CUY-90-14.90

PID 77332/85531

APPENDIX EX-38

CUY-490-0099 PID 03524
(Reference Document)

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

Innerbelt Bridge
Construction Contract Group 1 (CCG1)

Revision Date: 1986

91-17

CUYAHOGA COUNTY	OHIO		1
CUY-490-0.99	FHWA REGION 5		193
I-490-3(11)28	FEDERAL PROJECT		

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
CUY-490-0.99
I-490-3(11)28
PHASE 2- SUPERSTRUCTURE

CITY OF CLEVELAND, CUYAHOGA COUNTY
GRADE SEPARATION WITH BALTIMORE AND OHIO RAILROAD COMPANY
NORFOLK AND WESTERN RAILWAY COMPANY,
NEWBURG AND SOUTH SHORE RAILWAY COMPANY, AND
RIVER TERMINAL RAILWAY COMPANY

MICROFILMED
APR 11 1992

DESIGN DESIGNATION

	EAST END OF PROJECT
1985 A.D.T.	64,234
2005 A.D.T.	87,120
D.H.V.	8,712
D	60%-40%
T	5%
V	60 M.P.H.

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)
SLOPE LINE (CUT)
SLOPE LINE (FILL)

Sheets 1, 93, 94, 133, 154, 162, 165, 167, 169, 173 & 178 revised. Sheets 140, 141 & 142 superseded by Sheets 140-S, 141-S & 142-S.
12-24-86 CPD

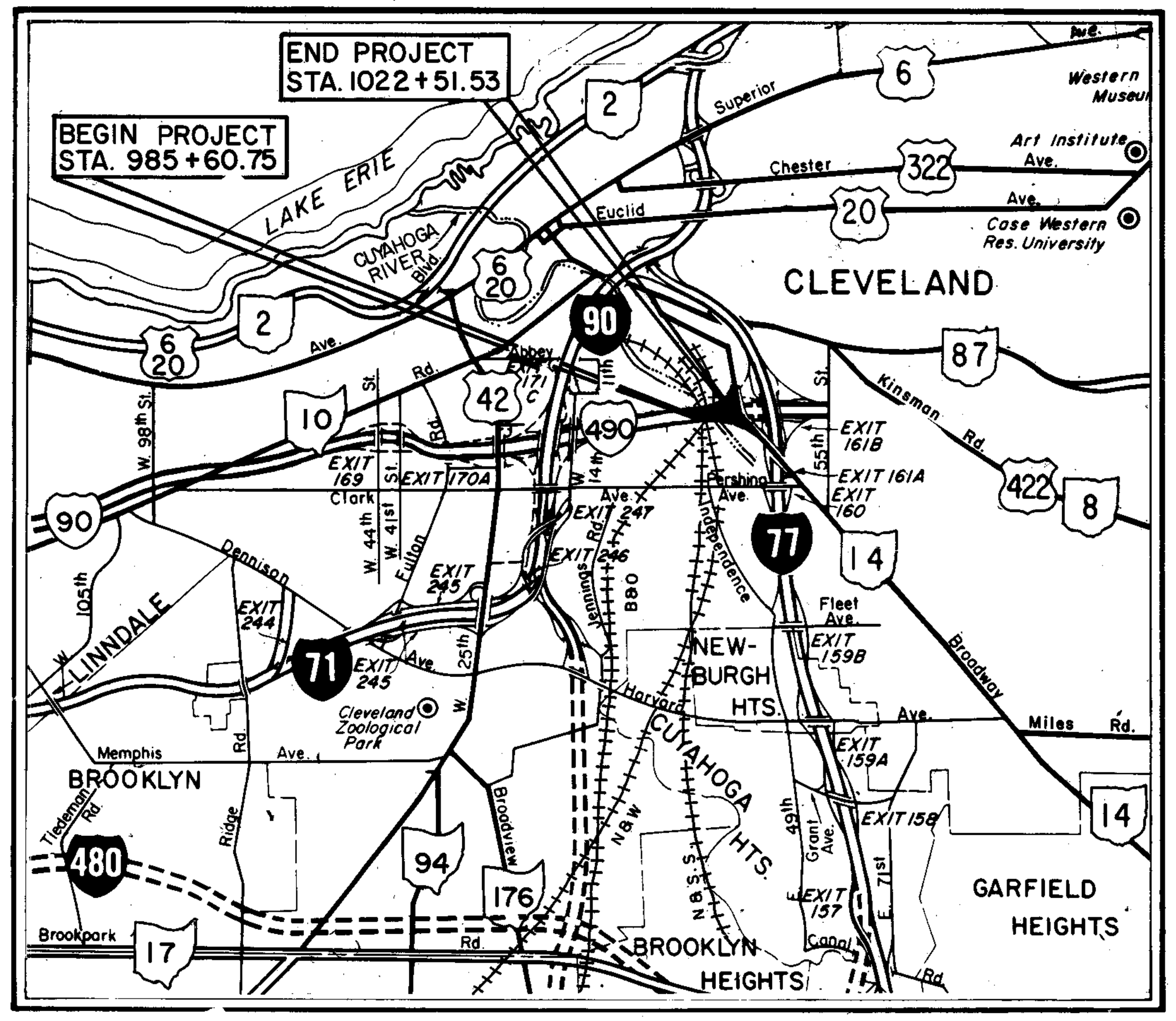
INDEX OF SHEETS

LINE DATA

BEGIN PROJECT STA. 985+60.75
END PROJECT STA. 1022+51.53
NET PROJECT LENGTH = 3,690.78 L.F. = 0.699 MILES

ADDITIONAL WORK
I-490 STA. 929+05.00 TO STA. 985+60.75 = 5,655.75 L.F.
STA. 1022+51.53 BACK = STA. 1023+49.97 AHEAD = 540.03 L.F.
STA. 1023+49.97 TO STA. 1028+90.00
WEST 7TH STREET STA. 6+00.00 TO STA. 19+70.00 = 1,370.00 L.F.
NET LENGTH OF WORK = 11,256.56 L.F = 2.132 MILES

UNDERGROUND UTILITIES
TWO WORKING DAYS BEFORE YOU DIG Call 800-362-2764 (Toll free) OHIO UTILITIES PROTECTION SERVICE NON-MEMBERS MUST BE CALLED DIRECTLY



LOCATION MAP

SCALE IN MILES
0 2 4 6 8

PORTION TO BE IMPROVED
INTERSTATE
U.S. HIGHWAY
STATE
OTHERS
UNDER CONSTRUCTION

SCALES
Plan 0 50 100
Profile: Horizontal 0 100 200, Vertical 0 10 20
Cross Section: Horizontal 0 10 20, Vertical 0 10 20

SUPPLEMENTAL SPECIFICATIONS		
824	10-8-82	
845	2-25-86	
836	11-12-85	
824	10-8-82	
953	8-21-80	
861	9-9-83	
932	3-25-85	
961	9-9-83	

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS			
HL-1	12-28-84	HL-11	6-1-79
HL-3	12-28-84	HL-12	12-28-84
HL-4	1-21-76	HL-15	12-28-84
HL-5	9-6-73	HL-16	12-28-84
HL-7	1-21-76	HL-19	3-22-77
HL-8	1-21-76	HL-22	12-28-84
HL-9	3-22-77	HL-2	7-27-73
HL-10	12-28-84		

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS									
BP-1	6-1-65	F-1	11-10-83	I-3A & B	4-1-80	TC-22.20	3-1-79	TC-52.20	4-3-79
BP-2	1-11-85	F-3	5-1-76	MC-4	7-26-76	TC-31.21	3-6-79	TC-61.10	4-5-82
BP-3	12-6-76	F-5	5-1-76	MC-6	1-30-84	TC-32.10	3-8-79	TC-71.10	4-9-79
BP-4	1-11-85	F-6	5-1-76	MC-7	10-15-76	TC-32.11	3-21-79	TC-72.20	2-26-82
				MC-9	1-30-84	TC-41.10	8-29-84	TC-81.10	1-20-84
BP-7	12-6-76	GR-1	1-11-85	MC-11	8-1-78	TC-41.20	3-26-79	TC-81.20	1-20-84
BP-9	12-6-76	GR-2B	2-5-82	TC-7.65	3-1-79	TC-41.40	6-18-79	TC-83.10	1-20-84
BP-10	1-30-84	GR-3	1-21-85	TC-9.10	4-24-80	TC-41.50	3-26-79	TC-84.20	1-20-84
BP-12	7-7-81	GR-4	2-5-82	TC-12.30	1-20-84	TC-42.10	8-19-77	TC-85.20	1-20-84
		GR-4A	1-30-84	TC-16.20	1-20-84	TC-42.20	3-26-79	AS-1-81 Sh. 1&2	11-27-81
CB-3	5-1-79	MC-9A	1-11-85	TC-18.24	4-25-79	TC-51.10	1-20-84	RB-1-55	2-2-59
		I-2A	12-18-84	TC-22.10	3-1-79	TC-52.10	4-3-79	SD-1-69 Sh. 1&2	6-12-69

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 of the Revised Code of Ohio.

1985 SPECIFICATIONS

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

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

APPROVED: Joseph L. Stamp
DATE: 7/8/86 DIRECTOR OF PUBLIC SERVICE, CITY OF CLEVELAND

APPROVED: Martin A. Gallitz
DATE: 7-15-86 DISTRICT DEPUTY DIRECTOR OF TRANSPORTATION

APPROVED:
DATE: ________ ENGINEER, BUREAU OF BRIDGES AND STRUCTURAL DESIGN

APPROVED: Wayne H. Kauble
DATE: 9-2-86 CHIEF ENGINEER, PLANNING AND DESIGN

APPROVED: Warren J. Smith
DATE: 9-2-86 DIRECTOR, DEPARTMENT OF TRANSPORTATION

I-290 and CUY-290-0.27 or CUY-490-1.00 appearing throughout these plans shall be considered to read I-490 and CUY-490-0.99 respectively throughout these plans.

FED. RD. DIVISION 2 appearing throughout the plans shall be considered to read.
FHWA REGION 5

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

Plan Prepared By:
Howard, Needles, Tammen & Bergendoff
CONSULTING ENGINEERS
CLEVELAND, OHIO
HNTB

Ralph E. Robison
RALPH E. ROBISON

STATE OF OHIO
RALPH E. ROBISON
29717
REGISTERED PROFESSIONAL ENGINEER
SEAL

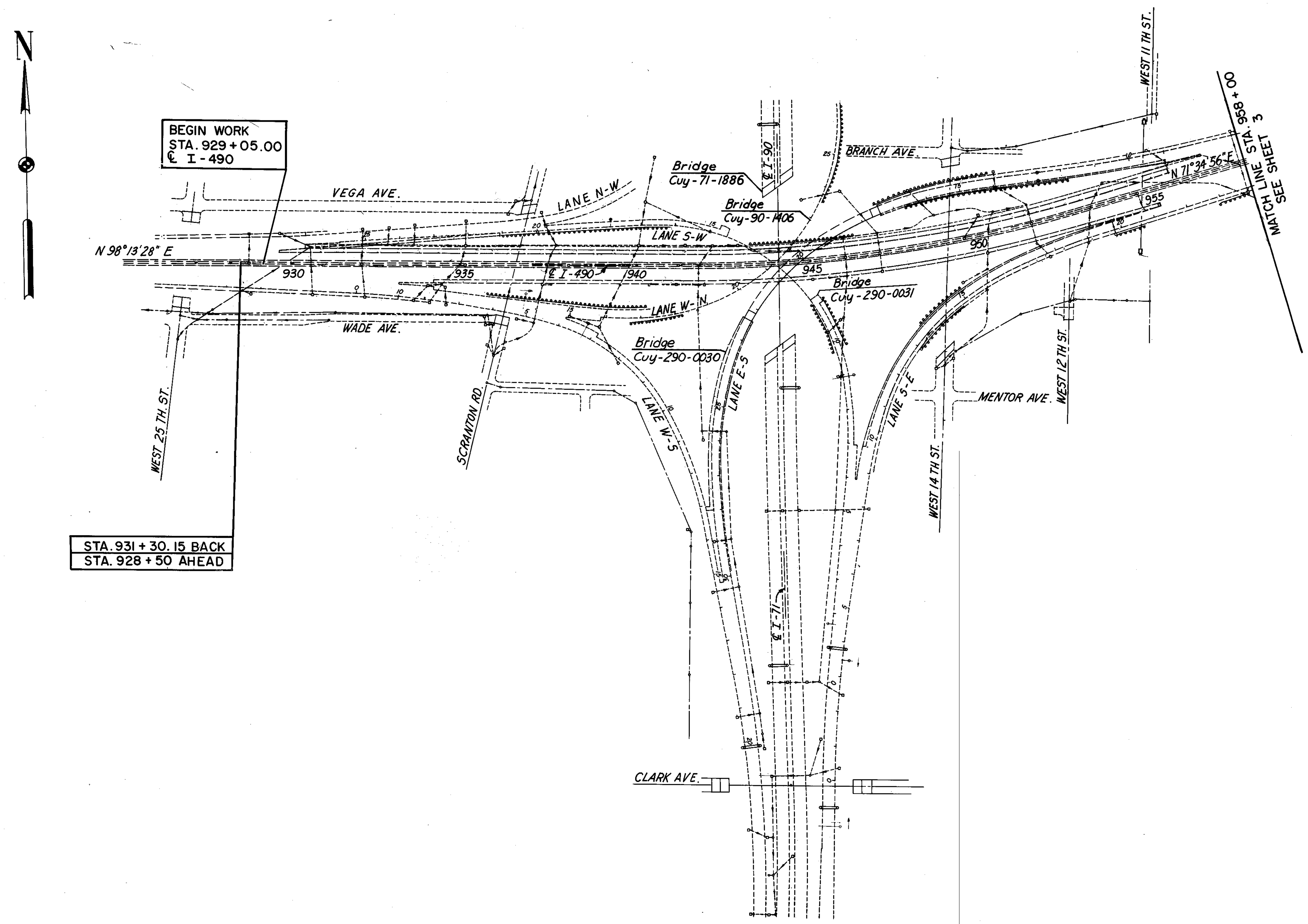
Project: CUY-490-0.99
Date of Letting ________ 19__, Contract No. ________
LD0300 Rev. 11-21-73

SCHEMATIC PLAN

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

2
193

CUYAHOGA COUNTY
CUY – 490 – 1.00



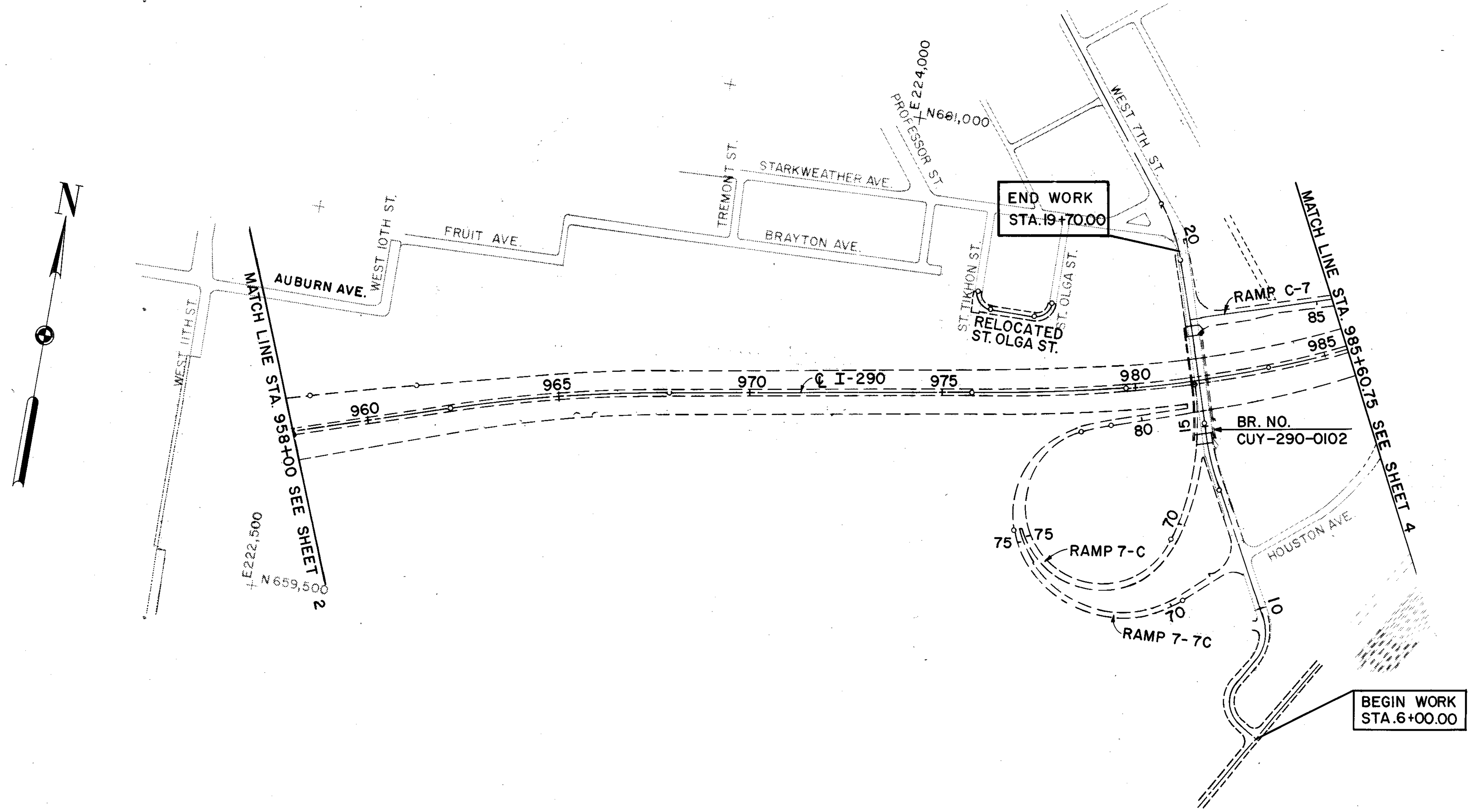
200 0 200 400 600 800
SCALE IN FEET

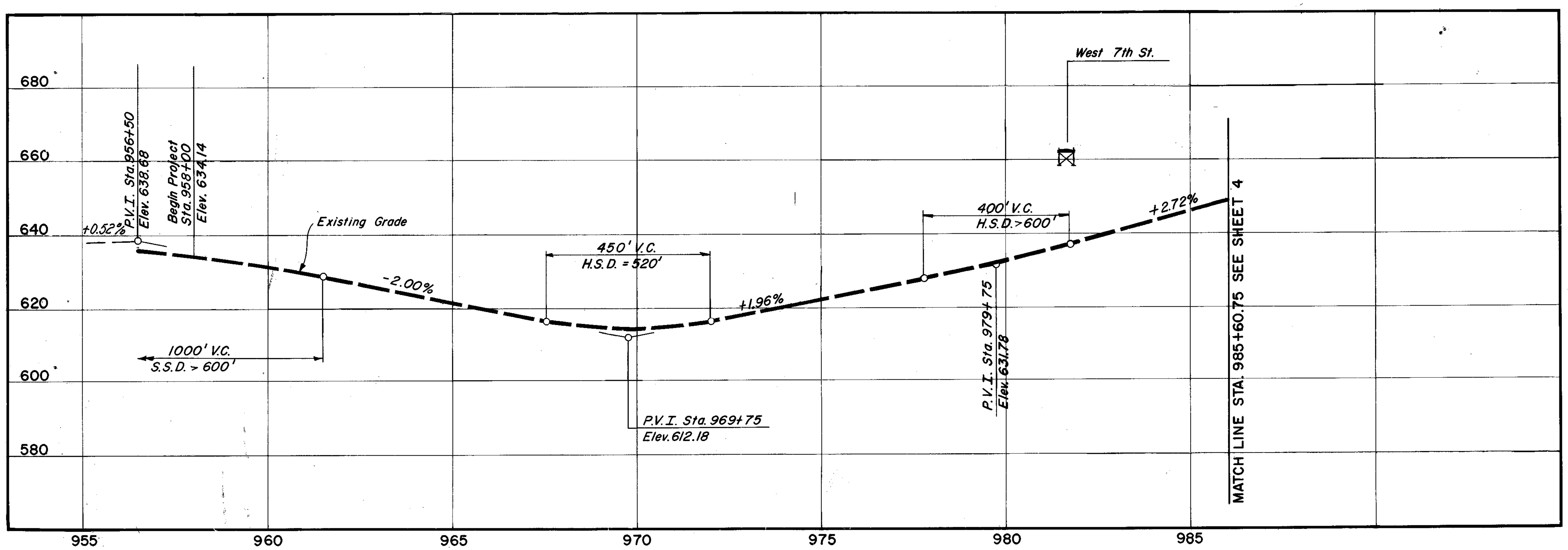
SCALE As Shown
MADE A.H.S. DATE 2-6-84
TRCD J.A.G. DATE 2-7-84
CKD R.L.N. DATE 4-3-84

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

SCHEMATIC PLAN

SCHEMATIC PLAN





Note:
For Curve Data See Sheets 5 and 6.

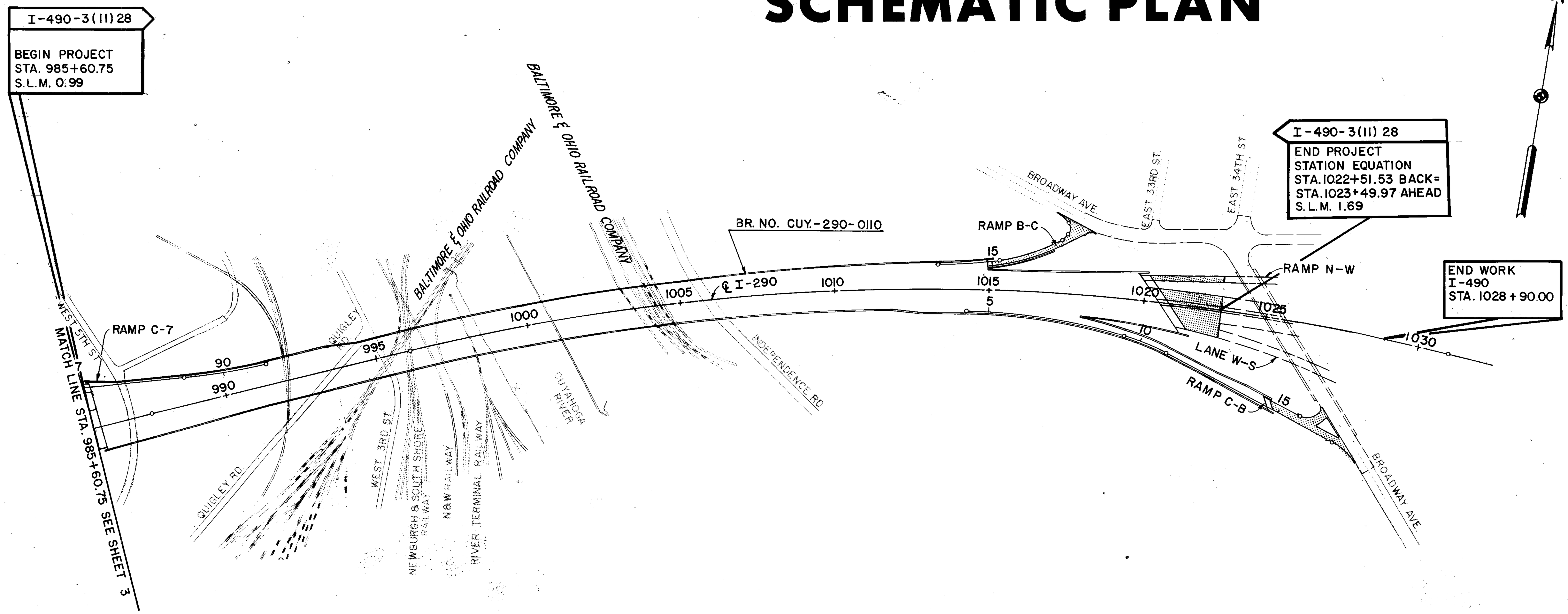
200 0 200 400 600 800 HORIZ.
20 0 20 40 60 80 VERT.
SCALE IN FEET

SCALE 1"=20' Vert. 1"=200' Horiz. HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE HLD DATE 9/22/69 CONSULTING ENGINEERS
TRCD HLD DATE 9/22/69
CKD LJD DATE 1/15/7? KANSAS CITY CLEVELAND NEW YORK

SCHEMATIC PLAN

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY.-290-0.27



PROPOSED STRUCTURE

TYPE: Continuous steel beam (Unit 1) continuous welded steel girder with floor system (Units 2, 3 and 4), continuous multiple welded steel girder (Units 5, 6 and C-B) with reinforced concrete deck and substructure.

SPANS: Spans are measured along ℄ I-490:
Unit 1 - 53'-0 1/16", 67'-0", 53'-0"
Unit 2L-15'-0" Cantilever, 131'-6", 180'-6", 180'-6", 180'-6".
Unit 3L- 20'-0" Cantilever, 237'-0", 330'-0", 174'-0", 20'-0" cantilever.
Unit 4L- 178'-0 1/16", 188'-11 13/16", 145'-0 1/16", 15'-0" Cantilever.
Unit 2R- 15'-0" Cantilever, 131'-6", 131'-6", 131'-6", 182'-6", 147'-0".
Unit 3R- 20'-0" Cantilever, 201'-0", 340'-0", 185'-0", 20'-0" Cantilever.
Unit 4R- 164'-0 1/16", 166'-11 13/16", 145'-0 1/16", 15'-0" Cantilever.
Unit 5 - 119'-0", 135'-0", 135'-2 1/4", 134'-9 13/16", 124'-11 15/16", 10'-0" Cantilever.
Unit 6 - 104'-9 1/4", 117'-7 1/2", 119'-8 5/16", 122'-9 1/2", 96'-10 7/8".
Spans are measured along ℄ Ramp C-B:
Unit 6C-B - 114'-6 1/4", 122'-11 3/4", 124'-9", 124'-9" 96'-0".

ROADWAYS: I-490 - Width Varies face to face of parapets, 67'-0" to 143'-5"± Left Bridge and 67'-0" to 103'-9"± Right Bridge. There is a 2" open joint between Left and Right Bridge.

Ramp C-B- Width Varies, 28'-0" to 36'-0" face to face of parapets.

LOADING: HS 20-44 and Interstate Alternate Loading.

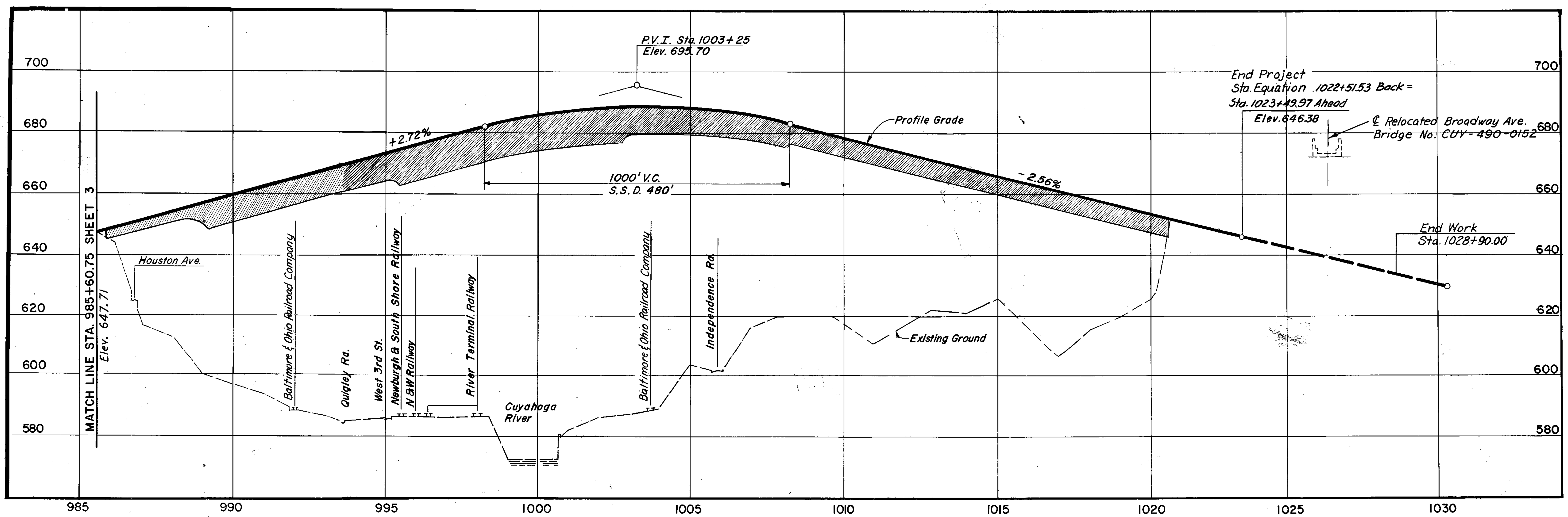
SKEW: Unit 1 - None with respect to local tangent at S.T. Sta. 987+54.50
Unit 2 - None
Unit 3 - None
Units 4,5 and 6 - Varies (See Plan)
Unit 6C-B - 45° Right Forward with respect to local tangent at P.T. Sta. 10+89.88

WEARING SURFACE: 1 1/4" Latex modified concrete

APPROACH SLABS: AS-1-81 (25' long)

ALIGNMENT: Units 1 thru 6 - Spiral left, Tangent and 0°50' Curve Right.
Unit 6C-B - 3° Curve Right, 8° Curve Right and Tangent.

SUPERELEVATION:
Unit 1 - Varies: -0.0156 ft. per ft. to +0.169 ft. per ft.
Unit 2 - Varies level to .0156 ft. per ft.
Unit 3 - Varies .0156 ft. per ft. to .02 ft. per ft.
Units 4,5 and 6 - .02 ft. per ft.
Unit 6C-B - Varies .0156 ft. per ft. to .064 ft. per ft.

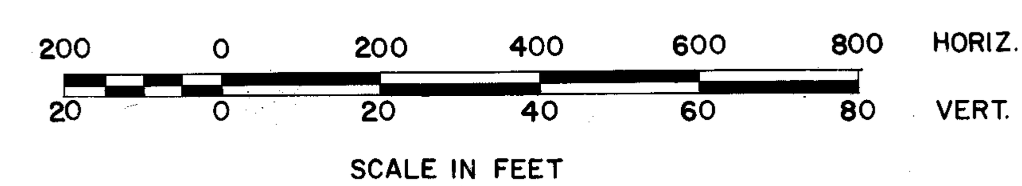


SUBSTRUCTURE IS NOT PART OF THIS CONTRACT.

LEGEND

I-490-3(11) 28

Note:
For Curve Data See Sheets 5 and 6.



SCALE 1" = 20' Vert 1" = 200' Horiz.
MADE DCF DATE 9/17/69
TRCD HLD DATE 9/24/69
CKD RSW DATE 3/5/70

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

SCHEMATIC GEOMETRIC PLAN

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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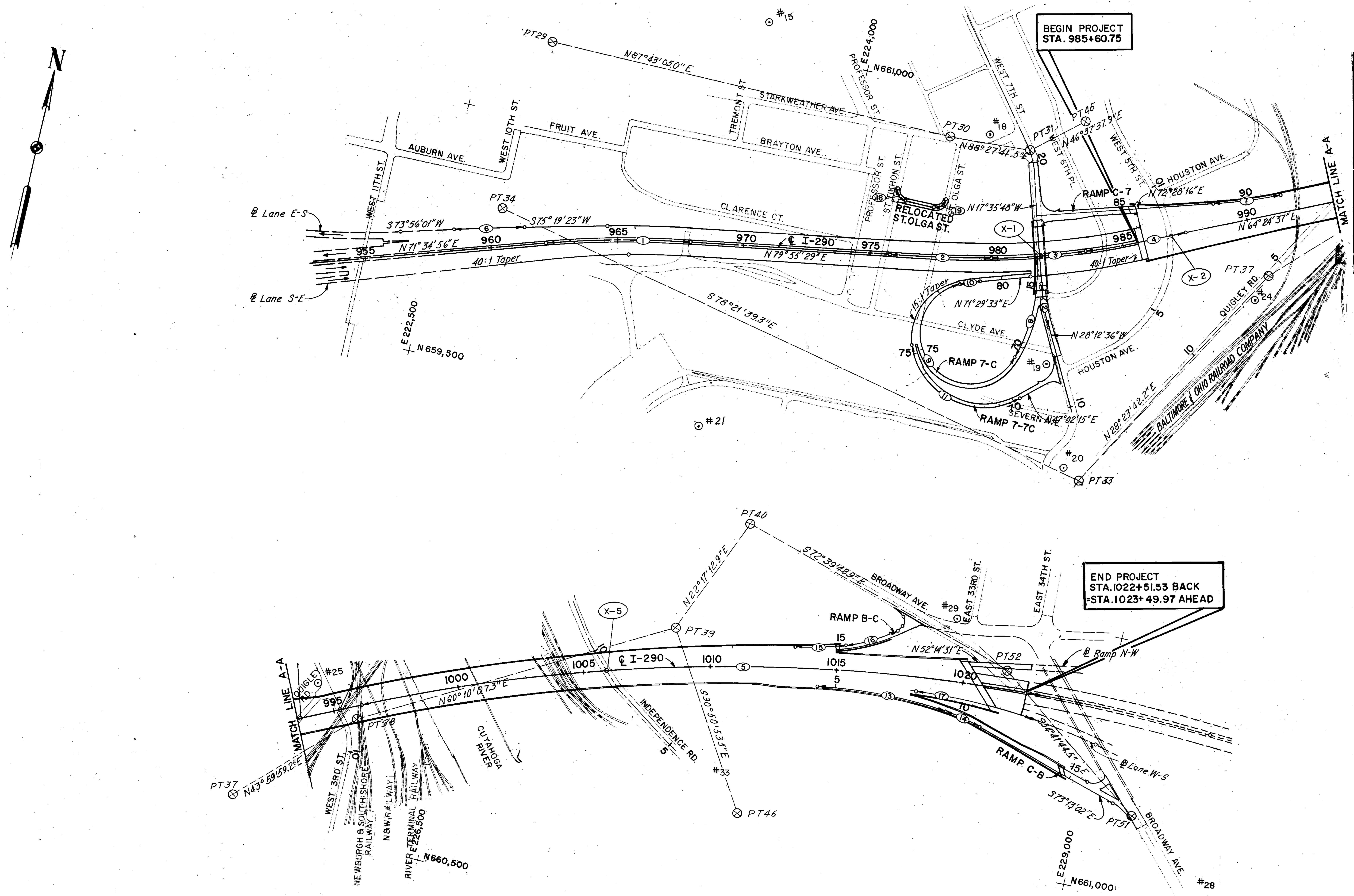
CUYAHOGA COUNTY
CUY.-290-0.27



INTERSECTION DATA				
Point	Location	Station	Coordinates North	Coordinates East
X-1	℄ I-290 ℄ West 7 st.	981+68.954 16+11.275	660 452.134	224 833.386
X-2	℄ I-290 ℄ Houston	986+82.51 8+12.46	660648.020	225307.655
X-3	℄ I-290 ℄ Quigley	993+62.952 1+57.67	660941.873	225921.377
X-4	℄ I-290 ℄ West 3 st.	995+12.065 11+82.33	661021.822	226071.408
X-5	℄ I-290 ℄ Independence Rd.	1005+85.949 8+82.91	661406.242	227051.210

BENCH MARKS		
No.	Description	Elevation
15.	N.E. Flange Bolt, Top of Hydrant on N. side of Starkweather at #1022.	682.81
18.	N. Flange Bolt, Top of Hydrant 100' W. of West 7th on N. side Starkweather.	672.533
19.	N.E. Flange Bolt, Top of Hydrant on W. side of West 7th at Houston.	628.146
20.	"a" Cut on S.E. corner of concrete base at S.E. corner of Tower at West 7th and Quigley.	594.477
21.	"a" Cut on N.W. corner of concrete base at N.W. corner of Air Products and Chemicals Fence.	591.319
24.	"a" Cut in concrete base of S.W. Leg of Tower 125' S. of Pt 37 on E side of Quigley.	590.291
25.	N.E. Flange Bolt, Top of Hydrant on N. side of 3rd and Quigley. B.M. has been disturbed	584.72
28.	N.E. Flange Bolt, Top of Hydrant on S. side of Broadway at gate 5 to Sohio.	665.44
29.	N.E. Flange Bolt, Top of Hydrant on S. side of Broadway and E. 33rd.	672.29
33.	N. Flange Bolt, Top of Hydrant on S. side of Independence Rd. at # 2981.	593.70

Note:
For Curve Data See Sheet 6
For Survey Data see Sheet 7

LEGEND

Intersection Data ______ (X-5)
Bench Mark ____________ ⊙#20
Traverse Points ________ ⊗ PT29
Curve Data ____________ (2)

Note:
Add 2,000,000 to all East Coordinates.

SCALE 1"=200'
MADE HLD DATE 9/25/69
TRCD HLD DATE 9/25/69
CKD L.J.D. DATE 9/30/69

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

GEOMETRICS TABLE

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY.– 290– 027

LINE	CURVE	P.C.			P.I.			P.T.			△	D	R	T	L	E
		STATION	N. COORD.	E. COORD.	STATION	N. COORD.	E. COORD	STATION	N. COORD.	E. COORD.						
I-290	1	962+16.45	660,042.01	222,926.47	965+01.35	660,132.03	223,196.78	967+85.25	660,181.87	223,477.29	8°20'33"	1°28'00"	3,906.53'	284.90'	568.80'	10.38'
	2	See Spiral	Table Below													
	3	979+78.77	660,399 80	224,650.59	981+66.91	660,445.55	224,833.07	983+54.50	660,514.77	225,008.00	7°30'52"	2°00'00"	2,864.79'	188.13'	375.72'	6.17'
	4	See Spiral	Table Below													
	5	996+09.63	661,048.42	226,143.86	1009+47.08	661626.10	227350.12	1022+51.53	661709.47	228684.96	22°00'57"	0°50'00"	6,875.49'	1337.45'	2641.90'	128.88'
Lane E-S	6	3+39.31	660,082.92	222,828.78	4+78.24	660,047.72	222,694.37	6+17.17	660,009.26	222,560.86	1°23'22"	0°30'00"	11,459.16'	138.94'	277.86'	0.84'
Ramp C-7	7	88+80.25	660,812.11	225,449.30	90+14.82	660,852.64	225,577.63	91+48.95	660,910.77	225,699.00	8°03'39"	3°00'00"	1,909.86'	134.57'	268.70'	4.74'
Ramp 7-C	8	66+36.50	660,439.88	224,823.63	68+47.14	660,239.10	224,887.32	70+46.24	660,035.80	224,832.15	32°46'44"	8°00'00"	716.20'	210.64'	409.74'	30.33'
	9	70+46.24	660,035.80	224,832.15	-	660,088.18	224,639.13	78+48.77	660,269.58	224,554.90	229°54'38"	28°38'52"	200.00'	-	802.54'	-
	10	78+48.77	660,269.58	224,554.90	78+88.82	660,286.44	224,591.22	79+28.77	660,299.15	224,629.19	6°24'00"	8°00'00"	716.20'	40.04'	80.00'	1.12'
Ramp 7-7C	11	69+75.27	659,884.00	224,889.03	73+98.95	659,595.26	224,578.98	75+34.62	659,990.55	224,426.50	111°52'09"	20°00'00"	286.48'	423.68'	559.35'	224.96'
West 7th	12	13+22.75	660,183.13	224,935.84	14+11.44	660,261.29	224,893.92	14+99.64	660,345.84	224,867.10	10°36'48"	6°00'00"	954.93'	88.70'	176.89'	4.11'
Ramp C-B	13	4+26.94	661,542.02	227,879.36	6+86.60	661,589.10	228,134.71	9+43.08	661,566.30	228,393.36	15°29'03"	3°00'00"	1,909.86'	259.65'	516.14'	17.57'
	14	9+43.08	661,566.30	228,393.36	10+16.74	661,559.82	228,466.73	10+89.88	661,538.56	228,537.25	11°44'38"	8°00'00"	716.20'	73.66'	146.80'	3.78'
Ramp B-C	15	See Spiral	Table Below													
	16	15+32.54	661,724.01	227,950.97	16+39.57	661,761.95	228,051.04	17+45.02	661,827.48	228,135.66	16°59'53"	8°00'00"	716.20'	107.02'	212.48'	7.95'
Lane W-S	17	0+00.00	661,607.91	228,219.00	4+02.12	661,660.66	228,617.65	7+96.13	661,574.35	229,010.44	19°54'12"	2°30'00"	2291.83'	402.12'	796.13'	35.01'
Reloc.St.Olga	18	1+76.36	660,529.23	224,270.40	2+17.84	660,527.09	224,228.96	2+40.65	660,568.57	224,228.34	92°05'25"	143°14'22"	40.00'	41.49'	64.29'	17.63'
	19	0+00.00	660,575.72	224,423.14	0+38.58	660,537.15	224,423.74	0+61.39	660,535.16	224,385.21	87°55'59"	143°14'22"	40.00'	38.58'	61.39'	15.58'

LINE	CURVE	T. S.	S. C.	C. S.	S. T.	θ_s	T_s	L_s	P	K	ST	LT	E_s
I-290	2	975+78.77 N 660,320.69 E 224,258.57	979+78.77 N 660,399.80 E 224,650.59	- - -	- - -	4°00'00"	590.53'	400.00'	2.33'	199.97'	133.40'	266.74'	28.81'
I-290	4	- -	- -	983+54.50 N 660,514.77 E 225,008.00	987+54.50 N 660,679.07 E 225,372.61	4°00'00"	590.53'	400.00'	2.33'	199.97'	133.40'	266.74'	28.81'
Ramp B-C	15	13+32.54 N 661,670.86 E 227,758.34	15+32.54 N 661,724.01 E 227,950.97	-	-	8°00'00"	253.71'	200.00'	2.32'	99.94'	66.79'	133.47'	18.60'

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.

Note:
Add 2,000,000 to all East Coordinates.

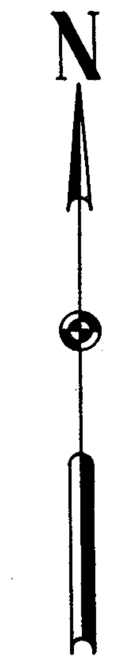
SCALE None	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE DCF DATE 8-4-70	CONSULTING ENGINEERS
TRCD MWD DATE 8-13-70	
CKD RSH DATE 8-19-70	KANSAS CITY CLEVELAND NEW YORK

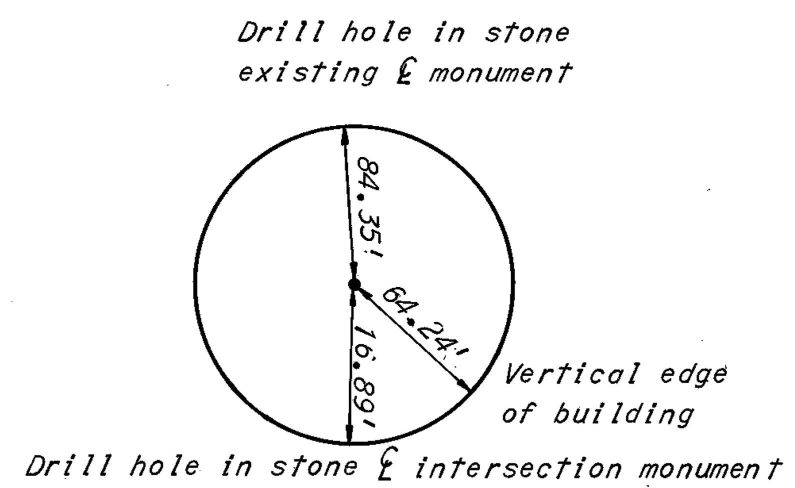
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

7
193

CUYAHOGA COUNTY
CUY.-290-0.27

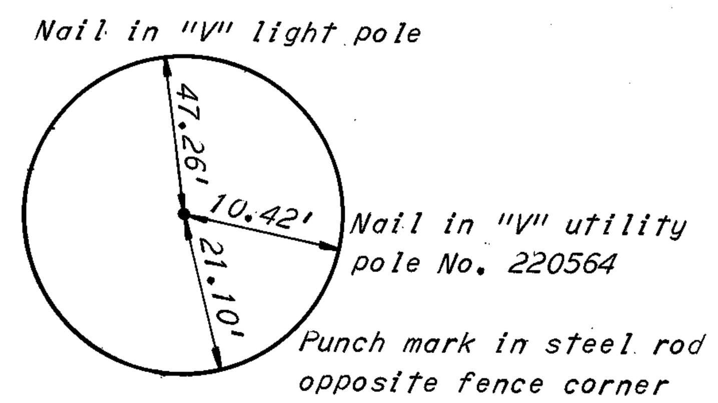
TRAVERSE TIES





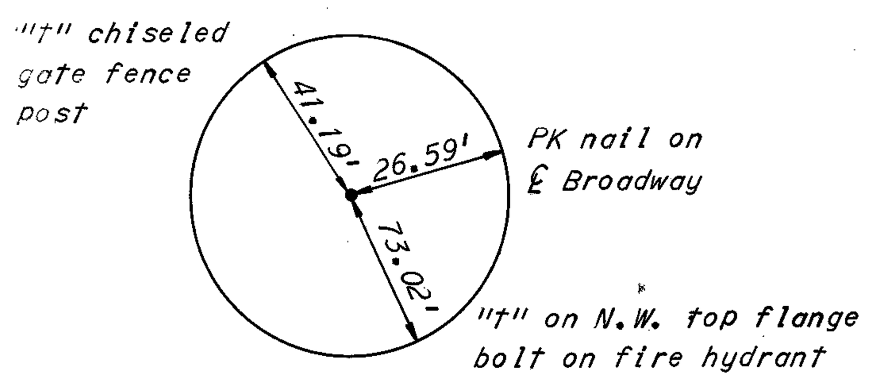
POINT 31

West 7th St. @ Starkweather
Punch mark in iron rod
driven through brick pavement



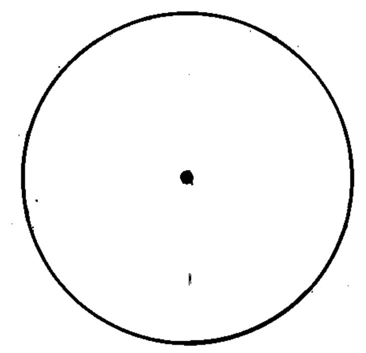
POINT 39

H.N.T.B. survey
marker on steel rod driven
into ground with concrete
paved around it.



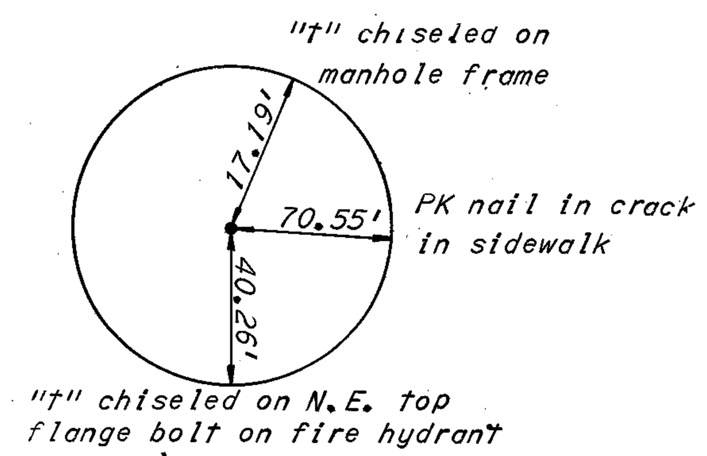
POINT 40

Stud driven into concrete
sidewalk with screw
inserted into it



POINT 50

Broadway Ave. @ Dille
existing C.R.G.S.
monument No.O.M. 914



POINT 52

Punch mark in head of
PK nail driven into
asphalt pavement on ℄
Broadway near E.34th St.

Traverse Points							
Point No.		Distance		Length	Bearing	Coordinates	
C.R.G.S.	H.N.T.B.	From Pt.	To Pt.			North	East
				Line No. 1			
	29					660,759.89	2,222,752.68
	30	29	30	1,621.05	N87°43'05"E	660,824.44	2,224,372.44
	31	30	31	328.85	N88°27'42"E	660,833.26	2,224,701.17
	45	31	45	253.87	N46°37'38"E	661,007.61	2,224,885.72
				Line No. 2			
	34					660,132.38	2,222,738.96
	33	34	33	2,506.74	S78°21'39"E	659,626.66	2,225,194.15
	37	33	37	1,082.28	N28°23'42"E	660,578.73	2,225,708.88
	38	37	38	585.37	N43°59'59"E	660,999.81	2,226,115.47
	39	38	39	1,319.79	N60°10'07"E	661,656.34	2,227,260.37
	46	39	46	791.73	S30°50'54"E	660,976.61	2,227,666.35
				Line No. 3			
	40					662,108.96	2,227,445.88
	52	40	52	1,185.33	S72°39'49"E	661,755.75	2,228,577.37
	51	52	51	747.58	S54°41'44"E	661,323.71	2,229,187.46
914	50	51	50	879.79	S42°21'36"E	660,673.61	2,229,780.25

SCALE No Scale
MADE C.M.D. DATE 10-25-67
TRCD. ____ DATE ____
CKD. R.H.A. DATE 11-23-67

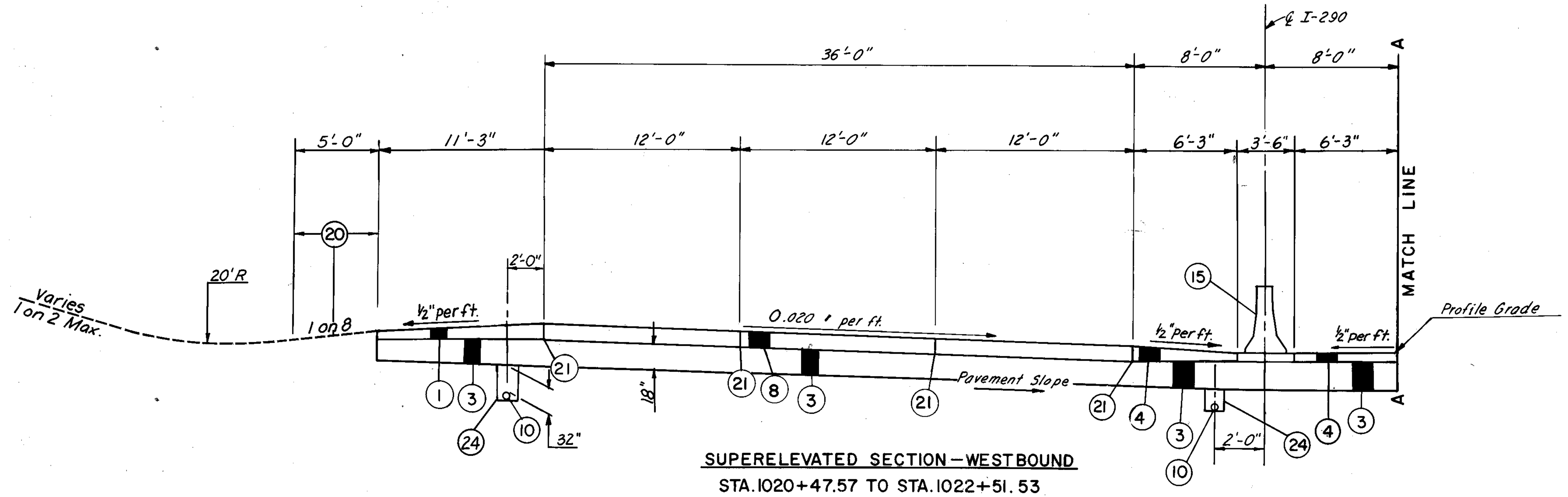
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

TYPICAL SECTIONS

FHWA REGION	STATE	PROJECT		
5	OHIO			

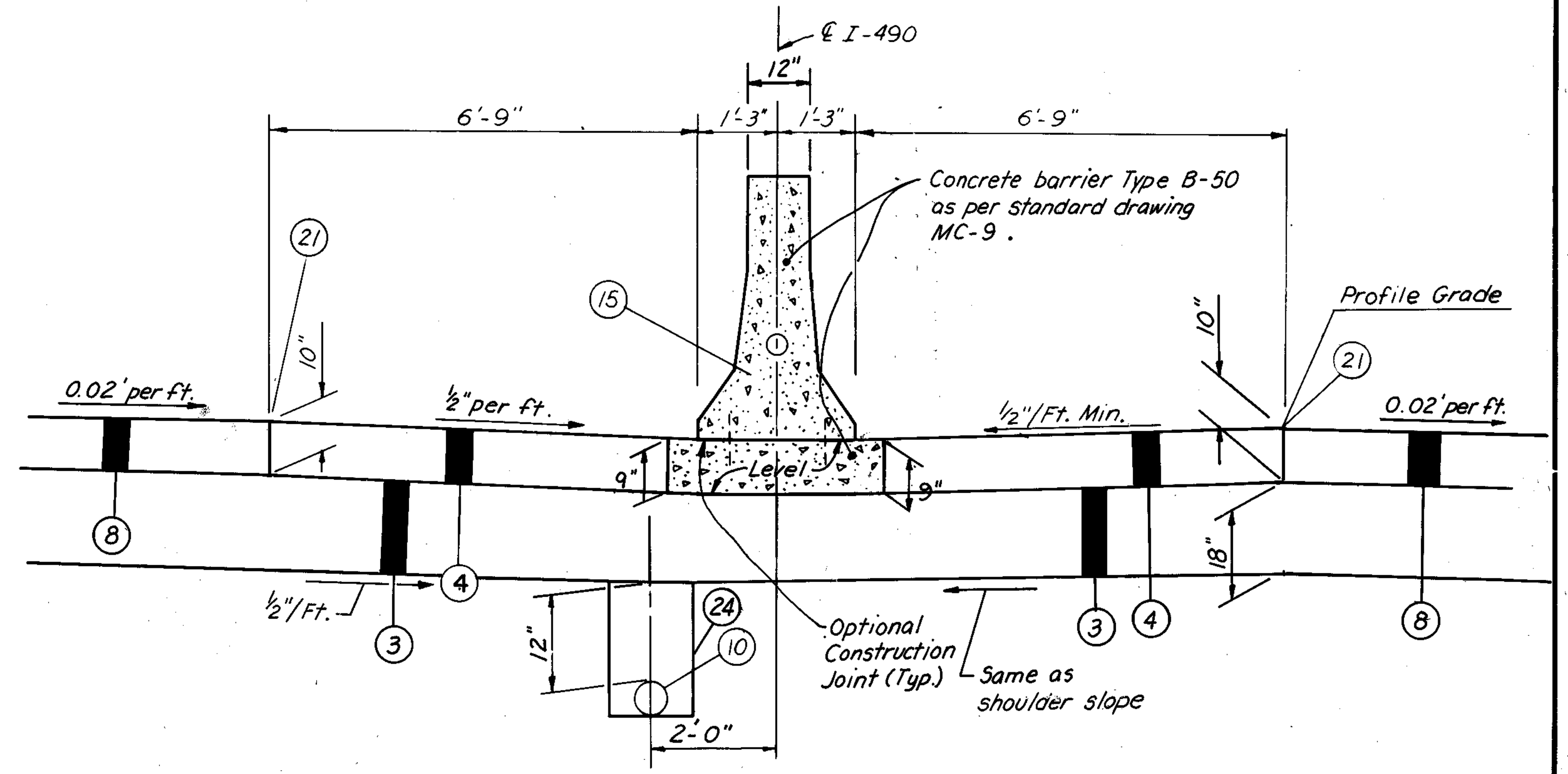
CUYAHOGA COUNTY
CUY- 490-1.00

TYPE 451 ON 310

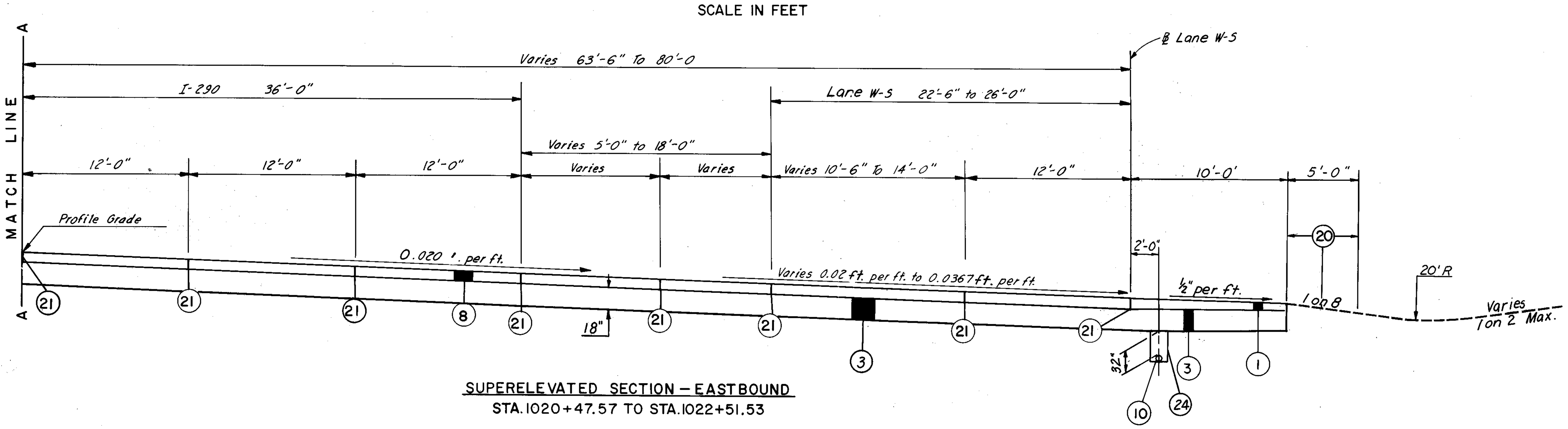


SUPERELEVATED SECTION—WESTBOUND
STA.1020+47.57 TO STA.1022+51.53

3 0 3 6 9
SCALE IN FEET



CONCRETE BARRIER MEDIAN DETAIL
Superelevated Section



SUPERELEVATED SECTION – EASTBOUND
STA.1020+47.57 TO STA.1022+51.53

3 0 3 6 9
SCALE IN FEET

LEGEND

1	ITEM 452	6" - 10" DEPTH, PLAIN CONCRETE PAVEMENT, AS PER PLAN
3	ITEM 310	SUBBASE, TYPE II, *AS PER PLAN*
4	ITEM 452	9" - 10" DEPTH, PLAIN CONCRETE PAVEMENT, AS PER PLAN
7	ITEM 451	9" REINFORCED CONCRETE PAVEMENT
8	ITEM 451	10" REINFORCED CONCRETE PAVEMENT
10	ITEM 605	6" PIPE UNDERDRAINS, *AS PER PLAN*
12	ITEM 452	6" - 9" DEPTH, PLAIN CONCRETE PAVEMENT, AS PER PLAN
14	ITEM 606	GUARD RAIL, TYPE 5
15	ITEM 622	CONCRETE BARRIER, STANDARD TYPE B-50
17	ITEM 609	CURB STANDARD, TYPE 6
19	ITEM 452	9" PLAIN CONCRETE PAVEMENT , AS PER PLAN
20	ITEM 659	SEEDING AND MULCHING
21		STANDARD LONGITUDINAL JOINT
24		FILTER FABRIC 712.09 , TYPE A
25	ITEM SPECIAL	HERBICIDES FOR WEED CONTROL
26	ITEM 301	3" BITUMINOUS AGGREGATE BASE FOR WEED CONTROL

Notes:

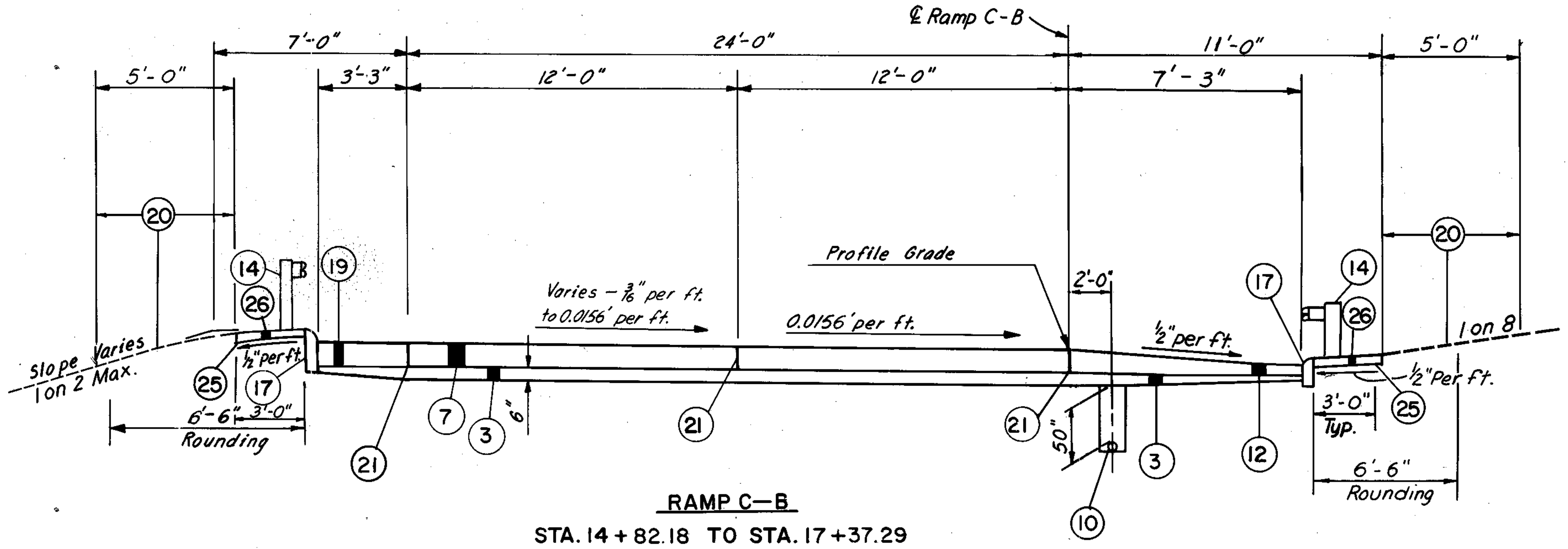
For Paved Shoulder Details see sheet 10.
Typical Sections show the general roadway features only. For details see the Pavement Plans, Paved Shoulder Typical Sections and Cross-Section sheets.

SCALE *As Shown* HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE *RSN* DATE *3-3-70* CONSULTING ENGINEERS
TRCD *MAG* DATE *3-3-70*
CKD *LJD* DATE *3-4-70* KANSAS CITY CLEVELAND NEW YORK

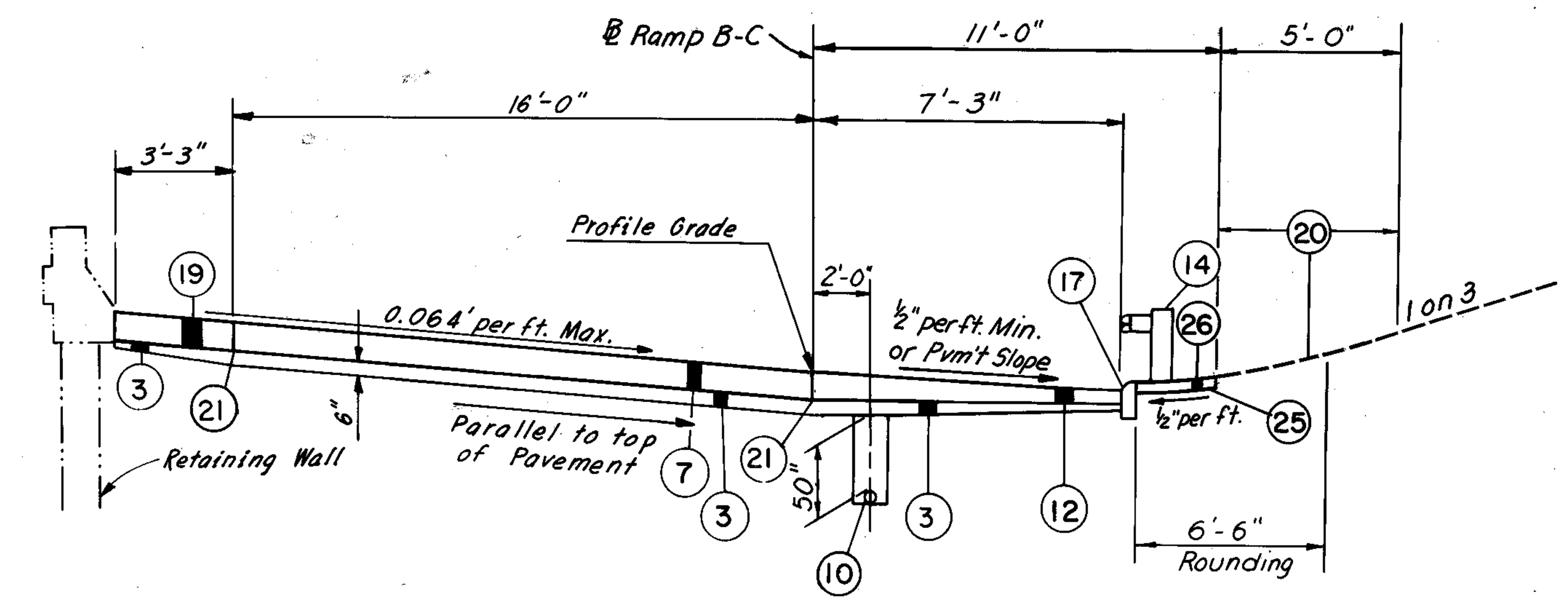
TYPICAL SECTIONS

TYPE 451 ON 310

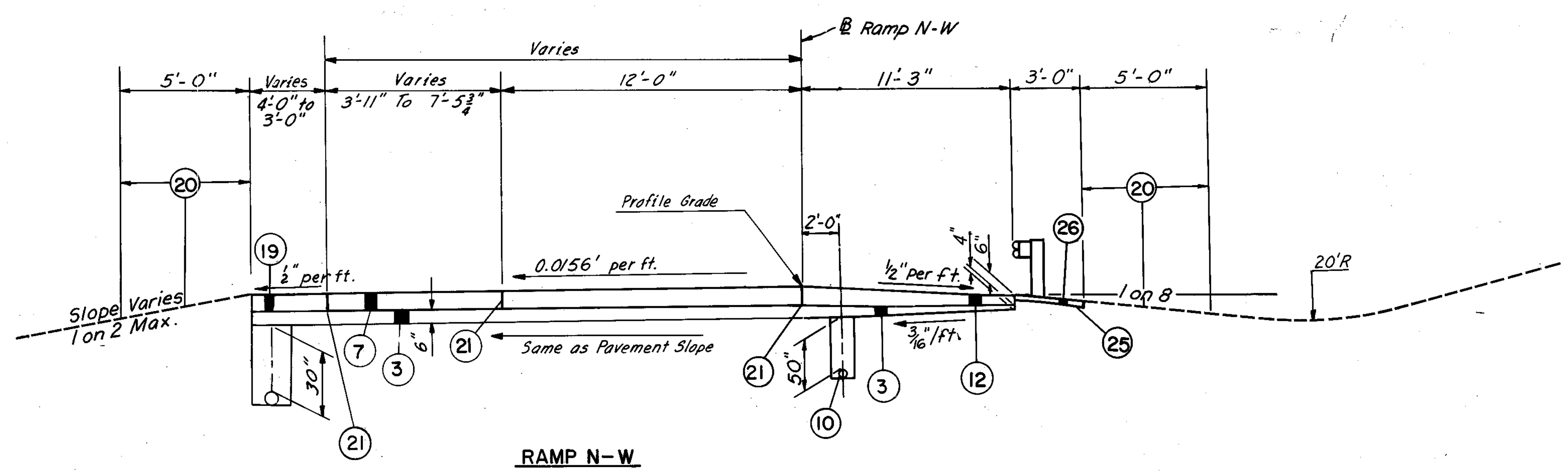
CUYAHOGA COUNTY
CUY. 290–0.27



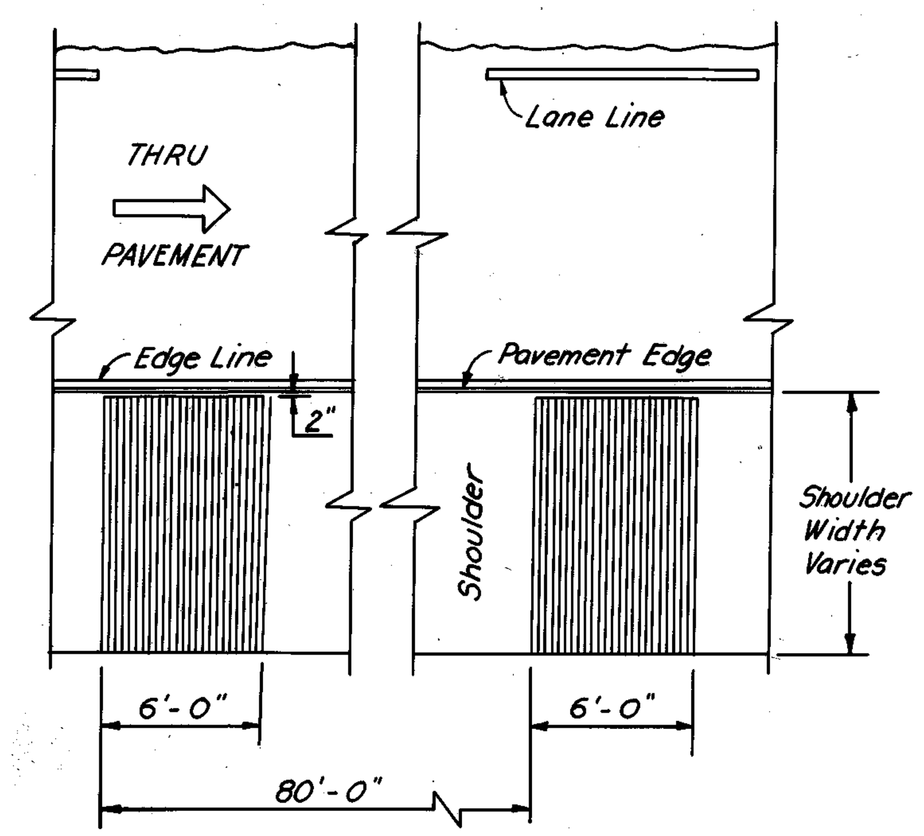
RAMP C–B
STA. 14 + 82.18 TO STA. 17 + 37.29

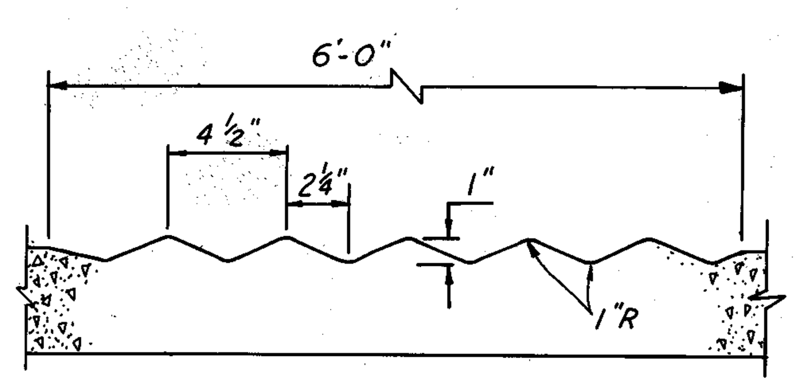


RAMP B–C
STA. 15 + 02.57 TO STA. 18 + 18.91



RAMP N–W
STA. 20 + 27.61 TO STA. 17 + 88.00





DETAIL OF CORRUGATIONS

Note All concrete shoulders are to receive rumble strip treatment. Rumble strips are to be located between transverse joints. Payment for rumble strip treatment of new concrete shoulders shall be included in the contract price for Item 452 - Plain Concrete Pavement, as per plan.

RUMBLE STRIP TREATMENT
FOR CONCRETE SHOULDER
No Scale

NOTES:
For Legend see sheet 8

For Paved Shoulder Details see sheet 10.
Typical Sections show the general roadway features only. For details see the Pavement Plans, Paved Shoulder Typical Sections and Cross-Section sheets.

8 4 0 4 8
SCALE IN FEET

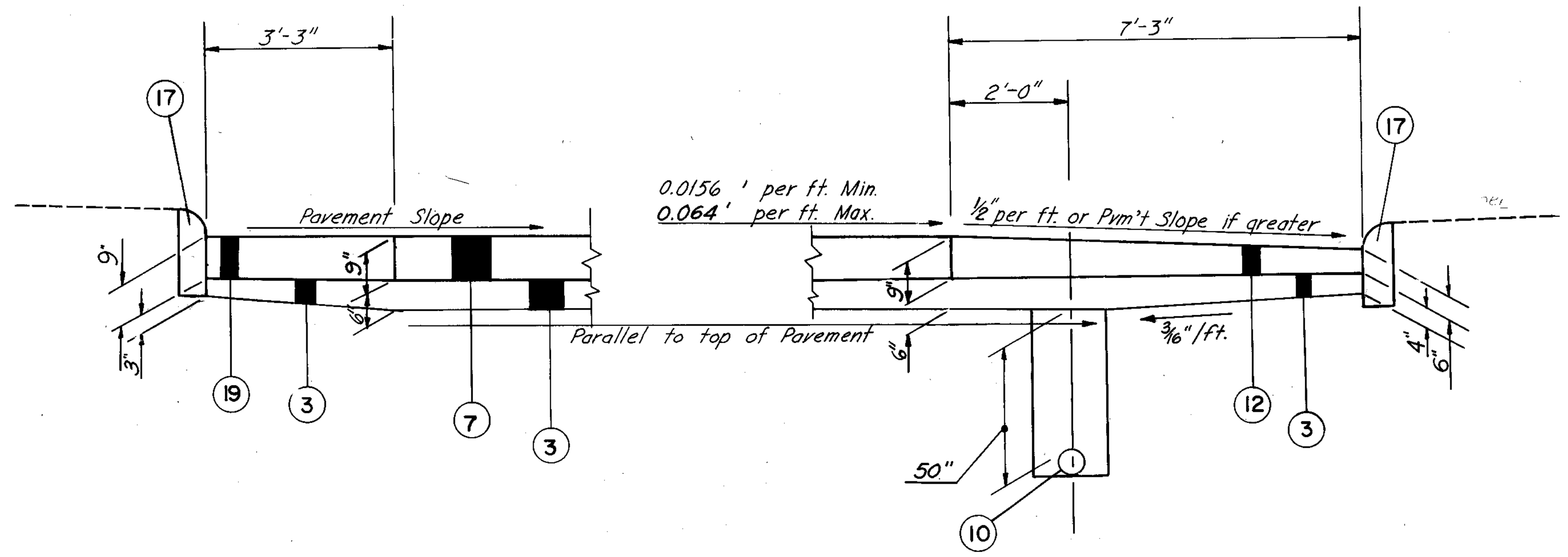
SCALE 1/4" = 1'-0"	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE LJD DATE 2/10/70	CONSULTING ENGINEERS
TRCD. MAG DATE 2/13/70	
CKD. RSW DATE 2/20/70	KANSAS CITY CLEVELAND NEW YORK

FHWA REGION	STATE	PROJECT		10/193
5	OHIO			

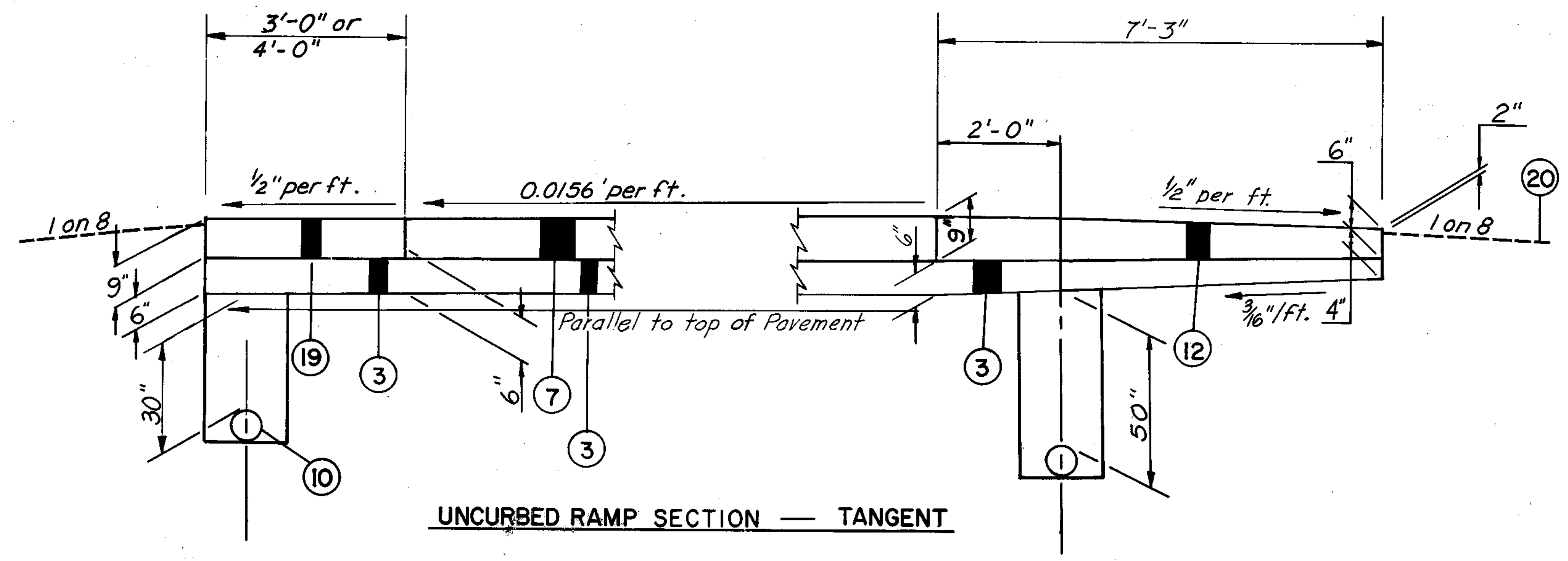
CUYAHOGA COUNTY
CUY- 490-1.00

TYPICAL SECTIONS

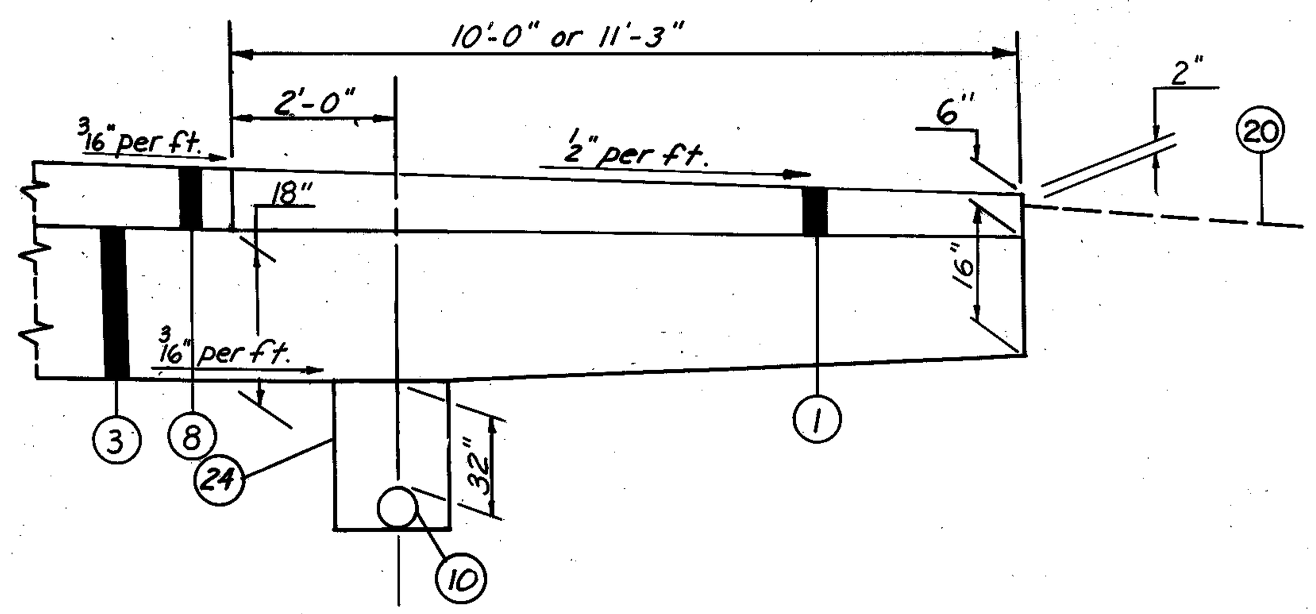
TYPE 451 ON 310



CURBED RAMP SECTION — TANGENT OR CURVE RIGHT



UNCURBED RAMP SECTION — TANGENT



TYPICAL SECTION - I-490 SHOULDER

SEQUENCE OF OPERATIONS:

1. *Install pipe underdrain on outside shoulder, where required. Install pipe underdrain in median*
2. *Place subbase out to outside edge of underdrain. Payment shall be made for all subbase placed in this operation.*
3. *Construct Item 451 pavement.*
4. *Remove and replace any contaminated material or backfill over the underdrain.*
5. *Complete Shoulder construction.*

NOTE :
For Legend see sheet 8.

Typical Sections show the general roadway features only. For details see the Pavement Plans, Paved Shoulder Typical Sections and Cross-Section sheets.

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.

The paved shoulder details shown on this sheet, shall apply for any width of pavement.

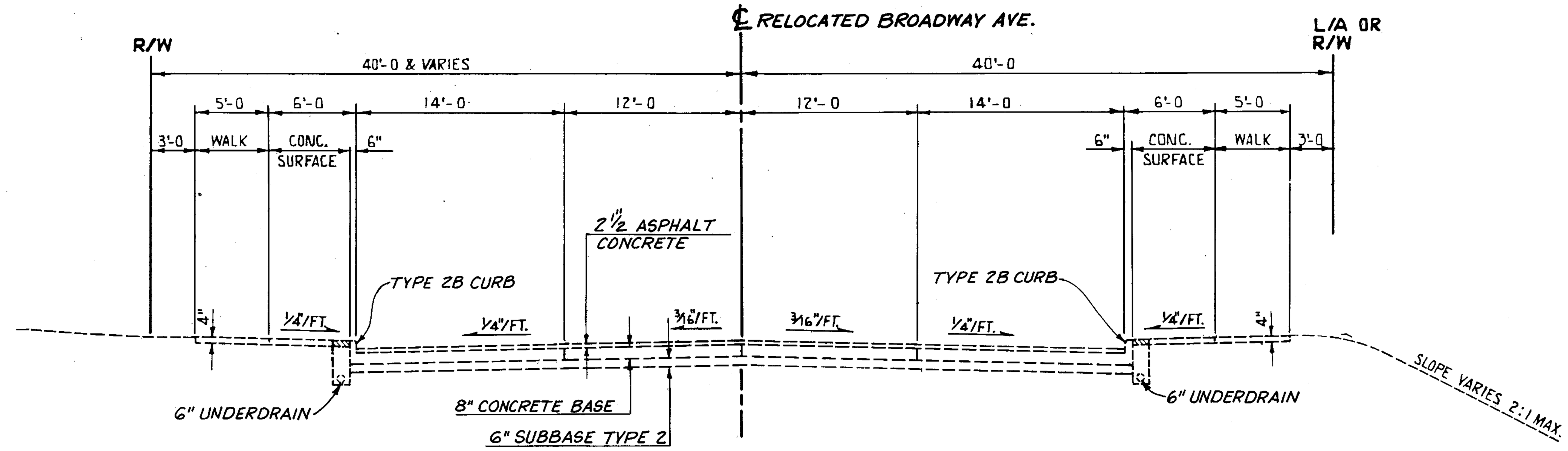
2 0 2 4
SCALE IN FEET

SCALE ½" = 1'-0" HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS
MADE R.S.W. DATE 2-2-70
TRCD T.P.M. DATE 2-11-70
CKD L.J.D. DATE 8-18-70
KANSAS CITY CLEVELAND NEW YORK

EXISTING TYPICAL SECTIONS

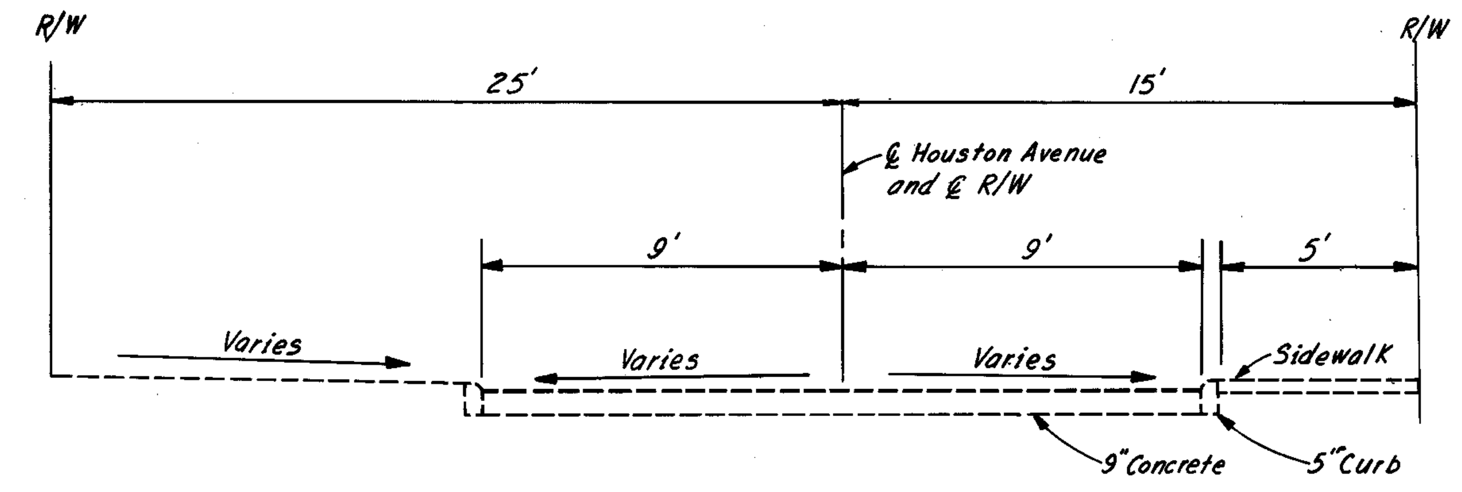
FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY
CUY- 490-1.00



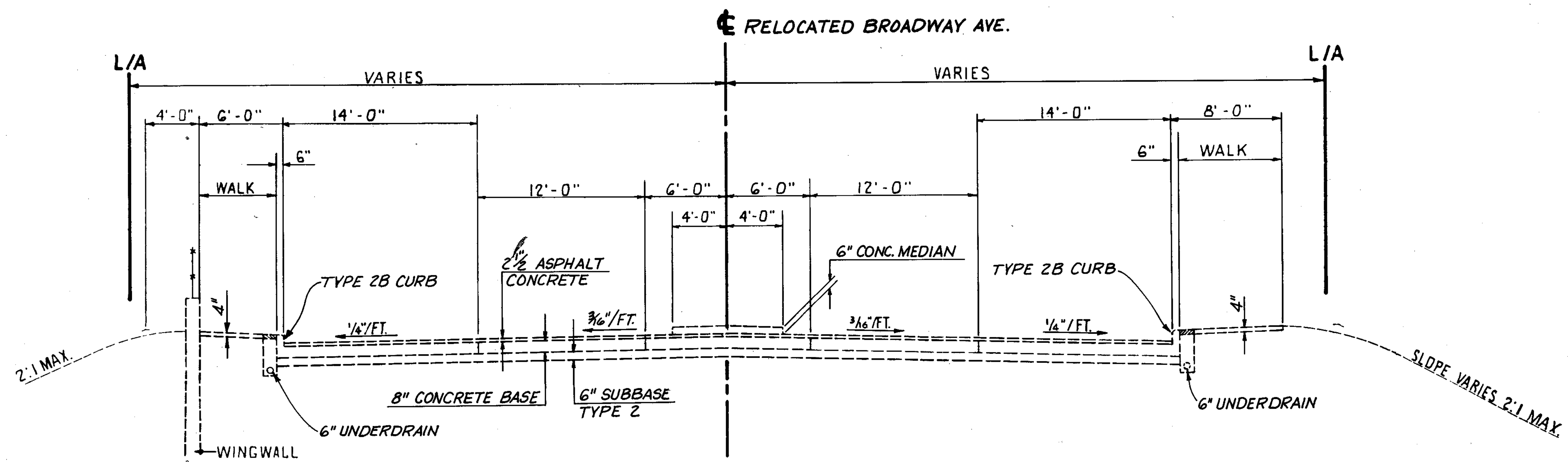
RELOCATED BROADWAY AVE.
STA. 5+52.56 TO STA. 11+25.12

10 5 0 5 10
SCALE



EXISTING HOUSTON AVENUE

8 4 0 4 8
SCALE



RELOCATED BROADWAY AVE.
STA. 16+58 ± TO STA. 19+25

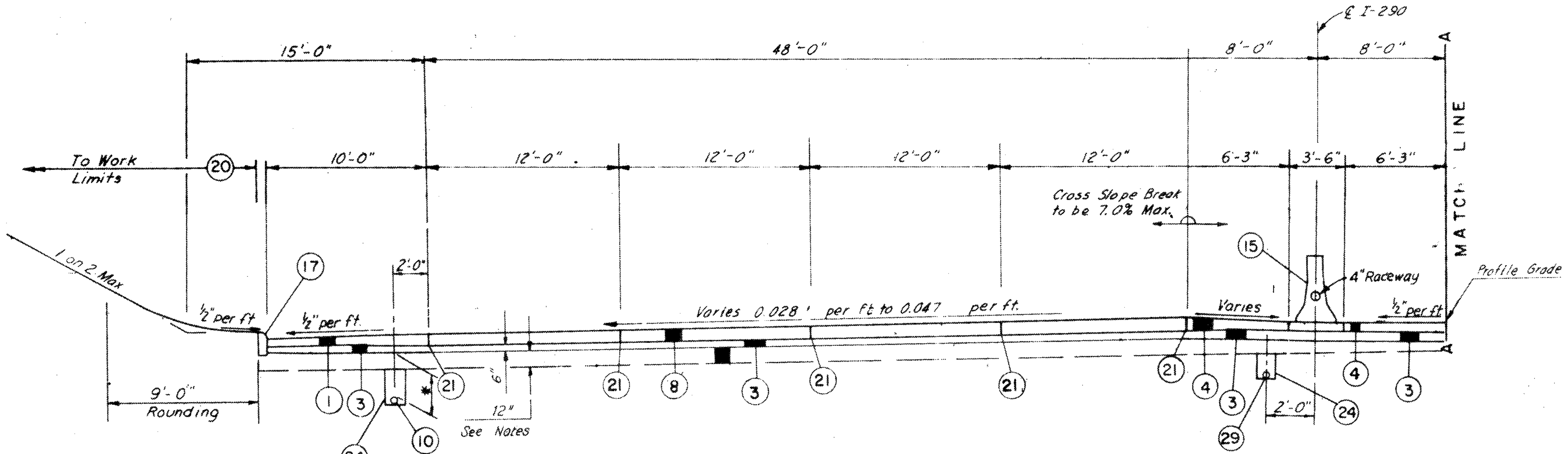
10 5 0 5 10
SCALE

MADE JAG DATE 10-5-83
TRACED JAG DATE 10-5-83
CHECKED R.L.N. DATE 10-6-83
SCALE AS SHOWN

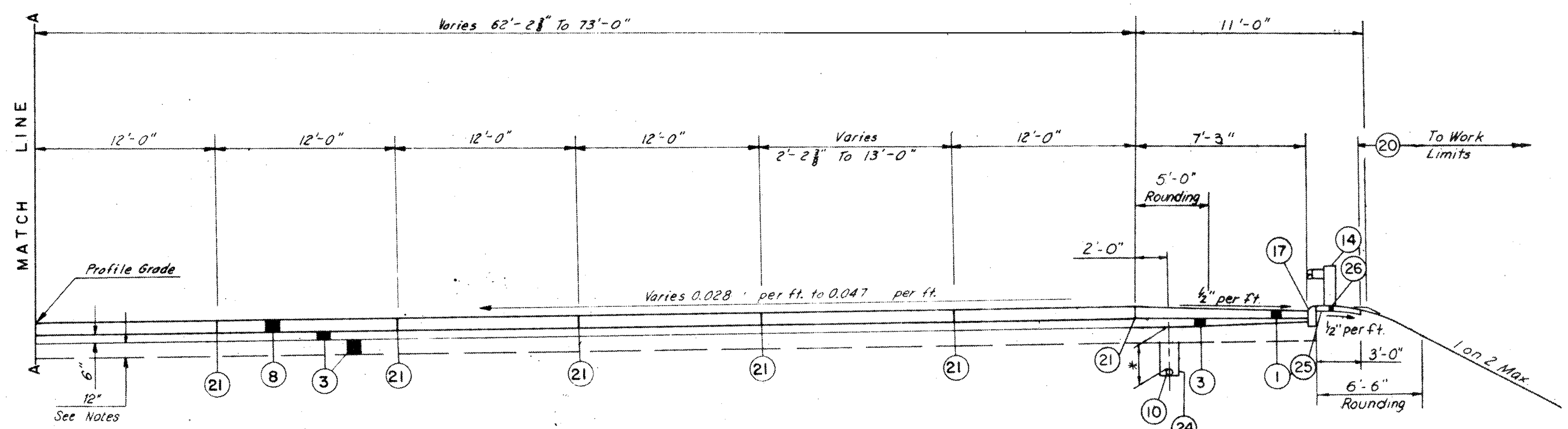
Howard, Needles, Tammen & Bergendoff
CONSULTING ENGINEERS
CLEVELAND, OHIO

HNTB

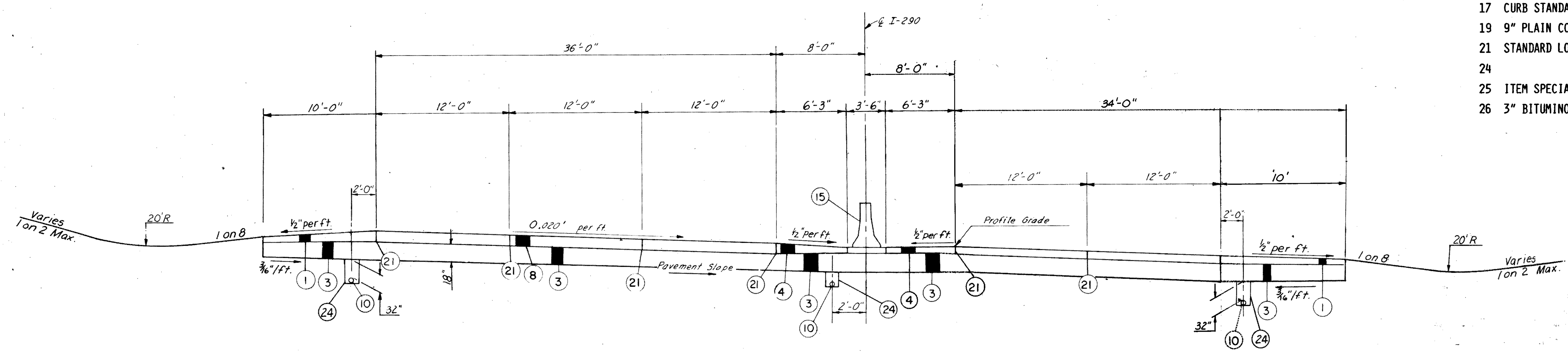
CUYAHOGA COUNTY
CUY- 490-1.00



I-490 — WEST OF THE PROJECT



I-490 — WEST OF THE PROJECT



I-490 — EAST OF THE PROJECT

3 0 3 6 9
SCALE IN FEET

LEGEND
EXISTING CONDITIONS

1 6"-10" DEPTH PLAIN CONCRETE PAVEMENT
3 SUBBASE, TYPE II
4 9"-10" DEPTH PLAIN CONCRETE PAVEMENT
7 9" REINFORCED CONCRETE PAVEMENT
8 10" REINFORCED CONCRETE PAVEMENT
10 6" PIPE UNDERDRAINS
12 6"-9" DEPTH, PLAIN CONCRETE PAVEMENT
14 GUARDRAIL, TYPE 5
15 CONCRETE BARRIER, STANDARD TYPE B-50
17 CURB STANDARD, TYPE 6
19 9" PLAIN CONCRETE PAVEMENT
21 STANDARD LONGITUDINAL JOINT
24 FILTER FABRIC
25 ITEM SPECIAL HERBICIDES FOR WEED CONTROL
26 3" BITUMINOUS AGGREGATE BASE FOR WEED CONTROL

SCALE ____	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE J.A.G. DATE 1-6-84	CONSULTING ENGINEERS
TRCD J.A.G. DATE 1-6-84	KANSAS CITY CLEVELAND NEW YORK
CKD R.L.N. DATE 1-6-84	

GENERAL NOTES

GENERAL

ITEMS OF WORK

THE PRINCIPAL ITEMS OF WORK TO BE PERFORMED UNDER THIS CONTRACT ARE:

1. COMPLETE THE CONSTRUCTION OF UNDERDRAINS, DRAINAGE, ROADWAY AND PAVEMENT ITEMS AS SHOWN IN THESE PLANS.

2. COMPLETE CONSTRUCTION OF SUPERSTRUCTURE AS SHOWN IN BRIDGE PLANS.

ELEVATION DATUM

ALL ELEVATIONS SHOWN ON THESE PLANS ARE BASED ON THE U.S. GEODETIC SURVEY AND ARE IN FEET ABOVE SEA LEVEL.

FIELD OFFICE

THE CONTRACTOR SHALL PROVIDE A SUITABLE FIELD OFFICE HAVING A MINIMUM OF 800 SQ.FT OF FLOOR SPACE. PAYMENT SHALL BE AT THE LUMP SUM PRICE BID FOR ITEM 619 - "FIELD OFFICE".

CONTINGENCY QUANTITIES

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

ROUNDING OF CORNERS SHOWN ON CROSS SECTIONS

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

UTILITIES

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

CLEVELAND PUBLIC POWER
1201 LAKESIDE AVENUE
CLEVELAND, OHIO 44114
216-664-3346

EAST OHIO GAS COMPANY
1717 EAST 9TH STREET
CLEVELAND, OHIO 44113
216-432-3232

CLEVELAND ELECTRIC ILLUMINATING COMPANY
55 PUBLIC SQUARE
CLEVELAND, OHIO 44101
216-622-9800

CITY OF CLEVELAND WATER DEPARTMENT
1201 LAKESIDE AVENUE
CLEVELAND, OHIO 44114
216-664-3355

OHIO BELL TELEPHONE COMPANY
820 SUPERIOR AVENUE WEST - ROOM 730
CLEVELAND, OHIO 44113
216-822-6241

CITY OF CLEVELAND SEWER DEPARTMENT
1825 LAKESIDE AVENUE
CLEVELAND, OHIO 44114
(216)664-2513

INLAND OIL COMPANY
POST OFFICE BOX 188
VANDALIA, OHIO 45377
513-898-3971

LAUREL PIPE LINE COMPANY
POST OFFICE BOX 426
CAMP HILL, PENNSYLVANIA 17011
717-737-8611

THE STANDARD OIL COMPANY
POST OFFICE BOX 188
VANDALIA, OHIO 45377
513-898-3971

AIR PRODUCTS AND CHEMICALS, INC.
2820 QUIGLEY ROAD
CLEVELAND, OHIO 44113
216-695-5695

UNITED STATES STEEL CORPORATION
1807 EAST 28TH STREET
LORAIN, OHIO 44055
216-277-2433

DIVISION OF ENGINEERING & CONSTRUCTION
CITY OF CLEVELAND, CITY HALL
601 LAKESIDE AVENUE
CLEVELAND, OHIO 44114
216-664-2381

OHIO DEPARTMENT OF TRANSPORTATION
DISTRICT 12
BOX 05931 NEWBURGH STATION
CLEVELAND, OHIO 44105-0931
216-641-1926

UNDERGROUND UTILITIES

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

COOPERATION

A CONTRACT FOR CONSTRUCTION OF AN ADJACENT SECTION MAY BE LET PRIOR TO THIS PROJECT CONTRACT OR WHILE THIS CONTRACT IS IN PROGRESS. THE CONTRACTOR FOR THIS PROJECT SHALL COORDINATE HIS OPERATION WITH THE ADJACENT PROJECT CONTRACTOR SO AS TO COMPLETE BOTH PROJECTS WIHTOUT UNDUE DELAY OR INTERFERENCE TO THE OTHER CONTRACTOR.

THE CONTRACTOR SHALL COOPERATE WITH THE OTHER CONTRACTOR TO ARRANGE A SUITABLE WORK SCHEDULE, SUBJECT TO THE APPROVAL OF THE ENGINEER, TO ALLOW EACH CONTRACTOR TO WORK AND OPERATE NECESSARY EQUIPMENT WITHIN WORK LIMITS AND TO CARRY OUT THE PROVISIONS OF HIS CONTRACT. THE ENGINEER SHALL NOTIFY EACH CONTRACTOR A MINIMUM OF THIRTY (30) DAYS PRIOR TO ANY SCHEDULED WORK BY THE OTHER 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 THE CONSTRUCTION PROJECT.

ROADWAY

ITEM 659
SEEDING AND MULCHING
COMMERCIAL FERTILIZER
AGRICULTURAL LIMING

FOLLOWING ESTIMATED QUANTITIES FOR SEEDING AND MULCHING, COMMERCIAL FERTILIZER, AND AGRICULTURAL LIMING HAVE BEEN INCLUDED IN GENERAL SUMMARY FOR RESEEDING, FERTILIZING AND LIMING THOSE AREAS DISTURBED BY THE CONTRACTOR OF THIS PROJECT. FOR APPROXIMATE LIMITS SEE SHEETS 8 AND 9.

ITEM 659 SEEDING AND MULCHING	2,000 SQ.YDS.
ITEM 659 COMMERCIAL FERTILIZER	0.2 TON
ITEM 659 AGRICULTURAL LIMING	0.9 TON

LOCATION 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. THE ENGINEER SHALL BE SATISFIED THAT ALL THE INSTALLATIONS WILL AFFORD MAXIMUM PROTECTION FOR TRAFFIC.

TEMPORARY SOIL EROSION AND SEDIMENT CONTROL

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER, FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES:

207 TEMPORARY SEEDING AND MULCHING	400 SQ.YDS.
207 STRAW OR HAY BALES	40 EACH
659 WATER	1 M GAL.
659 MOWING	5 M SQ.FT.
659 COMMERCIAL FERTILIZER	0.1 TON
659 REPAIR SEEDING AND MULCHING	100 SQ.YDS.

ITEM 203 PROOF ROLLING

AN ESTIMATED QUANTITY FOR THIS ITEM HAS BEEN PROVIDED IN THE GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER.

WATERING AND MOWING PERMANENT SEEDING AREAS

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

ITEM 659 WATER	2 M GAL.
ITEM 659 MOWING	5 M SQ.FT.

ITEM 310 - SUBBASE, TYPE II, AS PER PLAN

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

PAVEMENT

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 452 - PLAIN CONCRETE PAVEMENT, AS PER PLAN

IF THE SHOULDER AND ADJOINING PAVEMENT ARE PLACED AT THE SAME TIME, TIE BARS SHALL BE PLACED EVERY 60 INCHES. IF THE SHOULDER AND ADJOINING PAVEMENT ARE PLACED IN SEPARATE OPERATIONS, THE TIE BARS OR HOOK BOLTS SHALL BE SPACED EVERY 30 INCHES.

THE TRANSVERSE JOINTS SHALL BE AT A 20-FT SPACING AND EVERY SECOND JOINT SHOULD COINCIDE OR MATCH THE MAINLINE AND/OR RAMP TRANSVERSE JOINT. THE SURFACE SMOOTHNESS OF THE SHOULDERS SHOULD BE AS SPECIFIED IN SECTION 451.12, EXCEPT THAT THE SPECIFIC TOLERANCE SHALL BE 3/8-IN. IN 10 FEET.

ALL NEW SHOULDERS SHALL RECEIVE RUMBLE STRIP TREATMENT. FOR DETAILS, SEE SHEET 9. PAYMENT SHALL BE INCLUDED WITH THE CONTRACT PRICE FOR "ITEM 452 - PLAIN CONCRETE PAVEMENT, AS PER PLAN".

ITEM SPECIAL-HERBICIDE FOR WEED CONTROL & ITEM 301-BITUMINOUS AGGREGATE BASE(WEED CONTROL)

SPECIAL CARE SHALL BE EXERCISED BY COORDINATION OF WORK TO INSURE THE 301 BITUMINOUS AGGREGATE BASE IS INSTALLED IN THE PROPER LOCATIONS PRIOR TO ERECTING THE GUARDRAIL RUNS.

PREPARATION OF THE SUBGRADE SHALL INCLUDE AN APPLICATION OF SIMAZINE PRE-EMERGENCE HERBICIDE. THE RATE AND METHOD OF APPLICATION SHALL BE IN STRICT CONFORMANCE WITH THE MANUFACTURER'S INSTRUCTIONS. THE CONTRACTOR SHALL HAVE THE NECESSARY PERMIT FROM THE OHIO DEPARTMENT OF AGRICULTURE BEFORE APPLYING HERBICIDE.

AFTER SETTING THE GUARDRAIL POSTS BUT BEFORE ATTACHING THE RAIL ELEMENTS, ANY DAMAGE TO THE BASE RESULTING FROM THE POST-SETTING OPERATIONS SHALL BE REPAIRED AND ADDITIONAL PAVING MATERIAL SHALL BE COMPACTED AROUND THE POSTS SUFFICIENT TO PREVENT WATER FROM COLLECTING.

COST OF ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY TO ACCOMPLISH THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICES BID FOR ITEM 301 - BITUMINOUS AGGREGATE BASE (WEED CONTROL) AND ITEM SPECIAL - HERBICIDES FOR WEED CONTROL. FOLLOWING ESTIMATED QUANTITIES ARE CARRIED TO THE GENERAL SUMMARY TO PERFORM THE ABOVE MENTIONED WORK.

ITEM SPECIAL - HERBICIDES FOR WEED CONTROL	235 S.Y.
ITEM 301 - 3-IN. BITUMINOUS AGGREGATE BASE	20 C.Y.
ITEM 203 - EXCAVATION, NOT INCLUDING EMBANKMENT CONSTRUCTION	20 C.Y.

ITEM 622 - CONCRETE BARRIER

THE CONTRACTOR SHALL STENCIL STATION NUMBERS INTO BOTH SIDES OF THE CONCRETE BARRIER BEFORE IT TAKES ITS FINAL SET. THE COMPLETE STATION NUMBERS ARE TO BE MARKED EACH HUDNRED FEET. THE NUMERALS SHALL BE 3 TO 4 IN. IN HEIGHT AND 1/4-IN. IN DEPTH. THE STATION NUMBERS SHALL BE PLACED PARALLEL TO AND 3 OR 4 IN. BELOW THE TOP OF THE CONCRETE BARRIER. PAYMENT SHALL BE INCLUDED IN THE UNIT PRICE BID PER LINEAR FOOT FOR ITEM 622 CONCRETE BARRIER.

ITEM 451 REINFORCED CONCRETE PAVEMENT

IN LIEU OF THE FABRIC CALLED FOR ON BP-2, THE FABRIC USE IN ITEM 451 REINFORCED CONCRETE PAVEMENT SHALL CONSIST OF W9 or D9 LONGITUDINAL WIRES SPACED 6" c/c AND W4 OR D4 TRANSVERSE WIRES SPACED 12" c/c.

GENERAL NOTES

QUANTITY CALCULATIONS
MADE BY A.H.S. DATE 3-1-84
CHECKED BY R.L.N. DATE 3-16-84

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 AND THE CONTRACTOR, ALONG WITH LOCAL REPRESENTATIVES, SHALL MAKE AN INSPECTION OF THE EXISTING SEWERS WITHIN THE WORK LIMITS WHICH ARE TO REMAIN IN SERVICE AND WHICH MAY BE AFFECTED BY THE WORK. THE CONDITION OF THE EXISTING CONDUITS AND THEIR APPURTENANCES SHALL BE DETERMINED FROM FIELD OBSERVATIONS. RECORDS OF THE INSPECTIONS SHALL BE KEPT IN WRITING 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.

SANITARY FLOW INTO I-290 HIGHWAY DRAINAGE SYSTEMS

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

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.

DRAINAGE (CONT.)

EROSION CONTROL PADS AND ANIMAL GUARDS

EROSION CONTROL PADS AND ANIMAL GUARDS SHALL BE PROVIDED AT THE OUTLET END OF ALL PIPE UNDERDRAINS AND FARM DRAINS, AS PER STANDARD CONSTRUCTION DRAWING MC-4, EXCEPT WHEN THEY OUTLET INTO A DRAINAGE STRUCTURE.

PAYMENT FOR THE EROSION CONTROL PADS AND THE ANIMAL GUARDS SHALL BE INCLUDED IN THE PRICE BID FOR ITEM 603, 6-IN. CONDUIT, TYPE F.

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-IN. ITEM 603, TYPE F CONDUIT. THE FOLLOWING ESTIMATED QUANTITIES HAVE 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-IN. TYPE F CONDUIT 50 LIN.FT.

MANHOLES, CATCH BASINS AND INLETS REMOVED OR ABANDONED

THE CASTINGS SHALL BE CAREFULLY REMOVED AND STORED WITHIN THE RIGHT-OF-WAY FOR SALVAGE BY CITY FORCES.

PAYMENT FOR ALL OF THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT 202 ITEM.

ITEM 605 - 6" SHALLOW PIPE UNDERDRAINS, 707.01 TYPE III OR 707.21 TYPE III, AS PER PLAN
ITEM 605 - 6" DEEP PIPE UNDERDRAINS, AS PER PLAN
ITEM 605 - 6" SHALLOW PIPE UNDERDRAINS, AS PER PLAN
ALL GRANULAR FILTER MATERIALS FOR THESE ITEMS SHALL BE LIMITED TO DURABLE NATURAL AGGREGATES, NO. 8 OR NO. 9 SIZE.

ITEM 604 - PAVED SHOULDER INLET, STANDARD NO. I-2A-6 MODIFIED AS PER PLAN
ITEM 604 - PAVED SHOULDER INLET, STANDARD NO. I-2A-12 MODIFIED AS PER PLAN
ITEM 604 - PAVED SHOULDER INLET, STANDARD NO. I-2A-20 MODIFIED AS PER PLAN
ITEM 604 - PAVED SHOULDER INLET, STANDARD NO. I-3B-50 MODIFIED AS PER PLAN
ALL REQUIRED REINFORCING STEEL AS LISTED ON THE STANDARD CONSTRUCTION DRAWINGS OR AS MODIFIED, SHALL BE EPOXY-COATED IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION-824. I-BEAMS AND/OR ADDITIONAL PRECAST-REQUIRED REINFORCEMENT ARE NOT SUBJECT TO THIS REQUIREMENT.

ALL COSTS OF THIS TREATMENT SHALL BE INCLUDED IN THE COSTS OF THESE ITEMS.

COMPUTATIONS AND SUB SUMMARIES

QUANTITY CALCULATIONS

MADE BY R.L.N. DATE 2-24-84
CHECKED BY A.H.S. DATE 2-27-84

ITEM 202 - WALK REMOVED					
STATION FROM	STATION TO	SIDE	LENGTH LIN.FT.	WIDTH FT.	AREA S.F.
RELOCATED BROADWAY					
4+66.08	5+52.56	RT.	86.48	5	432
5+52.56	6+09.14	RT.	56.58X(479.215÷447.465)	5	303
16+44.84	18+69.49	RT.	224.65	6	1,348
				TOTAL =	2,083

ITEM 202 - CURB REMOVED			
STATION FROM	STATION TO	SIDE	LENGTH LIN.FT.
RELOCATED BROADWAY			
4+66.08	5+52.56	RT.	86.48
5+52.56	6+09.14	RT.	56.58X(473.465÷447.465) = 59.87
16+44.84	18+69.49	RT.	224.65
			TOTAL = 371

ITEM 203 SUBGRADE COMPACTION		
Under Item 451 9" R.P.C. Concrete Pavement	2,285	S.Y.
" " 452 P.C. Concrete Pavement at Ramps	808	S.Y.
" " 612 Concrete Traffic Island	238	S.Y.
TOTAL SUBGRADE COMPACTION	3331	S.Y.

ITEM 203 PROOF ROLLING	
3,331 Sq. Yds. ÷ 3,000 Sq. Yds. per hour	1.1 hours
TOTAL	1.1 hours

ITEM 310 SUBBASE, TYPE II, AS PER PLAN (MEDIAN & PAVEMENT)						
STATION From	STATION To	SIDE	LENGTH Lin.Ft.	END AREA Sq.Ft.	VOLUME Cu.Yds.	REMARKS
RAMP C-B						
14 + 57.18	14 + 82.18	Lt.& Rt.	25.00	17.75	16.4	
14 + 82.18	15 + 44.74	Lt.	(62.56 + 86.00)÷2 = 74.28	12.00	33.0	
15 + 44.74	17 + 84.76	Lt.& Rt.	Varies	Varies	175.0	Includes Island
RAMP N-W						
17 + 88.00	20 + 27.61	Lt.	(239.61 + 229.35)÷2 = 234.48	(9.7 + 8.00) ÷ 2 = 8.86	76.9	
LANE W-S						
3 + 29.00	4 + 68.14	Lt.	* 129	(39 + 38.25) ÷ 2 = 38.63	184.6	Width Scaled
TOTAL					2052	

* Average Length

ITEM 310 SUBBASE, TYPE II, AS PER PLAN (MEDIAN & PAVEMENT)						
STATION From	STATION To	SIDE	LENGTH Linear Feet	END AREA Sq.Ft.	VOLUME Cu.Yds.	REMARKS
I-290						
985 + 60.75	985 + 85.75	Lt.& Rt.	25.00	218.8	202.6	
1020 + 47.57	1020 + 72.57	Lt.& Rt.	25.00	262.00	242.6	
1020 + 72.57	1022 + 51.53	Lt.& Rt.	178.96	132.00	874.9	3 Lanes Lt.& Rt.
1021 + 07.00	1022 + 51.53	Rt.	144.53	15.00	80.3	
RAMP C-7						
85 + 56.92	85 + 81.92	Lt.& Rt.	25.00	18.37	17.0	
RAMP B-C						
14 + 77.57	15 + 02.57	Lt.& Rt.	25.00	13.75	12.7	
15 + 02.57	15 + 32.54	Rt.	(823.00 ÷ 815.00) x (29.97 + 31.81)÷2 = 31.19	8.00	9.2	
15 + 32.54	17 + 06.45	Rt.	(724.20 ÷ 716.20) x 173.91 = 175.85	8.00	53.3	Detail "Y" Added
17 + 06.45	18 + 38.48	Lt.& Rt.	Varies	Varies	73.0	Plainmeter

ITEM 310 SUBBASE, TYPE II, AS PER PLAN, (SHOULDERS)						
STATION From	STATION To	SIDE	DISTANCE Linear Feet	END AREA Sq.Ft.	VOLUME Cu.Yds.	REMARKS
RAMP B-C						
15 + 02.57	15 + 32.54	Lt.	(810.07 ÷ 815.00) x 29.97 = 29.79	3.02	3.3	
15 + 32.54	16 + 84.70	Lt.	(711.27 ÷ 716.20) x 152.16 = 151.11	3.02	16.9	
15 + 00.73	15 + 32.54	Rt.	(833.12 ÷ 815.00) x 31.81 = 32.52	1.63	2.0	
15 + 32.54	17 + 45.02	Rt.	(734.32 ÷ 716.20) x 212.48 = 217.86	1.63	13.2	
17 + 45.02	18 + 09.54	Rt.	64.52	1.63	3.9	
RAMP C-B						
14 + 58.00	15 + 35.00	Lt.	77.00	1.63	4.6	
14 + 82.18	16 + 60.55	Rt.	178.37	3.02	20.0	
RAMP N-W						
17 + 88.00	18 + 38.00	Rt.	50.00	(4.43 + 5.30)÷2 = 4.87	9.0	
18 + 38.00	20 + 27.61	Rt.	189.61	5.30	37.2	
17 + 88.00	18 + 38.00	Lt.	50.00	(1.50 + 2.00) ÷ 2 = 1.75	3.2	
18 + 38.00	20 + 20.00	Lt.	182.00	1.50	10.1	
LANE W-S						
3 + 61.50	4 + 11.50	Rt.	* 54.90	(4.43 + 5.30)÷2 + 10.63 = 15.50	31.5	
4 + 11.50	4 + 68.14	Rt.	(2285.52 ÷ 2291.83) x 56.64 = 56.48	14.43	30.2	
I-290						
1020 + 27.00	1020 + 42.00	Lt.	Varies	13.02	7.2	
1020 + 42.00	1022 + 51.53	Lt.	(6925.50 ÷ 6875.19) x 209.53 = 211.06	13.02	101.8	
	TOTAL				294	

* Average Length

SCALE
MADE R.L.N. DATE 2-24-84
TRCD. T.D. DATE 2-24-84
CKD. A.H.S. DATE 2-27-84

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

COMPUTATIONS AND SUB SUMMARIES

FHWA REGION	STATE	PROJECT	
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CUYAHOGA COUNTY
CUY- 490-1.00

QUANTITY CALCULATIONS
MADE BY R.L.N. DATE 2-24-84
CHECKED BY A.H.S. DATE 2-27-84

ITEM 451 9" REINFORCED CONCRETE PAVEMENT

STATION From	STATION To	SIDE	LENGTH Feet	WIDTH Feet	AREA Sq. Yds	REMARKS
RAMP B-C						
15 + 02.57	15 + 32.54	Rt.	(823.00÷815.00)x(29.92+31.81)÷2=31.16	16.00	55.40	Simulated Spiral
15 + 32.54	17 + 06.45	Rt.	(724.20÷716.20)x 173.91 = 175.85	16.00	319.63	Detail "Y" Added
17 + 06.45	18 + 38.48	Lt. & Rt.	Varies	Varies	438.00	Planimeter, includes turnout.
RAMP C-B						
14 + 82.18	15 + 44.74	Lt.	62.56 + 86.00 = 74.28	24.00	198.08	Detail "Y" Added
15 + 44.74	17 + 84.56	Lt.	Varies	Varies	812.00	Planimeter, includes turnout
RAMP N-W						
17 + 88.00	20 + 27.61	Lt.	(239.61 + 229.36) ÷ 2 = 234.48	(16.00+19.45) ÷ 2 = 17.72	461.67	
TOTAL					2285	

ITEM 451 10" REINFORCED CONCRETE PAVEMENT

STATION From	STATION To	SIDE	LENGTH Feet	WIDTH Feet	AREA Sq. Yds.	REMARKS
I-290						
1020 + 72.57	1022 + 51.53	Lt. & Rt.	178.96	72	1431.68	3 Lanes Lt. & Rt.
1021 + 05.82	1022 + 51.53	Rt.	145.71	(2.0 + 17.0) ÷ 2 = 9.5	153.81	Width Scaled
LANE W-S						
3 + 29.00	4 + 68.14	Lt.	* 129	(26.00 + 25.50 ÷ 2 = 25.75	369.08	STA. 3 + 29 Scaled
TOTAL					1955	

* Average Length

ITEM 452 - 6" - 9" DEPTH, CONCRETE PAVEMENT, AS PER PLAN

STATION FROM	STATION TO	SIDE	LENGTH LIN.FT.	WIDTH FT.	AREA SQ.YD.	REMARKS
RAMP B-C						
15+02.57	15+32.54	LT.	(810.07+815.00)X29.97=29.79	7.25	24.0	
15+32.54	16+84.70	LT.	(711.27÷716.20)X152.16=151.11	7.25	121.7	
RAMP C-B						
14+82.18	16+60.55	RT.	178.37	7.25	143.7	
RAMP N-W						
17+88.00	18+38.00	RT.	50.00	(11.25+10.00)÷2=10.63	59.1	
18+38.00	19+77.61	RT.	139.61	11.25	174.5	
19+77.61	20+27.61	RT.	50.00	(11.25+11.42)÷2=11.34	63.00	
				TOTAL	586	

ITEM 452 - 6" - 10" DEPTH CONCRETE PAVEMENT, AS PER PLAN

STATION FROM	STATION TO	SIDE	LENGTH LIN.FT.	WIDTH FT.	AREA SQ.YD.	REMARKS
I-490						
1020+27.00	1020+42.00	LT.	VARIES	VARIES	14.4	PLANIMETER
1020+42.00	1022+51.53	LT.	(6925.50÷6875.19)X209.53=211.06	10.00	234.5	
LANE W-S						
3+61.50	4+11.50	RT.	54.9 *	(11.42+10.00)÷2=10.71	65.3	
4+11.50	4+68.14	RT.	(2285.52÷2291.83)X56.64=56.48	10.00	62.8	
				TOTAL	377	

ITEM 452 - 9" - 10" DEPTH, CONCRETE PAVEMENT, AS PER PLAN

STATION FROM	STATION TO	SIDE	LENGTH LIN.FT.	WIDTH FT.	AREA SQ.YD.	REMARKS
1020+72.57	1021+35.00	C.L.	62.43	6.25(2)	86.7	
1021+35.00	1021+75.00	C.L.	40.00	(6.25+5.25)2÷2	51.1	TRANSITION
1021+75.00	1021+85.00	C.L.	10.00	5.25(2)	11.7	SIGN
1021+85.00	1022+25.00	C.L.	40.00	(6.25+5.25)2÷2	51.1	TRANSITION
1022+25.00	1022+51.53	C.L.	26.53	6.25(2)	36.8	
				TOTAL	237	

ITEM 452 - 9" PLAIN CONCRETE PAVEMENT, AS PER PLAN

STATION FROM	STATION TO	SIDE	LENGTH LIN.FT.	WIDTH FT.	AREA SQ.YD.	REMARKS
RAMP N-W						
17+88.00	18+38.00	LT.	50.00	(4.00+3.00)÷2=3.50	19.4	
18+38.00	20+20.00	LT.	182.00	3.00	60.7	
RAMP B-C						
15+00.73	15+32.54	RT.	(833.12÷815.00)X31.81=32.52	3.25	11.7	
15+32.54	17+45.02	RT.	(734.32÷716.20)X212.48=217.86	3.25	78.7	
17+45.02	18+09.54	RT.	64.52	3.25	23.3	
RAMP C-B						
14+58	15+35	LT.	77	3.25	27.8	
				TOTAL	222	

SCALE None
MADE R.L.N. DATE 2-24-84
TRCD. T.D. DATE 2-24-84
CKD. A.H.S. DATE 2-27-84

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

COMPUTATIONS AND SUB SUMMARIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

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CUYAHOGA COUNTY
CUY- 490-1.00

QUANTITY CALCULATIONS
MADE BY R.L.N. DATE 2-24-84
CHECKED BY A.H.S. DATE 2-27-84

ITEM 608 - 4" CONCRETE WALK

STATION From	STATION To	SIDE	DISTANCE Lin.Ft.	WIDTH Ft.	AREA Sq.Ft.
RELOCATED BROADWAY AVENUE					
4+66.08	5+13.00	Rt.	33.00	10.5	347
5+92.00	6+09.14	Rt.	17.14	10.5	180
16+44.84	18+69.49	Rt.	44.00	7.5	330
TOTAL					857

ITEM 608 - CURB RAMP, TYPE 2

STATION	SIDE	CURB RAMP EACH
17+68 RAMP B-C	LT.	1
18+20 RAMP B-C	RT.	1
15+92 RAMP C-B	LT.	1
16+17 RAMP C-B	LT.	1
16+90 RAMP C-B	LT.	1
17+48 RAMP C-B	RT.	1
	TOTAL	6

ITEM 609 CURB

STATION From	STATION To	SIDE	Std. Type 2-A Lin.Ft.	Std. Type 6 Lin.Ft.	REMARKS	
RAMP C-B						
14+53.00	15+35.00	Lt.		82	Scaled	
15+35.00	Broadway	Lt.	102		Curb Turnout	
14+90.20	16+60.00	Rt.		170		
16+60.00	Broadway	Rt.	130		Curb Turnout	
LANE W-S						
3+61.00	3+87.00	Rt.		26		
RAMP B-C						
14+98.50	15+04.00	Lt.				
15+04.00	16+85.00	Lt.		181		
16+85.00	Broadway	Lt.	169		Curb Turnout	
17+72.98	18+09.00	Rt.		36		
18+09.00	Broadway	Rt.	33		Curb Turnout	
RAMP N-W						
20+07	20+43			18		
TOTAL			434	513		

ITEM 612 - 9" CONCRETE TRAFFIC ISLAND

STATION From	STATION To	SIDE	DISTANCE Lin.Ft.	WIDTH Lin.Ft.	AREA Sq.Yds.
RAMP C-B RELOCATED BROADWAY AVENUE					
15+99.97	16+96.18	Lt.	Varies	Varies	238
TOTAL					238

ITEM SPECIAL - PRESSURE RELIEF JOINT, TYPE A

LOCATION	STATION	LENGTH LIN.FT.
RAMP N-W	19+88	31
I-490	1021+83	142
RAMP B-C	15+40	28
RAMP C-B	15+37	35
	TOTAL	236

ITEM 622 CONCRETE BARRIER, STD. TYPE B50 MODIFIED AS PER PLAN

STATION FROM	STATION TO	SIDE	LENGTH LIN. FT.
985+60.75	985+85.75	C.L.	25
1020+47.57	1020+72.57	C.L.	25
		TOTAL	50

ITEM 622 CONCRETE BARRIER, STANDARD TYPE B50

STATION FROM	STATION TO	SIDE	LENGTH LIN.FT.
I-490			
1020+72.57	1022+51.53	CENTERLINE	178.96

SUBTOTAL

DEDUCT FOR MEDIAN INLETS 1 X 20 = 20
LIGHT POLES 1 X 2.5 = 2.50
SIGN SUPPORTS 1 X 10 = 10.00

TOTAL 146

ITEM 611 REINFORCED CONCRETE APPROACH SLAB (T=15)

WEST APPROACH SLAB	
I-490	405 SQ.YD.
RAMP C-7	104 SQ.YD.
EAST APPROACH SLAB	
I-490	623 SQ.YD.
RAMP B-C	72 SQ.YD.
RAMP C-B	137 SQ.YD.
TOTAL	1,341 SQ.YD.

SCALE
MADE R.L.N. DATE 2-24-84
TRCD T.D. DATE 2-24-84
CKD A.H.S. DATE 2-27-84

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

GENERAL SUMMARY

QUANTITY CALCULATIONS
MADE BY A.H.S. DATE 3-12-84
CHECKED BY R.L.N. DATE 7-16-85

FHWA REGION	STATE	PROJECT
5	OHIO	

CUYAHOGA COUNTY
CUY- 490-1.00

Sheet 13	Sheet 15	Sheet 16	Sheet 17	Sheet 20	Sheet 23	Sheet 39	TOTAL QUANT.	UNIT	ITEM	DESCRIPTION
										ROADWAY
	2,083						2083	Sq. Ft.	202	Walk Removed
	371						371	Lin. Ft.	202	Curb Removed
20						4,118	4138	Cu. Yd.	203	Excavation Not Including Embankment Construction
	3331						3331	Sq. Yd.	203	Subgrade Compaction
	1.1						1.1	Hour	203	Proof Rolling
					512.5		512.5	Lin. Ft.	606	Guardrail, Standard Type 5
					4		4	Each	606	Anchor Assembly, Standard Type A
					3		3	Each	606	Anchor Assembly, Standard Type T
				1	5		6	Each	606	Bridge Terminal Assembly, Standard Type A
			857				857	Sq. Ft.	608	4" Concrete Walk
			6				6	Each	608	Curb Ramps, Standard Type 2
										PAVEMENT
20							20	Cu. Yd.	301	Bituminous Aggregate Base: AC-20, RT-11, or RT-12
	2346						2346	Cu. Yd.	310	Subbase, Type II, as per plan
		2285					2285	Sq. Yd.	451	9" Reinforced Concrete Pavement
		1955					1955	Sq. Yd.	451	10" Reinforced Concrete Pavement
		586					586	Sq. Yd.	452	6" - 9" Plain Concrete Pavement, as per plan
		377					377	Sq. Yd.	452	6" - 10" Plain Concrete Pavement, as per plan
		222					222	Sq. Yd.	452	9" ... Plain Concrete Pavement, as per plan
		237					237	Sq. Yd.	452	9" - 10" Plain Concrete Pavement, as per plan
			434				434	Lin. Ft.	609	Curb, Standard Type 2A
			513				513	Lin. Ft.	609	Curb, Standard Type 6
			1,341				1,341	Sq. Yd.	611	Reinforced Concrete Approach Slab (T = 15")
			238				238	Sq. Yd.	612	9" Concrete Traffic Island
			146				146	Lin. Ft.	622	Concrete Barrier, Standard Type B-50
			50				50	Lin. Ft.	622	Concrete Barrier, Standard Type B-50, Modified as per plan
			236				236	Lin. Ft.	Special	Pressure Relief Joint, Standard Type A
235							235	Sq. Yd.	Special	Herbicides for Weed Control
										EROSION CONTROL
40							40	Each	207	Straw or Hay Bales
400							400	Sq. Yd.	207	Temporary Seeding and Mulching
10							10	M.Sq. Ft.	659	Mowing
3							3	M Gal.	659	Water
2000							2000	Sq. Yd.	659	Seeding and Mulching
100							100	Sq. Yd.	659	Repair Seeding and Mulching
0.3							0.3	Ton	659	Commercial Fertilizer
0.9							0.9	Ton	659	Agricultural Liming

MADE A.H.S. DATE 3-12-84
TRACED T.D. DATE 3-12-84
CHECKED R.L.N. DATE 7-16-85
SCALE

Howard, Needles, Tammen & Bergendoff
CONSULTING ENGINEERS
CLEVELAND, OHIO
HNTB

GENERAL SUMMARY

QUANTITY CALCULATIONS
MADE BY A.H.S. DATE 3-12-84
CHECKED BY R.L.N. DATE 7-16-85

FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY
CUY- 490-1.00

SHEET NUMBER 14	32	33	TOTAL QUANT.	UNIT	ITEM	DESCRIPTION
						DRAINAGE
50	60		110	Lin. Ft.	603	6" Conduit, Type F
		114	114	Lin. Ft.	603	15" Conduit, Type B
		1	1	Each	604	Catch Basin, Standard No. 3 Modified as per plan
		1	1	Each	604	Paved Shoulder Inlet, Standard No. 2A-6 Modified as per plan
		1	1	Each	604	Paved Shoulder Inlet, Standard No. 2A-12 Modified as per plan
		1	1	Each	604	Paved Shoulder Inlet, Standard No. 2A-20, Modified as per plan
		1	1	Each	604	Barrier Median Inlet, Standard No. I-38 50, Modified as per plan
	380		380	Lin. Ft.	605	6" Shallow Pipe Underdrains, as per plan
	1210		1210	Lin. Ft.	605	6" Deep Pipe Underdrains, as per plan
	224		224	Lin. Ft.	605	6" Shallow Pipe Underdrains, 707.01 Type III or 707.21 Type III as per plan
						MISCELLANEOUS
			LUMP		614	Maintaining Traffic
			LUMP		619	Field Office
			LUMP		623	Construction Layout Stakes
			LUMP		624	Mobilization

For Traffic Control General Summary see sheets 40 & 41
For Structure General Summary see sheet 93.
For Lighting General Summary See Sheets 61 & 62

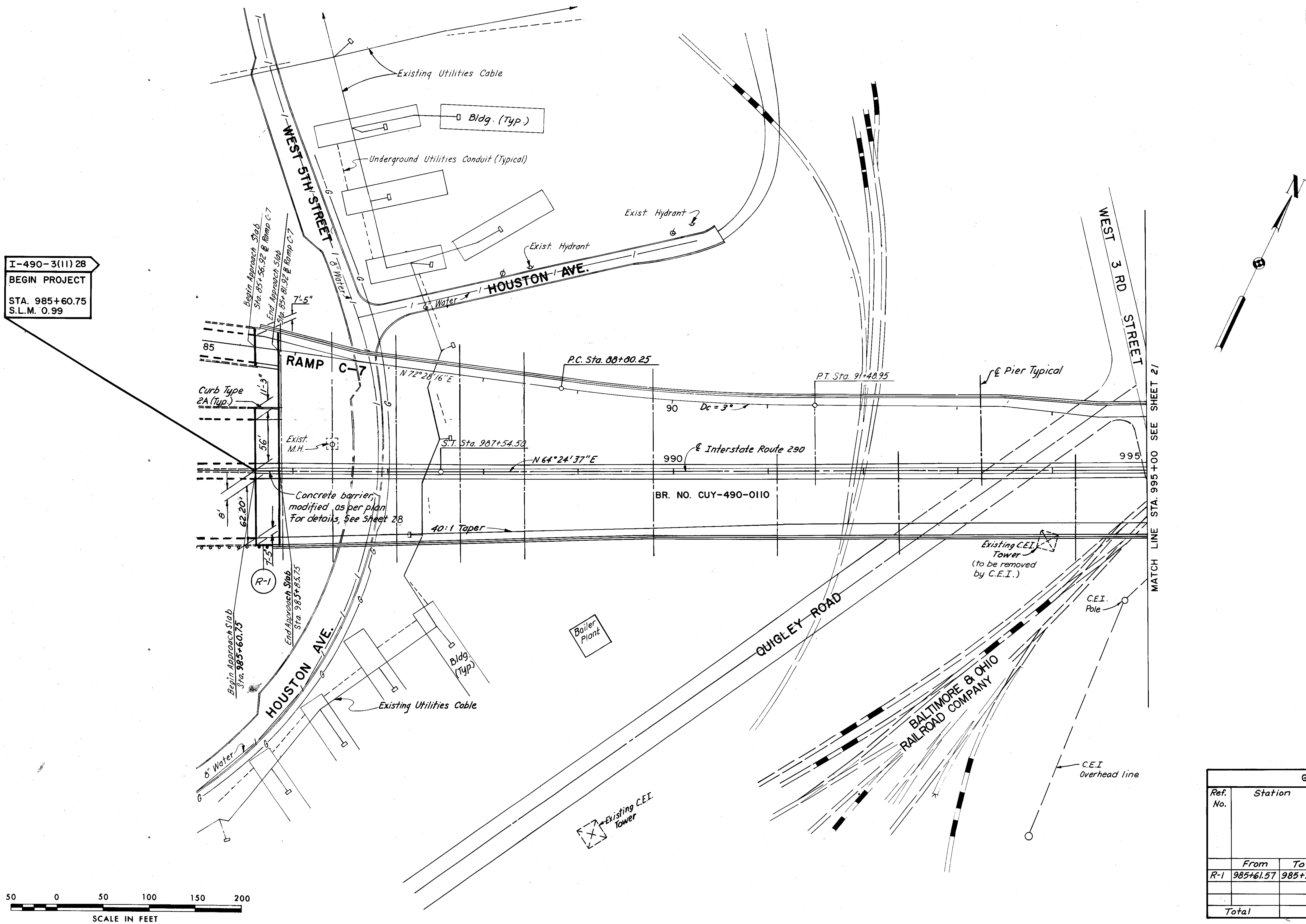
MADE A.H.S. DATE 3-12-84
TRACED T.D. DATE 3-12-84
CHECKED R.L.N. DATE 3-16-85
SCALE

Howard, Needles, Tammen & Bergendoff
CONSULTING ENGINEERS
CLEVELAND, OHIO

HNTB

FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY
CUY- 490-1.00



NOTES:
For Approach slab details see. Sheet. 30

GUARD RAIL						
Ref. No.	Station		Side	606 Bridge Terminal Assembly Type A		
	From	To		Each		
R-1	985+61.57	985+74.07	Rt.	1		
Total				1		

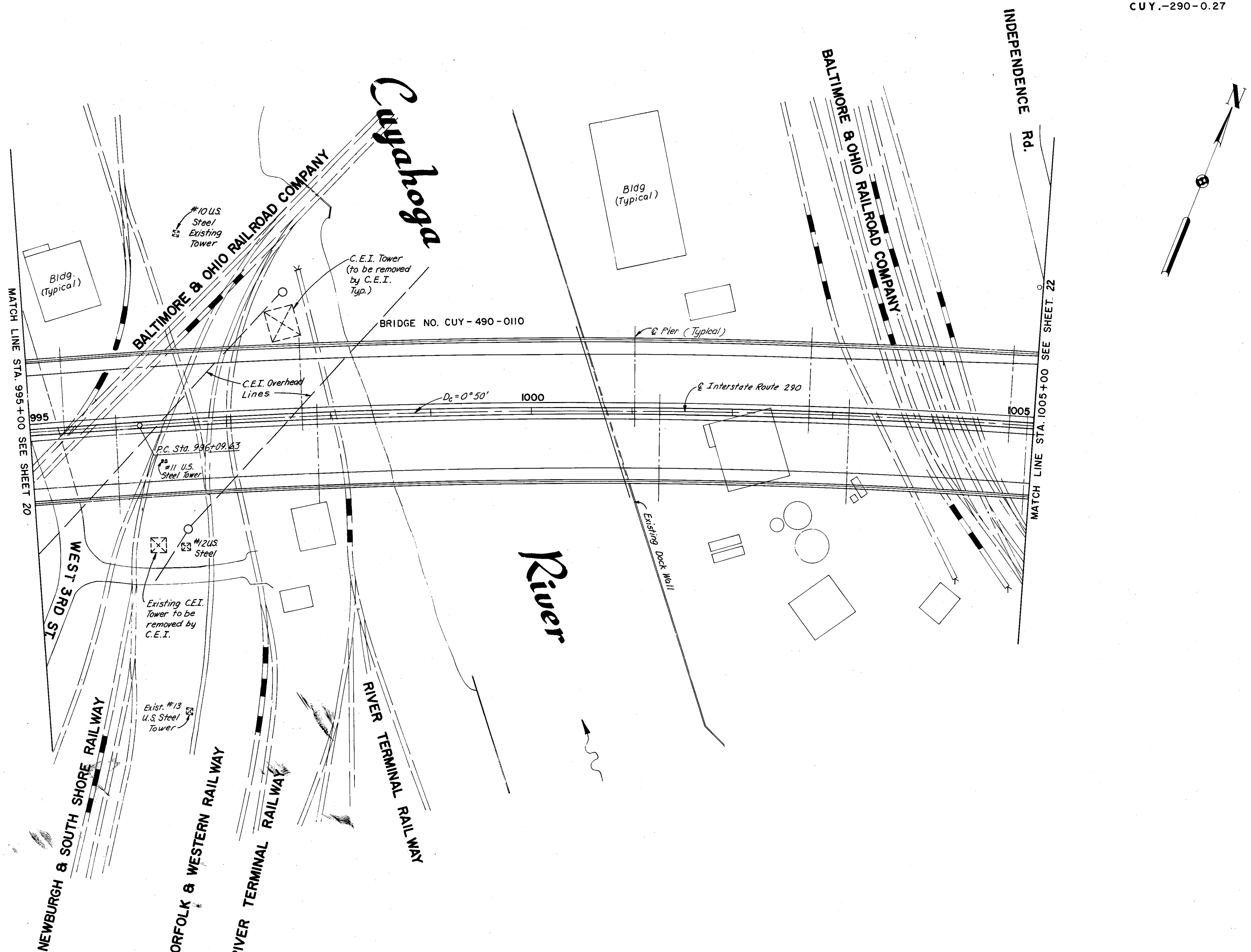
SCALE 1" = 50'
MADE T.P.M. DATE 5-2-69
TRCD. M.A.G. DATE 8-10-70
CKD. L.J.D. DATE 8-12-70

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

PAVEMENT PLAN STA. 985+60.75 TO STA. 995+00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY.-290-0.27



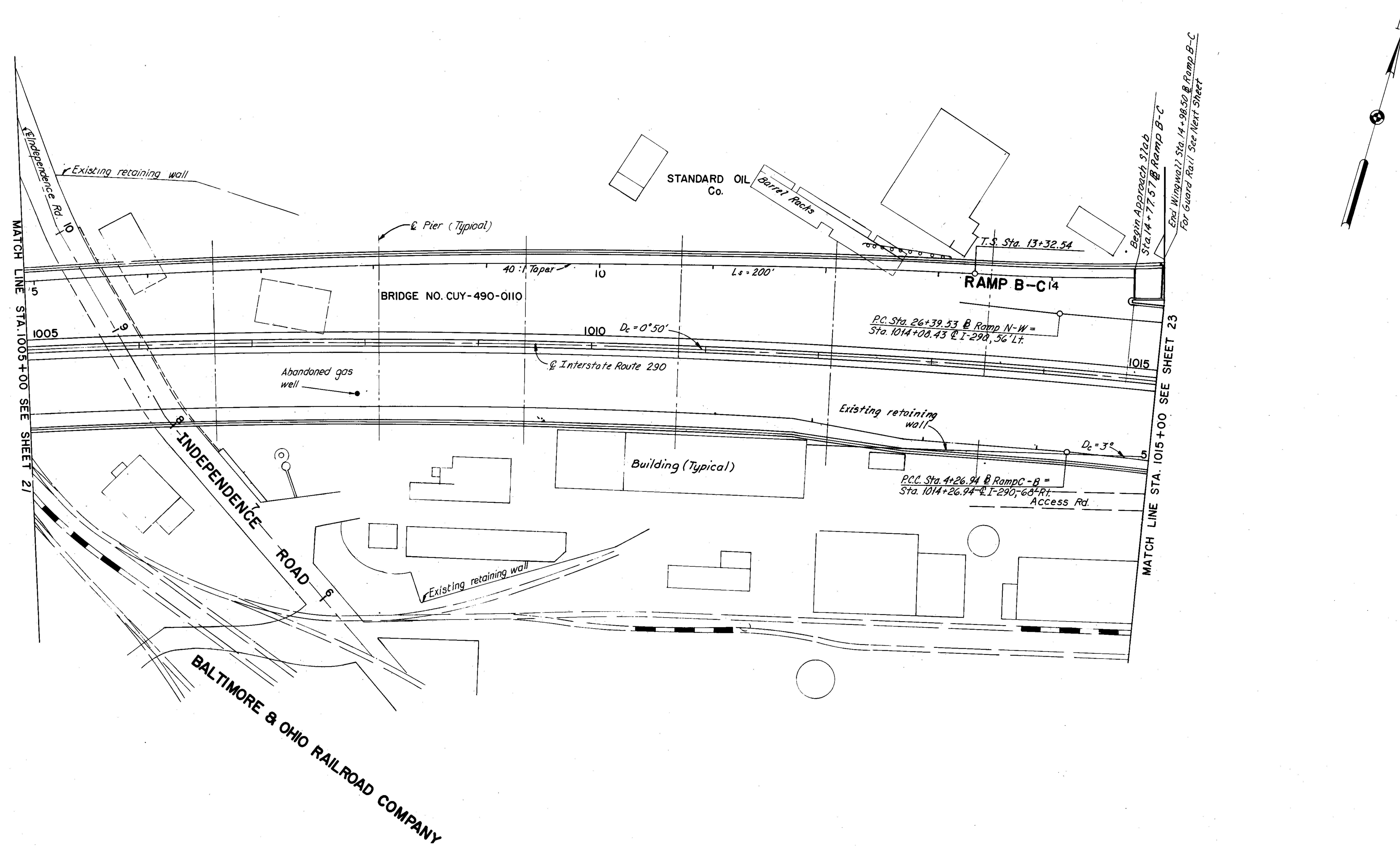
50 0 50 100 150 200
SCALE IN FEET

SCALE 1" = 50'
MADE T.P.M. DATE 5-3-69
TRCD M.A.G. DATE 8-7-70
CKD L.J.D. DATE 8-13-70

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

PAVEMENT PLAN STA. 995+00 TO STA. 1005+00

CUYAHOGA COUNTY
CUY.–290–0.27



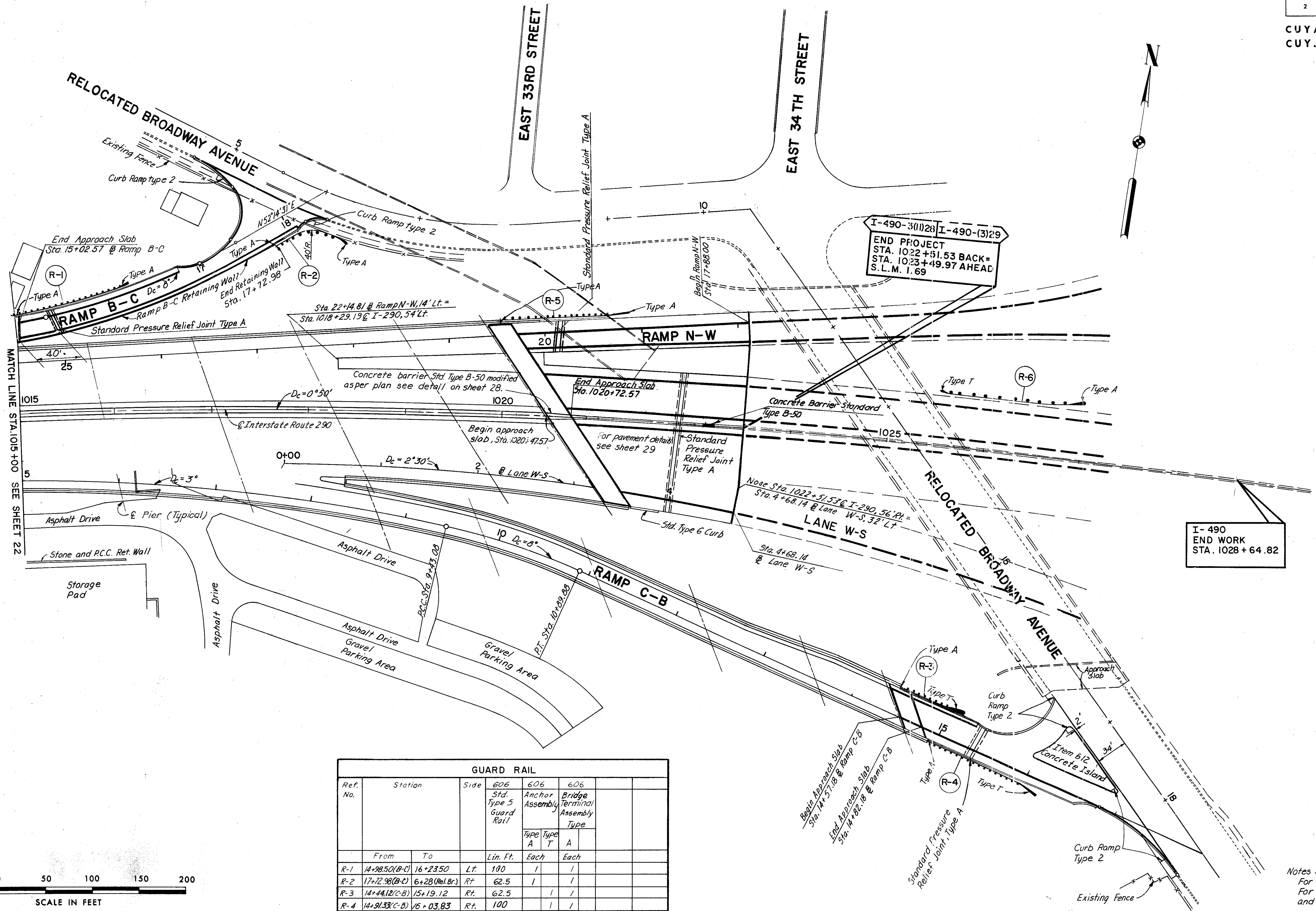
50 0 50 100 150 200
SCALE IN FEET

Note :

For approach slab details see sheet 31 .

SCALE 1" = 50'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE T.P.M. DATE 5-3-69	CONSULTING ENGINEERS
TRCD. M.A.G. DATE 8-7-70	
CKD. L.J.D. DATE 8-11-70	KANSAS CITY CLEVELAND NEW YORK

CUYAHOGA COUNTY
CUY.-290-0.27



GUARD RAIL									
Ref. No.	Station		Side	606 Std. Type 5 Guard Rail	606 Anchor Assembly		606 Bridge Terminal Assembly Type		
					Type A	Type T	A		
	From	To		Lin. Ft.	Each		Each		
R-1	14+98.50(B-C)	16+23.50	Lt.	100	1		1		
R-2	17+72.98(B-C)	6+28 (Rel. Br.)	Rt	62.5	1		1		
R-3	14+44.12(C-B)	15+19.12	Rt.	62.5		1	1		
R-4	14+91.33(C-B)	16+03.83	Rt.	100		1	1		
R-5	19+18 (N-W)	20+43	Rt.	100	1		1		
R-6	1025+75(I-490)	1027+00(I-490)	Lt.	87.5	1	1			
	Totals			512.5	4	3	5		

Notes:
For approach slab details see sheet 31.
For Pavement details at Ramp B-C and C-B see sheet 29.

SCALE 1" = 50'
MADE T.P.M. DATE 5-2-69
TRCD. D.C.F. DATE 7-2-70
CKD. L.J.D. DATE 7-22-70

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

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

24/193

CUYAHOGA COUNTY
CUY. -290-0.27

SCALE 1"=10' Vert. 1"=100' Horiz.
MADE C.M.D. DATE 10-31-67
TRCD. ____ DATE ____
CKD R.H.A. DATE 11-23-67

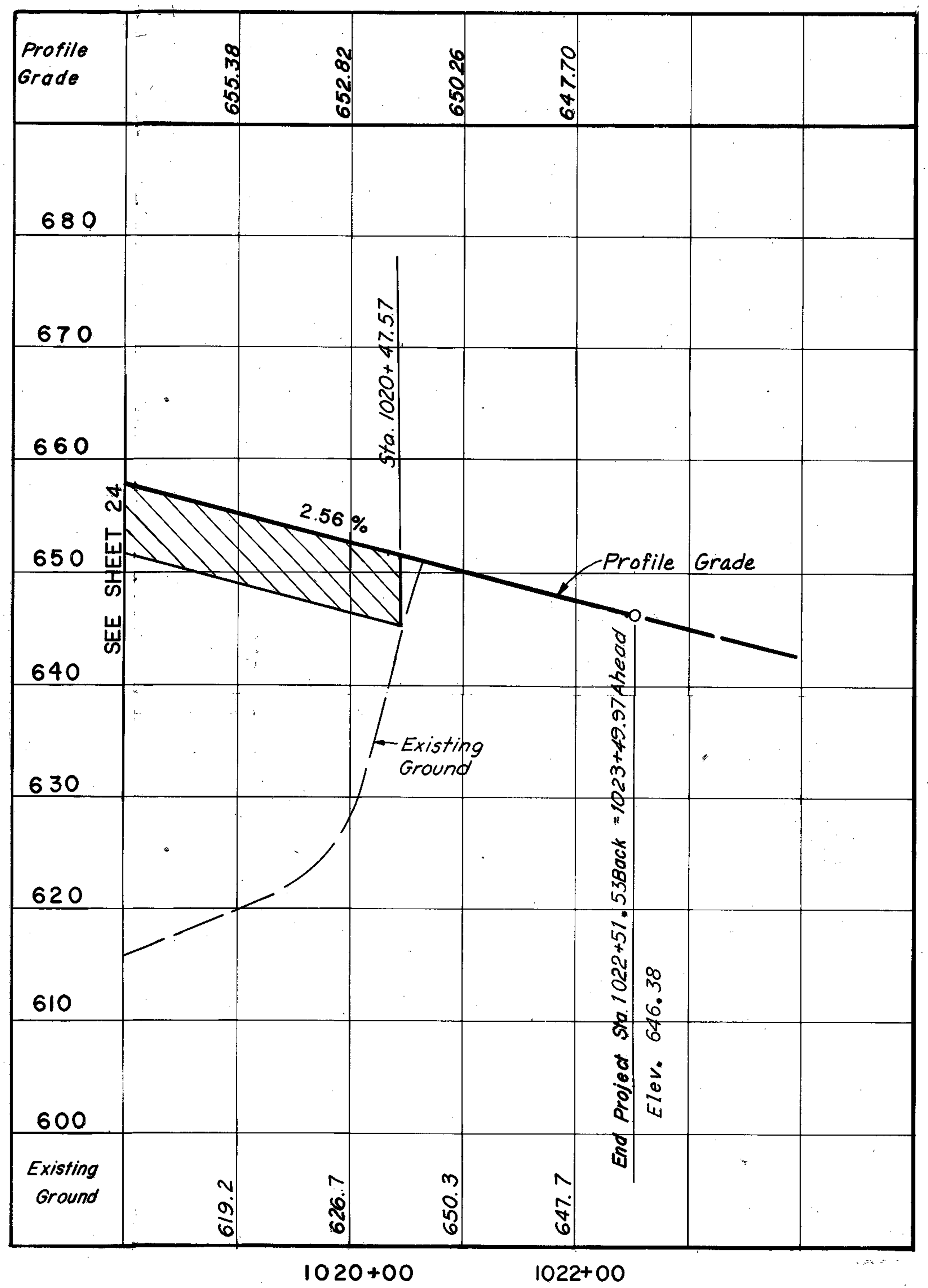
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

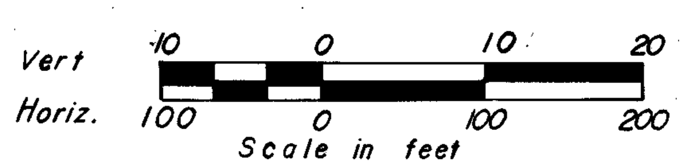
Vert 10 0 10 20
Horiz. 100 0 100 200
Scale in feet

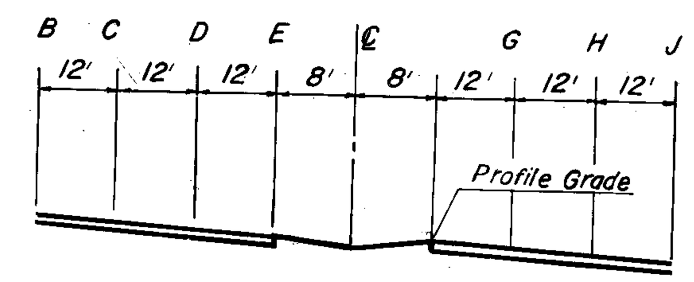
Note: For pavement elevations on bridge see Bridge Pavement Plans.

PROFILE I-290

CUYAHOGA COUNTY
CUY.-290-0.27







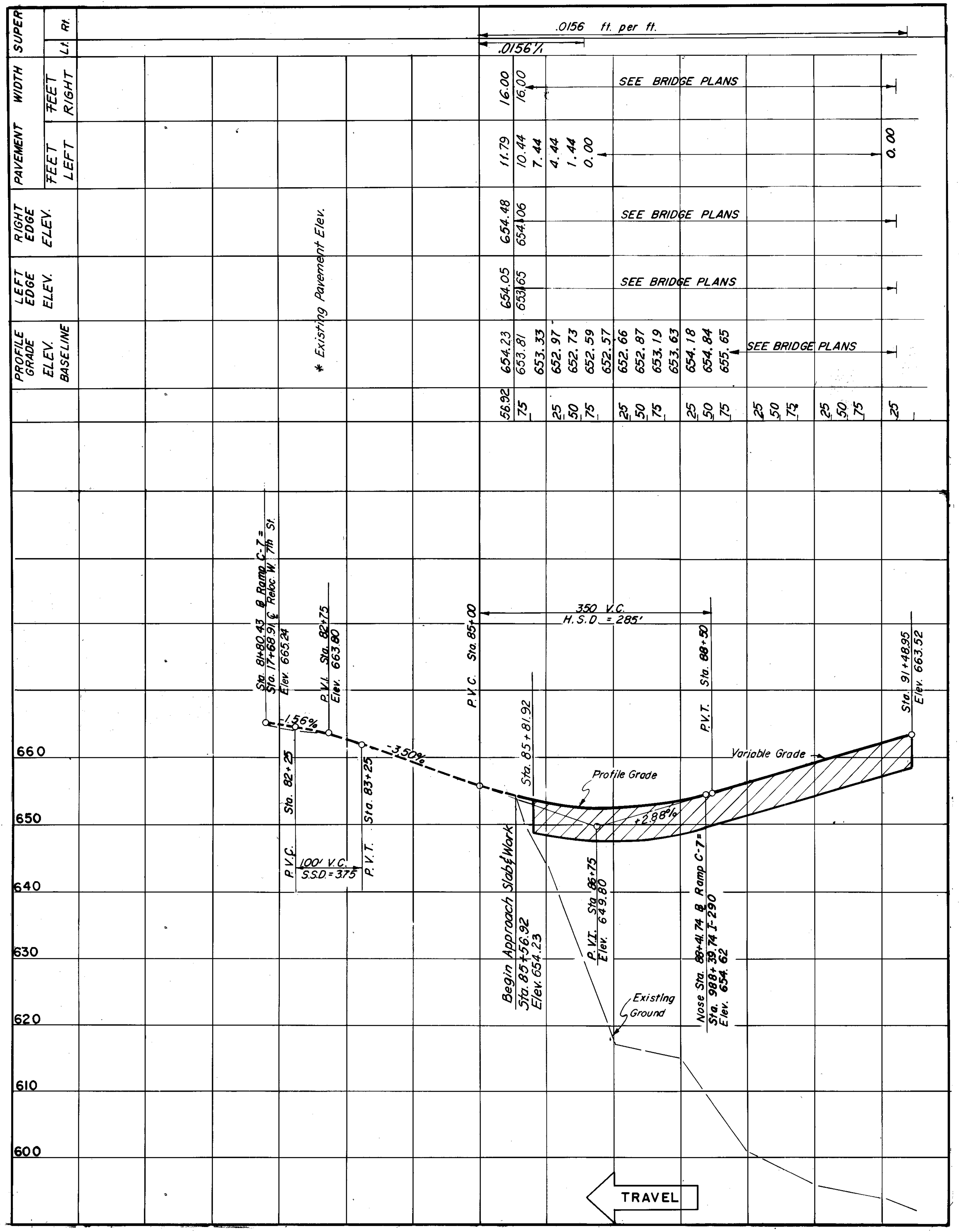
STATION				ELEV. B	ELEV. C	ELEV. D	ELEV. E	PROFILE GRADE	ELEV. G	ELEV. H	ELEV. J			
1020+25.00				652.90	652.66	652.42	652.18	652.18	651.94	651.70	651.46			
1020+50.00				652.26	652.02	651.78	651.54	651.54	651.30	651.06	650.82			
1020+75.00				651.59	651.35	651.11	650.87	650.90	650.66	650.42	650.18			
1021+00.00				650.93	650.69	650.45	650.21	650.26	650.02	649.78	649.54			
1021+25.00				650.29	650.05	649.81	649.57	649.62	649.38	649.14	648.90			
1021+50.00				649.65	649.41	649.17	648.93	648.98	648.74	648.50	648.26			
1021+75.00				649.01	648.77	648.53	648.29	648.34	648.10	647.86	647.62			
1022+00.00				648.37	648.13	647.89	647.65	647.70	647.46	647.22	646.98			
1022+25.00				647.73	647.49	647.25	647.01	647.06	646.82	646.58	646.34			
1022+50.00				647.09	646.85	646.61	646.37	646.42	646.18	645.94	645.70			

SCALE 1" = 10' Vert. 1" = 100' Horiz.
MADE C.H.D. DATE 10-31-67
TRCD. ___ DATE ___
CKD. R.H.A. DATE 11-23-67

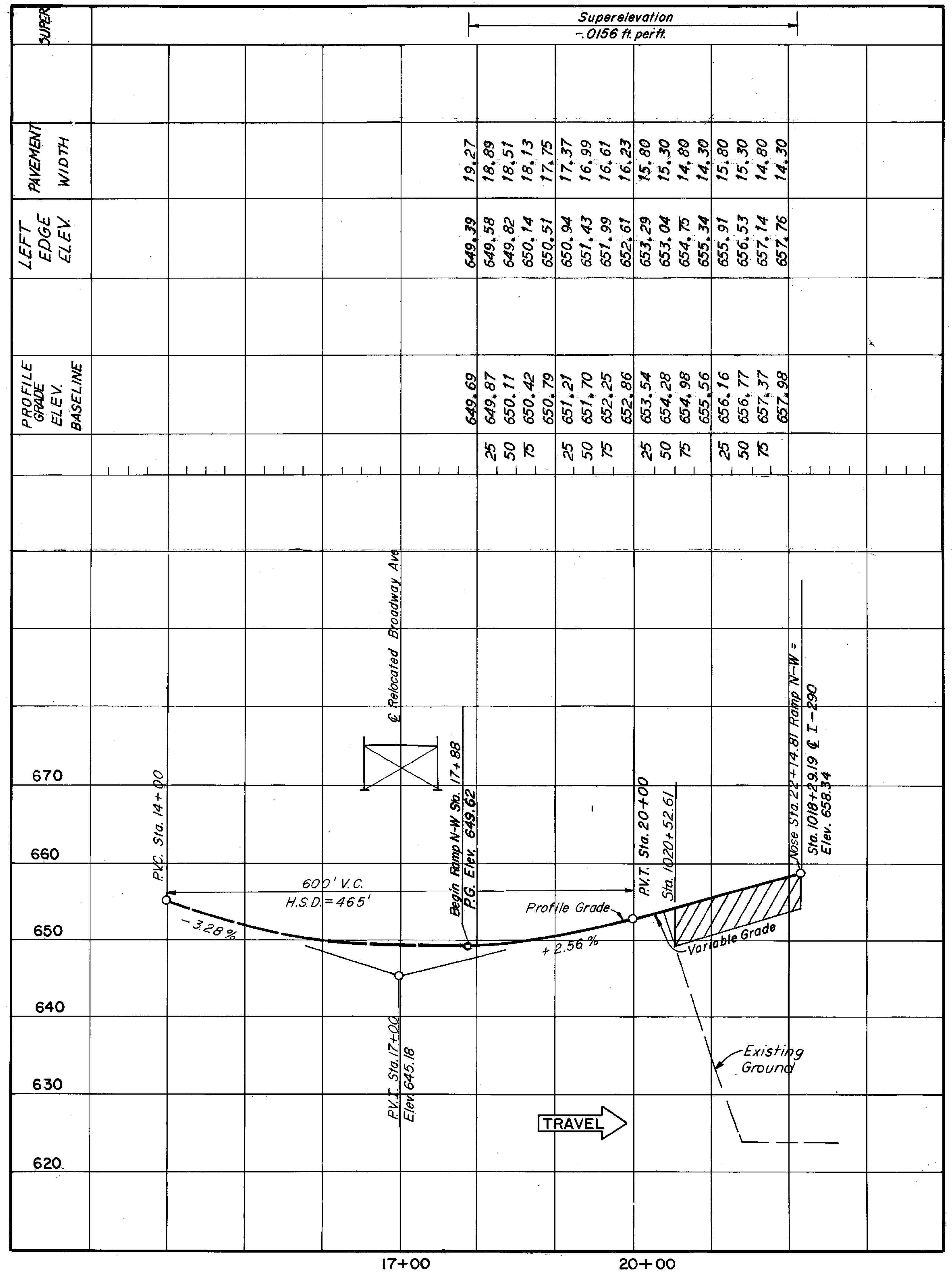
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

FHWA REGION	STATE	PROJECT		
5	OHIO			

CUYAHOGA COUNTY
CUY- 490-1.00



RAMP C-7



RAMP N-W

100 0 100 200 300 400 HORIZ.
10 0 10 20 30 40 VERT.
SCALE IN FEET

SCALE
MADE RSW DATE 2-5-70
TRCD MMD DATE 2-6-70
CKD. LJD DATE 8-19-70

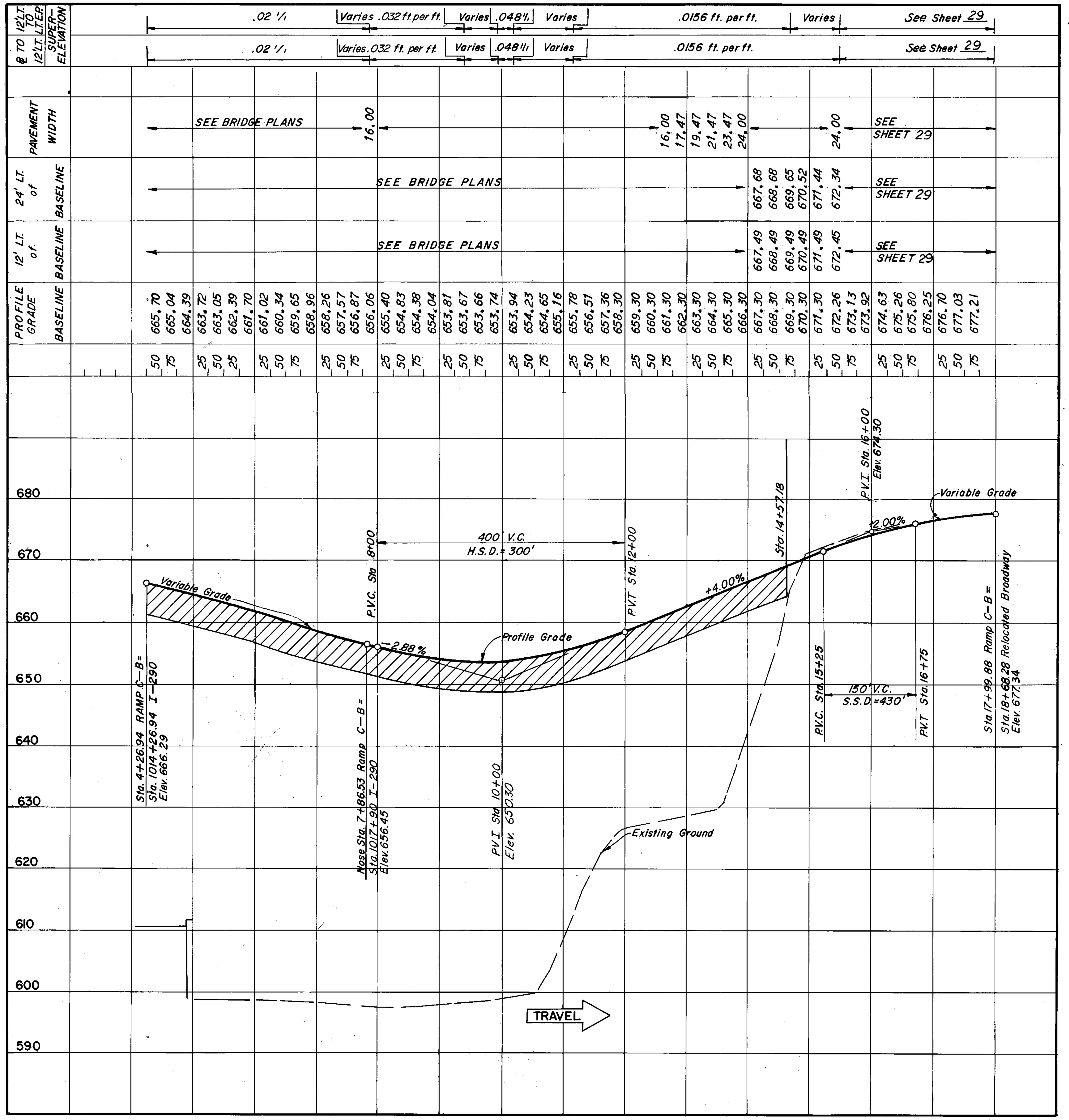
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PROFILE— RAMP C-7 AND RAMP N-W

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

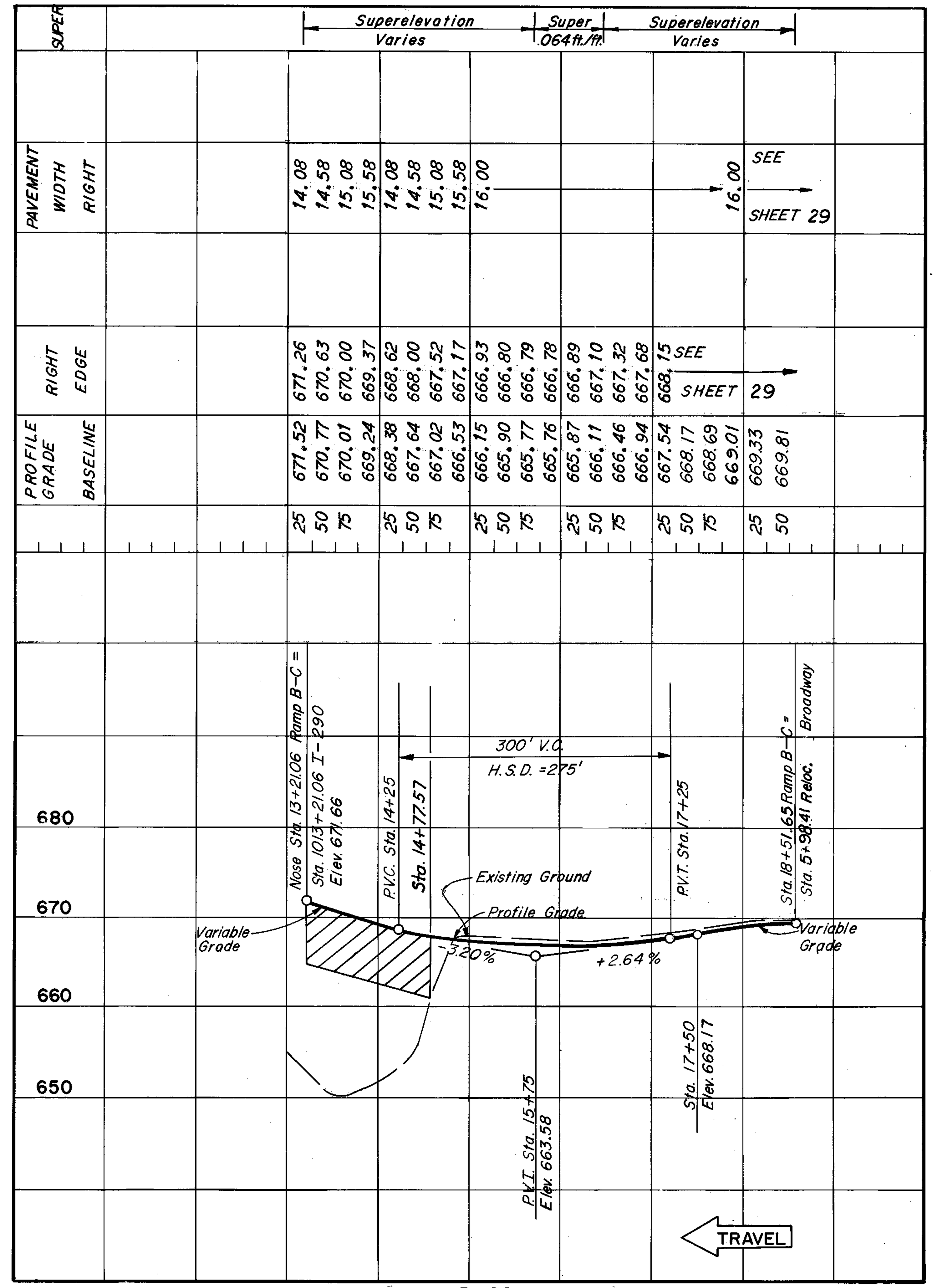
27
193

CUYAHOGA COUNTY
CUY. 290- 0.27



5+00 10+00 15+00

RAMP C-B



13+00 15+00 18+00

RAMP B-C

100 0 100 200 300 400 HORIZ.
10 0 10 20 30 40 VERT.
SCALE IN FEET

SCALE None
MADE R.S.W. DATE 2-5-70
TRCD M.M.D. DATE 2-6-70
CKD J.D. DATE 8-19-70

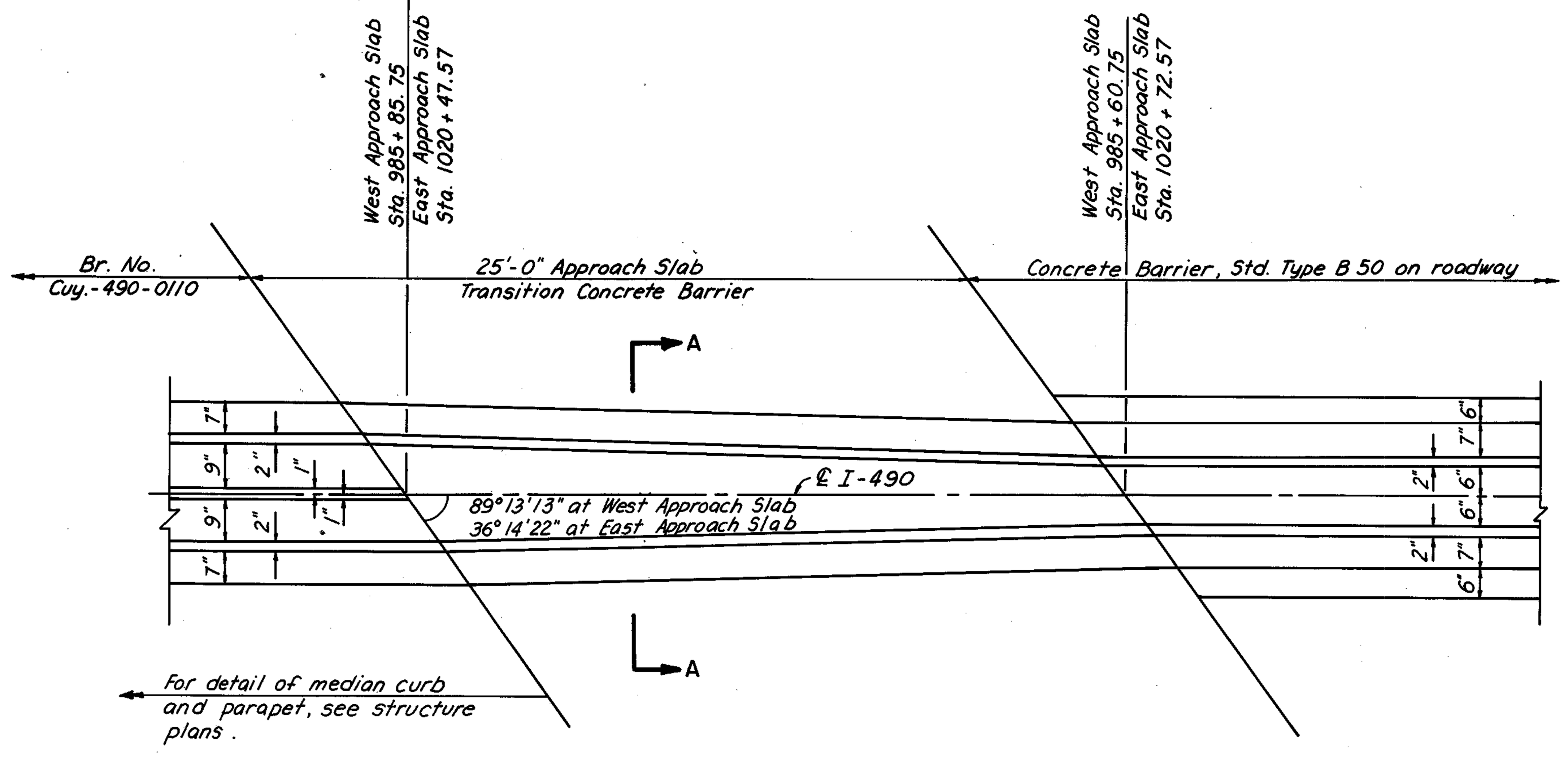
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PROFILE – RAMP C-B, RAMP B-C

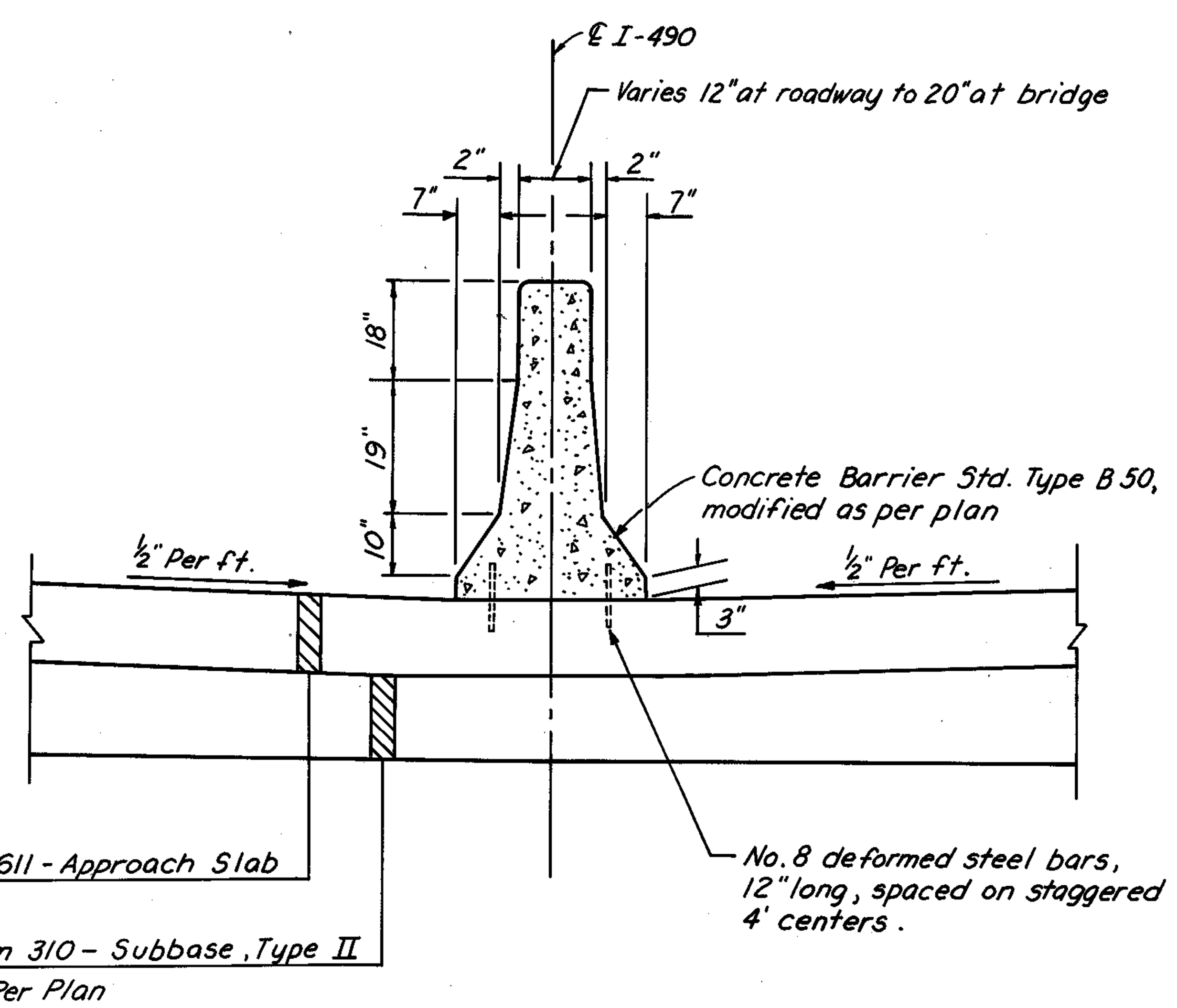
PAVEMENT DETAILS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY.–290–0.27

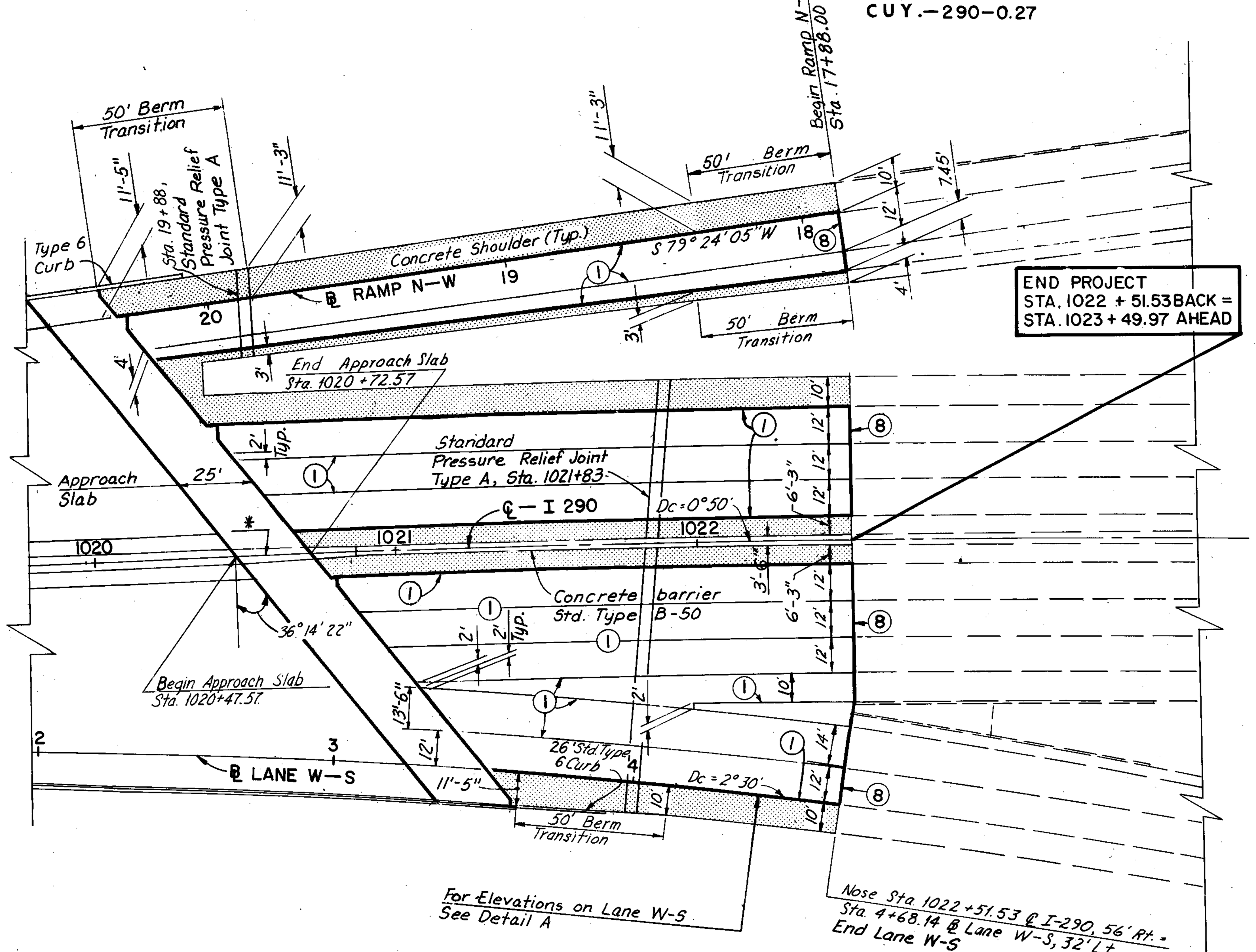


PLAN



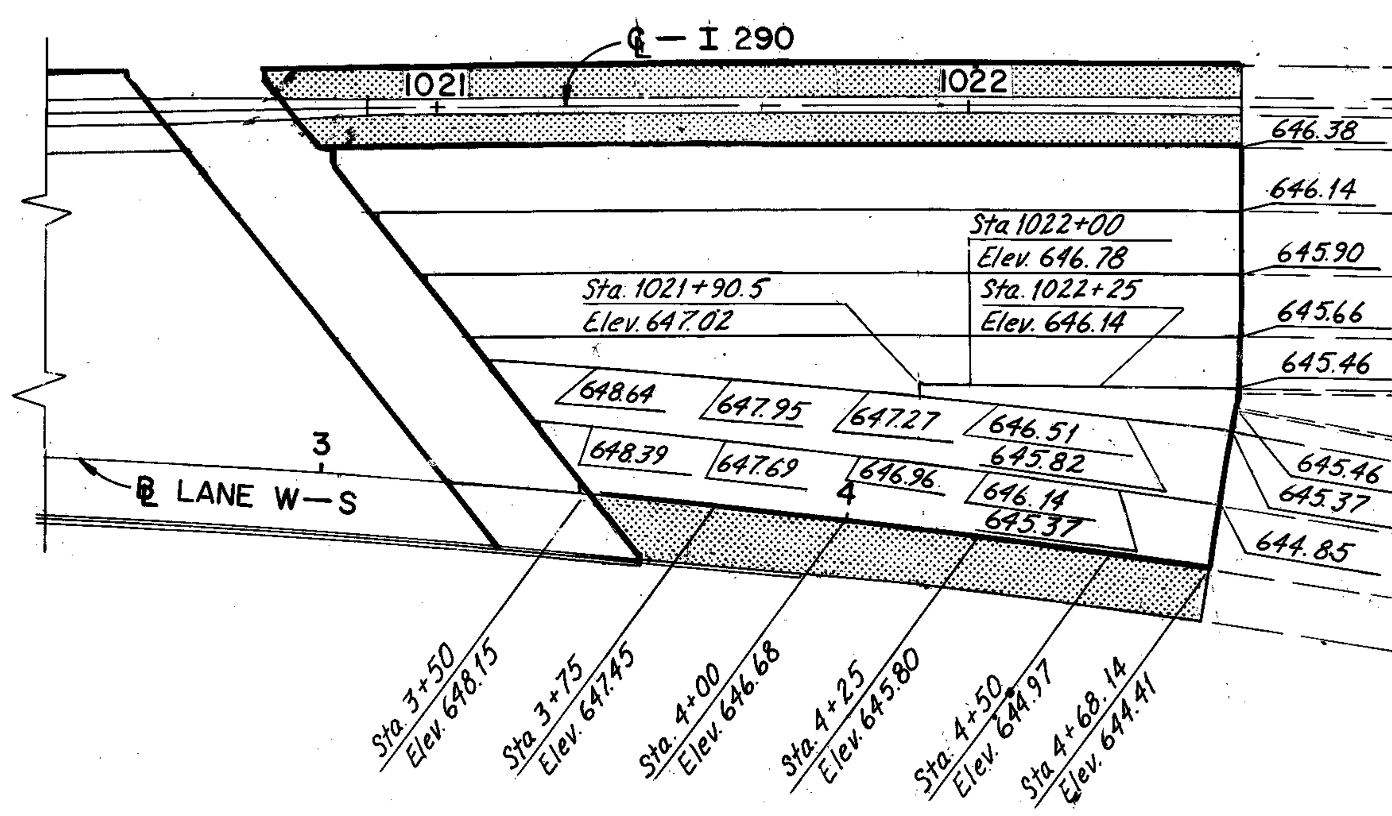
SECTION A-A

CONCRETE BARRIER, STANDARD TYPE B 50 MODIFIED AS PER PLAN



* Concrete barrier std. type B 50 modified as per plan. See details on this sheet.

I-490, RAMP N-W AND LANE W-S



DETAIL — A

30 0 30 60 90

JOINT LEGEND

(1) Standard Longitudinal Joint
(8) Standard Construction Joint

2 0 2 4 6 8

SCALE IN FEET

Note: For additional details, see standard construction drawing MC-9.

SCALE As Noted
MADE D.C.F. DATE 11-24-69
TR'CD ____ DATE ____
CKD L.J.D. DATE 11-12-70

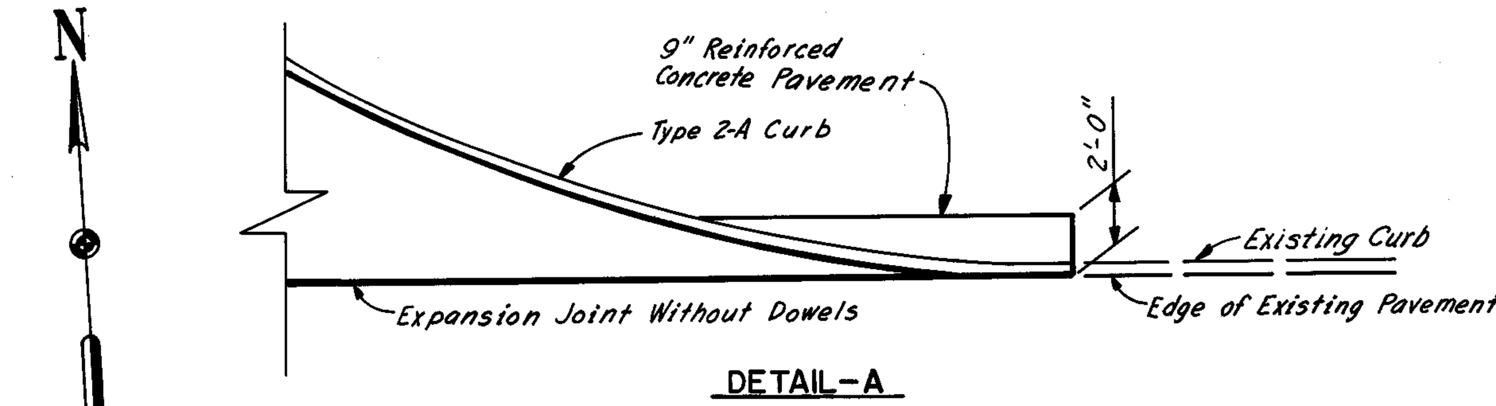
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

PAVEMENT DETAILS

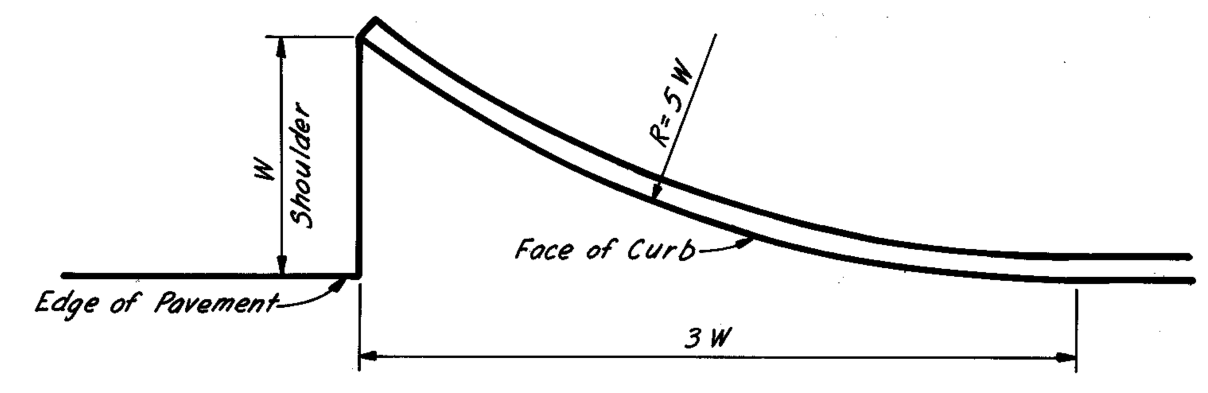
FHWA REGION	STATE	PROJECT		
5	OHIO			

29/193

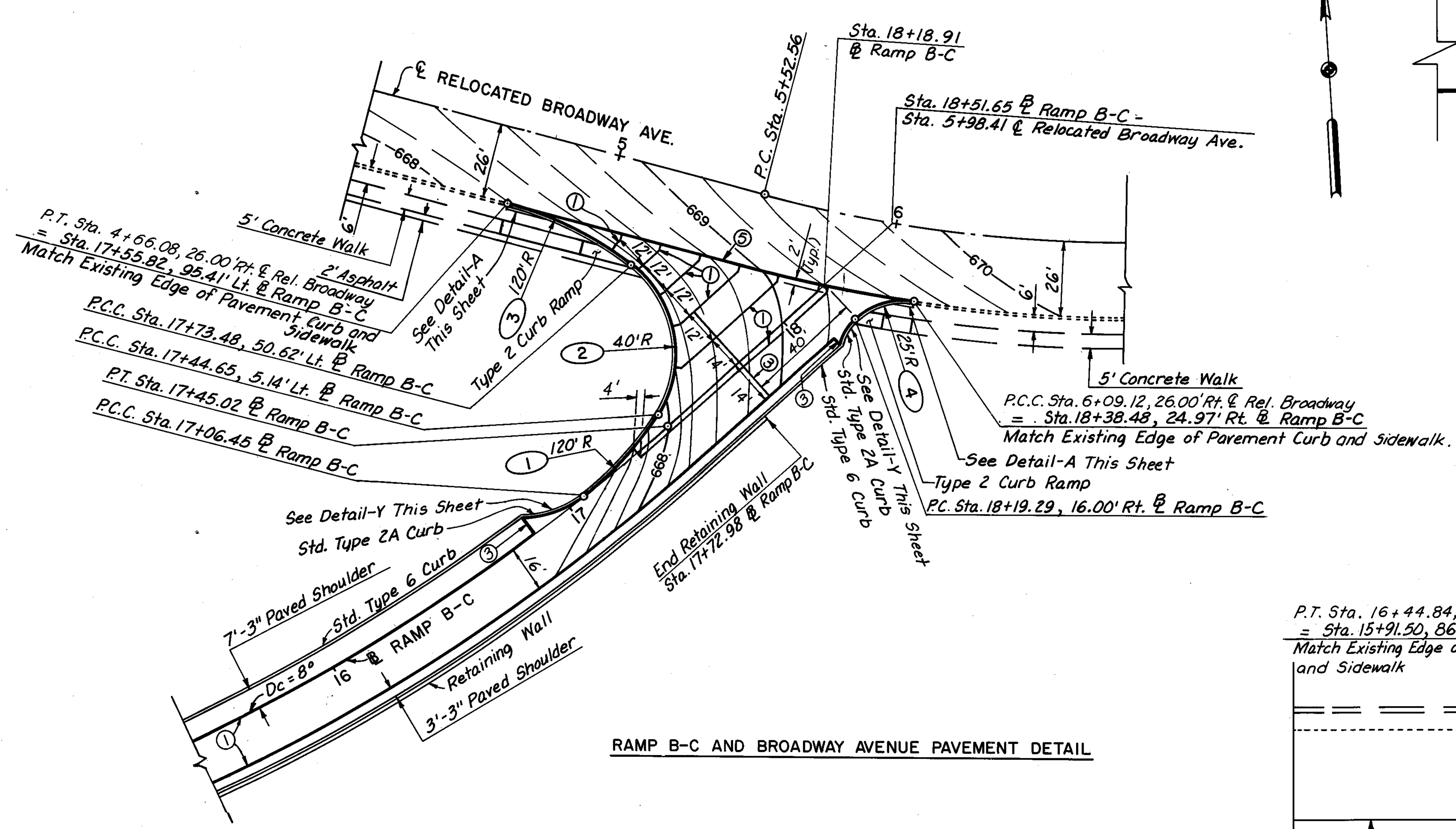
CUYAHOGA COUNTY
CUY- 290-0.27



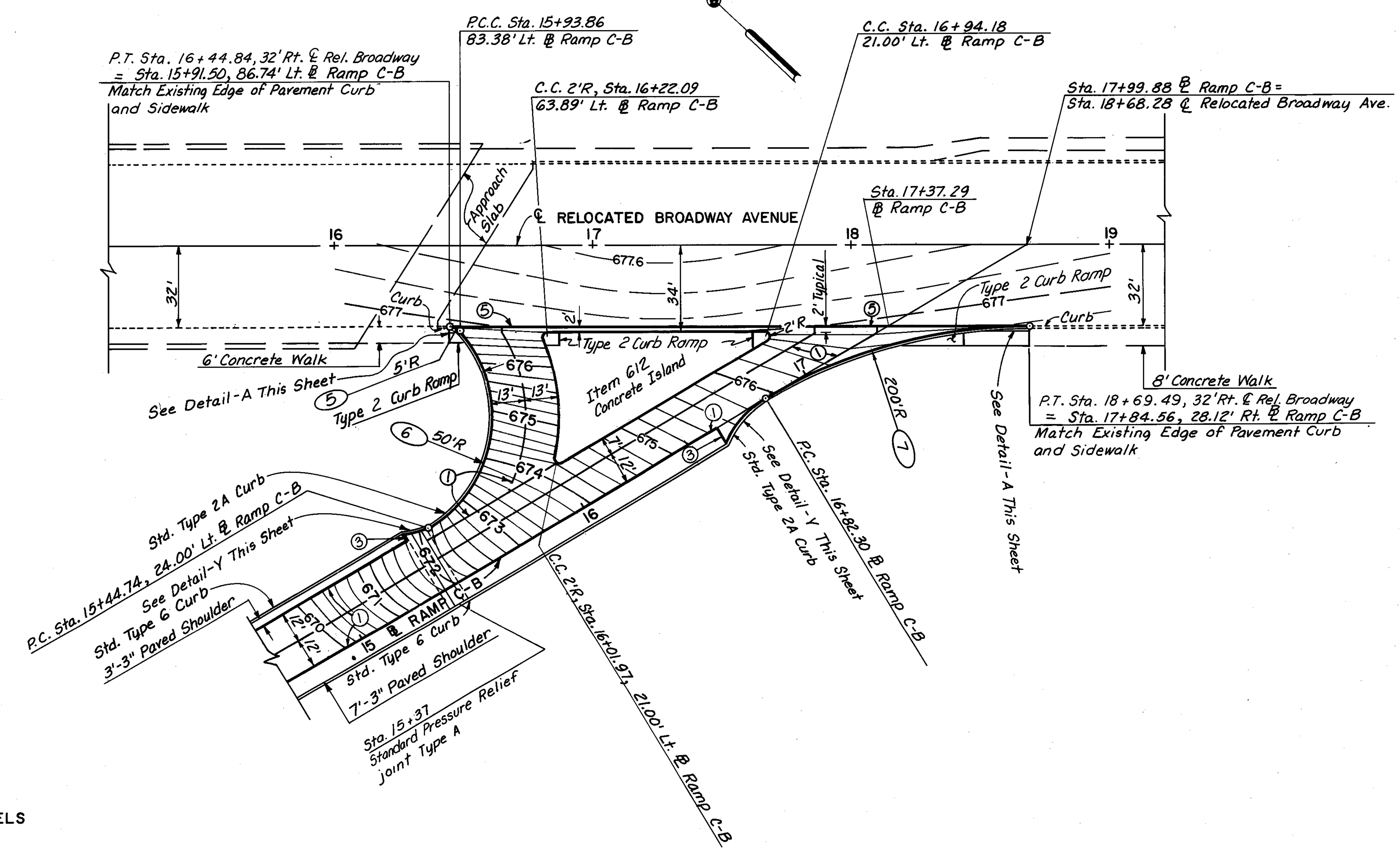
DETAIL-A



DETAIL-Y
No Scale



RAMP B-C AND BROADWAY AVENUE PAVEMENT DETAIL



RAMP C-B AND BROADWAY AVENUE PAVEMENT DETAIL

CURVE 1
Δ = 18° 25' 02"
R = 120.00'
T = 19.45'
L = 38.57'
E = 1.57'

CURVE 2
Δ = 84° 36' 51"
R = 40.00'
T = 36.41'
L = 59.07'
E = 14.09'

CURVE 3
Δ = 23° 08' 42"
R = 120.00'
T = 24.57'
L = 48.48'
E = 2.49'

CURVE 4
Δ = 50° 07' 17"
R = 25.00'
T = 11.69'
L = 21.87'
E = 2.60'

CURVE 5
Δ = 48° 26' 08"
R = 5.00'
T = 2.25'
L = 4.23'
E = 0.48'

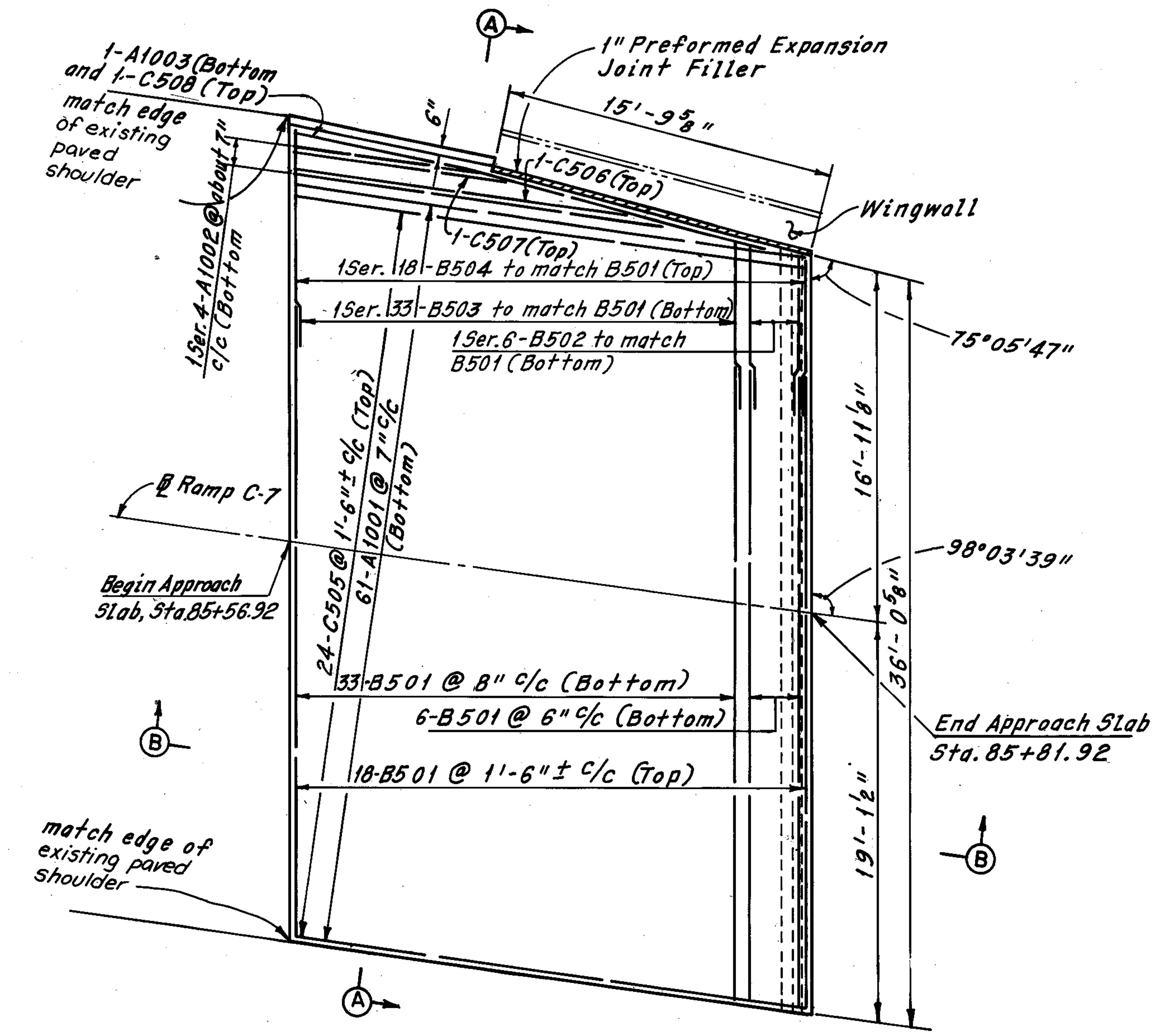
CURVE 6
Δ = 100° 48' 52"
R = 50.00'
T = 60.46'
L = 87.98'
E = 28.45'

CURVE 7
Δ = 30° 45' 00"
R = 200.00'
T = 55.00'
L = 107.34'
E = 7.42'

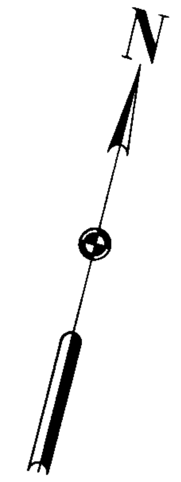
1. STANDARD LONGITUDINAL JOINT
2. STANDARD EXPANSION JOINT
3. STANDARD CONTRACTION JOINT
5. EXPANSION JOINT WITHOUT DOWELS

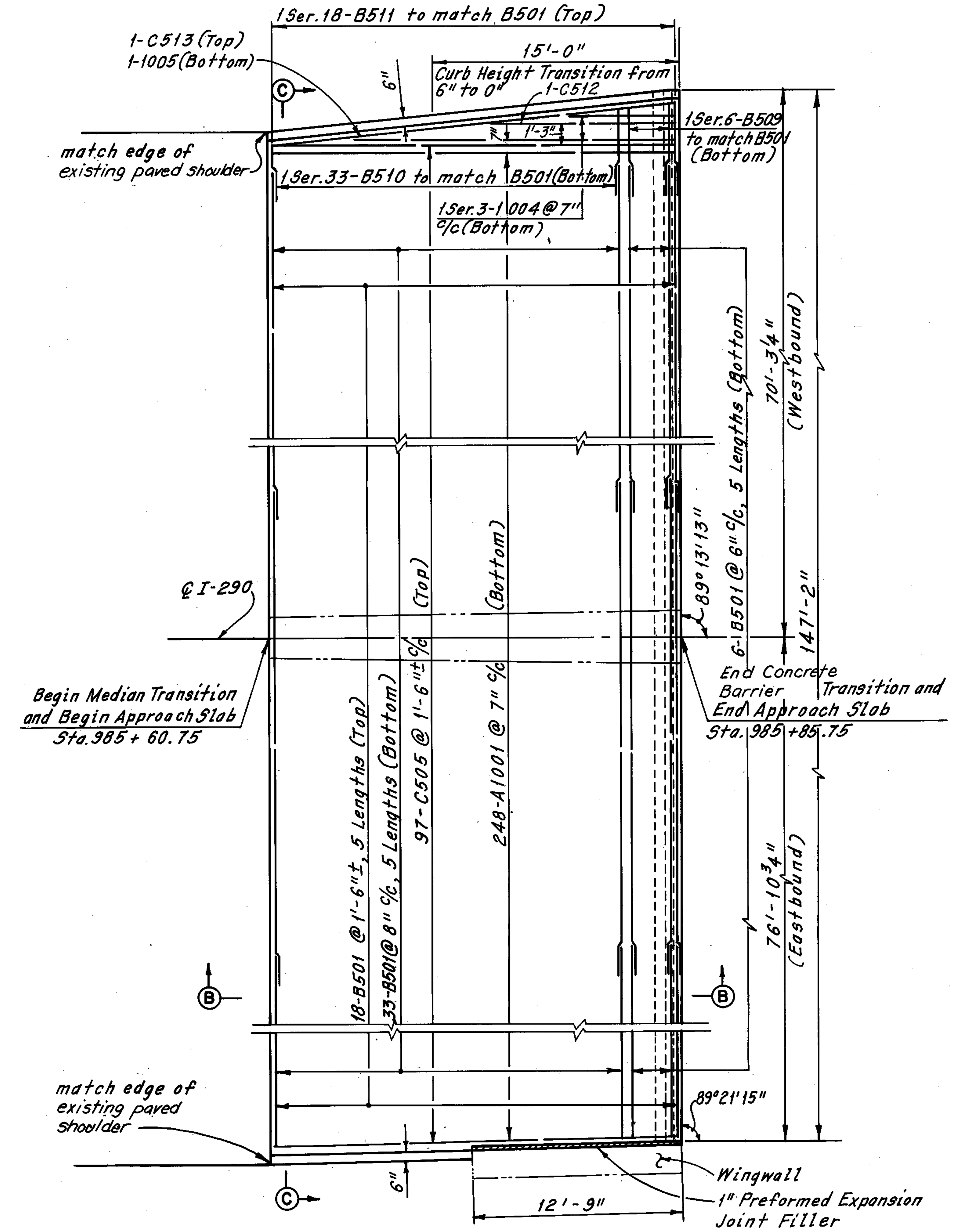
30 0 30 60 90 120
SCALE IN FEET

SCALE 1" = 30'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE JAG DATE 4-01-83	CONSULTING ENGINEERS
TRCD. JAG DATE 4-20-83	
CKD. R.L.N. DATE 4-21-83	KANSAS CITY CLEVELAND NEW YORK

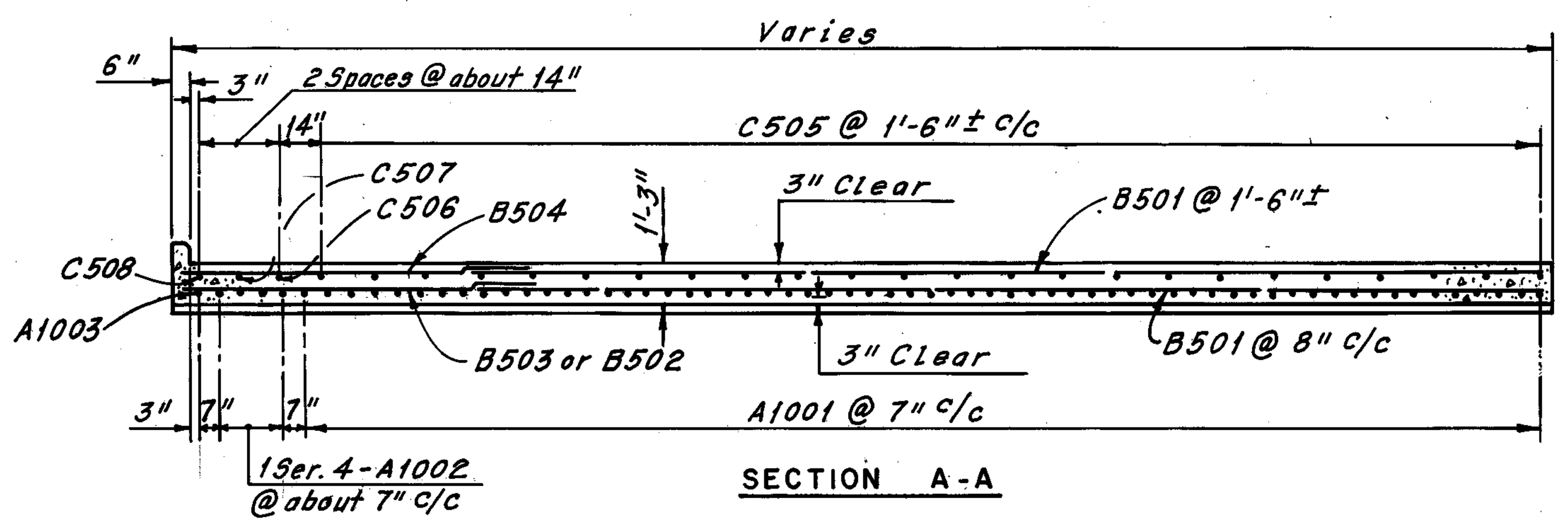


WEST APPROACH SLAB - RAMP C-7

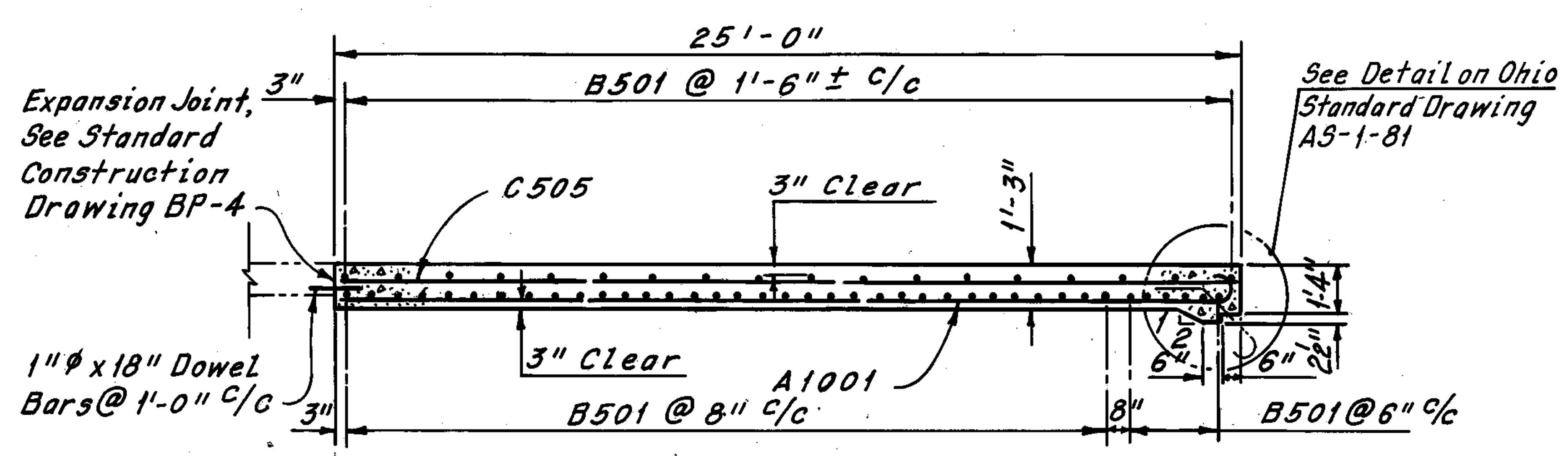




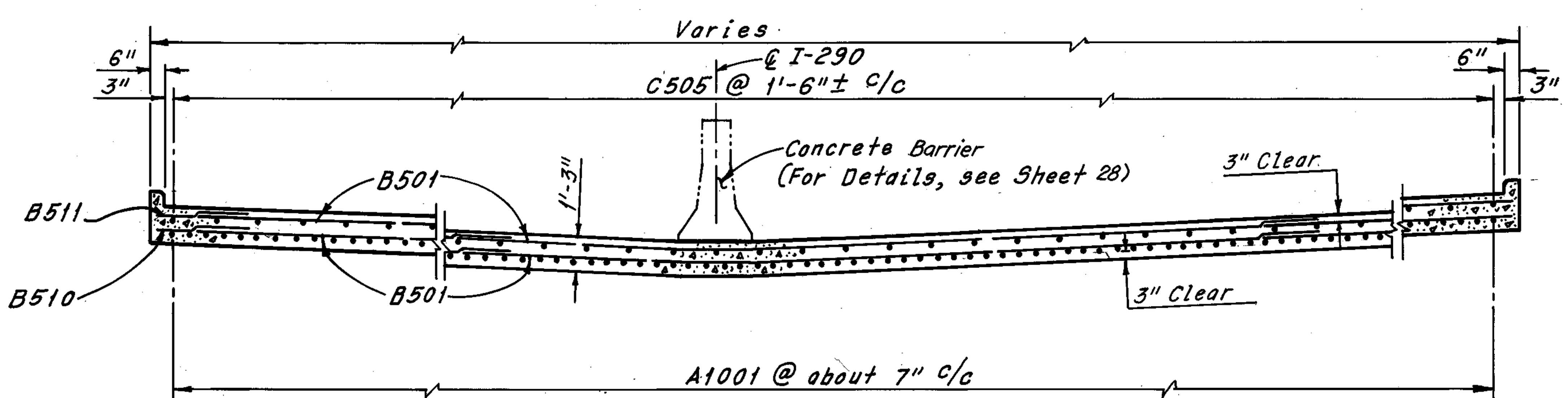
WEST APPROACH SLAB - I-290 EASTBOUND & WESTBOUND



SECTION A-A

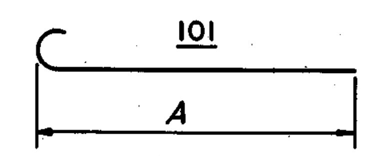


SECTION B-B



SECTION C-C

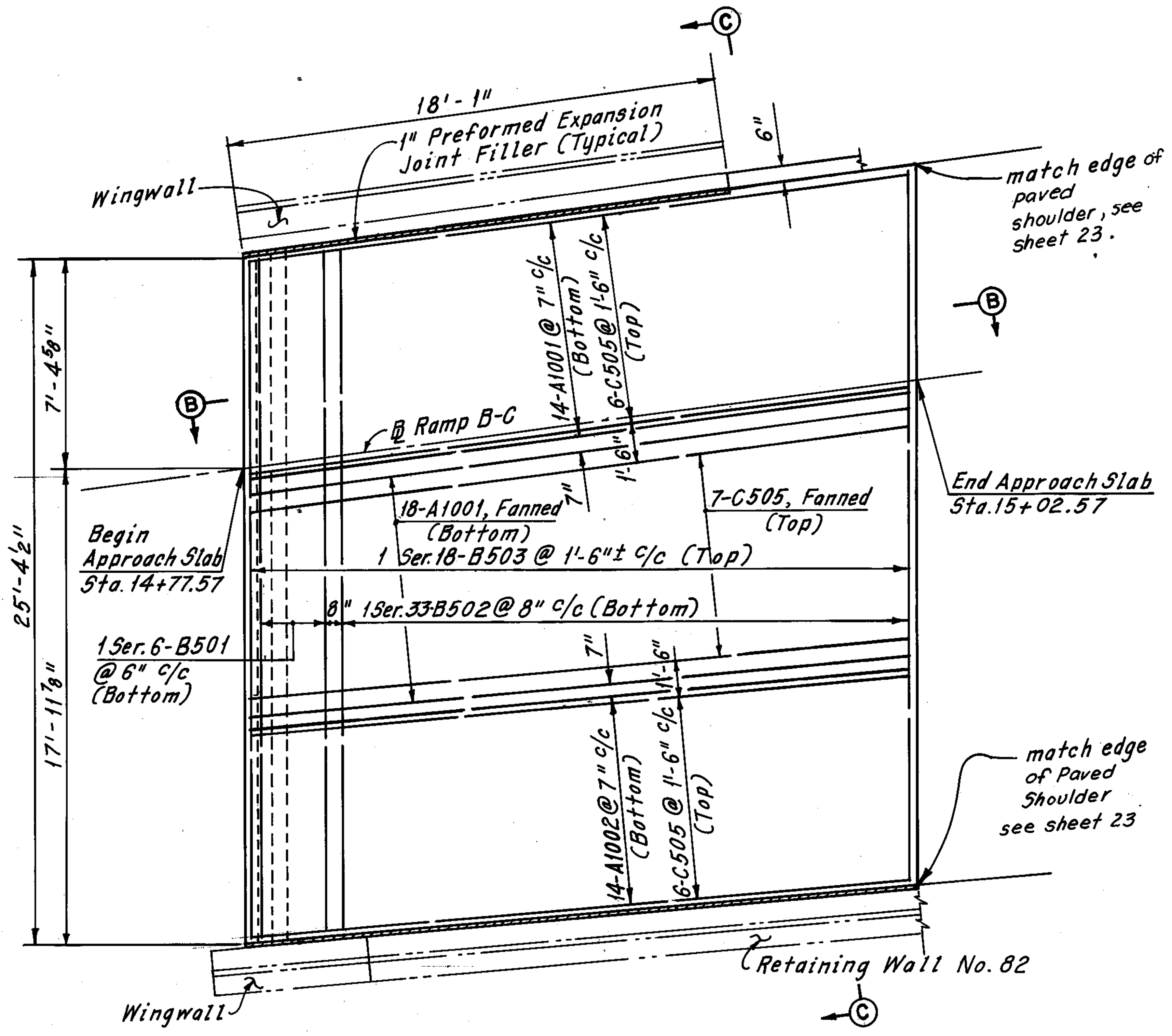
REINFORCEMENT SCHEDULE					
TYPE	LENGTH "A"	LENGTH BAR	NO. REQ.	SHAPE	SER. INCR.
WEST APPROACH SLAB - RAMP C-7					
A1001	24'-6"	25'-11"	61	101	
A1002		6'-0" / 21'-0"	1 SER 4	STR	5'-0"
A1003		25'- 0"	1	STR	
B501		30'- 0"	57	STR	
B502		7'-3" / 7'-6"	1 SER 6	STR	5/8"
B503		7'-9" / 10'-0"	1 SER 33	STR	13/16"
B504		7'-3" / 10'-0"	1 SER 18	STR	1 15/16"
C505		24'- 6"	24	STR	
C506		19'- 6"	1	STR	
C507		10'- 0"	1	STR	
C508		25'- 0"	1	STR	
WEST APPROACH SLAB I-290					
A1001	24'-6"	25'-11"	248	101	
A1004	17'-6" / 5'-6"	18'-11" / 6'-11"	1 SER 3	101	6'-0"
A1005	24'-7"	26'- 0"	1	101	
B501		30'- 0"	285	STR	
B509		5'-3" / 5'-6"	1 SER 6	STR	5/8"
B510		3'-3" / 5'-0"	1 SER 33	STR	5/8"
B511		3'-3" / 5'-6"	1 SER 18	STR	1 9/16"
C505		24'- 6"	97	STR	
C512		11'- 6"	1	STR	
C513		24'- 9"	1	STR	



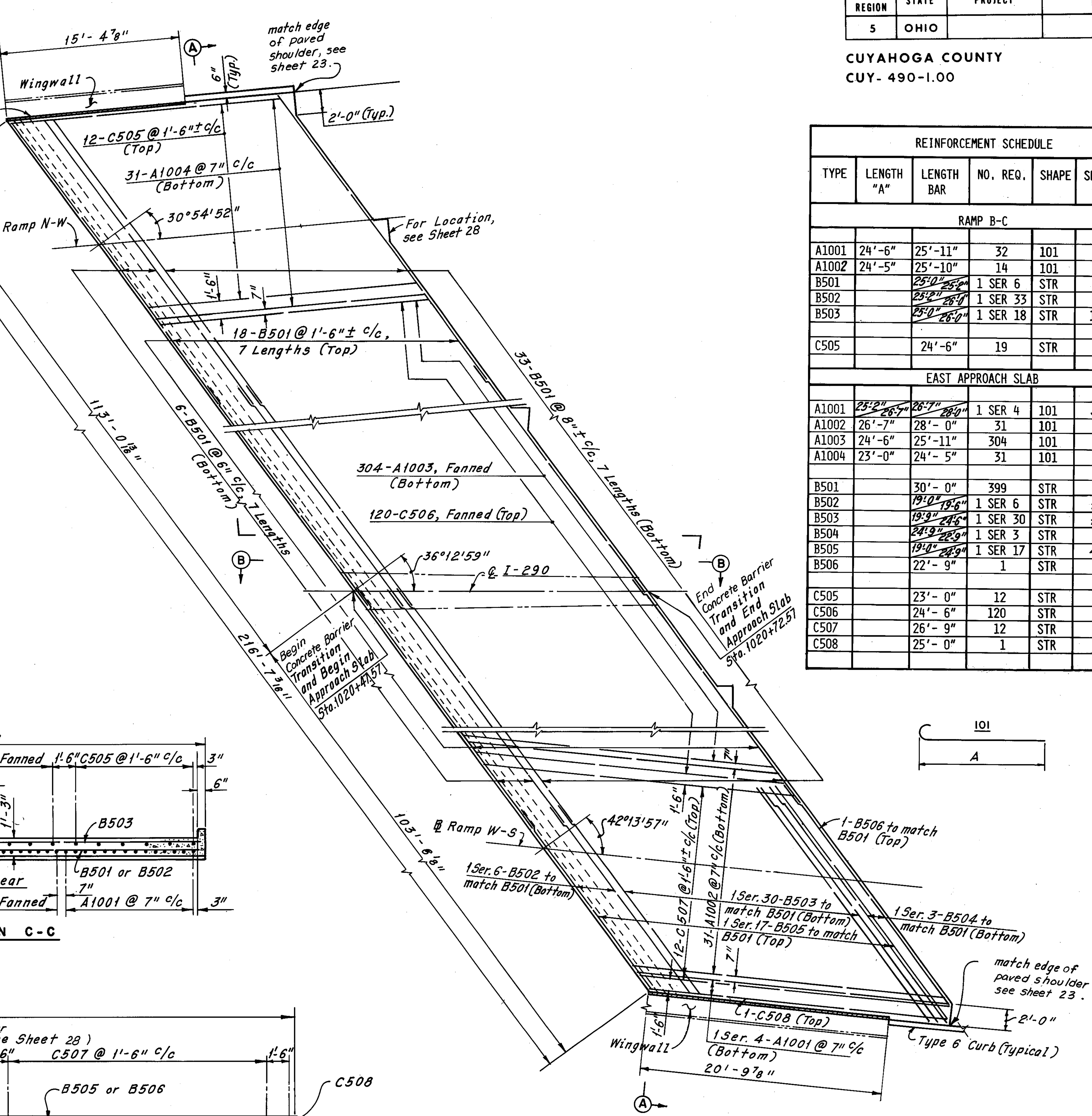
FHWA REGION	STATE	PROJECT		
5	OHIO			

31/193

CUYAHOGA COUNTY
CUY- 490-1.00

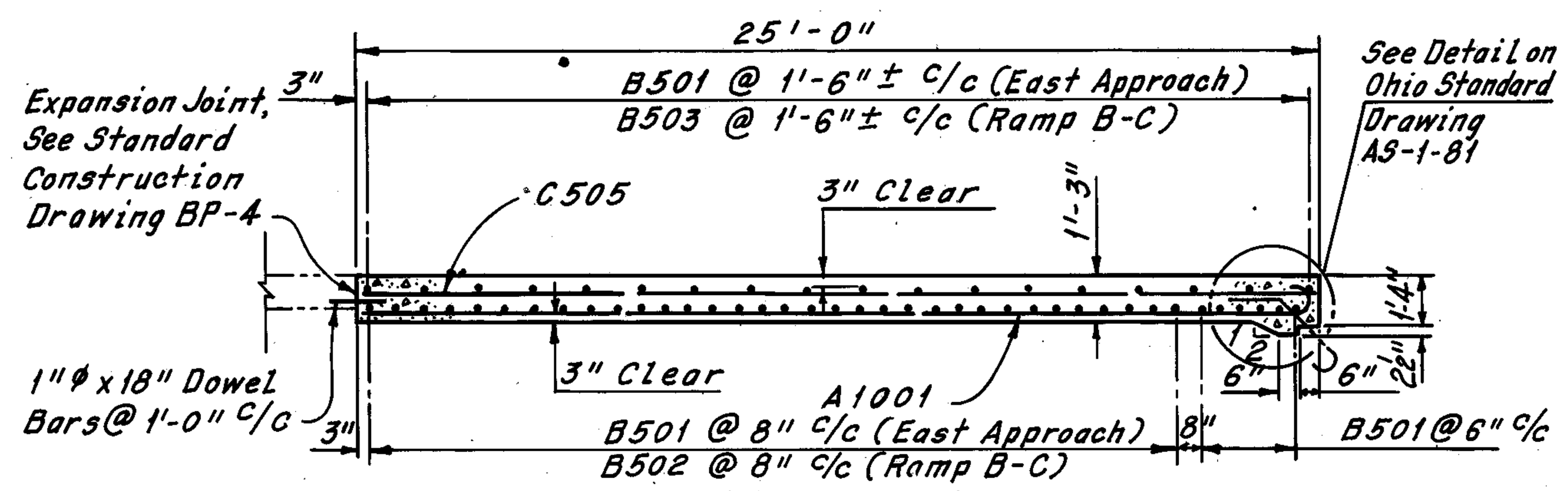


EAST APPROACH SLAB - RAMP B-C

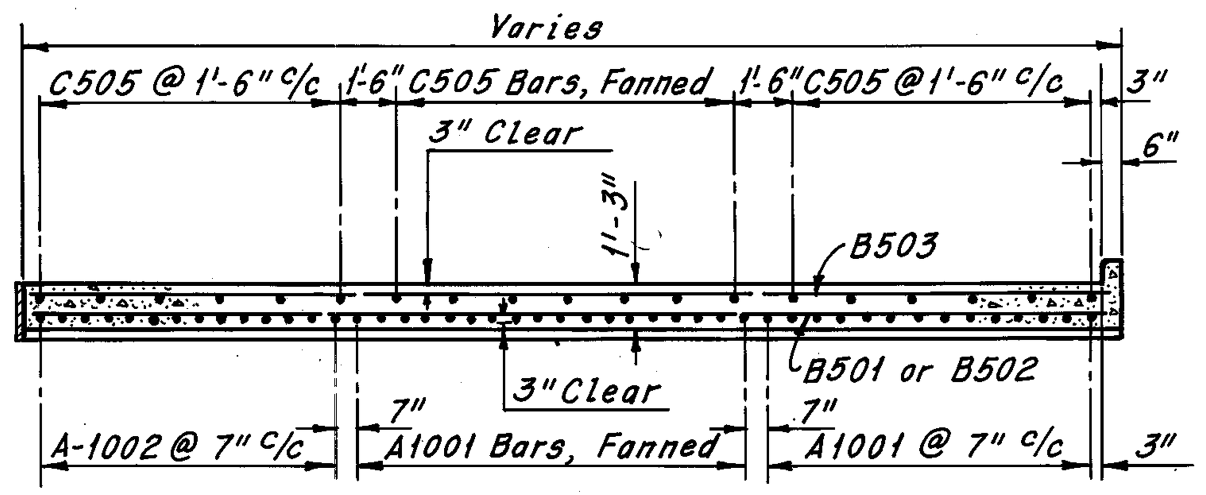


EAST APPROACH SLAB

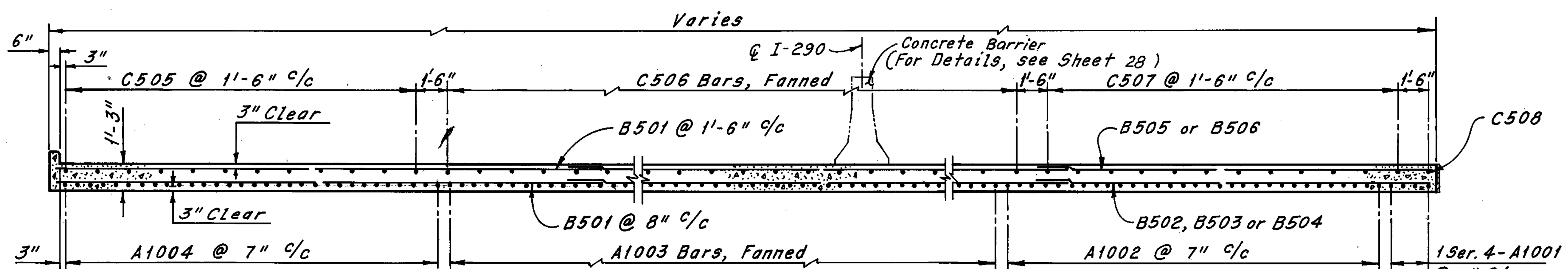
REINFORCEMENT SCHEDULE					
TYPE	LENGTH "A"	LENGTH BAR	NO. REQ.	SHAPE	SER. INCR.
RAMP B-C					
A1001	24'-6"	25'-11"	32	101	
A1002	24'-5"	25'-10"	14	101	
B501		25'-0" / 25'-2"	1 SER 6	STR	3/8"
B502		25'-2" / 26'-0"	1 SER 33	STR	5/16"
B503		25'-0" / 26'-0"	1 SER 18	STR	11/16"
C505		24'-6"	19	STR	
EAST APPROACH SLAB					
A1001	25'-2" / 26'-7"	26'-7" / 28'-0"	1 SER 4	101	5 11/16"
A1002	26'-7"	28'- 0"	31	101	
A1003	24'-6"	25'-11"	304	101	
A1004	23'-0"	24'- 5"	31	101	
B501		30'- 0"	399	STR	
B502		19'-0" / 19'-6"	1 SER 6	STR	1 3/16"
B503		19'-9" / 24'-6"	1 SER 30	STR	1 15/16"
B504		24'-9" / 22'-9"	1 SER 3	STR	1'-0"
B505		19'-0" / 24'-9"	1 SER 17	STR	4 5/16"
B506		22'- 9"	1	STR	
C505		23'- 0"	12	STR	
C506		24'- 6"	120	STR	
C507		26'- 9"	12	STR	
C508		25'- 0"	1	STR	



SECTION B-B



SECTION C-C



SECTION A-A

Note:
The approach slab for Ramp C-B is a standard approach slab. Use standard approach slab reinforcement as per Ohio Standard Drawing AS-1-81. The length is 25'-0".

SCALE None	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE C.P. DATE 8-13-85	CONSULTING ENGINEERS
TRCD. C.P. DATE 8-16-85	
CKD. D.L.R. DATE 8-21-85	KANSAS CITY CLEVELAND NEW YORK

EAST APPROACH SLAB DETAILS - BR. NO. CUY.-290-0110

QUANTITY CALCULATIONS

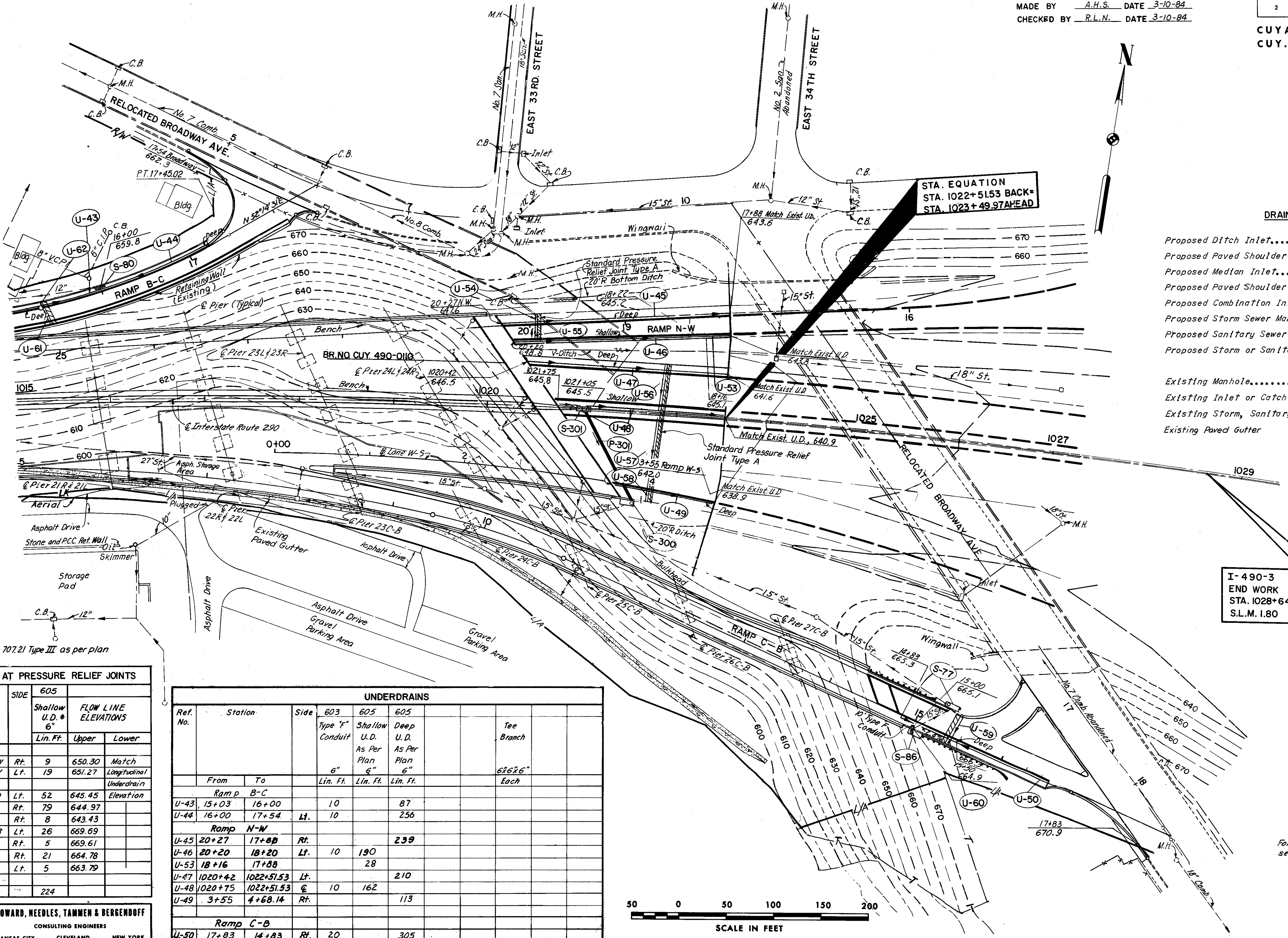
MADE BY A.H.S. DATE 3-10-84

CHECKED BY R.L.N. DATE 3-10-84

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY

CUY.-290-0.27



DRAINAGE LEGEND

- Proposed Ditch Inlet
- Proposed Paved Shoulder Inlet
- Proposed Median Inlet
- Proposed Paved Shoulder Inlet Manhole
- Proposed Combination Inlet
- Proposed Storm Sewer Manhole
- Proposed Sanitary Sewer Manhole
- Proposed Storm or Sanitary Sewer
- Existing Manhole
- Existing Inlet or Catch Basin
- Existing Storm, Sanitary or Combined Sewer
- Existing Paved Gutter

SUBSTRUCTURE IS NOT PART OF THIS CONTRACT.

For Drainage Quantities see Sheet 33.

* 707.01 Type III or 707.21 Type III as per plan

UNDERDRAINS AT PRESSURE RELIEF JOINTS

REF. NO.	STATION	SIDE	605 Shallow U.D.* 6"	FLOW LINE ELEVATIONS	
			Lin. Ft.	Upper	Lower
U-54	19+88 Ramp N-W	Rt.	9	650.30	Match
U-55	19+88 Ramp N-W	Lt.	19	651.27	Longitudinal
					Underdrain
U-56	1021+83 ℄ I-490	Lt.	52	645.45	Elevation
U-57	1021+83 ℄ I-490	Rt.	79	644.97	
U-58	4+00 Ramp W-S	Rt.	8	643.43	
U-59	15+37 Ramp C-B	Lt.	26	669.69	
U-60	15+37 Ramp C-B	Rt.	5	669.61	
U-61	15+40 Ramp B-C	Rt.	21	664.78	
U-62	15+40 Ramp B-C	Lt.	5	663.79	
	TOTAL		224		

SCALE 1" = 50'
MADE T.P.M. DATE 5-2-69
TRCD. M.A.G. DATE 6-17-70
CKD. ____ DATE ____

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

UNDERDRAINS

Ref. No.	Station		Side	603 Type "F" Conduit 6"	605 Shallow U.D. As Per Plan 6"	605 Deep U.D. As Per Plan 6"			Tee Branch 6"x6"x6"		
	From	To		Lin. Ft.	Lin. Ft.	Lin. Ft.			Each		
	Ramp B-C										
U-43	15+03	16+00		10		87					
U-44	16+00	17+54	Lt.	10		256					
	Ramp N-W										
U-45	20+27	17+88	Rt.			239					
U-46	20+20	18+20	Lt.	10	190						
U-53	18+16	17+88			28						
U-47	1020+42	1022+51.53	Lt.			210					
U-48	1020+75	1022+51.53	℄	10	162						
U-49	3+55	4+68.14	Rt.			113					
	Ramp C-B										
U-50	17+83	14+83	Rt.	20		305					
		TOTALS		60	380	1210					

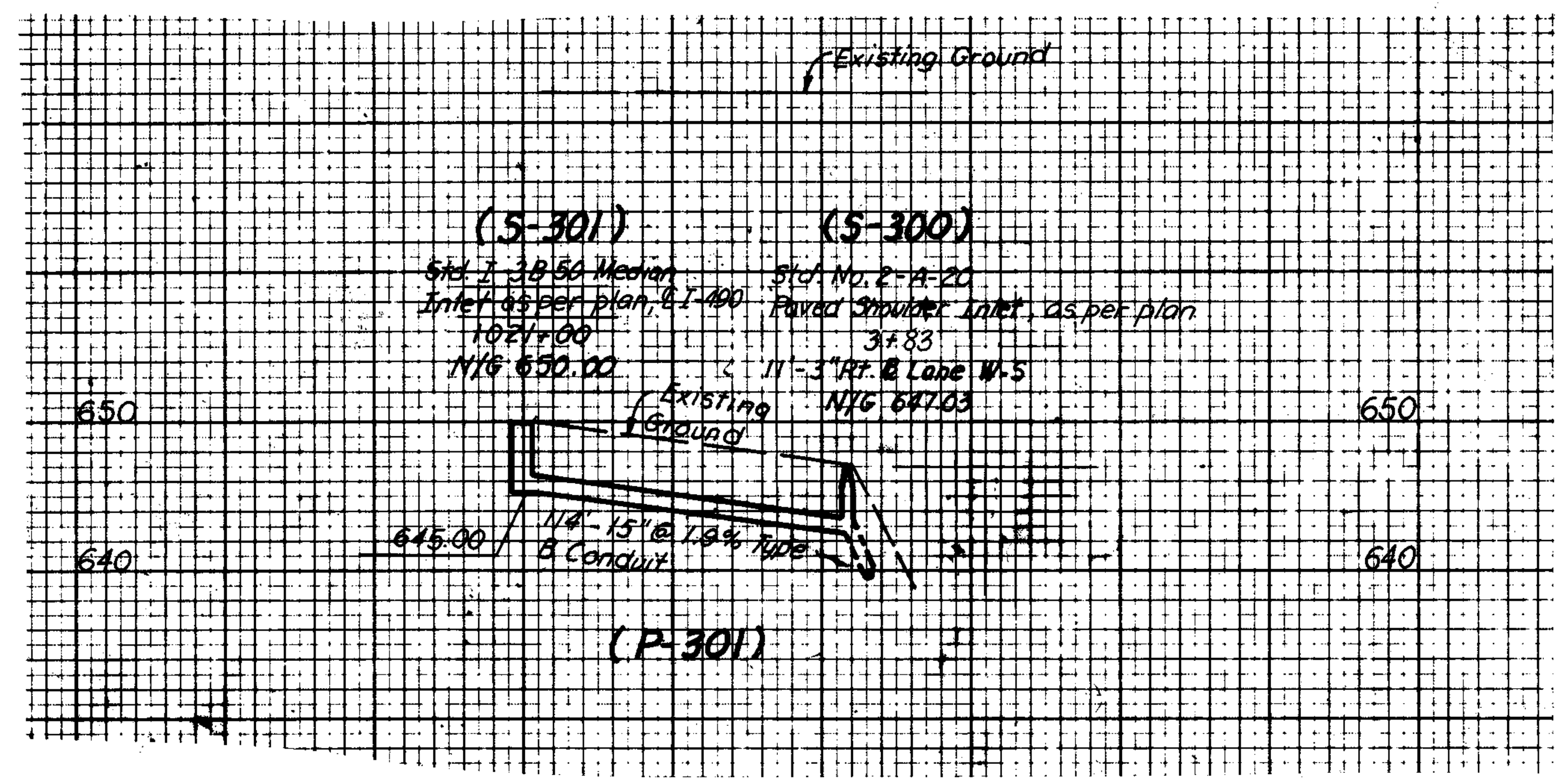
50 0 50 100 150 200

SCALE IN FEET

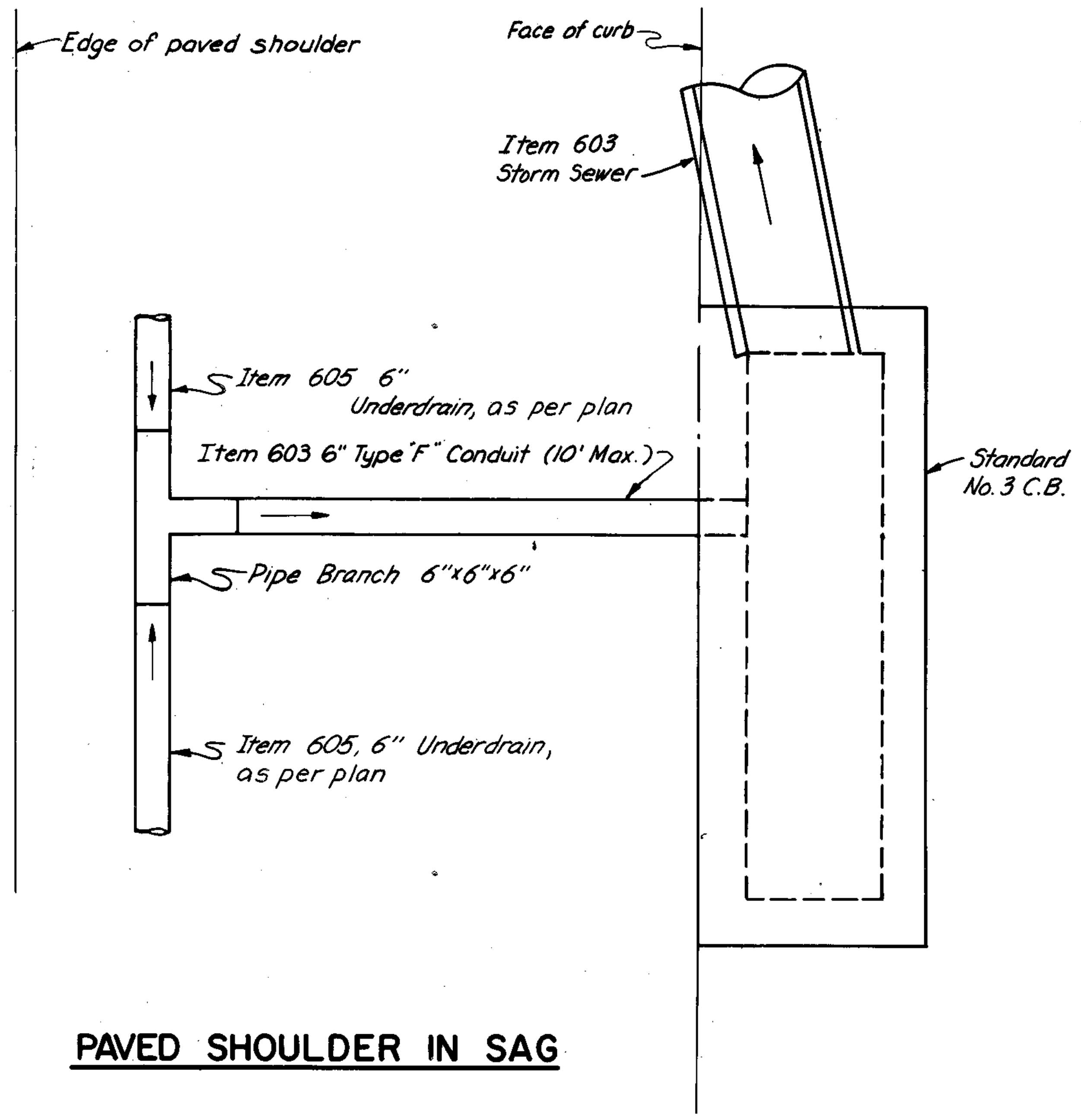
DRAINAGE AND GRADING STA. 1015+00 TO STA. 1028+64.82

DRAINAGE

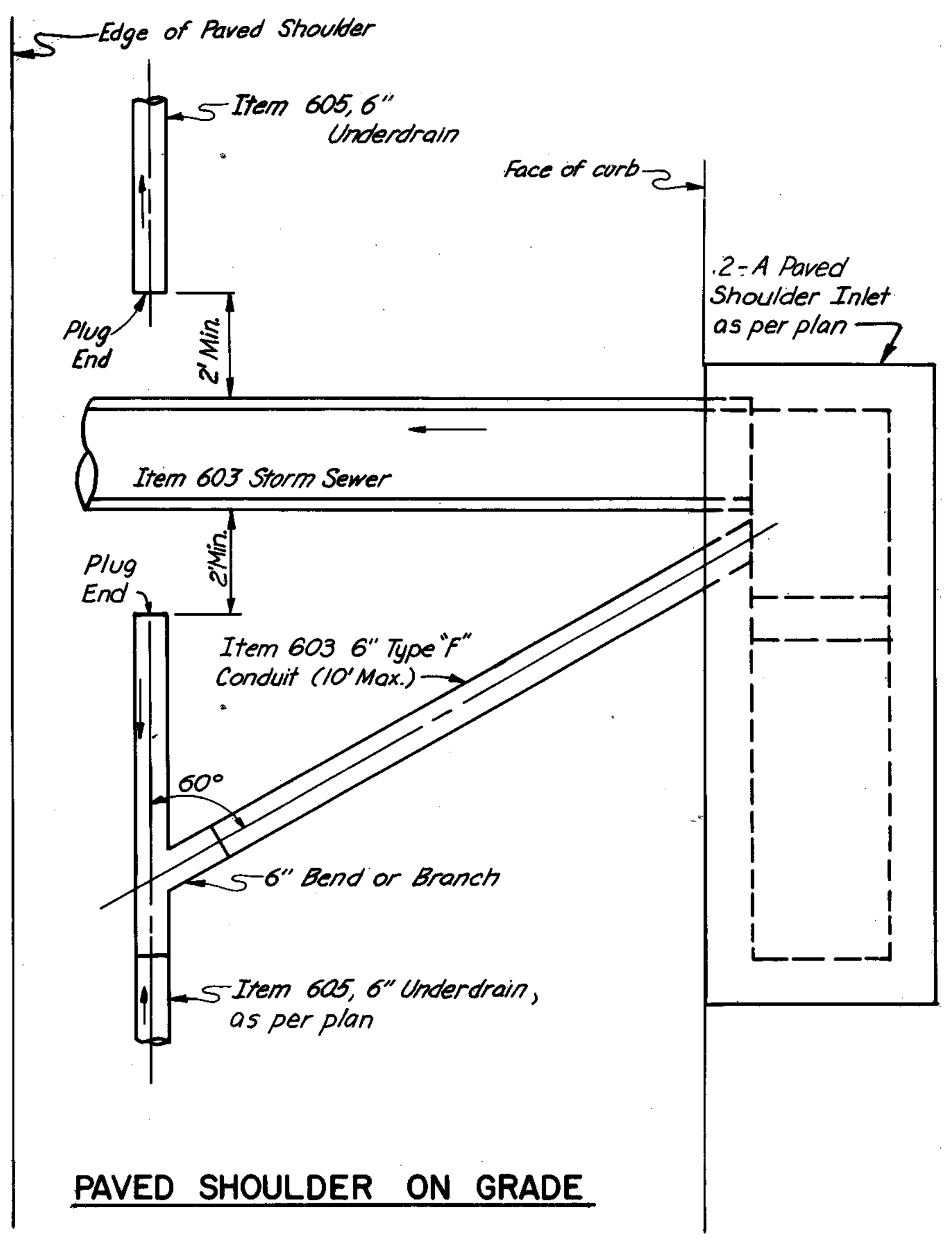
Ref. No.	Station		Side	Sewer Profile Sheet No.	603							604							
							Type B Conduit 15"					Std. No. 3 C.B. mod. as per plan	Std. No. 2-A-6 Paved Shoulder Inlet mod. as per plan	Std. No. 2-A-12 Paved Shoulder Inlet Mod. as per plan			Std. No. 2-A-20 Paved Shoulder Inlet, As Per Plan	Std. No. I3-B50 Median Inlet, As Per Plan	
	From	To			Lin. Ft.				–			Each							
P-301	1021+00 I-290	3+75 Ramp W-S	Rt.	33			114												
S-77	15+25 Ramp C-B		Lt.	–									1						
S-86	15+00± Ramp C-B		Rt.	–										1					
S-80	16+00 Ramp B-C		Lt.	–								1							
S-300	3+83 Ramp W-S		℄	33													1		
S-301	1021+00 I-290		℄	33														1	
		TOTAL					114					1	1	1			1	1	



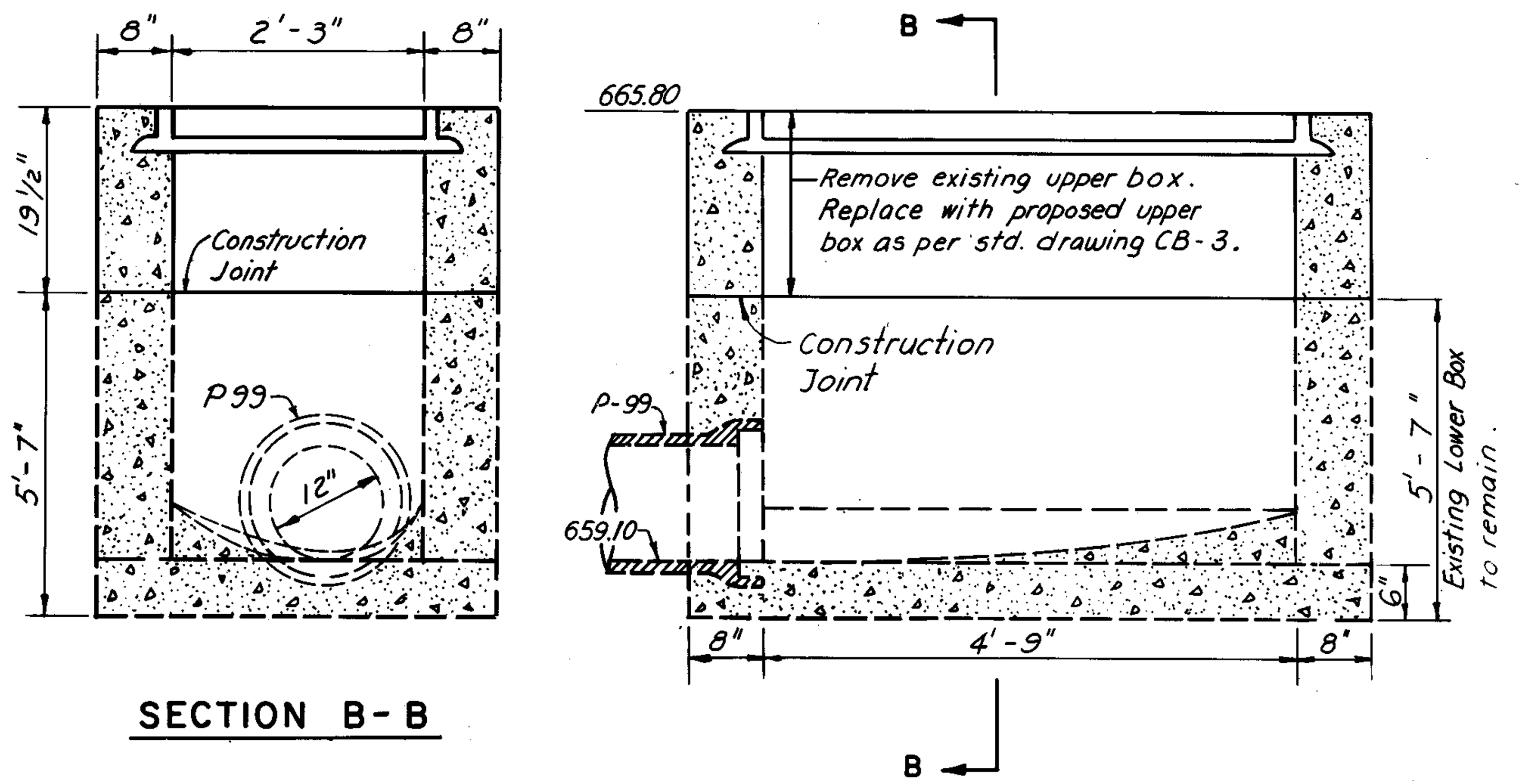
CUYAHOGA COUNTY
CUY- 490-1.00



PAVED SHOULDER IN SAG



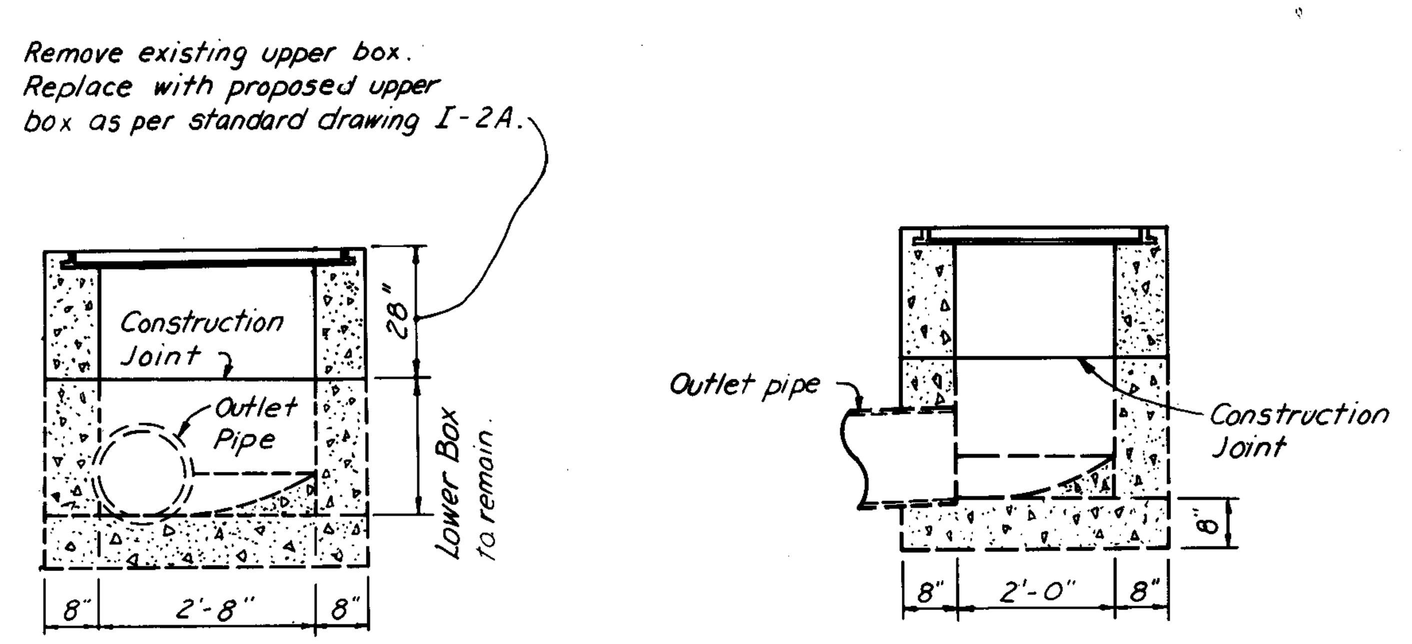
PAVED SHOULDER ON GRADE



SECTION B-B

S-80
STANDARD NO.3 CATCH BASIN MODIFIED AS PER PLAN

2-A-6 AT S-77
2-A-12 AT S-86



SECTION A-A

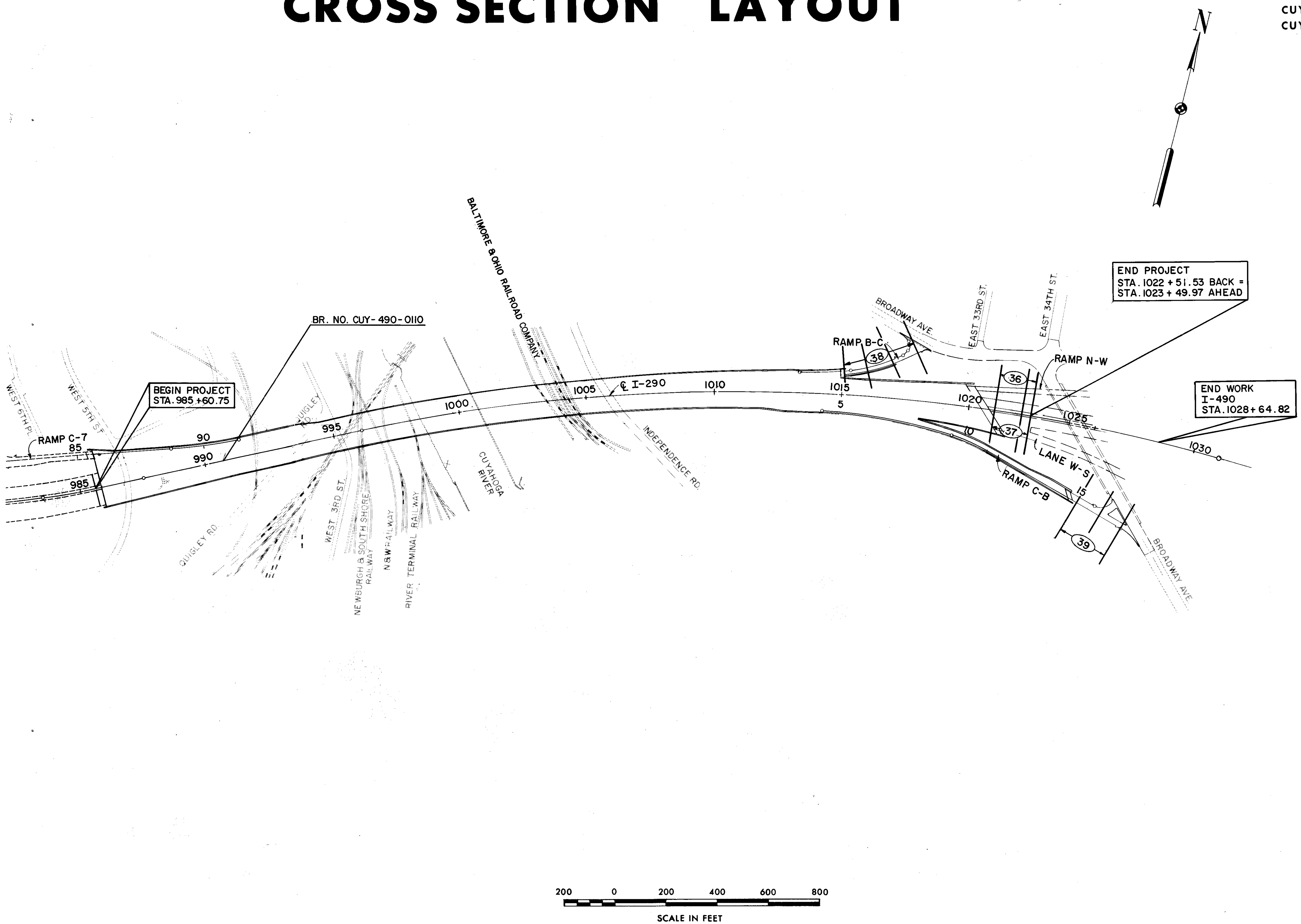
SECTION B-B

S-77 AND S-86
STANDARD I-2A INLET MOD. AS PER PLAN

SCALE	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE A.H.S. DATE 7-19-85	CONSULTING ENGINEERS
TRCD. T.D. DATE 7-19-85	KANSAS CITY CLEVELAND NEW YORK
CKD. R.L.N. DATE 7-19-85	

CROSS SECTION LAYOUT

CUYAHOGA COUNTY
CUY- 490-1.00

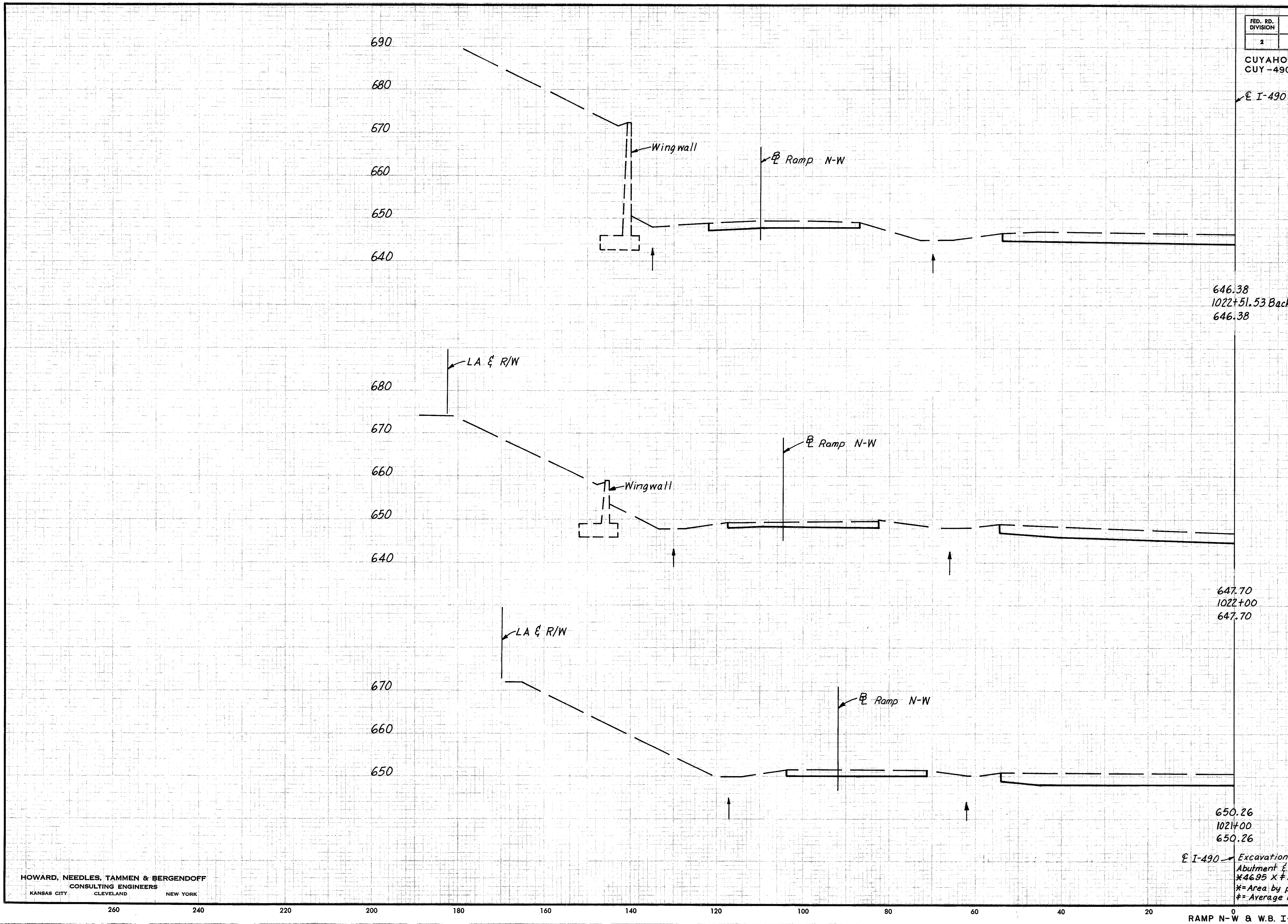


SCALE 1" = 200' HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE A.H.S. DATE 7-21-85 CONSULTING ENGINEERS
TRCD. T.D. DATE 7-21-85 KANSAS CITY CLEVELAND NEW YORK
CKD. R.L.N. DATE 7-21-85

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

36/193

CUYAHOGA COUNTY
CUY-490-1.00



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
170	0		
		324	0
170	0		
		630	0
170	0		
		405	0

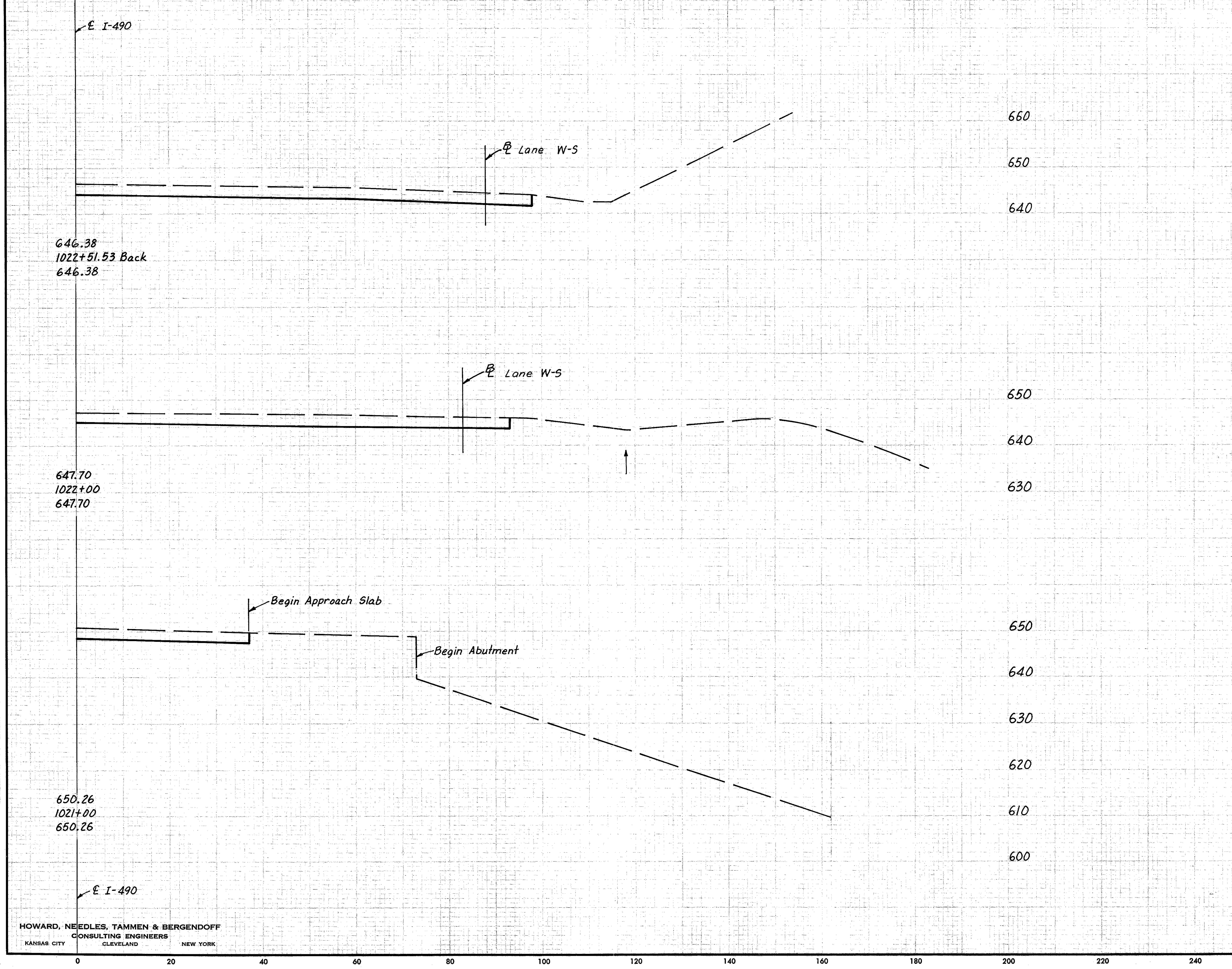
Excavation between Abutment ℄ Sta. 1021+00:
*4695 × ‡2.33 ÷ 27 = 405
*= Area by planimeter
‡= Average Depth

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

RAMP N-W & W.B. I-490 STA. 1021+00 TO STA. 1022+51.53 LEFT HALF

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY-490-1.00



EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
229	0		
		426	0
217	0		
		561	0
86	0		
		163	0

Excavation between
Abutment & Sta. 1021+00:
* 1890 x † 2.33 ÷ 27 = 163
* = Area by planimeter
† = Average Depth

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

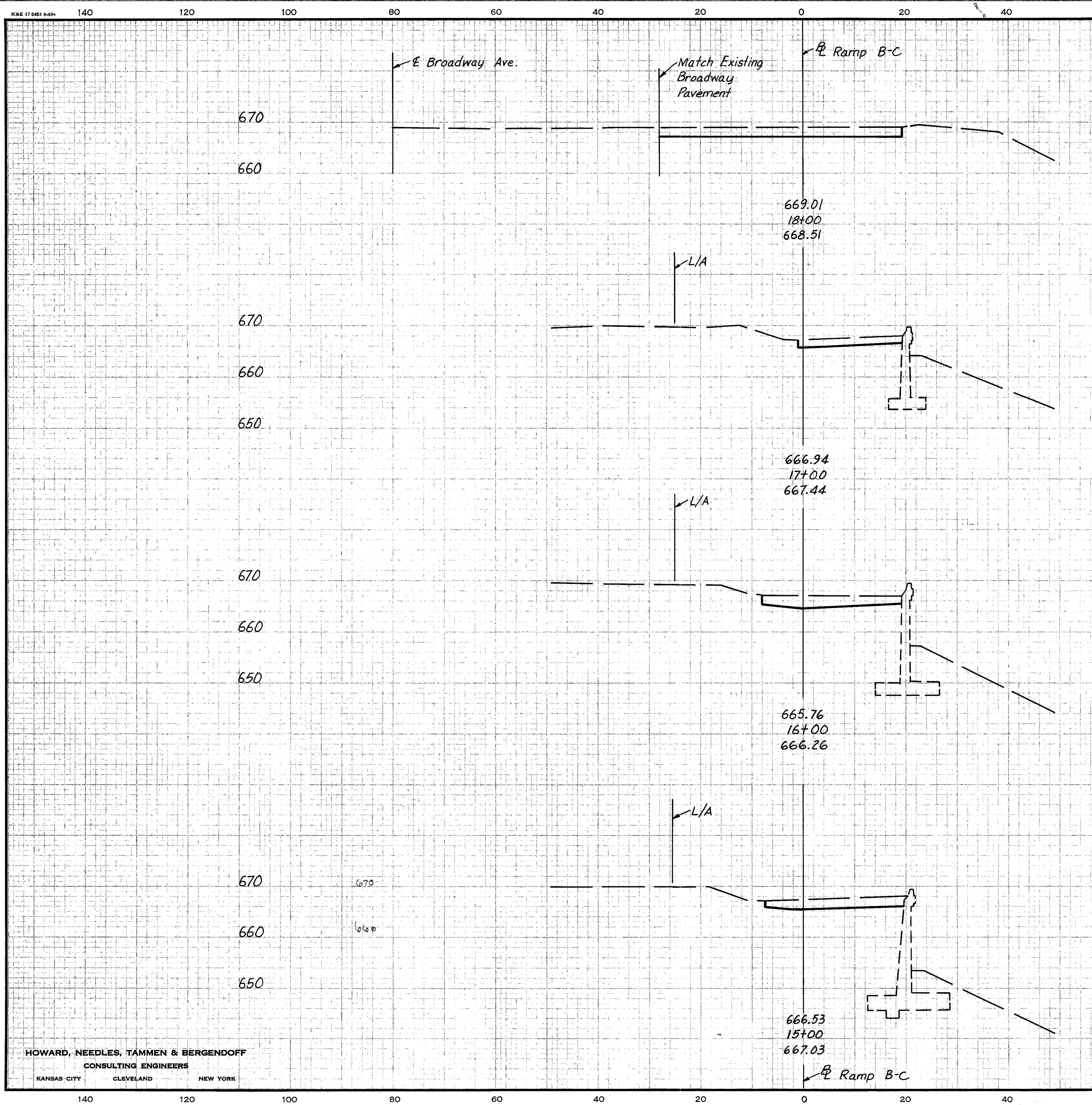
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

38 / 193

CUYAHOGA COUNTY
CUY-490-1.00

Excavation between
Sta. 18+00 & Broadway
Vol. = ✱ 972 × 1.75 ÷ 27 =
✱ = Area by planimeter

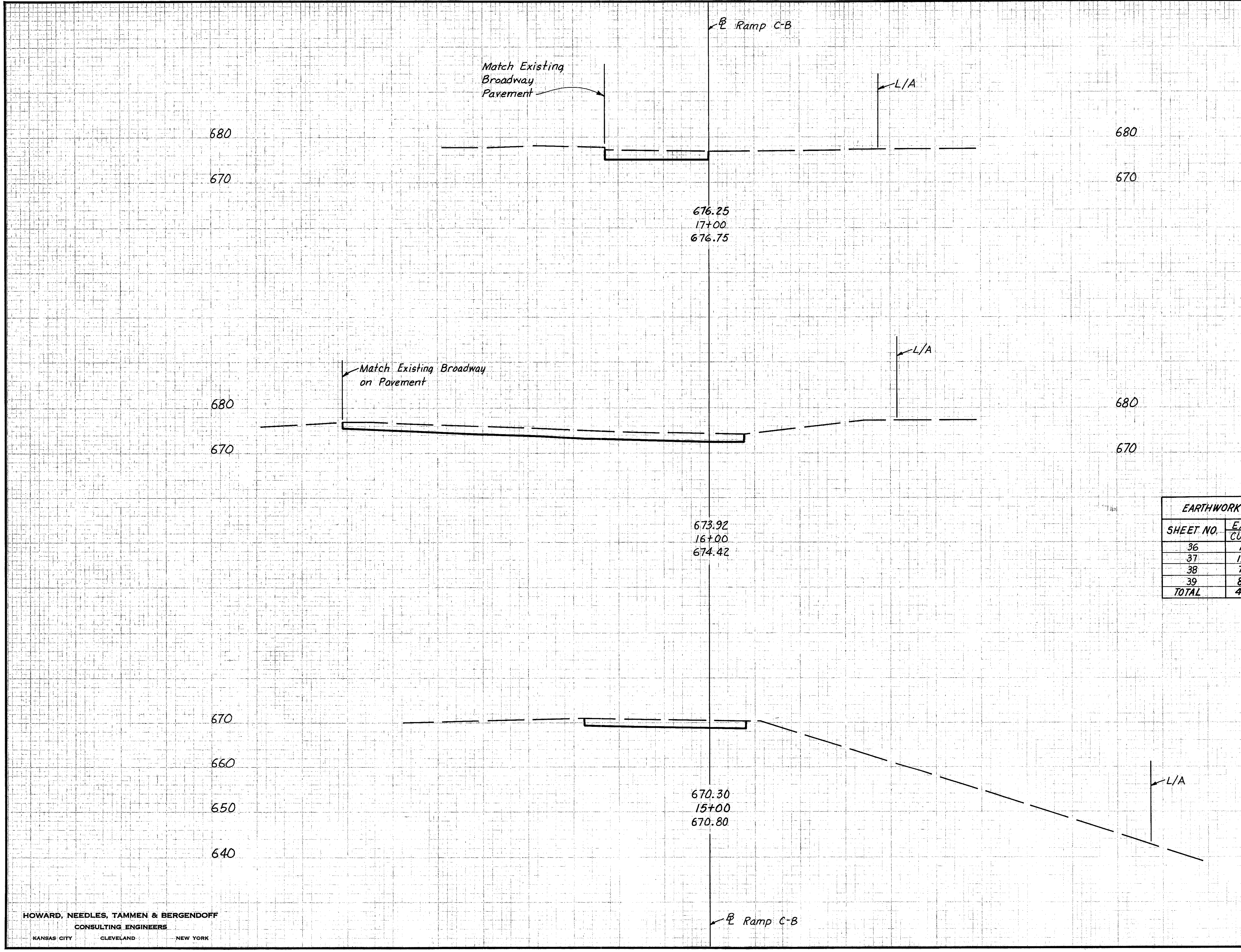
EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		63	0
112	0		
		296	0
48	0		
		178	0
48	0		
		178	0
48	0		



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

RAMP B-C STA. 15+00 TO STA. 18+00

CUYAHOGA COUNTY
CUY-490-1.00



Excavation between Sta. 17+00 and Broadway
Vol. = * 650 x 1.75 ÷ 27 =
* Area by planimeter

EARTHWORK	
SHEET NO.	EXC. CU. YD.
36	1,359
37	1,150
38	715
39	894
TOTAL	4,118

Excavation between Abutment & Sta. 15+00
Vol. = * 1980 x 1.25 ÷ 27 =
* Area by planimeter

EARTHWORK			
END AREA		VOLUME	
EXC.	EMB.	EXC.	EMB.
		42	0
35	0		
		354	0
156	0		
		406	0
63	0		
		92	0

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

RAMP C-B STA. 15+00 TO STA. 17+00

TRAFFIC CONTROL SUMMARY

QUANTITY CALCULATIONS
MADE BY R.L.N. DATE 7/19/85
CHECKED BY A.H.S. DATE 7/22/85

FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY
CUY-490-1.00

SHEET NUMBER 43	44	45	49	TOTAL QUANT.	UNIT	ITEM	DESCRIPTION
							SIGNS
292	205		8	505	Sq. Ft.	630	Signs, Flat Sheet, Type G Sheeting
64	30	3671		3765	Sq. Ft.	630	Signs, Extrusheet, Type G Sheeting
		40		40	Sq. Ft.	630	Signs, Overlay, Type G Sheeting
99	11			110	Lin. Ft.	630	Ground Mounted Supports, No. 2 Post
55				55	Lin. Ft.	630	Ground Mounted Supports, No. 3 Post
169	62			231	Lin. Ft.	630	Ground Mounted Supports, No. 4 Post
92	99			191	Lin. Ft.	630	Ground Mounted Supports, S4 x 7.7 Beam
29	27			56	Lin. Ft.	630	One Way Supports, No. 4 Post
	3			3	Each	630	Sign Support Assembly, Bridge Mounted, Type 2, As Per Plan
2	6			8	Each	630	Sign Support Assembly, Pole Mounted
	3			3	Each	630	Sign Support Assembly, Pole Mounted, As Per Plan
		1		1	Each	630	Sign Attachment Assembly
6	6			12	Each	630	Breakway Beam Connection
1.6	1.6			3.2	Cu. Yd.	630	Concrete For Embedded Foundation
		26.7		26.7	Cu. Yd.	630	Concrete For Anchor Base Foundation
		2		2	Each	630	Existing Signs Revised with Demountable Copy
		1		1	Each	630	Overhead Sign Support, Type TC-7.65, Design 8, Span 88.0 Feet
		2		2	Each	630	Overhead Sign Support, Type TC-7.65, Design 8, Span 71.0 Feet
		1		1	Each	630	Overhead Sign Support, Type TC-7.65, Design 8, Span 70.0 Feet
		1		1	Each	630	Overhead Sign Support, Type TC-7.65, Design 8, Modified, Span 85.0 Feet
		1		1	Each	630	Overhead Sign Support, Type TC-7.65, Design 8, Modified, Span 70.0 Feet
		1		1	Each	630	Overhead Sign Support, Type TC-7.65, Design 8, Span 96.0 Feet
		1		1	Each	630	Overhead Sign Support, Type TC-16.20, Design 4, Arm 37.5 Feet
		2		2	Each	630	Overhead Sign Support, Type TC-12.30, Design 6, Modified, Arm 26.0 Feet
		1		1	Each	630	Overhead Sign Support, Type TC-12.30, Design 6, Arm 24.0 Feet
		1		1	Each	630	Overhead Sign Support, Type TC-9.10, Design 1, Modified
		1		1	Each	630	Combination Overhead Sign Support, Type TC-12.30, Design 4, Arm 19.0 Feet
		1		1	Each	630	Overpass Structure Mounted Sign Support, Type TC-18.24
		1		1	Each	630	Overhead Sign Support, Type TC-12.30, Design 6, Arm 26.0 Feet
2				2	Each	630	Removal Of Ground Mounted Sign and Storage
2				2	Each	630	Removal of Ground Mounted Post Support
		3		3	Each	630	Removal of Overlay Sign
							ELECTRICAL
		13		13	Each	631	Sign Service
		26		26	Each	631	Signs Wired
		1		1	Each	631	Signs Wired, Overpass Structure Mounted
		13		13	Each	631	Disconnect Switch with Enclosure, Type X
		43		43	Each	631	Ballast, Type CMRI-175 (480)
		6		6	Each	631	Ballast, Type CMRI-250 (480)
		43		43	Each	631	Mercury Vapor Luminaire, Type TC-31.21 with 175 Watt Lamp
		6		6	Each	631	Mercury Vapor Luminaire, Type TC-31.21 with 250 Watt Lamp
		9		9	Each	631	Ballast Wiring Enclosure, Type A
		6		6	Each	631	Ballast Wiring Enclosure, Type B, As Per Plan
		5		5	Each	631	Ballast Wiring Enclosure, Mounting Bracket
		1		1	Each	631	Switch Enclosure Mounting Bracket Assembly
		7		7	Each	625	Ground Rod

MADE R.L.N. DATE 7-10-85
TRACED T.D. DATE 7-19-85
CHECKED A.H.S. DATE 7-22-85
SCALE

Howard, Needles, Tammen & Bergendoff
CONSULTING ENGINEERS
CLEVELAND, OHIO

HNTB

TRAFFIC CONTROL SUMMARY

QUANTITY CALCULATIONS
MADE BY R.L.N. DATE 7/9/85
CHECKED BY A.H.S. DATE 7/22/85

FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY
CUY-490-1.00

Sheet Number 42	45	46	47	49	TOTAL QUANT.	UNIT	ITEM	DESCRIPTION
								PAVEMENT MARKING
		162			162	Lin. Ft.	621	Stop Lines
		534			534	Lin. Ft.	621	Crosswalk Lines
		2083			2083	Lin. Ft.	621	Transverse Lines
		6087			6087	Lin. Ft.	621	Channelizing Lines
		1242			1242	Lin. Ft.	621	Curb Marking
			9508		9508	Lin. Ft.	621	4" Transverse Lines, As Per Plan
		7.1			7.1	Miles	621	Lane Lines
			7.0		7.0	Miles	621	Edge Line
			0.2		0.2	Miles	621	Centerlines
			2355		2355	Sq. Ft.	621	Island Marking
		10			10	Each	621	Lane Arrows
		4			4	Each	621	Word "Only" on Pavement, 72-IN.
110					110	Lin. Ft.	621	Removal of Pavement Markings
			43		43	Each	620	Delineator, Type C, Flexible Post Mounted
			25		25	Each	620	Delineator, Type C, Bracket Mounted
			33		33	Each	620	Delineator, Type D, Flexible Post Mounted
			8		8	Each	620	Delineator, Type D, Bracket Mounted
								TRAFFIC CONTROL
				240	240	Lin. Ft.	625	Trench
				200	200	Lin. Ft.	625	Conduit 3", 713.07
				40	40	Lin. Ft.	625	Conduit 2", 713.04
				2	2	Each	630	Sign Hanger Assembly Span Wire
				1	1	Each	632	Power Service
				60	60	Lin. Ft.	632	Power Cable, 3/C # 6 AWG.
				980	980	Lin. Ft.	632	Signal Cable 5/C # 12 AWG
				110	110	Lin. Ft.	632	Messenger Wire, 7 Strand 3/8" Dia. with Accessories
				1	1	Each	632	Strain Pole, Type TC-81.10, Design No. 7
				1	1	Each	632	Signal Support, Type TC-81.20, Design No. 2
				9.0	9.0	Cu. Yd.	632	Concrete for Anchor Base Foundations
				2	2	Each	632	Vehicular Signal Head, 3 Section 12 inch lens, 2-Way
				2	2	Each	632	Vehicular Signal Head, 3 Section 12 inch lens, 1-Way
				2	2	Each	632	Vehicular Signal Head, 3 Section 12 inch lens, 1-Way, As Per Plan
				1	1	Each	861	Controller, Pretimed 3 Dial Electromechanical, Master/Secondary with Cabinet

MADE R.L.N. DATE 7-19-85
TRACED T.D. DATE 7-19-85
CHECKED A.H.S. DATE 7-22-85
SCALE

Howard, Needles, Tammen & Bergendoff
CONSULTING ENGINEERS
CLEVELAND, OHIO

HNTB

TRAFFIC CONTROL STANDARD CONSTRUCTION DRAWINGS

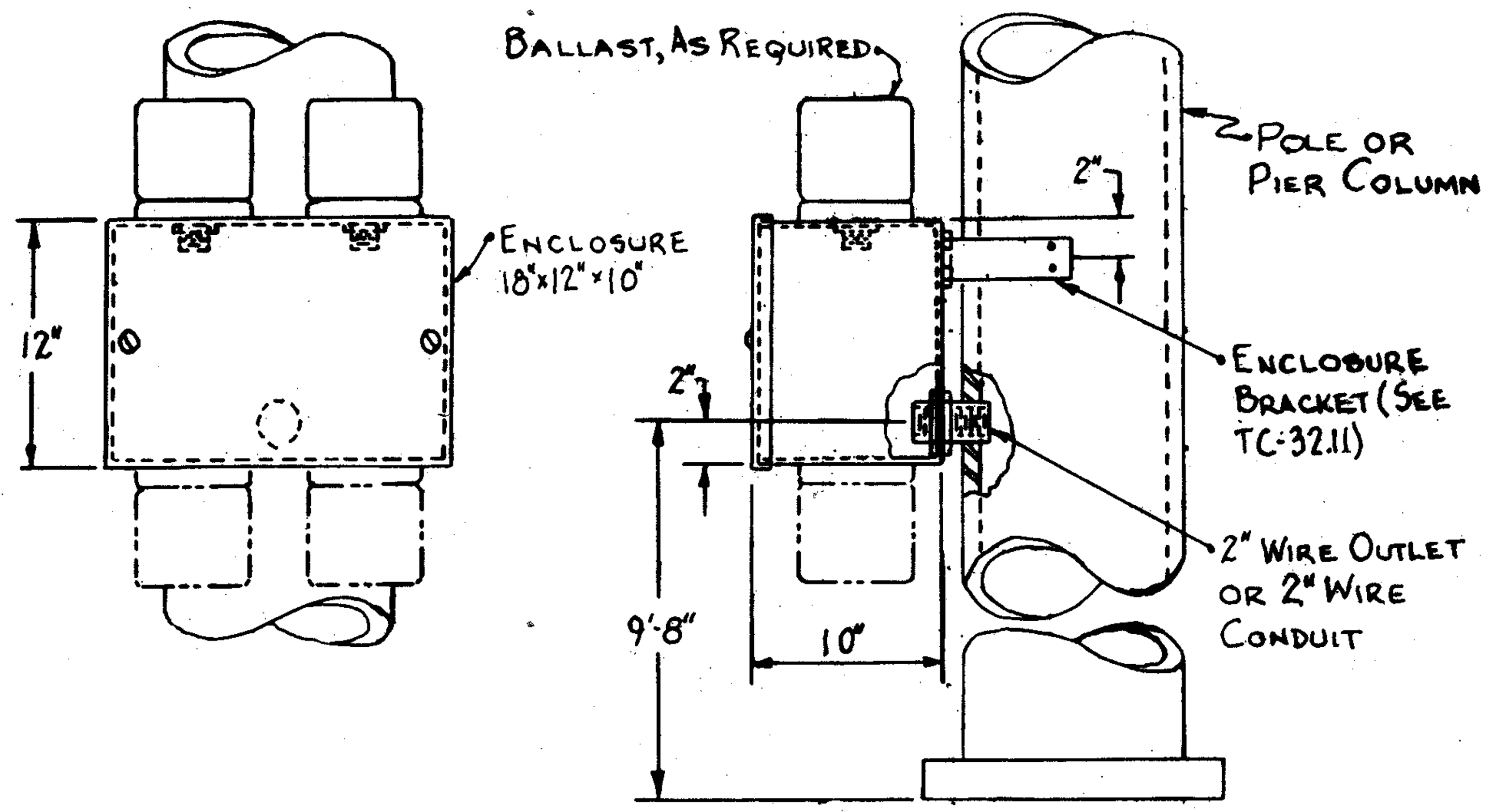
REFERENCES TO SUPPLEMENTAL SPECIFICATIONS 857, 858, 859, 957, 958 AND 959 ON THE TRAFFIC CONTROL STANDARD CONSTRUCTION DRAWINGS IN THESE PLANS SHALL BE CONSIDERED TO READ AS RESPECTIVE REFERENCES TO ITEMS 630, 631, 632, 730, 731 AND 732.

621 REMOVAL OF PAVEMENT MARKING

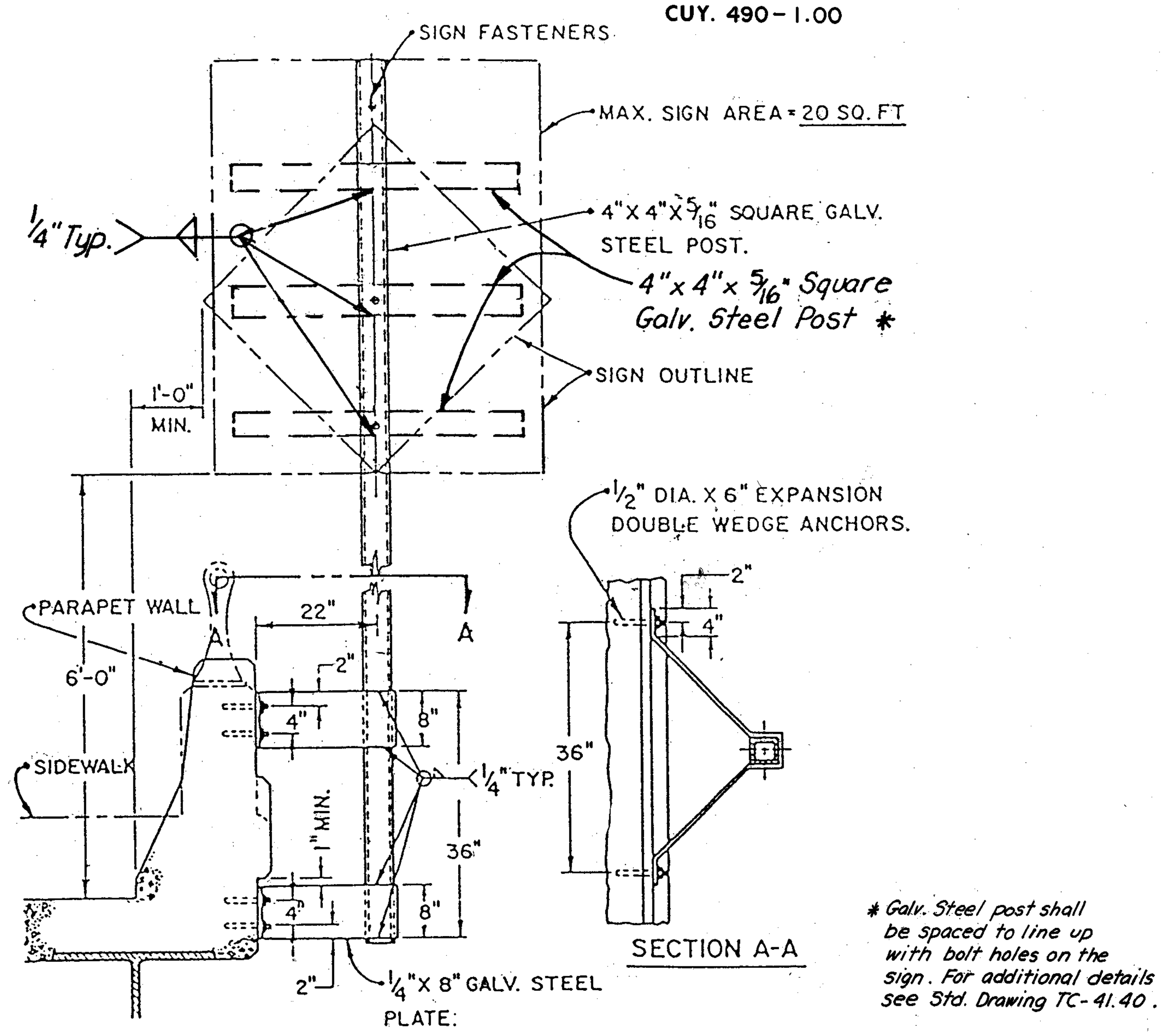
THIS ITEM SHALL CONSIST OF THE REMOVAL OF PAVEMENT MARKINGS AS DIRECTED BY THE ENGINEER, AT THE DISCRETION OF THE ENGINEER. THIS ITEM OF WORK MAY BE NONPERFORMED.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER.

ITEM 621 110 L.F. REMOVAL OF *CENTER LINES*

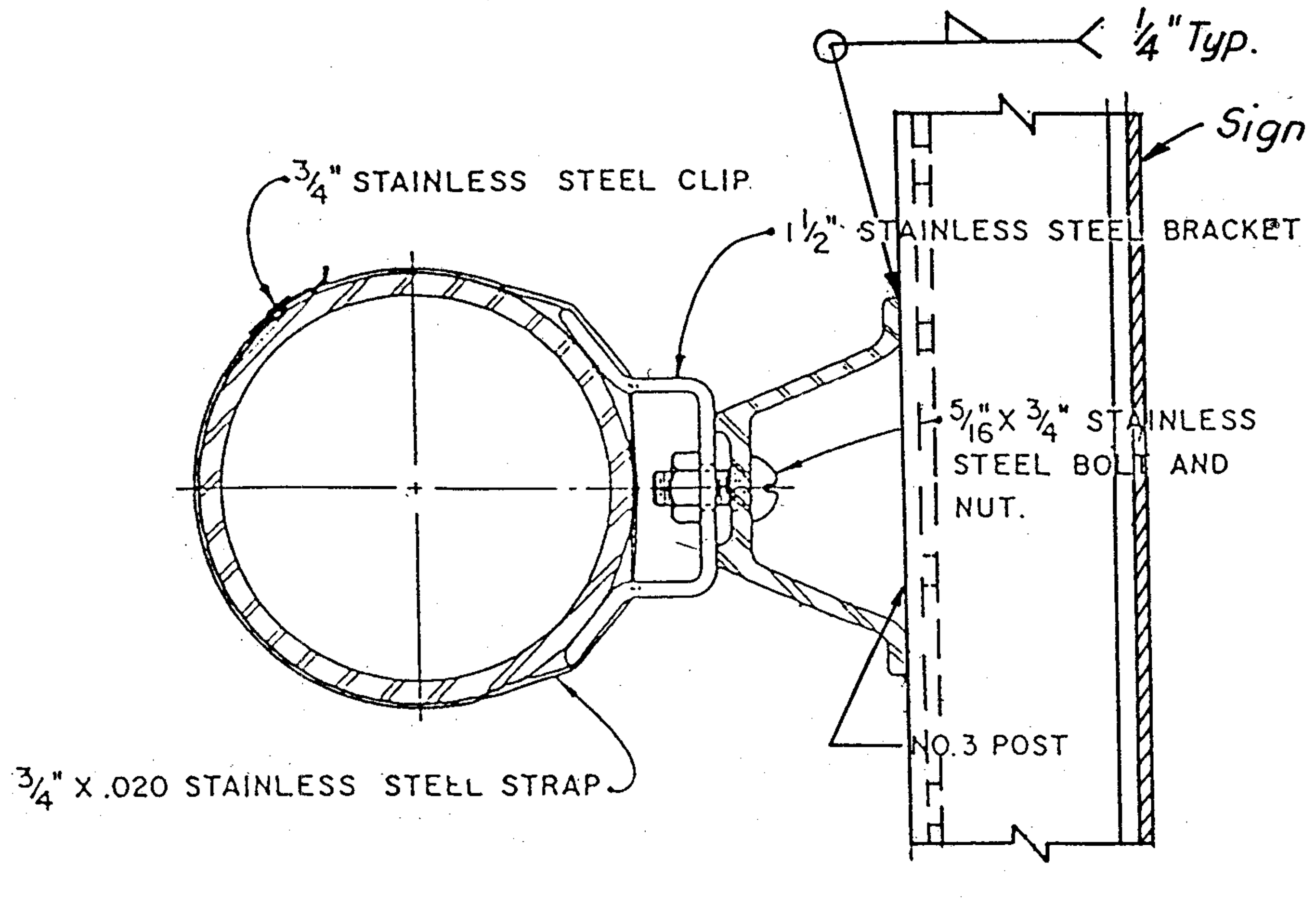


BALLAST WIRING ENCLOSURE
TYPE B AS PER PLAN



* Galv. Steel post shall be spaced to line up with bolt holes on the sign. For additional details see Std. Drawing TC-41.40.

SIGN SUPPORT ASSEMBLY,
BRIDGE MOUNTED, TYPE 2.
AS PER PLAN



SIGN SUPPORT ASSEMBLY, POLE MOUNTED
AS PER PLAN

Note :
For details not shown see standard drawing TC-41.40

SCALE	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE C.D. DATE 7-20-84	CONSULTING ENGINEERS
TRCD. T.D. DATE 7-20-84	
CKD. R.L.N. DATE 7-21-84	KANSAS CITY CLEVELAND NEW YORK

TRAFFIC CONTROL QUANTITIES

GROUND MOUNTED SIGNS

SHEET NO.	STATION	SIDE	CODE	SIZE	SIGNS: FLAT SHEET TYPE G SHEETING SQ. FT.	SIGNS: EXTRU SHEET TYPE G SQ. FT.	GROUND MOUNTED SIGN SUPPORTS: NO. 2 POST LIN. FT.	NO. 3 POST LIN. FT.	NO. 4 POST LIN. FT.	S4 X 7.7 BEAM LIN. FT.			ONE WAY SUPPORTS (NO. 4 POST) LIN. FT.	SIGN SUPPORT ASSEMBLY POLE MOUNTED EACH	CONCRETE FOR EMBEDDED FOUNDATION CU. YD.	BREAKAWAY BEAM CONNECTION EACH		REMOVAL OF GRD. MTD. SIGN AND STORAGE EACH			REMOVAL OF GRD. MTD. POST SUPPORT EACH	
51	980+00, I-490	Lt.	R-7B-48	4'x 8'	32					36					0.54	2						
↓	980+00, I-490	Rt.	W-49R-48	4'x 4'	16				31													
	68+00, Ramp 7-C	Rt.	R-15B-30	2.5'x 1.5'	3.8									2								
	69+00, Ramp 7-C	Rt.	W-SPEC-36	3'x 3'																		
			W-143-24	2'x 2'	13				14													
	69+00, Ramp 7-C	Lt.	W-SPEC-36	3'x 3'																		
			W-143-24	2'x 2'	13				14													
	71+30, Ramp 7-C	Lt.	W-32-96	8'x 4'		32				28					0.54	2						
	77+00, Ramp 7-C	Lt.	W-32-96	8'x 4'		32				28					0.54	2						
	68+50, Ramp 7-7C	Rt.	R-15B-30	2.5'x 1.5'	3.8		11															
	74+00, Ramp 7-7C	Rt.	R-2-48	4 x 4 x 4	7		26															
	Quigley & W. 7th St.	East of	IM-8-24	2(2'x 1')																		
	Intersection	Quigley	IM-39-24	2(2'x 1')																		
	(Back to Back)		M-5-24-3	2(2.5'x 2.1')																		
			IM-24-21	2(1.75'x 1.25')	22.4			30														
	9+10, W. 7th St.	Rt.	IM-39-24	2'x 1'																		
			M-5-24-3	2.5'x 2'																		
			IM-21-21	1.75'x 1.25'	9.2				14													
	9+10 W. 7th. St.	Rt.	IM-8-24	2'x 1'																		
			M-5-24-2	2'x 2'																		
			IM-21-21	1.75'x 1.25'	8.2				14													
	9+30 W. 7th St.	Lt.	R-1	2.5'x 2.5'														1			1	
	11+00 W. 7th St.	Rt.	GH	7'x 5'	35																	
	12+10 W. 7th. St.	Lt.	R-1	2.5'x 2.5'														1			1	
	18+20 W. 7th St.	Lt.	IM-39-24	2'x 1'	9.2				14													
			M-5-24-3	2.5'x 2'																		
			IM-21-21	1.75'x 1.25'																		
	18+20 W. 7th St.	Lt.	IM-8-24	2'x 1'					14													
			M-5-24-2	2'x 2'																		
			IM-21-21	1.75'x 1.25'	8.2																	
	82+30 Ramp C-7	Lt.	R-1-48	4'x 4'																		
	(Back to Back)		R-41B-36	3'x 3'					14.5				14.5									
			R-43L-36	3'x 1'																		
			R-43R-36	3'x 1'	31																	
	82+30 Ramp C-7	Rt.	R-1-48	4'x 4'																		
	(Back to Back)		R-41B-36	3'x 3'					14.5				14.5									
			R-43L-36	3'x 1'																		
			R-43R-36	3'x 1'	31																	
	83+70 Ramp C-7	Lt.	D-4D	7'x 2'					25													
	(Back to Back)		R-41A-36	3'x 2'	20																	
	83+70 Ramp C-7	Rt.	R-41A-36	3'x 2'	6			11.5														
	W. 6th Pl @ Marquardt		W-48-30	2.5' x 2.5'	6.3			13														
↓	W. 6th Pl @ Dead End		X-4-18	1.5'x 1.5'	2.3		9.5															
51	83+25 Ramp C-7	Lt.	R-31F-36	3'x 2.5'	7.5		26															
		Rt.	R-31F-36	3'x 2.5'	7.5		26															
			TOTAL		292.4	64	98.5	54.5	169	92			29	2	1.62	6		2			2	

* For details see sheet 42.

TRAFFIC CONTROL QUANTITIES

CALCULATIONS
MADE BY A.H.S. DATE 7-20-84
CHECKED C.D. DATE 10-1-84

FHWA	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY
CUY - 490 - 1.00

GROUND MOUNTED SIGNS

SHEET NO.	STATION	SIDE	CODE	SIZE	SIGNS: FLAT SHEET TYPE G SHEETING	SIGNS: EXTRU SHEET TYPE G	GROUND MOUNTED SIGN SUPPORTS: NO. 2 POST		NO. 4 POST	S4 X 7.7 BEAM	SIGN SUPPORT ASSEMBLY POLE MOUNTED AS PER PLAN *	SIGN SUPPORT ASSEMBLY BRIDGE MOUNTED TYPE 2 AS PER PLAN *	ONE WAY SUPPORTS (NO. 4 POST)	SIGN SUPPORT ASSEMBLY POLE MOUNTED	CONCRETE FOR EMBEDDED FOUNDATION	BREAKAWAY BEAM CONNECTION	SIGN SUPPORT ASSEMBLY BRIDGE MOUNTED TYPE 2	REMOVAL OF GRD. MTD. SIGN AND STORAGE	REMOVAL OF GRD. MTD. MAJOR SIGN AND STORAGE	REMOVAL OF GRD. MTD. BEAM SUPPORT	REMOVAL OF GRD. MTD. POST SUPPORT	SIGN SUPPORT ASSEMBLY BRIDGE MOUNTED TYPE 1
					SQ. FT.	SQ. FT.	LIN. FT.		LIN. FT.	LIN. FT.	EACH	EACH	LIN. FT.	EACH	CU. YD.	EACH	EACH	EACH	EACH	EACH	EACH	EACH
52	985 + 75 I-490	Lt.	GF-72	6'x5'		30				32					0.54	2						
52	985 + 50 I-490	Rt.	R-7B-48	4'x8'	32					36					0.54	2						
53	1015 + 71 I-490	Lt.	W-49R-48	4'x4'	16							1										
	1020 + 50 I-490	Lt.	W-49R-48	4'x4'	16				31													
	13+00 Ramp B-C	Rt.	R-15B-30	2.5'x1.5'	3.8		11															
	9+10 Ramp C-B	Rt.	W-47-48	4'x4'	16						3											
	12+53 Ramp C-B	Lt.	R-31 F-36	3'x2.5'								1										
			R-41A-36	3'x2'	13.5																	
	12+53 Ramp C-B	Rt.	R-31 F-36	3'x2.5'								1										
			R-41A-36	3'x2'	13.5																	
	15+00 Ramp C-B	Rt.	M-2-36-2	3'x3'																		
			M-25-30	2.5'x2'																		
			D-4D	7'x2'	28					31					0.54	2						
	16+50 Rel. Broadway	Rt.	R-41B-36	3'x3'																		
			R-43R-36	3'x1'																		
			R-43L-36	3'x1'	15								13.5									
	18+10 Rel. Broadway	Rt.	R-41B-36	3'x3'																		
			R-43R-36	3'x1'																		
			R-43L-36	3'x1'	15								13.5									
	10+30 Rel. Broadway	Lt.	IM-8	2'x1'																		
			IM-40	2'x1'																		
			M-5-24-3	2.5'x2'																		
			IM-24	1.75'x1.25'	11.2				16													
	13+70 Rel. Broadway	Lt.	Special	2'x4'	8									3								
	16+90 Rel. Broadway	Lt.	Special	2'x4'	8									3								
53	20+00 Rel. Broadway	Lt.	W-68-36	3'x3'	9				15													
			TOTAL		205	30	11		62	99	3	3	27.	6	1.62	6						

4E

OVERHEAD SIGNS SUB-SUMMARY

QUANTITY CALCULATIONS
MADE BY A.H.S. DATE 7-21-84
CHECKED BY C.D. DATE 10-2-84

FHWA REGION	STATE	PROJECT
5	OHIO	

CUYAHOGA COUNTY
CUY - 490 - 1.00

SIGN MARK NO.	PLAN SHEET NO.	ELEVATION SHEET NO.	LOCATION	SIDE	EFFECTIVE SIGN SIZE WXH FTxFT	SIGNS, EXTRUSHEET TYPE G SHEETING S.F.	SIGNS, OVERLAY, TYPE G SHEETING S.F.	SIGN ATTACHMENT ASSEMBLY EA.	EXISTING SIGNS REVISED WITH DEMOUNTABLE COPY EA.	CONCRETE FOR ANCHOR BASE FOUNDATIONS C.Y.	REMOVAL OF OVERLAY SIGN EA.	OVERHEAD SIGN SUPPORT TYPE TC-12.30, DESIGN 6 ARM 26 FEET	OVERHEAD SIGN SUPPORT TYPE TC-7.65, DESIGN 8, SPAN 88 FEET EA.	OVERHEAD SIGN SUPPORT TYPE TC-7.65, DESIGN 8, SPAN 71 FEET EA.	OVERPASS STRUCTURE MOUNTED SIGN SUPPORT TYPE TC-18.24 EA.	OVERHEAD SIGN SUPPORT TYPE TC-16.20, DESIGN 4, ARM 37.5 FEET EA.	OVERHEAD SIGN SUPPORT TYPE TC-7.65, DESIGN 8, SPAN 70 FEET EA.	COMBINATION OVERHEAD SIGN SUPPORT, TYPE TC-12.30, DESIGN 4, ARM 19.0 FEET EA.	OVERHEAD SIGN SUPPORT TYPE TC-7.65, DESIGN 8 MOD. SPAN 85 FEET EA.	OVERHEAD SIGN SUPPORT TYPE TC-7.65, DESIGN 8 MOD. SPAN 70 FEET EA.	OVERHEAD SIGN SUPPORT TYPE TC-12.30, DESIGN 6 MOD., ARM 26.0 FEET EA.	OVERHEAD SIGN SUPPORT TYPE TC-12.30, DESIGN 6, ARM 24.0 FEET EA.	OVERHEAD SIGN SUPPORT TYPE TC-7.65, DESIGN 8 SPAN 96.0 FEET EA.	OVERHEAD SIGN SUPPORT TYPE TC-9.10, DESIGN 1 MOD EA.	SIGN SERVICE EA.	SIGNS WIRED EA.	SIGNS WIRED, OVERPASS STRUCTURE MOUNTED EA.	DISCONNECT SWITCH WITH ENCLOSURE, TYPE X EA.	BALLAST TYPE CMRI-175 (480) EA.	BALLAST TYPE CMRI-250 (480) EA.	BALLAST WIRING ENCLOSURE TYPE A EA.	BALLAST WIRING ENCLOSURE, TYPE B AS PER PLAN EA.	MERCURY VAPOR LUMINAIRE TYPE TC-31.21 WITH 175 WATT LAMP EA.	MERCURY VAPOR LUMINAIRE TYPE TC-31.21 WITH 250 WATT LAMP EA.	SWITCH ENCLOSURE MOUNTING BRACKET ASSEMBLY EA.	BALLAST WIRING ENCLOSURE MOUNTING BRACKET EA.	GROUND ROD EA.
						630																			631													625
66B	50		26+75 N.B.O.R.	Lt./Rt.	17x9.5		20		1		1																											
67B	50		3+50 SW	Lt./Rt.	17x9.5		20		1		1															1			2		1		2			2	
68A	50		932+06 I-490	Rt.	25x12	300		1																		1			2		1		2			2	
69A	51		14+60 E-S	Lt./Rt.	13x9.5						1																										
70A	51	54	961+00 I-490	Lt.	17x10	170							1												1	1		1	2		1		2				1
B				Lt.	17x10 7x2	184																				1			2				2				
71A	51	54	971+00 I-490	Lt.	17x10	170								1											1	1		1	2		1		2				1
B				Lt.	17x10 7x2	184																				1			2				2				
72	51	55	981+90 I-490	Lt.	11x9	99									1										1		1	1	1			1	1		1	1	
74A	51	55	973+00 I-490	Rt.	13x12.5 7x2	176.5								1											1	1		1		2	1			2			1
B				Rt.	13x10 7x2	144																				1			2				2				
75	51	55	68+00 Ramp 7-C	Rt.	13x5.5	71.5												1							1	1		1	2			1	2				1
76A	52	54	989+89 I-490	Lt.	17x10	170													1						1	1		1	2		1		2				
B				Lt.	17x10 7x2	184																				1			2				2				
C				Lt.	14x6.5 7x2	105																				1			2				2				
77A	52	54	994+34 I-490	Rt.	7x7.5	52.5														1					1	1		1	1		1		1				
B				Rt.	17x6.5	110.5																				1			2				2				
C				Rt.	17x12.5 7x2	226.5																				1				2				2			
78A	52	56	1003+11 I-490	Lt.	22x12.5	275											1								1	1		1		2	1			2			
B				Lt.	15x6.5 7x2	111.5																				1			2				2				
79	52	56	1004+97 I-490	Rt.	13x10 7x2	144															1				1	1		1	2			1	2				
80	53	56	1015+31 I-490	Rt.	16x7.5 7x2	134															1				1	1		1	2			1	2				
82A	53	54	1021+80 I-490	Rt.	7x7.5	52.5				18.5													1		1	1		1	2		1		2				1
B				Rt.	17x6.5	110.5																				1			2				2				
C				Rt.	13x8	104																				1			2				2				
D				Rt.	12x10	120																				1			1				1				
83	53	54	8+29 Ramp C-B	Lt.	6x5	30																		1													
81A	53	55	6+25 Rel. Broad.	Rt.	10x6	65				2.9												1			1	1		1	1			1	1				1
B	53	55	6+25 Rel. Broad.	Rt.	10x6	65																				1			1				1				
84	53	55	1026+00 I-490	Lt.	15x6.5 7x2	111.5				5.3		1													1	1		1	2			1	2				1
			TOTALS			3671	40	1	2	26.7	3	1	1	2	1		1	1	1	1	2	1	1	1	13	26	1	13	43	6	9	6	43	6	1	5	7

MADE A.H.S. DATE 7-21-84
TRACED T.D. DATE 7-31-84
CHECKED C.D. DATE 10-2-84
SCALE

Howard, Needles, Tammen & Bergendoff
CONSULTING ENGINEERS
CLEVELAND, OHIO

HNTB

ITEM 621 - STOP LINES

STATION FROM	STATION TO	SIDE	CALCULATION	LIN.FT.
RAMP C-7				
82+10	--	RT&LT	1 X 60	60
RELOCATED BROADWAY AVENUE AT RAMP C-B				
16+00	--	RT.		26
17+15	--	LT.		28
RAMP C-B				
15+94	16+22	LT.	1 X 30	29
16+86	--	LT.	1 X 19	19
			TOTAL	162

ITEM 621 - CROSSWALK LINES

STATION FROM	STATION TO	SIDE	CALCULATION	LIN.FT.
RELOCATED BROADWAY AVE				
OFFSET 34 AND 40'				
16+48	16+81	RT	66	66
17+65	18+35	RT	140	140
RAMP B-C				
18+07	18+13	CL	95 + 80	175
RAMP C-7				
82+00	82+06	CL	85 + 68	153
			TOTAL	534

ITEM 621 - TRANSVERSE LINES

STATION FROM	STATION TO	SIDE	CALCULATION	LIN.FT.
I-490 WESTBOUND				
955+75	964+71	LT.	45 STRIPES X (0'+40')/2	900
985+85	990+25	LT.	22 STRIPES X (0'+70')/2	770
I-490 EASTBOUND				
1015+25	1017+92	RT.	14 STRIPES X (0'+25')/2	175
1020+00	1022+51	RT.	13 STRIPES X (0'+20')/2	130
RAMP C-7				
82+10	84+12	RT.	18 STRIPES X (0'+12')/2	108
			TOTAL	2,083

ITEM 621 - WORD "ONLY" ON PAVEMENT, 72-IN.

STATION FROM	STATION TO	SIDE	CALCULATION	EACH
RAMP C-7				
82+90			"ONLY"	2
RAMP C-B				
15+50	16+05		"ONLY"	2
			TOTAL	4

ITEM 621 - LANE ARROWS

STATION FROM	STATION TO	SIDE	CALCULATION	EACH
RAMP C-7				
82+40	83+40		TURN ARROW	6
RAMP C-B				
15+00	16+56		TURN ARROW	4
			TOTAL	10

ITEM 621 - LANE LINES

STATION FROM	STATION TO	SIDE	CALCULATION	LIN.FT.
I-290 WESTBOUND				
958+00	974+71	LT	2 X 1,671	3,342
974+71	1017+75	LT	3 X 4,304	12,912
990+25	991+85	LT	1 X 160	160
1009+21	1011+61	LT	1 X 240	240
1017+75	1022+52	LT	2 X 477	954
I-290 EASTBOUND				
958+06	960+46	RT	1 X 240	240
958+00	1016+00	RT	3 X 5,800	17,400
981+49	984+89	RT	1 X 340	340
1014+05	1015+25	RT	1 X 120	120
1016+00	1022+52	RT	2 X 652	1,304
RAMP C-7				
82+10	85+60	C.L.	1 X 350	350
RAMP C-B				
13+70	15+00	C.L.	1 X 130	130
			TOTAL	37,492
			MILES	7.10

ITEM 621 - CHANNELIZING LINES

STATION FROM	STATION TO	SIDE	CALCULATION	LIN.FT.
I-290 WESTBOUND				
955+75	974+71	LT	(2 X 896) X (1 X 1,000)	2,792
985+85	990+25	LT	2 X 440	880
1011+61	1013+21	LT	1 X 160	160
1017+75	1018+30	LT	1 X 55	55
I-290 EASTBOUND				
955+26	958+06	RT	1 X 280	280
981+29	982+49	RT	1 X 120	120
1015+25	1017+92	RT	2 X 267	534
1016+00	1022+52	RT	(2 X 252) X (1 X 400)	904
RAMP C-7				
82+10	83+37	RT	1 X 127	127
RAMP 7-C				
75+35	76+00	LT	2 X 65	130
RAMP C-B				
15+00	16+00	LT	1 X 105	105
			TOTAL	6,087

ITEM 621 - CURB MARKING

STATION FROM	STATION TO	SIDE	CALCULATION	LIN.FT
RAMP 7-C				
67+84	69+20	RT.	1 X 135	135
68+40	69+20	LT.	1 X 85	85
RAMP 7-7C CURB TURNOUT			130 + 66	196
RAMP C-7 CURB TURNOUT			98 + 54	152
RAMP C-B CURB TURNOUT			102 + 130 + 240	472
RAMP B-C CURB TURNOUT			169 + 33	202
			TOTAL	1,242

ITEM 620 - DELINEATORS

STATION FROM	STATION TO	SIDE	DIST. FT	TYPE C FLEXIBLE POST MOUNTED	TYPE C BRACKET MOUNTED	TYPE D FLEXIBLE POST MOUNTED	TYPE D BRACKET MOUNTED
CENTERLINE I-490							
982+90	984+90	RT	200	2			
984+90	990+90	RT	200		3		
992+20	996+20	LT	200		3		
1009+80	1011+80	RT	200		2		
1018+50	1020+50	RT	200		2		
LANE S-E							
958+00	966+00	RT	200	5			
LANE E-S							
958+00	966+00	LT	200	5			
RAMP 7-C							
66+40	68+80	RT	80	2	2		
68+40	70+00	LT	80			3	
70+50	74+00	LT	50			8	
75+90	78+90	LT	50			7	
79+70	81+30	RT	80	4			
RAMP 7-7C							
68+10	---	RT		1			
68+40	---	RT		1			
68+40	---	LT				1	
68+90	70+40	RT	50	4			
68+90	70+40	LT	50			4	
70+90	75+40	LT	50			10	
WEST 7TH STREET							
11+80	12+30	LT	50	2			
18+30	---	RT		1			
RAMP C-7							
82+20	82+70	LT	50	2			
83+20	85+20	LT	100	3			
86+20	90+20	LT	200		3		
RAMP B-C							
14+15	16+55	LT	80	3	1		
15+75	18+15	RT	80				4
17+05	17+55	LT	50	2			
REL. BROADWAY AVENUE							
4+75	5+25	RT		2			
RAMP C-B							
8+50	10+90	LT	80				4
3+85	7+85	RT	200		3		
9+45	10+25	RT	80		2		
11+85	15+85	RT	200	1	2		
16+85	17+35	RT	50	2			
RAMP N-W							
19+50	23+50	RT	200	1	2		
TOTALS				43	25	33	8

ITEM 621 - ISLAND MARKING

STATION FROM	STATION TO	SIDE	CALCULATION	SQ.FT.
WEST 7TH STREET AT RAMP 7-C				
14+02	14+17	LT.	(10 + 4)/ 2 X 15	105
RELOCATED BROADWAY AVENUE AT RAMP C-B				
16+00	16+98	RT.	(90 x 50)/2	2,250
			TOTAL	2,355

*AREA BY PLANIMETER

ITEM 621 - EDGE LINE

STATION FROM	STATION TO	SIDE	CALCULATION	LIN.FT.
I-290 WESTBOUND				
929+05	955+75	LT	1 X 2,670	2,670
958+00	1022+52	LT	1 X 6,452	6,452
964+71	985+85	LT	1 X 2,114	2,114
991+49	1013+21	LT	1 X 2,172	2,172
1011+61	1018+30	LT	1 X 669	669
1017+75	1022+52	LT	1 X 477	477
I-290 EASTBOUND				
955+26	958+06	RT	1 X 280	280
958+00	1022+52	RT	1 X 6,452	6,452
965+26	982+49	RT	1 X 1,723	1,723
981+29	1017+92	RT	1 X 3,663	3,663
1017+92	1022+52	RT	1 X 460	460
LANE E-S				
0+00	6+76	LT	1 X 676	676
LANE S-E				
24+03	32+24	RT	1 X 721	721
RAMP 7-C				
69+20	81+29	RT&LT	2 X 1,209	2,418
RAMP 7-7C				
68+60	75+35	LT	1 X 675	675
68+80	75+35	RT	1 X 655	655
RAMP B-C				
13+21	16+85	LT	1 X 364	364
13+21	18+10	RT	1 X 489	489
RAMP N-W				
17+88	22+15	LT&RT	2 X 427	854
RAMP C-B				
7+86	16+60	RT	1 X 874	874
7+86	15+35	LT	1 X 749	749
RAMP C-7				
82+50	85+85	RT	1 X 335	335
82+82	91+49	LT	1 X 867	867
			TOTAL	36,809
			MILES	6.97

ITEM 621 - CENTERLINES, DOUBLE SOLID

STATION FROM	STATION TO	SIDE	CALCULATION	LIN.FT
WEST 7TH STREET				
11+80	19+70	RT&LT	1 X 790	790
			TOTAL	790
			MILES	0.15

ITEM 621 - 4" TRANSVERSE LINES, AS PER PLAN

STATION FROM	STATION TO	SIDE	CALCULATION	LIN.FT.
I-490 EASTBOUND				
985+86	1017+92	RT.	3,206' X (9 LINES X 11.3')/80 L.F.	4,076
1017+92	1021+10	RT.	318' X (9 LINES X 11.3')/80 L.F.	404
RAMP C-B				
7+86	14+60	RT.	674' X (9 LINES X 7.5')/80 L.F.	569
RAMP B-C				
13+21	14+77	LT.	156 X (9 LINES X 7.5')/80 L.F.	132
I-490 WESTBOUND				
985+86	1013+21	LT.	2,735' X (9 LINES X 11.3')/80 L.F.	3,477
1013+21	1019+90	LT.	669' X (9 LINES X 11.3')/80 L.F.	850
			TOTAL	9,508

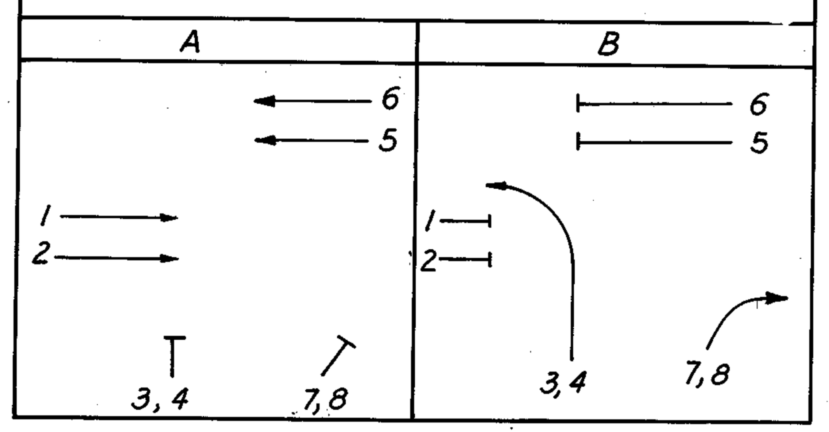
SIGNAL DISPLAY DIAGRAM							
SIGNAL HEAD	INTERVALS 1	2	3	4	5	6	7
1, 2	G	Y	R	R	R	R	R
3, 4	R	R	R	R	G	Y	R
5, 6	G	G	Y	R	R	R	R
7, 8	R	R	R	R	G	Y	R

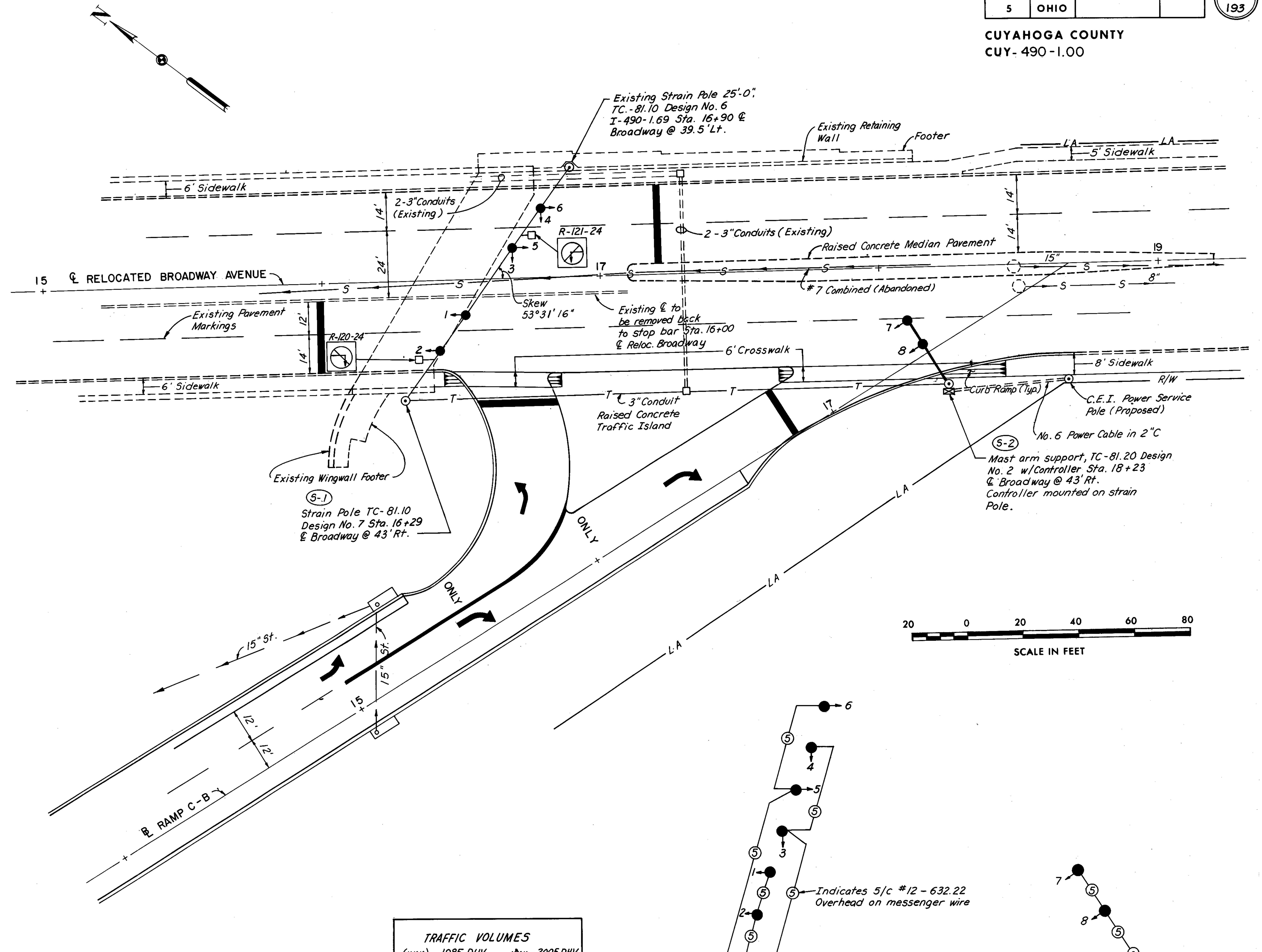
PHASE	A				B			
TIME	1	2	3	4	5	6	7	CYCLE
AM Peak	35	4	4	2	39	4	2	90
OFF Peak	35	4	4	2	39	4	2	90
PM Peak	35	4	4	2	39	4	2	90

Veh. Signal Head 3 & 5 = 3 section, 12 inch lens, 2-way
Veh. Signal Head 4 & 6 = 3 section, 12 inch lens, 2-way
Veh. Signal Head 1 & 2 = 3 section, 12 inch lens, 1-way
* Veh. Signal Head 7 & 8 = 3 section, 12 inch lens, 1-way

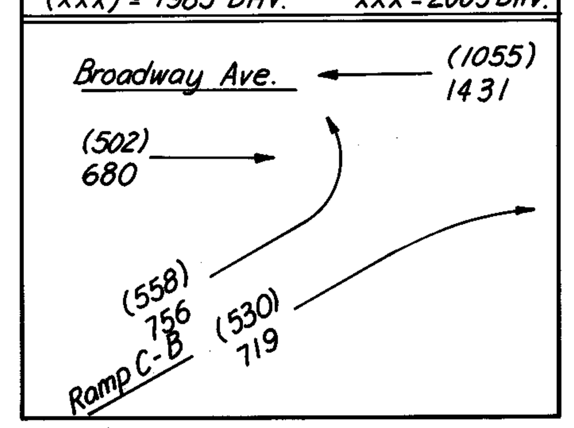
* Each section to include standard visor with louvers. Payment for these Signal Heads will be made under Item 632 - Vehicular Signal Head 3 Section, 12-inch lens, 1-Way, as per plan.

PHASE DIAGRAM





TRAFFIC VOLUMES
(xxx) = 1985 DHV. xxx = 2005 DHV.



WIRING DIAGRAM

LEGEND

- Proposed Signal Head
- Strain Pole or Service Pole
- Controller
- Existing Pullbox
- —T— Conduit (Traffic 3" - 713.07)
- (5) Signal Cable (5/C #12)

MADE CD DATE 10-26-84
TRACED TD DATE 10-29-84
CHECKED R.L.N. DATE 6-27-86
SCALE 1" = 20'

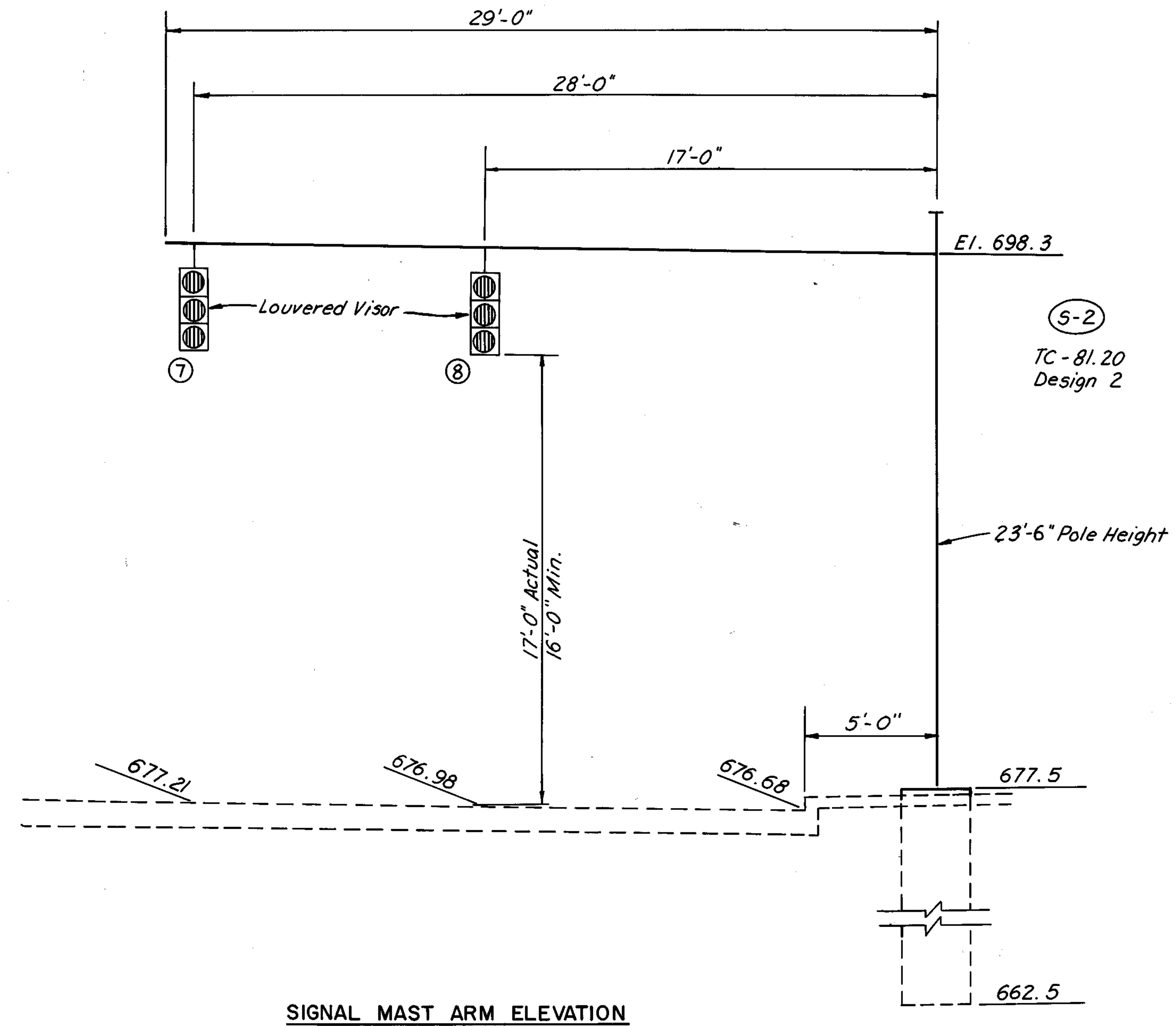
Howard, Needles, Tammen & Bergendoff CONSULTING ENGINEERS CLEVELAND, OHIO

HNTB

RAMP C-B & REL. BROADWAY - TRAFFIC SIGNAL PLAN

CUYAHOGA COUNTY
CUY-490-1.00

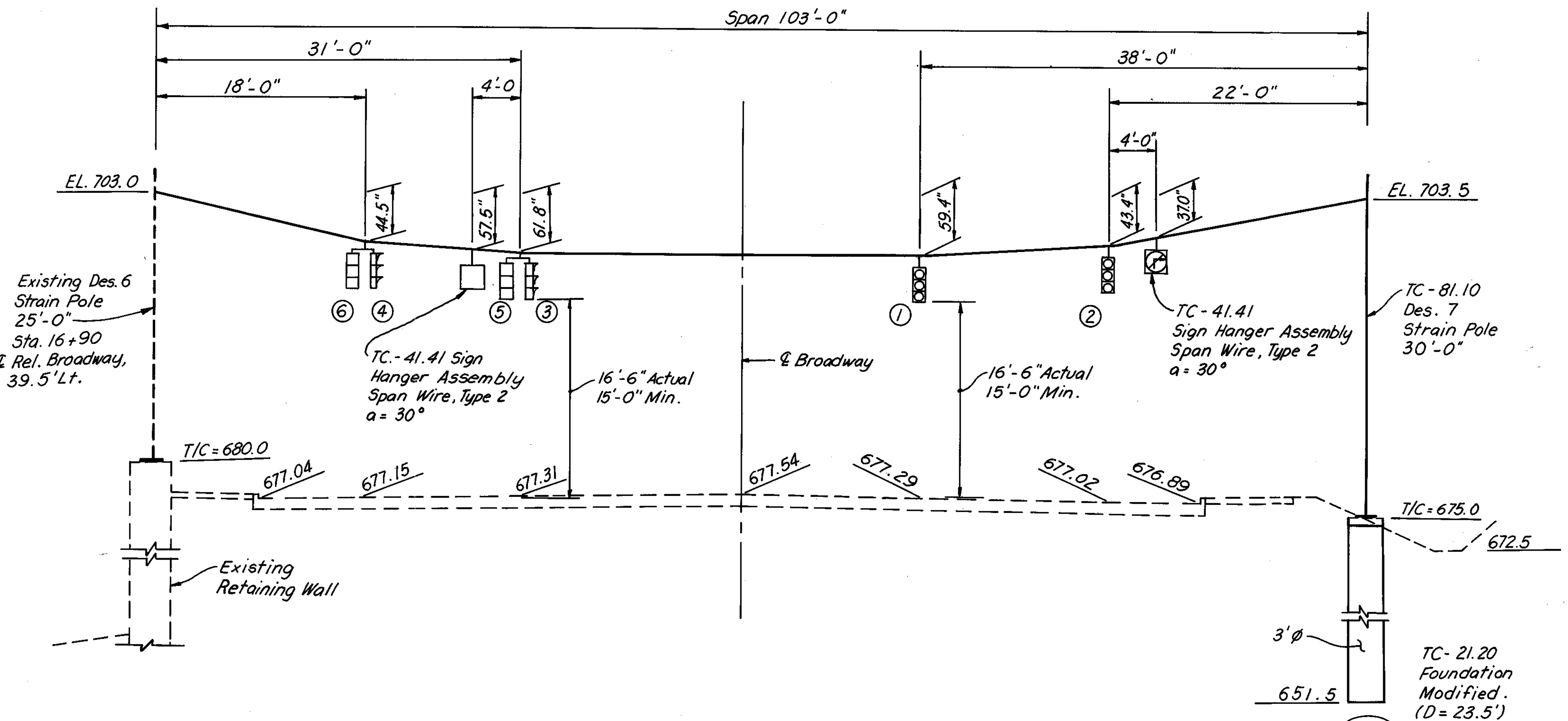
TRAFFIC SIGNAL SUB-SUMMARY																	
		632										625		630		625	861
SHEET No.	LOCATION	Vehicular Signal Head 3-Section, 12-inch lens, 1-Way, as per plan.	Vehicular Signal Head 3-Section, 12-inch lens, 1-way	Vehicular Signal Head 3-Section, 12-inch lens, 2-way	Concrete for anchor base foundations	Signal Support, Type TC-81.20, Design No. 2.	Strain Pole, Type TC-81.10, Design No. 7	Messenger Wire 7 Strand, 3/8" Dia. with accessories	Signal Cable, 5/C #12 AWG,	Power Cable, 3/C #6 AWG	Power Service	Trench	Conduit, 3" 713.07	Sign Hanger Assembly Span wire,	Signs, Flat Sheet Type G Sheeting	Conduit 2" 713.04	Controller Pretimed 3 Dial Electromechanical, Master Secondary
		EACH	EACH.	EACH	CU. YD.	EACH	EACH	LIN. FT.	LIN. FT.	LIN. FT.	EACH	LIN. FT.	LIN. FT.	EACH	SQ. FT.	LIN. FT.	Each
48	Ramp C-B and Broadway Intersection	2	2	2	90	1	1	110	980	60	1	240	200	2	8	40	1



SIGNAL MAST ARM ELEVATION
Looking East

SCALE IN FEET
1/4"=1'-0"

Sta. 18+23
℄ Rel. Broadway,
43' Rt.



SIGNAL SPAN ELEVATION
Looking Southeast

SCALE IN FEET
1/8"=1'-0"

Sta. 16+29
℄ Rel. Broadway,
43' Rt.

QUANTITY CALCULATIONS
MADE BY C.D. DATE 10-13-85
CHECKED BY R.L.N. DATE 10-20-85

MADE C.D. DATE 10-26-84
TRACED T.D. DATE 10-29-84
CHECKED R.L.N. DATE 10-30-84
SCALE As Shown

Howard, Needles, Tammen & Bergendoff
CONSULTING ENGINEERS
CLEVELAND, OHIO

HNTB

RAMP C-B & REL. BROADWAY - TRAFFIC SIGNAL ELEVATIONS AND QUANTITIES

TRAFFIC CONTROL PLAN

FED. RD. DIVISION	STATE	PROJECT
5	OHIO	

51/193

CUYAHOGA COUNTY

CUY.-490-1.00

Notes:

Sign sizes shown on this sheet are "effective" and do not include the 0'-6" for glare shield.

Indicates Yellow sign with black letters.

TYPICAL LOCATION OF LANE ARROWS

No Scale

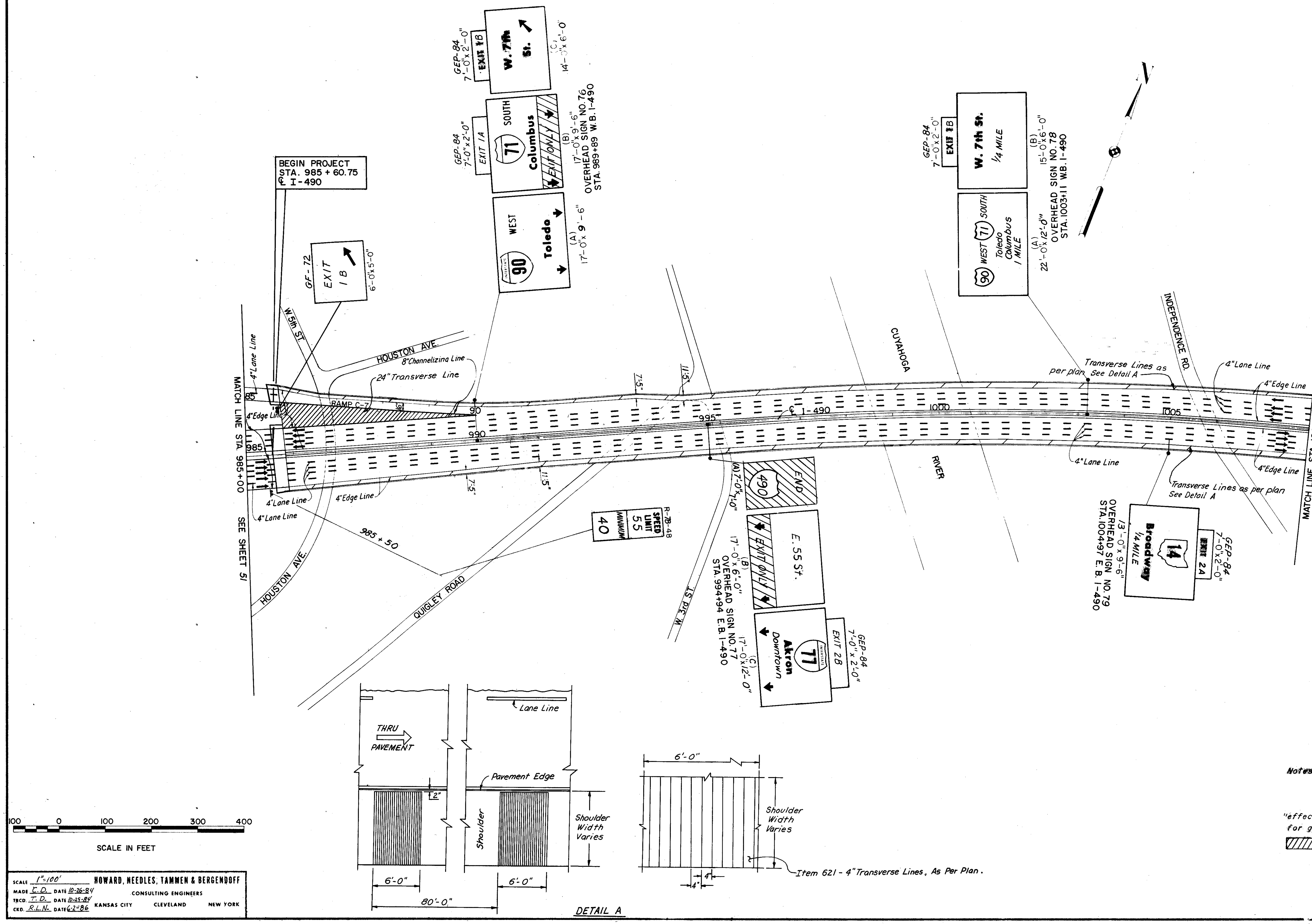
100 0 100 200 300 400

SCALE IN FEET

SCALE 1"=100'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE C.D. DATE 10-26-84	CONSULTING ENGINEERS
TRCD T.D. DATE 10-29-84	KANSAS CITY CLEVELAND NEW YORK
CKD R.L.N. DATE 6-12-86	

TRAFFIC CONTROL PLAN

CUYAHOGA COUNTY
CUY.-290-1.00



Notes:

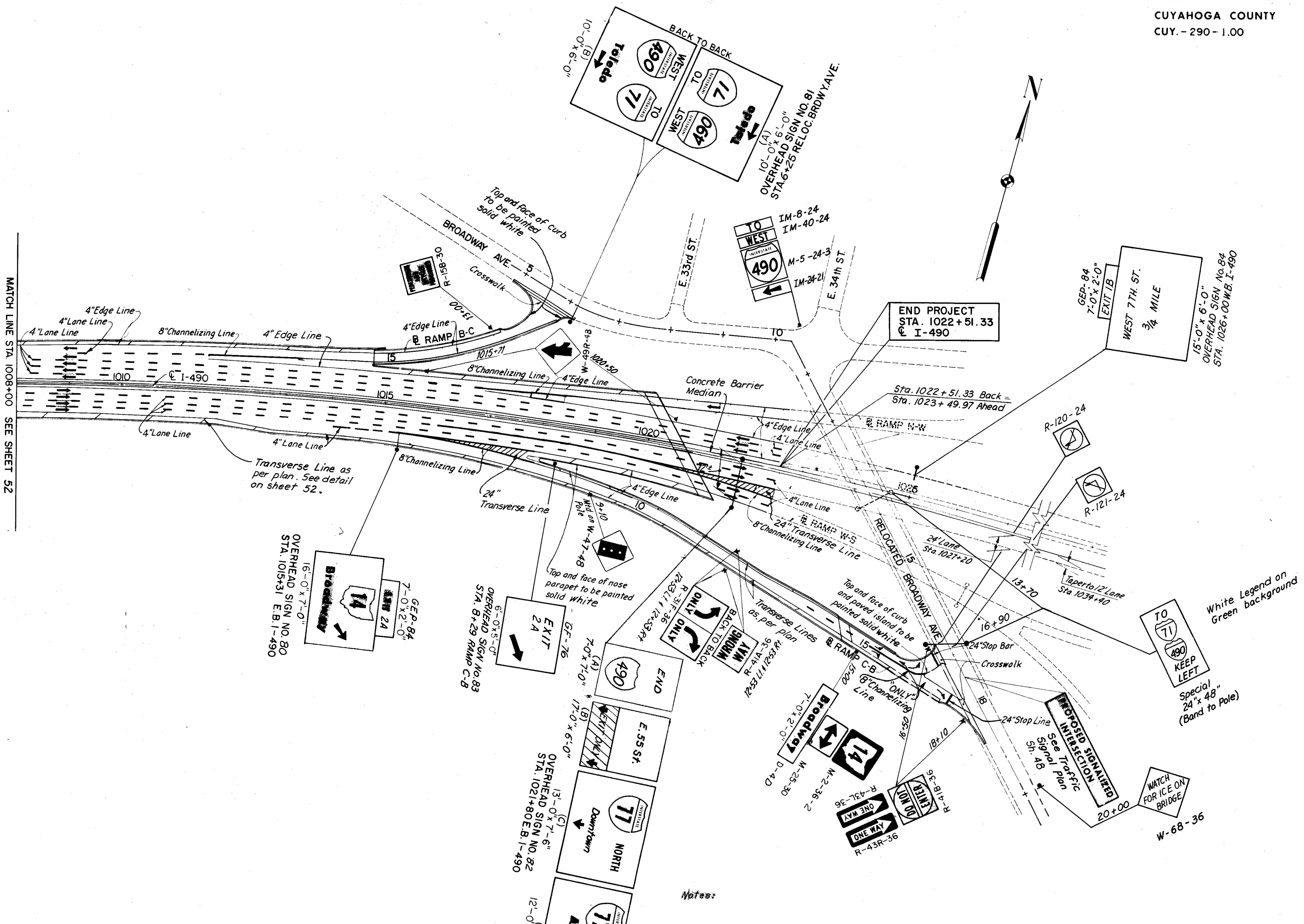
Sign sizes shown on this sheet are "effective" and do not include the 0'-6" for glare shield.

Indicates Yellow sign with black letters.

SCALE 1"=100'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE C.D. DATE 10-26-84	CONSULTING ENGINEERS
TRCD. T.D. DATE 11-29-84	KANSAS CITY CLEVELAND NEW YORK
CKD. R.L.N. DATE 6-2-86	

TRAFFIC CONTROL PLAN

CUYAHOGA COUNTY
CUY. - 290 - 1.00



Notes:

Sign sizes shown on this sheet are "effective" and do not include the 0'-6" for glare shield.

Indicates yellow sign with black letters.

100 0 100 200 300 400

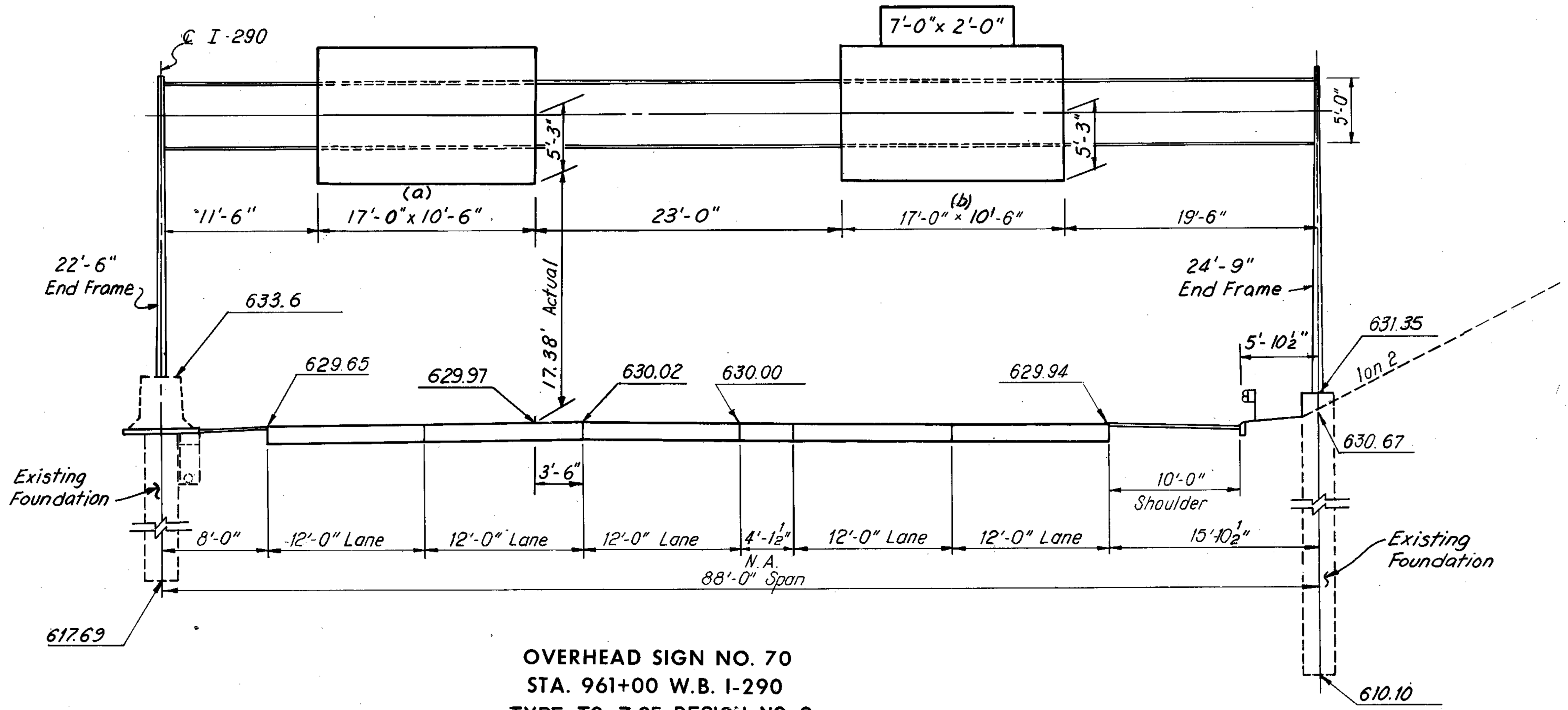
SCALE IN FEET

SCALE 1"=100'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF	
MADE C.D. DATE 10-26-84	CONSULTING ENGINEERS	
TRCD. T.D. DATE 10-29-84		
CKD. R.L.N. DATE 6-2-86	KANSAS CITY CLEVELAND NEW YORK	

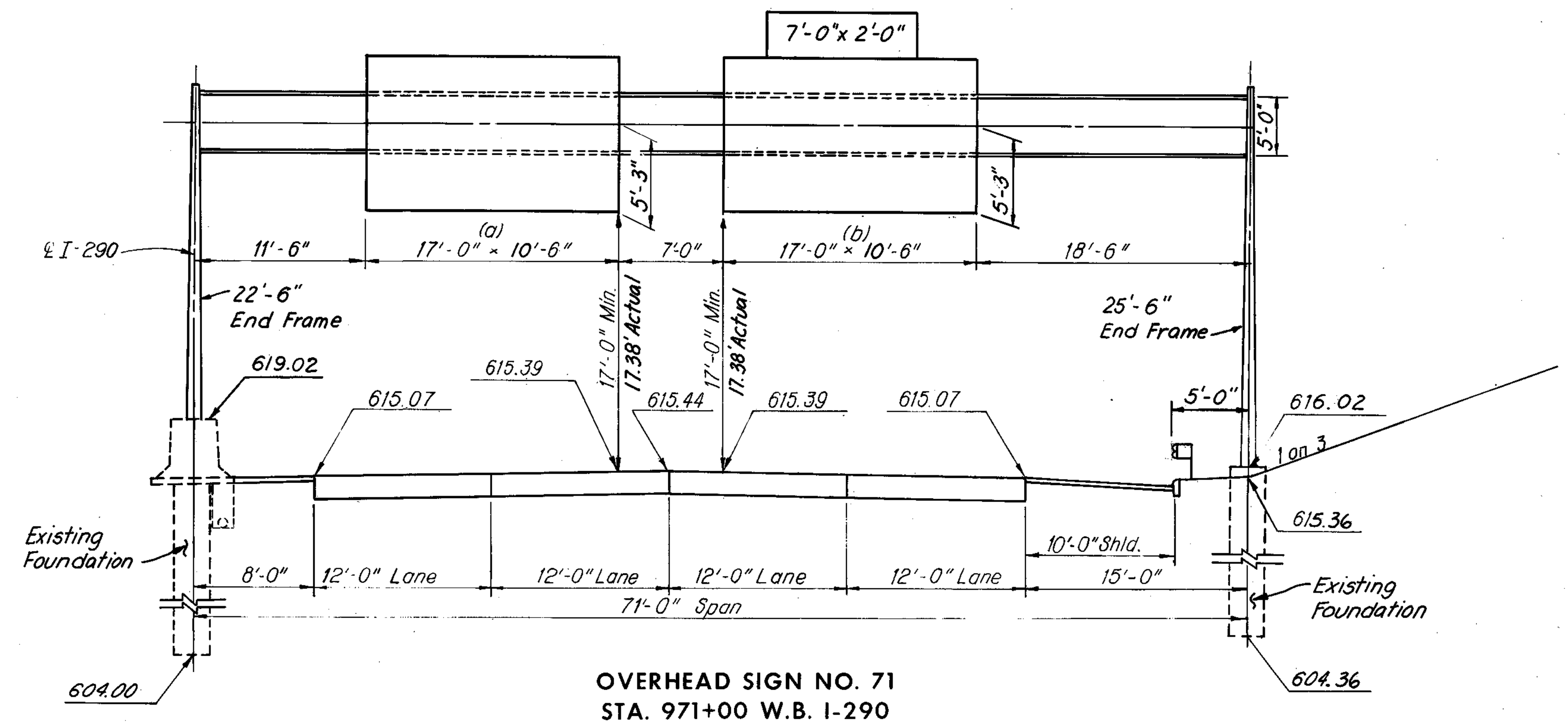
SIGN SUPPORT DETAILS

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

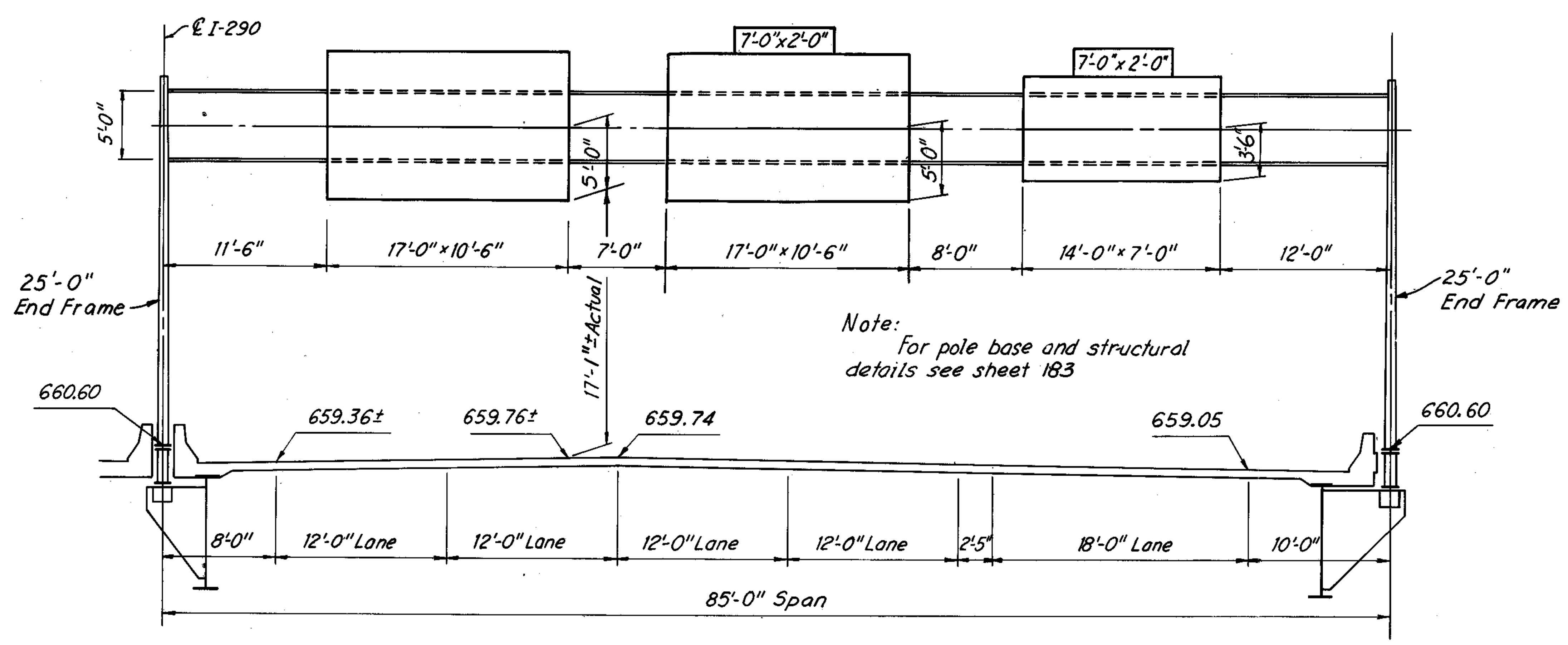
CUYAHOGA COUNTY
CUY.-490-1.00



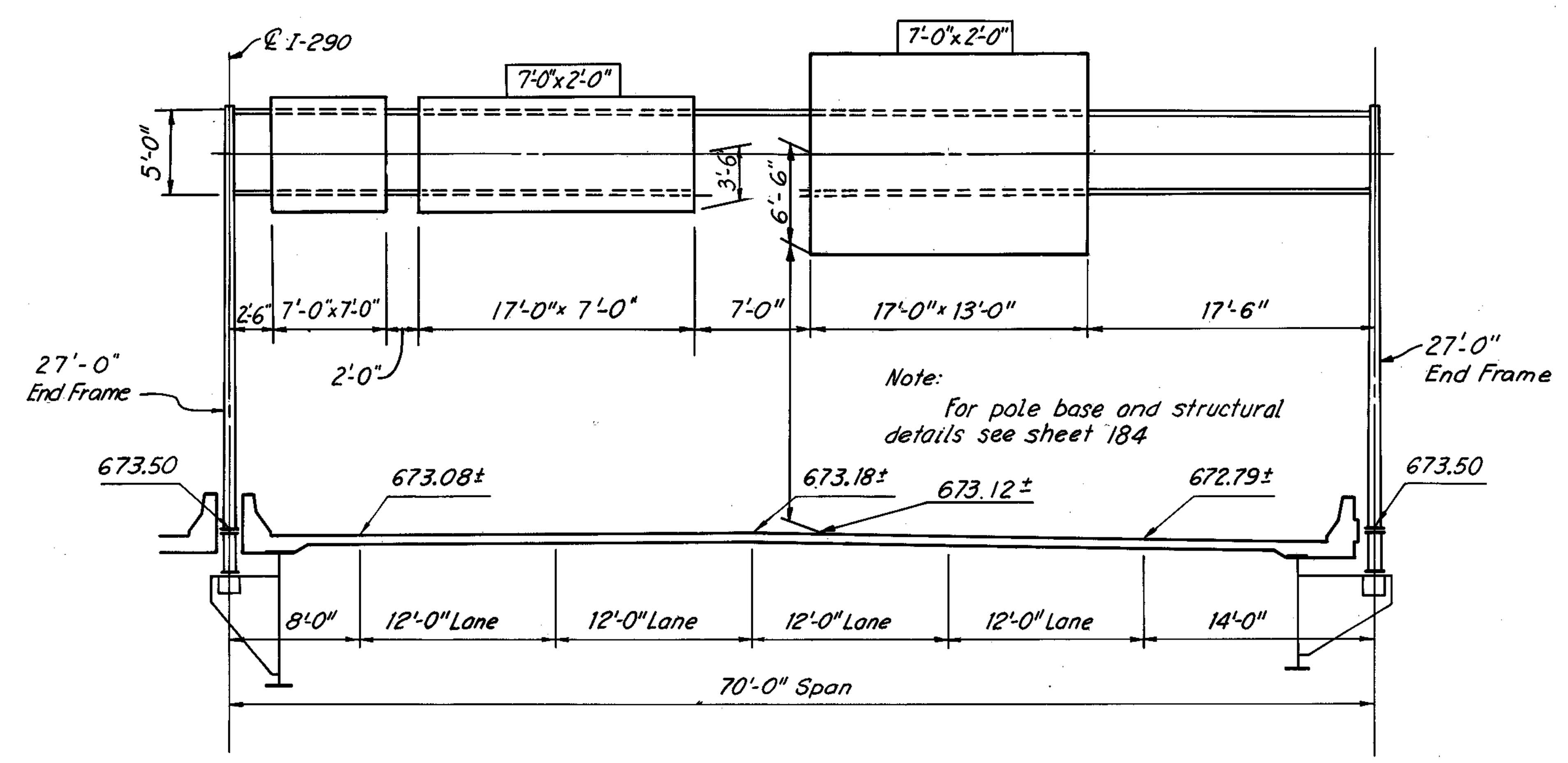
OVERHEAD SIGN NO. 70
STA. 961+00 W.B. I-290
TYPE TC-7.65 DESIGN NO. 8
88'-0" SPAN



OVERHEAD SIGN NO. 71
STA. 971+00 W.B. I-290
TYPE TC-7.65 DESIGN NO. 8
71'-0" SPAN



OVERHEAD SIGN NO. 76
STA. 989+89 W.B. I-290
TYPE TC-7.65 DESIGN NO. 8 MOD.
85'-0" SPAN



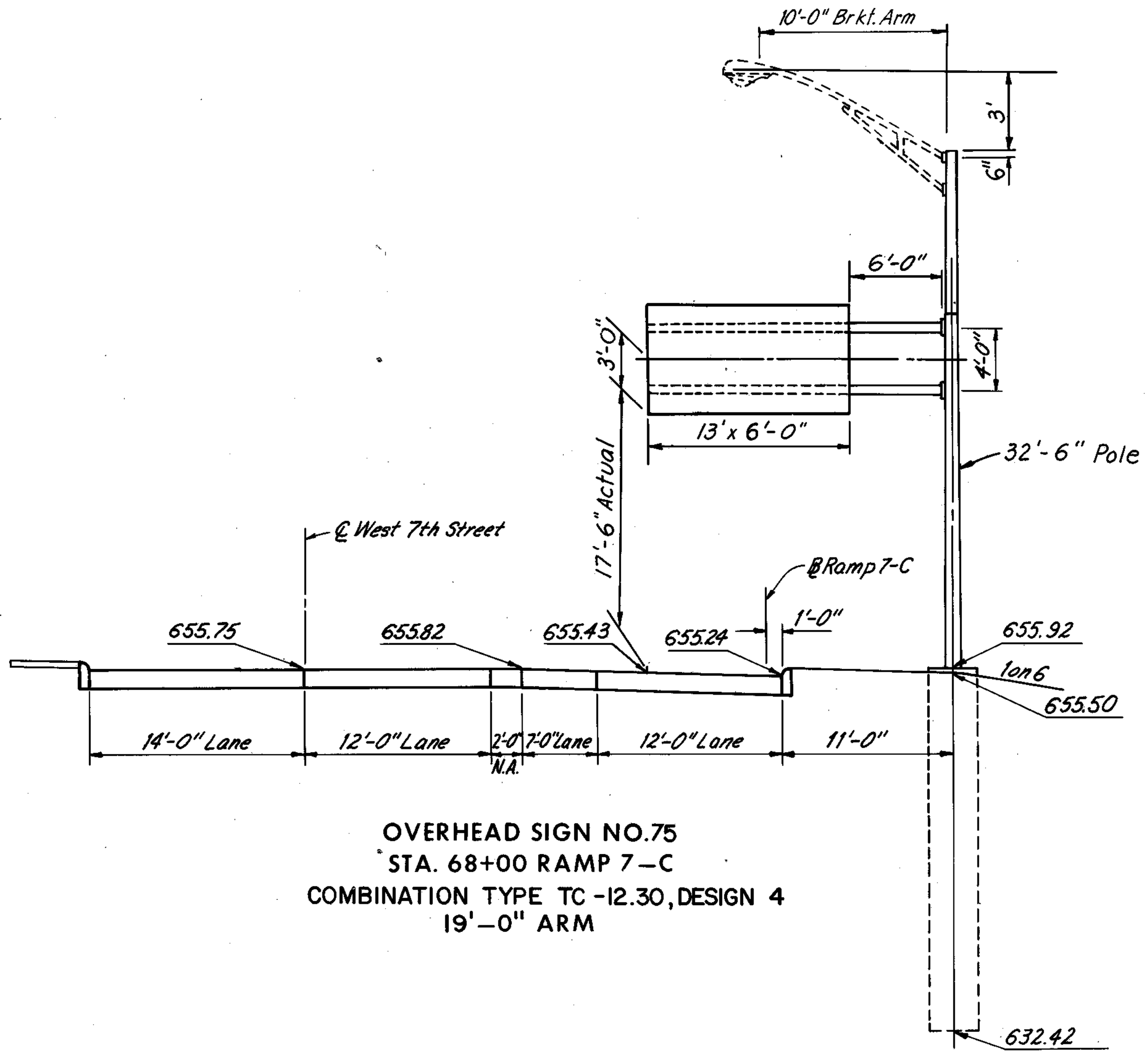
OVERHEAD SIGN NO. 77
STA. 994+94 E.B. I-290
TYPE TC-7.65 DESIGN NO. 8 MOD.
70'-0" SPAN

SCALE 1/8" = 1'-0"	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE D.C.F. DATE 4-24-71	CONSULTING ENGINEERS
TRCD. DCF DATE 4-24-71	
CKD. E.N. DATE 4-25-71	KANSAS CITY CLEVELAND NEW YORK

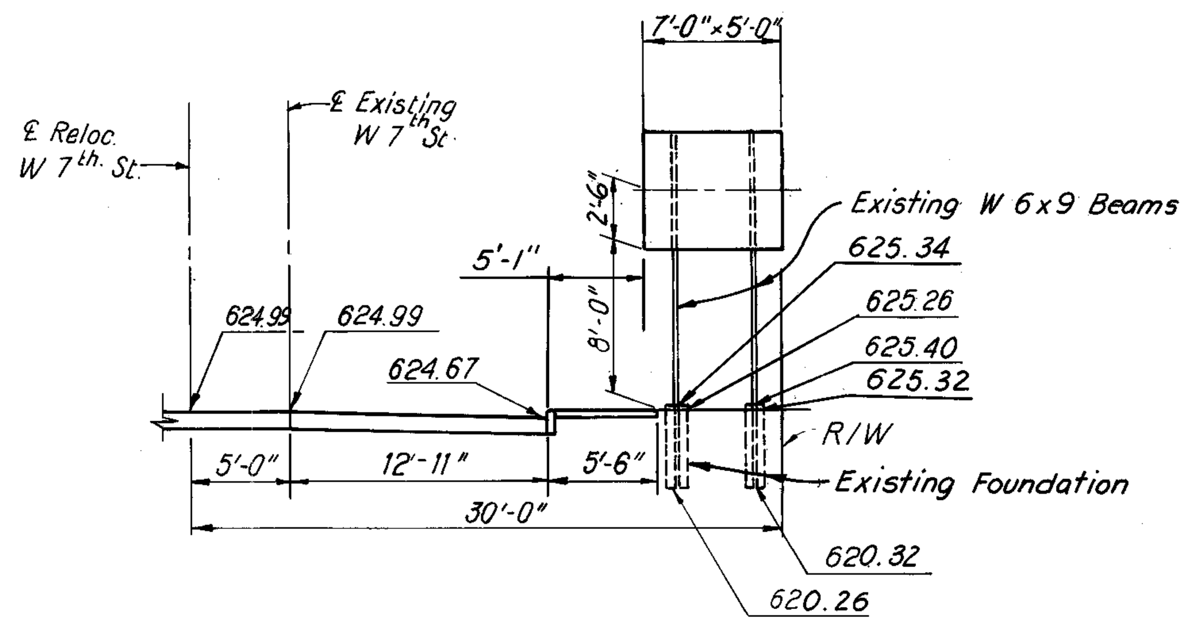
SIGN SUPPORT DETAILS

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

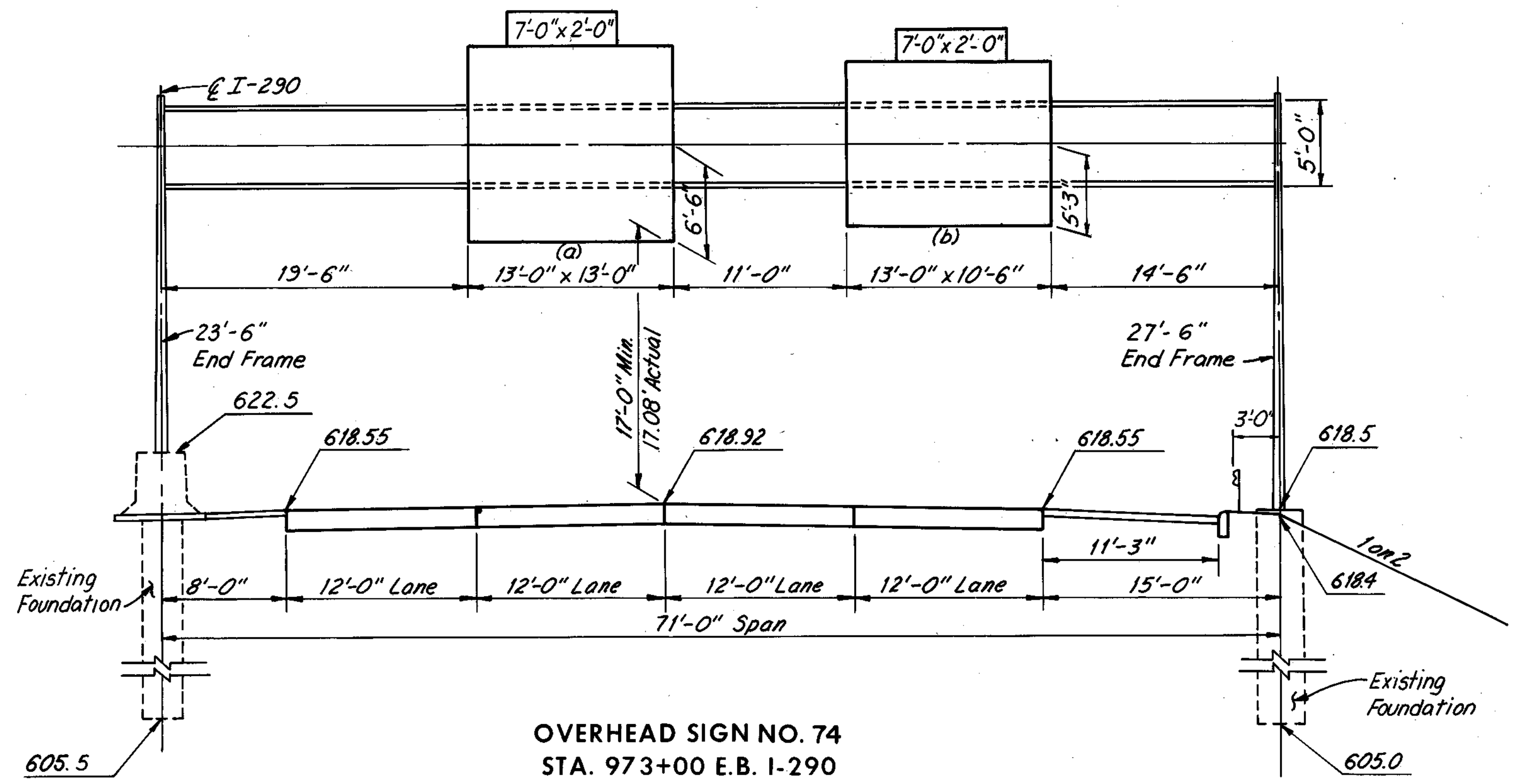
CUYAHOGA COUNTY
CUY. 490 - 1.00



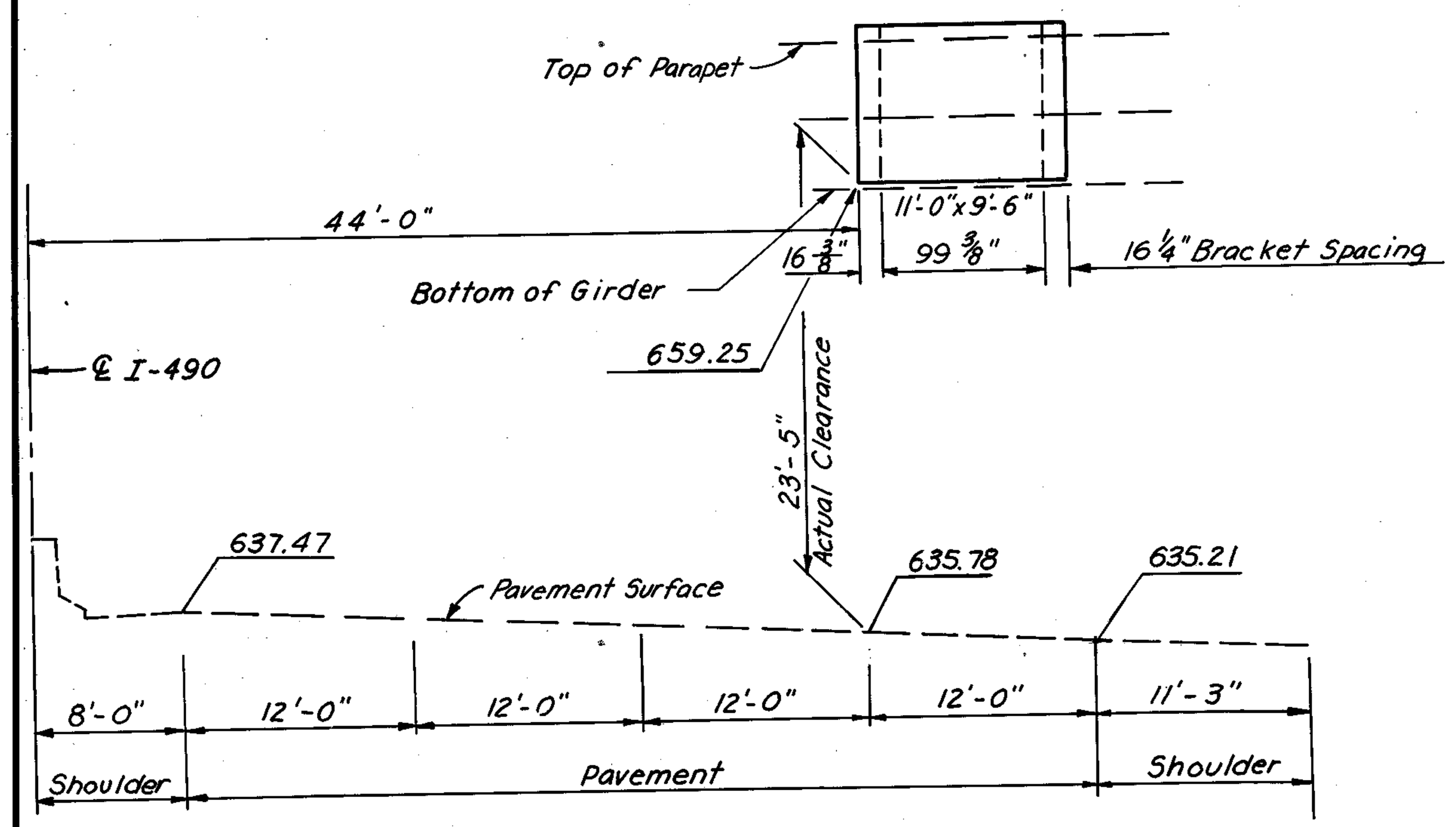
OVERHEAD SIGN NO.75
STA. 68+00 RAMP 7–C
COMBINATION TYPE TC -12.30, DESIGN 4
19'-0" ARM



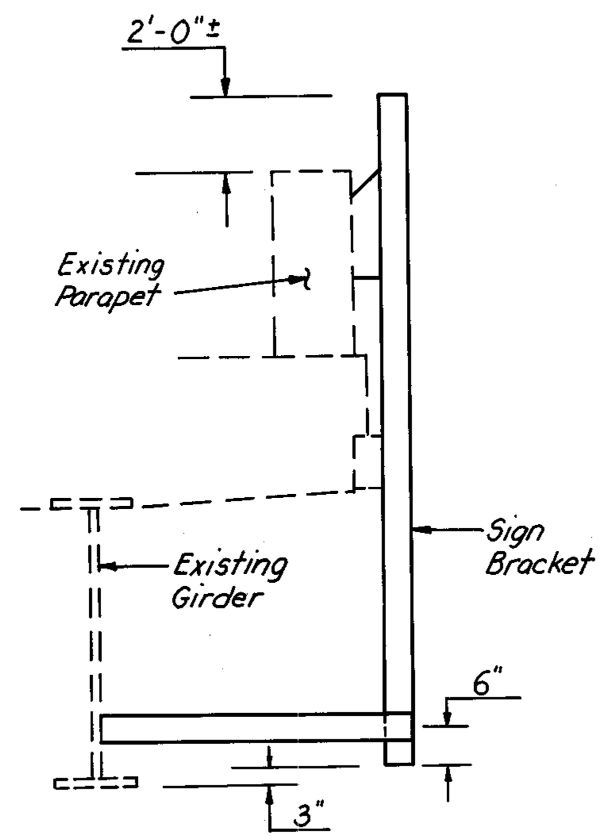
GROUND MOUNTED SIGN
STA. 11+00 WEST 7th STREET



OVERHEAD SIGN NO. 74
STA. 973+00 E.B. I-290
TYPE TC - 7.65 DESIGN NO. 8
71'-0" SPAN

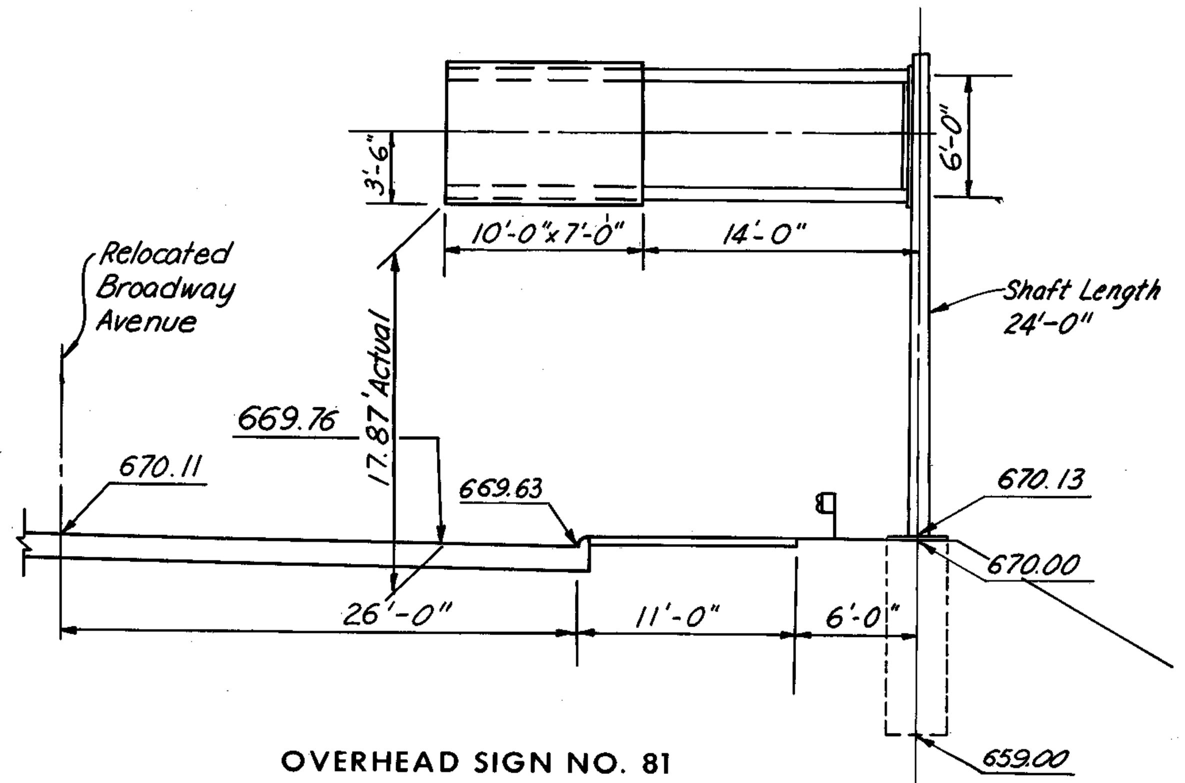


ELEVATION

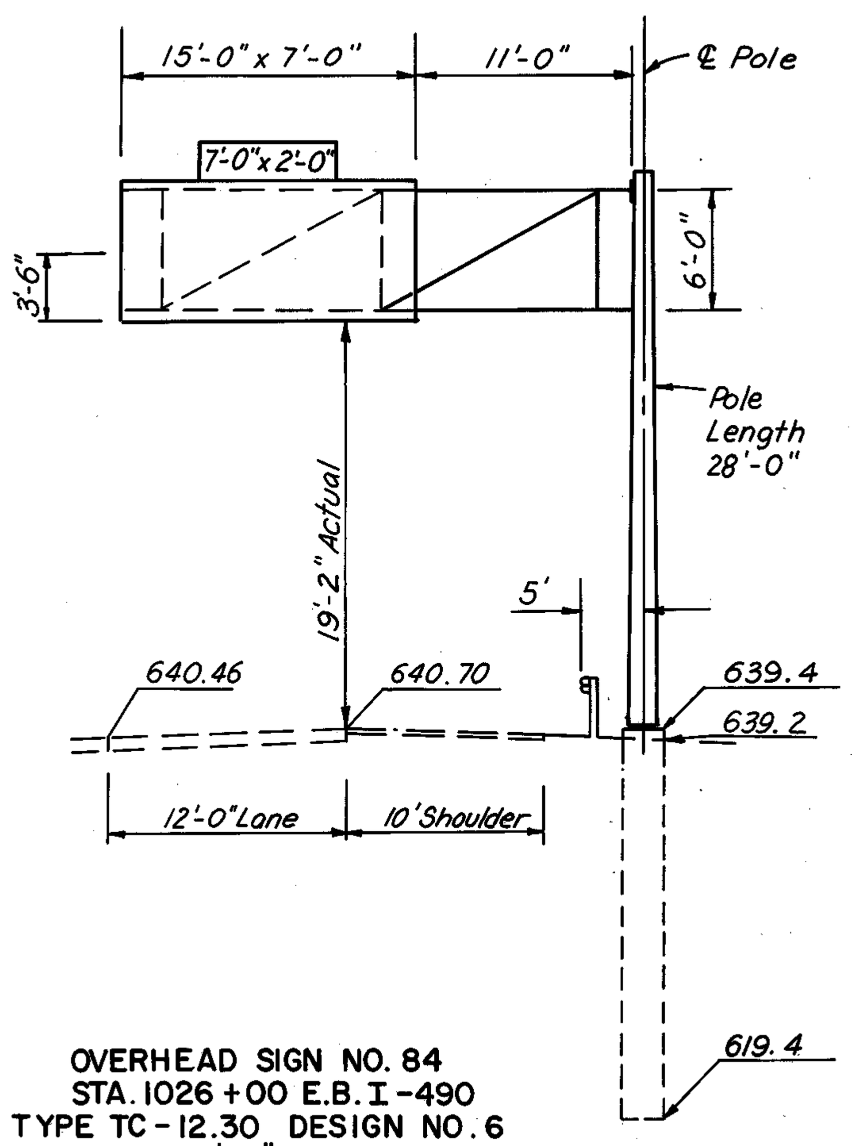


CROSS SECTION
SIGN NO. 72

OVERHEAD SIGN NO. 72
STA. 1025 + 55 ± W.B.
STRUCTURE MOUNTED
TYPE TC - 18.24



OVERHEAD SIGN NO. 81
STA. 6+25 RELOC. BROADWAY AVE.
TYPE TC-12.30 DESIGN NO.6
24' ARM

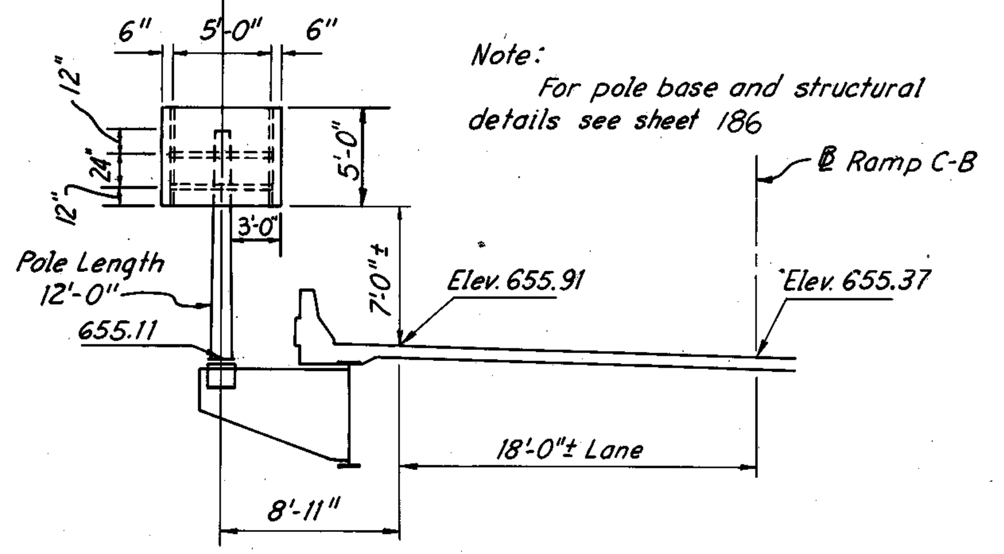


OVERHEAD SIGN NO. 84
STA. 1026 +00 E.B. I -490
TYPE TC - 12.30 DESIGN NO. 6
26'-0" ARMS

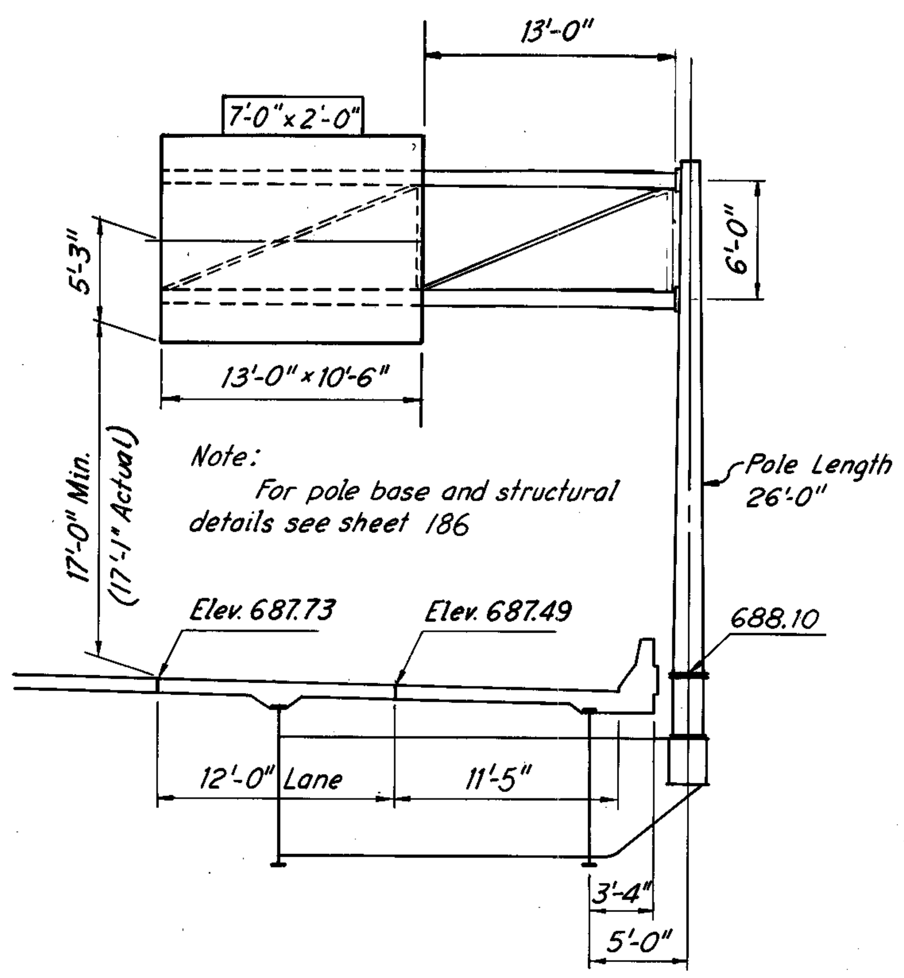
SCALE 1/8" = 1'-0"	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE DCF DATE 4-24-71	CONSULTING ENGINEERS
TRCD DCF DATE 4-24-71	
CKD J.E.N. DATE 4-25-71	KANSAS CITY CLEVELAND NEW YORK

SIGN SUPPORT DETAILS

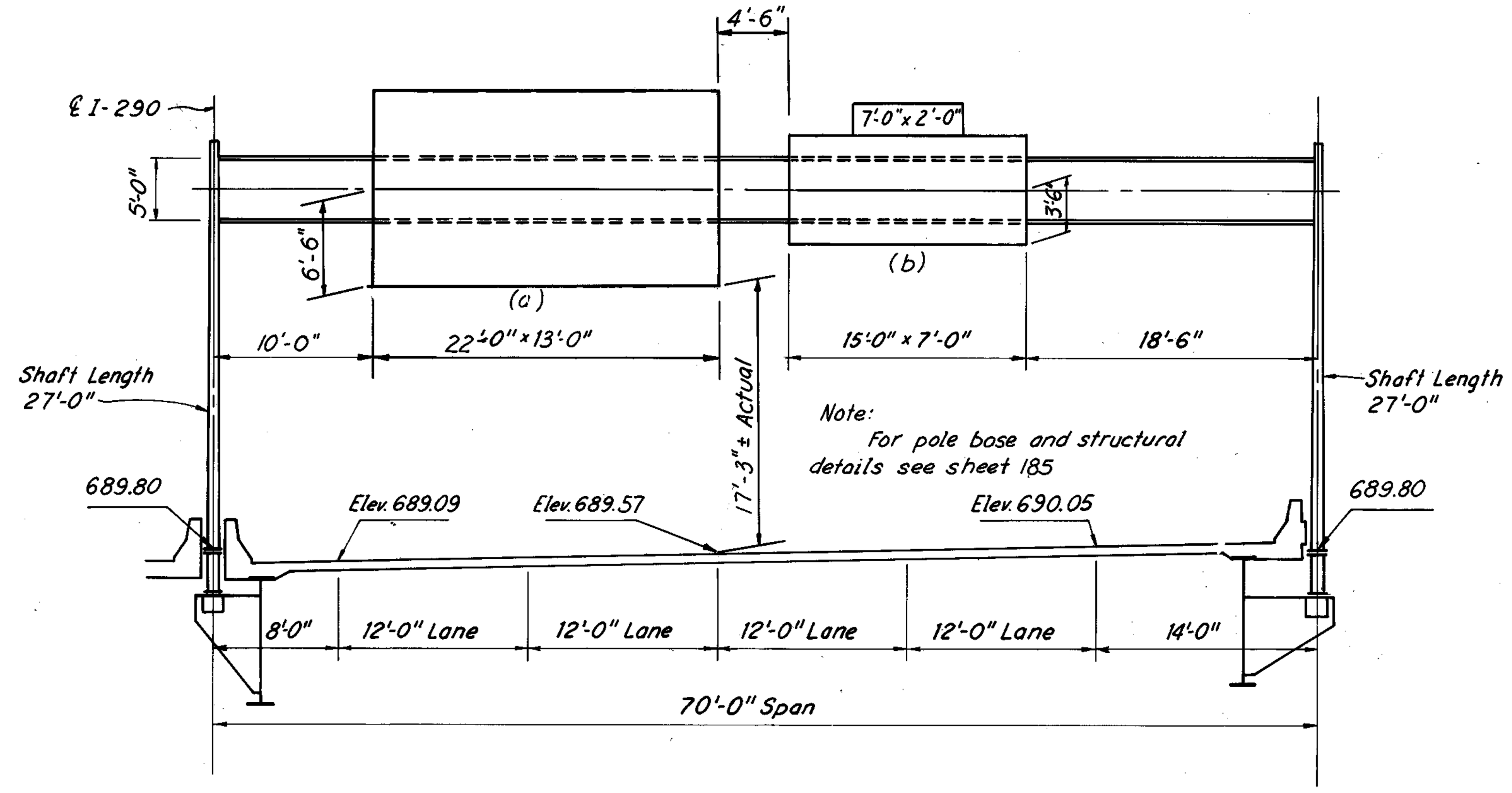
CUYAHOGA COUNTY
CUY.-490-1.00



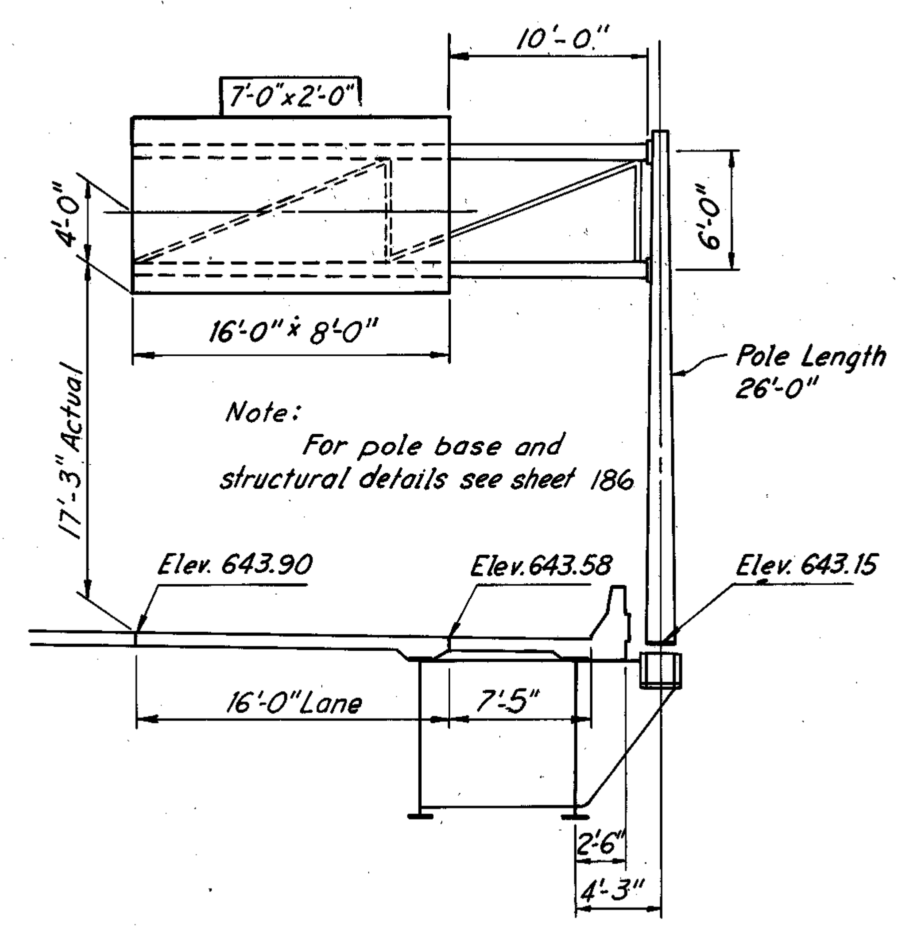
OVERHEAD SIGN NO.83
STA. 8+29 RAMP C-B
TYPE TC-9.10 DESIGN NO. 1 MOD.



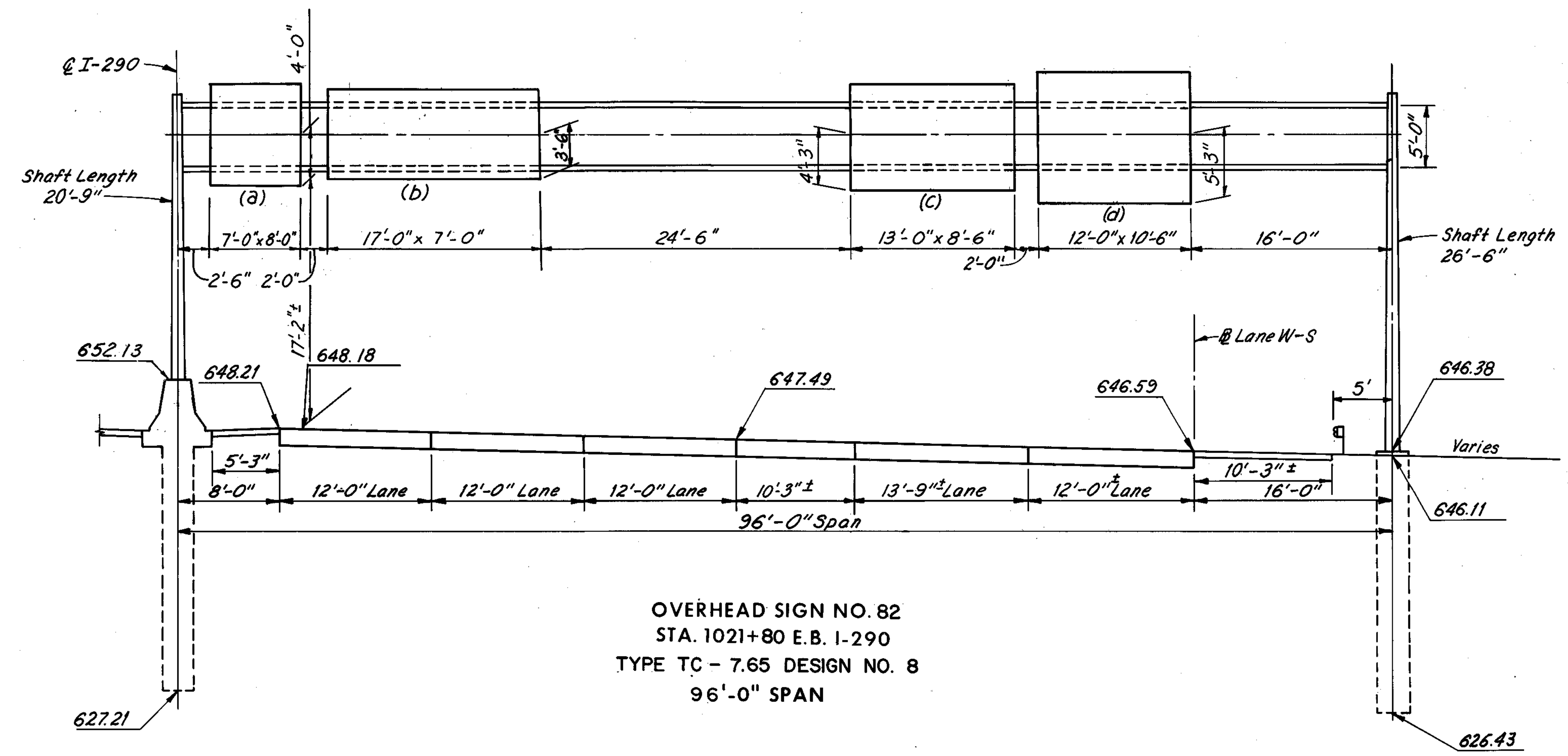
OVERHEAD SIGN NO. 79
STA. 1004+97 E.B. I-290
TYPE TC-12.30 DESIGN NO. 6 MOD.
26'-0" ARMS



OVERHEAD SIGN NO. 78
STA. 1003+11 W.B. I-290
TYPE TC-7.65 DESIGN NO. 8 MOD.
70'-0" SPAN



OVERHEAD SIGN NO. 80
STA. 1015+31 E.B. I-290
TYPE TC-12.30 DESIGN NO. 6 MOD.
26'-0" ARMS



OVERHEAD SIGN NO. 82
STA. 1021+80 E.B. I-290
TYPE TC - 7.65 DESIGN NO. 8
96'-0" SPAN

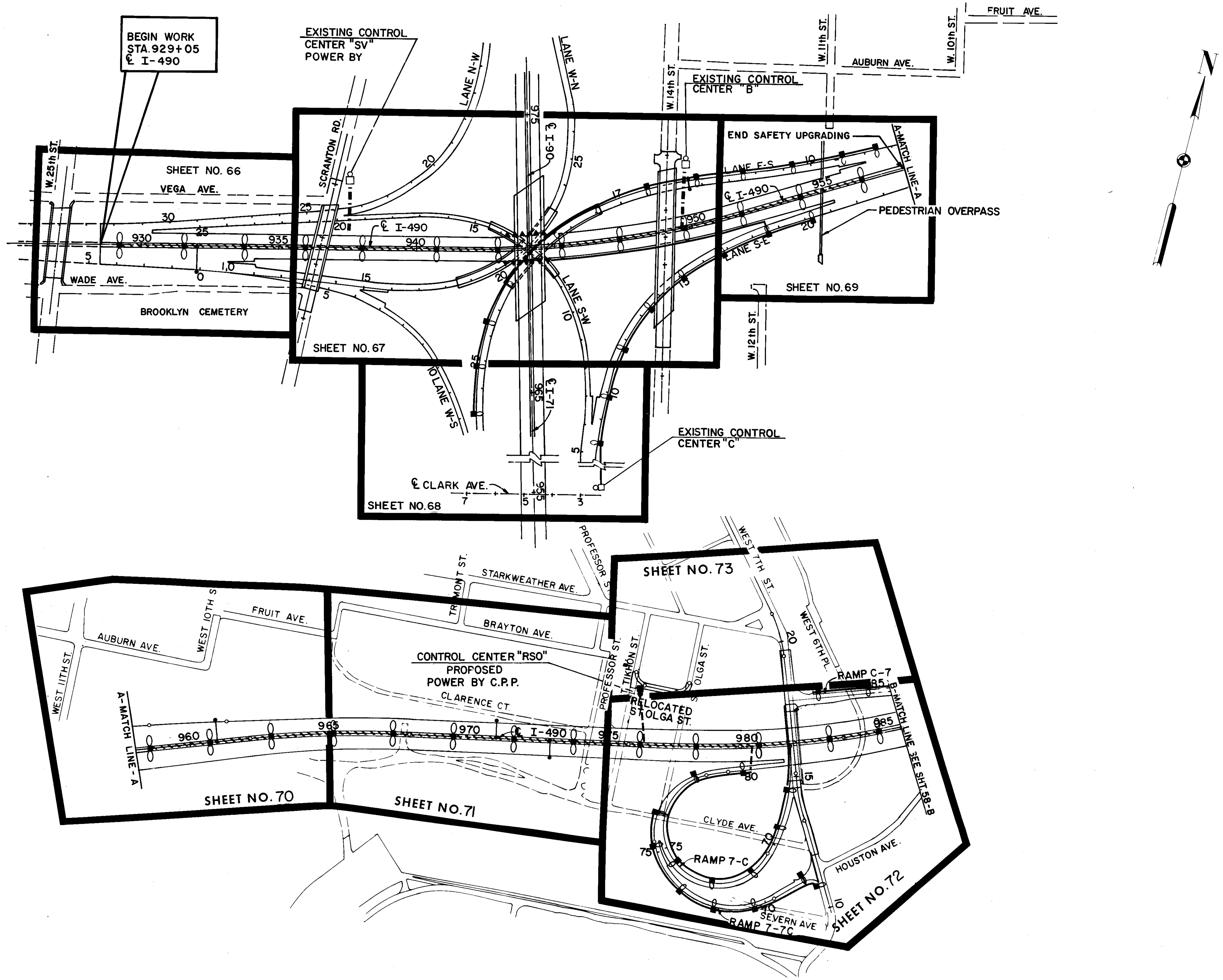
SCALE 1/8" = 1'-0"	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE LWF DATE 4-24-71	CONSULTING ENGINEERS
TRCD VEN DATE 4-25-71	
CKD E.N. DATE 4-25-71	KANSAS CITY CLEVELAND NEW YORK

SCHEMATIC PLAN

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

57
193

CUYAHOGA COUNTY
CUY.— 490–0.27



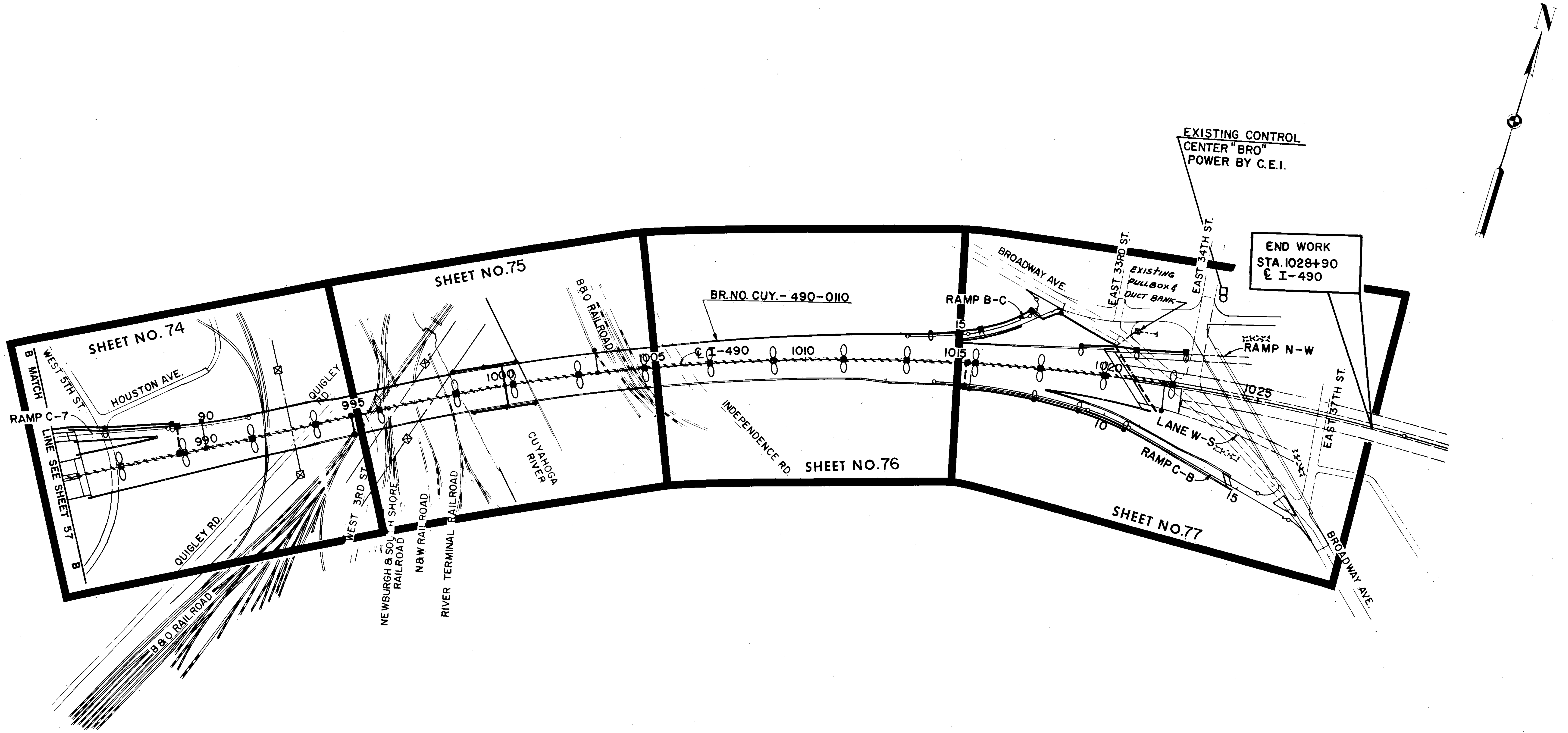
LEGEND

- MEDIAN LIGHT UNIT
- GROUND LIGHT UNIT
- STRUCTURE LIGHT UNIT
- EXISTING LIGHT TOWER
- ROADWAY SIGN
- PROPOSED CONTROL CENTER
- EXISTING CONTROL CENTER
- UNDERPASS LIGHTING
- NAVIGATION LIGHTING

SCALE 1" = 200'   HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE R.D.J. DATE 6-26-86   CONSULTING ENGINEERS
TRCD. ____ DATE ____
CKD. F.E.G. DATE 6-27-86   KANSAS CITY CLEVELAND NEW YORK

SCHEMATIC PLAN

CUYAHOGA COUNTY
CUY- 490- 0.27



SCALE 1" = 200'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE R.D.J. DATE 6-26-86	CONSULTING ENGINEERS
TRCD. ___ DATE ___	KANSAS CITY CLEVELAND NEW YORK
CKD. F.E.G. DATE 6-27-86	

LIGHTING NOTES

SPECIFICATIONS
THESE NOTES ARE SUPPLEMENTAL TO ITEMS 625 AND 713 OF THE STATE OF OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS.

REFERENCE SHALL BE MADE TO STANDARD CONSTRUCTION DRAWINGS LISTED ON THE TITLE SHEET OF THESE PLANS.

GENERAL
THIS PROJECT HAS BEEN DESIGNED ON THE BASIS OF FULL LIGHTING WITH AN AVERAGE ILLUMINATION OF 1.2 FT.-C.S. (INITIAL) AND A MAXIMUM UNIFORMITY RATIO OF 4.0 TO 1 FOR CONVENTIONAL UNITS AND 3.0 TO 1 FOR LIGHT TOWERS.

THE PROJECT WILL RECEIVE 480-VOLT, TWO-WIRE, CONTROLLED SECONDARY SERVICE WITH ONE SIDE GROUNDED, FROM:

CLEVELAND PUBLIC POWER
1201 LAKESIDE AVENUE
CLEVELAND, OHIO 44114
664-3922

AT POWER SERVICES "B", "C", "SV" AND "RSO".

THE PROJECT WILL RECEIVE 480-VOLT, TWO-WIRE, SECONDARY SERVICE WITH ONE SIDE GROUNDED, FROM:

CLEVELAND ELECTRIC ILLUMINATING CO.
55 PUBLIC SQUARE
P.O. BOX 5000
CLEVELAND, OHIO 44101
622-9800

AT POWER SERVICE "BRO".

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

ITEM SPECIAL - PLASTIC CAUTION TAPE
THE LOCATION OF UNDERGROUND DUCT CABLE OR NON-METALLIC CONDUIT, WHEN INSTALLED IN LOCATIONS OTHER THAN THE NORMAL OR ALTERNATE TRENCH ALIGNMENT SHOWN ON STANDARD CONSTRUCTION DRAWING HL-1, SHALL BE MARKED BY THE USE OF A CONTINUOUS IDENTIFYNG TAPE BURIED IN THE TRENCH ABOVE THE LINE. THE IDENTIFYING TAPE SHALL BE AN INERT MATERIAL, APPROXIMATELY 6" WIDE, COMPOSED OF POLYETHYLENE PLASTIC, HIGHLY RESISTANT TO ALKALIS, ACID OR OTHER CHEMICAL COMPONENTS LIKELY TO BE ENCOUNTERED IN SOILS. THE TAPE SHALL BE BRIGHT YELLOW WITH IDENTIFYING PRINTING "ELECTRIC" IN BLACK LETTERS, ONE SIDE ONLY. TAPES SHALL BE SUPPLIED IN CONTINUOUS ROLLS WITH THE IDENTFYING LETTERING REPEATED CONTINUOUSLY THE FULL LENGTH OF THE TAPE. IDENTIFYING TAPES SHALL BE BURIED IN THE ELECTRIC LINE TRENCH WITH ONE STRIP PLACED APPROXIMATELY DOWN THE CENTERLINE AND LOCATED APPROXIMATELY 8" TO 12" BELOW THE FINAL FINISHED GRADE. THE TAPE SHALL BE PLACED IN THE TRENCH WITH PRINTED SIDE UP AND SHALL BE ESSENTIALLY PARALLEL WITH THE FINISHED SURFACE. THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO INSURE THAT THE TAPE IS NOT PULLED, DISTORTED, OR OTHERWISE MISPLACED IN COMPLETING THE TRENCH BACKFILL. TAPE SHALL BE ALLEN SYSTEM'S, TERRA TAPE, OR EQUAL AS APPROVED BY THE ENGINEER.

THE TAPE SHALL BE PAID FOR PER LINEAR FOOT OF "ITEM SPECIAL - PLASTIC CAUTION TAPE".

625.07 - 713.11 LUMINAIRES
STYLE B LUMINAIRES SHALL HAVE SINGLE RATED 480 VOLT, 200 WATT, INTEGRAL REGULATOR BALLASTS FOR USE WITH HIGH PRESSURE SODIUM LAMPS AND SHALL BE GENERAL ELECTRIC M400, CROUSE HINDS OV-25, ITT AMERICAN 400, OR EQUAL APPROVED BY THE ENGINEER.

STYLE C LUMINAIRES SHALL HAVE SINGLE RATED 480 VOLT, 310 EATT, INTEGRAL REGULATOR BALLASTS AND SHALL BE GENERAL ELECTRIC M-1000, CROUSE HINDS OV-50, ITT AMERICAN 1000, OR EQUAL APPROVED BY THE ENGINEER.

625.07 - 713.13 UNDERPASS LUMINAIRES
UNDERPASS LUMINAIRES SHALL BE HOLOPHANE "UNDERPASS WALLPACK", CROUSE HINDS, OR GENERAL ELECTRIC WL-250 UNDERPASS UNIT OR EQUAL APPROVED BY THE ENGINEER AND SHALL BE FURNISHED WITH AN INTEGRAL FUSE HOLDER AND 10 AMPERE FUSE. THE INTEGRAL HIGH PRESSURE SODIUM BALLAST SHALL BE OF A REGULATOR TYPE RATED FOR 480 VOLTS, 100 WATTS.

MEDIAN LIGHT POLE CABLE CONNECTION
IN JUNCTION BOX BELOW MEDIAN LIGHT POLE CONNECT POLE AND BRACKET CABLE TO CIRCUIT WITH TYPE II AND III CONNECTOR KITS.

713.07 POLYVINYL CHLORIDE PLASTIC CONDUIT
CONDUIT FURNISHED UNDER THIS SPECIFICATION SHALL CONFORM 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.

EXISTING LIGHT POLE AND FOUNDATION, TO BE REMOVED FOR STORAGE
SUPPLEMENTING ITEM 202 OF THE SPECIFICATIONS, THE CONTRACTOR SHALL REMOVE EXISTING ROADWAY LIGHTING UNITS AND/OR FOUNDATION, AND THE ADJACENT PULLBOX WHERE DESCRIBED IN THE PLANS.

FOUNDATIONS TO BE REMOVED MAY BE REMOVED EITHER COMPLETELY OR TO NOT LESS THAN ONE FOOT BELOW FINISHED GRADE. PULLBOXES ARE TO BE ABANDONED IN PLACE IN THE MANNER DESCRIBED IN 202.09 AND BACKFILLED IN ACCORDANCE WITH 202.02.

UPON REMOVAL OF LIGHT POLES ON STRUCTURES, PROTRUDING STRUCTURE CONDUIT SHALL BE TRIMMED AT THE STRUCTURE AND A 3/4" GALVANIZED STEEL OR ALUMINUM COVER PLATE, FITTING THE EXISTING LIGHT POLE MOUNTING BOLT PATTERN, GASKETED OR CAULKED AND INSTALLED OVER THE OPENING. EXCESS BOLT MATERIAL SHALL BE TRIMMED AT THE NUT.

EXISTING LIGHTPOLES SHALL BE REMOVED BY THE CONTRACTOR AND STORED AT A LOCATION DESIGNATED BY THE ENGINEER FOR DISPOSAL BY STATE FORCES AS APPLICABLE

BASIS OF PAYMENT SHALL BE AT THE UNIT PRICE PER EACH:

202 - EXISTING LIGHT POLE FOUNDATIONS, TO BE REMOVED.
SPECIAL - EXISTING LIGHT POLE TO BE REMOVED FOR STORAGE.

INCLUDING ALL LABOR, MATERIAL, EQUIPMENT AND INCIDENTALS TO COMPLETE THE ITEM OF WORK AND ACCEPTED AS SPECIFIED, INCLUDING STORAGE OF LIGHTPOLES.

CONDUIT ON STRUCTURE
EXPANSION FITTINGS FOR CONDUIT ON STRUCTURES SHALL BE OZ TYPE AX-8, CROUSE HINDS TYPE XJ-8, APPLETON TYPE XJ-8 OR EQUAL APPROVED BY THE ENGINEER, FOR BRIDGE NO. CUY-490-0110.

EACH EXPANSION FITTING SHALL HAVE A COPPER EXTERNAL BONDING JUMPER.

MEDIAN LIGHT POLE FOUNDATIONS, STRUCTURE MOUNTED
THE MEDIAN LIGHT POLE FOUNDATION, STRUCTURE MOUNTED SHALL BE AS DETAILED ON SHEET 188 AND ADDITIONAL INFORMATION FROM HL-22.

PAYMENT FOR FORMING, TYPE S CONCRETE AND REINFORCING IS INCLUDED UNDER THE RESPECTIVE STRUCTURE PAY ITEMS. PAYMENT FOR ANCHOR BOLTS, CONDUIT AND JUNCTION BOXES IS INCLUDED UNDER THE RESPECTIVE 625 PAY ITEMS.

REMOVAL OF EXISTING WIRE IN FOUNDATION AND CONDUIT
THIS ITEM SHALL CONSIST OF REMOVING EXISTING WIRE IN LIGHT POLE FOUNDATION CONDUIT ELLS AND IN THE CONDUIT IN THE ROAD AND ON STRUCTURES IN ORDER TO MAKE ROOM FOR INSTALLING NEW 5000V CABLE.

THE COST FOR REMOVAL OF EXISTING WIRE IN FOUNDATIONS AND CONDUITS SHALL BE CONSIDERED TO BE INCIDENTAL TO THE COST FOR THE VARIOUS ELECTRICAL ITEMS BID ON THIS PROJECT.

POWER SERVICE
CONTRACTOR SHALL INSTALL AND WIRE CONTROL CENTER EQUIPMENT PER HL-15 AND HL-16, AS APPLICABLE, AND AS DETAILED ON SHEET 80.

EXISTING POWER SERVICES AT "B", "C" AND "SV" SHALL BE DISCONNECTED AND REMOVED. NEW POWER SERVICE(S) SHALL BE INSTALLED AS SHOWN ON THE PLANS AND DETAILED ON SHEET 80. PAYMENT SHALL INCLUDE REMOVAL OF EXISTING CONDUITS BETWEEN EXISTING SERVICE AND FIRST PULLBOX TO A DEPTH OF 1-FT BELOW GRADE, REMAINDER SHALL BE ABANDONED IN PLACE.

PADLOCKS AND KEYS
PADLOCKS FURNISHED SHALL BE EITHER BRASS OR BRONZE, EQUAL TO MASTER NO. 4RKA OR WILSON BOHANNAN 660A, AND SHALL BE KEYED IN ACCORDANCE WITH SPECIFICATION 631.08, PARAGRAPH PAYMENT SHALL BE INCLUDED IN THE BID FOR THE ITEM(S) BEING LOCKED.

ESTIMATED QUANTITIES
SPECIFIC LOCATIONS AND USAGE OF ESTIMATED QUANTITIES SET UP ON 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. PAYMENT SHALL BE AT THE UNIT BID PRICE FOR THE RESPECTIVE ITEM.

DRAINS FOR PULL BOXES
REFERENCE IS MADE TO STANDARD DRAWING HL-10 FOR DETAILS OF DRAINING PULL BOXES. DRAINS FOR PULL BOXES SHALL BE USED AS DIRECTED BY THE ENGINEER AND SHALL BE PROVIDED WHERE THE LENGTH REQUIRED FOR A SATISFACTORY OUTLET DOES NOT EXCEED APPROXIMATLEY 20 FEET. AN ESTIMATED QUANTITY OF "250 LINEAR FEET OF ITEM 603, 4" CONDUIT TYPE E, 707.15" IS INCLUDED IN THE LIGHTING GENERAL SUMMARY FOR THIS PURPOSE.

625.02 HAZARDOUS MATERIALS
NO MATERIAL FURNISHED UNDER THIS SPECIFICATION SHALL CONTAIN POLYCHLORINATED BIPHENYLS (PCBs). TRANSFORMERS, BALLASTS AND CAPACITORS SHALL BE MARKED "NO PCBs" IN ACCORDANCE WITH FEDERAL ENVIRONMENTAL PROTECTION AGENCY REGULATION 40 CFR 761.

EXPANSION JOINT AND GROUNDS
THE EXPANSION JOINTS AND GROUNDS SHOWN ARE NOT TO BE CONSIDERED COMPLETE IN NUMBER OR BETTER THAN APPROXIMATE IN LOCATION.

TRANSITION JUNCTION BOX
THE UNIT PRICE BID FOR EACH "ITEM 625, TRANSITION JUNCTION BOX, AS PER PLAN", SHALL BE FULL COMPENSATION FOR FURNISHING AND PLACING THE JUNCTION BOX AS SHOWN IN THE DETAIL ON SHEET , AND ALL LABOR, MATERIAL, EQUIPMENT, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK AS SPECIFIED.

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 DESIGNS, VARIATIONS FROM THESE DETAILS WILL BE ACCEPTABLE, AS APPROVED BY THE ENGINEER.

LEGEND

EF — MEDIAN MOUNTED LIGHT POLE, DESIGN A8B847.5 D, ANCHOR BASE, TWO EIGHT FOOT BRACKET ARMS WITH STYLE C LUMINAIRE, WITH 310 WATT HPS LAMP, TYPE III DISTRIBUTION, EF INDICATES EXISTING FOUNDATION.

EXISTING LIGHT UNIT - NO WORK.

LIGHT POLE DESIGN ATON17, ON ALUMINUM TRANSFORMER BASE, POLE TOP MOUNTED UNDERPASS LIGHTING UNIT WITH 100 WATT HPS LAMP.

LIGHT POLE DESIGN AT18B36.7 ON EXISTING FOUNDATION WITH ALUMINUM TRANSFORMER BASE, 18 FT. BRACKET ARM, STYLE B LUMINAIRE WITH 200WATT, HPS LAMP, TYPE II DISTRIBUTION

LIGHT POLE DESIGN ST15B36.7 ON EXISTING BRIDGE WITH STEEL TRANSFORMER BASE, 15FT. BRACKET ARM, STYLE B LUMINAIRE WITH 200 WATT HPS LAMP, TYPE II DISTRIBUTION.

LIGHT POLE DESIGN AT 8B36.7 ON EXISTING FOUNDATION WITH ALUMINUM TRANSFORMER BASE, 8FT BRACKET ARM, STYLE B LUMINAIRE WITH 200 WATT HPS LAMP, TYPE II DISTRIBUTION.

LIGHT POLE DESIGN AT10B36.7 ALUMINUM TRANSFORMER BASE, 10FT. BRACKET ARM, STYLE B LUMINAIRE WITH 200 WATT HPS LAMP, TYPE II DISTRIBUTION.

LIGHT POLE DESIGN AT15B36.7 ALUMINUM TRANSFORMER BASE, 15FT. BRACKET ARM, STYLE B LUMINAIRE WITH 200 WATT HPS LAMP, TYPE II DISTRIBUTION.

LIGHT POLE DESIGN ST10B36.7 ON BRIDGE WITH STEEL TRANSFORMER BASE, 10FT BRACKET ARM, STYLE B LUMINAIRE WITH 200WATT HPS LAMP, TYPE II DISTRIBUTION.

NAVIGATION LIGHT, 180° RED.

NAVIGATION LIGHT, 360° GREEN.

B — STRUCTURE GROUNDING SYSTEM PER HL-7.

TRAFFIC LANE AND DIRECTION.

OVERHEAD SIGN.

CANTILEVER SIGN.

EXISTING ROADWAY LIGHTING UNIT AND/OR FOUNDATION TO BE REMOVED FOR STORAGE, AS PER PLAN.

CONCRETE PULLBOX, PER HL-10.

MEDIAN PULLBOX.

EXISTING PULLBOX 18"

PARAPET JUNCTION BOX, TYPE II

MEDIAN TRANSITION JUNCTION BOX, PER DETAIL ON SHEET 79.

CONTROL CENTER, NEW

CONTROL CENTER, EXISTING.

EXISTING, 2" CONDUIT.

NEW, 2" CONDUIT ON STRUCTURE.

DUCT CABLE 1½"⌀, 713.03 IN 24" DEEP TRENCH, AWG PER PLAN.

3"⌀ CONDUIT, 713.04.

4"⌀ PVC CONDUIT IN MEDIAN BARRIER, WITH 713.02 CABLE SIZE AND NUMBER PER PLAN.

EXISTING UNDERGROUND DUCTS, PROPOSED WIRE SIZE AND NUMBER PER PLAN.

Ⓔ — EXPANSION JOINT

LIGHTING QUANTITIES GENERAL SUMMARY

* This entire sheet is "State-Local (Non-Federal)" participation

LINE NO.	STRUCTURES CUY-490-0030 SHEET NO. 67 PARTICIPATION	ROADWAY SHEET NO. 66 PARTICIPATION	67	68	69	82	83	84	85	COST PARTICIPATION	GRAND TOTAL *	ITEM	UNIT	DESCRIPTION	REFERENCE LETTER	LINE NO.
														SAFETY UPGRADING		
1																1
2																2
3						1	35	4	12		52	202	EA.	EXISTING LIGHT POLE, TO BE REMOVED FOR STORAGE		3
4						1	14		6		21	202	EA	EXISTING LIGHT POLE FOUNDATION, TO BE REMOVED		4
5																5
6																6
7	3										3	625	EA.	LIGHT POLE DESIGN ST 15B36,7		7
8			7	4	6						17	625	EA.	LIGHT POLE DESIGN AT 18B36,7		8
9		3	7		3						13	625	EA.	LIGHT POLE DESIGN A8BB 47.5 D		9
10			14								14	625	EA.	LIGHT POLE DESIGN AT ON17		10
11			14													11
12			10	4	6						20	625	EA.	LUMINAIRE, STYLE B TYPE II, 200 WATT HPS 713.11		12
13											14	625	EA.	LIGHT POLE FOUNDATION 24" x 6'		13
14		6	14		6						26	625	EA.	LUMINAIRE, STYLE C TYPE III, 310 WATT HPS 713.11		14
15			14								14	625	EA.	LUMINAIRE, UNDERPASS, 100 WATT HPS, 713.13		15
16											1	625	EA.	GLARE SHIELD, STYLE B, 713.11		16
17			2672	596	919						4187	625	L.F.	TRENCH 24" DEEP		17
18																18
19		1270	4935	300	1180						7685	625	L.F.	NO. 4 AWG 5000 VOLT DISTRIBUTION CABLE		19
20			2695	620	945						4260	625	L.F.	1-1/2" DUCT-CABLE WITH 2 NO. 4 AWG 5000 VOLT CABLES		20
21		420	2710	480	1140						4750	625	L.F.	NO. 10 AWG POLE AND BRACKET CABLE		21
22		3	31	4	9						47	625	EA.	CONNECTOR KIT, TYPE II		22
23	3	3	31	4	9						47	625	EA.	CONNECTOR KIT, TYPE III		23
24	3	2	3								8	625	EA.	CONNECTOR KIT, TYPE VII B		24
25			12	2	2						16	625	EA.	CABLE SPLICING KIT		25
26			100	50							150	625	L.F.	CONDUIT, 3" 713.04		26
27											LUMP	625	LUMP	HIGH VOLTAGE TEST		27
28			Y													28
29				1							1	625	EA.	POWER SERVICE "B"		29
30			1								1	625	EA.	POWER SERVICE "C"		30
31											1	625	EA.	POWER SERVICE "SV"		31
32																32
33																33
34																34
35																35
36																36
37																37
38																38
39																39
40																40
41																41
42																42
43																43
44																44
45																45
46																46
47																47
48																48
49																49
50																50
51																51
52																52
53																53
54																54
55																55
56																56
57																57
58																58
59																59
60																60

HOWARD, NEEDLES, TAMMEN & BERGENDOFF | HNTB
CONSULTING ENGINEERS
KANSAS CITY

MADE R.D.J. DATE 6-26-86
CHECKED E.E.G. DATE 6-27-86

Rev. 9-22-86

LIGHTING QUANTITIES GENERAL SUMMARY

I-490-3(11)28

LINE NO.	STRUCTURES CUY-490-0110 SHEET NO. 74 PARTICIPATION	CUY-490-0110 75	CUY-490-0110 76	CUY-490-0110 77	ROADWAY SHEET NO. 70 PARTICIPATION	71	72	73	74		75	77	COST PARTICIPATION	GRAND TOTAL	ITEM	UNIT	DESCRIPTION	REFERENCE LETTER	LINE NO.
1																	NEW CONSTRUCTION		1
2																			2
3												4		4	625	EA.	LIGHT POLE DESIGN AT15B36.7		3
4							2							2	625	EA.	LIGHT POLE DESIGN AT 10B36.7		4
5	2		1	4										7	625	EA.	LIGHT POLE DESIGN ST 10B36.7		5
6	4	5	4	3	3	5	5					1		30	625	EA.	LIGHT POLE DESIGN A8B47.5D		6
7							14							14	625	EA	LIGHT POLE DESIGN AT8B36.7		7
8							2					4		6	625	EA.	LIGHT POLE FOUNDATION, 24" X 6' DEEP		8
9												1		1	625	EA.	MEDIAN LIGHT POLE FOUNDATION		9
10	2		1	4			16					4		27	625	EA.	LUMINAIRE, STYLE B TYPE II, 200 WATT HPS 713.11		10
11	8	10	8	6	6	10	10					2		60	625	EA	LUMINAIRE, STYLE B TYPE III, 310 WATT HPS 713.11		11
12							2					5		17	625	EA.	GROUND ROD, 713.16		12
13	4	6							1		1	2		4	625	EA.	PULL BOX, CONCRETE 713.08		13
14	7	8	4	4								2		25	625	EA.	MEDIAN PULL BOX		14
15																			15
16							245		40		10	780		1075	625	L.F.	TRENCH, 24" DEEP		16
17																			17
18												300		300	625	L.F.	CONDUIT, 3" 713.04		18
19	1390	1650	1098	1300										5438	625	L.F.	CONDUIT, 2" 713.04		19
20																			20
21																			21
22	3440	2000	2200	2945	1280	2000	9230	120	300			2810		26325	625	L.F.	NO. 4 AWG 5000 VOLT DISTRIBUTION CABLE		22
23	760	2800	2380	1710	420	700	2300					1790		13050	625	L.F.	NO. 10 AWG POLE AND BRACKET CABLE		23
24							255		40		10	810		1115	625	L.F.	1-1/2" DUCT-CABLE WITH 2 NO. 4 AWG 5000 VOLT CABLES		24
25																			25
26																			26
27	6	5	4	7	3	5	21					5		56	625	EA.	CONNECTOR KIT, TYPE II		27
28	6	5	4	7	3	5	21					5		56	625	EA.	CONNECTOR KIT, TYPE III		28
29	8	6		4	2	4	6					8		38	625	EA.	CONNECTOR KIT, TYPE VII B		29
30							8		2		2	10		22	625	EA.	CABLE SPLICING KIT		30
31												230		230	SPEC	L.F	PLASTIC CAUTION TAPE		31
32																			32
33																			33
34								1						1	625	EA	POWER SERVICE "RSO"		34
35														1					35
36	1													1	625	EA.	STRUCTURE GROUNDING SYSTEM FOR BRIDGE NO. CUY-490-0110		36
37	1	9		1										11	625	EA.	STRUCTURE JUNCTION BOX - TYPE II		37
38									1			1		2	625	EA.	MEDIAN TRANSITION JUNCTION BOX, AS PER PLAN		38
39																			39
40	4		2	8										14	625	EA.	LIGHT POLE ANCHOR U-BOLTS FOR STRUCTURE (PARAPET MOUNTED)		40
41	16	20	16	12										64	625	EA.	LIGHT POLE ANCHOR U-BOLTS FOR STRUCTURE (MEDIAN MOUNTED)		41
42		4												4	SPEC	EA.	NAVIGATION LIGHT, 180 DEGREE RED, AS PER PLAN		42
43		2												2	SPEC	EA.	NAVIGATION LIGHT, 360 DEGREE, GREEN, AS PER PLAN		43
44																			44
45														500	603	L.F.	4" CONDUIT, TYPE E, 707.15		45
46														LUMP	625	LUMP	HIGH VOLTAGE TEST		46
47																			47
48																			48
49																			49
50																			50
51																			51
52																			52
53																			53
54																			54
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56																			56
57																			57
58																			58
59																			59
60																			60

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KANSAS CITY

MADE R.D.J. DATE 6-26-86
CHECKED F.E.G. DATE 6-27-86

Rev. 9-22-86

LIGHTING QUANTITIES SUB-SUMMARY

CUYAHOGA COUNTY
CUY.-290-0.27

				625																											SPEC.	625						SPECIAL		625	625
REFERENCE LINE	STATION	STATION	SIDE	LIGHT POLE DESIGN AT 18B36.7	LIGHT POLE DESIGN AT 8B36.7	LIGHT POLE DESIGN AT 0N17	LIGHT POLE DESIGN A8BB475D	LIGHT POLE DESIGN ST 15B36.7	LIGHT POLE DESIGN ST 10B36.7	LIGHT POLE FOUNDATION 24" X 6' DEEP	MEDIAN LIGHT POLE FOUNDATION	LUMINAIRE, STYLE B TYPE III, 200 W, HPS, 713.11	LUMINAIRE, STYLE B TYPE II, 200W, HPS, 713.11	LUMINAIRE STYLE C TYPE III, 310W, HPS, 713.11	LUMINAIRE, UNDERPASS 100 W, HPS	GLARE SHIELD, STYLE B, 713.11	GROUND ROD, 713.16	PULL BOX CONCRETE 713.08	MEDIAN PULL BOX	TRENCH, 24" DEEP	LIGHT POLE DESIGN AT10B36.7	CONDUIT, 3" - 713.04	CONDUIT, 2" - 713.04	NO. 4 AWG 500 VOLT DISTRIBUTION CABLE	1-1/2" DUCT-CABLE WITH 2 #4 AWG 5000 VOLT DISTRIBUTION CABLES	NO. 10 AWG POLE AND BRACKET CABLE	CONNECTOR KIT TYPE II	CONNECTOR KIT TYPE III	CONNECTOR KIT TYPE VII - B	CABLE SPLICING KIT	PLASTIC CAUTION TAPE	POWER SERVICE "RSO", "B", "C", "SV"	STRUCTURE GROUNDING SYSTEM FOR BRIDGE NO. CUY-490-0110	MEDIAN TRANSITION JUNCTION BOX	STRUCTURE JUNCTION BOX, TYPE II	LIGHT POLE ANCHOR U-BOLTS FOR STRUCTURE (PARAPET MOUNTED)	LIGHT POLE ANCHOR U-BOLTS FOR STRUCTURE (MEDIAN MOUNTED)	NAVIGATION LIGHT, 180 DEGREE, RED	NAVIGATION LIGHT, 360 DEGREE, GREEN	GROUND ROD, 713.16	LIGHT POLE DESIGN AT15B36.7
				Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	L.F.	Ea.	L.F.	L.F.	L.F.	L.F.	L.F.	Ea.	Ea.	Ea.	Ea.	L.F.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.
1	SHEET 66																																								
2	929+15	935+50	℄				3							6										1270		420	3	3	2												
3																																									
4	TOTAL	SHEET 66					3							6										1270		420	3	3	2												
5																																									
6	SHEET 67																																								
7	935+50	942+90	℄				4							8										1480		560	4	4													
8	937+50	POWER SERVICE "SV"	℄/Lt																			50		750					2			1									
9	945+19	951+00	℄				3							6										1165		420	3	3													
10	949+70	POWER SERVICE "B"	℄/Lt																			50		580					2	6		1									
11	943+40	949+70	Lt/Rt			14				14					14					1270					1270	565	14	14													
12	949+70		℄/Rt																					120					2	2											
13	949+70	951+00	RT.																	130					130																
14	LANE SE 11+00	LANE SE 17+00	RT.	4									4							600					600	480	4	4													
15	LANE ES 13+50	LANE ES 17+72	RT.	2									2							422					435	240	2	2		2											
16	BR. CUY-490-0030							3					3			1								1090		330	3	3													
17	LANE ES 22+50	LANE ES 25+00	RT.	1									1							250					260	120	1	1		2											
18																																									
19	TOTAL	SHEET 67		7		14	7	3		14			10	14	14	1				2672		100		5,135	2695	2710	31	31	6	12		2									
20																																									
21	SHEET 68																																								
22	LANE ES 25+00	LANE ES 26+81	RT.	2									2							181					190	240	2	2													
23	LANE SE 6+85	LANE SE 11+00	RT.	2									2							415					430	240	2	2		2											
24	POWER SERVICE "C"																					50		100								1									
25																																									
26																																									
27	TOTAL	SHEET 68		4									4							596		50		100	620	480	4	4		2		1									
28																																									
29	SHEET 69																																								
30	951+00	956+38	℄				3							6										1080		420	3	3													
31	951+00	952+55	RT.																	155					155					2											
32	952+55	LANE SE 18+55	Rt/Rt																					100																	
33	LANE SE 18+55	LANE SE 20+29	RT.	2									2							174					180	240	2	2													
34	LANE ES 13+50	957+11	LT.	4									4							590					610	480	4	4													
35																																									
36																																									
37	TOTAL	SHEET 69		6			3						6	6						919				1180	945	1140	9	9		2											
38																																									
39	SHEET 70																																								
40	958+60	965+00	℄				3							6										1280		420	3	3	2												
41																																									
42	TOTAL	SHEET 70					3							6										1280		420	3	3	2												
43																																									
44	SHEET 71																																								
45	965+00	975+00	℄				5							10										2000		700	5	5	4												
46																																									
47	TOTAL	SHEET 71					5							10										2000		700	5	5	4												
48																																									
49																																									
50																																									
51																																									
52																																									
53																																									
54																																									
55	GRAND TOTAL	THIS SHEET		17		14	21	3		14			20	42	14	1				4187		150		10965	4260	5870	55	55	14	16		3									

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY
HNTB

MADE R.D.J. DATE 6-26-86
CHECKED F.E.G. DATE 6-27-86

LIGHTING QUANTITIES SUB-SUMMARY

CUYAHOGA COUNTY
CUY.-290-0 27

REFERENCE LINE	STATION	STATION	SIDE	625																											SPEC.	625						SPECIAL		625	625
				LIGHT POLE DESIGN AT 18B36.7	LIGHT POLE DESIGN AT 8B36.7	LIGHT POLE DESIGN AT 0N17	LIGHT POLE DESIGN A8B8475D	LIGHT POLE DESIGN ST 15B36.7	LIGHT POLE DESIGN ST 10B36.7	LIGHT POLE FOUNDATION 24" X 6' DEEP	MEDIAN LIGHT POLE FOUNDATION	LUMINAIRE, STYLE B TYPE III, 200 W, HPS, 713.11	LUMINAIRE, STYLE B TYPE II, 200W, HPS, 713.11	LUMINAIRE STYLE C TYPE III, 310W, HPS, 713.11	LUMINAIRE, UNDERPASS 100 W, HPS	GLARE SHIELD, STYLE B, 713.11	GROUND ROD, 713.16	PULL BOX CONCRETE 713.08	MEDIAN PULL BOX	TRENCH, 24" DEEP	LIGHT POLE DESIGN AT10B367	CONDUIT, 3" - 713.04	CONDUIT, 2" - 713.04	NO. 4 AWG 500 VOLT DISTRIBUTION CABLE	1-1/2" DUCT-CABLE WITH 2 #4 AWG 5000 VOLT DISTRIBUTION CABLES	NO. 10 AWG POLE AND BRACKET CABLE	CONNECTOR KIT TYPE II	CONNECTOR KIT TYPE III	CONNECTOR KIT TYPE VII - B	CABLE SPLICING KIT	PLASTIC CAUTION TAPE	POWER SERVICE "RSO", "B" "C", "SV"	STRUCTURE GROUNDING SYSTEM FOR BRIDGE NO. CUY-490-0110	MEDIAN TRANSITION JUNCTION BOX	STRUCTURE JUNCTION BOX, TYPE II	LIGHT POLE ANCHOR U-BOLTS FOR STRUCTURE (PARAPET MOUNTED)	LIGHT POLE ANCHOR U-BOLTS FOR STRUCTURE (MEDIAN MOUNTED)	NAVIGATION LIGHT, 180 DEGREE, RED	NAVIGATION LIGHT, 360 DEGREE, GREEN	GROUND ROD, 713.16	LIGHT POLE DESIGN AT15B36.7
				Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	L.F.	Ea.	L.F.	L.F.	L.F.	L.F.	L.F.	Ea.	Ea.	Ea.	Ea.	L.F.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	Ea.	
1	SHEET 72																																								
2	975+00	985+00	℄				5							10										4000		700	5	5													
3	976+25	MATCH LINE	℄/Lt.																					680					4												
4	980+10	RAMP 7C 80+00	℄/Rt.																					210					2	2											
5																																									
6	RAMP 7C 68+00	RAMP 7C 80+00	RT.		8								8											2560		800	8	8		4											
7																																									
8	W. 7th ST. 10+93	RAMP 7-7C 68+50	Lt./Lt.		1								1											80		100	1	1		2											
9	RAMP 7-7C 68+49	RAMP 7-7C 68+50	Rt./Lt.		1								1											80		100	1	1													
10	RAMP 7-7C 68+50	RAMP 7C 76+98	LT.		4								4											1620		400	4	4													
11																																									
12																																									
13	RAMP C7 82+55	RAMP C7 85+00	LT.							2			2				2			245	2				255	200	2	2													
14																																									
15	TOTAL	SHEET 72			14		5			2			16	10			2			245	2			9230	255	2300	21	21	6	8											
16																																									
17	SHEET 73																																								
18	MATCH LINE	CONTROL CENTER "RSO"	LT.																					120								1									
19																																									
20	TOTAL	SHEET 73																						120								1									
21																																									
22	SHEET 74																																								
23	985+00	985+75	℄																					300																	
24	RAMP C7 85+00	RAMP C7 85+40	LT.															1		40					40					2				1							
25	BR. CUY-490-	0110					4		2				2	8					7				1390	3440		760	6	6	8				1		1	4	16				
26																																									
27	TOTAL	SHEET 74					4		2				2	8				1	7	40			1390	3740	40	760	6	6	8	2			1	1	1	4	16			4	
28																																									
29	SHEET 75																																								
30	BR. CUY-490-	0110					5							10					8				1650	2000		2800	5	5	6						9		20	4	2		
31																																									
32	TOTAL	SHEET 75					5							10					8				1650	2000		2800	5	5	6						9		20	4	2		
33	SHEET 76																																								
34	1014+92	1015+00	Lt.															1		10					10					2											
35	BR. CUY-490-	0110					4		1				1	8					4				1098	2200		2660	4	4								2	16			6	
36	TOTAL	SHEET 76					4		1				1	8				1	4	10			1098	2200	10	2660	4	4		2						2	16			6	
37																																									
38	SHEET 77																																								
39	BR-CUY-490-0110						3		4				4	6					4				1300	2945		1620	7	7	4					1	1	8	12				
40	1020+50	1022+51.13	℄				1				1			2			1		2					430		200	1	1	8												
41	1020+85	RAMP NW 20+40	℄/Rt.															1				130		520		260				2											
42	RAMP NW 17+93	RAMP NW 20+40	RT.							2			2				2			250	2				250	200	2	2													2
43	RAMP NW 20+40	CONTROL CENTER "BRO"	RT.																	50		100		1860		930				6											
44	RAMP NW 20+40	RAMP BC 18+28	Rt./Lt.															1		230					230					2	230										
45	RAMP BC 18+28	RAMP BC 17+60	Rt./Lt.							1			1				1				1	70			80	100	1	1													1
46	1015+00	RAMP BC 17+60	Lt.							1			1				1			250	1				250	100	1	1													1
47																																									
48	TOTAL	SHEET 77					4		4	4	1		8	8			5	2	6	780	4	300	1300	5755	810	3410	12	12	12	10	230			1	1	8	12				
49																																									
50																																									
51																																									
52																																									
53																																									
54	GRAND TOTAL THIS SHEET				14		22		7	6	1		27	44			7	4	25	1075	6	300	5438	23045	1115	11930	48	48	32	22	230	1	1	2	11	14	64	4	2	10	4
55	GRAND TOTAL SHTS 63 & 64			17	14	14	43	3	7	6	1		47	86	14	1	7	4	25	5262	6	300	5438	34,010	5375	17800	103	103	46	38	230	4	1	2	11	14	64	4	2	10	4

HOWARD, NEEDLES, TAMMEN & BERGENDOFF HNTB
CONSULTING ENGINEERS
KANSAS CITY

MADE RDJ. DATE 6-26-86
CHECKED F.E.G. DATE 6-27-86

LIGHTING REMOVAL SUB-SUMMARY

FHWA REGION	STATE	PROJECT	
5	OHIO		

65/193

CUYAHOGA COUNTY
CUY- 490-0.27

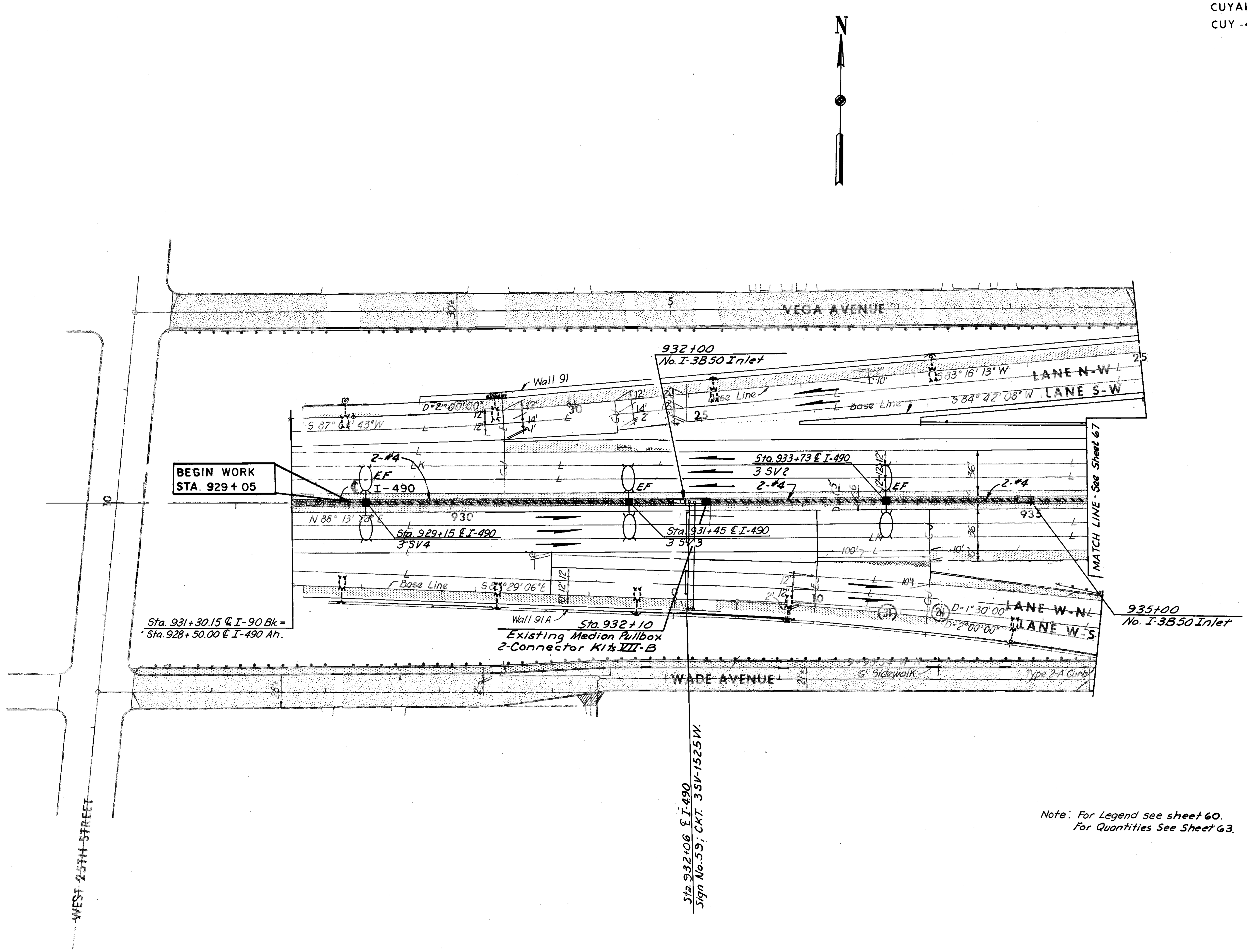
REFERENCE LINE	STATION	STATION	SIDE	202 Existing Light Pole To Be Removed For Storage Ea.	202 Existing Foundation To Be Removed Ea.			
1	SHEET 82							
2	934+27	935+50	RT.	1	1			
3								
4	TOTAL	SHEET 82		1	1			
5								
6	SHEET 83							
7	937+41	937+51	LT.		1			
8	937+51	C.C."B"	LT.	10	5			
9	935+50	951+00	RT.	15	8			
10	LANE ES 13+50	LANE ES 25+00	RT.	6				
11	LANE SE 11+00	LANE SE 17+00	RT.	4				
12								
13	TOTAL	SHEET 83		35	14			
14								
15	SHEET 84							
16	LANE ES 25+00	LANE ES 27+41	RT.	2				
17	LANE SE 6+85	LANE SE 11+00	RT.	2				
18								
19	TOTAL	SHEET 84		4				
20								
21	SHEET 85							
22	952+57	954+69	LT.	3	3			
23	951+00	952+57	RT.	1	1			
24	LANE SE 18+55	957+11	RT.	4	2			
25	LANE ES 13+50	957+11	RT.	4				
26								
27	TOTAL	SHEET 85		12	6			
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								
54								
55	GRAND TOTAL	SHEET		52	21			

SCALE —
MADE R.D.J. DATE 6-26-86
TRCD. ____ DATE ____
CKD. F.E.G. DATE 6-27-86

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

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY-490-0.27



Note: For Legend see sheet 60.
For Quantities See Sheet 63.

SCALE 1" = 50'
MADE R.D.L. DATE 6-26-86
TRCD. ____ DATE ____
CKD. F.E.G. DATE 6-27-86

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

LIGHTING PLAN
STA. 929+15 TO STA. 935+50.00
I-490

FED RD DIVISION	STATE	PROJECT	
2	OHIO		

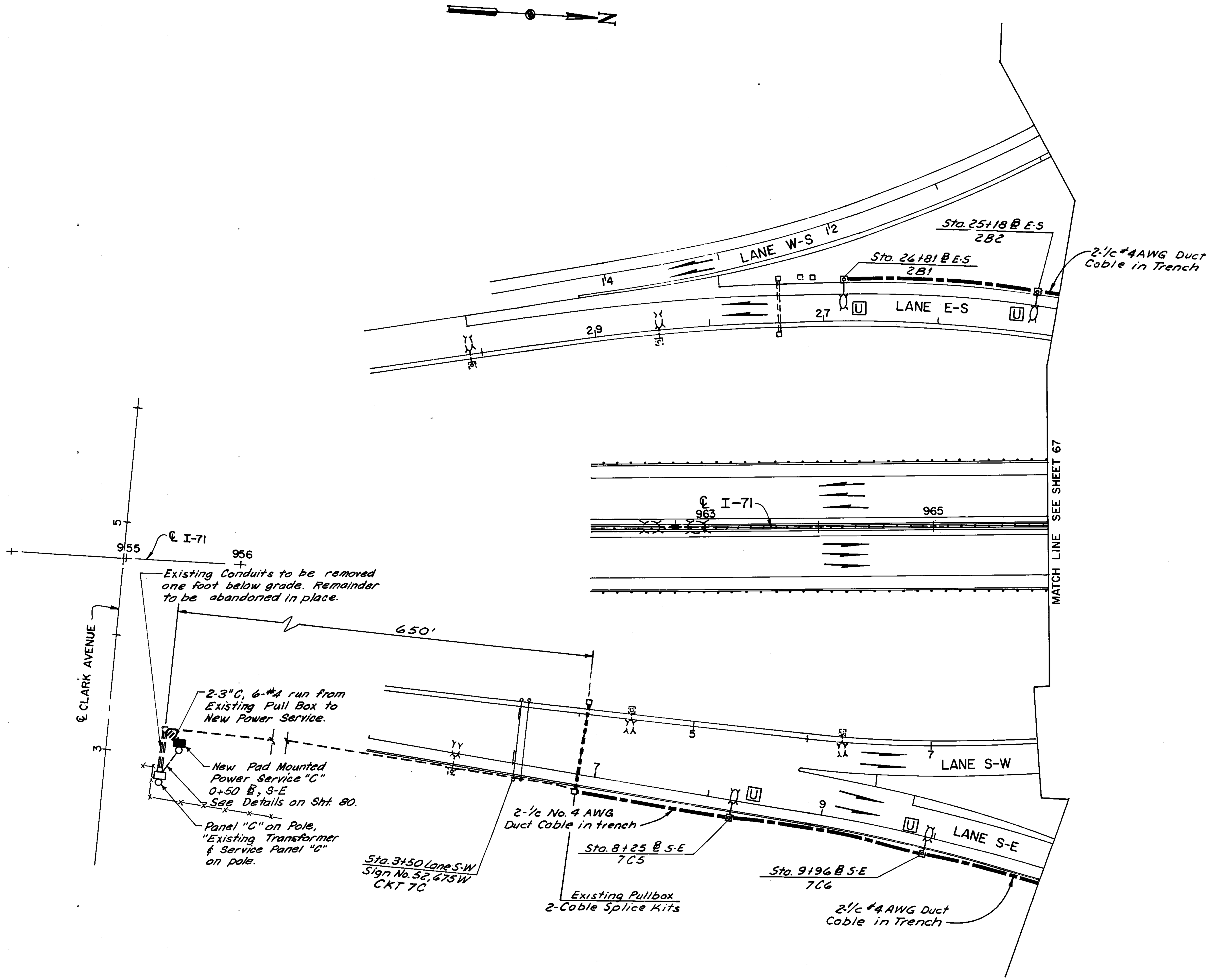
67/193

CUYAHOGA COUNTY
CUY-490-0.27

SCALE 1" = 50'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF	
MADE R.O. DATE 6-26-86	CONSULTING ENGINEERS	
TRCD. DATE	KANSAS CITY CLEVELAND NEW YORK	
CKD. F.E.G. DATE 6-27-86		

LIGHTING PLAN
STA. 935+50.00 TO STA. 951+00.00
I-490

CUYAHOGA COUNTY
CUY- 490- 0.27

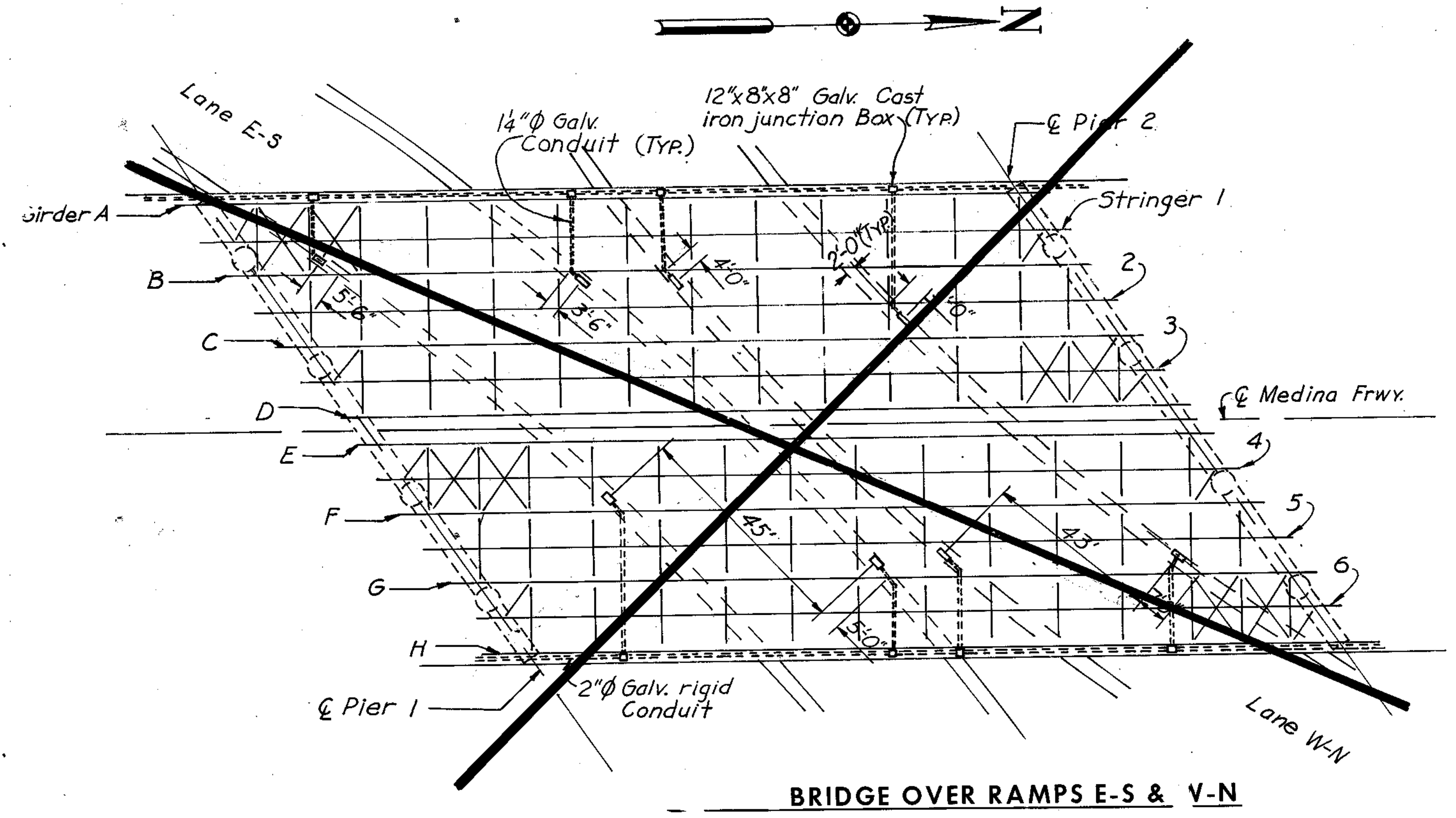


SCALE 1" = 50'
MADE RDJ. DATE 6-26-86
TRCD. ____ DATE ____
CKD. F.E.G. DATE 6-27-86

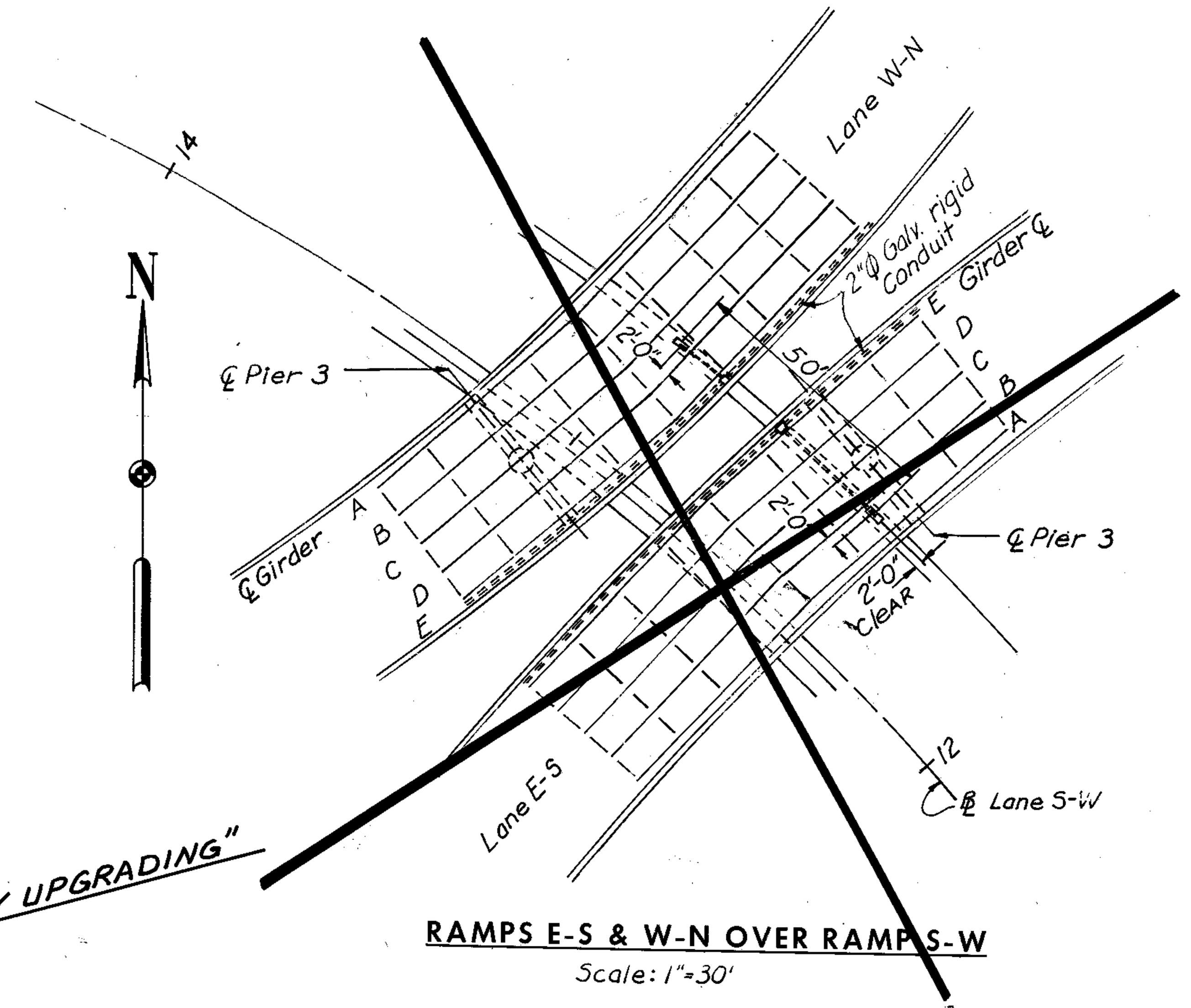
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

LIGHTING PLAN
I-490 LANE S-E AND LANE E-S

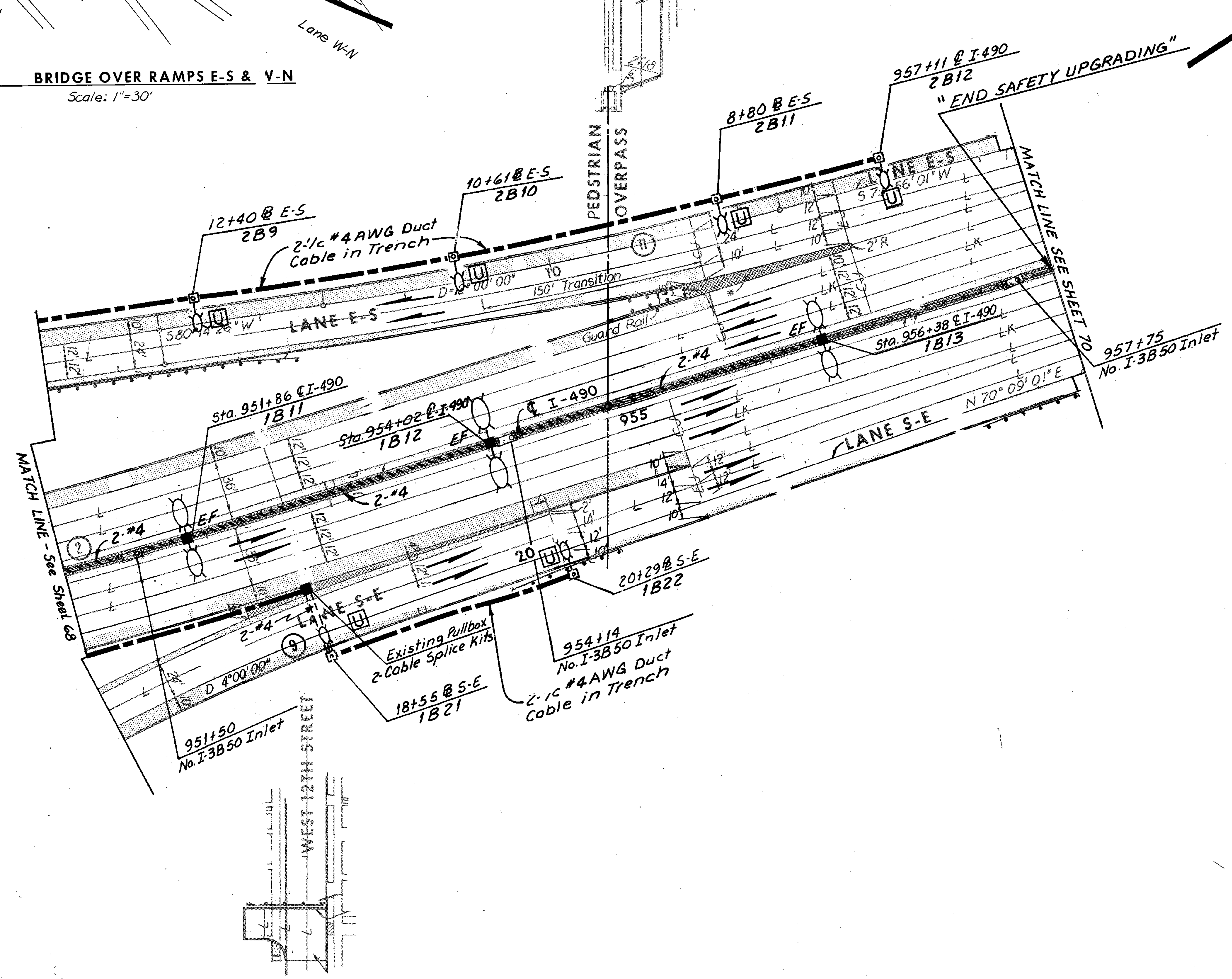
CUYAHOGA COUNTY
CUY-490-0.27

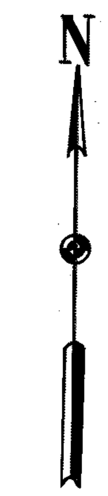


BRIDGE OVER RAMPS E-S & W-N
Scale: 1"=30'



RAMPS E-S & W-N OVER RAMP S-W
Scale: 1"=30'





Note:
. For Legend see sheet 60.
For Quantities See Sheet 63.

SCALE 1"=50'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE R.D.J. DATE 6-26-86	CONSULTING ENGINEERS
TRCD. DATE	
CKD. F.E.G. DATE 6-27-86	KANSAS CITY CLEVELAND NEW YORK

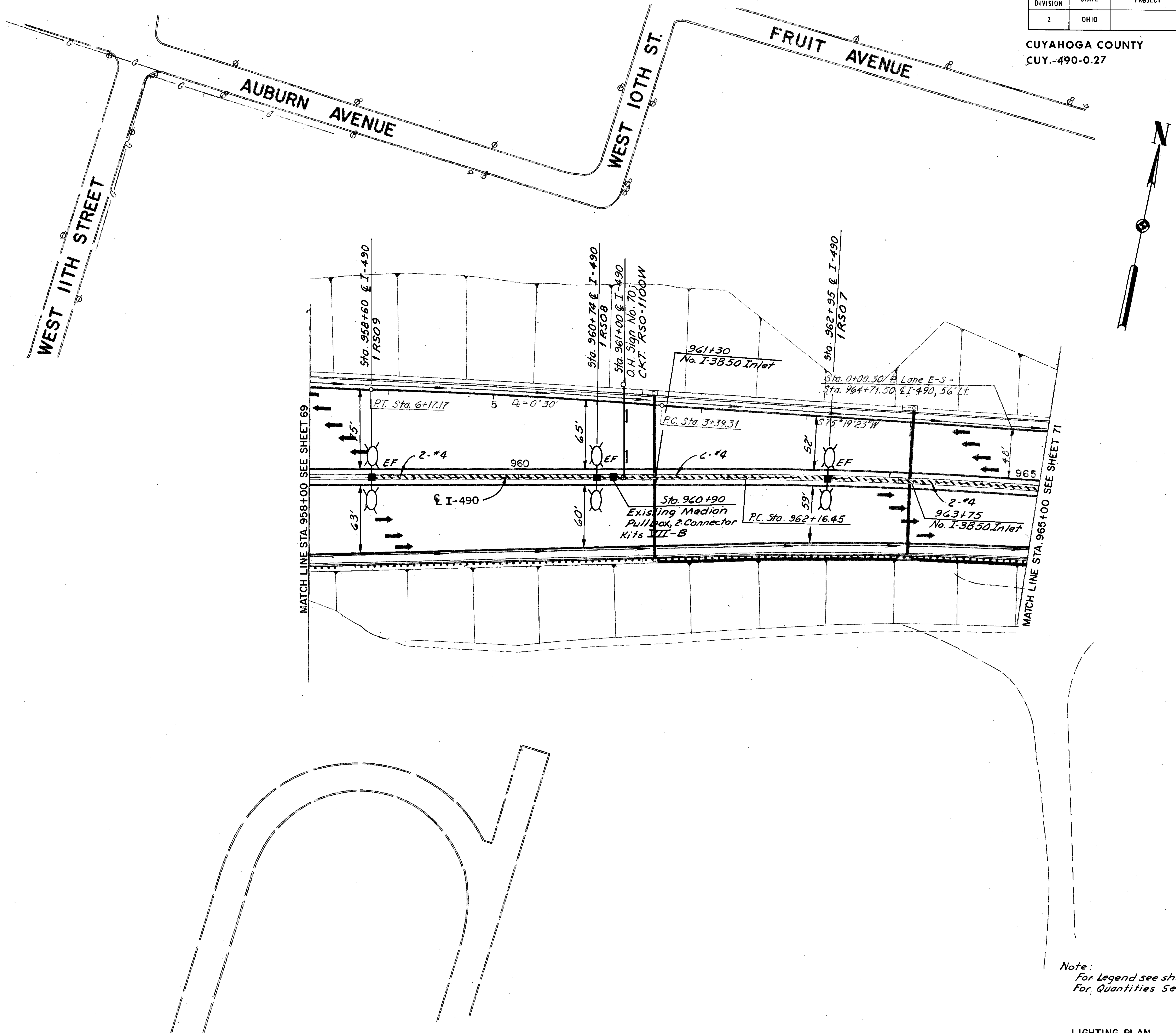
LIGHTING PLAN
STA. 951+00.00 TO STA. 958+00.00
I-490

910

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

70/193

CUYAHOGA COUNTY
CUY.-490-0.27



Note:
For Legend see sheet 60.
For Quantities See Sheet 63.

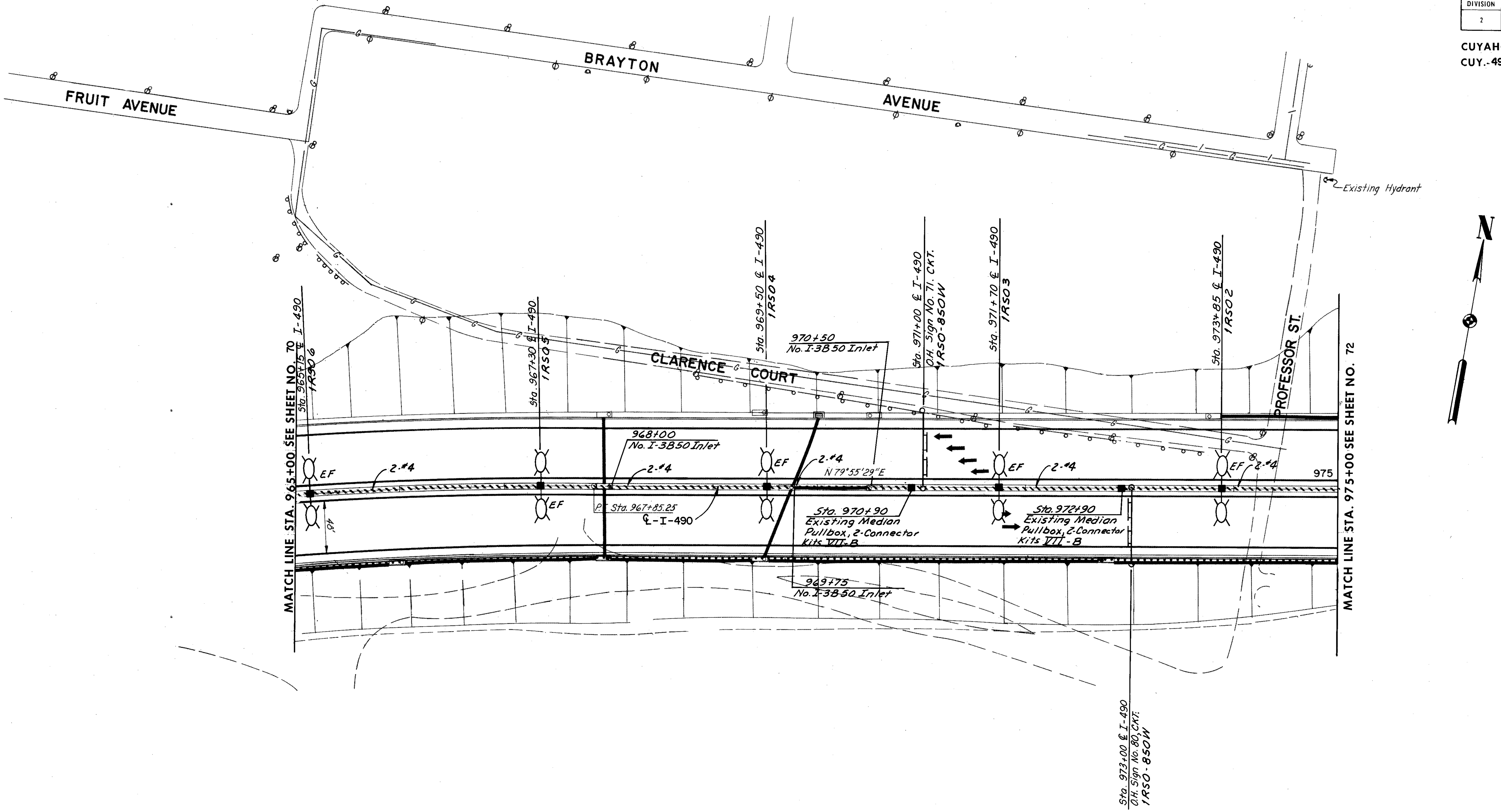
SCALE 1" = 50'
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
MADE R.D.J. DATE 6-26-86
TRCD. DATE
CKD. F.E.G. DATE 6-27-86

LIGHTING PLAN
STA. 958+00 TO STA. 965+00
I-490

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

71/193

CUYAHOGA COUNTY
CUY.-490-0.27



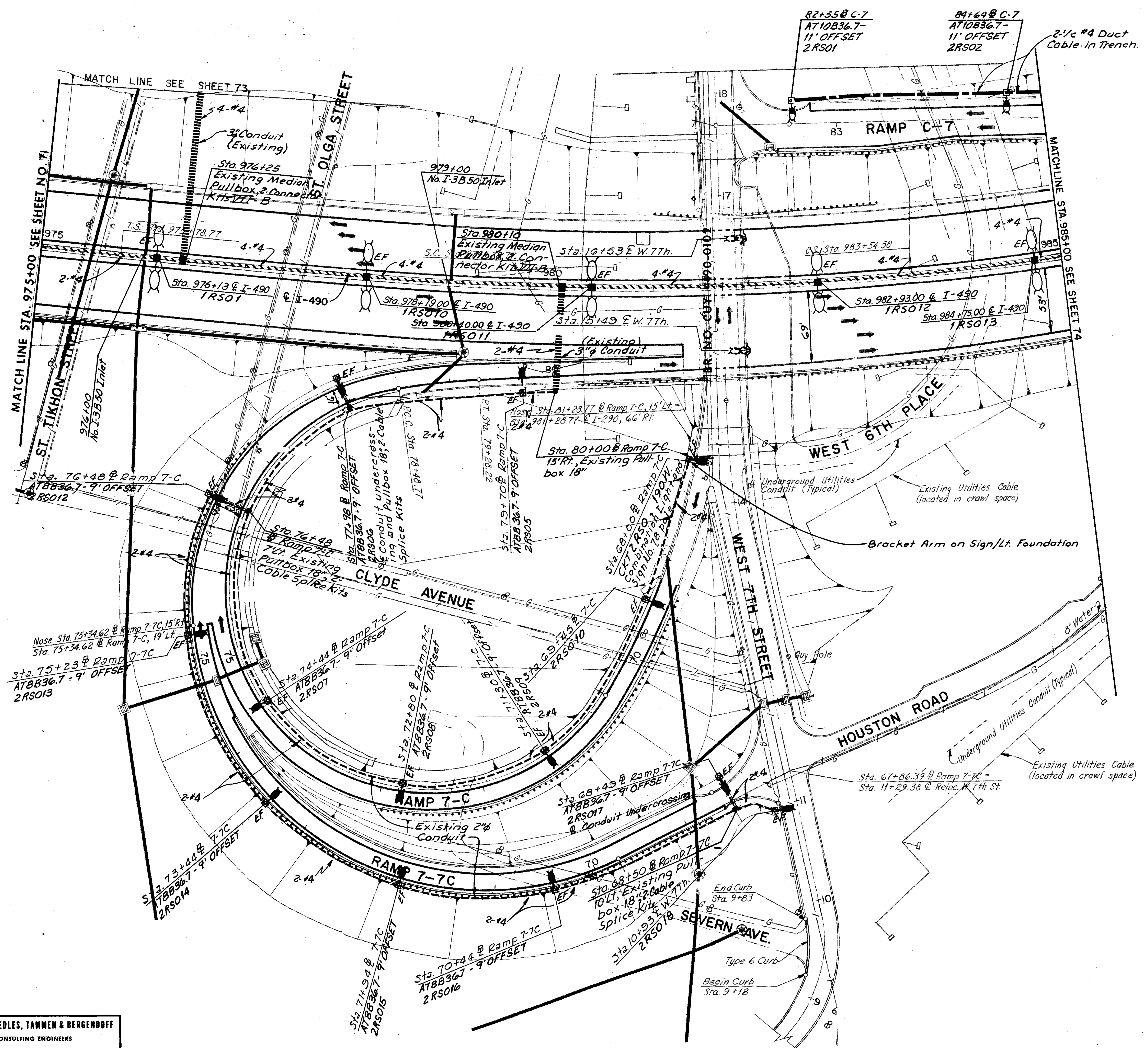
Note: For Legend see sheet 60.
For Quantities See Sheet 63.

SCALE 1" = 50'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE R.D.J. DATE 6-26-86	CONSULTING ENGINEERS
TRCD. ____ DATE ____	
CKD. F.E.G. DATE 6-27-86	KANSAS CITY CLEVELAND NEW YORK

LIGHTING PLAN
STA.965+00 TO STA.975+00
I-490

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY.-490-0.27



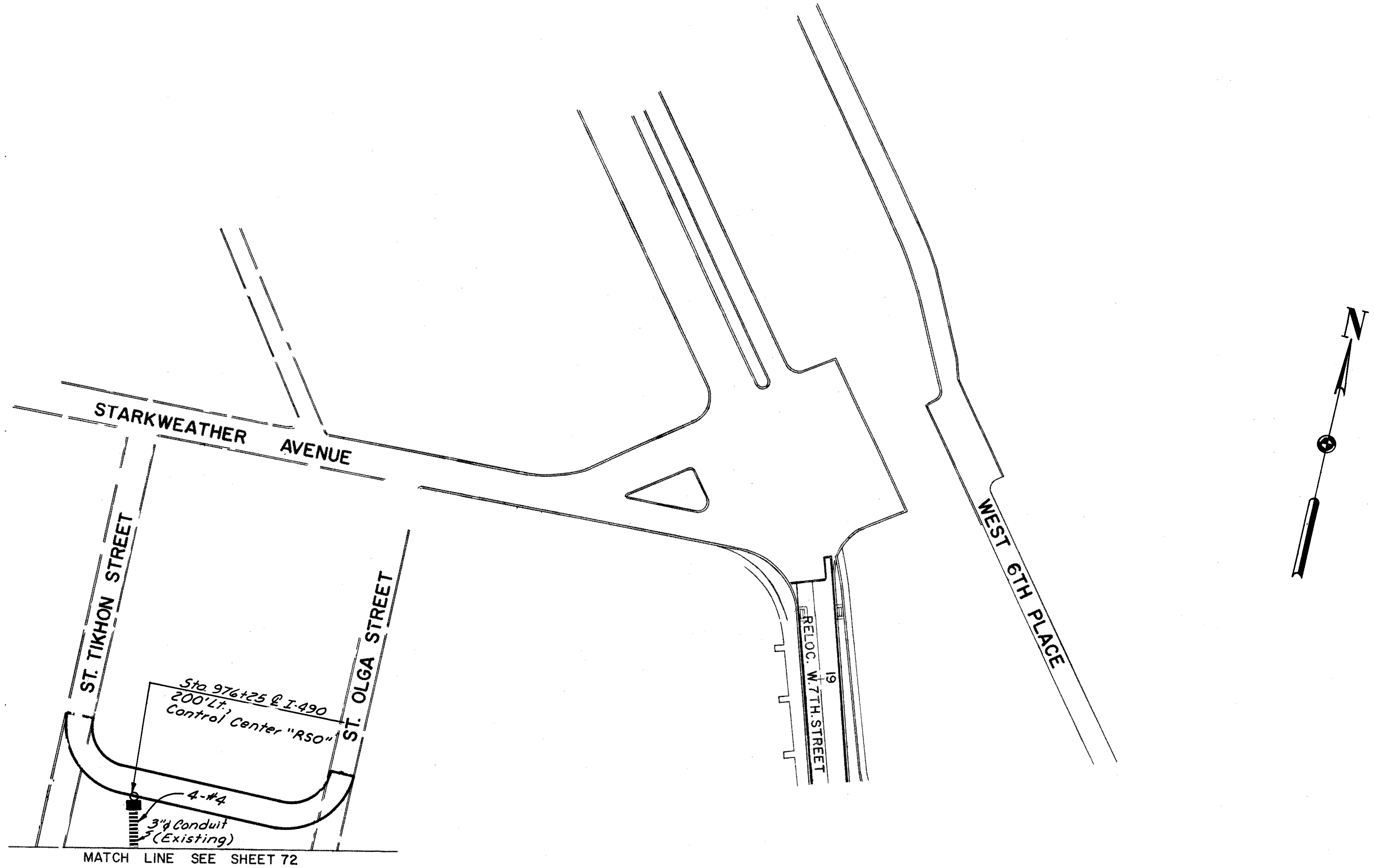
Note: For Legend see sheet 60.
For Quantities see sheet 64.

SCALE 1" = 50'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE R.D.J. DATE 6-6-86	CONSULTING ENGINEERS
TRCD. ____ DATE ____	
CKD. F.E.G. DATE 6-27-86	KANSAS CITY CLEVELAND NEW YORK

LIGHTING PLAN
STA. 975+00 TO STA. 985+00
I-490

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY.-490-0.27



Note: For Legend see sheet 60.
For Quantities see sheet 64.

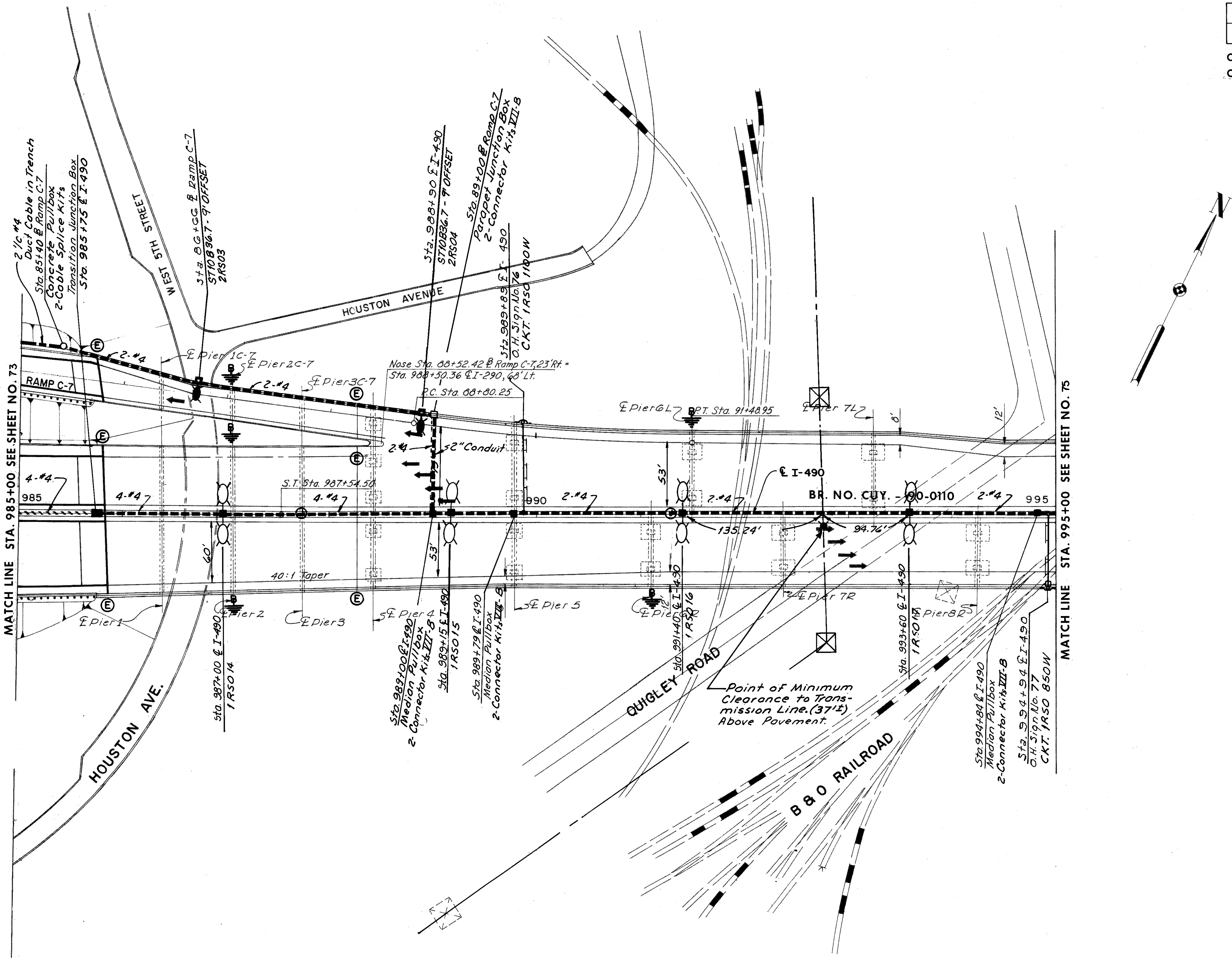
SCALE 1" = 50' HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE R.D.J. DATE 6-26-86 CONSULTING ENGINEERS
TRCD. ____ DATE ____
CKD. E.E.Q. DATE 6-27-86 KANSAS CITY CLEVELAND NEW YORK

LIGHTING PLAN
ST. TIKHON & ST. OLGA ST.'s

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

74/193

CUYAHOGA COUNTY
CUY-490-0.27



Note: For Legend see sheet 60.
For Quantities see sheet 64.

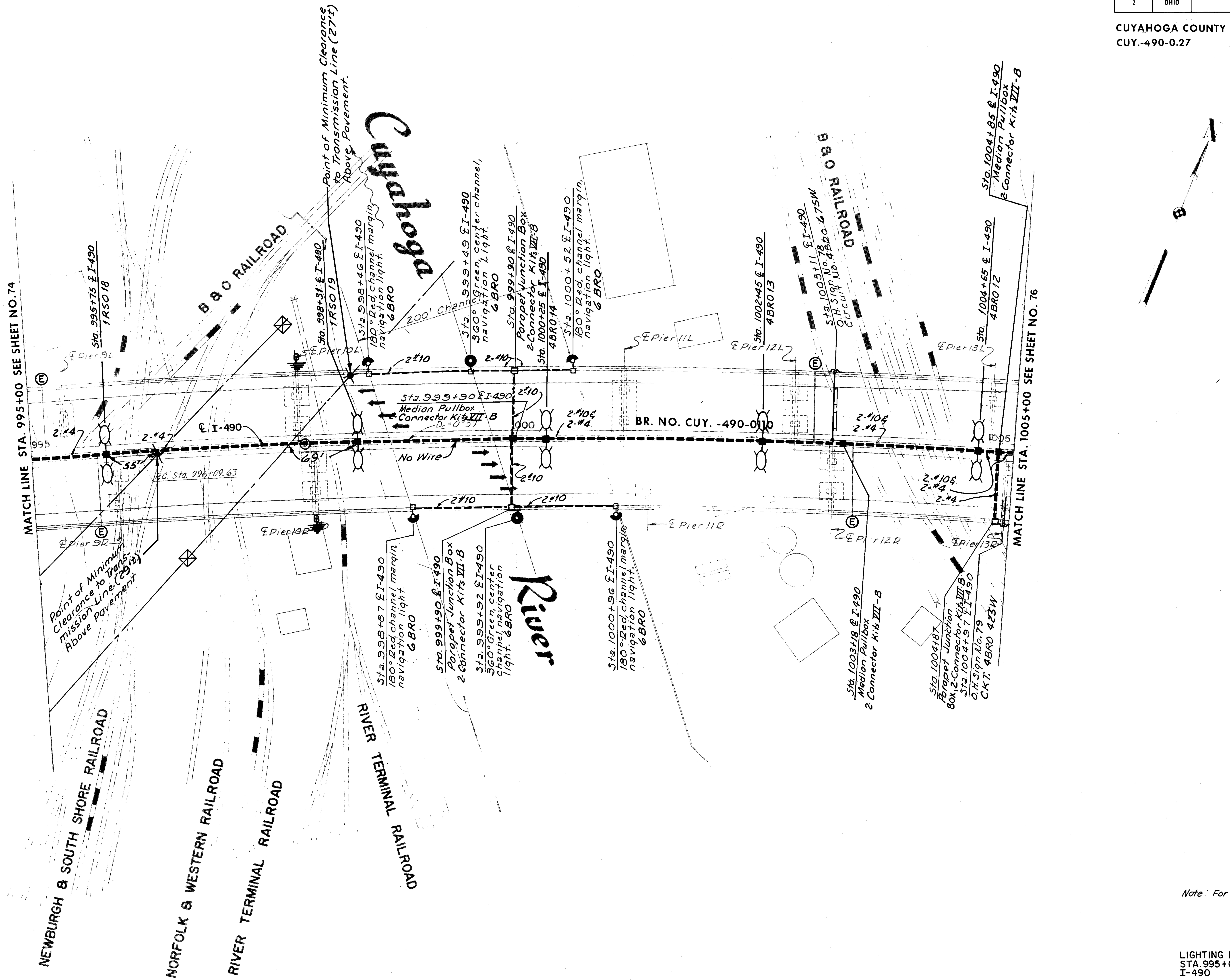
SCALE 1"=50' HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE RDJ DATE 6-26-86 CONSULTING ENGINEERS
TRCD. DATE
CKD. FEG DATE 6-27-86 KANSAS CITY CLEVELAND NEW YORK

LIGHTING PLAN
STA. 985+00 TO STA. 995+00
I-490

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

75/193

CUYAHOGA COUNTY
CUY.-490-0.27



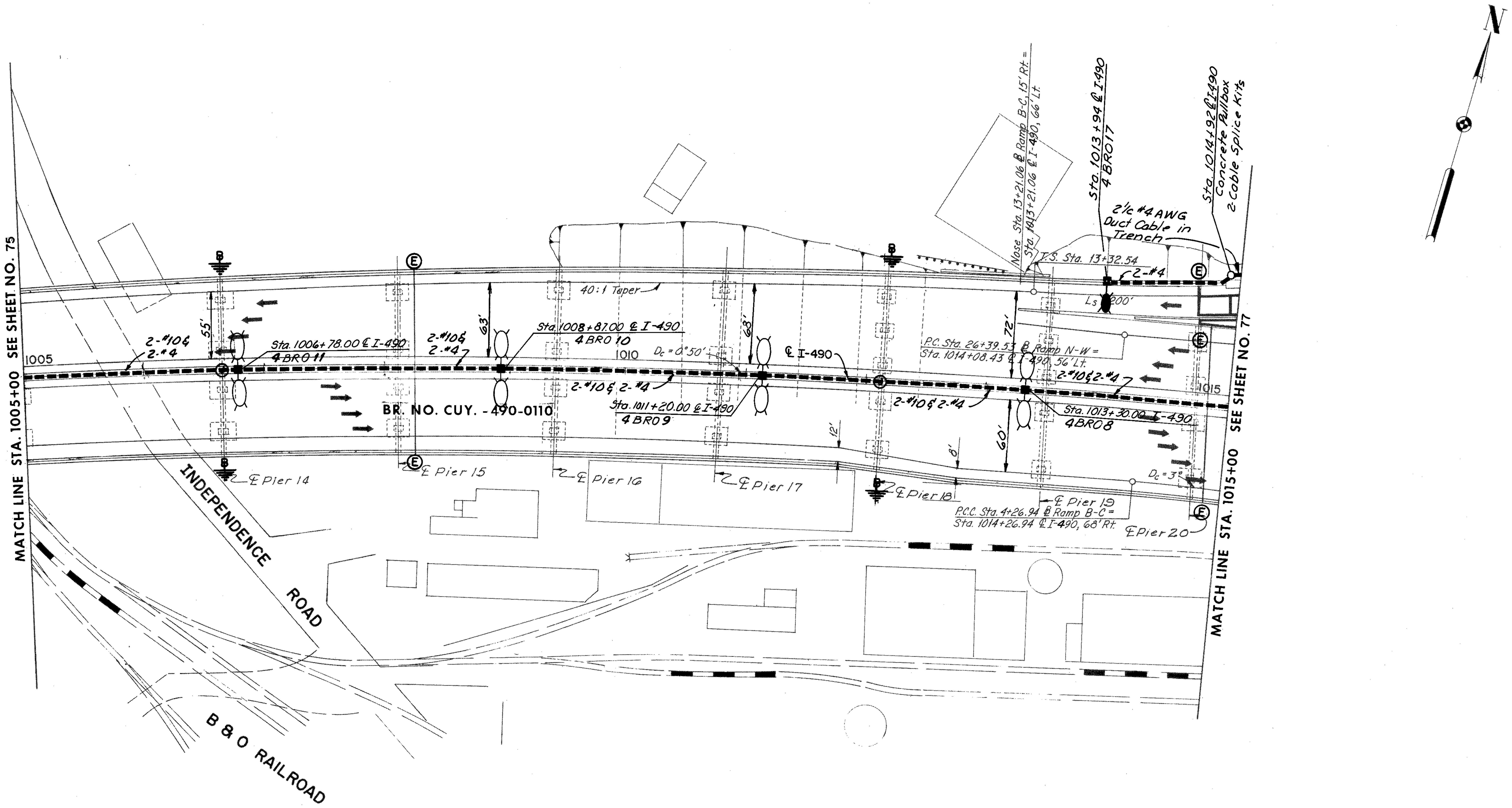
Note: For Legend see sheet 60.

SCALE 1"=50'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF		
MADE RDJ DATE 6-26-86	CONSULTING ENGINEERS		
TRCD. DATE			
CKD. FEG DATE 6-27-86	KANSAS CITY	CLEVELAND	NEW YORK

LIGHTING PLAN
STA. 995+00 TO STA. 1005+00
I-490

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY.-490-0.27



Note: For Legend see sheet 60.

SCALE 1" = 50'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE: RDJ DATE 6-26-86	CONSULTING ENGINEERS
TRCD. ____ DATE ____	
CKD. FEG DATE 6-27-86	KANSAS CITY CLEVELAND NEW YORK

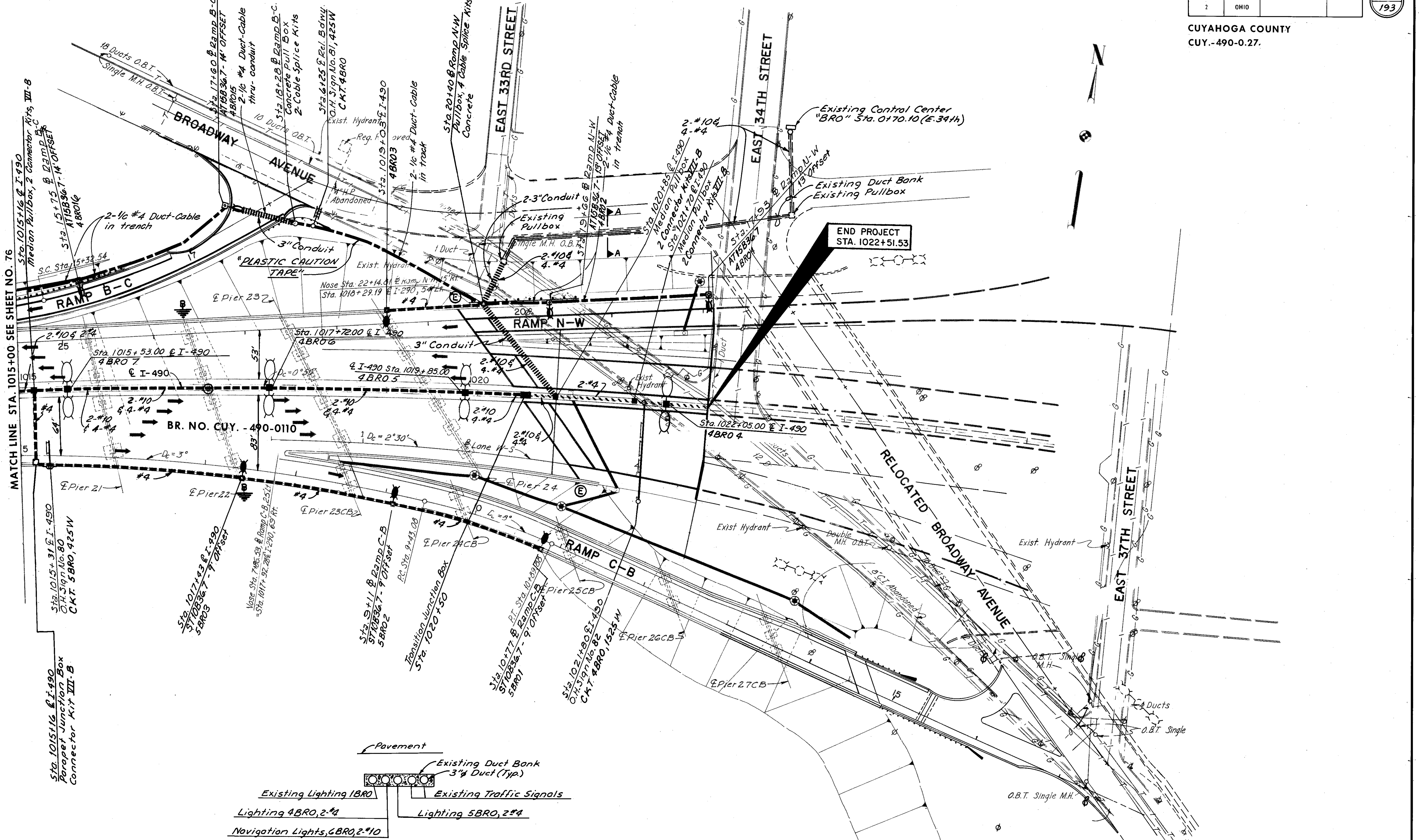
LIGHTING PLAN
STA.1005+00 TO STA.1015+00
I-490

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

77/193

P12

CUYAHOGA COUNTY
CUY.-490-0.27.

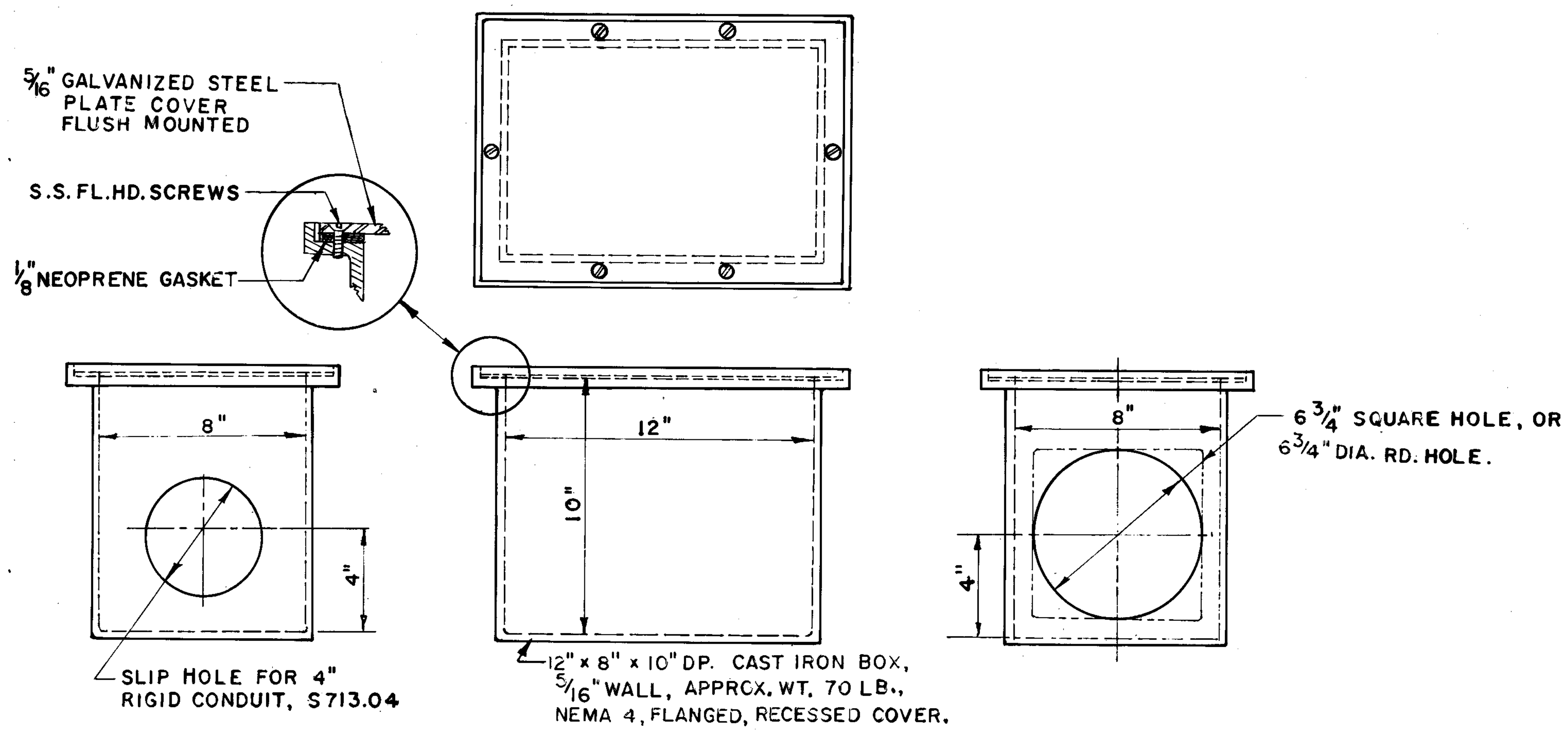


Note: For Legend see sheet 60.
For Quantities see sheet 64.

SCALE 1" = 50'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF		
MADE RDJ DATE 6-26-86	CONSULTING ENGINEERS		
TRCD. ___ DATE ___			
CKD. FEG DATE 6-27-86	KANSAS CITY	CLEVELAND	NEW YORK

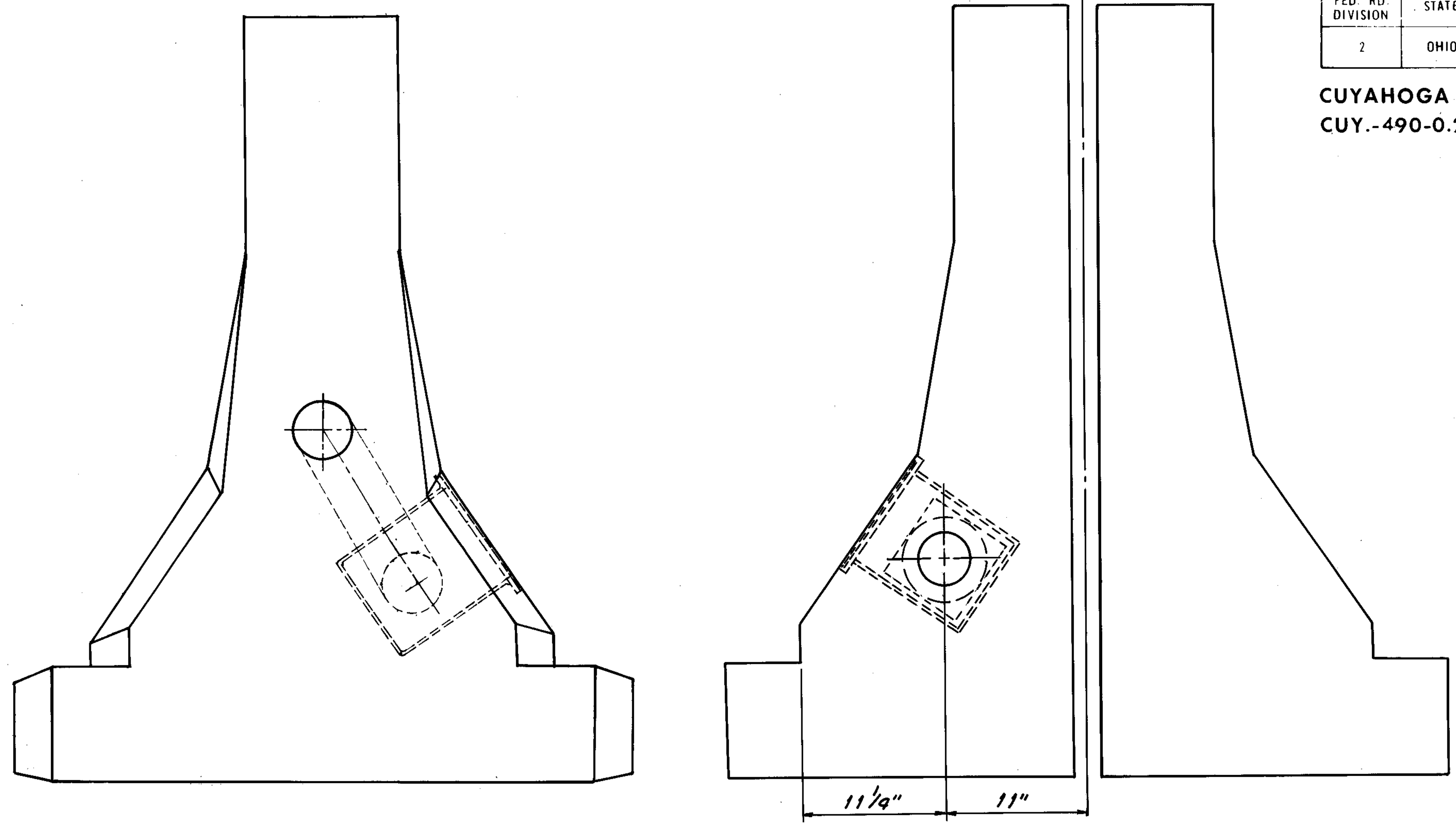
LIGHTING PLAN
STA. 1015+00 TO STA. 1022+51.53
I-490

FHWA REGION 5 | STATE OHIO | PROJECT
78/193
CUYAHOGA COUNTY
CUY- 490-0.27
CIRCUIT No. 3SV
14 310W HPS 11.9A
1 1525W SIGN 3.17A
15.07A (7.23 KVA)
EXISTING CONTROL CENTER "SV"
VEGA AVE.
WADE AVE.
BROOKLYN CEMETERY
W. 25th ST.
SCRANTON RD.
LANE N-W
LANE W-S
LANE W-N
LANE E-S
EXISTING CONTROL CENTER "B"
PEDESTRIAN OVERPASS
UNDERPASS LIGHTS 1B14 THRU 1B20
UNDERPASS LIGHTS 1B1 THRU 1B7
LANE W-N
LANE E-S
LANE S-W
W. 14th ST.
W. 12th ST.
CIRCUIT No. 1B
12 310W HPS 10.2A
14 100W HPS 3.8A
2 200W HPS 1.2A
15.2A
(7.3 KVA)
CIRCUITS No. 2B
12 200W HPS 7.2A
1 500W SIGN 1.1A
8.3A
(4.0 KVA)
CLARK AVE.
WEST 15TH ST.
WEST 14 TH ST.
EXISTING CONTROL CENTER
LANE S-W
LANE S-E
MATCH LINE
BRANCH AVE.
LIGHTS TO BE UPGRADED
EXISTING LIGHTS IN USE
CIRCUIT No. 7C
6-NEW 200W HPS 3.6A
(1.73 KVA)
AUBURN AVE.
WEST 10TH
FRUIT AVE.
STARKWEATHER AVE.
BRAYTON AVE.
PROFESSOR
NEW CONTROL CENTER ON EXISTING CONC. PAD "RSO"
WEST 7TH ST.
WEST 6TH PL.
WEST 5TH ST.
HOUSTON AVE.
CLARENCE CT.
RELOCATED TOLGA ST.
BR. NO. CUY-490-0110
QUIGLEY RD.
WEST 3RD ST.
NEWBURGH & SOUTH SHORE RAILROAD
N&W RAIL ROAD
RIVER TERMINAL RAILROAD
CIRCUIT No. 1RSO
38 310W HPS 32.3A
3 850W SIGN 5.31A
2 1100W SIGN 4.58A
42.2A
(20.25 KVA)
RELOCATED BROADWAY AVE.
EAST 33RD ST.
EAST 34TH ST.
EXISTING CONTROL CENTER "BRO"
EXISTING DUCT BANK
RAMP B-C
RAMP N-W
EAST 37TH ST.
LANE W-S
RAMP C-B
EXISTING LIGHT TOWER
BR. NO. CUY.-490-0110
CIRCUIT No. 5 BRO
3 200W HPS 1.8A
1 425W SIGN 0.89A
2.69A (1.29 KVA)
NEW CONTROL CENTER "RSO" W/EXIST. CONC. PAD
LEGEND
MEDIAN LIGHT UNIT
GROUND LIGHT UNIT
STRUCTURE LIGHT UNIT
EXISTING 3" CONDUIT
EXISTING 4" CONDUIT
2" RIGID CONDUIT
NEW 3" CONDUIT
ROADWAY SIGNS
EXIST. CONC. PAD w/ CONTROL CENTER
EXISTING CONTROL CENTER
UNDERPASS LIGHTS
NAVIGATION LIGHTS
NEW CONTROL CENTER
ST. TIKHON ST.
RELOCATED STOLGA ST.
RAMP C-7
CLYDE AVE.
RAMP 7-C
SEVERN AVE
RAMP 7-7C
B&O RAILROAD
CIRCUIT No. 2 RSO
18 200W HPS 10.8A
1 190W SIGN .4A
11.2A (5.37 KVA)
SCALE 1" = 200'
MADE R.D.L. DATE 6-26-86
TRCD. DATE
CKD. F.E.G. DATE 6-27-86
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
NAVIGATION LIGHTS 6BRO
B&O RAILROAD
INDEPENDENCE RD.
CUYAHOGA RIVER
CIRCUIT No. 4 BRO
22 310W HPS 18.7A
6 200W HPS 3.6A
1 1525W SIGN 3.17A
1 425W SIGN 0.89A
1 675W SIGN 1.4A
27.76A (13.33 KVA)
CIRCUIT No. 6BRO
NAVIGATION LIGHTS
6 250W INC. 3.13A
(1.5KVA-MAX.)
(2.4KVA-Connected)
CIRCUIT MAPS



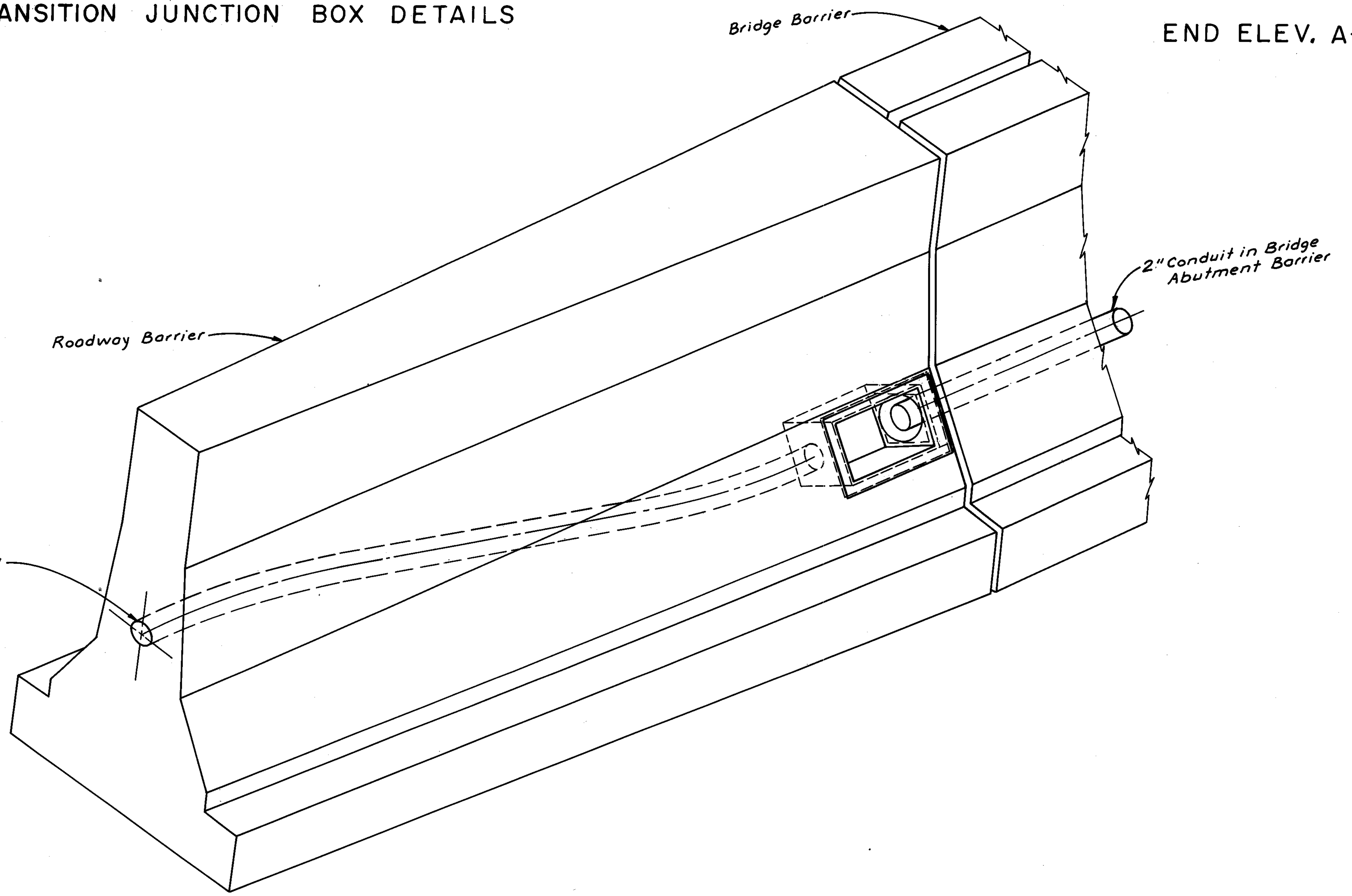
JUNCTION BOX SHALL CONFORM TO S713.10, EXCEPT THAT THE GALVANIZED STEEL PLATE COVER SHALL CONFORM TO ASTM A-242 OR A-36.

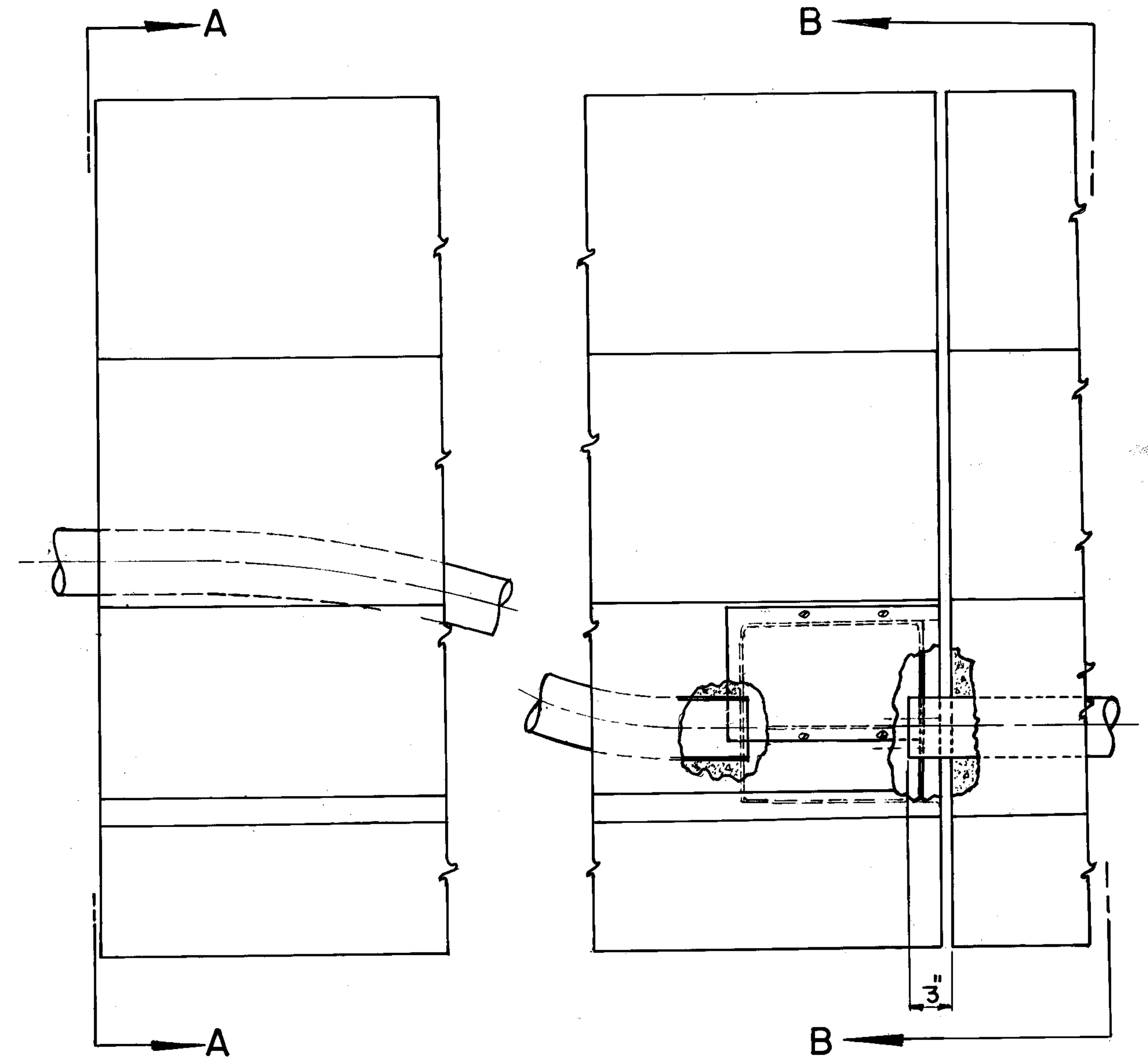
TRANSITION JUNCTION BOX DETAILS



END ELEV. A-A

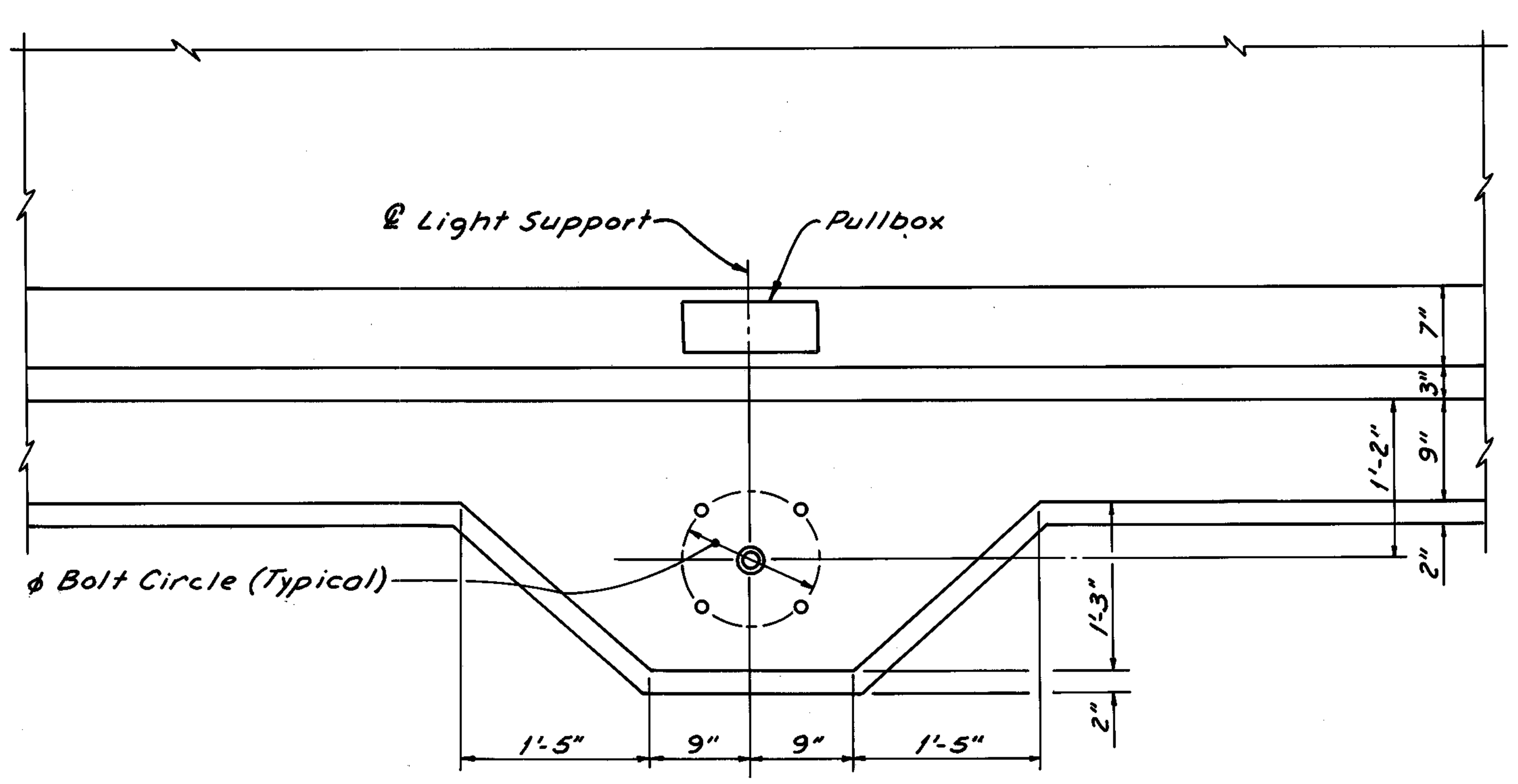
END ELEV. B-B



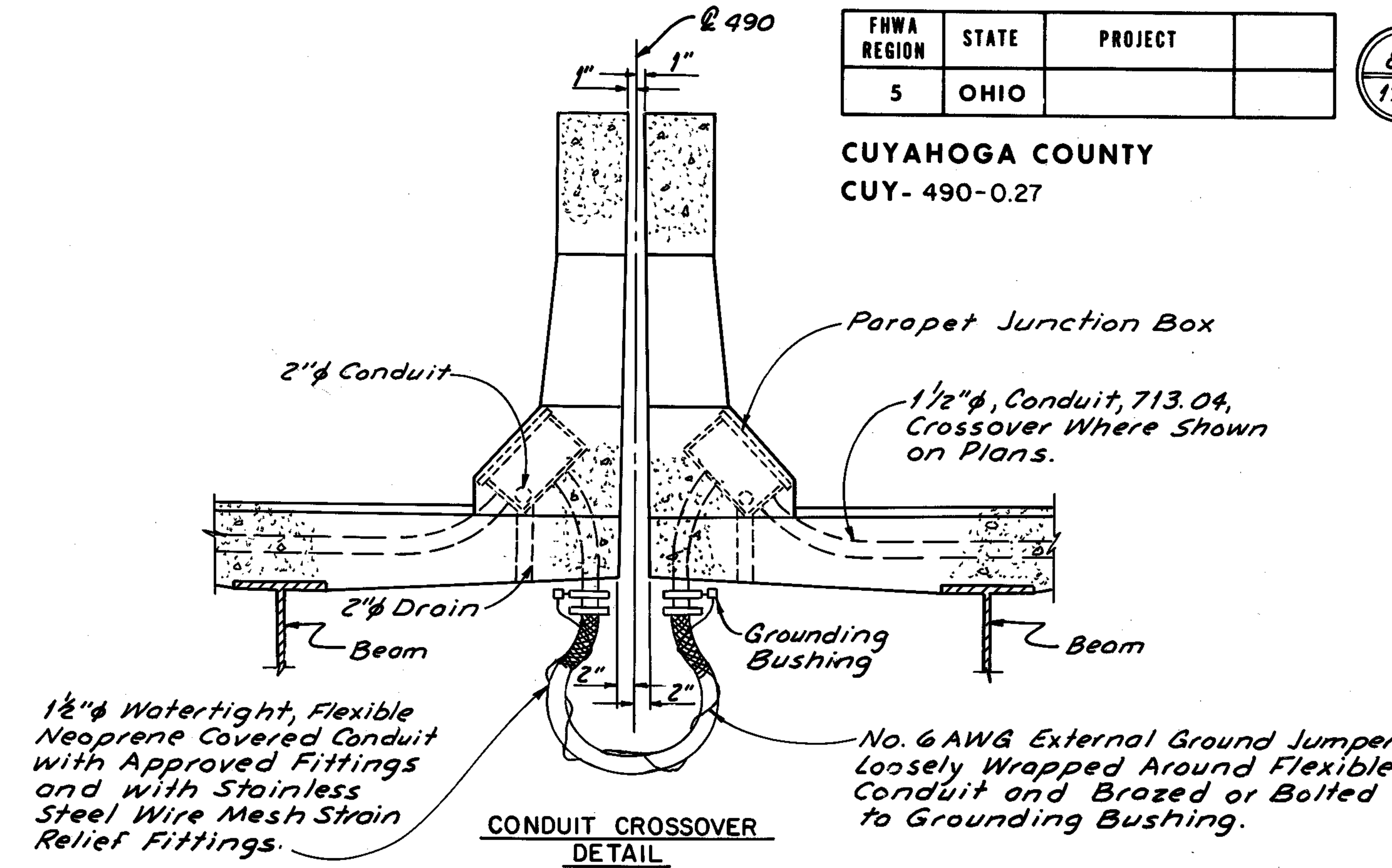


SIDE ELEVATION, TRANSITION BARRIER FROM ROADWAY TO BRIDGE CONFIGURATIONS

POWER SERVICE DATA						
POWER SERVICE LOCATION	CONNECTED LOAD KVA	SERVICE ENTRANCE CONDUCTOR SIZE AWG	SERVICE SWITCH (TYPE)	CIRCUIT NUMBER	CIRCUIT LOAD AMPS	CIRCUIT FUSE SIZE AMPS
BRO (Existing)	26.48 Adjacent Project			1BRO	24.8	35
				2BRO	29.4	40
				3BRO	7.1	10
	16.14			4BRO	27.8	40
				5BRO	2.7	10
				6BRO	3.13	10
RSO 976+25 ℄ I-490	25.7	#2	SC-100	1RSO	42.2	60
				2RSO	11.29	20
				Spare Ckt.		
B 14+80℄E-S	11.3 (1B & 2B)	#2	SC-100	1B	15.2	20
				2B	8.3	15
C 0+50℄S-E	1.73 (7C)	#2	SC-100	7C	3.6	10
SV 23+54℄N-W	7.23 (SV)	#2	SC-100	3SV	15.1	20

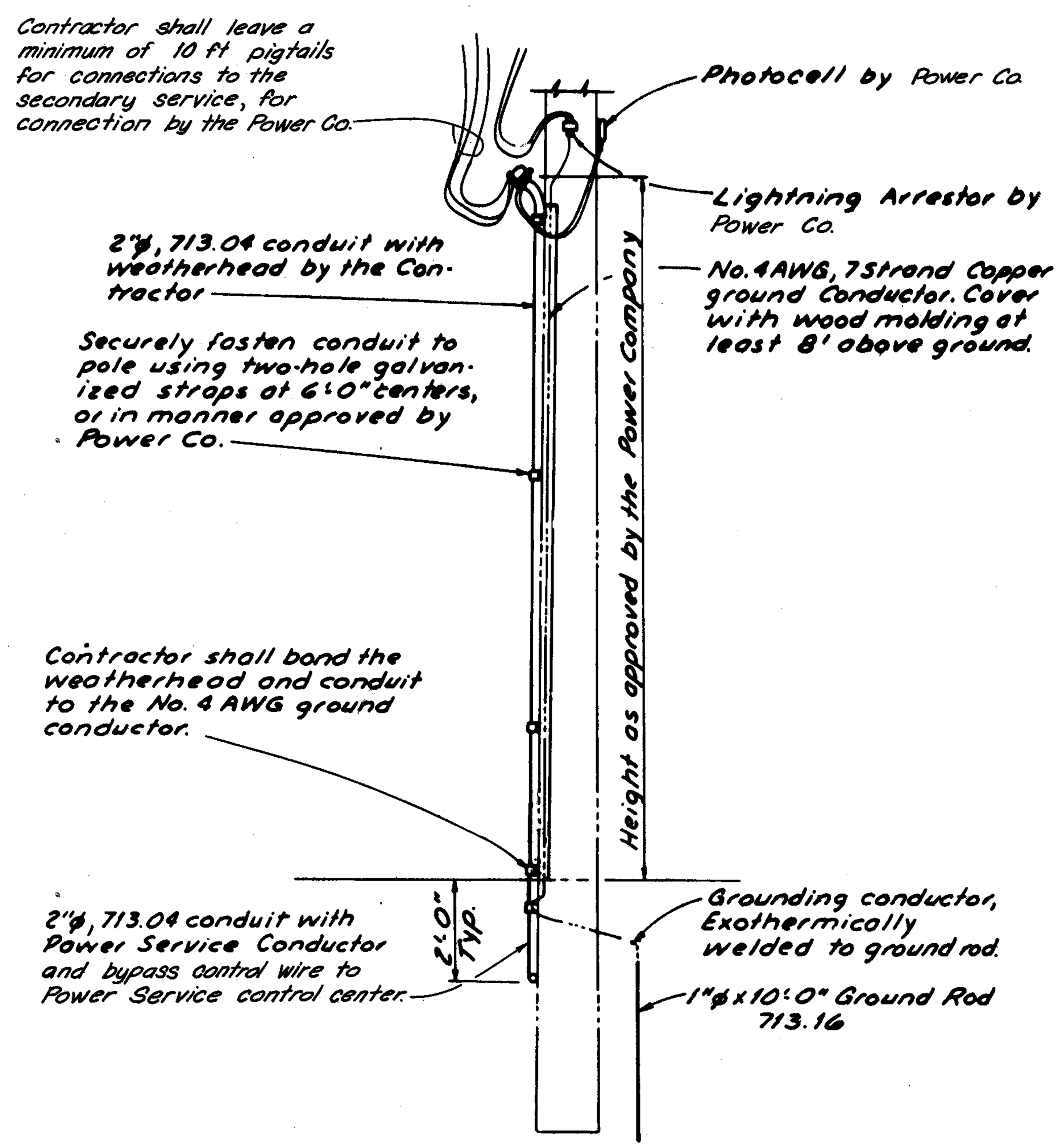


TYPICAL LIGHT SUPPORT BLISTER
Scale: 1" = 1'-0"

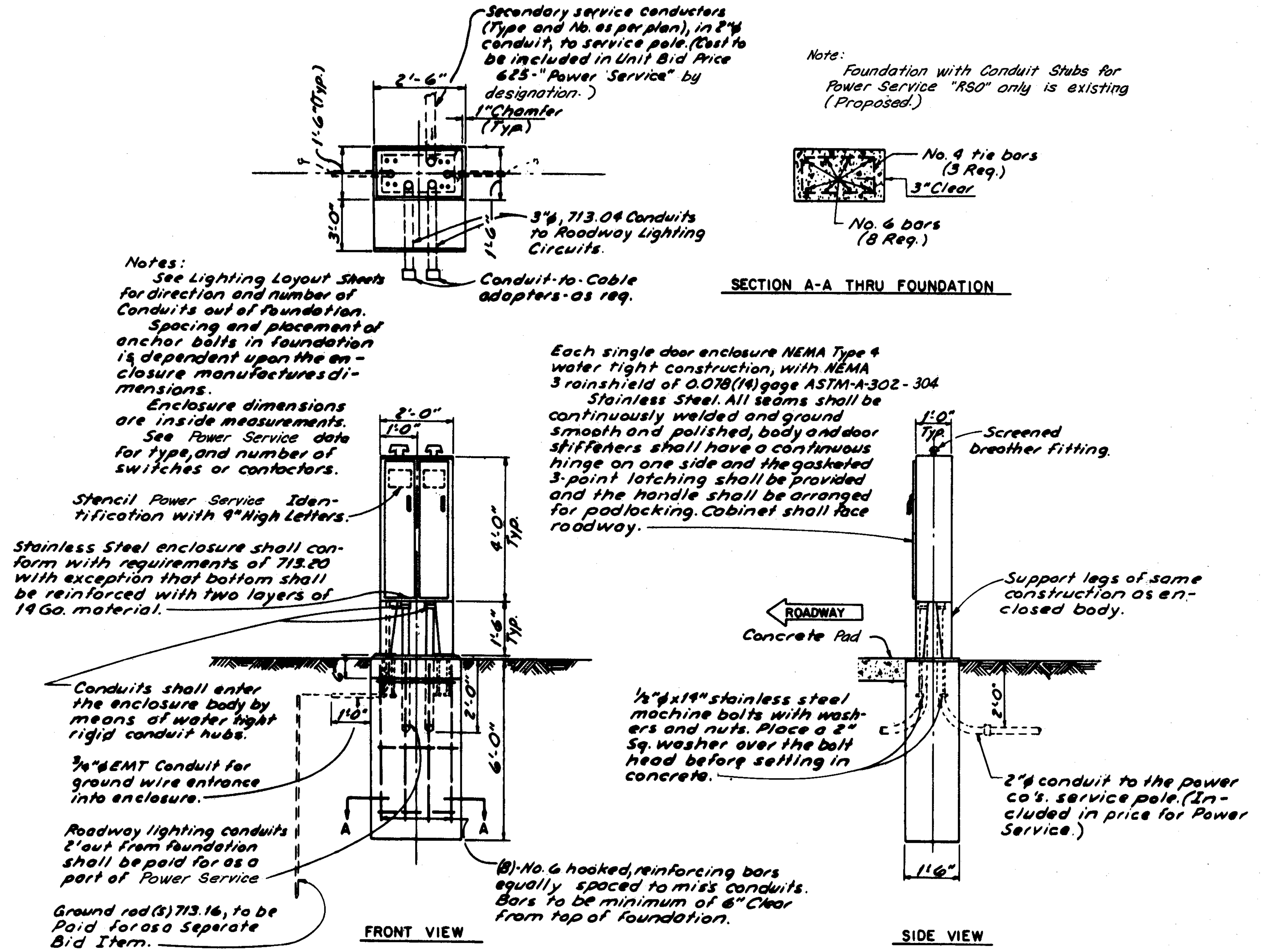


CONDUIT CROSSOVER DETAIL
Scale: ¾" = 1'-0"

Note:
All power service pole material shown, conduit weatherhead, wire, ground rod and miscellaneous material and labor are to be included in the unit bid price for the Item 625, "Power Service, by designation. Pole, Crossarms, Primary feeders, Transformers, etc. for secondary service by Power Co.

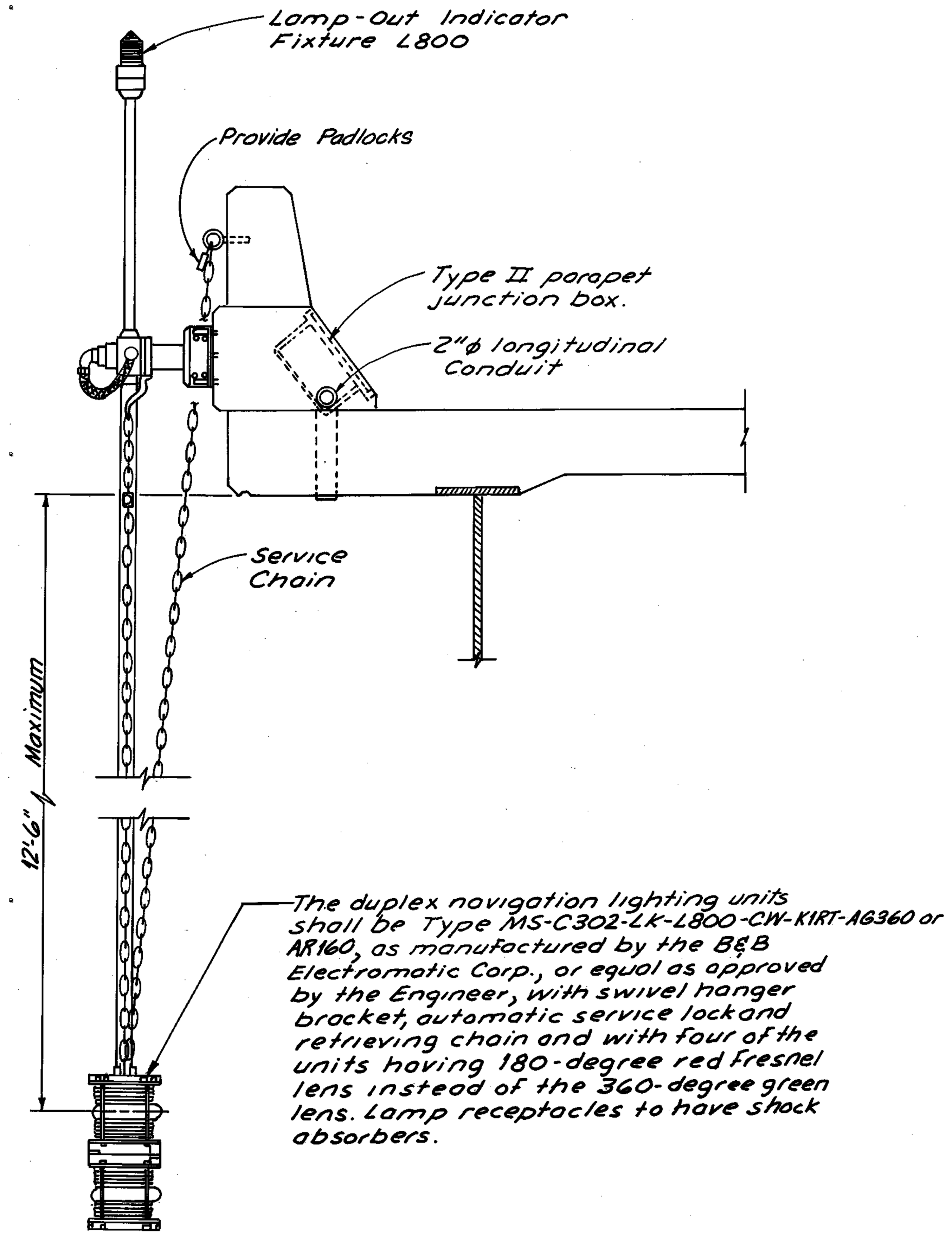


CONNECTION TO POWER SERVICE POLE (TYPICAL)
No Scale

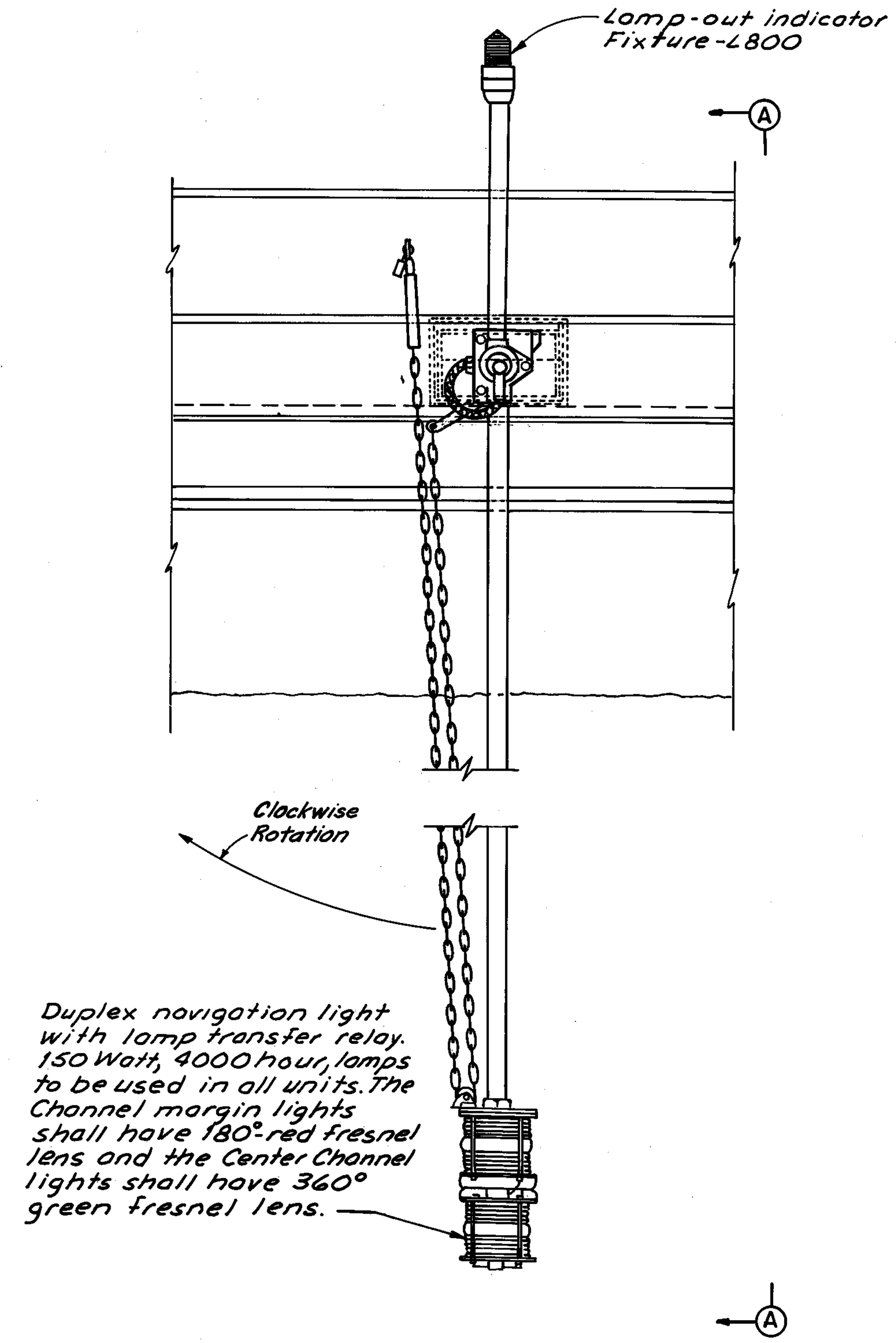


POWER SERVICE DETAILS (TYPICAL)
No Scale

SCALE AS SHOWN HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE R.D.J. DATE 6-26-86 CONSULTING ENGINEERS
TRCD. ____ DATE ____
CKD. F.E.G. DATE 6-27-86 KANSAS CITY CLEVELAND NEW YORK



SECTION A-A



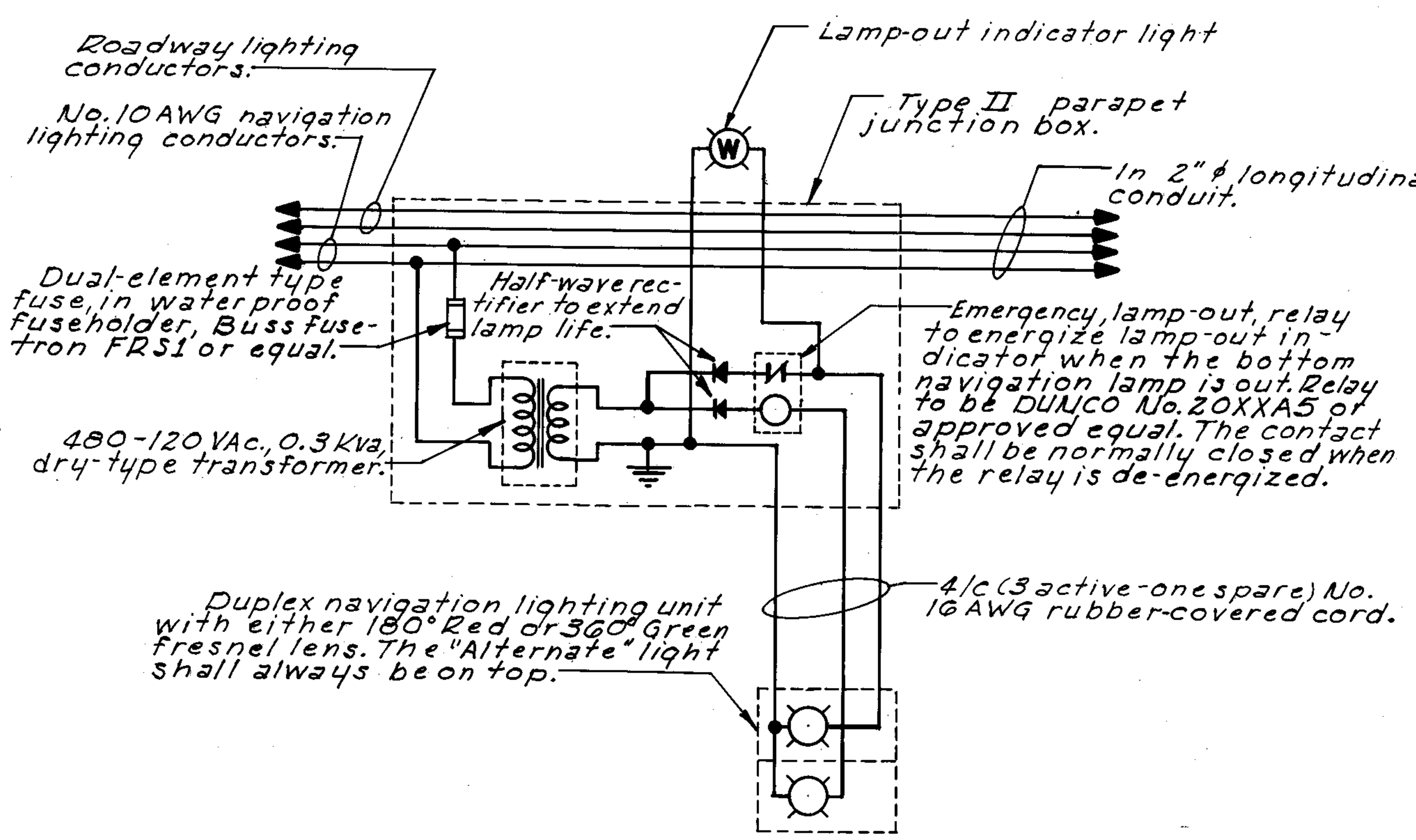
ELEVATION

NAVIGATION LIGHTING DETAILS
SCALE: 3/4" = 1'-0"

LIGHT POLE DATA				
REFERENCE LETTER	DESIGN NUMBER	FOUNDATION ANCHOR BOLTS: SIZE DIAMETER X LENGTH	FOUNDATION ANCHOR BOLTS: BOLT CIRCLE DIAMETER	TRANSFORMER BASE STYLE
A	A8BB47.5 D Median Mounted	1¼"ϕ x 70"	1'-7¾"ϕ	None *
B	A8BB47.5 D Median Mounted on Structure	1¼"ϕ x 100"	1'-7¾"ϕ	None *
C	ST 10 B36.7	1¼"ϕ x 85"	15"ϕ	ST
D	ST 15 B36.7	†	†	ST
E	AT 8 B 36.7	1"ϕ x 40"	15"ϕ	AT-A
F	AT 10 B 36.7	1"ϕ x 40"	15"ϕ	AT-A
G	AT 18 B 36.7	1¼"ϕ x 48"	13"ϕ	AT-X
H	AT ON 17	1"ϕ x 40"	15"ϕ	AT-A
I	AT 15 B 36.7	1"ϕ x 40"	15"ϕ	AT-A

* The Median Pole Base Plate shall be as shown on Standard Construction Drawing HL-22.

† Contractor to Field Check and Supply Type and Size required.

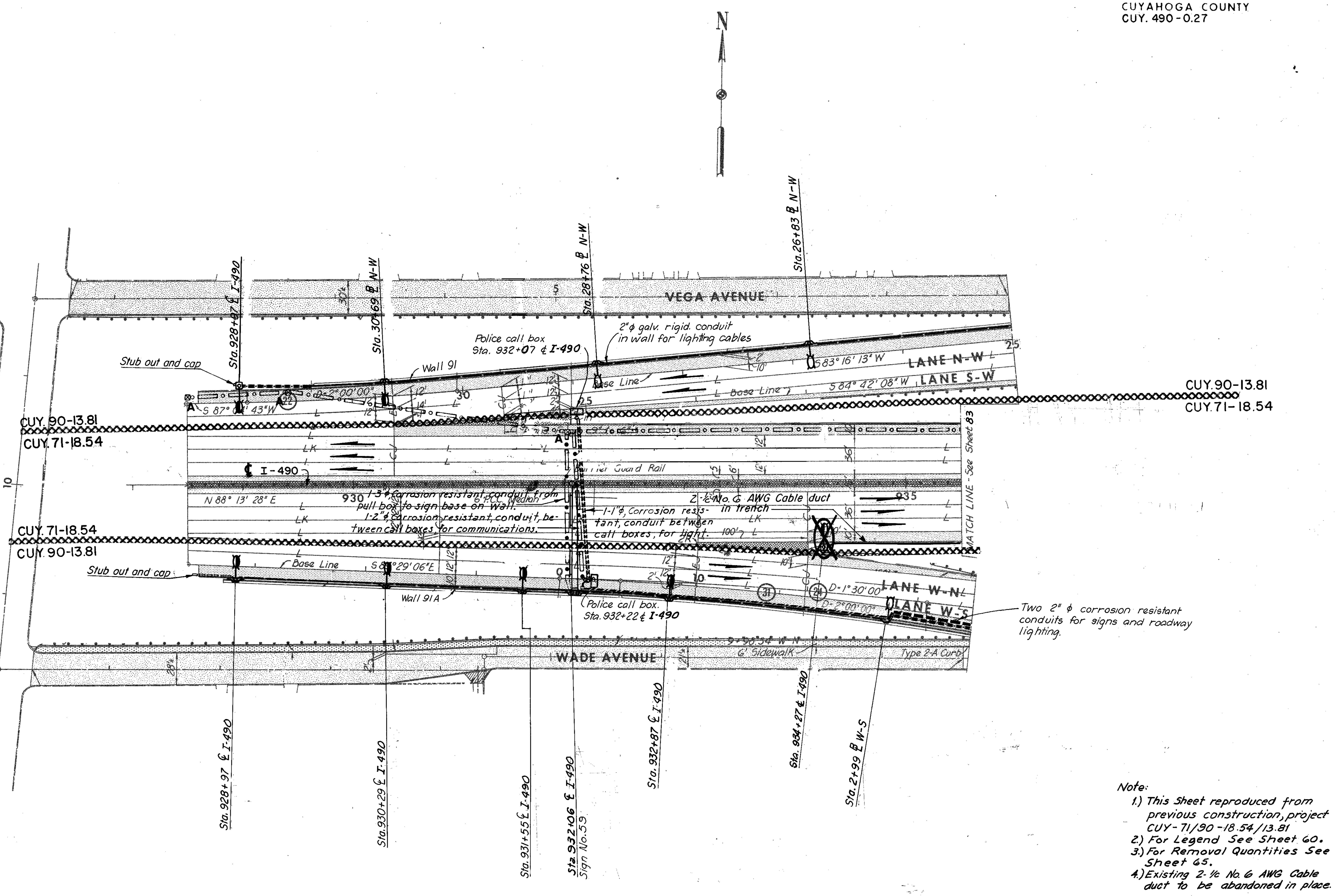


TYPICAL NAVIGATION LIGHT WIRING DIAGRAM

CUYAHOGA COUNTY
CUY. 490-0.27

LAYOUT KEY

- Typical Ground Mounted Lighting Unit: Clear Mercury Vapor Lamp; 400 watt size; ASA-IES Type II. on standard.
- Typical Ground Mounted Lighting Unit: Clear Mercury Vapor Lamp; 400 watt size; ASA-IES Type III, on standard.
- Typical Structure Mounted Lighting Unit: ASA-IES Type II. Same as above.
- Typical Structure Mounted Lighting Unit: ASA-IES Type III. Same as above.
- Typical Ground Mounted Underpass Lighting Unit: 250 watt, clear, M.V. Lamp; on standard.
- 2" Diam. corrosion resistant conduit for sign lighting.
- Concrete Pull Box, Type "B" for lighting and signing box.
- Junction Box, galv. cast-iron, in structures, of sizes as noted.
- Transformer Station and Service Panel for Roadway Lighting.
- Service Panel and Pole, for Sign
- Cable Duct, directly buried. for Roadway Lighting.
- Multiple Circuits, in 2" Diam. galv., rigid, conduit in structures. for Roadway Lighting.
- Multiple Circuits in 2" Diam., corrosion resistant, conduit, from end of structures to nearest pull box or lighting unit, directly buried, for Roadway Lighting.
- Multiple Circuits in 3" Diam., corrosion resistant, conduit under paved areas, for Roadway Lighting.
- Empty 2" Diam., galv., rigid, conduit in structures or buried underground.
- Multiple Circuits in Cable Duct. directly buried. for Sign Lighting.
- Multiple Circuits in 2" Diam., galv., rigid, conduit in structures, for Sign Lighting.
- Multiple Circuits in 3" Diam., corrosion resistant, conduit under paved areas, for Sign Lighting, or as called out on Layout Sheet.
- 2" Diam., corrosion resistant conduit, for power circuits to call boxes.
- 2-3" Diam., Plastic conduits for communications circuits, directly buried.
- 2-3" Diam., galv. rigid, conduits in structures, for communications circuits.
- 2-3" Diam., corrosion resistant, conduits for communications circuits.
- Concrete Pull Box for communication circuits. Type A
- Junction Box in structures, galv. cast-iron, for communications circuits.
- Call Box, with a 2" Diam. corrosion resistant, conduit to the nearest concrete Pull Box or junction box, as shown.
- Bridge Ground at fixed Piers, on outside beams, as shown.
- Ⓔ Expansion joint in conduit (s) in structures, as shown or required.
- Ⓓ Drain fitting in conduit(s), in low point in conduit runs, in structures, as shown.
- Typical Mercury Vapor Underpass Lighting Unit: 250 watt clear M.V. Lamp. Mounted on face of Pier or to Bridge superstructure as shown and detailed.



Existing light pole to be removed.

Note:
1.) This sheet reproduced from previous construction, project CUY-71/90-18.54/13.81
2.) For Legend See Sheet 60.
3.) For Removal Quantities See Sheet 65.
4.) Existing 2-1/c No. 6 AWG Cable duct to be abandoned in place.

SCALE 1" = 50'
MADE R.D.J. DATE 6-26-86
TRCD ___ DATE ___
CK. F.E.G. DATE 6-27-86

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

LIGHTING REMOVAL I-490 STA. 929+05 TO STA. 935+50.00

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

CUYAHOGA COUNTY
CUY. 490-0.27

Notes:
1. This Sheet reproduced from previous construction project CUY-71/90-18.54/13.81
2. For Legend see sheet 60.
3. For Removal Quantities See Sheet 65.

LIGHTING REMOVAL I-490 STA. 935+50.00 TO STA. 951+00.00

SCALE 1" = 50'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF		
MADE R.D.J. DATE 6-26-86	CONSULTING ENGINEERS		
TRCD. DATE			
CKD. F.E.G. DATE 6-27-86	KANSAS CITY	CLEVELAND	NEW YORK

CUYAHOGA COUNTY
CUY - 490 - 0.27

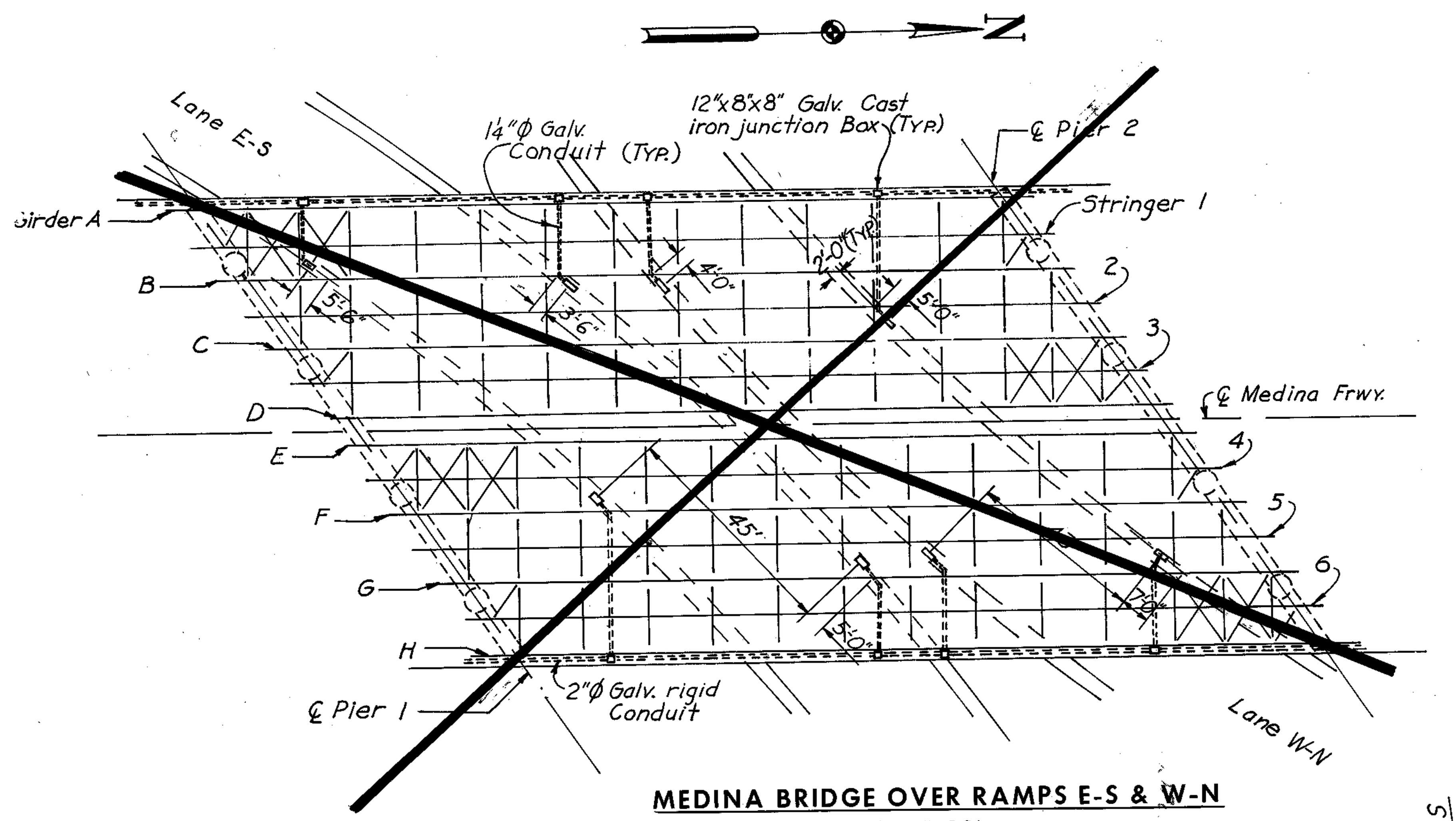
Note:
All items on this sheet are included in the CUY-71-18.54

Notes:
1. This Sheet Reproduced from previous construction project CUY-71/90 - 18.54/13.81.
2. For Legend see sheet 60.
3. For Removal Quantities see Sheet 65.

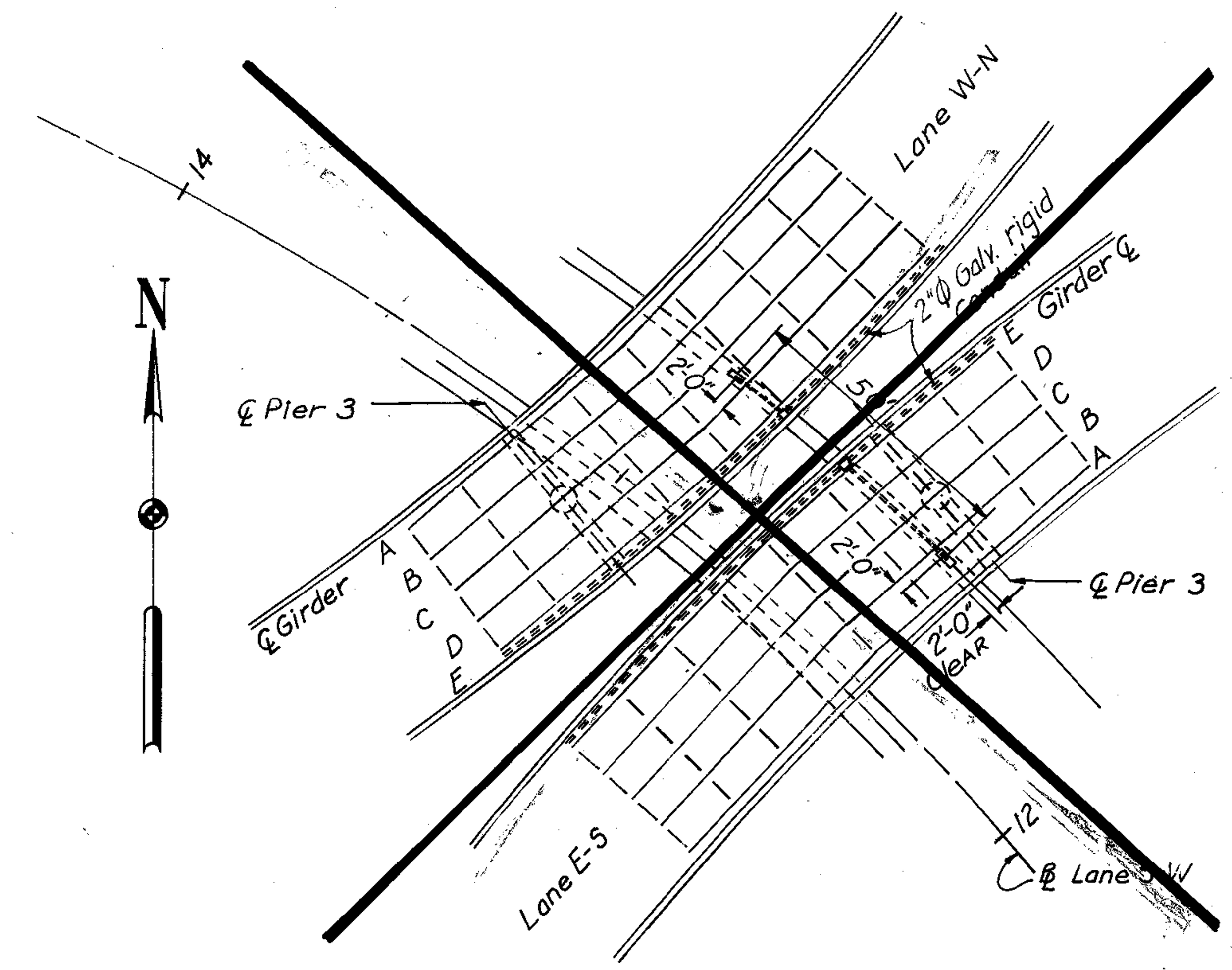
SCALE 1" = 50'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE RDJ DATE 6-26-86	CONSULTING ENGINEERS
TRCD DATE	
CKD FEG DATE 6-27-86	KANSAS CITY CLEVELAND NEW YORK

LIGHTING REMOVAL I-71 STA 951+13.98 TO STA. 966+00.00

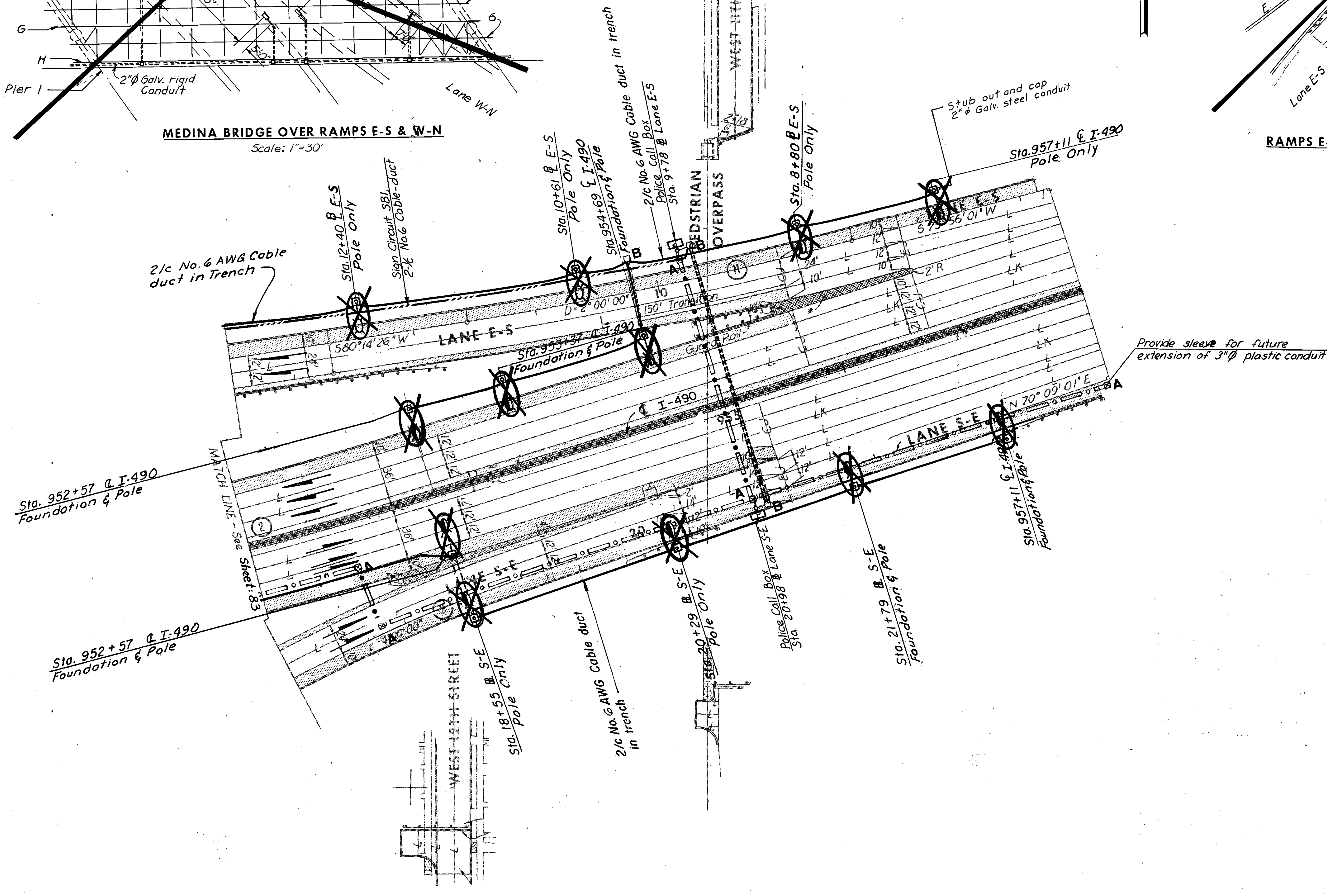
CUYAHOGA COUNTY
CUY. 490 - 0.27



MEDINA BRIDGE OVER RAMPS E-S & W-N
Scale: 1"=30'



RAMPS E-S & W-N OVER RAMP S-W
Scale: 1"=30'



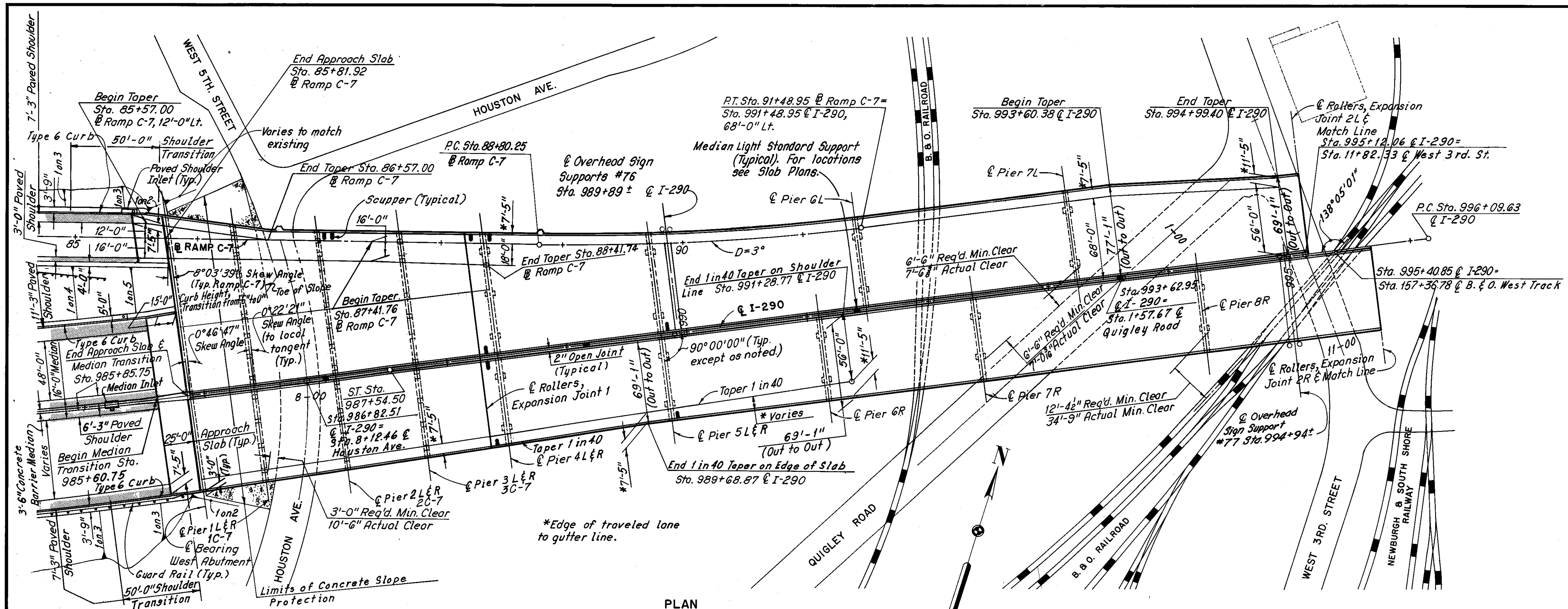
Note:
1. This sheet reproduced from previous construction project, CUY-71/90-18.54/13.81
2. For Legend see sheet 60.
3. For Removal Quantities See Sheet 65.

SCALE 1" = 50'	HOWARD, NEEDLES, TAMMEN & BERGENDOFF
MADE R.D.J. DATE 6-26-86	CONSULTING ENGINEERS
TRCD. ____ DATE ____	KANSAS CITY CLEVELAND NEW YORK
CKD F.E.G. DATE 6-27-86	

LIGHTING REMOVAL I-490 STA. 951+00.00 TO STA. 958+00.00

CUYAHOGA COUNTY

CUY- 290-027



PLAN

Scale: 1" = 50'

CURVE DATA

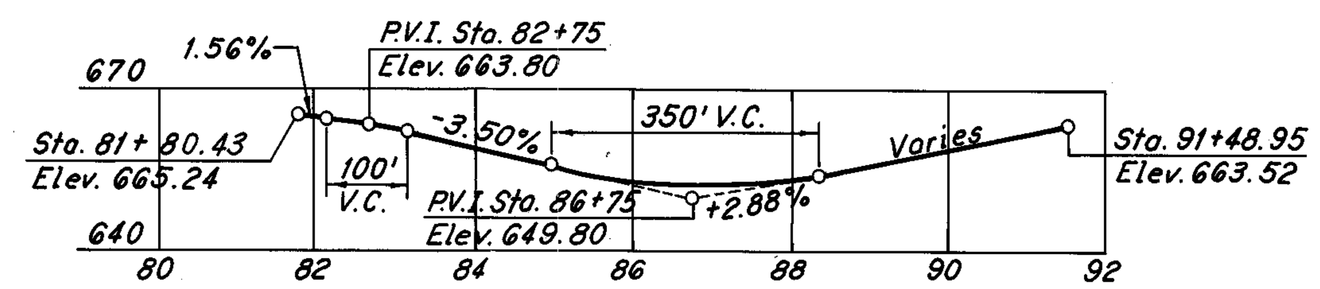
℄ RAMP C-7

P.I. Sta.	90+14.82
Δ =	8° 03' 39"
D =	3° 00' 00" Left
R =	1,909.86'
T =	134.57'
L =	268.70'
E =	4.74'

SPIRAL DATA

℄ I-290

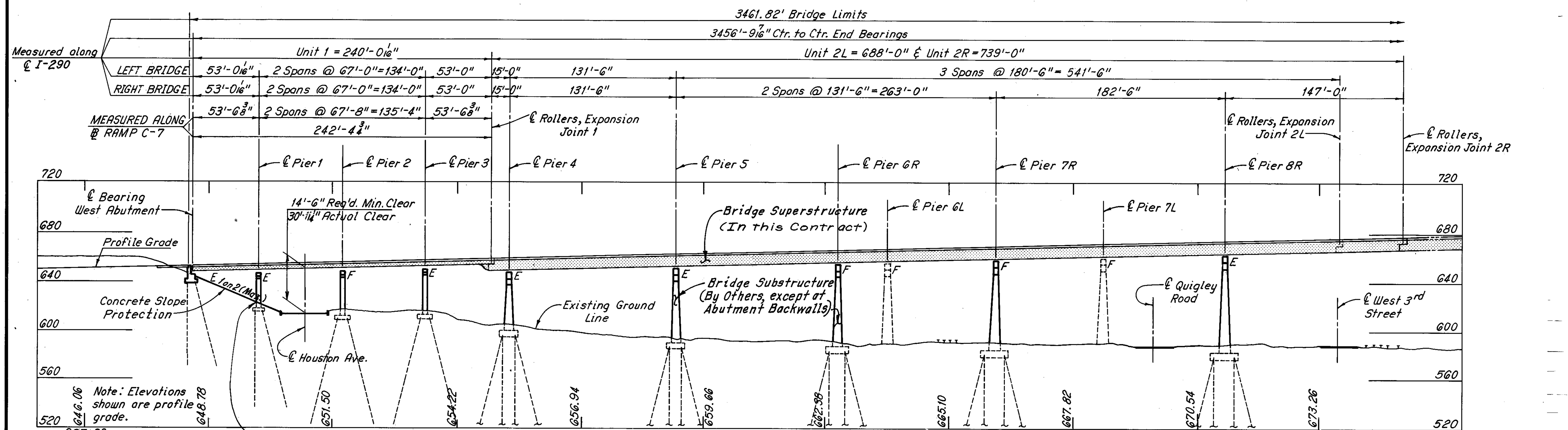
C.S. Sta.	983+54.50
S.T. Sta.	987+54.50
θs =	4° 00' 00"
Ts =	590.53'
Ls =	400.00'
P =	2.33'
K =	199.97'
S.T. =	133.40'
L.T. =	266.74'
Es =	28.81'



PROFILE RAMP C-7

Scale: Horiz. 1" = 200'

Vert. 1" = 30'



ELEVATION

Scale: 1" = 50'

PROPOSED STRUCTURE

TYPE: Continuous steel beam (Unit 1) continuous welded steel girder with floor system (Units 2, 3 and 4), continuous multiple welded steel girder (Units 5, 6 and C-B) with reinforced concrete deck and substructure.

SPANS: Spans are measured along ℄ I-490:
Unit 1 - 53'-0 1/16", 67'-0", 67'-0", 53'-0"
Unit 2L - 15'-0" Cantilever, 131'-6", 180'-6", 180'-6", 180'-6".
Unit 3L - 20'-0" Cantilever, 237'-0", 330'-0", 174'-0", 20'-0" cantilever.
Unit 4L - 178'-0 1/16", 188'-11 13/16", 145'-0 1/16", 15'-0" Cantilever.
Unit 2R - 15'-0" Cantilever, 131'-6", 131'-6", 131'-6", 182'-6", 147'-0".
Unit 3R - 20'-0" Cantilever, 201'-0", 340'-0", 185'-0", 20'-0" Cantilever.
Unit 4R - 164'-0 1/16", 166'-11 13/16", 145'-0 1/16", 15'-0" Cantilever.
Unit 5 - 119'-0", 135'-0", 135'-2 1/4", 134'-9 13/16", 124'-11 15/16", 10'-0" Cantilever.
Unit 6 - 104'-9 1/4", 117'-7 1/2", 119'-8 5/16", 122'-9 1/2", 96'-10 7/8".
Spans are measured along ℄ Ramp C-B:
Unit 6C-B - 114'-6 1/4", 122'-11 3/4", 124'-9", 124'-9" 96'-0".

ROADWAYS: I-290 - Width Varies face to face of parapets, 67'-0" to 143'-5"± Left Bridge and 67'-0" to 103'-9"± Right Bridge. There is an 2" open joint between Left and Right Bridge.

Ramp C-B - Width Varies, 28'-0" to 36'-0" face to face of parapets.

LOADING: HS 20-44 CASE I and Interstate Alternate Loading.

SKEW: Unit 1 - None with respect to local tangent at S.T. Sta. 987+54.50
Unit 2 - None
Unit 3 - None
Units 4,5 and 6 - Varies (See Plan)
Unit 6C-B - 45° Right Forward with respect to local tangent at P.T. Sta. 10+89.88

WEARING SURFACE: 1 1/4" Latex Modified Concrete

APPROACH SLABS: AS-1-81 (25' long)

ALIGNMENT: Units 1 thru 6 - Spiral left, Tangent and 0°50' Curve Right.

Unit 6C-B - 3° Curve Right,, 8° Curve Right and Tangent.

SUPERELEVATION:
Unit 1 - Varies: -0.0156 ft. per ft. to +0.169 ft. per ft.
Unit 2 - Varies level to .0156 ft. per ft.
Unit 3 - Varies .0156 ft. per ft. to .02 ft. per ft.
Units 4,5 and 6 - .02 ft. per ft.
Unit 6C-B - Varies .0156 ft. per ft. to .064 ft. per ft.

TRAFFIC DATA: (2005)
I-290 87,120 A.D.T.
8,172 D.H.V.
TRUCK 5%

Maintenance of Traffic

Two lanes of traffic with minimum vertical clearances of 14'-6" and minimum horizontal widths of 18'-0" at Houston Avenue, 35'-0" at Quigley Road and 30'-0" at West 3rd Street and Independence Road shall be maintained at all times.

Note:
For existing contours, buildings and underground utilities see Site Plan.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

GENERAL PLAN AND ELEVATION
UNITS 1 AND 2

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 — STA. 985+85.75 ~~TO~~ STA. 1020+47.57 (℄ I-290)

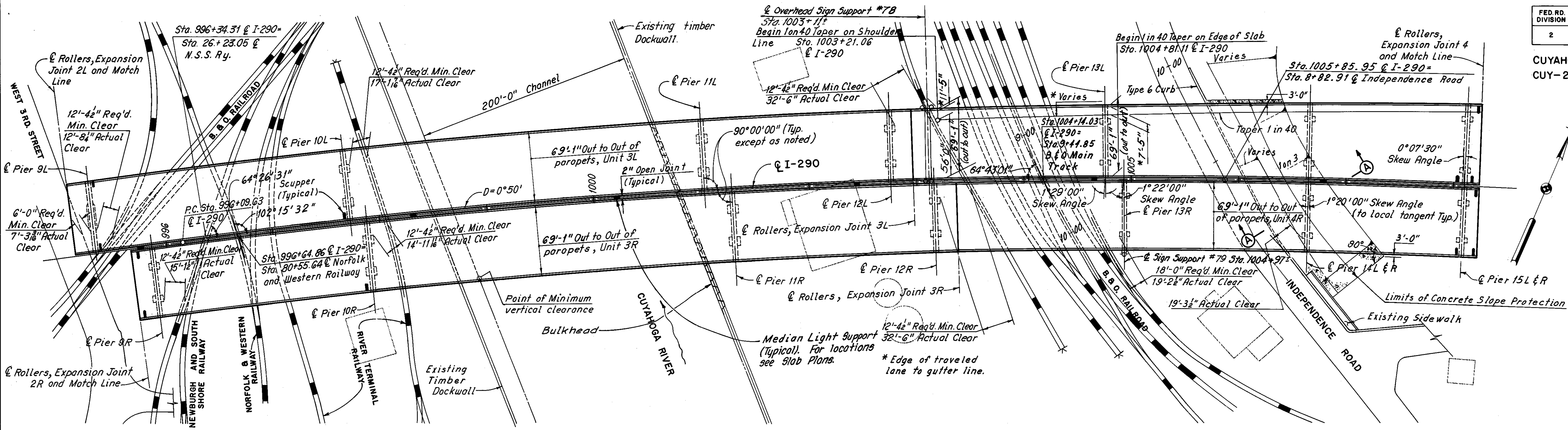
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN JWC	TRACED DLR	CHECKED D.H.S.	REVIEWED C.A.B.	REVISED
DATE 3-10-70	DATE 4-1-70	DATE 10-8-70	DATE 2-24-86	SHEET 1/108

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

87/193

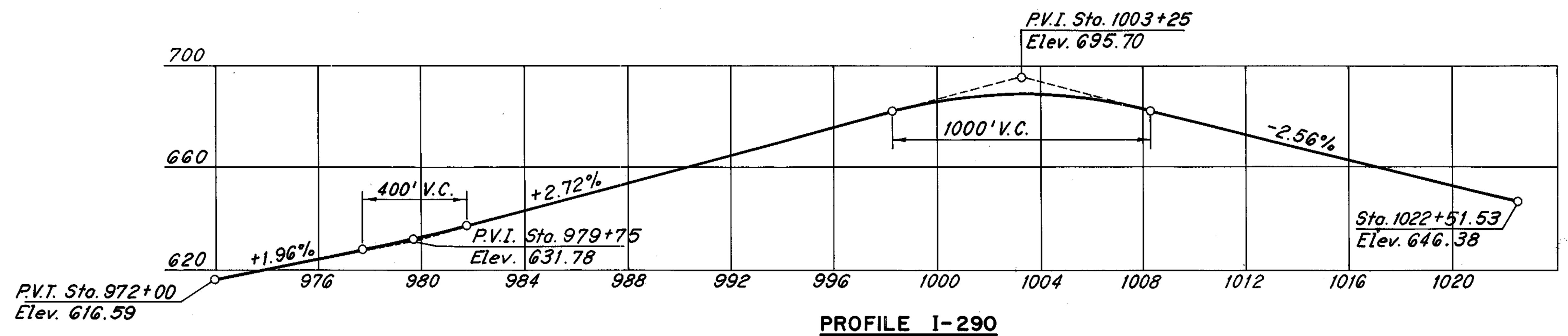
CUYAHOGA COUNTY
CUY-290-0.27



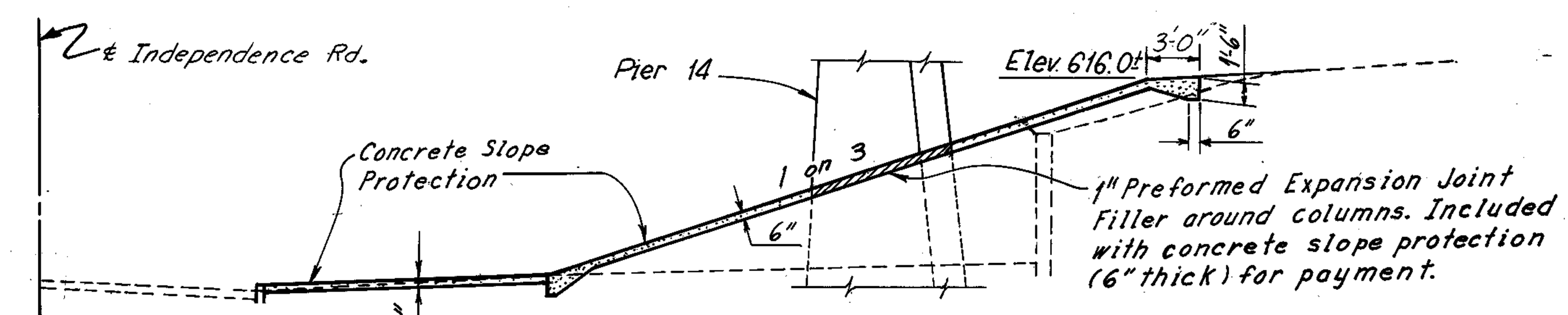
PLAN
Scale: 1"=50'

CURVE DATA
℄ I-290

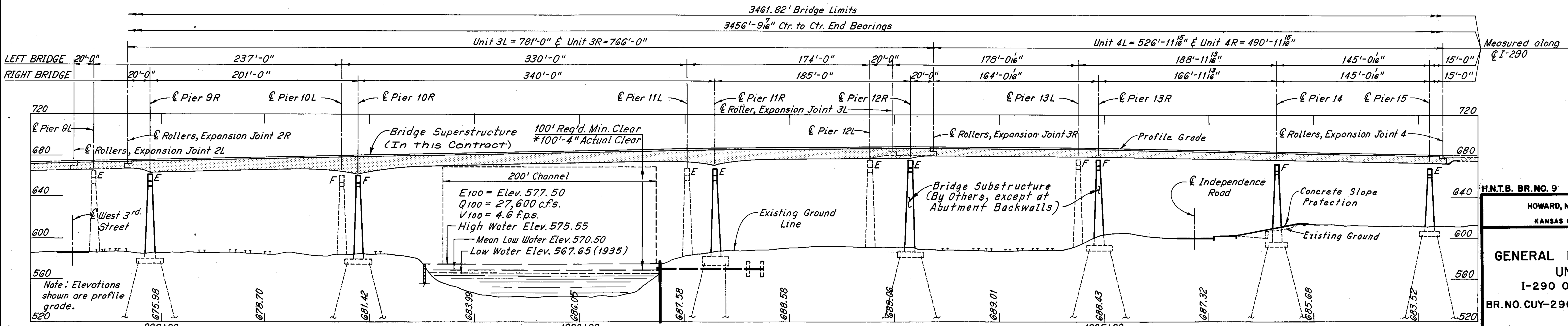
P.I. Sta. 1009+47.08
Δ = 22°00'57"
D = 0°50'00" Right
R = 6,875.49'
T = 1,337.45'
L = 2,641.90'
E = 128.88'



PROFILE I-290
Scale: Horiz. 1"=400'
Vert. 1"=40'



SECTION A-A



* Point of minimum vertical clearance occurs at the South exterior girder and West edge of 200' channel.

ELEVATION
Scale: 1"=50'

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

GENERAL PLAN AND ELEVATION
UNITS 3 AND 4
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN J.W.C.	TRACED D.L.R.	CHECKED D.H.S.	REVIEWED C.A.B.	REVISED
DATE 3-19-70	DATE 4-1-70	DATE 10-8-70	DATE 2-24-86	SHEET 2/108

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

88 / 193

CUYAHOGA COUNTY
CUY-290-0.27

PLAN
Scale: 1"=50'

SPIRAL DATA
℄ RAMP B-C

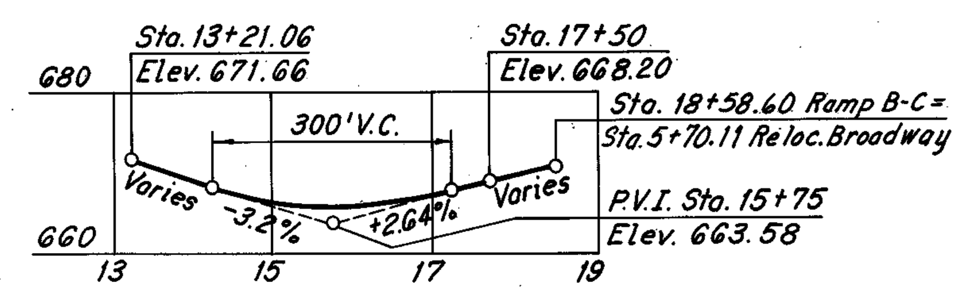
T.S. Sta. 13+32.54
S.C. Sta. 15+32.54
θs = 8°00'00"
Ts = 253.71'
Ls = 200.00'
P = 2.32'
K = 99.94'
S.T. = 66.79'
L.T. = 133.47'
Es = 18.60'

CURVE DATA
℄ RAMP B-C

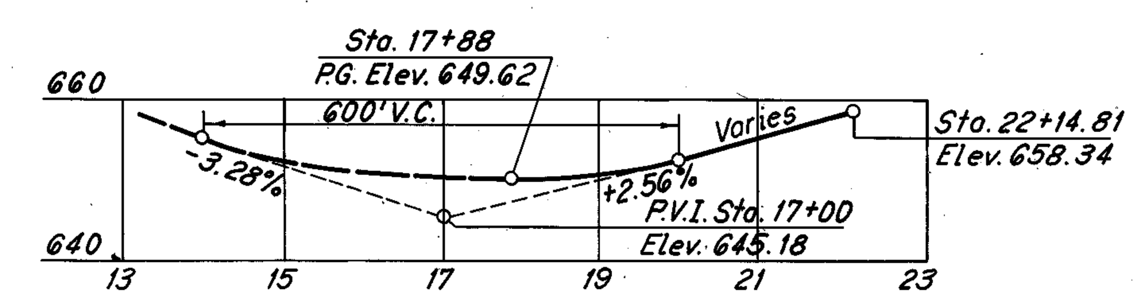
P.I. Sta. 16+39.57
Δ = 16°59'53"
D = 8°00'00"
R = 716.20'
T = 107.02'
L = 212.48'
E = 7.95'

CURVE DATA
℄ RAMP W-S

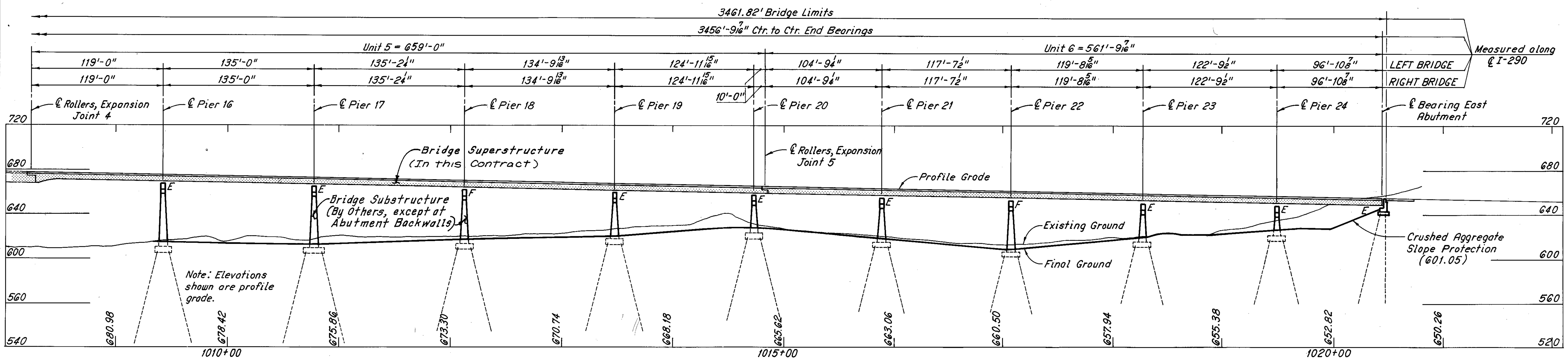
P.I. Sta. 4+02.12
Δ = 19°54'12"
D = 2°30'00"
R = 2,291.83'
T = 402.12'
L = 796.13'
E = 35.01'



PROFILE RAMP B-C
Scale: Horiz. 1"=200' Vert. 1"=20'



PROFILE RAMP N-W
Scale: Horiz. 1"=200' Vert. 1"=20'



ELEVATION
Scale: 1"=50'

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

GENERAL PLAN AND ELEVATION
UNITS 5 AND 6
I-290 OVER CUYAHOGA RIVER

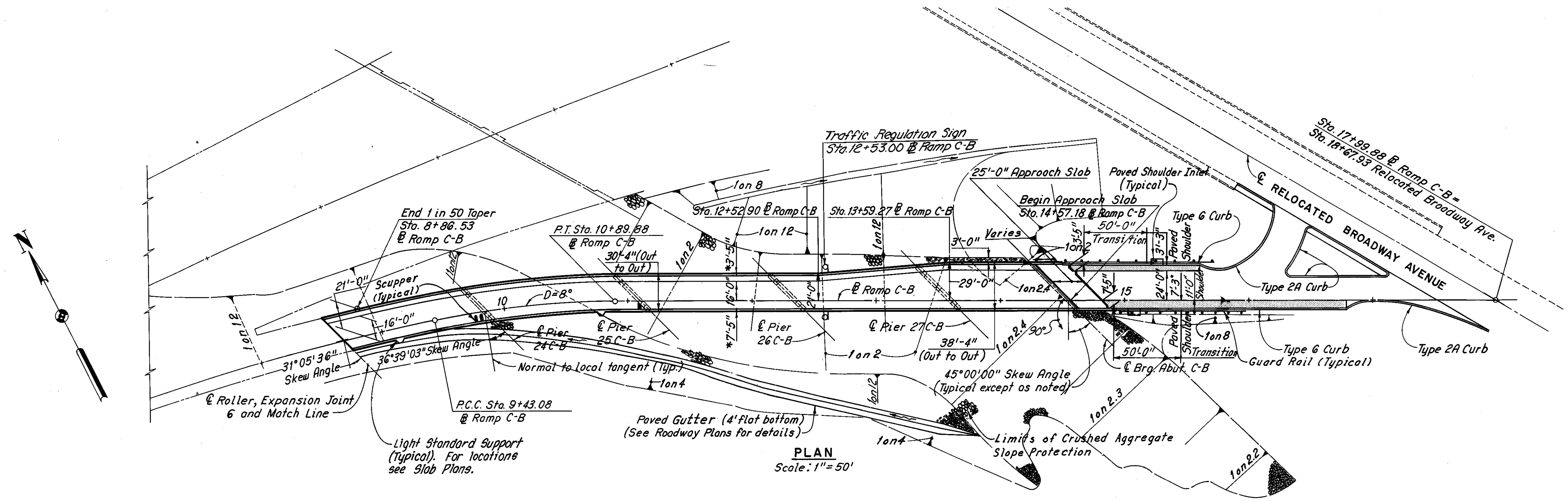
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

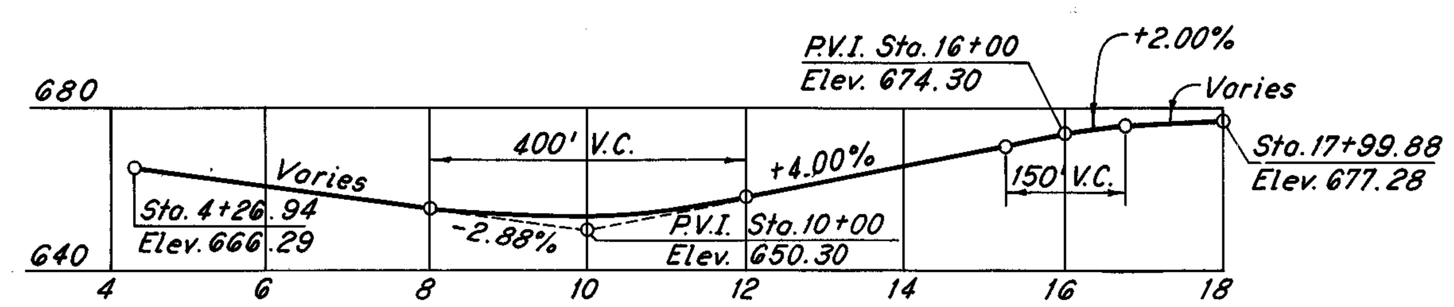
DRAWN J.W.C.	TRACED D.L.R.	CHECKED D.H.S.	REVIEWED	REVISED	
DATE 3-10-70	DATE 4-1-70	DATE 10-8-70	DATE 2-24-86		SHEET 3/108

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

CUYAHOGA COUNTY
CUY-290-0.27



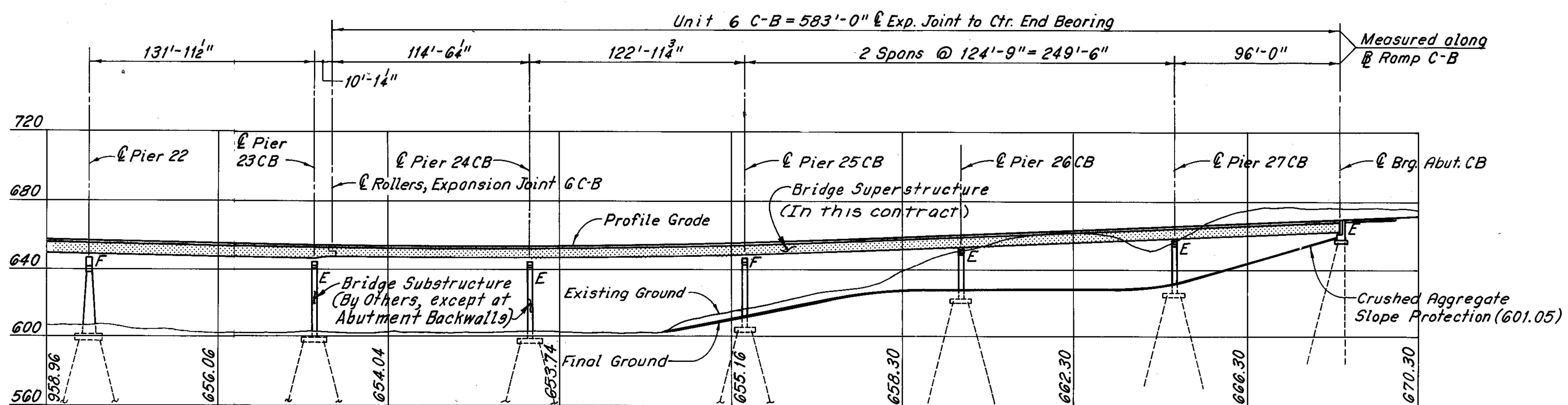
PLAN
Scale: 1"=50'



PROFILE RAMP C-B
Scale: Horiz. 1"=200'
Vert. 1"=40'
Direction of Traffic

CURVE DATA
℄ RAMP C-B

P.I. Sta. 6+86.60	P.I. Sta. 10+16.74
Δ = 15°29'03"	Δ = 11°44'38"
D = 3°00'00" Right	D = 8°00'00" Right
R = 1,909.86'	R = 716.20'
T = 259.65'	T = 73.66'
L = 516.14'	L = 146.80'
E = 17.57'	E = 3.78'



Note: Elevations shown are profile grade.

ELEVATION RAMP C-B
Scale: 1"=50'

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

GENERAL PLAN AND ELEVATION RAMP C-B

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN J.W.C.	TRACED D.L.R.	CHECKED D.H.S.	REVIEWED C.A.B.	REVISED
DATE 3-10-70	DATE 4-1-70	DATE 10-8-70	DATE 2-24-86	SHEET 4/108

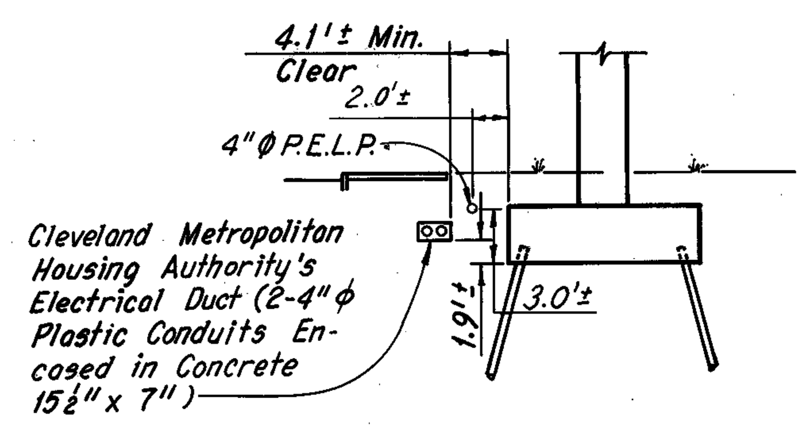
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

90/193

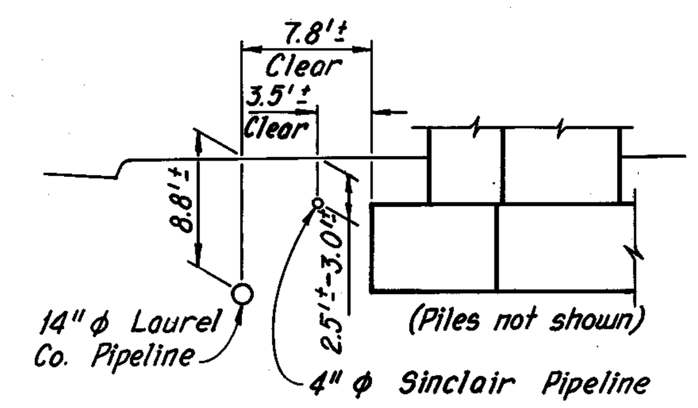
CUYAHOGA COUNTY
CUY-290-0.27

Note: The utilities shown west of Pier 4L and R, with the exception of the gas and water line under Houston Avenue, the gas lines on both sides of Houston Avenue and the Cleveland Metropolitan Housing Authority's electrical duct west of Pier 2, are abandoned.

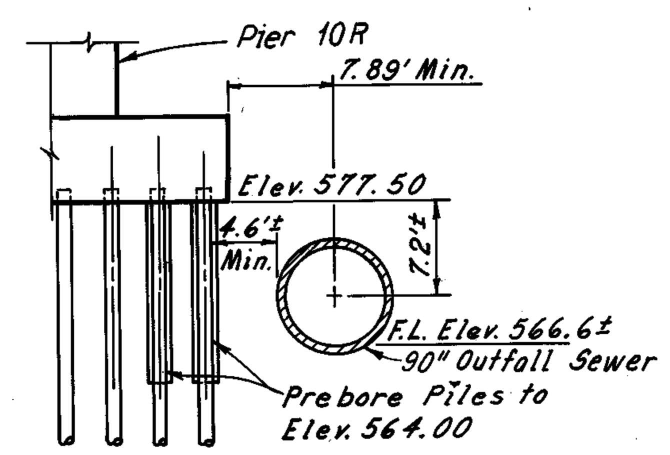
SITE PLAN
Scale: 1"=50'-0"



SECTION A-A



SECTION B-B



SECTION C-C

Notes:

The information shown on this drawing concerning type and location of underground utilities is not guaranteed to be accurate or all inclusive. 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.

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.

For Section D-D see Sheet 6/108.

FOR INFORMATION ONLY

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

SITE PLAN

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

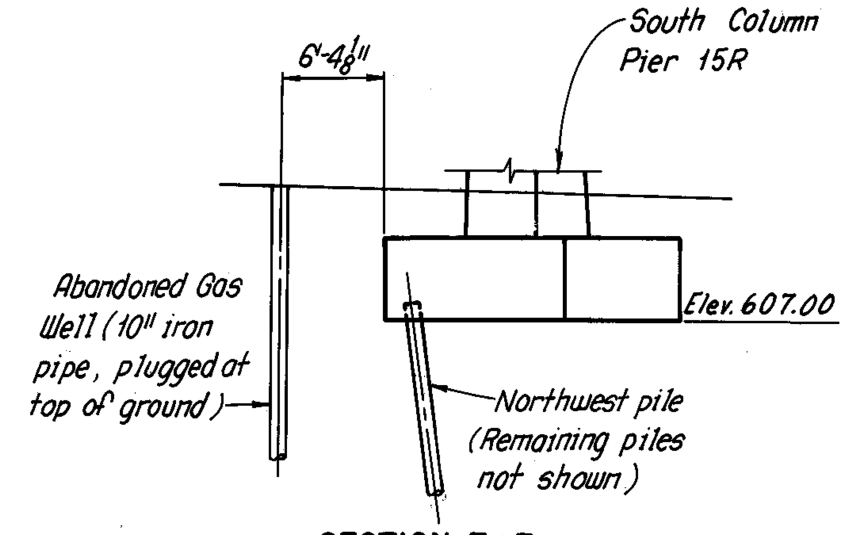
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN J.W.C. DATE 3-10-70	TRACED D.L.R. DATE 4-1-70	CHECKED R.A.B. DATE 10-8-70	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 5/108

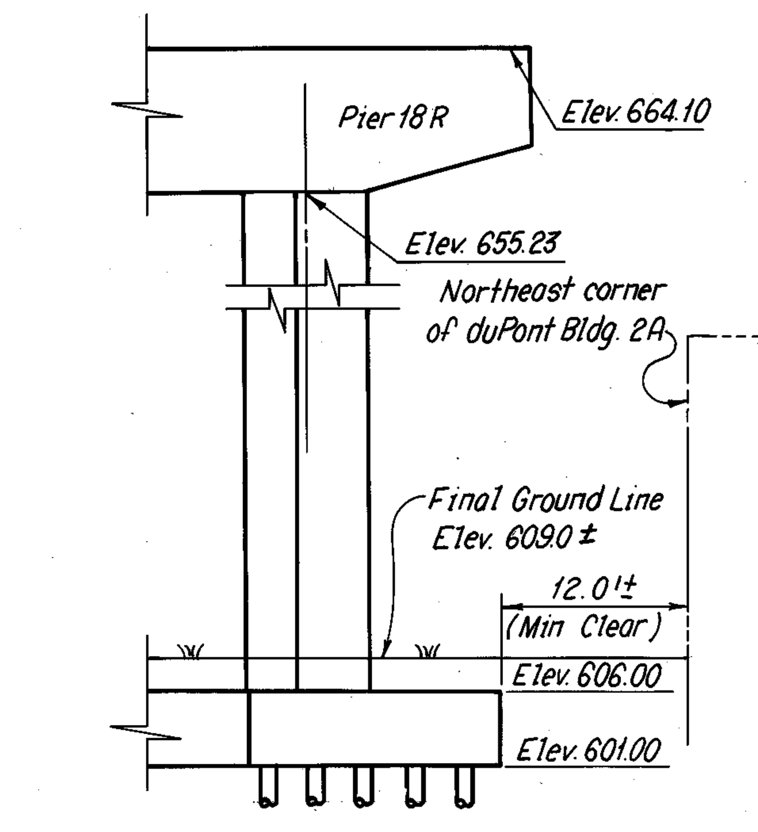
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

91
193

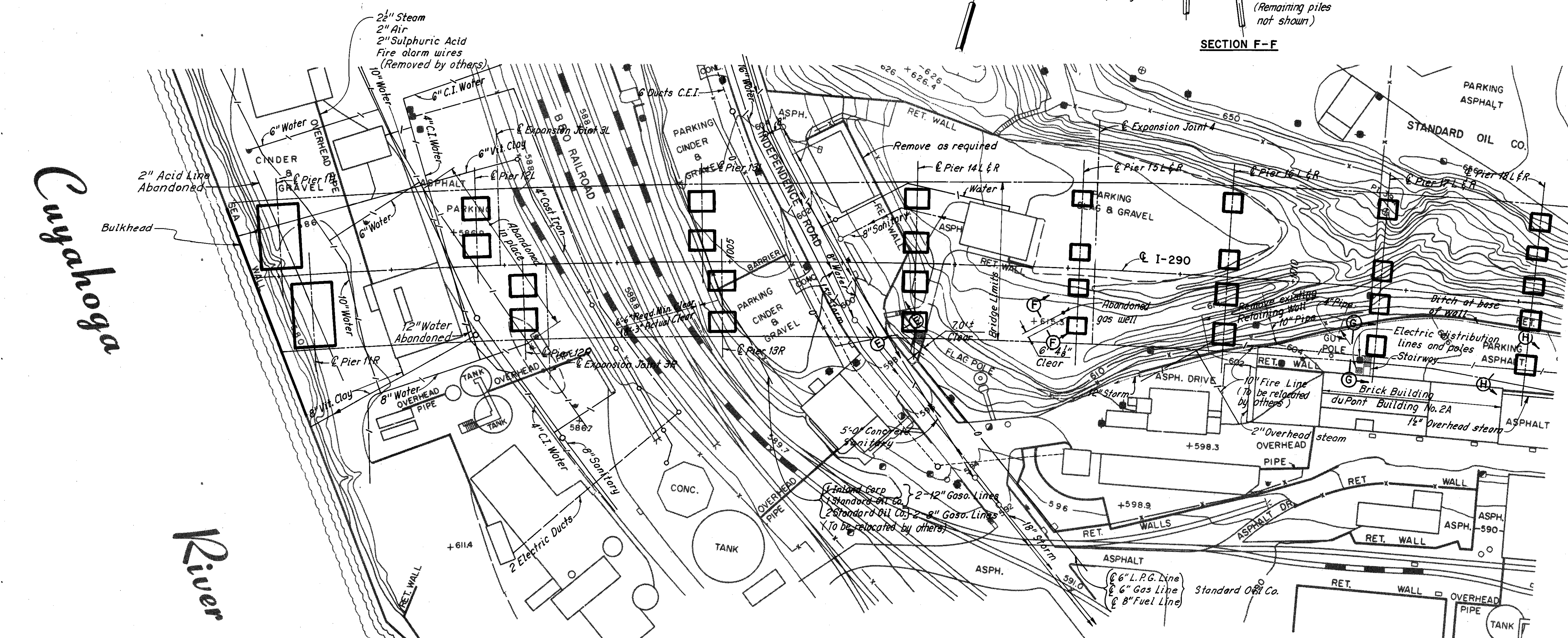
CUYAHOGA COUNTY
CUY-290-0.27



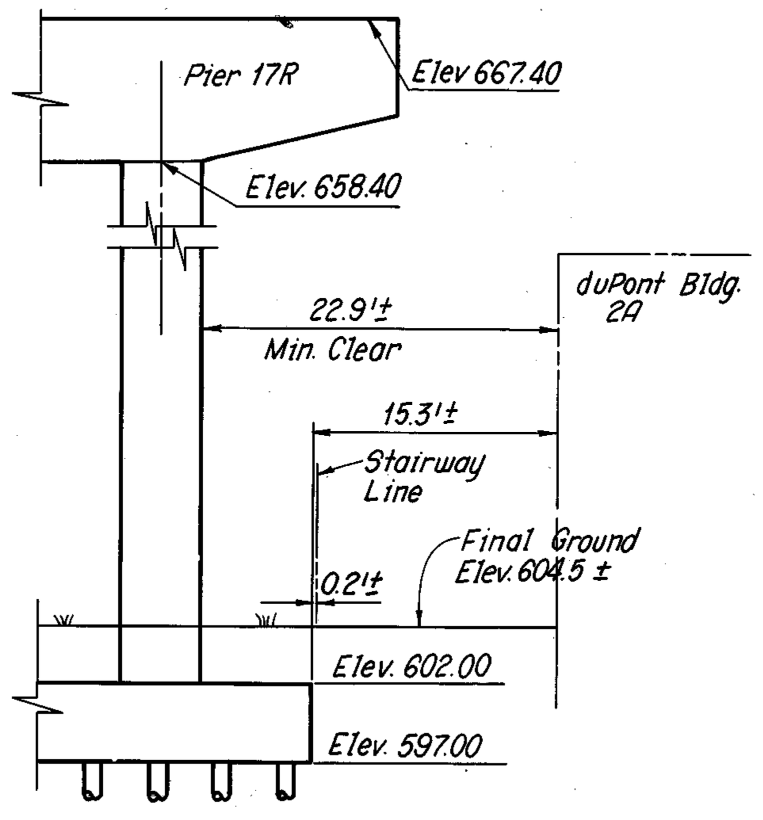
SECTION F-F



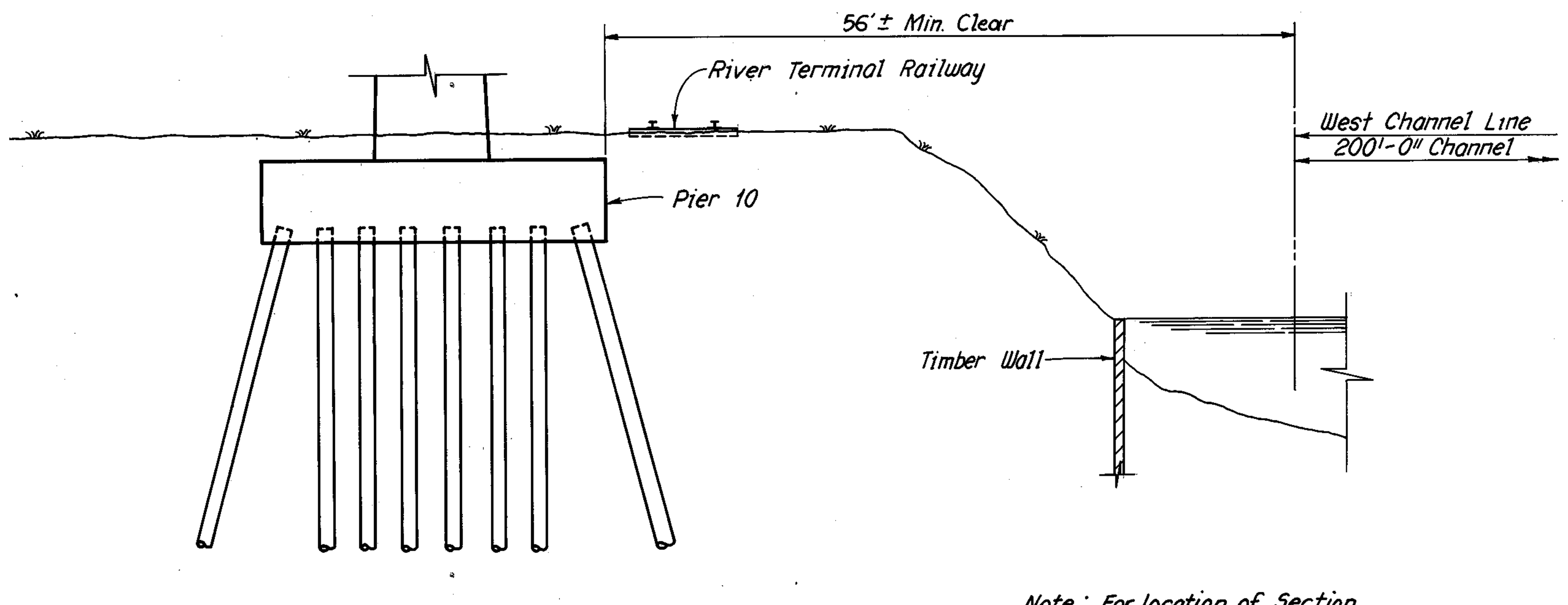
SECTION H-H



SITE PLAN
Scale: 1" = 50'

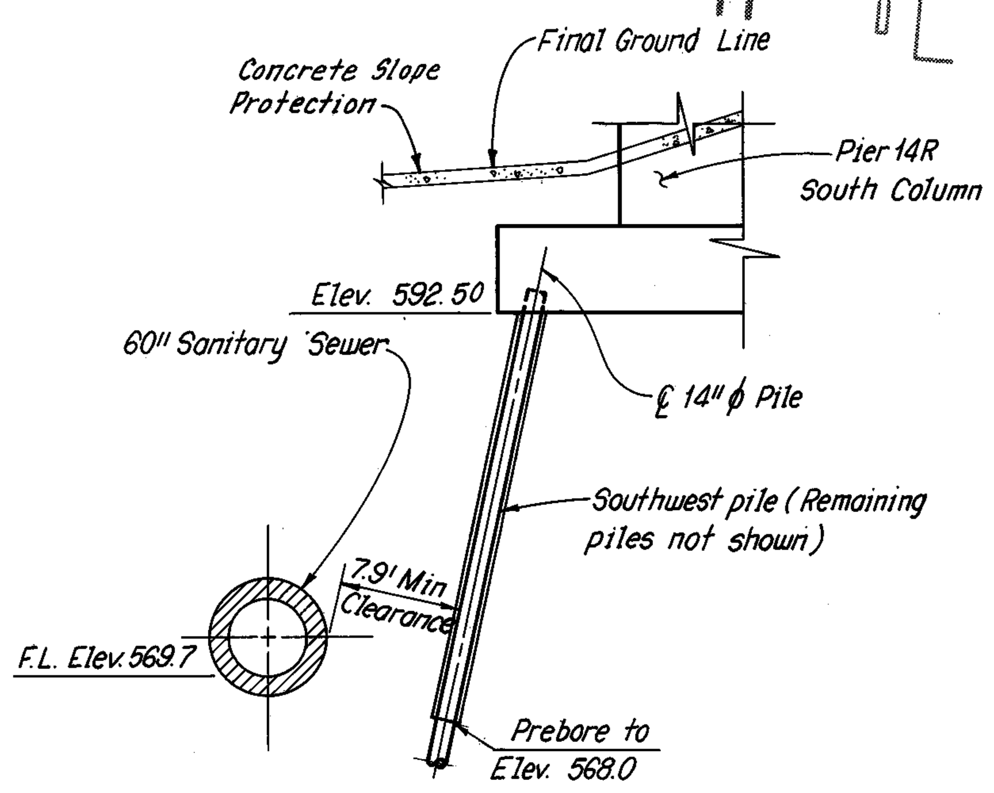


SECTION G-G



SECTION D-D

Note: For location of Section D-D see sheet 5/108.



SECTION E-E

Note: Standard Oil Co. gas lines not shown.

Notes:

The information shown on this drawing concerning type and location of underground utilities is not guaranteed to be accurate or all inclusive. 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.

Existing timber dockwall tie rods and anchorages are not shown. Locations of tie rods and anchorages shall be determined by the Contractor. See Notes pertaining to work in and over the Cuyahoga River on the General Note Sheet.

FOR INFORMATION ONLY

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

SITE PLAN

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

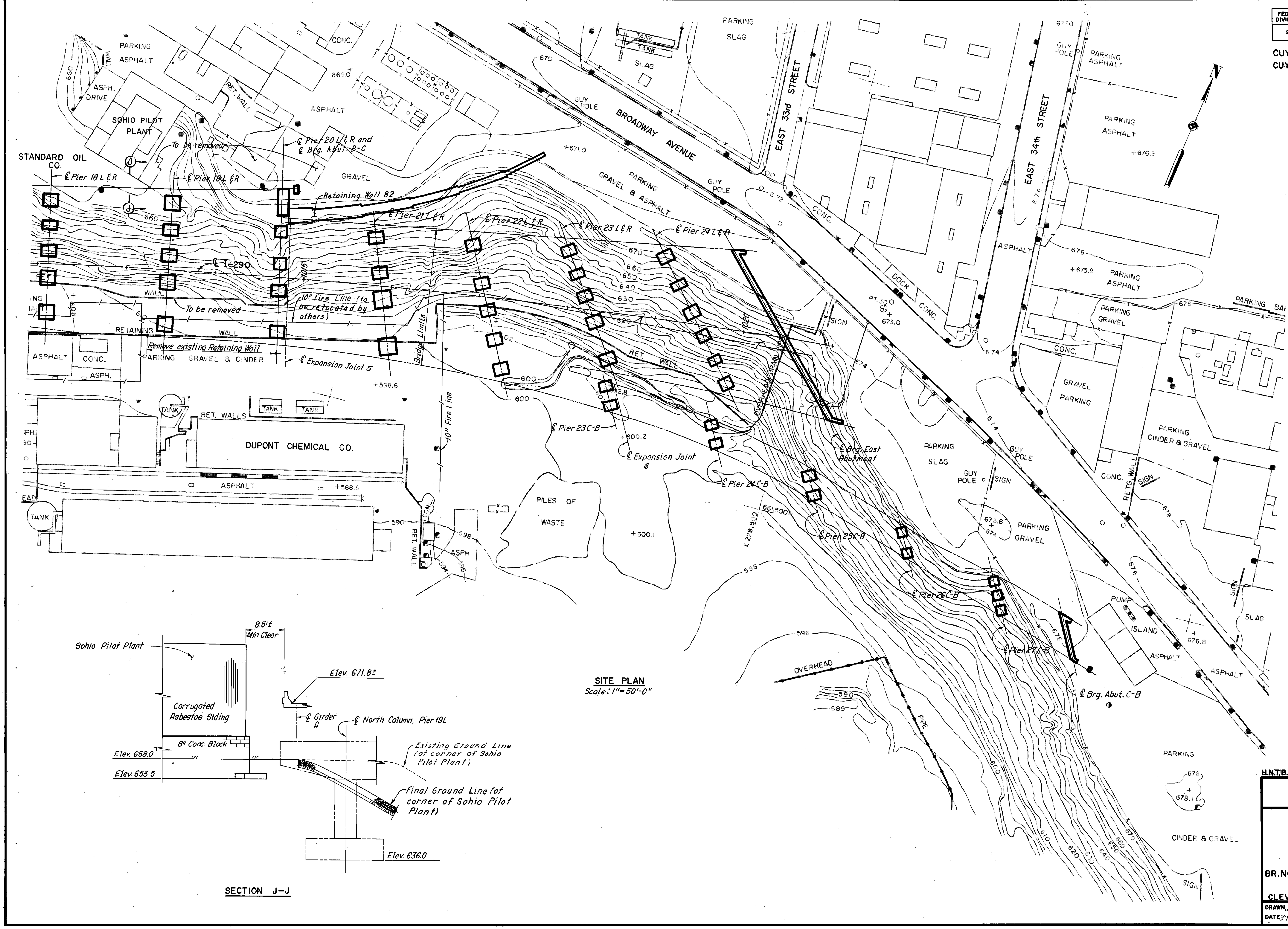
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN J.W.C. DATE 3-10-70	TRACED D.L.G. DATE 4-1-70	CHECKED R.A.B. DATE 10-8-70	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 6/108

FED.RD. DIVISION	STATE	PROJECT	
2	OHIO		

92/193

CUYAHOGA COUNTY
CUY-290-0.27



Notes:

The information shown on this drawing concerning type and location of underground utilities is not guaranteed to be accurate or all inclusive. 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.

The existing underground utilities in Broadway Avenue are not shown. For details see Roadway Plans.

FOR INFORMATION ONLY

H.N.T.B. BR.NO. 9 PART II - SUPERSTRUCTURE

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

SITE PLAN

I-290 OVER CUYAHOGA RIVER

BR.NO. CUY-290-0110 STA.985+85.75 TO STA.1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN J.W.C. DATE 3-10-70	TRACED D.L.R. DATE 4-1-70	CHECKED RAB DATE 10-1-70	REVIEWED C.A.B. DATE 2-24-96	REVISED

SHEET 7/108

GENERAL NOTES - STRUCTURES OVER 20 - FT SPAN

FHWA REGION	STATE	PROJECT		93/193
2	OHIO			

CUYAHOGA COUNTY
CUY- 290-027

ITEM	TOTAL	UNIT	DESCRIPTION	ABUTMENTS	SUPER-STRUCTURE	GENERAL		
511	14,071	CU.YD.	CLASS S CONCRETE, SUPERSTRUCTURE (SEE PROPOSAL NOTE)	2	14,069	--		
**511	14,071	CU.YD.	CLASS S CONCRETE, SUPERSTRUCTURE, USING SHRINKAGE COMPENSATING CEMENT			--		
			(SEE PROPOSAL NOTE)	2	14,069	--		
						--		
513	21,436,000	LBS.	STRUCTURAL STEEL, AISC CATEGORY III (ASTM A-572)		21,436,000			
514	21,436,000	LBS.	FIELD PAINTING OF NEW STRUCTURAL STEEL, SYSTEM A, AS PER PLAN	--	21,436,000	--		
516	250	LIN.FT.	STRUCTURAL EXPANSION JOINTS, INCLUDING ELASTOMERIC STRIP SEALS	--	250	--		
516	293	LIN.FT.	JOINT SEALER, AS PER PLAN	--	293	--		
518	35	EACH	SCUPPERS, INCLUDING SUPPORTS	--	35	--		
518	235	LIN.FT.	8"Ø STD. PIPE DOWNSPOUT, GALVANIZED STEEL 707.08, INCLUDING SPECIALS	--	235	--		
518	1,861	LIN.FT.	10"Ø STD. PIPE DOWNSPOUT, GALVANIZED STEEL 707.08, INCLUDING SPECIALS	--	1,861	--		
601	17,727	SQ. YD.	Crushed aggregate slope protection, as per plan					
607	8,160	LIN.FT.	FENCE, 4'-0" HIGH, TYPE CL, AS PER PLAN	--	8,160	--		
607	5	EACH	GATE, TYPE CL, AS PER PLAN	--	5	--		
625			FOR LIGHTING QUANTITIES, SEE LIGHTING PLANS					
824	5,247,288	LBS.	EPOXY COATED REINFORCING STEEL, GRADE 60	--	5,247,288	--		
845	57,569	SQ.YD.	LATEX MODIFIED CONCRETE OVERLAY OF PROPOSED CONCRETE DECK	--	--	--		
			(SEE PROPOSAL NOTE)		57,569	--		
845	157	CU.YD.	LATEX MODIFIED CONCRETE, AS PER PLAN	33	124	--		
SPECIAL	12,900	SQ.YD.	SEALING OF CONCRETE SURFACES, SEE PROPOSAL NOTE	10	12,890	--		
SPECIAL	760	LIN.FT.	NEOPRENE DRAINAGE TROUGH	--	760	--		
SPECIAL	266	LIN.FT.	EXPANSION JOINT SEAL (8"X4" BITUMEN IMPREGNATED FOAM)	--	266	--		
SPECIAL	3,360	LIN.FT.	MEDIAN BARRIER SEAL	--	3,360	--		
SPECIAL	LUMP SUM	LUMP SUM	SAFETY CLIMBING SYSTEM	--	--	LUMP SUM		
SPECIAL	32,358	LIN.FT.	5/8"Ø SAFETY CABLE SYSTEM	--	32,358	--		
SPECIAL	1	EACH	IMPACT ATTENUATOR	--	1	--		

*ITEM 513, STRUCTURAL STEEL INCLUDES 248,500 POUNDS OF ASTM A668 - CLASS H, STEEL FORGINGS AND 216,300 POUNDS OF ASTM A486 - CLASS 90, STEEL CASTINGS.
**ALTERNATE BID ITEM

1. DESIGN SPECIFICATIONS
STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, DATED 1969, INCLUDING THE 1970 INTERIM SPECIFICATIONS AND THE OHIO "SUPPLEMENT" TO THESE SPECIFICATIONS. THE DESIGN LOADING IS HS20-44 CASE I AND THE ALTERNATE MILITARY LOADING.

(LOAD FACTOR DESIGN USED FOR THE DESIGN OF THE DECK SLAB)

THE CLASSES OF CONCRETE AND THE GRADES OF REINFORCING STEEL, TOGETHER WITH THE STRENGTH FOR EACH ARE AS FOLLOWS:

CONCRETE CLASS S - COMPRESSIVE STRENGTH 4,500 PSI FOR SUPERSTRUCTURE
REINFORCING STEEL - ASTM A615, A616, A617 - GRADE 60, MIN. YIELD STRENGTH 60,000 PSI
STRUCTURAL STEEL - ASTM A36 - UNIT STRESS 20,000 PSI
ASTM A572, GRADE 50 - UNIT STRESS 27,000 PSI
ASTM A668, CLASS H - MIN. YIELD POINT 55,000 PSI
ASTM A486, CLASS 90 - MIN. YIELD POINT 60,000 PSI

2. SUPPLEMENTAL SPECIFICATIONS
REFERENCE SHALL BE MADE TO SUPPLEMENTAL SPECIFICATIONS 824 DATED 10-8-82 , 845 DATED 2-25-86, 953 DATED 8-21-80.

3. REFERENCE DRAWINGS
REFERENCE SHALL BE MADE TO STANDARD DRAWINGS AS-1-81 DATED 11-27-81 (SHEETS 1 AND 2), RB-1-55 REVISED 2-2-59, AND SD-1-69 (SHEET 1 AND 2 OF 4) DATED 6-12-69.

4. DECK PROTECTION METHOD
EPOXY COATED REINFORCED STEEL (BOTH MATS), AND LATEX MODIFIED CONCRETE OVERLAY. A 1-IN. MONOLITHIC WEARING SURFACE IS ASSUMED FOR DESIGN PURPOSES.

5. REINFORCING STEEL
ALL BAR DIMENSIONS ARE GIVEN OUT TO OUT.

ALL BARS ARE DESIGNATED ON PLANS BY BAR NUMBERS. THE BAR SIZE IS DESIGNATED BY THE FIRST DIGIT.

ALL BARS OF A SERIES SHALL VARY BY A CONSTANT INCREMENT.

6. SEALING OF CONCRETE SURFACES
A SEALER SHALL BE APPLIED TO THE FOLLOWING EXPOSED CONCRETE SURFACES:
A. THE ENTIRE PERIMETER OF THE EXTERIOR PARAPET, EDGE OF SLAB AND THE UNDERSIDE OF THE DECK OUTSIDE THE EXTERIOR GIRDER OR BEAM.

B. THE TOP AND FRONT FACES OF THE MEDIAN PARAPET.

C. THE PERIMETER OF ALL BARRIERS AT ABUTMENTS INCLUDED WITH THIS CONTRACT.

7. STRUCTURAL STEEL TYPE
ALL STRUCTURAL STEEL SHALL BE ASTM-A572 GRADE 50 EXCEPT THE ELEMENTS NOTED BELOW MAY BE ASTM A36 STRUCTURAL STEEL.

1) ROCKER AND BOLSTER ELEMENTS AS NOTED IN THE PLANS.
2) ALL CROSSFRAMES IN UNITS 1,5, 6 AND 6CB INCLUDING THE SLIDING PLATE TYPE END DAMS AT THE EAST ABUTMENT AND ABUTMENT CB.
3) ALL TRANSVERSE STIFFENER AND LONGITUDINAL STIFFENER PLATES.
4) SUPPORT CHANNELS AND BRACKETS FOR THE SAFETY CABLE SYSTEM.
5) FRAMING AND LADDERS FOR THE PIER ACCESS DETAILS.

8. PAINTING STRUCTURAL STEEL
STRUCTURAL STEEL SHALL BE PAINTED IN ACCORDANCE WITH SECTION 514 SYSTEM A WITH THE FOLLOWING ADDITIONS:

AN INTERMEDIATE COAT
SHALL BE APPLIED PRIOR TO THE FINAL TOP COAT. THE VINYL INTERMEDIATE STRUCTURAL STEEL PAINT COAT SHALL BE WHITE IN COLOR, A MINIMUM OF 2 MILS THICK AND RECOMMENDED BY THE MANUFACTURER. ALL COATING MATERIALS SHALL BE SUPPLIED BY THE SAME MANUFACTURER TO INSURE COMPATIBILITY. TOTAL DRY FILM THICKNESS OF THE THREE-COAT SYSTEM SHALL BE NOT LESS THAN 8 MILS.

Revised 12-24-86
Rev. 9-22-86

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
CLEVELAND
HNTB

ESTIMATED QUANTITIES AND GENERAL NOTES
I-290 OVER CUYAHOGA RIVER
BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED 9/22/86
R.H.W. DATE 2-14-86	C.P. DATE 2-14-86	B.B. & C.A.B. DATE 2-17-86	C.A.B. DATE 2-24-86	SHEET 8 / 108

GENERAL NOTES - STRUCTURES OVER 20 - FT SPAN

9. CONCRETE DECK

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 PORTLAND CEMENT CONCRETE ELEVATIONS AT THE GUTTER LINES BEFORE THE DEFLECTIONS FROM THE CONCRETE HAVE OCCURRED ARE TABULATED ON THE PLANS.

THE DEPTH OF CONCRETE OVER EACH BEAM, STRINGER OR GIRDER (TOP OF WEARING SURFACE 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, STRINGERS OR GIRDERS WITH ADJUSTMENTS OBTAINED BY VARYING THE THICKNESS OF THE HAUNCHES OVER THE BEAMS, STRINGERS OR GIRDERS.

THE DEPTH OF CONCRETE OVER EACH BEAM, STRINGER 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 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.

10. STRUCTURAL STEEL PLACEMENT

THE FOLLOWING NOTE IS INCLUDED IN THE SUBSTRUCTURE PLANS.

IN ORDER TO EXPEDITE SUPERSTRUCTURE CONSTRUCTION THE CONTRACTOR SHALL INITIALLY COMPLETE THE WORK IN UNIT 3. CONCURRENTLY OR SUBSEQUENT TO THIS WORK THE CONTRACTOR SHALL COMPLETE THE SUBSTRUCTURE UNITS IN THE FOLLOWING ORDER: UNIT 2, UNIT 1, UNIT 4, UNIT 5, UNIT 5 6 AND UNIT 6CB.

THE SUPERSTRUCTURE CONTRACTOR SHALL SCHEDULE THE PLACEMENT OF THE STRUCTURAL STEEL AS REQUIRED TO CORRESPOND WITH COMPLETION OF THE SUBSTRUCTURE. THE SUPERSTRUCTURE CONTRACTOR SHALL COOPERATE WITH THE CONTRACTOR FOR THE SUBSTRUCTURE BY ARRANGING HIS WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE MINIMIZED.

11. SEQUENCE OF PLACING DECK CONCRETE (Class S Concrete, Superstructure

THE DECK FOR UNIT 1 SHALL BE COMPLETED PRIOR TO PLACING THE DECK FOR UNIT 2; THE DECK FOR UNIT 2 SHALL BE COMPLETED PRIOR TO PLACING THE DECK FOR UNIT 3; THE DECK FOR UNIT 6C-B SHALL BE COMPLETED BEFORE PLACING THE DECK FOR UNIT 6; THE DECK FOR UNIT 6 SHALL BE COMPLETED BEFORE PLACING THE DECK FOR UNIT 5; THE DECK FOR UNIT 5 SHALL BE COMPLETED BEFORE PLACING THE DECK FOR UNIT 4; AND THE DECK FOR UNIT 4 SHALL BE COMPLETED BEFORE PLACING THE DECK FOR UNIT 3.

NO LONGITUDINAL CONSTRUCTION JOINTS WILL BE PERMITTED IN THE DECK. IN UNIT 2L BETWEEN PIER 7L AND ROLLERS 2L AND IN UNIT 3L BETWEEN ROLLERS 2L AND PIER 10L THE CONCRETE SHALL BE PLACED SYMMETRICALLY ABOUT THE LONGITUDINAL CENTERLINE OF THE DECK.

PRIOR TO PLACING CONCRETE IN A UNIT, THE GIRDER ELEVATIONS NEEDED TO OBTAIN SCREED SETTINGS SHALL BE TAKEN ONE UNIT AHEAD OF THE UNIT IN QUESTION.

THE DECKS OF THE LEFT AND RIGHT BRIDGE MAY BE PLACED INDEPENDENTLY BUT THE SEQUENCE AND DIRECTION FOR EACH SHALL BE AS SPECIFIED ABOVE EXCEPT AS OTHERWISE APPROVED BY THE DIRECTOR. THE CONTRACTOR SHALL SUBMIT A COMPLETE DETAILED POURING SEQUENCE FOR APPROVAL BY THE DIRECTOR PRIOR TO PLACING ANY DECK CONCRETE.

12. WORK IN AND OVER THE CUYAHOGA RIVER

ALL CONSTRUCTION OPERATIONS IN THE CUYAHOGA RIVER SHALL CONFORM TO THE REQUIREMENTS OF THE U.S. COAST GUARD.

THE CONTRACTOR SHALL NOTIFY THE COMMANDER, NINTH COAST GUARD DISTRICT, TEN DAYS IN ADVANCE OF COMMENCEMENT OF WORK IN AND ABOVE THE RIVER SO THAT NAVIGATION INTERESTS MAY BE NOTIFIED OF THE PRESENCE OF CONSTRUCTION EQUIPMENT. THE CONTRACTOR SHALL NOTIFY THE SAME OFFICE WHEN THE WORK IS COMPLETED. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN NAVIGATION LIGHTS AND OTHER NAVIGATION SIGNALS OR FACILITIES WHICH MAY BE REQUIRED BY THE U.S. COAST GUARD ON TEMPORARY CONSTRUCTION OR VESSELS.

13. CONSTRUCTION ADJACENT TO AND OVER DUPONT CORPORATION PROPERTY

THE CONTRACTOR SHALL PROTECT THE PLANT, THE EMPLOYEES AND THE PUBLIC FROM DAMAGE OR INJURIES RESULTING FROM FALLING OBJECTS OR FIRE RESULTING FROM CONSTRUCTION OVER THE BUILDINGS AND ADJACENT PROPERTY OF THE E.I. DUPONT DE NEMOURS AND COMPANY, HEREINAFTER REFERRED TO AS DUPONT.

IT IS UNDERSTOOD THAT THE RESPONSIBILITY FOR THE CONSTRUCTION ADJACENT TO DUPONT BUILDING NO. 2A REMAINS ENTIRELY WITH THE CONTRACTOR, AND HE ALONE SHALL BE RESPONSIBLE FOR ANY DAMAGE, INJURY OR LOSS RESULTING TO DUPONT FROM SAID CONSTRUCTION.

COST OF ALL OF THE ABOVE ITEMS SHALL BE INCIDENTAL TO THE CONSTRUCTION OF THE BRIDGE.

14. CONSTRUCTION ADJACENT TO AND OVER RAILROAD TRACKS

THE CONTRACTOR SHALL COOPERATE AT ALL TIMES WITH THE OFFICIALS OF THE RAILROAD COMPANY. HE SHALL USE ALL REASONABLE CARE AND DILIGENCE IN THE WORK IN ORDER TO AVOID ACCIDENTS, DAMAGE OR INTERFERENCE WITH THE TRAINS OR THE PROPERTY OF THE RAILROAD. THE CONTRACTOR SHALL NOTIFY THE RAILROAD PRIOR TO STARTING WORK THAT MAY AFFECT RAILROAD PROPERTY AND FACILITIES AND SHALL PAY THE RAILROAD COMPANY THE COST OF FLAGMEN FURNISHED BY THE RAILROAD COMPANY AND MADE NECESSARY BECAUSE OF ANY OF THE CONTRACTOR'S OPERATIONS ADJACENT TO OR OVER THE TRACKS.

NO SEPARATE PAYMENT WILL BE MADE FOR SPECIAL PRECAUTIONS REQUIRED BY THE RAILROAD COMPANY TO PROTECT THEIR PROPERTY INCLUDING FLAGMEN. THE COST OF ALL SPECIAL PRECAUTIONS SHALL BE INCLUDED IN THE PRICE BID FOR ITEM 513, STRUCTURAL STEEL.

15. CLASS S CONCRETE, AS PER PLAN

A. GENERAL

IN ADDITION TO THE PROVISIONS OF 511, THE FOLLOWING SHALL APPLY.

B. PLACEMENT

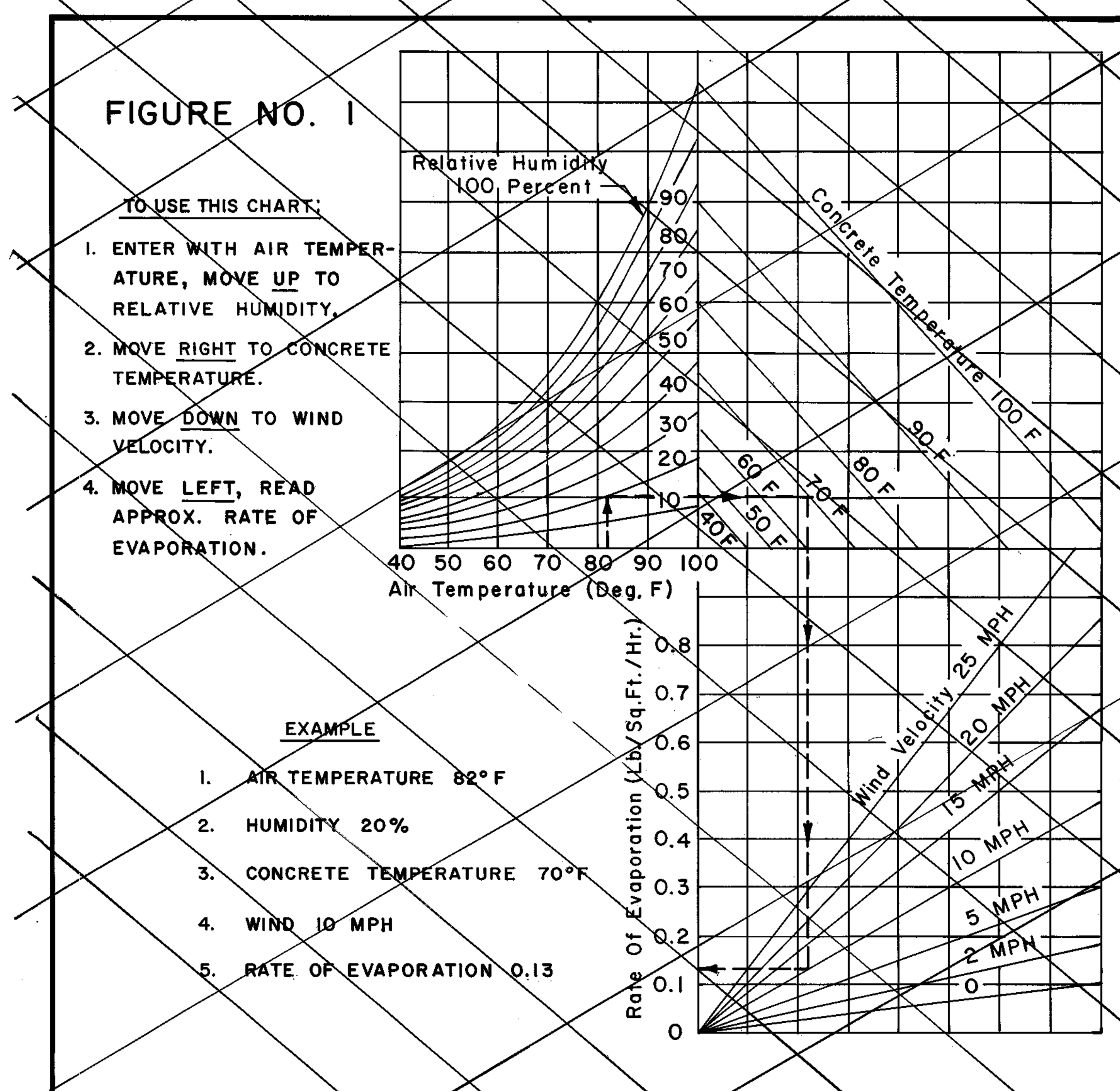
PLACEMENT OF CONCRETE SHALL BE COMPLETED UNDER FAVORABLE ATMOSPHERIC CONDITIONS. FAVORABLE ATMOSPHERE CONDITIONS EXIST WHEN THE SURFACE EVAPORATION RATE AS AFFECTED BY THE AMBIENT AIR TEMPERATURE, CONCRETE TEMPERATURE, RELATIVE HUMIDITY, AND WIND VELOCITY IS 0.1 POUNDS PER SQUARE FOOT PER HOUR OR LESS.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

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

ALL OTHER PROVISIONS OF 511 SHALL REMAIN IN EFFECT.

PAYMENT FOR THE ABOVE COMPLETED AND ACCEPTED QUANTITIES WILL BE MADE AT THE CONTRACT UNIT BID PRICE FOR:

ITEM	UNIT	DESCRIPTION
511	CU.YD.	CLASS S CONCRETE, SUPERSTRUCTURE, AS PER PLAN



16. CLASS S CONCRETE, SUPERSTRUCTURE - USING SHRINKAGE COMPENSATING CEMENT

A. GENERAL

ALL APPLICABLE PROVISION OF ITEM 511 OF THE SPECIFICATIONS SHALL APPLY EXCEPT AS MODIFIED HEREIN.

B. DESCRIPTION

THE CEMENT IN THE CLASS S SUPERSTRUCTURE CONCRETE SHALL BE SHRINKAGE COMPENSATING CEMENT, 701.08. THE FOLLOWING RESTRICTIONS SHALL APPLY TO THE SUPERSTRUCTURE CONCRETE.

1) CEMENT SHALL BE EXPANSIVE HYDRAULIC CEMENT, ASTM C845, TYPE K.
2) THE MAXIMUM WATER/CEMENT RATIO GIVEN FOR CLASS S CONCRETE IN 499.03 SHALL BE REVISED FROM 0.44 TO 0.50.
3) MAXIMUM SLUMP AT THE TIME AND PLACE OF CONCRETE PLACEMENT SHALL BE 6 INCHES.
4) CHEMICAL ADMIXTURES, WHEN REQUIRED BY 511.06, SHALL BE LIMITED TO 705.12 TYPE D.
5) MAXIMUM AMBIENT TEMPERATURE AT TIME OF PLACEMENT OF CONCRETE SHALL BE 80°F.
6) MEMBRANE CURING PER SS836 WILL NOT BE PERMITTED. CONCRETE SHALL BE CURED BY METHOD (A) WATER CURING.
7) IF REQUIRED BY THE ENGINEER, THE SURFACE OF THE CONCRETE SHALL BE GIVEN A FOG SPRAY OF WATER. THIS MAY BE REQUIRED PRIOR TO WATER CURING IF WEATHER CONDITIONS DICTATE. EQUIPMENT SHALL BE ON HAND.
8) THE PLACEMENT OF CONCRETE SHALL CONFORM TO THE REQUIREMENTS CALLED FOR UNDER ITEM 511, CLASS S CONCRETE, AS PER PLAN.

17. STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC STRIP SEALS

A. DESCRIPTION

THIS WORK SHALL INCLUDE FURNISHING AND INSTALLING CONTINUOUS SEAL EXPANSION JOINTS FOR THE BRIDGE DECK IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. THE FINISHED JOINTS SHALL BE IN CONFORMITY WITH LINES AND GRADES SHOWN ON THE PLANS OR ESTABLISHED BY THE ENGINEER.

B. QUALIFICATION

EACH LOT OF SEALS AND ADHESIVES FURNISHED UNDER THESE PROVISIONS SHALL BE IDENTIFIED, SHALL BE PRODUCTS WHICH HAVE BEEN TESTED BY THE MANUFACTURER OR A COMMERCIAL LABORATORY AND SHALL COMPLY WITH THESE PROVISIONS. ADHESIVES ARE REQUIRED.

C. CERTIFICATION

CERTIFIED COPIES OF THE QUALIFICATION TEST RESULTS FOR THE CONTINUOUS SEALS, INDICATING THAT THE TESTED MATERIALS COMPLY WITH THESE PROVISIONS, SHALL BE SUBMITTED TO THE TESTING LABORATORY FOR APPROVAL. SAMPLING, IF REQUESTED, WILL BE SUBMITTED TO THE TESTING LABORATORY. FROM EACH LOT, SEAL SAMPLES SHALL BE ONE PIECE TWO FEET LONG.

D. ACCEPTANCE

MATERIAL ACCEPTANCE WILL BE BASED UPON EVALUATION OF CERTIFIED TEST RESULTS SUBMITTED, UPON LABORATORY TEST OF SAMPLED MATERIAL, OR UPON EVALUATION OF BOTH CERTIFICATES AND TESTED SAMPLES.

E. REQUIREMENTS

CONTINUOUS SEALS OF THE SIZE, SHAPE AND TOLERANCES SHOWN ON THE PLANS SHALL BE OF THE WABO-ACME, D.S. BROWN OR OF AN APPROVED EQUAL TYPE COMPOSED OF AN EXTRUDED OR MOLDED VULCANIZED ELASTOMERIC VIRGIN POLYCHLOROPRENE MATERIAL CONFORMING TO ASTM D-2628 MODIFIED TO OMIT THE RECOVERY TEST. THE SEALS SHALL BE RESILIENT AND SHALL NOT SOFTEN EXCESSIVELY OR BECOME BRITTLE BETWEEN THE TEMPERATURE OF -30° AND 160°F. SEALS SHALL BE FURNISHED IN ONE CONTINUOUS PIECE.

Revised 12-24-86

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
CLEVELAND
HNTB

GENERAL NOTES

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110

STA. 985+85.75 TO
STA. 1020+47.57
(℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
R.H.W. DATE 2-14-86	C.P. DATE 2-17-86	C.A.B. DATE 2-17-86	C.A.B. DATE 2-24-86	

GENERAL NOTES - STRUCTURES OVER 20 - FT SPAN

ALL METAL WORK SHALL BE ASTM A36 AND SHALL MEET THE REQUIREMENTS OF 513. PORTIONS OF THE METAL WORK NOT ENCASED IN CONCRETE, NOT IN CONTACT WITH THE CONTINUOUS SEAL AND NOT COVERED BY ADHESIVE SHALL BE CLEANED AND PAINTED IN CONFORMANCE WITH ITEM 514, FIELD PAINTING OF NEW STRUCTURAL STEEL, SYSTEM A.

LUBRICANT-ADHESIVE USED TO INSTALL THE PREFORMED STRIP SEALS SHALL BE A POLYURETHANE AND HYDROCARBON SOLVENT MIXTURE AS SPECIFIED BY THE SEAL MANUFACTURER (UNLESS OTHERWISE APPROVED BY THE DIRECTOR). IT SHALL HAVE SUITABLE CONSISTENCY AT THE TEMPERATURE AT WHICH THE SEALS ARE INSTALLED AND SHALL BE COMPATIBLE WITH THE SEALS AND THE STEEL RETAINERS.

F. PREPARATION FOR INSTALLATION
TO AVOID THE SUBSEQUENT CONTAMINATION OF PREPARED SURFACES, ALL SURFACES OF ELASTOMERIC STRIP SEALS SHALL BE CLEANED WITH METHYL ETHYL KETONE (MEK), TOLUENE (T) OR OTHER APPROVED SOLVENT USING CLEAN DISPOSABLE CLOTHS.

THE BONDING SURFACES OF THE STEEL RETAINERS (THE INTERIOR OF THE ANCHOR GROOVES) SHALL BE PREPARED TO GRADE SA 3, ASTM D2200. PREPARATION SHALL BE ACCOMPLISHED NOT MORE THAN 24 HOURS PRIOR TO ADHESIVE BONDING.

G. INSTALLATION
IMMEDIATELY PRIOR TO ADHESIVE APPLICATION, BONDING SURFACES SHALL BE CLEAN, DRY AND WARMER THAN 45°F, AND THEY SHALL BE MAINTAINED AT OR ABOVE THIS TEMPERATURE UNTIL THE ADHESIVE HAS CURED. ADHESIVE SHALL BE APPLIED LIBERALLY TO BOTH STEEL AND ELASTOMERIC BONDING SURFACES USING A STIFF BRUSH IF NECESSARY TO ACHIEVE A COMPLETE AND RELATIVELY UNIFORM COAT. THEN THE BULBED EDGES OF THE ELASTOMERIC SEAL SHALL BE INSERTED INTO THE ANCHOR GROOVES. AFTER INSTALLATION, EXCESS ADHESIVE SHALL BE REMOVED FROM THE EXPOSED SEAL SURFACES.

THE WABO-ACME, D.S. BROWN OR AN APPROVED EQUAL, JOINT SEAL SHALL BE INSTALLED WITH EQUIPMENT DESIGNED SPECIFICALLY FOR THE INSTALLATION OF ELASTOMERIC STRIP SEALS. THIS EQUIPMENT SHALL NOT ELONGATE THE SEAL LONGITUDINALLY, CAUSE STRUCTURAL DAMAGE TO THE SEAL, NOR TWIST, DISTORT, OR CAUSE OTHER MALFORMATIONS IN THE COMPLETED SEAL. EQUIPMENT THAT DOES NOT PROVIDE A PROPERLY INSTALLED SEAL SHALL NOT BE USED.

H. SHOP DRAWINGS
SHOP DRAWINGS COVERING ALL DETAILS FOR "STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC STRIP SEALS", ARE REQUIRED.

I. MEASUREMENT AND PAYMENT
STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC STRIP SEALS WILL BE MEASURED BY THE LINEAL FOOT MEASURED HORIZONTALLY ALONG THE JOINT CENTERLINES AND BETWEEN THE OUTER LIMITS OF THE FABRICATED JOINT COMPLETE IN PLACE AND PAID FOR AT THE CONTRACT UNIT PRICE BID PER LINEAL FOOT FOR ITEM 516, STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC STRIP SEALS. THIS PRICE SHALL BE PAYMENT IN FULL FOR FURNISHING ALL MATERIALS, EQUIPMENT AND LABOR TO COMPLETE THE WORK AS SPECIFIED INCLUDING RETAINERS, PLATE EXTENSIONS OF RETAINERS, ANCHOR PLATES, AND ANCHOR STUDS, BUT NOT INCLUDING ANY OTHER METAL WORK. ALL OTHER METAL WORK IS INCLUDED WITH ITEM 513, STRUCTURAL STEEL (AISC CATEGORY III), ASTM A-572 FOR PAYMENT.

18. NEOPRENE DRAINAGE TROUGH

A. DESCRIPTION
THIS WORK SHALL INCLUDE FURNISHING AND INSTALLING AT ALL INTERMEDIATE EXPANSION JOINTS THE NEOPRENE TROUGHS, HOSES AND BITUMINOUS COATING AS DETAILED IN THE PLANS AND IN ACCORDANCE WITH THE SPECIFICATIONS. ALL STRUCTURAL STEEL, PLATES AND ANCHOR STUDS ARE INCLUDED WITH ITEM 513.

B. MATERIALS
1) NYLON REINFORCED NEOPRENE SHEET (TROUGH AND HOSE) - DUPONT'S FAIRPRENE NN-003, 3/32" THICK, CHEMPRENE, 1/8" THICK, OIL STATES RUBBER CO. OR AN APPROVED EQUAL.

THE ONE-PLY MATERIAL SHALL CONFORM TO ASTM D751 AND THE FOLLOWING:

BREAKING STRENGTH, GRAB, W x F, MINIMUM	700 X 700 LBS.
ADHESION, 1" STRIP, 2" MIN., MINIMUM	9 LBS.
BURSTING STRENGTH (MULLEN), MINIMUM	1,400 PSI
HEAT AGING, 180° BEND WITHOUT CRACKING AFTER 70 HOURS AT	212°F
LOW TEMPERATURE BRITTLENESS, ASTM D2136, PASS FLEX TEST AFTER 5 HOURS AT	-40°F

2. BITUMINOUS COATING - THE COATING SHALL CONFORM TO THE LATEST EDITION OF FEDERAL SPECIFICATION WW-P-405B, COATING F.

C. FABRICATION
TROUGH SHOP DRAWINGS SHALL BE PREPARED TO CONTROL THE WORK. THEY SHALL BE COORDINATED BY THE CONTRACTOR WITH THE STRUCTURAL STEEL FABRICATOR AND SHALL BE SUBMITTED TO THE DIRECTOR FOR APPROVAL PRIOR TO THE BEGINNING OF TROUGH FABRICATION.

TROUGHS SHALL BE PREFORMED IN THE SHOP TO CONFORM WITH THE TROUGH SHAPES AS SHOWN IN THE PLANS.

ALL JOINTS OR SEAMS IN THE TROUGH SHALL BE LAP SPLICED NYLON REINFORCED NEOPRENE SHEETS WHICH SHALL EXTEND AT LEAST 1-1/2" ON BOTH SIDES OF EACH JOINT. SPLICES SHALL BE VULCANIZED BONDED UNDER HEAT AND PRESSURE IN THE SHOP.

ENDS OF TROUGHS SHALL BE CLOSED WITH THE END REINFORCED AS DESCRIBED ABOVE FOR JOINTS OR SEAMS.

HOLES IN THE TROUGHS SHALL BE LOCATED WITH THE AID OF A TEMPLATE FURNISHED BY THE STRUCTURAL STEEL FABRICATOR.

D. BITUMINOUS COATING APPLICATION
THE BITUMINOUS COATING SHALL BE BRUSH OR TROWEL APPLIED. PRIOR TO ITS APPLICATION SURFACES SHALL BE WIPED WITH A SUITABLE SOLVENT USING CLEAN DRY CLOTHS TO REMOVE CONTAMINANT TRACES. SURFACES SHALL BE DRY AND WARMER THAN 40°F DURING COATING APPLICATION. COATING THICKNESS SHALL BE NOT LESS THAN 1/16 OF AN INCH.

E. MEASUREMENT AND PAYMENT
NEOPRENE DRAINAGE TROUGH MEASUREMENT WILL BE BASED ON THE ACTUAL NUMBER OF LINEAL FEET OF DRAINAGE TROUGH (MEASURED ALONG THE TOP OF THE TROUGH) COMPLETE AND IN PLACE AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR ITEM SPECIAL, NEOPRENE DRAINAGE TROUGH. THIS PRICE SHALL BE PAYMENT IN FULL FOR FURNISHING ALL MATERIALS, EQUIPMENT, LABOR, AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK.

19. EXPANSION JOINT SEAL (8" X 4" BITUMEN IMPREGNATED FOAM)

A. DESCRIPTION
THIS WORK SHALL CONSIST OF SEALING DECK JOINTS AT ABUTMENT CB AND THE EAST ABUTMENT USING BITUMEN IMPREGNATED FOAM IN ACCORDANCE WITH THESE SPECIFICATIONS, PLANS AND MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS AND AS DIRECTED BY THE ENGINEER.

B. MATERIAL
THE MATERIAL SHALL BE A PRECOMPRESSED SELF-ADHESIVE BITUMEN IMPREGNATED FOAM JOINT SEALANT SUCH AS EMSEAL PCSA, PERMABAND 8100 OR AN APPROVED EQUAL. EMSEAL U.S.A., INC. IS LOCATED AT 344 MILL RD. IN STAMFORD, CT 06903 AND HAS A TELEPHONE NUMBER OF (203) 322-3828. PERMABAND IS AVAILABLE FROM PERMAQUIK (CANADA) LTD. WHICH IS LOCATED AT 3043 UNIVERSAL DRIVE IN MISSISSAUGA, ONTARIO L4X2E2, TELEPHONE (416) 625-9444. ALL MATERIALS SHALL BE STORED AND INCORPORATED IN THE WORK AS RECOMMENDED BY THE MANUFACTURER.

C. SURFACE PREPARATION
THE FACES TO WHICH THE SEAL MUST ADHERE SHALL BE FREE OF FOREIGN MATERIAL SUCH AS DIRT, DUST, GREASE, FORM OIL, RELEASE AGENTS AND ANY OTHER MATERIAL DETRIMENTAL TO ADHESION OF THE SEALANT.

D. APPLICATION
JOINT SEALS SHALL BE INSTALLED ONLY WHEN THE JOINTS ARE DRY AND THEIR TEMPERATURE IS ABOVE 50°F. THE FOAM SEAL SHALL BE REMOVED FROM THE PACKAGING AND ITS NARROW EDGE INSERTED INTO THE JOINT OPENING. THE DEEP FACE WITH THE SELF-ADHESIVE BACKING SHALL BE PRESSED AGAINST THE FACE OF THE ABUTMENT BACKWALL SO THAT FOAM IS HELD IN PLACE WHILE IT EXPANDS.

AT TEMPERATURES ABOVE 70°F, THE MATERIAL WILL RECOVER IN A FEW HOURS. AT TEMPERATURES BELOW 70°F THE RECOVERY SHALL BE ACCELERATED BY HEATING THE MATERIAL WITH AN OPEN FLAME, GAS BURNER, INFRA-RED LAMP OR HOT-AIR BLOWER.

A CONTINUOUS LENGTH OF JOINT SEAL SHALL BE ACHIEVED BY JOINING INDIVIDUAL STRIPS ONLY BY MEANS OF SCARFED JOINTS CUT AT 45° OR LESS RELATIVE TO THE SIDES OF THE JOINT. THE SCARFED ENDS MUST BE PUSHED WELL PAST ONE ANOTHER. THE SEAL SHALL NOT BE PULLED OR STRETCHED SO THAT GAPS BETWEEN SUCCESSIVE LENGTHS ARE PREVENTED.

E. MEASUREMENT AND PAYMENT
EXPANSION JOINT SEAL (8" X 4" BITUMEN IMPREGNATED FOAM) WILL BE MEASURED BY THE LINEAR FOOT COMPLETE IN PLACE AND PAID FOR AT THE CONTRACT UNIT PRICE BID PER LINEAR FOOR FOR ITEM SPECIAL, EXPANSION JOINT SEAL (8" X 4" BITUMEN IMPREGNATED FOAM). THIS PRICE SHALL BE PAYMENT IN FULL FOR PREPARING THE SURFACES, FURNISHING AND PLACING ALL MATERIALS, AND ALL OTHER MATERIAL, LABOR AND EQUIPMENT NECESSARY TO COMPLETE THE WORK.

20. JOINT SEALER

A. DESCRIPTION
THIS WORK SHALL CONSIST OF SEALING THE DECK JOINT AT THE EAST ABUTMENT, ABUTMENT CB AND INTERMEDIATE EXPANSION JOINT 6, IN ACCORDANCE WITH THESE SPECIFICATIONS, THE MANUFACTURER'S RECOMMENDATIONS AND AS DIRECTED BY THE ENGINEER.

B. MATERIAL
THE SEALING MATERIAL SHALL BE GRACE PARA-PLASTIC, SEALTIGHT AS MANUFACTURED BY W.R. MEADOWS OR A HOT-APPLIED BRIDGE DECK WATERPROOFING MATERIAL WHICH MEETS THE REQUIREMENTS OF 705.01.

C. INSTALLATION
THE SEALER SHALL BE APPLIED TO THE OPENING BETWEEN THE END DAM ANGLE OR PLATE AND THE EDGE BAR. THE SEALER SHALL BE INSTALLED IN ACCORDANCE WITH ARTICLE 516.04 AND THE MANUFACTURER'S RECOMMENDATIONS. A BOND BREAKER SHALL BE PLACED ALONG THE BOTTOM HORIZONTAL SURFACE OF THE JOINT OPENING.

21. MEDIAN BARRIER SEAL

A. DESCRIPTION
THIS WORK SHALL INCLUDE FURNISHING AND INSTALLING A NEOPRENE SEAL ALONG THE TOP OF THE BRIDGE MEDIAN BARRIER IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS.

B. MATERIAL
1) THE NEOPRENE PIECES SHALL MEET THE FOLLOWING SPECIFICATIONS.

PROPERTY	REQUIREMENT	ASTM METHOD
TENSILE STRENGTH, MIN., PSI	2000	D-412-62T
ELONGATION AT BREAK, MIN.	250%	D-412-51T
HARDNESS, DUROMETER A	60 ±5	D-2240 MODIFIED
OZONE RESISTANCE, 20% ELONGATION 300 PPHM 40°C (104°F)(70 HRS) WIPE SURFACES WITH SOLVENT TO REMOVE CONTAMINATION	NO CRACKS	D-1149
HEAT AGING 70 HRS @ 212°F		D-573
TENSILE STRENGTH, MAX. % DECREASE	-20	
ELONGATION, MAX. % DECREASE	-20	
HARDNESS, MAX. CHANGE	±10/-0	
OIL SWELL, ASTM OIL #3 70 HRS @ 212°F MAX. WEIGHT INCREASE AT SPECIFIC GRAVITY 1.35 ±3	+45	D-471
COMPRESSION SET, 70 HRS @ 212°	40% MAX.	D-395(B)
LOW TEMPERATURE	NOT BRITTLE	D-746
RESISTANCE TO SALT, VARIATION OF VOLUME IN % 70 HRS AT 40°C IN $CaCl_2$ SOLUTION	-5% TO +10%	

2) ADHESIVES SHALL BE SIKADUR 31 MANUFACTURED BY THE SIKA CHEMICAL COMPANY OF LYNDHURST, NEW JERSEY, FEL-POXY FP-01 MANUFACTURED BY THE FELT PRODUCTS MANUFACTURING COMPANY OF SKOKIE, ILLINOIS, OR AN APPROVED EQUAL. ADHESIVES SHALL BE STORED AT TEMPERATURES BETWEEN 50°F AND 80°F AND SHALL BE USED WITHIN 270 DAYS AFTER THE DATE OF MANUFACTURE.

GENERAL NOTES - STRUCTURES OVER 20 - FT SPAN

C. REQUIREMENTS
THE MEDIAN SEAL SHALL BE CONTINUOUS ALONG THE LENGTH OF THE BRIDGE EXCEPT AT INTERMEDIATE EXPANSION JOINTS AND AT LIGHT AND SIGN SUPPORTS. ELASTOMERIC SHEETS SHALL BE AS LONG AS PRACTICAL WITH FIELD SPLICES BONDED TOGETHER WITH ADHESIVE.

D. SURFACE PREPARATION
1) NEOPRENE
TO AVOID THE SUBSEQUENT CONTAMINATION OF PREPARED SURFACES, ALL SURFACES OF THE NEOPRENE SHALL BE CLEANED WITH METHYL ETHYL KETON (MEK), TOLUENE (T) OR OTHER APPROVED SOLVENT USING CLEAN DISPOSABLE CLOTHS. THEN NOT MORE THAN 7 DAYS PRIOR TO THE SEAL INSTALLATION, A THIN (1/8" MIN. THICKNESS) COATING OF CYCLIZING PASTE* SHALL BE APPLIED TO THE BONDING SURFACS. AFTER 25 TO 40 MINUTES, THE PASTE SHALL BE WASHED FROM THE SURFACES WITH CLEAN WATER.

*CYCLIZING PASTE IS A MIXTURE OF ONE POUND OF PITTSBURGH PLATE GLASS INDUSTRIES' HISIL 223 OR AN APPROVED ALTERNATE AND SIX POUNDS OF CONCENTRATED SULFURIC ACID (18 MOLAR). TO MIX THE PASTE, ADD HISIL TO ACID SLOWLY WHILE STIRRING MIXTURE TO ACHIEVE A SMOOTH VISCOUS PASTE. NOTE: SINCE CONCENTRATED SULFURIC ACID IS VERY CORROSIVE AND HISIL IS AN EXTREMELY FINE NON-TOXIC POWDER, RUBBER GLOVES AND GLASSES SHOULD BE USED BY THOSE USING THE PASTE WHILE GLOVES, GLASSES AND A RESPIRATOR SHOULD BE USED BY THOSE MIXING THE PASTE.

2) CONCRETE
THE CONCRETE SURFACE SHALL BE THOROUHGLY CLEANED TO REMOVE DUST, CURING COMPOUND, LAITANCE AND OTHER FOREIGN MATERIALS BY MEANS OF SANDBLASTING FOLLOWED BY AIR BROOMING OR POWER SWEEPING TO REMOVE DUST AND SAND FROM THE SURFACE AND OPENED PORES.

E. FIELD BONDING
IMMEDIATELY PRIOR TO ADHESIVE APPLICATION, BONDING SURFACES SHALL BE CLEAN, DRY AND WARMER THAN 45°F AND SHALL BE MAINTAINED ABOVE 45°F UNTIL THE ADHESIVE HAS CURED.

ADHESIVE COMPONENTS SHALL BE COMBINED IN THE EXACT RATIOS RECOMMENDED BY THE ADHESIVE MANUFACTURER AND SHALL BE CAREFULLY AND THOROUGHLY MIXED TO ENSURE A UNIFORM MATERIAL FREE FROM ENTRAPPED AIR. THE BONDING PROCEDURES AND RATE OF APPLICATION SHALL BE IN ACCORDANCE WITH THE ADHESIVE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. FOR PROPER CONTROL DURING CURING, LIGHT PRESSURE SHOULD BE MAINTAINED UNTIL THE ADHESIVE HAS CURED.

F. MEASUREMENT AND PAYMENT
MEDIAN BARRIER SEAL WILL BE MEASURED BY THE LINEAR FOOT COMPLETED IN PLACE AND PAID FOR AT THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR ITEM SPECIAL, MEDIAN BARRIER SEAL. THIS PRICE SHALL BE PAYMENT IN FULL FOR FURNISHING ALL MATERIALS, EQUIPMENT AND LABOR TO COMPLETE THE WORK AS SPECIFIED.

22. SAFETY CLIMBING SYSTEM
A. DESCRIPTION
THIS WORK SHALL CONSIST OF FURNISHING AND INSTALLING SAFETY CLIMBING SYSTEMS ON ALL ACCESS MANHOLE LOCATIONS IN ACCORDANCE WITH THESE SPECIFICATIONS, IN REASONABLY CLOSE CONFORMITY WITH THE PLANS AND MANUFACTURER'S RECOMMENDATIONS AND AS DIRECTED BY THE ENGINEER.

B. SYSTEM COMPONENTS AND MANUFACTURERS
THE SYSTEM SHALL CONSIST OF A SAF-T-NOTCH RAIL, LADDER RUNG CLAMPS, SAF-T-MOUNT SECTION AT THE BOTTOM OF THE LADDER, REMOVABLE EXTENSION MANDRIL AT THE TOP OF THE LADDER AND 2 SAFETY LOCKING SLEEVE MECHANISM FOR EACH ACCESS MANHOLE LADDER (6 TOTAL). ALSO INCLUDED SHALL BE A TOTAL OF 2 REMOVABLE EXTENSION RAILS AND 2 TIE DOWN RODS WHICH SHALL BE DELIVERED TO THE ENGINEER.

ALL COMPONENTS SHALL BE STANDARD GALVANIZED SAF-T-CLIMB FALL PREVENTION SYSTEM AS MANUFACTURED BY NORTH CONSUMER SAFETY PRODUCTS AT 16624 EDWARDS ROAD, CERRITOS, CA 90701, (213) 926-0545 OR A SIMILAR SYSTEM BY AN APPROVED EQUAL.

C. MEASUREMENT AND PAYMENT
THIS ITEM SHALL BE MEASURED AS A UNIT COMPLETE, IN PLACE AND ACCEPTED AND WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE BID FOR ITEM SPECIAL, SAFETY CLIMBING SYSTEM. THIS PRICE SHALL BE PAYMENT IN FULL FOR FURNISHING AND INSTALLING THE SAFETY CLIMBING SYSTEM AND ALL OTHER MATERIAL, LABOR AND EQUIPMENT NECESSARY TO COMPLETE THE INSTALLATION ACCORDING TO SPECIFICATIONS AND THE PLANS.

23. 5/8"Ø SAFETY CABLE SYSTEM
A. DESCRIPTION
THIS WORK SHALL CONSIST OF FURNISHING AND INSTALLING A SAFETY CABLE SYSTEM ALONG THE GIRDERS OF SUPERSTRUCTURE UNITS 2, 3 AND 4 IN ACCORDANCE WITH THESE SPECIFICATIONS, PLANS AND AS DIRECTED BY THE ENGINEER.

B. MATERIALS
1) THE CABLE SHALL BE 5/8"Ø 6 X 19 ZINC COATED WIRE ROPE WITH AN INDEPENDENT WIRE ROPE CORE. THE CABLE SHALL MEET THE REQUIREMENTS OF ASTM A603 AND SHALL HAVE A MINIMUM BREAKING STRENGTH OF 40,000 LBS.

C. MEASUREMENT AND PAYMENT
THE 5/8"Ø SAFETY CABLE SYSTEM WILL BE MEASURED BY THE LINEAR FOOT OF SYSTEM (MEASURED ALONG THE TOP OF THE GIRDER WEB BETWEEN SUPPORT POINTS) COMPLETE AND IN PLACE AND PAID FOR AT THE CONTRACT UNIT PRICE BID FOR ITEM SPECIAL, 5/8"Ø SAFETY CABLE SYSTEM. THIS PRICE SHALL BE PAYMENT IN FULL FOR FURNISHING ALL MATERIALS, EQUIPMENT AND LABOR TO COMPLETE THE WORK AS SPECIFIED INCLUDING ALL CABLE, END ATTACHMENTS, AND INCIDENTALS AS REQUIRED. ALL OTHER METAL WORK INCLUDING BRACKETS AND SUPPORT CHANNELS ARE INCLUDED WITH ITEM 513, STRUCTURAL STEEL (AISC CATEGORY III) ASTM A572 FOR PAYMENT.

24. ITEM SPECIAL - IMPACT ATTENUATOR
A. DESCRIPTION
THIS WORK SHALL INCLUDE FURNISHING AND INSTALLING A HI-DRO CUSHION IMPACT ATTENUATOR UNIT AND ACCESSORIES IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND PLAN DETAILS AND AS DIRECTED BY THE ENGINEER.

B. REQUIREMENTS
THE IMPACT ATTENUATOR UNIT SHALL BE MODEL NO. 204710S12S WITH CONCRETE BACKUP AND PLATE TYPE FRONT ANCHOR SYSTEM AS MANUFACTURED BY ENERGY ABSORPTION SYSTEMS, INC., ONE EAST WACKER DRIVE, CHICAGO, ILLINOIS 60601.

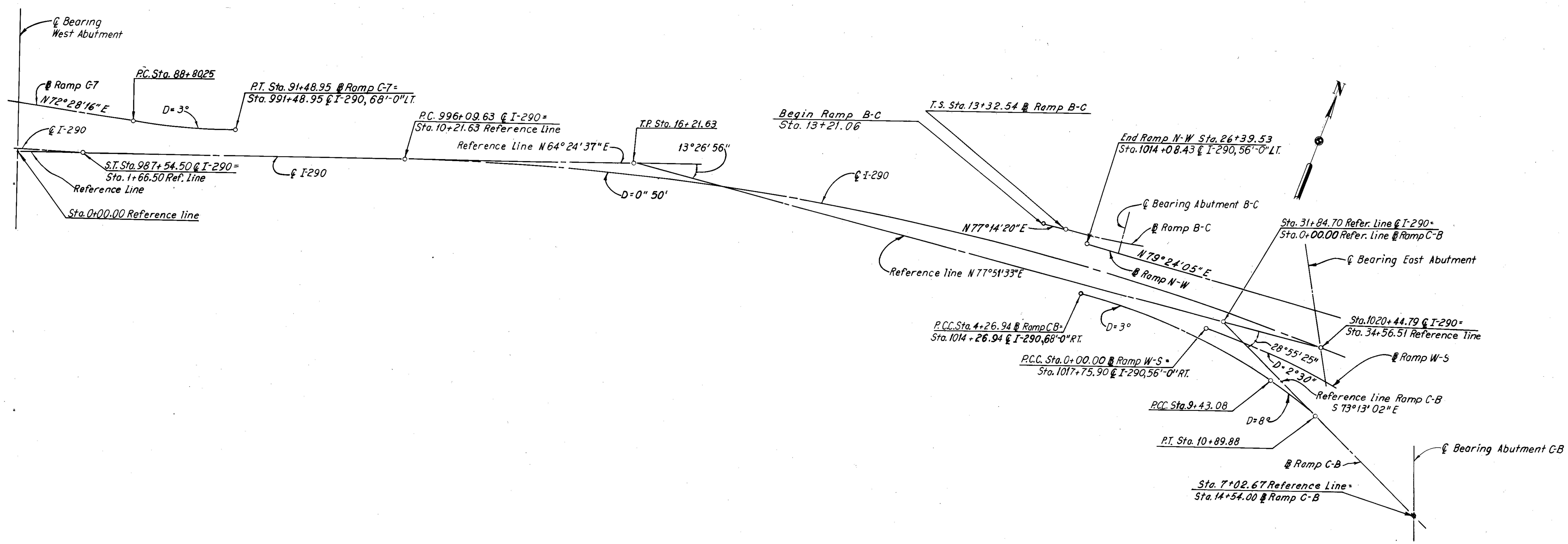
C. PAYMENT
PAYMENT FOR THE IMPACT ATTENUATOR, ACCEPTED AND IN PLACE, SHALL BE MADE AT THE CONTRACT UNIT PRICE BID FOR EACH ITEM SPECIAL, IMPACT ATTENUATOR. THIS PRICE SHALL BE PAYMENT IN FULL FOR ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY TO COMPLETE THE WORK IN ACCORDANCE WITH THE SPECIFICATIONS AND PLAN DETAILS.

25. ITEMS NOT INCLUDED IN BRIDGE PLANS
THE FOLLOWING ITEMS ARE NOT INCLUDED IN THE BRIDGE PLANS. SEE ROADWAY PLANS FOR DETAILS.

(1) GRADING, APPROACH PAVEMENT AND APPROACH SLABS.
(2) LIGHTING.
(3) SIGNING.

FED.RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY-290-0.27



H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

BRIDGE LAYOUT DIAGRAM

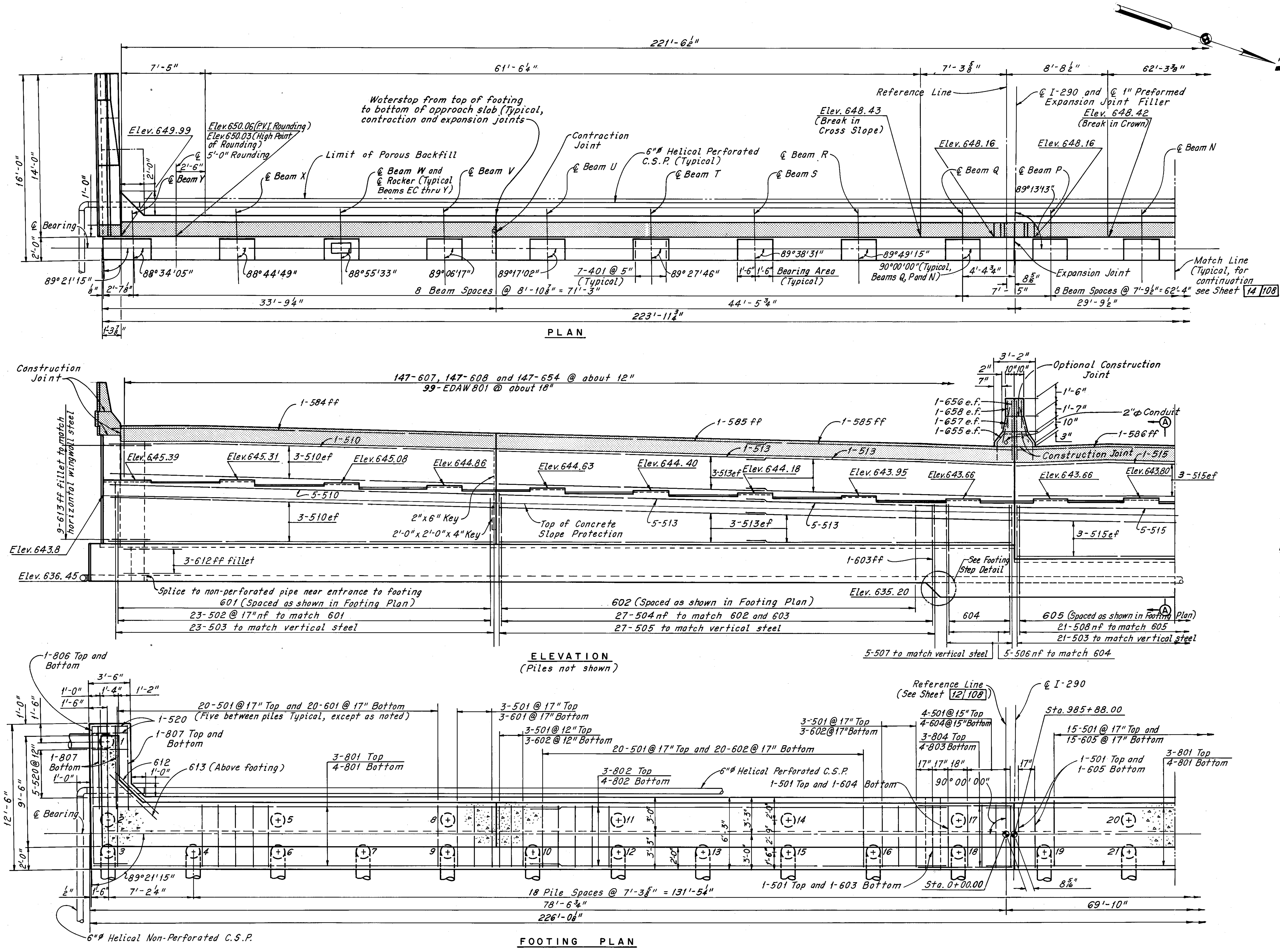
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN MCB	TRACED HCH	CHECKED	REVIEWED G.A.B.	REVISED
DATE 6-20-70	DATE 6-29-70	DATE 7-1-70	DATE 2-24-86	SHEET 12/108

CUYAHOGA COUNTY
CUY-290-0.27



Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Note:
Bars 515 and 586 shall be field bent as required.

Note:
All reinforcing bar marks shall be prefixed as follows:

401, 501 thru 549, 601 thru 630 and 801 thru 811 - AW

575 thru 593 and 650 thru 658 - EAW

Indicates latex modified concrete at the backwall and Class S Concrete at the barriers and median to be placed in this contract.

Notes:
All piles are 14"⌀ C.I.P. reinforced concrete.
All battered piles shall be inclined 3 in 12 in the direction shown.
For contraction and expansion joint details, see Sheet 16/108.
For Section A-A, see Sheet 15/108.
For footing step detail, see Sheet 15/108.
The following abbreviations are used:
nf = near face
ff = far face
ef = each face
For additional notes, see Sheet 15/108.

All work shown on this sheet is by Others, except specified backwall and barrier concrete.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

WEST ABUTMENT

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

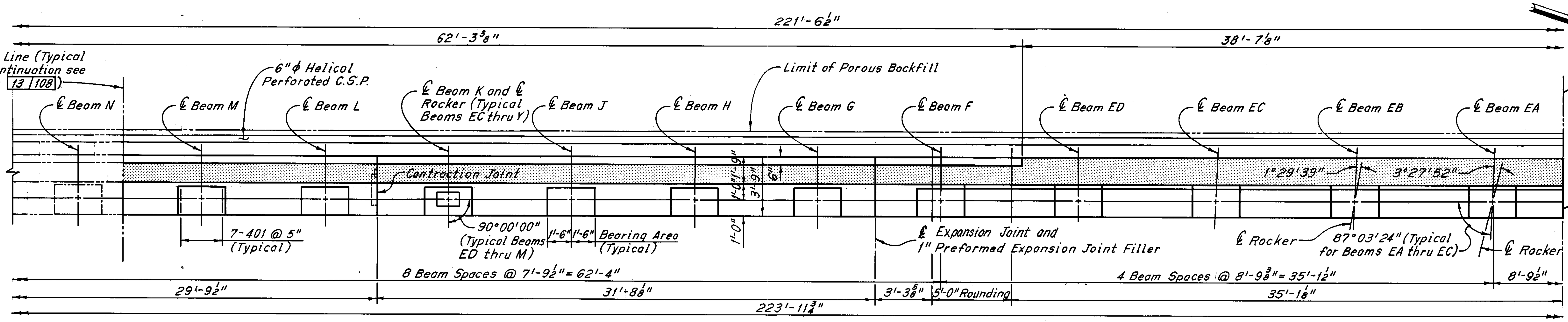
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN C.P. DATE 10-11-83	TRACED C.P. DATE 10-11-83	CHECKED C.K.B. DATE 10-18-83	REVIEWED C.A.B. DATE 6-24-86	REVISED	SHEET 13/108

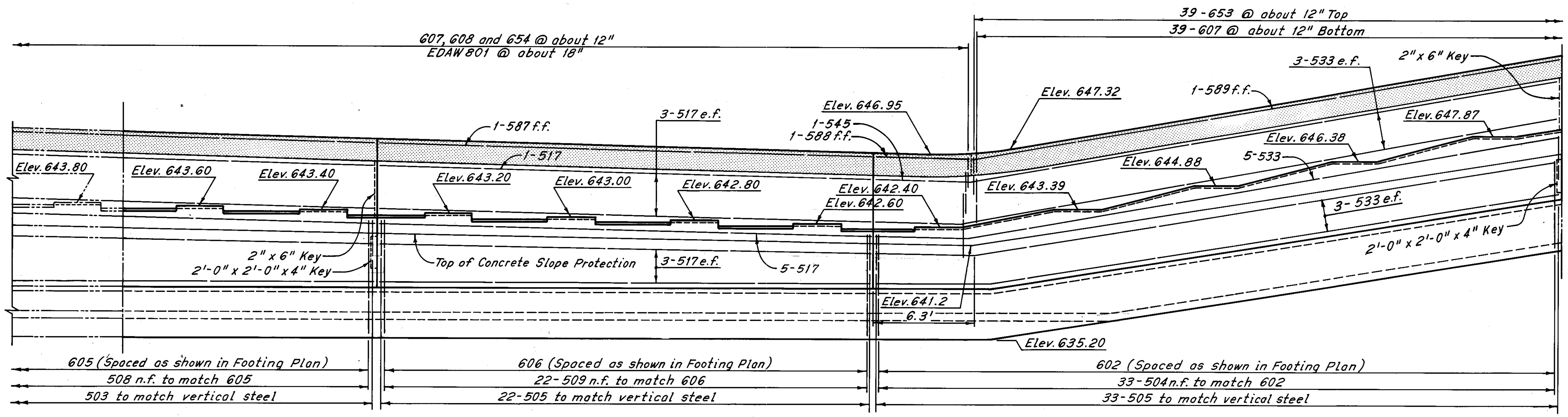
FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

99/193

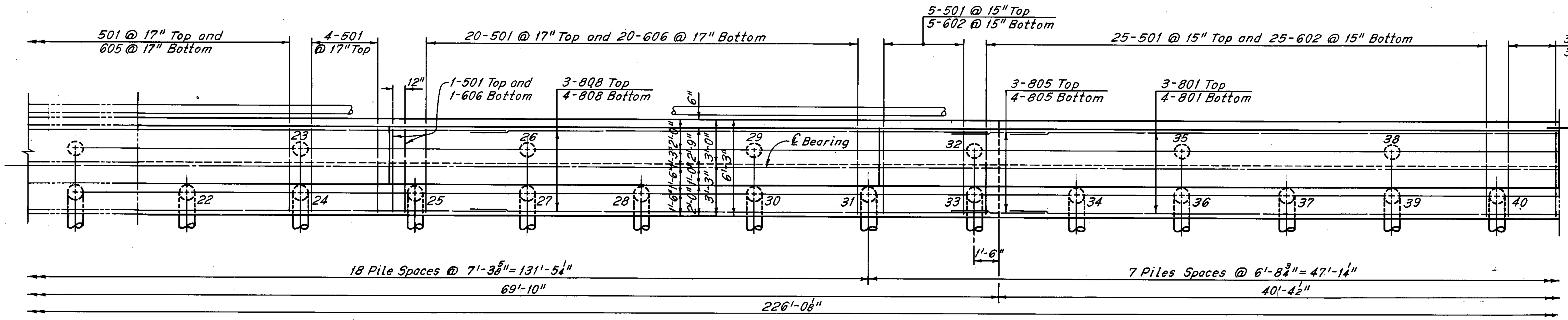
CUYAHOGA COUNTY
CUY-290-0.27



PLAN



ELEVATION
(Piles not shown)



FOOTING PLAN

Note:
All reinforcing bar marks shall be prefixed as follows:

401, 501 thru 549, 601 thru 630 and 801 thru 811 - AW

575 thru 593 and 650 thru 658 - EAW

Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Indicates latex modified concrete at the backwall and Class S Concrete at the barriers and median to be placed in this contract.

Note:
Bars 533 shall be field bent as required.

Note:
For notes, see Sheet 13/108.

All work shown on this sheet is by Others, except specified backwall and barrier concrete.

H.N.T.B. BR. NO. 9   PART II - SUPERSTRUCTURE

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

WEST ABUTMENT

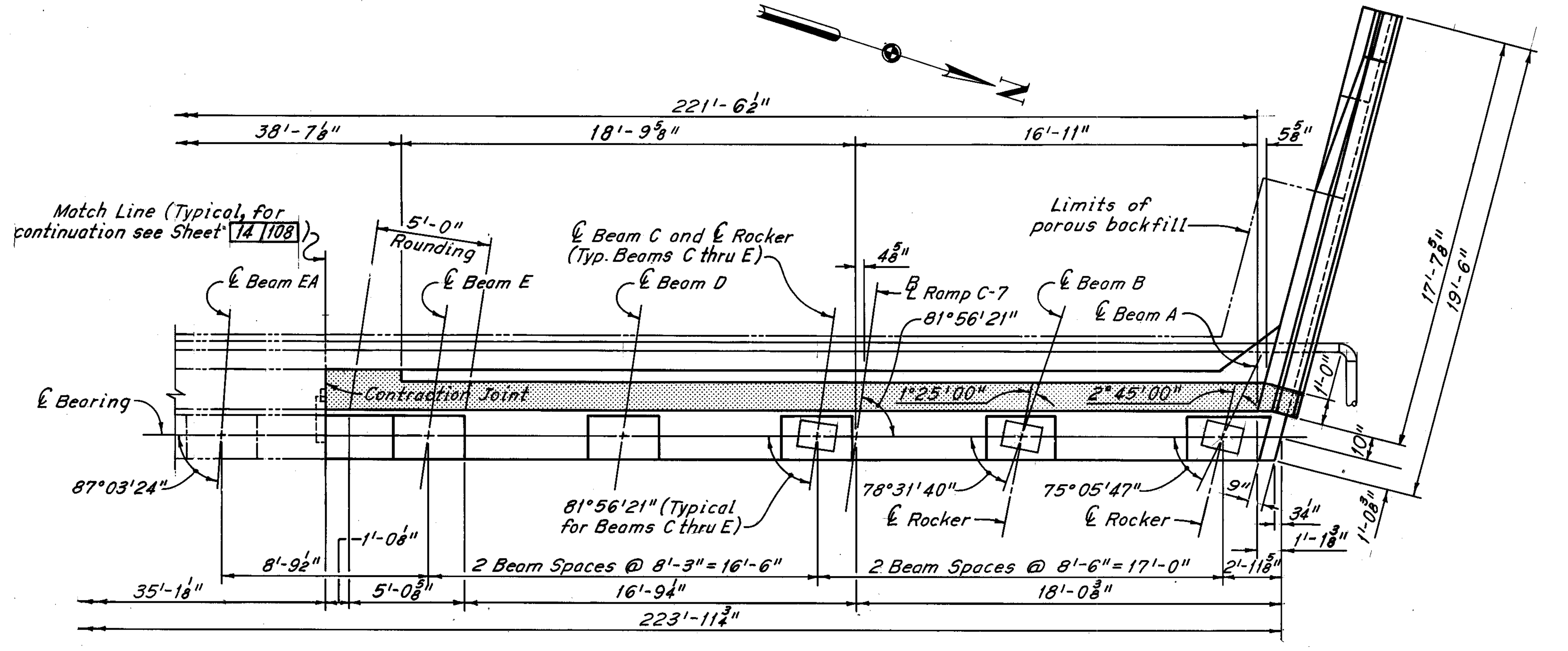
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110   STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

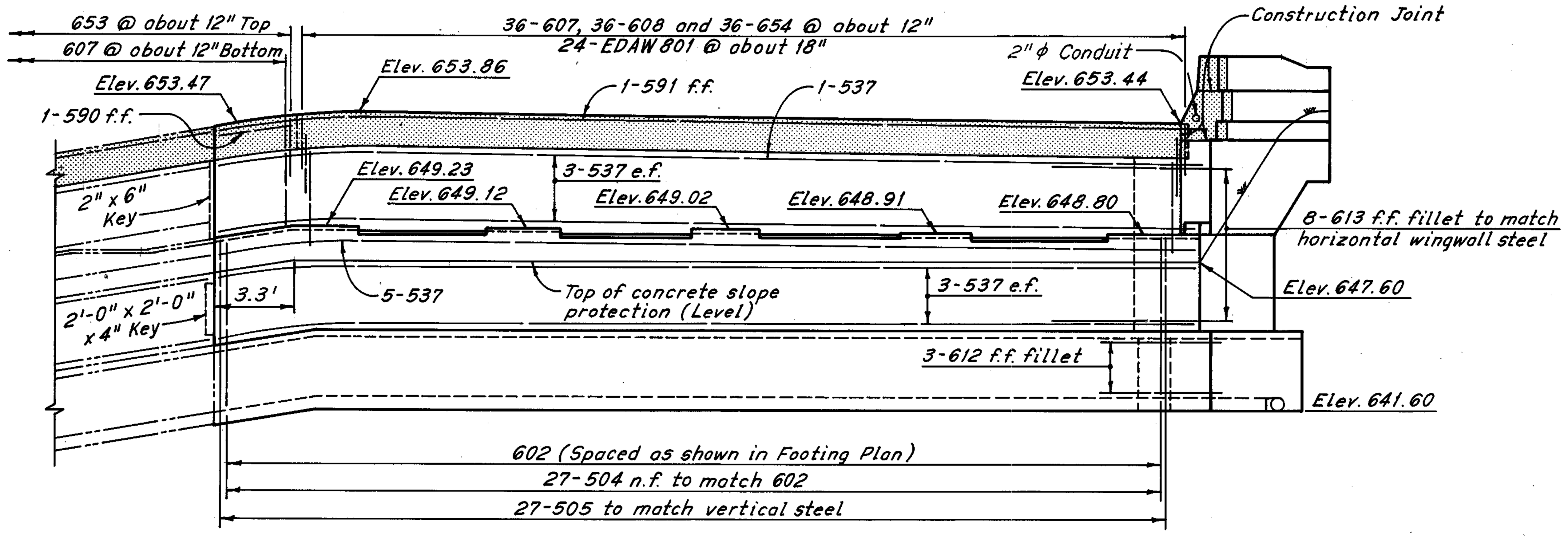
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
D.L.R. DATE 10-11-83	D.L.R. DATE 10-11-83	C.K.B. DATE 10-18-83	C.A.B. DATE 2-24-86	SHEET 14/108

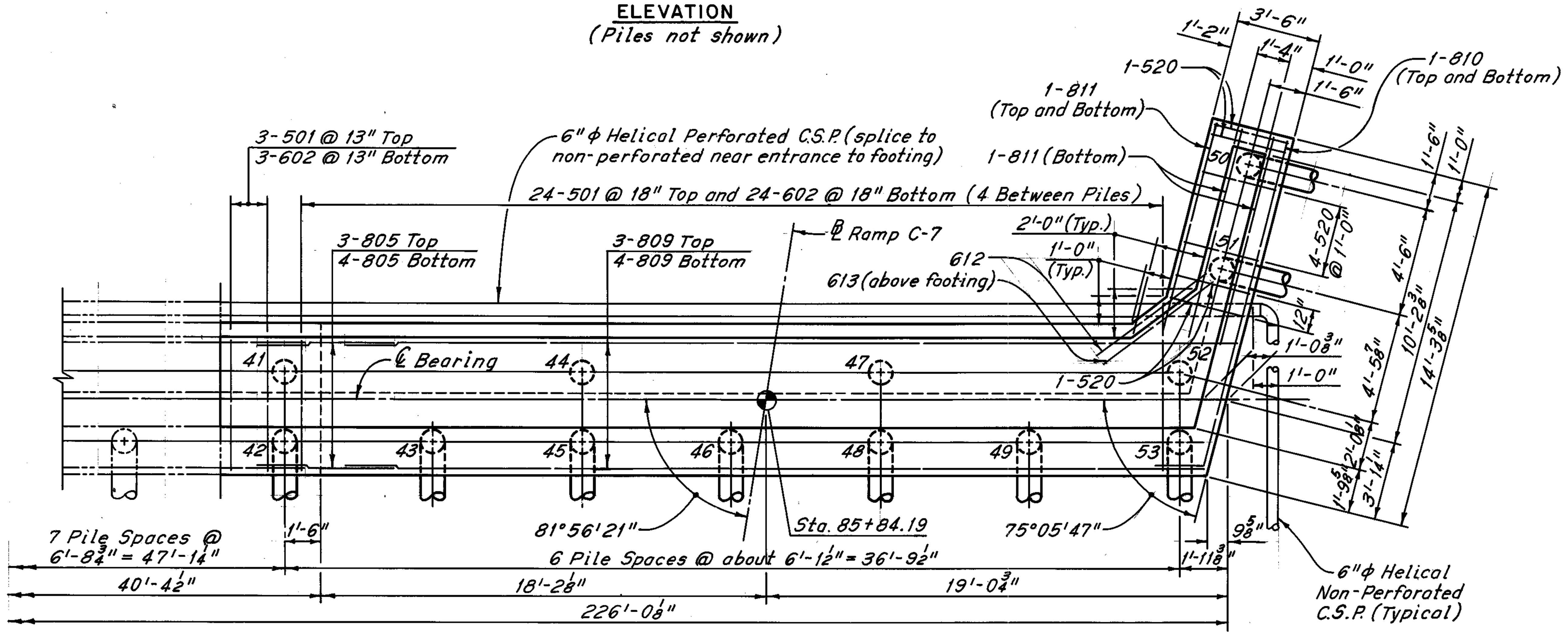
CUYAHOGA COUNTY
CUY-290-0.27



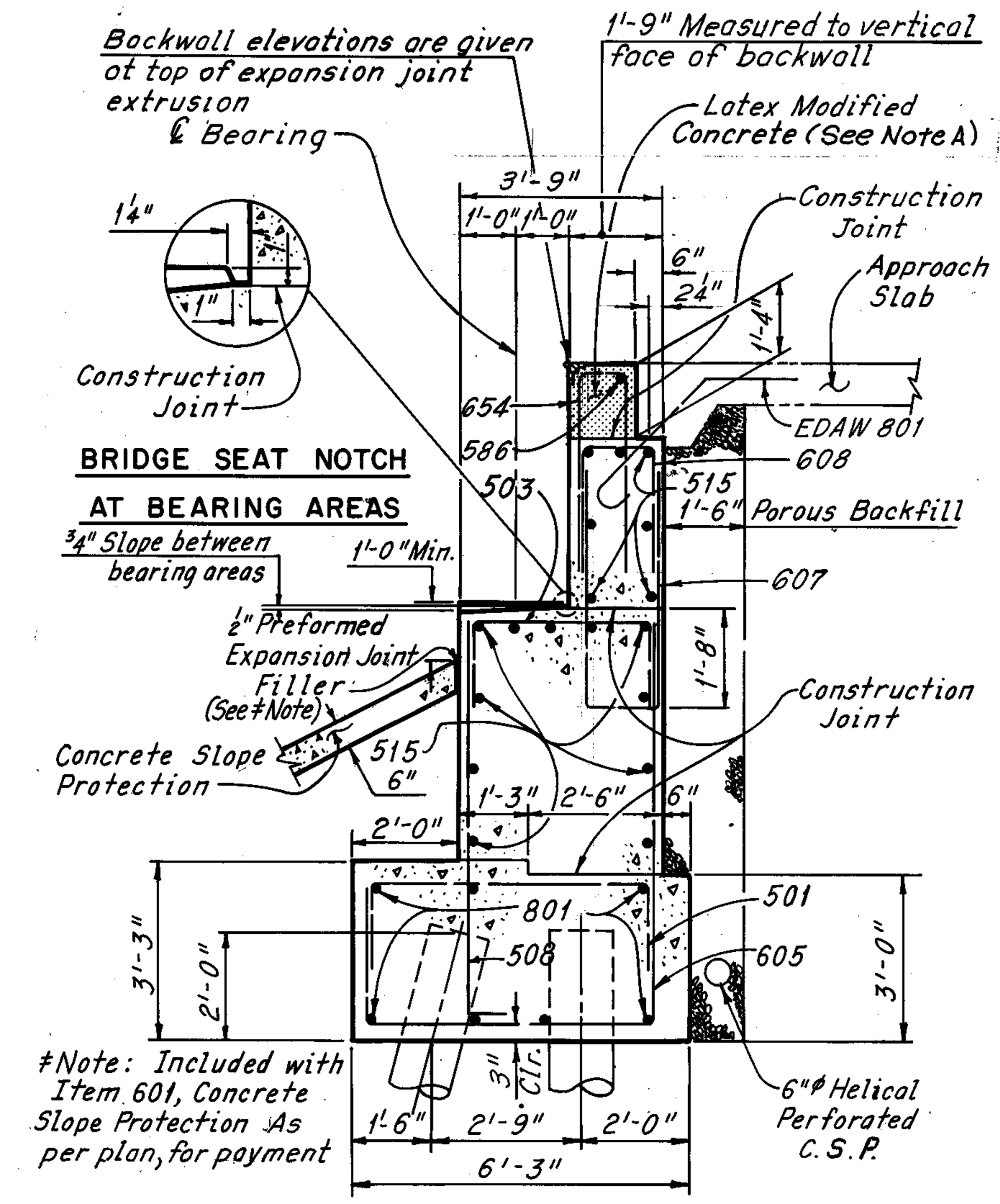
PLAN



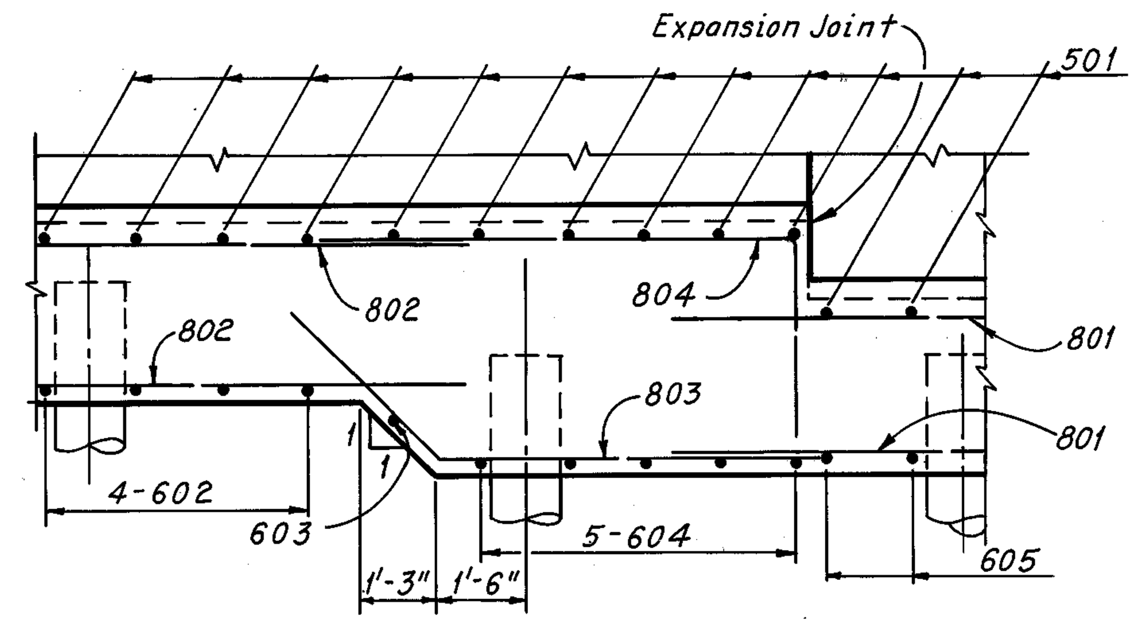
ELEVATION
(Piles not shown)



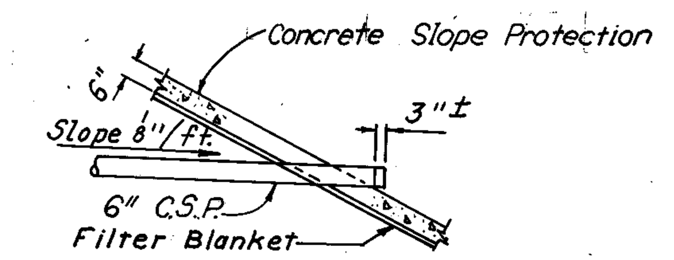
FOOTING PLAN



SECTION A-A



FOOTING STEP DETAIL



TERMINATION OF 6"φ C.S.P. AT THE FRONT SLOPE

Note A:

The backwall between curbs and above the approach slab construction joints shall be constructed with Latex Modified Concrete in accordance with Supplemental Specification 845 with the following exceptions:

1. Prior to placement of the Latex Modified Concrete, these surfaces shall be sandblasted for sufficient duration and intensity as to expose fine aggregate.
2. Sections 845.05 and 845.06 are not applicable.

Latex modified concrete, as specified above will be measured by volume in cubic yards and shall be paid for at the contract unit price bid for Latex Modified Concrete As Per Plan.

Note: All reinforcing bar marks shall be prefixed as follows:

401, 501 thru 549, 601 thru 630 and 801 thru 811 - AW

575 thru 593 and 650 thru 658 - EAW

Note: Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Note: Bars 537 and 591 shall be field bent as required.

Indicates latex modified concrete at the backwall and Class S Concrete at the barriers and median to be placed in this contract.

Note: For location of Section A-A, see Sheet 13/108.

All work shown on this sheet is by Others, except specified backwall and barrier concrete.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

WEST ABUTMENT

I-290 OVER CUYAHOGA RIVER

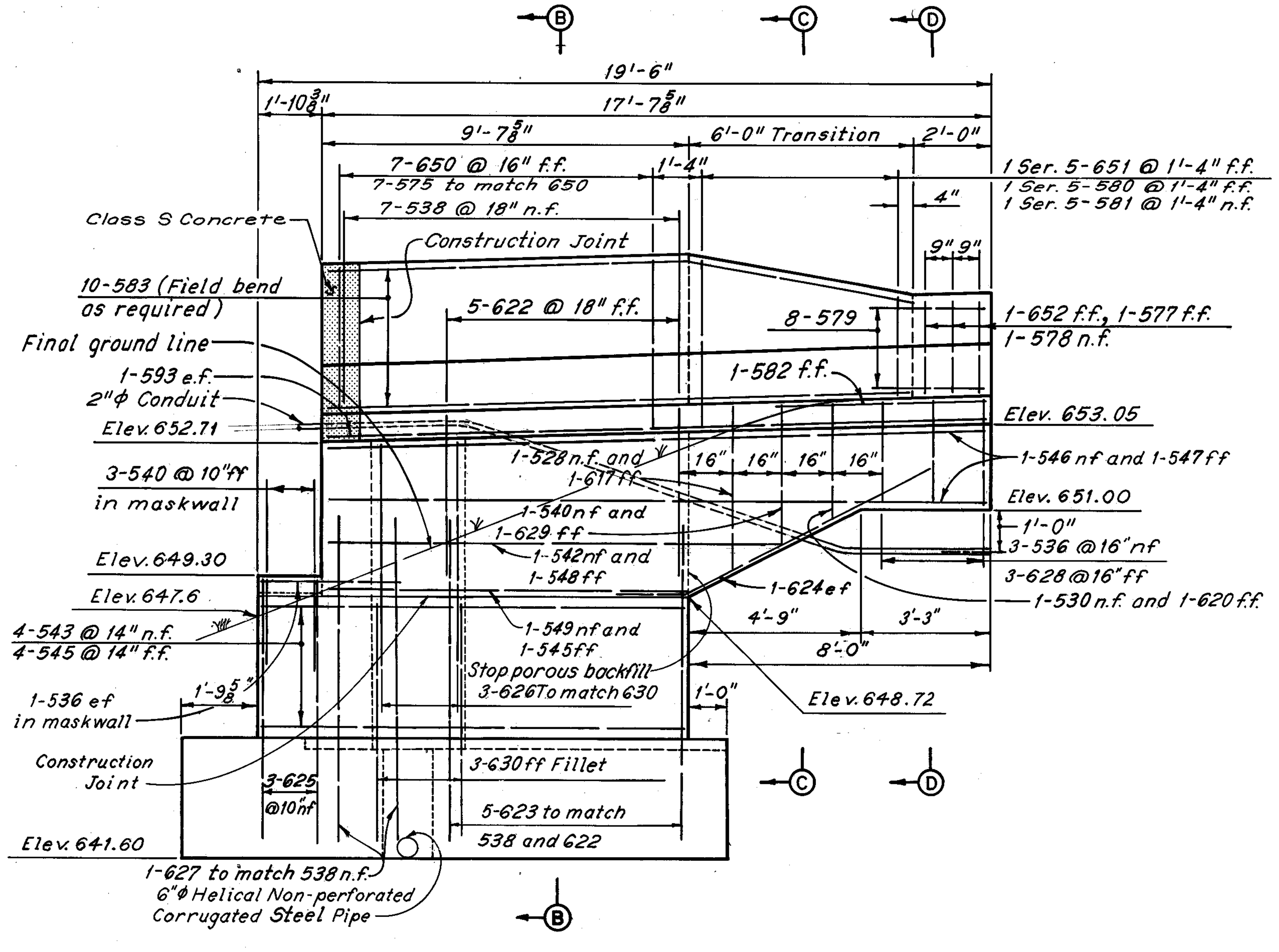
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

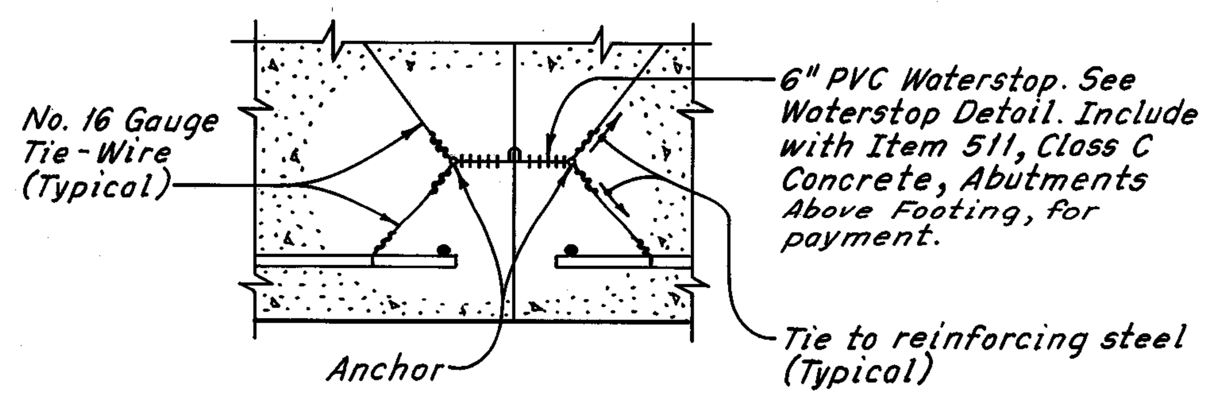
DRAWN D.L.R. DATE 10-11-83	TRACED D.L.R. DATE 10-11-83	CHECKED C.K.B. DATE 10-18-83	REVIEWED C.A.B. DATE 2-24-86	REVISED

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY-290-0.27

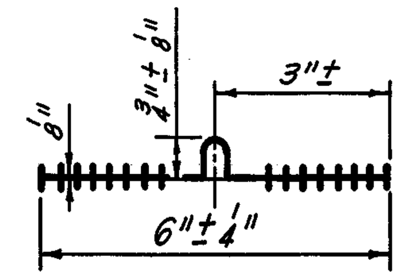


NORTH WINGWALL
(Piles not shown)



DETAIL B
(Contraction Joint Shown, Expansion Joint Similar)

For the first pour, the waterstop shall be held securely in place by the use of split forms and tie-wires. For the second pour, secure the free end of waterstop in proper position with tie wires.



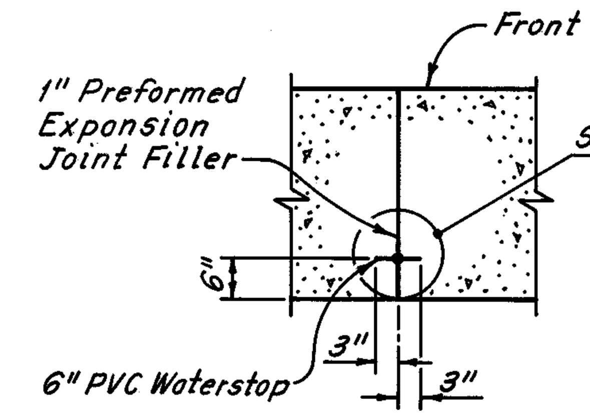
WATERSTOP

Indicates latex modified concrete at the backwall and Class S Concrete at the barriers and median to be placed in this contract.

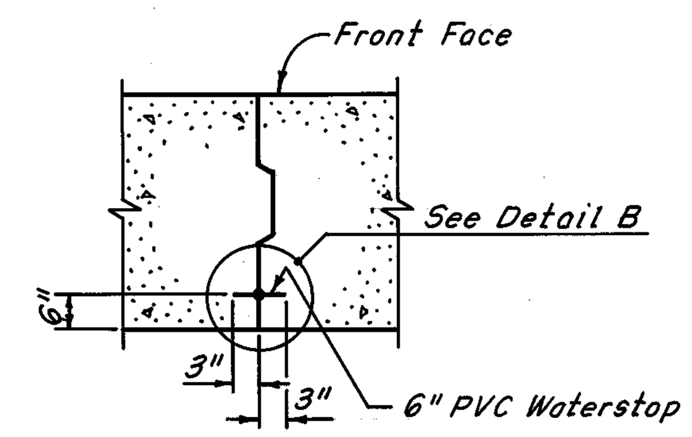
Note:
All reinforcing bar marks shall be prefixed as follows:

401, 501 thru 549, 601 thru 630, and 801 thru 811 - AW

575 thru 593 and 650 thru 658 - EAW

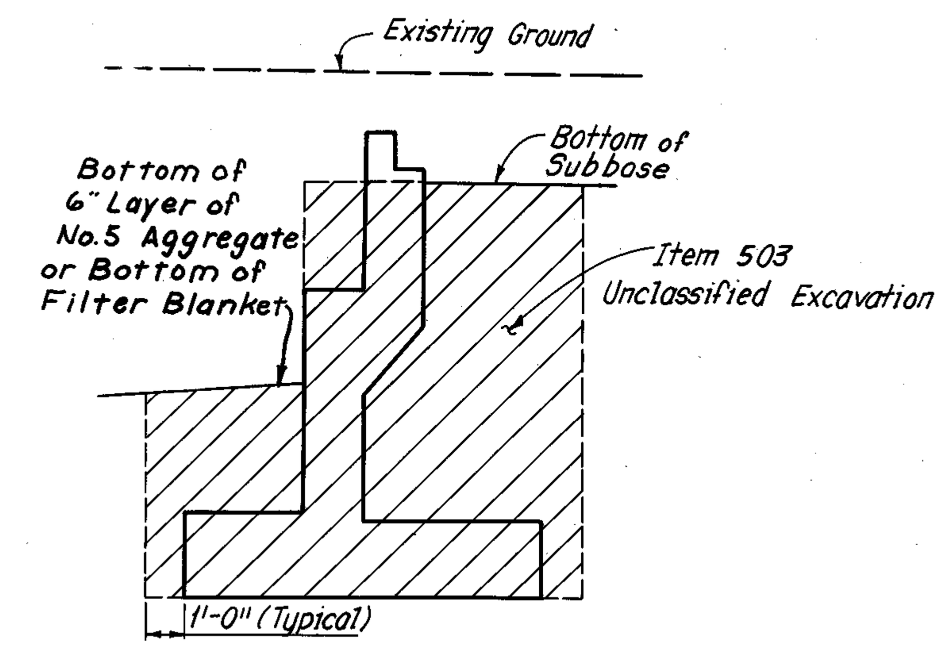


EXPANSION JOINT



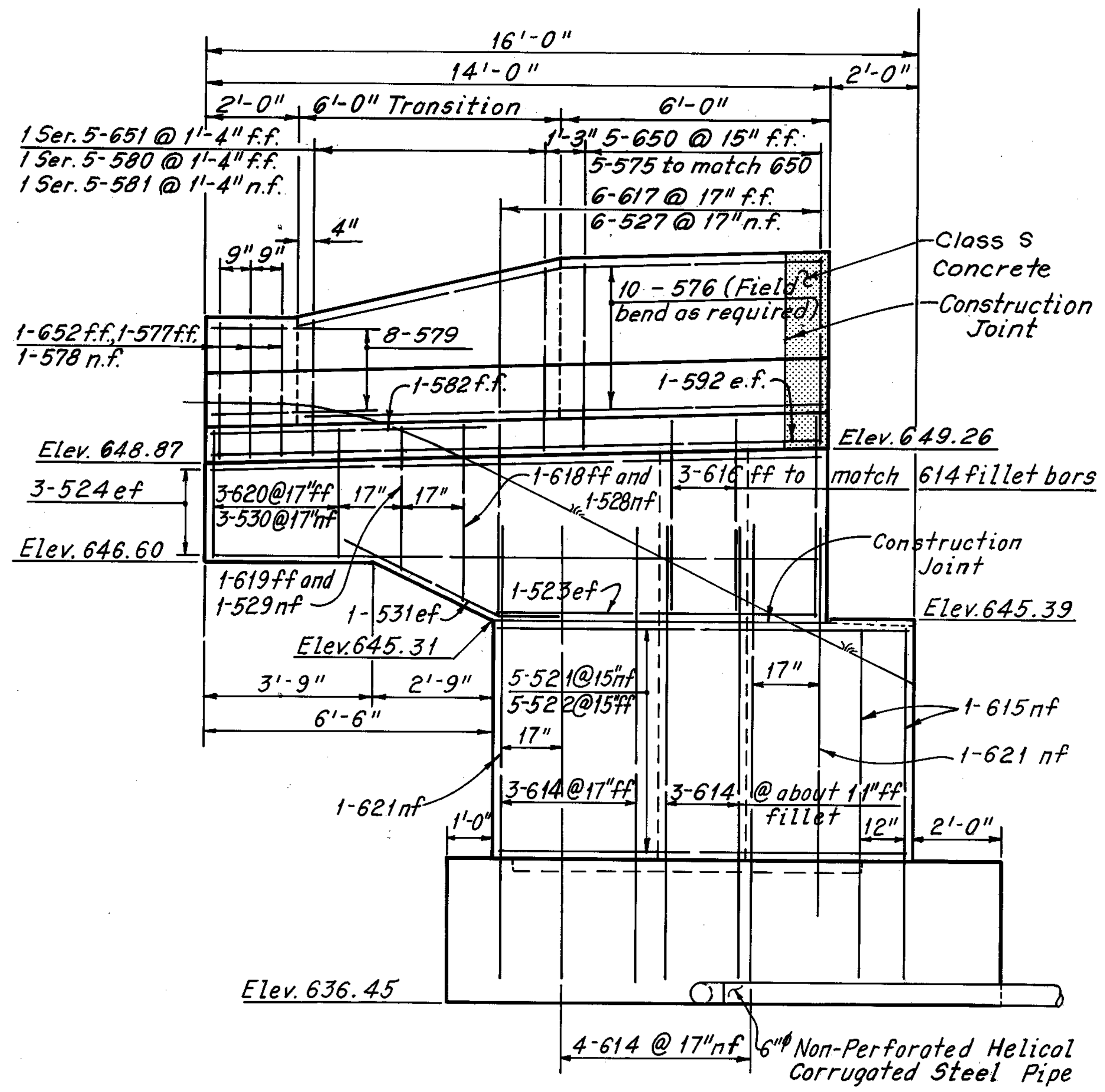
CONTRACTION JOINT

JOINT DETAILS

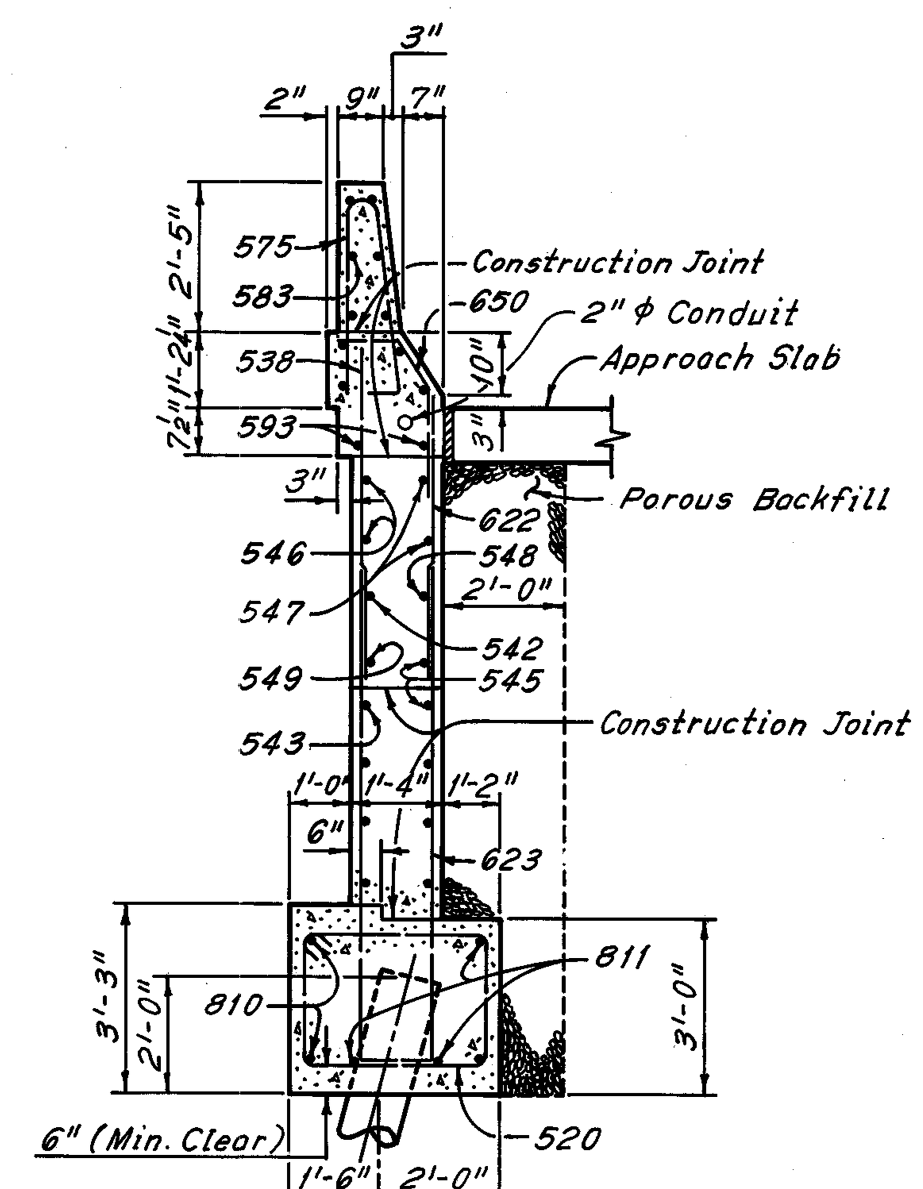


TYPICAL SECTION USED TO DETERMINE UNCLASSIFIED EXCAVATION

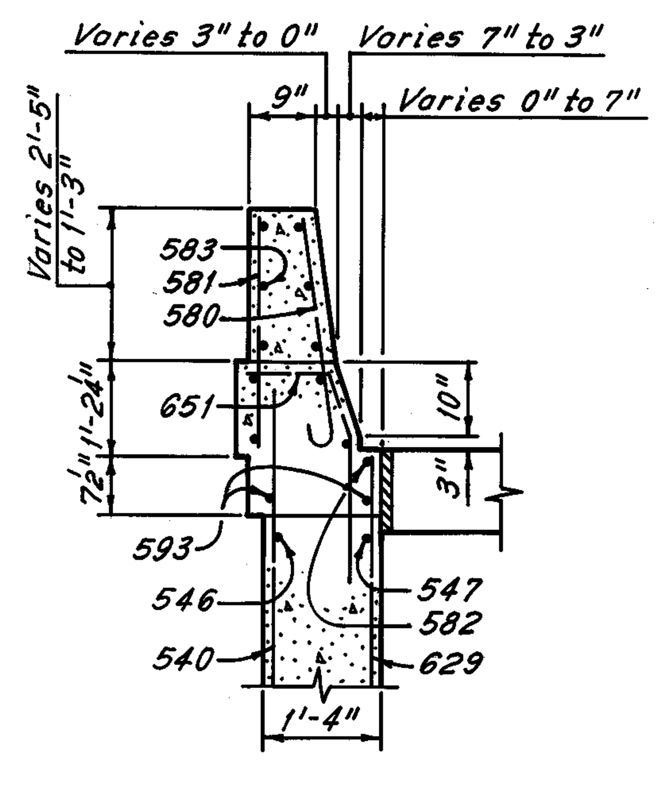
Note:
For notes, see Sheet 13/108.



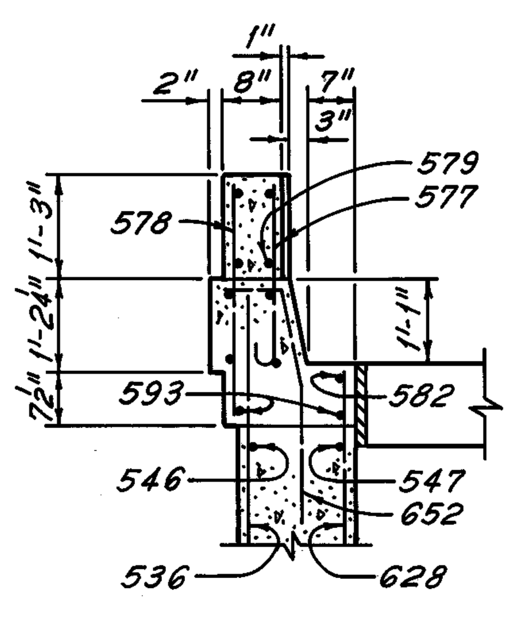
SOUTH WINGWALL
(Piles not shown)



SECTION B-B
(Section thru South Wingwall similar except for bar marks)



PART SECTION C-C



PART SECTION D-D

Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

All work shown on this sheet is by Others, except specified backwall and barrier concrete.

H.N.T.B. BR.NO. 9 PART II - SUPERSTRUCTURE

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

WEST ABUTMENT

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

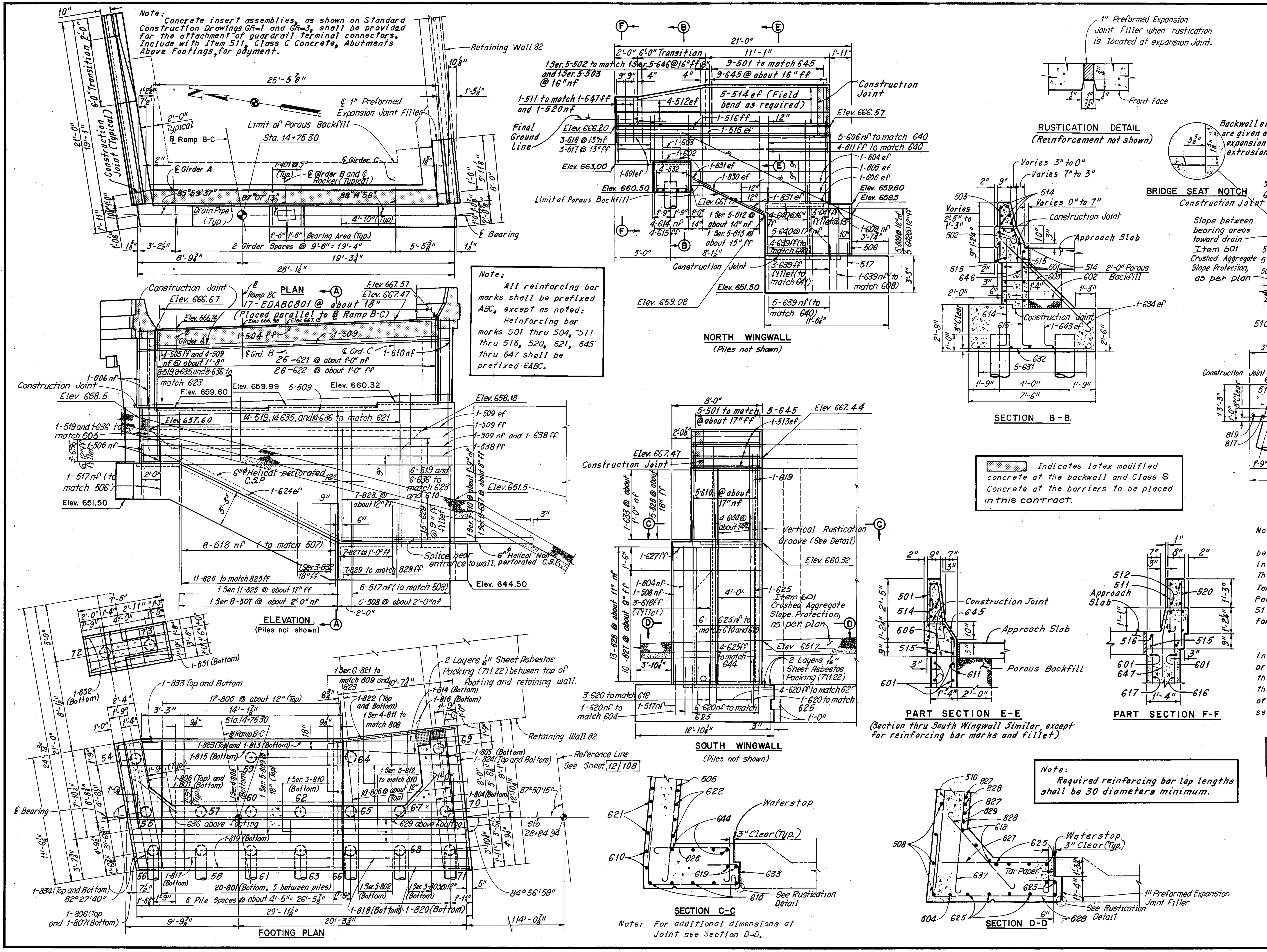
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.L.R.	TRACED D.L.R.	CHECKED C.K.B.	REVIEWED C.A.B.	REVISED
DATE 10-11-83	DATE 10-11-83	DATE 10-18-83	DATE 2-24-86	SHEET 16/108

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

102/193

CUYAHOGA COUNTY
CUY-290-0.27



Note: Concrete insert assemblies, as shown on Standard Construction Drawings GR-1 and GR-3, shall be provided for the attachment of guardrail terminal connectors. Include with Item 511, Class C Concrete, Abutments Above Footings, for payment.

Note: All reinforcing bar marks shall be prefixed ABC, except as noted: Reinforcing bar marks 501 thru 504, 511 thru 516, 520, 621, 645 thru 647 shall be prefixed EABC.

Indicates latex modified concrete at the backwall and Class S Concrete at the barriers to be placed in this contract.

Note: For additional dimensions at Joint see Section D-D.

Note: Required reinforcing bar lap lengths shall be 30 diameters minimum.

Notes:

The 1" Preformed Expansion Joint Filler between Abutment B-C and Retaining Wall 82 is included with the bridge quantities for payment.

The 4" ϕ Galvanized Steel Pipes, Waterstop, Tar Paper and two layers of 1/16" Sheet Asbestos Packing (711.22) shall be included with Item 511, Class C Concrete, Abutments Above Footing for payment.

For Waterstop Details, see Sheet 16/108.

The backfill shall be placed and compacted in front of the abutment to final ground line prior to or simultaneous with backfill behind the abutment. Before the backwall is constructed the backfill shall be constructed up to the level of the subgrade with a 1:1 slope from the bridge seat to the subgrade.

All work shown on this sheet is by Others, except specified backwall and barrier concrete.

H.N.T.B. BR. NO. 9 — PART II - SUPERSTRUCTURE

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

ABUTMENT B-C

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN LJW	TRACED BMF	CHECKED JT	REVIEWED CAB	REVISED	
DATE 8-8-70	DATE 8-15-70	DATE 9-25-70	DATE 2-24-86		SHEET 17/108

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

103/193

CUYAHOGA COUNTY
CUY-290-0.27

Note: Backwall elevations are given to the top of the 9 x 4 x 1 angle of the end dam 1'-4" above approach slab seat.

Note: Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.

PLAN

ELEVATION (Piles Not Shown)

FOOTING PLAN

Note: Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Note: All reinforcing bar marks shall be prefixed AE, except as noted. Reinforcing bar marks 401, 511, 536 thru 540, 603, 605 and 606 shall be prefixed EAE.

▒ Indicates latex modified concrete at the backwall and Class S Concrete at the barriers and median to be placed in this contract.

Notes:
For waterstop at joints, see Joint Details, Sheet 16/108.

All work shown on this sheet is by Others, except specified backwall and barrier concrete.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

EAST ABUTMENT

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S. DATE 2-2-70	TRACED C.P. DATE 2-16-70	CHECKED S.M.S. DATE 2-24-70	REVIEWED C.A.B. DATE 2-26-86	REVISED	SHEET 18/108

Note: Backwall elevations are given to the top of the 9 x 4 x 1 angle of the end dam, 1'-4" above the approach slab seat.

Note: Special core shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.

Indicates latex modified concrete at the backwall and Class S Concrete at the barriers and median to be placed in this contract.

Note: Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Note: All reinforcing bar marks shall be prefixed AE, except as noted.
Reinforcing bar marks 401, 511, 536 thru 540, 603, 605 and 606 shall be prefixed EAE.

All work shown on this sheet is by Others, except specified backwall and barrier concrete.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

EAST ABUTMENT

I-290 OVER CUYAHOGA RIVER

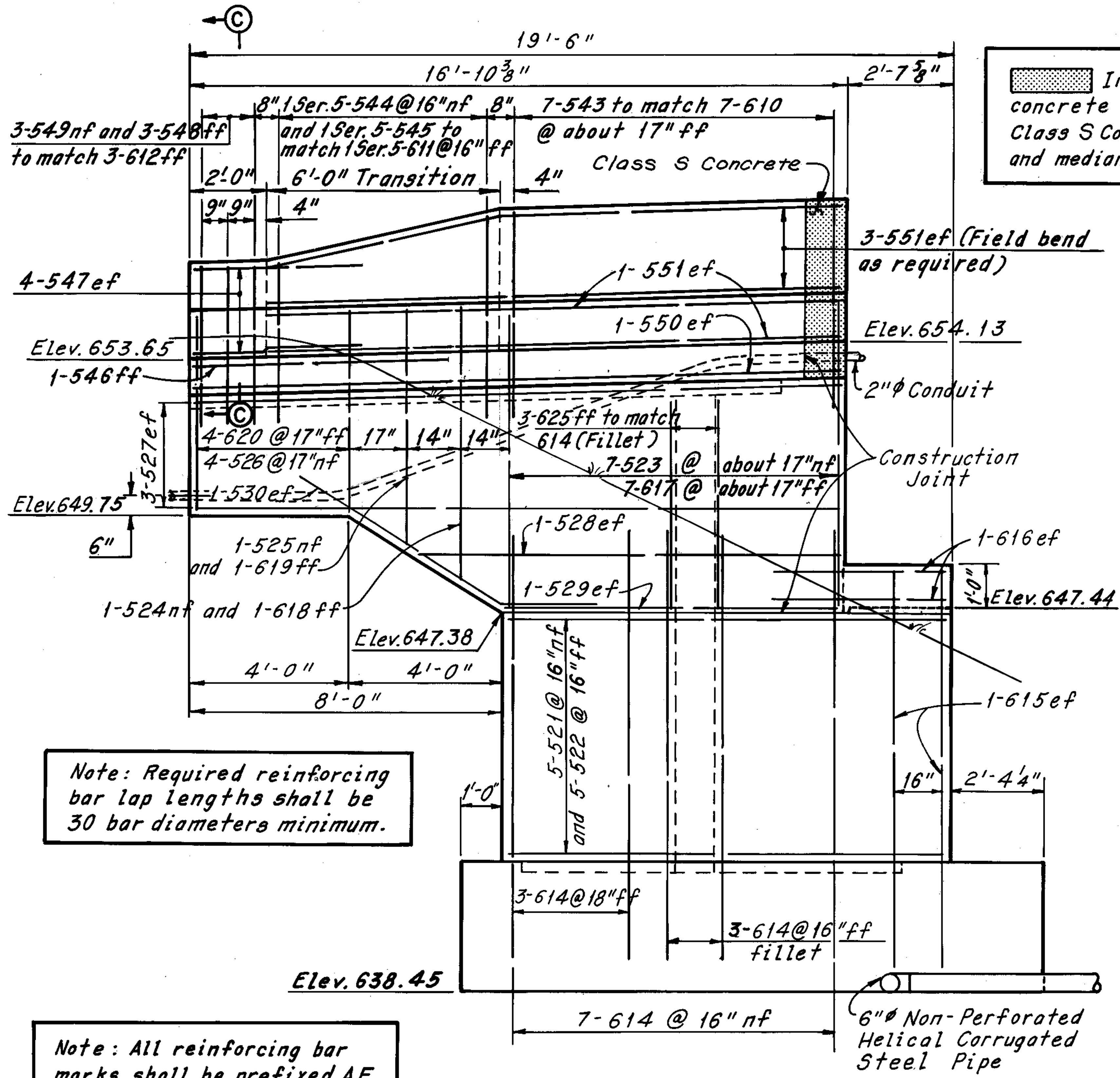
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S. DATE 2-3-70	TRACED C.P. DATE 2-17-70	CHECKED S.M.S. DATE 2-24-70	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 19/108

CUYAHOGA COUNTY
CUY-290-0.27

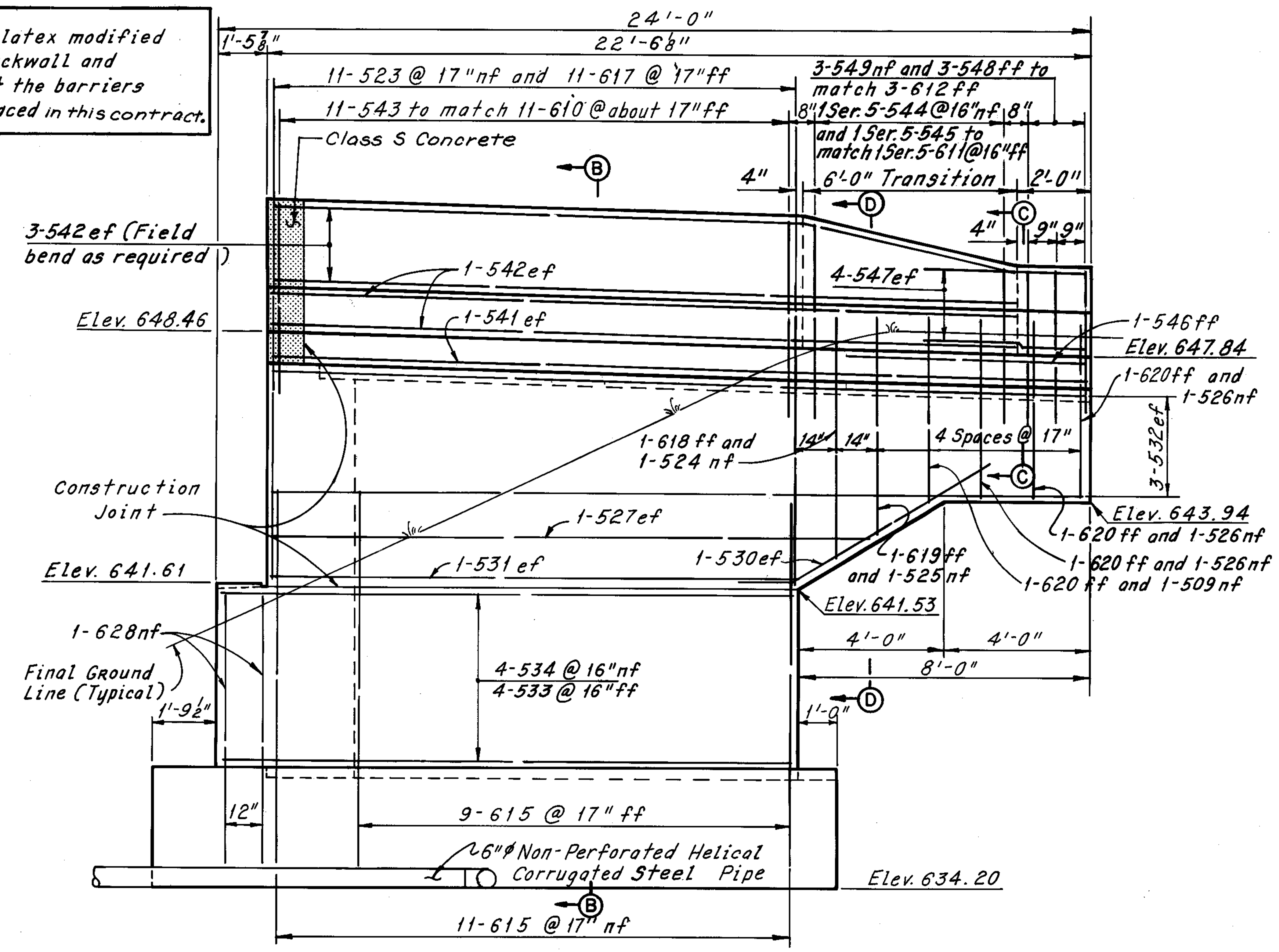
Indicates latex modified concrete at the backwall and Class S Concrete at the barriers and median to be placed in this contract.



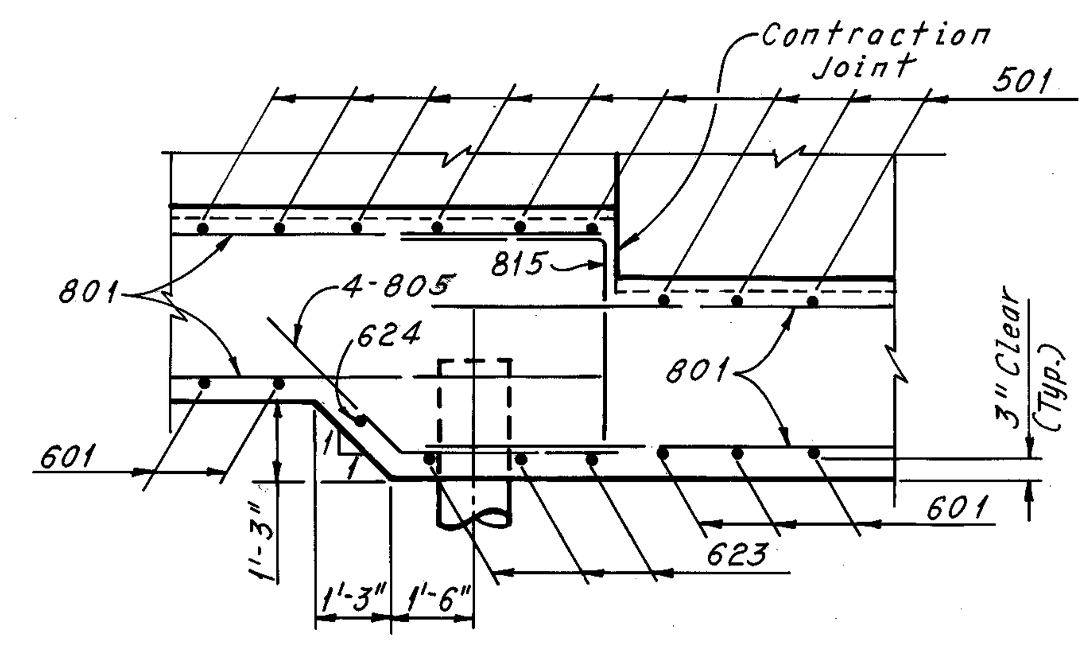
Note: Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Note: All reinforcing bar marks shall be prefixed AE, except as noted.
Reinforcing bar marks 511, 541 thru 551 and 603 thru 612 shall be prefixed EAE.

NORTH WINGWALL
(Piles Not Shown)

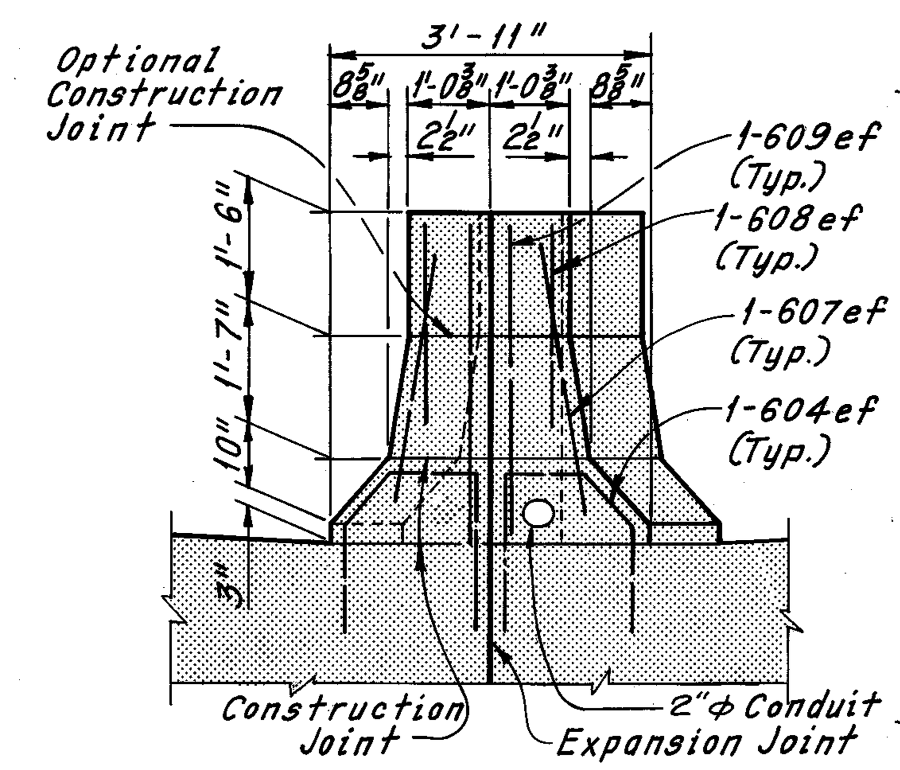


SOUTH WINGWALL
(Piles Not Shown)



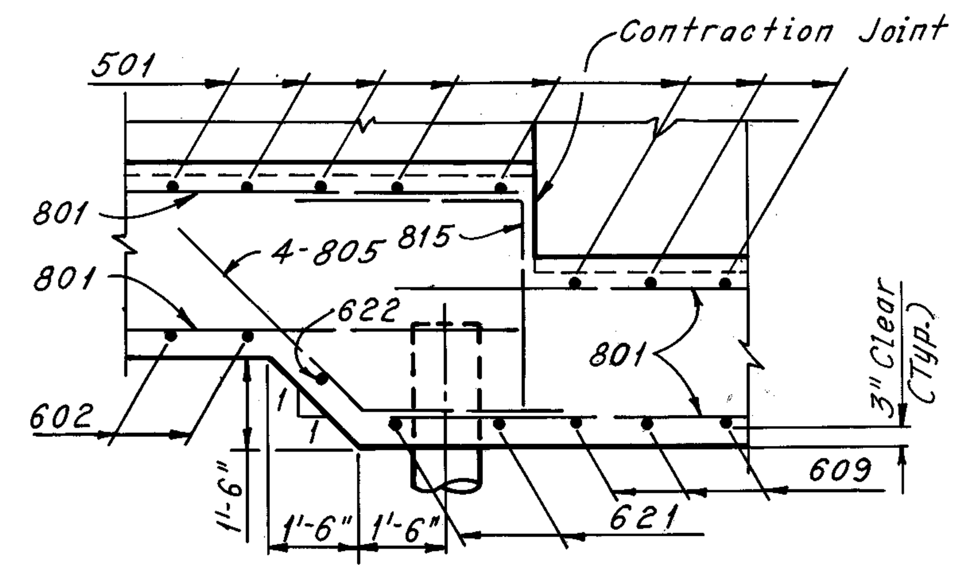
FOOTING STEP DETAIL C

Note: For location of Detail C see Sheet 19|108.



MEDIAN DETAIL

Note: For location of Median Detail see Sheet 18|108.

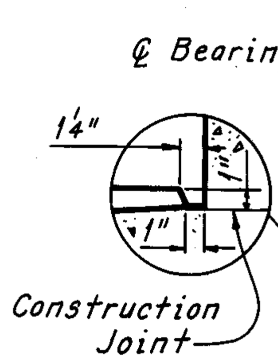


FOOTING STEP DETAIL A

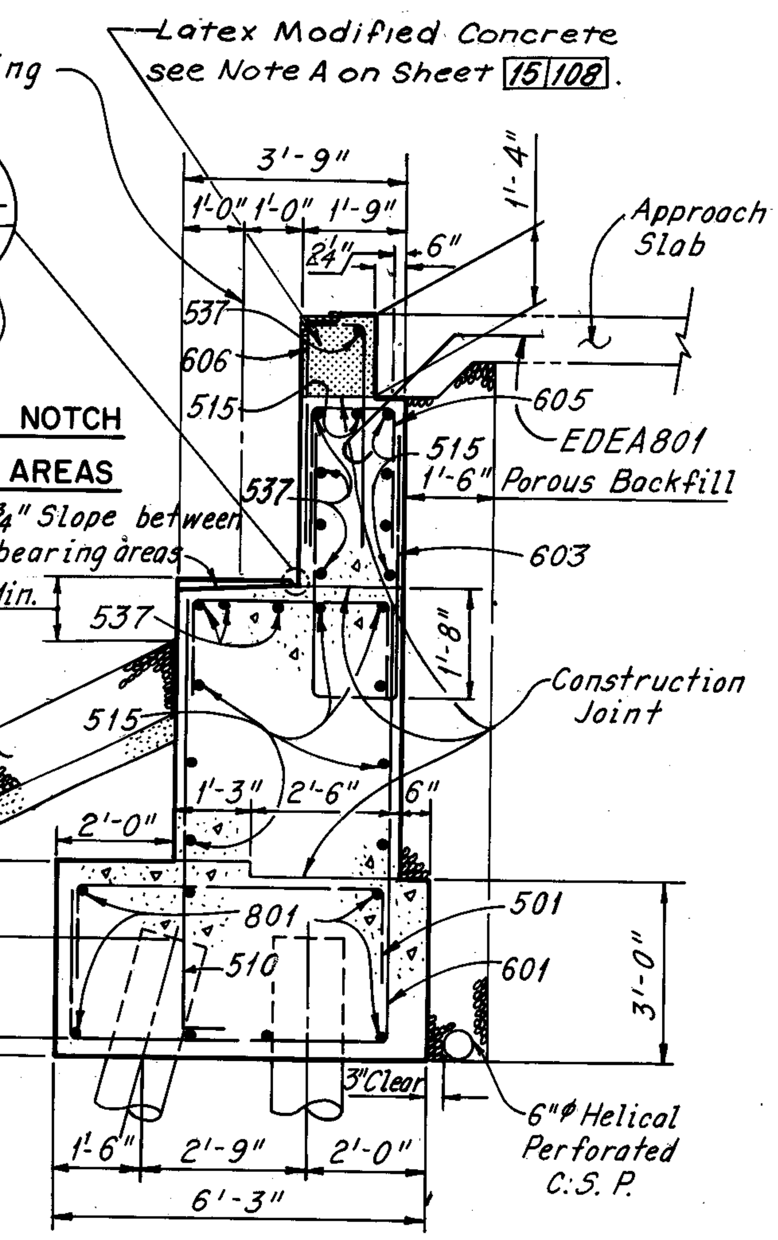
Note: For Location of Detail A see Sheet 18|108.

Notes:
The following abbreviations are used:
nf = near face   ef = each face
ff = far face   Typ. = Typical

All work shown on this sheet is by Others, except specified backwall and barrier concrete.

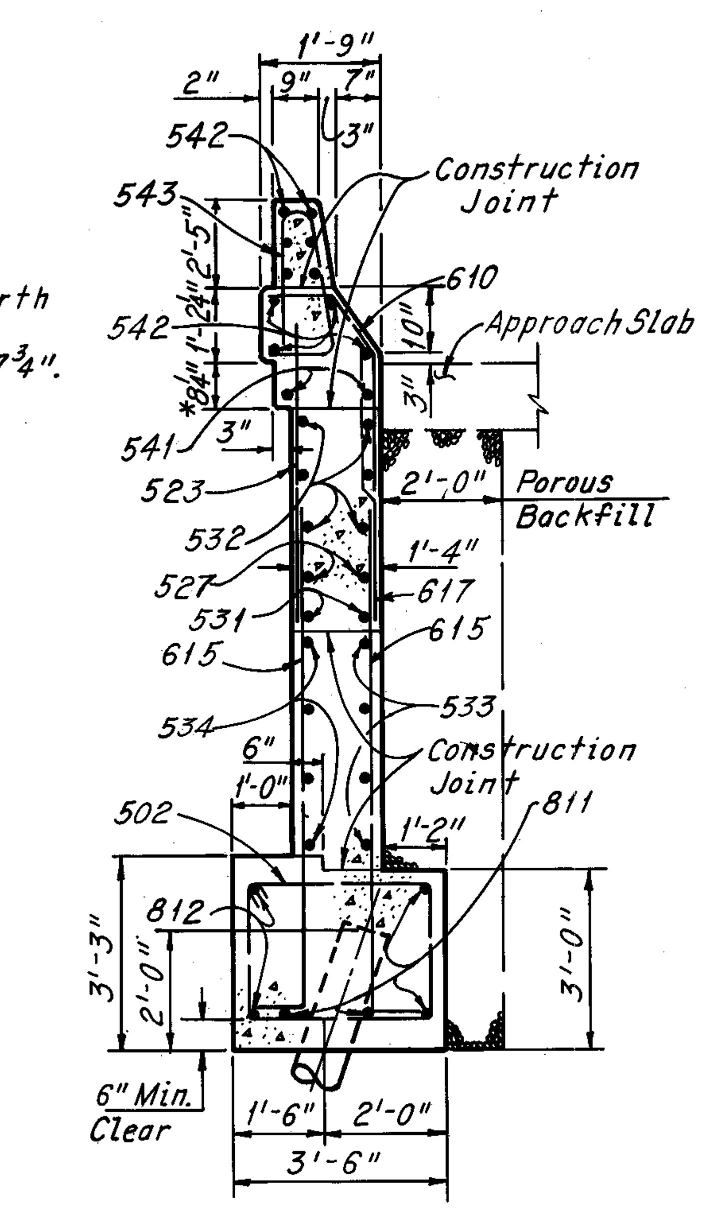


BRIDGE SEAT NOTCH AT BEARING AREAS

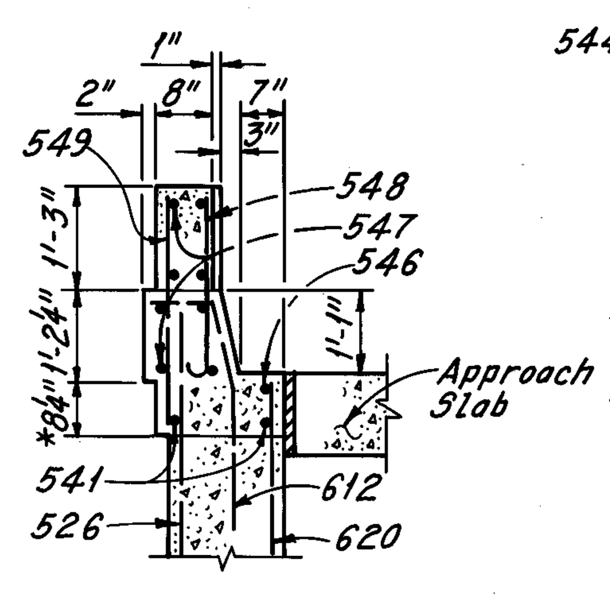


SECTION A-A
(For location of Section A-A see Sheet 19|108)

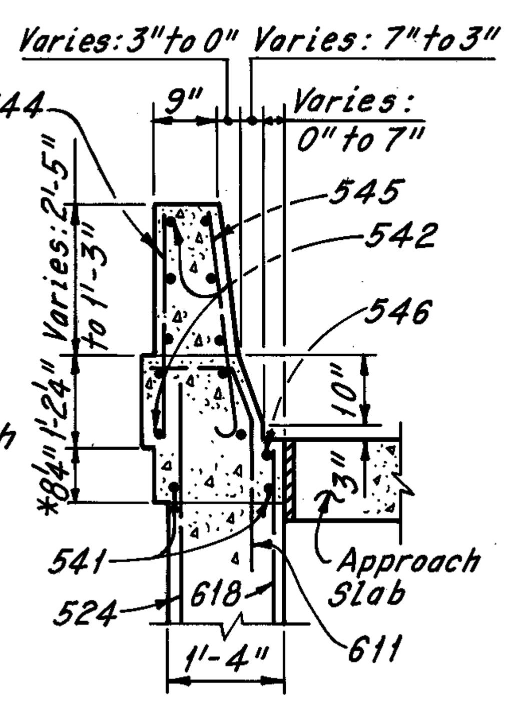
*Note: For North wingwall this dimension is 7¾".



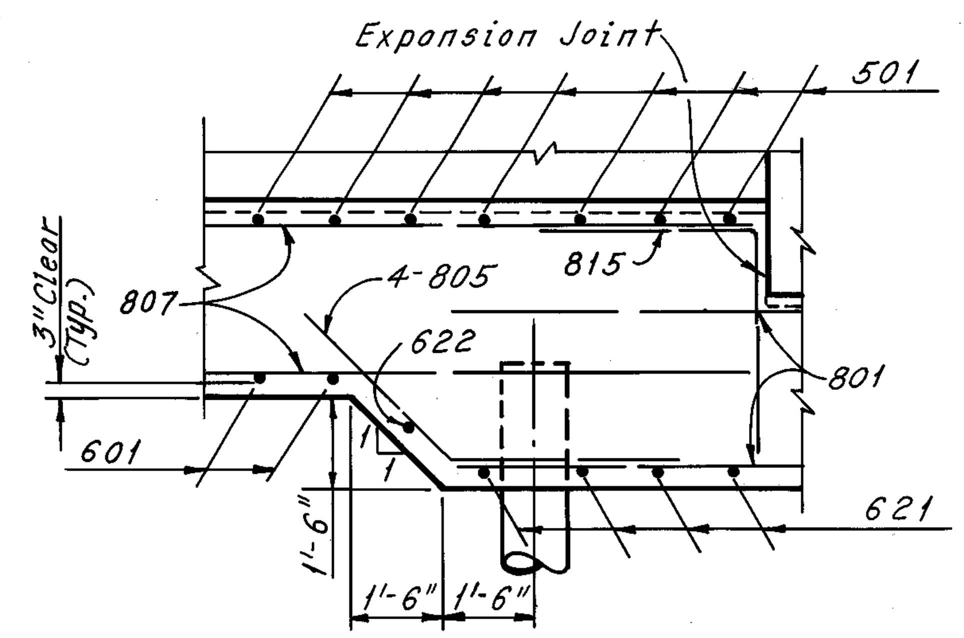
SECTION B-B
(Section thru North Wingwall Similar, except for bar marks)



PART SECTION C-C



PART SECTION D-D



FOOTING STEP DETAIL B

Note: For location of Detail B see Sheet 18|108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

EAST ABUTMENT WINGWALLS, SECTIONS AND DETAILS
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110   STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

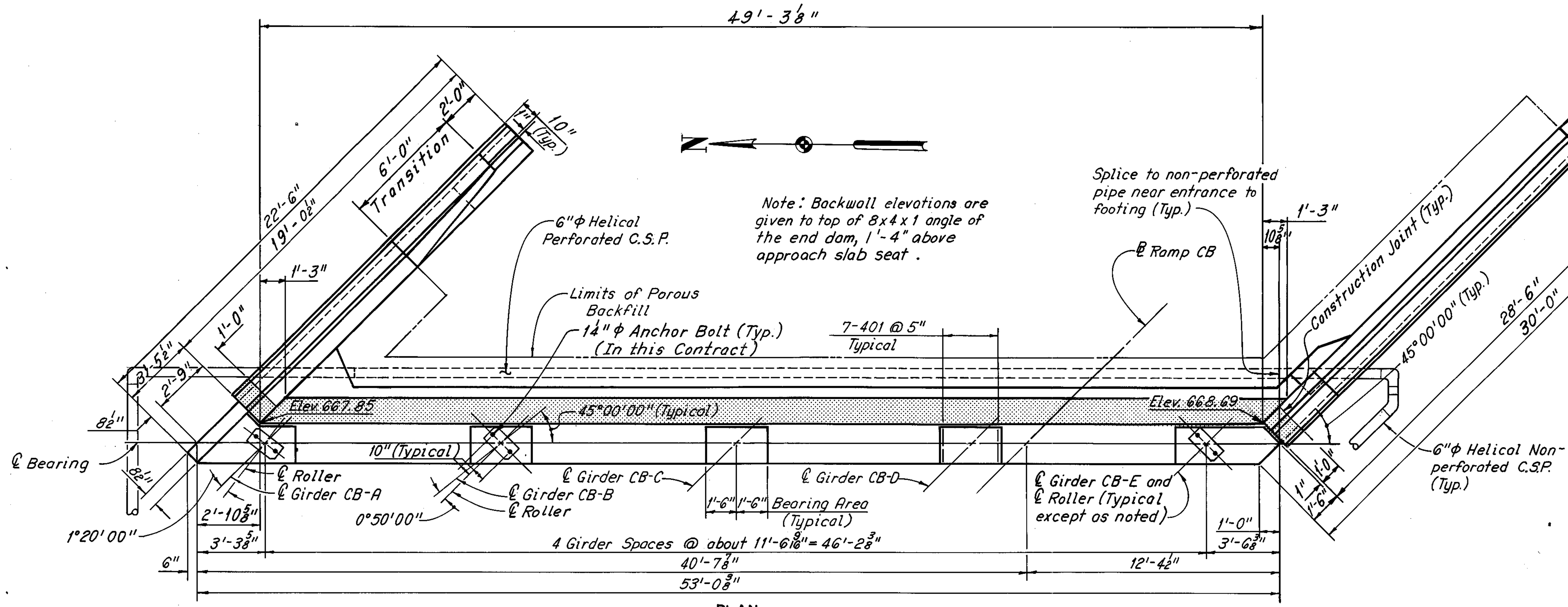
CLEVELAND CUYAHOGA COUNTY OHIO

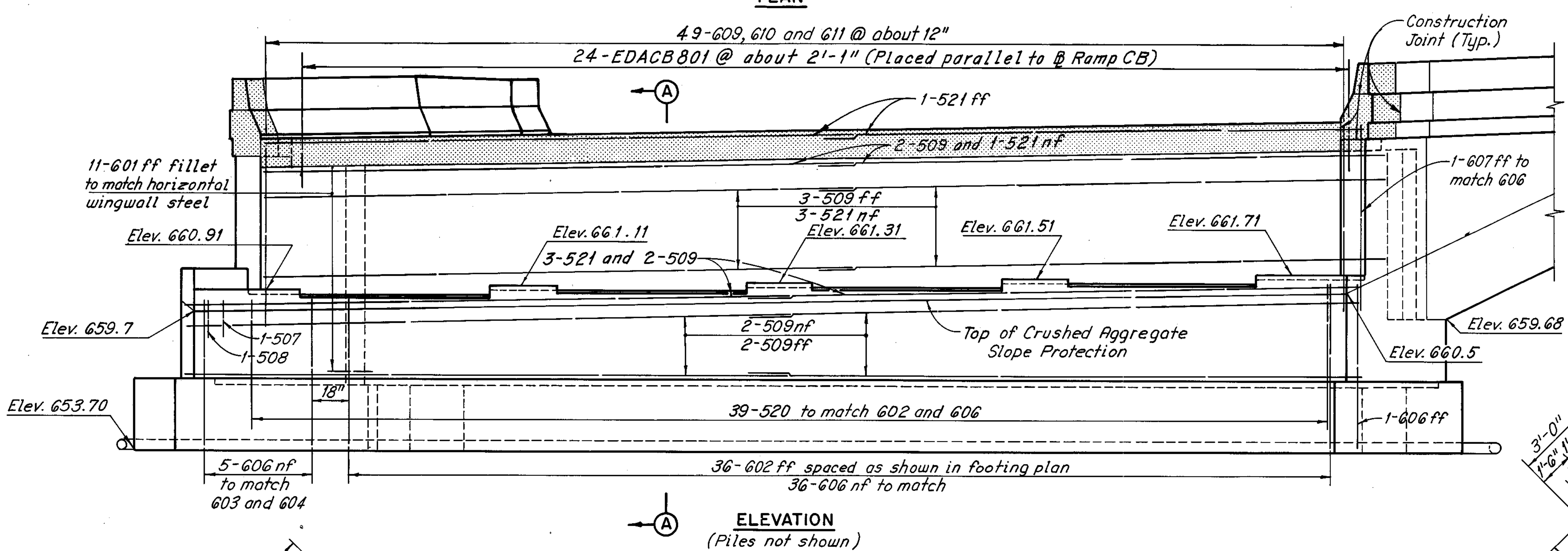
DRAWN D.H.S. DATE 2-4-70	TRACED C.P. DATE 2-12-70	CHECKED S.M.S. DATE 2-24-70	REVIEWED C.A.B. DATE 2-24-86	REVISED

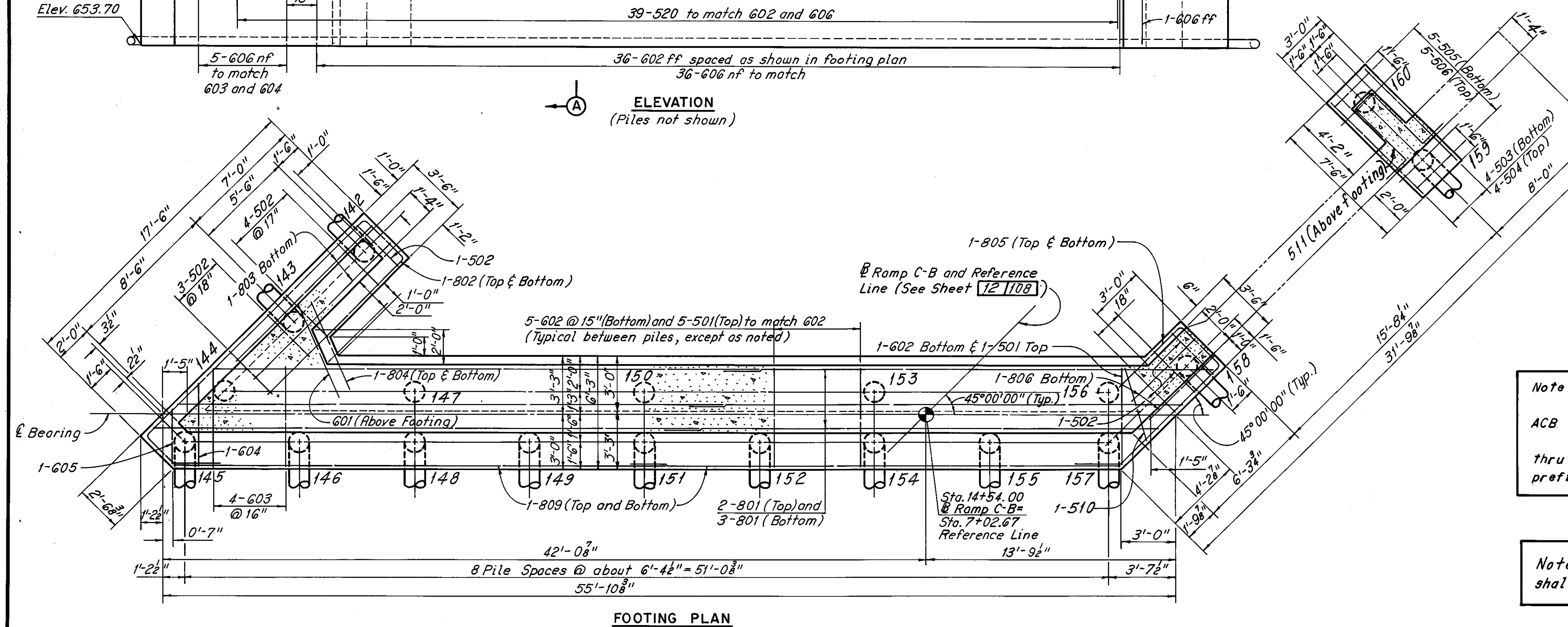
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

106/193

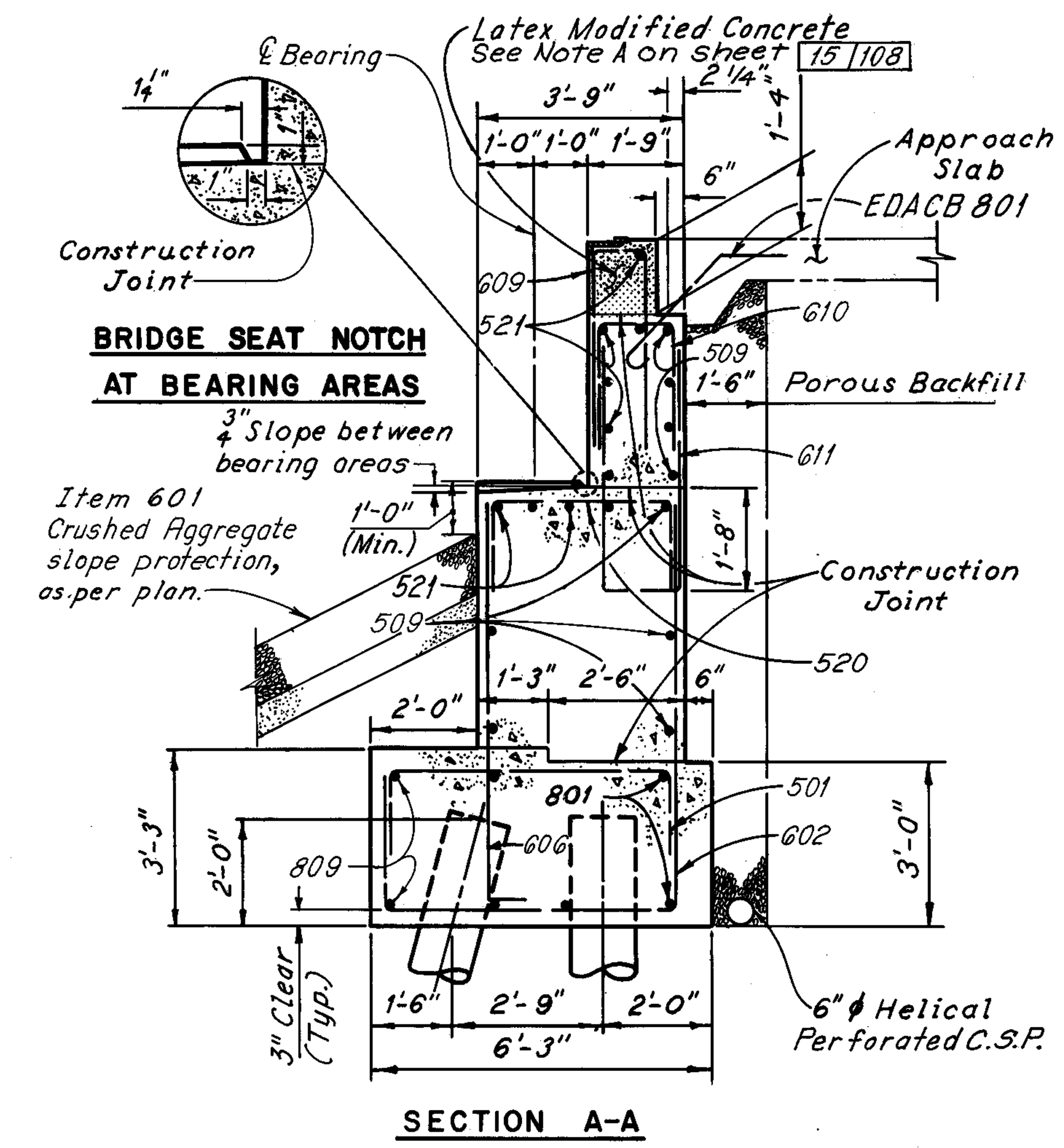
CUYAHOGA COUNTY
CUY-290-0.27







Note: Special care shall be taken when placing reinforcing steel so as not to interfere with anchor bolt setting.



Indicates latex modified concrete at the backwall and Class S Concrete at the barriers to be placed in this contract.

All work shown on this sheet is by Others, except specified backwall and barrier concrete.

Note:
All reinforcing bar marks shall be prefixed ACB except as noted.
Reinforcing bar marks 401, 507, 508, 512 thru 525, 609 thru 611 and 656 thru 658 shall be prefixed EACB.

Note: Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

ABUTMENT C-B

I-290 OVER CUYAHOGA RIVER

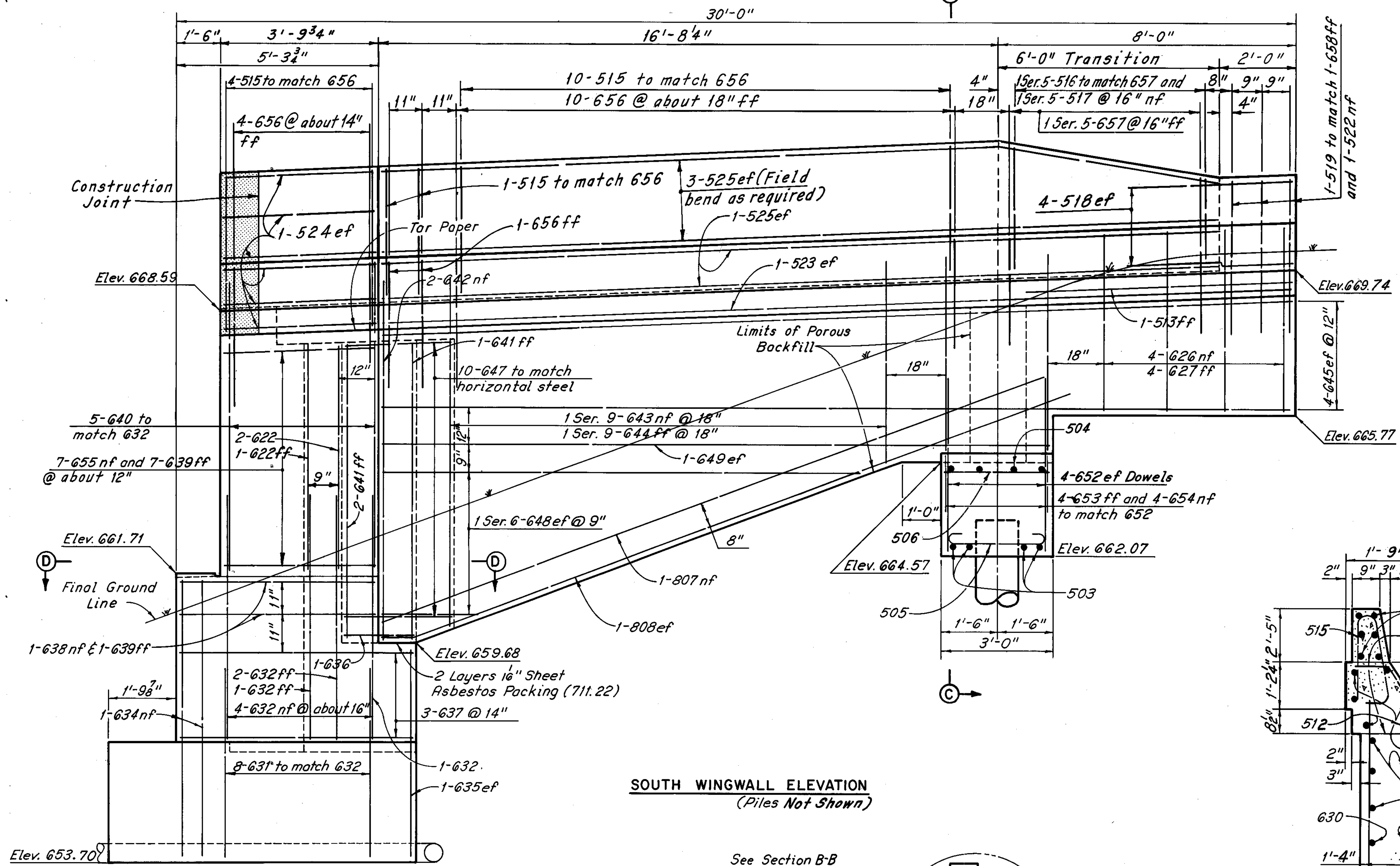
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

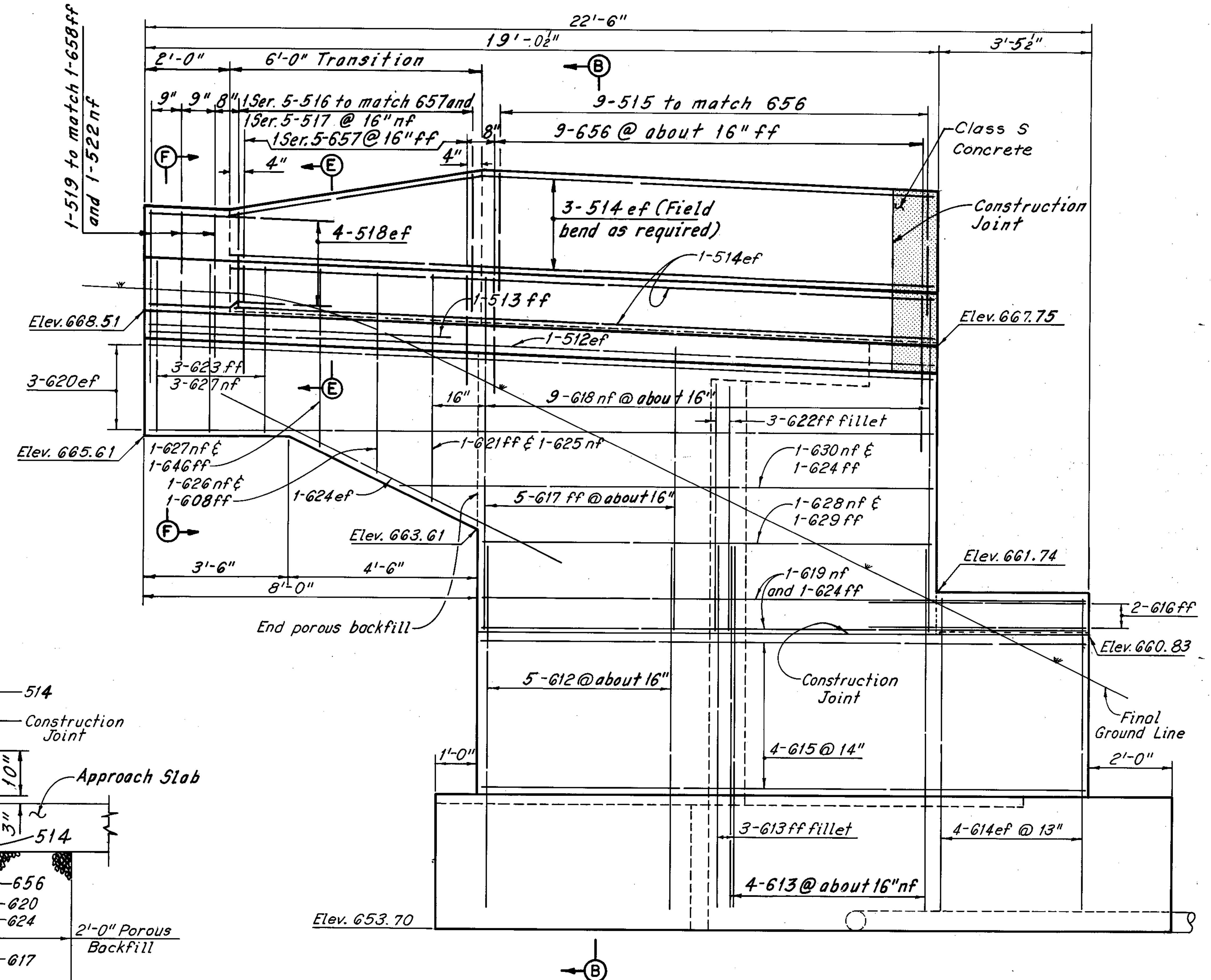
DRAWN D.L.R. DATE 6-7-70	TRACED D.L.R. DATE 6-7-70	CHECKED D.M.P. DATE 6-11-70	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 21/108

Indicates Class S Concrete, in this Contract.

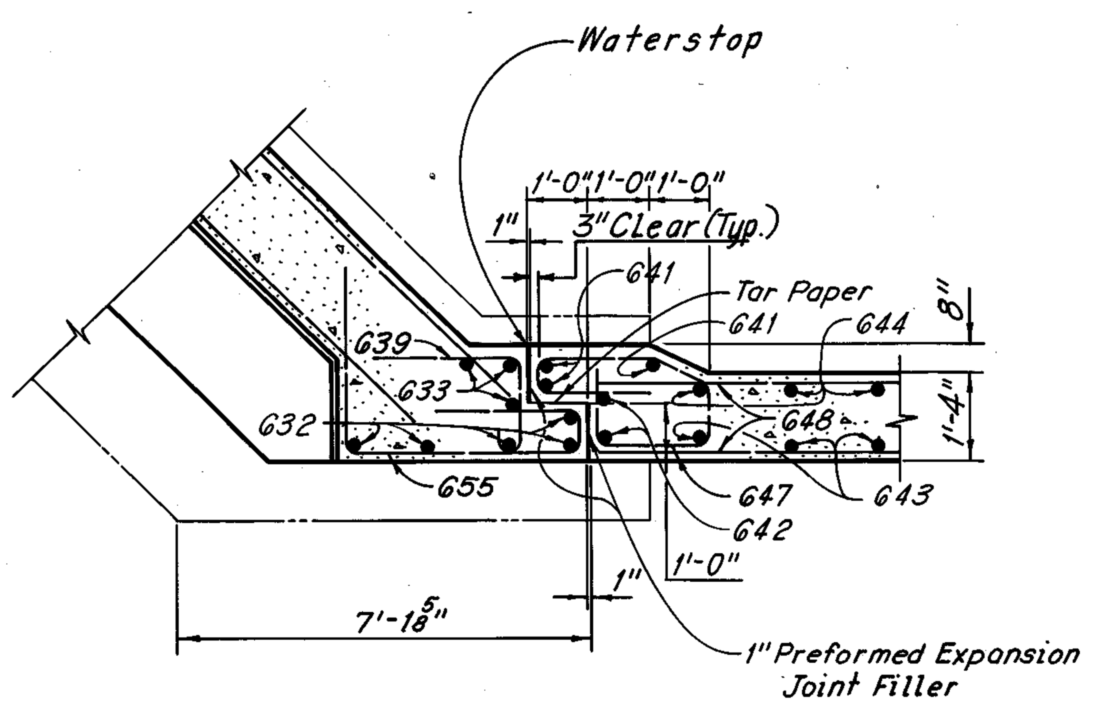
Note: Required reinforcing bar lap lengths shall be 30 bar diameters minimum.



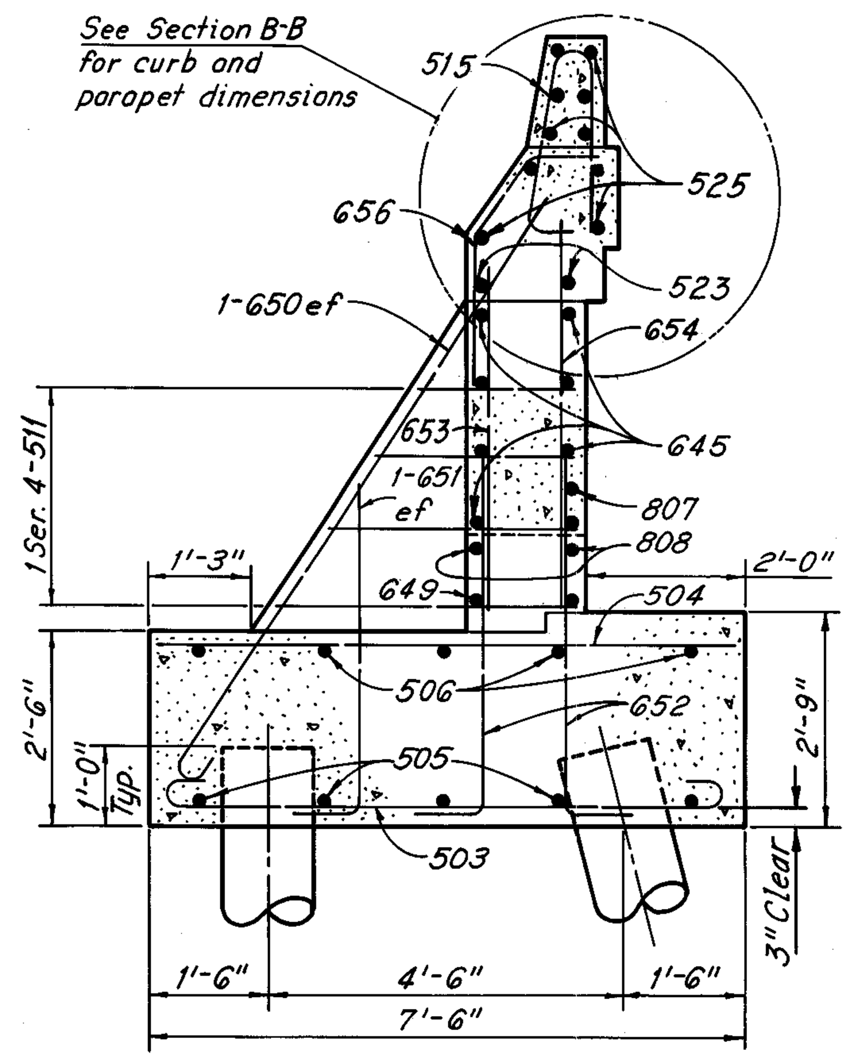
SOUTH WINGWALL ELEVATION
(Piles Not Shown)



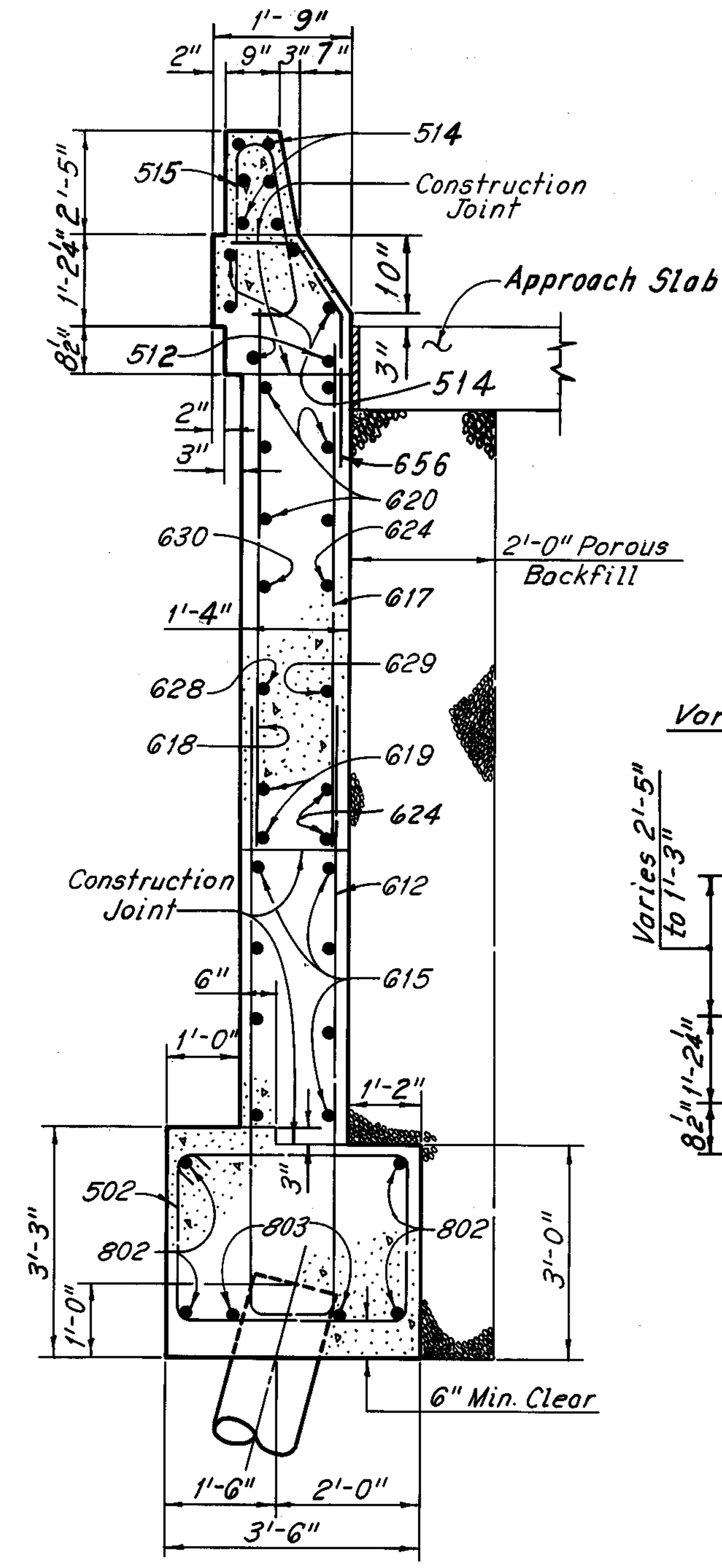
NORTH WINGWALL ELEVATION
(Piles Not Shown)



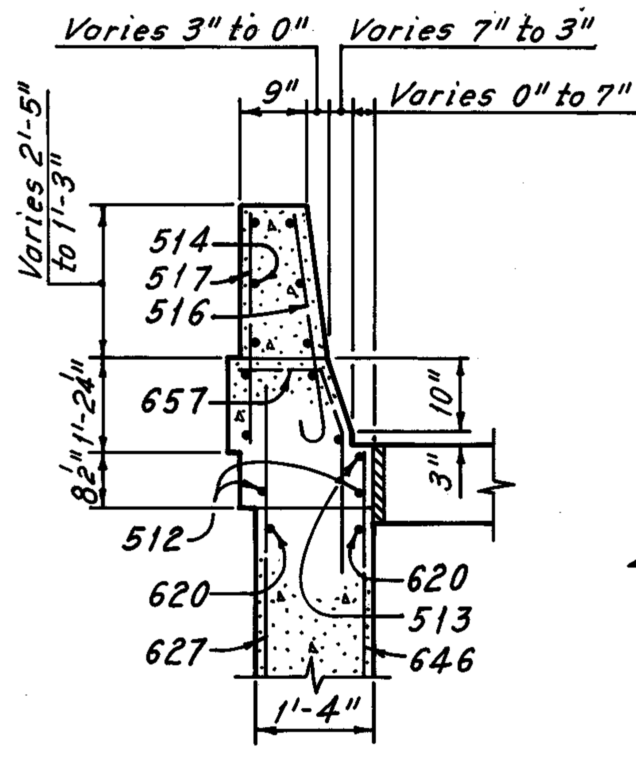
SECTION D-D



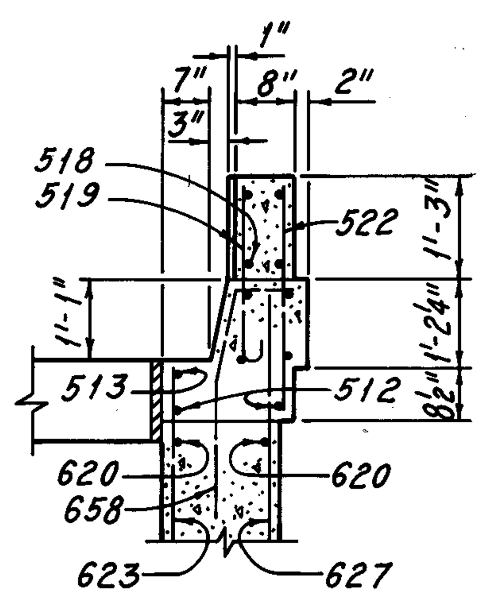
SECTION C-C



SECTION B-B
(North Wingwall Shown, South Similar)



PART SECTION E-E



PART SECTION F-F

(North Wingwall Shown, South Similar)

Notes:
For Waterstop Details, see Sheet 16/108.
Waterstop, Sheet Asbestos Packing (711.22) and Tar Paper shall be included with Item 511, Class C Concrete, Abutments Above Footing for payment.

All work shown on this sheet is by Others, except specified backwall and barrier concrete.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

ABUTMENT C-B WINGWALLS

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.L.R. DATE 11-26-69	TRACED D.L.R. DATE 11-28-69	CHECKED D.M.P. DATE 6-11-70	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 22/108

FHWA REGION	STATE	PROJECT		
2	OHIO			108/193

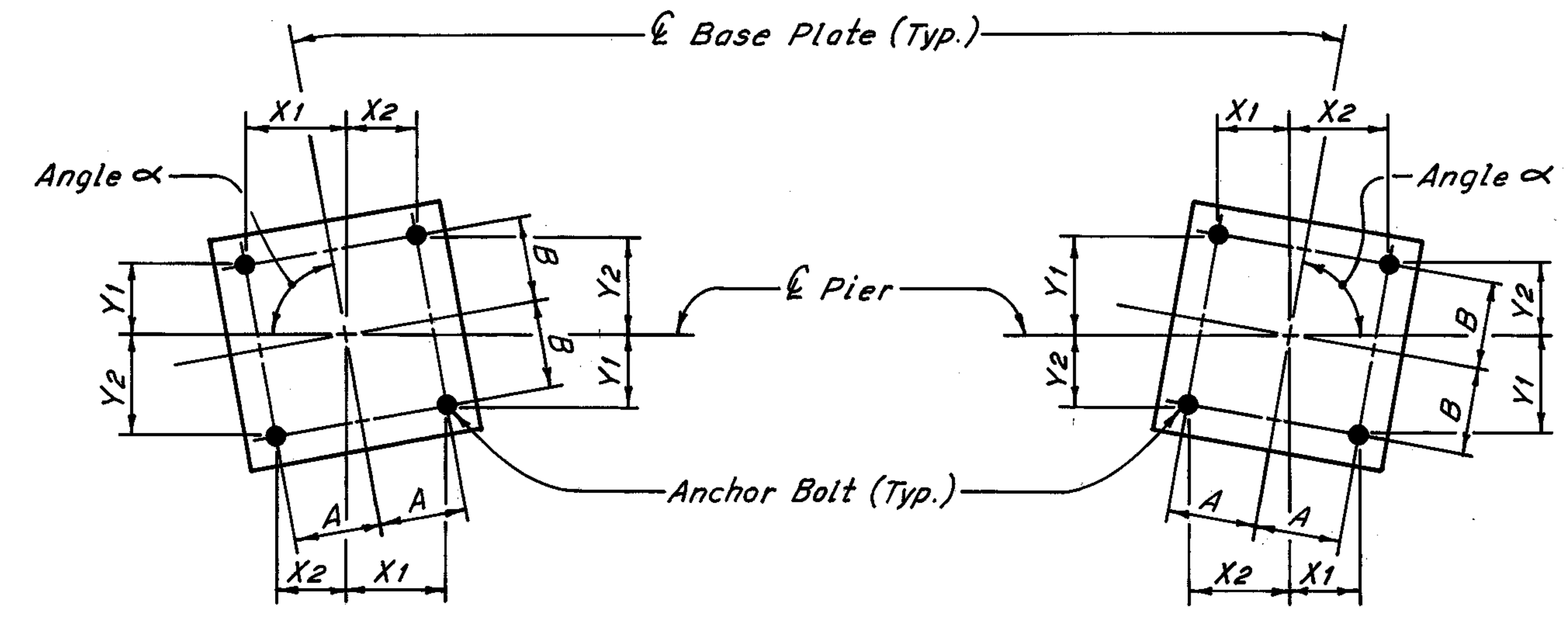
CUYAHOGA COUNTY
CUY-290-0.27

ANCHOR BOLT PLACEMENT

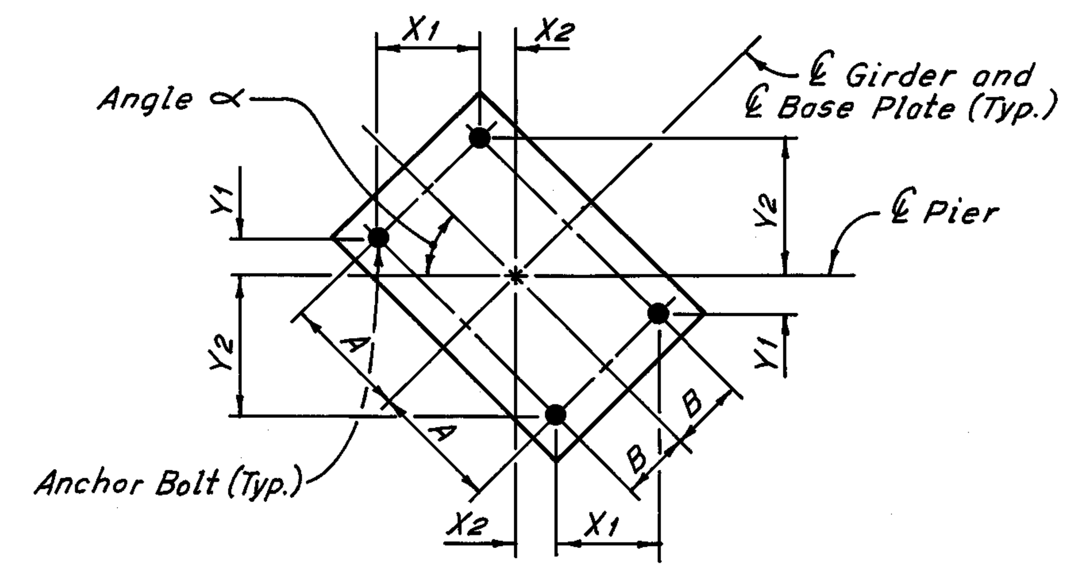
PIER	BEAM OR GIRDER	TYPE	ANGLE ∝	A	B	X1	X2	Y1	Y2
2C-7	Beam A	2	81°56'21"	9 1/2"	5"	8 11/16"	10 1/8"	6 1/4"	3 5/8"
	Beam C								
	Beam D								
	Beam E								
	Beam EA		81°56'21"			8 11/16"	10 1/8"	6 1/4"	3 5/8"
	Beam EC		86°28'32"			9 3/16"	9 13/16"	5 9/16"	4 3/8"
2C-7	Beam ED	2	87°18'58"	9 1/2"	5"	9 1/4"	9 3/4"	5 7/16"	4 9/16"
2L	Beams F thru P	1	90°00'00"	10"	6"	10"	10"	6"	6"
2R	Beam Q	1	90°00'00"	10"	6"	10"	10"	6"	6"
	Beam R		89°49'15"						
	Beam S		89°38'31"					6"	6"
	Beam T		89°27'46"			10"	10"	5 7/8"	6 1/8"
	Beam U		89°17'02"			10 1/8"	9 7/8"		
	Beam V		89°06'17"					5 7/8"	6 1/8"
	Beam W		88°55'33"					5 3/4"	6 1/4"
	Beam X		88°44'49"						
2R	Beam Y	1	88°34'05"	10"	6"	10 1/8"	9 7/8"	5 3/4"	6 1/4"
4L	Girder A	2	86°30'00"	12"	11"	11 1/4"	12 5/8"	11 3/4"	10 1/4"
	Girder B	2	89°26'24"			11 7/8"	12 1/8"	11 1/8"	10 7/8"
4L	Girders C thru G	1	90°00'00"	12"	11"	12"	12"	11"	11"
4R	Girder H	1	90°00'00"	12"	11"	12"	12"	11"	11"
	Girder J		89°38'31"			12 1/8"	11 7/8"	10 7/8"	11 1/8"
	Girder K		89°17'02"			12 1/8"	11 7/8"	10 7/8"	11 1/8"
	Girder L		88°55'33"			12 1/4"	11 3/4"	10 3/4"	11 1/4"
4R	Girder M	1	88°34'05"	12"	11"	12 1/4"	11 3/4"	10 3/4"	11 1/4"
5L	Girder A	2	88°20'00"	13"	14 1/4"	12 5/8"	13 3/8"	14 5/8"	13 7/8"
	Girder B	2	89°26'24"			12 7/8"	13 1/8"	14 3/8"	14 1/8"
	Girder C	1	90°00'00"	13"		13"	13"	14 1/4"	14 1/4"
	Girders D thru F			14"		14"	14"		
5L	Girder G	1	90°00'00"	13"	14 1/4"	13"	13"	14 1/4"	14 1/4"
5R	Girders H thru M	1	90°00'00"	13"	14 1/4"	13"	13"	14 1/4"	14 1/4"
6L	Girders A & D	1	90°00'00"	14"	11"	14"	14"	11"	11"
6L	Girders E thru G	1	90°00'00"	12"	10"	12"	12"	10"	10"
6R	Girders H & M	1	90°00'00"	14"	10"	14"	14"	10"	10"
6R	Girders J thru L	1	90°00'00"	15"	11"	15"	15"	11"	11"
7L	Girders A,E,F & G	1	90°00'00"	14"	11"	14"	14"	11"	11"
7L	Girder D	1	90°00'00"	15"	12"	15"	15"	12"	12"
7R	Girders H & M	1	90°00'00"	15 1/2"	11"	15 1/2"	15 1/2"	11"	11"
7R	Girders J thru L	1	90°00'00"	15"	8"	15"	15"	8"	8"
8R	Girders H & M	1	90°00'00"	13"	14 1/4"	13"	13"	14 1/4"	14 1/4"
8R	Girders J thru L	1	90°00'00"	14"	14 1/4"	13"	13"	14 1/4"	14 1/4"
9L	Girder A	2	89°56'41"	13"	14 1/4"	13"	13"	14 1/4"	14 1/4"
	Girder B		89°56'45"						
	Girder C		89°56'50"						
	Girder D		89°56'54"						
9L	Girder E	2	89°56'59"	13"	14 1/4"	13"	13"	14 1/4"	14 1/4"
9R	Girder F	2	89°51'21"	13"	11"	13"	13"	11"	11"
	Girder G		89°51'27"		14 1/4"			14 1/4"	14 1/4"
	Girders H & J		89°51'39"		14 1/4"			14 1/4"	14 1/4"
9R	Girder K	2	89°51'46"	13"	11"	13"	13"	11"	11"
10L & 10R	Girders A thru K	1	90°00'00"	15"	14"	15"	15"	14"	14"
11L & 11R	Girder A	1	88°40'00"	13"	18 1/2"	13 3/8"	12 5/8"	18 1/4"	18 3/4"
	Girders B thru D			18 1/2"		18 7/8"	18 1/8"		
	Girder E		88°40'00"	13"		13 3/8"	12 5/8"	18 1/4"	
	Girder F		88°30'00"	13"		13 1/2"	12 1/2"	18 1/8"	
	Girders G thru J			18 1/2"		19"	18"		
11L & 11R	Girder K	1	88°30'00"	13"	18 1/2"	13 1/2"	12 1/2"	18 1/8"	18 3/4"

ANCHOR BOLT PLACEMENT

PIER	BEAM OR GIRDER	TYPE	ANGLE ∝	A	B	X1	X2	Y1	Y2
12L & 12R	Girder A	1	87°54'07"	13"	14 1/4"	13 1/2"	12 1/2"	13 3/4"	14 3/4"
	Girder B		87°54'19"						
	Girder C		87°54'30"						
	Girder D		87°54'42"						
	Girder E		87°54'54"						
	Girder F		87°49'18"						
	Girder G		87°49'29"						
	Girder H		87°49'40"						
	Girder J		87°49'51"						
12L & 12R	Girder K	1	87°50'02"	13"	14 1/4"	13 1/2"	12 1/2"	13 3/4"	14 3/4"
13L	Girders A & E	2	89°23'31"	12"	10"	11 3/4"	12 1/4"	10 3/8"	9 5/8"
13L	Girders B thru D	2	89°23'31"	14"	11"	13 5/8"	14 1/4"	11 3/8"	10 5/8"
13R	Girders F thru K	2	89°42'40"	12"	10"	11 3/4"	12 1/4"	10 1/4"	9 3/4"
14L	Girder A	1	88°23'28"	12"	9"	12 1/4"	11 3/4"	8 5/8"	9 3/8"
	Girders B thru D		88°30'11"	15"	8"	15 1/4"	14 3/4"	7 5/8"	8 3/8"
14L	Girder E	1	88°30'11"	12"	9"	12 1/4"	11 3/4"	8 5/8"	9 1/4"
14R	Girder F	1	88°30'11"	15"	11"	15 1/4"	14 3/4"	10 5/8"	11 3/8"
	Girders G thru J			12"	10"	12 1/4"	11 3/4"	9 5/8"	10 1/4"
14R	Girder K	1	88°30'11"	15 1/2"	11"	15 3/4"	15 1/4"	10 5/8"	11 3/8"
15L & 15R	Girder A	1	87°49'01"	13"	14 1/4"	13 1/2"	12 1/2"	13 3/4"	14 3/4"
	Girders B thru E		88°42'14"		14 1/4"	13 3/8"	12 5/8"	14"	14 1/2"
15L & 15R	Girders F thru K	1	89°15'00"	13"	11"	13 1/8"	12 7/8"	10 7/8"	11 1/8"
18L	Girder A	1	86°00'23"	12"	8"	12 1/2"	11 3/8"	7 1/8"	8 7/8"
	Girder B		86°00'23"			12 1/2"	11 3/8"	7 1/8"	8 7/8"
	Girder C		87°24'41"			12 3/8"	11 5/8"	7 1/2"	8 1/2"
	Girder D		87°24'44"						
	Girder E		87°24'47"						
	Girder F		87°24'50"						
	Girder G		87°24'53"						
	Girder H		87°24'56"						
	Girder J		87°24'59"						
	Girder K		87°25'02"						
	Girder L		87°25'05"						
18L	Girder M	1	87°25'09"	12"	8"	12 3/8"	11 5/8"	7 1/2"	8 1/2"
18R	Girder N	1	87°54'14"	12"	8"	12 1/4"	11 3/4"	7 1/2"	8 3/8"
	Girder P		87°54'28"						
	Girder Q		87°54'41"						
	Girder R		87°54'54"						
	Girder S		87°55'08"						
	Girder T		87°55'21"						
	Girder U		87°55'35"						
	Girder V		87°55'49"			12 1/4"	11 3/4"	7 1/2"	8 3/8"
	Girder W	1	89°39'44"			12"	12"	7 7/8"	8 1/8"
18R	Girder X	2	88°35'44"	12"	8"	11 3/4"	12 1/4"	8 1/4"	7 3/4"
22L	Girders A thru G	2	75°36'37"	11"	7"	8 7/8"	12 3/8"	9 1/2"	4"
	Girder H		75°36'37"	10 1/2"	6 1/2"	8 1/2"	11 3/4"	8 7/8"	3 5/8"
	Girder J		74°31'10"	10 1/2"	6 1/2"	8 3/8"	11 7/8"	9 1/8"	3 1/2"
22L	Girder N	2	73°25'07"	11 1/2"	7 1/2"	8 7/8"	13 1/8"	10 1/2"	3 7/8"
22R	Girder P	2	73°38'28"	11 1/2"	7 1/2"	8 7/8"	13 1/8"	10 3/8"	4"
	Girder Q		73°36'41"	11"	7"	8 5/8"	12 1/2"	9 7/8"	3 5/8"
	Girder R		73°34'54"						
	Girder S		73°33'11"						
	Girder T		73°31'30"	11"	7"	8 5/8"	12 1/2"	9 7/8"	3 5/8"
	Girder U		73°29'48"	11 1/2"	7 1/2"	8 7/8"	13 1/8"	10 1/2"	3 7/8"
	Girder V		73°28'11"						
	Girder W		73°26'35"	11 1/2"	7 1/2"	8 7/8"	13 1/8"	10 1/2"	3 7/8"
	Girder ZA		71°25'58"	13"	7 3/4"	9 7/8"	14 7/8"	11 1/2"	3 1/4"
	Girder ZB		68°52'28"			9 3/8"	14 7/8"	11 7/8"	2 1/2"
	Girder ZC		68°03'48"			9 1/8"	15"	12"	2 3/8"
22R	Girder ZD	2	67°26'10"	13"	7 3/4"	9"	15"	12 1/8"	2 1/8"
25C-B	Girders A,C,D & E	3	45°00'00"	12"	8"	11 3/8"	2 7/8"	2 7/8"	14 1/8"



TYPE 1　　TYPE 2



TYPE 3

ANCHOR BOLT PLACEMENT

ANCHOR BOLT TYPES

Pier	Location	Type
2C-7	All	A
2L & R		A
4L & R		B
5L & R		B
6L		B
6R		A
7L	All	B
7R	Girders H & M	A
	Girders J thru L	B
8R	All	B
9L & R		B
10L & R		B
11L & R		B
12L & R		B
13L & R		B
14L	All	B
14R	Girders F & K	A
	Girders G thru J	B
15L & R	All	B
18L & R		A
22L & R		A
25C-B	All	A

Type A,
1 1/4" ϕ x 1'-9" Swedge anchor bolt drilled 1'-3" into concrete and threaded 5".

Type B,
1 1/2" ϕ x 2'-1" Swedge anchor bolt drilled 1'-6" into concrete and threaded 5".

Notes:
For anchor bolt placement at Abutments, see Abutment sheets.
All anchor bolts shall be drilled and grouted into the bridge seat in accordance with Item 510. The cost for drilling and grouting anchor bolts shall be included for payment with the unit price bid for Item 513, Structural Steel.

H.N.T.B. BR. NO. 9　PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
CLEVELAND
HNTB

ANCHOR BOLT PLACEMENT
AT PIERS
I-290 OVER CUYAHOGA RIVER
BR. NO. CUY-290-0110　STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)
CLEVELAND　CUYAHOGA COUNTY　OHIO

DRAWN D.L.R.	TRACED D.L.R.	CHECKED C.K.B	REVIEWED C.A.B.	REVISED
DATE 9-2-83	DATE 9-2-83	DATE 9-4-83	DATE 2-24-86	SHEET 23/108

CUYAHOGA COUNTY
CUY-290-0.27

PLAN

PLAN

Note:
The following abbreviations are used:

Grd.	=	Girder
Str.	=	Stringer
F. S.	=	Field Splice
B. L.	=	Bend Line
L	=	Left
R	=	Right
LR	=	Left and Right

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

SCHEMATIC FRAMING PLAN

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110

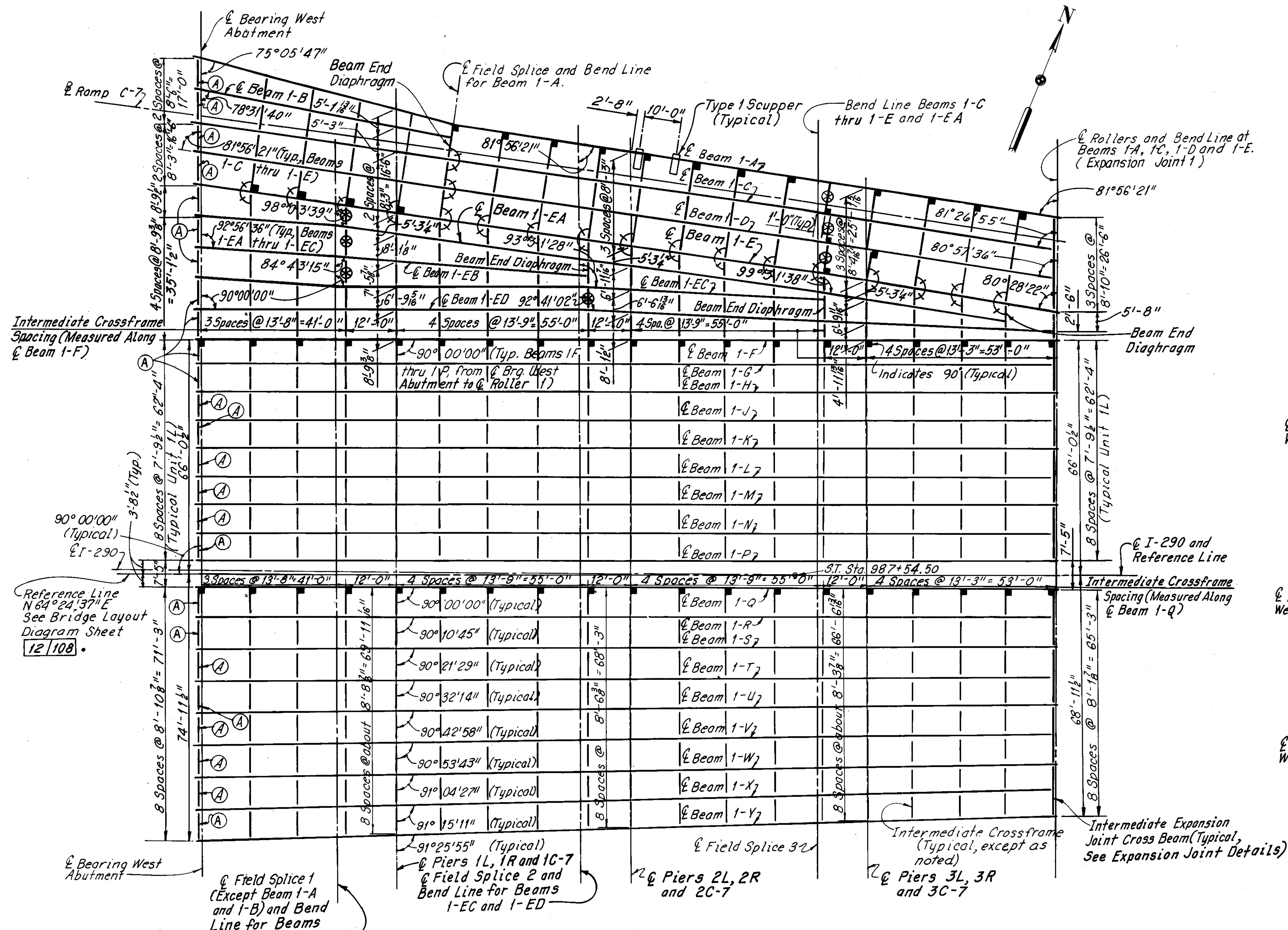
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

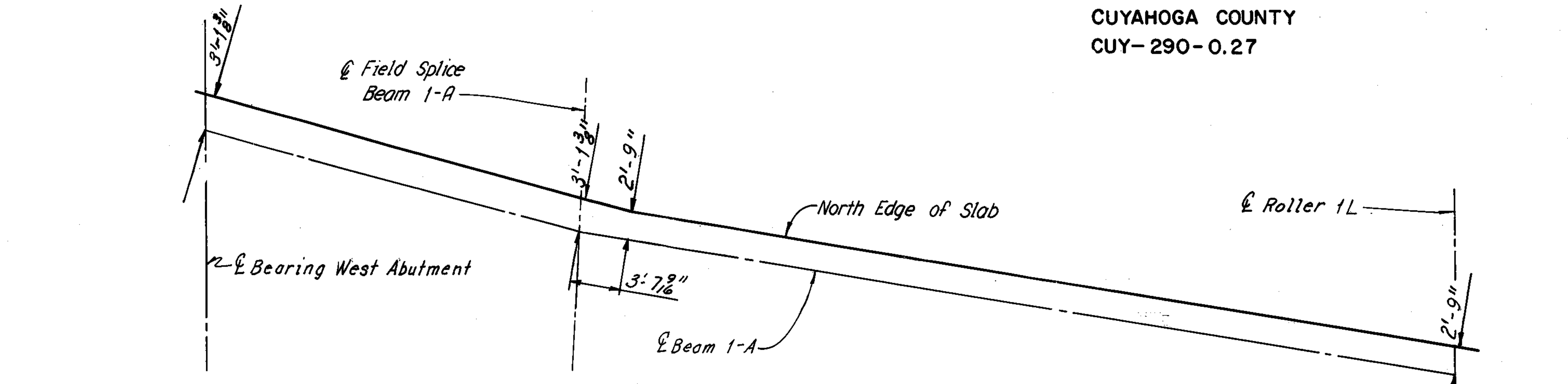
DRAWN D.M.P.	TRACED J.S.C.	CHECKED W.B.	REVIEWED C.A.B.	REVISED	
DATE 11-14-69	DATE 11-25-69	DATE 3-26-70	DATE 2-24-86		SHEET 24/108

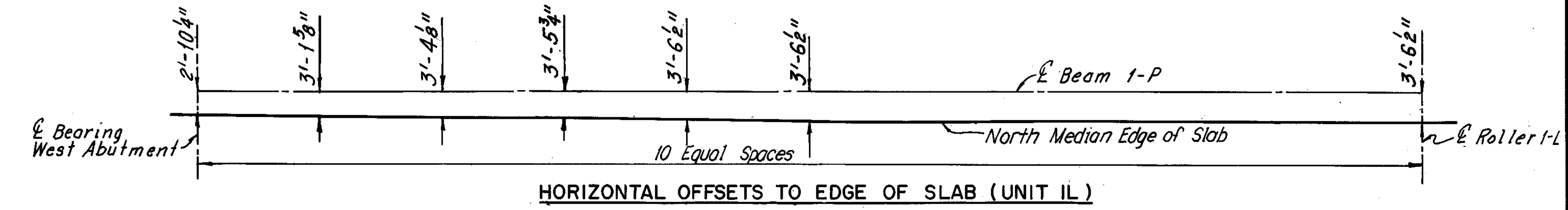
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY-290-0.27

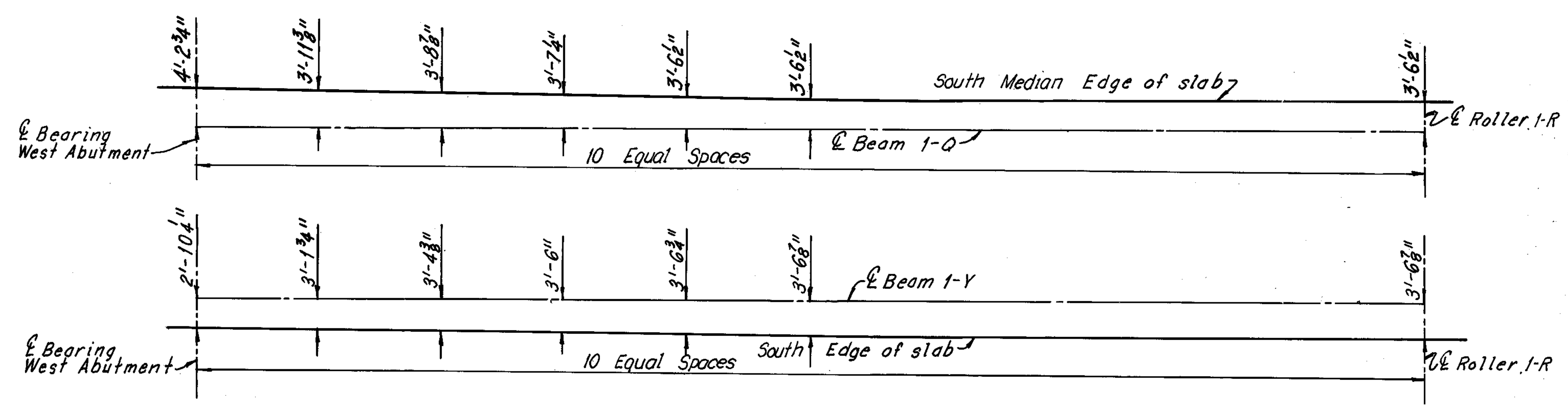


FRAMING PLAN





HORIZONTAL OFFSETS TO EDGE OF SLAB (UNIT IL)



HORIZONTAL OFFSETS TO EDGE OF SLAB (UNIT IR)

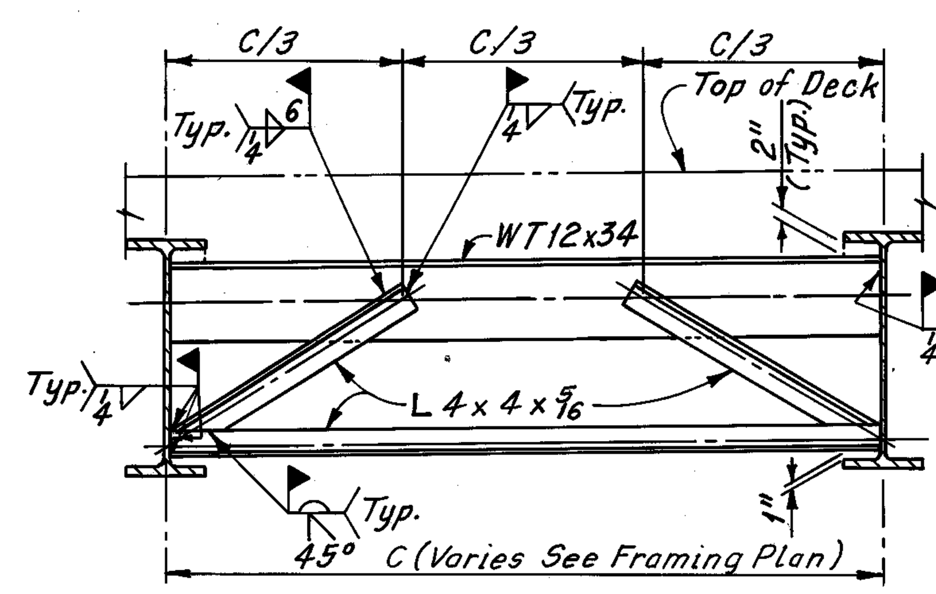
LEGEND:

- Indicates bend point crossframe.
- Indicates 90°.
- Indicates crossframe direction change.
- Ⓐ Indicates end crossframe at abutment.

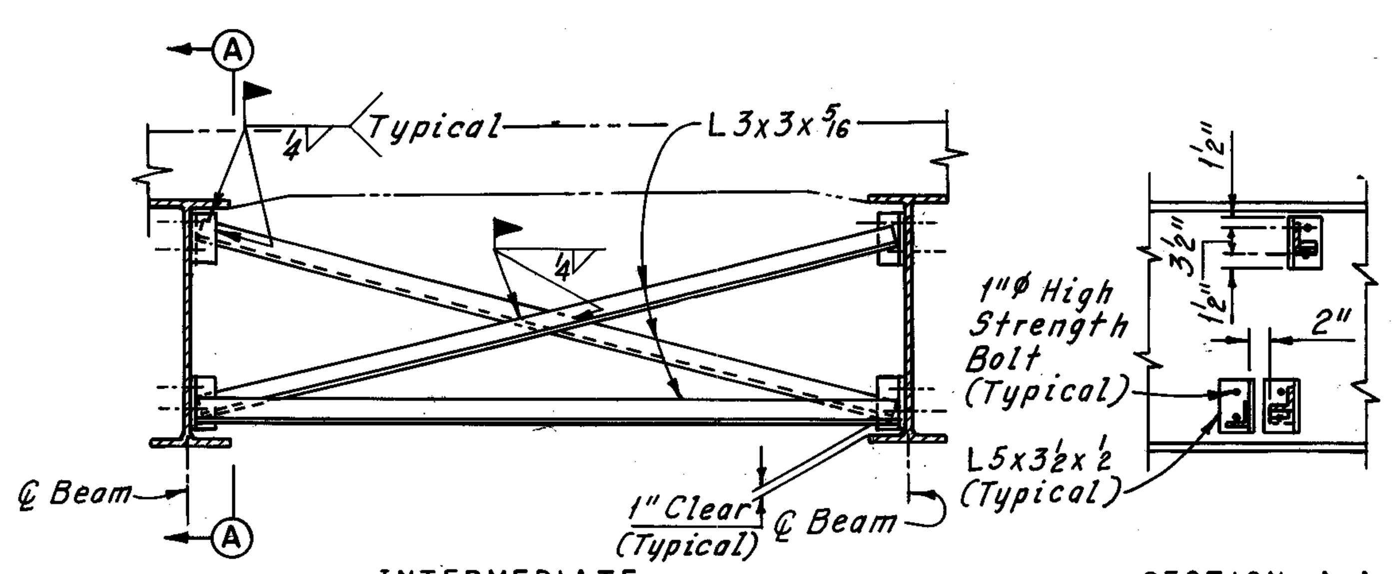
Notes:

Horizontal offsets are measured perpendicular to the beams.

For Beam End Diaphragm Details see Sheet 26/108

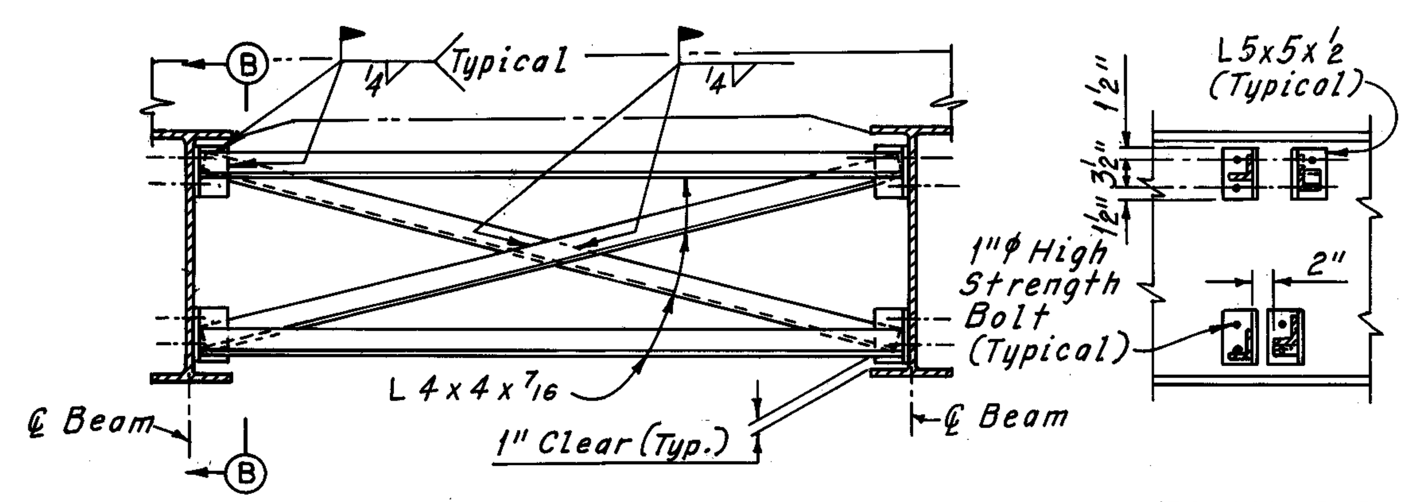


ABUTMENT



INTERMEDIATE

SECTION A-A



BEND POINT

SECTION B-B

CROSSFRAMES

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

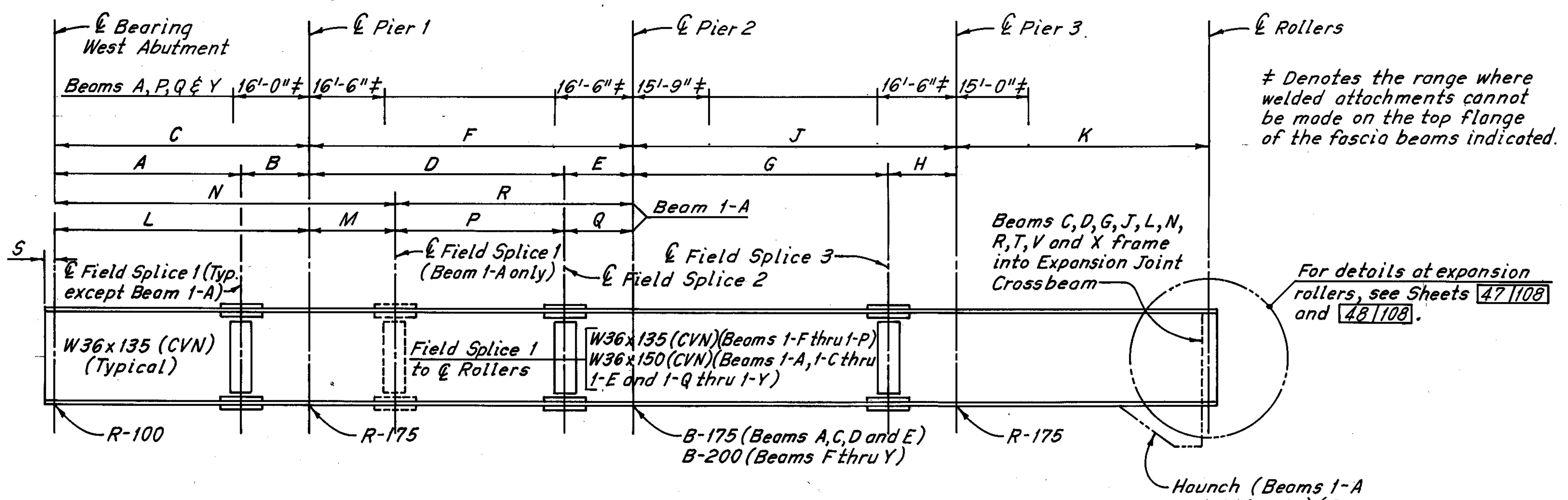
FRAMING PLAN - UNIT I

I-290 OVER CUYAHOGA RIVER

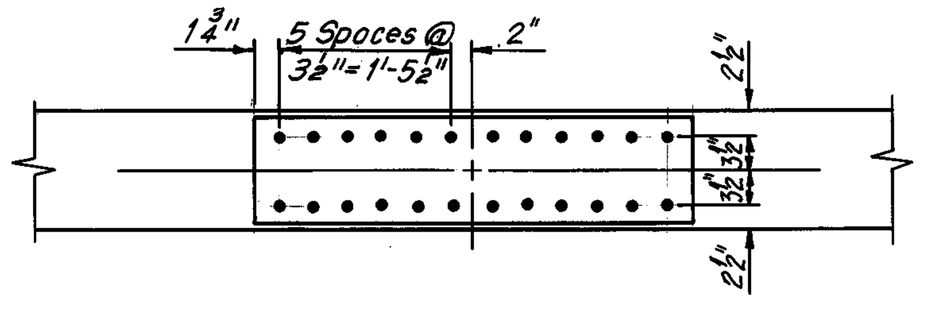
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

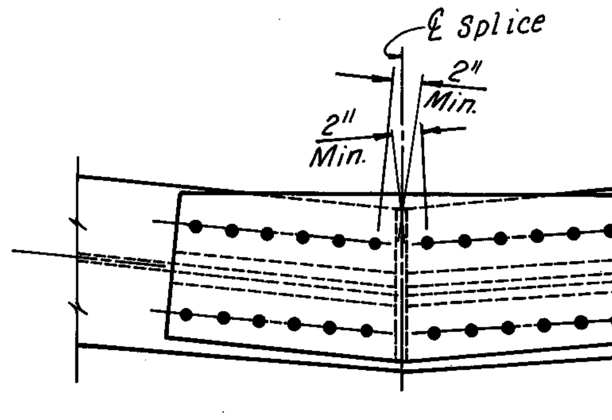
DRAWN GEM	TRACED	CHECKED MCB	REVIEWED C.A.B.	REVISED	
DATE 11-30-69	DATE	DATE 1-27-70	DATE 2-24-66		SHEET 25/108



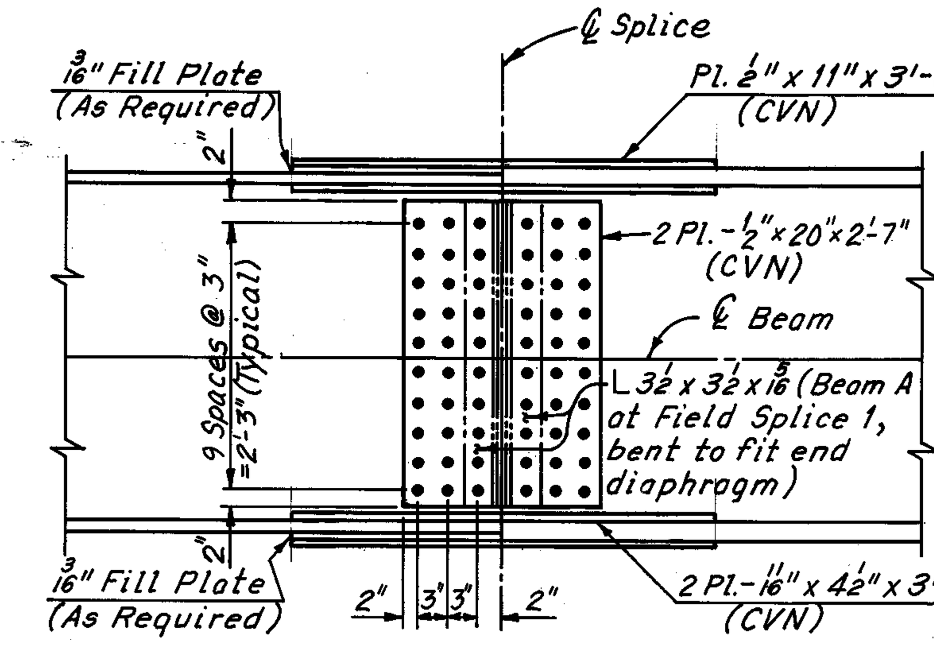
TYPICAL BEAM
(Except Beams 1-B and 1-EA thru 1-ED)



BEAM FLANGE SPLICE
(Except at bend points)

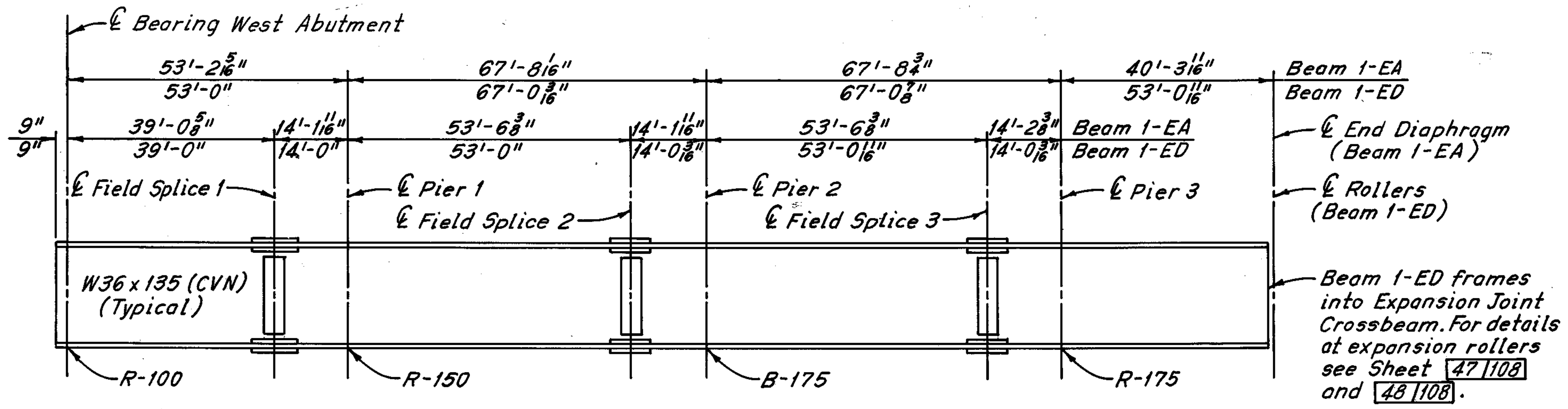


FLANGE SPLICE PLATES AT BEND POINT

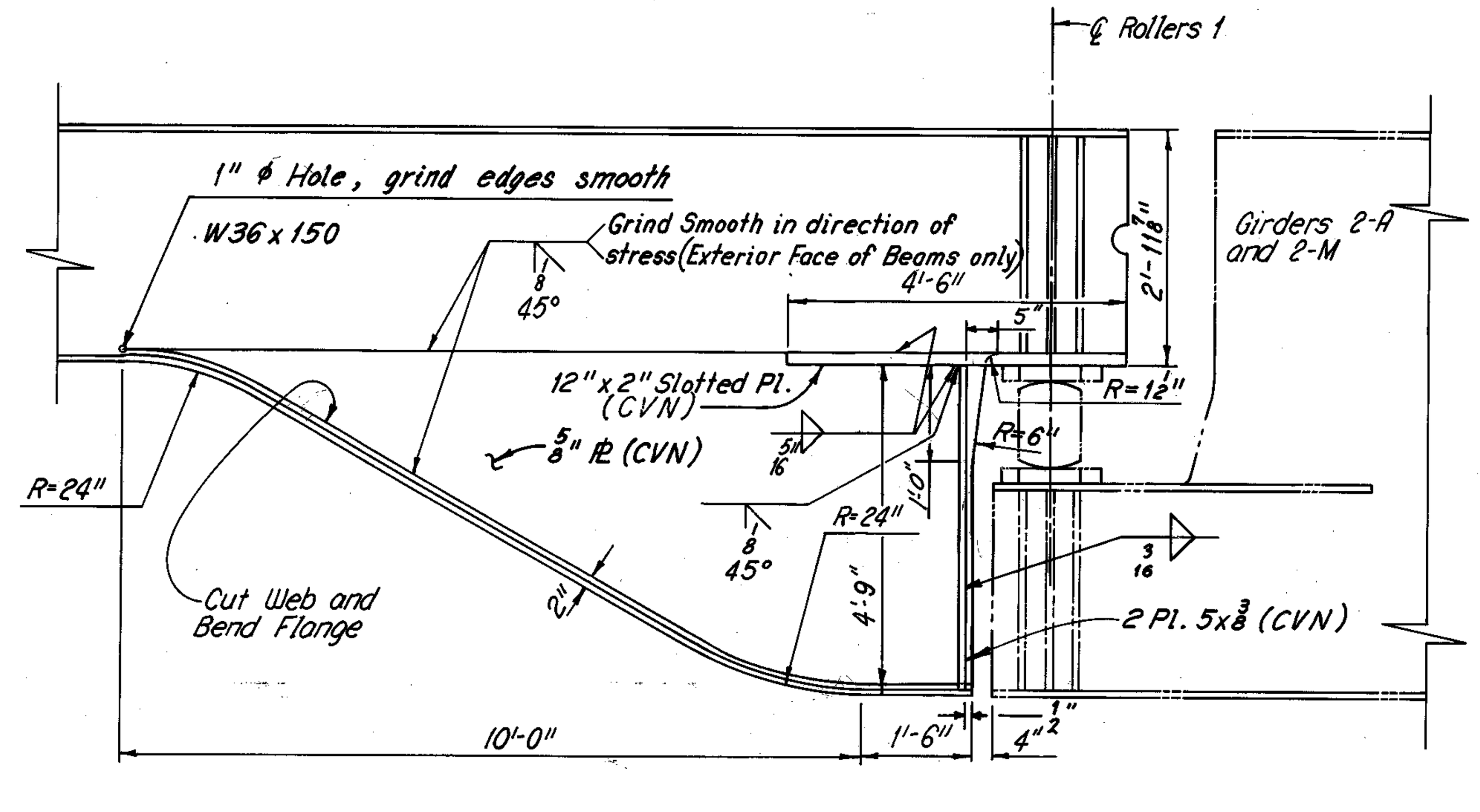


BEAM WEB SPLICE

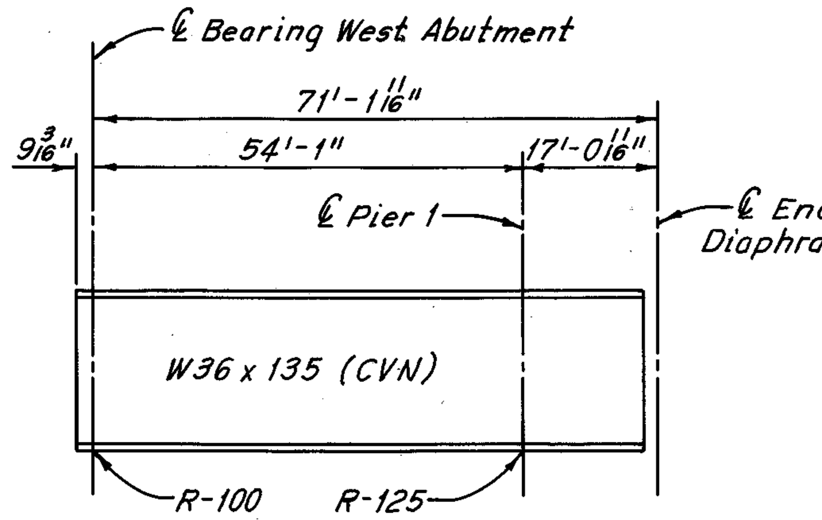
TABLE OF BEAM DIMENSIONS											
Beams \ Dimension	A	B	C	D	E	F	G	H	J	K	S
1-C	39'-4 11/16"	14'-1 11/16"	53'-6 3/8"	53'-6 3/8"	14'-1 11/16"	67'-8 1/16"	53'-6 3/8"	14'-1 7/8"	67'-8 1/4"	53'-7 3/16"	9 1/16"
1-D	39'-4 11/16"	14'-1 11/16"	53'-6 3/8"	53'-6 3/8"	14'-1 11/16"	67'-8"	53'-6 3/8"	14'-2 1/8"	67'-8 1/2"	53'-8"	9 1/16"
1-E	39'-4 11/16"	14'-1 11/16"	53'-6 3/8"	53'-6 3/8"	14'-1 11/16"	67'-8 1/16	53'-6 3/8"	14'-2 3/8"	67'-8 3/4"	53'-8 7/8"	9 1/16"
1-F thru 1-R	39'-0"	14'-0"	53'-0"	53'-0"	14'-0"	67'-0"	53'-0"	14'-0"	67'-0"	53'-0"	9"
1-S	39'-0"	14'-0"	53'-0"	53'-0 1/16"	14'-0"	67'-0 1/16"	53'-0"	14'-0"	67'-0"	53'-0"	9"
1-T	39'-0"	14'-0"	53'-0"	53'-0 1/16"	14'-0"	67'-0 1/16"	53'-0 1/16"	14'-0"	67'-0 1/16"	53'-0"	9"
1-U	39'-0 1/16"	14'-0"	53'-0 1/16"	53'-0 1/16"	14'-0"	67'-0 1/16"	53'-0 1/16"	14'-0"	67'-0 1/16"	53'-0 1/16"	9"
1-V	39'-0 1/16"	14'-0"	53'-0 1/16"	53'-0 1/8"	14'-0"	67'-0 1/8"	53'-0 1/8"	14'-0"	67'-0 1/8"	53'-0 1/16"	9"
1-W	39'-0 1/8"	14'-0"	53'-0 1/8"	53'-0 1/8"	14'-0"	67'-0 1/8"	53'-0 1/8"	14'-0"	67'-0 1/8"	53'-0 1/8"	9"
1-X	39'-0 1/8"	14'-0 1/16"	53'-0 1/8"	53'-0 1/8"	14'-0 11/16"	67'-0 3/16"	53'-0 1/8"	14'-0 1/16"	67'-0 3/16"	53'-0 1/8"	9"
1-Y	39'-0 1/8"	14'-0 1/16"	53'-0 3/16"	53'-0 3/16"	14'-0 1/16"	67'-0 1/4"	53'-0 3/16"	14'-0 1/16"	67'-0 1/4"	53'-0 3/16"	9"
Beam	G	H	J	K	L	M	N	P	Q	R	S
1-A	53'-6 3/8"	14'-1 11/16"	67'-8 1/16"	53'-6 3/8"	54'-10 3/16"	17'-10 11/16"	72'-8 7/8"	36'-0 13/16"	14'-1 11/16"	50'-2 1/2"	9 1/4"



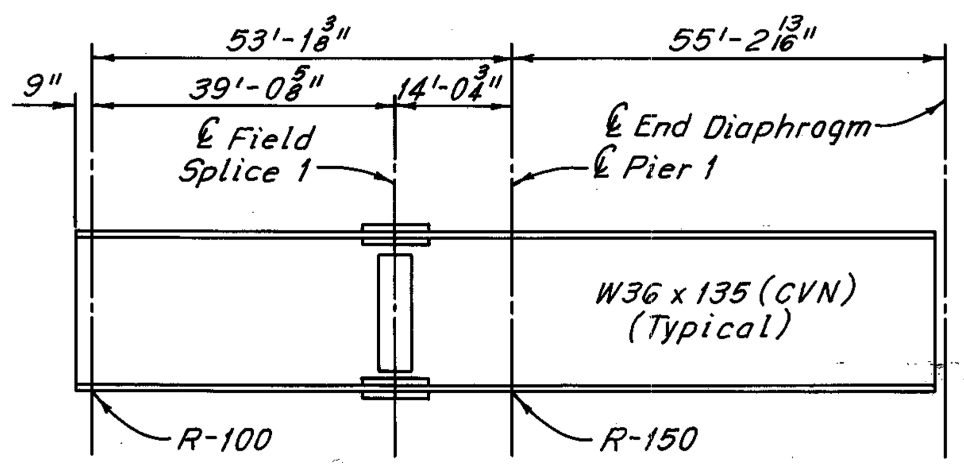
BEAMS 1-EA AND 1-ED



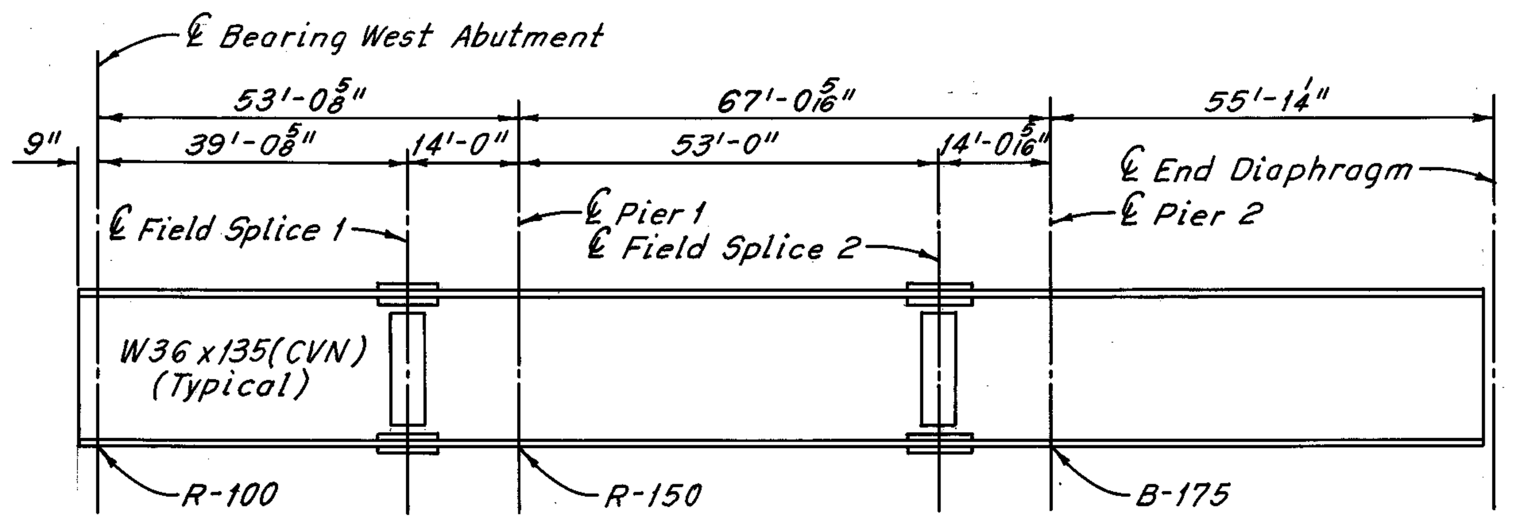
HAUNCH AT ROLLERS
(Beams 1-A and 1-Y)



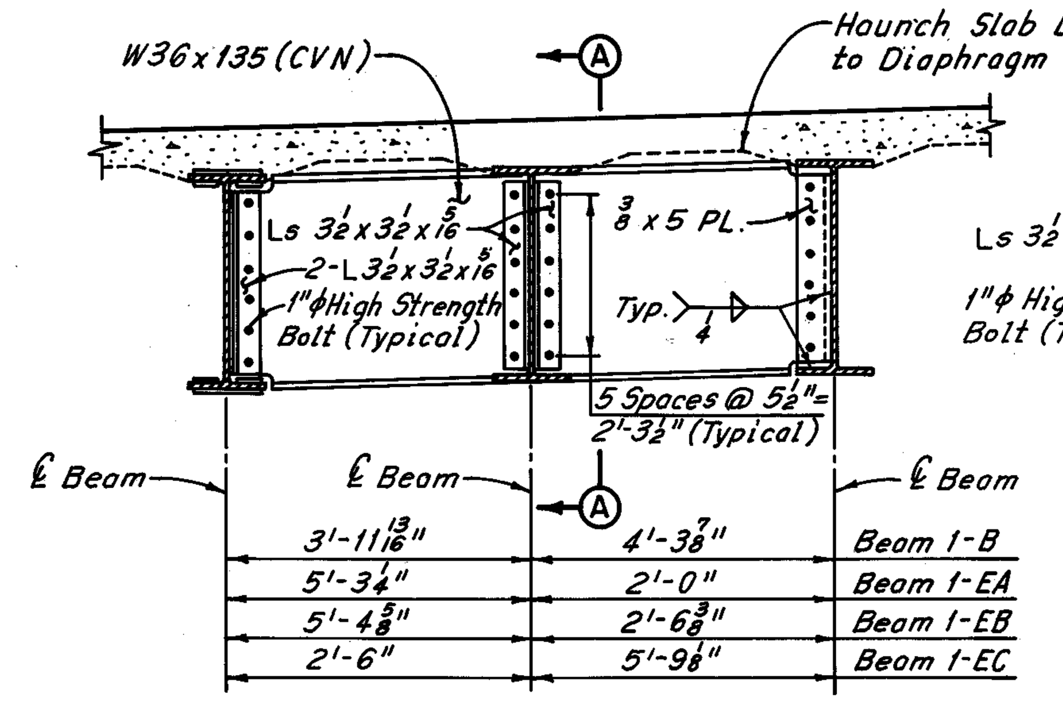
BEAM 1-B



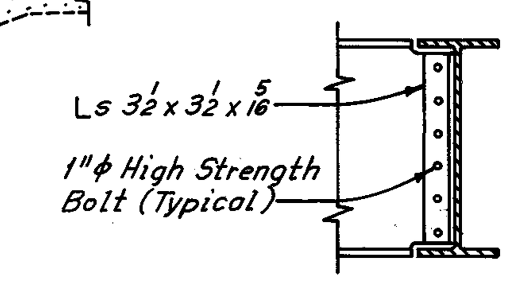
BEAM 1-EB



BEAM 1-EC



BEAM END DIAPHRAGM



SECTION A-A

Notes:

Where a shape or plate is designated (CVN) the material shall meet specified minimum notch toughness requirements as specified in 711.01 of CMS.

For details of Rockers and Bolsters, see Ohio Standard Drawing RB-1-55. Bevel top sole plates to match grade. Dimension C shall be measured at the ℄ of shoe. Omit the 1/2" side plates on the Rockers and Bolsters for Beams A, P, Q and Y.

In lieu of A572 steel, A36 steel, may be furnished for bearings, except for upper plate element of bearings. This A36 steel shall be included with the A572 steel quantity for payment.

Welded attachment of supports for concrete deck finishing machine may be made to areas of the fascia stringer flanges as indicated. Fillet welds to flanges shall be not closer than 1" from edge of flange, be not more than 2" long, and be not smaller than the minimum size required by AASHTO.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

BEAM ELEVATIONS AND DETAILS - UNIT I

I-290 OVER CUYAHOGA RIVER

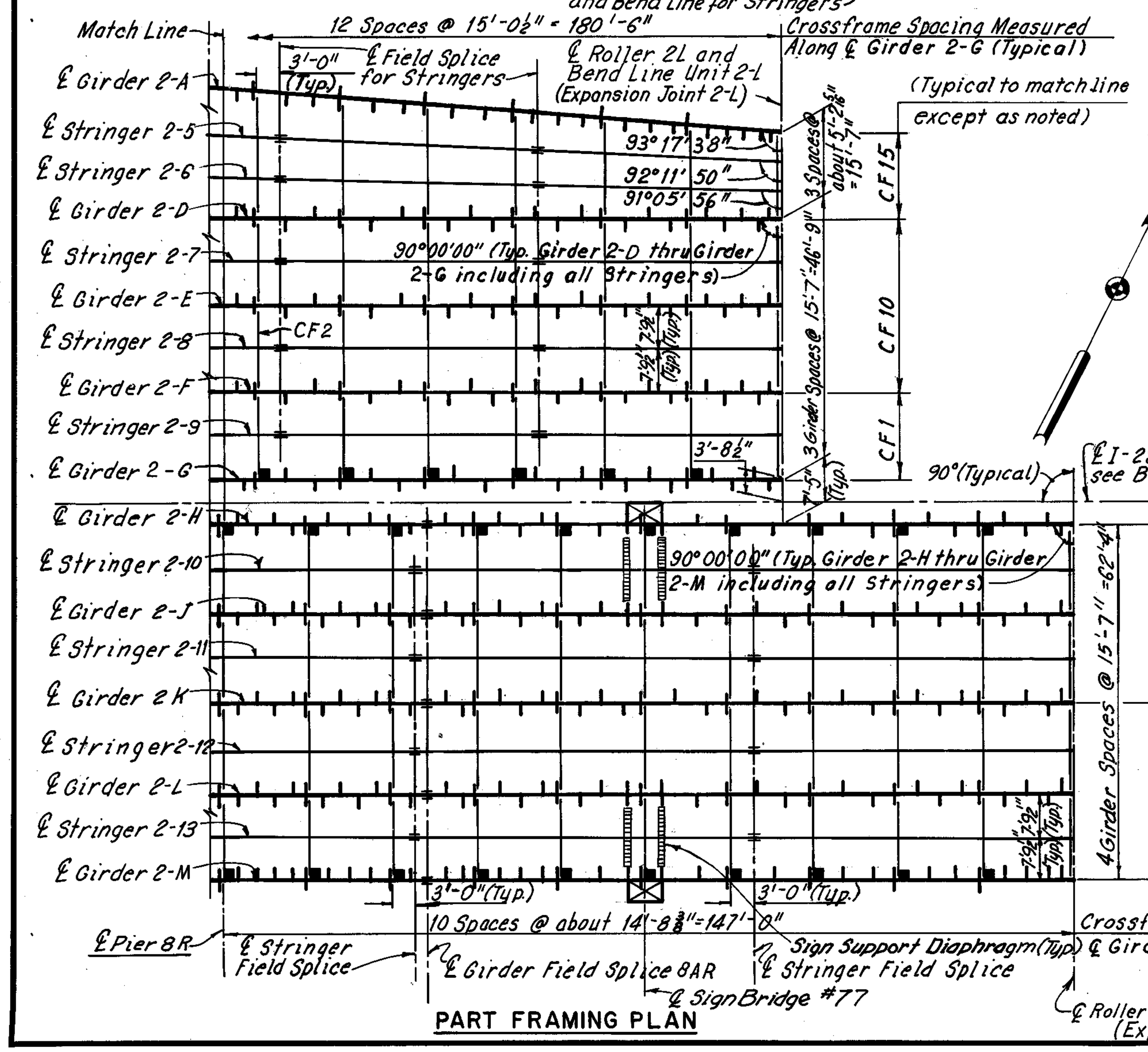
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN GEM	TRACED	CHECKED D.M.B.	REVIEWED	REVISED
DATE 11-25-69	DATE	DATE 12-19-69	DATE C.A.B. 2-24-70	SHEET 26/108

CUYAHOGA COUNTY
CUY-290-0.27

PART FRAMING PLAN



PART FRAMING PLAN

For Crossframes see Sheet 55/108 Thru 57/108.

HORIZONTAL OFFSETS TO EDGE OF SLAB											
		Girder A to North Edge of Slab						Girder G to North Median Edge of Slab	Girder H to South Median Edge of Slab	Girder M to South Edge of Slab	
From		℄ Roller 1	Field Splice 5L	Field Splice 5AL	Field Splice 6L	Field Splice 6AL	Field Splice 7AL	℄ Roller 1	℄ Roller 1	℄ Roller 1	Field Splice 5R
To		Field Splice 5L	Field Splice 5AL	Field Splice 6L	Field Splice 6AL	Field Splice 7AL	℄ Roller 2L	℄ Roller 2L	℄ Roller 2R	Field Splice 5R	℄ Roller 2R
10 Equal Spaces	0	2'-9"	3'-9¾"	3'-6⅝"	3'-6⅞"	3'-2"	2'-0"	3'-6½"	3'-6½"	3'-6¾"	3'-6¾"
	1		3'-8⅜"	3'-3½"	3'-5"						2'-11½"
	2		3'-7¼"	3'-1⅛"	3'-3½"						
	3		3'-6⅜"	2'-11⅜"	3'-2⅝"						
	4	2'-9"	3'-5¾"	2'-10⅜"	3'-2⅛"						
	5	2'-9⅛"	3'-5⅜"	2'-10"	3'-2"						
	6	2'-9⅞"	3'-5⅛"	2'-10⅜"							
	7	2'-11½"	3'-5⅛"	2'-11⅜"							
	8	3'-2⅛"	3'-5½"	3'-1⅛"		3'-2"	2'-0"				
	9	3'-5½"	3'-6"	3'-3⅝"		3'-0¾"	2'-2¼"				
	10	3'-9¾"	3'-6⅝"	3'-6⅞"	3'-2"	2'-0"	2'-11⅝"	3'-6½"	3'-6½"	3'-6¾"	2'-11½"

Note: Horizontal offsets are measured perpendicular to ℄ of Girders.

Notes:

For Girder End Diaphragm Details, see Sheet 31/108.
For Girder Notes, see Sheet 28/108.
For Stringer Notes, see Sheet 30/108.
For Sign No. 76 Support Details, see Sheet 98/108.
For Sign No. 77 Support Details see Sheet 99/108.

FRAMING PLAN LEGEND

CF Indicates Crossframe Type in Units 2, 3 and 4.
■ Indicates 90°.
Indicates a scupper. All scuppers are Type 1. For scupper details see Sheet 65/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

FRAMING PLAN - UNIT 2

I-290 OVER CUYAHOGA RIVER

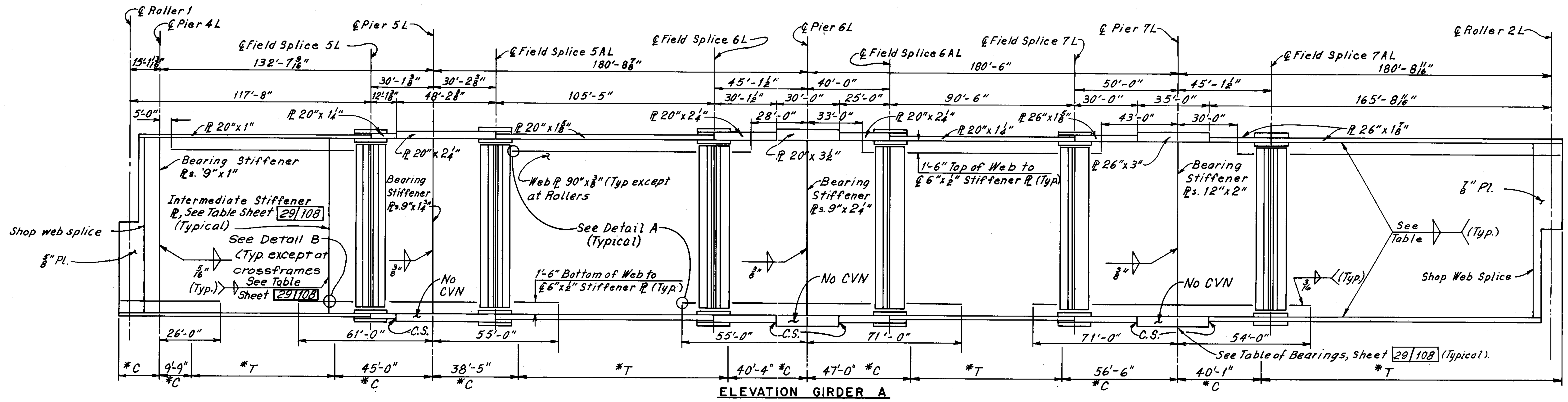
BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

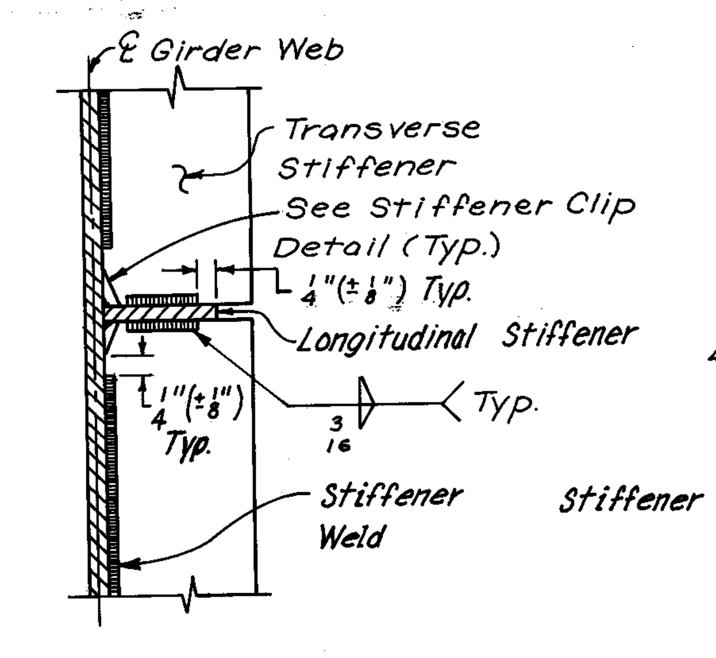
DRAWN D.M.P. DATE 10-7-69	TRACED G.E.M. DATE 11-6-69	CHECKED J.D.S. DATE 3-26-70	REVIEWED C.A.B. DATE 2-24-86	REVISED

WELD SIZE WEB TO FLANGE	
FLANGE PLATE THICKNESS	FILLET WELD SIZE
1" to $1\frac{1}{2}$"	$\frac{5}{16}$"
$1\frac{5}{8}$" to $2\frac{1}{4}$"	$\frac{3}{8}$"
$2\frac{3}{8}$" to $3\frac{1}{2}$"	$\frac{1}{2}$"

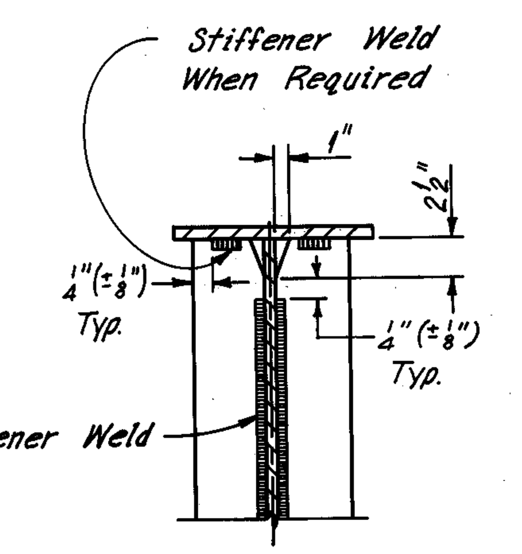
NOTE: All flange and web plates shall be labeled CVN except as shown.



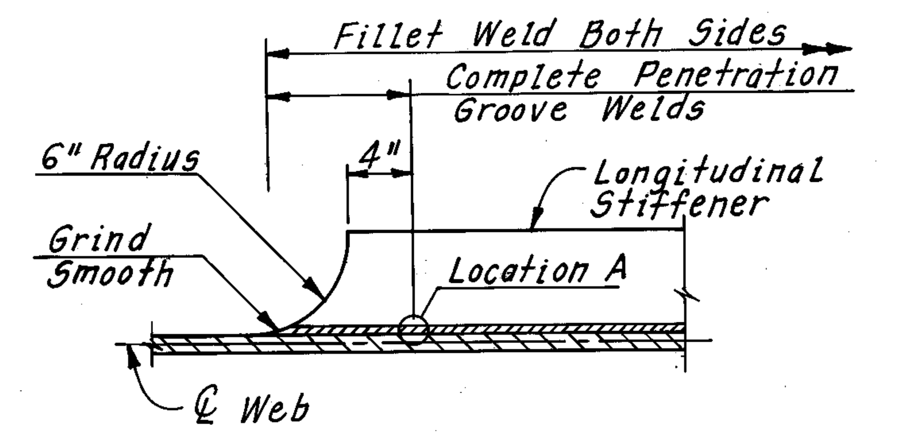
ELEVATION GIRDER A



DETAIL B

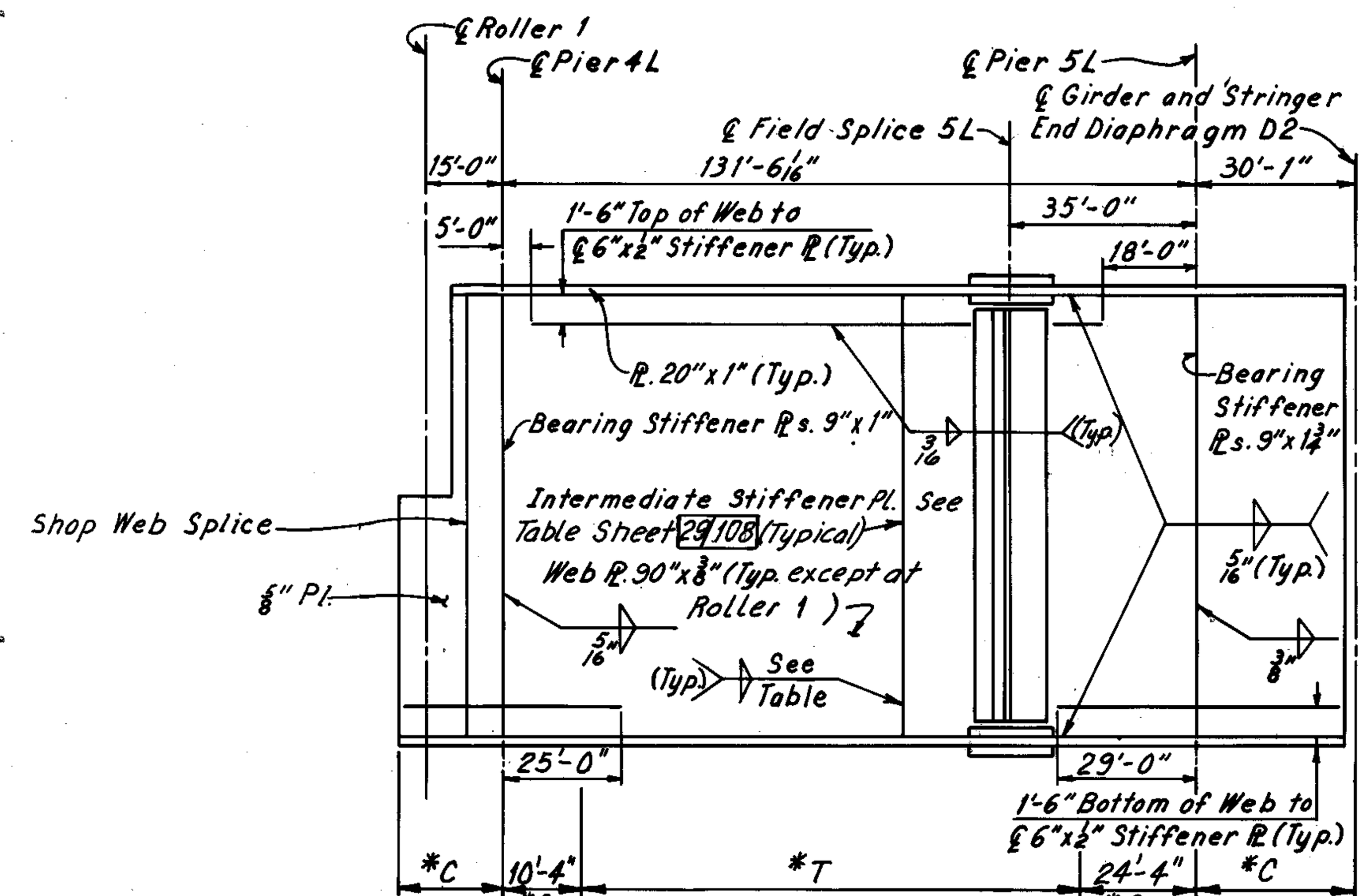


STIFFENER CLIP DETAIL

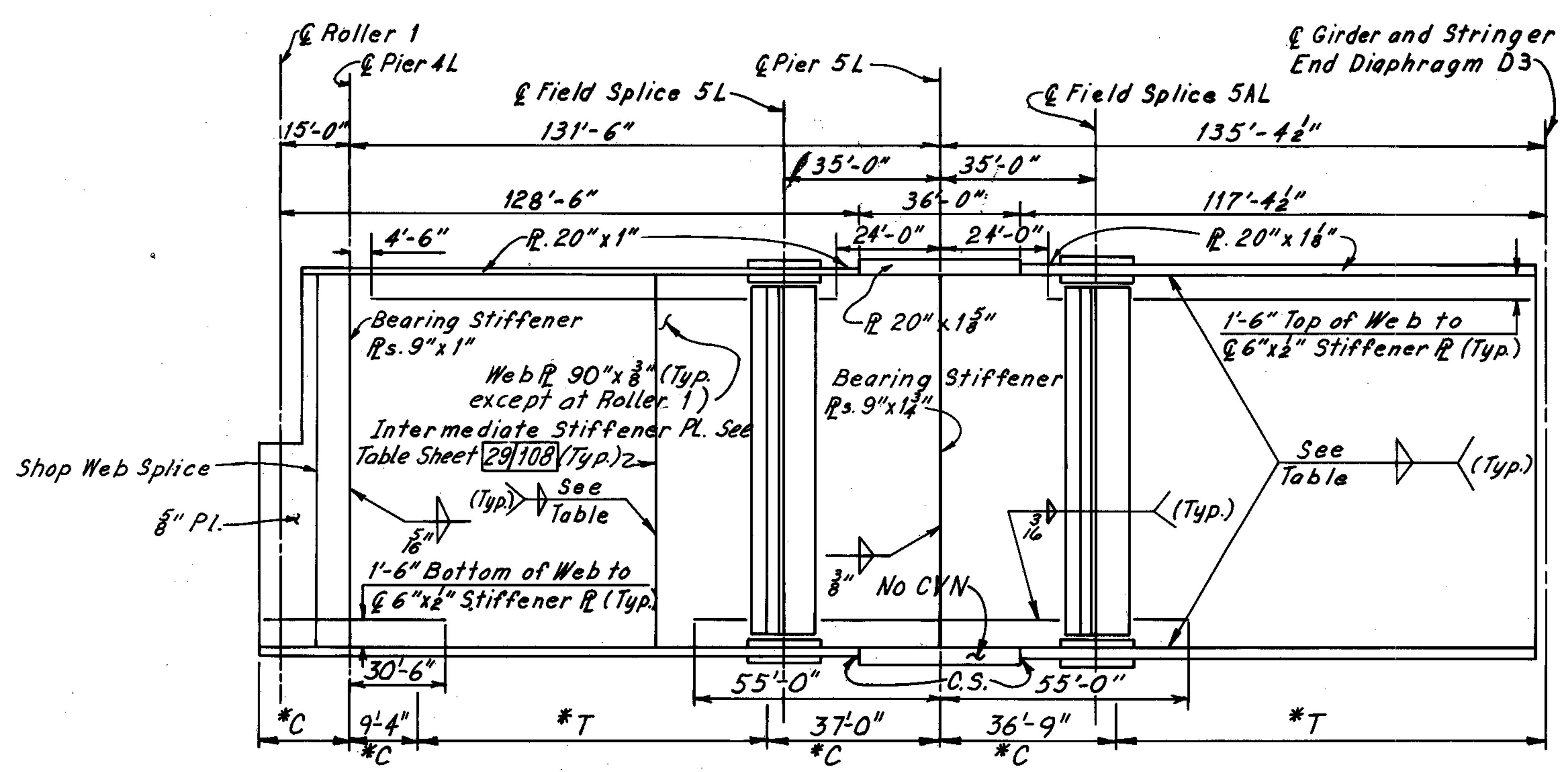


DETAIL A

(End of stiffener detail in areas of stiffener overlap. Stiffener may be terminated square at girder ends.)



ELEVATION GIRDER B



ELEVATION GIRDER C

GIRDER NOTES - ALL GIRDER UNITS:

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 centerline of the 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 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 singly, except at crossframes of girders where the stiffeners shall be placed in pairs. All intermediate stiffeners shall be welded to the web with continuous fillet welds on both sides of the stiffeners as shown. Singly placed stiffeners shall be welded to the compression flange with fillet welds of the same size as the web to flange weld at the same location. Crossframe and end diaphragm stiffeners shall be welded to both the top and bottom flanges with 5/16" fillet welds. The intermediate stiffeners shall be placed as shown on the Framing Plan, equally spaced between crossframes or crossframes and bearing stiffeners at pier, or crossframe and stiffener adjacent to abutments, or as noted.

In addition to the intermediate stiffeners shown on the framing plans, special stiffeners shall be added where the web depth changes at Piers 9, 10, 11 and 12. The stiffener spacing shall be adjusted to provide 6" minimum clearance between stiffeners and shop web splices.

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.

Longitudinal stiffener plates shall be placed only on the interior side of the webs in Units 2, 3 and 4.

All girder field splices shall be made with 1"Ø ASTM A325, Type I high strength steel bolts.

Where a shape or plate is labeled CVN, the material shall meet minimum notch toughness requirements in accordance with 711.01.

Butt welds shall be ground in the direction of stress.

C.S. indicates butt weld subject to compressive stress only.

*T Denotes area of tension in the bottom flange. The top flange in these areas are in compression.

*C Denotes area of compression in the bottom flange. The top flange in these areas are in tension.

WELDED ATTACHMENT of supports for concrete deck finishing machine may be made to areas of the fascia stringer top flanges designated "Compression". Attachments shall not be made to areas designated "Tension". Fillet welds to compression flanges shall be not closer than 1" from edge of flange, be not more than 2" long, and be not smaller than the minimum size required by AASHTO.

Note:
For details of field splices, see Sheet 36/108.

Detail A Fabrication Procedure

1. Bevel the portion of the stiffener that will be groove welded. A notch will exist where the bevel is stopped at Location A. This notch shall be ground or gouged to a smooth rounded contour to avoid weld flaws at that location.
2. Cut the end of the stiffener to the proper radius leaving enough material to permit a satisfactory groove weld where the cut edge becomes tangent to the web.
3. Manually groove weld the end portion, starting at the end of the bevel and moving toward the end of the stiffener. Do not use a backup bar; instead, back gouge as required by AWS specifications.
4. Ultrasonically test 100% of the groove weld.
5. Place submerged arc fillet welds on both sides of the stiffener for its entire length, including the end portions already groove welded.
6. Grind the weld and stiffener material to a smooth contour where the radiused stiffener end becomes tangent to the web.

H.N.T.B. BR.NO. 9 PART II - SUPERSTRUCTURE

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

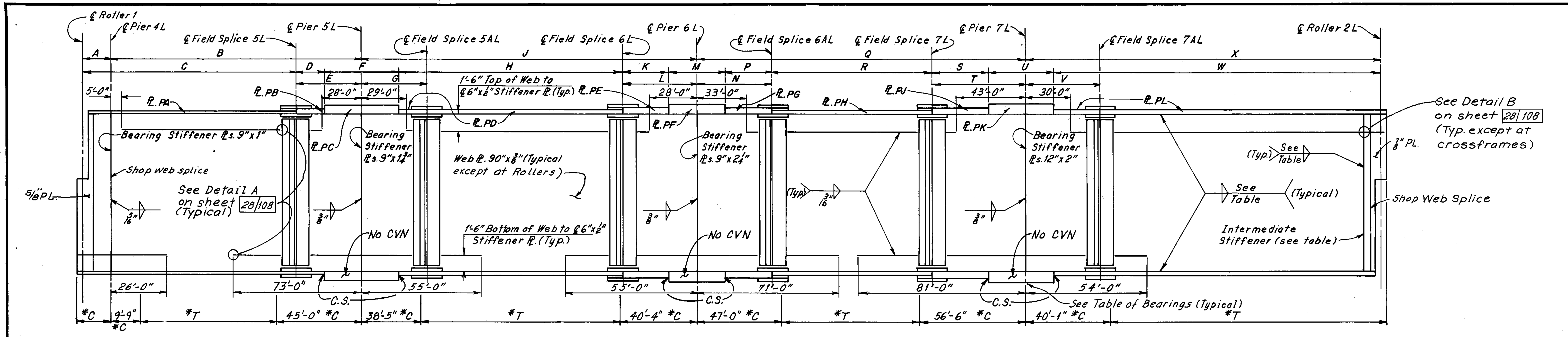
GIRDER ELEVATIONS
UNIT 2
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

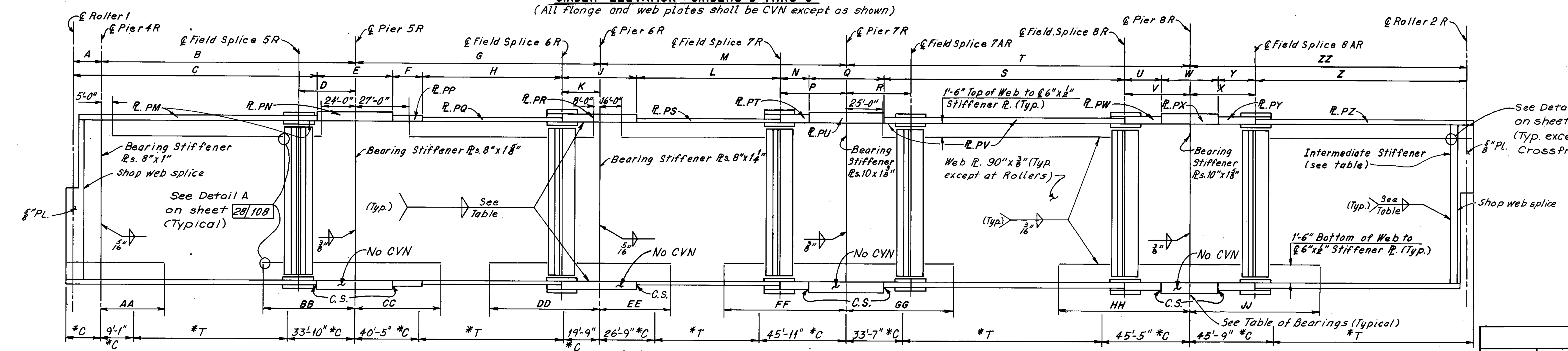
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.M.P. DATE 11-18-69	TRACED J.S.C. DATE 12-6-69	CHECKED R.S. DATE 3-26-70	REVIEWED C.A.B. DATE 2-24-86	REVISED

CUYAHOGA COUNTY
CUY-290-0.27



GIRDER ELEVATION—GIRDERS D THRU G
(All flange and web plates shall be CVN except as shown)



GIRDER ELEVATION—GIRDERS H THRU M
(All flange and web plates shall be CVN except as shown)

TABLE OF DIMENSIONS FOR PLACEMENT OF LONGITUDINAL STIFFENERS

DIMENSION	GIRDER 2-J THRU 2-L	GIRDERS 2-H & 2-M
AA	21'-0"	17'-0"
BB	48'-0"	41'-0"
CC	60'-0"	53'-0"
DD	44'-0"	36'-0"
EE	65'-9"	38'-0"
FF	65'-9"	63'-0"
GG	45'-0"	41'-0"
HH	57'-0"	53'-0"
JJ	61'-0"	56'-0"

TABLE OF BEARINGS

Pier	Girders	Shoes
4L	A thru G	E400
4R	H thru M	E400
5L	A, B, C, G	E650
	D, E, F	E800A
5R	H thru M	E650
6L	E, F, G	F800
	A, D	F900
6R	H, M	B400
	J, K, L	B500
7L	A, E, F, G	F850A
	D	F1125
7R	H, M	B525
	J, K, L	F850
8R	H, M	E650
	J, K, L	E800A

Notes: For Bearing Details see Sheet 58/108 and 59/108.

INTERMEDIATE STIFFENERS

Flange PL. Width	Normal Stiffener Pl. Size	Normal Stiffener Weld Size	Stiffeners at Sign Supports and Crossframes	Stiffeners at Field Splice	When Crossframe at Field Splice
16"	6"x3/8"	3/16"	8"x1/2" PL.	L 6x4x3/8	L 8x4x1/2
20"	6"x3/8"	3/16"	8"x1/2" PL.	L 6x4x3/8	L 8x4x1/2
22"	6"x3/8"	1/4"	8"x1/2" PL.	L 6x4x3/8	L 8x4x1/2
26"	8"x1/2"	1/4"	8"x1/2" PL.	L 8x4x1/2	L 8x4x1/2

Notes:
For placement of stiffener angles at field splices see Section A-A on Sheet 36/108. The weld size shown for the normal stiffeners shall also be used for stiffeners at crossframes. The stiffener located at End Diaphragm D-3 shall be welded with a 1/4" fillet weld.

TABLE OF DIMENSIONS GIRDERS D THRU G

DIMENSION	GIRDER D	GIRDER E	GIRDER F	GIRDER G
A	15'-0"	←	→	15'-0"
B	131'-6"	←	→	131'-6"
C	111'-6"	←	→	111'-6"
D	17'-0"	15'-0"	15'-0"	10'-0"
E	35'-0"	←	→	35'-0"
F	36'-0"	40'-0"	40'-0"	50'-0"
G	35'-0"	←	→	35'-0"
H	122'-6"	120'-6"	120'-6"	115'-6"
J	180'-6"	←	→	180'-6"
K	25'-0"	←	→	25'-0"
L	40'-0"	←	→	40'-0"
M	30'-0"	←	→	30'-0"
N	40'-0"	←	→	40'-0"
P	25'-0"	←	→	25'-0"
Q	180'-6"	←	→	180'-6"
R	90'-6"	←	→	90'-6"
S	30'-0"	←	→	30'-0"
T	50'-0"	←	→	50'-0"
U	35'-0"	←	→	35'-0"
V	40'-1 1/2"	←	→	40'-1 1/2"
W	165'-6"	←	→	165'-6"
X	180'-6"	←	→	180'-6"

FLANGE PLATE SIZES GIRDERS D THRU G

FLANGE PL.	GIRDER D	GIRDER E	GIRDER F	GIRDER G
PA	20"x1 1/8"	20"x1"	20"x1"	20"x1"
PB	20"x1 5/8"	20"x1 1/2"	20"x1 1/2"	20"x1"
PC	20"x2 3/4"	20"x2 3/4"	20"x2 3/4"	20"x2 1/4"
PD	20"x1 5/8"	20"x1 3/8"	20"x1 3/8"	20"x1"
PE	20"x2 1/2"	20"x2"	20"x2"	20"x1 5/8"
PF	20"x3 1/2"	20"x3"	20"x3"	20"x2 1/4"
PG	20"x2 1/2"	20"x2"	20"x2"	20"x1 5/8"
PH	20"x1 3/8"	20"x1 1/8"	20"x1 1/8"	20"x1"
PJ	26"x2"	26"x1 5/8"	26"x1 5/8"	26"x1 1/2"
PK	26"x3 1/2"	26"x2 3/4"	26"x2 3/4"	26"x2 1/4"
PL	26"x2 1/4"	26"x2"	26"x2"	26"x1 1/2"

TABLE OF DIMENSIONS (GIRDERS H THRU M)

DIMENSION	GIRDER H	GIRDER J	GIRDER K	GIRDER L	GIRDER M
A	15'-0"	←→	15'-0"	15'-0 1/16"	15'-0 1/16"
B	131'-6"	131'-6"	131'-6 1/8"	131'-6 3/16"	131'-6 3/8"
C	126'-6"	126'-6"	126'-6 1/8"	126'-6 1/4"	126'-6 7/16"
D	30'-0"	←	—	→	30'-0"
E	40'-0"	←	—	→	40'-0"
F	15'-0"	←	—	→	15'-0"
G	131'-6"	←	—	→	131'-6"
H	76'-6"	←	—	→	76'-6"
J	40'-0"	←	—	→	40'-0"
K	20'-0"	←	—	→	20'-0"
L	76'-6"	←	—	→	76'-6"
M	131'-6"	←	—	→	131'-6"
N	15'-0"	←	—	→	15'-0"
P	35'-0"	←	—	→	35'-0"
Q	40'-0"	←	—	→	40'-0"
R	35'-0"	←	—	→	35'-0"
S	127'-6"	←	—	→	127'-6"
T	182'-6"	←	—	→	182'-6"
U	20'-0"	←	—	→	20'-0"
V	35'-0"	←	—	→	35'-0"
W	30'-0"	←	—	→	30'-0"
X	35'-0"	←	—	→	35'-0"
Y	20'-0"	←	—	→	20'-0"
Z	112'-0"	←	—	→	112'-0"
ZZ	147'-0"	←	—	→	147'-0"

FLANGE PLATE SIZES GIRDERS H THRU M

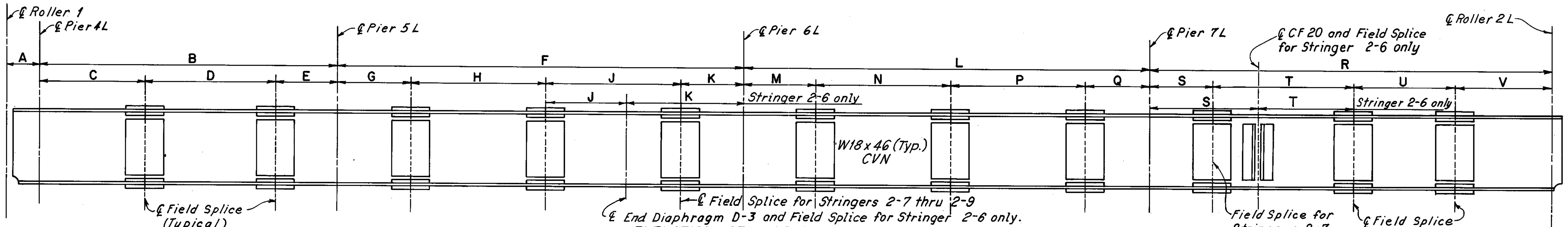
FLANGE PL.	GIRDER H	GIRDER J	GIRDER K	GIRDER L	GIRDER M
PM	16"x1"	16"x1 3/8"	←→	16"x1 3/8"	16"x1"
PN	16"x1 7/8"	16"x2 1/2"	←→	16"x2 1/2"	16"x1 7/8"
PP	16"x1"	16"x1 3/8"	←→	16"x1 3/8"	16"x1"
PQ	16"x7/8"	16"x7/8"	←→	16"x7/8"	16"x7/8"
PR	16"x1"	16"x1 1/2"	←→	16"x1 1/2"	16"x1"
PS	16"x7/8"	16"x1"	←→	16"x1"	16"x7/8"
PT	22"x1 1/8"	22"x1 1/4"	←→	22"x1 1/4"	22"x1 1/8"
PU	22"x1 1/2"	22"x2 1/4"	←→	22"x2 1/4"	22"x1 1/2"
PV	22"x1 1/8"	22"x1 1/4"	←→	22"x1 1/4"	22"x1 1/8"
PW	22"x1 1/2"	22"x2"	←→	22"x2"	22"x1 1/2"
PX	22"x2 1/4"	22"x3"	←→	22"x3"	22"x2 1/4"
PY	22"x1 1/2"	22"x2"	←→	22"x2"	22"x1 1/2"
PZ	22"x1 1/8"	22"x1 1/4"	←→	22"x1 1/4"	22"x1 1/8"

WELD SIZE WEB TO FLANGE

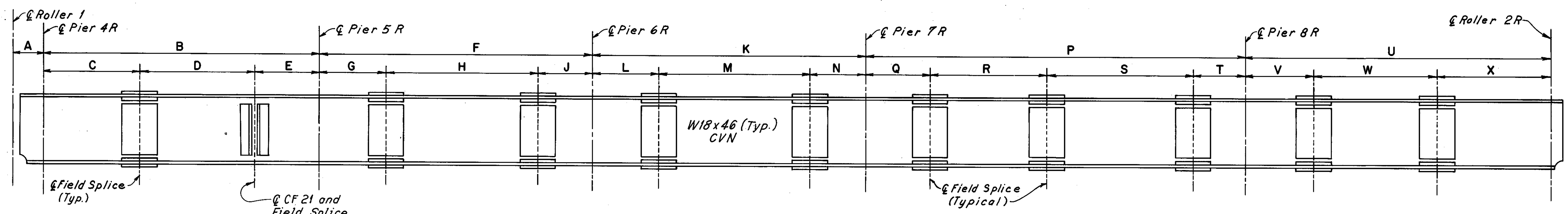
FLANGE PLATE THICKNESS	FILLET WELD SIZE
7/8" to 1 1/2"	5/16"
1 5/8" to 2 1/4"	3/8"
2 3/8" to 3 1/2"	1/2"

CUYAHOGA COUNTY
CUY-290-0.27

STRINGER 2-1 | STRINGER 2-2 | STRINGER 2-3 | STRINGER 2-4 | STRINGER 2-5



ELEVATION STRINGERS 2-6 THRU 2-9



ELEVATION STRINGERS 2-10 THRU 2-13

STRINGER NOTES:

The location of the stringer field splices shown in the plans may be relocated, except at bend points and end diaphragms, to facilitate erection and construction. Any additional or relocated splices shall be placed 3'-0" from an intermediate crossframe. Payment for splice material will be based on the quantity shown in the plans.

All stringer field splices shall be made with $\frac{7}{8}$" Ø high strength steel bolts. The bolts shall be placed with their heads on the bottom of the flange splice plates.

For Stringer Field Splice Details see Sheet 36/108

TABLE OF DIMENSIONS
STRINGERS 2-6 THRU 2-9

DIMENSION	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V
Stringer 2-6	15'-0"	131'-6"	46'-6"	58'-0"	27'-0"	180'-6"	33'-1"	60'-2"	42'-1½"	45'-1½"	180'-6"	33'-1"	60'-2"	60'-2"	27'-1"	180'-6⅜"	45'-1½"	48'-1⅝"	45'-1⅝"	42'-1⅝"
Stringer 2-7 thru 2-9	15'-0"	131'-6"	46'-6"	58'-0"	27'-0"	180'-6"	33'-1"	60'-2"	60'-2"	27'-1"	180'-6"	33'-1"	60'-2"	60'-2"	27'-1"	180'-6"	33'-1"	60'-2"	45'-1½"	42'-1½"

TABLE OF DIMENSIONS
STRINGERS 2-10 THRU 2-13

DIMENSION	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T	U	V	W	X
Stringer 2-10	15'-0"	131'-6"	46'-6"	55'-0"	30'-0"	131'-6"	32'-2⅜"	73'-1¼"	26'-2⅜"	131'-6"	31'-9⅝"	72'-8⅜"	27'-0"	182'-6"	31'-0"	56'-2⅜"	70'-3⅝"	25'-0"	147'-0"	32'-4¾"	58'-9⅝"	55'-9⅝"
Stringer 2-11	15'-0"	131'-6$\frac{1}{16}$"	46'-6$\frac{1}{16}$"	55'-0"																		
Stringer 2-12	15'-0"	131'-6⅛"	46'-6$\frac{1}{16}$"	55'-0$\frac{1}{16}$"																		
Stringer 2-13	15'-0"	131'-6$\frac{5}{16}$"	46'-6$\frac{3}{16}$"	55'-0⅛"	30'-0"	131'-6"	32'-2⅜"	73'-1¼"	26'-2⅜"	131'-6"	31'-9⅝"	72'-8⅜"	27'-0"	182'-6"	31'-0"	56'-2⅞"	70'-3⅝"	25'-0"	147'-0"	32'-4¾"	58'-9⅝"	55'-9⅝"

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

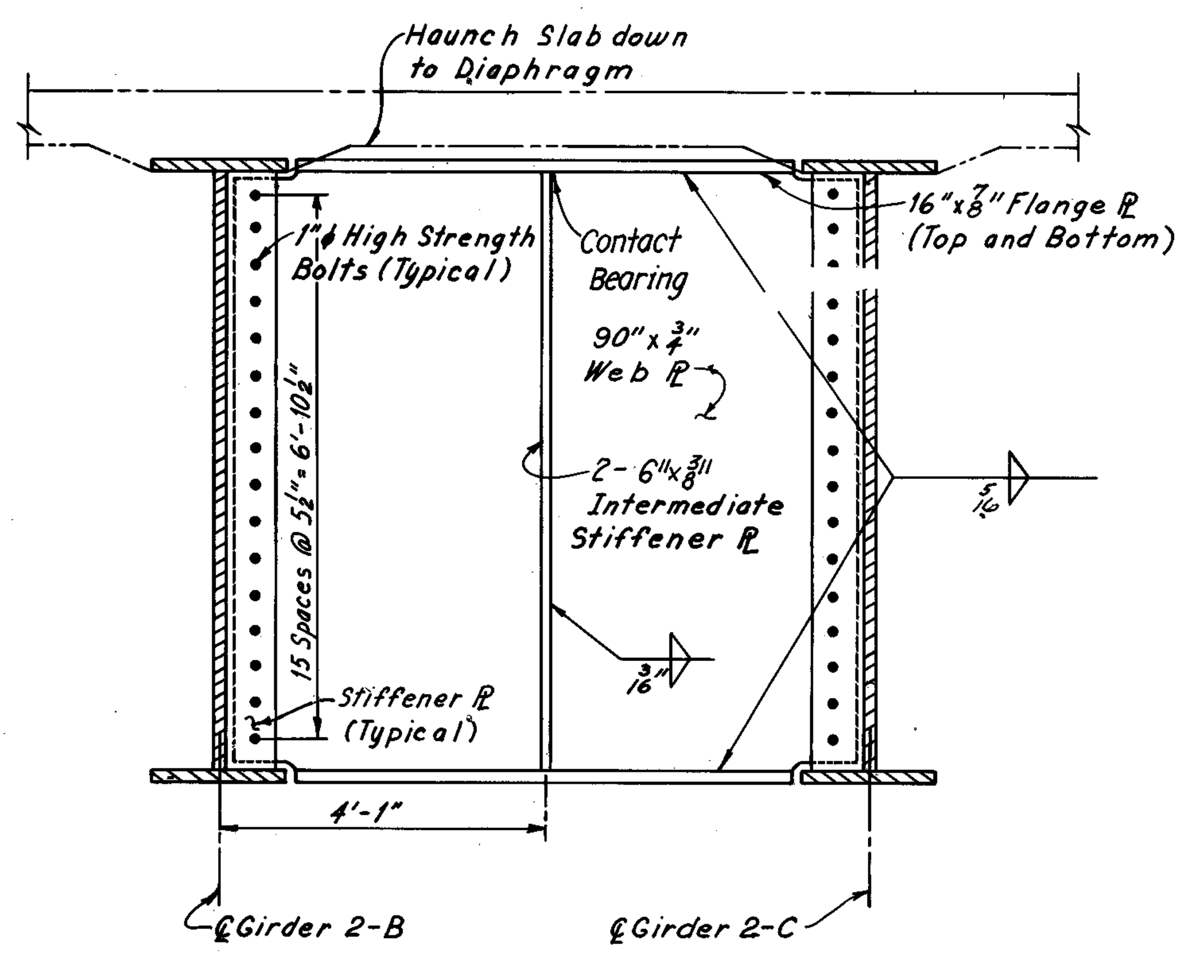
STRINGER ELEVATIONS
UNIT 2
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

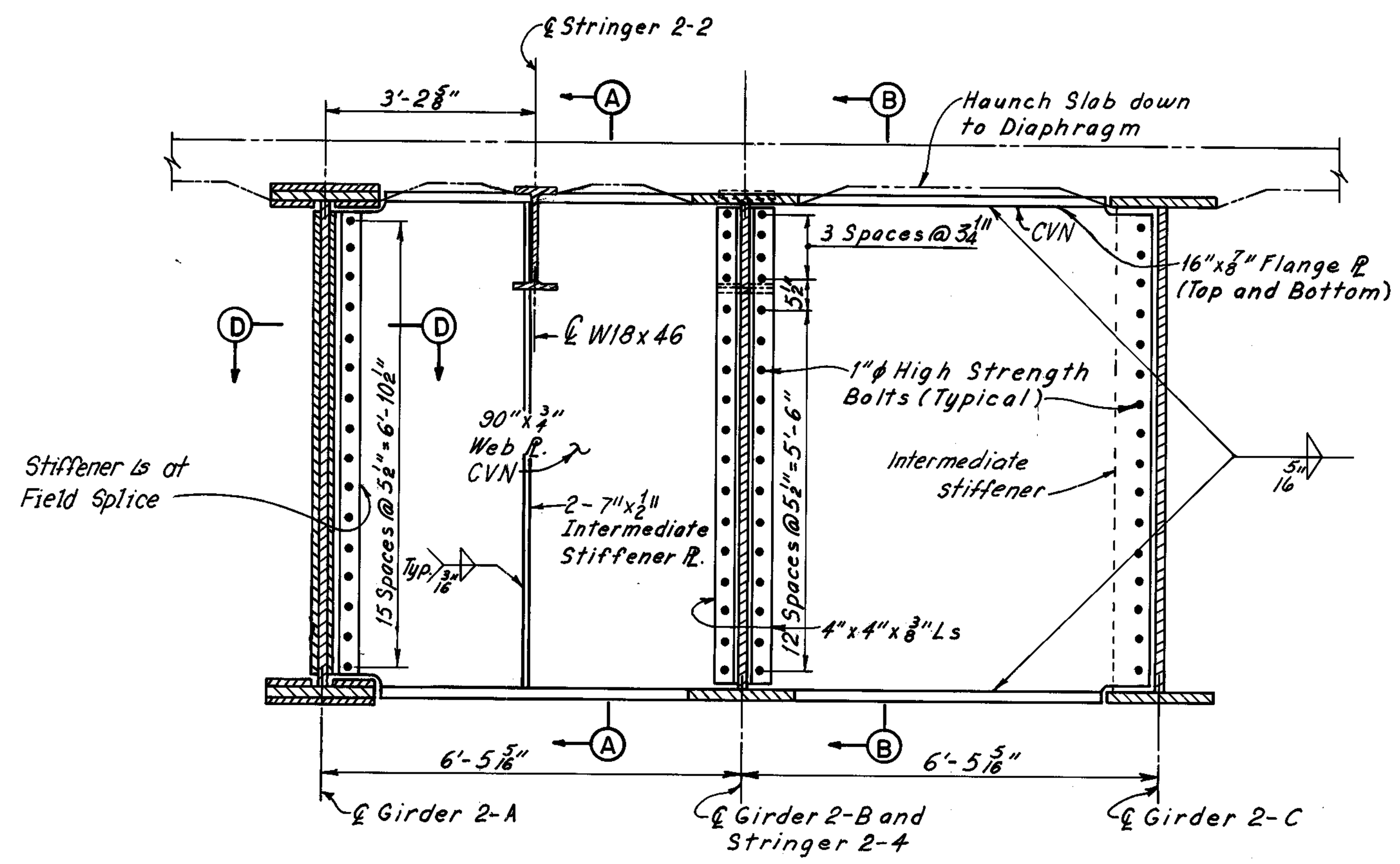
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.M.P.	TRACED J.S.C.	CHECKED J.D.S.	REVIEWED C.A.B.	REVISED
DATE 11-19-69	DATE 11-26-69	DATE 3-26-70	DATE 2-24-86	

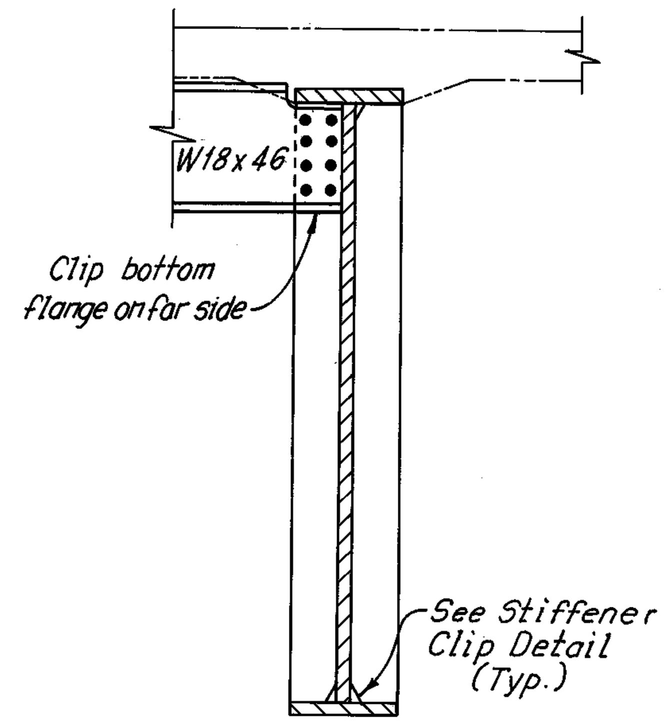
CUYAHOGA COUNTY
CUY-290-0.27



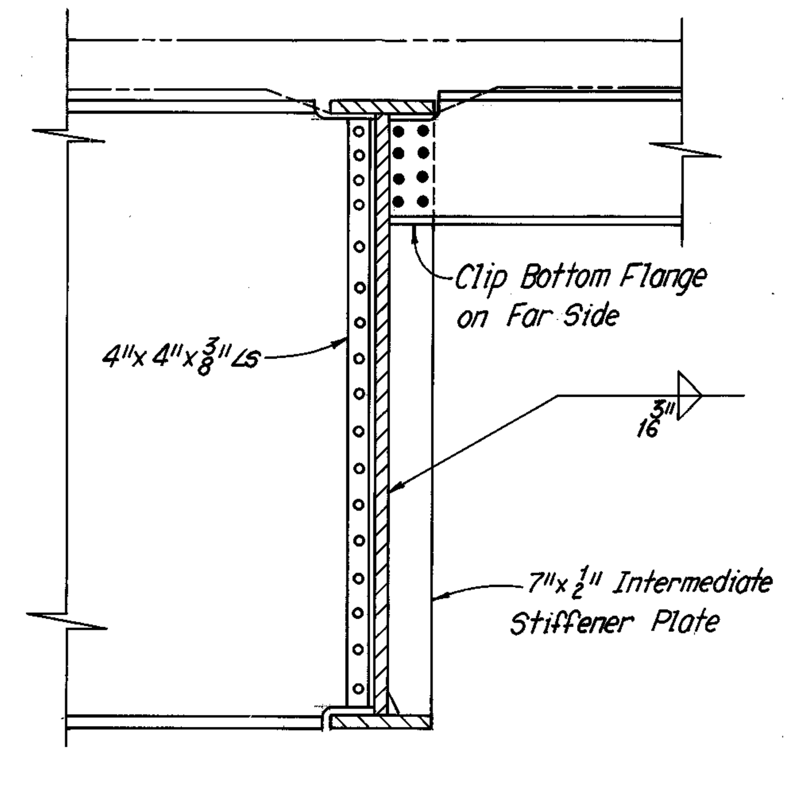
DIAPHRAGM D-I



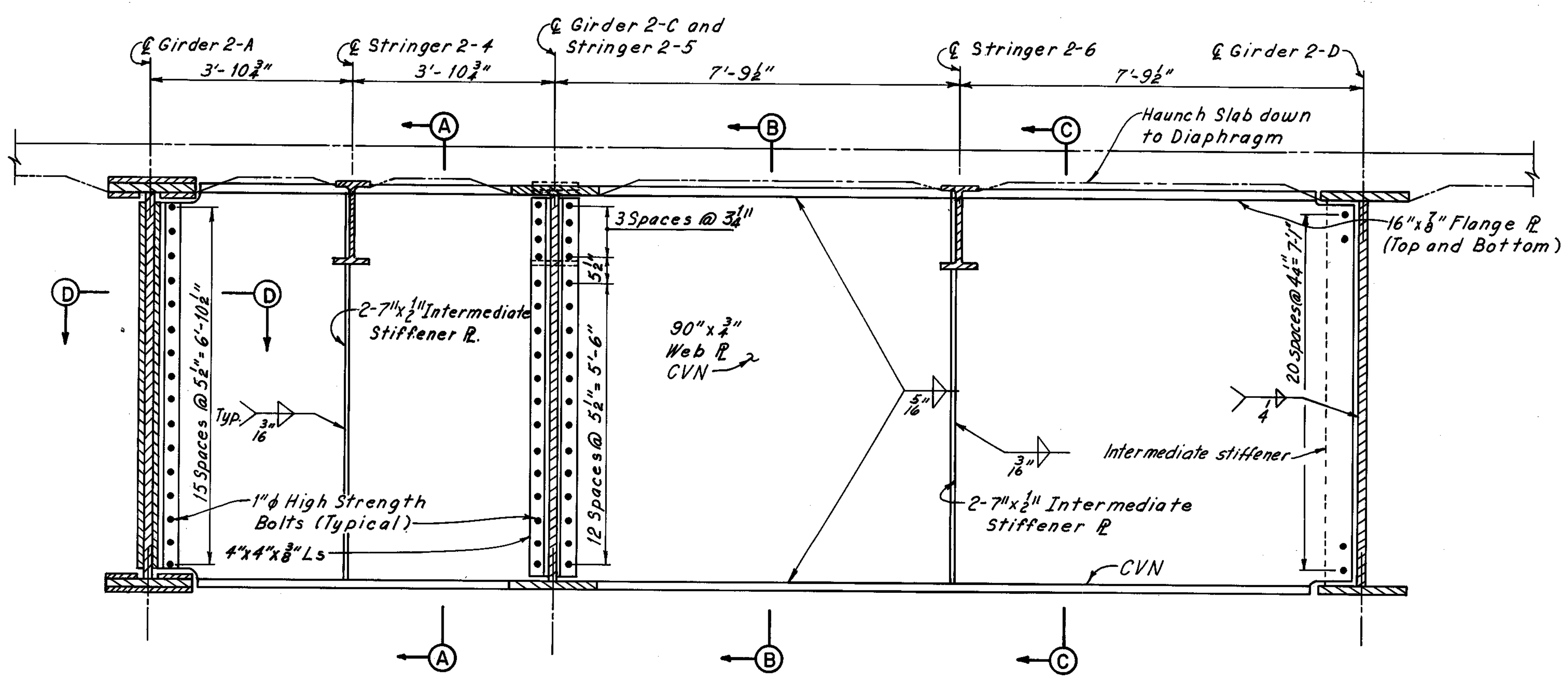
GIRDER & STRINGER END DIAPHRAGM D-2



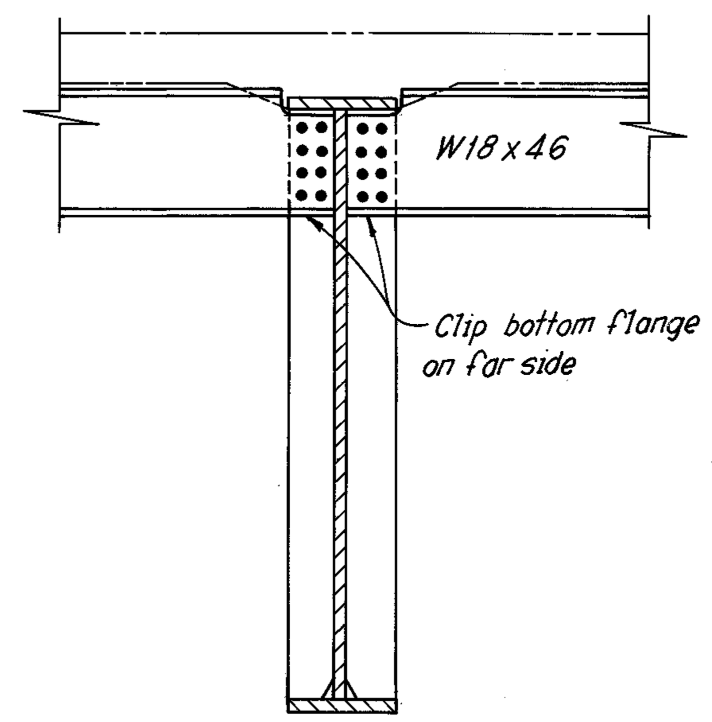
SECTION A-A



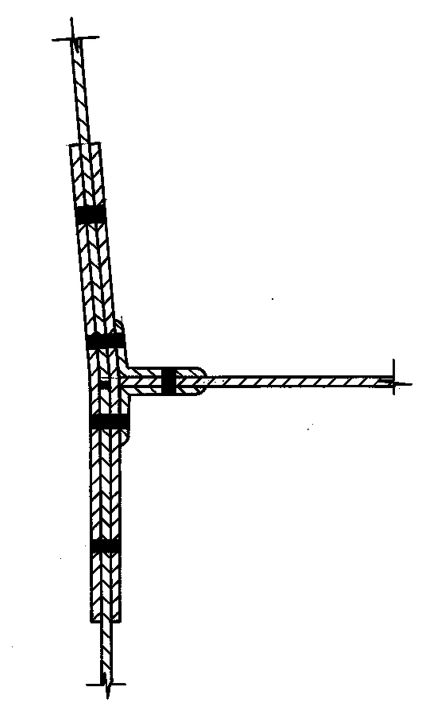
SECTION B-B



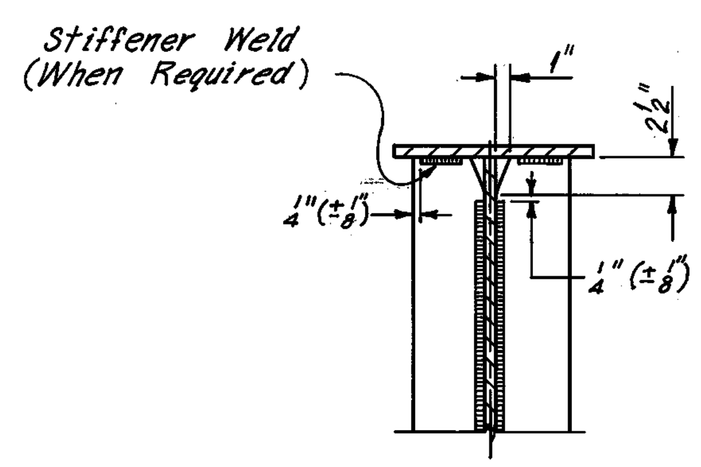
GIRDER AND STRINGER END DIAPHRAGM D-3



SECTION C-C



SECTION D-D



STIFFENER CLIP DETAIL

Note:
See Unit 2 Framing Plan for location of Diaphragms (Sheet 27/108).

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

GIRDER & STRINGER
END DIAPHRAGMS - UNIT 2

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

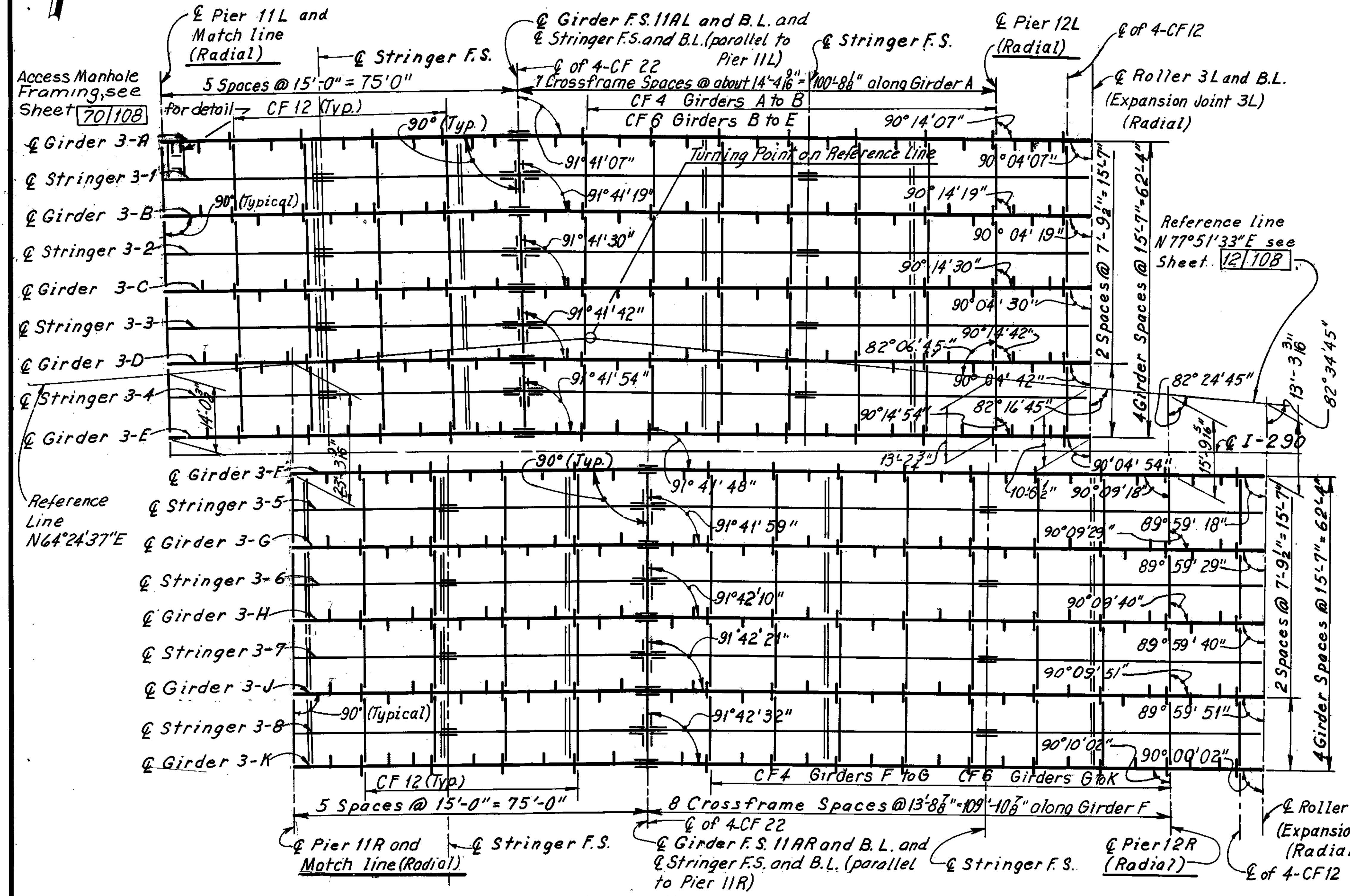
DRAWN D.M.P.	TRACED J.S.C.	CHECKED I.D.S.	REVIEWED C.A.B.	REVISED
DATE 11-24-69	DATE 12-2-69	DATE 3-26-70	DATE 2-24-86	SHEET 31/108

PART FRAMING PLAN

Note:

Spacing of Girders along ℄ of Piers is 4 spaces @ 15'-7" = 62'-4". Spacing of Stringers between Girders along ℄ of Piers is 2 spaces @ 7'-9 1/2" = 15'-7".

All crossframes are placed perpendicular to Girder C in Unit 3L and to Girder H in Unit 3R except for crossframe lines adjacent to Rollers and along Pier or Field Splices.



PART FRAMING PLAN

HORIZONTAL OFFSETS TO EDGE OF SLAB

GIRDER	GIRDER 3-A					GIRDER 3-E					GIRDER 3-F					GIRDER 3-K					GIRDER
SLAB	NORTH EDGE OF SLAB					NORTH MEDIAN EDGE OF SLAB					SOUTH MEDIAN EDGE OF SLAB					SOUTH EDGE OF SLAB					SLAB
FROM	Roller 2L	FS10L	FS10AL	FS11L	FS11AL	Roller 2L	FS10L	FS10AL	FS11L	FS11AL	Roller 2R	FS10R	FS10AR	FS11R	FS11AR	Roller 2R	FS10R	FS10AR	FS11R	FS11AR	FROM
TO	FS10L	FS10AL	FS11L	FS11AL	Roller 3L	FS10L	FS10AL	FS11L	FS11AL	Roller 3L	FS10R	FS10AR	FS11R	FS11AR	Roller 3R	FS10R	FS10AR	FS11R	FS11AR	Roller 3R	TO
10 EQUAL SPACES 0	2'-11 1/2"	2'-6 5/8"	2'-5 1/4"	2'-5 1/4"	2'-6 5/8"	3'-6 1/2"	3'-11 3/8"	4'-0 3/4"	4'-0 3/4"	3'-11 3/8"	3'-6 1/2"	3'-1 5/8"	3'-0 1/4"	3'-0 1/4"	3'-1 5/8"	2'-11 1/2"	3'-4 1/2"	3'-5 7/8"	3'-5 7/8"	3'-4 1/2"	0 10 EQUAL SPACES
.1	2'-11 3/4"	2'-8 1/2"	2'-7 3/8"	2'-7 3/8"	2'-9 1/4"	3'-6 3/8"	3'-9 1/2"	3'-10 3/4"	3'-10 5/8"	3'-8 7/8"	3'-7"	3'-3 1/2"	3'-2 1/2"	3'-2 3/8"	3'-4 3/8"	2'-11 1/8"	3'-2 5/8"	3'-3 5/8"	3'-3 3/4"	3'-1 3/4"	.1
.2	2'-11 7/8"	2'-9 7/8"	2'-9"	2'-9 1/8"	2'-11 1/2"	3'-6 1/8"	3'-8 1/8"	3'-9 1/4"	3'-9"	3'-6 1/2"	3'-7 3/8"	3'-4 7/8"	3'-4 1/4"	3'-4"	3'-6 7/8"	2'-10 5/8"	3'-1 1/8"	3'-2"	3'-2"	2'-11 1/4"	.2
.3	3'-0 1/8"	2'-10 7/8"	2'-10 1/8"	2'-10 1/4"	3'-1 5/8"	3'-6"	3'-7 1/8"	3'-8 1/8"	3'-7 3/4"	3'-4 1/2"	3'-7 7/8"	3'-5 7/8"	3'-5 1/2"	3'-5 1/4"	3'-9"	2'-10 1/4"	3'-0 1/8"	3'-0 3/4"	3'-0 3/4"	2'-9 1/8"	.3
.4	3'-0 3/8"	2'-11 3/8"	2'-10 3/4"	2'-11 1/8"	3'-3 3/8"	3'-5 3/4"	3'-6 5/8"	3'-7 3/8"	3'-6 7/8"	3'-2 5/8"	3'-8"	3'-6 3/8"	3'-6 1/4"	3'-6 1/8"	3'-10 7/8"	2'-10"	2'-11 5/8"	3'-0"	2'-11 7/8"	2'-7 1/4"	.4
.5	3'-0 5/8"	2'-11 1/2"	2'-11"	2'-11 1/2"	3'-5"	3'-5 1/2"	3'-6 1/2"	3'-7 1/4"	3'-6 1/2"	3'-1 1/8"	3'-7 7/8"	3'-6 1/2"	3'-6 1/2"	3'-6 1/2"	4'-0 1/2"	2'-10 1/4"	2'-11 1/2"	2'-11 3/4"	2'-11 1/2"	2'-5 5/8"	.5
.6	3'-0 1/2"	2'-11 1/8"	2'-10 3/4"	2'-11 3/8"	3'-6 1/4"	3'-5 5/8"	3'-6 7/8"	3'-7 3/8"	3'-6 5/8"	2'-11 3/4"	3'-7 3/8"	3'-6 1/8"	3'-6 1/4"	3'-6 3/8"	4'-1 3/4"	2'-10 3/4"	2'-11 7/8"	3'-0"	2'-11 5/8"	2'-4 3/8"	.6
.7	3'-0"	2'-10 1/4"	2'-10 1/8"	2'-10 7/8"	3'-7 3/8"	3'-6 1/8"	3'-7 3/4"	3'-8 1/8"	3'-7 1/8"	2'-10 3/4"	3'-6 1/2"	3'-5 1/4"	3'-5 1/2"	3'-5 7/8"	4'-2 3/4"	2'-11 5/8"	3'-0 3/4"	3'-0 3/4"	3'-0 1/8"	2'-3 3/8"	.7
.8	2'-10 3/4"	2'-9 1/8"	2'-9"	2'-9 7/8"	3'-8 1/8"	3'-7 3/8"	3'-9"	3'-9 1/4"	3'-8 1/8"	2'-9 7/8"	3'-5 1/4"	3'-4"	3'-4 1/4"	3'-4 7/8"	4'-3 1/2"	3'-0 7/8"	3'-2"	3'-2"	3'-1 1/8"	2'-2 5/8"	.8
.9	2'-9"	2'-7 3/8"	2'-7 3/8"	2'-8 1/2"	3'-8 3/4"	3'-9 1/8"	3'-10 5/8"	3'-10 3/4"	3'-9 1/2"	2'-9 3/8"	3'-3 5/8"	3'-2 3/8"	3'-2 1/2"	3'-3 1/2"	4'-3 7/8"	3'-2 1/2"	3'-3 3/4"	3'-3 5/8"	3'-2 5/8"	2'-2 1/8"	.9
1.0	2'-6 5/8"	2'-5 1/4"	2'-5 1/4"	2'-6 5/8"	3'-9"	3'-11 3/8"	4'-0 3/4"	4'-0 3/4"	3'-11 3/8"	2'-9"	3'-1 5/8"	3'-0 1/4"	3'-0 1/4"	3'-1 5/8"	4'-4"	3'-4 1/2"	3'-5 7/8"	3'-5 7/8"	3'-4 1/2"	2'-2"	1.0

Note: Horizontal offsets are measured perpendicular to ℄ of Girders.

Note:

The following abbreviations are used:

- F.S. = Field Splice
- B.L. = Bend Line
- CF = Crossframe

╫ Indicates a scupper. All scuppers are Type 1.

For scupper details see Sheet 65/108.

Notes:

For 5/8" diameter Safety Cable see Sheet 72/108.
For Girder Notes see Sheet 28/108.
For Stringer Notes see Sheet 30/108.
For location and details of Navigation Light Supports see Lighting Plans. The Supports are included with the lighting quantities for payment.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

FRAMING PLAN-UNIT 3

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

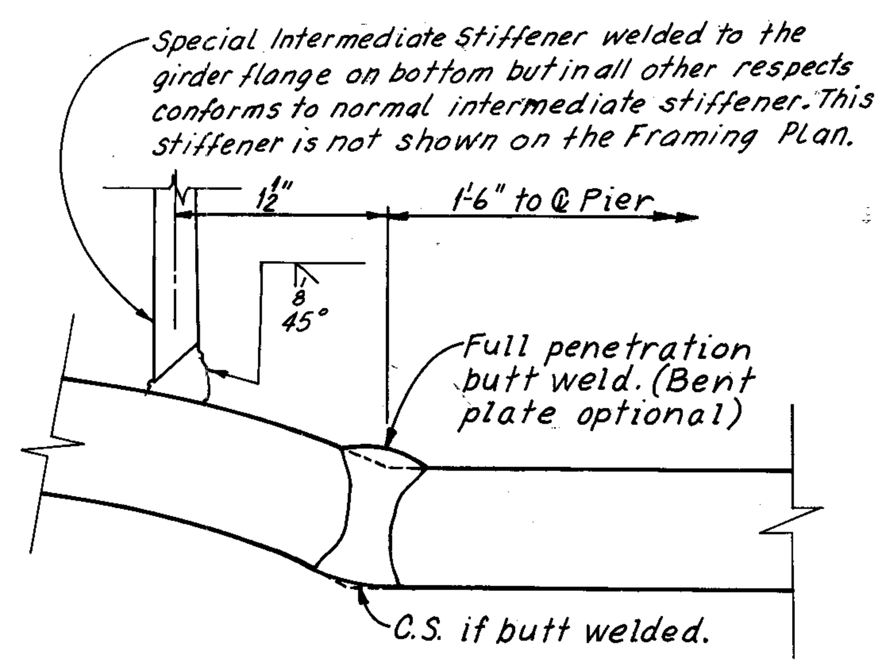
DRAWN J.O.S.	TRACED J.S.C.	CHECKED	REVIEWED C.A.B.	REVISED
DATE 7-30-69	DATE 8-13-69	DATE 3-30-70	DATE 2-24-66	SHEET 32/108

TYPICAL STRINGER ELEVATION

TYPICAL GIRDER ELEVATION
(All Flange and web plates shall be CVN except as shown)

TABLE OF DIMENSIONS AND BEARINGS

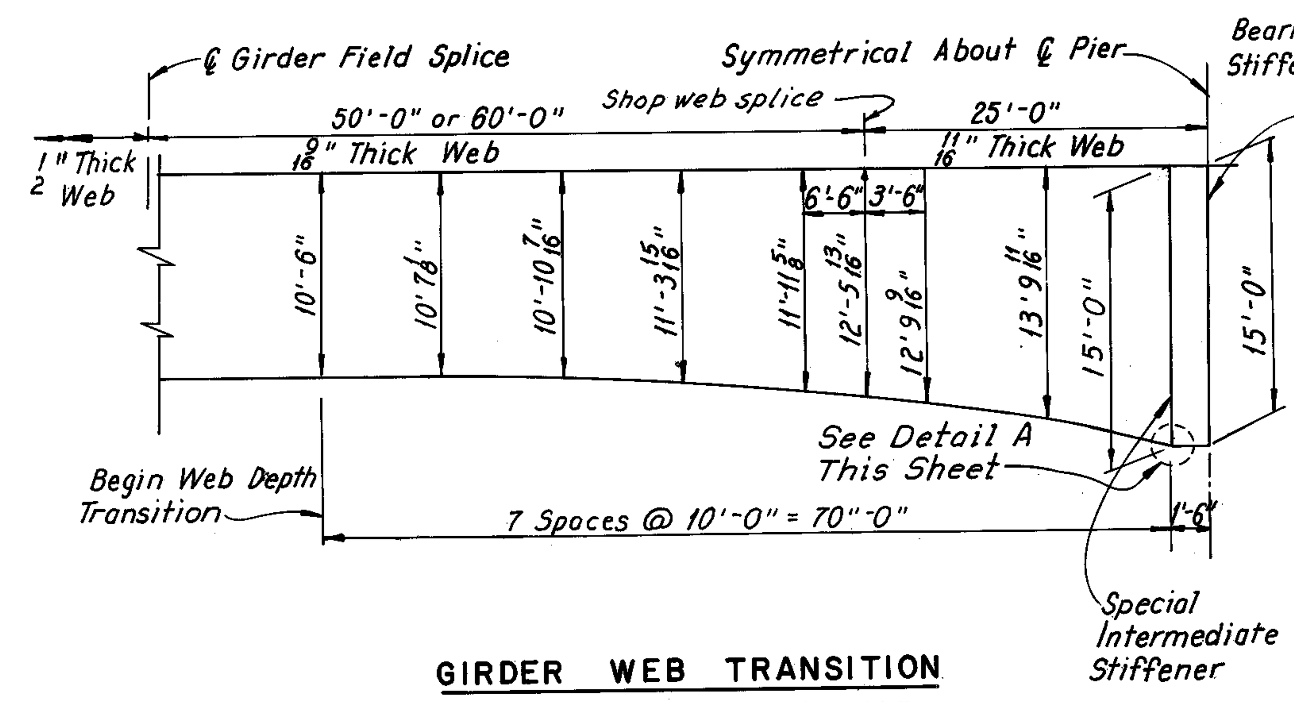
Dimension	Girder A	Girder B	Girder C	Girder D	Girder E	Girder F	Girder G	Girder H	Girder J	Girder K
A	128'-6 7/8"	128'-2 7/16"	127'-10"	127'-5 9/16"	127'-1 1/8"	—	—	—	—	—
B	—	—	—	—	—	95'-10 15/16"	95'-6 11/16"	95'-1 1/4"	94'-8 3/8"	94'-3 1/2"
C	163'-2 1/4"	162'-5 1/4"	161'-8 5/16"	160'-11 5/16"	160'-2 5/16"	169'-10"	169'-0 3/4"	168'-3 1/2"	167'-6 1/4"	166'-9"
D	120'-10 7/16"	120'-5 1/8"	119'-11 7/8"	119'-6 9/16"	119'-1 5/16"	129'-10 11/16"	129'-5 1/8"	128'-11 9/16"	128'-6"	128'-0 7/16"
E	20'-2 1/4"	20'-1 3/4"	20'-1 3/16"	20'-0 5/8"	20'-0 1/8"	19'-11 7/8"	19'-11 5/16"	19'-10 3/4"	19'-10 3/16"	19'-9 11/16"
F	25'-0"	←		→	25'-0"	30'-0"	←		→	30'-0"
G	108'-2 1/4"	107'-5 1/4"	106'-8 5/16"	105'-11 5/16"	105'-2 5/16"	109'-10"	109'-0 3/4"	108'-3 1/2"	107'-6 1/4"	106'-9"
H	35'-0"	←		→	35'-0"	30'-0"	←		→	30'-0"
J	20'-0"	←		→	20'-0"	25'-0"	←		→	25'-0"
K	60'-10 7/16"	60'-5 1/8"	59'-11 7/8"	59'-6 9/16"	59'-1 5/16"	79'-10 11/16"	79'-5 1/8"	78'-11 9/16"	78'-6"	78'-0 7/16"
L	60'-0"	←		→	60'-0"	50'-0"	←		→	50'-0"
Plates	20"x	26"x	26"x	26"x	20"x	20"x	26"x	26"x	26"x	20"x
PA	7/8"	1 1/8"	←→	1 1/8"	7/8"	7/8"	1 1/8"	←→	1 1/8"	7/8"
PB	1 1/4"	1 3/4"	←→	1 3/4"	1 1/4"	1 3/8"	1 3/4"	←→	1 3/4"	1 3/8"
PC	2"	←		→	2"	2"	2 1/4"	←→	2 1/4"	2"
PD	2 3/4"	←		→	2 3/4"	2 1/2"	2 3/4"	←→	2 3/4"	2 1/2"
PE	3 1/2"	←							→	3 1/2"
PF	2 3/4"	←		→	2 3/4"	2 1/2"	←		→	2 1/2"
PG	1 1/2"	←		→	1 1/2"	1 1/4"	1 1/2"	←→	1 1/2"	1 1/4"
PH	2"	←		→	2"	2"	2 1/4"	←→	2 1/4"	2"
PJ	2 1/2"	2 3/4"	←→	2 3/4"	2 1/2"	2 3/4"	←		→	2 3/4"
PK	2"	←		→	2"	2"	2 1/4"	←→	2 1/4"	2"
PL	1 1/2"	←		→	1 1/2"	1 1/4"	1 1/2"	←→	1 1/2"	1 1/4"
PM	2 1/4"	←		→	2 1/4"	2 1/2"	←		→	2 1/2"
PN	3"	←		→	3"	3 1/2"	←		→	3 1/2"
PP	2 1/2"	←		→	2 1/2"	2 3/4"	←		→	2 3/4"
PQ	1 1/2"	1 7/8"	←→	1 7/8"	1 1/2"	1 3/4"	2"	←→	2"	1 3/4"
PR	7/8"	1 1/8"	←→	1 1/8"	7/8"	7/8"	1 1/8"	←→	1 1/8"	7/8"
Bearings										
A	E800	E800	E800	E800	E800	E525	E800	E800	E800	E525
B	F1400	←							→	F1400
C	E1100	E1300	E1300	E1300	E1100	E1100	E1300	E1300	E1300	E1100
D	E800	←							→	E800
Dimension	Str. 3-1	Str. 3-2	Str. 3-3	Str. 3-4	Str. 3-5	Str. 3-6	Str. 3-7	Str. 3-8		
a	67'-6"	←	→	67'-6"	51'-0"	←	→	51'-0"		
b	59'-4"	←	→	59'-4"	56'-0"	←	→	56'-0"		
c	56'-6 11/16"	56'-2 1/4"	55'-9 13/16"	55'-5 3/8"	38'-8 1/2"	38'-3 5/8"	37'-10 13/16"	37'-5 15/16"		
d	47'-3 3/8"	46'-10 7/8"	46'-6 3/8"	46'-1 7/8"	59'-5 5/8"	59'-1"	58'-8 3/8"	58'-3 3/4"		
e	59'-4"	←	→	59'-4"	56'-7 1/2"	←	→	56'-7 1/2"		
f	56'-2 3/8"	55'-9 7/8"	55'-5 7/16"	55'-0 15/16"	53'-4 1/4"	52'-11 5/8"	52'-7"	52'-2 3/8"		
g	59'-7 3/4"	59'-2 1/2"	58'-9 3/16"	58'-3 5/16"	71'-1 7/8"	70'-8 5/16"	70'-2 3/4"	69'-9 3/16"		
h	61'-0"	←	→	61'-0"	58'-6"	←	→	58'-6"		



DETAIL A
(Typical at Piers)

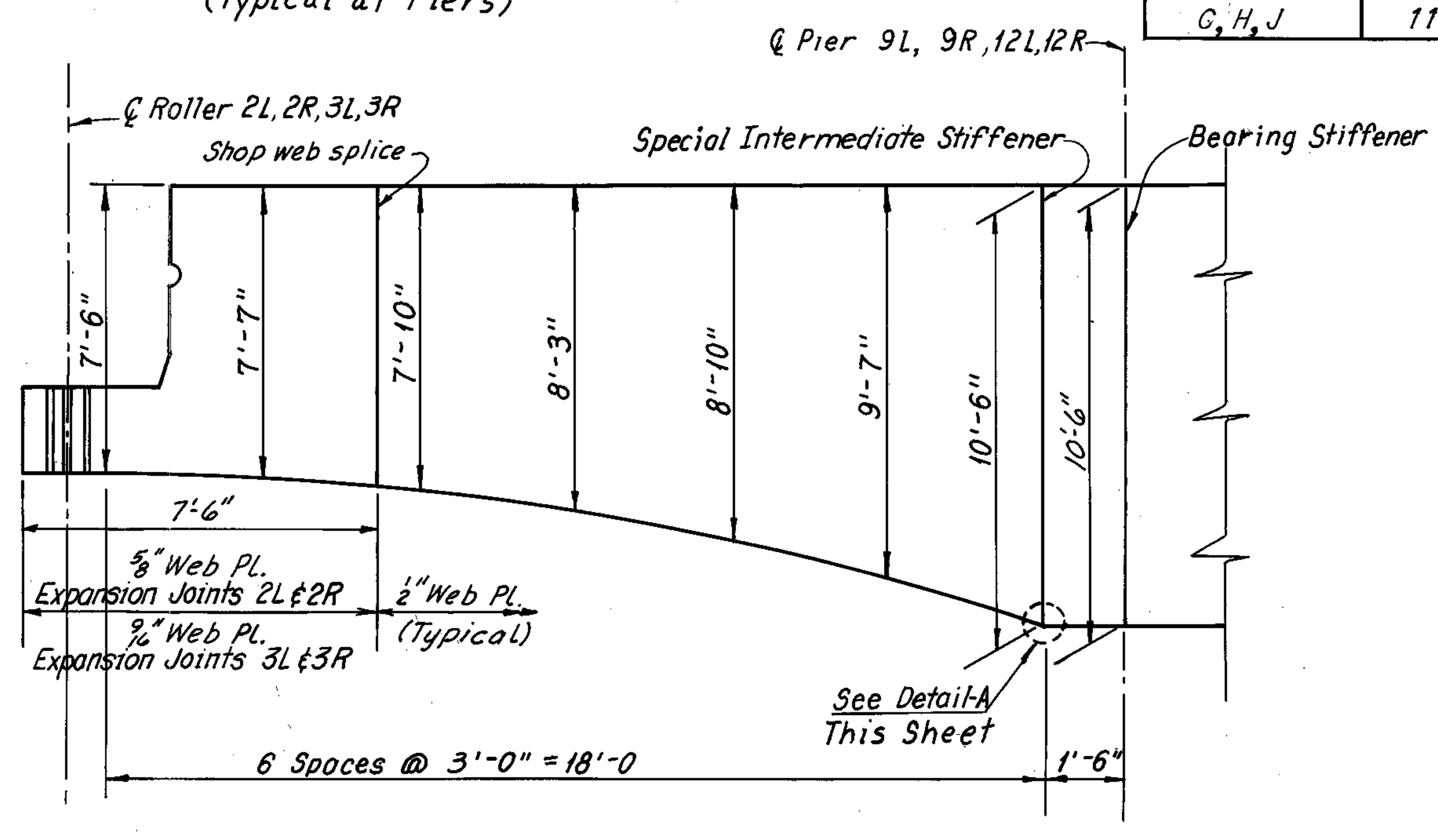
TABLE OF BEARING STIFFENER ℙ & WELD SIZES

Girders	Piers	ℙ	Weld
A, E, F, K	9L, 9R, 12L, 12R	9x1 1/2	5/16"
B, C, D, G, H, J	9L, 9R, 12L, 12R	12x1 1/2	5/16"
A, E, F, K	10L, 10R, 11L, 11R	9x2 3/4	1/2"
B, C, D, G, H, J	10L, 10R, 11L, 11R	12x2 3/4	1/2"



GIRDER WEB TRANSITION AT PIER 10L, 10R, 11L, 11R

Web depth formula
$d = 10.500 + .000918367(h)^2$
where d = web depth in feet at a distance h (in feet) from the beginning of the web depth transition.



GIRDER WEB TRANSITION AT ROLLERS

Notes: For Bearing details see Sheets 58/108 and 59/108.
For Girder Notes see Sheet 28/108.
For Stringer Notes see Sheet 30/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

GIRDER AND STRINGER ELEVATION
UNIT 3

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN J.D.S.	TRACED H.C.H.	CHECKED D.M.P.	REVIEWED C.A.B.	REVISED
DATE 4-12-69	DATE 5-1-70	DATE 5-27-70	DATE 2-24-86	SHEET 33/108

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY-290-0.27

FRAMING PLAN

Notes:

╪ Indicates a scupper. All scuppers are Type 1 unless otherwise specified. For scupper details see Sheet 65/108.

For Girder Notes see Sheet 28/108.

For Stringer Notes see Sheet 30/108.

The following abbreviations are used:

CF = Crossframe
B.L. = Bend Line
F.S. = Field Splice

For Sign Support Details see Sheets 100/108 and 101/108.

HORIZONTAL OFFSETS TO EDGE OF SLAB

GIRDER		GIRDER 4-A					GIRDER 4-E				
SLAB		NORTH EDGE OF SLAB					NORTH MEDIAN EDGE OF SLAB				
FROM		Roller 3L	F.S. 13L	F.S. 13AL	F.S. 14LR	F.S. 14ALR	Roller 3L	F.S. 13L	F.S. 13AL	F.S. 14LR	F.S. 14ALR
TO		F.S. 13L	F.S. 13AL	F.S. 14LR	F.S. 14ALR	Roller 4LR	F.S. 13L	F.S. 13AL	F.S. 14LR	F.S. 14ALR	Roller 4LR
10 EQUAL SPACES	.0	3'-9"	2'-3 3/8"	3'-1 3/8"	2'-11"	2'-0"	2'-9"	4'-2 7/8"	4'-1"	3'-7"	3'-9 1/8"
	.1	3'-8 7/8"	2'-3 7/8"	3'-2 1/2"	2'-10 1/8"	2'-3 3/8"	2'-9 1/8"	4'-2 1/4"	3'-11 1/8"	3'-6 7/8"	3'-8 3/8"
	.2	3'-8 1/4"	2'-4 3/8"	3'-3 1/4"	2'-9 1/4"	2'-6 1/2"	2'-9 3/4"	4'-1 3/4"	3'-9 5/8"	3'-6 7/8"	3'-8 1/8"
	.3	3'-7 3/8"	2'-4 7/8"	3'-3 3/4"	2'-8 3/8"	2'-9 3/8"	2'-10 5/8"	4'-1 3/8"	3'-8 3/8"	3'-7"	3'-8"
	.4	3'-6 1/8"	2'-5 1/8"	3'-3 7/8"	2'-7 3/8"	2'-11 7/8"	2'-11 7/8"	4'-1 1/8"	3'-7 3/8"	3'-7 1/8"	3'-8 1/4"
	.5	3'-4 5/8"	2'-5 3/8"	3'-3 3/4"	2'-6 1/4"	3'-2 1/8"	3'-1 1/2"	4'-0 7/8"	3'-6 5/8"	3'-7 1/4"	3'-8 7/8"
	.6	3'-2 5/8"	2'-5 1/2"	3'-3 3/8"	2'-5 1/8"	3'-4 1/8"	3'-3 3/8"	4'-0 3/4"	3'-6 1/8"	3'-7 1/2"	3'-9 3/4"
	.7	3'-0 3/8"	2'-7 1/2"	3'-2 3/4"	2'-4"	3'-5 3/4"	3'-5 3/4"	4'-0 5/8"	3'-6"	3'-7 3/4"	3'-10 7/8"
	.8	2'-9 3/4"	2'-9 1/2"	3'-1 3/4"	2'-2 3/4"	3'-7 1/8"	3'-8 3/8"	4'-0 5/8"	3'-6"	3'-8 1/8"	4'-0 1/4"
	.9	2'-6 3/4"	2'-11 1/2"	3'-0 1/2"	2'-1 3/8"	3'-8 1/4"	3'-11 1/2"	4'-0 3/4"	3'-6 3/8"	3'-8 5/8"	4'-2"
	1.0	2'-3 3/8"	3'-1 3/8"	2'-11"	2'-0"	3'-9"	4'-2 7/8"	4'-1"	3'-7"	3'-9 1/8"	4'-4"

GIRDER 4-F					GIRDER 4-K						GIRDER
SOUTH MEDIAN EDGE OF SLAB					SOUTH EDGE OF SLAB						SLAB
Roller 3R	F.S. 13R	F.S. 13AR	F.S. 14LR	F.S. 14ALR	Roller 3R	F.S. 13R	F.S. 13AR	F.S. 14LR	F.S. 14ALR		FROM
F.S. 13R	F.S. 13AR	F.S. 14LR	F.S. 14ALR	Roller 4LR	F.S. 13R	F.S. 13AR	F.S. 14LR	F.S. 14ALR	Roller 4LR		TO
4'-4"	3'-1 1/2"	3'-0 3/8"	3'-0 1/4"	2'-10 1/4"	2'-2"	3'-4 5/8"	3'-6"	3'-6"	3'-7 7/8"	.0	10 EQUAL SPACES
4'-3 7/8"	3'-1 3/4"	3'-1 1/8"	3'-0 3/8"	3'-1"	2'-2 1/8"	3'-4 3/8"	3'-5 1/4"	3'-5 7/8"	3'-5 1/8"	.1	
4'-3 3/8"	3'-1 7/8"	3'-1 3/4"	3'-0 3/8"	3'-3 1/2"	2'-2 5/8"	3'-4 1/4"	3'-4 5/8"	3'-5 7/8"	3'-2 1/2"	.2	
4'-2 3/4"	3'-2"	3'-2 1/4"	3'-0 3/8"	3'-5 3/4"	2'-3 3/8"	3'-4 1/8"	3'-4 1/4"	3'-5 7/8"	3'-0 1/4"	.3	
4'-1 5/8"	3'-2"	3'-2 1/2"	3'-0 1/4"	3'-7 3/4"	2'-4 3/8"	3'-4 1/8"	3'-4"	3'-6"	2'-10 3/8"	.4	
4'-0 3/8"	3'-2"	3'-2 5/8"	3'-0"	3'-9 3/8"	2'-5 5/8"	3'-4 1/4"	3'-3 7/8"	3'-6 1/8"	2'-8 3/4"	.5	
3'-10 3/4"	3'-1 3/4"	3'-2 1/2"	2'-11 7/8"	3'-9 5/8"	2'-7 1/4"	3'-4 3/8"	3'-4"	3'-6 3/8"	2'-7 3/8"	.6	
3'-8 7/8"	3'-1 5/8"	3'-2 1/4"	2'-11 1/2"	3'-11 5/8"	2'-9 1/4"	3'-4 3/4"	3'-4 1/4"	3'-6 5/8"	2'-6 3/8"	.7	
3'-6 3/4"	3'-1 1/4"	3'-1 3/4"	2'-11 1/8"	4'-0 3/8"	2'-11 3/8"	3'-5"	3'-4 5/8"	3'-7"	2'-5 5/8"	.8	
3'-4 1/4"	3'-0 7/8"	3'-1 1/8"	2'-10 3/4"	4'-0 7/8"	3'-1 7/8"	3'-5 1/2"	3'-5 1/4"	3'-7 3/8"	2'-5 1/8"	.9	
3'-1 1/2"	3'-0 3/8"	3'-0 1/4"	2'-10 1/4"	4'-1"	3'-4 5/8"	3'-6"	3'-6"	3'-7 7/8"	2'-5"	1.0	

Note: Horizontal offsets are measured perpendicular to ℄ of girders.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

FRAMING PLAN-UNIT 4

I-290 OVER CUYAHOGA RIVER
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN JDS	TRACED JSC	CHECKED	REVIEWED	REVISED
DATE 8/4/69	DATE 8/18/69	DATE 3/6/70	DATE	SHEET 34/108

TYPICAL STRINGER ELEVATION

TYPICAL GIRDER ELEVATION
(All Flange and web plates shall be CVN Except as shown)

TABLE OF DIMENSIONS AND BEARINGS – GIRDERS A THRU K

Dimension	Girder A	Girder B	Girder C	Girder D	Girder E	Girder F	Girder G	Girder H	Girder J	Girder K
A	143'-0"	←	—	→	143'-0"	129'-0"	←	—	→	129'-0"
B	19'-0"	←	—	→	19'-0"	13'-0"	←	—	→	13'-0"
C	16'-0"	←	—	—	—	—	—	—	→	16'-0"
D	129'-3 1/16"	127'-10 1/2"	126'-8 3/16"	125'-5 7/8"	124'-3 1/2"	101'-9 1/16"	100'-7 11/16"	99'-6 3/8"	98'-5"	97'-3 5/8"
E	30'-0 5/8"	30'-0"	←	—	—	—	—	—	→	30'-0"
F	30'-0 5/8"	30'-0"	←	—	—	—	—	—	→	30'-0"
G	12'-0"	14'-0"	12'-0"	←→	12'-0"	14'-0"	←	—	→	14'-0"
H	12'-0"	15'-0"	12'-0"	←→	12'-0"	17'-0"	←	—	→	17'-0"
J	130'-0 5/16"	130'-0 1/8"	←	→	130'-0 1/8"	130'-0"	←	—	→	130'-0"
K	15'-0 1/16"	15'-0"	←	—	—	—	—	—	→	15'-0"
L	35'-0"	←	—	→	35'-0"	28'-0"	←	—	→	28'-0"
M	43'-0"	←	—	→	43'-0"	38'-0"	←	—	→	38'-0"
N	61'-0"	←	—	→	61'-0"	51'-0"	←	—	→	51'-0"
P	73'-0"	←	—	→	73'-0"	77'-0"	←	—	→	77'-0"
R	30'-0"	←	—	→	30'-0"	24'-0"	←	—	→	24'-0"
S	56'-0"	←	—	→	56'-0"	64'-0"	←	—	→	64'-0"
T	70'-0"	←	—	→	70'-0"	54'-0"	←	—	→	54'-0"
U	37'-0"	←	—	→	37'-0"	30'-0"	←	—	→	30'-0"
PA	20x1 7/8	24x2	24x2	24x2	20x1 7/8	16x2 1/4	18x2 1/2	18x2 1/2	18x2 1/2	16x1 7/8
PB	20x3 1/2	24x3 1/2	24x3 1/2	24x3 1/2	20x3 1/4	16x3	18x3 1/2	18x3 1/2	18x3 1/2	16x3
PC	20x2 1/4	24x2 1/4	24x2 1/4	24x2 1/4	20x2	16x1 7/8	18x2 1/4	18x2 1/4	18x2 1/4	16x1 7/8
PD	20x1 1/8	24x1 1/4	24x1 1/4	24x1 1/4	20x1	16x 7/8	18x1	18x1	18x1	16x 7/8
PE	20x1 7/8	24x1 7/8	24x1 3/4	24x1 3/4	20x1 1/2	16x1 1/2	18x1 3/4	18x1 3/4	18x1 3/4	16x1 1/2
PF	20x2 3/4	24x2 3/4	24x2 1/2	24x2 1/2	20x2 1/4	16x2 1/4	18x2 1/2	18x2 1/2	18x2 1/2	16x2 1/4
PG	20x1 7/8	24x1 7/8	24x1 3/4	24x1 3/4	20x1 1/2	16x1 1/8	18x1 1/2	18x1 1/2	18x1 1/2	16x1 1/8
PH	20x1	24x1 1/4	24x1 1/4	24x1 1/4	20x1	16x1 1/8	18x1 1/2	18x1 1/2	18x1 1/2	16x1 1/8
Bearing A	F800	F900	F900	F900	F800	F800	F800	F800	F800	F800
Bearing B	F750	F850	F850	F850	F 750	B500	F800	F800	F800	B525
Bearing C	E650	←	—	→	E650	E 525	E 525	E 525	E 525	E 525

TABLE OF DIMENSIONS – STRINGERS 1 THRU 10

Dimension	Str. 1	2	3	4	5	6	7	8	9	10
a	—	45'-9"	—	45'-9"	←	—	—	—	→	45'-9"
b	—	57'-3"	—	57'-3"	←→	57'-3"	43'-3"	←	→	43'-3"
c	—	40'-0"	—	40'-0"	←	—	—	—	→	40'-0"
d	45'-9"	—	45'-6"	44'-11"	44'-4"	43'-9"	60'-9"	60'-2"	59'-7"	59'-0"
e	—	—	—	—	—	—	40'-5 3/8"	40'-5 11/16"	40'-6 1/16"	40'-6 3/8"
f	43'-0"	—	43'-0"	←	→	43'-0"	—	—	—	—
g	40'-0 7/16"	—	39'-9 7/8"	39'-4 3/8"	38'-9"	38'-1 1/16"	—	—	—	—
h	30'-0 5/16"	—	30'-0 1/8"	30'-0"	←	—	—	—	→	30'-0"
j	30'-0 3/8"	—	30'-0 1/8"	30'-0"	←	—	—	—	→	30'-0"
k	46'-0"	—	46'-0"	←	—	—	—	—	→	46'-0"
l	43'-0"	—	43'-0"	←	—	—	—	—	→	43'-0"
m	41'-0 1/4"	—	41'-0 3/16"	41'-0 1/8"	←→	41'-0 1/8"	41'-0"	←	→	41'-0"

TABLE OF BEARING STIFFENERS

	Girder A	Girder B	Girder C	Girder D	Girder E	Girder F	Girder G	Girder H	Girder J	Girder K
Pier 13	PL 9x2	PL 11x2	←→	PL 11x2	PL 9x2	PL 8x2 1/4	←	—	→	PL 8x2 1/4
Pier 14	PL 9x2	PL 11x2	←→	PL 11x2	PL 9x2	PL 8x2 1/4	←	—	→	PL 8x2 1/4
Pier 15	PL 9x1 1/2	PL 11x1 1/2	←→	PL 11x1 1/2	PL 9x1 1/2	PL 8x1 1/2	←	—	→	PL 8x1 1/2

INTERMEDIATE STIFFENERS

NORMAL STIFFENER	STIFFENERS AT SIGN SUPPORT AND CROSSFRAME	WHEN CROSSFRAME AT FIELD SPLICE
3/8" X 6"	1/2" X 8"	L 8" X 4" X 1/2"

Notes:
For Girder Notes see Sheet 28/108.
For Stringer Notes see Sheet 30/108.
For Bearing Details see Sheets 58/108 and 59/108.
For placement of stiffener angles at Field Splices, see Section A-A on Sheet 36/108.

WELD SIZE WEB TO FLANGE

FLANGE PLATE Thickness	FILLET WELD Size
7/8" Thru 1 1/2"	5/16"
1 5/8" Thru 2 1/4"	3/8"
2 3/8" Thru 3 1/2"	1/2"

H.N.T.B. BR. NO. 9 PART II – SUPERSTRUCTURE

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

GIRDER AND STRINGER ELEVATIONS – UNIT 4
I-290 OVER CUYAHOGA RIVER

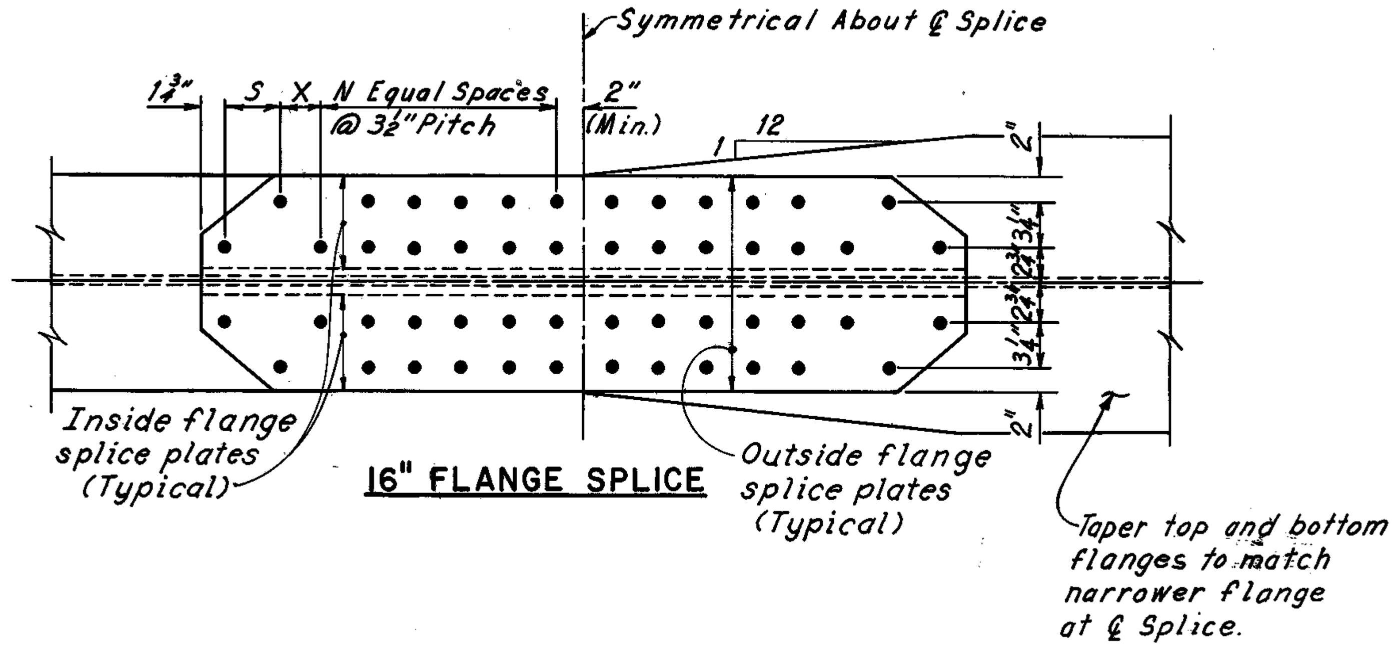
BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

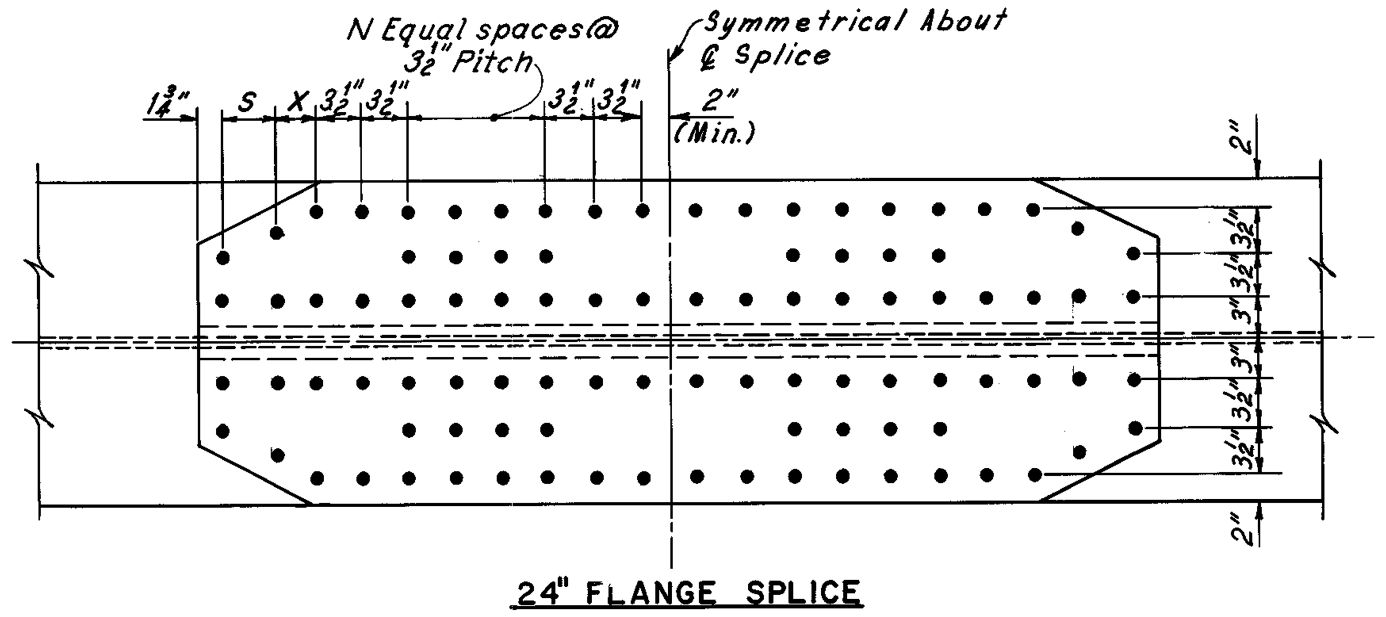
DRAWN J.D.S. DATE 12-4-69	TRACED HCH DATE 12-9-69	CHECKED DMA DATE 3-6-70	REVIEWED C.A.B. DATE 2-24-86	REVISED

CUYAHOGA COUNTY
CUY-290-0.27

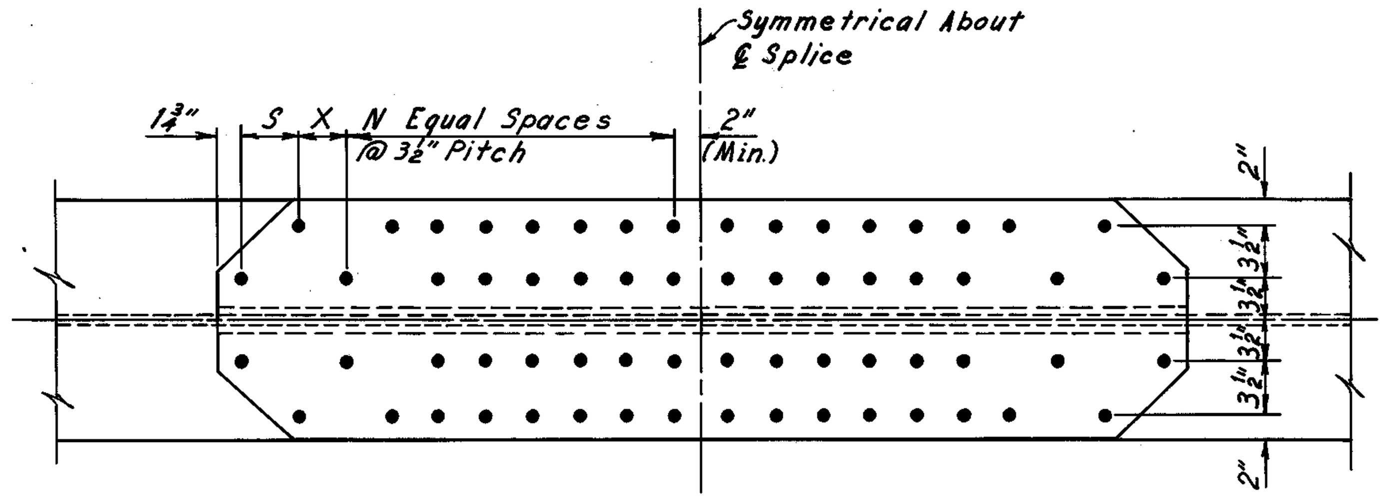
GIRDER FIELD SPLICE



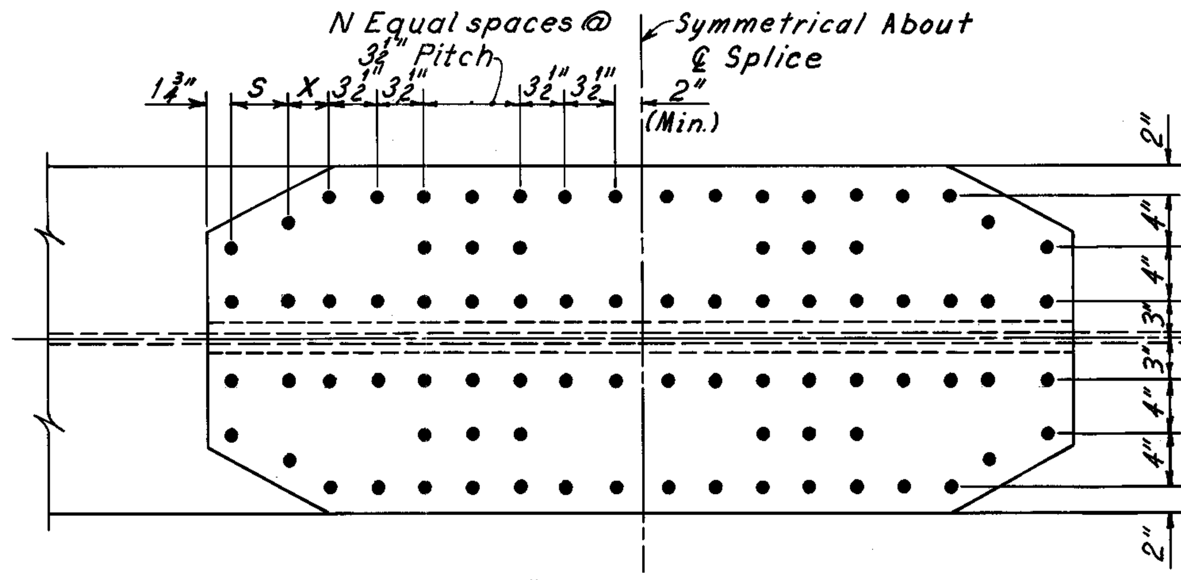
16" FLANGE SPLICE



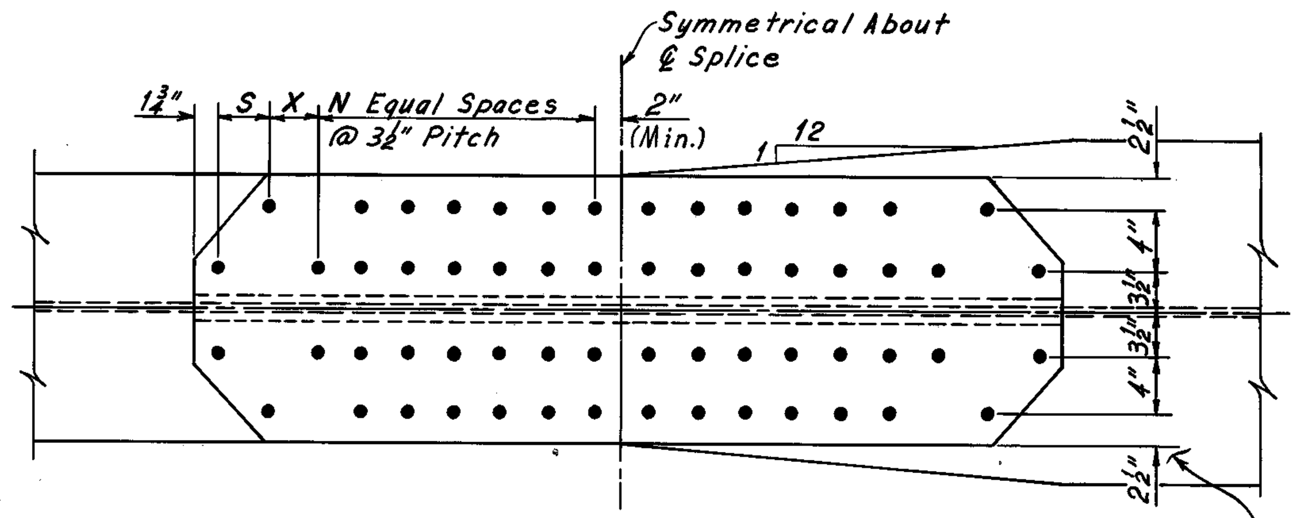
24" FLANGE SPLICE



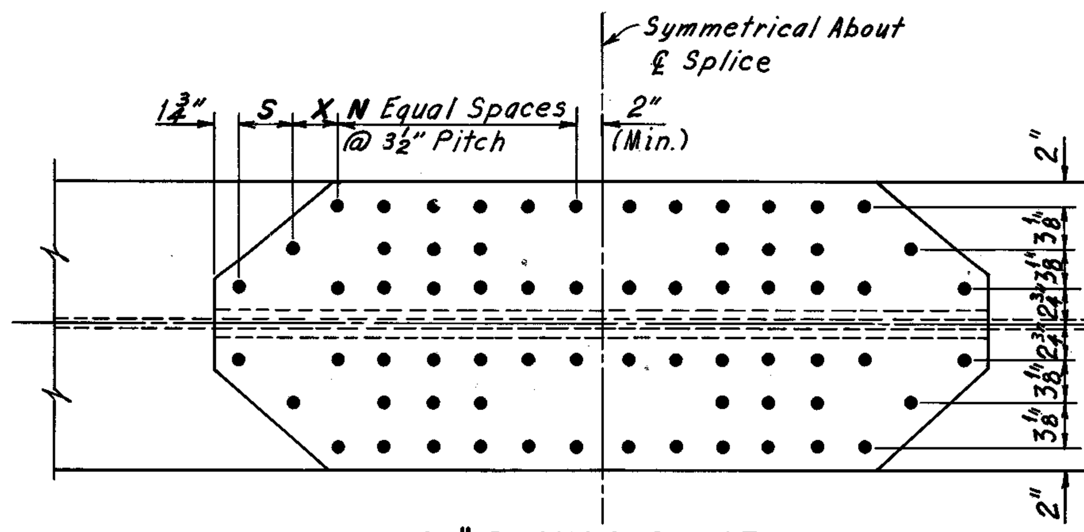
18" FLANGE SPLICE



26" FLANGE SPLICE



20" FLANGE SPLICE

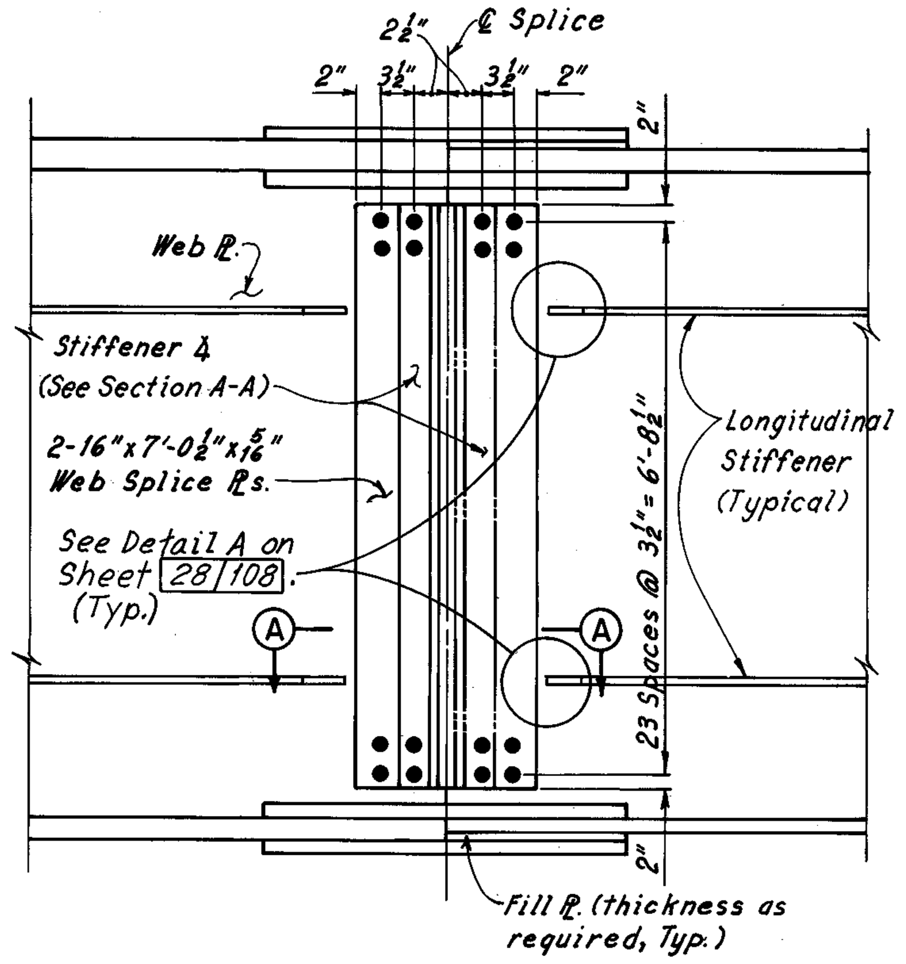


22" FLANGE SPLICE

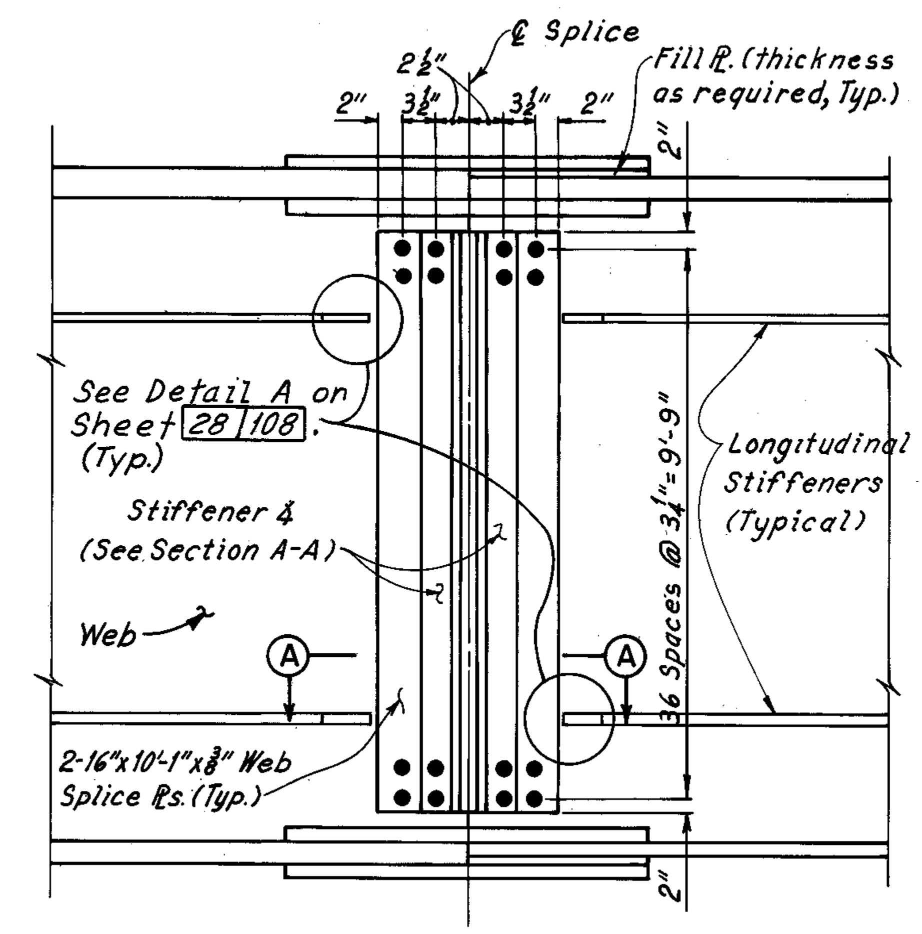
GIRDER FLANGE SPLICES

*Flange Width	*Flange Thickness	FLANGE PLATES Outside 2 Required	FLANGE PLATES Inside 4 Required	FLANGE BOLTS No.	FLANGE BOLTS N Spaces	DIMENSIONS S	DIMENSIONS X
16"	7/8"	16x1/2x3'-6 1/2"	7x11/16x3'-6 1/2"	72	3	4"	3"
	1"	16x5/8x4'-1 1/2"	7x3/4x4'-1 1/2"	88	4		
	1 1/8"	16x11/16x4'-1 1/2"	7x13/16x4'-1 1/2"	88	4		
	1 3/8"	16x13/16x4'-8 1/2"	7x1 1/16x4'-8 1/2"	104	5		3"
	1 7/8"	16x1 1/8x5'-11"	7x1 3/8x5'-11"	136	7		3 1/4"
	2 1/4"	16x1 3/8x7'-8"	7x1 5/8x7'-8"	168	10		3 1/4"
18"	1"	18x5/8x4'-8 1/2"	8x11/16x4'-8 1/2"	96	5		3"
	1 1/2"	18x7/8x5'-10 1/2"	8x1 1/16x5'-10 1/2"	128	7		3"
	2 1/2"	18x1 1/2x8'-10 1/2"	8x1 11/16x8'-10 1/2"	208	12	4"	3 1/2"
20"	7/8"	20x1/2x4'-2"	9x5/8x4'-2"	88	4	4 1/4"	3"
	1"	20x9/16x4'-9"	9x11/16x4'-9"	104	5		
	1 1/8"	20x11/16x5'-4"	9x3/4x5'-4"	120	6		
	1 1/4"	20x3/4x5'-4"	9x13/16x5'-4"	120	6		
	1 3/8"	20x13/16x5'-11"	9x7/8x5'-11"	136	7		
	1 1/2"	20x7/8x6'-6 1/2"	9x1x6'-6 1/2"	152	8		3"
	1 5/8"	20x15/16x6'-6 1/2"	9x1 1/16x6'-6 1/2"	152	8		3 1/4"
	1 3/4	20x1 1/16x7'-9"	9x1 1/4x7'-9"	184	10		3 1/2"
	1 7/8"	20x1 1/16x7'-9"	9x1 1/4x7'-9"	184	10	4 1/4"	3 1/2"
22"	1 1/8"	22x5/8x4'-10 1/2"	10x3/4x4'-10 1/2"	136	5	4"	4"
	1 1/4"	22x3/4x4'-10 1/2"	10x13/16x4'-10 1/2"	136	5	4"	4"
24"	1 1/4"	24x5/8x4'-8 1/2"	11x3/4x4'-8 1/2"	144	1	3 1/2"	3 1/2"
	2"	24x1x6'-5 1/2"	11x1 1/8x6'-5 1/2"	216	4		
26"	1 1/8"	26x9/16x4'-8 1/2"	12x5/8x4'-8 1/2"	144	1		
	1 1/2"	26x3/4x5'-10 1/2"	12x7/8x5'-10 1/2"	192	3		
	1 3/4"	26x7/8x6'-5 1/2"	12x1x6'-5 1/2"	216	4		
	1 7/8"	26x15/16x7'-0 1/2"	12x1 1/16x7'-0 1/2"	240	5		
	2"	26x1x7'-0 1/2"	12x1 1/8x7'-0 1/2"	240	5		
	2 1/4"	26x1 1/8x7'-7 1/2"	12x1 1/4x7'-7 1/2"	264	6	3 1/2"	3 1/2"

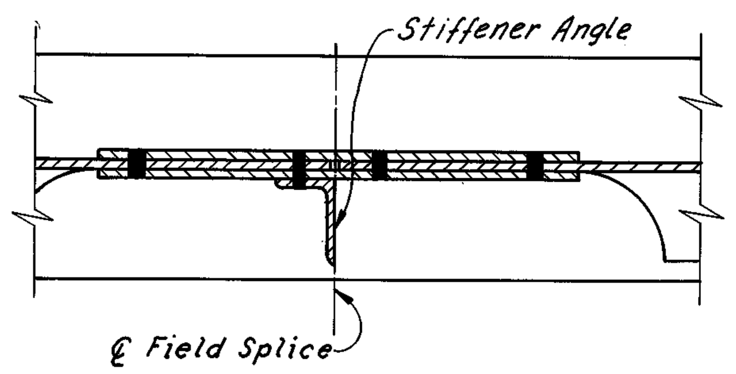
* When the flange size changes at a field splice use the smaller flange to determine the required splice material.



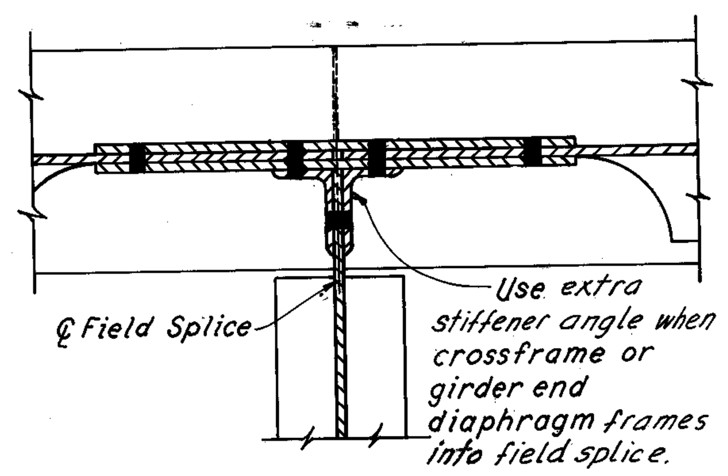
TYPICAL GIRDER WEB SPLICE (UNITS 2 & 4)



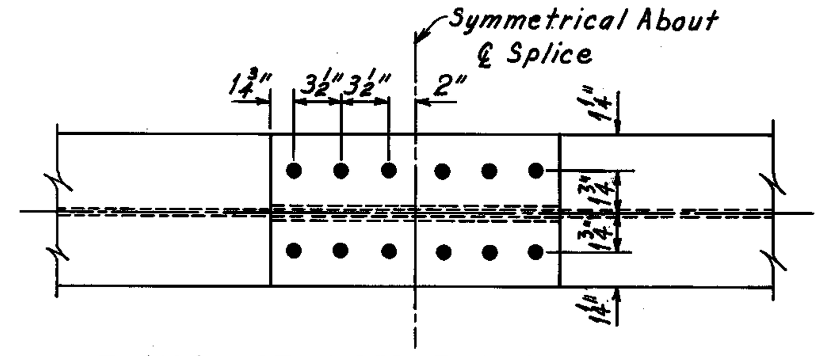
TYPICAL GIRDER WEB SPLICE (UNIT 3)



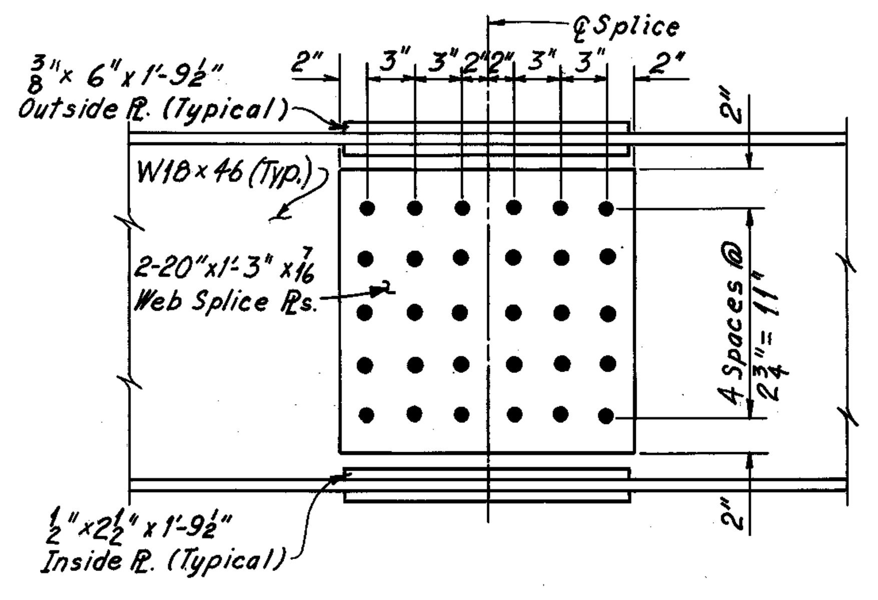
SECTION A-A
(Typical except as noted.)



SECTION A-A
(Typical where crossframe or girder end diaphragm frames into field splice.)



TYPICAL STRINGER FLANGE SPLICE



TYPICAL STRINGER WEB SPLICE

STRINGER FIELD SPLICE

Note: ⅞" ϕ high strength bolts shall be used for Stringer Field Splices.

Notes:
For Girder Notes see Sheet 28/108.
For Stringer Notes see Sheet 30/108.
For stiffener angle sizes see Girder Elevation Sheets for Units 2, 3 and 4.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

FIELD SPLICE DETAILS (UNITS 2,3 AND 4)

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.M.F. DATE 12-12-69 | TRACED J.S.C. DATE 12-29-69 | CHECKED J.D.S. DATE 4-29-70 | REVIEWED C.A.B. DATE 2-24-86 | REVISED

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
CUY. -290-0.27

PART FRAMING PLAN

* Note:
Crossframes placed parallel to adjacent pier.

HORIZONTAL OFFSETS TO EDGE OF SLAB																					
	NORTH EDGE OF SLAB					NORTH MEDIAN EDGE OF SLAB					SOUTH MEDIAN EDGE OF SLAB					SOUTH EDGE OF SLAB					
FROM	℄ Rollers 4	F.S.16L	F.S.17L	F.S.18L	F.S.19L	℄ Rollers 4	F.S.16L	F.S.17L	F.S.18L	F.S.19L	℄ Rollers 4	F.S.16R	F.S.17R	F.S.18R	F.S.19R	℄ Rollers 4	F.S.16R	F.S.17R	F.S.18R	F.S.19R	FROM
TO	F.S.16L	F.S.17L	F.S.18L	F.S.19L	℄ Brg. Abut. B-C	F.S.16L	F.S.17L	F.S.18L	F.S.19L	℄ Rollers 5	F.S.16R	F.S.17R	F.S.18R	F.S.19R	℄ Rollers 5	F.S.16R	F.S.17R	F.S.18R	F.S.19R	℄ Rollers 5	TO
GIRDER	5-A					5-M					5-N					5-X					GIRDER
10 EQUAL SPACES 0	3'-9"	3'-0"	3'-0 1/2"	3'-0"	2'-3 3/4"	4'-4"	3'-7"	3'-6 1/2"	3'-7"	3'-7 3/8"	4'-1"	2'-9 1/8"	2'-9 5/8"	3'-10 3/4"	3'-10 1/2"	2'-5"	3'-9"	3'-9 1/8"	2'-0"	2'-10 1/8"	0 10 EQUAL SPACES
.1	3'-9 7/8"	3'-1 1/2"	3'-2"	3'-0 1/4"	2'-2 1/2"	4'-1 3/8"	3'-5 1/2"	3'-5 1/8"	3'-5 5/8"	3'-6 7/8"	4'-1 1/8"	2'-10 5/8"	3'-0 3/8"	4'-0 1/4"	3'-11"	2'-4 7/8"	3'-7 1/2"	2'-9 1/8"	2'-8 1/8"	2'-9 5/8"	.1
.2	3'-10 1/4"	3'-2 5/8"	3'-3 1/4"	3'-0 1/8"	2'-1 7/8"	3'-11 1/8"	3'-4 3/8"	3'-4"	3'-4 1/2"	3'-6 5/8"	4'-1"	2'-11 7/8"	3'-2 3/4"	4'-1 1/4"	3'-11 1/4"	2'-5 1/8"	3'-6 3/8"	2'-0"	2'-7 5/8"	2'-9 3/8"	.2
.3	3'-10 3/8"	3'-3 3/8"	3'-4"	2'-11 5/8"	2'-1 3/4"	3'-9 1/4"	3'-3 1/2"	3'-3 1/4"	3'-3 3/4"	3'-6 5/8"	4'-0 3/8"	3'-0 5/8"	3'-4 7/8"	4'-2"	3'-11 1/4"	2'-5 3/4"	3'-5 5/8"	2'-0"	2'-6 3/4"	2'-9 1/4"	.3
.4	3'-10"	3'-4"	3'-4 1/2"	2'-10 7/8"	2'-2 1/4"	3'-7 3/4"	3'-3"	3'-2 7/8"	3'-3 3/8"	3'-6 5/8"	3'-11 3/8"	3'-1 1/4"	3'-6 3/4"	4'-2 1/2"	3'-11 1/4"	2'-6 3/4"	3'-5 1/8"	2'-0"	2'-6 1/4"	2'-9 3/8"	.4
.5	3'-9 1/4"	3'-4 1/8"	3'-4 5/8"	2'-9 3/4"	2'-3 3/8"	3'-6 5/8"	3'-2 3/4"	3'-2 3/4"	3'-3 1/4"	3'-7"	3'-10"	3'-1 3/8"	3'-8 1/8"	4'-2 5/8"	3'-10 7/8"	2'-8 1/8"	3'-5"	2'-0"	2'-6 1/8"	2'-9 5/8"	.5
.6	3'-8 1/4"	3'-4"	3'-4 3/8"	2'-8 1/2"	2'-5 1/8"	3'-6"	3'-2 7/8"	3'-3"	3'-3 3/8"	3'-7 1/2"	3'-8 1/8"	3'-1 1/4"	3'-9 3/8"	4'-2 1/2"	3'-10 3/8"	2'-9 7/8"	3'-5 1/8"	2'-0"	2'-6 1/4"	2'-10 1/2"	.6
.7	3'-6 3/4"	3'-3 5/8"	3'-3 7/8"	2'-7 1/8"	2'-7 1/2"	3'-5 5/8"	3'-3 1/4"	3'-3 1/2"	3'-3 7/8"	3'-8 1/8"	3'-6"	3'-0 7/8"	3'-10 1/8"	4'-1 7/8"	3'-9 3/4"	3'-0 1/8"	3'-5 5/8"	2'-0"	2'-6 3/4"	3'-0 1/8"	.7
.8	3'-4 7/8"	3'-2 7/8"	3'-2 7/8"	2'-5 3/4"	2'-10 3/8"	3'-5 3/4"	3'-4"	3'-4 3/8"	3'-4 3/4"	3'-9"	3'-3 1/2"	3'-0 1/8"	3'-10 3/4"	4'-1 1/8"	3'-8 7/8"	3'-2 5/8"	3'-6 3/8"	2'-0"	2'-7 1/2"	3'-2 3/8"	.8
.9	3'-2 5/8"	3'-1 7/8"	3'-1 5/8"	2'-4 3/8"	3'-2"	3'-6 1/8"	3'-5 1/8"	3'-5 1/2"	3'-5 7/8"	3'-10 1/8"	3'-0 1/2"	2'-11"	3'-10 7/8"	4'-0"	3'-7 3/4"	3'-5 5/8"	3'-7 1/2"	2'-0"	2'-8 5/8"	3'-5 3/8"	.9
1.0	3'-0"	3'-0 1/2"	3'-0"	2'-3 3/4"	3'-6 7/8"	3'-7"	3'-6 1/2"	3'-7"	3'-7 3/8"	3'-11 3/8"	2'-9 1/8"	2'-9 5/8"	3'-10 3/4"	3'-10 1/2"	3'-6 1/2"	3'-9"	3'-9"	2'-0"	2'-10 1/8"	3'-9"	1.0

Note: Horizontal offsets are measured perpendicular to Girders 5A, 5-M, 5-N or 5X
F.S. Denotes Field Splice.

Notes:
For Girder Notes see Sheet 28/108.
For Girder End Diaphragm details see Sheet 42/108.
For Crossframe details see Sheet 57/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

FRAMING PLAN
UNIT 5

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN J.D.S. DATE 9-9-69	TRACED J.S.C. DATE 9-18-69	CHECKED M.B. DATE 2-18-70	REVIEWED C.A.B. DATE 2-24-86	REVISED SHEET 37/108

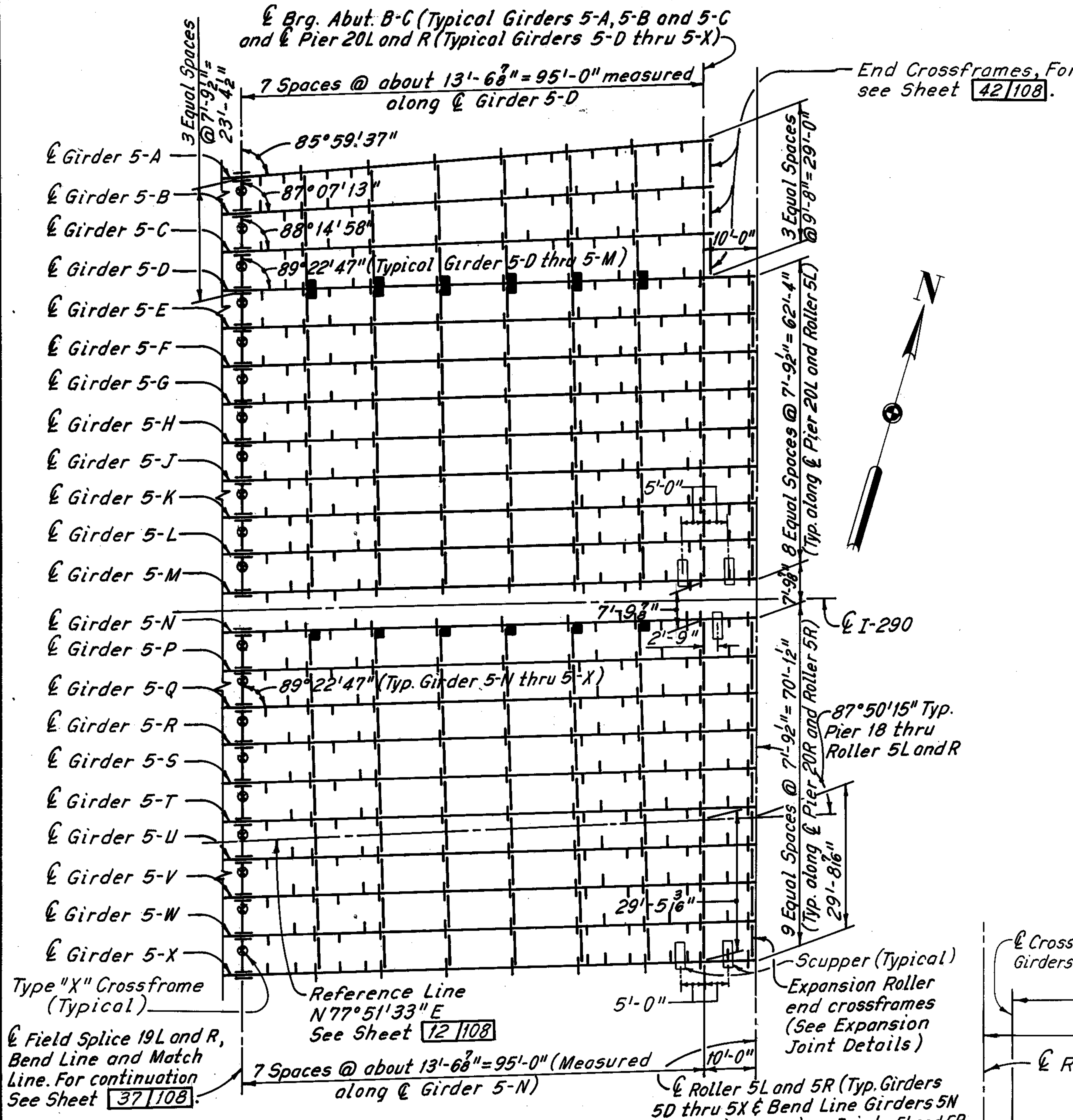
CUYAHOGA COUNTY
CUY-290-0.27

*Note: Dimensions measured from Pier 18 to Girder End Diaphragm at Field Splice 17.

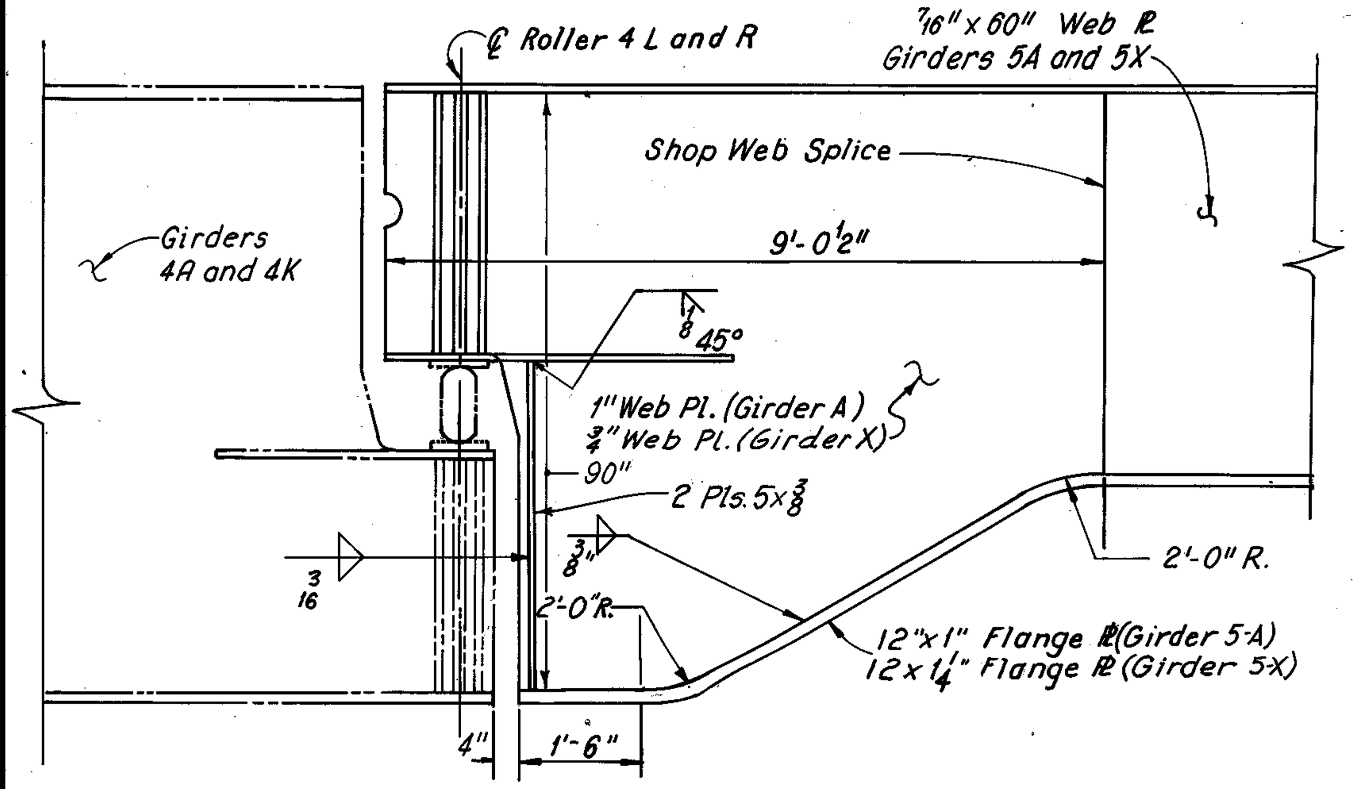
Note: M in Bearing Columns indicate Standard Rocker with modified dowels. (See Note below)

TABLE OF DIMENSIONS, PLATES AND BEARINGS - GIRDER A THRU X

DIMENSIONS	GIRDER A	GIRDER B	GIRDER C	GIRDER D	GIRDER E	GIRDER F	GIRDER G	GIRDER H	GIRDER J	GIRDER K	GIRDER L	GIRDER M	GIRDER N	GIRDER P	GIRDER Q	GIRDER R	GIRDER S	GIRDER T	GIRDER U	GIRDER V	GIRDER W	GIRDER X
A	119'-0 1/4"	—	—	—	—	119'-0 3/16"	—	119'-0 3/16"	—	119'-0 3/16"	—	119'-0 3/16"	119'-0"	—	119'-0"	—	119'-0"	—	119'-0"	—	—	119'-0"
B	30'-0 1/16"	—	30'-0 1/16"	30'-0"	30'-0 1/16"	30'-0 1/16"	←				→	30'-0 1/16"	30'-0"	←					→	30'-0"	—	30'-0"
C	134'-11 7/16"	—	135'-0 1/16"	135'-0"	←														→	135'-0"	—	135'-0"
D	29'-11 13/16"	—	30'-0"	←															→	30'-0"	—	30'-0"
E	143'-1 5/8"	*112'-9 3/4"	142'-2 7/8"	141'-5 15/16"	140'-9"	140'-0"	139'-3 1/16"	138'-6 1/8"	137'-9 1/8"	137'-0 3/16"	136'-3 1/4"	135'-6 1/4"	134'-10 1/8"	134'-1 3/16"	133'-4 1/4"	132'-7 5/16"	131'-10 5/16"	131'-1 3/8"	130'-4 3/8"	129'-7 7/16"	*99'-2 1/4"	128'-10 1/16"
F	29'-10 3/8"	29'-10 3/8"	29'-9 7/8"	←							→	29'-9 7/8"	29'-9 3/4"	←					→	29'-9 3/4"	29'-9 1/2"	29'-9 5/8"
G	135'-0"	134'-10 3/8"	134'-9 7/8"	←							→	134'-9 7/8"	134'-9 3/4"	←					→	134'-9 3/4"	134'-9 1/2"	134'-9 5/8"
H	30'-0 7/16"	30'-0"	←																		→	30'-0"
J	125'-3 3/16"	125'-1 3/8"	125'-0 7/16"	125'-0"	←																→	125'-0"
K	—	—	117'-0 1/2"	117'-0 3/8"	117'-0 3/8"	—	117'-0 7/16"	—	117'-0 7/16"	—	117'-0 7/16"	—	—	117'-0 1/4"	—	117'-0 1/4"	—	117'-0 1/4"	—	117'-0 1/4"	—	—
PLATE PA	1"	—	7/8"	1"	1-1/4"	←				→	1-1/4"	1-3/8"	1-1/4"	←				→	1-1/4"	1-1/4"	—	1-1/4"
PLATE PB	1-3/4"	—	1-1/2"	1-7/8"	2-1/4"	←												→	2-1/4"	2-1/4"	—	2-1/2"
PLATE PC	1"	—	7/8"	1-1/8"	←						→	1-1/8"	1-1/4"	←			→	1-1/4"	1-1/4"	1-1/4"	—	1-1/4"
PLATE PD	7/8"	—	7/8"	1-1/8"	←						→	1-1/8"	1"	←				→	1"	1-1/4"	—	1-1/4"
PLATE PE	1-1/8"	—	1-1/8"	←							→	1-1/8"	1"	←				→	1"	1-1/4"	—	1-1/4"
PLATE PF	2-1/4"	—	2-1/4"	←							→	2-1/4"	2"	←				→	2"	2-1/4"	—	2-1/4"
PLATE PG	1-1/8"	7/8"	1-1/8"	←							→	1-1/8"	1"	←				→	1"	1-1/8"	7/8"	1-1/8"
PLATE PH	2-1/4"	1-1/4"	2-1/4"	←							→	2-1/4"	2"	←					→	2"	1-1/2"	2"
PLATE PJ	1-1/8"	7/8"	1-1/8"	←														→	1-1/8"	1-1/4"	1-1/2"	1-1/4"
PLATE PK	1-1/8"	7/8"	1-1/8"	←														→	1-1/8"	1-1/4"	1-1/8"	1-1/4"
PLATE PL	1-1/2"	1-1/4"	1-1/2"	1-5/8"	1-1/8"	←												→	1-1/8"	1-1/4"	1-1/8"	1-1/4"
PLATE PM	2-1/2"	2-1/4"	2-1/2"	2-1/2"	2-1/4"	←					→	2 1/4"	2 1/2"	2 1/4"	←			→	2-1/4"	2-1/2"	2-1/4"	2-1/2"
PLATE PN	2-1/2"	2-1/4"	2-1/2"	2-1/2"	1-1/4"	←												→	1-1/4"	1-1/4"	1-1/4"	1-1/4"
PLATE PP	1-7/8"	1-7/8"	1-7/8"	1-5/8"	1-1/4"	←												→	1-1/4"	1-1/4"	1-1/4"	1-1/4"
BEARING A	R250	—	R250	R300	←						→	R300	R300M	←					→	R300M	—	R350M
BEARING B	R350	—	R350	R350	R300	←												→	R300	R350	—	R350*
BEARING C	R350	←																			→	R350
BEARING D	R150M	R150M	R150M	R250	R225	←				→	R225	R250	R250M	R225M	←			→	R225M	R250M	R250M	R250M

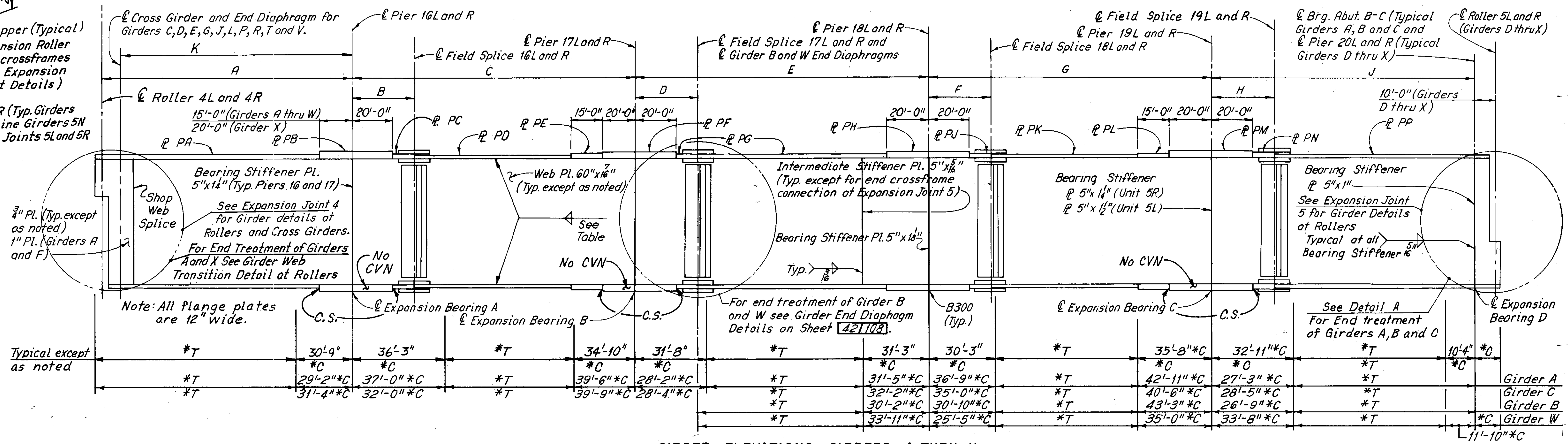


PART FRAMING PLAN



GIRDER WEB TRANSITION DETAIL AT ROLLERS
(Girders 5-A and 5-X)

Note:
For additional details of Girders 5-A and 5-X at Expansion Joint 4 see Section B-B on Sheet 51/108.
-⊟- Indicates a scupper. All scuppers are Type I.
For scupper Details see Sheet 65/108.

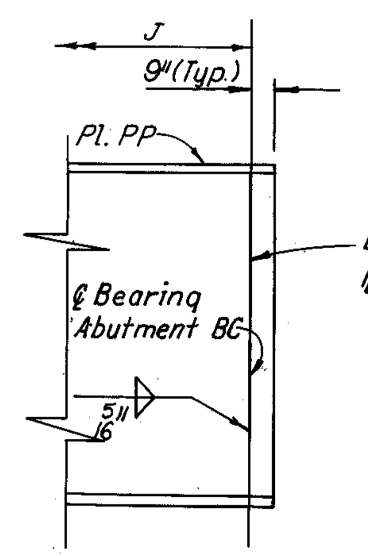


GIRDER ELEVATIONS GIRDERS A THRU X
(All flange and web plates shall be CVN except as shown)

Note:
For Bearings B300 and R150 thru R300 see Ohio Standard Drawing RB-1-55 and the dowel modification on Sheet 59/108 for the Modified Rockers. Bevel top sole plates to match grade. Dimension C shall be measured at the ℄ of shoe. For details of the R350 and R350M Bearings see Sheet 59/108.

Omit the 1/2" side plates on the following Rockers and Bolsters:
Piers 16 and 17L and R - Girders A, C, L, M, N and X
Piers 18, 19 and 20L and R and Abutment B-C - Girders A, B, L, M, N and X

WELD SIZE WEB TO FLANGE	
Flange Plate Thickness	Fillet Weld Size
7/8" Thru 2 1/4"	3/8"
2 1/2"	1/2"



DETAIL A

Notes:
For Girder Notes see Sheet 28/108.
For Crossframe Details see Sheet 57/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

GIRDER ELEVATION
UNIT 5

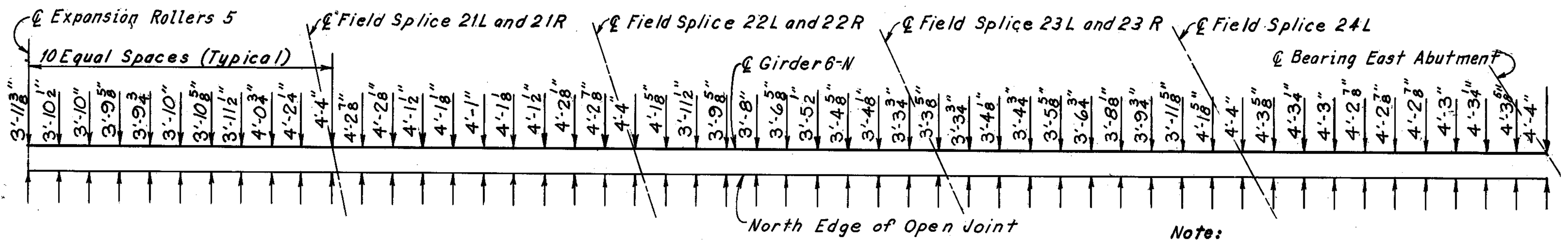
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

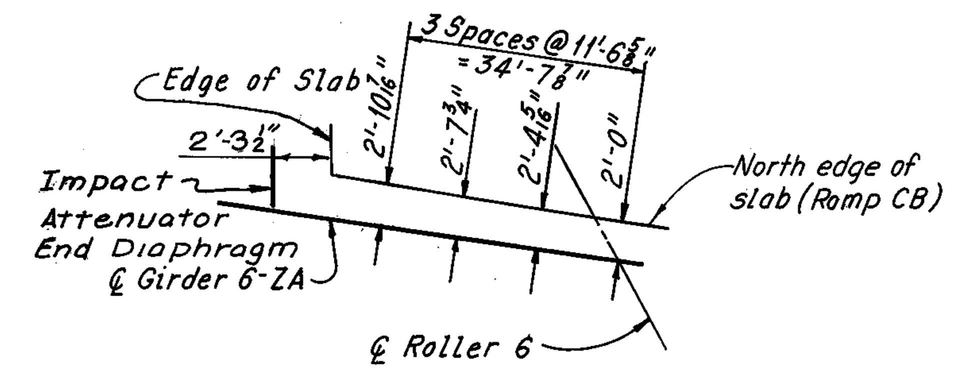
DRAWN JDS	TRACED AJT	CHECKED M.B	REVIEWED C.A.B.	REVISED
DATE 12-16-69	DATE 12-21-69	DATE 1-7-70	DATE 2-24-86	SHEET 38/108

CUYAHOGA COUNTY
CUY-290-0.27

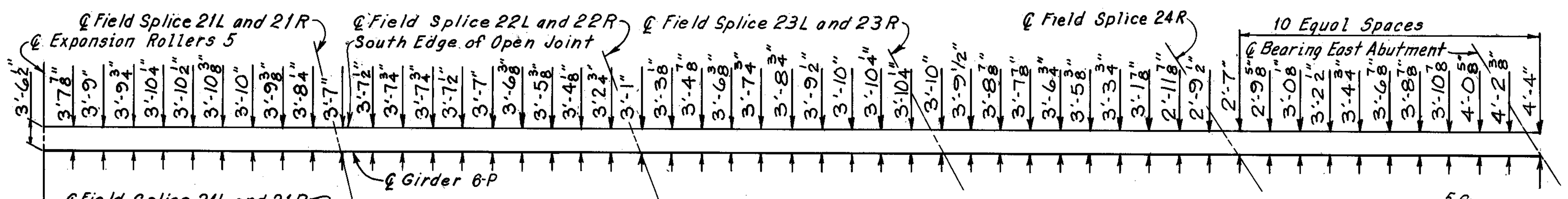


HORIZONTAL OFFSETS TO NORTH EDGE OF OPEN JOINT AT MEDIAN

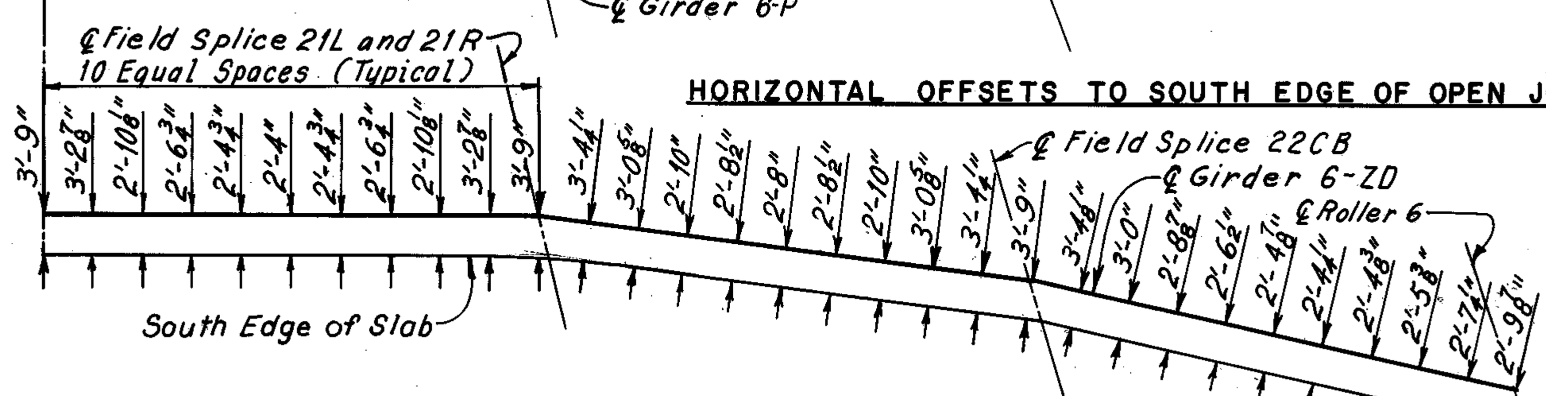
Note: Horizontal offset to North Edge of Slab from Girder A is 2'-11½". Horizontal offsets are measured perpendicular to ℄ Girder.



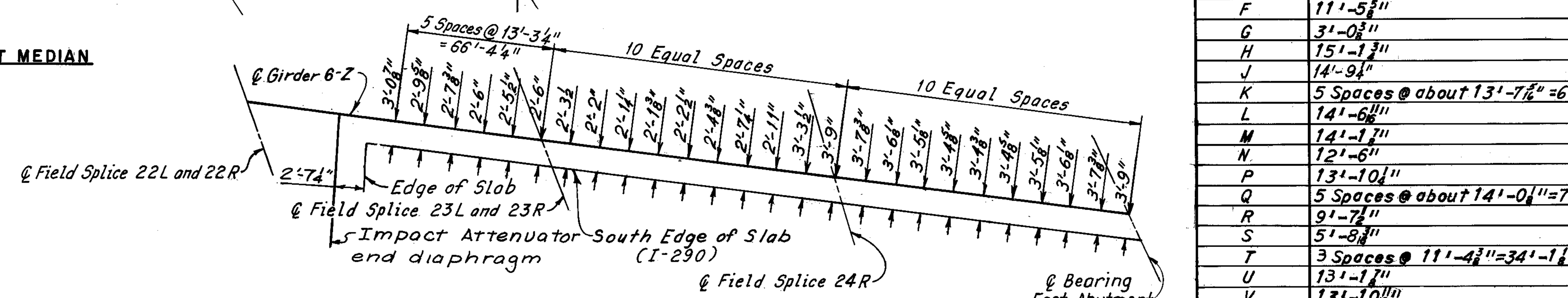
HORIZONTAL OFFSETS TO NORTH EDGE OF SLAB RAMP CB FROM GIRDER 6-ZA



HORIZONTAL OFFSETS TO SOUTH EDGE OF OPEN JOINT AT MEDIAN



HORIZONTAL OFFSETS TO SOUTH EDGE OF SLAB FROM ℄ GIRDER Z D



HORIZONTAL OFFSETS TO SOUTH EDGE OF SLAB FROM ℄ GIRDER Z

Notes:

Indicates 90°.

For Girder Notes see Sheet 28/108.

For Impact Attenuator End Diaphragm Details see Sheet 40/108.

For Girder End Diaphragm Details see Sheet 42/108.

For Crossframe Details see Sheet 57/108.

For Roadway End Dam Details and Details of End Crossframes, see Ohio Standard Drawing SD-1-69, Sheets 1 and 2 of 4 and Modifications to both on Sheet 42/108.

For Sign Support Details see Sheet 101/108.

Indicates a scupper. All scuppers are Type 1 unless otherwise specified. For Scupper Details see Sheet 65/108.

CROSSFRAME SPACING ALONG GIRDER P	
Dimension	Description
A	7 Spaces @ about 15'-0⅛" = 105'-3⅜"
B	2 Spaces @ about 13'-1 7/16" = 26'-2 15/16"
C	13'-10 11/16"
D	6 Spaces @ about 13'-4 7/16" = 80'-2 11/16"
E	12'-11 1/16"
F	11'-5⅝"
G	3'-0⅜"
H	15'-1¾"
J	14'-9¼"
K	5 Spaces @ about 13'-7 5/16" = 68'-0 11/16"
L	14'-6 11/16"
M	14'-1⅞"
N	12'-6"
P	13'-10¼"
Q	5 Spaces @ about 14'-0⅛" = 70'-0 11/16"
R	9'-7½"
S	5'-8 3/16"
T	3 Spaces @ 11'-4⅜" = 34'-1⅛"
U	13'-1⅞"
V	13'-10 11/16"
W	12'-2⅛"

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

FRAMING PLAN
UNIT - 6

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

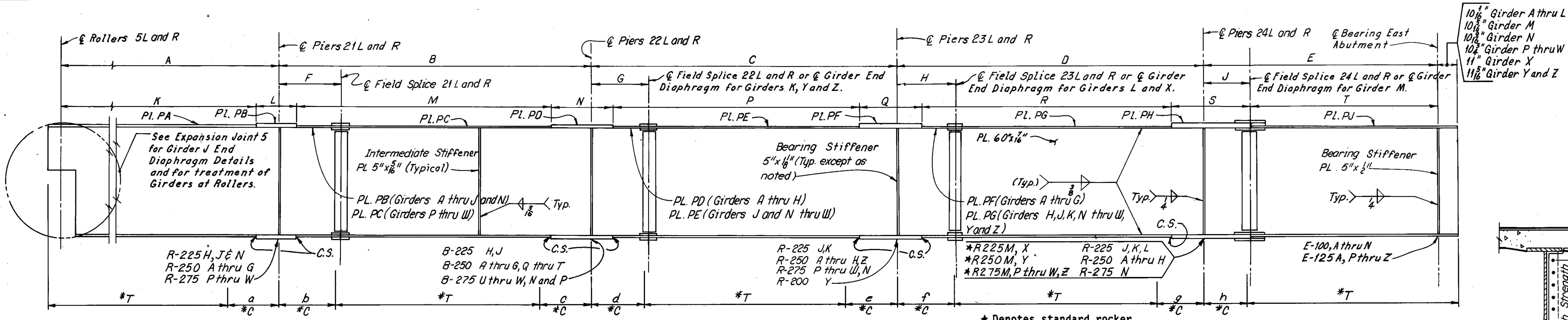
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN L.J.W.	TRACED J.S.C.	CHECKED M.C.B.	REVIEWED C.A.B.	REVISED
DATE 8-20-69	DATE 8-25-69	DATE 7-10-70	DATE 2-24-86	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

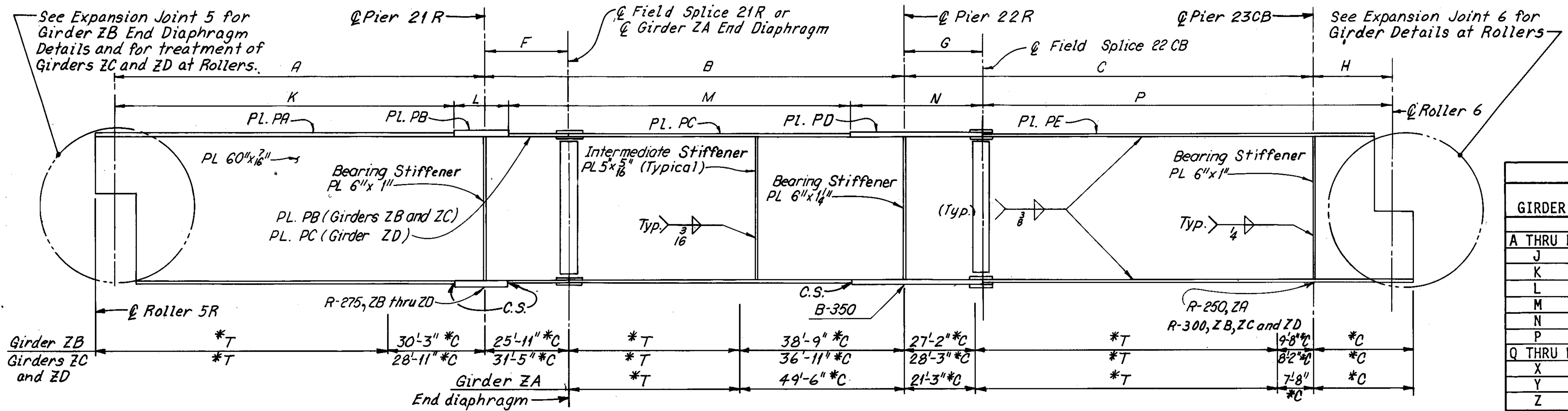
125/193

CUYAHOGA COUNTY
CUY-290-0.27



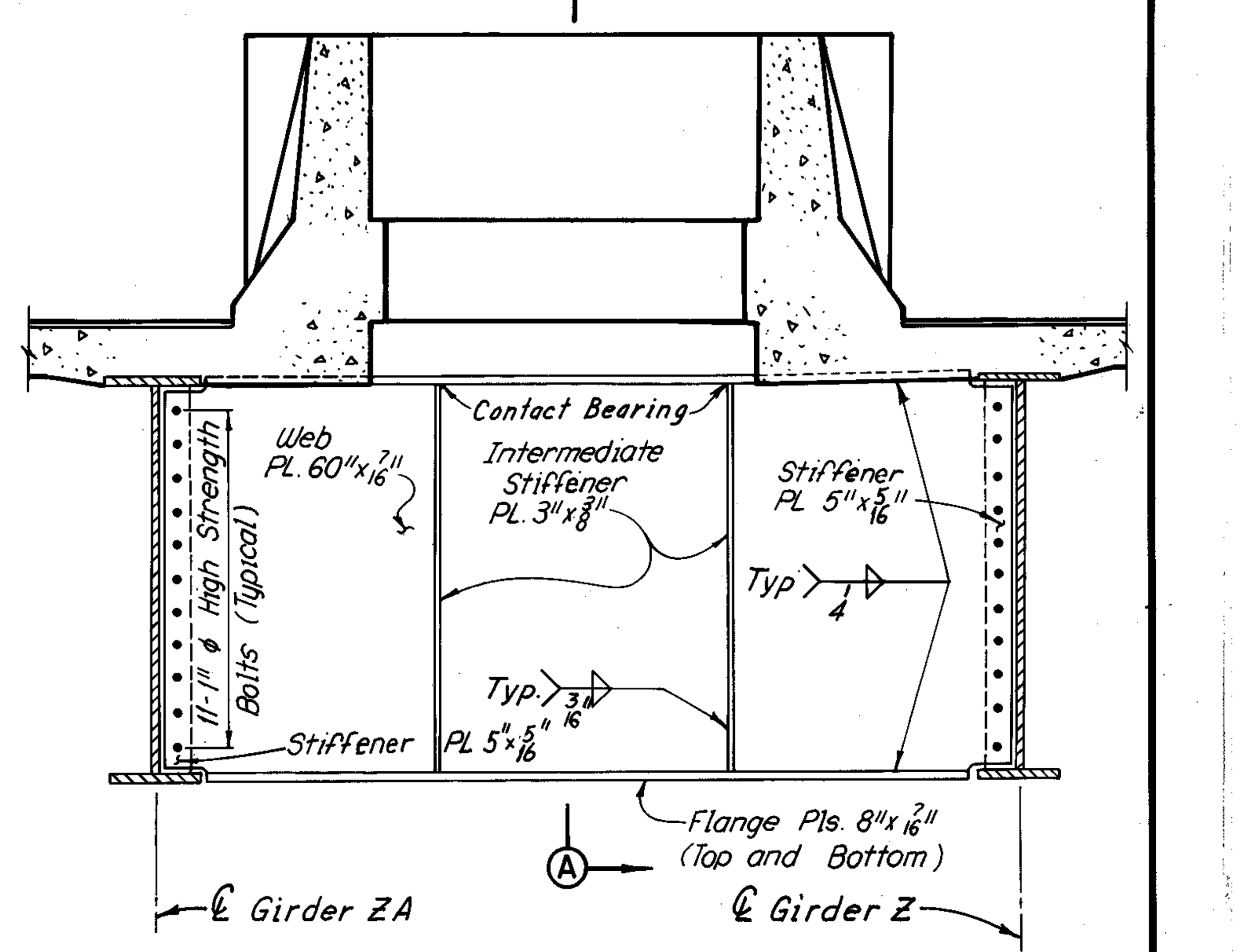
GIRDER ELEVATION GIRDERS A THRU Z

★ Denotes standard rocker with modified dowels.



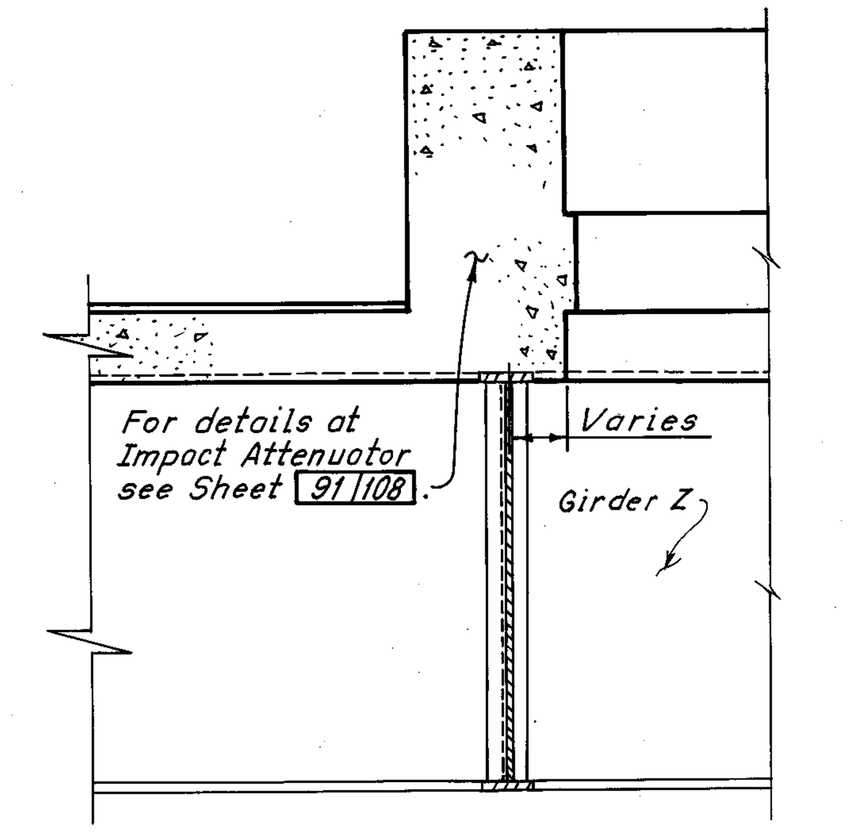
GIRDER ELEVATION GIRDER ZA THRU ZD

Note: All Flange and web plates shall be CVN except as noted.



IMPACT ATTENUATOR END DIAPHRAGM
(Looking West)
Note: For location of Impact Attenuator End Diaphragm see Sheet 39/108

LIMITS OF TENSION AND COMPRESSION FLANGES								
GIRDER	DIMENSION							
	a	b	c	d	e	f	g	h
A THRU H	25'- 5"	30'- 4"	26'- 9"	25'- 9"	26'- 8"	26'-11"	26'- 4"	25'- 3"
J	25'- 9"	26'- 0"	28'- 2"	22'- 0"	27'-10"	26'- 4"	25'-10"	25'- 8"
K	—	—	—	—	28'-10"	21'- 6"	27'- 4"	26'- 3"
L	—	—	—	—	—	—	27'- 6"	20'- 9"
M	—	—	—	—	—	—	—	—
N	26'-10"	28'- 5"	28'- 8"	23'-10"	29'- 3"	26'- 3"	31'- 0"	25'- 3"
P	25'- 6"	30'- 5"	27'- 6"	26'-11"	29'- 4"	28'-11"	28'- 8"	28'- 6"
Q THRU W	26'-11"	32'- 6"	29'- 9"	28'- 0"	31'- 4"	31'- 3"	29'-10"	29'- 8"
X	—	—	—	—	—	—	—	22'- 8"
Y	—	—	—	—	—	23'- 8"	34'- 4"	27'- 3"
Z	—	—	—	—	30'- 4"	28'- 3"	32'- 6"	27'- 8"



SECTION A-A

Notes: For details of the E100 and E125A Shoes see Sheet 58/108. For details of the B350 see Sheet 59/108. For the remaining Rockers and Bolsters see Ohio Standard Drawing RB-1-55 and the dowel modification on Sheet 59/108 for the Modified Rockers. Bevel top sole plates to match grade. Dimension C shall be measured at the ℄ of shoe.

Omit the 1/2" side plates on the following Rockers and Bolsters:

Piers 21 & 22L & R - Girders A, N, P, Q, ZC and ZD
Piers 23L & R - Girders A, B, K, N, P and Z
Piers 24L & R - Girders A, B, L, N, P and Z

TABLE OF GIRDER DIMENSIONS

Girders	A	B	C	D	E	F	G	H	J
A	96'-0"	107'-0"	107'-0"	107'-0"	86'-0"	21'-6"	21'-6"	21'-6"	17'-0"
B	97'-0"	108'-1"	108'-1"	108'-1"	86'-6"	22'-0"	22'-0"	22'-0"	17'-6"
C	98'-0"	109'-2"	109'-2"	109'-2"	87'-0"	22'-6"	22'-6"	22'-6"	18'-0"
D	99'-0"	110'-3"	110'-3"	110'-3"	87'-6"	23'-0"	23'-0"	23'-0"	18'-6"
E	100'-0"	111'-4"	111'-4"	111'-4"	88'-0"	23'-6"	23'-6"	23'-6"	19'-0"
F	101'-0"	112'-5"	112'-5"	112'-5"	88'-6"	24'-0"	24'-0"	24'-0"	19'-6"
G	102'-0"	113'-6"	113'-6"	113'-6"	89'-0"	24'-6"	24'-6"	24'-6"	20'-0"
H	103'-0"	114'-7"	114'-7"	114'-7"	89'-6"	25'-0"	25'-0"	25'-0"	20'-6"
J	102'-0 5/8"†	115'-8 7/8"	115'-8 5/8"	115'-7 1/16"	89'-11 9/16"	25'-3 7/8"	25'-7 1/8"	25'-5 9/16"	20'-11 9/16"
K	—	—	90'-4 1/2"†	116'-10 15/16"	90'-5 1/8"	—	—	26'-2 15/16"	21'-5 1/8"
L	—	—	—	94'-1 3/4"†	91'-2 7/8"	—	—	—	22'-2 7/8"
M	—	—	—	—	68'-6 3/8"†	—	—	—	—
N	104'-2 3/4"	117'-0"	119'-5 3/16"	121'-10 5/16"	96'-3 7/8"	25'-8 3/8"	26'-2 1/2"	27'-2 1/16"	23'-3 1/8"
P	105'-3 3/8"	118'-0 13/16"	120'-5 1/4"	122'-10"	98'-2 5/16"	26'-2 15/16"	26'-8 1/4"	27'-7 7/8"	19'-2 5/16"
Q	106'-3 7/16"	119'-2 1/8"	121'-6 13/16"	123'-11 3/4"	98'-8 13/16"	26'-9"	27'-2 1/2"	28'-2 1/4"	19'-8 13/16"
R	107'-3 7/16"	120'-3 7/16"	122'-8 5/16"	125'-1 1/2"	99'-3 1/4"	27'-3 1/16"	27'-8 11/16"	28'-8 9/16"	20'-3 1/4"
S	108'-3 1/2"	121'-4 11/16"	123'-9 13/16"	126'-3 5/16"	99'-9 11/16"	27'-9 1/16"	28'-2 7/8"	29'-2 7/8"	20'-9 11/16"
T	109'-3 1/2"	122'-6"	124'-11 3/8"	127'-5 1/16"	100'-4 1/8"	28'-3 1/8"	28'-9 1/8"	29'-9 3/16"	21'-4 1/8"
U	110'-3 9/16"	123'-7 5/16"	126'-0 7/8"	128'-6 13/16"	100'-10 9/16"	28'-9 1/8"	29'-3 5/16"	30'-3 1/2"	21'-10 9/16"
V	111'-3 9/16"	124'-8 5/8"	127'-2 3/8"	129'-8 9/16"	101'-5"	29'-3 3/16"	29'-9 9/16"	30'-9 13/16"	22'-5"
W	112'-3 5/8"	125'-9 15/16"	128'-3 15/16"	130'-10 3/8"	101'-11 7/16"	29'-9 1/4"	30'-3 3/4"	31'-4 3/16"	22'-11 7/16"
X	—	—	—	26'-5"†	105'-0 9/16"	—	—	—	23'-10 1/16"
Y	—	—	34'-1 3/4"†	134'-0 5/8"	107'-8 3/8"	—	—	31'-9 5/8"	24'-2 1/16"
Z	—	—	105'-4 13/16"†	136'-11 3/16"	108'-8 1/4"	—	—	32'-7 1/8"	25'-1 15/16"
ZA	—	96'-7 1/8"†	130'-3 3/16"	—	—	—	24'-9 3/16"	10'-0"	—
ZB	111'-7 11/16"†	129'-7 15/16"	131'-3 5/16"	—	—	30'-4 7/16"	25'-9 5/16"	10'-0"	—
ZC	114'-2 3/4"	131'-5 1/8"	132'-0 5/16"	—	—	30'-11 7/8"	26'-6 5/16"	10'-0"	—
ZD	115'-2 7/8"	133'-0 1/16"	132'-9 1/16"	—	—	31'-6"	27'-3 1/16"	10'-0"	—

Girders	K	L	M	N	P	Q	R	S	T
A	88'-0"	29'-6"	72'-6"	34'-6"	72'-6"	34'-6"	74'-6"	28'-0"	69'-0"
B	89'-0"	30'-0"	73'-1"	35'-0"	73'-1"	35'-0"	75'-1"	28'-6"	69'-0"
C	88'-0"	32'-6"	73'-8"	35'-6"	73'-8"	35'-6"	75'-8"	29'-0"	69'-0"
D	89'-0"	33'-0"	74'-3"	36'-0"	74'-3"	36'-0"	76'-3"	29'-6"	69'-0"
E	90'-0"	33'-6"	72'-10"	38'-6"	72'-10"	38'-6"	76'-10"	30'-0"	69'-0"
F	91'-0"	34'-0"	73'-5"	39'-0"	73'-5"	39'-0"	76'-5"	31'-6"	69'-0"
G	92'-0"	34'-6"	74'-0"	39'-6"	74'-0"	39'-6"	77'-0"	32'-0"	69'-0"
H	93'-0"	35'-0"	76'-7"	38'-0"	76'-7"	27'-0"	89'-7"	31'-6"	69'-0"
J	94'-0 5/8"†	33'-3 7/8"	79'-5"	21'-0"	94'-8 7/8"	22'-0"	93'-7 1/16"	31'-11 9/16"	69'-0"
K	—	—	—	—	79'-4 1/2"†	20'-0"	97'-10 15/16"	31'-5 1/8"	69'-0"
L	—	—	—	—	—	—	84'-1 3/4"†	32'-2 7/8"	69'-0"
M	—	—	—	—	—	—	—	—	68'-6 3/8"†
N	93'-2 3/4"	36'-8 3/8"	79'-3 5/8"	24'-0"	93'-5 3/16"	26'-0"	99'-10 5/16"	34'-3 1/8"	73'-0 3/4"
P	96'-3 3/8"	23'-0"	89'-0 13/16"	27'-0"	94'-5 1/4"	29'-0"	95'-10"	31'-2 5/16"	79'-0"
Q	97'-3 7/16"	23'-0"	90'-2 1/8"	27'-0"	95'-6 13/16"	29'-0"	96'-11 3/4"	31'-8 13/16"	79'-0"
R	98'-3 7/16"	22'-0"	94'-3 7/16"	25'-0"	94'-8 5/16"	31'-0"	98'-1 1/2"	32'-3 1/4"	79'-0"
S	98'-3 1/2"	23'-0"	95'-4 11/16"	27'-0"	93'-9 13/16"	31'-0"	99'-3 5/16"	32'-9 11/16"	79'-0"
T	99'-3 1/2"	23'-0"	94'-6"	29'-0"	94'-11 3/8"	33'-0"	97'-5 1/16"	34'-4 1/8"	79'-0"
U	100'-3 9/16"	24'-0"	94'-7 5/16"	29'-0"	94'-0 7/8"	35'-0"	98'-6 13/16"	34'-10 9/16"	79'-0"
V	100'-3 9/16"	26'-0"	94'-8 5/8"	27'-0"	101'-2 3/8"	29'-0"	102'-8 9/16"	34'-5"	79'-0"
W	99'-3 5/8"	28'-0"	95'-9 15/16"	27'-0"	102'-9 13/16"	31'-0"	101'-10 3/8"	34'-11 7/16"	79'-0"
X	—	—	—	—	—	—	—	50'-3 1/16"†	81'-2 1/2"
Y	—	—	—	—	—	65'-11 3/8"†	89'-3"	37'-2 1/16"	83'-6 5/16"
Z	—	—	—	—	93'-4 13/16"†	25'-0"	109'-11 3/16"	39'-1 15/16"	83'-6 5/16"
ZA	—	—	77'-7 1/8"†	43'-9 3/16"	115'-6"	—	—	—	—
ZB	98'-7 11/16"†	43'-4 7/16"	83'-3 1/2"	41'-9 5/16"	115'-6"	—	—	—	—
ZC	103'-2 3/4"	41'-11 7/8"	84'-5 1/4"	42'-6 5/16"	115'-6"	—	—	—	—
ZD	104'-2 7/8"	22'-0"	106'-0 1/16"	43'-3 1/16"	115'-6"	—	—	—	—

† Denotes measurement from girder end diaphragm.

TABLE OF FLANGE PLATES									
PLATE SIZE									Girders
PA	PB	PC	PD	PE	PF	PG	PH	PJ	
12"x 7/8"	12"x1 1/4"	12"x 7/8"	12"x1 1/8"	12"x 7/8"	12"x1 1/8"	12"x 7/8"	12"x1 1/8"	12"x 7/8"	A
12"x 7/8"	12"x1 1/4"	12"x 7/8"	12"x1 1/8"	12"x 7/8"	12"x1 1/8"	12"x 7/8"	12"x1 1/8"	12"x 7/8"	B
12"x 7/8"	12"x1 1/4"	12"x 7/8"	12"x1 1/8"	12"x 7/8"	12"x1 1/4"	12"x 7/8"	12"x1 1/8"	12"x 7/8"	C
12"x 7/8"	12"x1 3/8"	12"x 7/8"	12"x1 1/8"	12"x 7/8"	12"x1 1/4"	12"x 7/8"	12"x1 1/8"	12"x 7/8"	D
12"x 7/8"	12"x1 3/8"	12"x 7/8"	12"x1 1/4"	12"x 7/8"	12"x1 1/4"	12"x 7/8"	12"x1 1/4"	12"x 7/8"	E
12"x1"	12"x1 3/8"	12"x 7/8"	12"x1 1/4"	12"x 7/8"	12"x1 1/4"	12"x 7/8"	12"x1 1/4"	12"x 7/8"	F
12"x1"	12"x1 1/2"	12"x 7/8"	12"x1 1/4"	12"x 7/8"	12"x1 1/4"	12"x 7/8"	12"x1 1/4"	12"x 7/8"	G
12"x 7/8"	12"x1 1/8"	12"x 7/8"	12"x1 1/8"	12"x 7/8"	12"x1 1/4"‡	12"x 7/8"	12"x1 1/4"	12"x 7/8"	H
12"x 7/8"	12"x 7/8"	12"x 7/8"	12"x1 1/8"‡	12"x 7/8"	12"x1 1/4"‡	12"x 7/8"	12"x1 1/8"	12"x 7/8"	J
—	—	—	—	12"x 7/8"	12"x1 1/8"	12"x 7/8"	12"x1 1/8"	12"x 7/8"	K
—	—	—	—	—	—	12"x 7/8"	12"x1"	12"x 7/8"	L
—	—	—	—	—	—	—	—	12"x 7/8"	M
12"x 7/8"	12"x1 3/8"	12"x 7/8"	12"x1 1/2"‡	12"x 7/8"	12"x1 1/2"‡	12"x 7/8"	12"x1 1/2"	12"x 7/8"	N
12"x1 1/8"	‡12"x1 1/2"	12"x 7/8"	12"x1 1/2"‡	12"x 7/8"	12"x1 5/8"‡	12"x 7/8"	12"x1 1/2"	12"x 7/8"	P
12"x1 1/8"	‡12"x1 1/2"	12"x 7/8"	12"x1 1/2"‡	12"x 7/8"	12"x1 5/8"‡	12"x 7/8"	12"x1 1/2"	12"x 7/8"	Q
12"x1 1/8"	‡12"x1 5/8"	12"x 7/8"	12"x1 1/2"‡	12"x 7/8"	12"x1 5/8"‡	12"x 7/8"	12"x1 5/8"	12"x 7/8"	R
12"x1 1/8"	‡12"x1 5/8"	12"x 7/8"	12"x1 1/2"‡	12"x 7/8"	12"x1 3/4"‡	12"x 7/8"	12"x1 5/8"	12"x 7/8"	S
12"x1 1/8"	‡12"x1 5/8"	12"x 7/8"	12"x1 1/2"‡	12"x 7/8"	12"x1 3/4"‡	12"x 7/8"	12"x1 5/8"	12"x 7/8"	T
12"x1 1/8"	‡12"x1 3/4"	12"x 7/8"	12"x1 5/8"‡	12"x 7/8"	12"x1 3/4"‡	12"x 7/8"	12"x1 5/8"	12"x 7/8"	U
12"x1 1/8"	‡12"x1 3/4"	12"x 7/8"	12"x1 5/8"‡	12"x1"	12"x1 7/8"‡	12"x1"	12"x1 5/8"	12"x 7/8"	V
12"x1"	‡12"x1 3/4"	12"x 7/8"	12"x1 3/4"‡	12"x1"	12"x1 3/4"‡	12"x 7/8"	12"x1 1/2"	12"x 3/4"	W
—	—	—	—	—	—	—	12"x 7/8"	12"x 3/4"	X
—	—	—	—	—	12"x1"	12"x 3/4"	12"x1 1/2"	12"x 7/8"	Y
—	—	—	—	12"x 7/8"	12"x1 1/2"‡	12"x 7/8"	12"x1 3/4"	12"x1 1/8"	Z
—	—	14"x1"	14"x1 7/8"	14"x1 3/4"	—	—	—	—	ZA
14"x 3/4"	14"x1 3/8"	14"x1 1/8"	14"x2 1/4"	14"x1 5/8"	—	—	—	—	ZB
14"x 7/8"	14"x1 3/8"	14"x1 1/8"	14"x2 1/4"	14"x1 5/8"	—	—	—	—	ZC
14"x1"	14"x1 5/8"‡	14"x1 1/8"	14"x2 1/4"	14"x1 5/8"	—	—	—	—	ZD

‡ Indicates CVN designation is not required for bottom flange.

For Girder Notes see Sheet 28/108.

H.N.T.B. BR.NO. 9 PART II - SUPERSTRUCTURE

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

GIRDER ELEVATION
UNIT 6
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110
STA.985+85.75 TO STA.1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN L.J.W. DATE 12-6-69	TRACED AJT DATE 12-19-69	CHECKED M.C.B. DATE 7-20-70	REVIEWED C.A.B. DATE 2-24-66	REVISED	SHEET 40/108

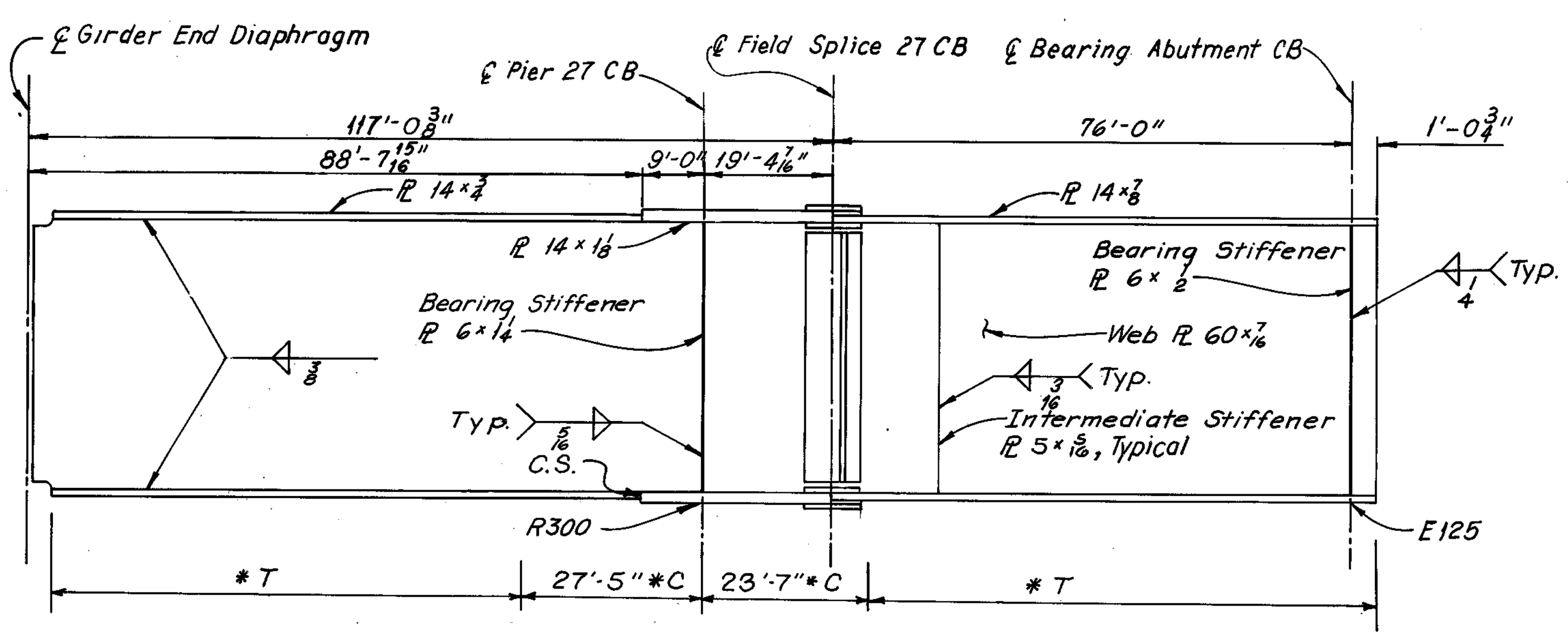
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY-290-0.27

ELEVATION

Girder CB-A, CB-C, CB-D, CB-E

Note: All flange and web plates shall be CVN except as shown.



ELEVATION

Girder CB-B

HORIZONTAL OFFSETS TO EDGE OF SLAB

Girder CB-A to North Edge of Slab

Span		Roller 6 → F.S. 24CB	F.S. 24CB → F.S. 24A-CB	F.S. 24A-CB → F.S. 25CB	F.S. 25CB → F.S. 26CB	F.S. 26CB → F.S. 27CB	F.S. 27CB → ℄ Bearing Abut. CB
10 Equal Spaces	0	2'-0"	2'-0"	2'-9 3/8"	2'-2 3/4"	2'-9 1/8"	2'-0"
	.1	2'-0 3/4"	2'-3 1/4"	2'-11 3/4"	2'-8 1/4"	2'-0"	2'-6 7/8"
	.2	2'-1"	2'-6"	3'-1 1/2"	2'-9"	2'-0"	2'-7"
	.3	2'-0 3/4"	2'-8 1/4"	3'-2 5/8"	2'-9"	2'-0"	2'-7"
	.4	2'-1 3/4"	2'-9 7/8"	3'-3"	2'-9"	2'-0"	2'-7"
	.5	2'-2 5/8"	2'-11 1/8"	3'-2 5/8"	2'-9"	2'-0"	2'-7"
	.6	2'-3"	2'-11 3/4"	3'-1 5/8"	2'-9"	2'-0"	2'-7"
	.7	2'-3"	3'-0"	3'-0"	2'-9"	2'-0"	2'-7"
	.8	2'-2 1/2"	2'-11 5/8"	2'-9 5/8"	2'-9"	2'-0"	2'-7"
	.9	2'-1 1/2"	2'-10 3/4"	2'-6 1/2"	2'-9"	2'-0"	2'-7"
	1.0	2'-0"	2'-9 3/8"	2'-2 3/4"	2'-9"	2'-0"	2'-7"

Girder CB-E to South Edge of Slab

Roller 6 → F.S. 24CB	F.S. 24CB → F.S. 24A-CB	F.S. 24A-CB → F.S. 25CB	F.S. 25CB → F.S. 26CB	F.S. 26CB → F.S. 27CB	F.S. 27CB → ℄ Bearing Abut. CB	Span	
2'-9 7/8"	3'-1 7/8"	3'-9"	2'-9 1/8"	2'-9"	2'-9"	0	10 Equal Spaces
2'-8"	3'-0 1/4"	3'-4 3/8"	2'-9"	2'-9"	2'-9"	.1	
2'-6 1/2"	2'-11"	3'-0 3/8"	2'-9"	2'-9"	2'-9"	.2	
2'-5 1/2"	2'-10 1/2"	2'-9 1/4"	2'-9"	2'-9"	2'-9"	.3	
2'-5"	2'-10 3/8"	2'-6 7/8"	2'-9"	2'-9"	2'-9"	.4	
2'-5"	2'-10 7/8"	2'-5 3/8"	2'-9"	2'-9"	2'-9"	.5	
2'-5 1/2"	2'-11 3/4"	2'-4 1/2"	2'-9"	2'-9"	2'-9"	.6	
2'-6 3/8"	3'-1 1/4"	2'-4 1/2"	2'-9"	2'-9"	2'-9"	.7	
2'-7 3/4"	3'-3 3/8"	2'-5 1/4"	2'-9"	2'-9"	2'-9"	.8	
2'-10 1/4"	3'-6"	2'-6 3/4"	2'-9"	2'-9"	2'-9"	.9	
3'-1 7/8"	3'-9"	2'-9 1/8"	2'-9"	2'-9"	2'-9"	1.0	

Note:

Horizontal offsets are measured perpendicular to ℄ Girders.

F. S. denotes Field Splice.

Notes:

For Girder Notes see Sheet 28/108.

For Girder End Diaphragm Details see sheet 42/108.

For Crossframe Details see sheet 57/108.

For Roadway End Dam Details and Details of End Crossframes see Ohio Standard Drawing SD-1-69, Sheets 1 and 2 of 4 and the Modification to Stand and End Crossframes on Sheet 42/108.

For details of R300 and B300 see Ohio Standard Drawing RB-1-55. Bevel top sole plates to match grade. Dimension C shall be measured at centerline of sole plate. For details of R350 shoes see Sheet 59/108. For details of E 125 see Sheet 58/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

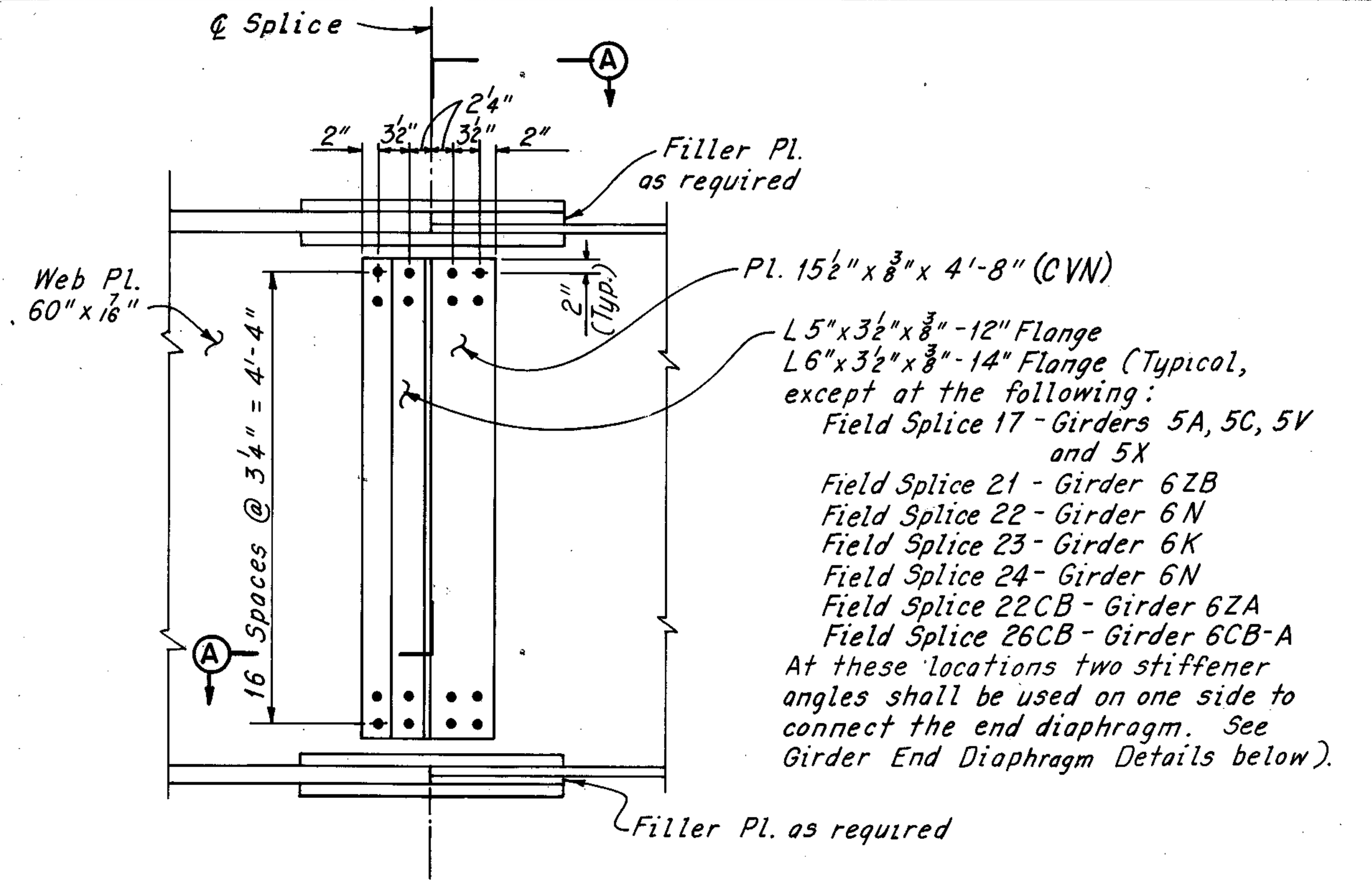
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

FRAMING PLAN AND
GIRDER ELEVATIONS
UNIT 6-CB
I-290 OVER CUYAHOGA RIVER

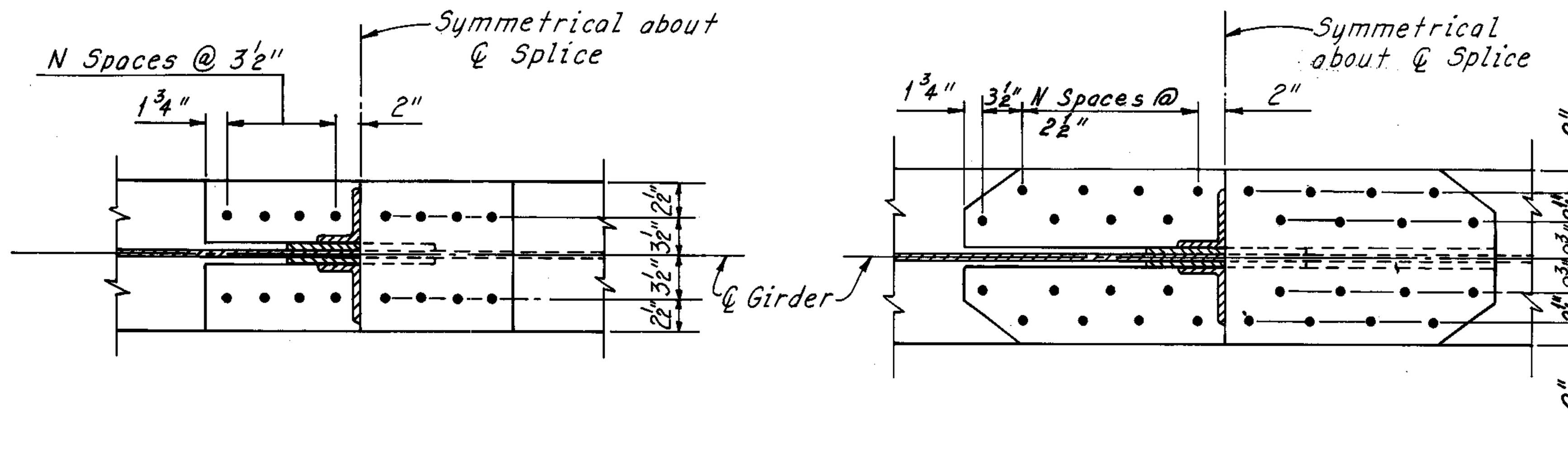
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S. DATE 10-2-69	TRACED A.J.T. DATE 10-15-69	CHECKED M.B. DATE 12-23-69	REVIEWED C.A.B. DATE 2-24-70	REVISED



GIRDER WEB SPLICE



FLANGE SPLICE
(12" FLANGE WIDTH)

FLANGE SPLICE
(14" FLANGE WIDTH)

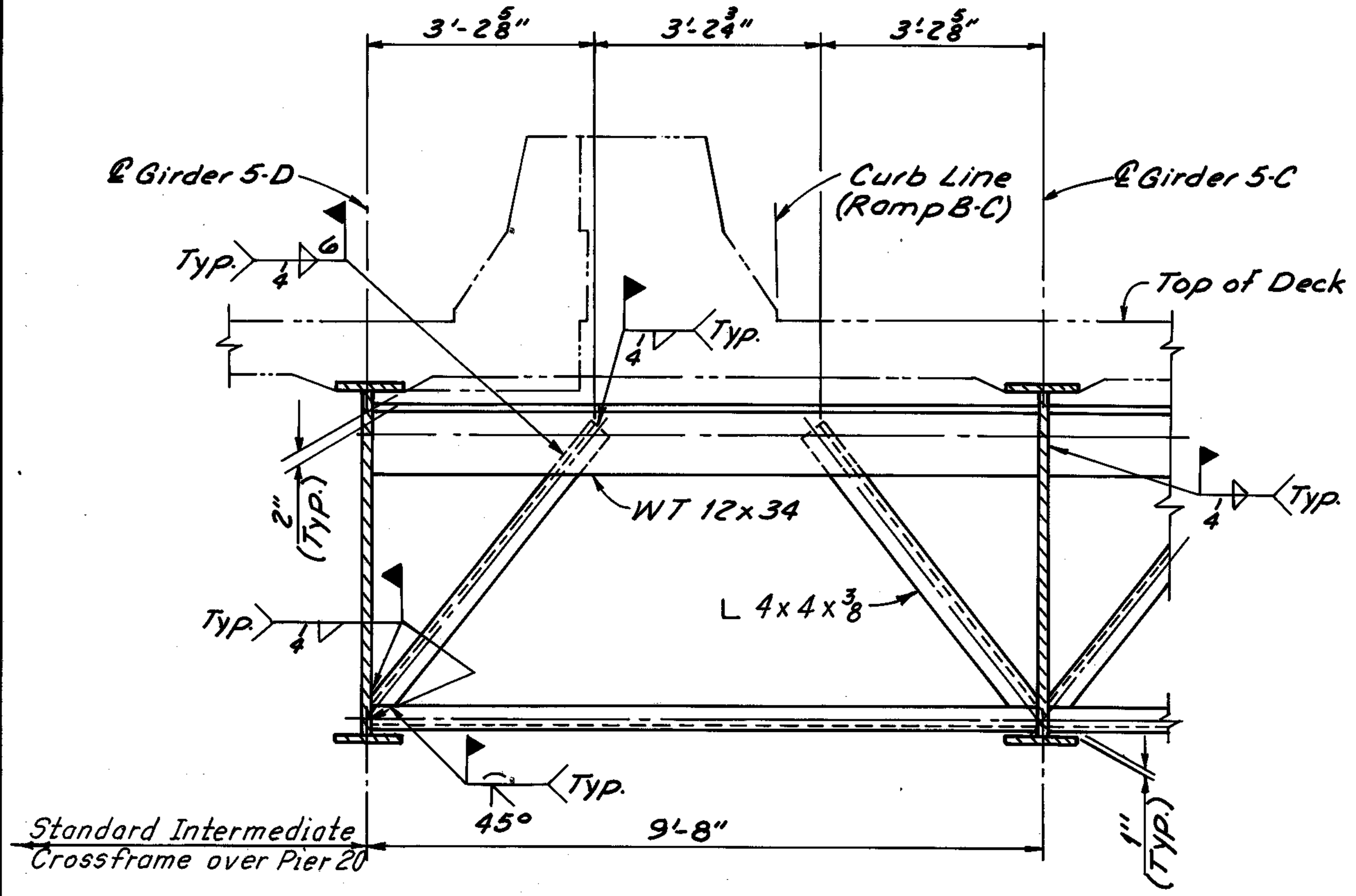
SECTION A-A

FIELD SPLICE DETAILS

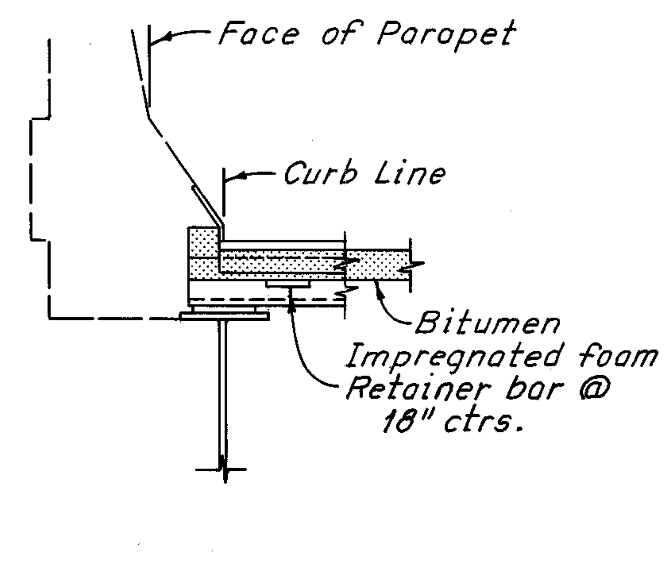
Flange Width	Thickness of thinner flange	FLANGE SPLICE PLATES (CVN)		FLANGE BOLTS		NUMBER OF SPLICES			
		Inside (4)	Outside (2)	Number	Spaces (N)	Unit 5	Unit 6	Unit 6CB	Total
12"	⅞" and 1"	5"x 11/16"x 4'-1½"	12"x ½"x 4'-1½"	56	6	17	79	0	96
12"	1⅛"	5"x ¾"x 4'-8½"	12"x 9/16"x 4'-8½"	64	7	41	1	0	42
12"	1¼"	5"x 13/16"x 4'-8½"	12"x ⅝"x 4'-8½"	64	7	22	0	0	22
12"	1⅝" and 1⅞"	5"x 1 3/16"x 7'-0½"	12"x 15/16"x 7'-0½"	96	11	4	0	0	4
14"	⅞"	6"x 11/16"x 3'-8½"	14"x 7/16"x 3'-8½"	64	6	0	0	21	21
14"	1" and 1⅛"	6"x ⅞"x 4'-6½"	14"x 9/16"x 4'-6½"	80	8	0	3	0	3
14"	1⅜	6"x 1⅛"x 5'-4½"	14"x ⅞"x 5'-4½"	96	10	0	0	4	4
14"	1½", 1⅝" and 1¾"	6"x 1¼"x 6'-2½"	14"x 15/16"x 6'-2½"	112	12	0	4	0	4

GIRDER FLANGE SPLICE DETAILS FOR UNITS 5, 6, AND 6CB

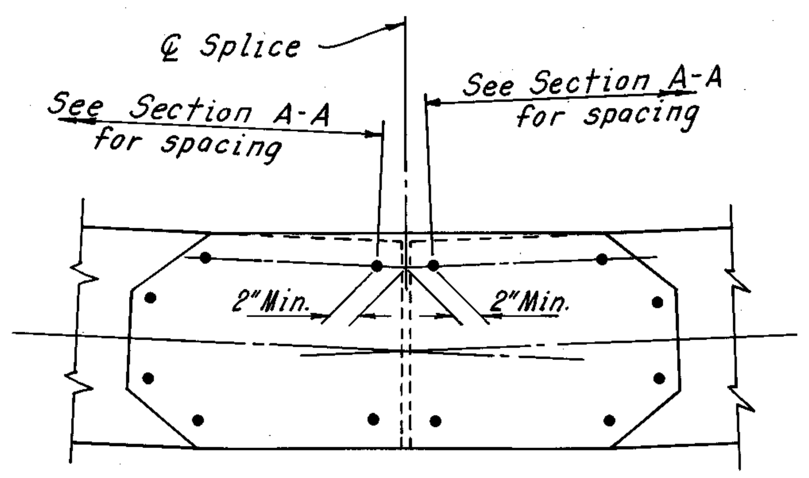
Note: For Girder Notes see Sheet 28/108.



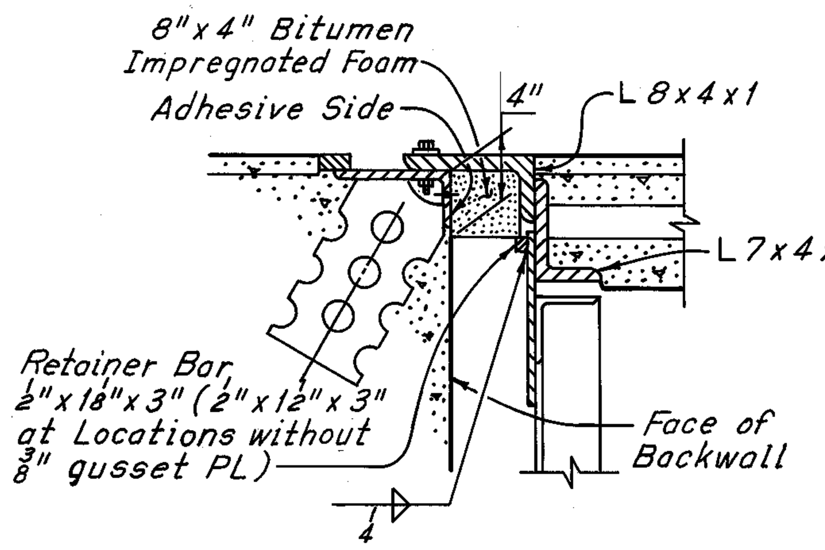
ABUTMENT CROSSFRAME AT RAMP B-C



TERMINATION OF BITUMEN IMPREGNATED FOAM AT CURB LINE

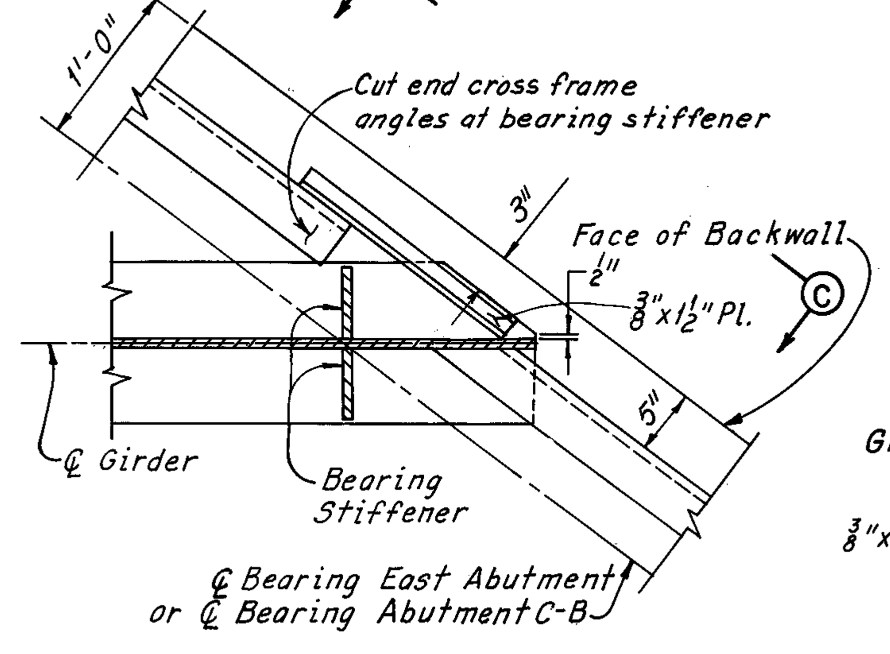


COVER PLATE DETAIL AT GIRDER BEND POINT
(14" Flange Splice Shown)

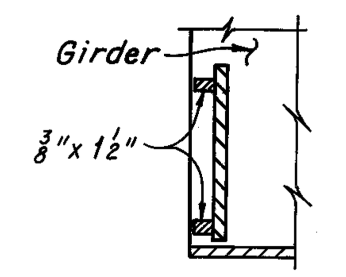


SECTION THRU END DAM AT ABUTMENT CB
For details not shown see Section A-A on Ohio Standard Drawing SD-1-69, Sheet 1 of 4.

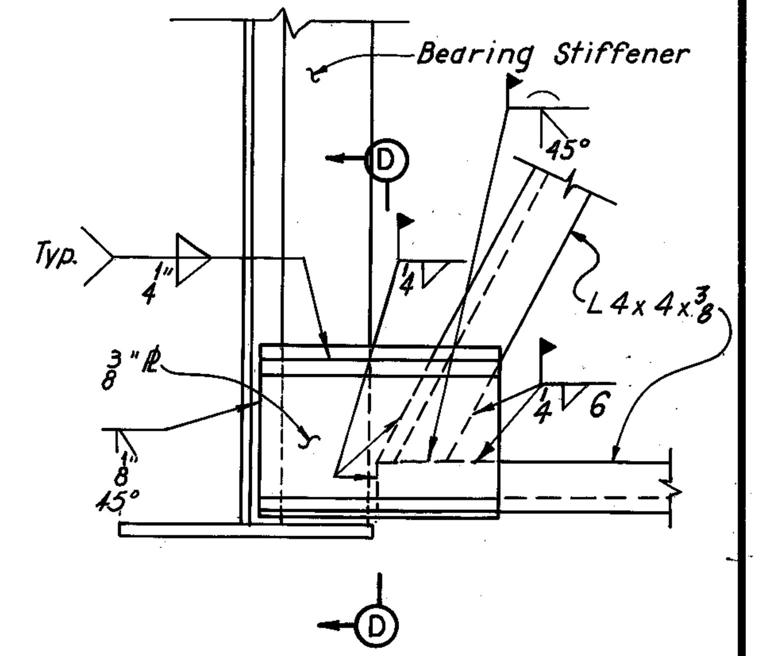
END DAM DETAILS FOR RAMP B-C AT SOUTH CURB



DETAIL A
(For location of Detail A see Sheets 39/108 and 41/108.)

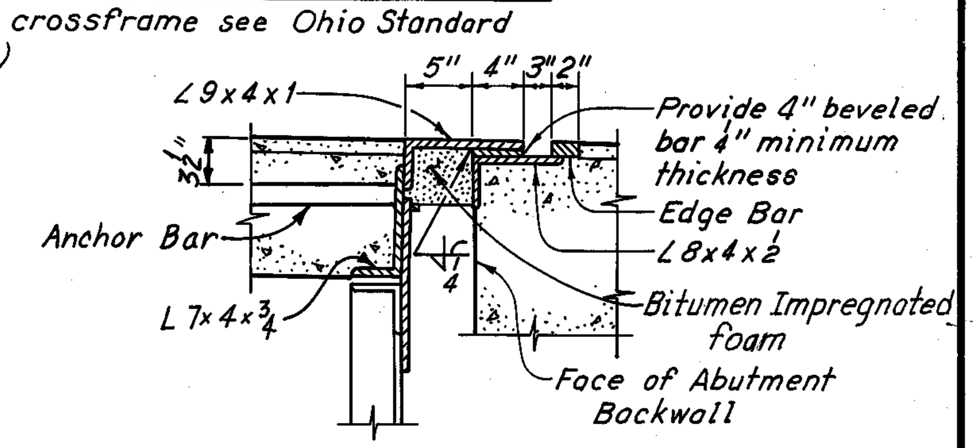


SECTION D-D
(Bearing Stiffener not Shown)



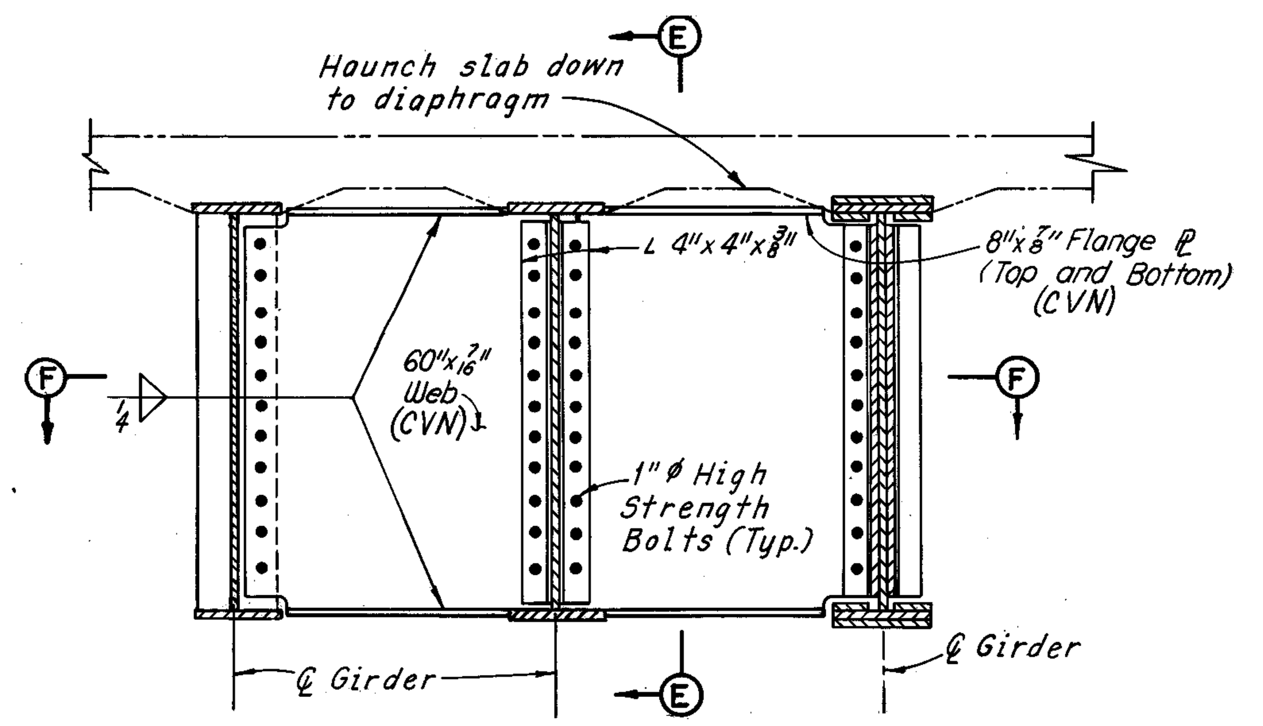
VIEW C-C

MODIFICATION TO STANDARD END CROSSFRAME DETAIL
(For additional details of end crossframe see Ohio Standard Drawing SD-1-69, Sheet 1 of 4.)

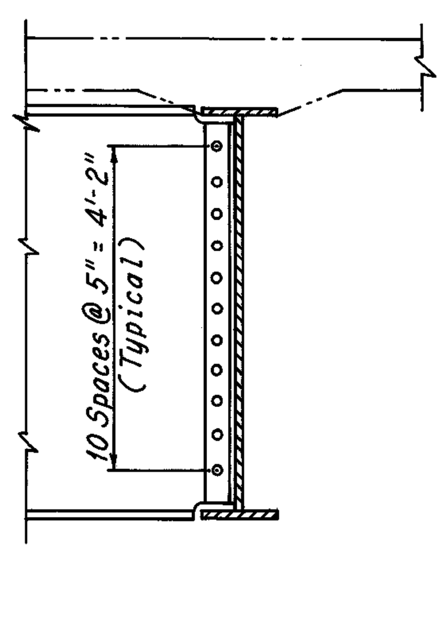


SECTION THRU END DAM
(For details not shown see Section A-A on Ohio Standard Drawing SD-1-69, Sheet 1 of 4.)

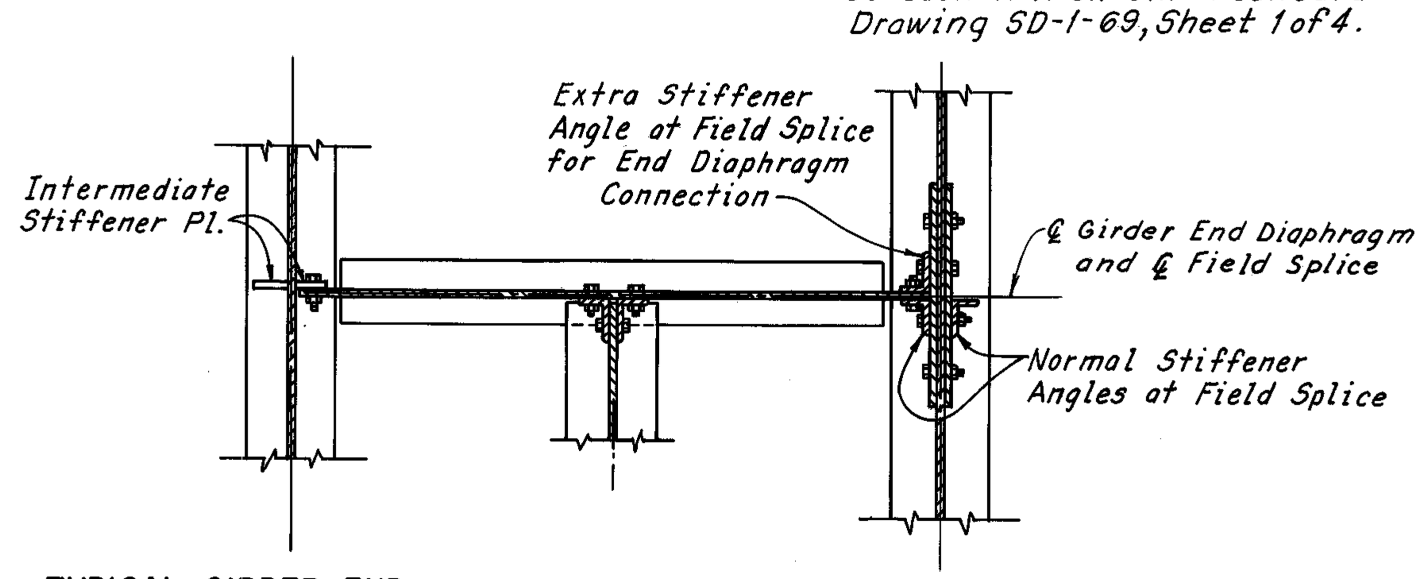
MODIFICATION TO ROADWAY END DAM AT EAST ABUTMENT



GIRDER END DIAPHRAGM
(Typical Units 5, 6 and 6CB, except for End Diaphragms at Expansion Joints 4 and 5. See Framing Plans for location.)



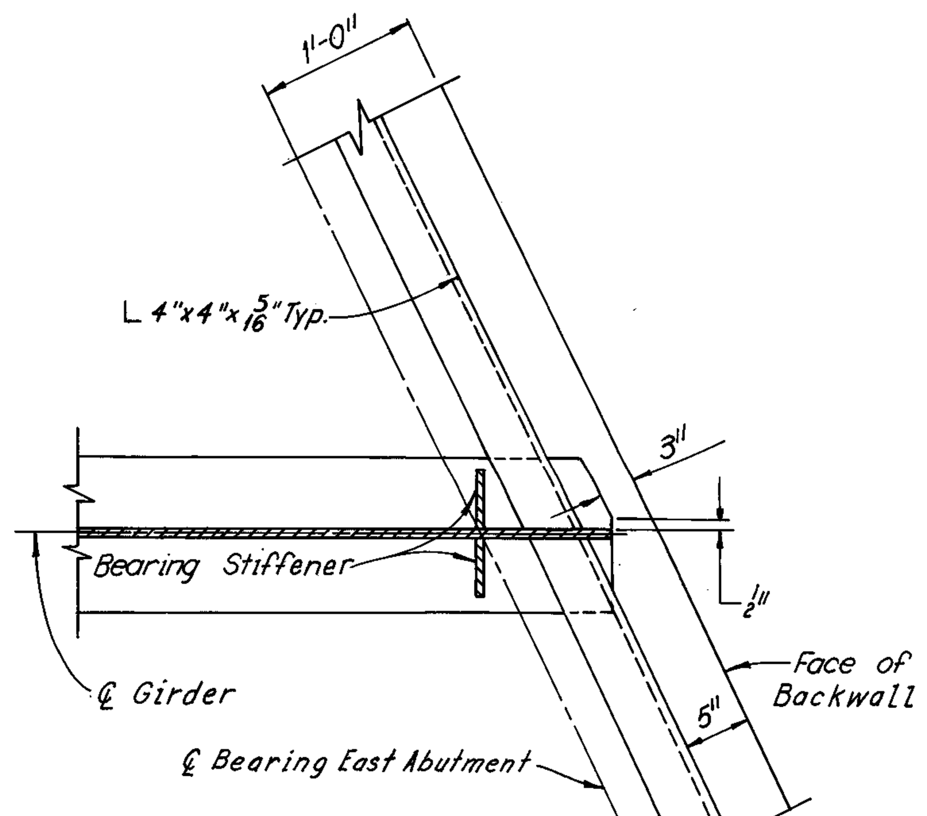
SECTION E-E



TYPICAL GIRDER END DIAPHRAGM CONNECTION AT INTERMEDIATE STIFFENER

TYPICAL GIRDER END DIAPHRAGM CONNECTION AT FIELD SPLICE
(Flange Splice Plate and Bolts Not Shown)

SECTION F-F



DETAIL B

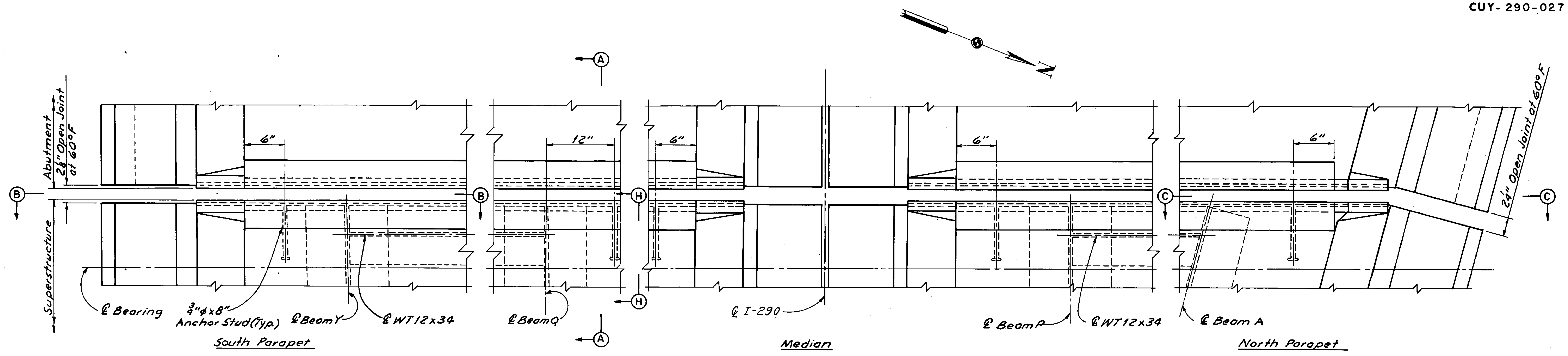
Note: Detail B is typical where Standard End Crossframe is used. For location of Detail B see Sheet 39/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

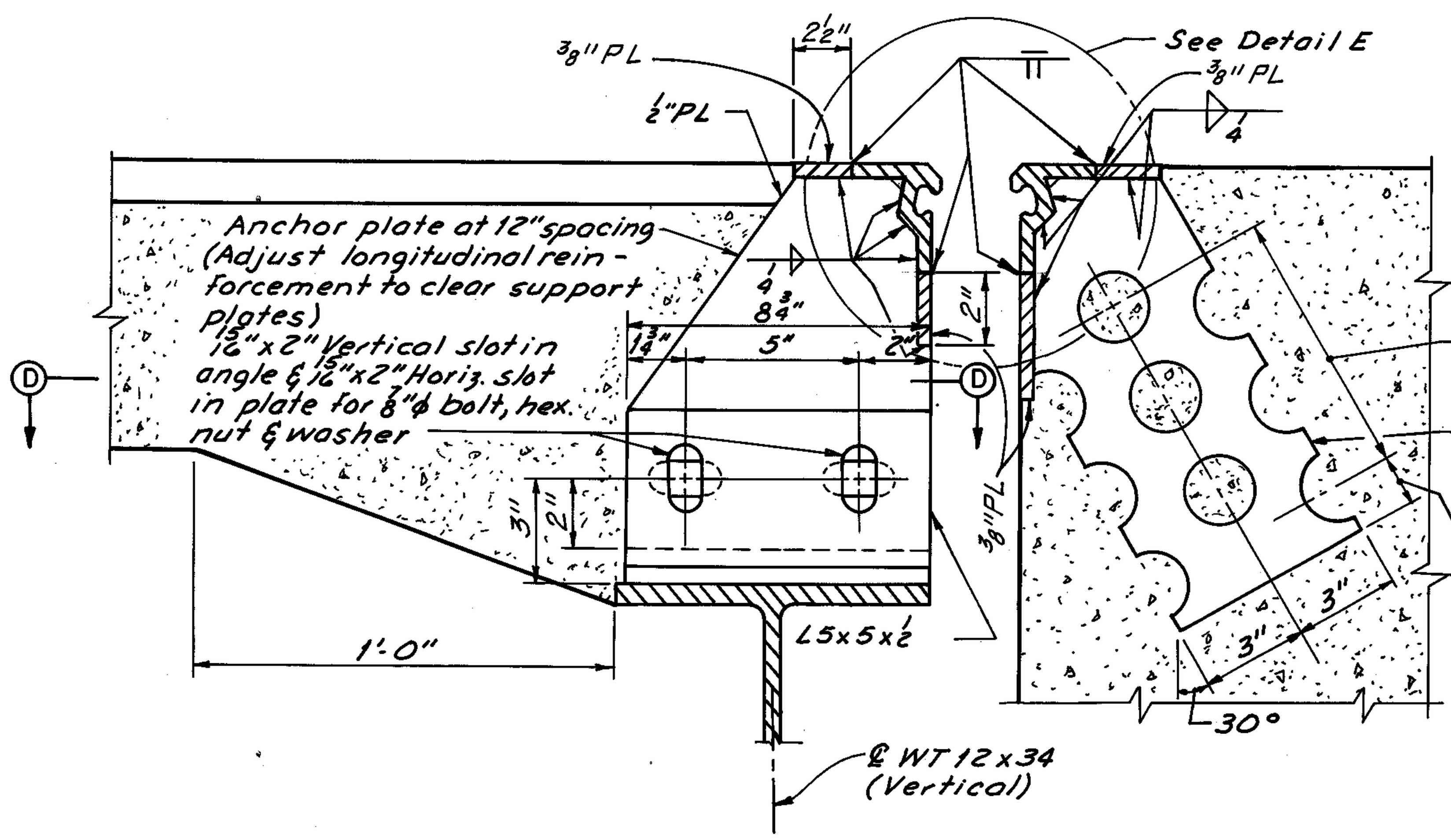
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK

GIRDER FIELD SPLICES, END DIAPHRAGM AND END CROSSFRAME DETAILS UNITS 5, 6 AND 6CB
I-290 OVER CUYAHOGA RIVER
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)
CLEVELAND CUYAHOGA COUNTY OHIO

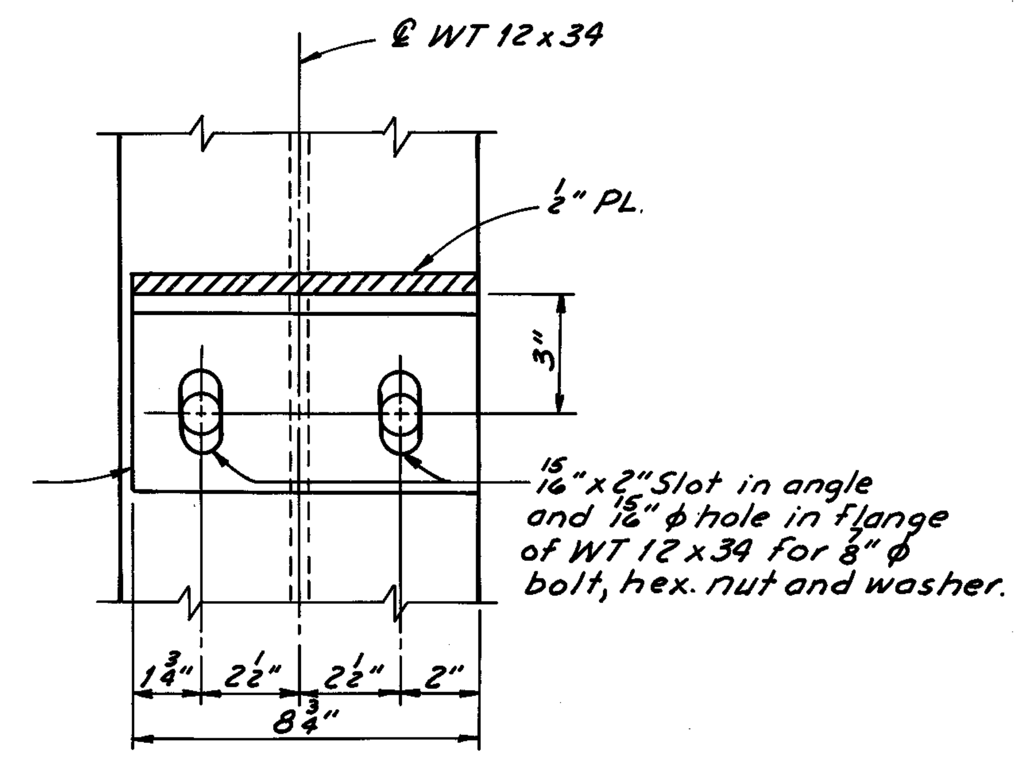
DRAWN L.J.W. DATE 12-8-69	TRACED A.J.T. DATE 12-19-69	CHECKED M.C.B. DATE 7-7-70	REVIEWED C.A.B. DATE 2-24-86	REVISED



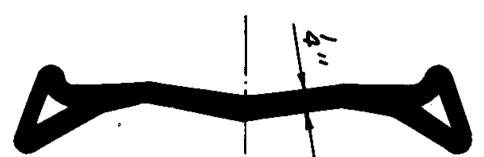
PART PLAN
(Armor Support and Anchor Plates not Shown)



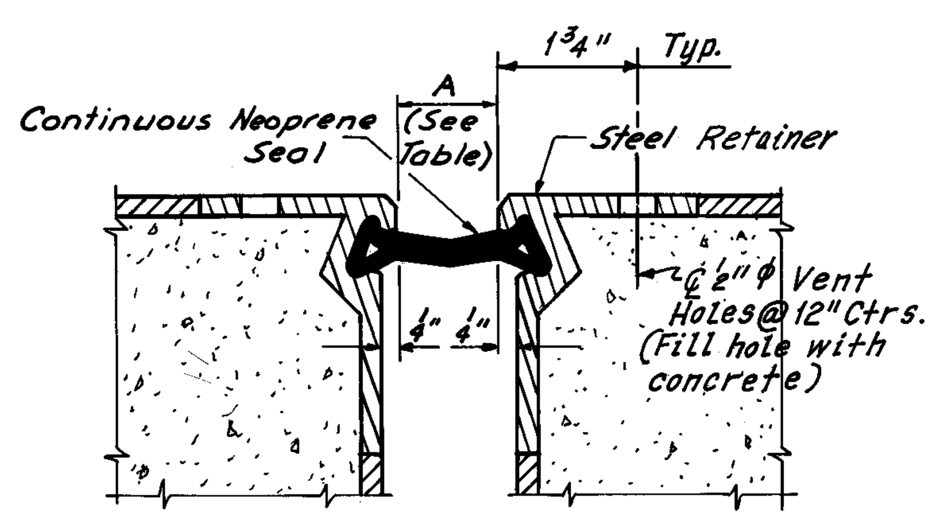
SECTION A-A
(Wabo-Acme retainers shown, D.S. Brown retainers similar)



SECTION D-D



SEAL STRIP DETAIL
(Wabo-Acme SE-300, D.S. Brown 300 or approved equal)



DETAIL E
(Wabo-Acme retainer and seal shown, D.S. Brown retainer and seal similar)
(Support details not shown)

DIMENSION A	
TEMP.	A
30°F	1⅝"
40°F	1 9/16"
50°F	1 7/16"
60°F	1⅜"
70°F	1¼"
80°F	1 3/16"
90°F	1 1/16"

Notes:

For Sections B-B, C-C and H-H, see Sheet 44/108.

Retainers, plate extension of retainers, anchor plates and anchor studs are included with Item 516, Structural Expansion Joints Including Elastomeric Strip Seals, As Per Plan, for payment.

5x5x½ Angles and ⅞"φ bolts, nuts and washers are included with Item 513, Structural Steel, for payment.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

DECK JOINT AT WEST ABUTMENT

I-290 OVER CUYAHOGA RIVER

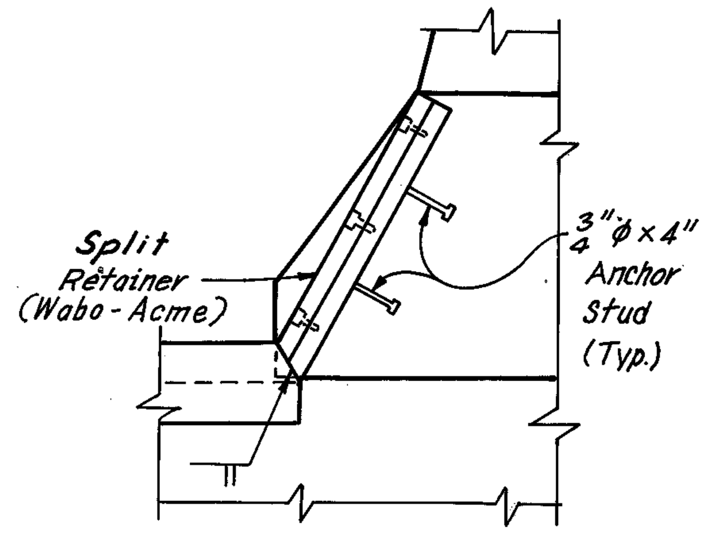
BR. NO. CUY-290-0110 — STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CUYAHOGA COUNTY — OHIO

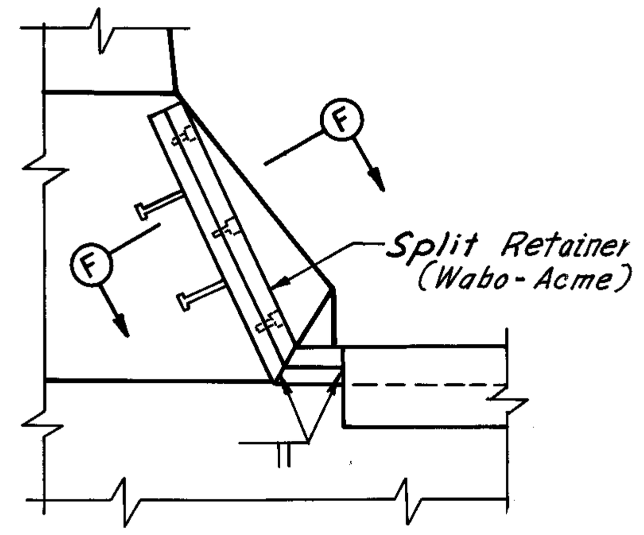
DRAWN B.B. DATE 4-25-85	TRACED R.D.J. DATE 5-7-85	CHECKED C.K.B. DATE 2-8-86	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 43/108

FHWA REGION	STATE	PROJECT	
2	OHIO		

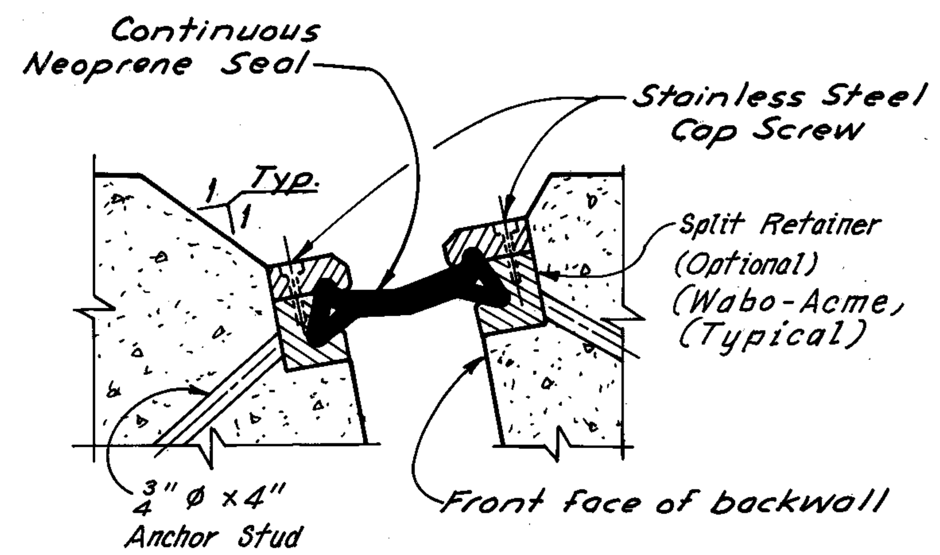
CUYAHOGA COUNTY
CUY-290-027



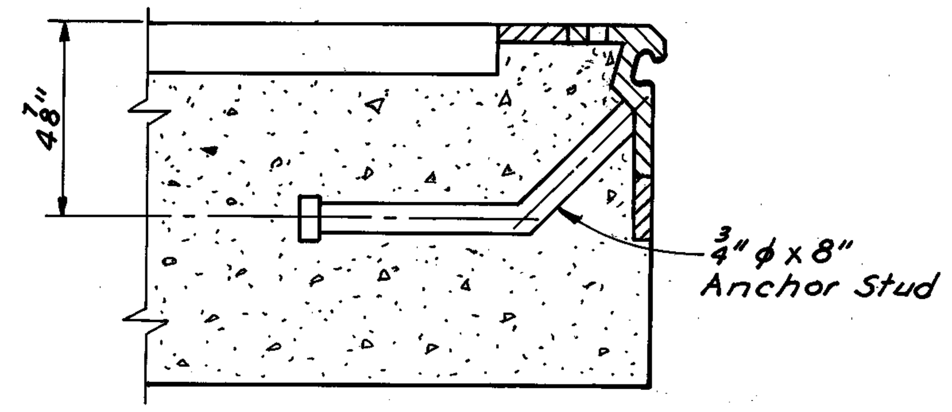
SECTION B-B



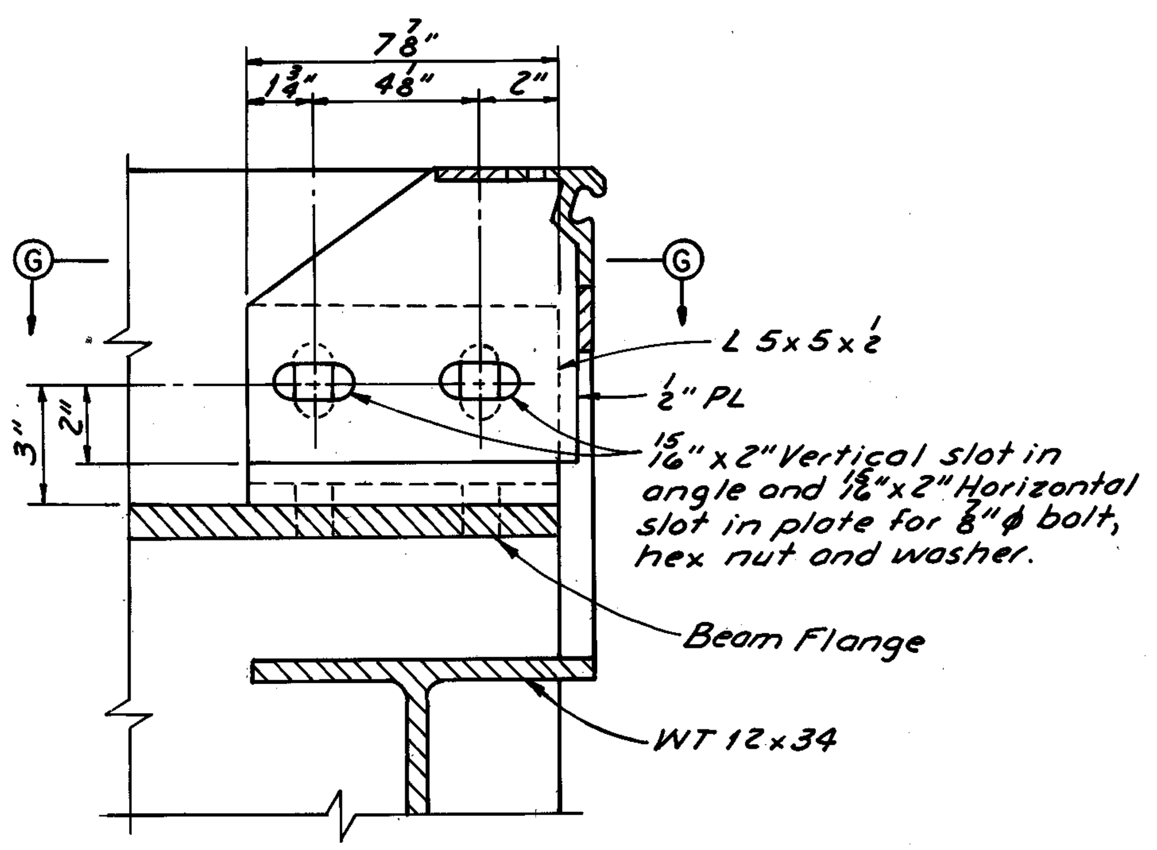
SECTION C-C



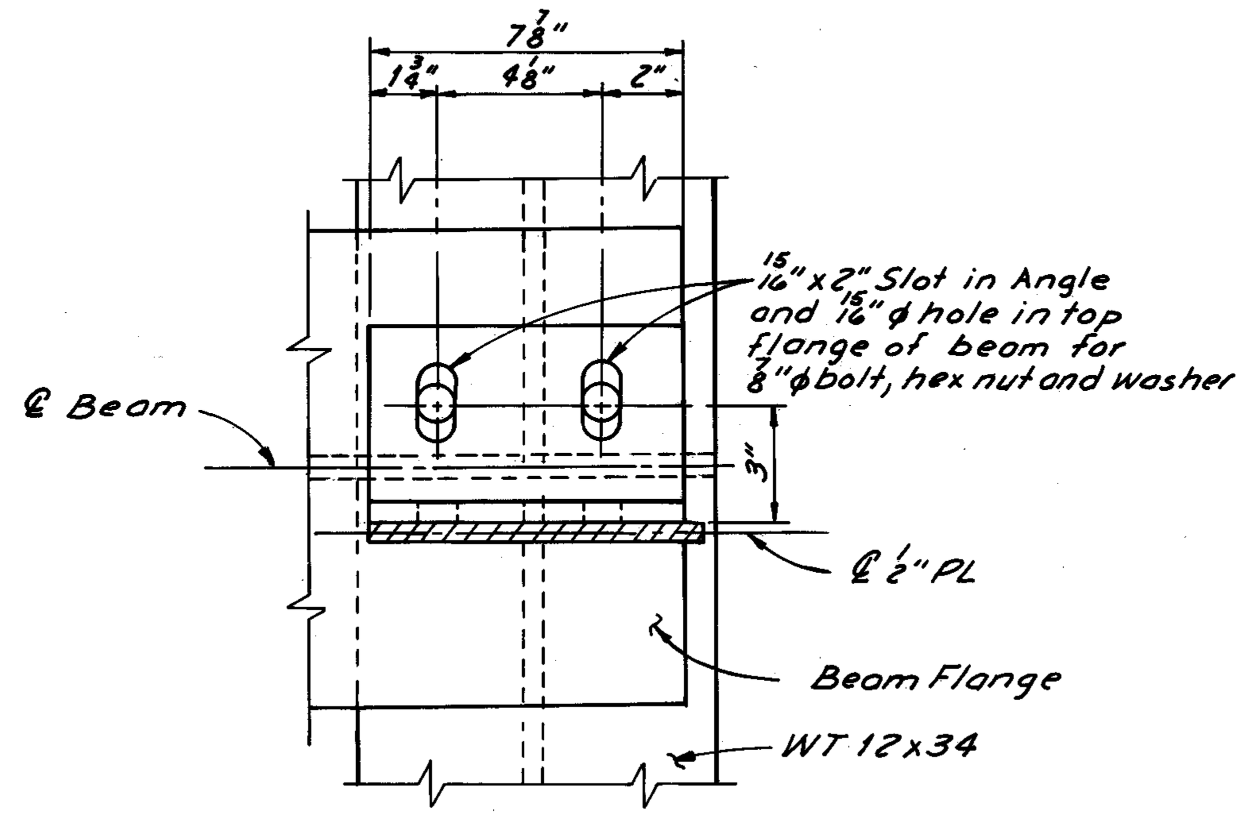
SECTION F-F
(North Parapet shown, South Parapet and Median similar)



SECTION H-H



TYPICAL SECTION



SECTION G-G

ARMOR SUPPORT DETAILS AT BEAMS

Note:
For locations of Sections B-B, C-C and H-H, see Sheet 43/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

DECK JOINT AT WEST ABUTMENT

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 — STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

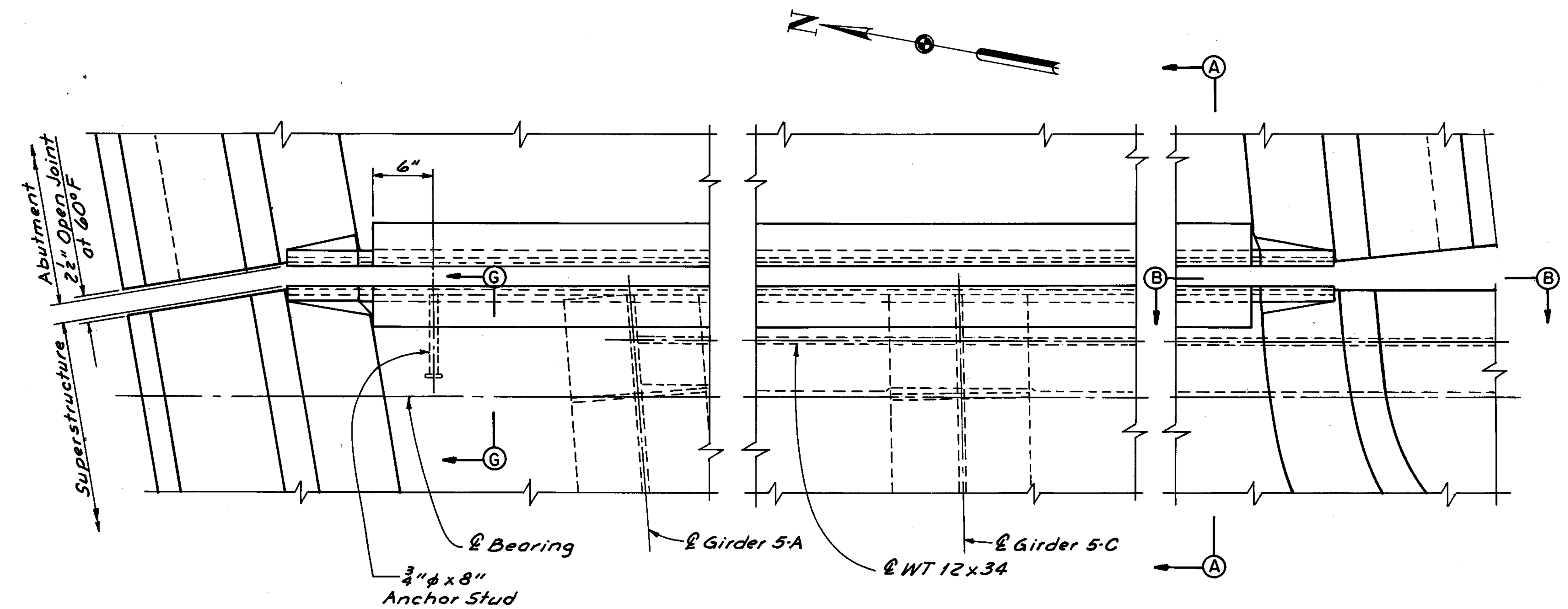
CUYAHOGA COUNTY — OHIO

DRAWN B.B. DATE 4-26-85	TRACED R.D.J. DATE 5-8-85	CHECKED C.K.B. DATE 2-8-86	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 44/108

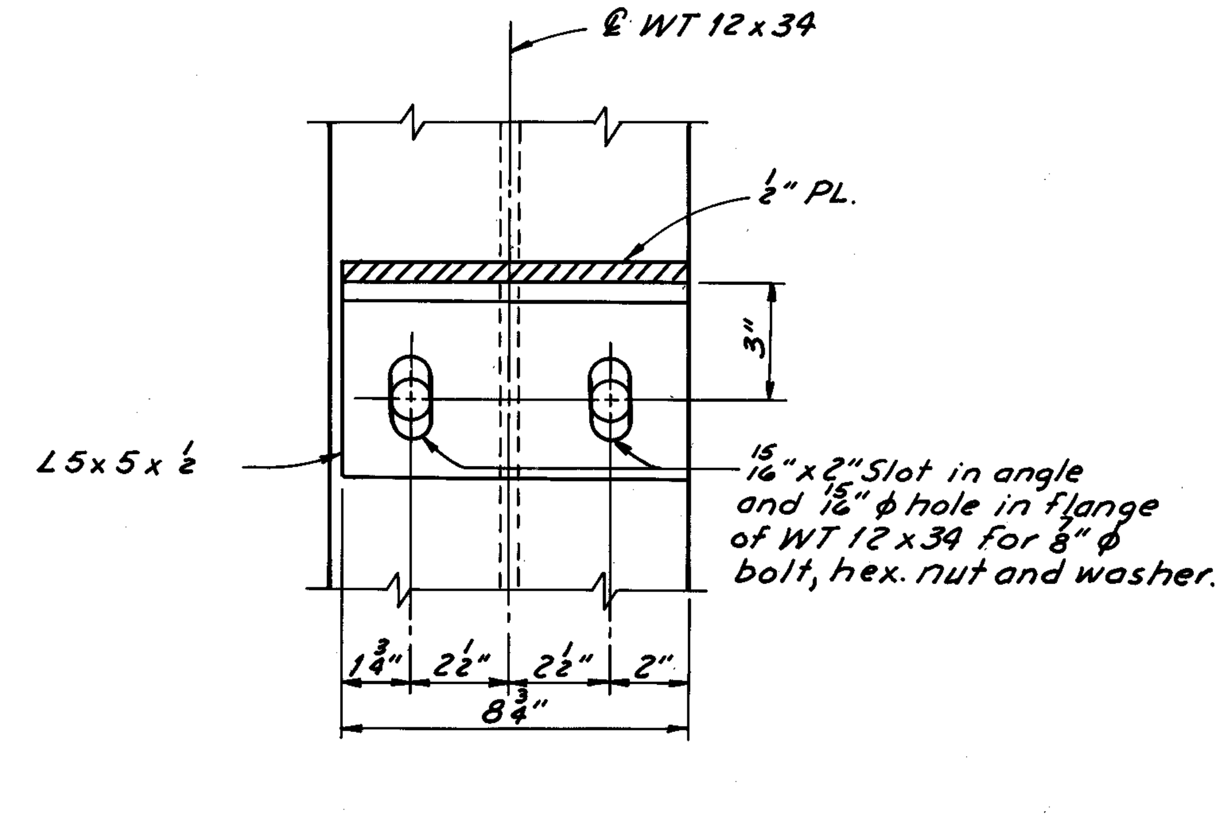
FHWA REGION	STATE	PROJECT	
2	OHIO		

130/193

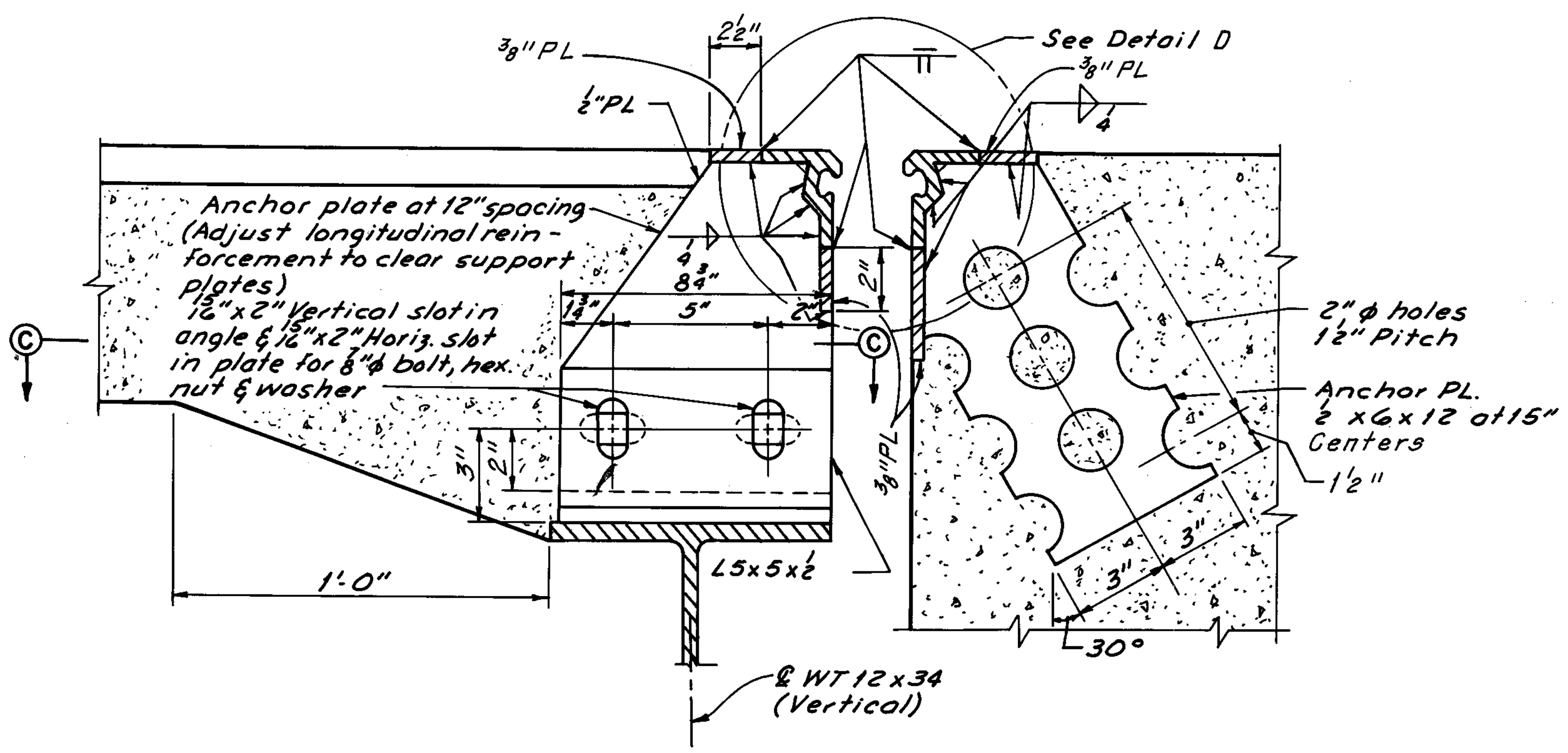
CUYAHOGA COUNTY
CUY-290-027



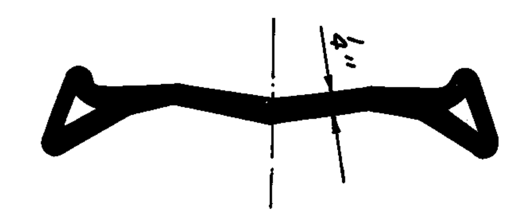
PART PLAN
(Armor support and anchor plates not shown)



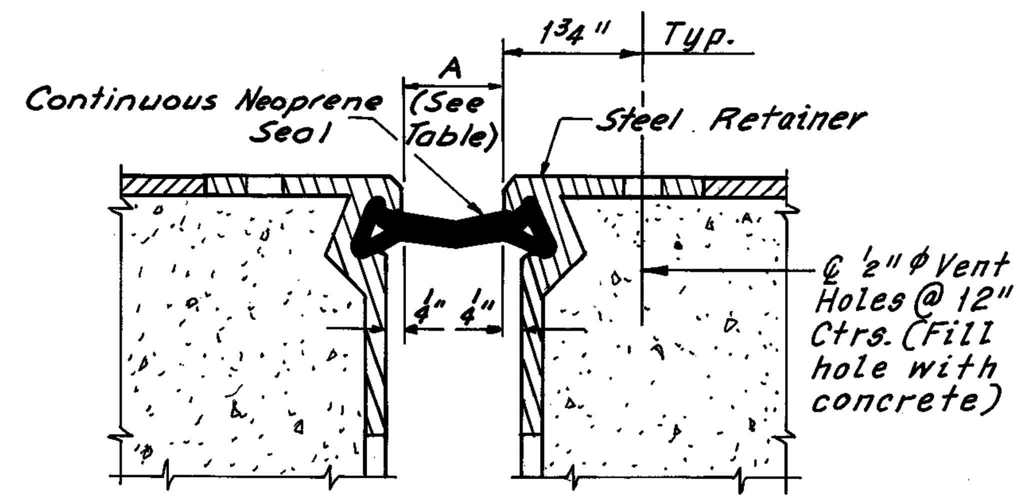
SECTION C-C



SECTION A-A
(Wabo-Acme retainers shown, D.S. Brown retainers similar)



SEAL STRIP DETAIL
(Wabo-Acme SE-400, D.S. Brown 400 or approved equal)



DETAIL D
(Wabo-Acme retainer and seal shown, D.S. Brown retainer and seal similar)
(Support details not shown)

DIMENSION-A	
TEMP.	A
30°F	2⅜"
40°F	2⅜"
50°F	2 3/16"
60°F	2"
70°F	1¾"
80°F	1⅝"
90°F	1⅜"

Notes:
For Sections B-B and G-G, see Sheet 46/108.
Retainers, plate extension of retainers, anchor plates and anchor studs are included with Item 516, Structural Expansion Joints Including Elastomeric Strip Seals, As Per Plan, for payment.
5x5x½ Angles and ⅞" φ bolts, nuts and washers are included with Item 513, Structural Steel, for payment.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

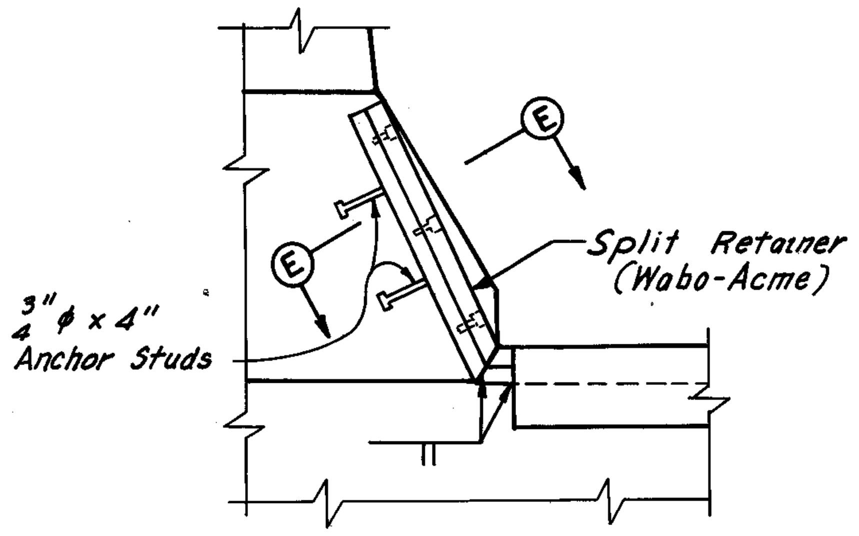
DECK JOINT AT ABUTMENT B-C

I-290 OVER CUYAHOGA RIVER

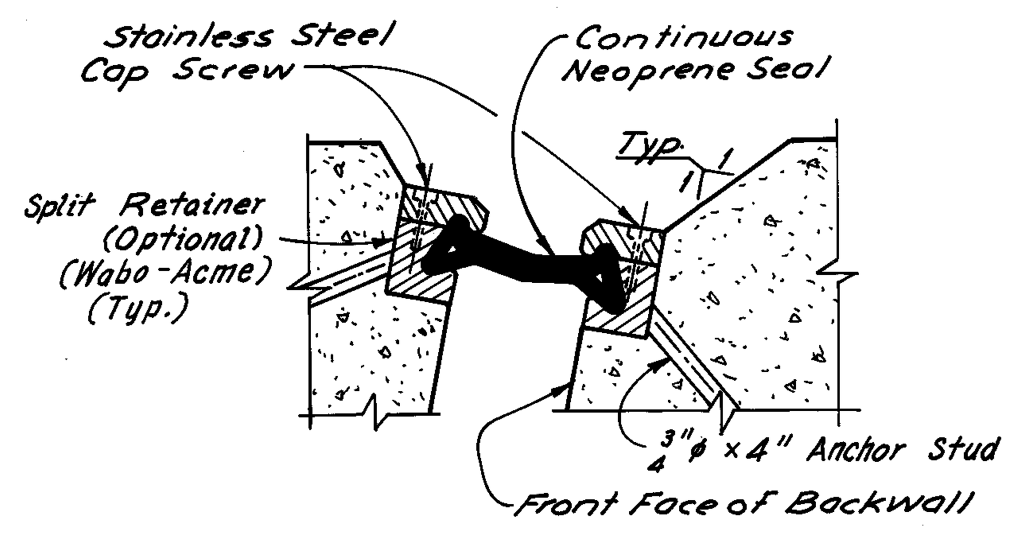
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CUYAHOGA COUNTY OHIO

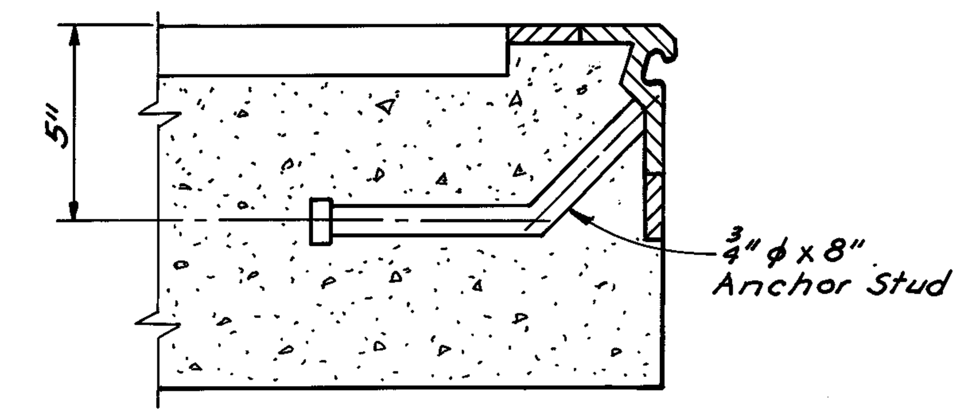
DRAWN B.B. DATE 5-1-85	TRACED R.D.J. DATE 5-13-85	CHECKED C.K.B. DATE 2-8-86	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 45/108



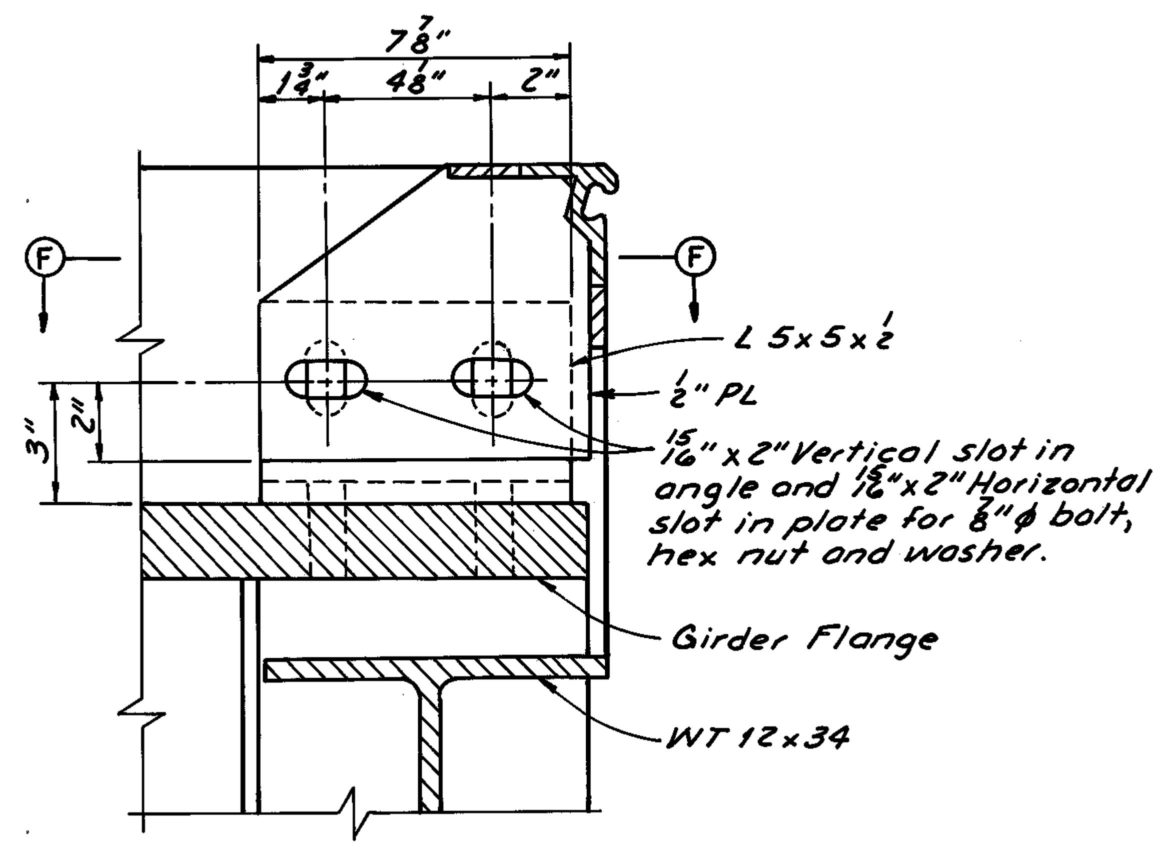
SECTION B-B



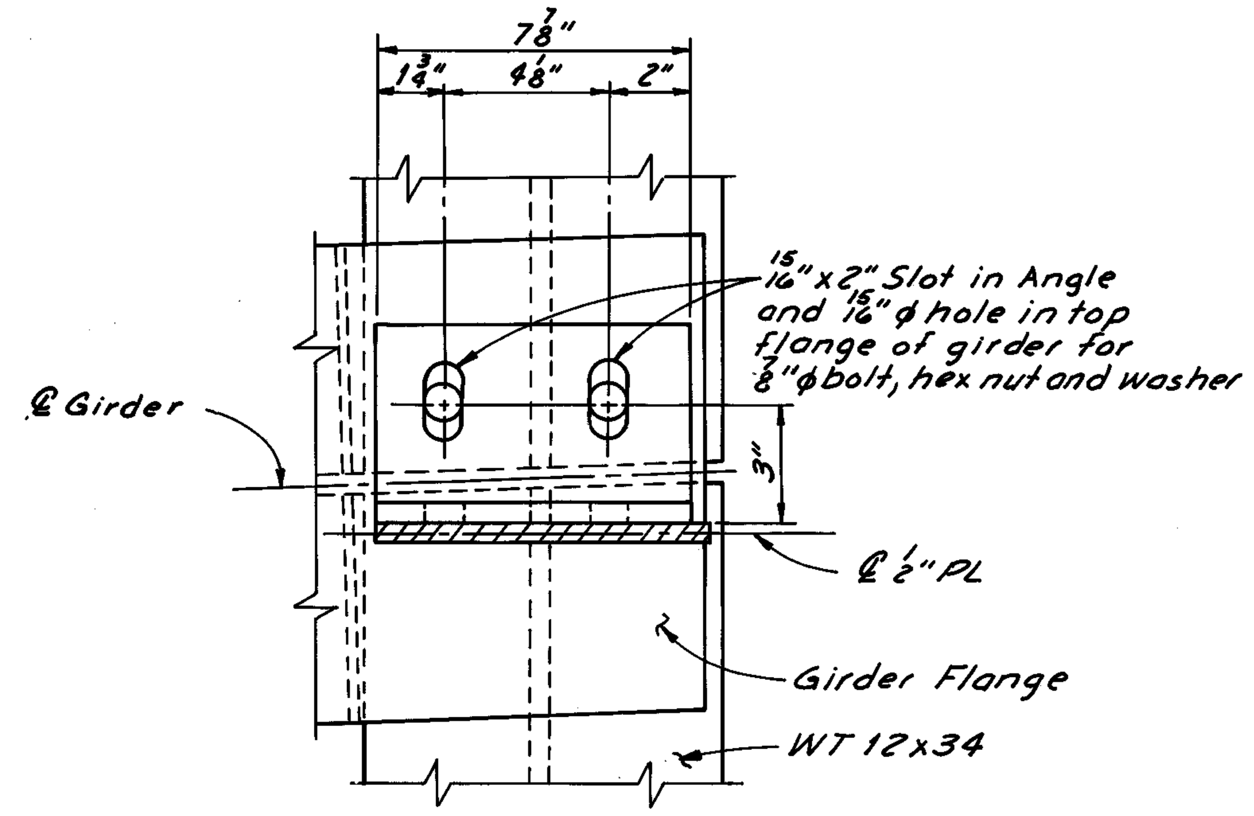
SECTION E-E



SECTION G-G



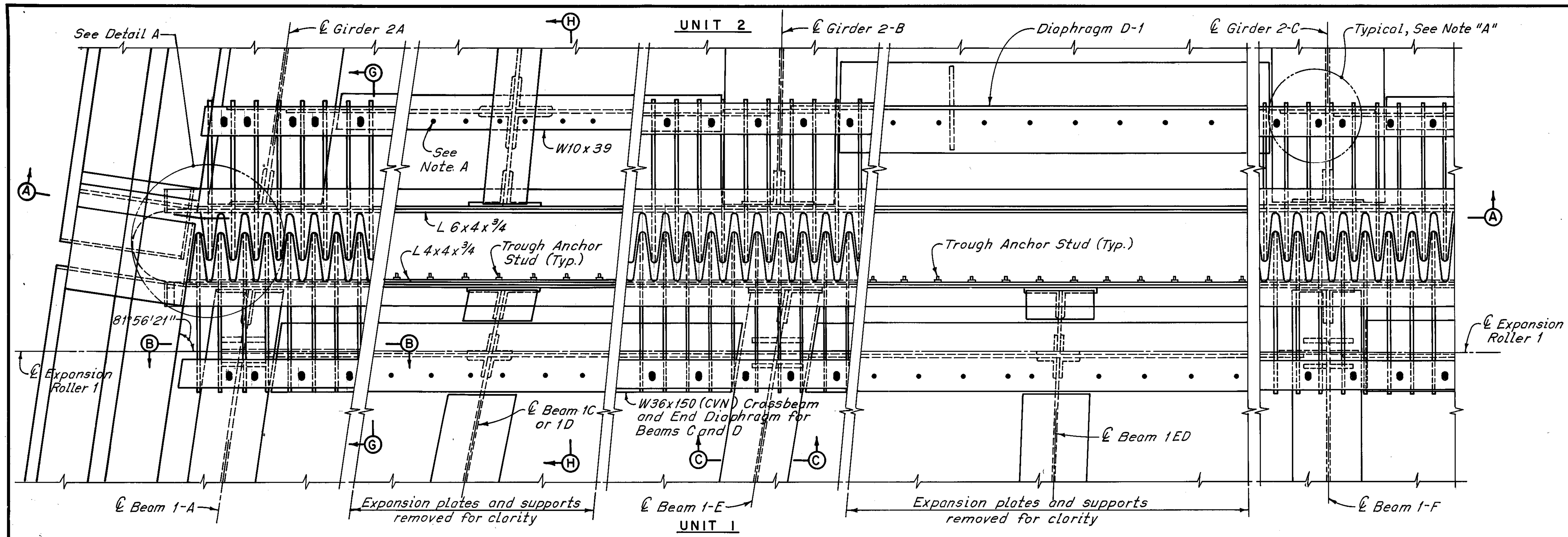
TYPICAL SECTION



SECTION F-F

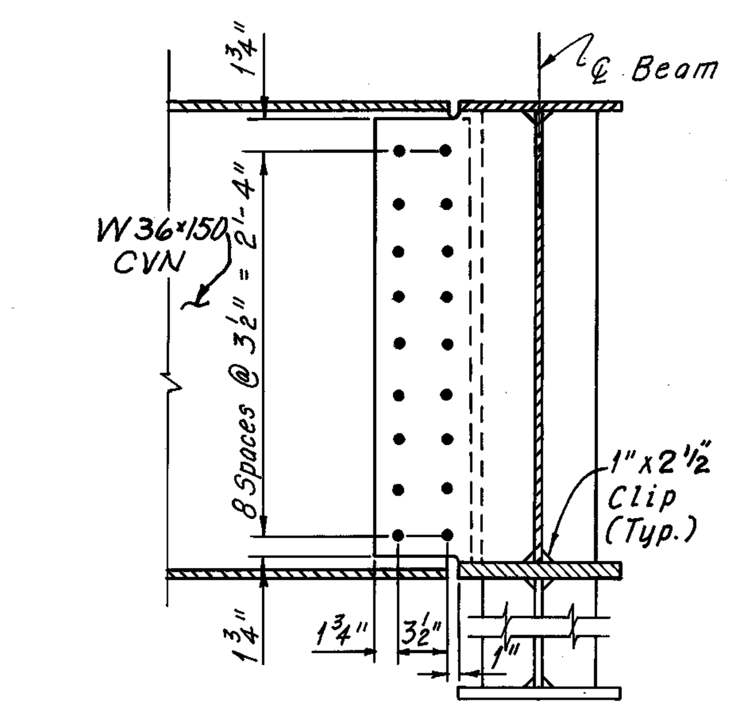
ARMOR SUPPORT DETAILS AT GIRDERS

Note:
For locations of Sections B-B and G-G, see Sheet 45/108.

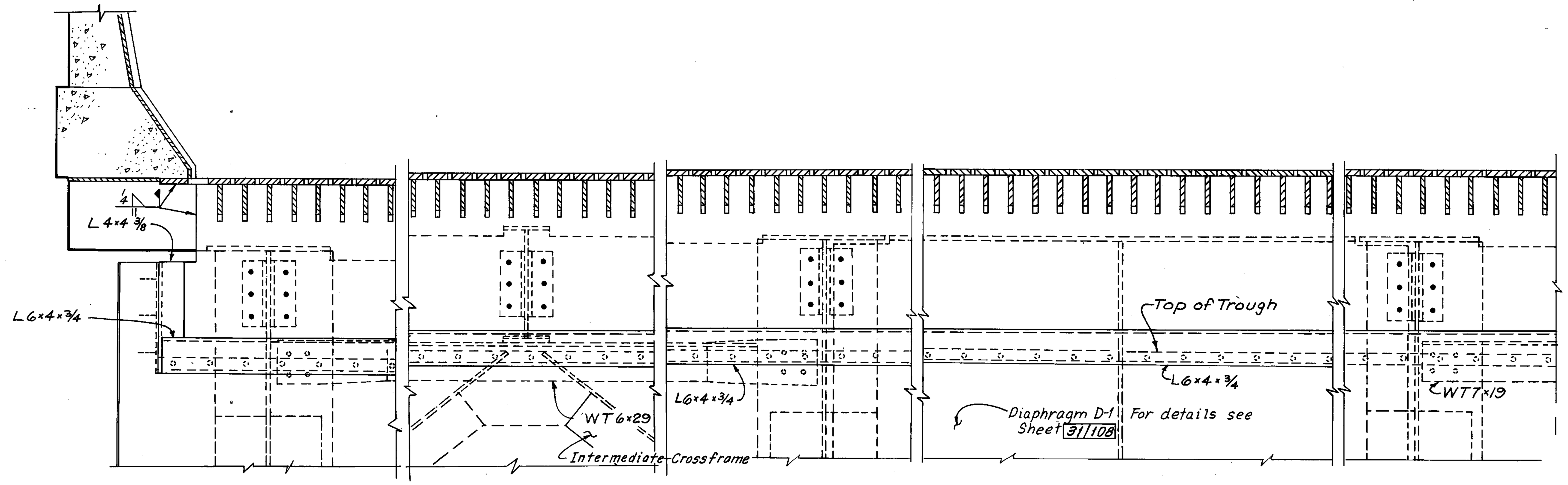


PART PLAN

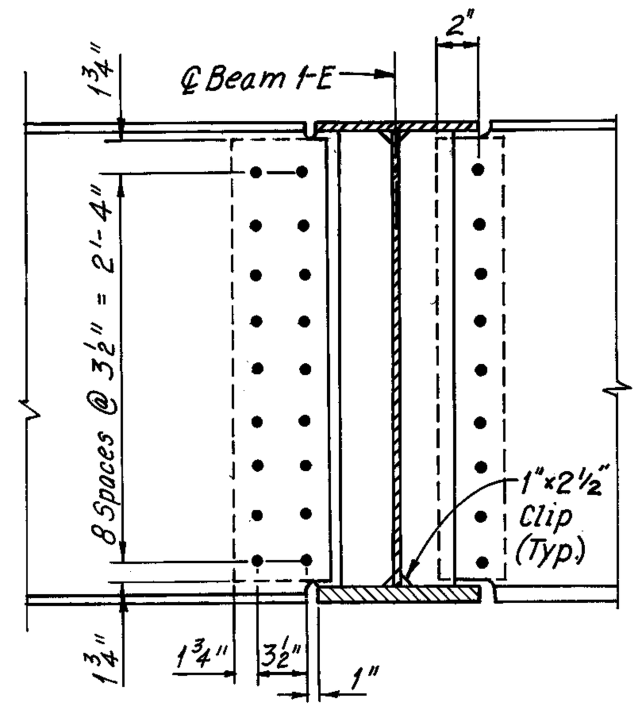
Note "A": A325 bolts shall be provided at 8" centers between alternating rib plates. Respace bolts as required for trough cleanout plate and for edge distance or clearance with 12" maximum and 4" minimum spacing to provide required number of bolts. For Trough Cleanout Plate Details see Sheet 54/108



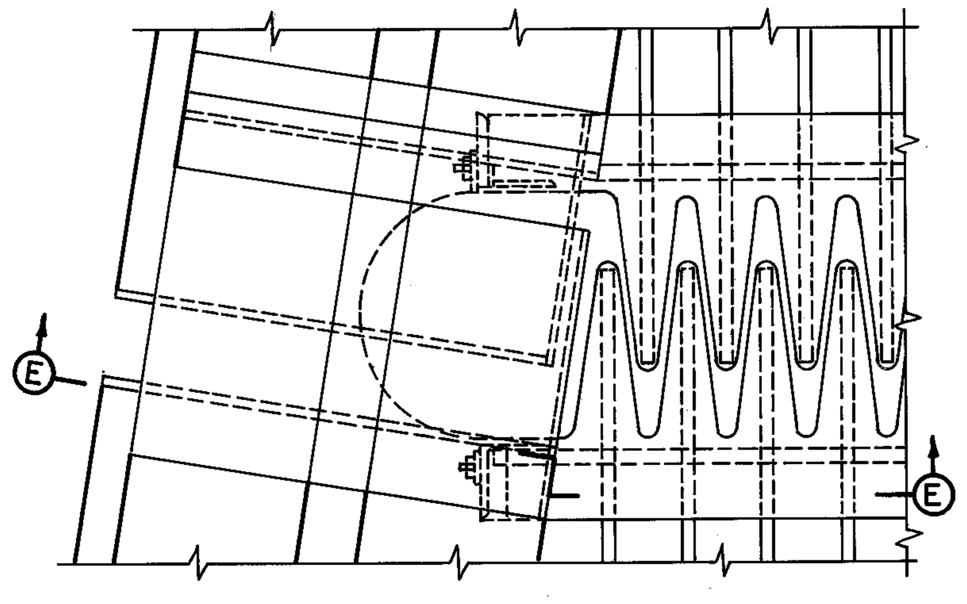
PART SECTION B-B



SECTION A - A



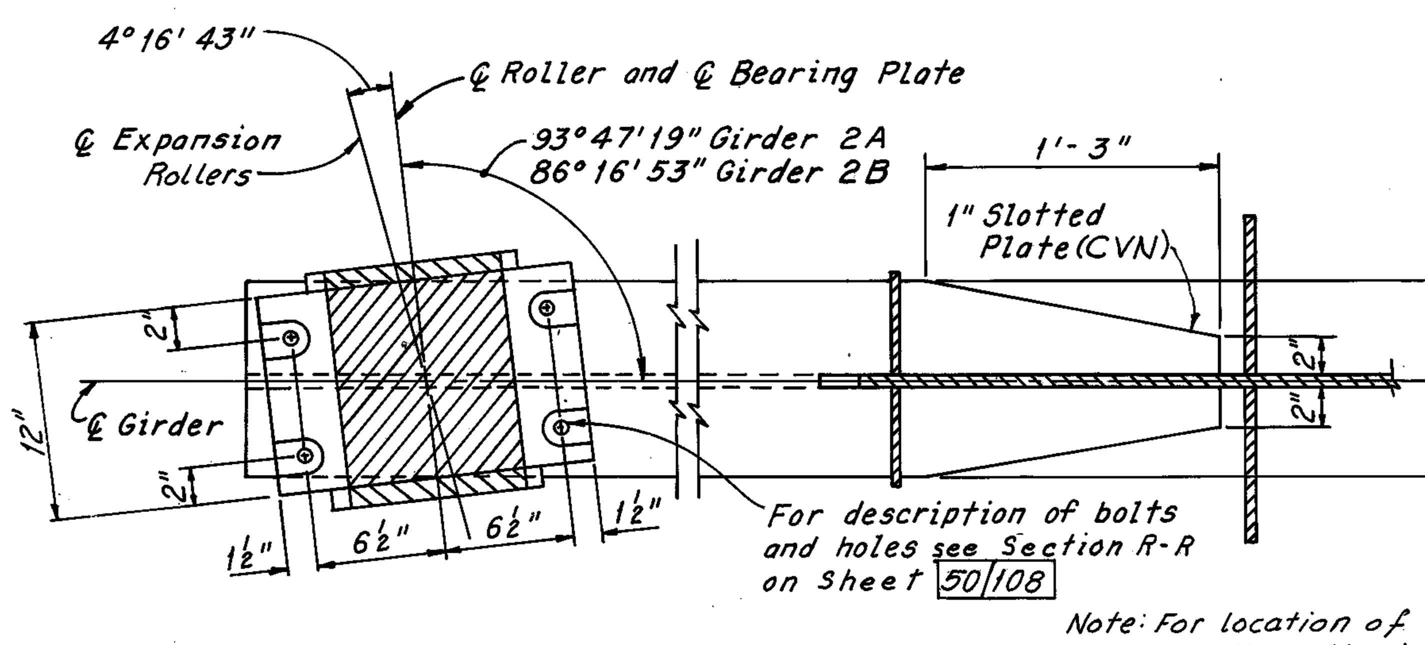
PART SECTION C-C



DETAIL A

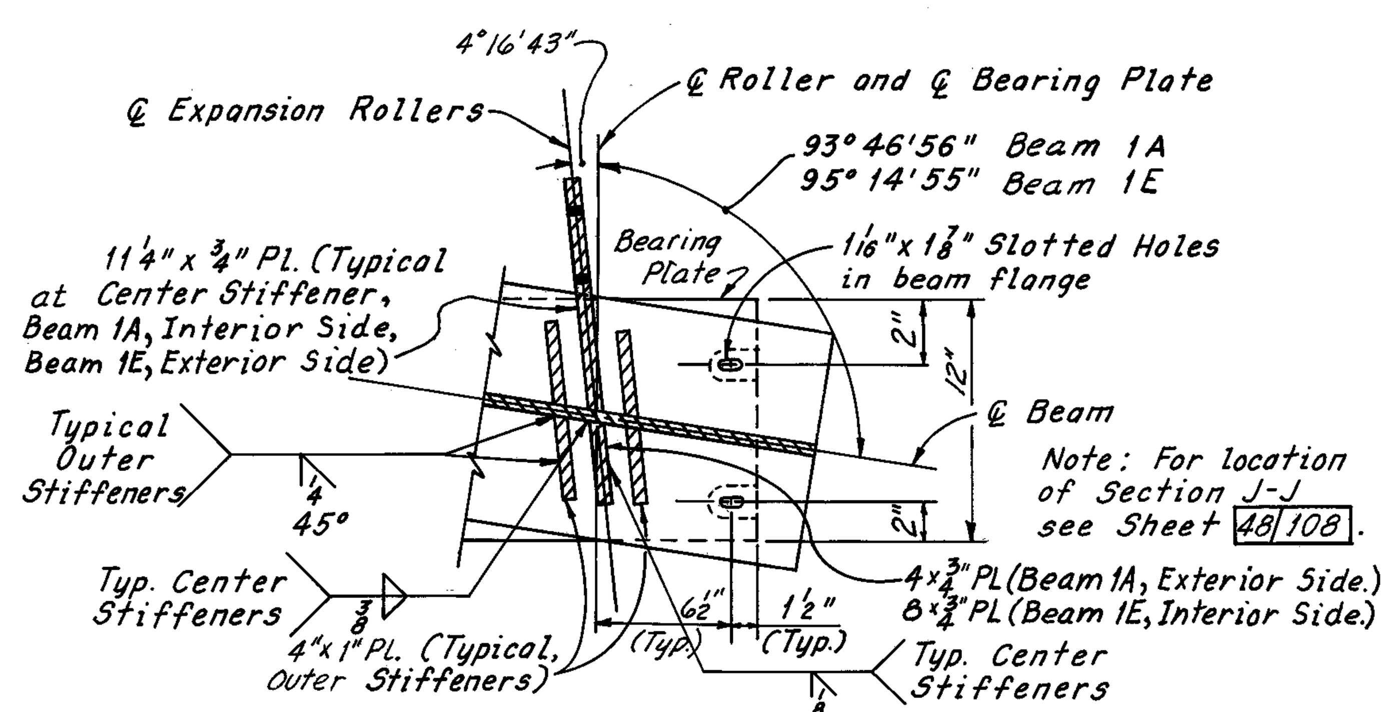
For additional curb and parapet details at Expansion Joints see Section C-C and D-D on Sheet 49/108.

Notes:
Work Sheets 47/108 and 48/108 together.
For Roller Details see Sheet 50/108.
For additional drainage trough details at Expansion Joint see Sheet 69/108.

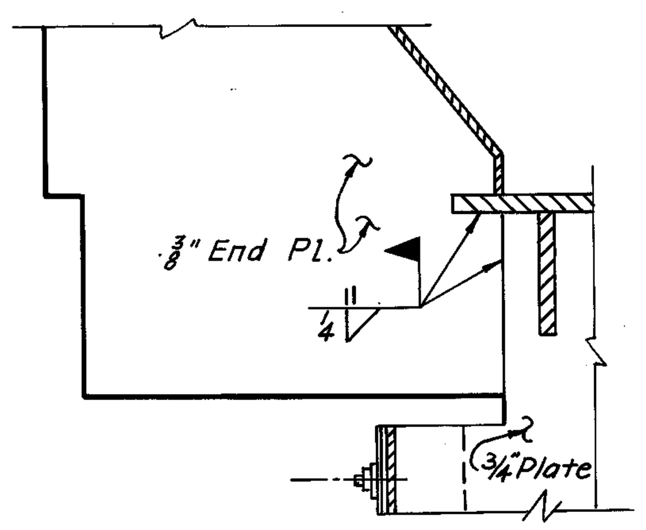


Note: For location of Section K-K see Sheet 48/108.

SECTION K - K
(Typical Girders 2A and 2B)



SECTION J - J
(Typical at Beam 1A and 1E)



SECTION E - E

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

EXPANSION JOINT I

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S. DATE 12-14-69	TRACED C.P. DATE 12-24-69	CHECKED L.J.W. DATE 3-17-70	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 47/108

FED. RD. DIVISION 2 | STATE OHIO | PROJECT
133/193
CUYAHOGA COUNTY
CUY-290-0.27
UNIT 2
℄ Girder
See Note "A"
℄ Girder 2-M
W18×46
W10×39
L6×4×3/4
L4×4×3/4
Optional Butt Joint in Expansion Joint (Typical at Interior Girders or Beams)
Trough Anchor Stud (Typ.)
℄ End Diaphragm for Beams G,J, L,N,R,T,V,X and ℄ Cross Beam (W36×150) (CVN)
℄ Expansion Rollers
See Note "A"
℄ Beam 1-Y
℄ Beam (Typical) W36×135 or W36×150(CVN)
Expansion plate and supports omitted for clarity
UNIT 1L AND 1R
PART PLAN
Note "A": A325 bolts shall be provided at 8" centers between alternating rib plates. Respace bolts as required for trough cleanout plate and for edge distance or clearance with 12" maximum and 4" minimum spacing to provide required number of bolts. For Trough Cleanout Plate Details see Sheet 54/108
Edge bar
6"
Top of Trough
WT 7×19
Intermediate Crossframe
SECTION D-D
Note: "B:
After deck concrete has been placed in adjacent spans and up to the deck joint bulkheads, adjust the expansion joint plates with respect to the supporting stringers and roadway surface. Then place remainder of deck concrete between bulkheads. Latex Modified Concrete at bulkheads will be measured by volume in cubic yards and shall be paid for at the contract unit price bid for Latex Modified Concrete ~~Overlay (Variable Thickness)~~ As Per Plan.
L 4×4×3/8
1"×2½"Clip (Typ.)
2" (Typ.)
SECTION F-F
1"φ High Strength Bolt (Typical)
1½" Min. Clear
W10×39
W18×46
L6×6×3/8
SECTION P-P
(Crossframe and 1"φ bolts thru (W18×46 flange not shown)
℄ 1"φ Bolt
C15×33.9
11¼"×¾" Pl. at Beams 1P,Q&Y
℄ Beam
SECTION M-M
℄ 1"φ High Strength Bolt (Typical)
W10×39
1"φ High Strength Bolts
Intermediate Stiffener
C15×33.9
SECTION L-L
(At Girders 2G, H and M)
Normal to ℄ Expansion Joint 1
℄ Stiffener Pl.
Latex Concrete
1'-6¾"
1'-1½"@60°F.
Rib cut from 6"×¾" Pl. under each tooth
1"φ A325 Bolts @ 8" Centers with 4 Hex. nuts. Two lower nuts to be self-locking (Typical)
Construction Joint (Typ.)
Expansion Joint Crossbeam W36×150(CVN)
W10×39
Field drill holes in web after adjustment (Typical)
L7×4×3/8 (Typ.)
Shop web splice
L6×4×3/4
Neoprene Trough
Beams A,E,F,H,K, M,P,Q,S,U,W and Y
Bearing Pl. Level (Typ.)
* ℄ Expansion Roller (Vertical @ 60°F.)
Pl. 6×3/8
3/8" Web Pl.
Notch Stiffener Pl. to provide for 1" Slotted Pl.
3/8" Web Plate
6'-0"
*Intersect ℄ Stiffeners at bottom of Unit 1 Beam and at bottom of 1" Slotted Flange Plate.
Longitudinal Stiffener Pl. (See Girder Details)
Haunch on Beams A and Y to match girder depth in Unit 2. See Haunch Details on Sheet 26/108
Pl. 6×3/8
5"×1" Pl. (For weld designations see Section J-J)
SECTION G-G
Note: Dimensions are measured parallel and perpendicular to grade.
5×¾ Pl. (Typical)
Laytex Concrete
2'-0"(Typ.) Deck Joint Bulkhead (See Note B)
Expansion Pl.
Provide ½"×½" Clips in 24"×¾" Pl. at Ribs
Slot plates at Ribs
Construction Joint (Typ.)
1"φ High Strength Bolts (Typical)
L4×4×3/8 (Typical)
Field drill web and ream holes after adjustment. (Typical)
5/8" Pl.
24"×¾" Pl.
L4×4×3/4
L6×4×3/4
L7×4×3/8 (Typ.)
L6×6×3/8
W10×39
Fill Pl. as required
Neoprene Trough
Beams C,D,G,J,L, N,R,T,V and X
W36×150(CVN) (Typical)
Cope Stringer Web R=3" (Typical)
Notes: Concrete haunch shall not be placed under stringer or girder flanges.
a = 0°00'00" Girders 2C thru 2H; 0°21'29" Girder 2J; 0°42'58" Girder 2K; 1°04'27" Girder 2L; 1°25'55" Girder 2M
℄ Roller and ℄ Bearing Plate
90° (Typical)
1'-3"
1" Slotted Plate (CVN)
℄ Girder
12" (Typical)
6½" 6½"
1'-4"
For description of bolts and holes see Section R-R on Sheet 50/108
℄ Expansion Rollers
SECTION K-K
(Typical, Girders 2C thru 2M)
W10×39
Clip flange near side as required to clear leg of crossframe tee at Girder A for Expansion Joint 3 and Unit 3 side of Expansion Joint 2
10" 10"
45°
Stiffeners to match bottom flange when flange width is less than 20"
1"×2½"Clip (Typ.)
SECTION N-N
(Crossframe and 1"φ bolts thru girder flange not shown)
Notes:
Work Sheets 47/108 and 48/108 together.
For Roller and Bearing Plate Details see Sheet 50/108.
For Curb and Parapet Details see Section C-C, D-D and E-E on Sheet 49/108.
For additional drainage trough details at Expansion Joint see Sheet 69/108.
SECTION H-H
8"×¾" Pl. (Typ. center stiffener except as noted)
4"×¾" Pl. (Exterior side of Beams 1-P and 1-Q)
11¼"×¾" Pl. (Exterior side of Beam 1-Y)
Typical Center Stiffener
Typical Outer Stiffener
Typical Center Stiffeners
℄ Beam
4"×1" Pl. (Typical)
1⅛"×1⅞" Slotted holes in beam flanges
℄ Roller and ℄ Bearing Plate
℄ Expansion Rollers
a (See Section K-K)
90° (Typical)
SECTION J-J
(Typical at Beams 1F thru 1Y, which are supported on roller)
℄ Expansion Rollers
4" 9" 3½"@4"
Optional Butt Joint at Interior Girder
2"×1¼" Slotted Holes (Typical)
8" Typical, except as noted (See Note "A")
℄ Cross Beam
See Expansion Pl. Tip Detail, Sheet 49/108
Expansion Plates cut from 17⅛"×¾" plate ⅛" Kerf and grind edges smooth
EXPANSION PLATE DETAIL
(Expansion Joint 1L and 1R)
Revised 12-24-86
H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS KANSAS CITY CLEVELAND NEW YORK
EXPANSION JOINT I
I-290 OVER CUYAHOGA RIVER
BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)
CLEVELAND CUYAHOGA COUNTY OHIO
DRAWN D.H.S. DATE 12-8-69 | TRACED C.P. DATE 12-16-69 | CHECKED L.J.W. DATE 2-27-70 | REVIEWED C.A.B. DATE 2-24-86 | REVISED
SHEET 48/108

Note "A": A325 bolts shall be provided at 8" centers between alternating rib plates. Respace bolts as required for trough cleanout plate and for edge distance or clearance with 12" maximum and 4" minimum spacing to provide required number of bolts. For Trough Cleanout Plate Details see Sheet 54/108.

Note "B": Cantilever C15x33.9 from exterior girders to curb line at the north and south median curbs at Expansion Joint 2 and north curb and south median curbs at Expansion Joint 3.

Note: For Section F-F see Sheet 50/108

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

EXPANSION JOINTS 2 AND 3 L AND R

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110

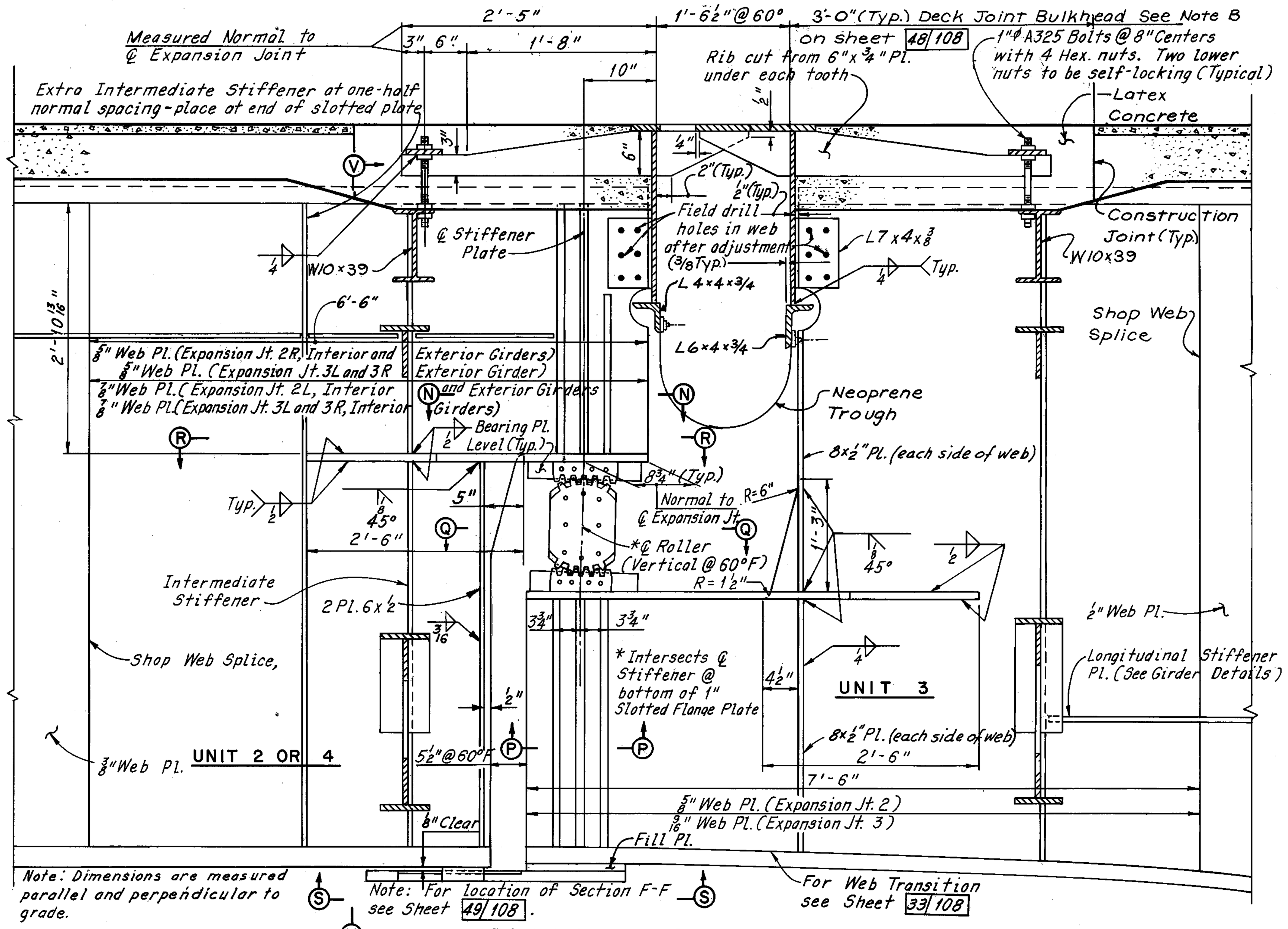
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S. DATE 11-12-69	TRACED C.P. DATE 12-3-69	CHECKED L.W. DATE 3-25-70	REVIEWED C.A.B. DATE 2-24-86	REVISED

SHEET 49/108

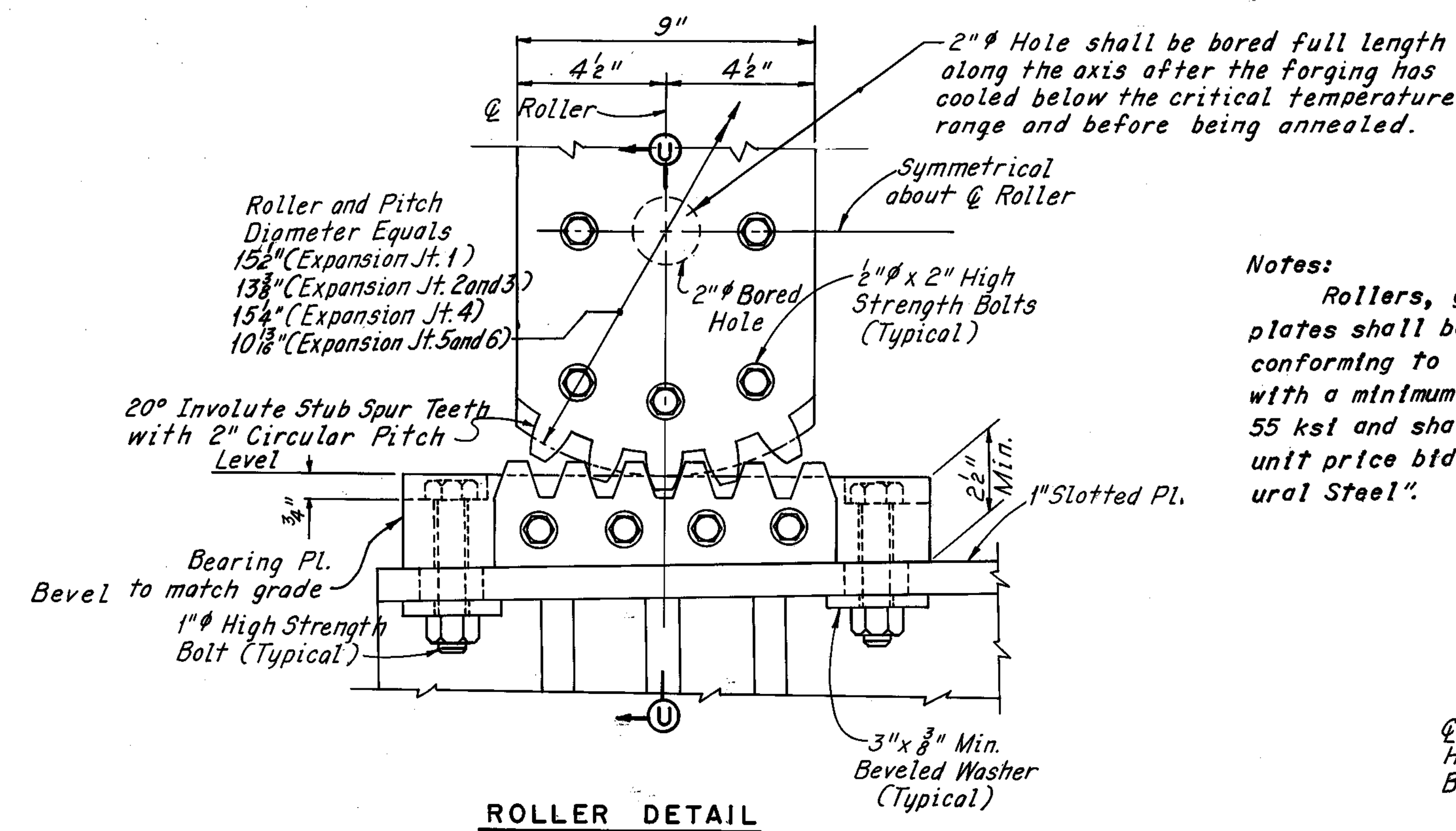
CUYAHOGA COUNTY
CUY-290-0.27



Note: Dimensions are measured parallel and perpendicular to grade.

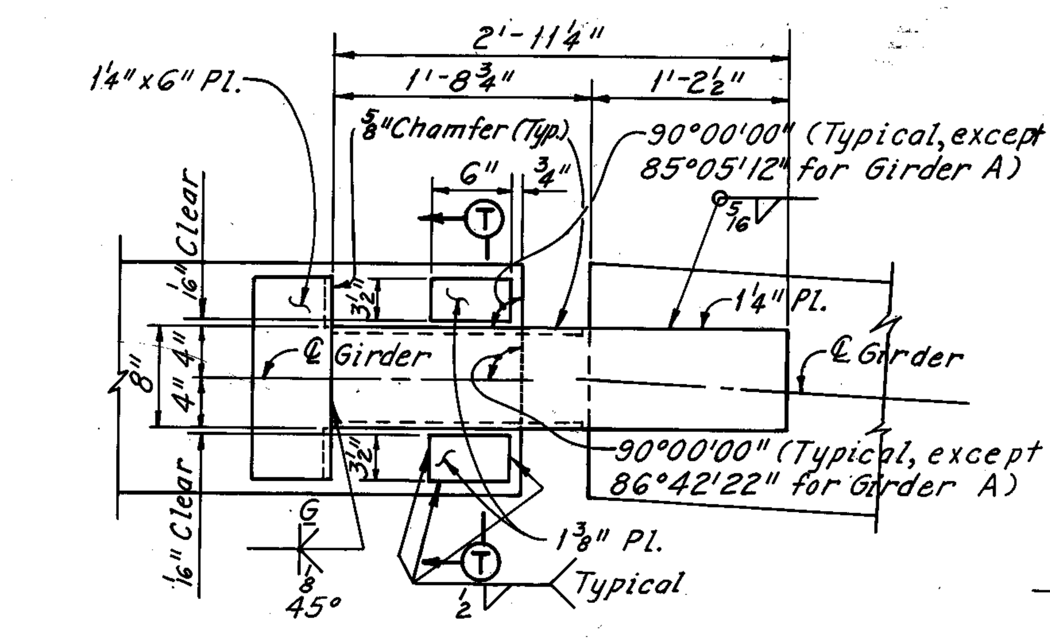
Note: For location of Section F-F see Sheet 49/108.

SECTION F - F
(Looking North at Expansion Joint 2 and Looking South at Expansion Joint 3)



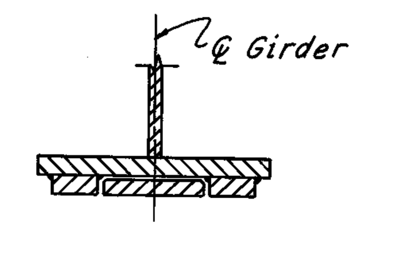
ROLLER DETAIL

Notes:
Rollers, gear plates and bearing plates shall be alloy steel forgings conforming to A668, Class H with a minimum yield strength of 55 ksi and shall be paid for at the unit price bid for Item 513 "Structural Steel".

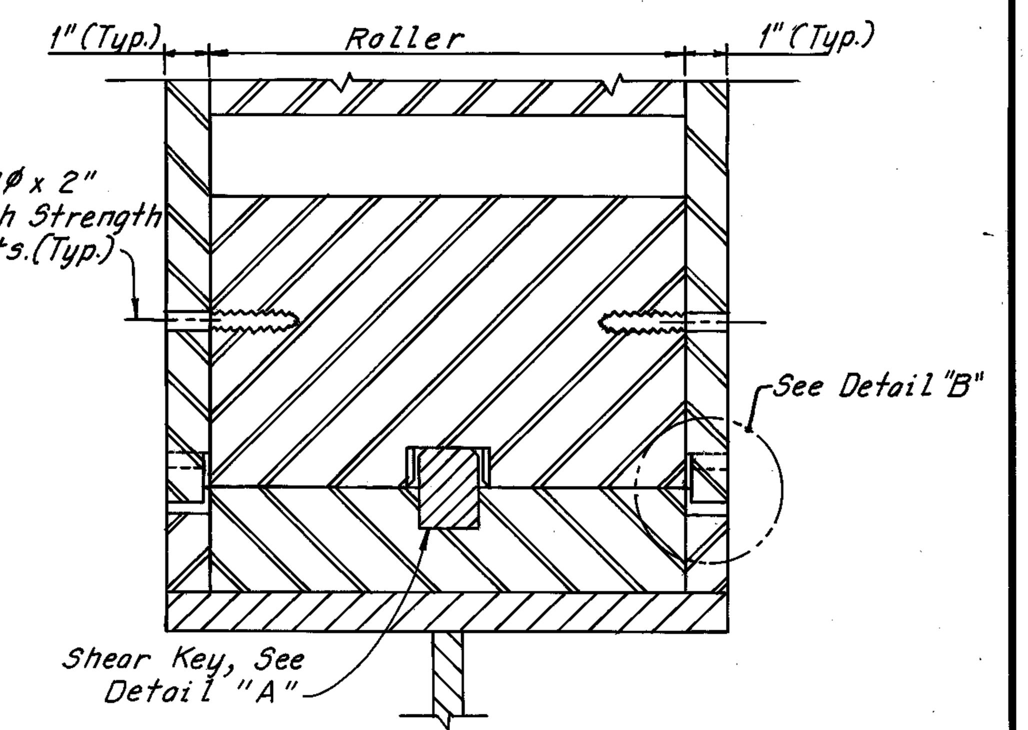


VIEW S-S

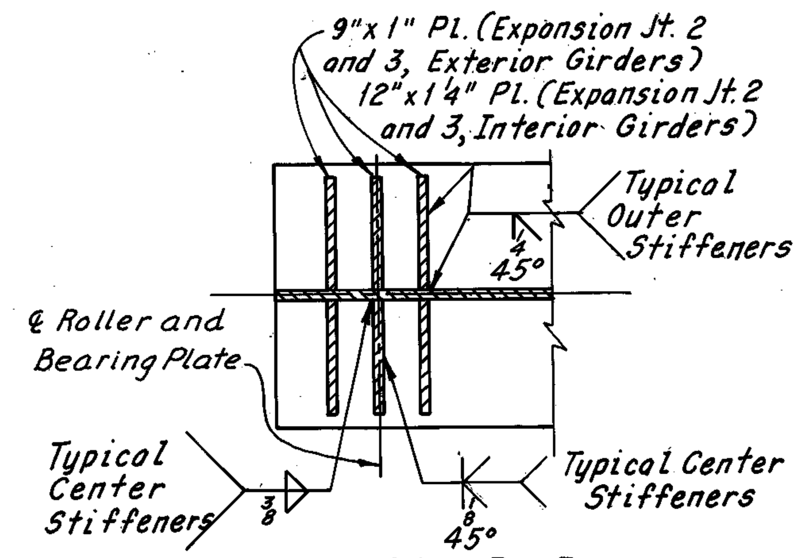
Note: For location of angles with respect to ℄ Roller and Bearing Plate, ℄ Expansion Rollers and ℄ Girders, see Sections Q-Q and R-R.



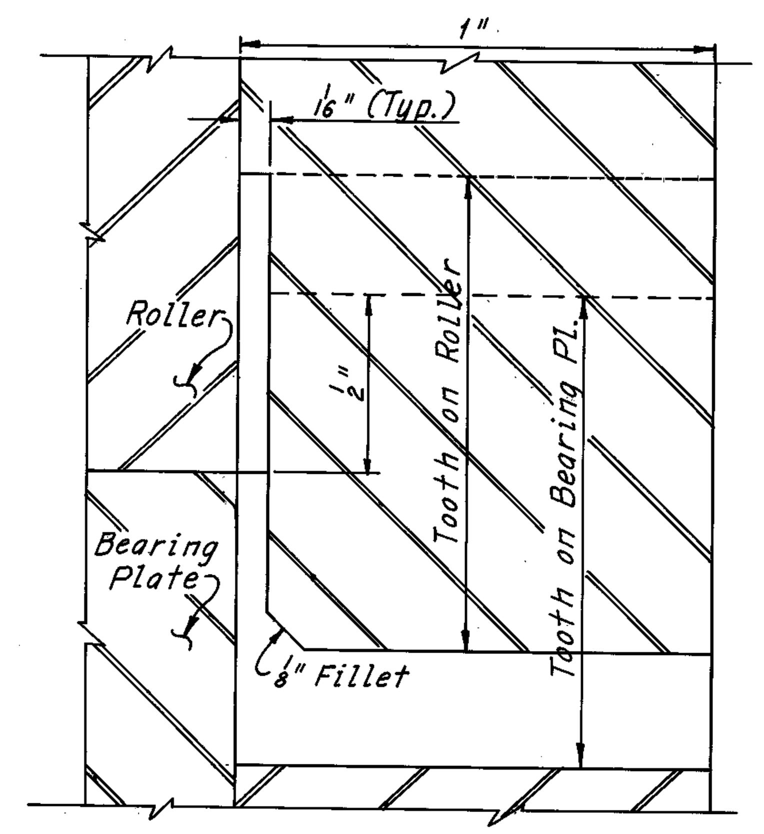
SECTION T-T



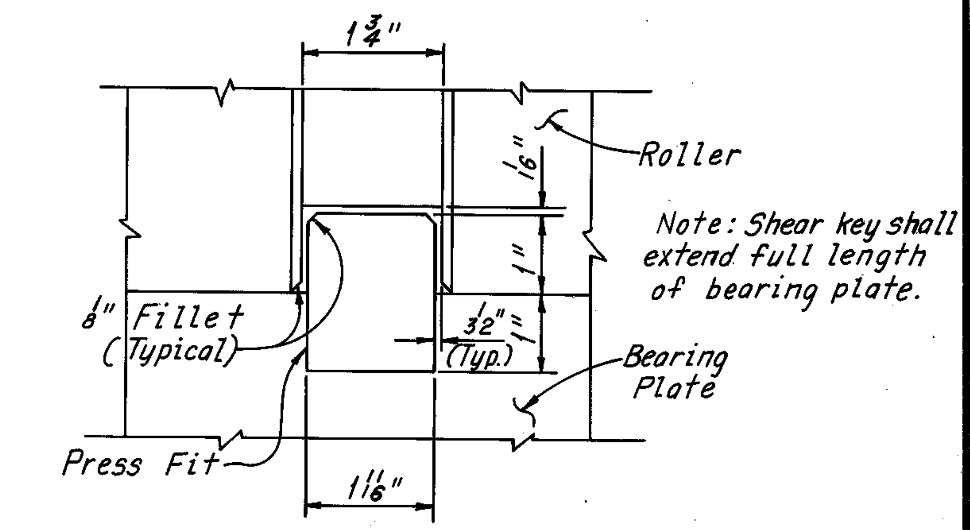
SECTION U-U



SECTION P-P



DETAIL "B"

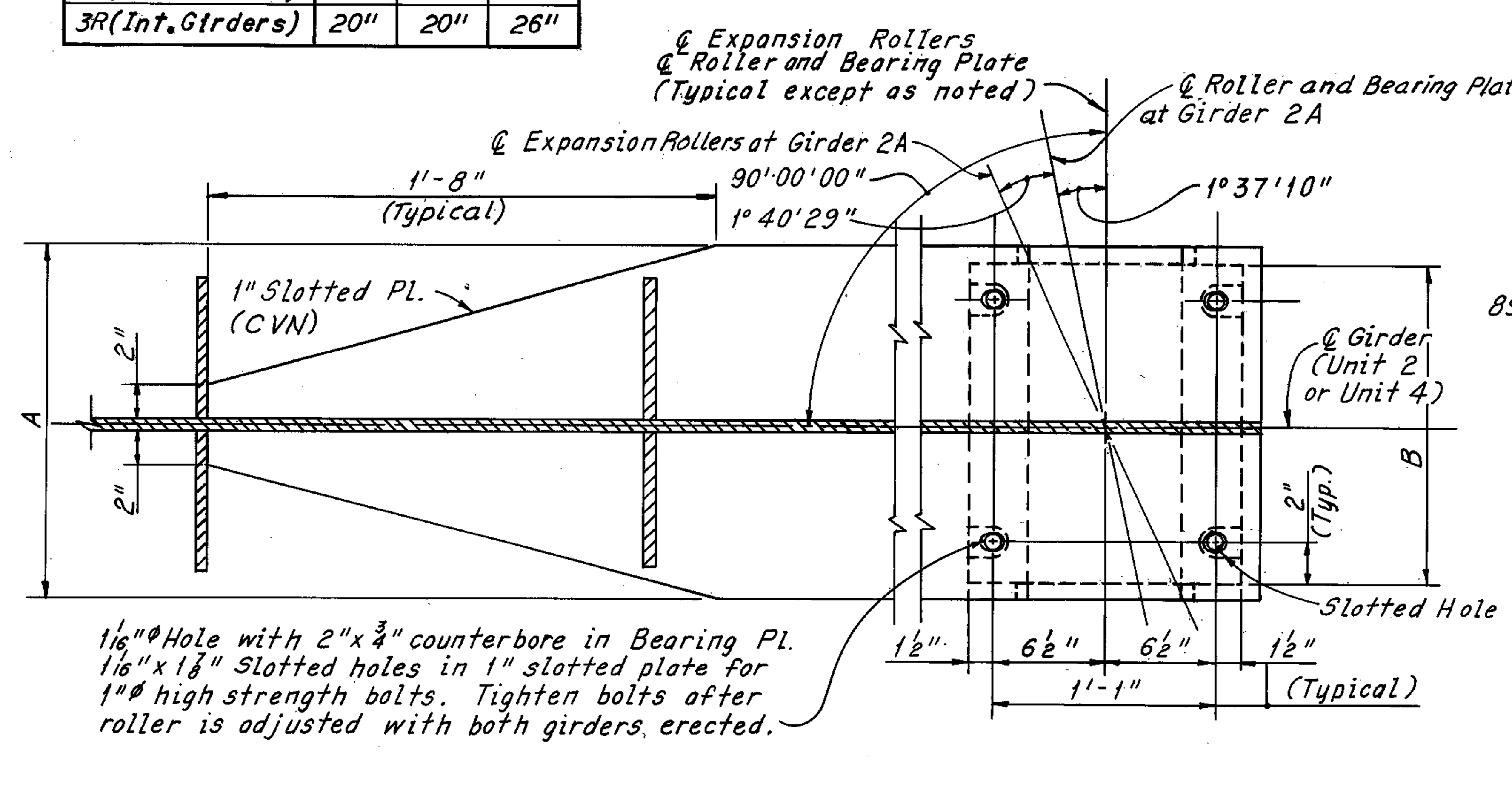


DETAIL "A"

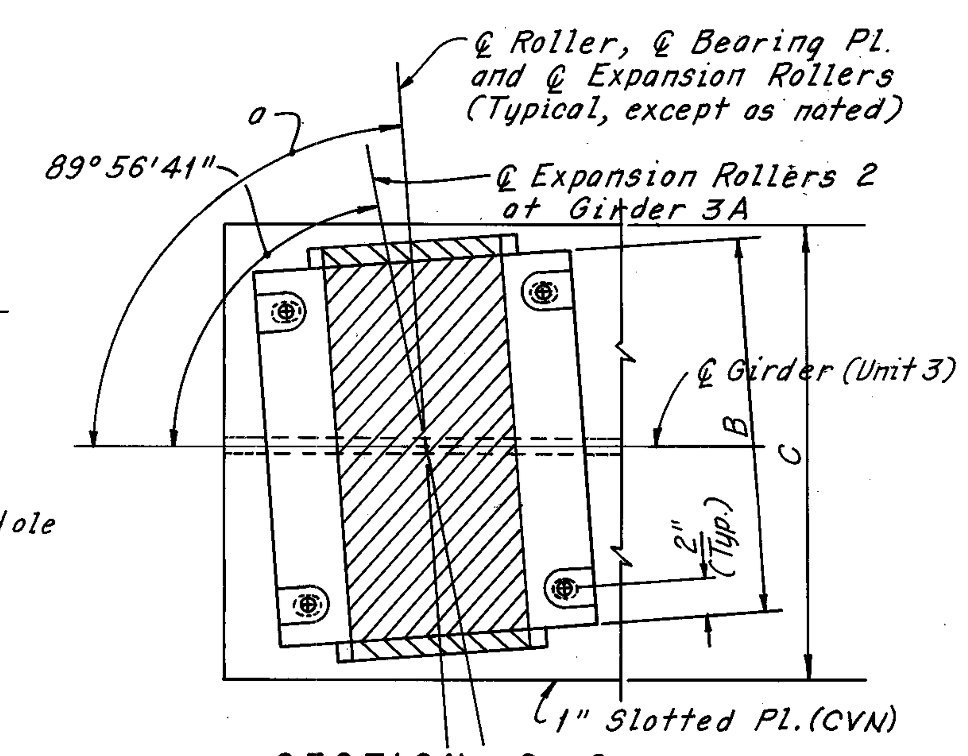
ROLLER AND SLOTTED FLANGE PL. DIMENSIONS			
Expansion Joint	Dimension A	B	C
2R(Ext. Girders)	26"	18"	20"
2L(Ext. Girders)	26"	20"	20"
2L(Int. Girders)	26"	24"	26"
2R(Int. Girders)	22"	20"	26"
3L(Ext. Girders)	20"	18"	20"
3L(Int. Girders)	24"	22"	26"
3R(Ext. Girders)	18"	18"	20"
3R(Int. Girders)	20"	20"	26"

ROLLERS	
Length	Number Required
24"	3
22"	3
20"	8
18"	6

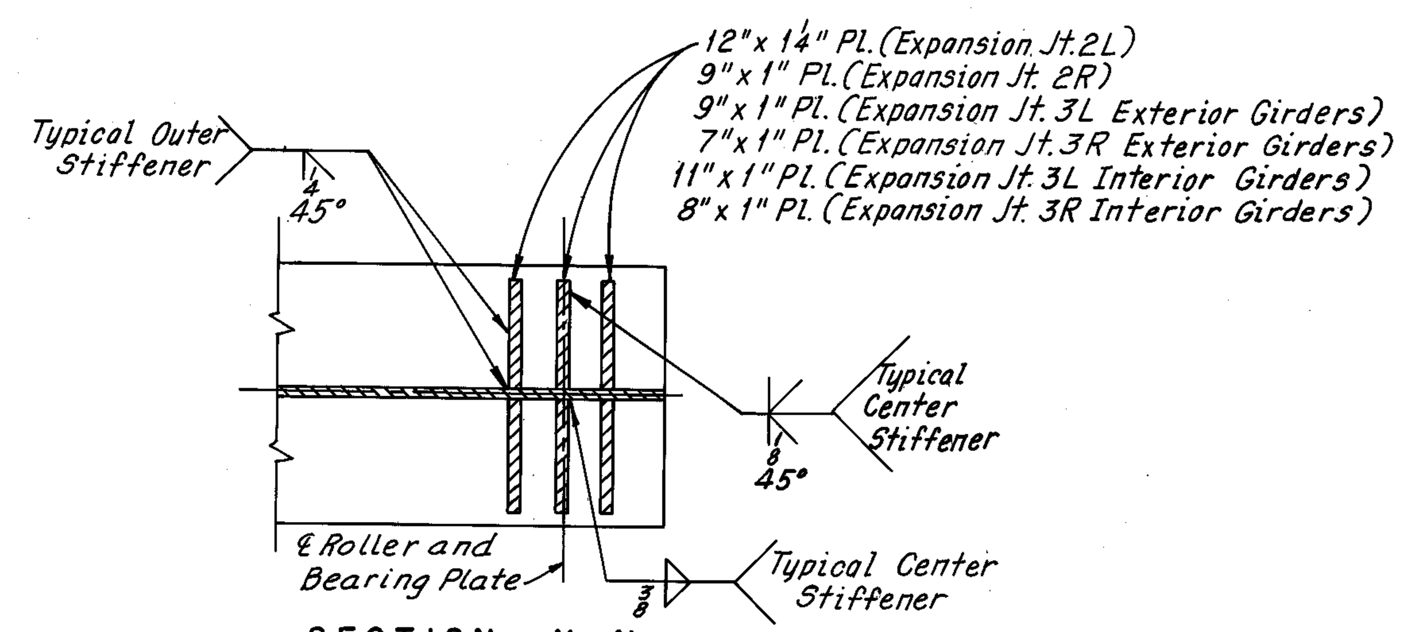
Girder	Expansion Joint 2 ∢ a	Expansion Joint 3 ∢ a
3A	91°37'10"	89°55'53"
3B	89°56'45"	89°55'41"
3C	89°56'50"	89°55'30"
3D	89°56'54"	89°55'18"
3E	89°56'59"	89°55'06"
3F	89°51'21"	90°00'42"
3G	89°51'27"	90°00'31"
3H	89°51'33"	90°00'20"
3J	89°51'39"	90°00'09"
3K	89°51'46"	89°59'58"



SECTION R-R
(Stiffeners Not Shown)



SECTION Q-Q



SECTION N-N

Note:
For additional drainage trough details at Expansion Joint see Sheet 69/108.
For Section V-V see Section N-N on Sheet 48/108.

H.N.T.B. BR.NO. 9 PART II - SUPERSTRUCTURE

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

EXPANSION JOINTS 2 AND 3
L AND R
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S.	TRACED C.P.	CHECKED J.W.	REVIEWED C.A.B.	REVISED
DATE 11-1969	DATE 12-869	DATE 3-25-70	DATE 2-24-86	SHEET 50/108

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

136/193

CUYAHOGA COUNTY
CUY-290-0.27

Notes:
For Roller and Gear Plate Details see Sheet 50/108.
For Curb and Parapet Details see Section C-C, D-D and E-E on Sheet 49/108.
For additional drainage trough details at Expansion Joint see Sheet 69/108.
For Section N-N see Sheet 48/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

EXPANSION JOINT 4

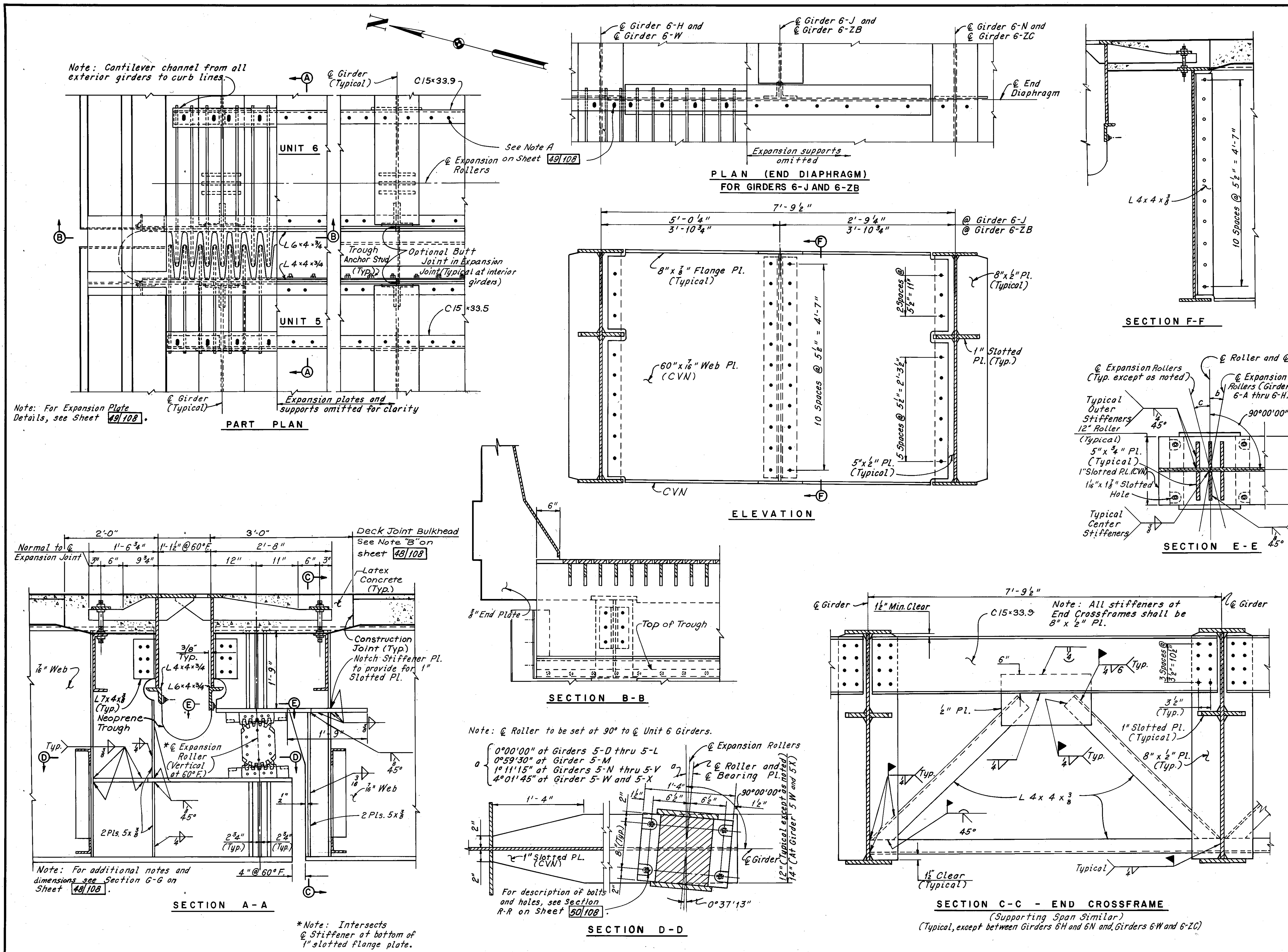
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S. DATE 12-31-69	TRACED C.P. DATE 1-12-70	CHECKED L.J.W. DATE 3-26-70	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 51/108

CUYAHOGA COUNTY
CUY-290-0.27



Girder	b or c
6-A thru 6-H	0°37'13"
6-N	0°22'17"
6-P thru 6-W	0°34'12"
6-ZC and 6-ZD	3°24'32"

Notes:
For Roller Details see Sheet 50/108.
For Curb and Parapet Details see Section C-C, D-D and E-E on Sheet 49/108.
For additional drainage trough details at Expansion Joint see Sheet 69/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

EXPANSION JOINT 5

I-290 OVER CUYAHOGA RIVER

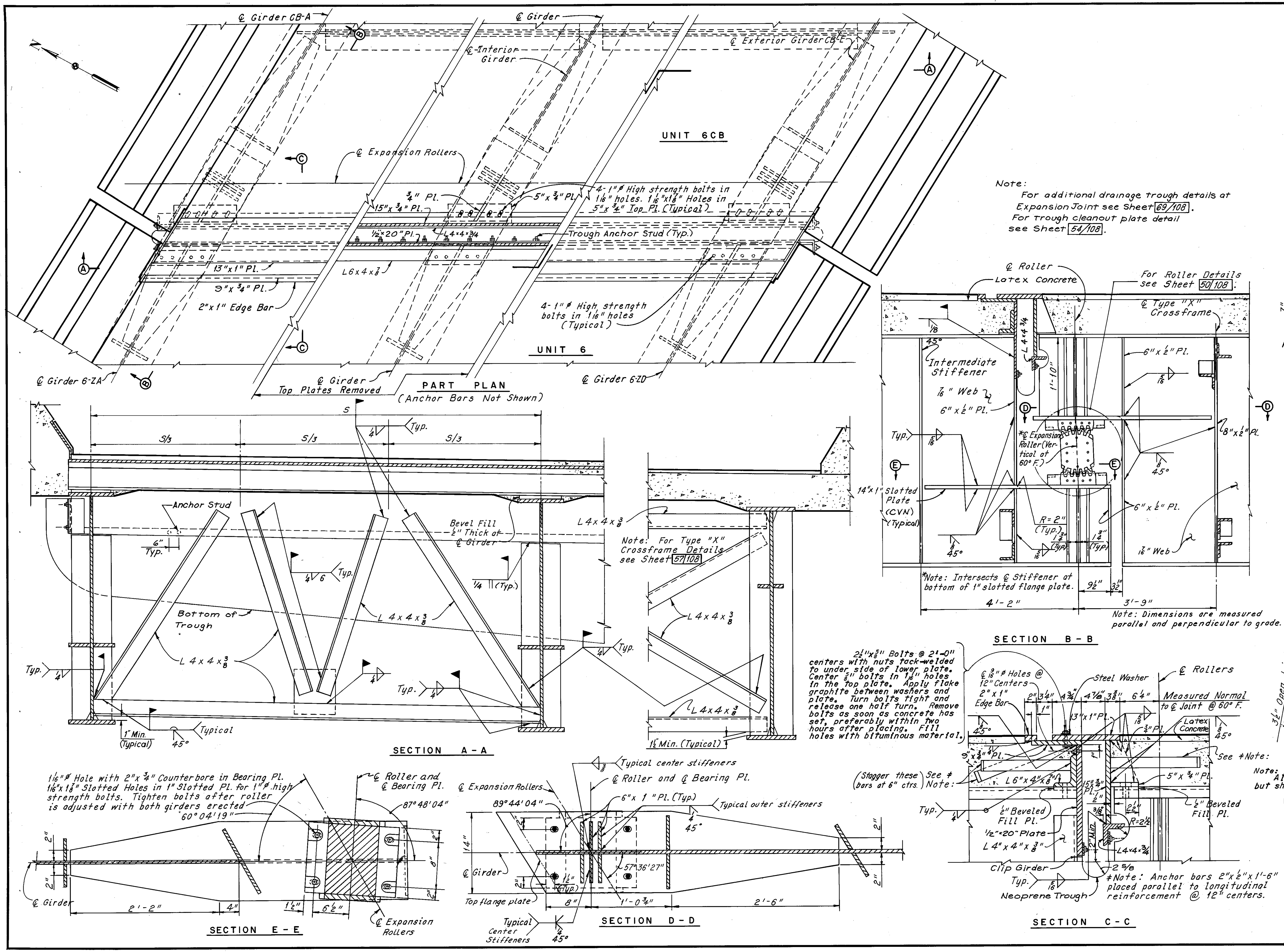
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

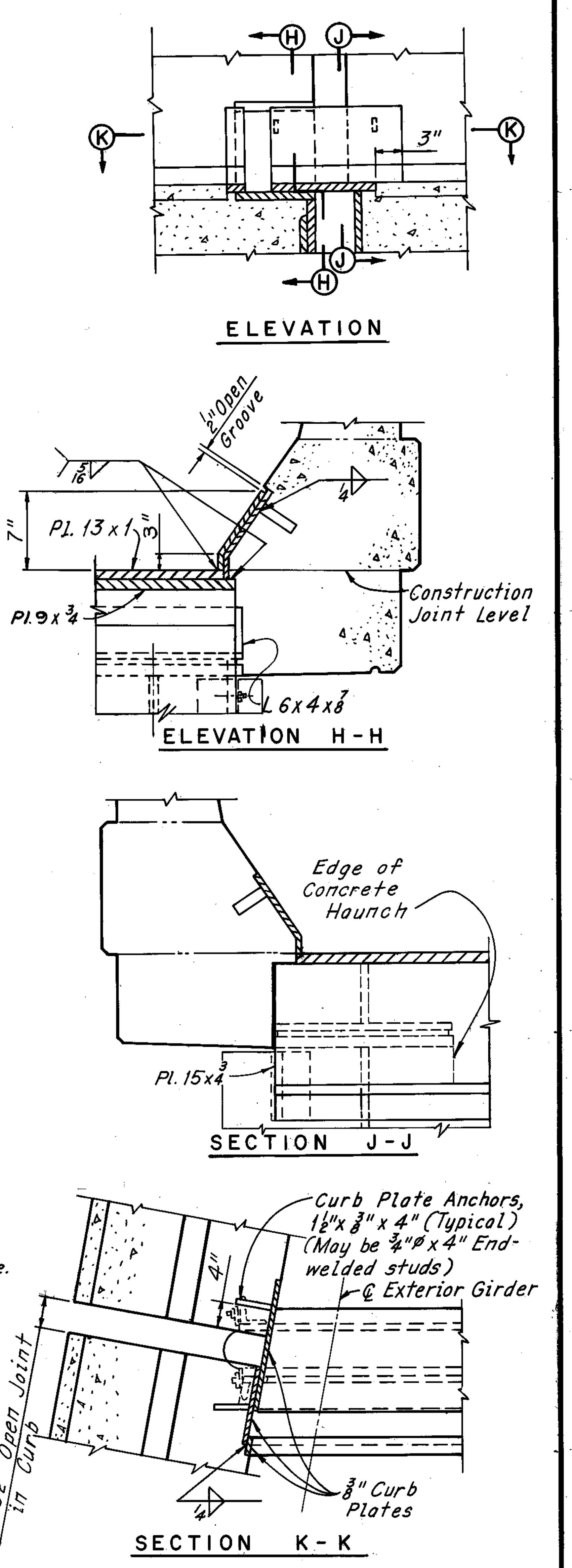
DRAWN D.H.S. DATE 1-7-70	TRACED C.P. DATE 2-2-70	CHECKED L.W. DATE 3-27-70	REVIEWED F.A.B. DATE 6-24-86	REVISED

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		138/193

CUYAHOGA COUNTY
CUY-290-0.27



Note:
For additional drainage trough details at Expansion Joint see Sheet 69/108.
For trough cleanout plate detail see Sheet 54/108.



CURB PLATE DETAILS

Note: All sliding contact surfaces shall not be painted but shall be lubricated with flake graphite.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

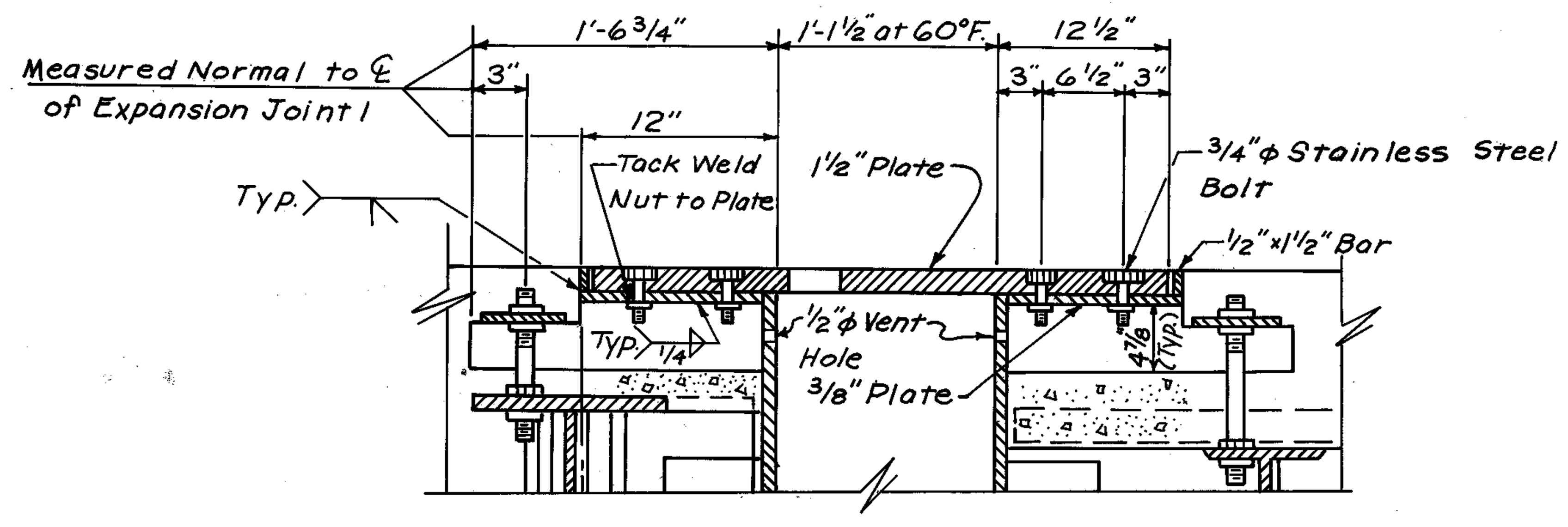
EXPANSION JOINT 6

I-290 OVER CUYAHOGA RIVER

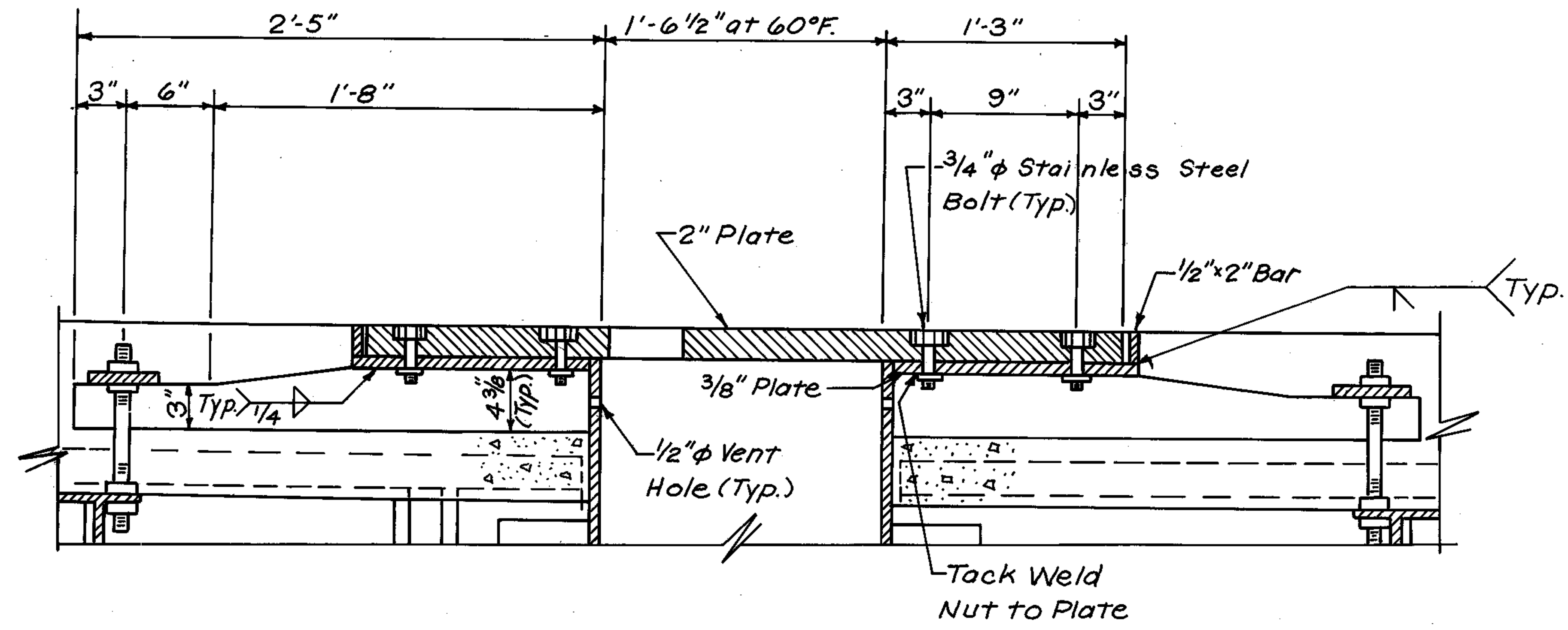
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

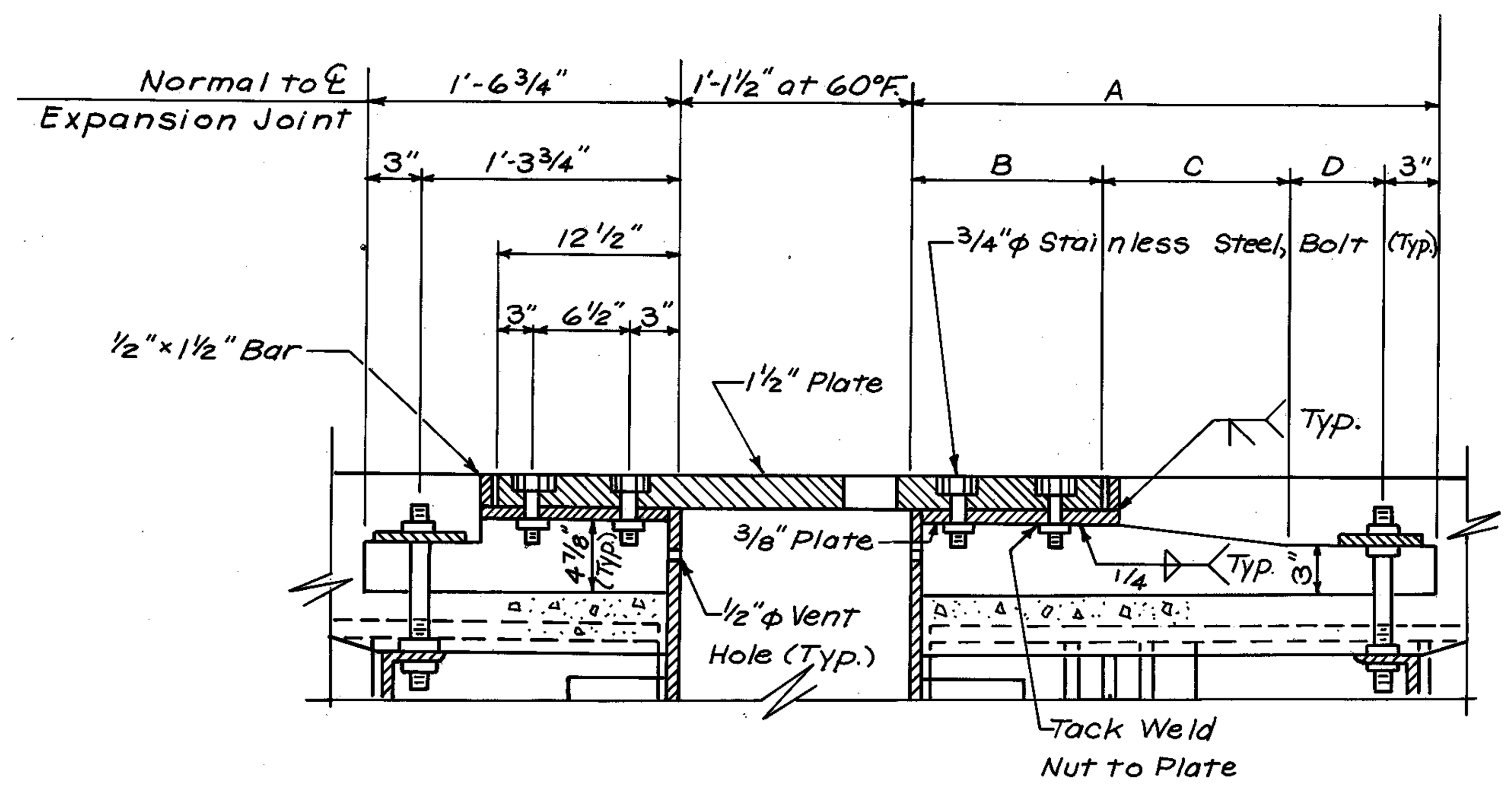
DRAWN D.H.S. DATE 1-14-70	TRACED C.P. DATE 2-6-70	CHECKED L.W. DATE 3-30-70	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 53/108



SECTION A-A -EXPANSION JOINT I



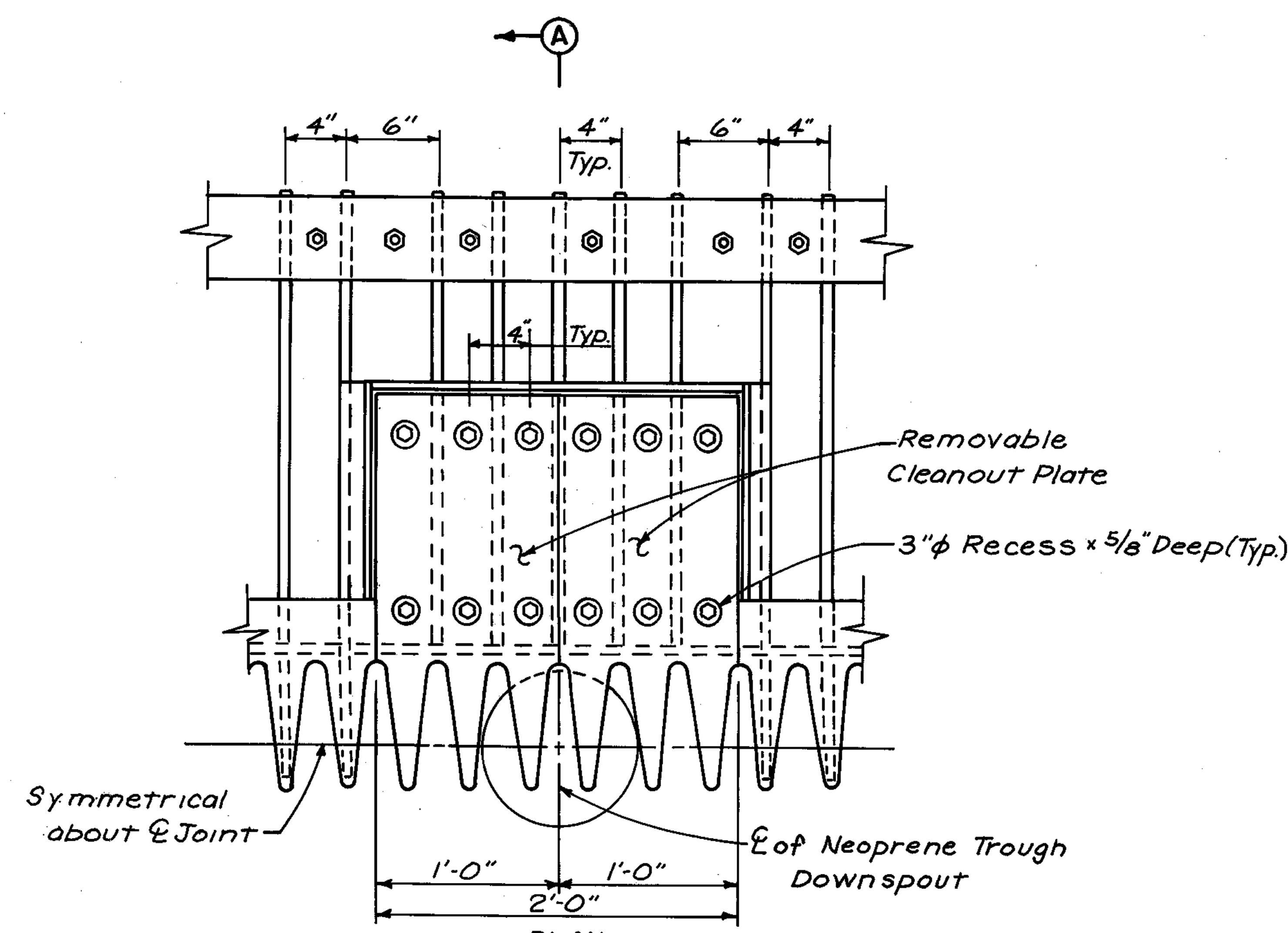
SECTION A-A -EXPANSION JOINT 2 & 3



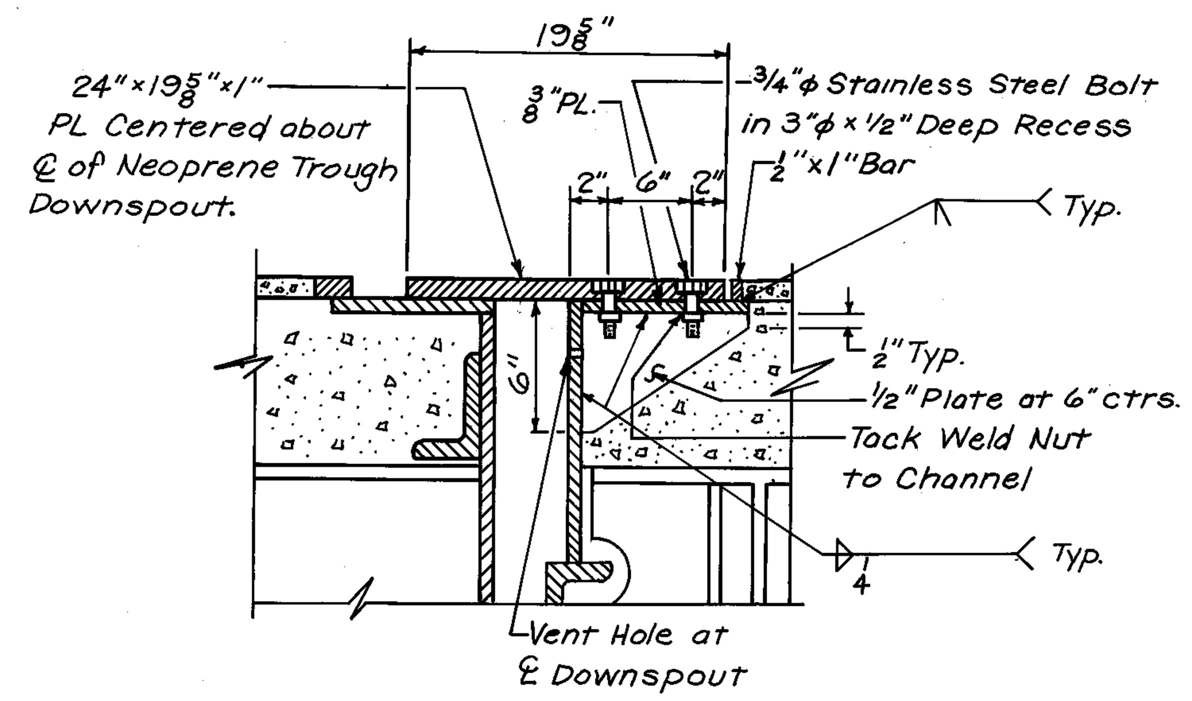
SECTION A-A -EXPANSION JOINT 4 & 5

TABLE OF DIMENSIONS

	A	B	C	D
EXP. JT. 4	3'-0"	12"	1'-3"	6"
EXP. JT. 5	2'-8"	12"	11"	6"



PLAN
(Expansion Joint 2 thru 5 shown Exp. Jt. 1 similar)



SECTION AT EXPANSION JOINT 6
(2"x1/2"x1'-6" Anchor Bars not Shown)

Notes:

For trough cleanout plate locations, see Sheet 69/108.

Loosen bolts after initial set of concrete, preferably not later than two hours after conclusion of concrete placement.

All bolts shall be 3/4" diameter ASTM 276 Type 302 Stainless Steel.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

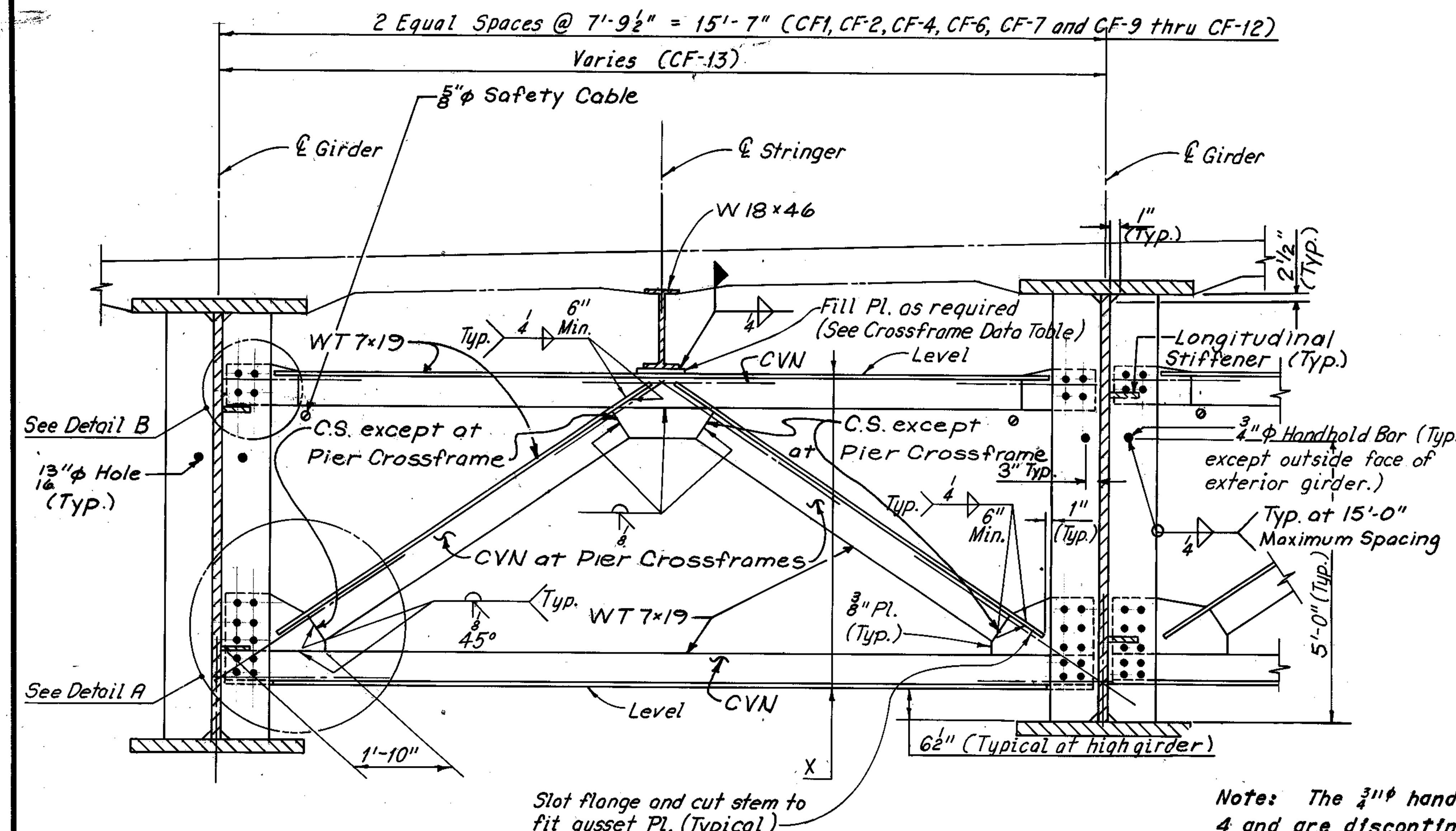
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND **HNTB**

EXPANSION JOINT
TROUGH CLEANOUT PLATE DETAILS
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

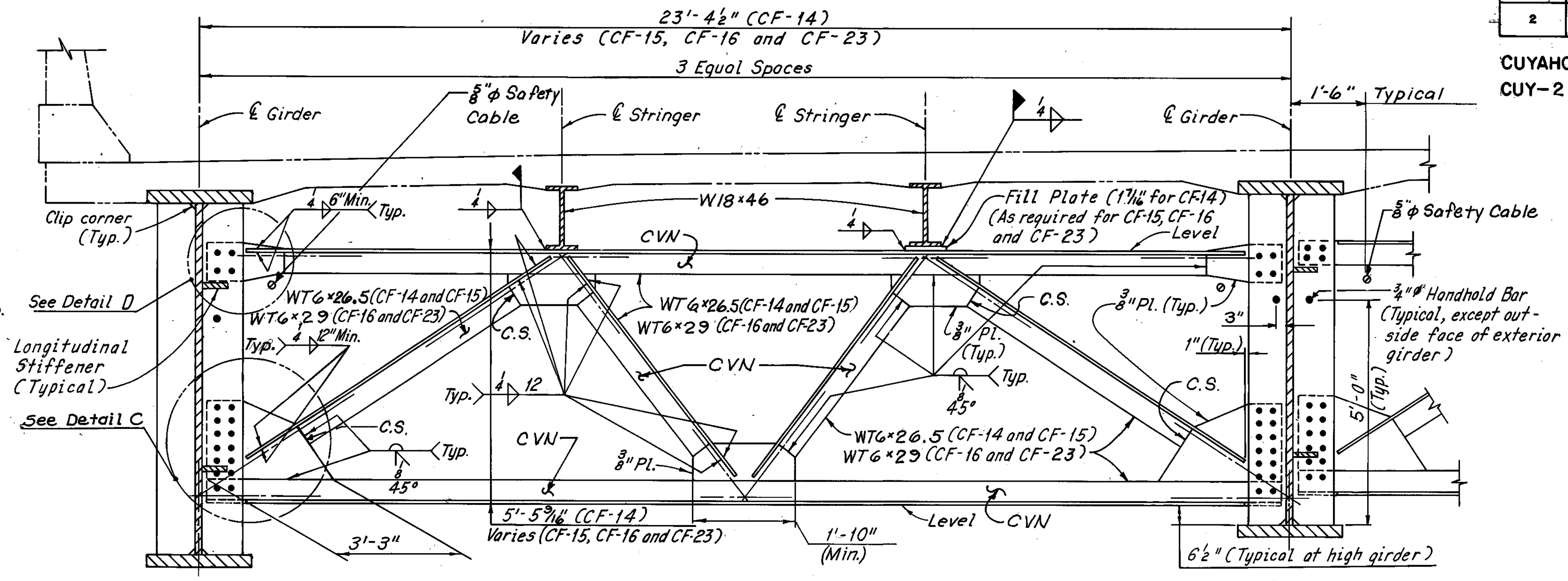
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN B.B.	TRACED J.E.	CHECKED R.H.W.	REVIEWED C.A.B.	REVISED
DATE 8-5-85	DATE 12-19-85	DATE 1-22-86	DATE 2-24-86	SHEET 54/108

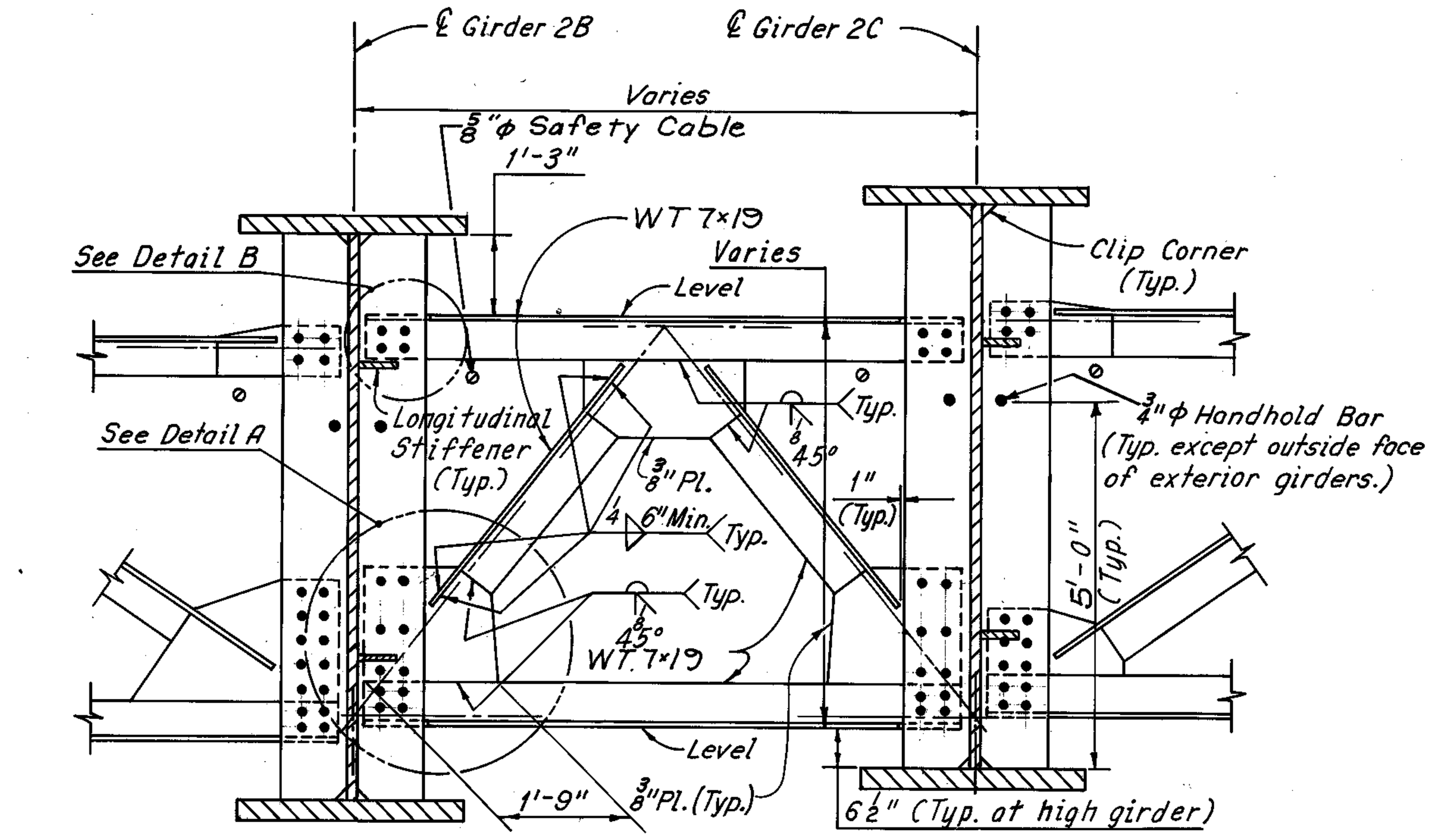


CF-1, CF-2, CF-4, CF-6, CF-7 AND CF-9 THRU CF-13
(See Crossframe Data Table)

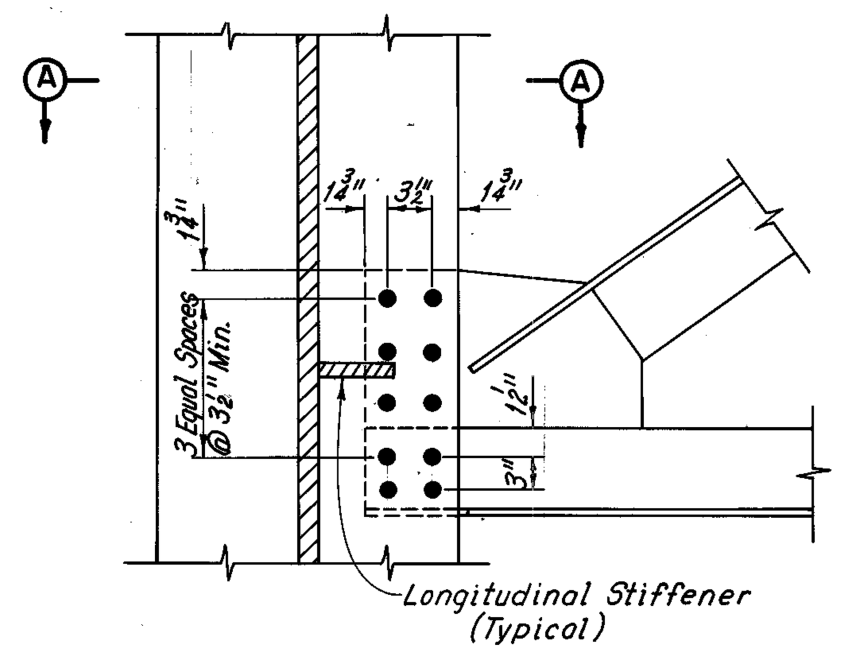
Note: The ¾"ϕ handhold bars are used in Units 2, 3 and 4 and are discontinuous thru the Expansion Joints. Where bars are spliced they shall be lap welded.



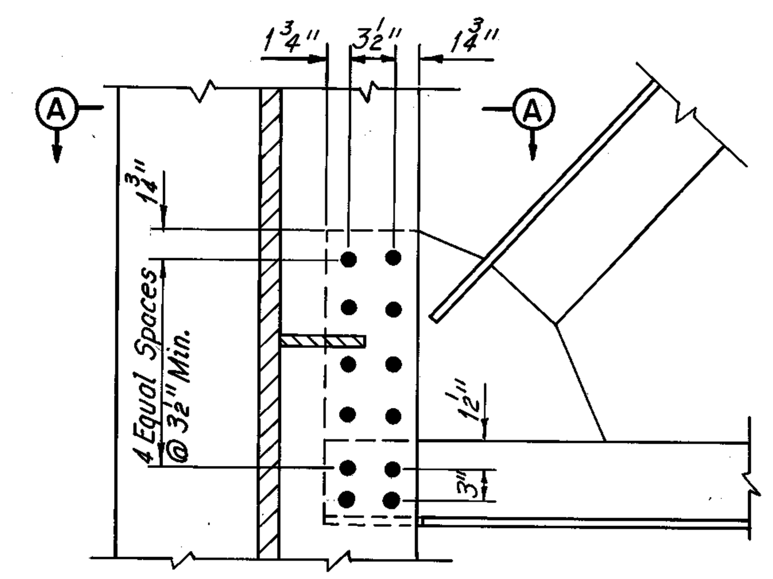
CF-14, CF-15, CF-16 AND CF-23



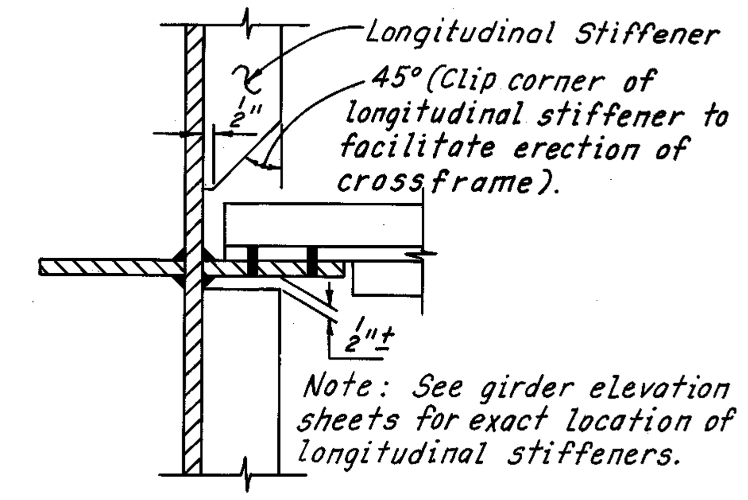
CF-17



DETAIL A
(Typical except as noted)

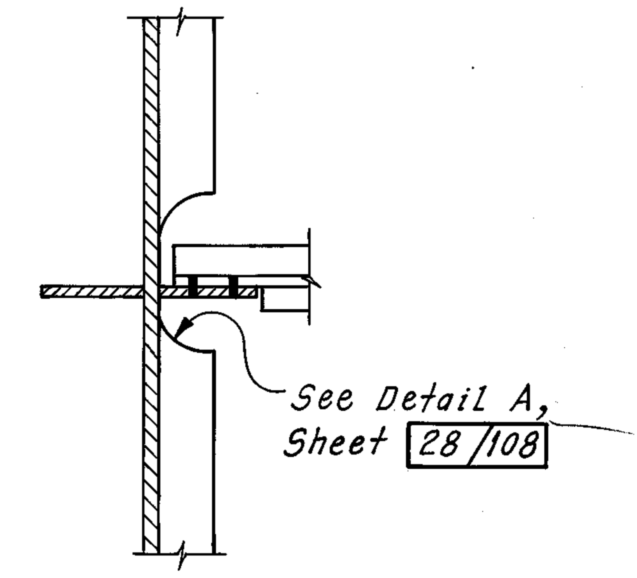


DETAIL A
(CF-4, CF-6, CF-11, and CF-12)



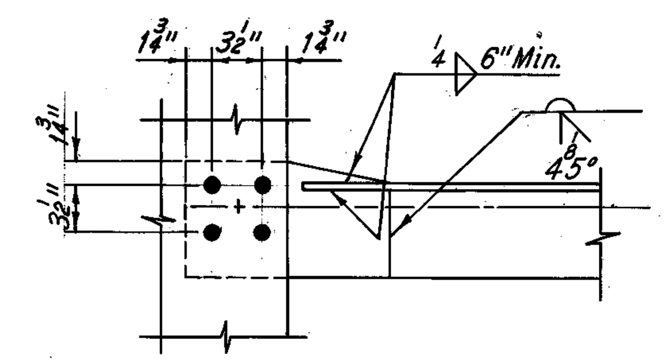
SECTION A-A
(See Note A)

Note: A
Use this detail in regions where longitudinal stiffeners are located only on the top or bottom of the girder. (No Overlap)

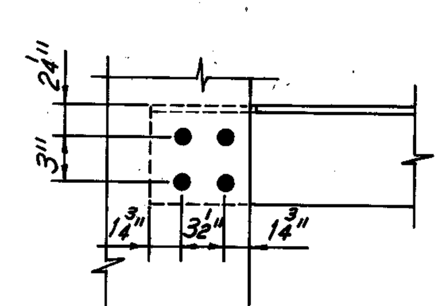


SECTION A-A
(See Note B)

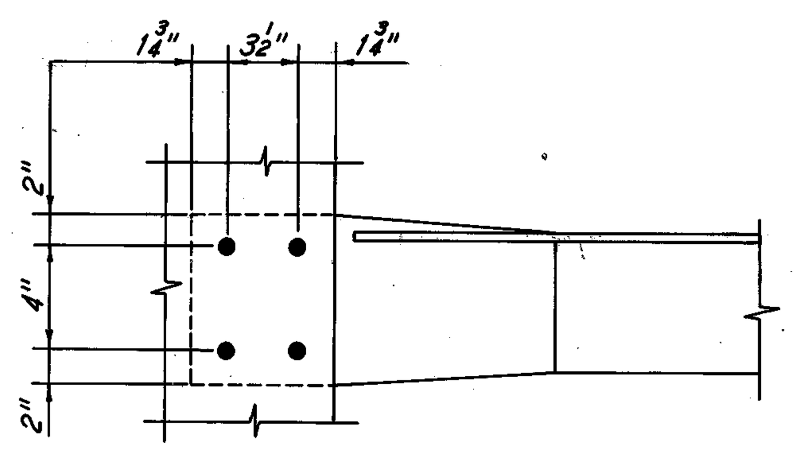
Note: B
Use this detail in regions where top and bottom longitudinal stiffener locations overlap.



DETAIL B
(Typical for Crossframes along ℄ Piers)

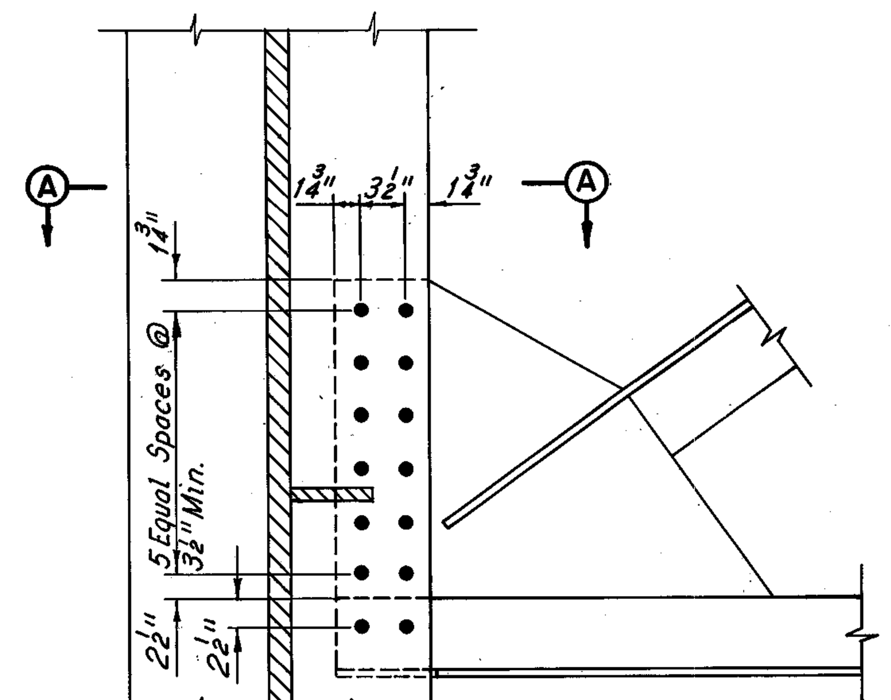


DETAIL B
(Typical except as noted)



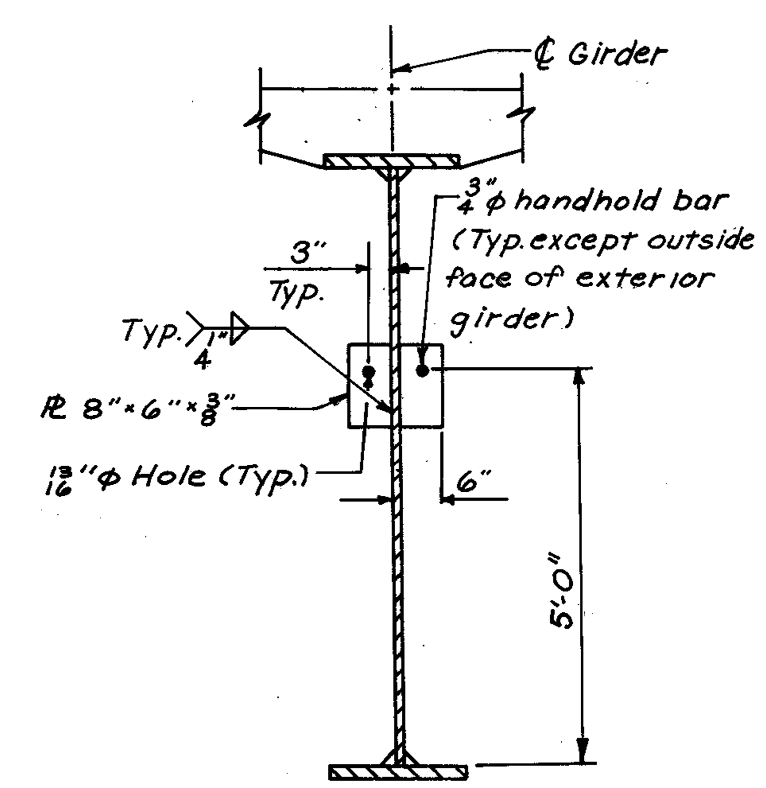
DETAIL D
(CF-15, CF-23)

Note: For CF14 and CF16 see Detail B along ℄ Pier.



DETAIL C

CROSSFRAME DATA TABLE			
CF	X	Fill Pl. Min.	Fill Pl. Max.
1	5'-7 1/16"	——	——
2	5'-8 1/8"	——	——
4	8'-8"	3/8"	2 3/16"
6	8'-6 5/8"	——	——
7	5'-8 3/4"	3/8"	1 5/8"
9	5'-6 5/8"	——	——
10	5'-6 5/8"	3/8"	2 3/8"
11	8'-6 5/16"	3/8"	2 1/8"
12	Varies	——	——
13	Varies	——	——



DETAIL E

Note:
Detail E shall be added as required to provide a maximum support spacing of 5'-0" for the ¾"ϕ handhold bar.

Notes:

Crossframe designations CF-3, CF-5, and CF-8 not used.

For location of crossframes see Framing Plans for Units 2, 3, and 4.

All bolts are 1"ϕ High Strength.

All crossframe butt welds shown on this sheet shall be radiographed except those in CF-17.

C.S. indicates butt weld subject to compressive stresses only.

For 5/8" diameter safety cable details see Sheet 72/108.

This sheet superseded by Sheet 140-5/193. 12-24-86

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

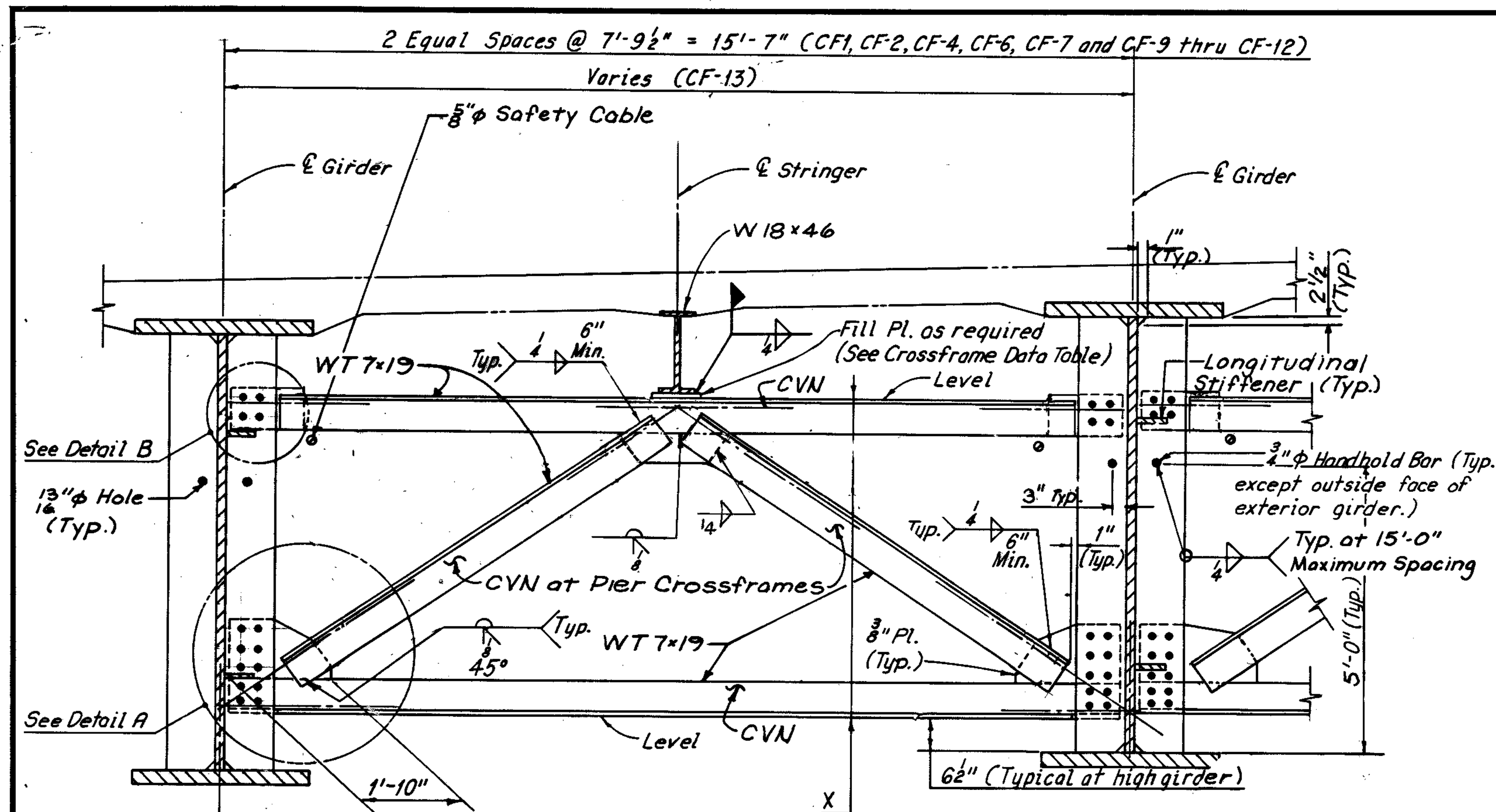
CROSSFRAME DETAILS
(CF 1 THRU 17 AND CF 23)

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

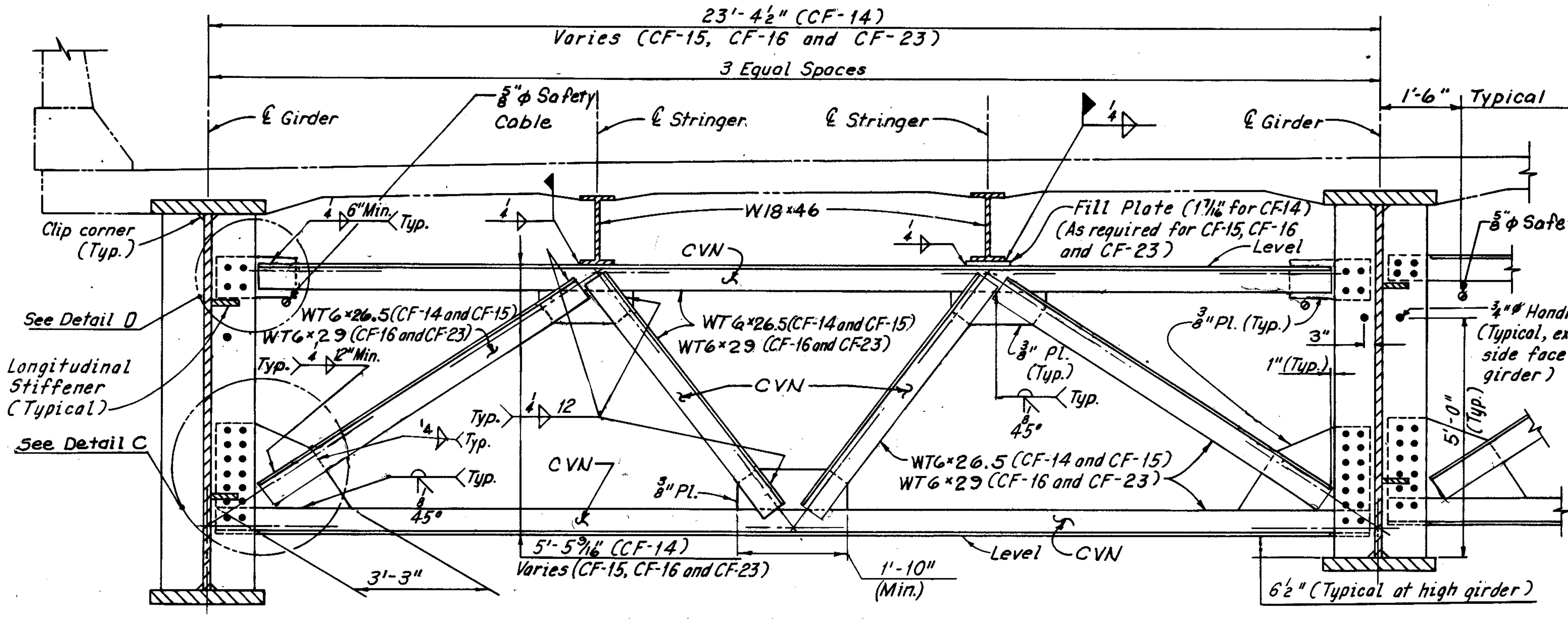
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S. DATE 1-26-70	TRACED D.L.R. DATE 2-11-70	CHECKED J.T. DATE 2-2-70	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 55/108

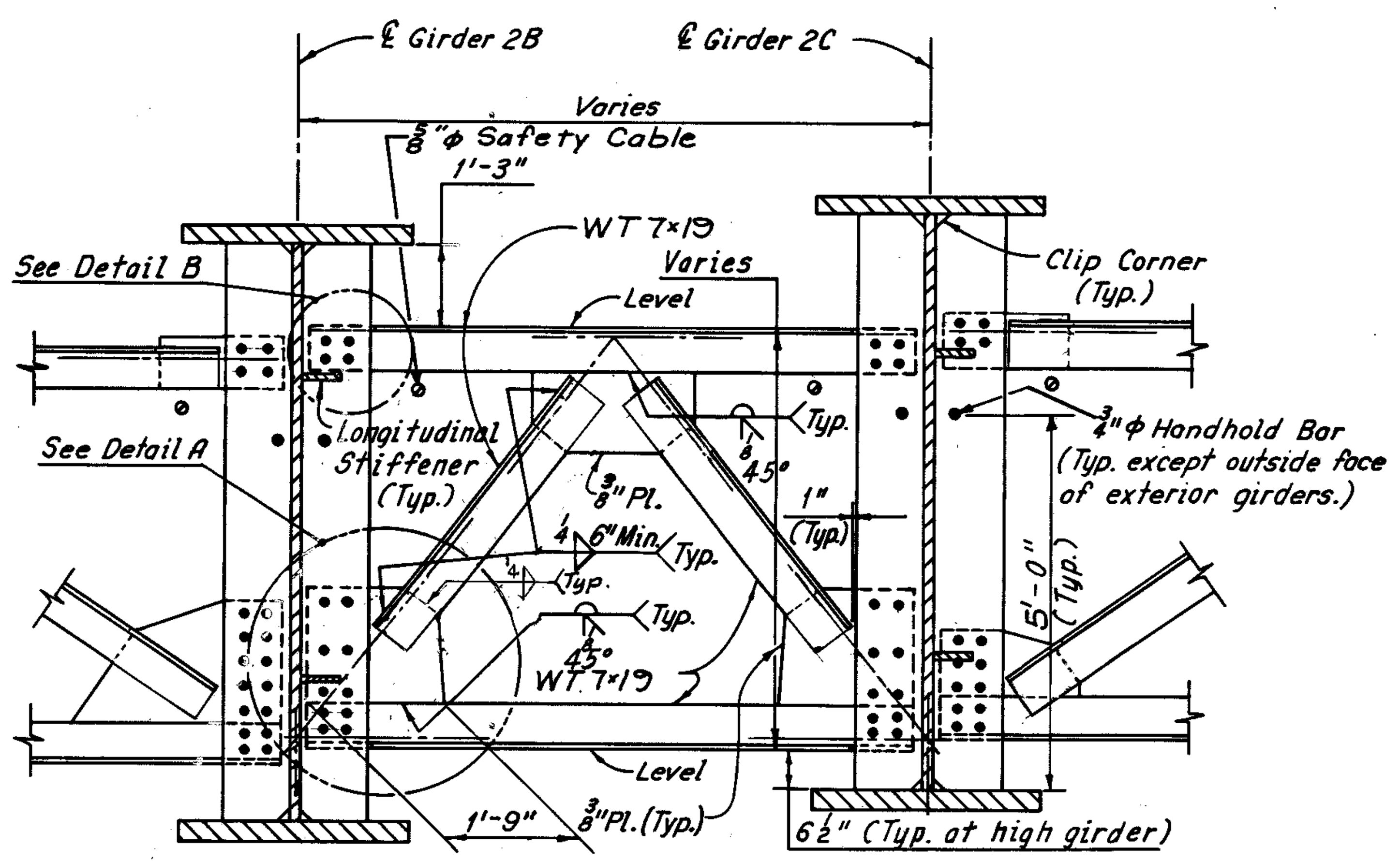


CF-1, CF-2, CF-4, CF-6, CF-7 AND CF-9 THRU CF-13
(See Crossframe Data Table)

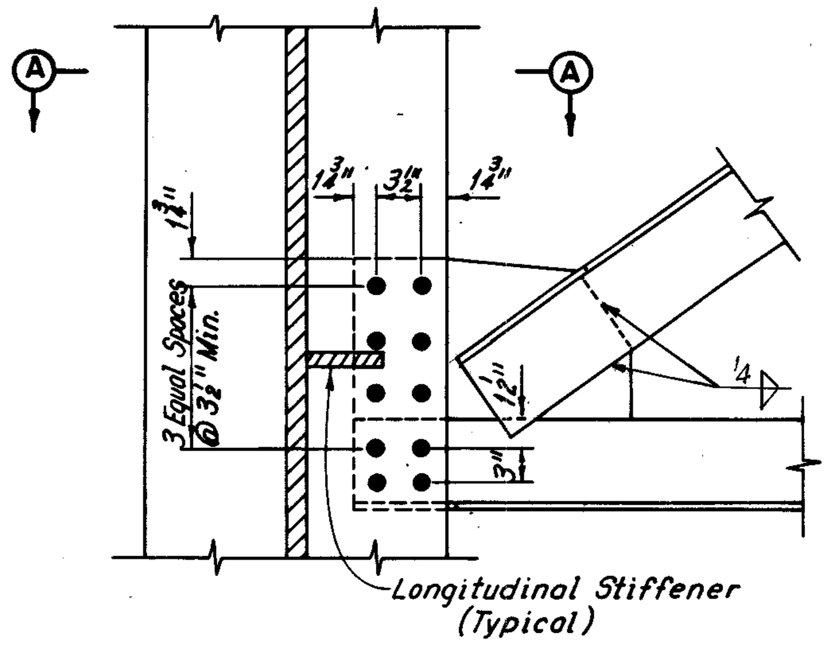
Note: The ¾"φ handhold bars are used in Units 2, 3 and 4 and are discontinuous thru the Expansion Joints. Where bars are spliced they shall be lap welded.



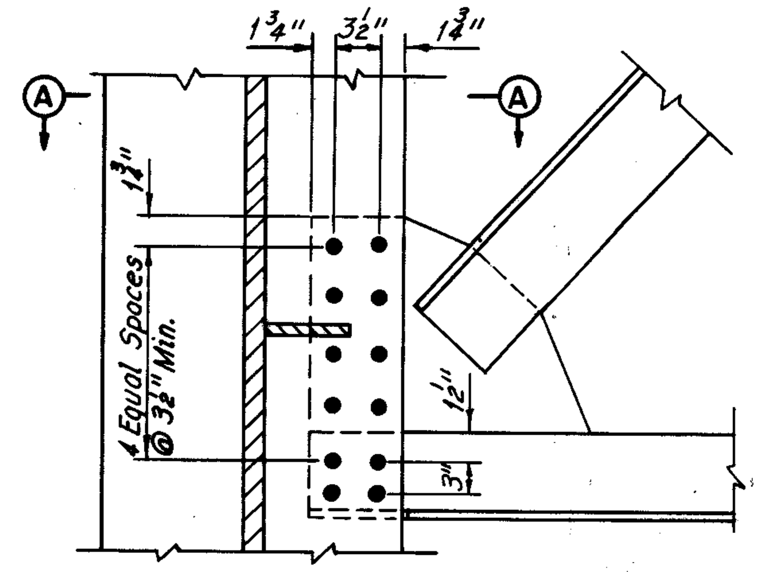
CF-14, CF-15, CF-16 AND CF-23



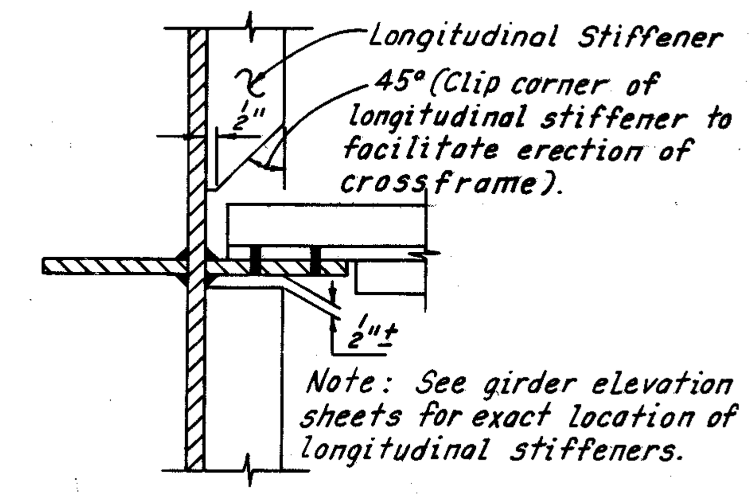
CF-17



DETAIL A
(Typical except as noted)

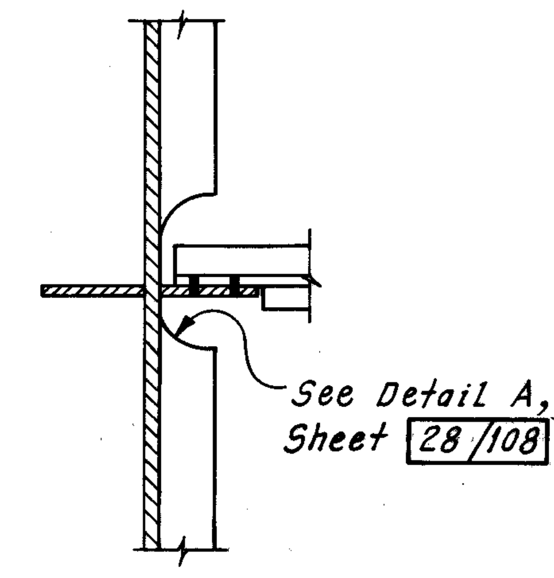


DETAIL A
(CF-4, CF-6, CF-11, and CF-12)



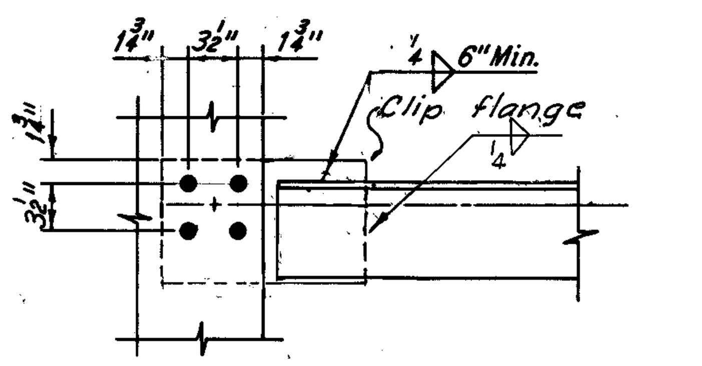
SECTION A-A
(See Note A)

Note: A
Use this detail in regions where longitudinal stiffeners are located only on the top or bottom of the girder. (No Overlap.)

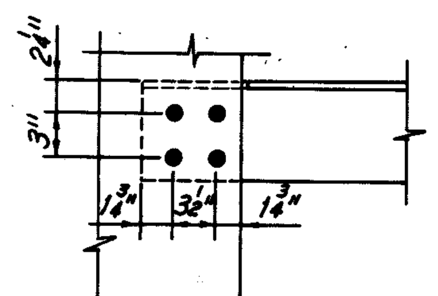


SECTION A-A
(See Note B)

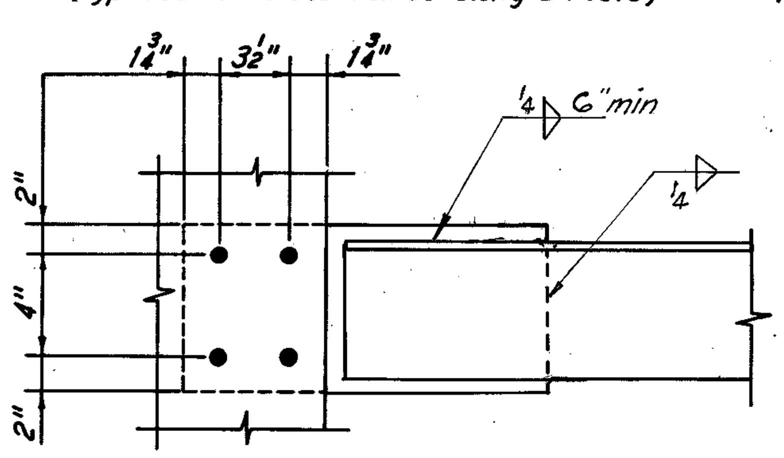
Note: B
Use this detail in regions where top and bottom longitudinal stiffener locations overlap.



DETAIL B
(Typical for Crossframes along ℄ Piers)

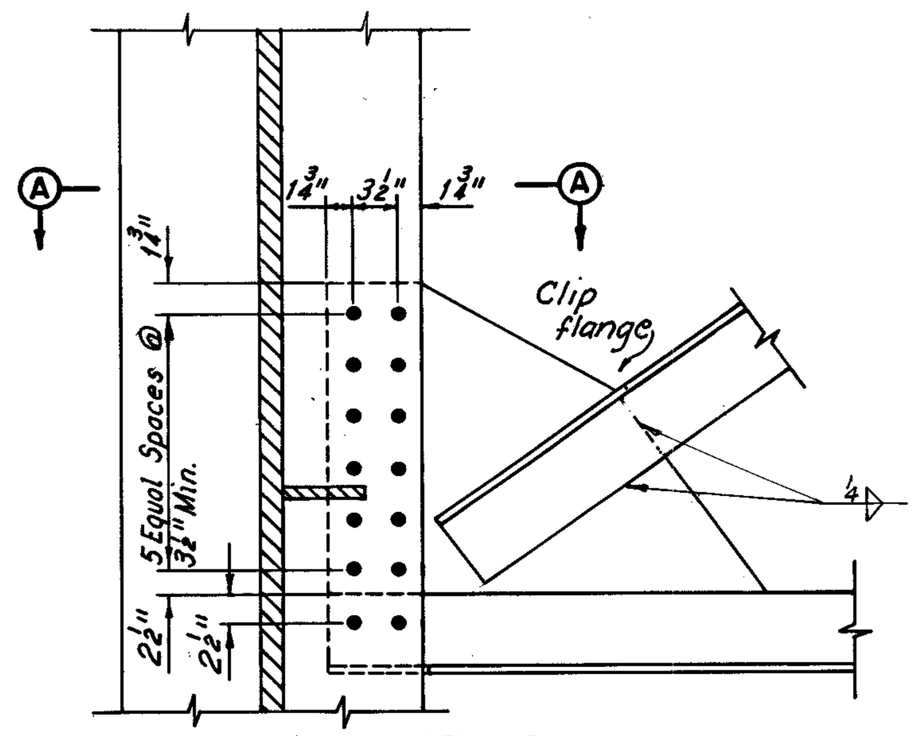


DETAIL B
(Typical except as noted)



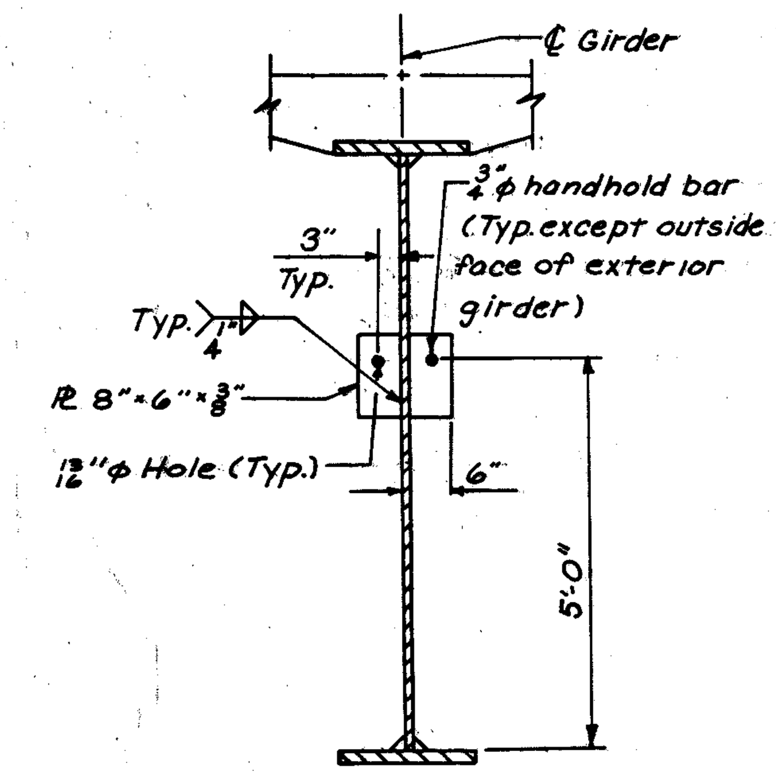
DETAIL D
(CF-15, CF-23)

Note: For CF14 and CF16 see Detail B along ℄ Pier.



DETAIL C

CROSSFRAME DATA TABLE			
CF	X	Fill Pl. Min.	Fill Pt. Max.
1	5'-7¹⁄₁₆"	——	——
2	5'-8⅛"	——	——
4	8'-8"	⅜"	2³⁄₁₆"
6	8'-6⅝"	——	——
7	5'-8¾"	⅜"	1⅝"
9	5'-6⅝"	——	——
10	5'-6⅝"	⅜"	2⅜"
11	8'-6⁵⁄₁₆"	⅜"	2⅛"
12	Varies	——	——
13	Varies	——	——



DETAIL E

Note:
Detail E shall be added as required to provide a maximum support spacing of 5'-0" for the ¾"φ handhold bar.

Notes:

Crossframe designations CF-3, CF-5, and CF-8 not used.

For location of crossframes see Framing Plans for Units 2, 3, and 4.

All bolts are 1"Ø High Strength.

C.S. indicates butt weld subject to compressive stresses only.

For 5/8" diameter safety cable details see Sheet 72/108.

This sheet supersedes Sheet 140/193. 12-24-86

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

CROSSFRAME DETAILS (CF 1 THRU 17 AND CF 23)

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

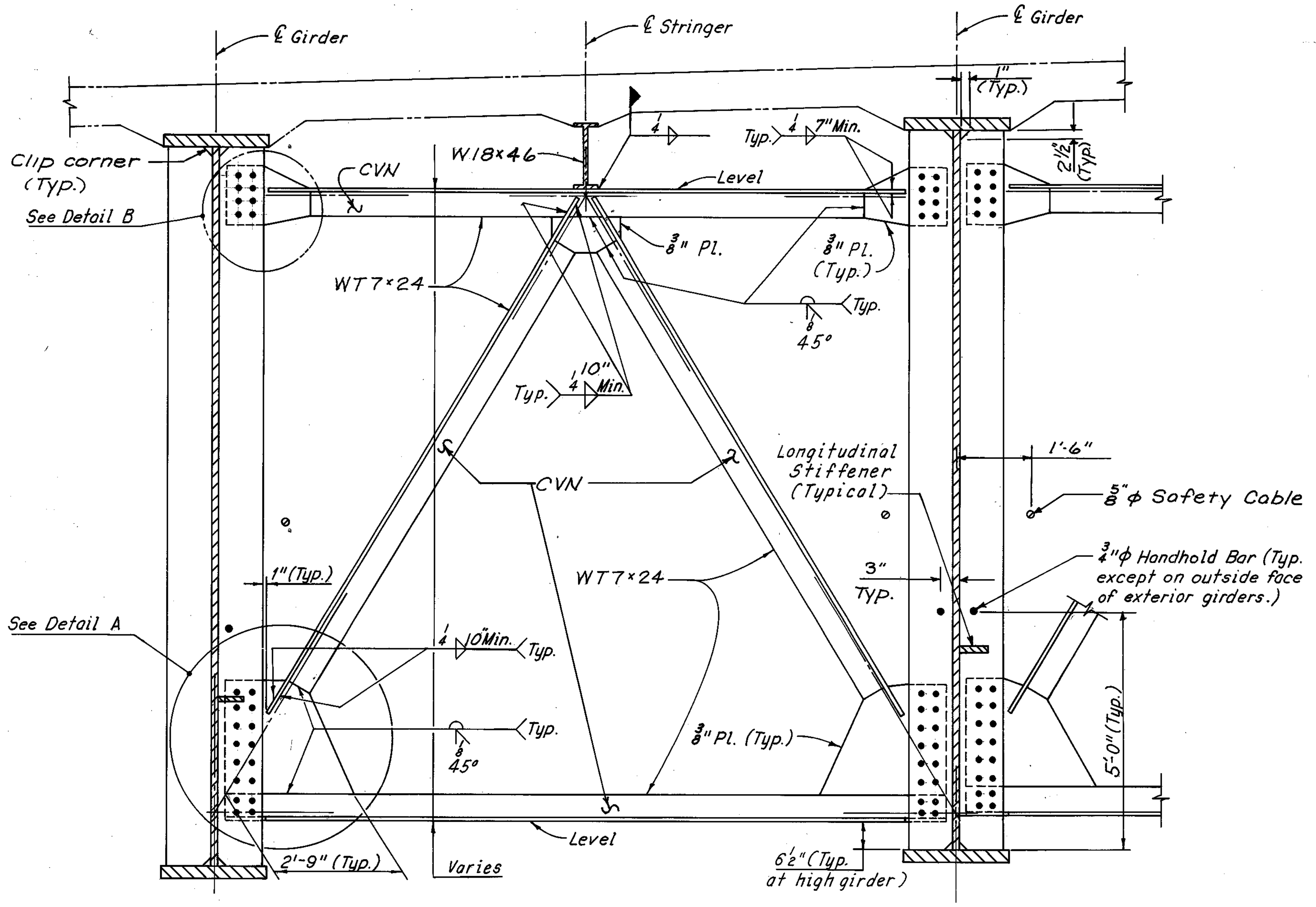
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S.	TRACED DLR	CHECKED J.T.	REVIEWED C.A.B.	REVISED
DATE 1-26-70	DATE 2-11-70	DATE 2-2-70	DATE 2-24-86	SHEET 55-S/108

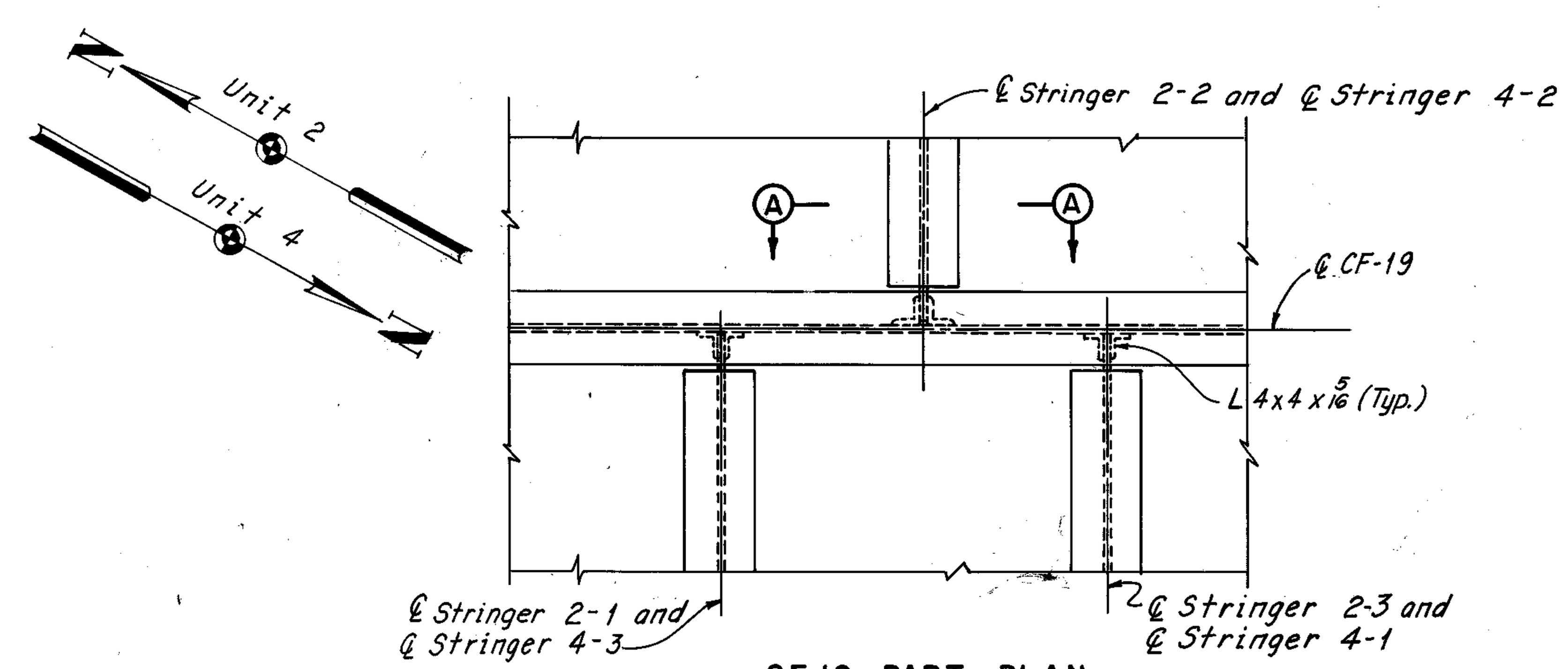
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

141/193

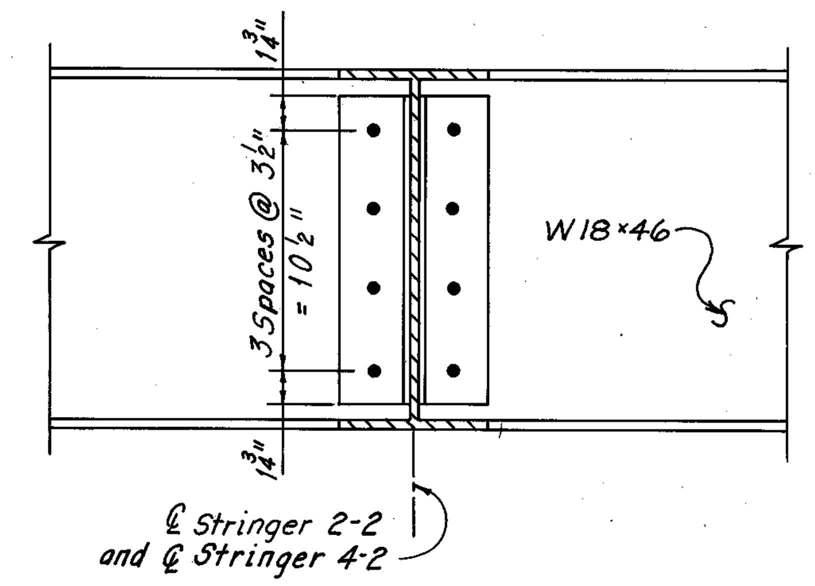
CUYAHOGA COUNTY
CUY-290-0.27



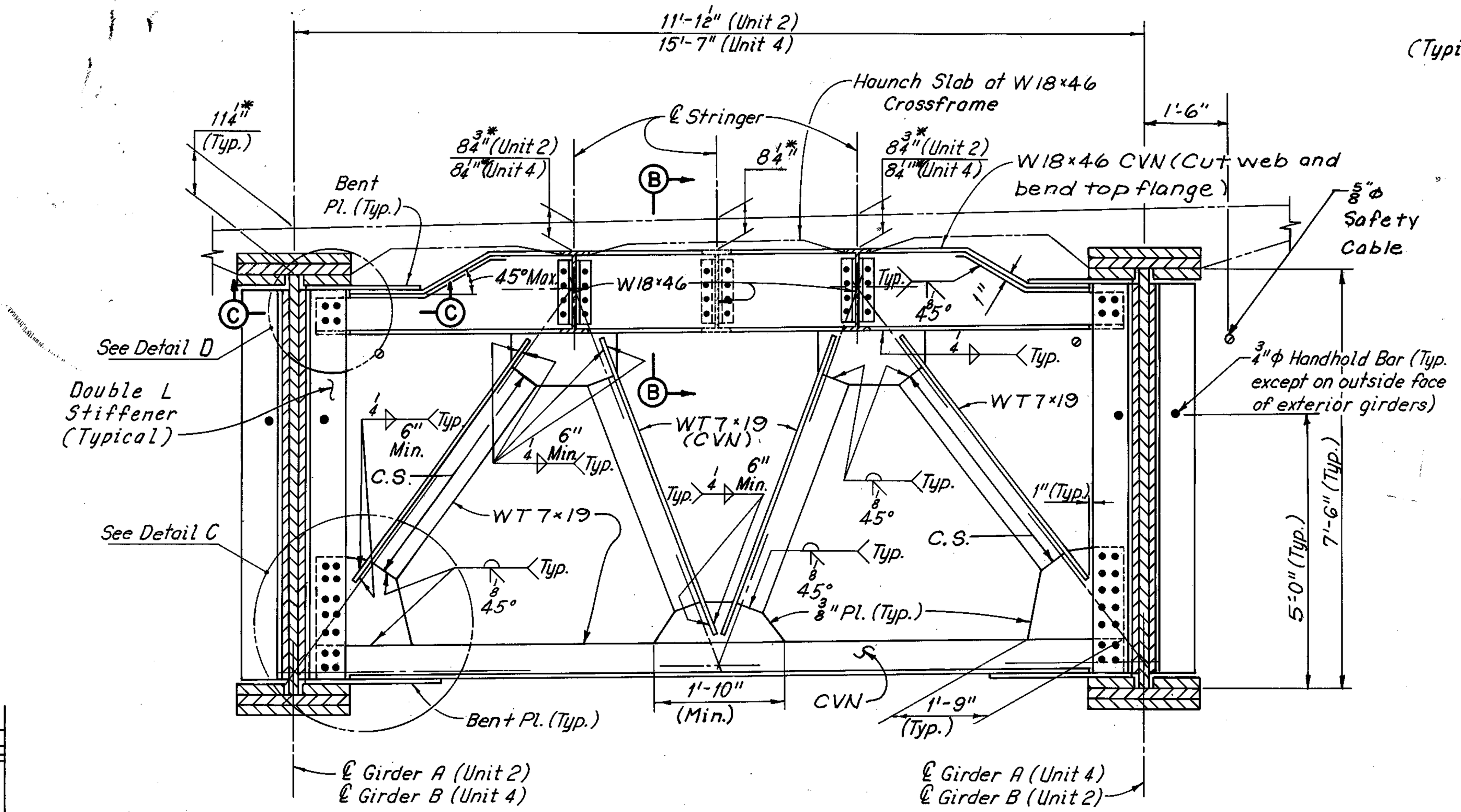
CF-18



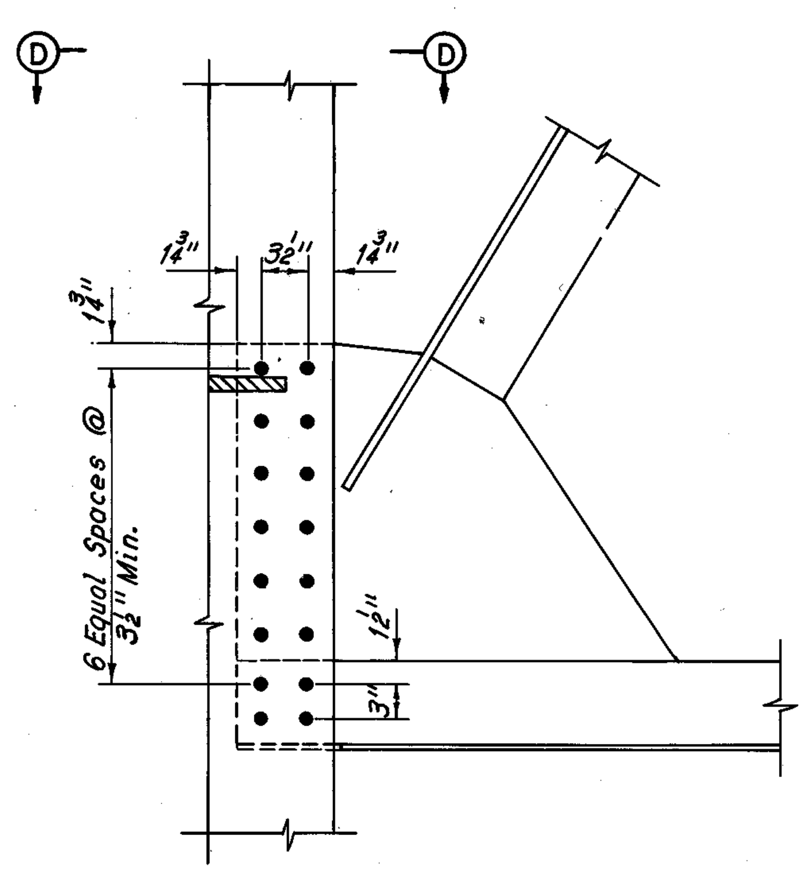
CF 19 PART PLAN



SECTION A-A
(Typical Stringer 2-1, 2-3, 4-1 and 4-3)

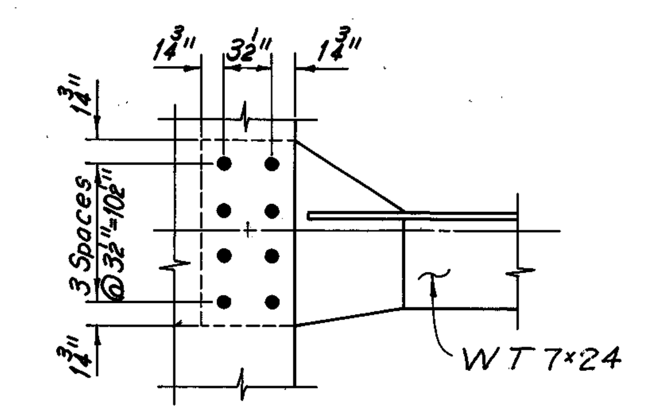


CF-19

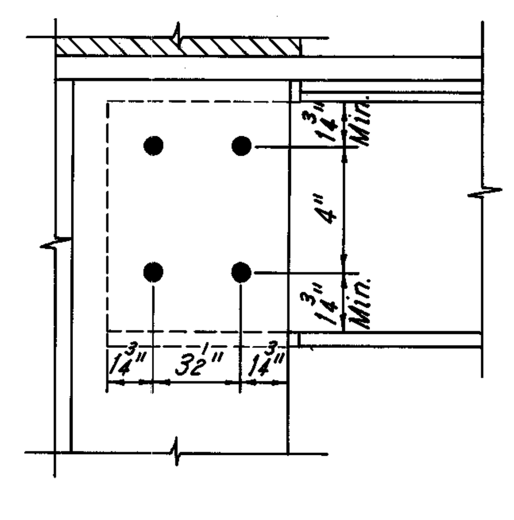


DETAIL A

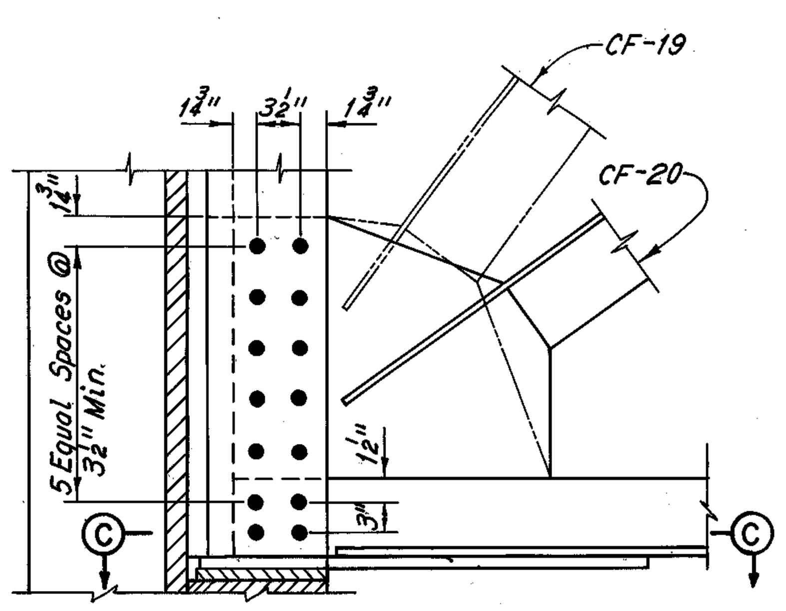
Note: For Section D-D see Section A-A on Sheet 55/108



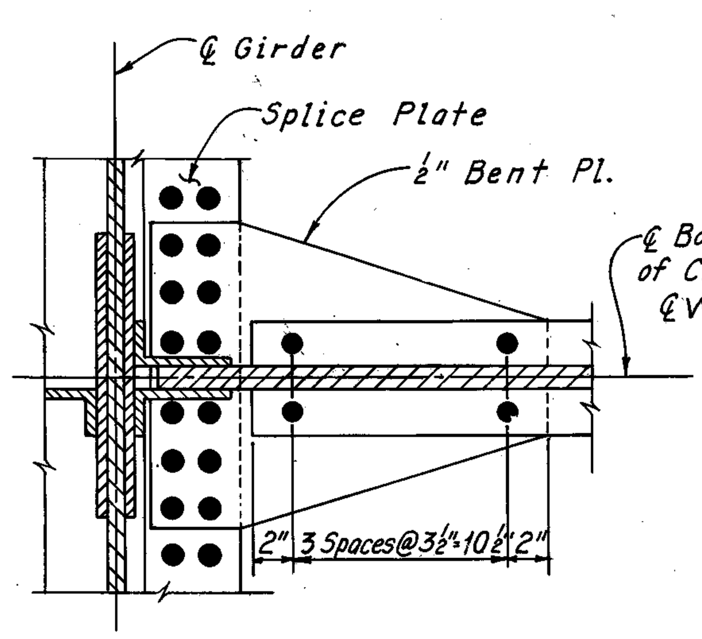
DETAIL B



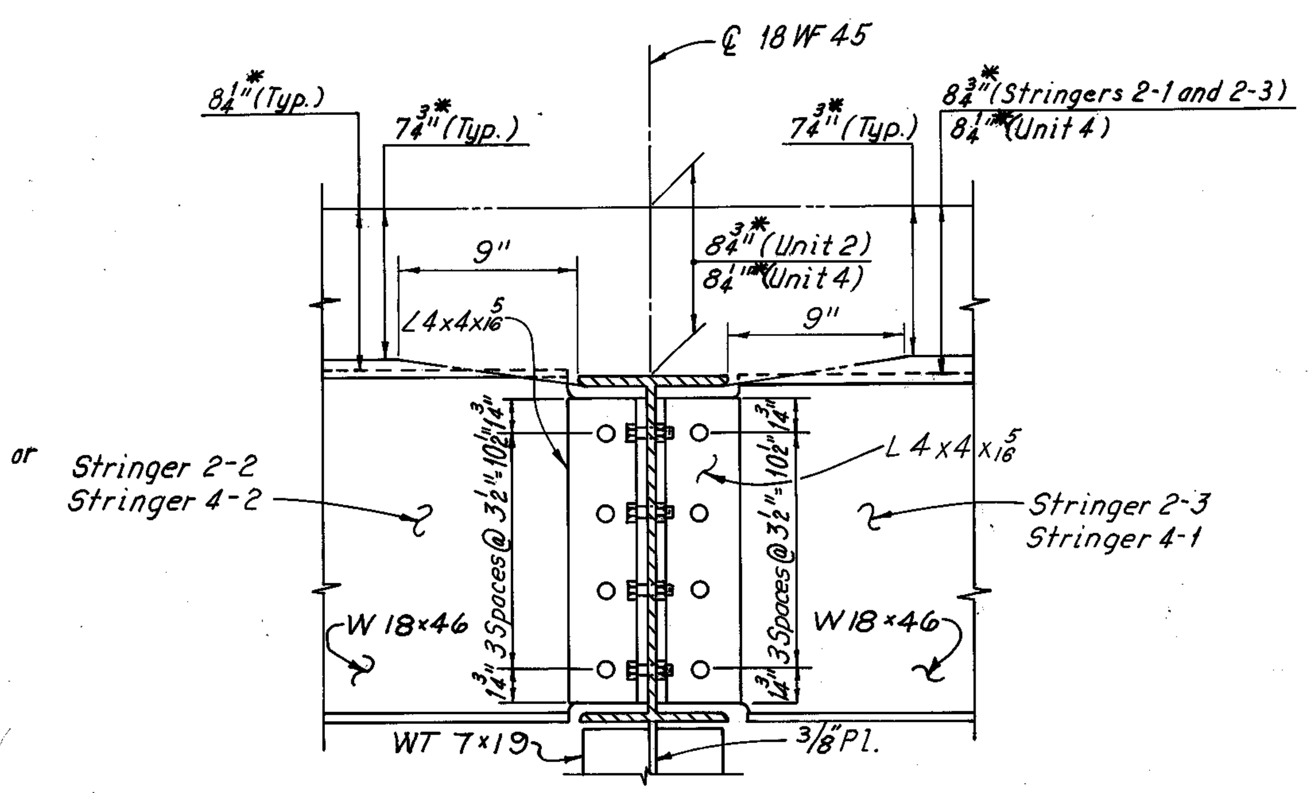
DETAIL D



DETAIL C



SECTION C-C



SECTION B-B

* Note: Includes 1 1/4" Latex Modified Concrete Wearing Surface.

This sheet superseded by Sheet 141-S/193. 12-24-86

Notes:

For locations of crossframes see Framing Plans for Units 2, 3 and 4.

For treatment of longitudinal stiffeners at crossframes see Section A-A on Sheet 55/108.

All crossframe buttwelds shown on this sheet shall be radiographed.

For additional crossframe notes see Sheet 55/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

CROSSFRAME DETAILS (CF 18 AND CF 19)

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

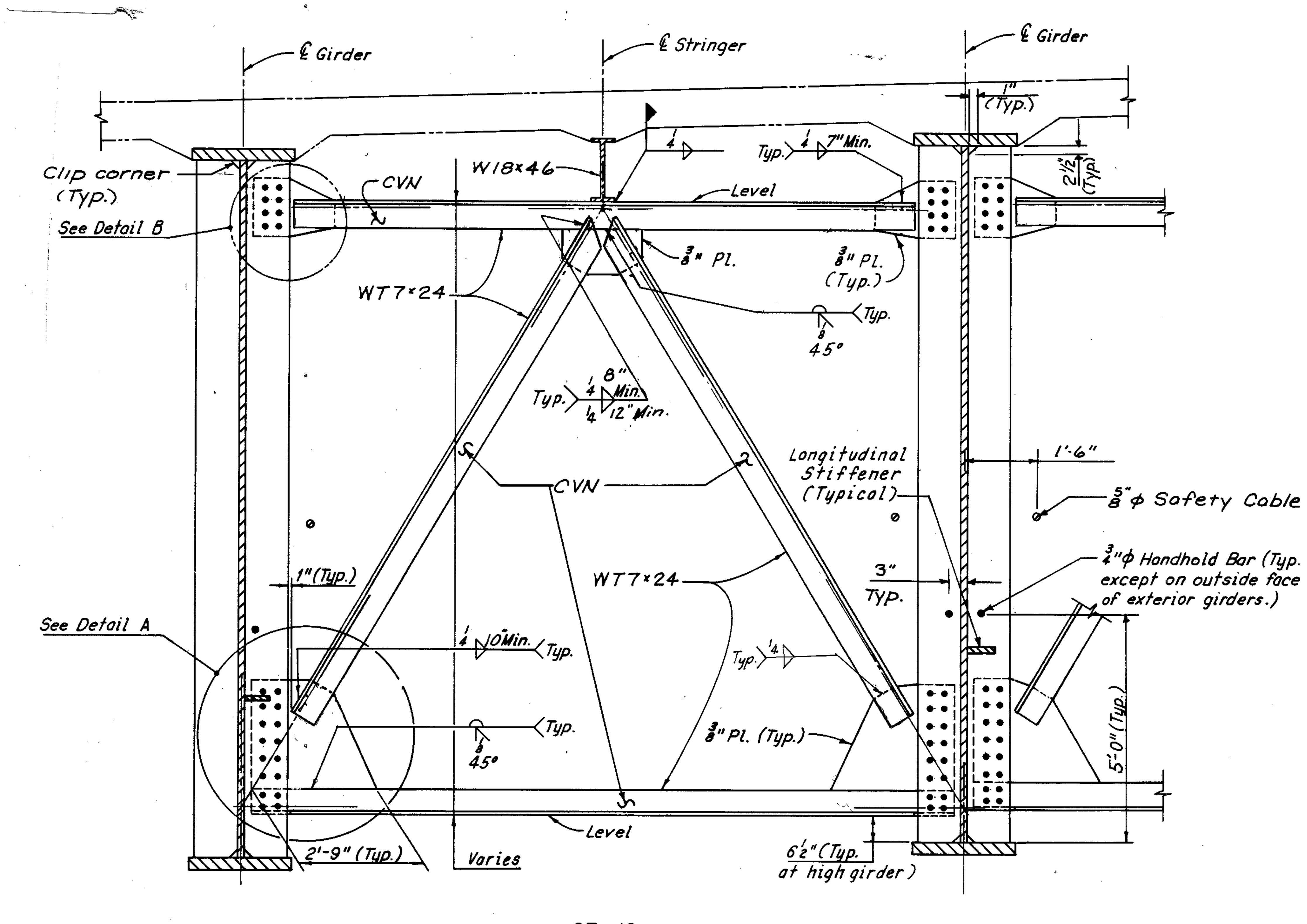
DRAWN D.H.S.	TRACED D.L.R.	CHECKED J.T.	REVIEWED C.A.B.	REVISED
DATE 1-30-70	DATE 2-1-70	DATE 2-2-70	DATE 2-24-86	SHEET 56/108

910

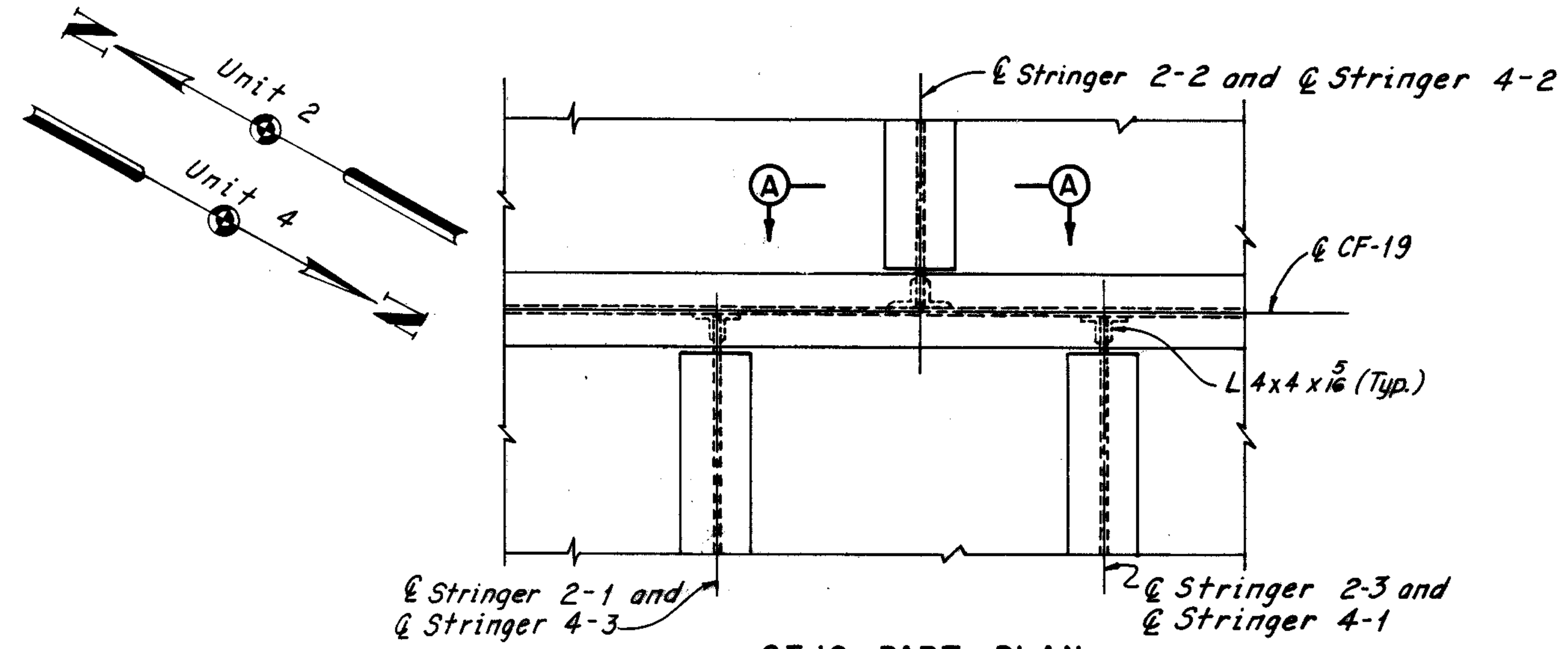
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

141-S / 193

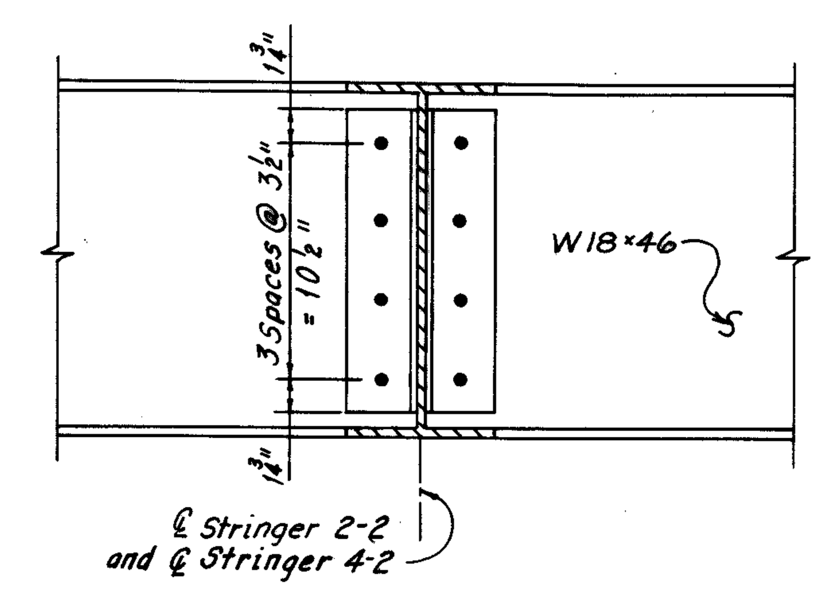
CUYAHOGA COUNTY
CUY-290-0.27



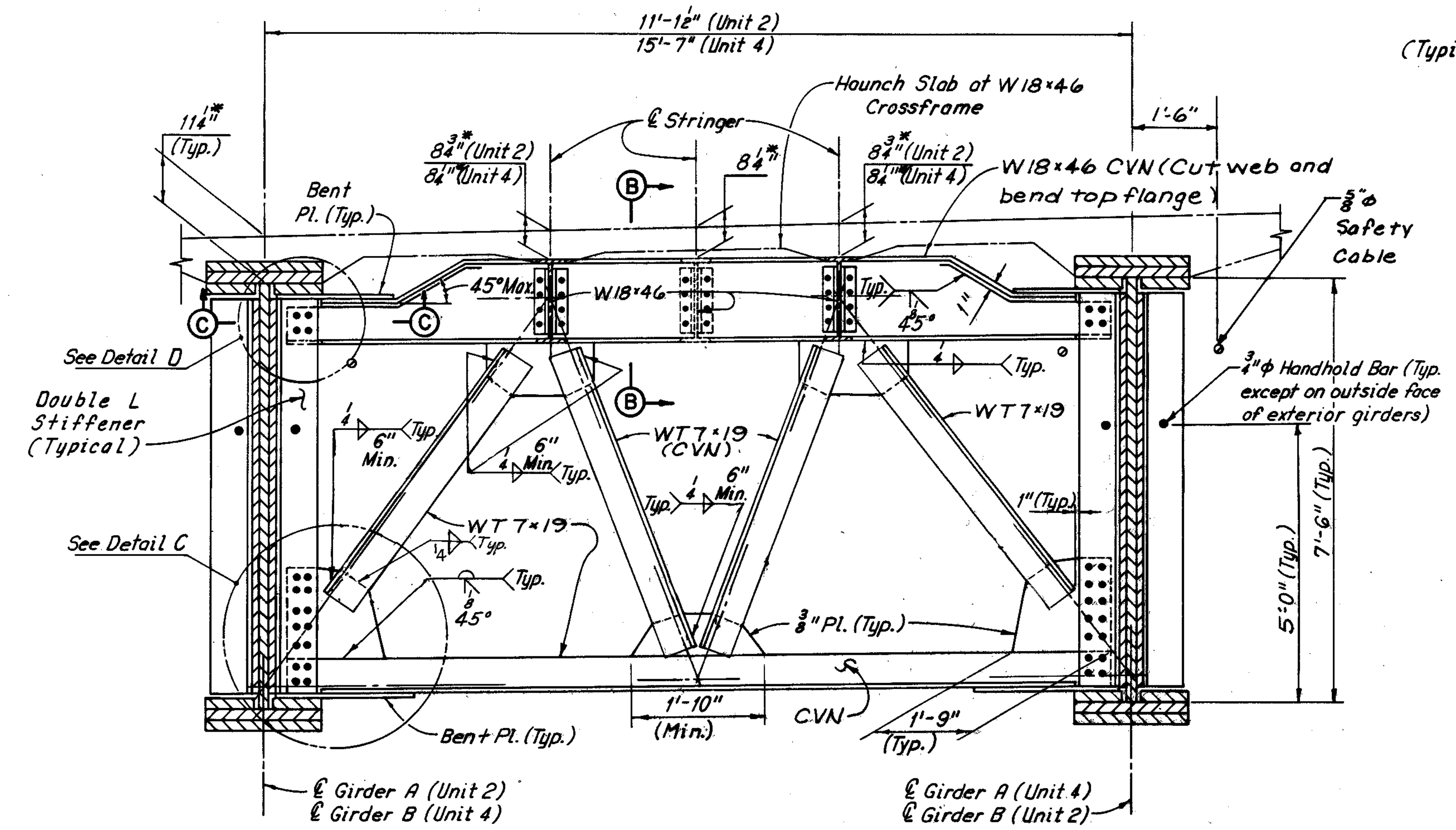
CF - 18



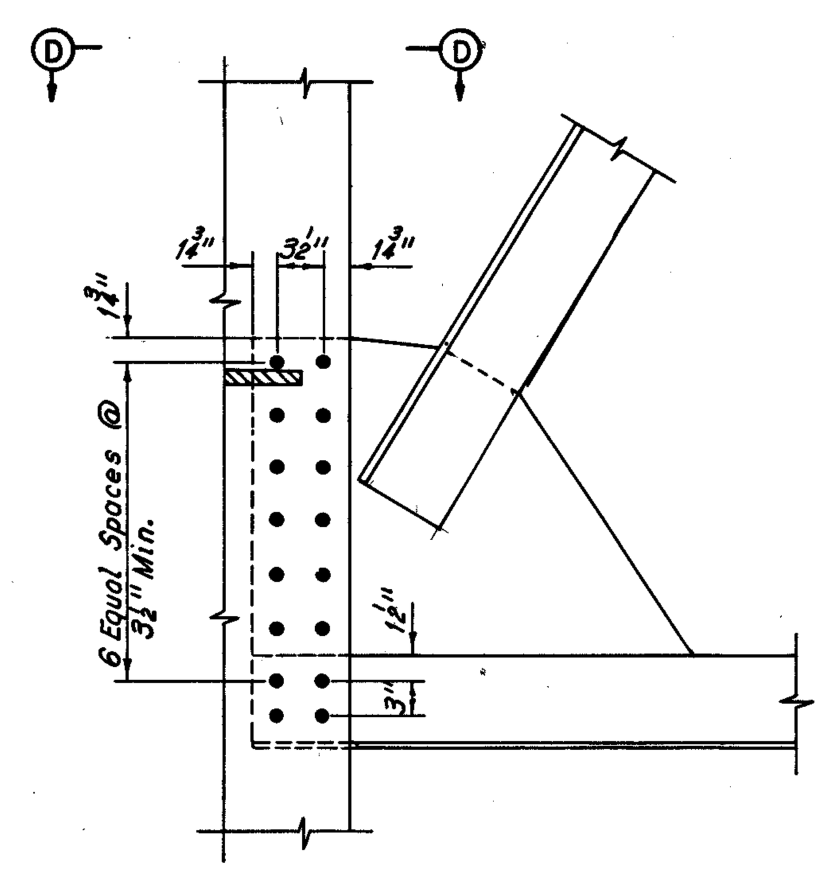
CF 19 PART PLAN



SECTION A-A
(Typical Stringer 2-1, 2-3, 4-1 and 4-3)

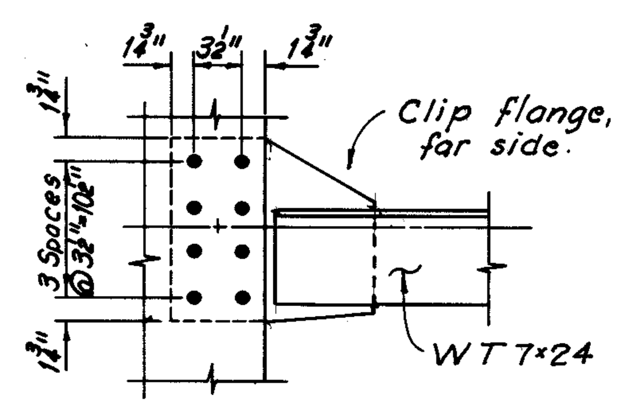


CF-19

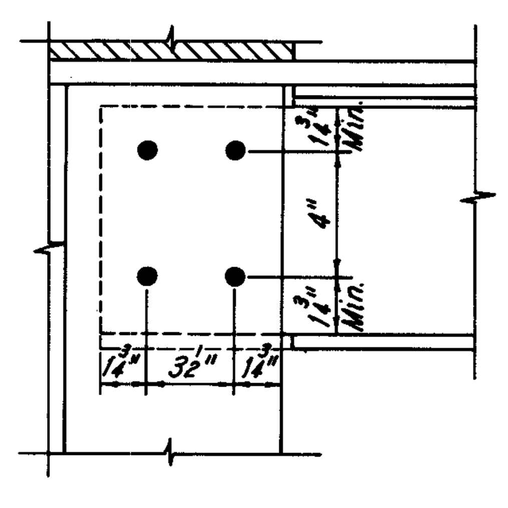


DETAIL A

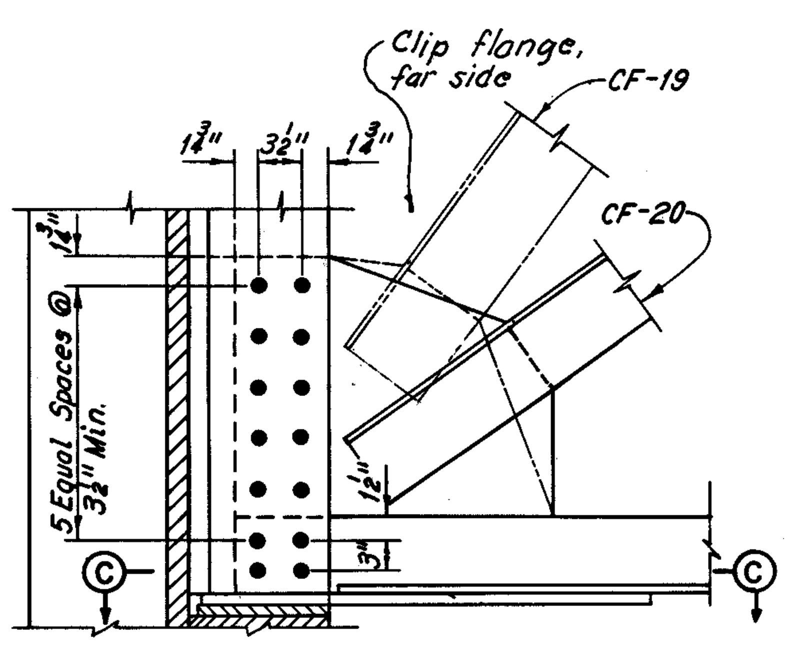
Note: For Section D-D see Section A-A on Sheet 55/108



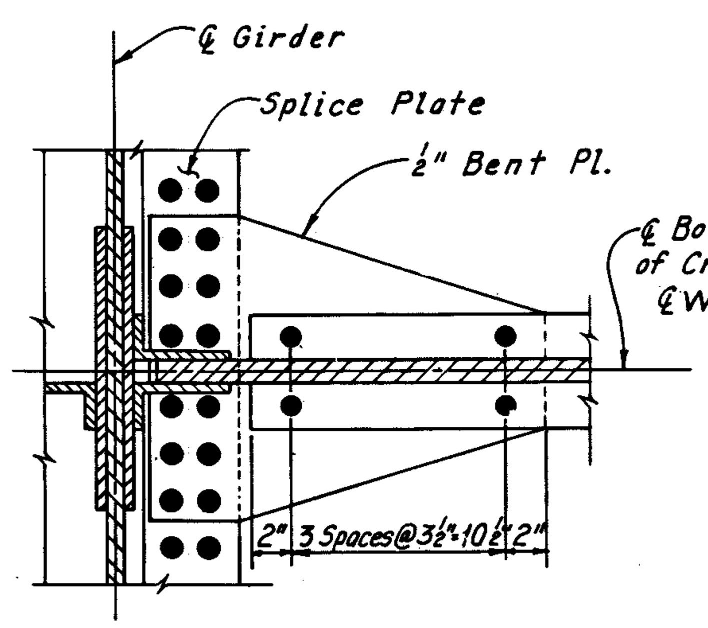
DETAIL B



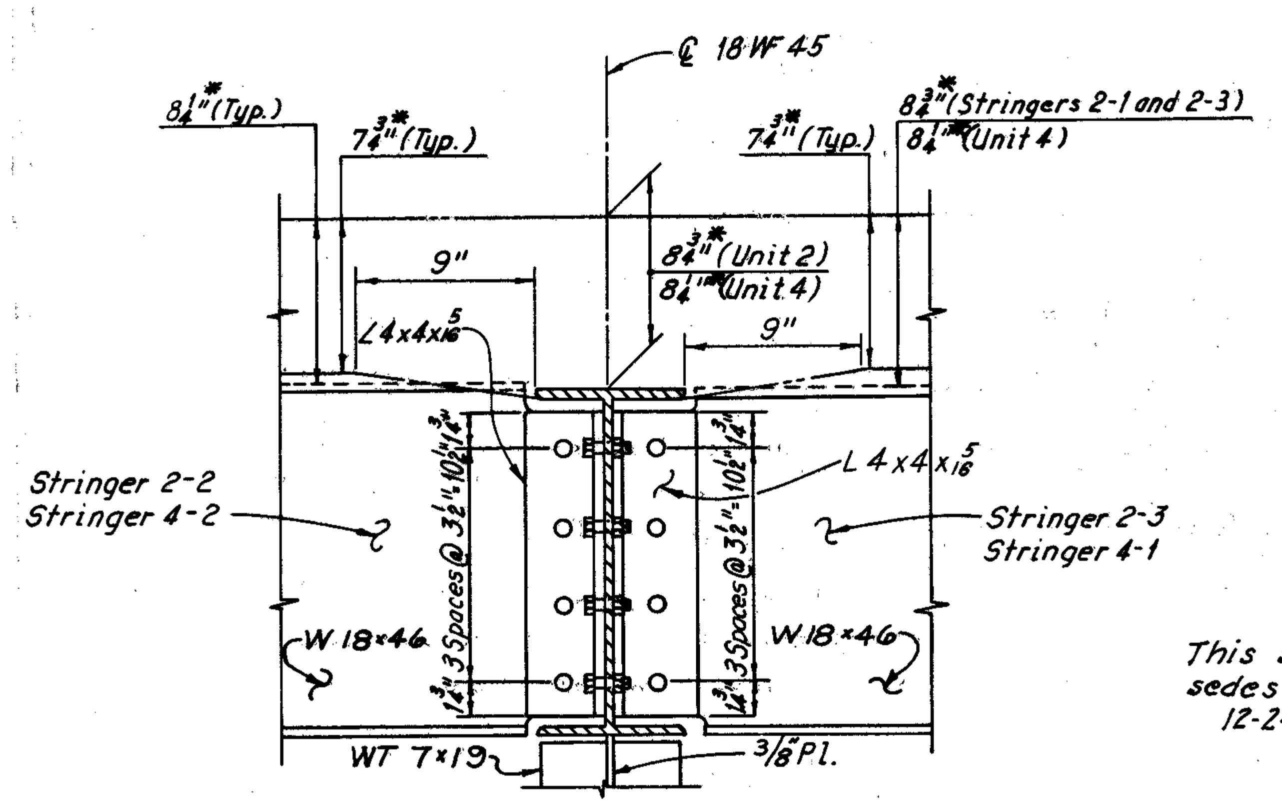
DETAIL D



DETAIL C



SECTION C-C



SECTION B-B

✱ Note: Includes 1¼" Latex Modified Concrete Wearing Surface.

Notes:

For locations of crossframes see Framing Plans for Units 2, 3 and 4.

For treatment of longitudinal stiffeners at crossframes see Section A-A on Sheet 55/108.

For additional crossframe notes see Sheet 55/108

This sheet supersedes Sheet 141/193. 12-24-86.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

CROSSFRAME DETAILS (CF 18 AND CF 19)

I-290 OVER CUYAHOGA RIVER

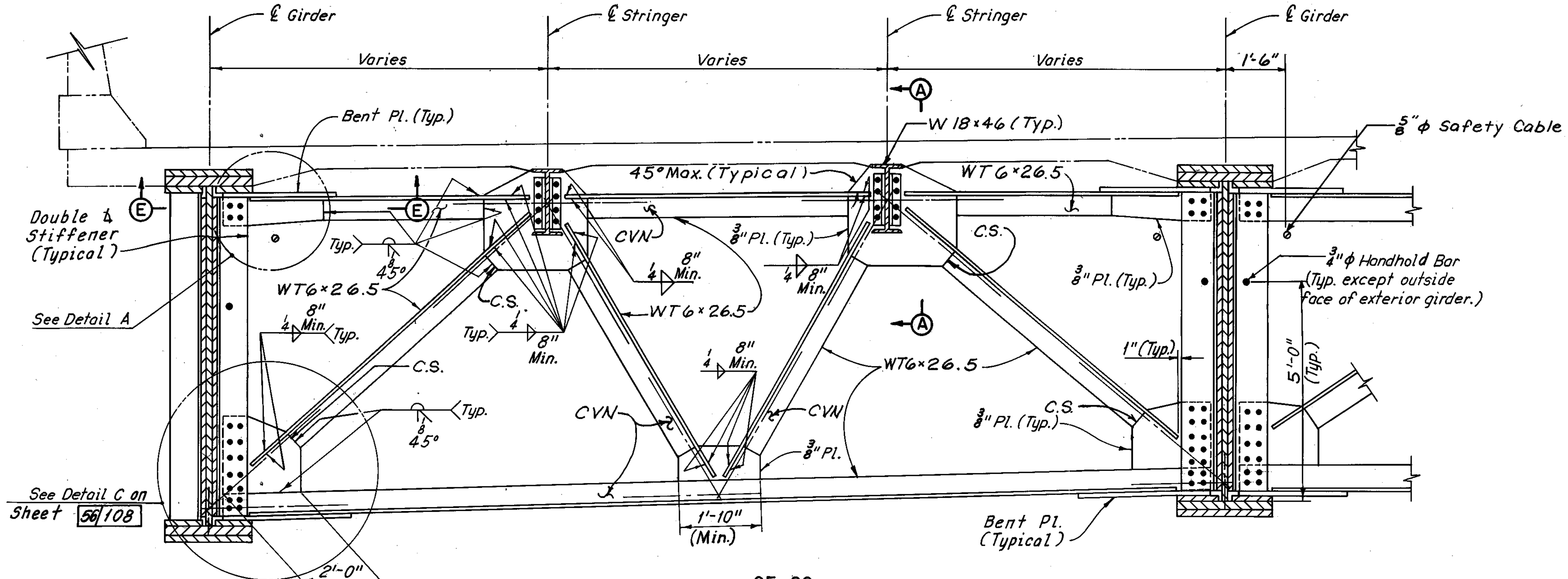
BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

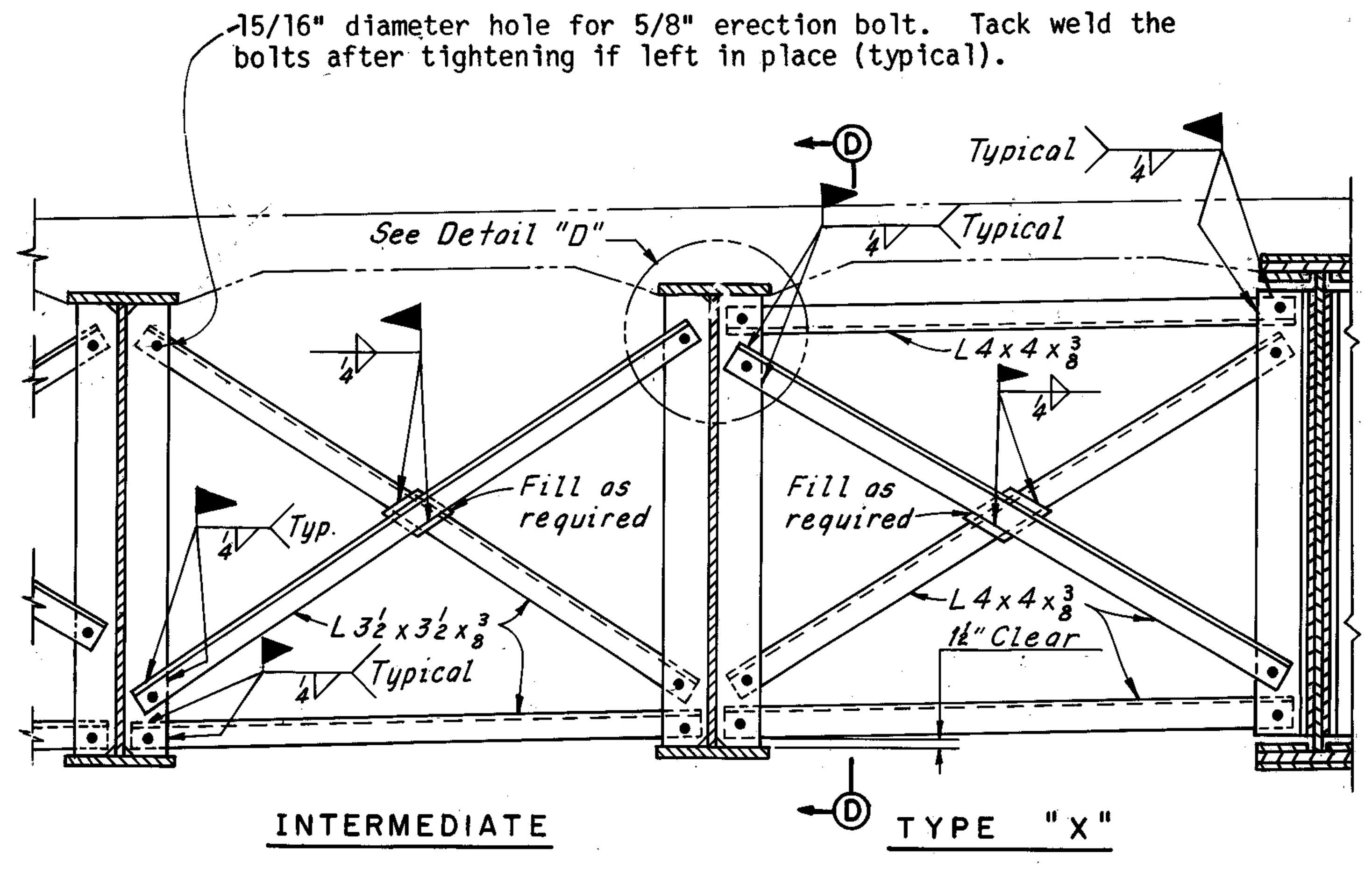
DRAWN D.H.S.	TRACED D.L.R.	CHECKED J.T.	REVIEWED C.A.B.	REVISED
DATE 1-30-70	DATE 2-1-70	DATE 2-2-70	DATE 2-24-86	

SHEET 56/108

CUYAHOGA COUNTY
CUY-290-0.27

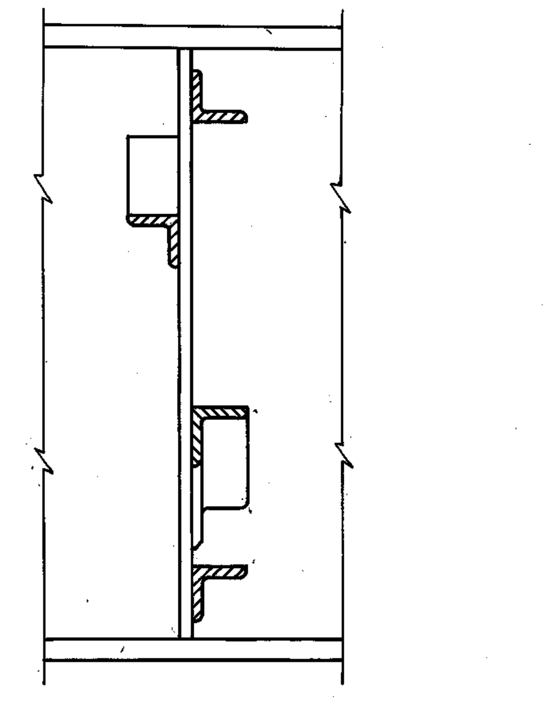


CF-20

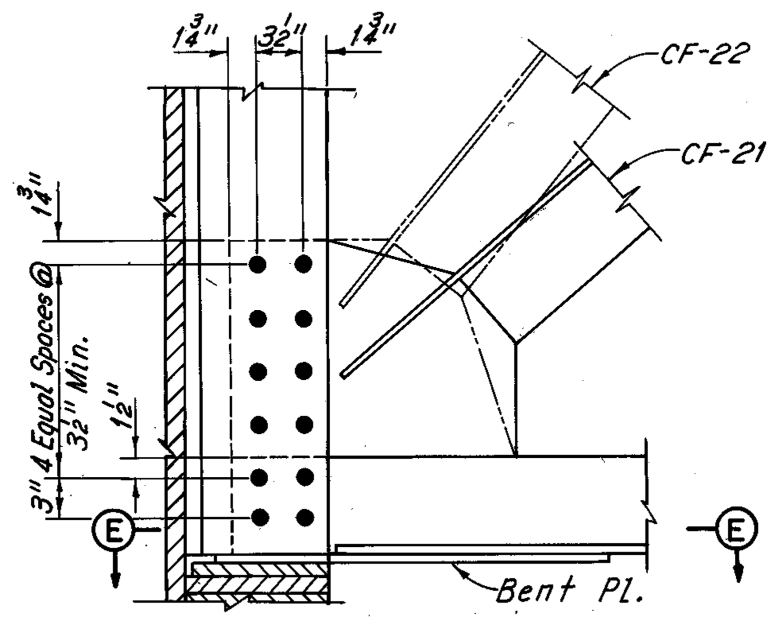


INTERMEDIATE TYPE "X"

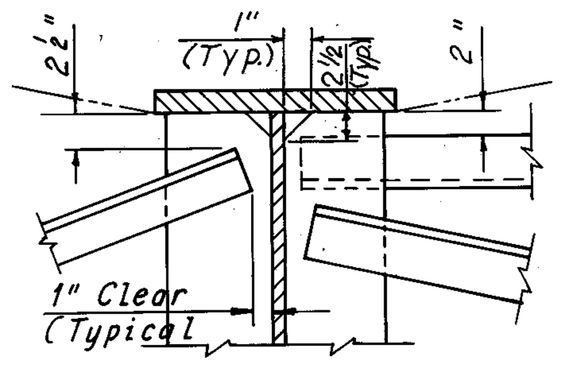
TYPICAL CROSSFRAMES - UNITS 5, 6 AND 6 CB



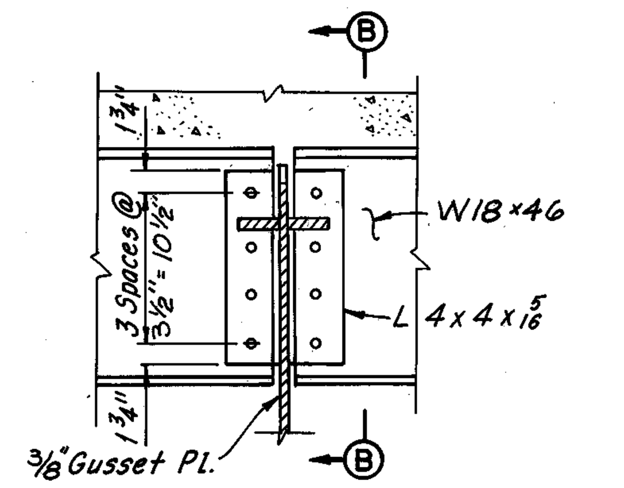
SECTION D-D



DETAIL B

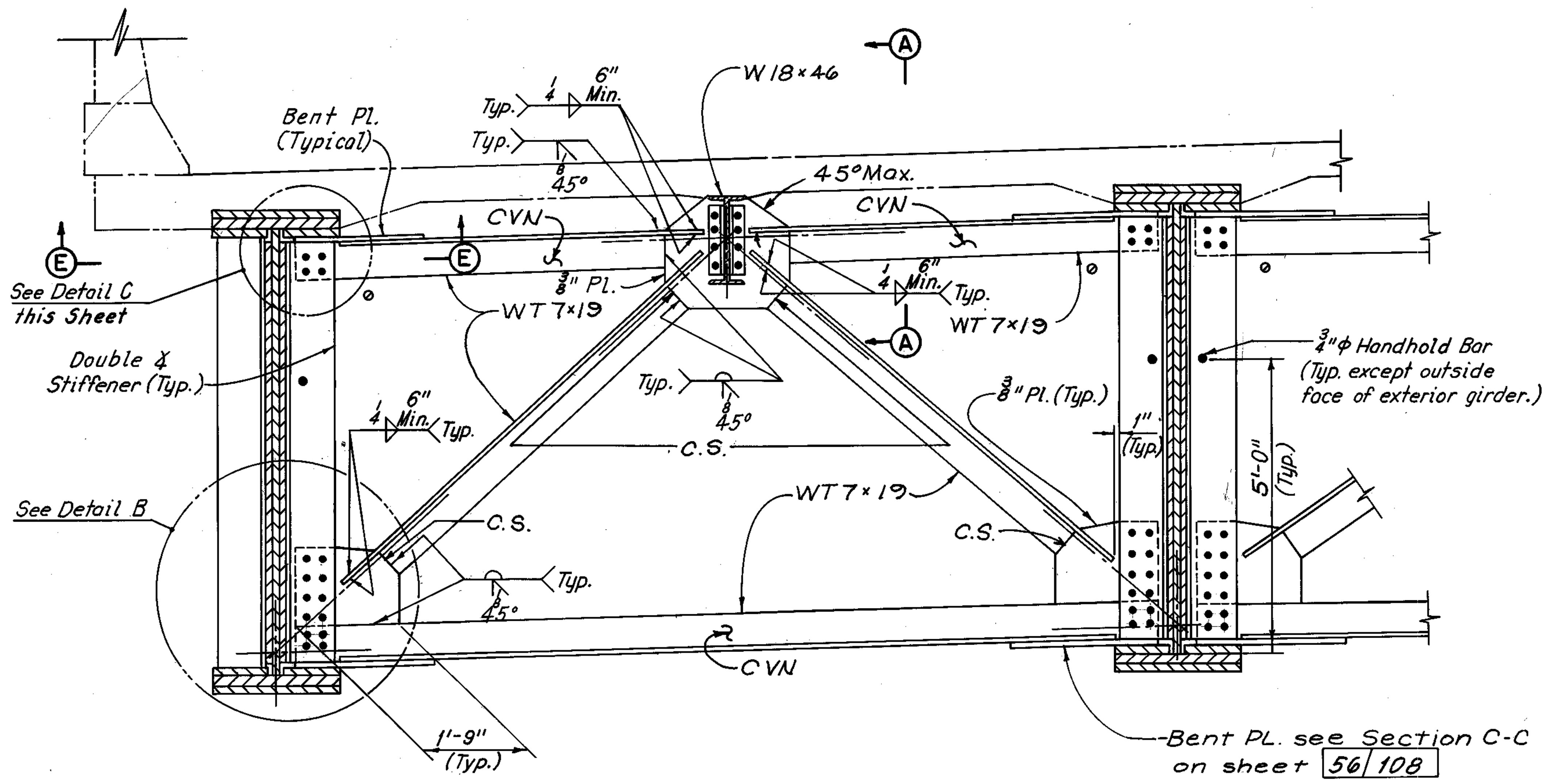


DETAIL "D"

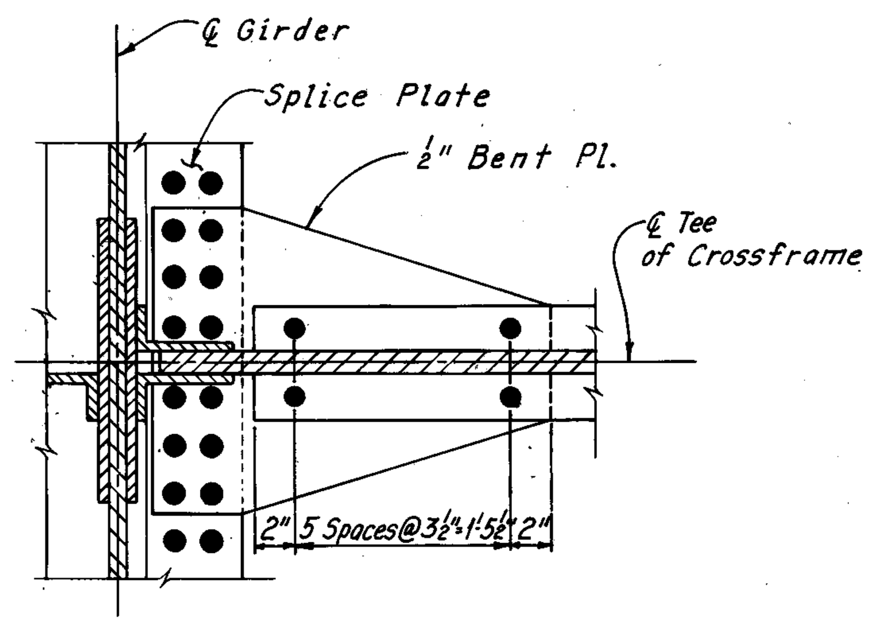


PART SECTION A-A

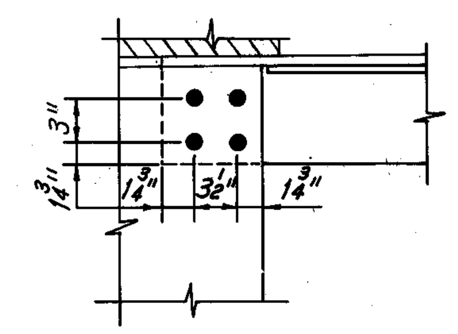
Note: CF-20 shown, CF-21 and 22 similar. Flanges of lower WT6×26.5 not shown.



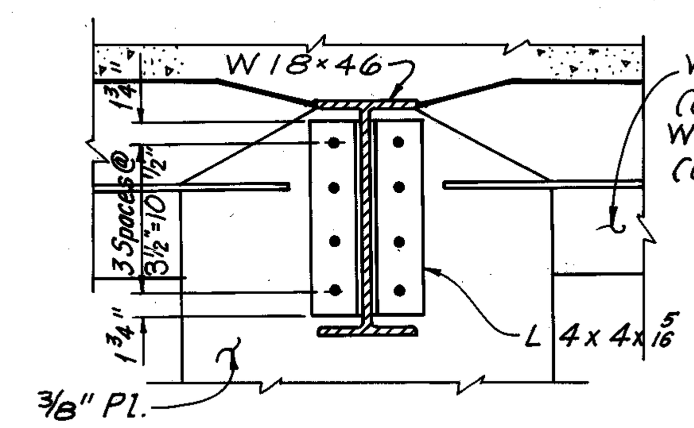
CF - 21 AND CF - 22



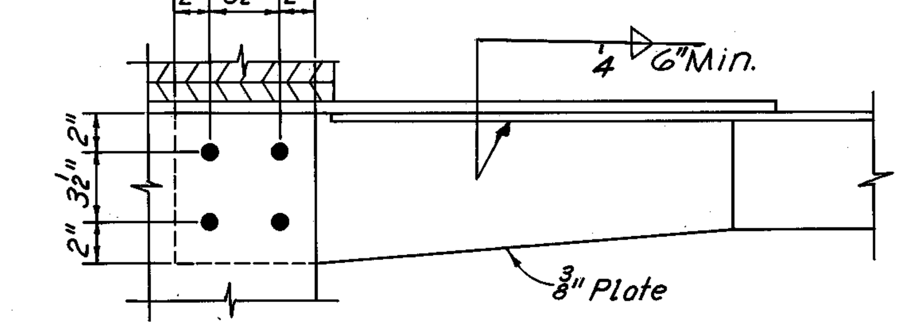
SECTION E-E
(Typical except as noted)



DETAIL C



PART SECTION B-B



DETAIL A

Notes:

For location of CF-20, 21 and 22 see Framing Plans for Units 2, 3 and 4. For crossframe locations in Units 5, 6, and 6-CB see the Framing Plans for these units.

For treatment of longitudinal stiffeners at crossframes see Section A-A on Sheet 55/108.

All crossframe buttwelds for CF-20, 21, 22 shall be Radiographed.

For additional crossframe notes see Sheet 55/108.

This sheet superseded by Sheet 142-5/193. 12-24-86.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

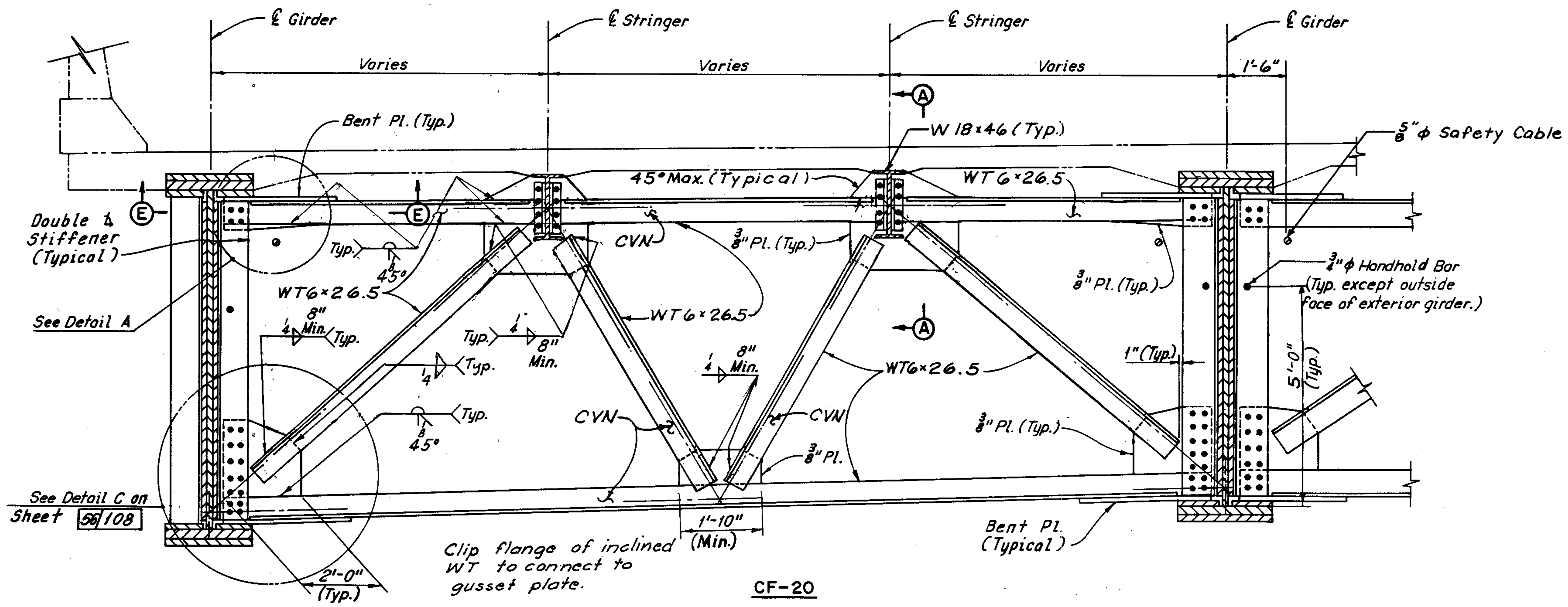
CROSSFRAME DETAILS
(CF 20, 21, 22 AND UNITS 5, 6 AND 6CB)

I-290 OVER CUYAHOGA RIVER

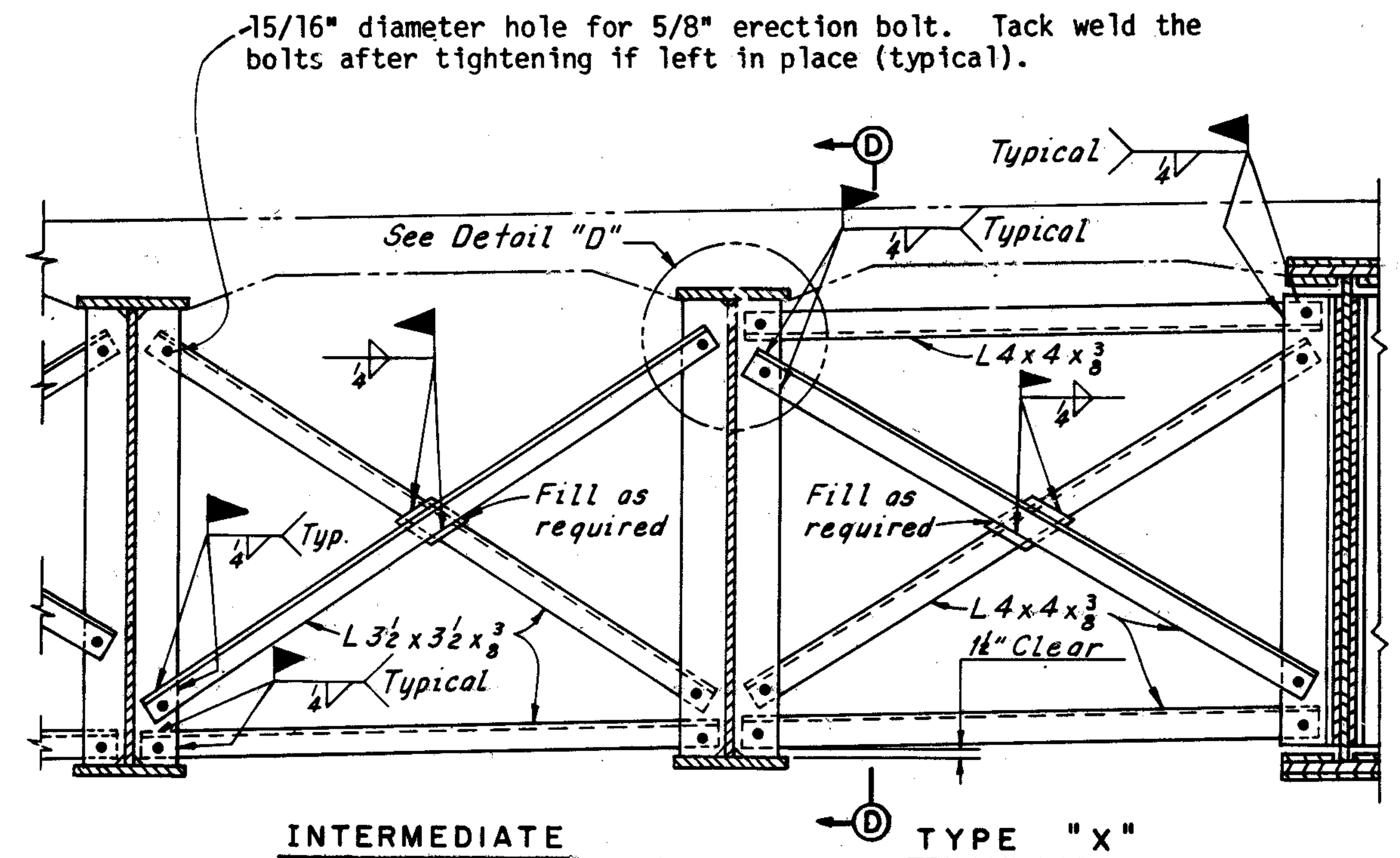
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S.	TRACED D.L.F.	CHECKED J.T.	REVIEWED C.A.B.	REVISED
DATE 1-28-70	DATE 1-30-70	DATE 2-2-70	DATE 2-24-86	



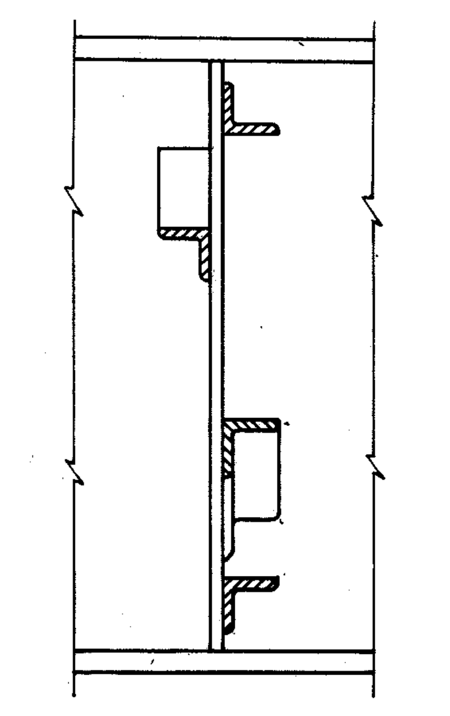
CF-20



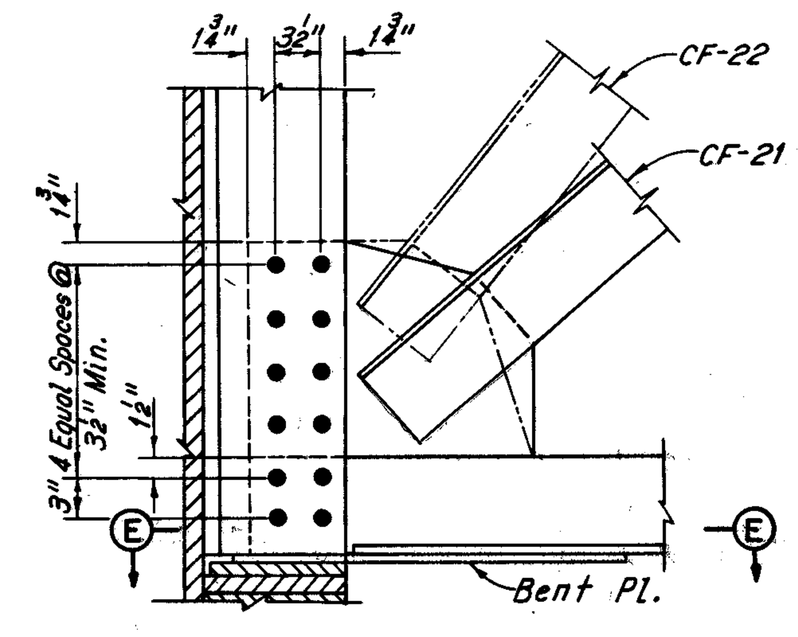
INTERMEDIATE

TYPE "X"

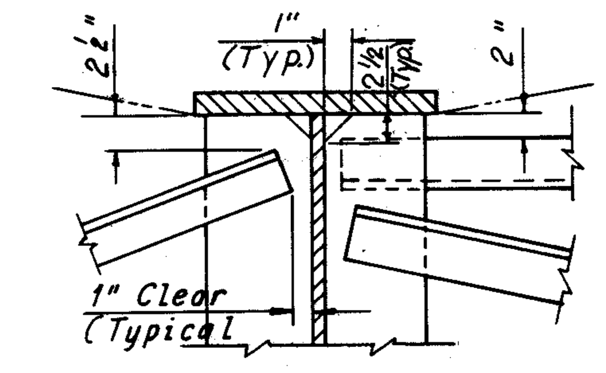
TYPICAL CROSSFRAMES - UNITS 5, 6 AND 6 CB



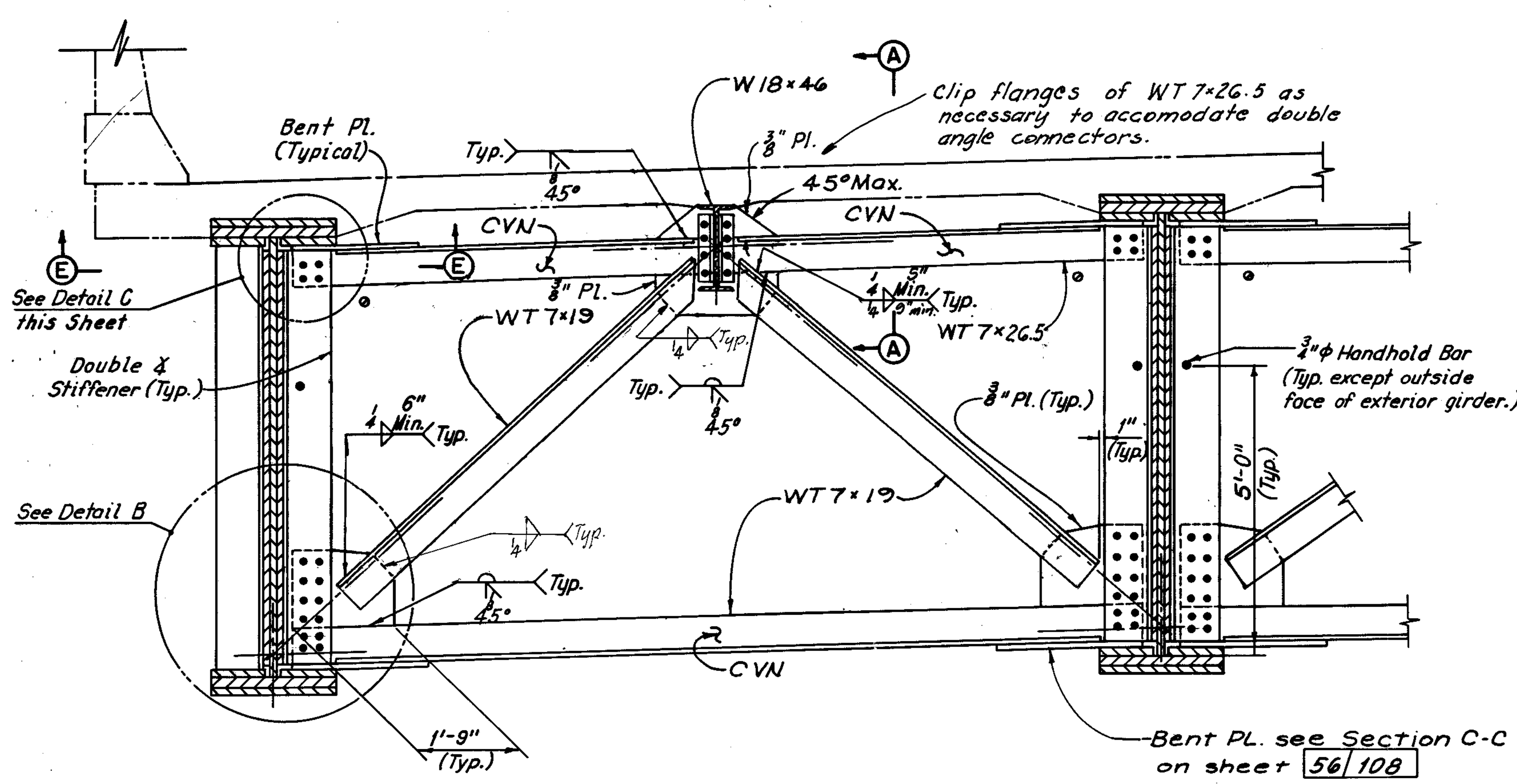
SECTION D-D



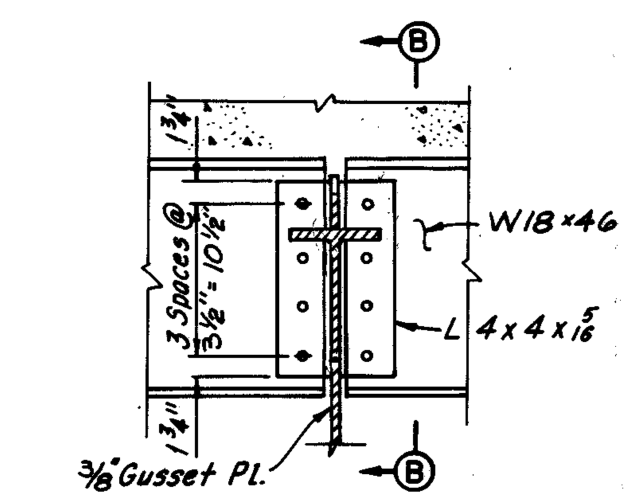
DETAIL B



DETAIL "D"

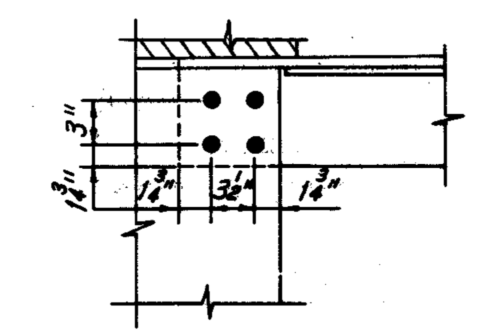


CF - 21 AND CF - 22

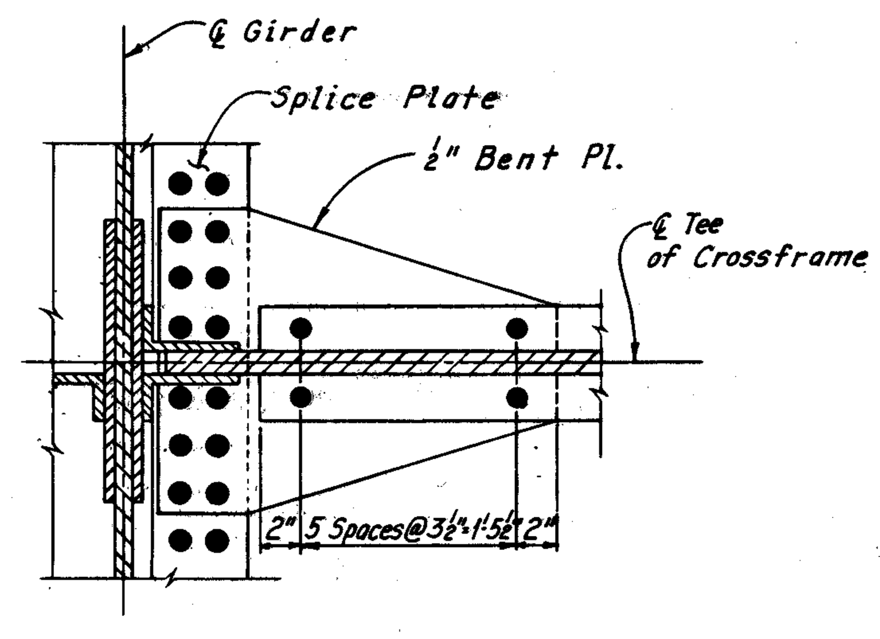


PART SECTION A-A

Note: CF-20 shown, CF-21 and 22 similar. Flanges of lower WT 6×26.5 not shown.

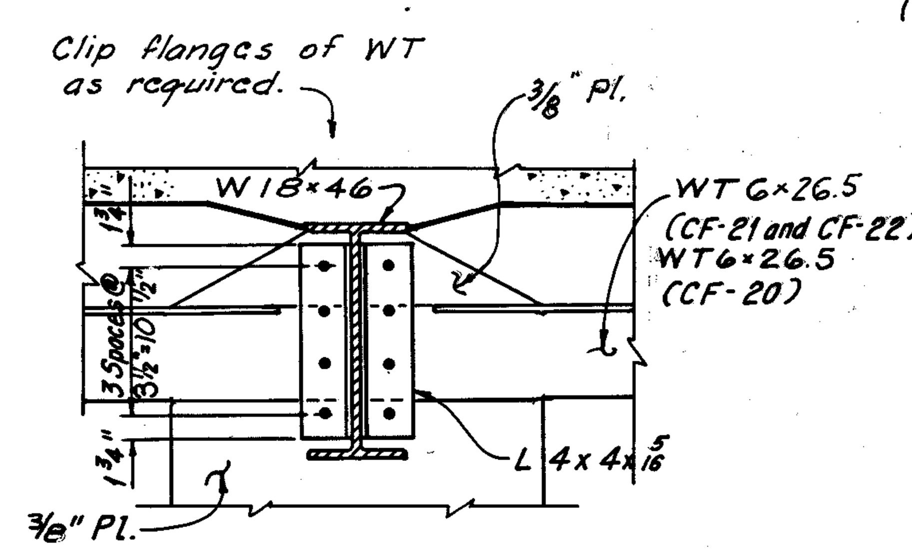


DETAIL C

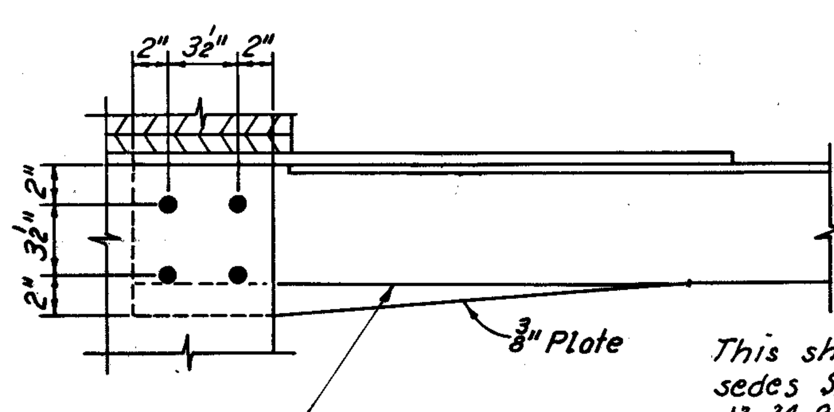


SECTION E-E

(Typical except as noted)



PART SECTION B - B



DETAIL A

Notes:

For location of CF-20, 21 and 22 see Framing Plans for Units 2, 3 and 4. For crossframe locations in Units 5, 6, and 6-CB see the Framing Plans for these units.

For treatment of longitudinal stiffeners at crossframes see Section A-A on Sheet 55/108.

For additional crossframe notes see Sheet 55/108.

This sheet supersedes Sheet 142/193. 12-24-86.

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

142S/193

CUYAHOGA COUNTY
CUY-290-0.27

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

CROSSFRAME DETAILS (CF 20, 21, 22 AND UNITS 5, 6 AND 6CB)

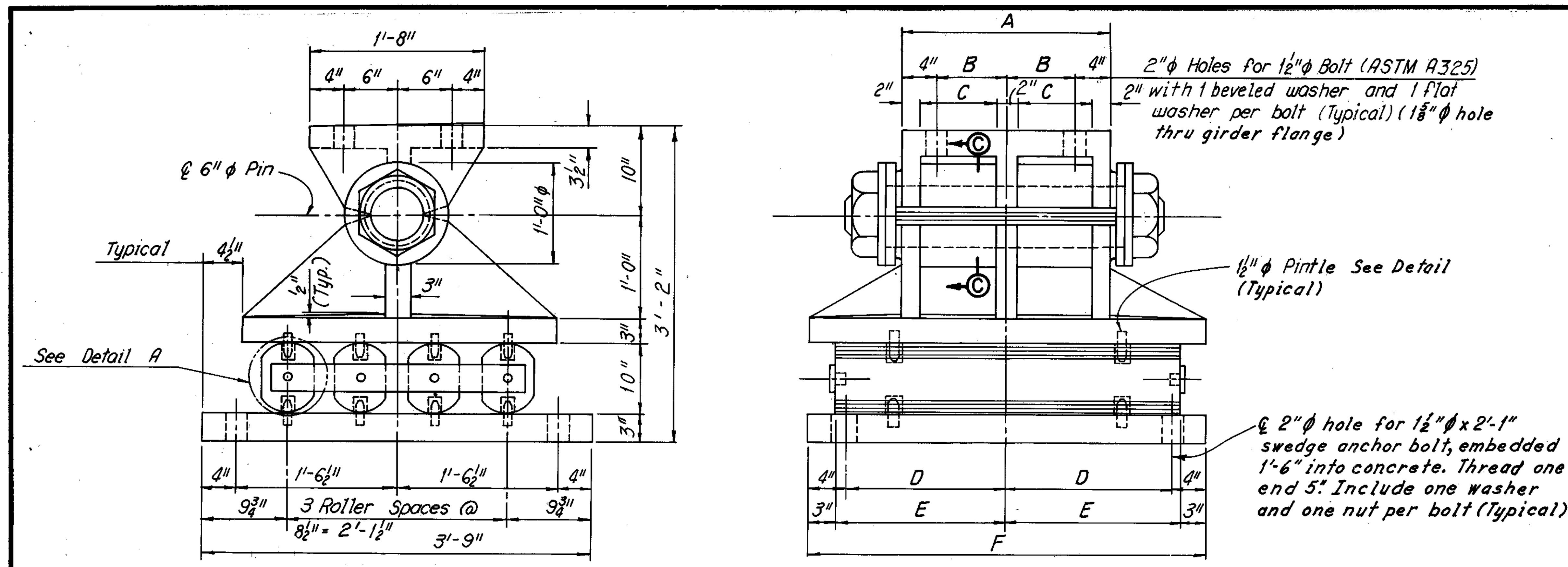
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S.	TRACED D.L.R.	CHECKED J.T.	REVIEWED C.A.B.	REVISED
DATE 1-28-70	DATE 1-30-70	DATE 2-2-70	DATE 2-24-86	SHEET 57-S/108

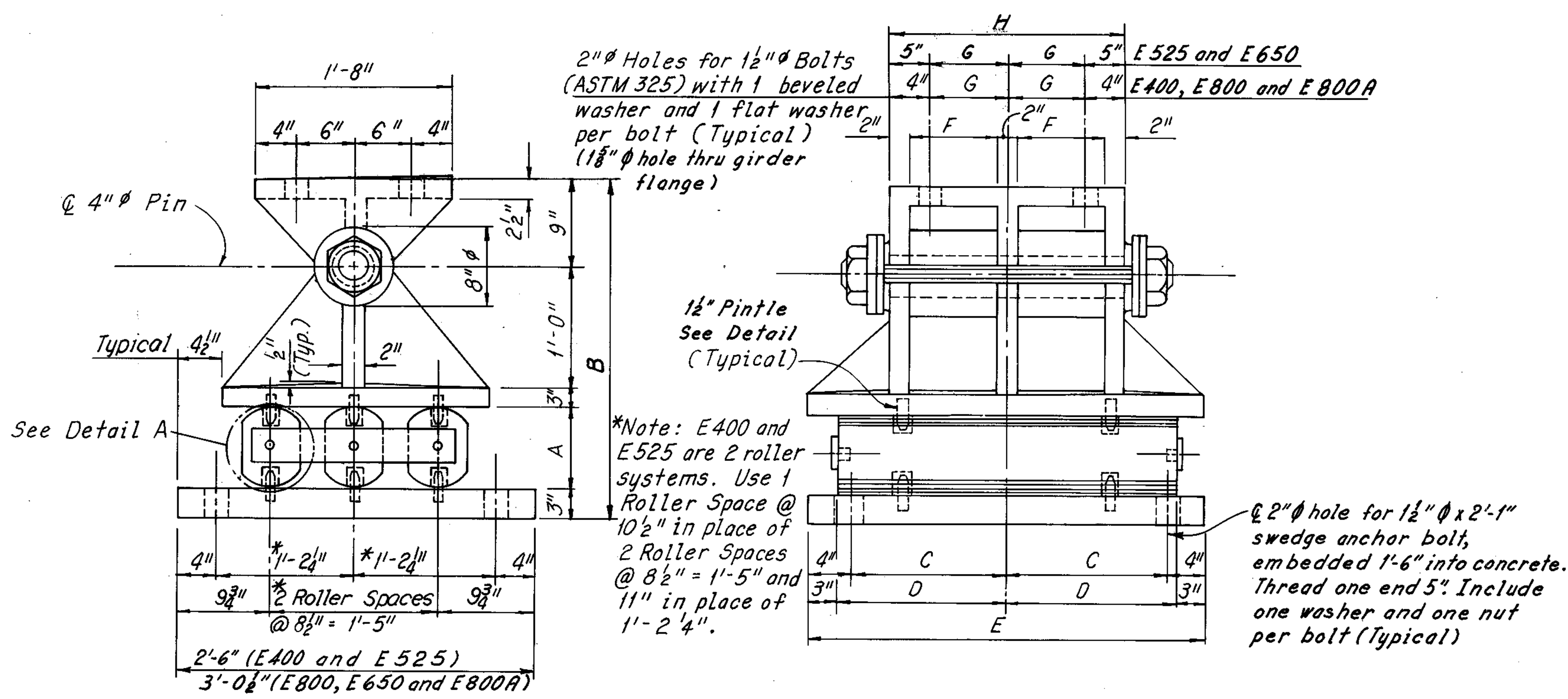
CUYAHOGA COUNTY
CUY-290-0.27



	Location	Number Required	A	B	C	D	E	F	Weight
E 1300	Pier 11L and 11R (Interior)	6	2'-0"	8"	9"	1'-6½"	1'-7½"	3'-9"	47220
E 1100	Pier 11L and 11R (Exterior)	4	1'-10"	7"	8"	1'-1"	1'-2"	2'-10"	24964

Note: Weights given are total for all bearings, including high strength bolts, anchor bolts, nuts, washers and ⅛" sheet lead.

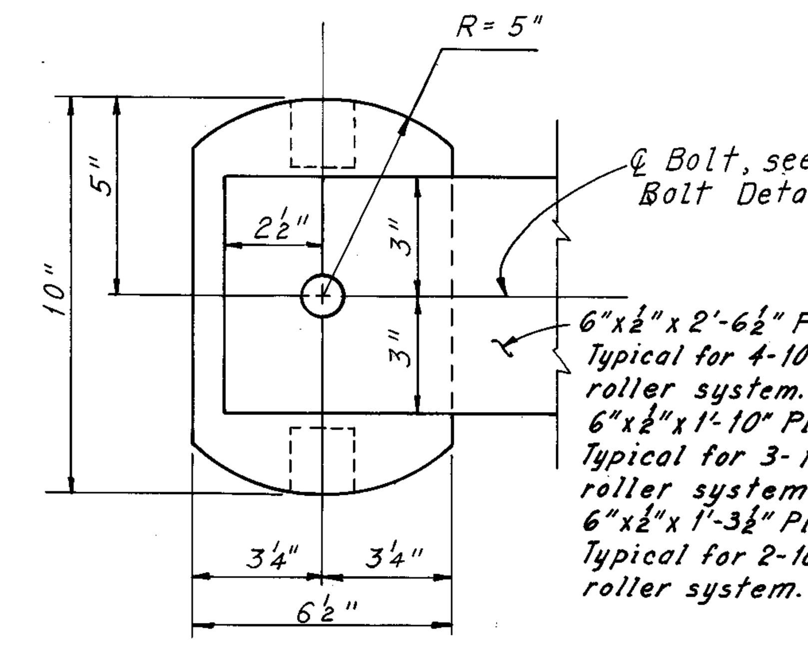
EXPANSION BEARINGS E 1300 AND E 1100



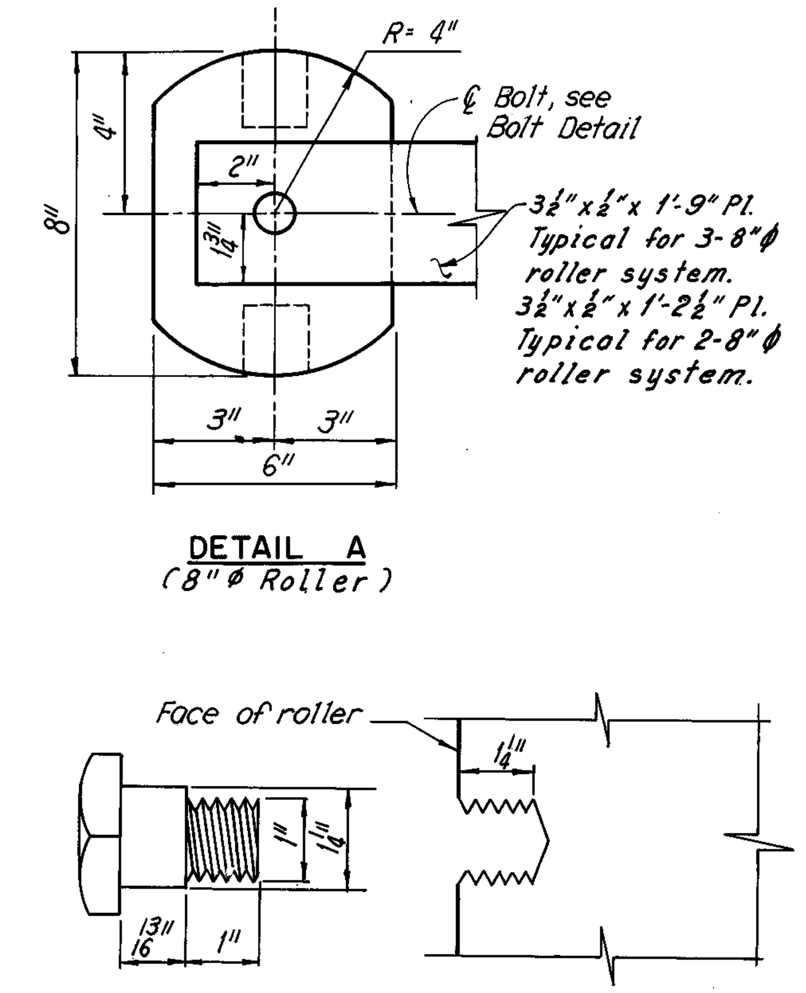
	LOCATION	NUMBER REQUIRED	A	B	C	D	E	F	G	H	WEIGHT
E400	Pier 4L and 4R	12	10"	3'-1"	1'-0"	1'-1"	2'-8"	7"	6"	1'-8"	41,232
E525	Pier 9R (Exterior) Pier 15R	7	8"	2'-11"	1'-1"	1'-2"	2'-10"	8"	6"	1'-10"	23,940
E800	Pier 12L and 12R Pier 9L Pier 9R, Girder G, H and J	18	10"	3'-1"	1'-1"	1'-2"	2'-10"	9"	8"	2'-0"	83,988
E650	Pier 8R (Exterior) Pier 5R Pier 5L, Girder A, B, C & G Pier 15L	16	8"	2'-11"	1'-1"	1'-2"	2'-10"	8"	6"	1'-10"	67,536
E800A	Pier 8R (Interior) Pier 5L, Girder D, E & F	6	8"	2'-11"	1'-2"	1'-3"	3'-0"	7"	6"	1'-8"	26,268

Note: Weights given are total for all bearings, including high strength bolts, anchor bolts, nuts, washers and ⅛" sheet lead.

EXPANSION BEARINGS E 400, E525, E650, E800 AND E800A



DETAIL A
(10"φ Roller)



DETAIL A
(8"φ Roller)

BOLT DETAIL

Notes:

All castings shall be ASTM A486, Class 90 Cast Steel, with a 60,000 psi minimum yield point. All fillets shall be 3/4" radius, except as shown.

All pins, rollers and base plates under the rollers shall be ASTM A668, Class H Steel Forgings, with 55,000 psi minimum yield point.

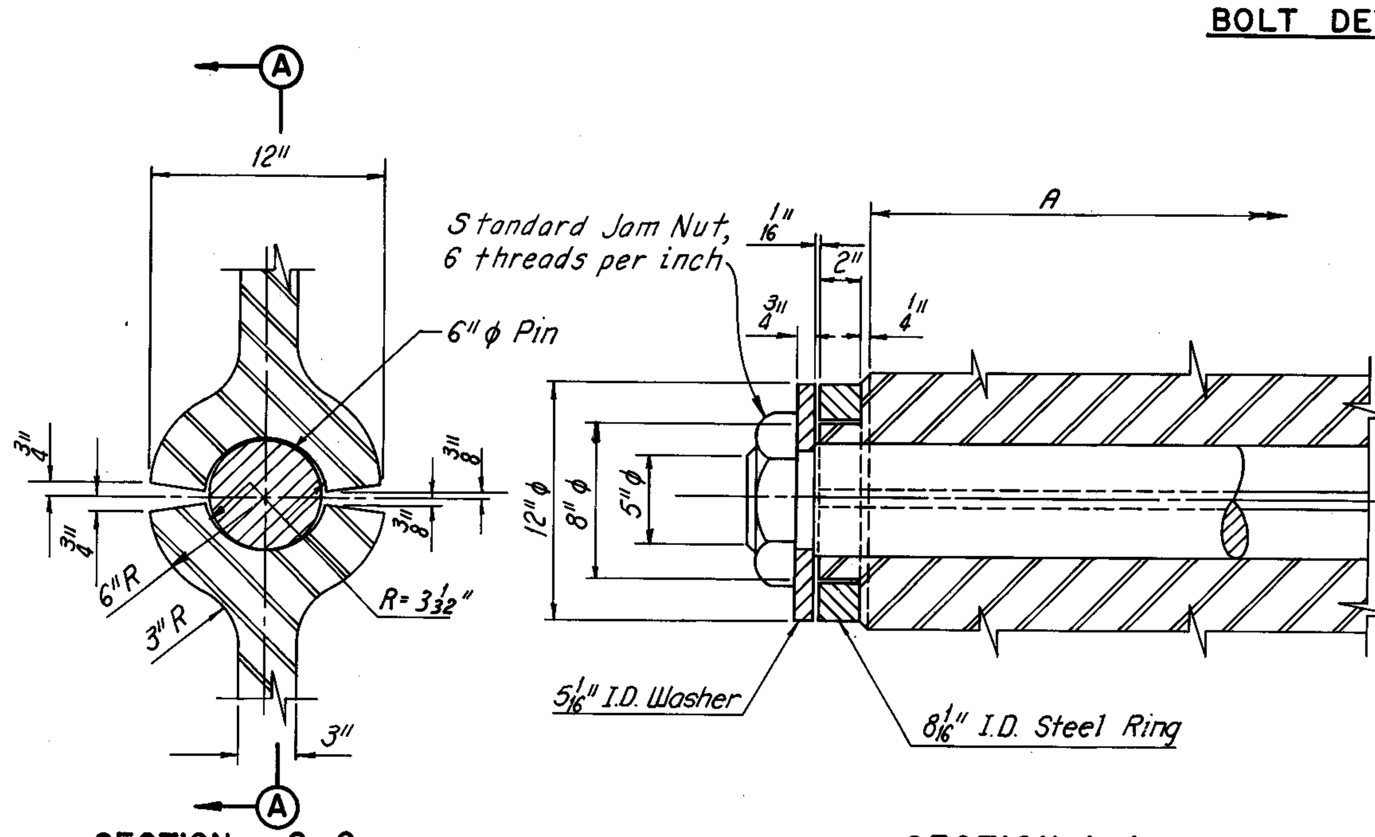
In lieu of A572 steel, A36 steel may be furnished for all rockers and bolsters (prefixed R or B), except for upper plate element of bearings. This A36 steel shall be included with the A572 steel quantity for payment.

All nuts, bolts, washers and rings shall be ASTM A325.

Provide 1/8" sheet lead between masonry and bearing and fill space around anchor bolts with molten lead before placing nuts.

All base plates and castings shall be scribed with longitudinal and transverse center lines.

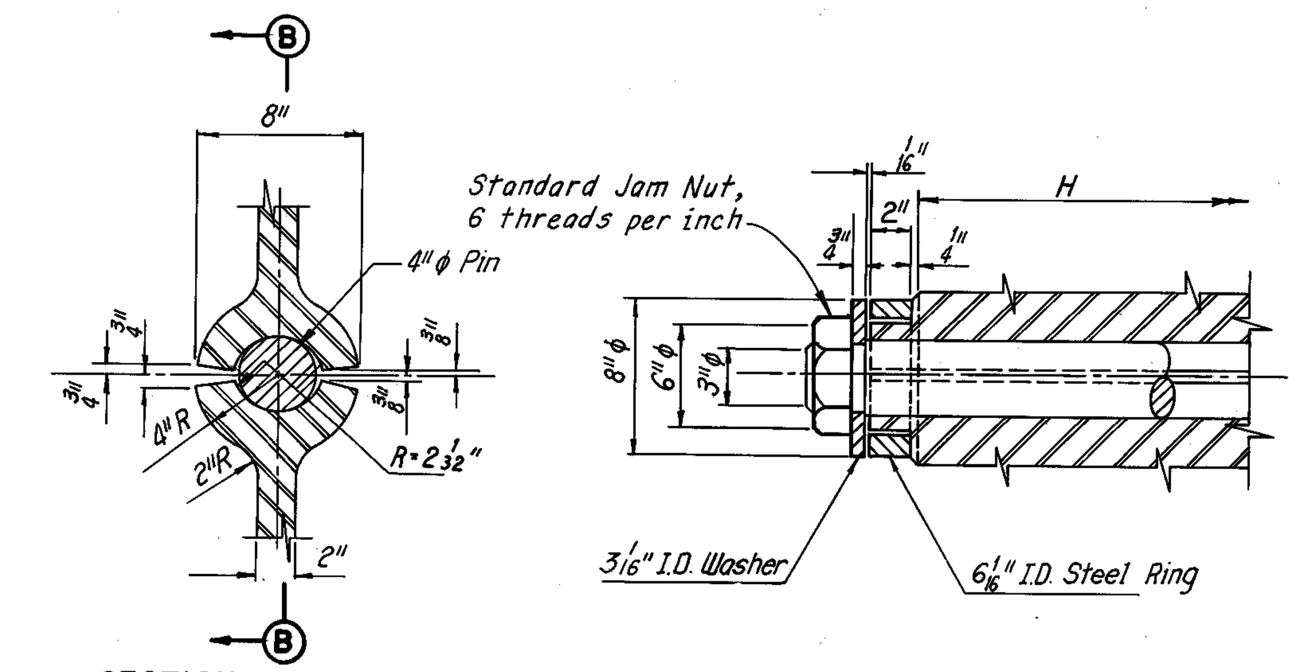
Bearings shall be accurately set in accordance with 516.05 as to level and alignment on a properly prepared bridge seat. The cost of preparing the bridge seat shall be included for payment with the unit price bid for Item 513, Structural Steel.



SECTION C-C

6"φ PIN DETAILS

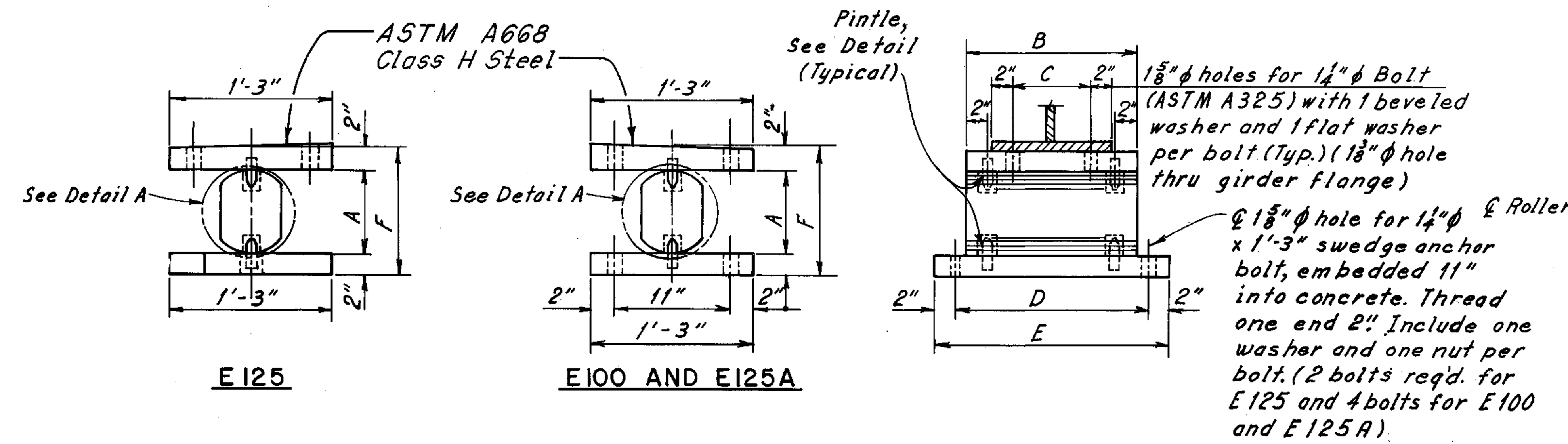
SECTION A-A



SECTION THRU PIN

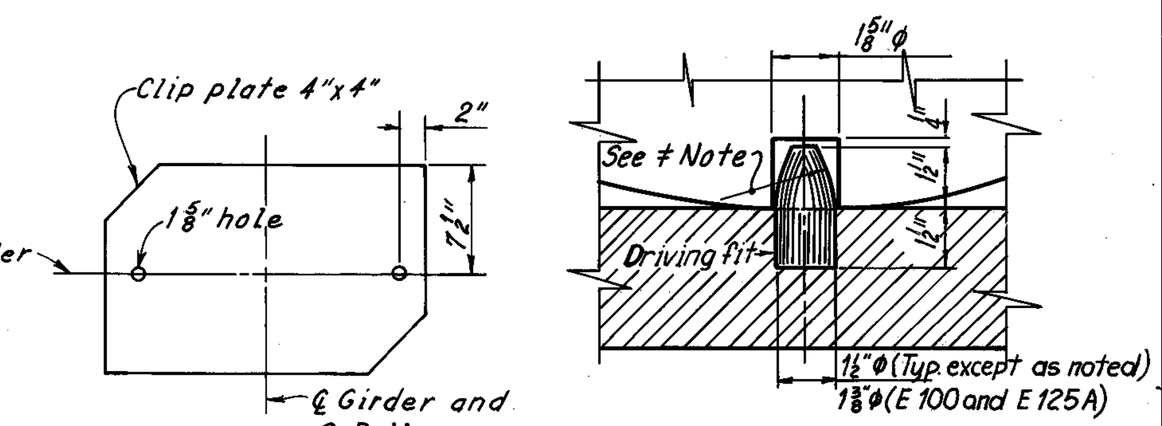
SECTION B-B

4"φ PIN DETAILS



E125

E100 AND E125A



BASE PLATE (E125 ONLY)

PINTLE DETAIL

‡ Note: R=2½" for 8"φ rollers.
R=3" for 10"φ rollers.

	Location	Number Required	A	B	C	D	E	F	Weight
E 125	Abut. C-B	5	8"	1'-4"	10"	1'-8"	2'-0"	1'-0"	3,230
E 100	E. Abut. Left	13	8"	1'-2"	8"	1'-4"	1'-8"	1'-0"	6,838
E 125A	E. Abut. Right	11	10"	1'-4"	8"	1'-6"	1'-10"	1'-2"	7,150

EXPANSION BEARINGS E125, E100 AND E125A

Note:
For additional notes, see Sheet 59/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

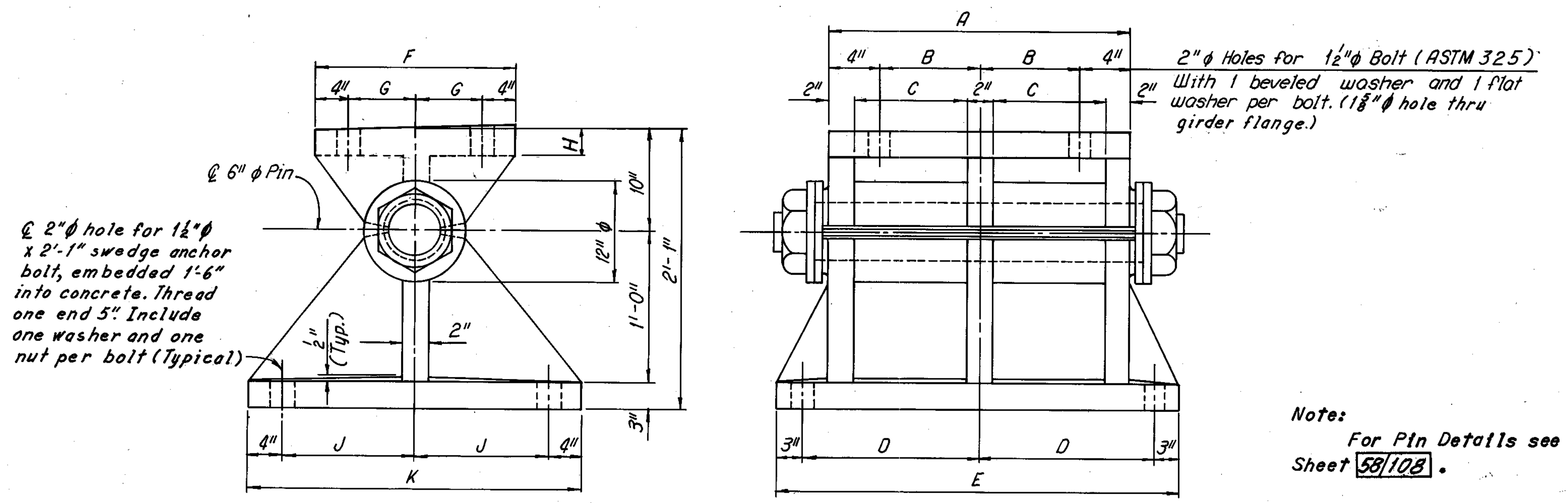
EXPANSION BEARINGS

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN LJW	TRACED AJT	CHECKED J.W.C.	REVIEWED C.A.B.	REVISED
DATE 12-29-69	DATE 1-8-70	DATE 8-8-70	DATE 2-24-86	SHEET 58/108



Note:
For Pin Details see Sheet 58/108.

FIXED BEARING

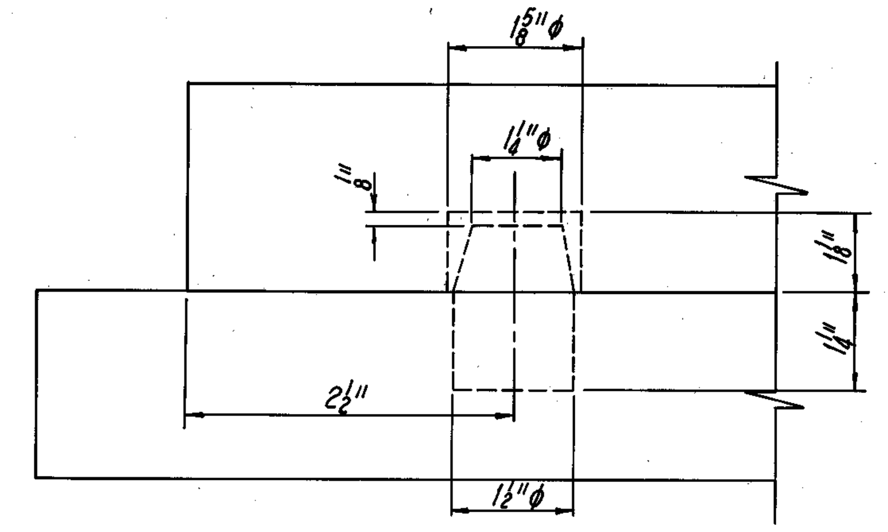
FIXED BEARING DIMENSIONS													
BEARING	LOCATION	NUMBER REQUIRED	A	B	C	D	E	F	G	H	J	K	WEIGHT
F1400	Piers 10L and 10R	10	2'-0"	8"	9"	1'-3"	3'-0"	1'-8"	6"	3½"	1'-2"	3'-0"	31,700
F1125	Pier 7L, Girder D	1	2'-0"	8"	9"	1'-3"	3'-0"	1'-8"	6"	3½"	1'-0"	2'-8"	2984
F900	Pier 13L, Girders B, C and D Pier 6L, Girder A and D	5	1'-10"	7"	8"	1'-2"	2'-10"	1'-8"	6"	3"	11"	2'-6"	13,570
F850A	Pier 7L, Girders A, E, F and G	4	2'-0"	8"	9"	1'-2"	2'-10"	1'-6"	5"	3"	11"	2'-6"	11,028
F850	Pier 7R, Girders J, K and L Pier 14L, Girder B, C and D	6	2'-0"	8"	9"	1'-3"	3'-0"	1'-6"	5"	3"	8"	2'-0"	15,396
F800	Pier 6L, Girder E, F and G Pier 13L, Girder A and E Pier 13R, Girders F thru K Pier 14R, Girders G, H and J	13	1'-6"	5"	6"	1'-0"	2'-6"	1'-6"	5"	2½"	10"	2'-4"	29,367
F750	Pier 14L, Girders A and E	2	1'-6"	5"	6"	1'-0"	2'-6"	1'-6"	5"	2½"	9"	2'-2"	4376

Note: Weights given are total for all bearings, including high strength bolts, anchor bolts, nuts, washers and ⅛" sheet lead.

ROCKER AND BOLSTER DIMENSIONS (INCHES)															
Rocker and Bolster No.	Number Required	A	B	C	D	F	G	H	K	L	M	R	T	Y	Weight
R-350 & *R-350 M	36	3½"	22"	4"	3¼"	⅞"	12"	20⅞"	15"	30"	25"	13¼"	3½"	1 11/16"	46548
‡B 350	4	3½"	22"	4"	-	⅞"	-	20⅞"	15"	30"	-	13¼"	3½"	1 11/16"	4604
B 400	2	3½"	24"	4"	-	1"	-	22⅛"	16"	32"	-	14½"	3½"	1 11/16"	2684
B 500	4	4"	26"	4"	-	1"	-	24⅛"	17"	34"	-	16"	4"	1 15/16"	6636
B 525	3	4"	26"	4"	-	1"	-	24⅜"	17"	35"	-	16"	4¼"	1 15/16"	5220

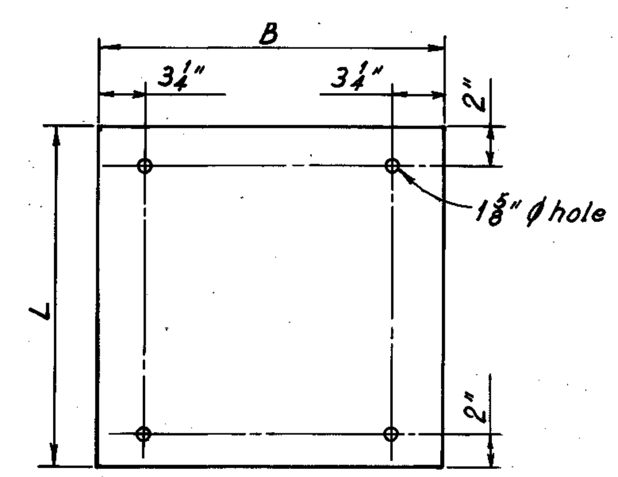
* See Rocker Dowel Modification for R-350M.
‡ See Modified base plate detail.

Note:
For dimension locations and details of Rockers and Bolsters see Ohio Standard Drawing RB-1-55, revised 2-2-59 and the modifications on this sheet.
Bevel top sole plates to match grade. Dimension C shall be measured at ℄ of sole plate.
For location of Rockers and Bolsters see Girder Elevation sheets.



ROCKER DOWEL MODIFICATION DETAIL

LOCATION OF ROCKERS WITH DOWEL MODIFICATION		
Rocker	Location	Number Required
R150 M	Abut. B-C, Girder A, B, C	3
R225 M	Pier 20R, Girders P thru U Pier 24R, Girder X	7
R250 M	Pier 20R, Girder V, W, X, N Pier 24R, Girder Y	5
R275 M	Pier 24R, Girder P thru W, Z	9
R300 M	Pier 16R, Girders N thru V	8
R350 M	Pier 16R, Girder X	1



MODIFIED BASE PL. DETAIL (B-350 ONLY)

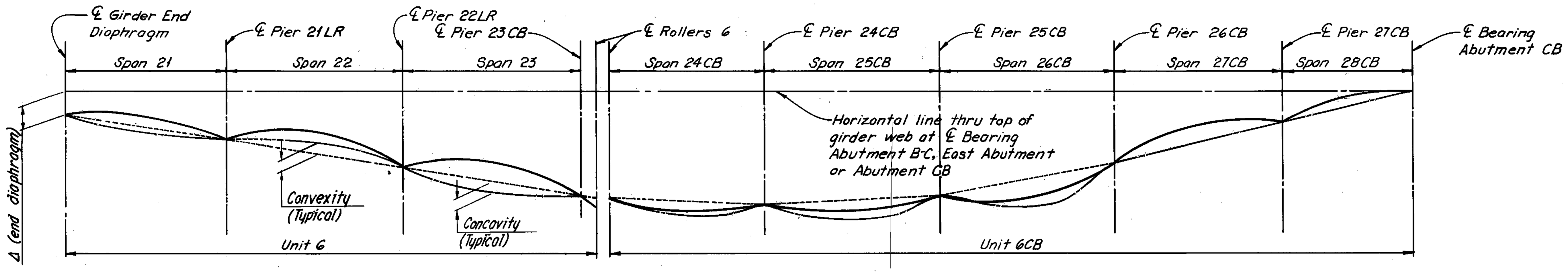
Note:
For additional notes see Sheet 58/108.

CAMBER DIAGRAM – UNITS 1 THRU 3

(Typical for beam and girder lines which intersect West Abutment)

CAMBER DIAGRAM – UNITS 4 THRU 6

(Typical for beam and girder lines which intersect West Abutment)



CAMBER DIAGRAM

(Typical for partial length girder lines which do not intersect West Abutment)

[Girder Line (6-ZB)-(6-CB-C) shown]

Note: No convexity correction is required in the spans in which the chord between ℄ Pier bearings does not appear.
Work Sheets 60/108 thru 64/108 together.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

CAMBER DIAGRAM

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN MCB	TRACED WB	CHECKED	REVIEWED C.A.B.	REVISED
DATE 10-10-69	DATE 12-31-69	DATE 9-15-70	DATE 2-24-86	

VERTICAL OFFSETS AT BEARING POINTS

Unit 1

Beam	Δ1	Δ2	Δ3	Δ1-1
1A	-8 5/8"	-11 7/16"	-4 9/16"	7 15/16"
1B	-9 1/16"	*-10 9/16"		
1C	-9 7/16"	-1'-0 7/16"	-5 3/8"	*7 3/8"
1D	-9 5/16"	-1'-0 1/8"	-4 7/8"	*8 1/8"
1E	-9 3/8"	-11 13/16"	-4 3/8"	8 7/8"
1EA	2 7/8"	-3/8"	10 3/16"	*1'-8 3/16"
1EB	6 13/16"	*9 15/16"		
1EC	11 7/8"	2'-3 15/16"	*3'-6 15/16"	
1ED	1'-7 5/16"	3'-4 3/4"	5'-1 5/16"	*6'-6 1/4"
1F	1'-9 1/8"	3'-11 11/16"	6'-0 15/16"	7'-7 13/16"
1G	1'-8 5/8"	3'-10 3/4"	6'-0"	*7'-6 7/8"
1H	1'-8 1/16"	3'-9 11/16"	5'-11 1/16"	7'-5 15/16"
1J	1'-7 9/16"	3'-8 13/16"	5'-10 1/8"	*7'-5"
1K	1'-7"	3'-7 15/16"	5'-9 3/8"	7'-4 1/16"
1L	1'-6 7/16"	3'-6 5/8"	5'-7 3/8"	*7'-1 3/4"
1M	1'-5 15/16"	3'-5 1/8"	5'-4 5/8"	6'-10 5/8"
1N	1'-5 3/8"	3'-3 11/16"	5'-2"	*6'-7 9/16"
1P	1'-5 9/16"	3'-3 1/2"	5'-1 3/8"	6'-6 11/16"
1Q	1'-5"	3'-2 13/16"	5'-0 11/16"	6'-6"
1R	1'-4 3/4"	3'-2 5/16"	5'-0 1/8"	*6'-5 3/8"
1S	1'-4 1/8"	3'-1 3/16"	4'-10 15/16"	6'-4 3/16"
1T	1'-3 7/16"	3'-0 1/16"	4'-9 13/16"	*6'-3"
1U	1'-2 13/16"	2'-10 1/2"	4'-7 9/16"	6'-0 5/8"
1V	1'-2 3/16"	2'-8 3/16"	4'-4 5/8"	*5'-9 1/8"
1W	1'-1 1/2"	2'-7 1/16"	4'-1 3/4"	5'-5 11/16"
1X	1'-0 7/8"	2'-5 3/8"	3'-10 13/16"	*5'-2 1/4"
1Y	1'-0 3/4"	2'-4 9/16"	3'-9 1/4"	5'-0 5/16"

Unit 2

Girder	Δ1-2	Δ4	Δ5	Δ6	Δ7	Δ8	Δ2-2
2A	1'-11 3/4"	2'-5 7/16"	6'-5 7/16"	11'-5 3/4"	16'-4 1/16"		21'-7 3/8"
2B	2'-0 11/16"	2'-4 15/16"	6'-1 15/16"	*6'-11 13/16"			
2C	8'-11 1/16"	9'-4 7/16"	13'-1 3/16"	*16'-9 3/8"			
2D	8'-9 3/8"	9'-2 9/16"	12'-11 5/16"	17'-10 3/16"	22'-9 1/8"		27'-11 1/16"
2E	8'-7 5/16"	9'-0 11/16"	12'-9 7/16"	17'-8 3/8"	22'-7 1/4"		27'-6 5/8"
2F	8'-1 7/8"	8'-7"	12'-2 13/16"	17'-1 11/16"	22'-0 5/8"		26'-11 9/16"
2G	7'-9 15/16"	8'-2 13/16"	11'-9 3/4"	16'-8 11/16"	21'-7 9/16"		26'-6 1/2"
2H	7'-9 15/16"	8'-2 13/16"	11'-9 3/4"	15'-4 5/8"	18'-11 9/16"	23'-11 1/8"	27'-11 1/8"
2J	7'-8 1/8"	8'-1"	11'-7 13/16"	15'-2 3/4"	18'-9 11/16"	23'-8 3/4"	27'-6 3/16"
2K	7'-4 9/16"	7'-9 3/8"	11'-4 1/4"	14'-11 1/8"	18'-6 1/16"	23'-4 9/16"	26'-11 3/16"
2L	6'-9 3/8"	7'-2 3/16"	10'-7 7/8"	14'-2 13/16"	17'-9 3/4"	22'-8 1/4"	26'-2 7/8"
2M	6'-4 1/4"	6'-8 9/16"	10'-1 3/8"	13'-8 1/4"	17'-3 3/16"	22'-1 11/16"	25'-8 5/16"

Unit 3

Girder	Δ2-3	Δ9	Δ10	Δ11	Δ12	Δ3-3
3A	21'-7 3/8"	22'-2 1/2"	29'-3 3/8"	36'-2 3/8"	37'-7 15/16"	37'-7 15/16"
3B	27'-11 1/16"	28'-6 3/16"	35'-5 1/16"	42'-4 5/16"	43'-8 11/16"	43'-9 3/8"
3C	27'-6 5/8"	28'-1 1/4"	34'-8 9/16"	41'-7 13/16"	43'-0 3/16"	43'-0 13/16"
3D	26'-11 9/16"	27'-6 1/16"	34'-0"	40'-11 3/16"	42'-3 5/8"	42'-4 5/16"
3E	26'-6 1/2"	27'-1"	33'-6 3/8"	40'-5 5/8"	41'-9 13/16"	41'-10 7/16"
3F	27'-11 1/8"	28'-5 11/16"	33'-11 1/4"	40'-9 1/8"	41'-11 9/16"	41'-11 13/16"
3G	27'-6 3/16"	28'-0 1/8"	33'-4 1/2"	40'-2 7/16"	41'-4 1/4"	41'-4 7/16"
3H	26'-11 3/16"	27'-4 1/2"	32'-7 3/8"	39'-5 1/4"	40'-7 1/16"	40'-7 5/16"
3J	26'-2 7/8"	26'-8 3/16"	31'-10 3/16"	38'-8 1/16"	39'-9 15/16"	39'-10 1/8"
3K	25'-8 5/16"	26'-1 5/8"	31'-2 13/16"	38'-0 11/16"	39'-2 9/16"	39'-2 3/4"

Unit 4

Girder	Δ3-4	Δ13	Δ14	Δ15	Δ4-4
4A	37'-7 15/16"	37'-5 1/4"	35'-2 9/16"	32'-3 15/16"	31'-11 7/16"
4B	43'-9 3/8"	43'-4 5/8"	41'-0 11/16"	38'-0 5/8"	37'-8 1/8"
4C	43'-0 13/16"	42'-8 1/16"	40'-4 1/4"	37'-4 1/16"	36'-11 5/8"
4D	42'-4 5/16"	41'-11 1/2"	39'-7 3/4"	36'-7 9/16"	36'-3 1/16"
4E	41'-10 7/16"	41'-5 15/16"	39'-2 1/4"	36'-2 1/8"	35'-9 11/16"
4F	41'-11 13/16"	41'-3 7/16"	39'-1 15/16"	36'-2"	35'-9 1/2"
4G	41'-4 7/16"	40'-8 15/16"	38'-7 11/16"	35'-6 15/16"	35'-2 3/4"
4H	40'-7 5/16"	39'-11 11/16"	37'-10 9/16"	34'-9 3/4"	34'-5 3/16"
4J	39'-10 1/8"	39'-2 1/2"	37'-1 1/2"	34'-0 5/8"	33'-8 1/16"
4K	39'-2 3/4"	38'-7 1/8"	36'-6 3/8"	33'-5 1/4"	33'-0 11/16"

Unit 5

Girder	Δ4-5	Δ16	Δ17	Δ18	Δ19	Δ20 or ΔABC	Δ5-5
5A	32'-0 5/16"	29'-0 3/8"	25'-8 1/4"	22'-1 5/8"	18'-6 13/16"	14'-8 1/2"	
5B			*9'-11 1/4"	7'-1 13/16"	3'-7 5/8"	0	
5C	*16'-7 7/16"	13'-8 1/2"	10'-3 13/16"	6'-8 5/8"	3'-2 1/2"	0	
5D	*29'-7 3/4"	26'-8 5/8"	23'-2 15/16"	19'-7 1/4"	16'-2 15/16"	13'-1 1/16"	12'-9 15/16"
5E	*29'-4 3/4"	26'-4 3/8"	22'-11 1/4"	19'-4 3/8"	15'-11 1/4"	12'-9 5/8"	12'-6 5/16"
5F	37'-8 7/8"	34'-8 3/8"	31'-3 3/8"	27'-8 1/2"	24'-3 3/8"	21'-1 3/8"	20'-10 5/16"
5G	*29'-5 3/16"	26'-5 7/8"	23'-0 1/16"	19'-5 5/8"	16'-0 3/8"	12'-10 3/8"	12'-7 3/8"
5H	37'-0 3/8"	33'-11 3/8"	30'-6 1/2"	27'-0 3/8"	23'-6 15/16"	20'-4 7/8"	20'-1 13/16"
5J	*29'-7 3/8"	26'-7 5/8"	23'-1 3/8"	19'-7 11/16"	16'-2 5/8"	13'-0 5/8"	12'-9 5/16"
5K	36'-3 3/8"	33'-3 3/8"	29'-9 13/16"	26'-3 13/16"	22'-10 1/8"	19'-8 3/8"	19'-5 5/16"
5L	*29'-10 1/4"	26'-10 3/8"	23'-4 1/8"	19'-10 13/16"	16'-5 3/8"	13'-3 3/8"	13'-0 5/16"
5M	35'-10 7/8"	32'-9 7/8"	29'-3 15/16"	25'-10 3/8"	22'-4 3/8"	19'-2 13/16"	18'-11 3/4"
5N	35'-10 1/4"	32'-9 3/8"	29'-3 3/8"	25'-10 3/8"	22'-5 3/8"	19'-2 5/8"	18'-11 11/16"
5P	*31'-4 1/4"	28'-4 7/8"	24'-11"	21'-5 1/2"	18'-0"	14'-9 5/8"	14'-6 9/16"
5Q	35'-3 1/8"	32'-2 7/8"	28'-9 1/8"	25'-3 7/8"	21'-10 1/4"	18'-7 7/8"	18'-4 13/16"
5R	*31'-7 3/8"	28'-7 5/8"	25'-2 1/8"	21'-9 1/8"	18'-3 3/8"	15'-0 13/16"	14'-9 7/8"
5S	34'-5 15/16"	31'-5 3/8"	27'-11 3/4"	24'-6 7/8"	21'-1 3/8"	17'-10 11/16"	17'-7 5/8"
5T	*31'-10 11/16"	28'-10 5/8"	25'-5 5/8"	22'-0 3/8"	18'-6 13/16"	15'-4 5/8"	15'-1 1/4"
5U	33'-8 13/16"	30'-8 3/8"	27'-2 7/8"	23'-9 13/16"	20'-4 3/8"	17'-1 3/8"	16'-10 1/2"
5V	*32'-2 5/8"	29'-2 1/4"	25'-8 1/2"	22'-4 1/8"	18'-10 5/8"	15'-7 11/16"	15'-4 9/16"
5W			*6'-0 13/16"	3'-5 1/4"	-1"	-3'-3 5/8"	-3'-6 3/4"
5X	33'-1 7/8"	30'-0 7/16"	26'-6 15/16"	23'-1 3/8"	19'-7"	16'-4 5/8"	16'-1 1/4"

Unit 6

Girder	Δ5-6	Δ21	Δ22	Δ23 or Δ23CB	Δ24 or Δ6-6	ΔEA
6A	12'-11 3/16"	10'-0 7/8"	7'-5 1/4"	4'-9 15/16"	2'-1 5/16"	0
6B	12'-7 9/16"	10'-2 3/16"	7'-6"	4'-10 7/16"	2'-1 13/16"	0
6C	20'-11 5/8"	18'-6 3/16"	15'-9 13/16"	13'-1 7/8"	10'-5 3/8"	8'-3 5/8"
6D	12'-8 5/8"	10'-2 3/4"	7'-6 1/16"	4'-9 13/16"	2'-1 3/8"	0
6E	20'-3 1/16"	17'-9"	14'-11 7/8"	12'-3 1/4"	9'-7 1/8"	7'-6 1/16"
6F	12'-10 9/16"	10'-4 1/16"	7'-6 5/8"	4'-9 11/16"	2'-1 3/16"	0
6G	19'-6 9/16"	16'-11 3/4"	14'-1 15/16"	11'-4 5/8"	8'-7 7/8"	6'-6 1/2"
6H	13'-1 9/16"	10'-6 7/16"	7'-8 5/16"	4'-10 5/8"	2'-1 1/2"	0
6J	*13'-2 3/4"	10'-8 3/16"	7'-9 1/4"	4'-11 1/16"	2'-1 5/8"	0
6K			*7'-3"	4'-11 13/16"	2'-1 13/16"	0
6L				*4'-5 15/16"	2'-2 3/16"	0
6M					*1'-8 1/4"	0
6N	19'-1"	16'-5 1/16"	13'-5 3/16"	10'-4 5/8"	7'-3 1/16"	4'-9 5/8"
6P	19'-0 7/16"	16'-4 3/16"	13'-3 11/16"	10'-2 15/16"	7'-0 11/16"	4'-7 3/16"
6Q	14'-7 7/16"	11'-10 11/16"	8'-10 1/8"	5'-8 9/16"	2'-6 11/16"	0
6R	18'-5 11/16"	15'-8 9/16"	12'-7 5/8"	9'-5 3/4	6'-3 7/16"	3'-8 9/16"
6S	14'-10 3/4"	12'-1 5/16"	9'-0"	5'-9 11/16"	2'-7 1/16"	0
6T	17'-8 1/2"	14'-10 11/16"	11'-9"	8'-6 5/16"	5'-3 5/16"	2'-8 1/16"
6U	15'-2 1/8"	12'-4"	9'-1 7/8"	5'-10 13/16"	2'-7 3/8"	0
6V	16'-11 3/8"	14'-0 7/8"	10'-10 3/8"	7'-6 15/16"	4'-3 1/8"	1'-7 9/16"
6W	15'-5 7/16"	12'-6 5/8"	9'-3 3/4"	5'-11 15/16"	2'-7 3/4"	0
6X				*3'-5 15/16"	2'-9 5/8"	0
6Y			*7'-4 1/4"	6'-5 3/16"	2'-11 1/16"	0
6Z			*9'-5 1/8"	6'-7 5/16"	2'-11 9/16"	0
6ZA		*-6'-7 1/2"	-9'-2 5/16"	-12'-5 3/16"	-12'-7 1/16"	
6ZB	*-3'-3"	-6'-3 3/4"	-9'-10"	-13'-2 7/16"	-13'-4 5/8"	
6ZC	-3'-5 7/8"	-6'-7 15/16"	-10'-3 1/4"	-13'-9 5/16"	-13'-11 3/8"	
6ZD	16'-2 1/8"	12'-11 9/16"	9'-3 1/2"	5'-8 1/16"	5'-6 1/8"	

Unit 6CB

Girder	Δ6-6CB	Δ24 CB	Δ25 CB	Δ26 CB	Δ27 CB	ΔACB
6CB-A	-12'-6 7/16"	-13'-5"	-12'-5 3/16"	-8'-7 9/16"	-3'-9 11/16"	0
6CB-B				*-7'-9 3/8"	-3'-9 7/8"	0
6CB-C	-13'-3 5/8"	-14'-1 1/2"	-12'-10 1/2"	-8'-9 15/16"	-3'-10 1/16"	0
6CB-D	-13'-10 3/8"	-14'-7 7/8"	-13'-0 3/4"	-8'-9 15/16"	-3'-10 1/16"	0
6CB-E	5'-7 7/8"	4'-9 13/16"	6'-9 11/16"	11'-2 1/4"	16'-2 1/8"	20'-0 1/4"

*Offset at ℄ End Diaphragm.

Notes:
Offsets at End Diaphragms and Expansion Rollers are given to the girder or beam in the Fully Loaded, Vertical position. Negative values indicate offsets below the baseline. See Camber Diagram for location of vertical offsets.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

TABULATION OF VERTICAL OFFSETS AT BEARING POINTS

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN WB	TRACED GES	CHECKED WCB	REVIEWED C.A.B.	REVISED
DATE 12-17-69	DATE 3-27-70	DATE 3-31-70	DATE 8-24-86	

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			147/193

CUYAHOGA COUNTY
CUY-290-0.27

DEAD LOAD DEFLECTION AND CAMBER — UNIT 1 WESTBOUND AND 1 EASTBOUND

BEAM	Span 1																Span 2															
	1/4				1/2				Field Splice 1				3/4				1/4				1/2				3/4				Field Splice 2			
	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	1/16	3/16	-5/8	-3/8	1/16	1/4	-13/16	-1/2	-	-	-	-	0	1/8	-5/8	-1/2	*0	*1/8	*-9/16	*-7/16	1/16	3/16	-13/16	-9/16	0	1/8	-1/2	-3/8	0	1/8	-3/8	-1/4
B	1/16	5/16	-5/8	-1/4	1/16	7/16	-13/16	-5/16	-	-	-	-	1/16	3/16	-5/8	-3/8	‡0	‡1/8	‡0	‡1/8	-	-	-	-	-	-	-	-	-	-	-	-
C	1/16	3/16	-9/16	-5/16	1/16	1/4	-3/4	-7/16	0	1/8	-5/8	-1/2	0	1/8	-9/16	-7/16	0	1/8	-15/16	-13/16	1/16	3/16	-1 1/4	-1	0	1/8	-15/16	-13/16	0	1/8	-13/16	-11/16
D	0	1/4	-9/16	-5/16	1/16	1/4	-3/4	-7/16	0	1/8	-5/8	-1/2	0	1/8	-9/16	-7/16	1/16	1/8	-15/16	-3/4	1/16	1/4	-1 1/4	-15/16	0	3/16	-15/16	-3/4	0	1/8	-13/16	-11/16
E	1/16	3/16	-9/16	-5/16	0	1/4	-3/4	-1/2	0	1/8	-5/8	-1/2	0	1/8	-9/16	-7/16	1/16	1/8	-15/16	-3/4	1/16	1/4	-1 1/4	-15/16	0	1/8	-15/16	-13/16	0	1/8	-13/16	-11/16
F	1/16	3/16	0	1/4	1/16	1/4	0	5/16	0	1/8	0	1/8	0	1/8	0	1/8	1/16	3/16	1/8	3/8	1/16	5/16	1/8	1/2	1/16	3/16	1/8	3/8	0	3/16	1/8	5/16
G	1/16	3/16	0	1/4	1/16	1/4	0	5/16	0	1/8	0	1/8	0	1/8	0	1/8	1/16	3/16	0	1/4	1/16	5/16	1/16	7/16	1/16	3/16	1/16	5/16	0	3/16	1/16	1/4
H	1/16	3/16	0	1/4	1/16	1/4	0	5/16	0	1/8	0	1/8	0	1/8	0	1/8	1/16	3/16	-1/16	3/16	1/16	5/16	-1/16	5/16	1/16	3/16	-1/16	3/16	0	3/16	0	3/16
J	1/16	3/16	0	1/4	1/16	1/4	0	5/16	0	1/8	0	1/8	0	1/8	0	1/8	1/16	3/16	-1/8	1/8	1/16	5/16	-3/16	3/16	1/16	3/16	-1/8	1/8	0	3/16	-1/8	1/16
K	1/16	3/16	0	1/4	1/16	1/4	0	5/16	0	1/8	0	1/8	0	1/8	0	1/8	1/16	3/16	-3/16	1/16	1/16	5/16	-1/4	1/8	1/16	3/16	-3/16	1/16	0	3/16	-3/16	0
L	1/16	3/16	0	1/4	1/16	1/4	0	5/16	0	1/8	0	1/8	0	1/8	0	1/8	1/16	3/16	-3/16	1/16	1/16	5/16	-1/4	1/8	1/16	3/16	-3/16	1/16	0	3/16	-3/16	0
M	1/16	3/16	0	1/4	1/16	1/4	0	5/16	0	1/8	0	1/8	0	1/8	0	1/8	1/16	3/16	-1/8	1/8	1/16	5/16	-1/8	1/4	1/16	3/16	-1/8	1/8	0	3/16	-1/16	1/8
N	1/16	3/16	0	1/4	1/16	1/4	0	5/16	0	1/8	0	1/8	0	1/8	0	1/8	1/16	3/16	-1/16	3/16	1/16	5/16	-1/16	5/16	1/16	3/16	-1/16	3/16	0	3/16	-1/16	1/8
P	1/16	3/16	0	1/4	1/16	3/16	0	1/4	0	1/8	0	1/8	0	1/8	0	1/8	1/16	3/16	0	1/4	1/16	5/16	1/16	7/16	1/16	3/16	0	1/4	0	3/16	0	3/16
Q	1/16	1/4	0	5/16	1/16	1/4	0	5/16	0	3/16	0	3/16	0	1/8	0	1/8	1/16	3/16	0	1/4	1/16	5/16	-1/16	5/16	1/16	3/16	0	1/4	0	3/16	0	3/16
R	1/16	1/4	0	5/16	1/16	1/4	0	5/16	0	3/16	0	3/16	0	1/8	0	1/8	1/16	3/16	-1/16	3/16	1/16	5/16	-1/16	5/16	1/16	3/16	-1/16	3/16	0	3/16	-1/16	1/8
S	1/16	1/4	0	5/16	1/16	1/4	0	5/16	0	3/16	0	3/16	0	1/8	0	1/8	1/16	3/16	-1/8	1/8	1/16	5/16	-3/16	3/16	1/16	3/16	-1/8	1/8	0	3/16	-1/8	1/16
T	1/16	1/4	0	5/16	1/16	1/4	-1/16	1/4	0	3/16	0	3/16	0	1/8	0	1/8	1/16	3/16	-3/16	1/16	1/16	5/16	-5/16	1/16	1/16	3/16	-1/4	0	0	3/16	-3/16	0
U	1/16	1/4	0	5/16	1/16	1/4	-1/16	1/4	0	3/16	0	3/16	0	1/8	0	1/8	1/16	3/16	-3/16	1/16	1/16	5/16	-1/4	1/8	1/16	3/16	-1/4	0	0	3/16	-3/16	0
V	1/16	1/4	0	5/16	1/16	1/4	-1/16	1/4	0	3/16	-1/16	1/8	0	1/8	0	1/8	1/16	3/16	-1/8	1/8	1/16	5/16	-3/16	3/16	1/16	3/16	-1/8	1/8	0	3/16	-1/8	1/16
W	1/16	1/4	0	5/16	1/16	1/4	-1/16	1/4	0	3/16	0	3/16	0	1/8	0	1/8	1/16	3/16	-1/16	3/16	1/16	5/16	-1/16	5/16	1/16	3/16	-1/16	3/16	0	3/16	-1/16	1/8
X	1/16	1/4	-1/16	1/4	1/16	1/4	-1/16	1/4	0	3/16	-1/16	1/8	0	1/8	-1/16	1/16	1/16	3/16	0	1/4	1/16	5/16	0	3/8	1/16	3/16	0	1/4	0	3/16	0	3/16
Y	1/16	3/16	-1/16	3/16	1/16	1/4	-1/16	1/4	0	3/16	-1/16	1/8	0	1/8	0	1/8	1/16	3/16	1/16	5/16	1/16	3/8	1/8	9/16	1/16	3/16	1/16	5/16	0	3/16	0	3/16

BEAM	Span 3																Span 4												BEAM
	1/4				1/2				3/4				Field Splice 3				1/4				1/2				3/4				
	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	3/16	-5/16	-1/8	1/16	1/4	-1/2	-3/16	0	3/16	-1 1/16	-7/8	0	1/8	-7/8	-3/4	0	1/16	-9/16	-1/2	1/16	3/16	-3/4	-1/2	0	3/16	-9/16	-3/8	A
B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B
C	0	3/16	-15/16	-3/4	1/16	5/16	-1 1/4	-7/8	0	3/16	-15/16	-3/4	0	3/16	-7/8	-11/16	0	1/8	-9/16	-7/16	1/16	3/16	-3/4	-1/2	1/16	3/16	-9/16	-5/16	C
D	0	3/16	-15/16	-3/4	1/16	1/4	-1 1/4	-15/16	1/16	1/8	-1	-13/16	0	1/8	-7/8	-3/4	0	1/8	-9/16	-7/16	1/16	3/16	-13/16	-9/16	1/16	3/16	-9/16	-5/16	D
E	0	1/8	-15/16	-13/16	1/16	1/4	-1 5/16	-1	1/16	1/8	-1	-13/16	0	1/8	-7/8	-3/4	0	1/16	-9/16	-1/2	1/16	3/16	-13/16	-9/16	0	3/16	-9/16	-3/8	E
F	1/16	3/16	1/8	3/8	1/16	5/16	1/4	5/8	1/16	3/16	3/16	7/16	0	3/16	3/16	3/8	0	1/8	0	1/8	1/16	1/4	0	5/16	1/16	3/16	0	1/4	F
G	1/16	3/16	1/8	3/8	1/16	5/16	1/4	5/8	1/16	3/16	3/16	7/16	0	3/16	3/16	3/8	0	1/8	0	1/8	1/16	1/4	0	5/16	1/16	3/16	0	1/4	G
H	1/16	3/16	1/8	3/8	1/16	5/16	1/4	5/8	1/16	3/16	3/16	7/16	0	3/16	3/16	3/8	0	1/8	0	1/8	1/16	1/4	0	5/16	1/16	3/16	0	1/4	H
J	1/16	3/16	1/8	3/8	1/16	5/16	1/4	5/8	1/16	3/16	3/16	7/16	0	3/16	3/16	3/8	0	1/8	0	1/8	1/16	1/4	0	5/16	1/16	3/16	0	1/4	J
K	1/16	3/16	1/8	3/8	1/16	5/16	1/4	5/8	1/16	3/16	3/16	7/16	0	3/16	3/16	3/8	0	1/8	0	1/8	1/16	1/4	0	5/16	1/16	3/16	0	1/4	K
L	1/16	3/16	1/8	3/8	1/16	5/16	3/16	9/16	1/16	3/16	3/16	7/16	0	3/16	1/8	5/16	0	1/8	0	1/8	1/16	1/4	0	5/16	1/16	3/16	0	1/4	L
M	1/16	3/16	1/16	5/16	1/16	5/16	1/8	1/2	1/16	3/16	1/8	3/8	0	3/16	1/16	1/4	0	1/8	0	1/8	1/16	1/4	0	5/16	1/16	3/16	0	1/4	M
N	1/16	3/16	0	1/4	1/16	5/16	1/16	7/16	1/16	3/16	1/16	5/16	0	3/16	0	3/16	0	1/8	0	1/8	1/16	1/4	0	5/16	1/16	3/16	0	1/4	N
P	1/16	3/16	0	1/4	1/16	5/16	0	3/8	1/16	3/16	0	1/4	0	3/16	0	3/16	0	1/8	0	1/8	1/16	3/16	0	1/4	1/16	3/16	0	1/4	P
Q	1/16	3/16	0	1/4	1/16	5/16	0	3/8	1/16	3/16	0	1/4	0	3/16	0	3/16	0	1/8	0	1/8	1/16	3/16	0	1/4	1/16	3/16	0	1/4	Q
R	1/16	3/16	0	1/4	1/16	5/16	0	3/8	1/16	3/16	0	1/4	0	3/16	0	3/16	0	1/8	0	1/8	1/16	3/16	0	1/4	1/16	3/16	0	1/4	R
S	1/16	3/16	0	1/4	1/16	5/16	0	3/8	1/16	3/16	0	1/4	0	3/16	0	3/16	0	1/8	0	1/8	1/16	3/16	0	1/4	1/16	3/16	0	1/4	S
T	1/16	3/16	0	1/4	1/16	5/16	0	3/8	1/16	3/16	0	1/4	0	3/16	0	3/16	0	1/8	0	1/8	1/16	3/16	0	1/4	1/16	3/16	0	1/4	T
U	1/16	3/16	-1/16	3/16	1/16	5/16	-1/16	5/16	1/16	3/16	-1/16	3/16	0	3/16	-1/16	1/8	0	1/8	0	1/8	1/16	3/16	0	1/4	1/16	3/16	0	1/4	U
V	1/16	3/16	-1/8	1/8	1/16	5/16	-3/16	3/16	1/16	3/16	-1/8	1/8	0	3/16	-1/8	1/16	0	1/8	0	1/8	1/16	3/16	0	1/4	1/16	3/16	0	1/4	V
W	1/16	3/16	-3/16	1/16	1/16	5/16	-5/16	1/16	1/16	3/16	-1/4	0	0	3/16	-3/16	0	0	1/8	0	1/8	1/16	3/16	0	1/4	1/16	3/16	0	1/4	W
X	1/16	3/16	-1/4	0	1/16	5/16	-3/8	0	1/16	3/16	-5/16	-1/16	0	3/16	-1/4	-1/16	0	1/8	0	1/8	1/16	3/16	0	1/4	1/16	3/16	0	1/4	X
Y	1/16	3/16	-1/4	0	1/16	3/8	-1/2	-1/16	1/16	3/16	-3/8	-1/8	0	3/16	-5/16	-1/8	0	1/8	-1/16	1/16	1/16	1/4	0	5/16	1/16	3/16	0	1/4	Y

UNIT 1 LEGEND
* Indicates values at Field Splice 1 for Beam A.
‡ Indicates values at ℄ Beam End Diaphragm.

Note:
For dead load deflection and camber for Beams EA thru ED, see Sheet 63/108.

DEAD LOAD DEFLECTION AND CAMBER - UNIT 2 WESTBOUND (SPANS 5 AND 6)

GIRDER	SPAN 5																				SPAN 6											
	EXPANSION JOINT 1				1/4				1/2				Field Splice 5L				3/4				.1				Field Splice 5AL				.2			
	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	-1/8	-5/16	0	-7/16	3/16	11/16	9/16	1 7/16	3/16	13/16	15/16	1 15/16	1/16	3/16	5/8	7/8	1/16	1/4	5/8	15/16	1/16	3/16	1/8	3/8	3/16	7/16	1/4	7/8	3/16	5/8	1/4	1 1/16
B	-1/8	-3/8	0	-1/2	1/4	11/16	1/2	1 7/16	5/16	13/16	13/16	1 15/16	3/16	7/16	1/2	1 1/8	1/8	7/16	7/16	1	*1/8	*7/16	*0	*9/16	-	-	-	-	-	-	-	-
C	-1/16	-1/4	0	-5/16	3/16	5/8	1/2	1 5/16	1/4	3/4	13/16	1 13/16	1/8	3/8	1/2	1	1/8	5/16	7/16	7/8	‡1/8	‡1/2	‡0	‡5/8	1/8	1/2	0	5/8	‡7/16	‡1 1/4	‡0	‡1 11/16
D	-1/16	-1/4	0	-5/16	1/8	1/2	1/2	1 1/8	1/8	1/2	13/16	1 7/16	1/16	1/16	1/2	5/8	0	1/16	7/16	1/2	1/8	5/16	0	7/16	1/4	13/16	0	1 1/16	1/4	13/16	0	1 1/16
E	-1/16	-1/4	0	-5/16	3/16	9/16	1/2	1 1/4	3/16	9/16	13/16	1 9/16	1/16	1/8	1/2	11/16	1/16	1/8	7/16	5/8	1/8	5/16	0	7/16	1/4	13/16	0	1 1/16	1/4	7/8	0	1 1/8
F	-1/16	-1/4	0	-5/16	3/16	9/16	1/4	1	3/16	9/16	3/8	1 1/8	1/16	1/8	1/4	7/16	1/16	1/8	3/16	3/8	1/8	5/16	0	7/16	1/4	13/16	0	1 1/16	1/4	7/8	0	1 1/8
G	-1/16	-1/4	0	-5/16	1/8	9/16	0	11/16	1/8	9/16	0	11/16	1/16	1/8	0	3/16	0	1/8	0	1/8	1/8	3/8	0	1/2	1/4	15/16	0	1 3/16	1/4	1	0	1 1/4

GIRDER	SPAN 6																												GIRDER
	.3				.4				.5				.6				.7				Field Splice 6L				.8				.9				
	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	3/8	1	1/4	1 5/8	1/2	1 5/16	1/4	2 1/16	9/16	1 7/16	5/16	2 5/16	1/2	1 7/16	5/16	2 1/4	3/8	1 1/8	5/16	1 13/16	3/8	15/16	3/8	1 11/16	1/4	11/16	1/4	1 3/16	1/8	1/4	1/8	1/2	A
B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B
C	‡1/2	‡1 1/2	‡0	‡2	*5/16	*1	*0	*1 5/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	C
D	7/16	1 5/16	0	1 3/4	9/16	1 11/16	0	2 1/4	5/8	1 13/16	0	2 7/16	9/16	1 11/16	0	2 1/4	7/16	1 5/16	0	1 3/4	5/16	15/16	0	1 1/4	1/4	13/16	0	1 1/16	1/8	5/16	0	7/16	D
E	7/16	1 7/16	0	1 7/8	9/16	1 13/16	0	2 3/8	5/8	1 15/16	0	2 9/16	9/16	1 13/16	0	2 3/8	7/16	1 3/8	0	1 13/16	5/16	15/16	0	1 1/4	1/4	7/8	0	1 1/8	1/8	5/16	0	7/16	E
F	7/16	1 7/16	0	1 7/8	9/16	1 13/16	0	2 3/8	5/8	1 15/16	0	2 9/16	9/16	1 13/16	0	2 3/8	7/16	1 3/8	0	1 13/16	5/16	15/16	0	1 1/4	1/4	7/8	0	1 1/8	1/8	5/16	0	7/16	F
G	7/16	1 9/16	0	2	9/16	2	0	2 9/16	9/16	2 3/16	0	2 3/4	9/16	2	0	2 9/16	7/16	1 1/2	0	1 15/16	5/16	1 1/16	0	1 3/8	1/4	15/16	0	1 3/16	1/16	3/8	0	7/16	G

UNIT 2 WESTBOUND (Spans 5 and 6) LEGEND
* Indicates values at ℄ Girder End Diaphragm.
‡ Indicates values at 1/4 points between Pier 5 and ℄ Girder End Diaphragm.

DEAD LOAD DEFLECTION AND CAMBER - UNIT 2 WESTBOUND (SPANS 7 AND 8)

GIRDER	SPAN 7																																											
	.1				.2				Field Splice 6AL				.3				.4				.5				.6				.7				Field Splice 7L				.8				.9			
	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.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.
A	0	-1/16	0	-1/16	1/16	3/16	0	1/4	1/16	5/16	0	3/8	1/8	9/16	0	11/16	3/16	13/16	0	1	1/4	7/8	0	1 1/8	3/16	3/4	0	15/16	1/8	3/8	0	1/2	1/16	3/8	0	7/16	0	1/8	0	1/8	0	-1/8	0	-1/8
D	0	0	0	0	1/16	3/16	0	1/4	1/16	5/16	0	3/8	1/8	9/16	0	11/16	3/16	3/4	0	15/16	3/16	13/16	0	1	3/16	5/8	0	13/16	1/8	5/16	0	7/16	1/16	1/4	0	5/16	0	1/16	0	1/16	-1/16	-1/16	0	-1/8
E	0	0	0	0	1/16	3/16	0	1/4	1/16	1/4	0	5/16	1/8	1/2	0	5/8	3/16	11/16	0	7/8	3/16	3/4	0	15/16	3/16	9/16	0	3/4	1/16	5/16	0	3/8	1/16	3/16	0	1/4	0	0	0	0	-1/16	-1/8	0	-3/16
F	0	0	0	0	1/16	3/16	0	1/4	1/16	1/4	0	5/16	1/8	1/2	0	5/8	3/16	11/16	0	7/8	3/16	3/4	0	15/16	3/16	9/16	0	3/4	1/16	5/16	0	3/8	1/16	3/16	0	1/4	0	0	0	0	-1/16	-1/8	0	-3/16
G	0	-1/16	0	-1/16	1/16	1/8	0	3/16	1/16	3/16	0	1/4	1/8	3/8	0	1/2	3/16	5/8	0	13/16	3/16	5/8	0	13/16	1/8	1/2	0	5/8	1/16	1/4	0	5/16	1/16	1/8	0	3/16	0	-1/16	0	-1/16	-1/16	-1/8	0	-3/16

GIRDER	SPAN 8																																								GIRDER
	.1				.2				Field Splice 7AL				.3				.4				.5				.6				.7				.8				.9				
	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.	Stl.	Rem. D.L.	Con.	Tot.	
A	3/16	3/8	-3/8	3/16	3/8	1	-11/16	11/16	1/2	1 5/16	-5/8	1 3/16	11/16	1 5/8	-5/8	1 11/16	7/8	2 3/16	-1/2	2 9/16	1	2 9/16	-3/16	3 3/8	1 1/16	2 9/16	-1/16	3 9/16	15/16	2 5/16	1/16	3 5/16	11/16	1 3/4	-1/16	2 3/8	3/8	15/16	-1/4	1 1/16	A
D	3/16	3/8	-5/16	1/4	7/16	1	-9/16	7/8	1/2	1 1/8	-5/8	1	11/16	1 11/16	-11/16	1 11/16	15/16	2 3/16	-11/16	2 7/16	1 1/16	2 9/16	-9/16	3 1/16	1 1/16	2 5/8	-7/16	3 1/4	1	2 5/16	-3/8	2 15/16	3/4	1 3/4	-1/4	2 1/4	3/8	15/16	-1/8	1 3/16	D
E	3/16	7/16	-1/16	9/16	7/16	1 1/16	-1/16	1 7/16	1/2	1 1/4	-1/16	1 11/16	3/4	1 11/16	-1/8	2 5/16	1	2 1/4	-1/8	3 1/8	1 1/8	2 9/16	-1/16	3 5/8	1 1/8	2 5/8	-1/16	3 11/16	1	2 3/8	-1/16	3 5/16	3/4	1 3/4	-1/16	2 7/16	7/16	15/16	0	1 3/8	E
F	3/16	7/16	0	5/8	7/16	1 1/16	0	1 1/2	1/2	1 1/4	0	1 3/4	3/4	1 11/16	0	2 7/16	1	2 1/4	0	3 1/4	1 1/8	2 9/16	0	3 11/16	1 1/8	2 5/8	0	3 3/4	1	2 3/8	0	3 3/8	3/4	1 3/4	0	2 1/2	7/16	15/16	0	1 3/8	F
G	3/16	7/16	0	5/8	7/16	1 1/8	0	1 9/16	1/2	1 5/16	0	1 13/16	11/16	1 7/8	0	2 9/16	15/16	2 1/4	0	3 3/16	1 1/16	2 7/8	0	3 15/16	1 1/16	2 15/16	0	4	15/16	2 5/8	0	3 9/16	3/4	1 15/16	0	2 11/16	3/8	1 1/16	0	1 7/16	G

DEAD LOAD DEFLECTION AND CAMBER - UNIT 2 EASTBOUND (SPANS 5, 6, AND 7)

GIRDER					SPAN 5																SPAN 6																SPAN 7																GIRDER
	Expansion Joint 1				1/4				1/2				3/4				Field Splice 5R				1/4				1/2				3/4				Field Splice 6R				1/4				1/2				Field Splice 7R				3/4				
	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.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.	
H	-1/8	-1/2	0	-5/8	1/4	1 1/16	0	1 5/16	5/16	1 5/16	0	1 5/8	3/16	11/16	0	7/8	1/8	5/8	0	3/4	0	3/16	0	3/16	1/8	1/2	0	5/8	1/16	3/8	0	7/16	1/16	3/16	0	1/4	1/16	3/16	0	1/4	1/16	1/4	0	5/16	0	0	0	0	0	0	0	0	H
J	-1/8	-3/8	0	-1/2	1/4	7/8	0	1 1/8	5/16	1 1/8	0	1 7/16	3/16	9/16	0	3/4	1/8	9/16	0	11/16	1/16	1/4	0	5/16	3/16	5/8	0	13/16	1/8	7/16	0	9/16	1/16	1/4	0	5/16	1/16	1/8	0	3/16	1/16	1/4	0	5/16	0	-1/16	0	-1/16	0	-1/16	0	-1/16	J
K	-1/8	-3/8	0	-1/2	1/4	7/8	-1/16	1 1/16	5/16	1 1/8	-1/8	1 5/16	3/16	9/16	0	3/4	1/8	9/16	0	11/16	1/16	1/4	0	5/16	3/16	5/8	0	13/16	1/8	7/16	0	9/16	1/16	1/4	0	5/16	1/16	1/8	0	3/16	1/16	1/4	0	5/16	0	-1/16	0	-1/16	0	-1/16	0	-1/16	K
L	-1/8	-3/8	0	-1/2	1/4	7/8	-7/16	11/16	5/16	1 1/8	-5/8	13/16	3/16	9/16	-5/16	7/16	1/8	9/16	-1/4	7/16	1/16	1/4	0	5/16	3/16	5/8	0	13/16	1/8	7/16	0	9/16	1/16	1/4	0	5/16	1/16	1/8	0	3/16	1/16	1/4	0	5/16	0	-1/16	0	-1/16	0	-1/16	0	-1/16	L
M	-1/8	-1/2	0	-5/8	1/4	1 1/8	-13/16	9/16	5/16	1 7/16	-1 1/16	11/16	3/16	11/16	-9/16	5/16	1/8	11/16	-1/2	5/16	0	3/16	0	3/16	1/8	1/2	0	5/8	1/16	3/8	0	7/16	1/16	3/16	0	1/4	1/16	3/16	0	1/4	1/16	5/16	0	3/8	0	0	0	0	0	0	0	0	M

Notes:
Negative values for deflections indicate deflections above chord line. Negative values of convexity or concavity and total required camber indicate values below the chord line. 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
In spans that end at an end diaphragm the chord from which Con. is measured is a chord from the adjacent pier to the final beam or girder position at the end diaphragm.
Work Deflection and Camber Table Sheets with Camber Diagram.

DEAD LOAD DEFLECTION AND CAMBER - UNIT 2 EASTBOUND (SPANS 8 AND 9)

GIRDER	SPAN 8																																											
	.1				Field Splice 7AR				.2				.3				.4				.5				.6				.7				.8				Field Splice 8R				.9			
	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.	Stl.	Rem. D.L.	Con.	Tot.	Stl.	Rem. D.L.	Con.	Tot.
H	1/8	3/8	0	1/2	1/4	7/8	0	1 1/8	1/4	15/16	0	1 3/16	7/16	1 7/16	0	1 7/8	1/2	1 13/16	0	2 5/16	1/2	1 7/8	0	2 3/8	7/16	1 11/16	0	2 1/8	5/16	1 1/4	0	1 9/16	3/16	5/8	0	13/16	3/16	9/16	0	3/4	1/16	3/16	0	1/4
J	1/8	1/2	1/16	11/16	5/16	1	1/16	1 3/8	5/16	1 1/16	1/8	1 1/2	1/2	1 5/8	1/8	2 1/4	5/8	2	3/16	2 13/16	11/16	2 1/16	1/4	3	9/16	1 7/8	5/16	2 3/4	7/16	1 3/8	5/16	2 1/8	1/4	3/4	5/16	1 5/16	1/4	11/16	5/16	1 1/4	1/16	5/16	3/16	9/16
K	1/8	1/2	1/8	3/4	5/16	1	3/16	1 1/2	5/16	1 1/16	3/16	1 9/16	1/2	1 5/8	5/16	2 7/16	5/8	2	7/16	3 1/16	11/16	2 1/16	1/2	3 1/4	9/16	1 7/8	5/8	3 1/16	7/16	1 3/8	3/4	2 9/16	1/4	3/4	11/16	1 11/16	1/4	11/16	11/16	1 5/8	1/16	5/16	7/16	13/16
L	1/8	1/2	1/8	3/4	5/16	1	3/16	1 1/2	5/16	1 1/16	3/16	1 9/16	1/2	1 5/8	5/16	2 7/16	5/8	2	7/16	3 1/16	11/16	2 1/16	1/2	3 1/4	9/16	1 7/8	5/8	3 1/16	7/16	1 3/8	3/4	2 9/16	1/4	3/4	11/16	1 11/16	1/4	11/16	11/16	1 5/8	1/16	5/16	7/16	13/16
M	1/8	3/8	1/8	5/8	1/4	7/8	3/16	1 5/16	1/4	15/16	3/16	1 3/8	7/16	1 7/16	5/16	2 3/16	1/2	1 13/16	7/16	2 3/4	9/16	1 7/8	1/2	2 15/16	7/16	1 11/16	5/8	2 3/4	5/16	1 1/4	3/4	2 5/16	3/16	5/8	11/16	1 1/2	3/16	5/8	11/16	1 1/2	1/16	3/16	7/16	11/16

GIRDER	SPAN 9																																								GIRDER
	.1				.2				Field Splice 8AR				.3				.4				.5				.6				.7				.8				.9				
	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.	Stl.	Rem. D.L.	Con.	Tot.	
H	0	0	0	0	1/16	1/4	0	5/16	1/8	5/16	0	7/16	1/8	9/16	0	11/16	1/4	7/8	0	1 1/8	5/16	1 1/8	0	1 7/16	5/16	1 1/4	0	1 9/16	5/16	1 1/8	0	1 7/16	1/4	7/8	0	1 1/8	1/8	1/2	0	5/8	H
J	0	1/16	1/16	1/8	1/16	5/16	1/8	1/2	1/8	7/16	1/8	11/16	3/16	5/8	1/8	15/16	5/16	15/16	3/16	1 7/16	3/8	1 3/16	1/4	1 13/16	3/8	1 5/16	1/4	1 15/16	3/8	1 1/4	5/16	1 15/16	5/16	15/16	1/4	1 1/2	3/16	1/2	1/8	13/16	J
K	0	1/16	1/8	3/16	1/16	5/16	3/16	9/16	1/8	7/16	1/4	13/16	3/16	5/8	5/16	1 1/8	5/16	15/16	3/8	1 5/8	3/8	1 3/16	1/2	2 1/16	3/8	1 5/16	9/16	2 1/4	3/8	1 1/4	5/8	2 1/4	5/16	13/16	9/16	1 11/16	3/16	1/2	5/16	1	K
L	0	1/16	1/8	3/16	1/16	5/16	3/16	9/16	1/8	7/16	1/4	13/16	3/16	5/8	5/16	1 1/8	5/16	15/16	3/8	1 5/8	3/8	1 3/16	1/2	2 1/16	3/8	1 5/16	9/16	2 1/4	3/8	1 1/4	5/8	2 1/4	5/16	15/16	9/16	1 13/16	3/16	1/2	5/16	1	L
M	0	0	1/8	1/8	1/16	1/4	3/16	1/2	1/8	5/16	1/4	11/16	1/8	9/16	5/16	1	1/4	7/8	3/8	1 1/2	5/16	1 1/8	1/2	1 15/16	5/16	1 1/4	9/16	2 1/8	5/16	1 3/16	5/8	2 1/8	1/4	7/8	9/16	1 11/16	1/8	1/2	5/16	15/16	M

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

DEFLECTION AND CAMBER TABLES
UNITS 1 AND 2
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN MCB & OMP	TRACED L.C.	CHECKED SMS/CMCB	REVIEWED C.A.B.	REVISED
DATE 9-3-70	DATE 9-10-70	DATE 9-21-70	DATE 9-24-86	SHEET 62/108

DEAD LOAD DEFLECTION AND CAMBER – UNIT 3 WESTBOUND AND 3 EASTBOUND (SPANS 10 AND 11)

SPAN 10

GIRDER	Expansion Joint 2				.1				Field Splice 9L				.2				.3				.4				.5				.6				Field Splice 10L or 10R				.7				.8				.9			
	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.	Stl.	Rem D.L.	Con.	Tot.	Stl.	Rem D.L.	Con.	Tot.	Stl.	Rem D.L.	Con.	Tot.
A	-1/16	-1/8	0	-3/16	1/8	7/16	11/16	1 1/4	1/4	5/8	1 1/16	1 15/16	5/16	13/16	1 5/8	2 3/4	3/8	1 1/16	2 1/2	3 15/16	3/8	1	3 1/4	4 5/8	1/4	11/16	3 9/16	4 1/2	1/16	3/16	2 15/16	3 3/16	-1/16	-1/4	2 1/8	1 13/16	-1/8	-1/4	2 1/16	1 11/16	-3/16	-9/16	1 7/16	11/16	-3/16	-7/16	3/4	1/8
B	-1/16	-1/16	0	-1/8	1/8	1/4	1/2	7/8	3/16	7/16	3/4	1 3/8	1/4	9/16	1 11/16	2 1/2	5/16	3/4	1 11/16	2 3/4	5/16	11/16	2 5/16	3 5/16	3/16	7/16	2 11/16	3 5/16	0	1/16	2 5/16	2 3/8	-1/8	-1/4	1 15/16	1 9/16	-1/8	-5/16	1 13/16	1 3/8	-1/4	-1/2	1 3/16	7/16	-3/16	-7/16	9/16	-1/16
C	-1/16	-1/8	0	-3/16	1/8	5/16	0	7/16	1/4	7/16	0	11/16	5/16	5/8	0	13/16	3/8	13/16	1/16	1 1/4	3/8	3/4	1/2	1 5/8	1/4	1/2	15/16	1 11/16	1/16	1/8	7/8	1 1/16	-1/8	-3/16	3/4	7/16	-1/8	-1/4	11/16	5/16	-1/4	-7/16	7/16	-1/4	-3/16	-3/8	3/16	-3/8
D	-1/16	-1/8	0	-3/16	1/8	5/16	-1/16	3/8	1/4	7/16	-1/16	5/8	5/16	5/8	-1/8	13/16	3/8	13/16	-1/8	1 1/16	3/8	3/4	1/8	1 1/4	1/4	1/2	5/16	1 1/16	1/16	1/8	5/16	1/2	-1/8	-3/16	5/16	0	-1/8	-1/4	5/16	-1/16	-1/4	-7/16	3/16	-1/2	-3/16	-3/8	1/16	-1/2
E	-1/16	-3/16	0	-1/4	3/16	7/16	0	5/8	1/4	11/16	0	15/16	5/16	15/16	0	1 1/4	3/8	1 3/16	0	1 9/16	3/8	1 1/8	0	1 1/2	1/4	13/16	0	1 1/16	1/8	1/4	1/8	1/2	-1/16	-3/16	3/16	-1/16	-1/16	-1/4	3/16	-1/8	-3/16	-1/2	1/16	-5/8	-1/8	-7/16	0	-9/16
F	1/8	1/4	0	3/8	-1/16	-1/8	0	-3/16	–	–	–	–	-1/8	-1/4	1/16	-5/16	-1/8	-7/16	0	-9/16	-1/4	-5/8	0	-7/8	-5/16	-15/16	-1/16	-1 5/16	-3/8	-1 1/8	-3/16	-1 11/16	-7/16	-1 1/8	-1/4	-1 13/16	-7/16	-1 3/16	-1/8	-1 3/4	-3/8	-1 1/16	-1/16	-1 1/2	-1/4	-5/8	0	-7/8
G	1/8	3/16	0	5/16	-1/16	-1/8	-7/16	-5/8	–	–	–	–	-1/8	-3/16	-11/16	-1	-3/16	-3/8	-13/16	-1 3/8	-1/4	-9/16	-3/4	-1 9/16	-3/8	-3/4	-9/16	-1 11/16	-7/16	-15/16	-7/16	-1 13/16	-7/16	-15/16	-3/8	-1 3/4	-7/16	-1	-5/16	-1 3/4	-3/8	-7/8	-3/16	-1 7/16	-1/4	-1/2	-1/8	-7/8
H	1/8	3/16	0	5/16	-1/16	-1/8	-7/8	-1 1/16	–	–	–	–	-1/8	-3/16	-1 7/16	-1 3/4	-3/16	-3/8	-1 3/4	-2 5/16	-1/4	-9/16	-1 11/16	-2 1/2	-3/8	-3/4	-1 3/8	-2 1/2	-7/16	-15/16	-1 1/16	-2 7/16	-7/16	-15/16	-15/16	-2 5/16	-7/16	-1	-3/4	-2 3/16	-3/8	-7/8	-1/2	-1 3/4	-1/4	-1/2	-1/4	-1
J	1/8	3/16	0	5/16	-1/16	-1/8	-7/8	-1 1/16	–	–	–	–	-1/8	-3/16	-1 5/8	-1 15/16	-3/16	-3/8	-2 3/16	-2 3/4	-1/4	-9/16	-2 3/16	-3	-3/8	-3/4	-1 13/16	-2 15/16	-7/16	-15/16	-1 3/8	-2 3/4	-7/16	-15/16	-1 1/4	-2 5/8	-7/16	-1	-1 1/16	-2 1/2	-3/8	-7/8	-11/16	-1 15/16	-1/4	-1/2	-3/8	-1 1/8
K	1/8	1/4	0	3/8	-1/16	-1/8	-7/8	-1 1/16	–	–	–	–	-1/8	-1/4	-1 13/16	-2 3/16	-1/8	-7/16	-2 5/8	-3 3/16	-1/4	-5/8	-2 11/16	-3 9/16	-5/16	-15/16	-2 3/16	-3 7/16	-3/8	-1 1/8	-1 11/16	-3 3/16	-7/16	-1 1/8	-1 5/8	-3 3/16	-7/16	-1 3/16	-1 5/16	-2 15/16	-3/8	-1 1/16	-7/8	-2 5/16	-1/4	-5/8	-7/16	-1 5/16

SPAN 11

GIRDER	.1				.2				Field Splice 10AL or 10AR				.3				.4				.5				.6				.7				Field Splice 11L or 11R				.8				.9				GIRDER
	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.	Stl.	Rem D.L.	Con.	Tot.	Stl.	Rem D.L.	Con.	Tot.	
A	1/2	15/16	2 3/8	3 13/16	1 3/16	2 1/2	4 11/16	8 3/8	1 5/8	3 1/2	5 11/16	10 13/16	2	4 1/4	6 7/16	12 11/16	2 11/16	5 9/16	7 11/16	15 15/16	2 15/16	6 1/8	8 3/16	17 1/4	2 3/4	5 7/8	7 7/8	16 1/2	2 1/4	4 3/4	6 13/16	13 13/16	1 15/16	4	6 1/16	12	1 7/16	3 1/16	5 3/16	9 11/16	9/16	1 5/16	3	4 7/8	A
B	1/2	7/8	2 1/2	3 7/8	1 5/16	2 3/16	4 15/16	8 7/16	1 13/16	3 1/16	6	10 7/8	2 1/4	3 11/16	6 3/4	12 11/16	2 7/8	4 3/4	7 13/16	15 1/16	3 1/8	5 1/4	8 3/16	16 9/16	2	5	7 15/16	14 15/16	2 7/16	4 1/16	7 1/16	13 9/16	2 1/8	3 7/16	6 1/2	12 1/16	1 9/16	2 5/8	5 7/16	9 5/8	5/8	1 1/8	3 1/16	4 13/16	B
C	1/2	7/8	2 1/2	3 7/8	1 5/16	2 3/16	4 15/16	8 7/16	1 13/16	3 1/16	6 1/16	10 15/16	2 1/4	3 11/16	6 3/4	12 11/16	2 7/8	4 3/4	7 13/16	15 1/16	3 1/8	5 1/4	8 3/16	16 9/16	2	5	7 15/16	14 15/16	2 7/16	4 1/16	7 1/16	13 9/16	2 1/8	3 7/16	6 7/16	12	1 9/16	2 5/8	5 7/16	9 5/8	5/8	1 1/8	3 1/16	4 13/16	C
D	1/2	7/8	2 1/2	3 7/8	1 5/16	2 3/16	4 15/16	8 7/16	1 13/16	3 1/16	6 1/16	10 15/16	2 1/4	3 11/16	6 3/4	12 11/16	2 7/8	4 3/4	7 13/16	15 1/16	3 1/8	5 1/4	8 3/16	16 9/16	2	5	7 15/16	14 15/16	2 7/16	4 1/16	7 1/16	13 9/16	2 1/8	3 7/16	6 1/2	12 1/16	1 9/16	2 5/8	5 7/16	9 5/8	5/8	1 1/8	3 1/16	4 13/16	D
E	1/2	15/16	2 1/2	3 15/16	1 3/16	2 1/2	5	8 11/16	1 5/8	3 1/2	6 1/4	11 3/8	2	4 1/4	6 13/16	13 1/16	2 11/16	5 9/16	7 13/16	16 1/16	2 15/16	6 1/8	8 1/4	17 5/16	2 3/4	5 7/8	8	16 5/8	2 1/4	4 3/4	7 3/16	14 3/16	1 15/16	4	6 5/8	12 9/16	1 7/16	3 1/16	5 1/2	10	9/16	1 5/16	3 1/16	4 15/16	E
F	11/16	1 7/16	2 7/8	5	1 11/16	3 5/16	5 5/16	10 5/16	2 3/16	4 3/8	6 3/8	12 3/4	2 5/8	5 1/4	7 1/4	15 1/8	3 3/16	6 11/16	8 1/2	18 3/8	3 1/2	7 1/16	8 15/16	19 1/2	3 1/4	6 9/16	8 9/16	18 3/8	2 5/8	5 1/4	7 3/8	15 1/4	2 3/16	4 5/16	6 1/2	13	1 5/8	3 5/16	5 5/8	10 9/16	11/16	1 3/8	3 3/16	5 1/4	F
G	11/16	1 3/16	2 15/16	4 13/16	1 11/16	2 13/16	5 9/16	10 1/16	2 1/4	3 11/16	6 5/8	12 9/16	2 5/8	4 1/2	7 7/16	14 9/16	3 3/8	5 5/8	8 9/16	17 9/16	3 9/16	6 1/16	8 15/16	18 9/16	3 3/8	5 5/8	8 5/8	17 5/8	2 11/16	4 1/2	7 5/8	14 13/16	2 1/4	3 3/4	6 13/16	12 13/16	1 11/16	2 7/8	5 7/8	10 7/16	3/4	1 3/16	3 1/4	5 3/16	G
H	11/16	1 3/16	2 15/16	4 13/16	1 11/16	2 13/16	5 9/16	10 1/16	2 1/4	3 11/16	6 11/16	12 5/8	2 5/8	4 1/2	7 7/16	14 9/16	3 3/8	5 5/8	8 9/16	17 9/16	3 9/16	6 1/16	8 15/16	18 9/16	3 3/8	5 5/8	8 5/8	17 5/8	2 11/16	4 1/2	7 5/8	14 13/16	2 1/4	3 3/4	6 7/8	12 7/8	1 11/16	2 7/8	5 7/8	10 7/16	3/4	1 3/16	3 1/4	5 3/16	H
J	11/16	1 3/16	2 15/16	4 13/16	1 11/16	2 13/16	5 9/16	10 1/16	2 1/4	3 11/16	6 11/16	12 5/8	2 5/8	4 1/2	7 1/2	14 5/8	3 3/8	5 5/8	8 9/16	17 9/16	3 9/16	6 1/16	8 15/16	18 9/16	3 3/8	5 5/8	8 5/8	17 5/8	2 11/16	4 1/2	7 5/8	14 13/16	2 1/4	3 3/4	6 15/16	12 15/16	1 11/16	2 7/8	5 7/8	10 7/16	3/4	1 3/16	3 1/4	5 3/16	J
K	11/16	1 7/16	2 15/16	5 1/16	1 11/16	3 5/16	5 9/16	10 9/16	2 3/16	4 3/8	6 3/4	13 5/16	2 5/8	5 1/4	7 1/2	15 3/8	3 3/16	6 11/16	8 9/16	18 7/16	3 1/2	7 1/16	8 15/16	19 1/2	3 1/4	6 9/16	8 5/8	18 7/16	2 5/8	5 1/4	7 5/8	15 1/2	2 3/16	4 5/16	6 7/8	13 3/8	1 5/8	3 5/16	5 7/8	10 13/16	11/16	1 3/8	3 1/4	5 5/8	K

DEAD LOAD DEFLECTION AND CAMBER – UNIT 3 WESTBOUND AND 3 EASTBOUND (SPAN 12)

SPAN 12

GIRDER	.1				.2				.3				.4				Field Splice 11AL or 11AR				.5				.6				.7				.8				.9				Expansion Joint 3				GIRDER
	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.	Stl.	Rem D.L.	Con.	Tot.	Stl.	Rem D.L.	Con.	Tot.	
A	-1/4	-9/16	13/16	0	-3/8	-15/16	1 7/16	1/8	-7/16	-1 3/16	1 13/16	3/16	-7/16	-1 1/4	1 15/16	1/4	-7/16	-1 1/4	2	5/16	-7/16	-1 3/16	2 1/8	1/2	-3/8	-1 1/16	2 1/8	11/16	-5/16	-13/16	1 15/16	13/16	-1/4	-5/8	1 1/2	5/8	-1/8	-3/8	7/8	3/8	1/4	9/16	0	13/16	A
B	-1/4	-1/2	7/8	1/8	-7/16	-13/16	1 5/8	3/8	-1/2	-1	2 1/8	5/8	-1/2	-1	2 7/16	15/16	-1/2	-1 1/16	2 1/2	15/16	-1/2	-15/16	2 9/16	1 1/8	-7/16	-13/16	2 3/8	1 1/8	-3/8	-11/16	2 1/16	1	-1/4	-1/2	1 9/16	13/16	-1/8	-5/16	7/8	7/16	1/4	7/16	0	11/16	B
C	-1/4	-1/2	7/8	1/8	-7/16	-13/16	1 5/8	3/8	-1/2	-1	2 1/8	5/8	-1/2	-1	2 7/16	15/16	-1/2	-1 1/16	2 1/2	15/16	-1/2	-15/16	2 9/16	1 1/8	-7/16	-13/16	2 3/8	1 1/8	-3/8	-11/16	2 1/16	1	-1/4	-1/2	1 9/16	13/16	-1/8	-5/16	7/8	7/16	1/4	7/16	0	11/16	C
D	-1/4	-1/2	7/8	1/8	-7/16	-13/16	1 5/8	3/8	-1/2	-1	2 1/8	5/8	-1/2	-1	2 7/16	15/16	-1/2	-1 1/16	2 1/2	15/16	-1/2	-15/16	2 9/16	1 1/8	-7/16	-13/16	2 3/8	1 1/8	-3/8	-11/16	2 1/16	1	-1/4	-1/2	1 9/16	13/16	-1/8	-5/16	7/8	7/16	1/4	7/16	0	11/16	D
E	-1/4	-9/16	15/16	1/8	-3/8	-15/16	1 5/8	5/16	-7/16	-1 3/16	2 1/4	5/8	-7/16	-1 1/4	2 5/8	15/16	-7/16	-1 1/4	2 11/16	1	-7/16	-1 3/16	2 11/16	1 1/16	-3/8	-1 1/16	2 1/2	1 1/16	-5/16	-13/16	2 1/8	1	-1/4	-5/8	1 9/16	11/16	-1/8	-3/8	7/8	3/8	1/4	9/16	0	13/16	E
F	-1/4	-11/16	15/16	0	-7/16	-1 1/8	1 5/8	1/16	-9/16	-1 5/16	2 1/16	3/16	-9/16	-1 7/16	2 1/4	1/4	-9/16	-1 7/16	2 1/4	1/4	-9/16	-1 5/16	2 1/2	5/8	-7/16	-1 3/16	2 7/16	13/16	-3/8	-7/8	2 3/16	15/16	-1/4	-11/16	1 11/16	3/4	-1/8	-3/8	1	1/2	1/4	9/16	0	13/16	F
G	-1/4	-9/16	1	3/16	-7/16	-7/8	1 13/16	1/2	-9/16	-1 1/16	2 3/8	3/4	-9/16	-1 1/16	2 3/4	1 1/8	-9/16	-1 1/16	2 3/4	1 1/8	-1/2	-1 1/16	2 13/16	1 1/4	-7/16	-7/8	2 11/16	1 3/8	-3/8	-11/16	2 5/16	1 1/4	-1/4	-1/2	1 3/4	1	-1/8	-5/16	1	9/16	3/16	7/16	0	5/8	G
H	-1/4	-9/16	1	3/16	-7/16	-7/8	1 13/16	1/2	-9/16	-1 1/16	2 3/8	3/4	-9/16	-1 1/16	2 3/4	1 1/8	-9/16	-1 1/16	2 13/16	1 3/16	-1/2	-1 1/16	2 13/16	1 1/4	-7/16	-7/8	2 11/16	1 3/8	-3/8	-11/16	2 5/16	1 1/4	-1/4	-1/2	1 3/4	1	-1/8	-5/16	1	9/16	3/16	7/16	0	5/8	H
J	-1/4	-9/16	1	3/16	-7/16	-7/8	1 13/16	1/2	-9/16	-1 1/16	2 3/8	3/4	-9/16	-1 1/16	2 3/4	1 1/8	-9/16	-1 1/16	2 13/16	1 3/16	-1/2	-1 1/16	2 13/16	1 1/4	-7/16	-7/8	2 11/16	1 3/8	-3/8	-11/16	2 5/16	1 1/4	-1/4	-1/2	1 3/4	1	-1/8	-5/16	1	9/16	3/16	7/16	0	5/8	J
K	-1/4	-11/16	1	1/16	-7/16	-1 1/8	1 13/16	1/4	-9/16	-1 5/16	2 3/8	1/2	-9/16	-1 7/16	2 3/4	3/4	-9/16	-1 7/16	2 13/16	13/16	-9/16	-1 5/16	2 13/16	15/16	-7/16	-1 3/16	2 11/16	1 1/16	-3/8	-7/8	2 5/16	1 1/16	-1/4	-11/16	1 3/4	13/16	-1/8	-3/8	1	1/2	1/4	9/16	0	13/16	K

DEAD LOAD DEFLECTION AND CAMBER UNIT 4 WESTBOUND AND 4 EASTBOUND (SPAN 15)

Span 15

Girder	.2				Field Splice 14ALR				.4				.6				.8				Expansion Joint 4				Girder
	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	5/16	5/8	1	1/16	5/16	5/8	1	1/4	15/16	1 3/8	2 9/16	5/16	1 3/16	1 1/2	3	3/16	3/4	1 1/16	2	-1/16	-1/4	0	-5/16	A
B	1/16	1/4	1 1/16	1 3/8	1/16	1/4	1 1/16	1 3/8	1/4	13/16	1 9/16	2 5/8	5/16	1	1 1/2	2 13/16	3/16	5/8	1	1 13/16	-1/16	-1/4	0	-5/16	B
C	1/16	1/16	1 1/16	1 3/16	1/16	1/8	1 1/8	1 5/16	3/16	9/16	1 9/16	2 5/16	1/4	3/4	1 1/2	2 1/2	3/16	7/16	1	1 5/8	-1/16	-1/8	0	-3/16	C
D	1/16	1/16	1 1/16	1 3/16	1/16	1/8	1 1/8	1 5/16	3/16	9/16	1 9/16	2 5/16	1/4	3/4	1 9/16	2 9/16	3/16	7/16	1	1 5/8	-1/16	-1/8	0	-3/16	D
E	1/16	1/4	1 1/16	1 3/8	1/16	1/4	1 1/8	1 7/16	3/16	7/8	1 1/2	2 9/16	5/16	1 1/16	1 1/2	2 7/8	3/16	11/16	1	1 7/8	-1/16	-5/16	0	-3/8	E
F	1/8	9/16	7/8	1 9/16	3/16	9/16	15/16	1 11/16	5/16	1 5/16	1 9/16	3 3/16	3/8	1 1/2	1 5/8	3 1/2	1/4	15/16	1 1/8	2 5/16	-1/8	-3/8	0	-1/2	F
G	3/16	7/16	1 1/8	1 3/4	3/16	7/16	1 3/16	1 13/16	3/8	1 1/16	1 5/8	3 1/16	7/16	1 3/16	1 5/8	3 1/4	1/4	3/4	1 1/16	2 1/16	-1/8	-5/16	0	-7/16	G
H	3/16	7/16	1 3/16	1 13/16	3/16	7/16	1 3/16	1 13/16	3/8	1 1/16	1 5/8	3 1/16	7/16	1 3/16	1 5/8	3 1/4	1/4	3/4	1 1/16	2 1/16	-1/8	-5/16	0	-7/16	H
J	3/16	7/16	1 3/16	1 13/16	3/16	7/16	1 3/16	1 13/16	3/8	1 1/16	1 5/8	3 1/16	7/16	1 3/16	1 5/8	3 1/4	1/4	3/4	1 1/16	2 1/16	-1/8	-5/16	0	-7/16	J
K	1/8	5/8	1 3/16	1 15/16	1/8	5/8	1 3/16	1 15/16	3/8	1 5/16	1 5/8	3 5/16	7/16	1 9/16	1 5/8	3 5/8	1/4	1	1 1/16	2 5/16	-1/8	-7/16	0	-9/16	K

DEAD LOAD DEFLECTION AND CAMBER – UNIT 4 WESTBOUND AND 4 EASTBOUND (SPANS 13 AND 14)

Span 13

Girder	.1				.2				.3				.4				.5				.6				.7				Field Splice 13R				.8				Field Splice 13L				.9			
	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.	Stl.	Rem D.L.	Con.	Tot.	Stl.	Rem D.L.	Con.	Tot.
A	5/16	7/8	5/8	1 13/16	9/16	1 11/16	1 5/16	3 9/16	3/4	2 3/16	1 15/16	4 7/8	13/16	2 3/8	2 3/8	5 9/16	13/16	2 3/16	2 1/2	5 1/2	5/8	1 7/8	2 3/8	4 7/8	7/16	1 5/16	2 1/16	3 13/16	—	—	—	—	1/4	11/16	1 1/2	2 7/16	1/4	11/16	1 7/16	2 3/8	1/16	1/4	15/16	1 1/4
B	3/8	13/16	7/8	2 1/16	5/8	1 1/2	1 9/16	3 11/16	7/8	1 15/16	2	4 13/16	15/16	2 1/8	2 5/16	5 3/8	7/8	2 1/16	2 7/16	5 3/8	3/4	1 3/4	2 3/8	4 7/8	1/2	1 1/4	2 1/8	3 7/8	—	—	—	—	5/16	11/16	1 11/16	2 11/16	5/16	5/8	1 9/16	2 1/2	1/16	1/4	15/16	1 1/4
C	3/8	13/16	7/8	2 1/16	11/16	1 9/16	1 9/16	3 13/16	7/8	2 1/16	2 1/16	5	1	2 1/4	2 3/8	5 5/8	15/16	2 3/16	2 7/16	5 9/16	13/16	1 7/8	2 3/8	5 1/16	5/8	1 5/16	2 1/8	4 1/16	—	—	—	—	3/8	3/4	1 11/16	2 13/16	5/16	3/4	1 11/16	2 3/4	1/8	1/4	15/16	1 5/16
D	3/8	13/16	7/8	2 1/16	11/16	1 9/16	1 9/16	3 13/16	7/8	2 1/16	2 1/16	5	1	2 1/4	2 3/8	5 5/8	15/16	2 3/16	2 1/2	5 5/8	13/16	1 7/8	2 3/8	5 1/16	5/8	1 5/16	2 1/8	4 1/16	—	—	—	—	3/8	3/4	1 11/16	2 13/16	5/16	3/4	1 11/16	2 3/4	1/8	1/4	15/16	1 5/16
E	3/8	1	7/8	2 1/4	5/8	1 3/4	1 1/2	3 7/8	13/16	2 5/16	2	5 1/8	7/8	2 9/16	2 5/16	5 3/4	7/8	2 1/2	2 7/16	5 13/16	3/4	2 1/8	2 7/16	5 5/16	1/2	1 1/2	2 3/16	4 3/16	—	—	—	—	5/16	7/8	1 13/16	3	5/16	7/8	1 13/16	3	1/8	5/16	1	1 7/16
F	1/4	13/16	13/16	1 7/8	1/2	1 7/16	1 7/16	3 3/8	5/8	1 15/16	1 7/8	4 7/16	11/16	2 1/8	2 1/8	4 15/16	11/16	2 1/16	2 3/16	4 15/16	5/8	1 13/16	2 1/16	4 1/2	7/16	1 3/8	1 11/16	3 1/2	5/16	15/16	1 5/16	2 9/16	1/4	13/16	1 1/4	2 5/16	—	—	—	—	1/8	5/16	11/16	1 1/8
G	5/16	11/16	3/4	1 3/4	9/16	1 1/4	1 5/16	3 1/8	3/4	1 11/16	1 3/4	4 3/16	13/16	1 7/8	2	4 11/16	13/16	1 13/16	2 1/8	4 3/4	11/16	1 5/8	2 1/16	4 3/8	1/2	1 3/16	1 13/16	3 1/2	5/16	13/16	1 1/2	2 5/8	5/16	11/16	1 7/16	2 7/16	—	—	—	—	1/8	1/4	13/16	1 3/16
H	5/16	11/16	3/4	1 3/4	9/16	1 1/4	1 5/16	3 1/8	3/4	1 11/16	1 3/4	4 3/16	13/16	1 7/8	2	4 11/16	13/16	1 13/16	2 1/8	4 3/4	11/16	1 5/8	2 1/16	4 3/8	1/2	1 3/16	1 13/16	3 1/2	5/16	13/16	1 1/2	2 5/8	5/16	11/16	1 7/16	2 7/16	—	—	—	—	1/8	1/4	13/16	1 3/16
J	5/16	11/16	3/4	1 3/4	9/16	1 1/4	1 5/16	3 1/8	3/4	1 11/16	1 3/4	4 3/16	13/16	1 7/8	2 1/16	4 3/4	13/16	1 13/16	2 1/8	4 3/4	11/16	1 5/8	2 1/16	4 3/8	1/2	1 3/16	1 7/8	3 9/16	5/16	13/16	1 1/2	2 5/8	5/16	11/16	1 7/16	2 7/16	—	—	—	—	1/8	1/4	13/16	1 3/16
K	5/16	7/8	3/4	1 15/16	9/16	1 9/16	1 3/8	3 1/2	3/4	2 1/8	1 3/4	4 5/8	13/16	2 3/8	2 1/16	5 1/4	13/16	2 5/16	2 1/8	5 1/4	11/16	2	2 1/16	4 3/4	1/2	1 9/16	1 7/8	3 15/16	5/16	1	1 9/16	2 7/8	5/16	15/16	1 7/16	2 11/16	—	—	—	—	1/8	3/8	13/16	1 5/16

Span 14

Girder	.1				Field Splice 13AL				.2				Field Splice 13AR				.3				.4				.5				.6				.7				.8				Field Splice 14LR				.9				Girder
	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.	Stl.	Rem D.L.	Con.	Tot.	Stl.	Rem D.L.	Con.	Tot.	Stl.	Rem D.L.	Con.	Tot.	
A	1/16	1/16	1 3/16	1 5/16	1/8	7/16	2	2 9/16	3/16	1/2	2 3/16	2 7/8	—	—	—	—	3/8	1 1/8	2 3/4	4 1/4	1/2	1 11/16	3 3/16	5 3/8	5/8	2	3 3/8	6	5/8	1 7/8	3 3/16	5 11/16	1/2	1 1/2	2 7/8	4 7/8	5/16	7/8	2 1/8	3 5/16	3/16	5/8	1 3/4	2 9/16	1/8	5/16	1 1/8	1 9/16	A
B	1/16	1/16	1 1/16	1 3/16	1/8	3/8	1 3/4	2 1/4	3/16	7/16	1 7/8	2 1/2	—	—	—	—	3/8	15/16	2 7/16	3 3/4	9/16	1 3/8	2 3/4	4 11/16	5/8	1 11/16	2 13/16	5 1/8	5/8	1 9/16	2 11/16	4 7/8	1/2	1 1/4	2 3/8	4 1/8	1/4	3/4	1 13/16	2 13/16	3/16	1/2	1 1/2	2 3/16	1/8	1/4	1 1/16	1 7/16	B
C	0	-1/16	1 1/16	1	1/16	1/8	1 3/4	1 15/16	1/16	3/16	1 7/8	2 1/8	—	—	—	—	3/16	5/8	2 3/8	3 3/16	3/8	1	2 11/16	4 1/16	7/16	1 1/4	2 13/16	4 1/2	7/16	1 3/16	2 11/16	4 5/16	3/8	15/16	2 3/8	3 11/16	3/16	9/16	1 13/16	2 9/16	1/8	3/8	1 1/2	2	1/16	3/16	1	1 1/4	C
D	0	-1/16	1 1/16	1	1/16	1/8	1 3/4	1 15/16	1/16	3/16	1 7/8	2 1/8	—	—	—	—	3/16	5/8	2 3/8	3 3/16	3/8	1	2 11/16	4 1/16	7/16	1 1/4	2 13/16	4 1/2	7/16	1 3/16	2 11/16	4 5/16	3/8	15/16	2 5/16	3 5/8	3/16	9/16	1 13/16	2 9/16	1/8	3/8	1 1/2	2	1/16	3/16	1	1 1/4	D
E	0	0	1 1/16	1 1/16	1/16	1/4	1 3/4	2 1/16	1/16	5/16	1 7/8	2 1/4	—	—	—	—	1/4	13/16	2 5/16	3 3/8	3/8	1 5/16	2 5/8	4 5/16	7/16	1 9/16	2 11/16	4 11/16	7/16	1 1/2	2 9/16	4 1/2	5/16	1 3/16	2 1/4	3 3/4	3/16	11/16	1 3/4	2 5/8	1/8	1/2	1 1/2	2 1/8	1/16	1/4	1	1 5/16	E
F	-1/16	-3/16	3/4	1/2	—	—	—	—	-1/16	-1/8	1 3/8	1 3/16	-1/16	-1/8	1 1/16	1 1/4	0	1/16	1 7/8	1 15/16	1/16	5/16	2 3/16	2 9/16	1/8	7/16	2 1/4	2 13/16	1/8	3/8	2 3/16	2 11/16	1/16	1/4	1 7/8	2 3/16	0	1/16	1 7/16	1 1/2	0	0	1 5/16	1 5/16	0	-1/16	13/16	3/4	F
G	-1/16	-1/8	13/16	5/8	—	—	—	—	-1/16	-1/16	1 7/16	1 5/16	-1/16	-1/16	1 7/16	1 5/16	1/16	1/16	1 13/16	1 15/16	1/8	5/16	2 1/16	2 1/2	1/8	1/2	2 3/16	2 13/16	1/8	1/2	2 1/16	2 11/16	1/8	5/16	1 13/16	2 1/4	1/16	1/16	1 3/8	1 1/2	1/16	1/16	1 5/16	1 7/16	0	-1/16	3/4	11/16	G
H	-1/16	-1/8	13/16	5/8	—	—	—	—	-1/16	-1/16	1 3/8	1 1/4	-1/16	-1/16	1 1/2	1 3/8	1/16	1/16	1 13/16	1 15/16	1/8	5/16	2 1/16	2 1/2	1/8	1/2	2 1/8	2 3/4	1/8	1/2	2 1/16	2 11/16	1/8	5/16	1 13/16	2 1/4	1/16	1/16	1 3/8	1 1/2	1/16	1/16	1 5/16	1 7/16	0	-1/16	3/4	11/16	H
J	-1/16	-1/8	3/4	9/16	—	—	—	—	-1/16	-1/16	1 3/8	1 1/4	-1/16	-1/16	1 1/16	1 1/16	1/16	1/16	1 13/16	1 15/16	1/8	5/16	2 1/16	2 1/2	1/8	1/2	2 1/8	2 3/4	1/8	1/2	2	2 5/8	1/8	5/16	1 13/16	2 1/4	1/16	1/16	1 3/8	1 1/2	1/16	1/16	1 5/16	1 7/16	0	-1/16	3/4	11/16	J
K	-1/16	-1/8	3/4	9/16	—	—	—	—	0	-1/8	1 3/8	1 1/4	0	-1/16	1 1/2	1 7/16	0	1/8	1 13/16	1 15/16	1/16	3/8	2	2 7/16	1/8	1/2	2 1/8	2 3/4	1/8	7/16	2	2 9/16	1/16	5/16	1 3/4	2 1/8	0	1/8	1 3/8	1 1/2	0	1/16	1 5/16	1 3/8	0	-1/16	3/4	11/16	K

Notes: See Sheet 62/108 for Notes.

DEAD LOAD DEFLECTION AND CAMBER – UNIT 1 (BEAMS EA THRU ED)

BEAM	SPAN 1: 1/4				SPAN 1: 1/2				SPAN 1: Field Splice 1				SPAN 1: 3/4				SPAN 2: 1/4				SPAN 2: 1/2				SPAN 2: 3/4				SPAN 2: Field Splice 2				SPAN 3: 1/4				SPAN 3: 1/2				SPAN 3: 3/4				SPAN 3: Field Splice 3				SPAN 4: 1/4				SPAN 4: 1/2				SPAN 4: 3/4				SPAN 4: Beam End Diaphragm				BEAM
	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.	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.	
EA	1/16	1/4	13/16	1 1/8	1/16	5/16	1 7/16	1 13/16	0	1/8	1 3/4	1 7/8	0	1/8	1 13/16	1 15/16	1/16	1/8	-2 15/16	-2 3/4	1/16	1/4	-3 9/16	-3 1/4	1/16	3/16	-2 3/8	-2 1/8	0	1/8	-2 1/4	-2 1/8	1/16	3/16	0	1/4	1/16	3/8	-3/8	1/16	1/16	1/4	-1/4	1/16	1/16	3/16	-5/16	-1/16	0	0	-7/16	-7/16	0	1/16	-5/16	-1/4	0	1/8	-3/8	-1/4	1/16	1/8	0	3/16	EA
EB	1/16	5/16	15/16	1 5/16	1/16	3/8	1 3/4	2 3/16	1/16	3/16	1 15/16	2 3/16	0	3/16	2 3/16	2 3/8	0	1/8	-1 7/8	-1 3/4	1/16	1/4	-2 5/8	-2 5/16	1/16	1/4	-1 1/2	-1 3/16	‡1/16	‡1/8	‡0	‡3/16	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	EB
EC	1/16	1/4	3/8	11/16	1/16	5/16	9/16	15/16	0	1/8	3/8	1/2	0	1/8	9/16	11/16	1/16	3/16	-1 5/8	-1 3/8	1/16	5/16	-1 11/16	-1 5/16	1/16	1/4	-3/16	1/8	1/16	3/16	1/4	1/2	0	1/16	5/16	3/8	1/16	1/4	7/8	1 3/16	1/16	1/4	3/4	1 1/16	‡1/16	‡3/16	‡0	‡1/4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	EC
ED	1/16	1/4	1 1/16	1 3/8	1/16	1/4	1 3/8	1 11/16	0	1/8	1	1 1/8	0	1/8	1 1/8	1 1/4	1/16	3/16	-1 3/8	-1 1/8	1/16	3/8	-1 1/16	-5/8	1/16	3/16	-9/16	-5/16	0	3/16	-7/16	-1/4	1/16	3/16	-1/8	1/8	1/16	5/16	1/4	5/8	1/16	1/4	13/16	1 1/8	1/16	3/16	9/16	13/16	0	0	-1/4	-1/4	1/16	1/8	-3/16	0	1/16	1/8	-3/16	0	0	0	0	0	ED

‡ Indicates values at ℄ Beam End Diaphragm.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

DEFLECTION AND CAMBER TABLES UNITS 1, 3 AND 4

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN J.D.S. / B.B. DATE 7-2-70	TRACED L.C. DATE 7-14-70	CHECKED W.F. / F.M.C.B. DATE 7-22-70	REVIEWED C.A.B. DATE 2-24-86	REVISED

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY-290-0.27

DEAD LOAD DEFLECTION AND CAMBER — UNIT 5 WESTBOUND AND 5 EASTBOUND

Girder	Span 16 ¼				Span 16 ½				Span 16 ¾				Field Splice 16 LR				Span 17 ¼			
	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	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
D	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
E	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
G	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
K	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Q	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
S	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
T	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
U	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
V	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
W	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Girder	Span 17 ½				Span 17 ¾				Field Splice 17 LR				Span 18 ¼				Span 18 ½			
	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	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B	-	-	-	-	-	-	-	-	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
D	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
E	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
G	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
K	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Q	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
S	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
T	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
U	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
V	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
W	-	-	-	-	-	-	-	-	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
X	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Girder	Span 18 ¾				Field Splice 18 LR				Span 19 ¼				Span 19 ½				Span 19 ¾			
	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	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
B	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
D	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
E	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
G	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
J	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
K	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
L	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
M	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
P	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Q	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
S	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
T	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
U	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
V	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
W	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
X	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Girder	Field Splice 19 LR				Span 20 ¼				Span 20 ½				Span 20 ¾				Expansion Joint 5				Girder
	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	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	-	-	-	A
B	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	-	-	-	B
C	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-	-	-	-	C
D	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	D
E	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	E
F	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	F
G	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	G
H	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	H
J	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	J
K	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	K
L	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	L
M	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	M
N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N
P	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	P
Q	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Q
R	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	R
S	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	S
T	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	T
U	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	U
V	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	V
W	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	W
X	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	X

DEAD LOAD DEFLECTION AND CAMBER — UNIT 6 WESTBOUND AND 6 EASTBOUND

Girder	Span 21 ¼				Span 21 ½				Span 21 ¾				Field Splice 21LR				Span 22 ¼			
	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	1/8	3/4	-5/16	9/16	3/16	7/8	-9/16	1/2	1/16	7/16	-3/4	-1/4	0	3/16	-1/16	1/8	1/16	3/16	-1/16	3/16
B	3/16	11/16	-1/16	13/16	3/16	7/8	-1/16	1	1/8	7/16	-1/16	1/2	0	3/16	0	3/8	1/16	3/16	-1/16	3/16
C	3/16	3/4	-1/16	7/8	3/16	15/16	-1/16	1 1/16	1/8	7/16	-1/16	1/2	1/16	1/8	-1/16	1/8	1/16	3/16	-1/16	3/16
D	3/16	13/16	-1/16	15/16	1/4	15/16	-1/16	1 1/8	1/8	7/16	-1/16	1/2	0	3/16	0	3/16	0	1/4	-1/16	3/16
E	3/16	13/16	-1/16	15/16	1/4	15/16	-1/16	1 1/8	1/8	7/16	-1/16	1/2	1/16	1/8	-1/16	1/8	1/16	3/16	-1/16	3/16
F	3/16	3/4	-1/16	7/8	1/4	7/8	-1/16	1 1/16	1/8	7/16	-1/16	1/2	1/16	1/8	-1/16	1/8	1/16	3/16	-1/16	3/16
G	3/16	13/16	-1/16	15/16	1/4	15/16	-1/16	1 1/8	1/8	7/16	-1/16	1/2	0	3/16	0	3/16	1/16	3/16	-1/16	3/16
H	1/4	3/4	-1/16	15/16	1/4	15/16	-1/16	1 1/8	1/8	7/16	-1/16	1/2	1/16	3/16	-1/16	3/16	1/16	1/4	-1/16	1/4
J	+3/16	+1/2	+0	+11/16	+1/4	+5/8	+0	+7/8	+1/16	+5/16	+1/16	+7/16	1/16	1/4	1/16	3/8	1/16	5/16	1/16	7/16
K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N	3/16	13/16	-1/16	15/16	3/16	15/16	-1/8	1	1/8	7/16	-1/16	1/2	1/16	1/4	1/8	7/16	1/16	5/16	1/8	1/2
P	3/16	15/16	1/16	1 3/16	1/4	1 1/16	1/8	1 7/16	1/8	9/16	1/16	3/4	1/16	3/16	-1/16	3/16	1/16	1/4	-1/16	1/4
Q	3/16	7/8	-1/16	1	1/4	1 1/16	-1/16	1 1/4	1/8	9/16	-1/16	5/8	1/16	3/16	0	1/4	1/16	1/4	0	5/16
R	1/4	7/8	-1/16	1 1/16	1/4	1 1/8	-1/16	1 5/16	1/8	9/16	-1/16	5/8	1/16	3/16	0	1/4	1/16	1/4	0	5/16
S	1/4	15/16	-1/16	1 1/8	1/4	1 1/8	-1/16	1 5/16	1/8	9/16	-1/16	5/8	1/16	1/4	0	5/16	1/16	5/16	0	3/8
T	1/4	15/16	-1/16	1 1/8	5/16	1 1/8	-1/16	1 3/8	1/8	5/8	-1/16	11/16	1/16	1/4	1/16	3/8	1/16	5/16	1/16	7/16
U	1/4	1	-1/16	1 3/16	5/16	1 3/16	-1/16	1 7/16	1/8	5/8	-1/16	11/16	1/16	1/4	1/16	3/8	1/16	5/16	1/16	7/16
V	1/4	1 1/16	-1/16	1 1/4	5/16	1 1/4	-1/16	1 1/2	1/8	5/8	-1/16	11/16	1/16	1/4	1/16	3/8	1/16	5/16	1/16	7/16
W	1/4	15/16	-1/16	1 1/8	5/16	1 1/8	-1/16	1 3/8	1/8	9/16	-1/16	5/8	1/8	5/16	1/16	1/2	1/8	5/16	1/16	1/2
X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Z	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZA	-	-	-	-	-	-	-	-	-	-	-	-	*1/8	*5/16	*0	*7/16	+1/16	+3/16	+0	+1/4
ZB	+1/4	+3/4	±1 1/8	±1/8	+5/16	+7/8	±11/16	+1/2	+1/8	+3/8	±3/8	+1/8	1/8	1/4	5/16	11/16	1/8	5/16	5/16	3/4
ZC	5/16	1	-1 1/16	1/4	3/8	1 3/16	-3/4	13/16	3/16	9/16	-3/8	3/8	1/16	1/4	1/4	9/16	1/16	5/16	1/4	5/8
ZD	5/16	1 3/16	-1 1/16	7/16	3/8	1 7/16	-3/4	1 1/16	3/16	11/16	-3/8	1/2	1/16	3/8	3/8	13/16	1/16	3/8	5/16	3/4

Girder	Span 22 ½				Span 22 ¾				Field Splice 22LR or 22CB				Span 23 ¼				Span 23 ½			
	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	7/16	-1/16	7/16	1/16	1/4	-1/16	1/4	1/16	1/4	0	5/16	1/16	5/16	-1/16	5/16	1/8	9/16	-1/16	5/8
B	1/16	7/16	-1/16	7/16	1/16	1/4	-1/16	1/4	1/16	1/4	0	5/16	1/16	5/16	-1/16	5/16	1/8	9/16	-1/16	5/8
C	1/8	7/16	-1/16	1/2	1/16	1/4	-1/16	1/4	1/16	1/4	-1/16	1/4	1/16	3/8	-1/16	3/8	1/8	9/16	-1/16	5/8
D	1/16	1/2	-1/16	1/2	1/16	1/4	-1/16	1/4	1/16	1/4	0	5/16	1/16	3/8	-1/16	3/8	1/8	5/8	-1/16	11/16
E	1/8	7/16	-1/16	1/2	1/16	1/4	-1/16	1/4	1/16	5/16	-1/16	5/16	1/16	3/8	-1/16	3/8	1/8	5/8	-1/16	11/16
F	1/8	7/16	-1/16	1/2	1/16	1/4	-1/16	1/4	1/16	5/16	-1/16	5/16	1/16	3/8	-1/16	3/8	1/8	11/16	-1/16	3/4
G	1/16	1/2	-1/16	1/2	1/16	1/4	-1/16	1/4	1/16	5/16	-1/16	5/16	1/8	3/8	-1/16	7/16	1/8	11/16	-1/16	3/4
H	1/8	1/2	-1/16	9/16	1/16	1/4	-1/16	1/4	1/16	3/8	-1/16	3/8	1/16	7/16	-1/16	7/16	3/16	11/16	-1/16	13/16
J	1/8	1/2	0	5/8	1/16	1/4	0	5/16	1/8	3/8	-1/8	3/8	1/8	7/16	-1/8	7/16	3/16	11/16	-1/8	3/4
K	-	-	-	-	-	-	-	-	*3/16	*7/16	*0	*5/8	+3/16	+9/16	+0	+3/4	+1/8	+1/2	+1/16	+9/16
L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N	1/8	5/8	0	3/4	1/16	5/16	0	3/8	1/16	1/2	3/16	3/4	1/8	9/16	1/8	13/16	1/4	7/8	1/16	1 3/16
P	1/8	5/8	1/16	13/16	1/16	3/8	1/16	1/2	1/16	7/16	-3/16	5/16	1/8	7/16	-3/16	3/8	3/16	13/16	-1/16	15/16
Q	1/8	9/16	0	11/16	1/16	5/16	0	3/8	1/8	7/16	1/8	11/16	1/8	1/2	1/16	11/16	3/16	7/8	0	1 1/16
R	1/8	5/8	0	3/4	1/16	5/16	0	3/8	1/8	7/16	1/8	11/16	1/8	1/2	1/16	11/16	3/16	7/8	0	1 1/16
S	3/16	5/8	0	13/16	1/16	3/8	0	7/16	1/8	7/16	1/16	5/8	1/8	1/2	1/16	11/16	3/16	15/16	0	1 1/8
T	1/8	11/16	0	13/16	1/16	3/8	0	7/16	1/8	7/16	1/16	5/8	1/8	1/2	1/16	11/16	3/16	15/16	0	1 1/8
U	1/8	11/16	0	13/16	1/16	3/8	0	7/16	1/8	1/2	1/16	11/16	1/8	9/16	1/16	3/4	1/4	15/16	0	1 3/16
V	3/16	11/16	0	7/8	1/16	3/8	0	7/16	1/8	7/16	1/16	5/8	1/8	1/2	1/16	11/16	1/4	7/8	0	1 1/8
W	3/16	11/16	0	7/8	1/16	5/16	0	3/8	1/8	5/8	1/16	13/16	3/16	5/8	1/16	7/8	1/4	1 1/16	0	1 5/16
X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Y	-	-	-	-	-	-	-	-	-	-	-	-	*1/8	*9/16	*0	*11/16	+1/16	+1/8	+0	+3/16
Z	-	-	-	-	-	-	-	-	*3/16	*1	*0	*13/16	+1/4	+1 1/16	±1/16	+1 5/16	+3/16	+1 1/4	±1/16	+1 3/8
ZA	±0	±1/8	±1/16	±3/16	+1/8	±1/4	+0	±3/8	1/4	1 1/16	-3/4	9/16	5/16	1 7/16	-15/16	13/16	1/2	2 3/8	-2 1/4	5/8
ZB	3/16	7/16	3/16	13/16	1/16	1/16	1/16	3/16	3/16	7/8	-9/16	1/2	5/16	1 1/8	-11/16	3/4	1/2	2	-2 1/4	1/4
ZC	1/8	9/16	1/8	13/16	1/16	1/8	1/16	1/4	3/16	7/8	-1/4	13/16	1/4	1 1/8	-5/16	1 1/16	1/2	1 15/16	-2 3/16	1/4
ZD	1/8	11/16	3/16	1	1/16	3/16	1/16	5/16	3/16	7/8	1/16	1 1/8	5/16	1 1/16	1/16	1 7/16	1/2	1 7/8	-2 9/16	-3/16

Girder	Span 23 ¾				Field Splice 23LR				Span 24 ¼				Span 24 ½				Span 24 ¾			
	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	5/16	-1/16	5/16	1/16	3/16	-7/16	-3/16	1/16	1/4	-1	-11/16	1/8	1/2	-3/4	-1/8	1/16	1/4	-3/8	-1/16
B	1/16	5/16	-1/16	5/16	1/16	3/16	3/8	5/8	1/16	1/4	5/16	5/8	1/8	1/2	-5/8	0	1/16	1/4	-3/8	-1/16
C	1/16	5/16	-1/16	5/16	1/16	3/16	-1/4	0	1/16	5/16	-3/8	0	1/8	1/2	-1/16	5/16	1/16	1/4	-3/16	1/8
D	1/16	5/16	-1/16	5/16	1/16	1/4	1/8	7/16	1/16	5/16	1/8	1/2	1/8	9/16	-1/16	5/8	1/16	5/16	-1/16	5/16
E	1/8	5/16	-1/16	3/8	1/16	1/4	-1/16	1/4	1/16	5/16	-1/16	5/16	1/8	9/16	-1/16	5/8	1/16	5/16	-1/16	5/16
F	1/16	3/8	-1/16	3/8	1/16	1/4	0	5/16	1/16	5/16	-1/16	5/16	1/8	9/16	-1/16	5/8	1/16	5/16	-1/16	5/16
G	1/16	3/8	-1/16	3/8	1/16	1/4	-1/16	1/4	1/16	3/8	-1/16	3/8	1/8	5/8	-1/16	11/16	1/16	5/16	-1/16	5/16
H	1/16	3/8	-1/16	3/8	1/16	5/16	-1/16	5/16	1/16	3/8	-1/16	3/8	3/16	5/8	-1/16	3/4	1/16	3/8	-1/16	3/8
J	1/16	3/8	-1/16	3/8	1/16	5/16	-1/16	5/16	1/16	3/8	-1/16	3/8	1/8	11/16	-1/16	3/4	1/16	3/8	-1/16	3/8
K	+1/16	+1/8	+0	+3/16	1/8	3/8	-1/4	1/4	1/8	7/16	-3/16	3/8	3/16	3/4	-3/16	3/4	1/8	3/8	-1/8	3/8
L	-	-	-	-	*1/16	*7/16	*0	*1/2	+3/16	+5/8	+1/8	+15/16	+3/16	+9/16	+1/16	+13/16	+1/16	+1/4	+0	+5/16
M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N	1/8	7/16	0	9/16	1/16	3/8	-1/16	3/8	1/16	7/16	-1/8	3/8	1/8	3/4	-1/8	3/4	1/16	5/16	-1/8	1/4
P	1/16	7/16	0	1/2	1/16	7/16	1/16	9/16	1/8	7/16	1/8	11/16	3/16	7/8	1/8	1 3/16	1/8	7/16	1/8	11/16
Q	1/8	7/16	0	9/16	1/8	3/8	-1/16	7/16	1/8	7/16	-1/16	1/2	3/16	7/8	-1/16	1	1/8	7/16	-1/16	1/2
R	1/8	7/16	0	9/16	1/8	3/8	-1/16	7/16	1/8	7/16	-1/16	1/2	3/16	15/16	-1/16	1 1/16	1/8	7/16	-1/16	1/2
S	1/8	7/16	0	9/16	1/16	7/16	-1/16	7/16	1/8	1/2	-1/16	9/16	3/16	15/16	-1/16	1 1/16	1/8	1/2	-1/16	9/16
T	1/8	7/16	0	9/16	1/8	7/16	-1/16	1/2	1/8	1/2	-1/16	9/16	1/4	15/16	-1/16	1 1/8	1/8	9/16	-1/16	5/8
U	1/8	7/16	0	9/16	1/8	7/16	-1/16	1/2	1/8	1/2	-1/16	9/16	1/4	1	-1/16	1 3/16	1/8	9/16	-1/16	5/8
V	1/8	7/16	0	9/16	1/8	3/8	-1/16	7/16	1/8	7/16	-1/16	1/2	1/4	7/8	-1/16	1 1/16	1/8	1/2	-1/16	9/16
W	1/8	1/2	0	5/8	1/8	5/8	-1/16	11/16	3/16	5/8	-1/16	3/4	5/16	1 1/8	-1/16	1 3/8	1/8	5/8	-1/16	11/16
X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*1/16	*5/16	*0	*3/8
Y	-	-	-	-	3/16	5/8	1/8	15/16	3/16	11/16	1/8	1	5/16	1 1/8	1/16	1 1/2	1/8	1/2	0	5/8
Z	+1/16	+1/2	±1/16	+1/2	3/16	3/4	1/16	1	3/16	13/16	1/16	1 1/16	3/8	1 3/8	0	1 3/4	3/16	11/16	0	7/8
ZA	3/8	1 3/4	-1 3/16	15/16	‡-1/8	‡1/2	‡0	‡-5/8	-	-	-	-	-	-	-	-	-	-	-	-
ZB	3/8	1 1/2	-1 1/2	3/8	‡-1/8	‡7/16	‡0	‡-9/16	-	-	-	-	-	-	-	-	-	-	-	-
ZC	3/8	1 1/2	-2 1/8	-1/4	‡-1/8	‡7/16	‡0	‡-9/16	-	-	-	-	-	-	-	-	-	-	-	-
ZD	3/8	1 7/16	-2 3/4	-15/16	‡-1/8	‡7/16	‡0	‡-9/16	-	-	-	-	-	-	-	-	-	-	-	-

Girder	Field Splice 24L or R				Span 25 ¼				Span 25 ½				Span 25 ¾				Girder
	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	3/16	0	3/16	1/16	3/16	1/16	5/16	1/16	1/2	5/16	7/8	1/16	7/16	1/2	1	A
B	1/16	1/8	1/16	1/4	1/16	3/16	0	1/4	1/8	7/16	5/16	7/8	1/8	3/8	3/4	1 1/4	B
C	1/16	1/8	1/16	1/4	1/16	3/16	1/8	3/8	1/8	7/16	7/16	1	1/8	3/8	5/8	1 1/8	C
D	0	3/16	0	3/16	1/16	3/16	0	1/4	1/16	1/2	1/4	13/16	1/16	7/16	1/8	5/8	D
E	0	3/16	0	3/16	1/16	3/16	0	1/4	1/16	1/2	-1/16	1/2	1/16	7/16	-1/16	7/16	E
F	0	3/16	-1/16	1/8	1/16	3/16	-1/16	3/16	1/16	1/2	-1/16	1/2	1/16	7/16	-1/16	7/16	F
G	1/16	3/16	0	1/4	1/16	3/16	-1/16	3/16	1/16	1/2	-1/16	1/2	1/16	7/16	-1/16	7/16	G
H	1/16	3/16	0	1/4	1/16	3/16	-1/16	3/16	1/16	1/2	-1/16	1/2	1/16	7/16	-1/16	7/16	H
J	0	3/16	-1/16	1/8	1/16	3/16	-1/16	3/16	1/8	7/16	-1/16	1/2	1/8	3/8	-1/16	7/16	J
K	1/16	3/16	-1/16	3/16	1/16	3/16	-1/16	3/16	1/16	1/2	-1/16	1/2	1/16	7/16	-1/16	7/16	K
L	1/16	5/16	-1/8	1/4	1/16	5/16	-1/8	1/4	1/8	9/16	-1/8	9/16	1/8	7/16	-1/16	1/2	L
M	*1/8	*7/16	*0	*9/16	+3/16	+9/16	+0	+3/4	+3/16	+9/16	+0	+3/4	+1/8	+3/8	+0	+1/2	M
N	1/16	7/16	1/8	5/8	1/16	7/16	1/8	5/8	3/16	7/8	1/16	1 1/8	3/16	11/16	0	7/8	N
P	1/16	3/16	-5/16	-1/16	1/16	1/4	-1/4	1/16	1/8	11/16	-1/8	11/16	1/8	9/16	-1/16	5/8	P
Q	1/16	3/16	3/16	7/16	1/16	5/16	1/8	1/2	3/16	11/16	1/16	15/16	1/8	5/8	0	3/4	Q
R	1/16	3/16	1/8	3/8	1/16	5/16	1/8	1/2	3/16	11/16	1/16	15/16	1/8	5/8	0	3/4	R
S	1/16	1/4	1/8	7/16	1/16	5/16	1/8	1/2	3/16	3/4	1/16	1	3/16	5/8	0	13/16	S
T	1/16	1/4	3/16	1/2	1/16	5/16	1/8	1/2	3/16	3/4	1/16	1	3/16	5/8	0	13/16	T
U	1/16	1/4	3/16	1/2	1/16	5/16	1/8	1/2	3/16	3/4	1/16	1	3/16	5/8	0	13/16	U
V	1/16	3/16	3/16	7/16	1/16	5/16	1/8	1/2	3/16	11/16	1/16	15/16	3/16	5/8	0	13/16	V
W	1/8	7/16	3/16	3/4	1/8	1/2	1/8	3/4	1/4	15/16	1/16	1 1/4	3/16	13/16	0	1	W
X	1/8	7/16	3/16	3/4	3/16	1/2	1/8	13/16	5/16	1 1/16	1/16	1 7/16	1/4	7/8	1/16	1 3/16	X
Y	3/16	9/16	5/16	1 1/16	3/16	9/16	5/16	1 1/16	5/16	1 1/4	3/16	1 3/4	1/4	1 1/16	1/16	1 3/8	Y
Z	1/8	5/8	3/16	15/16	1/8	11/16	3/16	1	5/16	1 5/16	1/8	1 3/4	1/4	1 1/16	1/16	3/8	Z
ZA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ZA
ZB	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ZB
ZC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ZC
ZD	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ZD

LEGEND

* Indicates values at ℄ Girder End Diaphragm
† Indicates values at ¼ pts. or ½ pts. between adjacent pier and ℄ end diaphragm.
‡ Indicates values at ℄ Expansion Rollers 6

Note: See Sheet 62/108 for Notes.

DEAD LOAD DEFLECTION AND CAMBER — UNIT 6CB

Girder	SPAN 24CB ¼				SPAN 24CB ½				SPAN 24CB ¾				Field Splice 24CB				Field Splice 24A-CB			
	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.
CB-A	1/4	15/16	-3 1/16	-1 7/8	5/16	1 5/8	-4 3/8	-2 15/16	3/8	9/16	-3 1/4	-2 1/2	7/16	9/16	-3 1/4	-2 1/2	1/16	1/4	-1/8	3/16
CB-B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CB-C	3/16	1 1/8	-2 15/16	-1 1/2	3/8	1 7/16	-4 1/16	-2 1/4	5/16	3/4	-2 15/16	-2	7/16	3/4	-2 3/8	-1 3/16	1/16	3/16	-1 1/4	-1
CB-D	5/16	1 1/8	-2 3/4	-1 5/16	3/8	1 3/8	-3 5/8	-1 7/8	5/16	3/4	-2 1/2	-1 9/16	5/16	11/16	-2 7/16	-1 3/8	1/16	3/16	-2 3/8	-1 15/16
CB-E	1/4	1	-2 7/16	-1 3/16	5/16	1 3/8	-3 1/16	-1 3/8	5/16	9/16	-2 1/16	-1 1/8	5/16	9/16	-2 1/16	-1 1/8	1/16	1/4	-2 3/4	-2 7/16

Girder	SPAN 25CB ¼				SPAN 25CB ½				SPAN 25CB ¾				Field Splice 25CB				Field Splice 25A-CB			
	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.
CB-A	1/16	1/4	-1/4	1/16	1/8	3/8	-1 1/8	-5/8	1/16	5/16	-1 1/16	-11/16	1/16	1/4	-1 1/8	-1	1/8	1/2	-3 3/4	-3 3/8
CB-B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CB-C	1/16	1/4	-1 1/16	-1 1/16	1/8	1/2	-3	-2 3/8	1/16	3/8	-2 1/4	-1 13/16	1/16	5/16	-2 1/8	-1 3/4	1/8	1/2	-3 1/8	-2 1/2
CB-D	1/16	5/16	-2 7/16	-2 1/16	1/8	1/2	-3 15/16	-3 1/16	1/16	3/8	-2 7/8	-2 7/16	1/16	5/16	-2 5/8	-2 1/4	1/8	9/16	-2 5/8	-1 15/16
CB-E	1/16	3/8	-3 1/16	-2 5/8	3/16	3/4	-4 7/16	-3 1/2	1/16	7/16	-3 1/16	-2 9/16	1/16	3/8	-2 13/16	-2 3/8	1/16	7/16	-2 1/4	-1 3/4

Girder	SPAN 26CB ¼				SPAN 26CB ½				SPAN 26CB ¾				Field Splice 26CB				SPAN 27CB ¼			
	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.
CB-A	1/8	5/8	-4 1/16	-3 5/16	1/4	1 1/16	-4 13/16	-3 1/2	1/8	5/8	-3 5/16	-2 9/16	1/16	1/4	-5/16	0	1/16	1/4	-1/4	1/16
CB-B	-	-	-	-	-	-	-	-	-	-	-	-	*1/16	*1/4	*0	*5/16	+3/16	+3/4	+0	+15/16
CB-C	1/8	5/8	-3 3/8	-2 5/8	1/4	1 1/16	-4 1/16	-2 3/4	1/8	1/2	-2 3/8	-1 3/4	1/16	3/8	0	1/2	1/8	1/2	0	5/8
CB-D	1/8	5/8	-2 13/16	-2 1/16	1/4	1 1/16	-3 9/16	-2 1/4	1/8	9/16	-2 1/4	-1 9/16	1/16	3/8	0	1/2	1/8	7/16	0	9/16
CB-E	1/8	1/2	-2 1/2	-1 7/8	3/16	7/8	-3 3/8	-2 1/4	1/8	7/16	-1 13/16	-1 1/4	1/8	7/16	0	9/16	1/8	1/2	0	5/8

Girder	SPAN 27CB ½				SPAN 27CB ¾				Field Splice 27CB				SPAN 28CB ¼				SPAN 28CB ½				SPAN 28CB ¾				Girder
	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.	
CB-A	1/8	7/16	-3/8	3/8	1/16	3/16	-1/16	3/16	1/16	1/4	3/16	1/2	1/16	3/8	3/16	5/8	3/16	3/4	1/8	1 1/16	1/8	11/16	1/16	7/8	CB-A
CB-B	+3/16	+3/4	+0	+15/16	+1/16	+5/16	+0	+3/8	1/16	5/16	1/8	1/2	1/16	7/16	1/16	9/16	3/8	3/8	1/16	1 1/8	1/8	3/4	0	7/8	CB-B
CB-C	3/16	7/8	0	1 1/16	1/8	7/16	0	9/16	1/16	1/4	0	5/16	1/16	3/8	0	7/16	1/8	3/4	0	15/16	1/8	11/16	0	13/16	CB-C
CB-D	3/16	1	0	1 3/16	1/8	1/2	0	5/8	1/16	1/4	0	5/16	1/16	3/8	0	7/16	3/16	3/4	0	15/16	1/8	11/16	0	13/16	CB-D
CB-E	3/16	1	0	1 3/16	1/8	1/2	0	5/8	1/16	5/16	0	1/4	1/16	3/8	0	7/16	3/16	3/4	0	7/8	1/8	5/8	0	3/4	CB-E

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

DEFLECTION AND CAMBER TABLES UNITS 5, 6 AND 6 CB

I-290 OVER CUYAHOGA RIVER

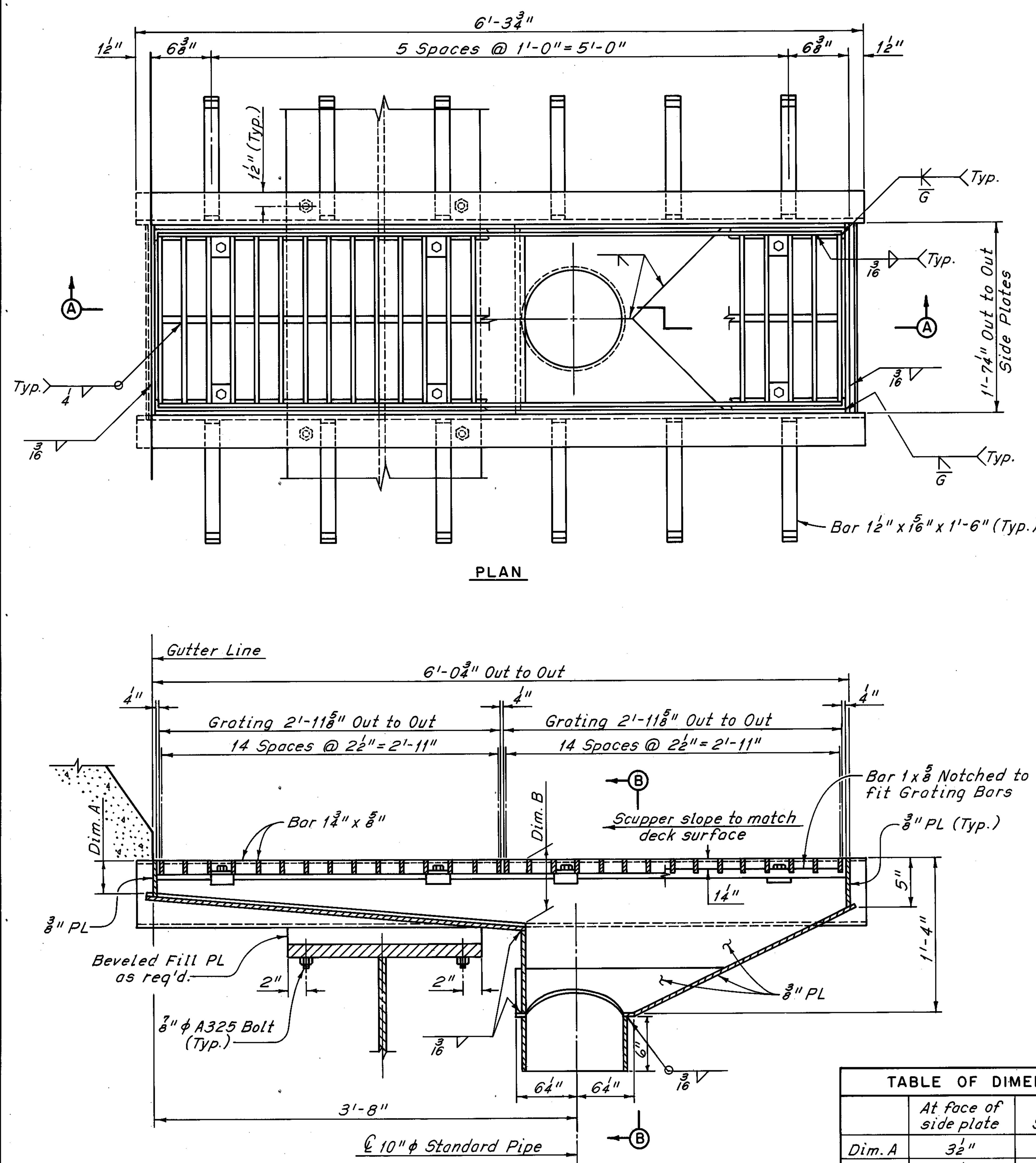
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

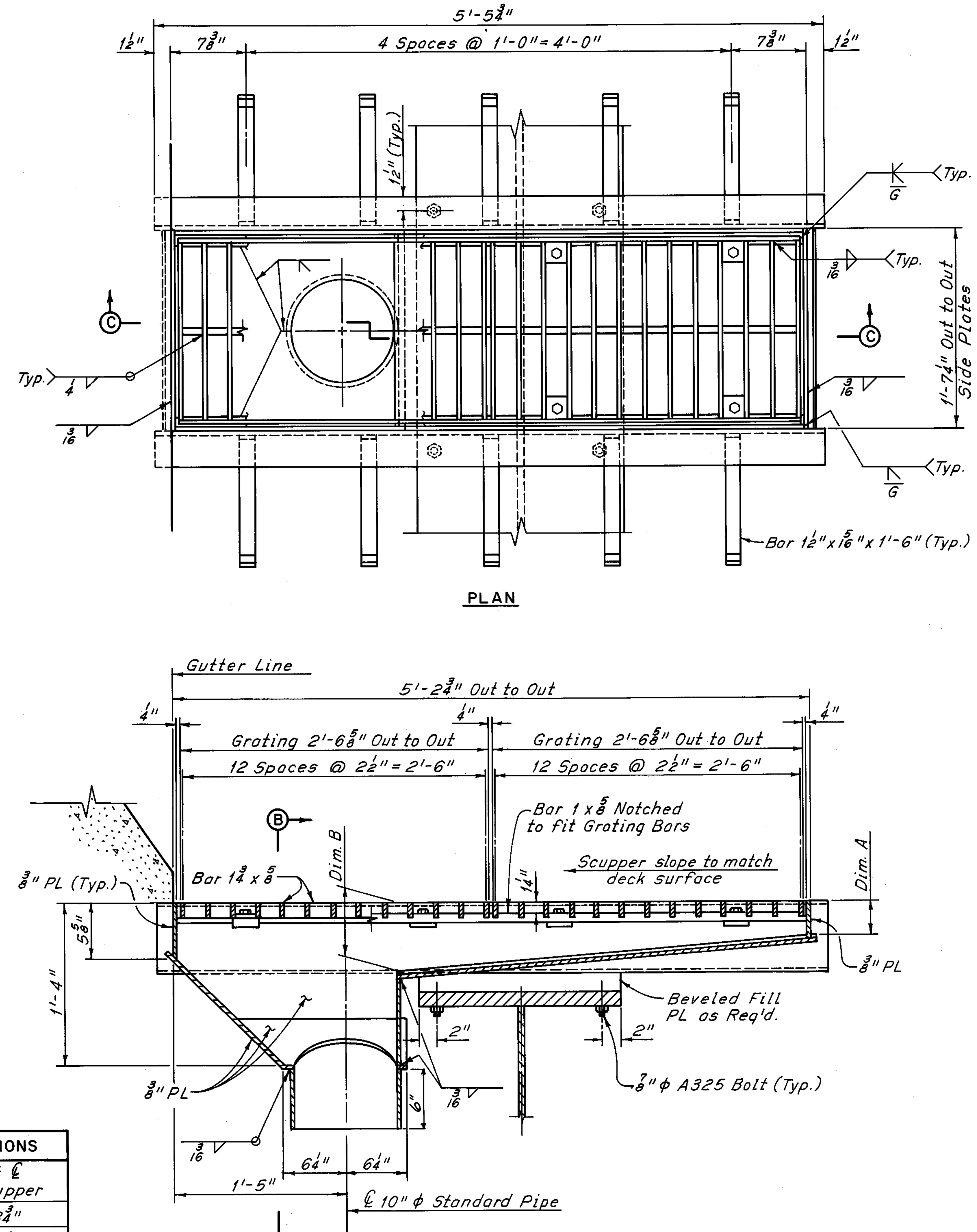
DRAWN DHS & GMP	TRACED L.C.	CHECKED SMS / DHS	REVIEWED C.A.B.	REVISED
DATE 9-3-70	DATE 9-10-70	DATE 9-21-70	DATE 2-24-86	SHEET 64/108

FHWA REGION	STATE	PROJECT	
2	OHIO		

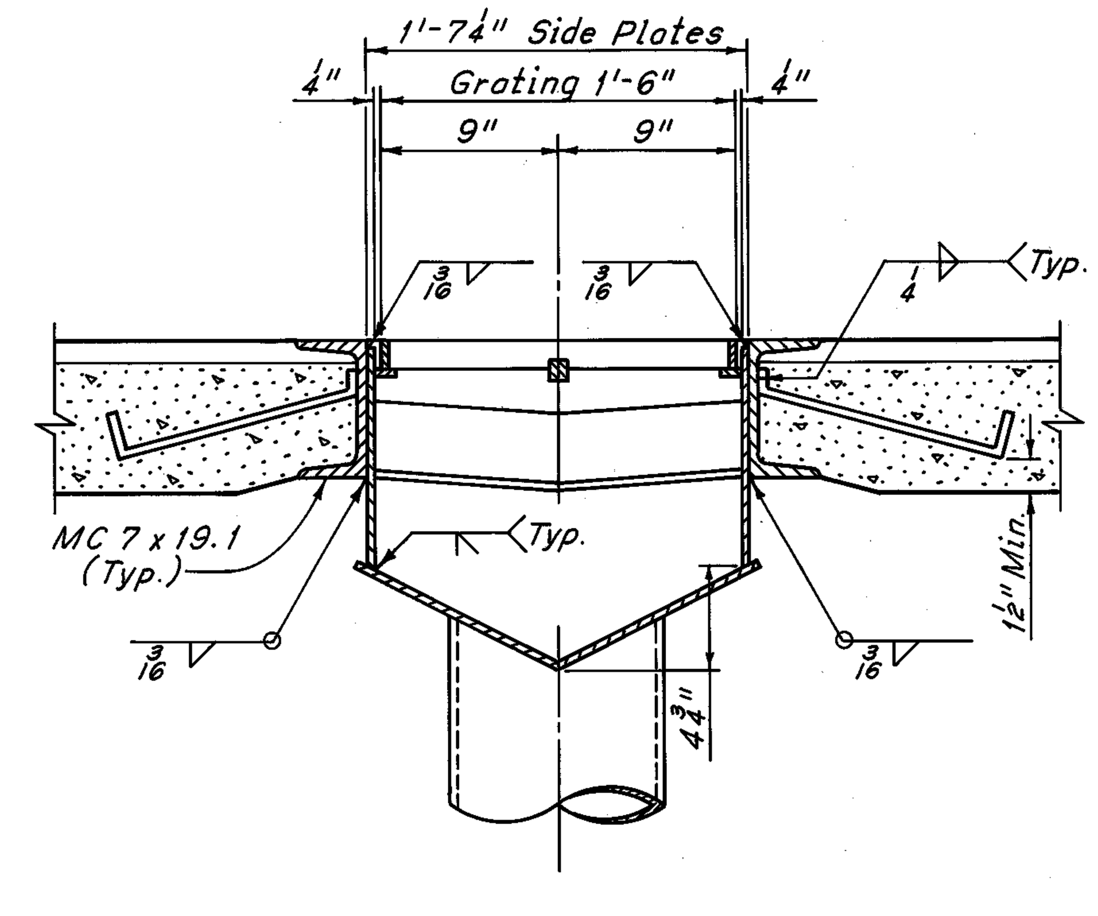
CUYAHOGA COUNTY
CUY- 290-027



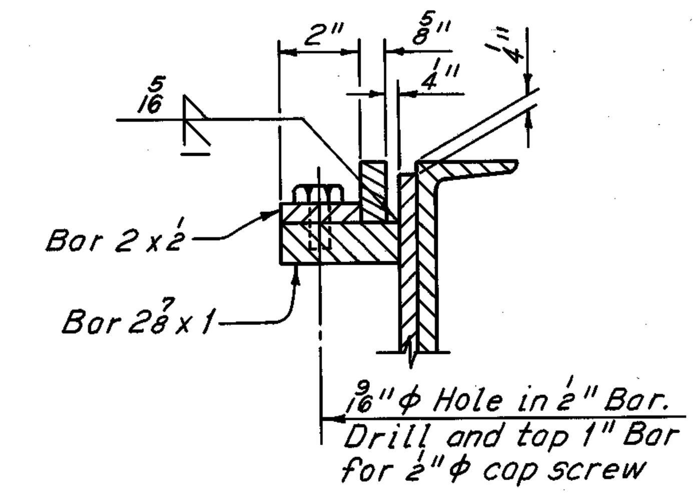
TYPE I SCUPPER



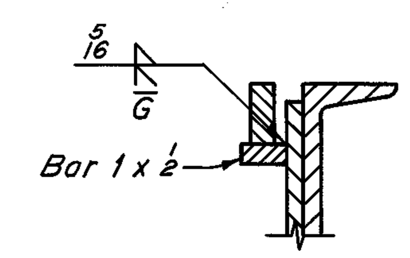
TYPE 2 SCUPPER



SECTION B-B
(Girder Flange not shown)

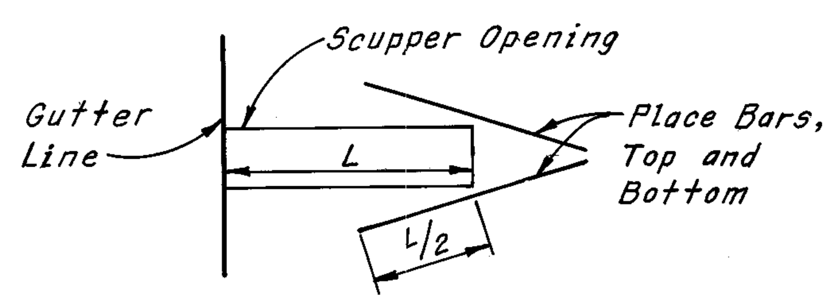


SECTION THRU GRATING FASTENING



SECTION THRU GRADING SUPPORT

TABLE OF DIMENSIONS		
	At face of side plate	At ℄ Scupper
Dim. A	3½"	3¾"
Dim. B	7⅛"	7⅜"



DETAIL A

Note: Deck slab reinforcement shall be field cut as required to place the scuppers. Transverse slab bars that have been cut shall be placed as shown in Detail A. The cost of field cutting reinforcing shall be included in Item 824 for payment.

Notes:

The scuppers and supports shall be hot-dip galvanized ASTM A36 steel.

The support channels, 7/8" diameter bolts and attached 10" diameter pipe are included with Item 518, Scuppers including supports for payment.

For scupper locations see framing plans.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

SCUPPER DETAILS

I-290 OVER CUYAHOGA RIVER

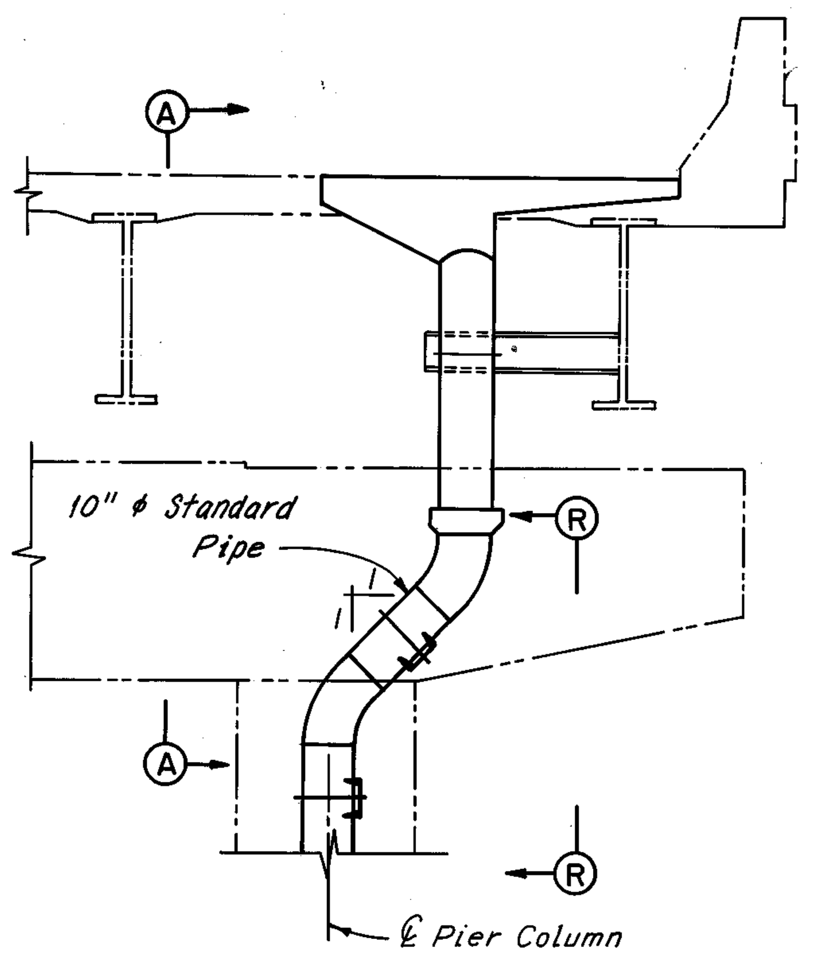
BR. NO. CUY-290-0110 — STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CUYAHOGA COUNTY OHIO

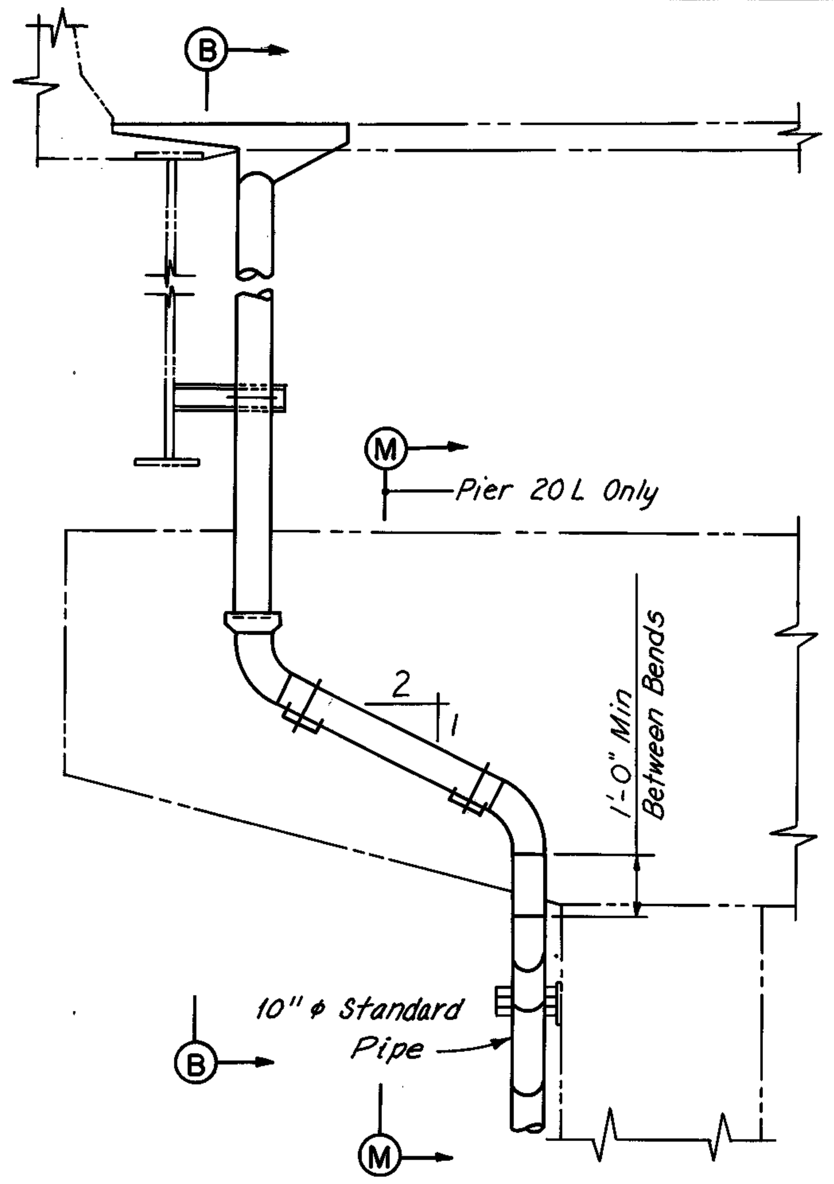
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
B.B. DATE 7-10-85	D.L.R. DATE 8-2-85	R.H.W. DATE 8-8-85	C.A.B. DATE 8-24-86	

FHWA REGION	STATE	PROJECT		
2	OHIO			

CUYAHOGA COUNTY
CUY- 290-027

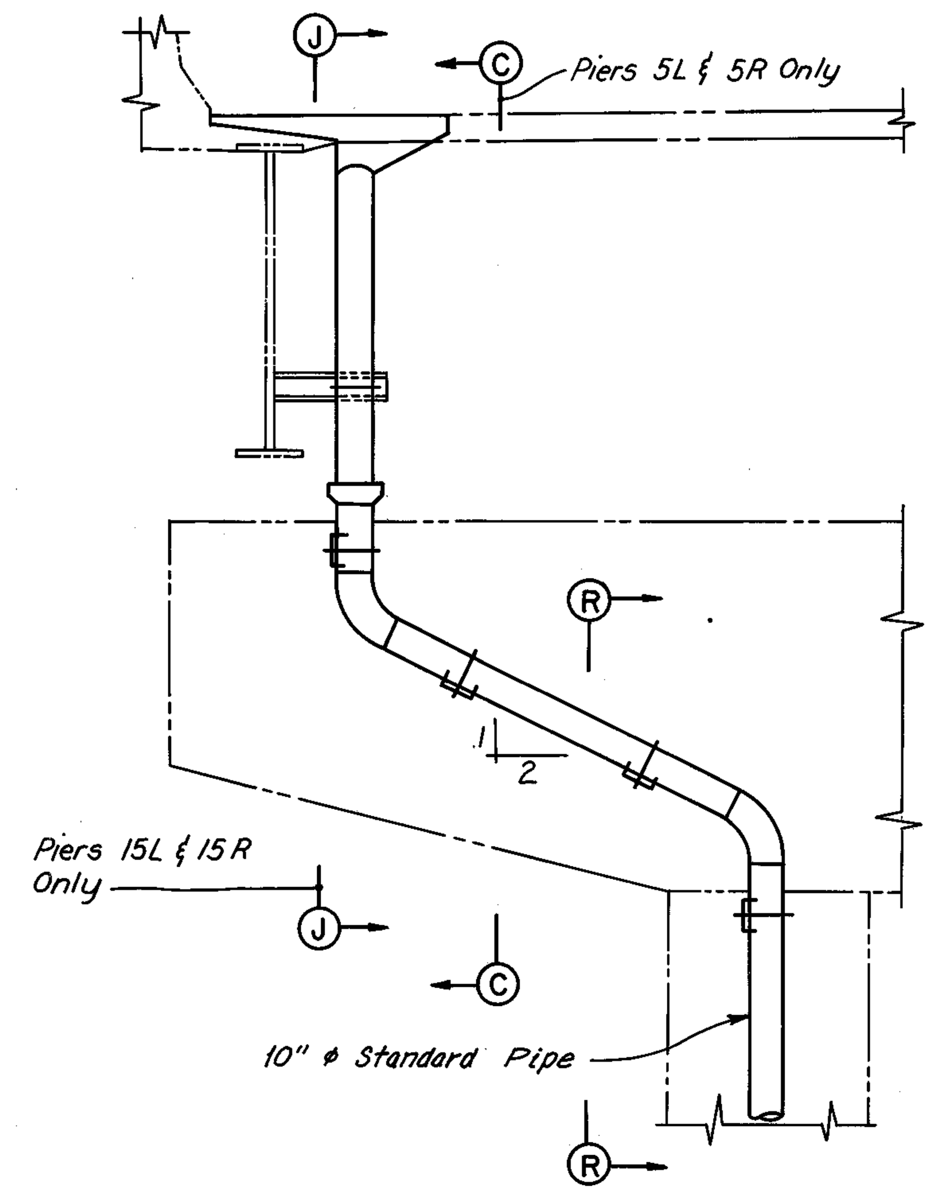


PIER 2C-7 (LOOKING WEST)

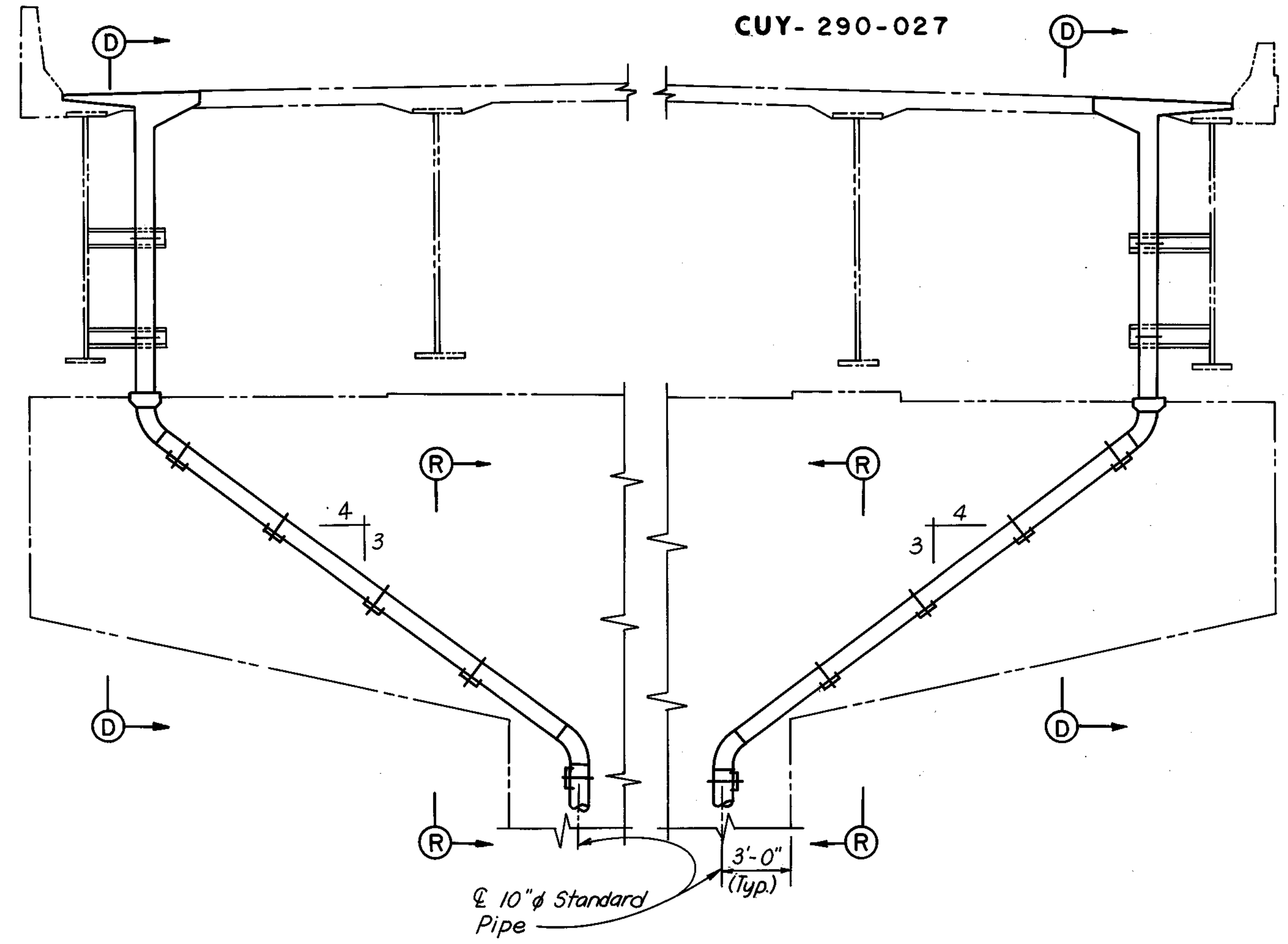


PIER 4L NORTH GUTTER (LOOKING EAST)
PIER 4L NORTH MEDIAN (OPPOSITE HAND, LOOKING EAST)
PIER 4R SOUTH MEDIAN (LOOKING EAST)
PIER 20L NORTH MEDIAN (LOOKING WEST)

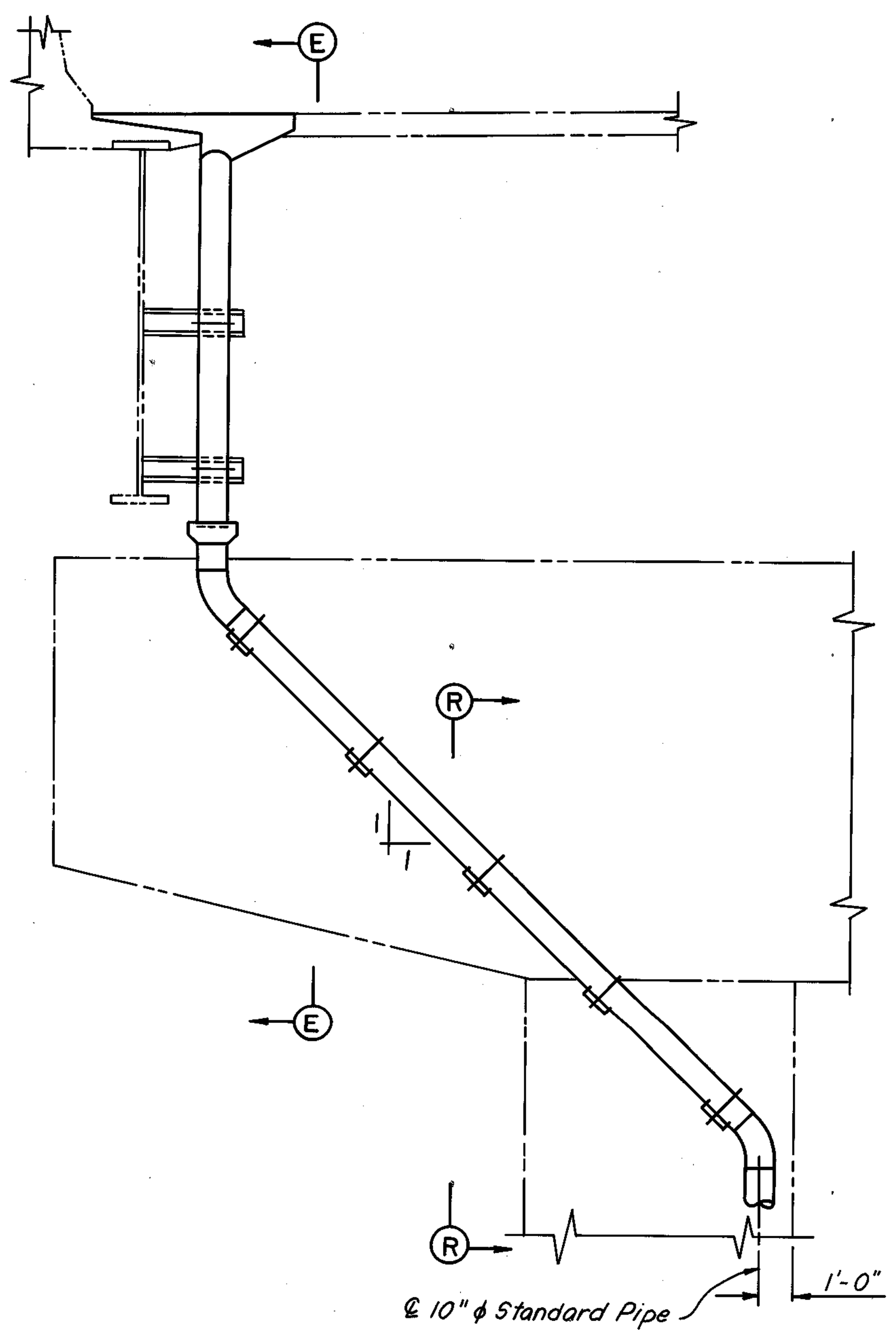
Note : For Pier 4R South Gutter See Sheet 67/108.



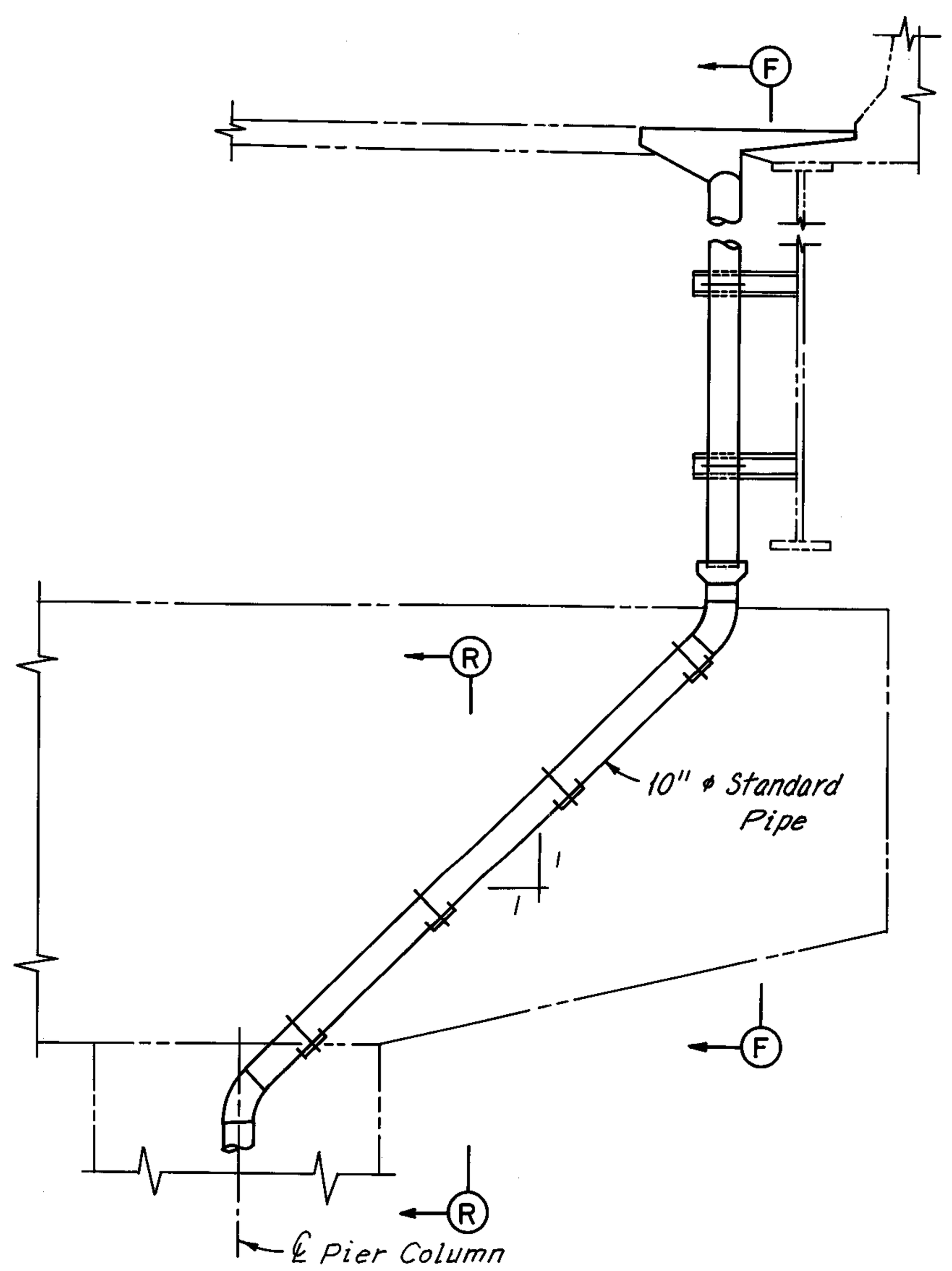
PIERS 5L & 5R (LOOKING WEST)
PIER 15R SOUTH GUTTER (LOOKING WEST)
PIER 15L NORTH GUTTER (OPPOSITE HAND, LOOKING WEST)



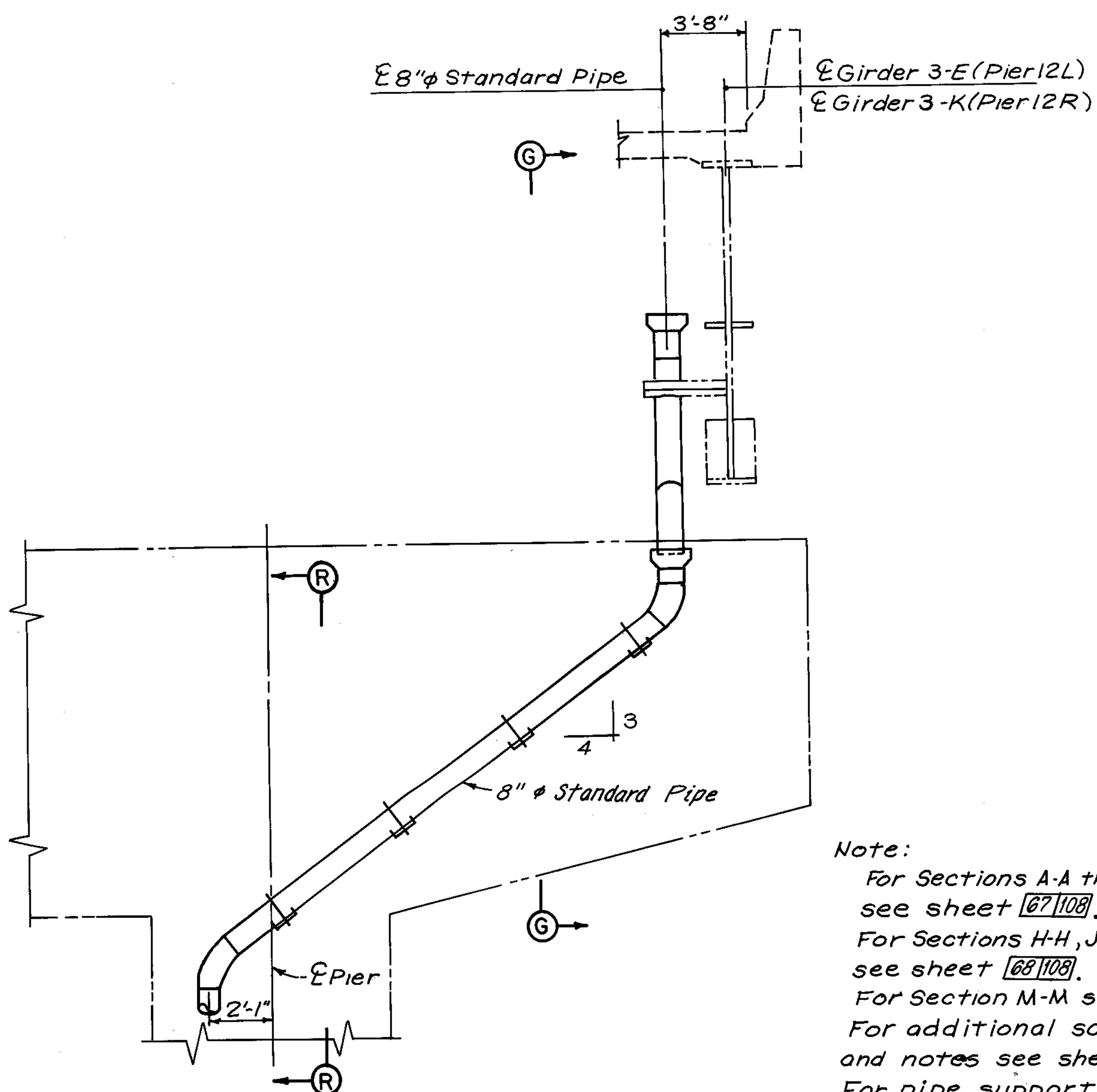
PIER 9L (LOOKING WEST)



PIER 9R SOUTH MEDIAN (LOOKING EAST)
PIER 9R SOUTH GUTTER (OPPOSITE HAND, LOOKING EAST)

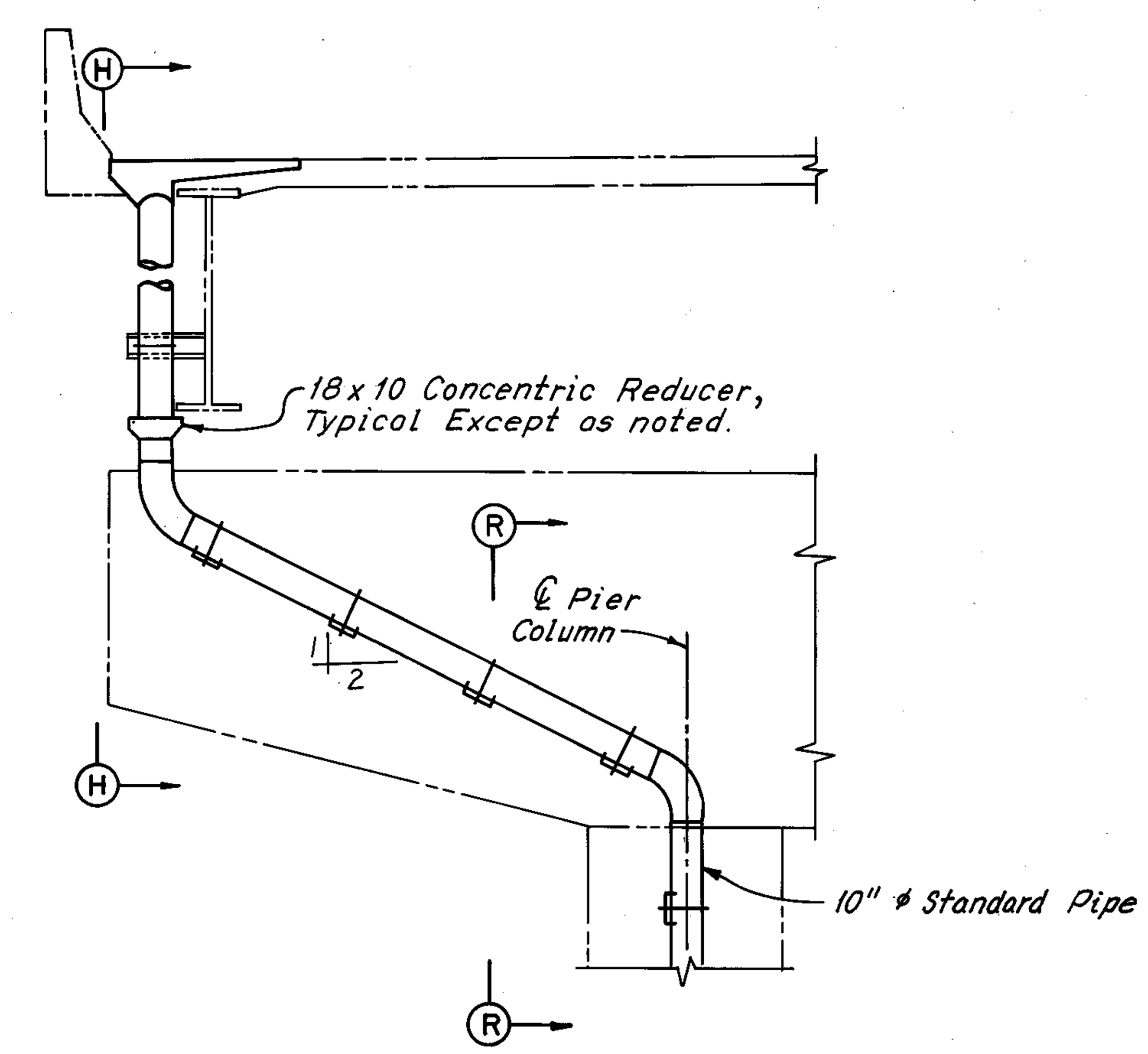


PIERS 10L & 10R (LOOKING EAST)



PIERS 12L & 12R (LOOKING EAST)

Note:
For Sections A-A thru G-G see sheet 67/108.
For Sections H-H, J-J and R-R see sheet 68/108.
For Section M-M see sheet 67/108.
For additional scupper details and notes see sheet 65/108.
For pipe support details see sheet 68/108.
The minimum radius on all pipe bends shall be 18" to ℄



PIER 15L NORTH MEDIAN (LOOKING WEST)
PIER 15R SOUTH MEDIAN (OPPOSITE HAND, LOOKING WEST)

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

DRAINAGE DETAILS

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 — STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CUYAHOGA COUNTY — OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
B.B. DATE 7-24-85	T.D. DATE 8-6-85	R.H.W. DATE 8-8-85	C.A.B. DATE 8-22-88	SHEET 66/108

FHWA REGION	STATE	PROJECT	
2	OHIO		

152/193

CUYAHOGA COUNTY
CUY- 290-027

Notes:
For locations of sections A-A thru G-G, and location of section M-M see sheet 66/108.
For sections K-K, N-N, P-P, and R-R see sheet 68/108.
For additional scupper details and notes see sheet 65/108.
For pipe support details see sheet 68/108.
The minimum radius on all pipe bends shall be 18" to ℄.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

DRAINAGE DETAILS

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 — STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

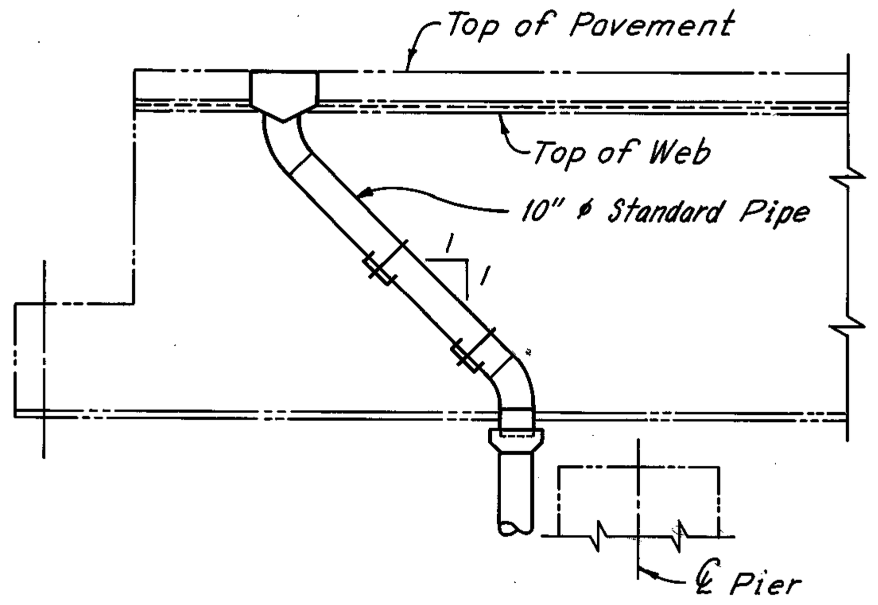
CUYAHOGA COUNTY — OHIO

DRAWN B.B. DATE 7-8-85	TRACED T.D. DATE 7-10-85	CHECKED R.H.W. DATE 7-11-85	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 67/108

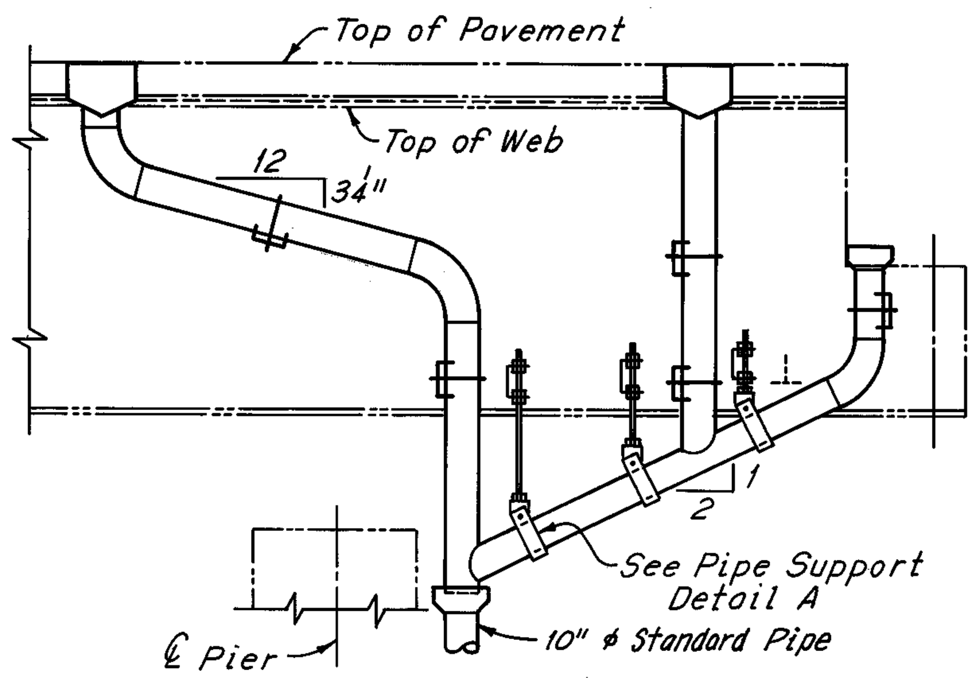
FHWA REGION	STATE	PROJECT	
2	OHIO		

153/193

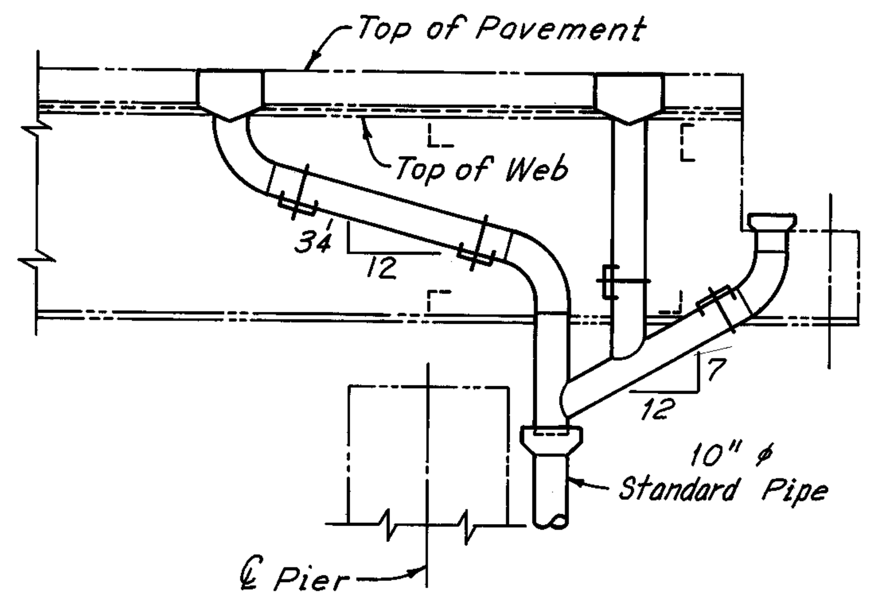
CUYAHOGA COUNTY
CUY- 290-027



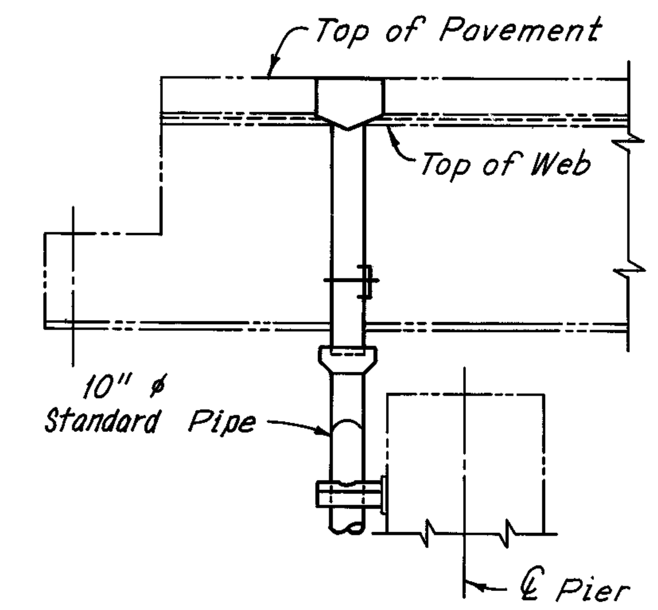
SECTION H-H (PIER 15R SOUTH MEDIAN)
SECTION J-J (PIER 15L NORTH GUTTER)



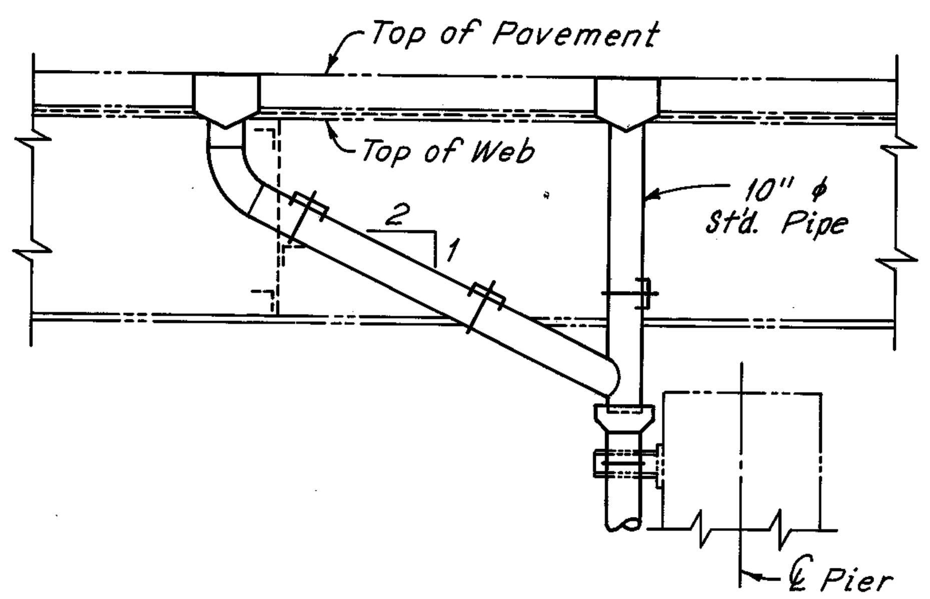
SECTION H-H (PIER 15L NORTH MEDIAN)
SECTION J-J (PIER 15R SOUTH GUTTER)



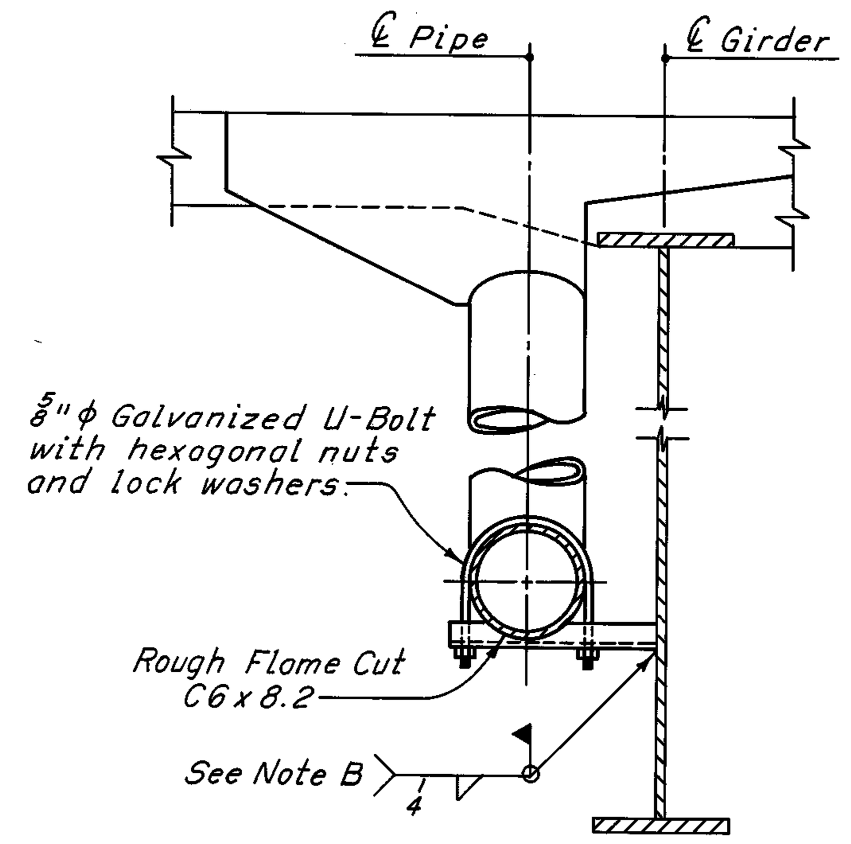
SECTION B-B (PIER 20L NORTH MEDIAN)
SECTION K-K (PIER 20R SOUTH GUTTER)



SECTION K-K (PIER 20R SOUTH MEDIAN)

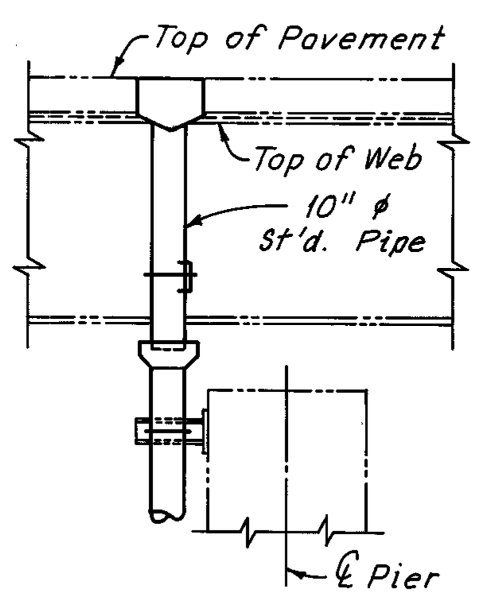


SECTION P-P (PIER 24-CB)

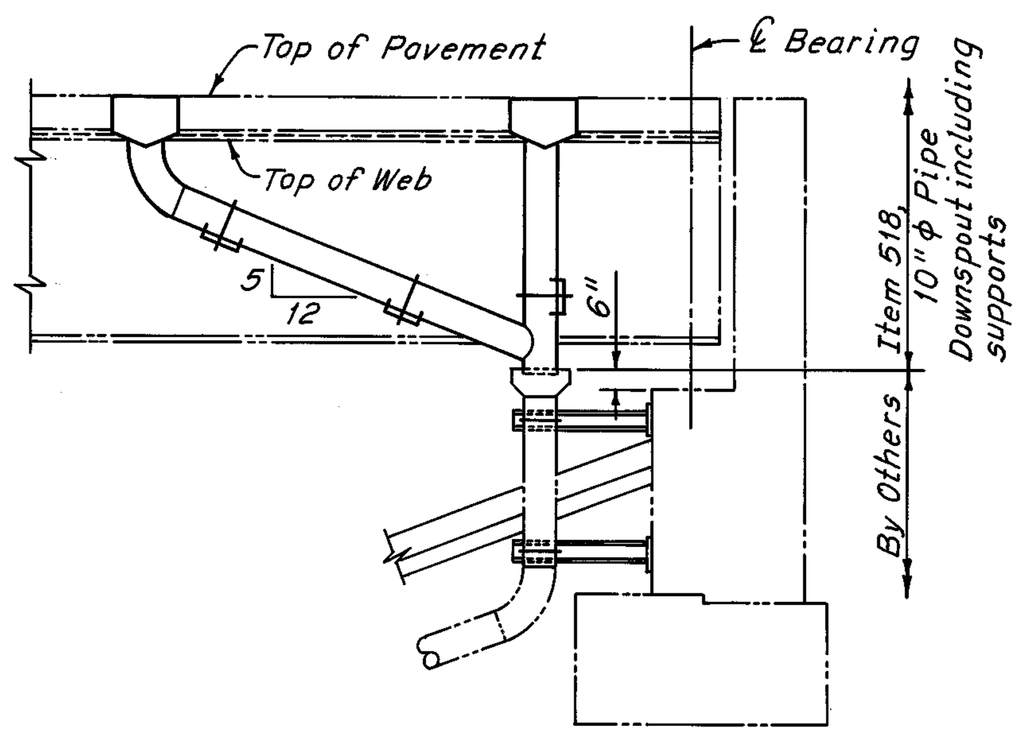


PIPE SUPPORT DETAIL ON GIRDERS

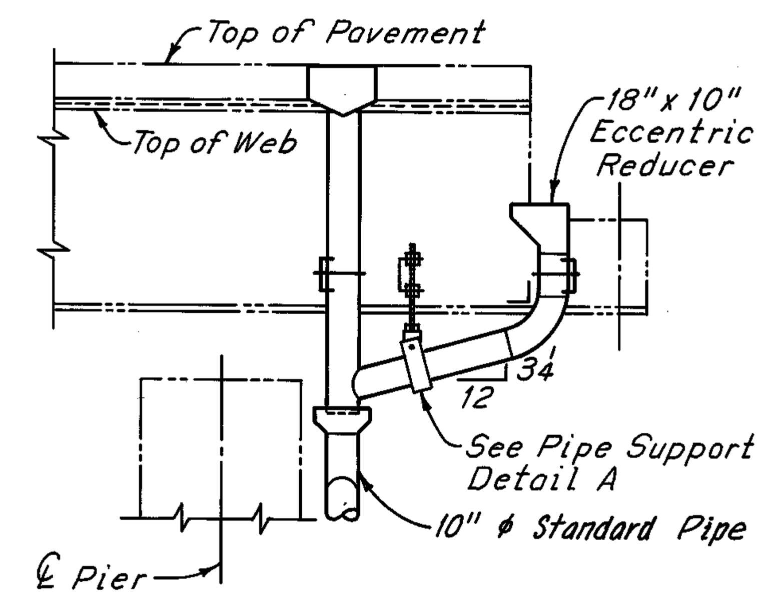
Note B: All pipe support welds shall be located in the region between mid depth of the web and the bottom flange of the Girder or Beam.



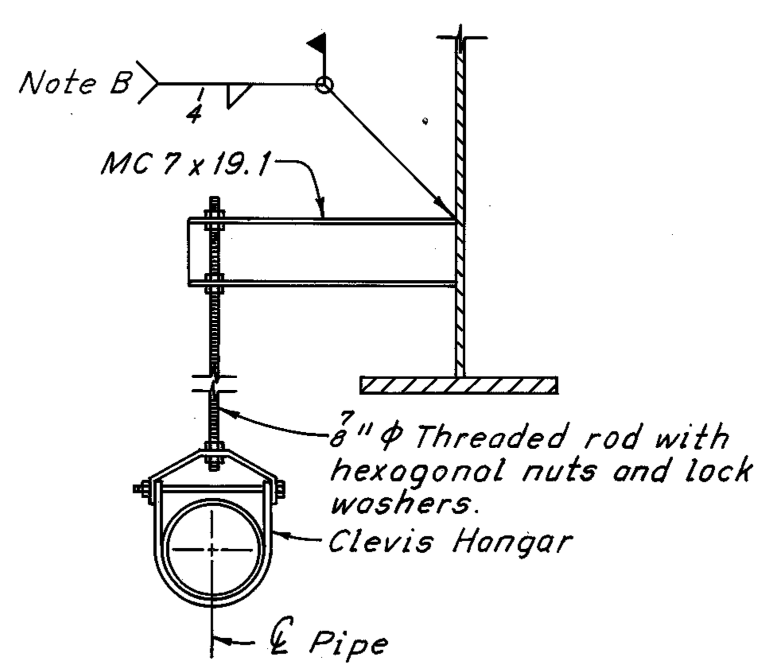
SECTION P-P (PIER 25-CB)



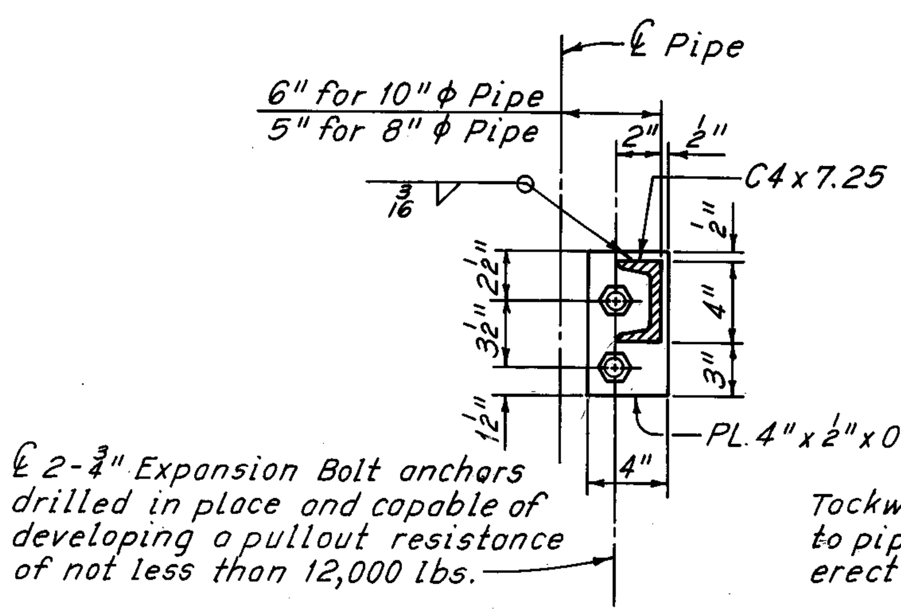
EAST ABUTMENT (NORTH MEDIAN)



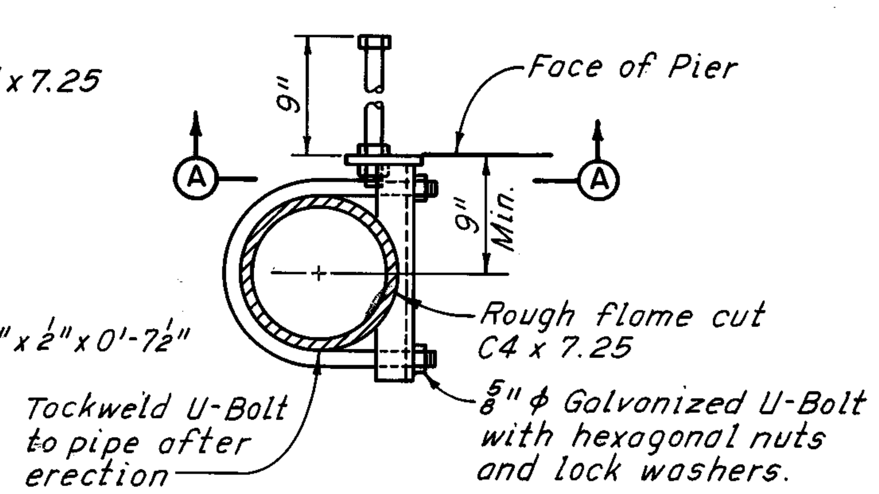
SECTION N-N (PIER 23-CB)



PIPE SUPPORT DETAIL A

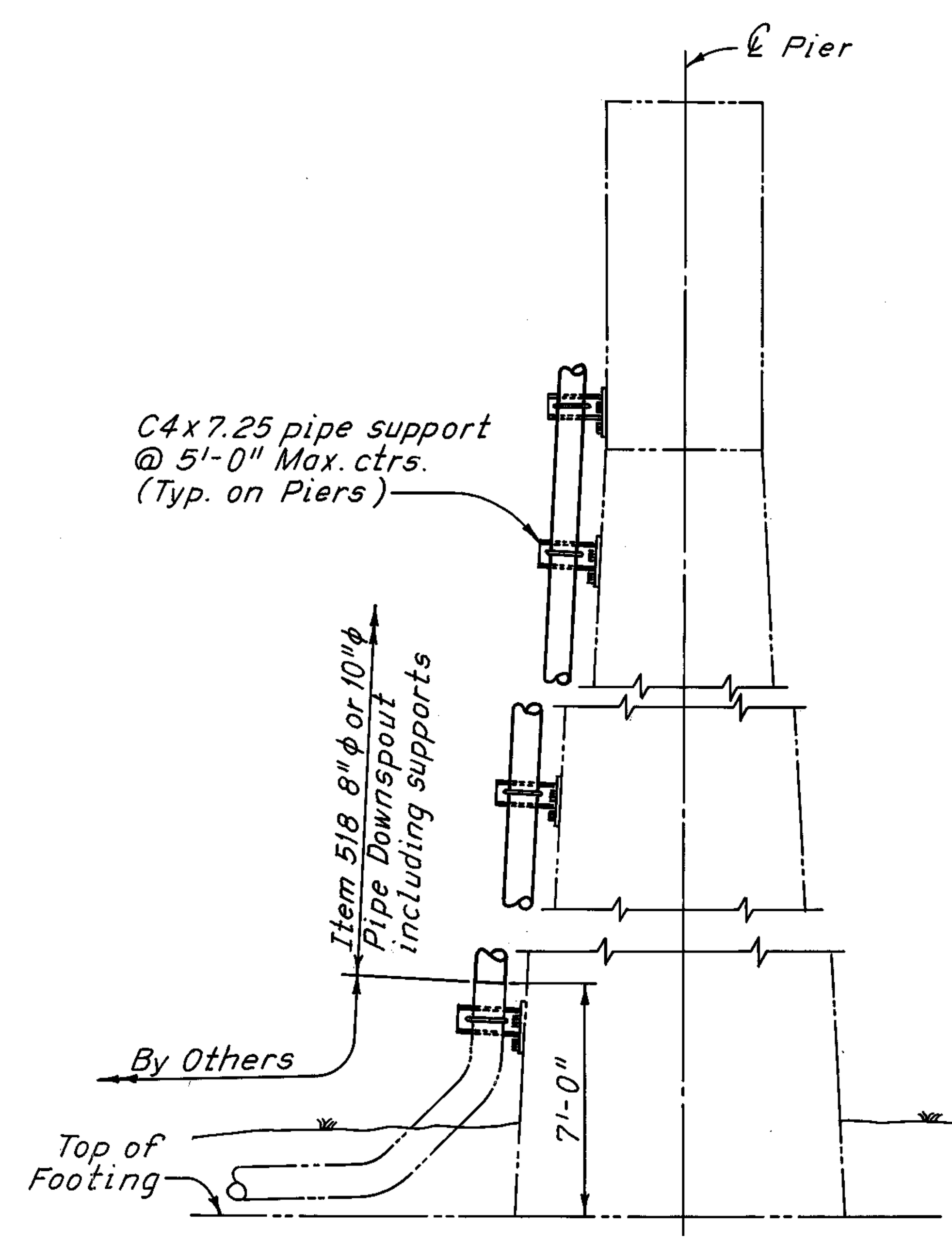


SECTION A-A

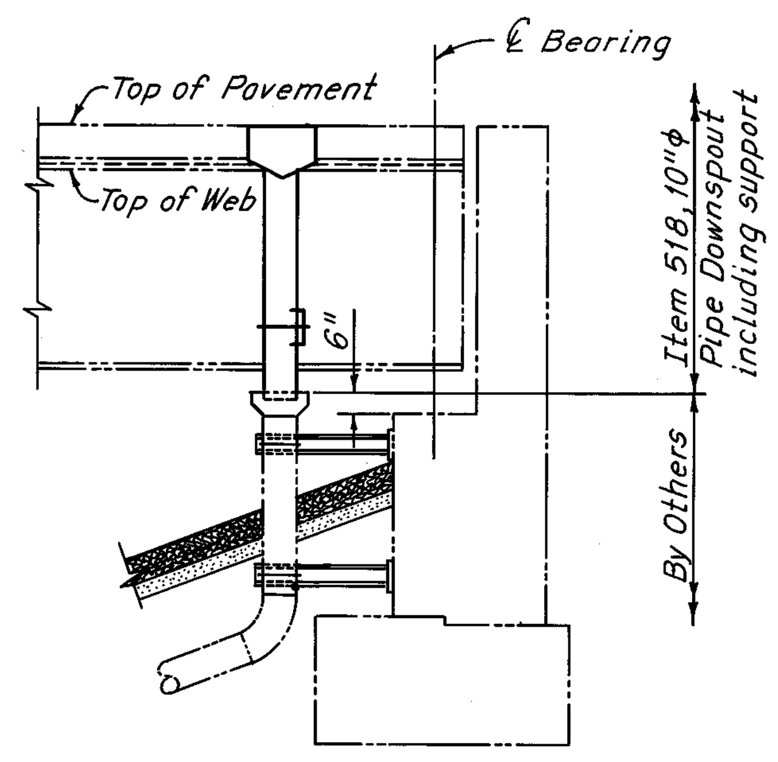


PLAN

PIPE SUPPORT DETAIL AT PIERS



SECTION R-R



EAST ABUTMENT
(EXCEPT NORTH MEDIAN)

Notes:
For locations of sections B-B, H-H, and J-J see sheet 66/108.
For locations of sections K-K, N-N, and P-P see sheet 67/108.
For location of section R-R see sheets 66/108 and 67/108.
For additional scupper details and notes see sheet 65/108.
The minimum radius on all pipe bends shall be 18" to ℄.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

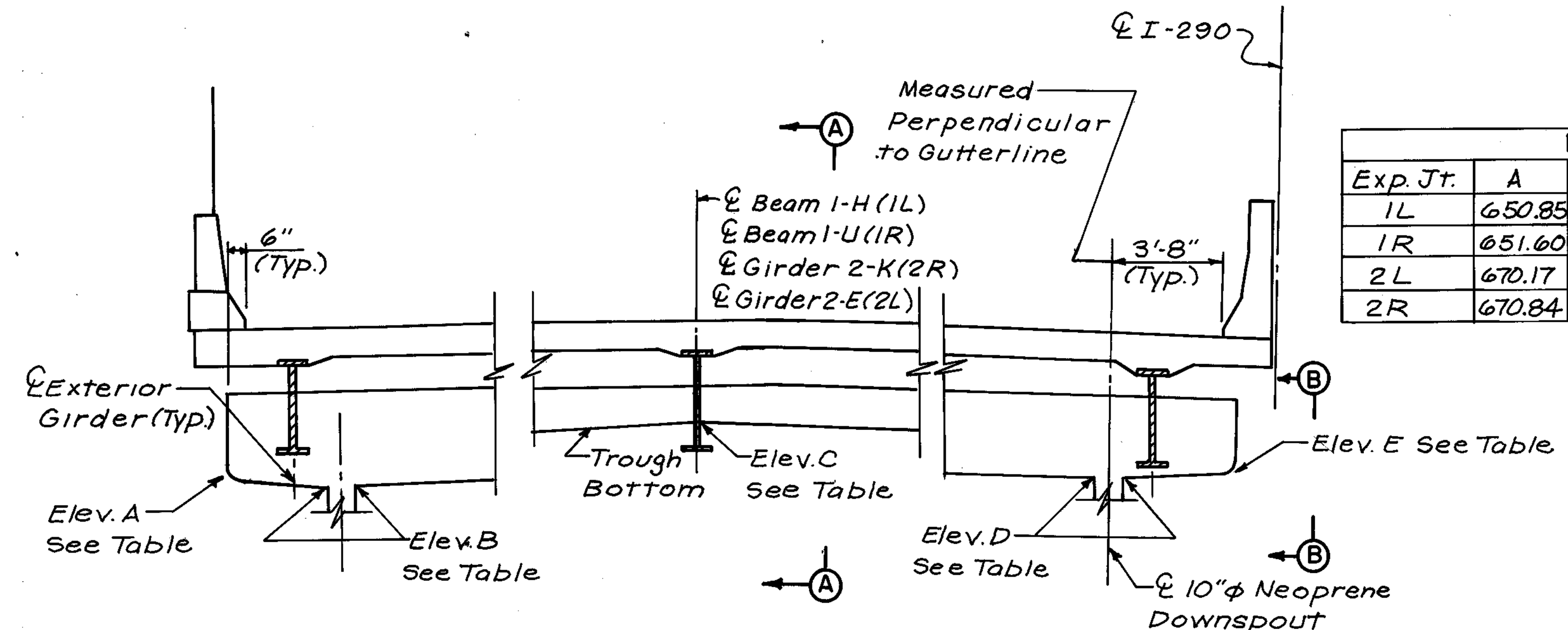
DRAINAGE DETAILS

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 — STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

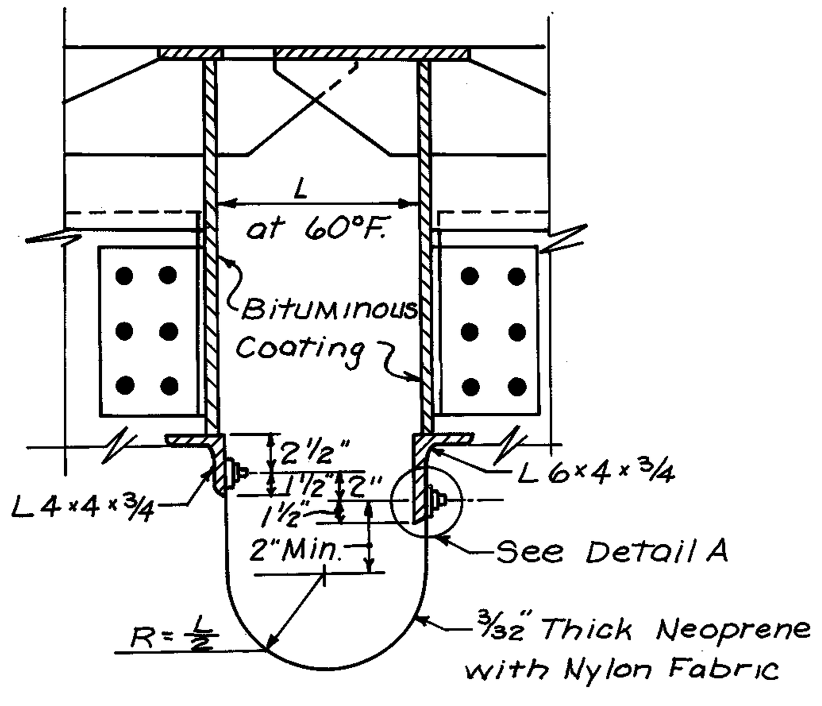
CUYAHOGA COUNTY — OHIO

DRAWN B.B. DATE 7-9-85	TRACED D.L.R. DATE 8-2-85	CHECKED R.H.W. DATE 8-8-85	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 68/108

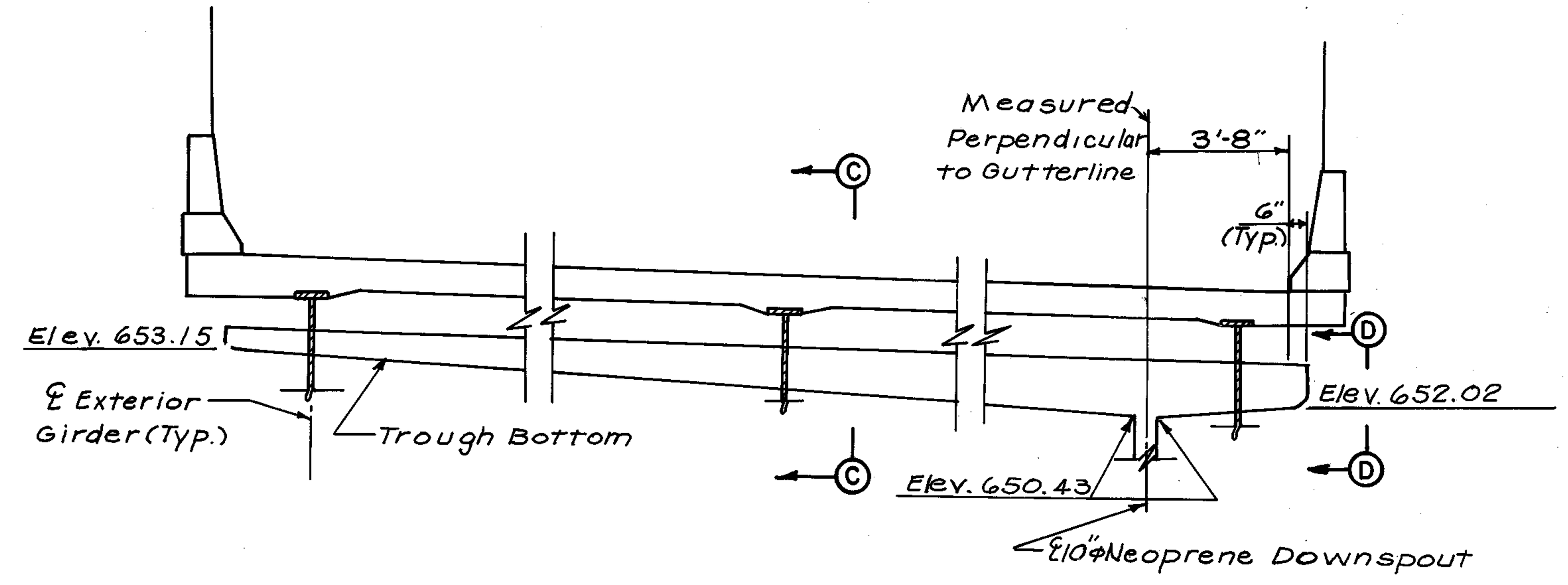


EXPANSION JOINT 1L & 2L LOOKING EAST
EXPANSION JOINT 1R & 2R LOOKING WEST

ELEVATION					
Exp. Jt.	A	B	C	D	E
1L	650.85	649.10	651.58	649.81	651.40
1R	651.60	650.02	652.02	649.81	651.44
2L	670.17	668.67	670.56	668.43	669.93
2R	670.84	669.28	671.38	669.81	671.30

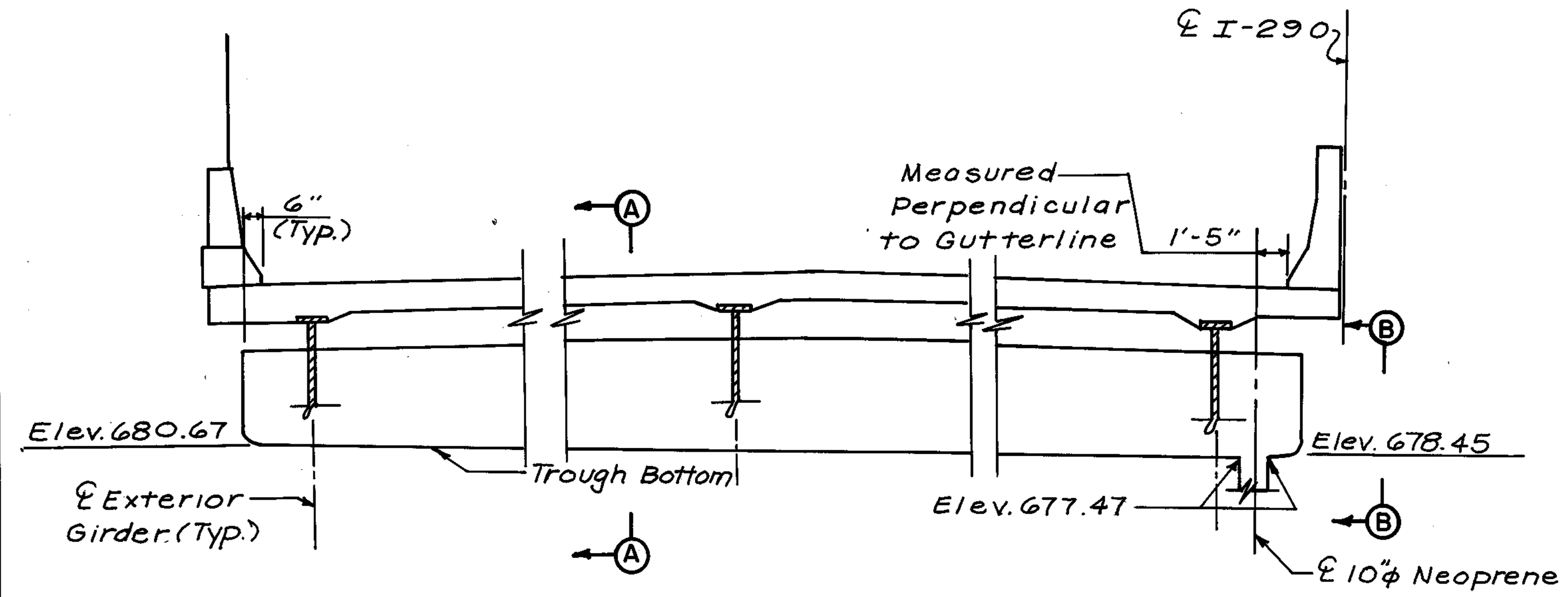


SECTION A-A

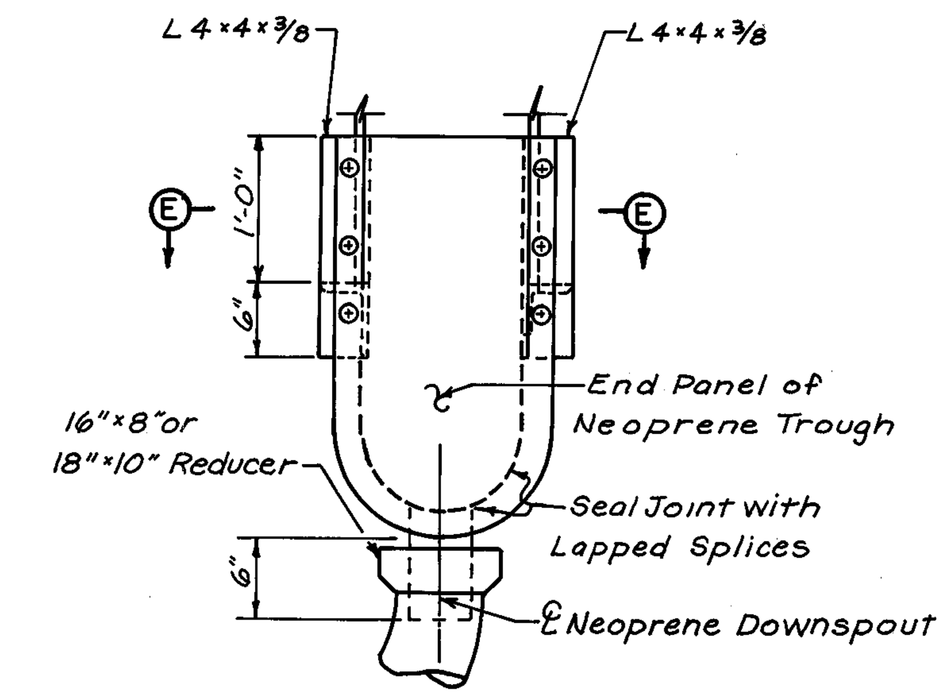


EXPANSION JOINT 6-LOOKING EAST
(For Section C-C see sheet 53/108)

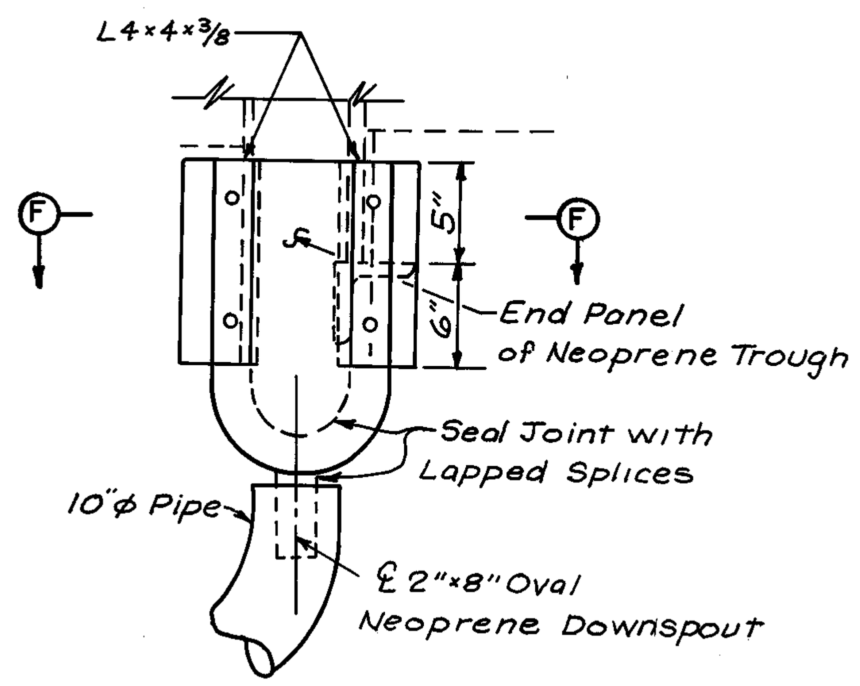
TABLE OF DIMENSIONS	
EXP. JT.	L
1L & 1R	1'-1 1/2"
2L & 2R	1'-6 1/2"
3L & 3R	1'-6 1/2"
4L & 4R	1'-1 1/2"
5L & 5R	1'-1 1/2"



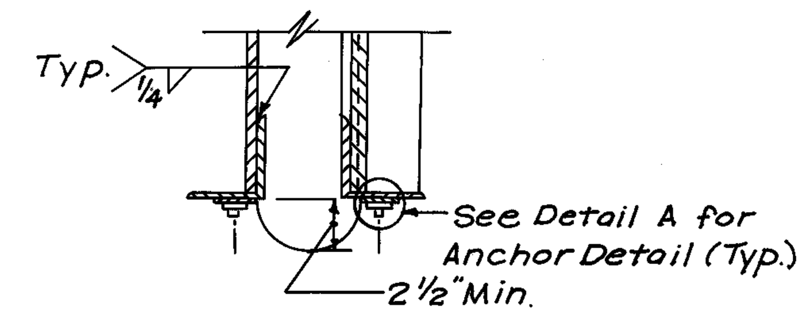
EXPANSION JOINT 4L-LOOKING EAST



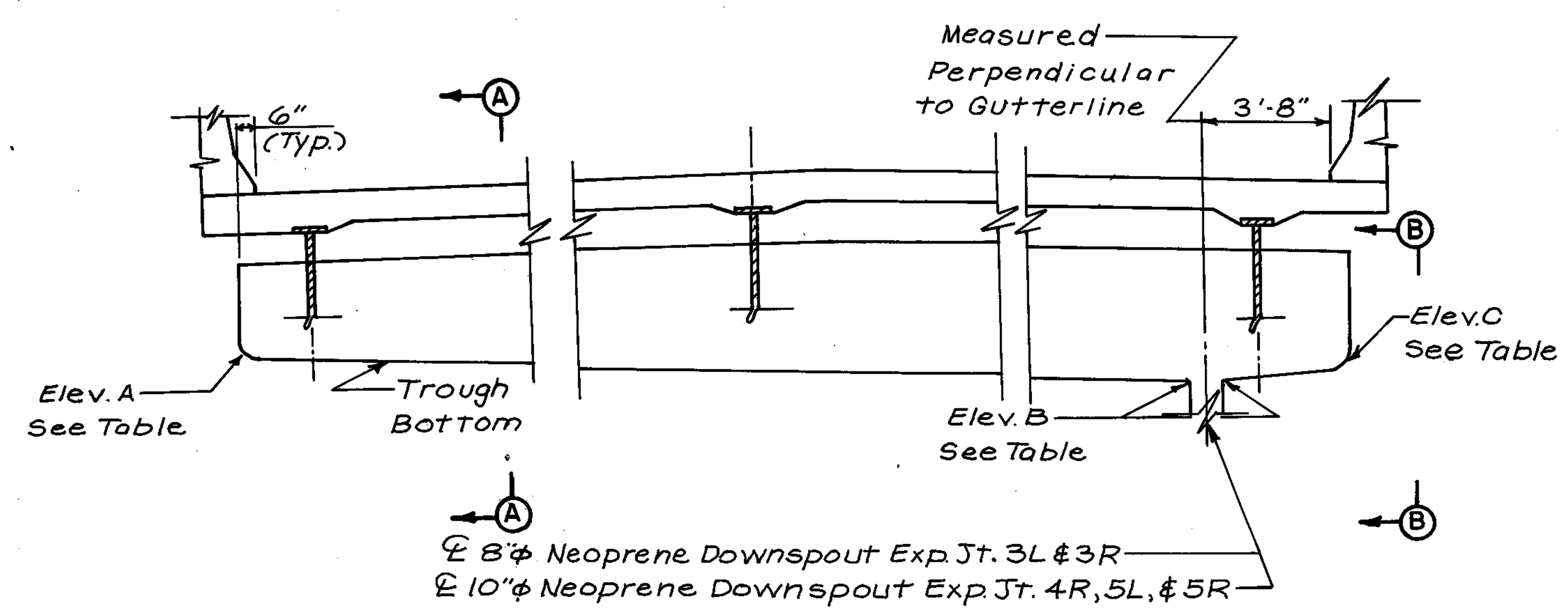
VIEW B-B



VIEW D-D

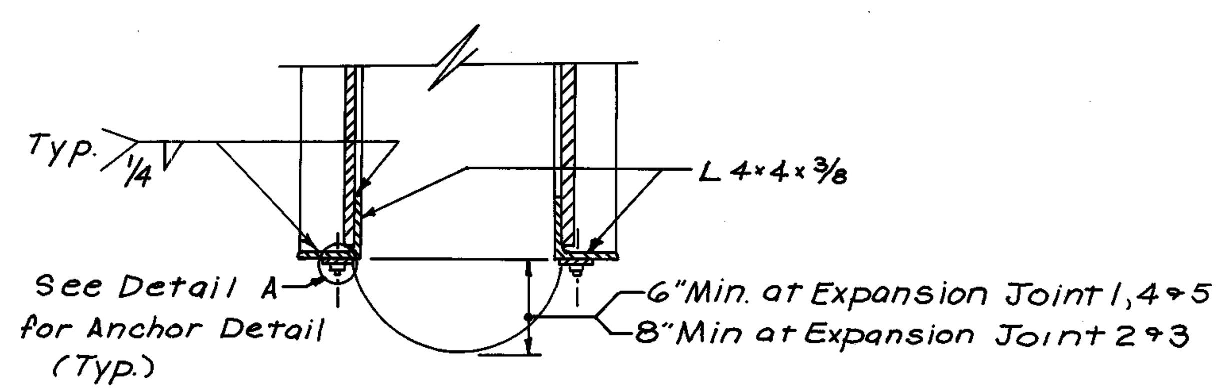


SECTION F-F

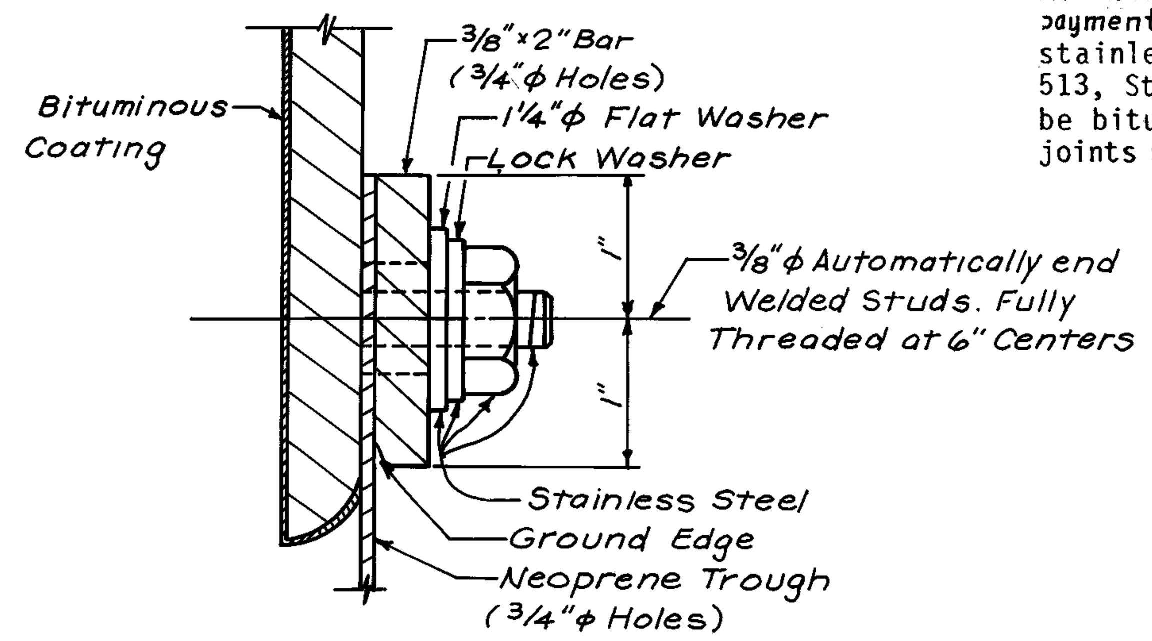


EXPANSION JOINT 3L, 3R, 4R, 5L, & 5R. LOOKING EAST

ELEVATION			
Exp. Jt.	A	B	C
3L	686.19	683.75	685.29
3R	685.34	682.84	684.42
4R	679.36	676.56	678.42
5L	663.95	662.04	662.46
5R	662.49	660.87	661.39



SECTION E-E



DETAIL A

Note:

Trough clamp bars (2"×3/8") shall be hot dipped galvanized, ASTM A36 steel and shall be included with Item 513 for payment. Trough fastening studs, nuts, and washers shall be stainless steel ASTM A-240 and shall be included with Item 513, Structural Steel ASTM A572 Portions, as shown, shall be bituminous coated. For details of intermediate expansion joints see Sheet 47/108 through 53/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

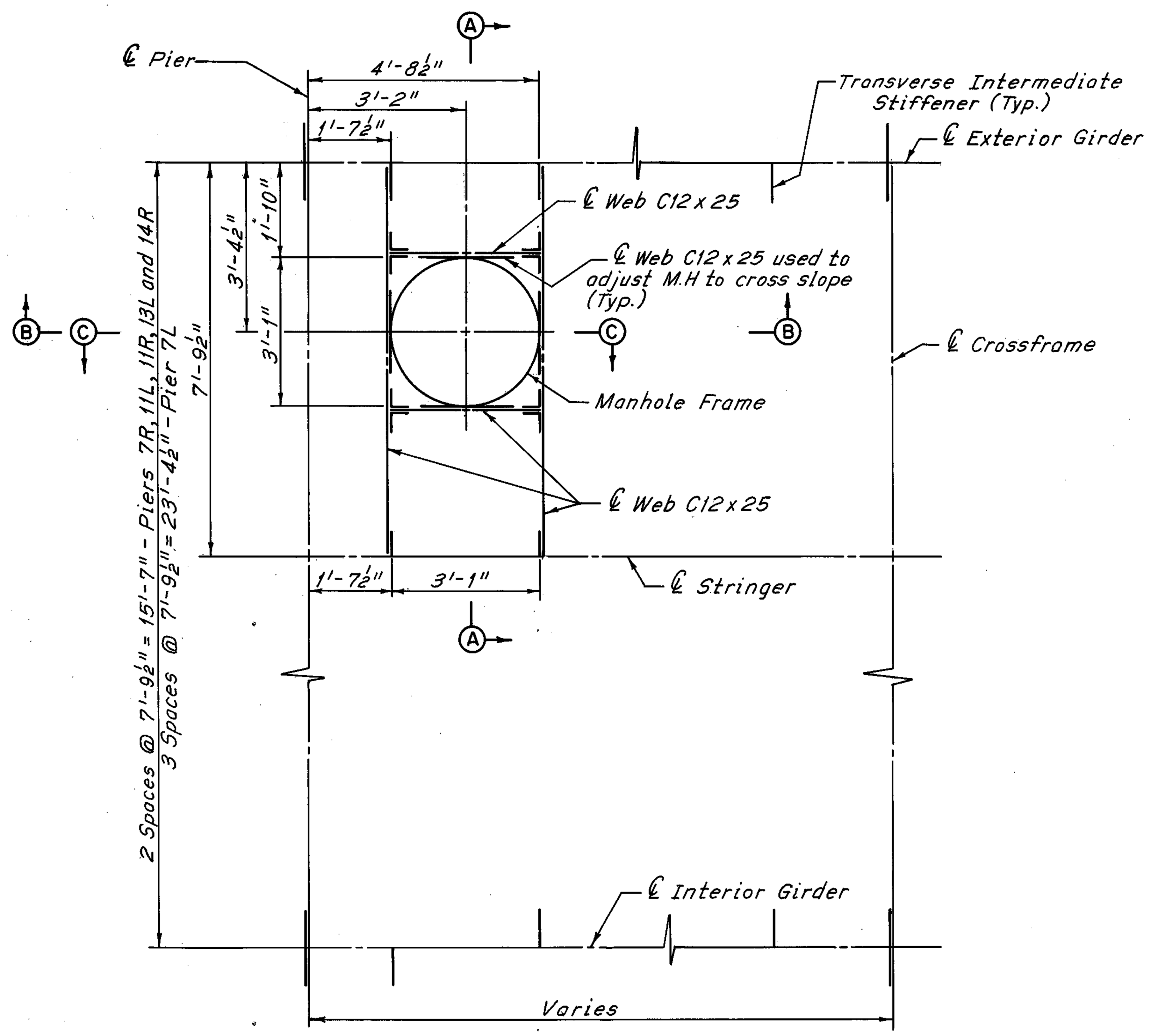
HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

EXPANSION JOINT
DRAINAGE DETAILS
I-290 OVER CUYAHOGA RIVER

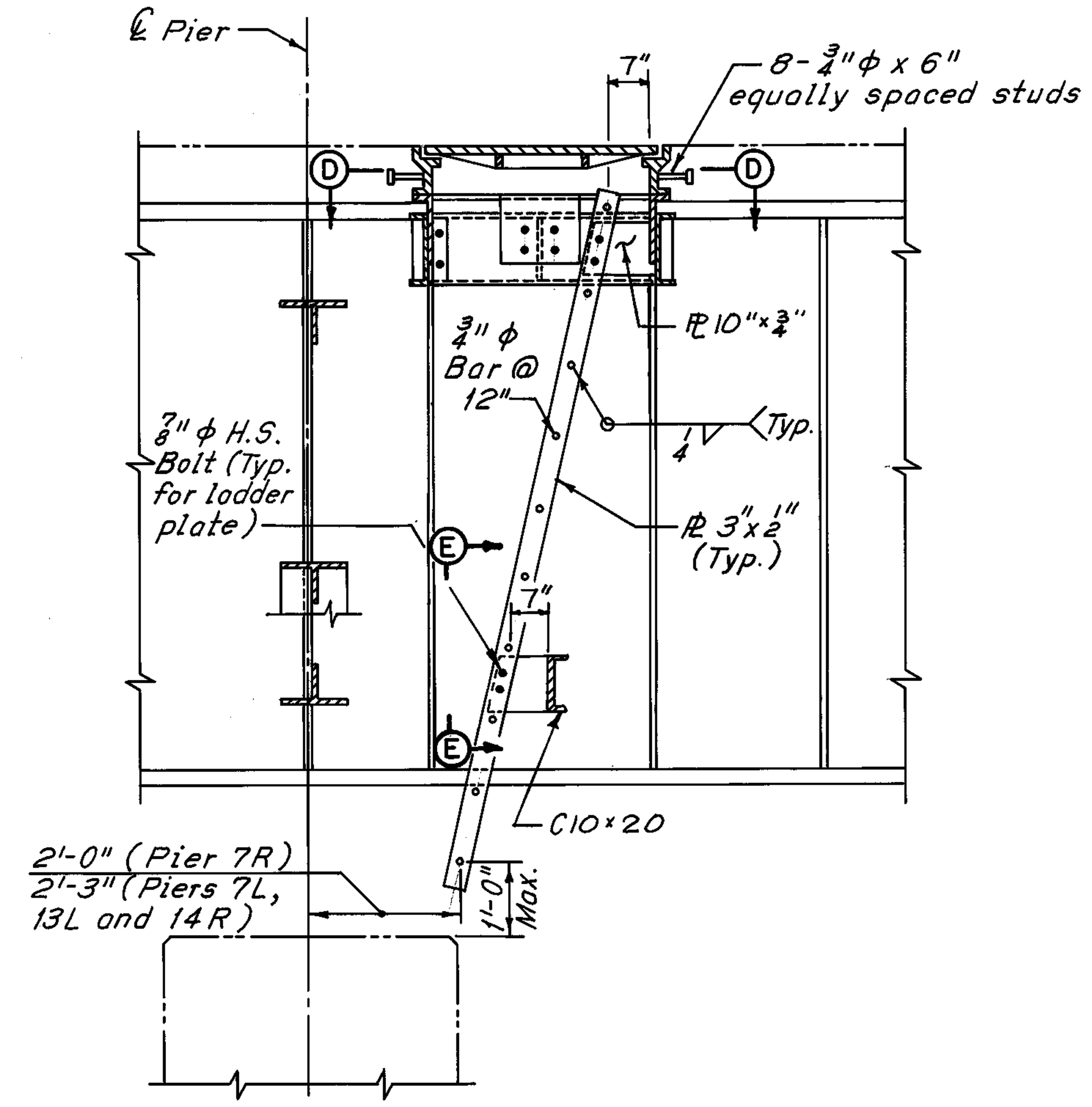
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

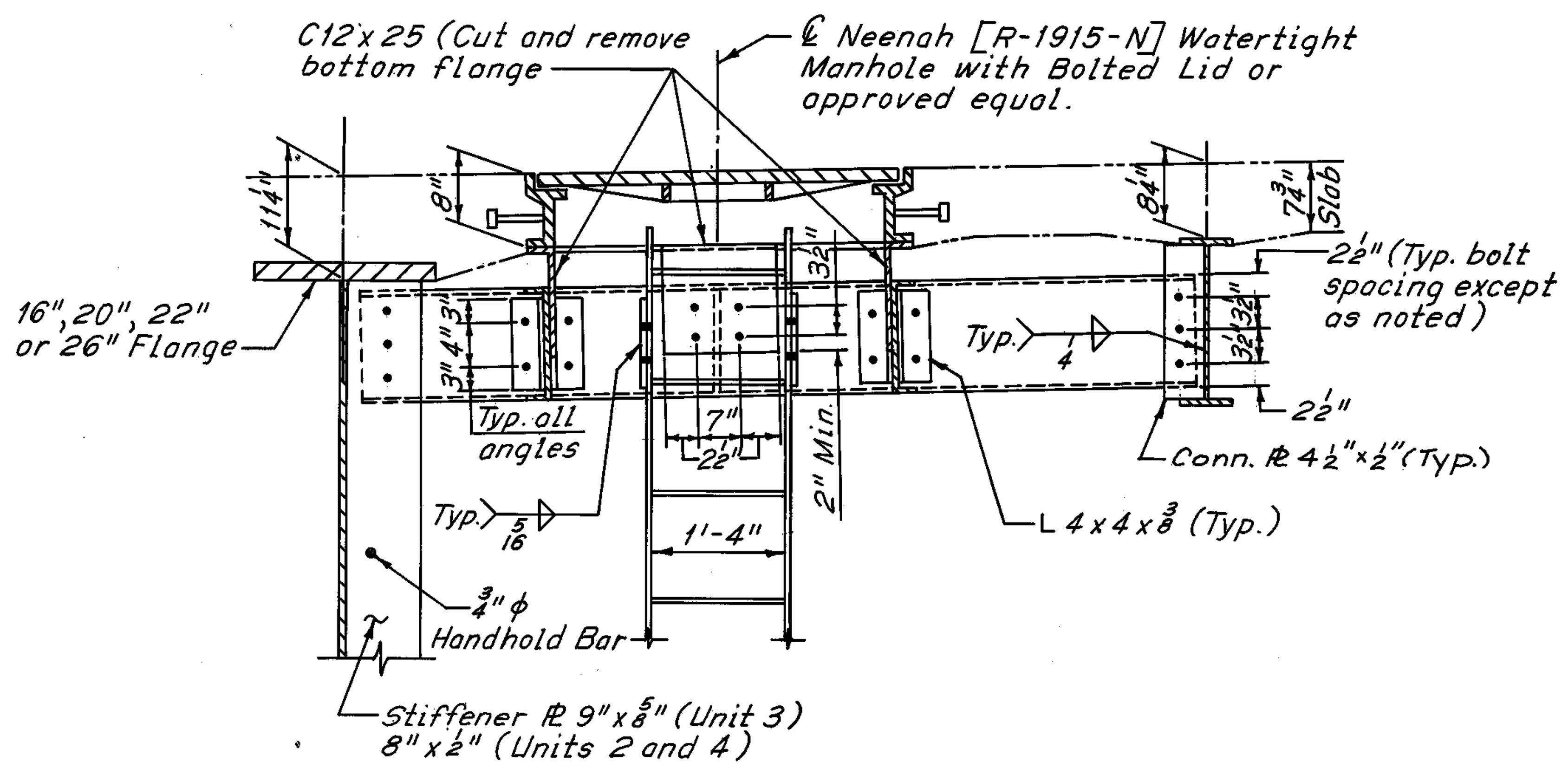
DRAWN D.H.S.	TRACED J.E.	CHECKED B.B.	REVIEWED C.A.B.	REVISED
DATE 10-20-85	DATE 1-16-86	DATE 11-20-85	DATE 2-24-86	SHEET 69/108



FRAMING PLAN
½" = 1'-0"
(C10×20 Ladder Support not shown)



SECTION B-B
(90" Web - Piers 7L, 7R, 13L and 14R)
½" = 1'-0"



SECTION A-A

Notes:
For Sections B-B (Piers 11L and 11R), C-C, D-D, and E-E see sheet 71/108

All materials necessary to provide access at Piers 7, 11, 13 and 14 are included with Item 513 Structural Steel for payment.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

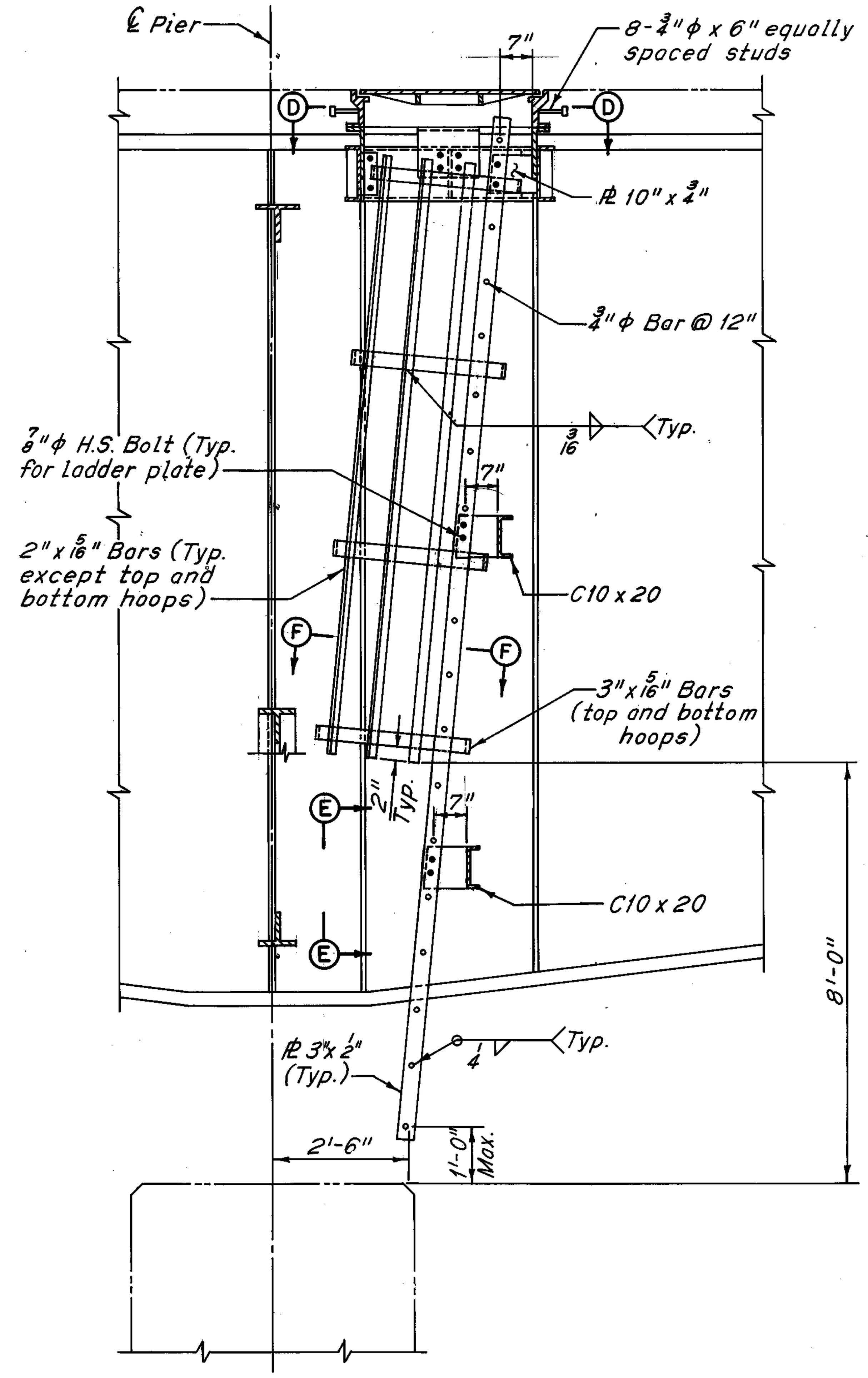
PIER ACCESS DETAILS

I-290 OVER CUYAHOGA RIVER

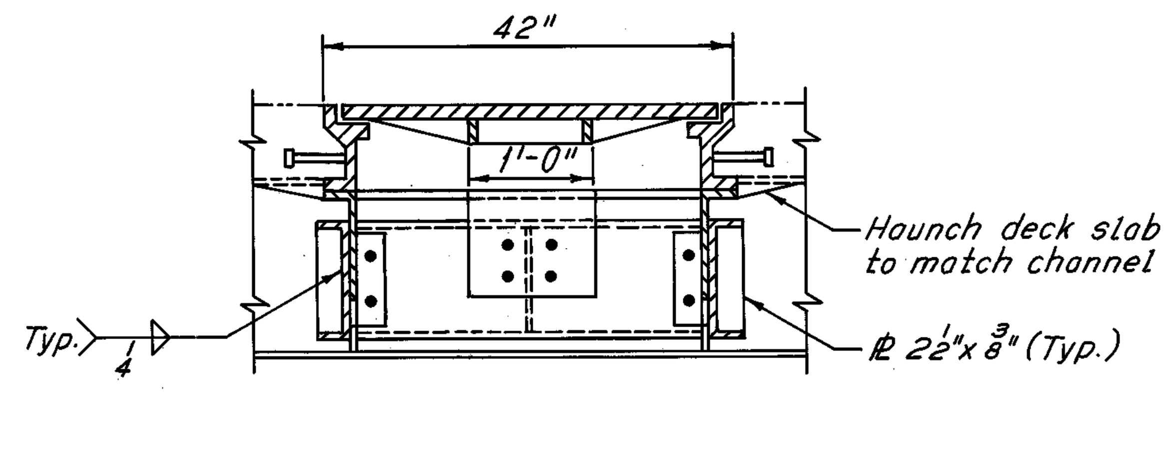
BR. NO. CUY-290-0110 — STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

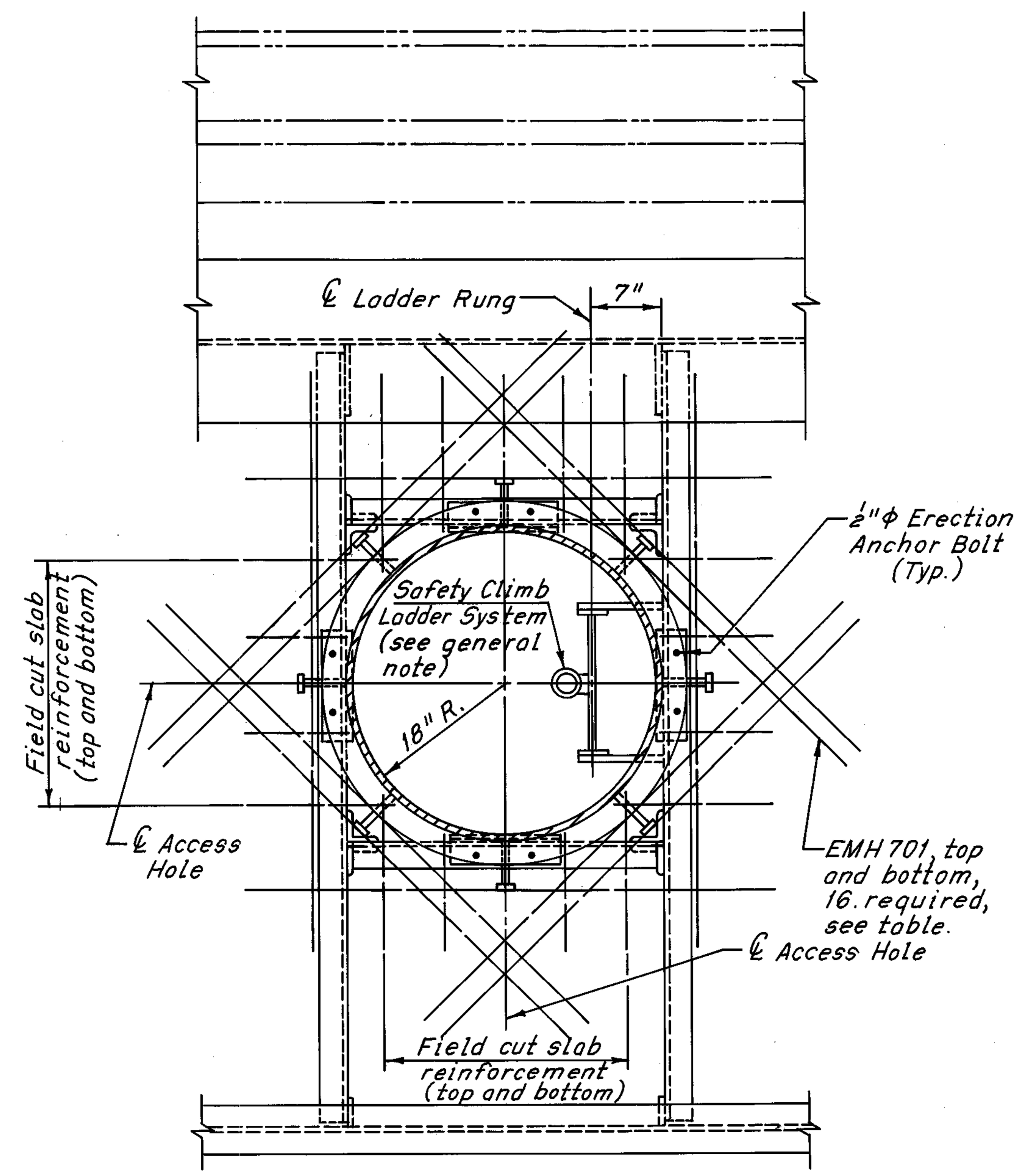
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
C.L.B. DATE 12-13-85	D.L.R. DATE 2-5-86	B.B. DATE 2-5-86	C.A.B. DATE 2-24-86	SHEET 70/108



SECTION B-B
(180" Web - Piers 11L and 11R)

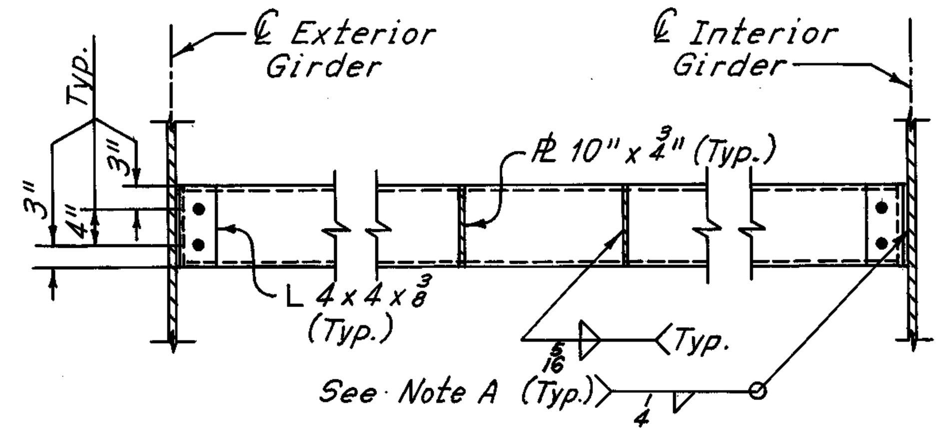


SECTION C-C
(Ladder not shown)



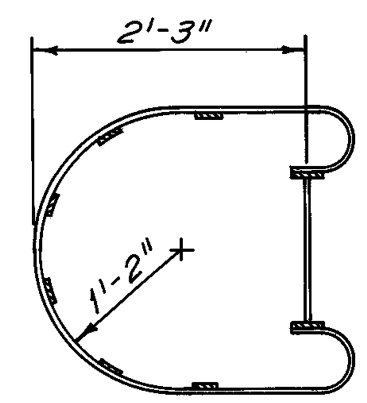
SECTION D-D
(Showing Slab reinforcement)

REINFORCEMENT SCHEDULE				
MARK	NO.	LENGTH	SHAPE	WEIGHT
EMH701	16	7'-6"	Str.	245

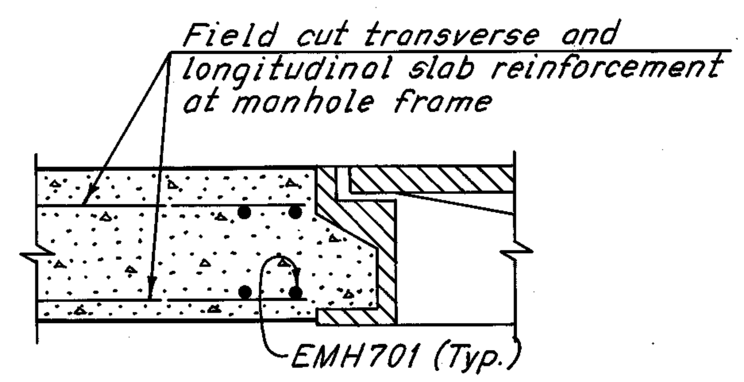


SECTION E-E
(Ladder not shown)

Note A:
All clip angle welds for ladder supports shall be located in the region between mid depth of the web and the bottom flange of the girder.



SECTION F-F



REINFORCEMENT DETAIL

Note:
For locations of Sections B-B, C-C and D-D see Sheet 70/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

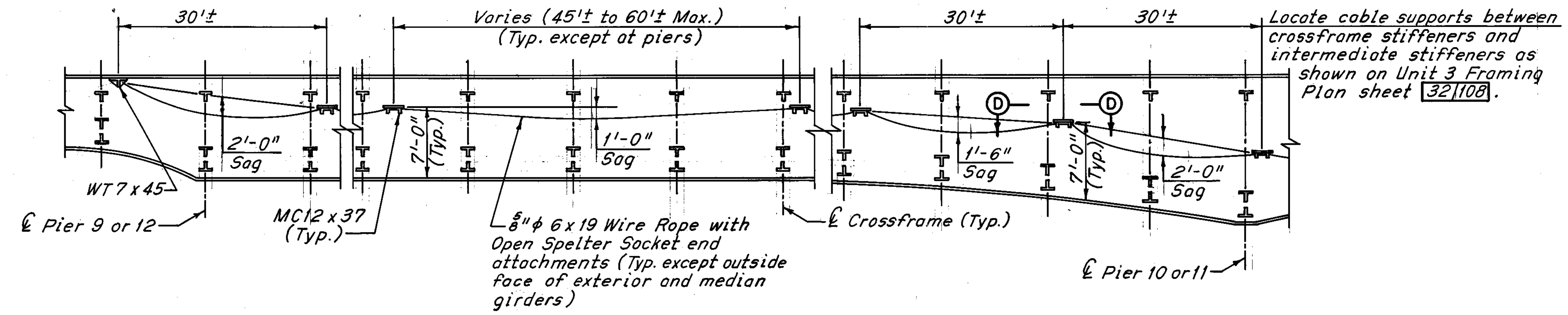
PIER ACCESS DETAILS

I-290 OVER CUYAHOGA RIVER

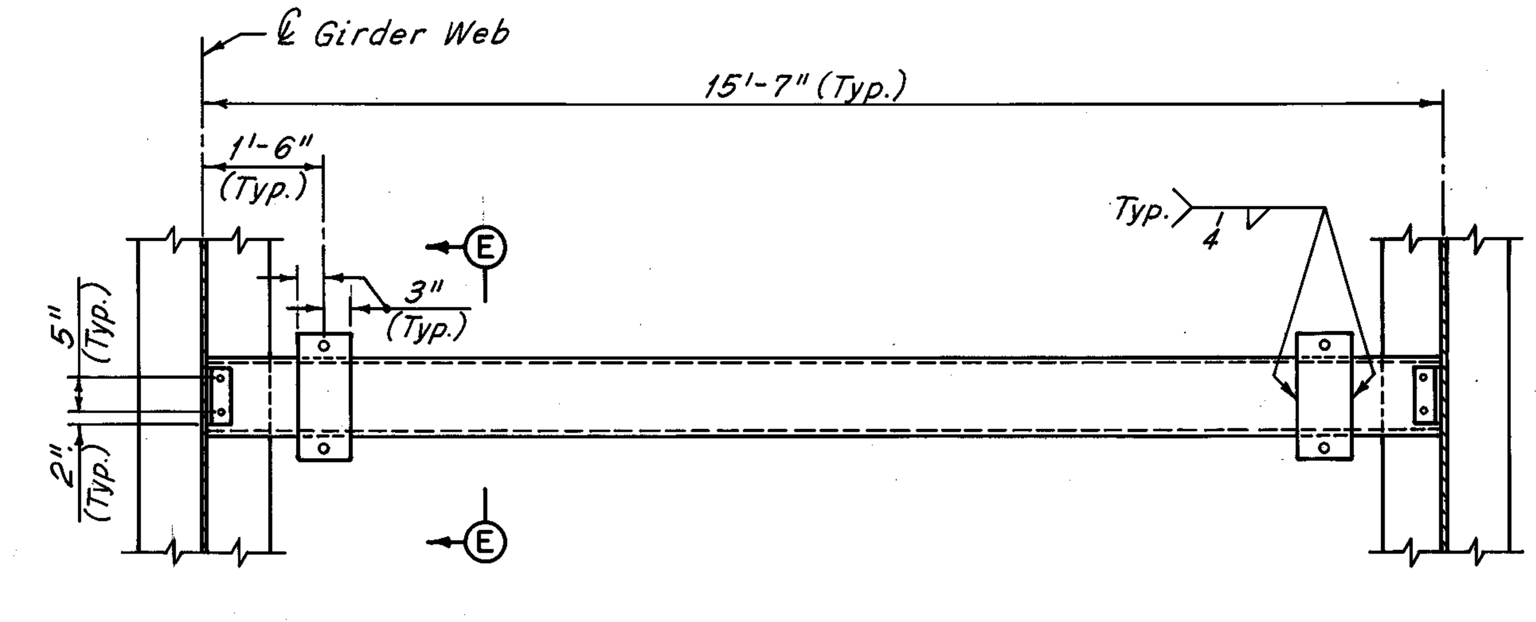
BR. NO. CUY-290-0110 — STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

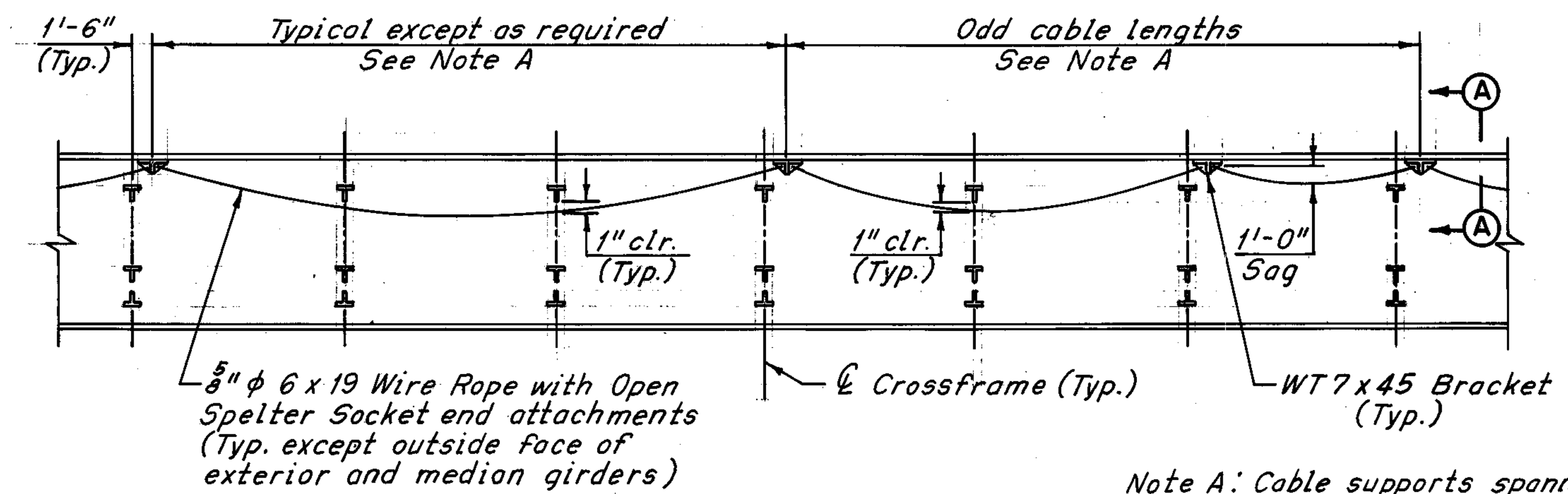
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
C.L.B. DATE 12-19-85	D.L.R. DATE 2-5-86	B.B. DATE 2-6-86	C.A.B. DATE 2-24-86	



SAFETY CABLE DETAIL
(Unit 3)

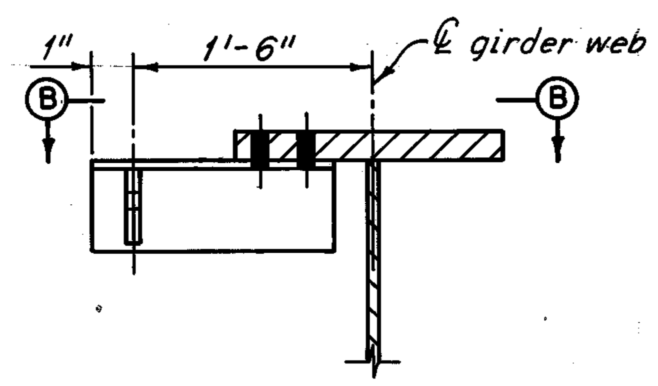


SECTION D-D

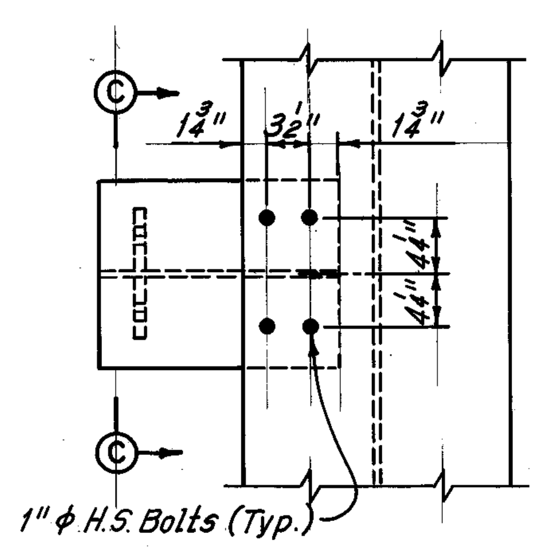


SAFETY CABLE DETAIL
(Units 2 and 4)

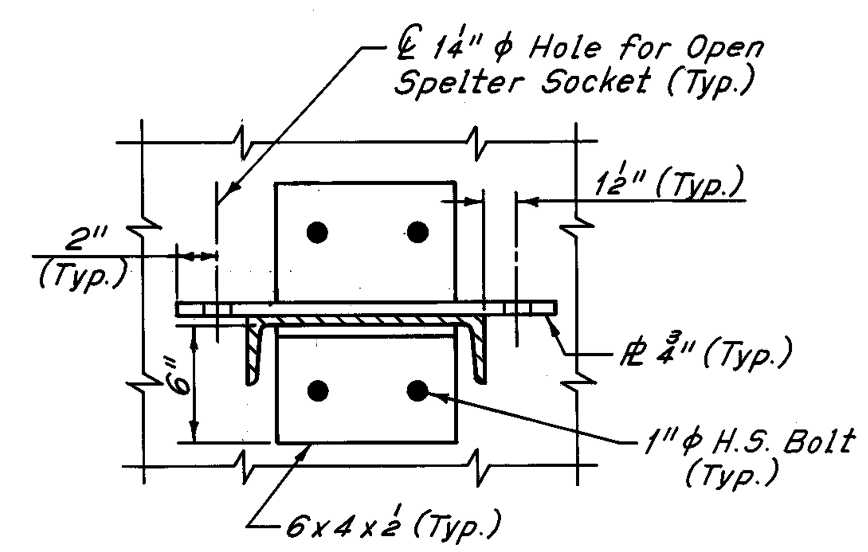
Note A: Cable supports spanning 3 crossframe spaces shall be used as much as possible with one and 2 crossframe spans being used as required to complete the length of the girder and to clear obstructions.



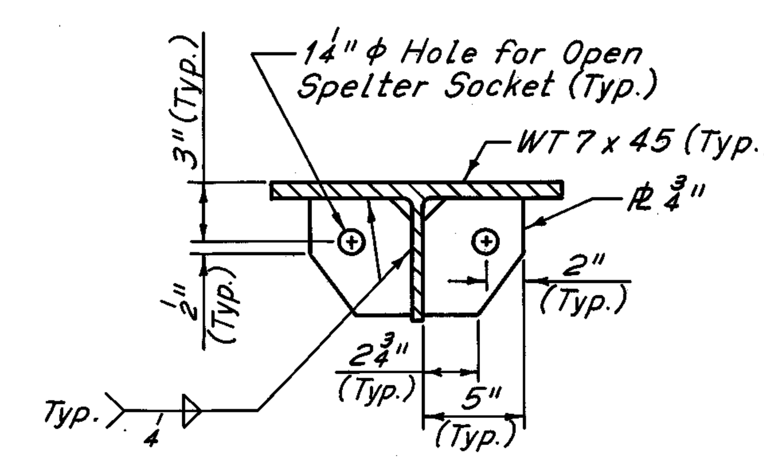
SECTION A-A



VIEW B-B



SECTION E-E



SECTION C-C

Note
Support channels, Brackets and bolts are included with Item 513 for payment.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

SAFETY CABLE SYSTEM

I-290 OVER CUYAHOGA RIVER

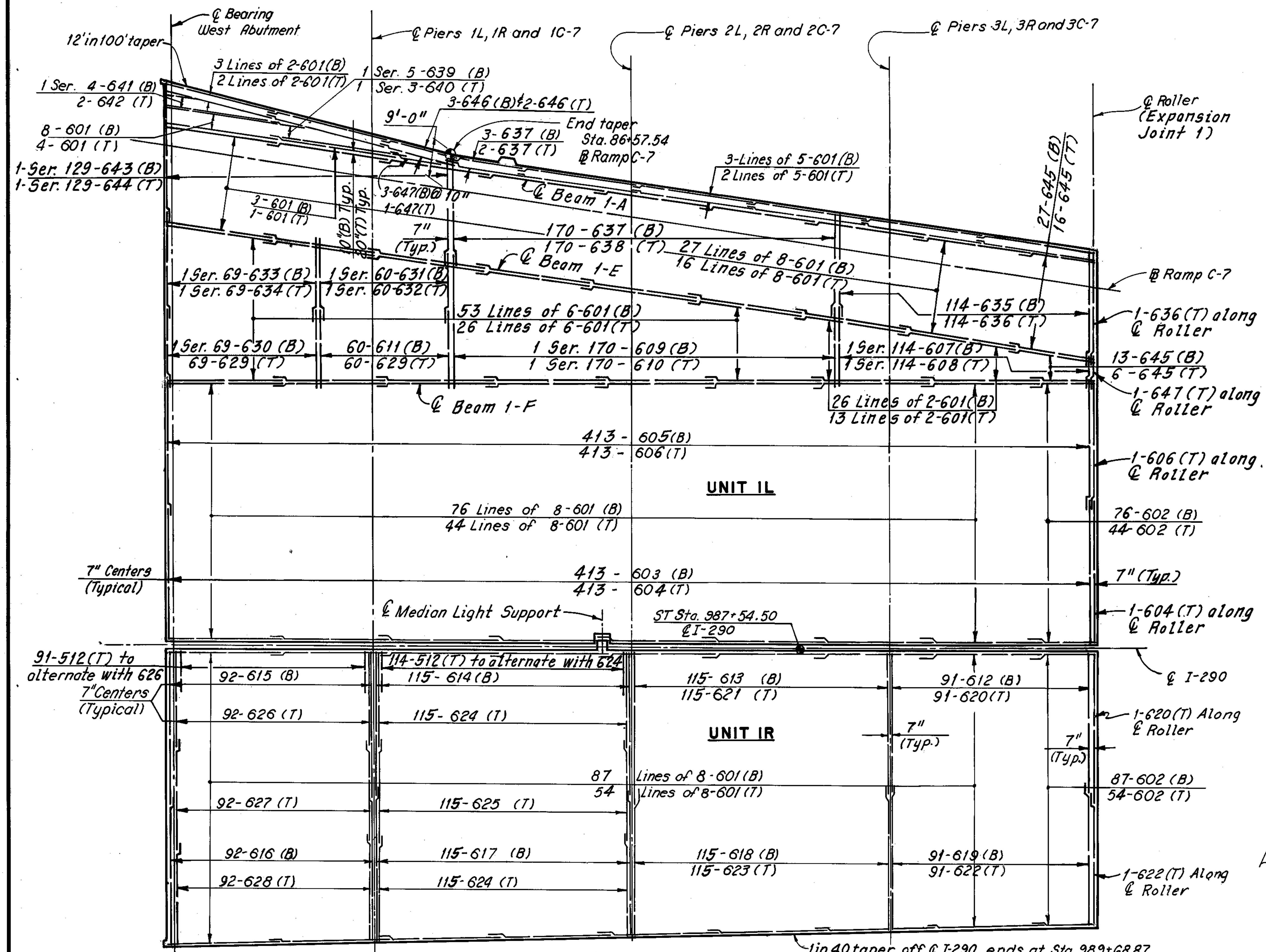
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

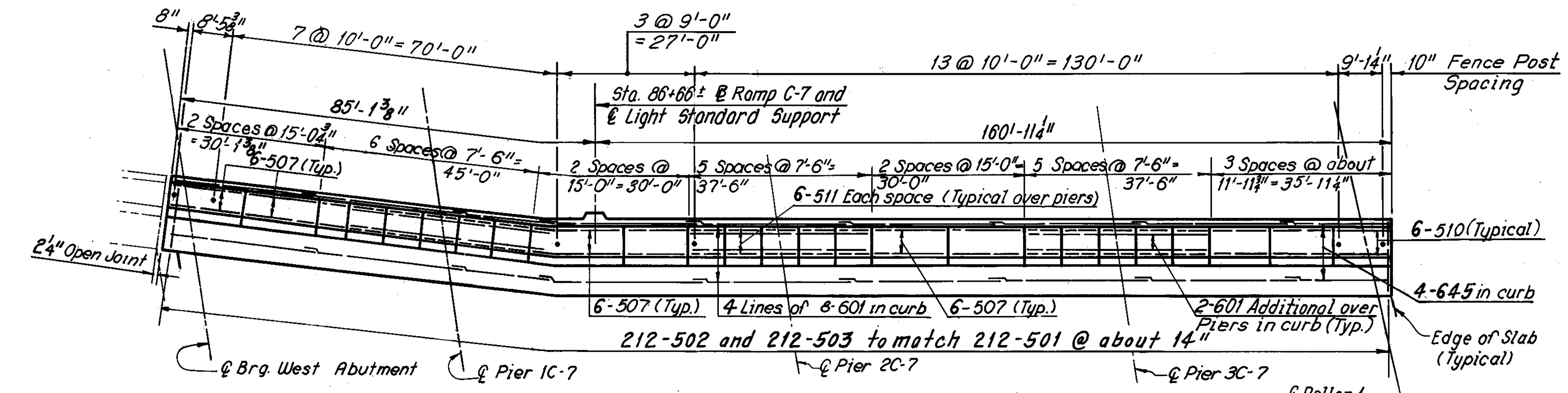
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
C.B. DATE 1-29-86	D.L.R. DATE 2-3-86	R.H.W. DATE 2-5-86	C.A.B. DATE 2-24-86	

Note: All reinforcing bar marks shall be prefixed ESA.

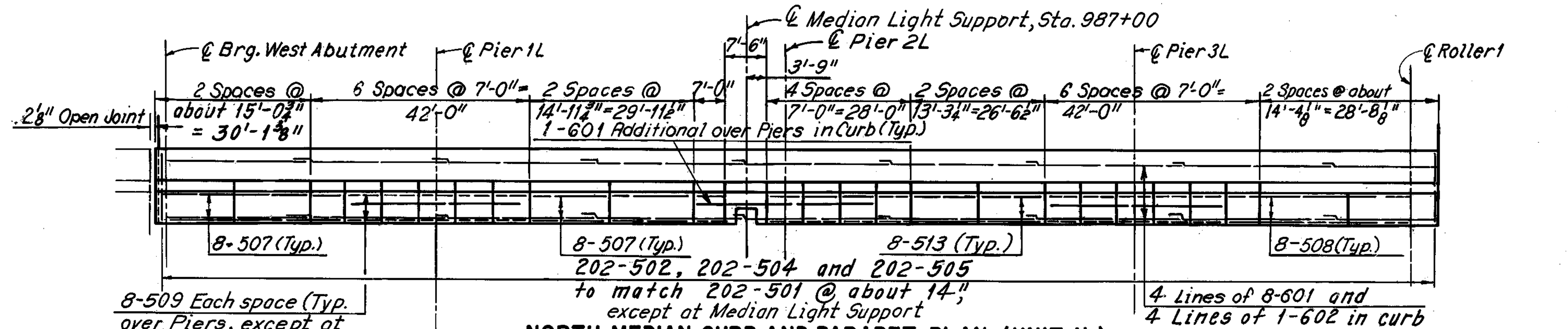
Note: Required reinforcing bar lap lengths shall be 30 bar diameters minimum.



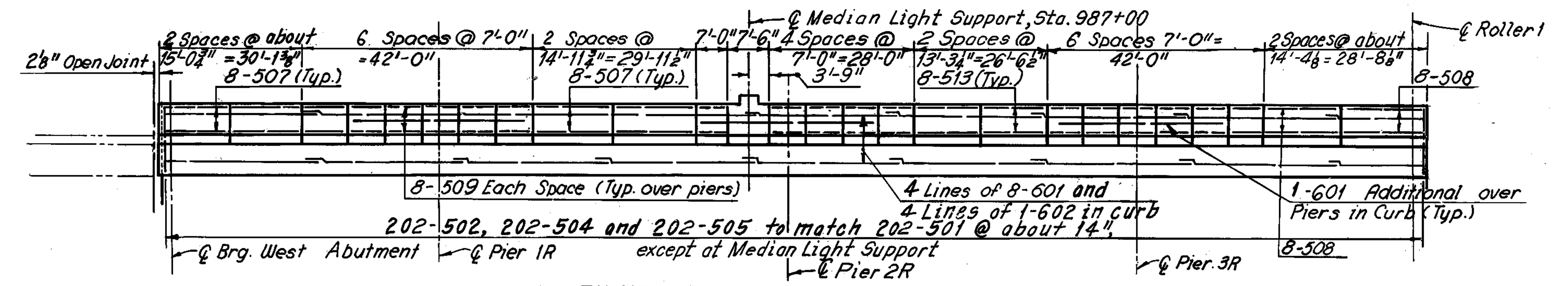
SLAB PLAN (UNIT I)



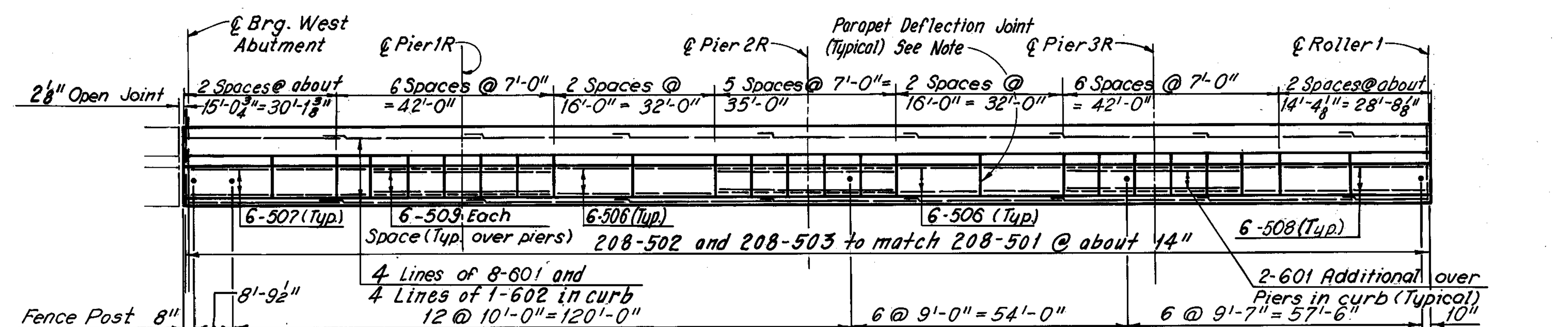
NORTH CURB AND PARAPET PLAN (UNIT IL)



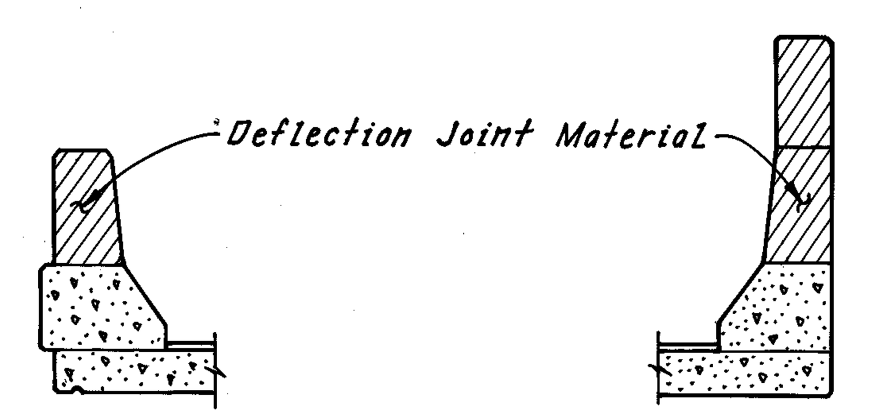
NORTH MEDIAN CURB AND PARAPET PLAN (UNIT IL)



SOUTH MEDIAN CURB AND PARAPET PLAN (UNIT IR)



SOUTH CURB AND PARAPET PLAN (UNIT I R)



EXTERIOR BARRIER CURB

MEDIAN BARRIER CURB

DEFLECTION JOINT DETAIL

PARAPET DEFLECTION JOINT NOTE:

The deflection joints in the barrier curb may be either ¼" gray sponge rubber or ¼" gray cellular polyvinyl chloride (PVC) sponge. Either material shall meet the requirements of AASHTO M-153, Type 1, except the density of the PVC sponge shall not be less than 20 pounds per cubic foot.

Barrier curbs shall be placed in alternate sections by the use of bulkheads. Closing sections shall be placed after the removal of bulkheads and after placement of sponge filler. The filler shall be attached to the face of the concrete on one side, flush with the surface of concrete and exposed edges shall be free of mortar.

Include with Item 511, Class S Concrete, Superstructure, for payment.

Notes:

For placement of longitudinal reinforcement and additional reinforcement over piers see Sheet 74/108.

The following abbreviations are used:

(T) = Top

(B) = Bottom

For roadway end dam and curb plate details at Expansion Joint 1, see Sheets 47/108 and 48/108.

For Light Standard Support Details, see Sheets 103/108 and 104/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

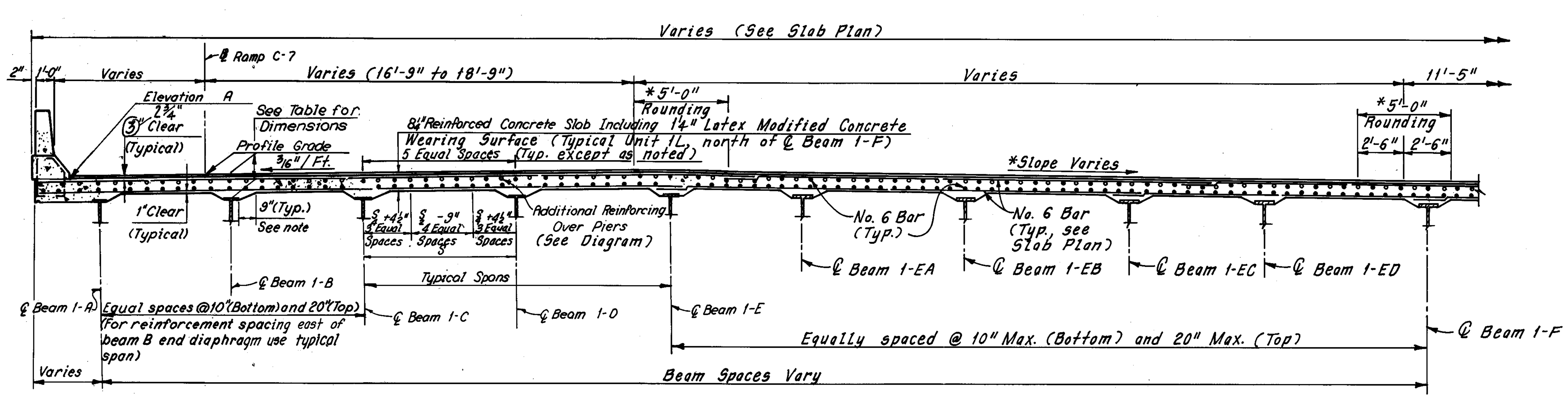
SLAB PLAN-UNIT I

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN DMP	TRACED JT	CHECKED DS	REVIEWED C.A.B.	REVISED
DATE 8-9-69	DATE 8-14-69	DATE 3-31-70	DATE 2-24-86	SHEET 73/108



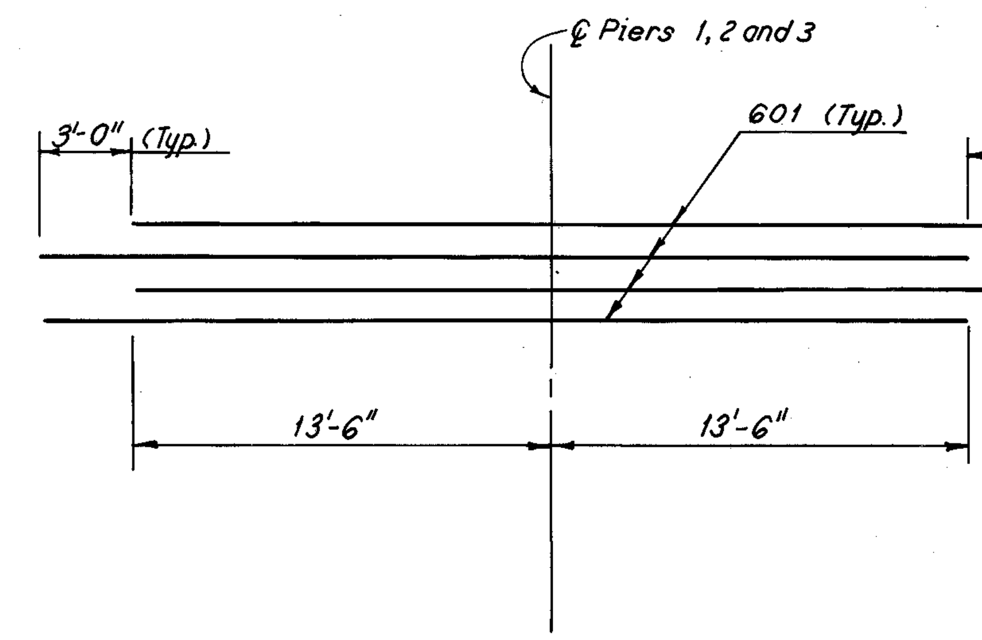
PART CROSS SECTION

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.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

159/193

CUYAHOGA COUNTY
CUY-290-0.27

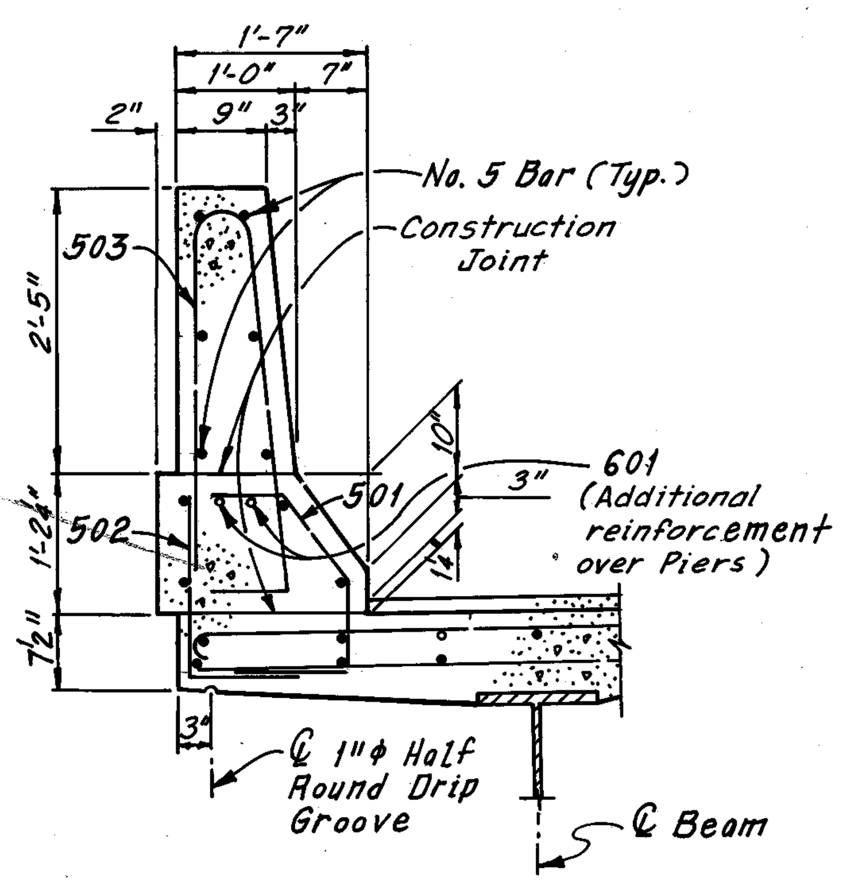


ADDITIONAL REINFORCEMENT OVER PIERS

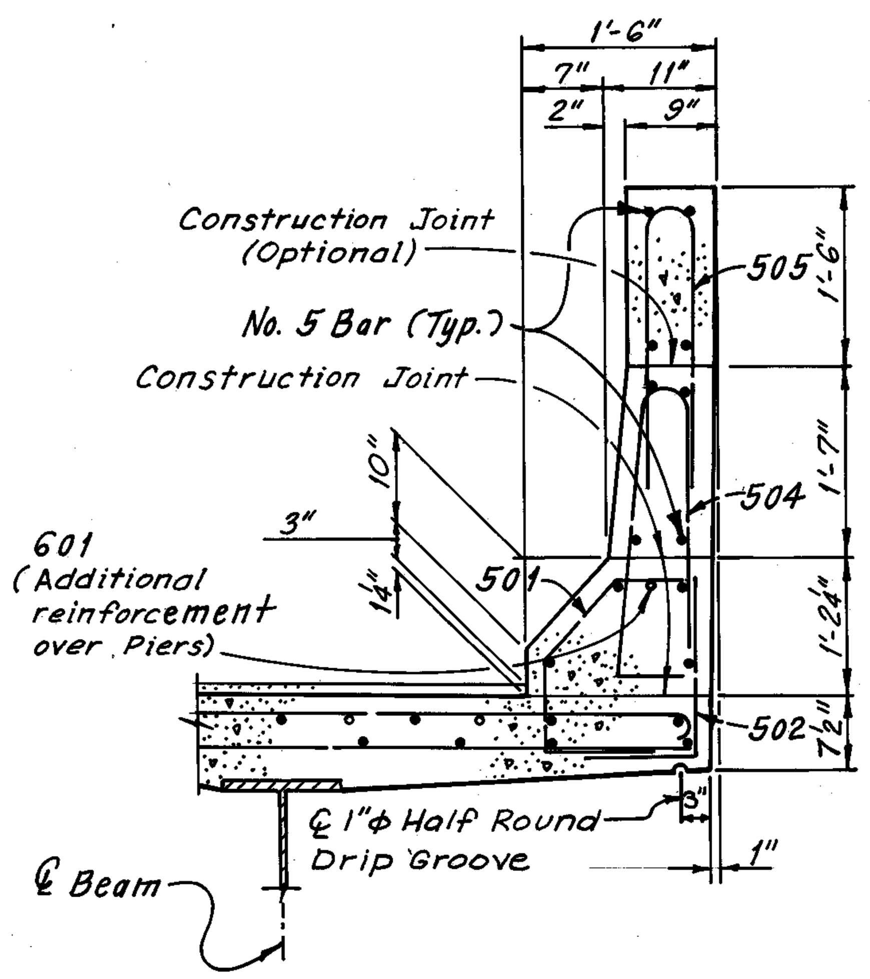
PART CROSS SECTION

TOP OF PORTLAND CEMENT CONCRETE (GIVEN AT QUARTER SPAN POINTS)																	
	℄ BRG. W.ABUT	1/4	1/2	3/4	℄ PIER 1	1/4	1/2	3/4	℄ PIER 2	1/4	1/2	3/4	℄ PIER 3	1/4	1/2	3/4	EXP. ROLLERS	
ELEV A	653.32	653.10	652.91	652.73	652.60	652.50	652.43	652.39	652.37	652.43	652.55	652.72	652.94	653.15	653.39	653.67	653.95	ELEV A
ELEV B	648.08	648.46	648.82	649.18	649.53	650.00	650.46	650.91	651.35	651.82	652.29	652.73	653.17	653.54	653.90	654.25	654.59	ELEV B
ELEV C	648.09	648.47	648.83	649.18	649.53	650.00	650.46	650.91	651.35	651.82	652.29	652.73	653.17	653.53	653.89	654.24	654.57	ELEV C
ELEV D	649.91	650.19	650.45	650.71	650.96	651.31	651.66	651.97	652.23	652.62	652.96	653.30	653.67	653.98	654.29	654.59	654.88	ELEV D

Note:
The top of Portland Cement Concrete elevations shown at the gutter lines 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 and wearing surface.



EXTERIOR CURB AND PARAPET DETAIL
(4'-0" Chain Link fence not shown)



MEDIAN CURB AND PARAPET DETAIL

TOP OF WEARING SURFACE TO TOP OF BEAM FLANGE							
Beams	West Abutment	Field Splice 1	Beam End Diaphragm	Field Splice Beam 1-A	Field Splice 2	Field Splice 3	Expansion Rollers 1
A	9 5/16"				9 1/8"		
B	9 5/16"			-			
C thru E	9 5/16"	9 1/8"					
EA thru ED	10"						
F thru P	8 3/4"	8 3/4"					
Q thru Y	9 7/16"	9 1/4"					

The above haunch dimensions are measured from top of Pavement to top of flange at ℄ Bearings.

Note: All reinforcing bar marks shall be prefixed ESA.

Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Note:
For Fence Details, see Sheet 105/108.

Revised 12-24-86

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

TYPICAL CROSS SECTION
UNIT 1

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

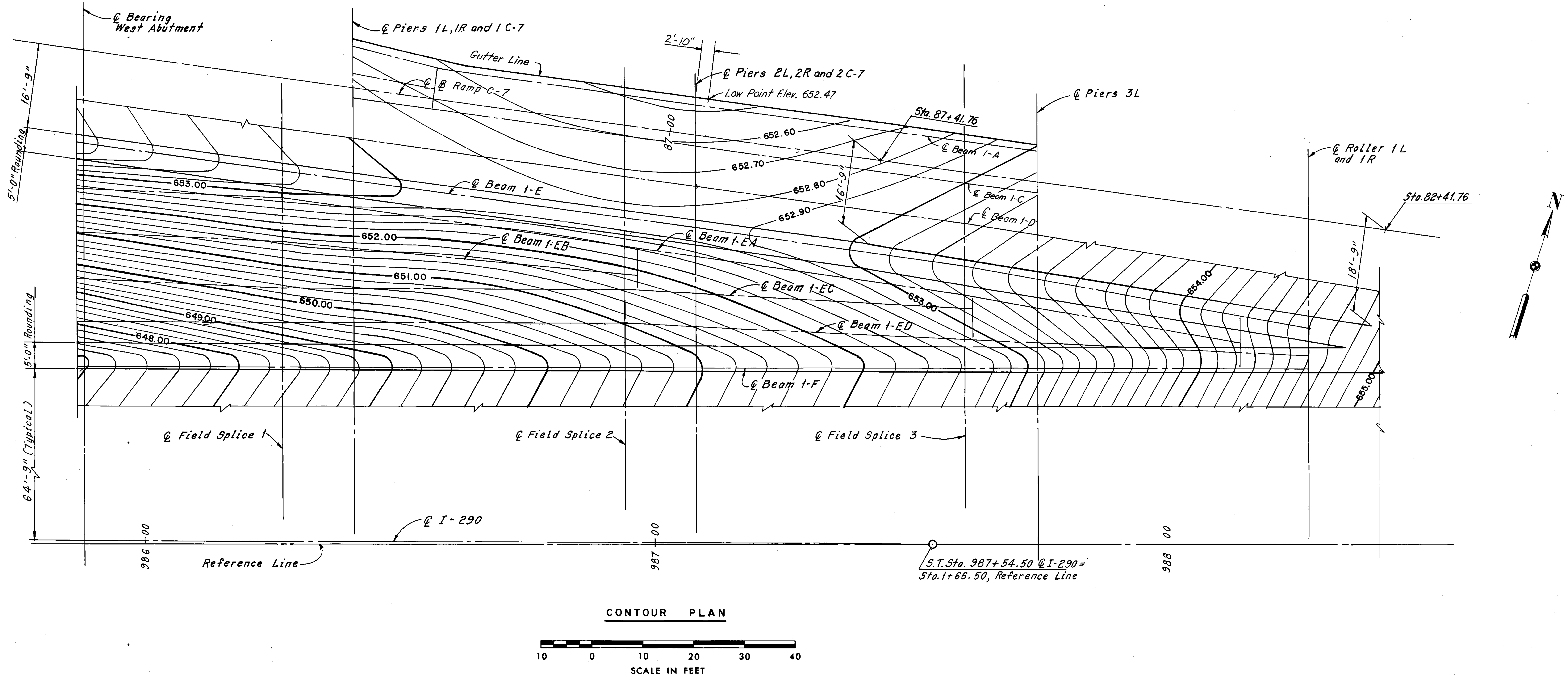
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.M.P. DATE 7-30-69	TRACED A.T. DATE 8-6-69	CHECKED J.D.S. DATE 3-27-70	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 74/108

FHWA REGION	STATE	PROJECT	
2	OHIO		

160/193

CUYAHOGA COUNTY
CUY- 290-0.27



CONTOUR PLAN

Note:
Elevations given on Contour Plan are to top of wearing surface.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

CONTOUR PLAN - UNIT I

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN C.K.B. DATE 5-19-83	TRACED C.P. DATE 5-19-83	CHECKED R.A.S./R.H.W. DATE 5-31-83	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 75/108

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

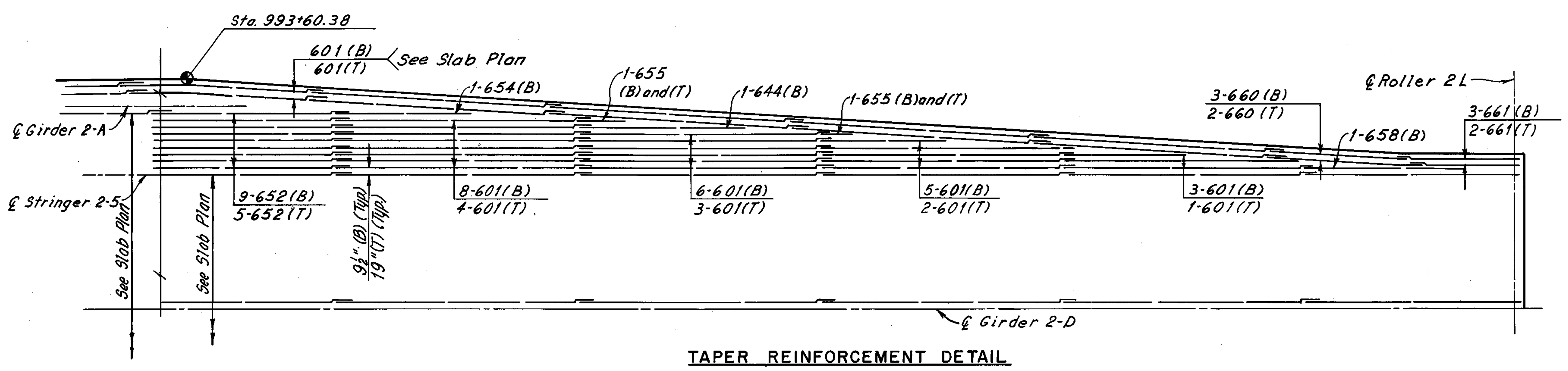
CUYAHOGA COUNTY
CUY-290-0.27

*Includes additional reinforcement over piers.

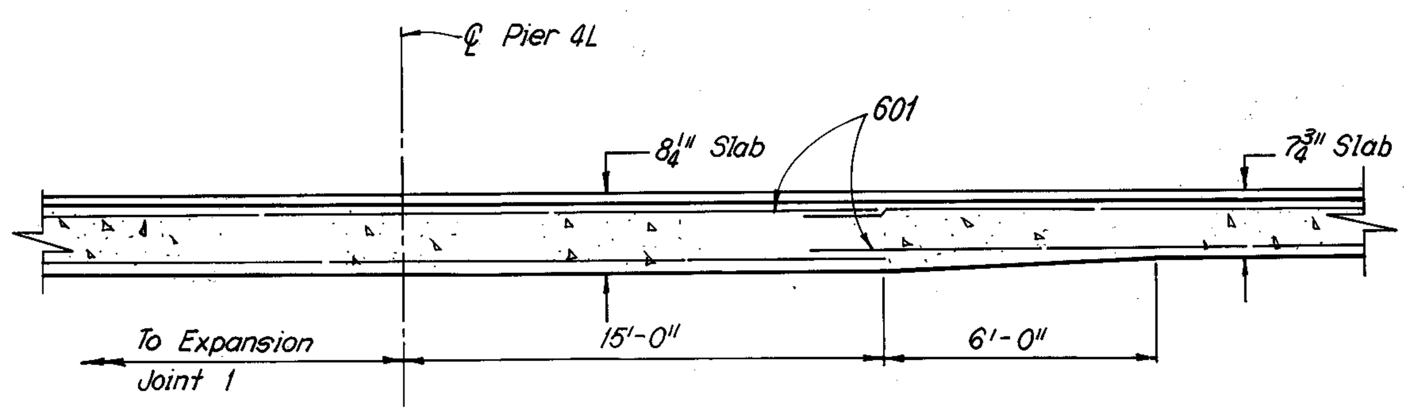
SLAB PLAN (UNIT 2)

Note: Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

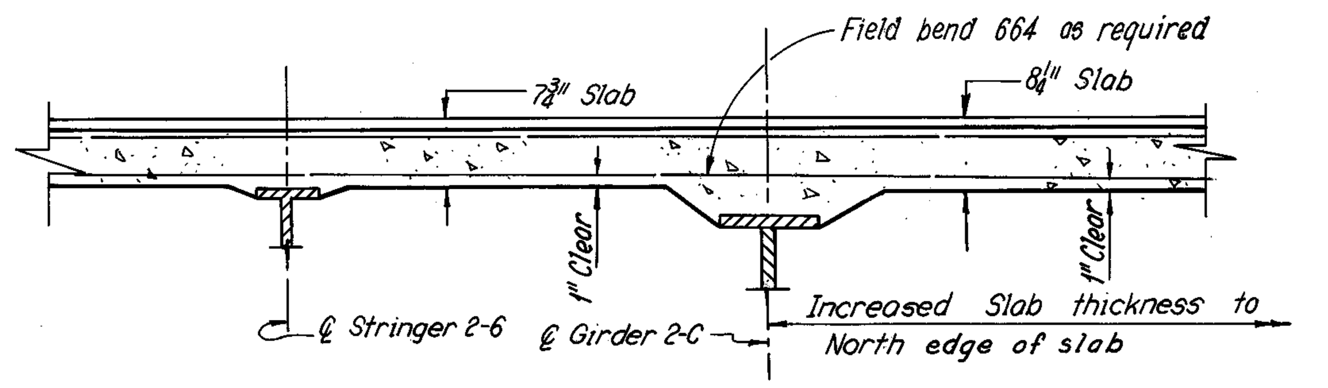
Note: All reinforcing bar marks shall be prefixed ESB.



TAPER REINFORCEMENT DETAIL
(Tranverse Steel not shown)



SECTION A-A



SECTION B-B

SLAB DEPTH TRANSITION DETAILS
(For reinforcement not shown see Typical Cross Section)

Notes:

For placement of longitudinal reinforcement and for additional reinforcement over piers see Sheet 77/108.

The following abbreviations are used:

(T) = Top
(B) = Bottom

For Light Standard Support, and Pull Box Locations see Sheet 78/108 and for Details see Sheets 103/108 and 104/108.

For Sign Support locations see Sheet 78/108 and for Details see Sheet 102/108.

For Reinforcement Details around Access Manholes see Sheet 70/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

SLAB PLAN - UNIT 2

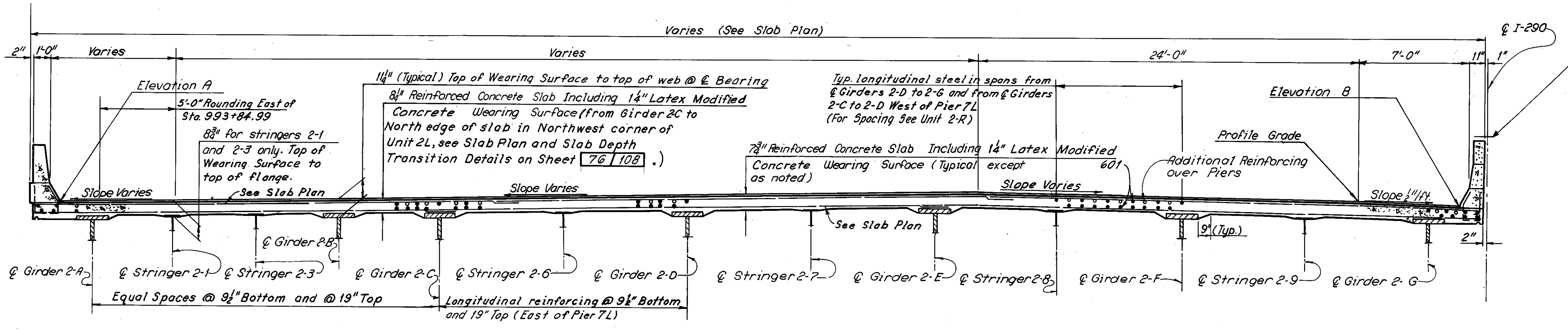
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

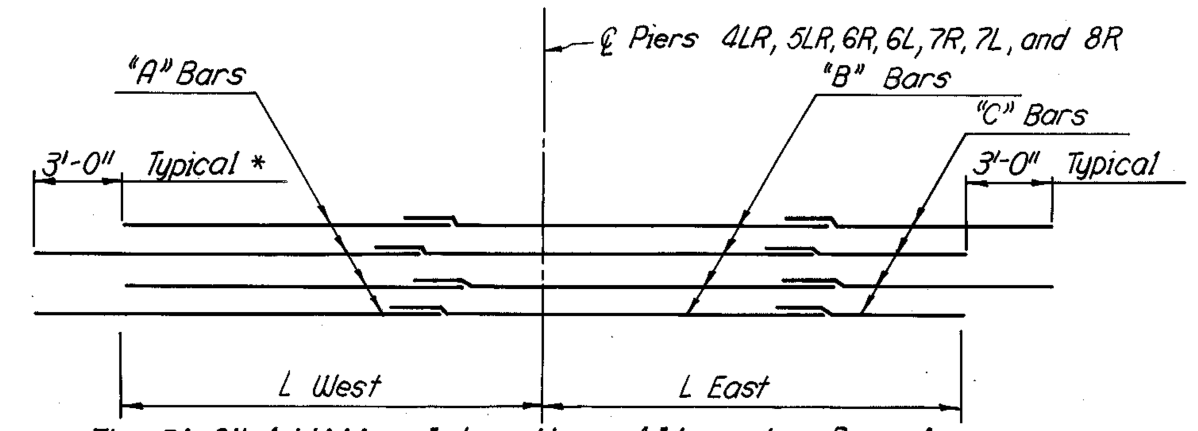
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.M.P.	TRACED A.J.T.	CHECKED J.D.S.	REVIEWED C.A.B.	REVISED	
DATE 9-5-69	DATE 9-10-69	DATE 3-27-70	DATE 2-24-86		SHEET 76/108

CUYAHOGA COUNTY
CUY-290-0.27



TYPICAL CROSS-SECTION (UNIT 2L)



The 3'-0" Additional Length on Alternate Bars is omitted on the West Side of Piers 4L and 4R

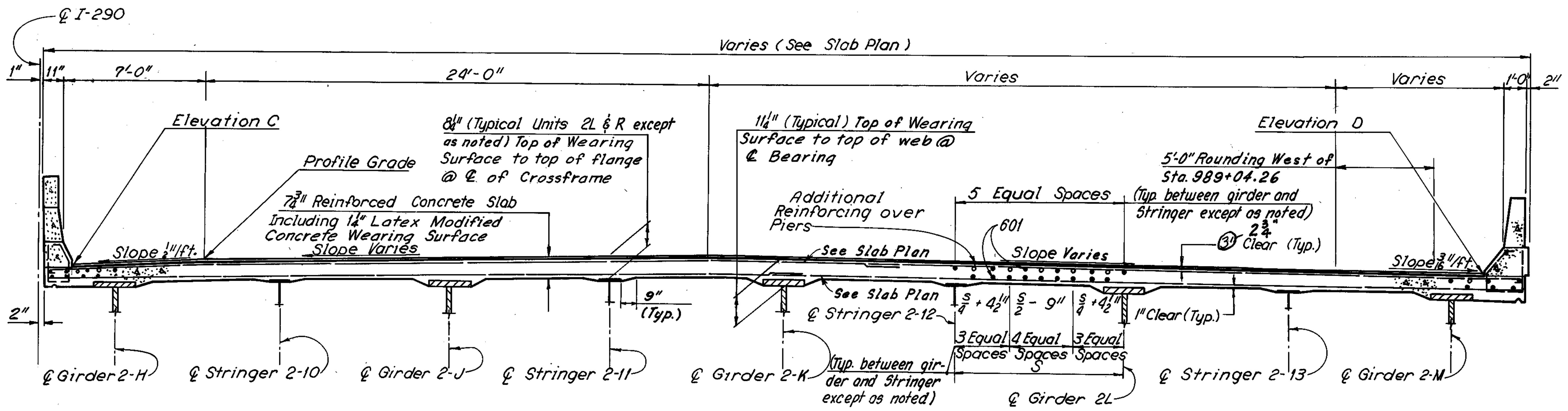
ADDITIONAL REINFORCEMENT OVER PIERS

Note: For additional reinforcement over Piers in Northwest corner of slab at Pier 4L see Slab Plan.

ADDITIONAL REINFORCING OVER PIERS (SEE DIAGRAM ABOVE)

Pier	L West	L East	A Bars	B Bars	C Bars
4L	12'-8"	27'	*661/653	601	—
4R	12'-8"	27'	*661/653	601	—
5L	27'	37'	659	601	—
5R	27'	27'	649	642	—
6L	37'	37'	601	657	642
6R	27'	27'	649	642	—
7L	37'	45'	652	659	601
7R	27'	37'	659	601	—
8R	37'	37'	601	657	642

*Alternate placement to give 3'-0" stagger between ends of bar.

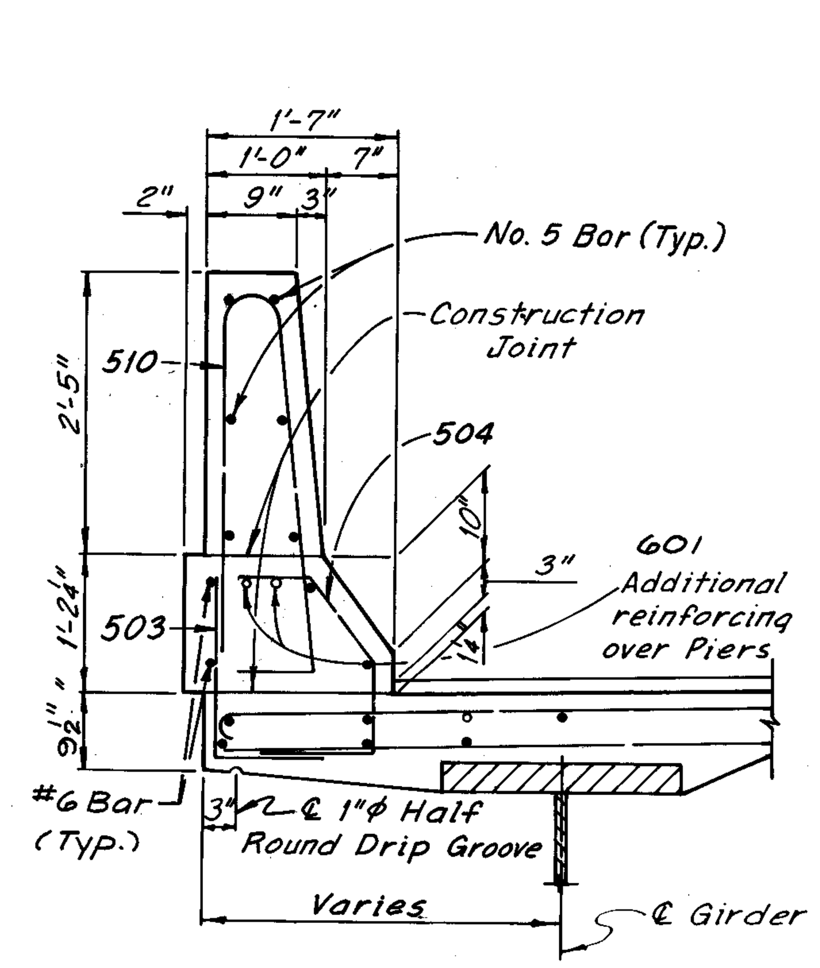


TYPICAL CROSS SECTION (UNIT 2R)

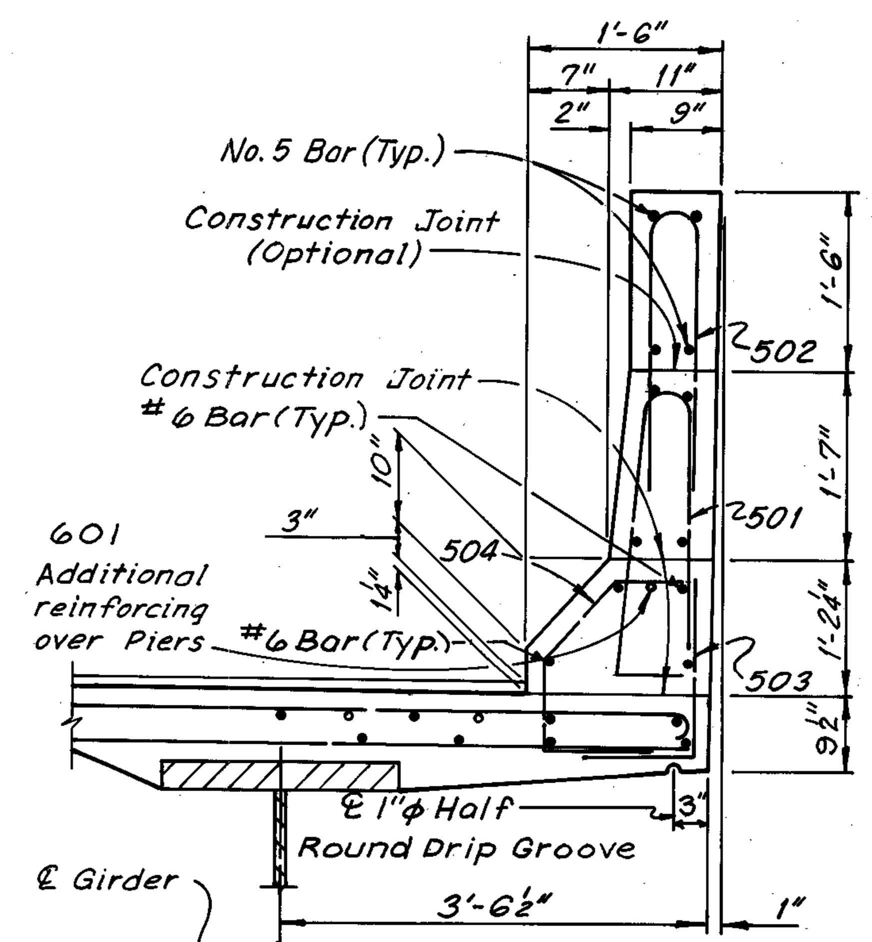
Notes:
For details of Stringer haunch transitions see CF-19 detail on Sheet 56/108.
A typical haunch width of 9" shall be used for computing quantity of concrete. However, the haunch width may vary between 6" and 12" provided that the slope shall not be more than 1:4 for a haunch less than 9" in width.
For Elevations A thru D see Sheet 78/108.
For cross slope details see Superelevation Transition Diagram, Sheet 94/108.
For Fence Details, see Sheet 105/108.

Note: All reinforcing bar marks shall be prefixed ESB.

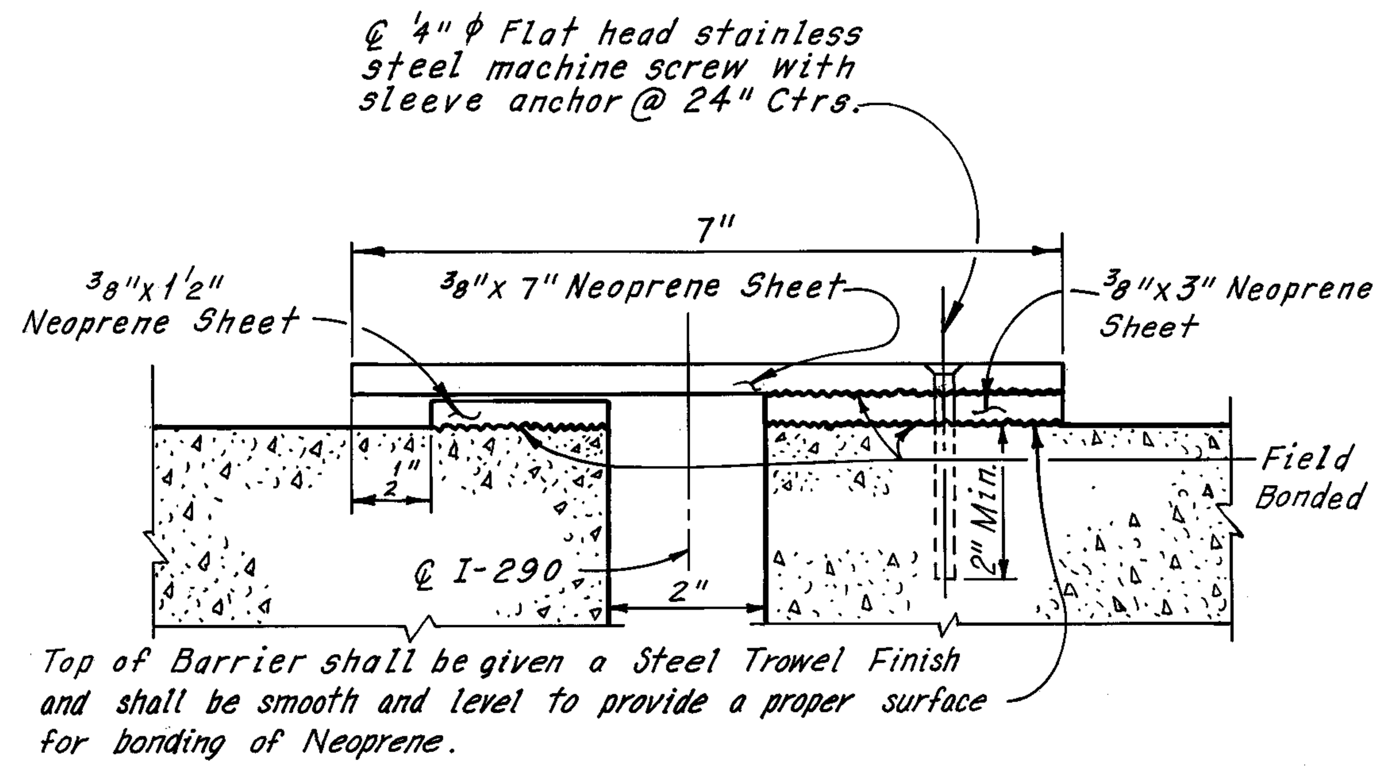
Note: Required reinforcing bar lap lengths shall be 30 bar diameters minimum.



EXTERIOR CURB AND PARAPET DETAIL
(4'-0" Chain Link fence not shown)



MEDIAN CURB AND PARAPET DETAIL



MEDIAN BARRIER SEAL

Note:
Barrier Seal shall be continuous, except at sign supports, light and pull box blisters and at expansion joints.
Payment for stainless steel screws shall be included in the unit price bid for Item Special, Median Barrier Seal, for payment.

Revised 12-24-86

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

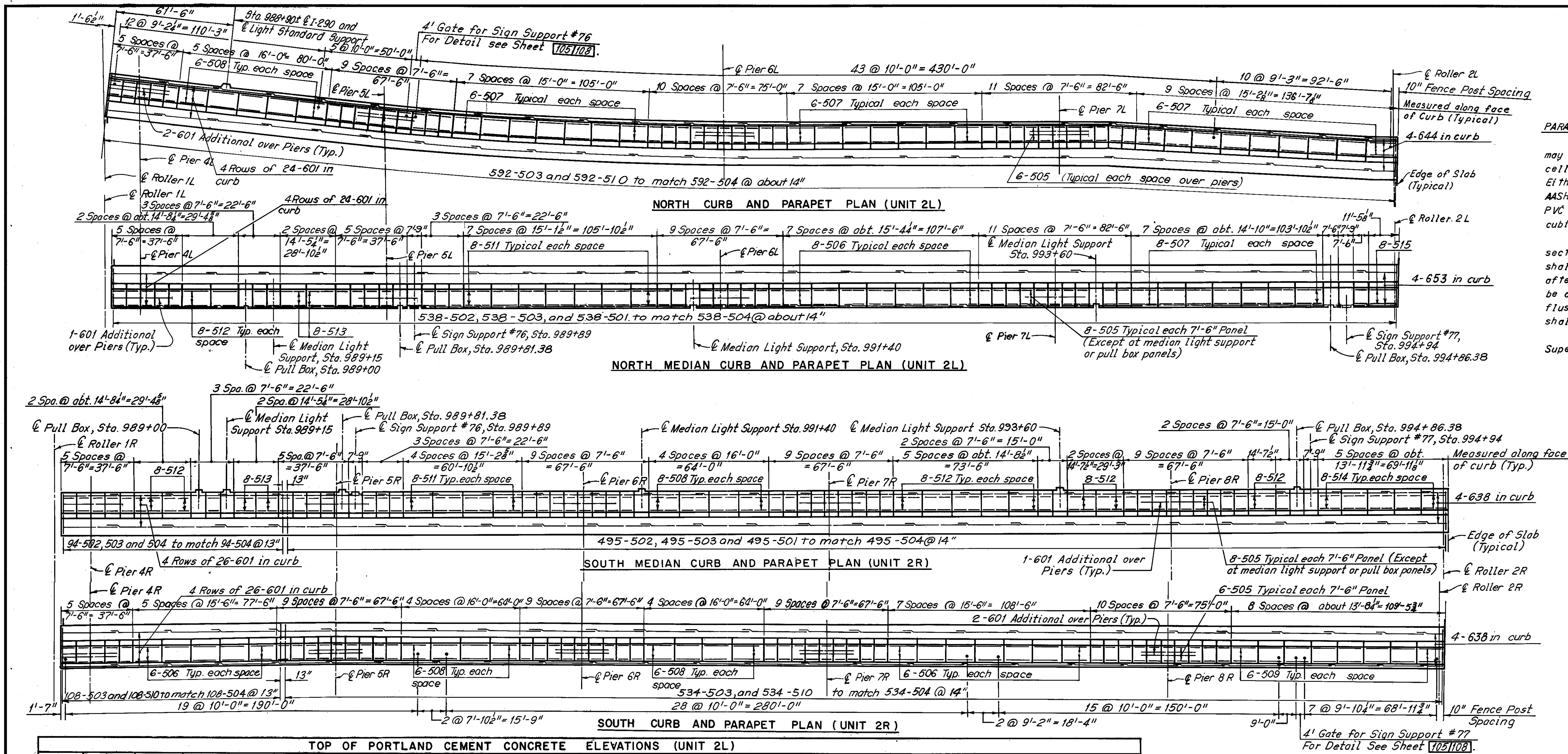
TYPICAL CROSS SECTIONS
UNIT 2

I-290 OVER CUYAHOGA RIVER
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.M.P.	TRACED L.J.T.	CHECKED J.D.S.	REVIEWED C.A.B.	REVISED
DATE 9-5-69	DATE 9-10-69	DATE 3-27-70	DATE 12-24-86	SHEET 77/108

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			163/193

CUYAHOGA COUNTY
CUY-290-0.27



PARAPET DEFLECTION JOINT NOTE:

The deflection joints in the barrier curb may be either ¼" gray sponge rubber or ¼" gray cellular polyvinyl chloride (PVC) sponge. Either material shall meet the requirements of AASHTO M-153, Type 1, except the density of the PVC sponge shall not be less than 20 pounds per cubic foot.

Barrier curbs shall be placed in alternate sections by the use of bulkheads. Closing sections shall be placed after the removal of bulkheads and after placement of sponge filler. The filler shall be attached to the face of the concrete on one side, flush with the surface of concrete and exposed edges shall be free of mortar.

Include with Item 511, Class S Concrete, Superstructure, for payment.

TOP OF PORTLAND CEMENT CONCRETE ELEVATIONS (UNIT 2L)

	℄ EXP. ROLLERS 1	℄ PIER 4L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	℄ PIER 5L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	℄ PIER 6L	
ELEV A	653.95	654.46	654.90	655.34	655.78	656.20	656.59	656.97	657.33	657.70	658.06	658.44	658.97	659.52	660.06	660.59	661.11	661.61	662.09	662.55	663.00	663.48	ELEV A
ELEV B	654.59	655.02	655.40	655.77	656.15	656.50	656.86	657.20	657.54	657.88	658.23	658.60	659.12	659.66	660.20	660.73	661.23	661.71	662.16	662.60	663.05	663.51	ELEV B

Note: Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Note: All reinforcing bar marks shall be prefixed ESB.

TOP OF PORTLAND CEMENT CONCRETE ELEVATIONS (UNIT 2R)

	℄ EXP. ROLLERS 1	℄ PIER 4R	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	℄ PIER 5R	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	℄ PIER 6R	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	
ELEV C	654.57	655.02	655.42	655.81	656.20	656.57	656.92	657.27	657.60	657.92	658.26	658.60	658.95	659.32	659.69	660.06	660.43	660.79	661.14	661.48	661.83	662.17	662.54	662.90	663.27	663.63	663.99	664.34	664.68	665.03	665.39	ELEV C
ELEV D	654.88	655.28	655.64	655.99	656.34	656.68	657.02	657.35	657.68	658.01	658.35	658.69	659.05	659.41	659.79	660.16	660.52	660.88	661.23	661.58	661.92	662.27	662.63	663.00	663.36	663.72	664.08	664.43	664.78	665.12	665.48	ELEV D

Note:
For location of Elevations A thru D and for Curb and Parapet Details see Sheet 77/108.
For light standard support details see Sheets 103/108 and 104/108.
For Sign support details see Sheet 102/108.

TOP OF PORTLAND CEMENT CONCRETE ELEVATIONS (UNIT 2L)

	℄ PIER 6L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	℄ PIER 7L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	℄ EXP. ROLLERS 2L	
ELEV A	663.48	663.96	664.47	665.00	665.51	666.00	666.48	666.94	667.41	667.88	668.39	668.91	669.47	670.05	670.63	671.20	671.74	672.23	672.70	673.14	673.57	ELEV A
ELEV B	663.51	663.99	664.50	665.01	665.52	666.01	666.49	666.96	667.43	667.92	668.42	668.94	669.49	670.04	670.58	671.10	671.60	672.06	672.49	672.91	673.31	ELEV B

TOP OF PORTLAND CEMENT CONCRETE ELEVATIONS (UNIT 2R)

	℄ PIER 7R	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	℄ PIER 8R	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	℄ EXP. ROLLERS 2R	
ELEV C	665.75	666.28	666.82	667.36	667.89	668.39	668.87	669.33	669.77	670.23	670.72	671.12	671.54	671.97	672.40	672.82	673.23	673.62	674.00	674.38	674.74	ELEV C
ELEV D	665.84	666.37	666.92	667.45	667.98	668.48	668.96	669.42	669.85	670.28	670.72	671.09	671.47	671.86	672.26	672.64	673.02	673.37	673.70	674.01	674.30	ELEV D

Note:
The top of Portland Cement Concrete elevations shown at the gutter lines 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 and wearing surface.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

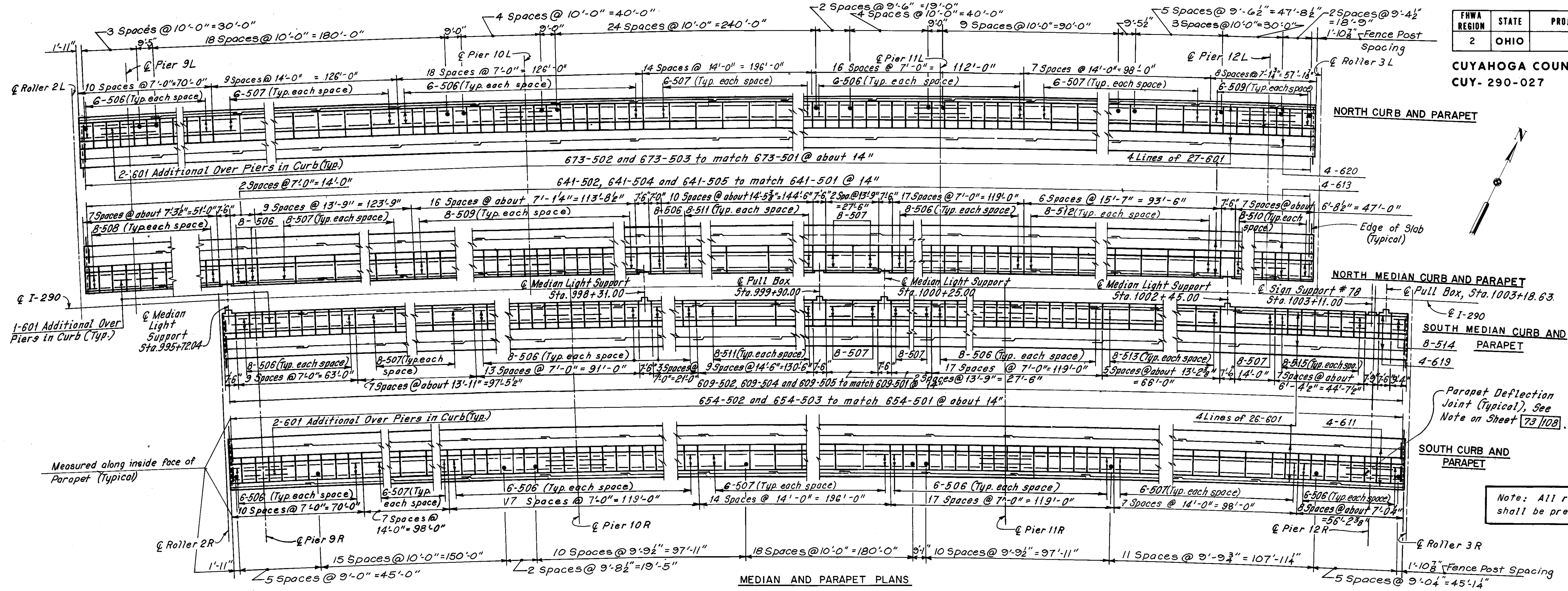
CURB & PARAPET PLANS
UNIT 2

I-290 OVER CUYAHOGA RIVER
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.M.P. DATE 9-5-69	TRACED A.J.T. DATE 9-10-69	CHECKED J.D.S. DATE 3-27-70	REVIEWED DATE	REVISED	SHEET 78/108

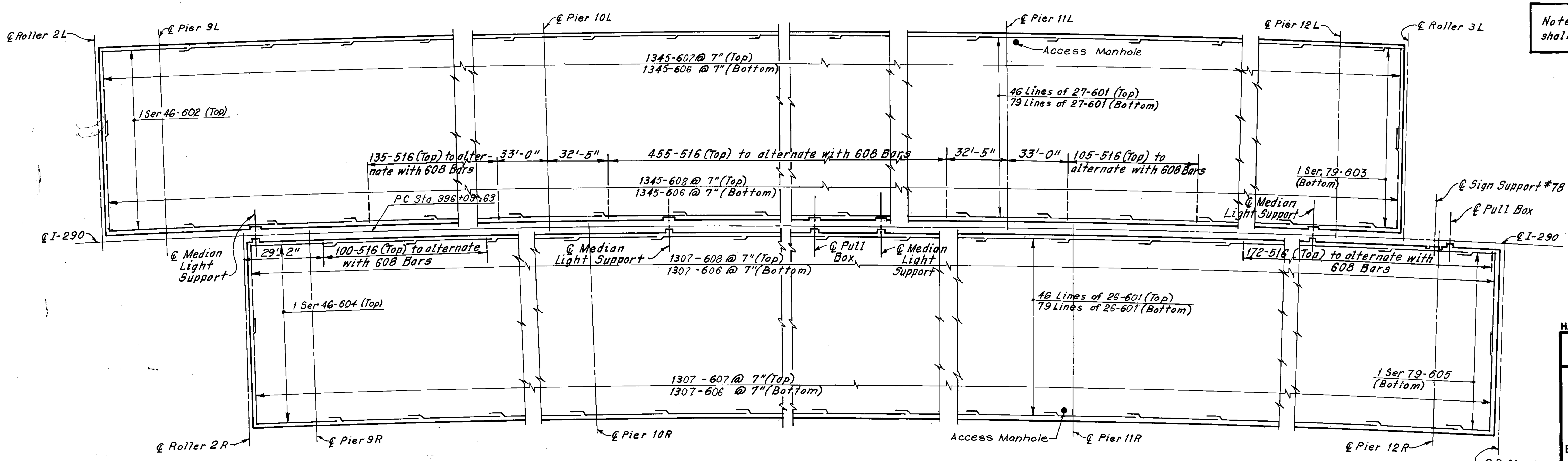
FHWA REGION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY- 290-027



MEDIAN AND PARAPET PLANS

Note: All reinforcing bar marks shall be prefixed ESC.



SLAB PLAN

Note: Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Note:

All transverse reinforcement is to be placed radially to and measured along the north edge of slab of each bridge.

For placement of longitudinal reinforcement and for additional reinforcement over the piers see Sheet 80/108.

For Median Light Standard Support Details, see Sheet 103/108.

For Pull Box Details, see Sheet 103/108.

For Sign Support Details, see Sheet 102/108.

For Reinforcement Details around Access Manhole see Sheet 71/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

SLAB PLAN
UNIT—3

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

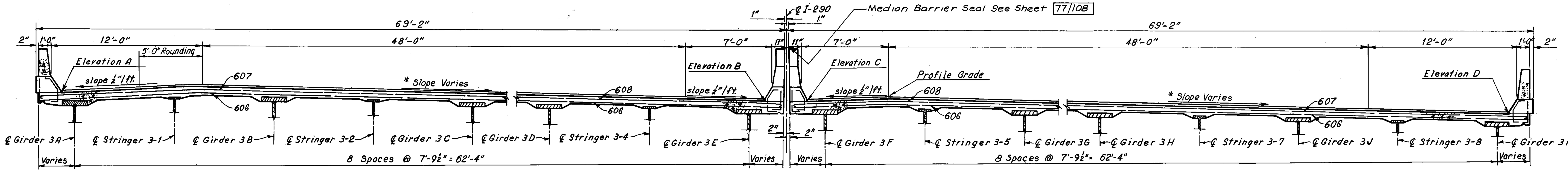
DRAWN JDS DATE 7-16-69	TRACED JSC DATE 8-4-69	CHECKED DMR DATE 3-4-70	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 79/108

FED.RD. DIVISION	STATE	PROJECT		
2	OHIO			

165/193

CUYAHOGA COUNTY
CUY-290-0.27

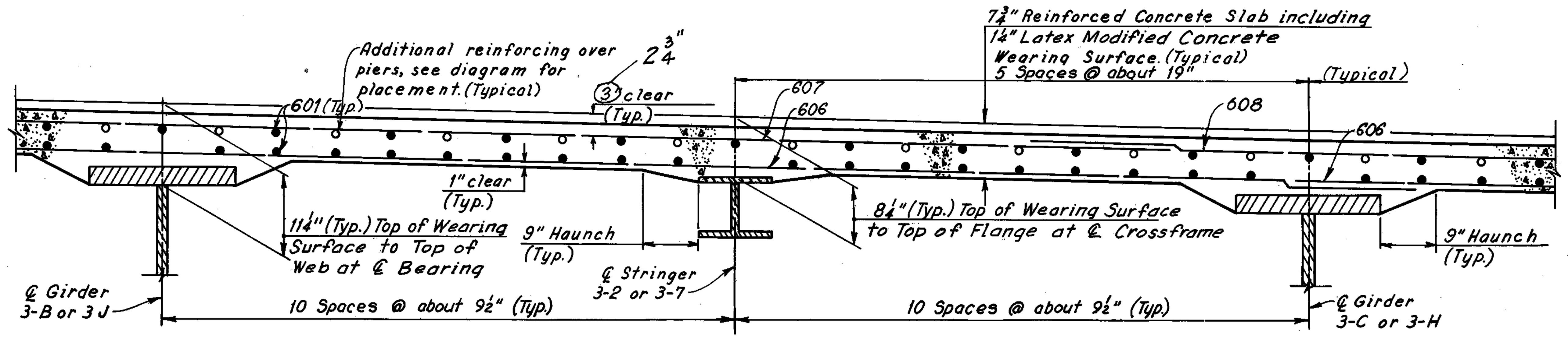
* See Superelevation Transition Diagram, Sheet 94/108.



TYPICAL CROSS SECTION, (UNIT THREE)

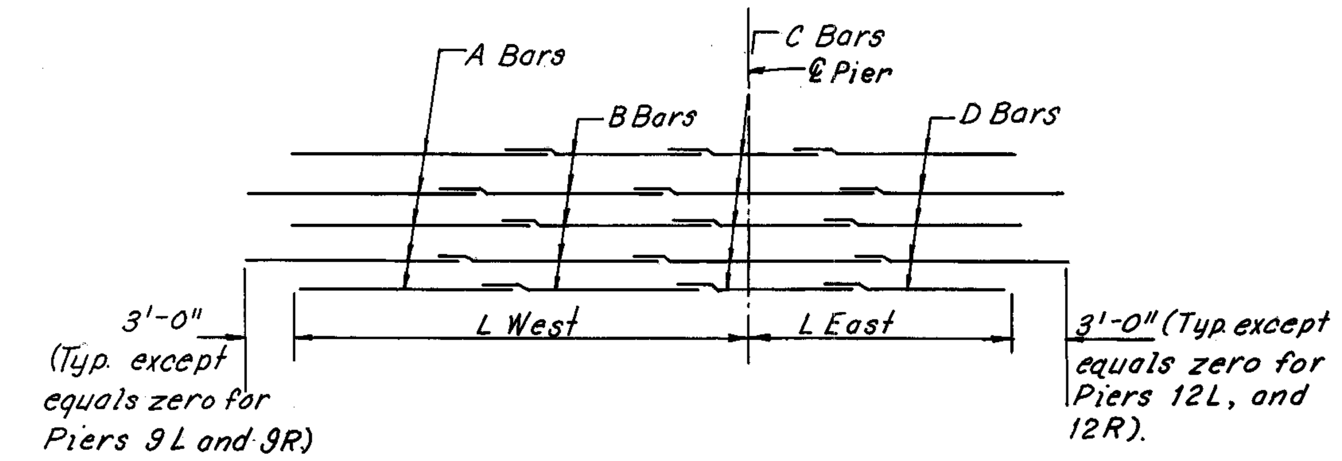
TOP OF PORTLAND CEMENT CONCRETE ELEVATIONS (UNIT 3)	℄ ROLLERS 2L OR 2R	℄ PIER 9L OR 9R	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ PIER 10L OR 10R	1/15	2/15	3/15	4/15	5/15	6/15	7/15	8/15	9/15	10/15	11/15	12/15	13/15	14/15	℄ PIER 11L OR 11R	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ PIER 12L OR 12R	℄ ROLLERS 3L OR 3R
ELEV A	673.57	674.18	674.97	675.78	676.59	677.35	678.06	678.68	679.28	679.90	680.55	681.23	681.88	682.55	683.23	683.90	684.53	685.12	685.65	686.12	686.54	686.90	687.21	687.48	687.72	687.95	688.17	688.33	688.49	688.65	688.81	688.96	686.10	689.23	689.35	689.45	689.55	689.65
ELEV B	673.30	673.86	674.54	675.23	675.89	676.53	677.15	677.75	678.35	678.98	679.63	680.31	680.95	681.62	682.30	682.97	683.60	684.19	684.73	685.20	685.62	685.98	686.29	686.56	686.79	687.02	687.24	687.41	687.57	687.73	687.88	688.03	688.17	688.31	688.42	688.52	688.62	688.73
ELEV C	674.73	675.25	675.78	676.32	676.85	677.38	677.90	678.43	678.99	679.53	680.12	680.71	681.40	682.11	682.81	683.49	684.13	684.70	685.22	685.68	686.07	686.41	686.69	686.93	687.14	687.34	687.54	687.68	687.82	687.97	682.11	688.75	688.36	688.47	688.56	688.64	688.71	688.77
ELEV D	674.30	674.72	675.14	675.56	675.99	676.47	676.99	677.53	678.07	678.63	679.21	679.81	680.50	681.21	681.91	682.59	683.22	683.80	684.32	684.77	685.17	685.50	685.79	686.02	686.24	686.44	686.63	686.77	686.92	687.06	687.20	687.33	687.45	687.57	687.65	687.73	687.80	687.87

Note:
The top of Portland Cement Concrete elevations shown at the gutter lines 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 and wearing surface.



TYPICAL SLAB REINFORCEMENT DETAIL
(Unit 3L shown, Unit 3R opposite hand)

Note:
A haunch width of 9" shall be used for computing quantity of concrete. However the haunch width may vary between 6" and 12" provided that the slope shall be not more than 1:4 for a haunch less than 9" in width.

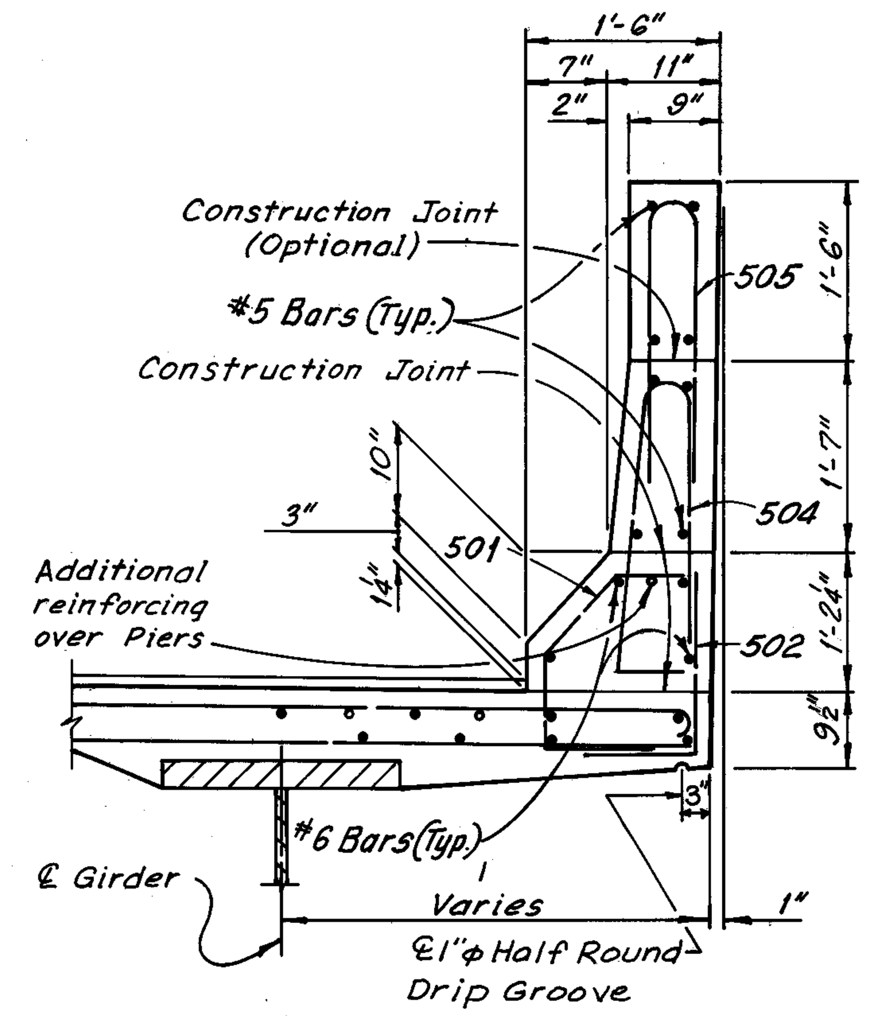


PLACEMENT DIAGRAM FOR ADDITIONAL REINFORCEMENT OVER PIERS

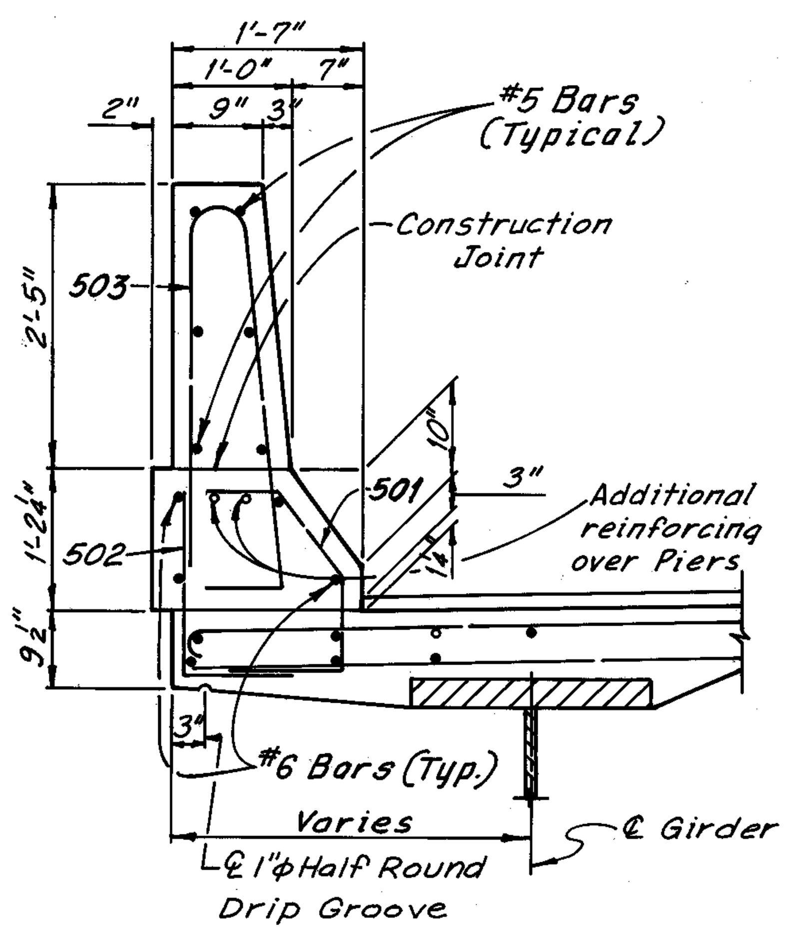
ADDITIONAL REINFORCING OVER PIERS						
Pier	L West	L East	A Bars	B Bars	C Bars	D Bars
9L	17'-6"	48'	*609/610	601	601	——
9R	17'-6"	43'	*601/614	614	——	——
10L	48'	66'	601	601	601	614
10R	41'	68'	616	601	601	601
11L	66'	35'	601	601	601	615
11R	68'	37'	601	601	601	617
12L	38'	17'-6"	616/612	601	——	——
12R	37'	17'-6"	618/601	601	——	——

* Alternate placement to give 3'-0" Stagger between ends of bar.

Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.



MEDIAN CURB AND PARAPET DETAIL



EXTERIOR CURB AND PARAPET DETAIL
(4'-0" Chain Link fence not shown)

Note: All reinforcing bar marks shall be prefixed ESC.

Note:
For Fence Details, see Sheet 105/108.

Revised 12-24-86

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

TYPICAL CROSS SECTION
UNIT—3

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

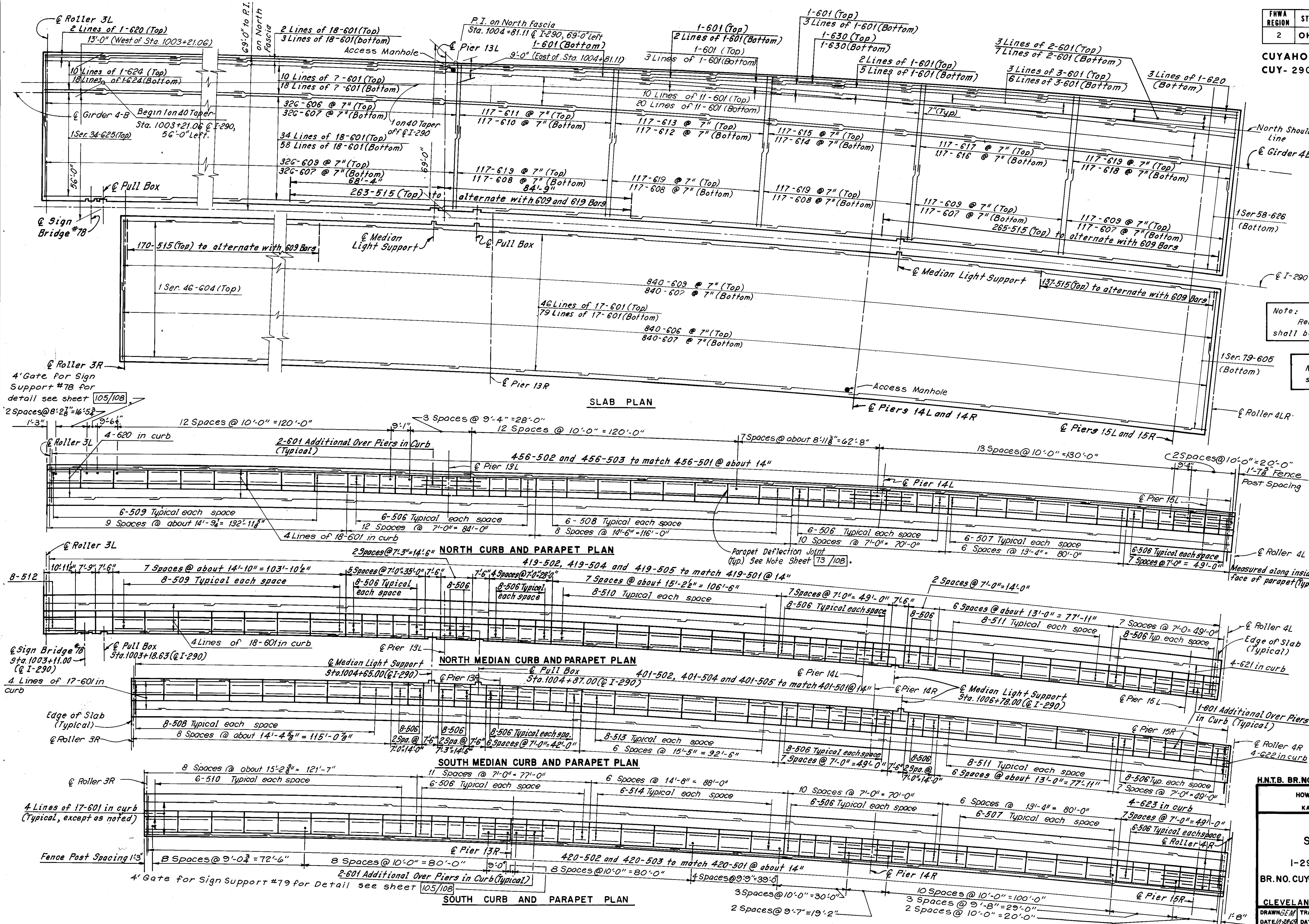
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN /DS	TRACED JSC	CHECKED DMP	REVIEWED C.A.B.	REVISED
DATE 7-11-69	DATE 8-6-69	DATE 3-4-70	DATE 2-24-86	SHEET 80/108

FHWA REGION	STATE	PROJECT	
2	OHIO		

166/193

CUYAHOGA COUNTY
CUY- 290-027



Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Note: All reinforcing bar marks shall be prefixed ESD.

Note:
All transverse reinforcement shall be placed radially to ℄ I-290 and is measured along the north edge of slab of each bridge.
For placement of longitudinal reinforcement and for additional reinforcement over piers see Sheet 82/108.
For Light Standard Support Details, see Sheet 103/108.
For Sign Support Details, see Sheet 102/108.
For Pull Box Details, see Sheet 103/108.
For Reinforcement Details around Access Manholes, see Sheet 71/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

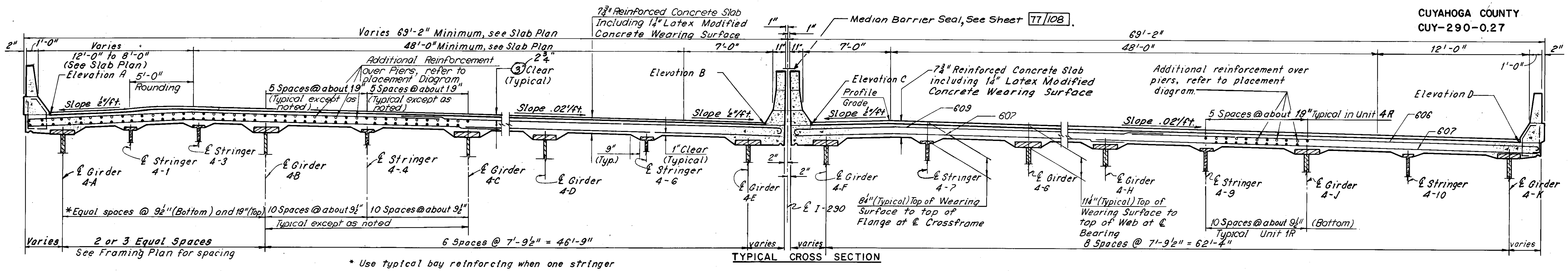
SLAB PLAN — UNIT 4

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN GEM	TRACED	CHECKED	REVIEWED	REVISED
DATE 10-20-69	DATE	DATE 10-30-70	DATE	SHEET 81/108



TYPICAL CROSS SECTION

* Use typical bay reinforcing when one stringer between Girders 4A and 4B (see Slab Plan).

TOP OF PORTLAND CEMENT CONCRETE ELEVATIONS (UNIT 4L)

	℄ ROLLERS 3L	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ PIER 13L	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ PIER 14L	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ PIER 15L	℄ ROLLER 4L
ELEV A	689.65	689.75	689.85	689.86	689.94	689.92	689.87	689.77	689.66	689.54	689.42	689.30	689.18	689.05	688.91	688.72	688.48	688.19	687.87	687.53	687.19	686.95	686.72	686.48	686.23	685.95	685.66	685.33	684.99	684.63	684.26	683.87
ELEV B	688.73	688.85	688.92	688.96	688.95	688.91	688.82	688.69	688.56	688.40	688.25	688.10	687.97	687.83	687.67	687.47	687.23	686.94	686.62	686.29	685.96	685.71	685.46	685.21	684.95	684.67	684.36	684.03	683.68	683.31	682.92	682.52

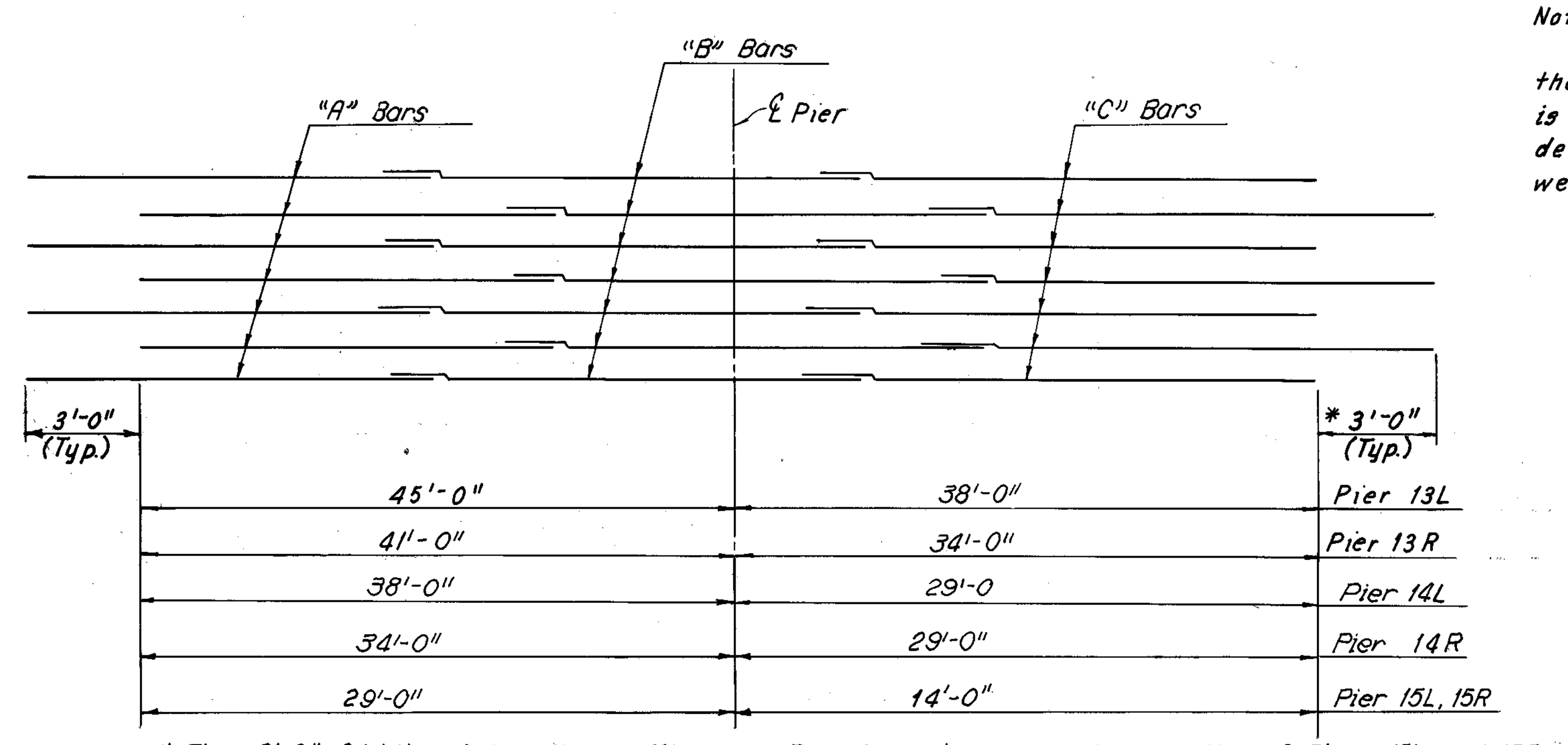
TOP OF PORTLAND CEMENT CONCRETE ELEVATIONS (UNIT 4R)

	℄ ROLLER 3R	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ PIER 13R	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ PIER 14R	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ PIER 15R	℄ ROLLER 4R
ELEV C	688.77	688.84	688.87	688.88	688.84	688.78	688.68	688.56	688.40	688.24	688.08	687.92	687.76	687.60	687.43	687.24	687.02	686.77	686.51	686.23	685.96	685.72	685.49	685.24	684.99	684.71	684.40	684.06	683.70	683.32	682.92	682.51
ELEV D	687.87	687.94	687.97	687.98	687.96	687.89	687.78	687.65	687.49	687.33	687.16	687.00	686.85	686.69	686.53	686.34	686.12	685.88	685.62	685.35	685.08	684.84	684.61	684.36	684.11	683.82	683.51	683.17	682.81	682.42	682.02	681.61

Note:
The top of Portland Cement Concrete elevations shown at the gutter lines 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 and wearing surface.

Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Note: All reinforcing bar marks shall be prefixed ESD.

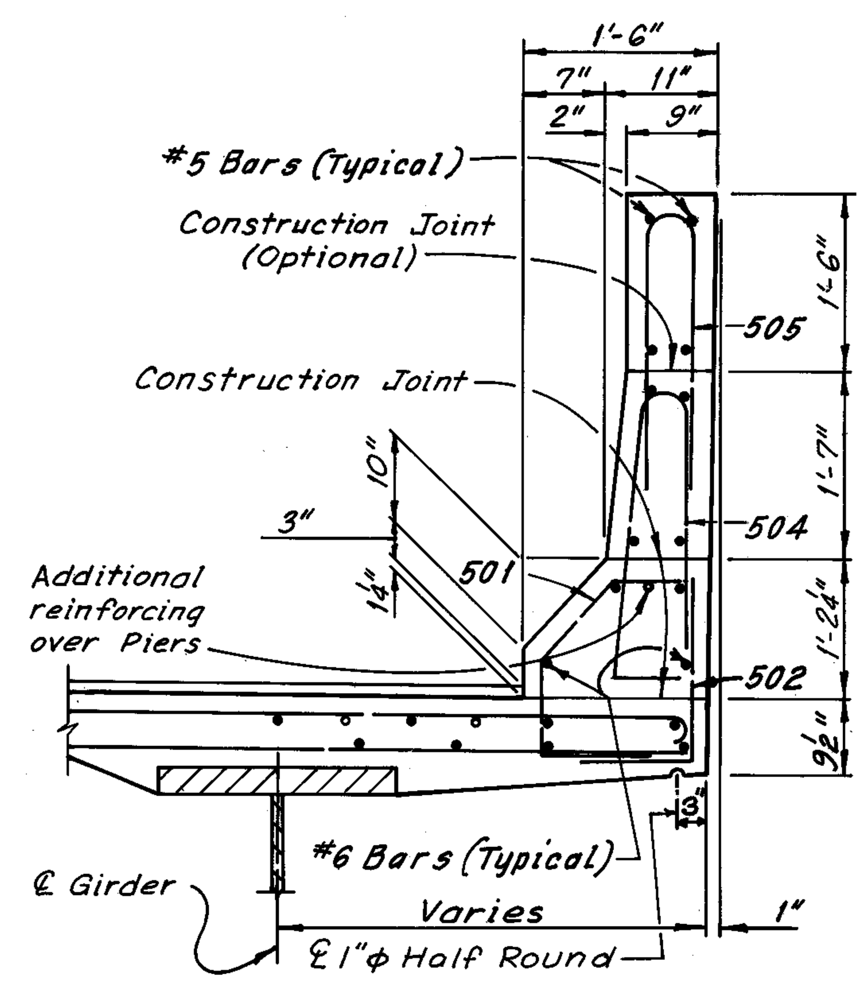


* The 3'-0" Additional Length on Alternate Bars is omitted on the East Side of Piers 15L and 15R.

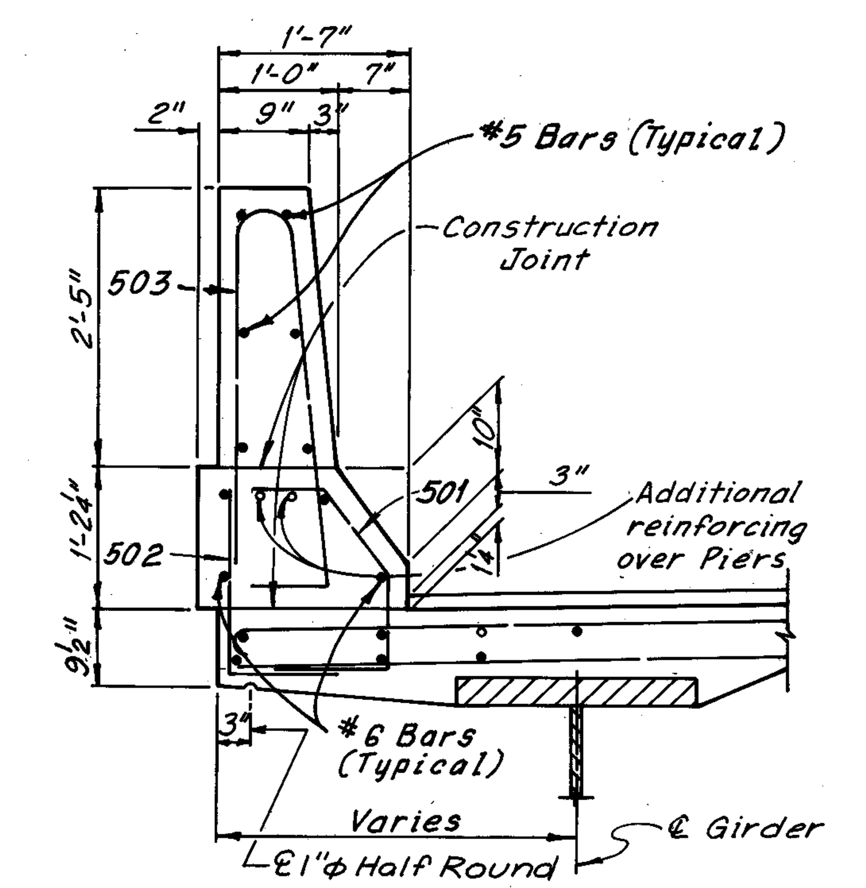
PLACEMENT DIAGRAM FOR ADDITIONAL REINFORCEMENT OVER PIERS

ADDITIONAL REINFORCING OVER PIERS					
	Pier 13L	Pier 13R	Pier 14L	Pier 14R	Piers 15L & 15R
"A" Bars	601	601	601	601	601
"B" Bars	601	601	601	627	‡628 / 629
"C" Bars	601	602	603	—	—

‡ Alternate placement to give 3'-0" Stagger between ends of bar.



MEDIAN CURB AND PARAPET DETAIL



EXTERIOR CURB AND PARAPET DETAIL
(4'-0" Chain Link fence not shown)

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

For Fence Details, see Sheet 105/108.

Revised 12-24-86

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

TYPICAL CROSS SECTION
UNIT 4

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

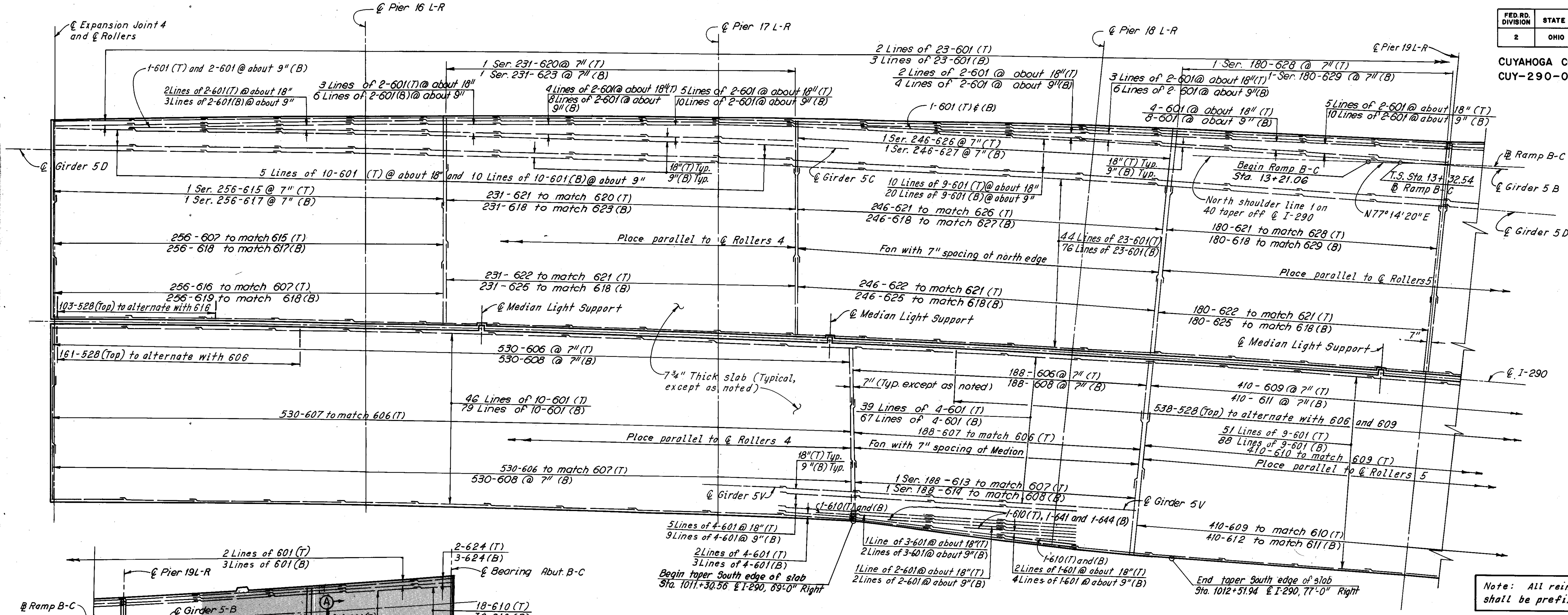
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN J.D.S. DATE 7-21-69	TRACED G.L.M. DATE 9-25-69	CHECKED D.W.F. DATE 11-5-69	REVIEWED G.A.B. DATE 12-24-86	REVISED

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

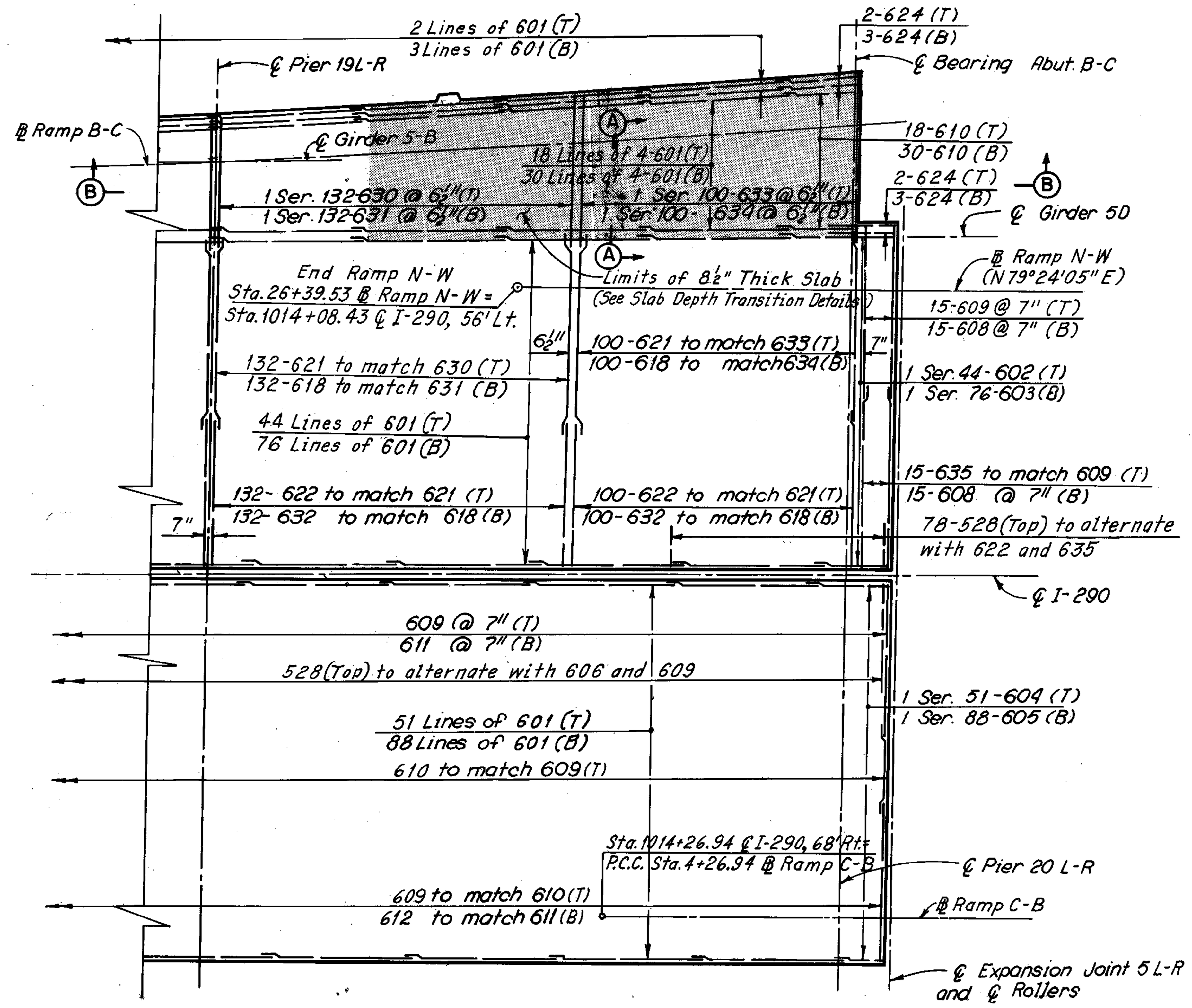
168/193

CUYAHOGA COUNTY
CUY-290-0.27



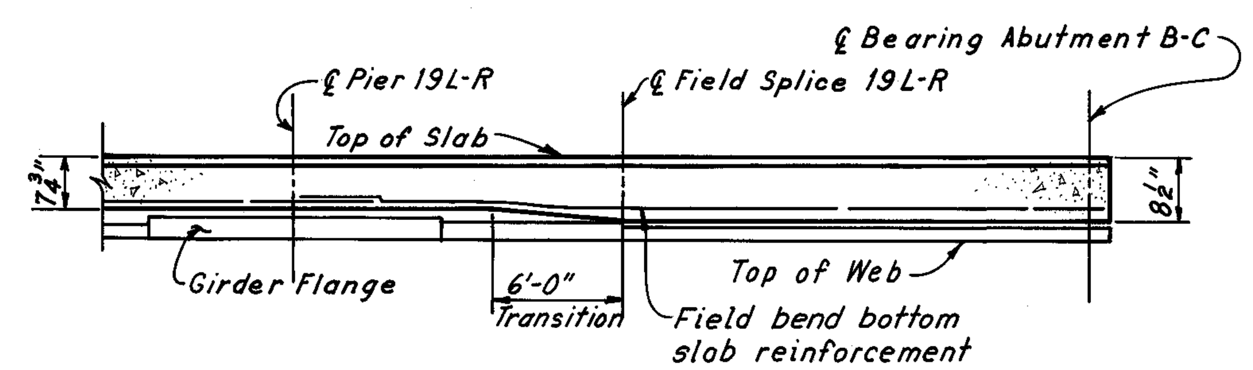
PART SLAB PLAN

Note: All reinforcing bar marks shall be prefixed ESE.

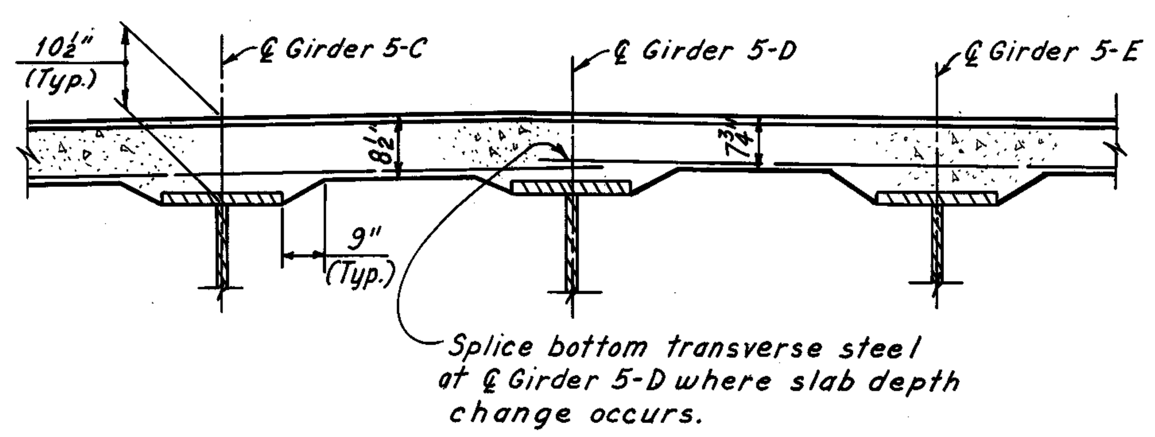


PART SLAB PLAN

Note: Required reinforcing bar lap lengths shall be 30 bar diameters minimum.



SECTION B-B



SECTION A-A

SLAB DEPTH TRANSITION DETAILS
(For slab reinforcement not shown see Typical Cross Section)

Notes:

The transverse reinforcement spacing shown in the slab plan shall be measured along the north edge of slab of each bridge.

For placement of longitudinal reinforcement and for additional reinforcement over the piers see Sheet 84/108.

The following abbreviations are used:

(T) = Top
(B) = Bottom
L = Left Bridge
R = Right Bridge

For Deck Joint Details at Abutment B-C, see Sheets 45/108 and 46/108.

For Roadway End Dam and Curb Plate Details at Expansion Joints 4 and 5, see Sheets 51/108 and 52/108.

For Light Standard Support Locations see Sheet 85/108 and for Details see sheets 103/108 and 104/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

SLAB PLAN-UNIT 5

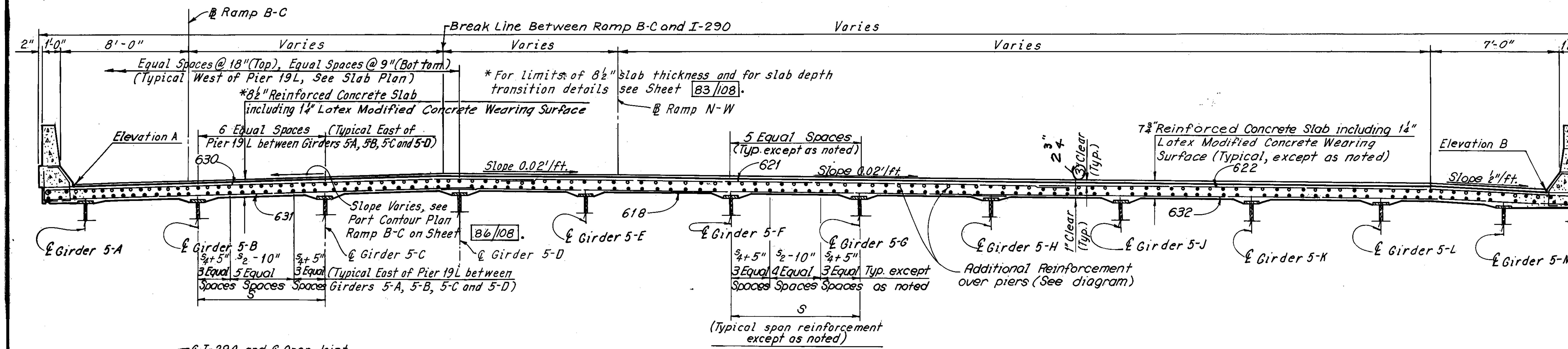
I-290 OVER CUYAHOGA RIVER

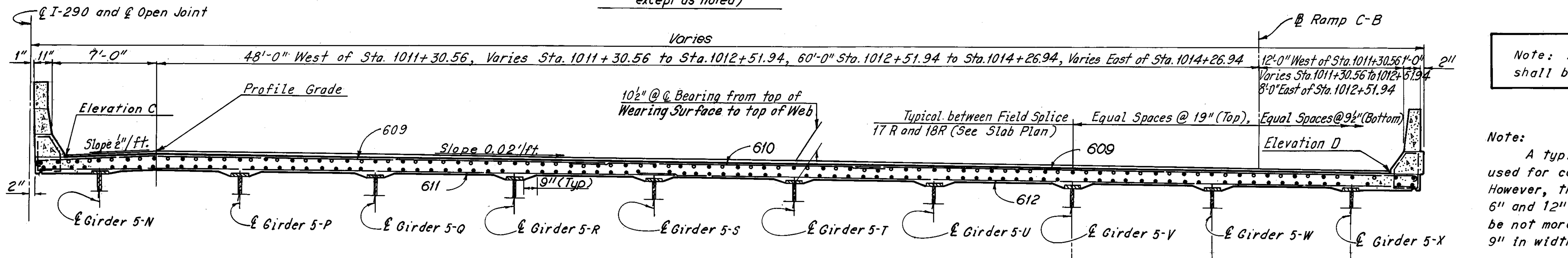
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S. DATE 9-26-63	TRACED A.J.T. DATE 10-2-63	CHECKED J.W.C. DATE 10-28-63	REVIEWED C.A.B. DATE 8-24-66	REVISED	SHEET 83/108

CUYAHOGA COUNTY
CUY-290-0.27



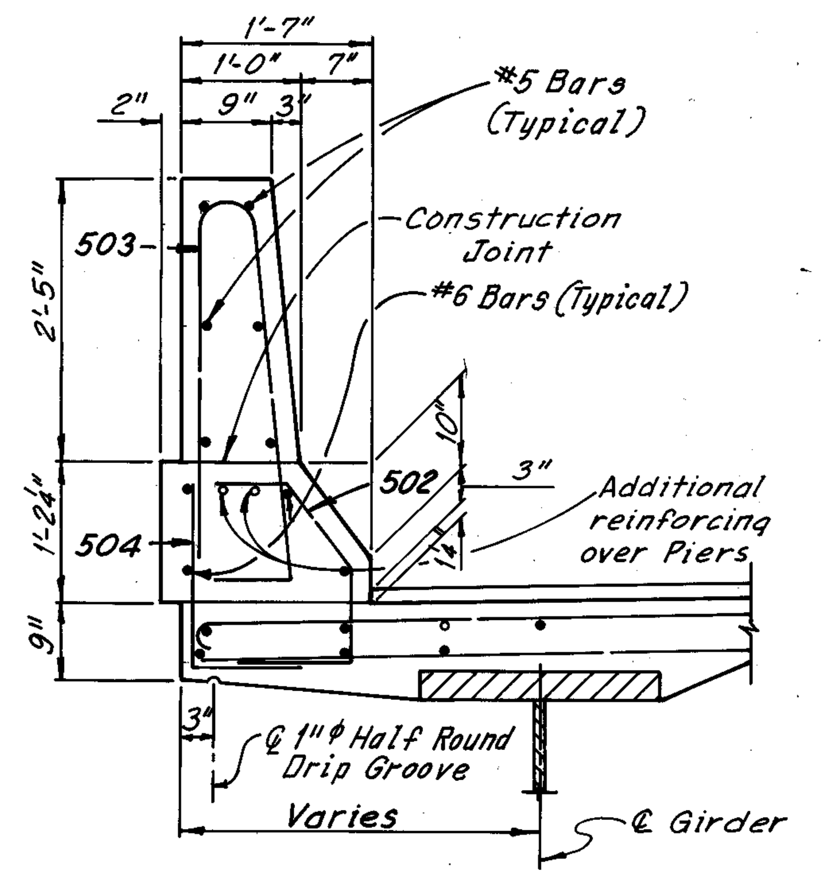


TYPICAL CROSS SECTION

See Typical Span Reinforcement — S, S: Typ. West of Field Splice 17R; S: Typ. East of Field Splice 18R

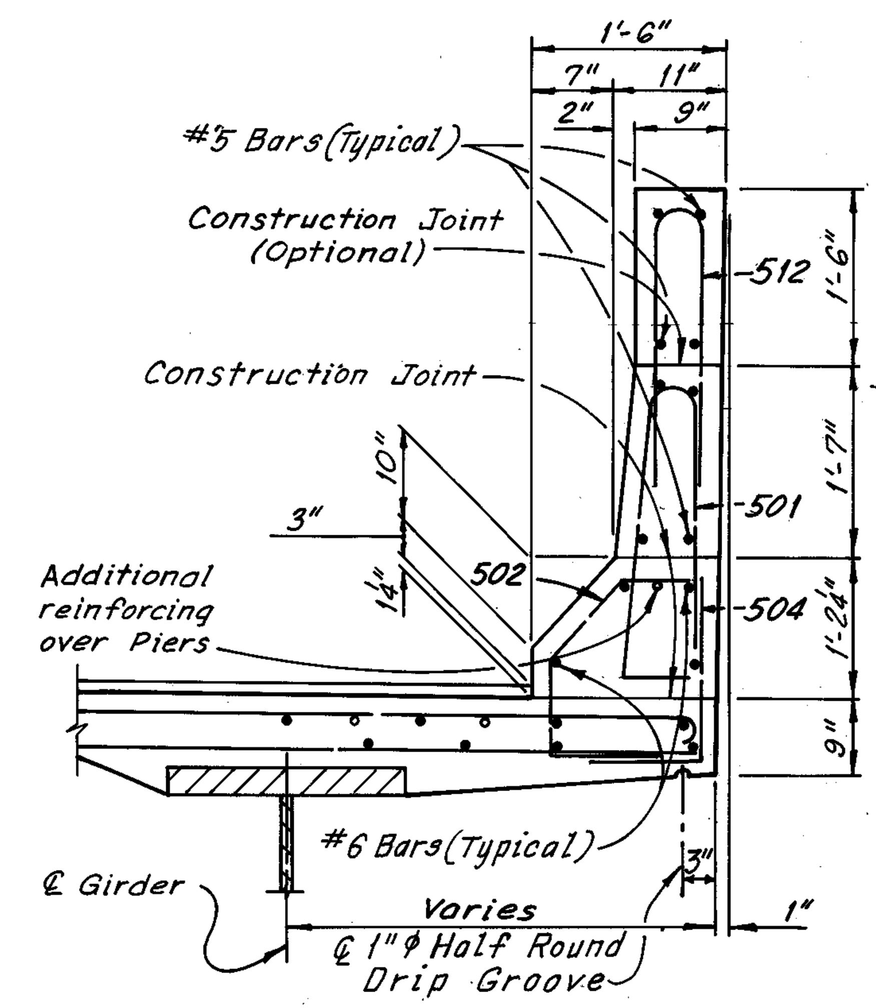
Note: All reinforcing bar marks shall be prefixed ESE.

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.



EXTERIOR CURB AND PARAPET DETAIL
(4'-0" Chain Link fence not shown)

Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.



MEDIAN CURB AND PARAPET DETAIL

	℄ EXPAN. ROLLERS 4L	0.2	0.4	0.6	0.8	℄ PIER 16L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	℄ PIER 17L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
ELEV A	683.87	683.39	682.85	682.23	681.58	680.94	680.60	680.27	679.95	679.63	679.30	678.96	678.61	678.26	677.92	677.59	677.26	676.94	676.62	676.29	675.94	675.58	675.19	674.80	674.42
ELEV B	682.52	682.01	681.45	680.82	680.16	679.50	679.16	678.82	678.50	678.17	677.84	677.49	677.13	676.76	676.40	676.05	675.72	675.40	675.08	674.76	674.41	674.06	673.69	673.32	672.94

TOP OF PORTLAND CEMENT CONCRETE ELEVATIONS (UNIT 5L)

	℄ PIER 18L	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	℄ PIER 19L	0.2	0.4	0.6	0.8	℄ BRG. ABUT. B-C OR ℄ PIER 20L	℄ EXPAN. ROLLERS 5L
ELEV A	674.04	673.70	673.37	673.04	672.72	672.38	672.04	671.70	671.35	670.88	670.49	669.75	669.02	668.15	667.33	666.58	
ELEV B	672.58	672.25	671.92	671.59	671.26	670.92	670.57	670.21	669.84	669.48	669.13	668.54	667.96	667.34	666.65	665.93	665.65

Note:
The top of Portland Cement Concrete elevations shown at the gutter lines 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 and wearing surface.

TOP OF PORTLAND CEMENT CONCRETE ELEVATIONS (UNIT 5R)

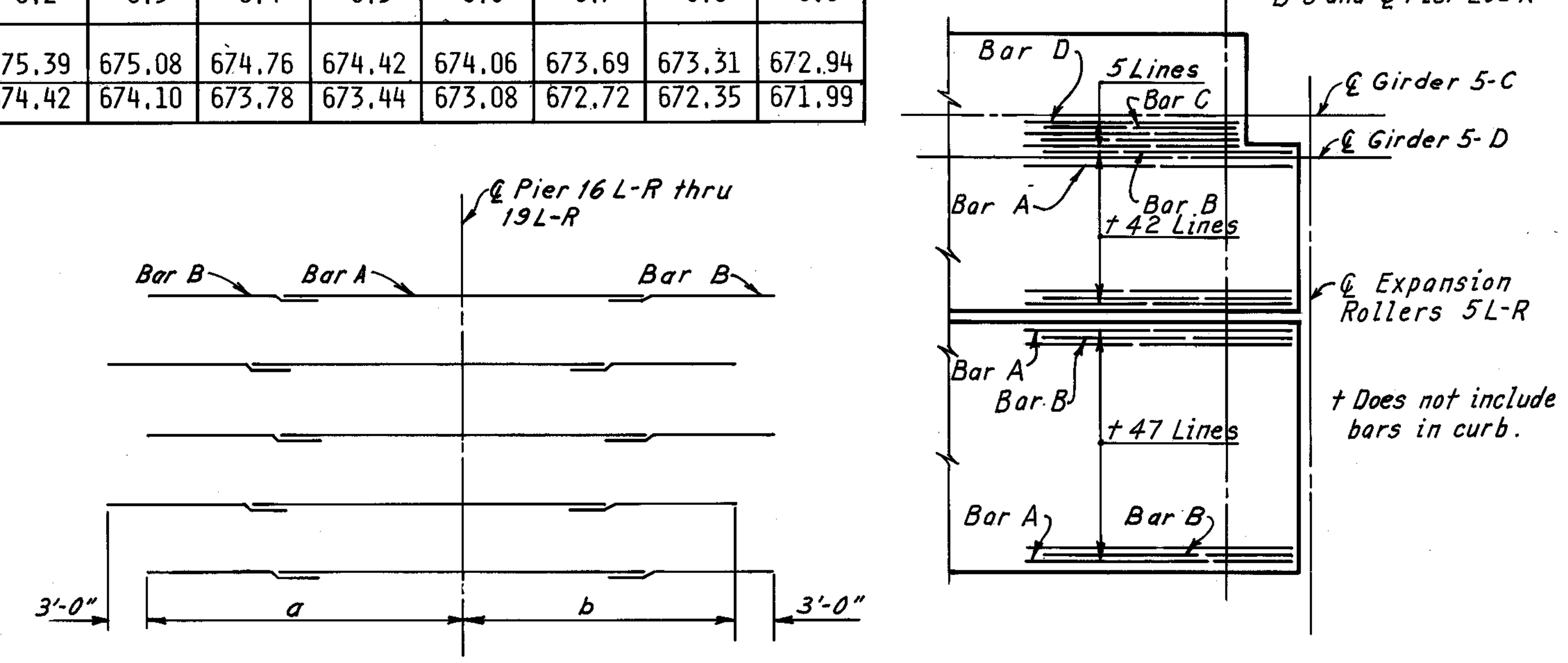
	℄ EXPAN. ROLLERS 4R	0.2	0.4	0.6	0.8	℄ PIER 16R	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	℄ PIER 17R	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
ELEV C	681.51	682.01	681.45	680.82	680.15	679.50	679.15	678.82	678.50	678.17	677.83	677.48	677.12	676.75	676.39	676.04	675.71	675.39	675.08	674.76	674.42	674.06	673.69	673.31	672.94
ELEV D	681.61	681.09	680.51	679.88	679.21	678.56	678.23	677.90	677.57	677.25	676.91	676.56	676.19	675.81	675.43	675.07	674.74	674.42	674.10	673.78	673.44	673.08	672.72	672.35	671.99

TOP OF PORTLAND CEMENT CONCRETE ELEVATIONS (UNIT 5R)

	℄ PIER 18R	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	℄ PIER 19R	0.2	0.4	0.6	0.8	℄ PIER 20R	℄ EXPAN. ROLLERS 5R
ELEV C	672.59	672.25	671.93	671.60	671.27	670.94	670.58	670.21	669.85	669.48	669.13	668.54	667.97	667.35	666.66	665.93	665.64
ELEV D	671.65	671.29	670.95	670.61	670.27	669.92	669.56	669.19	668.82	668.46	668.10	667.50	666.92	666.29	665.59	664.86	664.57

ADDITIONAL REINFORCEMENT OVER PIERS

	PIER 16		PIER 17		PIER 18		PIER 19		PIER 20	
	L	R	L	R	L	R	L	R	L	R
Bar A	601	←					→	601	643	643
Bar B	636	636	639	637	639	637	638	638	642	642
a	30'-0"	30'-0"	27'-0"	27'-0"	29'-0"	27'-0"	27'-0"	27'-0"	—	—
b	27'-0"	27'-0"	29'-0"	27'-0"	27'-0"	27'-0"	25'-0"	25'-0"	—	—
Bar C	—	—	—	—	—	—	—	—	640	—
Bar D	—	—	—	—	—	—	—	—	645	—



ADDITIONAL REINFORCEMENT OVER PIERS

Notes:
For Fence Details, see Sheet 105/108.

Revised 12-24-86

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

TYPICAL CROSS SECTION
UNIT 5
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S. DATE 9-19-69	TRACED A.J.T. DATE 10-7-69	CHECKED V.W.C. DATE 10-30-69	REVIEWED C.A.B. DATE 2-24-86	REVISED

FHWA REGION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY- 290-027

NORTH CURB AND PARAPET PLAN

MEDIAN CURB AND PARAPET PLAN

SOUTH CURB AND PARAPET PLAN

Note: All reinforcing bar marks shall be prefixed ESE.

Note: Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Note:
For Light Standard Support Details, see Sheet 103/108 and 104/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

CURB AND PARAPET PLAN
UNIT 5

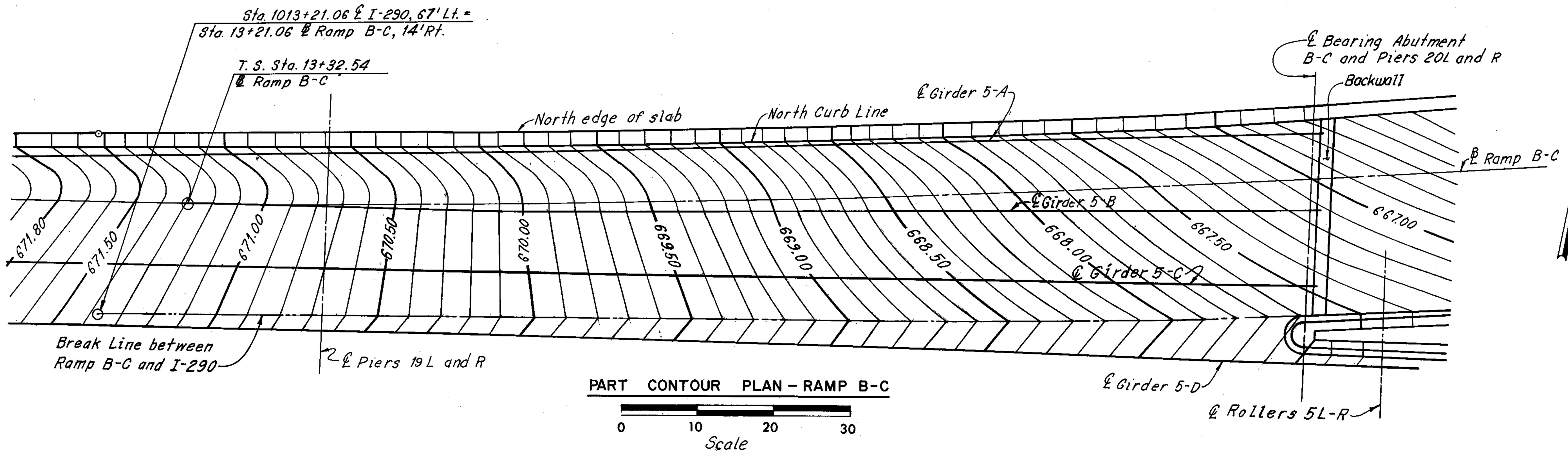
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

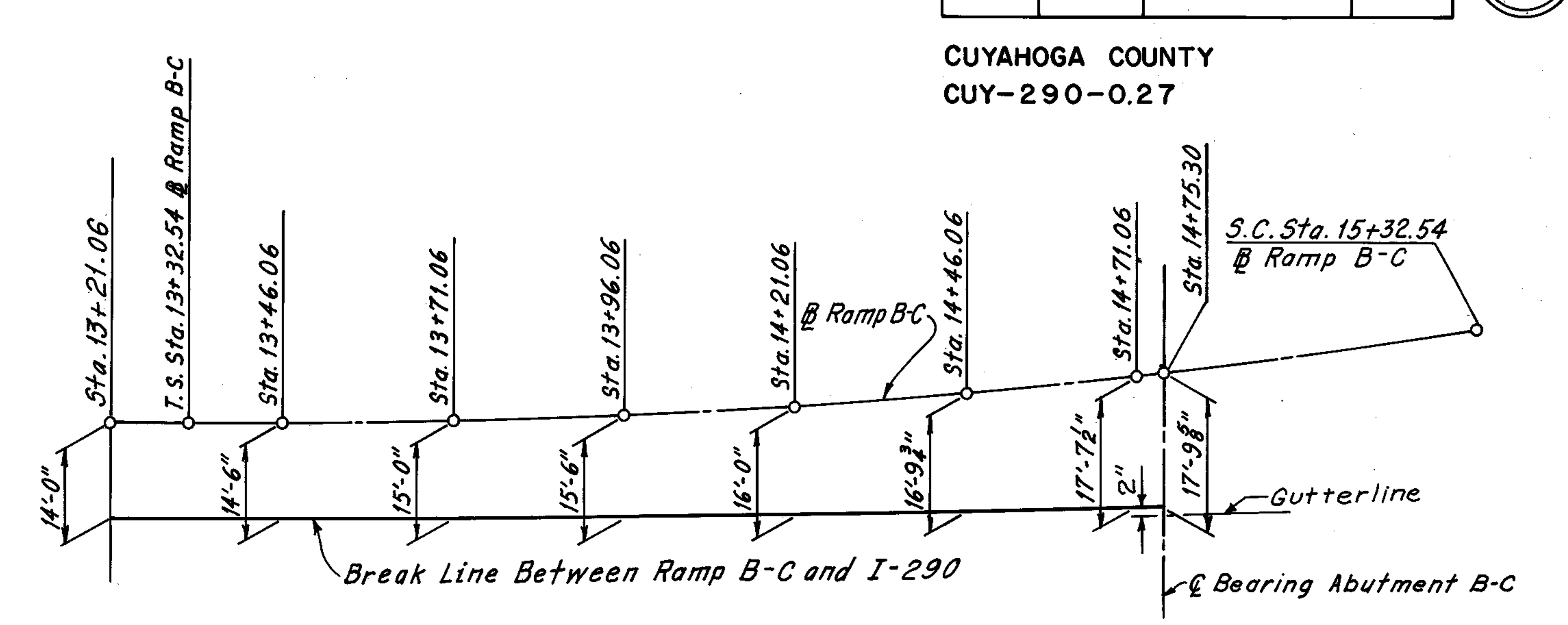
DRAWN D.H.S.	TRACED J.S.C.	CHECKED J.W.C.	REVIEWED C.A.B.	REVISED
DATE 9-20-63	DATE 10-3-63	DATE 11-4-63	DATE 2-24-66	SHEET 85/108

CUYAHOGA COUNTY
CUY-290-0.27

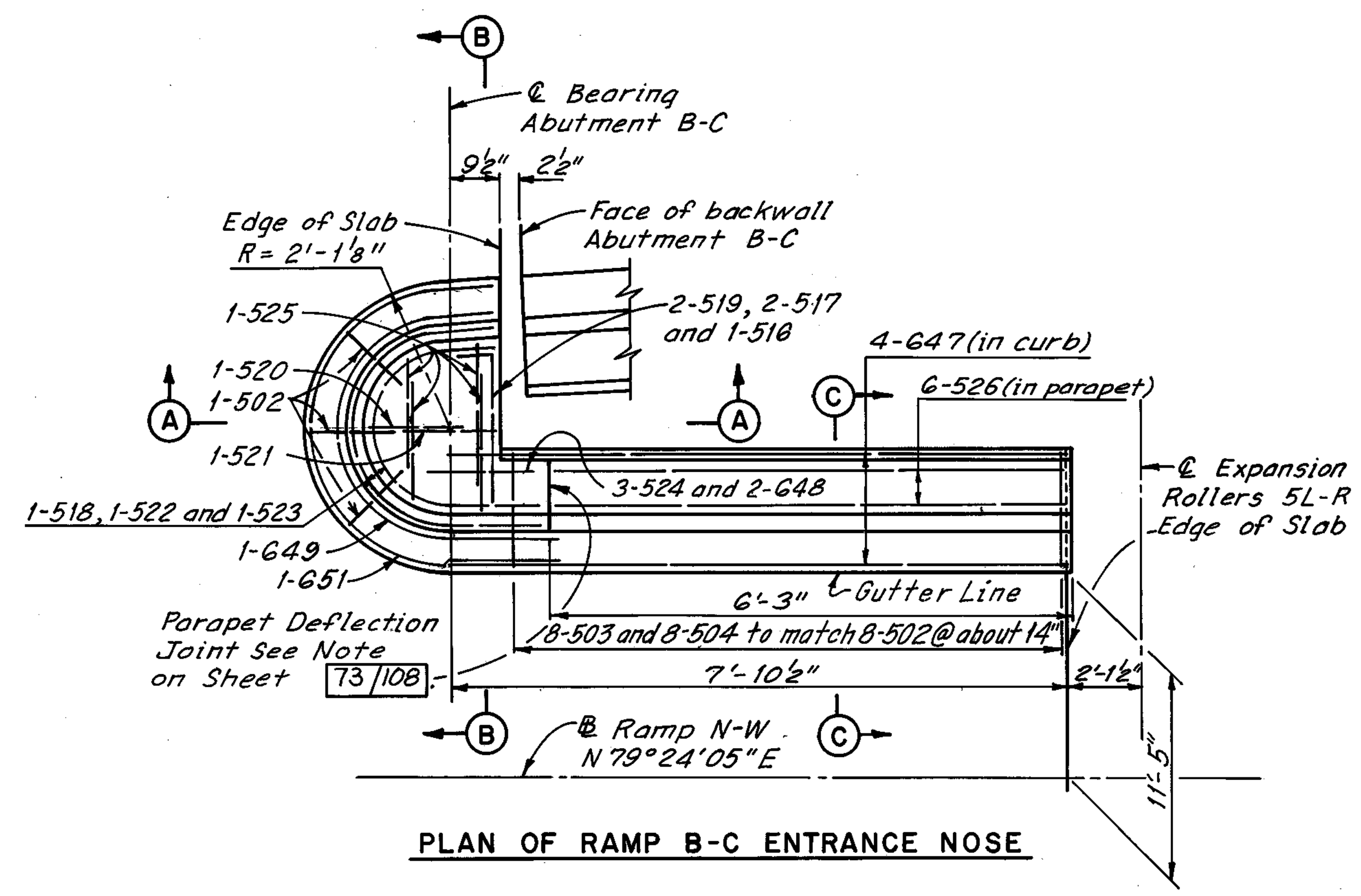


PART CONTOUR PLAN - RAMP B-C

0 10 20 30
Scale

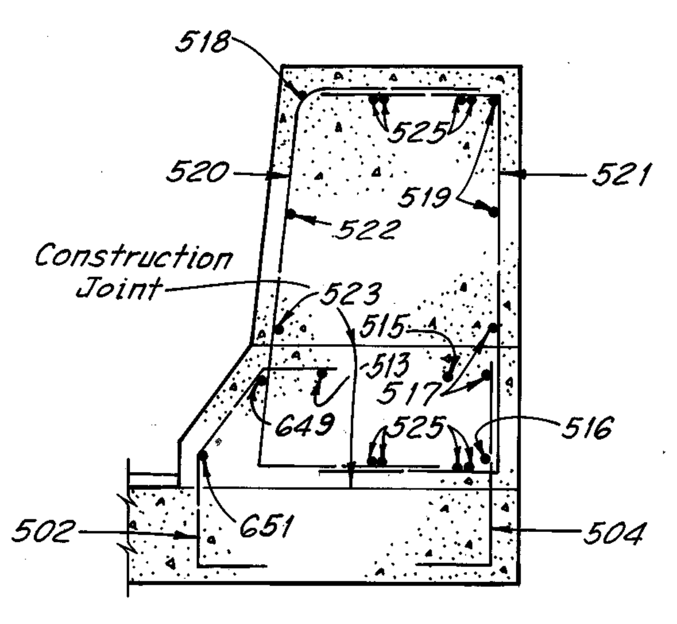


LAYOUT DIAGRAM
(Break Line Between Ramp B-C and I-290)

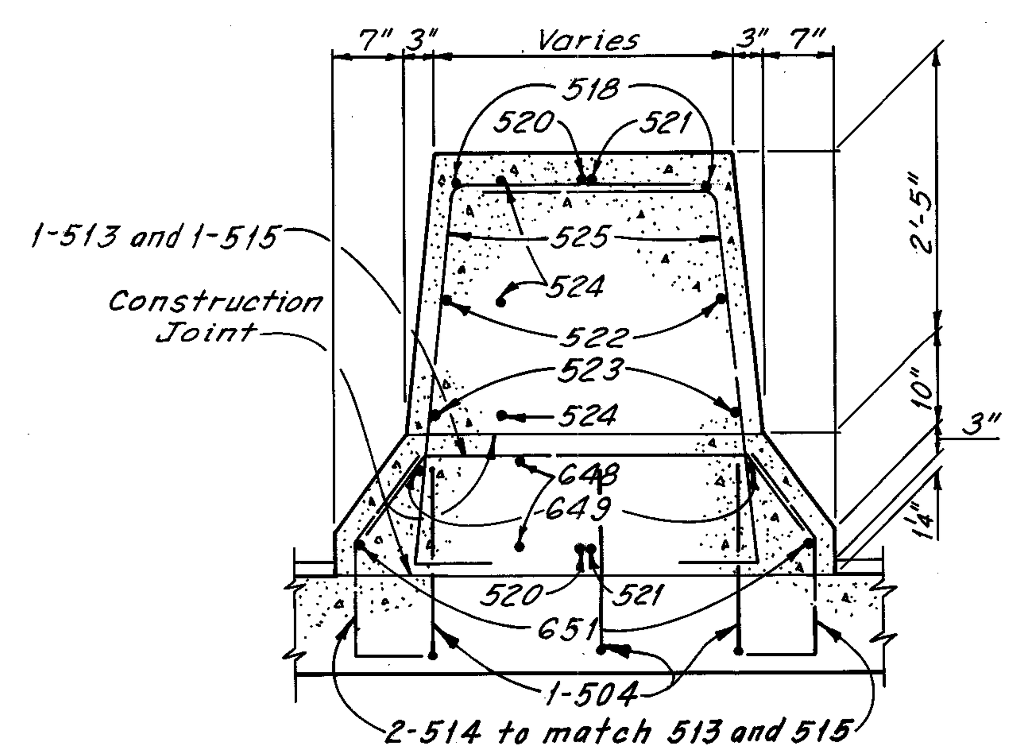


PLAN OF RAMP B-C ENTRANCE NOSE

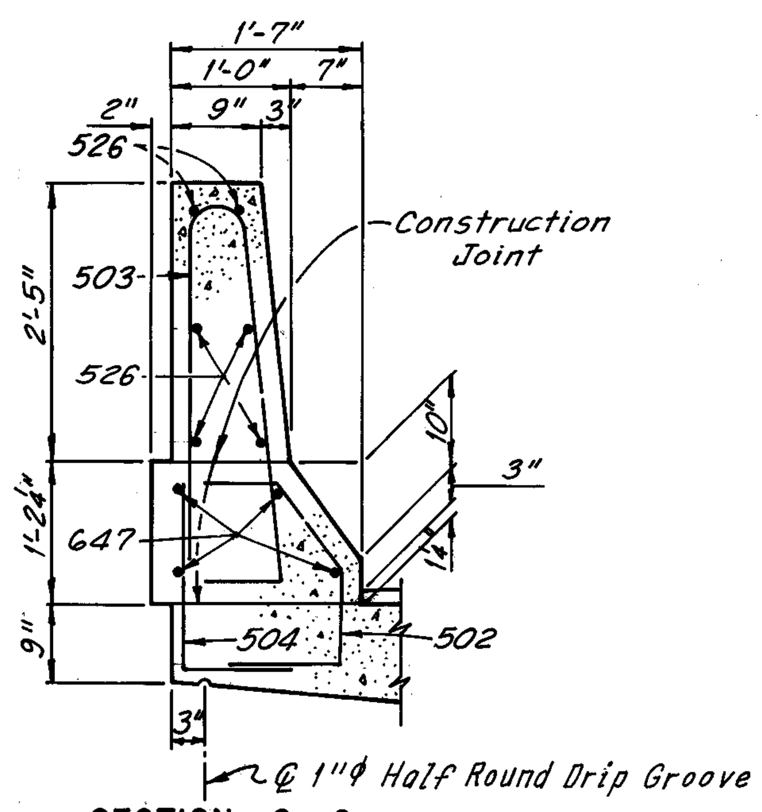
Note:
All reinforcing bar marks shall be prefixed E5E.



SECTION A-A



SECTION B-B



SECTION C-C

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

NOSE DETAILS-UNIT 5

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110

STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN D.H.S. DATE 9-23-69	TRACED A.J.T. DATE 10-6-69	CHECKED J.W.C. DATE 11-6-69	REVIEWED C.A.B. DATE 2-24-70	REVISED

FHWA REGION	STATE	PROJECT	
2	OHIO		

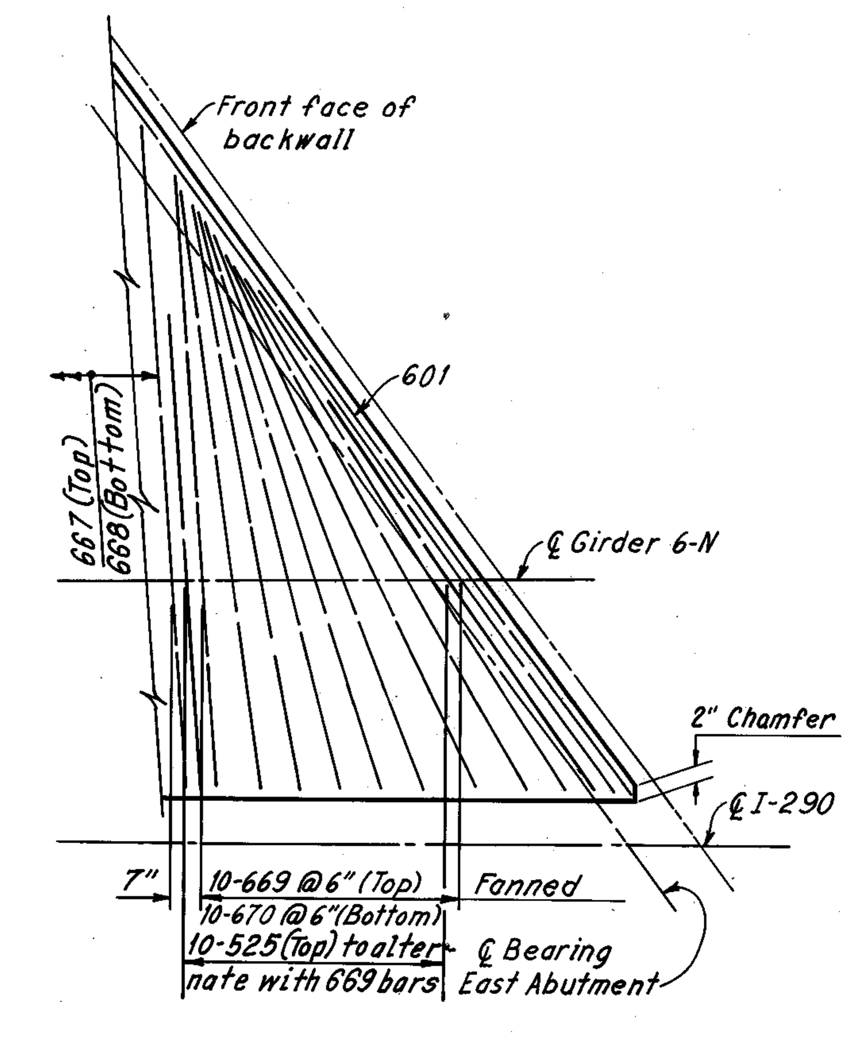
172/193

CUYAHOGA COUNTY
CUY- 290-027

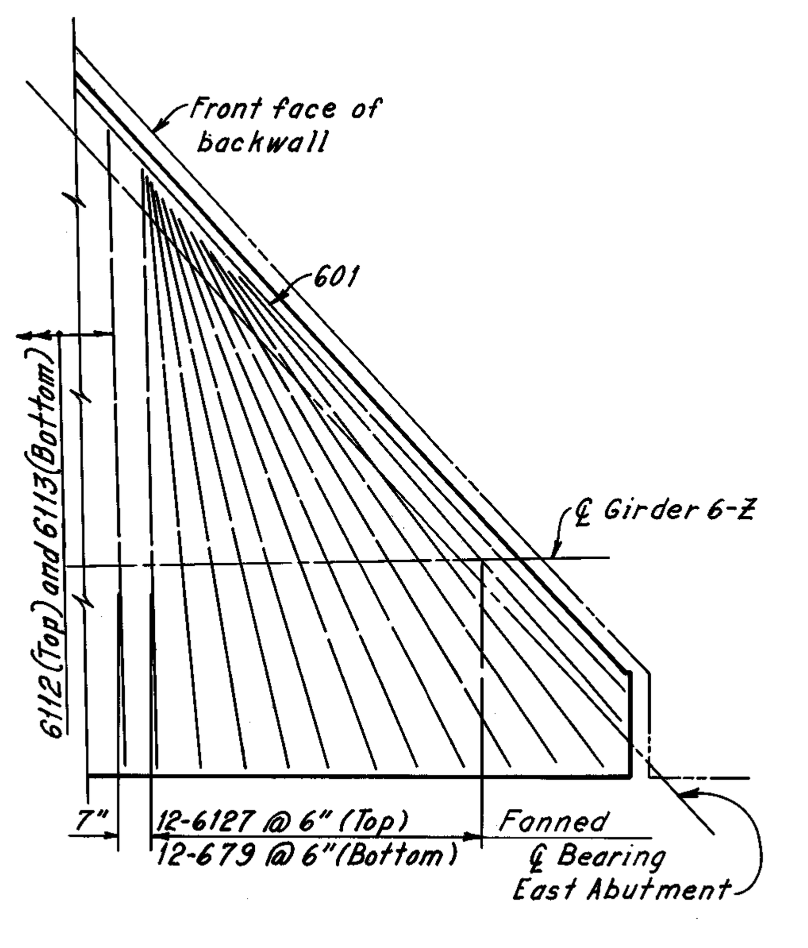
Note:
All reinforcing bar marks shall be prefixed ESF.

Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

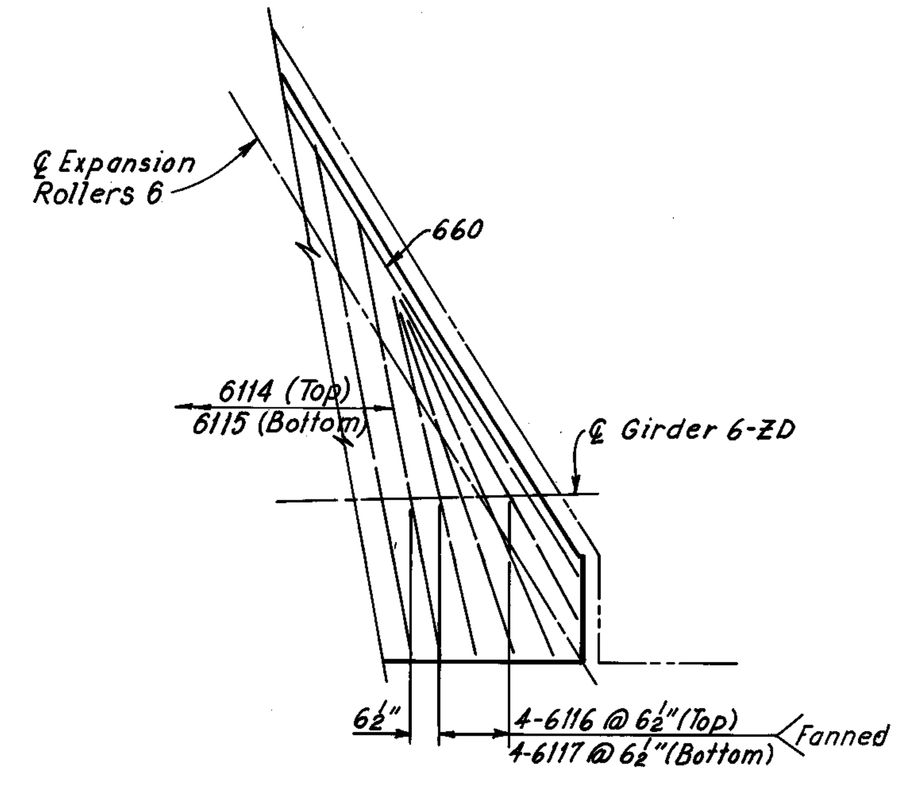
SLAB PLAN



DETAIL A



DETAIL B



DETAIL C

Notes:
The transverse reinforcement in Unit 6L shall be placed perpendicular to the north edge of slab except for the fanned bars in Detail A.
The transverse reinforcement in Unit 6R shall be measured along and placed radially to ℄ I-290, except as follows:
Corner reinforcement at East Abutment except for fanned bars in Detail B, shall be placed parallel to the last full length transverse bar.
Ramp C-B reinforcement east of the impact attenuator shall be placed parallel and the spacing measured perpendicular to the last full length transverse bar except for the fanned bars in Detail C.
For additional longitudinal reinforcement placement details see Typical Cross Sections.
For Light Standard Support Locations, see Sheet 89/108.
For Pull Box Details, see Sheet 103/108.
For Light Standard Support Details, see Sheets 103/108 and 104/108.
For additional reinforcement over the Piers, see Sheet 88/108.
For Curb and Parapet Plans, see Sheet 89/108.

Notes:
For roadway end dam and curb plate details at Expansion Joints 5 and 6, see Sheets 52/108 and 53/108.
For roadway end dam and curb plate details at the East Abutment, see Ohio Standard Drawing SD-1-69, Sheets 1 and 2 of 4 and "Modification to Roadway End Dam at East Abutment" on Sheet 42/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND HNTB

SLAB PLAN
UNIT 6

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

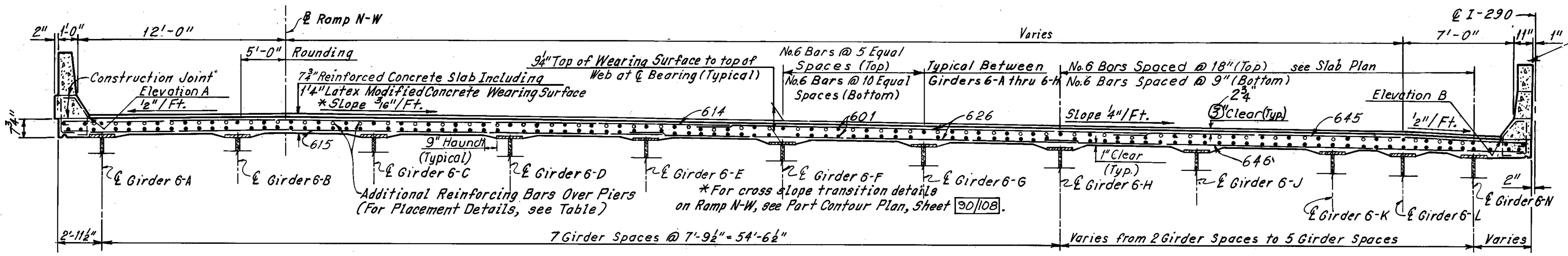
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN KYH DATE 10-6-69	TRACED JSC DATE 11-3-69	CHECKED JW DATE 11-20-69	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 87/108

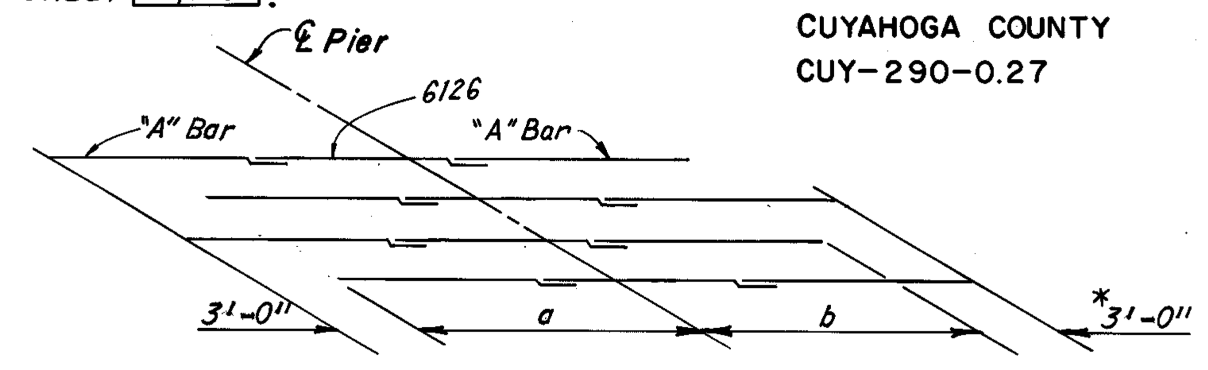
FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

173/193

CUYAHOGA COUNTY
CUY-290-0.27



TYPICAL CROSS SECTION UNIT 6L



*Note: Typical except at Pier 23 CB this dimension changes to 0.

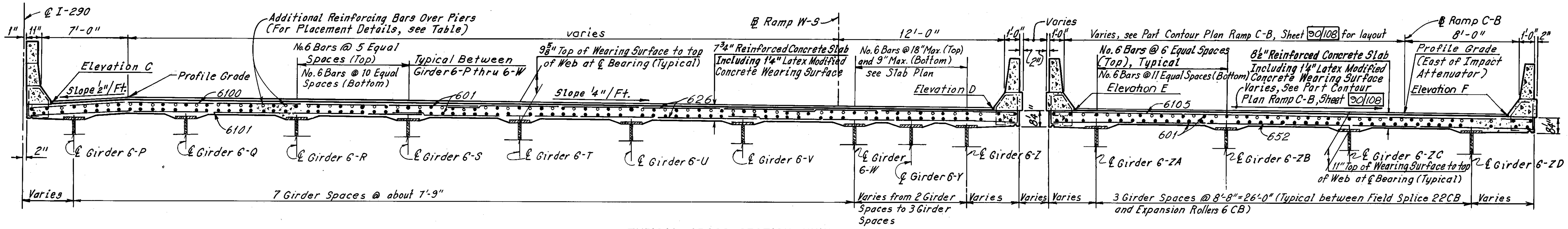
TABLE OF ADDITIONAL REINFORCEMENT OVER PIERS

	Pier 21L	Pier 22L	Pier 23L	Pier 24L	Pier 21R	Pier 22R	Pier 23R	Pier 23CB	Pier 24R
a	26'-0"	23'-6"	24'-0"	24'-6"	29'-0"	26'-9"	25'-6"	29'-6"	27'-6"
b	23'-6"	24'-0"	24'-6"	24'-0"	26'-9"	25'-6"	27'-6"	9'-9"	27'-3"
"A" Bars	632	630	6119	6119	638	687	6120	6122	6121

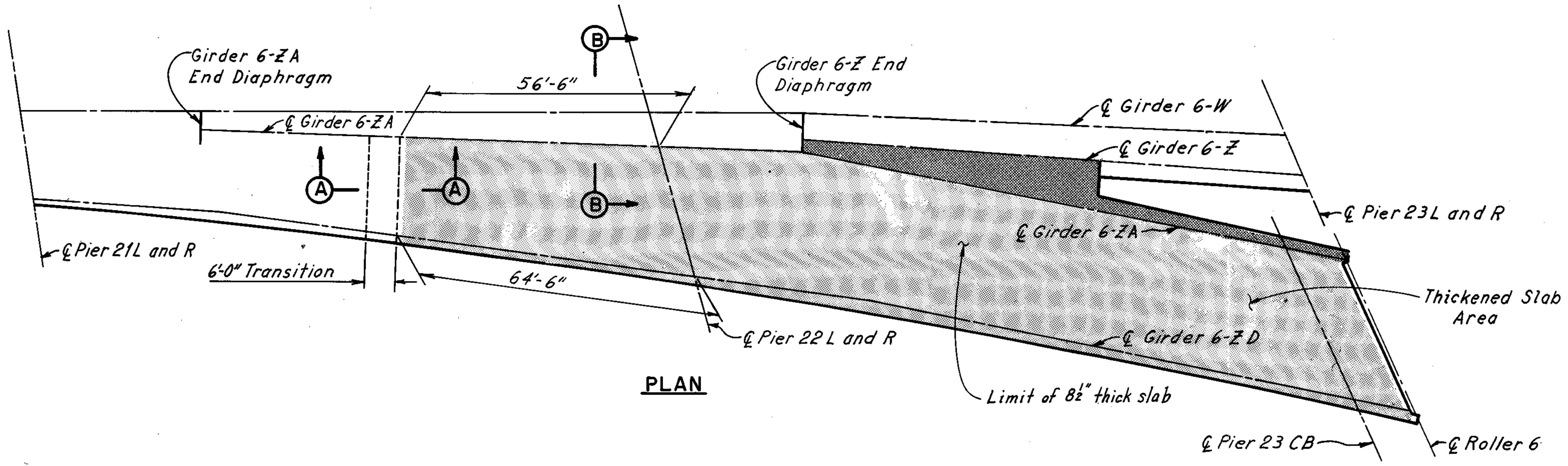
Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Note: All reinforcing bar marks shall be prefixed E5F.

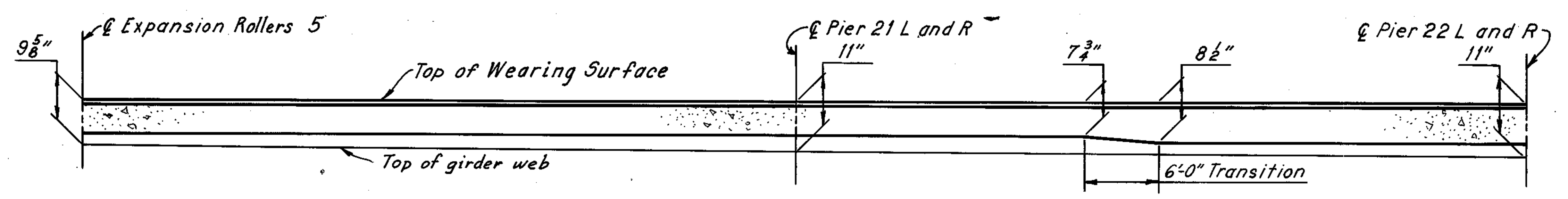
Note:
A typical haunch width of 9" shall be used for computing quantity of concrete. However, the haunch width may vary between 6" and 12" provided that the slope shall be not more than 1:4 for a haunch less than 9" in width.



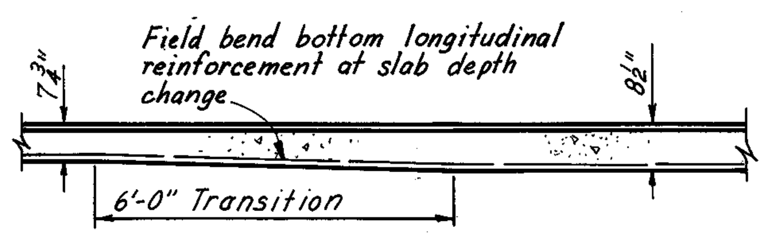
TYPICAL CROSS SECTION UNIT 6R



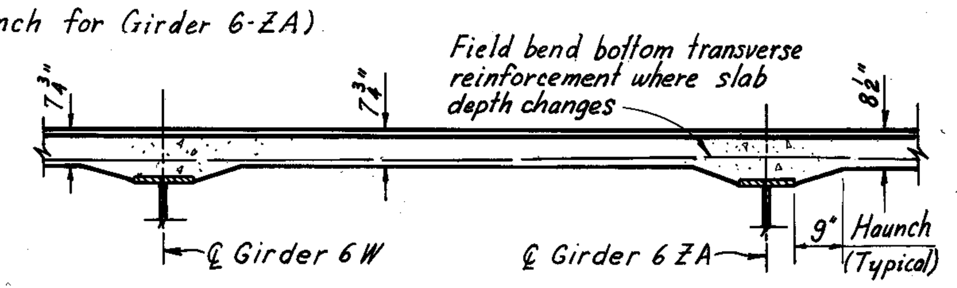
PLAN



HAUNCH TRANSITION, GIRDERS ZB THRU ZD
(Use constant 9⅝" haunch for Girder 6-Z and 11" haunch for Girder 6-ZA)

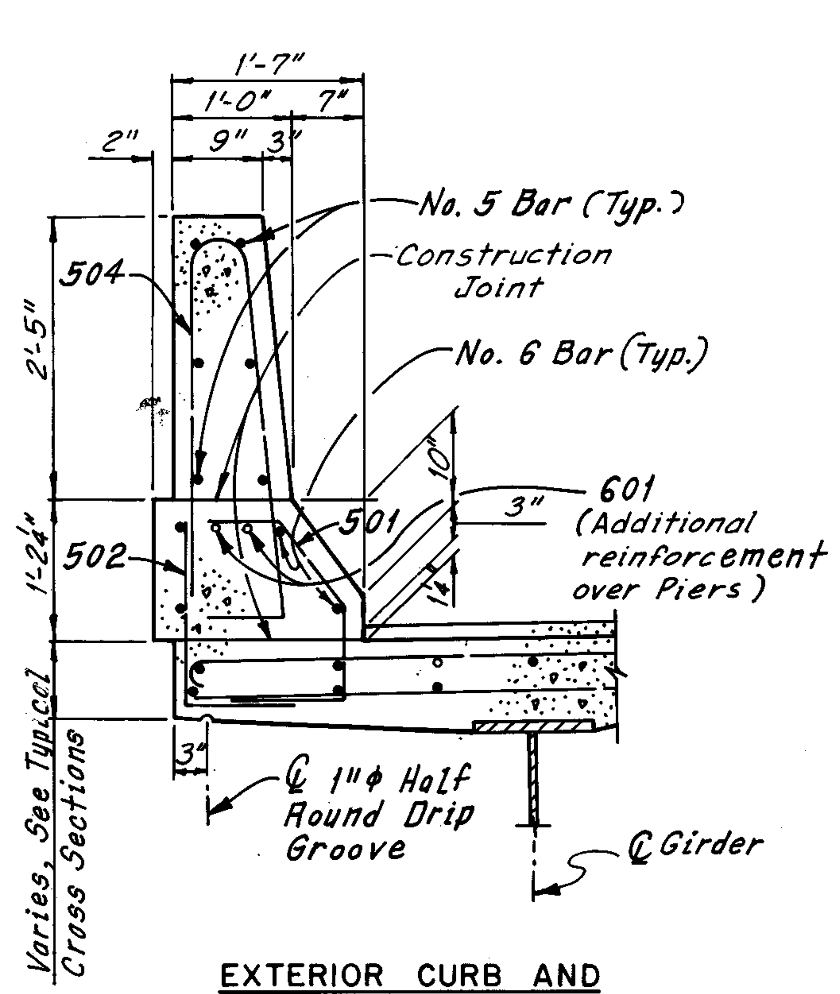


SECTION A-A

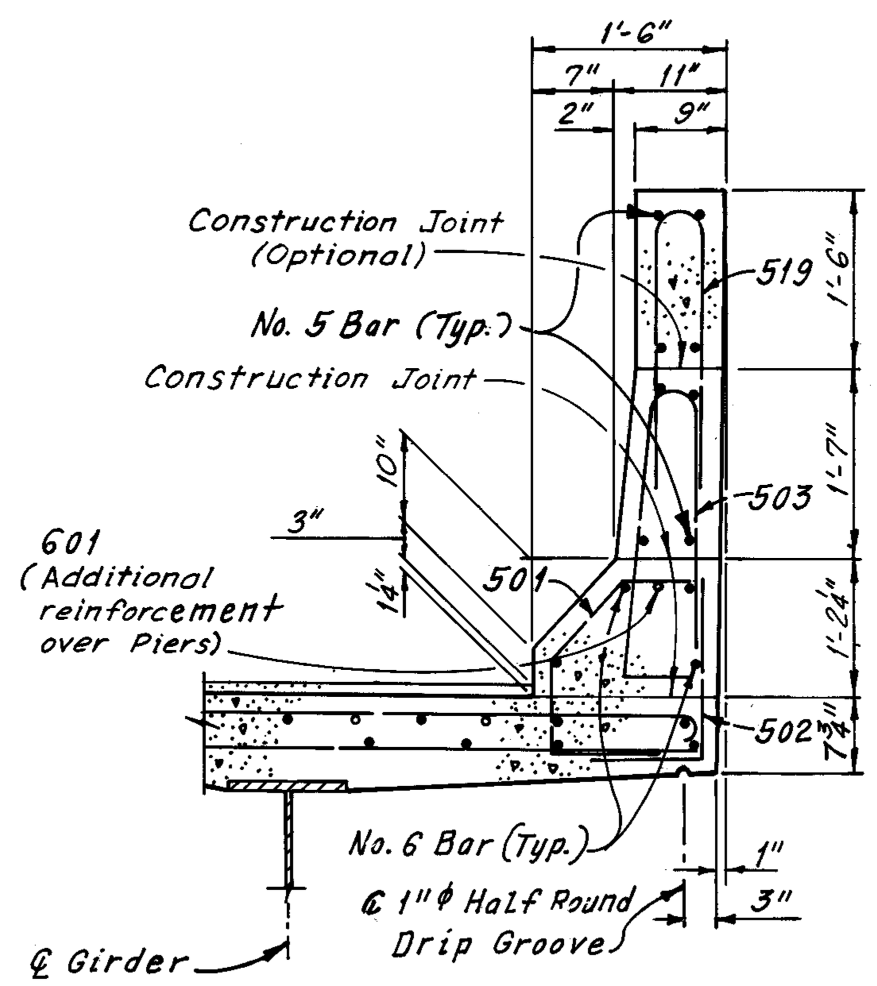


SECTION B-B

SLAB DEPTH TRANSITION DETAILS



EXTERIOR CURB AND PARAPET DETAIL
(4'-0" Chain Link fence not shown)



MEDIAN CURB AND PARAPET DETAIL

Notes:
For Fence Details, see Sheet 105/108.
For Elevations A thru F, see Sheet 90/108.

Revised 12-24-86

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

TYPICAL CROSS SECTIONS
UNIT 6

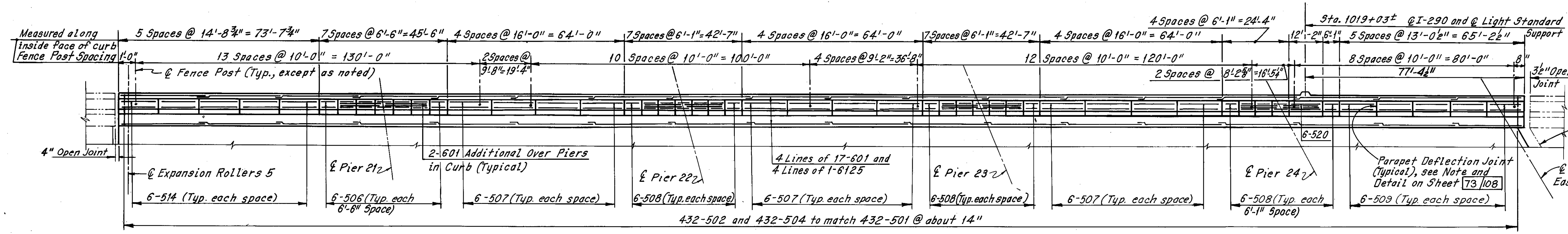
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN K.Y.H.	TRACED H.C.H.	CHECKED J.W.	REVIEWED C.A.B.	REVISED
DATE 10-6-69	DATE 11-1-69	DATE 11-18-69	DATE 2-24-86	SHEET 88/108

CUYAHOGA COUNTY
CUY-290-0.27

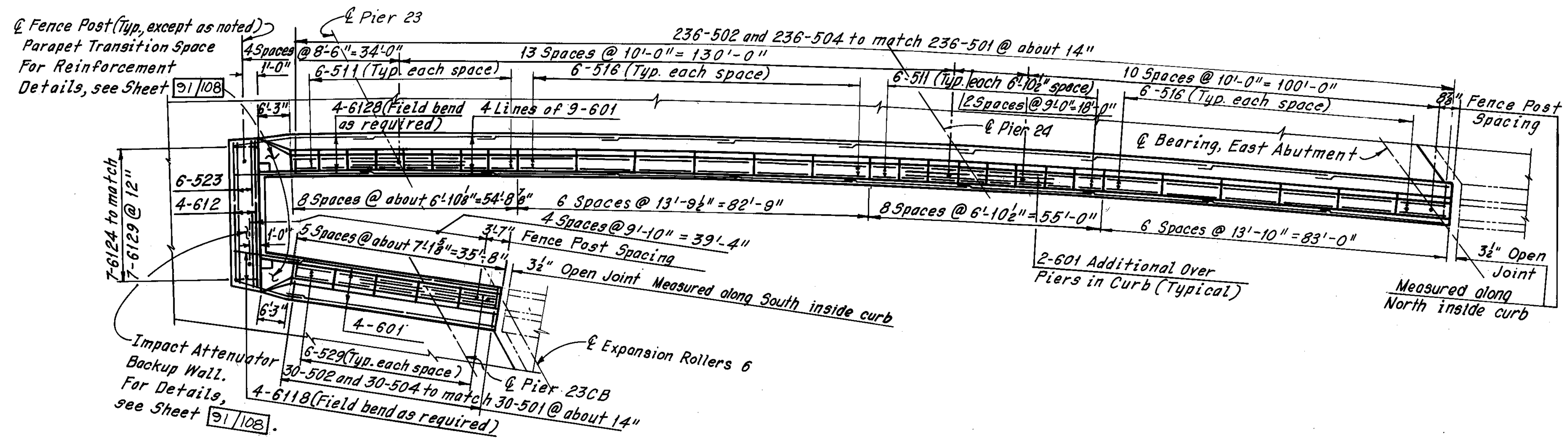


NORTH CURB AND PARAPET PLAN

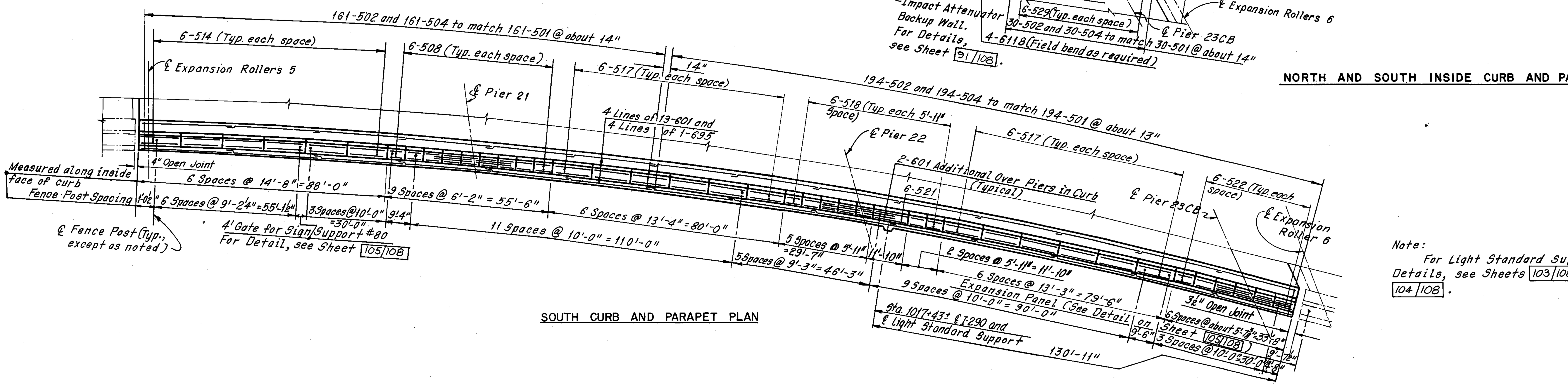
MEDIAN CURB AND PARAPET PLAN
(Reinforcement is typical for both sides of ℄ I-290, except as noted)

Note: All reinforcing bar marks shall be prefixed ESF.

Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.



NORTH AND SOUTH INSIDE CURB AND PARAPET PLAN



SOUTH CURB AND PARAPET PLAN

Note:
For Light Standard Support Details, see Sheets 103/108 and 104/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

CURB AND PARAPET PLANS
UNIT 6

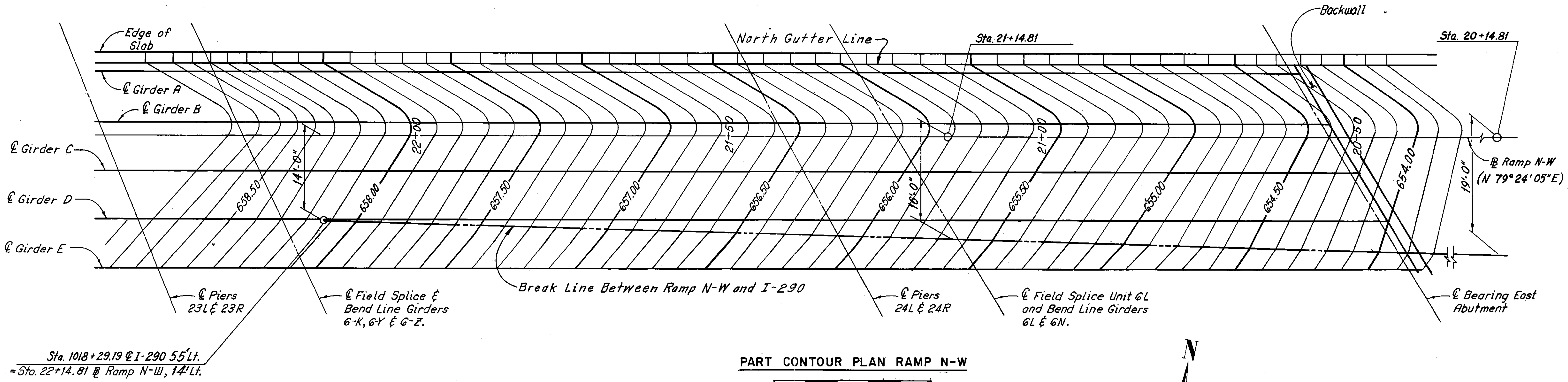
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA.985+85.75 TO STA.1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

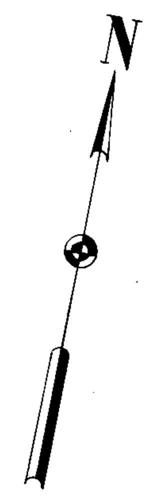
DRAWN KYH	TRACED JSC	CHECKED JJW	REVIEWED C.A.B.	REVISED
DATE 10-6-69	DATE 11-3-69	DATE 11-20-69	DATE 12-24-69	SHEET 89/108

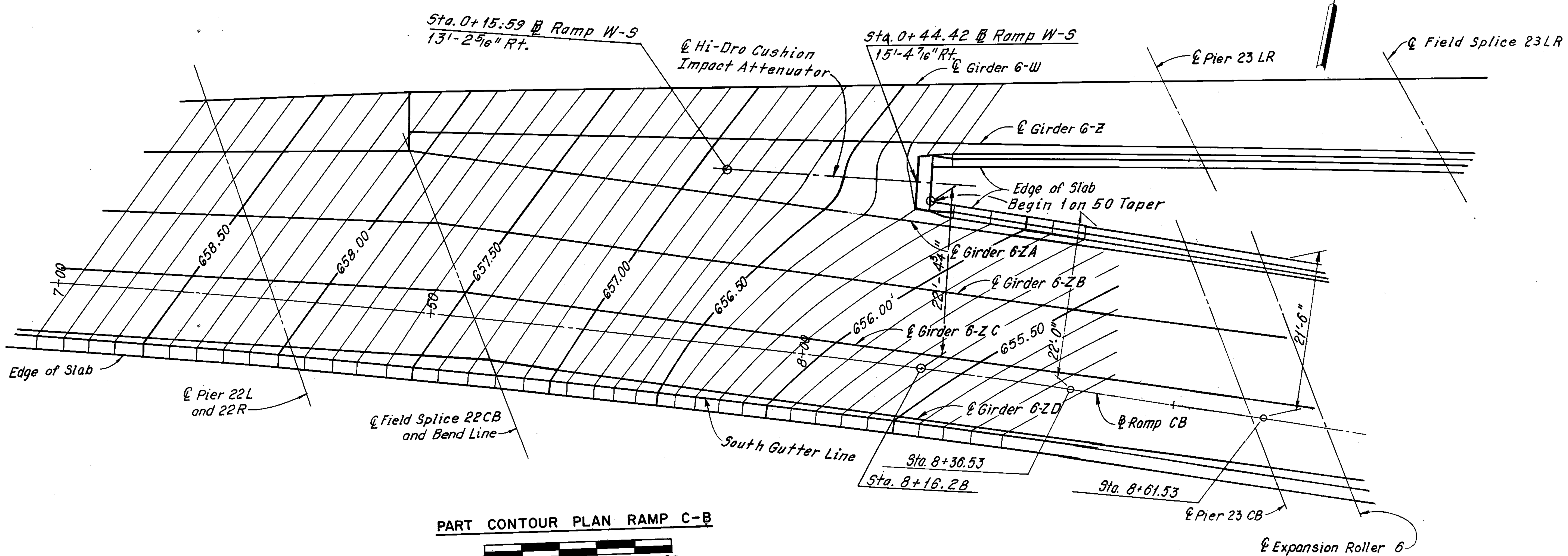
CUYAHOGA COUNTY
CUY-290-0.27



PART CONTOUR PLAN RAMP N-W

0 5 10 15 20 25
SCALE





PART CONTOUR PLAN RAMP C-B

0 5 10 15 20 25
SCALE

Note:
For location of Elevations A thru F see Sheet 88/108.

TOP OF PORTLAND CEMENT CONCRETE ELEVATIONS

	℄Roller 5L and R	0.2	0.4	0.6	0.8	℄Pier 21L and R	0.2	0.4	0.6	0.8	℄Pier 22L and R	0.2	0.4	0.6	0.8	℄Pier 23L and R or ℄Pier 23 CB	0.2	0.4	0.6	0.8	℄Pier 24L and R	0.2	0.4	0.6	0.8	℄ Bearing East Abutment or ℄Roller E.J.6
Elevation A	667.11	666.57	665.99	665.38	664.75	664.21	663.69	663.19	662.66	662.12	661.58	661.07	660.58	660.06	659.51	658.98	658.42	657.86	657.35	656.80	656.27	655.86	655.47	655.08	654.65	654.16
Elevation B	665.66	665.21	664.70	664.15	663.57	663.01	662.43	661.86	661.26	660.63	660.01	659.44	658.86	658.25	657.60	656.96	656.36	655.76	655.13	654.47	653.83	653.36	652.90	652.41	651.90	651.35
Elevation C	665.65	665.20	664.68	664.14	663.56	662.99	662.41	661.83	661.23	660.60	659.97	659.39	658.81	658.19	657.54	656.90	656.30	655.70	655.07	654.40	653.74	653.26	652.79	652.31	651.80	651.26
Elevation D	-	-	-	-	-	-	-	-	-	-	-	*656.92	*656.49	*656.04	*655.60	655.17	654.49	653.82	653.08	652.29	651.50	650.95	650.40	649.82	649.19	648.50
Elevation E	-	-	-	-	-	-	-	-	-	-	-	†656.97	†656.56	†656.15	†655.86	655.39	-	-	-	-	-	-	-	-	-	655.15
Elevation F	664.57	664.05	663.48	662.85	662.18	661.52	660.81	660.11	659.37	658.59	657.84	657.19	656.39	655.61	654.85	654.22	-	-	-		-	-	-	-	-	654.01

Note:
The top of Portland Cement Concrete elevations shown at the gutter lines 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 and wearing surface.

* Elevations at 16'-1½" intervals measured from ℄ Pier 23R along South Curb of Ramp W-S.
† Elevation at 15'-9⅞" intervals measured from ℄ Pier 23CB along North Curb of Ramp CB.

H.N.T.B. BR.NO. 9 PART II - SUPERSTRUCTURE

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

MISCELLANEOUS SLAB DETAILS UNIT 6

I-290 OVER CUYAHOGA RIVER

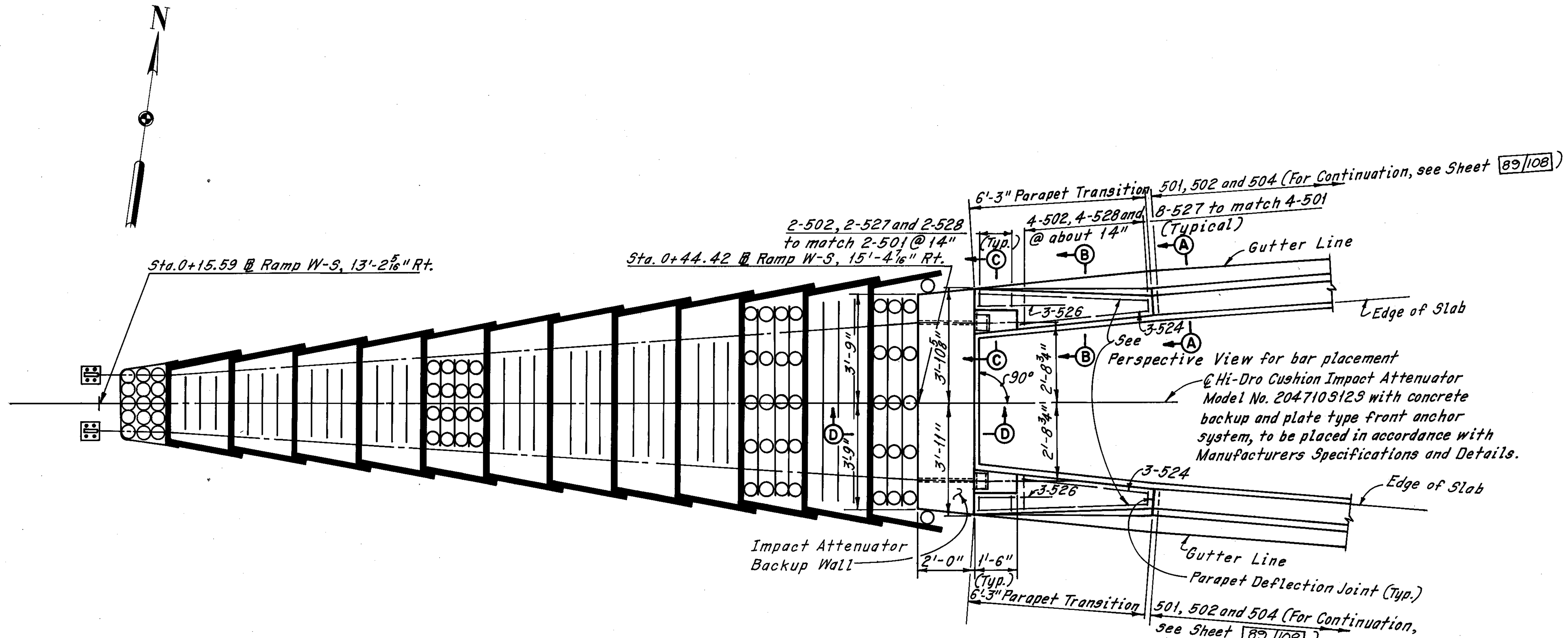
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

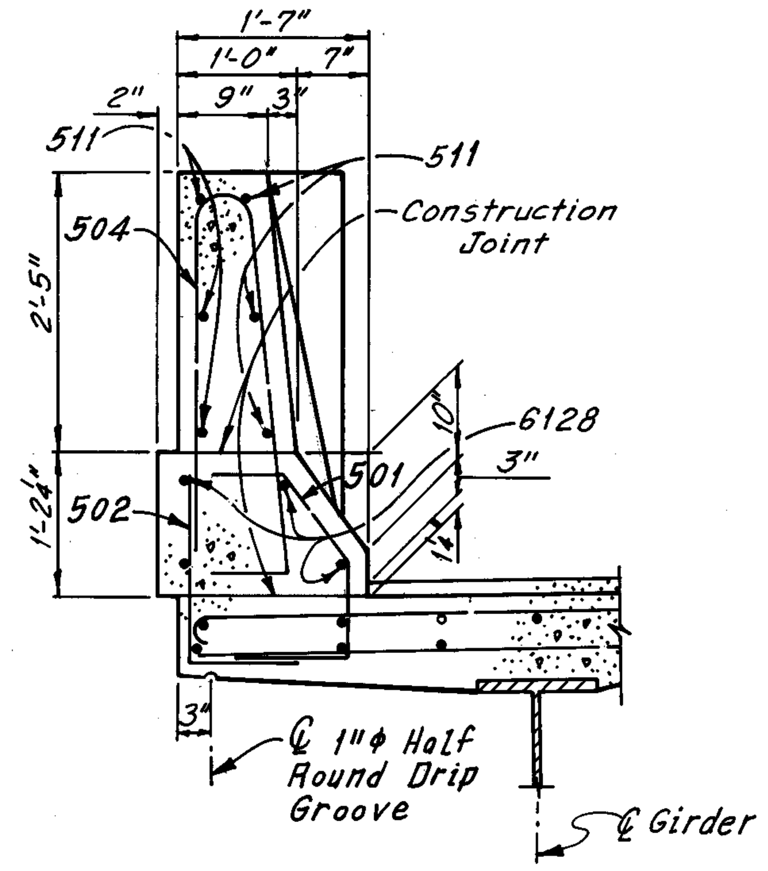
DRAWN K.Y.H.	TRACED J.S.C.	CHECKED J.W.	REVIEWED C.A.B.	REVISED
DATE 2-9-70	DATE 2-24-70	DATE 2-11-70	DATE 2-24-86	SHEET 90/108

FHWA REGION	STATE	PROJECT	
2	OHIO		

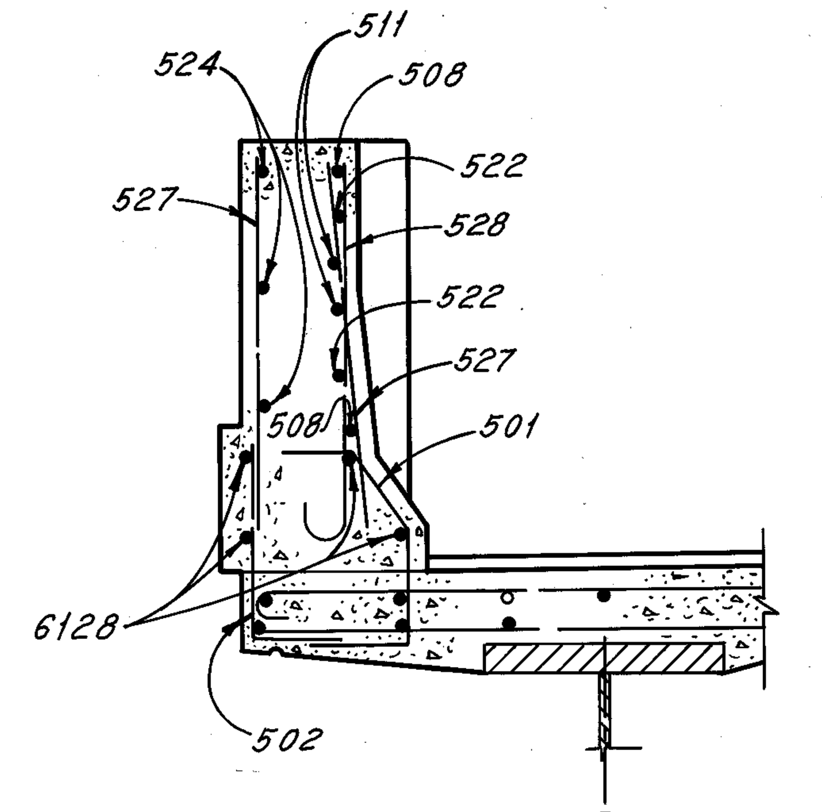
CUYAHOGA COUNTY
CUY- 290-027



PLAN



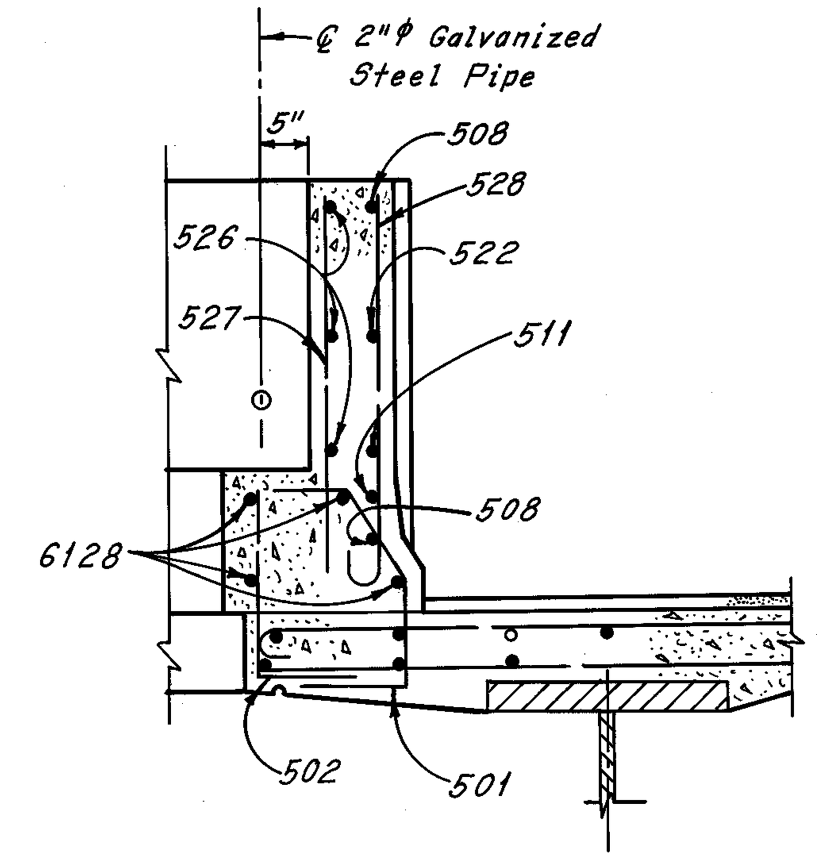
SECTION A-A



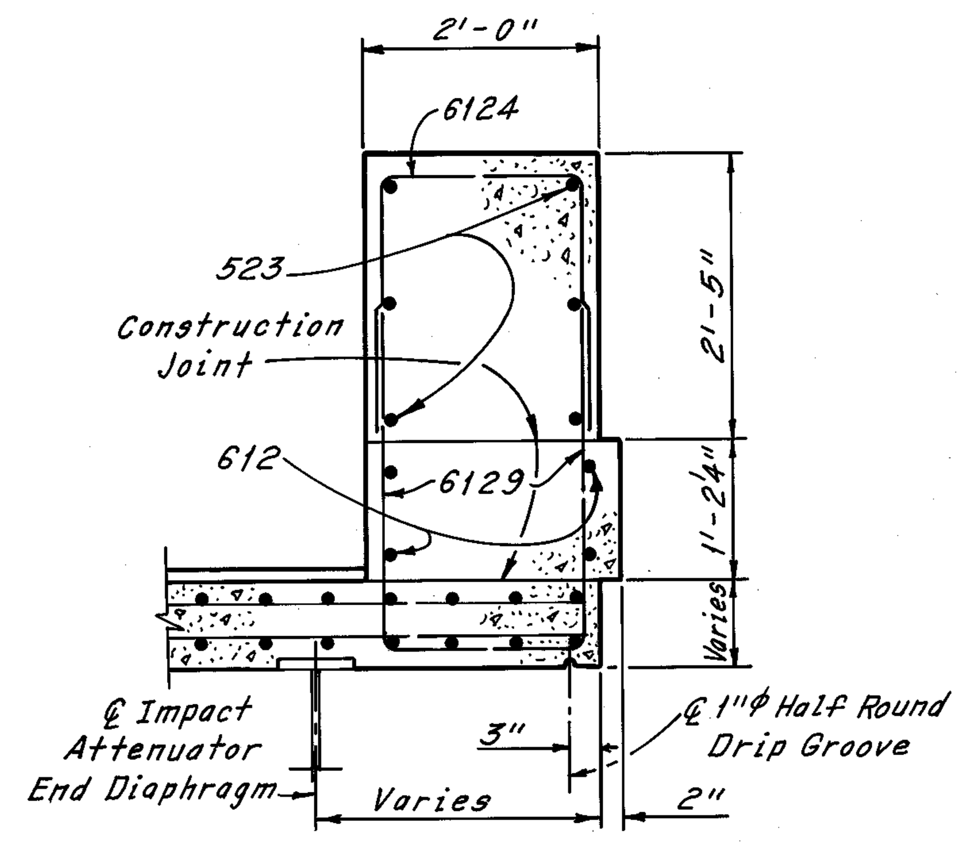
SECTION B-B

Note: All reinforcing bar marks shall be prefixed ESF.

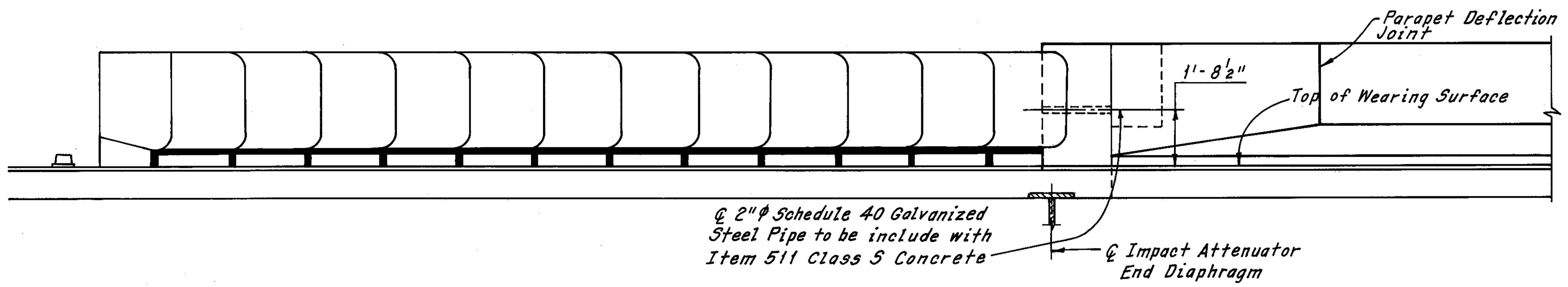
Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.



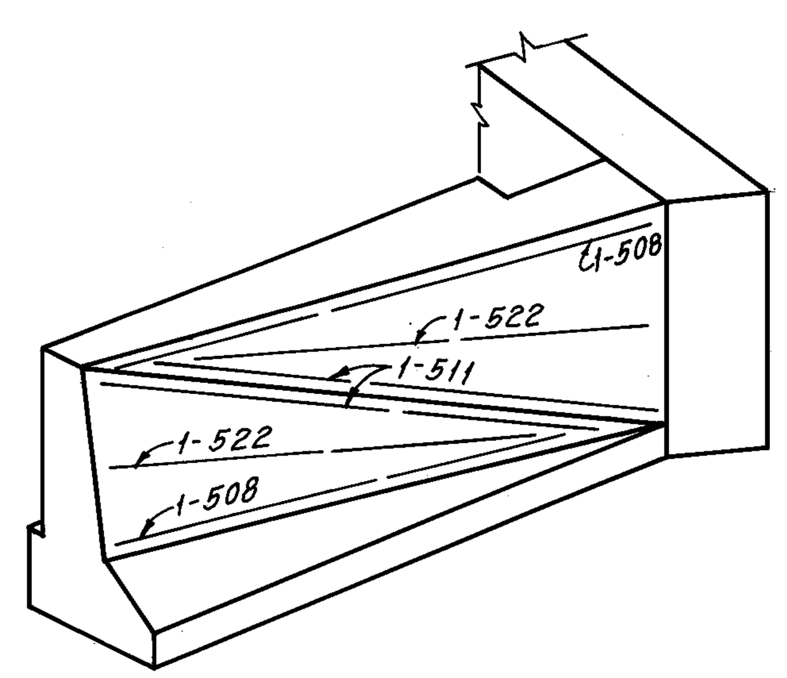
SECTION C-C



SECTION D-D



ELEVATION



PERSPECTIVE VIEW OF PARAPET TRANSITION SPACE

Notes:
For Fence Post Locations, see Sheet 89/108.
For reinforcement in Impact Attenuator Backup Wall, see Sheet 89/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

IMPACT ATTENUATOR

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN B.B. DATE 9-25-85	TRACED C.P. DATE 1-23-86	CHECKED C.P. DATE 10-16-85	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 91/108

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

177/193

CUYAHOGA COUNTY
CUY-290-0.27

Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.

Notes:

For longitudinal reinforcement spacing, additional reinforcement over the piers, Sections A-A and B-B and for Details A and B see Sheet 93/108.

For roadway end dam and curb plate details at Expansion Joint 6 see Sheet 53/108. For roadway end dam and curb plate details at Abutment CB see Ohio Standard Drawing SD-1-69, Sheets 1 and 2 of 4.

The following abbreviations are used:

(B) = Bottom
(T) = Top

For Light Standard Support Details see Sheet 104/108.

H.N.T.B. BR. NO. 9 — PART II - SUPERSTRUCTURE

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

UNIT 6CB
SLAB PLAN

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 — STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

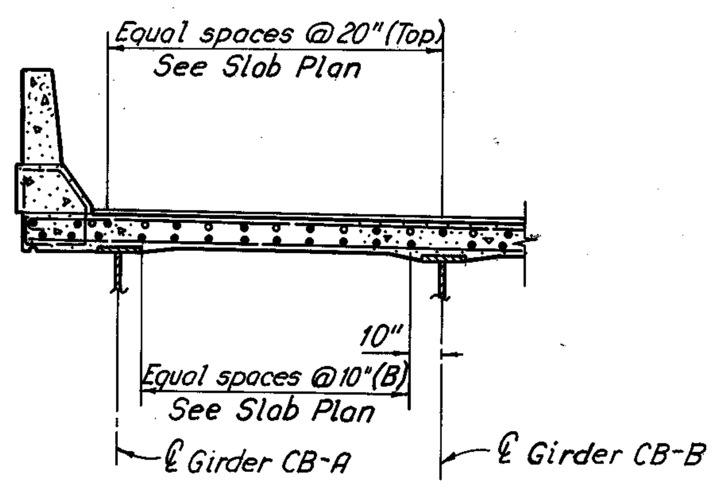
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN DLR DATE 10-15-69	TRACED DLR DATE 10-18-69	CHECKED DATE 11-26-69	REVIEWED C.A.B. DATE 2-24-70	REVISED	SHEET 92/108

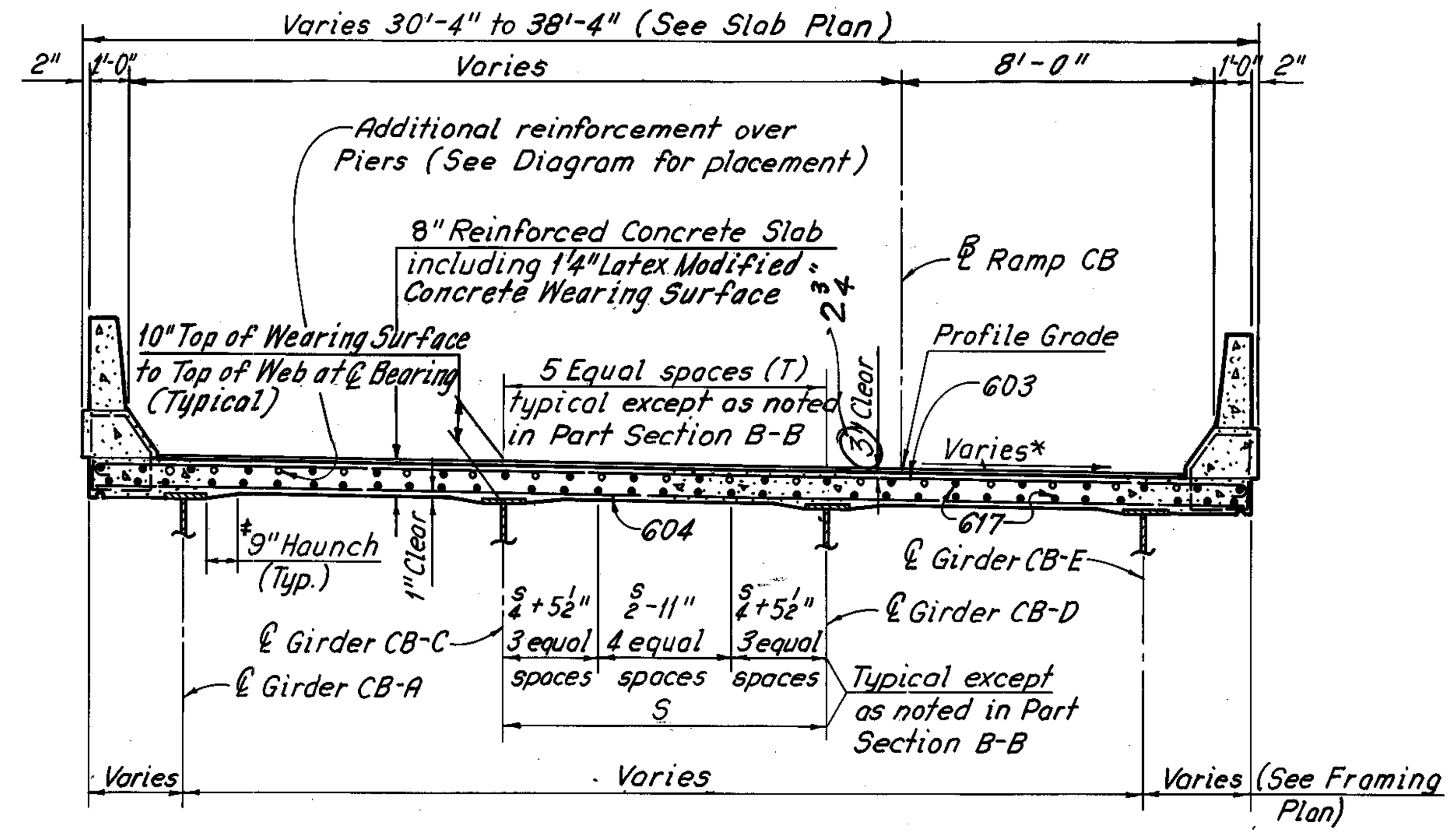
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

178/193

CUYAHOGA COUNTY
CUY-290-0.27

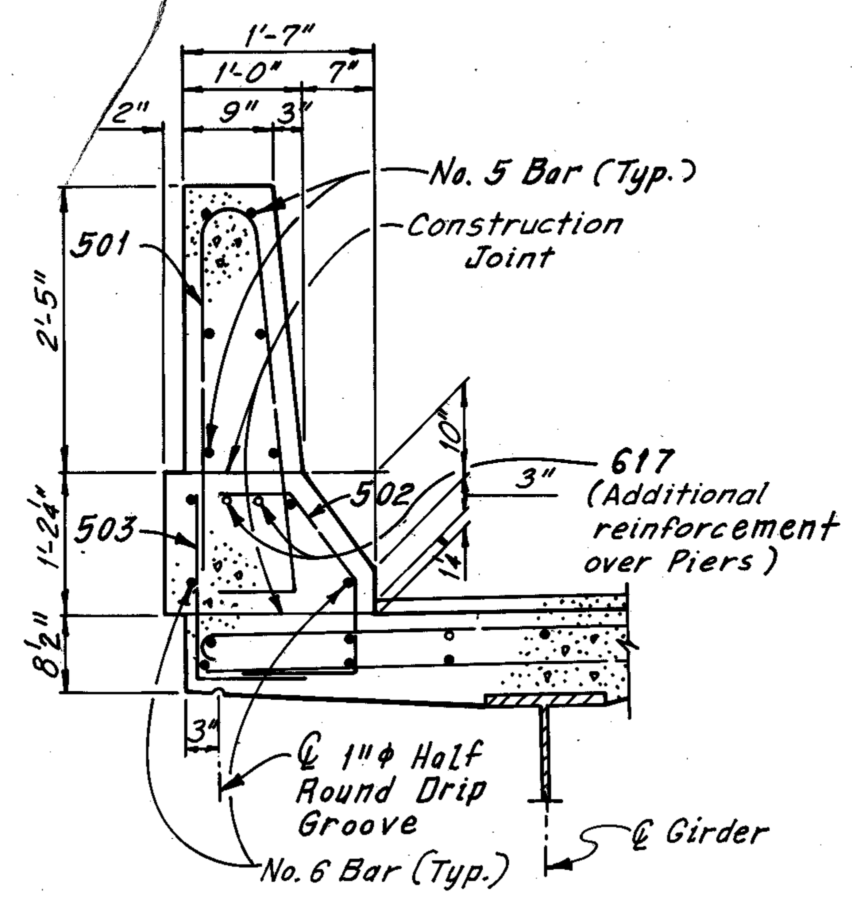


PART SECTION B-B
(For additional details see Section A-A)



SECTION A-A

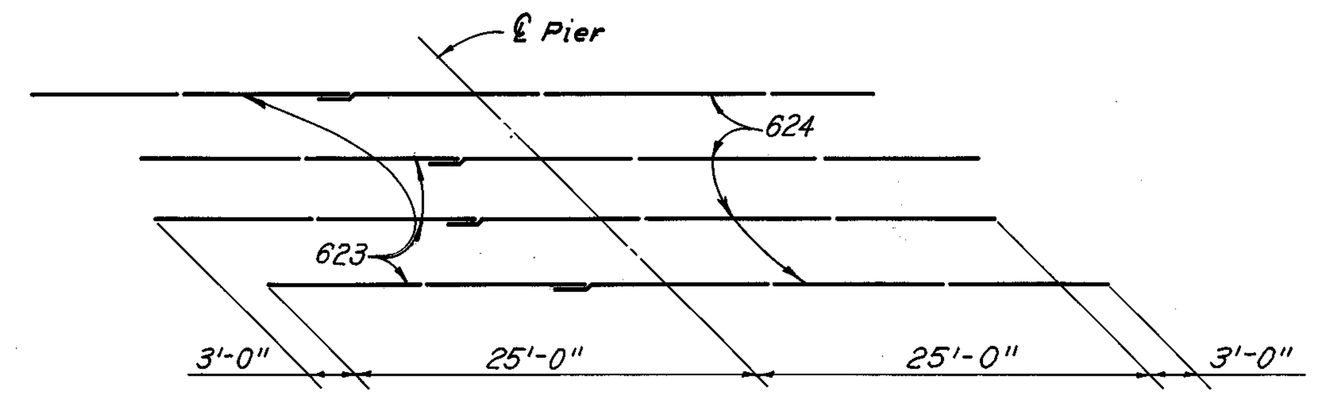
* See Superelevation Transition Diagram Sheet 94/108



EXTERIOR CURB AND PARAPET DETAIL
(4'-0" Chain Link fence not shown)

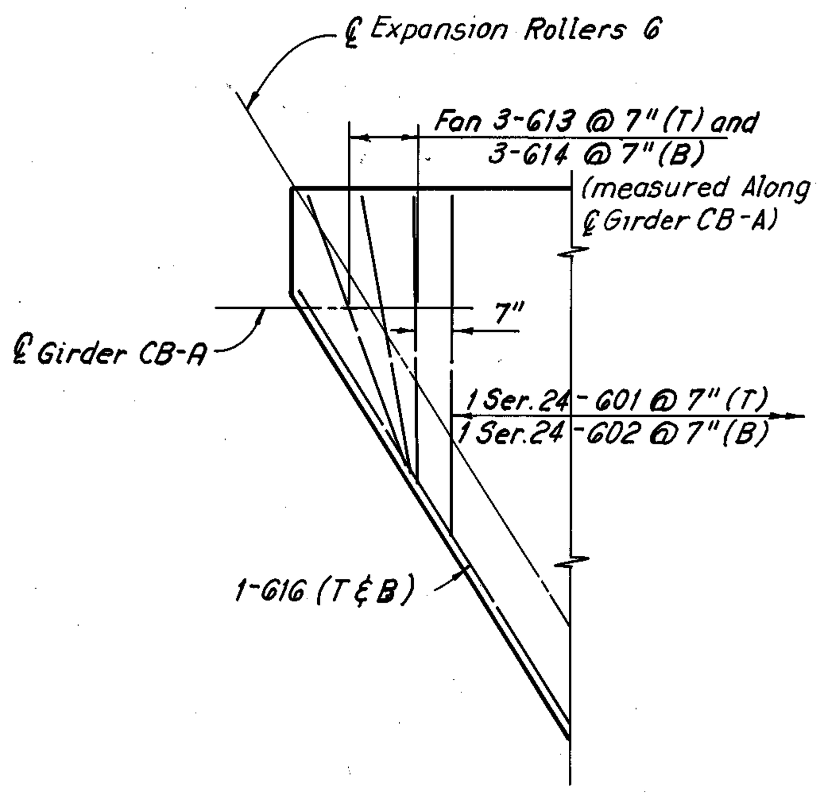
†Note:
A typical haunch width of 9" shall be used for computing quantity of concrete. However, the haunch width may vary between 6" and 12" provided that the slope shall be not more than 1:4 for a haunch less than 9" in width.

Note: All reinforcing bar marks shall be prefixed E96.

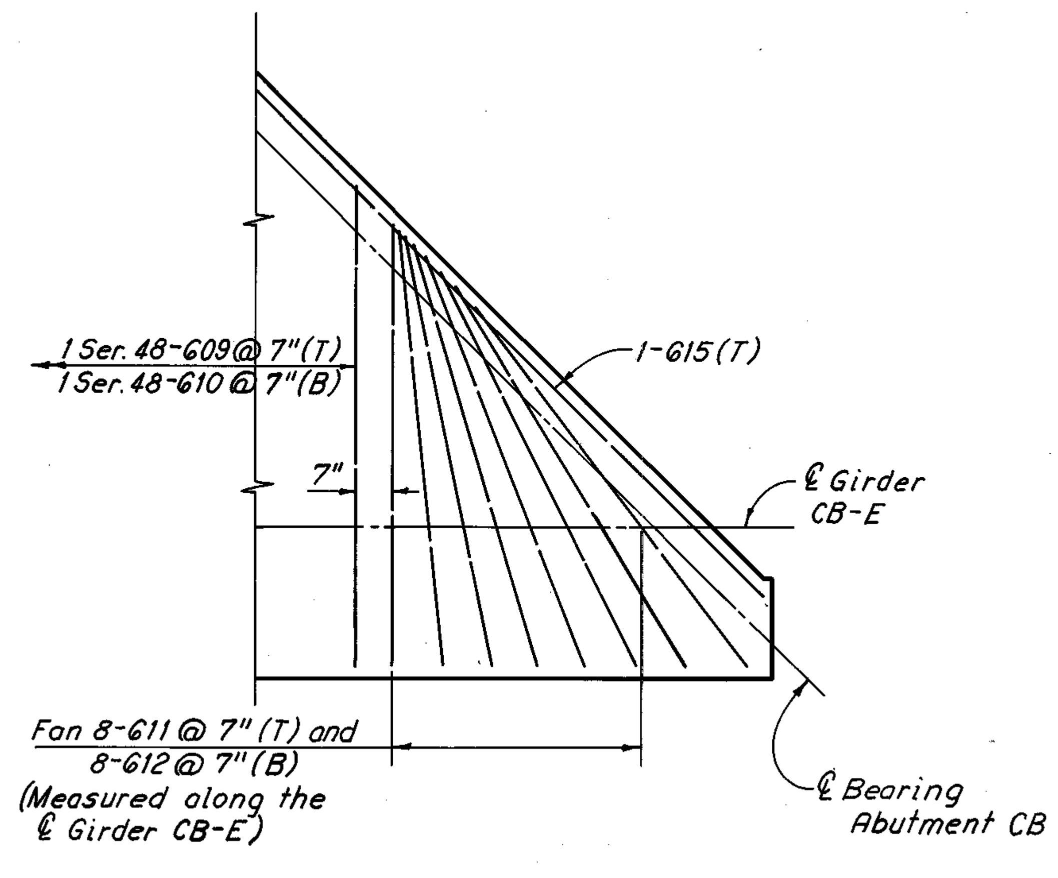


PLACEMENT OF 623 AND 624 BARS OVER PIERS 25CB, 26CB AND 27CB

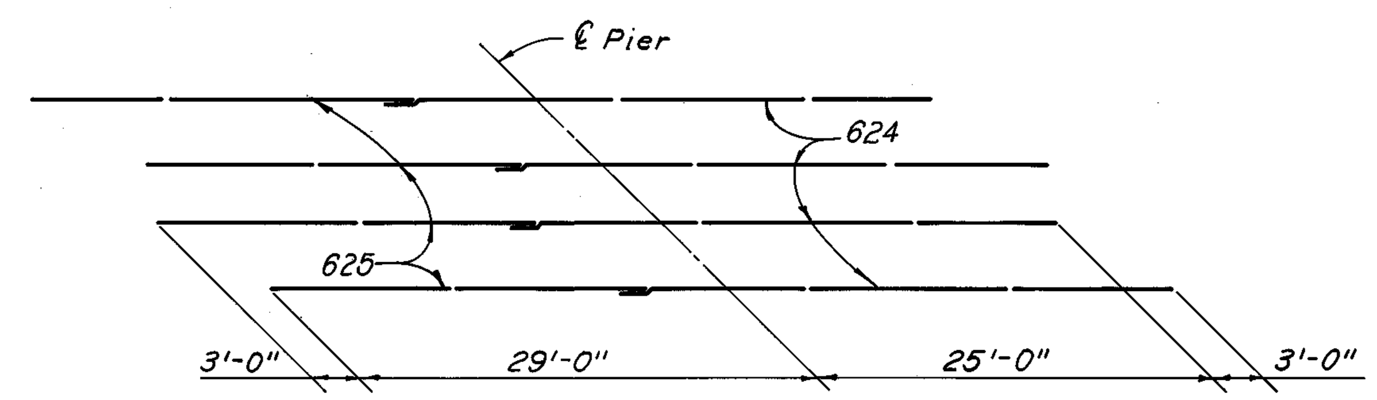
Note:
Required reinforcing bar lap lengths shall be 30 bar diameters minimum.



DETAIL "A"



DETAIL "B"



PLACEMENT OF 624 AND 625 BARS OVER PIER 24CB

Note:
For location of Sections A-A and B-B and Details A-A and B-B see Sheet 92/108.
The following abbreviations are used:
(T) = Top
(B) = Bottom
For Fence Details, see Sheet 105/108.

TOP OF PORTLAND CEMENT CONCRETE ELEVATIONS AT GUTTER LINE

Curb	℄ Exp. Rollers 6	.2	.4	.6	.8	℄ Pier 24 CB	.2	.4	.6	.8	℄ Pier 25 CB	.2	.4	.6	.8	℄ Pier 26 CB	.2	.4	.6	.8	℄ Pier 27 CB	1/4	1/2	3/4	℄ Brg. Abut. CB.
North	655.15	654.84	654.58	654.37	654.28	654.34	654.55	654.71	654.83	655.00	655.29	655.77	656.47	657.24	658.10	659.06	660.03	661.01	661.98	662.94	663.90	664.90	665.88	666.81	667.70
South	654.01	653.77	653.58	653.41	653.29	653.26	653.43	653.79	654.22	654.72	655.31	656.05	656.88	657.79	658.74	659.71	660.74	661.78	662.77	663.73	664.70	665.68	666.68	667.63	668.54

Note:
The top of Portland Cement Concrete elevations shown at the gutter lines 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 and wearing surface.

Revised 12-24-86

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

UNIT 6CB
TYPICAL CROSS SECTION

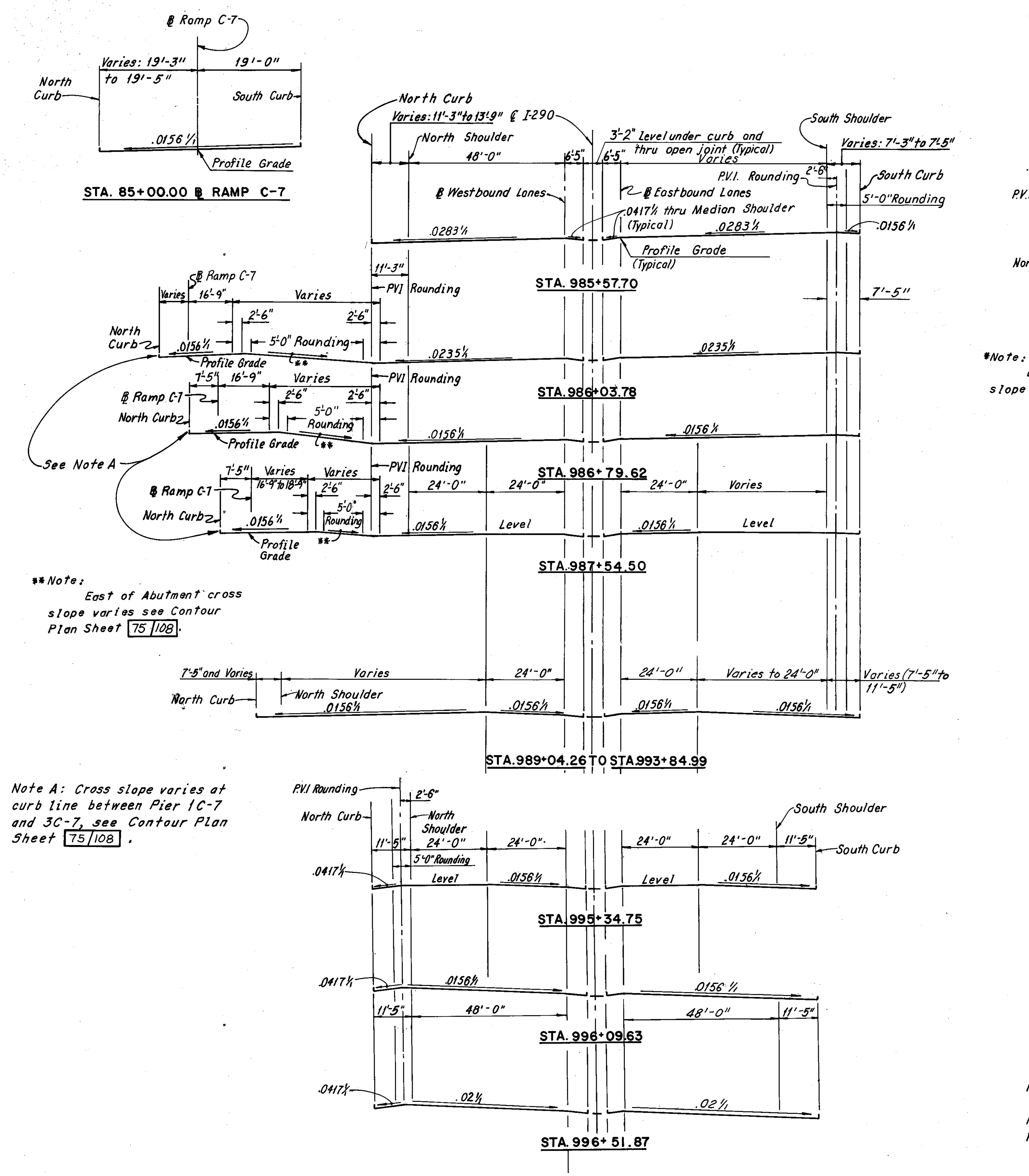
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

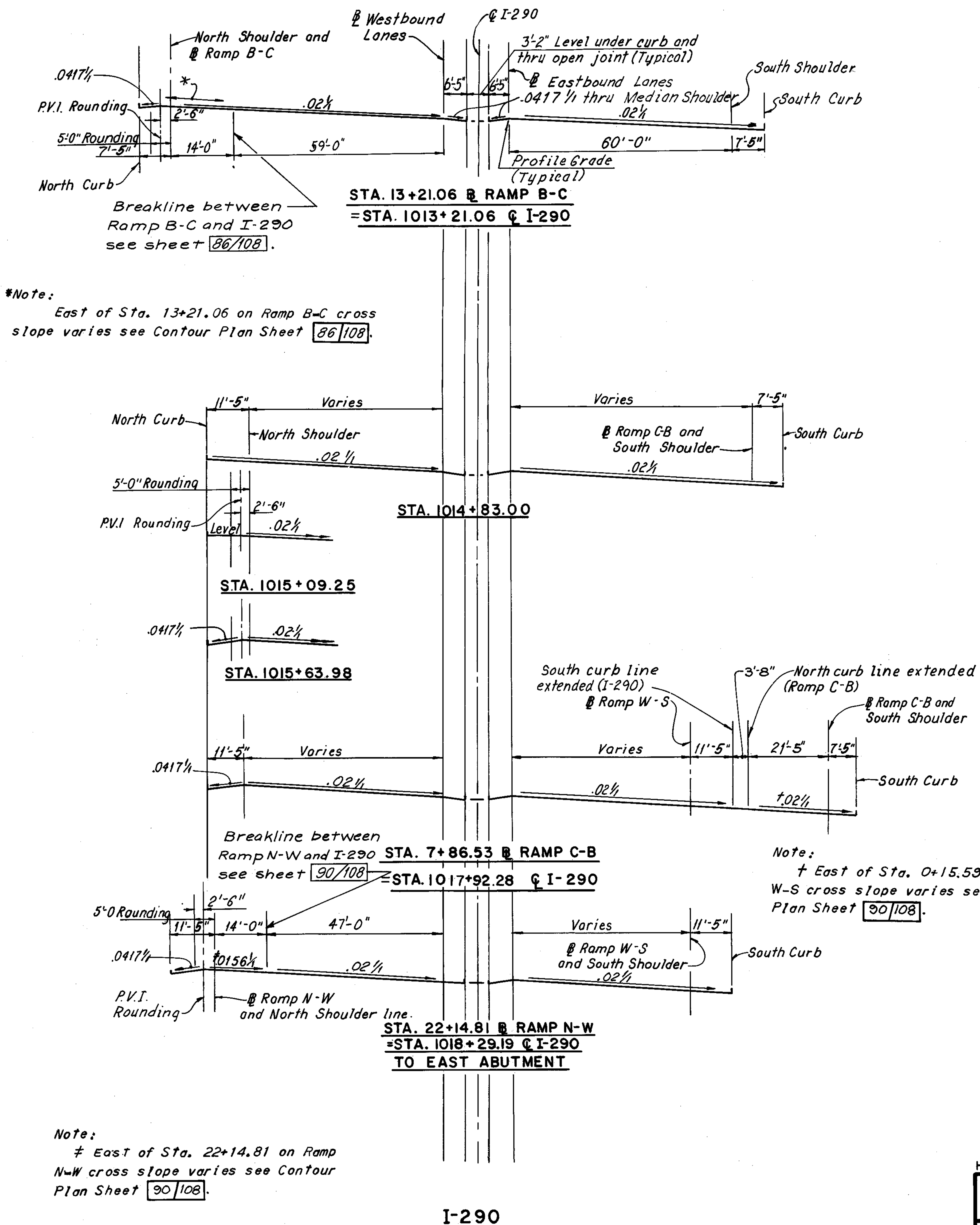
DRAWN D.L.R. DATE 10-15-69	TRACED D.L.R. DATE 10-18-69	CHECKED M.B. DATE 11-26-69	REVIEWED C.A.B. DATE 2-24-86	REVISED

CUYAHOGA COUNTY
CUY-290-0.27



**Note:
East of Abutment cross slope varies see Contour Plan Sheet 75/108.

Note A: Cross slope varies at curb line between Pier 1C-7 and 3C-7, see Contour Plan Sheet 75/108.

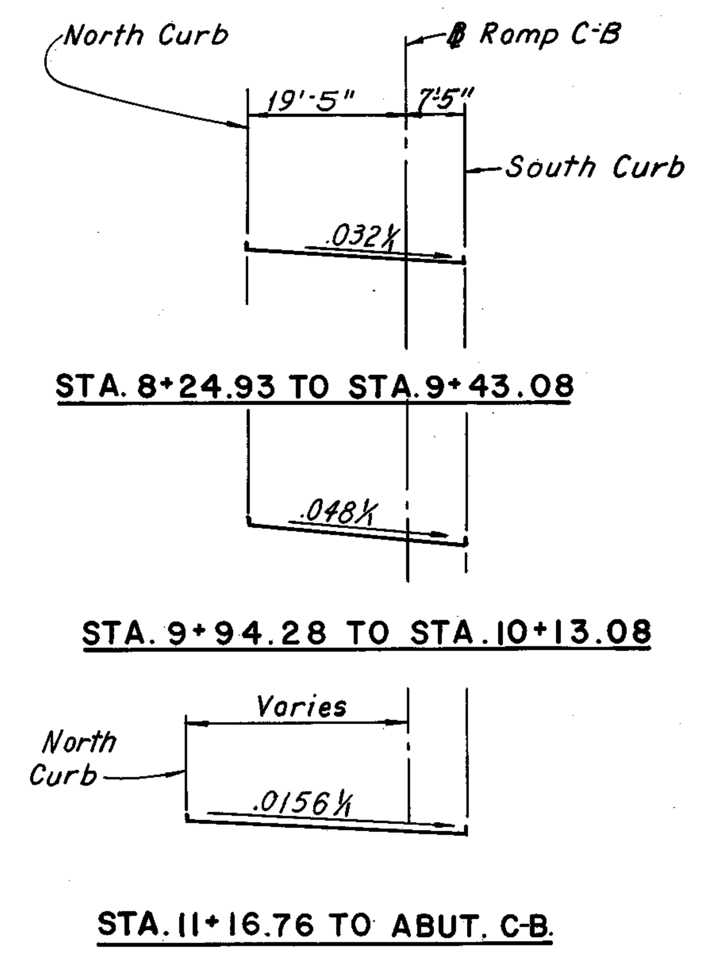


Breakline between Ramp B-C and I-290 see sheet 86/108.

*Note:
East of Sta. 13+21.06 on Ramp B-C cross slope varies see Contour Plan Sheet 86/108.

Note:
† East of Sta. 0+15.59 ℄ Ramp W-S cross slope varies see Contour Plan Sheet 90/108.

Note:
‡ East of Sta. 22+14.81 on Ramp N-W cross slope varies see Contour Plan Sheet 90/108.



RAMP C-B

Note:
The Superelevation Transition Diagrams are not intended to locate slab width transition points: see individual unit slab plan and cross section Sheets.
The rate of superelevation transition between above stations is uniform except in areas of Contour Plans.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

SUPERELEVATION TRANSITION DIAGRAMS

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110

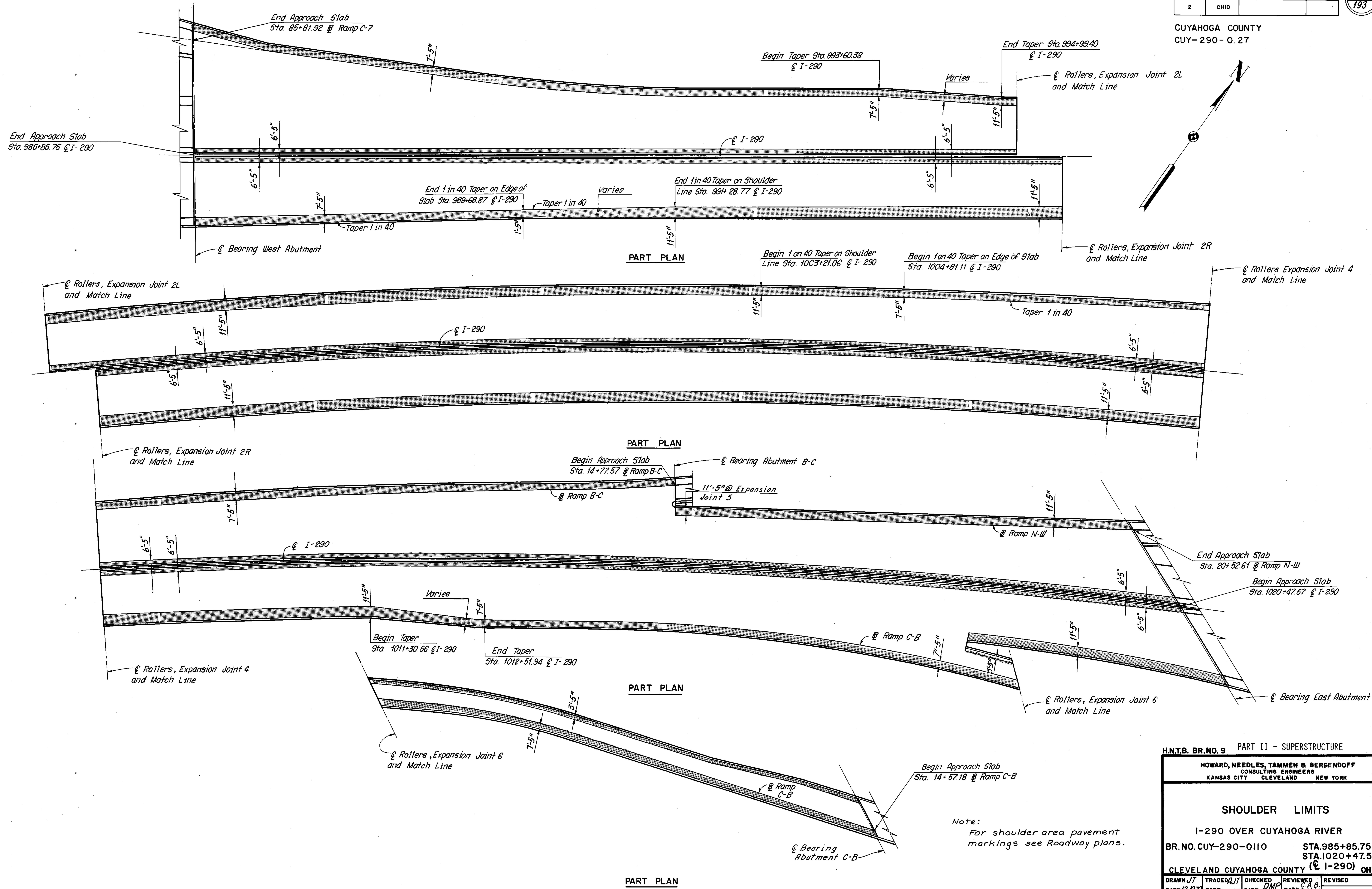
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN RAB	TRACED MCH	CHECKED KYH	REVIEWED C.A.B.	REVISED
DATE 12-22-69	DATE 1-10-70	DATE 2-10-70	DATE 2-24-36	SHEET 94/108

FED.RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY-290-0.27



Note:
For shoulder area pavement markings see Roadway plans.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

SHOULDER LIMITS

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

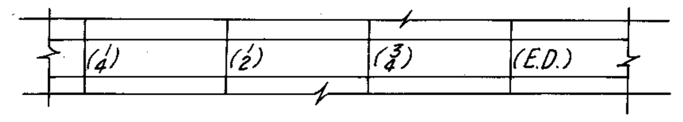
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN JT	TRACED AJT	CHECKED DMP	REVIEWED C.A.B.	REVISED
DATE 12-18-70	DATE 12-24-70	DATE 12-24-70	DATE 2-24-86	

CUYAHOGA COUNTY
CUY-290-0.27

TOP OF PAVEMENT ELEVATIONS - UNIT 1

Beam	℄ Brg. W. Abut.	¼	½	¾	℄ Piers 1LR and 1C7	¼	½	¾	℄ Piers 2LR and 2C7	¼	½	¾	℄ Piers 3LR and 3C7	¼	½	¾	℄ Exp. Joint 1	Beam
A	653.43	653.20	653.01	652.84	652.72	652.61	652.53	652.50	652.48	652.52	652.64	652.82	653.05	653.27	653.51	653.79	654.10	A
B	653.54	653.30	653.10	652.93	652.79	(ED)652.66	—	—	—	—	—	—	—	—	—	—	—	B
C	653.65	653.40	653.19	653.01	652.86	652.72	652.63	652.60	652.61	652.68	652.80	652.97	653.20	653.42	653.67	653.95	654.26	C
D	653.75	653.51	653.30	653.12	652.98	652.84	652.76	652.72	652.74	652.81	652.94	653.11	653.35	653.57	653.82	654.11	654.43	D
E	653.86	653.62	653.41	653.24	653.09	652.96	652.88	652.85	652.87	652.95	653.08	653.26	653.49	653.72	653.98	654.27	654.60	E
EA	652.56	652.69	652.80	652.89	652.80	652.49	652.37	652.40	652.53	652.75	652.94	653.17	653.41	653.58	653.80	654.00	(ED)654.24	EA
EB	651.07	651.29	651.50	651.68	651.64	651.55	651.55	651.71	(ED)651.90	—	—	—	—	—	—	—	—	EB
EC	649.57	649.85	650.11	650.36	650.56	650.76	651.09	651.55	651.90	652.24	652.60	652.90	(ED)653.15	—	—	—	—	EC
ED	648.08	648.57	649.00	649.38	649.69	650.01	650.47	650.95	651.43	651.86	652.33	652.82	653.19	653.52	653.88	654.23	654.60	ED
F	646.98	647.42	647.86	648.30	648.75	649.31	649.86	650.41	650.95	651.49	652.03	652.55	653.06	653.45	653.85	654.24	654.63	F
G	647.18	647.61	648.04	648.47	648.90	649.45	649.99	650.54	651.08	651.62	652.15	652.67	653.18	653.58	653.97	654.36	654.76	G
H	647.38	647.80	648.22	648.64	649.06	649.59	650.12	650.66	651.20	651.74	652.27	652.80	653.30	653.70	654.09	654.48	654.88	H
J	647.58	647.99	648.39	648.80	649.21	649.73	650.25	650.78	651.32	651.86	652.39	652.92	653.42	653.82	654.21	654.61	655.00	J
K	647.78	648.18	648.57	648.97	649.36	649.87	650.38	650.91	651.44	651.98	652.52	653.04	653.55	653.94	654.33	654.73	655.12	K
L	647.98	648.36	648.75	649.13	649.52	650.01	650.51	651.01	651.53	652.06	652.57	653.08	653.58	653.97	654.35	654.74	655.13	L
M	648.18	648.55	648.93	649.30	649.67	650.15	650.63	651.12	651.61	652.10	652.60	653.08	653.56	653.94	654.32	654.69	655.07	M
N	648.38	648.74	649.10	649.46	649.83	650.29	650.75	651.22	651.68	652.15	652.62	653.08	653.55	653.91	654.28	654.64	655.01	N
P	648.25	648.61	648.98	649.34	649.71	650.17	650.63	651.08	651.54	651.99	652.45	652.91	653.36	653.72	654.08	654.44	654.80	P
Q	648.31	648.66	649.01	649.37	649.72	650.18	650.63	651.08	651.54	651.99	652.45	652.91	653.36	653.72	654.08	654.44	654.80	Q
R	648.59	648.94	649.29	649.64	649.99	650.43	650.88	651.33	651.78	652.24	652.69	653.15	653.60	653.96	654.32	654.68	655.04	R
S	648.82	649.15	649.49	649.82	650.16	650.59	651.02	651.47	651.92	652.37	652.83	653.28	653.73	654.09	654.45	654.81	655.17	S
T	649.05	649.37	649.69	650.01	650.33	650.75	651.17	651.60	652.05	652.50	652.96	653.41	653.86	654.22	654.58	654.94	655.30	T
U	649.27	649.58	649.89	650.20	650.51	650.90	651.30	651.72	652.15	652.58	653.02	653.46	653.90	654.26	654.61	654.97	655.32	U
V	649.50	649.79	650.09	650.38	650.68	651.06	651.44	651.83	652.23	652.64	653.04	653.46	653.89	654.23	654.57	654.92	655.26	V
W	649.72	650.00	650.28	650.57	650.85	651.21	651.58	651.94	652.31	652.69	653.07	653.46	653.87	654.20	654.53	654.86	655.20	W
X	649.95	650.22	650.48	650.75	651.02	651.37	651.71	652.05	652.40	652.74	653.09	653.46	653.85	654.17	654.49	654.81	655.14	X
Y	650.03	650.29	650.55	650.82	651.09	651.42	651.76	652.08	652.41	652.73	653.06	653.42	653.80	654.11	654.42	654.74	655.05	Y



Elevations which are marked as indicated are at the ¼, ½, ¾, and ℄ End Diaphragm points along the ℄ of the beam or girder with the span being measured from ℄ Pier to ℄ End Diaphragm.

TOP OF PAVEMENT ELEVATIONS - UNIT 2 WESTBOUND

Girder	℄ Pier 4L	¼	½	¾	℄ Pier 5L	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ Pier 6L	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ Pier 7L	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ Exp. Joint 2L	Girders
A	654.57	655.62	656.65	657.62	658.57	659.08	659.59	660.10	660.60	661.11	661.61	662.12	662.62	663.11	663.60	664.09	664.58	665.07	665.56	666.05	666.54	667.04	667.53	668.02	668.51	669.00	669.50	670.02	670.56	671.10	671.64	672.16	672.68	673.19	673.73	A
B	654.96	655.94	656.90	657.81	658.71	(¼)659.12	(ED)659.53	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	B
C	655.08	656.06	657.01	657.92	658.81	(¼)659.73	(½)660.65	(¾)661.57	(ED)662.49	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	C
D	655.32	656.30	657.25	658.16	659.05	659.54	660.04	660.53	661.02	661.51	662.00	662.49	662.98	663.47	663.96	664.45	664.94	665.44	665.93	666.42	666.91	667.40	667.89	668.38	668.87	669.36	669.86	670.36	670.88	671.41	671.93	672.46	672.98	673.51	674.03	D
E	655.57	656.54	657.50	658.40	659.30	659.79	660.28	660.77	661.26	661.75	662.24	662.73	663.22	663.72	664.21	664.70	665.19	665.68	666.17	666.66	667.15	667.64	668.13	668.62	669.12	669.61	670.10	670.59	671.09	671.58	672.08	672.58	673.07	673.57	674.06	E
F	655.49	656.43	657.35	658.25	659.14	659.63	660.12	660.62	661.11	661.60	662.09	662.58	663.07	663.56	664.05	664.54	665.03	665.53	666.02	666.51	667.00	667.49	667.98	668.47	668.96	669.45	669.94	670.44	670.93	671.42	671.91	672.40	672.89	673.38	673.87	F
G	655.21	656.11	657.00	657.89	658.79	659.28	659.77	660.26	660.75	661.24	661.73	662.22	662.72	663.21	663.70	664.19	664.68	665.17	665.66	666.15	666.64	667.13	667.63	668.12	668.61	669.10	669.59	670.08	670.57	671.06	671.55	672.04	672.53	673.03	673.52	G

TOP OF PAVEMENT ELEVATIONS - UNIT 2 EASTBOUND

Girder	℄ Pier 4R	¼	½	¾	℄ Pier 5R	¼	½	¾	℄ Pier 6R	¼	½	¾	℄ Pier 7R	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ Pier 8R	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ Exp. Joint 2R	Girder
H	655.21	656.11	657.00	657.89	658.79	659.68	660.58	661.47	662.36	663.26	664.15	665.05	665.94	666.44	666.93	667.43	667.93	668.42	668.92	669.42	669.91	670.41	670.91	671.31	671.71	672.11	672.50	672.90	673.30	673.70	674.10	674.50	674.90	H
J	655.58	656.47	657.36	658.25	659.14	660.04	660.93	661.83	662.72	663.61	664.51	665.40	666.30	666.79	667.29	667.79	668.28	668.78	669.28	669.77	670.26	670.74	671.22	671.60	671.98	672.37	672.75	673.13	673.51	673.90	674.27	674.64	675.01	J
K	655.73	656.61	657.50	658.40	659.30	660.19	661.08	661.98	662.87	663.77	664.66	665.56	666.45	666.95	667.44	667.94	668.44	668.93	669.43	669.92	670.41	670.87	671.33	671.69	672.05	672.42	672.78	673.14	673.51	673.86	674.21	674.55	674.88	K
L	655.58	656.41	657.26	658.16	659.05	659.95	660.84	661.74	662.63	663.52	664.42	665.31	666.21	666.70	667.20	667.70	668.19	668.69	669.19	669.68	670.16	670.63	671.08	671.45	671.81	672.17	672.54	672.90	673.26	673.62	673.97	674.31	674.63	L
M	655.41	656.20	657.02	657.91	658.81	659.70	660.60	661.49	662.39	663.28	664.18	665.07	665.96	666.46	666.96	667.45	667.95	668.45	668.94	669.44	669.92	670.39	670.84	671.20	671.57	671.93	672.29	672.66	673.02	673.38	673.73	674.06	674.39	M

TOP OF PAVEMENT ELEVATIONS - UNIT 3

Girder	℄ Piers 9L or 9R	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ Piers 10L or 10R	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ Piers 11L or 11R	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ Piers 12L or 12R	Girder
A	674.33	675.09	675.87	676.65	677.42	678.15	678.80	679.44	680.09	680.74	681.38	682.28	683.16	684.00	684.80	685.53	686.20	686.80	687.36	687.87	688.32	688.53	688.72	688.89	689.05	689.20	689.34	689.46	689.57	689.66	689.73	A
B	674.63	675.36	676.10	676.84	677.58	678.30	678.97	679.61	680.25	680.89	681.54	682.43	683.33	684.18	684.96	685.69	686.36	686.98	687.54	688.03	688.47	688.68	688.88	689.06	689.22	689.36	689.49	689.60	689.69	689.77	689.84	B
C	674.62	675.28	675.94	676.61	677.30	678.00	678.65	679.30	679.94	680.58	681.22	682.12	683.02	683.87	684.65	685.38	686.05	686.67	687.22	687.72	688.16	688.37	688.56	688.75	688.91	689.05	689.18	689.29	689.38	689.46	689.52	C
D	674.42	675.06	675.71	676.36	677.02	677.69	678.34	678.99	679.63	680.27	680.91	681.81	682.71	683.55	684.34	685.06	685.74	686.36	686.91	687.41	687.85	688.06	688.25	688.43	688.60	688.74	688.87	688.97	689.07	689.15	689.21	D
E	674.06	674.70	675.35	675.99	676.64	677.29	677.94	678.59	679.22	679.86	680.51	681.41	682.31	683.16	683.93	684.66	685.34	685.96	686.51	687.00	687.44	687.65	687.85	688.03	688.20	688.34	688.46	688.56	688.65	688.73	688.79	E
F	675.45	676.00	676.55	677.09	677.64	678.18	678.71	679.26	679.82	680.37	680.92	681.84	682.73	683.56	684.35	685.07	685.72	686.31	686.84	687.32	687.74	687.94	688.11	688.27	688.41	688.55	688.66	688.76	688.84	688.90	688.94	F
G	675.50	676.01	676.52	677.05	677.59	678.14	678.69	679.23	679.78	680.32	680.87	681.79	682.70	683.54	684.31	685.03	685.68	686.28	686.82	687.28	687.69	687.89	688.07	688.24	688.38	688.50	688.61	688.69	688.76	688.81	688.85	G
H	675.32	675.77	676.25	676.75	677.28	677.82	678.38	678.92	679.46	680.01	680.56	681.48	682.39	683.23	684.00	684.71	685.37	685.97	686.50	686.97	687.38	687.58	687.76	687.93	688.07	688.19	688.30	688.38	688.45	688.50	688.53	H
J	675.08	675.52	675.98	676.45	676.96	677.51	678.06	678.61	679.15	679.70	680.24	681.17	682.08	682.91	683.69	684.40	685.06	685.66	686.19	686.66	687.07	687.27	687.45	687.61	687.76	687.88	687.98	688.07	688.14	688.19	688.22	J
K	674.83	675.27	675.70	676.15	676.65	677.20	677.75	678.30	678.84	679.39	679.93	680.86	681.76	682.60	683.38	684.09	684.75	685.35	685.88	686.35	686.76	686.96	687.14	687.30	687.45	687.57	687.67	687.76	687.83	687.88	687.91	K

Note:
Top of pavement elevations are given along ℄ beams and girders at quarter, fifth or tenth points between piers, between pier and abutment or between pier and expansion roller except as noted above.

TOP OF PAVEMENT ELEVATIONS - UNIT 4

Girder	℄ E.J. 3L or 3R	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ Piers 13L or 13R	.1	.2	.3	.4	.5	.6	.7	.8	.9	℄ Piers 14L and R	.2	.4	.6	.8	℄ Piers 15L and R	Girder
A	689.78	689.81	689.84	689.88	689.89	689.88	689.84	689.79	689.72	689.65	689.56	689.44	689.29	689.12	688.93	688.72	688.49	688.24	687.95	687.65	687.33	686.80	686.29	685.72	685.11	684.44	A
B	689.89	689.92	689.94	689.94	689.93	689.90	689.85	689.79	689.71	689.61	689.50	689.35	689.19	689.00	688.79	688.57	688.33	688.06	687.79	687.49	687.17	686.66	686.09	685.49	684.85	684.16	B
C	689.58	689.61	689.63	689.63	689.62	689.59	689.54	689.48	689.40	689.30	689.18	689.04	688.87	688.68	688.48	688.26	688.01	687.75	687.48	687.18	686.86	686.35	685.79	685.18	684.54	683.85	C
D	689.27	689.30	689.32	689.32	689.30	689.27	689.23	689.17	689.09	688.99	688.87	688.72	688.56	688.37	688.17	687.94	687.70	687.45	687.17	686.87	686.56	686.04	685.48	684.88	684.23	683.54	D
E	688.85	688.88	688.90	688.90	688.89	688.86	688.82	688.77	688.70	688.59	688.47	688.33	688.16	687.97	687.76	687.54	687.30	687.04	686.77	686.47	686.16	685.65	685.08	684.48	683.83	683.15	E
F	688.96	688.96	688.94	688.91	688.86	688.79	688.71	688.61	688.50	688.39	688.26	688.11	687.95	687.78	687.59	687.39	687.17	686.93	686.68	686.42	686.14	685.61	685.07	684.48	683.84	683.15	F
G	688.86	688.86	688.85	688.82	688.78	688.73	688.66	688.58	688.48	688.36	688.24	688.09	687.93	687.76	687.57	687.36	687.14	686.91	686.67	686.41	686.13	685.61	685.04	684.43	683.77	683.07	G
H	688.55	688.55	688.54	688.51	688.47	688.41	688.35	688.26	688.17	688.05	687.92	687.78	687.62	687.44	687.25	687.05	686.83	686.60	686.36	686.10	685.83	685.31	684.73	684.12	683.46	682.76	H
J	688.24	688.24	688.23	688.20	688.16	688.10	688.03	687.95	687.85	687.74	687.61	687.46	687.30	687.13	686.94	686.74	686.52	686.29	686.05	685.79	685.52	685.00	684.43	683.81	683.15	682.45	J
K	687.93	687.93	687.91	687.89	687.84	687.79	687.72	687.64	687.54	687.42	687.29	687.15	686.99	686.82	686.63	686.43	686.21	685.98	685.74	685.49	685.21	684.70	684.12	683.50	682.84	682.14	K

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

TOP OF PAVEMENT ELEVATIONS UNITS 1 THRU 4

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN WB DATE 11-20-69 | TRACED GEM DATE 12-22-69 | CHECKED RPS DATE 2-20-70 | REVIEWED C.A.B. DATE 5-24-86 | REVISED

FED.RD. DIVISION	STATE	PROJECT	
2	OHIO		

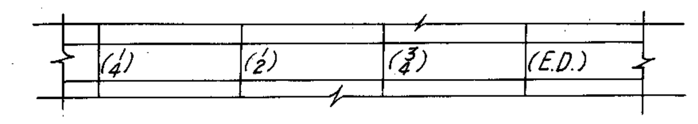
182
193

CUYAHOGA COUNTY
CUY-290-0.27

TOP OF PAVEMENT ELEVATIONS – UNIT 5

Girder	¢ Exp. Joint 4	1/4	1/2	3/4	¢ Pier 16LR	1/4	1/2	3/4	¢ Pier 17LR	1/4	1/2	3/4	¢ Pier 18LR	1/4	1/2	3/4	¢ Pier 19LR	1/4	1/2	3/4	¢ Brg. Abut. BC and ¢ Pier 20LR	Girder
A	684.07	683.33	682.60	681.85	681.10	680.25	679.42	678.58	677.74	676.86	675.98	675.09	674.19	673.36	672.52	671.68	670.62	669.61	668.57	667.55	666.76	A
B	—	—	—	—	—	—	—	—	(E.D.)677.09	(1/4)676.39	(1/2)675.69	(3/4)675.00	674.30	673.46	672.63	671.79	670.76	669.82	668.81	667.87	667.15	B
C	(E.D.)684.10	(1/4)683.38	(1/2)682.65	(3/4)681.92	681.19	680.36	679.51	678.66	677.80	676.91	676.00	675.10	674.20	673.35	672.49	671.64	670.69	669.84	668.93	668.09	667.48	C
D	(E.D.)684.04	(1/4)683.29	(1/2)682.55	(3/4)681.81	681.07	680.21	679.35	678.50	677.64	676.75	675.85	674.95	674.05	673.20	672.34	671.49	670.64	669.85	669.05	668.26	667.48	D
E	(E.D.)683.89	(1/4)683.14	(1/2)682.39	(3/4)681.65	680.91	680.05	679.19	678.33	677.48	676.59	675.69	674.80	673.91	673.05	672.19	671.34	670.48	669.70	668.90	668.11	667.32	E
F	683.79	683.03	682.27	681.51	680.75	679.89	679.03	678.17	677.31	676.43	675.53	674.64	673.76	672.90	672.04	671.19	670.33	669.54	668.75	667.95	667.17	F
G	(E.D.)683.58	(1/4)682.83	(1/2)682.08	(3/4)681.33	680.59	679.73	678.87	678.01	677.15	676.27	675.38	674.49	673.61	672.76	671.89	671.04	670.18	669.39	668.59	667.80	667.01	G
H	683.48	682.71	681.95	681.19	680.43	679.57	678.71	677.85	676.99	676.11	675.22	674.34	673.46	672.61	671.74	670.88	670.03	669.24	668.44	667.65	666.85	H
J	(E.D.)683.27	(1/4)682.52	(1/2)681.77	(3/4)681.02	680.27	679.41	678.55	677.68	676.83	675.95	675.07	674.19	673.31	672.46	671.59	670.73	669.88	669.08	668.29	667.49	666.70	J
K	683.17	682.40	681.64	680.87	680.11	679.25	678.39	677.52	676.66	675.79	674.91	674.04	673.17	672.31	671.44	670.58	669.72	668.93	668.13	667.34	666.54	K
L	(E.D.)682.96	(1/4)682.20	(1/2)681.45	(3/4)680.70	679.95	679.09	678.22	677.36	676.50	675.63	674.76	673.89	673.02	672.16	671.29	670.43	669.57	668.78	667.98	667.18	666.39	L
M	682.78	682.00	681.23	680.46	679.70	678.84	677.97	677.10	676.24	675.38	674.50	673.63	672.77	671.92	671.05	670.18	669.32	668.53	667.73	666.94	666.15	M
N	682.77	682.01	681.24	680.47	679.69	678.80	677.95	677.09	676.22	675.35	674.51	673.66	672.80	671.94	671.09	670.23	669.36	668.55	667.75	666.95	666.14	N
P	(E.D.)682.79	(1/4)682.04	(1/2)681.30	(3/4)680.55	679.81	678.95	678.08	677.22	676.35	675.50	674.63	673.76	672.90	672.03	671.16	670.30	669.44	668.64	667.84	667.04	666.24	P
Q	682.69	681.93	681.16	680.41	679.65	678.79	677.92	677.06	676.19	675.34	674.47	673.61	672.75	671.88	671.01	670.15	669.28	668.49	667.68	666.88	666.08	Q
R	(E.D.)682.48	(1/4)681.73	(1/2)680.98	(3/4)680.23	679.49	678.63	677.76	676.89	676.03	675.18	674.32	673.46	672.60	671.74	670.86	670.00	669.13	668.33	667.53	666.73	665.93	R
S	682.38	681.61	680.85	680.09	679.33	678.47	677.60	676.73	675.86	675.02	674.16	673.31	672.45	671.59	670.71	669.85	668.98	668.18	667.38	666.57	665.77	S
T	(E.D.)682.17	(1/4)681.42	(1/2)680.67	(3/4)679.92	679.17	678.31	677.44	676.57	675.70	674.86	674.01	673.16	672.31	671.44	670.56	669.70	668.83	668.03	667.22	666.42	665.62	T
U	682.07	681.30	680.53	679.77	679.01	678.15	677.28	676.41	675.54	674.70	673.85	673.00	672.16	671.29	670.41	669.54	668.68	667.88	667.07	666.26	665.46	U
V	(E.D.)681.86	(1/4)681.10	(1/2)680.35	(3/4)679.60	678.85	677.99	677.12	676.24	675.37	674.54	673.70	672.85	672.01	671.14	670.27	669.39	668.53	667.72	666.91	666.11	665.31	V
W	—	—	—	—	—	—	—	—	(E.D.)674.52	(1/4)673.86	(1/2)673.20	(3/4)672.54	671.88	670.99	670.11	669.24	668.37	667.57	666.76	665.95	665.15	W
X	681.75	680.99	680.22	679.46	678.69	677.83	676.96	676.08	675.21	674.38	673.50	672.62	671.75	670.84	669.97	669.09	668.22	667.42	666.61	665.80	665.00	X

Note:
Top of pavement elevations are given along ¢ beams and girders at quarter, fifth or tenth points between piers, between pier and abutment or between pier and expansion roller except as noted.



Elevations which are marked as indicated are at the 1/4, 1/2, 3/4, and ¢ End Diaphragm points along the ¢ of the beam or girder with the span being measured from ¢ Pier to ¢ End Diaphragm.

TOP OF PAVEMENT ELEVATIONS UNIT 6

Girder	¢ Exp. Joint 5	1/4	1/2	3/4	¢ Pier 21 L and R	1/4	1/2	3/4	¢ Pier 22 L and R	1/4	1/2	3/4	¢ Pier 23 L and R and 23CB	1/4	1/2	3/4	¢ Pier 24 L and R	1/4	1/2	3/4	¢ Brg. E. Abut.	Girder
A	667.22	666.48	665.75	665.02	664.36	663.70	663.04	662.38	661.73	661.07	660.42	659.77	659.12	658.36	657.70	657.05	656.40	655.88	655.37	654.86	654.29	A
B	667.07	666.45	665.84	665.22	664.62	663.94	663.28	662.61	661.95	661.28	660.62	659.97	659.31	658.66	657.90	657.24	656.59	656.05	655.54	655.04	654.44	B
C	666.91	666.30	665.68	665.07	664.46	663.78	663.10	662.43	661.76	661.09	660.42	659.76	659.10	658.39	657.72	657.05	656.39	655.86	655.35	654.83	654.24	C
D	666.76	666.13	665.51	664.89	664.27	663.59	662.91	662.22	661.55	660.87	660.20	659.52	658.86	658.19	657.50	656.83	656.16	655.63	655.12	654.58	654.04	D
E	666.60	665.97	665.34	664.72	664.09	663.40	662.71	662.02	661.33	660.65	659.97	659.29	658.61	657.94	657.27	656.60	655.94	655.41	654.89	654.37	653.85	E
F	666.45	665.81	665.17	664.54	663.91	663.21	662.51	661.81	661.12	660.43	659.74	659.06	658.37	657.69	657.01	656.34	655.67	655.14	654.61	654.09	653.57	F
G	666.29	665.65	665.00	664.36	663.72	663.02	662.31	661.61	660.91	660.21	659.51	658.82	658.13	657.44	656.76	656.08	655.40	654.87	654.34	653.81	653.28	G
H	666.13	665.48	664.83	664.19	663.54	662.82	662.11	661.40	660.69	659.99	659.29	658.59	657.89	657.19	656.50	655.81	655.13	654.59	654.06	653.53	653.00	H
J	(E.D.)665.97	(1/4)665.33	(1/2)664.70	(3/4)664.06	663.42	662.70	661.97	661.24	660.51	659.79	659.08	658.37	657.66	656.96	656.26	655.57	654.88	654.34	653.80	653.27	652.74	J
K	—	—	—	—	—	—	—	—	(E.D.)659.73	(1/4)659.16	(1/2)658.59	(3/4)658.03	657.46	656.74	656.03	655.33	654.63	654.09	653.55	654.01	652.48	K
L	—	—	—	—	—	—	—	—	—	—	—	—	(E.D.)656.71	(1/4)656.14	(1/2)655.56	(3/4)654.98	654.40	653.84	653.30	652.75	652.21	L
M	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(E.D.)653.64	(1/4)653.22	(1/2)652.79	(3/4)652.37	651.95	M
N	665.89	665.22	664.55	663.89	663.23	662.49	661.74	660.99	660.24	659.48	658.70	657.92	657.15	656.37	655.60	654.83	654.06	653.46	652.84	652.22	651.61	N
P	665.88	665.21	664.54	663.87	663.19	662.43	661.67	660.91	660.15	659.37	658.61	657.85	657.08	656.30	655.50	654.70	653.90	653.26	652.66	652.05	651.44	P
Q	665.99	665.30	664.62	663.94	663.26	662.60	661.73	660.97	660.21	659.43	658.65	657.86	657.08	656.29	655.50	654.71	653.92	653.29	652.65	652.01	651.37	Q
R	665.83	665.14	664.45	663.76	663.07	662.30	661.53	660.76	659.99	659.21	658.41	657.62	656.83	656.03	655.23	654.44	653.64	653.01	652.36	651.72	651.07	R
S	665.67	664.97	664.28	663.58	662.89	662.11	661.33	660.55	659.77	658.98	658.18	657.38	656.58	655.78	654.97	654.16	653.36	652.73	652.08	651.43	650.78	S
T	665.52	664.81	664.11	663.40	662.70	661.92	661.13	660.34	659.56	658.76	657.95	657.14	656.34	655.52	654.70	653.89	653.08	652.45	651.79	651.13	650.48	T
U	665.36	664.65	663.94	663.23	662.52	661.73	660.93	660.13	659.34	658.53	657.72	656.90	656.09	655.26	654.44	653.62	652.80	652.16	651.50	650.84	650.19	U
V	665.21	664.48	663.76	663.05	662.33	661.53	660.73	659.92	659.12	658.31	657.48	656.66	655.84	655.00	654.17	653.35	652.52	651.88	651.21	650.55	649.89	V
W	665.05	664.32	663.59	662.87	662.15	661.34	660.53	659.71	658.91	658.08	657.25	656.42	655.59	654.75	653.91	653.07	652.24	651.59	650.93	650.26	649.60	W
X	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	(E.D.)652.79	652.10	651.41	650.70	650.00	649.30	X
Y	—	—	—	—	—	—	—	—	—	—	(E.D.)656.35	(3/4)655.89	655.43	654.56	653.68	652.80	651.92	651.22	650.48	649.74	649.00	Y
Z	—	—	—	—	—	—	—	—	(E.D.)658.11	(1/4)657.41	(1/2)656.70	(3/4)656.00	655.30	654.39	653.47	652.56	651.65	650.92	650.17	649.43	648.68	Z
ZA	—	—	—	—	(E.D.)661.28	(1/4)660.63	(1/2)659.99	(3/4)659.35	658.71	657.82	656.90	656.18	655.47	—	—	—	—	—	—	—	—	ZA
ZB	(E.D.)664.93	(1/4)664.19	(1/2)663.46	(3/4)662.72	661.99	661.14	660.25	659.36	658.46	657.56	656.59	655.81	655.09	—	—	—	—	—	—	—	—	ZB
ZC	664.89	664.13	663.36	662.59	661.83	660.95	660.04	659.13	658.22	657.32	656.29	655.42	654.72	—	—	—	—	—	—	—	—	ZC
ZD	664.74	663.96	663.19	662.41	661.64	660.75	659.82	658.90	657.97	657.07	655.95	655.03	654.35	—	—	—	—	—	—	—	—	ZD

TOP OF PAVEMENT ELEVATIONS – UNIT 6CB

Girder	¢ Exp. Joint 6	1/4	1/2	3/4	¢ Pier 24	1/4	1/2	3/4	¢ Pier 25	1/4	1/2	3/4	¢ Pier 26	1/4	1/2	3/4	¢ Pier 27	1/4	1/2	3/4	¢ Brg. Abut. CB	Girder
CB-A	655.28	654.80	654.48	654.34	654.40	654.62	654.75	655.02	655.38	656.00	656.88	657.96	659.19	660.37	661.58	662.80	664.01	664.98	665.92	666.87	667.82	CB-A
CB-B	—	—	—	—	—	—	—	—	—	—	—	—	(E.D.)660.23	(1/4)661.22	(1/2)662.21	(3/4)663.20	664.19	665.15	666.11	667.06	668.02	CB-B
CB-C	654.91	654.46	654.16	654.05	654.09	654.28	654.47	654.84	655.34	656.07	657.02	658.14	659.38	660.63	661.88	663.13	664.37	665.33	666.29	667.25	668.21	CB-C
CB-D	654.55	654.12	653.85	653.75	653.76	653.95	654.23	654.72	655.35	656.17	657.17	658.34	659.58	660.83	662.08	663.33	664.57	665.53	666.49	667.45	668.41	CB-D
CB-E	654.19	653.79	653.54	653.43	653.41	653.65	654.04	654.65	655.40	656.29	657.33	658.54	659.78	661.03	662.28	663.53	664.77	665.73	666.69	667.65	668.61	CB-E

H.N.T.B. BR.NO. 9   PART II - SUPERSTRUCTURE

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

TOP OF PAVEMENT ELEVATIONS UNITS 5, 6 AND 6CB

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110   STA. 985+85.75 TO STA. 1020+47.57 (¢ I-290)

CLEVELAND CUYAHOGA COUNTY   OHIO

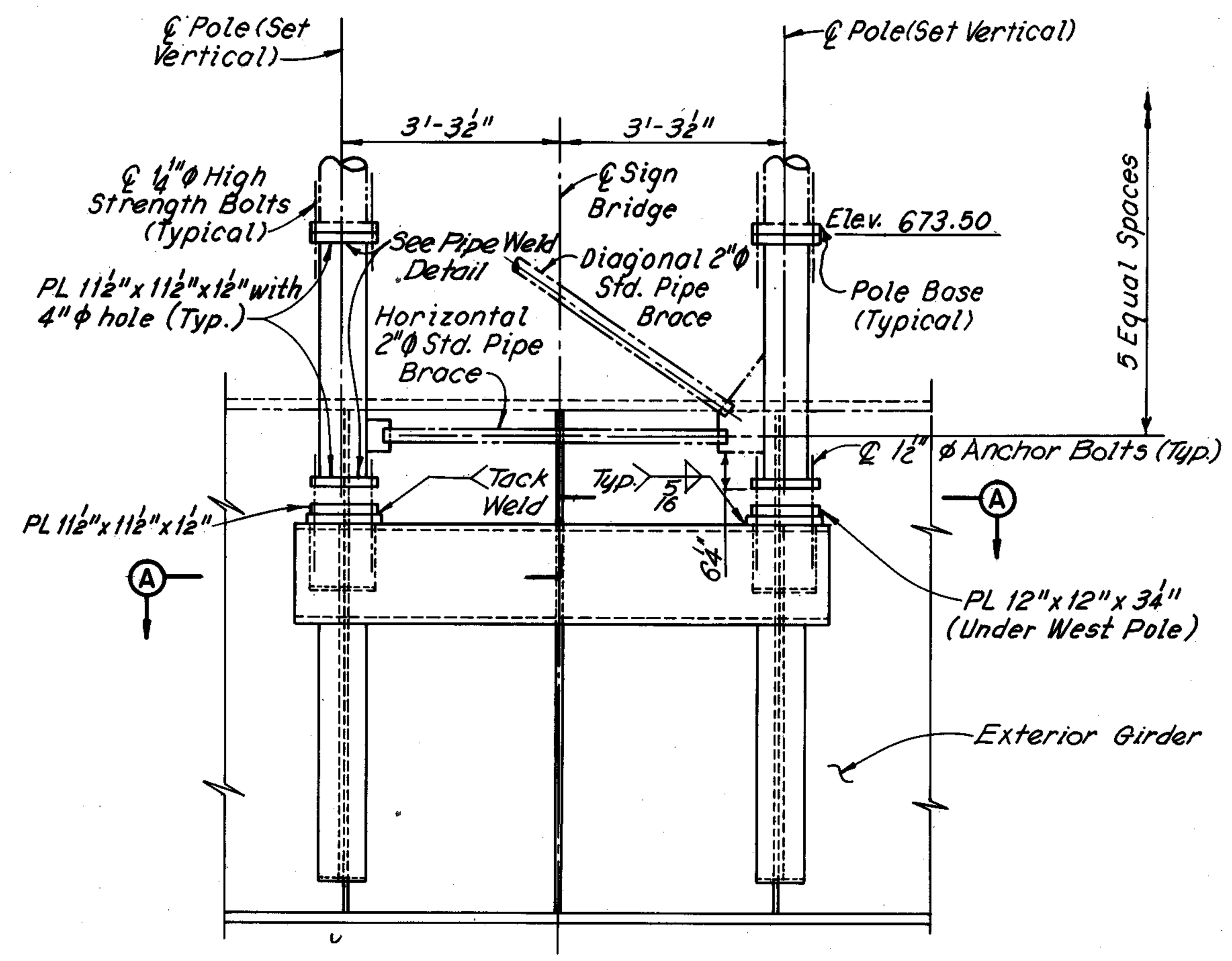
DRAWN WB	TRACED GEM	CHECKED NRS	REVIEWED C.A.B.	REVISED
DATE 11-24-69	DATE 1-5-70	DATE 2-20-70	DATE 2-24-86	SHEET 97/108


FED. RD. DIVISION 2 | STATE OHIO | PROJECT
183/193
CUYAHOGA COUNTY
CUY-290-0.27
TYPICAL SIDE ELEVATION
(North end shown. South end Similar.)
(Looking South)
Note:
Gussets attached to 8"φ pipe for connection of 2"φ pipe braces are ½" PL's, attached with ⅜" fillet welds on both sides. Pipe bracing will be slotted 1½" deep to fit gussets.
PART SECTION A-A
(North end)
PART SECTION A-A
(South end)
GUSSET PLATE DETAIL
(Sign No. 80 shown, Others similar)
SECTION D-D
ANCHOR BOLT DETAIL
PIPE WELD DETAIL
WEB COPING DETAIL
SECTION C-C
SECTION B-B
(South end)
SECTION B-B
(North end)
SECTION B-B
SIGN SUPPORT NO. 76
STA. 989+89 ℄ I-290
LOOKING WEST
Notes:
The following abbreviation is used:
H.S. = High Strength
For additional notes see Sheet 101/108
Steel below the pole base with the exception of the 2"φ pipe brace is included with Item 513 for payment.
H.N.T.B. BR. NO. 9
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY CLEVELAND NEW YORK
SIGN SUPPORT NO. 76
I-290 OVER CUYAHOGA RIVER
BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)
CLEVELAND CUYAHOGA COUNTY OHIO
DRAWN LJW DATE 6-16-71
TRACED RCK DATE 6-29-71
CHECKED RYH DATE 8-11-71
REVIEWED C.A.B. DATE 6-24-86
REVISED
SHEET 98/108

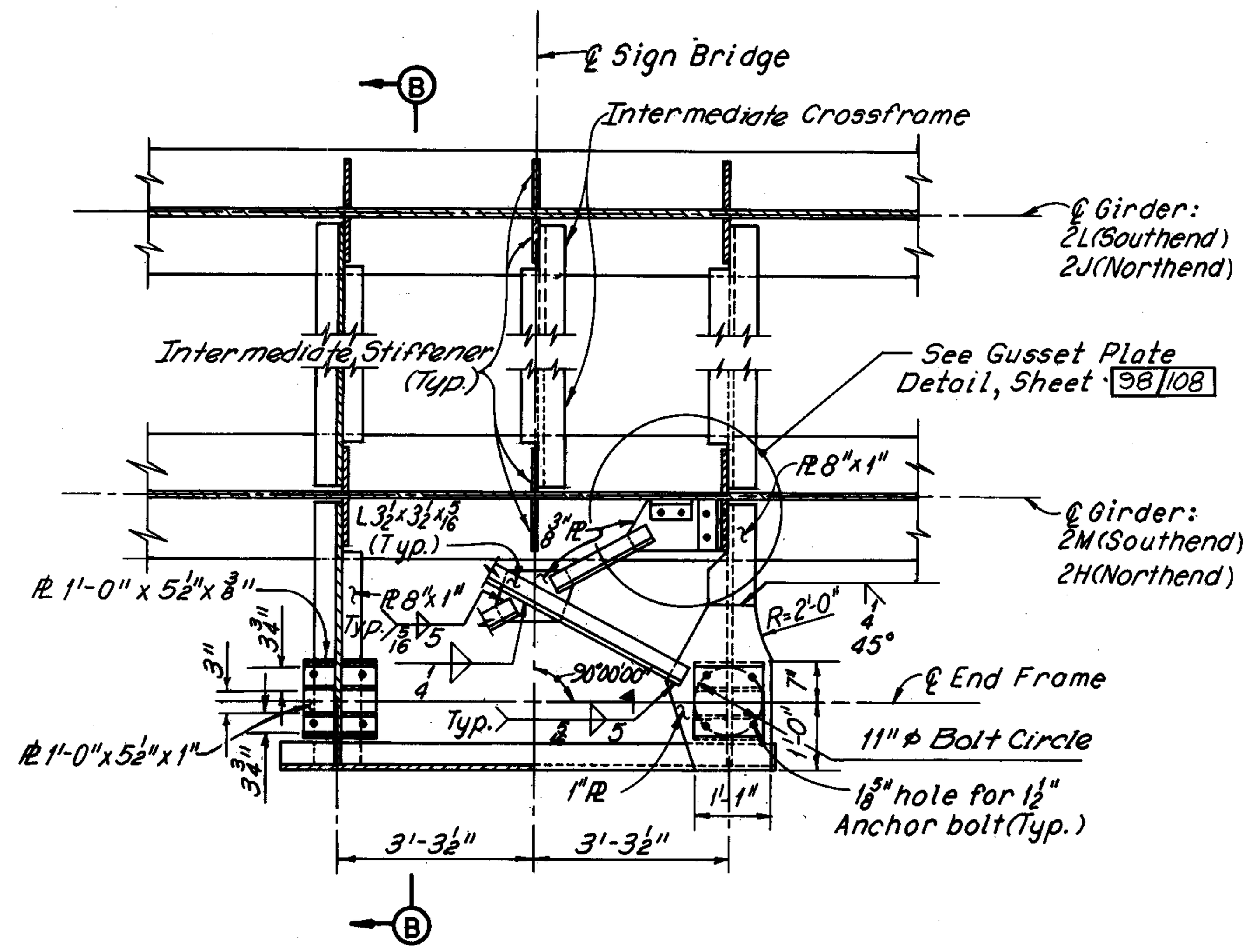
FHWA REGION	STATE	PROJECT		
2	OHIO			

184/193

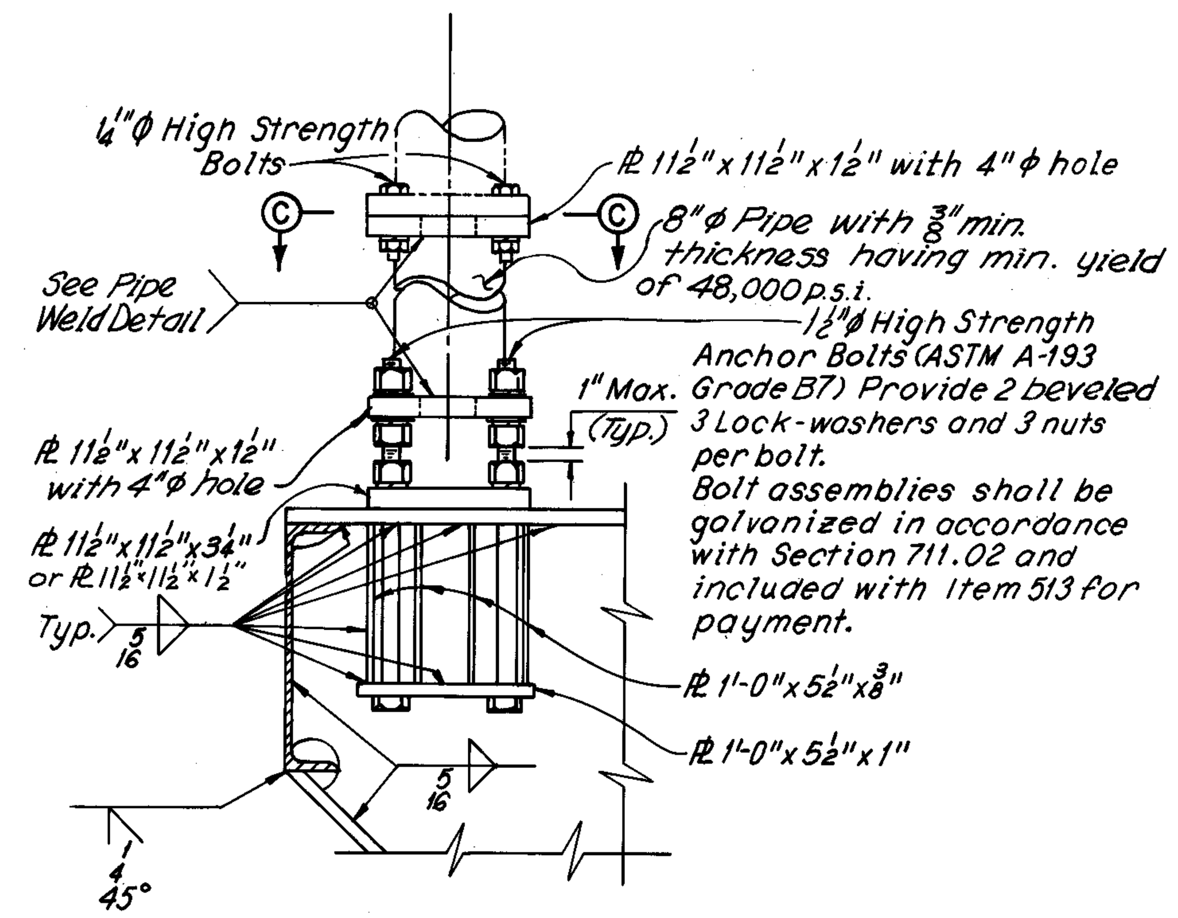
CUYAHOGA COUNTY
CUY- 290-027



TYPICAL SIDE ELEVATION
(Northend shown - Looking South)

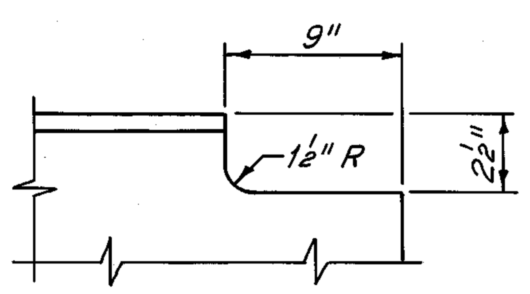


PART SECTION A-A

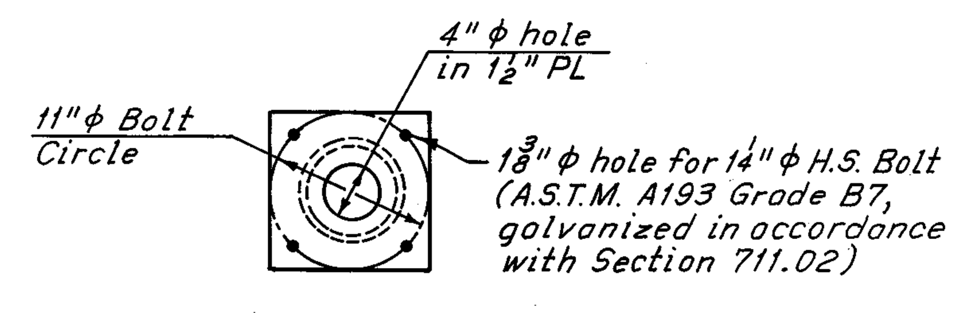


ANCHOR BOLT DETAIL

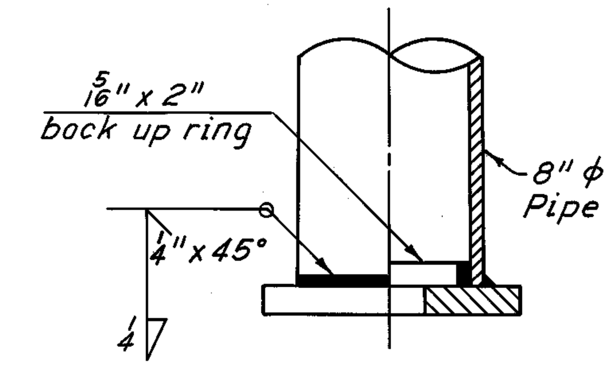
Note:
Gussets attached to 8"φ pipe for connection of 2"φ pipe braces are ½"℞'s, attached with ⅜" fillet welds on both sides. Pipe bracing will be slotted 1½" deep to fit gussets.



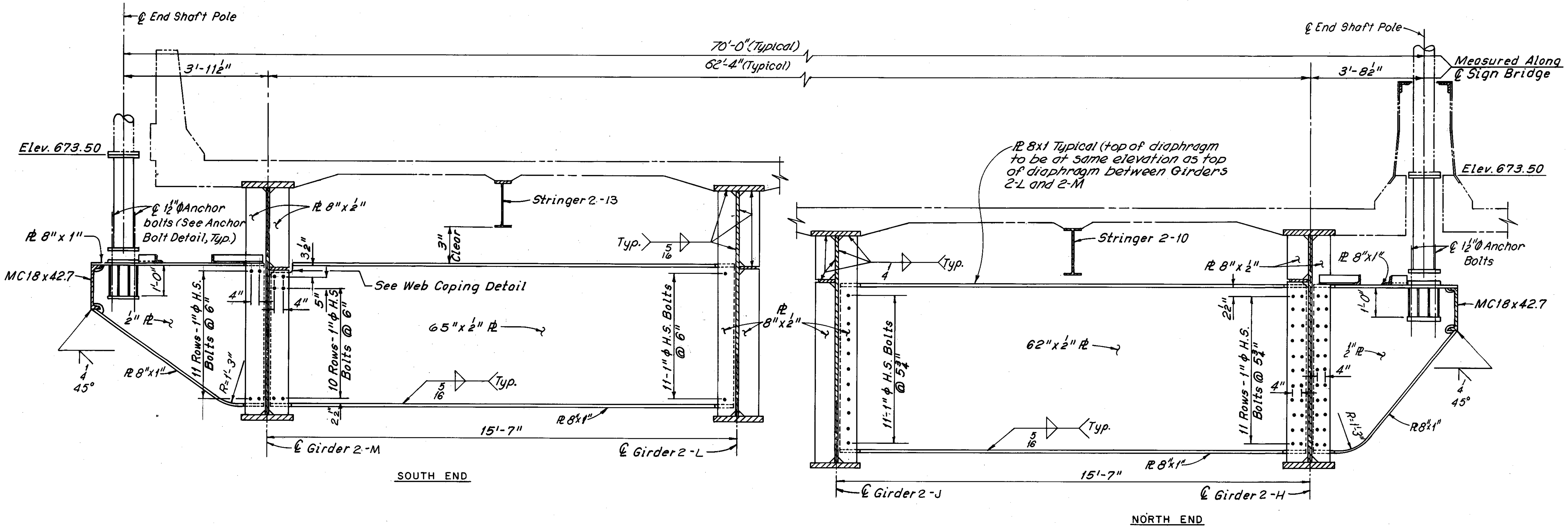
WEB COPING DETAIL



SECTION C-C



PIPE WELD DETAIL



SECTION B-B
S.B. NO. 77 STA. 994+94 ℄ I-290
LOOKING WEST

Note:
The following abbreviations are used:
S.B. = Sign Bridge
H.S. = High Strength
For additional notes see Sheet 101/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
CLEVELAND
HNTB

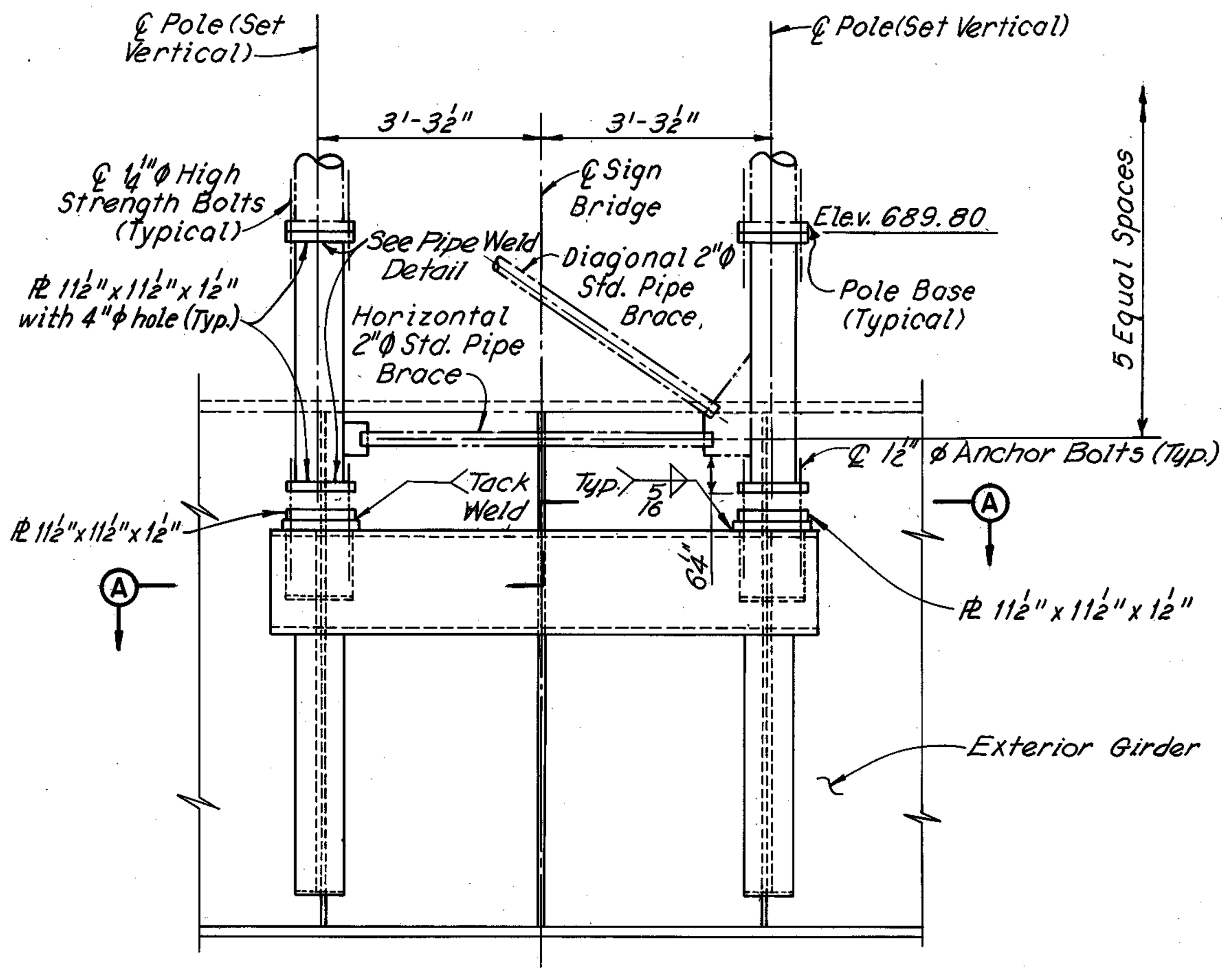
SIGN SUPPORT NO. 77

I-290 OVER CUYAHOGA RIVER
BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)
CLEVELAND CUYAHOGA COUNTY OHIO

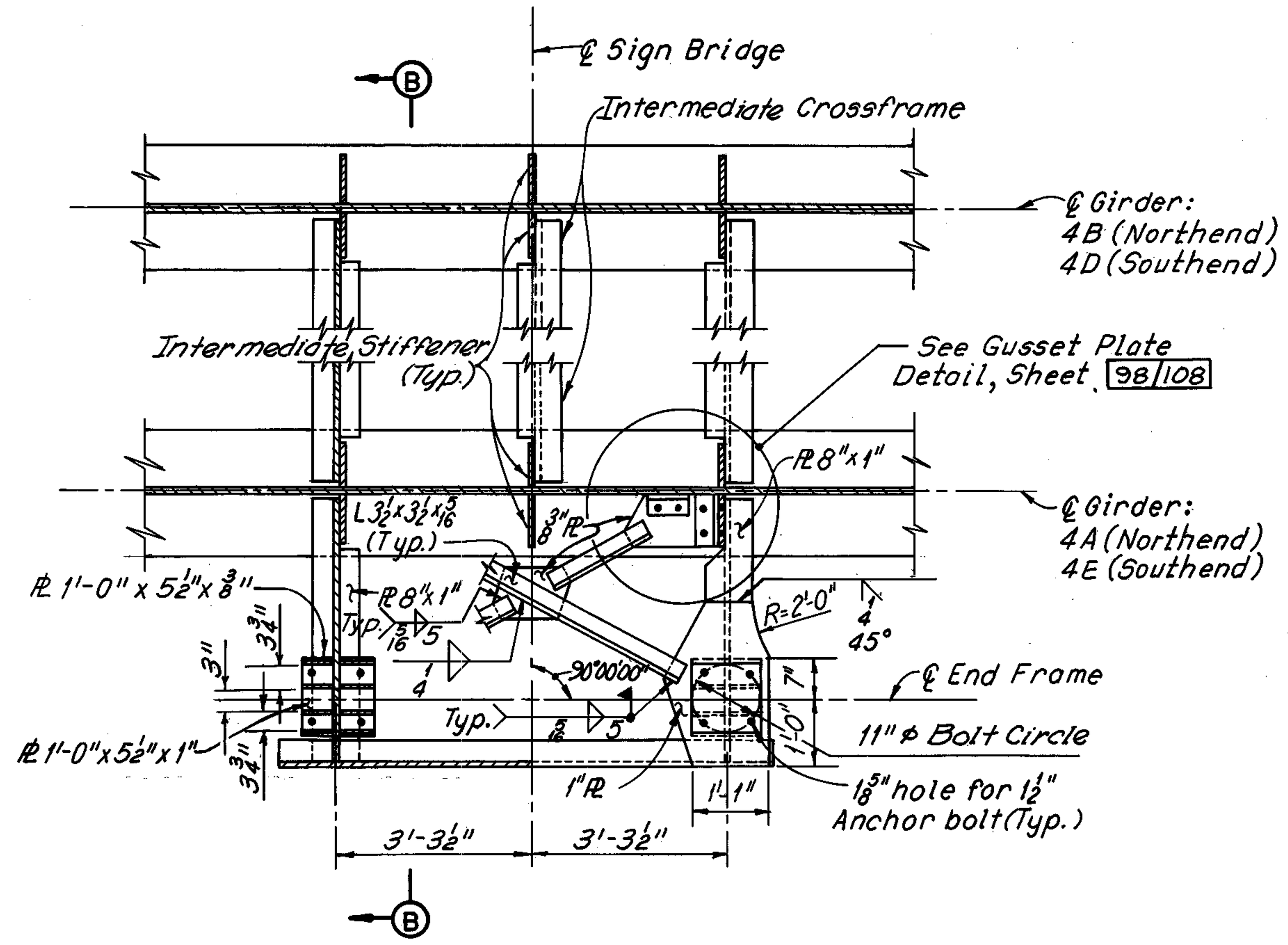
DRAWN D.M.P. DATE 9-5-69	TRACED A.J.T. DATE 9-10-69	CHECKED J.D.S. DATE 3-27-70	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 99/108

FED. RD. DIVISION	STATE	PROJECT		185/193
2	OHIO			

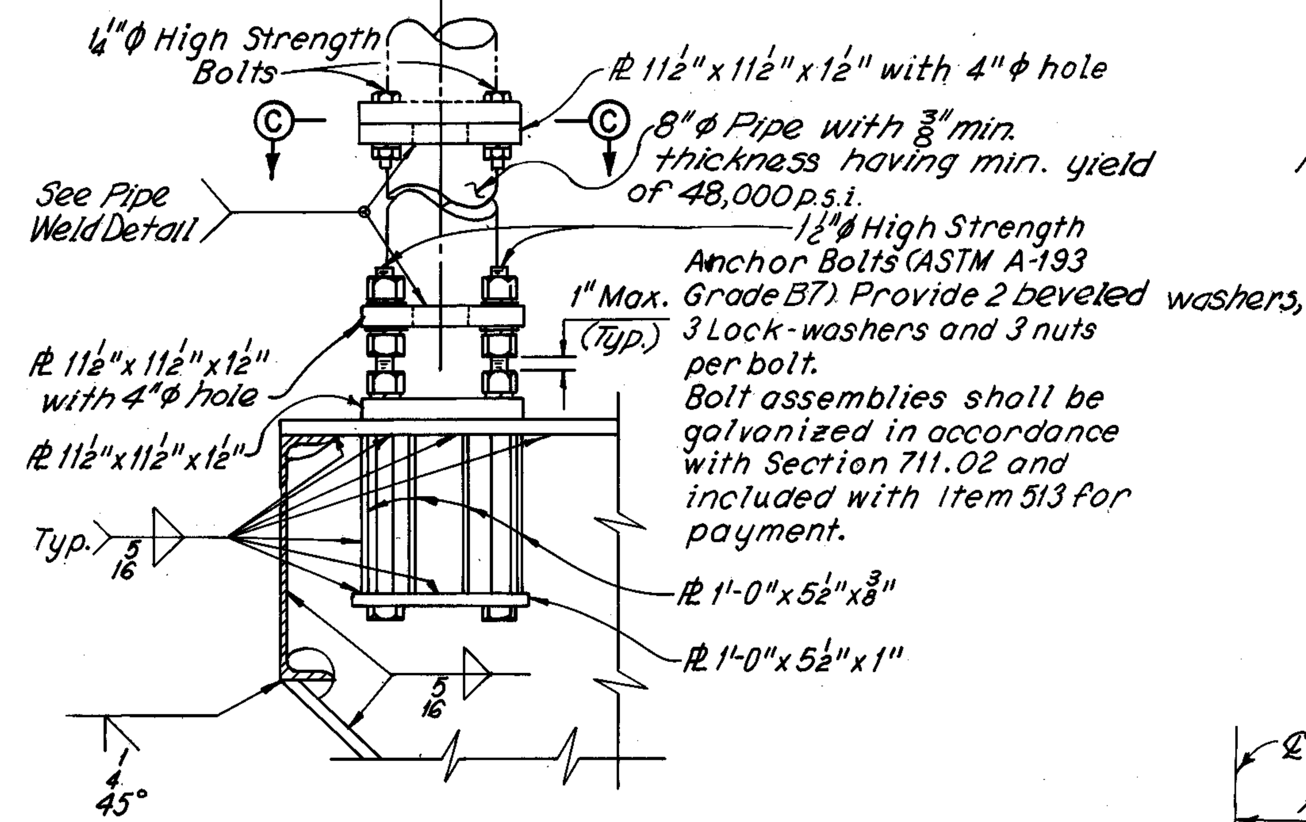
CUYAHOGA COUNTY
CUY-290-0.27



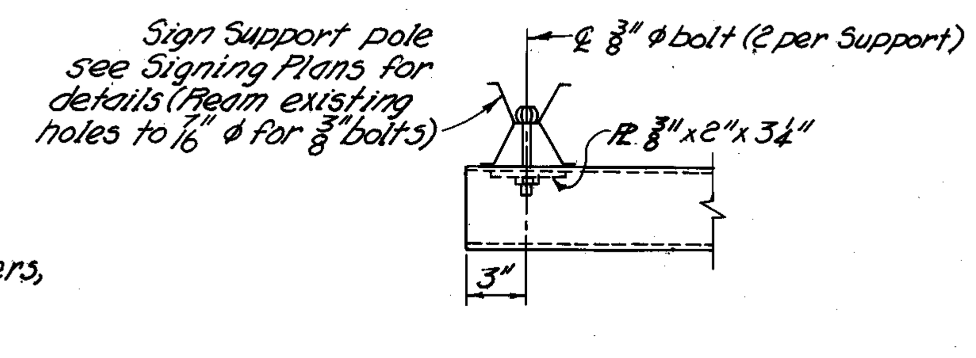
TYPICAL SIDE ELEVATION
(Northend shown - Looking South)



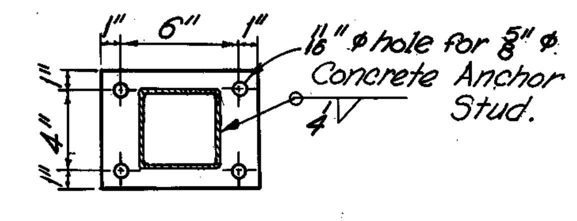
PART SECTION A-A



ANCHOR BOLT DETAIL

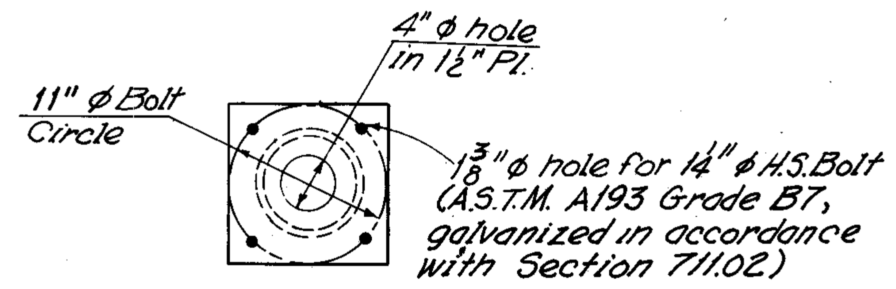


SECTION D-D

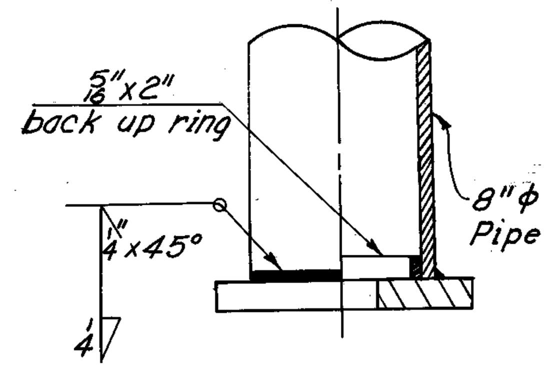


SECTION E-E

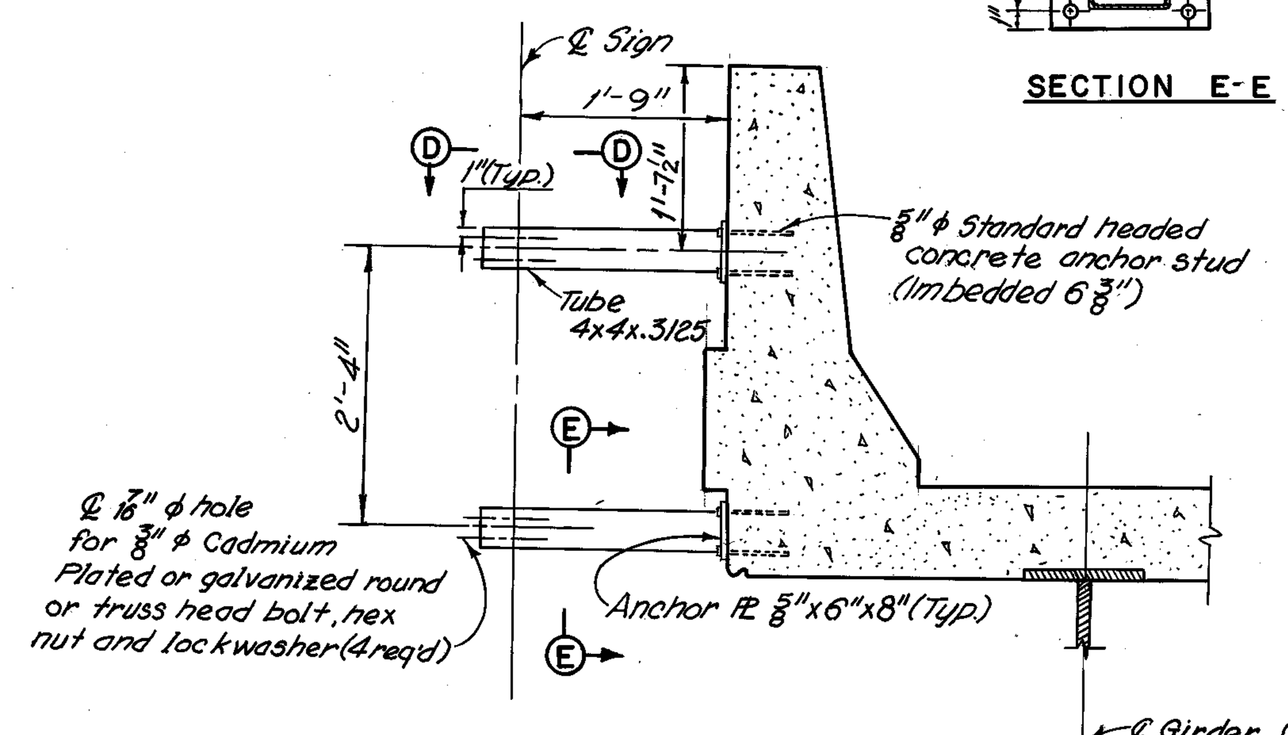
Note:
Gussets attached to 8"φ pipe for connection of 2"φ pipe braces are ½"℞'s, attached with ⅜" fillet welds on both sides. Pipe bracing will be slotted 1½" deep to fit gussets.



SECTION C-C



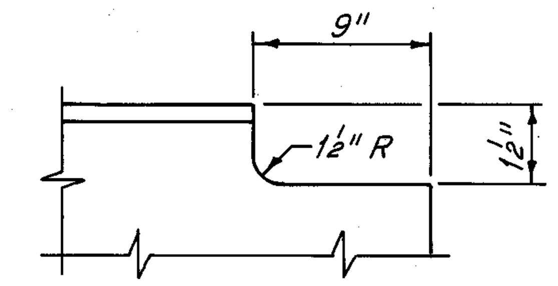
PIPE WELD DETAIL



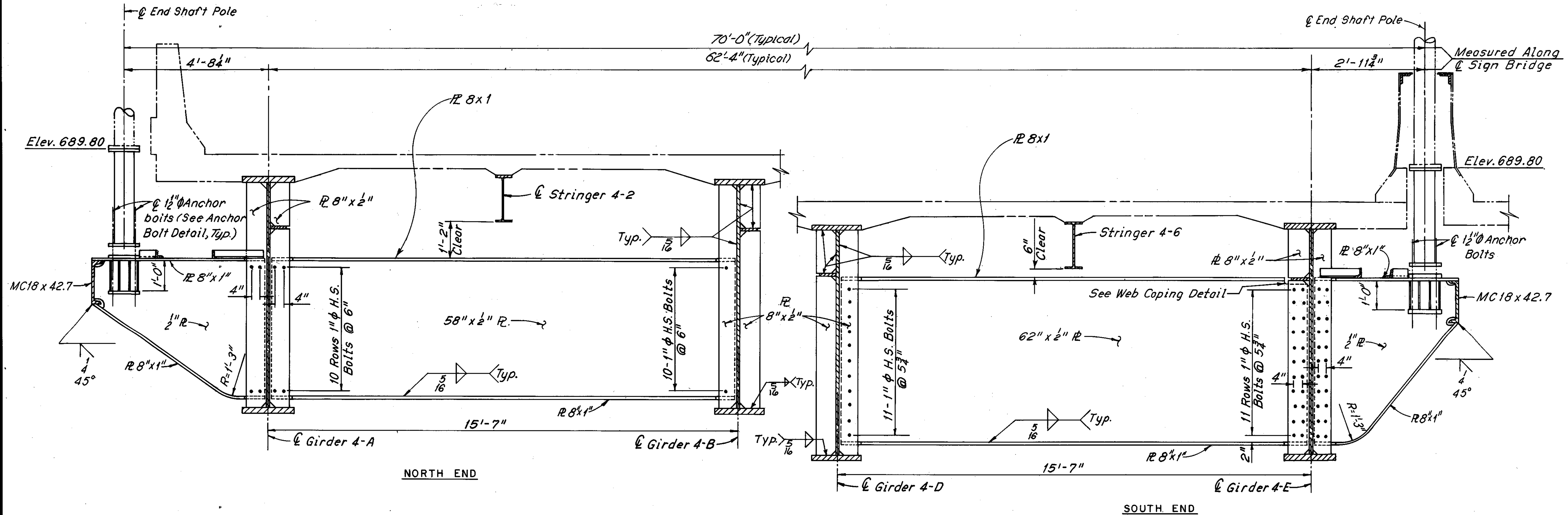
ELEVATION

Note: The anchor plates and 4x4x.3125 tubing shall be ASTM A588 steel and be painted.

TRAFFIC REGULATION SIGN
STA. 12+53.00 ℞ RAMP C-B



WEB COPING DETAIL



SECTION B-B
S.B. NO. 78 STA. 1003+11 ℄ I-290
LOOKING EAST

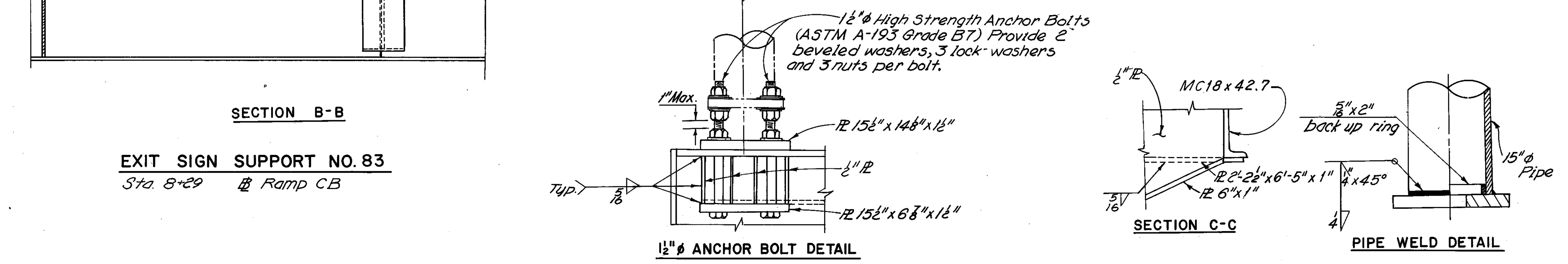
Note:
The following abbreviations are used:
S.B. = Sign Bridge
H.S. = High Strength
For additional notes see Sheet 101/108.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

SIGN SUPPORT NO. 78
AND RAMP C-B TRAFFIC
REGULATION SIGN
I-290 OVER CUYAHOGA RIVER
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN L.J.W. DATE 6-16-71	TRACED R.C.K. DATE 6-29-71	CHECKED R.Y.H. DATE 8-12-71	REVIEWED F.A.B. DATE 2-24-86	REVISED	SHEET 100/108



Notes:

For location of sign supports see Framing Plans.

All material shall be ASTM A572 Steel, except anchor bolt assemblies.

Anchor bolt assemblies shall be galvanized in accordance with Section 711.02 and included with Item 513 for payment.

Care shall be taken to insure vertical alignment of the end frame. Any vertical misalignment shall be taken up in the leveling nuts.

For signing and sign pole details see Traffic Control Plans.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

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

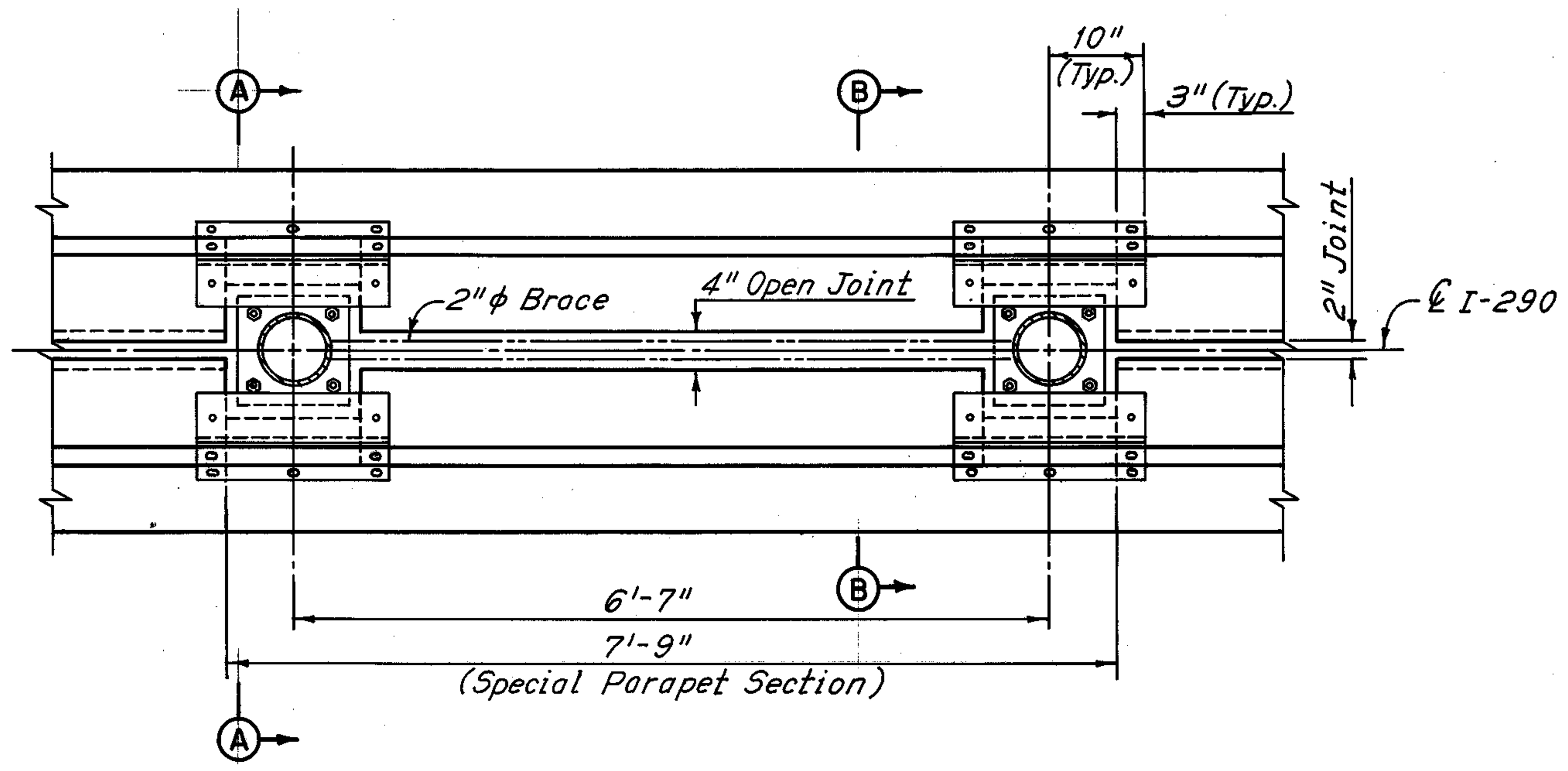
SIGN SUPPORTS NOS. 79, 80 and 83

I-290 OVER CUYAHOGA RIVER
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)
CLEVELAND CUYAHOGA COUNTY OHIO

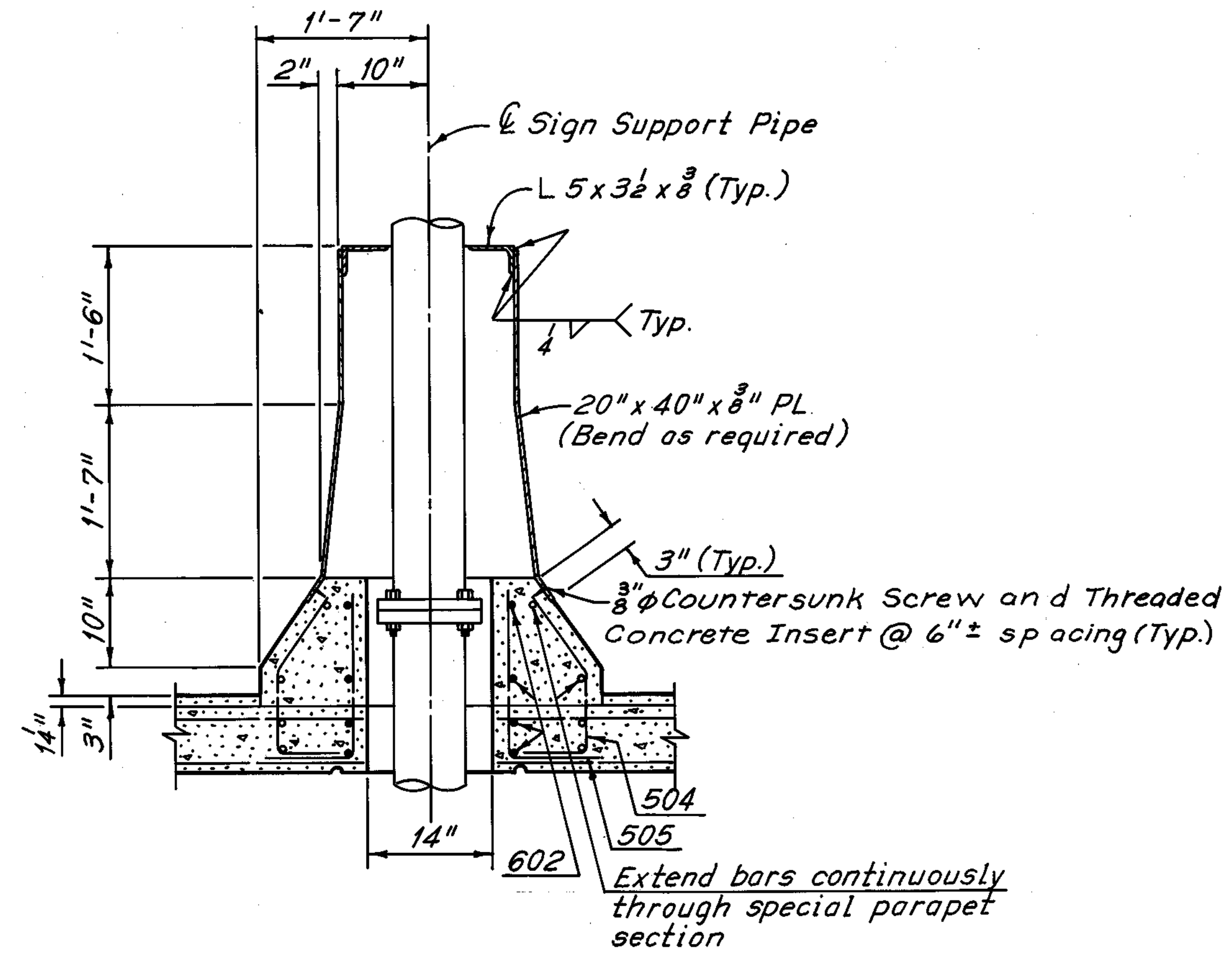
DRAWN LJW	TRACED WMS	CHECKED KRH	REVIEWED C.A.B.	REVISED
DATE 8-1-71	DATE 8-5-71	DATE 8-31-71	DATE 2-24-86	SHEET 101/108

FHWA REGION	STATE	PROJECT	
2	OHIO		

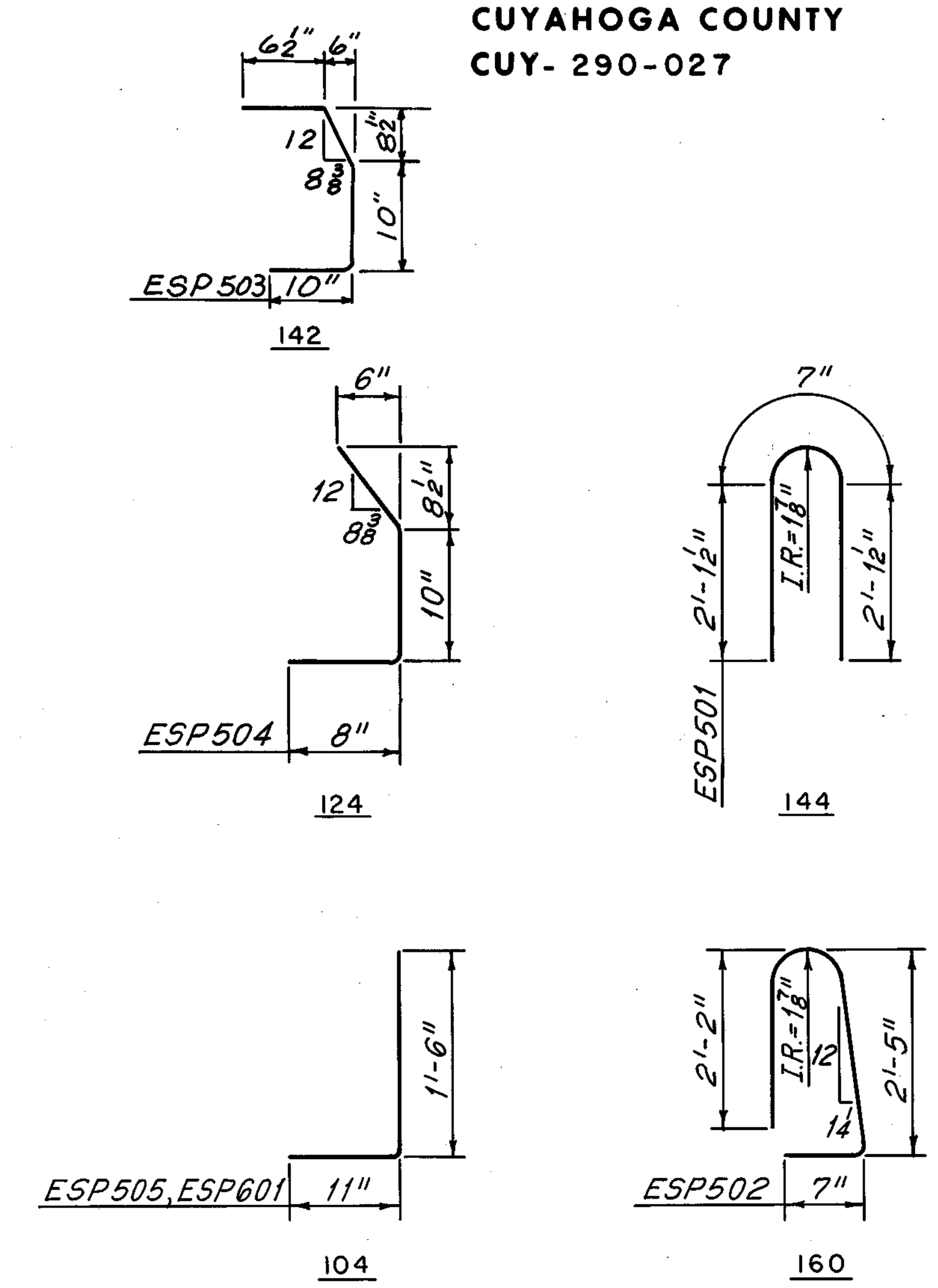
CUYAHOGA COUNTY
CUY- 290-027



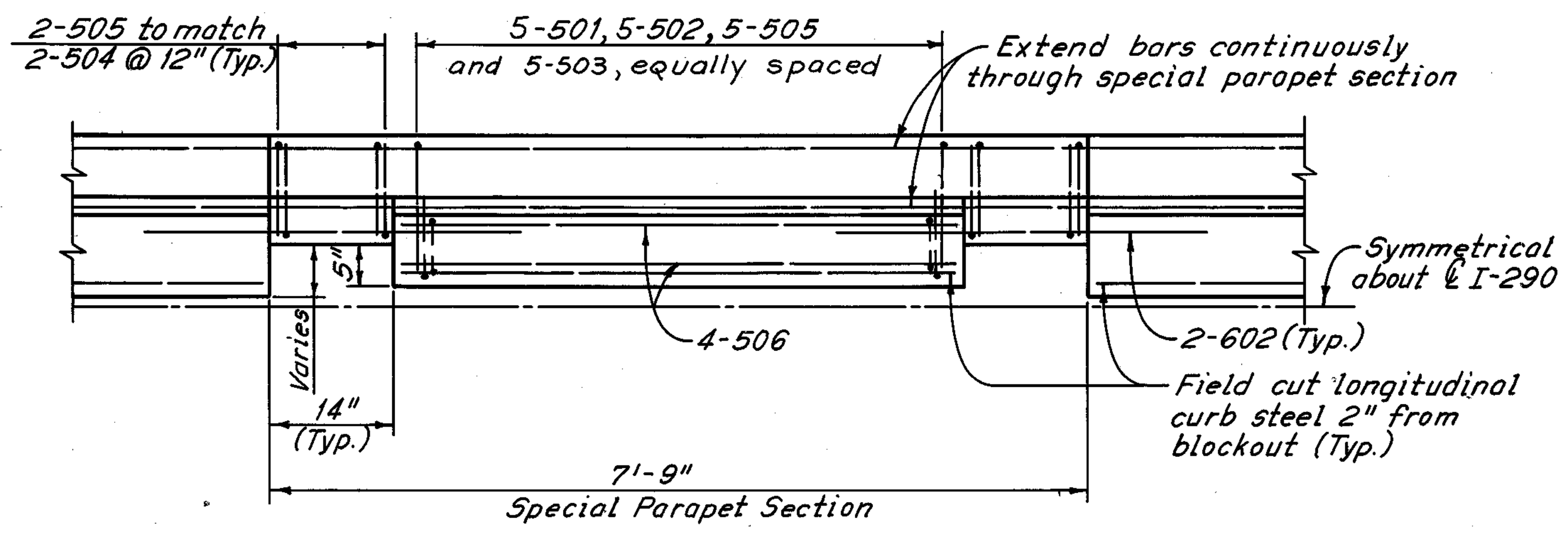
PLAN



SECTION A-A

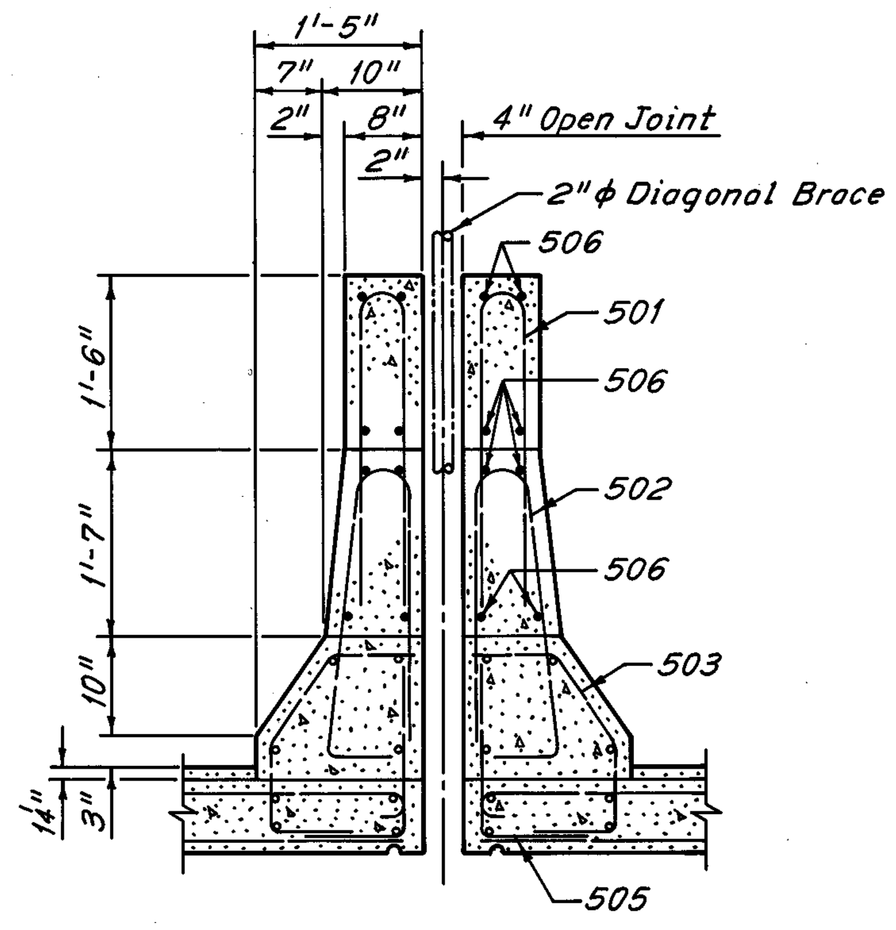


BAR BENDING DIAGRAMS

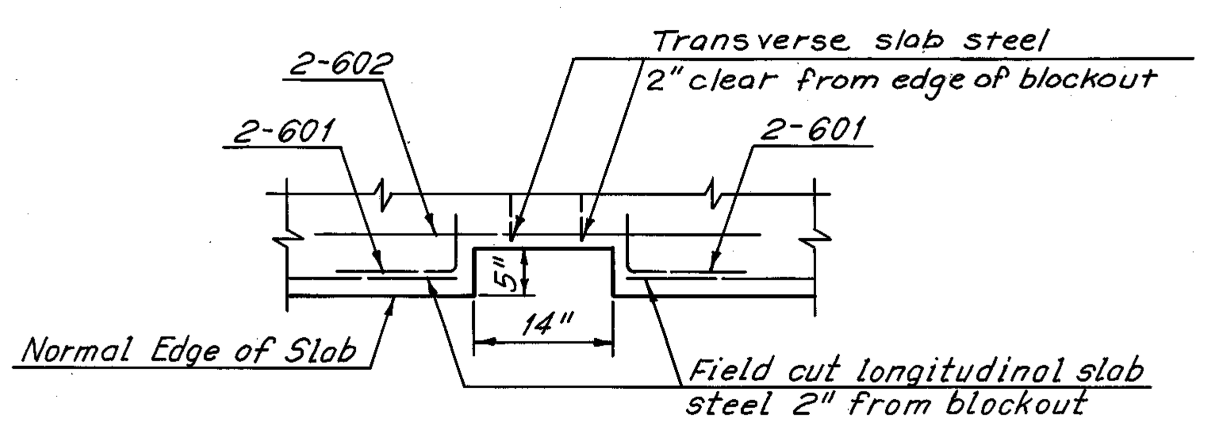


REINFORCEMENT LAYOUT AT MEDIAN BARRIER SIGN SUPPORT

REINFORCING SCHEDULE PARAPET SECTION AT SIGN SUPPORT				
MARK	NO.	LENGTH	SHAPE	WEIGHT
ESP501	10	4'-10"	144	50
ESP502	10	5'-3"	160	55
ESP503	10	2'-10"	142	30
ESP504	8	2'-2"	124	19
ESP505	18	2'-4"	104	44
ESP506	16	5'-0"	Str.	83
ESP601	16	2'-3"	104	54
ESP602	16	5'-0"	Str.	120
For 1 (One) Special Parapet Section for Sign Support, Total Weight =				455



SECTION B-B



SLAB BLOCKOUT DETAIL

Note: All reinforcing bar marks shall be prefixed ESP.

Note: All bars shall be epoxy coated.

Note: 20"x40"x⅜"PL., L5 x3½ x⅜ and anchor screws are included with Item 513

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND HNTB

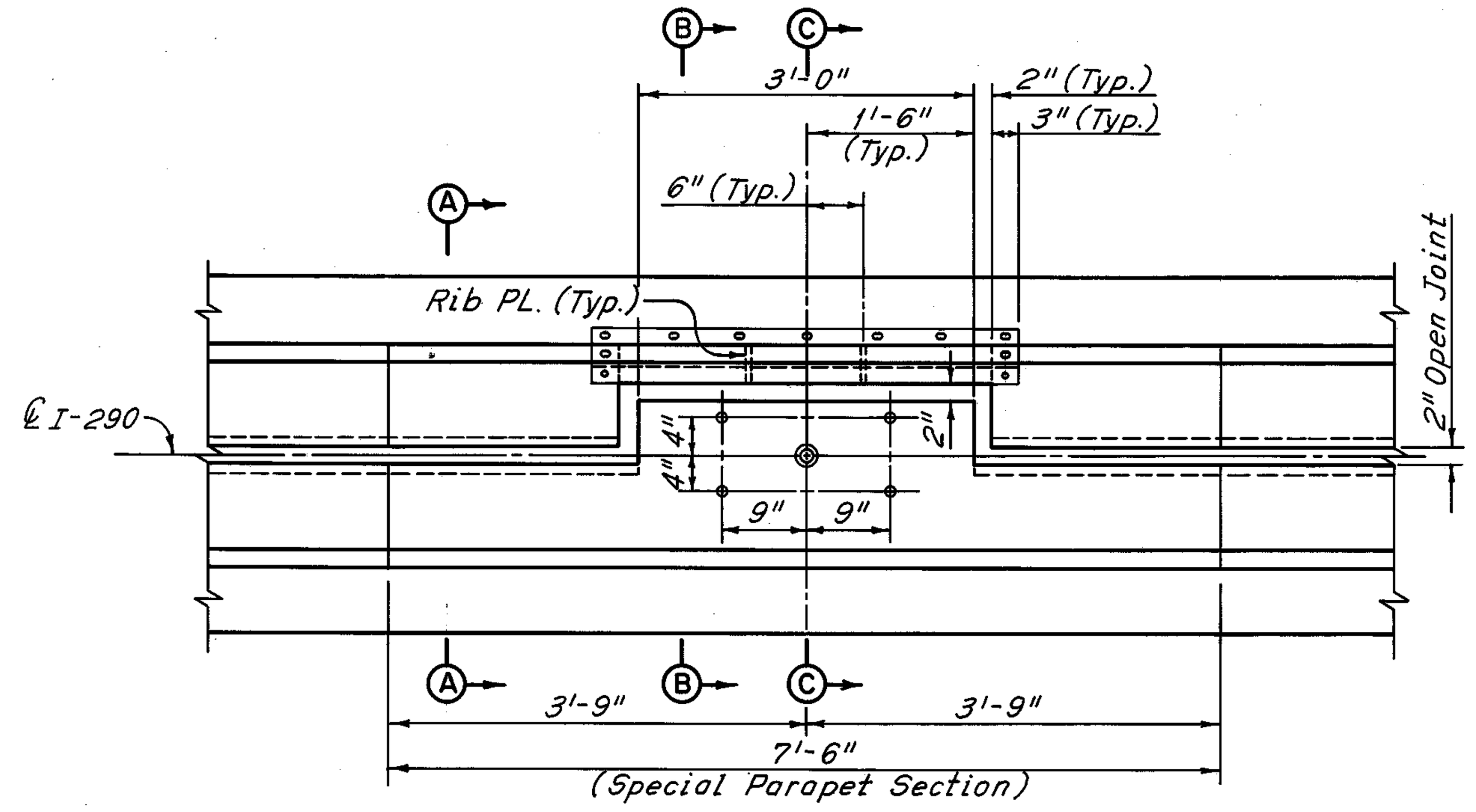
MEDIAN BARRIER SIGN SUPPORT DETAILS

I-290 OVER CUYAHOGA RIVER

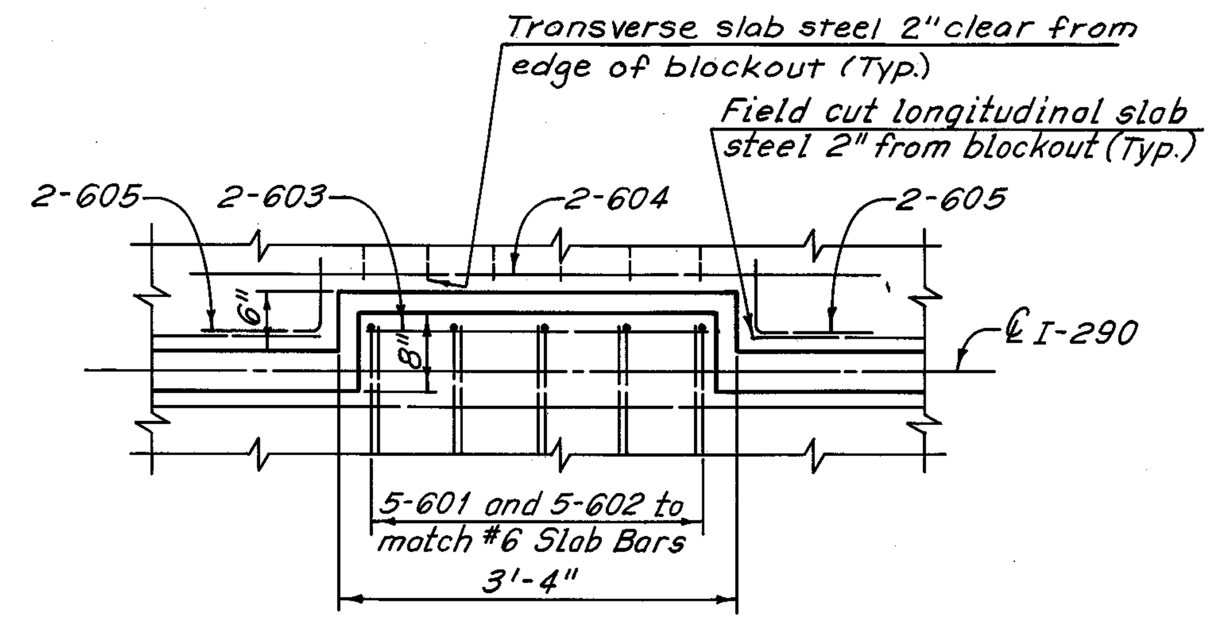
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN B.B. DATE 12-11-85	TRACED D.L.R. DATE 1-16-86	CHECKED C.L.B. DATE 2-12-86	REVIEWED C.A.B. DATE 2-24-86	REVISED	SHEET 102/108



PLAN

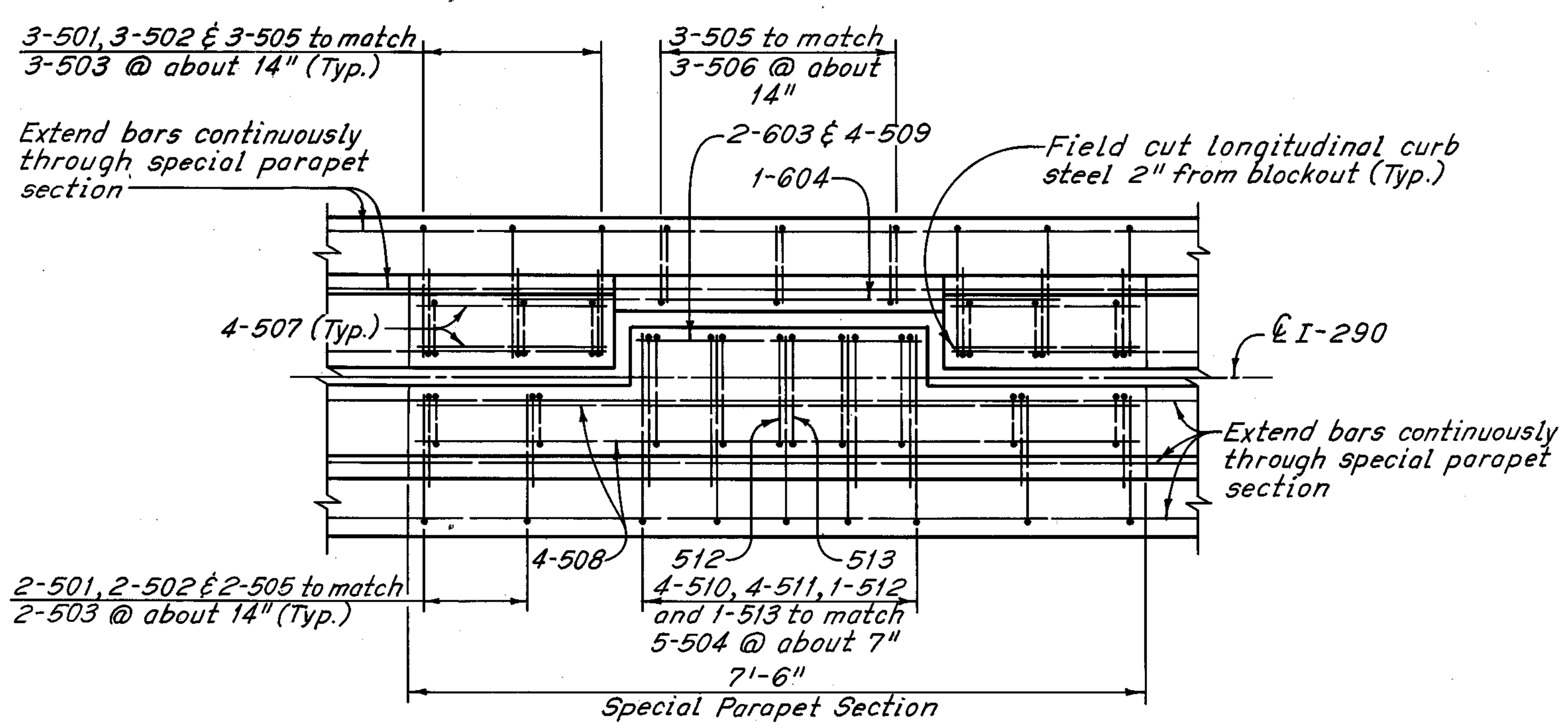


SLAB BLOCKOUT DETAIL

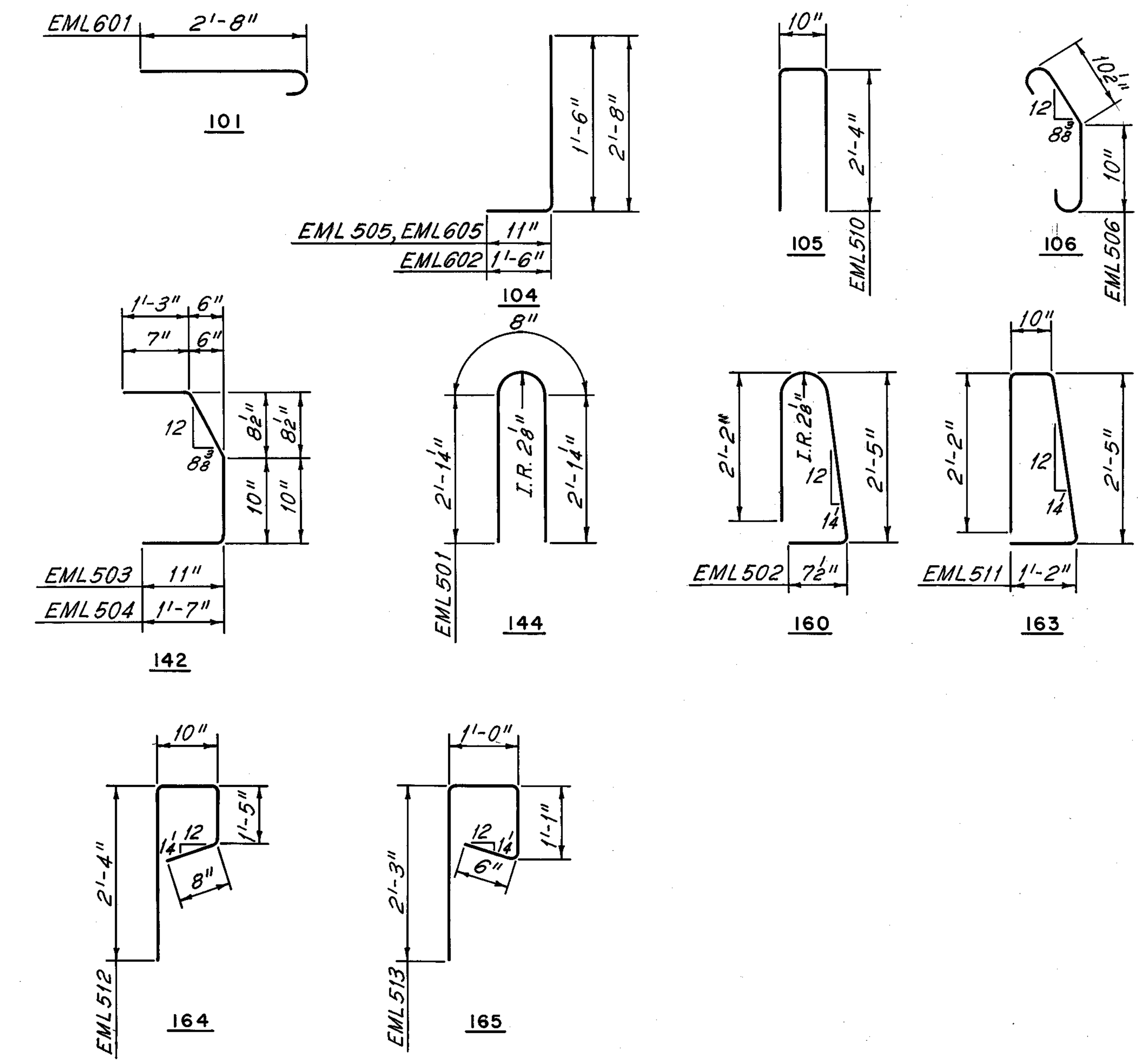
Note:
Details for the Median Pull Box are the same as for the Median Light Support except for the 1¼"ϕ U-Bolts and the 2"ϕ Conduit.
All bars shall be epoxy-coated.

Note:
All reinforcing bar marks shall be prefixed EML.

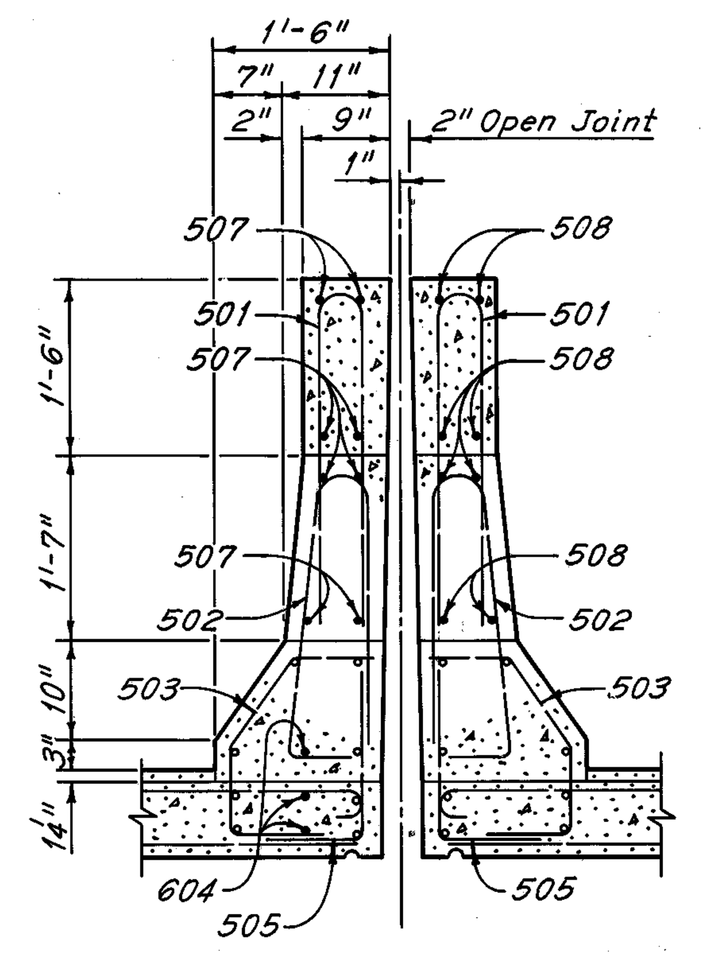
‡ Note: In areas where #5 bars alternate with #6 bars, extend only the #6 bars into the light blister with the 601 bars.



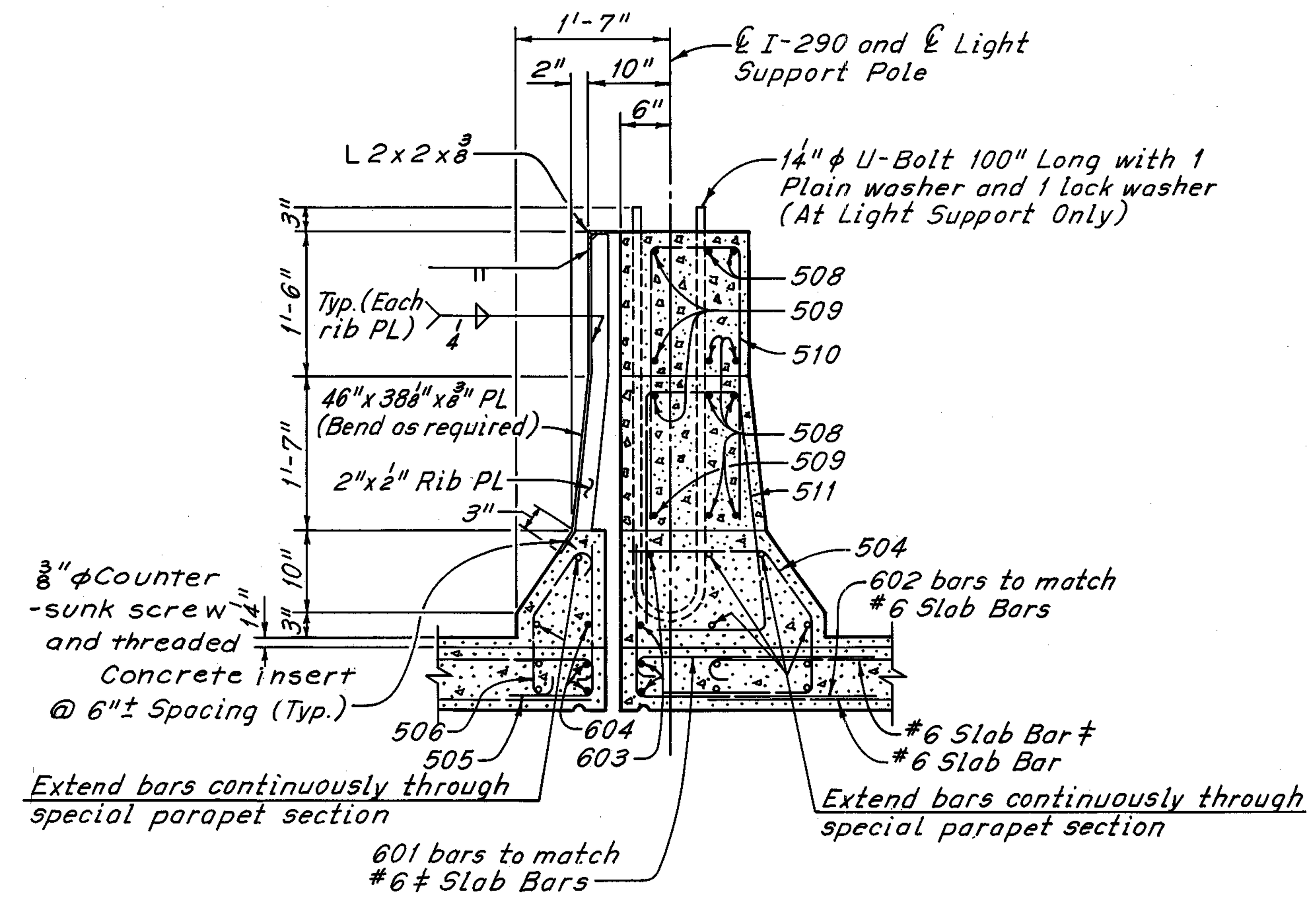
REINFORCEMENT LAYOUT AT MEDIAN LIGHT SUPPORT



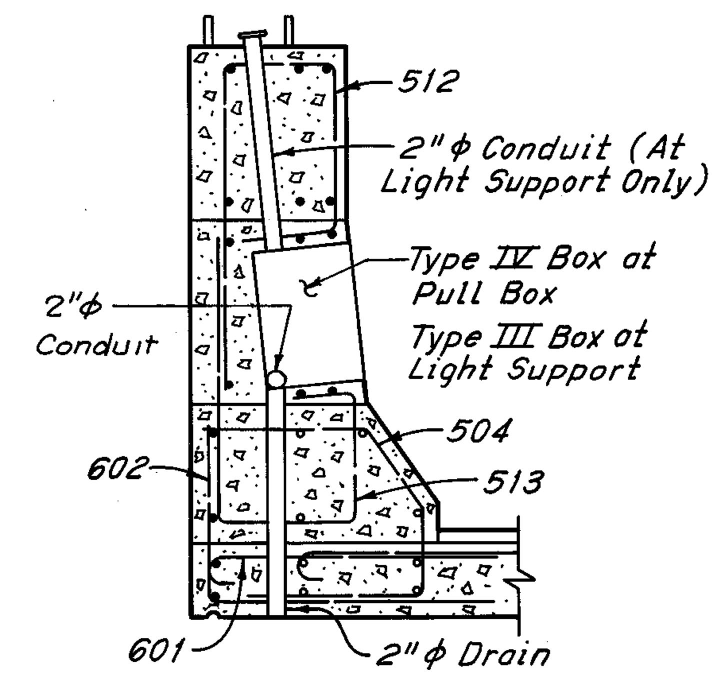
BAR BENDING DIAGRAMS



SECTION A-A



SECTION B-B



PART SECTION C-C

REINFORCING SCHEDULE PARAPET SECTION AT MEDIAN LIGHT SUPPORT OR MEDIAN PULL BOX				
MARK	NO.	LENGTH	SHAPE	WEIGHT
EML501	10	4'-11"	144	51
EML502	10	5'-3"	160	55
EML503	10	3'-0"	142	31
EML504	5	4'-4"	142	23
EML505	13	2'-4"	104	32
EML506	3	2'-11"	106	9
EML507	16	1'-9"	Str.	29
EML508	8	7'-0"	Str.	58
EML509	4	2'-6"	Str.	10
EML510	4	5'-3"	105	22
EML511	4	6'-3"	163	26
EML512	1	4'-10"	164	5
EML513	1	4'-6"	165	5
EML601	5	3'-4"	101	25
EML602	5	4'-0"	104	30
EML603	4	2'-6"	Str.	15
EML604	3	7'-0"	Str.	32
EML605	4	2'-3"	104	14
For 1 (One) Special Parapet Section for Median Light Support or Median Pull Box, Total Weight =				472

Notes:
46"x38⅝"x⅜" PL., L 2 x 2 x ⅜, 2"x½" Rib PL. and Anchor Screws are included with Item 513 for payment.

For location of conduit in structure, additional lighting details and lighting quantities see Lighting Plans.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND HNTB

MEDIAN BARRIER, LIGHT SUPPORT AND PULL BOX DETAILS
I-290 OVER CUYAHOGA RIVER

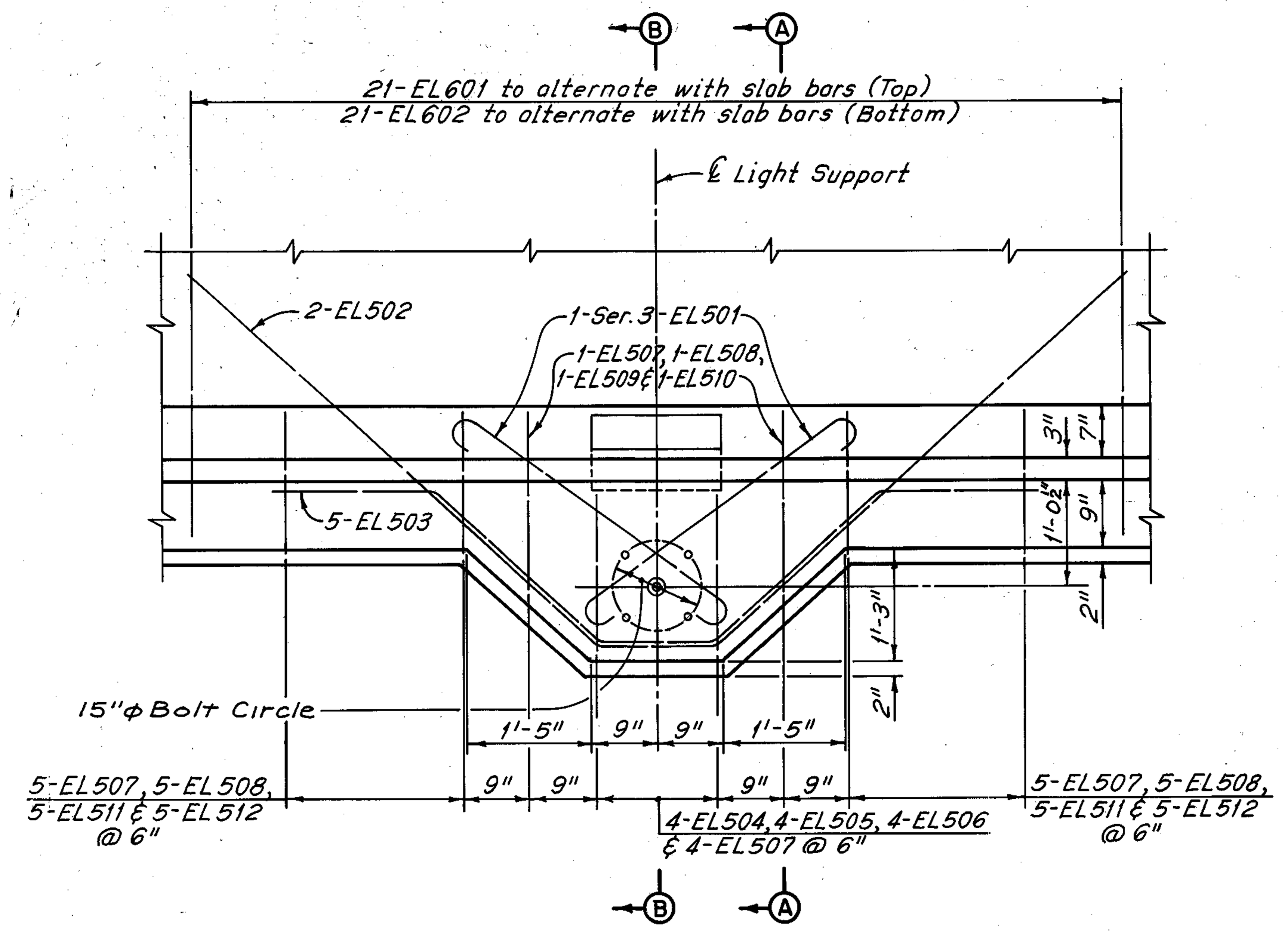
BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
B.B. DATE 12-10-85	D.L.R. DATE 1-10-86	C.L.B. DATE 2-12-86	C.A.B. DATE 2-24-86	SHEET 103/108

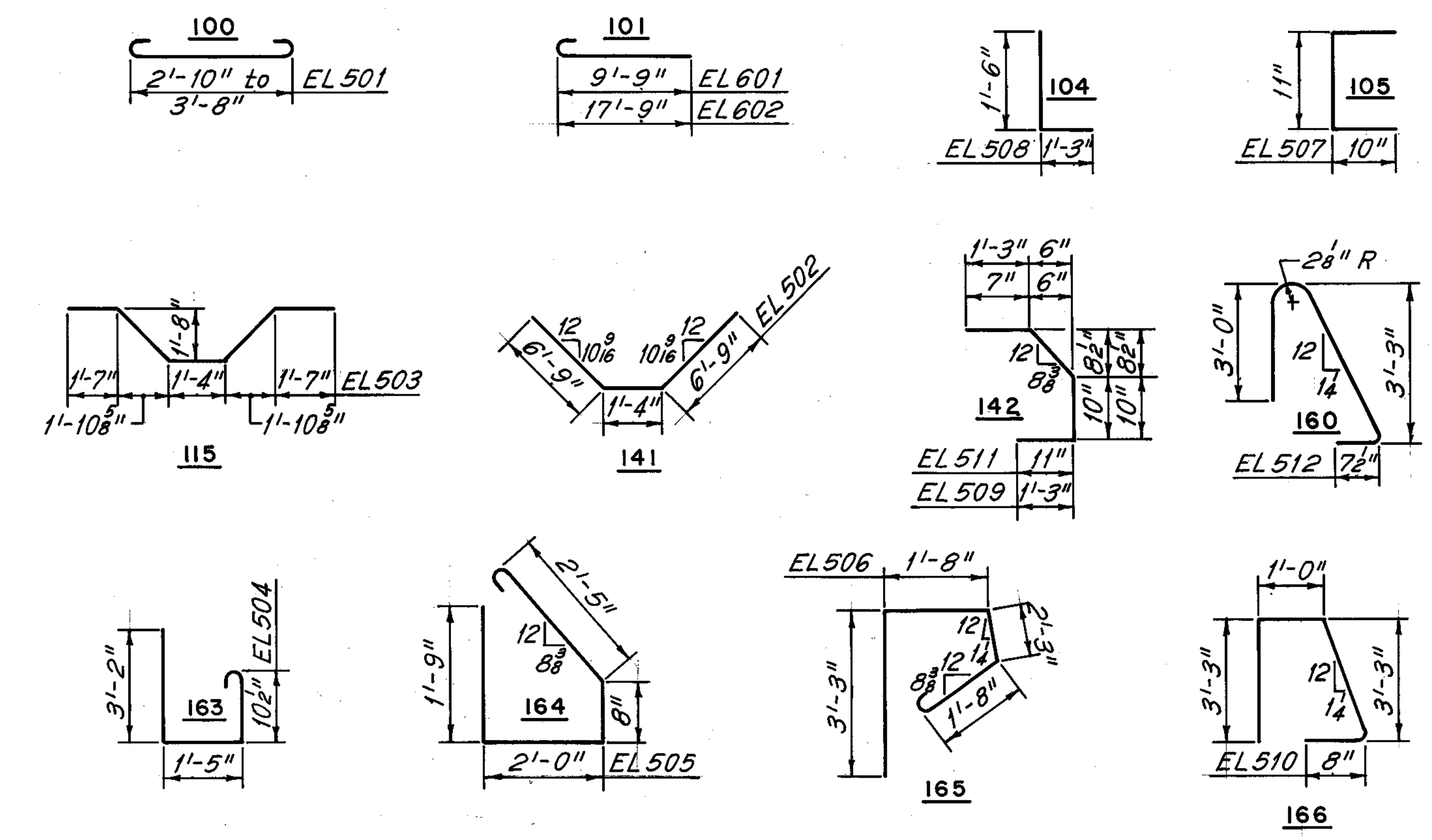
FHWA REGION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY- 290-027

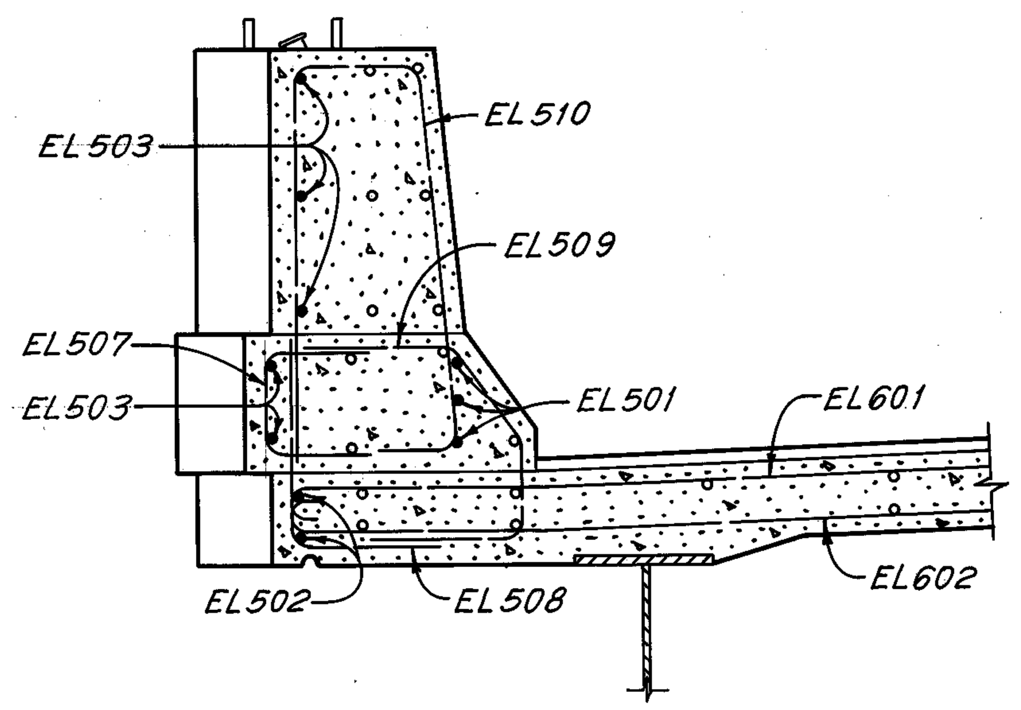


PLAN

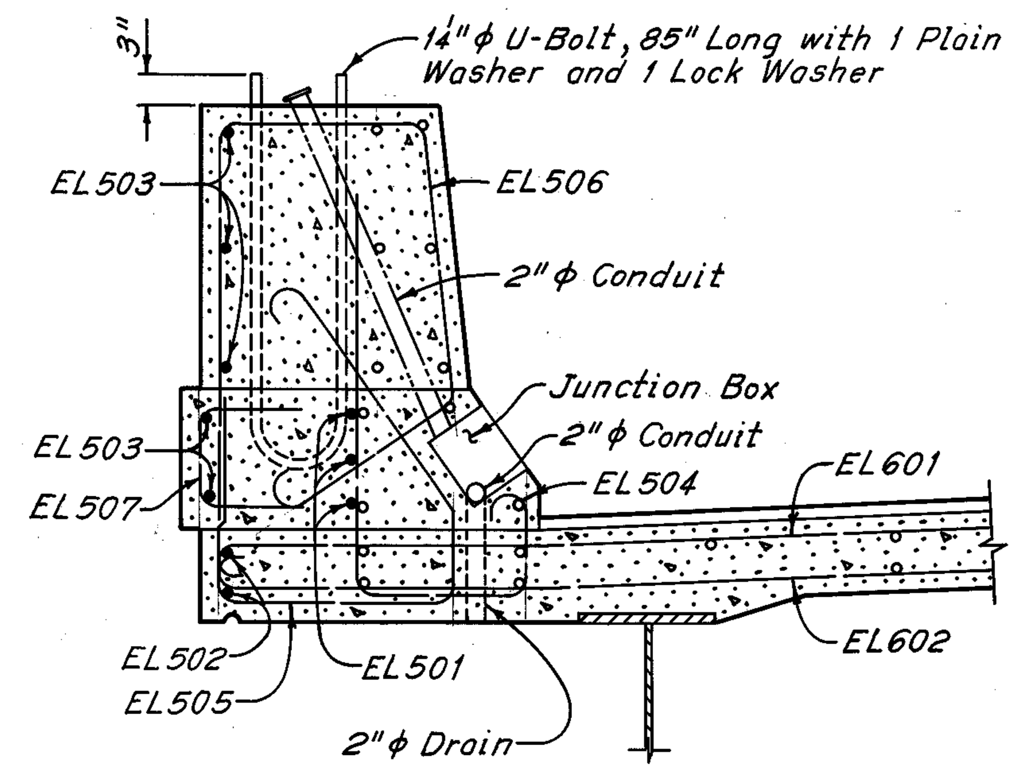
BAR BENDING DIAGRAMS



REINFORCING SCHEDULE CURB BARRIER LIGHT STANDARD SUPPORT					
MARK	NO.	LENGTH	SHAPE	SER. INCR.	WEIGHT
EL 501	2 Ser. 3	4'-10" / 4'-0"	100	5"	28
EL 502	2	14'-8"	141		31
EL 503	5	9'-4"	115		49
EL 504	4	5'-9½"	163		24
EL 505	4	7'-1"	164		30
EL 506	4	9'-2"	165		38
EL 507	16	2'-4"	105		39
EL 508	12	2'-7½"	104		33
EL 509	2	3'-11½"	142		8
EL 510	2	7'-10"	166		16
EL 511	10	2'-11½"	142		31
EL 512	10	7'-1"	160		74
EL 601	21	10'-5"	101		329
EL 602	21	18'-5"	101		581
For 1 (one) Light Standard Support on Bridge Total Weight=					1311



SECTION A-A



SECTION B-B

Notes:
- o denotes normal longitudinal barrier reinforcement.

For location of conduit in structures, additional lighting details and lighting quantities, see lighting plans.

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

CURB BARRIER LIGHT SUPPORT DETAILS

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 — STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

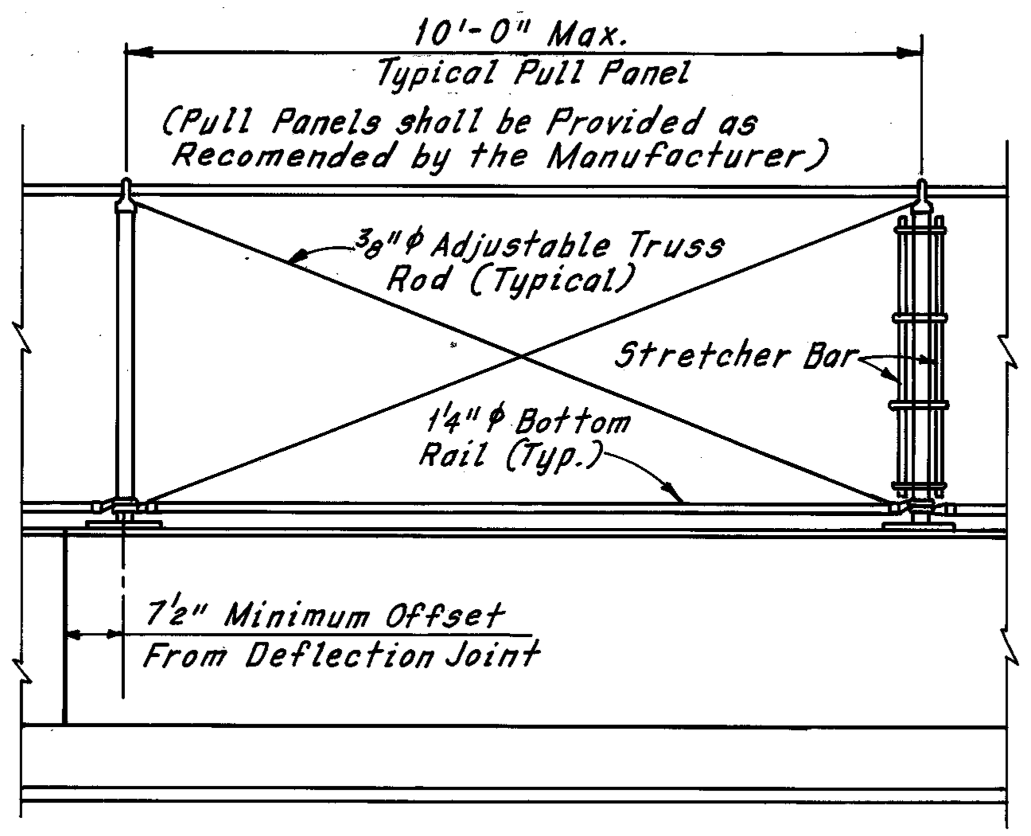
CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN B.B. DATE 12/11/85	TRACED D.L.R. DATE 1/16/86	CHECKED C.L.B. DATE 2/10/86	REVIEWED C.A.B. DATE 2/24/86	REVISED	SHEET 104/108

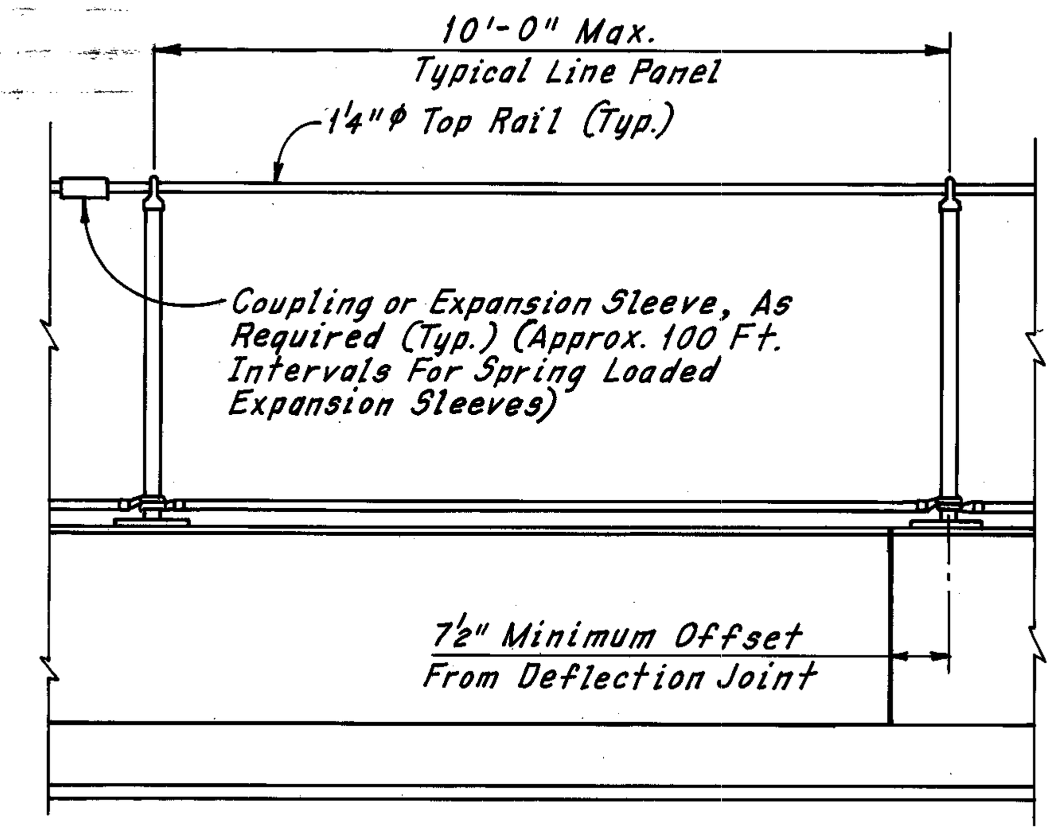
FHWA REGION	STATE	PROJECT	
2	OHIO		

190/193

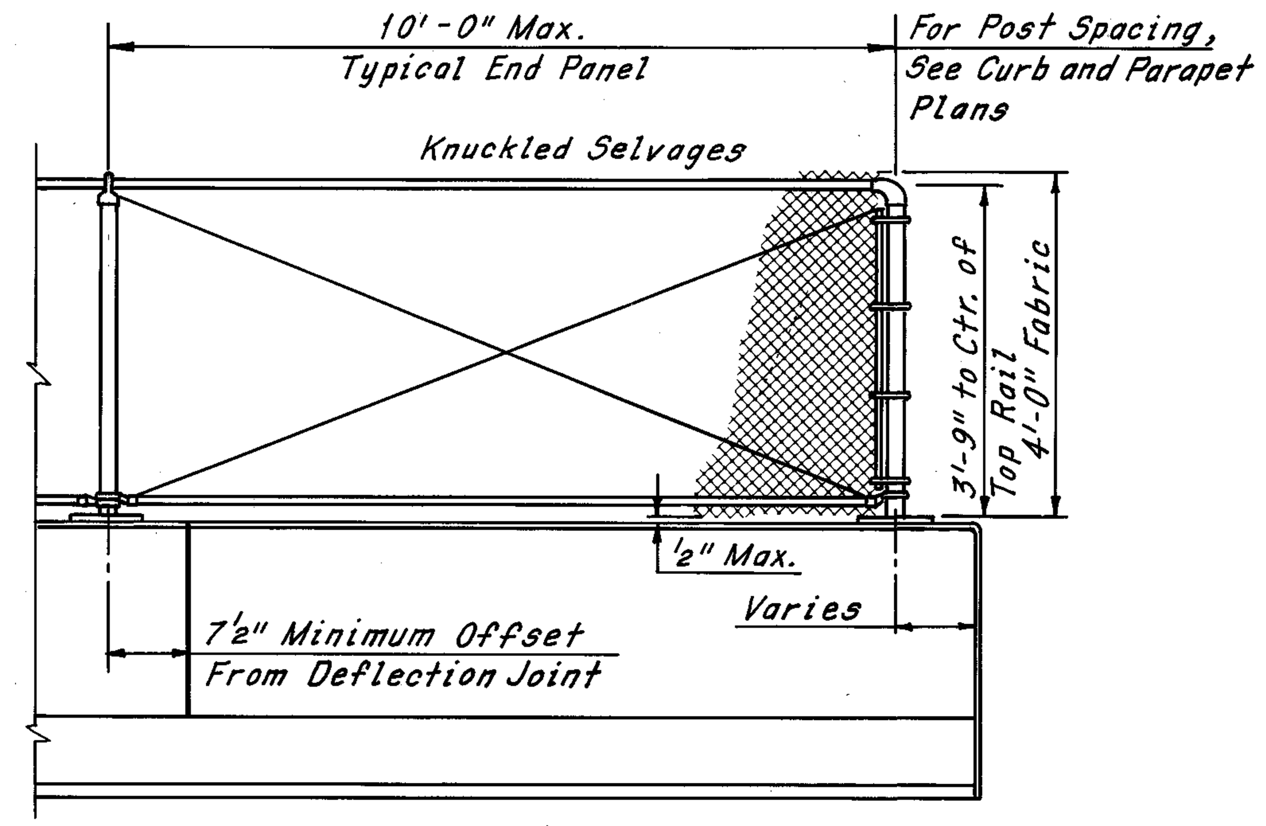
CUYAHOGA COUNTY
CUY- 290-027



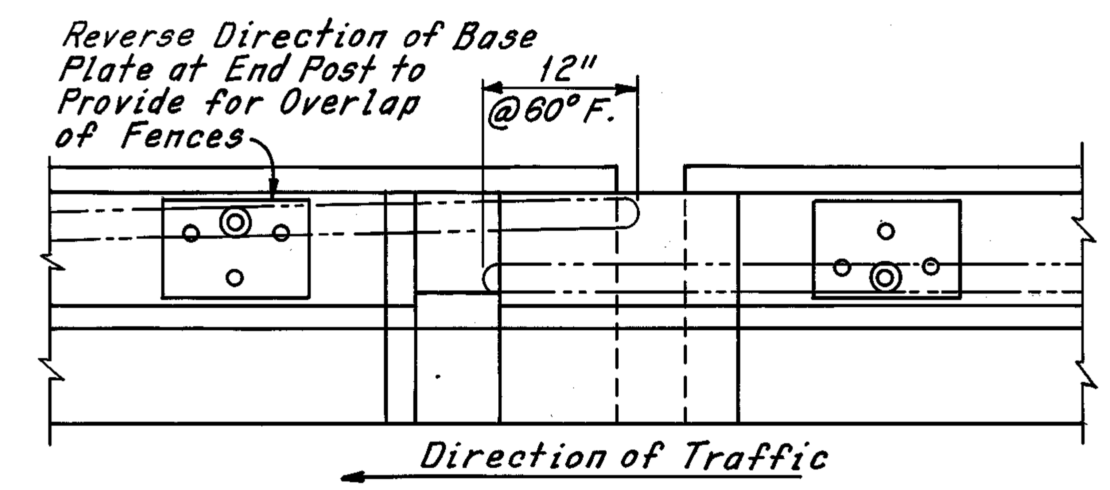
TYPICAL PULL PANEL



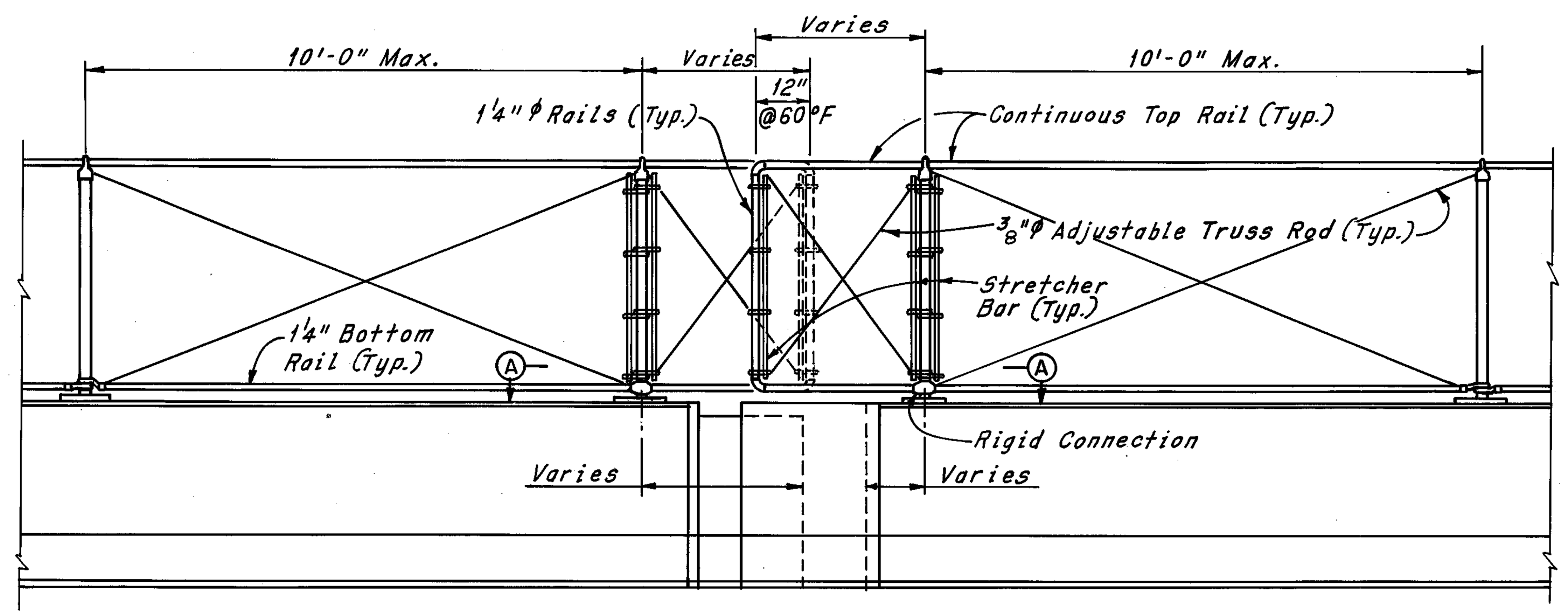
TYPICAL LINE PANEL



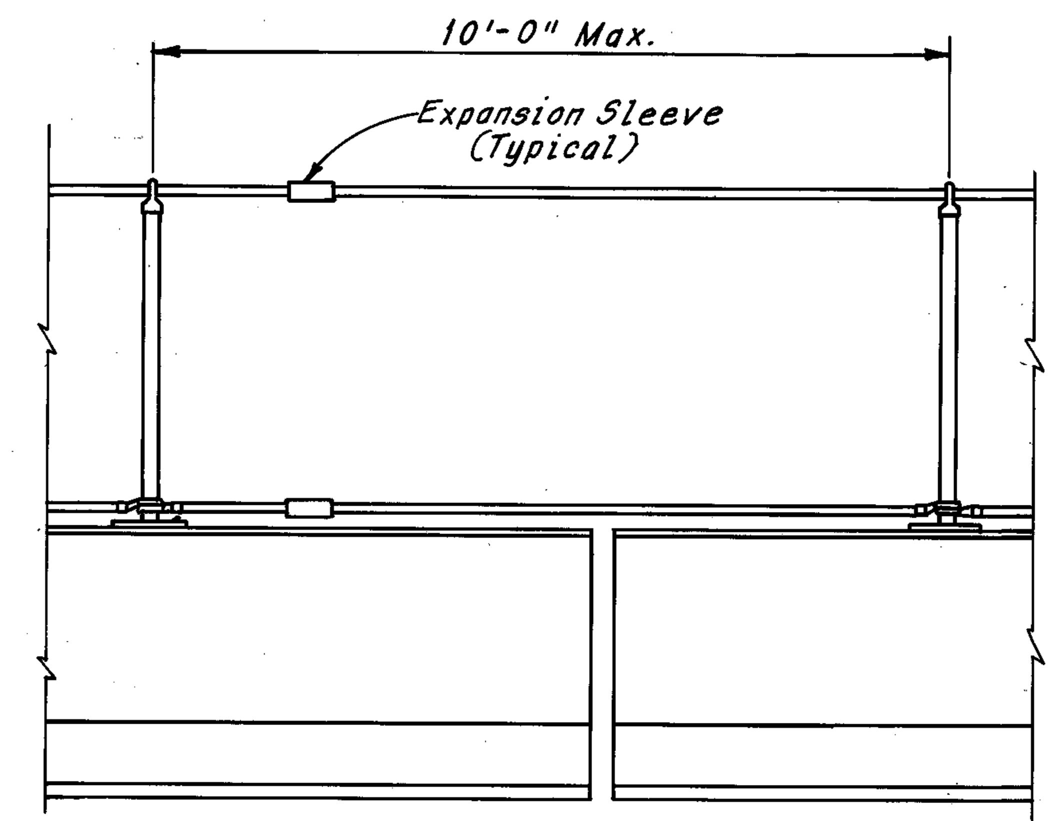
TYPICAL END PANEL



SECTION A-A



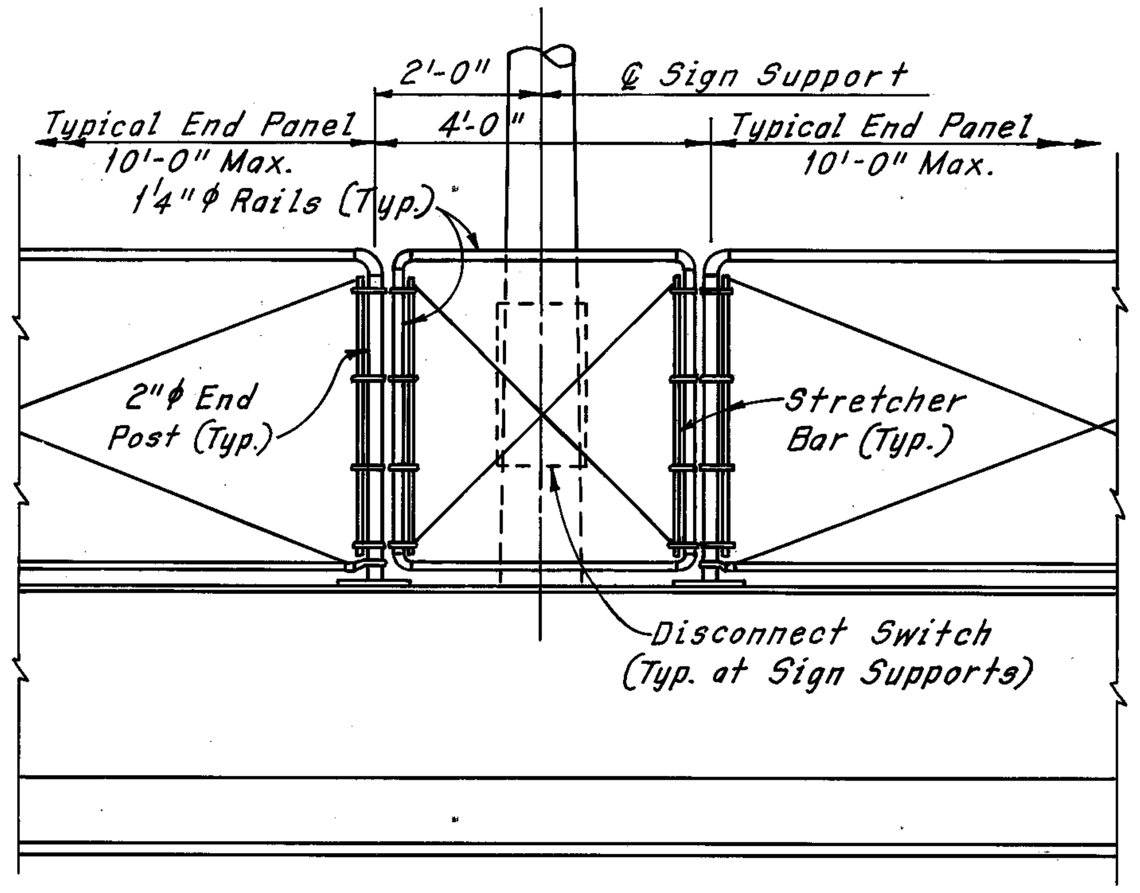
DETAIL AT EXPANSION · JOINT
(Typical, except at Expansion Joint 6)



DETAIL AT EXPANSION JOINT 6

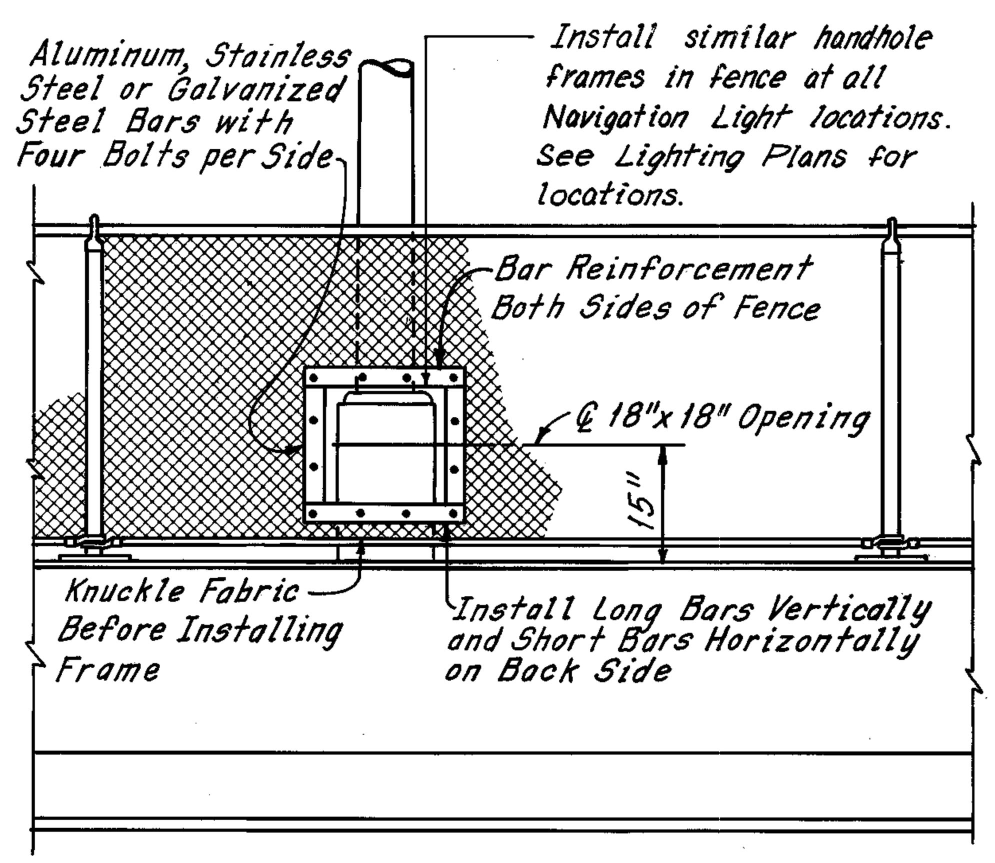
ITEM 607 - FENCE, TYPE CL, AS PER PLAN (4'-0" HIGH)

THIS ITEM INCLUDES THE FURNISHING OF ALL MATERIALS, LABOR, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE FENCING. TENSION BANDS SHALL BE A MINIMUM OF 12 GAUGE STEEL BY 7/8 INCHES WIDE ASSEMBLED WITH 5/16 INCH DIAMETER BY 1-1/4 INCH GALVANIZED OR CADMIUM PLATED BOLTS. ONE TENSION BAND SHALL BE REQUIRED FOR EACH FOOT OF FABRIC HEIGHT. FENCE POSTS AND ANCHOR BOLTS SHALL BE PERPENDICULAR TO GRADE. RAILS SHALL BE PARALLEL TO GRADE. THE BASE PLATE SHALL BE SET IN A POLYURETHANE OR POLYMERIC JOINT SEALANT BEDDING MATERIAL. THE FABRIC AND RAILS SHALL BE FREE TO EXPAND OR CONTRACT ACROSS EXPANSION JOINT 6. MATERIALS AND WORKMANSHIP SHALL MEET THE REQUIREMENTS OF ITEM 607 EXCEPT THAT ALUMINUM ALLOY POSTS AND BASE PLATES SHALL NOT BE USED. FABRIC TIES SHALL BE SPACED 14 INCH C/C MAXIMUM ON LINE OR END POSTS AND 24 INCH C/C MAXIMUM ON ALL RAILS. ALL POSTS AND PIPE SIZES ARE NOTED IN TERMS OF THE NOMINAL INSIDE DIAMETER OF STANDARD WEIGHT PIPE, SCHEDULE 40. STRETCHER BARS AND MISCELLANEOUS HARDWARE SHALL BE THAT OF THE CHAIN LINK FENCE INDUSTRY STANDARD. BASE PLATES AND MISCELLANEOUS BRACKETS FOR STEEL POSTS MAY BE OF ANY COMMERCIALLY WELDABLE STEEL HAVING A YIELD STRENGTH OF NOT LESS THAN 33,000 PSI. ALUMINUM ALLOY FABRIC (AASHTO M-181, TYPE III) SHALL BE USED. POSTS SHALL HAVE A YIELD STRENGTH OF 30 KSI.



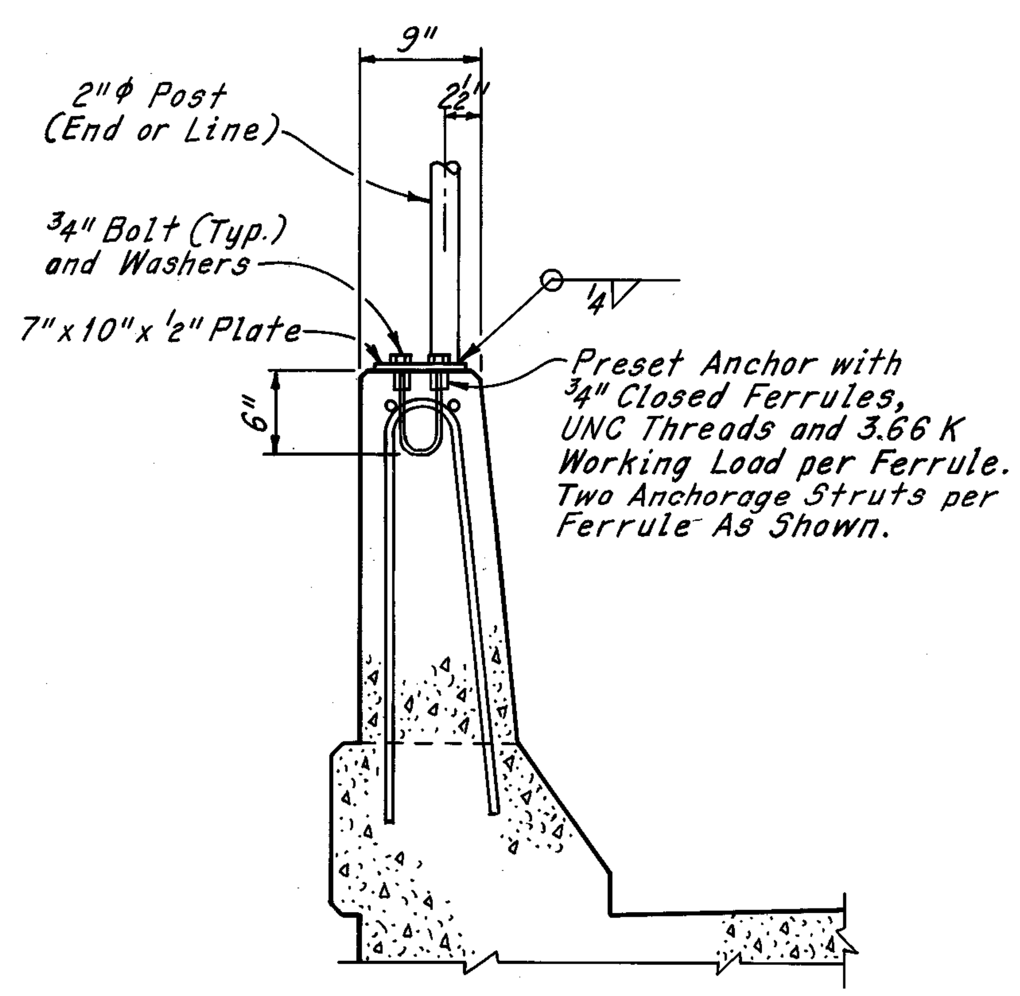
DETAIL AT SIGN SUPPORT

Note: Payment included in the unit price bid for Item 607, Gate, Type CL as per plan.

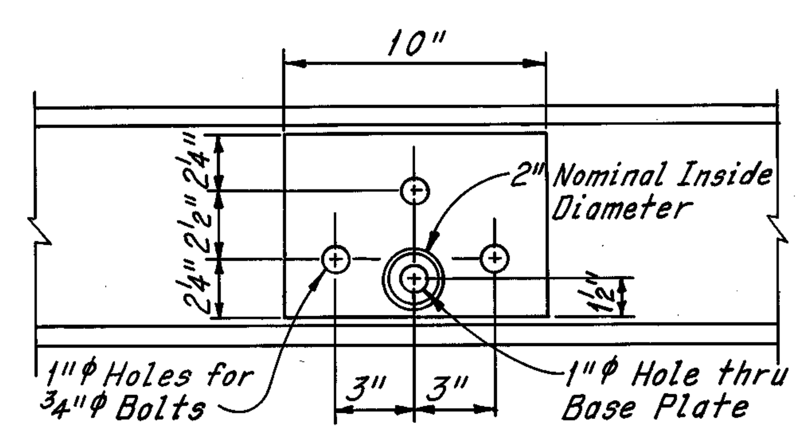


DETAIL AT LIGHT POLE

Note: All costs of material and labor necessary to install the handhole frames as detailed above shall be included in the Unit Price Bid for Item 607, Type CL As Per Plan. (4'-0" High)



TYPICAL SECTION



PLAN VIEW
BASE PLATE

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

FENCE DETAILS

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110

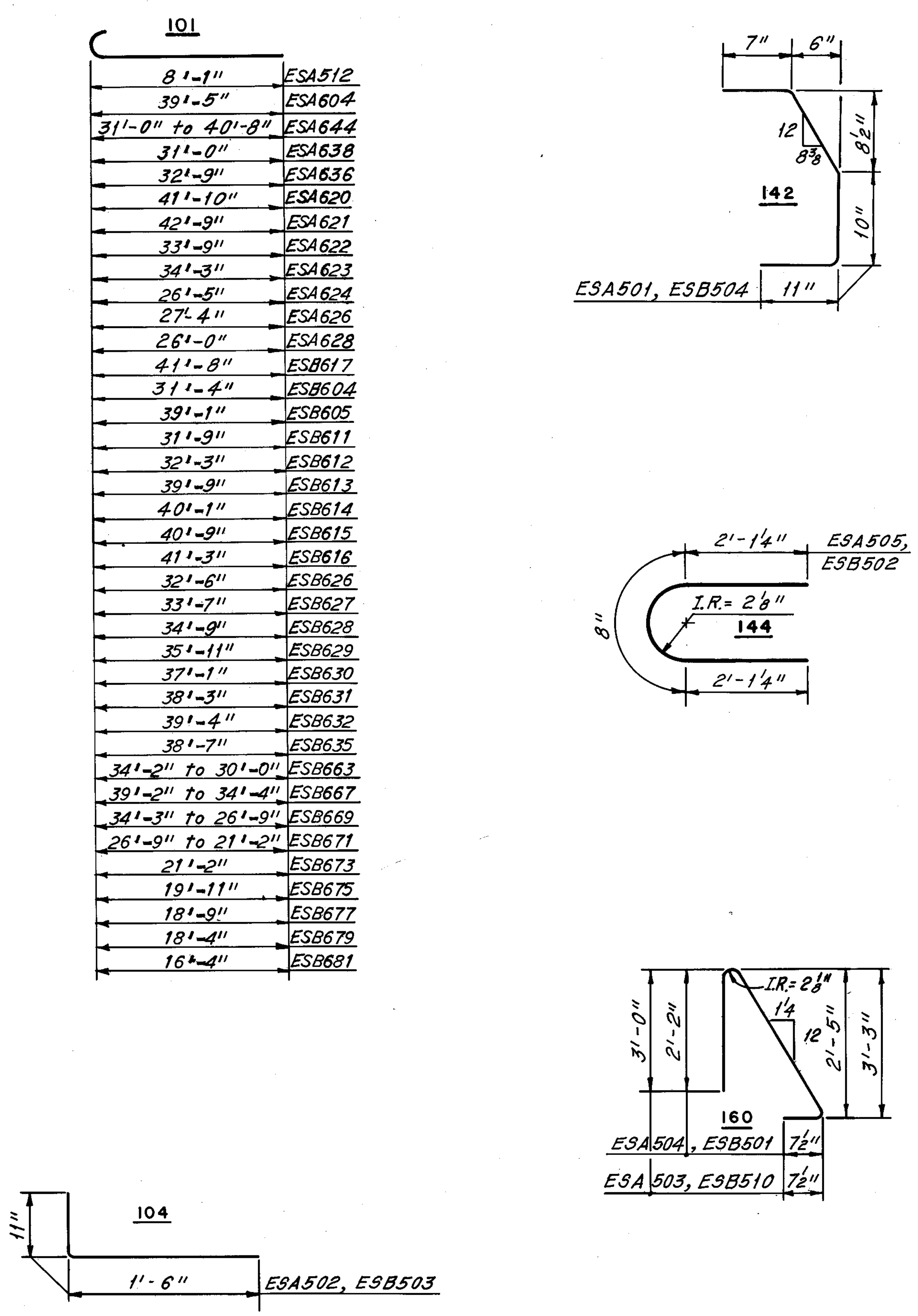
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN B.B.	TRACED C.P.	CHECKED C.P.	REVIEWED C.A.B.	REVISED	
DATE 9-3-85	DATE 12-5-85	DATE 12-8-85	DATE 2-24-86		SHEET 105/108

MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)	MARK	NO.	LENGTH	TYPE	SER. INCR	WEIGHT (LBS.)
SLAB - UNIT 1						SLAB - UNIT 2						ESB661	60	16'- 6"	STR		1,487
EPOXY COATED BARS						EPOXY COATED BARS						ESB662	1 SER 52	30'-1" / 25'-11"	STR	1"	2,187
												ESB663	1 SER 52	34'-10" / 30'-8"	101	1"	2,558
ESA501	824	3'- 0"	142		2,578	ESB501	1127	5'- 3"	160		6,171	ESB664	52	41'- 6"	STR		3,241
ESA502	824	2'- 4"	104		2,005	ESB502	1127	4'-11"	144		5,779	ESB665	52	43'- 0"	STR		3,358
ESA503	420	6'-11"	160		3,030	ESB503	2361	2'- 4"	104		5,746	ESB666	1 SER 44	34'-3" / 30'-6"	STR	1"	2,140
ESA504	404	5'- 3"	160		2,212	ESB504	2361	3'- 0"	142		7,388	ESB667	1 SER 44	39'-10" / 35'-0"	101	1 3/8"	2,473
ESA505	404	4'-11"	144		2,072	ESB505	1046	7'- 0"	STR		7,637	ESB668	1 SER 105	30'-6" / 22'-9"	STR	7/8"	4,199
ESA506	24	15'- 9"	STR		394	ESB506	128	15'- 0"	STR		2,003	ESB669	1 SER 105	35'-0" / 27'-5"	101	7/8"	4,922
ESA507	112	14'- 9"	STR		1,723	ESB507	194	14'- 6"	STR		2,934	ESB670	1 SER 105	22'-9" / 17'-3"	STR	5/8"	3,154
ESA508	44	14'- 0"	STR		642	ESB508	110	15'- 6"	STR		1,778	ESB671	1 SER 105	27'-5" / 21'-10"	101	5/8"	3,884
ESA509	374	6'- 9"	STR		2,633	ESB509	48	13'- 3"	STR		663	ESB672	43	17'- 3"	STR		1,114
ESA510	18	11'- 6"	STR		216	ESB510	1234	6'-11"	160		8,902	ESB673	43	21'-10"	101		1,410
ESA511	96	7'- 3"	STR		726	ESB511	88	14'- 9"	STR		1,354	ESB674	43	16'- 0"	STR		1,033
ESA512	205	8'- 8"	101		1,853	ESB512	96	14'- 3"	STR		1,427	ESB675	43	20'- 7"	101		1,329
ESA513	32	13'- 0"	STR		434	ESB513	32	14'- 0"	STR		467	ESB676	43	14'- 9"	STR		953
						ESB514	40	13'- 6"	STR		563	ESB677	43	19'- 5"	101		1,254
						ESB515	8	11'- 0"	STR		92	ESB678	50	13'- 6"	STR		1,014
ESA601	3576	30'- 0"	STR		161,135							ESB679	50	19'- 0"	101		1,427
ESA602	273	17'- 0"	STR		6,970							ESB680	67	11'- 9"	STR		1,182
ESA603	413	35'- 6"	STR		22,022	ESB601	7200	30'- 0"	STR		324,433	ESB681	67	17'- 0"	101		1,711
ESA604	414	40'- 1"	101		24,925	ESB602	125	10'- 9"	STR		2,018						
ESA605	413	33'- 3"	STR		20,626	ESB603	2978	35'- 3"	STR		157,672		1 CURB BARRIER LIGHT				
ESA606	414	25'- 6"	STR		15,857	ESB604	1649	32'- 0"	101		79,257		STANDARD SUPPORT @1311 =				1,311
ESA607	1 SER 114	10'-3" / 21'-3"	STR	1 3/16"	2,697	ESB605	1292	39'- 9"	101		77,138						
ESA608	1 SER 114	11'-6" / 22'-6"	STR	1 3/16"	2,911	ESB606	254	36'- 3"	STR		13,830		3 MEDIAN BARRIER LIGHT				
ESA609	1 SER 170	21'-3" / 35'-6"	STR	1"	7,245	ESB607	82	35'- 9"	STR		4,403		STANDARD SUPPORTS @472 =				1,416
ESA610	1 SER 170	22'-6" / 36'-9"	STR	1"	7,564	ESB608	38	36'- 9"	STR		2,098						
ESA611	60	17'- 6"	STR		1,577	ESB609	37	37'- 3"	STR		2,070		3 MEDIAN PULL BOXES @472 =				1,416
ESA612	91	37'- 9"	STR		5,160	ESB610	28	37'- 9"	STR		1,588						
ESA613	115	38'- 6"	STR		6,650	ESB611	113	32'- 5"	101		5,502		2 SIGN SUPPORTS @422 =				844
ESA614	115	39'- 6"	STR		6,823	ESB612	103	32'-11"	101		5,092						
ESA615	92	40'- 9"	STR		5,631	ESB613	81	40'- 5"	101		4,917		2 MANHOLE ACCESS SUPPORTS @245 =				490
ESA616	92	39'- 6"	STR		5,458	ESB614	38	40'- 9"	101		2,326						
ESA617	115	39'- 3"	STR		6,780	ESB615	76	41'- 5"	101		4,728		TOTAL WEIGHT =				1,003,881
ESA618	115	38'- 6"	STR		6,650	ESB616	37	41'-11"	101		2,329						
ESA619	91	37'- 9"	STR		5,160	ESB617	28	42'- 4"	101		1,780						
ESA620	92	42'- 6"	101		5,873	ESB618	122	23'- 3"	STR		4,260						
ESA621	115	43'- 5"	101		7,499	ESB619	35	36'- 3"	STR		1,906						
ESA622	92	34'- 5"	101		4,756	ESB620	34	37'- 6"	STR		1,915						
ESA623	115	34'-11"	101		6,031	ESB621	35	38'- 6"	STR		2,024						
ESA624	230	27'- 1"	101		9,356	ESB622	34	39'- 9"	STR		2,030						
ESA625	115	28'- 3"	STR		4,880	ESB623	35	41'- 0"	STR		2,155						
ESA626	92	28'- 0"	101		3,869	ESB624	34	42'- 0"	STR		2,145						
ESA627	92	28'- 9"	STR		3,973	ESB625	32	43'- 3"	STR		2,079						
ESA628	92	26'- 8"	101		3,685	ESB626	35	33'- 2"	101		1,744						
ESA629	129	18'- 0"	STR		3,488	ESB627	34	34'- 3"	101		1,749						
ESA630	1 SER 69	17'-6" / 19'-6"	STR	3/8"	1,917	ESB628	35	35'- 5"	101		1,862						
ESA631	1 SER 60	20'-0" / 24'-9"	STR	1"	2,016	ESB629	34	36'- 7"	101		1,868						
ESA632	1 SER 60	20'-9" / 25'-9"	STR	1"	2,095	ESB630	35	37'- 9"	101		1,985						
ESA633	1 SER 69	24'-9" / 28'-6"	STR	11/16"	2,759	ESB631	34	38'-11"	101		1,987						
ESA634	1 SER 69	25'-9" / 31'-3"	STR	1"	2,954	ESB632	32	40'- 0"	101		1,923						
ESA635	114	30'- 3"	STR		5,180	ESB633	363	43'- 0"	STR		23,445						
ESA636	115	33'- 5"	101		5,772	ESB634	363	35'- 6"	STR		19,356						
ESA637	175	28'- 3"	STR		7,426	ESB635	726	39'- 3"	101		42,800						
ESA638	170	31'- 8"	101		8,086	ESB636	1000	33'- 6"	STR		50,317						
ESA639	1 SER 5	33'-0" / 4'-0"	STR	7'-3"	140	ESB637	2 SER 5	30'-0" / 10'-0"	STR	5'-0"	300						
ESA640	1 SER 3	33'-0" / 4'-0"	STR	14'-6"	83	ESB638	8	8'- 6"	STR		102						
ESA641	1 SER 4	25'-9" / 4'-0"	STR	7'-3"	91	ESB639	1 SER 3	22'-6" / 8'-6"	STR	7'-0"	70						
ESA642	2	18'- 6"	STR		56	ESB640	2	22'- 6"	STR		68						
ESA643	1 SER 129	28'-6" / 38'-0"	STR	7/8"	6,442	ESB641	1 SER 4	26'-0" / 5'-0"	STR	7'-0"	93						
ESA644	1 SER 129	31'-8" / 41'-4"	101	15/16"	7,072	ESB642	179	19'- 0"	STR		5,108						
ESA645	66	22'- 0"	STR		2,184	ESB643	1 SER 4	25'-0" / 4'-6"	STR	6'-10"	89						
ESA646	5	24'- 6"	STR		184	ESB644	7	20'- 0"	STR		210						
ESA647	5	11'- 6"	STR		86	ESB645	1 SER 3	20'-0" / 4'-0"	STR	8'-0"	54						
						ESB646	1	18'- 0"	STR		27						
	1 CURB BARRIER LIGHT					ESB647	1 SER 3	22'-0" / 8'-0"	STR	7'-0"	68						
	STANDARD SUPPORT @1311 =				1,311	ESB648	1	16'- 0"	STR		24						
						ESB649	92	40'- 0"	STR		5,527						
	1 MEDIAN BARRIER LIGHT																
	STANDARD SUPPORT @472 =				472	ESB652	184	20'- 6"	STR		5,666						
						ESB653	56	13'- 6"	STR		1,136						
	TOTAL WEIGHT =				452,092	ESB654	1	15'- 9"	STR		24						
						ESB655	4	5'- 0"	STR		30						
						ESB657	279	32'- 0"	STR		13,410						
						ESB658	1	14'- 6"	STR		22						
						ESB659	145	39'- 0"	STR		8,494						
						ESB660	5	29'- 0"	STR		218						

BENDING DIAGRAMS



Notes:

For Median Light Support and Pull Box Reinforcement Schedules and Bending Diagrams, see Sheet 103/108.

For Curb Barrier Light Support Reinforcement Schedules and Bending Diagrams, see Sheet 104/108.

For Sign Support Reinforcement Schedules and Bending Diagrams, see Sheet 102/108.

For Manhole Access Support Reinforcement Schedule, see Sheet 71/108.

REINFORCING STEEL SAMPLES

Refer to CMS Sections 106.03, 700, 709.01 through 709.05 and 709.08. Sufficient additional reinforcing steel shall be provided for sampling. Random samples shall be replaced in the structures by the additional steel, spliced in accordance with 509.08.

FHWA REGION	STATE	PROJECT	
2	OHIO		

191/193

CUYAHOGA COUNTY
CUY- 290-027

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND — HNTB

SLAB REINFORCEMENT SCHEDULE UNITS 1 AND 2

I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110 STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

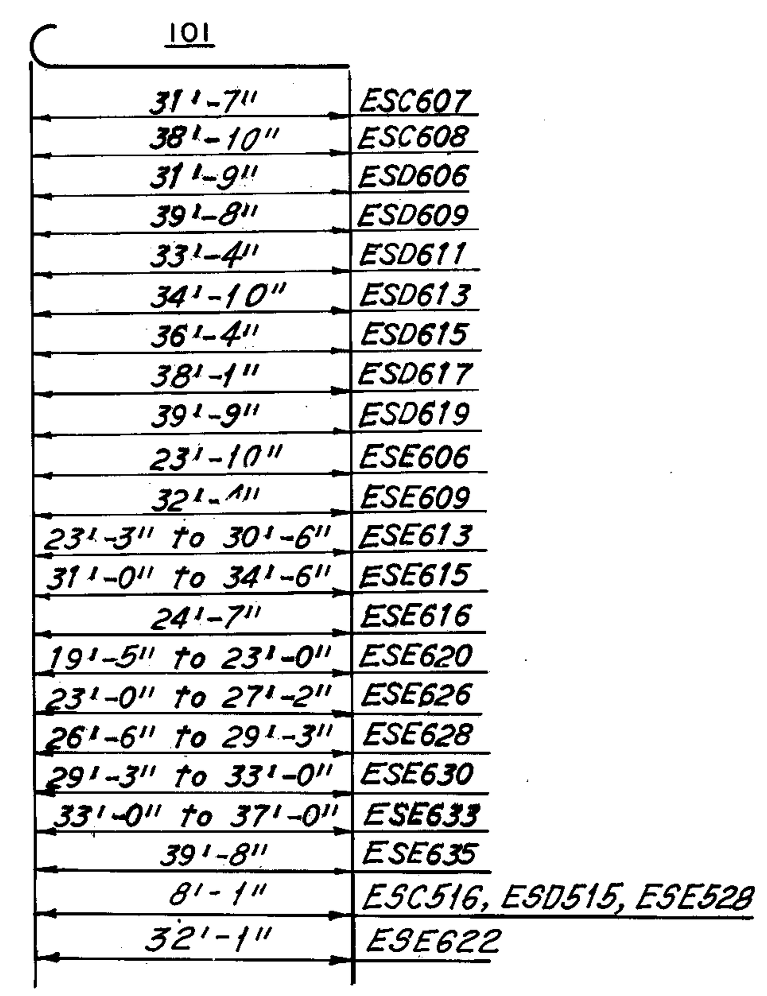
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
C.P. DATE 2-10-86	C.P. DATE 2-10-86	B.B. DATE 2-11-86	C.A.B. DATE 2-24-86	SHEET 106/108

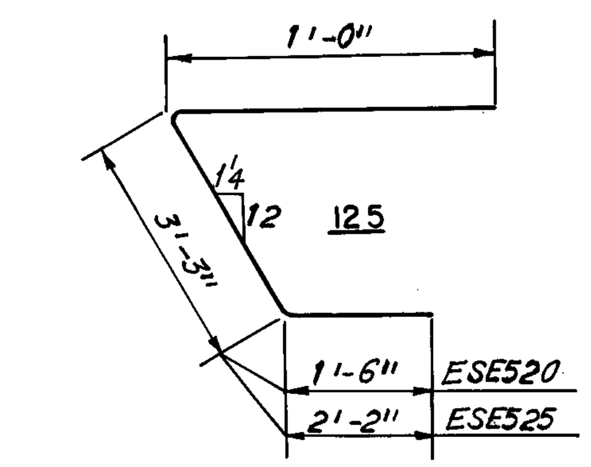
MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)
SLAB - UNIT 3					
EPOXY COATED BARS					
ESC501	2577	3'- 0"	142		8,063
ESC502	2577	2'- 4"	104		6,272
ESC503	1327	6'-11"	160		9,573
ESC504	1250	5'- 3"	160		6,845
ESC505	1250	4'-11"	144		6,410
ESC506	1072	6'- 6"	STR		7,268
ESC507	532	13'- 6"	STR		7,491
ESC508	56	7'- 0"	STR		409
ESC509	176	6'- 9"	STR		1,239
ESC510	56	6'- 3"	STR		365
ESC511	152	14'- 0"	STR		2,220
ESC512	48	15'- 3"	STR		763
ESC513	40	12'- 9"	STR		532
ESC514	8	9'- 0"	STR		75
ESC515	56	6'- 0"	STR		350
ESC516	967	8'- 8"	101		8,741
ESC601	7804	30'- 0"	STR		351,648
ESC602	1 SER 46	25'-3" / 17'-9"	STR	2"	1,485
ESC603	1 SER 79	25'-3" / 17'-9"	STR	1 1/8"	2,551
ESC604	1 SER 46	30'-6" / 23'-0"	STR	2"	1,848
ESC605	1 SER 79	30'-6" / 23'-0"	STR	1 1/8"	3,174
ESC606	5304	35'- 3"	STR		280,823
ESC607	2652	32'- 3"	101		128,462
ESC608	2652	39'- 6"	101		157,341
ESC609	23	10'- 0"	STR		345
ESC610	23	13'- 0"	STR		449
ESC611	4	24'- 9"	STR		149
ESC612	23	31'- 0"	STR		1,071
ESC613	4	18'- 6"	STR		111
ESC614	115	33'- 0"	STR		5,700
ESC615	46	20'- 0"	STR		1,382
ESC616	69	28'- 0"	STR		2,902
ESC617	46	24'- 0"	STR		1,658
ESC618	23	27'- 0"	STR		933
ESC619	4	31'- 9"	STR		191
ESC620	4	25'- 6"	STR		153
4 MEDIAN BARRIER LIGHT STANDARD SUPPORTS @472 =					1,888
2 MEDIAN PULL BOXES @472 =					944
1 SIGN SUPPORT (SEE *Note A*)					
2 MANHOLE ACCESS SUPPORTS @245 =					490
TOTAL WEIGHT =					1,012,314
SLAB - UNIT 4					
EPOXY COATED BARS					
ESD501	1696	3'- 0"	142		5,307
ESD502	1696	2'- 4"	104		4,127
ESD503	876	6'-11"	160		6,320
ESD504	820	5'- 3"	160		4,490
ESD505	820	4'-11"	144		4,205
ESD506	766	6'- 9"	STR		5,393
ESD507	72	13'- 0"	STR		976
ESD508	112	14'- 0"	STR		1,635
ESD509	110	14'- 6"	STR		1,664
ESD510	104	14'- 9"	STR		1,600
ESD511	96	12'- 6"	STR		1,252
ESD512	8	10'- 6"	STR		88
ESD513	48	15'- 0"	STR		751
ESD514	36	14'- 3"	STR		535
ESD515	835	8'- 8"	101		7,548
ESD601	5191	30'- 0"	STR		233,906
ESD602	46	22'- 0"	STR		1,520
ESD603	46	14'- 0"	STR		967
ESD604	1 SER 46	12'-0" / 7'-0"	STR	1 5/16"	656
ESD605	1 SER 79	12'-0" / 7'-0"	STR	3/4"	1,127
ESD606	1166	32'- 5"	101		56,772

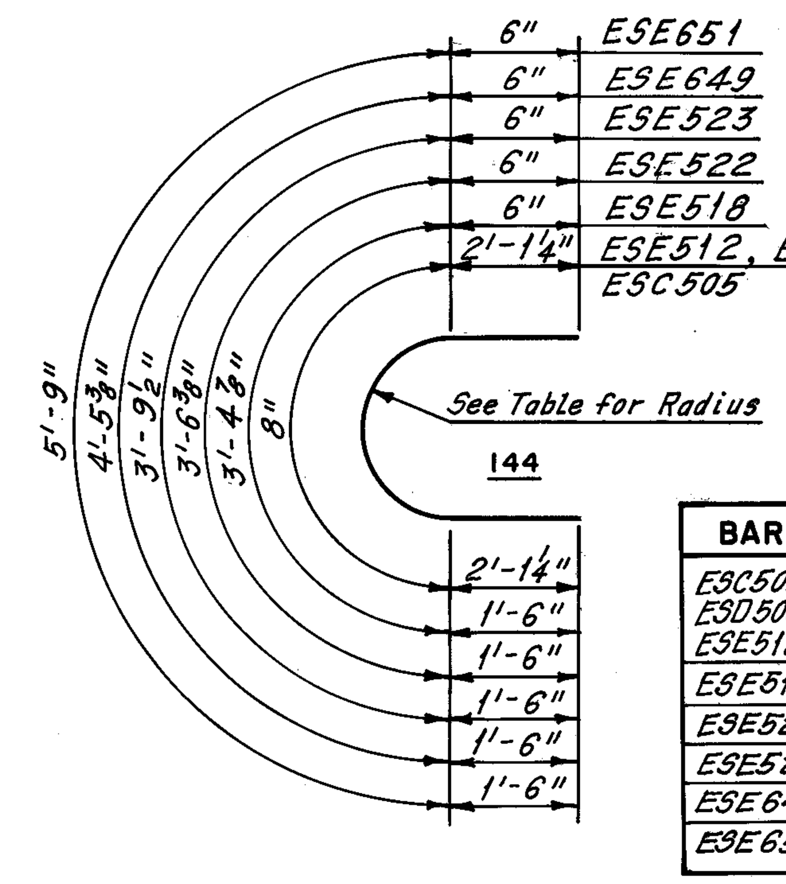
MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)
ESD607	2566	35'- 9"	STR		137,785
ESD608	351	35'- 3"	STR		18,584
ESD609	1400	40'- 4"	101		84,813
ESD610	117	37'- 3"	STR		6,546
ESD611	117	34'- 0"	101		5,975
ESD612	117	38'- 9"	STR		6,810
ESD613	117	35'- 6"	101		6,239
ESD614	117	40'- 9"	STR		7,161
ESD615	117	37'- 0"	101		6,502
ESD616	117	42'- 0"	STR		7,381
ESD617	117	38'- 9"	101		6,810
ESD618	117	43'- 9"	STR		7,688
ESD619	468	40'- 5"	101		28,410
ESD620	9	27'- 0"	STR		365
ESD621	4	21'- 6"	STR		129
ESD622	4	13'- 6"	STR		81
ESD623	4	8'- 6"	STR		51
ESD624	30	26'- 9"	STR		1,205
ESD625	1 SER 34	23'-9" / 20'-0"	STR	1 3/8"	1,117
ESD626	1 SER 58	23'-9" / 20'-0"	STR	13/16"	1,906
ESD627	46	38'- 0"	STR		2,625
ESD628	48	18'- 0"	STR		1,298
ESD629	48	15'- 0"	STR		1,081
ESD630	2	20'- 0"	STR		60
2 MEDIAN BARRIER LIGHT STANDARD SUPPORTS @472 =					944
1 MEDIAN PULL BOX @472 (*See Note A*) =					472
2 MANHOLE ACCESS SUPPORTS @245 =					490
1 SIGN SUPPORT @422 =					422
TOTAL WEIGHT =					683,789
SLAB - UNIT 5					
EPOXY COATED BARS					
ESE501	1107	5'- 3"	160		6,062
ESE502	2255	3'- 0"	142		7,056
ESE503	1145	6'-11"	160		8,260
ESE504	2255	2'- 4"	104		5,488
ESE505	930	7'- 0"	STR		6,790
ESE506	312	14'- 3"	STR		4,637
ESE507	236	15'- 0"	STR		3,692
ESE508	72	13'- 0"	STR		976
ESE509	42	14'- 0"	STR		613
ESE510	30	12'- 9"	STR		399
ESE511	30	13'- 6"	STR		422
ESE512	1107	4'-11"	144		5,677
ESE513	1	3'-10"	141		4
ESE514	4	2'- 4"	124		10
ESE515	1	4'- 1"	141		4
ESE516	1	4'- 6"	104		5
ESE517	2	3'- 4"	104		7
ESE518	1	5'- 5"	144		6
ESE519	2	2'-10"	104		6
ESE520	1	5'- 7"	125		6
ESE521	1	6'- 1"	105		6
ESE522	1	5'- 6"	144		6
ESE523	1	5'-10"	144		6
ESE524	3	2'- 0"	STR		6
ESE525	4	6'- 3"	125		26
ESE526	6	6'- 0"	STR		38
ESE527	30	15'- 6"	STR		485
ESE528	880	8'- 8"	101		7,955
ESE601	7500	30'- 0"	STR		337,950
ESE602	1 SER 44	12'-6" / 18'-6"	STR	1 1/16"	1,024
ESE603	1 SER 76	12'-6" / 18'-6"	STR	1"	1,769
ESE604	1 SER 51	6'-0" / 12'-6"	STR	1 9/16"	709
ESE605	1 SER 88	6'-0" / 12'-6"	STR	7/8"	1,223
ESE606	1248	24'- 6"	101		45,925
ESE607	974	25'- 6"	STR		37,305
ESE608	1278	35'- 9"	STR		68,624
ESE609	850	33'- 0"	101		42,131
ESE610	464	15'- 0"	STR		10,454

MARK	NO.	LENGTH	TYPE	SER. INCR	WEIGHT (LBS.)
ESE611	410	40'- 0"	STR		24,633
ESE612	410	41'- 6"	STR		25,557
ESE613	1 SER 188	23'-11" / 31'-2"	101	7/16"	7,777
ESE614	1 SER 188	34'-9" / 41'-9"	STR	7/16"	10,801
ESE615	1 SER 256	31'-8" / 35'-2"	101	3/16"	12,849
ESE616	256	25'- 3"	101		9,709
ESE617	1 SER 256	16'-6" / 22'-0"	STR	1/4"	7,402
ESE618	1145	33'- 6"	STR		57,613
ESE619	256	29'- 0"	STR		11,151
ESE620	1 SER 231	20'-1" / 23'-8"	101	3/16"	7,590
ESE621	889	33'- 0"	STR		44,064
ESE622	889	32'- 9"	101		43,730
ESE623	1 SER 231	23'-0" / 26'-6"	STR	3/16"	8,587
ESE624	10	11'- 6"	STR		173
ESE625	657	28'- 0"	STR		27,631
ESE626	1 SER 246	23'-8" / 27'-10"	101	3/16"	9,514
ESE627	1 SER 246	26'-6" / 30'-0"	STR	3/16"	10,438
ESE628	1 SER 180	27'-2" / 29'-11"	101	3/16"	7,717
ESE629	1 SER 180	30'-0" / 37'-9"	STR	3/16"	9,158
ESE630	1 SER 132	29'-11" / 33'-8"	101	3/8"	6,303
ESE631	1 SER 132	25'-3" / 29'-3"	STR	3/8"	5,403
ESE632	232	35'- 6"	STR		12,370
ESE633	1 SER 100	33'-8" / 37'-8"	101	1/2"	5,357
ESE634	1 SER 100	29'-8" / 33'-8"	STR	1/2"	4,756
ESE635	15	40'- 4"	101		909
ESE636	202	17'- 0"	STR		5,158
ESE637	194	15'- 6"	STR		4,517
ESE638	230	14'- 6"	STR		5,009
ESE639	236	16'- 6"	STR		5,849
ESE640	2	23'- 6"	STR		71
ESE641	2	7'- 9"	STR		23
ESE642	44	34'- 0"	STR		2,247
ESE643	45	37'- 0"	STR		2,501
ESE644	2	22'- 6"	STR		68
ESE645	3	26'- 6"	STR		119
ESE646	12	13'- 6"	STR		243
ESE647	4	8'- 3"	STR		50
ESE648	2	2'- 0"	STR		6
ESE649	1	6'- 5"	144		10
ESE650	4	5'- 9"	STR		35
ESE651	1	7'- 9"	144		12
3 MEDIAN BARRIER LIGHT STANDARD SUPPORTS @472 =					1,416
1 CURB BARRIER LIGHT STANDARD SUPPORT @1311 =					1,311
TOTAL WEIGHT =					1,005,599

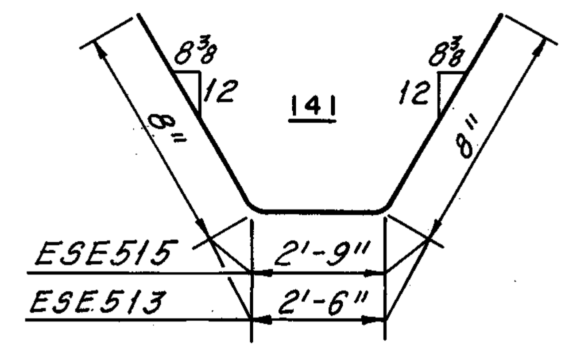
BENDING DIAGRAMS

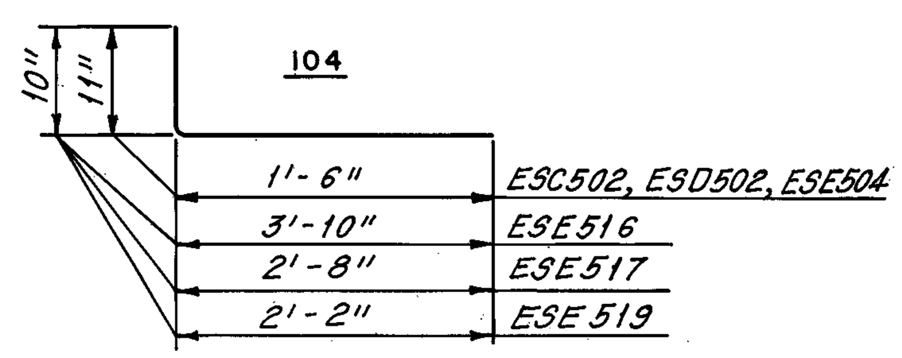


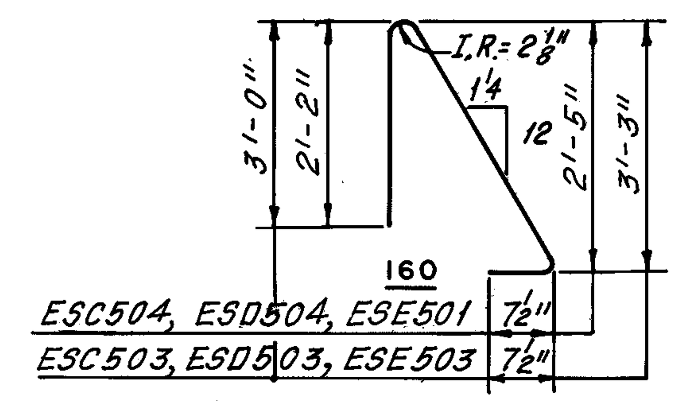


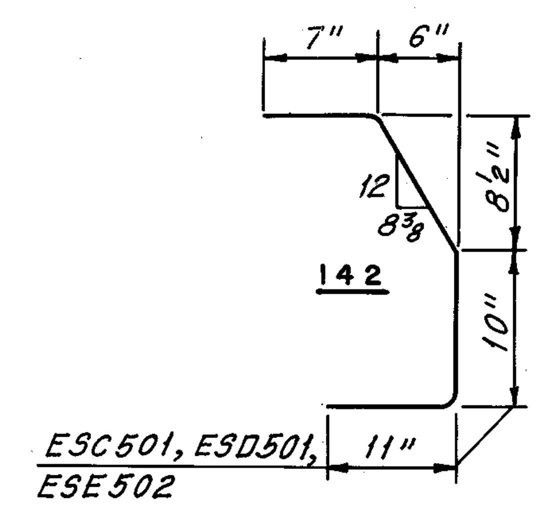


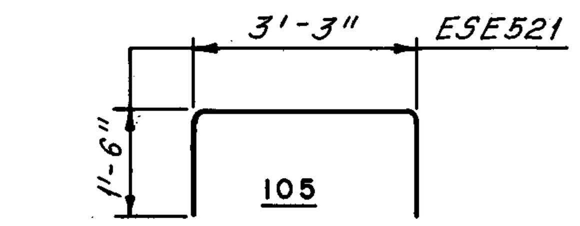
BAR	I.R.
ESC505, ESD505, ESE512	2 1/8"
ESE518	1'-0 3/4"
ESE522	1'-1 1/4"
ESE523	1'-2 1/4"
ESE649	1'-4 3/4"
ESE651	1'-9 3/4"

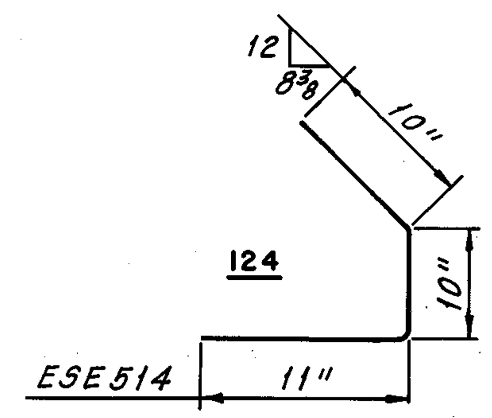












Note A:
Reinforcement for Sign Support #78, Sta. 1003+11.00 is included with Unit 4.
Reinforcement for Median Pull Box, Sta. 1003+18.63 is included with Unit 3.

Note:
For Notes, see Sheet 106/108.

REINFORCING STEEL SAMPLES

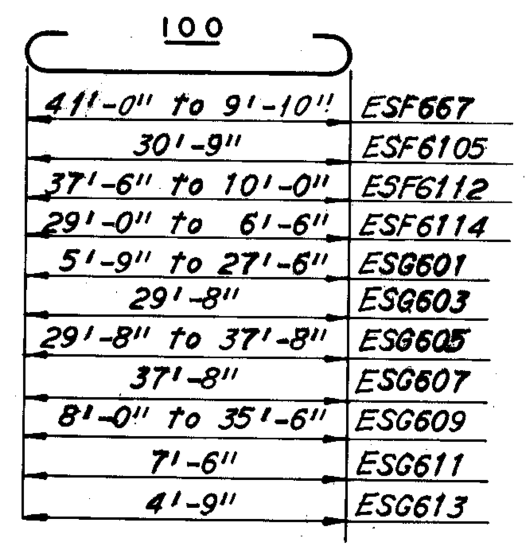
Refer to CMS Sections 106.03, 700, 709.01 through 709.05 and 709.08. Sufficient additional reinforcing steel shall be provided for sampling. Random samples shall be replaced in the structures by the additional steel, spliced in accordance with 509.08.

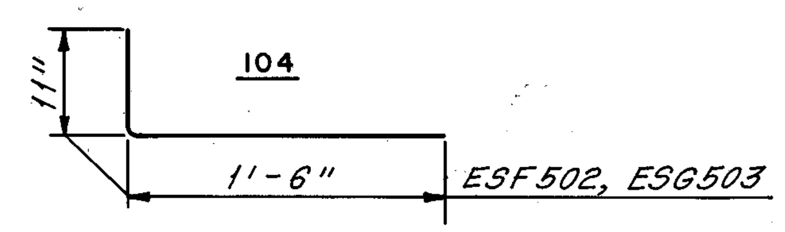
MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)
SLAB - UNIT 6					
EPOXY COATED BARS					
ESF501	2014	3'- 0"	142		6,302
ESF502	2014	2'- 4"	104		4,901
ESF503	949	5'- 3"	160		5,196
ESF504	1053	6'-11"	160		7,596
ESF505	84	13'- 9"	STR		1,205
ESF506	42	6'- 3"	STR		274
ESF507	72	15'- 9"	STR		1,183
ESF508	172	5'- 9"	STR		1,032
ESF509	34	12'- 9"	STR		452
ESF510	32	14'- 9"	STR		492
ESF511	612	6'- 6"	STR		4,149
ESF512	48	14'- 0"	STR		701
ESF513	80	12'- 0"	STR		1,001
ESF514	102	14'- 3"	STR		1,516
ESF515	64	15'- 3"	STR		1,018
ESF516	76	13'- 6"	STR		1,070
ESF517	72	13'- 0"	STR		976
ESF518	42	5'- 6"	STR		241
ESF519	949	4'-11"	144		4,867
ESF520	6	11'- 9"	STR		74
ESF521	6	11'- 6"	STR		72
ESF522	40	5'- 3"	STR		219
ESF523	6	7'- 3"	STR		45
ESF524	6	4'- 3"	STR		27
ESF525	1305	8'- 8"	101		11,796
ESF526	6	3'- 3"	STR		20
ESF527	20	3'- 0"	STR		63
ESF528	12	3'-10"	101		48
ESF529	30	6'- 9"	STR		211
ESF601	6039	30'- 0"	STR		272,117
ESF602	1 SER 13	26'-6" / 36'-3"	STR	9 3/4"	613
ESF603	1 SER 21	26'-6" / 36'-0"	STR	5 3/4"	986
ESF604	1 SER 25	8'-3" / 31'-3"	STR	11 1/2"	742
ESF605	1 SER 45	8'-0" / 31'-0"	STR	6 1/4"	1,318
ESF606	1 SER 3	32'-0" / 34'-6"	STR	1'-3"	150
ESF607	1 SER 6	31'-9" / 34'-6"	STR	6 5/8"	299
ESF608	1 SER 18	7'-3" / 25'-0"	STR	1'-0 1/2"	436
ESF609	1 SER 36	7'-0" / 25'-0"	STR	6 1/8"	865
ESF610	1 SER 3	25'-3" / 27'-6"	STR	1'-1 1/4"	119
ESF611	1 SER 6	25'-0" / 27'-6"	STR	6"	237
ESF612	4	7'- 3"	STR		44
ESF613	1 SER 4	28'-3" / 30'-3"	STR	8"	176
ESF614	864	40'- 3"	101		52,234
ESF615	864	35'- 6"	STR		46,069
ESF616	162	34'- 0"	101		8,273
ESF617	162	37'- 3"	STR		9,064
ESF618	116	35'- 0"	101		6,098
ESF619	116	38'- 3"	STR		6,664
ESF620	103	36'- 0"	101		5,569
ESF621	103	39'- 3"	STR		6,072
ESF622	68	37'- 0"	101		3,779
ESF623	68	40'- 3"	STR		4,111
ESF624	43	38'- 0"	101		2,454
ESF625	43	41'- 3"	STR		2,664
ESF626	3122	25'- 0"	STR		117,231
ESF627	43	15'-11"	101		1,028
ESF628	48	19'- 3"	STR		1,388
ESF629	39	16'-11"	101		991
ESF630	129	20'- 3"	STR		3,924
ESF631	119	17'-11"	101		3,202
ESF632	208	21'- 3"	STR		6,639
ESF633	224	18'-11"	101		6,364
ESF634	224	22'- 3"	STR		7,486
ESF635	78	19'-11"	101		2,333
ESF636	78	23'- 3"	STR		2,724
ESF637	67	20'-11"	101		2,105
ESF638	177	24'- 3"	STR		6,447
ESF639	59	21'-11"	101		1,942
ESF640	59	25'- 3"	STR		2,238
ESF641	53	22'-11"	101		1,824
ESF642	53	26'- 3"	STR		2,090
ESF643	49	23'-11"	101		1,760
ESF644	49	27'- 3"	STR		2,006
ESF645	24	24'-11"	101		898
ESF646	24	28'- 3"	STR		1,018

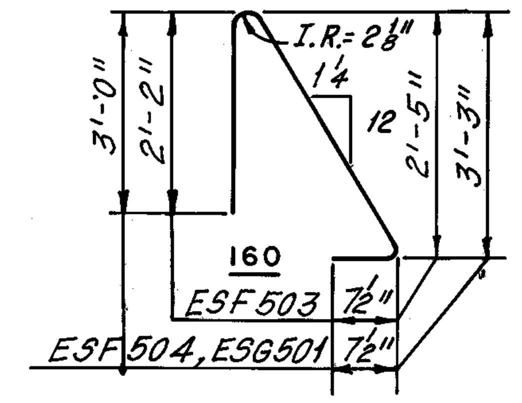
MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)
ESF647	24	25'-11"	101		934
ESF648	24	29'- 3"	STR		1,054
ESF649	108	26'-11"	101		4,366
ESF650	108	30'- 3"	STR		4,907
ESF651	90	27'-11"	101		3,774
ESF652	173	31'- 3"	STR		8,120
ESF653	54	28'-11"	101		2,345
ESF654	84	32'- 3"	STR		4,069
ESF655	50	29'-11"	101		2,247
ESF656	50	33'- 3"	STR		2,497
ESF657	48	30'-11"	101		2,229
ESF658	48	34'- 3"	STR		2,469
ESF659	46	31'-11"	101		2,205
ESF660	96	35'- 3"	STR		5,083
ESF661	45	32'-11"	101		2,225
ESF662	45	36'- 3"	STR		2,450
ESF663	1 SER 24	37'-6" / 15'-1"	101	11 11/16"	948
ESF664	1 SER 24	32'-9" / 10'-3"	STR	11 3/4"	775
ESF665	1 SER 30	37'-1" / 8'-11"	101	11 5/8"	1,036
ESF666	1 SER 30	32'-3" / 4'-3"	STR	11 9/16"	822
ESF667	1 SER 33	42'-4" / 11'-2"	100	11 11/16"	1,326
ESF668	1 SER 33	41'-0" / 9'-9"	STR	11 3/4"	1,258
ESF669	10	10'- 6"	101		158
ESF670	10	9'- 9"	STR		146
ESF671	1	29'- 9"	STR		45
ESF672	1 SER 9	29'-9" / 34'-6"	STR	7 1/8"	434
ESF673	1 SER 13	30'-0" / 34'-3"	STR	4 1/4"	627
ESF674	1 SER 30	7'-0" / 35'-9"	STR	11 7/8"	963
ESF675	1 SER 54	6'-9" / 35'-6"	STR	6 1/2"	1,713
ESF676	1 SER 4	8'-3" / 10'-3"	STR	8"	56
ESF677	1 SER 8	8'-0" / 10'-3"	STR	3 7/8"	110
ESF678	1 SER 3	25'-0" / 7'-0"	STR	9'-0"	72
ESF679	17	10'- 0"	STR		255
ESF680	2	18'- 0"	STR		54
ESF681	1 SER 3	34'-0" / 16'-0"	STR	9'-0"	113
ESF682	5	17'- 0"	STR		128
ESF683	2 SER 3	26'-0" / 8'-0"	STR	9'-0"	153
ESF684	1	39'- 0"	STR		59
ESF685	1	6'- 0"	STR		9
ESF686	3	29'- 0"	STR		131
ESF687	117	22'- 0"	STR		3,866
ESF688	1 SER 3	6'-0" / 22'-0"	STR	8'-0"	63
ESF689	3	9'- 0"	STR		41
ESF690	1 SER 3	9'-0" / 25'-0"	STR	8'-0"	77
ESF691	1 SER 7	15'-3" / 18'-3"	STR	6"	176
ESF692	1 SER 14	15'-0" / 18'-3"	STR	3"	350
ESF693	2	7'- 0"	STR		21
ESF694	1 SER 4	28'-3" / 8'-3"	STR	6'-8"	110
ESF695	4	24'- 9"	STR		149
ESF696	1 SER 4	25'-0" / 7'-0"	STR	6'-0"	96
ESF697	2 SER 3	24'-0" / 11'-0"	STR	6'-6"	158
ESF698	2	27'- 6"	STR		83
ESF699	1 SER 3	25'-9" / 27'-6"	STR	10 1/2"	120
ESF6100	987	32'- 3"	101		47,810
ESF6101	987	27'- 9"	STR		41,139
ESF6102	1 SER 149	35'-5" / 43'-8"	101	5/8"	8,849
ESF6103	1 SER 149	38'-9" / 47'-0"	STR	5/8"	9,595
ESF6104	2 SER 133	27'-6" / 37'-3"	STR	7/8"	12,935
ESF6105	83	32'- 1"	100		4,000
ESF6106	1 SER 102	23'-8" / 27'-5"	101	1/2"	3,913
ESF6107	1 SER 102	27'-0" / 30'-9"	STR	1/2"	4,424
ESF6108	1 SER 29	32'-0" / 10'-11"	101	9 1/8"	935
ESF6109	1 SER 29	27'-3" / 6'-3"	STR	9"	730
ESF6110	1 SER 29	34'-8" / 13'-8"	101	9"	1,053
ESF6111	1 SER 29	30'-0" / 9'-0"	STR	9"	849
ESF6112	1 SER 42	38'-10" / 11'-4"	100	8"	1,582
ESF6113	1 SER 42	37'-6" / 10'-0"	STR	8"	1,498
ESF6114	1 SER 16	30'-4" / 7'-10"	100	1'-6"	459
ESF6115	1 SER 16	29'-0" / 6'-6"	STR	1'-6"	427
ESF6116	4	6'-11"	101		42
ESF6117	4	6'- 3"	STR		38
ESF6118	4	15'- 6"	STR		93
ESF6119	216	20'- 3"	STR		6,570
ESF6120	84	22'- 6"	STR		2,839
ESF6121	104	23'- 3"	STR		3,632
ESF6122	40	15'- 9"	STR		946
ESF6123	2	31'- 3"	STR		94
ESF6124	7	5'- 8"	105		60
ESF6125	4	26'- 6"	STR		159

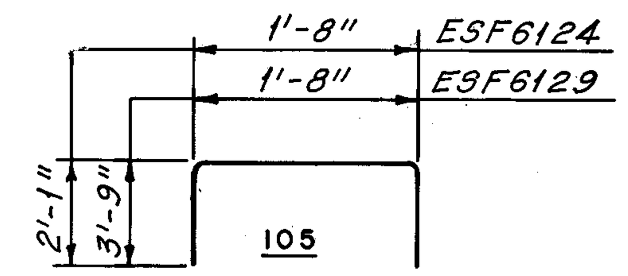
MARK	NO.	LENGTH	TYPE	SER. INCR.	WEIGHT (LBS.)
ESF6126	431	15'- 0"	STR		9,710
ESF6127	12	10'- 8"	101		192
ESF6128	4	30'- 9"	STR		185
ESF6129	7	9'- 0"	105		95
ESF6130	1	18'- 3"	STR		27
ESF6131	2	32'- 0"	STR		96
ESF6132	1 SER 3	27'-3" / 9'-3"	STR	9'-0"	82
	3 MEDIAN BARRIER LIGHT				
	STANDARD SUPPORTS @472 =				1,416
	1 MEDIAN PULL BOX @472 =				472
	2 CURB BARRIER LIGHT				
	STANDARD SUPPORTS @1311 =				2,622
		TOTAL WEIGHT =			900,781
SLAB - UNIT 6CB					
EPOXY COATED BARS					
ESG501	1006	6'-11"	160		7,257
ESG502	1006	3'- 0"	142		3,148
ESG503	1006	2'- 4"	104		2,448
ESG504	36	14'- 3"	STR		535
ESG505	384	6'- 9"	STR		2,703
ESG506	126	14'- 0"	STR		1,840
ESG507	120	15'- 9"	STR		1,971
ESG601	1 SER 24	7'-1" / 28'-10"	100	11 3/8"	647
ESG602	1 SER 24	5'-9" / 27'-6"	STR	11 3/8"	599
ESG603	665	31'- 0"	100		30,964
ESG604	665	29'- 9"	STR		29,715
ESG605	1 SER 180	31'-0" / 39'-0"	100	1/2"	9,463
ESG606	1 SER 180	29'-8" / 37'-8"	STR	1/2"	9,102
ESG607	120	39'- 0"	100		7,029
ESG608	120	37'- 8"	STR		6,789
ESG609	1 SER 48	9'-4" / 36'-10"	100	7"	1,664
ESG610	1 SER 48	8'-0" / 35'-6"	STR	7"	1,568
ESG611	8	8'-10"	100		106
ESG612	8	7'- 6"	STR		90
ESG613	3	6'- 1"	100		27
ESG614	3	4'- 9"	STR		21
ESG615	2	26'- 9"	STR		80
ESG616	2	33'- 6"	STR		100
ESG617	1296	30'- 0"	STR		58,398
ESG618	52	24'- 6"	STR		1,914
ESG619	1	16'- 0"	STR		24
ESG620	3	21'- 0"	STR		95
ESG621	2	9'- 6"	STR		29
ESG622	11	14'- 6"	STR		240
ESG623	70	20'- 0"	STR		2,103
ESG624	91	35'- 0"	STR		4,784
ESG625	21	24'- 0"	STR		757
	2 CURB BARRIER LIGHT				
	STANDARD SUPPORTS @1311 =				2,622
		TOTAL WEIGHT =			188,832

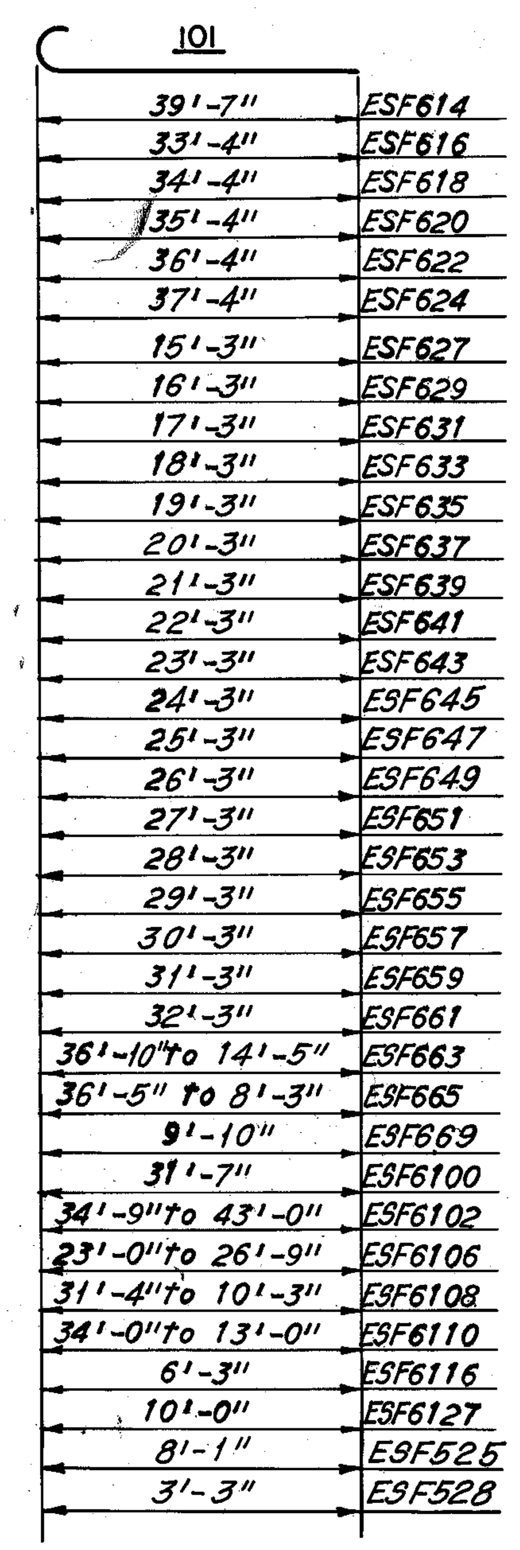
BENDING DIAGRAMS

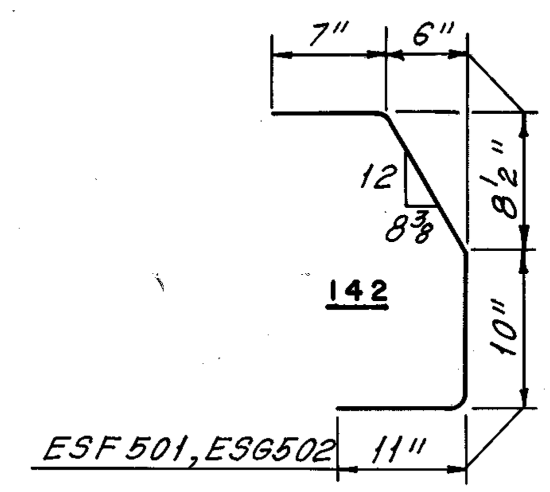


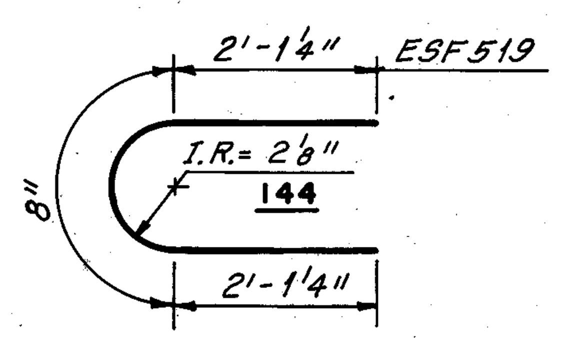












REINFORCING STEEL SAMPLES
Refer to CMS Sections 106.03, 700, 709.01 through 709.05 and 709.08. Sufficient additional reinforcing steel shall be provided for sampling. Random samples shall be replaced in the structures by the additional steel, spliced in accordance with 509.08.

Note:
For Notes, see Sheet 106/108.

FHWA REGION	STATE	PROJECT	
2	OHIO		

193/193

CUYAHOGA COUNTY
CUY- 290-027

H.N.T.B. BR. NO. 9 PART II - SUPERSTRUCTURE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF CONSULTING ENGINEERS CLEVELAND HNTB

SLAB REINFORCEMENT SCHEDULE
UNITS 6 AND 6 CB
I-290 OVER CUYAHOGA RIVER

BR. NO. CUY-290-0110
STA. 985+85.75 TO STA. 1020+47.57 (℄ I-290)

CLEVELAND CUYAHOGA COUNTY OHIO

DRAWN C.P.	TRACED C.P.	CHECKED B.B.	REVIEWED C.A.B.	REVISED	
DATE 2-6-86	DATE 2-6-86	DATE 2-11-86	DATE 2-24-86		SHEET 108/108