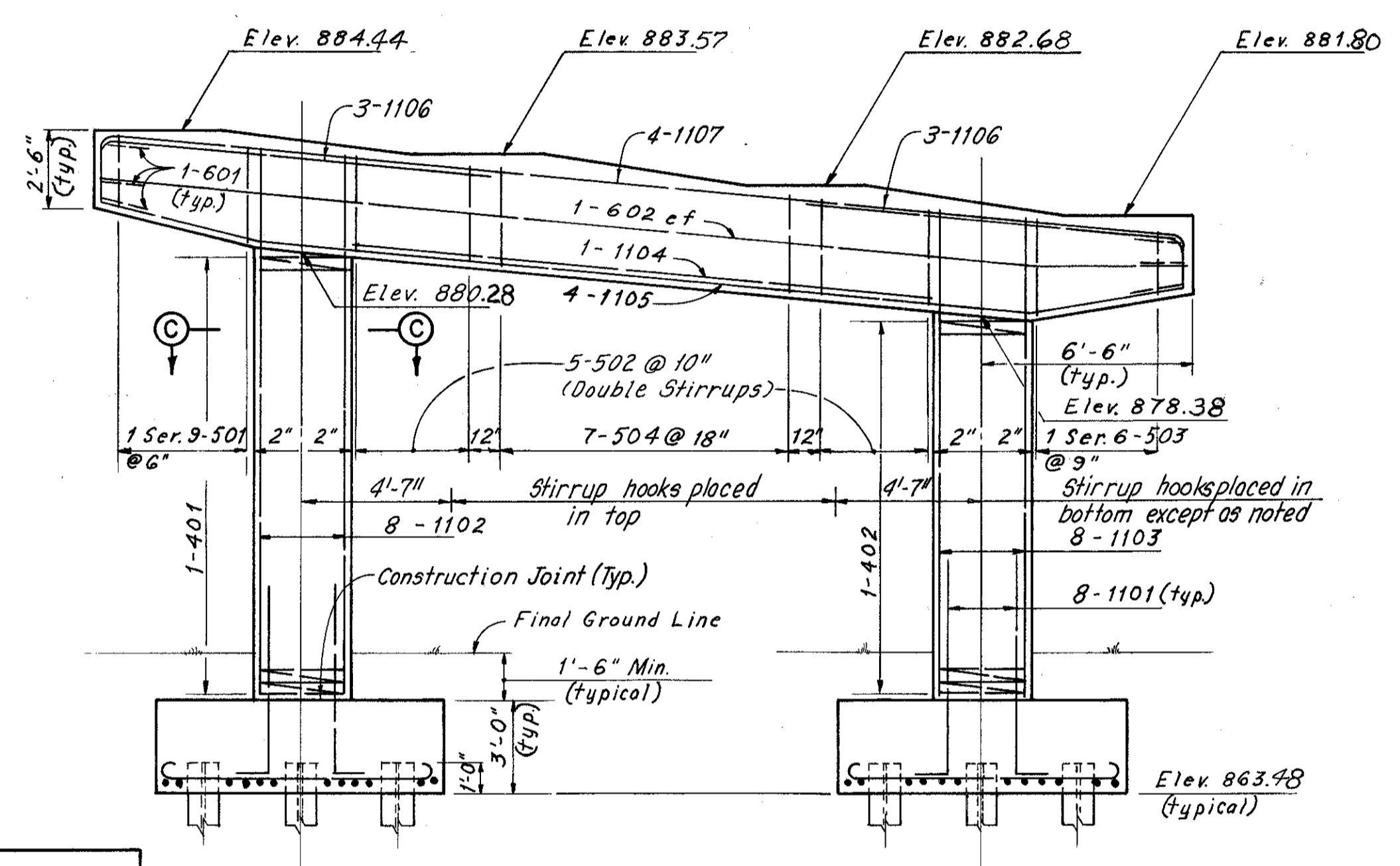
PLAN

PLAN

Note:
Special care shall be taken in placing reinforcing steel in the vicinity of the bridge seat so as to avoid interference with the drilling of anchor bolt holes.

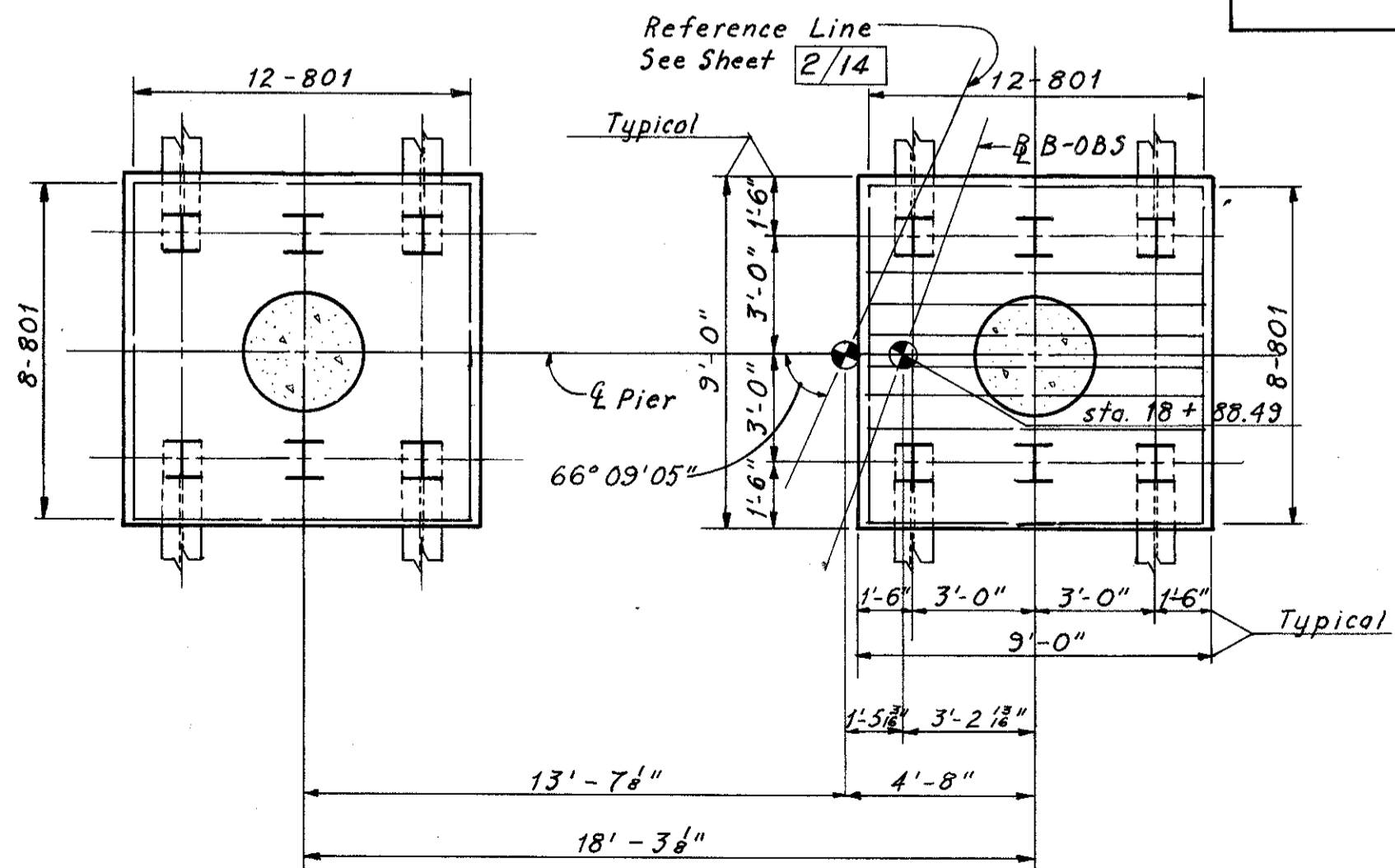


ELEVATION



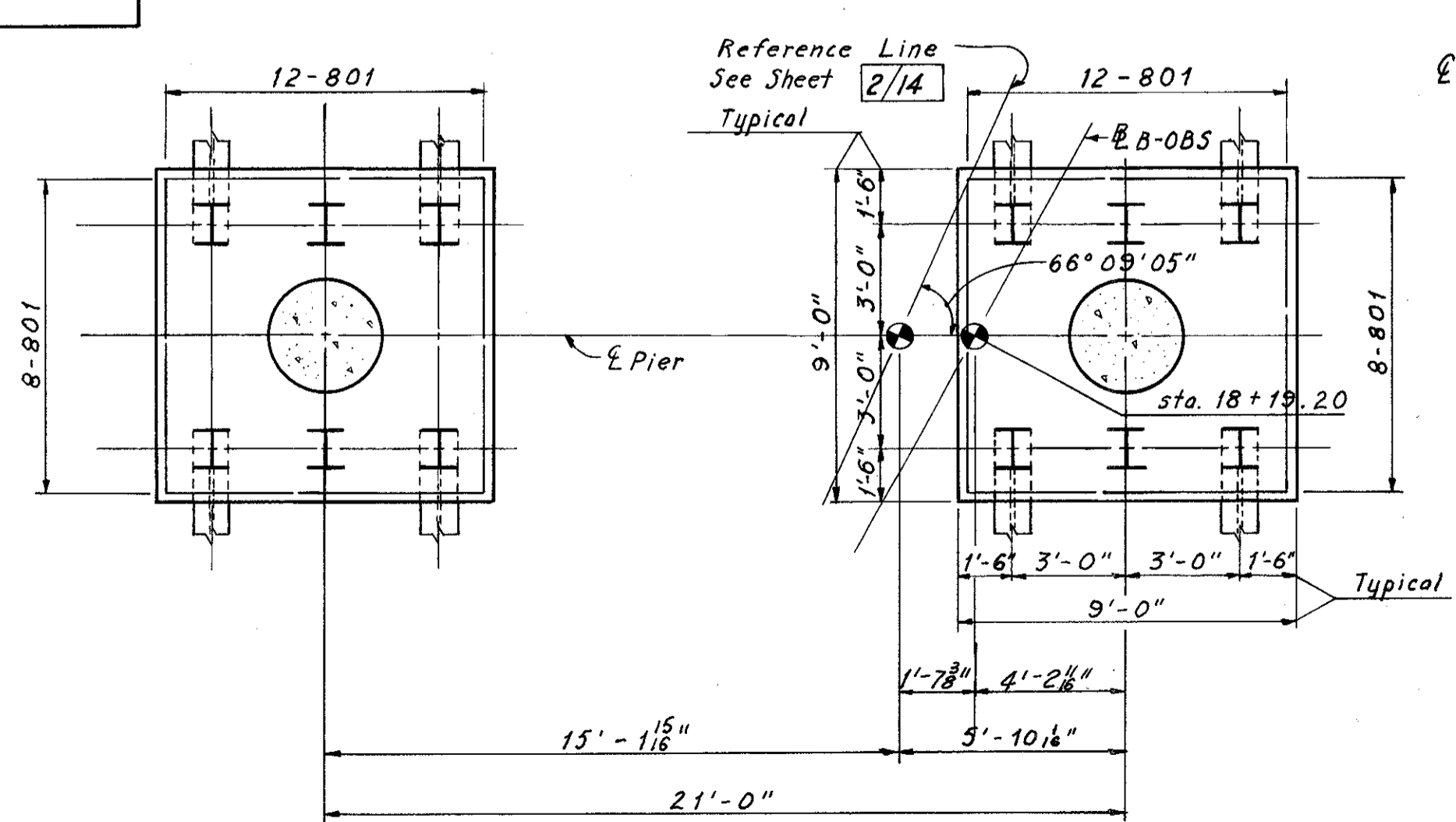
ELEVATION

Note: All reinforcing bar marks shall be prefixed as follows:
Pier 1 - PA
Pier 2 - PB



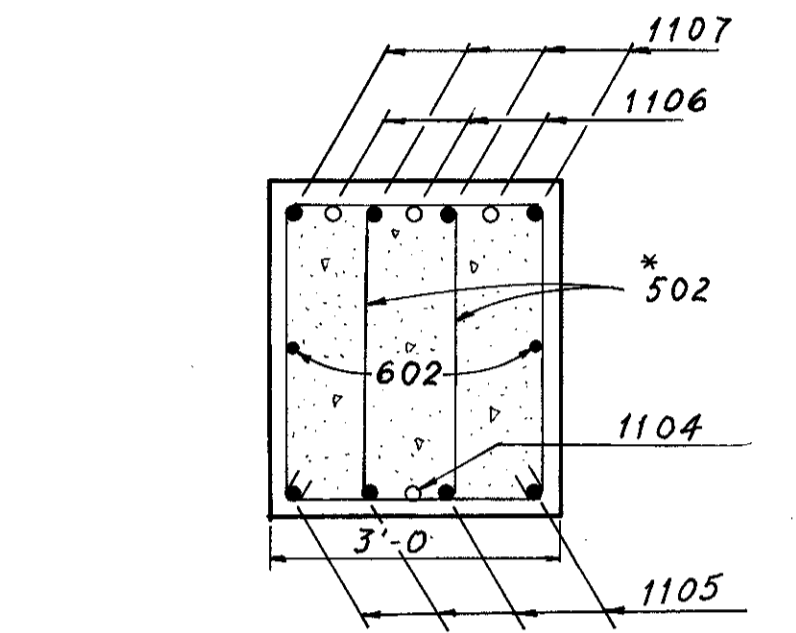
FOOTING PLAN

PIER 1

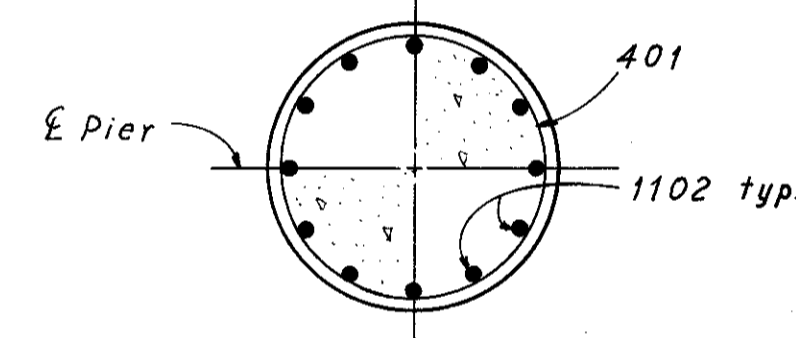


FOOTING PLAN

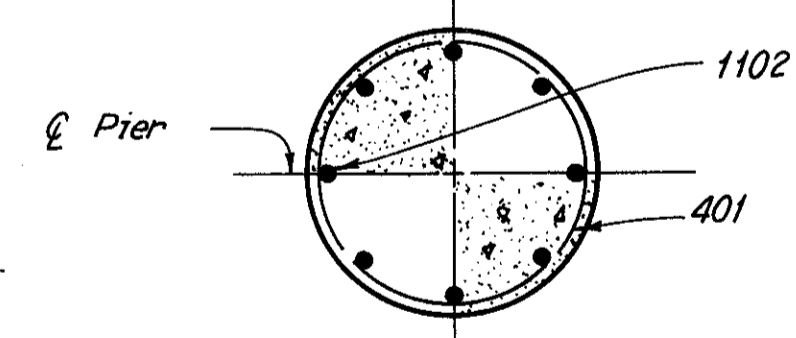
PIER 2



SECTION A A



SECTION B B



SECTION C-C

Notes:
All piles are HP 12x53.
All battered piles shall be inclined 3 in 12 in the direction shown.
Pile layout dimensions are measured along bottom of footing.
For anchor bolt details see Ohio Standard Drawing RB-1-55.
The following abbreviation is used:
ef = each face

H.N.T.B. BR. NO. 13L & 13R

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

RIGHT BRIDGE PIERS 1 AND 2
BEDFORD FREEWAY AND RAMP B-OBS
OVER RELOCATED McCracken Road

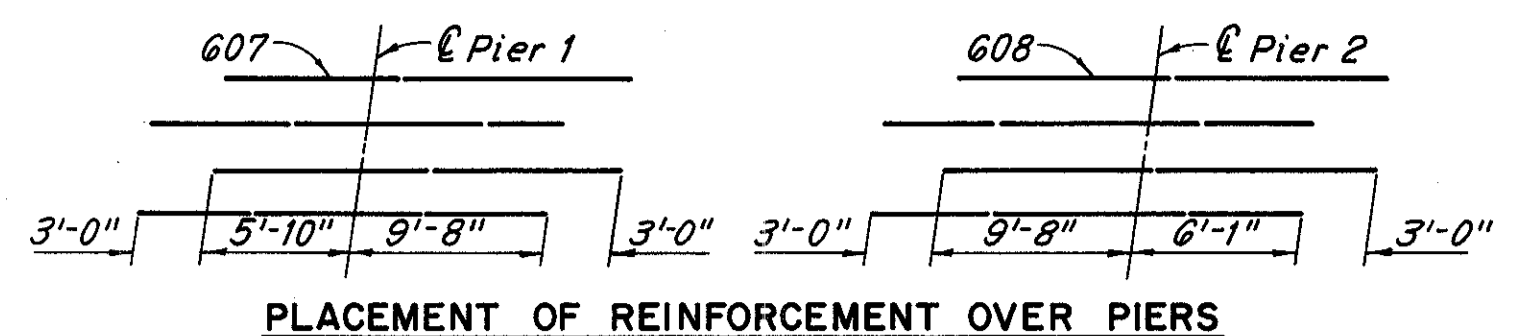
STA. 62+17.54 TO
STA. 63+62.80
(BEDFORD FREEWAY)

CUYAHOGA COUNTY OHIO

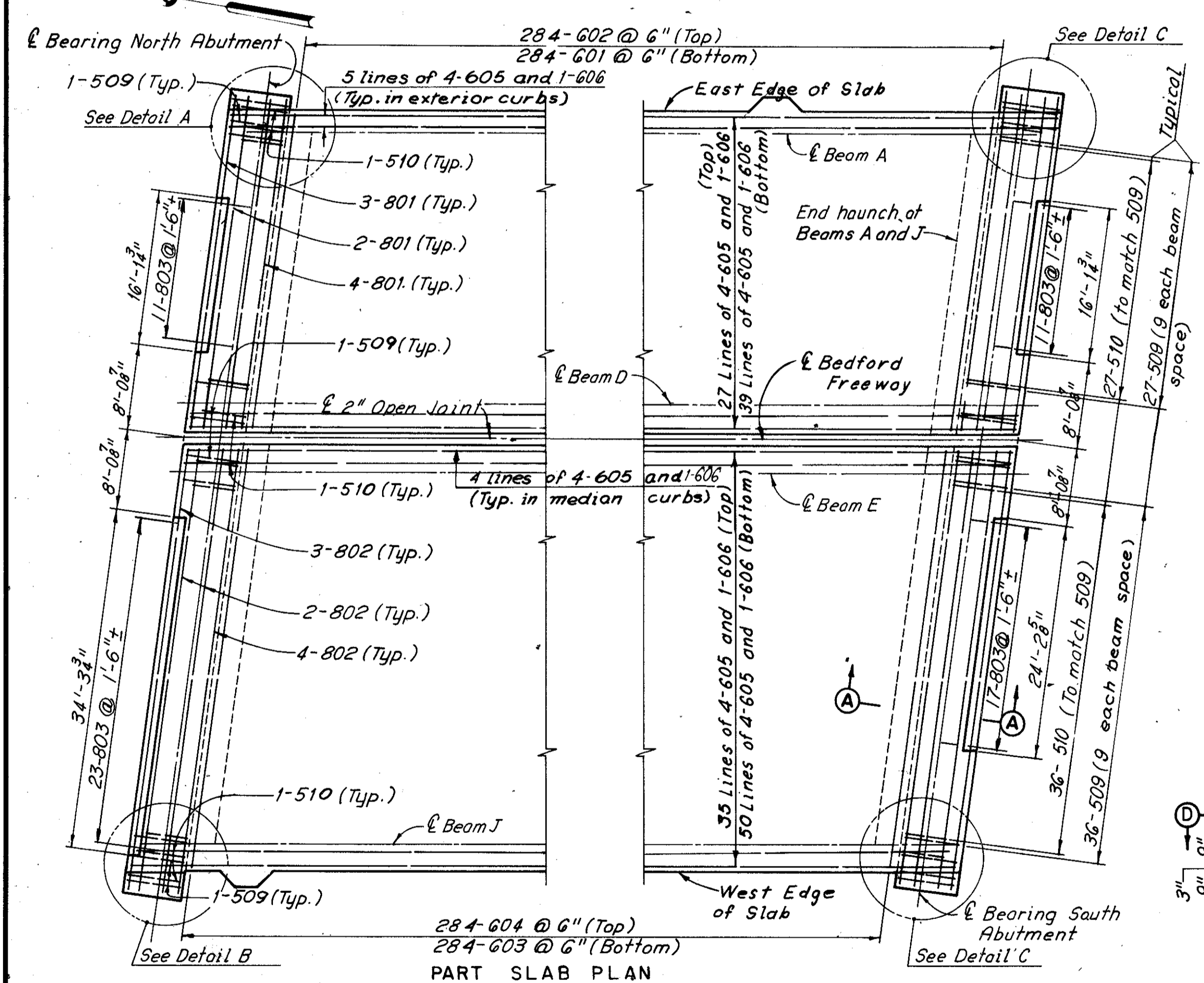
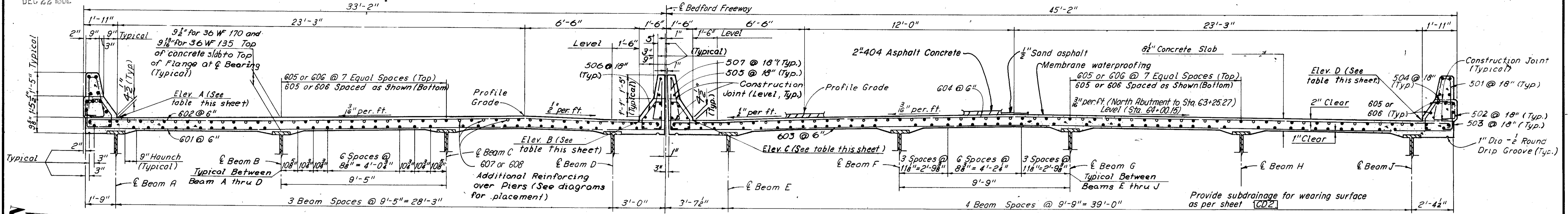
DRAWN D.D.G.	TRACED D.D.G.	CHECKED M.A.	REVIEWED	REVISED
DATE 4-15-69	DATE 4-29-69	DATE 3-12-70	DATE	SHEET 8/14

Note: A typical haunch width of 9" shall be used for computing quantity of concrete. However, the haunch width may vary between 6" and 12" provided that the slope shall be not more than 1:4 for a haunch less than 9" in width.

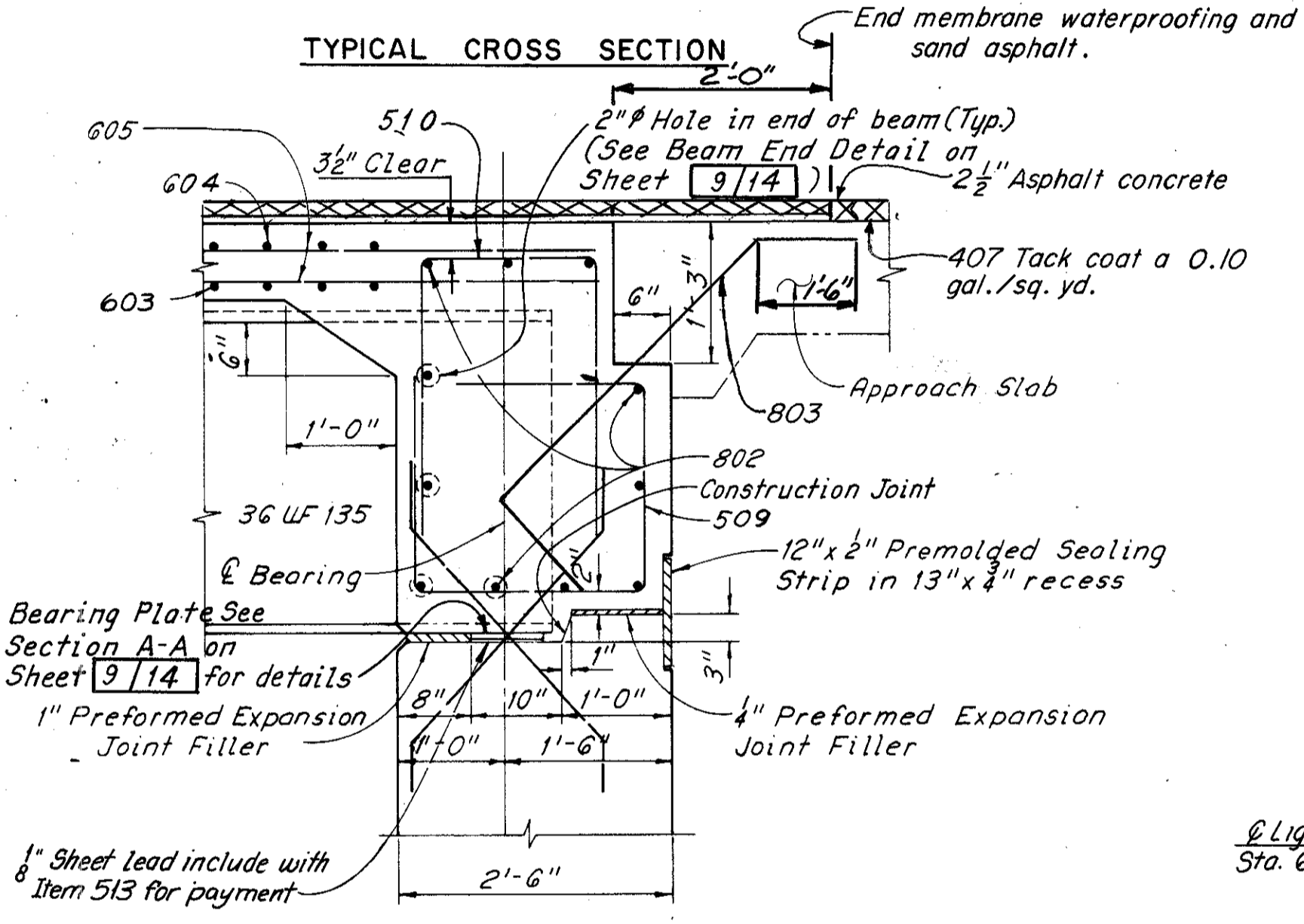
Note: Each Line of Longitudinal deck and curb reinforcement shall consist of 4-605 and 1-606. The 606 bars will be placed in the center span.



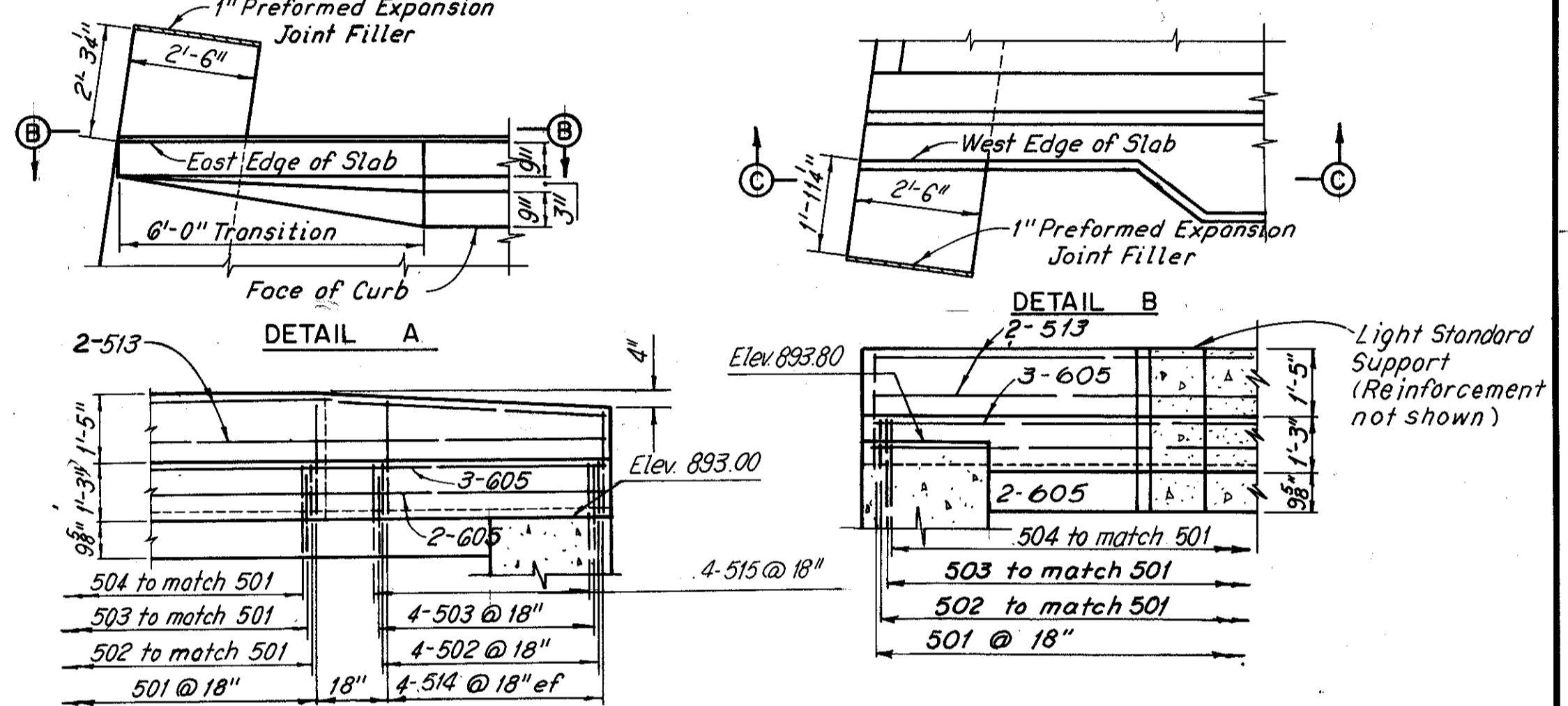
PLACEMENT OF REINFORCEMENT OVER PIERS



PART SLAB PLAN

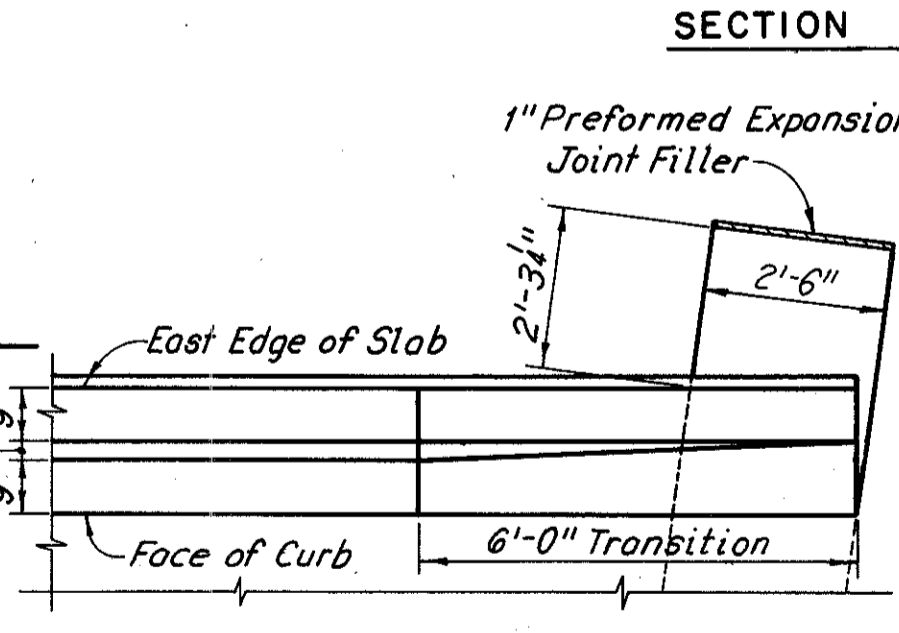


TYPICAL CROSS SECTION

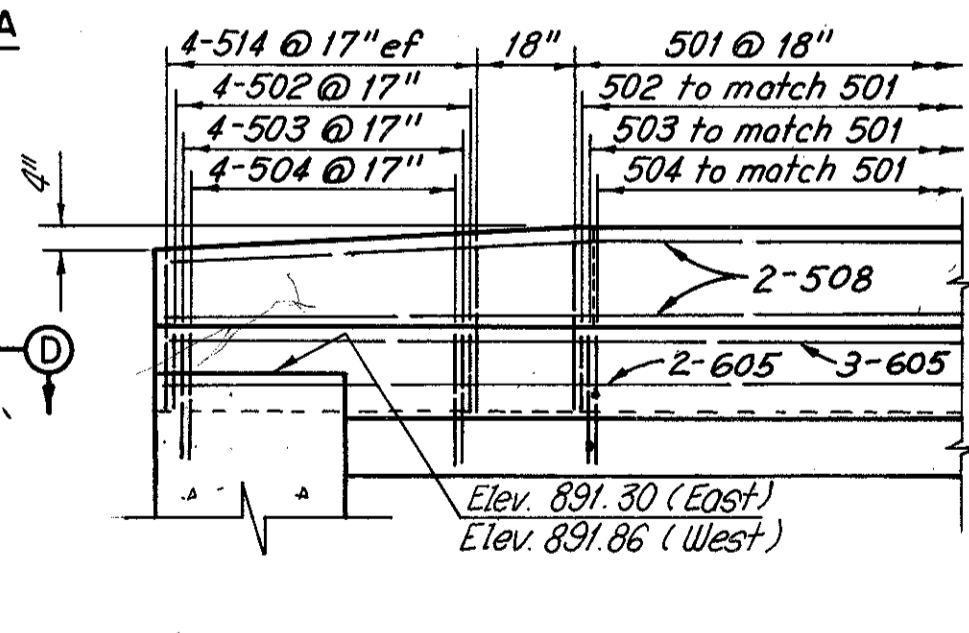


DETAIL A

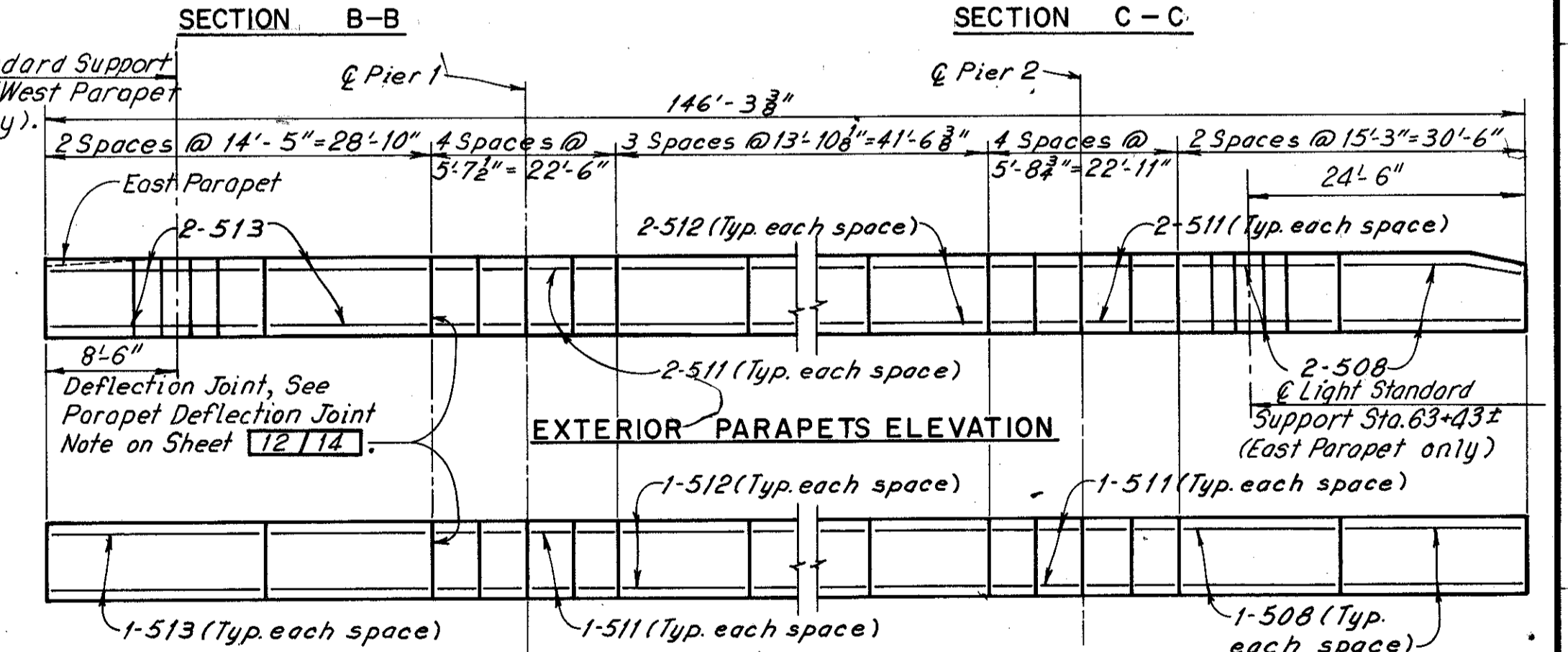
DETAIL B



SECTION A-A



SECTION D-D



SECTION B-B

SECTION C-C

Note: The elevations shown at the face of curb are those which are required before concrete is placed. Proper allowance has been made for the dead load deflection caused by the weight of the concrete.

Note: All reinforcing bar marks shall be prefixed SL.

Elevation	Span 1				Span 2				Span 3				Brg. S. Abut.
	Brg. N. Abut.	Point	Point	Point	Point	Point	Point	Point	Point	Point	Point	Point	
A	892.79	892.68	892.56	892.44	892.31	892.09	891.85	891.59	891.32	891.15	890.98	890.80	890.63
B	892.98	892.87	892.76	892.64	892.52	892.32	892.09	891.83	891.54	891.37	891.20	891.03	890.85
C	892.99	892.88	892.77	892.65	892.53	892.33	892.10	891.84	892.56	891.39	891.21	891.04	890.87
D	893.08	892.98	892.87	892.75	892.63	892.44	892.22	891.96	891.69	891.54	891.40	891.27	891.14

Beam	Span 1				Span 2				Span 3				Brg. Abut.
	Point	Point	Point	Point	Point	Point	Point	Point	Point	Point	Point	Point	
A	892.79	892.68	892.56	892.44	892.31	892.09	891.85	891.59	891.32	891.15	890.98	890.80	890.63
B	892.98	892.87	892.76	892.64	892.52	892.32	892.09	891.83	891.54	891.37	891.20	891.03	890.85
C	893.11	893.00	892.88	892.76	892.64	892.42	892.18	891.93	891.66	891.49	891.32	891.14	890.97
D	892.98	892.87	892.76	892.64	892.52	892.30	892.06	891.81	891.54	891.37	891.20	891.03	890.85
E	893.02	892.91	892.80	892.68	892.55	892.33	892.10	891.85	891.59	891.41	891.24	891.07	890.89
F	893.30	893.19	893.08	892.96	892.84	892.62	892.39	892.14	891.87	891.70	891.53	891.36	891.18
G	893.37	893.26	893.15	893.03	892.91	892.69	892.46	892.21	891.95	891.78	891.62	891.45	891.28
H	893.23	893.12	893.01	892.89	892.77	892.56	892.33	892.08	891.83	891.67	891.51	891.36	891.22
J	893.09	892.99	892.88	892.76	892.64	892.43	892.20	891.95	891.70	891.55	891.41	891.27	891.15

Note: For curb and parapet transition details see "PART PLANS - PARAPET ON WINGWALL" on Ohio Standard Drawing BR-1-67, Revised 10-15-71, Sheet 1 of 3. For Light Standard Support Details see Sheet CD1.

H.N.T.B. BR NO. 13L & 13R

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

LEFT BRIDGE-SLAB PLAN AND
TYPICAL CROSS SECTION
BEDFORD FREEWAY AND RAMP B-OBS
OVER RELOCATED McCRACKEN ROAD

STA. 62+17.54 TO
STA. 63+62.80
(BEDFORD FREEWAY)

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 5-11-68	DATE 5-17-68	DATE 4-23-68	DATE	DATE

SHEET 10/14

MISS. FILLED
DEC 22 1962

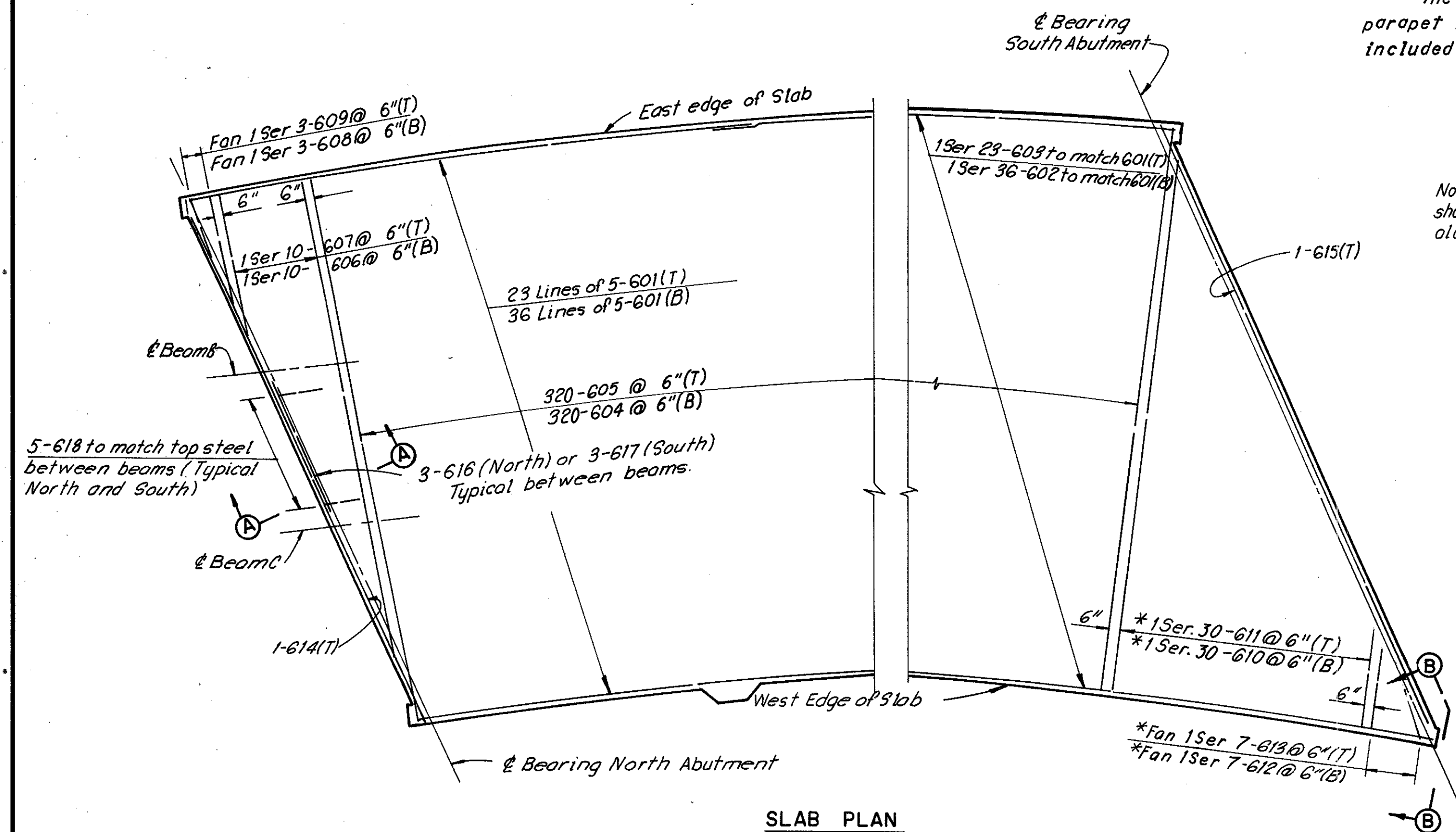
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

347
390

CUYAHOGA COUNTY
CUY.80-21.40

PARAPET DEFLECTION JOINT NOTE
The preformed expansion joint filler in the railing parapet deflection joints may be either 1/4" gray sponge rubber or 1/4" gray cellular polyvinylchloride (PVC) sponge.
The deflection joint extends from top of parapet to first construction joint and is included for payment with Superstructure Concrete.

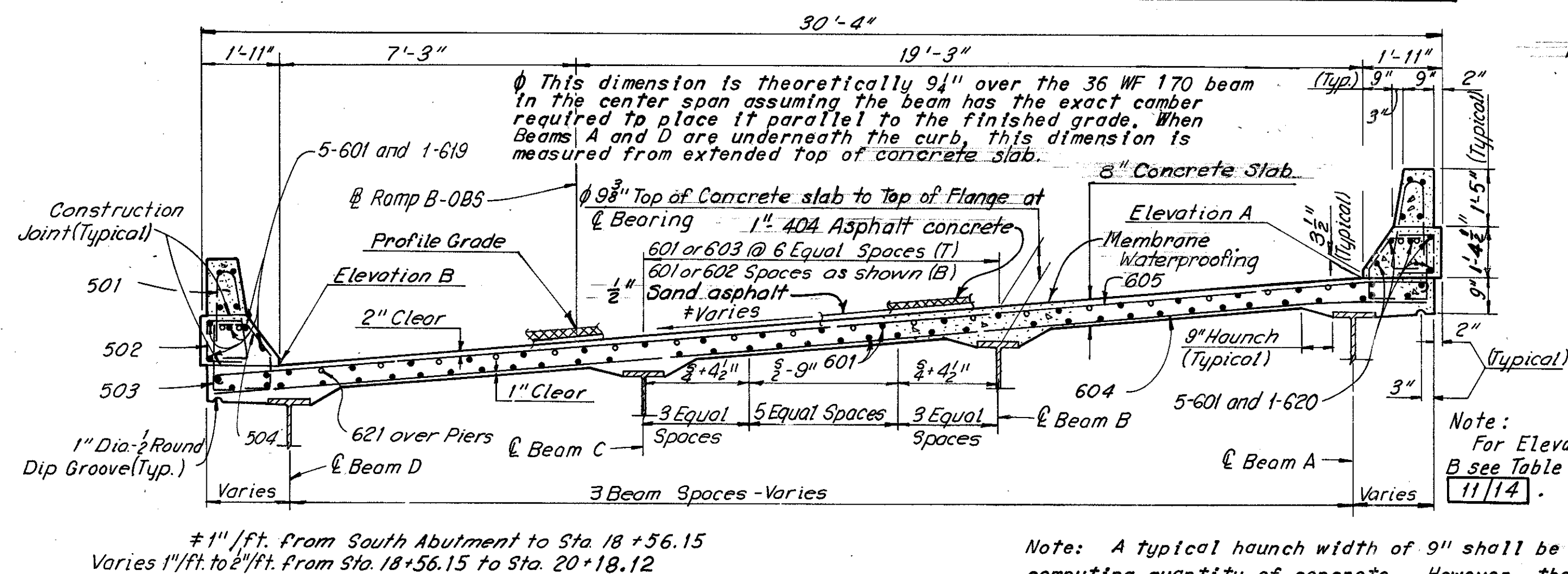
Note: All transverse reinforcing steel shall be placed radially and measured along East Edge of Slab (except as noted).



SLAB PLAN

* Measured along West Edge of Slab.

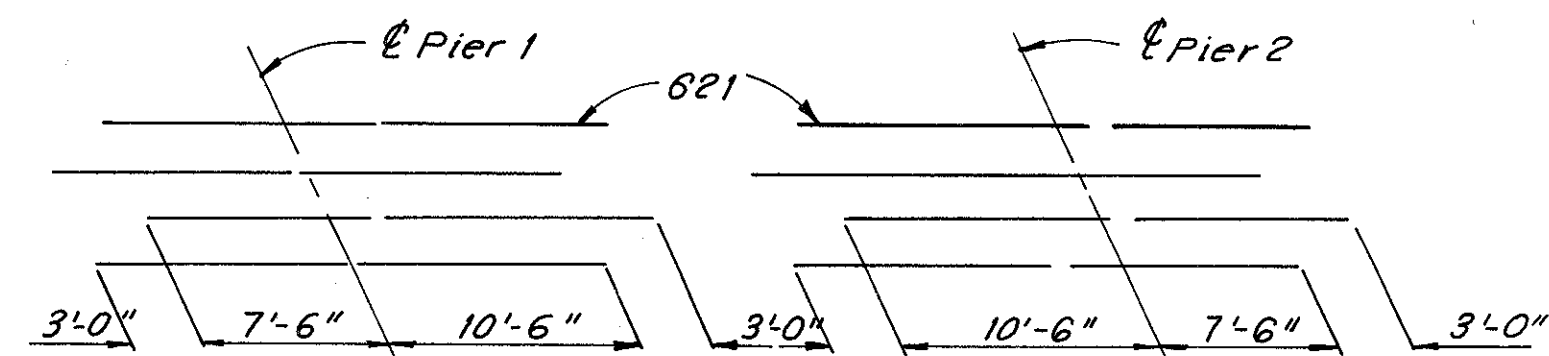
Note:
All reinforcing bar marks shall be prefixed SR.



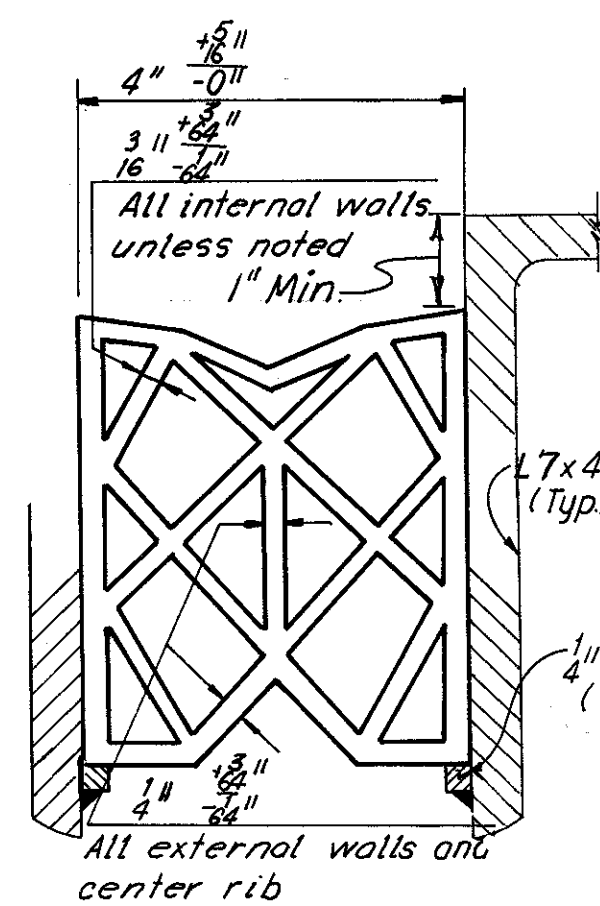
TYPICAL CROSS SECTION
(Section Looking North)

Provide subdrainage for wearing surface as per Sheet CD2 at low curb line only.

Note: A typical haunch width of 9" shall be used for computing quantity of concrete. However, the haunch width may vary between 6" and 12" provided that the slope shall be not more than 1:4 for a haunch less than 9" in width.



PLACEMENT OF REINFORCEMENT OVER PIERS



PREFORMED ELASTIC JOINT SEALER

(D.S. Brown CU-4000, Acme B-462 or equivalent)

L 7x4 x 1/2 (Top leg bent to match roadway grade) continuous between curbs.

1/2" Asphalt concrete 2" holes, 1/2" pitch

Pl. 6 x 1/2 x 1/2" 1/2" @ 15" ctrs. The holes may be burned in the plate.

4" Square Rod (between curbs)

Preformed Elastic Joint Sealer (See Detail this sheet)

Anchor Bars 2 x 1/2 x 1'-6" @ 12" ctrs. to alternate with 2 x 1/2 x 1'-6" anchor bars (stagger @ 6" ctrs.)

Anchor Bars 1/2 x 1/2 x 1'-0" @ 12" ctrs.

Construction Joint

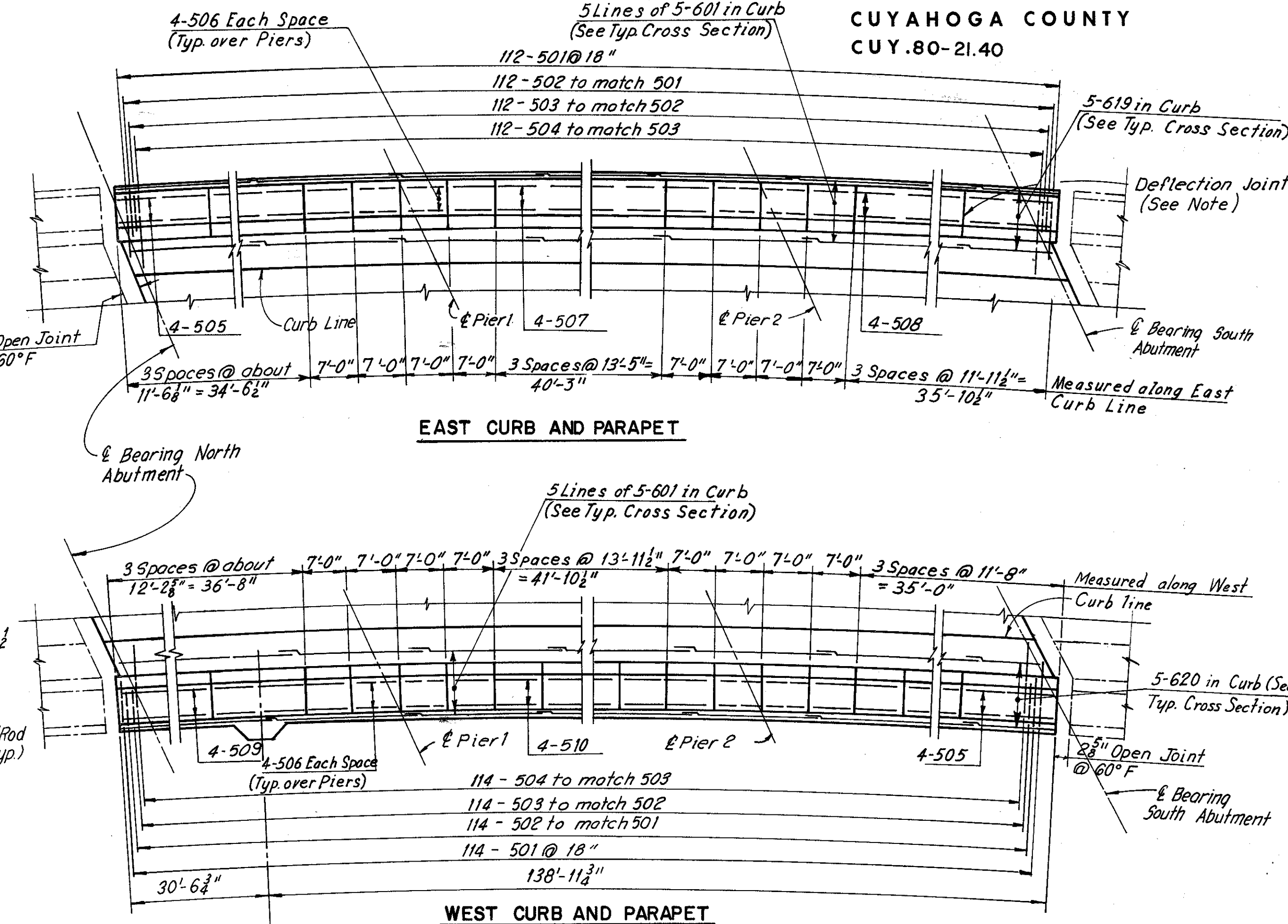
Preformed Elastic Joint Sealer

Abutment Bearing

SECTION A-A

(Abutment reinforcing steel not shown)

Note: Above dimensions are measured normal to abutment. Portions of end dam angles in contact with concrete shall not be painted. All other portions shall be cleaned and painted in accordance with Item 514.

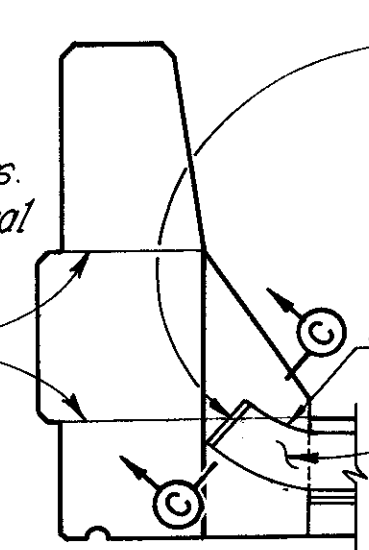


EAST CURB AND PARAPET

WEST CURB AND PARAPET

Note: All openings for preformed elastic joint sealers are to be accurately formed and constructed to smooth straight lines.

The ends shall be covered with a 3/8" sheet of the same material as the sealer; bonded on the top and 2 sides with an adhesive as recommended by the manufacturer.

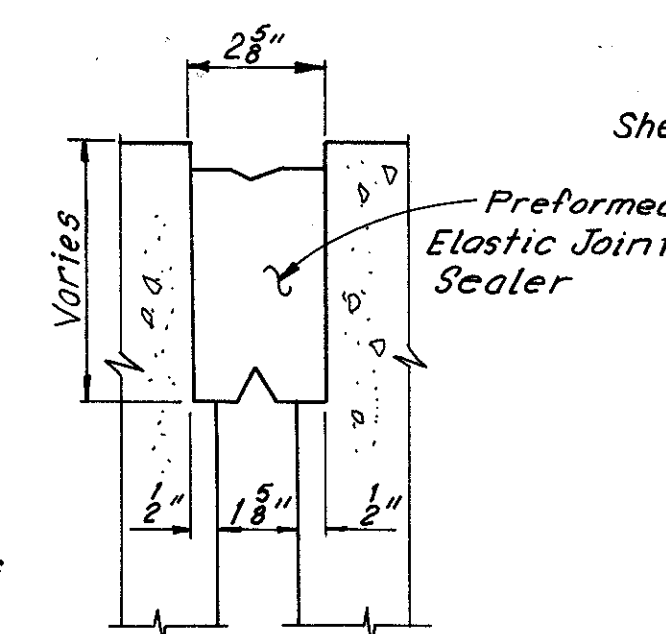


SECTION B-B

Notes:
The preformed elastic joint sealer shall meet the requirements of "Item 705.11, Preformed Elastic Joint Sealer and Lubricant Adhesive". Installation shall be according to manufacturers' recommendations.

The following abbreviations are used:
(T) = Top (B) = Bottom

For Light Standard Support Details see Sheet CD1.



SECTION C-C

H.N.T.B. BR. NO. 13L & 13R

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

RIGHT BRIDGE SLAB PLAN
BEDFORD FREEWAY AND RAMP B-OBS
OVER RELOCATED McCracken Road
STA. 62+17.54 TO
STA. 63+62.80
CUYAHOGA COUNTY OHIO

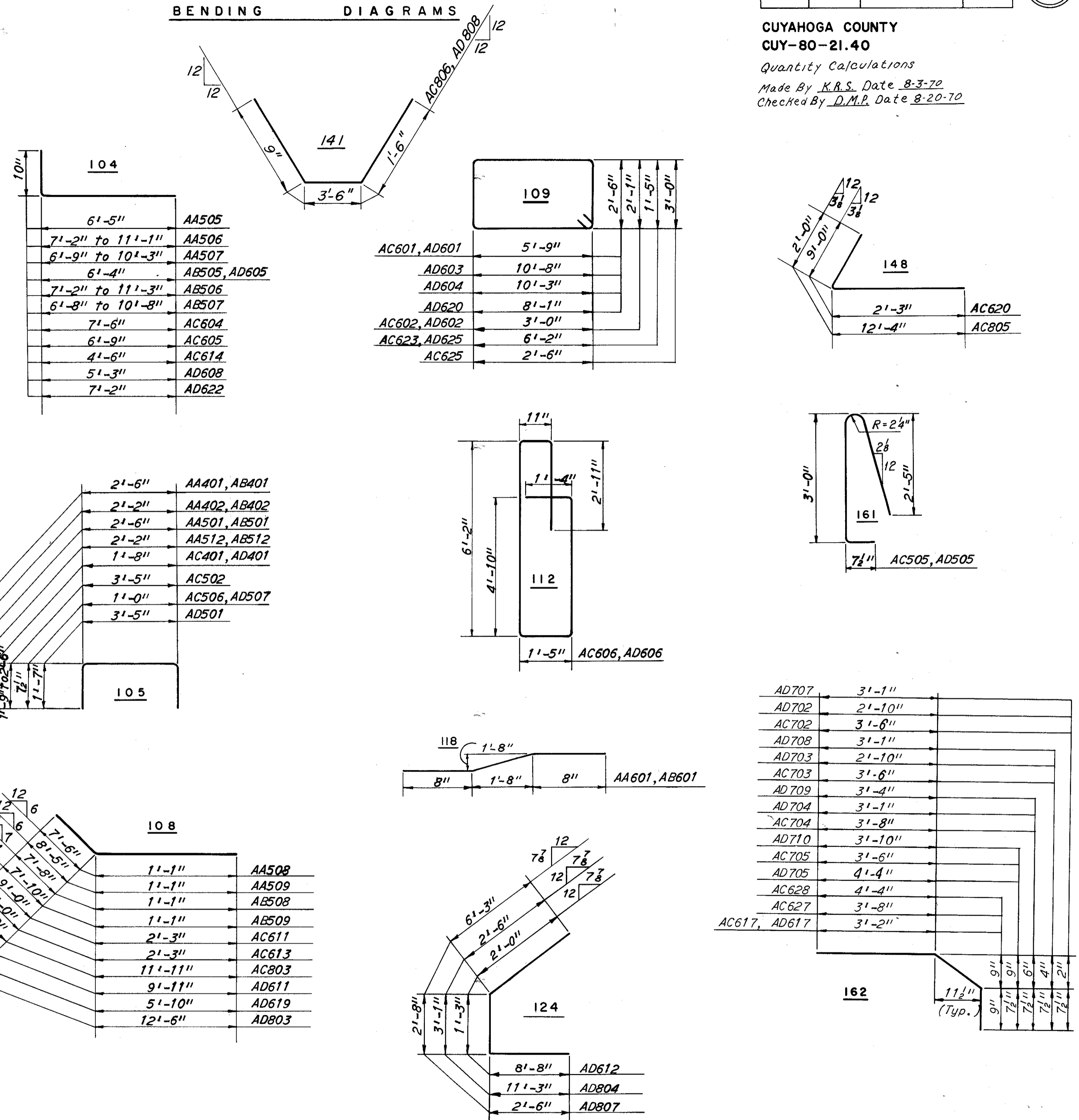
DRAWN L.J.G.	TRACED M.S.	CHECKED W.C.	REVIEWED	REVISED
DATE 8-28-62	DATE 9-13-62	DATE 5-13-63	DATE	DATE

SHEET 12/14

CUYAHOGA COUNTY
 CUY-80-21.40
 Quantity Calculations
 Made By K.B.S. Date 8-3-70
 Checked By D.M.P. Date 8-20-70

MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)
BR. NO. 13L - NORTH ABUTMENT						BR. NO. 13R - NORTH ABUTMENT						BR. NO. 13R - SOUTH ABUTMENT					
AA401	64	6'-3"	105		267	AC401	27	3'-5"	105		62	AD401	28	3'-5"	105		64
AA402	63	4'-1"	105		172	AC501	11	30'-3"	Str.		347	AD501	26	6'-4"	105		172
AA501	130	6'-5"	105		870	AC502	2 Ser. 10	6'-8" 8'-2"	105	2"	155	AD502	12	34'-0"	Str.		426
AA502	12	34'-3"	Str.		429	AC503	4	14'-3"	Str.		59	AD503	4	16'-0"	Str.		67
AA503	8	22'-6"	Str.		188	AC504	4	13'-9"	Str.		57	AD504	4	14'-9"	Str.		61
AA504	8	29'-0"	Str.		242	AC505	17	5'-11"	161		105	AD505	14	5'-11"	161		86
AA505	106	7'-1"	104		783	AC506	22	2'-0"	105		46	AD506	2	4'-3"	Str.		9
AA506	2 Ser. 6	7'-10" 7'-9"	104	9 3/8"	123	AC507	7	4'-0"	Str.		29	AD507	24	2'-0"	105		50
AA507	2 Ser. 6	7'-5" 7'-11"	104	8 3/8"	115	AC508	10	2'-9"	Str.		29	AD508	20	2'-9"	Str.		57
AA508	3	8'-7"	108		27	AC509	6	28'-6"	Str.		178	AD509	8	3'-6"	Str.		29
AA509	3	9'-6"	108		30	AC510	1	8'-3"	Str.		9	AD510	3	33'-3"	Str.		104
AA510	2 Ser. 3	3'-5" 7'-11"	Str.	2 3/4"	35	AC511	1	20'-0"	Str.		21	AD511	1	5'-0"	Str.		5
AA511	2 Ser. 3	3'-10" 8'-1"	Str.	2 1/2"	39	AC512	2	4'-3"	Str.		9	AD512	1	23'-0"	Str.		24
AA512	65	6'-3"	105		424	AC513	2	4'-9"	Str.		10	AD513	1	9'-9"	Str.		10
AA601	152	3'-6"	118		799	AC601	20	17'-3"	109		518	AD514	2	4'-6"	Str.		9
AA801	12	35'-0"	Str.		1121	AC602	4	10'-11"	109		66	AD601	23	17'-3"	109		596
AA1001	8	29'-6"	Str.		1016	AC603	6	5'-0"	Str.		45	AD602	6	10'-11"	109		98
AA1002	8	23'-3"	Str.		800	AC604	20	8'-2"	104		245	AD603	1	27'-1"	109		41
						AC605	20	7'-5"	104		223	AD604	1	26'-3"	109		39
						AC606	16	16'-9"	112		403	AD605	49	7'-0"	104		515
						AC607	2	5'-6"	Str.		17	AD606	20	16'-9"	112		503
						AC608	2	3'-9"	Str.		11	AD607	2	6'-0"	Str.		18
						AC609	12	14'-3"	Str.		257	AD608	22	5'-11"	104		196
						AC610	12	13'-9"	Str.		248	AD609	12	8'-6"	Str.		153
						AC611	4	11'-11"	108		67	AD610	2	4'-0"	Str.		12
						AC612	8	6'-0"	Str.		72	AD611	4	11'-10"	108		71
						AC613	4	8'-3"	108		50	AD612	4	11'-8"	124		70
						AC614	29	5'-2"	104		225	AD613	2	8'-0"	Str.		24
						AC615	3	8'-3"	Str.		37	AD614	7	5'-9"	Str.		60
						AC616	3	8'-0"	Str.		36	AD615	12	16'-0"	Str.		288
						AC617	15	5'-0"	162		113	AD616	12	14'-9"	Str.		266
						AC618	6	10'-6"	Str.		95	AD617	14	5'-0"	162		105
						AC619	6	8'-9"	Str.		79	AD618	5	5'-0"	Str.		38
						AC620	4	11'-11"	148		67	AD619	4	7'-9"	108		47
						AC621	7	6'-0"	Str.		63	AD620	1	21'-11"	109		33
						AC622	9	6'-9"	Str.		91	AD621	12	9'-0"	Str.		162
						AC623	12	15'-11"	109		287	AD622	1	7'-10"	104		12
						AC624	7	9'-9"	Str.		103	AD623	2	6'-9"	Str.		20
						AC625	5	11'-9"	109		88	AD624	2	4'-6"	Str.		14
						AC626	2	7'-3"	Str.		22	AD625	12	15'-11"	109		287
						AC627	1	5'-6"	162		8	AD626	2	3'-3"	Str.		10
						AC628	1	6'-2"	162		9	AD701	1	4'-4"	101		9
						AC701	1	5'-7"	101		11	AD702	1	4'-4"	162		9
						AC702	1	4'-8"	162		10	AD703	1	4'-5"	162		9
						AC703	1	5'-11"	162		11	AD704	1	4'-9"	162		10
						AC704	1	5'-4"	162		11	AD705	1	5'-5"	162		11
						AC705	1	6'-1"	162		13	AD706	1	4'-7"	101		9
						AC801	8	32'-3"	Str.		689	AD707	1	4'-7"	162		10
						AC802	6	8'-0"	Str.		128	AD708	1	4'-8"	162		10
						AC803	2	13'-9"	108		73	AD709	1	5'-0"	162		10
						AC804	6	6'-6"	Str.		104	AD710	1	5'-7"	162		12
						AC805	2	14'-2"	148		76	AD801	12	20'-6"	Str.		657
						AC806	11	5'-9"	141		169	AD802	4	18'-3"	Str.		195
												AD803	2	15'-0"	108		80
												AD804	2	16'-7"	124		89
												AD805	6	9'-6"	Str.		152
												AD806	4	11'-6"	Str.		123
												AD807	2	11'-2"	124		60
												AD808	13	5'-9"	141		200
												TOTAL WEIGHT					6506

BENDING DIAGRAMS



Note:
 For Replacement Bar Schedule see
 Sheet 12/12 of BR. NO. CUY-80-2169.

H.N.T.B. BR. NO. 13L & 13R

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

**REINFORCEMENT SCHEDULE
 ABUTMENTS**

BEDFORD FREEWAY AND RAMP B-OBS
 OVER RELOCATED McCRACKEN ROAD

STA. 62+17.54 TO
 STA. 63+62.80
 (BEDFORD FREEWAY)

CUYAHOGA COUNTY OHIO

DRAWN K.R.S.	TRACED M.C.	CHECKED D.M.P.	REVIEWED	REVISED
DATE 8-3-70	DATE 8-19-70	DATE 8-20-70	DATE	DATE

SHEET 13/14

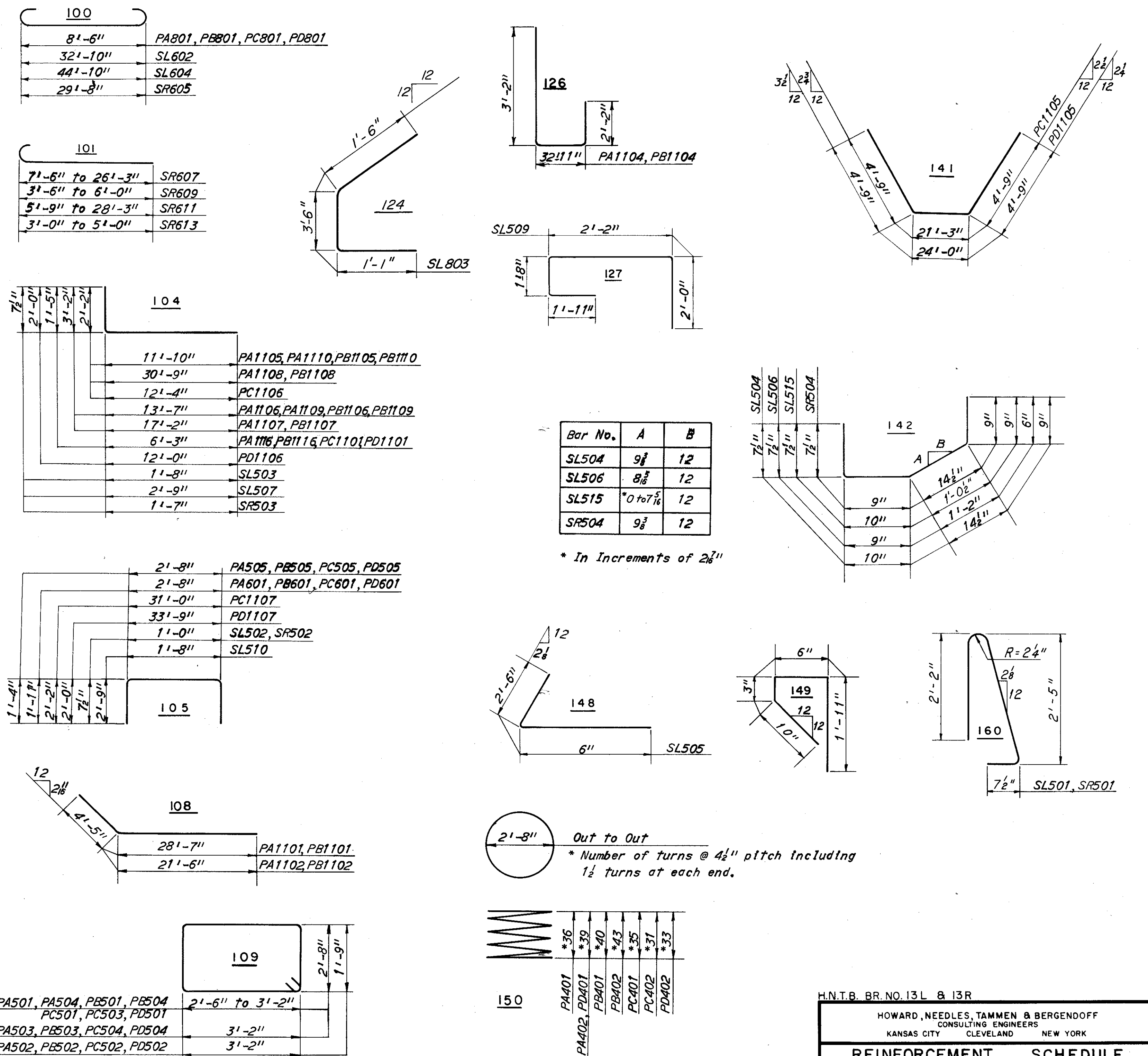
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
CUY-80-21.40

Quantity Calculations
Made By KRS Date 8-70
Checked By DMP Date 8-70

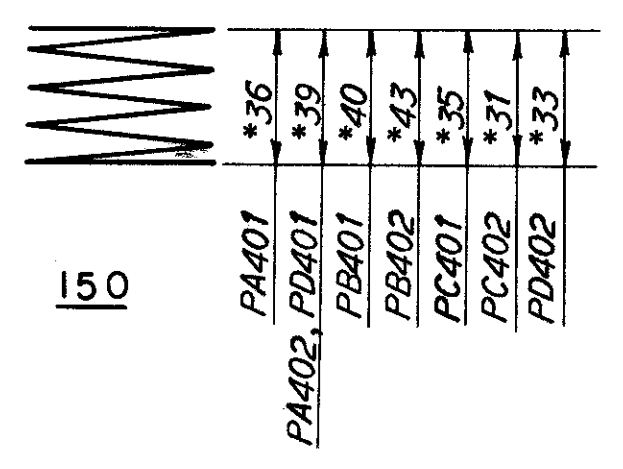
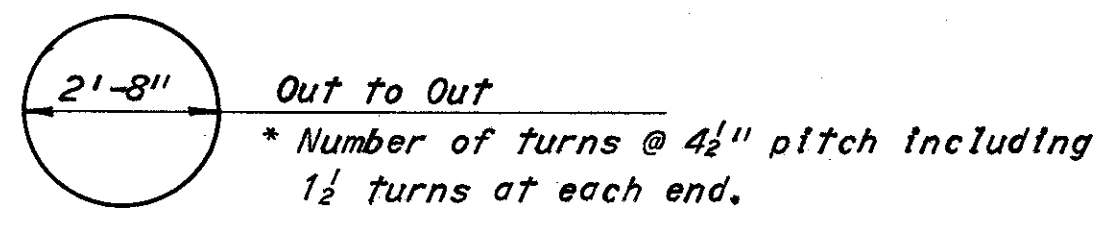
MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)						
BR. NO. 13L - PIER 1						BR. NO. 13R - PIER 1						SL604 284 46'-2" 100 19,693											
PA401	2	12'-6"	150		477	PC401	1	12'-0"	150		231	SL605	676	30'-0"	Str.		30,461						
PA402	3	13'-6"	150		775	PC402	1	10'-6"	150		205	SL606	169	32'-6"	Str.		8250						
PA501	1 Ser. 5	10'-10" 12'-2"	109	4"	60	PC501	1 Ser. 9	12'-2" 10'-10"	109	2"	108	SL607	58	18'-6"	Str.		1612						
PA502	28	10'-4"	109		302	PC502	16	10'-4"	109		172	SL608	58	18'-9"	Str.		1633						
PA503	38	12'-2"	109		482	PC503	1 Ser. 6	12'-2" 10'-4"	109	3 1/2"	72	SL801	22	32'-9"	Str.		1924						
PA504	1 Ser. 7	10'-10" 12'-2"	109	2 3/8"	84	PC504	6	12'-2"	109		76	SL802	22	45'-0"	Str.		2643						
PA505	63	5'-1"	105		334	PC505	28	5'-1"	105		148	SL803	62	6'-0"	Str.		993						
												2 Light Standard Supports = 1,470		TOTAL WEIGHT = 124,683									
BR. NO. 13R - SUPERSTRUCTURE																							
PA601	12	6'-2"	105		111	PC601	6	6'-2"	105		56	SR501	226	5'-4"	160		1257						
PA602	2	32'-9"	Str.		99	PC602	2	30'-9"	Str.		92	SR502	226	2'-0"	105		471						
PA603	2	18'-6"	Str.		56	PC801	40	10'-8"	100		1139	SR503	226	2'-1"	104		491						
PA604	2	27'-0"	Str.		81	PC1101	24	7'-5"	104		957	SR504	226	3'-1"	142		727						
PA801	96	10'-8"	100		2734	PC1102	12	15'-6"	Str.		988	SR505	24	11'-3"	Str.		282						
PA1101	4	32'-11"	108		700	PC1103	12	14'-0"	Str.		893	SR506	64	6'-6"	Str.		434						
PA1102	4	25'-10"	108		549	PC1104	1	15'-3"	Str.		81	SR507	12	13'-0"	Str.		163						
PA1103	4	21'-6"	Str.		457	PC1105	4	30'-9"	141		653	SR508	12	11'-6"	Str.		144						
PA1104	4	37'-8"	126		800	PC1106	6	14'-3"	104		454	SR509	12	11'-9"	Str.		147						
PA1105	3	13'-9"	104		219	PC1107	4	34'-9"	105		739	SR510	12	13'-6"	Str.		169						
PA1106	5	16'-6"	104		438	TOTAL WEIGHT = 7064						SR601	345	30'-0"	Str.		15,546						
PA1107	4	20'-1"	104		427	BR. NO. 13R - PIER 2												SR602	1 Ser. 36	26'-3" 28'-0"	Str.	8"	1467
PA1108	4	32'-8"	104		694	PD401	1	13'-4"	150		258	SR603	1 Ser. 23	26'-3" 28'-0"	Str.	1"	937						
PA1109	1	15'-6"	Str.		82	PD402	1	11'-5"	150		219	SR604	320	29'-6"	Str.		14,179						
PA1110	2	13'-9"	104		146	PD501	1 Ser. 9	12'-2" 10'-10"	109	2"	108	SR605	320	31'-0"	100		14,900						
PA1111	8	15'-6"	Str.		659	PD502	20	10'-4"	109		216	SR606	1 Ser. 10	7'-6" 26'-3"	Str.	2 1/2"	253						
PA1112	8	15'-9"	Str.		669	PD503	1 Ser. 6	12'-2" 10'-10"	109	3 1/2"	72	SR607	1 Ser. 10	8'-2" 26'-1 1/2"	101	2 1/2"	263						
PA1113	12	16'-6"	Str.		1052	PD504	7	12'-2"	109		89	SR608	1 Ser. 3	3'-6" 6'-0"	Str.	1 1/2"	21						
PA1114	8	17'-3"	Str.		733	PD505	28	5'-1"	105		148	SR609	1 Ser. 3	4'-2" 6'-8"	101	1 1/2"	24						
PA1115	12	16'-9"	Str.		1068	PD505	28	5'-1"	105		148	SR610	1 Ser. 30	5'-9" 28'-3"	Str.	9"	766						
PA1116	48	7'-5"	104		1891	PD505	28	5'-1"	105		148	SR611	1 Ser. 30	6'-5" 28'-1 1/2"	101	9"	796						
TOTAL WEIGHT = 16,179												SR612	1 Ser. 7	3'-0" 3'-0"	Str.	4"	42	SR613	1 Ser. 7	3'-8" 3'-8"	101	4"	49
BR. NO. 13L - PIER 2						BR. NO. 13L - SUPERSTRUCTURE																	
PB401	2	14'-0"	150		531	SL501	184	5'-4"	160		1024	SR614	1	29'-0"	Str.		44						
PB402	3	15'-1"	150		856	SL502	196	2'-0"	105		409	SR615	1	34'-3"	Str.		51						
PB501	1 Ser. 5	10'-10" 12'-2"	109	4"	60	SL503	196	2'-2"	104		443	SR616	9	8'-6"	Str.		115						
PB502	28	10'-4"	109		302	SL504	192	3'-2"	142		634	SR617	9	9'-6"	Str.		128						
PB503	38	12'-2"	109		482	SL505	196	2'-10"	148		579	SR618	30	3'-1"	149		139						
PB504	1 Ser. 7	10'-10" 12'-2"	109	2 3/8"	84	SL506	196	2'-10"	142		579	SR619	5	26'-3"	Str.		197						
PB505	63	5'-1"	105		334	SL507	196	3'-5"	104		698	SR620	5	28'-0"	Str.		210						
PB601	12	6'-2"	105		111	SL508	24	14'-9"	Str.		369	SR621	44	21'-0"	Str.		1388						
PB602	2	32'-9"	Str.		99	SL509	138	7'-5"	127		1068	1 Light Standard Support = 735											
PB603	2	18'-6"	Str.		56	SL510	138	6'-11"	105		996	TOTAL WEIGHT = 56,535											
PB604	2	27'-0"	Str.		81	SL511	96	5'-3"	Str.		526	BR. NO. 13L - SUPERSTRUCTURE											
PB801	96	10'-8"	100		2734	SL512	36	13'-6"	Str.		507	SL501	184	5'-4"	160		1024						
PB1101	4	32'-11"	108		700	SL513	24	14'-0"	Str.		350	SL502	196	2'-0"	105		409						
PB1102	4	25'-10"	108		549	SL514	24	2'-9"	Str.		69	SL503	196	2'-2"	104		443						
PB1103	4	21'-6"	Str.		457	SL515	4	3'-0"	142		13	SL504	192	3'-2"	142		634						
PB1104	4	37'-8"	126		800	SL601	284	32'-9"	Str.		13,970	SL505	196	2'-10"	148		579						
PB1105	3	13'-9"	104		219	SL602	284	34'-2"	100		14,574	SL506	196	2'-10"	142		579						
PB1106	5	16'-6"	104		438	SL603	284	45'-0"	Str.		19,196	SL507	196	3'-5"	104		698						
PB1107	4	20'-1"	104		427	TOTAL WEIGHT = 6436												SL508	24	14'-9"	Str.		369
PB1108	4	32'-8"	104		694	BR. NO. 13L - SUPERSTRUCTURE												SL509	138	7'-5"	127		1068
PB1109	1	15'-6"	Str.		82	BR. NO. 13L - SUPERSTRUCTURE												SL510	138	6'-11"	105		996
PB1110	2	13'-9"	104		146	BR. NO. 13L - SUPERSTRUCTURE												SL511	96	5'-3"	Str.		526
PB1111	8	17'-0"	Str.		723	BR. NO. 13L - SUPERSTRUCTURE												SL512	36	13'-6"	Str.		507
PB1112	8	17'-3"	Str.		733	BR. NO. 13L - SUPERSTRUCTURE												SL513	24	14'-0"	Str.		350
PB1113	12	18'-6"	Str.		1179	BR. NO. 13L - SUPERSTRUCTURE												SL514	24	2'-9"	Str.		69
PB1114	8	18'-9"	Str.		797	BR. NO. 13L - SUPERSTRUCTURE												SL515	4	3'-0"	142		13
PB1115	12	18'-3"	Str.		1164	BR. NO. 13L - SUPERSTRUCTURE																	
PB1116	48	7'-5"	104		1891	BR. NO. 13L - SUPERSTRUCTURE																	
TOTAL WEIGHT = 16,729																							

BENDING DIAGRAMS



Bar No.	A	B
SL504	9 3/8	12
SL506	8 3/8	12
SL515	*0 to 7/8	12
SR504	9 3/8	12

* In increments of 2 1/2"



Notes:
For Spiral Reinforcement Note and for Replacement Bar Schedule see Sheet [12] of BR. NO. CUY-80-2169.
For Light Standard Support Reinforcement Schedule and Bending Diagrams see Sheet CD1.

H.N.T.B. BR. NO. 13L & 13R

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KANSAS CITY CLEVELAND NEW YORK

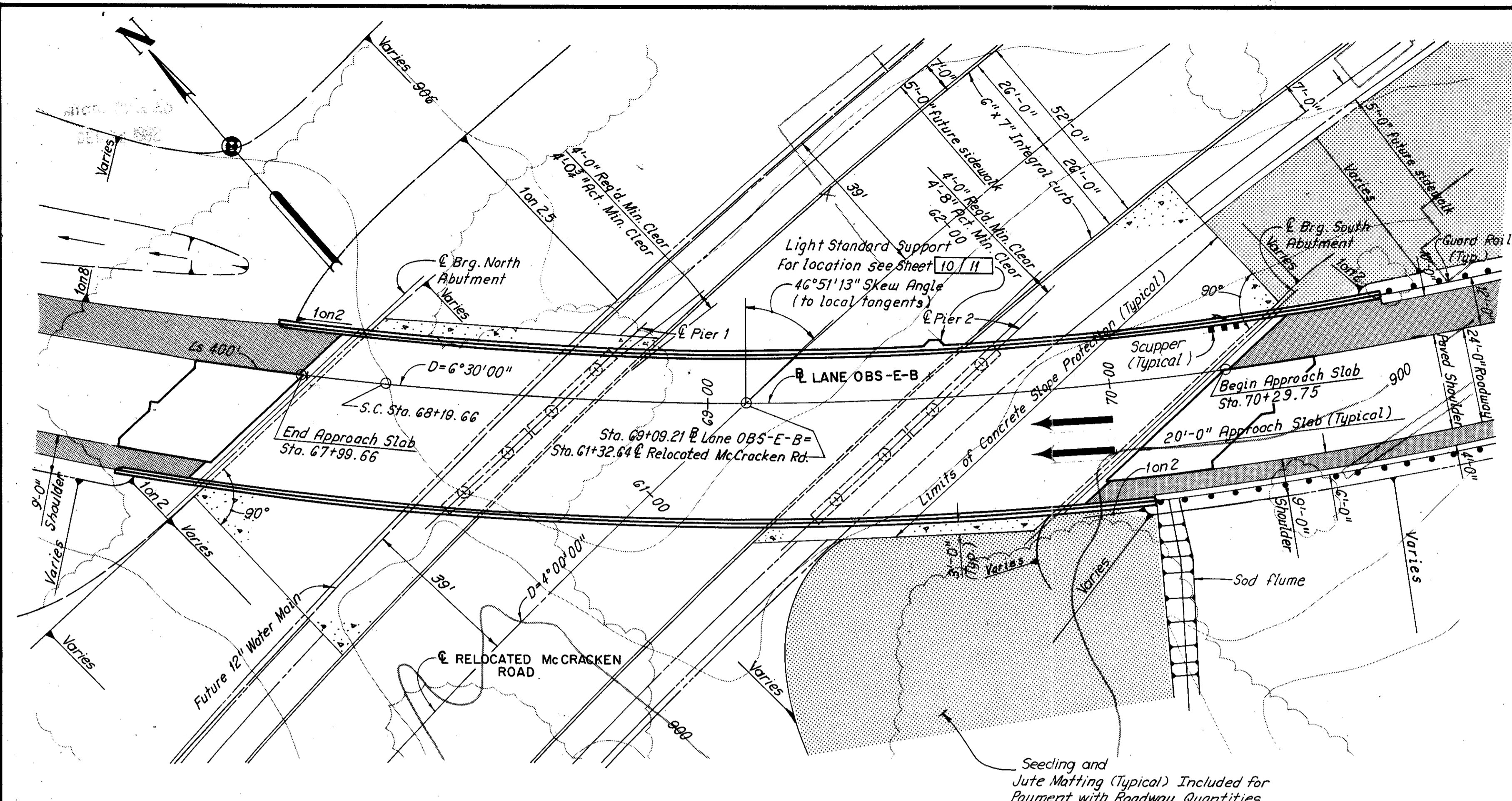
REINFORCEMENT SCHEDULE
PIERS AND SUPERSTRUCTURE
BEDFORD FREEWAY AND RAMP B-OBS
OVER RELOCATED McCRACKEN ROAD

STA. 62+17.54 TO
STA. 63+62.80
(E) BEDFORD FREEWAY

CUYAHOGA COUNTY OHIO

DRAWN K.R.S.	TRACED J.M.P.	CHECKED D.M.P.	REVIEWED	REVISED
DATE 8-5-70	DATE 1-17-70	DATE 8-18-70	DATE	DATE

SHEET 14/14



LANE OBS-E-B	
P. I. Sta.	70+54.74
Δ	= 52°11'29"
D_c	= 6°30'00"
L_c	= 402.95'
T_s	= 635.08'
θ_s	= 13°00'00"
L_s	= 400.00'
E_s	= 108.48'

RELOCATED McCracken Rd.	
P. I. Sta.	= 59+67.96
Δ	= 44°51'07"
D_c	= 4°00'00"
R_c	= 1432.39'
T	= 591.15'
L	= 1121.30'
E	= 117.19'

PROPOSED STRUCTURE

TYPE: Continuous steel girders with reinforced concrete deck and sub-structures.

SPAN: 61'-8 $\frac{1}{2}$ ", 95'-1 $\frac{1}{8}$ " and 66'-5" (Measured along @ Lane OBS-E-B)

ROADWAY: 42'-0" face to face of parapets.

DESIGN LOAD: HS 20-44

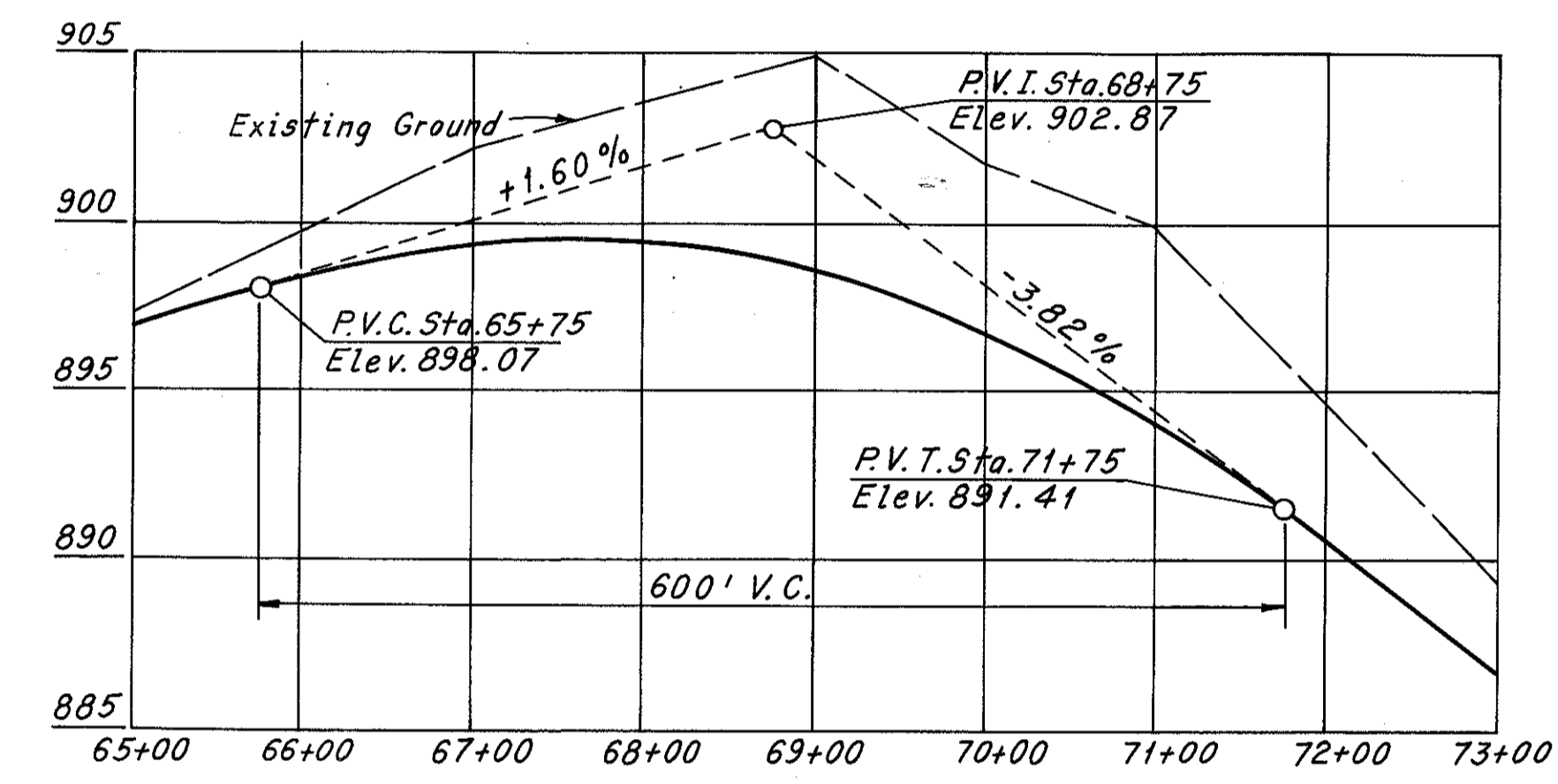
SKEW: 46°51'13" Left Forward

WEARING SURFACE: 2 $\frac{1}{2}$ " Asphalt Concrete

APPROACH SLABS: AS-1-67 (20 feet long)

ALIGNMENT: Spiral, 6°30'00" Left

SUPERELEVATION: .083 ft. per ft.



PROFILE - LANE OBS-E-B
Scale: Horiz. 1"=100'
Vert. 1"=5'

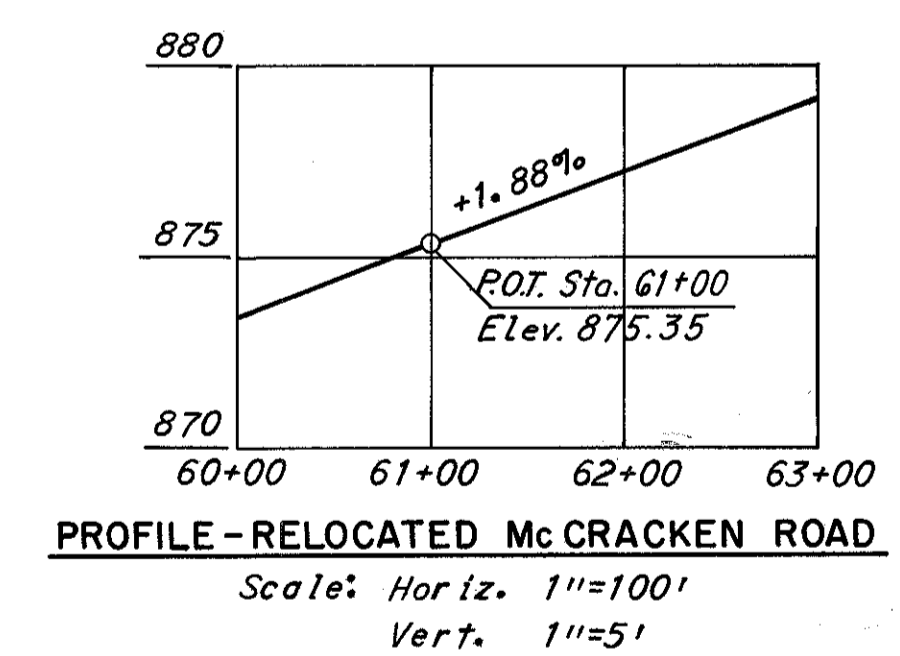
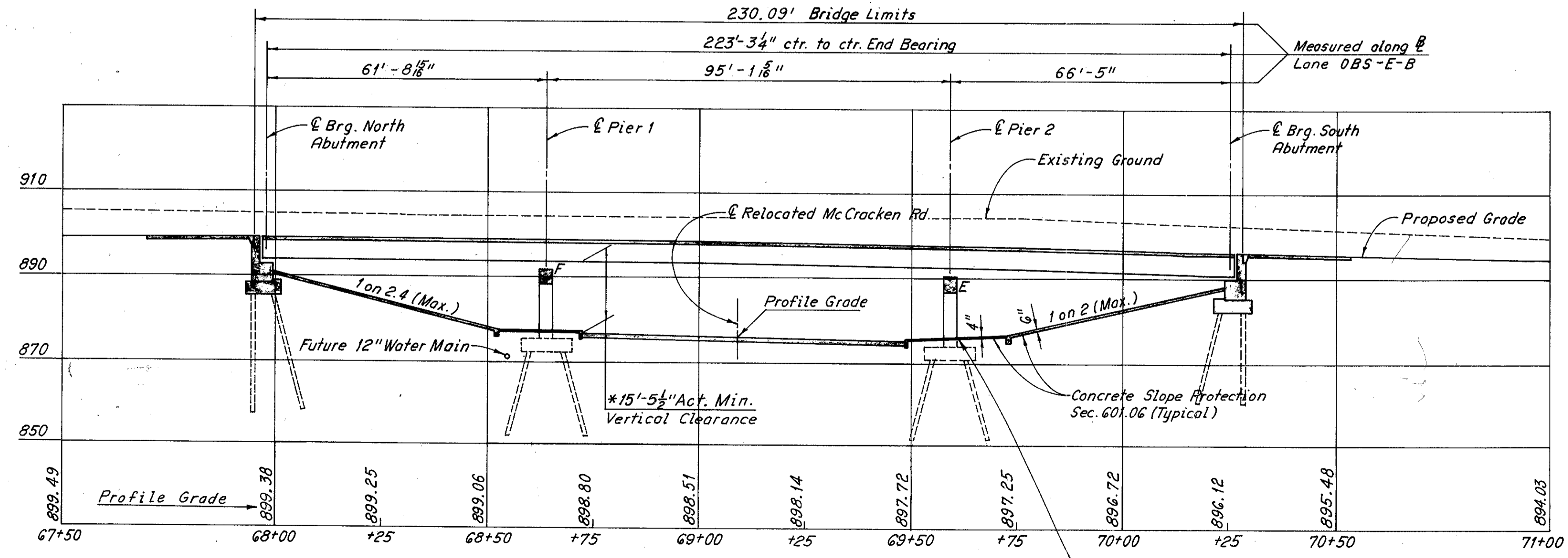
TRAFFIC DATA:

1991	Initial Construction:
	A.D.T. 16,417
	D.D.H.V. 2,267

Notes:
Earthwork limits shown are schematic. Actual slopes shall conform to plan cross-sections.
The 12" water main north of Pier 1 shall be set in place after the construction of Pier 1 footings.

REVISIONS
DEC 22 1992

PLAN
Scale: 1"=20'



PROFILE - RELOCATED McCracken ROAD
Scale: Horiz. 1"=100'
Vert. 1"=5'

Notes:
Roadway excavation shall be completed to the finish spill-thru slopes and to the level of the subgrades before excavating or driving piles for the abutments and piers.
All piles are 12" ϕ C.I.P. reinforced concrete at the abutments and HP12x53 at the piers. The estimated average pay lengths are as follows:
North Abutment = 29 ft.
Pier 1 = 20 ft.
Pier 2 = 20 ft.
South Abutment = 21 ft.
The piles at the abutments shall be driven to a minimum bearing capacity of 35 tons per pile. The piles at the piers shall be driven to a minimum bearing capacity of 40 tons per pile.
For underpass lighting details see Lighting Plans.

Notes:
*14'-6" Required minimum vertical clearance. Minimum vertical clearance occurs at the north edge of pavement of the westbound lanes of Relocated McCracken Road and the outside edge of the east exterior girder of Bridge No. 14

ELEVATION
Scale: Horiz. 1"=20'
Vert. 1"=20'

1" Preformed Expansion Joint Filler (Typ. around columns at piers). Included with Item 601 Concrete Slope Protection (4" thick) for payment.

MAINTENANCE OF TRAFFIC
Two lanes of traffic with a minimum horizontal width of 26'-0" and a minimum vertical clearance of 13'-6" shall be maintained on Relocated McCracken Road at all times.

H.N.T.B. BR. NO. 14

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

SITE PLAN
LANE OBS-E-B OVER
RELOCATED McCracken ROAD

STA. 67+99.66 TO
STA. 70+29.75

CUYAHOGA COUNTY OHIO

DRAWN G.L.	TRACED D.L.R.	CHECKED J.H.	REVIEWED	REVISED
DATE: 8-16-67	DATE: 8-23-67	DATE: 5-8-69	DATE	SHEET 1/11

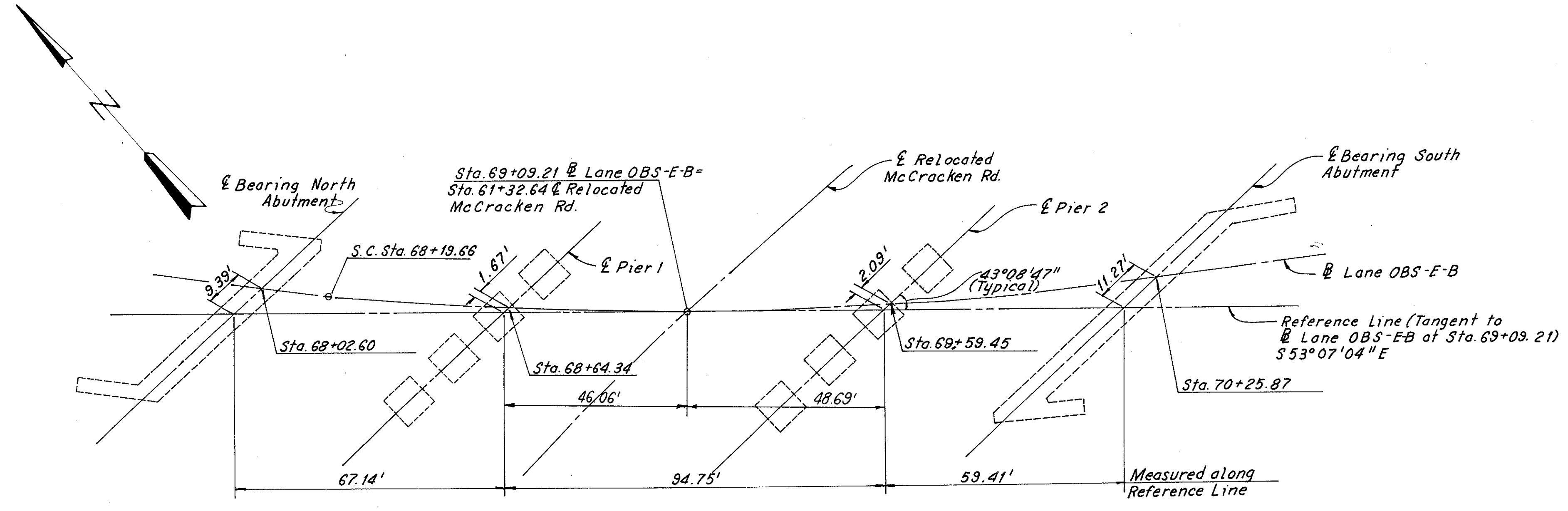
MICROFILMED
DEC 22 1962

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

351
390

CUYAHOGA COUNTY
CUY-80-21.40

Quantity Calculations
Made By K.Y.H. Date 5-69
Checked By M.C.B. Date 2-70



BRIDGE LAYOUT DIAGRAM

ESTIMATED QUANTITIES								
ITEM	TOTAL	UNIT	DESCRIPTION	H.N.T.B. BRIDGE NO. 14				
				ABUT-MENTS	PIERS	SUPER-STRUCTURE	GENERAL	
503	619	Cu. Yd.	Unclassified Excavation	433	186			
505	Lump	Lump	Test Pile				Lump	
503	Lump		Cofferdams, Cribs & Sheet piling				Lump	
507	1,110	Lin. Ft.	12" ϕ C.I.P. Reinforced Concrete Piles	1,110				
507	960	Lin. Ft.	Steel Piles, HP 12x53		960			
509	144,298	Pounds	Reinforcing Steel	24,510	25,368	94,420		
511	327	Cu. Yd.	Class "C" Concrete, Superstructure			327		
511	78	Cu. Yd.	Class "C" Concrete, Pier Caps and Columns		78			
511	181	Cu. Yd.	Class "C" Concrete, Abutments Above Footing	181				
511	191	Cu. Yd.	Class "C" Concrete, Footings	119	72			
512	10	Lin. Ft.	Premolded Sealing Strip	10				
513	277,700	Pounds	Structural Steel			277,700		
514	277,700	Pounds	Field Painting of Structural Steel			277,700		
404	56	Cu. Yd.	Asphalt Concrete (70-85 or AC-20)				56	
Special	14	Cu. Yd.	Sand Asphalt (see proposal note)				14	
Special	1018	Sq. Yd.	Membrane Waterproofing, sheet type (see proposal note)				1018	
518	104	Cu. Yd.	Porous Backfill	104				
518	112	Lin. Ft.	6" Perforated, Helical C.M.P., 707.01	112				
518	65	Lin. Ft.	6" Non-Perforated Helical C.M.P. Including specials, 707.01	65				
518	3	Each	Scuppers Including Supports				3	
518	229	Lin. Ft.	Subdrainage for wearing course, as per plan				229	
601	438	Sq. Yd.	Concrete Slope Protection (4" Thick)				438	
601	779	Sq. Yd.	Concrete Slope Protection (6" Thick)				779	
808	327	Units	Chemical admixture for Concrete, Type A, B or D			327		

H.N.T.B. BR. NO. 14

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KANSAS CITY CLEVELAND NEW YORK

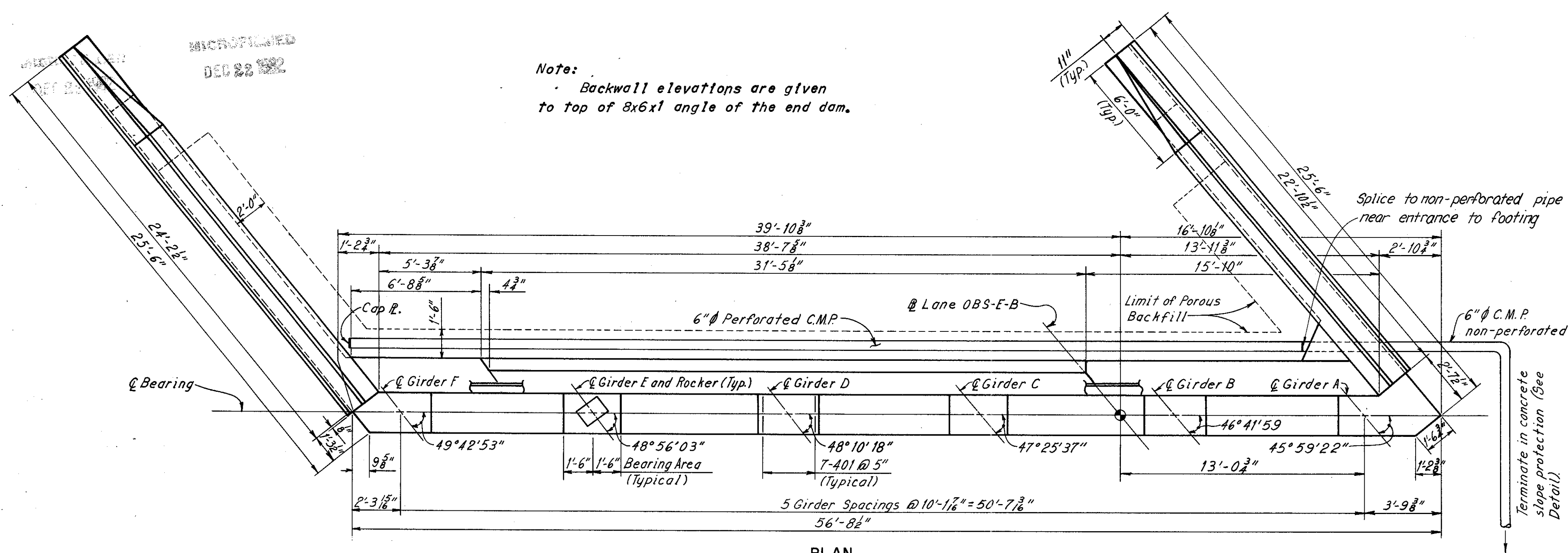
**BRIDGE LAYOUT DIAGRAM
AND ESTIMATED QUANTITIES**
LANE OBS-E-B OVER
RELOCATED MCCRACKEN ROAD
STA. 67+99.66 TO
STA. 70+29.75

CUYAHOGA COUNTY OHIO

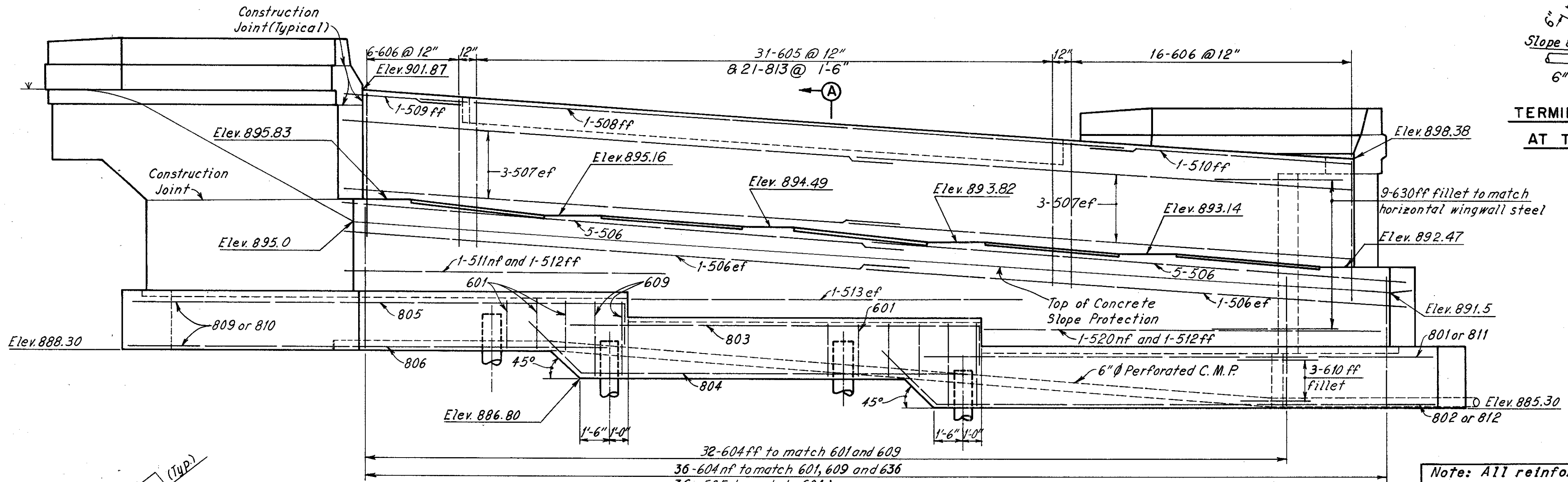
DRAWN BY	TRACED BY	CHECKED BY	REVIEWED BY	REVISED BY
K.Y.H.	J.S.C.	M.C.B.		
DATE 5-69	DATE 2-20-70	DATE 2-20-70	DATE	DATE

SHEET 2/11

Note:
Backwall elevations are given to top of 8x6x1 angle of the end dam.

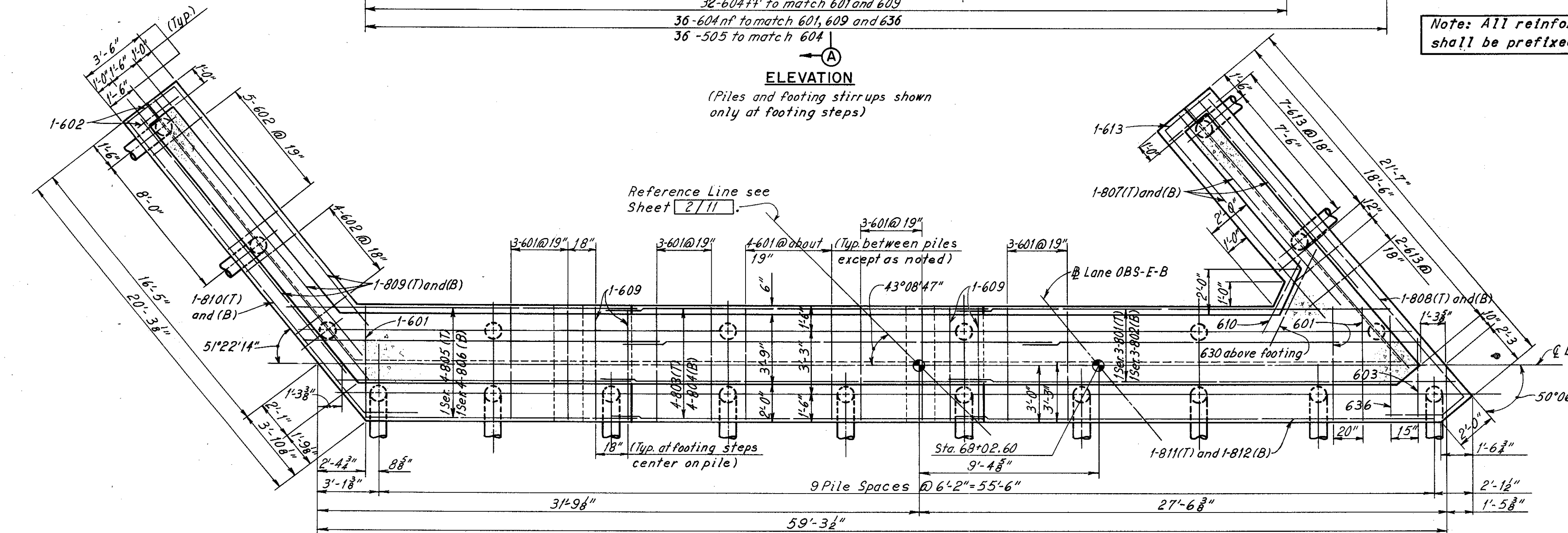


PLAN

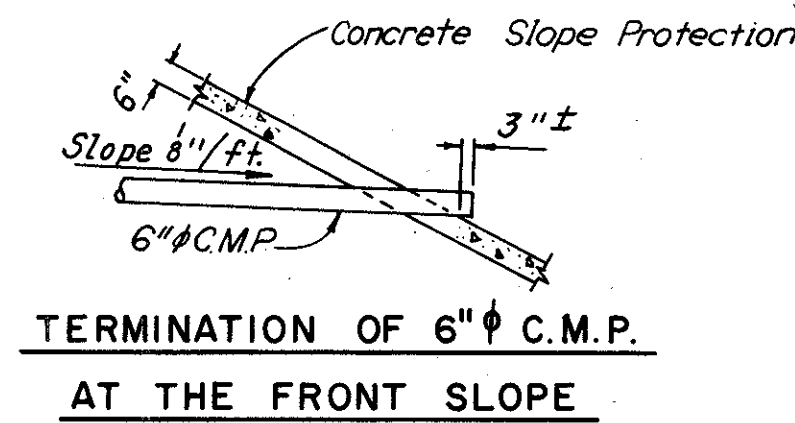
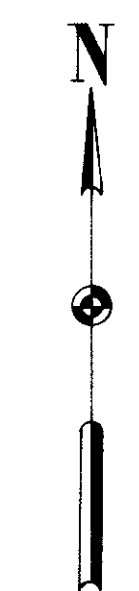


ELEVATION

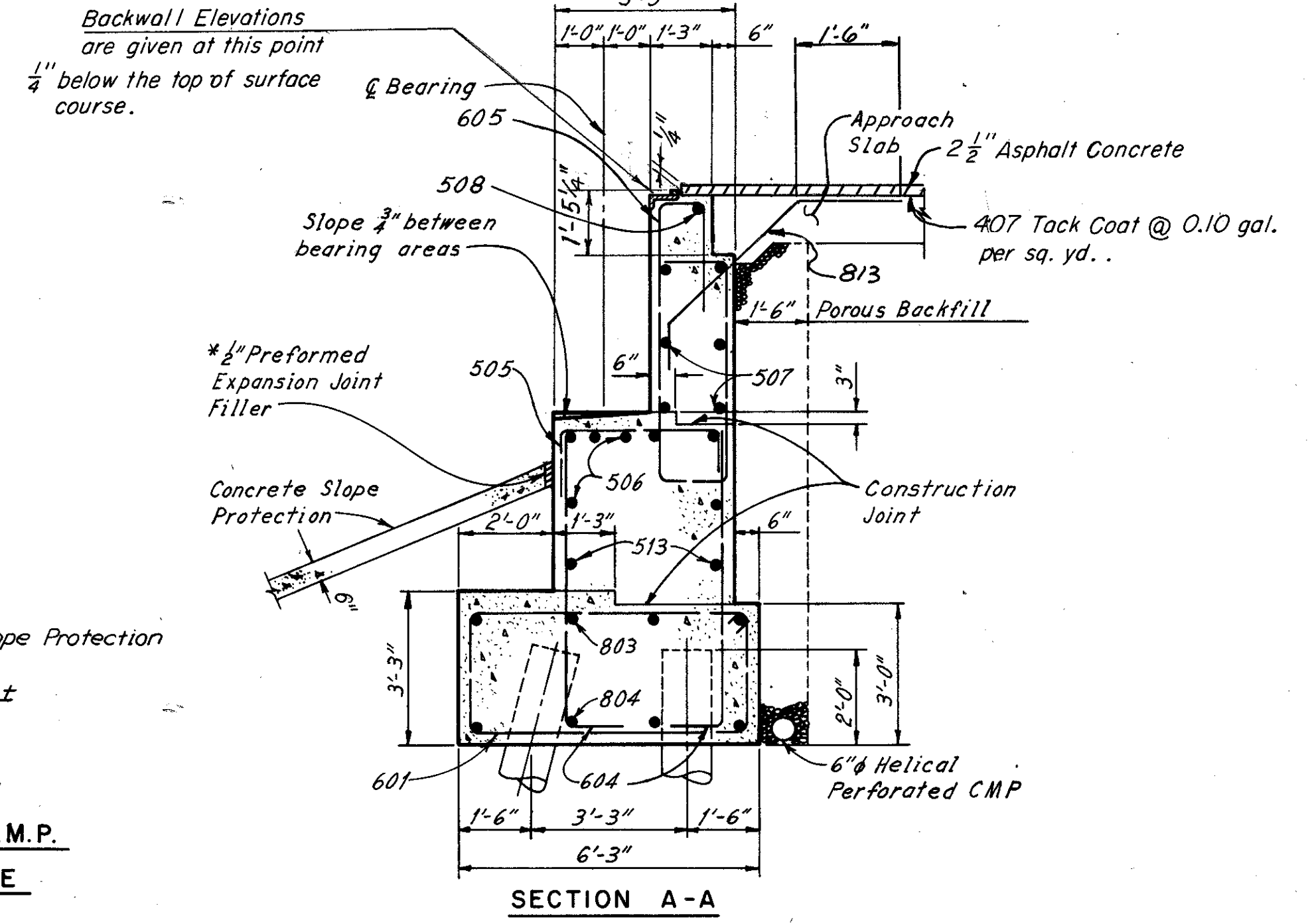
(Piles and footing stirrups shown only at footing steps)



FOOTING PLAN



TERMINATION OF 6" C.M.P. AT THE FRONT SLOPE



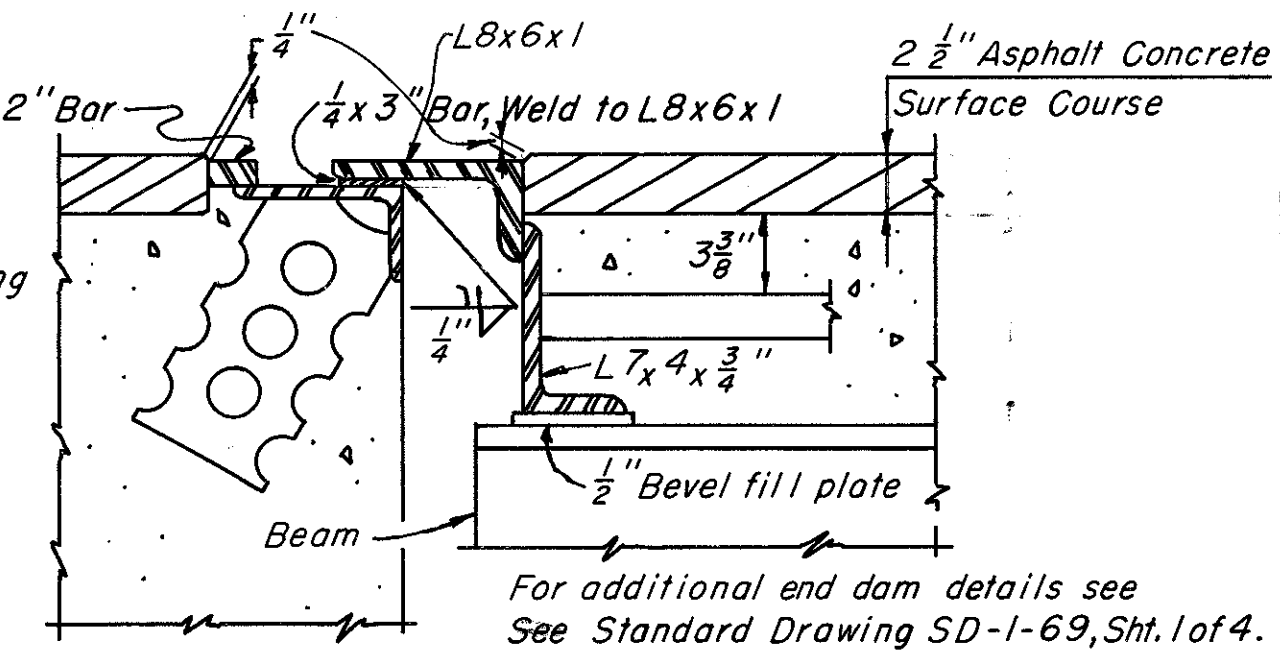
SECTION A-A

*Note: The 1/2" preformed expansion joint filler is included for payment with "Item 601, Concrete Slope Protection" (6" thick).

Note:
All piles are 12" C.I.P. reinforced concrete.
All battered piles shall be inclined 3 in 12 in the direction shown.

For additional roadway end dam and curb plate details see Ohio Standard Drawing SD-1-69, Sheets 1 and 2 of 4.

- The following abbreviations are used:
- nf = near face
 - ff = far face
 - ef = each face
 - B = Bottom face
 - T = Top face



END DAM DETAILS

H.N.T.B. BR. NO. 14

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

NORTH ABUTMENT
LANE OBS-E-B OVER
RELOCATED McCRACKEN ROAD

STA. 67+99.66 TO
STA. 70+29.75

CUYAHOGA COUNTY OHIO

DRAWN/EEF	TRACED/ISC	CHECKED/MS	REVIEWED
DATE 5-11-68	DATE 3-10-70	DATE 5-7-70	DATE

SHEET 3/11

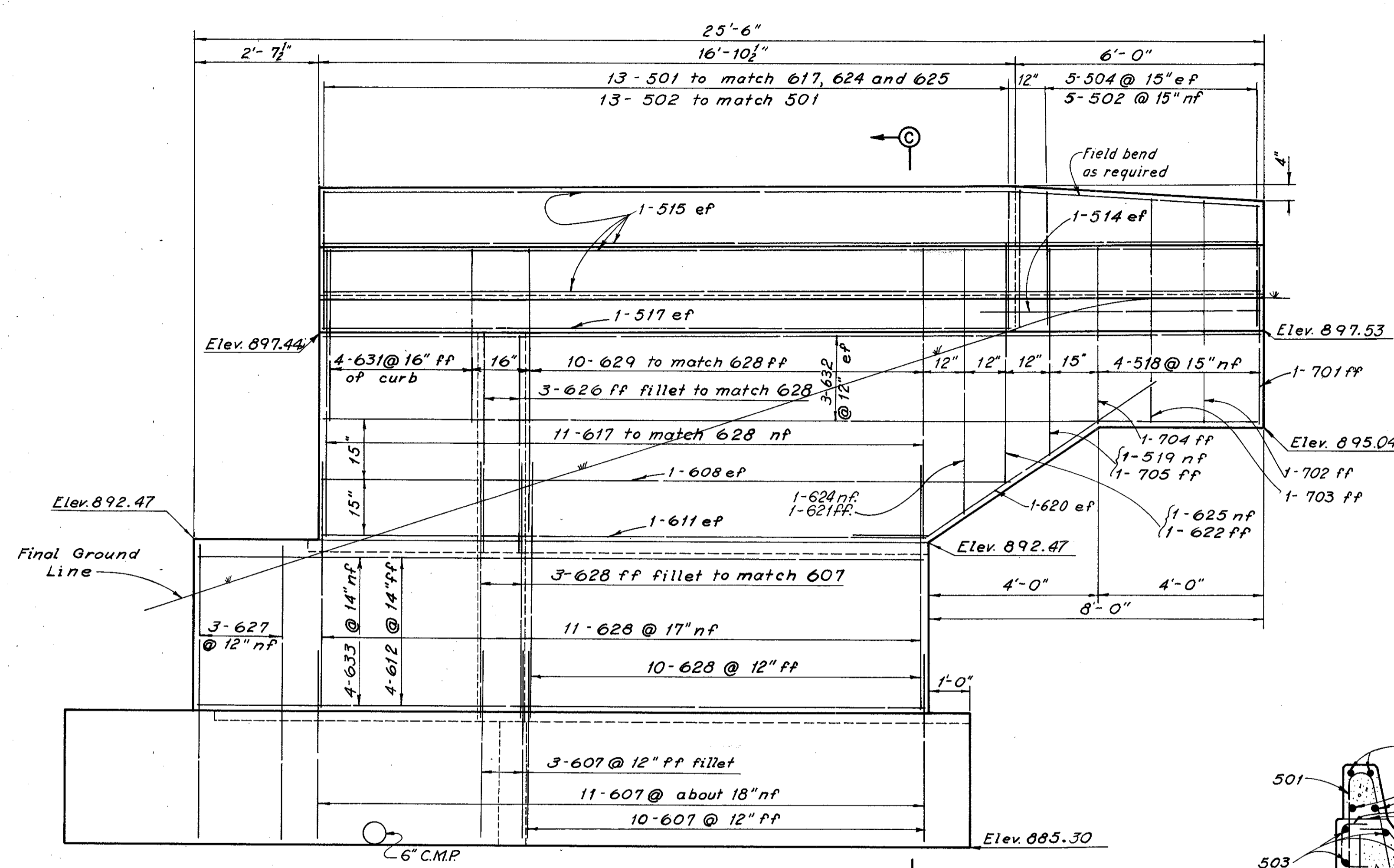
MICROFILMED
DEC 22 1962

PROJ. FILED
200 27 14

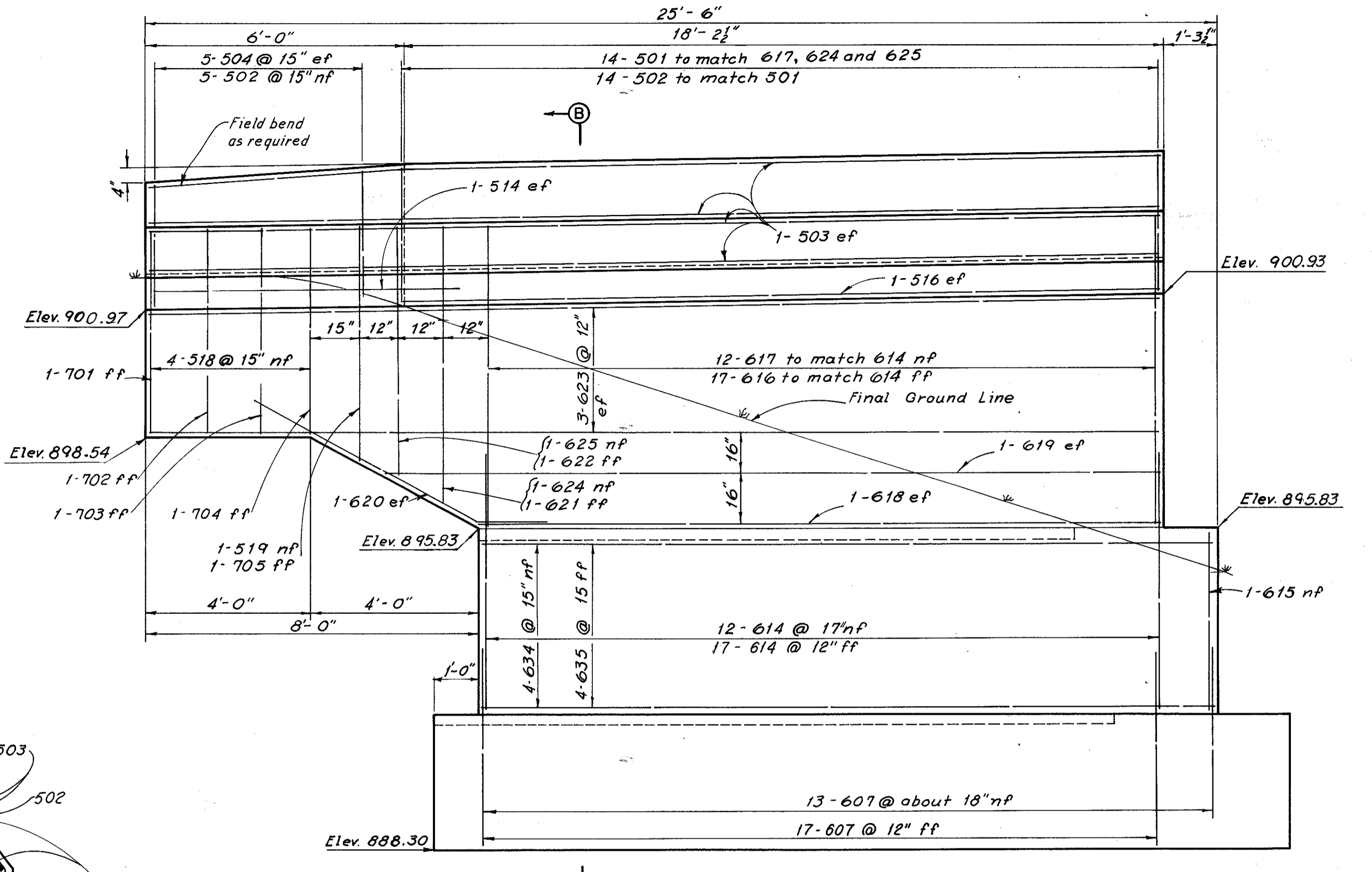
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

353
390

CUYAHOGA COUNTY
CUY.-80-21.40

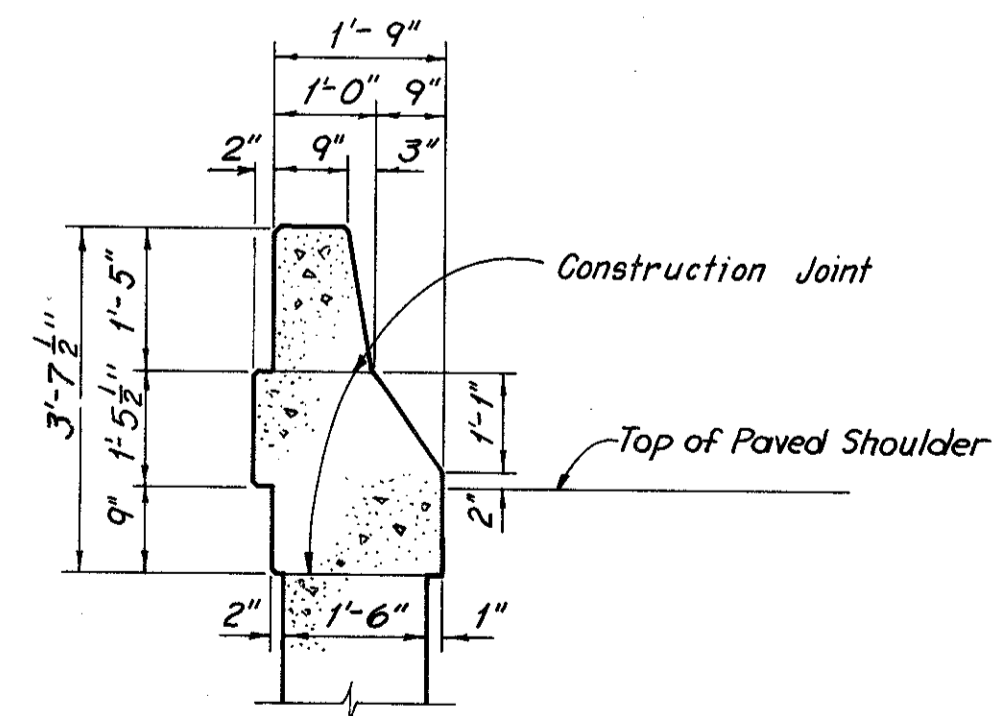


NORTHEAST WINGWALL ELEVATION
(Piles not shown)

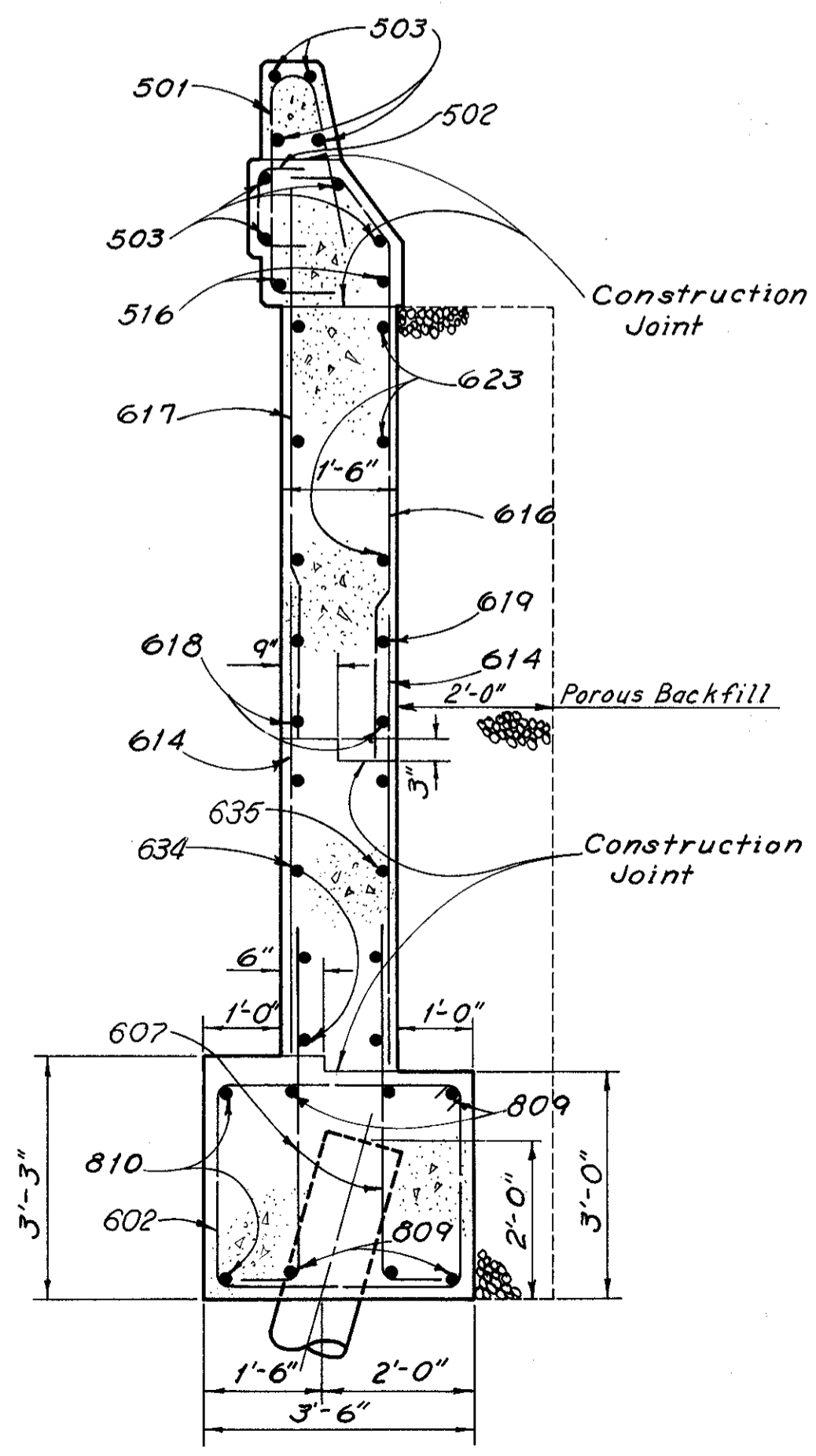


NORTHWEST WINGWALL ELEVATION
(Piles not shown)

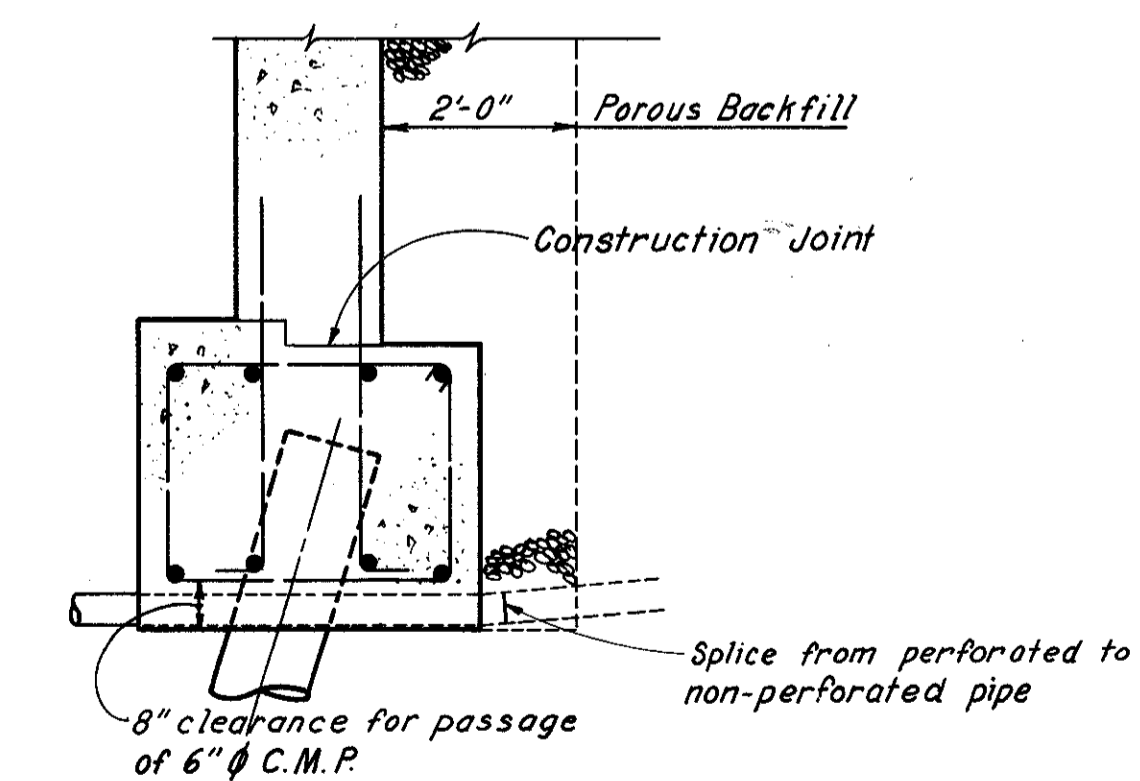
Note:
All reinforcing bar marks shall be prefixed AN.



CURB DETAIL
(Reinforcement not shown)



SECTION B-B
Northwest Wingwall Shown



SECTION C-C
Details not shown are similar to Section B-B, except for bar marks.

Note:
For curb and parapet transitions, see "Part Plans-Parapet on Wingwall" on Ohio Standard Drawing BR-1-67, Sheet 1 of 3, Revised 10-15-71.

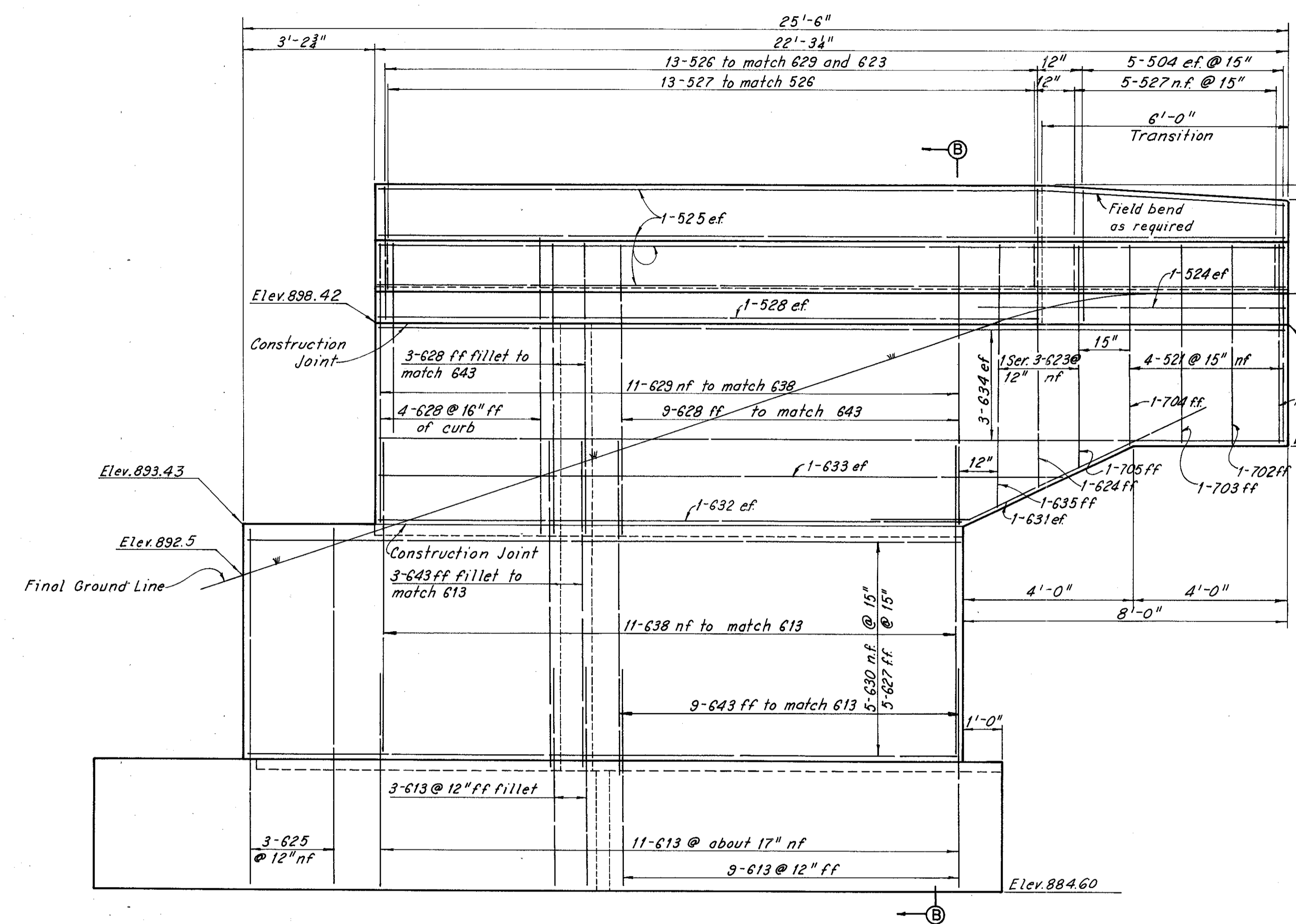
H.N.T.B. BR. NO. 14			
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK			
NORTH ABUTMENT WINGWALLS			
LANE OBS-E-B OVER RELOCATED McCRACKEN ROAD			
			STA. 67+99.66 TO STA. 70+29.75
CUYAHOGA COUNTY			OHIO
DRAWN	TRACED	CHECKED	REVIEWED
DATE 6-11-68	DATE 3-10-70	DATE 5-7-70	DATE

RECORDED
DEC 22 1968

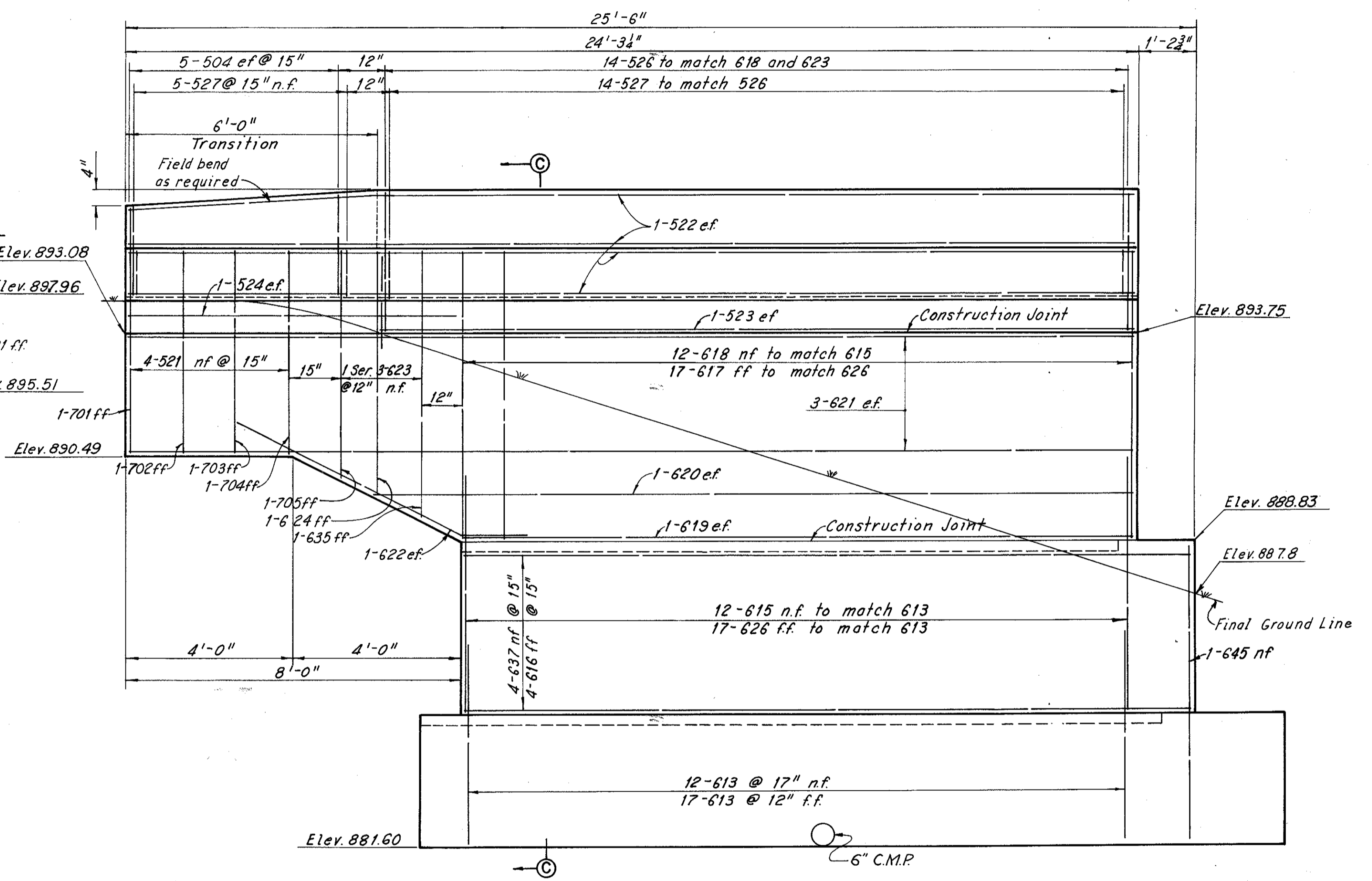
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

355
390

CUYAHOGA COUNTY
CUY-80-21.40



SOUTHWEST WINGWALL ELEVATION
(Piles not shown)



SOUTHEAST WINGWALL ELEVATION
(Piles not shown)

Note: All reinforcing bar marks shall be prefixed AS.

Notes:
For curb and parapet transitions and for guard rail anchor details, see "Part Plans-Parapet on Wingwall" on Ohio Standard Drawing BR-1-67, Sheet 1 of 3, Revised 10-15-71.
For Section B-B, C-C and Typical Curb Detail see Sheet 4/11.

H.N.T.B. BR. NO. 14

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CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

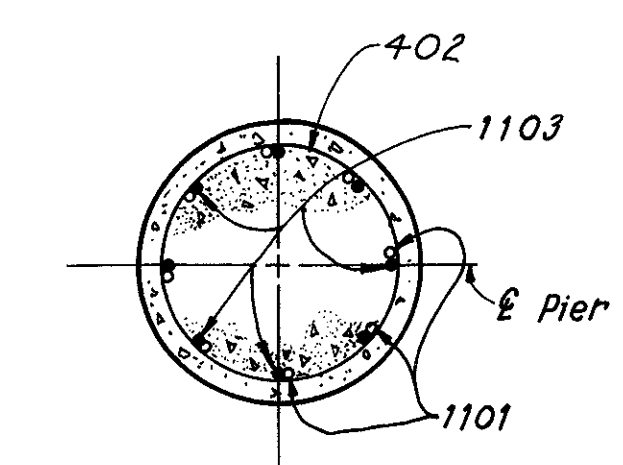
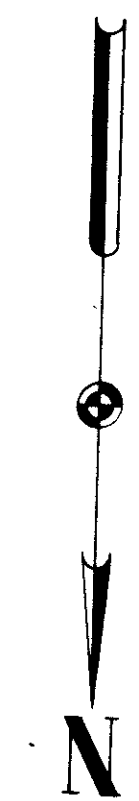
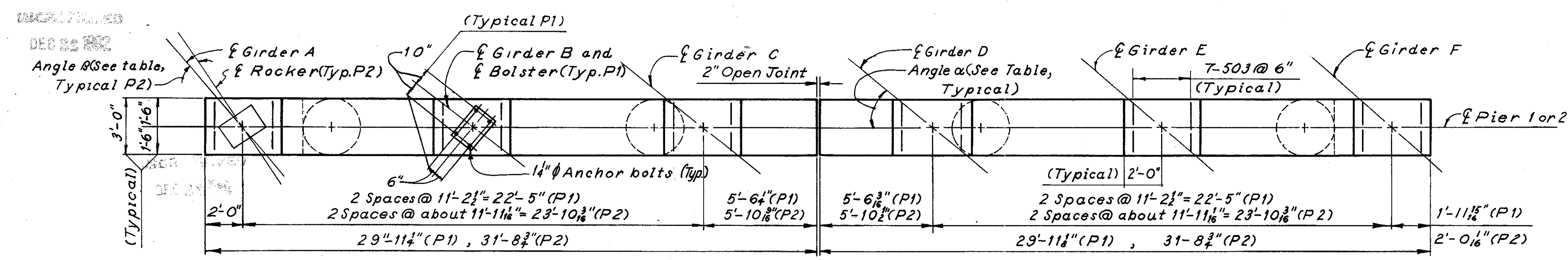
SOUTH ABUTMENT WINGWALLS
LANE OBS-E-B OVER
RELOCATED McCRACKEN ROAD

STA. 67+99.66 TO
STA. 70+29.75

CUYAHOGA COUNTY OHIO

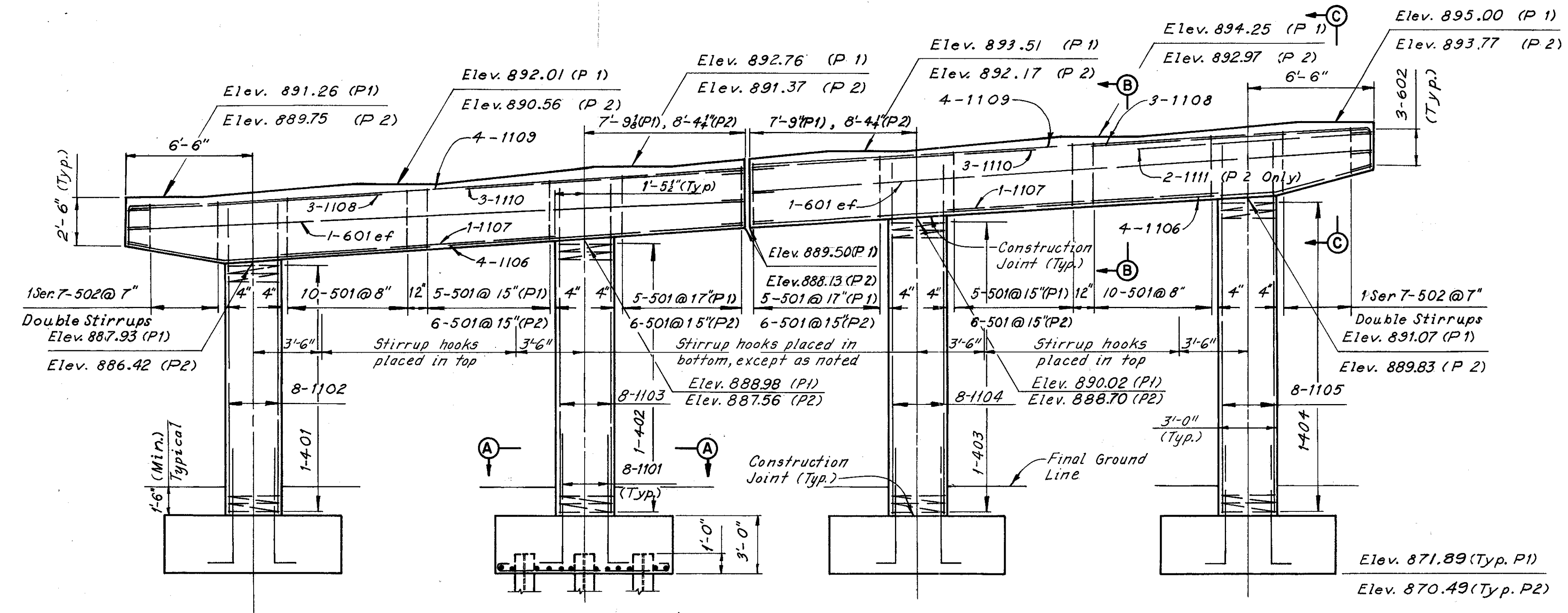
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DATE 6-11-68	DATE 6-13-68	DATE 6-13-68	DATE 6-13-68	DATE 6-13-68

SHEET 6/11



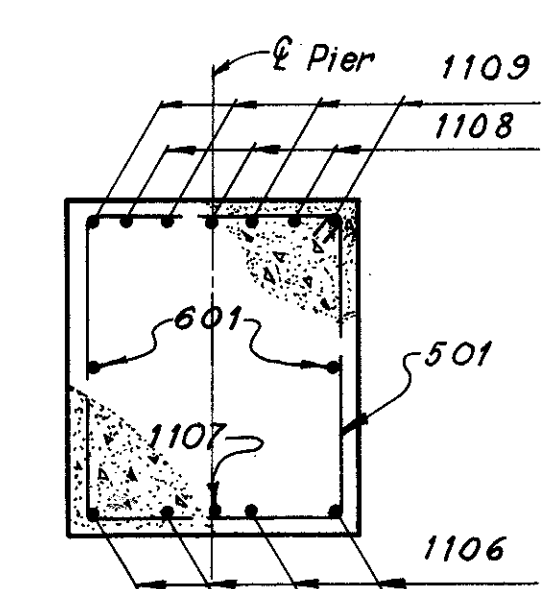
SECTION A-A

Girder	α		β
	Pier 1	Pier 2	
A	45°59'22"	37°16'26"	5°20'00"
B	46°41'59"	38°07'15"	4°40'00"
C	47°25'37"	39°00'02"	4°00'00"
D	48°10'18"	39°54'55"	3°20'00"
E	48°56'03"	40°51'58"	2°50'00"
F	49°42'53"	41°51'17"	2°10'00"

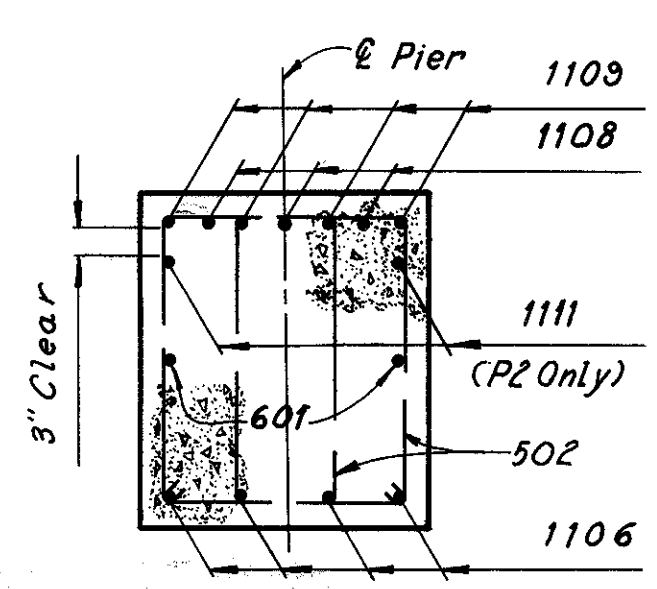
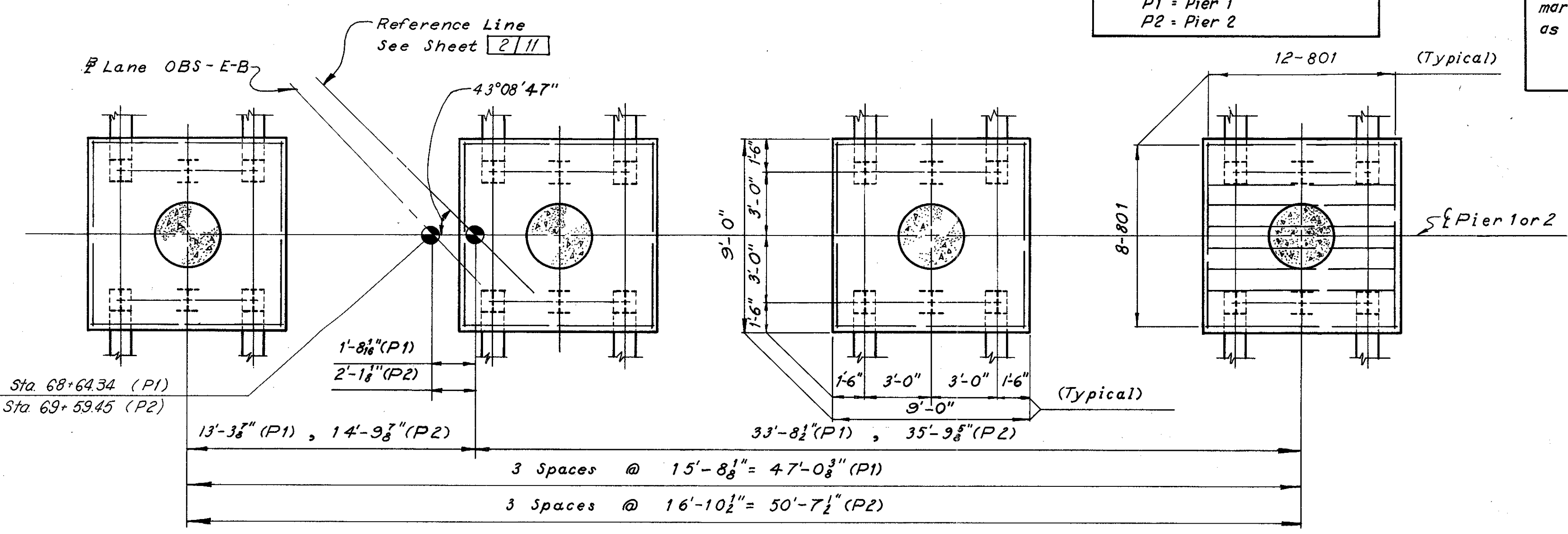


Note:
The following abbreviations are used:
P1 - Pier 1
P2 - Pier 2

Note:
All reinforcing bar marks shall be prefixed as follows:
Pier 1, PA
Pier 2, PB



SECTION B-B



SECTION C-C

Notes:
Special care shall be taken in placing reinforcing steel in the vicinity of the bridge seat for Pier 1 so as to avoid interference with the drilling of anchor bolt holes.
All dimensions and reinforcements are typical for both piers, except as noted.
For anchor bolt details see Ohio Standard Drawing RB-1-55.
All piles are HP 12x53.
All battered piles shall be inclined 3 in 12 in the direction shown.
Pile spacings are measured along bottom of footing.
The following abbreviation is used:
ef = each face

H.N.T.B. BR. NO. 14

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PIERS 1&2
LANE OBS-E-B OVER
RELOCATED McCRACKEN ROAD

STA. 67+99.66 TO
STA. 70+29.75

CUYAHOGA COUNTY OHIO

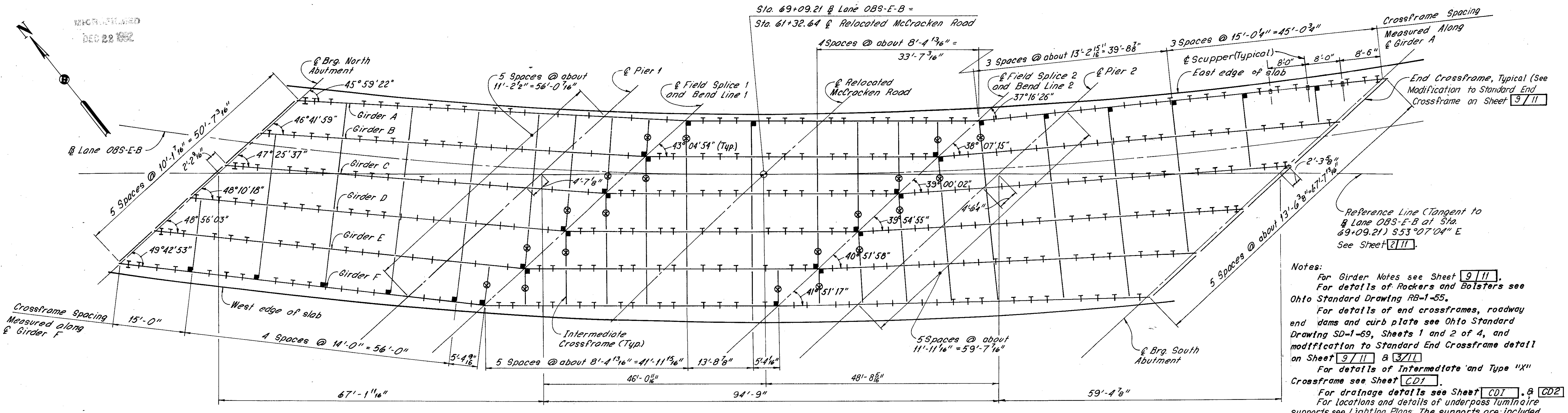
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
DATE 5-16-69	DATE 5-25-69	DATE 7-10-69	DATE	DATE

SHEET 7 / 11

CUYAHOGA COUNTY
CUY-80-21.40

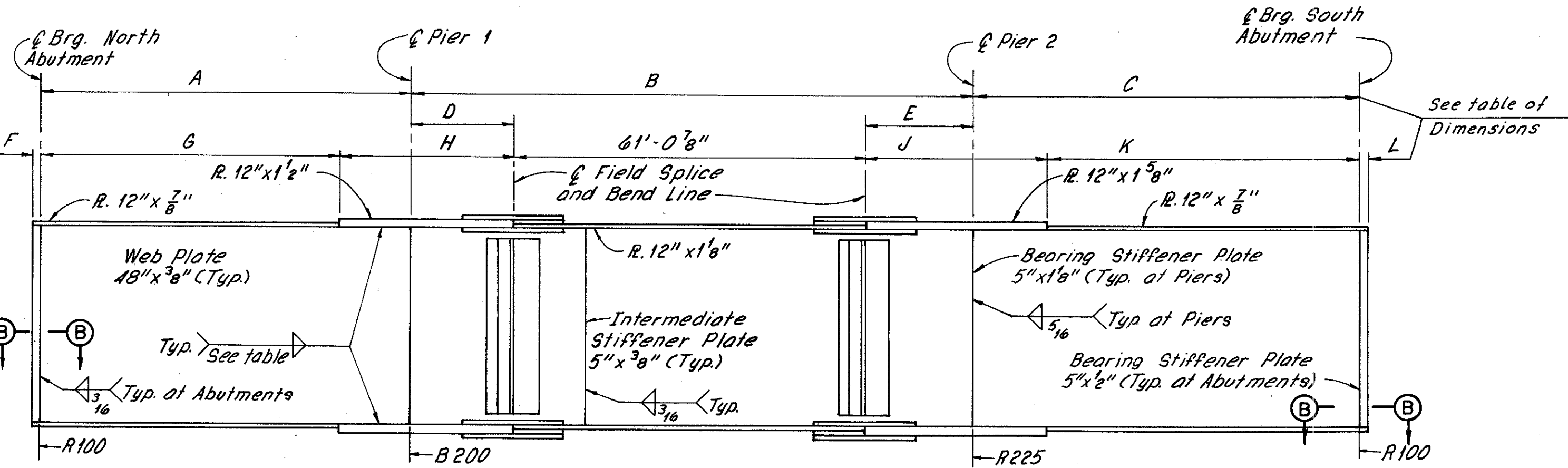
Note: The 1/4, 1/2 and 3/4 points are measured between the center of Abutment Bearing and Field Splice or between Field Splices. Horizontal offsets are given perpendicular to center of Girder.

LOCATION	HORIZONTAL OFFSETS TO EDGE OF SLAB												
	Center of Brg. N. Abut.	1/4	1/2	3/4	Center of Bend Line 1	1/4	1/2	3/4	Center of Bend Line 2	1/4	1/2	3/4	Center of Brg. S. Abut.
Center of Girder A to East edge of slab	3'-0 1/2"	2'-0 3/4"	1'-5 3/4"	1'-4 3/4"	1'-9 3/4"	1'-7 3/4"	1'-9"	2'-1 1/2"	2'-9 1/4"	1'-11 3/4"	1'-7 3/4"	1'-10 1/2"	2'-7 1/4"
Center of Girder F to West edge of slab	1'-11 1/4"	2'-4"	2'-3 3/4"	1'-11 3/4"	1'-2 3/8"	2'-0 3/4"	2'-7 3/8"	2'-11 1/2"	3'-0 3/4"	3'-2 3/8"	2'-11 3/4"	2'-4 3/4"	1'-5 3/4"



Notes:
 For Girder Notes see Sheet 9/11.
 For details of Rockers and Bolsters see Ohio Standard Drawing RB-1-55.
 For details of end crossframes, roadway end dams and curb plate see Ohio Standard Drawing SD-1-69, Sheets 1 and 2 of 4, and modification to Standard End Crossframe detail on Sheet 9/11 & 3/11.
 For details of Intermediate and Type "X" Crossframe see Sheet 3/11.
 For drainage details see Sheet CD1 & CD2.
 For locations and details of underpass Tunnair supports see Lighting Plans. The supports are included with the Lighting Quantities for payment.

FRAMING PLAN

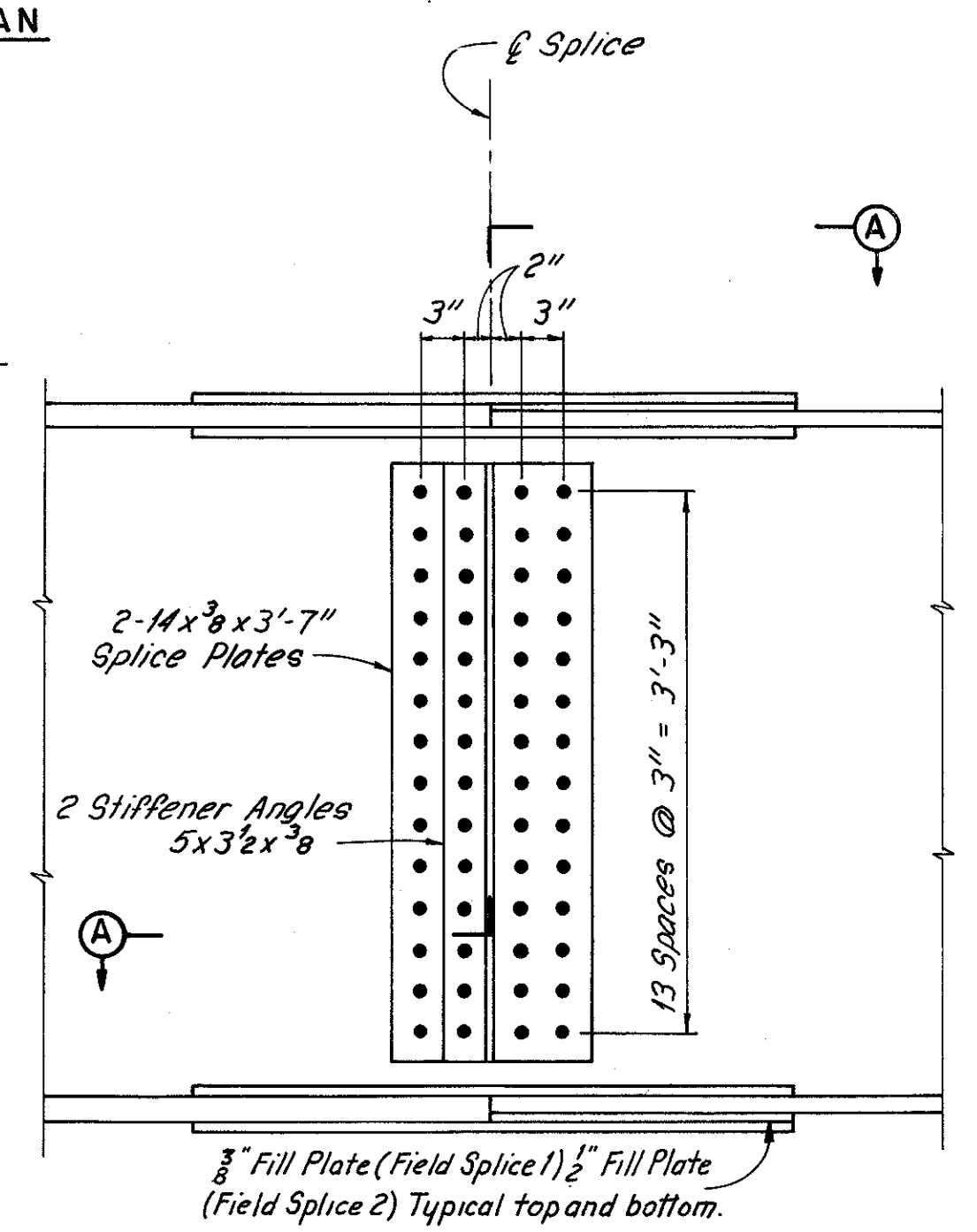


TYPICAL GIRDER ELEVATION

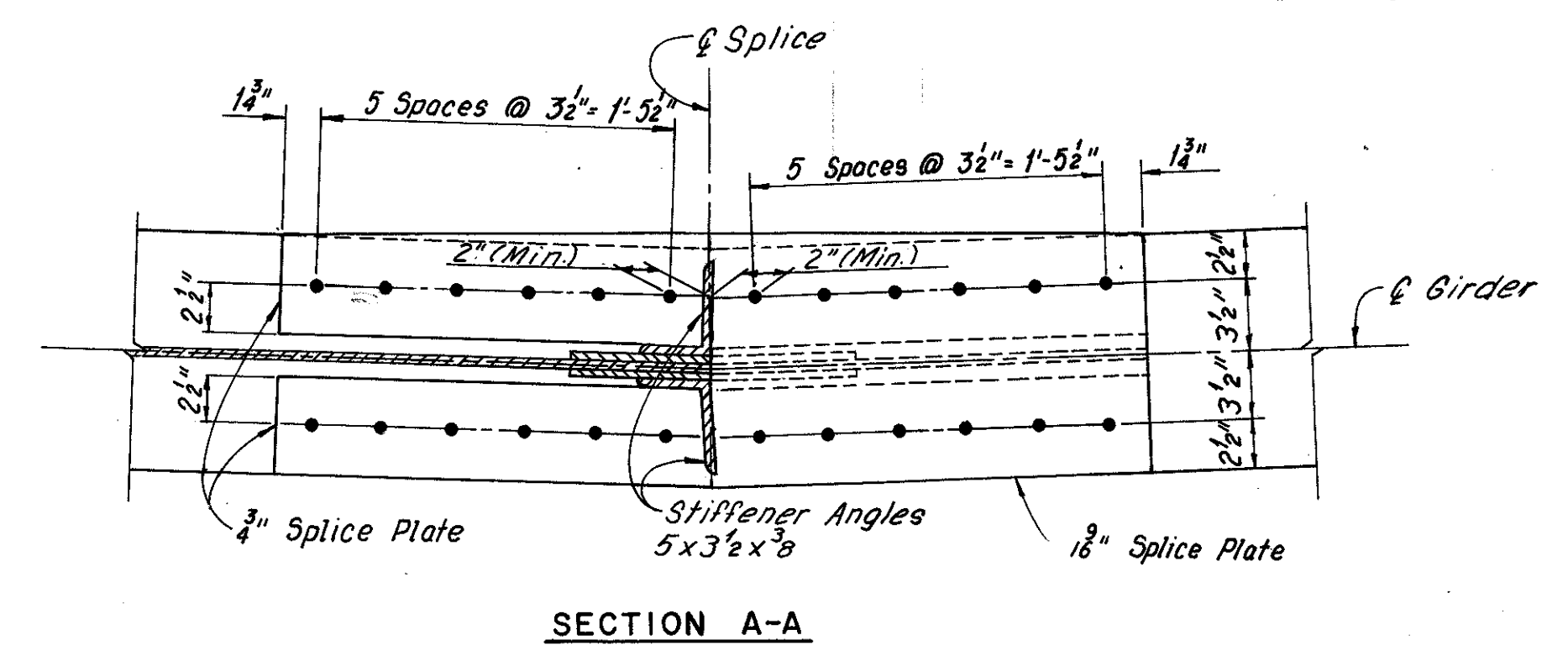
Note: For Section B-B see Sheet 9/11

GIRDER	DIMENSIONS										
	A	B	C	D	E	F	G	H	J	K	L
A	63'-10 1/2"	95'-11 3/4"	67'-1"	17'-2 1/2"	17'-8 3/4"	11'-0 3/4"	52'-10 1/2"	28'-2 1/2"	29'-8 3/4"	55'-1"	11'-2 3/4"
B	63'-1 1/2"	95'-5 1/2"	65'-9 3/4"	16'-11 3/4"	17'-4 3/4"	11'-0 3/4"	52'-1 1/2"	27'-11 3/4"	29'-4 3/4"	53'-9 3/4"	11'-2 3/4"
C	62'-4 3/4"	94'-10 3/4"	64'-6 3/4"	16'-9 1/4"	17'-0 3/4"	11'-0 3/4"	51'-4 3/4"	27'-9 1/4"	29'-0 3/4"	52'-6 3/4"	11'-2 3/4"
D	61'-7 1/4"	94'-4 3/4"	63'-3 3/4"	16'-6 3/4"	16'-8 3/4"	11 3/4"	50'-7 3/4"	27'-6 3/4"	27'-8 3/4"	52'-3 3/4"	11'-1 3/4"
E	60'-10 1/2"	93'-10 1/4"	62'-1 1/4"	16'-4 3/4"	16'-4 3/4"	11 3/4"	49'-10 3/4"	27'-4 3/4"	27'-4 3/4"	51'-1 1/4"	11'-1 3/4"
F	60'-2 1/4"	93'-4 3/4"	60'-10 1/4"	16'-2 1/4"	16'-1"	11 3/4"	49'-2 1/4"	27'-2 1/4"	27'-1"	49'-10 1/4"	11'-1 1/4"

WELD SIZE	
WEB TO FLANGE	
FLANGE PLATE THICKNESS	FILLET WELD SIZE
7/8"	5/16"
1/8" and 1/2"	5/16"
1 5/8"	3/8"



TYPICAL FIELD WEB SPLICE



SECTION A-A

FRAMING PLAN LEGEND

- ⊕ Indicates Type "X" Crossframe
- ⊙ Indicates 90°
- ⊥ Indicates intermediate stiffeners having contact bearing with the top flange.
- ⊥ Indicates intermediate stiffeners having contact bearing with the bottom flange.
- ⊥ Indicates intermediate stiffeners at one-half normal stiffener spacing having contact bearing with the top flange. See girder notes for stiffener spacing.

Note: Intermediate stiffeners located at crossframes are shown in the "Framing Plan" only at places where contact bearing with the flange changes adjacent to the crossframe.

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FRAMING PLAN
LANE OBS-E-B OVER
RELOCATED McCRACKEN ROAD

STA. 67+99.66 TO
STA. 70+29.75

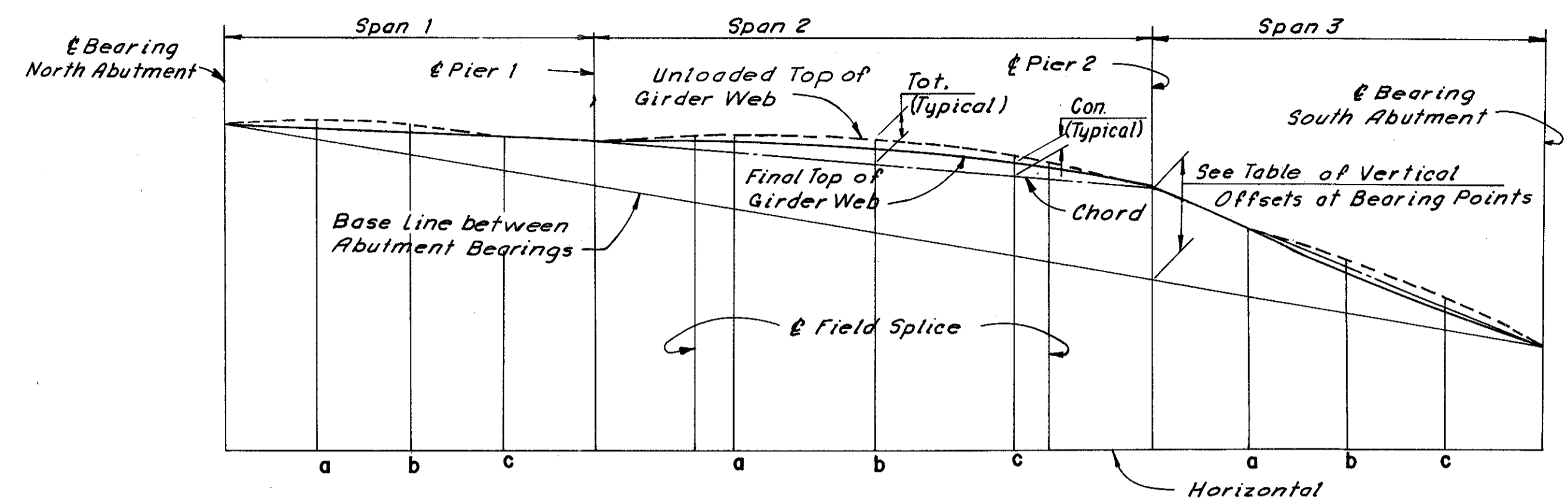
CUYAHOGA COUNTY OHIO

DRAWN: J.S. TRACED: J.L. CHECKED: L.J.G. REVIEWED: DATE: 6-28-68

DATE: 3-28-68 DATE: 1-18-68 DATE: 6-28-68

SHEET 8/11

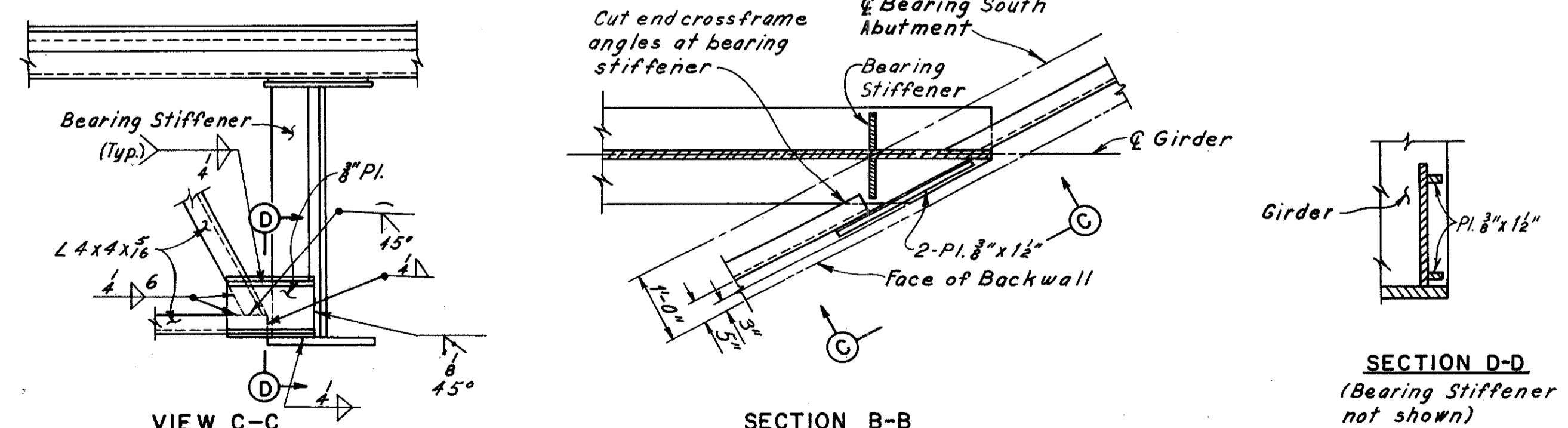
BEAM	PIER 1	PIER 2
A	4 1/8"	5 1/4"
B	4 3/8"	4 1/2"
C	4 1/2"	4 3/8"
D	4 1/2"	3 1/8"
E	4 3/8"	3 1/2"
F	4 1/8"	3"



CAMBER DIAGRAM
 (Girder E)

Notes:
 Negative values for deflection indicate deflections above the chord line.
 Negative values for convexity and total required camber indicate values below the chord line.
 Points a, b and c represent the 1/4, 1/2 and 3/4 points of the span respectively.
 Deflections and convexities are given to the nearest 1/16 inch.
 The following abbreviations are used:
 Stl. = Dead load deflection due to the weight of steel.
 Rem. D.L. = Remaining dead load deflection.
 Con. = Convexity.
 Tot. = Total required camber.

Girder	Span 1												Span 2												Span 3																		
	a				b				c				Field Splice 1				a				b				c				Field Splice 2				a				b				c		
	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.							
A	0	1/16	0	1/16	0	1/16	0	1/16	0	1/16	0	1/16	1/16	1/16	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	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16							
B	1/16	1/16	0	1/8	0	1/16	0	1/16	0	1/16	0	1/16	1/16	1/16	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	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16							
C	1/16	1/16	0	1/8	0	1/16	0	1/16	0	1/16	0	1/16	1/16	1/16	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	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16							
D	0	1/16	0	1/16	0	1/16	0	1/16	0	1/16	0	1/16	1/16	1/16	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	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16							
E	0	1/16	0	1/16	0	1/16	0	1/16	0	1/16	0	1/16	1/16	1/16	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	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16							
F	0	1/16	0	1/16	0	1/16	0	1/16	0	1/16	0	1/16	1/16	1/16	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	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/16								



MODIFICATION TO STANDARD END CROSSFRAME DETAIL
 (For additional details of end crossframe see Ohio Standard Drawing SD-1-69, Sheet 1 of 4.)

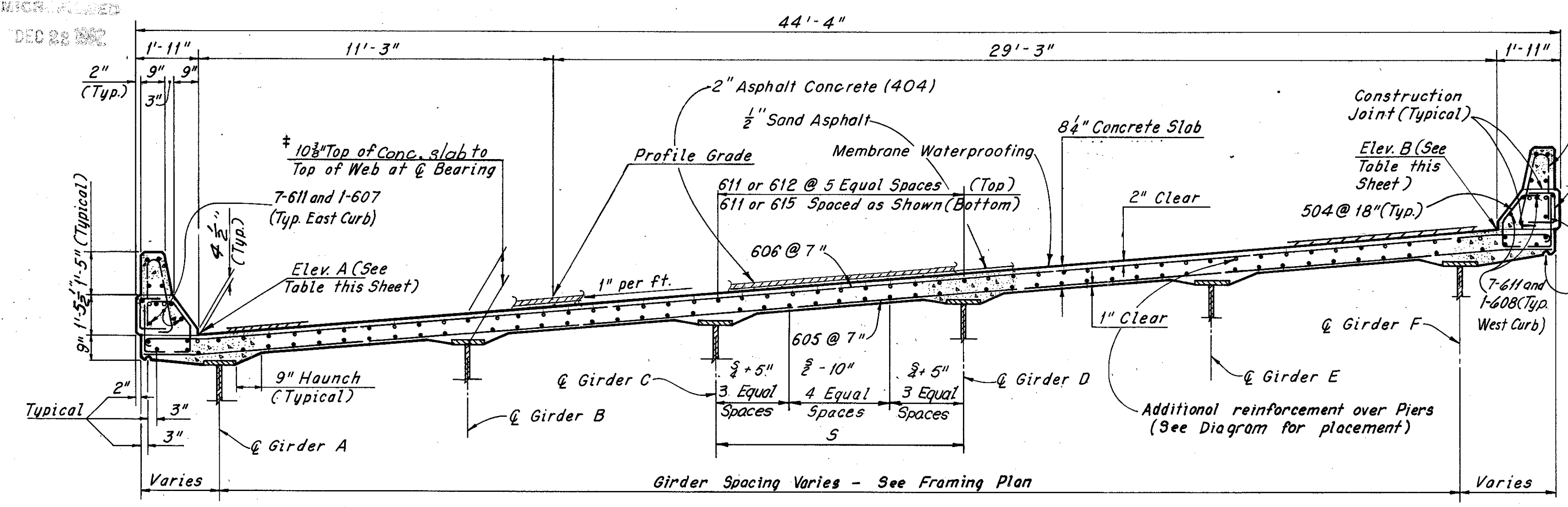
GIRDER NOTES:
 The girders shall be fabricated to compensate for the effects of dead load deflections, vertical curvature and superelevation. The top of the girder webs shall parallel the profile of the roadway surface directly over the center line of the girders.
 Top and bottom flange plates are to be the same and shall be spliced at points shown on the girder elevation. The web plates 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 the framing plan equally spaced between crossframes, or crossframes and bearing stiffeners, or crossframes and field splices, except the first two stiffener spaces at the ends of simply supported girders shall be one-half of this spacing. Stiffeners shall be placed in pairs and shall have contact bearing with both flanges.
 Bearing stiffeners at piers and abutments shall be placed in pairs on all girders. Intermediate stiffeners and bearing stiffeners at piers shall be normal to the top flange. Bearing stiffeners at abutments shall be vertical.
 All girder field splices shall be made with 1" ϕ high strength steel bolts. The bolts shall be placed with their heads on the outside face of the exterior girders and on the bottom of the flange plates.
 The Contractor shall submit to the Director for approval three prints showing his proposed erection procedure.

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CAMBER DIAGRAM AND GIRDER DETAILS
 LANE OBS-E-B OVER
 RELOCATED McCRACKEN ROAD
 STA. 67+99.66 TO STA. 70+29.75
 CUYAHOGA COUNTY OHIO
 DRAWN T.J.S. TRACED GEM CHECKED L.J.G. REVIEWED REVIS
 DATE 3-12-68 DATE 3-12-68 DATE 8-7-68 SHEET 9 / 11

RECORDED
DEC 28 1962

CUYAHOGA COUNTY
CUY-80-21.40

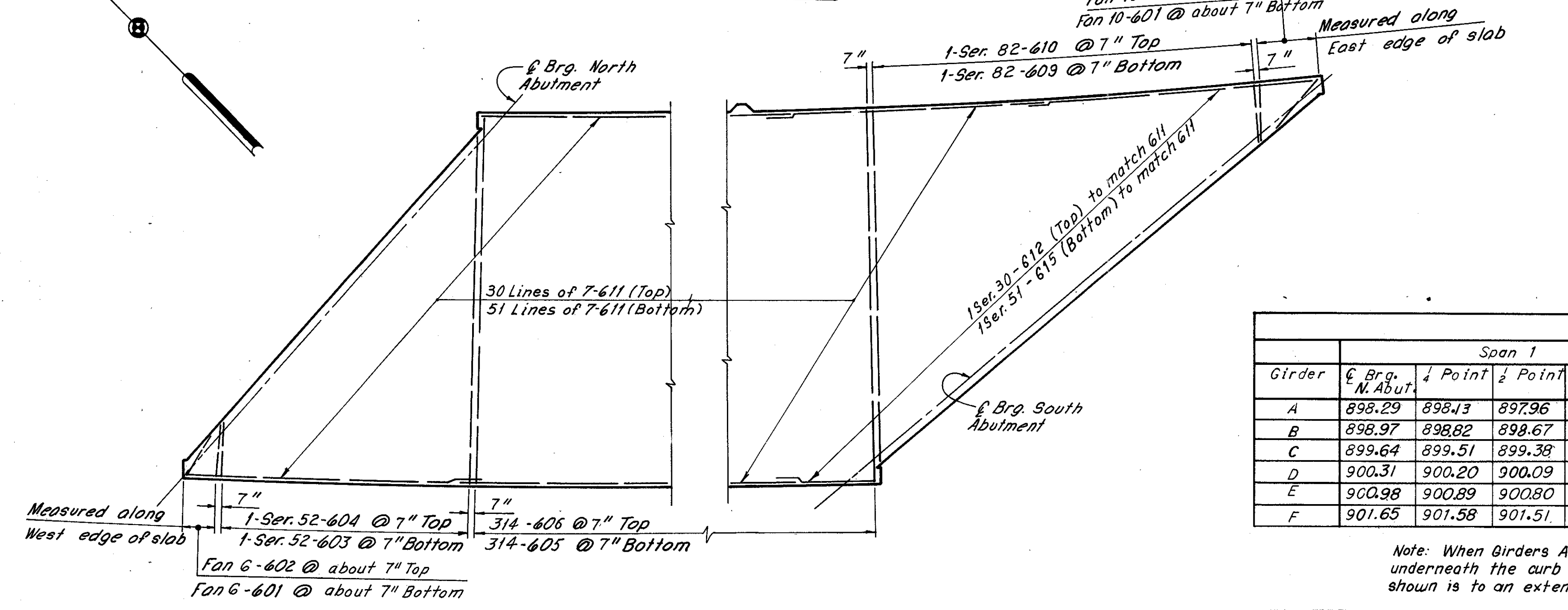
NOTE:
A typical haunch width of 9" shall be used for computing quantity of concrete. However, the haunch width may vary between 6" and 12" provided that the slope shall be not more than 1:4 for a haunch less than 9" in width.



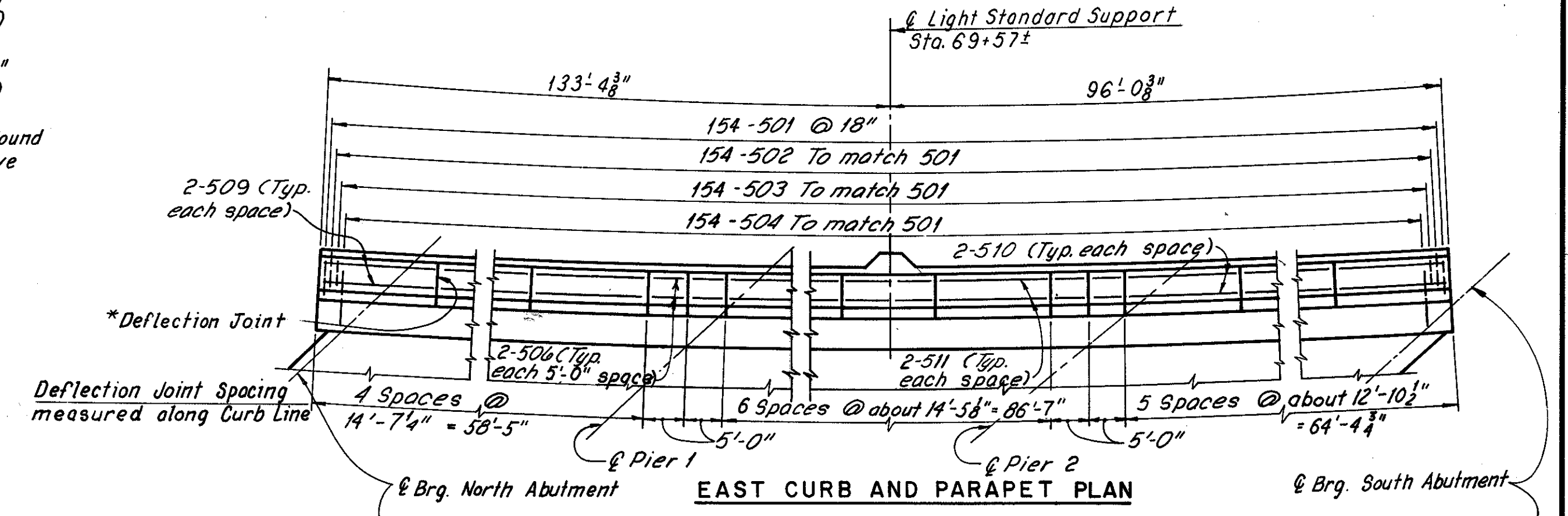
Provide subdrainage for wearing surface as per sheet CD2 at low curb line only
TYPICAL CROSS SECTION

* When Girders A and F are underneath the curb this dimension is measured from extended top of pavement to top of girder web.

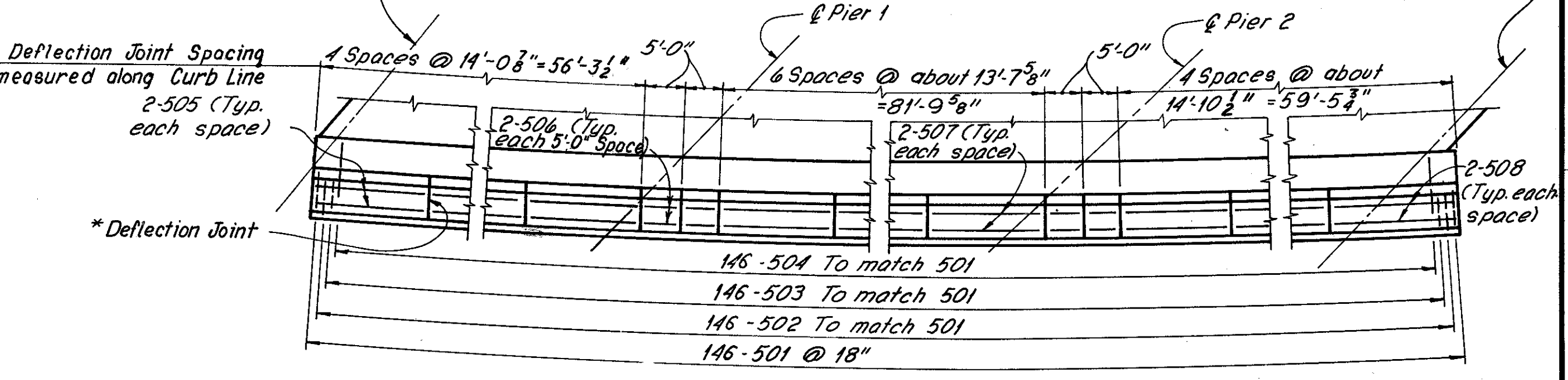
Note: All reinforcing bar marks shall be prefixed 5.



PART SLAB PLAN



EAST CURB AND PARAPET PLAN



WEST CURB AND PARAPET PLAN

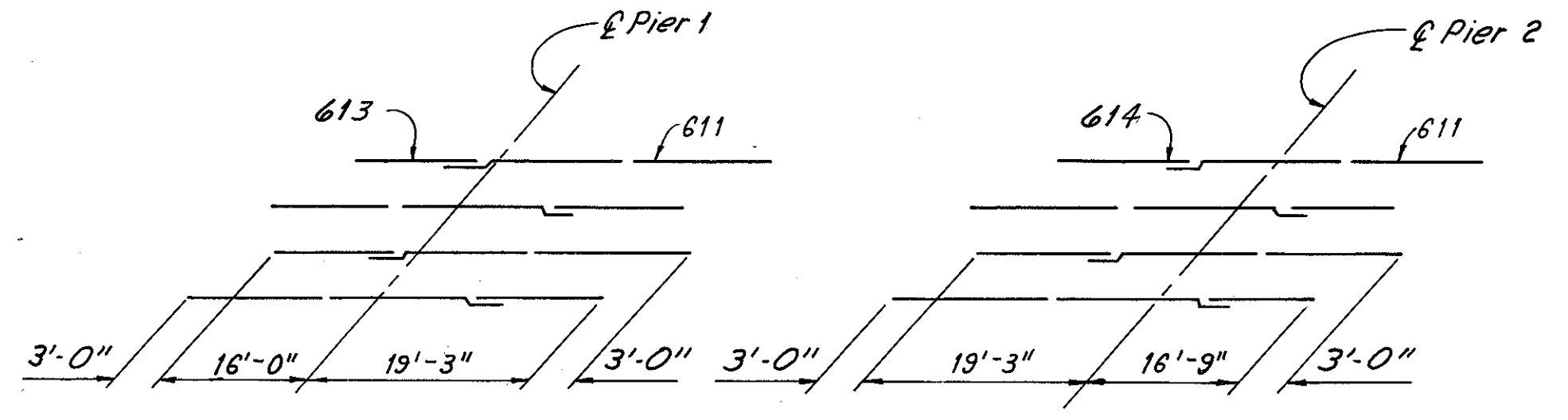
Note:
The preformed expansion joint filler in the railing parapet deflection joints may be either 1" gray sponge rubber or 1" gray cellular polyvinylchloride (P.V.C.) sponge.
The deflection joint extends from top of parapet to first construction joint and is included for payment with Superstructure Concrete.

Girder	TOP OF REINFORCED CONCRETE DECK													
	Brig. N. Abut.	Span 1			Span 2				Span 3				Brig. S. Abut.	
	4 Point	1/2 Point	3/4 Point	1/4 Point	1/2 Point	3/4 Point	1 Point	1/4 Point	1/2 Point	3/4 Point	1 Point	1/4 Point	1/2 Point	3/4 Point
A	898.29	898.13	897.96	897.79	897.63	897.35	897.01	896.66	896.17	895.79	895.41	895.03	894.65	
B	898.97	898.82	898.67	898.52	898.38	898.12	897.78	897.44	896.98	896.63	896.28	895.93	895.58	
C	899.64	899.51	899.38	899.25	899.13	898.89	898.55	898.22	897.78	897.46	897.14	896.82	896.51	
D	900.31	900.20	900.09	899.98	899.87	899.66	899.32	898.99	898.59	898.29	898.00	897.71	897.43	
E	900.98	900.89	900.80	900.71	900.62	900.43	900.09	899.77	899.39	899.12	898.86	898.60	898.34	
F	901.65	901.58	901.51	901.44	901.37	901.19	900.86	900.54	900.19	899.95	899.72	899.49	899.26	

Note: When Girders A and F are underneath the curb the elevation shown is to an extended top of concrete deck.

Elevation	FACE OF CURB, ELEVATIONS (TOP OF REINFORCED CONCRETE DECK)													
	Brig. N. Abut.	Span 1			Span 2				Span 3				Brig. S. Abut.	
	4 Point	1/2 Point	3/4 Point	1/4 Point	1/2 Point	3/4 Point	1 Point	1/4 Point	1/2 Point	3/4 Point	1 Point	1/4 Point	1/2 Point	3/4 Point
A	898.18	898.09	897.97	897.82	897.66	897.39	897.06	896.63	896.14	895.78	895.41	895.00	894.55	
B	901.67	901.63	901.57	901.47	901.38	901.22	901.00	900.70	900.33	900.08	899.82	899.53	899.20	

Note:
The elevations shown at the face of curbs are those which are required before concrete is placed. Proper allowance has been made for the dead load deflection caused by the weight of the concrete.



PLACEMENT OF ADDITIONAL REINFORCEMENT OVER PIERS

Notes:
For notes see Sheet 8/11.
For Light Standard Support Details see Sheet CD1.

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TYPICAL CROSS SECTION AND SLAB PLAN
LANE OBS-E-B OVER
RELOCATED McCRACKEN ROAD

STA. 67+99.66 TO
STA. 70+29.75

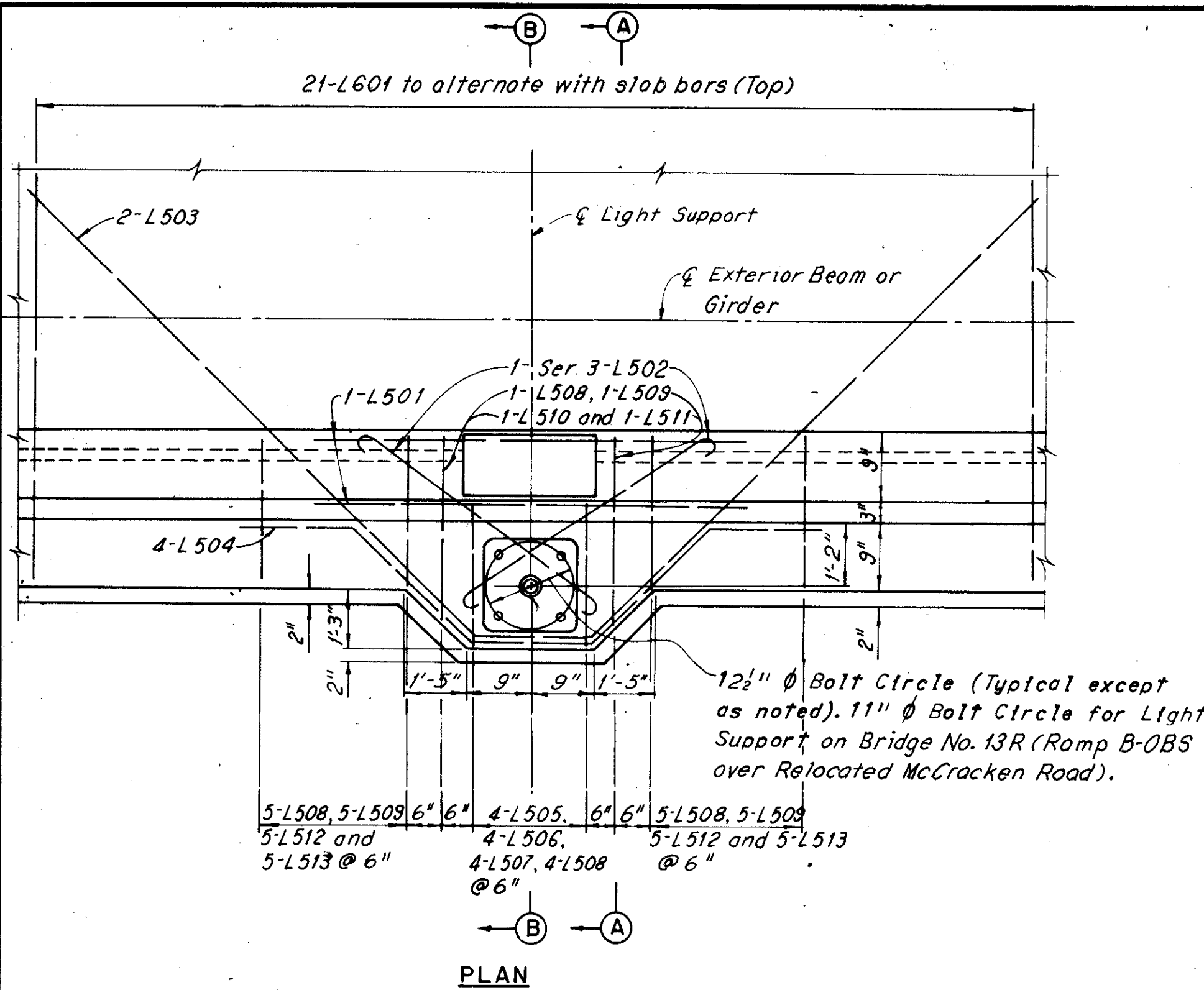
CUYAHOGA COUNTY OHIO

DRAWN T.J.S.	TRACED A.J.J.	CHECKED L.J.G.	REVIEWED	REVISED
DATE 3-12-63	DATE 4-17-68	DATE 8-7-68	DATE	DATE

SHEET 10/11

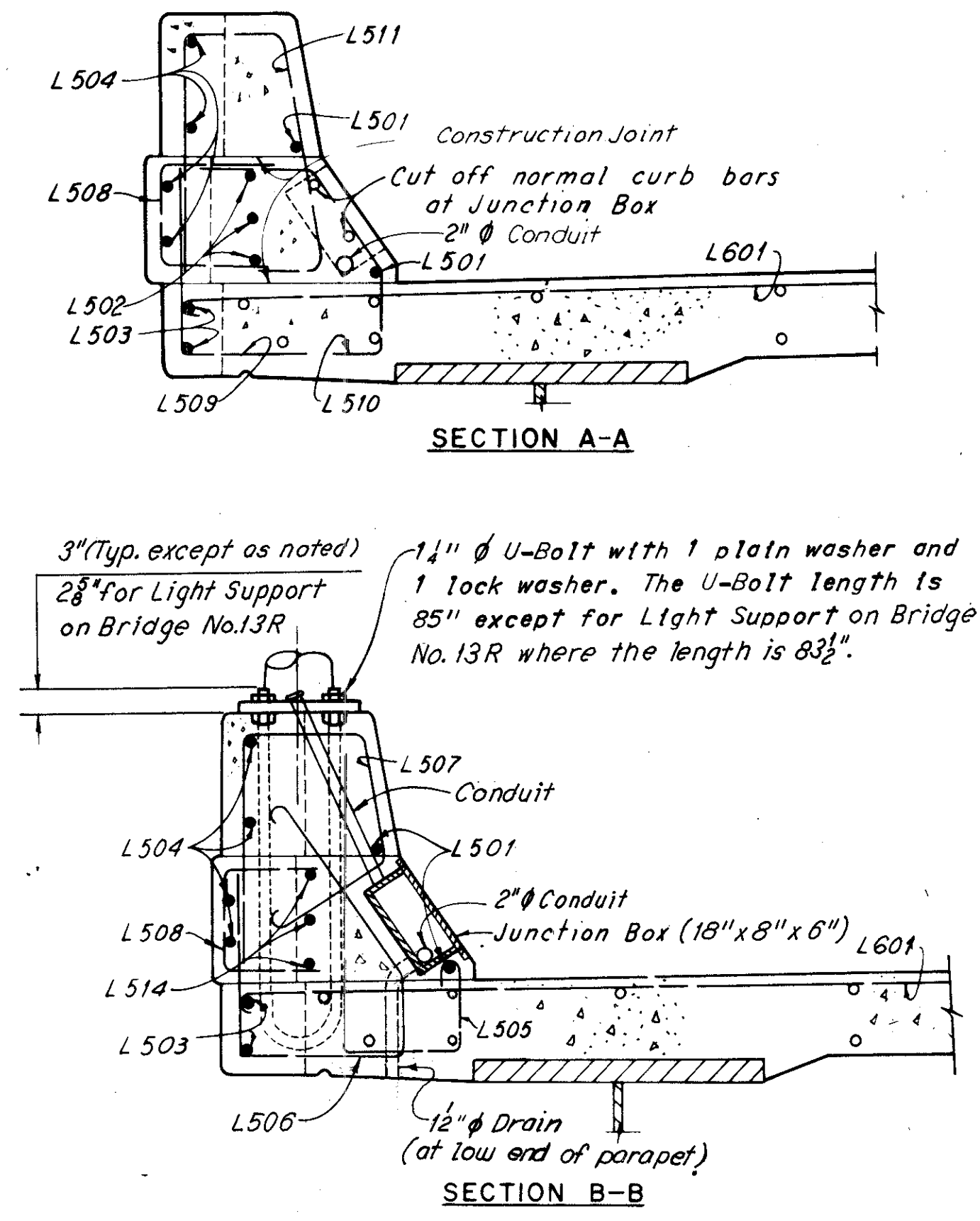
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NORTH ABUTMENT						SOUTH ABUTMENT						PIER 1						PIER 2							
AN401	42	3'-7"	105		101	AN809	6	17'-3"	Str.		276	AS637	4	18'-9"	108		113	PB602	12	6'-2"	105		111		
						AN810	2	22'-10"	108		122	AS638	14	7'-9"	Str.		163								
						AN811	1	27'-3"	Str.		73	AS639	1	19'-9"	109		30	PB801	80	10'-8"	100		2,278		
						AN812	1	30'-7"	108		82	AS640	1	22'-7"	109		34								
						AN813	21	5'-9"	163		322	AS641	27	18'-3"	109		740	PB1101	32	7'-5"	104		1,261		
AN501	27	5'-11"	161		167							AS642	41	19'-1"	112		1,175	PB1102	8	15'-6"	Str.		659		
AN502	37	2'-0"	105		77							AS643	12	8'-0"	Str.		144	PB1103	8	16'-9"	Str.		712		
AN503	8	23'-9"	Str.		198							AS644	9	11'-9"	109		159	PB1104	8	17'-9"	Str.		754		
AN504	20	2'-9"	Str.		57													PB1105	8	19'-0"	Str.		808		
AN505	36	7'-1"	105		266													PB1106	8	31'-6"	108		1,339		
AN506	14	29'-0"	Str.		423	AS401	40	3'-7"	105		96	AS701	2	4'-10"	101		16	PB1107	2	14'-0"	Str.		149		
AN507	12	27'-9"	Str.		347							AS702	2	4'-8"	162		19	PB1108	6	14'-9"	104		470		
AN508	1	34'-3"	Str.		36	AS501	3	36'-6"	Str.		114	AS703	2	4'-9"	162		20	PB1109	8	33'-4"	104		1,417		
AN509	1	7'-0"	Str.		7	AS502	3	34'-6"	Str.		108	AS704	2	4'-10"	162		20	PB1110	6	14'-3"	Str.		454		
AN510	1	15'-6"	Str.		16	AS503	6	19'-6"	Str.		122	AS705	2	5'-6"	162		23	PB1111	2	12'-9"	Str.		135		
AN511	1	16'-6"	Str.		17	AS504	20	2'-9"	Str.		57														
AN512	2	19'-0"	Str.		40	AS505	2	34'-0"	Str.		71	AS801	1 Ser. 3	32'-4"	104	240'	248								
AN513	2	20'-6"	Str.		43	AS506	2	38'-9"	Str.		81	AS802	1 Ser. 3	31'-0"	27'-0"	Str.	240'	232							
AN514	4	7'-6"	Str.		31	AS507	30	7'-6"	105		235	AS803	4	23'-8"	104		253								
AN515	8	22'-6"	Str.		188	AS508	16	7'-3"	105		121	AS804	4	24'-6"	108		262								
AN516	2	17'-9"	Str.		37	AS509	2	8'-0"	Str.		17	AS805	1 Ser. 4	36'-6"	27'-3"	Str.	249'	335							
AN517	2	16'-3"	Str.		34	AS510	2	11'-6"	Str.		24	AS806	1 Ser. 4	38'-1"	28'-10"	108	249'	363	S501	300	5'-4"	160		1,669	
AN518	8	4'-0"	Str.		33	AS511	1	24'-6"	Str.		26	AS807	2	25'-2"	124		134	S502	300	2'-1"	104		652		
AN519	2	4'-9"	Str.		10	AS512	1	29'-3"	Str.		31	AS808	6	12'-0"	Str.		192	S503	300	2'-1"	104		652		
AN520	1	21'-3"	Str.		22	AS513	1 Ser. 3	36'-6"	34'-6"	Str.	110"	111	AS809	6	16'-6"	Str.	264	S504	300	3'-1"	142		965		
						AS514	6	34'-0"	Str.		213	AS810	2	22'-9"	108		121	S505	16	13'-9"	Str.		229		
AN601	31	17'-3"	109		803	AS515	3	36'-0"	Str.		113	AS811	1	33'-5"	104		89	S506	32	4'-6"	Str.		150		
AN602	11	11'-9"	109		194	AS516	3	38'-0"	Str.		119	AS812	1	31'-6"	Str.		84	S507	24	13'-3"	Str.		332		
AN603	1	14'-3"	109		21	AS517	1	21'-0"	Str.		22	AS813	27	5'-9"	163		415	S508	16	14'-6"	Str.		242		
AN604	68	7'-3"	104		740	AS518	1	18'-6"	Str.		19							S509	16	14'-9"	Str.		238		
AN605	31	18'-11"	112		881	AS519	1	25'-6"	Str.		27							S510	20	12'-9"	Str.		261		
AN606	22	18'-1"	109		598	AS520	1	9'-6"	Str.		10							S511	24	14'-0"	Str.		350		
AN607	54	5'-8"	104		460	AS521	8	3'-9"	Str.		31														
AN608	2	16'-6"	Str.		50	AS522	8	23'-9"	Str.		198	PA401	1	12'-10"	150		245	S601	16	5'-6"	Str.		132		
AN609	4	20'-3"	109		122	AS523	2	18'-3"	Str.		38	PA402	1	13'-11"	150		265	S602	16	6'-2"	101		148		
AN610	3	4'-6"	Str.		20	AS524	4	7'-6"	Str.		31	PA403	1	14'-11"	150		285	S603	1 Ser. 52	5'-9"	41'-6"	Str.	8 1/2"	1,845	
AN611	2	14'-6"	Str.		44	AS525	8	21'-9"	Str.		181	PA404	1	16'-0"	150		305	S604	1 Ser. 52	6'-5"	42'-2"	101	8 1/2"	1,897	
AN612	4	13'-0"	Str.		78	AS526	27	5'-11"	161		167							S605	314	43'-6"	Str.		20,516		
AN613	10	10'-11"	109		164	AS527	37	2'-0"	105		77	PA501	40	12'-2"	109		508	S606	314	45'-0"	100		21,223		
AN614	29	6'-6"	Str.		283	AS528	2	16'-3"	Str.		34	PA502	4 Ser. 7	8'-6"	10'-6"	109	4"	277	S607	5	21'-6"	Str.		161	
AN615	1	4'-3"	Str.		6							PA503	42	5'-1"	105		223	S608	5	34'-0"	Str.		255		
AN616	17	8'-0"	162		204	AS601	39	17'-3"	109		1,010							S609	1 Ser. 82	5'-9"	41'-9"	Str.	5 3/4"	2,925	
AN617	23	6'-3"	Str.		216	AS602	1 Ser. 3	16'-9"	12'-9"	109	240'	66	PA601	4	29'-6"	Str.		177	S610	1 Ser. 82	6'-5"	42'-5"	101	5 3/4"	3,007
AN618	2	15'-9"	Str.		47	AS603	1	10'-3"	109		15	PA602	12	6'-2"	105		111	S611	699	30'-0"	Str.		31,497		
AN619	2	17'-9"	Str.		53	AS604	1 Ser. 3	16'-9"	13'-7"	109	147"	68						S612	1 Ser. 30	21'-6"	34'-0"	Str.	5 1/2"	1,250	
AN620	4	8'-0"	108		48	AS605	13	10'-11"	109		213	PA801	80	10'-8"	100		2,278	S613	31	10'-3"	Str.		477		
AN621	2	7'-1"	162		21	AS606	3	4'-6"	Str.		20							S614	31	11'-0"	Str.		512		
AN622	2	6'-5"	162		19	AS607	2 Ser. 12	8'-5"	7'-6"	104	1"	287	PA1101	32	7'-5"	104		1,261	S615	1 Ser. 51	21'-6"	34'-0"	Str.	3"	2,126
AN623	6	23'-9"	Str.		214	AS608	2 Ser. 17	8'-9"	7'-5"	104	1"	413	PA1102	8	15'-6"	Str.		659	1 Light Standard Support						735
AN624	2	5'-9"	Str.		17	AS609	4	20'-3"	109		122	PA1103	8	16'-6"	Str.		701								
AN625	2	5'-0"	Str.		15	AS610	1 Ser. 17	9'-2"	7'-2"	104	1 1/2"	209	PA1104	8	17'-9"	Str.		754							
AN626	3	4'-9"	Str.		21	AS611	1	9'-2"	104		14	PA1105	8	18'-9"	Str.		797								
AN627	3	7'-7"	104		34	AS612	6	7'-5"	104		67	PA1106	8	29'-6"	108		1,254								
AN628	24	6'-0"	Str.		216	AS613	52	5'-8"	104		443	PA1107	2	12'-9"	Str.		135								
AN629	10	7'-11"	162		119	AS614	1 Ser. 12	8'-5"	7'-2"	104	1 3/8"	140	PA1108	6	14'-9"	104		470							
AN630	9	5'-6"	Str.		74	AS615	12	6'-3"	Str.		113	PA1109	8	31'-6"	104		1,339								
AN631	4	5'-6"	162		33	AS616	4	14'-1"	Str.		89	PA1110	6	13'-6"	Str.		430								
AN632	6	22'-6"	Str.		203	AS617	17	7'-4"	162		187														
AN633	4	19'-7"	124		118	AS618	12	6'-0"	Str.		108														
AN634	4	18'-9"	108		113	AS619	2	16'-0"	Str.		48														
AN635	4	16'-0"	Str.		96	AS620	2	18'-3"	Str.		55														
AN636	1	17'-1"	109		26	AS621	6	23'-9"	Str.		214														
						AS622	2	8'-3"	108		25	PB401	1	12'-9"	150		245								
AN701	2	4'-10"	101		16	AS623	2 Ser. 3	6'-0"	5'-0"	Str.	6"	50	PB402	1	13'-10"	150		265							
AN702	2	4'-10"	162		20	AS624	2	6'-2"	162		19	PB403	1	15'-0"	150		285								
AN703	2	4'-11"	162		20	AS625	3	9'-3"	104		42	PB404	1	16'-2"	150		305								
AN704	2	5'-0"	162		21	AS626	17	6'-9"	Str.		172														
AN705	2	5'-10"	162		21	AS627	5	13'-0"	Str.		98	PB501	44	12'-2"	109		558								
						AS628	16	7'-7"	162		182	PB502	4 Ser. 7	8'-6"	10'-6"	109	4"	277							
AN801	1 Ser. 3	27'-9"	24'-3"	Str.	1'-9"	208	AS629	11	6'-3"	Str.		103	PB503	42	5'-1"	105		223							
AN802	1 Ser. 3	31'-1"	27'-9"	108	1'-8"	236	AS630	5	20'-0"	124	150														
AN803	4	23'-2"	104		247	AS631	2	8'-3"	108		25	PB601	4	31'-6"	Str.										

CUYAHOGA COUNTY
CUY-80-21.40



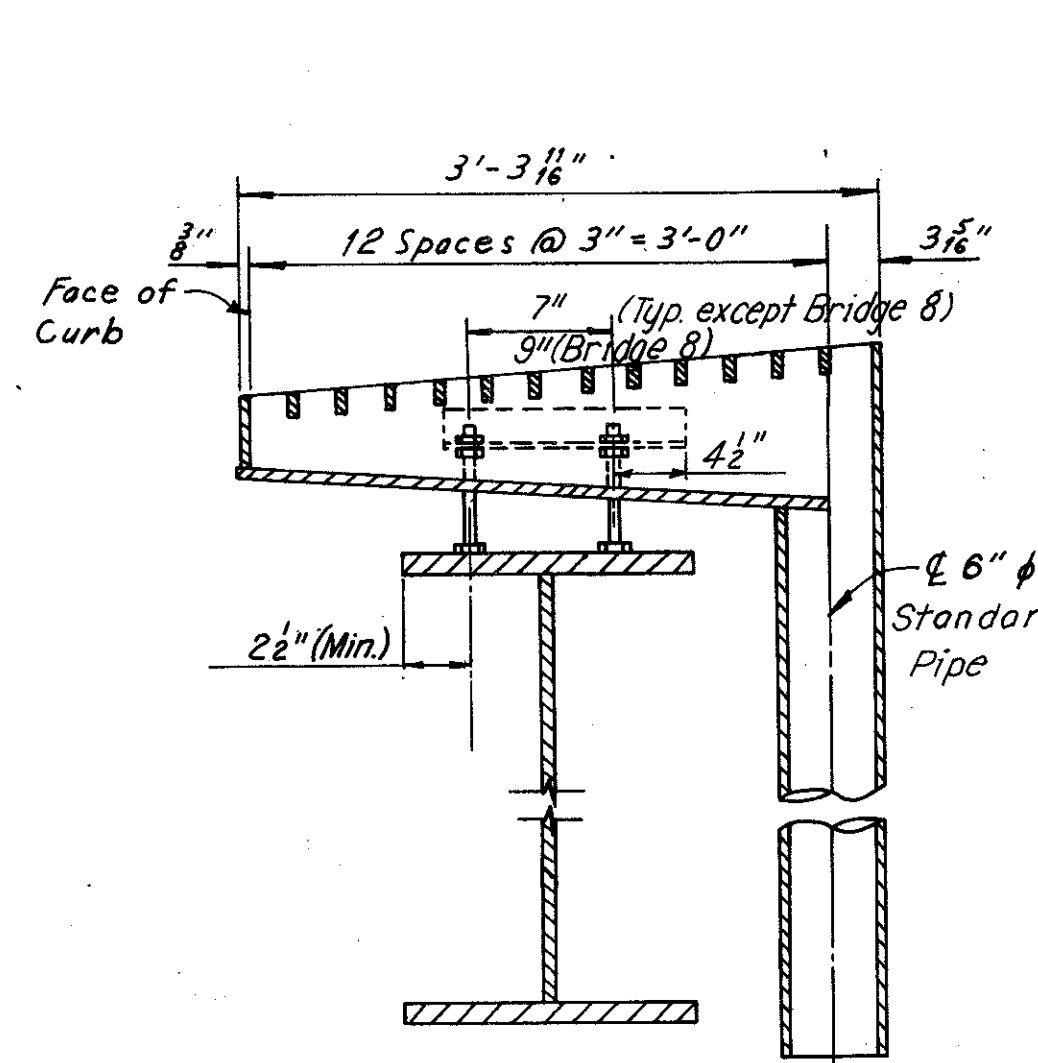
PLAN

Notes:
For location of conduit in structures, additional lighting details and lighting quantities see Lighting Plans.
For Light Standard Locations see Slab Plans.
Light standard support reinforcement is included for payment with slab reinforcement; see Reinforcement Schedules for weight summary.
Normal parapet reinforcement not shown; normal longitudinal reinforcement is continuous through Light Support except as noted.

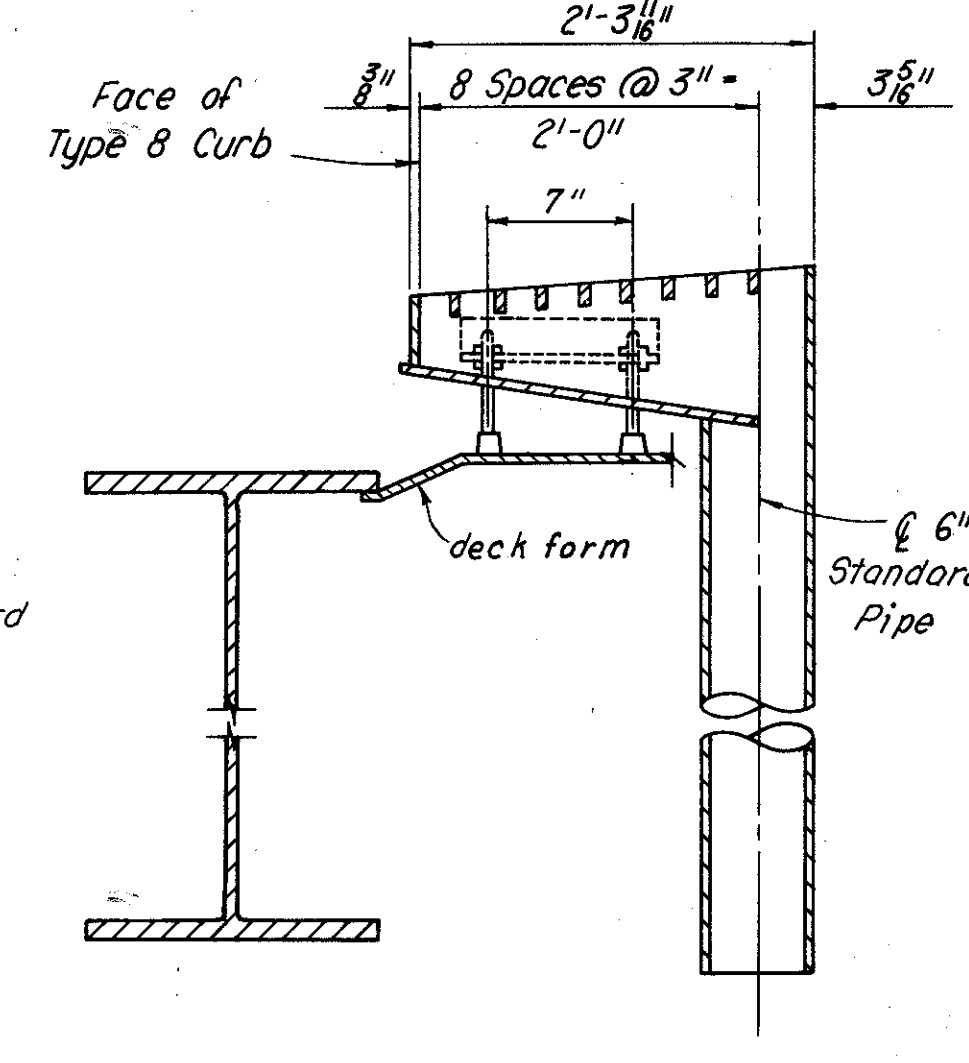


SECTION A-A

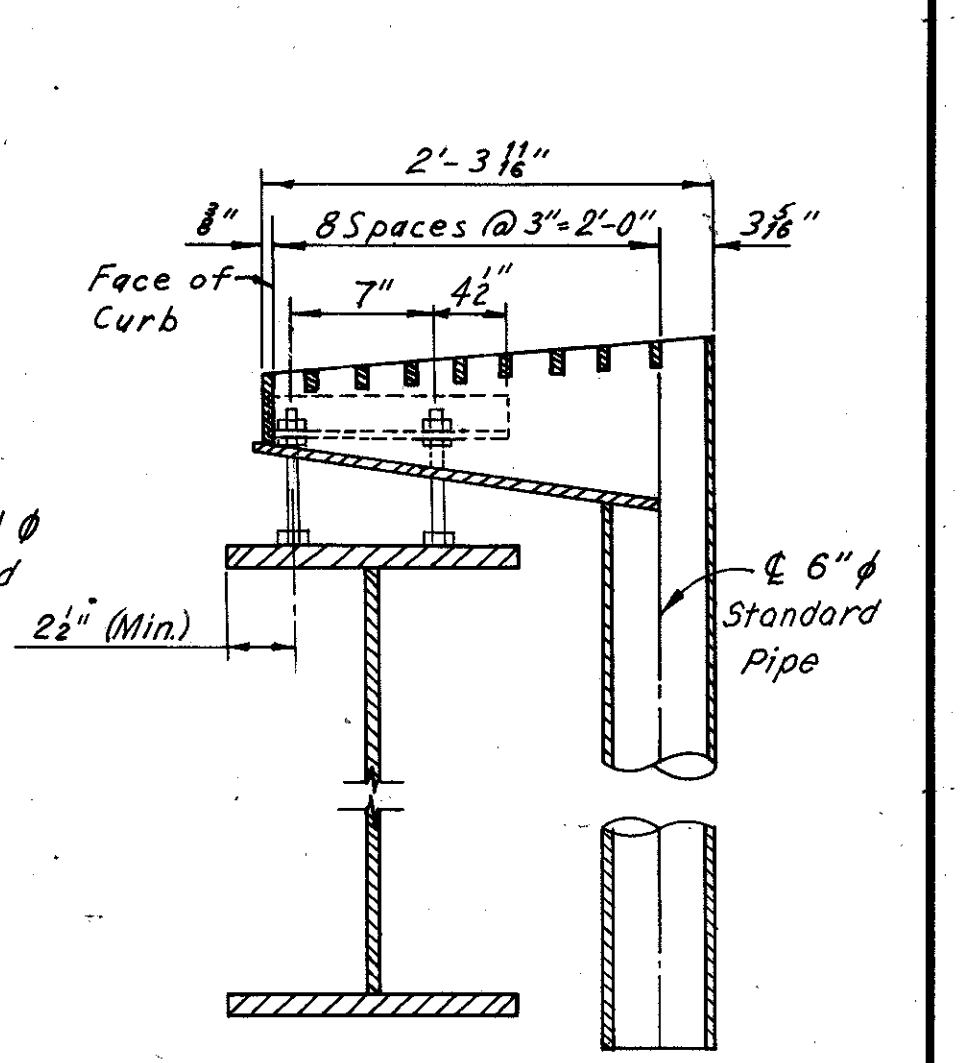
SECTION B-B



SCUPPER CROSS SECTION
(Typ. @ Bridges 6, 7, 8 and 13L
except as noted)

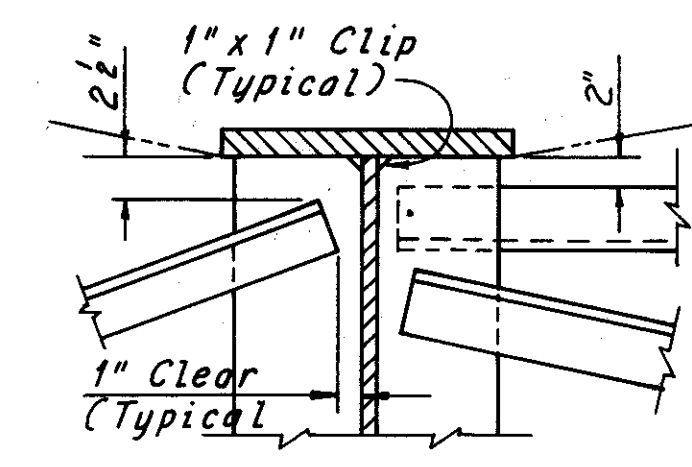


SCUPPER CROSS SECTION
(Typical Bridge 7 at Type 8 Curb)



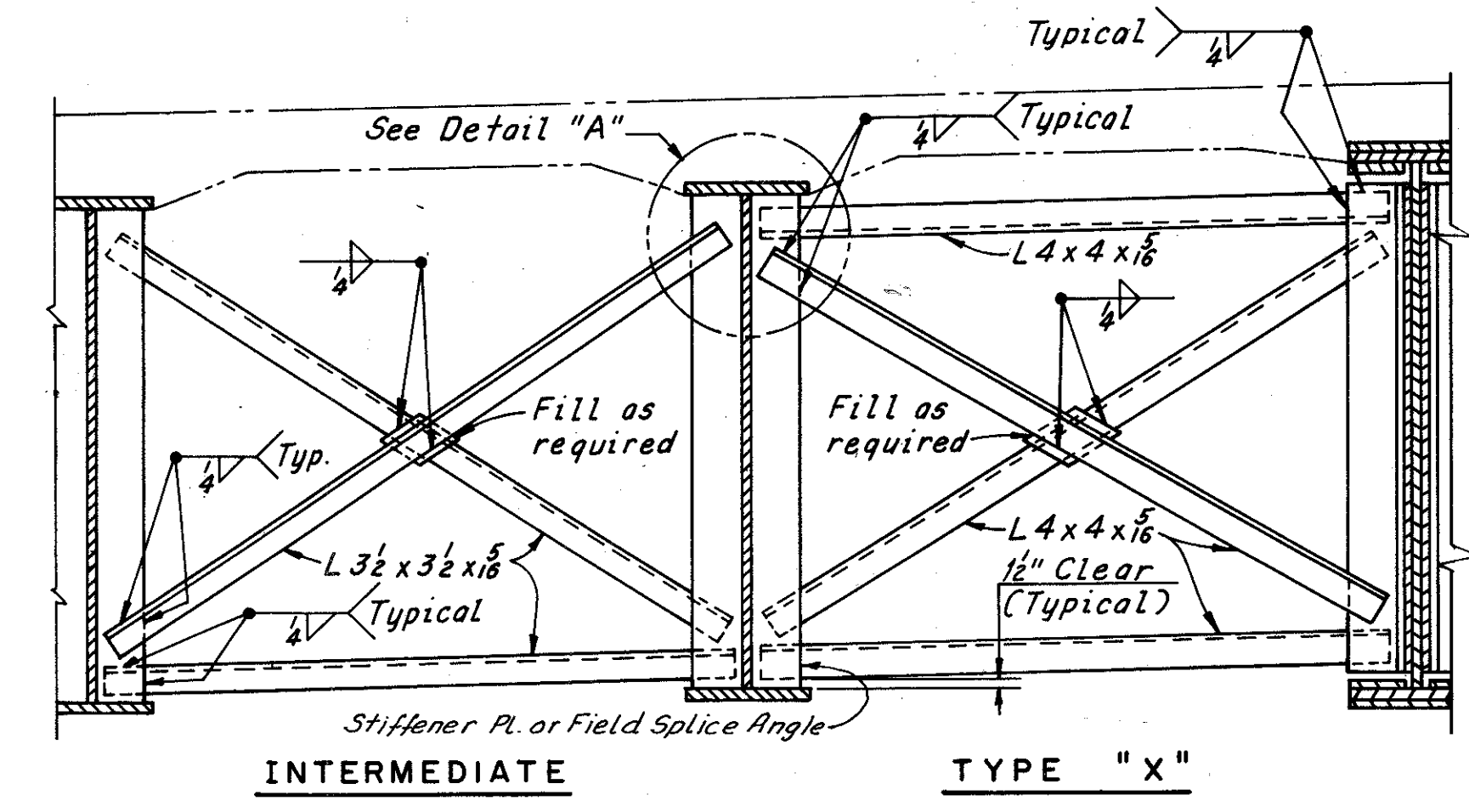
SCUPPER CROSS SECTION
(Typ. @ Bridges 13R and 14)

DRAINAGE DETAILS

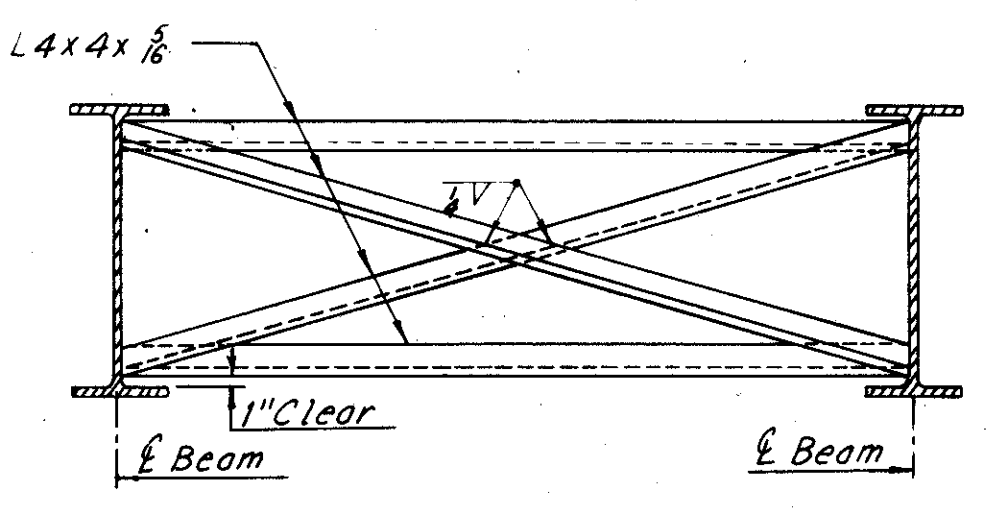


DETAIL "A"

Note:
For Scupper Details not shown, see Ohio Standard Drawing SD-1-69, Sheet 3 of 4. The scupper shall extend 8" below the bottom of the beams or girders instead of 2".
For Scupper locations see Framing Plan.
Scuppers, including two support angles 2 1/2" x 2 1/2" x 1/4", 6" ϕ pipes, supports and accessories, shall be included for payment with "Item 518, Scuppers."



INTERMEDIATE GIRDER TYPICAL CROSSFRAMES

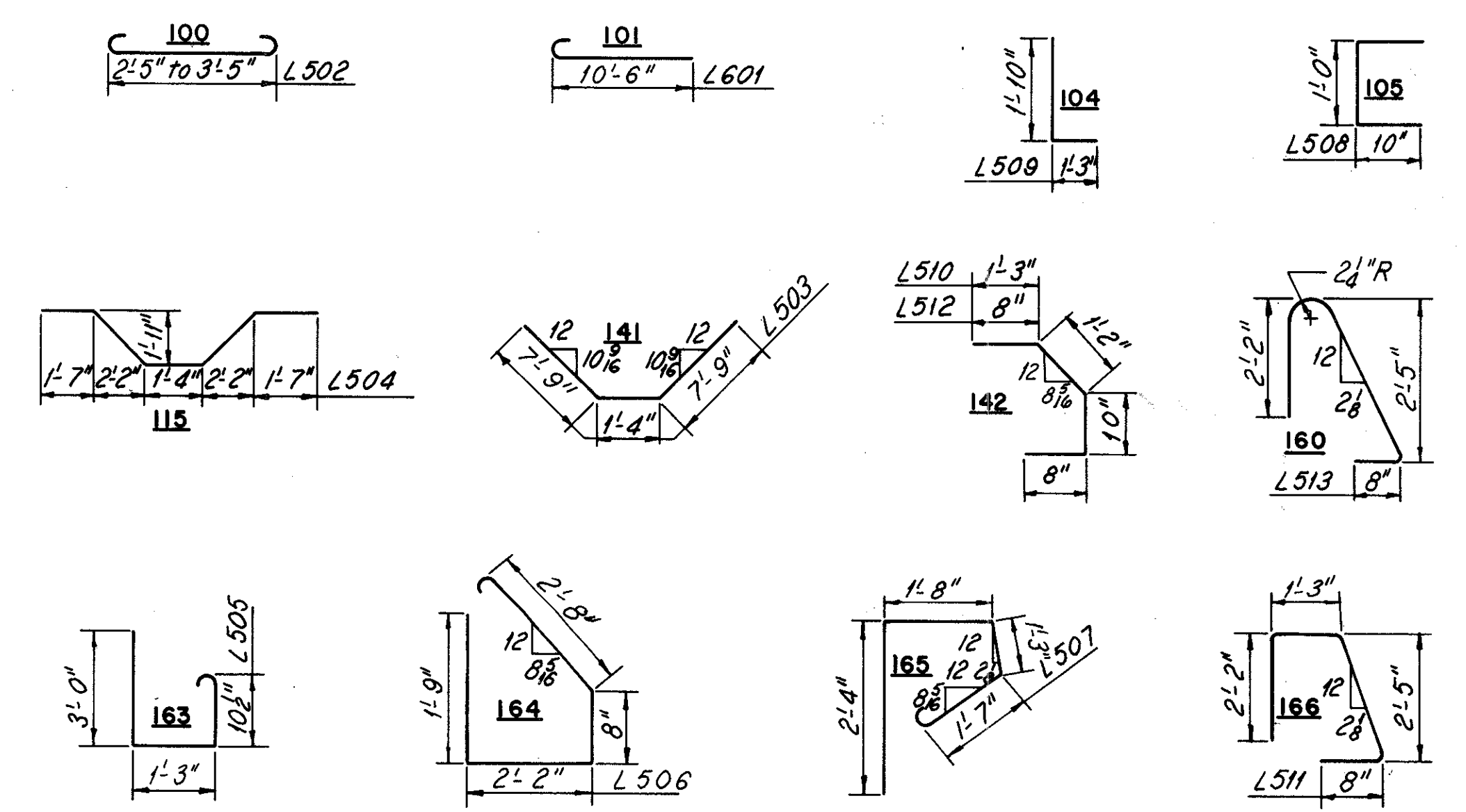


BEAM BEND POINT CROSSFRAME

CROSSFRAME DETAILS

REINFORCING SCHEDULE					
LIGHT STANDARD SUPPORT					
MARK	NO.	LENGTH	SHAPE	SER. INCR.	WEIGHT
L501	2	5'-0"	5#		10
L502	2 Ser 3	7'-3 1/2"	7#	100	26
L503	2	16'-8"	14#		34
L504	4	10'-1"	11#		42
L505	4	5'-6"	16#		23
L506	4	7'-6"	16#		31
L507	4	7'-2"	16#		30
L508	16	2'-5"	10#		40
L509	12	3'-0"	10#		38
L510	2	3'-8"	14#		8
L511	2	6'-2"	16#		13
L512	10	3'-1"	14#		32
L513	10	5'-4"	16#		56
L601	21	11'-2"	10#		352
For 1 (one) Light Standard Support on Bridge					
TOTAL WEIGHT =					735

BAR BENDING DIAGRAMS

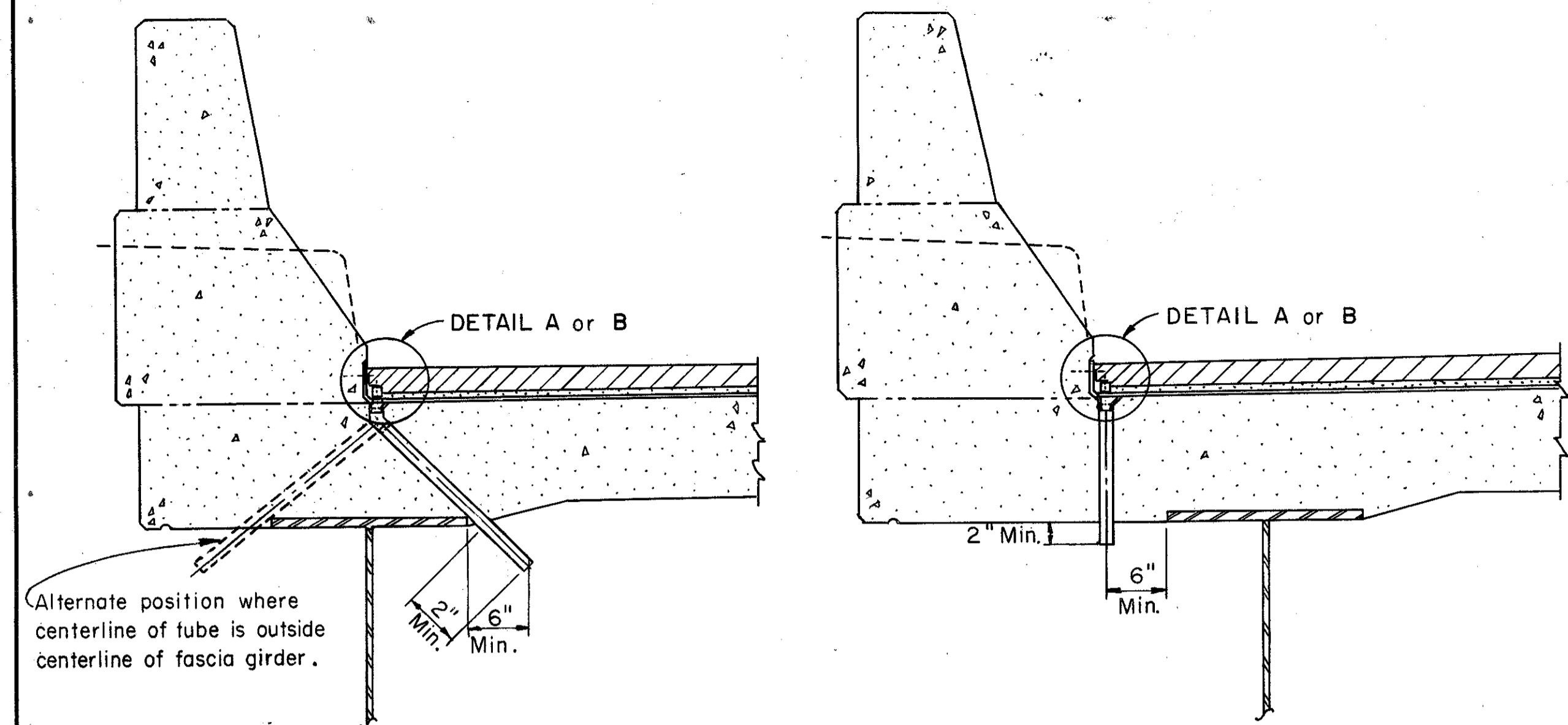


LIGHT SUPPORT DETAILS

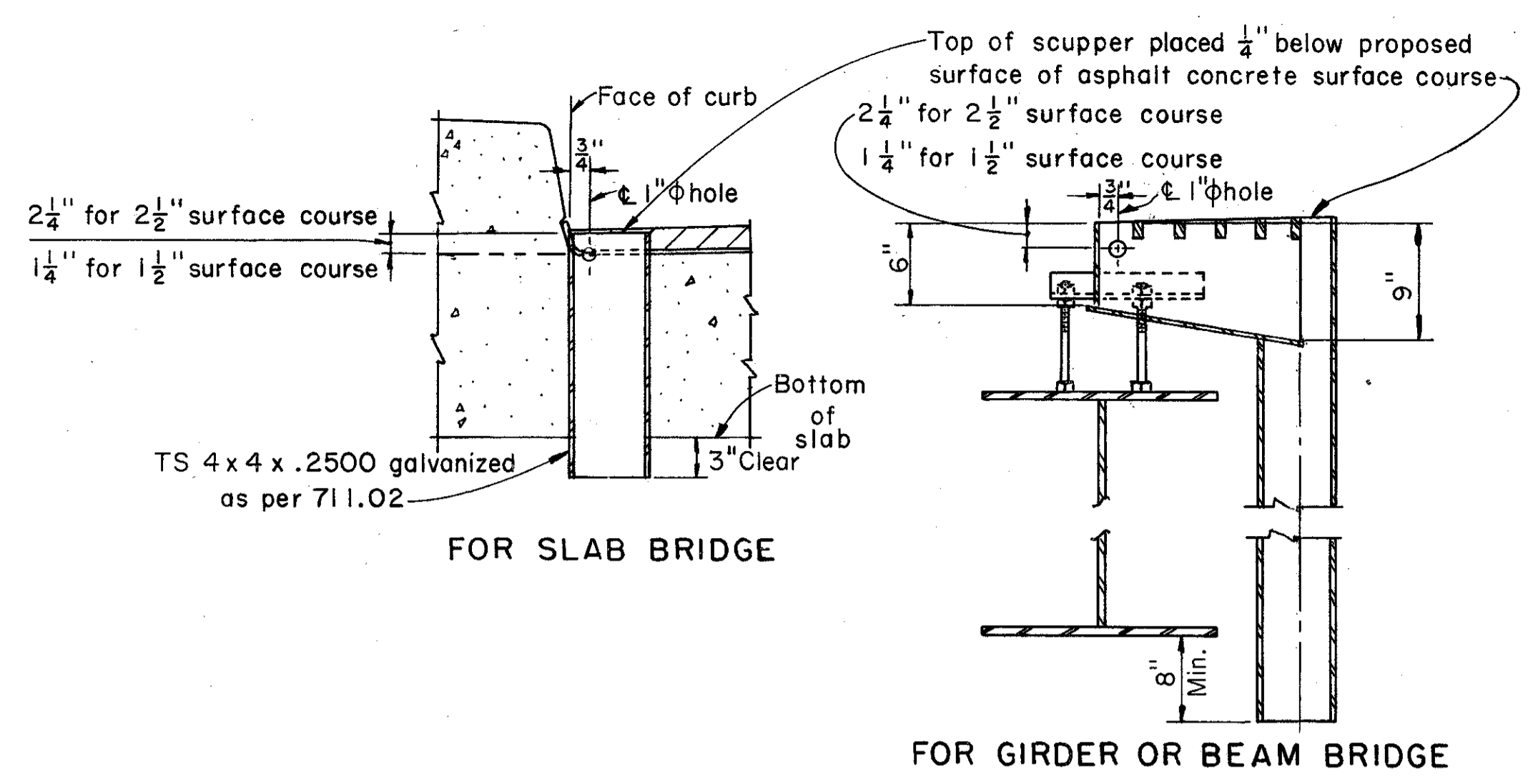
H.N.T.B. BR. NO. 6, 7, 8, 13L, 13R AND 14

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

CROSSFRAMES, DRAINAGE
AND LIGHT STANDARD SUPPORT
DETAILS



STRUCTURAL STEEL BELOW CURB LINE NO STRUCTURAL STEEL BELOW CURB LINE
DRAINAGE TUBE ARRANGEMENT



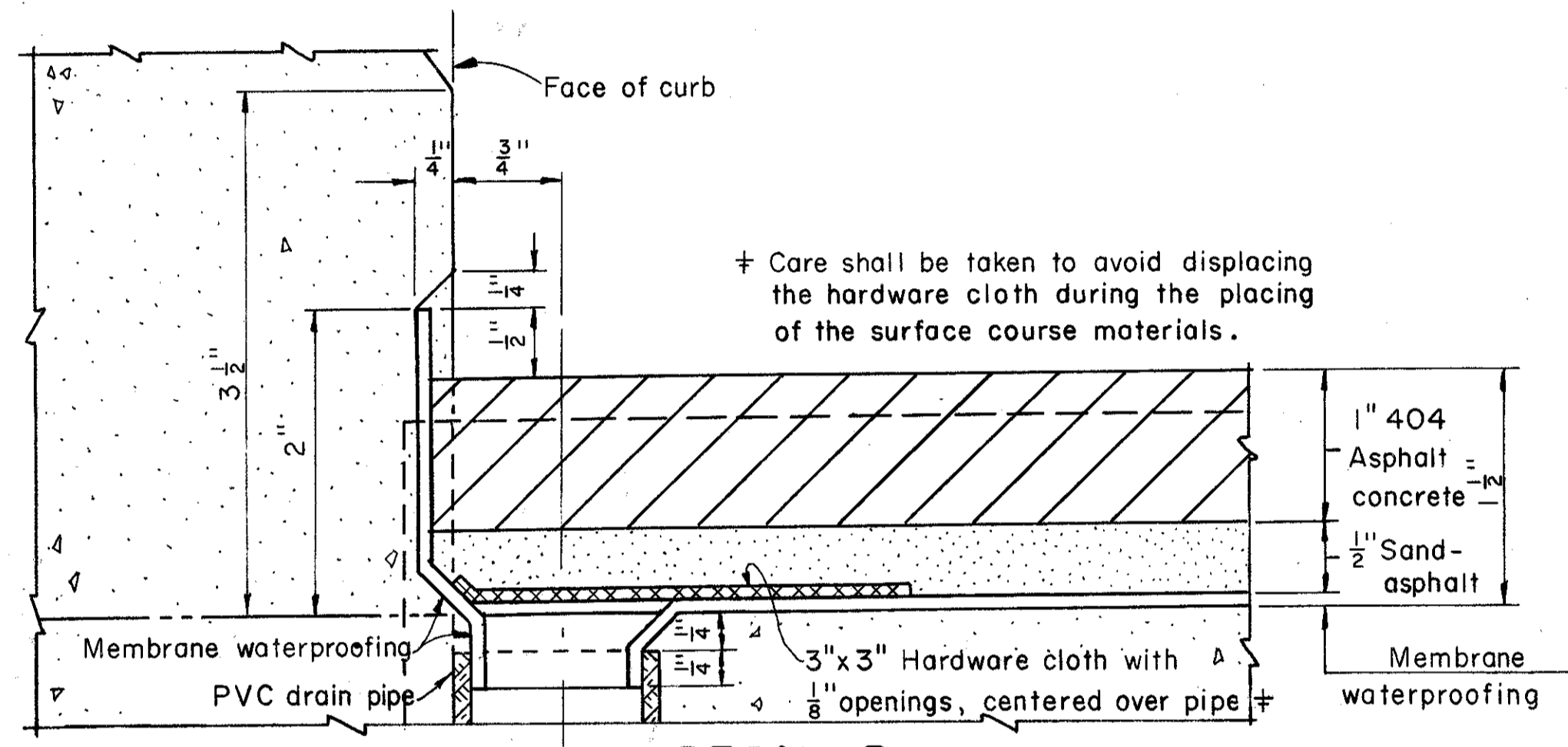
SCUPPER DETAILS
(Scupper details conform to SD-1-69 except as noted)

SUBDRAINAGE FOR ASPHALT CONCRETE SURFACE COURSE
The subdrainage system shall consist of PVC pipes and fittings and structural tubes as specified on this sheet. The pipes shall be spaced at approximately six foot intervals with a pipe placed within one foot of each expansion joint, except that they shall be relocated or extended as necessary for any discharge to clear bridge seats, structural members such as beams, diaphragms and crossbracing by at least six (6) inches. Pipes shall not be placed over or within four (4) feet of a pavement or sidewalk, within ten (10) feet of the centerline of a railroad track or along curb lines where the deck configuration does not permit water to accumulate.

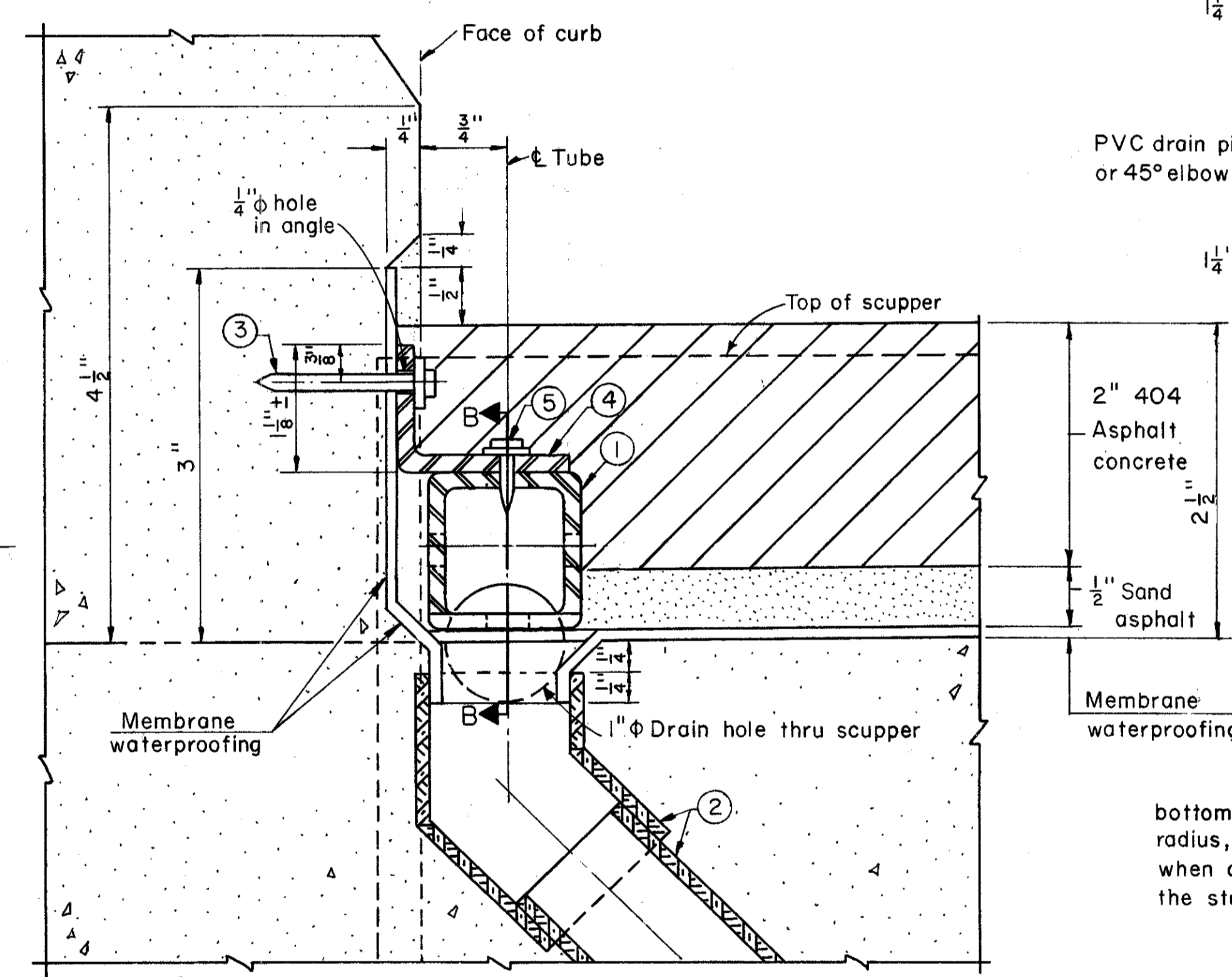
Where the plans specify a two and one half ($2\frac{1}{2}$) inch surface course, the subdrainage shall be as shown on Detail A. The structural tube may be placed in any convenient lengths using butt joints. The price bid per linear foot for this drainage system shall include all PVC pipe and fittings, structural tubes, and all labor necessary to complete the item. The quantity will be the actual length of structural tube required. Payment will be made at the contract price for: Item 518, Lin. Ft., Subdrainage for wearing course, as per plan.

Where the plans specify a one and one half ($1\frac{1}{2}$) inch surface course, the subdrainage shall be as shown in Detail B. The price bid for each drain shall include the PVC pipe and fitting, the hardware cloth and all necessary labor to complete the item. Payment will be made at the contract price for: Item 518, E.a., Subdrainage for wearing course, as per plan.

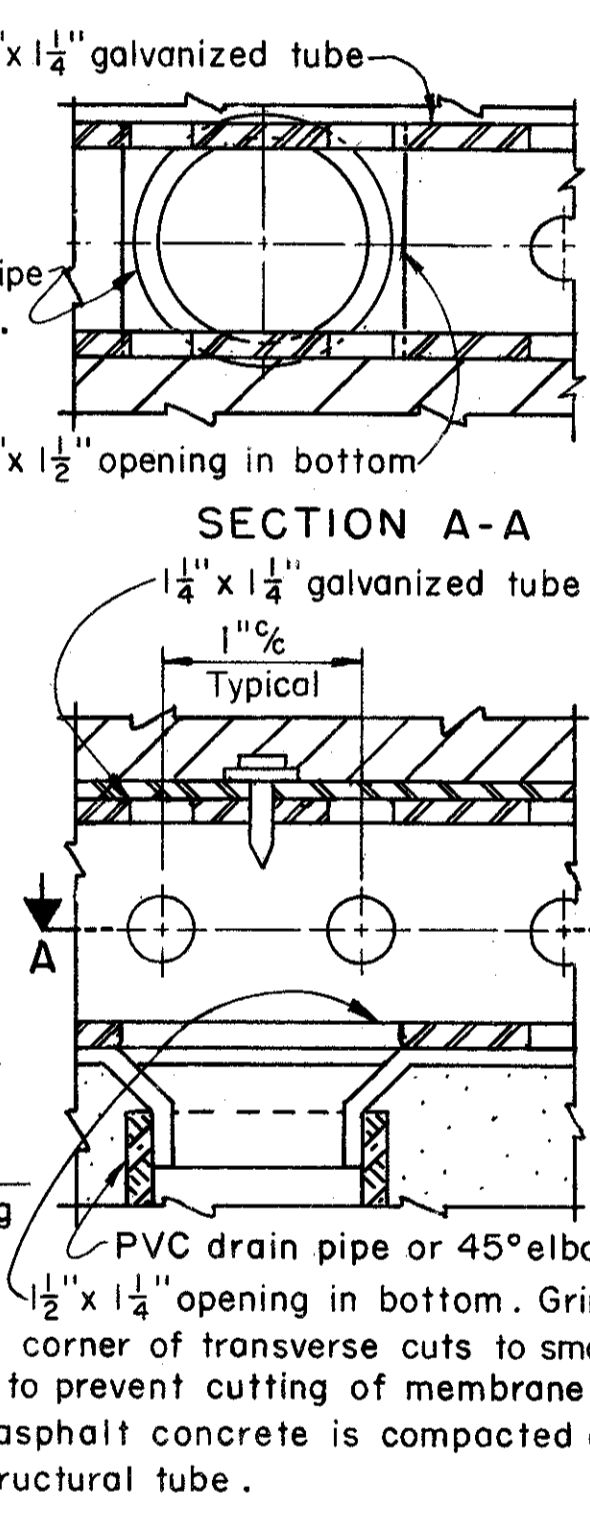
If no sand-asphalt is specified, the 404 shall be either $2\frac{1}{2}$ " placed in two $1\frac{1}{4}$ " courses or $1\frac{1}{2}$ " placed in one course.



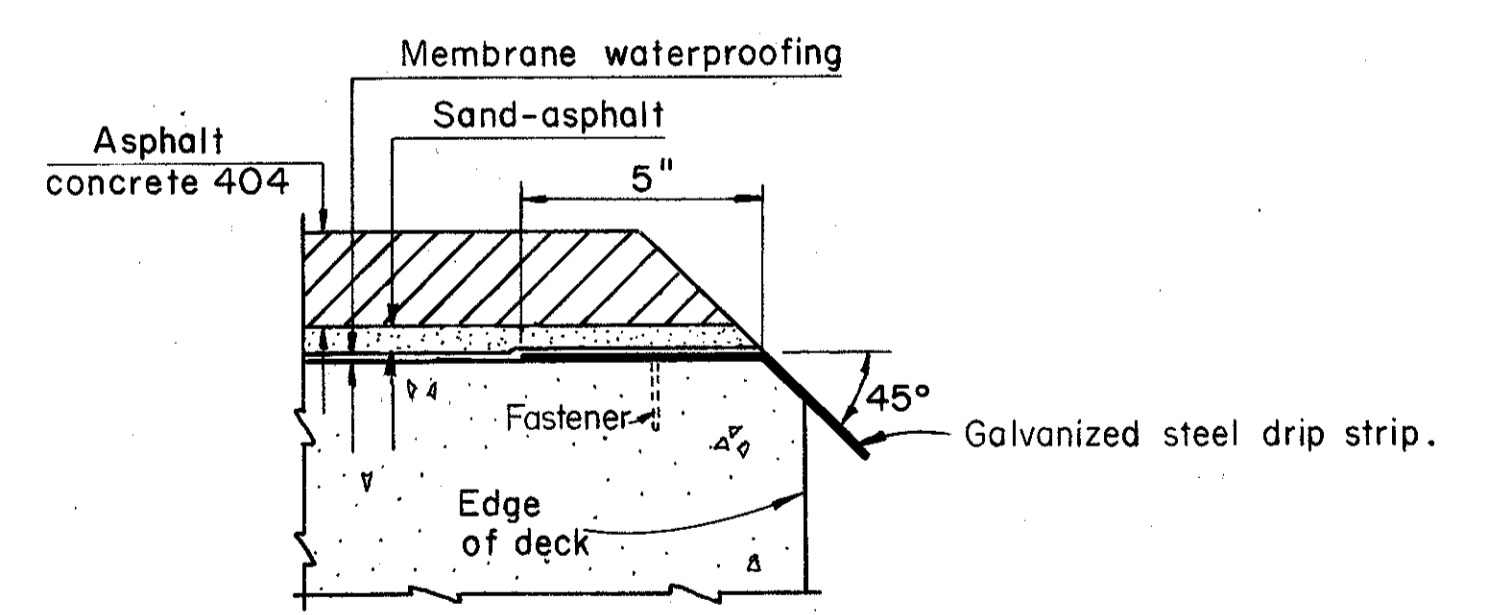
DETAIL B
SUBDRAINAGE FOR $1\frac{1}{2}$ " SURFACE COURSE



DETAIL A
SUBDRAINAGE FOR $2\frac{1}{2}$ " SURFACE COURSE

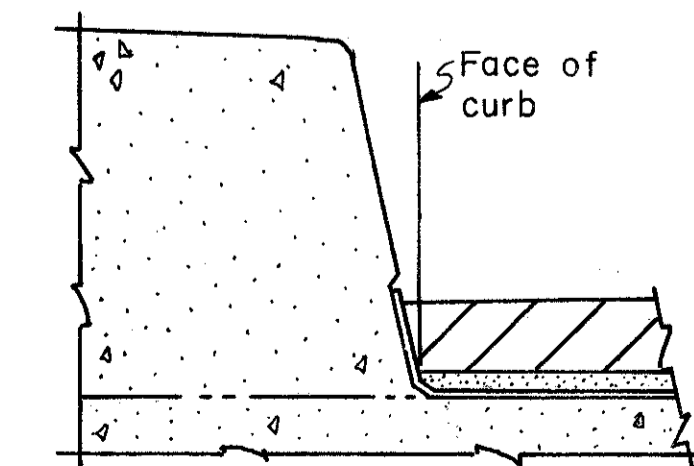


- $1\frac{1}{4}$ " x $1\frac{1}{4}$ " galvanized, perforated, structural tube with $\frac{1}{2}$ " \pm holes 1" on centers on all four sides as shown. Cut $1\frac{1}{2}$ " x $1\frac{1}{4}$ " opening in bottom, centered over each PVC drain pipe. The steel for the structural tube shall conform to the following: PREGALVANIZED, ASTM A446, Grade A Steel, Galvanizing as per ASTM A525. POSTGALVANIZED, ASTM A569 or A366, Galvanizing as per 711.02. The minimum steel thickness shall be 0.105". Any damaged galvanizing shall be repaired as per AASHO M36.
- 1" PVC DRAIN PIPE AND 45° ELBOW, SCHEDULE 40. Position accurately to match $1\frac{1}{2}$ " x $1\frac{1}{4}$ " openings in perforated tube. Place membrane to lap into the pipe, and seal the hole around the lip of the pipe. (This operation is important to the servicability of the membrane.) The drain pipe and elbow shall comply with the dimensions and markings of ASTM D1785 and ASTM D2466, Type I and II respectively. The elbow shall be used only where structural steel is below curb line. Where the elbow is not adequate to provide clearance between the PVC pipe and the structural steel, the elbow shall be canted as required and cut on a line $\frac{1}{4}$ " below and parallel with the deck surface. The solvent cement for the pipe and fittings shall conform to ASTM D2564.
- $1\frac{1}{4}$ " x $\frac{5}{32}$ " x $\frac{1}{4}$ " flat head drive pin and washer. Fastening of the structural tube by methods other than shown shall be subject to approval by the Engineer. (Driving pins into bridge deck is prohibited.)
- $1\frac{1}{2}$ " x $1\frac{1}{2}$ " x $\frac{1}{8}$ " x 3" long, clipped and galvanized, or bent galvanized steel plate $2\frac{1}{2}$ " x 3" x 0.105" thick. Attach to curb at approximately 10'-0" except near joints, where the angle shall be placed within 6" of the end of each tube section.
- $\frac{1}{2}$ " x $\frac{1}{8}$ " x $\frac{1}{4}$ " flat head drive pin and washer driven thru angle and tube.



DRIP STRIP
BRIDGES WITHOUT CURBS

Galvanized Steel Drip Strip: Prior to applying deck membrane waterproofing a bent galvanized steel drip strip, 8" x 0.105" shall be installed along the edges of the deck as shown. The strips shall be fastened at 3'-0" maximum with power driven pins or #10 galvanized expansion screws, subject to the approval of the Engineer. The strips shall be placed the full length of the deck. Where splices are required a 3" (min.) lap shall be used, with a fastener through the lap. Steel shall meet the requirements of ASTM A568 and galvanizing shall be in accordance with 711.02. Payment shall be at the contract price bid for Item Special, Sq. Ft., Galvanized steel drip strip, which shall include all materials, labor, tools and incidentals necessary to complete the item.



SHAPE OF SIDEWALK CURB

STATE OF OHIO DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS BUREAU OF BRIDGES						
DECK DRAINAGE DETAILS FOR BRIDGES WITH ASPHALT CONCRETE SURFACE COURSE						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	SHEET
DLM	GF		CPD	WJJ	7-27-73	CD 2

80-6

CONVENTIONAL SIGNS

PROPERTY LINE	— — — — —	— — — — —
EXISTING RIGHT OF WAY	— — — — —	— — — — —
SUBDIVISION LINE	— — — — —	— — — — —
SUBLOT LINE OR EXISTING EASEMENT	— — — — —	— — — — —
ORIGINAL TOWNSHIP LOT LINE	— — — — —	— — — — —
CORPORATION LINE	— — — — —	— — — — —
LIMITED ACCESS LINE	— — — — —	— — — — —
RIGHT OF WAY LINE	— — — — —	— — — — —
TEMPORARY RIGHT OF WAY	— — — — —	— — — — —
SEWER EASEMENT LINE	— — — — —	— — — — —
SLOPE EASEMENT LINE	— — — — —	— — — — —
CHANNEL EASEMENT	— — — — —	— — — — —
PARTICIPATION LINE	— — — — —	— — — — —
CENTER LINE	— — — — —	— — — — —
FENCE LINE	— — — — —	— — — — —
GUARD RAIL (EXISTING)	— — — — —	— — — — —
GUARD RAIL (PROPOSED)	— — — — —	— — — — —
RAILROAD	— — — — —	— — — — —
POWER POLES	— — — — —	— — — — —
TELEPHONE POLES	— — — — —	— — — — —
POWER AND TELEPHONE POLES	— — — — —	— — — — —
LIGHT POLES	— — — — —	— — — — —
TREES (EXISTING)	— — — — —	— — — — —
ELECTRICAL TOWER	— — — — —	— — — — —
WATER LINE	— — — — —	— — — — —
GAS LINE	— — — — —	— — — — —
TELEPHONE CONDUIT	— — — — —	— — — — —
SEWER (EXISTING)	— — — — —	— — — — —
OIL LINE	— — — — —	— — — — —
FIRE HYDRANT (EXISTING)	— — — — —	— — — — —
FIRE HYDRANT (PROPOSED)	— — — — —	— — — — —
MANHOLE (EXISTING)	— — — — —	— — — — —
MANHOLE (PROPOSED STORM)	— — — — —	— — — — —
MANHOLE (PROPOSED SANITARY)	— — — — —	— — — — —
CATCH BASIN OR INLET (EXISTING)	— — — — —	— — — — —
CATCH BASIN OR INLET (PROPOSED)	— — — — —	— — — — —
LIMIT ACCESS AND RIGHT OF WAY LINE	— — — — —	— — — — —
AERIAL EASEMENT LINE	— — — — —	— — — — —
CONSTRUCTION LIMIT LINE	— — — — —	— — — — —
EXISTING LIMIT ACCESS LINE	— — — — —	— — — — —

INDEX OF SHEETS

TITLE SHEET	1
CENTERLINE SURVEY PLAT	1
SCHEMATIC PLAN	2
SUMMARY OF ADDITIONAL RW REQUIRED	3-14
PLAN SHEETS	15-17A-25
PENN CENTRAL RR. PLAT	26
NORFOLK & WESTERN RR. PLAT	27

**STATE OF OHIO
DEPARTMENT OF HIGHWAYS
CUY-80-21.40**

**CUYAHOGA COUNTY
CITY OF GARFIELD HTS.
CITY OF MAPLE HTS.**

**I-80-4(8) RIGHT OF WAY ONLY
LIMITED ACCESS**

THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02, REVISED CODE OF OHIO

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

362
390

CUYAHOGA COUNTY
CUY-80-21.40
CUY-80-19.40 RIGHT OF WAY ONLY
I-80-4(8) RIGHT OF WAY ONLY
Project designation CUY-80-21.40 appearing throughout this plan shall be considered to read CUY-80-21.40

**I-80-4(31)174
1973 SPECIFICATIONS**

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES & SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

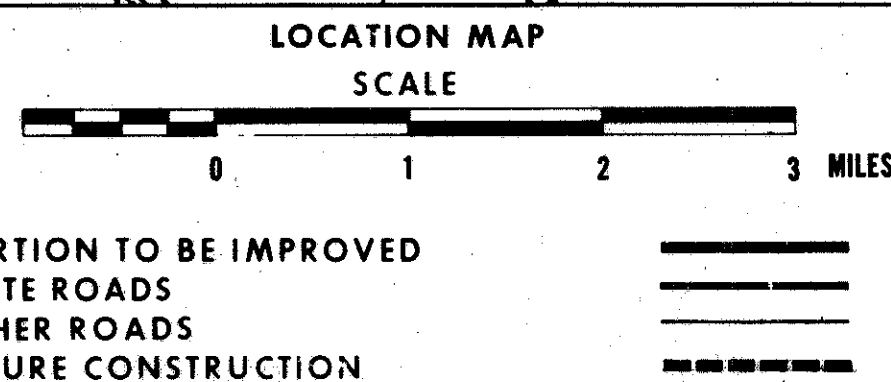
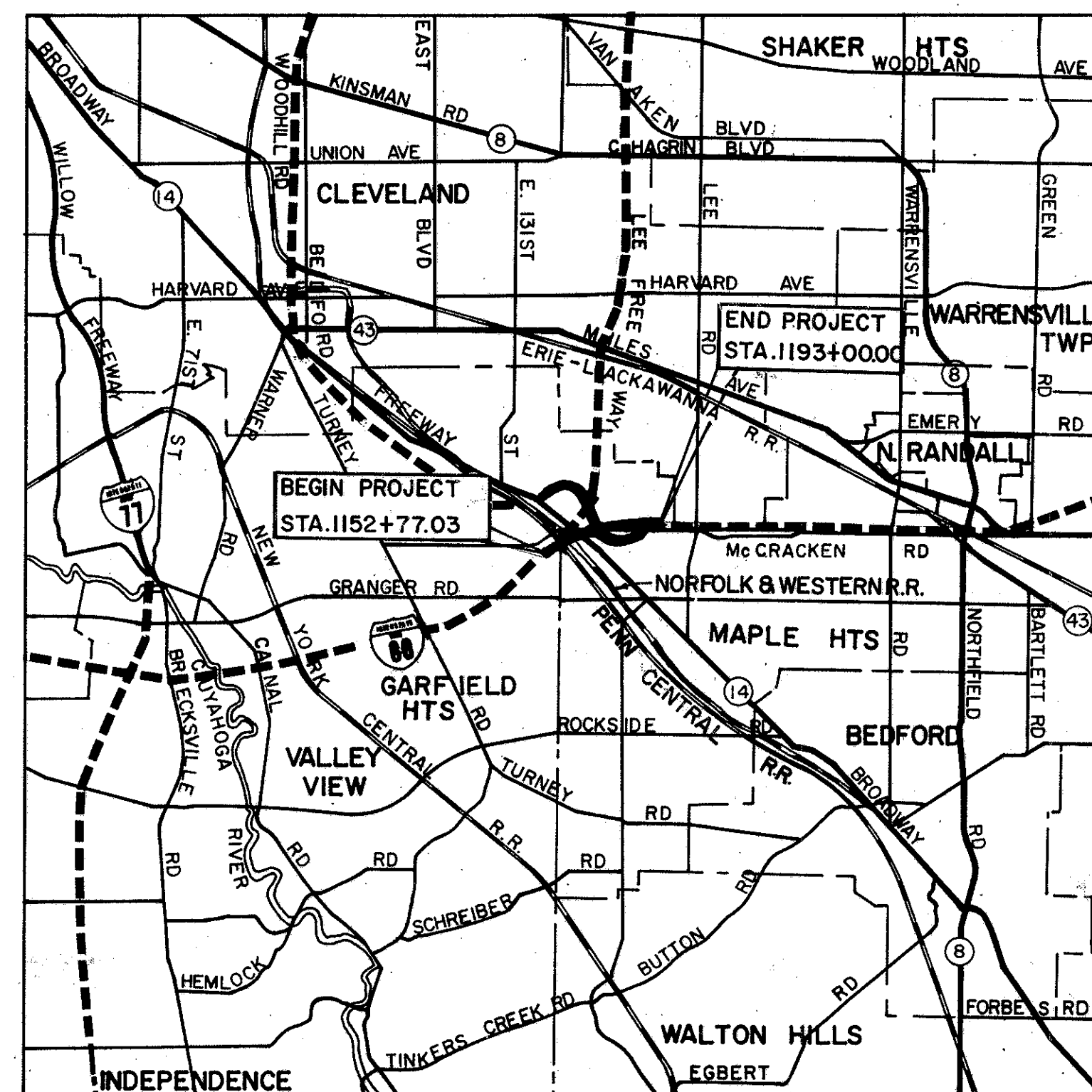
THE RIGHT OF WAY FOR THIS IMPROVEMENT WILL BE PROVIDED BY THE STATE OF OHIO.

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 _____ DISTRICT DEPUTY DIRECTOR OF TRANSPORTATION

APPROVED _____
DATE _____ ASSISTANT DEPUTY DIRECTOR FOR REAL ESTATE

APPROVED _____
DATE _____ DEPUTY DIRECTOR, DIVISION OF HIGHWAYS



PLAN SCALE 1"=20',50'

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

H.G. SOURS
ASSOCIATE
COLUMBUS

BROWNING CROW

FILE NO.	CUYAHOGA COUNTY
	DATE OF LETTING
	CONTRACT NO.

**DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

APPROVED _____
DIVISION ENGINEER _____ DATE _____

CENTER LINE SURVEY PLAT

I.R. 80
CUYAHOGA COUNTY SEC. 21.40
NEWBURGH TWP. T. 7, R. 12, O.L. 486
BEDFORD TWP. T. 6, R. 11, O.L.'S 1 & 2
WARRENSVILLE TWP. T. 7, R. 11, O.L.'S 103, 104 & 105

656508

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

363
390

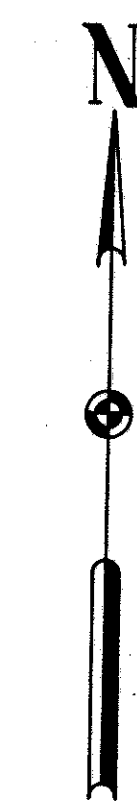
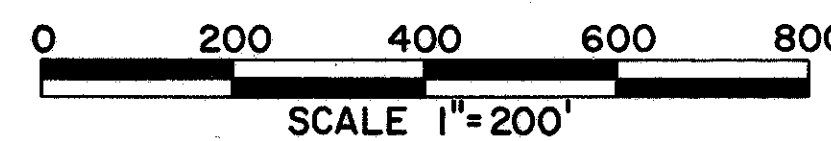
CUYAHOGA COUNTY
CUY. 80-21.40
CUY. 80-19.40 RIGHT OF WAY ONLY
I-80-4(8) RIGHT OF WAY ONLY

1
27

RECORDED FOR RECORD
AT 4:40 P.M.
SEP 25 1973

RECORDED IN CUYAHOGA COUNTY RECORDS
213

Note: All Monuments are Participation III except as noted.



CENTERLINE MONUMENT ASSEMBLY
LOCATION ON CENTERLINE AT STATIONS

Station	Monument Type	Location
50+80.89	PC.	Rel. McCracken Rd.
53+76.81		Rel. McCracken Rd.
59+37.46		Rel. McCracken Rd.
64+39.31	P.T.	Rel. McCracken Rd.
67+48.11	PC.	Rel. McCracken Rd.
73+48.29	P.T.	Rel. McCracken Rd.
74+64.90	P.T.	Rel. McCracken Rd.
76+85.72		Rel. McCracken Rd.
82+77.34		Rel. Greenhurst Rd.
8+30.00	PC.	Rel. Greenhurst Rd.
9+27.10	P.T.	Rel. Greenhurst Rd.
14+13.09	PC.	Rel. Greenhurst Rd.
15+36.26	P.T.	Rel. Greenhurst Rd.

CENTERLINE REFERENCE MONUMENT MODIFIED AS PER PLAN

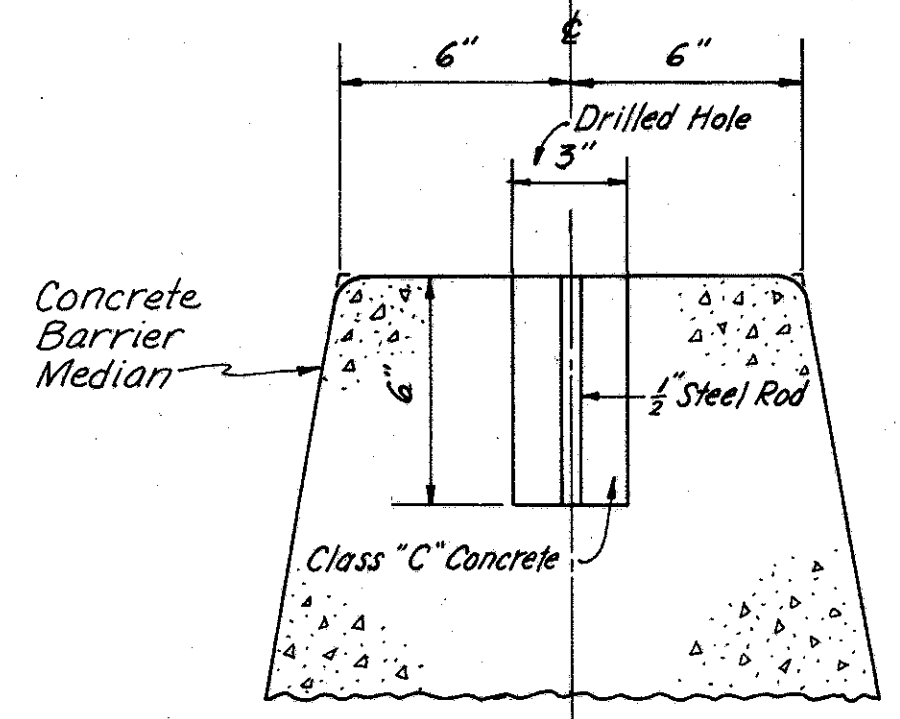
Station	Monument Type	Location
1159+64.53	T.S.	I-80
1163+00.00		I-80
1168+11.56		I-80
1174+08.58	C.S.	I-80
1176+58.58	S.T.	I-80
1185+00.00		I-80
44+06.16	Participation I	Bedford Frwy.
50+23.66		Bedford Frwy.
56+41.15	C.S.	Bedford Frwy.
60+41.15	S.T.	Bedford Frwy.
64+00.15	T.S.	Bedford Frwy.
68+00.15	S.C.	Bedford Frwy.
74+54.29		Bedford Frwy.

BEGIN PROJECT
I-80-4(32)176
CUY-80-22.16
I-80-4(31)174
END PROJECT
STA. 1193+00.00
CUY-80-21.40

LEGEND

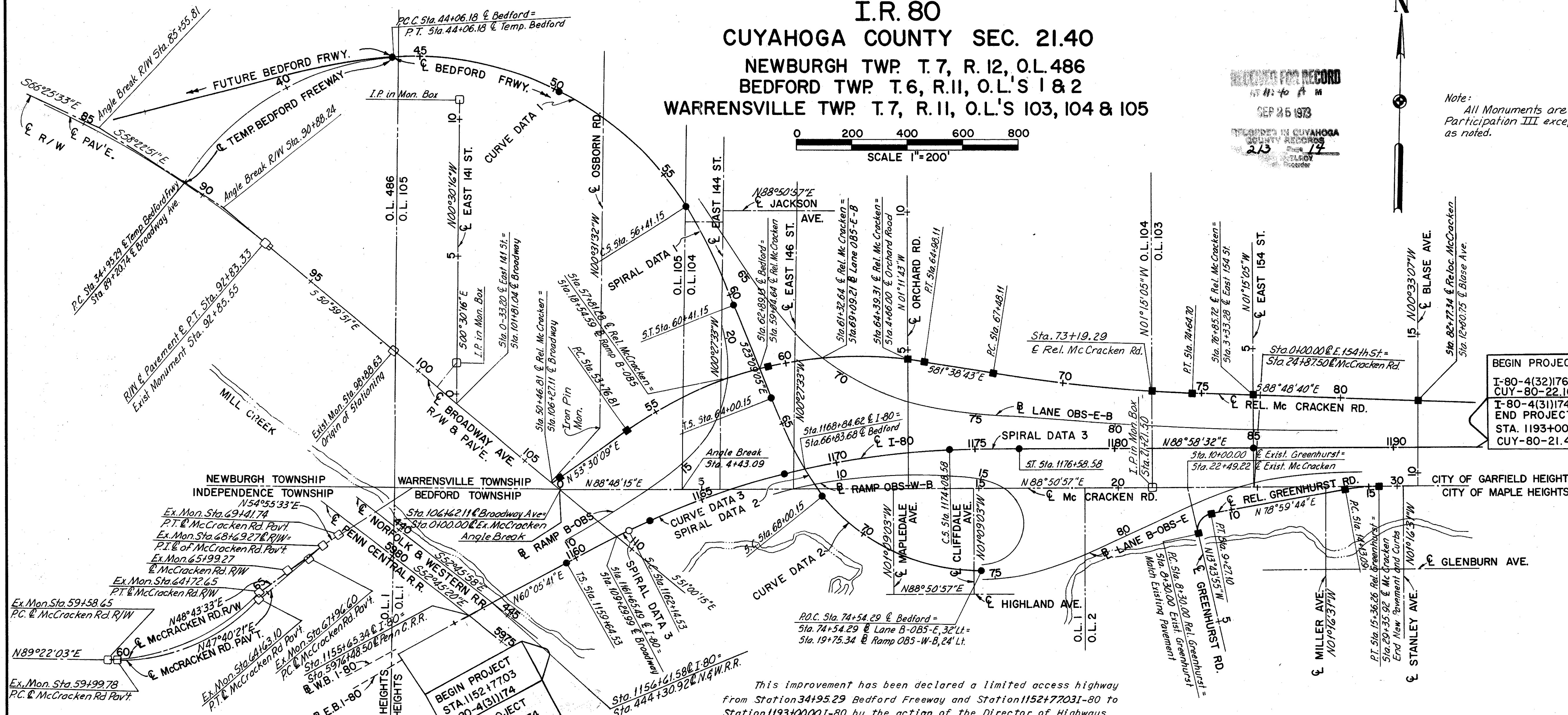
- Monument Assembly to be Provided, see Standard Construction Drawing MC-1. (See Station Call-Out)
- Existing Monument
- Centerline Reference Monument Modified as per Plan (See Station Call-Outs)
- Sta. Call-Outs

Note: Cost of furnishing and placing steel rod and class "C" concrete included in price bid for 604 centerline reference monuments.



CENTERLINE REFERENCE MONUMENT MODIFIED AS PER PLAN

This improvement has been declared a limited access highway from Station 34+95.29 Bedford Freeway and Station 1152+77031-80 to Station 1193+00001-80 by the action of the Director of Highways and recorded in Volume 45 Page 1230 of the Director's Journal pursuant to law.



CURVE DATA EX. McCracken Rd. PAV'T	CURVE DATA EX. McCracken Rd. R/W
Δ = 47°41'35"	Δ = 40°38'30"
R = 636.62	R = 716.20'
T = 242.46'	T = 265.23'
Arc = 463.32'	Arc = 508.02'
Ch = 453.16'	Ch = 497.44'
D = 9°00'00"	D = 8°00'00"

TEMPORARY BEDFORD FREEWAY CURVE DATA	BEDFORD FREEWAY CURVE DATA (1)	BEDFORD FREEWAY SPIRAL DATA (1)	REL. Mc CRACKEN RD. CURVE DATA	REL. GREENHURST RD. CURVE DATA	I-80 CURVE DATA (3)
PI = Sta. 39+88.73	PI = Sta. 50+91.30	θs = 16°00'00"	PI = Sta. 59+67.96	PI = Sta. 8+92.93	PI = Sta. 1168+20.35
Δ = 54°39'12"	Δ = 61°44'54"	Δ = 44°51'07"	Δ = 44°51'07"	Δ = 92°43'39"	Δ = 23°52'52"
D = 6°00'00"	D = 5°00'00"	Δ = 4°00'00"	D = 4°00'00"	D = 95°29'35"	D = 2°00'00"
R = 954.93'	R = 1145.92'	R = 1432.39'	R = 1432.39'	R = 60.00'	R = 2864.79'
T = 493.44'	T = 685.12'	T = 591.15'	T = 605.82'	T = 62.93'	T = 605.82'
L = 910.89'	L = 1234.97'	L = 1121.30'	L = 1194.05'	L = 97.10'	L = 1194.05'
E = 119.95'	E = 189.19'	E = 117.19'	E = 26.95'	E = 26.95'	E = 63.36'

BEDFORD FREEWAY SPIRAL DATA (2)	BEDFORD FREEWAY CURVE DATA (2)	REL. Mc CRACKEN RD. CURVE DATA	REL. GREENHURST RD. CURVE DATA	I-80 SPIRAL DATA (3)
θs = 10°00'00"	PI = Sta. 71+52.03	PI = Sta. 71+06.87	PI = Sta. 14+74.82	θs = 2°30'00"
Ls = 400.00'	Δ = 52°19'53"	Δ = 7°09'57"	Δ = 9°51'14"	Ls = 280.00'
D = 8°00'00"	D = 8°00'00"	D = 1°00'00"	D = 8°00'00"	S.T. = 83.35'
R = 716.20'	R = 716.20'	R = 5729.58'	R = 716.20'	L.T. = 166.68'
S.T. = 133.72'	T = 351.88'	T = 358.76'	T = 61.74'	
L.T. = 267.09'	L = 654.14'	L = 716.59'	L = 123.17'	
	E = 81.77'	E = 11.22'	E = 2.66'	

I hereby certify that this plat is a true delineation of a survey made for the Ohio Department of Highways in
By Henry H. Carpenter Registered Surveyor No. 4671
Date 3-16-72



Howard, Needles, Tammen and Bergendoff
Consulting Engineers

Signed Joseph J. Howell
Date 9-21-73 Division Deputy Director
Ohio Department of Highways

SCALE: HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE BY: DATE: 1-3-68 CONSULTING ENGINEERS
TRCD: DATE: 1-3-68 KANSAS CITY CLEVELAND NEW YORK
CRD: DATE: 4-28-72

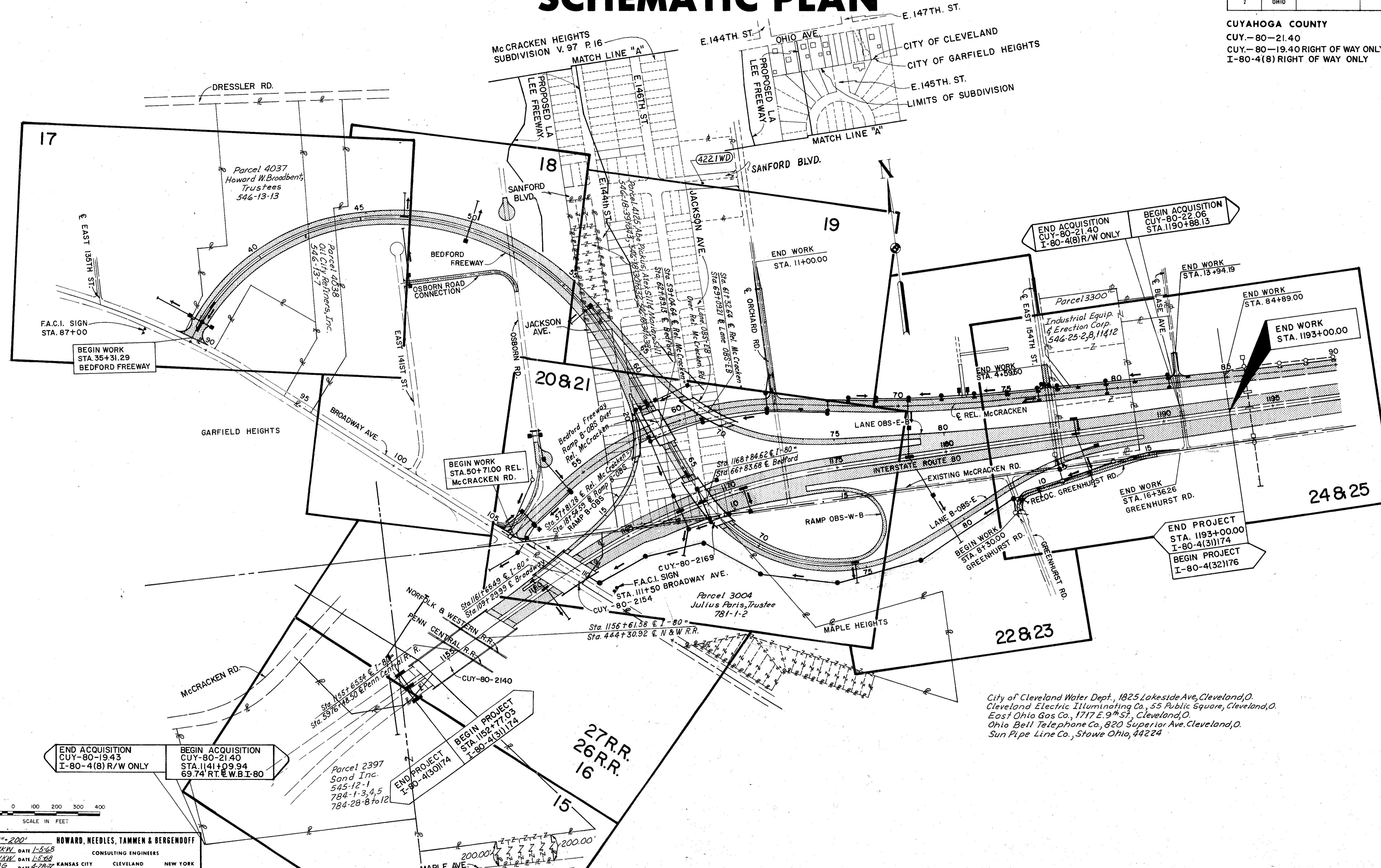
SCHEMATIC PLAN

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

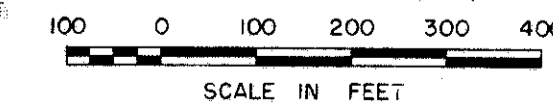
364
390

2
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CUYAHOGA COUNTY
 CUY.-80-21.40
 CUY.-80-19.40 RIGHT OF WAY ONLY
 I-80-4(8) RIGHT OF WAY ONLY



*City of Cleveland Water Dept., 1825 Lakeside Ave, Cleveland, O.
 Cleveland Electric Illuminating Co., 55 Public Square, Cleveland, O.
 East Ohio Gas Co., 1717 E. 9th St., Cleveland, O.
 Ohio Bell Telephone Co., 820 Superior Ave, Cleveland, O.
 Sun Pipe Line Co., Stowe Ohio, 44224*



SCALE 1"=200'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE WKN, DATE 1-5-68 CONSULTING ENGINEERS
 TRCD WKN, DATE 1-5-68
 CRD JAG, DATE 4-28-72 KANSAS CITY CLEVELAND NEW YORK

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

STATE NO. 12331(O)	FED RD DIVISION 2	STATE OHIO	PROJECT
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365
390

3
27

CUYAHOGA COUNTY
CUY. 80-21.40
CUY. 80-19.40 RIGHT OF WAY ONLY
I-80-4(8) RIGHT OF WAY ONLY

Quantity Calculations
 Made By WKW Date 12-22-67
 Checked By JAG Date 4-28-72

171- Total Owners
 117- Total Takes
 55- Total Structures
 46- Total Takes with Structures
 * Note:
 See last line for Parcel
 23985.

PARCEL NO.	OWNER	AUD. NO.	TYPE FUNDS	DEED RECORD		DEED AREA	TOTAL P.R.O.	TOTAL TAKE	P.R.O. INTAKE		NET TAKE		LEFT RESIDUE		RIGHT RESIDUE		SHEET NO.	REMARKS
				BOOK	PAGE				LAND	BLDG	NET	PRO.	NET	PRO.				
2397WL	Sand Inc.	545-12-1	I	9434	1	982,062	-	513241	-	513241	No	-	-	-	468778	-	15, 16	
2397Aerial		784-28-8 to 12		10987	605		-	2617	-	2617		-	-	-	-	-	16	
2397-1		784-1-3,4					-	19	-	19		-	-	-	-	-	16	
2397-2							-	24	-	24		-	-	-	-	-	16	
23977							-	36547	-	36547		-	-	-	-	-	15	Construct Slopes
2398WL	William L. Schloss Asphalt Paving	545-12-2		7690	28	145528	8712	122734	-	122734	Yes	33968	8712	-	-	-	15, 16	
2398Aerial		784-1-5					-	3140	-	3140		-	-	-	-	-	16	
2398-1							-	80	-	80		-	-	-	-	-	16	
2398-2							-	34	-	34		-	-	-	-	-	16	
2399Aerial	Penn Central Railroad Company	784-3-10		3984	407	-	-	42659	-	42659	No	-	-	-	-	-	27	
2399-1							-	152	-	152		-	-	-	-	-	27	
2399-2							-	274	-	274		-	-	-	-	-	27	
2399-3							-	442	-	442		-	-	-	-	-	27	
2399-4							-	442	-	442		-	-	-	-	-	27	
2399-5							-	468	-	468		-	-	-	-	-	27	
2399-6							-	442	-	442		-	-	-	-	-	27	
2399-7							-	284	-	284		-	-	-	-	-	27	
2399-8							-	312	-	312		-	-	-	-	-	27	
2399-9							-	340	-	340		-	-	-	-	-	27	
2399S							-	3708	-	3708		-	-	-	-	-	27	
2400Aerial	Norfolk and Western Railroad Company	784-2-10					-	15386	-	15386	No	-	-	-	-	-	26	
2400WL							-	14188	-	14188		-	-	-	-	-	26	
2400-1							-	358	-	358		-	-	-	-	-	26	
2400-2							-	168	-	168		-	-	-	-	-	26	
2400S							-	1998	-	1998		-	-	-	-	-	26	
2401WL	McCracken Properties, Inc.	784-1-2		9407	123	256,568	20743	148,087	10,580	137,507	Yes	58204	7634	40114	2529	16	Total Taking AP-12-124	
2401X				8603	250			6392	-	6392		-	-	-	-	-	16	
2401S			Interstate					706	-	706		-	-	-	-	-	16	
2401 EL-1			State					65838	7634	58204		-	-	-	-	-	16	Area of 2401EL-1 includes 2401S & 2401X Area.
2401 I		784-1-2	Interstate					29,508	25,229	26,979		-	-	-	-	-	16	Remove 15 Br&Bl Commercial Building.
2401 EL-2			State					42643	2529	40114		-	-	-	-	-	16	Area of 2401EL-2 includes 2401I Area.
2402WL	Lincoln National Life Insurance Company	784-1-1	Interstate	8874	462	38,573	9328	18,975	2751	16,224	Yes	13,021	6,577	-	-	-	16	
2402T								13,824	5235	8,589		-	-	-	-	-	16	Gas Pumps & Concrete Slabs
2402S								5774	1342	4432		-	-	-	-	-	16	
3001WL	Beatrice B. Sands, Alan Sands and The Cleveland Trust Company Trustees	781-1-1		9074	552	27,128	-	27,128	-	27,128	No	-	-	-	-	-	16, 20	Total Taking, separate Parcel from 3003WL
3001WD				9760	113			-	-	-		-	-	-	-	-	16, 20	3001WD Area included in 3001WL
3002WL	Mary Sabo	546-17-2		10142	72	15,000	-	15,000	-	15,000	No	-	-	-	-	-	20	Total Taking
3003WL	Beatrice B. Sands, Alan Sands, and the Cleveland Trust Company Trustees	781-1-1		9074	552	38,028	15,156	38,028	15,154	22,874	Yes	-	-	-	-	-	16, 20	Total Taking, Separate Parcel from 3001WL
3003 A-WL	Metromedia, Inc.	781-1-7		11370	600	16,109	3,180	16,409	3180	13,229	No	-	-	-	-	-	16, 20	Total Taking
3004 WL	Julius Paris, Trustee	781-1-2		10367	133	69,742	27,928	94,088	10,792	83,296	No	582,318	17,036	-	-	-	16, 20	P. R. O. in Take is McCracken Road
3004 X		781-1-1-3 to 6		10120	711, 717			52,619	-	52,619		-	-	-	-	-	20	
3004 S		781-2-45 to 49		10120	725			21,146	-	21,146		-	-	-	-	-	16, 20	
3004 T		781-2-79 to 89		10182	503			8139	-	8139		-	-	-	-	-	16, 20	Toe of Slope
3005 WL	Ed Robeson	781-1-1, 2		8029	582	26,680	-	26,680	-	26,680	No	-	-	-	-	-	20	Total Taking, Separate Parcel from 3015WL. Parcels 3005X and 3005S purchased under 3005WL.
3005 X		781-2-5		8029	584			-	-	-		-	-	-	-	-	20	
3005 S		781-1-31 to 34						-	-	-		-	-	-	-	-	20	
3007 WL	Clara Ban	781-1-3 781-2-4		7080	302 304	9600	-	9,600	-	9,600	No	-	-	-	-	-	20	Total Taking
3015 WL	Ed Robeson	781-1-16 to 30		8029	580	24000	-	24000	-	24000	No	-	-	-	-	-	20	Total taking, separate Parcel from 3005WL, Parcels 3015X and 3015S
3015 X				8029	584			-	-	-		-	-	-	-	-	20	purchases under 3015WL.
3015 S								-	-	-		-	-	-	-	-	20	
3020 WL	Louis S. Rubin	781-1-6 781-1-7	I	8070	727 729	9600	-	9,600	-	9,600	No	-	-	-	-	-	20	Total Taking, separate Parcel from 4141WL
23985			I	8070	729			618	-	618		-	-	-	-	-	16	

Item	Description		Unit	Lin. Ft.	Lin. Ft.	Lin. Ft.
	Chain Link Fence	Chain Link Fence				
Total Quantity	12,632	1711		0	0	15,005
23	1711	1711		0	0	
22	1860	1860		0	0	
20	2976	2976		0	0	
19	2110	2110		0	0	
18	1479	1479		0	0	
17	0	0		0	0	
16	2400	2400		0	0	
15	0	0		0	0	

SCALE: HOWARD NEEDLES, TAMMEN & BERGENDOFF
 MADE BY: WKW DATE: 12-22-67 CONSULTING ENGINEERS
 TRCD: WKW DATE: 12-22-67
 CRD: JAG DATE: 4-28-72 KANSAS CITY CLEVELAND NEW YORK

JAG	Revised Parcels 23985, 23995 & 24005	7-27-72
JAG	Adjusted Deed Area for Parcel 2397	5-6-71
NAME	REVISION	DATE

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

366
390

4
27

CUYAHOGA COUNTY
 CUY. 80-21.40
 CUY. 80-19.40 RIGHT OF WAY ONLY
 I-80-4(B) RIGHT OF WAY ONLY

Quantity Calculations
 Made By WKW Date 12-22-67
 Checked By JAG Date 4-28-72

PARCEL NO.	OWNER	AUD. NO.	TYPE FUNDS	DEED RECORD		DEED AREA	TOTAL P.R.O.	TOTAL TAKE	P.R.O. INTAKE	NET TAKE		LEFT RESIDUE		RIGHT RESIDUE		SHEET NO.	REMARKS	
				BOOK	PAGE					LAND	BLDG	NET	PRO.	NET	PRO.			
3022 WL	John C. Suhaj and Anna L. Suhaj	781-2-8 781-2-9	I	6270	252	9600	-	9600	-	9600	Yes	-	-	-	-	20	Total Taking	
				7018	447													
3024 WL	Joseph M Vasek and Marie M. Vasek	781-2-10, 11		6855	45	9600	-	9600	-	9600	Yes	-	-	-	-	20	Total Taking	
				7017	65													
3026 WL	Albert A. Levin	781-2-21 to 25		8426	452	24000	-	24000	-	24000	No	-	-	-	-	20	Total Taking, A Separate Parcel From	
3026 S																20	3041 WL. Parcel 3026 S purchased under 3026 WL.	
3031WL-1	The A.P. Investment Co. & Albert A. Levin Estate	781-2-35 to 44		7060	277	107325	-	14188	-	14188	No	-	-	77067(L)	-	20	Landlocked Due to Freeway	
3031WL-2																		
3031X-1										15366	-	-	-	-	-	20	Mapledale Ave, Cliffdale Ave, & Highland Rd	
3031X-2										5457	-	-	-	-	-	21	"Not Dedicated" as shown.	
3031S-1										1265	-	-	-	-	-	20		
3031S-2										8408	-	-	-	-	-	20		
			INTERSTATE															
3041 WL	Albert A. Levin	781-2-13		8426	448	28598	-	28598	-	28598	No	-	-	-	-	22	Total Taking, A Separate Parcel From	
3041 S		781-2-16 to 20		8426	450											21	3026 WL. Parcel 3041 S purchased under 3041 WL.	
3046 WL	Samuel B. Tilles	781-2-12		8266	137	4800	-	4800	-	4800	No	-	-	-	-	22	Total Taking	
3048 WL	Mary Bobinchuck	781-2-14		7630	515	4767	-	4767	-	4767	No	-	-	-	-	22	Total Taking	
3049 WL	Pearl L. Round	781-2-102		10990	105	7500	1000	7500	1000	6500	Yes	-	-	-	-	22	Total Taking	
3050 WL	John Windt and Maria Windt	781-2-100		6874	185	7650	1020	7650	1020	6630	Yes	-	-	-	-	22	Total Taking	
3051 WL	Charles L. Hevitan and Gizella Hevitan	781-2-101	I	8034	159	9090	-	9090	-	9090	Yes	-	-	-	-	22	Total Taking	

SCALE: HOWARD, NEEDLES, TAMMEN & BERGENOFF
 MADE BY WKW DATE 12-22-67 CONSULTING ENGINEERS
 TRCD WKW DATE 12-22-67
 CKD JAG DATE 4-28-72 KANSAS CITY CLEVELAND NEW YORK

NAME	REVISION	DATE

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

367
390

CUYAHOGA COUNTY
CUY. 80-21.40
CUY. 80-19.40 RIGHT OF WAY ONLY
I-80-4(B) RIGHT OF WAY ONLY

5
27

Quantity Calculations
Made By WKW Date 12-22-67
Checked By JAG Date 4-28-72

PARCEL NO.	OWNER	AUD. NO.	TYPE FUNDS	DEED RECORD		DEED AREA	TOTAL P.R.O.	TOTAL TAKE	P.R.O. INTAKE	NET TAKE		LEFT RESIDUE		RIGHT RESIDUE		SHEET NO.	REMARKS
				BOOK	PAGE					LAND	BLDG	NET	P.R.O.	NET	P.R.O.		
3052 WL	John L. Molner	781-2-15	I	10357	361	88027	801	42148	801	41347	Yes	-	-	45879(L)	-	22	Total Taking
3052 T			I				-	8115	-	8115	-	-	-	-	-	22	
3052 X			I				-	21770	-	21770	-	-	-	-	-	22	
3052 S			I				-	6529	-	6529	-	-	-	-	-	22	
3052 EL			State				-	45879(L)	-	45879(L)	-	-	-	-	-	22	
3053 X	Donald M. Grossmyer and Patricia Grossmyer	781-3-52	I	12319	411	31620	1400	447	-	447	No	-	-	30220	1400	22	
3054 X	Joseph H. Mulac and Dorothy Mulac	781-3-51		6086	166	30498	1400	11562	-	11562	No	-	-	29098	1400	24	
3055 WL-1	Abe Pickus	781-3-7		7659	338	55209	4509	9135	3010	6125	No	-	-	31722	1499	24	A Separate Parcel From 3077 WL and
3055 WL2		781-3-50		7659	340		-	12853	-	12853	-	-	-	-	-	24	4148 WL
3055 S-1							-	5177	-	5177	-	-	-	-	-	24	
3055 S-2							-	7341	-	7341	-	-	-	-	-	24	
3055 X-1							-	8871	-	8871	-	-	-	-	-	24	
3055 X-2							-	995	-	995	-	-	-	-	-	24	
3056 WL	Leonard Serio and Rose Serio	781-3-1		10364	547	7310	860	7310	860	6450	Yes	-	-	-	-	22	Total Taking
3057 WL	Leo J. Spreitzer, Jr. and Bernadette M. Spreitzer	781-3-2		10302	650	7310	860	7310	860	6450	Yes	-	-	-	-	22	Total Taking
3058 WL	Donald F. Carrizzo and Helen L. Carrizzo	781-3-3		9986	293	7310	860	7310	860	6450	Yes	-	-	-	-	22	Total Taking
3059 WL	Louise Fowler, Bert Svenson and Richard Deacon, Trustees	781-3-4		8252	176	7310	860	7310	860	6450	Yes	-	-	-	-	22	Total Taking
3060 WL	Albert Bramson	781-3-5		7694	68	14620	1720	14620	1720	12900	No	-	-	-	-	22	Total Taking, A Separate Parcel From
3060 S							-	-	-	-	-	-	-	-	-	22	3063 WL. Parcel 3060 S purchased under
3061 WL	Stanley E. Sibits and Irene F. Sibits	781-3-6		8473	169	7310	860	7310	860	6450	Yes	-	-	-	-	22	3060WL. Total Taking, Parcel 3061 S purchased
3061 S							-	-	-	-	-	-	-	-	-	22	under 3061 WL.
3063 WL	Albert Bramson	781-3-8		7694	68	46106	7657	12,234	4863	7,371	No	-	-	25047	-	24	A Separate Parcel From 3060 WL
3063 WD							-	8825	2794	6,031	-	-	-	-	-	24	
3063 T							-	3707	-	3707	-	-	-	-	-	24	Construct Slopes
3063 S							-	1200	-	1200	-	-	-	-	-	24	
3063 T-1							-	583	-	583	-	-	-	-	-	24	Work Area to Construct B "Water Main
3064 WL	Joseph Cavaluchi	781-3-9		7861	305	5086	-	1597	-	1597	No	-	-	1836	-	25	
3064 WD							-	1653	-	1653	-	-	-	-	-	25	
3064 T							-	994	-	994	-	-	-	-	-	25	Construct slopes.
3065 WL	Mary Bobinchuck	781-3-10		7621	425	6500	-	1242	-	1242	No	-	-	3229	-	25	
3065 WD							-	2029	-	2029	-	-	-	-	-	25	
3065 T							-	1417	-	1417	-	-	-	-	-	25	Construct slopes.
3067 WL	Margherita F. Lanese	781-3-11		7657	313	6500	-	808	-	808	No	-	-	3663	-	25	
3067 WD							-	2029	-	2029	-	-	-	-	-	25	
3067 T							-	1892	-	1892	-	-	-	-	-	25	Construct slopes.
3069 WL	Michael Marlow	781-3-12		7631	381	6500	-	374	-	374	No	-	-	4097	-	25	
3069 WD							-	2029	-	2029	-	-	-	-	-	25	
3069 T							-	2501	-	2501	-	-	-	-	-	25	Construct Slopes.
3069 S							-	63	-	63	-	-	-	-	-	25	
3071 WL	Jerry Jezek	781-3-13		7628	18	6500	-	28	-	28	No	-	-	4531	-	25	A Separate Parcel From 4150 WL and
3071 WD							-	1941	-	1941	-	-	-	-	-	25	4152 WL. Construct slopes.
3071 T							-	2027	-	2027	-	-	-	-	-	25	
3071 S			I				-	487	-	487	-	-	-	-	-	25	

INTERSTATE

L) = Landlocked Rest due

SCALE: WKW HOWARD, NEEDLES, TAMMEN & BERGENDOFF
DATE: 12-22-67 CONSULTING ENGINEERS
TRCD: WKW DATE: 12-22-67
CKD: JAG DATE: 4-28-72 KANSAS CITY CLEVELAND NEW YORK

JAG	Added Parcel 3063T-1	10-31-73
NAME	REVISION	DATE

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD DIVISION	STATE	PROJECT
2	OHIO	

368
390

CUYAHOGA COUNTY
CUY. 80-21.40
CUY. 80-19.40 RIGHT OF WAY ONLY
I-80-4(B) RIGHT OF WAY ONLY

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27

Quantity Calculations
Made By *WKW* Date *12-22-67*
Checked By *JAG* Date *4-28-72*

PARCEL NO.	OWNER	AUD. NO.	TYPE FUNDS	DEED RECORD		DEED AREA	TOTAL P.R.O.	TOTAL TAKE	P.R.O. INTAKE	NET TAKE		LEFT RESIDUE		RIGHT RESIDUE		SHEET NO.	REMARKS
				BOOK	PAGE					LAND	BLDG	NET	P.R.O.	NET	P.R.O.		
3073 WD 3073 T	George J. Spera	781-3-14	I	10972	407	6500	-	1535	-	1535	No	-	-	4965	-	25	Construct Slopes
								1476	-	1476	-	-	-	-	-	25	
3075 WL	Tony Fazi and Ann Fazi	781-2-104		10177	415	12000	1600	12000	1600	10400	No	-	-	-	-	22	Total Taking
3076 WL	Floyd K. Maxwell and Kathryn Maxwell	781-2-103		9047	9	6000	800	6000	800	5200	Yes	-	-	-	-	22	Total Taking
3077 WD 3077 T	Abe Pickus	781-4-1		6500	179	6825	-	678	-	678	No	-	-	6147	-	25	A Separate Parcel From 3055 WL and 4148 WL, 3077 T to construct slopes.
								886	-	886	-	-	-	-	-	25	
3078 WD 3078 T	The T.D. Improvement Company	781-4-2		8407	467	6500	-	272	-	272	No	-	-	6228	-	25	Construct Slopes
								943	-	943	-	-	-	-	-	25	
3079 WD 3079 T	Theima N. Mehn	781-4-3		1612	312	6500	-	53	-	53	No	-	-	6447	-	25	Construct Slopes
								871	-	871	-	-	-	-	-	25	
3080	Alex N. Sill and Abe and Etta Pickus	781-4-4		11860	567	-	-	-	-	-	-	-	-	-	-	-	Not Needed
3100 WL	John G. Studnicka and Joan Marie Studnicka	546-17-3	INTERSTATE	8058	685	10806	900	10806	900	9906	Yes	-	-	-	-	20	Total Taking
				10677	253												
3101 WL	John Svedek and Mildred Svedek	546-17-4		9780	337	10972	914	10972	914	10058	Yes	-	-	-	-	20	Total Taking
3102 WL	Town and Suburb Development, Inc.	546-17-5		11360	672	5000	-	5000	-	5000	No	-	-	-	-	20	Total Taking
3103 WL	Robert W. Foke and Aldona Foke	546-17-6 546-17-7 546-17-77 546-17-78		9004	171	18148	-	18148	-	18148	Yes	-	-	-	-	20	Total Taking
3105 WL	Edward J. Kaweckl and Lillian M. Kaweckl	546-17-8, 9		8454	527	8950	-	8950	-	8950	No	-	-	-	-	20	Total Taking
				8454	529												
3107 WL	Reno Muzzin and Pete Muzzin	546-17-10, 11		9966	112	8400	-	8400	-	8400	No	-	-	-	-	20	Total Taking
3109 WL	Joseph L. Rubin	546-17-12, 13	I	9920	626	8958	-	8958	-	8958	No	-	-	-	-	20	Total Taking

SCALE: *NKW* HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE: *NKW* DATE: *12-22-67* CONSULTING ENGINEERS
TRCD: *WKW* DATE: *12-22-67*
CRD: *JAG* DATE: *4-28-72* KANSAS CITY CLEVELAND NEW YORK

JAG	Deleted Parcel 3080	1-22-73
NAME	REVISION	DATE

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

369
390

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27

CUYAHOGA COUNTY
CUY. 80-2140
CUY. 80-19.40 RIGHT OF WAY ONLY
I-80-4(8) RIGHT OF WAY ONLY

Quantity Calculations
Made By WKW Date 12-22-67
Checked By JAG Date 4-28-72

PARCEL NO.	OWNER	AUD. NO.	TYPE FUNDS	DEED RECORD		DEED AREA	TOTAL P.R.O.	TOTAL TAKE	P.R.O. INTAKE	NET TAKE		LEFT RESIDUE		RIGHT RESIDUE		SHEET NO.	REMARKS
				BOOK	PAGE					LAND	BLDG	NET	P.R.O.	NET	P.R.O.		
3111 WL	Albert H. Bramson	546-17-14	Interstate	8880	623	4800	-	4800	-	4800	No	-	-	-	-	20	Total Taking, A Separate Parcel From 3113 WL
3112 WL	Della Brown	546-17-15		7472	139	4800	-	4800	-	4800	No	-	-	-	-	20	Total Taking
				8079	507												
3113 WL	Albert H. Bramson	546-17-16		8880	623	4079	-	4079	-	4079	No	-	-	-	-	20	Total Taking, A Separate Parcel From 3111 WL
3114 WL	James M. Glaco, Jr. and Irene A. Glaco	546-17-40 to 42		7661	119	13699	-	13699	-	13699	No	-	-	-	-	20	Total Taking
3116 WL	Charley Bakffy	546-17-17		7857	293	77142	10761	77142	10761	66381	Yes	-	-	-	-	20	Total Taking
3200 WL	Frances Wilson	546-22-13	INTERSTATE	6004	82	12016	-	12016	-	12016	Yes	-	-	-	-	20	Total Taking
3201 WL	Morris W. Stanley and Margaret B. Stanley	546-22-1		7084	571	30009	2004	30009	2004	28005	Yes	-	-	-	-	20	Total Taking
3202 WL	Frances Srna	546-22-2		9933	267	8979	1000	8979	1000	7979	No	-	-	-	-	20	Total Taking
3203 WL	John T. Wilson and Margaret Wilson	546-22-3		4167	459	8820	980	8820	980	7840	Yes	-	-	-	-	20	Total Taking
3204 WL	Joseph Patronite	546-22-4		10981	483	37095	820	37095	820	36275	No	-	-	-	-	20,22	Total Taking
3204 WD																19,22	3204 WD Area Included in 3204 WL
3205 WL	Catherine Gatter	546-22-16		9800	722	40813	1600	40813	1600	39213	No	-	-	-	-	22	Total Taking
3205 WD																22	3205 WD Area Included in 3205 WL
3206 WL	James F. Nejedlik, Jr.	546-22-5		7011	265	43900	1721	31253	1721	29532	No	5682	-	-	-	22	Total Taking
3206 WD								6965	-	6965						22	
3206 T			Interstate					5682	-	5682						22	Slopes
3206 EL			State					5682	-	5682						22	Includes All of 3206T
3207 WL	Marvin Hoffman	546-22-6	Interstate	7012	211	43900	1721	30183	1721	28462	No	6767	-	-	-	22	Total Taking
3207 WD								6950	-	6950						22	
3207 T			Interstate					6767	-	6767						22	Slopes
3207 EL			State					6767	-	6767						22	Includes All of 3207T
3208 WL	Richard H. Scott and Sara Scott	546-22-7	Interstate	7266	472	81522	2476	44200	2476	41724	Yes	26212	-	-	-	22	
3208 WD				8674	65												
3208 WD								11110	-	11110						22	
3208 T								8127	-	8127						22	Slopes
3209 WL	Sylvia Helz	546-22-15		10398	137	127604	4718	72898	4718	68180	Yes	36914	-	-	-	22	
3209 WD								17792	-	17792						22	
3209 T								24853	-	24853						22	Slopes
3210 WL	David Horvath	546-25-14		11831	631	54560	-	909	-	909	No	26514	-	-	-	22	
3210 WD			Interstate					27137	-	27137						22,24	
3210 T								18772	-	18772						22,24	Slopes

SCALE: HOWARD, NEEDLES, TAMMEN & BERGENOFF
MADE BY WKW DATE 12-22-67 CONSULTING ENGINEERS
TRCD WKW DATE 12-22-67
CKD JAG DATE 4-28-72 KANSAS CITY CLEVELAND NEW YORK

NAME	REVISION	DATE

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

370
390

CUYAHOGA COUNTY
CUY. 80-21.40
CUY. 80-19.40 RIGHT OF WAY ONLY
I-80-4(8) RIGHT OF WAY ONLY

8
27

Quantity Calculations
Made By WKW Date 12-22-67
Checked By JAG Date 4-28-72

PARCEL NO.	OWNER	AUD. NO.	TYPE FUNDS	DEED RECORD		DEED AREA	TOTAL P.R.O.	TOTAL TAKE	P.R.O. INTAKE	NET TAKE		LEFT RESIDUE		RIGHT RESIDUE		SHEET NO.	REMARKS
				BOOK	PAGE					LAND	BLDG.	NET	P.R.O.	NET	P.R.O.		
3210 A-T	Fred W. Klotzman	546-25-17	Interstate	10964	1	122760	-	14,721	-	14,721	No	122760	-	-	-	22,23	Slopes and Temp. Drive
3210A-WA-1		546-25-15		12331	429												Slag Parking Area
3210A-WA-2		546-25-13		10112	113												Slag Parking Area
3211 WL	Joseph C. Paterniti and Josephine S. Paterniti	546-25-1		9014	217	27000	-	27000	-	27000	Yes	-	-	-	-	22	Total Taking
3212 WL	Model Pattern Co.	546-25-9		9014	71	27000	-	27000	-	27000	Yes	-	-	-	-	22	Total Taking
3213 WL	Edward D. Familo et. al., Trustees	546-25-10		9046	255	38014	-	38014	-	38014	No	-	-	-	-	22,23	Total Taking
3213 WD																22,23	3213 WD Area Included in 3213 WL
3300 WL	Industrial Equipment and Erection Corp.	546-25-2		12113	537	271574	2000	13450	-	13450	Yes	153996	2000	-	-	23	Total Area being Taken = 87812
		546-25-11						74362	-	74362	-	-	-	-	-	23	
3300 WD		546-25-2						27766	-	27766	-	-	-	-	-	23	
3300 T		546-25-8 & 12						17740	-	17740	-	-	-	-	-	23	Slopes & E. 154th St Temp. Run-Around
3300A-T																-	Not Needed, Combined with Parcel 3300
3302	Donald A. Baker	546-25-7														-	Not Needed
3303 WL	Melvin H.A. Rott and Gertrude O. Rott	546-25-3		8495	302	64499	6060	37133	3440	33693	Yes	-	-	-	-	23	Total Taking
		546-25-6															
3303 WD								18376	2620	15756	-	-	-	-	-	23	
3303 T			Interstate					8990	-	8990	-	-	-	-	-	23	Slopes - Includes all of 3303EL
3303 EL			State					8990	-	8990	-	-	-	-	-	23	SOLD - DATE OF TRANSFER 9-13-78 RECORDED IN
3305 WL	Norman L. Jacobi and Melba M. Jacobi	546-25-4	Interstate	8033	15	23010	5900	23010	5900	17110	Yes	-	-	-	-	23	Total Taking
		546-25-5		3512	323												
4023 WL	Joseph L. Rubin	546-15-14 & 15	State	10120	202	29611	-	17767	-	17767	No	-	-	-	-	18	Total Taking, Acquired for Cuy-80-1927
4023 WD		546-15-13	Interstate					11844	-	11844	-	-	-	-	-	18	
4026 WL	Hawkings Trading Company	546-15-16	State	11601	18	4235	-	4235	-	4235	No	-	-	-	-	18	Total Taking, A Separate Parcel From 4146 WL, Acquired for Cuy-80-1927
4026 A-WL	Andrew J. Lee and Eleanor M. Lee	546-15-23	Interstate	7274	641	16708	-	15277	-	15277	No	-	-	-	-	18	Total Taking, A Separate Parcel From 4028 WL, Acquired for Cuy-80-1927
			State					1431	-	1431	-	-	-	-	-		
4027 WL	Eleanor M. Lee	546-15-17	Interstate	7252	451	136,800	-	27469	-	27469	Yes	74115(L)	-	-	-	17,18	Total Take Area = 62,685
			State					35216	-	35216	-	-	-	-	-	17,18	
4027 X			Interstate					17590	-	17590	-	-	-	-	-	17,18	
4027 S			Interstate					301	-	301	-	-	-	-	-	18	
4028 WL	Andrew J. Lee and Eleanor M. Lee	546-15-18	State	7274	639	23647	-	23647	-	23647	No	-	-	-	-	17,18	Total taking, A separate Parcel from 4026WL
4029 WL	Summit Gardens, Inc.	546-13-8	State	10653	1431145	156819	495	12753	-	12753	No	-	-	143368	495	17	Total Area being Taken = 12956
		546-15-19		10937	739			203	-	203	-	-	-	-	-		
		546-15-20 & 22															
		546-16-1 & 10															
4029A-WD	Charlotte A. Anderson et.al.	546-14-1	State	10970	7	29369	-	1472	-	1472	Yes	27897	-	-	-	17A	Structure Removals
4029A-T			State					6056	-	6056	-	-	-	-	-	17A	
4031 WL	La Rosa Castle Arms Corporation	546-13-2	State	12178	305	44541	3067	44541	3067	41474	Yes	-	-	-	-	17	Total Taking
		546-13-3		12116	265												
4033 WD	William Oberdoerster et. al.	546-13-1	State	10654	381	64671	6625	8918	6625	2293	No	55753	-	-	-	17A	
4033 T			State					2444	-	2444	-	-	-	-	-	17A	DRIVE IMPROVEMENT, CHANNEL SLOPES AND REMOVAL OF EXISTING FOOTER.
4033A	Ann H. MULLEN	544-22-12 to 15														17A	SIGN INSTALLATION, Not Required
4034WL	Henry Portman	546-13-4	State	5056	333	13030	-	1346	-	1346	No	8536	-	-	-	17	
4034 WD			State					3148	-	3148	-	-	-	-	-	17	
4035 WD	Leonard G. Workman and Zela Workman	546-14-23	State	12131	1457	5999	-	372	-	372	No	5627	-	-	-	17	
4036	Agnes O. Conte, Trustee	546-14-13 & 14														-	Not Needed.
4036 A	Edward J. Kraker and Susan M. Kraker	546-14-15 & 22														-	Not Needed.

SCALE: _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE BY: WKW DATE: 12-22-67 CONSULTING ENGINEERS
TRCD: WKW DATE: 12-22-67
CKD: JAG DATE: 4-28-72 KANSAS CITY CLEVELAND NEW YORK

(L) = Landlocked Residue

HRT	Rev. areas. added to Remarks - Pct. 3303	4-13-83
D.A.S.	Parcel 4033A Not Required	11/1/76
D.A.S.	ADDED PARCEL 4033A	9-10-76
HRT	Added Parcels 3210A-WA-1 & WA-2	10-15-73
NAME	REVISION	DATE

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD DIVISION	STATE	PROJECT
2	OHIO	

371
390

9
27

CUYAHOGA COUNTY
CUY. 80-2140
CUY. 80-19.40 RIGHT OF WAY ONLY
I-80-4(8) RIGHT OF WAY ONLY

Quantity Calculations
Made By WKW Date 12-22-67
Checked By JAG Date 4-28-72

PARCEL NO.	OWNER	AUD. NO.	TYPE FUNDS	DEED RECORD		DEED AREA	TOTAL P.R.O.	TOTAL TAKE	P.R.O. INTAKE	NET TAKE		LEFT RESIDUE		RIGHT RESIDUE		SHEET NO.	REMARKS
				BOOK	PAGE					LAND	BLDG	NET	PRO.	NET	PRO.		
4037 WL	Howard W. Broadbeat, Trustees	546-13-13	State	11802	715	399530	7001	136924	-	136924	Yes	221056	7001	(A)289800	-	17	
4037 T			State				-	2804	-	2804	-	-	-	(B)4360	-	17	Remove 1 story block garage.
4037 WD			State				-	932	-	932	-	-	-	-	-	17	
4037 WD-1			State				-	277	-	277	-	-	-	-	-	17A	
4037A-WL	Eldorado Motels Inc.	546-13-5	State	12354	37	118869	-	1683	-	1683	No	-	-	116527	-	17	
4037A-WD			State				-	659	-	659	-	-	-	-	-	17A	
4038 WL	Oil City Refiners, Inc.	546-13-7	State	9954	377	234206	8408	32408	-	32408	No	99644	3765	93746	4643	17	
4038A-WD	Mae W. Hoehn	546-10-9	State	108960	-	14595	-	322	-	322	No	14071	-	-	-	17A	Total WD Area = 524
		546-10-10					-	202	-	202	-	-	-	-	-		
		546-10-11					-		-		-	-	-	-	-		
4040 WL	Edward Sauvain and Frank M. Mirand	546-15-6	Interstate	10151	289	86091	8696	10074	-	10074	No	66696	-	-	-	18	
4040 WD							-	9321	8696	625	-	-	-	-	-	18	
4040 T							-	1080	-	1080	-	-	-	-	-	18	Construct Slopes
4040 X							-	16937	-	16937	-	-	-	-	-	18	
4046 WL	Elsie and Mildred Collier	546-15-7		11680	655	14729	1500	14729	1500	13229	Yes	-	-	-	-	18	Total Taking
4046 WD							-	-	-	-	-	-	-	-	-	18	4046 WD Area Included in 4046 WL
4047 WL	Annette E. Chapman	546-15-8		12305	151	14730	1500	14730	1500	13230	Yes	-	-	-	-	18	Total Taking 4047 WD Area Included in 4047 WL
4048 WL	John Vanek and Olga Ida W. Vanek	546-15-9	Interstate	2875	539	14731	1500	13966	1500	12466	Yes	-	-	-	-	18	Total Taking
			State	5647	17		-	765	-	765	-	-	-	-	-	18	Acquired for Cuy-80-19.27
4049 WL	Albert C. Grau and Mildred P. Grau	546-15-10	Interstate	7299	695	14319	1458	9532	1458	8074	Yes	-	-	-	-	18	Total Taking
			State				-	4787	-	4787	-	-	-	-	-	18	Acquired for Cuy-80-19.27
4050 WL	Dorthea & Floyd Alexander	546-15-11	Interstate	11823	903	13553	1380	6713	1380	5333	Yes	-	-	-	-	18	Total Taking
			State				-	6212	-	6212	-	-	-	-	-	18	Acquired for Cuy-80-19.27
4050 WD			Interstate				-	2398	-	2398	-	-	-	-	-	18	
4050 A-WL	Harry Bright and Elizabeth Flora Bright	546-15-12	Interstate	6665	303	15323	1560	15323	1560	13763	Yes	-	-	-	-	18	Total Taking, 4050 A-WD Area Included in 4050 A-WL
4050 A-WD							-	-	-	-	-	-	-	-	-	18	
4051 WD	Joseph F. Breznikar and Helen Breznikar	546-16-29		7831	470	14855	1500	3249	1500	1749	No	-	-	11,606	-	18	
4051 T							-	988	-	988	-	-	-	-	-	18	Driveway
4052							-	-	-	-	-	-	-	-	-	-	Not Needed
4057 WD	Andrew Homolak and Julius Homolak	546-16-42	Interstate	10338	349	154776	24608	25845	24608	1237	No	128931	-	-	-	16,18,20	
4057 T			County	10144	692		-	4475	-	4475	-	-	-	-	-	16,20	Construct Slopes
4057 S			Interstate	9987	442		-	5085	-	5085	-	-	-	-	-	16,20	
		546-16-34,42,43					-	-	-	-	-	-	-	-	-	16,18,20	
4057A	ANDREW HOMOLAK AND JULIUS HOMOLAK	544-27-11	INTERSTATE			35,750	15,225	506		506	No		20,019	15,731	16,23	Highway Easement	
4062 WL	George Reynolds and Mamie L. Reynolds	546-17-99	Interstate	8254	499	15870	2584	15870	2584	13286	Yes	-	-	-	-	20	Total Taking
4062 WD							-	-	-	-	-	-	-	-	-	20	4062 WD Area Included in 4062 WL
4063 WL	Patrick J. Connelly and Anna E. Connelly	546-17-98	Interstate	8456	576	43287	4385	43287	4385	38902	Yes	-	-	-	-	20	Total Taking
4063 WD							-	-	-	-	-	-	-	-	-	20	4063 WD Area Included in 4063 WL
4064 WD	Fred Harlan	546-17-97	Interstate	5094	617	21650	2192	14670	2192	12478	Yes	-	-	-	-	20	Total Taking
			State	12588	987		-	6980	-	6980	-	-	-	-	-	20	

SCALE: HOWARD, NEEDLES, TAMMEN & BERGENOFF
MADE BY WKW DATE 12-22-67 CONSULTING ENGINEERS
TRCD. WKW DATE 12-22-67
CKD. JAG DATE 4-28-72 KANSAS CITY CLEVELAND NEW YORK

(L) = Landlocked Residue

DAS	Added Parcel 4057A	1-13-76
JAG	4051WD Area Adjusted	1-27-72
NAME	REVISION	DATE

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

372
390

CUYAHOGA COUNTY
CUY. 80-21.40
CUY. 80-19.40 RIGHT OF WAY ONLY
I-80-4(8) RIGHT OF WAY ONLY

10
27

Quantity Calculations
Made By WKW Date 12-22-67
Checked By JAG Date 4-28-72

PARCEL NO.	OWNER	AUD. NO.	TYPE FUNDS	DEED RECORD		DEED AREA	TOTAL P.R.O.	TOTAL TAKE	P.R.O. INTAKE	NET TAKE		LEFT RESIDUE		RIGHT RESIDUE		SHEET NO.	REMARKS
				BOOK	PAGE					LAND	BLDG	NET	P.R.O.	NET	P.R.O.		
4065 WD	Mildred Jezek	546-17-96	County	11805	899	21781	2192	521	-	521	No	19068	2192	-	-	20	
4066	- - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Not Needed For This Project
4067	- - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Not Needed For This Project
4068 A-WL	Harry E. McArdle and Frances L. McArdle	546-17-94	Interstate State	9490	369	12070	-	337	-	337	Yes	-	-	-	-	19	Total Taking
4068 A-EL								11733	-	11733	-	-	-	-	-	18,19	Acquired for CUY-80-19.27
4069 WL	Ludlow Investment Co.	546-18-1	Interstate	11811	831	43560	4382	9935	-	9935	No	-	-	29243	4382	19	SOLD-DATE OF TRANSFER 7-28-82 RECORDED IN
4070 WL	Effie D. Thomas	546-18-2		11186	697	39181	-	25421	-	25421	Yes	-	-	13760	-	18,19	
4070 T								2908	-	2908	-	-	-	-	-	18,19	Remove 2 1/2 story frame house.
4071 WL	Walter Reese and Alice May Reese	546-18-3	Interstate	6887	53	30191	-	30191	-	30191	Yes	-	-	-	-	18,19	Total Taking
4072 WL	Alice May Joseph	546-18-4	State	5644	273	13363	-	13363	-	13363	No	-	-	-	-	18,19	Total Taking
4073 WL	Annie S. Chovan	546-18-5 & 6	Interstate State	10979	443	81887	-	13996	-	13996	No	52548	-	-	-	18,19	4073 WL Total Take = 28258 Sq. Ft.
		546-18-7	Interstate	10356	460			11505	-	11505	-	-	-	-	-	18,19	Acquired for Cuy-80-19.27
		546-18-8	Interstate	10979	447			2497	-	2497	-	-	-	-	-	18	
4073 WD		546-18-8	Interstate	10356	461			260	-	260	-	-	-	-	-	18	4073 WD Total Take = 1081 Sq. Ft.
4073 T		546-18-9	Interstate					650	-	650	-	-	-	-	-	18	Drive, Sanitary and Water Relocations
								431	-	431	-	-	-	-	-	18	
								2121	-	2121	-	-	-	-	-	18	
4078	- - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Not Needed For This Project
4079	- - -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Not Needed For This Project
4125 WL	Abe Pickus, Alex Sill and Marian Sill	546-18-39 to 43	Interstate State	7659	336	60183	-	13799	-	13799	No	37185	-	-	-	19	Acquired for CUY-80-19.27
		546-18-30 to 32		9727	287			9199	-	9199	-	-	-	-	-	19	
		546-18-34 to 38		9727	288												Not needed for this project.
4138 WL	Jennie Brescan	546-18-44	Interstate	11364	97	4553	-	4553	-	4553	No	-	-	-	-	19	Total Taking
4140 WL	Abe Pickus, Alex Sill and Marian Sill	546-18-45	Interstate	9727	288	4552	-	4552	-	4552	No	-	-	-	-	19	Total Taking, A Separate Parcel From 4142 WL, 4177 WL, 4215 WL and 4220 WL

SCALE: HOWARD, NEEDLES, TAMMEN & BERGENOFF
MADE WKW DATE 12-22-67 CONSULTING ENGINEERS
TRCD WKW DATE 12-22-67
CKD JAG DATE 4-28-72 KANSAS CITY CLEVELAND NEW YORK

(L) = Landlocked Residue

H.R.T.	PCL. 4068A-EL - ADDED REMARKS	11-12-82
H.R.T.	ADDED PARCEL 4068A-EL	2-4-82
NAME	REVISION	DATE

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

375
390

CUYAHOGA COUNTY
 CUY. 80-21.40
 CUY. 80-19.40 RIGHT OF WAY ONLY
 I-80-4(B) RIGHT OF WAY ONLY

13
27

Quantity Calculations
 Made By W.K.W. Date 12-22-67
 Checked By J.A.G. Date 4-28-72

PARCEL NO.	OWNER	AUD. NO.	TYPE FUNDS	DEED RECORD		DEED AREA	TOTAL P.R.O.	TOTAL TAKE	P.R.O. INTAKE	NET TAKE		LEFT RESIDUE		RIGHT RESIDUE		SHEET NO.	REMARKS
				BOOK	PAGE					LAND	BLDG	NET	PRO.	NET	PRO.		
4180 WL	Lottie Sczesny	546-18-51	Interstate	3836	630	4353	-	1022	-	1022	No	3331	-	-	-	19	
4180 EL	" "		State					3331		3331						19	
4194 WL	Robert S. Turowski	546-17-59	Interstate	7620	238	4400	-	734	-	734	No	3666	-	-	-	19	A Separate Parcel From 4144WL and 4174 WL
4195 WL	Gus Kornicks	546-17-55	Interstate	7654	718	17600	-	14667	-	14667	No	-	-	-	-	19	Total Taking
		546-17-56	State	7654	716		-	2933	-	2933	-	-	-	-	-	19	Acquired for CUY-80-1927.
		546-17-57		7654	724												
		546-17-58		7654	726												
4199 WL	Stanley W. Gronowski and Helen Gronowski	546-17-54	Interstate	7665	511	4400	-	4400	-	4400	No	-	-	-	-	19	Total Taking
4200 WL	Joseph Patronite	546-17-52		10981	479	8800	-	8800	-	8800	No	-	-	-	-	19,20	Total Taking
		546-17-53															
4202 WL	Cosimer Milewski	546-17-50		10988	175	8800	-	8800	-	8800	No	-	-	-	-	20	Total Taking
		546-17-51															
4204 WL	Rose Potter	546-17-48		4730	112	8800	-	8800	-	8800	No	-	-	-	-	20	Total Taking
		546-17-49															
4206 WL	Stanley W. Gronowski and Helen Gronowski	546-17-43 to 47		7661	123	22000	-	22000	-	22000	No	-	-	-	-	20	Total Taking (See Parcel 4163WL, Purchased Separately)
4212 WL	Stanley R. Gronowski, Jr. and Victoria Gronowski	546-17-37 to 39		7661	121	13719	-	13719	-	13719	No	-	-	-	-	20	Total Taking
4215 WL	Abe Pickus, Alex Sill and Marian Sill	546-17-36		9727	287	4577	-	4577	-	4577	No	-	-	-	-	20	Total Taking A Separate Parcel From 4140 WL, 4142WL, 4177WL and 4220 WL
4216 WL	Margherita F. Lanese	546-17-35		7657	321	4580	-	4580	-	4580	No	-	-	-	-	20	Total Taking
4217 WL	John Stanley Pulka and Harriet Pulka	546-17-33		7661	117	9166	-	9166	-	9166	No	-	-	-	-	19,20	Total Taking
		546-17-34															
4219 WL	Louis Paltza and Priscilla Paltza	546-17-32		3836	541	4586	-	4586	-	4586	No	-	-	-	-	19	Total Taking
4220 WL	Abe Pickus, Alex Sill and Marian Sill	546-17-29	Interstate	9727	287	13773	-	1882	-	1882	No	11291	-	-	-	19	A Separate Parcel From 4140 WL, 4142 WL
		546-17-30					-	600	-	600						19	4177 WL and 4215 WL. Total Area being Taken = 2482
		546-17-31															
4221 WD	Rudolph J. Mihalak	546-18-93		11820	273	91884	7461	13802	-	13802	No	35291	3958	35330	3503	17A	R/W for Proposed Sanford Blvd. Extension
		546-18-94															

INTERSTATE

SCALE _____ HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE W.K.W. DATE 12-22-67 CONSULTING ENGINEERS
 TRCD W.K.W. DATE 12-22-67
 CRD J.A.G. DATE 4-28-72 KANSAS CITY CLEVELAND NEW YORK

HRT	Changed Par. 4180E to 4180EL	3-8-74
D.B.F.	Added Parcel 4221 WD	12/18/73
D.B.F.	Added Par. 4180E	11/26/73
NAME	REVISION	DATE

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

376
390

14
27

CUYAHOGA COUNTY
 CUY. 80-21.40
 CUY. 80-19.40 RIGHT OF WAY ONLY
 I-80-4(8) RIGHT OF WAY ONLY

Quantity Calculations
 Made By *WKW* Date *12-22-67*
 Checked By *JAG* Date *4-28-72*

PARCEL NO.	OWNER	AUD. NO.	TYPE FUNDS	DEED RECORD		DEED AREA	TOTAL P.R.O.	TOTAL TAKE	P.R.O. INTAKE	NET TAKE		LEFT RESIDUE		RIGHT RESIDUE		SHEET NO.	REMARKS
				BOOK	PAGE					LAND	BLDG	NET	P.R.O.	NET	P.R.O.		
4225 T	Jennie Vah, Nicholas J. Vah, Gloria Vah and James Andrew Vah	596-17-25 596-17-102	I	5808 9058 10640	377 67 315	48215	3730	12235	3730	8505	No	44485	3730	-	-	19	Construct Slopes and Relocated Drive, & Temporary 1/4" Service Pipe.
4227 T 4227EL	Donald Nichols and Lucille Nichols	546-17-24	I State	3799	260	12285	940	12285 11345	940	11345	Yes	11345	940	-	-	19	Total Taking Remove 1/2 story frame house, & Construct Slopes
4228 WD	Walter E. Welch and Georgie Welch	546-17-23	I	9446	730	12113	930	12113	930	11183	Yes	-	-	-	-	19	Total Taking
4229 WD 4229 WL	Linda Howell	546-17-22		9484	638	11216	-	11216	-	11216	Yes	-	-	-	-	19	Total Taking 4229 WL Area Included in 4229 WD
4230 WL 4230 WD	Josephine Hido	546-17-21		5415	736	12195	930	12195	930	11265	Yes	-	-	-	-	19,20	Total Taking 4230 WD Area Included in 4230 WL
4231 WL	Cona Favazzo	546-17-20		7898	723	11827	900	11827	900	10927	Yes	-	-	-	-	19,20	Total Taking
4232 WL	Gloria F. Legat	546-17-19		11169	503	12176	-	12176	-	12176	Yes	-	-	-	-	20	Total Taking
4233 WL	Richard Sullivan Sr. and Bernice Sullivan	546-17-18		17700	919	11893	900	11893	900	10993	Yes	-	-	-	-	20	Total Taking
4235 T 4235 T-1	Edward B. Price and Vera A. Price	546-22-9 546-24-1 546-24-2	INTERSTATE	11196 7499	85 83	217800	8503	16440 2861	8503	7937 2861	No	209297	8503	-	-	19	Construct Slopes and T-Turn Around T-Turn Around
4236 T	Helen N. Souhrada	546-22-10		5622 6072	421 290	87120	3401	24,298	3401	24,298	Yes	83719	3401	-	-	19,22	Construct slopes, 2 story brick garage, 2 story brick house.
4237 WL 4237 WD	Stephen J. Bede and Alice Bede	546-22-11 546-22-14		8460 6435	220 434	19520	-	19520	-	19520	Yes	-	-	-	-	19,20	Total Taking 4237 WD Area Included in 4237 WL
4239 WL	Betty D. Weltman, Ina C. Rothman and Naomi R. Saltz	546-22-12		11142	348	6008	-	6008	-	6008	No	-	-	-	-	20	Total Taking
4240 T	Michael Feckanin	546-18-100		6698 10903	120 381	47748	3731	7181	3731	3450	No	44017	3731	-	-	19	Construct slopes, & Temporary 1/4" Service Pipe.
4241 T	Harvie G. Taggart and Iva L. Taggart	546-18-99		10155	619	9150	720	1306	720	586	No	8430	720	-	-	19	Construct slopes.
4242 T	Clyde A. Farmer and Elva E. Farmer	546-18-98	I	8898	596	15341	1210	1590	1210	380	No	14131	1210	-	-	19	Construct Slopes

SCALE: HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE *WKW* DATE *12-22-67* CONSULTING ENGINEERS
 TRCD *WKW* DATE *12-22-67*
 CKD *JAG* DATE *4-28-72* KANSAS CITY CLEVELAND NEW YORK

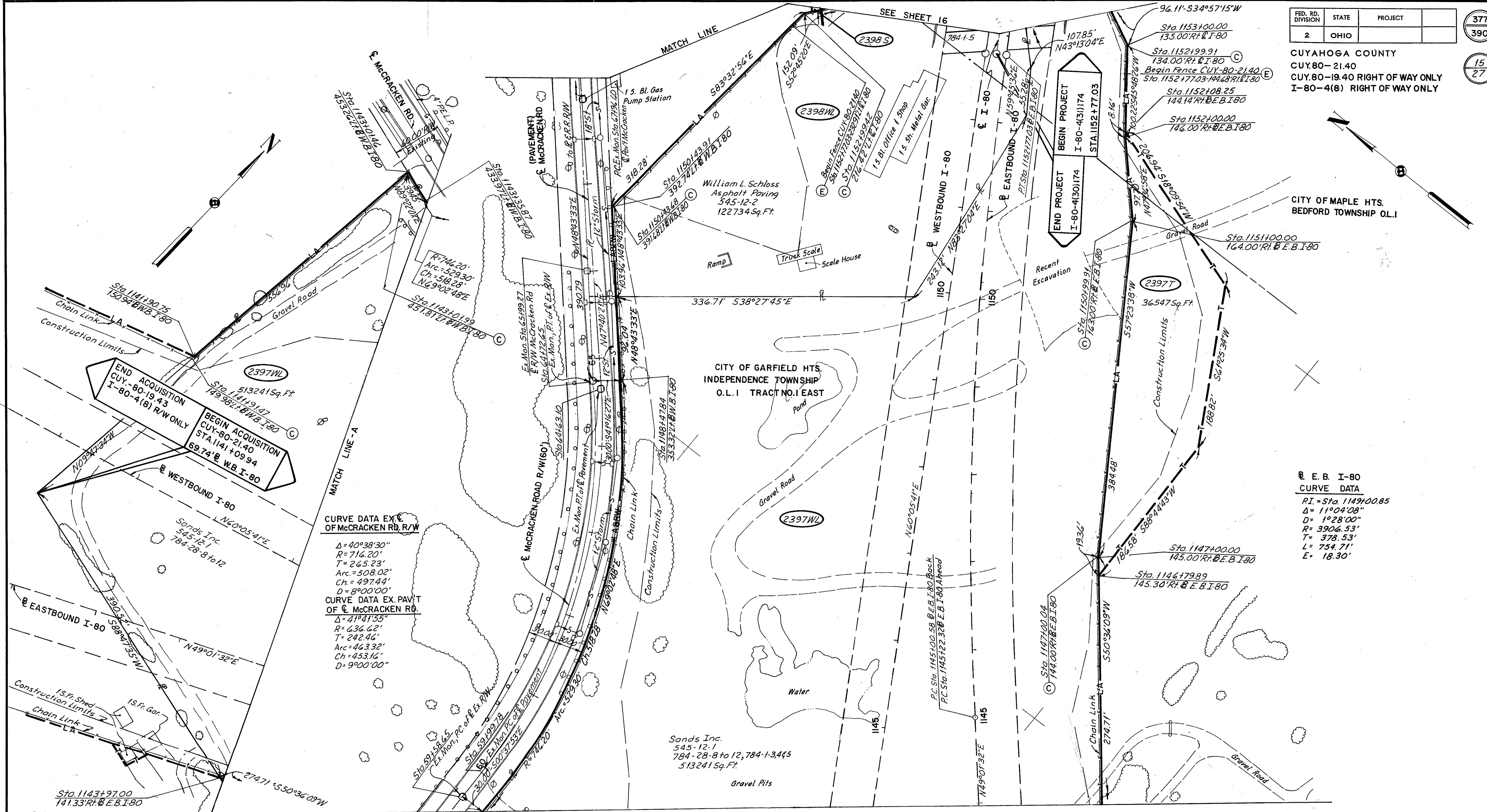
JAG	Added 4235 T-1	2-25-72
NAME	REVISION	DATE

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

377
390

15
27

CUYAHOGA COUNTY
 CUY.80-21.40
 CUY.80-19.40 RIGHT OF WAY ONLY
 I-80-4(B) RIGHT OF WAY ONLY



E. B. I-80
 CURVE DATA
 P.I. = Sta. 1149+00.85
 Δ = 11°04'08"
 D = 1°28'00"
 R = 3906.53'
 T = 378.53'
 L = 754.71'
 E = 18.30'

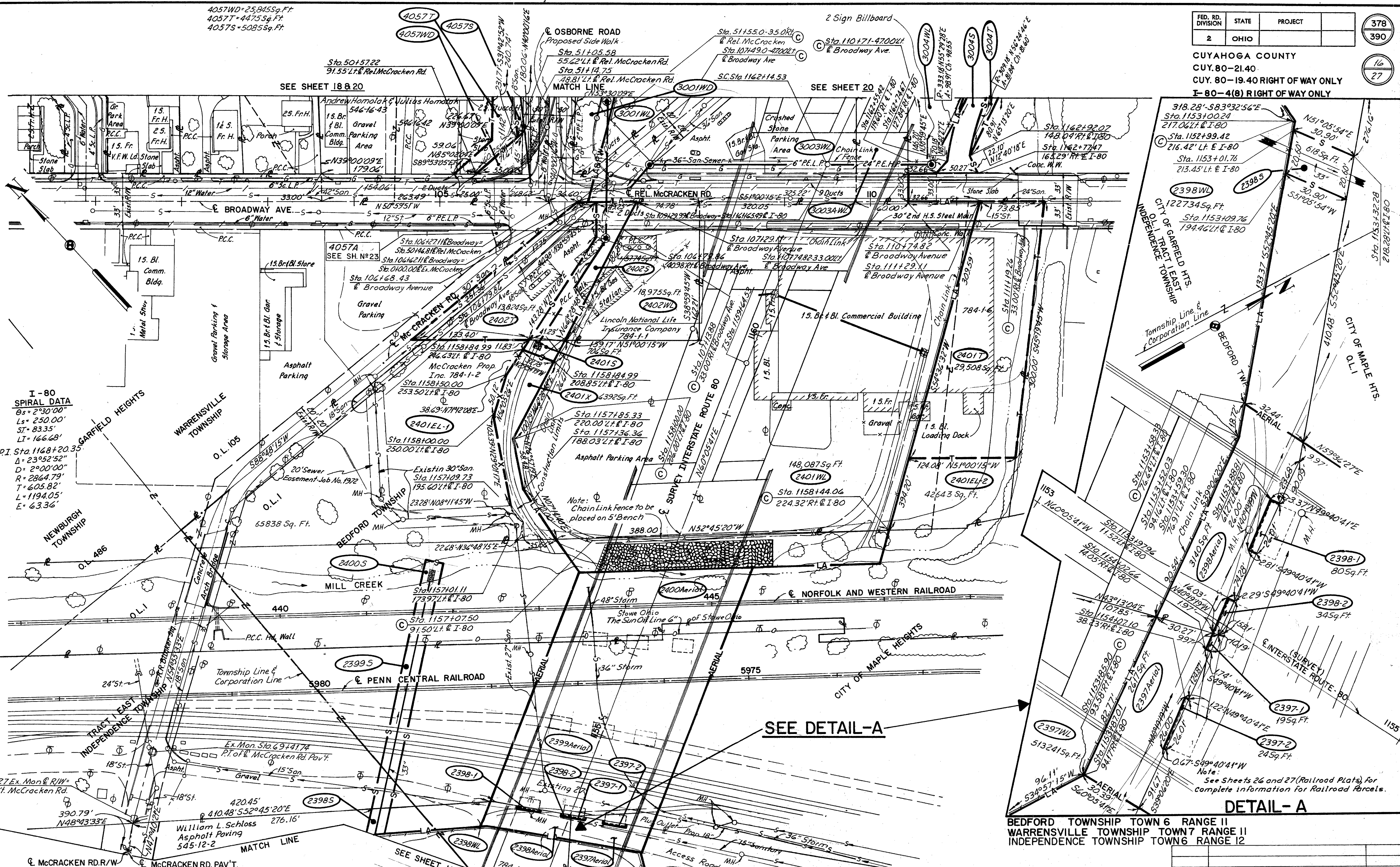
MADE WKW DATE 1-10-68 TRACED MAG DATE 2-26-68
 CHECKED JAG DATE 4-28-72 SCALE 1"=50'

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

INDEPENDENCE TOWNSHIP TOWN 6 RANGE 12 TRACT 1 EAST
 BEDFORD TOWNSHIP TOWN 6 RANGE 11

NAME	REVISION	DATE

STA. 1144+00 TO STA. 1152+50



I-80 SPIRAL DATA
 θs = 2°30'00"
 Ls = 250.00'
 ST = 83.35'
 LI = 166.68'
 P.I. Sta. 1168+20.35
 Δ = 23°52'52"
 D = 2°00'00"
 R = 2864.79'
 T = 605.82'
 L = 1194.05'
 E = 63.36'

SEE DETAIL-A

DETAIL-A

BEDFORD TOWNSHIP TOWN 6 RANGE 11
 WARRENSVILLE TOWNSHIP TOWN 7 RANGE 11
 INDEPENDENCE TOWNSHIP TOWN 6 RANGE 12

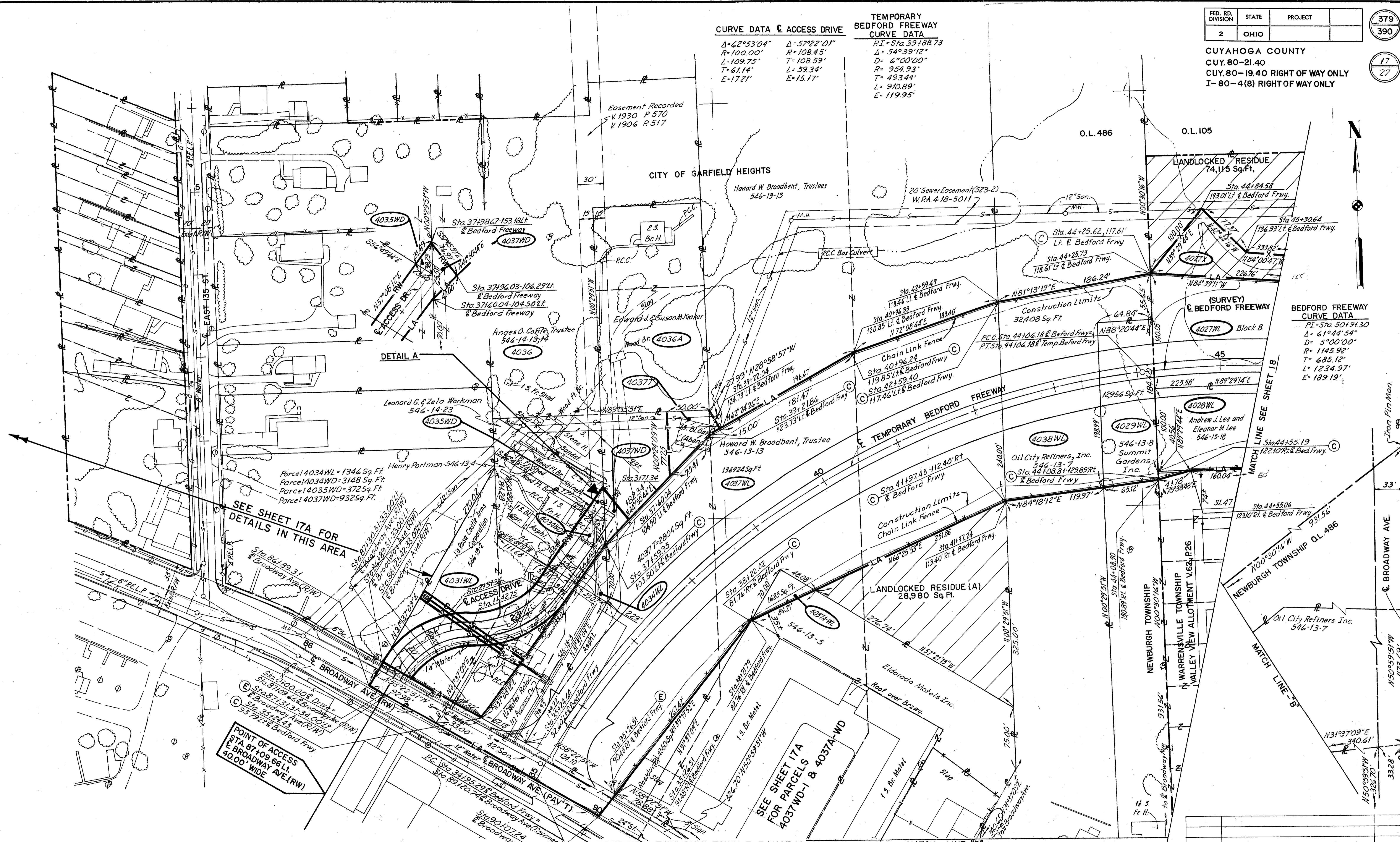
MADE RDJ DATE 2-9-68 TRACED MAG DATE 3-5-68
 CHECKED JAG DATE 4-28-72 SCALE 1"=50'

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

Sands Inc.
 545-12-1, 784-28-8 to 12, 784-1-3, 4, 5

NAME	REVISION	DATE
D.A.S.	ADDED PARCEL 4057A (SEE SHEET 23) FOR DETAIL	1-13-76
JAG	Revised Parcels 23985, 23995 & 24005	7-27-72

CURVE DATA & ACCESS DRIVE		TEMPORARY BEDFORD FREEWAY CURVE DATA
$\Delta = 62^{\circ}53'04''$	$\Delta = 57^{\circ}22'01''$	PI = Sta 39+88.73
R = 100.00'	R = 108.45'	$\Delta = 54^{\circ}39'12''$
L = 109.75'	T = 108.59'	D = 6'00'00"
T = 61.14'	L = 59.34'	R = 954.93'
E = 17.21'	E = 15.17'	T = 493.44'
		L = 910.89'
		E = 119.95'



SEE SHEET 17A FOR
 DETAILS IN THIS AREA

SEE SHEET 17A
 FOR PARCELS
 4037WD-1 & 4037A-WD

MADE *WKW* DATE *2-1-68* TRACED *MAG* DATE *3-8-68*
 CHECKED *JAG* DATE *4-28-72* SCALE *1"=50'*

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

NEWBURGH TOWNSHIP TOWN 7 RANGE 12
 WARRENSVILLE TOWNSHIP TOWN 7 RANGE 11

NAME	REVISION	DATE

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

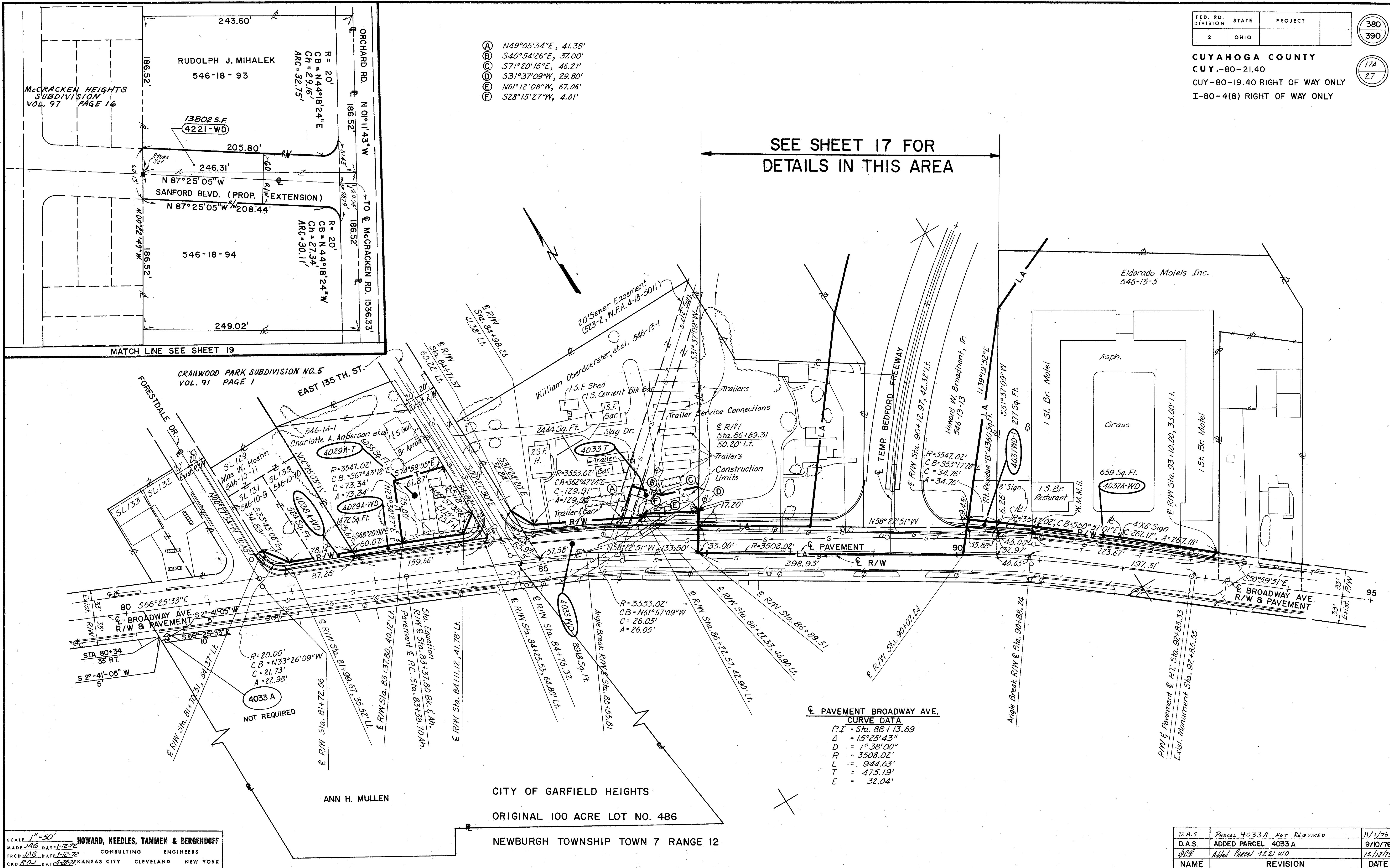
380
390

CUYAHOGA COUNTY
 CUY-80-21.40
 CUY-80-19.40 RIGHT OF WAY ONLY
 I-80-4(8) RIGHT OF WAY ONLY

17A
27

SEE SHEET 17 FOR
 DETAILS IN THIS AREA

- Ⓐ N49°05'34"E, 41.38'
- Ⓑ S40°54'26"E, 37.00'
- Ⓒ S71°20'16"E, 46.21'
- Ⓓ S31°37'09"W, 29.80'
- Ⓔ N61°12'08"W, 67.06'
- Ⓕ S28°15'27"W, 4.01'



PAVEMENT BROADWAY AVE.
 CURVE DATA

PI	= Sta. 88+13.89
Δ	= 15°25'43"
D	= 1°38'00"
R	= 3508.02'
L	= 944.63'
T	= 475.19'
E	= 32.04'

CITY OF GARFIELD HEIGHTS
 ORIGINAL 100 ACRE LOT NO. 486
 NEWBURGH TOWNSHIP TOWN 7 RANGE 12

SCALE 1"=50'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE JAG DATE 1-12-72 CONSULTING ENGINEERS
 TRCD JAG DATE 1-12-72
 CKD RDJ DATE 1-22-72 KANSAS CITY CLEVELAND NEW YORK

D.A.S.	Parcel 4033A Not Required	11/1/76
D.A.S.	ADDED PARCEL 4033 A	9/10/76
W.P.	Added Parcel 4221 WD	12/18/73
NAME	REVISION	DATE

OSBORNE RD. CONNECTOR
CURVE DATA
 *PI = Sta. 5+17.03
 Δ = 89°58'43"
 D = 57°17'45"
 R = 100.00'
 T = 99.96'
 L = 157.04'
 E = 41.40'

Match Line See Sheet 17

BEDFORD FREEWAY
CURVE DATA
 PI = Sta. 50+19.30
 Δ = 61°44'54"
 D = 5°00'00"
 R = 1145.92'
 T = 685.12'
 L = 1234.97'
 E = 189.19'

Note:
 The Sanitary and Water Line Locations will be finalized in the field by the Contractor for Parcel 4073.

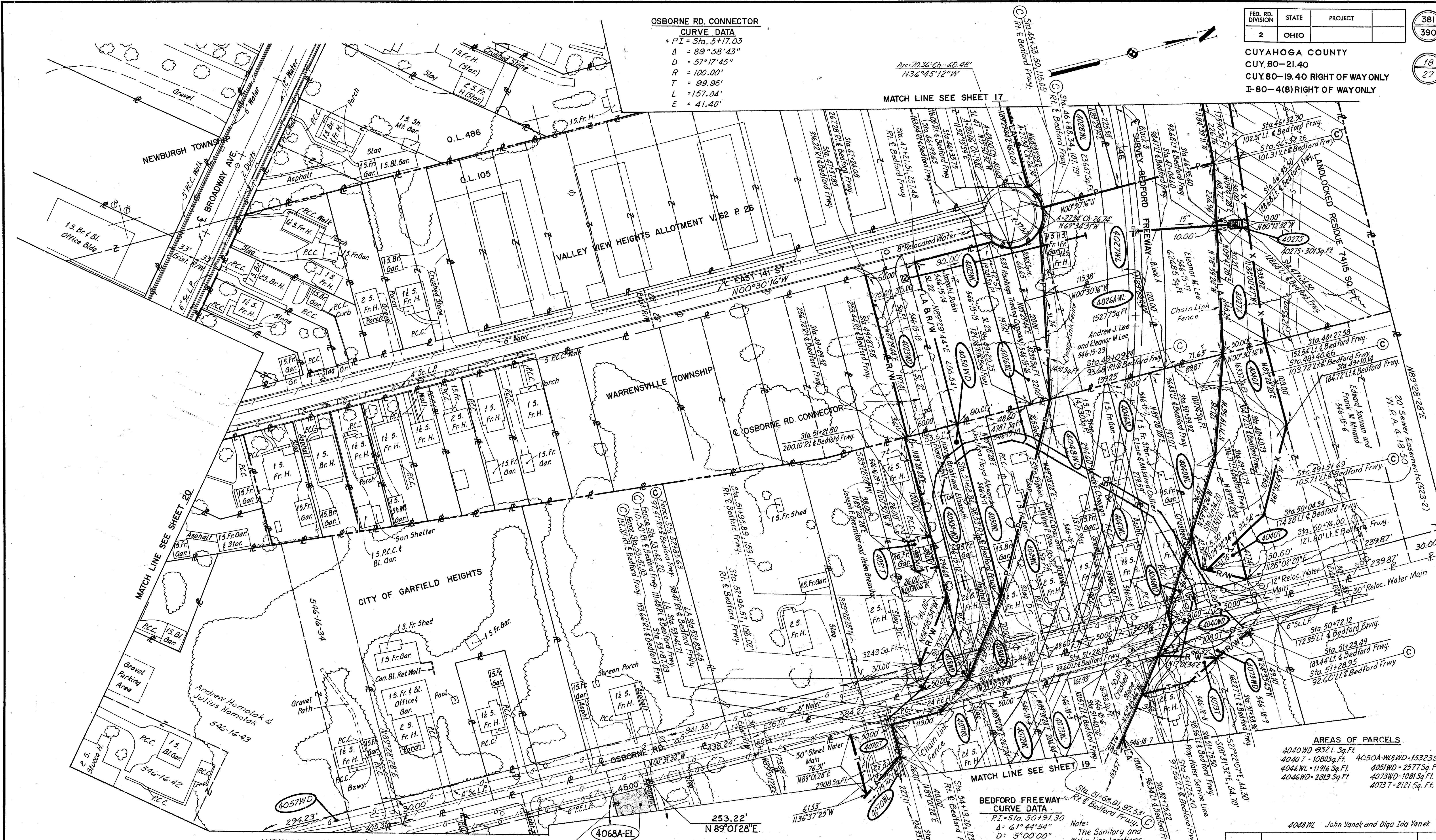
AREAS OF PARCELS

4040WD - 9321 Sq. Ft.	4050A-WL&WD - 15323 Sq. Ft.
4040T - 10805 Sq. Ft.	4051WD - 2577 Sq. Ft.
4046WL - 11916 Sq. Ft.	4073WD - 1081 Sq. Ft.
4046WD - 2813 Sq. Ft.	4073T - 2121 Sq. Ft.

4048WL John Vanek and Olga Ida Vanek

HRT	Added Parcel 4068A-EL	2-4-82
JAG	Const. Limits & R/W Line Rev. 4051WD	1-27-72
NAME	REVISION	DATE

EXCESS LAND PARCELS SOLD BY STATE



MADE WKN DATE 2-14-68 TRACED MAG DATE 3-13-68
 CHECKED JAG DATE 4-28-72 SCALE 1" = 50'

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

NEWBURGH TOWNSHIP TOWN 7 RANGE 12
 WARRENSVILLE TOWNSHIP TOWN 7 RANGE 11

STA. 45+50 TO STA. 53+50



BEDFORD FRWY CURVE DATA
 P.I. = Sta. 50+19.30
 Δ = 61°44'54"
 D = 5900.00'
 R = 1145.92'
 T = 685.12'
 L = 1234.97'
 E = 189.19'

BEDFORD FRWY SPIRAL DATA
 θ = 10°00'00"
 L = 400.00'
 ST = 133.72'
 LT = 26.709'

REL. McCracken RD. CURVE DATA
 P.I. = Sta. 59+67.96
 Δ = 44°51'07"
 D = 4000.00'
 R = 1432.39'
 T = 591.15'
 L = 1121.30'
 E = 117.19'

EXCESS LAND PARCELS SOLD BY STATE

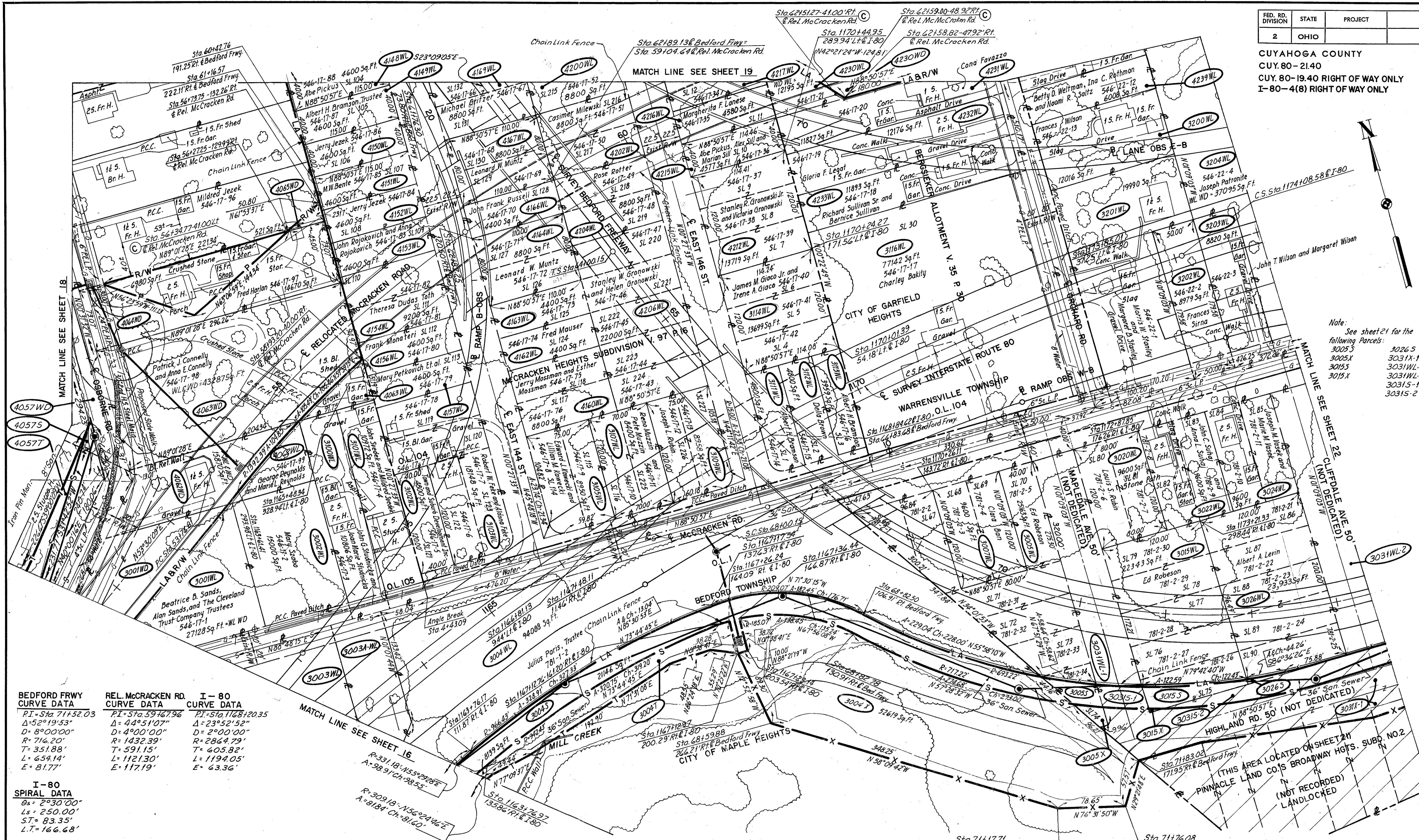
MADE *NKY* DATE 2-21-68 TRACED *MAG* DATE 3-18-68
 CHECKED *JAG* DATE 4-28-72 SCALE 1"=50'

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

WARRENSVILLE TOWNSHIP TOWN 7 RANGE II

NAME	REVISION	DATE
HRT	Added Parcel 4068A-EL	2-4-82
F.L.K.	Changed @ STA. 54+16.00	6-24-76
HRT	Changed Par. 4180E to 4180EL	3-5-74
D.C.P.	Added 4180-E	11/26/73
JAG	Added 4235T-1	2-25-72

CUYAHOGA COUNTY
CUY. 80-21.40
CUY. 80-19.40 RIGHT OF WAY ONLY
I-80-4(8) RIGHT OF WAY ONLY



Note:
See sheet 21 for the following parcels:
3026 S
3026 X
3026 Y
3026 Z
3026 A
3026 B
3026 C
3026 D
3026 E
3026 F
3026 G
3026 H
3026 I
3026 J
3026 K
3026 L
3026 M
3026 N
3026 O
3026 P
3026 Q
3026 R
3026 S
3026 T
3026 U
3026 V
3026 W
3026 X
3026 Y
3026 Z

BEDFORD FRWY CURVE DATA	REL. McCRACKEN RD. CURVE DATA	I-80 CURVE DATA
PI=Sta 71152.03	PI=Sta 39467.96	PI=Sta 1168120.35
$\Delta=52^{\circ}19'53''$	$\Delta=44^{\circ}51'07''$	$\Delta=23^{\circ}52'52''$
$D=8^{\circ}00'00''$	$D=4^{\circ}00'00''$	$D=2^{\circ}00'00''$
$R=716.20'$	$R=1432.39'$	$R=2864.79'$
$T=351.88'$	$T=591.15'$	$T=605.82'$
$L=654.14'$	$L=1121.30'$	$L=1194.05'$
$E=81.77'$	$E=117.19'$	$E=63.36'$

I-80 SPIRAL DATA
$\theta_s=2^{\circ}30'00''$
$L_s=250.00'$
$S.T.=83.35'$
$L.T.=166.68'$

BEDFORD TOWNSHIP TOWN 6 RANGE II
WARRENSVILLE TOWNSHIP TOWN 7 RANGE II

MADE WKW DATE 2-29-68 TRACED MAG DATE 3-21-68
CHECKED JAG DATE 4-5-72 SCALE 1"=50'

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

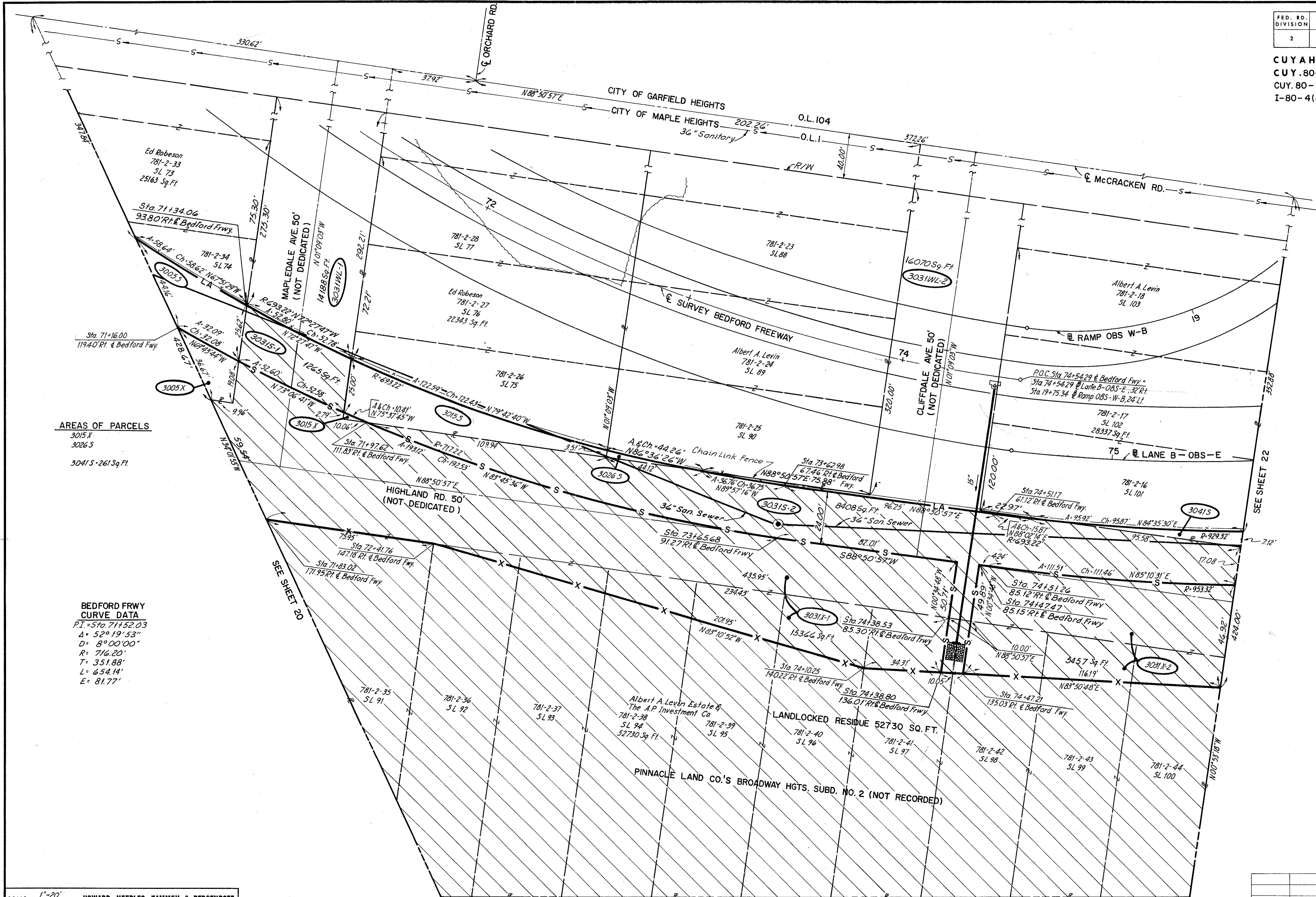
HRT	Rev. # On Pcl. 3031WL-1#WL-2	6-4-73
NAME	REVISION	DATE

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

384
390

CUYAHOGA COUNTY
 CUY. 80-21.40
 CUY. 80-19.40 RIGHT OF WAY ONLY
 I-80-4(8) RIGHT OF WAY

21
27



AREAS OF PARCELS
 3015 X
 3026 S
 3041 S = 261 Sq. Ft.

BEDFORD FRWY
 CURVE DATA
 P.I. = Sta. 71+52.03
 Δ = 52° 19' 53"
 D = 8° 00' 00"
 R = 716.20'
 T = 351.88'
 L = 654.14'
 E = 81.77'

SCALE 1"=20'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE R.O.W. DATE 6-10-69 CONSULTING ENGINEERS
 TRCD R.O.W. DATE 6-10-69 KANSAS CITY CLEVELAND NEW YORK
 CKD JAG DATE 6-4-72

BEDFORD TOWNSHIP TOWN 6 RANGE II

HRT	Rev. Take Areas - Pcls 3031WL-1 & WL-2	6-4-73
NAME	REVISION	DATE

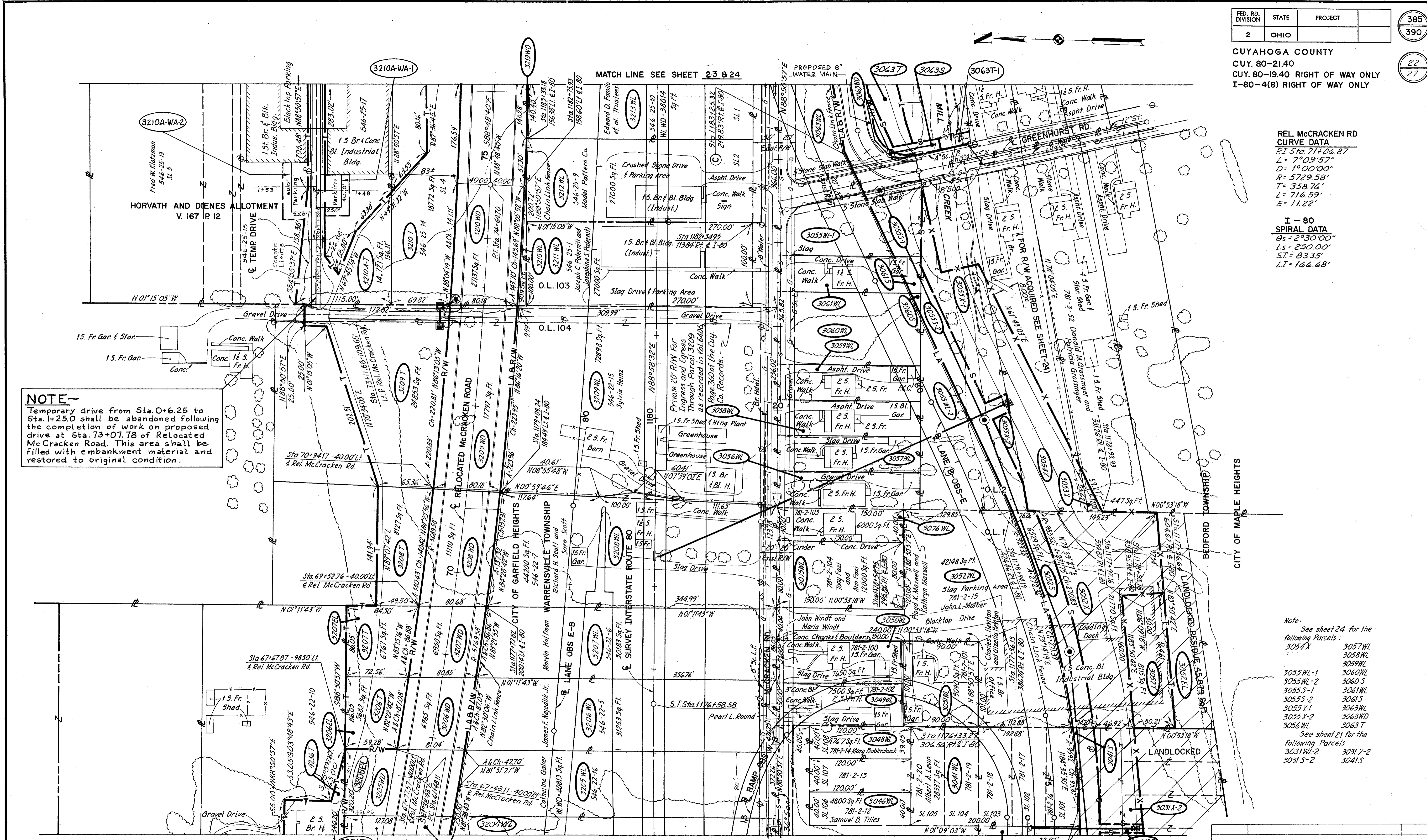
RIGHT OF WAY PLAN

REL. McCracken RD
 CURVE DATA
 PI Sta. 71+06.87
 $\Delta = 7^{\circ}09'57''$
 $R = 1^{\circ}00'00''$
 $T = 358.76'$
 $L = 716.59'$
 $E = 11.22'$

I - 80
 SPIRAL DATA
 $\Delta s = 2^{\circ}30'00''$
 $Ls = 250.00'$
 $ST = 83.35'$
 $LT = 166.68'$

NOTE
 Temporary drive from Sta. 0+6.25 to Sta. 1+25.0 shall be abandoned following the completion of work on proposed drive at Sta. 73+07.78 of Relocated McCracken Road. This area shall be filled with embankment material and restored to original condition.

Note:
 See sheet 24 for the following Parcels:
 3054X 3057WL
 3055WL-1 3058WL
 3055WL-2 3059WL
 3055S-1 3060WL
 3055S-2 3060S
 3055X-1 3061WL
 3055X-2 3061S
 3055X-3 3063WL
 3055X-4 3063WL
 3056WL 3063WD
 3063T 3063T
 See sheet 21 for the following Parcels:
 3031WL-2 3031X-2
 3031S-2 3041S



MADE R.D.J. DATE 2-13-68 TRACED WKW DATE 3-26-68
 CHECKED JAG DATE 4-4-72 SCALE 1"=50'

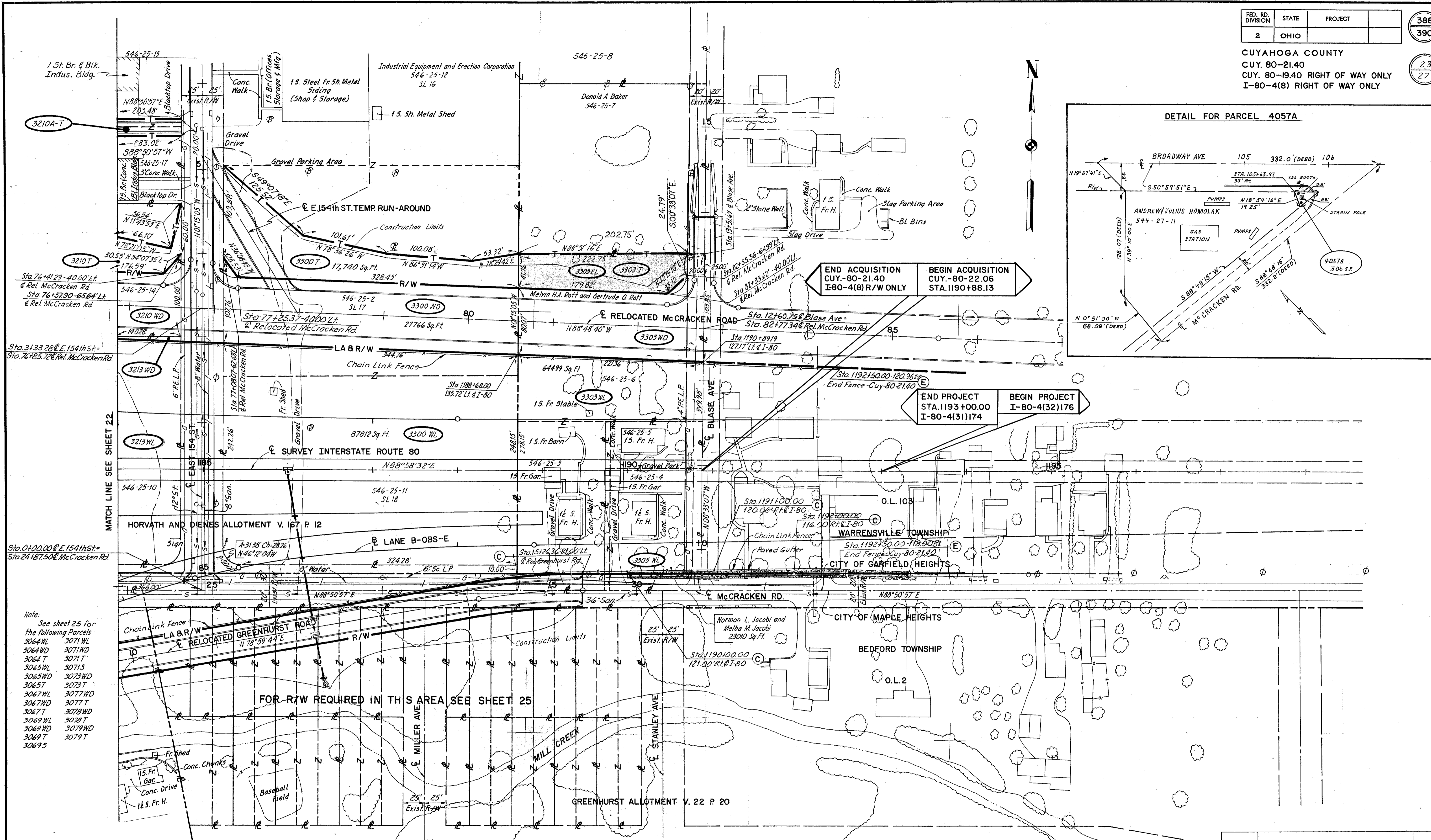
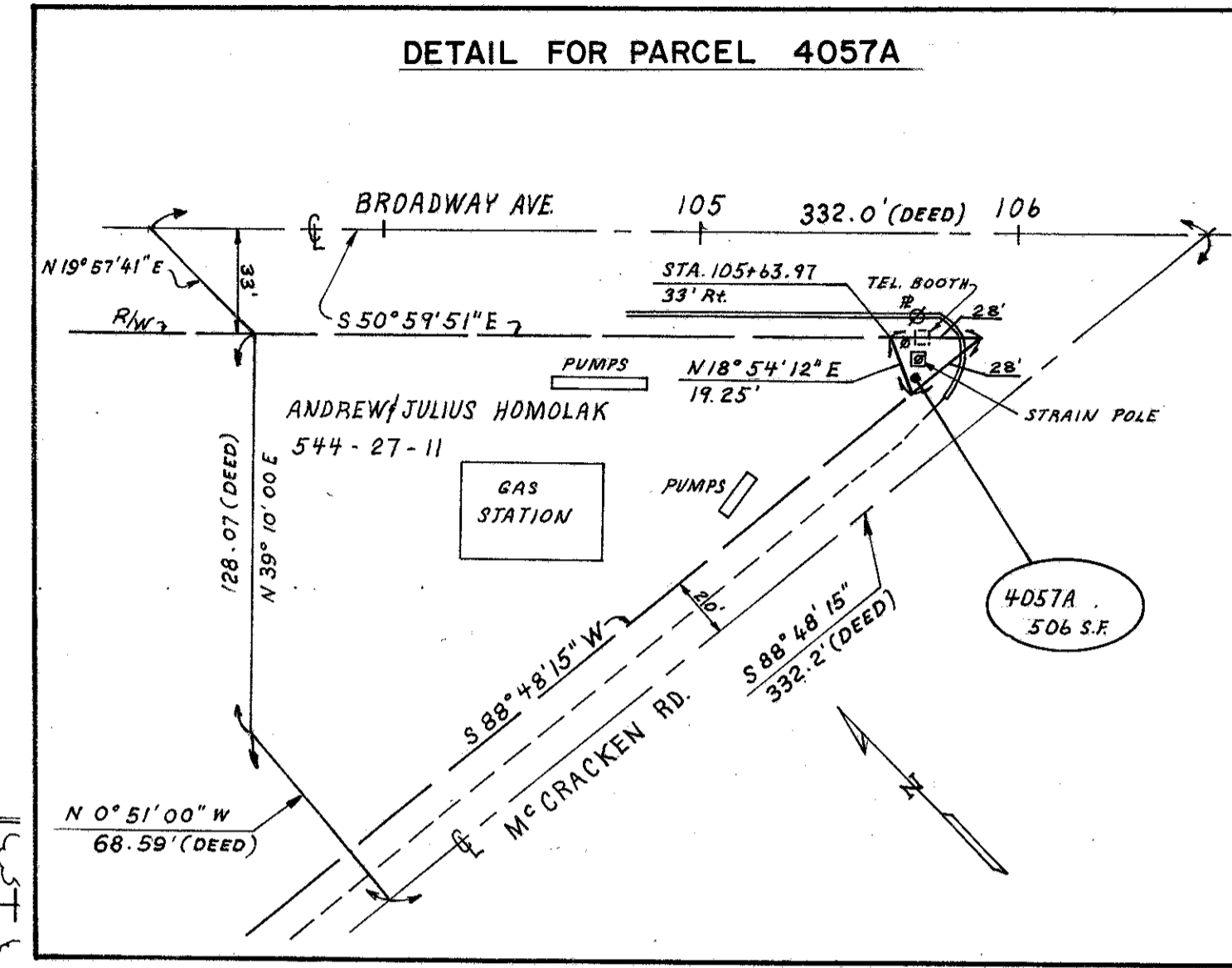
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 CONSULTING ENGINEERS
 KANSAS CITY CLEVELAND NEW YORK

BEDFORD TOWNSHIP TOWN 6 RANGE II
 WARRENSVILLE TOWNSHIP TOWN 7 RANGE II

SEE SHEETS 198.20&21

HRT	Added Parcels 3210A-WA-1 & WA-2	11-6-73
JAG	Added Parcel 3063T-1	10-31-73
NAME	REVISION	DATE

CUYAHOGA COUNTY
CUY. 80-21.40
CUY. 80-19.40 RIGHT OF WAY ONLY
I-80-4(8) RIGHT OF WAY ONLY



END ACQUISITION
CUY.-80-21.40
I-80-4(8) R/W ONLY

BEGIN ACQUISITION
CUY.-80-22.06
STA. 1190+88.13

END PROJECT
STA. 1193+00.00
I-80-4(31)174

BEGIN PROJECT
I-80-4(32)176

MATCH LINE SEE SHEET 22

- Note:
See sheet 25 for the following Parcels
- 3064WL 3071WL
 - 3064WD 3071WD
 - 3064T 3071T
 - 3065WL 3071S
 - 3065WD 3073WD
 - 3065T 3073T
 - 3067WL 3077WD
 - 3067WD 3077T
 - 3067T 3078WD
 - 3069WL 3078T
 - 3069WD 3079WD
 - 3069T 3079T
 - 3069S

FOR R/W REQUIRED IN THIS AREA SEE SHEET 25

MADE RDJ DATE 3-6-68 TRACED WKW DATE 3-29-68
CHECKED JAG DATE 4-4-72 SCALE 1"=50'

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

BEDFORD TOWNSHIP TOWN 6 RANGE II
WARRENSVILLE TOWNSHIP TOWN 7 RANGE II

EXCESS LAND PARCELS SOLD BY STATE

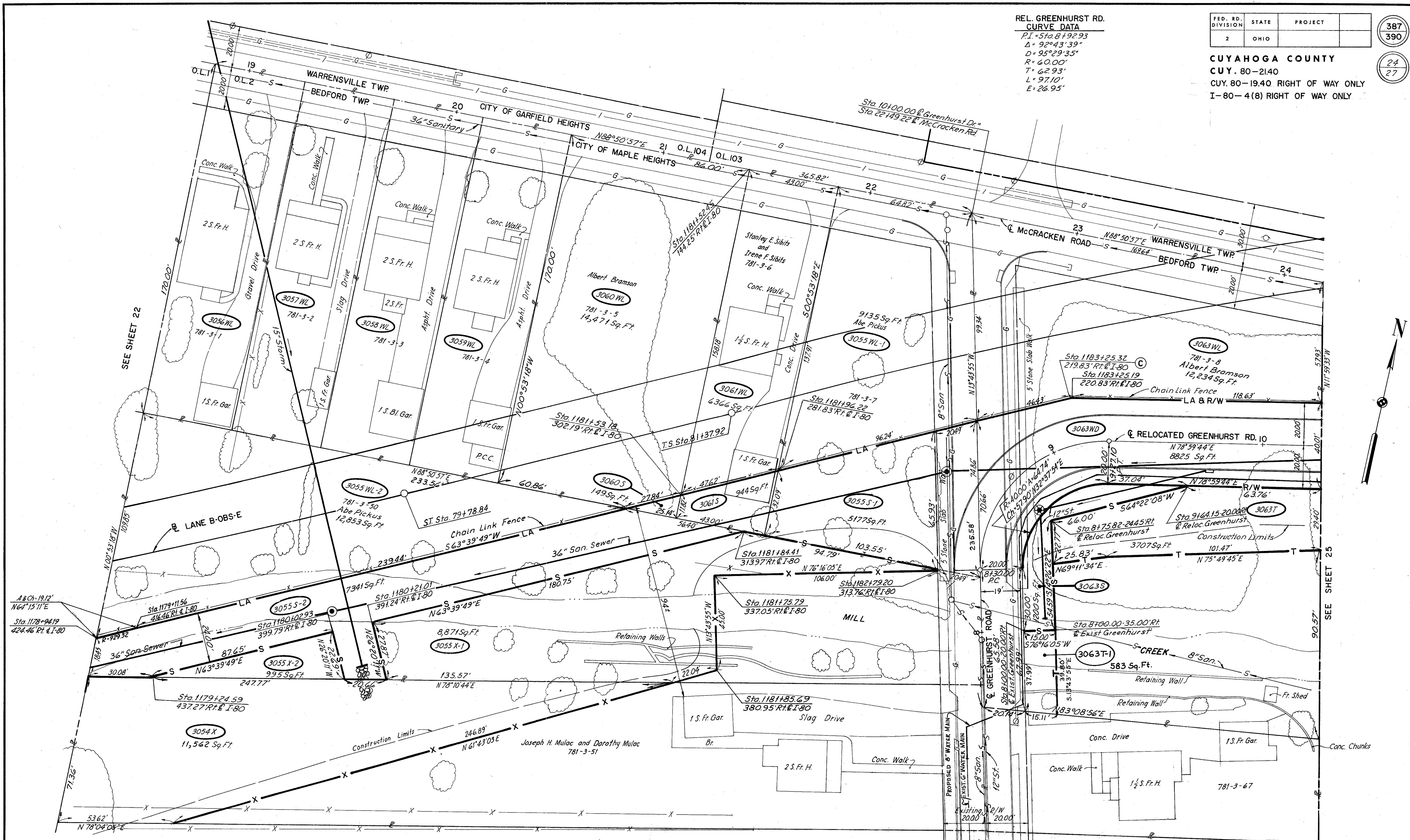
NAME	REVISION	DATE
P.A.S.	ADDED PARCEL DETAIL 4057A	1-13-76
JAG	DELETED PARCEL 3080	1-22-73

REL. GREENHURST RD.
 CURVE DATA
 P.I. = Sta 8+92.93
 $\Delta = 92^{\circ}43'39''$
 $D = 95^{\circ}29'35''$
 $R = 60.00'$
 $T = 62.93'$
 $L = 97.10'$
 $E = 26.95'$

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

387
 390
 24
 27

CUYAHOGA COUNTY
 CUY. 80-2140
 CUY. 80-1940 RIGHT OF WAY ONLY
 I-80-4(8) RIGHT OF WAY ONLY



SCALE 1" = 20'
 HOWARD, NEEDLES, TAMMEN & BERGENDOFF
 MADE B.S. DATE 6-12-70 CONSULTING ENGINEERS
 TRCD B.S. DATE 6-12-70
 CKD JAG DATE 4-4-72 KANSAS CITY CLEVELAND NEW YORK

BEDFORD TOWNSHIP TOWN 6 RANGE II
 WARRENSVILLE TOWNSHIP TOWN 7 RANGE II

JAG	Added Parcel 3063T-1	10-31-73
NAME	REVISION	DATE

RIGHT OF WAY PLAN

AREAS OF PARCELS

3064 WL = 1597 Sq. Ft.	3069 WL = 374 Sq. Ft.	3073 T = 1476 Sq. Ft.
3064 WD = 1653 Sq. Ft.	3069 WD = 2029 Sq. Ft.	3077 WD = 678 Sq. Ft.
3064 T = 994 Sq. Ft.	3069 T = 2501 Sq. Ft.	3077 T = 886 Sq. Ft.
3065 WL = 1242 Sq. Ft.	3069 S = 63 Sq. Ft.	3078 WD = 272 Sq. Ft.
3065 WD = 2029 Sq. Ft.	3071 WL = 28 Sq. Ft.	3078 T = 943 Sq. Ft.
3065 T = 1417 Sq. Ft.	3071 WD = 1941 Sq. Ft.	3079 WD = 53 Sq. Ft.
3067 WL = 808 Sq. Ft.	3071 T = 2027 Sq. Ft.	3079 T = 871 Sq. Ft.
3067 WD = 2029 Sq. Ft.	3071 S = 487 Sq. Ft.	
3067 T = 1892 Sq. Ft.	3073 WD = 1535 Sq. Ft.	

REL. GREENHURST RD. CURVE DATA

PI = Sta. 14+74.82
 Δ = 9° 51' 14"
 D = 8° 00' 00"
 R = 716.20'
 T = 61.74'
 L = 123.17'
 E = 2.66'

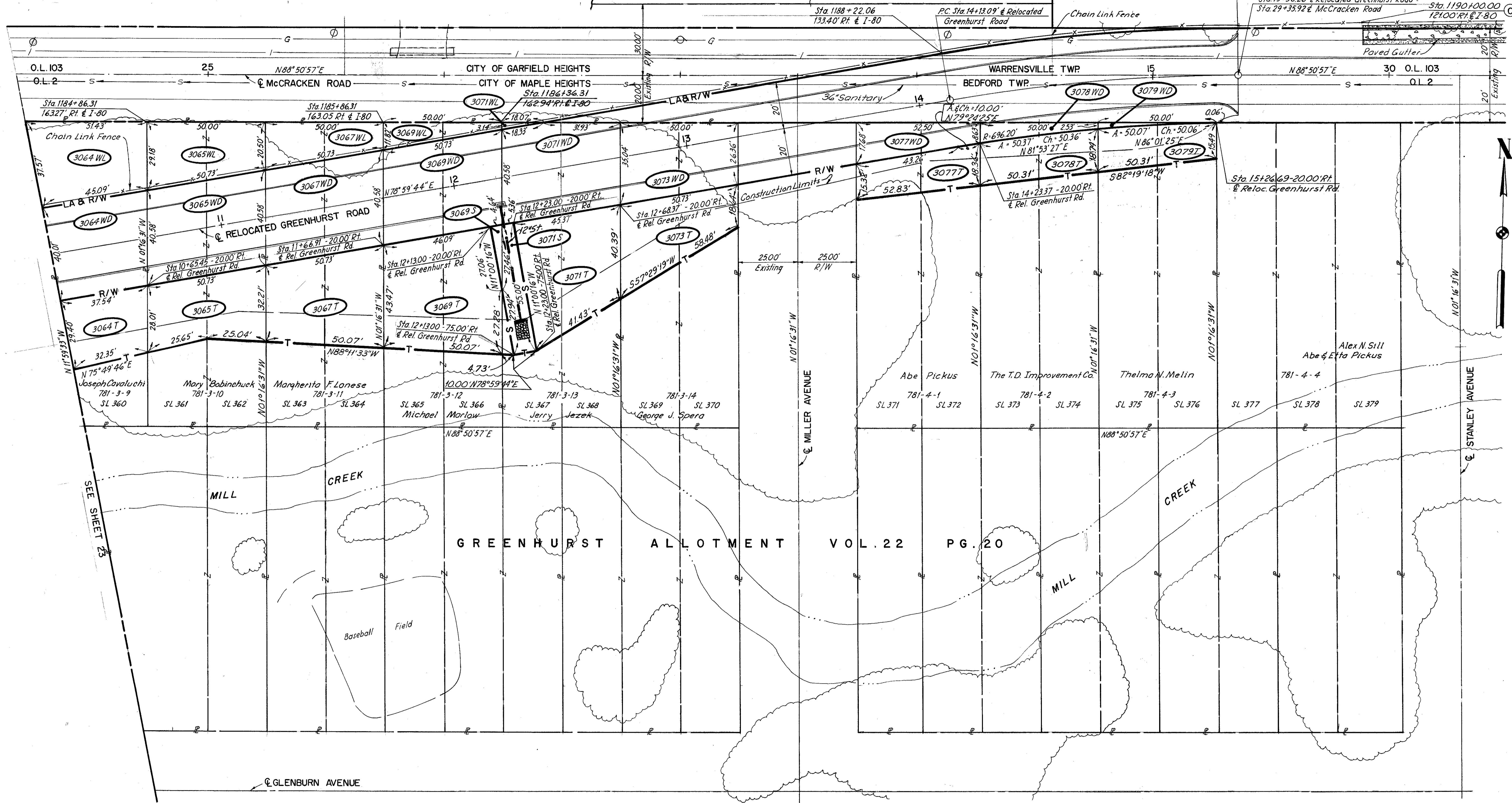
Sta. 15+36.26 - 21.00' Lf. @ Rel. Greenhurst Rd.

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
 CUY. 80-2140
 CUY. 80-19.40 RIGHT OF WAY ONLY
 I-80-4(8) RIGHT OF WAY ONLY

388
390

25
27



SCALE 1" = 20'

HOWARD, NEEDLES, TAMMEN & BERGENOFF
 MADE 85 DATE 6-22-70 CONSULTING ENGINEERS
 TRCD 85 DATE 6-24-70
 CKD 106 DATE 4-4-72 KANSAS CITY CLEVELAND NEW YORK

BEDFORD TOWNSHIP TOWN 6 RANGE II
WARRENSVILLE TOWNSHIP TOWN 7 RANGE II

JAG	Deleted Parcel 3080	1-22-73
NAME	REVISION	DATE

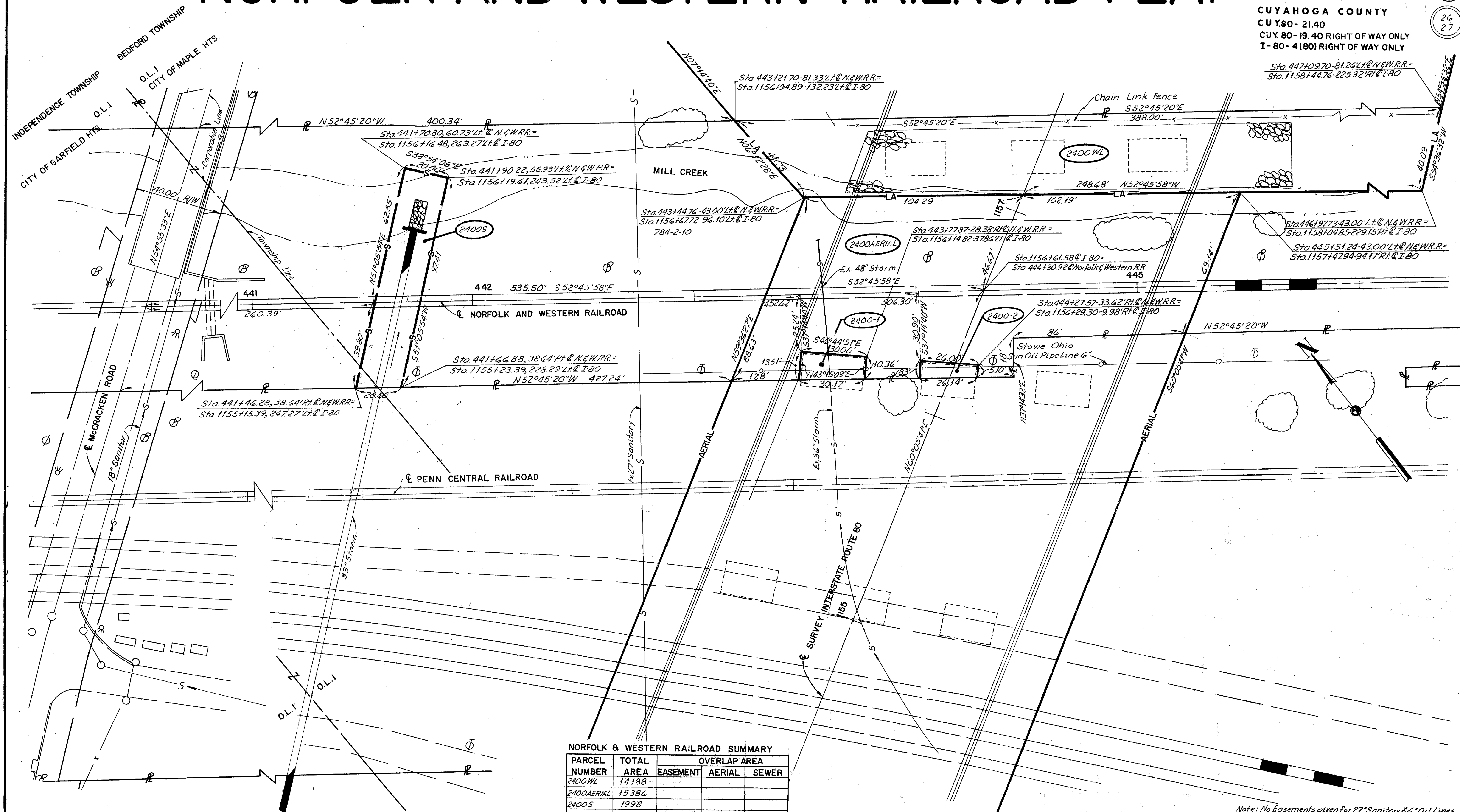
RIGHT OF WAY PLAN

NORFOLK AND WESTERN RAILROAD PLAT

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

389
390
26
27

CUYAHOGA COUNTY
CUY. 80- 21.40
CUY. 80- 19.40 RIGHT OF WAY ONLY
I- 80- 4 (80) RIGHT OF WAY ONLY



NORFOLK & WESTERN RAILROAD SUMMARY

PARCEL NUMBER	TOTAL AREA	OVERLAP AREA		
		EASEMENT	AERIAL	SEWER
2400WL	14188			
2400AERIAL	15386			
2400S	1998			
2400-1	358		358	
2400-2	168		168	

Note: Areas are in Square Feet.

Note: No Easements given for 27" Sanitary & 6" Oil Lines.

SCALE 1"=20'
MADE R.O.L. DATE 7-15-70
TRCD R.O.L. DATE 7-15-70
CRD JAG DATE 8-6-72
HOWARD, NEEDLES, TAMMEN & BERGENOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

BEDFORD TOWNSHIP TOWN 6 RANGE 11
INDEPENDENCE TOWNSHIP TOWN 6 RANGE 12

JAG	Revised Parcel 2400S	7-27-72
NAME	REVISION	DATE

PENN CENTRAL RAILROAD PLAT

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

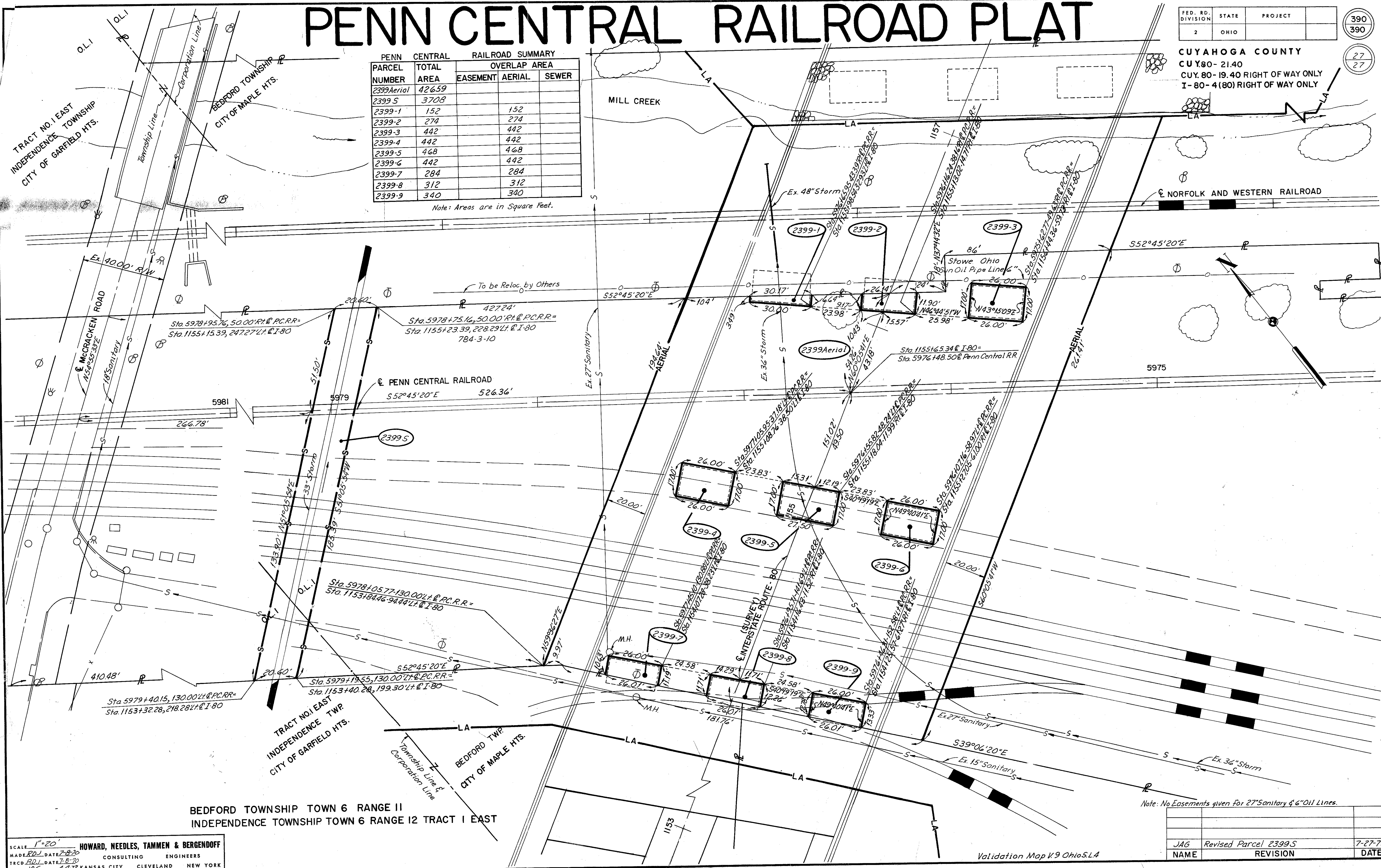
390
390

CUYAHOGA COUNTY
CUY.80-21.40
CUY.80-19.40 RIGHT OF WAY ONLY
I-80-4(80) RIGHT OF WAY ONLY

27
27

PARCEL NUMBER	TOTAL AREA	OVERLAP AREA		
		EASEMENT	AERIAL	SEWER
2399 Aerial	426.59			
2399-5	370.8			
2399-1	152		152	
2399-2	274		274	
2399-3	442		442	
2399-4	442		442	
2399-5	468		468	
2399-6	442		442	
2399-7	284		284	
2399-8	312		312	
2399-9	340		340	

Note: Areas are in Square Feet.



BEDFORD TOWNSHIP TOWN 6 RANGE 11
INDEPENDENCE TOWNSHIP TOWN 6 RANGE 12 TRACT 1 EAST

SCALE 1"=20'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE P.D. DATE 7-8-70
TRCD P.D. DATE 7-8-70
CKD JAG DATE 4-9-72 KANSAS CITY CLEVELAND NEW YORK
CONSULTING ENGINEERS

Note: No Easements given for 27" Sanitary & 6" Oil Lines.

JAG	Revised Parcel 2399.5	7-27-72
NAME	REVISION	DATE

Validation Map V9 Ohio S.L.A.