h-W

L-20

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	I-71-5 (18) 247	

1/679

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

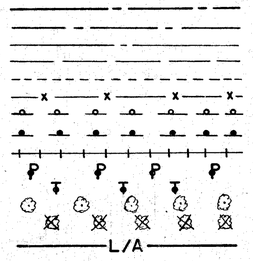
CUY. 71-13.68
CITY OF BROOKLYN - CITY OF CLEVELAND
VILLAGE OF LINNDALE
CUYAHOGA COUNTY
GRADE SEPARATION WITH THE N.Y.C. R.R.

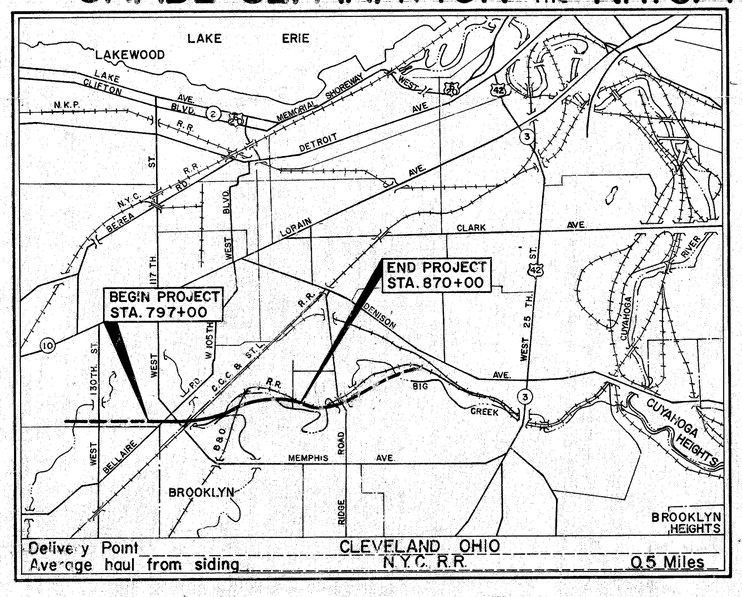
CUYAHOGA COUNTY
CUY-71-13.68

I-71-5 (18) 247

CONVENTIONAL SIGNS

County Line
Corporation Line
Center Line
Township Line
Section Line
Fence Line
Guard Rail (existing)
Guard Rail (proposed)
Railroad
Power Poles
Telephone Poles
Trees or stumps (existing)
Trees or stumps (to be removed)
L/A





N

LOCATION MAP
SCALE OF MILES
0 1 2 3

Portion to be improved
Future Improvement

INDEX SHEETS

Title Sheet	1	Bellaire Road	88-102
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Profile Sheets	25-32	Traffic Control Plans	190-201
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		Structure 20Ft. Span & Under	252-256
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Sheets Omitted from Plans 263-267

Sheet No. 117, 202, 203, 211, 217, 218, 2 9, 220, 225, 230, 231, 241, 248, and 249 revised 3-26-65
Sheet No. 211A and 223A added 3-26-65

Sheets Revised- 2, 10, 11, 13, 14, 16, 89, 104, 178 Rev. 6-4-65 C.E.H.
Revised Sheets No. 176 & 185 12-8-65 C.E.H.
Revised Sheets No. 124, 176, 192 1-3-66 C.E.H.

LINE DATA

Begin Project	Station 797+00
End Project	Station 870+00 E.B.
Net Length For Project	= 7300 Lin. Ft. or 1.382 Mi.
Begin Work	= Station 795+55
End Work	= Station 870+80 E.B.
Net Length of Work	= 7525 Lin. Ft.
Add for Work Side Roads	= 3617 Lin. Ft. (See Sheet 9)
Net Length of Work	= 11,142 Lin. Ft. or 2.110 Mi.

SCALE
Plan _____ 1" = 50'
Profile _____ 1" = 50' Horiz. & 5' Vert
X-Sections _____ 1" = 10' Horiz. & Vert

LIMITED ACCESS

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

1963 SPECIFICATIONS

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

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

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

Approved Charles M. Gerrick
Date 11-27-64 Division Deputy Director
Approved C. K. Advatis
Date 1-11-65 Engineer of Bridges
Approved R. D. Ritter
Date 1-20-65 Engineer of Location and Design
Approved R. E. Shultz
Date 1-20-65 Deputy Director of Design and Construction
Approved T. T. Bond
Date 12-15-64 Deputy Director of Right of Way
Approved Eugene Wilson
Date 1-26-65 Deputy Director of Planning and Programming
Approved _____
Date _____ First Assistant Director
Approved P. E. Blecher
Date _____ Director of Highways
Approved Louis R. Prasler
Date 10/5/64 Director of Public Service, City of Cleveland, Ohio

PLANS PREPARED BY
RACKOFF ASSOCIATES
ENGINEERS
COLUMBUS, OHIO
Melvin Rackoff
MELVIN RACKOFF

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
APPROVED:
DIVISION ENGINEER _____ DATE _____

Supplemental Prints of Standard Construction Drawings

SD-1-63 Sht. 2 & 4	11-12-63	L-2	4-1-50	BT-70-71	11-15-60	I-8 CB NO. 5	2-1-63	I-15 NO. 2-A	8-17-60
L-1	4-1-50	F-3	2-1-63	BT-71 R	3-2-53	I-8 MH NO. 1	2-1-63	I-15 NO. 6	2-1-63
L-3	4-1-50	G-707	4-1-64	HW E	2-1-63	I-8 MH NO. 1A	2-1-63	L-J NO. 1	7-1-55
L-3A	4-1-50	FAC1-1	2-25-64	T J	9-12-60	I-8 MH NO. 2	2-1-63	I-21-23	3-10-64
R1-1	9-1-64	FAC1-2	2-25-64	I-1	11-15-60	I-8 CB NO. 3	2-1-63	RB-1-55	2-2-59
T 35	1-2-56	HW-2	8-1-63	FSB-1-62	1-15-63	I-12	2-1-63	AR-1-57	4-2-62
F-1	2-1-63	HW 3	8-1-63	I-8 CB 2-5 & 2-6	2-1-63	I-15 NO. 1	11-15-60	DR-1	1-3-55
								AS-1-54	7-5-62

Supplemental Specifications

		S-103	Rev. 2-16-65
CE-101.04	5-22-56	S-107	Rev. 2-16-65
L-120	Rev. 1-2-62	T-212	Rev. 6-23-61
S-307	Rev. 10-1-64		
S-101	7-12-62		
I-129	Rev. 4-5-61		
M-106.11	1-26-61		
M-106.6 (c)	2-17-59		
T-335	10-28-63		

00322R

File No.	CUY-71-13.68
	Date of Letting _____ 19
	Contract No. _____

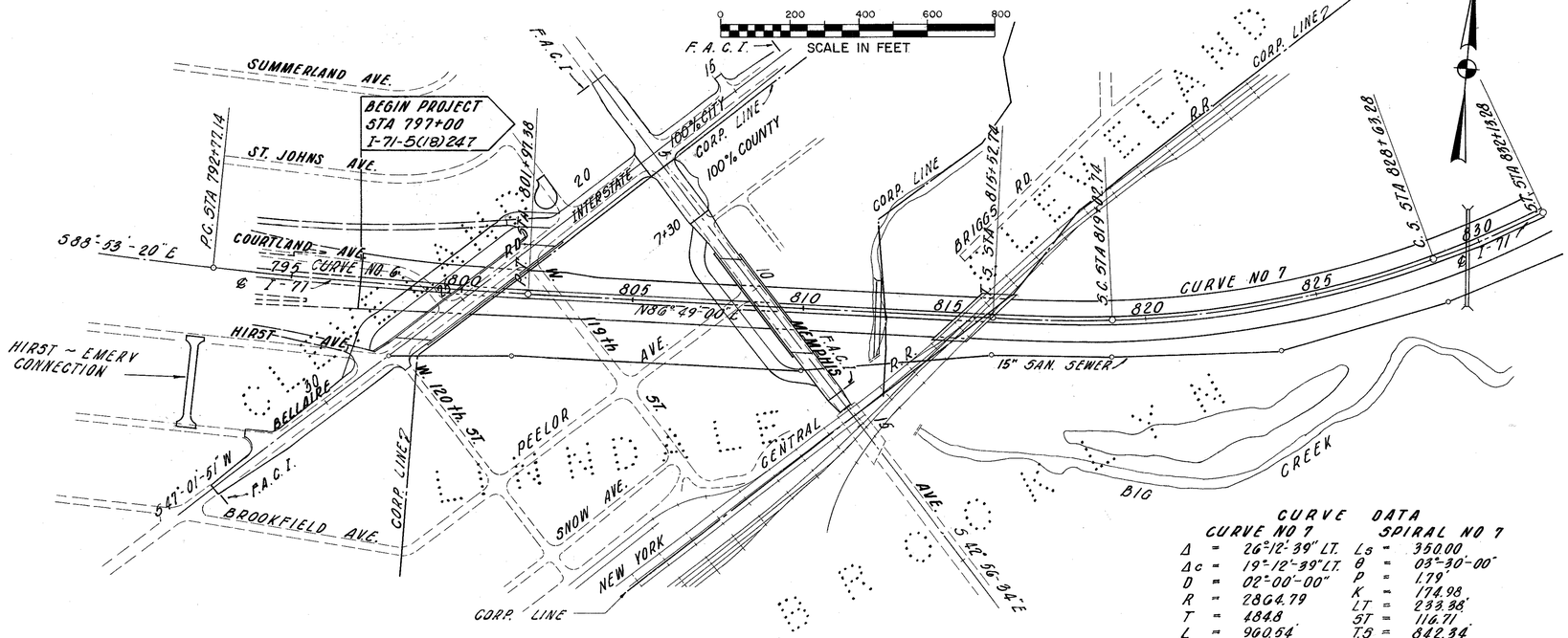
SCHEMATIC LAYOUT PLAN

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

2 / 279

CUYAHOGA COUNTY
CUY-71-13.68

CURVE DATA
CURVE NO. 6
P.I. STA 797+37.47
Δ = 04°17'40"
D = 00°28'00"
R = 12,277.67'
L = 920.24'
T = 460.33'
E = 8.63'

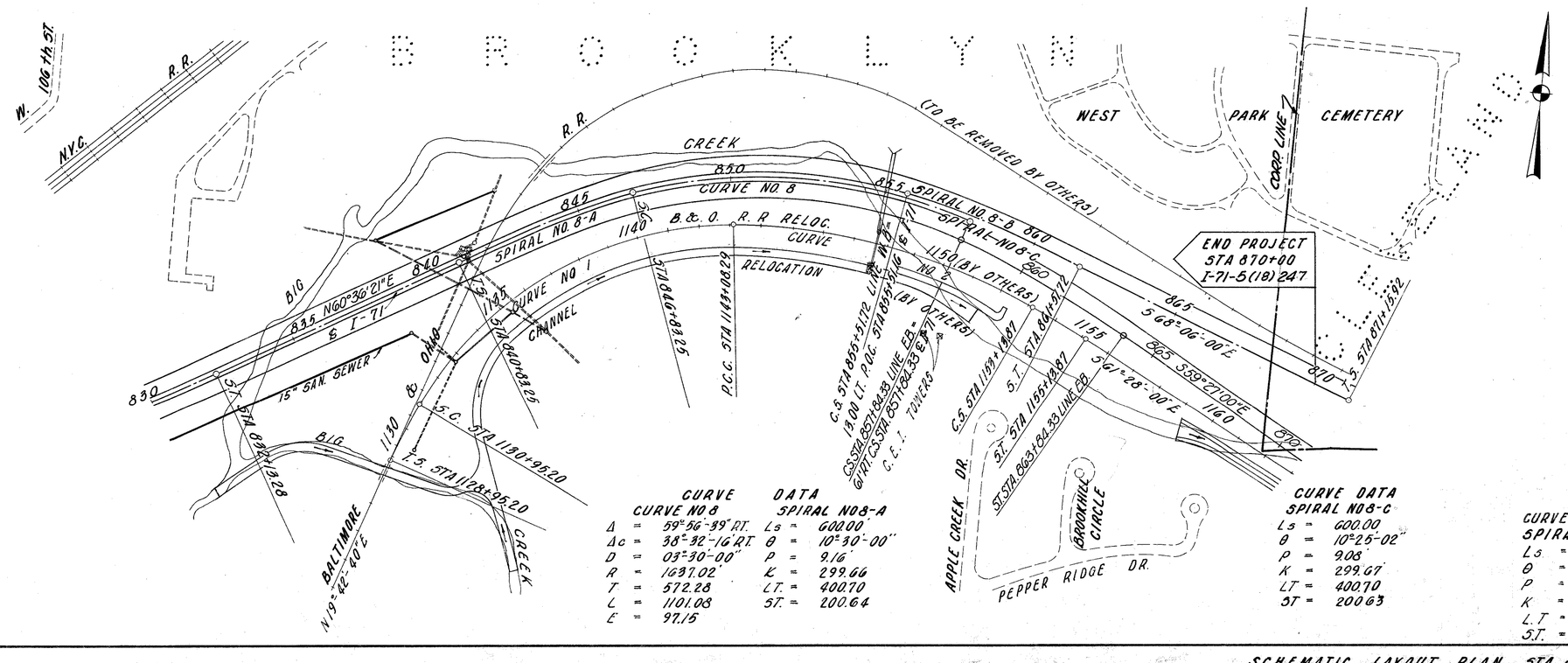


CURVE DATA
CURVE NO 7

Δ	=	26°12'-39" LT.
Δc	=	19°-12'-39" LT.
D	=	02°-00'-00"
R	=	2864.79
T	=	664.8
L	=	960.54
E	=	40.74

CURVE DATA
SPIRAL NO 7

Ls	=	350.00
θ	=	03°-30'-00"
P	=	1.79'
K	=	174.98
LT	=	233.38'
ST	=	116.71'
T.S	=	842.34'
Es	=	18.44



CURVE DATA
CURVE NO 8

Δ	=	59°56'-39" RT.
Δc	=	38°-32'-16" RT.
D	=	03°-30'-00"
R	=	1637.02'
T	=	572.28
L	=	1101.08
E	=	97.15

CURVE DATA
SPIRAL NO 8-A

Ls	=	600.00'
θ	=	10°-30'-00"
P	=	9.16'
K	=	299.66
LT.	=	400.70
ST.	=	200.64

CURVE DATA
SPIRAL NO 8-C

Ls	=	600.00
θ	=	10°25'-02"
P	=	9.08
K	=	299.67
LT	=	400.70
ST	=	200.63

CURVE DATA
SPIRAL NO. 8-B

Ls	=	600'
θ	=	10°-54'-33"
P	=	9.51
K	=	299.63
L.T	=	400.77
S.T.	=	200.70

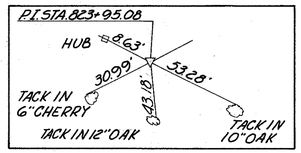
SCHEMATIC LAYOUT PLAN STA 800+00 TO STA 870+00

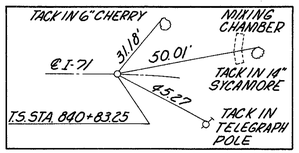
REFERENCE SHEET

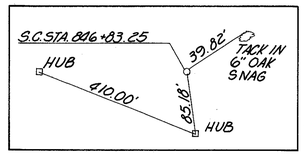
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

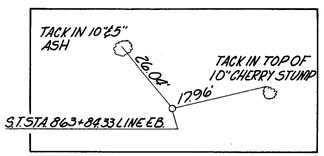
3 / 279

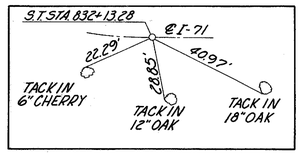
CUYAHOGA COUNTY
CUY-71-13.68

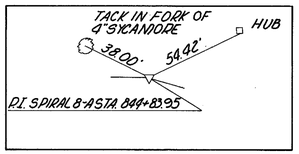


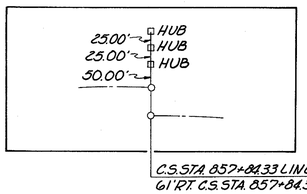


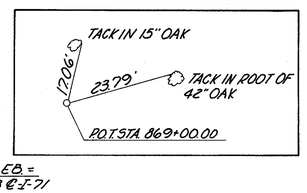


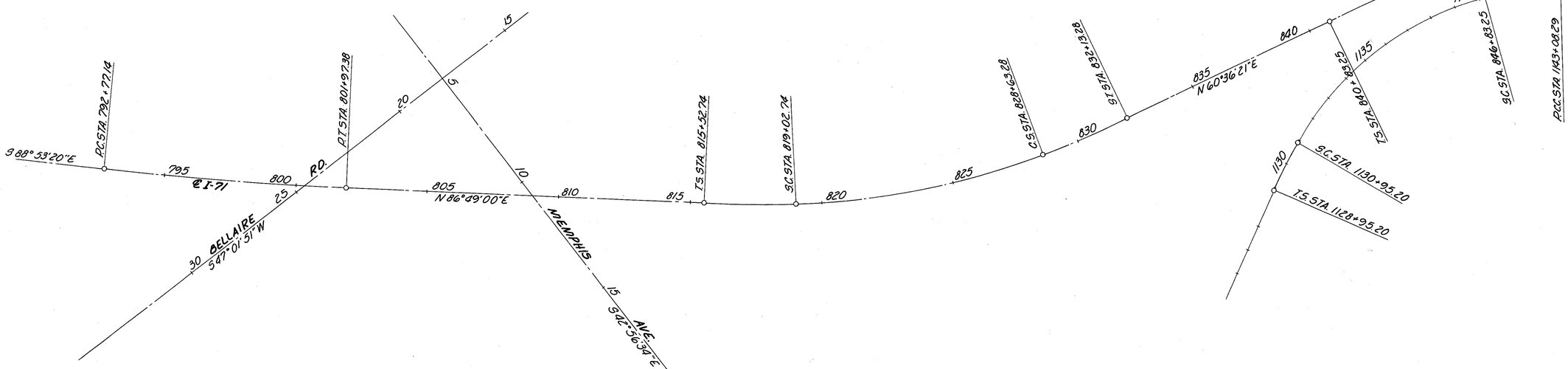


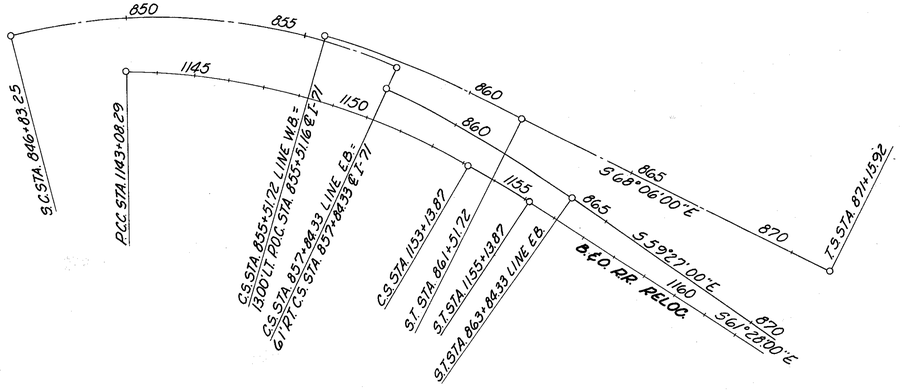


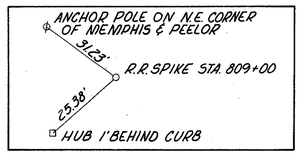


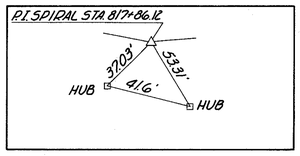


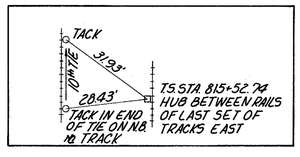












DESCRIPTION	PLOTTED BY	DATE	INKED BY	DATE	CHECKED BY	DATE
TOPOGRAPHY						
STRUCTURES						
DRAINAGE						
R. O. W.						
QUANTITIES						

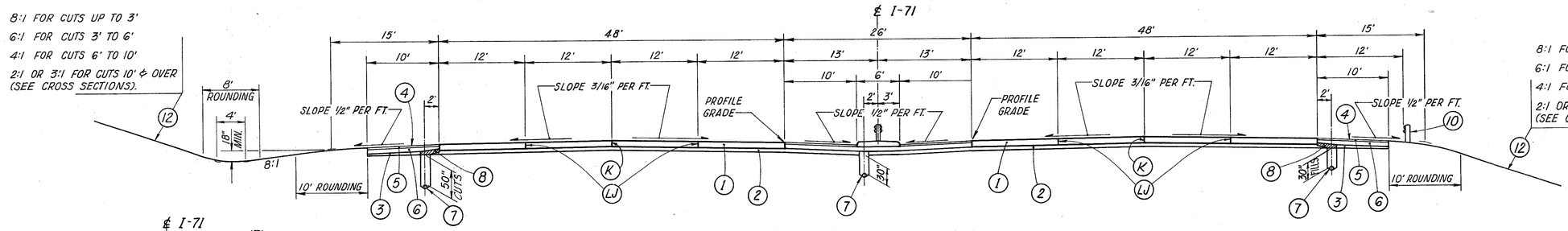
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

4 / 279

CUYAHOGA COUNTY
CUY-71-13.68

TYPICAL SECTIONS

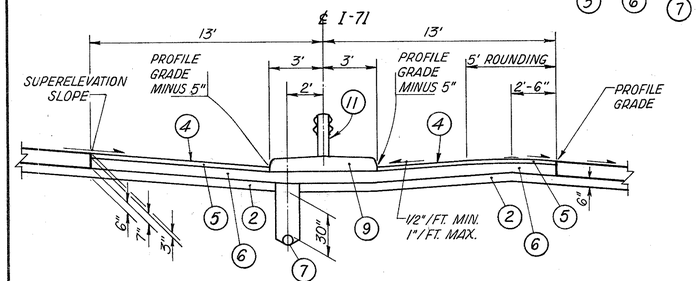
TYPE T-71



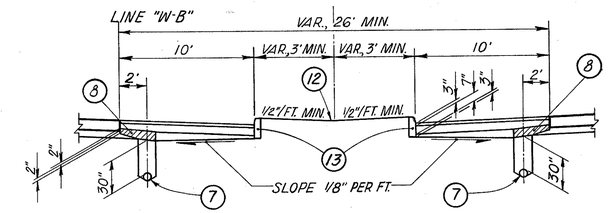
NORMAL SECTION

LIMITING STATIONS

STA. 797+00 TO STA. 814+00
STA. 833+75 TO STA. 839+50

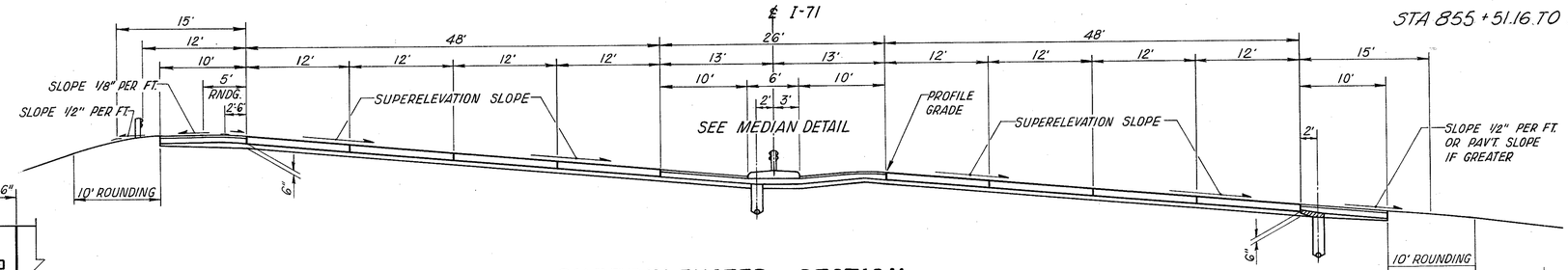


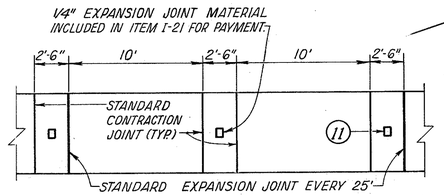
MEDIAN DETAIL



CURB & MEDIAN DETAIL

STA 855+51.16 TO STA 862+00 E.B.





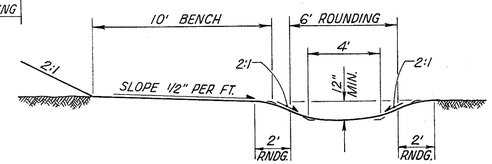
IN LIEU OF SPACING REQUIREMENTS OF STANDARD DRAWING I-21-23, EXPANSION AND CONTRACTION JOINTS SHALL BE PROVIDED IN ITEM I-21 MEDIAN PAVEMENT, AS DETAILED HEREON, WHENEVER GUARD RAIL IS CALLED FOR.

JOINT DETAIL @ GUARD RAIL POSTS

SUPERELEVATED SECTION

LIMITING STATIONS

STA. 814+00 TO STA. 833+75
STA. 839+50 TO STA. 855+51.16



BENCH & DITCH DETAIL FOR 2:1 FILL SLOPES

ITEM		DESCRIPTION
(1)	T-71	10" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT.
(2)	I-22	SUBBASE, GRADING "A" OR "B" AS PER PLAN (SEE GENERAL NOTES).
(3)	I-22	SUBBASE.
(4)	T-31	BITUMINOUS SURFACE TREATMENT USING 0.008 CU. YDS. NO. 6 AGGREGATE AND 0.25 GALS. BITUMINOUS MATERIAL PER SQ. YD. (SEE NOTE IN PROPOSAL).
(5)	B-21	WATERPROOFED AGGREGATE BASE COURSE (TYPE "A" T-35 OR T-335 MATERIAL MAY BE USED IN CONSTRUCTION OF THIS COURSE - SEE NOTE IN PROPOSAL). *
(6)	B-19	AGGREGATE BASE COURSE.
(7)	I-1	6" PIPE, CLASS I-3.

ITEM		DESCRIPTION
(8)	SPECIAL	DRAINAGE CONNECTION, USING NO. 6 AGGREGATE (SEE NOTE IN PROPOSAL).
(9)	I-21	PORTLAND CEMENT CONCRETE MEDIAN PAVEMENT.
(10)	I-15	GUARD RAIL, STEEL BEAM STANDARD TYPE (DEEP).
(11)	I-15	GUARD RAIL, STEEL BEAM BARRIER TYPE (DEEP).
(12)	L-9	SEEDING AND PROTECTING.
(13)	I-12	CONCRETE CURB, STANDARD TYPE 6.
(LJ)		STANDARD LONGITUDINAL JOINT.
(K)		STANDARD KEY JOINT W/O TIE BARS.

NOTE:

SEQUENCE OF OPERATIONS: (1) INSTALL PIPE UNDERDRAIN ON OUTSIDE SHOULDER. INSTALLATION OF SHALLOW UNDERDRAIN IN MEDIAN MAY BE DEFERRED UNTIL T-71 IS PLACED. (2) PLACE SUBBASE OUT TO OUTSIDE EDGE OF UNDERDRAIN OR TO ONE FOOT BEYOND EDGE OF PAVEMENT WHERE NO UNDERDRAIN IS PRESENT. (3) CONSTRUCT T-71. (4) REMOVE SUBBASE AND ANY CONTAMINATED BACKFILL OVER DRAIN AND REPLACE WITH NO. 6 AGGREGATE AS SHOWN BY (8). (5) COMPLETE SHOULDER CONSTRUCTION.

* THICKNESS SHOWN IS "DESIGNED" THICKNESS AS DESCRIBED IN SECTION 8-21.01.

CHECKED BY DATE
INKED BY DATE
PLOTTED BY DATE
DESCRIPTION
TOPOGRAPHY
PARCEL LINE
R.O.W.
QUANTITIES

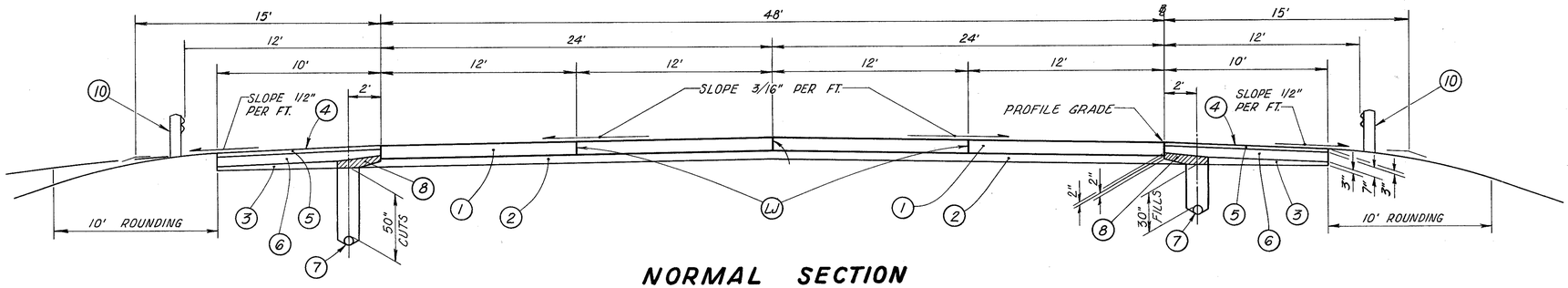
TYPICAL SECTIONS

TYPE T-71

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

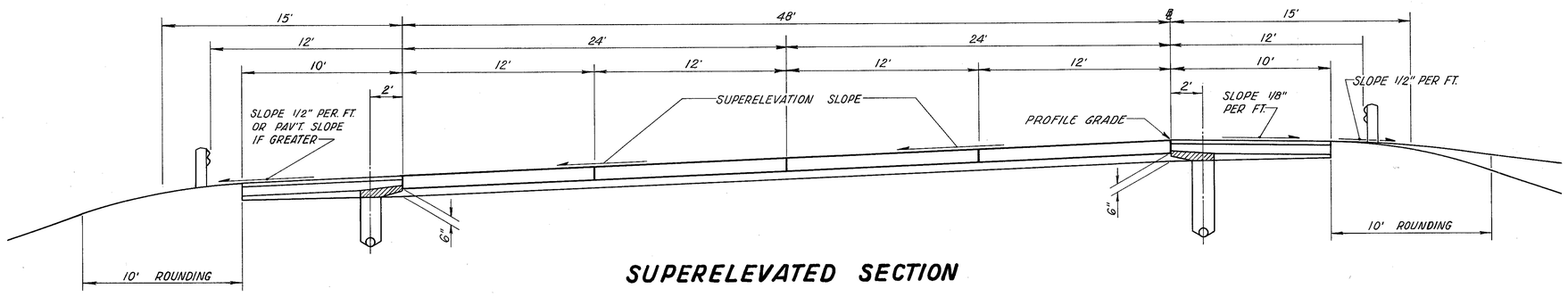
5 / 279

CUYAHOGA COUNTY
CUY-71-13.68



NORMAL SECTION

STA. 865+50 TO STA. 870+00 LINE "EB"
STA. 863+00 TO STA. 870+00 LINE "WB"



SUPERELEVATED SECTION

STA. 855+51.16 TO STA. 865+50 LINE "EB"
STA. 855+51.72 TO STA. 863+00 LINE "WB"

ITEM		DESCRIPTION
(1)	T-71	10" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT.
	I-22	SUBBASE, GRADING "A" OR "B" AS PER PLAN (SEE GENERAL NOTES).
(3)	I-22	SUBBASE.
(4)	T-31	BITUMINOUS SURFACE TREATMENT USING 0.008 CU. YDS. NO. 6 AGGREGATE AND 0.25 GALS. BITUMINOUS MATERIAL PER SQ. YD. (SEE NOTE IN PROPOSAL).
(5)	B-21	WATERPROOFED AGGREGATE BASE COURSE (TYPE "A" T-35 OR T-335 MATERIAL MAY BE USED IN CONSTRUCTION OF THIS COURSE ~ SEE NOTE IN PROPOSAL). *

ITEM		DESCRIPTION
(6)	B-19	AGGREGATE BASE COURSE.
(7)	I-1	6" PIPE, CLASS I-3.
(8)	SPECIAL	DRAINAGE CONNECTION, USING NO. 6 AGGREGATE (SEE NOTE IN PROPOSAL).
(10)	I-15	GUARD RAIL, STEEL BEAM STANDARD TYPE (DEEP).
(12)	L-9	SEEDING AND PROTECTING.
(LJ)		STANDARD LONGITUDINAL JOINT.

NOTE:

▨ SEQUENCE OF OPERATIONS: (1) INSTALL PIPE UNDERDRAIN. (2) PLACE SUBBASE OUT TO OUTSIDE EDGE OF UNDERDRAIN OR TO ONE FOOT BEYOND EDGE OF PAVEMENT WHERE NO UNDERDRAIN IS PRESENT. (3) CONSTRUCT T-71. (4) REMOVE SUBBASE AND ANY CONTAMINATED BACKFILL OVER DRAIN AND REPLACE WITH NO. 6 AGGREGATE AS SHOWN BY (8) (5) COMPLETE SHOULDER CONSTRUCTION.

* THICKNESS SHOWN IS "DESIGNED" THICKNESS AS DESCRIBED IN SECTION B-21.01.

1. DITCH & SLOPE CRITERIA SAME AS SHOWN ON SHEET NO. 4

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY						
PAVEMENT						
DRAINAGE						
R. O. W.						
QUANTITIES						

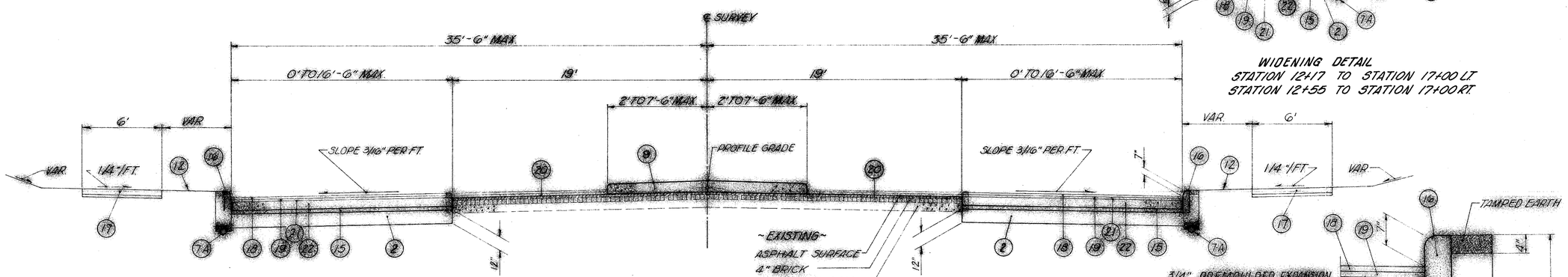
TYPICAL SECTIONS

TYPE T-35

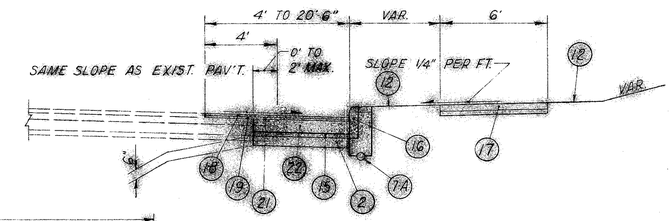
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

6/279

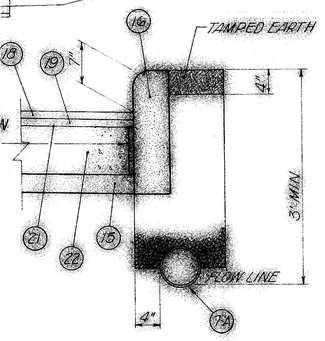
CUYAHOGA COUNTY
CUY-71-13.66



STATION 17+00 TO STATION 20+50 = 350 LIN. FT.
STATION 29+25 TO STATION 34+45 = 520 LIN. FT.
TOTAL = 870 LIN. FT.

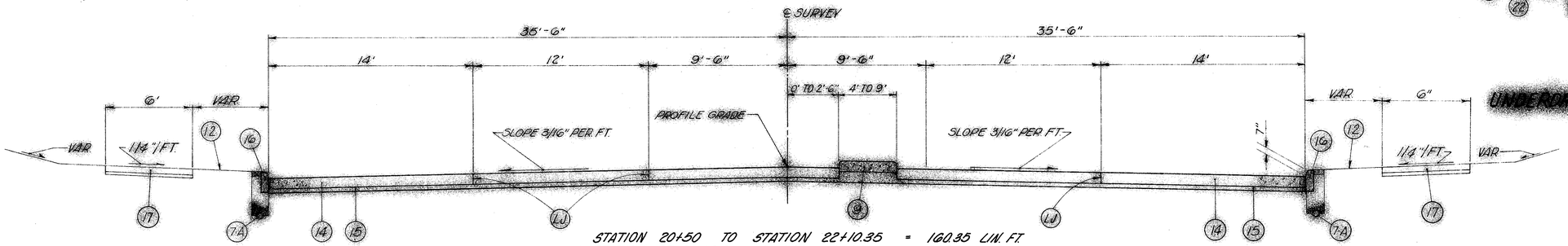


WIDENING DETAIL
STATION 12+17 TO STATION 17+00 LT.
STATION 12+55 TO STATION 17+00 RT.



UNDERDRAIN DETAIL

TYPE T-71



STATION 20+50 TO STATION 22+10.35 = 160.35 LIN. FT.
STATION 27+08.49 TO STATION 34+45 = 736.51 LIN. FT.
TOTAL = 896.86 LIN. FT.

ITEM		DESCRIPTION
(2)	I-22	SUBBASE, GRADING "A" OR "B" AS PER PLAN (SEE GENERAL NOTES).
(7A)	I-1	6" PIPE CLASS I-3, SEC. M-6.8 (a)
(9)	I-21	PORTLAND CEMENT CONCRETE MEDIAN PAVEMENT
(12)	L-9	SEEDING AND PROTECTING
(14)	T-71	9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT
(15)	I-19	3" INSULATION COURSE & SUBBASE COURSE

ITEM		DESCRIPTION
(16)	I-11	SANDSTONE CURB, AS PER PLAN.
(17)	I-13	4½" CONCRETE SIDEWALK ON 2" GRANULATED SLAG OR SCREENINGS BED (SEE PLAN FOR LIMITING STATIONS)
(18)	T-35	1¼" ASPHALTIC CONCRETE SURFACE COURSE, TYPE "C" (70-85) *
(19)	B-35	1¼" ASPHALTIC CONCRETE LEVELING COURSE (70-85) *
(20)	B-35	ASPHALTIC CONCRETE PRE-LEVELING COURSE (70-85) (0" MIN. T.) *

ITEM		DESCRIPTION
(21)	T-30	BITUMINOUS TACK COAT, SEC. M-5.5, MS-2 or RS-1, or SEC. M-5.2, RC-1 or RC-2 AS PER SEC. T-30.02 APPLIED AT THE RATE of 0.10 GALS PER SQ. YD.
(22)	B-71	9" REINFORCED PORTLAND CEMENT CONCRETE BASE COURSE.
(LJ)		STAINDARD LONGITUDINAL JOINT

* THICKNESS SHOWN IS "DESIGNED" THICKNESS AS DESCRIBED IN SECTION T-35.01 & B-35.01

3/4" PREMOULDED EXPANSION JOINT MATERIAL, SEC. M-18.02

TYPICAL SECTIONS

TYPE T-35

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2	OHIO		

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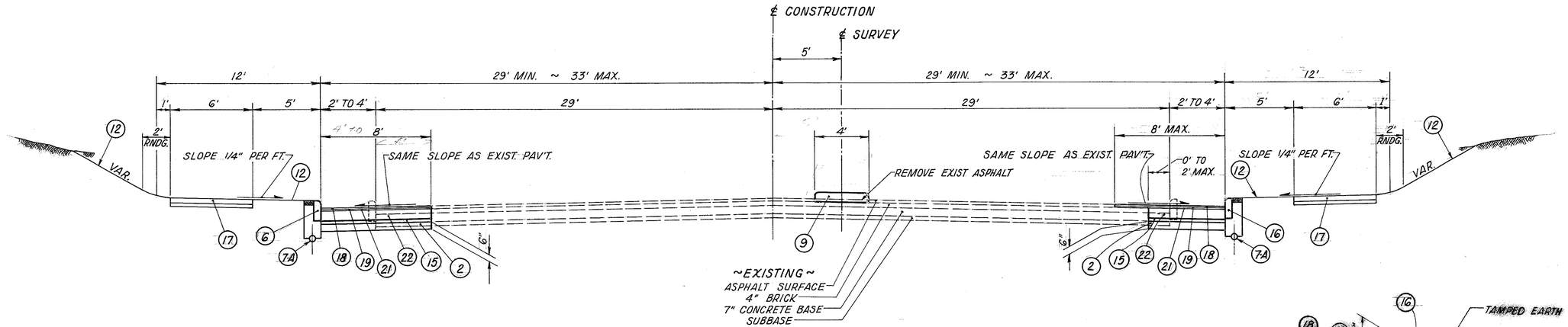
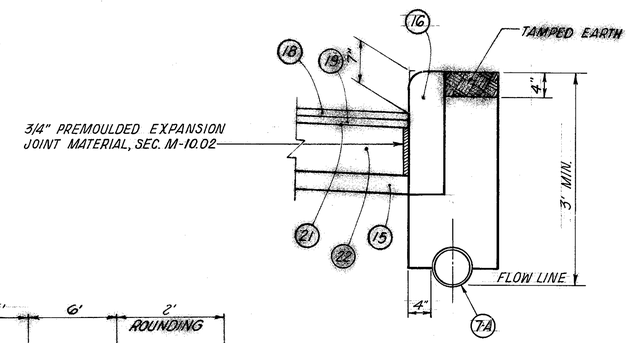
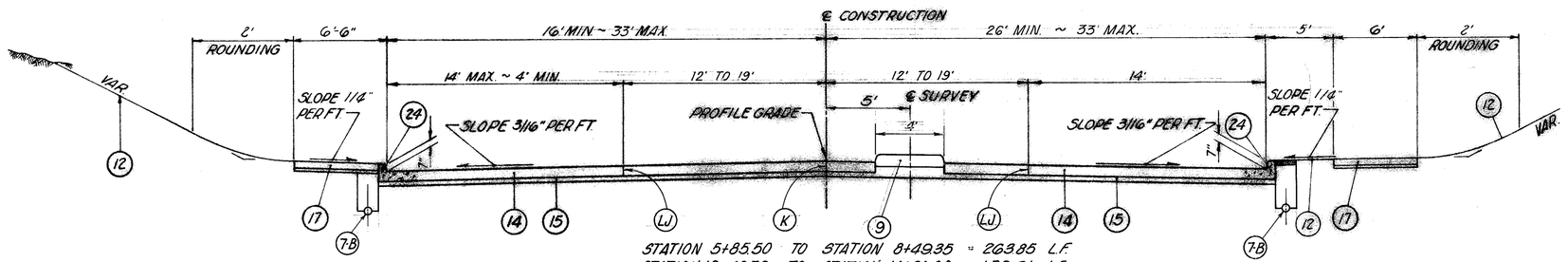


STATION 2+07 TO STATION 4+00 = 193 L.F.



UNDERDRAIN DETAIL

TYPE T-71



STATION 5+85.50 TO STATION 8+49.35 = 263.85 L.F.
STATION 12+43.79 TO STATION 14+20.00 = 176.21 L.F.
TOTAL = 439.86 L.F.

ITEM		DESCRIPTION
(2)	I-22	SUBBASE, GRADING "A" OR "B" AS PER PLAN (SEE GENERAL NOTES).
(7B)	I-1	6" PIPE, CLASS I-3, SEC. M-6.8(c). (7A) 6" PIPE, CLASS I-3, SEC. M-6.8(a).
(12)	L-9	SEEDING AND PROTECTING.
(15)	I-19	3" INSULATION COURSE & SUBBASE COURSE.
(17)	I-13	4 1/2" CONCRETE SIDEWALK ON 2" GRANULATED SLAG OR SCREENINGS BED.
(18)	T-35	1 1/4" ASPHALTIC CONCRETE SURFACE COURSE, TYPE "C" (70-85). #
(19)	B-35	1 1/4" ASPHALTIC CONCRETE LEVELING COURSE (70-85). #
(16)	I-11	SANDSTONE CURB, AS PER PLAN.
(9)	I-21	PORTLAND CEMENT CONCRETE MEDIAN PAVEMENT.

ITEM		DESCRIPTION
(21)	T-30	BITUMINOUS TACK COAT, SEC. M-5.5, MS-2 OR RS-1, OR SEC. M-5.2, RC-1 OR RC-2 AS PER SEC. T-30.02 APPLIED AT THE RATE OF 0.10 GALS. PER SQ. YD.
(22)	B-71	9" REINFORCED PORTLAND CEMENT CONCRETE BASE COURSE.
(24)	I-12	CONCRETE CURB, STANDARD TYPE 2-A MODIFIED AS PER PLAN.
(14)	T-71	9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT.
(LJ)		STANDARD LONGITUDINAL JOINT
(K)		STANDARD KEY JOINT w/o TIE BARS.

NOTE:

THICKNESS SHOWN IS "DESIGNED" THICKNESS AS DESCRIBED IN SECTION T-35.01 & B-35.01

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2	OHIO		

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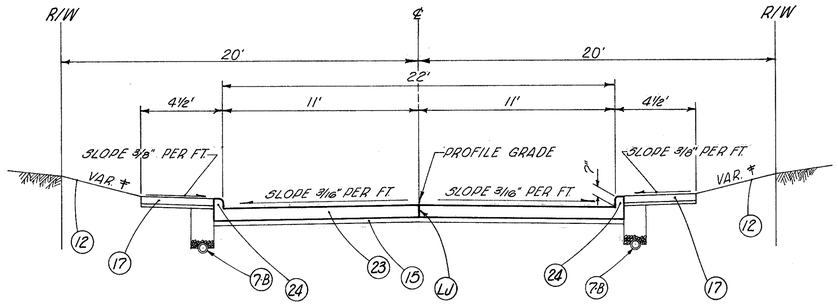
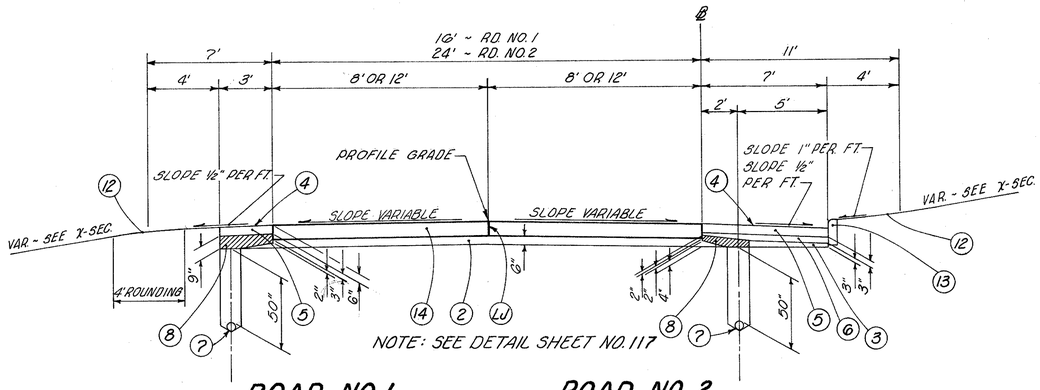
TYPICAL SECTIONS

TYPE T-71



EMERY-HIRST CONNECTION

LIMITING STATIONS
0+00 TO 2+71.79



ROAD NO. 1 ROAD NO. 2

	ITEM	DESCRIPTION
(14)	T-71	9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT.
(2)	I-22	SUBBASE, GRADING "A" OR "B" AS PER PLAN (SEE GENERAL NOTES).
(3)	I-22	SUBBASE.
(4)	T-31	BITUMINOUS SURFACE TREATMENT USING 0.008 CU. YDS. NO. 6 AGGREGATE AND 0.25 GALS. BITUMINOUS MATERIAL PER SQ. YD. (SEE NOTE IN PROPOSAL).
(5)	B-21	WATERPROOFED AGGREGATE BASE COURSE (TYPE "A" T-35 MATERIAL MAY BE USED IN CONSTRUCTION OF THIS COURSE - SEE NOTE IN PROPOSAL. *
(6)	B-19	AGGREGATE BASE COURSE.
(7)	I-1	6" PIPE, CLASS I-3.
(78)	I-1	6" PIPE, CLASS I-3, SEC. M-6.8(e).

	ITEM	DESCRIPTION
(8)		SPECIAL DRAINAGE CONNECTION, USING NO. 6 AGGREGATE (SEE NOTE IN PROPOSAL).
(12)	L-9	SEEDING AND PROTECTING.
(13)	I-12	CONCRETE CURB, STANDARD TYPE G.
(15)	I-19	3" INSULATION COURSE AND SUBBASE COURSE.
(17)	I-13	4½" CONCRETE SIDEWALK ON 2" GRANULATED SLAG OR SCREENINGS BED.
(23)	T-71	7" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT.
(24)	I-12	CONCRETE CURB, STANDARD TYPE 2-A, MODIFIED AS PER PLAN.
(LJ)		STANDARD LONGITUDINAL JOINT.

NOTE:

▨ SEQUENCE OF OPERATIONS: (1) INSTALL PIPE UNDERDRAIN ON OUTSIDE SHOULDER. (2) PLACE SUBBASE OUT TO OUTSIDE EDGE OF UNDERDRAIN OR TO ONE FOOT BEYOND EDGE OF PAVEMENT WHERE NO UNDERDRAIN IS PRESENT. (3) CONSTRUCT T-71. (4) REMOVE SUBBASE AND ANY CONTAMINATED BACKFILL OVER DRAIN AND REPLACE WITH NO.6 AGGREGATE AS SHOWN BY (8) (5) COMPLETE SHOULDER CONSTRUCTION.

* THICKNESS SHOWN IS "DESIGNED" THICKNESS AS DESCRIBED IN SECTION B-210.1.

† VARY SLOPE TO FIT RIGHT OF WAY.

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY						
PAVEMENT						
DRAINAGE						
R/W						
QUANTITIES						

CUYAHOGA COUNTY
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GENERAL NOTES

DESIGN SPEED

THE GEOMETRICS FOR THIS PROJECT HAVE BEEN PLANNED FOR A DESIGN SPEED OF 60 MILES PER HOUR.

REMOVAL OF TREES AND STUMPS

ALL TREES AND STUMPS LYING WITHIN THE CONSTRUCTION LIMITS OF THIS PROJECT SHALL BE REMOVED UNDER THE LUMP SUM PRICE BID FOR E-9, REMOVAL OF TREES AND STUMPS, EXCEPT THAT THOSE TREES AND STUMPS FOR WHICH PROTECTION AND PRESERVATION WORK IS INDICATED ELSEWHERE IN THESE PLANS SHALL NOT BE REMOVED.

THE FOLLOWING IS AN APPROXIMATE ESTIMATE OF THE NUMBER OF TREES AND STUMPS TO BE REMOVED:

SIZES

12" - 18" - 152
18" - 24" - 18
24" - 30" - 10
30" - 36" - 4
36" - 42"
42" - 48" - 1
Over 48" - 3

THE ABOVE ESTIMATE IS APPROXIMATE AND THE STATE OF OHIO RESERVES THE RIGHT TO ORDER THE REMOVAL OF ADDITIONAL TREES OR STUMPS OUTSIDE THE LIMITS OF CONSTRUCTION BUT WITHIN THE RIGHT-OF-WAY AND/OR EASEMENT LINES. PAYMENT FOR THE REMOVAL OF THESE ADDITIONAL TREES OR STUMPS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM E-9, REMOVAL OF TREES AND STUMPS.

SPECIAL DITCH ELEVATIONS

FOR ELEVATIONS OF SPECIAL DITCHES SEE CROSS SECTIONS.

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.

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

AN ESTIMATED QUANTITY FOR THIS ITEM HAS BEEN PROVIDED IN THE GENERAL SUMMARY FOR USE IN PROOF ROLLING OF SUBGRADE ON THE MAINLINE AND RAMP PAVEMENTS AS DIRECTED BY THE ENGINEER. PROOF ROLLING WILL NOT BE REQUESTED WHERE ROCK OR SHALE OCCURS IN SUBGRADE AND IN AREAS WHERE SUBBASE HAS BEEN THICKENED TO REPLACE FROST SUSCEPTIBLE SILTS. IN LIEU OF THE REQUIREMENTS OF CE-101.04, A MINIMUM OF ONE COVERAGE WILL BE REQUIRED TO CHECK THE SUBGRADE. MOISTURE CONTENT OF THE TOP 12" OF SUBGRADE SHALL NOT EXCEED OPTIMUM AT THE TIME OF PROOF ROLLING. TIRE PRESSURE AND TOTAL LOAD SHALL BE VARIED AS DIRECTED BY THE ENGINEER WITHIN THE LIMITS PROVIDED IN SUPPLEMENTAL SPECIFICATION NO. CE-101.04.

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

MATERIAL FOR THIS ITEM SHALL MEET THE REQUIREMENTS OF GRADING "A" OR "B" OF SECTION I-22.02 EXCEPT THAT FOR EITHER GRADING, NO MORE THAN 10% OF THE MATERIAL SHALL PASS A NO. 200 SIEVE AFTER ALL OPERATIONS OF PLACING AND COMPACTING HAVE BEEN COMPLETED.

CONTRACTION AND EXPANSION JOINTS

ALTHOUGH SPECIFIC LOCATIONS OF CERTAIN EXPANSION AND CONTRACTION JOINTS HAVE BEEN DETAILED ON THIS PLAN, NO WAIVER OF SPECIFICATIONS IS INTENDED. PROVISION OF EXPANSION JOINTS AT ALL MAJOR STRUCTURES AND THE MAXIMUM SPACING BETWEEN CONTRACTION JOINTS SHALL BE IN ALL CASES BE IN ACCORDANCE WITH STANDARD CONSTRUCTION DRAWING T-J.

FEDERAL AID CONSTRUCTION IDENTIFICATION SIGNS

THE CONTRACTOR SHALL FURNISH, ERECT, MAINTAIN AND SUBSEQUENTLY REMOVE FEDERAL AID CONSTRUCTION IDENTIFICATION SIGNS AT EACH OF THE FOLLOWING LOCATIONS:

BELLAIRE STA. 11+90 RT.
34+50 LT
MEMPHIS STA. 2+00 RT.
13+25 LT

SIGN DETAILS SHALL BE AS SPECIFIED ON STANDARD DRAWING FACI-1, "CODE M-55(1)-132 (3) AND THE SIGNS SHALL BE ERECTED IN ACCORDANCE WITH STANDARD DRAWING FACI-2. ADDITIONAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH NOTES IN THE PROPOSAL.

GRID REFERENCE MONUMENTS AS PER PLAN

MONUMENTS SHALL BE CONSTRUCTED OF CLASS C CONCRETE, CAST-IN-PLACE IN A CIRCULAR HOLE, EIGHT INCHES IN DIAMETER AND FORTY-FOUR INCHES IN DEPTH. TOP OF CONCRETE SHALL BE FINISHED AT A DEPTH OF TWO INCHES BELOW GROUND LEVEL AND THE UPPER SIX INCH PORTION OF THE CONCRETE SHALL BE FORMED. A ½ INCH STEEL ROD SHALL BE IMBEDDED IN THE WET CONCRETE AS DIRECTED BY THE ENGINEER TO MARK COORDINATE STATION

ITEM I-4 DUST CONTROL

THE FOLLOWING ESTIMATED QUANTITIES ARE PROVIDED FOR DUST CONTROL, FOR USE AS DIRECTED BY THE ENGINEER:

ITEM I-4 WATER FOR DUST CONTROL	25	M. GALS.
ITEM I-4 CALCIUM CHLORIDE	5	TONS

ELEVATION DATUM

ALL ELEVATIONS ARE BASED ON U.S.G.S. DATUM.

CONSTRUCTION LAYOUT STAKES

SEE NOTE IN PROPOSAL DESCRIBING THE WORK INCLUDED IN THIS LUMP SUM PAY ITEM.

SUPERELEVATION

SUPERELEVATED CURVES SHALL BE BUILT WITHOUT CROWN. THE CROWN SHALL BE WORKED OUT OF THE PAVEMENT IN THE PORTION BETWEEN THE BEGINNING OF THE TRANSITION AND THE POINT WHERE THE SUPERELEVATION EQUALS TWICE THE CROWN.

NON-RIGID PAVEMENT REMOVAL

REMOVAL AND DISPOSAL OF EXISTING NON-RIGID PAVEMENT, UNLESS OTHERWISE INDICATED ON THESE PLANS, SHALL BE MEASURED AND PAID FOR AS ITEM E-1, ROADWAY EXCAVATION.

ROUNDING OF CORNERS SHOWN ON CROSS SECTIONS

THE ROUNDED CORNERS SHOWN ON STANDARD DRAWING R1-1, AS MODIFIED BY THE TYPICAL SECTIONS, APPLY TO ALL CROSS SECTIONS, EVEN THOUGH OTHERWISE SHOWN ON THESE PLANS.

FIELD OFFICE

THE CONTRACTOR SHALL, IN ACCORDANCE WITH SEC.S-0.01 (B), PROVIDE FOR THE EXCLUSIVE USE OF THE STATE'S EMPLOYEES, A SUITABLE FIELD OFFICE HAVING A MINIMUM OF 500 SQ.FT. OF FLOOR SPACE. THE FIELD OFFICE SHOULD BE CONSTRUCTED WITHIN TEN (10) DAYS AFTER CONTRACTOR HAS STARTED WORK. THE CONTRACTOR SHALL HAVE A TELEPHONE INSTALLED AND MAINTAINED IN THIS FIELD OFFICE DURING THE CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR SHALL ALSO PROVIDE AND INSTALL WIRING AND OUTLETS SUITABLE FOR CONNECTING ELECTRIC LIGHTS AND OFFICE EQUIPMENT IN THE FIELD OFFICE AND PROVIDE 110-VOLT ALTERNATING CURRENT TO THE OFFICE DURING THE ENTIRE PERIOD OF CONSTRUCTION OF THIS PROJECT.

SEWER TAP EXTENSIONS

APPROX. LOCATION	QUANT. (L.F.)
W. 117 TH	
Sta. 2+18 L & R	4*
3+00 R	4*
6+02 L & R	23*^
6+42 L&R	23*^
6+80 L	23*^
+98	20*^
7+28 L & R	15*^
BELLAIRE ROAD	
12+85 R	3*
12+95 L	4*
13+56 R	10*
+85 R	11*
14+22 R	14*
+42 L	8*
+90 L	10*
15+45 L	11*
+95 L	12*
16+42 L	14*
+95 L	16*
18+45 L	20
+60 R	20
19+90 L	18
20+40 L	18
30+70 R	12
31+20 R	11
31+65 R	8

TOTAL QUANTITIES OF 1-L PIPE 6" CL. B-1 SEE M 6.8 (A)

INTERSTATE	107 LIN. FT.
100% CITY	121 LIN. FT.*
106% COUNTY	104 LIN. FT.**

NOTE: THESE QUANTITIES ARE PROVIDED TO EXTEND EXIST SEWER HOUSE TAPS TO THE BACK OF PROPOSED CURBS. THESE QUANTITIES CARRIED TO SHEET NO. 14

TRAFFIC NOTES

TRAFFIC MAINTENANCE

TWO WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES BY USE OF EITHER THE EXISTING PAVEMENT, THE PROPOSED PAVEMENT, OR TEMPORARY ROADWAYS SURFACED WITH T-10 AGGREGATE AND STABILIZED WITH ITEM T-35 SURFACE COURSE. THE FOLLOWING QUANTITIES ARE PROVIDED FOR THIS PURPOSE.

T-10 60 C.Y.
T-35-ASPH CONC. SURFACE COURSE TYPE "C (70-85) 20 C.Y.

TRAFFIC
THE CONTRACTOR MUST NOTIFY THE TRAFFIC SECTION* 10 DAYS PRIOR TO AFFECTING ANY PROPOSED CHANGE IN TRAFFIC PATTERN.
*REFERS TO CITY OF CLEVELAND DIVISION OF TRAFFIC

TEMPORARY RUNAROUNDS
THE BELLAIRE RD. AND MEMPHIS AVE. TEMP. RUNAROUNDS SHALL NOT BE IN OPERATION WHILE THE MEMPHIS AVE-BELLAIRE RD. INTERSECTION IS BEING CONSTRUCTED.

BUILD HIRST AVE.-EMERY AVE. CONNECTION AND W. 118TH CUL DE SAC PRIOR TO CONSTRUCTION OF BELLAIRE TEMPORARY RUNAROUND.

FOUR TRAFFIC LANES ON THE TEMP. RUNAROUNDS WILL BE REQUIRED TO BE PASSABLE DURING THE PEAK HOURS 7 A.M. TO 8:30 A.M. AND 4 P.M. TO 6 P.M.

THE COST OF INSTALLING TEMPORARY CIRCUITING FOR MAINTAINING THE EXISTING STREET LIGHTING AND TRAFFIC SIGNAL SYSTEM SHALL BE INCLUDED IN THE LUMP SUM BID FOR THE TEMPORARY RUN-AROUND
MATERIALS & PLANS TO BE FURNISHED BY CITY OF CLEVELAND M.E.L.&P.

ALTERNATE METHODS
IF THE CONTRACTOR SO ELECTS, HE MAY SUBMIT ALTERNATE METHODS FOR THE MAINTAINANCE OF TRAFFIC PROVIDED THE INTENT OF THE ABOVE PROVISIONS IS FOLLOWED AND NO ADDITIONAL INCONVENIENCE TO THE TRAVELING PUBLIC RESULTS THEREFROM. NO ALTERNATE PLAN SHALL BE PLACED INTO EFFECT UNTIL APPROVAL HAS BEEN GRANTED IN WRITING BY THE DIRECTOR.

TRENCH FOR WIDENING
TRENCH EXCAVATION FOR BASE WIDENING SHALL BE PERFORMED ONLY ON ONE SIDE OF THE PAVEMENT AT A TIME. THE OPEN TRENCH SHALL BE ADEQUATELY MAINTAINED AND PROTECTED WITH TEMPORARY GUIDE MARKERS OR BARRICADES AT ALL TIMES. PLACEMENT OF PROPOSED SUBBASE AND BASE MATERIAL SHALL FOLLOW AS CLOSELY AS POSSIBLE BEHIND THE EXCAVATION OPERATIONS. THE LENGTH OF WIDENING TRENCH WHICH IS OPEN AT ANY ONE TIME SHALL BE HELD TO A MINIMUM AND SHALL AT ALL TIMES BE SUBJECT TO APPROVAL OF THE ENGINEER.

GUARD RAIL ADJACENT TO BRIDGE
One (1) additional guardrail post shall be provided in the center of each panel of guard rail adjacent to the bridge, payment for which shall be included in the unit price bid for Item I-15 Guard Rail.

OVERHEAD SIGNS
* The exact stationing of Bridge Type Overhead Sign Assemblies in guard rail sections may be adjusted at the time of construction as directed by the Engineer, to avoid interference with guard rail posts.

LENGTH OF WORK ON SIDE STREETS

BELLAIRE STA. 12+17 TO 34+20 = 2203
MEMPHIS STA. (2+07 TO 4+64.5 = 157.5
(5+35.5 TO 14+20 = 884.5
HIRST-EMERY CONNECTION STA. 0+00 TO 2+72 = 272
3617 LIN. FT.

SEALING OF PIPE JOINTS
Where connections are made between rigid and flexible pipe sections or between pipe section of different kind or type of end fabrication, whether required by the plans, arising from permissible use of optional materials, or encountered in connection to existing facilities, the joint shall be sealed by means of a Class "E" concrete collar having a minimum thickness of 6" and a minimum length of 12". Payment for sealing as described above shall be included in the unit price bid for the pertinent item

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GENERAL NOTES

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ITEM I-10 RIPRAP, AS PER PLAN

CUTOFF WALL AND END SILL AS DETAILED ON THE PLANS SHALL BE PROVIDED AND PAYMENT THEREOF SHALL BE INCLUDED IN THE UNIT PRICE BID PER SQ. YD. FOR THIS ITEM.

EXTRA DEPTH CATCH BASINS

STANDARD MANHOLE STEPS SHALL BE PROVIDED AT ANY CATCH BASIN DEEPER THAN SIX (6) FEET. COST OF STEPS TO BE INCLUDED IN THE PRICE BID FOR ITEM I-8 CATCH BASINS.

SPECIAL DITCH ELEVATIONS

FOR ELEVATIONS OF SPECIAL DITCHS SEE CROSS SECTIONS.

CONNECTIONS TO EXISTING PIPE

AT PLACES WHERE THE PLANS PROVIDE FOR PROPOSED DRAINAGE PIPE TO BE CONNECTED TO EXISTING PIPES, 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 PIPE. THE COST OF THIS OPERATION SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT PIPE ITEM.

MAINTENANCE OF SEWER FLOWS

THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS SO AS TO MAINTAIN AT ALL TIMES SEWER FLOWS THROUGH EXISTING FACILITIES TO REMAIN IN PLACE AND THROUGH EXISTING FACILITIES TO BE REPLACED UNTIL NEW FACILITIES ARE COMPLETED AND PLACED INTO USE!

PAYMENT FOR ANY ADDITIONAL COSTS INVOLVED IN MAINTAINING THESE FLOWS BY PUMPING OR BY ANY OTHER MEANS APPROVED BY THE ENGINEER SHALL BE INCLUDED IN THE UNIT PRICES BID FOR THE RESPECTIVE PIPE ITEMS.

EXISTING SEWER HOUSE DRAINS

ALL EXISTING HOUSE DRAINS, WHICH INCLUDE SANITARY, YARD, ROOF, BASEMENT AND ALL OTHER SIMILAR PIPE DRAINS, NOW IN USE WHICH ARE DISTURBED BECAUSE OF THE HIGHWAY IMPROVEMENT, SHALL BE REPLACED BY THE CONTRACTOR. IF THE EXISTING SEWER IS TO BE ABANDONED, THEN A SATISFACTORY HOUSE CONNECTION SHALL BE PROVIDED. PAYMENT FOR THIS WORK SHALL BE AT THE CONTRACT UNIT PRICE BID OF PERTINENT PIPE ITEM. UNRECORDED HOUSE DRAINS THAT ARE ENCOUNTERED DURING CONSTRUCTION AND REQUIRED TO BE REPLACED UNDER THE DIRECTION OF THE ENGINEER SHALL BE PAID FOR AS SPECIFIED.

WHERE AN EXISTING HOUSE IS TO BE REMOVED THE UPGRADE END OF THE EXISTING HOUSE CONNECTION SHALL BE PLUGGED BY THE PROPER INSTALLATION OF A SUITABLE PRECAST CONCRETE OR VITRIFIED PLUG, OR THE CONSTRUCTION OF A BULKHEAD OF BRICK OR CONCRETE MASONRY WITH A MINIMUM THICKNESS OF 12 INCHES. PAYMENT FOR THE WORK SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR ITEM E-1 ROADWAY EXCAVATION.

SPECIFICATION FOR 114" PIPE AS PER PLAN

THE SUPPLEMENTAL SPECIFICATION NO. M-106.6 (C) REINF. CONC, **PIPE SHALL APPLY FOR THIS PIPE WITH THE FOLLOWING PROVISIONS.**

INTERNAL DIAMETER = 114"

MINIMUM WALL THICKNESS = ~~10 1/2"~~ 9½"

CIRCULAR REINFORCEMENT - INNER CAGE = 1.41 SQ.IN. /FT. of PIPE
- OUTER CAGE = 1.06 SQ.IN. / FT. OF PIPE

STRENGTH TEST REQUIREMENTS - CRACKING LOAD = 19,000 # / L.F.

(3 - EDGE BEARING) - ULTIMATE LOAD = 28,500 # / L.F.

D-LOAD - 2000 #

(1) CONCRETE STRENGTH OF 5,000 PSI

(2) CLASS IV WALL B

(3) AUXILIARY SUPPORTS - # 0000 AT 6"; ~~11~~ 13 LINES @ 6"

SEEDING

QUANTITIES FOR SEEDING ARE CALCULATED FOR THE SOIL AREAS BETWEEN THE RIGHT-OF-WAY FENCE LINES, BETWEEN THE RIGHT-OF-WAY LINES IN UNFENCED AREAS, AND WITHIN THE WORK LIMITS FOR THE AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENTS OR SLOPE EASEMENTS.

QUANTITIES FOR SEEDING ON SIDE STS. ARE CALCULATED FOR THE SOIL AREAS BETWEEN THE WORK LIMITS.

SEEDING FORMULA

THE FOLLOWING SEED MIXTURE SHALL BE USED IN LIEU OF THE MIXTURE LISTED IN SEC. L-9.11 THROUGHOUT THE PROJECT UNLESS OTHERWISE NOTED.

STANDARD SEED MIXTURE (% BY WEIGHT)
25% KENTUCKY BLUEGRASS
15% PERENNIAL RYE
50% CREEPING RED FESCUE
10% RED TOP

SPECIAL SEED MIXTURE TO BE USED LT STA 835+00 TO 857+00 SEE LANDSCAPING PLANS
25% KENTUCKY BLUEGRASS
15% PERENNIAL RYE
20% CREEPING RED FESCUE
30% CROWN VETCH
10% RED TOP

SPECIAL SEEDING PREPARATION AREAS

THE REFERENCES IN THE FIRST PARAGRAPH OF SECTION L-9.11 TO PREPARATION OF THE SEED IN FRONT OF RESIDENCES, ETC., SHALL, ON THIS PROJECT BE CONSIDERED TO BE PARTICULARLY APPLICABLE IN THE FOLLOWING AREAS:

BELLAIRE STA. 12+17 to 17+50 LT
12+55 to 14+95 RT
15+21 to 16+80 RT
30+25 to 34+20 LT
30+25 to 31+98 RT
32+50 to 34+20 RT
MEMPHIS STA. 2+07 to 3+30 LT
2+07 to 4+50 RT
13+75 to 14+20 RT

SANITARY FLOW INTO HIGHWAY DRAINAGE SYSTEMS

THIS PLAN MAKES NO PROVISION FOR CONNECTING, NOR SHALL THE ENGINEER OR CONTRACTOR CONNECT, ANY EXISTING OR NEW DRAINAGE INTO THE HIGHWAY DRAINAGE SYSTEM WHEN SUCH DRAINS CARRY FLOW FROM ANY PLUMBING FIXTURES INCLUDING FLOOR DRAINS AND SINK DRAINS OR DRAINS FROM LIVESTOCK LOTS OR BARNS OR POLLUTED WATER OF ANY KIND.

E-10 BUILDING REMOVAL PARCEL No. 1663 WL
Removal of this structure must be performed in such a manner that all utilities servicing the buildings located on the residue of property that is retained by the owner shall not be interrupted. All utility rearrangement necessary to provide continued service must be done to the satisfaction of the HIGHWAY DEPT. INSPECTOR. Costs involved to rearrange, or adjust utility lines shall be included in the unit price bid for the E-10 item.

SODDING

AN 18" WIDTH OF SOD SHALL BE PLACED ALONG THE BACK SIDE OF RETAINING WALL AND AROUND CATCH BASIN, LT. STA. 810+98. THE COST OF THE SODDING SHALL BE PAID FOR AT THE UNIT PRICE BID PER SQUARE YARD FOR ITEM L-10 SODDING.

EROSION CONTROL

ITEMS I-10, I-14 AND L-10 & L-120 ARE PROVIDED ON THESE PLANS FOR EROSION CONTROL. ROCK OF A STABLE NATURE WILL NOT BE REMOVED IN ORDER TO PLACE ANY OF THESE ITEMS. THE ENGINEER SHALL CHECK AND NON-PERFORM QUANTITIES OR ADJUST LOCATIONS AND QUANTITIES FOR THESE ITEMS WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION.

ITEM I-5 PIPE SPECIALS
Pipe without perforations will be permitted for use on this project for all Item I-5 Pipe Specials.

APPROACH SLAB LONGITUDINAL JOINTS
Longitudinal impressed or sawed joints shall be provided between lane elements, on all approach slabs, in accordance with "Standard Construction Drawing L.J No. 1 Revised 7-1-55.

ITEM SPECIAL - MOWING SEEDED AND SODDED AREAS
The Contractor shall mow all seeded & sodded areas placed under this project as often as required by the Engineer so that grass height will not exceed six inches at any time during the life of this contract. Mowing shall be performed with suitable tools and equipment so that grass growth will be cut no shorter than three inches in height.
The number of acres to be paid for will be for each operation performed by the Contractor for the actual area mowed, as directed by the Engineer.
The acres measured as provided above shall be paid for at the contract unit price bid per acre for "Item Special - Mowing Seeded and Sodded areas," which price and payment shall constitute full compensation for furnishing all labor, material, tools, equipment and incidentals necessary to complete this item.

REMOVAL OF EXISTING PIPE

THE REMOVAL OF ALL EXISTING PIPES, HEADWALLS AND/OR APPURTENANCES WITHIN THE LIMITS OF PROPOSED EXCAVATION ITEMS SHALL BE INCLUDED FOR PAYMENT IN THE UNIT PRICE BID FOR THE RESPECTIVE EXCAVATION ITEMS, UNLESS OTHERWISE ITEMIZED IN THE PLANS.

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

UNDERGROUND UTILITIES

THE LOCATIONS OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS HAVE BEEN OBTAINED BY DILIGENT FIELD CHECKS AND SEARCHES OF AVAILABLE RECORDS. IT IS BELIEVED THAT THEY ARE ESSENTIALLY CORRECT, BUT THE STATE OF OHIO MAKES NO GUARANTEES AS TO THEIR ACCURACY OR COMPLETENESS.

UTILITIES

THE CONTRACTOR SHALL NOTIFY, AT LEAST 2 WORKING DAYS BEFORE BREAKING GROUND, ALL PUBLIC SERVICE CORPORATIONS HAVING WIRE, POLES, PIPE, CONDUITS, MANHOLES OR OTHER STRUCTURES WHICH MAY BE AFFECTED BY THIS OPERATION, INCLUDING ALL STRUCTURES WHICH ARE AFFECTED AND NOT SHOWN ON THESE PLANS. HE SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO AVOID DAMAGES TO ANY AND ALL UTILITIES. ANY AND ALL WORK REQUIRED FOR PUBLIC OR PRIVATE UTILITIES WILL BE DONE BY AND AT THE EXPENSE OF THEIR RESPECTIVE OWNERS, UNLESS OTHERWISE NOTED ON THESE PLANS.

ROCK SUBGRADE

THE CONTRACTOR SHALL BE PAID FOR THE THICKNESS OF I-22 MATERIAL SHOWN ON THE TYPICAL SECTIONS IN ROCK EXCAVATION AREAS. ANY POCKETS IN THE ROCK BELOW THE PLAN SUBGRADE ELEVATION SHALL DRAIN EITHER LONGITUDINALLY OR LATERALLY AND ALL IRREGULARITIES IN THE ROCK BELOW THIS ELEVATION SHALL BE FILLED WITH I-22 MATERIAL AT NO ADDITIONAL COST TO THE STATE.

LOCATION AND SIZE OF PIPES

THE LOCATION, TYPE, DEPTH AND SIZE OF ALL EXISTING PIPES ARE SHOWN AS NEAR EXACT AS THE AVAILABLE INFORMATION WILL PERMIT. THE STATE WILL NOT BE RESPONSIBLE FOR ANY VARIATIONS FOUND DURING CONSTRUCTION.

REINFORCED ENDS ON CORRUGATED METAL PIPE

REINFORCED ENDS WILL BE REQUIRED ON ALL CORRUGATED METAL CLASS F-4, SEC. m-64 (C) PIPE FOR DRIVEWAYS AND UNDERDRAIN OUTLETS IF THE PIPE ENDS ARE UNPROTECTED BY HEADWALLS, CATCH BASINS, OR MANHOLES.

PALEONTOLOBICAL SALVAGE

PALEONTOLOGICAL SALVAGE OPERATIONS INVOLVING THE RETRIVAL OF FOSSIL DEPOSITS WILL BE A PART OF THIS CONTRACT. SEE NOTE IN PROPOSAL.

SANDSTONE CURB REMOVED & RESET

EXISTING SANDSTONE CURB SHALL BE USED ONLY WHEN DEEMED SALVAGABLE BY THE ENGINEER. WHERE SALVAGED SANDSTONE CURB IS USED IT SHALL BE IN A CONTINOUS LINE AND NOT INTERMITTENT WITH NEW CURB AS DIRECTED BY THE ENGINEER.

COOPERATION WITH OTHER CONTRACTORS

IN ADDITION TO THE PROVISIONS AS SET FORTH IN SEC. G 5.05 OF THE SPECIFICATIONS THE CONTRACTOR SHALL COOPERATE WITH THE CONTRACTOR OR CONTRACTORS, AS THE CASE MAY BE, ENGAGED IN THE RELOCATIONS OF THE B. & O. RAILROAD AND THE BIG CREEK CHANNEL

LEGEND
I. = INTERSTATE
C. = CITY (100%) (Cleveland)
CO. = COUNTY (100%)

GENERAL SUMMARY

TYPE CODE 7221

CUYAHOGA COUNTY
CUY-71-13.68

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

SHEET NUMBER

ITEM	9	14 I.	14 C.	14 CO.	15	16 I.	16 C.	16 CO.	19	20	21	22	23	24
E-1		699,254	746	170										
E-1		123,495	1911	1048										
S.S. CE 101.04		60												
E-8		11,478	267	1035										
E-8			[illegible]	[illegible]						194				
E-8		24,157	~~3845~~	~~1586~~										
E-8		5664	64	290										
E-8		1412	1549											
I-11		1412	1549											
E-9	Lump													
E-11		3182	5											
I-4	25													
I-4	5													
I-8														
I-13						2106								
I-15									1087.5	1612.5	1100	2990	1497.5	
I-15									550	1187.5	1500	1375	650	
E-12													245	
I-26														
L-9		136,130	1209	201										
L-9		12.28	0.11	0.02										
L-9		61.43	0.54	0.09										
L-10										60		70	241	
L-120													1045	417
T-35	20													
T-10	60													
S-15														
Special		56.4	0.5	0.1										
S-24														

ITEM	88 C.	89 C.	90	91	92	93	94	95	103 C.	104 I.	104 C.	104 CO.	105	106	115	116	117	269	120 I.	120 C.	279	257
E-8	33	188	60.8		25.3	41.3	6.6		3.3		40.7											
I-8																		14				
I-13		1091	2395	204	1099	102			1848	678	180	1620	985	1983								
I-15										305			32									
E-12				340	50																	
I-26																					9999	
L-10																			10			
L-120																			917			
S-15															Lump	Lump						
S-24				Lump									Lump									Lump

SUB-TOTALS

ITEM	From Sht. 120 Code Y060 I.		Code 7221 Inter-State	Code 7221 100% City	Code 7221 100% County	Grand Total	Unit	Description
								ROADWAY
E-1			699,254	746	170	700,170	Cu. Yds.	Roadway Excavation Method B., As per Plan
E-1			123,495	1911	1048	126,454	Sq. Yds.	Compacted Subgrade.
S.S. CE 101.04			60			60	Hours	Compaction Using Heavy Pneumatic Tired Roller.
E-8			11,612	532	1035	13,179	Sq. Yds.	Removal and Disposal of Existing Pavement
E-8			194	(3270)	(2261)	194	Sq. Yds.	Removal and Disposal of Existing Pavement, as per Plan.
E-8			24,157	~~3845~~	~~1586~~	29,588	Sq. Ft.	Removal and Disposal of Existing Sidewalk.
E-8			5664	64	290	6018	Lin. Ft.	Removal and Disposal of Existing Curb.
E-8			1412	1549		2961	Lin. Ft.	Removal for Re-use. of Existing Curb
E-9			Lump			Lump	Lump	Removal of Trees and Stumps.
E-11			3182	5		3187	M Gals.	Water.
I-4			25			25	M Gals.	Water for Dust Control.
I-4			5			5	Tons	Calcium Chloride for Dust Control.
I-8			14			14	Each	Centerline Reference Monuments.
I-13			9552	~~3119~~ (2639)	~~1620~~ (2100)	14,291	Sq. Ft.	4 1/2" Concrete Sidewalk on 2" Granulated Slag or Screenings Bed.
I-15			8350			8350	Lin. Ft.	Guard Rail, Steel Beam Standard Type (Deep).
I-15			5262.5			5262.5	Lin. Ft.	Guard Rail, Steel Beam Barrier Type (Deep).
E-12			635			635	Lin. Ft.	Pipe Removed, Over 15".
I-26			9999			9999	Lin. Ft.	Chain Link Fence.
L-9			136,130	1209	201	137,540	Sq. Yds.	Seeding and Protecting. as per Plan
L-9			12.28	0.11	0.02	12.41	Tons	Commercial Fertilizer. (12-12-12)
L-9			61.43	0.54	0.09	62.06	Tons	Agricultural Liming Material.
L-10			381			381	Sq. Yds.	Sodding.
L-120			2379			2379	Sq. Yds.	Jute Matting.
T-35			20			20	cu. yds.	Asphaltic concrete surface course or an approved bituminous premixed surface course for maintaining traffic.
T-10			60			60	Cu. Yds.	Traffic Compacted Surface Course for Maintaining Traffic.
S-15			Lump			Lump	Lump	Temporary Runaround Roads using class 'A' pavement.
Special			56.4	0.5	0.1	57	Acres	Mowing Seeded and Sodded Areas
S-24			Lump			Lump	Lump	Removal of Existing Structures

BUILDING REMOVALS

Item	Inter State	100% City	100% County	Grand Total	Unit	TYPE CODE 7221 DESCRIPTION		
E-10	Lump			Lump	Lump	Removal of 1 1/2 story frame stucco residence, concrete block garage.	Parcel	1463 WL
E-10	Lump			Lump	Lump	Removal of 1 story concrete block commercial building.	Parcel	1519 WL
E-10	Lump			Lump	Lump	Removal of 1 story and 2 story concrete block commercial building.	Parcel	1520 WL
E-10	Lump			Lump	Lump	Removal of 1 story brick residence and commercial building, 2 car conc. block garage	Parcel	1523 WL
E-10	Lump			Lump	Lump	Removal of 1 story concrete block commercial building and shed.	Parcel	1544 WL
E-10	Lump			Lump	Lump	Removal of 2 story frame residence.	Parcel	1601 WL
E-10	Lump			Lump	Lump	Removal of 2 story brick residence.	Parcel	1602 WL
E-10	Lump			Lump	Lump	Removal of 2 1/2 story frame residence.	Parcel	1606 WL
E-10	Lump			Lump	Lump	Removal of 1 story brick commercial building, (bowling alley and tavern.)	Parcel	1607 WL
E-10	Lump			Lump	Lump	Removal of 2 story frame residence, 2 frame garages.	Parcel	1608 WL
E-10	Lump			Lump	Lump	Removal of 2 story frame residence, 1 1/2 story frame residence, 2 car frame garage	Parcel	1614 WL
E-10	Lump			Lump	Lump	Removal of 2 1/2 story frame converted commercial building, brick 2 car garage.	Parcel	1618 WL
E-10	Lump			Lump	Lump	Removal of 1 story and 2 story frame residence, and store, one frame shop building.	Parcel	1620 WL
E-10	Lump			Lump	Lump	Removal of one corrugated metal shed.	Parcel	1630 WL
E-10	Lump			Lump	Lump	Removal of 2 story corrugated metal shed.	Parcel	1636 WL
E-10	Lump			Lump	Lump	Removal of 2 story frame residence.	Parcel	1661 WL
E-10	Lump			Lump	Lump	Removal of 1 1/2 story frame residence.	Parcel	1663 WL
E-10	Lump			Lump	Lump	Removal of 2 story frame residence	Parcel	1667 WL
E-10	Lump			Lump	Lump	Removal of 2 1/2 story frame residence, frame garage.	Parcel	1668 WL
E-10	Lump			Lump	Lump	Removal of 1 story frame residence.	Parcel	1675 WL

Rev. 6-4-65 C.E.H.

DESCRIPTION | PLOTTED BY DATE | INKED BY DATE | CHECKED BY DATE
TOPOGRAPHY
PAVEMENT
DRAINAGE
R.O.W.
QUANTITIES

LEGEND
I. = INTERSTATE
C. = CITY (100%) (Cleveland)
CO. = COUNTY (100%)

GENERAL SUMMARY

CUYAHOGA COUNTY
CUY-71-13.68

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

12/279

SHEET NUMBER

ITEM	9	14 I.	14 C.	14 CO.	15	16 I.	16 C.	16 CO.	19	20	21	22	23	24	88 C.	89	90	91	92	93	94	95	103 C.	104 I.	104 C.	104 CO.	105	106	115	116	117	119	120 I.	120 C.	255
I-8																																1		
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I-1		107	121	104																														
I-1																																215		
I-1																																75		
I-1																																120		
I-1																																82		
I-1																																131	52	
I-1									50	110	30	30	30		30	30	60		80	70	20			20	20	20		20						
I-1										10	10	20	20	40													10							
I-1																																		
I-1										481	2635	3591	3435	2040																188				
I-1									508						273	726	544	26	378	731	122		386		10									
I-1																								112		350	128	344						
I-1									2276	3543	600																							
I-1									56																									
I-1																																743	118	
I-1																																1052	50	
I-1																																301		
I-1																																180		
I-1																																224		
I-1																																1563		
I-1																																278		
I-1																																234		
I-1																																52		
I-2																			0.5	0.5												1562		
I-5									5	11	1	2	4	4													1							
I-5									5																									
I-8																																2		
I-8																																15	6	
I-8										1																						7		
I-8																																2		
I-8																																11	3	
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I-8																																1		
I-8																																4		
I-8																																1		
I-8																																1		
E-2																																	Lump	
I-8																																	1	
I-8																																2	1	
I-8																																4		
I-8																1																2	2	
I-10																																	129	
I-10										16.7	50.5	54.8	54.0																			39		
I-10										7			22																			18		
E-2																																	350	
I-16													1																					
I-16									1						2	1	5		4	4														
S-1																																	872	
S-4																																	12765	
S-22																																	LUMP	

ITEM		SUB-TOTALS FROM SHT. 120 CODE Y060 I.	SUB-TOTALS CODE 7221 INTER-STATE	100% CITY	100% COUNTY	GRAND TOTAL	UNIT	DESCRIPTION
								TYPE CODE Y060 SANITARY SEWERS * With Compression Jts
I-8		9				9	Each	Standard No. 1 Manhole
I-8		1				1	Each	Standard No. 2 Manhole
I-8		2				2	Each	Standard No. 2 Manhole w/o Drop Pipe
I-8		1				1	Each	Standard No. 2 Manhole (Detail "A"), as per Plan
I-8		1				1	Each	Standard No. 2 Manhole (Detail "B"), as per Plan
I-8		3				3	Each	Manholes Adjusted to Grade
I-1		170				170	Lin Ft	8" Pipe, Class B-1 Sec. M-6.8 (b)*
I-1		1101				1101	Lin. Ft.	15" Pipe, Class B-1, Sec. M-6.8 (a), Encased, as per Plan
I-1		407				407	Lin. Ft.	18" Pipe, Class B-1, Sec. M-6.8 (a)*
I-1								
I-1		308				308	Lin. Ft.	15" Pipe, Class B-1, Sec. M-6.8(b) Encased Under Railroad
I-1		2338				2338	Lin. Ft.	15" Pipe, Class B-1, Sec. M-6.8 (b)*
I-1								
I-1		568				568	Lin. Ft.	42" Pipe, Class B-1, Sec. M-6.6 (c)* & Full Vitrified Liner, as per Plan
I-1		87				87	Lin. Ft.	48" Pipe, Class B-1, Sec. M-6.6 (c)* and 1/3 Vitrified Liner, as per Plan
I-1		275				275	Lin. Ft.	48" Pipe, Class B-1, Sec. M-6.6 (d)* and 1/3 Vitrified Liner, as per Plan
I-1		107		121	104	332	Lin. Ft.	6" Pipe, Class B-1, Sec. M-6.8 (a).
								TYPE CODE 7221 DRAINAGE
I-1			215			215	Lin. Ft.	15" Pipe, Class E-1.
I-1			75			75	Lin. Ft.	21" Pipe, Class E-1.
I-1			120			120	Lin. Ft.	24" Pipe, Class E-1, Sec. M-6.6 (d)
I-1			82			82	Lin. Ft.	48" Pipe, Class E-1, Sec. M-6.6 (d).
I-1			131	52		183	Lin. Ft.	12" Pipe, Class E-1
I-1			520	80	20	620	Lin. Ft.	6" Pipe, Class F-4.
I-1			110			110	Lin. Ft.	8" Pipe, Class F-4, Sec. M-6.4 (c).
I-1								
I-1			12,370			12,370	Lin Ft	6" Pipe, Class I-3.
I-1			2309	1395		3704	Lin Ft	6" Pipe, Class I-3, Sec. M-6.8 (a).
I-1			584		350	934	Lin Ft	6" Pipe, Class I-3, Sec. M-6.8 (e).
I-1			6419			6419	Lin. Ft.	6" Pipe, Class I-3, Sec. M-6.4 (h).
I-1			56			56	Lin Ft	6" Pipe, Class J-1, Sec. M-6.6 (b) or Sec. M-6.8 (b)
I-1			743	118		861	Lin Ft	12" Pipe, Class J-1.
I-1			1052	50		1102	Lin Ft	15" Pipe, Class J-1.
I-1			301			301	Lin Ft	15" Pipe, Class J-1, Sec. M-6.6 (b) or Sec. M-6.8 (b).
I-1			180			180	Lin Ft	30" Pipe, Class J-1.
I-1			224			224	Lin Ft	36" Pipe, Class J-1, Sec. M-6.6 (d).
I-1			1563			1563	Lin Ft	114" Pipe, Class J-1, Sec. M-106.6 (c) as per Plan.
I-1			278			278	Lin Ft	24" Pipe, Class A-1, Sec. M-6.6 (d)
I-1			234			234	Lin Ft	48" Pipe, Class A-1, Sec. M-6.6 (d)
I-1			52			52	Lin Ft	114" Radius Pipe, Class J-1, Sec. M-106.6 (c) as per Plan
I-2			16.62			16.62	Cu Yds.	Masonry.
I-5			28			28	Each	6" Pipe Specials, Class I-3.
I-5			5			5	Each	6" Pipe Specials, Class J-1.
I-8			2			2	Each	Standard No. 3 Catch Basin.
I-8			15	6		21	Each	Special No. 4 Catch Basin. as per plan
I-8			8			8	Each	Standard No. 5 Catch Basin.
I-8			2			2	Each	Standard No. 2-5 Catch Basin, Modified, as per Plan
I-8			11	3		14	Each	Special No. 4 Inlet as per plan
I-8			4			4	Each	Special No. 2-6 Inlet, as per plan
I-8			1			1	Each	Special No. 2-8 Inlet, as per plan
I-8			4			4	Each	Special No. 2-10 Inlet, as per plan
I-8			1			1	Each	Special No. 2-12 Inlet, as per plan
I-8			1			1	Each	Special No. 2-14 Inlet, as per plan
E-2			Lump			Lump	Lump	Cofferdams, Cribs and Sheeting
I-8				1		1	Each	Standard No. 1 Manhole.
I-8			2	1		3	Each	Standard No. 2 Manhole
I-8			4			4	Each	Special Manhole, as per plan.
I-8			2	3		5	Each	Manholes Adjusted to Grade.
I-10			129			129	Sq Yds	Crushed Aggregate Slope Protection
I-10			215			215	Cu Yds.	Dumped Rock Channel Protection.
I-10			47			47	Sq Yds.	Riprap, using 6" Reinforced Concrete Slab.
E-2			350			350	Cu Yds.	Excavation for Structures (Shale)
I-16			1			1	Each	Manholes Abandoned.
I-16			14	5		19	Each	Catch Basins Abandoned.
S-1			872			872	Cu Yds	Concrete for Structures, Class "C"
S-4			12765			12765	Lbs.	Reinforcing Steel Revised C.E.H. 1-22-65
S-22			Lump			LUMP	LUMP	Removal of Portions of Existing Structures

CHECKED DATE
PLOTTED BY DATE
DESCRIPTION
SUPERELEVATION
PAVEMENT
SHOULDERS
GUARDRAIL

LEGEND
I. = INTERSTATE
C. = CITY (100%) (Cleveland)
CO. = COUNTY (100%)

GENERAL SUMMARY

TYPE CODE 7221

CUYAHOGA COUNTY
CUY-71-13.68

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

13

ITEM	SHEET NUMBER 9	14 I.	14 C.	14 CO.	15	16 I.	16 C.	16 CO.	19	20	21	22	23	24	88 C.	89 C.	90	91	92	93	94	95	103 C.	104 I.	104 C.	104 CO.	105	106	115	116	117	119	120 I.	120 C.	259	ITEM	SUB-TOTALS FROM SHT. 120 CODE Y060 I.	SUB-TOTALS CODE 7221 INTERSTATE	100% CITY	100% COUNTY	GRAND TOTAL	UNIT	DESCRIPTION
																																										PAVEMENT
B-19					6181																								6.3	96.7				B-19		6284			6284	Cu. Yds.	Aggregate Base Course.
B-21					2389																								16	287				B-21		2692			2692	Cu. Yds.	Waterproofed Aggregate Base Course, as per Plan
Special					441																								10					Special		451			451	Cu. Yds.	Drainage Connection, Using No. 6 Aggregate.
B-35						278	149								6	16							7		2									B-35		278 (274 / 176)	180	8	458	Cu. Yds.	Asphaltic Concrete Leveling Course (70-85).
B-35																																										
B-70															33	188	60.8		25.3	41.3	6.6		3.3		40.7									B-70		134	265		399	Sq. Yds.	8" Portland Cement Concrete Base Course.
B-71						2484	1655																											B-71		2484 (2471)	1655 (1598)	40	4139	Sq. Yds.	9" Reinforced Portland Cement Concrete Base Course.
I-7																		200	200								147	147							I-7		694			694	Sq. Yds.	Reinforced Concrete Approach Slab, as per Plan (T=13").
I-11		131																												481					I-11		612	1499		612	Lin. Ft.	Sandstone Curb, as per Plan.
I-11		1412	1549																																I-11		1412	1549	50	2961	Lin. Ft.	Sandstone Curb, Re-set
I-12																								140		289	101	352		486					I-12		1079		289	1368	Lin. Ft.	Concrete Curb, Standard Type 2-A, Modified as per Plan.
I-12					720																									94					I-12		814			814	Lin. Ft.	Concrete Curb, Standard Type 6.
I-19						5191	1653	1053							468	282	180		141.6	236.4	7.2		103.2	44.4	40.8	26.4					4074					I-19		(9764.6 / 9874.0)	(2116.8 / 2073.8)	(1142.4 / 1079.4)	13027.8	Sq. Yds.	3" Insulation Course & Subbase Course.
I-21					3605	203	236	46																						227.7	566.3				I-21		4602	236	46	4884	Sq. Yds.	Portland Cement Concrete Median Pavement.
I-21																														11.2					I-21		112			112	Sq. Yds.	Portland Cement Concrete Traffic Island Pavement as per plan.
I-22					13920	360	276																							128.5	2279.5				I-22	16,660	16688	360	276	17,324	Cu. Yds.	Subbase, Grading "A" or "B" as per Plan
I-22					2345																										194			5482	I-22		8021	(3671 / 2288)		8021	Cu. Yds.	Subbase.
T-30						266	165								17.2	46.4	6.1		2.5	4.1	0.6		17.7		5.4										T-30	268.3	2793 (265.7 / 251.7)		7	531	Gals.	Bituminous Tack Coat, Sec. M-5.5, MS-2 or RS-1, or Sec. M-5.2, RC-1 or RC-2 as per Sec. T-30.02.
T-31					230																								1	27				T-31		258			258	Cu. Yds.	Bituminous Surface Treatment, No. 6 Aggregate.
T-31					7167																								24	863				T-31		8054			8054	Gals.	Bituminous Surface Treatment, Bituminous Material, as per Plan
T-35						172	100								6	16							7		2									T-35		(172 / 168)	(131 / 130)	5	303	Cu. Yds.	Asphaltic Concrete Surface Course, Type "C" (70-85).
T-70															13.2	12							49.8											T-70			75		75	Sq. Yds.	6" Portland Cement Concrete Pavement.
T-71						756																												T-71		756			756	Sq. Yds.	7" Reinforced Portland Cement Concrete Pavement
T-71																21.2	11.9		116.7	194.5			55.3	45.2		26.1								T-71		475.4	76.5	26.1	578	Sq. Yds.	8" Reinforced Portland Cement Concrete Pavement.
T-71						1679		1027																						354.7					T-71		5226		1027	6253	Sq. Yds.	9" Reinforced Portland Cement Concrete Pavement.
T-71					68,800																										11,221			T-71		80021			80,021	Sq. Yds.	10" Reinforced Portland Cement Concrete Pavement.
I-3																																			I-3		Lump / Lump	Lump / Lump	Lump / Lump	Lump / Lump	Lump	Maintaining Traffic / Construction Layout Stakes.

For Lighting Summary See Sheet No. 176
For Traffic Control Summary See Sheet No. 192
For Landscaping Summary See Sheet No. 169
For Water Works Summary See sheet No. 144

STRUCTURES OVER 20' SPAN

STRUCTURE NO.		FOR QUANTITIES SEE SHEET NO.
CUY-I-71-1352	I-71 Under Bellaire Rd.	204
CUY-I-71-1372	I-71 Under Memphis Ave.	219
CUY-I-71-1381	I-71 Under N.Y.C. P.R.	230

Rev. 6-4-65 C.E.H.

DESCRIPTION | PLOTTED BY DATE | CHECKED BY DATE | INKED BY DATE | TEU | TEMPORARY | PAVEMENT | STRUCTURES | R.O.W. | UTILITIES

CUYAHOGA COUNTY
CUY-71-13.69

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

14/279

QUANTITIES & SUB-SUMMARY

ITEM E-1 EARTHWORK

STATION	TO	STATION	EXCAVATION CU. YDS.	EMBANKMENT
MAINLINE				
797+00	~	810+00	357281	
810+00	~	820+00	162,747	16,947
820+00	~	830+00	93,799	14,580
830+00	~	840+00	13,482	207,109
840+00	~	850+00	22,613	98,931
850+00	~	857+84	8,040	134,514
857+84	~	869+00	23,293	25,980
W.B. 869+00	~	870+90	2,045	78
E.B. 869+00	~	870+80	126	4,317
From Sh. 259 N.Y.C. Track Beds (Temp. & Perm)			10,700	
BELLAIRE RD.				
11+92	~	18+22	628 *	
18+22	~	22+35	1061	56
26+85	~	34+45	13 78	
MEMPHIS AVE				
1+87	~	5+85.5	118 *	
5+85.5	~	8+75	170 *	13 *
12+20	~	14+20	1395	
EMERY - HIRST CONNECTION				
0+00	~	2+71.79	494	
INTERSTATE			699,254	502, 712
100% CITY *			746 *	
100% COUNTY *			170 *	13 *
EXCAVATION	EMBANKMENT +	12%		WASTE
709,170	563,052			137, 118

ITEM E-8 CURB REMOVAL FOR REUSE & I-11 SANDSTONE CURB RESET

		TOTAL QUANTITY CARRIED TO SUMMARY
INTERSTATE	3530'+0.40 =	1412 LIN. FT.
100% CITY	=	1549 LIN. FT.

I-11 SANDSTONE CURB		
FROM SHT. #	100% CITY	INTERSTATE
88	344	
89	790	
90		502
92		150
93		851
94		40
103	386	
104	29	
TOTALS	1549	1543
DEDUCT I-11	1549	1412
	0	131
TOTAL I-11 SANDSTONE CURB TO SUMMARY	=	131 * LIN. FT.

* INTERSTATE

SEWER TAP EXTENSIONS FROM SHEET NO. 9

I-1 PIPE 6" CL. B-1 SEC. NO 6.8 (a)

INTERSTATE	= 107 LIN. FT.
100% CITY	= 210 LIN. FT.
100% COUNTY	= 15 LIN. FT.

ITEM E-8 CURB REMOVAL

REF. NO.	STATION	TO	STATION	SIDE	100% CITY LIN. FT.	I-71-5 (17) 246 LIN. FT.
	MAINLINE					
1CR	CUL DE SAC					230
2CR	801+97	~	804+71	LT&RT		745
3CR	795+80	~	799+60	LT		560
4CR	805+23	~	808+65	LT&RT		695
	BELLAIRE RD.					
1CR	12+17	~	17+80	LT	618	
2CR	12+55	~	14+97	RT	289	
3CR	15+22	~	17+67	RT	292	
4CR	18+20	~	22+55	LT		501
5CR	18+25	~	20+87	RT		347
6CR	19+82	~	20+02	LT		35
7CR	21+13	~	25+35	RT		462
8CR	22+84	~	27+33	LT		503
9CR	25+62	~	28+55	RT		341
10CR	27+58	~	34+20	LT		694
11CR	28+65	~	32+39	RT		446
12CR	32+57	~	34+05	RT		201
	TOTAL BELLAIRE					3530
	MEMPHIS AVE.					
1CR	2+07	~	4+14.5	LT	207	
2CR	2+07	~	4+14.5	RT	207	
3CR	5+85.5	~	9+74	LT		251
4CR	5+85.5	~	9+66	RT	145 *	239
5CR	10+05	~	14+20	LT	145 *	415
6CR	10+09	~	14+20	RT		411
	DEDUCT REMOVED & RESET				1549	1412
	INTERSTATE					5664
	100% CITY				64	
	100% COUNTY *				290	

ITEM E-8 PAVEMENT REMOVAL

REF. NO.	STATION	TO	STATION	SIDE	100% CITY SQ. YDS.	I-71-5 (17) 246 SQ. YDS.
	MAINLINE					
1R	CUL DE SAC			LT		72
2R	801+00	~	801+40	LT		79
3R	798+50	~	800+15	LT		184
4R	797+00			℄		97
5R	796+20	~	797+00	RT		62
8R	808+75	~	809+20	LT		84
6R	801+78	~	802+45	RT		73
7R	802+09	~	804+54	LT&RT		1236
	BELLAIRE RD.					
1R	13+00	~	13+08	RT	16	
2R	14+23	~	14+31	LT	18	
3R	16+81	~	17+09	RT	88	
4R	18+70	~	19+00	RT		98
5R	19+09	~	19+21	LT		12
6R	19+84	~	20+16	RT		96
7R	20+01	~	20+35	LT		129
8R	20+71	~	20+91	LT		46
9R	21+74	~	21+87	RT		49
10R	20+50	~	29+25	LT&RT		4574
11R	22+91	~	23+07	RT		57
12R	23+47	~	23+64	RT		90
13R	24+80	~	24+95	RT		40
14R	26+21	~	26+32	LT		29
15R	28+03	~	28+29	LT		71
16R	28+30	~	28+45	RT		14
17R	29+13	~	29+67	LT		158
18R	28+62	~	28+91	RT		33
19R	28+63	~	28+98	RT		100
20R	29+87	~	30+06	RT		73
21R	30+70	~	30+80	LT		35
22R	31+09	~	31+33	LT		71
	MEMPHIS AVE.					
1R	2+42	~	2+60	LT	32	
2R	3+32	~	3+58	LT	40	
3R	2+49	~	2+58	LT	17	
4R	2+97	~	3+14	RT	30	
5R	7+46	~	7+58	RT		31
6R	8+22	~	8+90	LT		72
7R	8+94	~	9+46	LT		17
8R	8+05	~	8+35	RT		26
9R	8+50	~	14+20	℄		2752
2AR	4+02	~	4+49	LT	26	
10R	5+85	~	8+49		1035 *	738
	EMERY - HIRST CONNECTION					
1R	0+00	~	0+12	LT&RT		
2R	2+59	~	2+72	LT&RT		90
						90
	INTERSTATE					11,478
	100% CITY				267	
	100% COUNTY *				1035	

ITEM E-8 SIDEWALK REMOVAL

REF. NO.	STATION	TO	STATION	SIDE	100% CITY SQ. FT.	I-71-5 (17) 246 SQ. FT.
	MAINLINE					
1SR	CUL DE SAC			LT		456
2SR	802+53	~	805+00	LT&RT		1600
3SR	801+80	~	803+87	LT&RT		1788
4SR	795+80	~	799+60	LT&RT		3800
5SR	795+80	~	797+60	RT		810
6SR	805+47	~	808+22	LT&RT		1670
7SR	806+15	~	808+57	LT&RT		1250
	BELLAIRE RD.					
1SR	14+71	~	14+97	RT	263	
2SR	15+22	~	15+50	RT	686	
3SR	17+41	~	17+75	LT	475	
4SR	17+23	~	17+66	RT	526	
5SR	18+25	~	19+20	RT		728
6SR	19+82	~	22+26	LT		869
7SR	20+81	~	20+87	RT		420
8SR	21+13	~	24+80	RT		1339
9SR	23+14	~	23+46	LT		310
10SR	25+17	~	25+71	RT		324
11SR	24+95	~	25+36	RT		205
12SR	25+93	~	26+21	LT		168
13SR	25+62	~	28+11	RT		1476
14SR	26+32	~	27+33	LT		500
15SR	27+58	~	27+68	LT		46
16SR	28+50	~	28+85	RT		180
17SR	29+85	~	30+24	LT		252
18SR	30+04	~	30+21	RT		102
19SR	31+88	~	32+00	LT		48
20SR	32+49	~	32+55	LT		54
21SR	32+85	~	32+89	RT		69
22SR	32+44	~	33+54	RT		84
	MEMPHIS AVE					
1SR	2+07	~	2+42	LT	175	
2SR	2+62	~	3+32	LT	350	
3SR	2+07	~	2+59	RT	287	
4SR	3+60	~	4+14.5	LT	573	
5SR	3+15	~	4+14.5	RT	510	
6SR	5+85.5	~	7+45	LT	648 *	68
7SR	5+29	~	7+46	RT	938 *	72
8SR	7+58	~	8+06	RT		216
9SR	8+33	~	9+66	RT		665
10SR	10+09	~	11+15	LT		636
11SR	10+10	~	13+93	RT		1748
12SR	11+25	~	12+86	LT		1156
13SR	13+15	~	13+96	LT		648
	EMERY - HIRST CONNECTION					
1SR	0+18	~	0+23	LT&RT		200
2SR	2+47	~	2+53	LT&RT		200
	INTERSTATE					24,157
	100% CITY			3370	→ 3,845	
	100% COUNTY *			2061	→ 1,586	

100% County

ITEM E-1 COMPACTED SUBGRADE

		INTERSTATE SQ. YDS.	100% CITY SQ. YDS.	100% COUNTY SQ. YDS.
MAINLINE		118,959		
BELLAIRE RD.		1,650	983	
MEMPHIS AVE.		1,723	928	1048
EMERY-HIRST		756		
CUL DE SAC		407		
TOTALS	INTERSTATE	123,495		
	100% CITY		1911	
	100% COUNTY			1048

ITEM E-11 WATER

ITEM		CU. YDS. @ 5 GAL.	M GALS.
EMBANKMENT + 12%	INT.	563,052	2815
	100% CITY	0	0
	100% COUNTY	15	0
COMPACTED SUBGRADE	INT.	123,495	205
	100% CITY	1,911	32
	100% COUNTY	1,048	0
B-19	INT.	6,946	35
I-22	INT.	25,345	127
	100% CITY	276	1.4
INTERSTATE			3182
100% CITY			5
100% COUNTY			

ITEM L-9 SEEDING & PROTECTING

ITEM			SQ. YDS.
MAINLINE GROSS AREA			283,000
DEDUCTS			
PAVED AREAS	92,895		
SODDING	266		
JUTE MATTING	1,879		
DUMPED ROCK	142		
RIP RAP @ STR'S.	25		
LANDSCAPING	54,223		
TOTAL DEDUCTS			149,430
	CITY	COUNTY	INTERSTATE
MAINLINE NET AREA			133,570
BELLAIRE RD.	1105		2494
MEMPHIS AVE.	104	201	66
TOTAL	1209	201	136,130

ITEM L-9 COMMERCIAL FERTILIZER

Interstate	136,511 x .00009 =	12.28 Tons
City	1209 x .00009 =	0.11 Ton
County	201 x .00009 =	0.02 Ton

ITEM L-9 AGRICULTURAL LIMING MATERIAL

Interstate	136,511 x .00045 =	61.43 Tons
City	1,209 x .00045 =	0.54 Ton
County	201 x .00045 =	0.09 Ton

CE-101.04 PROOF ROLLING

NW 118,959 S.Y. @ 1Hr/2000 S.Y. = 60 Hrs.

ITEM SPECIAL - MOWING

Interstate (136,511 x 2) ÷ 4840 = 56.4 Ac.
100% City (1209 x 2) ÷ 4840 = .5 Ac.
100% County (201 x 2) ÷ 4840 = .1 Ac.

Rev. 6-4-65 C.E.H.

DESCRIPTION | PLOTTED BY DATE | INKED BY DATE | CHECKED BY DATE
TOPOGRAPHY
RIGHT-OF-WAY
BRIDGE
R. R.
QUANTITIES

CALCULATION SHEET

CUYAHOGA COUNTY
CUY-71-13.68

* NORMAL STATIONS EXTENDED 350' INTO CURVE STATIONS

MAINLINE PAVEMENT QUANTITIES ~

FULL WIDTH TYPICAL SECTION (FOR CALCULATION PURPOSES) *

NORMAL ~ STA. 805+50 TO STA. 817+50 = 1200.00
STA. 830+25 TO STA. 843+00 = 1275.00 TOTAL NORMAL = 2475.00 LIN.FT.

SUPER ~ STA. 817+50 TO STA. 830+25 = 1275.00
STA. 843+00 TO STA. 855+51.16 = 1251.16 TOTAL SUPER = 2526.16 LIN.FT.

LINE "EB" & LINE "WB" TYPICAL SECTIONS (FOR CALCULATION PURPOSES)

NORMAL ~ STA. 862+00 TO STA. 870+00 LINE "EB" = 800.00
STA. 859+50 TO STA. 870+00 LINE "WB" = 1050.00 TOTAL NORMAL = 1850.00 LIN.FT.

SUPER ~ STA. 855+51.16 TO STA. 862+00 LINE "EB" = 648.84
STA. 855+51.16 TO STA. 859+50 LINE "WB" = 398.84 TOTAL SUPER = 1047.68 LIN.FT.

T-71 10" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT

NORMAL & SUPER ~ 96' X 5001.16' X 1/9 = 53,345.71
LINE "EB" & LINE "WB" ~ 48' X 2897.68 X 1/9 = 15,454.29
68,800.00

UNIT: SQ.YDS | TOTAL QUANTITIES: 68,800

T-31 BITUMINOUS MATERIAL

NORMAL & SUPER ~ 40' X 5001.16' X 1/9 X 0.25 = 5556.84
LINE "EB" & LINE "WB" ~ 20' X 2897.68 X 1/9 X 0.25 = 1609.82
7166.66

UNIT: GALS. | TOTAL QUANTITIES: 7,167

№ 6 AGGREGATE

NORMAL & SUPER ~ 40' X 5001.16 X 1/9 X .008 = 177.82
LINE "EB" & LINE "W.B" ~ 20' X 2897.68 X 1/9 X .008 = 51.51
229.33

UNIT: CU.YDS. | TOTAL QUANITIES: 230

B-21

NORMAL & SUPER ~ 40' X 5001.16 X 0.25 X 1/27 = 1852.28
LINE "EB" & LINE "WB" ~ 20' X 2897.68 X 0.25 X 1/27 = 536.61
2388.89

UNIT: CU.YDS. | TOTAL QUANITIES: 2389

B-19 FROM STA. 805+00 TO STA. 855+51.16

NORMAL { SHLD'R. END AREA = 2 X [7/12 X 7.5] + [(5+7)/2(12) X 2.5] = 11.250 □'
MEDIAN END AREA = 7/12 X 26 = 15.167 □'
26.417 □'

26.417 □' X 2475.00 X 1/27 = 2421.56

SUPER { SHLD'R. END AREA = 5.625 □' + 7/12 X 10 = 11.458 □'
MEDIAN END AREA = 7/12 X 26 = 15.167 □'
26.625 □' X 2526.16 X 1/27 = 2491.07

LINE "EB" & LINE "WB"

NORMAL = 11.250 □' X 1850.00' X 1/27 = 770.83
SUPER = 11.458 □' X 1047.68' X 1/27 = 444.60

STA. 855+51.16 TO STA. 858+55 (VARIABLE CONCRETE MEDIAN)

303.84 X (6'+10')/2 X 7/12 X 1/27 = 52.52
6,180.58

UNIT: CU.YDS. | TOTAL QUANITIES: 6181

I-12 STANDARD TYPE G CURB

LINE "EB" STA. 858+52 TO STA. 862+12 = 360
LINE "WB" STA. 858+52 TO STA. 862+12 = 360
720

UNIT: LIN.FT. | TOTAL QUANITIES: 720

I-21 MEDIAN PAVEMENT

STA. 805+50 TO STA. 855+51.16 = 5001.16' X 6' X 1/9 = 3,334.11
STA. 855+51.16 TO STA. 858+55 = 303.84' X (6'+10')/2 X 1/9 = 270.08
3,604.19

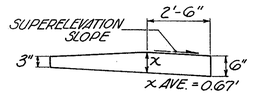
UNIT: SQ.YDS. | TOTAL QUANITIES: 3605

ITEM SPECIAL, DRAINAGE CONNECTION

END AREA = 1.5((4+6)/2(12)) + (0.5)(1) = 1.125
TOTAL LIN.FT. UNDERDRAIN = 10,576.16
№ 6 AGGREGATE = (10,576.16)(1.125) X 1/27 = 440.67

UNIT: CU.YDS. | TOTAL QUANITIES: 441

I-22 SUBBASE *GRADING "A" OR "B" AS PER PLAN



X1 = (.047)(2.5) = 0.12
X2 = (.083)(2.5) = 0.21
X AVE = 0.33/2 + 0.5 = 0.67

SUPER { (HIGH SIDE) SHLD'R. END AREA = ((0.50+0.67)/2) 2.5 + ((0.25+0.67)/2) 7.5 = 4.91 □'
(LOW SIDE) " " " = [(6+3)/2(12) X 10] = 3.75 □'

* PAVEMENT & MEDIAN END AREA = 122' X 6/12 = 61.00 □'

* VOL. = 61.00 □' X 2526.16 X 1/27 = *5707.25
VOL. = 68.66 □' X 2526.16 X 1/27 = 810.24

NORMAL SHLD'R. END AREA = [2 X (6+3)/2(12) X 10] = 7.50

* PAVEMENT & MEDIAN END AREA = 122' X 6/12 = 61.00 □' *

VOL. = 7.50 □' X 2475.00' X 1/27 = 687.50
* VOL. = 61.00 X 2475.00 □' X 1/27 = 5591.67 *

LINE "EB" & LINE "WB"

NORMAL ~ VOL = 7.50 □' X 1850.00 X 1/27 = 513.89
SUPER ~ (4.91 □' + 3.75 □') = 8.66 □' VOL. = 8.66 □' X 1047.68 □' X 1/27 = 336.03
48' PAVEMENT (1850.00 + 1047.68) X 48' X 6/12 X 1/27 = 2,575.71 *

STA. 855+51.16 TO 858+55

VOL. = 303.84' X (6'+10')/2 X 6/12 X 1/27 = 45.01 *
13,919.64 *
2,347.60

UNIT: CU.YDS. | TOTAL QUANITIES: 13,920 * / 2,345

CALCULATION SHEET
(SIDE STREETS)

See Sheet No. 104 for participation limits as revised 6-4-65

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

16/279

CUYAHOGA COUNTY
CUY-71-13.68

* FOR QUANTITIES ~ STA. 20+50 TO STA. 29+25 SEE SHEET NO. 117

W. 117th ST.

			UNIT	SUB TOTAL
	STA. 1+87 TO STA. 5+85.50	100% County		100% CITY
T-35	Ⓒ 16,370 ▫' X 0.104167 X 1/27 = 63.6	.5	CU.YDS.	63 58
B-35	BASE ~ Ⓒ 16,370 ▫' X 0.104167 X 1/27 = 63.6	.5	CU.YDS.	63 58
I-22 ‡	Ⓐ 5176 ▫' X 0.5 X 1/27 = 95.85	12 ‡	CU.YDS.	96 ‡ 84
B-35	PRELEVING Ⓑ 11,094 ▫' X 0.12 X 1/27 = 49.30	3	CU.YDS.	49 46
B-71 9"	Ⓐ 5176 ▫' X 1/9 = 575.11	70	SQ.YDS.	575 505
T-30	Ⓐ 5176 ▫' X 1/9 X 0.10 GAL./SQ.YD. = 57.51	7	GALS.	57 50
I-19	Ⓐ 5176 ▫' X 1/9 X 3/36 = 47.92	70	SQ.YDS.	575 505
I-21	STA. 2+87 TO STA. 4+38 151' X 4' + 2(π/2 X 2²) = 616.6 X 1/9 = 68.84		SQ.YDS.	68

MEMPHIS AVE.

			UNIT	SUB TOTAL
	STA. 5+~~85.50~~ 50 TO STA. 7+30			100% COUNTY
T-71 9"	Ⓓ 9243 ▫' X 1/9 = 1027.00		SQ.YDS	1027
I-21	STA. 5+60 TO STA. 6+60 ~ 100' X 4' + 2(2π) X 1/9 = 45.8		SQ.YDS.	46
I-19	9292 ▫' ÷ 9 = 1032.44		SQ.YDS.	1033
	STA. 7+30 TO STA. 14+20			INTERSTATE
T-71 9"	15,080 ▫' X 1/9 = 1675.56		SQ.YDS.	1676
I-19	17680 ▫' ÷ 9 = 1964.44		CU.YDS.	1965

BELLAIRE RD.

		UNIT	SUB TOTAL	GRAND TOTAL
	STA. 12+17 TO STA. 18+~~22~~ 28			100% CITY
T-35	Ⓓ ~~9718~~ 10,738 ▫' X 0.104167 X 1/27 = 37.49	CU.YDS.	41 37	104 100
B-35	BASE ~ Ⓓ ~~9718~~ 10,738 ▫' X 0.104167 X 1/27 = 37.49	CU.YDS	41 37	104 100
I-22	Ⓓ ~~9718~~ 10,738 ▫' X 0.5' X 1/27 = 179.96 ‡	CU.YDS.	~~180~~ 177	~~270~~ ‡ 295
		CU.YDS.		49
B-71 9"	Ⓓ ~~9718~~ 10,738 ▫' X 1/9 = 1079.78	SQ.YDS.	1080 1193	~~1655~~ 1768
T-30	Ⓓ 9718 ▫' X 1/9 X 0.1 GAL/SQ.YD = 107.98	GALS.	~~108~~ 119	~~165~~ 176
I-19	Ⓓ 9718 ▫' X 1/9 = 1079.78	SQ.YDS.	1080 1193	~~1655~~ 1768
I-21	STA. 15+55 TO STA. 17+37 182' X 4' + 2(π/2 X 2²) = (728 ▫' + 12.56) X 1/9 = 82.36 STA. 13+52 TO STA. 14+64.50 112.5 X ((4+9)/2) + (2π + 45²π/2) = (731 ▫' + 38 ▫') X 1/9 = 85.44	SQ.YDS.	168	230
	STA. 18+~~22~~ 28 TO STA. 34+24 *		INTERSTATE SUB-TOTAL	INTERSTATE TOTAL
T-35	Ⓖ 38,485 ▫' X 0.104167 X 1/27 = 151.43 CONFORM 0.21 X 38 X 4 X 1/27 = 1.18 152.61	CU.YDS.	153	172
B-35	BASE Ⓖ 38,485 X 0.104167 X 1/27 = 151.43	CU.YDS.	~~151~~ 152	~~168~~ 165
B-35	PRELEVELING Ⓕ 19,029 ▫' X 0.16 X 1/27 = 112.76	CU.YDS.	#3 149	#3 161
B-71 9"	Ⓔ 18,690 ▫' X 1/9 = 2077	SQ.FT.	~~2077~~ 1964	~~2484~~ 2371
T-30	Ⓔ 18,690 ▫' X 1/9 X 0.1 GAL/SQ.YD. = 208	GALS.	208 127	~~260~~ 255
I-19	Ⓔ 18,690 ▫' X 1/9 = 2076.66	CU.YDS.	~~2077~~ 1964	~~5181~~ 5013
I-21	STA. 29+25 TO STA. 29+95.77 ~ 70.77 X 15 = 1062 ▫' STA. 29+95.77 TO STA. 30+90 ~ 94.23' X ((15+4)/2) 895 STA. 18+52 TO STA. 20+50 ~ [(192' X 4') + 2π] X 1/9 = 774 } 2731 X 1/9 =	SQ.YDS.	203	203

EMERY - HIRST CONNECTION

		UNIT	TOTAL QUANTITIES
T-71 7"		⊗ SUB TOTALS	
	245.79' X 23' X 1/9 = 628.13		
	FILLETS 4 (20² - 1/4 π 20²)		
	400 (4 - π) X 1/9 = 38.22		
	62 X 13 X 1/9 = 89.55		
	755.90	SQ.YDS.	756
I-19			
	755.90	SQ.YDS.	756
I-13	468' X 4.5' = 2106	SQ.FT.	2106

W. 118th ST. CUL-DE-SAC. SEE SHEET NO. 135

	UNIT	TOTAL QUANTITIES
B-71 9"		
393 S.Y. + 14 S.Y. = 407	SQ.YDS.	407 ⊗
B-35		
393 S.Y. X 0.104167' X 1/3 = 13.64	CU.YDS.	14 ⊗
I-19		
393 S.Y.	CU.YDS.	393 ⊗
T-35		
(407 S.Y. X 0.104167') X 1/3 = 14.13		
FEATHERING 168 S.Y. X 0. 8333 X 1/3 = 4.67		
18.80	CU.YDS.	19 ⊗
T-30		
(407 S.Y. + 168 S.Y.) X 0.10 = 57.5	GALS.	58 ⊗

BELLAIRE RD.

		UNIT	INTERSTATE TOTAL QUANTITIES
I-22 ‡	STA. 18+~~22~~ 28 TO STA. 34+25		
	9718 ▫' X 1.00' X 1/27 = 359.93	CU.YDS.	~~360~~ ‡ 341
	‡ Grading "A" or "B" as per Plan		

PAVEMENT AREAS ~ MEMPHIS AVE. ~~(100% CITY)~~

STA. 1+87 TO STA. 5+85.50

BASE WIDENING AREAS

			REF. NO.
TAPERS STA. 2+07 TO STA. 2+87 LT. & RT. ~ 2X(80' X 2 AVE.)	= 320	100% CITY	
STA. 2+87 TO STA. 4+14.46 LT. & RT. ~ 2X(127.46' X 4')	= 1020		
FILLET AREAS @ MEMPHIS INTERSECTION, N.	= 1548		
BETWEEN PROPOSED RADIUS RETURNS E.	= 2288	(A)	
ON BELLAIRE S.	= 1696	INTERSTATE *	
W.	= 1424		

NOTE: 100% CITY RESURFACING AREA IN INTERSECTION ONLY

PRELEVELING AREA (ON EXISTING PAVEMENT)

				REF. NO.
4+15 TO 4+81 ~ 66' X 40'	= 2640			
5+19 TO 5+86 ~ 67' X 58'	= 3886			
17+12 TO 18+22 (BELLAIRE) ~ 110' X 38'	= 4180			
2 FILLETS @ 194 ▫'	= 388 ▫'	County 630	City 9,674	(D)
	10,094 ▫'			

RESURFACING AREA

			REF. NO.
11,094 ▫' + 5176	1,420 = ~~16,370~~ ▫'	15,740	(C)

100% COUNTY

STA. 5+85.50 TO STA. 7+30

		REF. NO.
5+85.50 TO STA. 6+60 ~ 74.5' X 33' X 2 = 4917		
6+60 TO 7+30 ~ 70' X ((33+29.5)/2) X 2	= 4375	
	9292	
DEDUCT I-21	46	
	9246	

INTERSTATE ~ STA. 7+30 TO STA. 14+20

		REF. NO.
7+30 TO 8+00 ~ 70' X ((29.5+26)/2) X 2	= 3885	
8+00 TO 8+49.35 ~ 49.35 X 52	= 2566	
12+43.78 TO 13+20 ~ 76.22 X 52	= 3963	
LT. 13+20 TO 14+20 ~ 100' X ((26 X 16)/2)	= 2100	(D)
RT. 13+20 TO 14+20 ~ 100 X 26'	= 2600	
TOTAL	= 15,114	(C)

PAVEMENT AREAS ~ BELLAIRE RD. 100% CITY

STA. 12+17 TO STA. 17+12

BASE WIDENING AREAS

		REF. NO.
STA. 12+17 TO STA. 17+12.04 LT. ~ ((0+16.5)/2) X 495.04	= 4084	
STA. 12+81.34 TO STA. 14+64.5 RT. ~ ((4.29+16.5)/2) X 183.16	= 1904	
FILLET AREA @ HIGHLAND ST.	= 136	
FILLET AREA @ W. 116th ST. (N.E.)	= 508	
FILLET AREA @ W. 116th ST. (N.W.)	= 368	
STA. 15+47.22 TO STA. 17+11.96 ~ 164.74 X 16.5	= 2718	
TOTAL	9718	(D)

INTERSTATE

STA. 18+22 TO STA. 34+25
FOR QUANTITIES STA. 20+50 TO STA. 29+25 SEE SHT. # 117

BASE WIDENING AREAS

		REF. NO.
STA. 18+77.96 TO STA. 20+50 LT. & RT. ~ 2X(172.04 X 16.5)	= 5677.32	
STA. 29+25 TO STA. 31+72.5 LT. ~ 247.5 X 16.5	= 4083.75	
TAPER STA. 31+72.5 TO STA. 34+20 LT. ~ 247.5 X 825 (AVE.)	= 2041.88	
STA. 29+25 TO STA. 31+68.48 RT. ~ 243.48 X ((16.5+838)/2)	= 3028.89	
FILLETS EMERY AVE. ~ (50 ▫' + 332 ▫')	= 382.00	
TAPER STA. 32+73.8 TO STA. 34+20 RT. ~ 146.2 X ((0+48.7)/2)	= 356.00	
* 2 FILLETS @ MEMPHIS AVE.	3120.00	(E)
	18,690.00	

PRELEVELING AREAS

		REF. NO.
STA. 29+25 TO STA. 34+20 ~ 495' X 38'	= 18,810	
EMERY AVE. ~ 26' X 82'	= 2,132	
FILLET AREAS (50 ▫' + 780 ▫')	= 830	
	21,772	
DEDUCT I-21	2743	
	19,029	(F)

RESURFACING AREA

	REF. NO.
18,690 ▫' + 19,795 ▫' = 38,485	(G)

Rev. 6-4-65 C.E.H.

DESCRIPTION | PLOTTED (BY, DATE) | INKED (BY, DATE) | CHECKED (BY, DATE)
TOPOGRAPHY
PAVEMENT
DRAINAGE
R/W
QUANTITIES
REF. 116+66

SUPERELEVATION TABLES

CUYAHOGA COUNTY
CUY-71-13.68

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

17/279

WEST BOUND LANES			STATION	PROFILE GRADE	EAST BOUND LANES		
LT. EDGE	24' LT.	RT. EDGE			LT. EDGE	24' RT.	RT. EDGE
P.I.c. STATION 823+87.56							
Dc= 2° 00' 00"				MAXIMUM SUPERELEVATION = .047			
733.46	733.83	733.46	814+00.00	733.46	733.46	733.83	733.46
733.68	734.05	733.74	814+25.00	733.74	733.74	734.11	733.80
733.90	734.27	734.02	814+50.00	734.02	734.02	734.39	734.14
734.11	734.49	734.30	814+75.00	734.30	734.30	734.67	734.49
734.33	734.70	734.58	815+00.00	734.58	734.58	734.95	734.83
734.55	734.92	734.86	815+25.00	734.86	734.86	735.23	735.17
734.77	735.14	735.14	815+50.00	735.14	735.14	735.51	735.51
734.92	735.30	735.42	815+75.00	735.42	735.42	735.79	735.92
735.08	735.45	735.70	816+00.00	735.70	735.70	736.07	736.32
735.23	735.61	735.98	816+25.00	735.98	735.98	736.35	736.73
735.38	735.82	736.26	816+50.00	736.26	736.26	736.70	737.14
735.52	736.03	736.54	816+75.00	736.54	736.54	737.05	737.56
735.67	736.24	736.82	817+00.00	736.82	736.82	737.40	737.97
735.81	736.46	737.10	817+25.00	737.10	737.10	737.74	738.39
735.96	736.67	737.38	817+50.00	737.38	737.38	738.09	738.80
736.10	736.88	737.66	817+75.00	737.66	737.66	738.44	739.22
736.25	737.09	737.94	818+00.00	737.94	737.94	738.79	739.63
736.39	737.30	738.22	818+25.00	738.22	738.22	739.14	740.05
736.53	737.52	738.50	818+50.00	738.50	738.50	739.48	740.47
736.59	737.60	738.61	818+59.40	738.61	738.61	739.62	740.63
736.67	737.73	738.78	818+75.00	738.78	738.80	739.85	740.91
736.81	737.93	739.06	819+00.00	739.06	739.11	740.24	741.37
737.09	738.21	739.34	819+25.00	739.34	739.39	740.52	741.65
737.37	738.49	739.62	819+50.00	739.62	739.67	740.80	741.93
737.65	738.77	739.90	819+75.00	739.90	739.95	741.08	742.21
737.93	739.05	740.18	820+00.00	740.18	740.23	741.36	742.49
738.21	739.33	740.46	820+25.00	740.46	740.51	741.64	742.77
738.49	739.61	740.74	820+50.00	740.74	740.79	741.92	743.05
738.77	739.89	741.02	820+75.00	741.02	741.07	742.20	743.33
739.05	740.17	741.30	821+00.00	741.30	741.35	742.48	743.61
739.33	740.45	741.58	821+25.00	741.58	741.63	742.76	743.89
739.61	740.73	741.86	821+50.00	741.86	741.91	743.04	744.17
739.89	741.01	742.14	821+75.00	742.14	742.19	743.32	744.45
740.17	741.29	742.42	822+00.00	742.42	742.47	743.60	744.73
740.45	741.57	742.70	822+25.00	742.70	742.75	743.88	745.01
740.73	741.85	742.98	822+50.00	742.98	743.03	744.16	745.29
741.01	742.13	743.26	822+75.00	743.26	743.31	744.44	745.57
741.29	742.41	743.54	823+00.00	743.54	743.59	744.72	745.85
741.57	742.69	743.82	823+25.00	743.82	743.87	745.00	746.13
741.85	742.97	744.10	823+50.00	744.10	744.15	745.28	746.41
742.13	743.25	744.38	823+75.00	744.38	744.43	745.56	746.69
742.41	743.53	744.66	824+00.00	744.66	744.71	745.84	746.97
742.69	743.81	744.94	824+25.00	744.94	744.99	746.12	747.25
742.97	744.09	745.22	824+50.00	745.22	745.27	746.40	747.53
743.25	744.37	745.50	824+75.00	745.50	745.55	746.68	747.81
743.53	744.65	745.78	825+00.00	745.78	745.83	746.96	748.09
743.81	744.93	746.06	825+25.00	746.06	746.11	747.24	748.37
744.09	745.21	746.34	825+50.00	746.34	746.39	747.52	748.65
744.37	745.49	746.62	825+75.00	746.62	746.67	747.80	748.93
744.65	745.77	746.90	826+00.00	746.90	746.95	748.08	749.21
744.92	746.04	747.17	826+25.00	747.17	747.22	748.35	749.48
745.18	746.30	747.43	826+50.00	747.43	747.48	748.61	749.74
745.42	746.54	747.67	826+75.00	747.67	747.72	748.85	749.98

WEST BOUND LANES			STATION	PROFILE GRADE	EAST BOUND LANES		
LT. EDGE	24' LT.	RT. EDGE			LT. EDGE	24' RT.	RT. EDGE
745.65	746.77	747.90	827+00.00	747.90	747.95	749.08	750.21
745.87	746.99	748.12	827+25.00	748.12	748.17	749.30	750.43
746.07	747.19	748.32	827+50.00	748.32	748.37	749.50	750.63
746.25	747.37	748.50	827+75.00	748.50	748.55	749.68	750.81
746.43	747.55	748.68	828+00.00	748.68	748.73	749.86	750.99
746.58	747.70	748.83	828+25.00	748.83	748.88	750.01	751.14
746.73	747.85	748.98	828+50.00	748.98	749.03	750.16	751.29
746.85	747.97	749.10	828+75.00	749.10	749.15	750.28	751.41
747.11	748.17	749.22	829+00.00	749.22	749.24	750.29	751.35
747.25	748.26	749.27	829+15.60	749.27	749.27	750.28	751.29
747.34	748.33	749.31	829+25.00	749.31	749.31	750.29	751.28
747.57	748.48	749.40	829+50.00	749.40	749.40	750.32	751.23
747.78	748.62	749.47	829+75.00	749.47	749.47	750.32	751.16
747.96	748.74	749.52	830+00.00	749.52	749.52	750.30	751.08
748.14	748.85	749.56	830+25.00	749.56	749.56	750.27	750.98
748.30	748.95	749.59	830+50.00	749.59	749.59	750.23	750.88
748.45	749.02	749.60	830+75.00	749.60	749.60	750.18	750.75
748.58	749.09	749.60	831+00.00	749.60	749.60	750.11	750.62
748.70	749.14	749.58	831+25.00	749.58	749.58	750.02	750.46
748.80	749.18	749.55	831+50.00	749.55	749.55	749.92	750.30
748.88	749.25	749.50	831+75.00	749.50	749.50	749.87	750.12
748.94	749.32	749.44	832+00.00	749.44	749.44	749.81	749.94
749.00	749.37	749.37	832+25.00	749.37	749.37	749.74	749.74
748.97	749.34	749.28	832+50.00	749.28	749.28	749.65	749.59
748.92	749.29	749.17	832+75.00	749.17	749.17	749.54	749.42
748.87	749.25	749.06	833+00.00	749.06	749.06	749.43	749.25
748.80	749.17	748.92	833+25.00	748.92	748.92	749.29	749.04
748.72	749.09	748.78	833+50.00	748.78	748.78	749.15	748.84
748.61	748.98	748.61	833+75.00	748.61	748.61	748.98	748.61
P.I.c. STATION 852+55.53							
Dc= 3° 30' 00"				MAXIMUM SUPERELEVATION = .083			
742.30	742.67	742.30	839+50.00	742.30	742.30	742.67	742.30
742.06	742.37	742.00	839+75.00	742.00	742.00	742.31	741.94
741.82	742.07	741.70	840+00.00	741.70	741.70	741.95	741.58
741.59	741.77	741.40	840+25.00	741.40	741.40	741.59	741.21
741.35	741.47	741.10	840+50.00	741.10	741.10	741.22	740.85
741.11	741.17	740.80	840+75.00	740.80	740.80	740.86	740.49
740.87	740.87	740.50	841+00.00	740.50	740.50	740.50	740.13
740.70	740.57	740.20	841+25.00	740.20	740.20	740.08	739.70
740.52	740.27	739.90	841+50.00	739.90	739.90	739.65	739.28
740.35	739.97	739.60	841+75.00	739.60	739.60	739.23	738.85
740.21	739.75	739.30	842+00.00	739.30	739.30	738.85	738.39
740.07	739.53	739.00	842+25.00	739.00	739.00	738.47	737.93
739.92	739.31	738.70	842+50.00	738.70	738.70	738.09	737.48
739.78	739.09	738.40	842+75.00	738.40	738.40	737.71	737.02
739.64	738.87	738.10	843+00.00	738.10	738.10	737.33	736.56
739.50	738.65	737.80	843+25.00	737.80	737.80	736.95	736.10
739.36	738.43	737.50	843+50.00	737.50	737.50	736.57	735.64
739.22	738.21	737.20	843+75.00	737.20	737.20	736.19	735.18
739.10	738.02	736.93	844+00.00	736.90	736.90	735.82	734.73
738.98	737.82	736.66	844+25.00	736.60	736.60	735.44	734.28
738.86	737.63	736.39	844+50.00	736.30	736.30	735.06	733.83
738.75	737.44	736.13	844+75.00	736.00	736.00	734.69	733.38

WEST BOUND LANES			STATION	PROFILE GRADE	EAST BOUND LANES		
LT. EDGE	24' LT.	RT. EDGE			LT. EDGE	24' RT.	RT. EDGE
738.63	737.24	735.86	845+00.00	735.70	735.70	734.31	732.93
738.51	737.05	735.59	845+25.00	735.40	735.40	733.94	732.47
738.40	736.86	735.32	845+50.00	735.10	735.10	733.56	732.02
738.28	736.67	735.05	845+75.00	734.80	734.80	733.18	731.57
738.16	736.47	734.78	846+00.00	734.50	734.50	732.81	731.12
738.05	736.28	734.52	846+25.00	734.20	734.20	732.43	730.67
737.93	736.09	734.25	846+50.00	733.90	733.90	732.06	730.21
737.81	735.89	733.98	846+75.00	733.60	733.60	731.68	729.76
737.69	735.70	733.71	847+00.00	733.30	733.30	731.30	729.31
737.39	735.40	733.41	847+25.00	733.00	733.00	731.00	729.01
737.09	735.10	733.11	847+50.00	732.70	732.70	730.70	728.71
736.79	734.80	732.81	847+75.00	732.40	732.40	730.40	728.41
736.49	734.50	732.51	848+00.00	732.10	732.10	730.10	728.11
736.19	734.20	732.21	848+25.00	731.80	731.80	729.80	727.81
735.89	733.90	731.91	848+50.00	731.50	731.50	729.50	727.51
735.59	733.60	731.61	848+75.00	731.20	731.20	729.20	727.21
735.29	733.30	731.31	849+00.00	730.90	730.90	728.90	726.91
734.99	733.00	731.01	849+25.00	730.60	730.60	728.60	726.61
734.69	732.70	730.71	849+50.00	730.30	730.30	728.30	726.31
734.39	732.40	730.41	849+75.00	730.00	730.00	728.00	726.01
734.09	732.10	730.11	850+00.00	729.70	729.70	727.70	725.71
733.79	731.80	729.81	850+25.00	729.40	729.40	727.40	725.41
733.49	731.50	729.51	850+50.00	729.10	729.10	727.10	725.11
733.19	731.20	729.21	850+75.00	728.80	728.80	726.80	724.81
732.89	730.90	728.91	851+00.00	728.50	728.50	726.50	724.51
732.59	730.60	728.61	851+25.00	728.20	728.20	726.20	724.21
732.29	730.30	728.31	851+50.00	727.90	727.90	725.90	723.91
731.99	730.00	728.01	851+75.00	727.60	727.60	725.60	723.61
731.69	729.70	727.71	852+00.00	727.30	727.30	725.30	723.31
731.39	729.40	727.41	852+25.00	727.00	727.00	725.00	723.01
731.09	729.10	727.11	852+50.00	726.70	726.70	724.70	722.71
730.79	728.80	726.81	852+75.00	726.40	726.40	724.40	722.41
730.49	728.50	726.51	853+00.00	726.10	726.10	724.10	722.11
730.19	728.20	726.21	853+25.00	725.80	725.80	723.80	721.81
729.89	727.90	725.91	853+50.00	725.50	725.50	723.50	721.51
729.59	727.60	725.61	853+75.00	725.20	725.20	723.20	721.21
729.29	727.30	725.31	854+00.00	724.90	724.90	722.90	720.91
728.99	727.00	725.01	854+25.00	724.60	724.60	722.60	720.61
728.69	726.70	724.71	854+50.00	724.30	724.30	722.30	720.31
728.39	726.40	724.41	854+75.00	724.00	724.00	722.00	720.01
728.09	726.10	724.11	855+00.00	723.70	723.70	721.70	719.71
727.79	725.80	723.81	855+25.00	723.40	723.40	721.40	719.41
			855+50.00	723.10	723.10	721.10	719.11
			855+75.00	722.80	722.80	720.80	718.81
			856+00.00	722.50	722.50	720.50	718.51
			856+25.00	722.20	722.20	720.20	718.21
			856+50.00	721.90	721.90	719.90	717.91
			856+75.00	721.60	721.60	719.60	717.61
			857+00.00	721.30	721.30	719.30	717.31
			857+25.00	721.00	721.00	719.00	717.01
			857+50.00	720.70	720.70	718.70	716.71
			857+75.00	720.40	720.40	718.40	716.41

SUPERELEVATION TABLES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY-71-13.68

LINE "WB"			STATION	STATION	LINE "EB"		
LT. E.P.	CTR. PAV'T	RT. E.P. P.G.			LT. E.P.	CTR. PAV'T	RT. E.P. P.G.
727.50	725.51	723.52	855+50.00	858+00.00	720.10	718.11	716.12
727.05	725.14	723.22	855+75.00	858+25.00	719.65	717.74	715.82
726.60	724.76	722.92	856+00.00	858+50.00	719.20	717.36	715.52
726.15	724.38	722.62	856+25.00	858+75.00	718.75	716.98	715.22
725.70	724.01	722.32	856+50.00	859+00.00	718.30	716.61	714.92
725.24	723.62	722.01	856+75.00	859+25.00	717.85	716.23	714.62
724.78	723.24	721.70	857+00.00	859+50.00	717.40	715.86	714.32
724.29	722.83	721.37	857+25.00	859+75.00	716.94	715.48	714.02
723.81	722.43	721.04	857+50.00	860+00.00	716.49	715.11	713.72
723.31	722.00	720.69	857+75.00	860+25.00	716.04	714.73	713.42
722.80	721.57	720.33	858+00.00	860+50.00	715.59	714.36	713.12
722.28	721.12	719.96	858+25.00	860+75.00	715.14	713.98	712.82
721.75	720.66	719.58	858+50.00	861+00.00	714.69	713.60	712.52
721.21	720.20	719.19	858+75.00	861+25.00	714.24	713.23	712.22
720.65	719.72	718.79	859+00.00	861+50.00	713.78	712.85	711.92
720.08	719.23	718.38	859+25.00	861+75.00	713.32	712.47	711.62
719.50	718.73	717.96	859+50.00	862+00.00	712.86	712.09	711.32
718.90	718.21	717.52	859+75.00	862+25.00	712.40	711.71	711.02
718.30	717.69	717.08	860+00.00	862+50.00	711.94	711.33	710.72
717.69	717.15	716.62	860+25.00	862+75.00	711.49	710.95	710.42
717.07	716.61	716.16	860+50.00	863+00.00	711.05	710.59	710.14
716.44	716.06	715.69	860+75.00	863+25.00	710.61	710.23	709.86
715.84	715.59	715.22	861+00.00	863+50.00	710.20	709.95	709.58
715.25	715.12	714.75	861+25.00	863+75.00	709.82	709.69	709.32
714.65	714.65	714.28	861+50.00	864+00.00	709.43	709.43	709.06
714.12	714.18	713.81	861+75.00	864+25.00	709.13	709.19	708.82
713.59	713.71	713.34	862+00.00	864+50.00	708.83	708.95	708.58
713.06	713.24	712.87	862+25.00	864+75.00	708.53	708.71	708.34
712.52	712.77	712.40	862+50.00	865+00.00	708.24	708.49	708.12
711.99	712.30	711.93	862+75.00	865+25.00	707.96	708.27	707.90
711.46	711.83	711.46	863+00.00	865+50.00	707.70	708.07	707.70

F.A.P. NO.	STATE	PROJECT		19
2	OHIO			279

CUYAHOGA COUNTY
CUY-71-13.68

ESTIMATED QUANTITIES

REF NO.	STATION TO STATION		SIDE	I-15 GUARD RAIL STEEL BEAM STD. TYPE (DEEP) LIN. FT	I-15 GUARD RAIL STEEL BEAM BARRIER TYPE (DEEP) LIN. FT	I-16 C-B REMOVED EACH	
1G	800+75	801+625	LT	1875			
2G	797+00	800+25	℄		325		
3G	800+25	802+75	℄	500			
4G	802+75	805+00	℄		225		
5G	798+55	800+03	RT	1875			
6G	37+00	0+39 BELLAIRE		125			
1DR	0+10	EMERY-HIRST CONN				1	
7G	35+92	39+80 RD "B"	RT	875			
TOTAL				10187.5	550	1	

CURVE DATA

CURVE NO 6
PI STA 797+37.47
Δ = 04°17'40" LT
D = 00°28'00"
R = 12277.63'
T = 460.55'
L = 920.24'
E = 8.63'

ABBREVIATIONS USED IN DRAINAGE PLAN AND PROFILE

I- PROPOSED INLETS
C- PROPOSED CATCH BASINS
M- PROPOSED MANHOLES
P- PROPOSED PIPES
UD- UNDERDRAINS
H- PROPOSED HEADWALLS
D- DITCH PROTECTION
I-10, DUMPED ROCK CHANNEL PROTECTION
L-10, SODDING
L-120, JUTE MATTING

FOR DETAIL OF CUL-DE-SAC SEE SHEET NO. 135

BEGIN WORK STA 795+55

BEGIN PROJECT STA 797+00 I-71-5 (18) 247

6" I-3 FOR QUANT SEE SHEET NO. 117

6" I-3 FOR QUANT SEE SHEET NO. 117

FOR PROFILE & X-SEC. EMERY HIRST CONN SEE SHT #83

FOR BELLAIRE ROAD PLANS SEE SHEET NOS 88-96

DETAIL B SEE SHEET #137

12.6 Overhead Sign Support for details See Sheet 192.

ESTIMATED QUANTITIES

REF NO.	STATION TO STATION	SIDE	I-1 CL I-3 6"	I-1 CL I-4 6"	I-3 CL I-3 8"	I-3 CL J-1 6" (2) (3) (2)	I-5 6" CL I-3 60° BEND	I-5 30° BEND	I-5 T.E.E.	6" CL J-1 TEE	6" CL J-1 90° BEND
			L.F.	L.F.	L.F.	L.F.	EA.	EA.	EA.	EA.	EA.
1-UD	797+00 ~ 800+50	LT	373	10					1		
2-UD	797+00 ~ 801+50	℄	443	10			2	1			
3-UD	797+00 ~ 801+50	RT	443	10			1				
4-UD	800+75 ~ 805+00	LT	425								
5-UD	801+54 ~ 805+00	℄	346								
6-UD	801+54 ~ 805+00	RT	346								
1-UD	OH13 ~ 2+59 Em.	RT		10	254	23				2	
2-UD	OH13 ~ 2+59 Em.	LT		10	254	33				2	1
TOTALS			2916	50	508	56	3	1	1	4	1

NOTES:

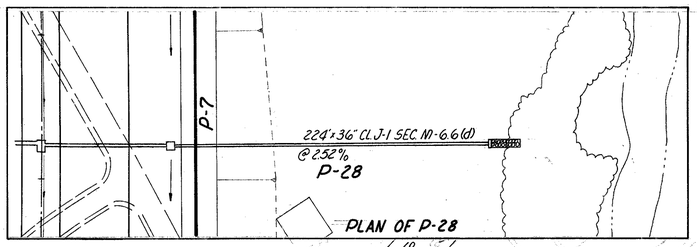
1. FOR QUANTITIES AND LOCATION OF DRAINAGE STRUCTURES AND PIPES SEE PIPE PROFILES, SHTS. Nº 123 - 133
2. FOR REMOVAL ITEMS TABULATIONS SEE SHT. #14

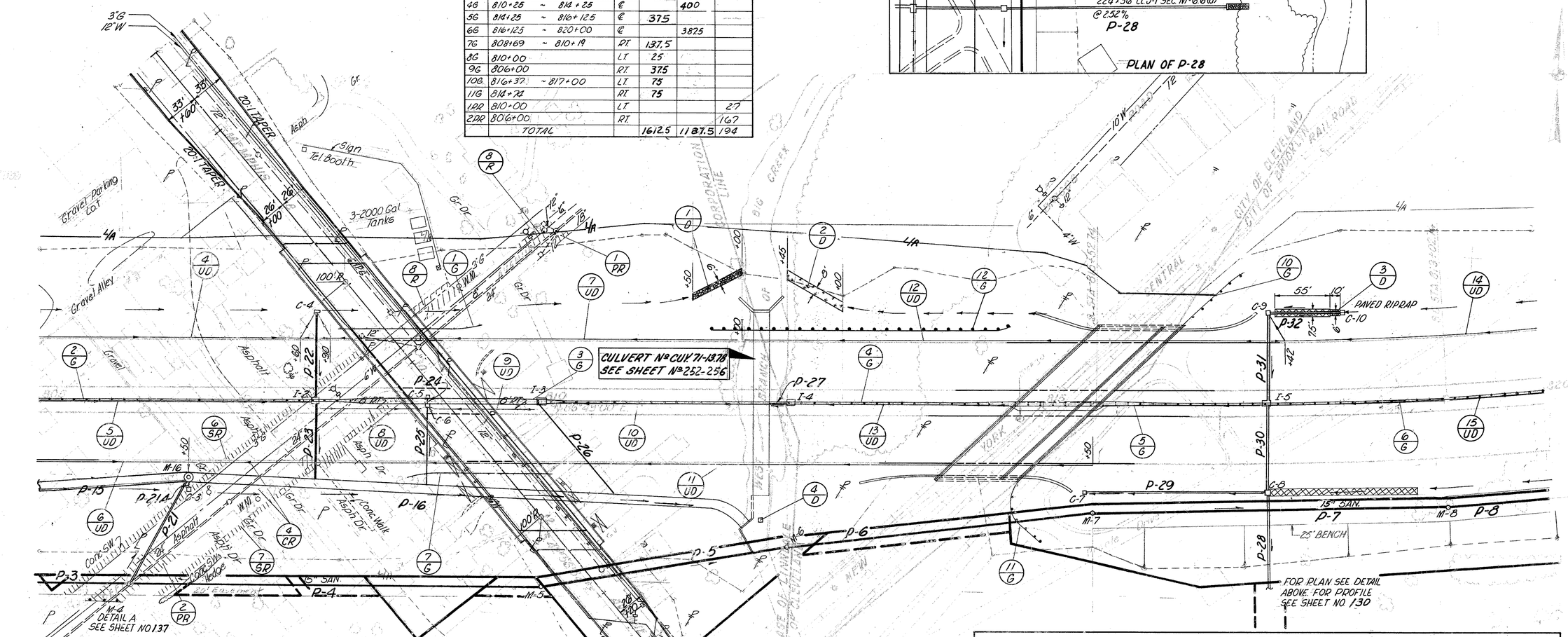
CUYAHOGA COUNTY
CUY-71-13.68

FOR MEMPHIS AVE. PLANS
SEE SHEETS NO. 103-106

ESTIMATED QUANTITIES

REF NO.	STATION TO STATION	SIDE	I-15 GUARDRAIL STANDARD TYPE (DEEP)	I-15 GUARDRAIL BARRIER TYPE DEEP	E-8 REMOVAL & DISP. OF EXIST. PAVEMENT ASPHALT	
			LIN. FT.	LIN. FT.	SQ. YDS.	
1G	807+95 ~ 809+45	LT	137.5			
2G	805+00 ~ 808+00	℄		300		
3G	808+00 ~ 810+25	℄	450			
4G	810+25 ~ 814+25	℄		400		
5G	814+25 ~ 816+125	℄	375			
6G	816+125 ~ 820+00	℄		387.5		
7G	808+69 ~ 810+19	RT	137.5			
8G	810+00	LT	25			
9G	806+00	RT	37.5			
10G	816+37 ~ 817+00	LT	75			
11G	814+72	RT	75			
1DR	810+00	LT				27
2DR	806+00	RT				167
	TOTAL		1612.5	1187.5		194





NOTES:

1. FOR QUANTITIES AND LOCATION OF DRAINAGE STRUCTURES AND PIPES SEE PIPE PROFILES, SHTS Nº 123-133
2. FOR RADIUS PIPE DETAILS SEE SHEET NO. 252.
3. FOR RAILROAD FORCE ACCOUNT WORK AND RAILROAD TEMPORARY RUNAROUND SEE SHEETS 257-262.

ESTIMATED QUANTITIES

REF NO.	STATION TO STATION	SIDE	I-1 6" CL. I-3 5EGM 6.40(b)	I-1 6" CL. I-3 6"	I-1 CL. F-4 6.40(c) 8"	I-5 6" CL. I-3 WYE	I-5 6" CL. I-3 TEE	I-5 90° BEND	I-5 30° BEND	I-10 DUMPED ROCK CHANNEL PROT. 18" DEEP	I-10 RIPRAP CUSHION 6" REINF. CONC. SLAB	I-8 STANDARD NO. 5 C.B.	I-10 SODDING
			LIN. FT.			EACH				CU. YDS.	SQ. YDS.	EACH	SQ. YDS.
4-UD	805+00 ~ 807+75	LT		290*	10*	1*							
5-UD	805+00 ~ 807+75	℄		265*	10*								
6-UD	805+00 ~ 806+50	RT		150*	10*		1*						
7-UD	807+75 ~ 811+96	LT		435*	10*	1*							
8-UD	807+79 ~ 807+873	℄		98*	10*				1*				
9-UD	807+873 ~ 809+96	℄		99*	10*				1*				
10-UD	810+00 ~ 812+41	℄	231*		10*								
11-UD	806+50 ~ 815+50	RT	604* 296@		10*								
12-UD	812+00 ~ 817+21	LT	150@ 290@ 94≠		10*			1*					
13-UD	812+45 ~ 817+21	℄	100@ 26@ 150≠	10@					4≠				
14-UD	817+25 ~ 820+00	LT	231≠	10≠		1*							
15-UD	817+25 ~ 820+00	℄	265≠	10≠									
4-D	812+18	RT										1*	
1-D	811+50 ~ 812+00	LT								16.7*			
2-D	812+45 ~ 813+00	LT											60@
3-D	817+88 ~ 817+98	LT									6.7≠		
	TOTALS		481	3548	110	11						1	
TOTALS	VILLAGE OF LINDALE *		231	1941	80	10	2	1	1	2	16.7		1*	
	CITY OF CLEVELAND @		250	802	10								60
	CITY OF BROOKLYN ≠			800	20		1			4		6.7	

STA 805+00 TO STA 820+00

CUYAHOGA COUNTY
CUY-71-13.68

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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279

CURVE DATA

CURVE NO. 7

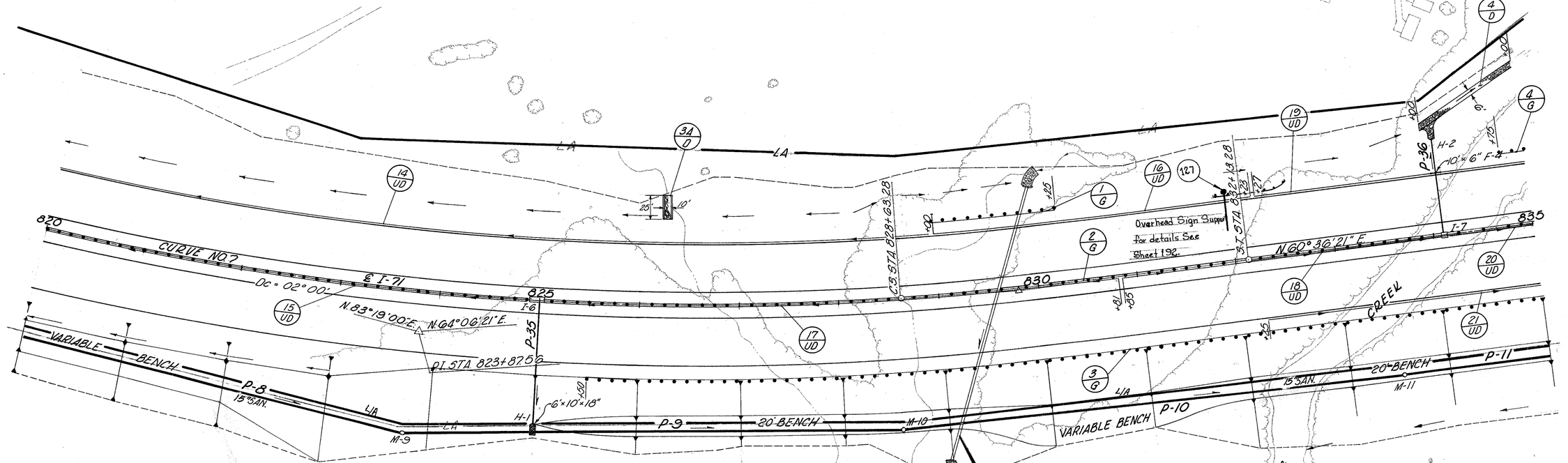
△	=	26°12'39" LT.
△c	=	19°12'39" LT.
D	=	02°00'00"
R	=	2864.79'
T	=	484.82'
L	=	960.54'
E	=	40.74'

SPIRAL NO. 7

Ls	=	350.00'
θ	=	03°30'00"
p	=	1.78'
k	=	174.98'
LT.	=	233.38'
ST.	=	116.71'
Ts	=	842.34'
Es	=	78.44'

ESTIMATED QUANTITIES

REF. NO.	STATION TO STATION	SIDE	I-15 STANDARD TYPE GUARD RAIL	I-15 BARRIER TYPE GUARD RAIL
			LIN. FT.	LIN. FT.
1-G	829+00 ~ 830+25	LT.	125	
2-G	820+00 ~ 835+00	℄		1500
3-G	825+50 ~ 835+00	RT.	950	
4-G	834+75 ~ 835+00		25	
	TOTALS		1100	1500



ESTIMATED QUANTITIES

REF NO.	STATION TO STATION	SIDE	I-1 6" CL. I-3 SEC.M 64(h)	I-1 CL. I-4 6"	I-1 CL. I-4 64(c) 8"	I-5 6" CL. I-3 90° BEND	I-10 DUMPED ROCK CHAN. PROT. 18" DEEP
			LIN. FT.			EA.	CU YDS.
14-UD	820+00 ~ 828+96	LT.	596	300			
15-UD	820+00 ~ 824+96	℄	196	300			
16-UD	829+00 ~ 832+23	LT.	333		10	1	
17-UD	825+00 ~ 830+81	℄	571		10		
18-UD	830+85 ~ 834+10	℄	315		10		
19-UD	832+27 ~ 835+00	LT.	263		10		
20-UD	834+14 ~ 835+00	℄	86				
21-UD	832+25 ~ 835+00	RT.	275				
34-O	826+20	LT.					13.9
4-O	834+00 ~ 835+00	LT.					36.6
TOTALS			2635	600	30	10	1	50.5

NOTES:

1. FOR QUANTITIES AND LOCATION OF DRAINAGE STRUCTURES AND PIPES SEE PIPE PROFILES, SHTS. Nº 123-133

STA. 820+00 TO STA. 835+00

DESCRIPTION	PLOTTED	INKED	CHECKED
TOPOGRAPHY			
PAVEMENT			
DRAINAGE			
R/W			
QUANTITIES			

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

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CUYAHOGA COUNTY
CUY-71-13.68

CURVE DATA
CURVE NO. 1-A

Δ	=	64°52'04"
D	=	16°00'00"
R	=	358.10'
L	=	405.42'
T	=	227.55'
E	=	66.18'

CURVE DATA
CURVE NO. 1-B

Δ	=	41°09'53"
D	=	05°25'27"
R	=	1056.28'
L	=	758.89'
T	=	396.66'
E	=	72.02'

ESTIMATED QUANTITIES

REF. NO.	STATION TO STATION	SIDE	I-15 STANDARD TYPE GUARD RAIL LIN. FT.	I-15 BARRIER TYPE GUARD RAIL LIN. FT.
1-G	835+00 - 850+00	L.T.	1527.5	
2-G	835+00 - 850+00	℄	250 #	1375
3-G	835+00 - 841+00	RT.	600	
4-G	841+75 - 848+07	RT.	612.5	
TOTALS			2990	1375

For sign standard at Sta. 840+00
See Detail Sht. 135

N 71,000
E 69,000

Existing 42" W.I. Sewer

TO BE REMOVED BY OTHERS

LA

P-33

BIG CREEK

10' BENCH

SPIRAL NO. 8A

℄ I-71

N 60°36'21" E

840

845

I-9

CURVE NO. 8

Dc = 03°30'

850

Overhead Sign Support (12B)
for Details See Sheet 192

P-37

P-38

10"x6" F4

6"x10"x18"

H-4

S.C. STA. 846+83.25

H-3

5 STA.

TO BE REMOVED BY OTHERS

℄ B&O RR RELOCATION

TO BE PERFORMED BY OTHERS

1140

CURVE NO. 1

P-11

M-12

15" SAN.

20' BENCH

10' BENCH

6'

℄ CHANNEL RELOCATION

CURVE NO. 1-B

1140

TO BE PERFORMED BY OTHERS

℄ B&O RAILROAD

LA

1135

Dc = 05° 00'

15" SANITARY TO BE PERFORMED BY OTHERS

1135

P.C.C. STA. 1142+43.89

S.C. STA. 1130+95.20

CURVE NO. 1-A

P.C.C. STA. 1134+85.00 ℄ CHAN. RELOC.
9000 RT. P.O.C. STA. 1134+85.00 ℄ I-71

N 70,500
E 70,000

NOTES:
1. FOR QUANTITIES AND LOCATION OF DRAINAGE STRUCTURES AND PIPES SEE PIPE PROFILES, SHTS. Nº 123-133

ESTIMATED QUANTITIES

REF. NO.	STATION TO STATION	SIDE	I-1 CL. B 6"	I-1 CL. F-4 6"	I-1 CL. F-4 6.4(6) 8"	I-5 6" CL. F-3 90° BEND EA.	I-5 6" CL. F-3 60° BEND EA.	I-10 DUMPED ROCK CHANNEL PROT. 18" D CU. YDS.	L-10 SODDING SQ. YDS.
19-UD	835+00 ~ 841+00	LT.	610		10	1			
20-UD	835+00 ~ 841+00	℄	590	10					
21-UD	835+00 ~ 841+00	RT.	623		10		1		
22-UD	841+04 ~ 846+00	℄	486	10					
23-UD	846+04 ~ 850+00	℄	396						
24-UD	841+04 ~ 850+00	RT.	886	10					
4-D	835+00 ~ 835+65	LT.						200	
5-D	838+00 ~ 839+00	RT.						34.6	
6-D	840+00 ~ 841+00	RT.							70
TOTALS			3591	30	20	1	1	54.6	70

STA. 835+00 TO STA. 850+00

PLOTTED		INKED		CHECKED	
BY	DATE	BY	DATE	BY	DATE
DESCRIPTION					
TOPOGRAPHY					
PAVEMENT					
DRAINAGE					
R.O.W.					
STRUCTURES					

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY.
CUY-71-13.68

CURVE DATA

CURVE NO. 8

Δ	=	59°56'39" RT.
Δc	=	38°32'16" RT.
D	=	03°30'00"
R	=	1637.02'
T	=	572.28'
L	=	1101.08
E	=	97.15

SPIRAL NO. 8-A

Ls	=	600.00'
θ	=	10°30'00"
p	=	9.16'
k	=	299.66'
L.T.	=	400.70'
S.T.	=	200.64'

SPIRAL NO. 8-B

Ls	=	600.00'
θ	=	10°54'23"
p	=	9.51'
k	=	299.63'
L.T.	=	400.77'
S.T.	=	200.70'

SPIRAL NO. 8-C

Ls	=	600.00'
θ	=	10°25'02"
p	=	9.08'
k	=	299.67'
L.T.	=	400.70'
S.T.	=	200.63'

CURVE DATA
CURVE NO. 2-A

Δ	=	23°45'05" RT.
D	=	03°08'51"
R	=	1820.08'
L	=	754.50'
T	=	382.74'
E	=	39.81'

N. 71,500
E. 70,500

24" V.S.P.
M.H.
C.B.
36" CMP
C.B.
M.H.
CULVERT NO. CUY-71-16.37
FOR DETAIL SEE SHT. 122
LA
8' WIDE
8' WIDE
185
100
7/D
8/D
8A/D
CONSTRUCTION LIMITS
I-10 RIPRAP 10'x20'
B.&O. RAILROAD
TO BE REMOVED BY OTHERS
1/G
C.S. STA. 855+51.72 LINE "W.B." = 13.00' LT. ROC. STA. 855+51.16 ℄ I-71
P.I. STA. 852+55.53
N 71°06'21" E.
S 70°21'23" E.
448
2/G
END BARRIER RAIL
BEGIN GUARD RAIL
STA. 856+50
Overhead Sign Support for details See Sheet 192.
129
28/UD
3/G
175
SPIRAL NO. 8-C
860
125
M.H. ABANDON
27/UD
25/UD
℄ I-71
855
I-11
P-40
10'-6" F-A
1/DR
REMOVE
32' CONC. MEDIAN
4/B
SPIRAL NO. 8-B
860
TYPE G CURB
LINE "W.B."
S 68°06'00" E.
AT STA. 861+51.72
150
865
850
I-10
CURVE NO. 8
Dc = 03°30'
23/UD
D-39
H-6
6'x10'x18"
26/UD
7.5' WIDE
C.S. STA. 857+84.33 LINE "E.B." = 6.100' RT. ROC. STA. 857+84.33 ℄ I-71
LINE "E.B."
SOD 10' WIDE
10/D
30/UD
29/UD
H-5
6'x10'x18"
200
9/D
24/UD
1145
CURVE NO. 2
℄ R.R. RELOCATION
1150
Dc = 03°00'
(TO BE PERFORMED BY OTHERS)
7.5' WIDE
1155
S 59°27'00" E.
GROUTED RIPRAP
10:1 TAPER
℄ CHANNEL RELOCATION
1145
CURVE NO. 2-A
(TO BE PERFORMED BY OTHERS)
130.25
CURVE NO. 2-B
10:1 TAPER
25.00
P.C.
P.T.
AT STA. 1154+13.82
AT STA. 1155+13.82
S 61°28'00" E.
ELECTRICAL POWER TRANSMISSION TOWERS
P.C.C. STA. 1142+43.80
E. 70,500
N. 70,500

ESTIMATED QUANTITIES

REF. NO.	STATION TO STATION	SIDE	E-12 PIPE REMOVED OVER 15"	I-16 M.H. ABANDONED	I-10 RIPRAP USING 6" REINFORCD CONC. SLAB
			L.F.	EA.	S.Y.
1DR	857+52	℄	245	1	
8AD		LT.			22
	TOTAL		245	1	22

ESTIMATED QUANTITIES

REF. NO.	STATION TO STATION	SIDE	I-1 CLASS I-3 6"	I-1 CLASS F-4 6"	I-1 CLASS F-4 8"	I-5 6" CLASS I-3 60° WYE	I-5 6" CLASS I-3 90° BEND	I-5 6" CLASS I-3 30° BEND	I-10 DUMPED ROCK CHANNEL PROT.	L-10 SODDING	L-120 JUTE MATTING	I-15 GUARD RAIL STEEL BEAM TYPE	I-15 GUARD RAIL STEEL BEAM BARRIER TYPE (DEEP)
			LIN.FT.	LIN.FT.	LIN.FT.	EACH	EACH	EACH	C.Y.	S.Y.	S.Y.	LIN.FT.	
23UD	850+00 ~ 851+00	℄	90	10									
24UD	850+00 ~ 851+00	RT.	116	10	10	1							
25UD	851+04 ~ 856+00	℄	486	10									
26UD	851+04 ~ 861+00	RT.	1001		10		1						
27UD	861+50 ~ 865+00	LT.	350										
28UD	856+04 ~ 865+00	℄	896					2					
29UD	864+00 ~ 865+00	RT.	100										
30UD	861+04 ~ 865+00	RT.	396										
1G	850+00 ~ 857+48	LT.										772.5	
2G	850+00 ~ 860+25	LT. & RT.										725.0	650.0
7D	854+95 ~ 856+00	LT.							54				
8D	856+00 ~ 857+00	LT.								152			
9D	852+00 ~ 860+00	RT.									1045		
10D	862+00 ~ 860+38	℄								89			
SUB TOTAL						1	1	2					
TOTAL			3435	30	20		4		54	241	1045	1497.5	650.0

STA. 850+00 (℄ I-71) TO STA. 865+00 (LINE "E.B.") (LINE "W.B.")

PLOTTED	CHECKED
BY: [illegible]	BY:
DATE: 6-28-68	DATE:

DESCRIPTION
TOPOGRAPHY
ENGINEERING
R. & W.
QUANTITIES

CUYAHOGA COUNTY
CUY-71-13.68

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

24
279

CURVE DATA

CURVE NO. 14
P.I. STA. 879+40.30
Δ = 44°44'19" LT.
Δc = 19°59'19" LT.
D = 04°30'00"
R = 1273.24'
T = 224.38'
L = 444.19'
E = 19.62

SPIRAL NO. 14A
Ls = 600.00'
θ = 13°30'00"
p = 11.76'
k = 299.45'
L.T. = 401.17'
S.T. = 201.06'
Ts = 828.28'
Es = 116.32'

N. 71,000
E. 72,000

LA
B. & O. RAILROAD
(27 UD)
(28 UD)
(29 UD)
(30 UD)
(9 D)
(TO BE REMOVED BY OTHERS)
TS STA. 871+45.92
SC STA. 877+45.92
CURVE NO. 14
S. 81°36'00" E.
N. 78°24'21" E.
FUTURE I-71
LINE "W.B."
SPIRAL NO. 14A
S. 68°06'00" E.
END WORK STA. 870+90
PC STA. 868+55.33 LINE "E"
48.00' LT. STA. 868+55.83 LINE "E.B."
END PROJECT STA. 870+00
I-71-5(118)247
END WORK STA. 870+80
CREEK
BIG
CS STA. 874+06.28
TS STA. 870+52.75
Dc = 01°28'00"
SC STA. 876+52.75
FUTURE I-71
LINE "E.B."
SPIRAL NO. 9
S. 59°27'00" E.
S. 61°28'00" E.
B. & O. R.R. RELOCATION
TO BE PERFORMED BY OTHERS
TS STA. 1167+82.40
SC STA. 1169+82.40
Dc = 05°00'
CURVE NO. 3
CURVE NO. 3A
CURVE NO. 3B
I-10 GROUTED RIPRAP
10:1 TAPER
10:1 TAPER
PC STA. 1158+98.50
PT STA. 1160+89.00
AC STA. 1168+82.37
E. 72,000
N. 70,000
865
870
875
880
1160
1165
1170
+05
22'
20'
60'
61.5'

ESTIMATED QUANTITIES

REF NO.	STATION TO STATION	SIDE	I-1 CL. I-3 6"	I-1 CL. F-A 6.4(C) 8"	I-5 CL. I-3 6" 90° BENDS	L-120 JUTE MATTING
			LIN. FT.	LIN. FT.	EACH	S.Y.
27UD	865+00 ~ 870+00	LT.	510	10	1	
28UD	865+00 ~ 870+00	RT.	510	10	1	
29UD	865+00 ~ 870+00	LT.	510	10	1	
30UD	865+00 ~ 870+00	RT.	510	10	1	
9D	865+00 ~ 870+00	RT.				417
TOTALS			2040	40	4	417

STA. 865+00 TO STA. 880+00

27

CUYAHOGA COUNTY
CUY-71-13.68

PLOTTED	CHECKED
BY	BY
DATE	DATE

DESCRIPTION	INKED BY	PLOTTED BY
EXISTING GROUND		
PROFILE GRADE		
DRAINAGE		
BRIDGE MARKS		

749.52 748.35 747.18 746.01 744.84 743.67 742.50 741.33 740.16 738.99 737.82 736.65 735.48 734.31 733.14 731.97

BEGIN WORK
STA. 795+55

BEGIN PROJECT
STA. 797+00

℄ COURTLAND AVE.

℄ BELLAIRE RD.

℄ W 119th ST.

℄ ALLEY

3.0 TO 1 SLOPE

+00 LT OUT
℄ ~ 737.97

+00 RT OUT
℄ ~ 738.00

+00 ℄ RT ℄
℄ ~ 737.63

2-6" CL. I-3 SEC. NO. 6.4 (h)

6" CL. I-3 SEC. NO. 6.4 (h)

-1.17%

+65 ℄ RT ℄
℄ ~ 734.53

+75 ℄ RT ℄
℄ ~ 734.44

C-1, +50
℄ ~ 731.81

+25 LT OUT
℄ ~ 733.76

+43 ℄ RT ℄
℄ ~ 732.48

I-1, +50
℄ ~ 730.45

+43 RT OUT
℄ ~ 732.99

N0-15, +50
℄ ~ 732.93

+00 LT OUT
℄ ~ 731.12

+00 LT OUT
℄ ~ 730.14

760
750
740
730
720
710

758.2 759.7 758.7 759.0 758.9 760.7 761.1 761.1 760.7 761.2 +92 760.5 +92 762.3 +10 761.4 +27 760.8 +27 761.6 761.9 +15 760.5 +15 762.5 +45 762.0 +75 762.4 +75 763.5 +95 763.4 763.3 760.5 +60 760.9 +74 760.3 +74 760.6 +90 760.5 760.9 +09 760.5 762.6 +65 762.9 +17 762.8 762.8 +48 762.8 +27 762.5 +31 762.7 +35 760.0

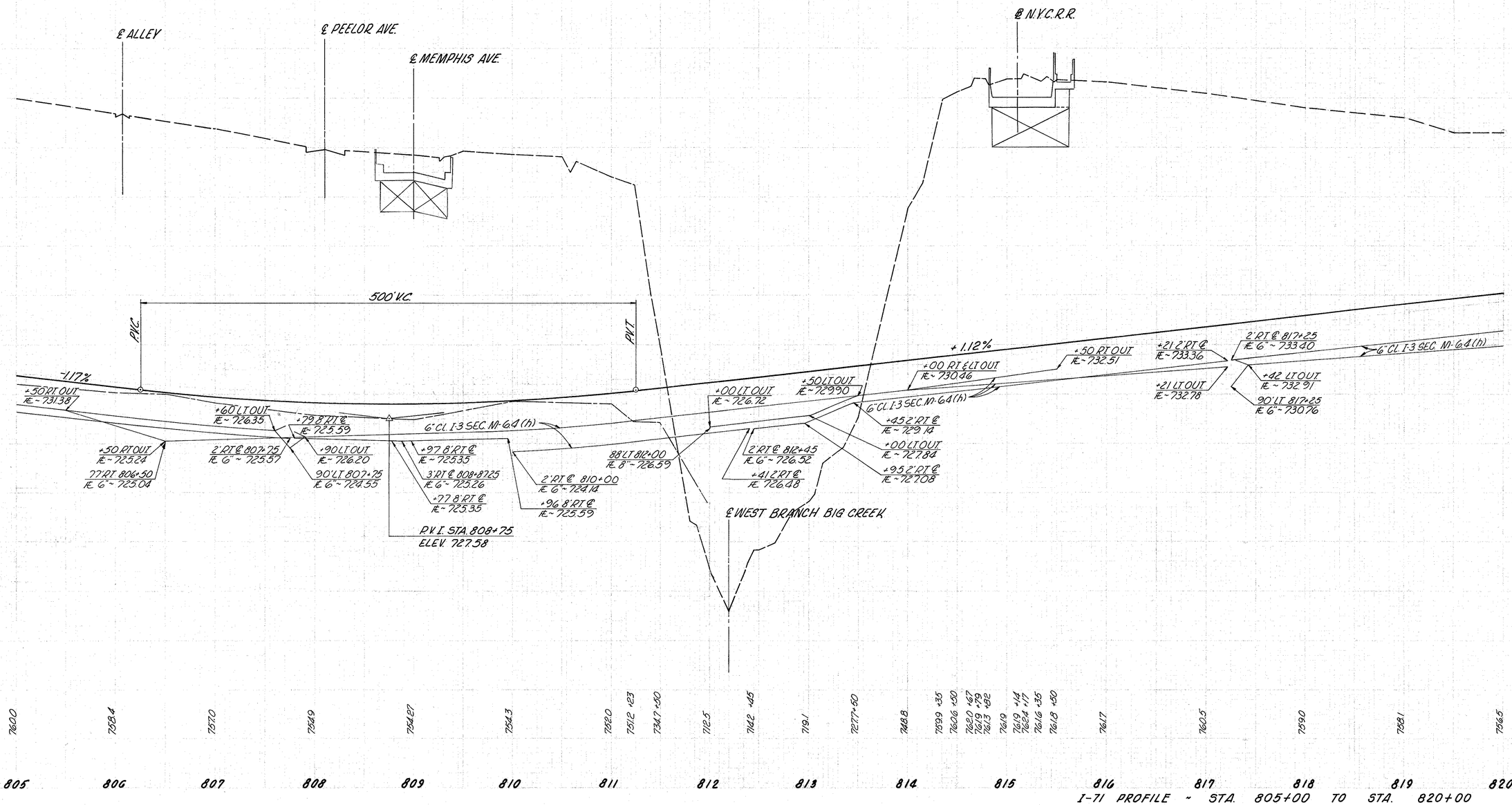
790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805

I-71 PROFILE STA. 797+00 TO STA. 805+00

CUYAHOGA COUNTY.
CUY-71-13.68

BENCH MARK
Top NW Bolt on R.R. Tower
15' Rt. of Sta. 814+77
Elev. ~ 763.25

731.97 730.80 730.51 730.23 729.98 729.76 729.56 729.40 729.27 729.16 729.08 729.03 729.01 729.02 729.06 729.12 729.22 729.34 729.49 729.67 729.83 730.11 730.38 731.22 732.34 733.46 734.58 735.70 736.82 737.94 739.06 740.18



760.0 758.4 757.0 754.9 754.87 754.3 752.0 751.2 +23 734.7 +50 732.5 742 +45 729.1 727.7 +60 728.8 759.9 +35 760.6 +50 762.0 +67 761.9 +79 761.3 +82 761.9 +14 762.4 +17 761.6 +35 761.8 +50 761.7 760.5 759.0 758.1 756.5

805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820

I-71 PROFILE - STA. 805+00 TO STA. 820+00

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
EXISTING GROUND	G.A.K.	12-15-69				
PROFILE GRADE						
REVISIONS						
ENGR. MARKS						

CUYAHOGA COUNTY
CUY-71-13.68

740.18 741.30 742.42 743.54 744.66 745.78 746.90 747.17 747.43 747.67 747.90 748.12 748.32 748.50 748.63 748.83 748.98 749.10 749.22 749.31 749.40 749.47 749.52 749.56 749.59 749.60 749.60 749.58 749.55 749.50 749.44 749.37 749.28 749.17 749.06 748.92 748.78 748.61 748.44 748.24 748.04 747.82 747.58

BENCH MARK
Spike in E Root of 12" Oak, 45' Rt. of Sta. 834+95
Elev. ~ 703.93

760
750
740
730
720
710
700
690

P.V.I. STA. 831+00
ELEV. 752.50

+1.12%
-1.20%
+1.12%

+00 2' RT @ E ~ 747.60
+00 2' RT @ E ~ 738.34
6" CL. I-3 SEC. N-641(h)
6" CL. I-3
+00 LT OUT E ~ 736.05
+00 LT OUT E ~ 736.79
+96 2' RT @ E ~ 740.54
2' RT @ 825+00 E 6" ~ 740.58
P.V.C.
+96 LT OUT E ~ 742.47
+00 LT OUT E ~ 742.61
93' LT 829+00 E 8" ~ 742.00
+81 2' RT @ E ~ 744.40
+85 2' RT @ E ~ 744.40
6" CL. I-3
1000' V.C.
+23 LT OUT E ~ 744.50
+27 LT OUT E ~ 744.50
+25 RT OUT E ~ 745.24
6" CL. I-3
+00 LT & RT OUT E ~ 744.11
2' RT @ 834+10 E 6" ~ 743.16
+14 2' RT @ E ~ 743.13

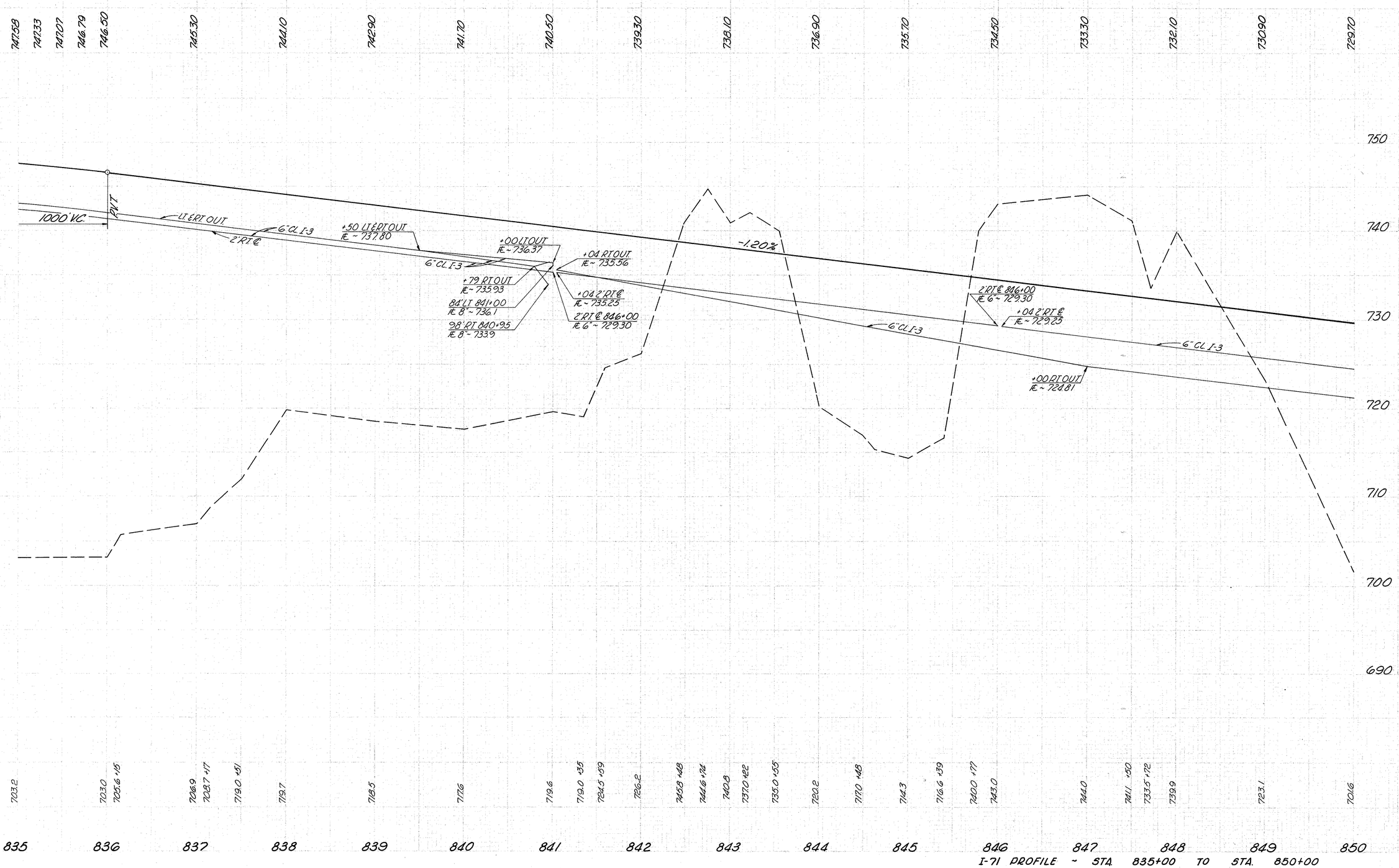
756.5 756.8 756.9 757.8 757.3 755.9 752.8 749.77 747.0 749.8 746.5 +22 725.4 +61 744.8 751.0 752.7 751.9 752.0 751.9 +29 700.3 +79 699.3 700.3 +49 700.3 +53 703.2

820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835

I-71 PROFILE ~ STA. 820+00 TO STA. 835+00

CUYAHOGA COUNTY
CUY-71-13.68

BENCH MARK
Spike in Telegraph Pole
15' Rt of Sta. 841+25
Elev.~ 727.91

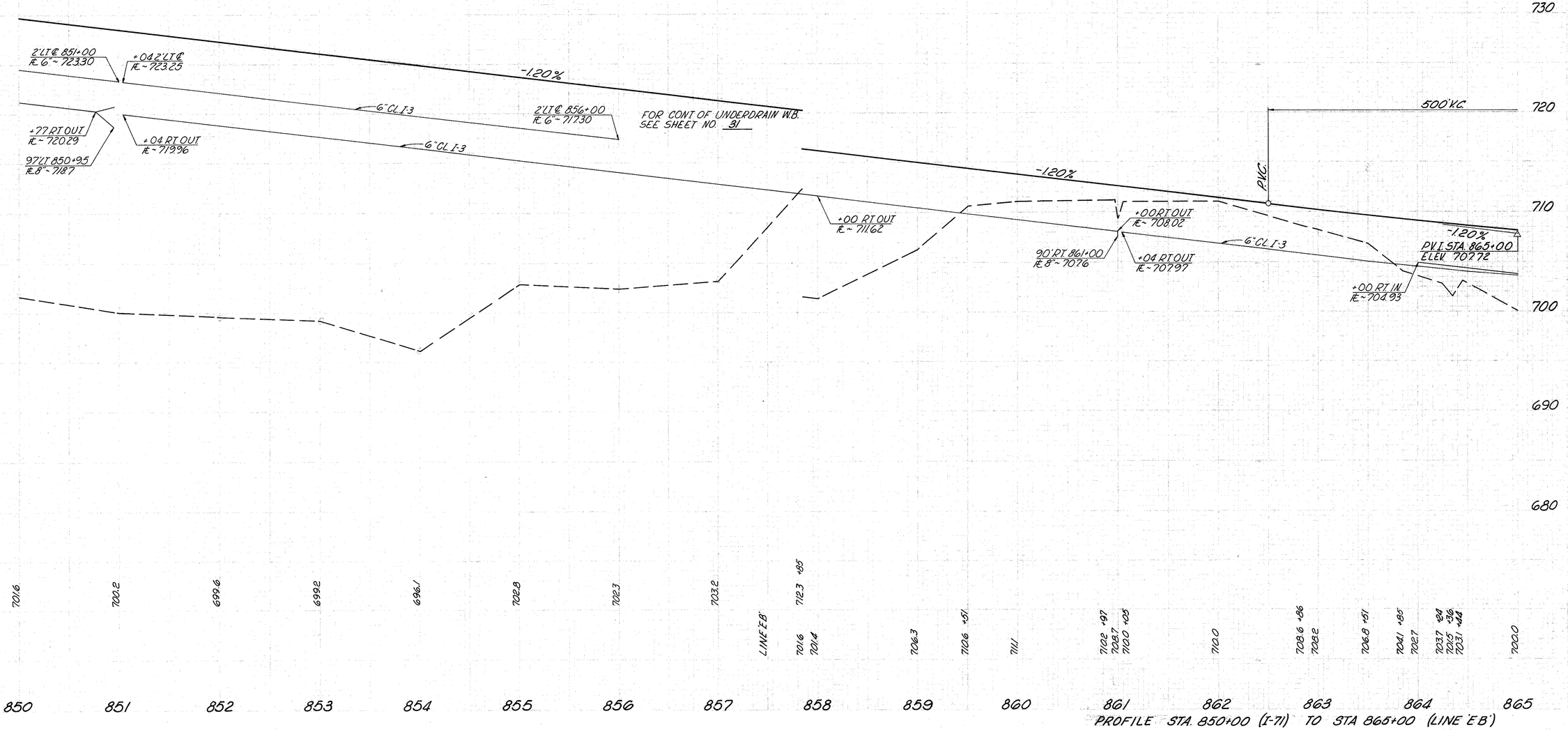


I-71 PROFILE ~ STA. 835+00 TO STA. 850+00

CUYAHOGA COUNTY
CUY-71-13.68

BENCH MARK
Spike in N. Root of 8" Wild Cherry Tree
22' Rt. of Sta 855+17
Elev. 701.05

I-71	729.10	728.50	727.30	726.10	724.90	723.70	722.50	721.30	LINE 'F-71'	+83.43	722.29	716.31	716.12	714.92	713.72	712.52	711.32	710.72	710.42	710.14	709.86	709.58	709.32	709.06	708.82	708.58	708.34	708.12	LINE 'E-8'
850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865														



I-71	701.6	700.2	699.6	699.2	696.1	702.8	702.3	703.2	LINE 'E-8'	712.3 +85	710.6	710.4	706.3	710.6 +51	711.1	710.2 +97	708.7	710.0 +05	710.0	708.6 +56	708.2	706.8 +51	704.1 +85	702.7	703.7 +24	703.5 +36	703.1 +44	700.0
850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865													

PROFILE STA. 850+00 (I-71) TO STA 865+00 (LINE 'E-8')

CUYAHOGA COUNTY
CUY-71-13.68

708.12 707.90 707.70 707.50 707.30 707.12 706.94 706.78 706.62 706.46 706.32 706.04 705.48 704.92 704.36 703.80 703.24 702.68 702.12 701.56 701.00 700.44 699.88 699.32

END WORK
STA. 870+80

END PROJECT
STA. 870+00

500' V.C.

P.V.T. STA. 867+50

-0.56%

+50 LT & RT OUT
E ~ 703.20

P.I. STA. 865+00
ELEV. 707.72

+00 LT & RT OUT
E ~ 701.54

+00 RT OUT
E ~ 700.42

6" CL I-3

+00 LT OUT
E ~ 700.06

78" LT 870+00
E 8" ~ 699.9

-0.56%

720
710
700
690
680

700.0 698.1 698.2 698.4 698.8 699.9 698.8+03 697.9 +05 716.5 +10 717.4 +17 714.4 713.3 +69 714.1 714.0 +42 714.8 +66 712.7 +91 712.9 709.4 708.7 +42 705.9 +59 705.1 +96 703.8 +09 704.7 +09 703.6 +67 701.7 701.7 +10 704.5 +90 704.0 +64 702.7 703.0 +50 702.2 701.4 +50 700.2 +65 700.1 +96 699.1

865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880

LINE "E-B" PROFILE ~ STA. 865+00 TO STA. 880+00

SHEET NO.	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
CUY-71-13.68

DESCRIPTION	PLOTTED	UNROLLED
	DATE	DATE

723.50 722.92 722.32 722.01 721.70 721.37 721.04 720.69 720.33 719.96 719.58 719.19 718.79 718.38 717.96 717.52 717.08 716.62 716.16 715.22 713.34 711.46 709.58 707.70

740
730
720
710
700
690

P.V.I. STA. 858+50
ELEV. 719.92

-1.20%
-1.20%
-1.88%
-1.88%

+04.11 RT
I.E.= 717.67

6"CL I-3

+52 RT OUT
I.E.= 714.30

+75 RT OUT
I.E.= 714.13

+52 RT OUT
I.E.= 713.02

+50 LT OUT
I.E.= 710.15

+00 LT & RT OUT
I.E.= 706.90

6"CL I-3

P.V.C.
P.V.T.

702.8 +51 | 702.6 | 704.0 +89 | 703.8 | 711.2 +23 | 711.8 | 712.2 | 712.8 | 712.4 | 712.4 | 712.7 | 714.1 | 712.9 +25 / 712.8 +30 | 713.6 +60 | 711.1 +90 / 711.9

850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865

W. B. PROFILE STA. 855+51.16 TO STA. 865+00

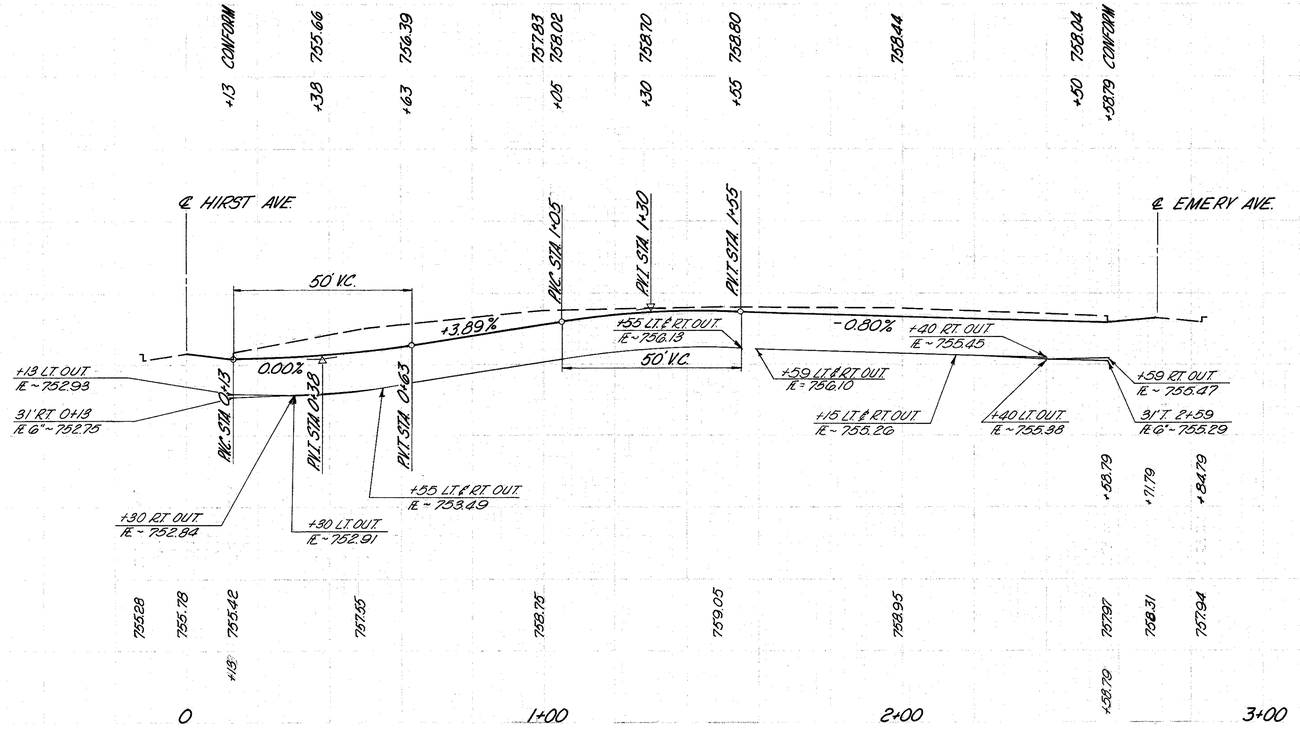
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

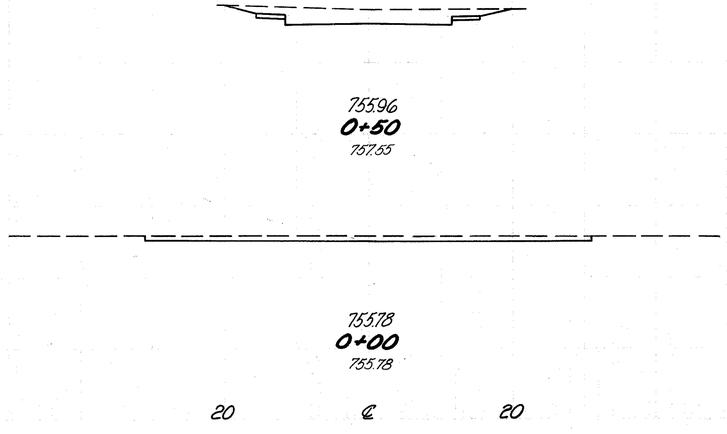
CUYAHOGA COUNTY
CUY-71-13.68

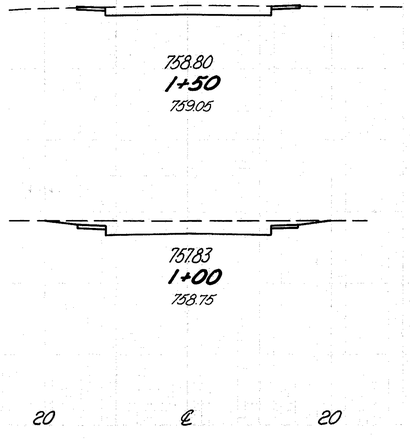
LINE "W-B" PROFILE STA. 865+00 TO STA 880+00

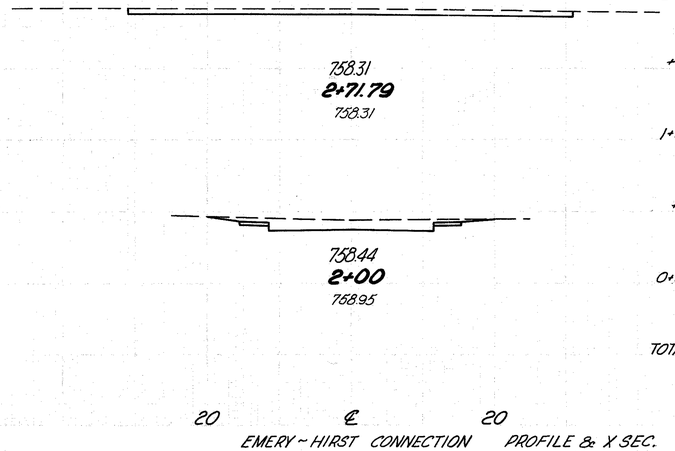
DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
EXISTING GROUND						
PROFILE GRADE						
DRAINAGE						
BENCH MARKS						

CUYAHOGA COUNTY
CUY-71-13.68









	END AREA		VOLUMN	
	CUT	FILL	CUT	FILL
+71.79	6			
			126	
2+00	5			
			70	
+50	3			
			80	
1+00	6			
			112	
+50	7			
			106	
0+00	6			
TOTAL			494	

EMERY ~ HIRST CONNECTION PROFILE & X SEC.

DESCRIPTION	SLOTTED	INKED	CHECKED
	BY	BY	BY
EXISTING GROUND	DATE	DATE	DATE
PROPOSED GRADE			
DRAINAGE			
BENCH MARKS			

ENTIRE SHEET U.S.S. DATUM I.G.S.

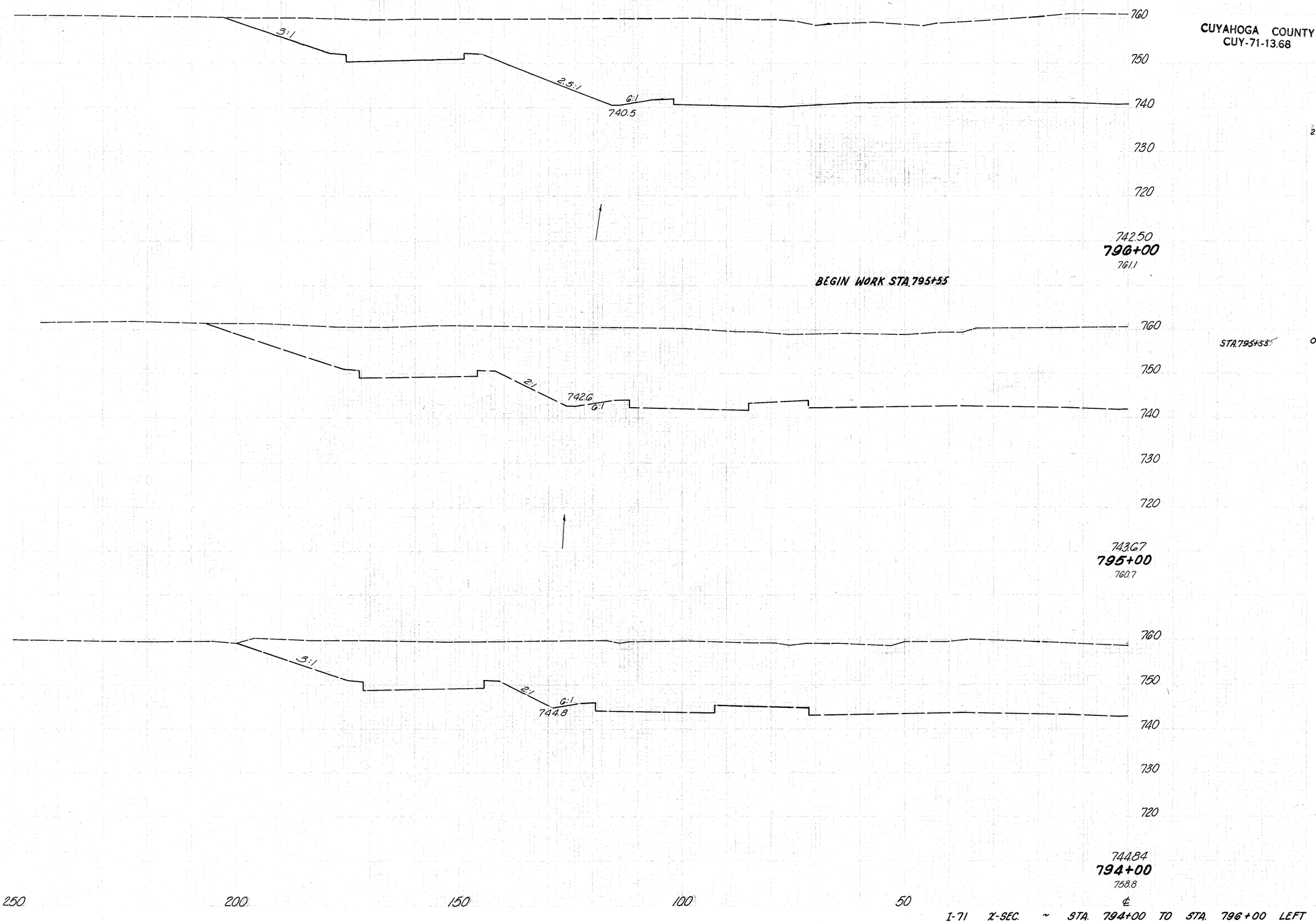
11-W

L-20

34
279

CUYAHOGA COUNTY
CUY-71-13.68

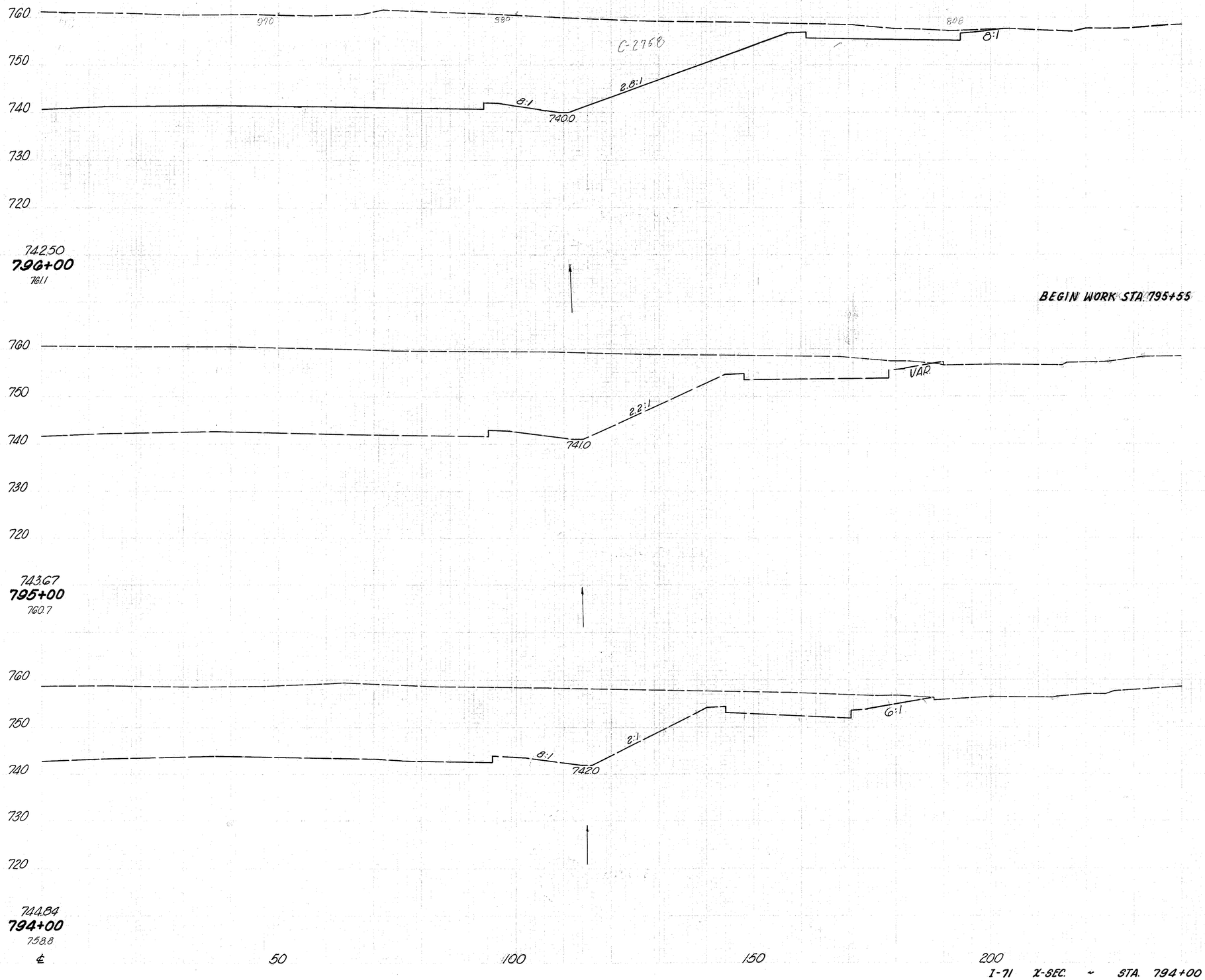
2931



I-71 X-SEC. ~ STA. 794+00 TO STA. 796+00 LEFT

DESIGN	PLOTTED-INKED	CALCL.	CHKD.
ORIGINAL GROUND			
TEMPLATES			
END AREAS			
CROSS SECTIONS			
STATION AREAS			

CUYAHOGA COUNTY
CUY-71-13.68



I-71 X-SEC. ~ STA. 794+00 TO STA. 796+00 RIGHT

DESCRIPTION	PLOTTED BY	LINKED BY	DATE	CALC'D BY	DATE	CHK'D BY	DATE
ORIGINAL GROUND	D.J.J.						5-96
TOPSOIL							
DRAINAGE							
EXC. AREAS							
EMBANKMENT							
SEEDING AREAS							

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

36
279

CUYAHOGA COUNTY
CUY-71-13.68

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME	
CUT	FILL	CUT	FILL
	3880		
	2997		
	6877		
			24,421
	3510		
	2800		
	6310		
			22,123
	3146		
	3030		
	6176		

760
750
740
730
720
760
750
740
730
720
760
750
740
730
720

2:1
2:1
739.5
114" C.I. E-1
74099
798+00
761.2
2:1
2:1
739.0
114" C.I. E-1
74016
798+00
760.8
6:1
4:1
739.5
74133
797+00
761.1

STA. 798+00

010

09

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

37/279

CUYAHOGA COUNTY
CUY-71-13.68

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME	
CUT	FILL	CUT	FILL
3880			
3510			
3146			

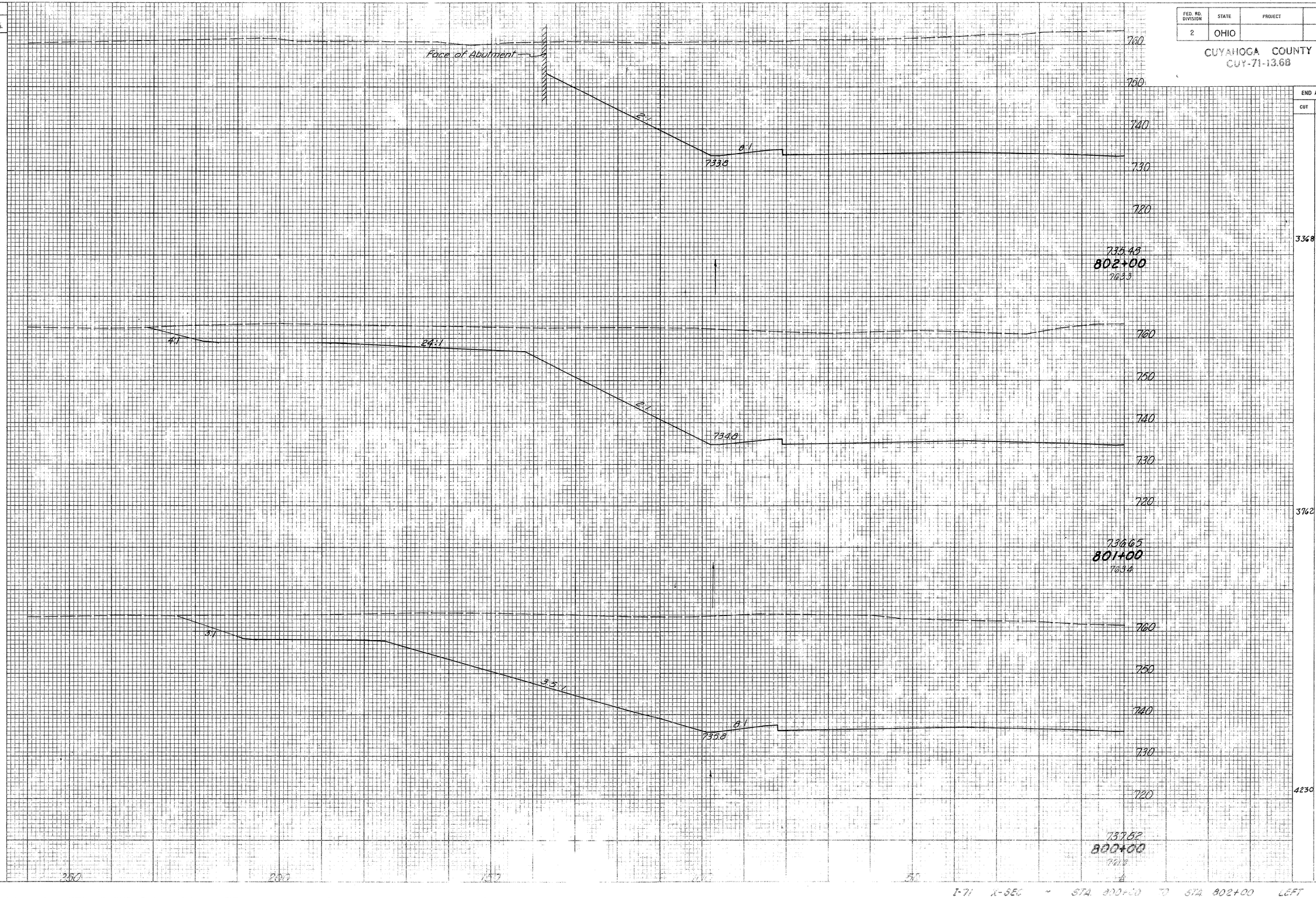
I-71 X-SEC. ~ STA. 797+00 TO STA. 799+00 LEFT

SEEDING	
END WIDTH	SQ. YDS.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

39
279

CUYAHOGA COUNTY
CUY-71-13.68



END AREA		VOLUME	
CUT	FILL	CUT	FILL
3368			
3162			
4230			

I-71 X-SEC ~ STA 800+00 TO STA 802+00 LEFT

CUYAHOGA COUNTY
CUY-71-13.68

3786
3308
7154

26,769

3560
3740
7300

27,359

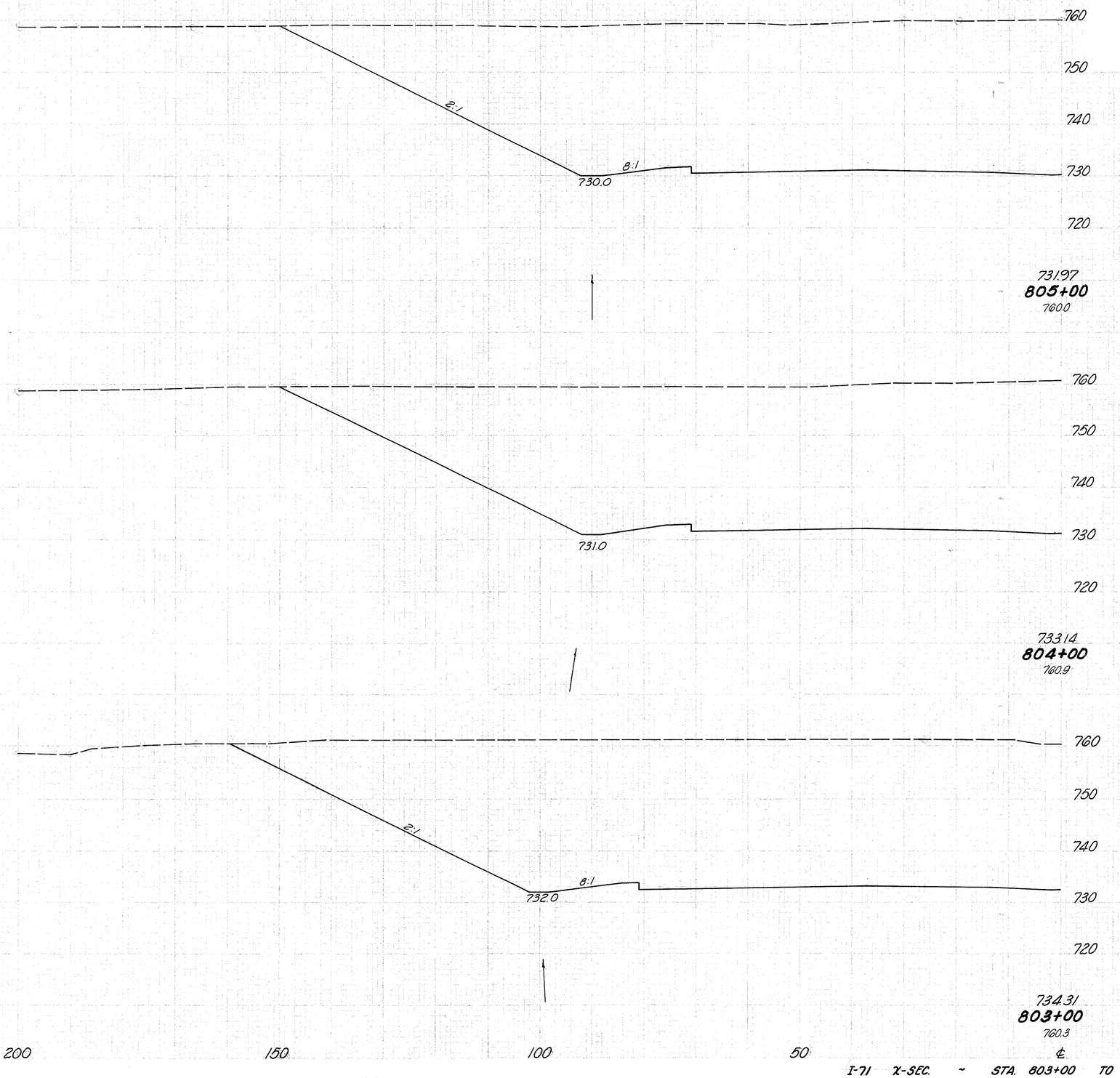
3270
4204
7474

26,576

6877

I-71 X-SEC. ~ STA. 800+00 TO STA. 802+00 RIGHT

CUYAHOGA COUNTY
CUY-71-13.68

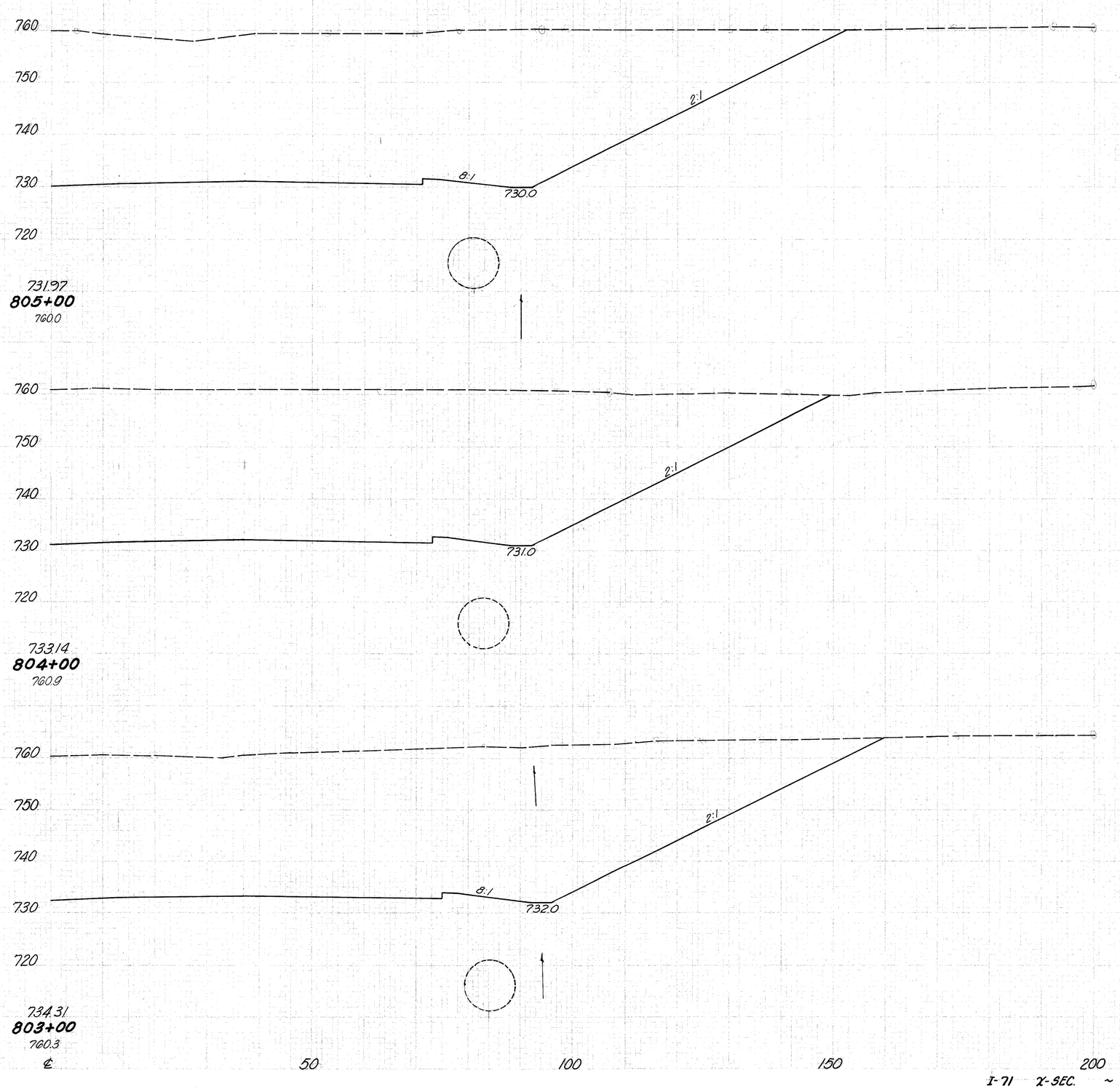


I-71 X-SEC. ~ STA. 803+00 TO STA. 805+00 LEFT

PLOTTED/NKED | CALCULATED | CHECKED
BY | DATE | BY | DATE | BY | DATE
MJ | 10-22-84 | | | B | 5-86

EARTHWORK
BEDDING AREAS

CUYAHOGA COUNTY.
CUY-71-13.68



3550
3496
7046

25,901

3526
3414
6940

26,652

3700
3752
7452

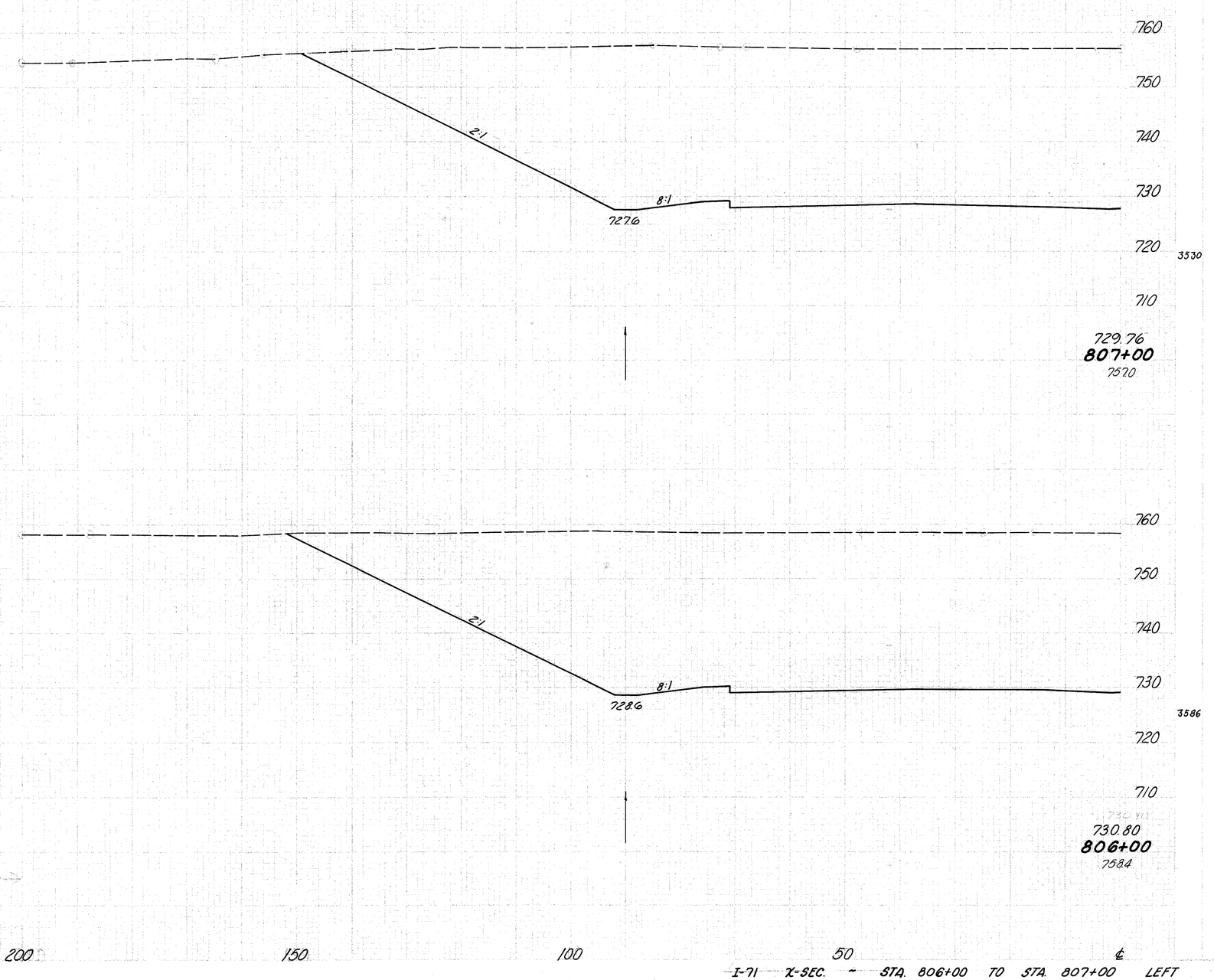
27,048

7154

I-71 X-SEC. ~ STA. 803+00 TO STA. 805+00 RIGHT

DESCRIPTION	PLOTTED/INKED	CALCULATED	CHECKED
PROPOSED GROUND	BY	BY	BY
TRAPEZOIDS	DATE	DATE	DATE
DRAINAGE	BY	BY	6-82
STRUCTURES	DATE	DATE	
EARTHWORK	10/26/82		
EARTHWORK AREAS			

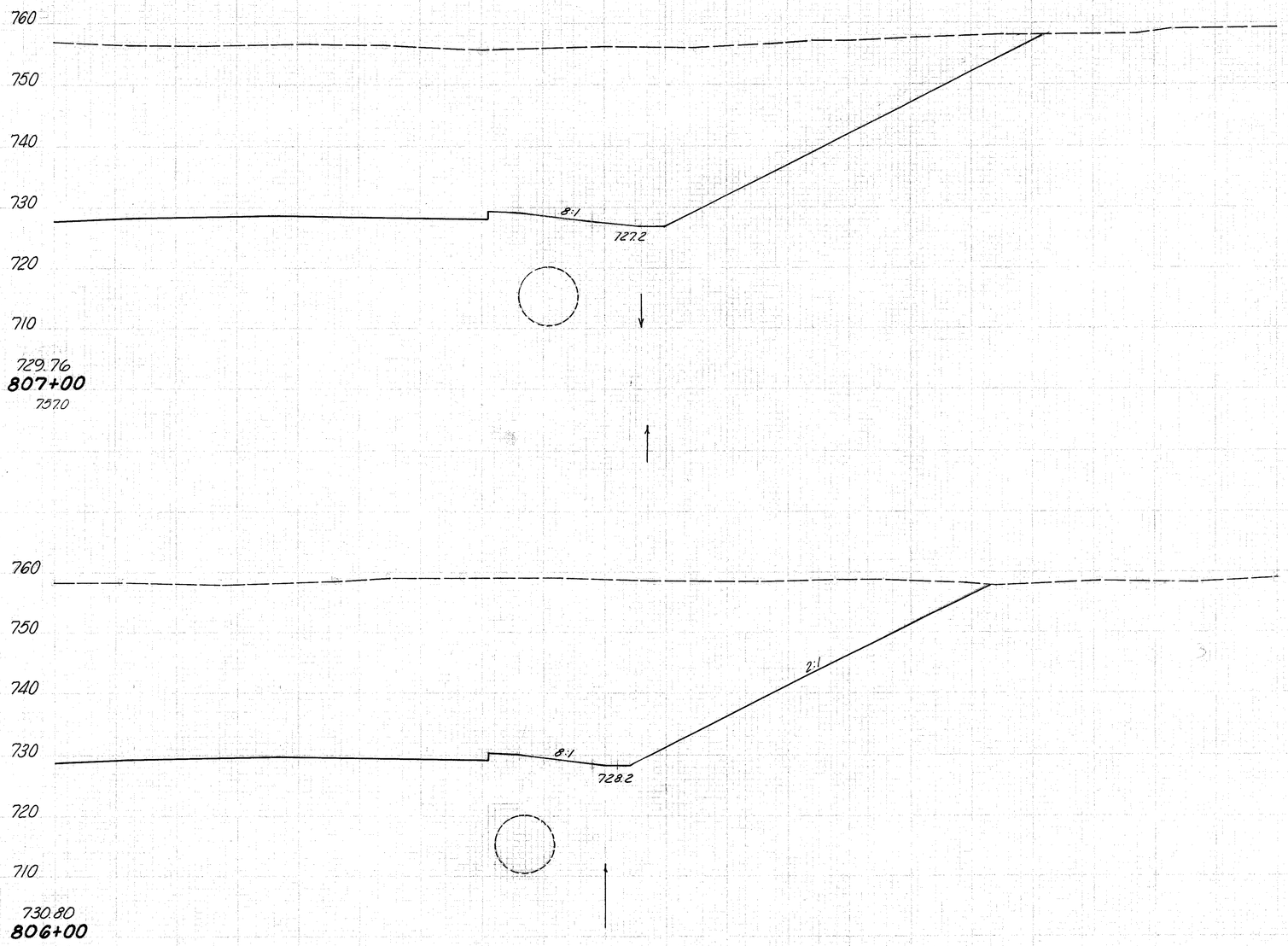
CUYAHOGA COUNTY
CUY-71-13.68



I-71 X-SEC. ~ STA. 806+00 TO STA. 807+00 LEFT

DESCRIPTION	PLOTTED-INKED BY	DATE	CALCULATED BY	DATE	CHECKED BY	DATE
EXISTING GROUND						
TEMP. GRADE	UPM	10/13/83			S	5/84
DRAINAGE						
SURFACE						
EARTHWORK						
BORROW AREAS						

CUYAHOGA COUNTY
CUY-71-13.68



3594
3530
7124

26,619

3664
3586
7250

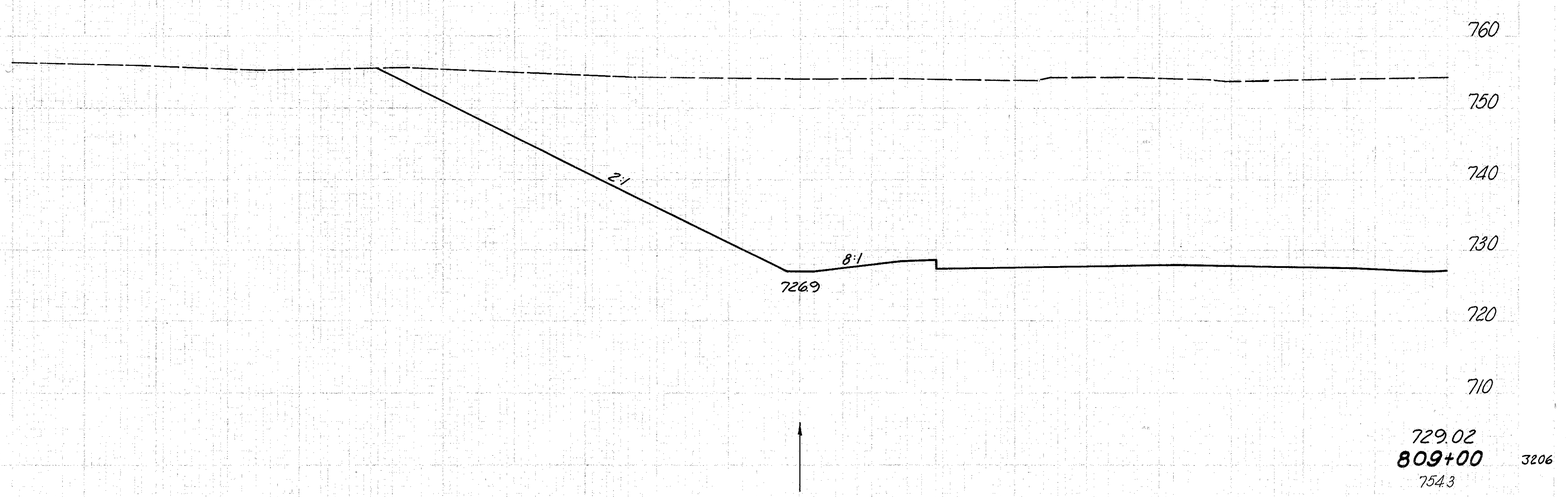
26,475

7046

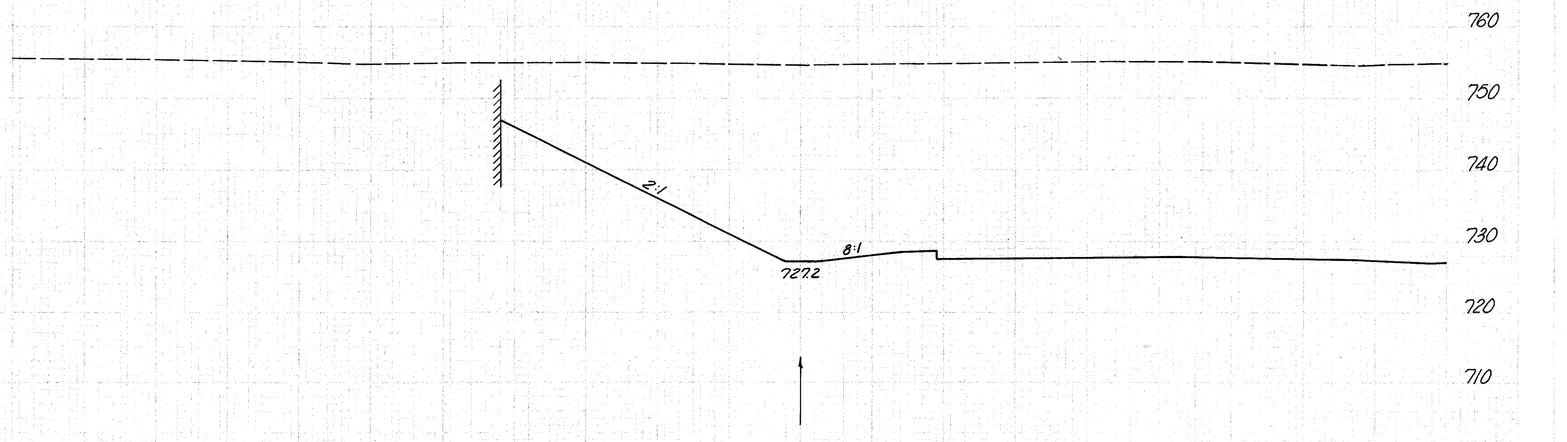
I-71 X-SEC. ~ STA. 806+00 TO STA. 807+00 RIGHT

DESCRIPTION	PLOTTED	INKED	CALCULATED	CHECKED
CONTROL BEHIND	BY	DATE	BY	DATE
TRAFFIC	5/		W.F.	
DRAINAGE	DATE	12/30	DATE	5-95
STRUCTURES				
EARTHWORK				
EXISTING AREAS				

CUYAHOGA COUNTY
CUY-71-13.68



729.02
809+00
754.3
3206



729.16
808+00
754.9
3224

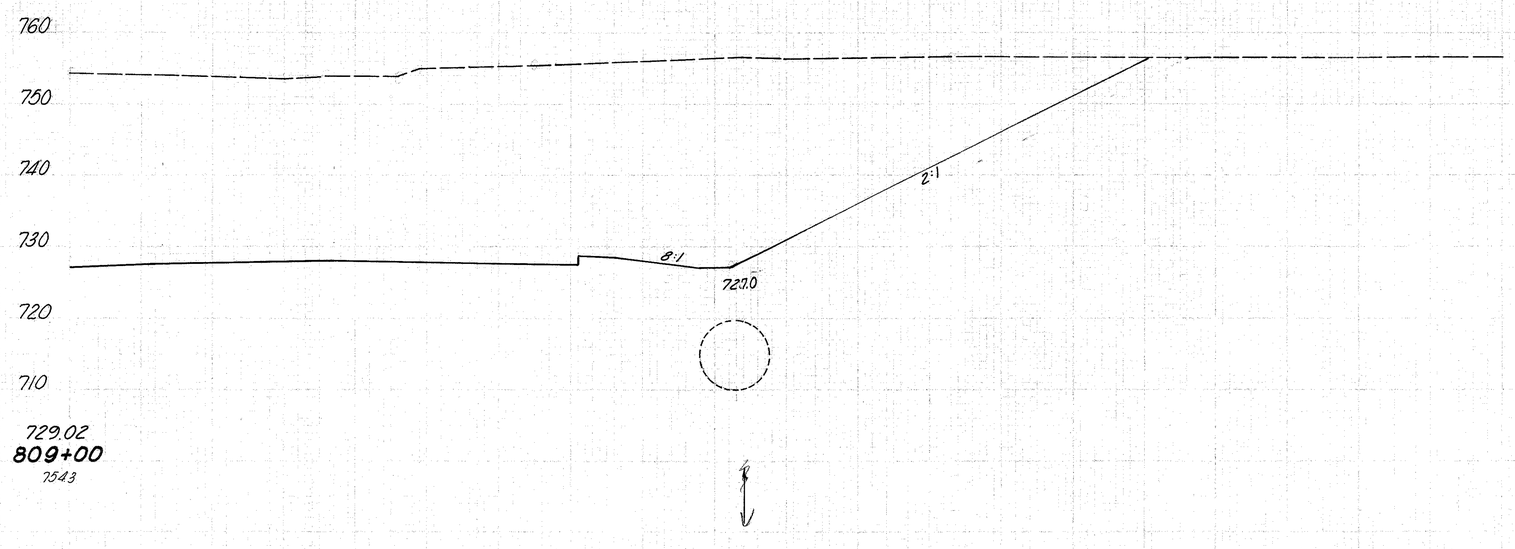
200 150 100 50 ℄

I-71 X-SEC. ~ STA. 808+00 TO STA. 809+00 LEFT

PLOTTED/INKED BY JAM 10/5/16
CALCULATED BY DATE
CHECKED BY S DATE 5-98

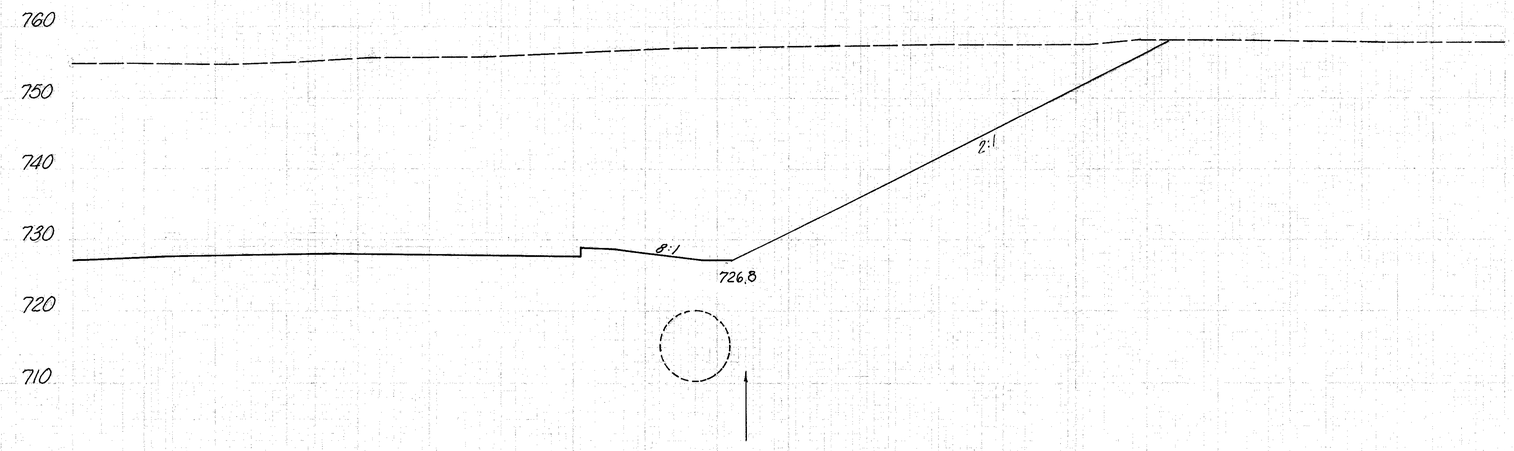
45
279

CUYAHOGA COUNTY
CUY-71-13.68



729.02
809+00
754.3

3520
3206
6726



729.16
808+00
754.9

25,219

3668
3224
6892

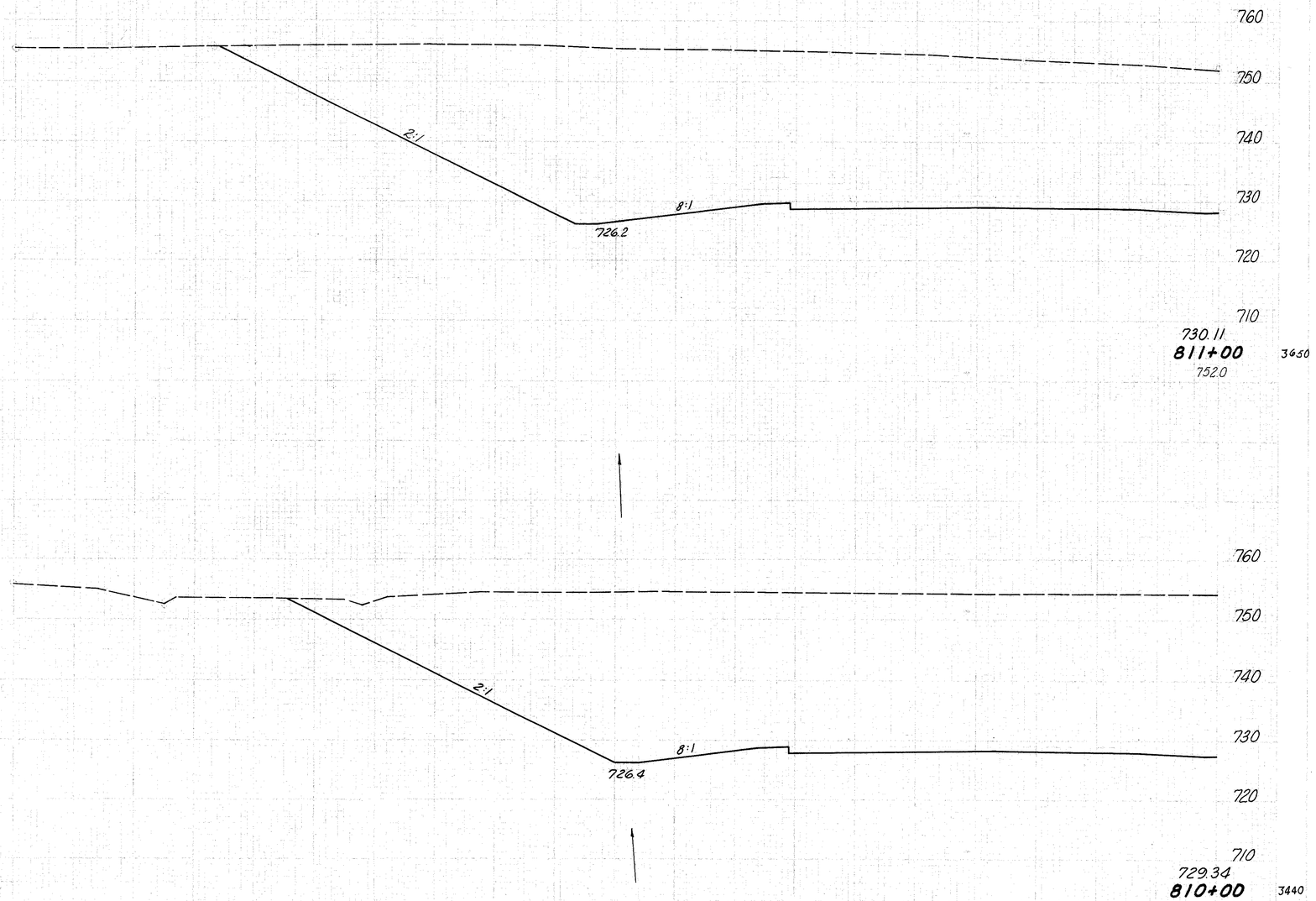
25,956

℄ 50 100 150 200 250 STA. 807+00 7124

I-71 X-SEC. - STA. 808+00 TO STA. 809+00 RIGHT

DESCRIPTION	PLOTTED/INKED	CALCULATED	CHECKED
ORIGINAL GROUND	BY	BY	BY
TEMP. FILLS	DATE	DATE	DATE
PAVEMENT			
PAVEMENT			
STRUCTURES			
SUBBASE & BASE			

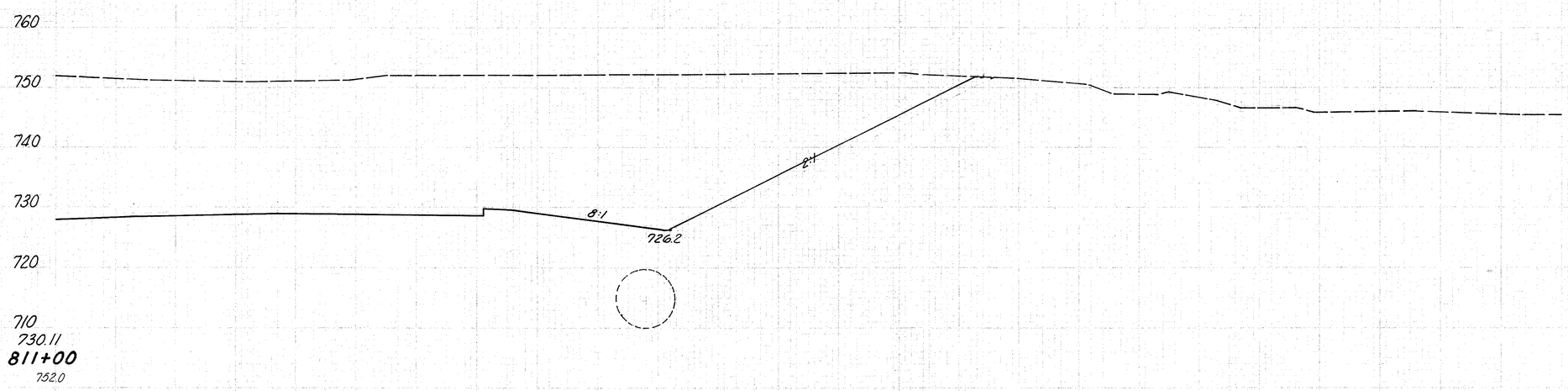
CUYAHOGA COUNTY
CUY-71-13.68



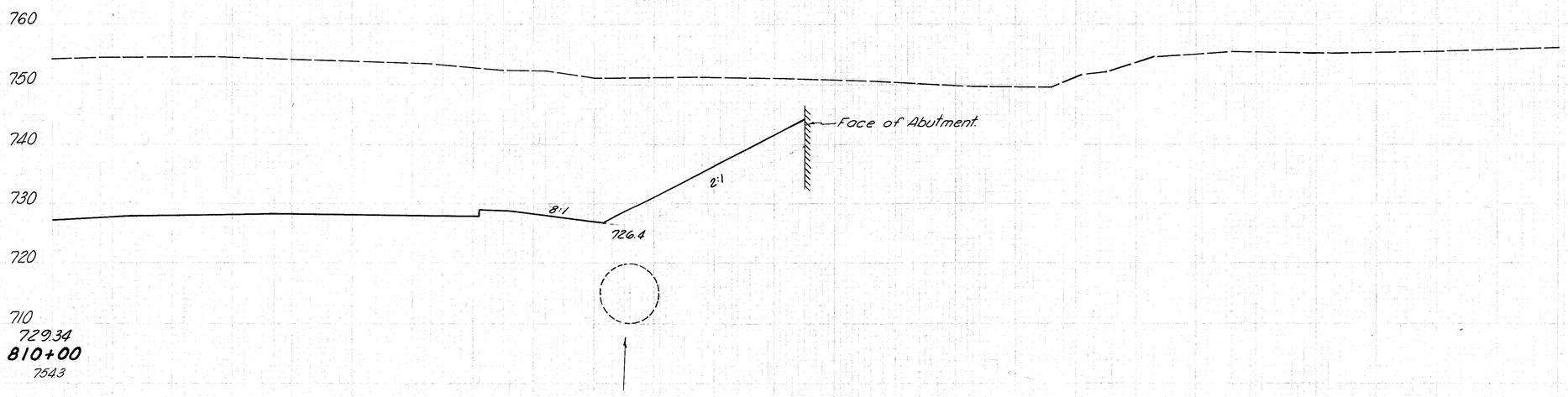
I-71 X-SEC. ~ STA. 810+00 TO STA. 811+00 LEFT

DESCRIPTION	PLOTTED-INKED	CALCULATED	CHECKED
ORIGINAL GROUND	VSM		S.Gd
PROPOSED	10.23.03		
DRAINAGE			
EXIST. AREAS			
R/W & CONST.			
EXISTING AREAS			

CUYAHOGA COUNTY
CUY-71-13.68



3022
3650
6672



24,053

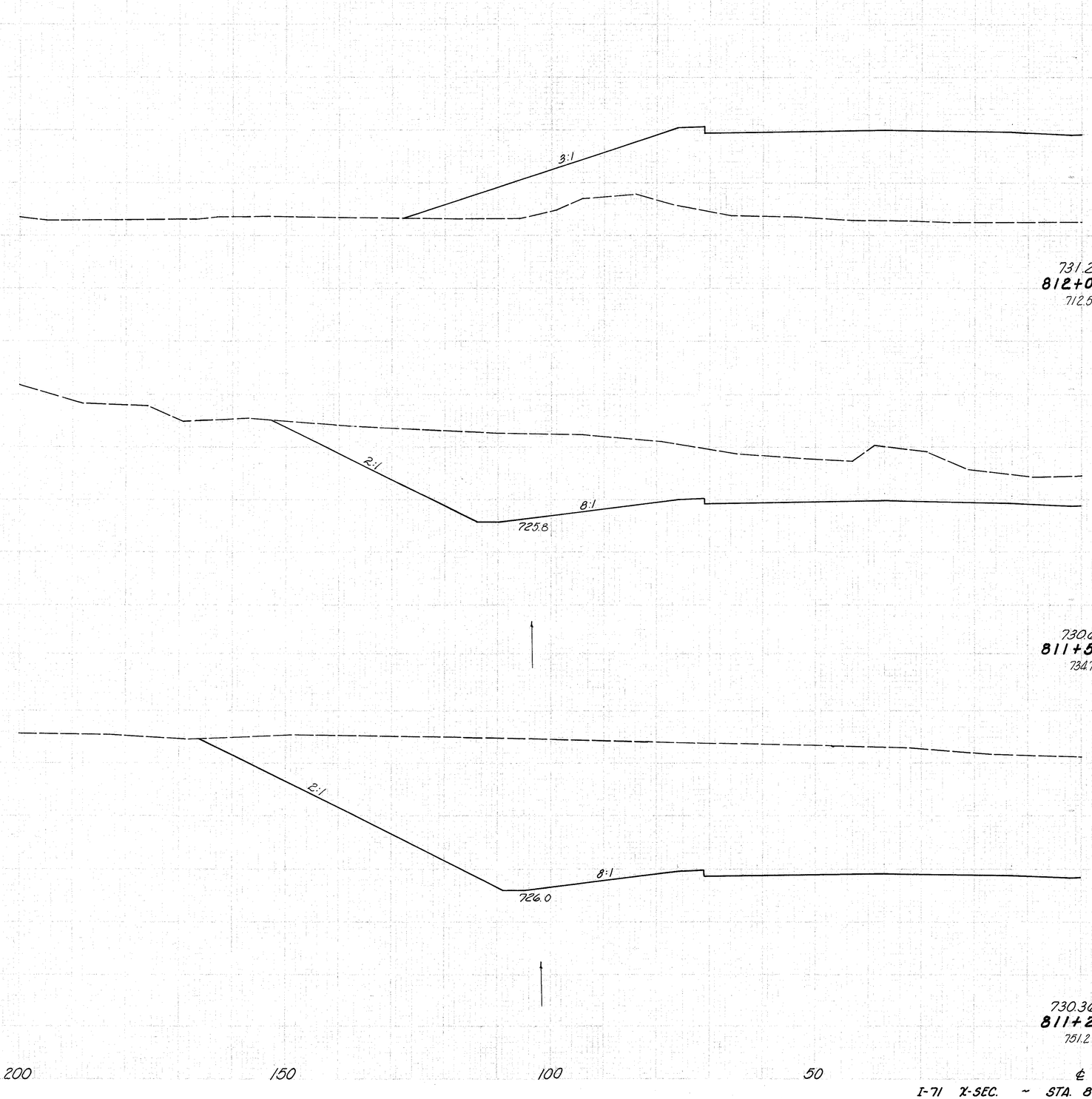
2876
3440
6316

24,153

6726

I-71 X-SEC. - STA. 810+00 TO STA. 811+00 RIGHT

CUYAHOGA COUNTY
CUY-71-13.68



1624

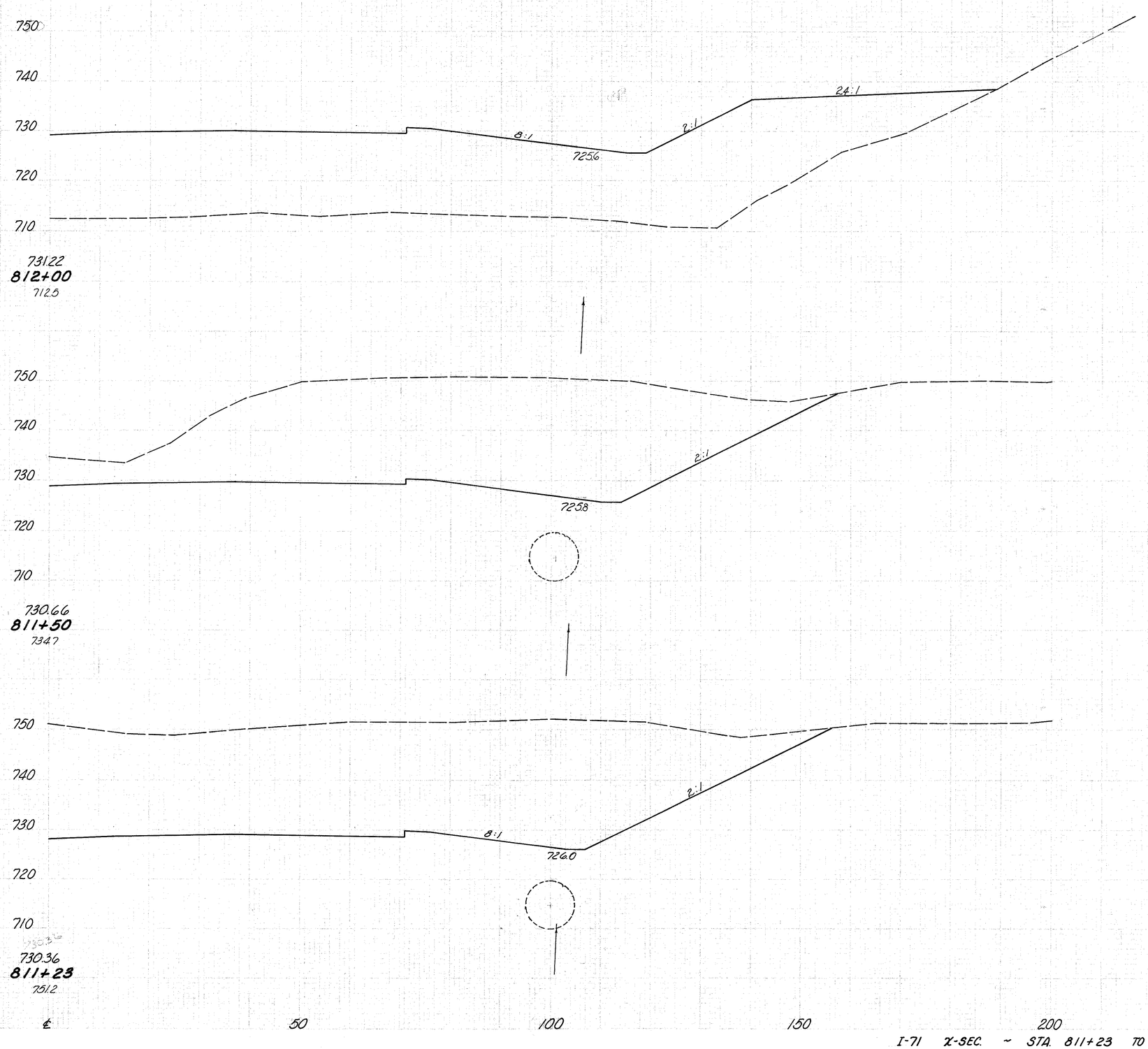
1484

3560

I-71 X-SEC. ~ STA. 811+23 TO STA. 812+00 LEFT

DESCRIPTION	PLOTTED/INKED	CALCULATED	CHECKED
	BY	BY	BY
	DATE	DATE	DATE
EXISTING GROUND	CDM 10/30		S 2-02
TOPSOIL DEPTH			
SHRINKAGE			
ROCK LINE			
EARTHWORK			
BEDDING AREAS			

CUYAHOGA COUNTY
CUY-71-13.68



2838
1624
4462

3592 4131

2396
1484
3880

5207

2974
3560
6534

5625

6672

I-71 X-SEC. ~ STA. 811+23 TO STA. 812+00 RIGHT

DESCRIPTION	PLOTTED/INKED	CALCULATED	CHECKED
TOP SOIL, GROUND	DATE 7-8-74	BY	BY
3" MATTE	BY W.K.	DATE	DATE 5-82
ROUNDED			
EARTHWORK			
LAYOUT 2			

50
279

CUYAHOGA COUNTY
CUY-71-13.68

DESCRIPTION	PLOTTED/INKED BY	DATE	CALCULATED BY	DATE	CHECKED BY	DATE
ORIGINAL GROUND	R.J.J.	8-8-63				
SURFACES						
DRAINAGE						
END AREAS						
QUANTITIES						
SECOND AREAS						

760
750
740
730
720
710

4:1
4:1
717.5

732.34
813+00
719.1

19 617

760
750
740
730
720
710

3:1

731.72
812+45
714.2

1654

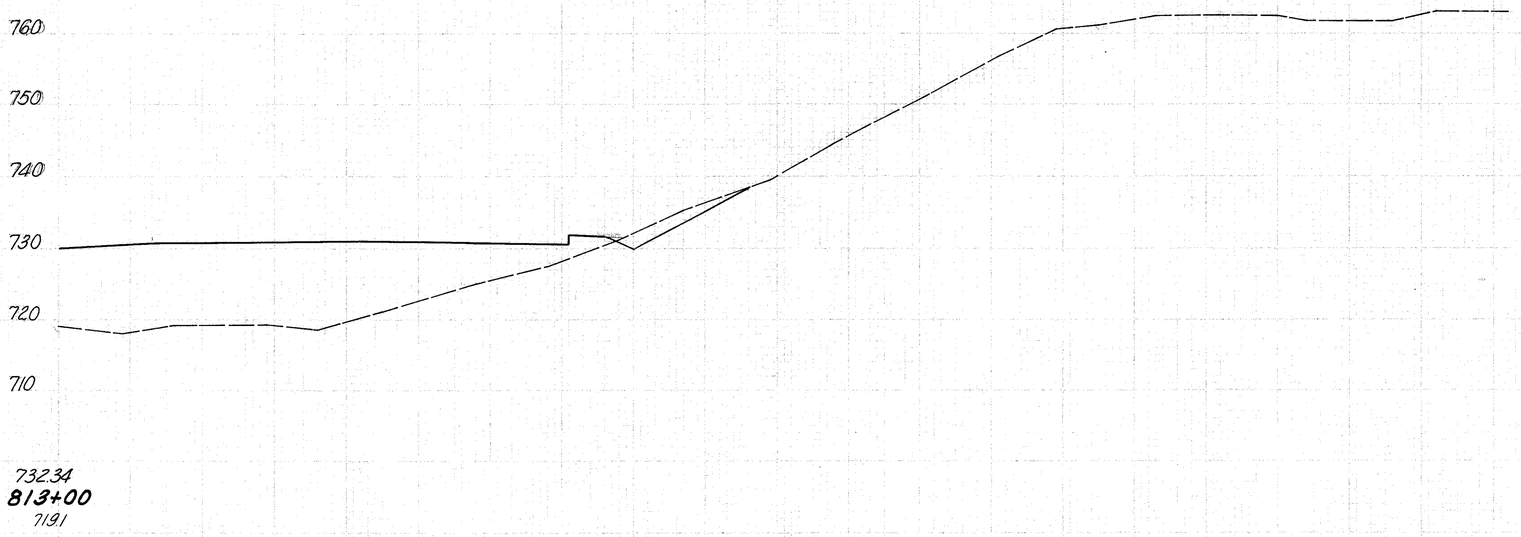
200 150 100 50 ℄

I-71 X-SEC. ~ STA. 812+45 TO STA. 813+00 LEFT

102

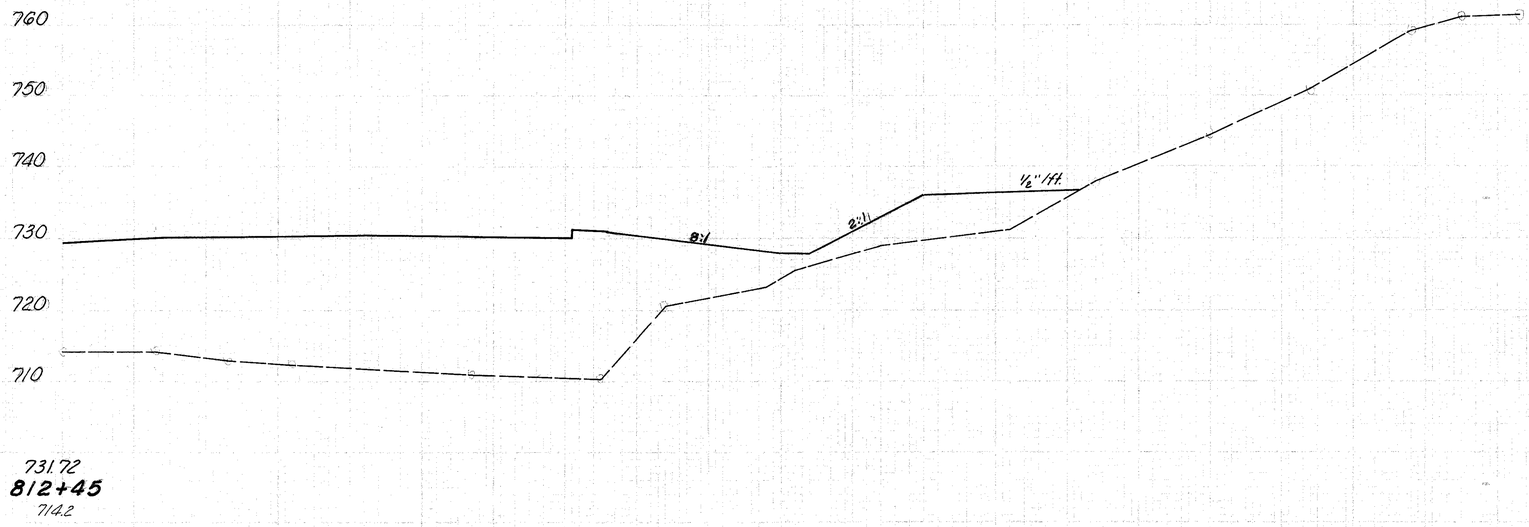
51
2.79

CUYAHOGA COUNTY
CUY-71-13.68



732.34
813+00
719.1

22 692
19 617
41 1309



731.72
812+45
714.2

42 4830

1780
1654
3434

6580

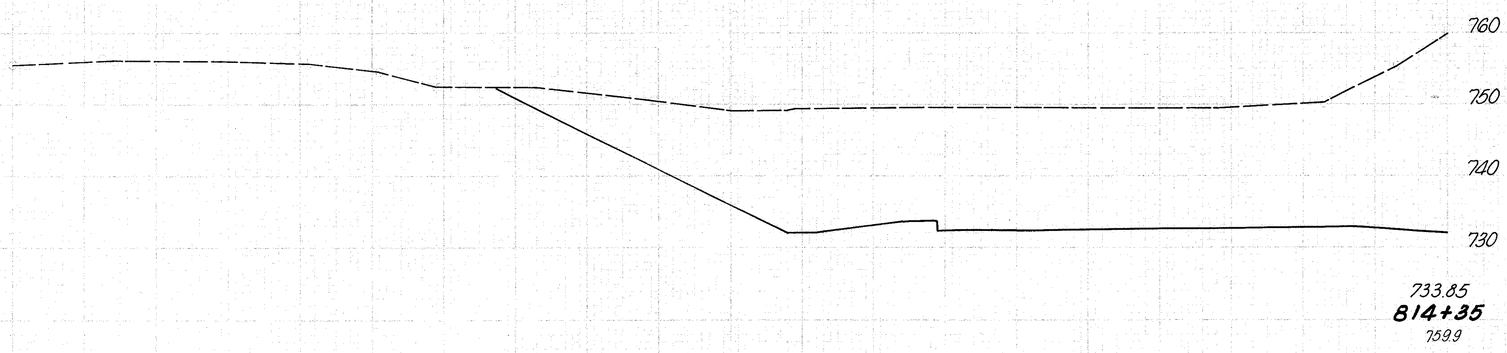
4462

℄ 50 100 150 200 STA. 812+00

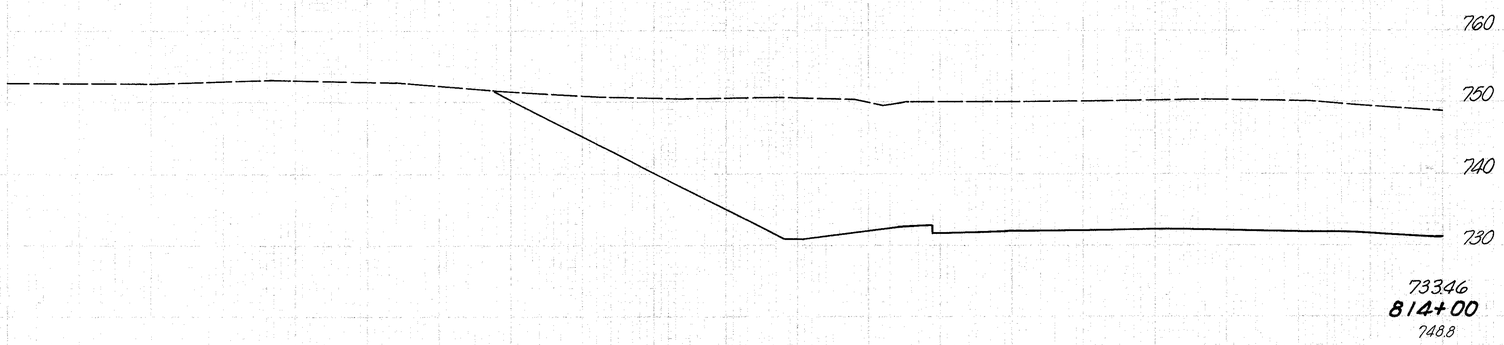
I-71 X-SEC. ~ STA. 812+45 TO STA. 813+00 RIGHT

52
279

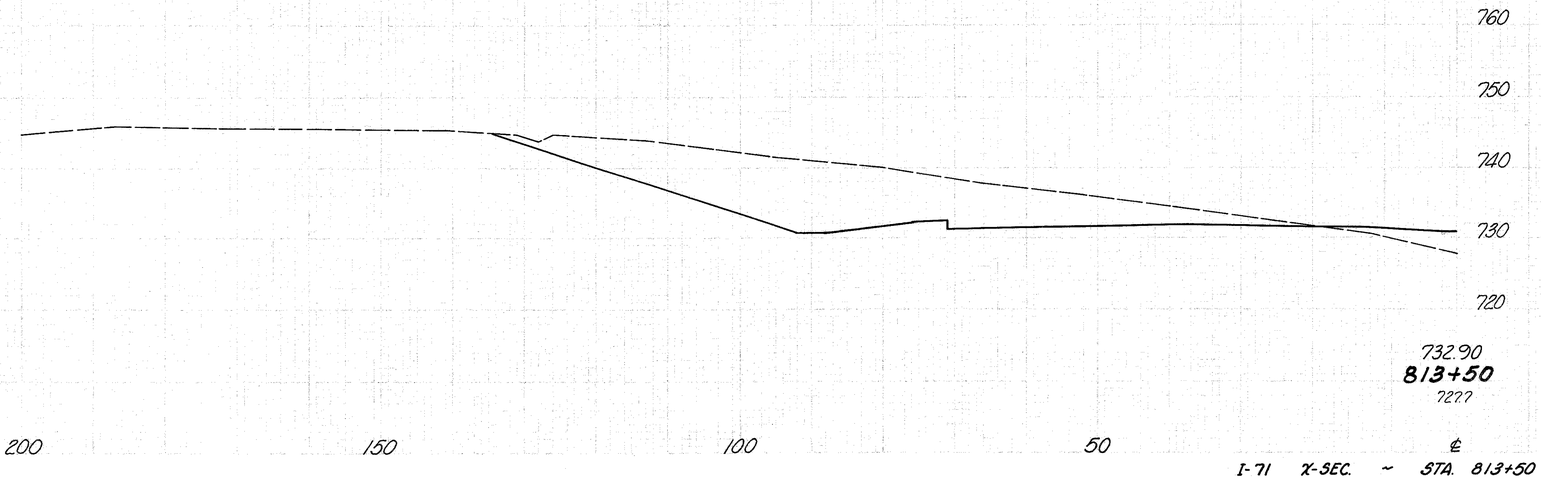
CUYAHOGA COUNTY
CUY-71-13.68



1998



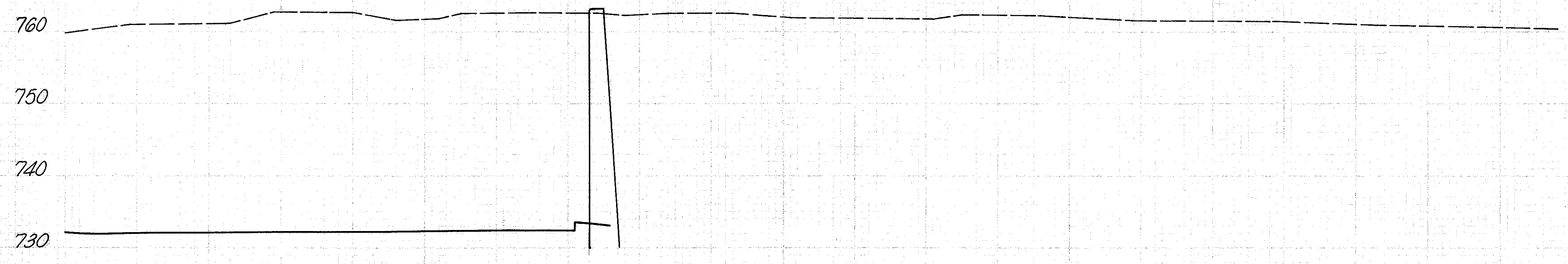
2054



602 25

I-71 X-SEC. ~ STA. 813+50 TO STA. 814+35 LEFT

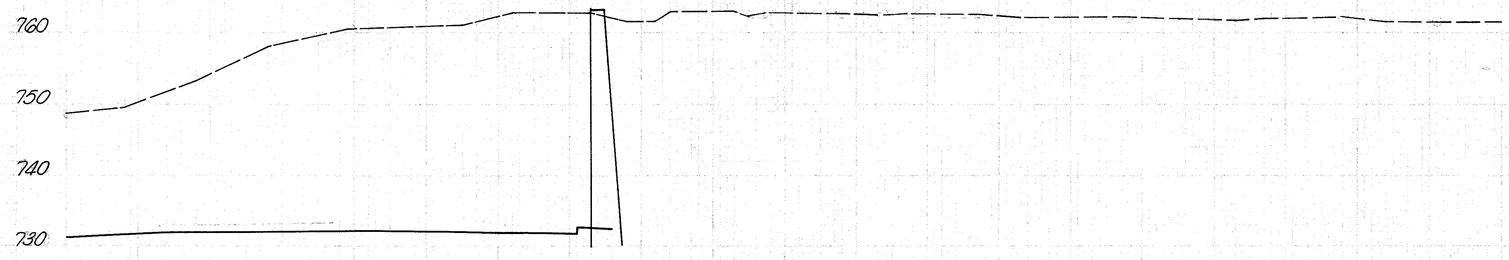
CUYAHOCA COUNTY
CUY-71-13.68



733.85
814+35
759.9

2159
1998
4157

5232



733.46
814+00
748.8

1866
2054
3920

4580 97

732.90
813+50
727.7

425 80
602 25
1027 105

983 1309

℄ 50 100 150 200 STA. 813+00

41 1309

I-71 X-SEC. ~ STA. 813+50 TO STA. 814+35 RIGHT

DESCRIPTION	PLOTTED/INKED BY	DATE	CALCULATED BY	DATE	CHECKED BY	DATE
ORIGINAL GROUND	D.J.J.	11-26-85				
SURFACE						
DRAINAGE						
CNST. APP.						
MATERIAL						
SEE TYPICAL AREAS						

DESIGN	DRAWN	TRACED	CHECKED

DESCRIPTION	PLOTTED-INKED	CALCULATED	CHECKED
ORIGINAL GROUND	BY VBM 10/26/63	BY MAK	BY DATE
ESTIMATES			
INDEX MAP			
FOG AREAS			
EARTHWORK			
MISC. DATA			

54
279

CUYAHOGA COUNTY
CUY-71-13.68

SHEET NO.	AREA CUT	AREA FILL	VOLUME CUT	VOLUME FILL

760
750
740
730

2070

735.14
815+50
761.8

760
750
740
730

2919

734.58
815+00
761.9

760
750
740
730

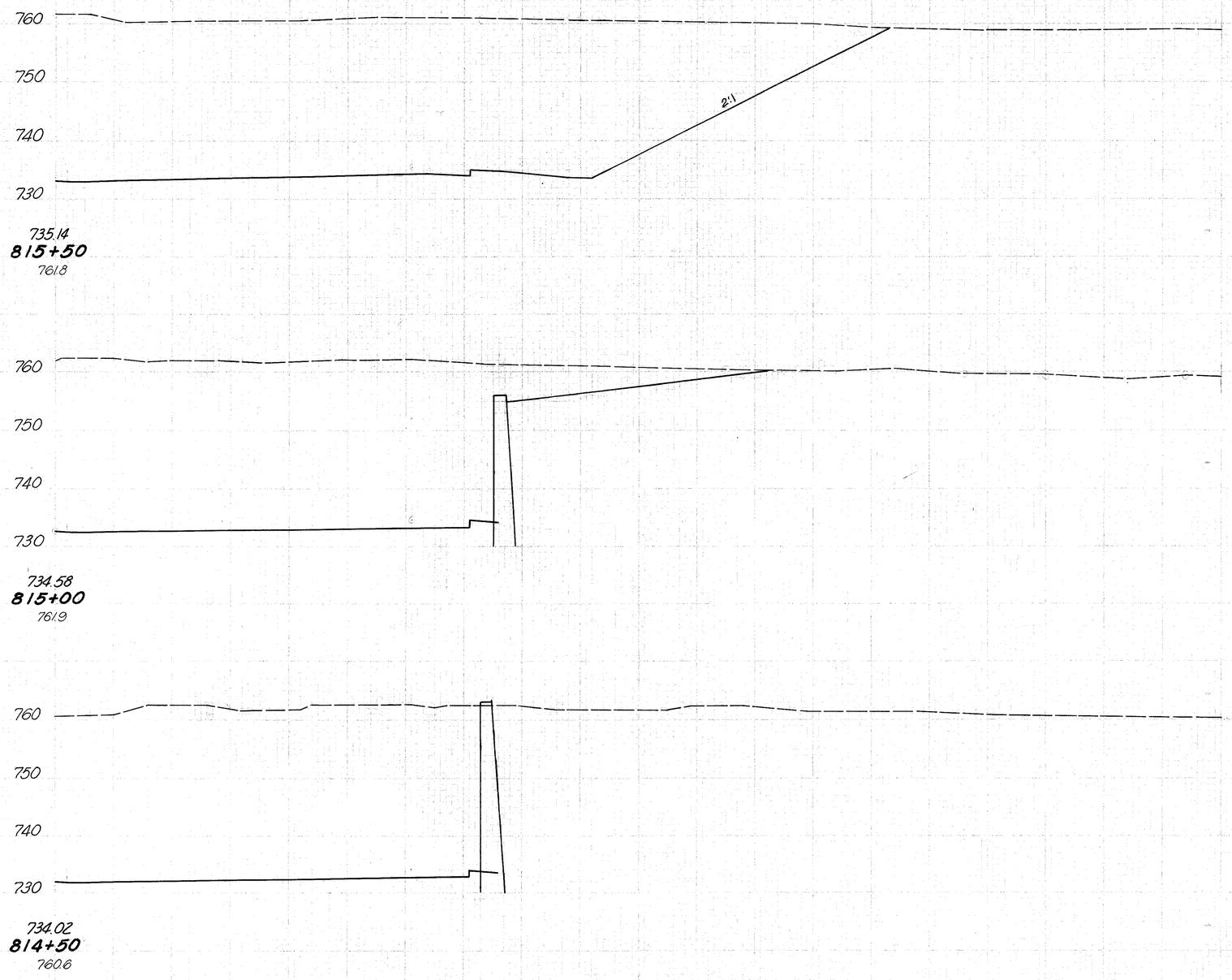
2166

734.02
814+50
760.6

200 150 100 50 ℄

I-71 X-SEC. ~ STA. 814+50 TO STA. 815+50 LEFT

CUYAHOGA COUNTY
CUY-71-13.68



I-71 X-SEC. ~ STA. 814+50 TO STA. 815+50 RIGHT

DESCRIPTION	PLOTTED-INKED	CALCULATED	CHECKED
1. ORIGINAL GROUND	BY: TJM 10/2/13	BY:	BY:
2. IMPLACES			
3. PAVING AREA			
4. C.I.D. AREA			
5. R/W AREA			
6. GRADING AREAS			

CUYAHOGA COUNTY
CUY-71-13.68

PLOTTED/NKED		CALCULATED		CHECKED	
BY	DATE	BY	DATE	BY	DATE
DESCRIPTION					
ORIGINAL GROUND					
FINISH GRADE					
SUBGRADE					
END AREAS					
CUT AREA =					
FILL AREA =					

760
750
740
730

737.94
818+00
759.0

3215

760
750
740
730

736.82
817+00
760.5

2636

760
750
740
730

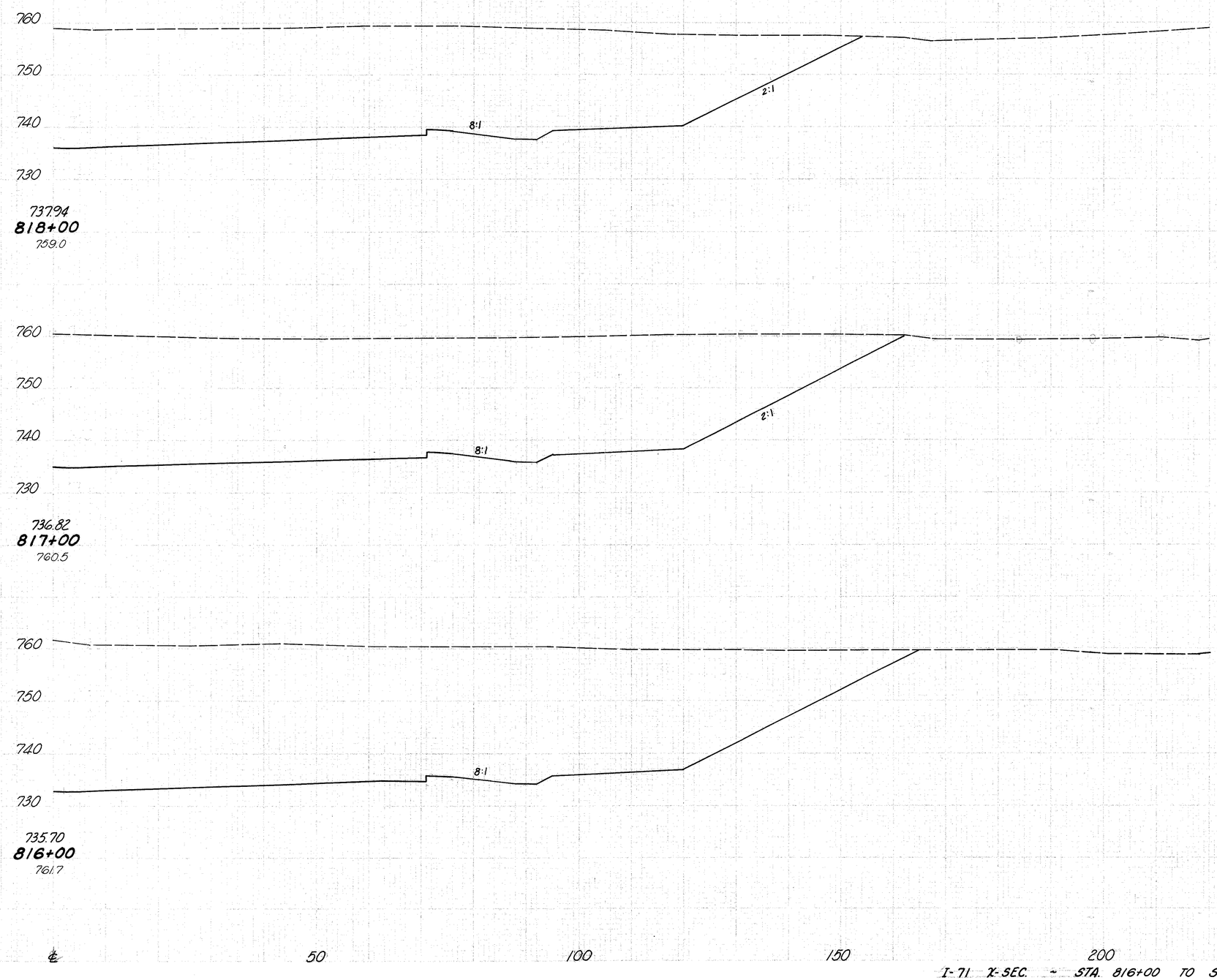
735.70
816+00
761.7

1993

200 150 100 50 ℄

I-71 X-SEC. ~ STA. 816+00 TO STA. 818+00 LEFT

CUYAHOGA COUNTY
CUY.-71-13.68



2801
3215
6016

22,110

3287
2636
5923

21,341

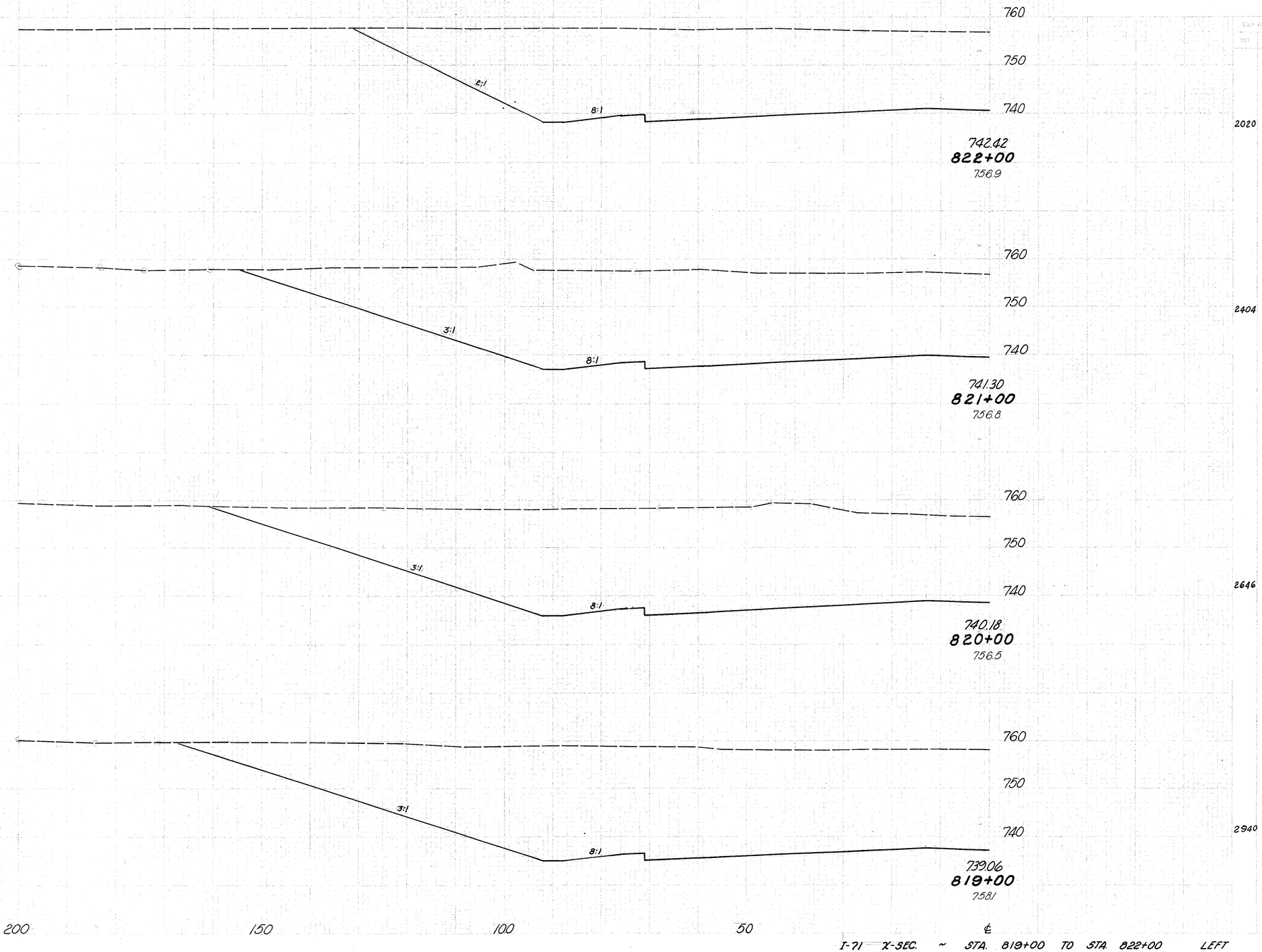
3608
1993
5601

10,035

I-71 X-SEC. ~ STA. 816+00 TO STA. 818+00 RIGHT

58
279

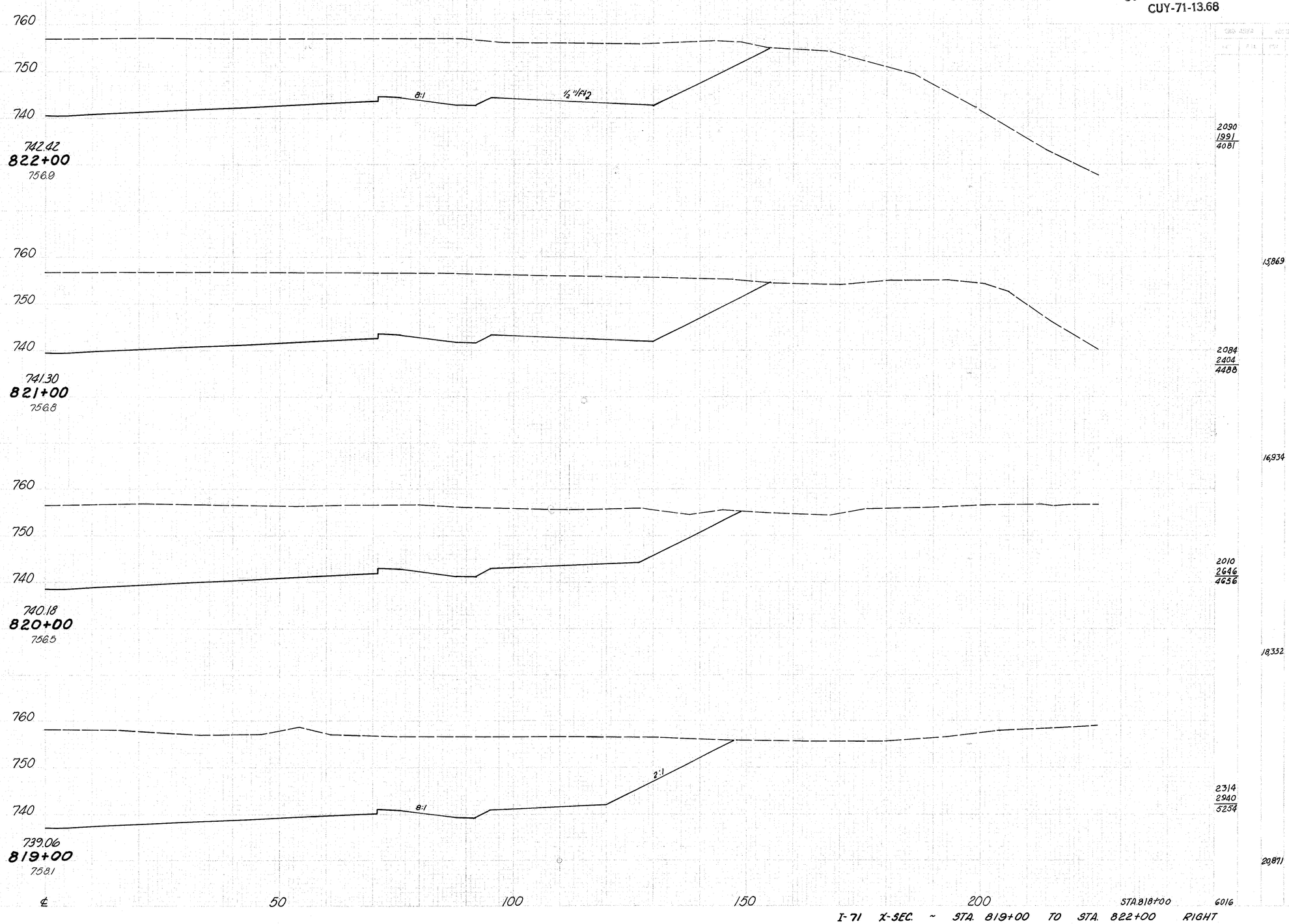
CUYAHOGA COUNTY
CUY-71-13.68



I-71 X-SEC. ~ STA. 819+00 TO STA. 822+00 LEFT

DESCRIPTION	PLOTTED-INKED	CALCULATED	CHECKED
ORIGINAL GROUND	BY	BY	BY
FUTURE	DATE	DATE	DATE
DRAINAGE			
END AREAS			
EXCAVATION			
BEDDING AREAS			

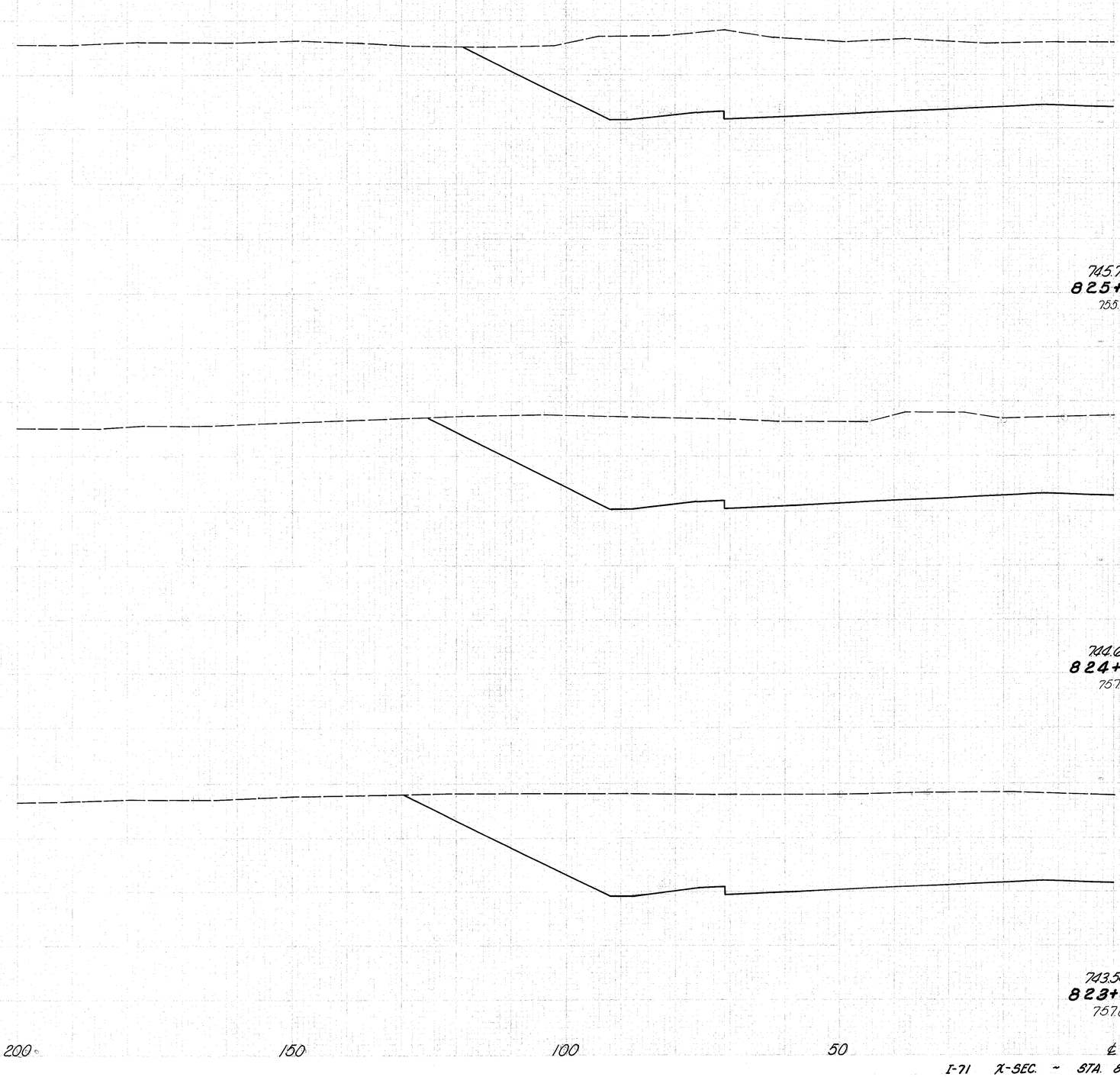
CUYAHOGA COUNTY
CUY-71-13.68



I-71 X-SEC. ~ STA. 819+00 TO STA. 822+00 RIGHT

60
279

CUYAHOGA COUNTY
CUY-71-13.68



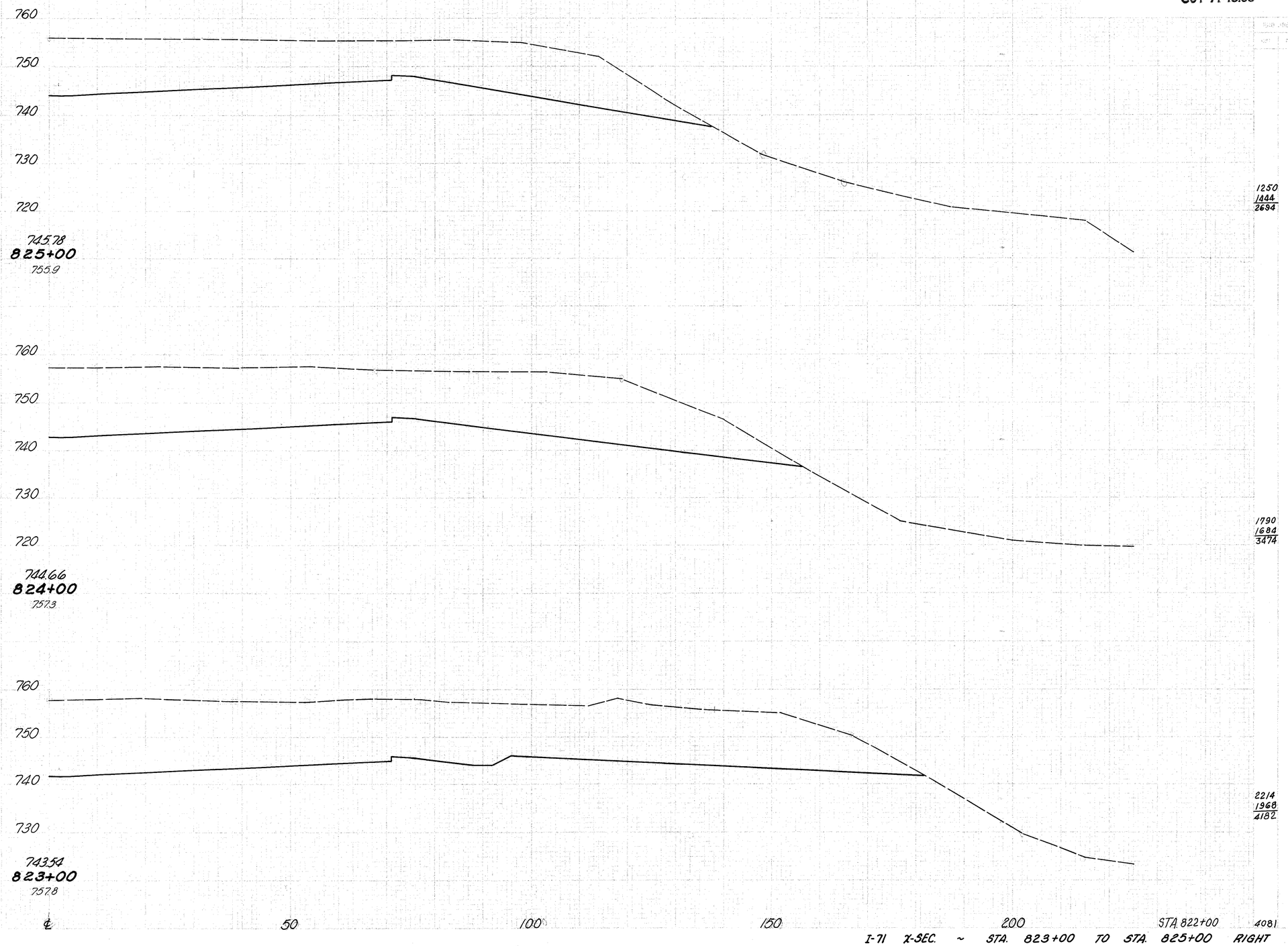
1444

1684

1968

I-71 X-SEC. ~ STA. 823+00 TO STA. 825+00 LEFT

CUYAHOGA COUNTY
CUY-71-13.68



I-71 X-SEC. ~ STA. 823+00 TO STA. 825+00 RIGHT

PLOTTED-INKED	CALCULATED	CHECKED
BY	BY	BY
DATE	DATE	DATE

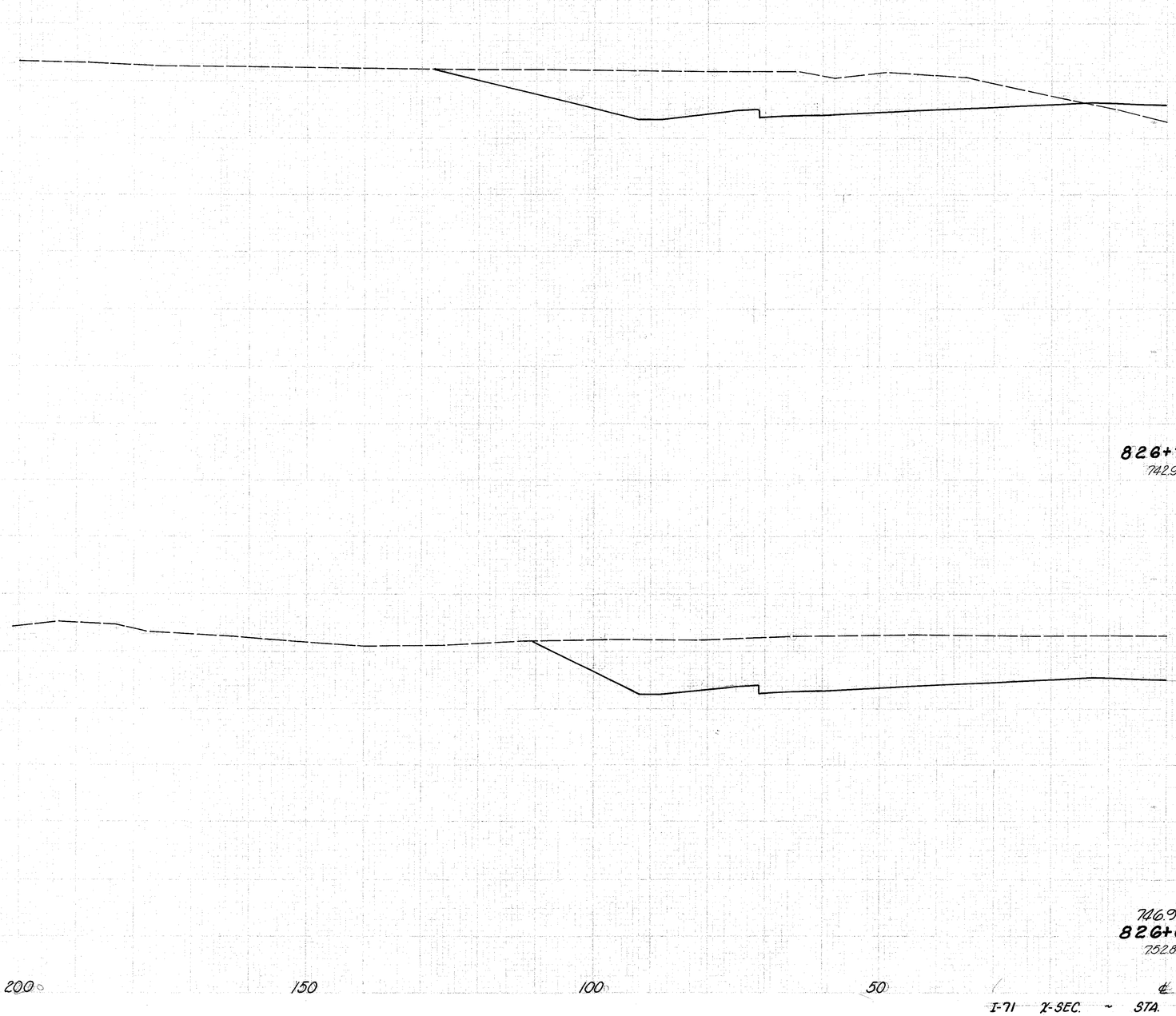
DESCRIPTION	AREA
ORIGINAL GROUND	1028.5
TEMPLATES	
FINISH	
END AREAS	
EARTHWORK	
BALANCE POINTS	

STATE	SHEET	PROJECT
OHIO		

62
279

CUYAHOGA COUNTY
CUY-71-13.68

DESCRIPTION	PLOTTED-INKED BY	DATE	CALCULATED BY	DATE	CHECKED BY	DATE
ORIGINAL GROUND						
TEMPLATES						
REMARKS						
EXC AREAS						
EARTHWORK						
LIQUIDATIONS						



AREA (SQ FT)		VOLUME (CU YD)	
CUT	FILL	CUT	FILL
		625	20
		880	0

I-71 X-SEC. ~ STA. 826+00 TO STA. 826+77 LEFT

63
279

CUYAHOGA COUNTY
CUY-71-13.68

760
750
740
730
720
710
700

102 103
625 20
727 123

826+77
742.9

3375 285

750
740
730
720
710

760 77
880 0
1640 77

746.90
826+00
752.8

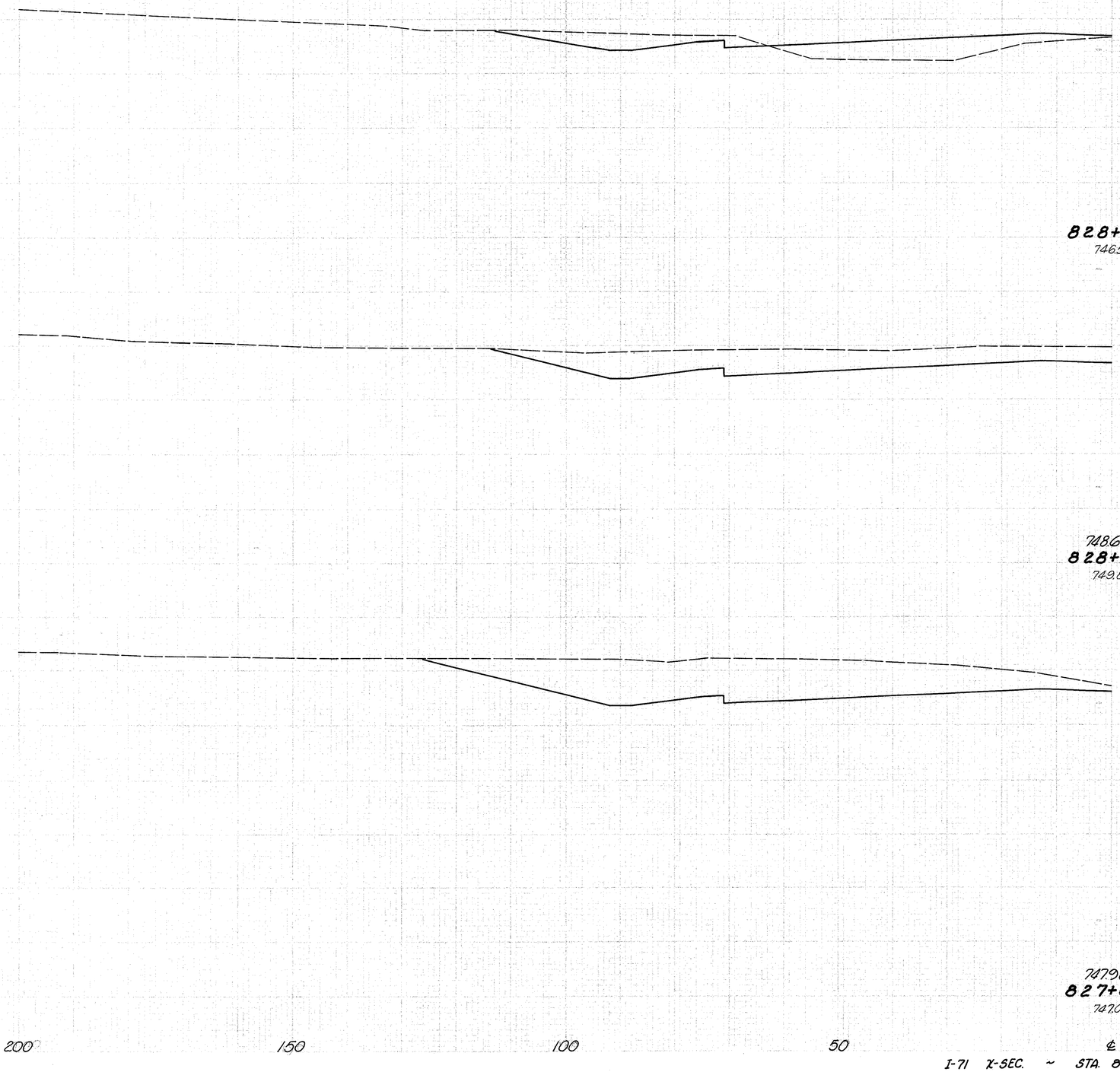
8026 142

℄ 50 100 150 200 STA. 825+00 2694

I-71 X-SEC. ~ STA. 826+00 TO STA. 826+77 RIGHT

DESCRIPTION	PLOTTED/INKED BY	DATE	CALCULATED BY	DATE	CHECKED BY	DATE
ORIGINAL GROUND	VDM	10.28.02				
TEMPLATES						
PAVEMENT						
END AREAS						
EARTHWORK						
MISCELLANEOUS						

CUYAHOGA COUNTY
CUY-71-13.68



86 162

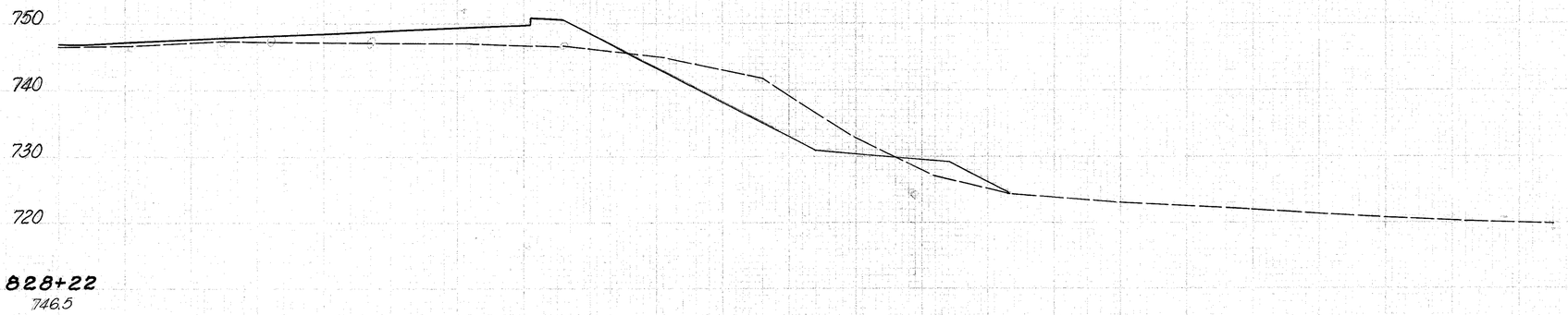
386 0

688 0

I-71 X-SEC. ~ STA. 827+00 TO STA. 828+22 LEFT

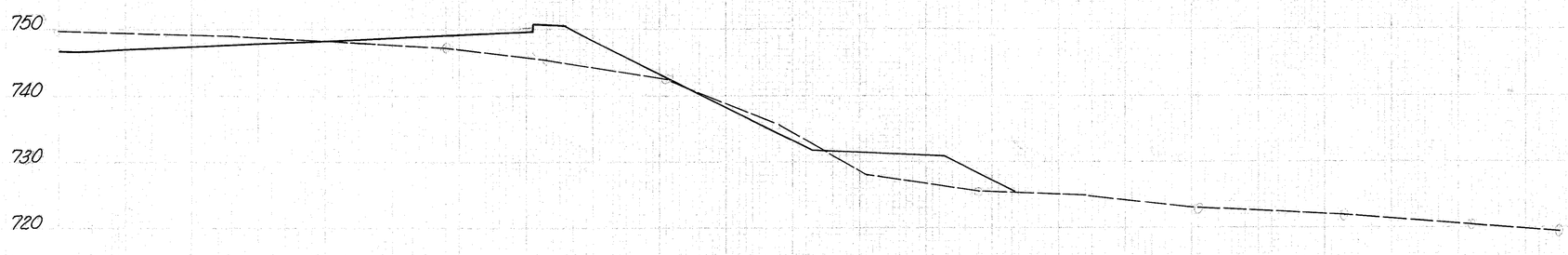
DESCRIPTION	PLOTTED/INKED BY / DATE	CALCULATED BY / DATE	CHECKED BY / DATE
ORIGINAL GROUND	DPM 10/28/03	MEL 8/13/04	
TOP OF PAVEMENT			
CHANNEL			
EXIST. AREAS			
NEW AREAS			
REMOVAL AREAS			

CUYAHOGA COUNTY
CUY-71-13.68



828+22
746.5

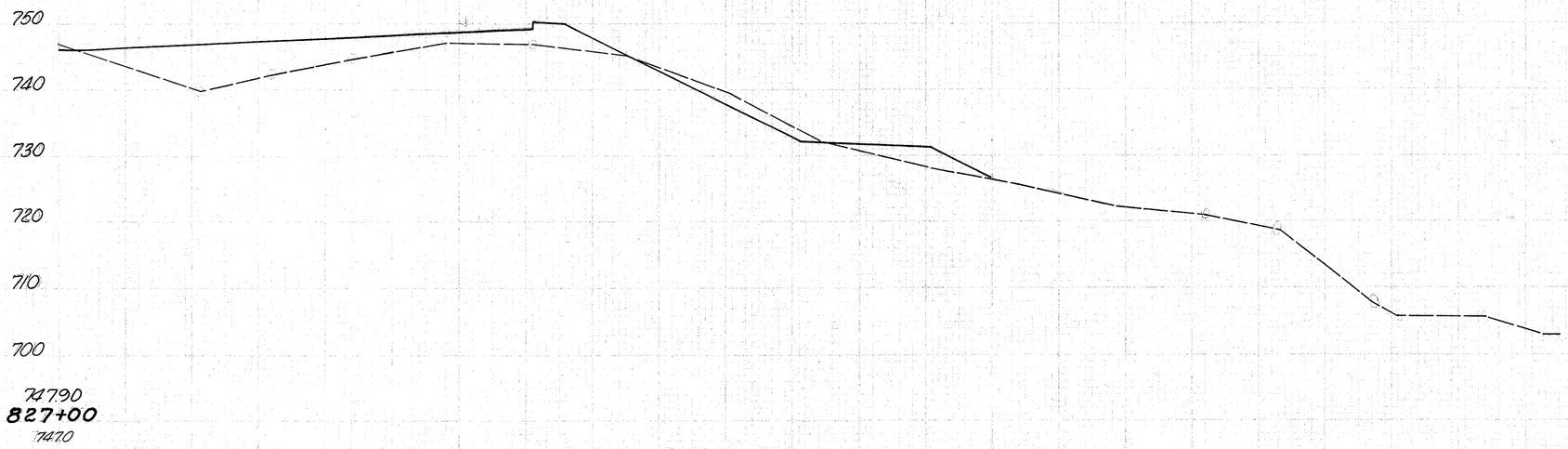
152 162
86 162
238 324



288 219

748.68
828+00
749.8

84 214
386 0
470 214



2215 989

38 320
688 0
726 320

747.90
827+00
747.0

619 189

℄ 50 100 150 200 STA. 826+77 727 123

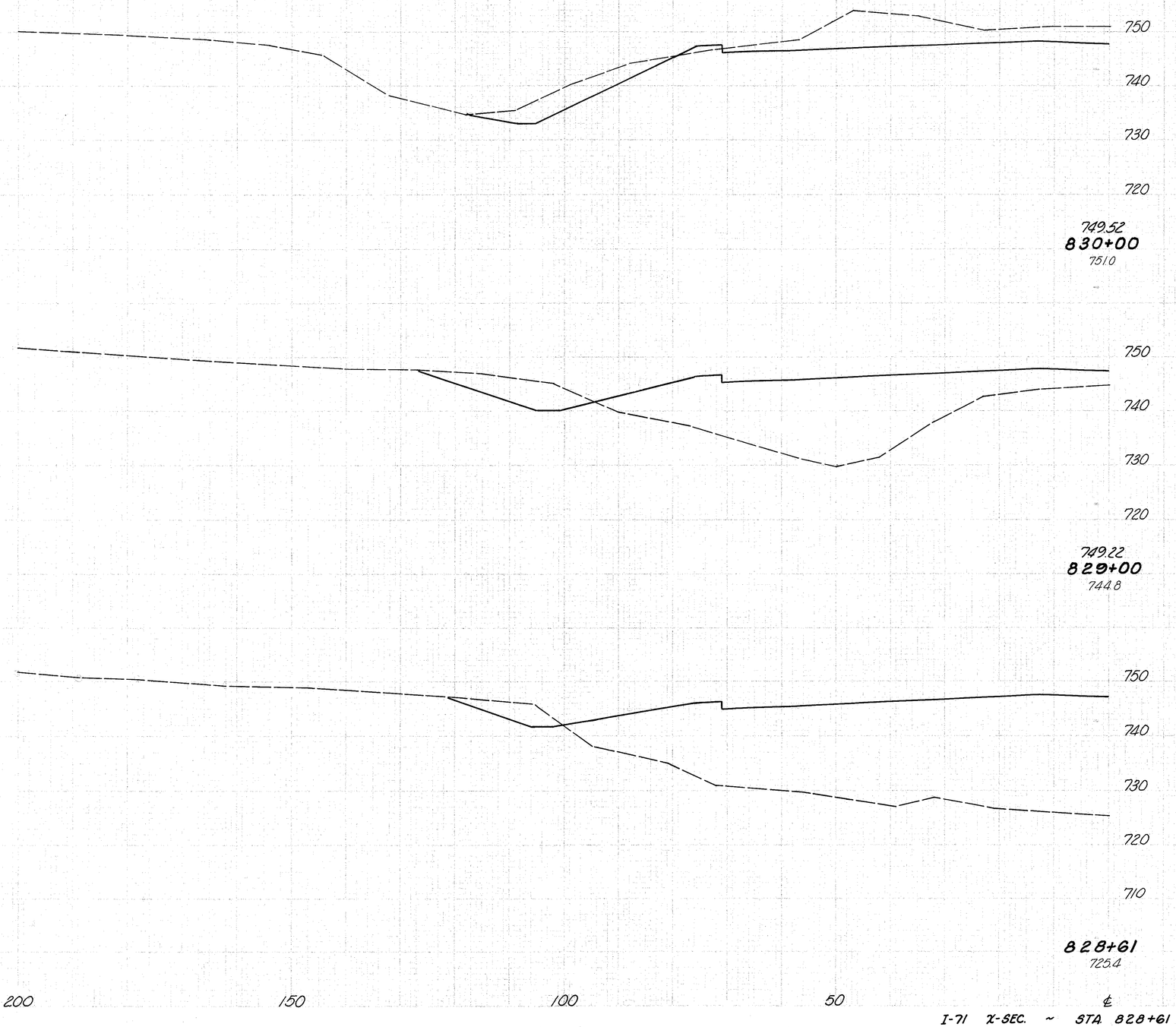
I-71 X-SEC. ~ STA. 827+00 TO STA. 828+22 RIGHT

PLOTTED	CALCULATED	CHECKED
BY	BY	BY
DATE 10/24/73	DATE	DATE

DESCRIPTION
ORIGINAL GROUND
TOP SOILED
PAVEMENT
ENG. AREAS
EARTHWORK
SUBGRADE AREAS

CUYAHOGA COUNTY
CUY-71-13.68

DESCRIPTION	PLOTTED/INKED	CALCULATED	CHECKED
	BY	BY	BY
ORIGINAL GROUND	VPM	DATE	DATE
TEMPLATES	10/28/85		
CURVE			
END AREAS			
EARTHWORKS			
SECOND CHECK			



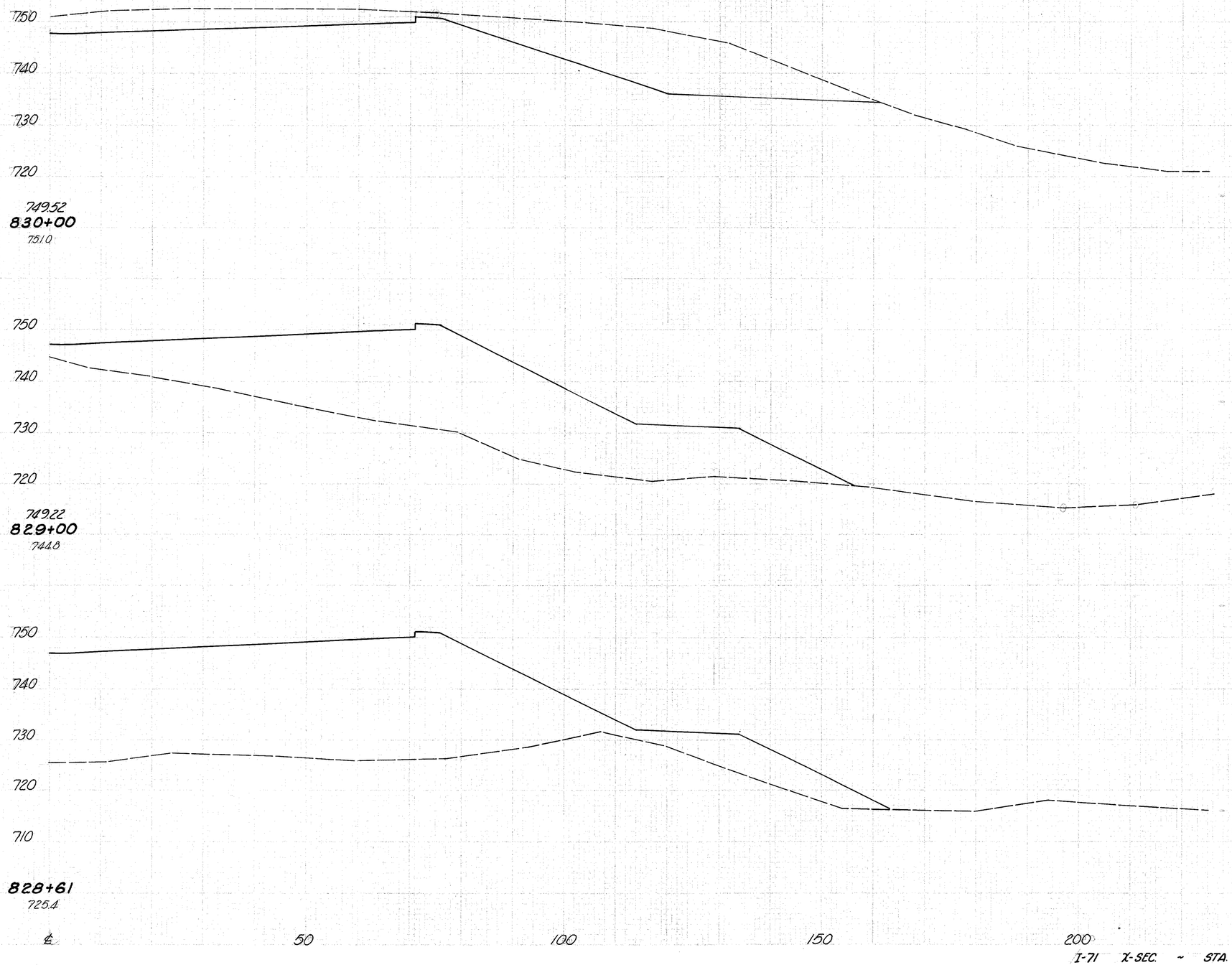
350 6

104 818

54 1592

I-71 X-SEC. ~ STA. 828+61 TO STA. 830+00 LEFT

CUYAHOGA COUNTY
CUY-71-13.68



DESCRIPTION	ADJUSTED/INKED	CALCULATED	CHECKED
	BY / DATE	BY / DATE	BY / DATE
ORIGINAL GROUND	VPM 10/23	MAT 8/16	
SURFACES			
ROADWAY			
END AREAS			
EARTHWORK			
SECTION SHEETS			

838	0
350	6
1188	6

2393 4859

0	1800
104	818
104	2618

114 4777

0	2424
54	1572
54	3996

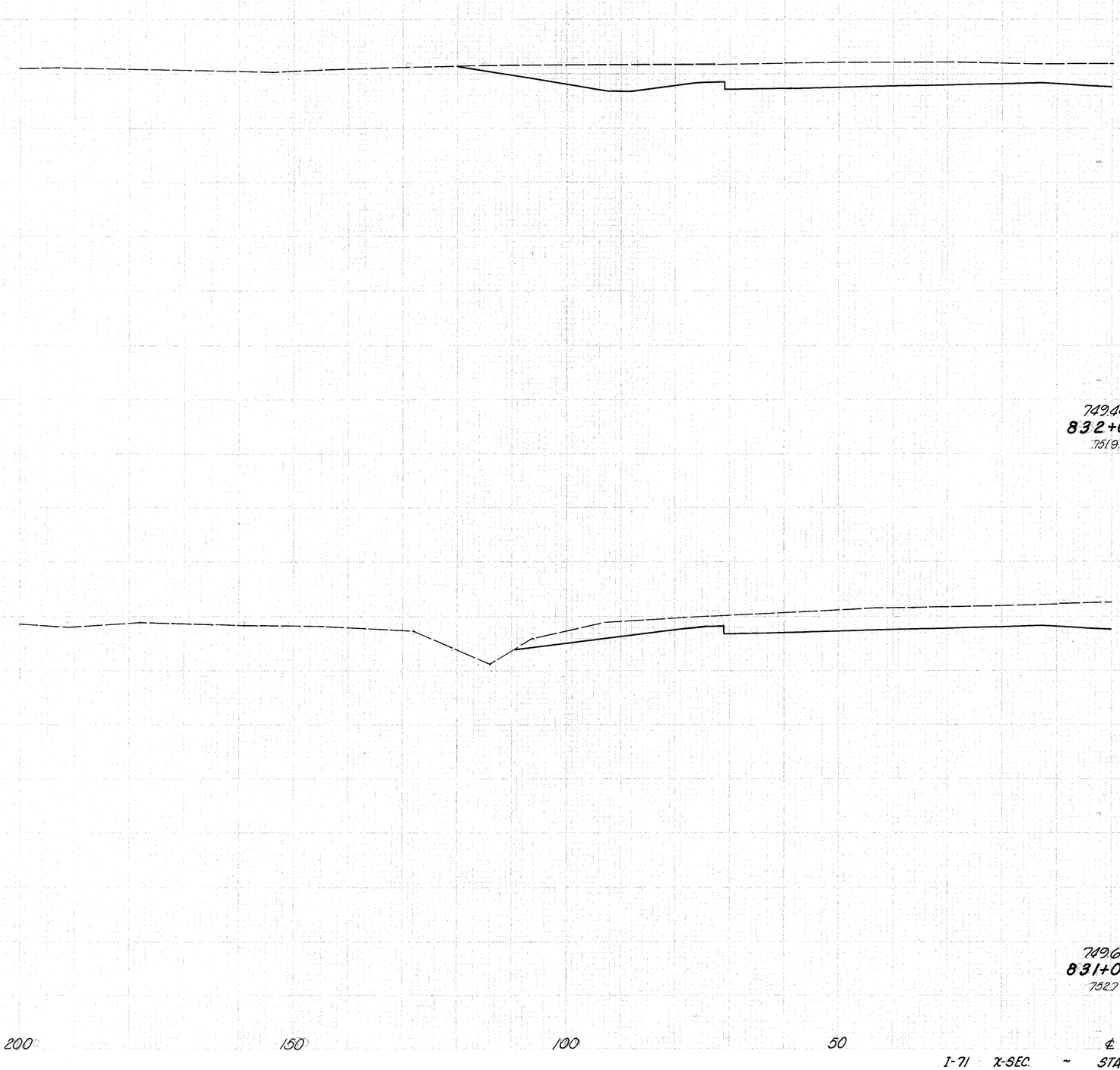
210 3120

238 324

I-71 X-SEC. ~ STA. 828+61 TO STA. 830+00 RIGHT

68
279

CUYAHOGA COUNTY
CUY-71-13.68



I-71 X-SEC. ~ STA. 831+00 TO STA. 832+00 LEFT

DESCRIPTION | PLOTTED/INKED | CALCULATED | CHECKED
BY | DATE | BY | DATE
ORIGINAL GROUND
FINISH GRADE
SLOPES
DITCHES
AREAS
EARTHWORK
STRUCTURES

CUYAHOGA COUNTY
CUY-71-13.68

760
740
720
700

749.44
832+00
751.9

749.44

288 846
452 0
740 846

760
740
720
700

749.60
831+00
752.7

℄ 50 100 150 200 250 STA. 830+00

872 0
358 0
1230 0

3648 1567

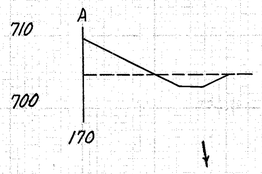
4478 11

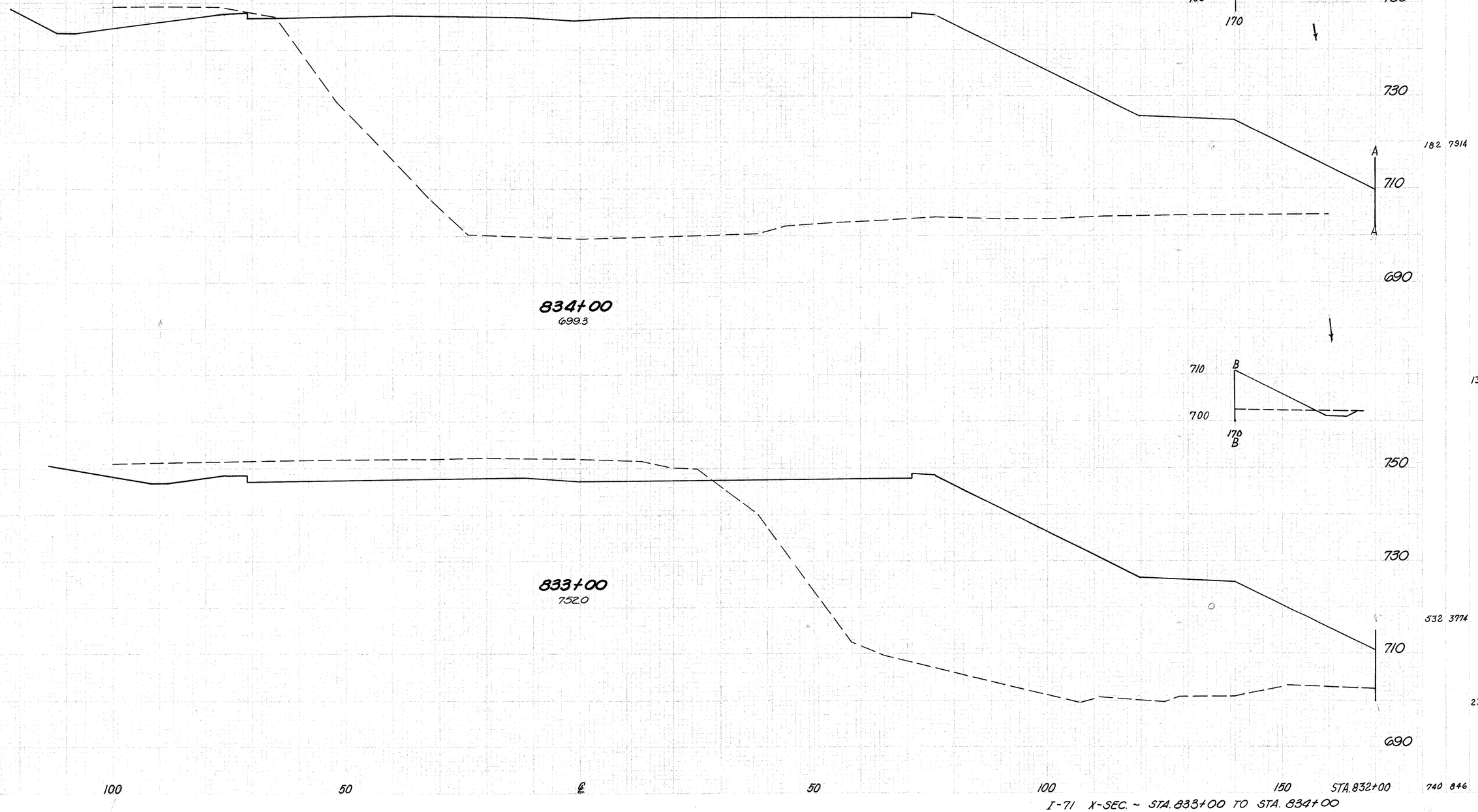
1188 6

I-71 X-SEC. ~ STA. 831+00 TO STA. 832+00 RIGHT

DESCRIPTION	PLOTTED/INKED	CALCULATED	CHECKED
ORIGINAL GROUND	BY	BY	BY
TEMPLATES	DATE 10/28/63	DATE	DATE
END AREAS			
EARTHWORK			
SECTIONAL AREAS			

CUYAHOGA COUNTY
CUY-71-13.68



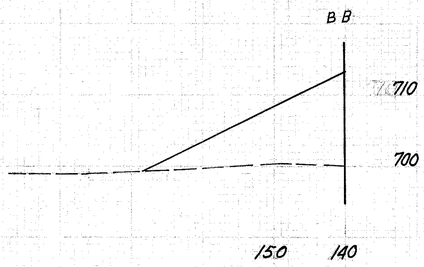


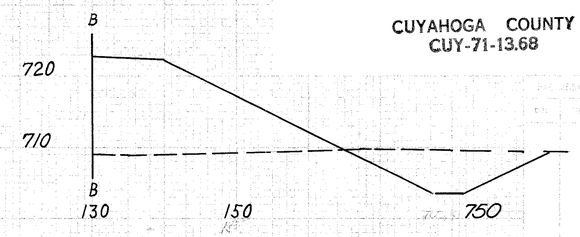
1322 1645

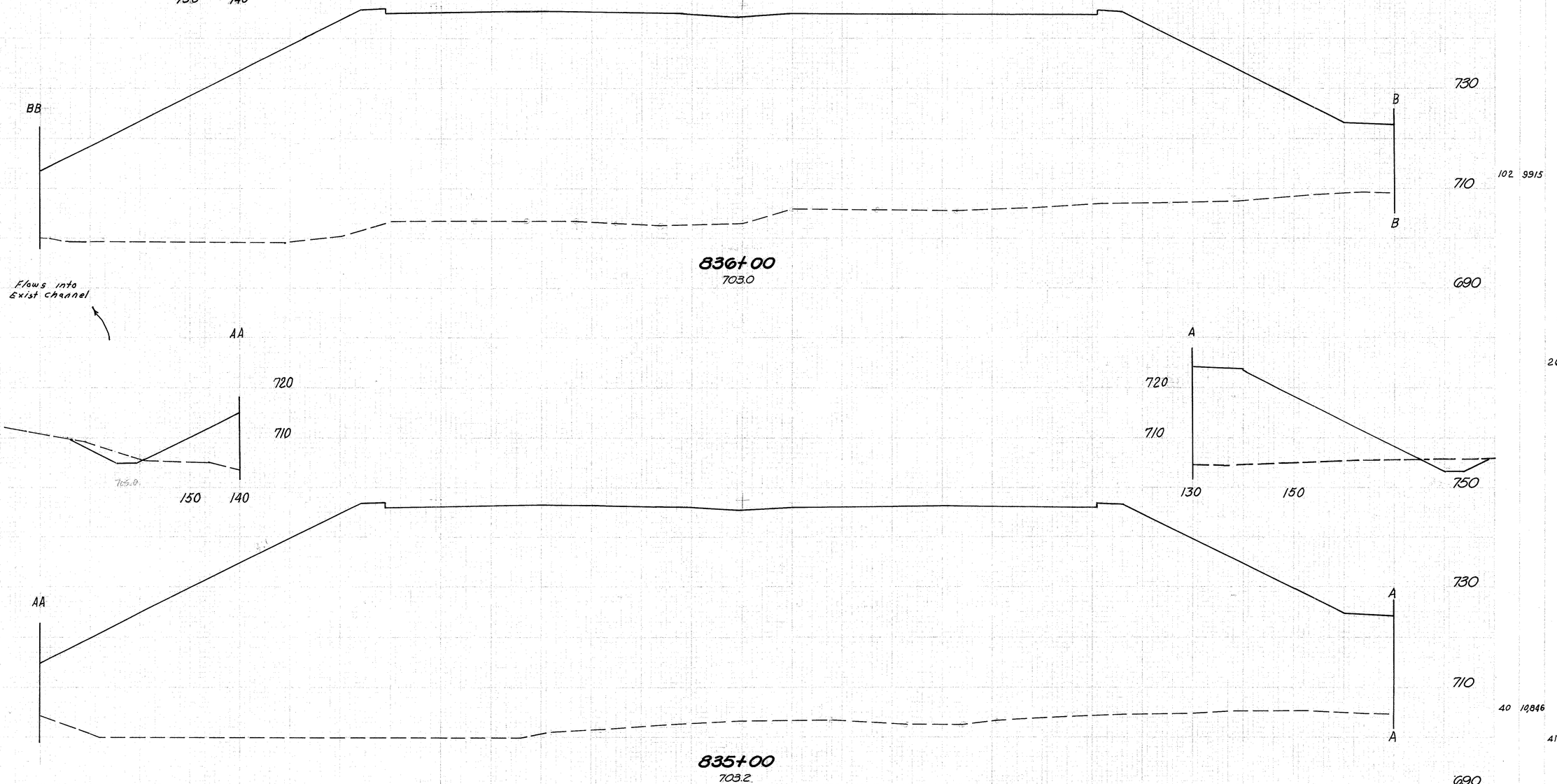
I-71 X-SEC. ~ STA. 833+00 TO STA. 834+00

DESIGNED	PLOTTED/INKED	CALCULATED	CHECKED
	BY	BY	BY
REGIONAL DEMAND	DATE	DATE	DATE
DUPLICATES	7-14-69		
MATHIAS			
WILEY			
ANTHOWICZ			
REVISIONS			

CUYAHOGA COUNTY
CUY-71-13.68



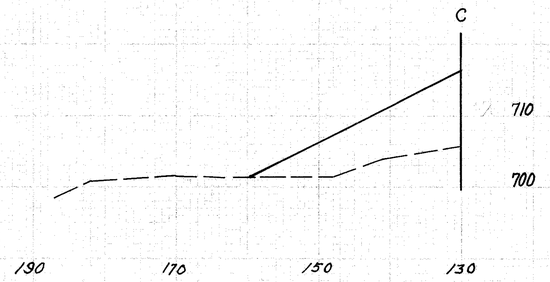


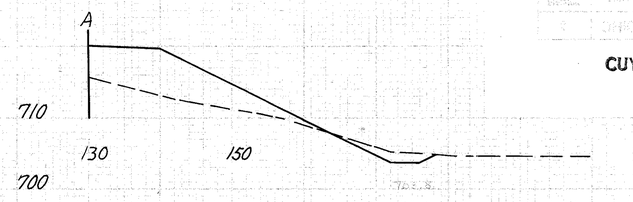


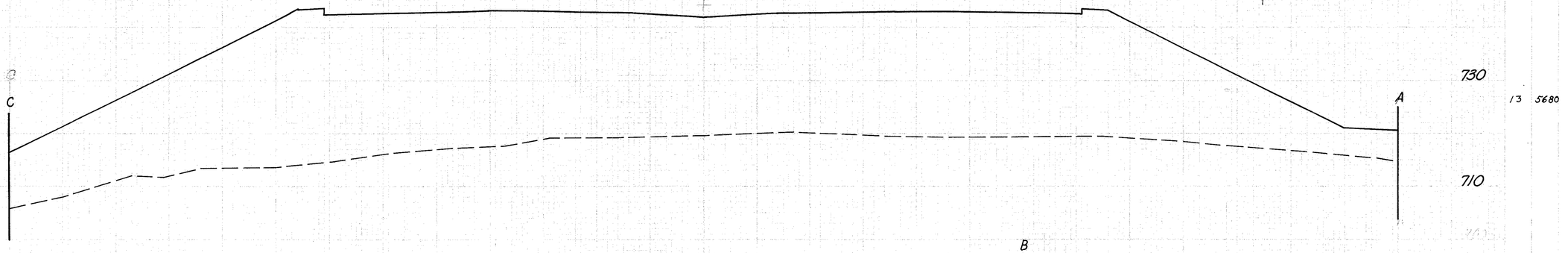
102 9915
263 38447
40 10846
411 34741
182 7914

I-71 X-SEC. ~ STA.835+00 TO STA. 836+00

CUYAHOGA COUNTY
CUY-71-13.68

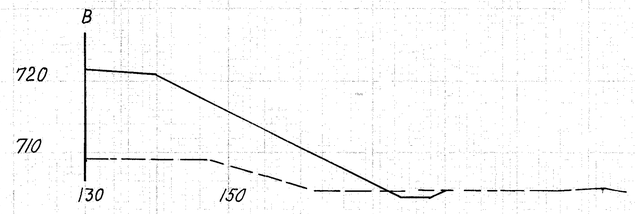




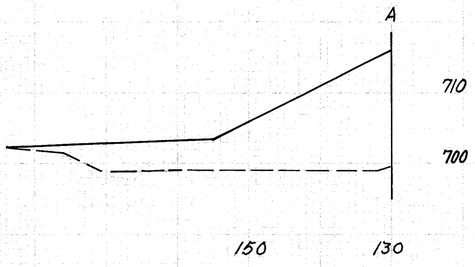


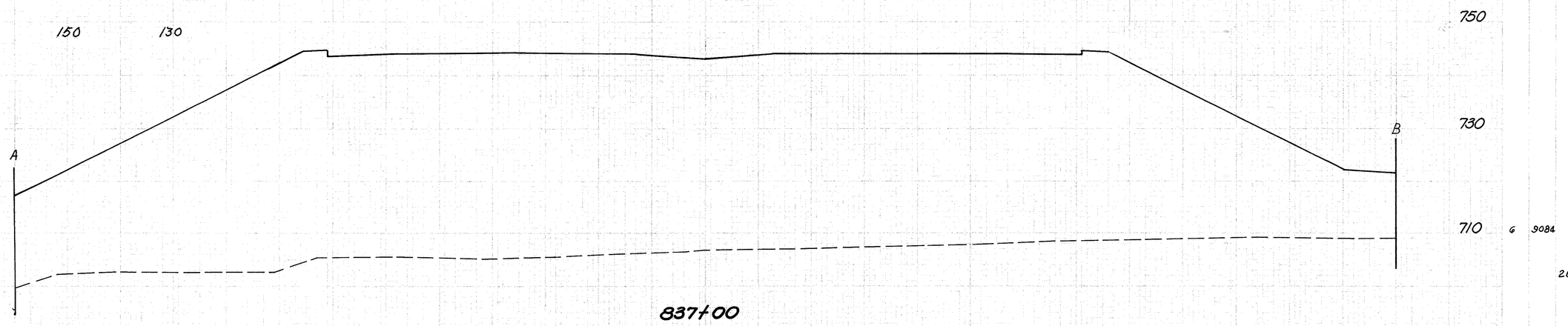
13 5680

838+00
719.7



35 2731





6 9084

2.00 35,184

837+00
706.9

100 50 ℄ 50 100 STA. 836+00

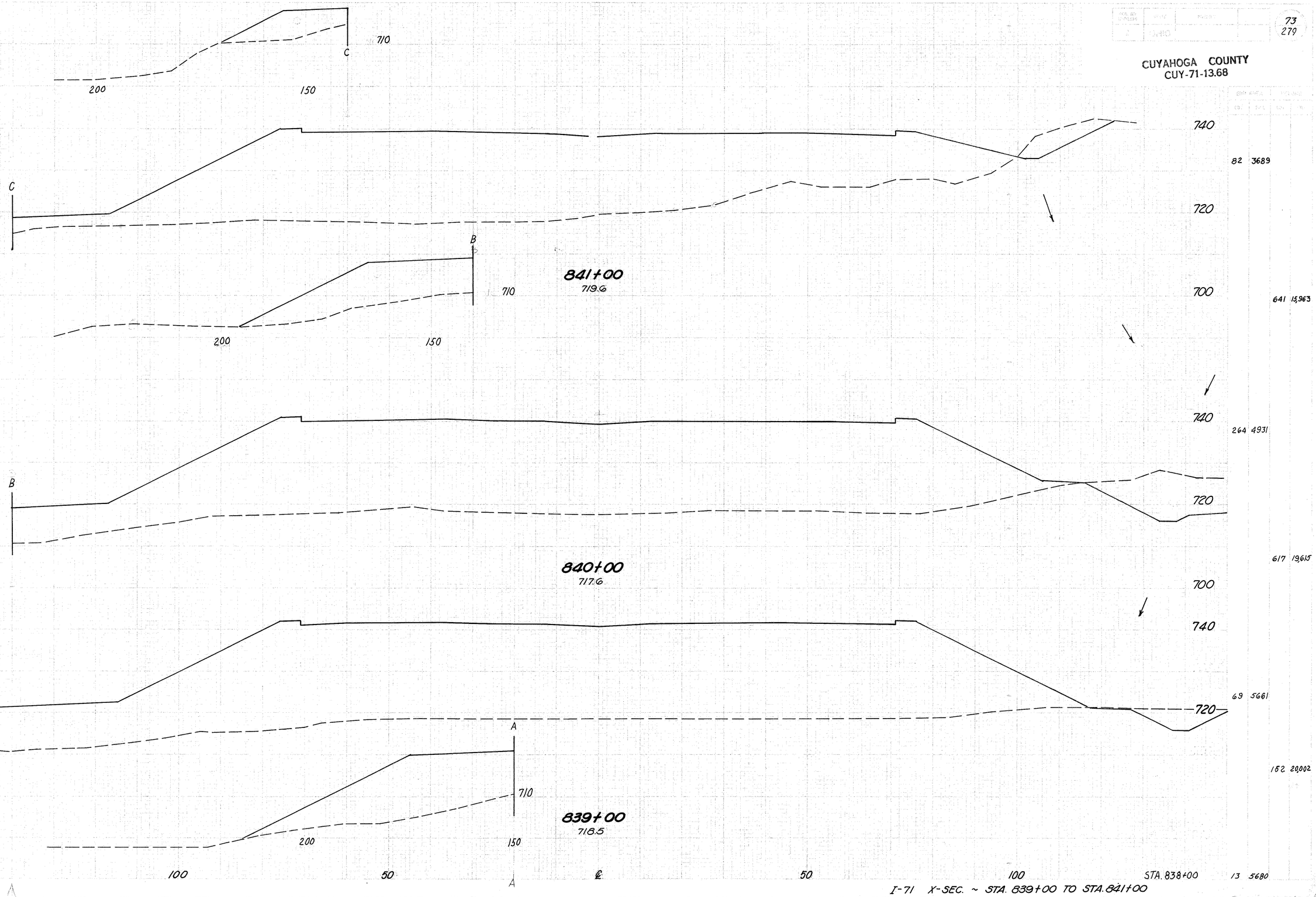
102 9915

I-71 X-SEC. ~ STA. 837+00 TO STA. 838+00

DESCRIPTION	PLOTTED/HELD BY	DATE	CALCULATED BY	DATE	CHECKED BY	DATE
ORIGINAL GROUND	DAC	7-14-88				
TEMPLATES						
AREAS						
END AREAS						
EARTHWORK						
SECTIONAL VIEWS						

CUYAHOGA COUNTY
CUY-71-13.68

DESCRIPTION	PLOTTED/KEYED	CALCULATED
	BY	BY
	DATE	DATE
ORIGINAL GROUND		
TEMPLATES		
CONSTRAINTS		
CONSTRUCTION		
CARTWAYS		
SECTIONS ADDED		



I-71 X-SEC. ~ STA. 839+00 TO STA. 841+00

74
279

CUYAHOGA COUNTY
CUY-71-13.68

740
720
700

4 1510

844+00
720.2

711 5274

740
720

380 1338

843+00
740.8

1281 6343

720
710

150

740
720

312 2087

842+00
726.2

730 10696

100 50 ℄ 50 100 STA. 841+00 82 3689

I-71 X-SEC. ~ STA. 842+00 TO STA. 844+00

DESCRIPTION	PLOTTED-INKED	DRAWN	CHECKED
ORIGINAL GROUND	8/15/2002	BY	BY
TEMPLATES		DATE	DATE
SLOPES			
DITCHES			
CURVE DATA			

CUYAHOGA COUNTY
CUY-71-13.68

DESCRIPTION	PLOTTED	CALCULATED	CHECKED
	BY	BY	BY
ORIGINAL GROUND			
TEMP. WATER			
DRAINAGES			
ROADWAYS			
EARTHWORK			
CLEARING & GRUB			

C
700
160
C
C

740
730
720
710
700

1297 2758

733.30
847+00
744.0

4400 9709

B
700
160
B
B

740
730
720
710
700

1079 2485

734.50
846+00
743.0

2926 10813

A
700
160
A
A

750
740
730
720
710
700

501 3354

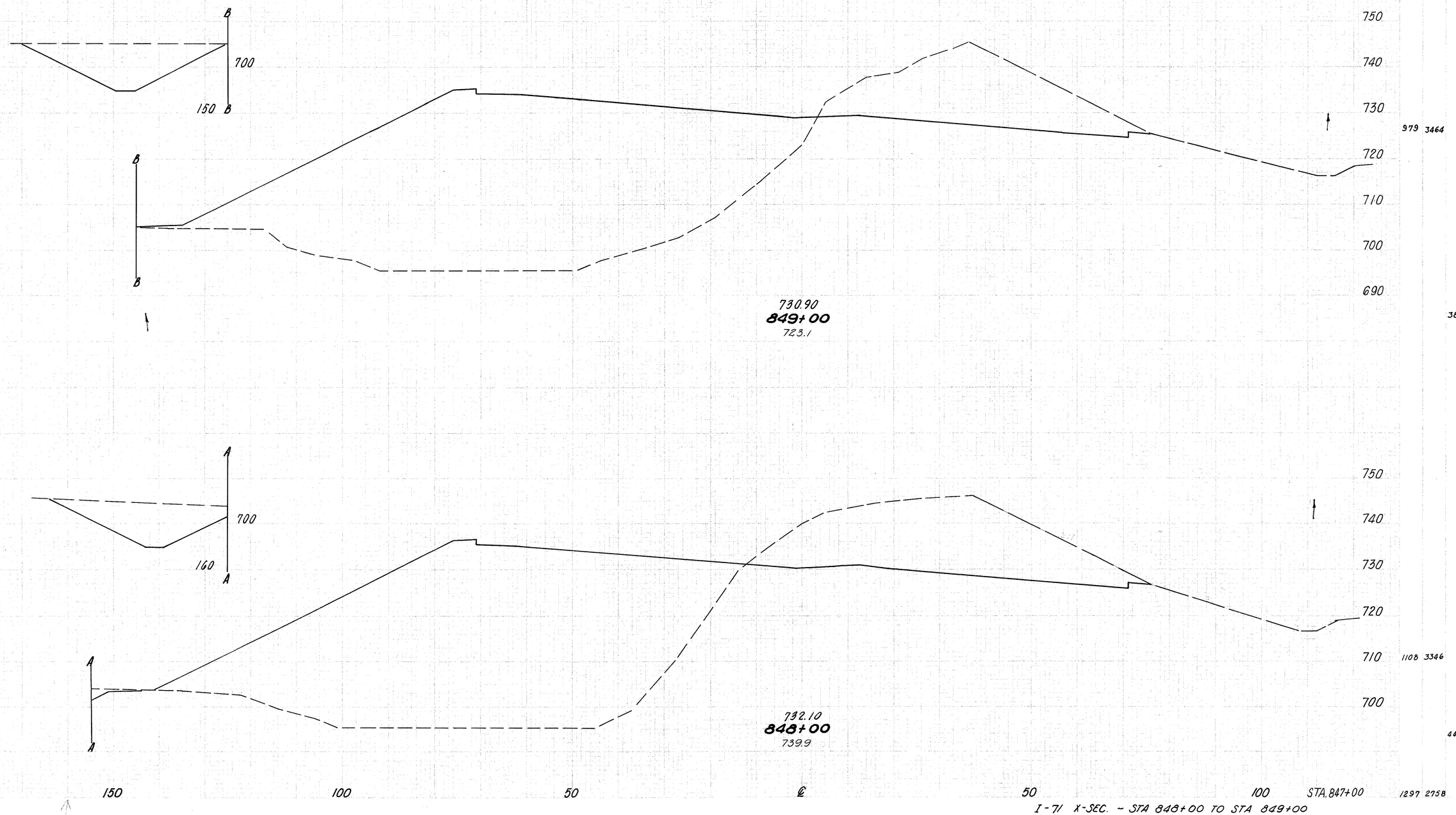
735.70
845+00
714.3

935 1581

A 150 100 50 ℄ 50 100 STA. 844+00 4 1510

I-71 X-SEC. ~ STA 845+00 TO STA 847+00

CUYAHOGA COUNTY
CUY-71-13.68



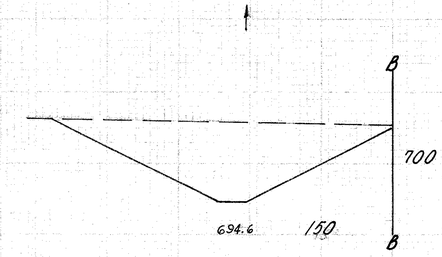
DESCRIPTION	PLOTTED	BY	DATE	CALCULATED	BY	DATE	CHECKED	BY	DATE
ORIGINAL GROUND									
FINISH GRADE									
DATA PAGE									
CUT									
FILL									
EARTHWORK									
EXCESS AREAS									

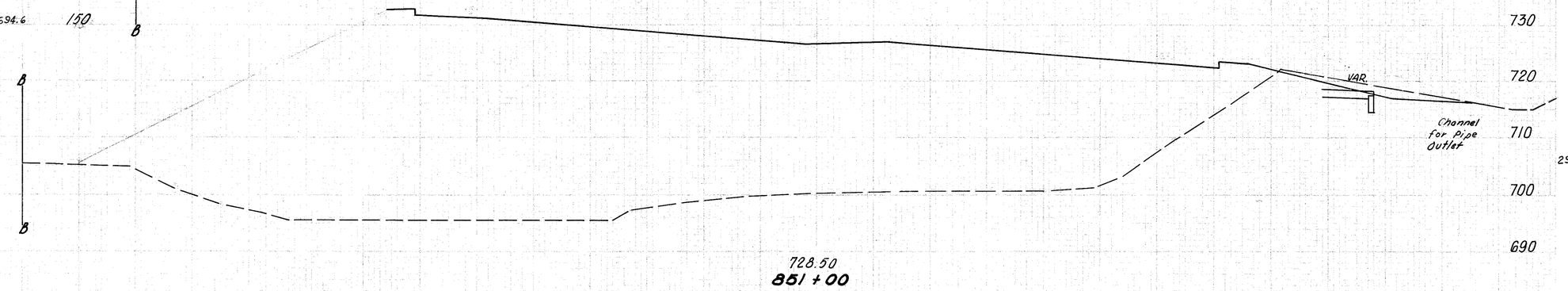
I-71 X-SEC. ~ STA 848+00 TO STA 849+00

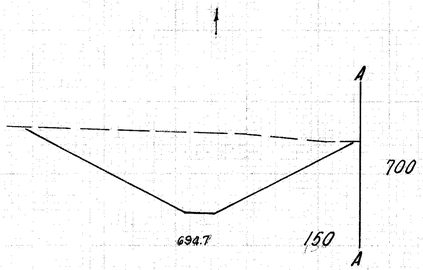
77
279

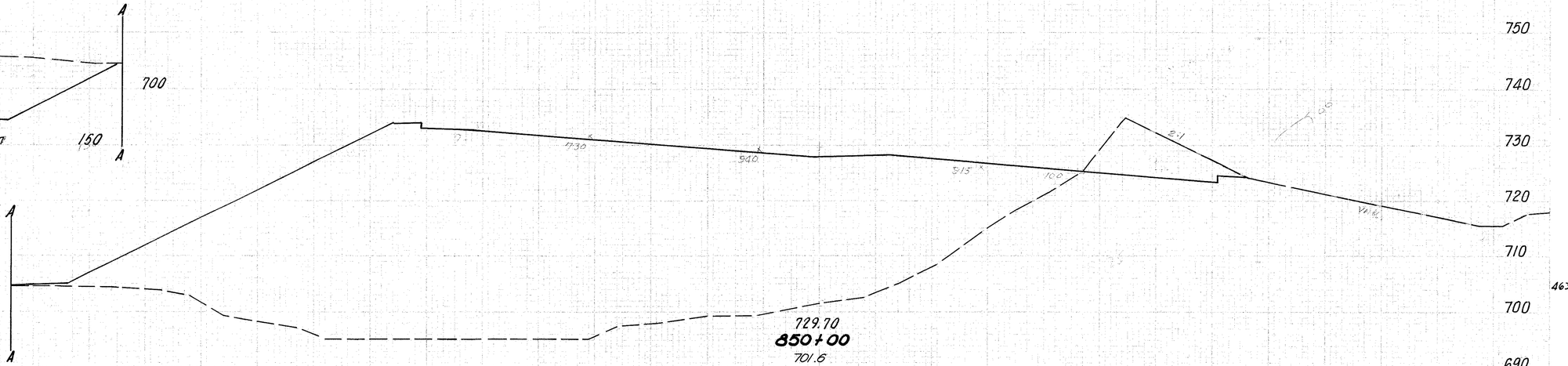
CUYAHOGA COUNTY
CUY-71-13.68

DESCRIPTION	PLOTTED-INKED		CALCULATED		CHECKED	
	BY	DATE	BY	DATE	BY	DATE
ADDITIONAL EROSION						
TEMPLATES						
CROSSINGS						
TOTAL AREAS						
EARTHWORK						
SECONDARY AREAS						







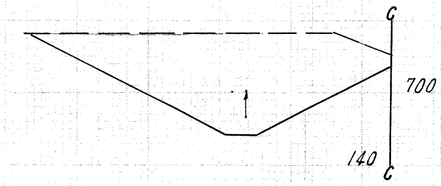


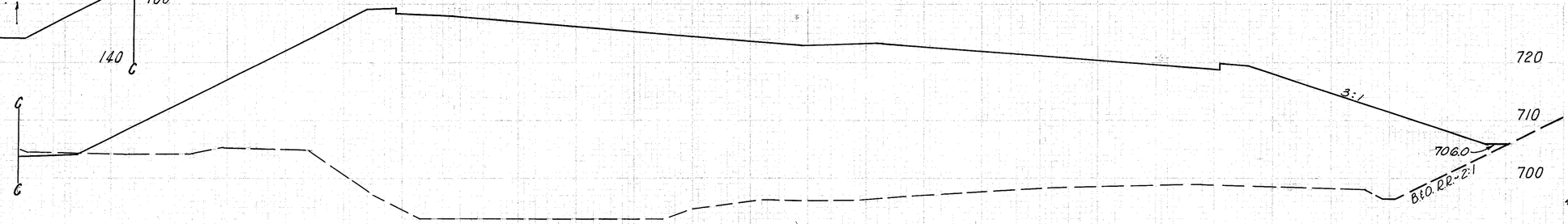
150 100 50 ℄ 50 100 STA. 849+00 979 3464

I-71 X-SEC. ~ STA 850+00 TO STA 851+00

CUYAHOGA COUNTY
CUY-71-13.68

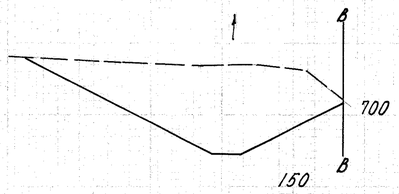
DESCRIPTION	PLOTTED/INKED		CALCULATED		CHECKED	
	BY	DATE	BY	DATE	BY	DATE
ORIGINAL GROUND						
TEMPLATES						
VARIOUS						
NO PLOTS						

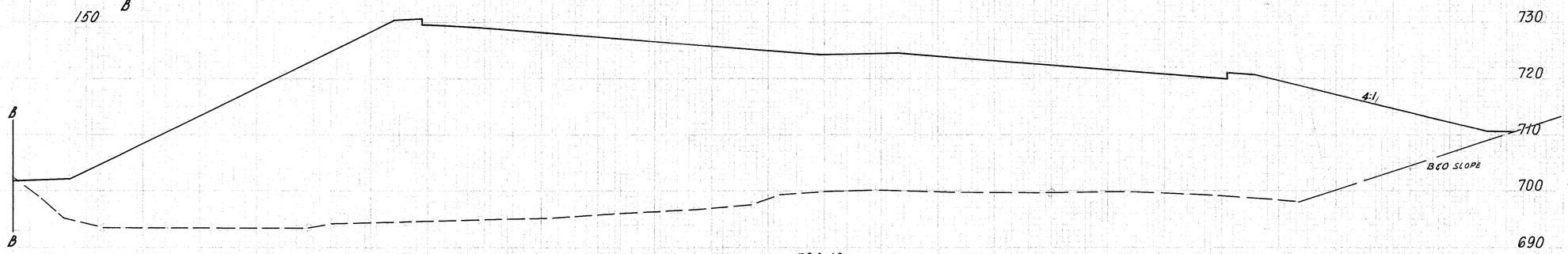




4/7 5410

724.90
854+00
696.1

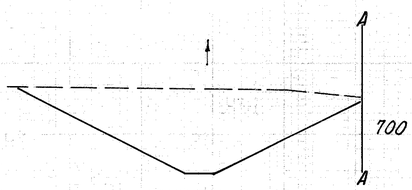


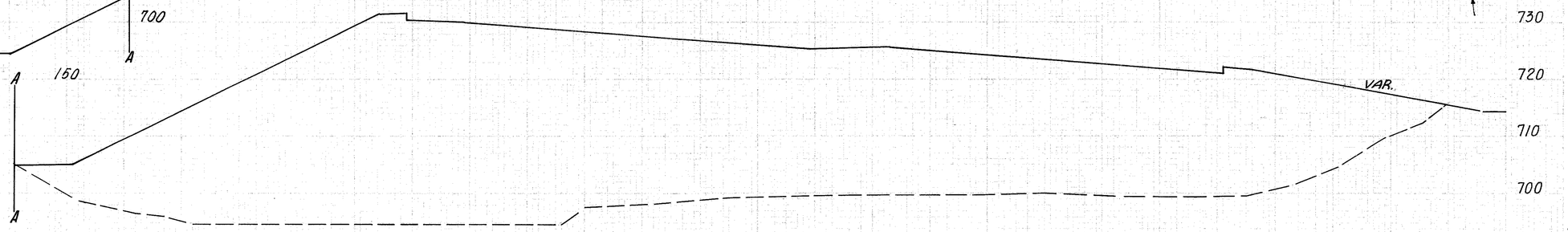


1365 21,060

320 5962

726.10
853+00
699.9





1169 21,865

311 5845

727.30
852+00
699.6

1130 20,393

150 100 50 ℄ 50 100 STA.851+00 299 5167

I-71 X-SEC. ~ STA 852+00 TO STA 854+00

79
279

CUYAHOGA COUNTY
CUY-71-13.68

MATCHLINE AHEAD
"W.B" "E.B."

Exist. M.H. 162' Lt. Sta. 857+74
Riprap Around Exist. Outlet
3.6:1
706.5
Remove Exist. 30" Conc. Pipe
Abandon Exist. M.H. @ Sta. 857+52
Remove Exist. Conc. Pipe
720.29
857+84
106' Rt. Limit of Removal for I-71
Removed by others
710
700
690
100
120
110
100
170
2100
499
499 7446

151
706.3
721.30
857+00
703.2
720
710
700
690
151
151 2687

62
706.1
708.0
694.1
130
A
A
722.50
856+00
702.3
4:1
706.3
720
710
700
690
62
62 3728

A
A
723.70
855+00
702.8
3:1
B.&O. R.R.-2:1
720
710
700
690
536 4632
1765 18597

1107
1107 15482

394
394 11880

417 5410

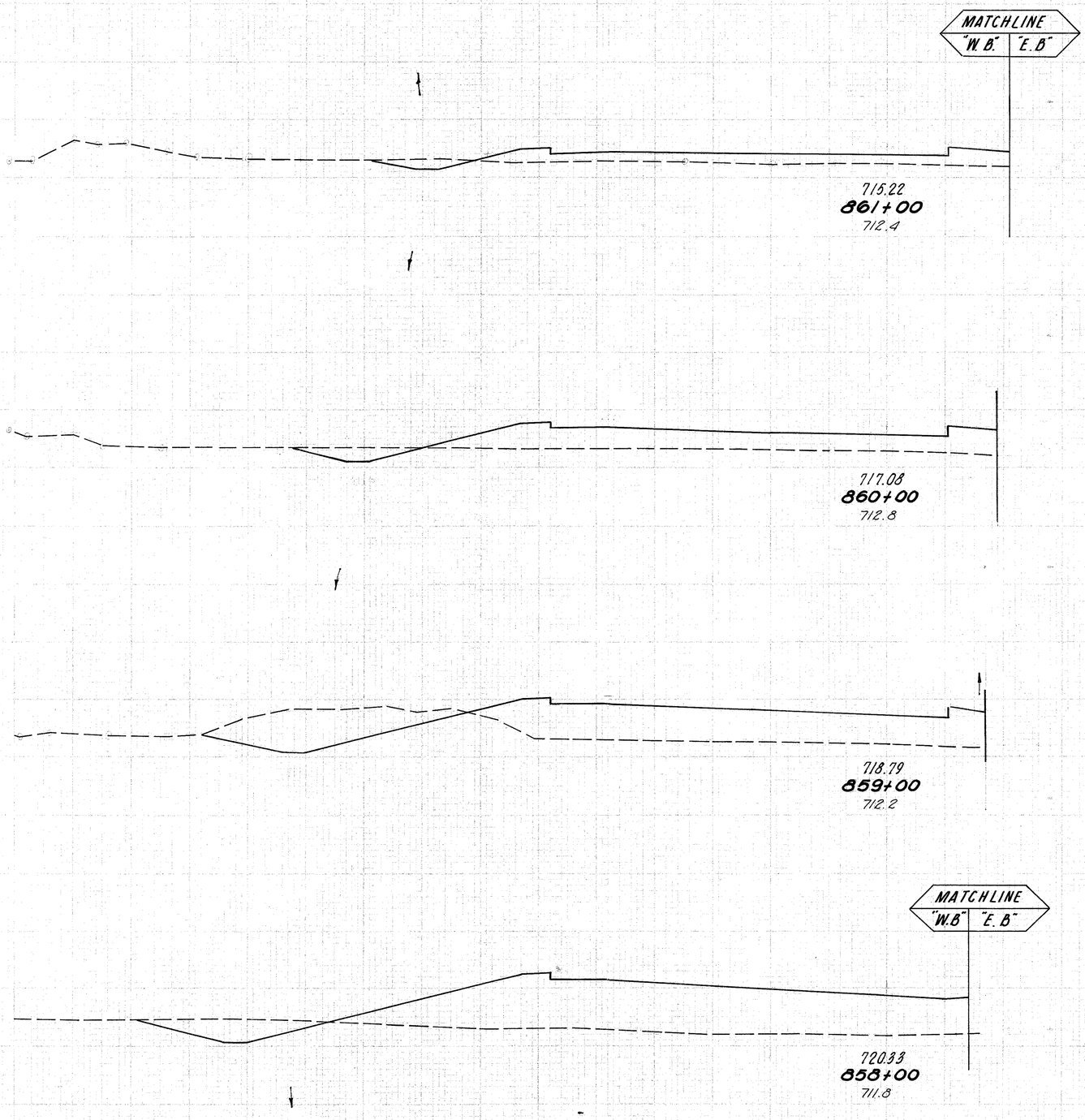
150 100 50 ℄ 50 100 STA. 854+00

I-71 X-SEC. ~ STA 855+00 TO STA 857+84

PLOTTED-SHOWN | CALCULATED | CHECKED
DESCRIPTION | BY | DATE | BY | DATE | BY
Original Ground
Final Grade
Cut Area
Fill Area
Existing Areas

CUYAHOGA COUNTY
CUY-71-13.68

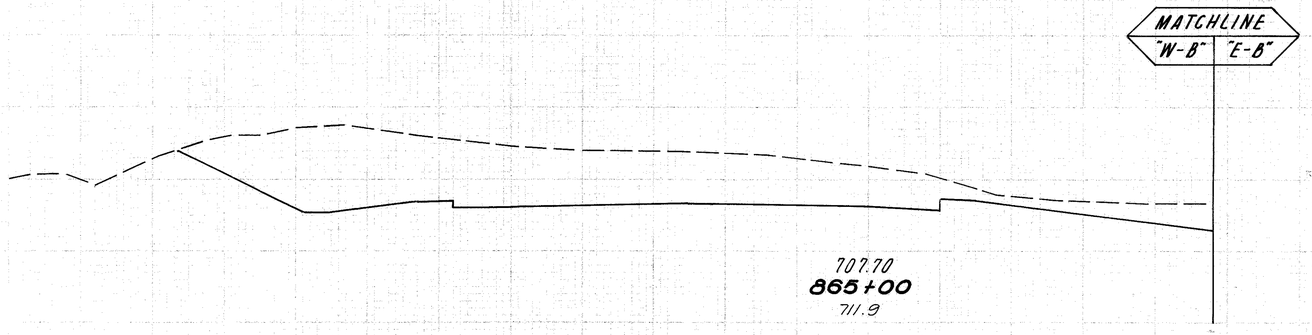
DESCRIPTION	PLOTTED-INKED BY	DATE	CALCULATED BY	DATE	CHECKED BY	DATE
ORIGINAL GROUND						
TABULATED						
FILLS						
CUT AREAS						
CAT/WORK						
SECONDS AREAS						



720			
	19	162	
710			
			93 867
720			
	31	306	
710			
			424 1456
720			
	198	480	
710			
			504 2296
720			
	74	760	
710			
			72 847
	170	2100	
	170		

LINE "W-B" X-SEC - STA. 858+00 TO STA 861+00

CUYAHOGA COUNTY
CUY-71-13.68



710
700
886 0
3111
720
710
700
794
2393
720
710
700
498
943 204
720
710
700
11 110
56 504
19 162

LINE "W-B" X-SEC. - STA. 862+00 TO STA. 865+00

CUYAHOGA COUNTY
CUY-71-13.68

MATCHLINE
"W-B" "E-B"

704.72
869+00
704.9

704.62
868+00
705.6

705.08
867+00
706.1

706.10
866+00
708.1

MATCHLINE
"W-B" "E-B"

710
700
698 0
2674
720
710
746 0
700
3015
720
710
882
700
3489
720
710
1002
700
3496

100 50 ℄ 50 STA. 886+00 886 0

LINE "W-B" X-SEC. ~ STA. 866+00 TO STA. 869+00

DESCRIPTION	PLOTTED-INKED BY	DATE	CALCULATED BY	DD'T	CHECKED BY	DATE
ORIGINAL GROUND						
TEMPLATES						
CHK. FILES						
FIELD NOTES						
EARTHWORK						
SECTIONS AREAS						

FED. RD DIVISION	STATE	PROJECT	
2	OHIO		

83
279

CUYAHOGA COUNTY
CUY-71-13.68

SEEDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME	
CUT	FILL	CUT	FILL

700
690
710
700
690
710
700
690
720
710
700
690

708.28
873+00
694.8

707.32
872+00
695.7

706.36
871+00
700.7

END WORK STA. 870+90

705.40
870+00
705.6

703.4 C-116 F F22 698.5 C-98

STA. 870+90 0 0

356 37

214 22

1689 41

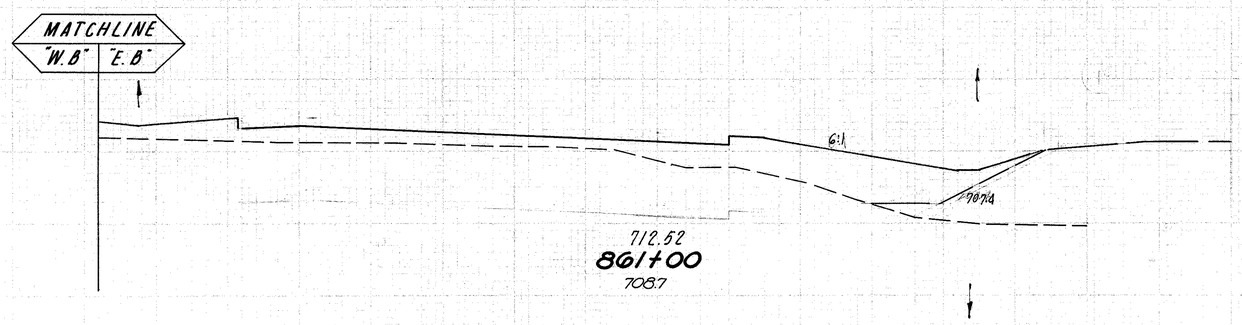
STA 869+00 698 0

150 100 50 0 100

LINE W-B X 525 STA 870+00 TO STA 873+00

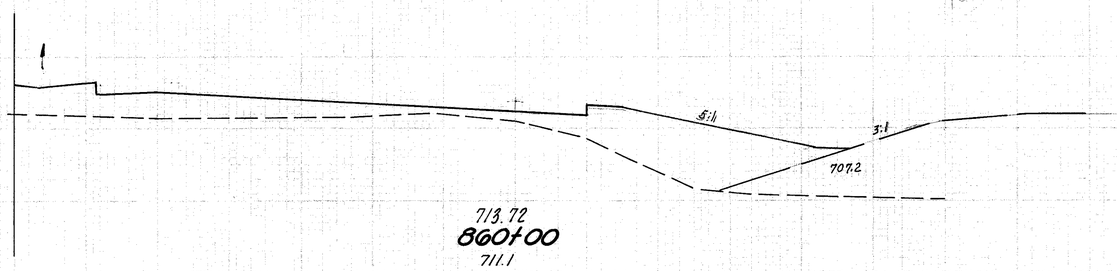
84
279

CUYAHOGA COUNTY
CUY-71-13.68



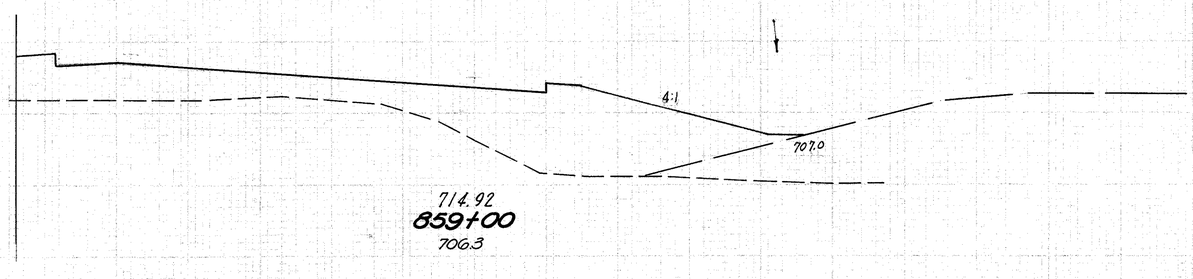
	CUT AREA	FILL AREA
710		
700	0	338
	19	162
	19	500

93 2267



	CUT AREA	FILL AREA
720		
710		
700	0	418
	31	306
	31	724

424 3422



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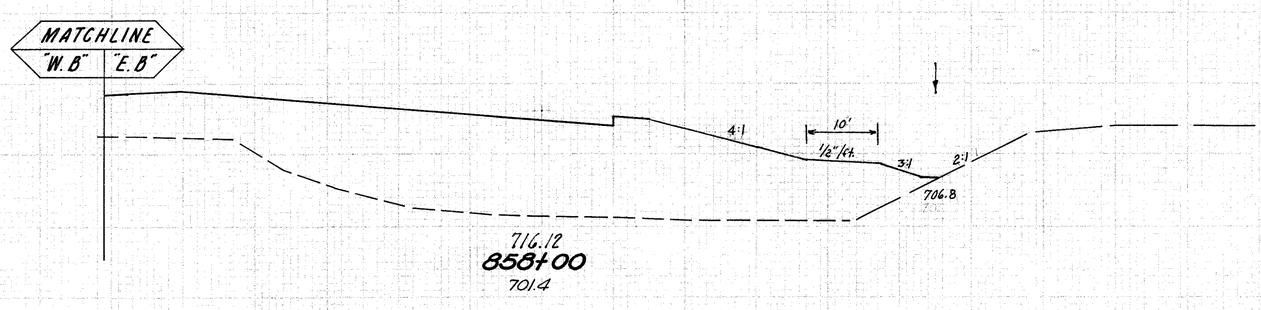
720		
710		
700	0	644
	198	480
	198	1124

504 5656



	CUT AREA	FILL AREA
720		
710		
700	0	1170
	74	760
	74	1930

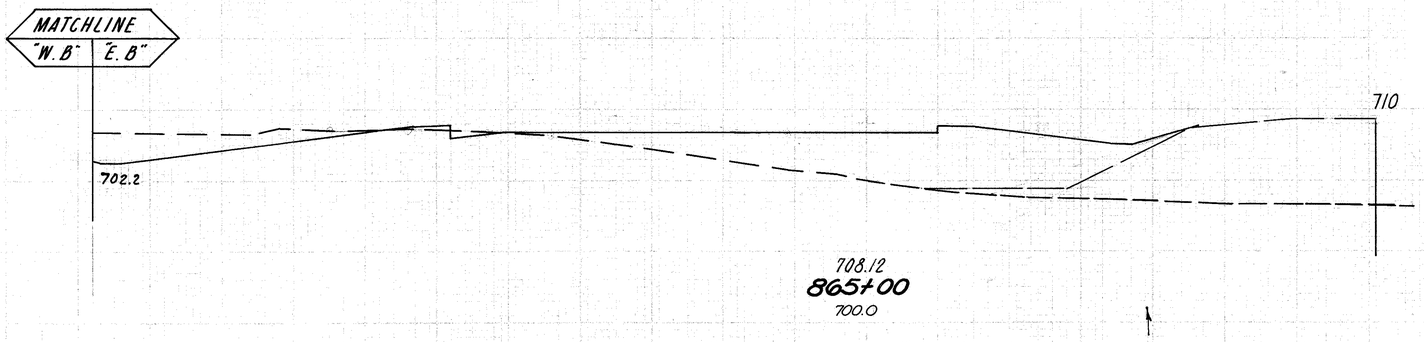
22 1194

50 ℄ 50 STA. 857+84 170 2100

LINE "E-B" X-SEC. ~ STA. 858+00 TO STA. 861+00

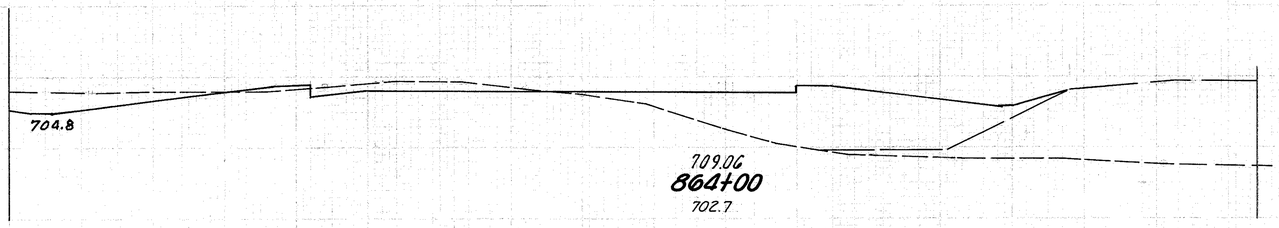
85
279

CUYAHOGA COUNTY
CUY-71-13.68



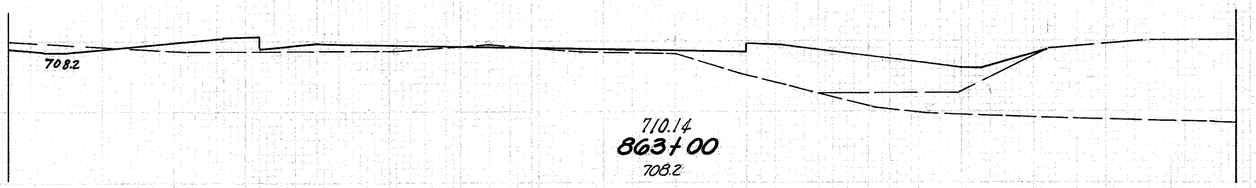
700
690 90 394 / 886 0 / 976 394

3441 1293



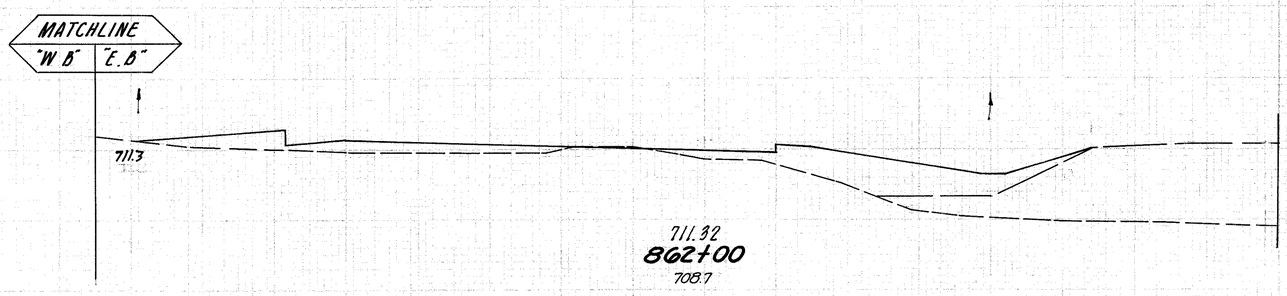
710
700 88 304 / 794 0 / 882 304

2580 993



710
700 13 232 / 498 0 / 511 232

967 1063



710
700 0 232 / 11 110 / 11 342

56 1559

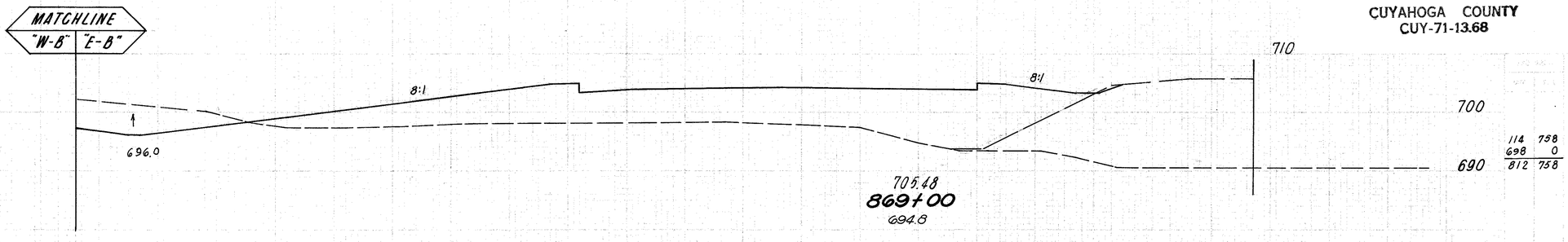
100 50 ℄ 50 STA. 861+00 19 500

LINE "E-B" X-SEC. ~ STA. 862+00 TO STA. 865+00

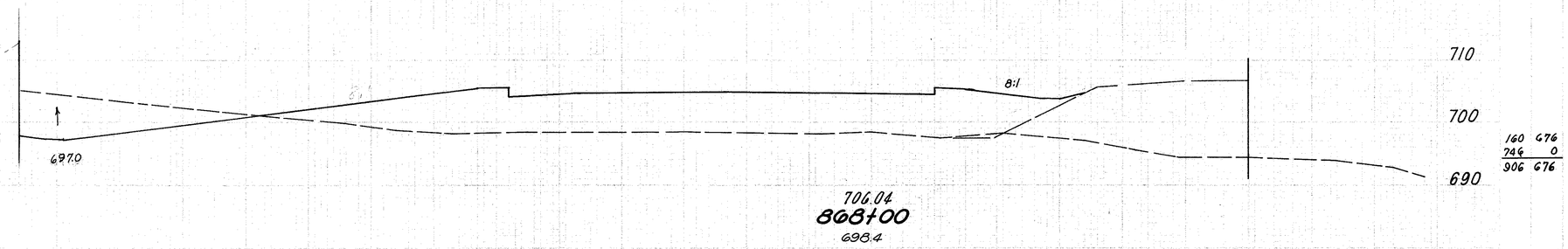
DESIGNED	DRAWN	TRACED	CHECKED	QUANTITIES	CHECKED
DESIGN FILE					
QUADRANT					
TYPE USE					
END AREAS					
PRISMOIDAL					
PLOTTED-INPUT DATE	CALCULATED DATE	CHECKED BY DATE			

86
279

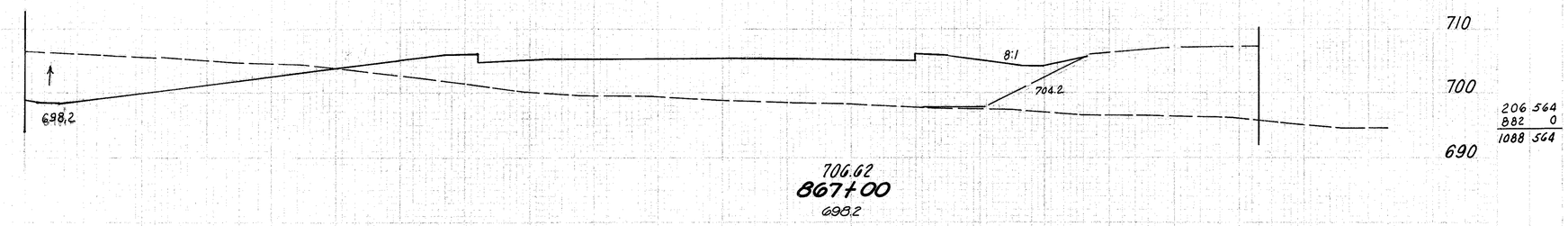
CUYAHOGA COUNTY
CUY-71-13.68



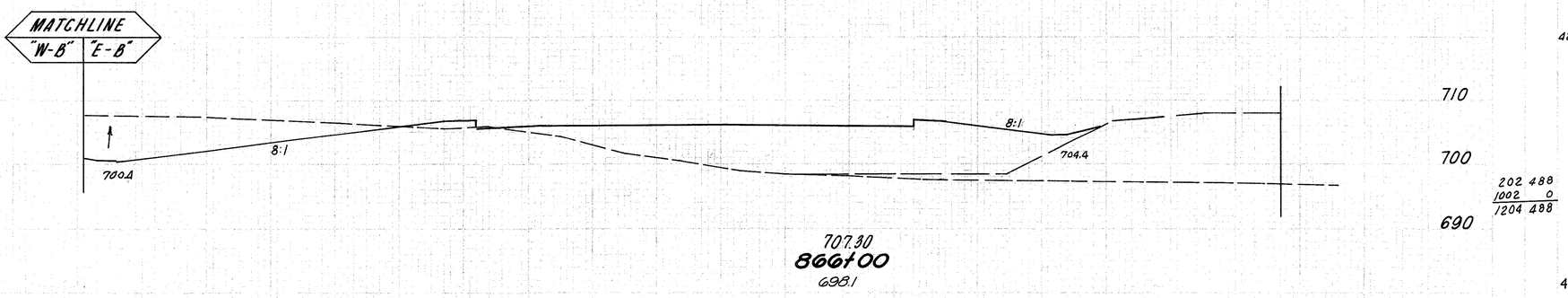
3182 2656



3693 2296



4244 1948



4037 1633

DESCRIPTION	PLOTTED BY	DATE	LINKED	CALCULATED BY	DATE	CHECKED BY	DATE
ORIGINAL GROUND							
TEMPLATES							
SLOPES							
END AREAS							
EARTHWORK							
BORING DATA							

150 100 50 ℄ 50

976 394

LINE "E-B" X-SEC. ~ STA. 866+00 TO STA. 869+00

SEEDING	
END WIDTH	SQ. YDS.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

87
279

CUYAHOGA COUNTY
CUY-71-13.68

END AREA		VOLUME	
CUT	FILL	CUT	FILL

720
710
700
690
680

70324
873+00
714.1

1'

70380
872+00
714.4

704.36
871+00
697.9

END WORK, STA. 870+80

STA. 870+80 0 0

F 934

702.4

END PROJECT
STA. 870+00

704.92
870+00
699.9

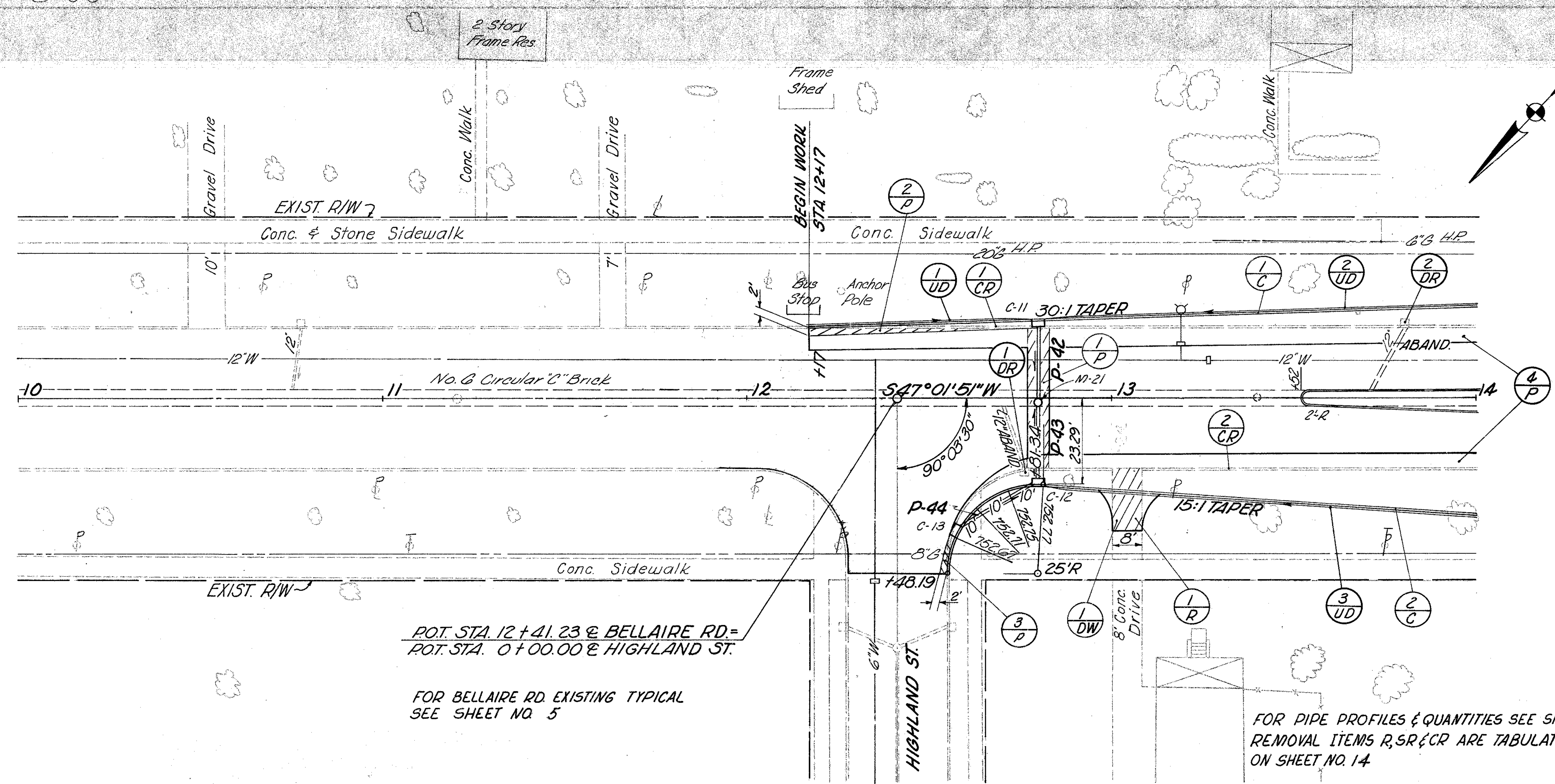
STA. 869+00 114 758

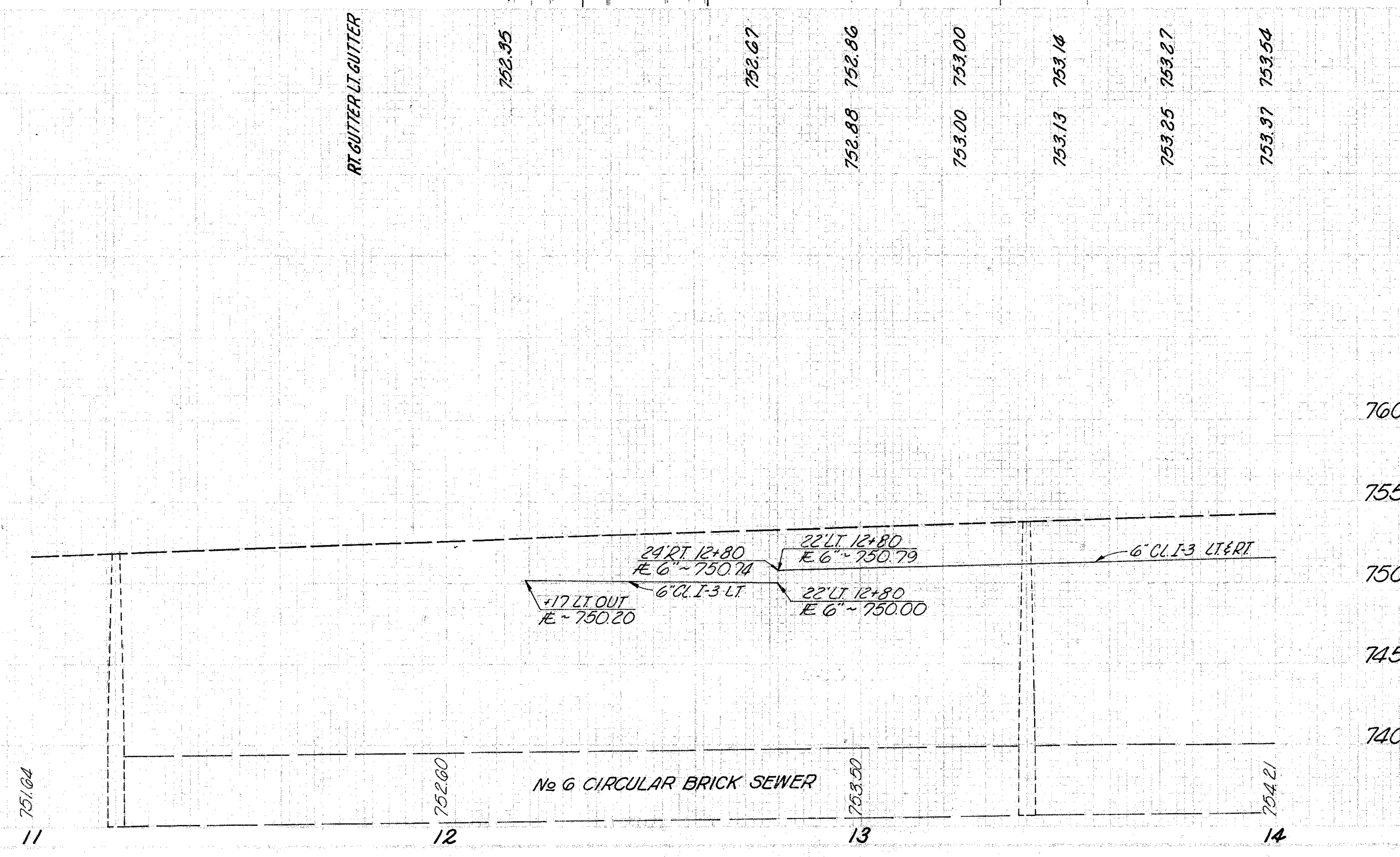
18 1384

12 934

233 3133

150 100 50 0 50





* SEC. M-6.8(d)

* QUANTITIES TO SHEET No 14

100% CITY

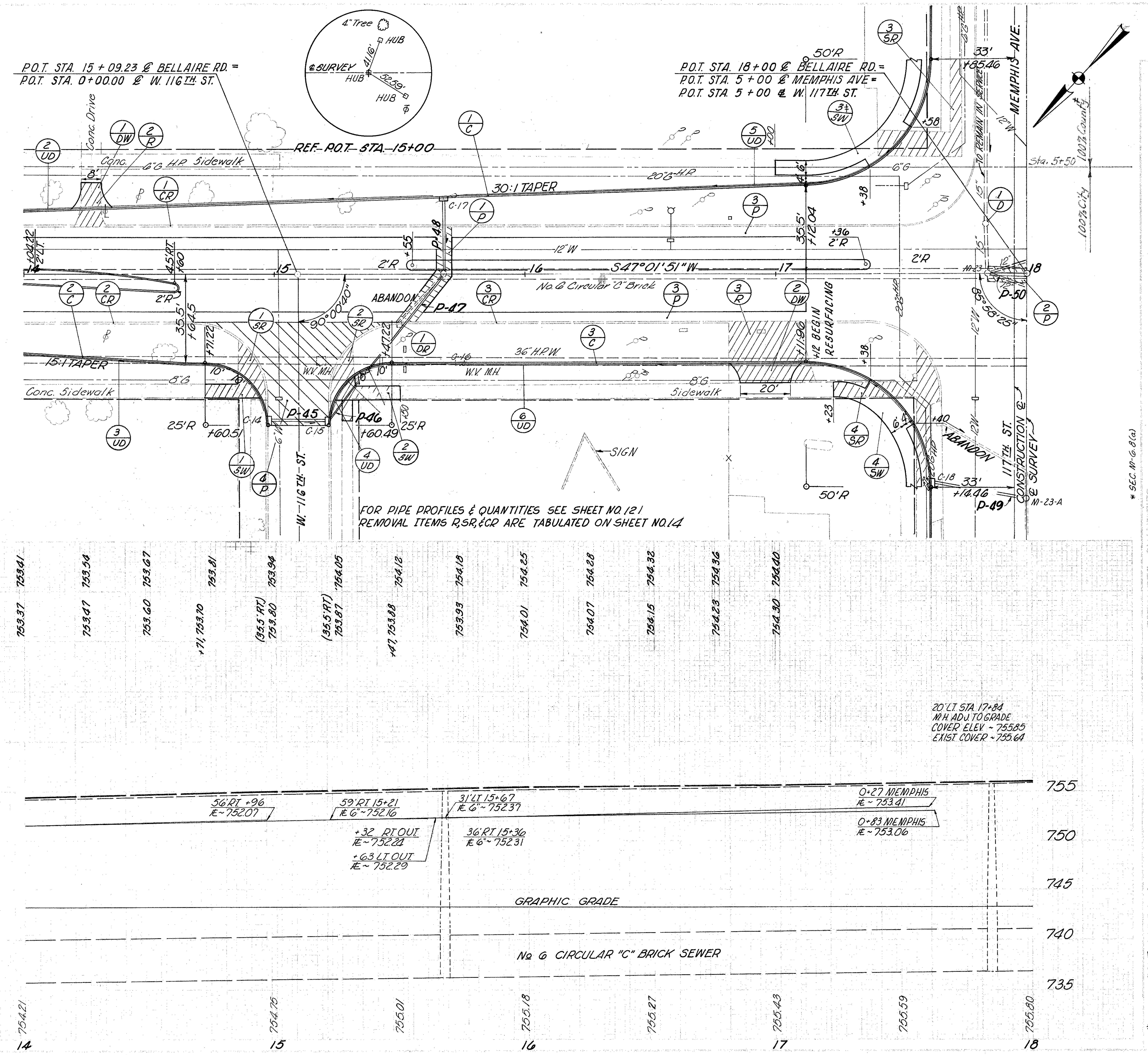
Item	Station	Side	I-11 * SPECIAL SANDSTONE CURB LIN. FT.	I-16 C.B. ABANDON EA.	I-1 CL. I-3 * 6"	I-1 CL. F-4 M6.8(d) 6" L.F.	T-35 1¼" ASPH. BASE C.Y.	B-35 1¼" ASPH. BASE C.Y.	E-8 PAVEMENT REMOVAL SQ. YDS.	B-70 8" PORT. CEM. CONC. BASE COURSE SQ. YDS.	T-30 BIT. TACK COAT GALS.	I-19 3" INSULATION COURSE & SUBBASE SQ. YDS.	T-70 6" PORT. CEMENT CONCRETE PAVEMENT SQ. YDS.
1UD	12+17 ~ 12+80	LT.			53	10							
2UD	12+80 ~ 14+00	LT.			110	10							
3UD	12+80 ~ 14+00	RT.			110	10							
1D	13+40	℄											
1DR	12+96	RT.		1									
2DR	13+81	LT.		1									
1DW	13+04	RT.										13.8	13.2
2P	12+17 ~ 12+77	LT.					0.23	0.23	6.7	6.7	0.7	7.2	
1P	13+80	LT. / LT.&RT.					0.88	0.88	25.3	25.3	2.5	25.2	
3P	12+54	RT.					0.04	0.04	1.1	1.1	0.1	1.2	
1C	12+17 ~ 14+00	LT.	184										
2C	12+55 ~ 14+00	RT.	160										
4P	12+17 ~ 14+00	LT.&RT.					4.83	4.83			13.9		
			344 *	2	273	30	5.98	5.98	33.1	33.1	17.2	46.8	13.2

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY	JAS	9-10-63	JAS	9-10-63		
PAVEMENT	JAS	"	JAS	"		
DRAINAGE						
R. O. W.						
QUANTITIES						

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
EXISTING GROUND						
PROFILE GRADE						
DRAINAGE						
BENCH MARKS						

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY	J.H.S.	9-11-63	J.H.S.	9-11-63		
PAVEMENT	J.H.S.	"	J.H.S.	"		
DRAINAGE						
R. O. W.						
QUANTITIES						

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
EXISTING GROUND						
PROFILE GRADE						
DRAINAGE						
BENCH MARKS						



ESTIMATED QUANTITIES

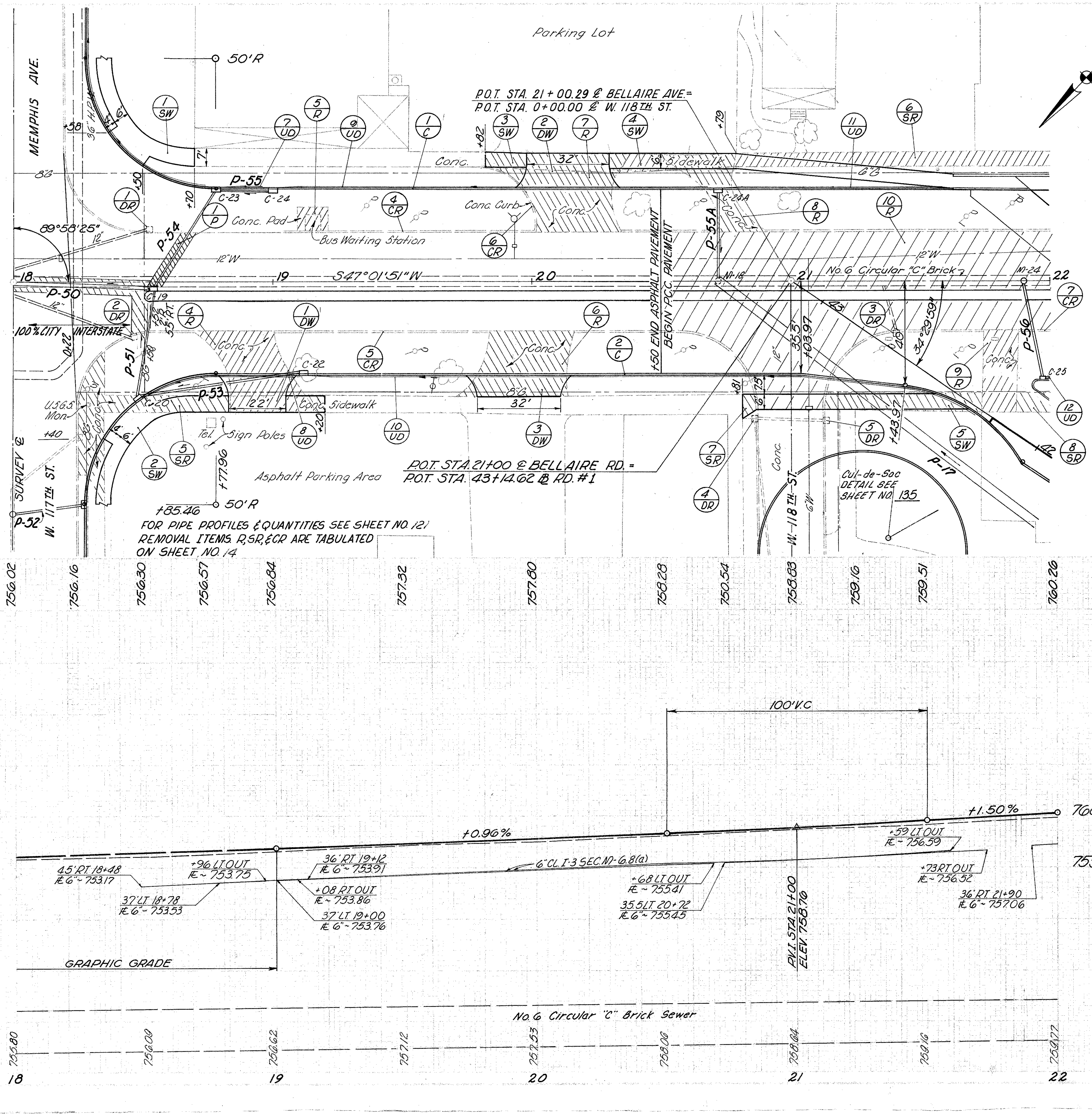
* SEC. M-6.8(a)

* QUANTITIES TO SHEET No. 14

Item	Station to Station	Side	I-1 CL.E3 * 6" LIN. FT.	I-1 CL.F-4 6" LIN. FT.	100% CITY I-11 * Special Sandstone Curb LIN. FT.	I-13 4½" Concrete Sidewalk SQ. FT.	I-16 C.B. Abandon EA.	I-8 M.H. Adjusted to Grade	T-35 1¼" Asph. C.Y.	B-35 1¼" Asph. Base C.Y.	E-8 Pavement Removal SQ. YDS.	B-70 8" Port. Cem. Conc. Base Course SQ. YDS.	T-30 Bit. Tack Coat GALS.	I-19 3" Insulation Course & Subbase CU. YDS.	T-70 6" Port. Cement Concrete Pavement SQ. YDS.	T-71 8" Port. Cement Concrete Pavement SQ. YDS.
2UD	14+00 ~ 15+67	LT.	163													
3UD	14+00 ~ 14+96	RT.	98													
4UD	15+21 ~ 15+60	RT.	51	10												
5UD	15+67 ~ 0+83 MEMPHIS	LT.	213	10												
6UD	15+67 ~ 0+27 MEMPHIS	RT.	201	10												
1DR	15+50	RT.					1									
1D	17+84	LT.						1								
1DW	14+27	LT.												12	12.3	
2DW	16+96	RT.												21.6		21.2
1SW	14+71 ~ 14+94	RT.				121										
2SW	15+25 ~ 15+50	RT.				151										
3SW	17+00 ~ 17+59	LT.				480 to 100% County										
4SW	17+23 ~ 17+58	RT.				339										
1P	15+67 ~ 18+00	LT.&RT.							0.88	0.88	25.3	25.3	2.5	25.2		
2P	17+84 ~ 17+12	LT.&RT.									10.7	10.7	1.1	10.8		
3P	14+00 ~ 17+62	LT.&RT.							9.50	9.50			27.4			
1C	14+00 ~ 14+97	LT.			391 to (50' 100% County)											
2C	14+00 ~ 17+61	RT.			113											
3C	15+22	RT.			286											
4P	14+71 ~ 15+47	RT.							5.3	5.3	152	152	15.2	152.4		
100% City					740	611										
100% County					50	480										
Total			726	30	790	1091	1	1	15.68	15.68	188	188	46.2	222	12.3	21.2

Rev. 6-4-65 C.E.H.

CUYAHOGA COUNTY
CUY-71-13.68



INTERSTATE *QUANTITIES TO SHEET No 14

Ref.	Station to Station	Side	E-8 Pavement Removal SQ.YDS	B-70 8" Port. Cem. Conc. Base Course SQ.YDS	T-30 Bit. Tack Coat GALS	I-19 3" Insulation Course & Subbase CU.YDS	T-71 8" Port. Cement Concrete Pavement SQ.YDS	I-11* Special Sandstone Curb LIN.FT	I-13 4½" Concrete Sidewalk SQ.FT	I-16 C.B. Abandon EA	I-1 CL. I-3 Sec. M 6.8(a) 6" LIN.FT	I-1 CL. F-4 6" LIN.FT
7UD	18+78 ~ 18+96	LT.									8	10
8UD	18+48 ~ 19+08	RT.									50	10
9UD	19+00 ~ 20+68	LT.									158	10
10UD	19+12 ~ 21+73	RT.									251	10
11UD	20+72 ~ 21+59	LT.									77	10
12UD	21+90 ~ 22+00	RT.										10
1DR	18+53	LT.								1		
2DR	18+46	RT.								1		
3DR	21+41	RT.								1		
4DR	20+85									1		
5DR	21+13									1		
1DW	18+94	RT.				37.2	37.6					
2DW	20+14	LT.				49.2	49.6					
3DW	19+95	RT.				32.4	31.8					
1SW	18+32 ~ 18+70	LT.							350			
2SW	18+31 ~ 19+20	RT.							519			
3SW	19+82 ~ 19+98	LT.							96			
4SW	20+30 ~ 21+89	LT.							931			
5SW	20+81 ~ 21+52	RT.							499			
1P	18+00 ~ 18+68	LT. & RT.	60.8	60.8	6.1	61.2						
1C	18+28 ~ 20+50	LT.						252				
2C	18+27 ~ 20+50	RT.						250				
Total			60.8	60.8	6.1	180	119	502	2395	5	544	60

CUYAHOGA COUNTY
CUY-71-13.68

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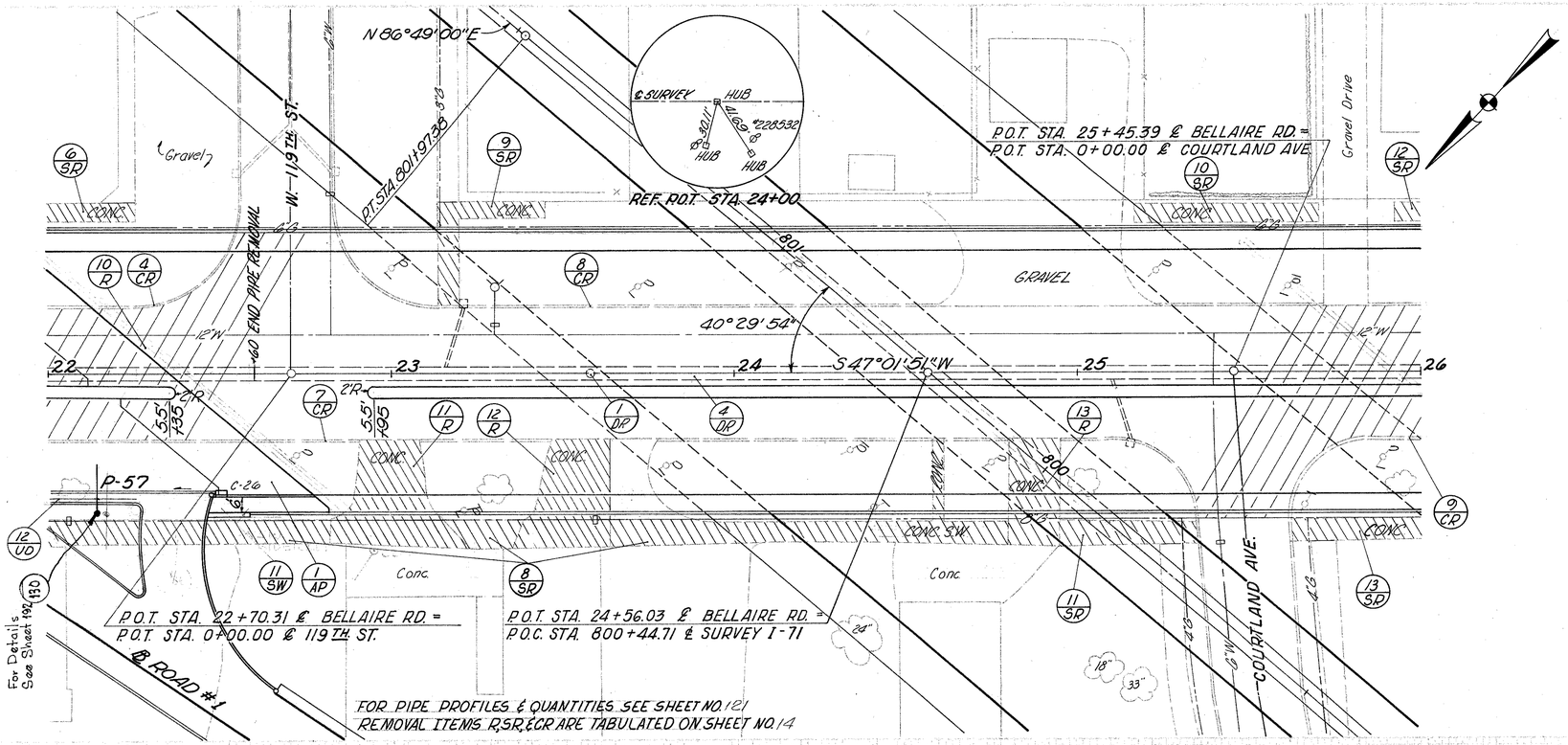
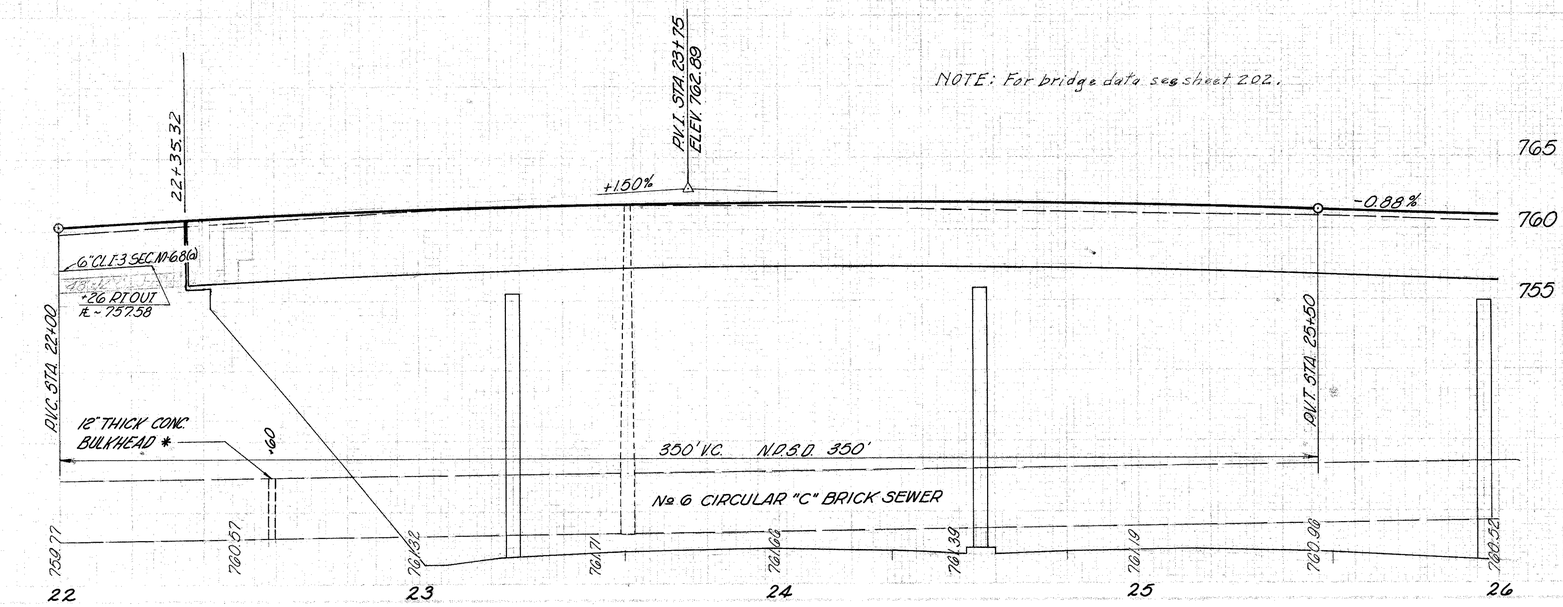
279



760.20 760.02 760.92 761.20 761.42 761.01 761.74 761.85 761.90 761.92 761.89 761.82 761.70 761.55 761.35 760.91

* 0.5 CU. YDS. I-2 MASONRY
PROVIDED FOR CONC. BULKHEAD

NOTE: For bridge data see sheet 202.

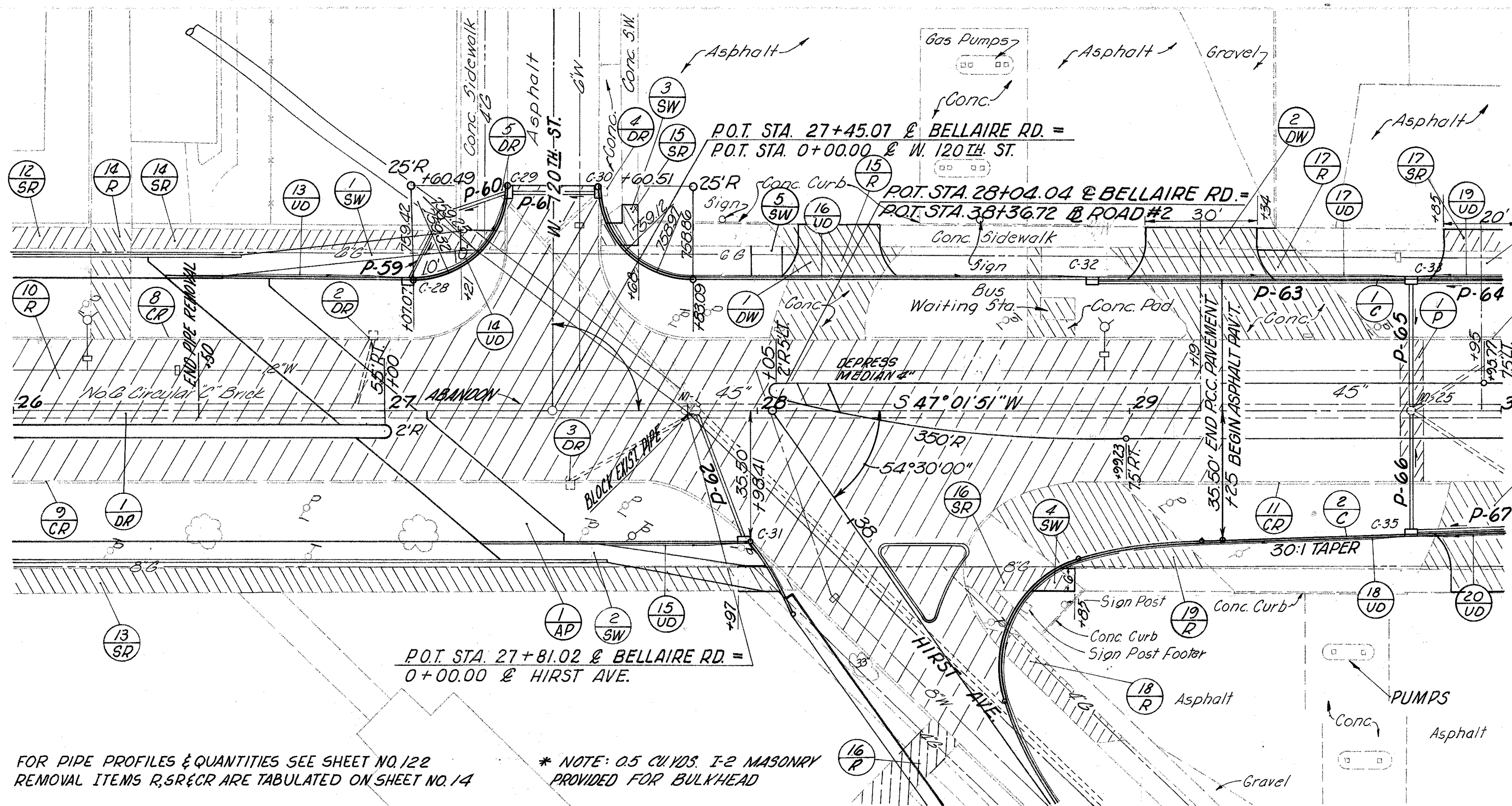


I-3	6" CONC. SIDEWALK	S.F.		204	204
I-2	MASONRY	C.Y.	0.5	0.5	0.5
E-16	PIPE REMOVED	L.F.	340	340	340
S-34	REMOVAL & DISPOSAL OF CONCR. SLAB	SQ. YDS.	LUMP	LUMP	LUMP
I-1	CL. I-3 SEC. M 608 (a)				
I-7	APPROACH SLAB	LIN. FT.	90.705	26	26
				200	200

12VD	22+00	~	22+26	RT
10P	23+21	~	26+00	LT. &
2DP	22+60	~	26+00	
11SW	22+47	~	22+80	LT&RT
1AP	22+33			

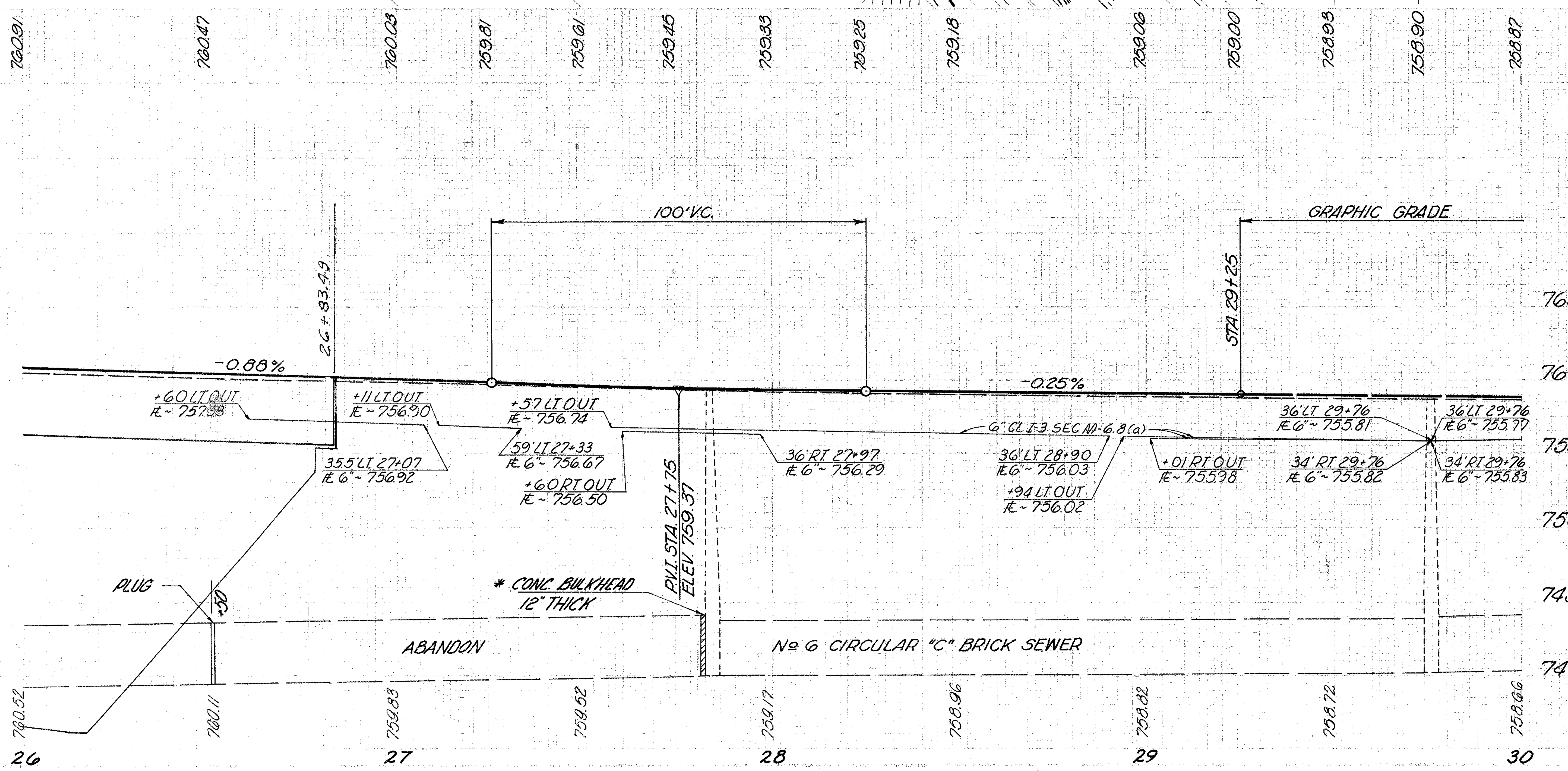
BELLAIRE RD. PLAN & PROFILE ~ STA. 22+00 TO STA. 26+00

DESCRIPTION	PLOTTED BY	DATE	INK'D BY	DATE	CHK'D BY	DATE
TOPOGRAPHY						
PROFILE GRADE						
DRAINAGE						
R.O.W.						
BENCH MARKS						



FOR PIPE PROFILES & QUANTITIES SEE SHEET NO. 122
REMOVAL ITEMS R, SR & CR ARE TABULATED ON SHEET NO. 14

* NOTE: 0.5 CU.YDS. I-2 MASONRY PROVIDED FOR BULKHEAD



ESTIMATED QUANTITIES

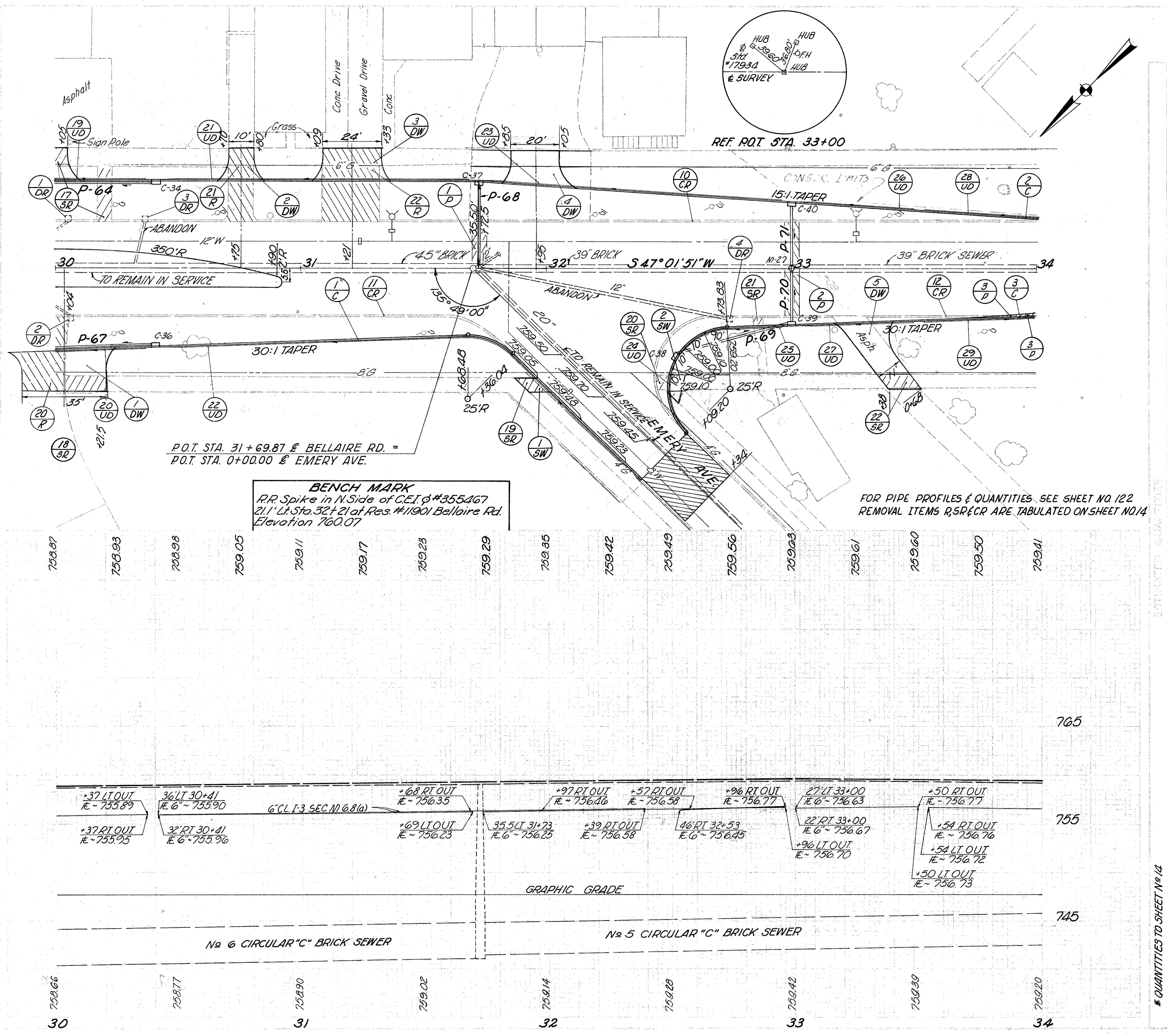
* QUANTITIES TO SHEET No 14

Ref.	Station	Side	E-8 PAVEMENT REMOVAL SQ.YDS.	B-70 8" PORT. CEM. CONC. BASE COURSE SQ.YDS.	T-30 BIT. TACK COAT GALS.	I-19 3" INSULATION COURSE & SUBBASE CU.YDS.	T-71 8" PORT. CEMENT CONCRETE PAVEMENT SQ.YDS.	I-7 APPROACH SLAB SQ.YDS.	I-2 MASONRY CU.YDS.	I-11* SPECIAL SANDSTONE CURB LIN.FT.	I-13 4½" CONCRETE SIDEWALK SQ.FT.	E-12 PIPE REMOVED OVER 15" LIN.FT.	I-16 C.B. ABANDON EA.	I-1 CL. I-3 SEC. M 6.8(a) 6" LIN.FT.	I-1 CL. F-4 6" LIN.FT.
13UD	26+60 ~ 27+07	LT.												37	10
14UD	27+11 ~ 27+33	LT.												24	10
15UD	27+60 ~ 27+97	RT.												27	10
16UD	27+57 ~ 28+90	LT.												130	10
17UD	28+94 ~ 29+76	LT.												72	10
18UD	29+01 ~ 29+76	RT.												65	10
19UD	29+76 ~ 30+00	LT.												14	10
20UD	29+76 ~ 30+00	RT.												14	10
1DR	26+00 ~ 26+50								0.5			50			
2DR	26+97	LT.											1		
3DR	27+50	RT.											1		
4DR	27+57	LT.											1		
5DR	27+32	LT.											1		
1DW	28+05	LT.				37.2	37.6								
2DW	29+19	LT.				46.8	46.7								
3DW	29+95	LT.				32.4	32.3								
1SW	26+39 ~ 27+21	LT.									492				
2SW	27+28 ~ 28+04	RT.									456				
3SW	27+60 ~ 27+68	LT.									554				
4SW	28+74 ~ 28+85	RT.									48				
5SW	29+38 ~ 29+89	LT.									48				
1P	29+76	LT.&RT.	25.3	25.3	2.5	25.2									
1C	29+25 ~ 30+00	LT.								75					
2C	29+25 ~ 30+00	RT.								75					
1AP	26+96	LT.&RT.						200							
Total			25.3	25.3	2.5	141.6	110.6	200	0.5	150	1099.4	50	4	378	80

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY	J.H.S.	9-13-63	J.H.S.	9-13-63		
PAVEMENT	J.H.S.	"	J.H.S.	"		
DRAINAGE						
R. O. W.						
QUANTITIES						

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
EXISTING GROUND						
PROFILE GRADE			D.J.U.	4-28-64		
DRAINAGE						
BENCH MARKS						

BELLAIRE RD. PLAN & PROFILE ~ STA. 26+00 TO STA. 30+00



DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY	J.H.S.	9-13-63	J.H.S.	9-13-63		
PAVEMENT	J.H.S.	〃	J.H.S.	〃		
DRAINAGE						
R. O. W.						
QUANTITIES						

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
EXISTING GROUND						
PROFILE GRADE						
DRAINAGE						
BENCH MARKS						

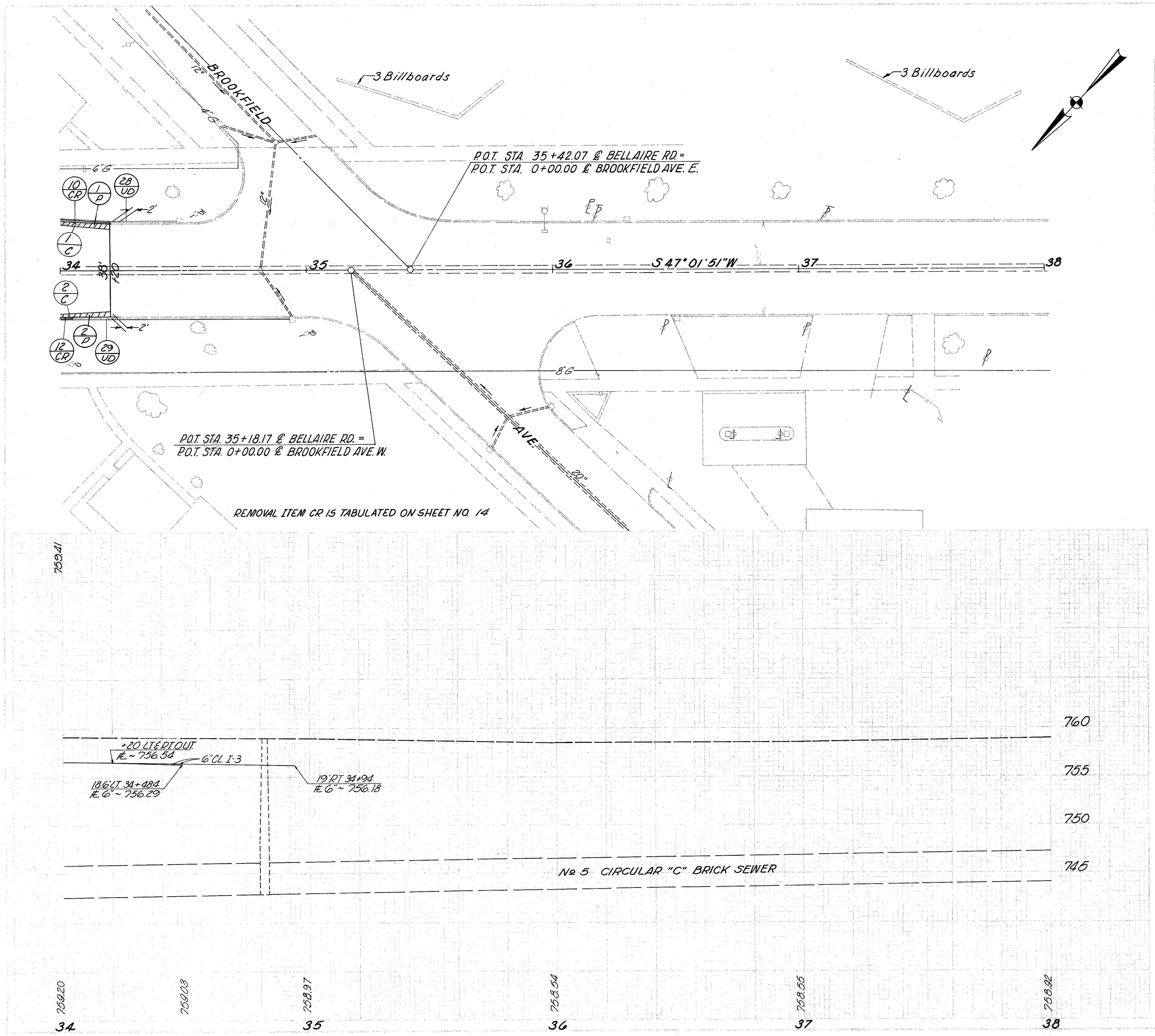
ESTIMATED QUANTITIES

	E-8 PAVEMENT REMOVAL SQ. YDS.	B-20 8" PORT. CEM. CONC. BASE COURSE SQ. YDS.	T-30 BIT. TACK COAT GALS.	I-19 3" INSULATION COURSE & SUBBASE CU. YDS.	T-71 8" PORT. CEMENT CONCRETE PAVEMENT SQ. YDS.	I-11 * SPECIAL SANDSTONE CURB LIN. FT.	I-13 4½" CONCRETE SIDEWALK SQ. FT.	I-16 C.B. ABANDON EA.	I-1 CL. I-3 SEC. N 6.8(a) 6" LIN. FT.	I-1 CL. F-4 6" LIN. FT.
19UD 30+00 ~ 30+37 LT.									37	
20UD 30+00 ~ 30+37 RT.									37	
21UD 30+41 ~ 31+69 LT.									118	10
22UD 30+41 ~ 32+39 RT.									189	10
23UD 31+73 ~ 32+96 LT.									113	10
24UD 32+53 ~ 32+57 RT.									24	10
25UD 32+53 ~ 32+96 RT.									41	10
26UD 33+00 ~ 33+50 LT.									40	10
27UD 33+00 ~ 33+50 RT.									40	10
28UD 33+54 ~ 34+00 LT.									46	
29UD 33+54 ~ 34+00 RT.									46	
1DR 30+06 LT.								1		
2DR 30+07 RT.								1		
3DR 30+37 LT.								1		
4DR 32+75 RT.								1		
1DW 30+04 RT.				69.6	69.5					
2DW 30+75 LT.				18.0	17.8					
3DW 31+21 LT.				38.4	38.1					
4DW 31+95 LT.				33.0	33.9					
5DW 33+26 RT.				34.8	35.2					
1SW 31+88 ~ 32+00 RT.							48			
2SW 32+49 ~ 32+55 RT.							54			
1P 31+73 LT.&RT.	12.7	12.7	1.3	13.2						
2P 33+00 LT.&RT.	25.3	25.3	2.5	25.2						
3P 33+70 ~ 34+00 RT.	3.3	3.3	0.3	3.6						
1C 30+00 ~ 32+39 RT.						263				
2C 30+00 ~ 34+00 LT.						402				
3C 32+57 ~ 34+00 RT.						186				
	41.3	41.3	4.1	236.4	194.5	851	102	4	731	70

* QUANTITIES TO SHEET № 14

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY	J.A.S.	9-16-63	J.A.S.	9-16-63		
PAVEMENT	J.A.S.	11	J.A.S.	11		
DRAINAGE						
R. O. W.						
QUANTITIES						

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
EXISTING GROUND			D.J.J.	4-28-64		
PROFILE GRADE						
DRAINAGE						
BENCH MARKS						



ESTIMATED QUANTITIES

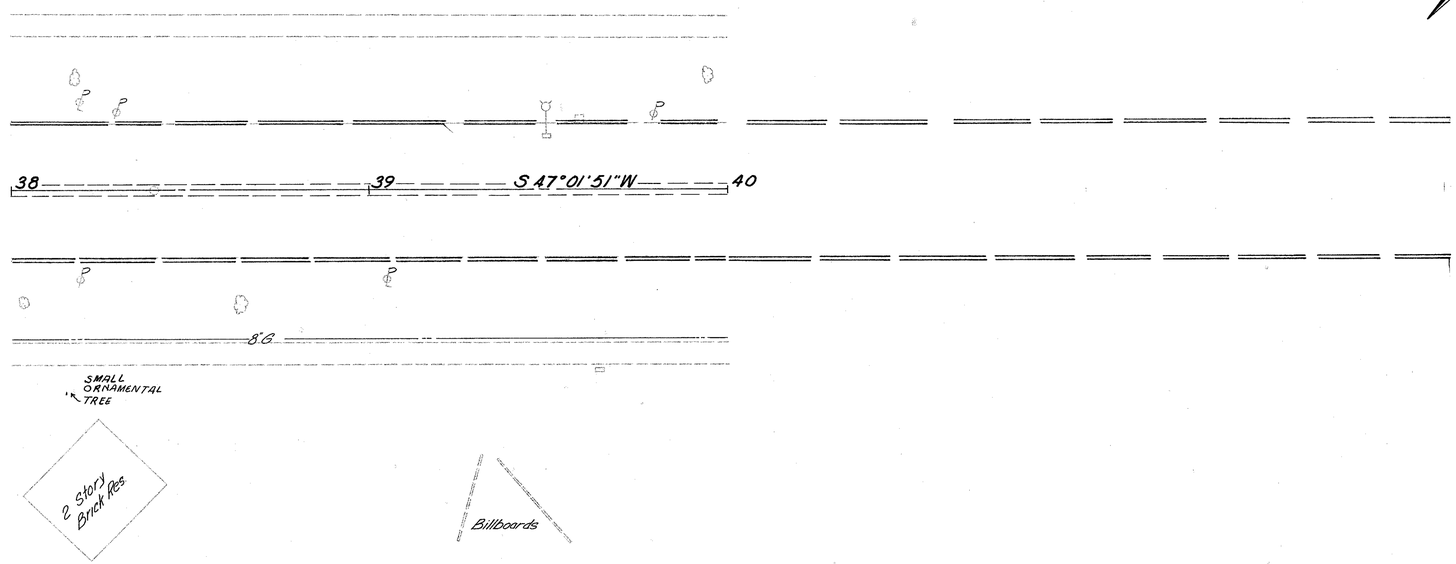
* CARRIED TO SHEET 14

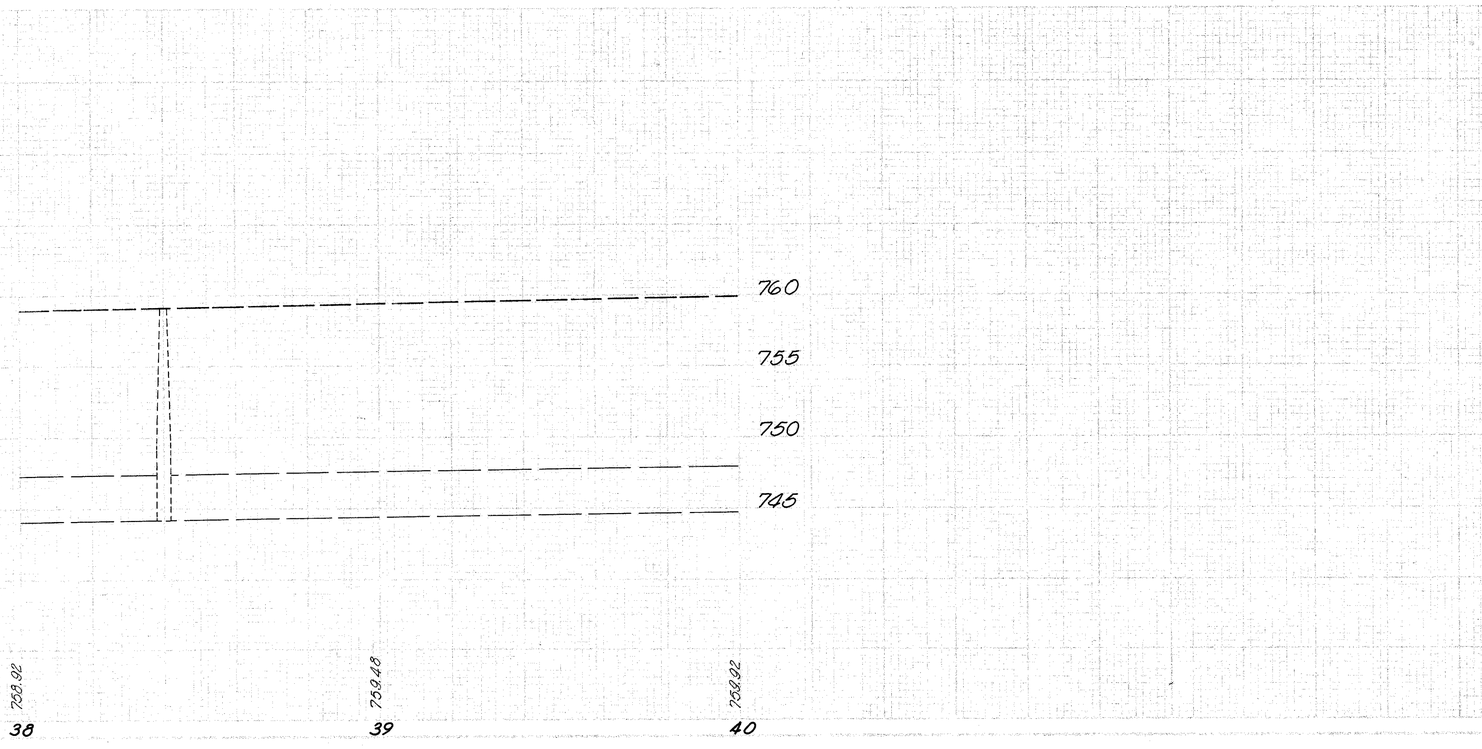
REF. NO.	STATION TO STATION	SIDE	E-8 PAV'T REMOVAL S.Y.	B-70 8" PORT. CEM. CONC. BASE S.Y.	T-30 BIT. TACK COAT GALS.	I-19 3" INSUL. COURSE C.Y.	I-11 * SPEC. SANDST. CURB LIN. FT.	I-1 CL. I-3 SEC. M-6.8(a) 6" LIN. FT.	I-1 CL. F-4 6" LIN. FT.
28UD	34+00 ~ 34+48	LT.						38	10
29UD	34+00 ~ 34+94	RT.						84	10
1C	34+00 ~ 34+20						20		
2C	34+00 ~ 34+20						20		
1-P	34+00 ~ 34+20	LT.	4.4	4.4	0.4	4.8			
2-P	34+00 ~ 34+20	RT.	2.2	2.2	0.2	2.4			
			6.6	6.6	0.6	7.2	40	122	20

CUYAHOGA COUNTY
CUY-71-13.68

FED. ROAD DIV. NO.	STATE	PROJECT	
2	OHIO		

95
279





DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
EXISTING GROUND						
PROFILE GRADE						
DRAINAGE						
BENCH MARKS						

ESTIMATED QUANTITIES

STATION TO STATION	SIDE

BELLAIRE RD. PLAN & PROFILE ~ STA. 38+00 TO STA. 40+00

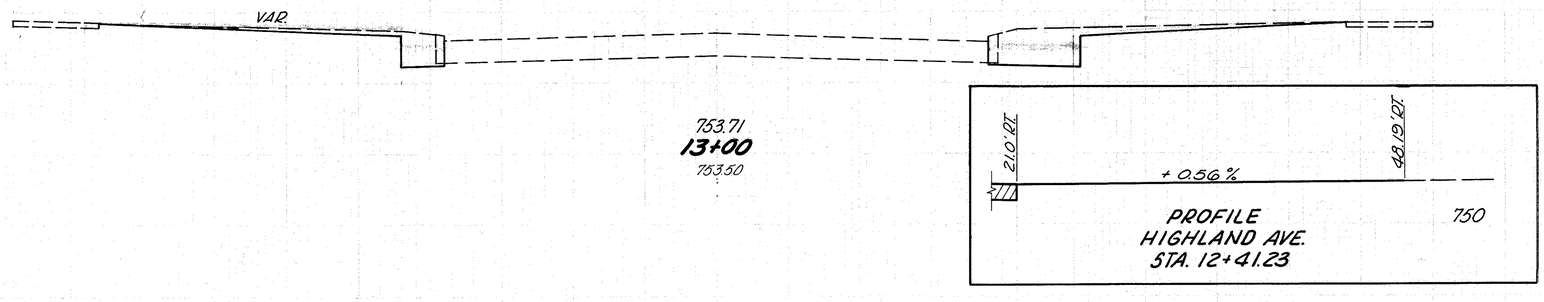
96
279

CUYAHOGA COUNTY
CUY-71-13.68

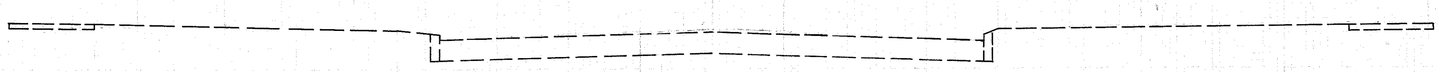
39.3

2222

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY						
PROFILE						
DRAINAGE						
R.O.W.						
QUANTITIES						

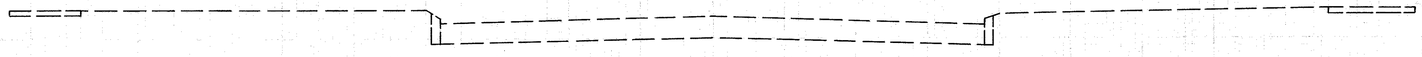


PROFILE
HIGHLAND AVE.
STA. 12+41.23



12+00
752.60

BEGIN WORK STA. 11+92.00



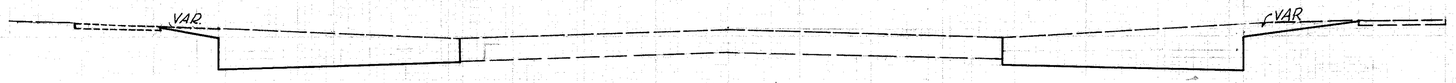
11+00
751.64

75 50 25 ℄ 25 50

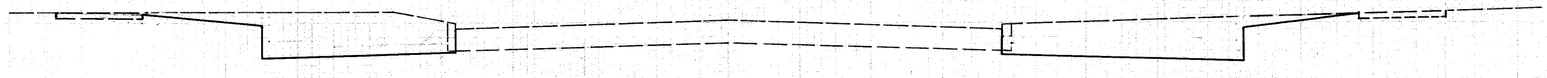
BELLAIRE RD. X-SEC. ~ STA. 11+00 TO STA. 13+00

43

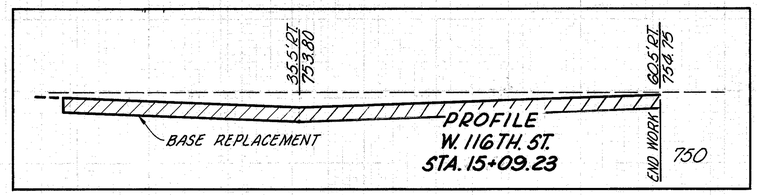
CUYAHOGA COUNTY
CUY-71-13.68



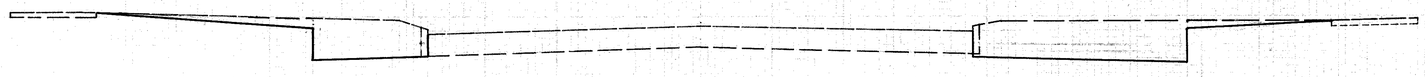
755.64
17+00
755.43



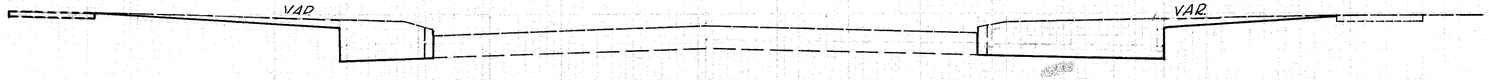
755.39
16+00
755.18



754.96
15+00
754.75



754.58
14+30
754.37



754.42
14+00
754.21

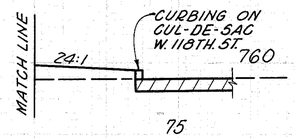
STA. 13+00

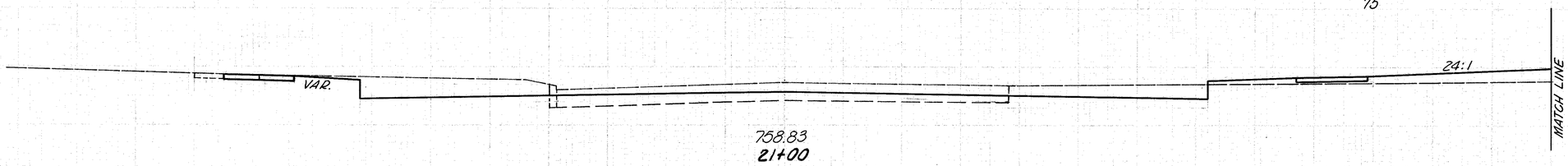
75 50 25 ℄ 25 50 STA. 13+00

BELLAIRE RD. X-SEC. ~ STA. 14 + 00 TO STA. 17 + 00

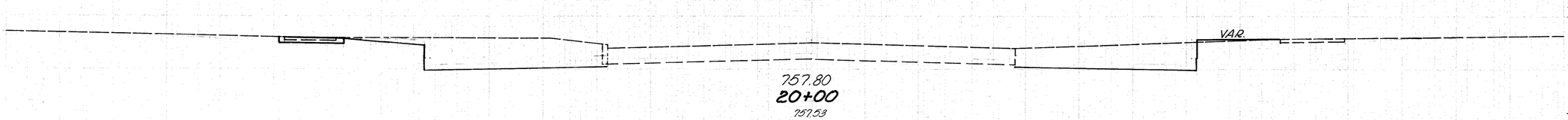
DESCRIPTION	PLOTTED/ANED	CALCULATED	CHK'D
	BY	DATE	BY
ORIGINAL GROUND	JR	5/28	
TEMPLATES	12	5/28	
REMARKS	0.02	8 3.68	
ESTIMATE			
EARTHWORK			
EXISTING AREAS			

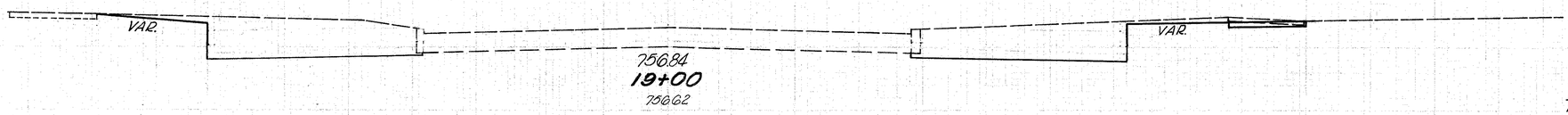
CUYAHOGA COUNTY
CUY-71-13.68

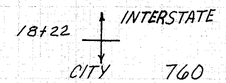


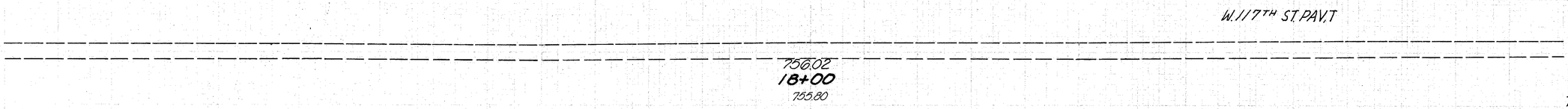


20+50.00
SUSPEND WIDENING AND RESURFACING
USING T-35 AND BEGIN T-71.









STA. 17+00

75 50 25 ℄ 25 50 STA. 17+00

BELLAIRE RD. Z-SEC. STA. 18+00 TO STA. 21+00

99
279

CUYAHOGA COUNTY
CUY-71-13.68

STA. 29+25.00
END T-71 AND RESUME WIDENING AND RESURFACING USING T-35.

14 144 12 78 16 22 122 22 STA. 21+00

760 750 760 750 760 750

73 71 75 75 75 84 84

759.06
29+00
758.82

759.33
28+00
759.17

759.61
27+50
759.52

759.51
21+50
759.16

PROFILE
825'±LT
355'±LT
+3.2%
W. 120TH. ST.
STA. 27+45.07
755

STRUCTURE STA. 22+35 TO STA. 26+83

BEGIN EARTHWORK
STA. 26+85

END EARTHWORK
STA. 22+35

24:1 24:1
CURBING ON CUL-DE-SAC, W. 118TH. ST.

267 135 42 264 147 17

75 50 25 ℄ 25 50 STA. 21+00 74 19

BELLAIRE RD. X-SEC. STA. 21+50 TO STA. 29+00

PLOTTED
DESCRIPTION
PLANIMETERED
CALCULATED
CHECKED
DATE

CUYAHOGA COUNTY
CUY-71-13.68

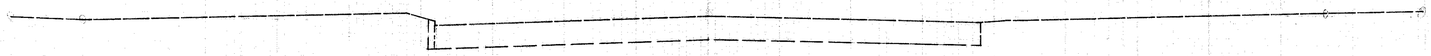
DESCRIPTION	PLOTTED/TRACED BY	DATE	CALCULATED BY	DATE	CHECKED BY	DATE
ORIGINAL GROUND	JBS	8/28/68				
TEMPLATES	DDL	9/3/68				
ROADWAY						
END AREAS						
EARTHWORK						
MISCELLANEOUS						

LEFT AREA	LEFT VOLUME		RIGHT AREA	RIGHT VOLUME
36		759.03		760
		33+00		31
400		759.42		750
				148
36		759.35		760
		32+00		49
311		759.14		750
				220
20		759.11		760
		31+00		70
217		758.90		750
				246
19		758.87		760
		30+00		63
183		758.66		750
				252
14	STA. 29+00			73

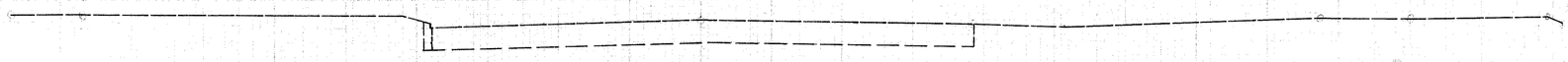
75 50 25 ℄ 25 50 STA. 29+00

BELLAIRE RD. X-SEC. STA. 30+00 TO STA. 33+00

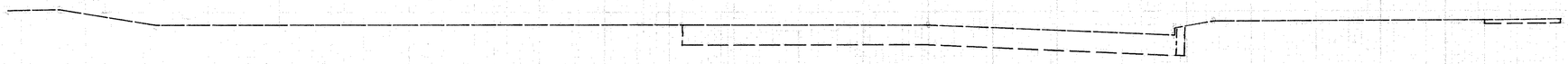
CUYAHOGA COUNTY
CUY-71-13.68



37+00
758.55

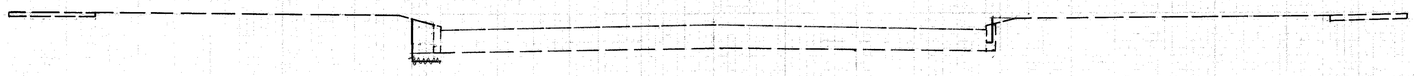


36+00
758.54



35+00
758.97

END WORK STA. 34+45



759.41
34+00
759.20

760
750
760
750
760
750
760
750

STA. 34+45

0
115
46
456
36

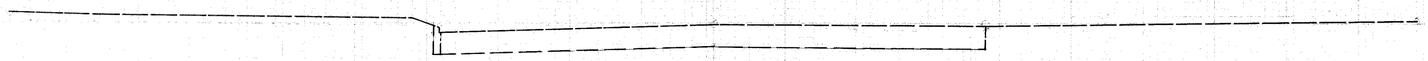
STA. 33+00

75 50 25 ℄ 25 50

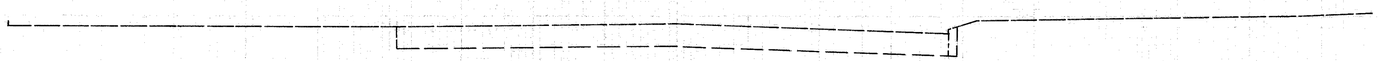
STA. 34+45
0
3
4
65
STA. 33+00
31

BELLAIRE RD. Y-SEC. STA. 34+00 TO STA. 37+00

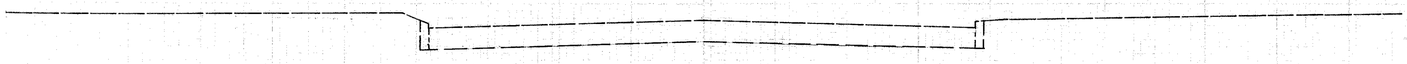
CUYAHOGA COUNTY
CUY-71-13.68



40+00
759.92



39+00
759.48

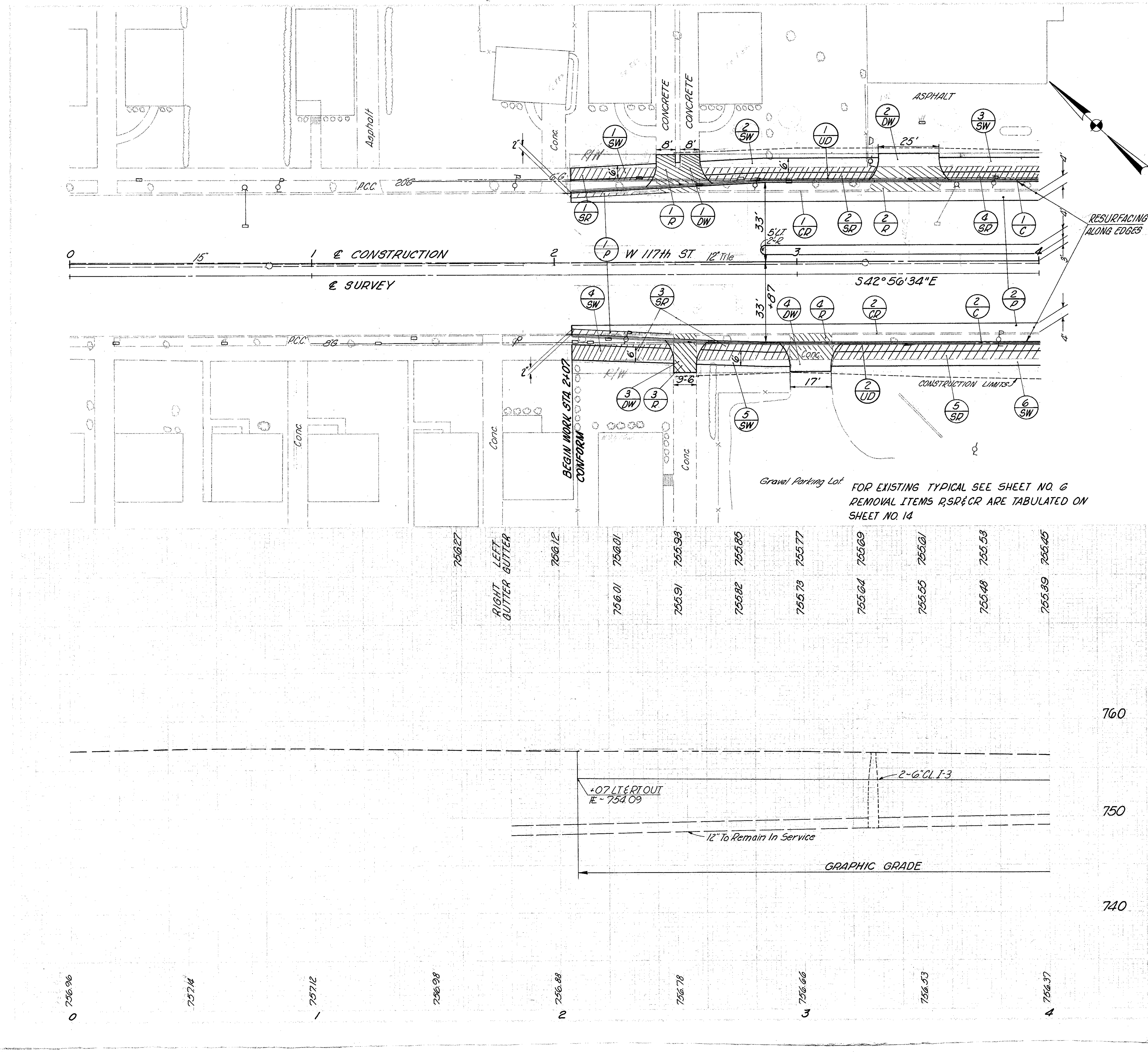


38+00
758.92

760
750
760
750
760
750

75 50 25 ℄ 25 50

BELLAIRE RD. ℄-SEC. STA. 38+00 TO STA. 40+00

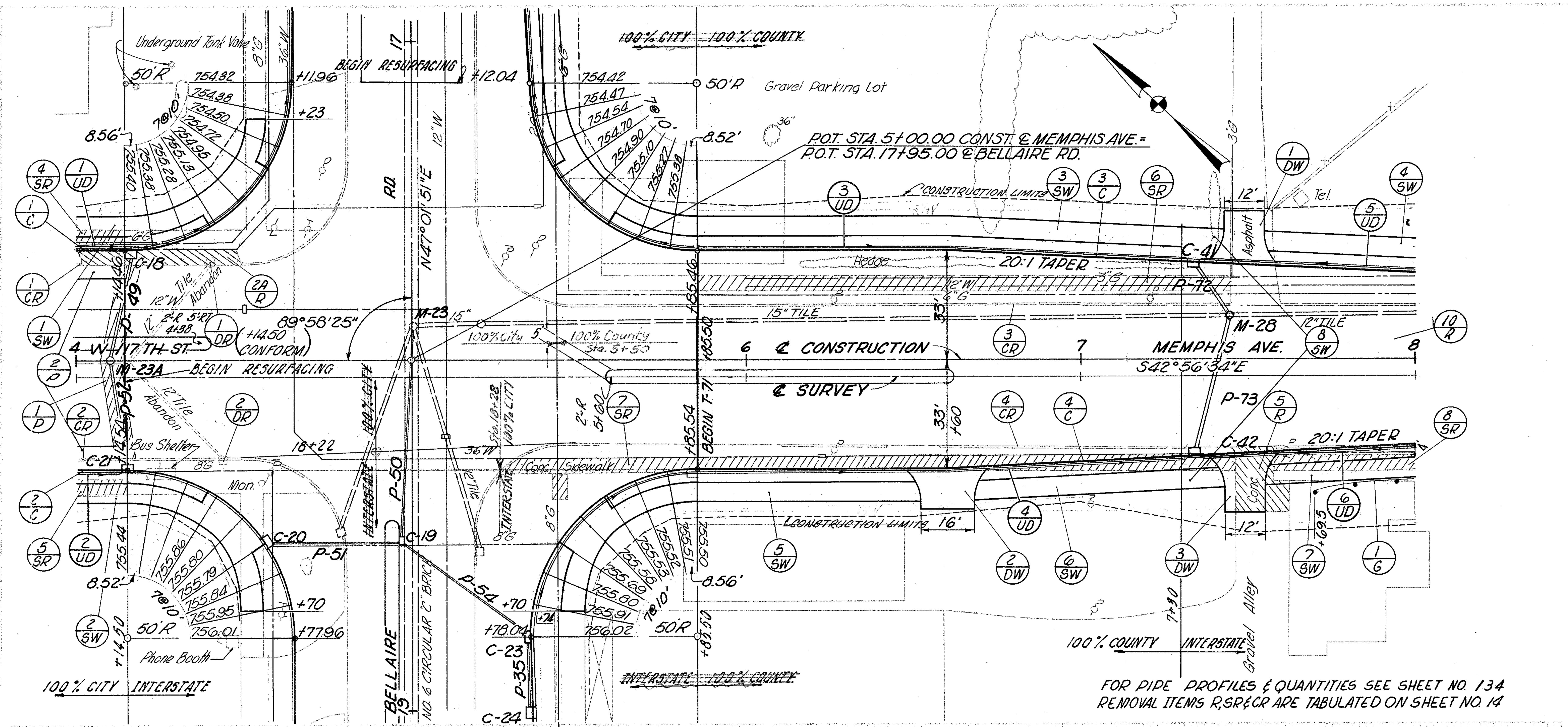


FOR EXISTING TYPICAL SEE SHEET NO. 6
REMOVAL ITEMS R, SR & CR ARE TABULATED ON SHEET NO. 14

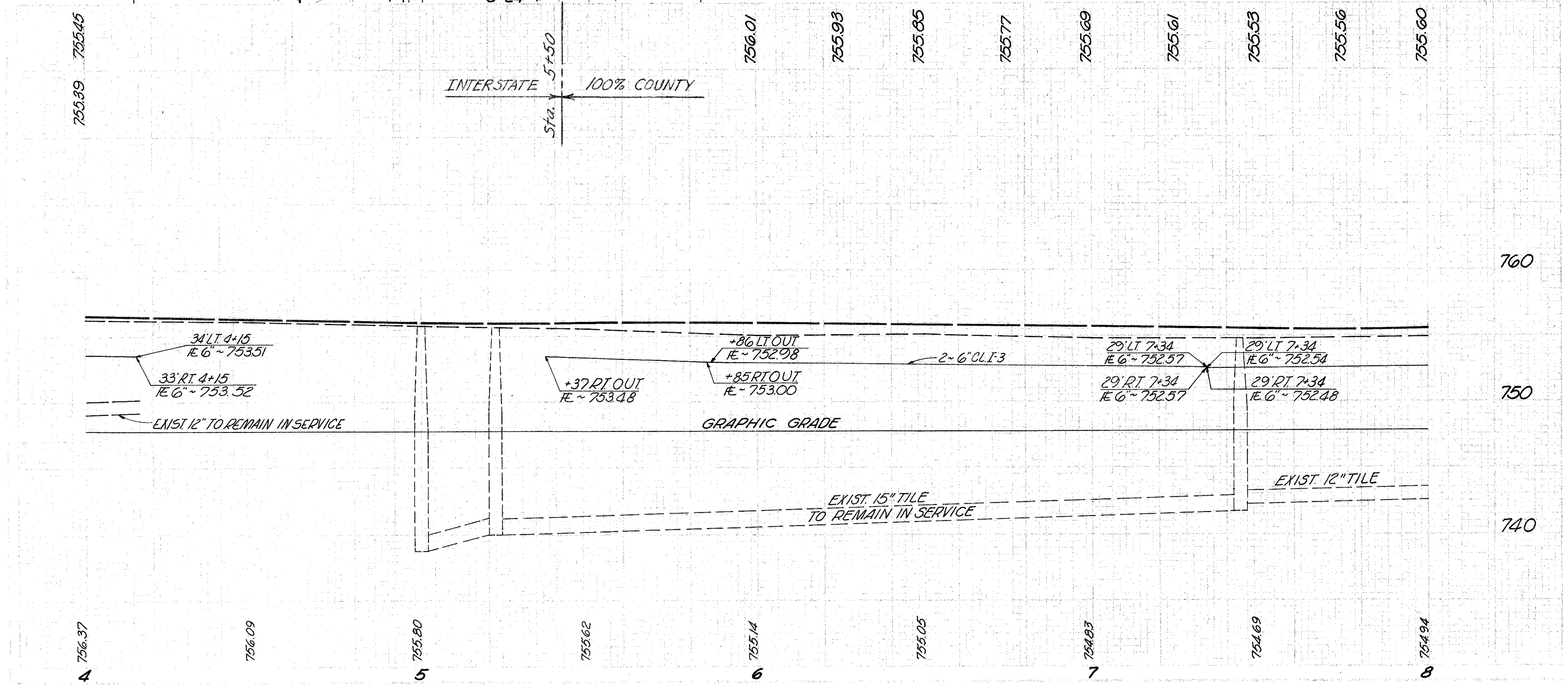
ESTIMATED QUANTITIES

100 % CITY — *QUANTITIES TO SHEET NO. 14

Item	Station	Side	I-1 CL. I-3 SEC. NO 0.8(a) 6" LIN. FT.	I-19 3" INSULATION COURSE & SUBBASE CU. YDS.	T-70 6" PORT. CEMENT CONCRETE PAVEMENT SQ. YDS.	T-71 8" PORT. CEMENT CONCRETE PAVEMENT SQ. YDS.	I-13 4½" CONCRETE SIDEWALK SQ. FT.	I-11* SAND-STONE CURB LIN. FT.	E-8 REM. & DISPOSAL EXIST. PAVT. S.Y.	B-70 9" PORT. CEM. CONC. PAVT. S.Y.	T-30 BIT. TACK COAT GAL.	T-35 1¼" ASPH. C.Y.	B-35 1¼" ASPH. BASE C.Y.
1UD	2+07 ~ 4+00	LT.	193										
2UD	2+07 ~ 4+00	RT.	193										
1DW	2+51	LT.		33.6	33.2								
2DW	3+46.5	LT.		33.6		33.6							
3DW	2+54	RT.		16.8	16.6								
4DW	3+06	RT.		21.6		21.7							
1C	2+07 ~ 4+00	LT.						193					
2C	2+07 ~ 4+00	RT.						193					
1SW	2+07 ~ 2+42	LT.					210						
2SW	2+62 ~ 3+32	LT.					420						
3SW	3+60 ~ 4+00	LT.					240						
4SW	2+07 ~ 2+48	RT.					246						
5SW	2+59 ~ 2+96	RT.					222						
6SW	3+15 ~ 4+00	RT.					510						
1P	2+07 ~ 2+37	L.&R.		3.6					3.3	3.3	0.3	0.11	0.11
2P	2+07 ~ 4+00	L.&R.									17.4	6.84	6.84
Total			386	109.2	49.8	55.3	1848	386	3.3	3.3	17.7	6.95	6.95



FOR PIPE PROFILES & QUANTITIES SEE SHEET NO. 134
REMOVAL ITEMS R, SR & CR ARE TABULATED ON SHEET NO. 14



DESCRIPTION	PLOTTED BY	DATE	INKED BY	DATE	CHECKED BY	DATE
TOPOGRAPHY						
PAVEMENT						
DRAINAGE						
R. O. W.						
QUANTITIES						

DESCRIPTION	PLOTTED BY	DATE	INKED BY	DATE	CHECKED BY	DATE
EXISTING GROUND						
PROFILE GRADE						
DRAINAGE						
BENCH MARKS						

ESTIMATED QUANTITIES

* 100% CITY ‡ 100% COUNTY *QUANTITIES TO SHEET NO. 14

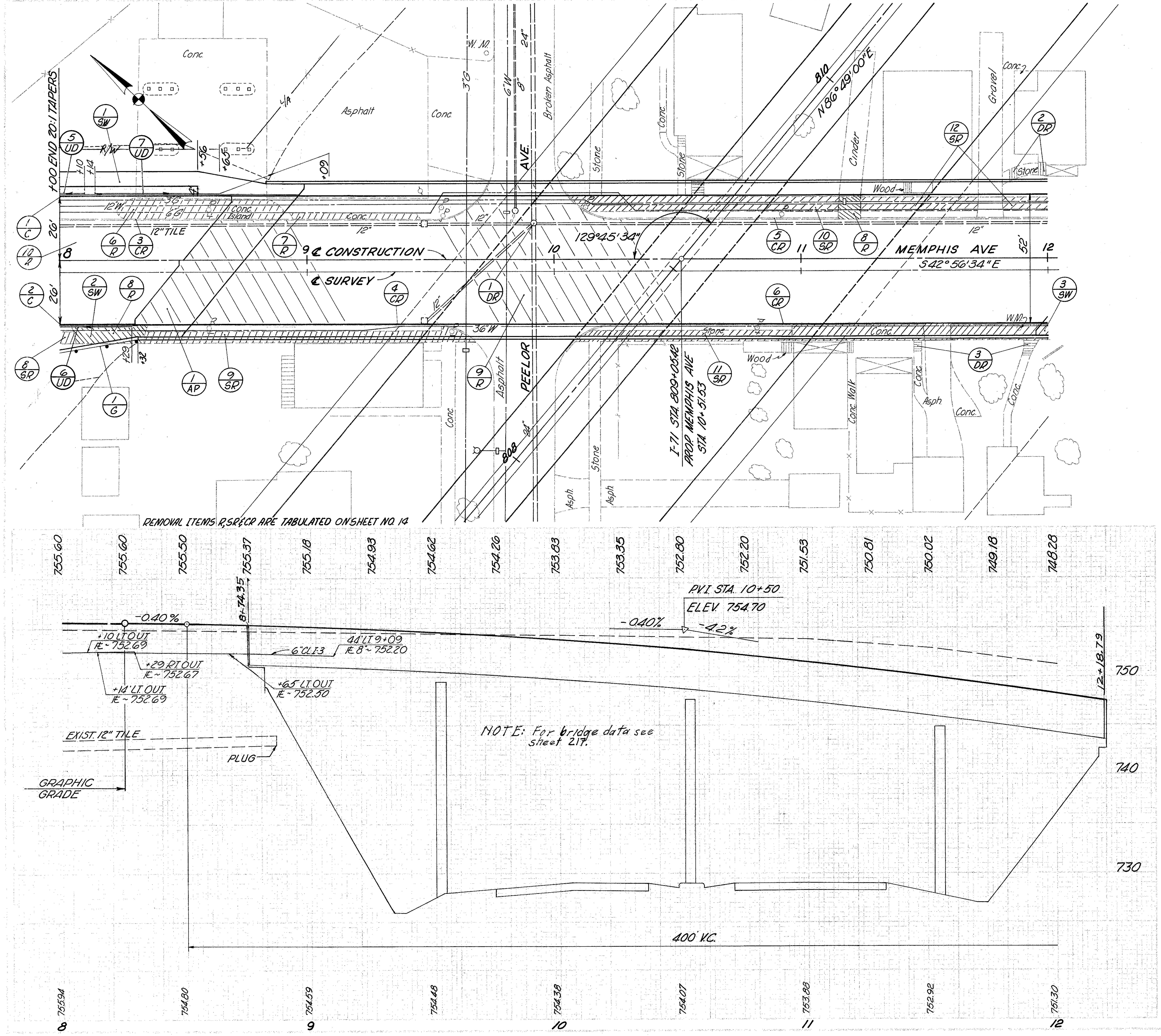
SHEET NO.	STATION TO STATION	SIDE	I-1 CL. I-36" SEC. NO. 6.8(e)‡ 6.8(a)* LIN. FT.	CL. F-4 6"	I-11* SANDSTONE CURB LIN. FT.	I-12 CONCRETE CURB TYPE 2-A LIN. FT.	I-13 4½" CONCRETE SIDEWALK SQ. FT.	I-15 GUARD RAIL STANDARD TYPE (DEEP) LIN. FT.	I-16 CATCH BASIN ABANDON EA.	T-35 1¼" ASP. C.Y.	B-35 1¼" ASP. BASE C.Y.	E-8 PAVEMENT REMOVAL SQ. YDS.	B-70 8" PORT. CEM. CONC. BASE COURSE SQ. YDS.	T-30 BIT. TACK COAT GALS.	I-19 3" INSULATION COURSE & SUBBASE CU. YDS.	T-71 8" PORT. CEMENT CONCRETE PAVEMENT SQ. YDS.
1UD	4+00 ~ 4+15	LT.	5 *	10 *												
2UD	4+00 ~ 4+15	RT.	5 *	10 *												
3UD	5+86 ~ 7+34	LT.	138 ‡	10 ‡												
4UD	18+74 BELLAIRE ~ 7+34	RT.	212 ‡	10 ‡												
5UD	7+34 ~ 8+00	LT.	56	10												
6UD	7+34 ~ 8+00	RT.	56	10												
1DR	4+40	LT.							1 *							
2DR	4+44	RT.							1 *							
1DW	7+49	LT.													21.6	22.2
2DW	6+60	RT.													26.4 ‡	26.1 ‡
3DW	7+49	RT.													22.8	23.0
1C	4+00 ~ 4+14.5	LT.			14.5 *											
2C	4+00 ~ 4+14.5	RT.			14.5 *											
3C	5+85.5 ~ 7+30	LT.				144.5 ‡										
4C	5+85.5 ~ 7+30	RT.				144.5 ‡										
4C	7+30 ~ 8+00	L.R.				140										
1SW	4+00 ~ 4+15	LT.					90 *									
2SW	4+00 ~ 4+15	RT.					90 *									
3SW	5+85.5 ~ 7+30	LT.					848 ‡									
4SW	7+55 ~ 8+00	LT.					270									
5SW	5+85.5 ~ 6+52	RT.					399 ‡									
6SW	6+68 ~ 7+30	RT.					373 ‡									
7SW	7+56 ~ 8+00	RT.					264									
8SW	7+30 ~ 7+42	L & R					144									
1P	4+10	LT. & RT.								1.41 *	1.41 *	40.7 *	40.7 *	4.1 *	40.8 *	
2P	4+00 ~ 4+14.5	LT. & RT.								0.45	0.45			1.3		
1G	7+69.5 ~ 8+00	RT.						30.5								
	INTERSTATE		112 ‡	20		140	678	30.5							44.4	45.2
	100% COUNTY		350	20		289	1620								26.4	26.1
	100% CITY		10	20	29		180		2	1.86	1.86	40.7	40.7	5.4	40.8	

Rev. 6-4-65 CEH

W 117 TH. ST. ~ MEMPHIS AVE STA. 4+00 to STA. 8+00

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY						
PAVEMENT						
DRAINAGE						
R. O. W.						
QUANTITIES						

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
EXISTING GROUND						
PROFILE GRADE						
DRAINAGE						
BENCH MARKS						



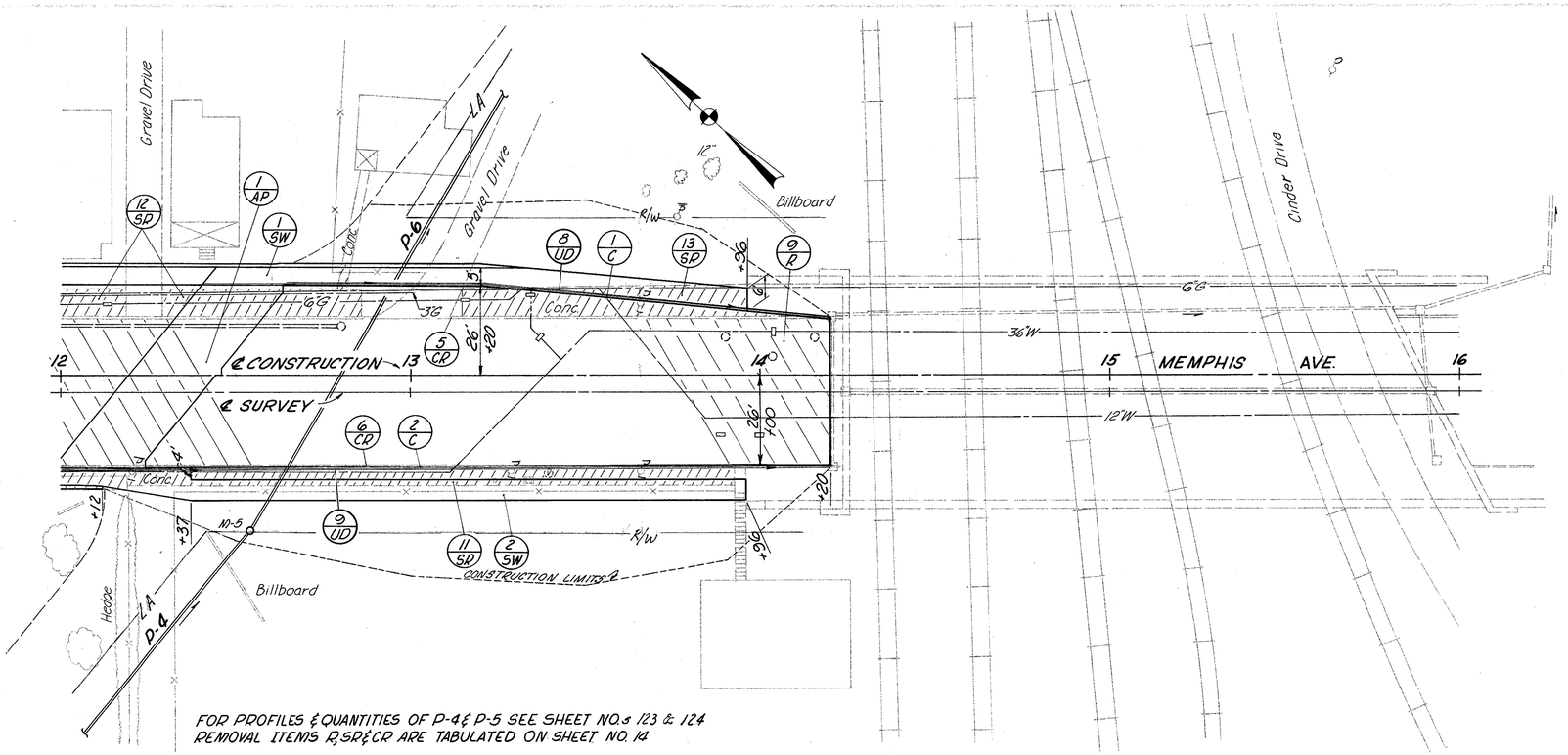
ESTIMATED QUANTITIES

SEE SHEET NO.	STATION TO STATION			SIDE	I-1 CL. I-3 SEC. M 6.8(e) 6" LIN. FT.	I-1 CL. F-4 SEC. N 6.4(c) 8" LIN. FT.	I-5 PIPE SPEC. CL. I-3 30° BEND 6" EA.	I-12 CONCRETE CURB TYPE 2-A LIN. FT.	I-13 4½" CONCRETE SIDEWALK SQ. FT.	I-15 GUARDRAIL STANDARD TYPE (DEEP) LIN. FT.	S-24 REMOVAL OF EXISTING STRUCTURE LUMP	I-7 APPROACH SLAB SQ. YDS.
5UD	8+00	~	8+10	LT.	10							
6UD	8+00	~	8+29	RT.	29							
7UD	8+14	~	9+09	LT.	89	10	1					
1DR	9+92			LT.							LUMP	
2DR	11+90			LT.							LUMP	
3DR	11+46	&	11+94	RT.							LUMP	
1C	8+00	~	8+69	LT.				69				
2C	8+00	~	8+32	RT.				32				
1SW	8+00	~	8+98	LT.					621			
2SW	8+00	~	8+51	RT.					340			
3SW	11+96	~	12+00	RT.					24			
1G	8+00	~	8+32	RT.						32		
1AP	8+62			LT. & RT.								147
					128	10	1	101	985	32	LUMP	147

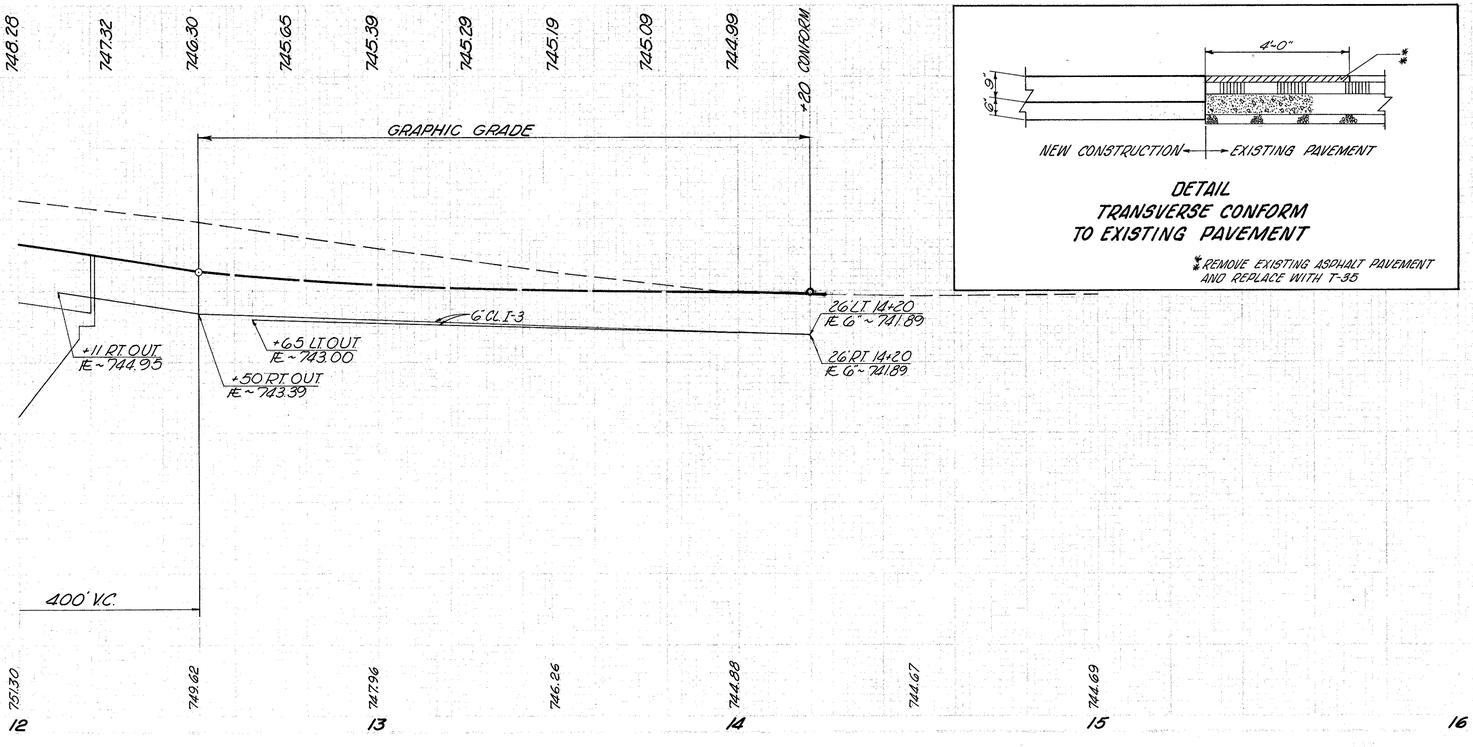
W 117TH. ST. ~ MEMPHIS AVE STA. 8+00 to STA. 12+00

CUYAHOGA COUNTY
CUY-71-13.68

106
279



FOR PROFILES & QUANTITIES OF P-4 & P-5 SEE SHEET NO.s 123 & 124
REMOVAL ITEMS R, SR & CR ARE TABULATED ON SHEET NO. 14



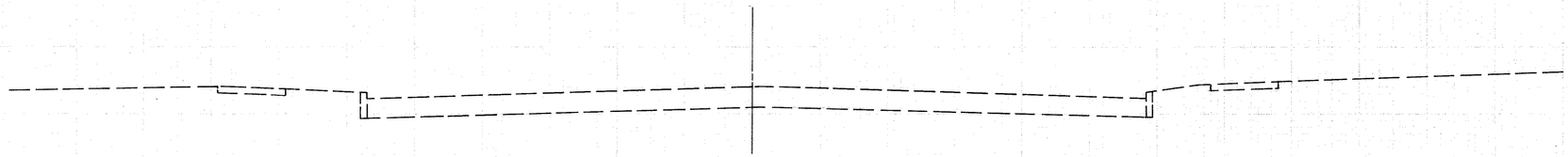
DETAIL
TRANSVERSE CONFORM
TO EXISTING PAVEMENT

* REMOVE EXISTING ASPHALT PAVEMENT AND REPLACE WITH T-35

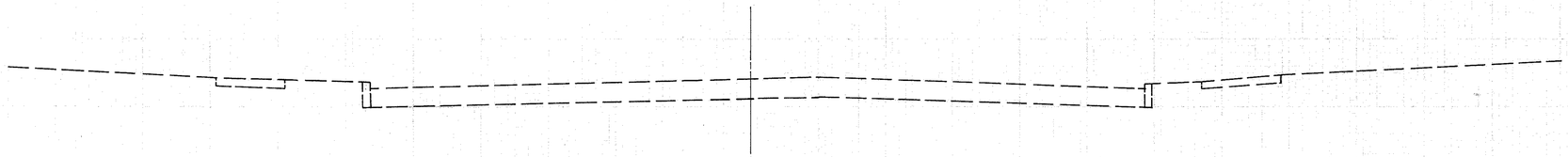
						I-13		
						4" CONCRETE SIDEWALK	LIN. FT.	1983
					I-7	I-12		
					APPROACH SLAB	CONCRETE CURB TYPE 2-A	SQ. YDS.	352
							156	
							196	
							798	
							1185	
							417	417
F-1								
CL. I-3 SEC. M 6" & 8" (as) 6"								
		6"					LIN. FT.	344
			10	LT	14+20			20
			10	RT	14+20			
			145	LT	14+20			
			199	RT	14+20			
					13+96			
					13+96			
							L.T.&RT.	
BUD	12+65	~	14+20					
BUD	12+11	~	14+20					
1C	12+64	~	14+20	LT				
2C	12+24	~	14+20	RT				
15W	12+40	~	13+96	LT				
25W	12+00	~	13+96	RT				
IAD	12+32							

W 117 TH. ST ~ MEMPHIS AVE STA. 12+00 to STA. 16+00

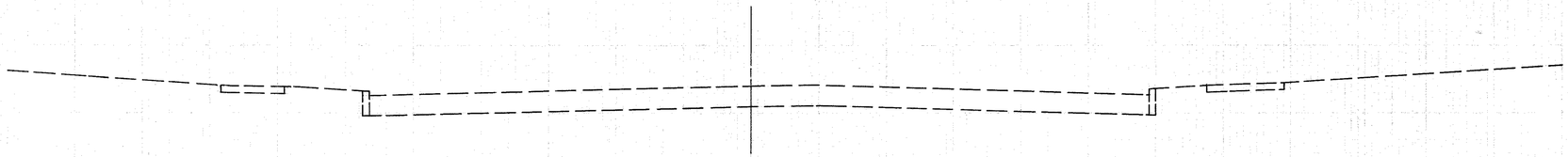
CUYAHOGA COUNTY
CUY-71-13.68



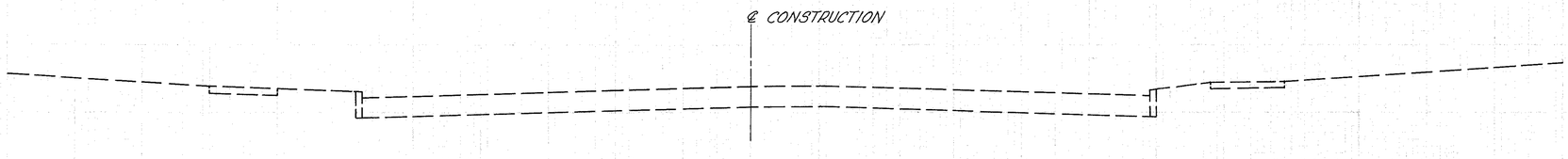
1+50
756.98



1+00
757.12



0+50
757.14



0+00
756.96

750
760
750
760
750
760
750

50 25 ℄ 25 50

W 117th ST. ~ MEMPHIS AVE. X. SEC. STA. 0+00 TO STA 1+50

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY						
FACILITIES						
R. O. W.						
QUANTITIES						

108
279

CUYAHOGA COUNTY
CUY-71-13.68

DESCRIPTION	PLOTTED BY	PLOTTED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY				
PAVEMENT	MJB	8-24-72	DJL	8-24-72
DRAINAGE				
R/W				
QUANTITIES				

5

20

2

28

8

756.75

3+50

756.53

756.89

3+00

756.66

757.03

2+50

756.78

BEGIN WORK STA. 2+07

℄ CONSTRUCTION

2+00

756.88

50 25 ℄ 25 50

W 117th ST ~ MEMPHIS AVE. X-SEC. STA. 2+00 TO STA. 3+50

750 7

12

760

6

750

760

10

750 4

2

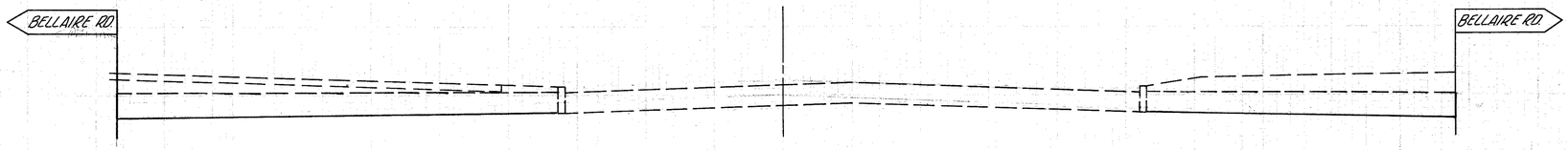
760

0 0

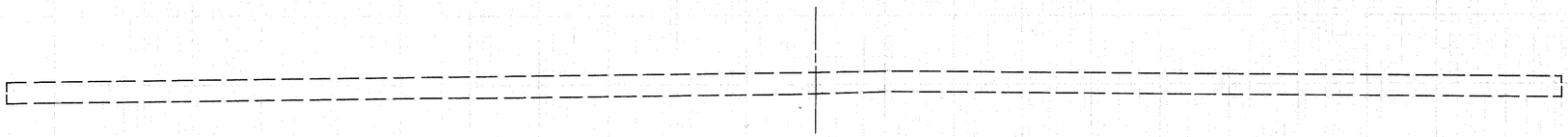
750

109
279

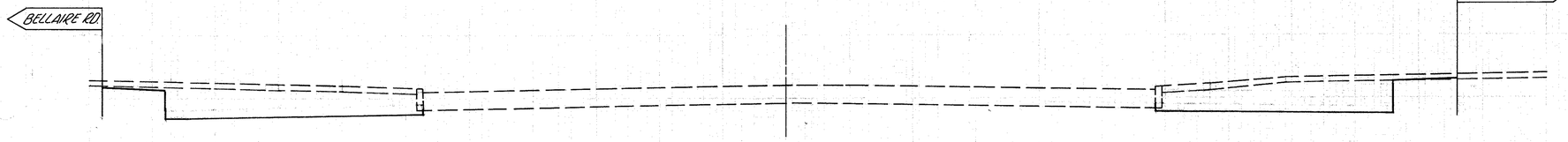
CUYAHOGA COUNTY
CUY-71-13.68



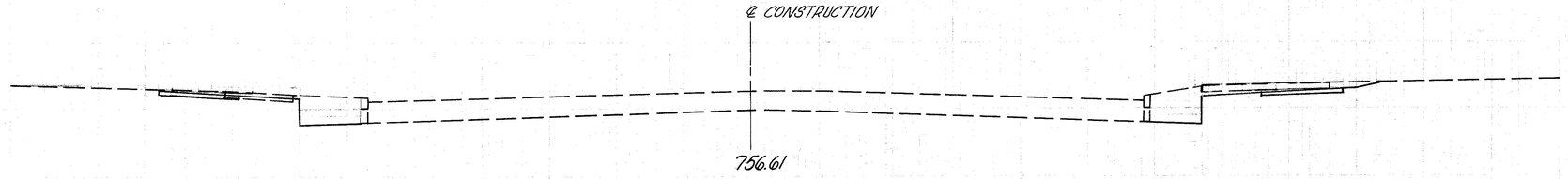
5+50
755.79



4+80
755.94



4+50
756.15



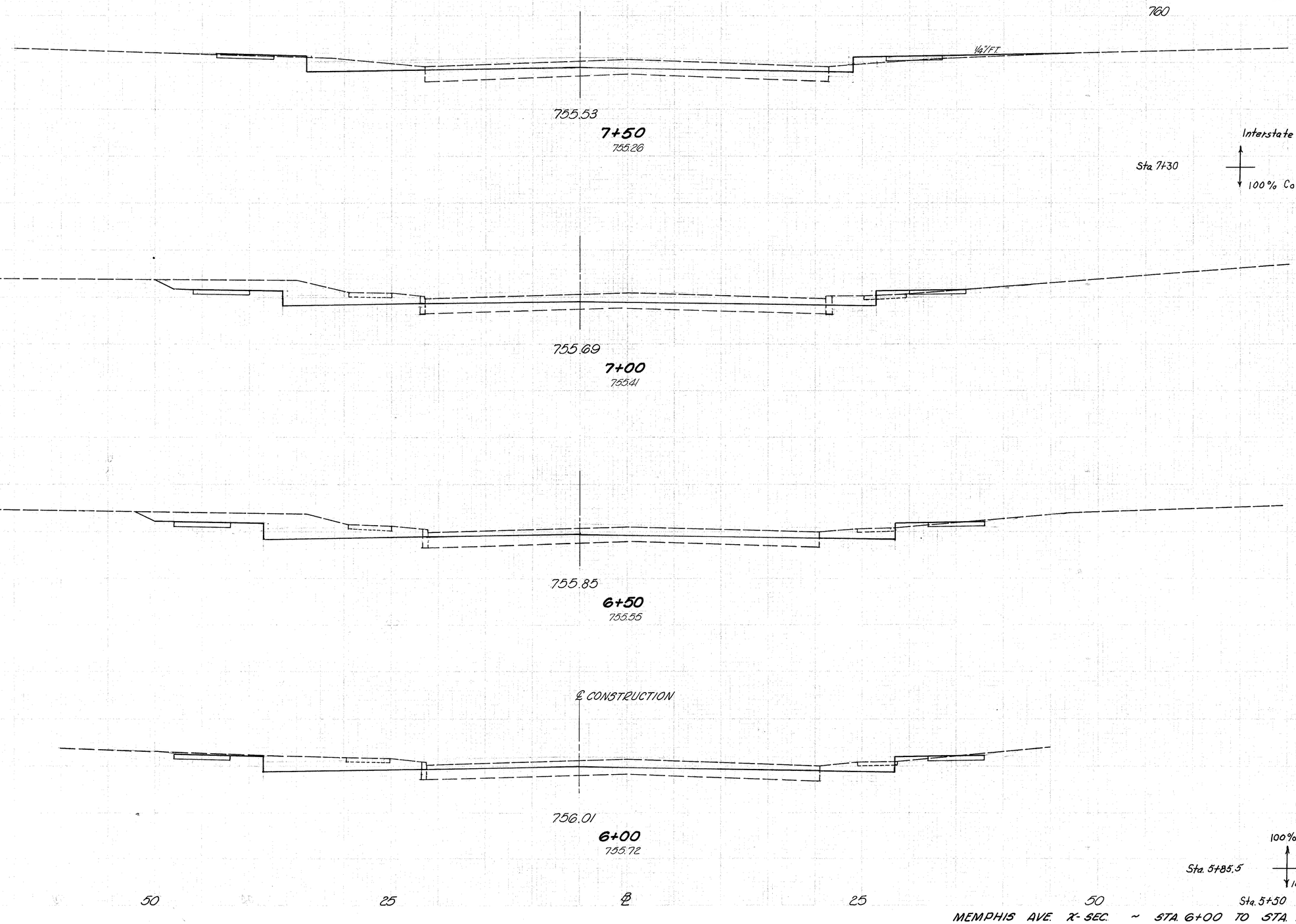
756.61

4+00
756.37

STA. 3+50 — 50 — 25 — ℄ — 25 — 50 — STA. 3+50

W 117th ST. ~ MEMPHIS AVE. X-SEC. STA 4+00 TO STA. 5+50

CUYAHOGA COUNTY
CUY-71-13.68



MEMPHIS AVE. X-SEC. ~ STA. 6+00 TO STA. 7+50

DESCRIPTION	PLOTTED/NKED BY	DATE	CALCULATED BY	DATE	CHECKED BY	DATE
ORIGINAL GROUND						
FINISHED GRADE						
DRAINAGE						
R/W AREAS						
EASEMENTS						
SURFACE AREAS						

CUYAHOGA COUNTY
CUY-71-13.68

760

750

754.62

9+50

754.64

STRUCTURE

760

750

755.18

9+00

754.77

END EARTHWORK
STA. 8+75

0 0

STRUCTURE

760

750

755.50

8+50

754.93

7 1

14 2

39

27 5

℄ CONSTRUCTION

760

750

755.60

8+00

755.07

15 3

27 5

7 39 STA. 7+50

50 25 ℄ 25 50 STA 7+50

14 2

MEMPHIS AVE. X-SEC. ~ STA. 8+00 TO STA. 9+50

PLOTTED	CALCULATED	CHECKED
BY	BY	BY
DATE	DATE	DATE

DESCRIPTION	PLOTTED BY	CALCULATED BY	CHECKED BY
EXISTING GROUND	754.62	754.64	
PROFILE GRADE	755.18	754.77	
EX. RATE			
EX. TAN AS			
PROJ. AS			

CUYAHOGA COUNTY
CUY-71-13.68

760

750

11+50
75306

STRUCTURE

760

750

11+00
75402

STRUCTURE

760

750

10+50
75424

STRUCTURE

760

750

10+00
75442

50 25 ℄ 25 50

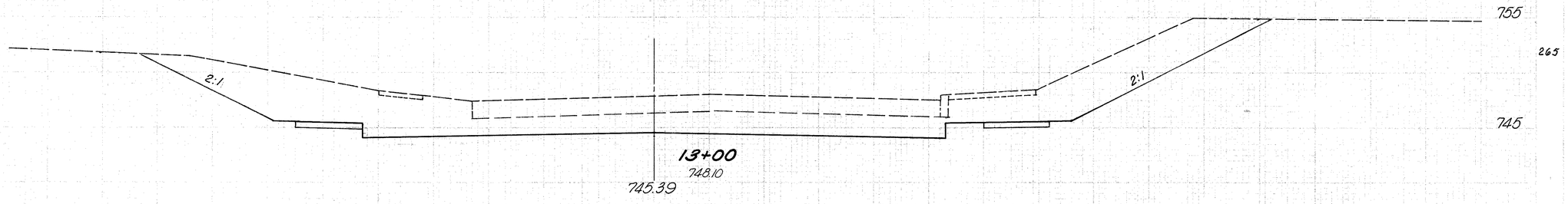
MEMPHIS AVE. X-SEC. ~ STA. 10+00 TO STA. 11+50

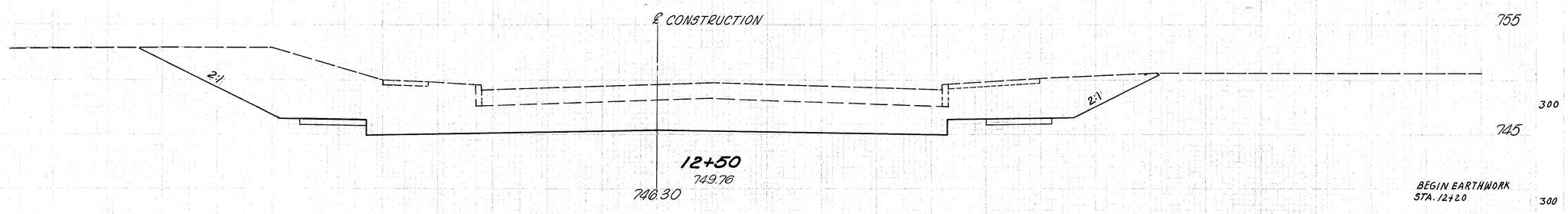
DESCRIPTION	PLOTTED-INKED BY	DATE	CALCULATED BY	DATE	CHECKED BY	DATE
ORIGINAL GROUND						
ESTIMATES						
R/W AREAS						
EASEMENTS						
E. (ING AREAS						

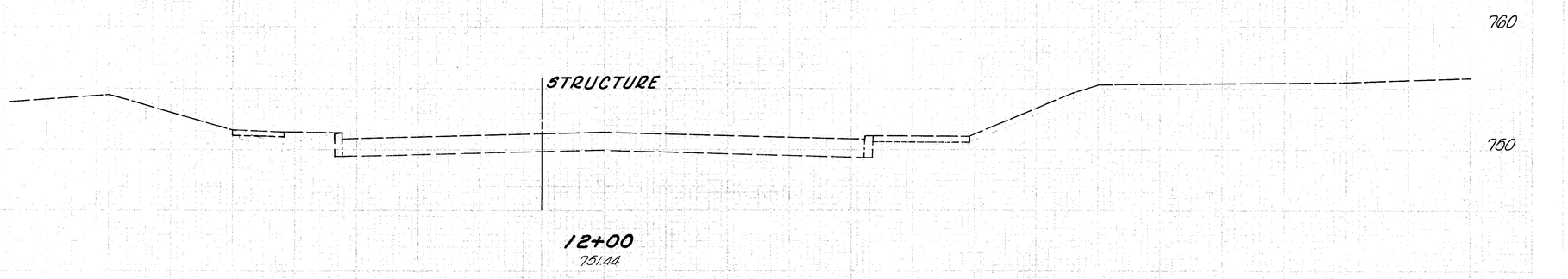
113
279

CUYAHOGA COUNTY
CUY-71-13.68

DESCRIPTION	PLOTTED-INKED	CALCULATED	CHECKED
	BY	DATE	BY	DATE
ORIGINAL GROUND				
TEMPLATES				
NEW WORK				
NO. AREAS				
ADJ. WORK				
REVISIONS AREAS				







MEMPHIS AVE. X-SEC. ~ STA. 12+00 TO STA. 13+50

CUYAHOGA COUNTY
CUY-71-13.68

DESCRIPTION	PLOTTED/INKED	CALCULATED	CHECKED
	BY	BY	BY
ORIGINAL GROUND	DATE	DATE	DATE
TEMPLATES	12-23-86		
DRAINAGE			
ROADWAYS			
EARTHWORK			
SPECIAL AREAS			

750

740

750

740

15+00
740.41

14+50
740.44

STA. 14+20

CONFORM
STA. 14+20

750

740

744.99

14+00
745.03

22

4

℄ CONSTRUCTION

750

740

745.19

13+50
740.41

22

4

STA. 13+00

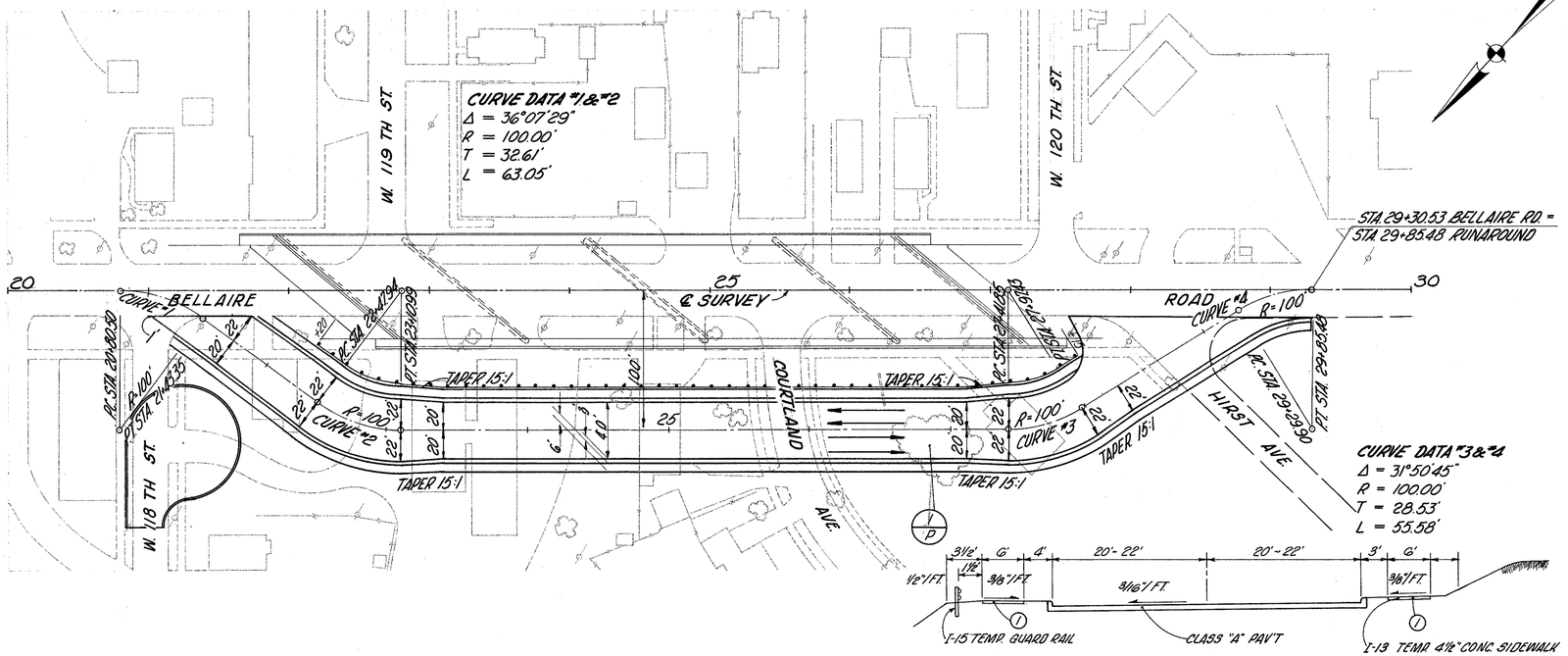
50 25 ℄ 25 50

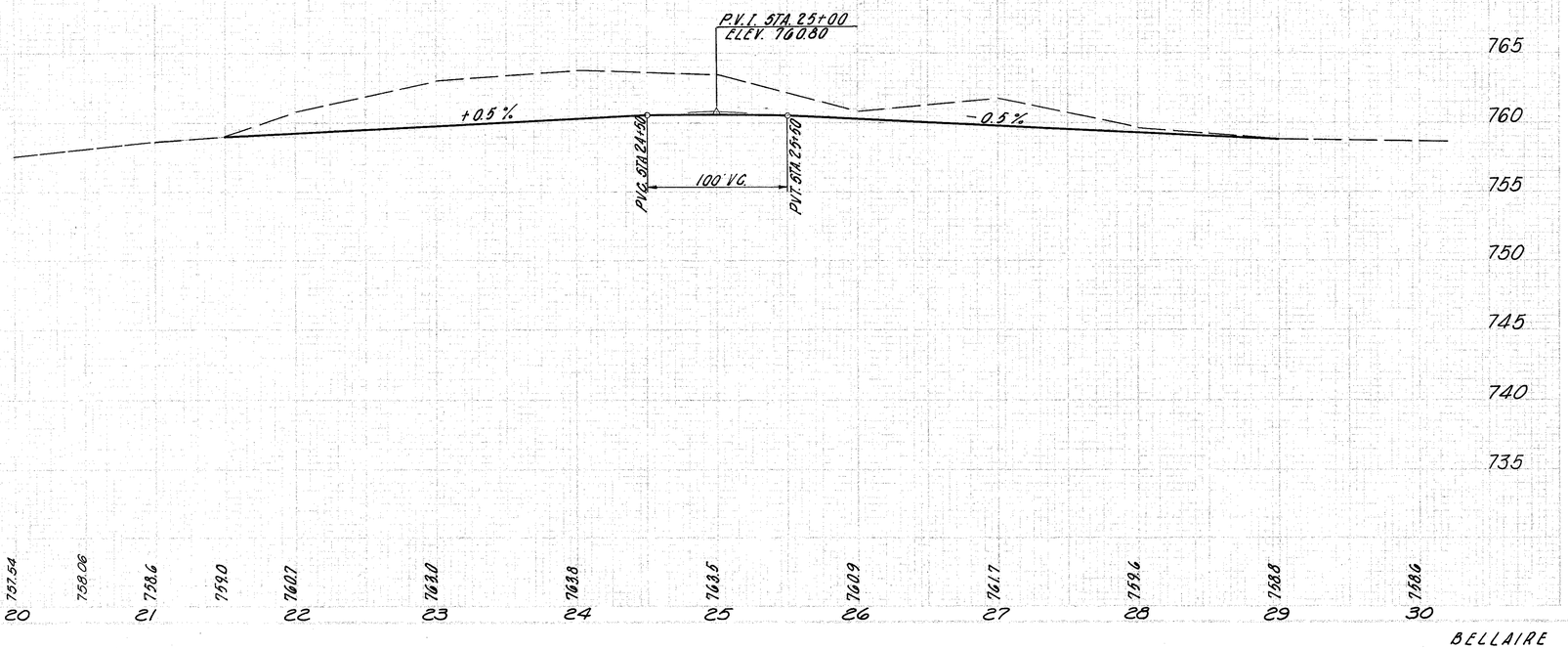
STA. 13+00

MEMPHIS AVE. X-SEC. ~ STA. 13+50 TO STA. 15+00

CUYAHOGA COUNTY
CUY-71-13.68

FED. ROAD DIVISION	STATE	PROJECT		115
5	OHIO			279





DESCRIPTION	PLOTTED BY	DATE	INKED BY	DATE	CHECKED BY	DATE
TOPOGRAPHY			D.W.M.	1-24-89		
PAVEMENT						
DRAINAGE						
STRUCTURES						

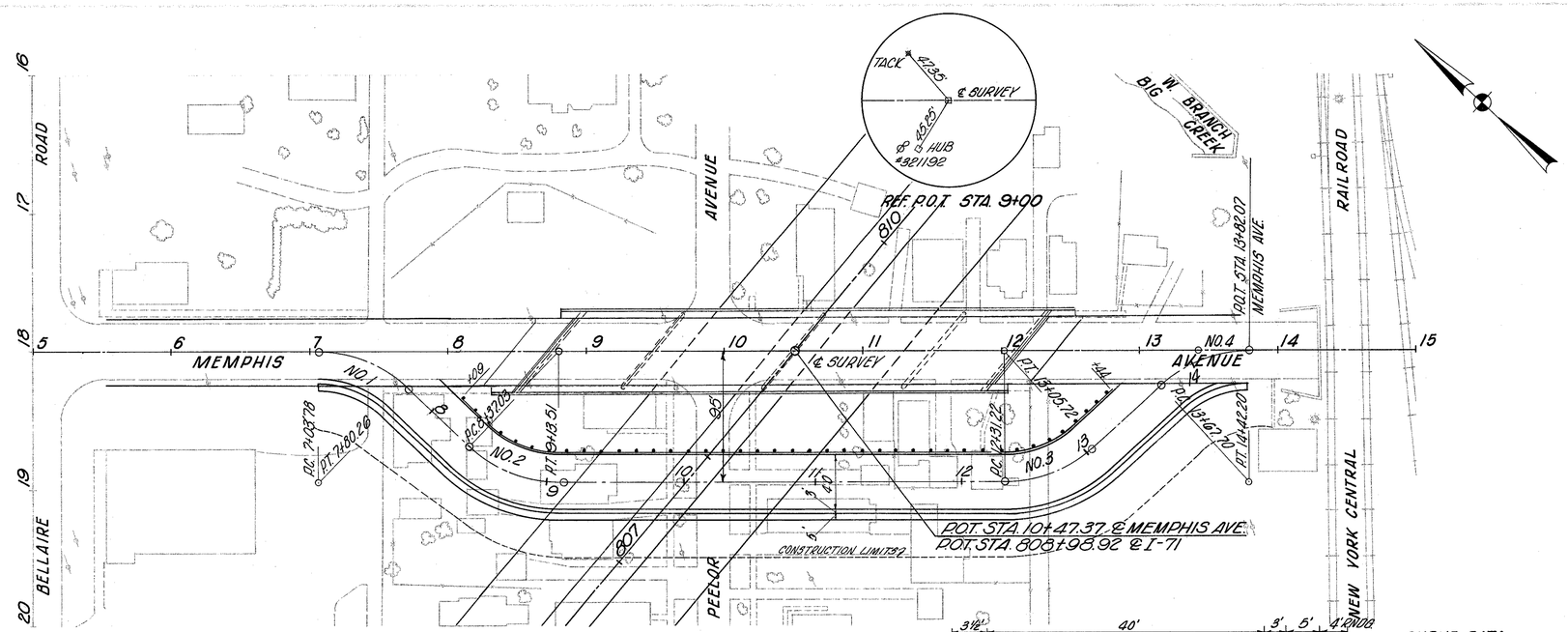
5-15 TEMP. RUNARND CL. 'A'	LUMP	LUMP
I/P 21+50 - 29+00		

BELLAIRE ROAD TEMPORARY RUNAROUND STA. 20+00 TO STA. 30+00

CUYAHOGA COUNTY
CUY-71-13.68

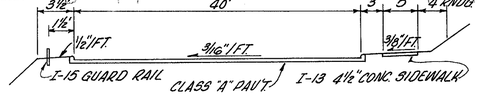
SHEET	NO.	TOTAL SHEETS
DIVISION	OHIO	

116
279



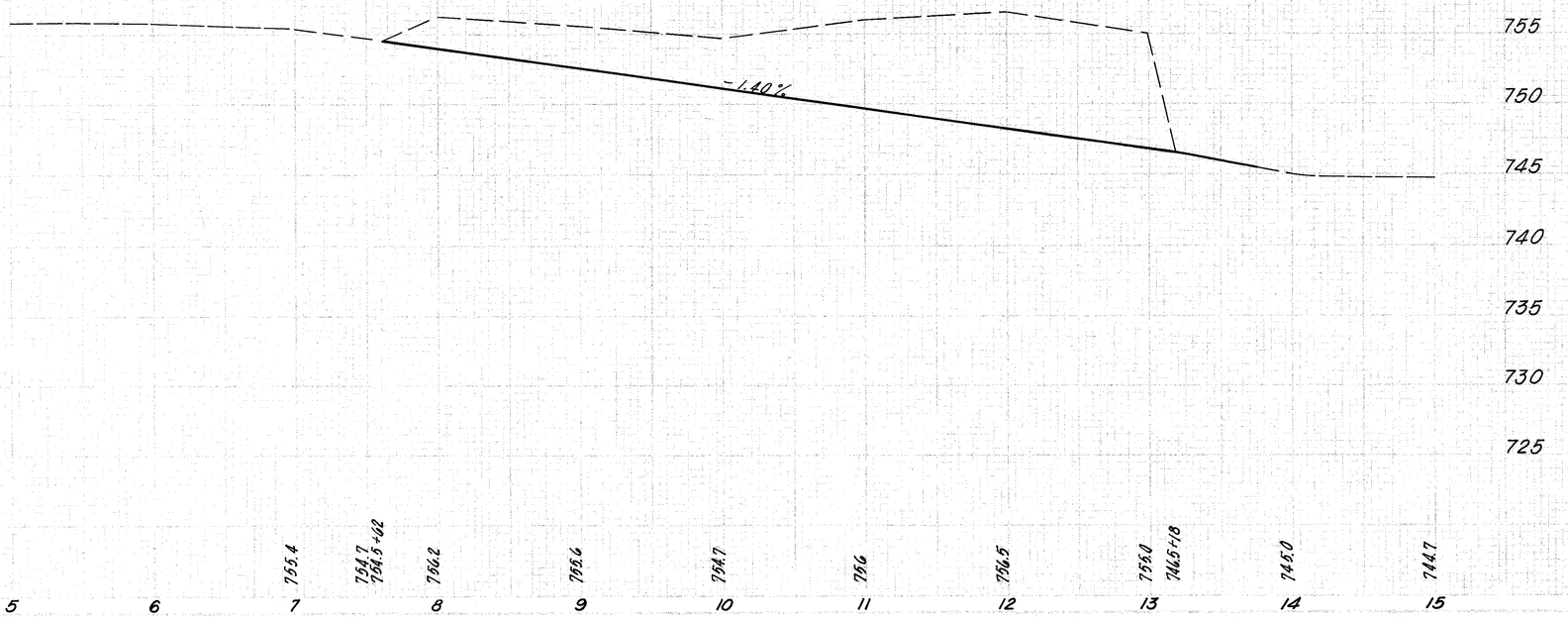
CURVE DATA
CURVE NO. 1 & 2
△ = 43°49'11"
R = 100'
T = 40.22'
L = 76.48'

BENCH MARK 29
Spike in Guy Pole #332887
N.W. Corner Memphis & Peelor, 86' Lt. Sta 808+58
Elev. - 754.73



TYPICAL TEMP. RUNAROUND

CURVE DATA
CURVE NO. 3 & 4
△ = 42°41'08"
R = 100'
T = 39.07'
L = 74.50'



DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY			D.W.M.	1-25-69		
PAVEMENT						
STRUCTURES						
R. & W.						
QUANTITIES						

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
EXISTING GROUND						
PROFILE GRADE						
GRADE POINTS						
BENCH MARKS						

ESTIMATED QUANTITIES

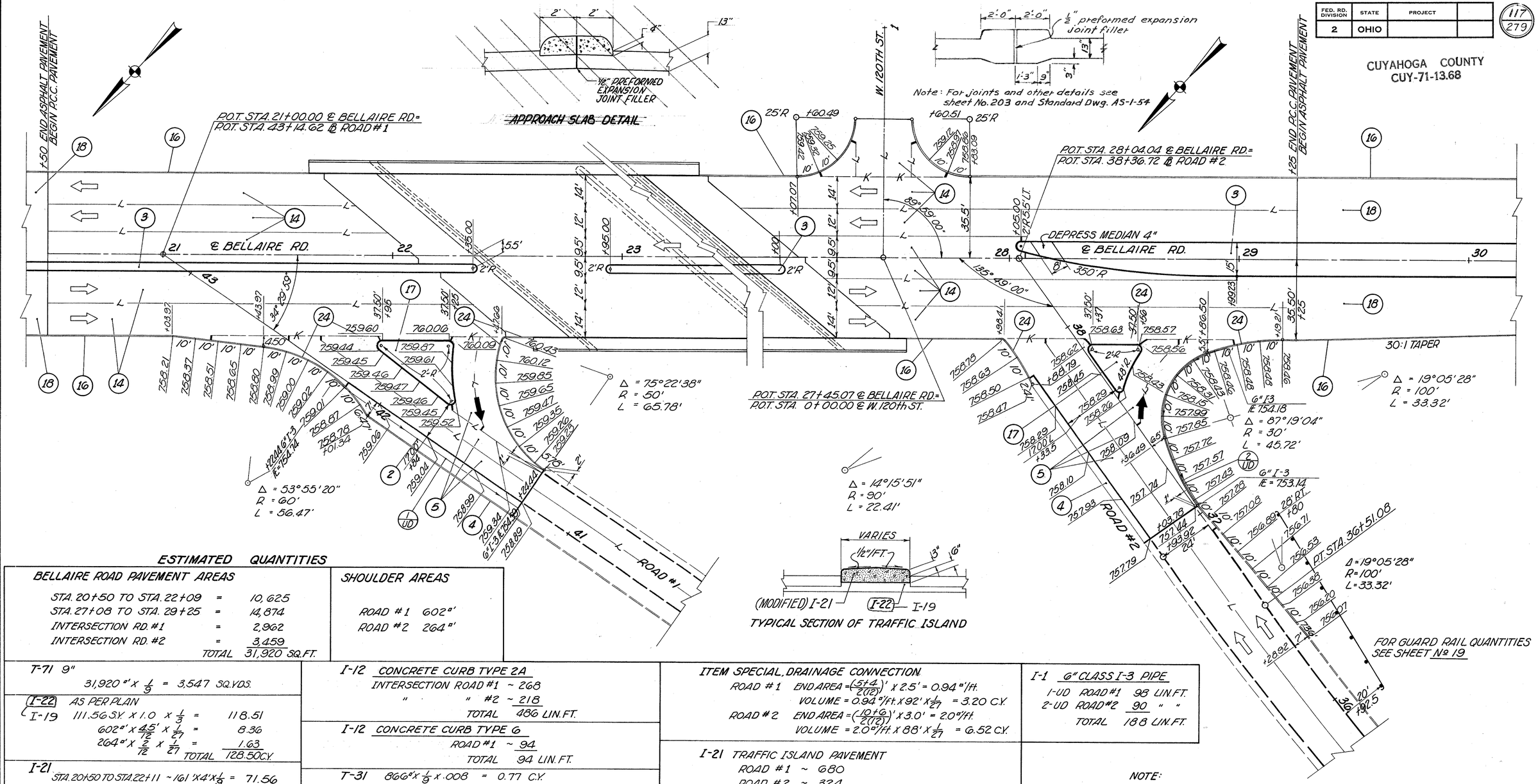
STRUCTURE NUMBER	STATION	ITEM	QUANTITY
		5-15 TEMP RUNAROUND CL. 'A'	LUMP
	1P 7+62 - 13+75		LUMP

MEMPHIS AVE. TEMPORARY RUNAROUND STA. 5+00 TO STA. 15+00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

117
279

CUYAHOGA COUNTY
CUY-71-13.68



ESTIMATED QUANTITIES

BELLAIRE ROAD PAVEMENT AREAS

STA. 20+50 TO STA. 22+09	=	10,625
STA. 27+08 TO STA. 29+25	=	14,874
INTERSECTION RD. #1	=	2,962
INTERSECTION RD. #2	=	3,459
TOTAL		31,920 SQ.FT.

SHOULDER AREAS

ROAD #1 602 ▱'
ROAD #2 264 ▱'

T-71 9"
31,920 ▱' × 1/9 = 3,547 SQ.YDS.

I-22 AS PER PLAN
I-19 111.56 S.Y. × 1.0 × 1/3 = 118.51
602 ▱' × 45/12 × 1/27 = 8.36
264 ▱' × 2/12 × 1/27 = 1.63
TOTAL 128.50 C.Y.

I-21
STA. 20+50 TO STA. 22+11 ~ 161'×4'×1/9 = 71.56
STA. 26+85 TO STA. 27+00 ~ (15'×4'+6.28)1/9 = 7.36
STA. 28+05 TO STA. 28+99 ~ 94'×((4+15)/2)×1/9 = 99.22
+2π = 6.28
STA. 28+99 TO STA. 29+25 ~ 26'×15'×1/9 = 43.33
TOTAL 227.75 S.Y.

I-11 SANDSTONE CURB
BELLAIRE ROAD LT. 377
RT. 104
TOTAL = 481 LIN.FT.

I-12 CONCRETE CURB TYPE 2A
INTERSECTION ROAD #1 ~ 268
" " #2 ~ 218
TOTAL 486 LIN.FT.

I-12 CONCRETE CURB TYPE 6
ROAD #1 ~ 94
TOTAL 94 LIN.FT.

T-31 866 ▱' × 1/9 × .008 = 0.77 C.Y.
866 ▱' × 1/9 × 0.25 = 24.05 GALS.

B-21
866 ▱' × 0.5' × 1/27 = 16.04 C.Y.

B-19
AVERAGE HEIGHT = 3.47"
VOLUME = 602 ▱' × 3.47" × 1/12 × 1/27 = 6.45 C.Y.

ITEM SPECIAL, DRAINAGE CONNECTION
ROAD #1 END AREA = ((5+4)/2(12))' × 2.5' = 0.94 ▱'/ft.
VOLUME = 0.94 ▱'/ft. × 92' × 1/27 = 3.20 C.Y.
ROAD #2 END AREA = ((10+6)/2(12))' × 3.0' = 2.0 ▱'/ft.
VOLUME = 2.0 ▱'/ft. × 88' × 1/27 = 6.52 C.Y.

I-21 TRAFFIC ISLAND PAVEMENT
ROAD #1 ~ 680
ROAD #2 ~ 324
TOTAL 1004 ▱' × 1/9 = 111.56 SQ.YDS.

I-19
31,920' × 3/12 × 1/27 = 295.56
166' × 4' × 6/12 × 1/27 = 12.30
TOTAL 307.86 CU. YDS.

I-1 6" CLASS I-3 PIPE
1-UD ROAD #1 98 LIN.FT.
2-UD ROAD #2 90 " "
TOTAL 188 LIN.FT.

NOTE:
FOR LEGEND AND ITEM DESCRIPTIONS SEE SHEET № 118

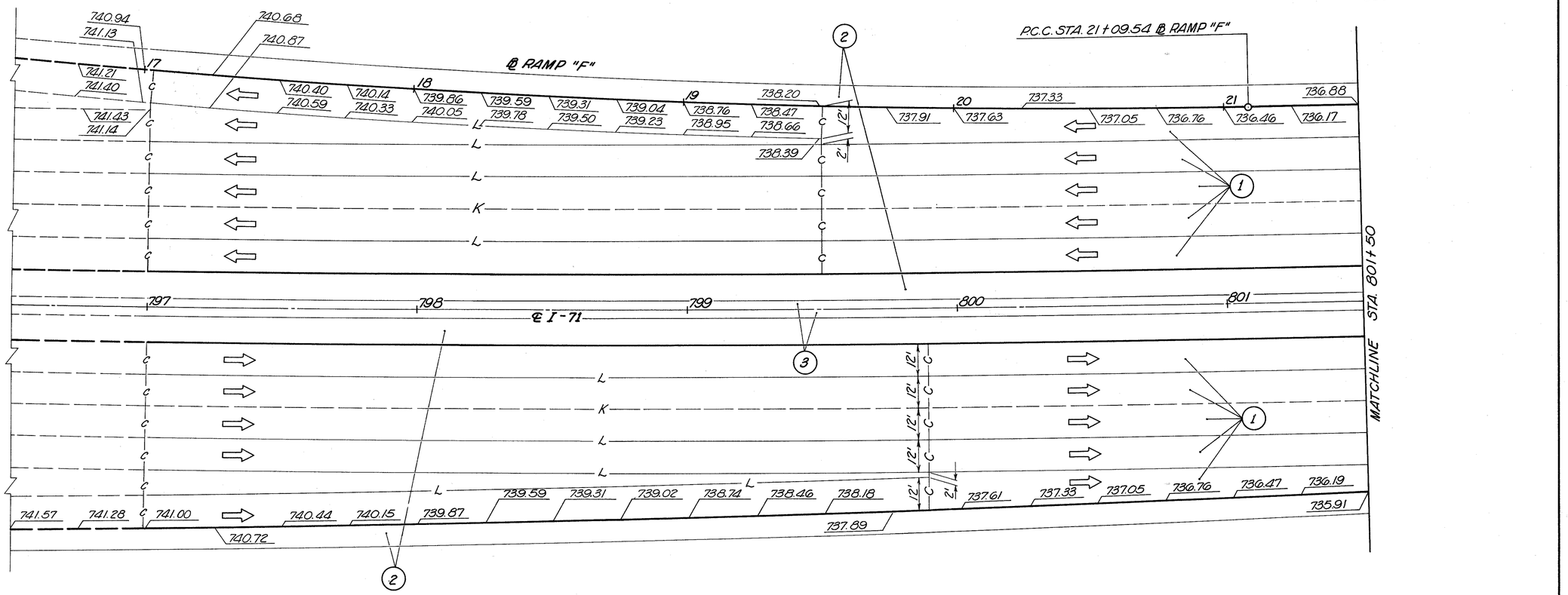
Revised 3-26-65

INTERSECTION DETAILS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

118
279

CUYAHOGA COUNTY
CUY-71-13.68



ITEM		DESCRIPTION
(1)	T-71	10" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT
(2)	T-31	BITUMINOUS SURFACE TREATMENT USING 0.008 CU.YDS. No6 AGGREGATE AND 0.25 GALS. BITUMINOUS MATERIAL PER SQ. YD. (SEE NOTE IN PROPSAL)
(3)	I-21	PORTLAND CEMENT CONCRETE MEDIAN PAVEMENT
(4)	I-12	CONCRETE CURB, STANDARD TYPE 6
(5)	T-71	9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT
(6)	I-11	SPECIAL SANDSTONE CURB (6"x18")
(7)	I-13	4½" CONCRETE SIDEWALK ON 2" GRANULATED SLAG OR SCREENING BED
(8)	T-35	1¼" ASPHALTIC CONCRETE SURFACE COURSE, TYPE "C" (70-85)
(9)	I-12	CONCRETE CURB, STANDARD TYPE 2-A, MODIFIED AS PER PLAN

LEGEND

———L——— STANDARD LONGITUDINAL JOINT
– – –K– – – KEY JOINT W/O TIEBARS
—C———C— STANDARD CONTRACTION JOINT
▬ EXPANSION JOINT W/O DOWELS

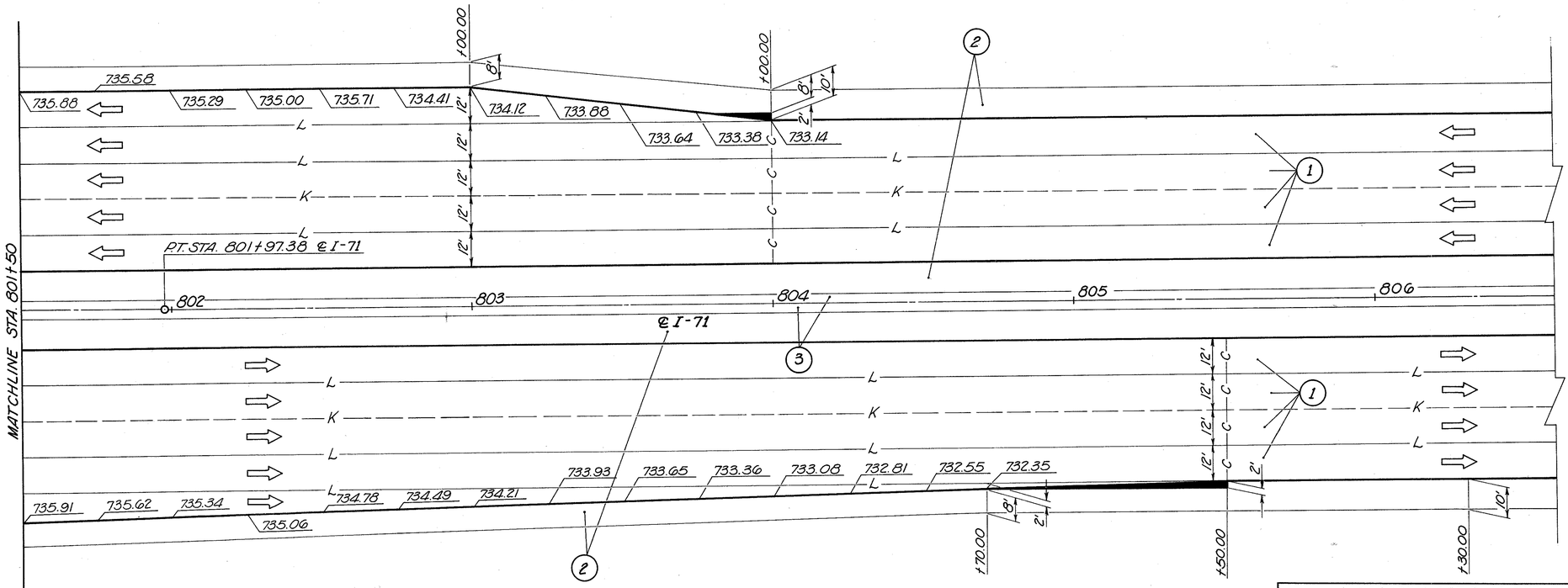
DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOP GRAPHY						
PROFILES						
TRUSSES						
R.O.W.						
QUANTITIES						

PAVEMENT DETAILS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

119
279

CUYAHOGA COUNTY
CUY-71-13.68



FROM SHT. 126 E.B. WIDENING ONLY = 2175 SQ.FT.
LIMITING STATIONS ~ 797+00 TO 805+50

ESTIMATED QUANTITIES

PAVEMENT AREAS

8 LANES	=	81,600
WIDENING LEFT	=	10,013
" RIGHT	=	9,160
865+55 TO 870+00 E.B.	=	217
		100,990 SQ.FT.

T-71 10"
100,990 $\square'$ × $\frac{1}{9}$ = 11,221 SQ.YDS.

T-31

LEFT	~	8' × 600'	= 4,800
LEFT	~	$\frac{8'+10'}{2}$ × 100'	= 900
LEFT	~	10' × 150'	= 1,500
MEDIAN	~	20' × 850'	= 17,000
RIGHT	~	8' × 770'	= 6,160
RIGHT	~	$\frac{8'+10}{2}$ × 80'	= 720
			31,080 SQ.FT.

BITUMINOUS MATERIAL 31,080 $\square'$ × $\frac{1}{9}$ × 0.25 = 863.33 GALS.
№ 6 AGGREGATE 31,080 $\square'$ × $\frac{1}{9}$ × .008 = 27.63 CU.YDS.

B-21

31,080 $\square'$ DEDUCTS ~ LEFT ~ 16.7 × $\left(\frac{0+2}{2}\right)$ = 16.7
" " ~ RIGHT ~ 80.0 × $\left(\frac{0+2}{2}\right)$ = 80.0
TOTAL 96.7 SQ.FT.

31,080 $\square'$ − 97 $\square'$ = 30,983 SQ.FT.
30,983 $\square'$ × 0.25 × $\frac{1}{27}$ = 286.88 CU. YDS.

B-19

8' SHLD'R. END AREA = $\left[\frac{7}{12} \times 5.5\right] + \left[\frac{5+7}{2(12)} \times 2.5\right]$ = 4.46 SQ.FT.

8' SHLD'R. LEFT ~ 4.46 $\square'$ × 600' × $\frac{1}{27}$ = 99.11
(FROM SHT. # 14A) 10' " " ~ 5.63 $\square'$ × 150' × $\frac{1}{27}$ = 31.28
AVERAGE ~ $\frac{4.46+5.63}{2}$ × 100 × $\frac{1}{27}$ = 18.69
MEDIAN ~ 26' × $\frac{7}{12}$ × 850' × $\frac{1}{27}$ = 477.47
RIGHT ~ 4.46 $\square'$ × 850' × $\frac{1}{27}$ = 140.41
TOTAL 766.96 CU.YDS.

I-22 *GRADING A OR B AS PER PLAN

8' SHLD'R. END AREA = $\frac{6"+3"}{2(12)}$ × 8 = 3.00 SQ.FT.

8' SHLD'R. LEFT ~ 3.00 $\square'$ × 600' × $\frac{1}{27}$	=	66.67
(FROM SHT. # 14A) 10' " " ~ 3.75 $\square'$ × 150' × $\frac{1}{27}$	=	20.83
AVERAGE $\frac{3.00+3.75}{2}$ × 100' × $\frac{1}{27}$	=	12.50
MEDIAN 26' × $\frac{6}{12}$ × 850' × $\frac{1}{27}$	=	409.26*
RIGHT 3.00 × 850' × $\frac{1}{27}$	=	94.44
PAVEMENT AREA 100,990 $\square'$ × $\frac{6}{12}$ × $\frac{1}{27}$	=	1870.18*
TOTAL		2279.44 C.Y.*
		194.44 C.Y.

I-21

6' × 850' × $\frac{1}{9}$ = 566.67 SQ.YDS.

NOTE:

FOR LEGEND AND ITEM DESCRIPTIONS SEE SHEET № 118

SHADED AREA SHALL BE T-71 CONSTRUCTION TO AN ELEVATION 1/2" LOWER THAN THE ADJACENT PAVEMENT AND SURFACED WITH T-31 AND № 6 AGGREGATE. COST OF T-31 AND AGGREGATE SHALL BE INCLUDED IN PRICE BID FOR T-71.

DESCRIPTION	PLOTTED BY	DATE	INKED BY	DATE	CHECKED BY	DATE
T.P. GRAPHY						
RAILWAY						
R.R. CROSSINGS						

DRAINAGE SUB-SUMMARY

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY-71-13.68

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ITEM	SHEET NUMBER 121	122	123	124	125	126	127	128	129	130	131	132	133	100% CITY 133	134	135
I-1	278															
I-1		234														
I-1			850*	251*								407*				
I-1				308*	859	1479										
I-1			87*					568*								
I-1			275*													
			170*													
I-1								16		183			64	52	67	
I-1										75					16	
I-1								120								
I-1								82								
I-1								23					263	118	425	32
I-1								343	279		416		66	50	30	
I-1								78	201	82						
I-1										180						
I-1										224						
I-1							1563									
I-1																
I-1																
I-1							52									
I-2	56	82							0.52	0.26	1.04					
I-8									2							
I-8		1								1						
I-8								4		3						
I-8								1					4	6	10	
I-8								1	2	1						
I-8											1					
I-8								1			3					
I-8										1						
I-8									1							
I-8													4	3	5	2
I-8			2*	2*	1*	2*		1*				1*		1		
I-8			1*										1	1	1	
I-8					2*											
I-8			1*													
I-8			1*													
I-8							4									
I-8			1*			1*		1*						2	2	
I-10	23								4	4	8					
I-10	18															
L-10	6	4														
L-120								500		417						

ITEM	QUANTITIES TO SUMMARY CODE Y060 INTER-STATE*	CODE 7221 100% CITY	CODE 7221 INTER-STATE	UNIT	DESCRIPTION
					DRAINAGE
I-1			278	Lin. Ft.	24" Pipe, Class A-1, Sec. M-6.6(d).
I-1			234	Lin. Ft.	48" Pipe, Class A-1, Sec. M-6.6(d).
					SANITARY SEWERS (* WITH COMPRESSION JOINTS)
I-1	1101			Lin. Ft.	15" Pipe, Class B-1, Sec. M-6.8(a)* Encased.
I-1	407			Lin. Ft.	18" Pipe, Class B-1, Sec. M-6.8(a). *
I-1					
I-1	308			Lin. Ft.	15" Pipe, Class B-1, Sec. M-6.8(b)* Encased under R.R.
I-1	2338			Lin. Ft.	15" Pipe, Class B-1, Sec. M-6.8(b). *
I-1					
I-1	568			Lin. Ft.	42" Pipe, Class B-1, Sec. M-6.6(c) * and vit. liner.
I-1	87			Lin. Ft.	48" Pipe, Class B-1, Sec. M-6.6(c) * and Vit liner.
I-1	275			Lin. Ft.	48" Pipe, Class B-1, Sec. M-6.6(d) * and Vit liner.
I 1	170			Lin. Ft.	8" Pipe, Class B-1, Sec M 6.8(b)*
I-1		52	131	Lin. Ft.	12" Pipe, Class E-1.
I-1			215	Lin. Ft.	15" Pipe, Class E-1.
I-1			75	Lin. Ft.	21" Pipe, Class E-1.
I-1			120	Lin. Ft.	24" Pipe, Class E-1, Sec. M-6.6(d).
I-1			82	Lin. Ft.	48" Pipe, Class E-1, Sec. M-6.6 (d)
I-1		118	743	Lin. Ft.	12" Pipe, Class J-1
I-1		50	1052	Lin. Ft.	15" Pipe, Class J-1
I-1			301	Lin. Ft.	15" Pipe, Class J-1, Sec M-6.6 (b) or Sec. M-6.8(b)
I-1			180	Lin. Ft.	30" Pipe, Class J-1
I-1			224	Lin. Ft.	36" Pipe, Class J-1, Sec M-6.6(d)
I-1			1563	Lin. Ft.	114" Pipe, Class J-1, Sec M-106.6(c) as per Plan
I-1					
I-1					
I-1			52	Lin. Ft.	114" Radius Pipe, Class J-1, Sec M-106.6(c) as per Plan.
I-2			1562	Cu. Yds.	Masonry.
I-8			2	Each	Standard No. 3 Catch Basin.
I-8			2	Each	Standard No. 2-5 Catch Basin, Modified
I-8			7	Each	Standard No. 5 Catch Basin.
I-8		6	15	Each	Special No. 4 Catch Basin
I-8			4	Each	Special No. 2-6 Inlet.
I-8			1	Each	Special No. 2-8 Inlet.
I-8			4	Each	Special No. 2-10 Inlet.
I-8			1	Each	Special No. 2-12 Inlet.
I-8			1	Each	Special No. 2-14 Inlet.
I-8		3	11	Each	Special No. 4 Inlet.
I-8	9	1		Each	Standard No. 1 Manhole.
I-8	1	1	2	Each	Standard No. 2 Manhole.
I-8	2			Each	Standard No. 2 Manhole w/o drop pipe.
I-8	1			Each	Standard No. 2 Manhole (Detail 'A')
I-8	1			Each	Standard No. 2 Manhole (Detail 'B')
I-8			4	Each	Special Manhole.
I-8	3	2	2	Each	Manholes Adjusted to grade.
I-10			39	Sq. Yds.	Dumped Rock Channel Protection.
I-10			18	Sq. Yds.	Riprap, using 6" Reinforced concrete slab.
L-10			10	Sq. Yds.	Sodding.
L-120			917	Sq. Yds.	Jute Matting.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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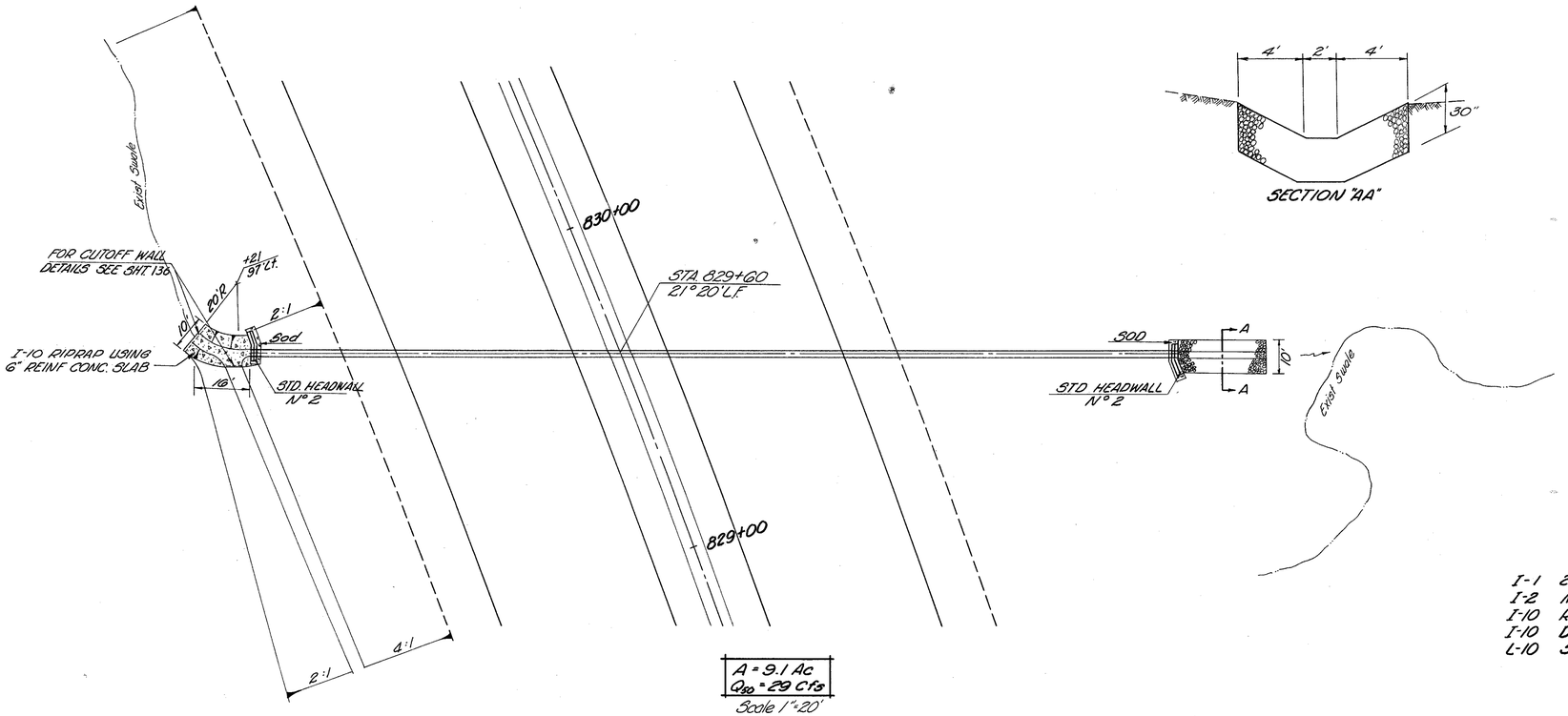
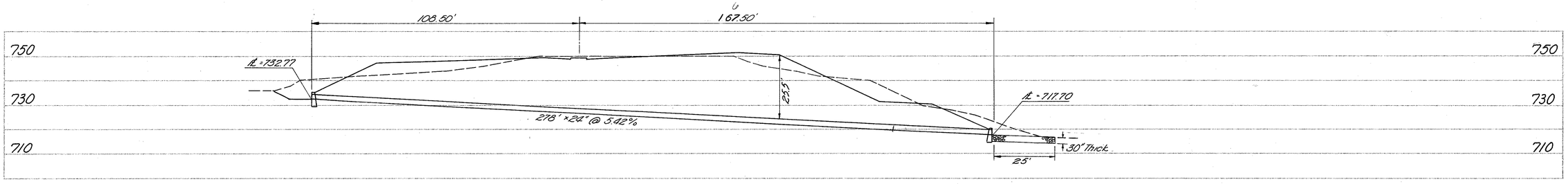
CUYAHOGA COUNTY
CUY-71-13.68



ESTIMATED QUANTITIES

I-1	24" PIPE CLASS A-1 Sec. M6.6(d)	278 LIN. FT.
I-2	MASONRY	5.6 CU. YDS.
I-10	RIPRAP USING 6" REINF. CONC. SLAB	18 SQ. YDS.
I-10	DUMPED ROCK CHANNEL PROT.	23 CU. YDS.
L-10	SODDING	6 SQ. YDS.



CULVERT STA. 829+60

PLOTTED BY DATE
INKED BY DATE
CHECKED BY DATE
DESCRIPTION
S.P. - SUMMARY
PAVEMENT
SURFACING
QUANTITIES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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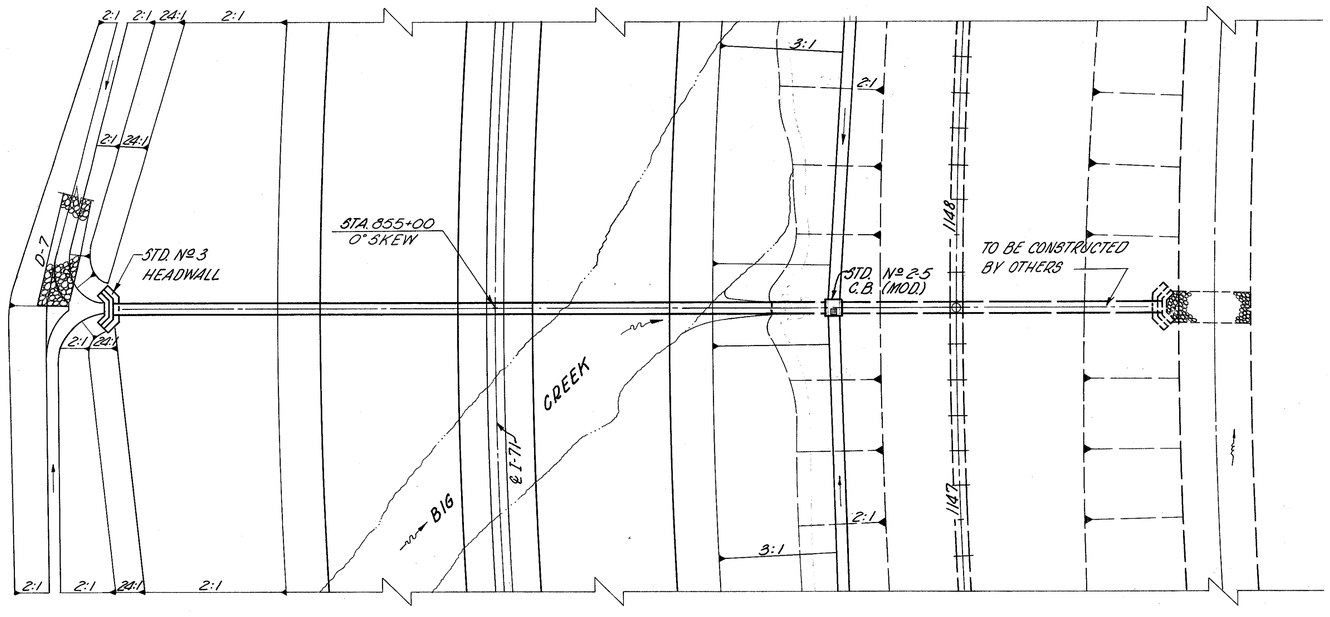
CUYAHOGA COUNTY
CUY-71-13.68

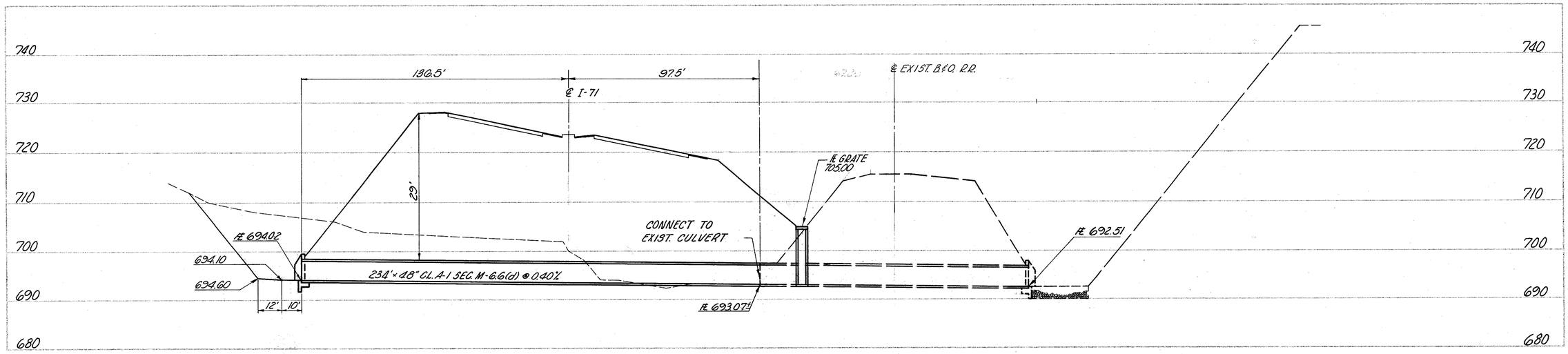


ESTIMATED QUANTITIES

I-1 PIPE, 48" CL. A-1, SEC. M-6.6(d)	=	234 L.F.
I-2 MASONRY	=	8.2 C.Y.
I-8 STD. Nº 2-5 C.B. (MOD.)	=	1 E.A.
L-10 SODDING	=	4 S.Y.

D.A. = 6.0 ACRES
Q_{50} = 117 C.F.S.

SCALE:
HOR. 1" = 25'
VERT. 1" = 10'



DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY						
ALIGNMENT						
DRAINAGE						
PROFILE						
QUANTITIES						

L-20

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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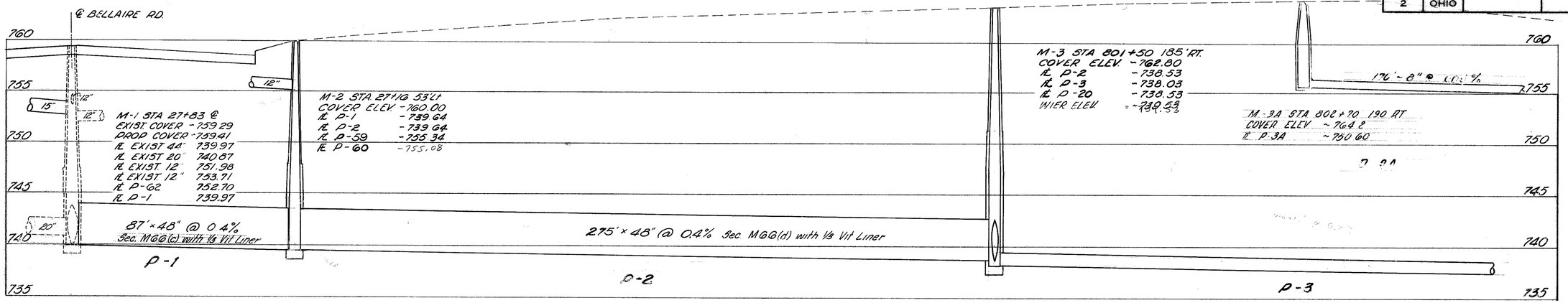
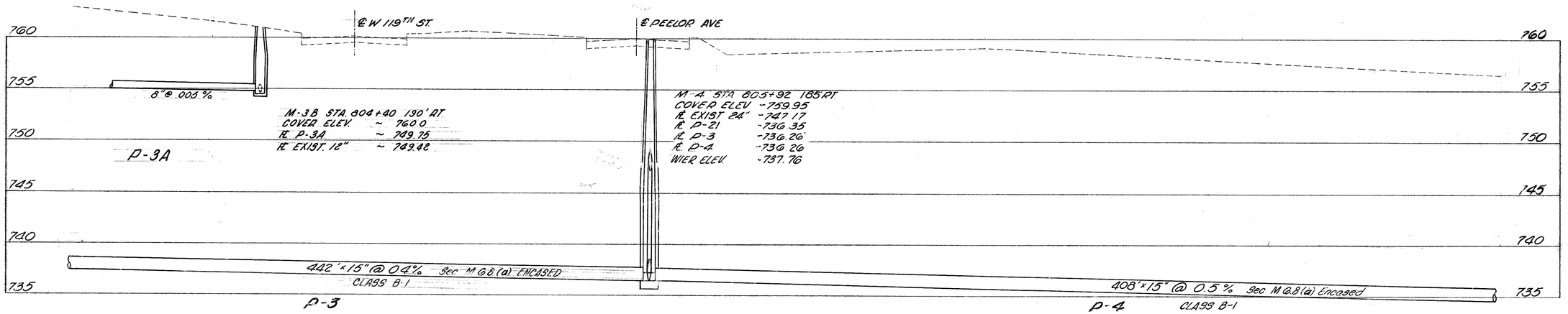
CUYAHOGA COUNTY
CUY-71-13.68





CODE V060

ESTIMATED QUANTITIES

PIPE REFERENCE	STRUCTURES INCLUDED	I-1 CLASS B-1 SEC M-6.8(a) ENCASED 15" LIN. FT.	SEC. M-6.6(c) 1/8 VIT LINER 48" LIN. FT.	SEC. M-6.6(d) 1/8 VIT LINER 48" LIN. FT.	I-8 MANHOLE ADJUSTED TO GRADE EACH	I-8 STANDARD NO. 2 MANHOLE (PIPE) EACH	DETAIL 'B' EACH	STANDARD NO. 2 MANHOLE DETAIL 'A' EACH	I-1 CLASS B-1 6.8 (b) 8" L.F.	I-8 STANDARD NO. 1 M.H. EACH	SEE SHEET NO.
P-1	M-1		87		1						
P-2	M-2			275		1					
P-3	M-3	442					1				
P-4	M-4	408						1			
P-3A	M-3A, M-3B								170	2	
	TOTALS	850	87	275	1	1	1	1	170	2	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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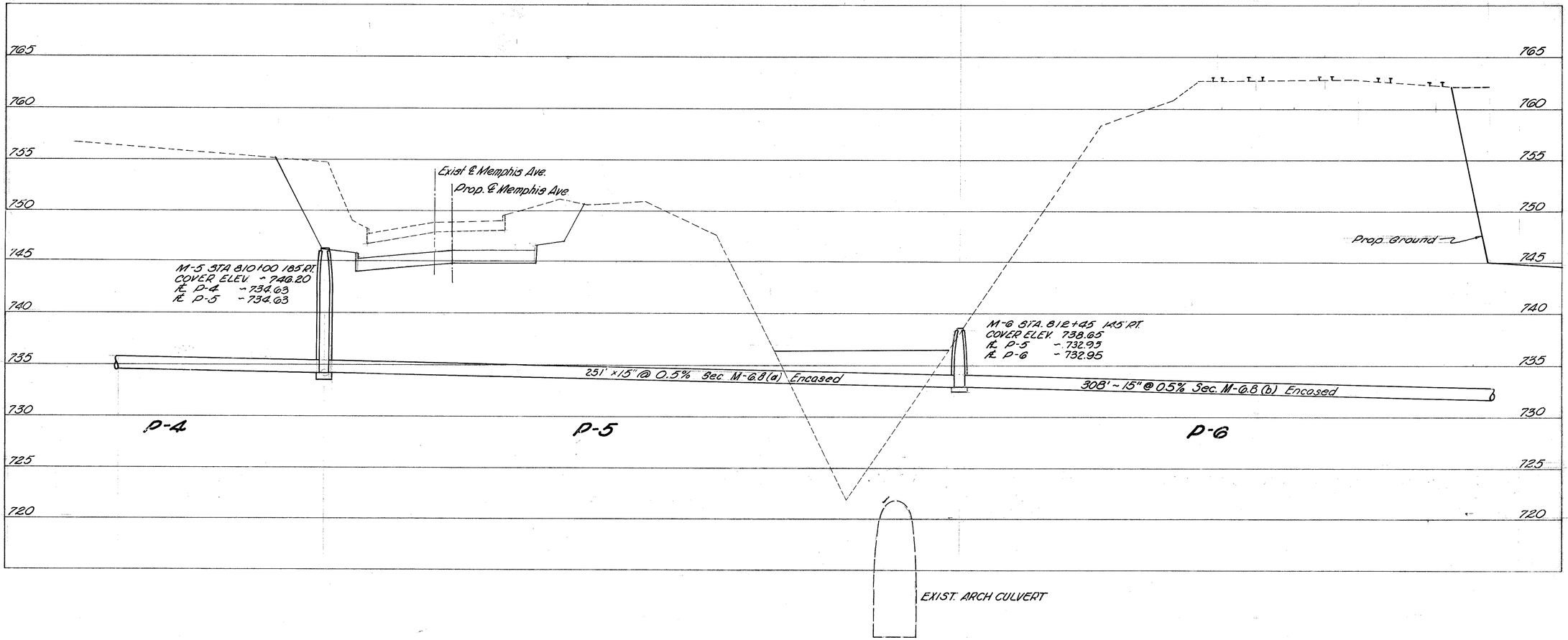

CODE Y 060

* For Encasement Detail See Sheet 141

ESTIMATED QUANTITIES

PIPE REFERENCE	STRUCTURES INCLUDED	I-1 CLASS B-1 M-6.8(a) ENCASED * 15" LIN.FT.	I-1 CLASS B-1 M-6.8(b) ENCASED 15" LIN.FT.	I-1 CLASS B-1 SEC. M-6.8(b) ENCASED UNDER R.R. * 15" LIN.FT.	I-8 STANDARD NO. 1 MANHOLE EACH		SEE SHEET NO.
P-5	M-5	251			1		
P-6	M-6			308	1		
	TOTALS	251		308	1	1	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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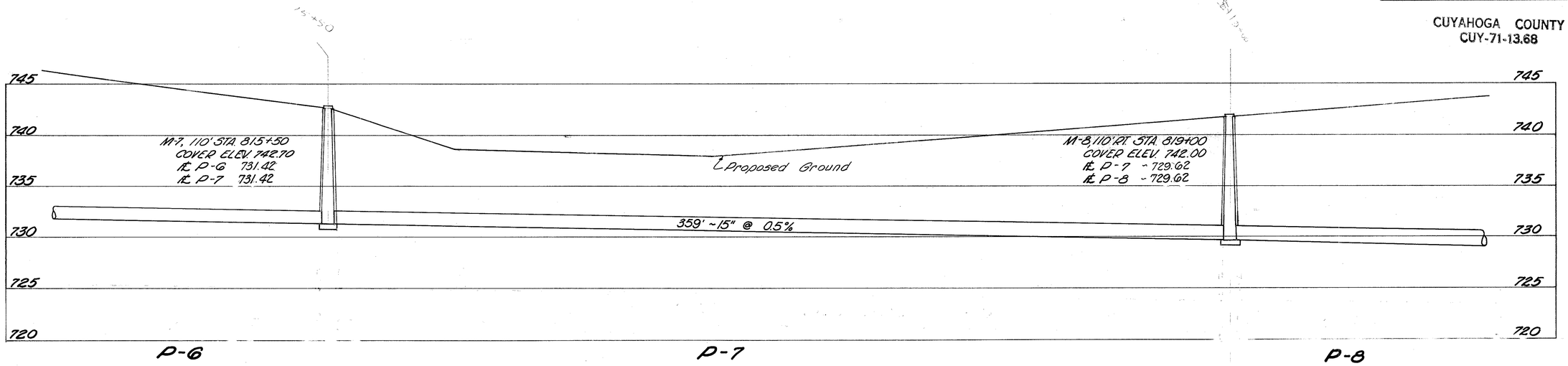

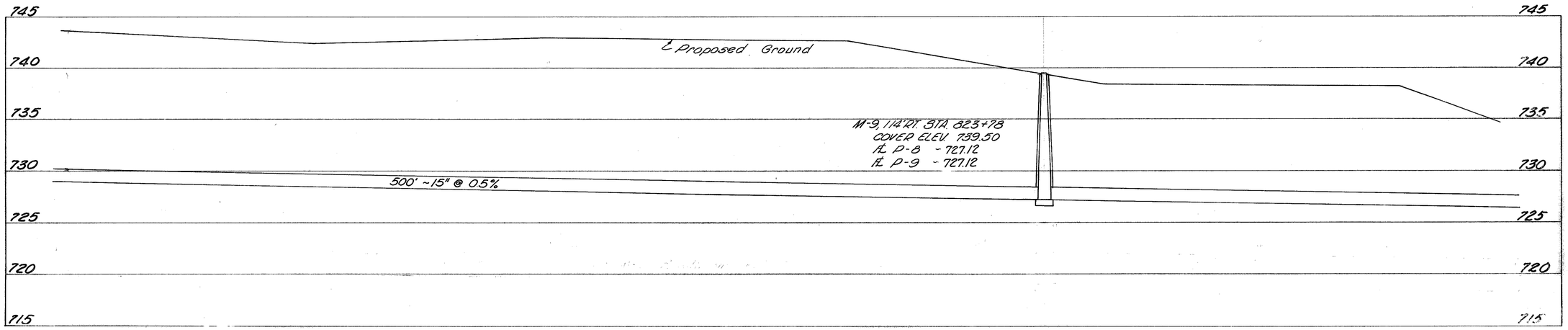

CODE YOGO

ESTIMATED QUANTITIES

PIPE REFERENCE	STRUCTURES INCLUDED	I-1 CLASS B-1 SEC. M-6.8(b) 15" LIN. FT.	I-8 STANDARD NO. 2 MANHOLE W/O DROP PIPE EACH	Standard №. 1 Manhole Each	SEE SHEET NO.
P-7	M-7	359		1	
P-8	M-8	500	1		
	M-9		1		
TOTALS		859	2	1	

CUYAHOGA COUNTY
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FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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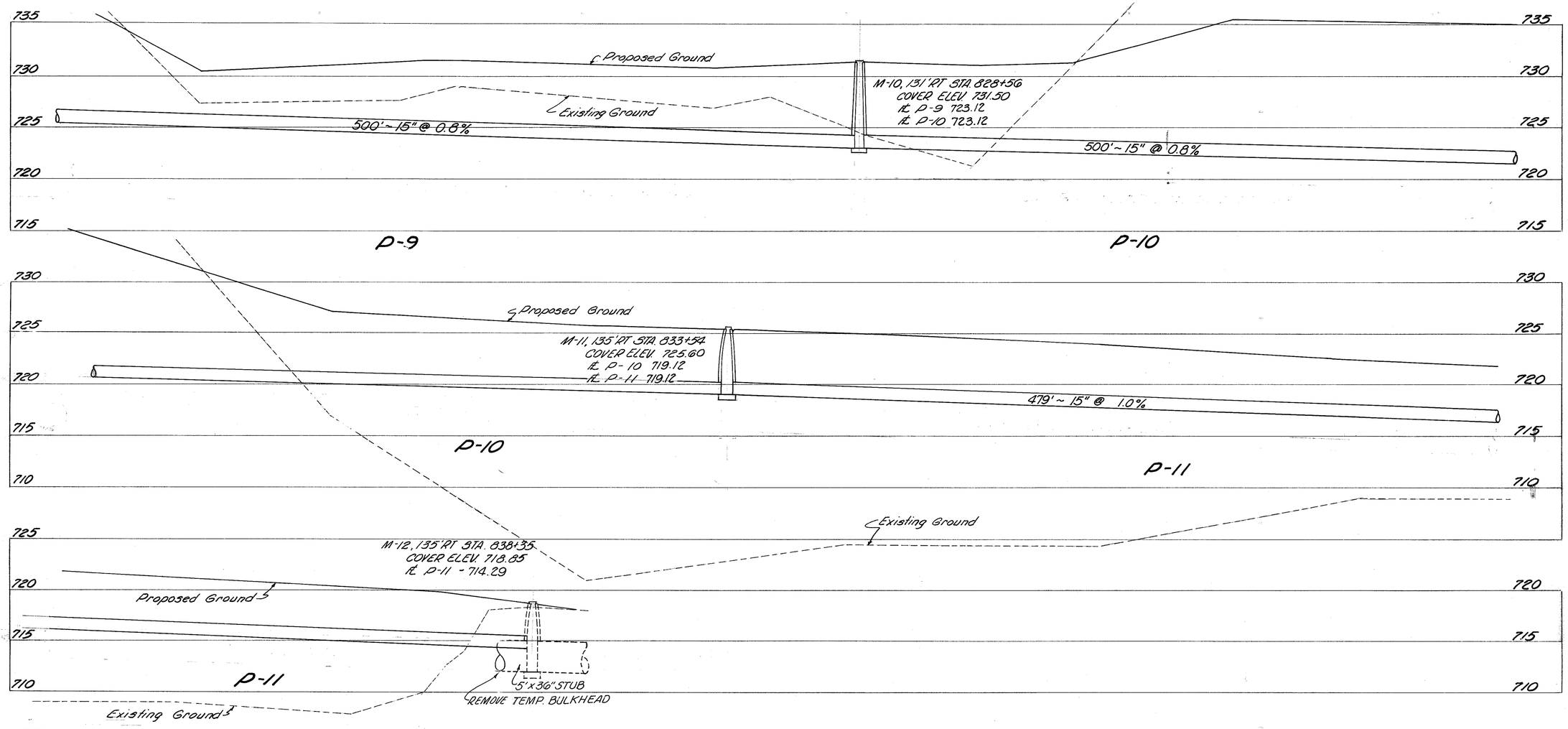

CODE YOGO

ESTIMATED QUANTITIES

PIPE REFERENCE	STRUCTURES INCLUDED	I-1 CLASS B-1 SEC. M-6.8.1(b) 15" LIN. FT.	I-8 STANDARD NO. 1 MANHOLE EACH	I-8 MANHOLE ADJUSTED TO GRADE EACH	SEE SHEET NO.
P-9		500			
P-10	M-10	500	1		
P-11	M-11	479	1		
	M-12			1	
TOTALS		1479	2	1	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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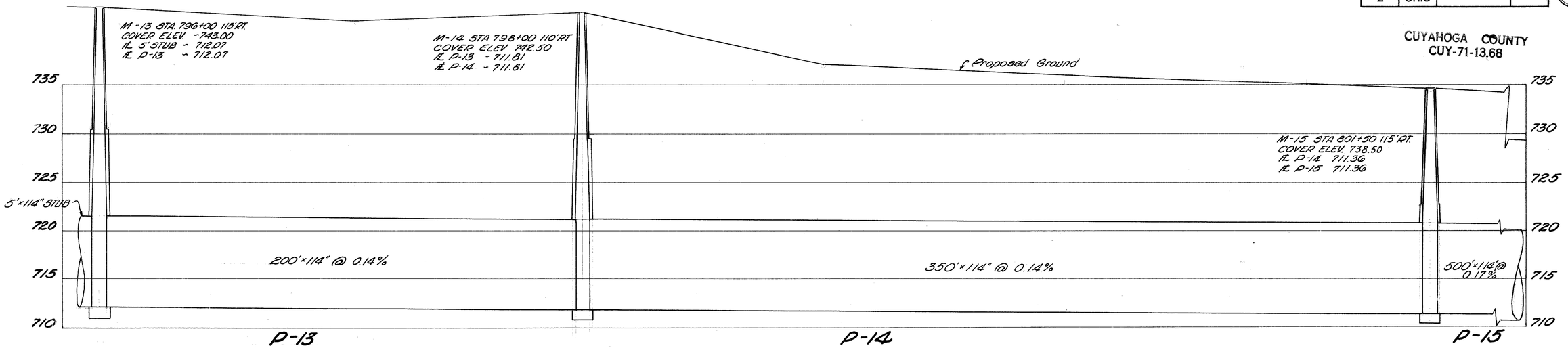

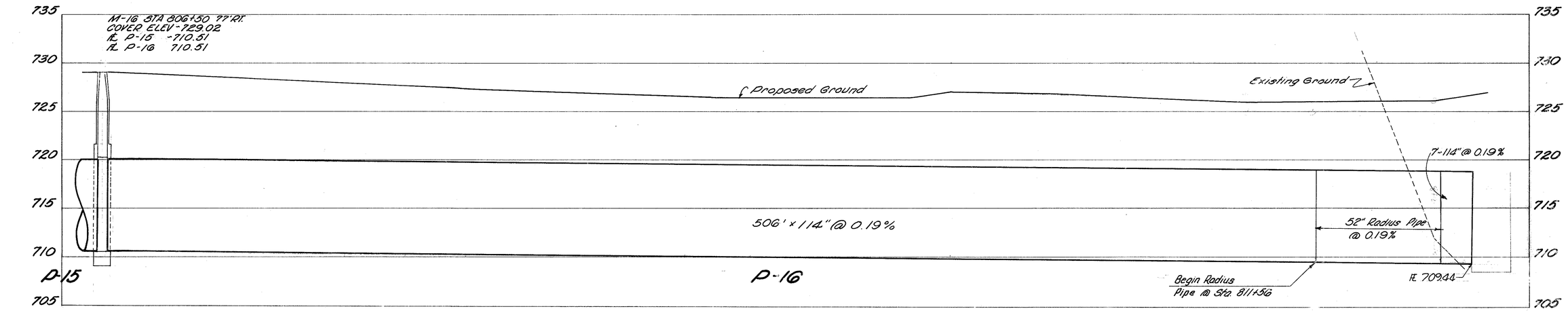

FOR RADIUS PIPE DETAIL SEE SHEET NO. 252
FOR SPECIAL M.H. DETAILS SEE SHEET NO. ____

ESTIMATED QUANTITIES

PIPE REFERENCE	STRUCTURES INCLUDED	I-1 CLASS J-1 SEC. IV-10(a)(c) AS / PLAN 1.14" LIN. FT.			I-8 SPECIAL MANHOLE EACH	I-1 CLASS J-1 SEC. M-6.6.(a) RADIUS PIPE LIN. FT.	SEE SHEET NO.
P-13	M-13	200			1		
P-14	M-14	350			1		
P-15	M-15	500			1		
P-16	M-16	513			1	52	
	TOTALS	1563			4	52	

PLOTTED | INKED | CHECKED
DESCRIPTION

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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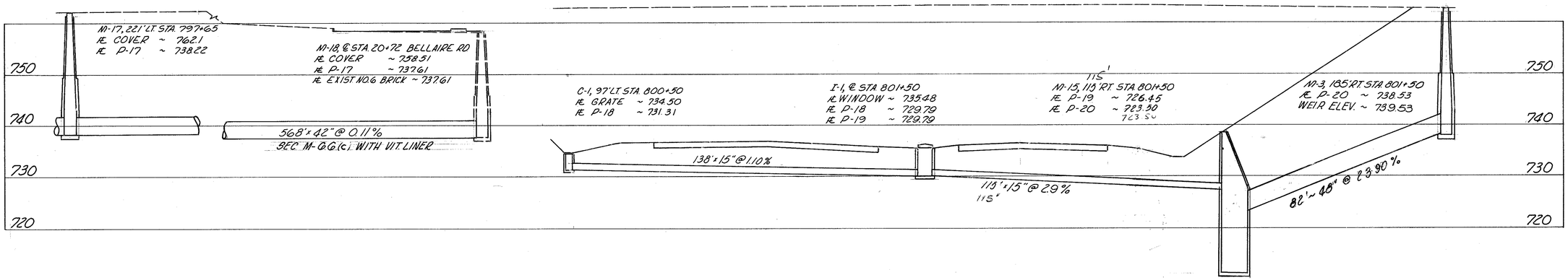
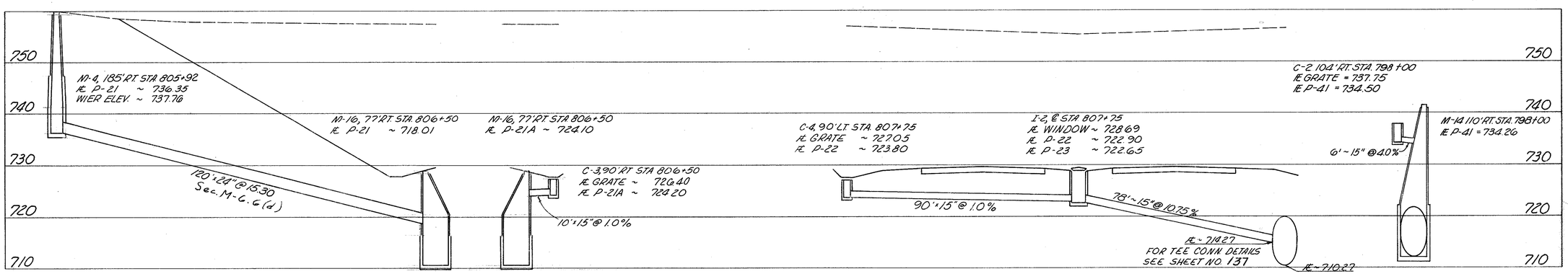


CLASS B-1
P-17

CLASS J-1
P-18

CLASS J-1
P-19

CLASS B-1 SEC. M-G.G (d)
P-20



CLASS B-1 SEC M-G.G(d)
P-21

CLASS E-1
P-21A

CLASS J-1
P-22

CLASS J-1 SEC. M-G.G (b)
P-23

SEC. M-G.G (b)
P-41

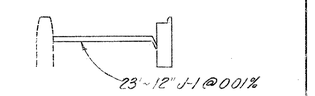
* CODE Y060 † SEC M-G.G(b) or G.8(b)

ESTIMATED QUANTITIES

PIPE REFERENCE	STRUCTURES INCLUDED	I-1 CLASS J-1 12" LIN FT	I-1 CLASS J-1 15" LIN FT	I-1 CLASS J-1 #	I-1 CLASS B-1 SEC M-G.G.(c) W/ VIT LINER 42" LIN FT	I-1 CLASS B-1 SEC M-G.G(d) 24" LIN FT	I-1 CLASS B-1 SEC M-G.G(d) 48" LIN FT	I-1 CLASS B-1 15" LIN FT	I-8 STANDARD NO. 5 CATCH BASIN EACH	I-8 SPECIAL INLET NO. 2-G EACH	I-8 SPECIAL INLET NO. 2-10 EACH	I-8 STANDARD NO. 1 MANHOLE EACH	I-8 MANHOLE ADJUSTED TO GRADE EACH	I-8 SPECIAL NO. 4 CATCH BASIN EACH	L-120 JUTE MATTING	SEE SHEET NO.
P-17	M-17, M-18				568*							1 †	1 *			
P-18	C-1		138						1						125	
P-19	I-1		115								1					
P-20							82									
P-21						120										
P-21A	C-3							10	1						125	
P-22	C-4		90						1						125	
P-23	I-2			78						1						
P-41	C-2							6	1						125	
P-12		23												1		
	TOTALS	23	343	78	568*	120	82	16	4	1	1	1 *	1 *	1	500	

8' Rt 0+00
IE Cover = 755.70
Exist MH
IE P-12 = 750.37

28' Rt 0+12
IE Grate = 755.05
IE P-12 = 750.50



P-12
EMERY-HIRST CONNECTION

CHECKED BY DATE
PLOTTED BY DATE
DESCRIPTION
TOP SOIL
SEED
MULCH
QUANTITIES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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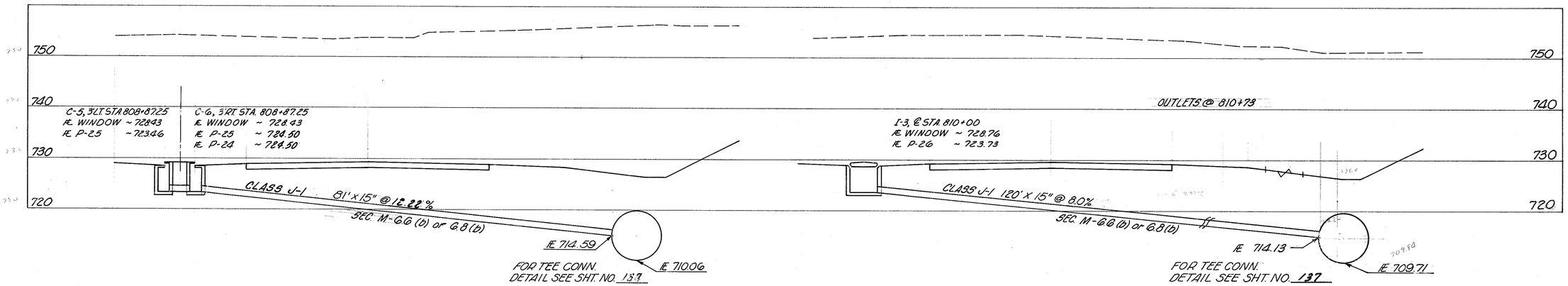

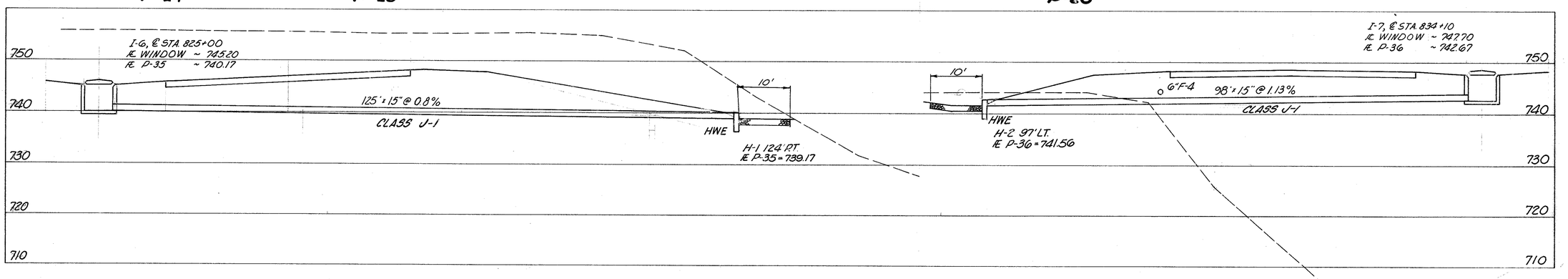

ESTIMATED QUANTITIES

PIPE REFERENCE	STRUCTURES INCLUDED	I-1 CLASS J-1 15" LIN.FT.	I-1 CLASS J-1 SEC. M-6.6 (b) or 6.8 (b) 15" LIN.FT.	I-2 MASONRY C.Y.	I-10 DUMPED ROCK CHANNEL PROTECTION 18" THICK C.Y.	I-8 STANDARD NO. 3 CATCH BASIN EACH	I-8 SPECIAL INLETS NO. 2-6 EA.	I-8 SPECIAL INLETS NO. 2-14 EACH	SEE SHEET NO.
P-24	C-5	6				1			
P-25	C-6		81			1			
P-26	I-3		120				# 1		
P-35	I-6	125		0.26	2			1	
P-36	I-7	98		0.20	2		1 #		
	TOTALS	229	201	0.52	4	2	2	1	

PLOTTED DATE
CHECKED BY DATE
INKED BY DATE
DESCRIPTION BY
TOPOGRAPHY
PLANIMETRIC
PROFILES
R O W
QUANTITIES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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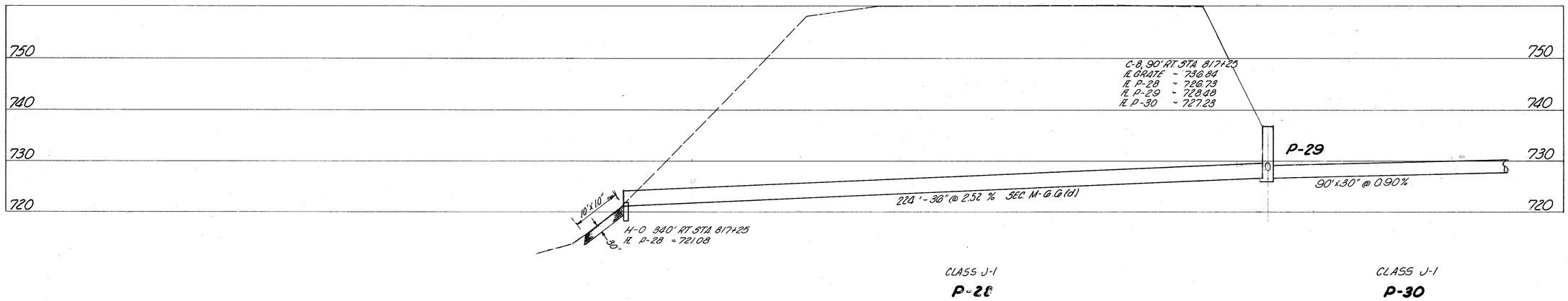
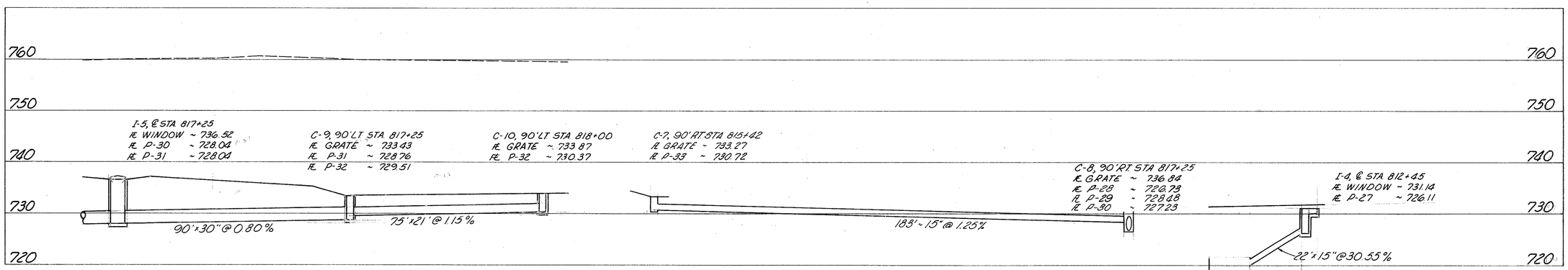
CUYAHOGA COUNTY
CUY-71-13.68



CLASS J-1
P-28

CLASS J-1
P-30



CLASS J-1
P-30

CLASS J-1
P-31

CLASS E-1
P-32

CLASS E-1
P-29

CLASS J-1
P-27

ESTIMATED QUANTITIES

PIPE REFERENCE	STRUCTURES INCLUDED	I-1 CLASS J-1 N-G.6(b) N-G.8(b) 15" LIN.FT.	I-1 CLASS J-1 30" LIN.FT.	I-1 CLASS J-1	I-1 CLASS J-1	I-1 CLASS J-1 Sec.M 6.6(d) 36" LIN.FT.	I-1 CLASS E-1	I-1 CLASS E-1 15" LIN.FT.	I-1 CLASS E-1 21" LIN.FT.	I-8 STANDARD NO 2-5 C.B MODIFIED EACH	I-8 SPECIAL INLET NO 2-G EACH	I-8 SPECIAL INLET NO 2-12 EACH	I-8 STANDARD NO 5 CATCH BASIN EACH	L-120 JUTE MATTING S.Y.	I-10 DUMPED ROCK CHANNEL PROTECTION C.Y.	I-2 MASONRY C.Y.	SEE SHEET NO.
P-28	C-7					224							1	125	4	026	
P-29	C-8							183		1				125			
P-30	I-5		90									1					
P-31	C-9		90										1	42			
P-32	C-10								75				1	125			
P-27	I-4	22									1						
TOTALS		22	180			224		183	75	1	1	1	3	417	4	026	

CHECKED BY DATE
PLOTTED BY DATE
DESCRIPTION
FILE CHANGES
REVISIONS
RUT

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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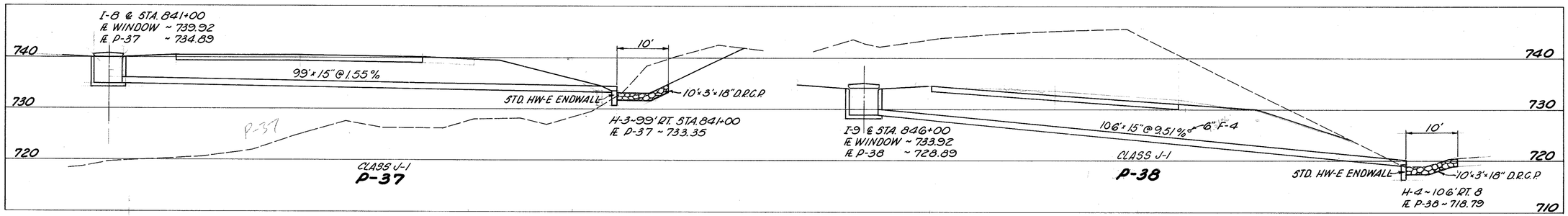
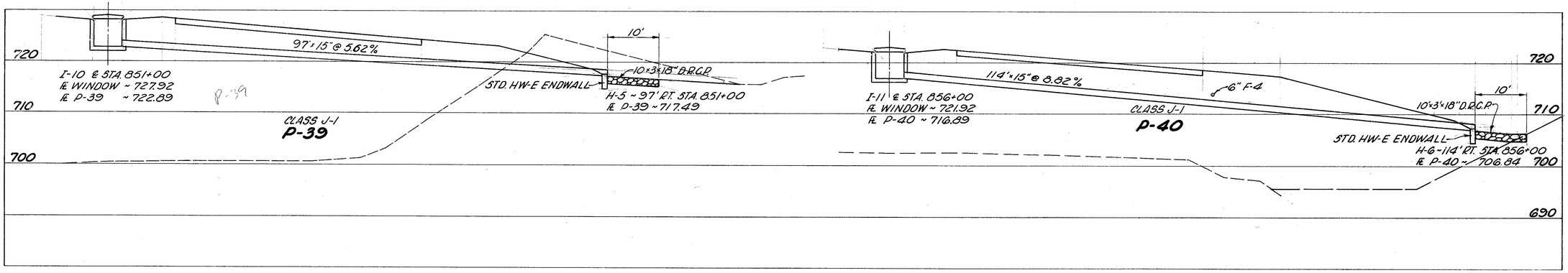
CUYAHOGA COUNTY
CUY-71-13.68





ESTIMATED QUANTITIES

PIPE REFERENCE	STRUCTURES INCLUDED	I-1 CLASS J-1 15"		I-2 MASONRY	I-8 SPECIAL INLET 2-8	I-8 SPECIAL INLET 2-10		I-10 DUMPED ROCK CHANNEL PROT.		SEE SHEET NO.
		LIN. FT.		CU. YDS.	EACH			CU. YDS.		
P-37	I-8, H-3	99		0.26	1			2		
P-38	I-9, H-4	106		0.26		1		2		
P-39	I-10, H-5	97		0.26		1		2		
P-40	I-11, H-6	114		0.26		1		2		
	TOTALS	416		1.04	1	3		8		

FED. RD DIVISION	STATE	PROJECT	
2	OHIO		

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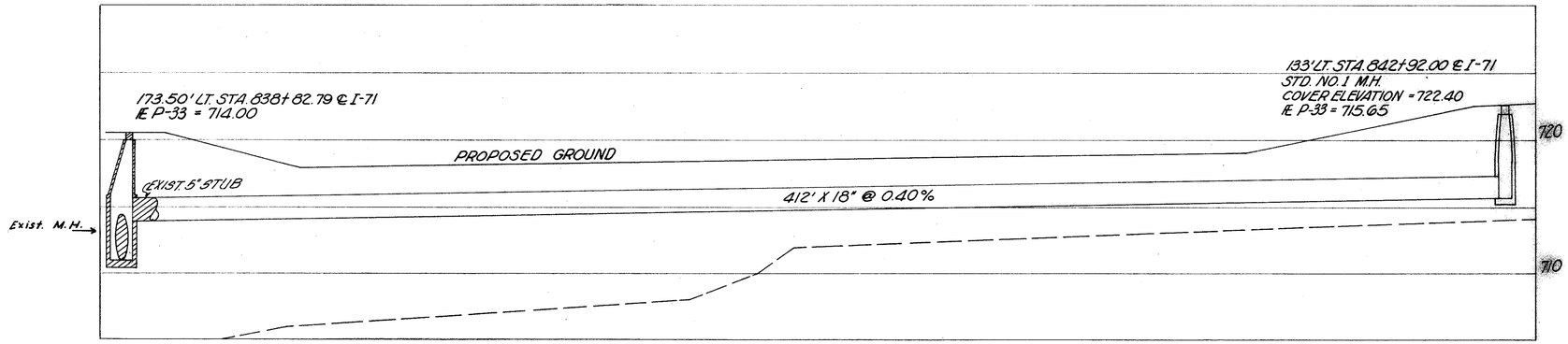
CUYAHOGA COUNTY
CUY-71-13.68



P-33
CLASS B-1

CODE YOGO

PIPE REF.	STRUCTURES INCLUDED	CLASS B-1 SEC. M-601(a) 18"	STANDARD NO. 1 MANHOLE		SEE SHEET NO.
		L.F.	EA.		
P-33		407'	1		
	TOTALS	407'	1		

SCALE HORIZ 1"=20'
VERT 1"=5'

CUYAHOGA COUNTY
CUY-71-13.68

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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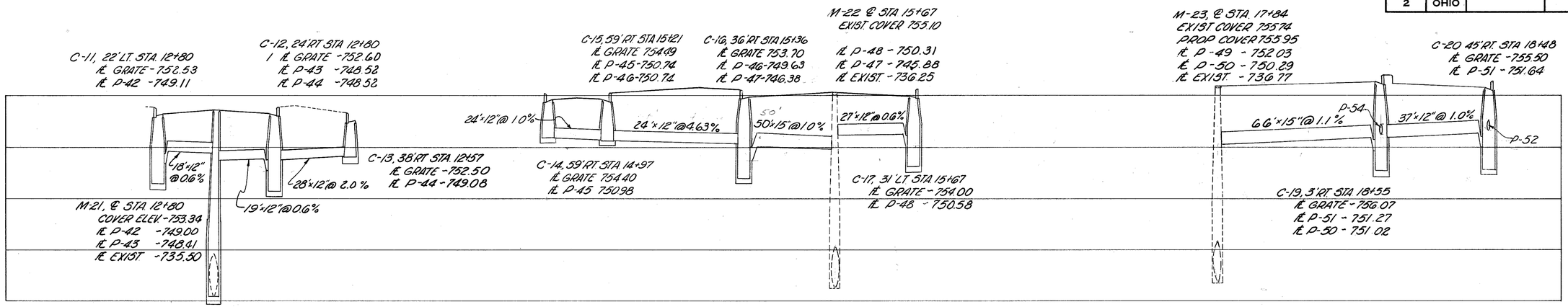

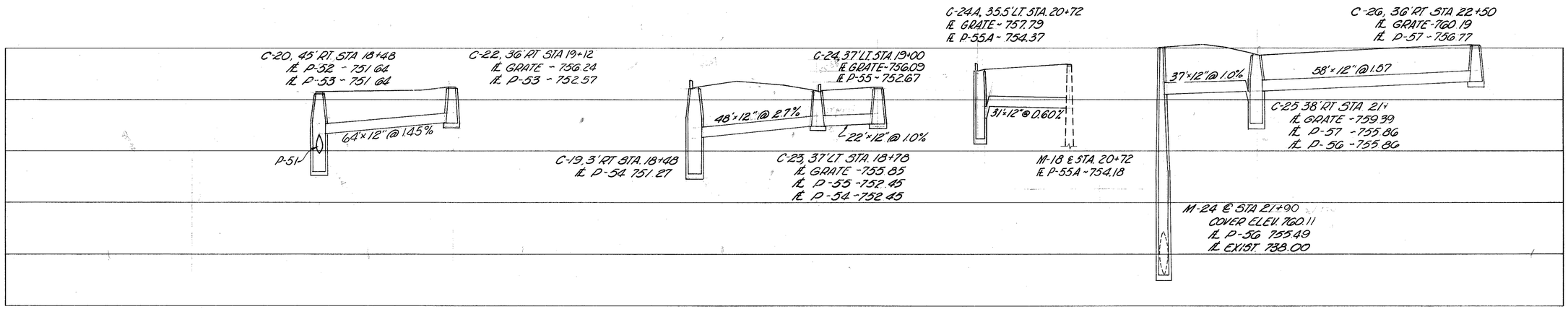

*100% CITY

ESTIMATED QUANTITIES

PIPE REFERENCE	STRUCTURES INCLUDED	I-1 CLASS J-1 12" (LIN. FT.)	I-1 CLASS J-1 15" (LIN. FT.)	I-1 CLASS E-1 12" (LIN. FT.)	I-1 STD NO1 M.H. (EACH)	I-8 STD. NO.2 MANHOLE (EACH)	I-8 MANHOLE ADJUSTED TO GRADE (EACH)	I-8 SPECIAL No 4 CATCH BASIN (EACH)	I-8 SPECIAL No 4 CURB INLET (EACH)	SEE SHEET NO.
P-42	C-11, M-21	18*				1*		1*		
P-43	C-12	19*						1*		
P-44	C-13			28*					1*	
P-45	C-14	24*							1*	
P-46	C-15			2424*					1*	
P-47	C-16		560*					1*		
P-48	C-17, M-22	27*					1*	1*		
P-49	C-18 M-23A	30			1*			1*		
P-50	C-19, M-23		66				1*	1		
P-51	C-20	37						1	1	
P-52	C-21	30*						1*		
P-53	C-22			64					1	
P-54	C-23	48							1	
P-55	C-24	22							11	
P-55A	C-24A	31						1		
P-56	C-25, M-24	37				1		1		
P-57	C-26	58							1	
	TOTALS	110*263	50*66	52*64	1*	1* 1	2*	6* 6	3* 4	

PLOTTED DATE | CHECKED BY DATE | INKED BY DATE
DESCRIPTION
TOPOGRAPHIC, PROFILE & CROSS SECTIONS

CUYAHOGA COUNTY
CUY-71-13.68

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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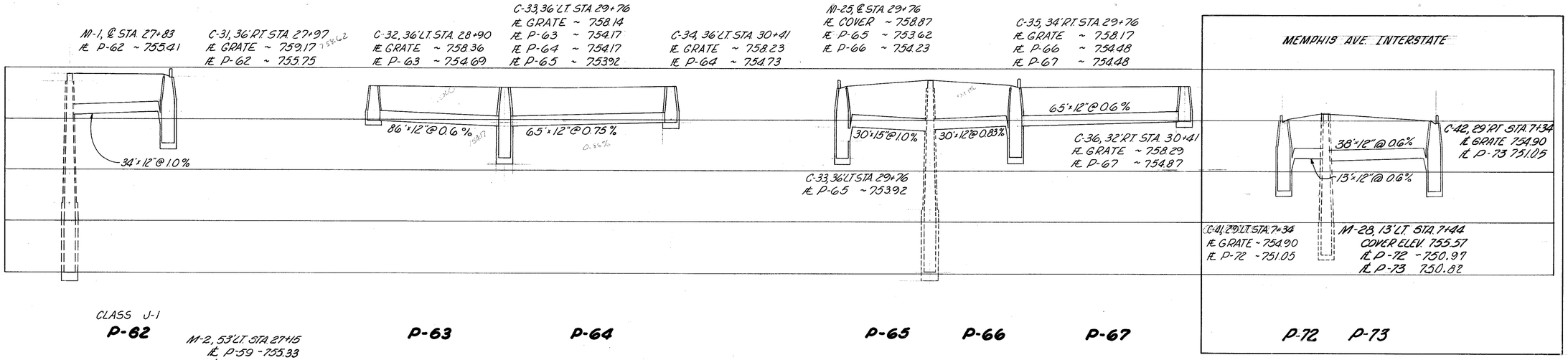
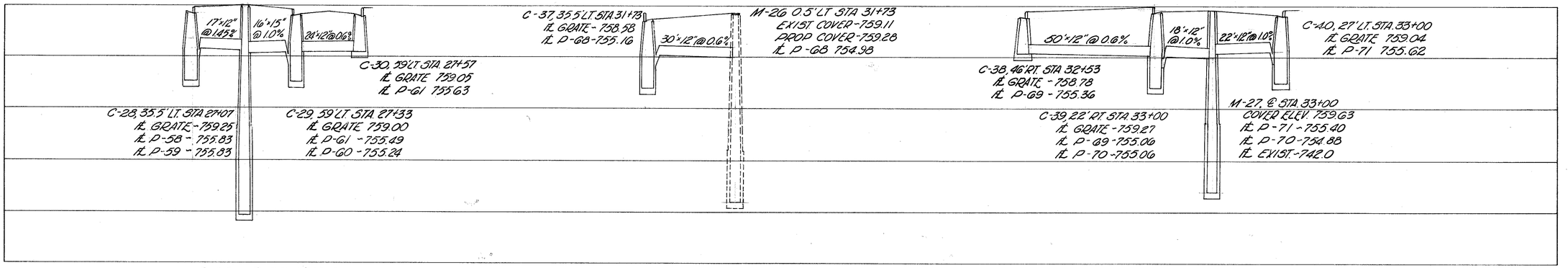
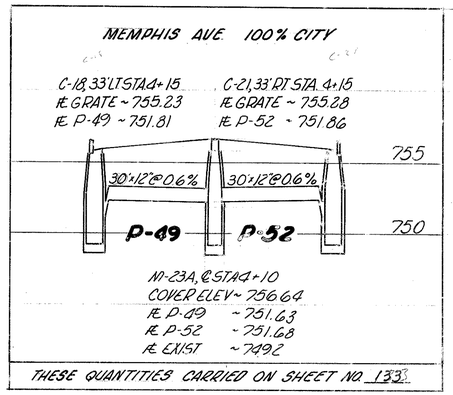




ESTIMATED QUANTITIES

PIPE REFERENCE	STRUCTURES INCLUDED	I-1 CLASS J-1 12" (LIN FT.)	I-1 CLASS J-1 15" (LIN FT.)	I-1 CLASS E-1 12" (LIN FT.)	I-1 CLASS E-1 15" (LIN FT.)	I-8 SPECIAL Nº 4 CATCH BASIN (EACH)	I-8 SPECIAL Nº 4 CURB INLET (EACH)	I-8 STANDARD Nº 2 MANHOLE (EACH)	I-8 MANHOLE ADJUSTED TO GRADE (EACH)	SEE SHEET NO.
P-62	C-31	34				1				
P-63	C-32	86					1			
P-64	C-34	65					1			
P-65	C-33		30			1				
P-66	C-35, M-25	30				1			1	
P-67	C-36	65					1			
P-72	C-41	13				1				
P-73	C-42, M-28	38				1			1	
P-59	C-28			17		1				
P-60	C-29				16	1				
P-61	C-30	24					1			
P-68	C-37, M-26	30				1			1	
P-69	C-38			50			1			
P-70	C-39	18				1				
P-71	C-40, M-27	22				1		1		
	TOTALS	425	30	67	16	10	5	1	3	



THESE QUANTITIES CARRIED ON SHEET NO. 133

DESCRIPTION	PLOTTED	CHECKED
ESTIMATED QUANTITIES	BY	BY
	DATE	DATE

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
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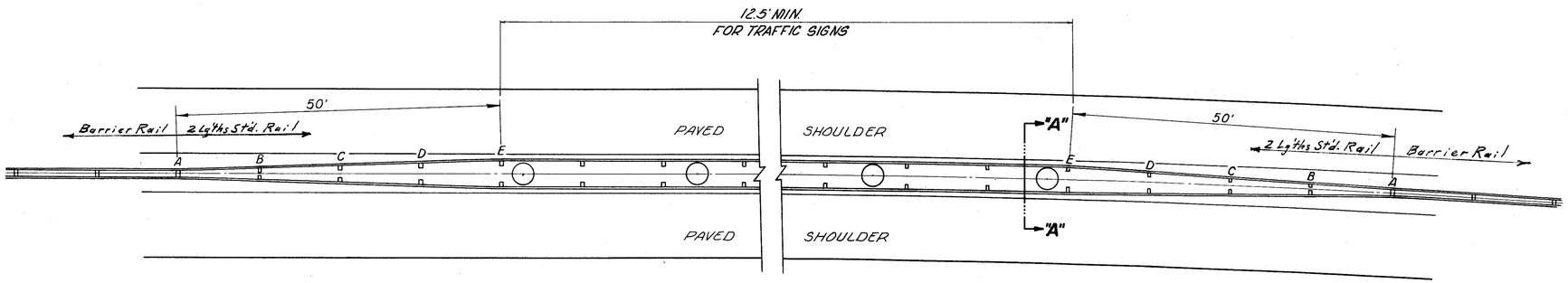
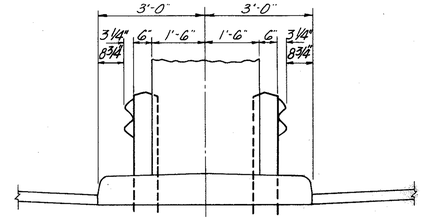




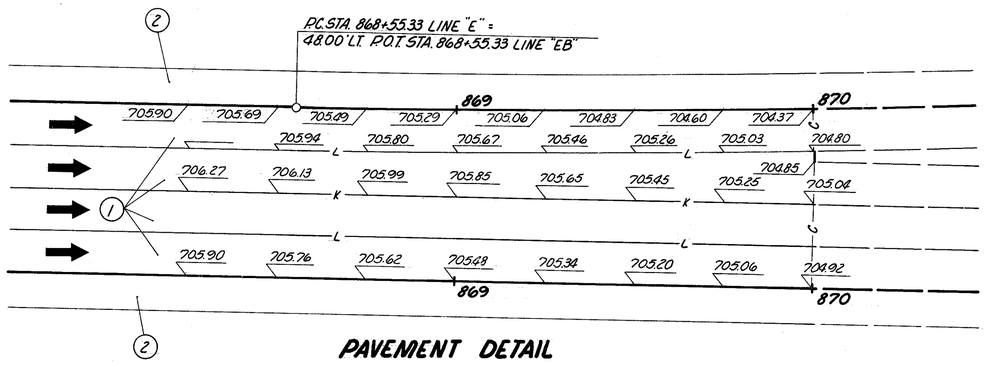
SECTION "A-A"

MEDIAN GUARD RAIL DETAIL AT BRIDGE PIERS & TRAFFIC SIGNS

TABLE OF OFFSETS	
POST	DISTANCE FACE CURB TO FACE OF GUARD RAIL
A	2'-0 1/4"
B	1'-10 5/8"
C	1'-4 7/8"
D	0'-10 7/8"
E	0'-8 3/4"

DRAINAGE QUANTITIES - W. 118TH CUL-DE-SAC		
ITEM	DESCRIPTION	QUANTITY
I-1	12" PIPE, CLASS J-1.	32 LIN. FT.
I-8	SPECIAL NO. 4 INLET	2 EACH
QUANTITIES CARRIED TO SHEET NO. 120		

NOTE: FOR PAVEMENT QUANTITIES SEE SHEET NO.

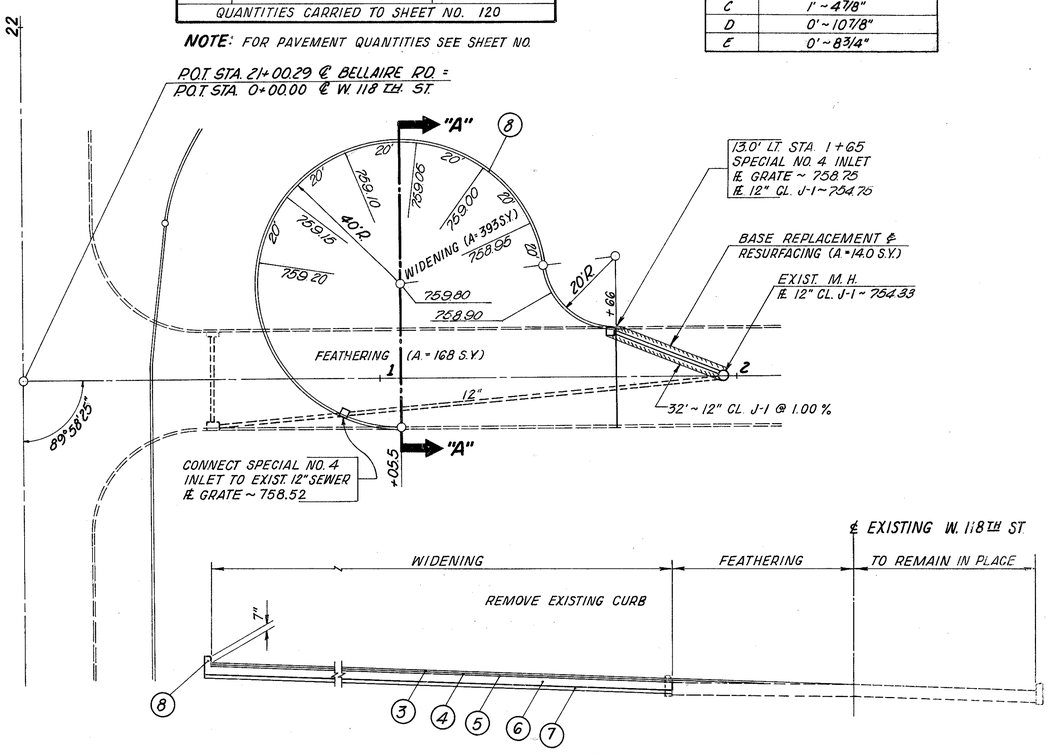


PAVEMENT DETAIL

ITEM		DESCRIPTION
(1)	T-71	10" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT
(2)	T-31	BITUMINOUS SURFACE TREATMENT USING 0.008 CU. YDS. NO. 6 AGGREGATE AND 0.25 GALS. BITUMINOUS MATERIAL PER SQ. YD. (SEE NOTE IN PROPOSAL).
(3)	T-35	1 1/4" ASPHALTIC CONCRETE SURFACE COURSE, TYPE "C" (70-85)
(4)	B-35	1 1/4" ASPHALTIC CONCRETE LEVELING COURSE (70-85)
(5)	T-30	BITUMINOUS TACK COAT, SEC. M-5.5, MS-2 OR RS-1 OR SEC. M-5.2, RC-1 OR RC-2 AS PER SEC. T-30.02 APPLIED AT THE RATE OF 0.10 GALS. PER SQ. YD.
(6)	B-71	7" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT
(7)	I-19	3" INSULATION COURSE AND SUBBASE COURSE
(8)	I-12	CONCRETE CURB, STANDARD TYPE 2-B, MODIFIED AS PER PLAN

STANDARD KEY JOINT WITHOUT TIE BARS ——— K ———
STANDARD LONGITUDINAL JOINT ——— L ———
EXPANSION JOINT WITHOUT TIE BARS ▬
STANDARD CONTRACTION JOINT ——— C ———

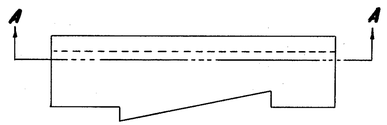
BELLAIRE ROAD



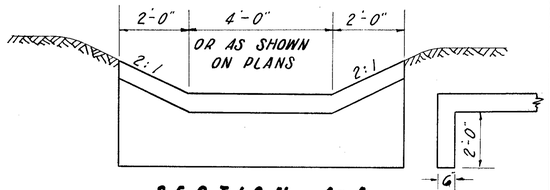
SECTION "A-A"

W. 118TH STREET CUL-DE-SAC

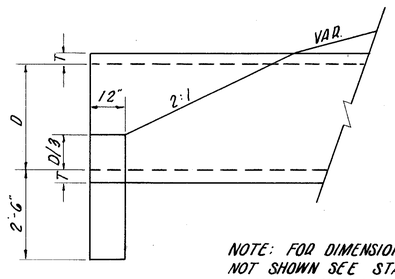
DESCRIPTION	PLOTTED BY	DATE	CHECKED BY	DATE
CROSSWALK PAVEMENT				
DRAINAGE				
M.H. & I.				
QUANTITIES				



PLAN

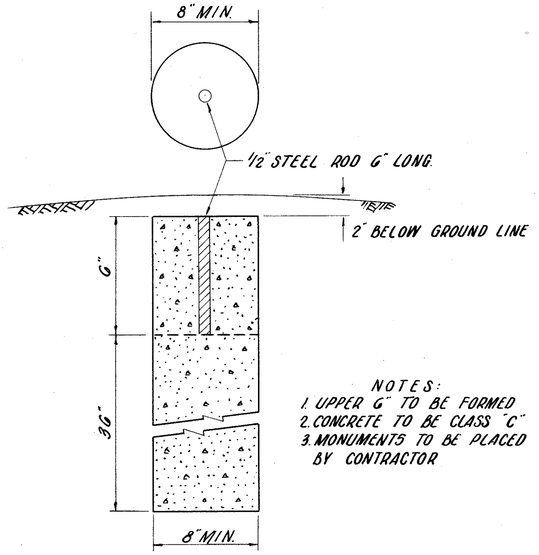


SECTION A-A
CUTOFF WALL DETAIL
FOR I-10 PAVED RIP-RAP



NOTE: FOR DIMENSIONS & DETAILS NOT SHOWN SEE STANDARD DRAWING HW-E

DETAIL OF SLOPE TREATMENT
AT HW-E ENDWALLS



NOTES:
1. UPPER 6" TO BE FORMED
2. CONCRETE TO BE CLASS "C"
3. MONUMENTS TO BE PLACED BY CONTRACTOR

CENTERLINE REFERENCE
MONUMENT DETAIL

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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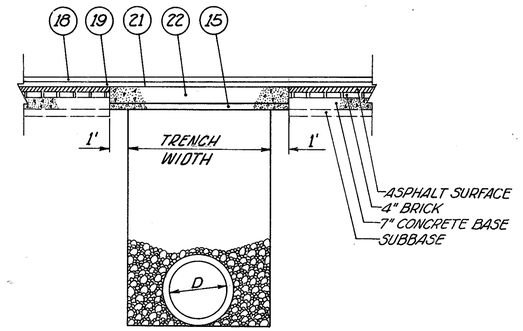


(15) I-19 3" INSULATION COURSE & SUBBASE

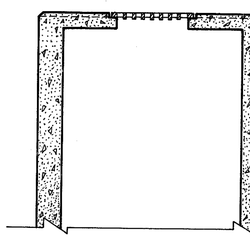
(18) T-35 1 1/4" ASPHALTIC CONCRETE SURFACE COURSE, TYPE "C" (70-85)

(19) B-35 1 1/4" ASPHALTIC CONCRETE LEVELING COURSE (70-85)

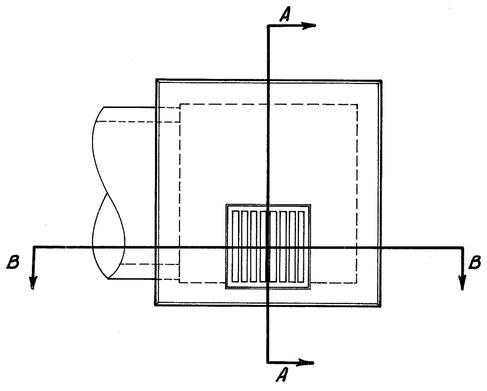
(21) T-30 BITUMINOUS TACK COAT, SEC. M-5.5, MS-2 or RS-1, or SEC. M-5.2, RC-1 or RC-2 AS PER SEC. T-30.02 APPLIED AT THE RATE OF 0.10 GALS. PER SQ. YD.

(22) ~~B-70~~ 8" PORTLAND CEMENT CONCRETE BASE COURSE

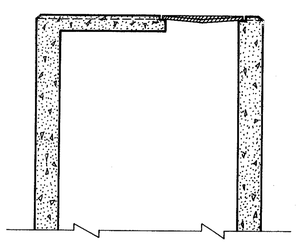
BASE REPLACEMENT TYPICAL



SECTION BB



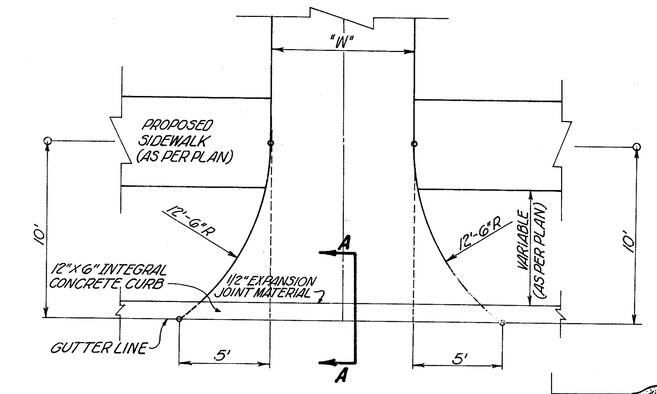
PLAN



SECTION A-A

NOTE:
FOR DETAILS AND DIMENSIONS NOT SHOWN SEE STD. DWG. FOR I-8 CATCH BASIN NO. 2-5

STANDARD NO. 2-5 C.B.
(MODIFIED)



SECTION AA

(1) T-70 6" PORTLAND CEMENT CONCRETE PAVEMENT (FOR RESIDENCE DRIVE)

(2) T-71 8" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT (FOR COMMERICAL DRIVE)

(3) I-19 3" INSULATION COURSE & BASE COURSE

DRIVEWAY TYPICAL

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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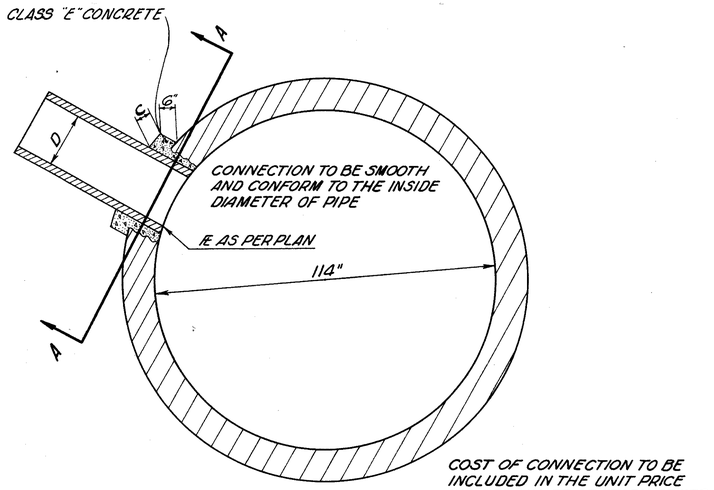
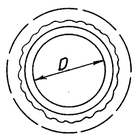
CUY-71-13.68

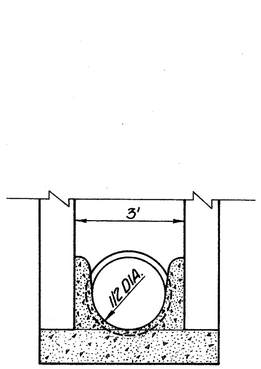


COST OF CONNECTION TO BE INCLUDED IN THE UNIT PRICE BID PER LIN. FT. OF STORM SEWER

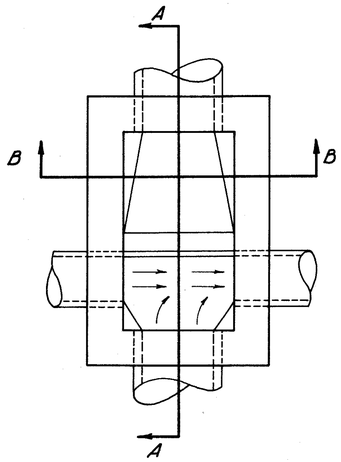


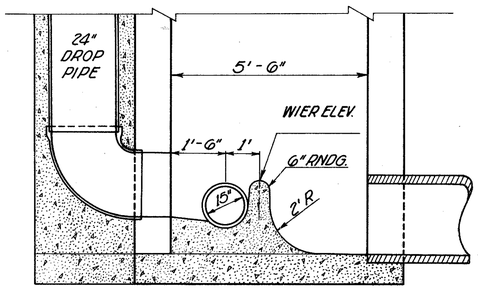
SECTION AA

DETAIL OF CONNECTING STORM SEWERS TO 114" TRUNK SEWER



SECTION BB

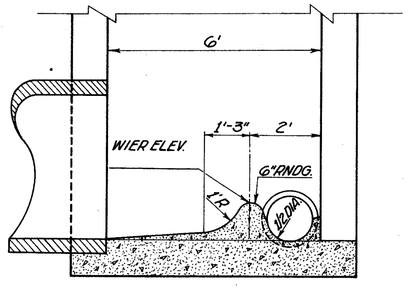




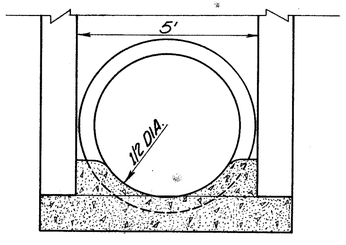
SECTION AA

STANDARD NO. 2 MANHOLE DETAIL "A"

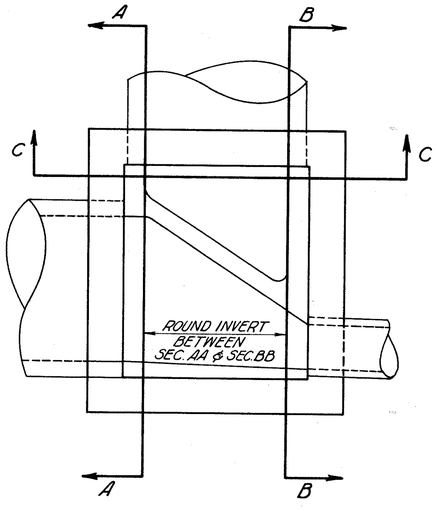
NOTE:
FOR DETAILS NOT SHOWN SEE STD. DWG. FOR I-8 STD. NO. 2 MANHOLE.

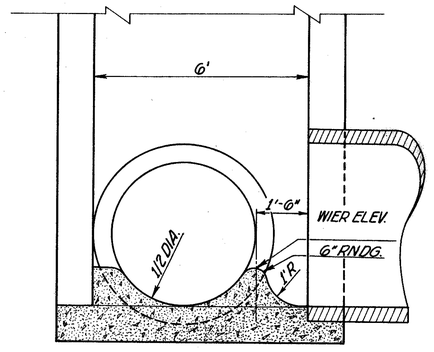


SECTION BB



SECTION CC





SECTION AA

STANDARD NO. 2 MANHOLE DETAIL "B"

NOTE:
FOR DETAILS NOT SHOWN SEE STD. DWG. FOR I-8 STD. NO. 2 MANHOLE.

DESCRIPTION	INKED	CHECKED
THICKNESS	BY	BY
PARTICIPATING	DATE	DATE
RATIO		
QUANTITIES		
CHECKED		

ADDITIONS		
	BY	DATE

MISCELLANEOUS DETAILS

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

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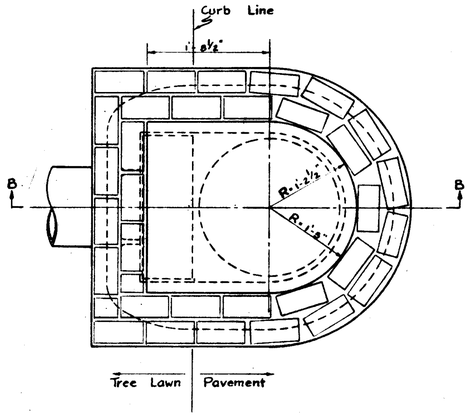
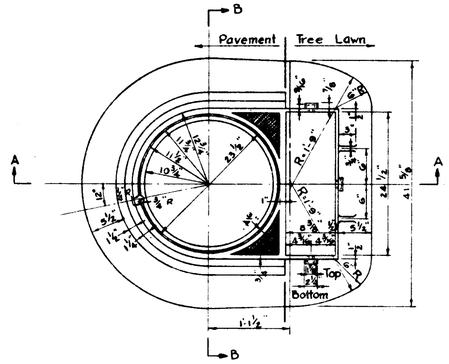
SPECIAL CURB INLET Nº 4

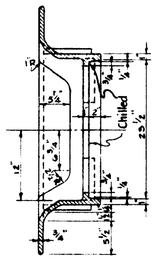


PLAN INLET BASIN
VIEW "A-A"
Scale: 1"-1'-0"

Position of casting shown in dashed lines

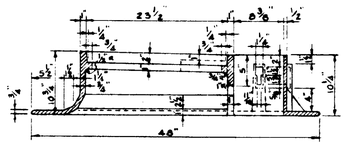


PLAN FRAME
(CAST IRON)

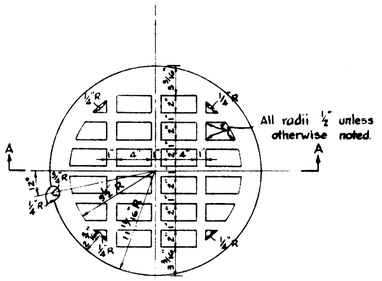


SECTION "B-B"

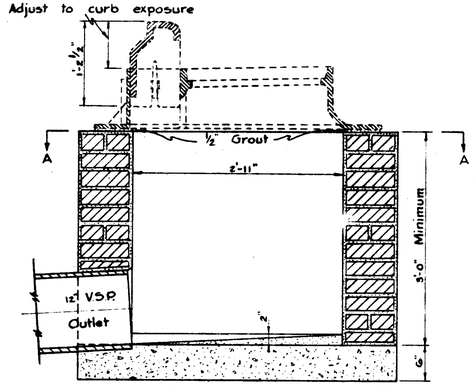
Note:
Cover seat surface to be chilled & chipped or ground to smooth round regular edge.



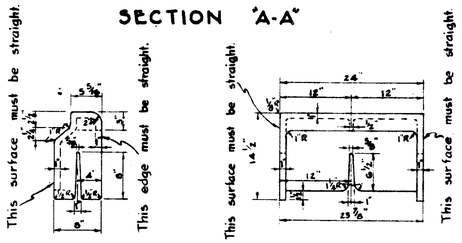
SECTION "A-A"



PLAN
CITY STANDARD CAST IRON
CATCH BASIN COVER
Scale: 1½"-1'-0"

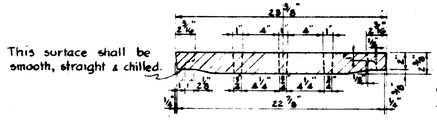


SECTION "B-B"

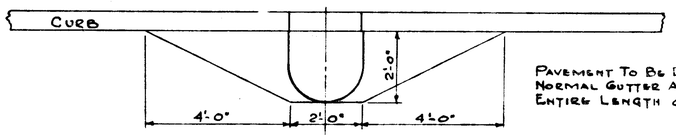


END VIEW FRONT ELEVATION
CURB BOX

CITY STANDARD CATCH BASIN FRAME
AND CAST IRON CURB BOX
Scale: 1"-1'-0"



SECTION "A-A"

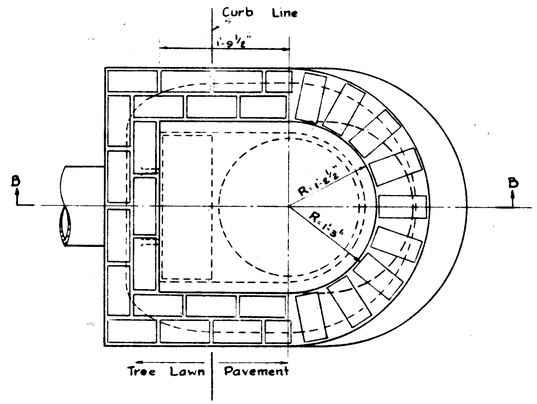


Pavement To Be Depressed 2" Below Normal Gutter Along Curb Line For Entire Length of Curb Opening.

DETAIL FOR DEPESSING PAVEMENT
FOR ABOVE STRUCTURES

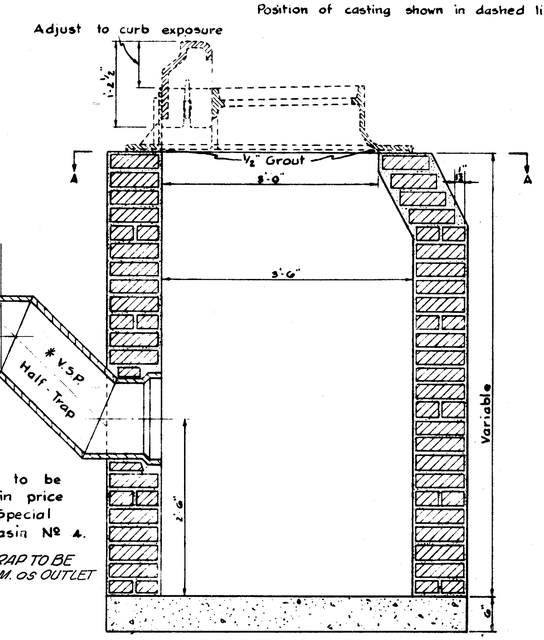
SPECIAL CATCH BASIN Nº 4

CUYAHOGA COUNTY
CUY-71-13.68



PLAN CATCH BASIN
VIEW "A-A"
Scale: 1"-1'-0"

Position of casting shown in dashed lines.



Note:
Half-Trap to be included in price bid for Special Catch Basin Nº 4.

* SIZE of TRAP TO BE SAME DIAM. as OUTLET PIPE

SECTION "B-B"

NOTES:

BRICK WALLS:
Brick walls shall be 8" thick and plastered on the inside and outside with 1:2 cement mortar ½" thick. Concrete sidewalls, where used in place of brick, shall be made 6" thick of Class "C" concrete.

OUTLET:
The outlet shall be of the size shown on the Plans and may be constructed in any side.

BOTTOM:
The bottom shall be built as per Plan, of Class "C" concrete, or of 2 courses of brick, set in mortar.

CASTING:
Casting to be in accordance with Section M-7.8 of the Material Details.

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO		

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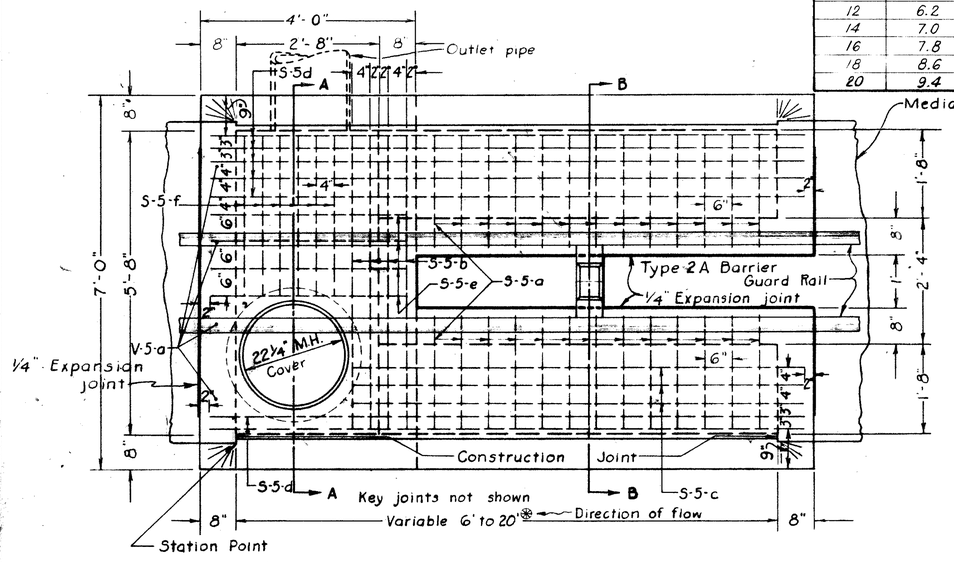
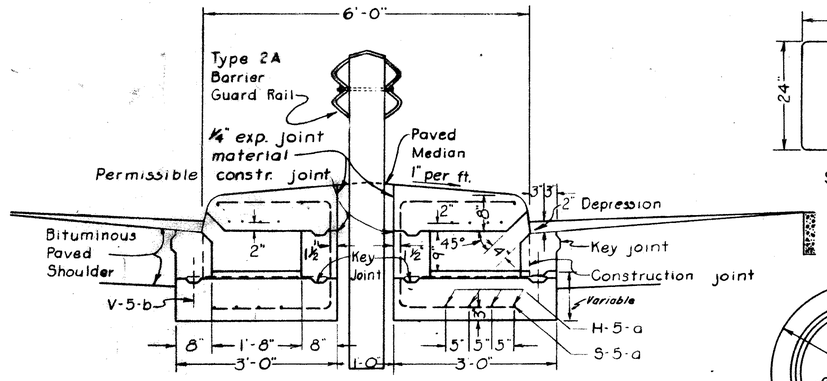
CUYAHOGA COUNTY
CUY-71-13.68

CONCRETE AND REINFORCING STEEL QUANTITIES

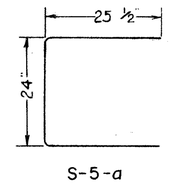
LENGTH (FT.)	CONCRETE (CU. YDS)	S-5-a		S-5-b		S-5-c		S-5-d		S-5-e		S-5-f		H-5-a		V-5-a		V-5-b		WEIGHT
		NO.	LIN. FT.	NO	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	NO.	LIN. FT.	LBS.
6	3.8	10	6'-3"	4	5'-6"	3	4'-4"	7	7'-0"	4	3'-8"	6	3'-0"	8	3'-8"	4	2'-6"	10	1'-0"	238
8	4.6	18	6'-3"	4	5'-6"	3	6'-4"	7	9'-0"	4	3'-8"	6	3'-0"	8	5'-8"	4	2'-6"	14	1'-0"	332
10	5.4	26	6'-3"	4	5'-6"	3	8'-4"	7	11'-0"	4	3'-8"	6	3'-0"	8	7'-8"	4	2'-6"	18	1'-0"	426
12	6.2	34	6'-3"	4	5'-6"	3	10'-4"	7	13'-0"	4	3'-8"	6	3'-0"	8	9'-8"	4	2'-6"	22	1'-0"	520
14	7.0	42	6'-3"	4	5'-6"	3	12'-4"	7	15'-0"	4	3'-8"	6	3'-0"	8	11'-8"	4	2'-6"	26	1'-0"	614
16	7.8	50	6'-3"	4	5'-6"	3	14'-4"	7	17'-0"	4	3'-8"	6	3'-0"	8	13'-8"	4	2'-6"	30	1'-0"	708
18	8.6	58	6'-3"	4	5'-6"	3	16'-4"	7	19'-0"	4	3'-8"	6	3'-0"	8	15'-8"	4	2'-6"	34	1'-0"	802
20	9.4	66	6'-3"	4	5'-6"	3	18'-4"	7	21'-0"	4	3'-8"	6	3'-0"	8	17'-8"	4	2'-6"	38	1'-0"	895



PLAN



SECTION B-B



S-5-a

NOTES

Castings shall be of cast iron in accordance with Material Details. The design shall be essentially the same and equally as strong as those shown hereon and shall be given one coat of asphaltum paint as per specifications.

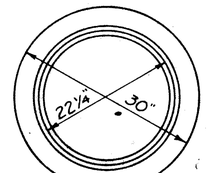
Bearing areas of frame and cover shall be so fitted and finished as to provide a firm and even seat for the entire cover in the frame. No projections shall exist on bearing areas of either casting and the cover shall seat in its frame without rocking.

Minimum weight of frame and cover 262 lbs.

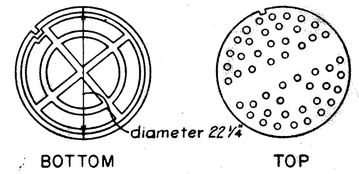
Reinforcing steel shall be 5/8" round bars in accordance with steel details shown hereon and conforming to Item S-4 of the Construction Materials Specifications. Cost of furnishing and placing reinforcing steel shall be included in Item 1-8 for payment.

Concrete shall be class "C".

Quantities of curb, pavement and median pavement within the limits of the inlet shall be deducted from the project quantities.

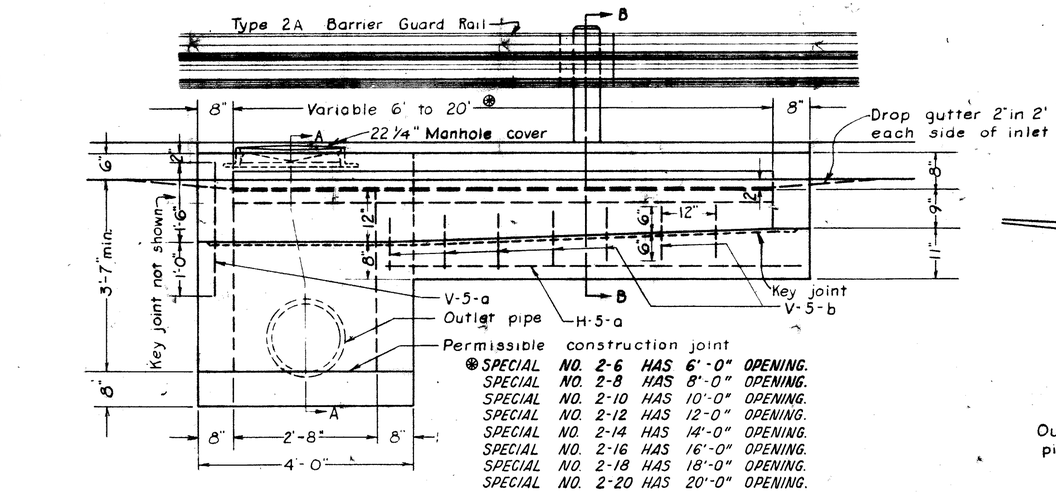


PLAN



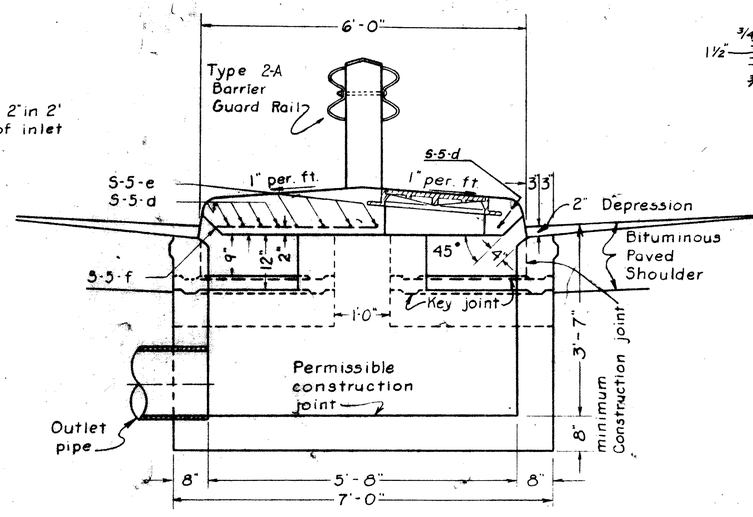
BOTTOM TOP

LID

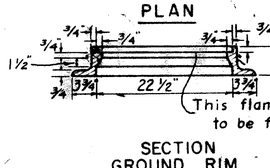


ELEVATION

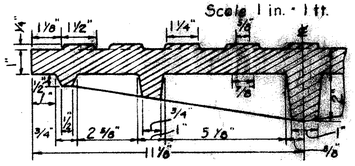
⊛ SPECIAL	NO. 2-6	HAS	6'-0"	OPENING.
SPECIAL	NO. 2-8	HAS	8'-0"	OPENING.
SPECIAL	NO. 2-10	HAS	10'-0"	OPENING.
SPECIAL	NO. 2-12	HAS	12'-0"	OPENING.
SPECIAL	NO. 2-14	HAS	14'-0"	OPENING.
SPECIAL	NO. 2-16	HAS	16'-0"	OPENING.
SPECIAL	NO. 2-18	HAS	18'-0"	OPENING.
SPECIAL	NO. 2-20	HAS	20'-0"	OPENING.



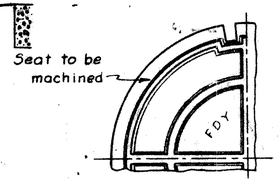
SECTION A-A



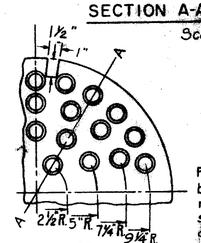
SECTION GROUND RIM
Scale 1 in = 1 ft.



SECTION A-A
Scale 1 in. = 3 in.



BOTTOM



TOP

1/4 LID

Foundry name shall be cast on the underneath of unexposed surface of both lid and ground rim

Scale: 1 in = 6 in.

Approximate weight of frame and cover for inlet = 262 lbs.

SPECIAL NO. 2-6 TO 2-20 INLETS FOR USE IN MEDIAN

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
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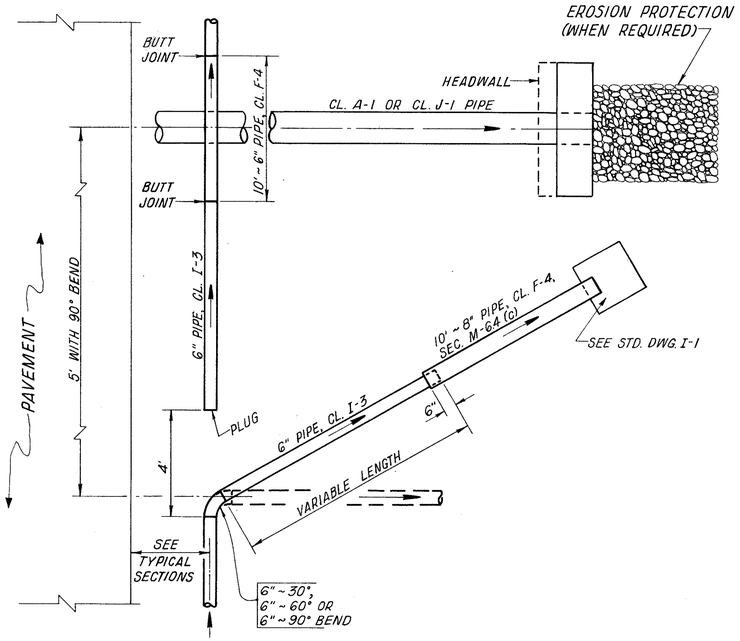
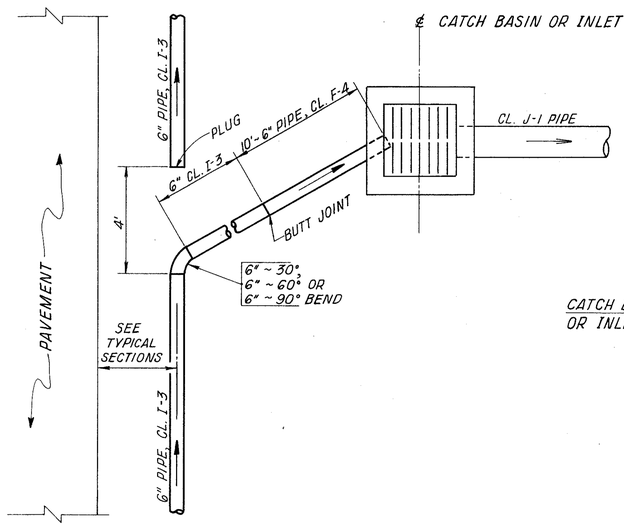
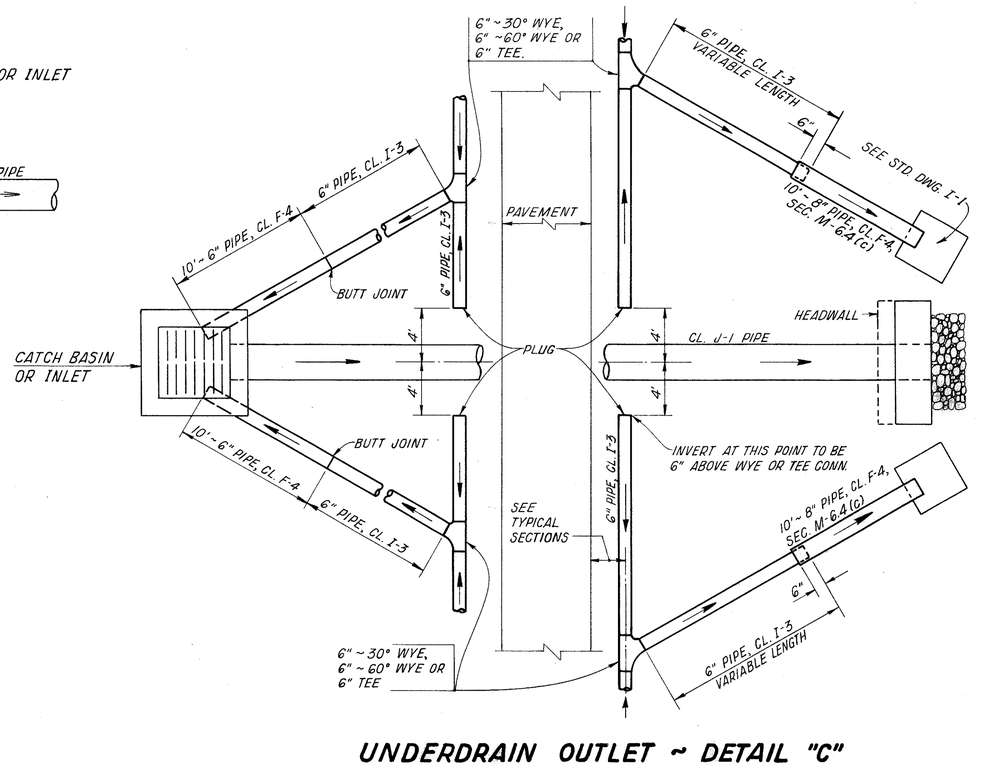


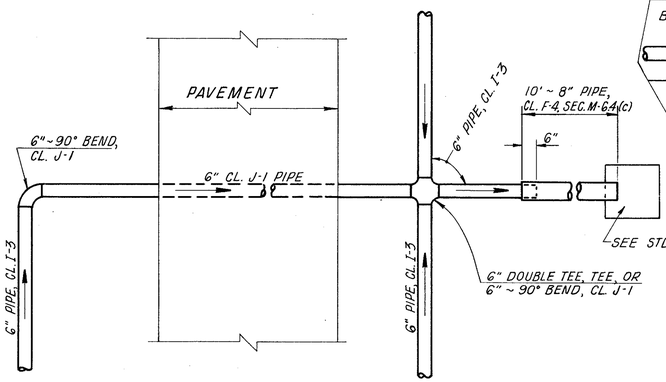
UNDERDRAIN OUTLET ~ DETAIL "A"



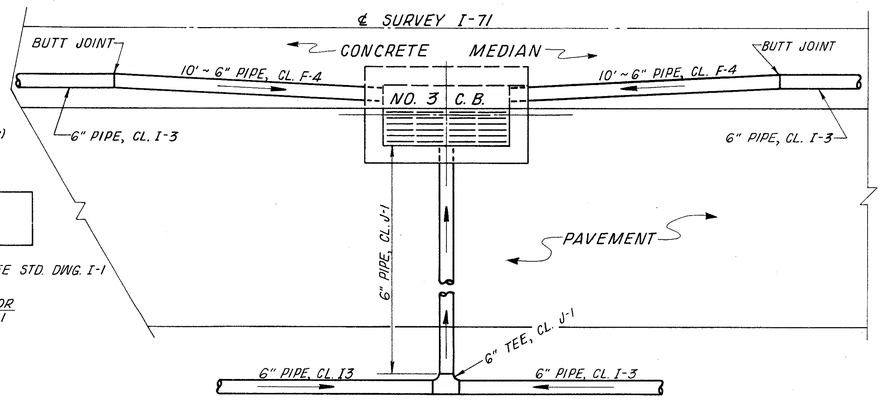
UNDERDRAIN OUTLET ~ DETAIL "B"



UNDERDRAIN OUTLET ~ DETAIL "C"



UNDERDRAIN OUTLET ~ DETAIL "D"



UNDERDRAIN OUTLET ~ DETAIL "E"

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY						
PAVEMENT						
DRAINAGE						
STRUCTURES						
QUANTITIES						

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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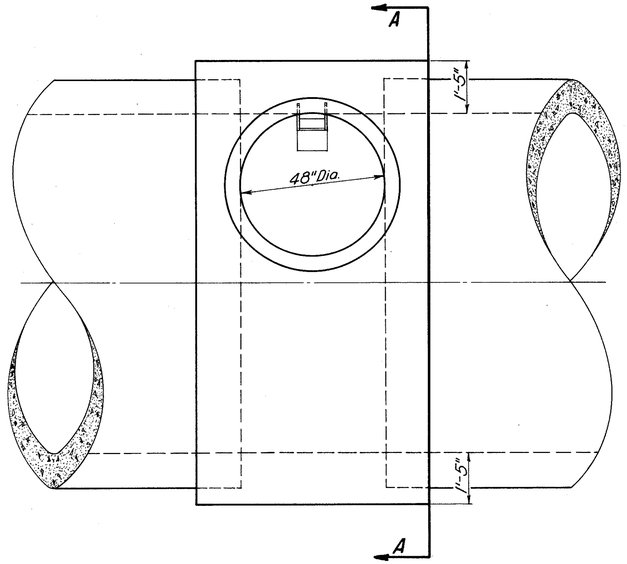
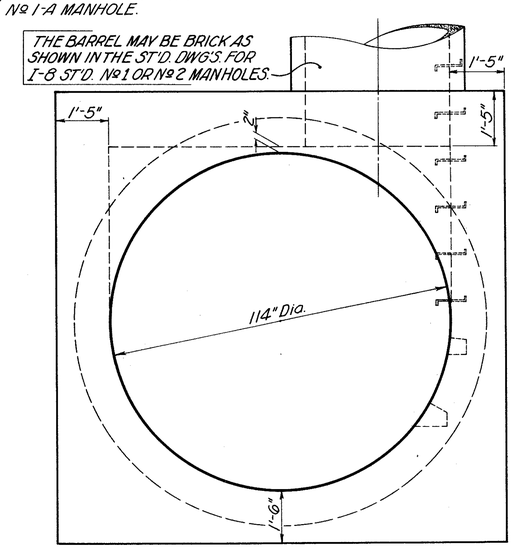
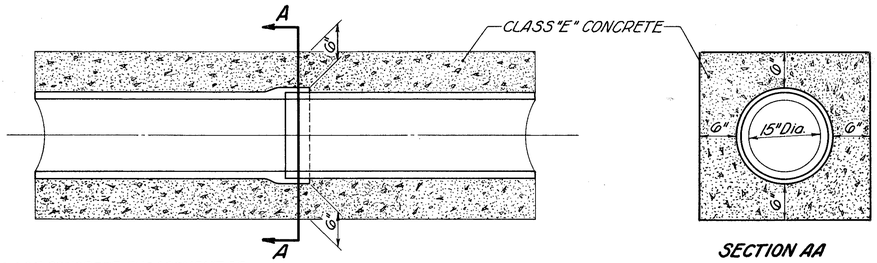


NOTE:
(1) USE No 8 REINFORCING BARS WITH THE SPACING CALLED FOR IN THE STANDARD DRAWING, I-8 STANDARD No 1-A MANHOLE.
(2) FOR DIMENSION AND DETAILS NOT SHOWN SEE STANDARD DRAWINGS, I-8 STANDARD No 1-A MANHOLE.



SECTION AA

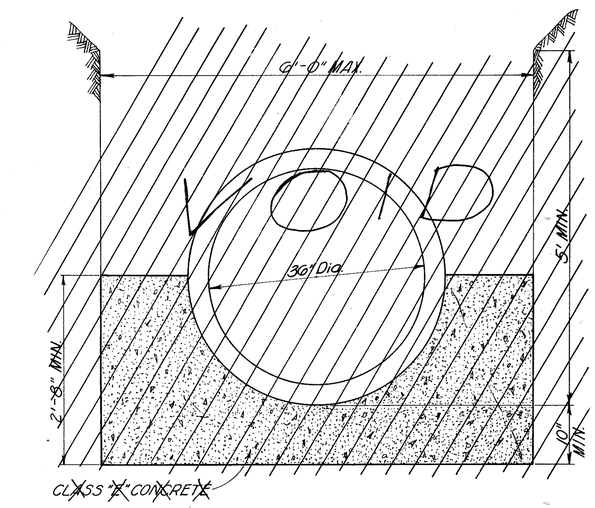
SPECIAL MANHOLE



SECTION AA

COST OF CONCRETE ENCASEMENT TO BE INCLUDED IN THE UNIT PRICE BID PER LINEAR FOOT FOR ITEM I-1 VITRIFIED PIPE.

CONCRETE ENCASEMENT



COST OF CONCRETE ENCASEMENT TO BE INCLUDED IN THE UNIT PRICE BID PER LINEAR FOOT FOR ITEM I-1 VITRIFIED PIPE.

CONCRETE CRADLE DETAIL

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
ESTIMATE OF QUANTITIES						
PAVT. & SHT.						
REVISED						
AS BUILT QUANTITIES						

TYPICAL DETAILS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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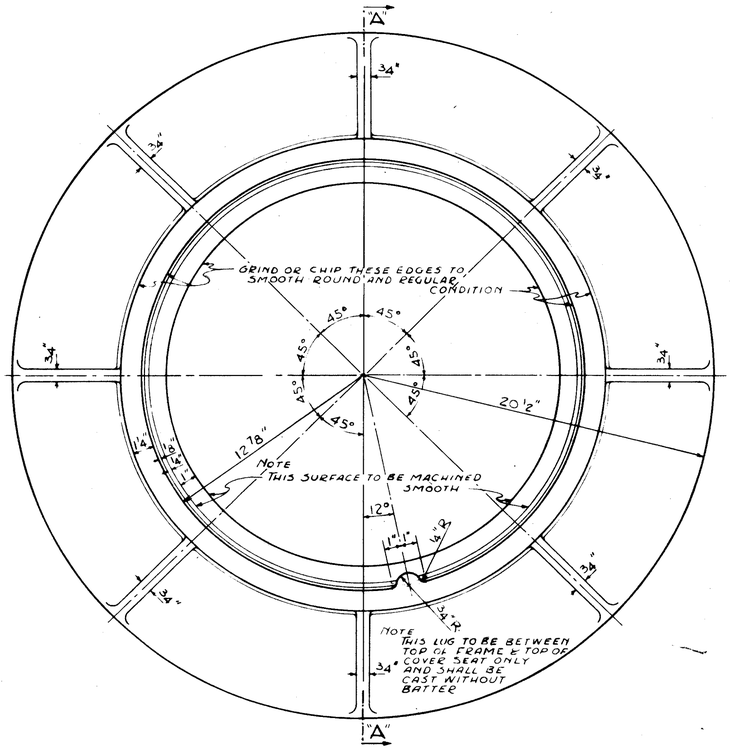
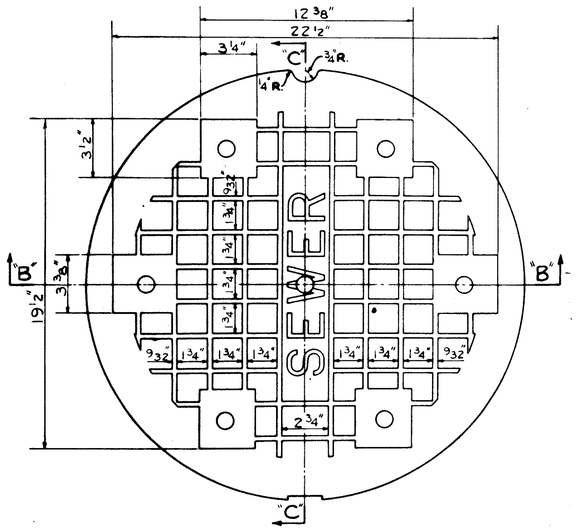
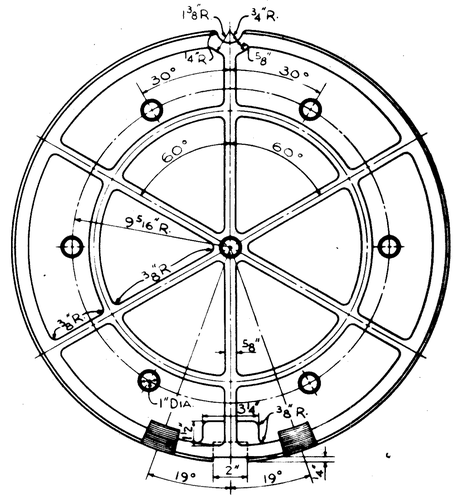
CUYAHOGA COUNTY
CUY-71-13.68



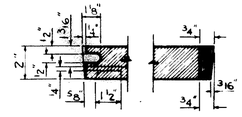
PLAN



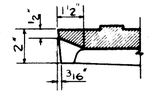
PLAN OF TOP



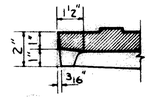
PLAN OF BOTTOM



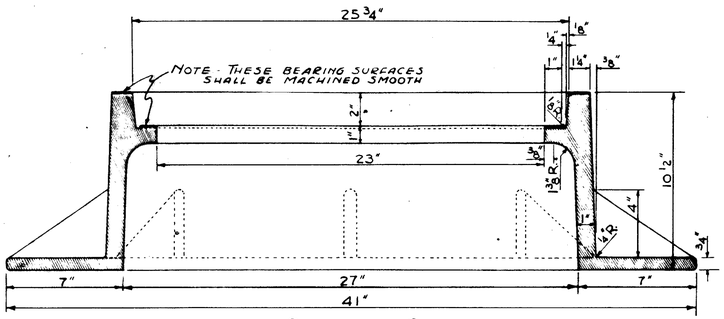
SECTION C



SECTION D



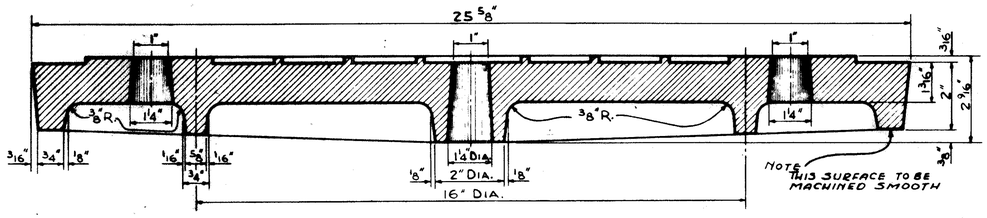
SECTION E



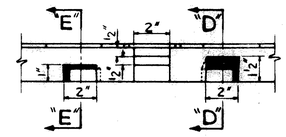
SECTION A

DETAIL OF CITY OF CLEVELAND STANDARD MANHOLE FRAME

WEIGHT OF FRAME = 400 LBS.



SECTION B



SIDE ELEVATION OF NOTCHES

DETAIL OF CITY OF CLEVELAND STANDARD MANHOLE COVER

WEIGHT OF COVER = 195 LBS.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY-71-13.68

RELOCATION OF WATER MAINS

MEDINA FREEWAY

CUY. 71-13.68
(I-71)

BELLAIRE AVE. SNOW ROAD

MEMPHIS AVE. SHAMROCK CT.

INDEX

SHEET NO.	DESCRPTION
143	TITLE SHEET
144	SUMMARY OF WATERWORK QUANTITIES
145-154	WATERWORK NOTES
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GENERAL NOTES

NOTES FOR PRE-STRESSED CONCRETE CYLINDER WATER MAIN

THE 36" CONCRETE WATER MAIN IS TO BE OF THE TYPE KNOWN AS PRE-STRESSED CONCRETE CYLINDER PIPE AND CLASS OF PIPE WILL BE DESIGNED FOR CONDITIONS SHOWN ON CONTRACT DRAWINGS, AND A STATIC HEAD MEASURED FROM ELEVATION 899.0.

CLOSURE PIECES SHALL BE MEASURED IN THE FIELD AND SHALL BE PRE-FABRICATED.

DETAILS SHALL BE DEVELOPED BY FABRICATOR AND SUBMITTED FOR APPROVAL BY CONTRACTOR. SEE SPECIFICATIONS.

ELEVATIONS ARE BASED ON SEA LEVEL DATUM. BENCHMARK O.M. 417-ELEV. 755.882-OF THE CLEVELAND REGIONAL GEODETIC SURVEY, LOCATED NEAR THE INTERSECTION OF BELLAIRE RD. AND WEST 117th ST.

THE STATIC HEAD TO BE USED FOR BOTH DESIGN AND TESTING SHALL BE MEASURED FROM ELEV. 899.0. THE FIELD TESTING HEAD SHALL BE 75 LBS. PER SQ. IN. PLUS THAT DUE TO STATIC HEAD, BUT IN NO CASE LESS THAN 100 LBS. PER SQ. IN. AS CALLED FOR IN THE SPECIFICATIONS.

ALIGNMENT DRAWINGS, UNLESS OTHERWISE NOTED, ARE BASED ON PRE-STRESSED CONCRETE CYLINDER WATER MAIN.

DETAIL LAYOUTS BY FABRICATOR SHALL MAINTAIN ALL P.I. POINTS, AS LOCATED ON THESE CONTRACT DRAWINGS.

THE PIPE LINE STATIONING IS ALONG HORIZONTAL CENTER LINES OF PIPES AND ALONG TANGENTS TO P.I. POINTS AT HORIZONTAL BENDS.

THE PIPE FABRICATOR SHALL FOLLOW AS CLOSELY AS POSSIBLE THE POINTS OF CHANGES OF GRADE AS GIVEN IN THESE CONTRACT DRAWINGS.

THE CONTRACTOR MAY FURNISH ADDITIONAL CLOSURES TO EXPEDITE THE SATISFACTORY INSTALLATION OF THE WATER MAIN.

CORRECTNESS OF UNDERGROUND INFORMATION SHOWN ON ALIGNMENT DRAWINGS IS NOT GUARANTEED AND MUST BE USED AT BIDDERS OWN RISK.

NOTES FOR CAST IRON WATER MAIN

ALL CAST IRON PIPE TO BE CLASS 25 WITH CLASS 250 FITTINGS.

ALL FITTINGS SHALL HAVE BELL AND BELL OR BELL AND SPIGOT ENDS WITH CAST LEAD JOINTS.

ALL PIPE SHALL HAVE BELL AND SPIGOT ENDS FOR CAST LEAD JOINTS OR A SLIP-ON TYPE JOINT WITH COMPRESSED RUBBER RING INSERTS.

ALL C. I. PIPE AND FITTINGS TO BE CEMENT LINED.

QUANTITIES

ALL WATER MAIN RELOCATION WORK IS ITEM SPECIAL, SEE "SUMMARY OF WATERWORK QUANTITIES" & "WATERWORK NOTES" OF THESE PLANS FOR ALL SPECIFICATIONS AND SUB-SUMMARIES.

1ST. HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED, DEC. 21, 1964.

_____ DIRECTOR OF PUBLIC UTILITIES

_____ COMMISSIONER OF WATER AND HEAT

_____ COMMISSIONER - DIVISION OF UTILITIES - ENGINEERING

_____ ENGINEER OF CONSTRUCTION & SURVEYS

_____ ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

RELOCATED WATER MAINS
MEDINA FREEWAY
CUY. 71-13.68
TITLE SHEET

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

144
279

CUYAHOGA COUNTY
CUY-71-13.68

SUMMARY OF WATERWORK QUANTITIES

CODE Y060

	SHEET NO.	LOCATION	6" CEMENT LINED CAST IRON PIPE & FITTINGS	8" CEMENT LINED CAST IRON PIPE & FITTINGS	12" CEMENT LINED CAST IRON PIPE & FITTINGS	12" CEMENT LINED DUCTILE IRON PIPE & FITTINGS	36" PRESTRESSED CONCRETE CYLINDER PIPE & FITTINGS	EXTRA CONCRETE PRESSURE PIPE FITTINGS	2" EXTRA HEAVY GALVANIZED WROUGHT IRON PIPE & FITTINGS	2" AIR COCK	4" CAST IRON PIPE & FITTINGS	6"x6" BRANCH SLEEVE & VALVE	8"x6" BRANCH SLEEVE & VALVE	8"x8" BRANCH SLEEVE & VALVE	12"x8" BRANCH SLEEVE & VALVE	12"x12" BRANCH SLEEVE & VALVE	36"x24" BRANCH SLEEVE & VALVE (TEMP)	4" GATE VALVE - FLG. ENDS	6" GATE VALVE-HUB ENDS	8" GATE VALVE-HUB ENDS	12" GATE VALVE-HUB ENDS	30" GATE VALVE - FLANGE ENDS	6" INSERTING VALVE & SLEEVE	8" INSERTING VALVE & SLEEVE	12" INSERTING VALVE & SLEEVE	TEMPORARY WATER MAINS AND TEMPORARY SERVICE CONNECTIONS	HYDRANTS & VALVES REMOVED	6" HYDRANTS, FURNISH & SET	EXTEND 6" HYDRANTS	BRICK MASONRY	CONCRETE MASONRY	MISCELLANEOUS METAL WORK	PLUGGING CURB CONNECTIONS @ MAIN	NEW CURB CONNECTIONS	SERVICE CONNECTIONS & WATER METERS RELOCATED	HOUSE SERVICE LINES	SPECIAL: M.H. Nº 1 & M.H. Nº 2 ADJUSTED TO GRADE	24" GATE VALVE-FLANGE ENDS (TEMP)
			L.F.	L.F.	L.F.	L.F.	L.F.	EA.	L.F.	EA.	L.F.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	LUMP	EA.	EA.	EA.	CY.	CY.	LBS.	EA.	EA.	EA.	EA.	EA.	EA.
ITEM SPECIAL	155-156-156A	GENERAL PLAN	360									1	2						2						LUMP	10	4	6		4.2	1044	6	5	70	2	2	
	157	INTERSECTION OF HIRST & BELLAIRE		276										1					1	1			1				1			4.0	701	1	2				
	158	BELLAIRE AVE.			348	304															1			2						6.0	561						
	159-160	SNOW ROAD	*25	*1,018								1							*2	*4			1		LUMP		*2			3.5	1387						
	161-162	MEMPHIS AVE.			350	246	619		12	1	26				1	2	3					2		2	LUMP				18.9	32.7	7263						2
ITEM SPECIAL	163	SHAMROCK CT. & PEPPER RIDGE DR.	*5	*172										1					*1								*1			1.7	530	2⊛	2		2		
ITEM SPECIAL	154	GENERAL NOTES						1																														
		SUB-TOTAL	360	276	690	550	619	1	12	1	26	2	2	2	1	2	3	3	1	1	2	2	1	4	LUMP	10	5	6	18.9	42.1	11,486	9	9	70	4	2	2
		* BETTERMENT ITEMS	30	1190														3	4								3										
		TOTAL	390	1,466	690	550	619	1	12	1	26	2	2	2	1	2	3	6	5	1	2	2	1	4	LUMP	10	8	6	18.9	42.1	11,486	9	9	70	4	2	2
	156	100% CITY								1																		2						34		2	

* DENOTES SPECIAL PARTICIPATION
NOTE: SEE WATERWORK NOTES FOR DESCRIPTION AND BASIS OF PAYMENT OF ITEMS

⊛ City of Cleveland & State

ITEM	DESCRIPTION	155, 156 and 156A	157	Normal Particip.	100% C I Y	TOTAL
I-8	Water Valve Boxes Adjusted to Grade	16	2	8	10	18

PLOTTED		INKED		CHECKED	
BY	DATE	BY	DATE	BY	DATE
DESCRIPTION					
TOPOGRAPHY					
PAVEMENT					
DRAINAGE					
R.R. & T.					
QUANTITIES					

1ST. HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO
APPROVED, DEC. 21, 1964.

DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER AND HEAT
COMMISSIONER - DIVISION OF UTILITIES - ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ENGINEER OF DESIGN

Revised 1-3-66 C.E.H.
REVISED C.E.H. 1-22-65

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

SUMMARY OF WATER WORK QUANTITIES

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

GENERAL NOTES (WATER)

DEFINITIONS

"DIRECTOR" SHALL MEAN THE DIRECTOR OF PUBLIC UTILITIES OF THE CITY OF CLEVELAND.

SCOPE OF WORK

THE WATER WORK CONTEMPLATED UNDER THIS CONTRACT COMPRISES THE FURNISHING AND INSTALLING OF CEMENT LINED CAST IRON PIPE, DUCTILE IRON PIPE AND PRESTRESSED CONCRETE CYLINDER PIPE AT THEIR RESPECTIVE LOCATIONS IN BELLAIRE AVE., SNOW RD., HURST AVE., SHAMROCK CT., AND MEMPHIS AVE., WITH ALL APPURTENANCES. COMPLETE IN ALL DETAILS, TESTED AND READY FOR OPERATION. THE CONTRACTOR SHALL DO ALL THE WORK AND FURNISH ALL THE LABOR AND MATERIALS NECESSARY FOR THE PROPER AND FINAL COMPLETION OF THIS CONTRACT IN THE MANNER AND UNDER THE CONDITIONS HEREIN SPECIFIED AND PROVIDED, AND IN ACCORDANCE WITH THE CONTRACT DRAWINGS.

ABANDONED WATER WORK ITEMS

ALL EXISTING WATERWORK FACILITIES, TO BE ABANDONED OR REMOVED EXCEPT 6" HYDRANTS, SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED AND DISPOSED OF BY HIM, EXCEPT WHERE PLANS SHOW THAT THE MATERIAL IS TO BE RESET AS PART OF THIS PROJECT.

STATUS OF CITY INSPECTOR

INSPECTORS AS DESIGNATED BY THE DIRECTOR OF PUBLIC UTILITIES SHALL BE AUTHORIZED TO INSPECT ALL WORK DONE AND MATERIALS FURNISHED. SUCH INSPECTION MAY EXTEND TO ALL OR ANY PART OF THE WATERWORKS, AND TO THE PREPARATION OR MANUFACTURE OF THE MATERIALS TO BE USED IN THE WATERWORKS. THE CITY INSPECTORS AS DESIGNATED BY THE DIRECTOR OF PUBLIC UTILITIES SHALL WORK INSTRUCTIONS THROUGH PROJECT ENGINEER.

ACCESS TO WORK AND PLACE OF MANUFACTURE

THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND DIRECTOR OF PUBLIC UTILITIES, AT LEAST SEVEN (7) DAYS PREVIOUS TO THE COMMENCEMENT OF THE MANUFACTURE OF ANY MATERIALS, OF THE TIME AND PLACE WHERE THE MANUFACTURE IS TO COMMENCE, IN ORDER THAT A REPRESENTATIVE OF THE ENGINEER AND DIRECTOR MAY BE PRESENT TO INSPECT THE MANUFACTURE. THE CONTRACTOR SHALL PROVIDE, WITHOUT CHARGE OR EXPENSE TO THE STATE AND CITY, ALL NECESSARY ASSISTANCE TO THE ENGINEER AND DIRECTOR WHEN REQUIRED FOR INSPECTION OR VERIFICATION OF WORK DONE.

TESTS, INSPECTION AND REPORTS

NOT WITHSTANDING THE REQUIREMENTS OF ANY OTHER PROVISIONS OF THESE SPECIFICATIONS, THE CONTRACTOR SHALL ARRANGE FOR AND PAY ALL COSTS INVOLVED FOR INSPECTION OF ALL MATERIALS FURNISHED, MANUFACTURE OF ALL PIPE, VALVES, FITTINGS, ETC., FIELD AND SHOP WELDS AND WELDING, AND FURNISH TO THE STATE AND THE CITY OF CLEVELAND COPIES OF ALL SHOP, FABRICATION, MANUFACTURE AND OTHER RELATED INSPECTION REPORTS OF MATERIALS FURNISHED. THIS INSPECTION SHALL BE DONE BY A RECOGNIZED INSPECTION LABORATORY APPROVED BY THE CITY OF CLEVELAND.

DIMENSIONS, DETAILED DRAWINGS AND ELEVATIONS

(A) - FIGURED DIMENSIONS ON DRAWINGS SHALL TAKE PRECEDENCE OVER MEASUREMENTS BY SCALE, AND DETAILED DRAWINGS ARE TO TAKE PRECEDENCE OVER GENERAL DRAWINGS AND SHALL BE CONSIDERED AS EXPLANATORY OF THEM AND NOT AS INDICATING EXTRA WORK. IF, HOWEVER, ANY OF THE DETAILED DRAWINGS SHOW MORE ELABORATE OR EXPENSIVE WORK THAN IS SPECIFIED AND INDICATED BY THE CONTRACT DRAWINGS, NOTICE THEREOF MUST BE GIVEN TO THE ENGINEER BY THE CONTRACTOR WITHIN TEN (10) DAYS AFTER THE RECEIPT OF SUCH DETAILED DRAWINGS IN ORDER THAT THE DRAWINGS MAY BE AMENDED OR THE ADDITIONAL EXPENSE ON ACCOUNT OF SUCH WORK MAY BE ADJUSTED AND AUTHORIZED. IF THE ENGINEER DOES NOT RECEIVE SUCH NOTICE FROM THE CONTRACTOR WITHIN TEN (10) DAYS AFTER DETAILED DRAWINGS HAVE BEEN RECEIVED BY HIM, IT IS HEREBY AGREED THAT THE CONTRACTOR ACCEPTS THE DRAWING AND WILL EXECUTE THEM WITHOUT CLAIM FOR EXTRA COMPENSATION.

FLOODS AND FREEZING WEATHER

PROPER FACILITIES SHALL BE PROVIDED FOR PROTECTING THE WORK FROM DAMAGE BY FLOOD, RAIN OR FROST, AND WORK DONE IN FREEZING WEATHER SHALL BE DONE IN SUCH MANNER AS THE ENGINEER MAY APPROVE. VALVES SHALL BE PROTECTED FROM FREEZING UNTIL BACKFILLED IN THE COMPLETED WORK.

ADDITIONAL WORK

(A) - ATTENTION IS CALLED TO THE FACT THAT THE WORK OF THIS CONTRACT INCLUDES CERTAIN PERFORMANCES AS INCIDENTAL TO THE ITEMIZED REQUIREMENTS HEREOF AND THOUGH NOT EXCLUSIVE AS FOLLOWS: TO PERFORM ALL EXCAVATION, BACKFILLING, SHEETING, SHORING, TEMPORARY AND FINAL REPAVING AND TO TEST THE INSTALLATION, ADJUSTING MANHOLE COVERS AND VALVE BOXES TO FINAL GRADE. SAND BACKFILL SHALL BE PLACED UNDER EXISTING PAVEMENT AND SIDEWALK. FOR THE PERFORMANCES HEREIN DESCRIBED AND FOR OTHER INCIDENTAL PERFORMANCES OF LIKE NATURE, THE STATE WILL MAKE NO SPECIFIC OR SEPARATE PAYMENT OR ALLOWANCE, BUT THE COST THEREOF SHALL BE INCLUDED IN THE PRICES STIPULATED TO BE PAID FOR THE VARIOUS ITEMS OF THE WORK TO BE DONE UNDER THIS CONTRACT.

(B) - PRELIMINARY FLUSHING: BEFORE BEING PLACED IN SERVICE ALL DIRT AND FOREIGN MATTER SHALL BE REMOVED FROM THE NEW WATER MAIN OR EXTENSIONS TO EXISTING MAINS BY A THOROUGH FLUSHING THROUGH THE HYDRANTS OR BY OTHER APPROVED MEANS. EACH VALVED SECTION OF NEWLY LAID PIPE SHALL BE FLUSHED INDEPENDENTLY. THIS SHALL BE DONE AFTER THE PRESSURE TEST AND MAY BE DONE BEFORE OR AFTER THE TRENCH SHALL HAVE BEEN BACKFILLED.

(C) - CHLORINATION: FOLLOWING PRELIMINARY FLUSHING, THE NEWLY LAID WATER PIPE SHALL BE CHLORINATED. THE PROCESS OF CHLORINATING, THE METHOD OF PROCEDURE, THE CHLORINATING AGENT, AND THE RATE OF APPLICATION SHALL BE DETERMINED BY THE ENGINEER. THE CITY OF CLEVELAND WILL FURNISH THE NECESSARY LABOR AND MATERIAL REQUIRED FOR SUCH CHLORINATION AND INSTALL THE NECESSARY TAPS AT THE ENDS OF THE WATER MAIN SECTIONS TO BE CHLORINATED. THE CONTRACTOR SHALL PAY FOR CHLORINATION OR SAMPLING OF THE WATER AT THE RATE OF TEN CENTS (10) PER LINEAR FOOT FOR THE FIRST THOUSAND FEET, AND FIVE CENTS (5) PER FOOT THEREAFTER OF THE WATER MAIN PROPER, WITH A MINIMUM CHARGE OF ONE HUNDRED DOLLARS ($100.00). THE CONTRACTOR SHALL FURNISH THE NECESSARY LABOR FOR EXCAVATING AND BACKFILLING WHICH WILL BE REQUIRED FOR THE INSTALLATION OF TAPS FOR INJECTING THE CHLORINE SOLUTION, OPERATING PUMPS AND FLUSHING MAINS. IN CASES WHERE THE WATER MAIN INSTALLATION DOES NOT EXCEED 350 FEET IN LENGTH, THE CONTRACTOR SHALL PAY A MINIMUM CHARGE OF THIRTY-FIVE DOLLARS ($35.00) FOR FLUSHING AND SAMPLING WATER.

(D) - FINAL FLUSHING AND TEST: FOLLOWING CHLORINATION, ALL TREATED WATER SHALL BE THOROUGHLY FLUSHED FROM THE NEWLY LAID PIPE AT ITS EXTREMITIES UNTIL THE REPLACEMENT WATER THROUGHOUT ITS LENGTH SHALL, UPON TEST, BOTH CHEMICALLY AND BACTERIOLOGICALLY, BE PROVEN EQUAL TO THE WATER QUALITY SERVED THE PUBLIC FROM THE EXISTING WATER SUPPLY SYSTEM.

(E) - FOR THE PERFORMANCES DESCRIBED IN PARAGRAPHS B, C AND D, THE STATE WILL MAKE NO SPECIFIC OR SEPARATE PAYMENT OR ALLOWANCES, BUT THE COST THEREOF SHALL BE INCLUDED IN THE PRICES STIPULATED TO BE PAID FOR EACH LINEAR FOOT OF PIPE FURNISHED AND INSTALLED.

PAINTING

(A) - IT IS THE INTENTION OF THESE SPECIFICATIONS TO PROVIDE THAT ALL METAL WORK SUBJECT TO CORROSION SHALL BE SATISFACTORILY PROTECTED BY A DURABLE COATING OF PAINT OR OTHER APPROVED MATERIAL AND THAT ALL METAL SURFACES NOT BURIED IN EARTH, OR IN CONCRETE SHALL BE LEFT CLEAR AND WELL PAINTED AT THE COMPLETION OF THE CONTRACT. UNLESS OTHERWISE SPECIFIED, THE PROTECTION SHALL BE AT LEAST THAT GIVEN BY THREE (3) COATS OF APPROVED PAINT. THE FIRST COAT IS TO BE APPLIED AT THE SHOP BEFORE THE METAL HAS RUSTED AND AFTER ALL GREASE, DIRT AND SCALE HAS BEEN REMOVED. BOLTS AND NUTS SHALL NOT BE SHOP COATED, BUT SHALL RECEIVE THREE (3) COATS OF APPROVED PAINT AFTER INSTALLATION.

(B) - ALL METAL WORK WHICH HAS NOT BEEN COATED BEFORE THE ARRIVAL ON THE JOB SHALL BE GIVEN A TEMPORARY PROTECTIVE COATING OF SUCH A NATURE AS TO PERMIT THE READY ADHERENCE OF FUTURE COATINGS. THE TEMPORARY COATING SHALL BE A GOOD GRADE ASPHALTIC PAINT OR OTHER APPROVED MATERIAL. THIS TEMPORARY PROTECTION SHALL APPLY PARTICULARLY TO THE FOLLOWING MATERIAL, AND ELSEWHERE WHEN IN THE OPINION OF THE ENGINEER, SUCH PROTECTION IS NECESSARY.

MANHOLE RINGS AND COVERS
LADDERS AND LADDER RUNGS
VALVE BOXES AND COVERS
VICTAULIC TYPE COUPLINGS
DRESSER TYPE COUPLINGS

(C) - ALL SURFACES OF METAL WHICH WILL BE IN CONTACT AFTER ASSEMBLING SHALL BE PAINTED, AT LEAST ONE COAT, BEFORE ASSEMBLING. THE FINAL COAT OF PAINT ON ALL EXPOSED WORK SHALL BE GIVEN SHORTLY BEFORE THE COMPLETION OF THE CONTRACT.

(D) - WHERE PAINTING CLAUSES APPEAR HEREINAFTER, THEY SHALL TAKE PRECEDENCE OVER THIS SECTION, EXCEPT THAT TEMPORARY PROTECTION HEREIN DESCRIBED MAY BE REQUIRED.

(E) - ALL OF THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE PARTICULAR ITEM REQUIRING THE PAINTING.

WORK TO BE DONE BY THE CITY

(A) - THE CLEVELAND WATER DEPARTMENT WILL FURNISH THE PIPING MATERIAL FOR AND MAKE ALL CHANGES REQUIRED IN THE LOCATION OF EXISTING HOUSE SERVICE CONNECTIONS AND METERS BUT THE CONTRACTOR SHALL DO ALL THE NECESSARY EXCAVATION, BACKFILLING AND REPAVING REQUIRED THEREFORE AND THE CITY WILL CHARGE THE CONTRACTOR FOR MATERIALS AND LABOR FURNISHED IN MAKING THESE SERVICE CONNECTIONS AND ALTERATIONS AND COSTS THEREOF SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "SERVICE CONNECTIONS" OR "WATER METERS RELOCATED".

(B) - THE CLEVELAND WATER DEPARTMENT WILL INSTALL ALL BRANCH SLEEVES AND VALVES, BUT THE CONTRACTOR SHALL SUPPLY THE BRANCH SLEEVES AND VALVES, LEAD, AND DO ALL THE NECESSARY EXCAVATION, BACKFILLING AND REPAVING REQUIRED THEREFOR.

TO COVER LABOR AND INSTALLATION COSTS, THE CITY WILL CHARGE THE FOLLOWING FLAT RATES FOR THE INSTALLATION OF TAPPING SLEEVES AND VALVES. IN ADDITION TO THE ABOVE REQUIREMENTS, THE CONTRACTOR SHALL FURNISH ALL AIR COMPRESSORS REQUIRED FOR THE WORK.

SIZE OF MAIN	LABOR AND INSTALLATION BY CITY
6"	130.00
8"	140.00
10"	150.00
12"	160.00
16"	260.00
20"	310.00
24"	410.00
30"	500.00
36"	560.00

(C) - IN LOCATIONS WHERE BRANCH SLEEVES AND VALVES CANNOT BE INSTALLED, THE CONTRACTOR WILL BE REQUIRED TO CUT IN TEES AND SLEEVE-IN THE REMAINDER OF THE CUT SECTION OF THE EXISTING MAIN. TO SPEED UP THIS OPERATION, IT IS CALLED TO THE CONTRACTOR'S ATTENTION THAT THE WATER DEPARTMENT HAS ON HAND AT HARVARD YARDS MOTOR OPERATED PIPE CUTTERS WHICH ARE AVAILABLE FOR CUTTING PIPE BY CITY FORCES AT THE FOLLOWING RATES. THESE PRICES INCLUDE COST OF LABOR, USE OF PIPE CUTTING MACHINE, AND TRUCK. THE CONTRACTOR SHALL DO ALL NECESSARY EXCAVATION, BACKFILLING AND REPAVING AND ALL AIR COMPRESSOR EQUIPMENT SHALL BE FURNISHED BY THE CONTRACTOR.

SIZE OF PIPE	COST PER CUT
12"	30.00
16"	35.00
20"	45.00
24"	60.00
30"	80.00
36"	100.00
42"	120.00
48"	150.00

CLOSING VALVES AND DRAINING 24" & 36" WATER MAINS

WHENEVER IT BECOMES NECESSARY TO OPERATE VALVES AND DRAIN EXISTING OR TEMPORARY 24" OR 36" WATER MAINS, INCLUDING BY-PASSES, THE CONTRACTOR SHALL BE CHARGED $150.00 BY THE DIVISION OF WATER AND HEAT OF THE CITY OF CLEVELAND AND EACH TIME THE WATER MAIN VALVES MUST BE OPERATED AND THE WATER MAIN DRAINED. A SEPERATE CHARGE SHALL BE MADE. THERE WILL BE A $20.00 CHARGE FOR EACH 24" OR 36" VALVE OPERATED WHEN FILLING THE WATER MAINS WITH A TOTAL CHARGE OF NOT MORE THAN $100.00 AT ANY ONE TIME.

CHANGES IN WATER PIPES

(A) - WHEREVER IT BECOMES NECESSARY IN THE OPINION OF THE ENGINEER TO CHANGE THE LOCATION OF HOUSE CONNECTIONS, SUCH CHANGES WILL BE MADE AS "WORK TO BE DONE BY CITY". THE CONTRACTOR SHALL NOTIFY THE CITY IN AMPLE TIME TO PERMIT THE CITY TO MAKE SUCH CHANGES AND AVOID UNNECESSARY DELAY IN THE COMPLETION OF THE WORK. THE CONTRACTOR SHALL ALSO COOPERATE WITH THE CITY IN MAKING THESE CHANGES AND SHALL DO ALL EXCAVATING, BACKFILLING AND REPAVING AS MAY BE REQUIRED.

(B) - WHEREVER IT BECOMES NECESSARY, IN THE OPINION OF THE ENGINEER TO CHANGE THE LOCATION OR ELEVATION OF WATER MAINS AND HYDRANTS AND WHERE CONNECTIONS ARE TO BE MADE BETWEEN EXISTING DISTRIBUTION MAINS AND WATER MAINS UNDER THIS CONTRACT, THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING WATER LINE MATERIALS REQUIRED TO MAKE THE CONNECTION, AND SHALL FURNISH AND INSTALL COMPLETE, ALL THE CAST IRON PIPE, FITTINGS AND VALVES TO MAKE THE CONNECTIONS INDICATED EXCEPT BRANCH SLEEVES AND VALVES WHICH WILL BE INSTALLED BY THE CITY. THE CONTRACTOR SHALL ALSO FURNISH ALL NECESSARY LABOR, MATERIALS, TOOLS AND EQUIPMENT AND MAKE THE EXCAVATION, BACKFILL AND REPAVING FOR SUCH CONNECTIONS. PAYMENT FOR THIS WILL BE INCLUDED IN PRICE BID UNDER APPROPRIATE ITEM FOR SIZE OF WATER MAIN OR CONNECTION TO BE INSTALLED.

HANDLING PIPE AND ACCESSORIES

(A) - PROTECTION OF PIPE COATING: PIPE SHALL BE HANDLED IN SUCH MANNER THAT A MINIMUM AMOUNT OF DAMAGE TO THE COATING WILL RESULT. ANY CAST IRON PIPE OR FITTING, THE COATING OF WHICH HAS BEEN DAMAGED IN SHIPPING OR HANDLING, SHALL HAVE THE DAMAGED PORTION WELL CLEANED AND COVERED WITH AN ASPHALT PAINT, APPROVED BY THE ENGINEER, BEFORE BEING PLACED IN THE WORK. THE CONTRACTOR SHALL THOROUGHLY COAT ALL EXPOSED PARTS OF BOLTS AND NUTS WITH AN APPROVED ASPHALT PAINT, AFTER ALL PIPE HAS BEEN LAID AND BEFORE BACKFILLING HAS BEEN PLACED. ALL FIELD COATING SHALL BE FURNISHED BY THE CONTRACTOR.

(B) - PIPE KEPT CLEAN: THE INTERIOR OF THE PIPE, FITTINGS AND OTHER ACCESSORIES SHALL BE KEPT FREE FROM DIRT AND FOREIGN MATTER AT ALL TIMES.

(C) - FROST PROTECTION: VALVES AND HYDRANTS BEFORE INSTALLATION SHALL BE DRAINED AND STORED IN A MANNER THAT WILL PROTECT THEM FROM DAMAGE BY FREEZING.

(D) - UNLOADING CAST IRON PIPE, PRE-STRESSED CONCRETE CYLINDER PIPE, FITTINGS, VALVES, HYDRANTS, AND OTHER ACCESSORIES SHALL, UNLESS OTHERWISE DIRECTED, BE UNLOADED AT THE POINT OF DELIVERY, HAULED TO AND DISTRIBUTED AT THE SITE OF THE PROJECT BY THE CONTRACTOR; THEY SHALL AT ALL TIMES BE HANDLED WITH CARE TO AVOID DAMAGE. IN LOADING AND UNLOADING THEY SHALL BE LIFTED BY HOISTS OR SLID OR ROLLED ON SKIDWAYS IN SUCH MANNER AS TO AVOID SHOCK. UNDER NO CIRCUMSTANCES SHALL THEY BE DROPPED. PIPE HANDLED ON SKIDWAYS MUST NOT BE SKIDDED OR ROLLED AGAINST PIPE ALREADY ON THE GROUND.

(E) - AT SITE OF WORK: IN DISTRIBUTING THE MATERIAL AT THE SITE OF THE WORK, EACH PIECE SHALL BE UNLOADED OPPOSITE OR NEAR THE PLACE WHERE IT IS TO BE LAID IN THE TRENCH.

EXCAVATION

(A) - THE CONTRACTOR SHALL REMOVE ALL EXISTING STRUCTURES, ROADWAYS, DRIVEWAYS AND OTHER SIMILAR MATERIALS AND MAKE TO THE LINES AND GRADES GIVEN, ALL EXCAVATION NECESSARY FOR THE PROPER CONSTRUCTION OF THE WATER MAIN, PIPE CONNECTIONS AND APPURTENANT STRUCTURES INCLUDING TUNNEL AND SHAFT EXCAVATION. THE EXCAVATION SHALL INCLUDE THE REMOVAL, HANDLING, REHANDLING AND DISPOSAL OF MATERIALS ENCOUNTERED IN THE WORK AND SHALL INCLUDE ALL PUMPING, BAILING, DRAINING, SHEETING AND BRACING. MOREOVER, THE CONTRACTOR MUST ASSUME ALL RESPONSIBILITY FOR ANY ADDED EXPENSE OR OTHER LIABILITY WHICH MAY ARISE BY MEANS OF QUICKSAND, OBSTACLES OR CONDITIONS FORESEEN OR UNFORESEEN AND ENCOUNTERED IN THE WORK OF THIS CONTRACT.

(B) - TRENCHES SHALL IN EVERY CASE BE OF SUFFICIENT WIDTH TO PERMIT SOLID PACKING OF REFILL UNDER AND AROUND PIPES, AND SATISFACTORY CONSTRUCTION OF ALL APPURTENANCES AND FOR SUCH SHEETING AND SHORING, PUMPING AND DRAINING AS MAY BE NECESSARY.

(C) - ALL SURFACING MATERIAL WITHIN THE LOCATION OF THE WORK, INCLUDING LOAM, SOD, STONE SIDEWALKS, ETC., SHALL BE REMOVED AND KEPT SEPARATE, TO BE AGAIN USED FOR SIDEWALKS OR GROUNDS, AS DIRECTED BY THE ENGINEER.

(D) - THE TRENCH SHALL BE DUG TO THE ALIGNMENT AND DEPTH REQUIRED AND ONLY SO FAR IN ADVANCE OF PIPE LAYING AS THE ENGINEER SHALL PERMIT. THE TRENCH SHALL BE SO BRACED AND DRAINED THAT WORKMEN MAY WORK THEREIN SAFELY AND EFFICIENTLY. IT IS ESSENTIAL THAT THE DISCHARGE FROM PUMPS BE LED TO NATURAL DRAINAGE CHANNELS, TO DRAINS, OR TO SEWERS.

(E) - THE TRENCH WIDTH MAY VARY WITH AND DEPEND UPON THE DEPTH OF TRENCH AND THE NATURE OF THE EXCAVATED MATERIAL ENCOUNTERED; BUT IN ANY CASE SHALL BE AMPLE WIDTH TO PERMIT THE PIPE TO BE LAID AND JOINTED PROPERLY AND FOR THE BACKFILL TO BE PLACED AND COMPACTED PROPERLY. THE MINIMUM WIDTH OF UNSHEETED TRENCH SHALL BE EIGHTEEN (18) INCHES AND FOR PIPE TEN (10) INCHES OR LARGER, AT LEAST TWELVE (12) INCHES LARGER THAN THE OUTSIDE DIAMETER OF THE PIPE FOR CONCRETE PIPE AND EIGHTEEN (18) INCHES FOR CAST IRON AND STEEL PIPE, EXCEPT BY CONSENT OF THE ENGINEER. THE MAXIMUM CLEAR WIDTH OF TRENCH SHALL BE NOT MORE THAN TWO (2) FEET GREATER THAN THE OUTSIDE PIPE DIAMETER. WHEN SHEETING AND BRACING IS USED, THE TRENCH WIDTH SHALL BE INCREASED ACCORDINGLY.

(F) - THE TRENCH, UNLESS OTHERWISE SPECIFIED, SHALL HAVE A FLAT BOTTOM CONFORMING TO THE GRADE TO WHICH THE PIPE IS TO BE LAID. THE PIPE SHALL BE LAID UPON SOUND SOIL CUT TRUE AND EVEN SO THAT THE BARREL OF THE PIPE WILL HAVE A BEARING FOR ITS FULL LENGTH.

(G) - ANY PART OF THE TRENCH EXCAVATED BELOW GRADE SHALL BE CORRECTED WITH APPROVED MATERIAL, THOROUGHLY COMPACTED.

(H) - WHEN THE UNCOVERED TRENCH BOTTOM AT SUBGRADE IS SOFT AND IN THE OPINION OF THE ENGINEER CANNOT SUPPORT THE PIPE, A FURTHER DEPTH AND OR WIDTH SHALL BE EXCAVATED AND REFILLED TO PIPE FOUNDATION GRADE AS REQUIRED UNDER (G), OR OTHER APPROVED MEANS SHALL BE ADOPTED TO ASSURE A FIRM FOUNDATION FOR THE PIPE.

(I) - LEDGE ROCK, BOULDERS, LARGE STONES, AND SHALE SHALL BE REMOVED TO PROVIDE A CLEARANCE OF AT LEAST SIX (6) INCHES BELOW ALL PARTS OF THE PIPE, VALVES, OR FITTINGS, AND TO A CLEAR WIDTH OF SIX (6) INCHES ON EACH SIDE OF ALL CONCRETE PIPE AND NINE (9) INCHES ON EACH SIDE OF ALL CAST IRON AND STEEL PIPE SHALL BE PROVIDED.

(J) - EXCAVATIONS BELOW SUBGRADE IN ROCK, SHALE OR IN BOULDERS SHALL BE REFILLED TO SUBGRADE WITH APPROVED MATERIAL, THOROUGHLY COMPACTED.

(K) - BELL HOLES OF AMPLE DIMENSIONS SHALL BE DUG TO EARTH TRENCHES AT EACH JOINT TO PERMIT THE JOINTING TO BE MADE PROPERLY. ADEQUATE CLEARANCE FOR PROPERLY JOINTING PIPE LAID IN ROCK SHALL BE PROVIDED AT BELL HOLES.

(L) - THE USE OF EXCAVATING MACHINERY WILL BE PERMITTED EXCEPT IN PLACES WHERE OPERATION OF SAME WILL CAUSE DAMAGE TO TREES, BUILDINGS, OR EXISTING STRUCTURES ABOVE OR BELOW GROUND; IN WHICH CASE HAND METHODS SHALL BE EMPLOYED.

(M) - HYDRANTS UNDER PRESSURE, VALVE PIT COVERS, VALVE BOXES, CURB STOP BOXES, FIRE OR POLICE CALL BOXES, OR OTHER UTILITY CONTROLS SHALL BE LEFT UNOBSTRUCTED AND ACCESSIBLE DURING THE CONSTRUCTION PERIOD.

(N) - TREES, FENCES, POLES AND ALL OTHER PROPERTY SHALL BE PROTECTED UNLESS THEIR REMOVAL IS AUTHORIZED; ANY PROPERTY DAMAGED SHALL BE SATISFACTORILY RESTORED BY THE CONTRACTOR.

(O) - THE CONTRACTOR SHALL MAINTAIN ALL EXCAVATIONS IN GOOD ORDER DURING THE CONSTRUCTION, SO AS NOT TO HINDER OR INJURE THE PIPE LAYING, MASONRY OR OTHER WORK; HE SHALL TAKE ALL REASONABLE PRECAUTIONS TO PREVENT MOVEMENT OF THE SIDES OF SUCH EXCAVATION; AND SHALL REMOVE AT HIS OWN EXPENSE ANY MATERIAL SLIDING INTO THE EXCAVATION.

SHEETING AND BRACING

(A) - THE CONTRACTOR SHALL FURNISH AND PUT IN PLACE SUCH SHEETING AND BRACING AS MAY BE REQUIRED TO SUPPORT THE SIDES OF TRENCHES OR OTHER EXCAVATION AND SHALL REMOVE SUCH SHEETINGS AND BRACINGS, AS THE TRENCH OR EXCAVATION IS FILLED UP, UNLESS THE ENGINEER SHALL ORDER IT LEFT IN PLACE, IN WHICH CASE THE CONTRACTOR SHALL CUT THE PLANK OFF AT A HEIGHT AS ORDERED BY THE ENGINEER, OR AS CALLED FOR ON THE CONTRACT DRAWINGS. THAT PORTION OF THE TIMBER ORDERED TO BE LEFT IN PLACE WILL BE PAID FOR AT THE RATE OF EIGHTY DOLLARS ($80.00) PER THOUSAND FEET BOARD MEASURE. NO PAYMENT WILL BE MADE FOR WASTED ENDS.

(B) - WHENEVER THE EXCAVATIONS FOR THE WORK HEREIN TO BE DONE ARE IMMEDIATELY ADJACENT TO OTHER SUBSURFACE STRUCTURES, THE CONTRACTOR SHALL FURNISH AND PLACE SHEETING AND BRACING WHERE NOTED ON CONTRACT DRAWINGS AND AS MAY BE NECESSARY, SO AS TO REDUCE TO A MINIMUM THE POSSIBILITY OF INJURING OR DAMAGING THE SAME.

(C) - IF THE ENGINEER IS OF THE OPINION THAT AT ANY POINT SUFFICIENT OR PROPER SUPPORTS, SHEETING, OR BRACINGS HAVE NOT BEEN PROVIDED, HE MAY ORDER ADDITIONAL SUPPORTS, SHEETING OR BRACING, AT THE EXPENSE OF THE CONTRACTOR, AND THE COMPLIANCE WITH SUCH ORDERS BY THE CONTRACTOR SHALL NOT RELIEVE OR RELEASE HIM FROM HIS RESPONSIBILITY FOR SUFFICIENCY OF SUCH SUPPORTS.

REMOVAL OF EXCAVATED MATERIAL

(A) - ALL SURPLUS MATERIAL AND SUCH OTHER MATERIAL AS THE ENGINEER MAY DEEM UNFIT FOR USE AS BACKFILL, SHALL BE DISPOSED OF BY THE CONTRACTOR SO AS TO GIVE A MINIMUM OF INCONVENIENCE TO THE PUBLIC. IN CASE OF SETTLEMENT AFTER BACKFILL, THE CONTRACTOR SHALL SUPPLY SUFFICIENT MATERIAL SATISFACTORY TO THE ENGINEER TO MAKE UP FOR THE DEFICIENCY.

(B) - IN THE STORING OF EXCAVATED MATERIAL, WHICH IS TO BE USED AS A BACKFILL, THE CONTRACTOR SHALL EXERCISE CARE SO AS TO AVOID INCONVENIENCING THE PUBLIC. IF, IN THE OPINION OF THE ENGINEER, IT IS NECESSARY TO REMOVE THIS EXCAVATED MATERIAL FROM THE STREETS OR LOTS, THE CONTRACTOR SHALL BE REQUIRED TO DO SO.

(C) - ANY MATERIAL WHICH MAY SPILL OR DRIP FROM VEHICLES BY HAULING IN THE STREETS, SHALL BE REMOVED AND THE STREETS CLEANED BY THE CONTRACTOR, TO THE SATISFACTION OF THE DIRECTOR OF PUBLIC SERVICE OF THE CITY OF CLEVELAND OR THE PROPER OFFICIALS OF THE MUNICIPALITY OR TOWNSHIP IN WHICH THE WORK IS BEING DONE.

(D) - WHEN SO DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL IMMEDIATELY REMOVE ALL EXCAVATED MATERIALS FROM THE SITE AND DISPOSE OF THE SAME.

LAYING PIPE

(A) - PROPER IMPLEMENTS, TOOLS, AND FACILITIES, SATISFACTORY TO THE ENGINEER SHALL BE PROVIDED AND USED BY THE CONTRACTOR FOR THE SAFE AND CONVENIENT PROSECUTION OF THE WORK. ALL PIPE, FITTINGS, AND VALVES SHALL BE CAREFULLY LOWERED INTO THE TRENCH PIECE BY PIECE BY MEANS OF DERRICK, PROPER SLINGS, AND OTHER SUITABLE TOOLS OR EQUIPMENT; IN SUCH MANNER AS TO PREVENT DAMAGE TO PIPE OR COATING. UNDER NO CIRCUMSTANCES SHALL PIPE OR ACCESSORIES BE DROPPED OR DUMPED INTO THE TRENCH. IF ANY DEFECTIVE PIECE BE DISCOVERED WHILE PIPE IS SUSPENDED OR AFTER BEING LAID, A NEW PIECE SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR AT THE SITE OF THE WORK.

(B) - ALL FOREIGN MATTER OR DIRT SHALL BE REMOVED FROM THE INSIDE OF THE PIPE BEFORE IT IS LOWERED INTO ITS POSITION IN THE TRENCH, AND IT SHALL BE KEPT CLEAN BY APPROVED MEANS DURING AND AFTER LAYING.

(C) - (1) - AT TIME WHEN PIPE LAYING IS NOT IN PROGRESS, THE OPEN ENDS OF PIPE SHALL BE CLOSED BY APPROVED MEANS AND NO TRENCH WATER SHALL BE PERMITTED TO ENTER THE PIPE. NO PIPE SHALL BE LAID IN WATER, OR WHEN THE TRENCH CONDITIONS OR THE WEATHER IS UNSUITABLE FOR SUCH WORK, EXCEPT BY PERMISSION OF THE ENGINEER.

(C) - (2) - WHEREVER NECESSARY TO DEFLECT PIPE FROM A STRAIGHT LINE, EITHER IN THE VERTICAL OR HORIZONTAL PLANE TO AVOID OBSTRUCTIONS, TO PLUMB STEMS, OR FOR OTHER REASONS, THE DEGREE OF DEFLECTION SHALL BE APPROVED BY THE ENGINEER.

(D) - (1) BLOCKING: IF ORDERED BY THE ENGINEER, PIPES SHALL BE LAID ON WOOD BLOCKING AND HELD IN CORRECT ALIGNMENT BY WOOD WEDGES PLACED TRANSVERSELY TO THE LINE OF PIPE. BLOCKING AND WEDGES SHALL BE CUT FROM SOUND LUMBER.

(D) - (2) - DIMENSION SCHEDULE: BLOCKING AND WEDGES SHALL VARY IN SIZE WITH THE PIPE DIAMETER AND THE NATURE OF THE FOUNDATION MATERIAL AND THE SIZES SHALL CONFORM TO THE FOLLOWING SCHEDULE OF DIMENSIONS:

SIZE OF PIPE	BLOCKING	WEDGES
6" AND 8"	2" X 10" X 24"	4" X 4" X 10"
10" TO 24"	2" X 10" X 30"	4" X 4" X 10"
30" AND 36"	3" X 10" X 36"	4" X 4" X 12"
42"	3" X 10" X 42"	4" X 4" X 12"
48"	3" X 12" X 48"	4" X 4" X 12"
54"	4" X 12" X 54"	4" X 4" X 15"
60"	4" X 12" X 60"	4" X 4" X 15"

(D) - (3) - NUMBER OF BLOCKS: PIPE 12 FEET LONG SHALL BE SUPPORTED ON TWO BLOCKS WITH THE CENTER OF EACH BLOCK PLACED 30 INCHES FROM THE JOINT. PIPE 16 AND/OR 18 FEET LONG SHALL BE SUPPORTED BY THESE BLOCKS AND PIPE 20 FEET LONG BY FOUR BLOCKS, THE BLOCKS IN EACH INSTANCE BEING PLACED 30 INCHES FROM THE JOINT.

(E) - BEFORE LAYING CONCRETE PIPE, THE PIPE ENDS SHALL BE MADE SMOOTH WITH EMERY CLOTH, FILE OR OTHER APPROVED MEANS, WIRE BRUSHED AND WIPED UNTIL CLEAN AND DRY. PIPE ENDS SHALL BE KEPT CLEAN UNTIL JOINTS ARE MADE. AFTER CLEANING AND DRYING, ALL CONTACT SURFACES OF THE GASKETS AND STEEL JOINT RINGS SHALL BE COATED WITH AN APPROVED FLAX SOAP BEFORE ENTERING THE SPIGOT AND INTO THE SOCKET. IMMEDIATELY AFTER THE JOINT IS PULLED TOGETHER THE PIPE SHALL BE BLOCKED WITH WOOD BLOCKING. A SURCINGLE SHALL BE INSTALLED AROUND THE JOINT AND PIPE SHALL BE SECURED THERE WITH EARTH OR SAND AS REQUIRED, CAREFULLY TAMPED UNDER AND ON EACH SIDE OF IT UP TO THE SPRING LINE OR PIPE INCLUDING THE BELL HOLES. ALL BLOCKING SHALL BE REMOVED WHEN BACKFILL HAS REACHED THE SPRING LINE OF PIPE.

(F) - BEFORE LAYING CAST IRON PIPE, ALL LUMPS, BLISTERS AND EXCESS COAL TAR COATING SHALL BE REMOVED FROM THE BELL AND SPIGOT ENDS OF EACH PIPE, THE PIPE ENDS SHALL THEN BE KEPT CLEAN UNTIL JOINTS ARE MADE.

FLOATING

THE CONTRACTOR SHALL TAKE EVERY PRECAUTION AGAINST THE FLOATING OF THE PIPE DUE TO WATER COMING INTO THE TRENCH, OR THROUGH CAVING IN, FLUSHING OR PUDDLING. IN CASE OF SUCH FLOATING THE CONTRACTOR SHALL REPLACE THE PIPE AT HIS OWN EXPENSE, AND MAKE WHOLLY GOOD ANY INJURY OR DAMAGE WHICH MAY HAVE RESULTED.

TESTING MAINS

(A) - ALL PIPES, VALVES, FITTINGS, ETC., SHALL BE LAID IN SUCH A MANNER AS TO LEAVE ALL JOINTS WATERTIGHT. AFTER THE PIPE IS LAID, AND BEFORE BACKFILLING IS PLACED AROUND THE JOINTS, SUCH LENGTHS OF THE WATER MAIN AS THE ENGINEER MAY DETERMINE, SHALL BE TESTED UNDER A HYDROSTATIC PRESSURE OF SEVENTY-FIVE (75) POUNDS PER SQUARE INCH ABOVE THE STATIC PRESSURE, BUT NOWHERE LESS THAN 100 POUNDS PER SQUARE INCH.

(B) - THE TEST SHALL BE UNDER THE DIRECTION OF THE DIRECTOR OF PUBLIC UTILITIES OF THE CITY OF CLEVELAND OR HIS DESIGNATE. THE CONTRACTOR MAY OBTAIN WATER FOR TESTING BY OBSERVING THE RULES AND REGULATIONS ENFORCED IN THE MUNICIPALITIES OR TOWNSHIPS IN WHICH THE WORK IS BEING DONE. THE CITY OF CLEVELAND WILL FURNISH A PRESSURE GAGE FOR MEASURING THE PRESSURE ON THE WATER MAIN, BUT THE CONTRACTOR SHALL FURNISH A SUITABLE PUMP, PIPES, TEST HEADS AND ALL APPLIANCES, LABOR FUEL AND OTHER APPURTENANCES NECESSARY TO MAKE THESE TESTS.

(C) - THE TEST PRESSURE SHALL BE MAINTAINED FOR A SUFFICIENT LENGTH OF TIME TO ALLOW FOR A THOROUGH EXAMINATION OF JOINTS AND ELIMINATION OF LEAKAGE WHERE NECESSARY. THE PIPE LINES SHALL BE MADE ABSOLUTELY TIGHT UNDER THE TEST PRESSURE.

(D) - AFTER A SECTION OF THE WATER MAIN HAS BEEN TESTED, THE CONTRACTOR SHALL DRAIN SAME. IN CASE THE DRAINS ARE CONNECTED TO VALVE OR DRAIN VAULTS, THEN THE CONTRACTOR SHALL, WITHIN A REASONABLE TIME AFTER THE TEST HAS BEEN COMPLETED, PUMP ALL WATER OUT OF THE VAULTS.

(E) - IN COLD WEATHER IMMEDIATELY AFTER TESTING A SECTION OF THE WATER MAIN, THE CONTRACTOR IS TO OPEN ALL VALVES, AIR COCKS, BY-PASSES AND DRAINS AND PROPERLY DRAIN BONNETS OR ALL VALVES IN THE SECTION OF THE WATER MAIN, AND TAKE ALL OTHER PRECAUTIONS NECESSARY TO PREVENT INJURY TO WATER MAIN AND APPURTENANCES DUE TO FREEZING.

(F) - AS AN ALTERNATE FOR TESTING CONCRETE AND C.I. MAINS OTHER THAN BY THE PRECEDING METHOD, THE CONTRACTOR MAY CHOOSE THE FOLLOWING PROCEDURE:

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THE WATER MAIN SHALL BE TESTED UNDER THE SAME HYDROSTATIC PRESSURE AS PREVIOUSLY NOTED. THE TEST PRESSURE SHALL BE MAINTAINED FOR A PERIOD OF TWO (2) HOURS BY PUMPING ADDITIONAL WATER INTO THE MAIN, IF NECESSARY. THE QUANTITY OF WATER THUS PUMPED INTO THE MAIN MULTIPLIED BY TWELVE (12) SHALL BE TAKEN AS THE LEAKAGE PER TWENTY-FOUR (24) HOURS.

(G) - THE PERMITTED LEAKAGE SHALL NOT EXCEED A RATE OF SEVENTY-FIVE (75) GALLONS PER TWENTY-FOUR (24) HOURS PER MILE OF PIPE PER INCH OF NOMINAL DIAMETER.

(H) - IN CALCULATING LEAKAGE, THE ENGINEER WILL MAKE ALLOWANCE FOR ANY LEAKAGE AT THE VALVES, THE REMOVABLE BULKHEADS, ETC.

(I) - IN USING THIS METHOD OF TESTING, THE CONTRACTOR MAY BACKFILL THE PIPE EXCEPT AT LEAD JOINTS, FLANGED JOINTS, VICTAULIC COUPLINGS, AND DRAIN CONNECTIONS IMMEDIATELY FOLLOWING THE LAYING AND BEFORE THE ACTUAL TEST HAS BEEN MADE. In CASE THE LEAKAGE EXCEEDS THE PERMISSIBLE AMOUNT MENTIONED ABOVE, THE CONTRACTOR SHA FURNISH SUITABLE MEANS FOR DETERMINING THE QUANTITY OF WATER LOST BY LEAKAGE DURING THE TEST.

(J) - IN ORDER TO BE ABLE TO MAKE PROPER ALLOWANCES FOR LEAKAGE AT VALVES, ETC., PREVIOUSLY NOTED, ONLY SUCH SECTIONS OF WATER MAIN MAY BE SELECTED FOR TEST AS WILL HAVE SUCH VALVES, REMOVABLE BULKHEADS, ETC., ACCESSIBLE.

(K) - THE EVALUATION OF ACTUAL LEAKAGE TO STANDARD PRESSURE (150#) LEAKAGE IS CALCULATED BY THE APPLICATION OF THE RATIO DETERMINED FROM THE SQUARE ROOT OF RESPECTIVE PRESSURES, OTHER FACTORS BEING EQUAL.

CLOSING VALVES

THE CLOSING OF ALL GATE VALVES ON EXISTING MAINS FOR MAKING CONNECTIONS, TESTS, OR FOR ANY OTHER CAUSE, SHALL BE DONE BY THE CITY OF CLEVELAND AND SUFFICIENT NOTICE SHALL BE GIVEN TO THE CITY, BY THE CONTRACTOR, SO THAT THE WORK MAY BE DONE WITH A MINIMUM OF INCONVENIENCE TO THE PUBLIC AND DELAY TO THE CONTRACTOR.

PLUGGING DEAD ENDS

STANDARD PLUGS WITH CLAMPS SHALL BE INSERTED INTO THE BELLS OF ALL DEAD ENDS OF PIPES, TEES, OR CROSSES, AND SPIGOT ENDS CAPPED AND CLAMPED BY THE CONTRACTORS, ON ALL MAINS CONSTRUCTED BY HIM, AND AT DEAD ENDS INDICATED ON THE CONTRACT DRAWINGS WHERE CALLED FOR. CONCRETE PIERS SHALL BE PLACED WHEN CALLED FOR ON THE CONTRACT DRAWINGS, OR ORDERED BY THE ENGINEER. THE COST OF FURNISHING AND INSTALLING PLUGS, CAPS, CLAMPS AND PIERS SHALL BE INCLUDED IN THE LINEAR FOOT PRICE BID FOR THE VARIOUS SIZES OF WATER MAINS

BACKFILLING

(A) - THIS WORK INCLUDES ALL BACKFILLING, TOGETHER WITH TAMPING, PUDDLING, AND ROLLING, AS REQUIRED; THE REGRADING OF GROUNDS; THE REPLACING OF SURFACE AND SUBSURFACE STRUCTURES; THE PLACING AND MAINTAINING OF TEMPORARY SIDEWALKS; AND DRIVEWAYS; THE FURNISHING OF SUITABLE MATERIAL FOR BACKFILL, RESEEDING LAWNS AND REPLACING TREES AND SHRUBBERY DAMAGED BY THE CONTRACTOR; AND ALL APPURTENANT WORK INCIDENTAL THERETO. PAVEMENTS, CURBS, SIDEWALKS AND DRIVEWAYS WITHIN THE LIMITS OF THE WORK SHALL BE TEMPORARILY SURFACED, MAINTAINED AND FINALLY REPLACED OR REPAVED AS SET FORTH ELSEWHERE IN THESE NOTES.

(B) - BACKFILL, UNLESS OTHERWISE SPECIFIED, MAY BE MADE WITH MATERIAL EXCAVATED FROM THE TRENCHES, PROVIDING SAME IS SATISFACTORY TO THE ENGINEER. If, IN THE OPINION OF THE ENGINEER, THE MATERIAL EXCAVATED IS UNSATISFACTORY, THEN THE CONTRACTOR SHALL FURNISH AT HIS OWN EXPENSE OTHER MATERIAL SUITABLE FOR BACKFILL. ALL BACKFILL SHALL BE FREE FROM SLAG, CINDERS, RUBBISH AND OTHER OBJECTIONABLE MATERIAL.

(C) - BEFORE LAYING THE PIPE, THE BOTTOM OF THE TRENCH SHALL BE BROUGHT TO THE GRADE OF THE BOTTOM OF THE PIPE, EXCEPT OF FIELD JOINTS. WHEREVER THE BOTTOM OF THE TRENCH HAS BEEN EXCAVATED BELOW THE BOTTOM OF THE PIPE, THE CONTRACTOR SHALL PLACE SAND, OR OTHER MATERIAL SATISFACTORY TO THE ENGINEER TO BRING THE BOTTOM OF THE TRENCH TO THE GRADE OF THE BOTTOM OF THE PIPE. THIS BED SHALL BE THOROUGHLY TAMPED BEFORE THE PIPE IS LAID.

(D) - UNLESS OTHERWISE SPECIFIED, THE BACKFILL UNDER, AROUND AND TO A DEPTH OF ONE (1) FOOT ABOVE THE TOP OF ALL PIPE, SHALL BE MADE WITH MATERIAL SATISFACTORY TO THE ENGINEER, WHICH MATERIAL SHALL BE FREE FROM STONE AND OTHER OBJECTIONABLE MATERIAL NOTED ABOVE. THE CONTRACTOR MUST USE SPECIAL CARE IN PLACING THIS PORTION OF THE BACKFILL, SO AS TO AVOID INJURING, DISTORTING OR MOVING THE PIPE WHEN COMPACTING SAME. ABOVE THIS LEVEL THE BACKFILL SHALL BE MADE WITH MATERIAL SATISFACTORY TO THE ENGINEER. HOWEVER, WHERE SPECIFIED, SAND SHALL BE USED FOR THE ENTIRE PORTION OF THE BACKFILL. SEE BELOW.

(E) - BACKFILLING AS NOTED IN PARAGRAPH (D) SHALL BE TAMPED IN THIN LAYERS, SIMULTANEOUSLY ON EACH SIDE OF THE PIPE, AND THOROUGHLY COMPACTED SO AS TO PROVIDE A SOLID BACKING AGAINST THE EXTERNAL SURFACE OF THE PIPE.

(F) - ONLY AFTER THE BACKFILL PREVIOUSLY MENTIONED HAS BEEN SATISFACTORILY COMPACTED, MAY WORK PROCEED IN PLACING THE REMAINING BACKFILL WHICH MUST BE CAREFULLY PLACED AND COMPACTED BY TAMPING, PUDDLING, OR ROLLING. ALL PRECAUTIONS MUST BE TAKEN TO ELIMINATE FUTURE SETTLEMENT. THE NUMBER OF MEN TAMPING SHALL BE NOT LESS THAN THE NUMBER BACKFILLING, AND ADDITIONAL MEN SHALL BE KEPT IN THE TRENCH TO SPREAD THE MATERIAL.

(G) - BACKFILLING SHALL NOT BE DONE IN FREEZING WEATHER, EXCEPT BY PERMISSION OF THE ENGINEER, AND IT SHALL NOT BE MADE WITH FROZEN MATERIAL, NOR SHALL ANY FILL BE MADE WHERE THE MATERIAL ALREADY IN THE DITCH IS FROZEN.

(H) - THE ENTIRE BACKFILL SHALL BE MADE WITH SAND WHERE PERMANENT PAVEMENTS, CURBS, DRIVEWAYS, OR SIDEWALKS, HAVE BEEN OPENED FOR OR UNDERCUT BY THE EXCAVATION.

(I) - ALL SAND TO BE USED FOR BACKFILL SHALL BE A NATURAL BANK SAND, GRADED FROM FINE TO COARSE, NOT LUMPY OR FROZEN, AND FREE FROM SLAG, CINDERS, ASHES, RUBBISH, OR OTHER DELETERIOUS OR OBJECTIONABLE MATERIAL. IT SHALL NOT CONTAIN A TOTAL OF MORE THAN 10 PER CENT BY WEIGHT OF LOAM AND CLAY, AND ALL MATERIAL MUST BE CAPABLE OF BEING PASSED THROUGH A 3/4 INCH SIEVE. NOT MORE THAN 5 PER CENT SHALL REMAIN ON A NO. 4 SIEVE.

(J) - SPECIAL TREATMENT OF THE TRENCH WILL BE REQUIRED WHERE CINDER EXCAVATION, EXCEEDING ONE FOOT MEASURED FROM THE TOP SURFACE, IS ENCOUNTERED. BEFORE LAYING THE PIPE, THE BOTTOM OF THE TRENCH SHALL BE DUG BELOW GRADE AND THEN BROUGHT TO THE GRADE OF THE PIPE IN THE FOLLOWING MANNER: A FOUR (4) INCH LAYER OF CRUSHED LIMESTONE SHALL BE PLACED ON THE ENTIRE WIDTH OF THE BOTTOM OF THE TRENCH, FOLLOWED BY A FILLER OF HYDRATED LIME AND A LAYER OF THREE (3) INCHES OF SAND. THE CRUSHED LIMESTONE SHALL BE WELL GRADED FROM FINE TO COARSE, AND FREE FROM SLAG, CINDERS, ASHES, RUBBISH OR OTHER OBJECTIONABLE MATERIAL. ALL LIMESTONE MUST BE CAPABLE OF BEING PASSED THROUGH A 3/4 INCH SIEVE. ON TOP OF THIS LAYER OF CRUSHED STONE, HYDRATED LIME SHALL BE SUPPLIED IN THE AMOUNT OF 3/8 OF A POUND PER SQUARE FOOT OF TRENCH. THIS BED OF CRUSHED LIMESTONE SHALL BE THOROUGHLY TAMPED BEFORE THE 3" LAYER OF SAND IS PLACED. THE BACKFILL AROUND AND TO THE DEPTH OF 3 INCHES ABOVE THE TOP OF THE PIPE SHALL BE MADE WITH SAND. THE CONTRACTOR MUST USE SPECIAL CARE IN PLACING THIS PORTION OF THE BACKFILL SO AS TO AVOID INJURING OR MOVING THE PIPE WHEN COMPACTING SAME. ON TOP OF THE SAND THE CONTRACTOR SHALL PLACE ANOTHER LAYER OF CRUSHED LIMESTONE FIVE (5) INCHES THICK ON THE ENTIRE WIDTH OF THE TRENCH. ON TOP OF THE COMPACTED LAYER OF LIMESTONE HYDRATED LIME SHALL BE THEN APPLIED IN THE AMOUNT OF 3/4 OF A POUND PER SQUARE FOOT OF TRENCH. THE REMAINING BACKFILL SHALL BE MADE WITH SAND, CAREFULLY PLACED AND COMPACTED BY TAMPING, PUDDLING, OR ROLLING. ALL PRECAUTIONS SHALL BE TAKEN TO ELIMINATE FUTURE SETTLEMENT. THE TREATMENT OF THE TRENCH BOTTOM, PREVIOUSLY DESCRIBED, MAY BE OMITTED WHERE THE CINDER DEPTH, MEASURED FROM THE TOP SURFACE DOES NOT EXCEED 2' - 6".

ROAD SURFACES, SIDEWALKS, DRIVEWAYS, AND CURBING

(A) - THE CONTRACTOR SHALL REMOVE ALL PAVEMENTS AND ROAD SURFACES WITHIN THE LINES OF EXCAVATION. AFTER THE PIPE HAS BEEN LAID, ALL APPURTENANT WORK CONSTRUCTED AND BACKFILL COMPLETED, HE SHALL FURNISH, PLACE AND MAINTAIN, WHEREVER THE PAVEMENT OR ROAD SURFACE HAS BEEN REMOVED OR DAMAGED BY HIM, A TEMPORARY PAVEMENT IN THE PAVED PORTION OF STREETS, OR A TEMPORARY ROAD SURFACE IN THE UNPAVED PORTION OF STREETS, SO AS TO PROVIDE A SAFE AND PASSABLE ROADWAY UNTIL SUCH TIME AS THE FINAL PAVEMENT OR ROAD SURFACE IS COMPLETED.

(B) - WHEN ONLY A PORTION OF THE STREET IS PAVED AND THE LINES OF EXCAVATION ARE IN THE UNPAVED PORTION OF SAME, THE CONTRACTOR SHALL USE THE UTMOST CARE IN PREVENTING INJURY TO THE PAVEMENT. IF, IN MAKING THE EXCAVATION OR FOR ANY OTHER CAUSE, THE PAVEMENT IS REMOVED OR INJURED BY THE CONTRACTOR, HE SHALL FURNISH, PLACE AND MAINTAIN A TEMPORARY PAVEMENT WHEREVER THE PAVEMENT HAS BEEN REMOVED OR DAMAGED, SO AS TO PROVIDE A SAFE AND PASSABLE ROADWAY UNTIL SUCH TIME AS THE FINAL PAVEMENT IS COMPLETED. ALL FINAL PAVING OF ROAD SURFACES, IF SO NOTED ON CONTRACT DRAWINGS, SHALL BE DONE BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER AND IN CONFORMITY TO THE CITY OF CLEVELAND "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PAVEMENTS, SIDEWALKS AND SEWERS", DATED JANUARY 1950. THE CONTRACTOR SHALL BEAR THE ENTIRE COST OF THE WORK. THE BASE OF PAVEMENT OF CLASS 6 CONCRETE SHALL BE INSTALLED ON A CAREFULLY PREPARED BED (LEVEL WITH THE BOTTOM OF THE ABUTTING BASE) OVER DISTURBED AREAS AND SHALL BE OF THE THICKNESS SPECIFIED, BUT IN NO CASE LESS THAN 7" THICK. WHERE PAVEMENT OR BASE OF PAVEMENT HAS BEEN DAMAGED BY CAVE-IN, OR BY TRENCH CUT LEAVING A PORTION OR PORTIONS OF PAVEMENT 18 INCHES OR LESS IN WIDTH (BETWEEN SUCH CUT OR DAMAGE) TO CURB OR OTHER SUBSTRUCTURE, THAT REMAINING PORTION OF PAVEMENT SHALL BE REMOVED AND RESTORED MONOLITHIC WITH THE TYPE AND KIND OF PAVEMENT SPECIFIED FOR THE ADJACENT TRENCH AREA. THE WEARING COURSE OVER TRENCH OR OTHER DISTURBED AREAS SHALL BE RESTORED TO MATCH EXISTING PAVEMENT UNLESS OTHERWISE SPECIFIED. ASPHALTIC CONCRETE WEARING COURSE OVER SUCH AREAS SHALL BE NEATLY AND SQUARELY CUT, NOT LESS THAN 3 FEET WIDE, BEFORE THE INSTALLATION OF A CAREFULLY TOOTHED-IN-TO ADJACENT PAVEMENT, UNLESS OTHERWISE SPECIFIED. EXPANSION JOINTS SHALL BE INSTALLED BETWEEN BRICK, WEARING COURSE (IF GROUTED) AND CURB OR OTHER SUBSTRUCTURE, WHERE SUCH RESTORATION IS REQUIRED BY THESE SPECIFICATIONS.

(C) - ALL DAMAGED OR DISPLACED CURB SHALL BE RENEWED OR RESET TO THE SATISFACTION OF THE ENGINEER. NO FAULTY CURB OR CURB LESS THAN 30" LONG WILL BE PERMITTED FOR REUSE.

(D) - AT ALL LOCATIONS NOT SPECIFICALLY MENTIONED, THE CONTRACTOR SHALL RESTORE THE SAME TYPE OF PAVEMENT AS ENCOUNTERED.

(E) - IF PRIOR TO THE EXPIRATION OF THIS CONTRACT, ANY OF THE PAVEMENTS OR ROAD SURFACES WITHIN THE LINES OF EXCAVATION OR ADJACENT THERETO, SHALL HAVE BEEN DAMAGED OR INJURED, DUE TO UNDERMINING, OR FOR ANY OTHER CAUSE WHICH MAY BE ATTRIBUTED TO THE WORK WHICH IS BEING DONE BY THE CONTRACTOR, THEN THE CONTRACTOR SHALL REMOVE SUCH DAMAGED OR INJURED PAVEMENTS OR ROAD SURFACES, FOUNDATIONS OF SAME AND ALL LOOSE FINAL PAVEMENT OR ROAD SURFACE.

(F) - IF ANY SIDEWALKS, DRIVEWAYS OR CURBS, ARE REMOVED OR INJURED BY THE CONTRACTOR IN THE COURSE OF MAKING EXCAVATION OR HANDLING MATERIALS, OR FOR ANY OTHER REASON WHICH MAY BE ATTRIBUTED TO WORK WHICH HAS BEEN DONE BY THE CONTRACTOR, THEN HE SHALL RELAY SAME AFTER ALL WORK, INCLUDING BACKFILLING HAS BEEN COMPLETED. IF ANY STONE SIDEWALKS, DRIVEWAYS, OR CURBS WHICH HAVE BEEN REMOVED OR INJURED, ARE UNFIT TO BE RELAID, THEN THE CONTRACTOR SHALL FURNISH NEW MATERIAL AND RELAY SAME. ALL CONCRETE OR CEMENT SIDEWALKS, DRIVEWAYS OR CURBS, WHICH ARE REMOVED OR INJURED BY THE CONTRACTOR SHALL BE BROKEN UP BY HIM AND HE SHALL FURNISH NEW MATERIAL AND CONSTRUCT NEW SIDWALKS, DRIVEWAYS OR CURBS, TO REPLACE THOSE REMOVED OR INJURED. AT INTERSECTING WALKS, DRIVES, ETC., ADDITIONAL CONCRETE SLABS BEYOND THE EXCAVATION LIMITS SHALL BE REMOVED AND REPLACED WITH NEW MATERIAL, IN ORDER TO AVOID HAVING MORE JOINTS THAN IN THE ORIGINAL WORK. ALL SLABS REPLACED SHALL BE OF FULL WIDTH. THE CONTRACTOR SHALL FURNISH, PLACE AND MAINTAIN, WHEREVER THE SIDEWALK HAS BEEN REMOVED OR DAMAGED BY HIM, A TEMPORARY SIDEWALK SO AS TO PROVIDE A SAFE AND PASSABLE SIDEWALK UNTIL SUCH TIME AS THE FINAL SIDEWALK IS COMPLETED.

(G) - ALL PAVEMENTS, ROAD SURFACES, SIDEWALKS, DRIVEWAYS, OR CURBS, WHICH THE CONTRACTOR IS REQUIRED TO REPLACE OR TO HAVE REPLACED, SHALL, AT THE EXPIRATION OF THIS CONTRACT, BE IN AT LEAST AS GOOD CONDITION AS AT THE TIME OF AWARDING THE CONTRACT.

(H) - ALL WORK WHICH THE CONTRACTOR MAY DO IN CONNECTION WITH THE OPENING UP OR REPLACING OF PAVEMENTS, ROAD SURFACES, SIDEWALKS, DRIVEWAYS, OR CURBS, AS WELL AS THE FINAL REPAVING, SHALL BE DONE AT HIS EXPENSE, IN ACCORDANCE WITH THE RULES AND REQUIREMENTS OF THE STREET OR SIDEWALK DEPARTMENTS OF THE CITY OF CLEVELAND, AND IN ACCORDANCE WITH THE ADDITIONAL REQUIREMENTS OF THESE SPECIFICATIONS, AND THE CONTRACTOR SHALL FURNISH EVIDENCE TO THE ENGINEER THAT THE WORK HAS BEEN COMPLETED TO THEIR SATISFACTION.

(I) - TUNNELING WILL NOT BE PERMITTED WITHOUT PERMISSION OF THE ENGINEER. IN BACKFILLING TUNNELS, SAND SHALL BE USED AS FAR AS POSSIBLE AND BALANCE OF BACKFILLING MADE WITH CLASS E CONCRETE, RAMMED IN PLACE.

(J) - THE CONTRACTOR SHALL MAKE ALL PAVEMENT CUTS BY CHANNELING MACHINE, HAND-OPERATED PNEUMATIC TOOLS OR BY SUCH OTHER METHODS AS WILL FURNISH A CLEAN CUT IN THE PAVEMENT AND PAVEMENT BASE WITHOUT UNDUE SHATTERING. THE USE OF BALL OR WEIGHT TO BREAK THE PAVEMENT WILL NOT BE PERMITTED.

(K) - NO SPECIFIC OR SEPARATE PAYMENT WILL BE MADE FOR ALL OF THIS WORK, BUT THE COST THEREOF SHALL BE INCLUDED IN THE PRICES BID FOR THE VARIOUS ITEMS OF THE WORK TO BE DONE UNDER THIS CONTRACT. RESTORATION AS NOTED ABOVE WILL ONLY BE REQUIRED IN AREAS WHERE THE PLANS DO NOT OTHERWISE PROPOSE NEW CONSTRUCTION OF PAVEMENT, SIDEWALKS, AND CURBS, EXCEPT THAT TEMPORARY RESTORATION IN SUCH AREAS MAY BE REQUIRED BY THE ENGINEER IN ORDER TO MAINTAIN TRAFFIC OR LOCAL ACCESS PER SEC. G. 4.05 AND G-7.07.

LIST AND INVOICES

(A) - THE CONTRACTOR SHALL FURNISH THE ENGINEER WITH THE LIST IN DUPLICATE OF PIECES IN EACH SHIPMENT OF PIPE AND SPECIALS, GIVING THE SERIAL NUMBER AND DESIGNATION OF EACH PIPE AND SPECIAL SENT AT THAT TIME.

(B) - THE MATERIAL SHALL BE SHIPPED IN SUCH SECTIONS AS THE ENGINEER MAY ORDER.

CAST IRON PIPE AND FITTINGS

WORK INCLUDED

(A) - THE CONTRACTOR SHALL FURNISH ALL THE MATERIALS FOR AND SHALL PROPERLY CONSTRUCT AND CONNECT IN PLACE AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED, ALL CAST IRON AND DUCTILE IRON PIPE AND FITTINGS, INCLUDING ALL EXCAVATION WORK, THE CUTTING INTO AND REMOVAL OF EXISTING PIPE, BACKFILLING, SAND BACKFILL, AND REPAVING, ALL AS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

(B) - IN MAKING THE CONNECTION TO EXISTING MAINS WHERE BRANCH SLEEVES CAN BE USED, THE CONTRACTOR SHALL SUPPLY THE SAME. THE DIVISION OF WATER WILL INSTALL THE BRANCH SLEEVES AND VALVES. IF THE INSTALLATION OF BRANCH SLEEVES AND VALVES CANNOT BE ACCOMPLISHED, THE CONTRACTOR WILL BE REQUIRED TO USE TEES AND SLEEVES TO COMPLETE THE CONNECTION. THE CONTRACTOR WILL BE REQUIRED TO MAKE THE NECESSARY EXCAVATION, BACKFILL AND REPAVING.

CAST IRON PIPE AND FITTINGS

(A) CAST IRON PIPE CENTRIFUGALLY CAST SHALL MEET THE FOLLOWING REQUIREMENTS. THE METAL SHALL HAVE A MODULUS OF RUPTURE OF NOT LESS THAN 40,000 POUNDS AND A TENSILE STRENGTH OF NOT LESS THAN 18,000 POUNDS AND SHALL BE FOR CLASS 25. PIPE MAY BE FURNISHED IN 12, 16, OR 18 FOOT LENGTHS. THE CENTRIFUGALLY CAST PIPE SHALL CONFORM TO THE AMERICAN STANDARD SPECIFICATIONS A 21.6-62 OR A 21.8-62 AND ALL SUBSEQUENT AMENDMENTS THERETO.

(B) - (1) - THE THICKNESS OF THE CENTRIFUGALLY CAST IRON OR DUCTILE IRON PIPE SHALL CONFORM TO THE FOLLOWING TABLE.

STANDARD THICKNESS OF CENTRIFUGALLY CAST IRON PIPE

SIZE	WORKING PRESSURE	STANDARD THICKNESS	CLASS
4"	250	.41	24
6"	250	.48	25
8"	250	.52	25
10"	250	.56	25
12"	250	.60	25
16"	200	.68	25
16"	250	.73	26

(C) - DUCTILE IRON PIPE AS REQUIRED BY THE CONTRACT DRAWINGS SHALL BE MANUFACTURED IN ACCORDANCE WITH A.S.A. SPECIFICATION A21.6 OR FEDERAL SPECIFICATION W.W.P. - 421B. ALL DUCTILE IRON FITTINGS SHALL BE MANUFACTURED IN ACCORDANCE WITH A.S.A. A21.10 OR A.W.W. A-C100-08. DUCTILE IRON SHALL HAVE A MINIMUM OF 60,000 P.S.I. ULTIMATE STRENGTH 40,000 P.S.I. YIELD POINT 10% ELONGATION AND HARDNESS ROCKWELL B-90. ALL DUCTILE IRON PIPE SHALL BE CLASS 25.

(D) - (1) - ALL FITTINGS TO BE CLASS "D". ALL FITTINGS, SUCH AS BENDS, TEES, CROSSES, OFFSETS, HYDRANT BRANCHES, ETC., SHALL HAVE BELL AND BELL OR BELL AND SPIGOT ENDS WITH CAST LEAD JOINTS. PIPE BETWEEN OFFSETS OR BENDS AND ON HYDRANT BRANCHES SHALL ALSO BE OF BELL AND SPIGOT TYPE WITH LEAD JOINTS.

(D) - (2) - ALL PIPE SHALL HAVE BELL AND SPIGOT ENDS FOR CAST LEAD JOINTS OR A SLIP ON TYPE JOINT WITH COMPRESSED RUBBER RING INSERTS. ALL PIPE AND FITTINGS SHALL BE CEMENT LINED.

(E) - GASKETS SHALL BE OF RUBBER OR OTHER EQUALLY EFFECTIVE PROTECTION AGAINST UNEVEN DISTORTION OF THE GASKET.

(F) - WHERE FITTINGS ARE SHOWN WHICH ARE NOT COVERED BY THE ABOVE SPECIFICATIONS, THEY SHALL CONFORM TO THE DIMENSIONS AND OTHERWISE MEET THE SPECIFICATIONS FOR THE RESPECTIVE TYPE WHICH ARE CARRIED IN THE LATEST REVISIONS TO THE CURRENT EDITION OF THE "HANDBOOK OF CAST IRON PIPE" BY THE CAST IRON PIPE RESEARCH ASSOCIATION OR WHICH ARE OTHERWISE SHOWN ON THE CONTRACT DRAWINGS.

(G) - WHEREVER CHANGES IN LINE AND GRADES OF THE MAIN AS SHOWN ON THE DRAWINGS ARE NOT STANDARD FITTING DEFLECTIONS, THE CONTRACTOR WILL BE PERMITTED TO SUBMIT DETAILS USING COMBINATIONS OF STANDARD FITTINGS AND SMALL DEFLECTIONS (NOT TO EXCEED A MAXIMUM OF ONE HALF (½) INCH JOINT OPENING) IN THE ADJOINING LENGTHS OF PIPE. PIPE TO BE INSTALLED WITH AIR COCKS OR DRAINS SHALL BE CAST WITH BOSSES THEREON, AND DRILLED AND TAPPED FOR TWO (2) INCH CONNECTIONS, AND PLUGGED INTHE SHOP WITH CAST IRON THREADED PLUGS, BEFORE SHIPMENT.

(H) - PLUGS FOR BELL AND SPIGOT PIPE AND CAPS FOR LUGGED PIPE SHALL BE FURNISHED WITH TWO (2) PLUGGED TWO (2") INCH TAPS FOR DRAIN AND AIR COCK CONNECTIONS.

(I) - CLOSURE PIECES SHALL BE ACCURATELY MEASURED AND CUT IN THE FIELD AND INSTALLED USING SOLID TYPE PATTERN SLEEVES AS SHOWN OR AS REQUIRED.

(J) - TESTS, INSPECTION, REPORTS AND ANALYSES OF TESTS OF SAMPLES FOR ALL MATERIALS SHALL BE FURNISHED AS SET FORTH ELSEWHERE IN THESE NOTES.

(K) - BITUMASTIC COATING SHALL BE APPLIED ON THE EXTERIOR OF ALL CAST IRON PIPE AND FITTINGS IN ACCORDANCE WITH AWWA SPECIFICATIONS.

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CEMENT LINING

ALL CAST IRON PIPE AND FITTINGS SHALL BE GIVEN A CEMENT MORTAR LINING AT THE POINT OF MANUFACTURE. THE LINING SHALL CONFORM TO THE AMERICAN STANDARD SPECIFICATION A 21.4-1952 AND ALL SUBSEQUENT AMENDMENTS THERETO.

MARKING

ALL CAST IRON PIPE AND FITTINGS SHALL BE SUITABLY MARKED TO DENOTE THE MANUFACTURER, CLASS, DATE, WEIGHT, AND OTHER ELEMENTS OF IDENTIFICATION.

FACING AND DRILLING

ALL FLANGES SHALL BE CAST SOLID AND FACED ACCURATELY AT RIGHT ANGLES TO THE AXIS OF THE PIPE. ALL FLANGES SHALL BE COATED WITH WHITE LEAD IMMEDIATELY AFTER THEY HAVE BEEN FACED AND DRILLED. ALL FLANGED PIPE AND FITTINGS SHALL BE FACED AND DRILLED TO "AMERICAN 1928 STANDARD" DRILLING, UNLESS SPECIAL DRILLING IS CALLED FOR. WHERE TAP OR STUD BOLTS ARE REQUIRED, FLANGES SHALL ALSO BE TAPPED.

LAYING

(A) - PROPER AND SUITABLE TOOLS AND APPLIANCES FOR THE SAFE AND CONVENIENT HANDLING AND LAYING OF THE PIPES AND FITTINGS SHALL BE USED. GREAT CARE SHALL BE TAKEN TO PREVENT THE PIPE COATING FROM BEING DAMAGED PARTICULARLY ON THE INSIDE OF PIPES AND FITTINGS AND ANY SUCH DAMAGE SHALL BE REMEDIED AS DIRECTED. ALL PIPES AND FITTINGS SHALL BE CAREFULLY EXAMINED BY THE CONTRACTOR FOR DEFECTS JUST BEFORE LAYING AND NO PIPE OR FITTINGS SHALL BE LAID WHICH IS KNOWN TO BE DEFECTIVE.

(B) - IF ANY DEFECTIVE PIPE IS DISCOVERED AFTER HAVING BEEN LAID, IT SHALL BE REMOVED AND REPLACED WITH A SOUND PIPE OR FITTING IN A SATISFACTORY MANNER, BY THE CONTRACTOR AT HIS OWN EXPENSE. ALL PIPES AND FITTINGS SHALL BE THOROUGHLY CLEANED BEFORE THEY ARE LAID, SHALL BE KEPT CLEAN UNTIL THEY ARE USED IN THE COMPLETED WORK, AND WHEN LAID, SHALL CONFORM TO THE LINES AND GRADES GIVEN BY THE ENGINEER. OPEN ENDS OF PIPES SHALL BE KEPT PLUGGED WITH A BULKHEAD DURING CONSTRUCTION. IN NO EVENT SHALL ANY PORTION OF THE DAMAGED PIPE BE PERMITTED TO REMAIN IN THE LINE. ANY APPROVAL STAMPS FOUND ON THE PIPE SHALL BE REMOVED OR THE PIPE BROKEN UP FOR SCRAP.

(C) - PIPE LAID IN TRENCH SHALL BE LAID TO A FIRM AND EVEN BEARING FOR ITS FULL LENGTH. PRECAUTIONS SHALL BE TAKEN AGAINST FLOATING.

(D) - IT IS THE INTENTION OF THESE SPECIFICATIONS TO SECURE FIRST CLASS WORKMANSHIP IN THE PLACING OF PIPE AND ACCESSORIES. IN SUCH DETAILS AS ARE NOT SPECIFICALLY MENTIONED HEREIN OR CALLED FOR ON THE DRAWINGS, THE CONTRACTOR WILL BE REQUIRED TO CONFORM WITH THE APPLICABLE SECTIONS OF THE LATEST "STANDARD SPECIFICATIONS FOR LAYING CAST IRON PIPE" AS ADOPTED BY THE AMERICAN WATER WORKS ASSOCIATION.

CUTTING PIPE

WHENEVER THE PIPES REQUIRE CUTTING TO FIT INTO THE LINES, THE WORK SHALL BE DONE IN A SATISFACTORY MANNER SO AS TO LEAVE A SMOOTH END AT RIGHT ANGLES TO THE AXIS OF THE PIPE. IN NO EVENT SHALL FLAME CUTTING BE USED. WHEN A PIECE OF PIPE IS CUT TO FIT INTO THE LINE, NO PAYMENT WILL BE MADE FOR THE PORTION CUT OFF AND NOT USED IN THE LINE. THE CONTRACTOR'S ATTENTION IS CALLED TO PARAGRAPH C OF THE SECTION, "WORK TO BE DONE BY THE CITY" OF THESE NOTES.

JOINTS

(A) - FLANGED JOINTS

(1) FLANGED JOINTS SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS. FLANGES SHALL BE EITHER CAST STEEL, FORGED OR ROLLED STEEL, OR PROPERLY WELDED AND MACHINED FABRICATED STEEL PLATES, WELDED TO PIPE WITH TWO CONTINUOUS WELDS. THEY SHALL HAVE PLAIN FACES AND SHALL BE FACED TRUE AND SMOOTH AT RIGHT ANGLES TO THE AXIS OF THE PIPE AND SHALL BE SPOT FACED ON THE BACK. DRILLING SHALL CONFORM TO "AMERICAN 1928 STANDARD". EACH BLIND FLANGE SHALL BE CAST IRON AND HAVE BOSSES TAPPED AT TOP AND BOTTOM FOR TWO (2) - INCH STANDARD PIPE AND FURNISHED WITH PLUGS. ALL BOLTS FOR FLANGES AND OTHER TYPES OF BOLTING SHALL CONFORM TO THE "TENTATIVE SPECIFICATIONS FOR STEEL MACHINE BOLTS AND NUTS AND TAP BOLTS, ASTM DESIGNATION: A 307-49T".

(2) - ALL BOLTS USED IN THE FINISHED WORK FOR FLANGES SHALL BE OF MEDIUM OPEN HEARTH STEEL. THE ENDS OF ALL BOLTS MUST BE FINISHED TO STANDARD RADIUS IN ACCEPTABLE MANNER. ALL SCREW THREADS SHALL BE AMERICAN STANDARD COARSE THREAD (N.C.). STUD BOLTS DOUBLE END (ROD) SHALL BE USED TO MAKE THE FLANGED JOINTS ON PIPE. ALL NUTS SHALL BE HEXAGONAL, COLD PRESSED SEMI-FINISHED AND MADE OF MEDIUM OPEN HEARTH STEEL. ALL DIMENSIONS TO BE ACCORDING TO AMERICAN STANDARD HEAVY. BOLTS AND NUTS SHALL BE DELIVERED TO THE FIELD FREE FROM GREASE, RUST AND DIRT AND SHALL BE PROPERLY PROTECTED FROM MOISTURE AND DIRT IN THE FIELD. GASKETS FOR FLANGED PIPE SHALL BE 5X MANILA ROPE PATTERN OR OTHER APPROVED TYPE.

(B) - LEAD JOINTS. - IN JOINTING ALL BELL AND SPIGOT PIPE AND FITTINGS HAVING LEAD JOINTS, THE SPIGOT OF EACH PIPE SHALL BE PROPERLY SEATED IN THE BELL OF THE NEXT ADJACENT PIECE AND ADJUSTED SO AS TO GIVE A UNIFORM ANNULAR SPACE. THE JOINT SHALL BE MADE WITH TWISTED HARD JUTE AND SOFT PIG LEAD. BEFORE PLACING THE JUTE, IT SHALL BE STERILIZED EITHER BY BOILING, OR BY DIPPING IN A CONCENTRATED SOLUTION OF "HTH". THE JUTE SHALL BE TWISTED AND THOROUGHLY DRIVEN INTO THE BELL SO THAT THE LEAD, AFTER HAVING BEEN CAULKED, SHALL HAVE THE FOLLOWING DEPTH:

SIZE OF PIPE	DEPTH OF LEAD
4 - 20 (BOTH INCLUSIVE)	2½ INCHES
24	2-3/4 "
30	3-1/4 "
30- 36	3-1/4 "
SLEEVES	SOLID

THE FURNACE AND MELTING POT SHALL BE KEPT NEAR THE JOINT TO BE POURED AND EACH JOINT SHALL BE MADE WITH ONE POURING. DROSS SHALL NOT BE ALLOWED TO ACCUMULATE IN THE MELTING POT. THE JOINTS SHALL BE THOROUGHLY CAULKED BY COMPETENT PIPE JOINERS AND IN SUCH MANNER AS WILL SECURE A TIGHT JOINT WITHOUT OVERSTRAINING THE IRON OF THE BELL.

(C) - VICTAULIC TYPE COUPLINGS

(1) - WHERE SHOWN ON THE DRAWINGS OR WHERE REQUIRED, THE CONTRACTOR SHALL FURNISH AND INSTALL VICTAULIC TYPE COUPLINGS FOR CONNECTION OF CAST IRON REDUCERS TO CONCRETE PIPE OR STEEL PIPE. STEEL PIPE ENDS SHALL BE FABRICATED AND GROOVED AS INDICATED ON THE DRAWINGS. THE COUPLINGS SHALL BE ADAPTED FOR INSTALLATION ON SHOULDERED END CAST IRON SPACERS, REDUCERS AND FITTINGS ARE DESIGNED FOR NOT LESS THAN THE WORKING PRESSURE NOTED ON THE CONTRACT DRAWINGS. COUPLINGS SHALL BE COMPOSED OF MALLEABLE IRON HOUSINGS HELD TOGETHER WITH STEEL BOLTS HEAT TREATED AND WITH A CONTINUOUS HOLLOW, MOLDED RUBBER SEALING RING, OF SUCH TYPE THAT THE SEAL BECOMES TIGHT AS THE PRESSURE WITHIN THE PIPE INCREASES. THE JOINTS SHALL BE CONSTRUCTED AND INSTALLED AND BE EQUAL IN ALL RESPECTS TO THOSE MANUFACTURED BY THE VICTAULIC COMPANY OF AMERICA. MALLEABLE HOUSINGS SHALL CONFORM TO THE "STANDARD SPECIFICATIONS FOR MALLEABLE IRON CASTINGS, A.S.T.M. DESIGNATION: A 47-33". BOLTS SHALL BE MANUFACTURED BY THE COUPLING MANUFACTURER AND SHALL BE HEAT TREATED STEEL BOLTS HAVING 100,000 PSI TENSILE STRENGTH.

(2) - ALL METAL PARTS OF THE COUPLINGS SHALL BE COATED AT THE SHOP WITH ONE COAT OF BITUMINOUS PRIMER FURNISHED BY THE SAME MANUFACTURER WHO FURNISHES THE COATINGS AS SPECIFIED UNDER "COATING".

(D) - WHERE LUGGED JOINTS ARE USED FOR "TIED DISTANCES" AS SHOWN ON THE DRAWINGS, THE CONTRACTOR SHALL SUPPLY PIPE AND FITTINGS HAVING LUGGED JOINTS. THESE JOINTS SHALL, IN ALL RESPECTS, COMPLY TO THE STANDARD A.W.W.A. SPECIFICATIONS, AND DIMENSIONS FOR THE CLASS OF PIPE AND FITTINGS SPECIFIED. ALL BOLT DIMENSIONS AND OTHER FEATURES SHALL STRICTLY COMPLY WITH THOSE WHICH HAVE BEEN ESTABLISHED UNDER THE AMERICAN WATER WORKS ASSOCIATION STANDARDS.

(E) - ALL BOLTS AND NUTS SHALL BE OF THE SAME QUALITY AS PROVIDED ABOVE FOR FLANGED JOINTS.

PAINTING

AFTER ERECTION, ALL EXPOSED OR DAMAGED COATINGS AND ALL BOLTS FOR FLANGES, LUGGED JOINTS AND VICTAULIC COUPLINGS SHALL BE CLEANED AND PAINTED WITH THREE (3) FIELD COATS OF INERTOL 50 OR BITUMASTIC 50 OR EQUIVALENT.

DRAWINGS

(A) - THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL, DUPLICATE PRINTS OF ALL SHOP DRAWINGS FOR PIT CAST IRON PIPE AND FITTINGS AND MISCELLANEOUS DETAILS WHICH ARE NOT STANDARD CONSTRUCTION, AND ARE NOT MENTIONED IN THE REGULAR CATALOGUE OF THE COMPANY FURNISHING THE PIPE. NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN APPROVED.

(B) - THE APPROVAL OF THE DRAWINGS BY THE ENGINEER SHALL NOT RELIEVE THE CONTRACTOR OF ANY OF HIS OBLIGATIONS IN CONNECTION WITH THIS CONTRACT.

MEASUREMENT

THE NUMBER OF LINEAL FEET OF CAST IRON OR DUCTILE IRON PIPE LINE AND CONNECTIONS TO BE PAID FOR SHALL BE THE ACTUAL NUMBER OF LINEAL FEET FURNISHED AND PLACED IN ACCORDANCE WITH THESE SPECIFICATIONS AS MEASURED ALONG THE AXIS OF THE PIPING INCLUDING FITTINGS AND VALVES CONNECTED UP IN PLACE. FOR CONNECTIONS BETWEEN NEW AND EXISTING MAINS, MEASUREMENT SHALL BE THE DISTANCE FROM CENTER LINE TO CENTER LINE OF MAINS AND THE ACTUAL LENGTH OF EXISTING MAIN ORDERED TO BE REMOVED TO MAKE THE CONNECTION.

PAYMENT

(A) - THE UNIT PRICE STIPULATED TO BE PAID FOR EACH LINEAL FOOT OF CAST IRON AND FOR DUCTILE IRON PIPE LINE AND CONNECTIONS SHALL INCLUDE THE FURNISHING, LAYING, CONNECTING, PAINTING AND TESTING OF CAST IRON AND/OR DUCTILE IRON PIPE AND FITTINGS, THE EXCAVATION, SHEETING AND SHORING, BACKFILLING, SAND BACKFILL, THE PERMANENT REPAVING, IF SO NOTED ON THE CONTRACT DRAWINGS, THE CUTTING INTO, REMOVAL, PLUGGING, AND DISPOSAL OF EXISTING MAINS AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT TO COMPLETE THE WORK AS SPECIFIED, SHOWN OR ORDERED.

FURNISHING AND SETTING 6" HYDRANTS

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL HYDRANTS, CAULKING MATERIAL, LABOR, TOOLS AND EQUIPMENT FOR AND SHALL PROPERLY CONNECT AT THE LOCATION SHOWN ON THE CONTRACT DRAWINGS 6" HYDRANTS, COMPLETE WITH VALVES, VALVE BOXES, CAST IRON WATER MAINS, TEES, SOLID SLEEVES AS THESE AND ANY OTHER ITEMS ARE NECESSARY FOR THE PROPER COMPLETION OF THE WORK IN CONFORMANCE WITH THESE PLANS AND SPECIFICATIONS.

HYDRANTS

THE 6" HYDRANTS SHALL BE TO THE CITY OF CLEVELAND STANDARD AND SHALL CONFORM TO THE CITY'S SPECIFICATIONS ON FILE IN ROOM 624, LINCOLN BUILDING, CLEVELAND 14, OHIO.

SETTING

(A) - GENERAL LOCATION: HYDRANT SHALL BE LOCATED IN A MANNER TO PROVIDE COMPLETE ACCESSIBILITY, AND IN SUCH MANNER THAT THE POSSIBILITY OF DAMAGE FROM VEHICLES OR INJURY TO PEDESTRIANS WILL BE MINIMIZED. UNLESS OTHERWISE DIRECTED THE SETTING OF ANY HYDRANT SHALL CONFORM TO THE FOLLOWING:

(B) - LOCATION REGARDING CURB LINES: WHEN PLACED BEHIND CURB THE HYDRANT BARREL SHALL BE SET SO THAT CENTER OF BARREL WILL BE NO LESS THAN 3 FEET FROM THE GUTTER FACE OF THE CURB, OR DEVIATE FROM LOCATION INDICATED ON CONTRACT DRAWINGS, EXCEPT BY CONSENT OF THE ENGINEER.

(C) - LOCATION REGARDING SIDEWALK: WHEN SET IN THE LAWN SPACE BETWEEN THE CURB AND THE SIDEWALK, OR BETWEEN THE SIDEWALK AND THE PROPERTY LINE, NO PORTION OF THE HYDRANT OR NOZZLE CAP SHALL BE WITHIN 6 INCHES OF THE SIDEWALK.

(D) - POSITION OF NOZZLES: THE HYDRANT SHALL STAND PLUMB, WITH NOZZLE POINTING TOWARD CURB AND AT AN ANGLE OF FORTY-FIVE DEGREES THEREFROM. WHERE HYDRANT BRANCH PIPING IS PARALLEL WITH, OR NOT AT RIGHT-ANGLES TO CURB, THE CONTRACTOR SHALL RELEASE SWIVEL HEAD BOLTS AND ADJUST HYDRANT NOZZLES TO FACE CURB AT PROPER ANGLE. HYDRANT WITHOUT SWIVEL HEADS WILL BE ADJUSTED BY THE CITY WHERE NECESSARY TO CORRECT ANGLE ON NOZZLES WITH CURBING. ELEVATION SHALL CONFORM TO THE ESTABLISHED GRADE WITH TOPS OF FROST CASING AT LEAST FOUR INCHES ABOVE GRADE.

(E) - CONNECTION TO MAIN: THE HYDRANT SHALL BE CONNECTED TO THE MAIN PIPE WITH A CAST IRON BRANCH CONTROLLED BY THE INDEPENDENT GATE VALVE OF THE SAME SIZE AS HYDRANT, EXCEPT AS OTHERWISE DIRECTED. THE CAST IRON BRANCH SHALL HAVE LEAD JOINTS.

(F) - DRAINAGE AT HYDRANT: DRAINAGE SHALL BE PROVIDED AT BASE OF THE HYDRANT BY FILLING AROUND ELBOW WITH COARSE GRAVEL OR CRUSHED STONE TO AT LEAST SIX INCHES ABOVE THE WASTE OPENING. WHEREVER HYDRANT IS SET IN ROCK, CLAY OR OTHER IMPERVIOUS SOIL, THE TRENCH SHALL BE WIDENED AND DEEPENED ON EACH SIDE OF HYDRANT BASE, WHICH SPACE SHALL BE FILLED COMPACTLY WITH COARSE GRAVEL OR BROKEN STONE MIXED WITH COARSE SAND OR SUFFICIENT QUANTITY TO ABSORB ALL WATER TO BE DRAINED FROM HYDRANT WHEN VALVE IS CLOSED.

(G) - ANCHORAGE FOR HYDRANT: THE HYDRANT SHALL BE SET ON A STONE SLAB OR SIMILAR FOUNDATION AND BASE OF HYDRANT AND HYDRANT TEE WELL BRACED AGAINST UNEXCAVATED EARTH AT THE END OF THE TRENCH WITH CONCRETE BACKING, OR IT SHALL BE TIED TO THE PIPE WITH SUITABLE RODS OR CLAMPS AS DIRECTED BY THE ENGINEER. ANY BEND IN THE CAST IRON BRANCH 22° OR GREATER, SHALL ALSO BE BLOCKED AGAINST UNEXCAVATED EARTH WITH CONCRETE BLOCKING.

(H) - CLEANING: HYDRANT SHALL BE THOROUGHLY CLEANED OF DIRT OR FOREIGN MATTER BEFORE SETTING.

PAYMENT

(A) THE UNIT PRICE STIPULATED TO BE PAID FOR THE HYDRANT SETTING SHALL INCLUDE THE FURNISHING. HYDRANT BRANCH AND VALVE, IN ACCORDANCE WITH RESPECTIVE SPECIFICATION SET FORTH ELSEWHERE IN THESE NOTES, SETTING, TESTING, PAINTING, THE EXCAVATION, SHEETING AND SHORING, BACKFILLING, AND THE FURNISHING OF ALL LABOR, MATERIAL, TOOL AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

(B) THE CAST IRON PIPE WILL BE PAID FOR UNDER CAST IRON PIPE AND FITTINGS.

(C) THE VALVES WILL BE PAID FOR UNDER VALVES.

HYDRANTS AND VALVES REMOVED

WORK INCLUDED

THE CONTRACTOR SHALL PERFORM ALL OPERATIONS NECESSARY TO THE PROPER REMOVAL OF THE HYDRANT AND VALVE AND VALVE BOX AT THE LOCATIONS SHOWN ON THE PLANS. THIS WORK SHALL INCLUDE EXCAVATING, REMOVING, STORING, BACKFILLING, SEEDING AND SODDING, AND REPAVING REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

4" HYDRANTS AND VALVES AND VALVE BOXES WILL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED AND DISPOSED OF BY HIM.

6" HYDRANTS SHALL BE REMOVED AND STORED ON THE RIGHT-OF-WAY BY THE CONTRACTOR FOR DISPOSAL BY THE CITY OF CLEVELAND.

METHOD OF MEASUREMENT

THE PAY QUANTITIES FOR THIS ITEM SHALL BE DETERMINED AFTER ALL OF THE REQUIREMENTS OF THIS ITEM SHALL HAVE BEEN PERFORMED. THE HYDRANTS AND VALVES AND VALVE BOXES REMOVED TO BE PAID FOR SHALL BE THE ACTUAL NUMBER OF EACH REMOVED IN ACCORDANCE WITH THE REQUIREMENTS OF THIS ITEM.

BASIS OF PAYMENT

THE ACTUAL NUMBER OF HYDRANTS AND VALVES AND VALVE BOXES MEASURED AS PROVIDED ABOVE SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR "HYDRANTS & VALVES REMOVED". THIS PRICE AND PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR PERFORMING ALL OF THE REQUIREMENTS OF THIS ITEM, FURNISHING ALL NECESSARY MATERIALS, LABOR, TOOLS, EQUIPMENT, SUPPLIES AND INCIDENTALS.

EXTEND 6" HYDRANT

WORK INCLUDED

THE WORK UNDER THIS ITEM SHALL INCLUDE THE RELOCATION OF THE HYDRANT TO THE NEW LOCATION AS REQUIRED BY THE CONTRACT DRAWINGS AND SPECIFICATIONS, ALL EXCAVATION, BACKFILLING, REPAVING AND RESEEDING, RESODDING, THE FURNISHING OF ALL LABOR TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS HEREIN SPECIFIED. WHEREVER APPLICABLE, THE SPECIFICATIONS UNDER ITEM "FURNISHING AND SETTING 6" HYDRANTS" SHALL APPLY.

PAYMENT

THE UNIT PRICE STIPULATED AND THE PAYMENT FOR EACH 6" HYDRANT EXTENDED SHALL INCLUDE FULL PAYMENT FOR THE WORK AS HEREIN SET FORTH.

2-INCH GALVANIZED WROUGHT IRON AND BRASS PIPE

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL THE MATERIALS FOR AND SHALL PROPERLY CONNECT IN PLACE AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS ORDERED, ALL 2-INCH EXTRA STRONG BRASS PIPE AND FITTINGS AND ALL 2-INCH EXTRA HEAVY GALVANIZED WROUGHT IRON PIPE AND FITTINGS RESPECTIVELY, WHICH ARE NECESSARY FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

BRASS PIPE AND FITTINGS

ALL BRASS PIPE AND FITTINGS SHALL BE EXTRA STRONG; 2-INCH PIPE SIZE AND THE PIPE SHALL CONFORM TO ASTM SPECIFICATION B 43-42, FITTINGS SHALL BE EXTRA STRONG WEIGHT AND SHALL HAVE SOUND, WELL FITTING THREADS.

GALVANIZED WROUGHT IRON PIPE AND FITTINGS

ALL GALVANIZED WROUGHT IRON PIPE, NIPPLES AND FITTINGS SHALL BE EXTRA HEAVY GENUINE WROUGHT IRON PIPE. THE FITTINGS SHALL BE BEADED, OF MALLEABLE IRON EXTRA HEAVY WEIGHT. ALL PIPE AND FITTINGS SHALL BE HOT GALVANIZED INSIDE AND OUTSIDE, AND SHALL HAVE SOUND, WELL-FITTING THREADS.

ERECTION

ALL PIPE SHALL BE CAREFULLY PLACED TO THE PROPER LINES AND GRADES AND SHALL BE CONNECTED UP, UNLESS OTHERWISE SHOWN, WITH SCREW FITTINGS. SCREW JOINTS SHALL BE MADE TIGHT WITH A GRAPHITE PASTE AND SCREWED HOME. A LIBERAL NUMBER OF UNIONS SHALL BE USED TO PERMIT THE READY REMOVAL OF ANY SECTION.

TESTING

AFTER ALL PIPING HAS BEEN CONNECTED UP IN PLACE, IT SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SECTION "TESTING MAINS" OF THESE NOTES.

MEASUREMENT

THE LENGTHS OF 2-INCH EXTRA STRONG BRASS PIPE AND FITTINGS AND 2-INCH EXTRA HEAVY GALVANIZED WROUGHT IRON PIPE AND FITTINGS TO BE PAID FOR SHALL BE THE LENGTH ACTUALLY FURNISHED AND PLACED IN ACCORDANCE WITH THESE SPECIFICATIONS, MEASURED ALONG THE AXIS AFTER PIPE AND FITTINGS HAVE BEEN CONNECTED UP IN PLACE. NO SEPARATE PAYMENT WILL BE MADE FOR FITTINGS AND JOINT MATERIALS, BUT THE COST SHALL BE INCLUDED IN THE PRICE BID PER LINEAL FOOT OF PIPE.

PAYMENT

THE UNIT PRICE STIPULATED PER LINEAL FOOT FOR 2-INCH EXTRA STRONG BRASS PIPE AND FITTINGS AND FOR 2-INCH EXTRA HEAVY GALVANIZED WROUGHT IRON PIPE AND FITTINGS SHALL INCLUDE THE FURNISHING, PLACING, CONNECTING AND TESTING OF THE PIPE AND FITTINGS AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

VALVES

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL THE MATERIALS FOR AND SHALL PROPERLY SET IN PLACE AND CONNECT AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED, ALL AIR COCKS, DRAIN VALVES, AND GATE VALVES OF THE VARIOUS SIZES AND TYPES SPECIFIED OR ORDERED ALL AS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

AIR COCKS

ALL AIR COCKS OR AIR VENT VALVES SHALL BE 2-INCH BRASS ANGLE TYPE GLOBE VALVES AND SHALL BE EQUAL IN ALL RESPECTS TO THE FARNAN "CLEVELAND STANDARD" BRASS AIR VENT VALVE NO. W-4695 AS MANUFACTURED BY THE FARNAN BRASS WORKS.

GATE VALVES

(A.) TYPE OF VALVES:
THE GATE VALVES SHALL BE MANUFACTURED IN FULL COMPLIANCE WITH THE STANDARD SPECIFICATIONS FOR GATE VALVES FOR ORDINARY WATER WORKS SERVICE OF THE AMERICAN WATER WORKS ASSOCIATION AWWA C-500-61 OR LATEST REVISION THEREOF AND IN ADDITION SHALL COMPLY WITH THE FOLLOWING SUPPLEMENTARY REQUIREMENTS. ALL GATE VALVES SHALL BE OF THE NON-REVOLVING DOUBLE DISC PARALLEL SEAT BOTTOM WEDGE OR SIDE WEDGE TYPE. ALL GATE VALVES 20 IN. AND OVER IN SIZE SHALL INCLUDE BY-PASS VALVES ATTACHED THERETO. IN OPENING OR CLOSING THE VALVE, THE GATES SHALL BE FORCED ASCEND OR DESCEND BY REASON OF THE THRUST EXERTED UPON THEM BY THE VALVE STEM NUT; THIS THRUST BEING GENERATED BY THE ROTATION OF THE VALVE STEM. IN CLOSING THE VALVE, THE DISCS WHEN OPPOSITE THE PORTS, SHALL BE PRESSED FIRMLY AGAINST THE BODY SEATS BY WEDGES OR SOME OTHER DEVICE EQUALLY SUITABLE TO THE DIRECTOR.

(B) - VALVES WITH STATIONARY STEMS: ALL GATE VALVES, UNLESS OTHERWISE ORDERED, SHALL BE MADE WITH SINGLE, NON-RISING STEMS.

(C) - OUTSIDE SCREW AND YOKE VALVES: GATE VALVES WITH OUTSIDE SCREW AND YOKES, SHALL BE MADE WITH SINGLE RISING STEMS.

(D) - WHEELS: ALL OUTSIDE SCREW AND YOKE VALVES SHALL BE EQUIPPED WITH WHEELS FOR OPERATING SAME. WHEELS ARE TO BE OF MALLEABLE IRON. WHEELS SHALL HAVE CAST ON THEM AN ARROW INDICATING THE DIRECTION OF TURNING FOR OPENING THE VALVE.

(E) - HUB ENDS: THE DIMENSIONS OF THE BELLS ON VALVES UP TO AND INCLUDING 24 IN. IN DIAMETER SHALL CONFORM TO THOSE FOR CLASS D PRESSURE FITTINGS, AS REQUIRED BY AWWA C 100. ON VALVES 30 IN. AND LARGER IN SIZE, THE BELL DIMENSIONS SHALL BE FOR THE CLASSES ORDERED.

(F) - VICTAULIC ENDS; VICTAULIC ENDS SHALL CONFORM TO THE DIMENSIONS GIVEN ON THE CONTRACT DRAWINGS.

(G) - FLANGE ENDS: THE END FLANGES OF FLANGED END GATE VALVES SHALL CONFORM IN DIMENSIONS AND DRILLING TO THE "AMERICAN 125 LB. CAST IRON FLANGES STANDARD", UNLESS OTHERWISE ORDERED.

(H) - SCREW ENDS: ALL 2 IN. GATE VALVES AND UNDER SHALL BE MADE WITH SCREW ENDS; UNLESS OTHERWISE SPECIFIED. THE 3 IN. AND 4 IN. HAND-WHEEL GATE VALVES SHALL BE FURNISHED WITH SCREW ENDS WHENEVER REQUIRED BY THE DIRECTOR. THREADS TO BE INSIDE STANDARD IRON PIPE THREADS.

(I) - SOLDER JOINT ENDS: THE END CONNECTION SOCKETS OF SOLDER-JOINT GATE VALVES SHALL BE MADE TO CLOSE TOLERANCES AND SNUGLY FIT TYPE K AND L COPPER TUBING TO PERMIT MAKING SWEAT JOINTS. DEPTH OF JOINTS ON 1-1/2 IN. VALVES SHALL BE NOT LESS THAN 1-3/16 IN. AND ON 2 IN. VALVES NOT LESS THAN 1-3/8 IN.

(J) - VERTICAL AND HORIZONTAL VALVES: ALL GATE VALVES, 16 IN. AND UNDER, SHALL BE CONSTRUCTED TO WORK VERTICALLY. VALVES OVER 16 IN. WATERWAY, SHALL BE CONSTRUCTED TO WORK HORIZONTALLY.

(K) - BY-PASSES: BY-PASSES WITH GATE VALVES SHALL BE PROVIDED ON VALVES 20 IN. AND LARGER. THE BY-PASSES SHALL BE LOCATED ON OR BELOW THE HORIZONTAL CENTERLINE OF THE VALVES. By-pass VALVES SHALL BE OF THE SAME SIZE AS THE BY-PASS AND SHALL CONFORM TO THE REQUIREMENT OF THESE SPECIFICATIONS FOR THE SPECIFIC VALVE USED. THE SIZE REQUIREMENTS OF BY-PASSES SHALL BE AS FOLLOWS: 20 IN. VALVES SHALL BE PROVIDED WITH 3 IN. BY-PASSES: VALVES 24 IN. TO 30 IN. INCLUSIVE, SHALL BE PROVIDED WITH 4 IN. BY-PASSES: VALVES 36 IN. TO 42 IN. INCLUSIVE, SHALL BE PROVIDED WITH 6 IN BY-PASSES: 48 IN. VALVES SHALL BE PROVIDED WITH 8 IN. BY-PASSES.

(L) - BOSSES: OUTSIDE SCREW AND YOKE, GATE VALVES 6 IN. AND LARGER IN SIZE SHALL BE PROVIDED WITH TWO BOSSES ON ONE SIDE OF BODY, LOCATED ON THE HORIZONTAL CENTERLINE OF GATE VALVES, TO PERMIT THE INSTALLATION OF BY-PASS AROUND THE GATE. BOSSES ARE TO BE LEFT SOLID AND OF AMPLE SIZE TO PERMIT DRILLING AND TAPPING FOR BY-PASSES HAVING DIAMETERS NOT LESS THAN ONE-SIXTH OF THE NOMINAL SIZE OF GATE VALVE.

(M) - FLANGES: WHEN FLANGED VALVES ARE REQUIRED, THE FLANGES SHALL BE FACED AND DRILLED. BOLT HOLES SHALL BE SPOT FACED ON THE BACK WHEN NECESSARY TO SECURE AN EVEN BEARING. ALL BOLT HOLES SHALL BE OF THE SIZE SHOWN ON THE DRAWINGS TO BE SUBMITTED AND APPROVED, SHALL BE ACCURATELY DRILLED FROM TEMPLATES, SPACED EQUAL DISTANCES APART AND SHALL STRADDLE HORIZONTAL AND VERTICAL AXIS, ALL AS SHOWN ON THE DRAWINGS. THE DIMENSIONS AND DRILLING OF ALL END FLANGES SHALL CONFORM TO THE SPACING INDICATED ON THE DRAWINGS WHICH SHALL BE THE AMERICAN 125 LB. CAST IRON FLANGE STANDARD. FLANGES SHALL BE PLAIN FACE WITH A SMOOTH FINISH.

(N) - MARKING: ALL GATE VALVES 3 IN. AND OVER SHALL HAVE THE IDENTITY OF MAKER, SIZE AND THE YEAR WHEN MADE AND ALSO THE LETTERS "C.W.D." CAST UPON ITS BODY OR DOME IN RAISED LETTERS.

(O) - STUFFING BOXES: THE STUFFING BOX ON EACH GATE VALVE 3 IN. OR OVER, MUST BE SEPARATE FROM THE DOME AND FASTENED TO IT BY BOLTS. FOR 2 IN. VALVES AND UNDER, THE STUFFING BOXES MAY BE FORMED IN THE DOME OF THE VALVE. WHEN REQUIRED BY THE *DIRECTOR*, VALVES 16 IN. AND SMALLER, SHALL BE FURNISHED WITH "O" RING TYPE SEAL PLATE. THE SEAL PLATE SHALL BE FITTED WITH AT LEAST TWO "O" RINGS THE LOWER "O" RING SERVING AS THE PRESSURE SEAL AND THE UPPER "O" RING AS A COMBINED DIRT AND MOISTURE SEAL. THE "O" RINGS SHALL BE PRECISION RUBBER CORPORATION QUALITY COMPOUND NO. 122-70, OR APPROVED EQUAL.

(P) - SEAT AND GATE RINGS: DIMENSIONS OF THE BRONZE SEAT AND GATE RINGS SHALL BE PROPORTIONED TO FIT THE TEST PRESSURE REQUIRED, AND SHALL MEET THE APPROVAL OF THE *DIRECTOR*. THE RINGS SHALL BE FIRMLY SECURED IN PLACE BY AN APPROVED DEVICE WHICH WILL PREVENT THEM FROM WORKING LOOSE, PARTICULARLY WHEN THE VALVE IS LEFT PARTLY OPEN. DIMENSIONS OF THE BRONZE SEAT AND GATE RINGS FOR THE GATE VALVES SHALL BE NOT LESS THAN THAT SPECIFIED IN THE FOLLOWING TABLES: BODY SEAT RINGS SHALL BE MADE OF GRADE ONE BRONZE. GATE SEAT RINGS SHALL BE MADE OF GRADE FIVE BRONZE.

BODY AND GATE RINGS
BOTTOM WEDGE

VALVE SIZE	BODY RINGS FACE	BODY RINGS DEPTH	BODY RINGS THICKNESS AT BASE OF THREADS	GATE RINGS FACE THICKNESS	GATE RINGS FACE	GATE RINGS *FACE* THICKNESS	GATE RINGS DEPTH
3"	9/16	9/16	3/16	3/16	5/8	5/32	1/4
4"	9/16	9/16	3/16	3/16	5/8	5/32	5/16
6"	11/16	9/16	3/16	5/32	11/16	5/32	5/16
8"	3/4	5/8	3/16	7/32	13/16	5/32	5/16
10"	3/4	5/8	3/16	7/32	13/16	5/32	11/32
12"	7/8	5/8	7/32	7/32	1	5/32	11/32
16"	1-1/8	3/4	1/4	9/32	1-1/4	3/16	1/2
20"	1-3/8	1-1/8	5/16	3/8	1-3/8	3/8	5/8
24"	1-3/8	1-1/8	5/16	3/8	1-3/8	3/8	5/8
30"	1-1/2	1-1/4	3/8	7/16	1-1/2	7/16	3/4
36"	1-1/2	1-1/4	3/8	7/16	1-1/2	7/16	3/4
42"	1-3/4	1-1/2	1/2	1/2	1-3/4	1/2	7/8
48"	2	1-3/4	1/2	5/8	2	5/8	1

SIDE WEDGES

3"	13/32	1/2	3/16	3/16	ALL BRONZE DISC	
4"	7/16	9/16	3/16	3/16	1/2	5/32	21/64
6"	1/2	11/16	9/32	1/4	5/8	5/32	21/64
8"	17/32	11/16	9/32	1/4	11/16	5/32	21/64
10"	5/8	13/16	3/8	5/16	13/16	5/32	21/64
12"	5/8	13/16	3/8	5/16	13/16	5/32	21/64
16"	3/4	1	15/32	3/8	7/8	3/16	13/32
20"	7/8	1-5/16	17/32	7/16	1	1/4	17/32
24"	1-1/16	1-3/8	21/32	1/2	1-3/16	5/16	19/32
30"	1-5/16	1-1/2	25/32	1/2	1-7/16	5/16	19/32
36"	1-1/2	1-1/2	27/32	1/2	1-9/16	5/16	19/32
42"	1-3/4	1-9/16	29/32	9/16	1-13/16	5/16	5/8
48"	2	1-5/8	29/32	5/8	2-1/16	3/8	11/16

DIMENSIONS IN INCHES.

(Q) - VALVE STEM: ALL GATE VALVES SHALL BE OF THE SINGLE SCREW TYPE. THE STEMS SHALL BE OF GRADE THREE BRONZE. THE THREADS OF STEMS AND STEM NUTS SHALL BE OF ACME, MODIFIED ACME OR ONE-HALF V TYPE. IF REQUESTED, A MANUFACTURER'S CERTIFICATE OF TEST SHALL BE FURNISHED WITH ALL BRONZE STEMS. ALL STEM COLLARS SHALL BE CAST INTEGRAL WITH STEMS. THE DIAMETERS OF STEMS AT THE BASE OF THE THREAD SHALL BE NOT LESS THAN THOSE SHOWN BELOW. THE STEM OPENING AND THRUST-BEARING RECESS SHALL BE GRADE ONE, BRONZE BUSHED. THE NUMBER OF THREADS PER INCH SHALL BE AS GIVEN BELOW:

SIZE OF VALVE INCHES	DIAMETER OF STEM AT BASE OF THREAD - INCHES	NO. OF THREADS PER INCH
1-1/2	0.469	4
2	0.469	4
3	0.859	4
4	0.859	3
6	1.000	3
8	1.000	3
10	1.125	3
12	1.188	3
16	1.438	3
20	1.896	3
24	1.980	2
30	2.480	2
36	2.730	2
42	3.230	2
48	3.980	2

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(R) - WRENCH CAPS: THE WRENCH CAPS AND RETAINING NUTS ON HEADS OF VALVE STEMS AND PINION SHAFTS SHALL BE OF GRADE THREE BRONZE. ON VALVES 24 IN. AND OVER, WRENCH CAPS SHALL BE 2 IN. SQUARE AND 2 IN. DEEP. ON VALVES 4 IN. TO 20 IN. INCLUSIVE, THEY SHALL BE 1-3/4 IN. SQUARE ON TOP, 1-7/8 IN. SQUARE AT BASE, AND 1-3/4 IN. DEEP. ON 3 IN. VALVES AND UNDER, THEY SHALL BE 1-1/4 IN. SQUARE ON TOP, 1-3/8 IN. SQUARE AT BASE AND 1-1/2 IN. DEEP. MACHINED WRENCH CAPS FOR VALVES 3 IN. TO 48 IN. INCLUSIVE SHALL BE FITTED TO A MACHINED SQUARE STEM OR PINION SHAFT AND HELD IN PLACE BY A RETAINING NUT. WRENCH CAPS SHALL HAVE A CUT-AWAY SKIRT TO PERMIT EASY ACCESS TO GLAND BELTS.

(S) - VALVES TO OPEN CLOCKWISE, EXCEPT 2 IN. AND UNDER: ALL GATE VALVES 3 IN. AND OVER, INCLUDING BY-PASS VALVES, SHALL BE MADE TO OPEN BY TURNING IN A CLOCKWISE DIRECTION. VALVES 2 IN. AND UNDER SHALL BE MADE TO OPEN BY TURNING IN A COUNTER-CLOCKWISE DIRECTION. ALL VALVES TO BE SO MADE THAT THEY CAN BE EASILY OPERATED.

(T) - FACING OF GATES: ALL DISCS OR GATES AND THREADS FOR SEAT RINGS IN THE BODY SHALL BE MACHINED TRUE AND A GROOVE OR GROOVES SHALL BE MACHINED IN EACH DISC OR GATE FOR THE RECEPTION OF THE FACE RING. THE DISC AND SEAT RINGS SHALL BE SECURELY AND RIGIDLY ATTACHED TO THE DISCS OR BODY SEATS IN A MANNER APPROVED BY THE *DIRECTOR*, AND THE RINGS ARE TO BE FINISHED TO A TRUE SURFACE.

(U) - ROLLERS AND SCRAPERS: IN ALL VALVES 20 IN. IN DIAMETER AND LARGER, DESIGNED TO LIE HORIZONTALLY, EACH GATE OR DISC SHALL BE PROVIDED WITH TWO BRONZE ROLLERS TRAVELLING ON BRONZE-FACED TRACKS AND PROVIDED WITH SUITABLE BRONZE SCRAPERS OR TWO STAINLESS STEEL ROLLERS TRAVELLING ON STAINLESS STEEL-FACED TRACKS AND PROVIDED WITH SUITABLE STAINLESS STEEL SCRAPERS. THE THICKNESS OF THE FACING OF THE TRACKS SHALL BE NOT LESS THAN 1/4 IN. THE BRONZE SHALL BE CLASS 1 AND THE STAINLESS STEEL SHALL BE ASTM A 276-55, TYPE 302.

(V) - VALVE GUIDES: ALL VALVES 20 IN. IN DIAMETER AND LARGER SHALL BE PROVIDED WITH GUIDES OR TRACKS WHICH SHALL BE MADE STRAIGHT AND TRUE, AND ALL IRREGULARITIES MUST BE MACHINED OFF. THE GUIDES OR TRACKS OF HORIZONTAL VALVES SHALL BE SUBSTANTIALLY FACED WITH A MINIMUM OF 1/4 IN. OF GRADE ONE BRONZE, OR STAINLESS STEEL ASTM A 276-55, TYPE 302, SATISFACTORY TO THE *DIRECTOR*, SECURELY FASTENED AND PLANED OFF SMOOTH AND TRUE.

(W) - GEARING: ALL VALVES 20 IN. IN DIAMETER AND LARGER SHALL BE EQUIPPED WITH ENCLOSED CUT TOOTH STEEL GEARS. GEARS, SHAFTS AND BEARINGS, SHALL BE SUCH AS TO PRODUCE EASY OPERATION WITHOUT BENDING OR TWISTING.

(X) - DOWEL PINS: ALL GEAR VALVES SHALL HAVE TWO DOWEL PINS SET IN THE FLANGES CONNECTING THE DOME AND BODY. SIZE OF THE PINS TO BE SHOWN IN PLANS.

(Y) - INDICATORS: ALL VALVES 20 IN. IN DIAMETER AND OVER, SHALL BE EQUIPPED WITH INDICATORS DENOTING THE POSITIONS OF THE GATE. THE MOVING PART AND BEARINGS TO BE OF BRONZE OR BRONZE-LINED.

(Z) - GREASE CASES: ALL VALVES 20 IN. IN DIAMETER AND LARGER, SHALL HAVE WATER TIGHT GREASE CASES INSTALLED. THE GREASE CASES SHALL BE OF THE EXTENDED TYPE AND SHALL BE MADE OF CAST IRON CONFORMING TO ASTM SPECIFICATIONS SERIAL DESIGNATION:A 126, CLASS B OR ANY SUBSEQUENT AMENDMENT THERETO. BEARING SURFACES FOR VALVE STEM AND PINION SHAFT SHALL BE BRONZE BUSHED WITH GRADE ONE BRONZE. THE GREASE CASES SHALL BE SECURELY BOLTED TO THE VALVE BONNET THROUGH A HEAVY CAST IRON YOKE. THE YOKE SHALL BE OF SUFFICIENT LENGTH TO PROVIDE SPACE FOR REPACKING VALVE AND GREASE CASE STUFFING BOXES. ALL GREASE CASES SHALL BE PROVIDED WITH A REMOVABLE COVER SECURELY BOLTED IN PLACE TO ALLOW EASY ACCESS TO THE GEARS. THERE SHALL ALSO BE PROVIDED CONVENIENT FILLING AND DRAINING PLUGS AND SUFFICIENT OIL TO FULLY SUBMERGE THE PINION GEAR. THE VALVES SHALL BE DELIVERED WITH THE GREASE CASES FILLED WITH THE PROPER OIL AS RECOMMENDED BY THE MANUFACTURER.

(AA) - BRONZE PARTS: THE STEMS, STEM NUTS, OPERATING NUTS, RETAINING NUTS, DISC AND SEAT RINGS, SHALL BE OF SOLID BRONZE. OTHER PARTS SUCH AS WEDGES, GLANDS, THRUST BEARINGS, GEAR SPINDLES, ROLLERS, SCRAPERS AND TRACKS, AND ALL OTHER PARTS COMING TOGETHER IN OPERATION, SHALL BE OF BRONZE, OR SUBSTANTIALLY LINED WITH BRONZE OR STAINLESS STEEL OF A THICKNESS NOT LESS THAN 1/4 OF AN INCH AND AS SHOWN ON DRAWINGS SUBMITTED AND APPROVED. ALL 2" VALVES AND UNDER SHALL BE MADE ENTIRELY OF BRONZE, EXCEPT HAND-WHEELS WHICH SHALL BE OF MALLEABLE IRON.

(BB) - CAST IRON PARTS: THE BODIES, COVERS, DISCS, FRAMES, ETC., OF ALL GATE VALVES 3" AND OVER, SHALL BE OF CAST IRON.

(CC) WATERWAY OPENING:
WITH THE VALVE OPEN, AN UNOBSTRUCTED WATERWAY SHALL BE AFFORDED, THE DIAMETER OF WHICH IS NOT TO BE LESS THAN THE FULL NOMINAL DIAMETER OF THE VALVE.

CHECK VALVES

(A) TYPE OF VALVES:
ALL CHECK VALVES SHALL BE OF THE SWING GATE TYPE, WITH HINGED GATES SEATING IN A VERTICAL OR INCLINED POSITION. CHECK VALVES SHALL BE CONSTRUCTED TO BE USED IN A HORIZONTAL POSITION.

(B) MATERIAL: CHECK VALVES 2" AND UNDER SHALL BE OF ALL BRONZE CONSTRUCTION, AND CHECK VALVES 3" AND OVER IN SIZE SHALL HAVE IRON BODIES WITH BRONZE MOUNTINGS.

(C) BODIES AND COVERS:
THE BODIES OF ALL CHECK VALVES SHALL BE PROVIDED WITH HANDHOLES OR MANHOLES OF SUFFICIENT SIZE TO PERMIT REMOVAL OF SWING GATES. CHECK VALVES 2" AND UNDER IN SIZE SHALL HAVE HANDHOLES FITTED WITH THREADED CAPS, CHECK VALVES 3" TO 12" INCLUSIVE IN SIZE SHALL BE PROVIDED WITH HANDHOLES HAVING FLANGED COVERS. ALL FLANGED COVERS SHALL BE SECURELY BOLTED IN PLACE. ARROWS SHALL BE CAST ON THE VALVE BODIES TO ASSURE PROPER INSTALLATION. THE ARROWS SHALL POINT IN THE DIRECTION OF FLOW IN THE LINE.

(D) GATES:
CHECK VALVES 12" AND UNDER IN SIZE SHALL BE PROVIDED WITH ONE GATE AND SHALL BE EQUIPPED WITH AN OUTSIDE LEVER. THE GATES FOR CHECK VALVES 6" AND UNDER IN SIZE SHALL BE OF CAST BRONZE; THE GATES FOR CHECK VALVES 8" AND OVER IN SIZE SHALL BE OF CAST IRON WITH BRONZE GATE RINGS. THE GATES SHALL BE SO CONSTRUCTED TO PREVENT THEIR SWINGING HIGHER THAN HORIZONTAL WHEN WIDE OPEN AND FREE OF THE WATERWAY, ALSO TO PREVENT THEM FROM BECOMING STUCK IN THE OPEN POSITION. GATES FOR CHECK VALVES 2" AND UNDER IN SIZE SHALL BE ATTACHED TO THE HINGES BY MEANS OF A HUB OR STUD ON BACK OF GATE, ON WHICH THE GATE SHALL BE FREE TO ROTATE. GATES FOR CHECK VALVES 3" AND LARGER IN SIZE SHALL BE ATTACHED TO HINGES BY MEANS OF HUBS, STUDS OR HINGE PINS: WHERE HINGE PINS ARE USED FOR ATTACHING GATES TO HINGES THE MOVEMENT OF GATES SHALL BE CONFINED TO PREVENT EXCESSIVE TILTING ON HINGES.

(E) HINGES AND PINS:
THE HINGES FOR SUSPENDING GATES OF CHECK VALVES SHALL BE OF CAST BRONZE. ALL PINS USED FOR FASTENING GATES TO HINGES AND FOR SUSPENDING HINGES IN BODIES OR CHECK VALVES SHALL BE OF GRADE FOUR BRONZE. WHERE PINS ATTACHING HINGES TO BODIES ARE ACCESSIBLE FROM THE OUTSIDE OF BODIES, THEY SHALL BE RETAINED IN PLACE BY MEANS OF REMOVABLE BRONZE SIDE PLUGS. ALL PINS SHALL BE SECURELY FASTENED IN PLACE.

(F) SEAT AND GATE RINGS:
ALL CHECK VALVES HAVING CAST IRON BODIES SHALL HAVE BODY SEAT RINGS OF BRONZE SCREWED IN PLACE. WHERE GATES ARE MADE OF MATERIAL OTHER THAN BRONZE, THEY SHALL BE FITTED WITH BRONZE SEAT RINGS SECURELY FASTENED IN PLACE. THE FACES OF GATE AND SEAT RINGS COMING INTO CONTACT SHALL BE MACHINED FLAT TO PROVIDE TIGHT JOINTS. THE DIMENSIONS OF BRONZE SEAT AND GATE RINGS FOR THE VARIOUS SIZE CHECK VALVES SHALL NOT BE LESS THAN THOSE GIVEN IN SEC. (P.) FOR BOTTOM WEDGE GATE VALVES OF THE SAME SIZE.

(G) FLANGE ENDS:
THE END FLANGES OF FLANGED AND CHECK VALVES SHALL CONFORM IN DIMENSIONS AND DRILLING TO THE "AMERICAN 125 LB. CAST IRON FLANGE STANDARD" UNLESS OTHERWISE ORDERED.

(H) SCREW ENDS:
ALL 2" CHECK VALVES, AND UNDER, SHALL BE MADE WITH SCREW ENDS. THE 3" CHECK VALVES SHALL BE FURNINHED WITH SCREW ENDS WHENEVER REQUIRED BY THE DIRECTOR. THREADS TO BE INSIDE STANDARD IRON PIPE THREADS.

(I) BOLTS AND NUTS:
ALL BOLTS AND NUTS FOR FLANGED COVERS SHALL MEET REQUIREMENTS OF THESE SPECIFICATIONS.

MATERIAL SPECIFICATIONS

(A) - STRENGTH OF VALVES: THE GATE AND CHECK VALVES SHALL BE DESIGNED FOR 150 LB. WORKING PRESSURE AND SHALL WITHSTAND AN INTERNALLY APPLIED HYDROSTATIC PRESSURE AT ALL POINTS OF AT LEAST 300 LBS. PER SQUARE INCH. A FACTOR OF SAFETY OF NOT LESS THAN 10 SHALL BE USED ON THE DESIGN. SHOULD TESTS DEVELOP ANY WEAKNESS, THE VALVES FROM THAT DESIGN SHALL BE REJECTED AND A NEW DESIGN MADE.

(B) - REINFORCEMENT AT FLANGES: ALL VALVE FLANGES SHALL BE REINFORCED BY FILLETS IN ACCORDANCE WITH THE MANUFACTURER'S PRACTICE PROVEN SATISFACTORY IN ACTUAL SERVICE.

(C) - JOINTS: ALL JOINTS OF THE VALVES SHALL BE FACED TRUE IN A LATHE OR PLANER, AND PUT TOGETHER WITH A GASKET OF SOME MATERIAL ACCEPTABLE TO THE *DIRECTOR*.

(D) - BOLT HOLES: ALL BOLT HOLES SHALL BE ACCURATELY DRILLED FROM TEMPLATES AND SPACED EQUAL DISTANCES APART.

(E) - BOLTS AND NUTS: ALL BOLTS AND NUTS SHALL BE MADE OF SILICON BRONZE (ASTM B 98-55, ALLOY A) OR STAINLESS STEEL (ASTM A 276-55, TYPE 302).

(F) - PARTS TO BE INTERCHANGEABLE: ALL PARTS OF VALVES OF THE SAME SIZE AND MAKE MUST BE PERFECTLY INTERCHANGEABLE AND ALL WORK DONE IN A THOROUGH AND WORKMANLIKE MANNER.

(G) - CASTINGS: ALL CASTINGS, WHETHER OF BRONZE, IRON OR STEEL, SHALL BE SOUND AND SMOOTH WITHOUT COLD SHUTS, SWELLS, LUMPS, SCABS, BLISTERS, SAND HOLES OR OTHER IMPERFECTIONS, AND SHALL BE MADE IN ACCORDANCE WITH THE BEST MODERN FOUNDRY PRACTICE TO OBTAIN CASTINGS OF THE BEST QUALITY AND OF UNIFORM THICKNESS. NO WELDING, PLUGGING OR FILLING OF HOLES OR OTHER DEFECTS WILL BE PERMITTED. FOR PARTS WHOSE THICKNESS IS LESS THAN ONE (1") INCH, CASTING BEING THINNER THAN THE SPECIFIED THICKNESS BY .06 INCH OR MORE SHALL BE REJECTED, AND FOR PARTS WHOSE THICKNESS IS ONE (1") INCH OR MORE, CASTINGS BEING THINNER THAN SPECIFIED BY .08 INCH OR MORE SHALL BE REJECTED.

(H) - BRONZE PARTS: (1) BRONZE FOR PARTS, OTHER THAN THOSE LISTED BELOW, SHALL BE GRADE ONE. (2) VALVE STEMS, PINION SHAFTS, STEM NUTS, WRENCH CAPS AND RETAINING NUTS SHALL BE MADE OF GRADE THREE BRONZE. (3) DISC RINGS SHALL BE MADE OF GRADE FIVE BRONZE.

(I) - TESTS OF BRONZE: (1) IF DEMANDED, A MANUFACTURER'S CERTIFICATE OF TEST SHALL BE FURNISHED WITH ALL BRONZE STEMS. (2) ALL STEMS OF 16-INCH GATE VALVES AND OVER, SHALL HAVE A PROLONGATION ON ONE END OF EACH STEM, OF THE SAME DIMENSIONS AND CROSS SECTION AS THE STEM, AND OF SUFFICIENT LENGTH TO ENABLE THE CUTTING OF SPECIMENS PARALLEL WITH THE LONGITUDINAL AXIS OF THE STEM. SPECIMENS SHALL BE CUT FROM PROLONGATIONS ONE-HALF WAY BETWEEN SURFACE AND CENTRAL AXIS. OTHER METHODS OF TEST WILL BE CONSIDERED BY THE *DIRECTOR*, BUT MUST BE SUBMITTED IN DETAIL WITH THE BID. (3) FOR ALL STEMS OF GATE VALVES SMALLER THAN 16 INCHES, NOT LESS THAN TWO TEST PIECES SHALL BE CAST FROM THE MOLTEN METAL OF EACH HEAT, FROM WHICH VALVE STEMS ARE BEING MADE. (4) ALL STEMS MADE FROM BRONZE SHOWING LESS STRENGTH, ELONGATION AND/OR DUCTILITY THAN ABOVE REQUIRED SHALL BE REJECTED. (5) TESTS OF VALVE STEMS, OR THE VARIOUS PARTS OF ANY VALVE MAY BE MADE AT ANY TIME BEFORE OR AFTER DELIVERY, AND IF FOUND TO BE DEFICIENT IN STRENGTH OR UNSATISFACTORY TO THE *DIRECTOR*, THE WHOLE LOT OR SHIPMENT MAY BE REJECTED.

(J) - CAST IRON

(1) - QUALITY: CAST IRON SHALL CONFORM TO ASTM SPECIFICATIONS A 126, CLASS B, OR LATEST REVISION THEREOF. ALL IRON CASTINGS SHALL BE TOUGH AND WITHOUT BRITTLENESS, SUCH AS MAY BE CUT DRILLED AND CHIPPED BY HAND WITH DUE EASE. A BLOW FROM A HAMMER SHALL PRODUCE AN INDENTATION ON THE EDGE OF THE CASTING WITHOUT FLAKING THE METAL.

(2) - TESTS: BARS FROM THE MOLTEN METAL FROM WHICH THE VALVES ARE BEING MADE SHALL BE TESTED AT SUCH TIME AND IN SUCH MANNER, AS THE *DIRECTOR* MAY REQUIRE. THE REQUIREMENTS OF ASTM SPECIFICATIONS A 126 SHALL GOVERN TESTING PROCEDURES TO DETERMINE THE PHYSICAL AND CHEMICAL CHARACTERISTICS OF THE IRON CASTINGS. SHOULD THE RESULT OBTAINED FROM THE BAR TESTED FAIL TO SHOW THAT THE CAST IRON MEETS THE REQUIREMENTS HEREIN SPECIFIED, THE ENTIRE MELT WILL BE REJECTED. TEST BARS, HOWEVER, WHOSE FAILURE IS DUE TO INHERENT DEFECTS SHALL NOT BE CONSIDERED. ALL VALVES MADE FROM IRON SHOWING LESS STRENGTH THAN CALLED FOR IN THE ASTM SPECIFICATIONS SHALL BE REJECTED.

(K) - QUALITY OF WROUGHT IRON: ALL WROUGHT IRON SHALL BE TOUGH, FIBROUS, AND UNIFORM IN CHARACTER; SPECIMENS CUT FROM BARS AND BROKEN IN A TESTING MACHINE SHALL SHOW A TENSILE STRENGTH OF NOT LESS THAN 45,000 PSI, WITH AN ELONGATION OF 18 PERCENT IN EIGHT DIAMETERS.

(L) - QUALITY OF MATERIALS:

GRADE ONE CAST BRONZE SHALL CONFORM TO THE PROPERTIES OF ASTM B 62.

PHYSICAL PROPERTIES

MINIMUM TENSILE STRENGTH	30,000 PSI
MINIMUM YIELD STRENGTH	14,000 PSI
MINIMUM ELONGATION IN 2 INCHES, PERCENT	20

CHEMICAL COMPOSITION

COPPER, PERCENT	85
TIN, PERCENT	5
LEAD, PERCENT	5
ZINC, PERCENT	5

GRADE TWO CAST BRONZE SHALL CONFORM TO THE PROPERTIES OF ASTM B 132 ALLOY A.

PHYSICAL PROPERTIES

MINIMUM TENSILE STRENGTH	60,000 PSI
MINIMUM YIELD STRENGTH	20,000 PSI
MINIMUM ELONGATION IN 2 INCHES, PERCENT	15

CHEMICAL COMPOSITION

COPPER, PERCENT	56.0 to 62.0
LEAD, PERCENT	0.5 to 1.5
TIN, MAXIMUM PERCENT	1.5
MANGANESE, MAXIMUM PERCENT	1.5
ALUMINUM, MAXIMUM PERCENT	1.5
IRON, MAXIMUM PERCENT	2.0
ZINC	REMAINDER

GRADE THREE CAST IRON BRONZE SHALL CONFORM TO THE PROPERTIES OF ASTM B 132 ALLOY B.

PHYSICAL PROPERTIES

MINIMUM TENSILE STRENGTH	80,000 PSI
MINIMUM YIELD STRENGTH	32,000 PSI
MINIMUM ELONGATION IN 2 INCHES, PERCENT	15

CHEMICAL COMPOSITION

COPPER, PERCENT	55.0 TO 60.0
LEAD, PERCENT	0.5 TO 1.5
TIN, MAXIMUM PERCENT	1.5
MANGANESE, MAXIMUM PERCENT	3.5
ALUMINUM, MAXIMUM PERCENT	3.0
IRON, MAXIMUM PERCENT	3.0
ZINC	REMAINDER

GRADE FOUR ROLLED BRONZE SHALL CONFORM TO THE PROPERTIES OF ASTM B 21, ALLOY A. (ONE-HALF HARD).

PHYSICAL PROPERTIES

DIAMETER OR THICKNESS, IN.	MIN. TENSILE STRENGTH PSI	MIN. YIELD STRENGTH PSI	MINIMUM ELONGATION IN 4X DIA. OR THICKNESS OF SPECIMEN, PERCENT
1/2 AND UNDER	60,000	27,000	22
OVER 1/2 TO 1 INC.	60,000	27,000	25
OVER 1 TO 2-1/2 INC.	58,000	26,000	25
OVER 2-1/2 TO 3-1/2 INC.	54,000	25,000	27
OVER 3-1/2	54,000	22,000	30

CHEMICAL COMPOSITION

COPPER, PERCENT	59.0 TO 62.0
TIN, PERCENT	0.5 TO 1.0
LEAD, MAXIMUM PERCENT	0.20
ZINC, PERCENT	REMAINDER
IRON, MAXIMUM PERCENT	0.10
ELEMENTS OTHER THAN COPPER, TIN, IRON, LEAD AND ZINC, MAXIMUM PERCENT	0.10

GRADE FIVE BRONZE SHALL BE SUFFICIENTLY MALLEABLE TO CONFORM TO DOVETAILED GROOVES WHEN PEENED OR ROLLED, AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH, WITHOUT DEFORMATION OF 4000 PSI, AND SHALL HAVE THE FOLLOWING CHEMICAL COMPOSITION:

COPPER, PERCENT	91.0
TIN, PERCENT	0.0
ZINC, PERCENT	5.0
LEAD, PERCENT	4.0

SILICON BRONZE

THIS BRONZE SHALL CONFORM TO ASTM SPECIFICATION B-98, ALLOY A.

PHYSICAL PROPERTIES

MINIMUM TENSILE STRENGTH	85,000 PSI
MINIMUM YIELD STRENGTH	50,000 PSI
MINIMUM ELONGATION IN 4X DIAMETER, PERCENT	28

CHEMICAL COMPOSITION

COPPER, MIN. PERCENT	94.8
SILICON, PERCENT	2.8 TO 3.8
MANGANESE, MAX., PERCENT	1.5
IRON, MAX., PERCENT	1.6
LEAD, MAX., PERCENT	0.05

STAINLESS STEEL

THE STAINLESS STEEL SHALL CONFORM TO ASTM SPECIFICATIONS A-276, TYPE 302.

PHYSICAL PROPERTIES

MINIMUM TENSILE STRENGTH	90,000 PSI
MINIMUM YIELD STRENGTH	45,000 PSI
MINIMUM ELONGATION IN 2 INCHES, PERCENT	35

CHEMICAL COMPOSITION

CARBON, PERCENT	OVER 0.08 TO 0.20
MANGANESE, MAXIMUM PERCENT	2.00
SILICON, MAXIMUM PERCENT	1.00
PHOSPHORUS, MAXIMUM PERCENT	0.045
SULPHUR, MAXIMUM PERCENT	0.030
CHROMIUM, PERCENT	17.00 TO 19.00
NICKEL, PERCENT	8.00 TO 10.00

CAST IRON

THE CAST IRON SHALL CONFORM TO ASTM SPECIFICATION A 126 CLASS B.

PHYSICAL PROPERTIES

MINIMUM TENSILE STRENGTH	31,000 PSI
TRANSVERSE STRENGTH	3,300 PSI
DEFLECTION (12 INCH CENTERS)	0.12 IN.

CHEMICAL COMPOSITION

PHOSPHOROUS, MAXIMUM PERCENT	0.75
SULPHUR, MAXIMUM PERCENT	0.12

(M) - OTHER MATERIALS: ALL OTHER MATERIALS USED IN THE MANUFACTURE OF THESE VALVES AND NOT SPECIFIED IN THE SPECIFICATIONS SHALL BE OF THE BEST QUALITY OF THEIR RESPECTIVE KINDS, AND SUBJECT TO INSPECTION, TESTS, AND APPROVAL BY THE *DIRECTOR*.

(N) - CHEMICAL ANALYSIS: CHEMICAL ANALYSIS OF THE MATERIAL USED SHALL BE FURNISHED BY THE CONTRACTOR WHENEVER REQUIRED BY THE *DIRECTOR*.

(O) - CLEANING OF CASTINGS: ALL IRON CASTINGS SHALL BE THOROUGHLY CLEANED ON THE OUTSIDE AND INSIDE SURFACES AND PROTECTED FROM RAIN OR MOISTURE UNTIL THEY ARE PAINTED.

(P) HYDROSTATIC TESTS AT SHOP:
ALL GATE VALVES SHALL BE TESTED IN THE SHOP BY HYDROSTATIC PRESSURE, BY CLOSING THE VALVE AND APPLYING THE REQUIRED TEST PRESSURE IN THE BODY AND DOME OF THE VALVE AS SPECIFIED BELOW.

3" AND UNDER ------ 300 P.S.I. - NO TIME REQUIREMENT.
4" THROUGH 12"----- 400 P.S.I. - NO TIME REQUIREMENT.
14" THROUGH 20" ---- 300 P.S.I. FOR 15 MINUTES, DROP PRESSURE TO 150 P.S.I., THEN ELEVATE AGAIN TO 300 P.S.I. FOR 15 MINUTES - A TOTAL OF 1/2 HOUR.
24" THROUGH 48"---- 300 P.S.I. FOR 1/2 HOUR, DROP PRESSURE TO 150 P.S.I., THEN ELEVATE AGAIN TO 300 P.S.I. FOR 30 MINUTES - A TOTAL OF 1 HOUR.

THIS IS A MODIFICATION OF SECTION 29 OF THE "STANDARD SPECIFICATIONS AWWA DESIGNATION C-500-61". ALL LEAKS, FLAWS OR OTHER DEFECTS DEVELOPED IN MAKING THESE TESTS SHALL BE CORRECTED TO THE SATISFACTION OF THE DIRECTOR OR THE ENTIRE PIECE SHALL BE REJECTED. AFTER TESTING, ALL VALVES SHALL BE THOROUGHLY DRAINED. ALL EQUIPMENT FOR TESTING AND ALL TESTS SHALL BE MADE AT THE CONTRACTOR'S EXPENSE.

(Q) PERFORMANCE TESTS:
EACH VALVE SHALL BE OPERATED IN THE POSITION THAT IT WILL ASSUME IN SERVICE AND FOR THE FULL LENGTH OF GATE TRAVEL IN BOTH DIRECTIONS, TO DEMONSTRATE THE FREE AND PERFECT FUNCTIONING OF ALL PARTS IN THE INTENDED MANNER. ANY DEFECTS OF WORKMANSHIP SHALL BE CORRECTED AND THE TEST REPEATED UNTIL SATISFACTORY PERFORMANCE IS DEMONSTRATED.

PLACING AND TESTING

(A) - ALL VALVES SHALL BE SET ACCURATELY AND CAREFULLY TO THE LINES AND GRADES GIVEN. ALL CONNECTIONS TO PIPE SHALL HAVE THE NECESSARY FLANGE, LEAD, MECHANICAL, SCREWED, VICTAULIC OR SOLDERED ENDS AS REQUIRED UNDER THE FOLLOWING ITEMS: "CAST IRON PIPE AND FITTINGS", "PRESTRESSED CONCRETE CYLINDER PIPE," FURNISHING AND SETTING 6" HYDRANTS" AND "2-INCH GALVANIZED WROUGHT IRON AND BRASS PIPE" AND AS SHOWN ON THE VALVE SCHEDULE!

(B) - AFTER THE VALVES ARE SET IN PLACE AND READY TO OPERATE, THE CONTRACTOR SHALL TEST THEM UNDER WORKING PRESSURE AND CONDITIONS HEREIN SPECIFIED UNDER THE SPECIFICATION TESTING MAINS AND ANY VALVE FOUND TO LEAK SHALL BE MADE WATER-TIGHT, AND IF FOUND TO BE OF FAULTY DESIGN, SHALL BE SATISFACTORILY REPAIRED OR REPLACED BY THE CONTRACTOR.

PAINTING

(A) - IRON BODY VALVES SHALL EITHER BE DIPPED IN ASPHALT PAINT AND ALL BRONZE PARTS CLEANED, OR ALL IRON CASTINGS SHALL BE PAINTED INSIDE, BEFORE ASSEMBLING, WITH TWO (2) COATS OF AN APPROVED PAINT, AND, AFTER PASSING THE HYDRAULIC TEST, SHALL BE GIVEN AT LEAST TWO (2) COATS OF APPROVED PAINT OUTSIDE.

(B) - AFTER ERECTION, ALL EXPOSED METAL SURFACES OF VALVES EXCEPT BRASS OR BRONZE SHALL BE PAINTED WITH TWO (2) FIELD COATS OF COAL TAR PITCH PAINT EQUAL TO INERTOL 66 OR KOPPERS BITUMASTIC 50.

INSPECTION

THE DIRECTOR OR HIS AUTHORIZED DESIGNATE, WILL INSPECT THE MATERIAL AND WORK DONE, AS THE INTERESTS OF THE CITY OF CLEVELAND MAY REQUIRE. SUCH OFFICER SHALL HAVE UNRESTRICTED ACCESS TO THE CONTRACTOR'S PLANT, AND TO ALL PARTS OF THE WORK AND OTHER PLACES AT WHICH THE PREPARATION OF THE MATERIAL AND THE CONSTRUCTION OF THE DIFFERENT PARTS OF THE WORK TO BE DONE UNDER THESE SPECIFICATIONS ARE CARRIED ON, AND HE SHALL RECEIVE ALL FACILITIES AND ASSISTANCE TO CARRY OUT HIS WORK OF INSPECTION AND TESTING, IN A MANNER SATISFACTORY TO THE *DIRECTOR*. SUCH INSPECTION SHALL NOT RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM *SAID* WORK STRICTLY IN ACCORDANCE WITH THE SPECIFICATIONS, OR ANY MODIFICATIONS THEREOF, AS HEREIN PROVIDED, AND WORK NOT SO CONSTRUCTED SHALL BE REMOVED AND MADE GOOD BY THE CONTRACTOR, AT HIS OWN EXPENSE.

DATA WITH PROPOSALS.
PROPOSAL SHALL BE ACCOMPANIED BY DRAWINGS FURNISHED BY THE MANUFACTURER, FULLY AND DISTINCTLY ILLUSTRATING AND DESCRIBING AND GIVING THE WEIGHT OF EACH OF THE VALVES PROPOSED TO BE FURNISHED.

DRAWINGS
(A) - PRIOR TO THE MANUFACTURE OF ANY VALVES, THE CONTRACTOR SHALL SUBMIT FOR THE APPROVAL OF THE ENGINEER, COMPLETE WORKING, DETAIL, AND DIMENSION DRAWINGS SHOWING THICKNESSES AND KINDS OF MATERIAL AND SIMILAR INFORMATION.

(B) - ONE PRINT OF EACH OF THE DRAWINGS SUBMITTED WILL BE RETURNED WITH THE CRITICISMS OR APPROVAL OF THE DIRECTOR. IN CASE THE DRAWINGS ARE NOT APPROVED, THE CONTRACTOR SHALL AGAIN SEND FOR APPROVAL, DUPLICATE REVISED PRINTS OF THE DRAWINGS TO TAKE CARE OF THE CRITICISMS NOTED, AND AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED, THE CONTRACTOR SHALL AGAIN FURNISH TO THE DIRECTOR EIGHTEEN (18) ADDITIONAL PRINTS, SIXTEEN (16) ON PAPER AND TWO (2) ON CLOTH, OF EACH DRAWING. NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED.

PAYMENT

THE UNIT PRICE STIPULATED FOR VALVES SHALL INCLUDE THE FURNISHING, PLACING, TESTING AND PAINTING OF THE AIR COCKS, DRAIN VALVES, CHECK AND GATE VALVES, INCLUDING BY-PASS VALVES, OPERATING NUTS AND OTHER ACCESSORIES AND APPURTENANCES AND THE FURNISHING OF ALL LABOR, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

BRANCH SLEEVE AND VALVES

WORK INCLUDED

(a) - THE CONTRACTOR SHALL FURNISH THE BRANCH SLEEVE AND VALVES FOR THE LOCATIONS SHOWN ON THE DRAWINGS OR ON WORKING DRAWINGS FURNISHED BY THE ENGINEER OR AS DIRECTED OF THE SIZES SHOWN OR REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

(B) - IN GENERAL, THE WORK OF THIS ITEM CONTEMPLATES THE FURNISHING AND DELIVERY OF THE MATERIAL TO THE PROPER LOCATION ON THE JOB. THE DIVISION OF WATER WILL INSTALL THE BRANCH SLEEVES AND VALVES, BUT THE CONTRACTOR SHALL DO ALL THE NECESSARY EXCAVATION AND BACKFILLING REQUIRED THEREFOR AND REPAVING IF SO NOTED ON THE CONTRACT DRAWINGS.

QUALITY OF VALVES

THE BRANCH SLEEVE AND VALVES SHALL BE A.P. SMITH MFG. CO. OR APPROVED EQUAL. ALL SLEEVES SHALL BE OF THE CLASS AND SIZE AS SHOWN OR AS DIRECTED AND SHALL CONFORM FOR MATERIALS, TESTS, PAINTING, DRAWINGS, ETC., TO THE REQUIREMENTS OF THE ITEM CAST IRON PIPES AND FITTINGS OF THESE SPECIFICATIONS INSOFAR AS THEY APPLY. THE VALVES FURNISHED AND USED UNDER THIS ITEM SHALL COMPLY WITH THE REQUIREMENTS OF THE ITEM VALVES OF THIS CONTRACT WHENEVER THE SAME MAY BE PERTINENT. THE PROVISIONS OF THE SECTIONS (U), (V), AND (W) OF THE ITEM ON VALVES PERTAINING TO GREASE CASES SHALL APPLY TO THE BRANCH SLEEVES AND VALVES.

PAYMENT

THE UNIT PRICE STIPULATED FOR EACH BRANCH SLEEVE AND VALVE FURNISHED UNDER THIS ITEM, SHALL INCLUDE THE FURNISHING AND DELIVERY TO THE PROPER LOCATION, AND SHALL INCLUDE ALL EXCAVATION, SHEETING AND SHORING, BACKFILLING, SAND BACKFILLING, SEEDING AND SODDING AND REPAVING, IF SO NOTED ON THE CONTRACT DRAWINGS, AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

INSERTING VALVES AND SLEEVES

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH AND INSTALL INSERTING VALVES AS REQUIRED BY THESE PLANS OR AS DIRECTED BY THE ENGINEER. THE WORK INCLUDES ALL NECESSARY EXCAVATION, BACKFILLING, RESEEDING OR PAVING AS REQUIRED BY THESE SPECIFICATIONS. THE INSERTING VALVES SHALL BE INSTALLED IN ADVANCE OF OTHER WATER WORK SO AS TO KEEP DISCONTINUATION OF WATER SERVICE TO A MINIMUM.

QUALITY OF VALVES

THE INSERTING VALVE SLEEVE SHALL CONFORM WITH RESPECT TO CLASS, MATERIALS TESTS, PAINTING, DRAWINGS, ETC. TO THE REQUIREMENTS OF ITEM "CAST IRON PIPE AND FITTINGS" OF THESE SPECIFICATIONS. THE VALVES FURNISHED UNDER THIS ITEM SHALL CONFORM WITH RESPECT TO WORKING PRESSURE AND ANY OTHER PERTINENT ITEM OF CONSTRUCTION REQUIRED UNDER ITEM "VALVES" OF THESE SPECIFICATIONS.

PAYMENT

THE UNIT PRICE STIPULATED FOR INSERTING VALVES SHALL INCLUDE THE FURNISHING AND INSTALLING OF THE INSERTING VALVE AND ALL EXCAVATION, BACKFILLING RESEEDING OR PAVING AS REQUIRED BY THESE PLANS AND SPECIFICATIONS.

VALVE BOXES

SEE SPECIFICATIONS FOR "MISCELLANEOUS METAL WORK".

CURB CONNECTIONS

(A) - GENERAL, IN SUCH LOCATIONS AS MAY BE INDICATED ON THE CONTRACT DRAWINGS, OR AS ORDERED BY THE ENGINEER, THE CONTRACTOR SHALL EXCAVATE FOR HOUSE CONNECTION BETWEEN THE WATER MAIN AND A POINT 3 FEET BEYOND CURB LINE. THE CONNECTION SHALL BE STANDARD EXTRA HEAVY LEAD PIPE OR COPPER CONFORMING IN ALL RESPECTS TO THE RULES FOR WATER CONNECTIONS APPLICABLE AT THE TIME OF INSTALLATION AS PUBLISHED BY THE DIVISION OF WATER OF THE CITY OF CLEVELAND. WHEREVER THE CONNECTION CROSSES AN EXISTING PAVEMENT, THE CONTRACTOR SHALL BORE OR JACK OPENINGS OF SUFFICIENT SIZE TO PERMIT THE INSTALLATION OF SERVICE CONNECTIONS. IF BORING OR JACKING IS FOUND TO BE IMPOSSIBLE, HE SHALL MAKE THE NECESSARY TRENCH EXCAVATION, SAND BACKFILL, TEMPORARY AND PERMANENT REPAVING REQUIRED FOR THE INSTALLATION OF THE SERVICE CONNECTION.

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(B) - TAPPING. THE CONTRACTOR SHALL ARRANGE WITH THE DIVISION OF WATER TO MAKE THE PRESSURE TAP, INSTALL THE CORPORATION COCK AND FURNISH ANY OTHER MATERIAL WHICH THE DIVISION ELECTS TO SUPPLY. THE CONNECTION SHALL BE BLOCKED UP WITH STONE, BRICK OR CONCRETE TO INSURE A FIRM SUPPORT FOR SAID COUPLING AND RESIST ALL SETTLEMENTS IN BACKFILLING. THE BLOCKING SHALL BE HELD FIRMLY IN PLACE BY FINE DRY EARTH FIRMLY TAMPED AROUND IT. WHERE EXCAVATION IS IN SAND, CLAY OR LIGHT EARTH, THE WATER CURB CONNECTION MUST BE LAID IN A TRENCH SEPARATE FROM ANY SEWER LINES. IN ROCK OR SHALE THE WATER CURB CONNECTION MAY BE LAID IN THE SAME TRENCH WHICH CONTAINS THE SEWER PIPE PROVIDING THE TRENCH IS OF SUFFICIENT WIDTH AND AN EIGHT INCH SHELF IS PROVIDED ON WHICH TO LAY THE CONNECTION. AT THE CURB END OF THE CONNECTION, A SHUT-OFF VALVE SHALL BE CONNECTED, MOUNTED ON A BLOCKING OF STONE, BRICK OR CONCRETE TO RESIST SETTLEMENT AND WITH CURB BOX MOUNTED AND MAINTAINED PLUMB OVER THE GATE VALVE NUT, WITH THE TOP OF BOX AT THE FINISHED GRADE OF LAWN SPACE.

MEASUREMENT

THE CURB CONNECTIONS TO BE PAID FOR SHALL BE THE ACTUAL NUMBER OF EACH, LISTED AND ESTIMATED SEPARATELY, COMPLETED AND ACCEPTED.

PAYMENT

THE UNIT PRICE STIPULATED FOR EACH CURB CONNECTION UNDER THIS ITEM SHALL INCLUDE THE FURNISHING, PLACING, CONNECTING AND TESTING OF THE PIPE AND FITTINGS AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

SERVICE CONNECTIONS AND WATER METERS RELOCATED

WORK INCLUDED

(A) - THE CLEVELAND WATER DEPARTMENT WILL FURNISH THE PIPING MATERIAL FOR AND MAKE ALL CHANGES REQUIRED IN THE LOCATION OF EXISTING HOUSE CONNECTIONS AND METERS BUT THE CONTRACTOR SHALL DO ALL THE NECESSARY EXCAVATION, BACKFILLING AND REPAVING REQUIRED THEREFORE AND THE CITY WILL CHARGE THE CONTRACTOR FOR THE MATERIALS AND LABOR FURNISHED IN MAKING THESE SERVICE CONNECTIONS AND ALTERATIONS AND COSTS THEREOF SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "SERVICE CONNECTIONS" OR "WATER METERS RELOCATED".

("WORK INCLUDED" continued on Sheet No. 154)

MEASUREMENT

THE SERVICE CONNECTIONS AND WATER METERS RELOCATED TO BE PAID FOR SHALL BE THE ACTUAL NUMBER OF EACH, LISTED AND ESTIMATED SEPARATELY, COMPLETED AND ACCEPTED.

BASIS OF PAYMENT

THE UNIT PRICE STIPULATED FOR EACH SERVICE CONNECTION AND WATER METER RELOCATED UNDER THIS ITEM SHALL INCLUDE THE FURNISHING AND DELIVERY TO THE PROPER LOCATION, EXCAVATION, BACKFILLING, SEEDING AND SODDING AND RE-PAVING AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED AS SHOWN.

SERVICE LINES TO HOUSES

THE CONTRACTOR SHALL SUPPLY ALL MATERIALS AND PERFORM ALL WORK NECESSARY TO COMPLETE THE SERVICE CONNECTION FROM THE CURB CONNECTION TO HOUSE WHERE REQUIRED OR AS SHOWN ON DRAWINGS. ALL WORK AND MATERIALS SHALL CONFORM THE THE REQUIREMENTS OF THE DIVISION OF WATER OF THE CITY OF CLEVELAND.

MEASUREMENT

THE SERVICE LINES TO BE PAID FOR SHALL BE THE ACTUAL NUMBER OF EACH, LISTED AND ESTIMATED SEPARATELY, COMPLETED AND ACCEPTED.

PAYMENT

THE UNIT PRICE STIPULATED FOR EACH SERVICE LINE UNDER THIS ITEM SHALL INCLUDE THE FURNISHING, PLACING, CONNECTION, AND TESTING OF THE PIPE AND FITTINGS AND THE FURNISHING OF ALL LABOR AND MATERIALS NECESSARY FOR THE COMPLETION OF THE WORK AS SPECIFIED OR SHOWN ON DRAWINGS.

CURB CONNECTIONS PLUGGED AT MAIN

WORK INCLUDED

THE CONTRACTOR SHALL ARRANGE WITH THE DIVISION OF WATER AND HEAT OF THE CITY OF CLEVELAND TO PLUG ABANDONED CURB CONNECTIONS AT MAIN. THE CONTRACTOR SHALL PERFORM THE NECESSARY EXCAVATION, BACKFILLING, REPAVING AND RESEEDING. THE CITY SHALL FURNISH AND INSTALL THE PLUGS.

PAYMENT

THE CITY OF CLEVELAND WILL CHARGE THE CONTRACTOR FOR FURNISHING AND INSTALLING CURB CONNECTION PLUGS. THE UNIT PRICE STIPULATED FOR EACH CURB CONNECTION SHALL INCLUDE FURNISHING AND INSTALLING PLUGS, AND ALL NECESSARY EXCAVATION, BACKFILLING AND REPAVING NECESSARY TO SATISFACTORILY COMPLETE THE WORK AS SPECIFIED.

TEMPORARY WATER MAINS AND TEMPORARY SERVICE CONNECTIONS

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL LABOR AND MATERIALS NECESSARY TO COMPLETE THE TEMPORARY WATER LINES AND CONNECTIONS IN CONFORMANCE WITH THE PLANS AND SPECIFICATIONS OF THIS CONTRACT. THE WORK SHALL INCLUDE ALL NECESSARY EXCAVATION, PIPING , THRUST BLOCKING, BACKFILLING, REPAVING AND RESEEDING AS REQUIRED BY THE PLANS OR AS DIRECTED BY THE ENGINEER. THE WORK SHALL BE DONE IN A MANNER TO GIVE THE LEAST HINDRANCE TO TRAFFIC. WHEN REMOVAL OF TEMPORARY WATER MAINS IS REQUIRED BY THE DRAWINGS THE WORK SHALL ALSO INCLUDE REMOVAL OF THE TEMPORARY WATER MAIN, ANY ADDITIONAL EXCAVATION, BACKFILLING, & REPAVING OF THE TRENCH ACCORDING TO THESE SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SATISFACTORY OPERATION OF ALL TEMPORARY LINES UNTIL PERMANENT LINES ARE COMPLETED. ALL TEMPORARY CONNECTIONS SHALL HAVE WATER METERS CONNECTED, AND SHALL PROVIDE TEMPORARY WATER SERVICE AS REQUIRED AND IN A MANNER SATISFACTORY TO THE ENGINEER. THE TEMPORARY WATER MAIN PIPING SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND BE DISPOSED OF BY HIM.

MEASUREMENT

ALL TEMPORARY WATER MAINS AND TEMPORARY SERVICE CONNECTIONS SHALL BE LISTED AS A LUMP SUM , AS LISTED IN THE QUANTITIES. WHERE ONLY TEMPORARY SERVICE CONNECTIONS ARE REQUIRED BY THE DRAWINGS, NO SEPARATE PAYMENT WILL BE MADE FOR THESE ITEMS.

PAYMENT

THE LUMP SUM PRICE STIPULATED FOR TEMPORARY WATER MAINS AND TEMPORARY SERVICE CONNECTIONS SHALL INCLUDE ALL WORK AS SET FORTH UNDER THIS ITEM COMPLETED AND ACCEPTED EXCLUDING VALVES AND BRANCH SLEEVES AND VALVES WHICH SHALL BE PAID FOR SEPARATELY.

BRICK AND PLAIN CONCRETE MASONRY

UNDER THESE ITEMS THE CONTRACTOR SHALL FURNISH ALL NECESSARY LABOR, MATERIALS, TOOLS AND EQUIPMENT FOR THE CONSTRUCTION, COMPLETE, OF ALL MISCELLANEOUS, MASONRY STRUCTURES, AND INCLUDING ALL WATER MAIN DRAIN VAULTS, ACCESS AND ANCHORAGE MANHOLES, VALVE CHAMBERS, SEWER MANHOLES, CATCH BASINS, ANCHORS, PIERS AT PIPE BENDS AND UNDER LINE VALVES, FLOORS FOR DRAIN AND VALVE FORMS, SCAFFOLDING, SHEETING AND BRACING, GROUTING, PLASTERING, CURING, ETC., ALL AS SPECIFIED, REQUIRED OR SHOWN ON THE CONTRACT DRAWINGS.

BRICK AND MASONRY MATERIAL

(A) THE MATERIAL FURNISHED BY THE CONTRACTOR FOR THE VARIOUS KINDS OF MASONRY CONSTRUCTION TO BE CONSTRUCTED SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS.

(B) ALL BRICK FURNISHED AND USED SHALL BE NO. 2 SHALE BRICK AND SHALL COMPLY WITH THE REQUIREMENTS FOR "GRADE SA" ASTM DESIGNATION C 32-42.

(C) ALL CEMENT SHALL CONFORM TO OHIO STATE HIGHWAY CONSTRUCTION AND MATERIAL SPECIFICATIONS SEC. M-1.3.

(D) ALL SAND FOR CONCRETE SHALL CONFORM TO OHIO STATE HIGHWAY CONSTRUCTION AND MATERIAL SPECIFICATIONS SEC. M-2.1.

(E) ALL CRUSHED ROCK AND SLAG SHALL CONFORM TO OHIO STATE HIGHWAY CONSTRUCTION AND MATERIAL SPECIFICATIONS SEC. M-3.5.

(F) ALL CRUSHED SLAG SHALL CONFORM TO OHIO STATE HIGHWAY CONSTRUCTION AND MATERIAL SPECIFICATIONS SEC. M-3.6.

(G) ALL WATER SHALL BE CLEAN AND ACCURATELY MEASURED FOR EACH BATCH OF CONCRETE.

(H) ALL PLAIN CONCRETE SHALL BE MIXED IN THE PROPORTION OF ONE (1) PART OF CEMENT TWO (2) PARTS OF SAND AND FOUR (4) PARTS OF COARSE AGGREGATE.

(I) ALL CEMENT MORTAR SHALL BE MIXED IN THE PROPORTION OF ONE (1) PART OF CEMENT TO THREE (3) PARTS OF SAND, EXCEPT THE MORTAR FOR BRICK CATCH BASINS AND SEWER MANHOLES WHICH SHALL BE 1:2 MIX.

("MANHOLE CONSTRUCTION" Continued on Sht. No. 154)

MISCELLANEOUS METAL WORK

WORK INCLUDED

(A) THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MISCELLANEOUS METAL WORK WHICH IS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT AND IS NOT SPECIFICALLY INCLUDED UNDER THE OTHER ITEMS OF THESE SPECIFICATIONS.

(B) IN GENERAL, THE WORK SHALL INCLUDE THE FURNISHING AND INSTALLING OF MANHOLE FRAMES AND COVERS, MANHOLE STEPS, VALVE BOXES, EXTENSION STEMS AND BRACE, STRUCTURAL MEMBERS, BRONZE BOLTS, AND OTHER SIMILAR ITEMS REQUIRED FOR THE PROPER COMPLETION OF THE WORK.

MATERIALS

ALL CASTINGS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 0-7.81 OF THE "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PAVEMENTS, SIDEWALKS AND SEWERS" OF THE CITY OF CLEVELAND DATED JANUARY, 1950, EXCEPT THAT THE CAST IRON SHALL BE CLASS NO. 30. WROUGHT IRON SHALL MEET THE REQUIREMENTS OF THE ASTM SPECIFICATIONS A 207-39. ALL STRUCTURAL STEEL SHALL MEET THE REQUIREMENTS OF THE ASTM SPECIFICATIONS A7-46. ALL BRONZE BOLTS AND NUTS SHALL CONFORM TO U.S. STANDARD SIZES, AND SHALL BE CLEAN CUT AND HAVE WELL FITTED THREADS. ALL BRONZE BOLTS AND NUTS SHALL BE OF TOBIN OR MANGANESE BRONZE, OR OF SIMILAR APPROVED MATERIALS.

CLEANING AND TESTING

ALL CASTINGS SHALL BE THOROUGHLY CLEANED AND SUBJECTED TO A CAREFUL HAMMER TEST. NO CASTINGS SHALL BE COATED UNLESS CLEAN AND FREE FROM RUST, AND APPROVED IN THESE RESPECTS BY THE ENGINEER OR HIS AUTHORIZED INSPECTOR IMMEDIATELY BEFORE BEING DIPPED.

COATING

EACH CASTING SHALL BE SPRAYED OR BRUSHED INSIDE AND OUT WITH ONE COAT OF ASPHALTIC COMPOUND VARNISH. THE VARNISH SHALL BE MADE OF HIGH GRADE ASPHALT FLUXED AND BLENDED WITH PROPERLY TREATED DRYING OILS AND THINNED TO A PROPER CONSISTENCY WITH A VOLATILE SOLVENT. OTHER METHODS OF COATING AND TYPES OF COATING MATERIALS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. IN ADDITION TO THE SHOP COAT THE CASTINGS SHALL RECEIVE TWO (2) COATS OF APPROVED PAINT.

INSPECTION

THE ENGINEER OR HIS AUTHORIZED ASSISTANT, SHALL HAVE THE RIGHT TO INSPECT THE MATERIAL AND WORK DONE, AS THE INTERESTS OF THE CITY OR STATE MAY REQUIRE. SUCH INSPECTION SHALL NOT RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM SAID WORK STRICTLY IN ACCORDANCE WITH THE SPECIFICATIONS, OR ANY MODIFICATION THEREOF, AS HEREIN PROVIDED, AND WORK NOT SO CONSTRUCTED SHALL BE REMOVED AND MADE GOOD BY THE CONTRACTOR, AT HIS OWN EXPENSE. ALL MANHOLE RINGS AND COVERS MUST BE SOUND AND SHALL CONFORM TO THESE SPECIFICATIONS, AND ANY DEFECTIVE CASTINGS WHICH MAY HAVE PASSED THE INSPECTOR AT THE WORKS, OR ELSEWHERE, SHALL BE AT ALL TIMES LIABLE TO REJECTION WHEN DISCOVERED, UNTIL THE DATE OF FINAL PAYMENT UNDER THIS CONTRACT.

STEPS AND LADDERS

GALVANIZED WROUGHT IRON STEPS AND LADDERS OF THE SIZE AND SHAPE SHOWN ON THE CONTRACT DRAWINGS, SHALL BE BUILT INTO THE BRICK AND CONCRETE MASONRY OF THE MANHOLES AS INDICATED ON THE DRAWINGS.

RIMS AND COVERS

(A) ALL CAST IRON MANHOLE RIMS AND COVERS OF THE FORMS, DIMENSIONS AND DETAILS SHOWN ON THE CONTRACT DRAWINGS, SHALL BE FURNISHED AND INSTALLED AS DIRECTED.

(B) THE RIMS SHALL BE PROPERLY SET IN PLACE IN A FULL BED OF MORTAR OR POURED MONOLITHIC IN THE MASONRY, AT SUCH ELEVATION AS TO MAKE THE TOP OF THE RIM CONFORM TO THE FINISHED SURFACES OF THE STRUCTURES OR THE FINISHED GRADE AS ESTABLISHED BY THE ENGINEER.

VALVE BOXES AND COVERS

THE CONTRACTOR SHALL FURNISH AND INSTALL, OVER EACH VERTICALLY SET VALVE OF THE LOCATIONS SHOWN ON THE DRAWINGS, OR AS REQUIRED, VALVE BOXES AND COVERS OF THE TYPES AND SIZES INDICATED ON THE CONTRACT PLANS. THESE SHALL BE CAREFULLY LOCATED OVER THE VALUE NUTS, AND SHALL BE SET PLUMB AND TRUE TO ELEVATION AS REQUIRED.

DETAILED DRAWINGS

COMPLETE DETAILED DRAWINGS OF MISCELLANEOUS METAL WORK SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL, PRIOR TO THE MANUFACTURE OF ANY WORK TO BE FURNISHED UNDER THIS ITEM, IN ACCORDANCE WITH THESE SPECIFICATIONS.

PAINTING

ALL MISCELLANEOUS METAL WORK NOT GALVANIZED SHALL BE THOROUGHLY CLEANED AND GIVEN THREE (3) FIELD COATS OF COAL TAR PITCH EQUAL TO INERTOL 50 OR BITUMASTIC 50.

MEASUREMENT

The weight of miscellaneous metal work to be paid for shall be the number of pounds of metal work actually furnished and placed in accordance with these specifications and the detailed drawings approved by the Engineer. In computing the weights, if not determined by weighing, one (1) cubic foot of cast iron shall be assumed to weigh four hundred fifty (450) pounds, and one (1) cubic foot of steel shall be assumed to weigh four hundred ninety (490) pounds.

PAYMENT

The unit price stipulated per pound for miscellaneous metal work shall include the furnishing, erecting, machining, fitting, adjusting, bolting, cleaning and painting of all miscellaneous metal work, and the furnishing of all labor, materials, tools and appliances necessary to complete the work as specified or as shown.

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PRESTRESSED CONCRETE CYLINDER PIPE

(A) ALL PRESTRESSED CONCRETE PIPE TO BE FURNISHED SHALL CONFORM TO THESE SPECIFICATIONS AND SHALL CONFORM TO THE LATEST AWWA C 301 "STANDARD SPECIFICATIONS FOR REINFORCED CONCRETE WATER PIPE-STEEL CYLINDER TYPE, PRESTRESSED".

(B) THE PRESTRESSED CONCRETE CYLINDER PIPE SHALL BE FURNISHED IN UNIFORM LENGTH OF NOT LESS THAN SIXTEEN FEET FOR THE PIPE EXCEPT THAT SHORTER LENGTHS MAY BE USED TO MEET SPECIAL CONDITIONS. THE NOMINAL THICKNESS OF THE CORE AND THE NOMINAL THICKNESS OF THE MORTAR COATING SHALL NOT BE LESS THAN THAT GIVEN IN THE FOLLOWING TABLE:

NOMINAL INSIDE DIAMETER	CORE THICKNESS	MINIMUM MORTAR COATING
24"	1-1/2"	3/4"
30"	1-7/8"	3/4"
36"	2-1/4"	3/4"

THE INTERIOR DIAMETER OF THE PIPE SHALL NOT BE LESS THAN THE NOMINAL DIAMETER BY MORE THAN ONE PERCENT (1%). THE THICKNESS OF THE WALL OF THE PIPE SHALL NOT BE LESS THAN THE NOMINAL THICKNESS BY MORE THAN EIGHT (8) PERCENT. THE ENDS OF PIPE SHALL BE AT RIGHT ANGLES TO THE PIPE AXIS. PIPES MAY BE BEVELED TO FORM CURVES. THE CONCRETE USED TO LINE THE STEEL CYLINDERS SHALL BE MADE FROM SUITABLE AGGREGATES COMPOSED OF HARD, DURABLE PARTICLES, CLEAN AND FREE FROM LOAM OR ORGANIC MATERIAL. CEMENT SHALL FULFILL THE REQUIREMENTS OF ASTM DESIGNATION: C 150-52, "STANDARD SPECIFICATIONS FOR PORTLAND CEMENT". IT IS THE INTENT OF THIS SPECIFICATION TO PRODUCE A CONCRETE HAVING A 28-DAY STRENGTH OF 4500 OR A 7-DAY STRENGTH OF 3000 POUNDS PER SQUARE INCH FOR STANDARD 6" x 12" TEST CYLINDERS WHICH SHALL BE CURED IN THE SAME MANNER AS THE PIPE. CONCRETE FOR WHICH 28-DAY STRENGTH TESTS SHALL SHOW STRENGTHS OF LESS THAN 4500 POUNDS PER SQUARE INCH MAY BE USED PROVIDING THAT THE MAXIMUM DESIGN COMPRESSIVE STRESSES IN THE CONCRETE SHALL NOT EXCEED FORTY (40%) PERCENT OF THE STRENGTH OF THE CONCRETE AT THE TIME OF WRAPPING.

(C) THE CONCRETE LINING OF THE STEEL CYLINDER MAY BE PLACED VERTICALLY BY THE USE OF INTERIOR FORMS OR MAY BE PLACED BY THE CENTRIFUGAL PROCESS. WHEN THE CENTRIFUGAL PROCESS IS USED, THE CYLINDER SHALL BE HELD SECURELY IN SPINNING FRAMES AND THE FRAMES PLACED HORIZONTALLY IN A MACHINE WHICH WILL CAUSE THEM TO ROTATE RAPIDLY ABOUT THEIR LONGITUDINAL AXIS AT A RIM SPEED SUFFICIENT TO INSURE GOOD COMPACTION OF THE CONCRETE. THE CONCRETE SHALL BE PLACED IN THE STEEL CYLINDER WHILE THEY ARE REVOLVING IN SUCH MANNER THAT THE ROTATION SHALL EVENLY DISTRIBUTE. THE CONCRETE ALONG THE ENTIRE LENGTH OF THE PIPE. AFTER THE CONCRETE HAS BEEN DEPOSITED, THE FRAMES SHALL CONTINUE TO REVOLVE UNTIL THE EXCESS WATER HAS COME TO THE SURFACE AND THE CONCRETE HAS BECOME THOROUGHLY COMPACTED. THE INTERIOR SURFACE OF THE PIPE MAY BE FINISHED EITHER WHILE IT IS STILL IN THE CENTRIFUGAL MACHINE OR BY MEANS OF A HONING OPERATION AFTER THE CONCRETE HAS SET. WHEN THE SPINNING OF THE CONCRETE IS COMPLETED, THE LINED CYLINDERS SHALL BE REMOVED FROM THE MACHINE AND PLACED IN A VERTICAL POSITION FOR CURING. AFTER THE CONCRETE HAS TAKEN ITS FINAL SET, THE PIPES SHALL BE KEPT IN A WARM ATMOSPHERE FOR CURING.

(D) WHEN THE CONCRETE LINING IS PLACED BY A VERTICAL CASTING, THE STEEL CYLINDER SHALL BE PLACED VERTICALLY ABOUT AN INTERIOR MOLD AND THE MOLD AND CYLINDER SHALL BE HELD IN CIRCULAR AND CONCENTRIC POSITION BY TOP AND BOTTOM RINGS OF STEEL OR CAST IRON. WHILE THE CONCRETE IS BEING PLACED, VIBRATION SHALL BE EMPLOYED SO AS TO PRODUCE A CONCRETE OF MAXIMUM DENSITY - AFTER COMPLETION OF THE POURING OPERATION AND WHEN CONCRETE HAS TAKEN ITS FINAL SET, THE LINED CYLINDERS SHALL BE KEPT IN A WARM ATMOSPHERE UNTIL THE FOLLOWING DAY, WHEN THE MOLDS MAY BE REMOVED.

(E) AFTER THE INTERIOR MOLDS HAVE BEEN REMOVED, OR IN THE CAST OF CENTRIFUGAL CASTING AFTER THE CONCRETE HAS HARDENED SUFFICIENTLY, THE CONCRETE LINING SHALL BE KEPT MOIST BY WATER OR STEAM UNTIL AT LEAST 36 HOURS AFTER THE PLACING OF THE CONCRETE. THE TEMPERATURE OF THE ATMOSPHERE TO WHICH THE NEW CONCRETE IS EXPOSED DURING THIS CURING PERIOD SHALL BE MAINTAINED ABOVE 50° F. BUT NOT EXCEEDING - 150° F. ON THE SECOND DAY AFTER PLACING THE CONCRETE, THE PIPE MAY BE TIPPED INTO HORIZONTAL POSITION AND PLACED IN STORAGE. WHERE STEAM HAS NOT BEEN USED DURING THIS INITIAL CURING PERIOD, THE CONCRETE SHALL BE KEPT MOIST FOR A FURTHER PERIOD OF 5 DAYS BY INTERMITTENT SPRINKLING.

(F) IN LIEU OF THE MOIST CURING METHOD PREVIOUSLY DESCRIBED, THE MANUFACTURER MAY USE CURING COMPOUNDS OF THE EMULSIFIED ASPHALT OR SYNTHETIC RESIN TYPE. BUT SUCH COMPOUNDS MUST BE APPLIED TO THE CONCRETE AT SUCH TIME AS TO ASSURE THE RETENTION OF ADEQUATE MOISTURE FOR THE PROPER HYDRATION OF THE CEMENT.

(G) WHATEVER METHOD IS USED, HOWEVER, THE CURING SHALL PROCEED IN SUCH MANNER AND FOR SUCH A PERIOD AS TO ASSURE THE CONCRETE LINING ATTAINTING THE REQUIRED STRENGTH.

(H) THE CEMENT MORTAR COATING SHALL BE APPLIED TO THE CORES AFTER THEY HAVE BEEN WRAPPED UNDER TENSION WITH HIGH TENSIBLE WIRE. THE MORTAR USED FOR THIS COATING SHALL CONSIST OF ONE PART OF CEMENT TO NOT MORE THAN THREE PARTS OF FINE AGGREGATE, MEASURED BY VOLUME. THE MORTAR SHALL BE PLACED ON THE PIPE BY A MACHINE IN WHICH THE MORTAR, PREVIOUSLY MIXED, IS DRIVEN AGAINST THE EXTERIOR SURFACE OF THE CORE SO AS TO PRODUCE A DENSE COATING AROUND THE PIPE AND COVERING THE STEEL REINFORCING. UPON COMPLETION OF THE COATING OPERATION, THE PIPES SHALL BE PLACED WHERE THEY ARE PROTECTED FROM SUN, WIND AND RAIN AND AFTER THE MORTAR HAS HARDENED SUFFICIENTLY IT SHALL BE KEPT MOIST WITH WATER OR STEAM UNTIL THE FOLLOWING DAY OR FOR A PERIOD OF NOT LESS THAN TWELVE HOURS, AT WHICH TIME THE PIPES MAY BE PLACED IN THE STORAGE YARD. IF WATER IS USED FOR CURING, THE PIPES SHALL BE KEPT MOIST BY PERIODIC SPRINKLING FOR AN ADDITIONAL 3 DAYS AFTER BEING PLACED IN STORAGE. IN LIEU OF THE MOIST CURING METHOD, THE MANUFACTURER MAY USE CONCRETE CURING COMPOUNDS OF THE EMULSIFIED ASPHALT OR SYNTHETIC RESIN TYPE, PROVIDED THAT SUCH COMPOUNDS MUST BE APPLIED TO THE MORTAR AT SUCH TIME AS TO ASSURE THE RETENTION OF ADEQUATE MOISTURE FOR THE PROPER HYDRATION OF THE CEMENT.

(I) THE PIPE SHALL BE REINFORCED WITH A CONTINUOUS WELDED STEEL CYLINDER OF HOT ROLLED STEEL SHEETS NOT LIGHTER THAN 16 U.S. GAGE AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION: A 245-52T, GRADE B, SPECIFICATIONS FOR "HEAVY GAGE STRUCTURAL QUALITY FLAT HOT-ROLLED CARBON STEEL OPEN HEARTH", OR ANY SUBSEQUENT AMENDMENTS THERETO, AND ASTM DESIGNATION: A 242-52T, SPECIFICATIONS FOR "LOW-ALLOY STRUCTURAL STEEL" OR ANY SUBSEQUENT AMENDMENTS THERETO. EITHER OPEN HEARTH OR BESSEMER SHEETS HAVING PHYSICAL AND CHEMICAL QUALITIES EQUIVALENT TO THOSE MENTIONED MAY BE USED. WHERE THE PIPES ARE DESIGNED FOR SPECIAL CONDITIONS OR FOR HIGH OPERATING PRESSURES, THE CYLINDERS MAY BE MADE FROM HOT-ROLLED SHEETS OF SPECIAL ALLOY STEEL HAVING HIGHER ELASTIC LIMIT AND ULTIMATE STRENGTH THAN THOSE SPECIFIED. IN SUCH CASE THE SHEETS SHALL BE OF GOOD WELDING QUALITY AND SHALL CONFORM TO THE STEEL MANUFACTURER'S PUBLISHED SPECIFICATIONS FOR THE SPECIAL GRADE OF STEEL BEING SUPPLIED. EACH COMPLETED CYLINDER WITH JOINT RINGS, FILLING WITH WATER IN CONTACT AT ALL POINTS WITH WELDS, AND RAISING THE WATER PRESSURE TO STRESS THE CYLINDER TO A FIBRE STRESS OF 25,000 POUNDS PER SQUARE INCH. WHILE UNDER PRESSURE TEST, ALL WELDS SHALL BE THOROUGHLY INSPECTED. IF ANY LEAKS ARE FOUND, THEY SHALL BE REPAIRED AND THE CYLINDER SHALL BE RE-TESTED. THE FINISHED CYLINDER WITH JOINT RINGS ATTACHED SHALL BE WATER TIGHT UNDER THE REQUIRED TEST PRESSURE. ARC WELDING SHALL BE AN APPROVED PROCESS AND TEST WELDS SHALL BE FURNISHED FROM THE WORK AS REQUIRED.

(J) THE HIGH TENSIBLE WIRE USED FOR CIRCUMFERENTIAL REINFORCEMENT SHALL BE OF HIGH TENSILE PROPERTIES EITHER COLD DRAWN OF HIGH CARBON MB BASIC, UNTEMPERED ACCORDING TO THE DIAMETER OF THE PIPE AND THE PRESSURE FOR WHICH IT IS DESIGNED. THE TYPE OF WIRE TO BE USED SHALL BE DETERMINED BY THE MANUFACTURER AND SHALL CONFORM TO THE APPROPRIATE ASTM SPECIFICATIONS AS FOLLOWS:

ASTM DESIGNATION	A82-34	A227-47T
TITLE	COLD-DRAWN STEEL WIRE FOR CONCRETE REINFORCEMENT	HARD-DRAWN STEEL SPRING WIRE
MIN. ULTIMATE STRENGTH: 6 GA. U.S.S.	80,000 PSI	192,000 PSI
MIN. ELASTIC LIMIT: 6 GA. U.S.S.	64,000 PSI	100,000 PSI

THE ELASTIC LIMIT SHALL BE DETERMINED BY THE JOHNSON METHOD.

(K) THE THICKNESS OF SHEETS FOR THE STEEL CYLINDER AND THE DIAMETER OF WIRE USED AS WELL AS THE CENTERLINE SPACING AT WHICH IT IS PLACED AND THE TENSION UNDER WHICH IT IS WOUND AROUND THE LINED CYLINDER SHALL BE SUCH THAT THE ZERO COMPRESSION PRESSURE BE AT LEAST 50 POUNDS PLUS 1-1/4 TIMES THE STATIC PRESSURE. THE MAXIMUM CENTERLINE SPACING OF THE WIRE SHALL NOT EXCEED ONE INCH AND THE WIRE SHALL NOT BE LIGHTER THAN 6 GAUGE U.S.S. THE LINED CYLINDER SHALL NOT BE WRAPPED WITH WIRE UNTIL AT LEAST 6 DAYS AFTER PLACING OF THE CONCRETE.

(L) STEEL OF SPECIAL SECTION OF SPIGOT JOINT RINGS SHALL CONFORM TO ASTM DESIGNATION: A 31-52T, GRADE A, SPECIFICATIONS FOR "BOILER RIVET STEEL AND RIVETS".

(M) STEEL OF FLAT SECTION FOR BELL RINGS SHALL CONFORM TO ASTM DESIGNATION: A 245-46T, GRADE B, SPECIFICATION FOR "LIGHT GAGE STRUCTURAL QUALITY FLAT HOT-ROLLED CARBON STEEL" OR A 283-46T, GRADE A, SPECIFICATION FOR "STRUCTURAL QUALITY LOW AND INTERMEDIATE TENSILE STRENGTH CARBON STEEL PLATES," OR ANY SUBSEQUENT AMENDMENTS THERETO.

(N) FITTINGS OR SPECIALS SHALL BE FURNISHED AND INSTALLED AS SHOWN ON THE DRAWINGS FOR CONCRETE CYLINDER PIPE OR AS REQUIRED AND SHALL INCLUDE SPECIALS WITH BELL END, SPIGOT END, FLANGED END, AND VICTAULIC END OUTLETS, WITH ACCESS MANHOLES, AIR COCKS, PITOMETER AND DRAIN CONNECTIONS, ANCHOR RINGS, BENDS, TEST HEADS, CLOSURE PIECES, BEVEL AND PIPE, JOINT HARNESS, ETC. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER DETAILED DESIGNS AND SHALL RECEIVE HIS APPROVAL BEFORE THE CONSTRUCTION OF ANY SUCH SPECIALS. THE ZINC COATED JOINT RINGS SHALL MEET THE REQUIREMENTS OF ONE OF THE FOLLOWING ASTM SPECIFICATIONS: 3/16 BELL RINGS A 303-52T, GRADE A; 1/4" AND 5/16 BELL RINGS LESS THAN 6" IN WIDTH: A 31-52T, GRADE A; ALL SPIGOT RINGS A 31-52T, GRADE A.

(O) SPECIAL PIECES, SUCH AS TEES, WYES, OR BRANCH OPENINGS, SHALL ALSO BE OF CYLINDER CONSTRUCTION. IN ALL CASES, THE REINFORCEMENT SHALL ADEQUATELY COMPENSATE FOR THE OPENINGS IN THE PIPE WALL. IF THE SPECIAL PIECE IS PRESTRESSED, THEN THE AREA OF THE STEEL IN THE CYLINDER AND CAGE, IN ADDITION TO THE COMPENSATING REINFORCEMENT PREVIOUSLY MENTIONED, SHALL BE NOT LESS THAN THAT FOR THE ADJOINING PRESTRESSED STRAIGHT PIPE. IF THE SPECIAL PIECE IS NOT PRESTRESSED THEN THE ADDITIONAL AREA OF THE STEEL IN THE CYLINDER AND CAGE SHALL BE NOT LESS THAT THAT FOR THE ADJOINING STRAIGHT PIPE IF SUCH STRAIGHT PIPE WERE DESIGNED AS CONCRETE CYLINDER PIPE.

(P) THE OPENINGS IN THE SPECIAL MAY BE FORMED BY STEEL RINGS OR CASTINGS OF SUITABLE DESIGN SECURELY WELDED TO THE CYLINDER AND REINFORCING CAGE. ALL BENDS AND SPECIAL PIECES SHALL BE PROVIDED WITH JOINT RINGS CORRESPONDING TO THOSE IN THE STRAIGHT PIPE.

(Q) - ALL VERTICAL BENDS, WHERE THE DEFLECTION IS 15° OR GREATER, FLANGED PIPE BETWEEN THE VERTICAL BENDS, AND ALL CONCRETE CYLINDER PIPE REDUCERS SHALL BE CONSTRUCTED OF STEEL CYLINDERS OF 3/16" THICKNESS PLATE AND SHALL HAVE THE SAME LONGITUDINAL AND CIRCUMFERENTIAL STEEL IN THE CAGE AS THE ADJOINING STRAIGHT PIPE WOULD HAVE, IF SUCH STRAIGHT PIPE WERE DESIGNED AS CONCRETE CYLINDER PIPE.

(R) - CAST STEEL SADDLES AND FORGINGS OR THE EQUIVALENT IN FABRICATED STEEL PLATES SHALL BE WELDED TO THE STEEL CYLINDER FOR MANHOLE AND PIPE CONNECTIONS AND FOR DRAIN, PITOMETER, AND AIR COCK CONNECTIONS, AND SHALL BE DRILLED AND TAPPED AND PROVIDED WITH MALLEABLE IRON PLUGS.

(S) - UNLESS OTHERWISE SHOWN OR REQUIRED, THE ENDS OF EACH PIPE FOR TYPICAL FIELD JOINTS SHALL BE FORMED BY ZINC COATED STEEL JOINT RINGS SECURELY WELDED TO THE STEEL CYLINDERS, WITH THE RING FORMING THE BELL END COVERED ON THE EXTERIOR SURFACE WITH REINFORCED CONCRETE AND THE RING FORMING THE SPIGOT END LINED ON ITS INNER SURFACE WITH CONCRETE. THE SPIGOT RING SHALL HAVE A SUBSTANTIAL GROOVE ON ITS OUTER SURFACE FOR THE PURPOSE OF RECEIVING, HOLDING AND PROTECTING THE GASKET. THE JOINTS SHALL BE SELF-CENTERING AND THE RINGS FORMING THE JOINTS SHALL BE OF SUCH SHAPE AND DIMENSIONS THAT THE PIPE SHALL CENTER THEMSELVES WITHOUT THE AID OF THE RUBBER GASKET. THE WELDING OF THE JOINT RINGS TO THE CYLINDER PIPE SHALL CONSIST OF AT LEAST ONE FULL CONTINUOUS WELD FOR PIPE SECTIONS THAT ARE PROPERLY TESTED HYDRAULICALLY FOR STRENGTH AND WATER TIGHTNESS. FOR PIPE SECTIONS THAT HAVE TO BE CUT TO BE FITTED UP TO MAKE BENDS, SUCH CONSTRUCTION SHALL HAVE DOUBLE CONTINUOUS WELDS. LIKEWISE ANY SPECIAL CONSTRUCTION SUCH AS FOR OUTLETS OR FOR PIPE HAVING SPECIAL ENDS SHALL HAVE DOUBLE CONTINUOUS WELDS.

(T) - THE GASKET SEALING THE JOINT SHALL BE OF SPECIAL COMPOSITION RUBBER HAVING A TEXTURE TO SECURE A PERMANENTLY WATERTIGHT SEAL. THE TYPE OF GASKET FURNISHED SHALL HAVE BEEN IN SATISFACTORY USE IN COMPARABLE INSTALLATIONS FOR NOT LESS THAN FIVE (5) YEARS.

(U) - ACCESS CONSTRUCTION MANHOLES IN ADDITION TO THOSE SHOWN ON THE DRAWINGS SHALL BE LOCATED AS REQUIRED TO PROVIDE EASY ACCESS FOR FIELD WELDING AND PLACING OF MORTAR AS REQUIRED FOR FIELD JOINTS.

(V) - T ESTING BULKHEADS SHALL BE FURNISHED AND INSTALLED FOR TESTING ANY COMPLETED SECTIONS OF THE PRESTRESSED CONCRETE CYLINDER PIPE MAINS AS MAY BE REQUIRED.

(W) - ALL STEEL FOR CASTINGS SHALL CONFORM TO THE SPECIFICATIONS FOR GRADE 70-36 STEEL CASTINGS, AS GIVEN IN THE "STANDARD SPECIFICATIONS FOR MILD-TO-MEDIUM-STRENGTH CARBON-STEEL CASTINGS FOR GENERAL INDUSTRIAL USE, ASTM DESIGNATION: A 27-52T."

(X) - ALL STEEL FORGINGS SHALL CONFORM TO "STANDARD SPECIFICATIONS FOR CARBON-STEEL FORGINGS, ASTM DESIGNATION: A 235-52T."

(Y) - ALL FORGED OR ROLLED STEEL PIPE FLANGES SHALL CONFORM TO THE "STANDARD SPECIFICATIONS FOR FORGED OR ROLLED STEEL PIPE FLANGES FOR GENERAL SERVICE, ASTM DESIGNATION: A 181-49, GRADE 1."

(Z) - ALL STRUCTURAL STEEL INCLUDING ANGLES FOR ANCHOR RINGS SHALL CONFORM TO TENTATIVE SPECIFICATIONS FOR STEEL FOR BRIDGES AND BUILDINGS, ASTM DESIGNATION: A 7-52T."

(AA) - ALL CAST IRON PIPE AND FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF THESE SPECIFICATIONS.

(BB) - ALL WROUGHT IRON USED SHALL CONFORM TO "STANDARD SPECIFICATIONS FOR ROLLED WROUGHT IRON SHAPES AND BARS, ASTM DESIGNATION: A 207-39," AND ALL SUBSEQUENT AMENDMENTS THERETO.

(CC) - IRON CASTINGS MUST BE SMOOTH AND FREE FROM BLOHOLES AND OTHER DEFECTS AND THE MATERIAL SHALL CONFORM TO "STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS, ASTM DESIGNATION: A 48-48, CLASS NO. 30," AND ALL SUBSEQUENT AMENDMENTS THERETO.

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(DD) - CLOSURE PIECES WITH FOLLOWER RING JOINTS SHALL BE PROVIDED AS SHOWN ON CONTRACT DRAWINGS OR AS APPROVED BY THE ENGINEER. THE CLOSURE SHALL BE MEASURED IN THE TRENCH AND CUT TO FIT. THE JOINTS WILL BE FIELD WELDED AS SHOWN ON CONTRACT DRAWINGS, IF REQUIRED.

(EE) - TESTS, INSPECTION, REPORTS AND ANALYSES OF TESTS OF SAMPLES FOR ALL MATERIALS SHALL BE FURNISHED IN ACCORDANCE WITH PREVIOUS INSTRUCTIONS IN THESE NOTES.

MARKING

EACH PIPE AND SPECIAL SHALL HAVE CONSPICUOUSLY PAINTED IN BLACK ON THE INSIDE, A SERIAL NUMBER FOR THE PURPOSE OF IDENTIFICATION. SERIAL NUMBERS SHALL AGREE WITH LISTS TO BE FURNISHED TO THE ENGINEER. THE TOP CENTER LINE OF ALL SPECIAL FITTINGS AND EACH PIPE THAT HAS A BEVELED END SHALL HAVE A WHITE RING PAINTED IN THE SHOP AROUND THE MARK BOTH ON THE INSIDE AND OUTSIDE OF THE PIPE.

TIED HARNESS JOINTS AND TYPICAL FIELD JOINTS

THE CONTRACTOR SHALL MAKE ALL TIED JOINTS WHERE REQUIRED ON THE ALIGNMENT DRAWINGS CONFORM WITH THE RESPECTIVE DETAILS OF THE CONTRACT DRAWINGS OR AS APPROVED BY THE ENGINEER. THE ANNULAR RECESSES AT THE JOINT, BOTH INSIDE AND OUTSIDE OF THE PIPE, SHALL BE FILLED WITH CEMENT MORTAR MIXED IN A PROPORTION OF NOT LESS THAN 1:2.

VICTAULIC TYPE COUPLINGS

(A) - WHERE SHOWN ON THE DRAWINGS OR WHERE REQUIRED, THE CONTRACTOR SHALL FURNISH AND INSTALL VICTAULIC TYPE COUPLINGS FOR CONNECTION OF LINE VALVES TO PRESTRESSED CONCRETE CYLINDER PIPE REDUCERS. STEEL PIPE ENDS SHALL BE FABRICATED AND GROOVED AS INDICATED ON THE DRAWINGS. THE COUPLINGS SHALL BE ADAPTED FOR INSTALLATION ON SHOULDERED END CAST IRON SPACERS, REDUCERS AND FITTINGS AND DESIGNED FOR NOT LESS THAN THE WORKING PRESSURE NOTED ON THE CONTRACT DRAWINGS. COUPLINGS SHALL BE COMPOSED OF MALLEABLE IRON HOUSINGS HELD TOGETHER WITH STEEL BOLTS HEAT TREATED AND WITH A CONTINUOUS HOLLOW, MOLDED RUBBER SEALING RING, OF SUCH TYPE THAT THE SEAL BECOMES TIGHT AS THE PRESSURE WITHIN THE PIPE INCREASES. THE JOINTS SHALL BE CONSTRUCTED AND INSTALLED AND BE EQUAL IN ALL RESPECTS TO THOSE MANUFACTURED BY THE VICTAULIC COMPANY OF AMERICA. MALLEABLE HOUSINGS SHALL CONFORM TO THE "STANDARD SPECIFICATIONS FOR MALLEABLE IRON CASTINGS, ASTM DESIGNATION: A 47-48." BOLTS SHALL BE MANUFACTURED BY THE COUPLING MANUFACTURER AND SHALL BE HEAT TREATED STEEL BOLTS HAVING 100,000 PSI TENSILE STRENGTH.

(B) - ALL METAL PARTS OF THE COUPLINGS SHALL BE COATED AT THE SHOP WITH ONE COAT OF BITUMINOUS PRIMER FURNISHED BY THE SAME MANUFACTURER WHO FURNISHED THE COATINGS AS SPECIFIED UNDER "COATING."

SHOP COATING AND PAINTING

(A) - THE EXPOSED SURFACED OF THE STEEL ENDS OF SPIGOT, BELL VICTAULIC OR FLANGED STEEL OUTLET CONNECTIONS AND THE FLANGED ENDS OF CONCRETE PIPE, ETC., SHALL BE CLEANED PRIMED AND ENAMELED INSIDE AND OUTSIDE IN ACCORDANCE WITH THE AWWA SPECIFICATIONS C 203-51 AND C 204-51. THE ENAMEL SHALL BE TYPE A. THE COATING MAY BE APPLIED BY BRUSH OR SPRAY. ALL COATINGS SHALL BE APPLIED IN THE SHOP BEFORE SHIPMENT. THE OUTSIDE COATING SHALL STOP AGAINST THE FLANGES AT ENDS OF PIPE SECTIONS.

(B) - ZINC COATED PIPE ENDS FOR RUBBER GASKET JOINTS ARE NOT TO BE COATED.

(C) - NO PRIMER OR COATING IS REQUIRED FOR THE GROOVED STEEL BANDS AT THE ENDS OF THE CONCRETE CYLINDER PIPE TO RECEIVE VICTAULIC TYPE COUPLINGS.

(D) - ALL FINISHED SURFACES SHALL BE COATED WITH WHITE LEAD AND TALLOW OR EQUAL AND NOT PRIMED.

(E) - AFTER ERECTION ALL EXPOSED OR DAMAGED COATINGS ON SURFACES BURIED UNDER GROUND, ALL BOLTS ON FLANGES AND VICTAULIC COUPLINGS SHALL BE CLEANED AND PAINTED WITH THREE FIELD COATS OF INERTOL 50 OR BITUMASTIC 50 OR EQUIVALENT.

TRANSPORTATION AND DELIVERY

(A) - THE CONTRACTOR SHALL TRANSPORT, DELIVER AND DISTRIBUTE ALONG THE LINE OF THE WORK, THE PIPE, SPECIALS AND APPURTENANCES.

(B) - PIPE SHALL BE LOADED FOR SHIPMENT UPON SUITABLE CARS OR TRUCKS WHICH SHALL BE PROVIDED WITH WOODEN SKIDS. IN LOADING AND UNLOADING THE PIPE MORE THAN ORDINARY CARE MUST BE TAKEN TO PREVENT ANY INJURY TO THE CONCRETE CYLINDER PIPE* STEEL PIPE ENDS AND PROTUBERANT STEEL CONNECTIONS. SUCH WORK MUST BE DONE SLOWLY WITH THE PIPE AT ALL TIMES UNDER PERFECT CONTROL, AND UNDER NO CONDITION SHALL THE PIPE BE DROPPED.

(C) - IN DISTRIBUTING THE PIPE IN THE FIELD EACH PIPE MUST BE PLACED AS NEARLY AS POSSIBLE TO THE POINT WHERE IT IS TO BE LAID, AND FACING IN THE PROPER DIRECTION. SUITABLE SKIDS OR BLOCKS MUST ALSO BE LEFT UNDER EACH PIPE, AND THE PIPE SECURELY WEDGED IN PLACE TO PREVENT ITS BEING MOVED UNTIL REQUIRED. A STEEL CABLE SLING SHALL BE USED FOR ROLLING OR LIFTING PIPE. NO IRON CHAINS SHALL BE USED. PIPE WHICH HAS BEEN IMPROPERLY DISTRIBUTED AND WHICH MUST BE MOVED LONGITUDINALLY ALONG THE TRENCH SHALL BE RELOADED ON A WAGON, OR LIFTED AND SWUNG BY A DERRICK OR MOVED BY SUCH MEANS AS MAY BE SATISFACTORY TO THE DIRECTOR.

(D) - IF, IN THE PROCESS OF MANUFACTURE, TRANSPORTATION, OR HANDLING, ANY CONCRETE PIPE OR SPECIAL RECEIVES ANY INDENTATION OR DEFORMATION TO THE CONCRETE, STEEL ENDS OR CONNECTIONS, THE REMOVAL OF WHICH WILL IN ANY DEGREE INJURE IT, SUCH PIPE OR SPECIAL SHALL BE REJECTED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

(E) - PIPE WHICH IS PLACED IN STORAGE, STREETS OR DRIVES MUST BE SO ARRANGED AS NOT TO CAUSE UNDUE INCONVENIENCE TO TRAFFIC AND MUST BE PROTECTED SUFFICIENTLY TO PREVENT INJURY TO THE CONCRETE CYLINDER PIPE, AND THE COATING OF THE STEEL ENDS AND CONNECTIONS.

MATERIALS DATA WITH PROPOSAL

EACH BIDDER SHALL SUBMIT WITH HIS PROPOSAL, AND IN THE FORM PROVIDED, THE INFORMATION CALLED FOR BELOW:

1. NAME OF PIPE MANUFACTURER AND LOCATION OF PLANT.
2. NAME OF COUPLING MANUFACTURER AND LOCATION OF PLANT.
3. PIPE COATING AND LINING DATA.

DRAWINGS

(A) - THE CONTRACTOR SHALL SUBMIT TO THE DIRECTOR FOR APPROVAL, DUPLICATE PRINTS OF ALL SHOP DRAWINGS FOR CONCRETE PIPE, FITTINGS AND SPECIALS, AND MISCELLANEOUS DETAILS, SUCH AS AIR COCK AND DRAIN FORGINGS, CASTINGS, ETC.

(B) - THE CONTRACTOR SHALL ALSO FURNISH AND ASSEMBLY PLAN FOR THE ENTIRE LENGTH OF THE PIPE LINE FOR WHICH CONCRETE PIPE IS FURNISHED UNDER THE APPROPRIATE ITEMS. THIS ASSEMBLY PLAN SHALL ALSO SHOW THE CORRECT LOCATION OF ALL FITTINGS FURNISHED.

(C) - ONE PRINT OF EACH OF THE DRAWINGS SUBMITTED WILL BE RETURNED WITH THE CRITICISMS OR APPROVAL OF THE DIRECTOR. IN CASE THE DRAWINGS ARE NOT APPROVED, THE CONTRACTOR SHALL AGAIN SEND FOR APPROVAL, DUPLICATE REVISED PRINTS OF THE DRAWINGS TO TAKE CARE OF THE CRITICISMS NOTED, AND AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED, THE CONTRACTOR SHALL AGAIN FURNISH TO THE DIRECTOR EIGHTEEN (18) ADDITIONAL PRINTS, SIXTEEN (16) ON PAPER AND TWO (2) ON CLOTH, OF EACH DRAWING. NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED.

(D) - THE APPROVAL OF THE DRAWINGS BY THE DIRECTOR SHALL NOT RELIEVE THE CONTRACTOR OF ANY OF HIS OBLIGATIONS IN CONNECTION WITH THIS CONTRACT.

EXPERIENCE QUALIFICATIONS

ALL BIDDERS WILL BE REQUIRED TO SHOW TO THE SATISFACTION OF THE DIRECTOR THAT THE TYPE AND SIZE OF PIPE AND FITTINGS HE PROPOSED TO FURNISH, WILL BE MADE BY A MANUFACTURER WHOSE PIPE HAS BEEN SUCCESSFULLY USED FOR LIKE WORK OUTSIDE OF THE BUILDER'S WORKS FOR A PERIOD OF NOT LESS THAN FIVE YEARS!

MEASUREMENT

THE NUMBER OF LINEAR FEET OF WATER MAIN TO BE PAID FOR UNDER ITEM 1 FOR PRESTRESSED CONCRETE CYLINDER PIPE SHALL BE THE ACTUAL NUMBER OF LINEAR FEET FURNISHED AND PLACED IN ACCORDANCE WITH THESE SPECIFICATIONS AS MEASURED ALONG THE AXIS OF THE MAIN INCLUDING FITTINGS AND VALVES CONNECTED UP IN PLACE.

PAYMENT

(A) - THE UNIT PRICE STIPULATED TO BE PAID FOR EACH LINEAR FOOT OF CONCRETE PIPE WATER MAIN SHALL INCLUDE THE FURNISHING, LAYING, PAINTING AND INSPECTION AND TESTING OF PRESTRESSED CONCRETE PIPE, CONCRETE CYLINDER FITTINGS, CAST IRON PIPE AND FITTINGS, VICTAULIC AND DRESSER COUPLINGS, THE EXCAVATION, SHEETING AND SHORING, BACKFILLING, SAND BACKFILLING, SEEDING AND SODDING, SIDEWALK REPLACEMENT, AND THE TEMPORARY AND PERMANENT REPAVING FOR THE ABOVE MAIN AND FOR SERVICE CONNECTION CHANGES BY THE CITY WATER DEPARTMENT, AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS, APPLIANCES AND EQUIPMENT TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

(B) - PAYMENT FOR ITEMS OTHER THAN CONCRETE PIPE WILL BE AS OTHERWISE STIPULATED IN THESE NOTES.

EXTRA CONCRETE PRESSURE PIPE FITTINGS

WORK INCLUDED

(A) - THE CONTRACTOR SHALL FURNISH ALL THE MATERIALS FOR AND SHALL PROPERLY INSTALL ALL THE CONCRETE PRESSURE PIPE FITTINGS OF THE VARIOUS SIZES SPECIFIED WHICH ARE NOT SHOWN ON THE CONTRACT DRAWINGS OR ON APPROVED SHOP DRAWINGS AND WHICH ARE ORDERED INSTALLED BY THE DIRECTOR IN ORDER TO CHANGE LINE OR GRADE TO AVOID OBSTACLES PREVIOUSLY UNKNOWN, OR TO MEET OTHER FIELD CONDITIONS, AND ANY OUTLET CONNECTIONS FOR DRAINS, AIR COCKS OR OTHER USE WHICH MAY BE REQUIRED DUE TO FIELD CONDITIONS, AND INCLUDING ALL EXTRA EXCAVATION, SHEETING, SHORING, BACKFILLING, SAND BACKFILL, SEEDING, SODDING AND TEMPORARY AND PERMANENT REPAVING REQUIRED THEREFOR FOR THE PROPER COMPLETION OF THE WORK UNDER THIS CONTRACT.

(B) - IN GENERAL, THE WORK OF THIS ITEM SHALL INCLUDE BEVELS, HALF BEVELS, ADAPTERS, ELBOWS, TANGENTIAL OUTLET PIECES AND PIPES WITH SMALL OUTLETS (WITH OR WITHOUT TIED JOINTS) WHICH WERE NOT SHOWN ON APPROVED SHOP DRAWINGS AND WHICH ARE ORDERED INSTALLED BY THE DIRECTOR.

(C) - THE PROVISIONS OF THIS ITEM SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITIES TO INVESTIGATE EXISTING FACILITIES AS INDICATED UNDER NOTES AND SPECIFICATIONS, NOR TO USE LESS THAN NORMAL DILIGENCE IN EXCAVATING OR LAYING PIPE TO ANTICIPATE POSSIBLE DIFFICULTIES.

CONCRETE PRESSURE PIPE FITTINGS

ALL FITTINGS TO BE FURNISHED AND INSTALLED UNDER THIS ITEM SHALL BE MANUFACTURED AND INSTALLED IN FULL CONFORMANCE WITH THE REQUIREMENTS OF ITEM "PRESTRESSED CONCRETE CYLINDER PIPE" OF THESE SPECIFICATIONS. JOINTS, MARKING, SHOP COATING, PAINTING, TESTING AND CHLORINATING SHALL CONFORM TO THE REQUIREMENTS OF ITEM "PRESTRESSED CONCRETE CYLINDER PIPE", AND DRAWINGS SHALL BE SUBMITTED AND APPROVED AS REQUIRED THEREIN.

PAYMENT

(A) - THE UNIT PRICE STIPULATED PER EACH FOR THE VARIOUS SIZES OF EXTRA CONCRETE PRESSURE PIPE FITTINGS, SHALL BE IN FULL COMPENSATION FOR THE FURNISHING AND INSTALLING OF SUCH EXTRA FITTINGS AS ARE ORDERED BY THE DIRECTOR AND WHICH ARE NOT SHOWN ON THE CONTRACT DRAWINGS OR APPROVED SHOP DRAWINGS, AND SHALL INCLUDE ANY EXTRA EXCAVATION, SHEETING, SHORING, BACKFILLING, SAND BACKFILL, SEEDING, SODDING, AND TEMPORARY AND PERMANENT REPAVING REQUIRED THEREFOR, AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

(B) - NO DEDUCTION WILL BE MADE IN THE LENGTHS OF PIPE AND FITTINGS TO BE PAID FOR UNDER ITEM "PRESTRESSED CONCRETE CYLINDER PIPE", WHERE EXTRA FITTINGS ARE ORDERED TO BE INSTALLED AND, LIKEWISE, NO PAYMENT WILL BE MADE FOR EXTRA FITTINGS WHICH ARE INSTALLED FOR THE CONVENIENCE OF THE CONTRACTOR WITHOUT SPECIFIC ORDERS FROM THE DIRECTOR.

(C) A QUANTITY OF 1-EACH EXTRA PIPE FITTING HAS BEEN SET UP IN THE SUMMARY (SHEET No. 144) FOR USE AS DIRECTED BY THE ENGINEER.

SERVICE CONNECTION AND WATER METERS RELOCATED

WORK INCLUDED (Continued from 1st column sheet No. 152)
The Cleveland Water Department will make the tap connection, reset meters and meter vaults and extended connections only. The city will charge the contractor the following unit price:

For House Connection, Reconnection or Relocated
3/4" - $50.00
1" - 75.00
1-1/2" - 185.00
2" - 280.00

For Resettling Meters
3/4" - $25.00
1" - 30.00
1-1/2" - 185.00
2" - 280.00

For Building or Resetting Meter Vaults
3/4" - $110.00
1" - 110.00
1-1/2" - 125.00

The Contractor shall do all necessary excavation, backfilling and repaving required in making these service connections and alterations and costs thereof shall be included in the unit price bid for "Service Connections" or "Water Meters Relocated".

BRICK AND PLAIN CONCRETE MASONRY

Manhole Construction (Continued from 2nd column sheet No. 152)
(A) - All brick manholes, brick necks and extensions shall be built in accordance with the contract drawings.
(B) - The walls of manholes shall be built of No. 2 shale brick laid in 1:3 portland cement mortar, with brick arranged radially as headers, forming a wall nine inches thick. In deep manholes the wall shall be 13" thick below a point 12' from the surface. Below the exterior of the sewer, in sewer manholes, the masonry of the manhole must conform to that of the sewer proper. All of the brick composing said manholes shall be laid in full mortar beds and joints, with no mortar joints appearing on the inner surface of the manhole exceeding three-eighths inches (3/8") thick.
(C) - The top of the walls of manholes shall be properly leveled off with mortar so as to form a flat surface upon which the cast iron manhole ring is to rest, and said manhole shall be carried to proper height as indicated by the contract drawings.
(D) - The entire outer surface of all brick manholes shall be plastered with a smooth coating of 1:3 portland cement mortar, at least one-half (1/2) inch thick.

Payment
Payment shall be made on the unit price bid per cubic yard of Brick Masonry or Concrete Masonry complete and accepted in place. Payment for concrete piers shall be included in the unit price bid for the pipe.

REVISED C.E.H 1-22-65

CUYAHOGA COUNTY
CUY-71-13.68

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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SCALE 1"=50'

NOTE:
ALL TAP Nos SHOWN WILL BE ABANDONED UNLESS OTHERWISED NOTED.

LEGEND

- RELOCATED WATER MAIN & VALVES — 6"WM
- EXISTING WATER MAIN & VALVES — 6"WM
- EXISTING WATER MAIN TO BE ABANDONED — 6"WM
- CONNECTIONS TO BE PLUGGED AT MAIN — 6"WM
- PLUGS, CAPS, OR FLUSHING PIPES AS NOTED — 6"WM
- HYDRANT (NEW) & VALVES
- HYDRANT (EXISTING) & VALVES — 6"WM

1ST. HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED _____, 19__

_____ DIRECTOR OF PUBLIC UTILITIES
_____ COMMISSIONER OF WATER AND HEAT
_____ COMMISSIONER - DIVISION OF UTILITIES - ENGINEERING
_____ ENGINEER OF CONSTRUCTION & SURVEYS
_____ ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS - CLEVELAND, OHIO

MEDINA FREEWAY
GENERAL PLAN
WATERLINE RELOCATION
(CUY. 71-13.68)

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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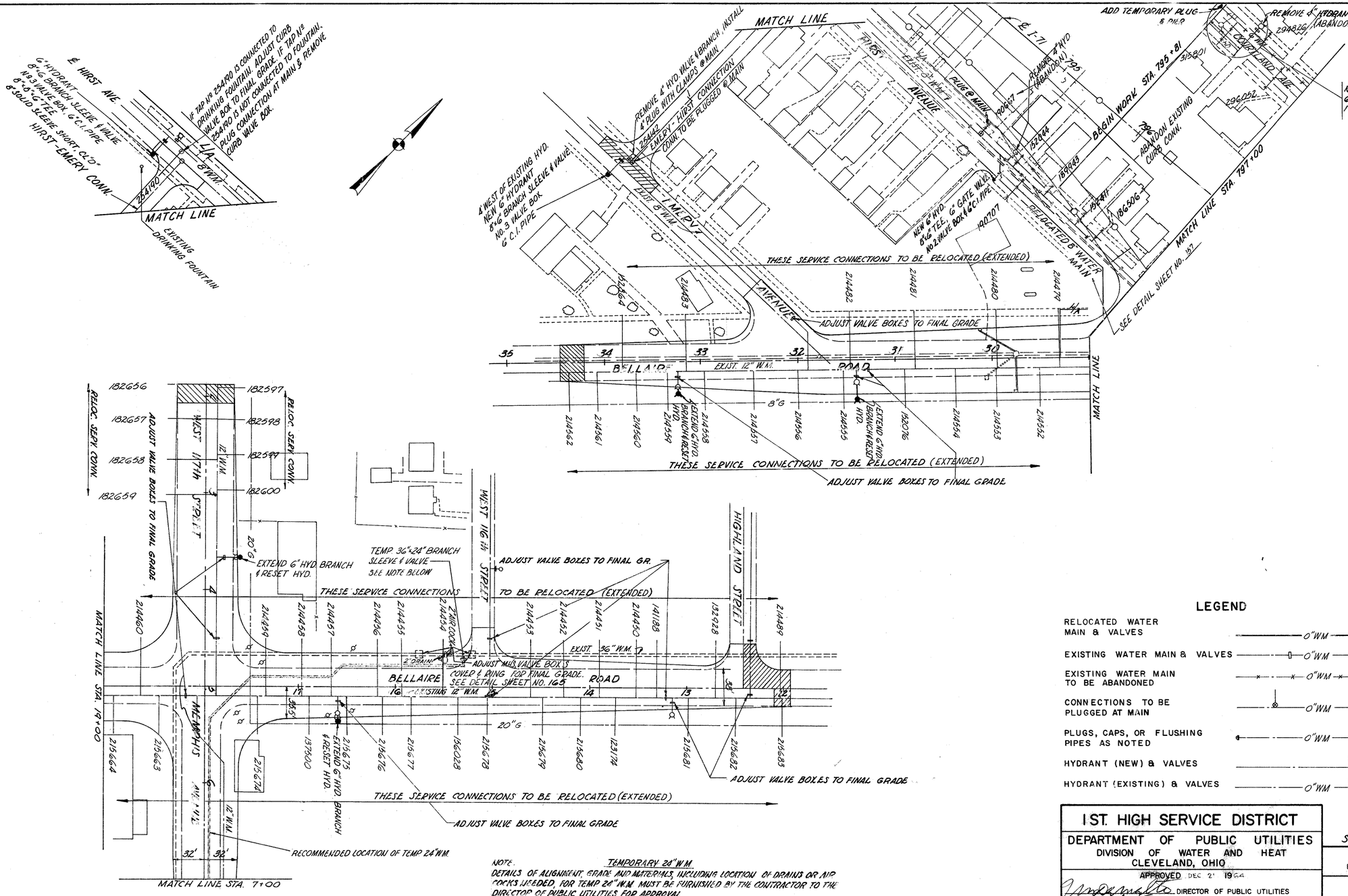
CUYAHOGA COUNTY
CUY-71-13.68

NOTE
6" VALVE IN COURTLAND AVE. (ON THIS LINE) 18'6 LEFT I-71 STA. 791+00.



NOTE: TEMPORARY 24" W.M.
DETAILS OF ALIGNMENT, GRADE AND MATERIALS, INCLUDING LOCATION OF DRAINS OR AIR COCKS NEEDED, FOR TEMP. 24" W.M. MUST BE FURNISHED BY THE CONTRACTOR TO THE DIRECTOR OF PUBLIC UTILITIES FOR APPROVAL.
SEE WATERWORK NOTES FOR OTHER SPECIFICATIONS AND METHOD OF PAYMENT. UPON COMPLETION OF NEW 36" W.M., THE TEMPORARY 24" W.M. SHALL BE DISCONNECTED FROM THE 36" W.M. SEE NOTE SHEET 161 FOR DETAILS

LEGEND

RELOCATED WATER MAIN & VALVES	0"WM
EXISTING WATER MAIN & VALVES	0"WM
EXISTING WATER MAIN TO BE ABANDONED	0"WM
CONNECTIONS TO BE PLUGGED AT MAIN	0"WM
PLUGS, CAPS, OR FLUSHING PIPES AS NOTED	0"WM
HYDRANT (NEW) & VALVES	
HYDRANT (EXISTING) & VALVES	0"WM

SCALE: 1"=50'

1ST. HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED DEC 2' 19G4

DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER AND HEAT
COMMISSIONER - DIVISION OF UTILITIES-ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS-CLEVELAND, OHIO

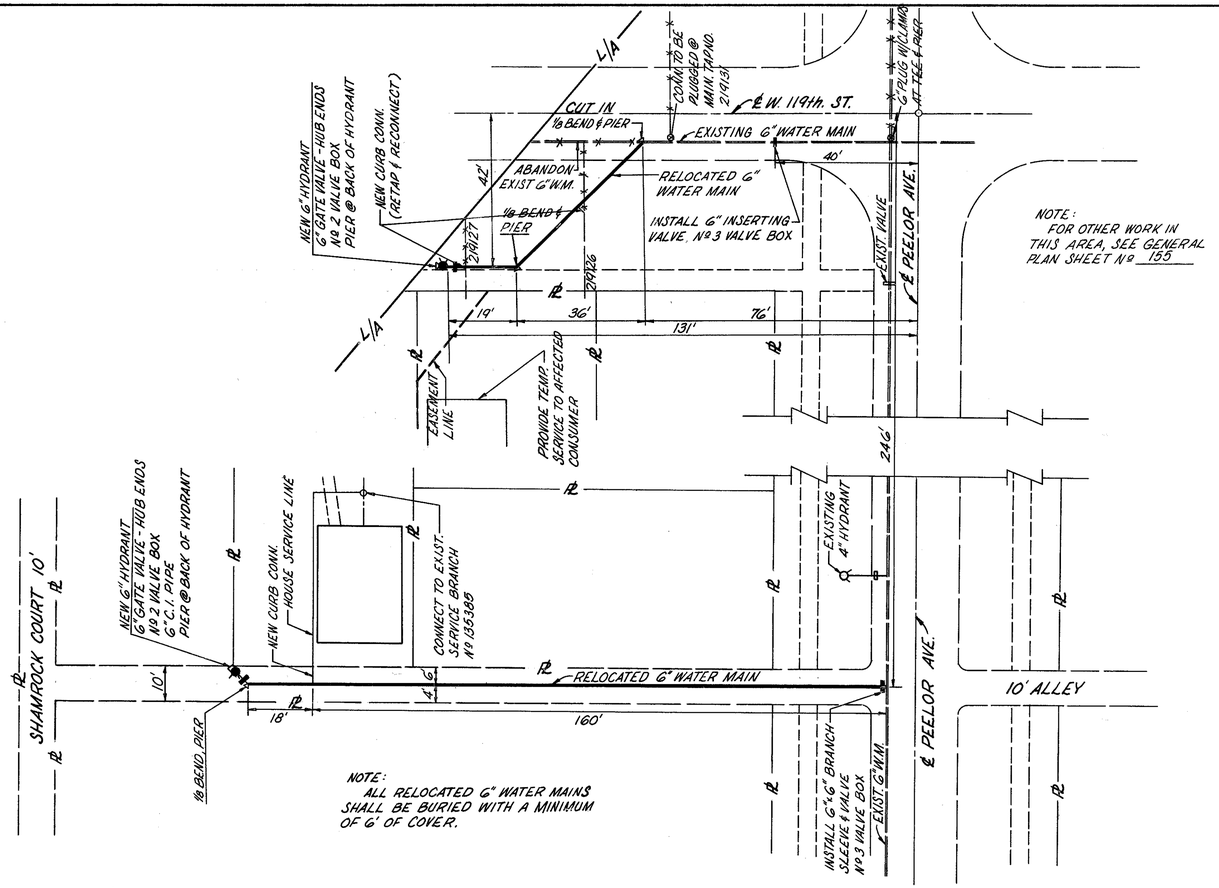
MEDINA FREEWAY
GENERAL PLAN
WATERLINE RELOCATION
(CUY. 71-13.68)

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

156A
279

CUYAHOGA COUNTY
CUY-71-13.68



NOTE:
ALL RELOCATED 6" WATER MAINS SHALL BE BURIED WITH A MINIMUM OF 6' OF COVER.

1ST. HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED DEC. 21, 1964.

DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER AND HEAT
COMMISSIONER - DIVISION OF UTILITIES - ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ENGINEER OF DESIGN

HORIZONTAL & VERTICAL SCALE: 1"=20'

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS-CLEVELAND, OHIO

RELOCATED 6" WATER MAIN IN ALLEY WEST OF W. 119th ST. AND WATERWORK IN W. 119th ST.

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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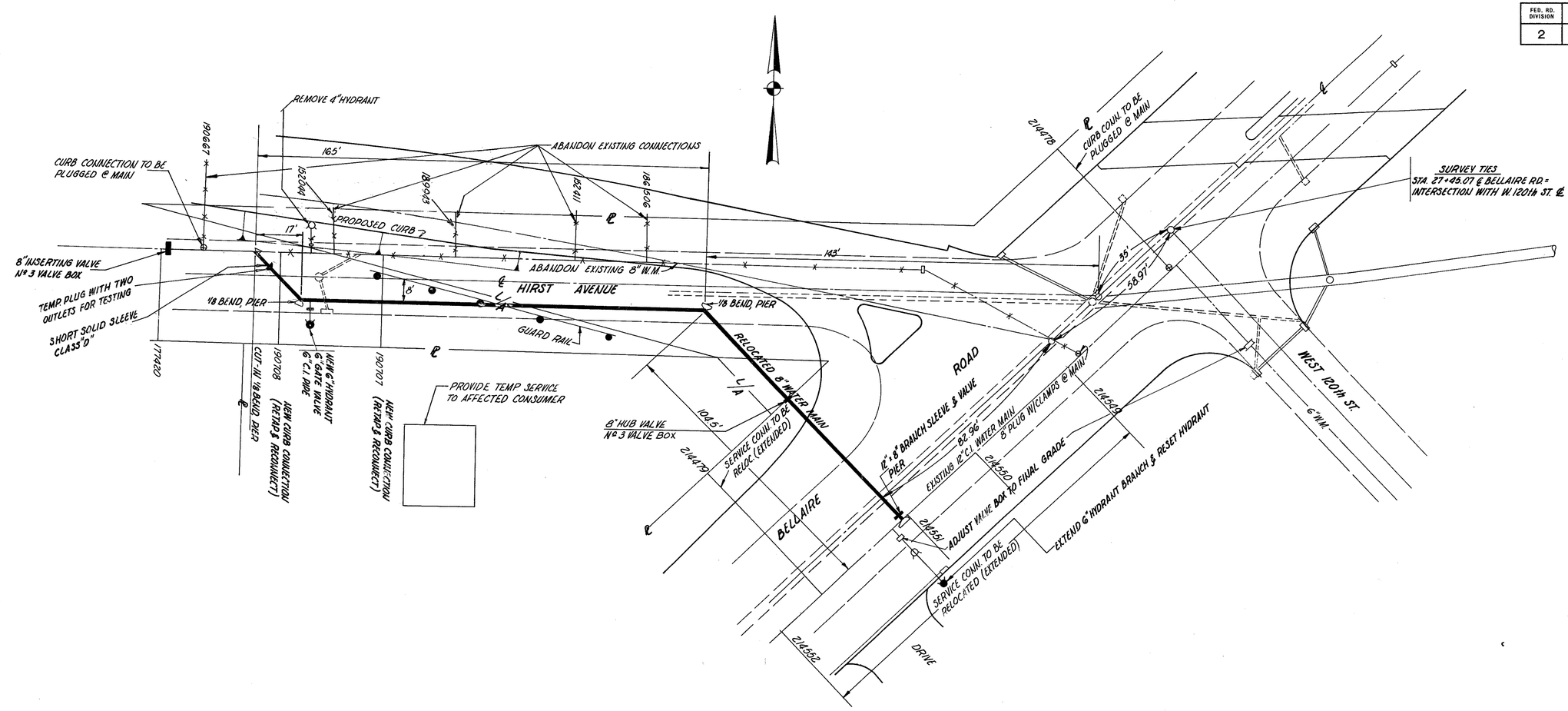
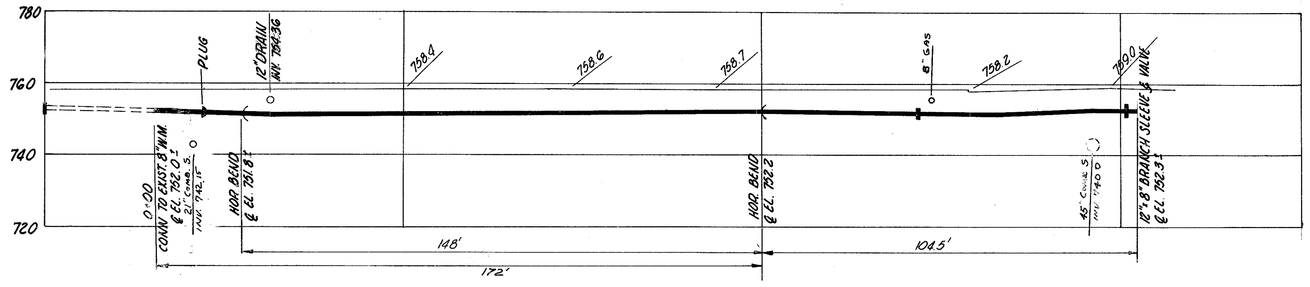
279

CUYAHOGA COUNTY
CUY-71-13.68





HORIZONTAL & VERTICAL SCALE: 1" = 20'

I ST. HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED DEC. 21, 1964.

DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER AND HEAT
COMMISSIONER - DIVISION OF UTILITIES - ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS - CLEVELAND, OHIO

MEDINA FREEWAY
RELOCATED 8" WATER MAIN
AT
BELLAIRE - HIRST INTERSECTION

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

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CUYAHOGA COUNTY
CUY-71-13.68

RELOCATED 12" WATER MAIN

0+00 ℄ EXISTING TEE - 10' LT. STA. 21+08.29 BELLAIRE ℄

0+40 12" GATE VALVE - MJ ENDS No. 4 VALVE BOX

1+22 Vert. Bend B & S

1+25.48 1/8 Bend B & S PIER

0+60 Vert. Bend

LEAD JOINTS

EXIST. W.M. 0+18 1/8 BEND PIER B & S

CONC. ANCHOR, LOCATED AT BELL

SEE DETAIL "A"

PROVIDE TEMP. PLUG WITH TWO OUTLETS FOR TESTING AND CHLORINATING

1/8 BEND & PIER

SLEEVE

0+33, 12" INSERTING VALVE No. 4 VALVE BOX

EXIST. VALVE

SURVEY TIES
STA. 21+00.29 ℄ BELLAIRE = INTERSECTION OF ℄'S BELLAIRE & WEST 118th. ST.

WEST 119th ST.

2+00

3+00

15" STORM JEWER

℄ I-71

4+00

4+26 Vert. Bend

114" STORM SEWER

LEAD JOINTS

5+51.78 VERT. BEND

5+61.19 1/8 BEND PIER

SEE GENERAL NOTES FOR TESTING & CHLORINATING ALL NEW WATER MAIN

6+00

EASEMENT LINE

48" COMB SEWER

WEST 120th ST.

6+76.66 1/8 BEND B & S PIER

7+03 12" INSERTING VALVE, NO. 4 VALVE BOX

EXIST. 12" W.M.

REMOVE EXIST. HYDRANT

ABANDON 12" W.M.

REMOVE EXIST. HYDRANT

12" W.M.

S. 47° 01' 51" W.

No. 6 Circular "C" Brick

BELLAIRE AVENUE

PROVIDE TEMP. PLUG WITH TWO OUTLETS FOR TESTING AND CHLORINATING

SLEEVE

1/8 BEND & PIER

7+07.74 ℄ EXIST. 12"x12"x6" TEE = 11' LT. STA 27+54.07 BELLAIRE ℄

ABANDON

COURTLAND AVE.

2 WEST 118th ST.

DETAIL "A"
CONNECTION @ W. 118th & BELLAIRE

0+33 12" INSERTING VALVE No. 4 VALVE BOX

0+00 EXISTING ℄ 12"x12"x6" TEE

0+18 12½° 1/8 BEND, PIER

C.I. PIPE

SLEEVE

DETAIL "B"
CONNECTION @ W. 120th & BELLAIRE

SURVEY TIES
STA. 27+48.07 ℄ BELLAIRE = INTERSECTION OF ℄'S BELLAIRE & WEST 120th ST.

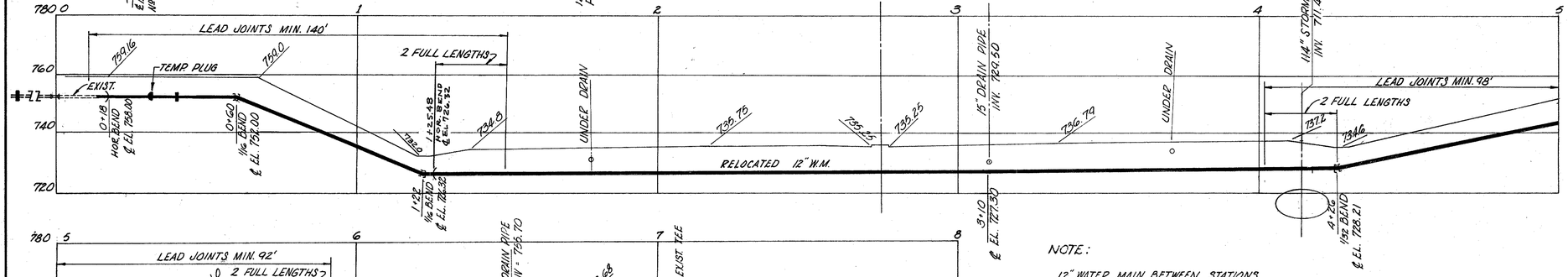
7+03 12" INSERTING VALVE NO. 4 VALVE BOX

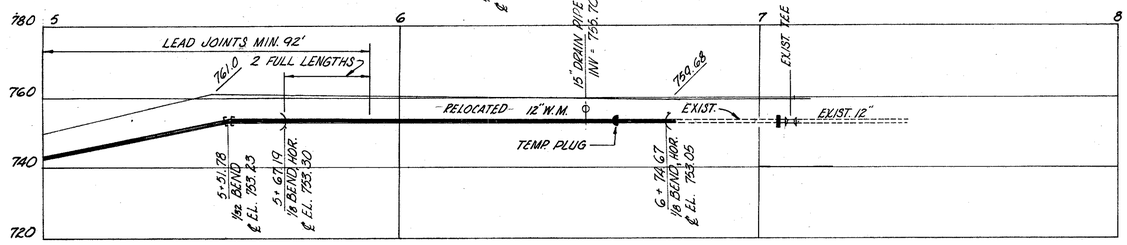
7+07.74 12"x12"x6" TEE

℄ EXISTING 12"x12"x6" TEE

6"x6"x6" 1/8 BEND B&S

12" — 1/8 BEND PIER





PROFILE RELOCATED 12" WATER MAIN

NOTE:

12" WATER MAIN BETWEEN STATIONS 1+22 & 4+26 TO BE CEMENT LINED DUCTILE IRON PIPE, CLASS 25 PIPE

HORIZONTAL & VERTICAL SCALES: 1" = 20'

1ST. HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED, DEC. 21, 1964.

DIRECTOR OF PUBLIC UTILITIES

COMMISSIONER OF WATER AND HEAT

COMMISSIONER - DIVISION OF UTILITIES - ENGINEERING

ENGINEER OF CONSTRUCTION & SURVEYS

ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

MEDINA FREEWAY
RELOCATION OF 12" WATER MAIN IN BELLAIRE AVE.

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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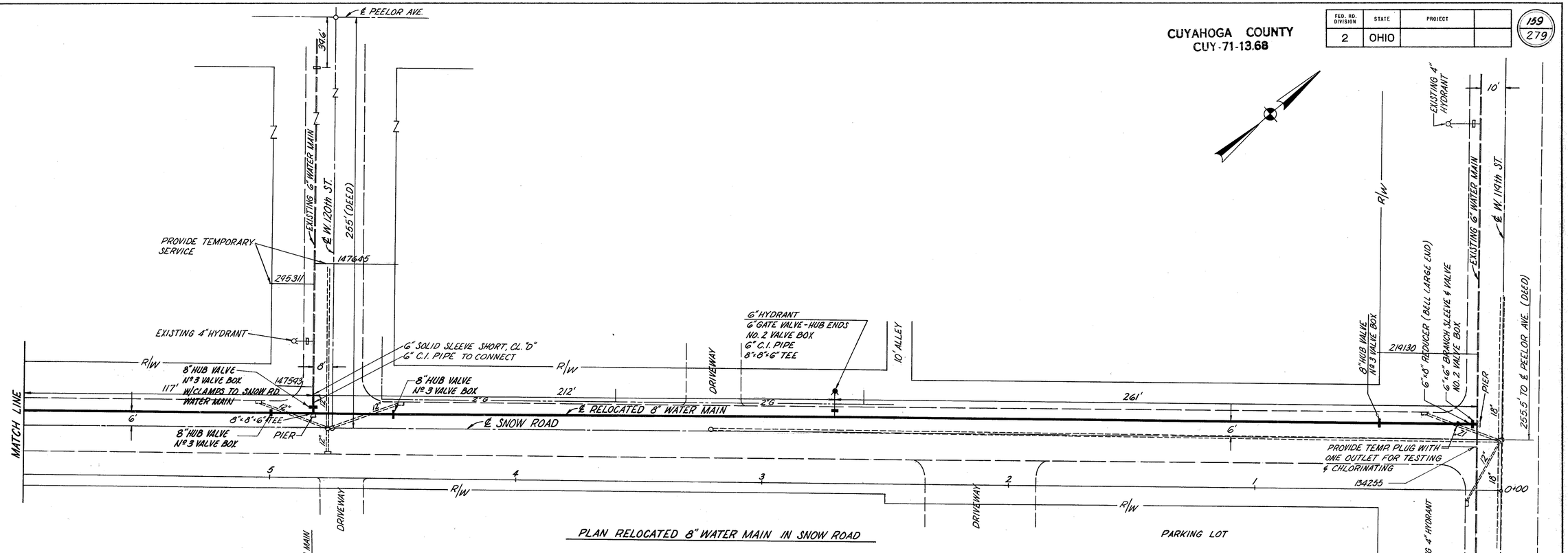
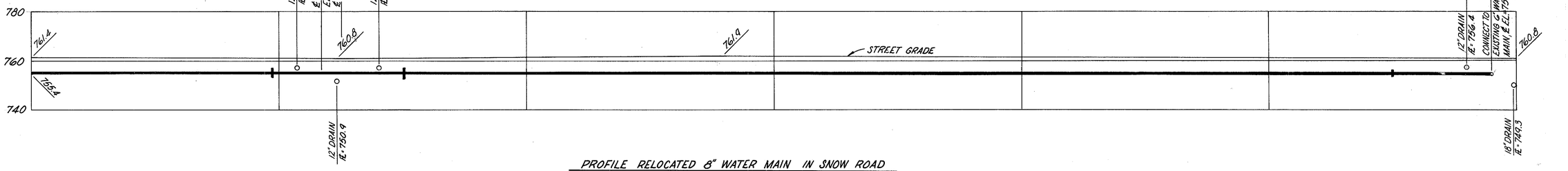
279

CUYAHOGA COUNTY
CUY-71-13.68



PLAN RELOCATED 8" WATER MAIN IN SNOW ROAD



PROFILE RELOCATED 8" WATER MAIN IN SNOW ROAD

HORIZONTAL & VERTICAL SCALE 1"= 20'

1ST. HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED DEC. 21, 1964.

W. D. Lamplite — DIRECTOR OF PUBLIC UTILITIES
J. E. Hunter — COMMISSIONER OF WATER AND HEAT
Harold Pritchett — COMMISSIONER - DIVISION OF UTILITIES - ENGINEERING
T. R. Connor — ENGINEER OF CONSTRUCTION & SURVEYS
William J. Sweeney — ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS-CLEVELAND, OHIO

MEDINA FREEWAY
RELOCATED 8" WATER MAIN
IN
SNOW ROAD

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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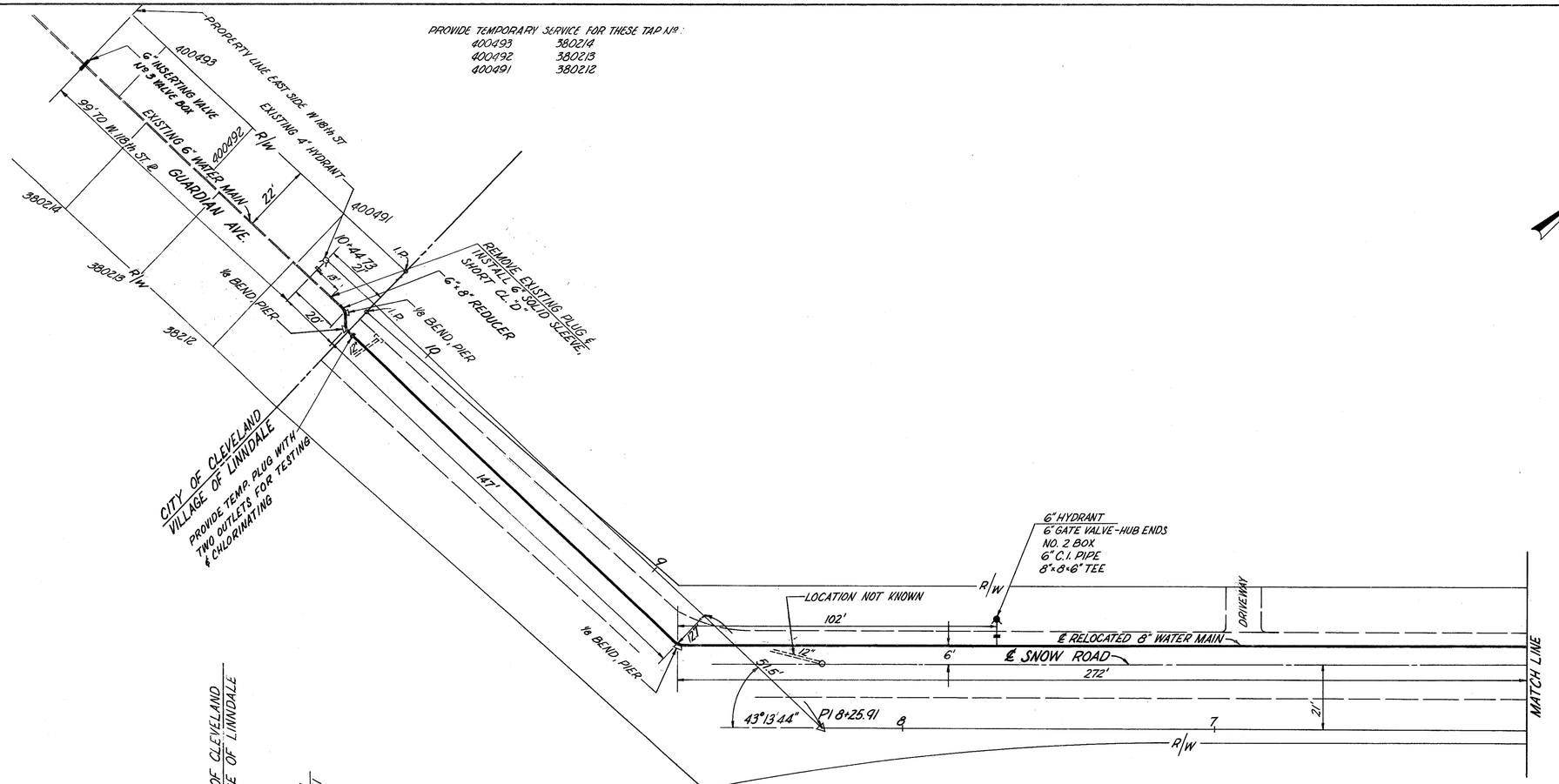
279

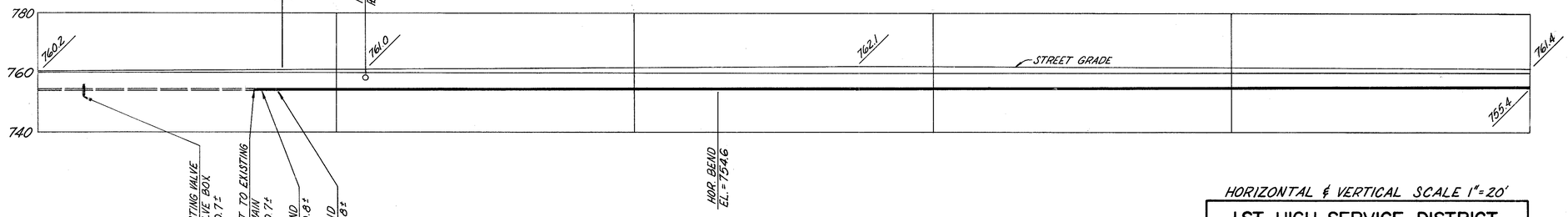
CUYAHOGA COUNTY
CUY-71-13.68

PROVIDE TEMPORARY SERVICE FOR THESE TAP NO^S.:

400493	380214
400492	380213
400491	380212



PLAN RELOCATED 8" WATER MAIN IN SNOW ROAD



PROFILE RELOCATED 8" WATER MAIN IN SNOW ROAD

HORIZONTAL & VERTICAL SCALE 1"=20'

1ST. HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED DEC. 21, 1964.

- DIRECTOR OF PUBLIC UTILITIES
- COMMISSIONER OF WATER AND HEAT
- COMMISSIONER - DIVISION OF UTILITIES - ENGINEERING
- ENGINEER OF CONSTRUCTION & SURVEYS
- ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS-CLEVELAND, OHIO

MEDINA FREEWAY
RELOCATED 8" WATER MAIN IN SNOW ROAD

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

161
279

NOTE: SEE SHEET NO. 163 FOR RECONN. TAP NOS. 122776 & 115884

0+61.00 ℄ 12" W.M= 26'LT. STA. 81+19.38 SURVEY ℄

SEE SHEET Nº 156 FOR NOTES & RECOMMENDED ALIGNMENT OF TEMP. 24" WATER MAIN

SLEEVE
PROVIDE TEMP. PLUG WITH 2 OUTLETS FOR TESTING & CHLORINATING

0+77
18" OFFSET B & J

1+31.26
45° BEND PIER

1+49.6
VERT. BEND

SOLID SLEEVE SHORT, CL "D" TO CONNECT

0+01.57
12" INSERTING VALVE NO. 4 VALVE BOX

3'G

EXIST. W.M.

6"H.P.G.

TEMP 24" FLANGE VALVE (SEE NOTE)

TEMP 24" WATER MAIN

CONC. PIER
2" AIR COCK

TYPE "A"

0+00 CONNEC. TO EXIST 36" W.M. SEE DETAIL 'A'

0+16
45° BEND PIER

0+00.00 ℄ 36" W.M= 26'60" RT. STA. 7+82.28 ℄ SURVEY

2-ACCESS M.H.'S. TYPE "A" SEE SHT. 164 FOR DETAILS

6"H.P. GAS TO BE RAISED BY OTHERS

3" GAS

755.7

755.57

6" AIR COCK

755.6

755.4

4" DRAIN

0+60
30" GATE VALVE FLANGED ENDS & CHAMBER

0+68
24" FLANGED END OUTLET OR 24"x36" TEE SHOP WELDED TO 36" PIPE

12" COMB. S. INV. 742.7

729.9

UNDER DRAIN

730.25

729.84

729.84

730.61

UNDER DRAIN

730.0

726.9

1+36.41
18 BEND PIER

1+36.26
18 BEND PIER

1+49.6
22°30' BEND BES ℄ EL. 749.71

2+17.22
22°30' BEND ℄ EL. 721.7

TIED DISTANCE - SEE DETAILS MIN. 198'

TIED DISTANCE SEE DETAILS MIN. 48'

SURVEY TIES
TIE TO CITY MONUMENT AT INTERSECTION OF BELLAIRE & W. 117th ST.
CITY MONUMENT = 4.83' LT. STA. 4+99.88 MEMPHIS ℄ SURVEY
BRG. MEMPHIS SURVEY ℄ = S. 42° 36' 34" E.
BRG. CITY ℄ = S. 42° 57' 29" E.

SEE SHEET NO. 162 FOR NOTES ON TEMP. LINES AND TIE IN'S

RELOCATED 36" WATER MAIN

RELOCATED 12" WATER MAIN

EXISTING R/W

ABANDON EXISTING 12" WATER MAIN

12" Comb. Sewer TO BE ABANDONED

MEMPHIS AVE.

SURVEY ℄

ABAND. EXISTING 36" WATER MAIN & REMOVE

EXISTING 6" WATER MAIN & PEELOFF

AVENUE

TEST BULKHEAD & BLOCKING FOR FULL TEST

0+68
℄ OUTLET (SEE PROFILE)

0+60
30" GATE VALVE

CLOSURE

(ACCESS M.H. & DRAIN)

47'

55'

809

800

NOTE:
FOR TEMP. GRADE TO CONNECT STRUCTURE TO EXISTING PAVEMENT. SEE MEMPHIS AVENUE PROFILE.

SEE DETAIL SHEET Nº 162
CONCRETE CRADLE
12' WIDE x 25' LONG - LONGITUDINALLY CENTERED ON AXIS OF 114" SEWER

4+61 SEE DETAIL SHEET 168
4" DRAIN VALVE & VAULT (TOP OF VAULT TO BE BURIED 1' BELOW SURFACE)

4+64.00
VERT. BEND

G'-0" MIN.

4+72
VERT. BEND

5+00

5+40
VERT. BEND

5' SIDEWALK

12" SEWER TO BE ABAND.

NEW PAVEMENT 9" THICK REINF. CONC.

18" SANITARY SEWER

12" C.I. PIPE
12" C.I. SPIGOT OUTLET IN CONC. PIPE
2-12"x8"x10" SLEEVE CL. D, SHORT
12"x12" BRANCH SLEEVE & VALVE, Nº 4 VALVE BOX
12" OFF SET

CUYAHOGA COUNTY
CUY-71-13.68
6+50.98 ℄ 36" W.M. = 15.06' LT. 13+82.93 SURVEY ℄

5+60.76
45° BEND, PIER

5+82.4
℄ 30" GATE VALVE & VAULT

CONC. PIER

TYPE A ACCESS M.H.

TEST PRESSURE THIS POINT
PROVIDE TEST HEAD & BLOCKING FOR FULL TEST
6+42± CONNECT TO EXIST 36" W.M. DETAILS OF CONN. BY PIPE M.F.G.
SEE DETAIL SHEET Nº 162

CONC. PIER
4" DRAIN

TEMP. 24" WATER MAIN

CLOSURE CONC. PIER

5+51.84
18 BEND, PIER

6+17.33
18 45° BEND, PIER

DRAIN VALVE BOXES TO BE ADJUSTED TO FINAL GRADE

CONC. PIER

EXISTING 30" VALVE & ACCESS M.H.'S MANHOLE COVERS & RINGS TO BE ADJUSTED TO FINAL GRADE

6+29
18 BEND, PIER

PROVIDE TEMP. PLUG WITH 2 OUTLETS FOR TESTING

SLEEVE

6+60.55
REMOVE EXIST. 18" BEND & CONN. TO 12" W.M.

12"x24" BRANCH SLEEVE & 24" GATE VALVE & 24" VALVE BOX

TEMP. 36"x24" SLEEVE & VALVE Nº 4 VALVE BOX

6+60.55 ℄ 12" W.M. = 9' RT. 13+85.50 ℄ SURVEY

CONTRACTOR SHALL PROVIDED REINFORCING BANDS & ANCHOR ANGLES ON EXISTING PIPE & INSTALL PLAIN ANCHOR AGAINST ACCESS M.H., SEE ACCESS M.H. TYPE "A" FOR MINIMUM DIMENSIONS.

NOTES: UPON COMPLETION OF NEW 36" W.M., TEMP. 24" W.M.'S SHALL BE DISCONNECTED FROM 36" W.M. AND TEMP. 24" VALVES & 36"x24" TAPPING VALVES SHALL BE LEFT IN PLACE. THE TEMP. W.M.'S SHALL BE REMOVED UPON COMPLETION OF THE 36" W.M. SEE WATERWORK NOTES FOR PAYMENT.

AFTER REMOVAL OF TEMP. 24" LINES PROVIDE 24" BLIND FLANGES WITH CONC. PIERS AT ALL BARE ENDS OF VALVES. 24" VALVES TO HAVE Nº 2 A VALVE BOXES & BYPASS VALVES TO HAVE Nº 2 VALVE BOXES.

PROFILE - 36" RELOCATED WATER MAIN - MEMPHIS AVENUE

4" TANGENT FLANGED BLOW OFF WITH VAULT SEE DETAIL OF 4" DRAIN

INV. 4" PIPE @ VAULT 714.8

INV. 4" STORM SEWER 714.77

4+64.00 Δ = 15°-0" ℄ EL. 720.28

5+40 GO Δ 15°-0" ℄ EL. = 740.7

5+60.76 HOR. BEND

5+82.4 ℄ 30" GATE VALVE FLANGE ENDS 4" DRAIN LOCATE 1'-2" FROM END OF PIPE

5+98 12" BELL OUTLET

INV. 5" SAN. S. INV. 734.15

5+74 TEMP. 24" FLANGE OUTLET

ACCESS ANCHOR M.H. TYPE "A"

5+41.5 ± ℄ ACCESS M.H.

744.9

TIED DISTANCE - SEE DETAILS MIN. 244'

NOTE: PIPE IN THIS LOCATION TO BE DESIGNED FOR H-20 LOADING WITH 2½ COVER MIN. 47" PIPE STA. 5+74 TO 6+21

SEE DETAIL SHT. Nº 162

3+44 ℄ 22.7210

TEMP. GRADE See Note

7450

6"H.P. GAS

EXIST. ACCESS M.H.

EXIST. 30" VALVE

24" TEMP. CONN.

INSTALL NEW ANCHOR

6+95± = ℄ EL. 738.5 OF EXIST 36" W.M.

6+17.30 HOR. BEND (½ BEVEL END) ℄ EL. 740.8±

6+47± CONN. TO EXIST 36" W.M.

SEE NOTE ABOVE FOR PIPE DESIGN

TIED DISTANCE SEE DETAILS

780 760 740 720 0 1 2 3 4 5 6 7

Horizontal & Vertical Scales: 1"=20'

1ST. HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED, DEC. 21, 1964.

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COMMISSIONER OF WATER AND HEAT

COMMISSIONER DIVISION OF UTILITIES - ENGINEERING

ENGINEER OF CONSTRUCTION & SURVEYS

ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

MEDINA FREEWAY
RELOCATION OF 12" & 36" WATER MAINS
MEMPHIS AVENUE

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

PLOTTED BY DATE | INKED BY DATE | CHECKED BY DATE

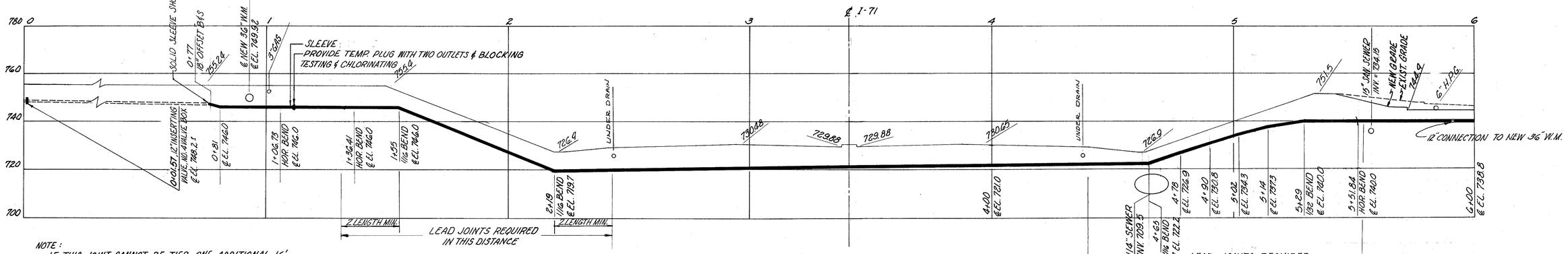
DESCRIPTION BY DATE
TOPOGRAPHY
TRACING
ERASURE
R. O. W.
QUANTITIES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

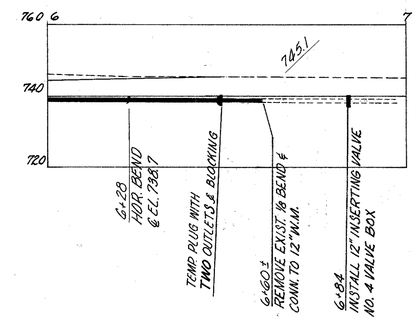
162
279

CUYAHOGA COUNTY
CUY-71-13.68

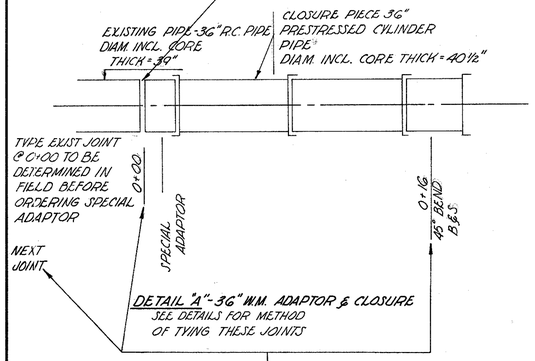
PROFILE 12" WATER MAIN MEMPHIS AVENUE



12" WATER MAIN BETWEEN STATIONS 2+19 & 4+65 TO BE CEMENT LINED DUCTILE IRON PIPE, CLASS 25

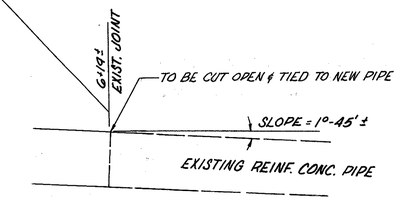


NOTE:
IF THIS JOINT CANNOT BE TIED, ONE ADDITIONAL 16' LENGTH OF PIPE MUST BE ADDED AND TIED TO THE NEW WATER MAIN.



DETAIL "A" - 36" W.M. ADAPTOR & CLOSURE
SEE DETAILS FOR METHOD OF TYING THESE JOINTS

THESE APPROXIMATE LOCATIONS OF EXISTING JOINTS SHALL BE LOCATED ACCURATELY BY SURVEY BY THE CONTRACTOR AND THE INFORMATION SHALL BE FURNISHED THE PIPE FABRICATOR TO ENABLE THE PIPE CLOSURE OR ADAPTOR TO BE MADE.



DETAIL OF CONNECTION AT STA. 6+19 36" W.M.

NOTES FOR MEMPHIS AVE. WATER MAINS

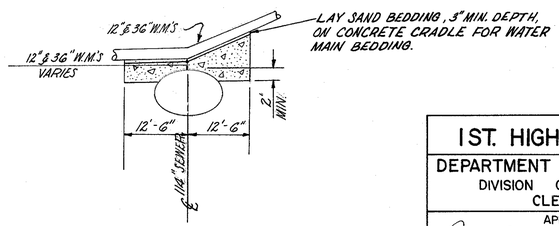
RELOCATED 12" WATER MAIN TO BE IN SERVICE BEFORE SERVICE IN THE EXISTING 36" WATER MAIN IS INTERRUPTED.

SPECIAL ADAPTORS WILL BE NESSARY AT THE BEGINNING & END OF THE RELOCATED 36" WATER MAIN. THE CONTRACTOR WILL DETERMINE THE TYPE ADAPTOR REQUIRED. THE ADAPTORS WILL BE TIED AS REQUIRED BY THE CONTRACT DRAWINGS.

24" TEMPORARY LINE ALIGNMENT SHALL BE LAID OUT BY THE CONTRACTOR WITH NECESSARY INFORMATION FROM SURVEYS FOR TIE IN'S. MINIMUM DEPTH OF COVER TO BE 3 FEET. SEE SHEETS 161 & 156 FOR SUGGESTED ALIGMENT AND NOTES.

ALL 24" VALVES TO HAVE № 4 VALVE BOXES & ALL BYPASS VALVES TO HAVE № 2 VALVE BOXES.

ALL EXISTING PIPE AND TIED JOINTS ARE AS MANUFACTURED BY THE LOCK JOINT PIPE COMPANY.



DETAIL OF CONCRETE CRADLE FOR 12" & 36" WATER MAINS

DESCRIPTION	PLOTTED BY	DATE	INKED BY	DATE	CHECKED BY	DATE
TOPOGRAPHY						
PARCEL LIST						
DRAINAGE						
R/W PLAN						
QUANTITIES						

1ST. HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED, DEC. 21, 1964.

DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER AND HEAT
COMMISSIONER DIVISION OF UTILITIES + ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ENGINEER OF DESIGN

HORIZONTAL & VERTICAL SCALES: 1"=20

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

MEDINA FREEWAY
RELOCATION OF 12" & 36" W.M.
MEMPHIS AVENUE

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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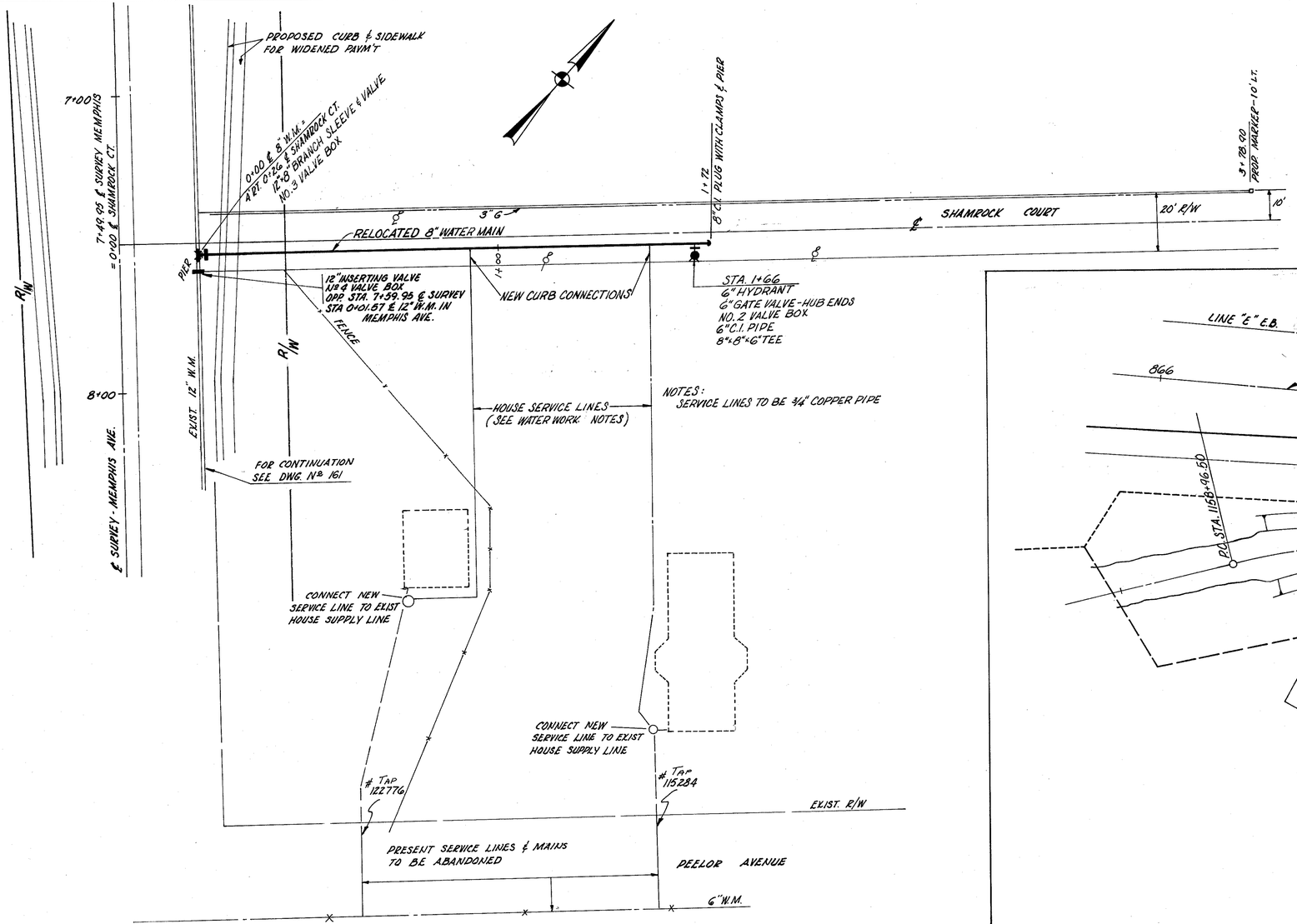
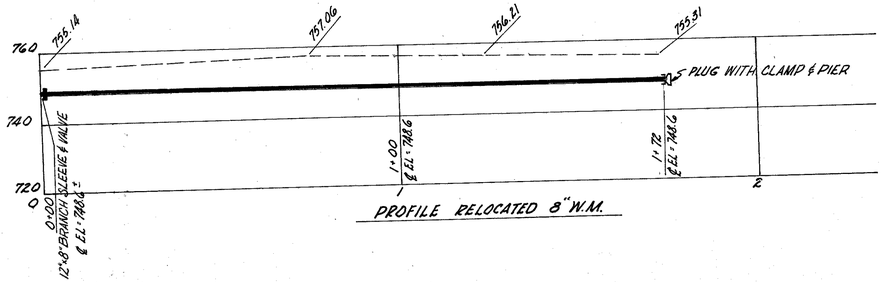
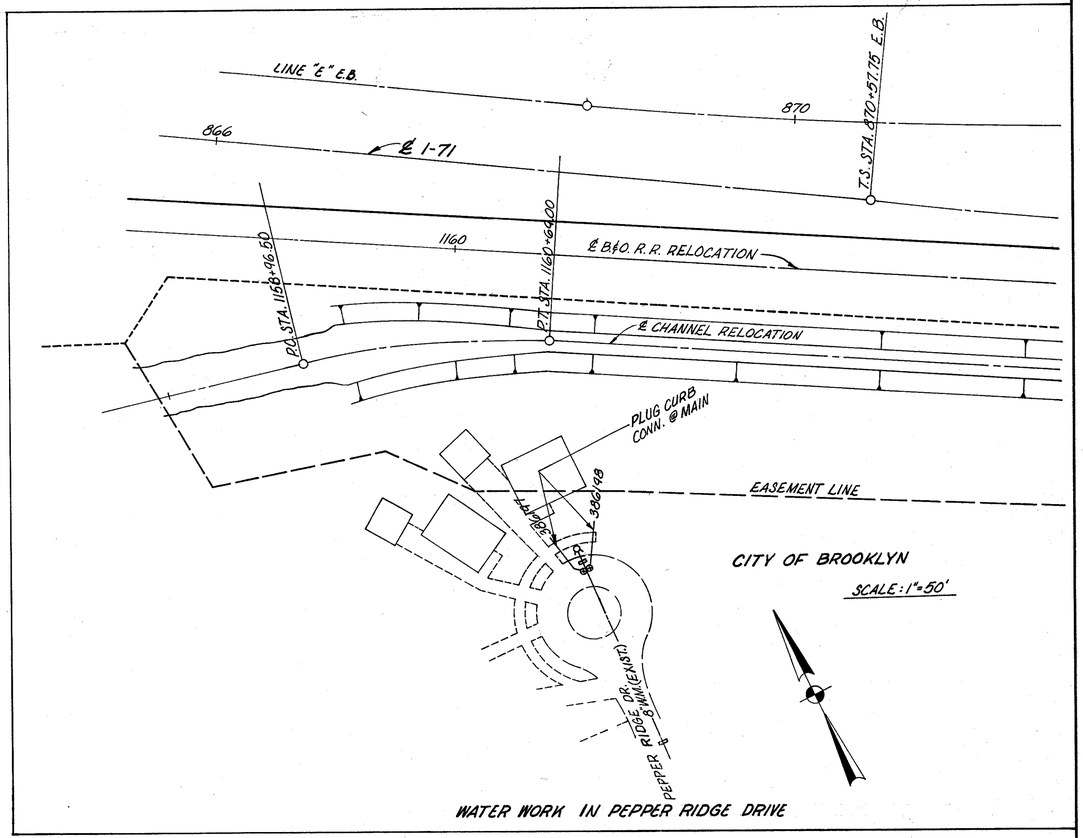
279

CUYAHOGA COUNTY
CUY-71-13.68





PROFILE RELOCATED 8" W.M.



WATER WORK IN PEPPER RIDGE DRIVE

HORIZONTAL & VERTICAL SCALE: 1"=20'

1ST. HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
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- COMMISSIONER - DIVISION OF UTILITIES - ENGINEERING
- ENGINEER OF CONSTRUCTION & SURVEYS
- ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

RELOCATED 8" W.M. IN SHAMROCK COURT AND WATER WORK IN PEPPER RIDGE DR.

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

164
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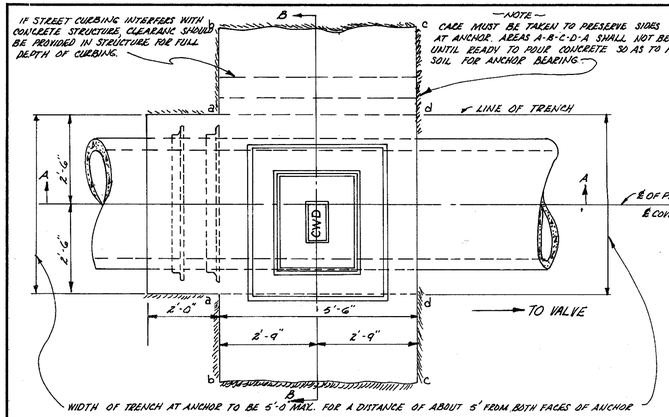
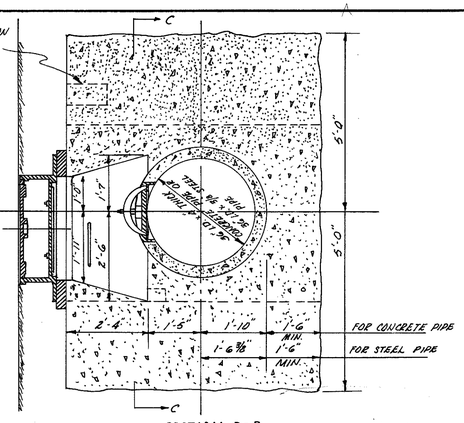
CUYAHOGA COUNTY
CUY-71-13.68

IF STREET CURBING INTERFERS WITH CONCRETE STRUCTURE, CLEARANCE SHOULD BE PROVIDED IN STRUCTURE FOR FULL DEPTH OF CURBING.

—NOTE—
CARE MUST BE TAKEN TO PRESERVE SIDES OF EXCAVATION AT ANCHOR. AREAS A-B-C-D-A SHALL NOT BE EXCAVATED UNTIL READY TO POUR CONCRETE SO AS TO HAVE FIRM SOIL FOR ANCHOR BEARING.

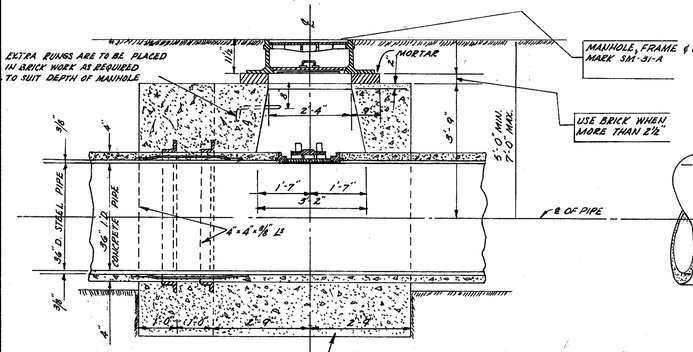


PLAN

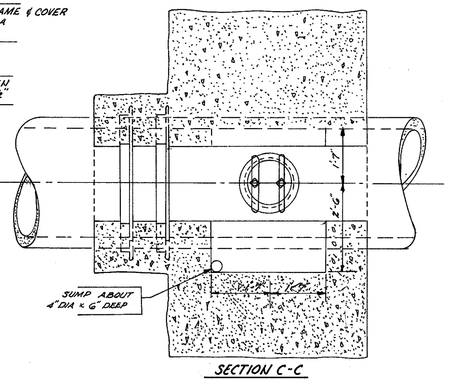


SECTION B-B

EXTRA RUNGS ARE TO BE PLACED IN BRICK WORK AS REQUIRED TO SUIT DEPTH OF MANHOLE

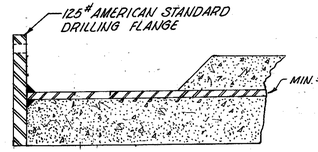


SECTION A-A

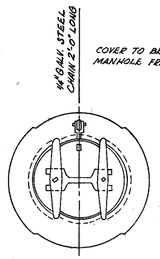


SECTION C-C

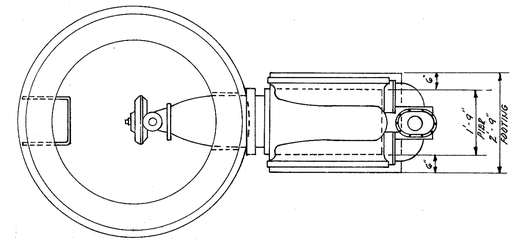
ACCESS MANHOLE AND ANCHORAGE TYPE "A"



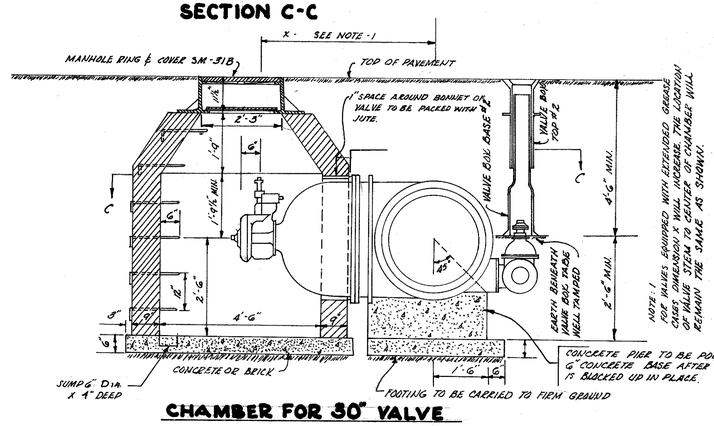
DETAIL "A"
FLANGE END FOR 30" VALVE COUPLING



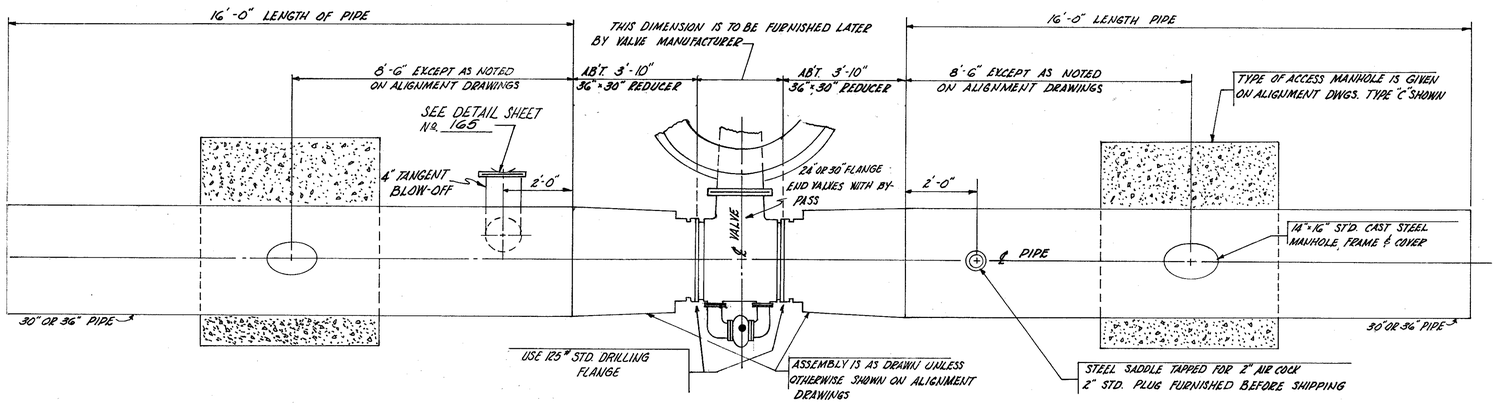
14" x 16" STD. MANHOLE FRAME AND COVER
(FRAME, COVER, & YOKES TO BE CAST STEEL)



SECTION C-C



CHAMBER FOR 30" VALVE



TYPICAL VALVE ASSEMBLIES FOR 30" AND 36" CONCRETE PIPE

1ST. HIGH SERVICE DISTRICT
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APPROVED, DEC. 21, 1964.

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COMMISSIONER - DIVISION OF UTILITIES - ENGINEERING
J. R. Conner — ENGINEER OF CONSTRUCTION & SURVEYS
William J. Sweeney — ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

MEDINA FREEWAY
WATER MAIN DETAILS

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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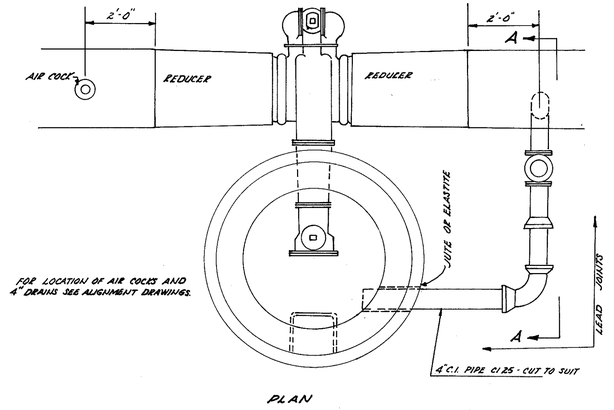
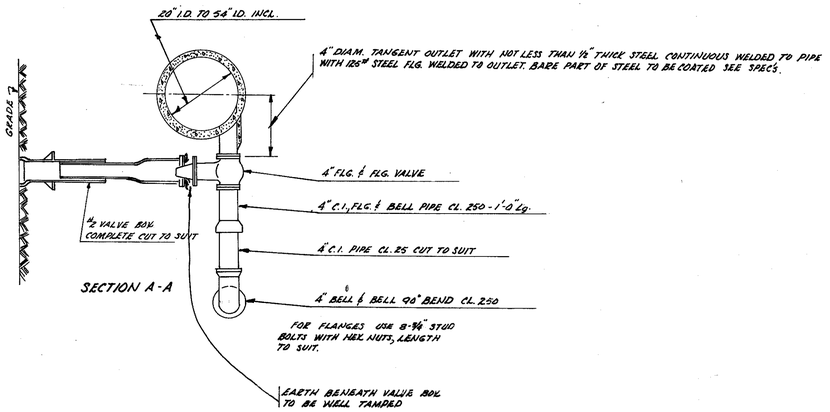
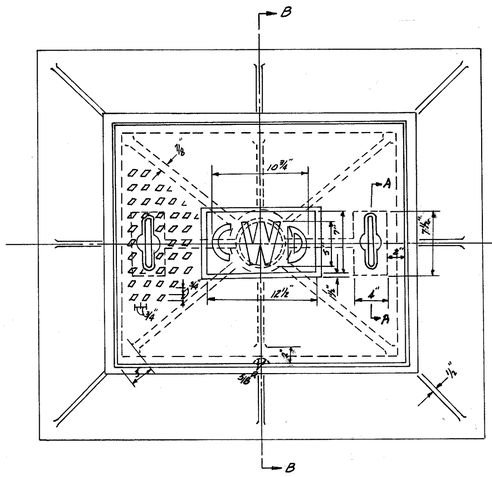
279

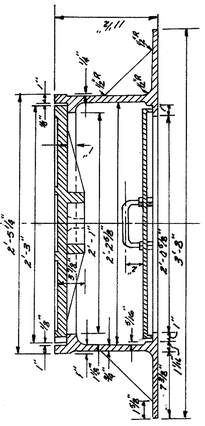
CUYAHOGA COUNTY
CUY-71-13.68

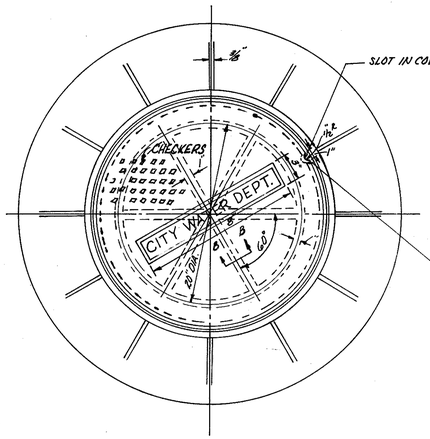


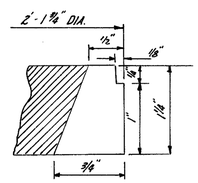


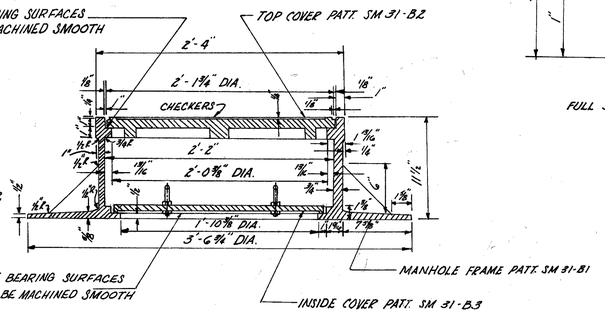
TYPICAL DETAIL SHOWING 4" DRAIN FROM WATER MAIN TO VALVE CHAMBER

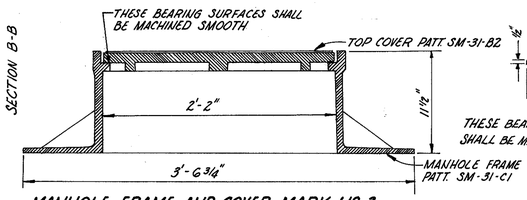








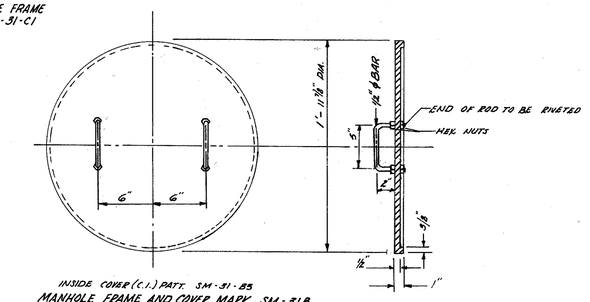




MANHOLE FRAME AND COVER MARK No 3

CONSISTING OF { C.I. MANHOLE FRAME PATT. SM-31-C1 ; C.I. TOP COVER PATT. SM-31-B2 }

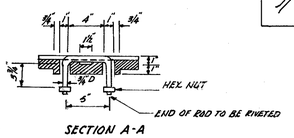
(DIMENSIONS NOT GIVEN ARE THE SAME AS THOSE SHOWN FOR MANHOLE FRAME PATT. MARK SM-31-B1)

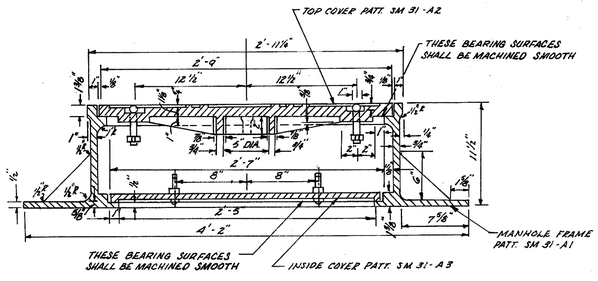


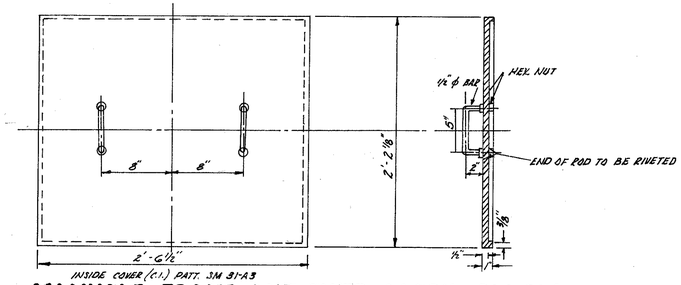
MANHOLE FRAME AND COVER MARK SM-31B

CONSISTING OF { C.I. MANHOLE FRAME PATT. SM-31-B1 ; C.I. TOP COVER PATT. SM-31-B2 ; C.I. INSIDE COVER PATT. SM-31-B3 }

APPROXIMATE WEIGHT = 764#







MANHOLE FRAME AND COVER MARK SM 31A

CONSISTING OF { C.I. MANHOLE FRAME PATT. SM-31-A1 ; C.I. TOP COVER PATT. SM 31-A2 ; C.I. INSIDE COVER PATT. SM 31-A3 }

APPROX. WT. = 1166#

1ST. HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED, DEC. 21, 1964.

DIRECTOR OF PUBLIC UTILITIES

COMMISSIONER OF WATER AND HEAT

COMMISSIONER - DIVISION OF UTILITIES - ENGINEERING

ENGINEER OF CONSTRUCTION & SURVEYS

ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

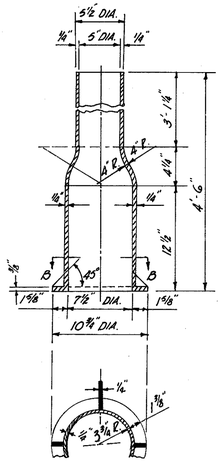
MEDINA FREEWAY
WATER MAIN DETAILS

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

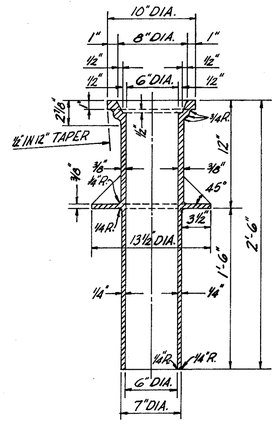
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

166
279

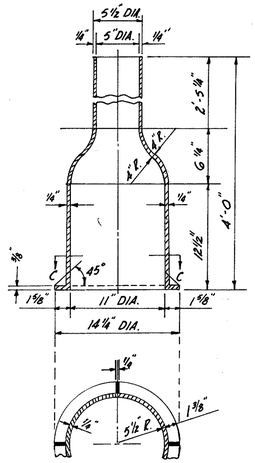
CUYAHOGA COUNTY
CUY-71-13.68



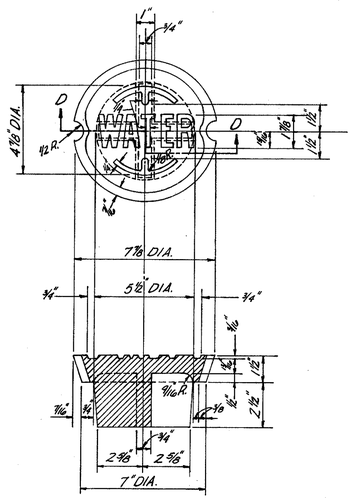
SECTION B-B
BASE Nos 2 AND 3 FOR 3", 4", 6" AND 8" VALVES
EST. WT. 71#



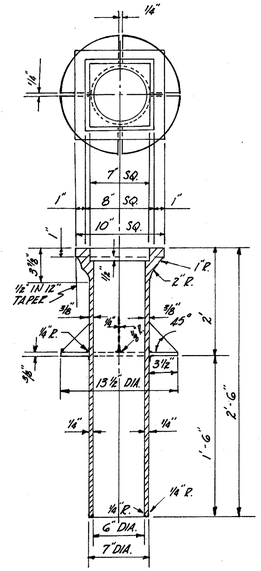
SECTION OF TOP WITH SQUARE HEAD NO. 1 AND 2
EST. WT. 73#



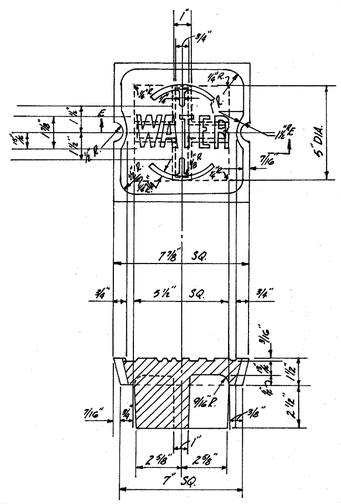
SECTION C-C
BASE Nos 4 FOR 10", 12" AND 16" VALVES
EST. WT. 79#



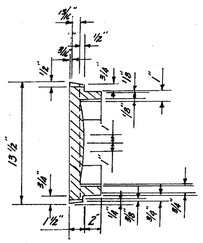
SECTION D-D
DETAIL OF ROUND COVER FOR NO. 142 TOP
EST. WT. 20#



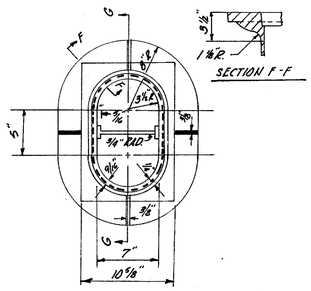
SECTION OF TOP WITH SQUARE HEAD Nos 3 AND 4
EST. WT. 85#



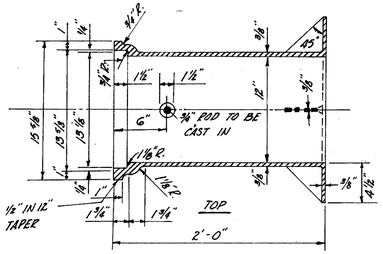
SECTION E-E
DETAIL OF SQUARE COVER FOR Nos 3 & 4 TOP
EST. WT. 23#



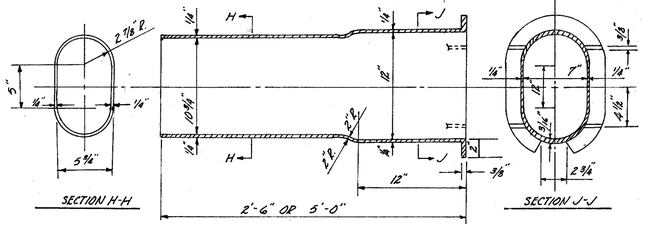
SECTION K-K



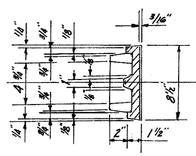
PLAN



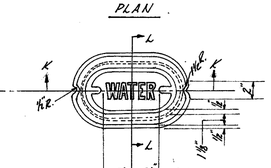
SECTION G-G
AIR COCK BOX No 5 IS TOP AND COVER
AIR COCK BOX No 6 IS TOP, BASE 2'-6" LONG AND COVER



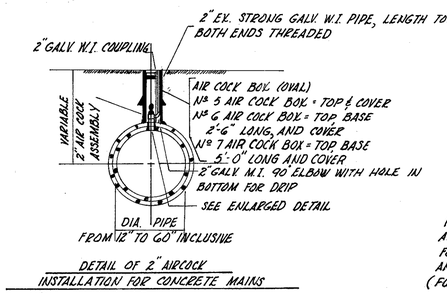
BASE
EST. WEIGHT 2'-6" LONG = 70#
EST. WEIGHT 5'-0" LONG = 126#



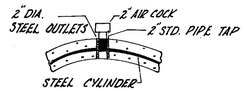
SECTION L-L



COVER



DETAIL OF 2" AIRCOCK INSTALLATION FOR CONCRETE MAINS



ENLARGED DETAIL SHOWING CONNECTION FOR AIRCOCK OR PITOMETER

FOR C.I. PIPE, BOSS WILL BE CAST ON PIPE AND TAPPED AT FOUNDRY FOR 2" STANDARD PIPE.
FOR W.I. PIPE, W.I. FORGING SHALL BE WELDED TO PIPE AND TAPPED FOR 2" STANDARD PIPE.
(FURNISH WITH 2" MALLEABLE IRON PLUG)

1ST. HIGH SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

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COMMISSIONER - DIVISION OF UTILITIES - ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

MEDINA FREEWAY
WATER MAIN DETAILS

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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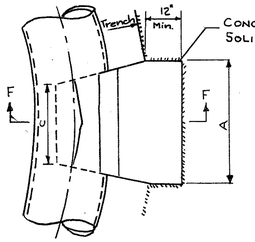
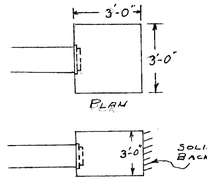
279

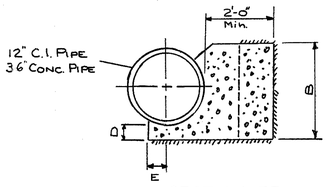
CUYAHOGA COUNTY
CUY-71-13.68



PLAN

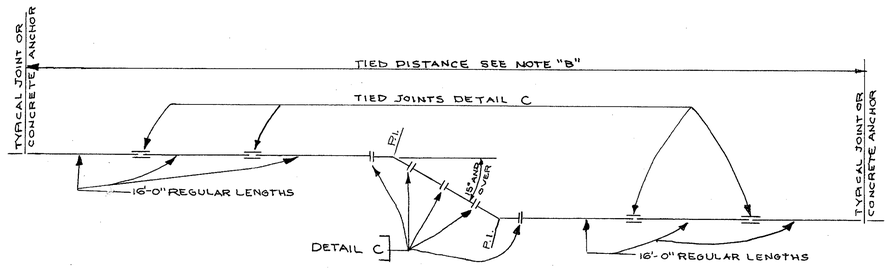


PIER FOR 6" & 8" DEAD-ENDED WATER MAINS



SECTION-FF
CONCRETE PIER FOR BENDS & TEES
FOR TEES, USE 90° BEND PIER

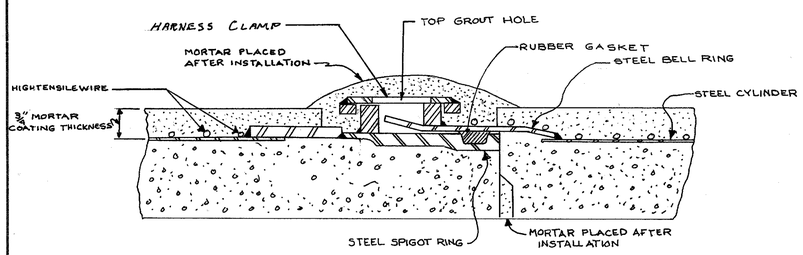
DIMENSIONS OF PIERS FOR BENDS & TEES					
SIZE & ANGLE	A	B	C	D	E
12"	2'-0"	3'-0"	2'	6"	6"
36"-31°-46°	7'	5'	3'-0"	1'-0"	1'-0"
36"-47°-90°	11'	5'	3'-0"	1'-0"	1'-0"

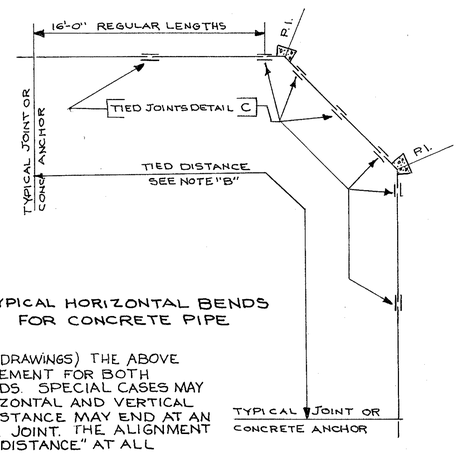


TYPICAL VERTICAL BENDS FOR CONCRETE PIPE

DETAIL C

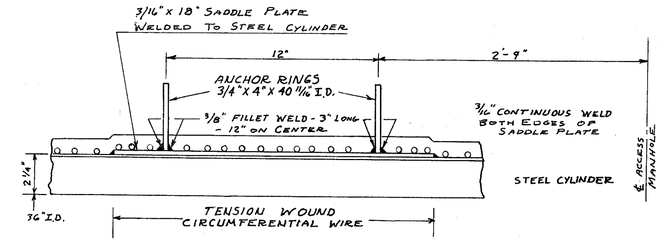
PRESTRESSED CONCRETE CYLINDER PIPE WITH RUBBER AND STEEL JOINT SHOWING CLAMP TYPE JOINT





TYPICAL HORIZONTAL BENDS FOR CONCRETE PIPE

NOTE "B" (CALLED FOR ON ALIGNMENT DRAWINGS) THE ABOVE LAYOUTS SHOW TYPICAL ARRANGEMENT FOR BOTH HORIZONTAL AND VERTICAL BENDS. SPECIAL CASES MAY REQUIRE A COMBINATION OF HORIZONTAL AND VERTICAL "TIED DISTANCE", OR THE "TIED DISTANCE MAY END AT AN ANCHOR INSTEAD OF AT A TYPICAL JOINT. THE ALIGNMENT DRAWINGS GIVE DEFINITE "TIED DISTANCE" AT ALL REQUIRED POINTS.



ANCHORAGE DETAILS FOR 36" PRESTRESSED CONC. CYLINDER PIPE FOR MANHOLE TYPE "A"

1ST. HIGH SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

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COMMISSIONER- DIVISION OF UTILITIES - ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

MEDINA FREEWAY
WATER MAIN DETAILS

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

DESCRIPTION	PLOTTED BY	DATE	INKED BY	DATE	CHECKED BY	DATE
TOPOGRAPHY						
PROFILE						
DRAINAGE						
R. O. W.						
QUANTITIES						

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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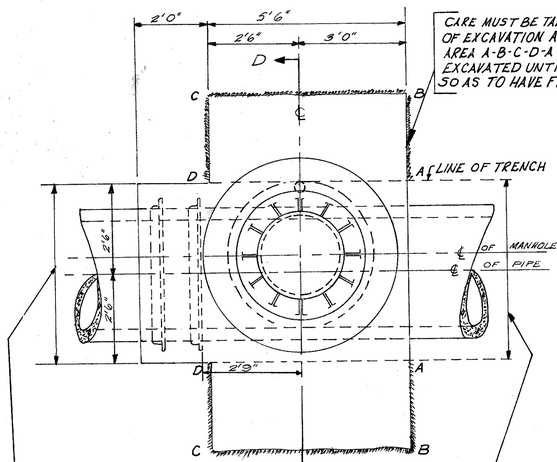
CUYAHOGA COUNTY
CUY-71-13.68

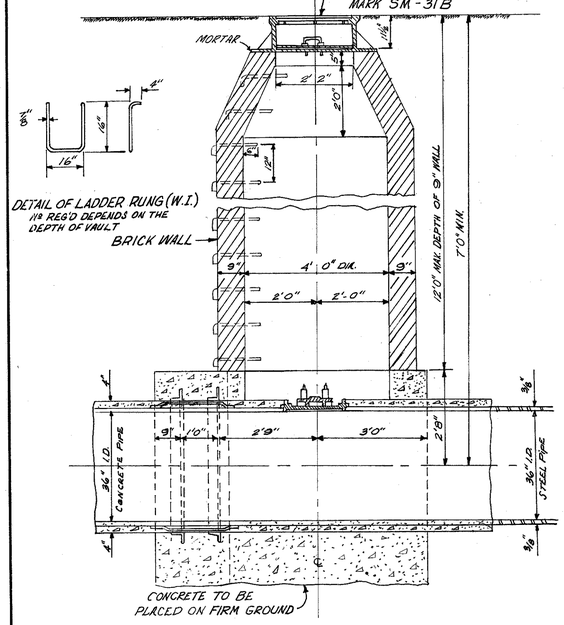
- NOTE -

CARE MUST BE TAKEN TO PRESERVE SIDES OF EXCAVATION AT ANCHOR. AREA A-B-C-D-A SHALL NOT BE EXCAVATED UNTIL READY TO POUR CONCRETE SO AS TO HAVE FIRM SOIL FOR ANCHOR BEARING.



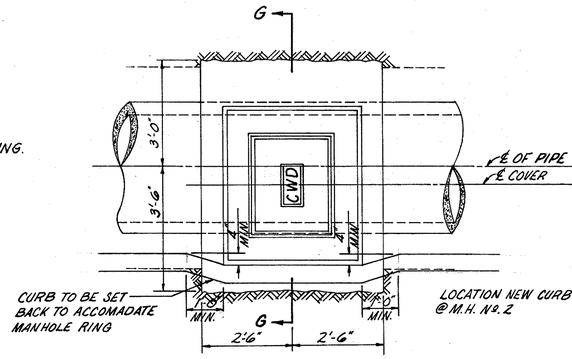
WIDTH OF TRENCH AT ANCHOR TO BE 5'-0" MAX. FOR A DISTANCE OF ABOUT 5'-0" FROM BOTH FACES OF ANCHOR

PLAN

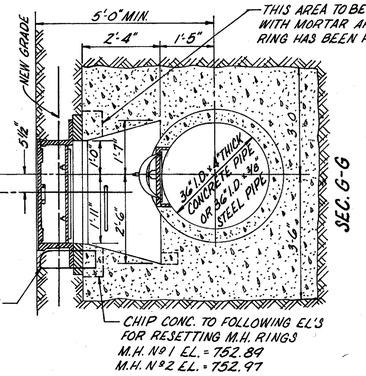


ELEVATION

ACCESS MANHOLE AND ANCHORAGE TYPE "B"



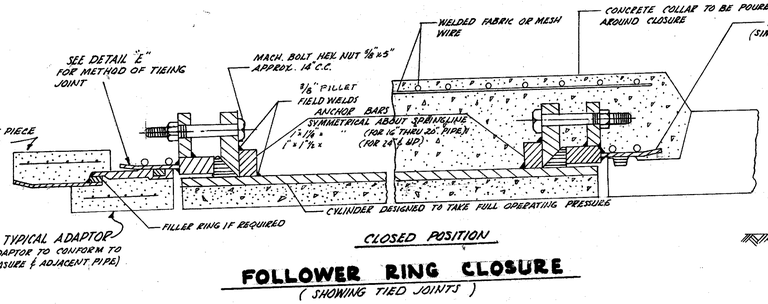
PLAN



SEC. G-G

SPECIAL : M.H. Nº 1 & Nº 2 ADJUSTED TO GRADE

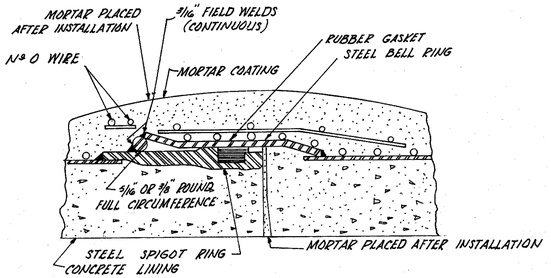
M.H. Nº 1 = STA. 15+19 BELLAIRE RD.
M.H. Nº 2 = STA. 15+74 BELLAIRE RD.



CLOSED POSITION

FOLLOWER RING CLOSURE

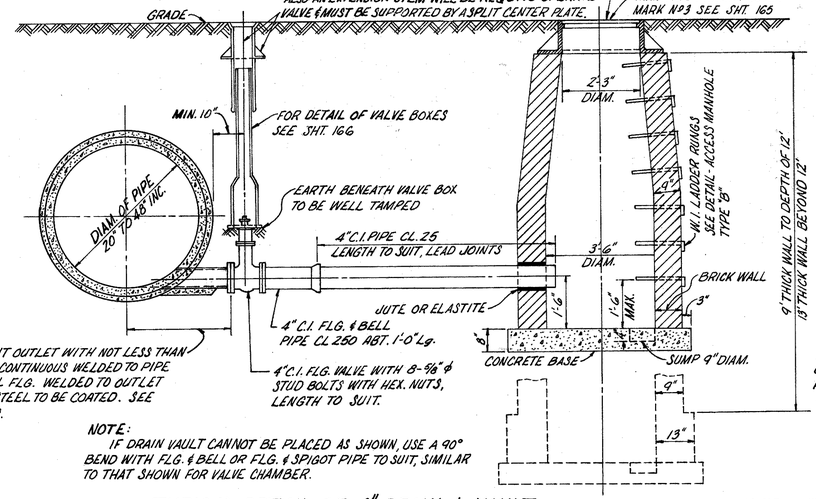
(SHOWING TIED JOINTS)



DETAIL "E"

WELDED TIED JOINT

TO BE USED ON ADAPTORS

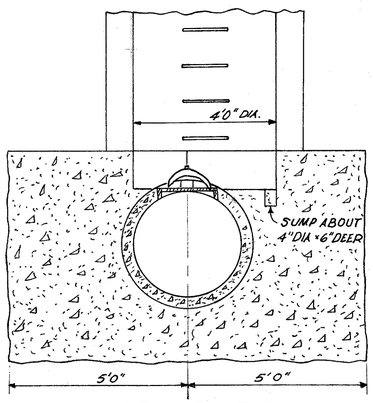


NOTE:
PLASTER OUTSIDE OF BRICK MASONRY WITH NO LESS THAN ½" CEMENT MORTAR FOR WATER PROOF.

NOTE:
IF DRAIN VAULT CANNOT BE PLACED AS SHOWN, USE A 90° BEND WITH FLG. & BELL OR FLG. & SPIGOT PIPE TO SUIT, SIMILAR TO THAT SHOWN FOR VALVE CHAMBER.

TYPICAL DETAIL OF 4" DRAIN & VAULT

SEE SHT. 161 FOR LOCATION



SECTION D-D

SEE ACCESS M.H. TYPE "A", SHT. 164 FOR DIMENSIONS OF ANCHOR BLOCK

1ST. HIGH SERVICE DISTRICT	
DEPARTMENT OF PUBLIC UTILITIES DIVISION OF WATER AND HEAT CLEVELAND, OHIO	
APPROVED, DEC. 21, 1964.	
	DIRECTOR OF PUBLIC UTILITIES
	COMMISSIONER OF WATER AND HEAT
	COMMISSIONER - DIVISION OF UTILITIES - ENGINEERING
J.R. Connor	ENGINEER OF CONSTRUCTION & SURVEYS
William J. Lowry	ENGINEER OF DESIGN

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

MEDINA FREEWAY

WATER MAIN DETAILS

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised

H-W L-20

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY-71-13.68

GENERAL SUMMARY

PLANT MATERIALS

TYPE CODE 7221

ITEM ~ BOTANICAL NAME	COMMON NAME	UNIT	SIZE	SHEET	SHEET	SHEET	SHEET	SHEET	SHEET	TOTAL
SHRUBS, VINES AND GROUND COVERS										
L-13 FORSYTHIA SUSPENSA	WEEPING FORSYTHIA	EACH	3'-4' B & B 15"		14	53				67
L-12 LONICERA JAPONICA HALLIANA	HALL'S HONEYSUCKLE	EACH	2 YR. NO. 1 3' O.C.				240	508	450	1198
L-12 LYCIUM HALIMOFOLIUM	COMMON MATRIMONY VINE	EACH	2'-3' SPRD 3' O.C.			4776				4776
L-12 POLYGONUM AUBERTI	SILVER FLEECE VINE	EACH	2 YR. NO. 1 4' O.C.		6741	1518	115			8374
L-13 SALIX PURPUREA NANA	DWARF PURPLE OSIER	EACH	12"-18" 4' O.C.	337	860	594				1791
L-13 SYMPHORICARPOS CHENAULTI HANCOCK	CHENAULT CORALBERRY HANCOCK VARIETY	EACH	1½'-2' 3' O.C.				8278			8278
MAJOR DECIDUOUS TREES										
L-14 ACER RUBRUM	RED MAPLE	EACH	2"-2½" B & B 24"	7	4		3	10	8	32
L-14 ACER SACCHARUM	SUGAR MAPLE	EACH	2"-2½" B & B 24"		7		8			15
L-14 GLEDITSIA TRIACANTHOS	COMMON HONEY LOCUST	EACH	2"-2½" B & B 24"	6	16	7	6			35
L-14 LIQUIDAMBAR STYRACIFLUA	SWEET-GUM	EACH	2"-2½" B & B 24"		3	5	7	10	22	47
L-14 PHELLODENDRON AMURENSE	AMUR CORK TREE	EACH	2"-2½" B & B 24"		8		5	7	10	30
L-14 PLATANUS ACERIFOLIA	LONDON PLANE TREE	EACH	2"-2½" B & B 24"	4	10	6	5	11	16	52
L-14 POPULUS ALBA	WHITE POPLAR	EACH	6'-8' B & B 18"			8	7			15
L-14 POPULUS SIMONI	SIMON POPLAR	EACH	5'-6' B & B 16"			5	2	17		24
L-14 SALIX ELEGANTISSIMA	THURLOW WEEPING WILLOW	EACH	6'-8' B & B 18"		3		6			9
L-14 TILIA CORDATA	LITTLELEAF LINDEN	EACH	2"-2½" B & B 24"		3		5			8
MINOR DECIDUOUS TREES										
L-14 ACER GINNALA	AMUR MAPLE	EACH	6'-7' 7/8" Cal. MIN. B & B 18"	4	9	7		16	16	52
L-14 CRATAEGUS PHAENOPYRUM	WASHINGTON HAWTHORN	EACH	6'-7' " " " B & B 18"						6	6
L-14 ELAEAGNUS ANGUSTIFOLIA	RUSSIAN OLIVE	EACH	4'-5' 9/16" " " B & B 15"	6	4		3	12		25
L-14 MALUS ARNOLDIANA	ARNOLD CRAB APPLE	EACH	6'-7' 7/8" " " B & B 18"	5	6		5	7		23
L-14 MALUS ATROSANGUINEA	CARMINE CRAB APPLE	EACH	6'-7' " " " B & B 18"	7	18		8	4		37
L-14 MALUS BACCATA JACKII	JACKII CRAB APPLE	EACH	6'-7' B & B 18"			13				13
L-14 MALUS FLORIBUNDA	JAPANESE FLOWERING CRAB APPLE	EACH	6'-7' B & B 18"		15	13		8	21	57
L-14 MALUS HUPEHENSIS	TEA CRAB APPLE	EACH	6'-7' B & B 18"			8				8
L-14 MALUS PURPUREA ALDENHAMENSIS	ALDENHAM PURPLE CRABAPPLE	EACH	6'-7' B & B 18"				13	17		30
L-14 MALUS ZUMI CALOCARPA	ZUMI CRAB APPLE	EACH	6'-7' B & B 18"		6	14	8			28

NOTES

MATERIALS AND METHODS

MATERIALS AND METHODS INVOLVED IN THIS WORK WILL BE IN ACCORDANCE WITH STATE OF OHIO, DEPARTMENT OF HIGHWAYS-1963-CONSTRUCTION AND MATERIAL SPECIFICATIONS, AMENDED IN CERTAIN INSTANCES AS SHOWN BELOW:

L-12,17 POCKET HOLES

IN AREAS WHICH ARE DESIGNATED FOR GROUND COVER, SHRUBS OR VINES, THE PLANTS SHALL BE POCKET PLANTED ACCORDING TO THE SPACING INDICATED ON THE PLANS.
The dimensions shall be based on horizontal Measurements.

L-12.18, L-13.22, L-14.29 SURPLUS EXCAVATION

SURPLUS EXCAVATION SHALL BE DISPOSED OF "OFF THE SITE."

L-12.23, L-13.26, L-14.29 MULCHING

DEPTH OF MULCH FOR ALL TYPES OF PLANTING SHALL BE (FOUR INCH) 4" LOOSE MEASUREMENT.

Large Trees Item L-14
These items shall be planted no closer than 10 ft. from the near edge of wall structures.

L-12.07 LOCATION AND SOURCE OF SUPPLY

THE CONTRACTOR SHALL SUPPLY WITHIN (FIFTEEN) 15 DAYS' AFTER RECEIPT OF THE NOTICE OF AWARD OF THE CONTRACT TO HIM, THE NAME OF THE SUBCONTRACTOR WHO IS GOING TO DO THE LANDSCAPE WORK, AND COMPLETE AND DETAILED INFORMATION CONCERNING THE SOURCE OF SUPPLY FOR EACH ITEM OF PLANT MATERIALS INCLUDED IN THE PLANTING LIST, WHICH IS A PART OF THIS CONTRACT. REGARDLESS OF THE LOCATIONS OF TREES ON THE PLANS THE MINIMUM DISTANCE BETWEEN ANY TREE ON THE PLANS AND THE PAVEMENT EDGE ALONG "THROUGH TRAFFIC LANES" SHALL BE (TWENTY-FIVE) 25 FEET.

THE MINIMUM DISTANCE BETWEEN ANY TREE AND THE PAVEMENT EDGE SHALL BE (TWENTY) 20 FEET ALONG RAMPS. WHERE CITY STREETS ARE ADJUNCTS OF A FREEWAY OR INTERCHANGE, TREES TO BE PLANTED ALONG SUCH STREETS SHALL BE IN ACCORDANCE TO LOCATIONS SHOWN ON THE PLANS.

THE ACTUAL OPERATION OF PLANTING ITEMS L-12, L-13, L-14 SHALL NOT BE PERFORMED BETWEEN THE DATES OF MAY 10TH AND OCTOBER 1ST.

L-12 FERTILIZING

ALL PLANTS UNDER THIS ITEM SHALL BE FERTILIZED AFTER PLANTING BUT BEFORE MULCHING WITH A DRY COMMERCIAL FERTILIZER OF 12-12-12 ANALYSIS. FERTILIZER SHALL BE SPREAD AROUND PLANTS AT RATE OF (TWO) 2 OUNCES PER PLANT. IN APPLYING FERTILIZER THE CONTRACTOR SHALL NOT ALLOW ANY TO FALL ON LEAVES OR ROOTS.

Existing Growth
Care should be taken to conserve existing growth. One such area is right of Sta. 823-829.

L-13 FERTILIZING

ALL PLANTS UNDER THIS ITEM SHALL BE FERTILIZED AFTER PLANTING BUT BEFORE MULCHING WITH A DRY COMMERCIAL FERTILIZER OF 12-12-12 ANALYSIS. FERTILIZER SHALL BE SPREAD AROUND PLANTS AT THE RATE OF (EIGHT) 8 OUNCES PER FOOT OF SPREAD PER PLANT. IN APPLYING FERTILIZER THE CONTRACTOR SHALL NOT ALLOW ANY TO FALL ON LEAVES OR ROOTS.

L-13.24 BACKFILL

THE POCKET HOLES SHALL BE BACKFILLED WITH TOPSOIL AS EACH PLANT IS SET. THE TOPSOIL SHALL BE WELL TAMPED BY THE WORKER'S FEET, RODS, OR OTHER APPROVED TAMPING DEVICES AS IT IS SHOVELED INTO THE HOLE AND SPREAD. THE BACKFILL IN HOLES SHALL BE FORMED INTO A "SAUCER" WITH A (THREE INCH) 3" LIP AND A CIRCUMFERENCE EQUAL TO THE CIRCUMFERENCE OF THE PLANTING HOLE TO CATCH AND HOLD WATER.

L-12.04, L-13.04, L-14.04 MULCHING MATERIAL

MATERIAL FOR MULCHING SHALL BE WOOD CHIPS, SHREDDED TREE BARK, OR GROUND CORN COBS. MATERIALS SHALL BE SUBJECT TO APPROVAL BY ENGINEER. SHREDDED TREE BARK MUST PASS A (ONE HALF INCH) ½" SIEVE. GROUND CORN COBS MUST PASS A (THREE QUARTER INCH) 3/4" SIEVE. AT LEAST 50% BY WEIGHT OF THE WOOD CHIPS SHALL PASS A (ONE INCH) 1" SIEVE WITH NONE OF THE CHIPS HAVING A LENGTH OF MORE THAN (SIX) 6 INCHES.

L-14 FERTILIZING

ALL PLANTS UNDER THIS ITEM SHALL BE FERTILIZED AFTER PLANTING BUT BEFORE MULCHING WITH A DRY COMMERCIAL FERTILIZER OF 12-12-12 ANALYSIS. FERTILIZER SHALL BE SPREAD AROUND PLANTS AT THE RATE OF (ONE) 1 POUND PER INCH OF CALIPER PER PLANT.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

170
279

CUYAHOGA COUNTY
CUY-71-13.68

BEGIN PROJECT
STA. 797+00

6 ELAEAGNUS ANGUSTIFOLIA
4 ACER RUBRUM
4 GLEDITSIA TRIACANTHOS
7 MALUS ATROSANGUINEA
2 GLEDITSIA TRIACANTHOS
166 SALIX PURPUREA NANA 4'0" O.C.
1 PLATANUS ACERIFOLIA
3 MALUS ARNOLDIANA
3 PLATANUS ACERIFOLIA
171 SALIX PURPUREA NANA 4'0" O.C.
4 ACER GINNALA
3 ACER RUBRUM

L A

ROAD NO. 1
RAMP "F"
RAMP "E"
ROAD NO. 2
L C I R 70
ROAD
BELLAIRE

MATCH LINE STA 786+00

786 787 788 789 790 791 792 793 794 795 796 797 798 799 800

35 30 10 15 20 22 23 24 26 27 28 29 30 31 90 95

LANDSCAPING PLAN ~ STA. 786+00 TO STA. 800+44.71

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

171
279

CUYAHOGA COUNTY
CUY-71-13.68

MATCHLINE STA. 17+00

MATCHLINE STA. 813+75

LA

ROAD

BELLAIRE

MEMPHIS

20

25

10

15

805

810

114 SALIX PURPUREA NANA 4' O.C.
1620 POLYGONUM AUBERTI 4' O.C.
2 ACER RUBRUM
3 ACER SACCHARUM
4 GLEDITSIA TRIACANTHOS
5 MALUS FLORIBUNDA
1 PLATANUS ACERIFOLIA
75 SALIX PURPUREA NANA 4' O.C.
6 PLATANUS ACERIFOLIA
6 MALUS ZUMI CALOCARPA
1 GLEDITSIA TRIACANTHOS
4 MALUS ATROSANGUINEA
2 GLEDITSIA TRIACANTHOS
3 MALUS ATROSANGUINEA
3 SALIX ELEGENTISSIMA
160 SALIX PURPUREA NANA 4' O.C.
825 POLYGONUM AUBERTI 4' O.C.
1 LIQUIDAMBAR STYRACIFLUA

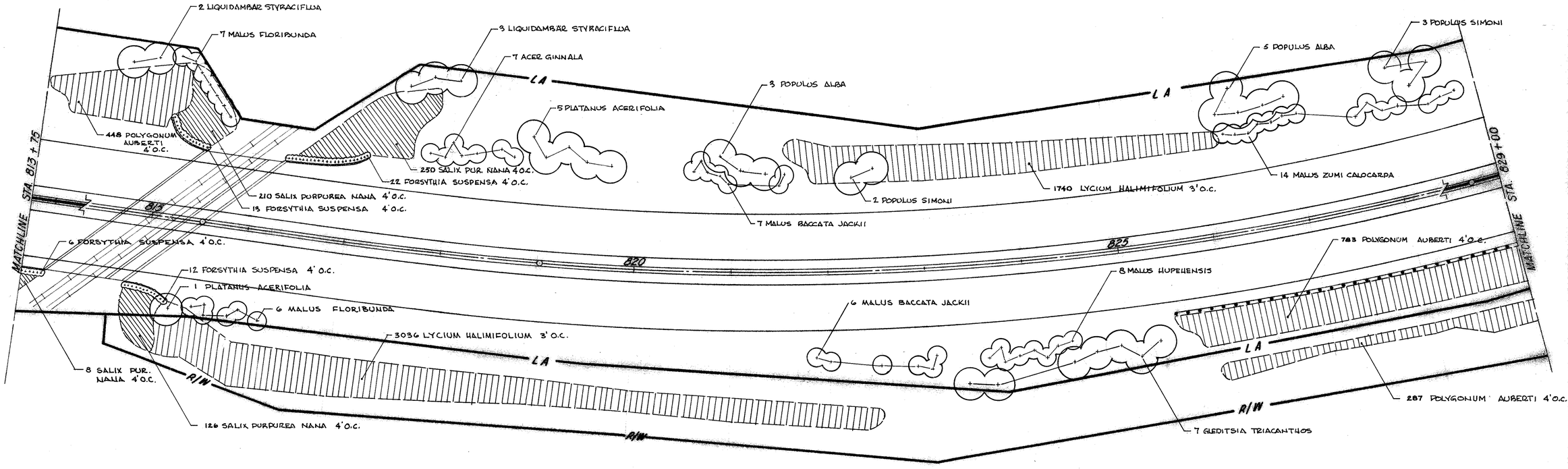
168 SALIX PURPUREA NANA 4' O.C.
2 ACER RUBRUM
6 GLEDITSIA TRIACANTHOS
6 MALUS ATROSANGUINEA
4 ACER SACCHARUM
6 MALUS ARNOLDIANA
3600 POLYGONUM AUBERTI 4' O.C.
7 PHELLODENDRON AMURENSE
4 ACER GINNALA
3 GLEDITSIA TRIACANTHOS
1 PHELLODENDRON AMURENSE
4 ELAEAGNUS ANGUSTIFOLIA
5 MALUS ATROSANGUINEA
3 PLATANUS ACERIFOLIA
5 ACER GINNALA
14 FORSYTHIA SUSPENSA 4' O.C.
142 SALIX PURPUREA NANA 4' O.C.
3 TILIA CORDATA
66 SALIX PURPUREA NANA 4' O.C.
696 POLYGONUM AUBERTI 4' O.C.
10 MALUS FLORIBUNDA
165 SALIX PURPUREA NANA 4' O.C.
2 LIQUIDAMBAR STYRACIFLUA

LANDSCAPING PLAN ~ STA. 800 + 44.71 TO STA. 813 + 75

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

172
279

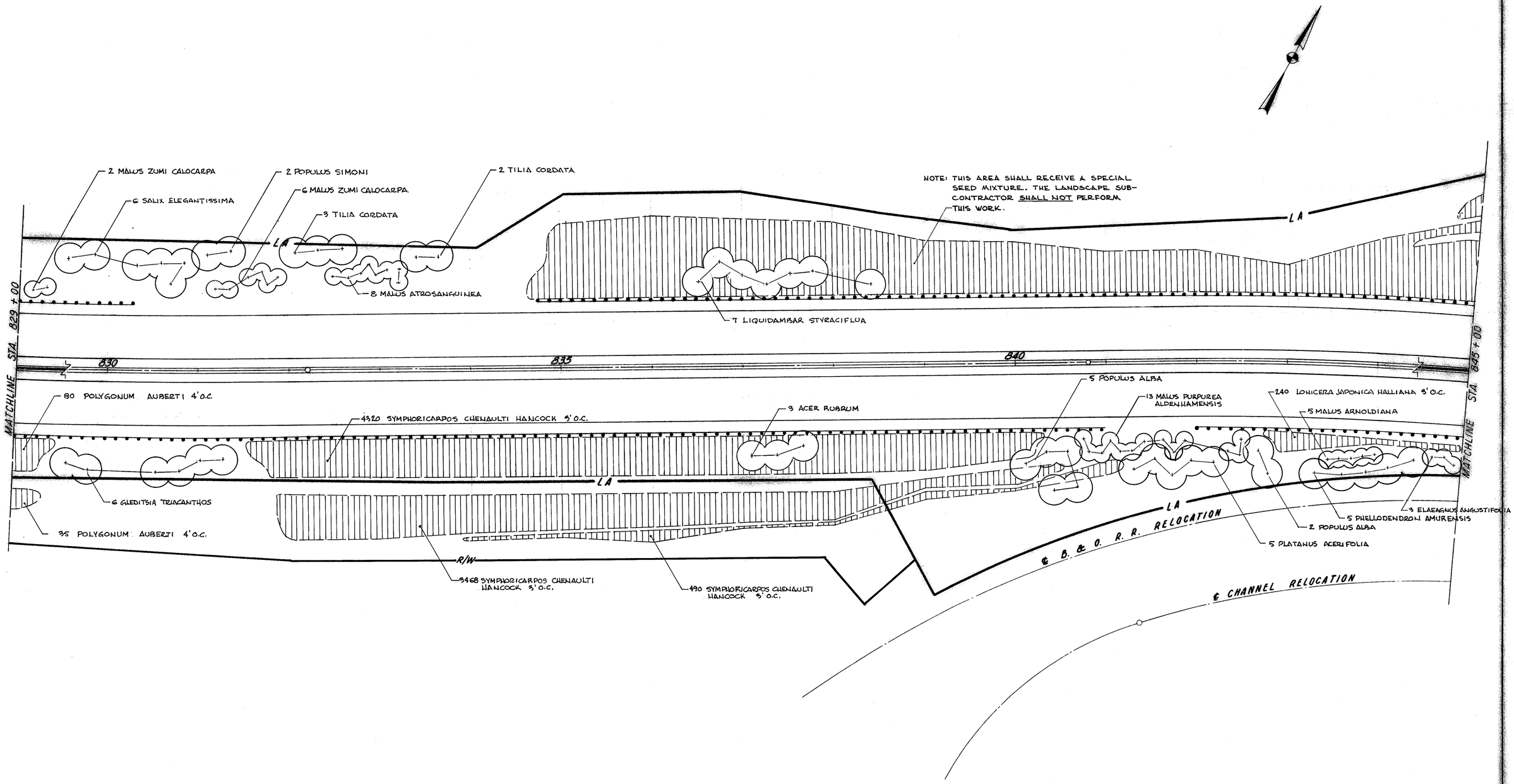
CUYAHOGA COUNTY
CUY-71-13.68



LANDSCAPING PLAN ~ STA. 813+75 TO STA. 829+00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY-71-13.68



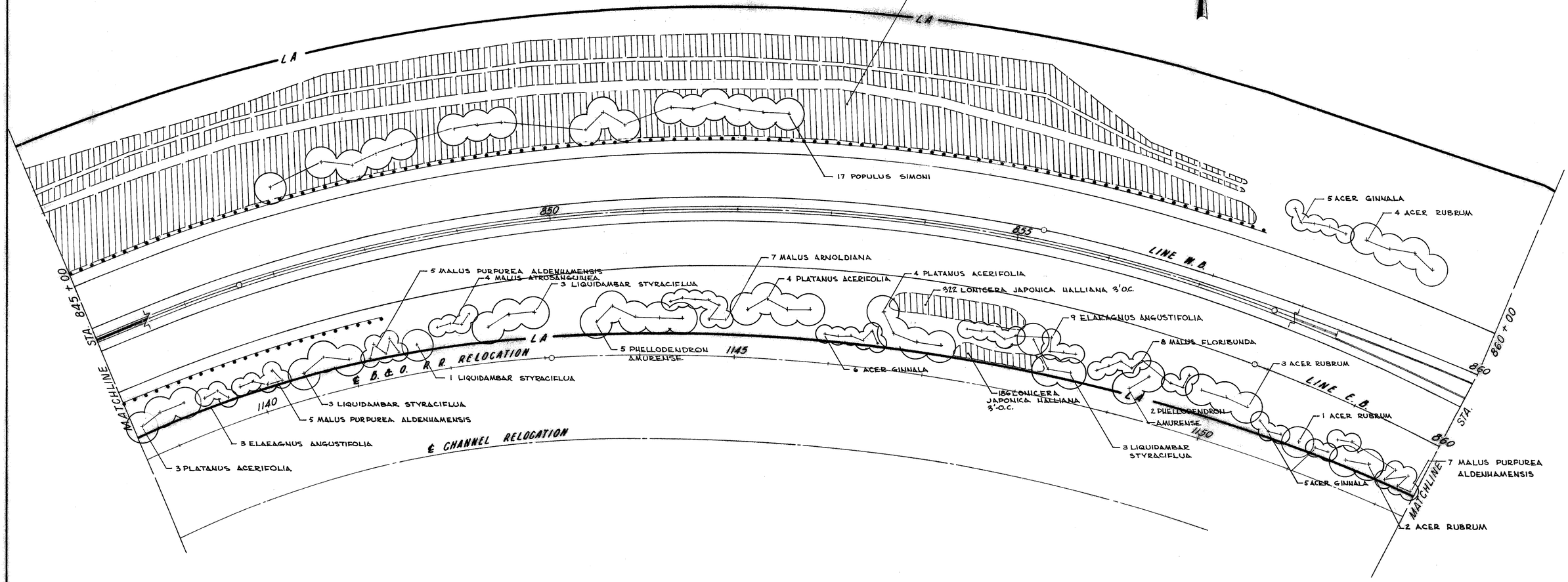
LANDSCAPING PLAN ~ STA. 829 + 00 TO STA. 845 + 00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

174
279

CUYAHOGA COUNTY
CUY-71-13.68

NOTE: THIS AREA SHALL RECEIVE A SPECIAL SEED MIXTURE. THE LANDSCAPE SUB-CONTRACTOR SHALL NOT PERFORM THIS WORK.



LANDSCAPING PLAN ~ STA. 845+00 TO STA. 860+00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

175
279

CUYAHOGA COUNTY
CUY-71-13.68

END PROJECT
STA. 870 + 00

2 LIQUIDAMBAR STYRACIFLUA
8 ACER RUBRUM
450 LONICERA JAPONICA HALLIANA 3' O.C.
6 CRATAEGUS PHAENOPYRUM
6 ACER GINNALA
3 PLATANUS ACERIFOLIA
5 LIQUIDAMBAR STYRACIFLUA
L A
L A
875
870
865
860
LINE "W. B"
11 MALUS FLORIBUNDA
5 LIQUIDAMBAR STYRACIFLUA
9 PLATANUS ACERIFOLIA
860
7 PHELLODENDRON AMURENSE
LINE "E. B"
865
870
875
1155
E. B. & O. RAILROAD RELOCATION
6 ACER GINNALA
4 ACER GINNALA
4 LIQUIDAMBAR STYRACIFLUA
6 LIQUIDAMBAR STYRACIFLUA
L A
6 MALUS FLORIBUNDA
1160
4 MALUS FLORIBUNDA
3 PHELLODENDRON AMURENSE
4 PLATANUS ACERIFOLIA
L A
1165
℄ CHANNEL RELOCATION

LANDSCAPING PLAN ~ STA. 860 + 00 TO STA. 875 + 00

LIGHTING SUMMARY

FED. RD. DIVISION	STATE	PROJECT		176 / 279
2	OHIO			

CUYAHOGA COUNTY
CUY-71-13.68

ITEM	SHEET NUMBER 184 (FOR PARTICIPATION SEE RIGHT COLUMNS)	185	186	187	188	189	192	193 (100% City)	194	STRUCTURE LOCATION BELLAIRE RD OVER I-71	MEMPHIS AVE OVER I-71	RAIL ROAD OVER I-71	ITEM	TOTALS (EXCLUDING STRUCTURES) TYPE CODE 7221 100% CITY	SPEC. PARTIC.	100% COUNTY	STATE & CITY	INTERSTATE NORMAL PARTICIPATION	TOTAL	UNIT	DESCRIPTION	NORMAL PARTICIPATION	SPECIAL PARTICIPATION	100% CITY CLEVE.
S-25										24	16	20	S-25							Each	Mercury Vapor 175 Watt Lamp (H-39-22 KB)		CLE	
S-25	12	35	20	21	20	12				4			S-25	8	H10		6	96-H2-93	120	Each	Mercury Vapor 400 Watt Lamp (H-33-1 CO)	29	35 / 11	8
S-25	12	35	20	21	20	12				4			S-25	8	H10			102-H2-101	120	Each	Luminaire - Type III with Integral 400 Watt Mercury Ballast	29	28 / 11	8
S-25										24	16	20	S-25							Each	Luminaire - Underpass Type with Integral 175 Watt Mercury Ballast		6	
S-25							8						S-25					8	8	Each	Fixture & Lamp 72" HO (As Per Plan)			
S-25							1						S-25					1	1	Each	Fixture & Lamp 72" SHO (As Per Plan)			
S-25							2						S-25					2	2	Each	Fixture & Lamp 96" SHO (As Per Plan)	4 / 5	4 / 4	8
S-25	6	17											S-25	8	H10			15 A5	23	Each	Pole - 35'-0" Mounting Height with 10'-0" Arm for Streets : (Round	X # 9 ections		
S-25	3	18	20	21	20	12							S-25				6	94 5A	94	Each	Pole - 35'-0" Mounting Height with 18'-0" Arm for Main Roadways ("	X 21	"	)
S-25	3												S-25					3	3	Each	Pole - 40'-0" Mounting Height with 18'-0" Arm for Entry Areas ("	X 3	"	)
S-25										4			S-25							Each	Pole - 32'-6" Mounting Height with 12'-0" Arm for Bridges ("	X	"	)
S-25	9	35	20	21	20	12							S-25	8	H1		6	109 92 98	117	Each	Light Pole Foundations (As Per Plan) w/1¼" x 48" Anchor Bolts .	26 23	0 H	8
S-25	3												S-25					3	3	Each	" " " " " " w/1½" x 60" " " .			
S-25	13	48	26	33	27	26	5						S-25	8	H10		6	120 150 54	178	Each	Ground Rods for Signs & Lighting (Complete)	42	10 H	8
S-25	9	27	8	9	6	7		8	8				S-25	4 2	6			80 72	82	Each	Pullbox (Single) 2'-8½" x 1'-8½"	26	8	4
S-25	1	7	3	6	4	7							S-25					28	28	Each	Pullbox (Double) 4'-0" x 2'-11"	8		
S-25										2			S-25							Each	Cast Iron Pullbox for Bridge (As Per Plan)			
S-25	1,170	5545	2690	510	1,450	2000							S-25	1,130	1555	135		13,100 11,515	14,365	Lin Ft	Trench (100% Cl. = 155)	4593	1555	1130
S-25			360	2,690	1,550								S-25					4600	4,600	Lin Ft	Trench (In Area with Guard Rail)			
S-25	425	1220	1550	1600	1500	2000							S-25					8305	8305	Lin Ft	Trench (Lighting, Signs and Communication Ducts.	1655		
S-25										670	450	510	S-25							Lin Ft	Conduit - ¾" Rigid Galvanized - Bridge Understructures			
S-25										40	60	27	S-25							Lin Ft	Conduit - 1¼" Rigid Galvanized - Bridge Understructures			
S-25		725								2525	1,400		S-25					725	725	Lin Ft	Conduit - 2" Rigid Galvanized - Bridge & Feeder	725		
S-25	570	2375	640	960	320	640		358	420				S-25	608	425			6,283 5608	6,283	Lin Ft	Conduit - 3" Rigid Galvanized - Crossovers	2270	425	250
																		52.86						
S-25										1,440	1,200	1,100	S-25							Lin Ft	Circuit Cable - 1/c Number 10, 600 Volt for Understructure Lighting			
S-25	1,200	1,800	520	550	240	300				1,200			S-25	480 200	930			4410 3200	4,610	Lin Ft	Circuit Cable - 1/c Number 4, 600 Volt for Bridges & Crossovers	1550	930	480
S-25		3500	270										S-25					3770 96	3,770	Lin Ft	Circuit Cable - 1/c Number 2, 600 Volt for Feeders	3500		
S-25	1,200	3500	2000	2100	2000	1200				400			S-25	800	1000 H10		600	11,200	12,000	Lin Ft	Pole & Bracket Cable - 1/c Number 12, 600 Volt	2600	1400	800
S-25								1,195	355	200			S-25	1195				1,550 355	1,550	Lin Ft	Detector Loop Cable (Number 12 TW Solid)			
S-25	1,750	6780	4700	2600	4700	4400							S-25	1,200	1665	135		23,595 21,930	24,930	Lin Ft	Cableduct - 2 Single Conductors, Number 4, 600 Volt. (135 Cu.	935 5665	1665	1200
S-25		1,070	340										S-25					1,410	1,410	Lin Ft	Cableduct - 3 Single Conductors, Number 2, 600 Volt for Circuits AB-2 & AB-3 Feeder			
S-25	870 (11% City)	2440 (11% City)	3100 (11% City)	3200 (11% City)	3000 (11% City)	4000 (11% City)							S-25	5300				16,600 5300	16,600	Lin Ft	3" Styrene duct for Alarm and Surveillance System with No 10 Pull Wire	1650		1650
S-25								40	25	5			S-25	40				65	65	Lin Ft	2" Fiber Duct for Detector Leads			
S-25								1,170	470				S-25	1170				1640	1640	Lin Ft	2" Polyethylene Duct Spare with Pull-Wire (Number 10)			
S-25		Lump											S-25					LUMP	Lump	Lump	Installation of Lighting for Temporary Runarounds		LUMP	
S-25										Lump	Lump	Lump	S-25							Lump	Bridge Structure Grounding System			
S-25										4	4	4	S-25							Each	Junction Box for Understructure Lighting			
S-25										4	4		S-25							Sets of 4	Light Pole Anchor Rods for Bridges			
S-25											280		S-25							Lin Ft	Unistrut Including Brackets & Hardware (As Per Plan)			
S-25		Lump											S-25					Lump	Lump	Lump	Service Pole	LUMP		
S-25		4	2	4	2	4							S-25					16	16	Each	Emergency Call Box Foundations	4		
S-25							5						S-25					5	5	Each	Photoelectric Cell			
S-25							Lump						S-25					Lump	Lump	Lump	Sign Wiring Complete (As Per Plan)			
S-25		2 City	1 City	2 City	1 City	3 City							S-25	3				9	9	Each	Direct Burial, Dry Type 480/120 V Transformer 0500 KVA with 30'-#12 Primary & Secondary Leads		2	
S-25	4	40	10	14	10	12							S-25	6	12			84 72	90	Each	Esna Kit Number 51	26	12	6
S-25	12	35	20	21	20	12	5			4			S-25	8	H10		6	125 109 109	133	Each	Esna Kit Number 82	36	H10	8
S-25	12	35	20	21	20	12	5			4			S-25	8	H10		6	125 109 109	133	Each	Esna Kit Number 83	36	H10	8
S-25	16	30	6	14	10	12							S-25	2	6			86 72	88	Each	Esna Kit Number 84	38	6	2
S-25							4						S-25					4	4	Each	Transformer, 0.75 KVA, Type III (As Per Plan)			
S-25							1						S-25					1	1	Each	Transformer, 150 KVA, Type V (As Per Plan)			
S-25							4						S-25					4	4	Each	30 Ampere Fusible Disconect Switch with Enclosure Y			
S-25							1						S-25					1	1	Each	30 Ampere Fusible Disconect Switch with Enclosure Z			
S-25							2						S-25					2	2	Each	Ballast, 475 Watt, Type A (As Per Plan)			
S-25							3						S-25					3	3	Each	Ballast, 310 Watt, Type B (As Per Plan)			
S-25							1						S-25					1	1	Each	Ballast, 1375 Watt, Type C (As Per Plan)			
S-25							2						S-25					2	2	Each	Ballast, 1375 Watt, Type D (As Per Plan)			
																					ALTERNATE BID ITEMS (NON-ROUND POLES)			
S-25	6	17											S-25	8				15	23	Each	Pole 35'-0" Mounting Height with 10'-0" Arm for Streets			
S-25	3	18	20	21	20	12							S-25					94	94	Each	Pole 35'-0" Mounting Height with 18'-0" Arm for Main Roadways			
S-25	3												S-25					3	3	Each	Pole 40'-0" Mounting Height with 18'-0" Arm for Entry Areas			
S-25										2										Each	Pole 32'-6" Mounting Height with 12'-0" Arm for Bridges .			

Revised 1-3-66 C E H
Revised 12-1-65 C E H
Revised C E H 1-22-65

GENERAL NOTES (LIGHTING)

CUYAHOGA COUNTY
CUY-71-13.68

GENERAL:

THIS ITEM SHALL CONSIST OF A COMPLETE ROADWAY LIGHTING SYSTEM OF LUMINAIRES SUPPORTED ON METAL POLES INSTALLED ON CONCRETE FOUNDATIONS. INCLUDING ALL LABOR AND MATERIALS TO PROVIDE THE LIGHTING SYSTEM COMPLETE, TESTED, AND READY FOR OPERATION. LIGHTING SYSTEM SHALL BE OF THE MULTIPLE TYPE, UTILIZING MERCURY VAPOR LUMINAIRES SUPPORTED ON STEEL LIGHT POLE STANDARDS. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF ITEM 8-25, FURTHER, THE RIGHT IS RESERVED BY THE CITY OF CLEVELAND TO INSTALL (AT THE APPROPRIATE TIME) IN STRUCTURES AND AT OTHER POINTS, NECESSARY CONDUITS, PULL BOXES AND APPURTENANCES REQUIRED FOR FUTURE ELECTRICAL CIRCUITS.

ALL MATERIAL, WORKMANSHIP AND CONSTRUCTION METHODS OF THIS PROJECT, EXCEPT AS MODIFIED HEREIN, OR ON THE DRAWINGS, SHALL CONFORM TO THE GENERAL REQUIREMENTS OF STATE OF OHIO, DEPARTMENT OF HIGHWAYS, CONSTRUCTION AND MATERIAL SPECIFICATIONS, JANUARY 1, 1963. OTHER ITEMS WHICH APPLY ARE INCLUDED BELOW WITH MODIFICATIONS OF THE SPECIFICATIONS WHICH SHALL BE COMPLIED WITH BY CONTRACTOR.

IN GENERAL THE ELECTRIC WORK IS SHOWN ON THE DRAWINGS BY SYMBOLS AND NUMERICAL DESIGNATION, A KEY TO WHICH IS INDICATED ON THE DRAWINGS.

THROUGHOUT THESE PLANS THE USE OF TRADE NAMES FOR ELECTRICAL LIGHTING EQUIPMENT IS MEANT TO BE DESCRIPTIVE ONLY. COMPARABLE PRODUCTS OF OTHER ELECTRICAL FIRMS ARE ACCEPTABLE IF ACCESSORIES AND MAIN MEMBERS ARE COMPATIBLE WITH ONE ANOTHER AND SERVE THE INTENDED PURPOSE.

THE CONTRACTOR SHALL ALSO COMPLY WITH THE NATIONAL SAFETY CODE AND ELECTRICAL SERVICE RULES AND REGULATIONS OF THE CITY OF CLEVELAND, OHIO.

LUMINAIRE AND BALLAST:

FURNISH AND INSTALL AT EACH LIGHT STANDARD, THE LUMINAIRE, LAMP AND LAMP BALLAST, SPECIFIED ON THE PLANS. LUMINAIRE SHALL BE END MOUNTED WITH 2" SLIPFITTER FOR HORIZONAL OPERATING MERCURY VAPOR TYPE LAMPS AND SHALL INCLUDE ALUMINUM HOUSING, REFLECTOR, REFRACTOR, BALLAST AND MOGUL MULTIPLE SOCKET. THE REFRACTOR AND REFLECTOR ASSEMBLE SHALL BE DESIGNED TO PROVIDE A LIGHT DISTRIBUTION PATTERN CONFORMING TO ASA-IES TYPE III

BALLASTS SHALL BE OF THE SINGLE LAMP, HIGHPOWER FACTOR, REGULATOR OUTPUT (CONSTANT WATTAGE) TYPE FOR OPERATION ON A NOMINAL 230/460 VOLT MULTIPLE SYSTEM SUITABLE FOR SATISFACTORY OPERATION ON VOLTAGES FROM 420 TO 500 VOLTS AND TO START AND OPERATE THE LAMPS IN AN AMBIENT TEMPERATURE DOWN TO -20° FAHRENHEIT. BALLASTS SHALL BE AN INTEGRAL PART OF THE LUMINAIRE.

DETAILS OF EQUIPMENT AND CERTIFIED CURVES OF LUMINAIRE PERFORMANCE SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

PAYMENT WILL BE MADE ON A UNIT BID PRICE BASIS FOR INSTALLATION OF LUMINAIRE AND BALLAST SPECIFIED.

SEPARATE PULLBOX:

FURNISH AND INSTALL THE SEPARATE SINGLE OR DOUBLE STEEL REINFORCED CONCRETE RECTANGULAR TUBE PULL BOXES COMPLETE WITH CONCRETE COVER AS SHOWN ON PLANS. PULL BOXES SHALL CONSIST OF A PRE-CAST CONCRETE TUBE SUITABLE FOR MOUNTING FLUSH OR BELOW GROUND LEVEL. BOTTOM OF THE TUBE TO BE LEFT OPEN AND THE TOP TO HAVE PROVISIONS FOR FLUSH COVER. BOX INTERIOR SURFACES SHALL BE SMOOTH, FREE FROM OBSTRUCTIONS, ROUGH OR FLAKY AREAS. SEE DETAILS ON PLANS FOR STANDARD CABLE-DUCT OR CONDUIT ENTRY HOLES; HOLES NOT USED SHALL BE SEALED WITH GROUT OR MORTAR.

PULL BOX COVERS SHALL BE PRECAST CONCRETE STEEL REINFORCED. PROVIDE IN EACH COVER TWO (2) HOLES 1-1/2" DIAMETER x 3/4" DEEP TO EXPOSE #6 GALVANIZED WIRE WHICH WILL BE USED TO GRIP COVER FOR REMOVAL. PAYMENT SHALL BE MADE ON A UNIT BID PRICE BASIS FOR EACH SEPARATE PULL BOX AND COVER INSTALLED COMPLETE, INCLUDING 6" OF AGGREGATE FOR SUMP.

LAMPS:

LAMPS SHALL BE OF THE MERCURY VAPOR TYPE, WEATHER-RESISTANT WITH QUARTZ-ARC TUBE HAVING 20,500 LUMENS (400 WATT),
AND 7,000 LUMENS (175) WATT) RESPECTIVELY. LAMPS SHALL BE CLEAR ASA CODE H33-1CD (400 WATT), H 39-22KB (175 WATT).

ANCHOR-ROD TEMPLATE:

THE CONTRACTOR SHALL OBTAIN A CERTIFIED ANCHOR ROD SETTING TEMPLATE BEFORE SETTING RODS. TEMPLATES MUST BE SENT TO THE HIGHWAY LIGHTING ENGINEER FOR APPROVAL BEFORE RODS ARE INSTALLED.

LIGHTING STANDARD FOUNDATIONS:

FOUNDATIONS SHALL CONFORM TO THE DESIGN AND DETAILS SHOWN ON THE PLANS AND AS SPECIFIED HEREIN, AND SHALL BE OF CLASS C CONCRETE.

LOCATION OF LIGHTING UNIT FOUNDATION IS REFERENCED BY A STATION ON THE ROADWAY CENTERLINE AND OFFSET DISTANCE FROM THE ROADWAY PAVEMENT. CONTRACTOR SHALL CHECK THE OFFSET DISTANCE IN THE FIELD TO PREVENT IMPROPER PLACEMENTS, STAKE OUT LOCATIONS AND OBTAIN ENGINEER APPROVAL PRIOR TO EXCAVATION. FINAL POSITION SHALL BE ADJUSTED TO MEET FIELD CONDITIONS. A TEMPLATE SHALL BE PROVIDED TO ACCURATELY AND FIRMLY HOLD THE ANCHOR BOLTS DURING THE POURING OF THE CONCRETE. THE CONCRETE FOUNDATIONS SHALL BE CAST IN PLACE. THE LOWER PORTION MAY BE POURED IN A 2'-0" DIAMETER HOLE WITHOUT FORMS. THE TOP PORTION SHALL BE FORMED 2'-0" SQUARE FOR AT LEAST 1'-0" DEEP OR A MINIMUM SIX (6) INCHES BELOW THE FINISHED GRADE LINE. FOUNDATION MUST BE TO A MINIMUM DEPTH OF 7' (FOR 35' MOUNTING HEIGHTS) AND 8' (FOR 40' MOUNTING HEIGHTS) BELOW LOWEST POINT OF FINISHED GRADE, ADDITIONAL DEPTH REQUIRED DEPENDING UPON SOIL CONDITIONS AND SHALL HAVE TWO 2"-90° FIBER BENDS.'

ALL SERVICE EQUIPMENT, LIGHTING STANDARDS OR SIGN STRUCTURES SHALL BE PROPERLY GROUNDED IN ACCORDANCE WITH NATIONAL SAFETY CODE REQUIREMENTS. 1" x 10' 0" SOLID WROUGHT IRON GROUND RODS WITH APPROVED EXOTHERMAL TYPE CONNECTION AND NO. 4 (7 STRAND 600 VOLT INSULATION) WIRE SHALL BE USED. RED CONNECTORS SHALL BE PAINTED WITH TWO COATS OF INSULATING VARNISH AFTER INSTALLATION. RESISTANCE TO GROUND SHALL NOT EXCEED 25 OHMS. GROUND RODS SHALL BE DRIVEN IN THE TRENCH ADJACENT TO THE LIGHT STANDARD FOUNDATIONS. THE TOP OF THE GROUND ROD SHALL BE DRIVEN WITHIN A FEW INCHES OF THE BOTTOM OF THE TRENCH TO FACILITATE EXOTHERMIC WELDING OF THE NO. 4 INSULATED GROUND WIRE TO THE TOP OF THE GROUND ROD.

THE TOP ELEVATION OF THE POLE FOUNDATIONS SHALL BE SET TO PROVIDE THE SPECIFIED MOUNTING HEIGHT OF LUMINAIRES ABOVE TOP OF PAVEMENT, EXCEPT ON SUPER ELEVATED SECTIONS WHERE THE FOUNDATION MUST BE RAISED TO REACH GRADE ELEVATION, THEREFORE, THE LUMINAIRE MOUNTING HEIGHT MAY BE EXCEEDED IN SUCH CASES.

UNIT PRICE BID FOR STANDARD FOUNDATIONS SHALL INCLUDE FURNISHING AND PLACING OF CONCRETE, ANCHOR BOLTS, CONDUIT ELLS, ETC., AND THE COST OF EXCAVATION BACKFILL AND DISPOSAL OF SURPLUS MATERIAL.

SEPARATE PAYMENT SHALL BE MADE FOR EACH TYPE OF FOUNDATION FURNISHED.
Separate payment shall be made for each ground rod installed.

MARKERS:

MARKERS SHALL BE CONSTRUCTED OF CLASS C CONCRETE AND SET FLUSH WITH FINISHED GRADE AT THE FOLLOWING LOCATIONS OR AS DIRECTED BY THE ENGINEER.

CROSSOVER END WHERE PULL BOX IS NOT WARRANTED OR SHOWN. ABRUPT CHANGE IN DIRECTION OF CABLE-DUCT.
PAYMENT SHALL BE ON A PER UNIT BASIS FOR EACH MARKER INSTALLED.

TRENCH:

TRENCH SHALL BE PROVIDED FOR ALL UNDERGROUND CABLE AT THE LOCATIONS AND IN CONFORMITY TO THE DESIGN, DETAILS AND DIMENSIONS SHOWN ON THE PLANS.

TRENCH FOR CABLE MAY BE EXCAVATED MANUALLY OR WITH MECHANICAL TRENCHING EQUIPMENT. TRENCH WALLS SHALL BE ESSENTIALLY VERTICAL SO THAT A MINIMUM OF SHOULDER SURFACE IS DISTURBED. GRADERS SHALL NOT BE USED TO EXCAVATE TRENCHES WITH THEIR BLADES.

TRENCH BOTTOM SHALL BE SMOOTH AND FREE OF COARSE AGGREGATE. MINIMUM WIDTH OF TRENCH BOTTOM SHALL BE FOUR INCHES FOR ONE (1) CABLE-DUCT. MINIMUM DEPTH SHALL BE 24 INCHES. THE TRENCH SHALL BE WIDENED WHERE MORE THAN ONE (1) CABLE-DUCT IS TO BE INSTALLED PARALLEL IN THE SAME TRENCH (SEE DETAILS ON PLANS.) *Sheets 180 and 181A.*

BACKFILLING AND COMPACTING OF THE TRENCH SHALL BE IN ACCORDANCE WITH SEC. I-1.07 CLASS 4, EXCEPT THAT MATERIAL IN FIRST 4 INCHES ABOVE CABLE-DUCT SHALL CONTAIN NO PIECES LARGER THAN 1".

CABLE TRENCH SHALL BE LOCATED WITH RESPECT TO PAVED SHOULDER AS SHOWN ON THE PLANS. IN AREAS WHERE GUARDRAIL IS LOCATED THE CONTRACTOR SHALL EXCAVATE THE TRENCH MANUALLY OR EMPLOY MECHANICAL EQUIPMENT THAT WILL NOT DISTURB OR DAMAGE THE EXISTING GUARDRAIL. GUARDRAIL THAT IS REMOVED SHALL BE REPLACED IN ACCORDANCE WITH ITEM I-15, SECTION I-15.08, GUARDRAIL REMOVED AND REBUILT.

SEPARATE MEASUREMENT SHALL BE MADE FOR TRENCH INSTALLED IN AREAS WHERE NO GUARDRAIL IS PRESENT AND FOR TRENCH INSTALLED IN AREAS WHERE GUARDRAIL IS EXISTING.

PAYMENT FOR TRENCH SHALL BE MADE AT THE CONTRACT UNIT PRICE BID, FOR EACH TYPE OF TRENCH. PRICE SHALL INCLUDE EXCAVATION, BACKFILL, RESTORATION, GUARDRAIL REMOVAL AND REPLACEMENT, DISPOSAL OF SURPLUS MATERIAL, REMOVAL OF ROCK, SAND AND GRADED BACKFILL AND FOR ALL PREPARATION, LABOR, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK. NO SEPARATE PAYMENT SHALL BE MADE FOR TRENCHES OF DIFFERENT WIDTHS.

CIRCUIT CABLES:

FURNISH AND INSTALL THE CABLE INSTALLATION INCLUDING CONDUCTORS IN CONDUIT, (CABLE-DUCT UNDER SEPARATE ITEM). ALL CABLES SHALL TERMINATE AT EACH JUNCTION POINT AND BE PROVIDED WITH HEAVY DUTY "STAKED TYPE" TERMINALS. SPLICE CONNECTIONS IN PULL BOXES SHALL BE MADE WITH ESNA CONNECTOR KITS STYLE 51 & STYLE 84 OR BISHOP SPLICING KITS BI-CAST EPC-44 OR APPROVED EQUAL AND SHALL BE INSTALLED IN A MANNER AS PER MANUFACTURERS RECOMMENDATION. SPLICES IN HANDHOLE AREA OF EACH STANDARD SHALL BE MADE WITH ESNA CONNECTOR KITS STYLES 82 AND 83. SPLICES SHALL BE MADE IN A MANNER APPROVED BY CABLE MANUFACTURER.

CIRCUIT CABLES FOR CONDUIT OR CABLE-DUCT SHALL MEET FAA-L-824 SPECIFICATIONS, TYPE A, 600 VOLT, 4/64" INSULTATION THICKNESS, 3/64" JACKET THICKNESS, NO. 4 A.W.G. SIZE WIRE.

FEEDER CABLES IN CONDUIT AND CABLE-DUCT SHALL BE #2 SINGLE CONDUCTOR 600 V RHW 75° C USE 75° C WITH MINIMUM 3/64" INSULATION AND .030 NEOPRENE JACKET AND SHALL CARRY UNDERWRITERS LABORATORIES LABEL AS TYPE USE 75C.

FIVE FEET OF SLACK CABLE SHALL BE PROVIDED AT EACH PULL BOX AND FOUR FEET OF SLACK CABLE SHALL BE PROVIDED ABOVE POLE BASE. SLACK CABLE SHALL BE INCLUDED IN THE PRICE PER LINEAR FOOT OF CIRCUIT AS DESCRIBED BELOW. CABLES SHALL BE PAID FOR ON A LINEAR FOOT BASIS FOR A SINGLE CONDUCTOR INSTALLED IN CONDUIT COMPLETE INCLUDING SLACK CABLE AND CONNECTION (CONDUIT, AND CABLE-DUCT PAID UNDER SEPARATE ITEMS). MEASUREMENT FOR PAYMENT SHALL BE THE HORIZONTAL CENTERLINE OR TRENCH OR CONDUIT AS SHOWN ON PLANS.

POLE WIRING:

POLE WIRING SHALL BE NO. 12 A.W.G. FEDERAL SPECIFICATION NO. FAA-L-824 TYPE A, 3/64" INSULATION AND 3/64" JACKET, 600 VOLT STRANDED, COPPER, TWO SINGLE CONDUCTORS, FROM HANDHOLD AND SPLICE UP TO LUMINAIRE. INSTALL IN BOTH LINES TO LUMINAIRE AN ESNA (ELASTIC STOPNUT CORPORATION OF AMERICA) "Y" TYPE CONNECTOR, ONE SHALL BE FUSED STYLE 82 AND THE OTHER UNFUSED STYLE 83 FOR GROUNDED PHASE.

PAYMENT SHALL BE MADE ON A UNIT BID PRICE BASIS PER LINEAL FOOT.

RIGID CONDUIT IN BRIDGE STRUCTURES:

FURNISH AND INSTALL COMPLETE, THE RIGID CONDUIT THAT SHALL BE OF A RIGID GALVANIZED (INSIDE AND OUT) STEEL CONDUIT OR A WELDED AND SEAMLESS ALLOY STEEL PIPE IN ACCORDANCE WITH STATE OF OHIO HIGHWAY SUPPLEMENTAL SPEC. M-106.11 SEC. M-106.11 DATED JANUARY 26, 1961. CONDUIT SHALL BE COMPLETE WITH ALL FITTINGS, COUPLINGS, ELLS, ETC., REQUIRED TO MAKE A COMPLETE INSTALLATION. ON THE BRIDGE STANDARDS BASES POURED IN WITH THE STRUCTURE CONDUIT SHALL MAKE CONNECTION TO CONDUIT ELL AT BASE TO CONTINUE RUNS AS SHOWN ON PLANS. CONDUITS SHALL BE COMPLETE WITH ALL COUPLINGS, FITTINGS, INSULATED BUSHINGS, CAPS, ETC., CAPS SHALL BE INSTALLED ON ENDS OF RUNS UNTIL WIRES ARE PULLED IN. CONDUIT OFF BRIDGES TO THE NEAREST LIGHT STANDARD FOUNDATION OR PULL BOX SHALL BE EITHER WROUGHT IRON-HOT DIPPED GALVANIZED INSIDE AND OUT AFTER TRENDING OR ALLOY STEEL AS SPECIFIED ABOVE. ALL CONDUITS SHALL BE FURTHER COATED ON THE INSIDE WITH AN APPROVED ENAMEL OR PLASTIC TO PROVIDE A SMOOTH WIRE RACEWAY. PAYMENT WILL BE MADE ON A PER LINEAR FOOT BASIS AS MEASURED HORIZONTALLY ALONG CENTERLINE OF CONDUIT FROM START TO TERMINATION.

CABLE-DUCT:

FURNISH AND INSTALL COMPLETE THE CABLE-DUCT ASSEMBLY AS HEREIN DESCRIBED.

THE DUCT IS THAT PORTION OF A POLYETHYLENE CABLE-DUCT (FACTORY PREASSEMBLED CABLE IN DUCT WHICH IS USED TO CONTAIN A NUMBER OF INSULATED CONDUCTORS FOR AN UNDERGROUND DIRECT BURIAL SYSTEM. THE ASSEMBLY OF CABLE-DUCT MAY BE PERFORMED BY EXTRUDING THE DUCT AROUND THE SPECIFIED CONDUCTORS OR BY PULLING THE CONDUCTORS THROUGH THE PREFORMED DUCT AT THE FACTORY. WHEN ASSEMBLED BY THE EXTRUSION METHOD, THE CONTRACTOR SHALL DEMONSTRATE THE FREENESS OF THE CONDUCTORS BY PULLING ONE FOOT OF THE CONDUCTOR FROM THE INSTALLED CABLE-DUCT. CABLE-DUCT SHALL BE MANUFACTURED IN CONTINUOUS LENGTHS SO THAT IT CAN BE INSTALLED WITHOUT SPLICES BETWEEN PULL BOXES, LIGHTING POLES OR LIGHTED SIGNS.

THE DUCT SHALL BE LAID PARALLEL TO THE TRENCH PRIOR TO INSTALLATION. THIS SHALL BE ACCOMPLISHED BY UNREELING THE DUCT FROM THE BED OF A SLOWLY MOVING TRUCK OR BY SIMILAR MEANS. DUCT ENTERING POLE BASES SHALL TERMINATE JUST BELOW BOTTOM OF HAND HOLE IN LIGHT STANDARD OR SIGN WITH A MINIMUM OF 18 INCHES OF WIRE EXTENDING OUTSIDE HAND HOLE FOR MAKING SPLICES. DUCT ENTERING PULL BOXES SHALL BE CUTOFF AS PER DETAIL AND THE CONDUCTORS EXTENDING INTO THE PULL BOX A MINIMUM OF 5 FEET FOR SPLICING. ALL CABLE-DUCT OR CONDUIT TERMINATIONS SHALL BE PLUGGED USING MATERIAL APPROVED BY THE CABLE-DUCT AND/OR CONDUIT MANUFACTURES WHICH WILL NOT AFFECT EITHER THE CABLE INSULATION CABLE-DUCT OR CONDUIT MATERIAL. ALL SPARE DUCTS INSTALLED SHALL CONTAIN ONE NO.10 GALVANIZED PULL WIRE AND BE PLUGGED AS ABOVE TEMPORARILY.

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GENERAL NOTES (LIGHTING)

IN NO CASE SHALL THE NOMINAL DIAMETER OR CABLE-DUCT BE LESS THAN 1-1/4 INCHES. The number of conductors used in the duct shall conform to the requirements of the National Electric Code.

RIGID CONDUIT SLEEVES ARE NOT REQUIRED WHEN INSTALLING CABLE-DUCT IN POLE BASES, BUT MAY BE USED AT THE DISCRETION OF THE CONTRACTOR.

PROPERTIES OF PLASTIC DUCT FOR CABLE-DUCT.

Duct for Cable shall conform to ASTM D 2104, Schedule 40, Type II Grade 3, or Type III Grades 1, 2, or 3.

CABLE-DUCT SHALL BE PAID FOR ON A LINEAR FOOT BASIS OF UNITIZED DUCT COMPLETE, INCLUDING SLACK CABLE AND CONNECTIONS. MEASUREMENT FOR PAYMENT SHALL BE THE HORIZONTAL OUTERLINE OF TRENCH AS SHOWN ON PLANS.

SERVICE POLE AND CONTROL STATION:

FURNISH AND INSTALL AT LOCATIONS SHOWN, SERVICE POLE TO RECEIVE UTILITY SERVICE DROP TO FEED SYSTEM. AT EACH POLE LOCATION FURNISH AND INSTALL COMPLETE THE 45' POLE, TRANSFORMERS, SERVICE ENTRANCE EQUIPMENT, WIRING, WEATHERPROOF CABINETS, BRACKERS, CONTROLLERS, TIME SWITCH, GROUNDING, FENCH, ETC., AS SHOWN ON PLANS OR REQUIRED IN CONTROL STATION EQUIPMENT DETAIL.

TRANSFORMERS SHALL BE OVERHEAD TYPE 37½ KVA or 25 KVA AS SHOWN ON PLANS, 2400/4160 VOLT PRIMARY 480 VOLT SECONDARIES TWO WIRE, SINGLE PHASE, ONE LEG GROUNDED. PRIMARY WINDING SHALL BE 2400/4160 VOLTS WITH (4) 2-1/2% TAPS BELOW NORMAL. FOR EACH TRANSFORMER BID THE BIDDER SHALL SUPPLY THE FOLLOWING INFORMATION:

NO LOAD LOSS IN WATTS AT 85° C.
FULL LOAD LOSS IN WATTS AT 85° C.
PERCENT REGULATION AT 85° C AND 80% P.F.
MAXIMUM OVERALL DIMENSIONS: WIDTH, HEIGHT, DEPTH
MAXIMUM EXCITING CURRENT IN AMPERES
MAXIMUM OIL CONTENTS IN GALLONS
MAXIMUM NET WEIGHT IN POUNDS.

THE BIDDER IN SUPPLYING THE DATA ABOVE SHALL THEREBY ~~GUARANTEE~~ certify THAT, IF AWARDED THE CONTRACT, ALL TRANSFORMERS DELIVERED UNDER THAT CONTRACT SHALL MEET OR IMPROVE ON THE DATA SO SUPPLIED. ~~AWARD SHALL BE MADE AFTER AN EVALUATION OF PURCHASED AND OPERATING COSTS.~~ ALL TRANSFORMERS SHALL BE MANUFACTURED, TESTED, AND SHIPPED TO MEET OR IMPROVE ON ALL APPLICABLE EE1-NEMA STANDARDS, EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE. This

THE FOLLOWING CERTIFIED DATA SHALL BE REQUIRED ON EACH AND EVERY TRANSFORMER SHIPPED WITH AN ATTACHED TAG.

A) SERIAL NUMBER
B) FULLWAVE IMPULSE TEST KV SUBJECTED TO IN ACCORDANCE WITH NEMA STANDARDS
C) ACTUAL CORE LOSS IN WATTS
D) TOTAL LOSS IN WATTS
E) IMPEDANCE IN PER CENT

TRANSFORMERS SHIPPED WITHOUT SUCH A TAG SHALL BE REJECTED.

PAYMENT SHALL BE MADE ON A UNIT BID PRICE BASIS FOR EACH SERVICE POLE AND CONTROL STATION COMPLETE.

INSPECTIONS, CODES, RULES AND REGULATIONS:

OBTAIN ALL INSPECTIONS REQUIRED BY LAWS, ORDINANCES, RULES, REGULATIONS, AND THE CITY OF CLEVELAND. OBTAIN CERTIFICATES OF SUCH INSPECTIONS AND SUBMIT SAME TO ENGINEER. CONTRACTOR SHALL PAY ALL FEES, CHARGES AND OTHER EXPENSE IN CONNECTION THEREWITH.

STRUCTURES ELECTRICAL GROUND SYSTEM:

SUPER STRUCTURE GROUNDING SHALL BE NO. 1/0 AWG 7 STRAND SOFT ANNEALED BARE COPPER CABLE ENCASED IN OUTSIDE COLUMN ON EITHER SIDE OF STRUCTURE AT FIXED PIER OR PIERS, CONNECT BY EXOTHERMIC WELD PROCESS THE LOWER END OF CABLE TO A STEEL PILE OR STEEL SHELL OF A CAST IN PLACE CONCRETE PILE. IF STEEL PILING OR CAST IN PLACE CONCRETE PILING IS NOT USED THEN INSTALL 25 FOOT OF CABLE LOOPED UNDER THE PIER FOOTING AND SEPARATE FROM THE CONCRETE WITH 2 LAYERS OF TAR PAPER. EXTEND CABLE IN ONE CONTINUOUS LENGTH THROUGH TOP OF PIER CAP WITH LEAD IN OF SUFFICIENT LENGTH TO EXOTHERMIC WELD AT UPPER END OF CABLE TO OUTSIDE GIRDER OR BEAM OF SUPER STRUCTURE.

LIGHT POLE GROUND SHALL BE NO. 1/0 AWG 7 STRAND, SOFT ANNEALED BARE COPPER CABLE AND BE EXOTHERMIC WELD CONNECT ONE END OF CABLE TO A LIGHT POLE ANCHOR ROD AND EXOTHERMIC WELD THE OTHER END TO THE TOP FLANGE OF OUTSIDE GIRDER OR BEAM OF THE SUPER STRUCTURE.

PAYMENT SHALL BE MADE ON A LUMP SUM BASIS FOR EACH STRUCTURE.
* For Bridge No. CUY.71-1352 a No. 1/0 ground wire shall be encased in the outside on each side of the structure (see sheets 208 & 209).

INSPECTIONS, CODES, RULES AND REGULATIONS:

OBTAIN ALL INSPECTIONS REQUIRED BY LAWS, ORDINANCES, RULES, REGULATIONS, AND THE CITY OF CLEVELAND. OBTAIN CERTIFICATES OF SUCH INSPECTIONS AND SUBMIT SAME TO ENGINEER. CONTRACTOR SHALL PAY ALL FEES, CHARGES AND OTHER EXPENSE IN CONNECTION THEREWITH.

LIGHT POLES ARMS AND ACCESSORIES:

LIGHT POLES SHALL BE TAPERED STEEL POLES. THE SHAFT SHALL BE FABRICATED FROM #7 OR #11 MANUFACTURERS STANDARD GUAGE, HOT ROLLED, BASIC OPEN HEARTH, CARBON STEEL. IT SHALL HAVE ONLY ONE LONGITUDINAL, AUTOMATICALLY, ELECTRICALLY WELDED JOINT AND SHALL HAVE NO INTERMEDIATE TRANSVERSE JOINTS OR WELDS. ONLY ONE LENGTH OF STEEL SHEET SHALL BE USED, WHICH SHALL BE FORMED INTO A CONTINUOUSLY TAPERED SHAFT, HAVING A TAPER OF APPROXIMATELY 0.14 INCH PER FOOT.

SHAFT SHALL BE COLD WORKED AFTER WELDING WITH SUFFICIENT PRESSURE TO DEVELOP A MINIMUM YIELD STRENGTH OF 48,000 P.S.I. AND TO FLATTEN THE WELD TO A TRUE TAPERED TUBE OF UNIFORM THICKNESS THROUGHOUT (INCLUDING THE WELD AREA), WITHOUT FLAT SPOTS AND WITHOUT FINISH GRINDING.

IF THE TAPERED STEEL SHAFTS OF THE LIGHTING POLES ARE MANUFACTURED BY OTHER MEANS THAN THAT SPECIFIED ABOVE, ALTERNATES WILL BE ACCEPTED PROVIDED THEY BE MADE OF STEEL HAVING A MINIMUM SIZE 11 GUAGE (U.S.STD.) AND A MINIMUM YIELD STRENGTH OF 48,000 P.S.I., AND MEET THE PERMANENT SET AND DEFLECTIONS SPECIFICATIONS TABULATED FOR EACH OF THE POLE SIZES LISTED BELOW, ALSO, SUCH POLES SHALL BE SHOT BLASTED TO REMOVE MILL SCALE AND WELD SLAG PREPARATORY TO GALVANIZING.

LIGHT POLES SHALL BE CAPABLE OF WITHSTANDING LOADING (APPLIED 18" FROM THE TOP) AS INDICATED BELOW WITHOUT EXCEEDING THE PERMANENT SET AND DEFLECTION (MEASURED IN INCHES 18" FROM TOP OF POLE) AS INDICATED.

SHAFT SIZE	GAUGE	MAX ARM LENGTH	BOLT PROJ'N ABOVE GROUND	BOLT CIRCLE DIA.	ELASTIC DEF'L. RATE, IN. PER 100 LB.	AT 2/3 OF YIELD STRESS			AT YIELD STRESS			
						LOAD IN LB.	TOTAL DEF'L. IN IN.	PERM. SET IN IN.	LOAD IN LBS	TOTAL DEF'L IN IN.	PERM. SET IN IN.	
A-9.5" x 5.02"x 32'-0"	7	18'	3 1/8"	13"	1.61	1007	16.70	.50	1512	27.30	2.94	
B-9.0"X 4.52"X 32'-0"	11	10'	3"	12 ½"	2.92	605	18.17	.50	908	29.66	3.15	RAMP
C-9.0"X 4.87"X 29'-6"	11	12'	3"	12 ½"	2.16	659	14.73	.50	989	24.00	2.64	BRIDGE
D-11.0"X 5.75"X 37'-6"	7	18'	6"	15"	1.70	1156	20.15	.50	1734	32.93	3.45	

THE BRACKET ARMS AND THEIR RELATED POLE ATTACHMENT DEVICES SHALL SUSTAIN A VERTICAL LOAD OF 100 LBS. APPLIED WITHIN 3" OF THE LUMINAIRE END OF THE SUPPORT AND WITH THE SUPPORT ATTACHED TO A RIGID STRUCTURE. THE VERTICAL DEFLECTION SHALL NOT EXCEED 5-1/2% OF THE SUPPORT LENGTH. THIS INCLUDES A MAXIMUM ALLOWANCE OF 1/2 OF 1% OF THE SUPPORT LENGTH FOR TESTING METHODS AND PERMANENT SET.

THE BRACKET ARMS AND THEIR RELATED POLE ATTACHMENT DEVICES SHALL SUSTAIN A TRANSVERSE HORIZONTAL LOAD OF 50 LBS. APPLIED WITHIN 3" OF THE LUMINAIRE END OF THE SUPPORT WITH THE SUPPORT ATTACHED TO A RIGID STRUCTURE. THE HORIZONTAL DEFLECTION SHALL NOT EXCEED 10% OF THE SUPPORT LENGTH AND THE POLE ATTACHMENT DEVICES SHALL NOT DEVELOP ANY LOOSENESS WITHIN THE SPECIFIED LOADING RANGE. THIS TEST SHALL BE CONDUCTED WITH A VERTICAL LOAD OF 30 LBS. ON THE SUPPORT.

DEFLECTION SHALL BE DEFINED AS THE TOTAL TRANSVERSE DISPLACEMENT OF THE LONGITUDINAL CENTERLINE OF THE SHAFT OR LUMINAIRE SUPPORT AT THE POINT OF TEST LOAD APPLICATION BETWEEN ITS INITIALLY UNLOADED AND FULLY LOADED POSITION.

PERMANENT SET IS DEFINED AS THE TOTAL TRANSVERSE DISPLACEMENT OF THE LONGITUDINAL CENTERLINE OF THE SHAFT AT THE POINT OF TEST LOAD APPLICATION BETWEEN ITS INITIALLY UNLOADED POSITION AND THE FINAL UNLOADED POSITION AFTER APPLICATION OF TEST LOADS.

FREEWAY LIGHT POLES ARE IDENTIFIED BY FREEWAY CENTERLINE STATIONS WITH BRACKET ARMS NORMAL WHEN 90° TO FREEWAY CENTERLINE, EXCEPT AS SHOWN. LIGHT POLES ON INTERSECTING STREETS ARE IDENTIFIED BY INTERSECTING STREET CENTERLINE STATIONS OR BY DIMENSION FROM CENTERLINE OF FREEWAY WITH BRACKET ARMS NORMAL WHEN 90° TO INTERSECTION STREET CENTERLINE. ORIENT FOUNDATION ANCHOR BOLTS ACCORDING TO ABOVE ARRANGEMENTS.

EACH POLE SHALL BE FITTED WITH A "J" HOOK AND LOCATED AT POLE TOP AS SHOWN ON POLE DETAIL. THE SHAFTS OR ANCHOR BASE STANDARDS SHALL BE FITTED WITH A 4" x 6-1/2" MINIMUM SIZED REINFORCED HANDHOLD WITH LOCKING STEEL COVER WITH CAPTIVE CHAIN AND GROUNDING NUT WELDED TO INSIDE OF SHAFT OPPOSITE HANDHOLE. HANDHOLES ON GROUND MOUNTED STANDARDS SHALL BE ON THE SIDE OPPOSITE THE LUMINAIRE SUPPORT ARM. FOR BRIDGE MOUNTED STANDARDS, HANDHOLE SHALL BE 17" ABOVE BASE ON SAME SIDE OF SHAFT AS LUMINAIRE SUPPORT ARM. THE POLES SHALL ALSO BE FITTED WITH POLE TOPS AND ORNAMENTAL ANCHOR BOLT COVERS. (CAPTIVE CHAIN SHALL BE #35 STAINLESS STEEL SASH CHAIN)

ANCHOR BASES SHALL BE ONE-PIECE CAST STEEL CONFORMING TO SECTION M-7.7, AND TOP FLANGE SHALL BE SECURED TO THE LOWER END OF THE SHAFT BY TWO CONTINUOUS ELECTRIC ARC WELDS. THE BASE SHALL TELESCOPE THE SHAFT AND THE ONE WELD SHALL BE ON THE INSIDE OF THE BASE AT THE END OF THE SHAFT, WHILE THE OTHER WELD SHALL BE ON THE OUTSIDE OF THE TOP OF THE BASE. THE TWO WELDS SHALL BE NOT LESS THAN 1-1/2" APART. THE WELDED CONNECTION SHALL DEVELOP THE FULL STRENGTH OF THE ADJACENT SHAFT SECTION TO RESIST BENDING ACTION.

THE BASE SHALL BE PROVIDED WITH FOUR (4) HOLES TO RECEIVE THE ANCHOR BOLTS, FOUR (4) HOLES FOR VENTILATION LOCATED IN THE BODY OF THE BASE DIRECTLY BEHIND EACH ANCHOR BOLT HOLD, AND FOUR (4) TAPPED HOLES FOR ATTACHING THE ORNAMENTAL COVERS.

FOUR (4) HIGH GRADE STEEL ANCHOR RODS, EACH FITTED WITH A HEX NUT, SHALL BE FURNISHED. EACH ANCHOR BOLT SHALL HAVE AN "L" BEND AT THE BOTTOM END AND BE THREADED AT THE TOP END. THREADED ENDS AND ALL NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A-153 WITH GALVANIZING EXTENDING NO MORE THAN 1" TO 4" BEYOND THREAD. PROVIDE LEVELING NUTS ON 1¼" X 60" ANCHOR RODS.

ANCHOR BOLTS SHALL CONFORM TO ASTM-A-107, GRADE 1035 SPECIAL QUALITY, AND SHALL HAVE A MINIMUM YIELD STRENGTH OF 46,000 P.S.I. FOR BOLTS 1-1/4" & 1 1/2" IN DIAMETER. BOLT STOCK SHALL CONFORM WITH ASTM SPECIFICATION A-29 AND NORMINAL BAR SIZE SHALL EQUAL NOMINAL BOLT SIZE. ANCHOR BOLTS ON BRIDGES MAY EITHER BE "U" SHAPED OR MADE SPECIAL TO CONFORM WITH THE DEPTH AND DESIGN OF THE BRIDGE STRUCTURES AND SHALL HAVE THE SAME PULLOUT QUALITIES AS THE 1-1/4" X 48" BOLTS USED IN THE ROADWAY LIGHT STANDARD FOUNDATIONS.

ALL STEEL STANDARDS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION M-7.4 (d). AFTER ERECTION, STANDARD SHALL BE INSPECTED FOR SCRATCHES IN THE GALVANIZED SURFACES. SUCH SCRATCHES SHALL BE GIVEN TWO COATS OF A ZINC RICH BASE PAINT. SECOND COAT SHALL BE APPLIED AFTER FIRST COAT HAS COMPLETELY DRIED.

SHAFT TRANSVERSE SECTION CONFIGURATION

1. BID ITEMS, AS SHOWN IN DETAIL, ARE FOR STANDARDS WITH SHAFTS OF CIRCULAR TRANSVERSE SECTION.
2. ALTERNATE BID ITEMS ARE FOR STANDARDS WITH SHAFTS OF TRANSVERSE SECTION OTHER THAN CIRCULAR. SPECIFY CONFIGURATION BID.
3. ALL SHAFTS THROUGHOUT THE PROJECT SHALL HAVE THE SAME TRANSVERSE SECTIONAL CONFIGURATION.

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GENERAL NOTES (LIGHTING)

THE BRACKET ARM ASSEMBLY SHALL CONSIST OF AN UPPER AND LOWER MEMBER SECURELY JOINED BY MEANS OF VERTICAL STRUT OR STRUTS. THE UPPER AND LOWER MEMBERS SHALL BE STANDARD STEEL PIPE OF 2" I.P.S. ASTM-120 SCHEDULE 40 (or 2½" w/ 2" tenon) OR LARGER AS REQUIRED. THE POLE END OF THE ARM OF BOTH MEMBERS SHALL HAVE A STEEL FITTING WELDED TO IT WHICH WILL PERMIT THE POSITIONING OF THE ARM OF THE POLE PLATE AND SHALL BE HELD ONLY BY GRAVITY WHILE THE ARM IS SECURED TO THE POLE BY TWO CAP SCREWS PER FITTING. ALL ARMS SHALL BE ARRANGED TO ACCOMMODATE A 2" SLIP FITTING.

BRACKET ARMS AND THEIR RELATED POLE ATTACHMENT DEVICES SHALL SUSTAIN A VERTICAL LOAD OF 250 LBS. APPLIED WITHIN 3" OF THE LUMINAIRE END OF THE SUPPORT WITHOUT COLLAPSE OR RUPTURE OF ANY PORTION OF THE POLE ASSEMBLY.

COMPLETE DETAILED DRAWINGS OF SAID STANDARDS AND BRACKET ARMS SHOWING STANDARDS AND SPECIAL CONFIGURATIONS, SHALL BE FURNISHED TO AND APPROVED BY THE ENGINEER PRIOR TO FABRICATION. PAYMENT WILL BE MADE AT THE UNIT BID PRICE FOR EACH STANDARD TYPE A, B, C OR D EQUIPPED WITH BRACKET ARM AND APPURTENANCES INSTALLED COMPLETE INCLUDING LIGHT POLE DECAL AS SHOWN ON PLANS.

EMERGENCY CALL BOX CONDUIT SYSTEM:

FURNISH AND INSTALL EMERGENCY CALL-BOX CONDUIT SYSTEM AS HEREIN SPECIFIED AND SHOWN ON DRAWINGS. PROVIDE 3" STYRENE DUCT DOWN ONE SIDE OF ROADWAY WITH PULL BOXES AT A MAXIMUM SPACING OF 500'. PROVIDE PULL-BOX AT EACH CALL-BOX FOUNDATION WITH 2-3" RIGID GALVANIZED CONDUIT CROSSOVERS TO PULL-BOX AND CALL-BOX ON OTHER SIDE OF ROADWAY. PROVIDE CALL-BOX FOUNDATIONS APPROXIMATELY EVERY 1000' ON EACH SIDE OF ROADWAY. RUN 1-2" DUCT BETWEEN PULL BOX AND CALL BOX FOUNDATIONS. See detail sheet No. 181A.

PAYMENT FOR DUCT SHALL BE MADE ON A LINEAR FOOT BASIS INCLUDING SLACK.

PAYMENT FOR CALL-BOX FOUNDATIONS WILL BE MADE ON A UNIT PRICE BID INCLUDING FINISHING, PLACEMENT OF CONCRETE, ANCHOR BOLTS, CONDUIT ELLS, ETC. AND THE COST OF EXCAVATION, BACKFILL AND DISPOSAL OF SURPLUS MATERIAL.

SPARE CONDUIT SYSTEM:

FURNISH AND INSTALL ONE SPARE 2" POLYETHYLENE DUCT WHICH WILL FOLLOW 480 VOLT SIGN FEEDER DUCT AND TERMINATE IN ALL PULL-BOXES IN WHICH SIGN DUCT TERMINATES.

PAYMENT SHALL BE MADE ON A LINEAR FOOT BASIS OF DUCT COMPLETED, INCLUDING SLACK.

TESTING:

CONTRACTOR SHALL FURNISH ALL NECESSARY EQUIPMENT AND APPLIANCES FOR TESTING THE UNDERGROUND CABLE CIRCUITS AFTER INSTALLATION. THE CONTRACTOR SHALL TEST AND DEMONSTRATE TO THE SATISFACTION OF THE ENGINEER, THE FOLLOWING:

1. THAT ALL LIGHTING, POWER AND CONTROL CIRCUITS ARE CONTINUOUS AND FREE FROM SHORT CIRCUITS.
2. THAT ALL CIRCUITS ARE FREE FROM UNSPECIFIED GROUNDS.
3. THAT THE RESISTANCE TO GROUND OF A NON-GROUNDED MULTIPLE CIRCUIT CONDUCTORS IS NOT LESS THAN 15 MEGOHMS.
4. THAT ALL CIRCUITS ARE PROPERLY CONNECTED AND OPERABLE.

RESISTANCE MEASUREMENTS SHALL BE MADE WITH BALLAST CONNECTED IN THE CIRCUITS. TESTS SHALL BE MADE WITH 500 VOLT MEGGAR IN THE PRESENCE OF THE ENGINEER. RECORD OF ALL TESTS SHALL BE FURNISHED IN TRIPLICATE TO THE ENGINEER. RECORD OF ALL TESTS SHALL BE FURNISHED IN TRIPLICATE TO THE ENGINEER AND HIGHWAY LIGHTING ENGINEER.

RESISTANCE MEASUREMENT OF GROUND ROD AT EACH STANDARD SHALL BE TAKEN-READING SHALL BE 25 OHMS OR LESS. IF UNABLE TO OBTAIN 25 OHMS OR LESS ADDITIONAL RODS UP TO 5 SHALL BE INSTALLED.

TESTING SHALL BE CONSIDERED A SUBSIDIARY WORK ITEM PERTAINING TO CABLE AND COST SHALL BE INCLUDED IN UNIT PRICE BID FOR CABLE. SIX COPIES OF CERTIFIED TESTS SHALL BE MADE. SEND THREE COPIES TO THE ENGINEER AND THREE COPIES TO THE HIGHWAY LIGHTING DEPARTMENT, COLUMBUS, OHIO.

CROSSOVER CONDUIT: (UNDER PAVEMENT)

RUN 2 - 3" RIGID STEEL CONDUIT HOT-DIPPED GALVANIZED INSIDE AND OUTSIDE, AFTER THREADING, WITH AN ENAMELED OR PLASTIC INSIDE COATING. CONDUIT SHALL CONFORM TO ASA SPEC. DESIGNATION C-80.1 AND FURTHER COMPLY WITH (a) SUPPLEMENTAL SPECIFICATION M-106.11 OR FED. GEN. SER. SPECIFICATION NO. WWP-441B FOR WROUGHT IRON. LOCATE PULL BOXES AT BOTH ENDS OF CROSSOVER AND INSTALL NO. 10 GALVANIZED PULL WIRE AND CAP EACH END OF SPARE CONDUIT OR FUTURE CONDUIT.

PAYMENT WILL BE MADE ON A LINEAR FOOT BASIS AS MEASURED HORIZONTALLY BETWEEN PULL BOXES.

S-25 "INSTALLATION OF LIGHTING FOR TEMPORARY RUN-AROUND"

LIGHTING FOR TEMPORARY RUN-AROUND SHALL BE PAID FOR AT THE LUMP SUM BID PRICE FOR "INSTALLATION OF LIGHTING FOR TEMPORARY RUN-AROUND" FOR THE BELLAIRE ST. AND MEMPHIS AVE. RUN-AROUNDS. ITEM SHALL INCLUDE INSTALLATION, MAINTAINANCE AND REMOVAL OF ITEMS IN GOOD CONDITION FOR RETURNING THEM TO CITY UPON REMOVAL AT THE RUNAROUND. MATERIALS & PLANS WILL BE FURNISHED BY THE "MUNICIPLE ELECTRIC LIGHT & POWER" CITY OF CLEVELAND.

THE OPERATION AND MAINTENANCE OF TEMPORARY LIGHTING SYSTEM TO BE PAID FOR BY THE STATE OF OHIO FOR THE MEMPHIS AVE. RUN-AROUND.

PERFORMANCE TEST

THE CONTRACTOR SHALL OPERATE THE LIGHTING SYSTEM INCLUDING ALL SPECIFIED APPARATUS INCLUDING AUTOMATIC CONTROL EQUIPMENT, FROM SUNSET TO SUNRISE FOR SEVEN CONSECUTIVE DAYS WITHOUT INTERRUPTION OR FAILURE AFTER ALL FAULTS ARE CORRECTED AND PRIOR TO ACCEPTANCE. RECORD FAULTS, METHOD OF CORRECTION AND DATE MADE AND BEGINNING AND END OF SEVEN DAY TEST. SUBMIT SIX CERTIFIED COPIES OF TEST LOG, THREE TO THE ENGINEER AND THREE TO THE HIGHWAY LIGHTING ENGINEER IN COLUMBUS, OHIO.

THE CONTRACTOR SHALL ARRANGE FOR ELECTRICAL ENERGY FOR TESTS WITH THE MUNICIPAL ELECTRIC LIGHT PLANT AND SHALL INCLUDE BOTH COSTS OF PERFORMANCE TEST AND ENERGY IN UNIT PRICE BID FOR RESPECTIVE ITEMS TESTED.

UNDERPASS LUMINAIRES SHALL BE MERCURY TYPE HOLOPHANE, U-488-480-CG-60° FOR 175 WATT MERCURY VAPOR LAMPS, HAVING AN INTEGRAL 480 V AUTO TRANSFORMER.

DETAILS OF EQUIPMENT AND CERTIFIED CURVES OF LUMINAIRE PERFORMANCE SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

PAYMENT WILL BE MADE ON A UNIT BID PRICE BASIS FOR INSTALLATION OF LUMINAIRE AND BALLAST SPECIFIED.

STYRENE CONDUIT

3" STYRENE CONDUIT TYPE II SHALL MEET FEDERAL SPECIFICATION (L-C-0074-GSA-FSS) AND FAA SPECIFICATIONS FOR PLASTIC CONDUIT. PRICE BID PER LINEAL FOOT SHALL INCLUDE INSTALLATION COMPLETE WITH COUPLINGS, ETC.

GUARD RAIL & ELECTRICAL EQUIPMENT

EXTREME CARE MUST BE EXERCISED IN THE PLACEMENT OF GUARD RAIL POST AND ALL UNDERGROUND ELECTRICAL WORK SO AS TO PREVENT CONFLECT.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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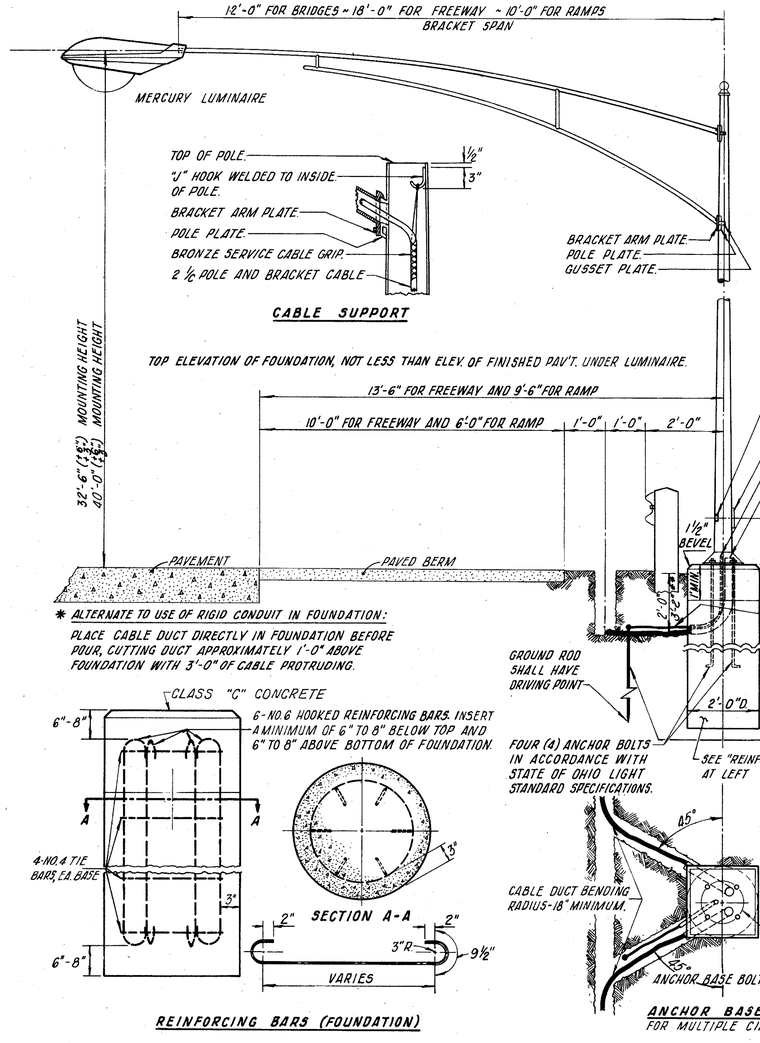
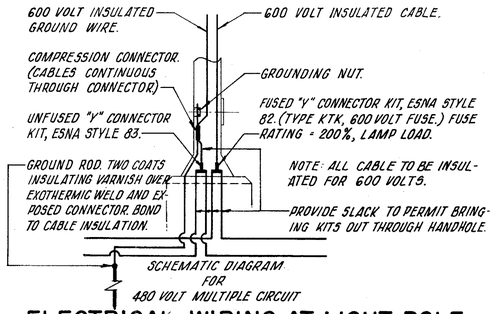
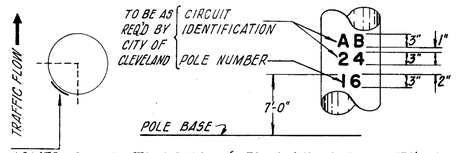


LIGHT POLE & FOUNDATION DETAILS



ELECTRICAL WIRING AT LIGHT POLE

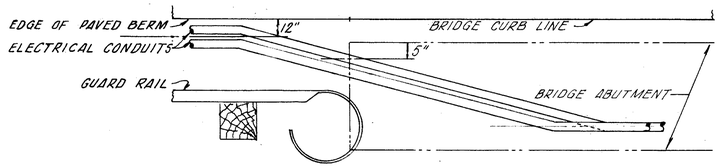
DECALS SHALL BE ADHESIVE TYPE WITH SILVER WHITE REFLECTIVE CHARACTERS ON A REFLECTIVE GREEN BACKGROUND, WITH CIRCUIT AND POLE NUMBERS AS SCHEDULED ON LIGHTING PLAN SHEETS.



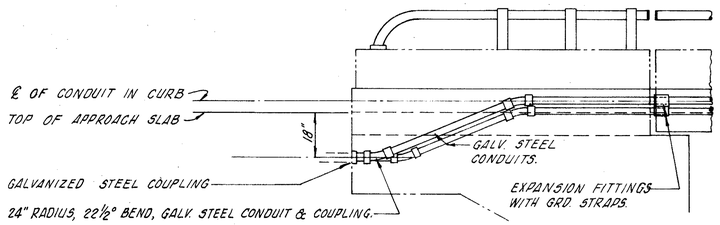
LOCATE IDENTIFICATION DECALS (CIRCUIT AND POLE NUMBERS) IN THIS AREA AND APPROXIMATELY SEVEN (7) FEET ABOVE POLE BASE.

REFLECTIVE LETTERS AND NUMBERS (SPECIFICATION MIL-R-13689 A), SERIES "B" TYPE LETTERS AND NUMBERS WITH SPACING PER A.A.S.H.O. SPECIFICATIONS.

LIGHT POLE CIRCUIT IDENTIFICATION

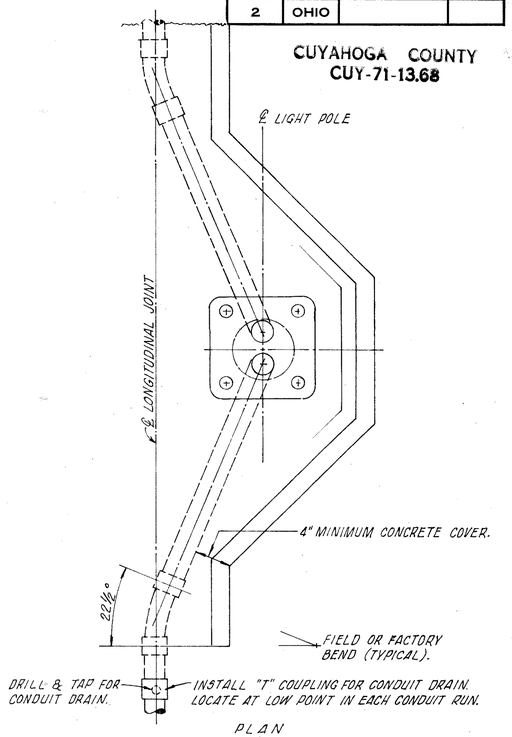


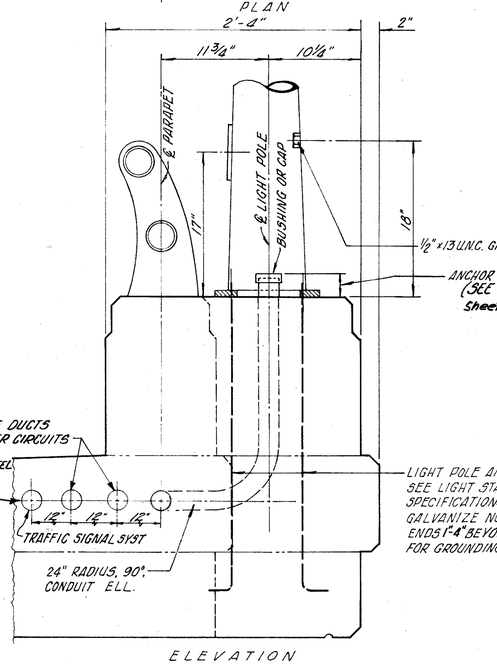
PLAN VIEW ~ CONDUIT ENTERING BRIDGE ABUTMENT



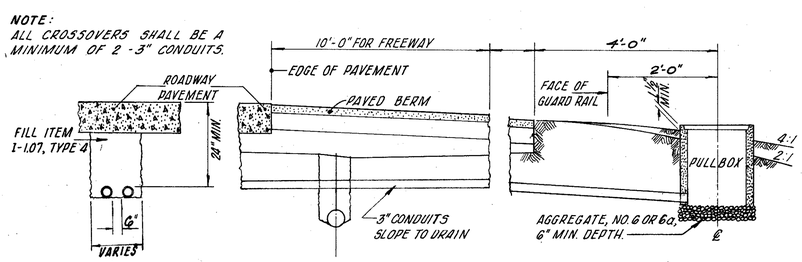
ELEVATION ~ WITH WING WALL

SUPERSTRUCTURE ABUTMENT CONDUIT

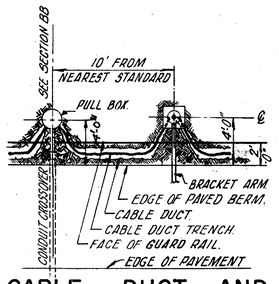




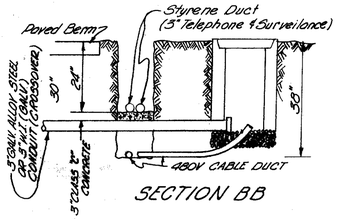
SECTION MULTIPLE CIRCUIT



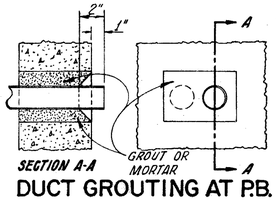
TYPICAL CONDUIT CROSSOVER DETAIL



CABLE DUCT AND PULLBOX LOCATIONS



SECTION BB



DUCT GROUTING AT P.B.

LIGHTING DETAILS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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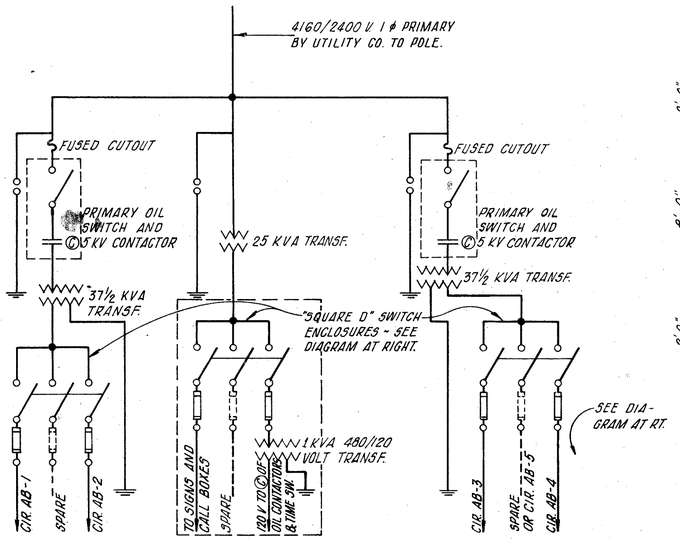
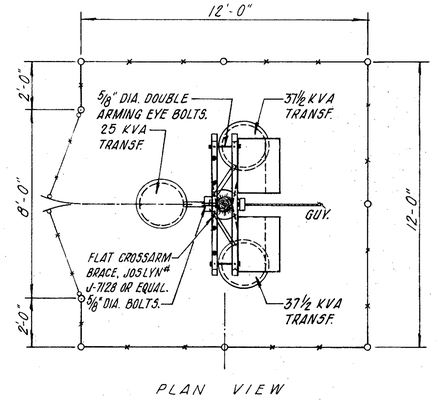
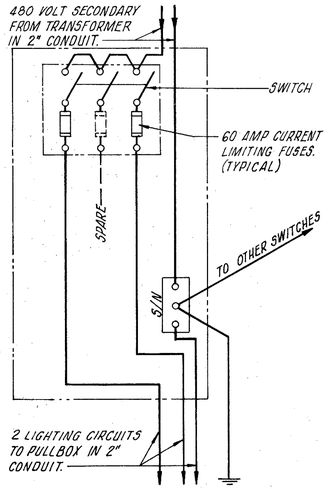


SCHEMATIC WIRING DIAGRAM

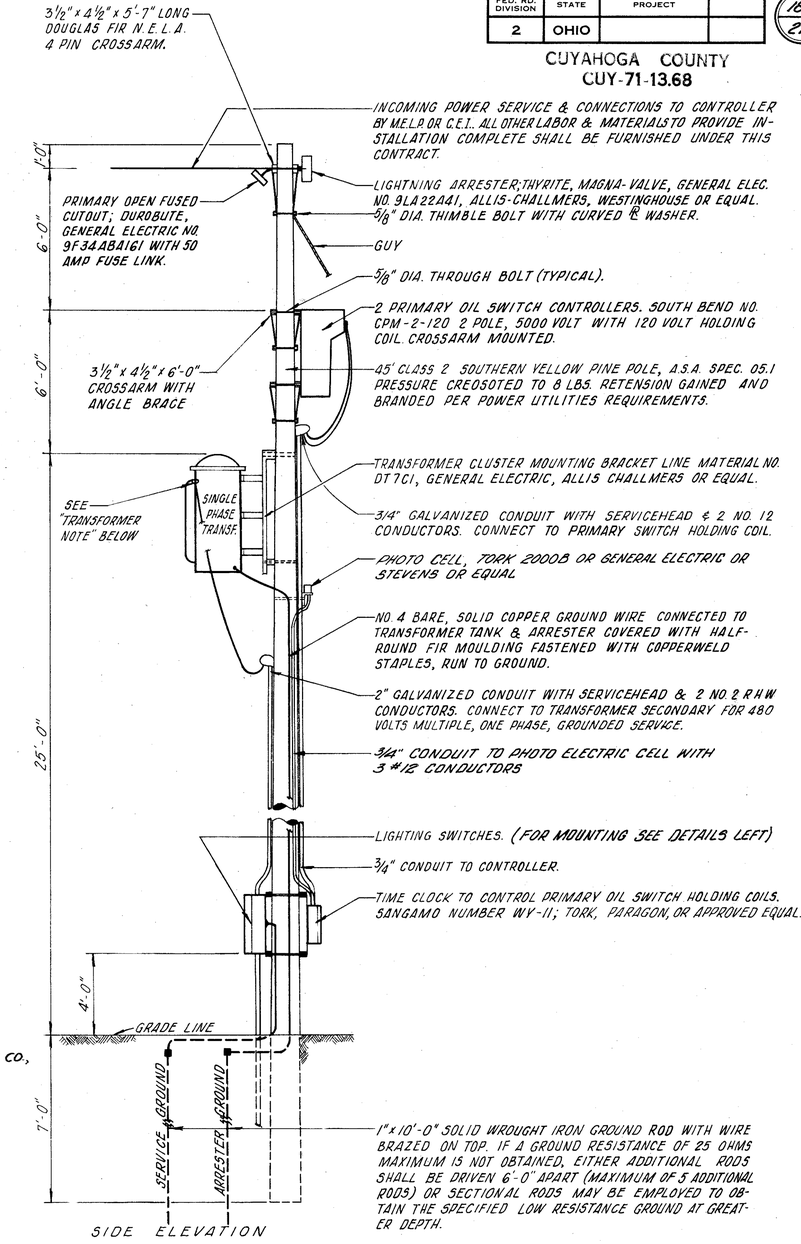


PLAN VIEW

12' SQUARE FENCED ENCLOSURE AND 8' WIDE DOUBLE GATE. CHAIN LINK FENCE AND GATE SHALL BE 8' HIGH PLUS 1' 3 STRAND BARBED WIRE AT TOP. MATERIALS AND INSTALLATION SHALL CONFORM TO SPECIFICATION NUMBER I-26 . LOCK TO BE PROVIDED BY CITY OF CLEVELAND.



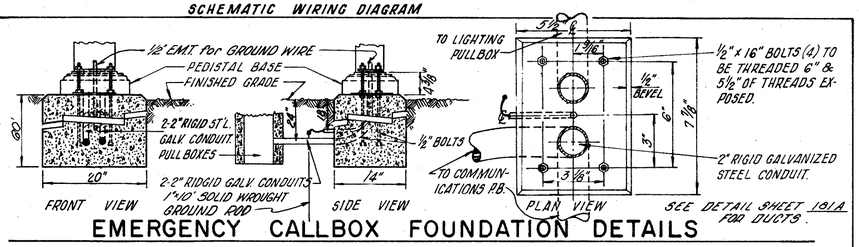
SQUARE "D" SWITCH WIRING DIAGRAM



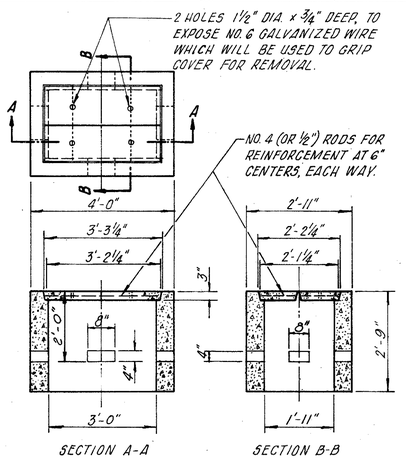
SIDE ELEVATION

TRANSFORMER NOTE:
TRANSFORMERS SHALL BE OIL IMMERSED, SELF COOLED, 55°C RISE RATED, 37½ OR 25 KVA, SINGLE PHASE 4160/2400 VOLT PRIMARY, 480 VOLT SECONDARY, ONE PHASE GROUNDED, WITH **FOUR** TAPS 2½% BELOW RATED HIGH VOLTAGE, AND SHALL BE EQUIPPED WITH MANUAL TAP CHANGERS. TRANSFORMERS SHALL CONFORM TO APPLICABLE EEI-NEMA STANDARDS FOR DISTRIBUTION TYPE TRANSFORMERS AND SHALL BE COMPLETELY SELF-PROTECTED WITH FUSED CUTOUTS, LIGHTNING ARRESTERS, ET CETERA; GENERAL ELECTRIC, WESTINGHOUSE, ALLIS CHALLMERS, OR EQUAL.

EMERGENCY CALLBOX FOUNDATION DETAILS



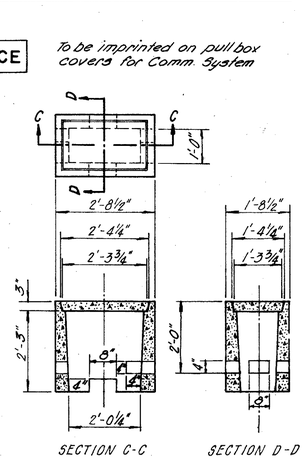
SEE DETAIL SHEET 181A FOR DUCTS.



DOUBLE PULLBOX

POLICE

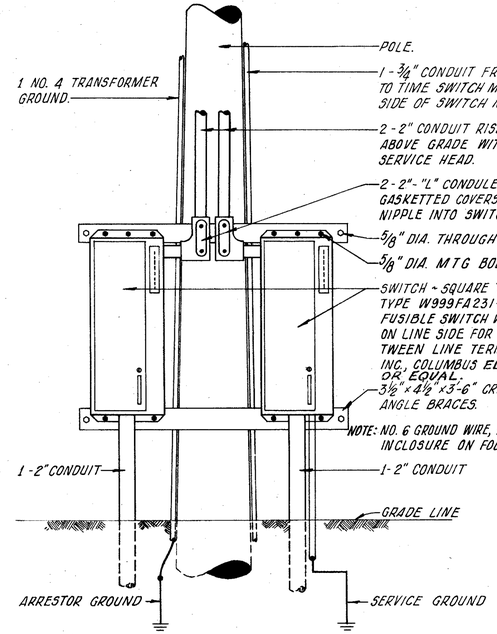
To be imprinted on pullbox covers for Comm System



SINGLE PULLBOX

NOTE:
(1) PROVIDE OPENINGS IN PULLBOXES FOR RIGID CONDUIT OR CABLE DUCT AS REQUIRED. DIMENSIONS SHOWN ARE FOR TOP OPENING. COVER TO BE APPROXIMATELY ½" LESS.
(2) HOLE & SLOT ARRANGEMENT FOR PRECAST BOXES GOOD ONLY FOR TYPICAL INSTALLATION & OTHER HOLES MAY BE NEEDED FOR PRIMARY CIRCUIT BOXES.

PRECAST CONCRETE PULLBOXES



FRONT ELEVATION

SWITCH MOUNTING

SERVICE POLE DETAILS

Revised C.E.H 1-22-65

LIGHTING DETAILS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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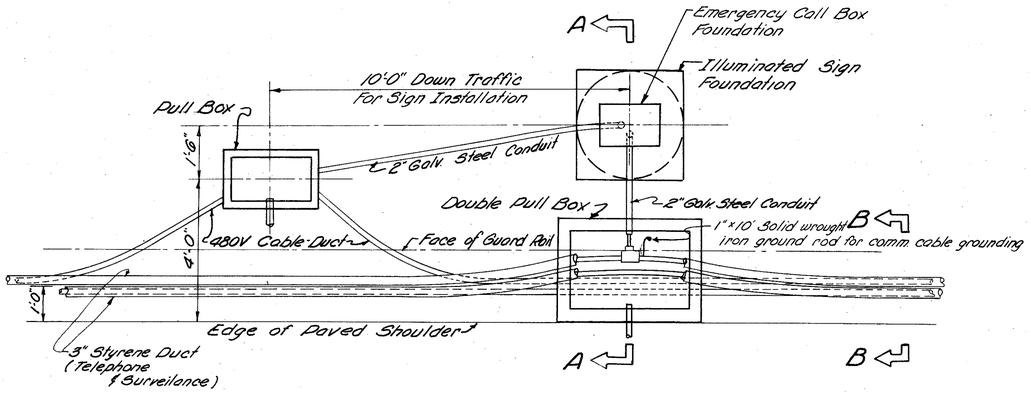
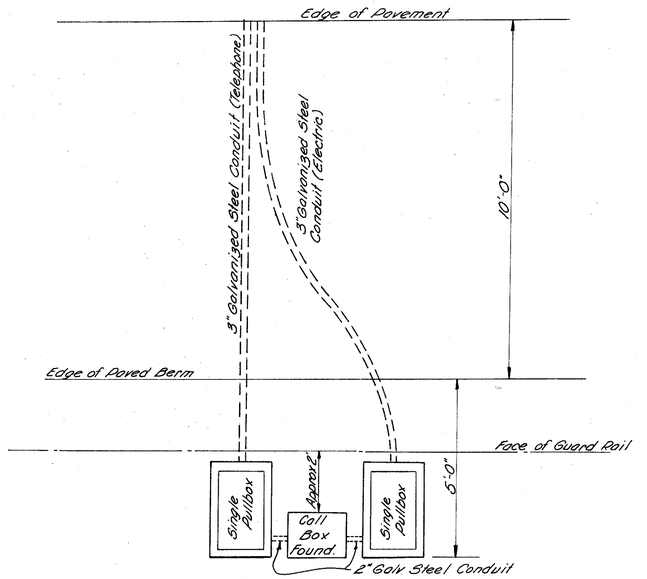
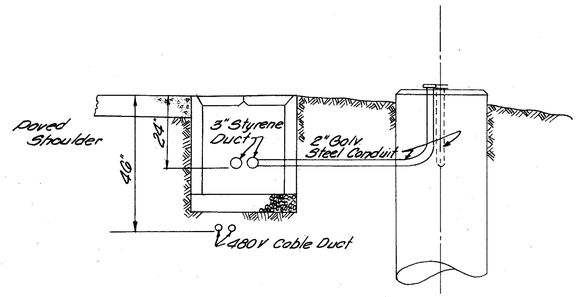


TYPICAL PULL BOX LAYOUT

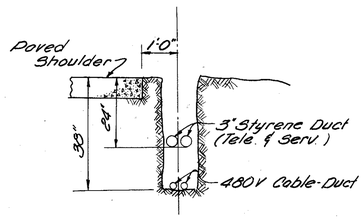
NOTE: Installation of Emergency Call Box System similar except that the power pull box will have the transformer set up as per below and conduits will be crossing the roadway from both pull boxes to the installation as shown Right. The location of the power pull box will be as shown on the plans as to the direction of traffic, however always 10' from the foundation



RELATIONSHIP OF EMERGENCY TELEPHONE ON SIDE OF ROAD OPPOSITE POWER SUPPLY



SECTION AA



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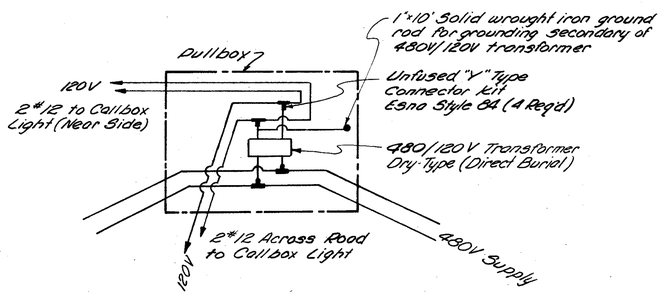

WIRING IN TRANSFORMER PULLBOX

DESCRIPTION	PLOTTED BY	DATE	TRACED BY	DATE	CHECKED BY	DATE
TOPOGRAPHY						
PROFILE						
DRAINAGE						
& QUANTITIES						

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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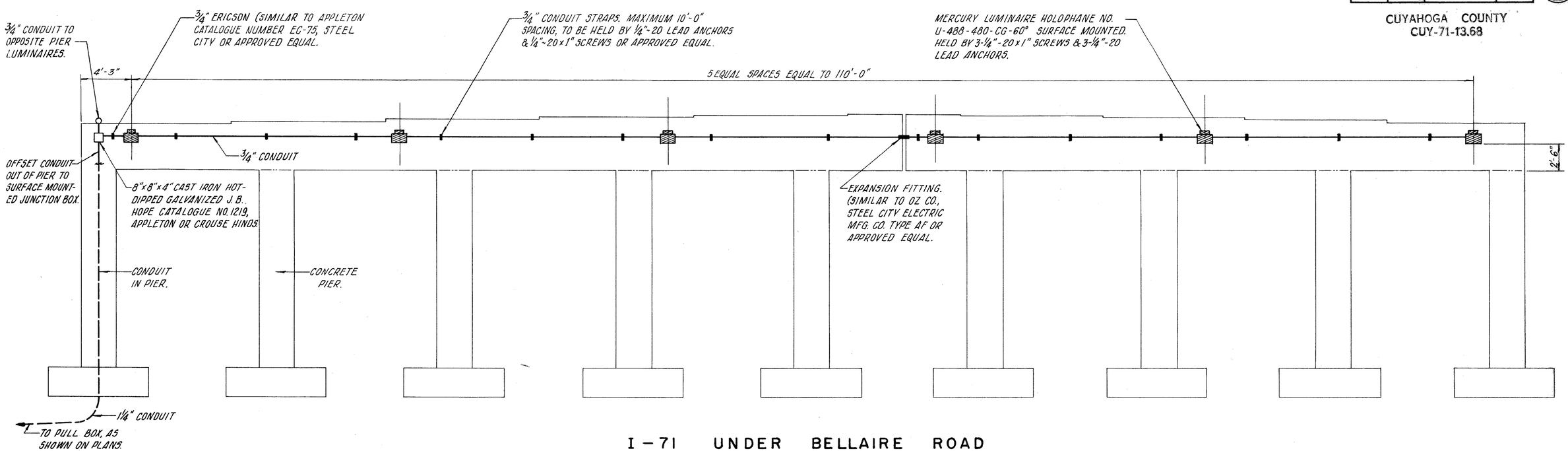
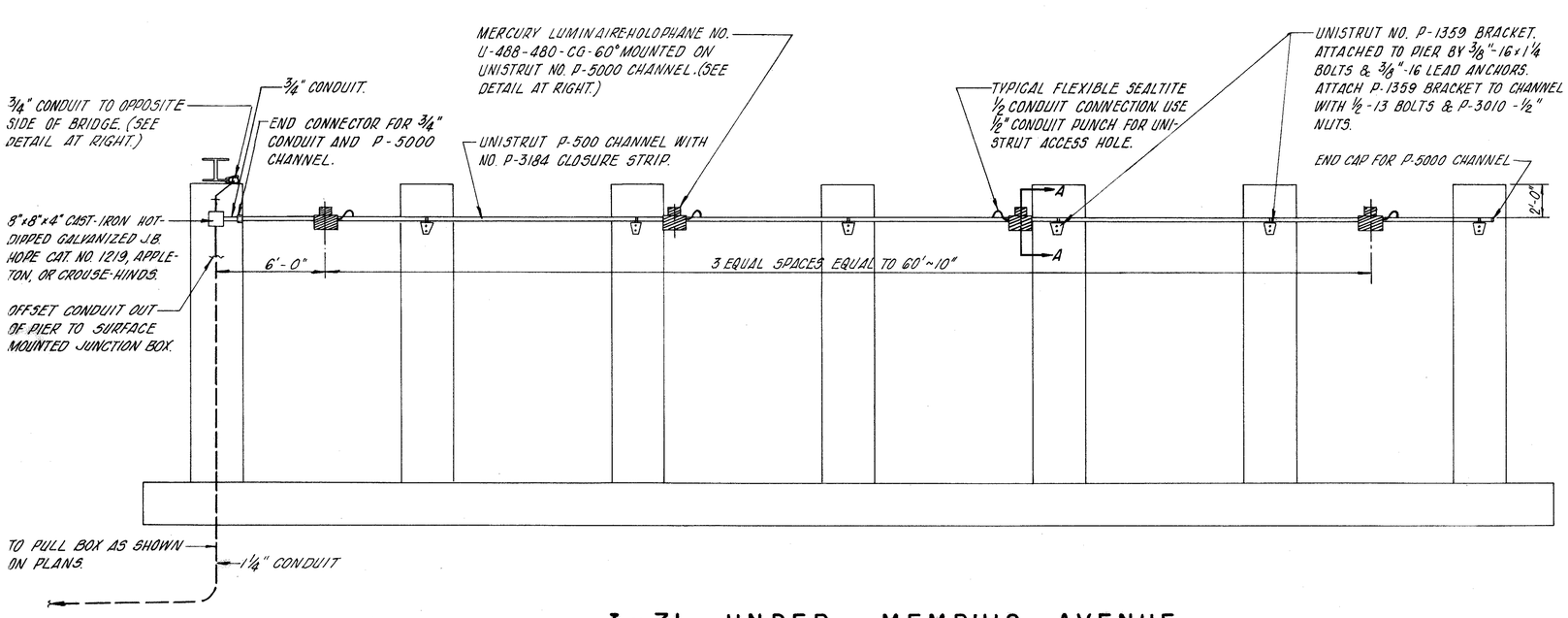
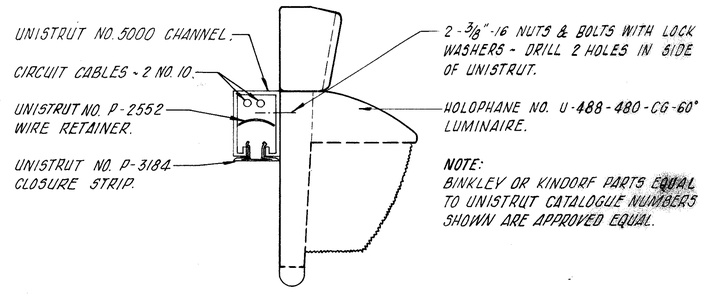


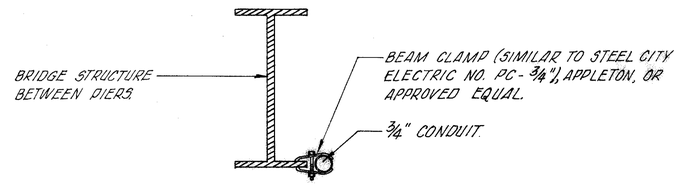
I – 71 UNDER BELLAIRE ROAD



I – 71 UNDER MEMPHIS AVENUE



SECTION A-A



UNDER-STRUCTURE CONDUIT CLAMPING

DESIGNED	BY	DATE	DRAWN	BY	DATE	CHECKED	BY	DATE	QUANTITIES	BY	DATE	REVISIONS	BY	DATE	DESCRIPTION

FED. RD. DIVISION	STATE	PROJECT	
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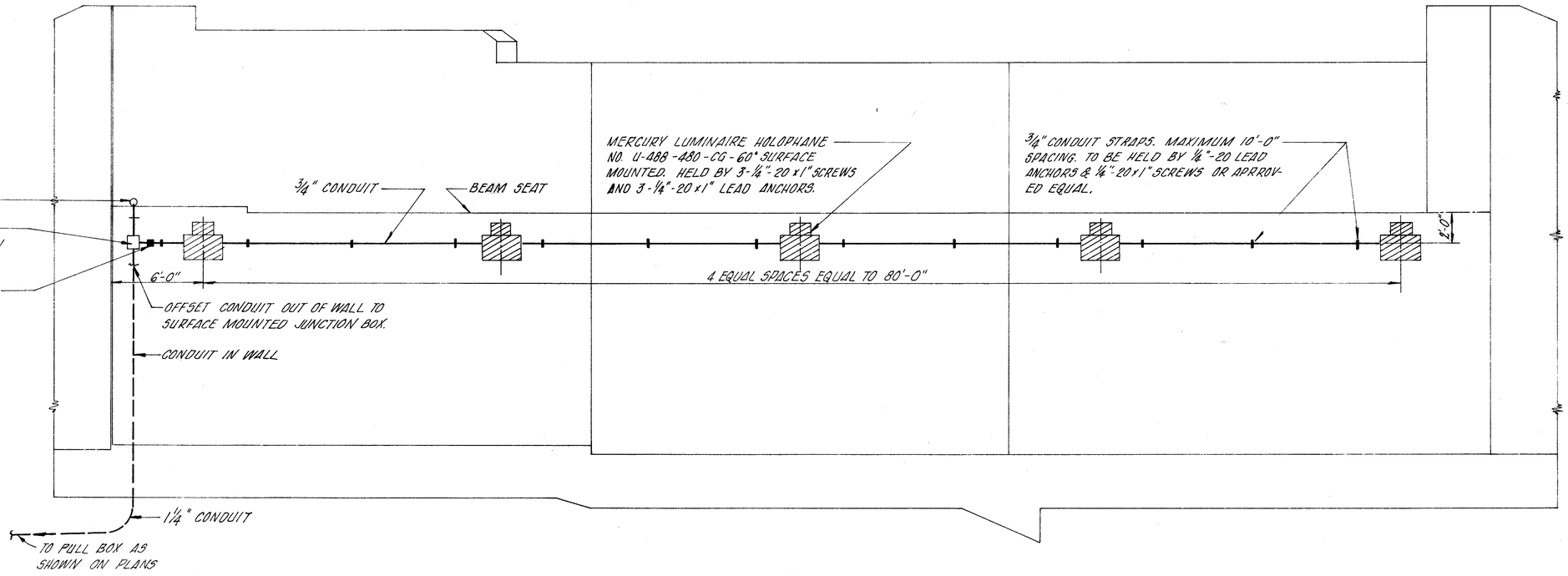

I-71 UNDER NEW YORK CENTRAL RAILROAD

UNDERSTRUCTURE LIGHTING DETAIL - NEW YORK CENTRAL R.R.

FED. RD. DIVISION	STATE	PROJECT	
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DESCRIPTION	PLOTTED	INKED	CHECKED
TOPOGRAPHY	BY	BY	BY
DRAINAGE	DATE	DATE	DATE
R. & W.			
MONUMENTS			
LIGHTING			

BEGIN PROJECT
STA. 797+00

MATCH LINE STA 786+00

ROAD NO. 1

ROAD NO. 2

RAMP "F"

RAMP "E"

L A

℄ I R 71

786 787 788 789 790 791 792 793 794 795 796 797 798 799 800

10 15 30 35 90 95

17+14

17+31
18'-AB-4-10
PB
40' POLE

18+31
18'-AB-4-14
40' POLE

19+41
18'-AB-4-13

20+51
18'-AB-4-12

23+95
12'-AB-1-7

25+85
12'-AB-1-8

42' Ducts

PROVIDE SLEEVE IN FOUNDATION FOR FUTURE EXTENSION OF CIRCUIT.

40' POLE
797+33
18'-AB-4-30

798+31
18'-AB-4-29

27+15
10'-AB-1-9
PB

37+47 - 17' RT.
10'-AB-1-10
PB

SP
29+65
10'-AB-1-11

SP
31+55
10'-AB-1-12
PB

SP
33+45
10'-AB-1-13

PB

42+30
10'-AB-1-6
PB

OVERHEAD SIGN
455 Rt. 22+17

PB

PB

PB

20 21 22 23 24 25 26 27 28 29 30 31 32 33 34

23 ROAD

BELLAIRE

MATCHLINE STA. 361+00

MATCHLINE STA. 324+00

LIGHTING PLAN ~ STA. 786+00 TO STA. 800+44.71

FED. RD. DIVISION	STATE	PROJECT	
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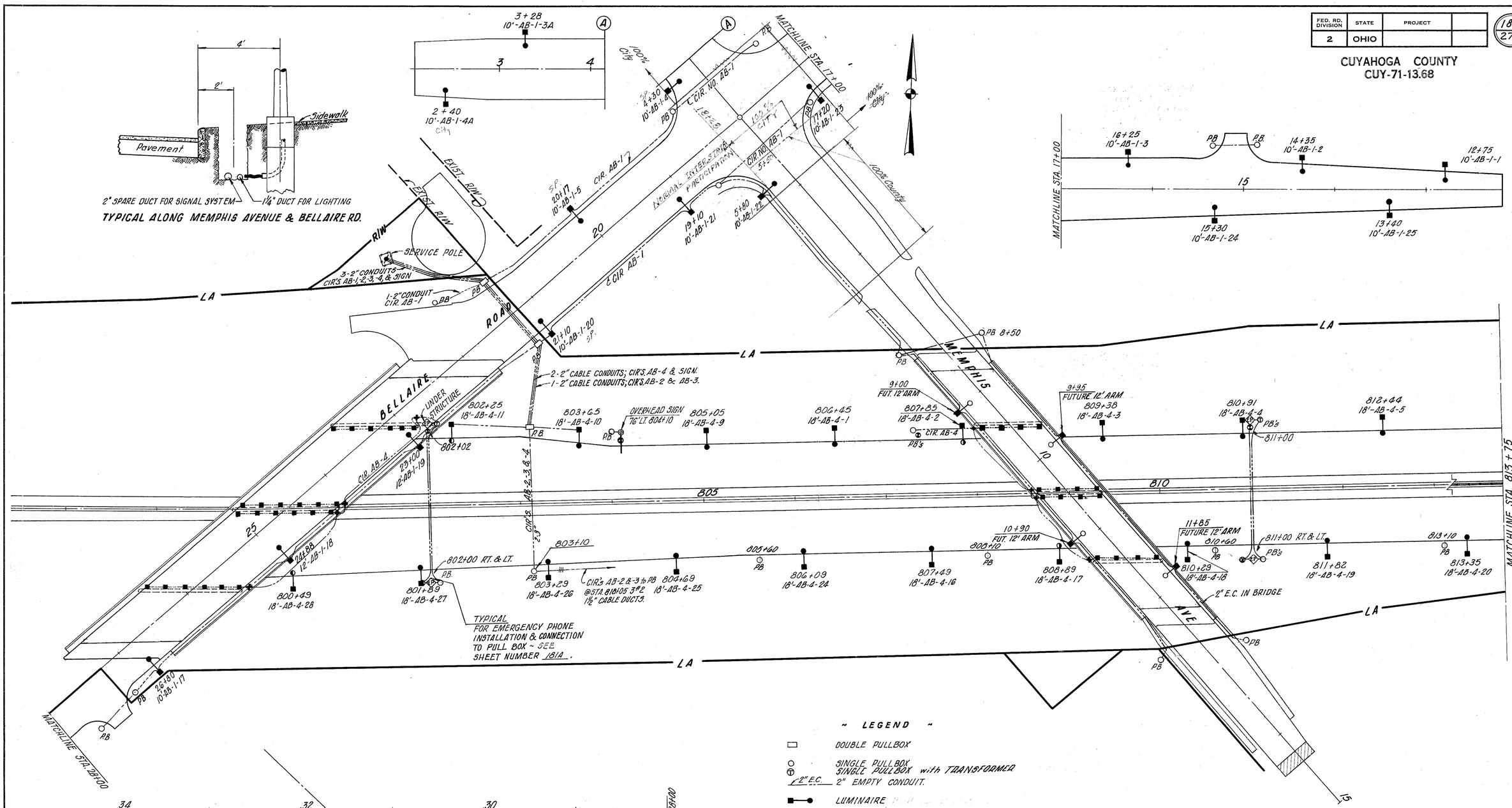
TYPICAL ALONG MEMPHIS AVENUE & BELLAIRE RD.



~ LEGEND ~

- DOUBLE PULLBOX
- SINGLE PULLBOX
- SINGLE PULLBOX with TRANSFORMER
- 2" E.C. — 2" EMPTY CONDUIT.
- LUMINAIRE
- EMERGENCY PHONE STATION PULLBOX. (DOUBLE)
- EMERGENCY PHONE STATION PULLBOX. (SINGLE)
- EMERGENCY PHONE STATION.
- FUTURE BRIDGE LUMINAIRE~ ANCHOR BOLTS, CONDUIT IN BRIDGE IN CONTRACT.
- LUMINAIRE WITH GLARE SHIELD.
- OVERHEAD SIGNS
- LUMINAIRES UNDER STRUCTURES.
- JUNCTION BOX

NOTE:
See Sheet No. 181A for Typical Pull Box Arrangement at Emergency Call Boxs and Sign Structures.

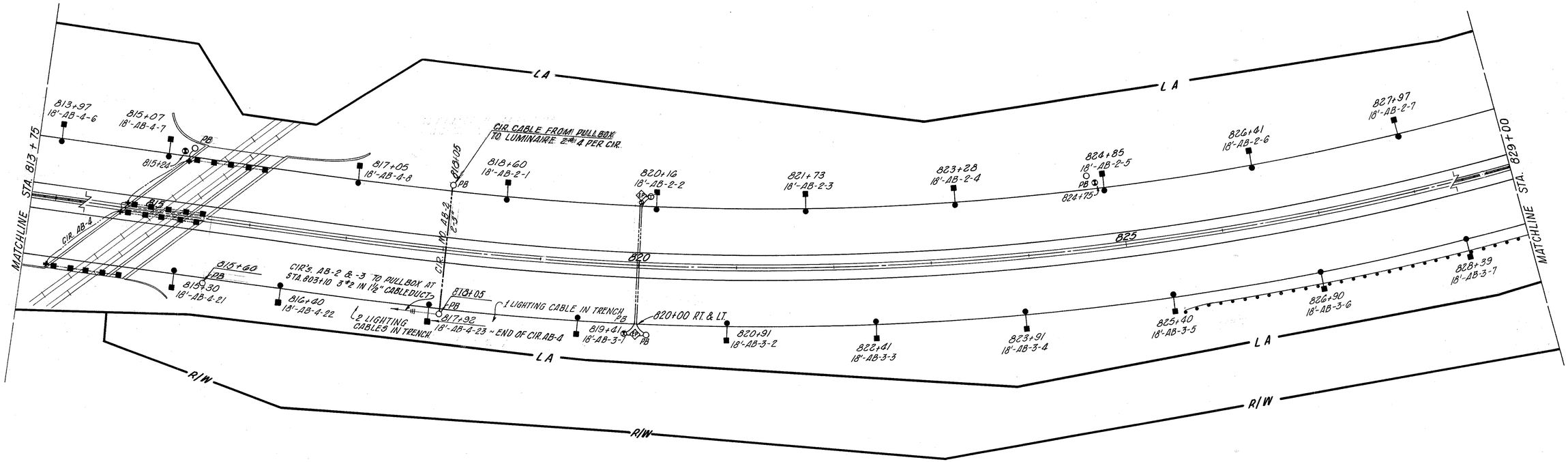
Revised 12-9-65 CEH

LIGHTING PLAN ~ STA. 800 + 44.71 TO STA. 813 + 75

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

186
279

CUYAHOGA COUNTY
CUY-71-13.68

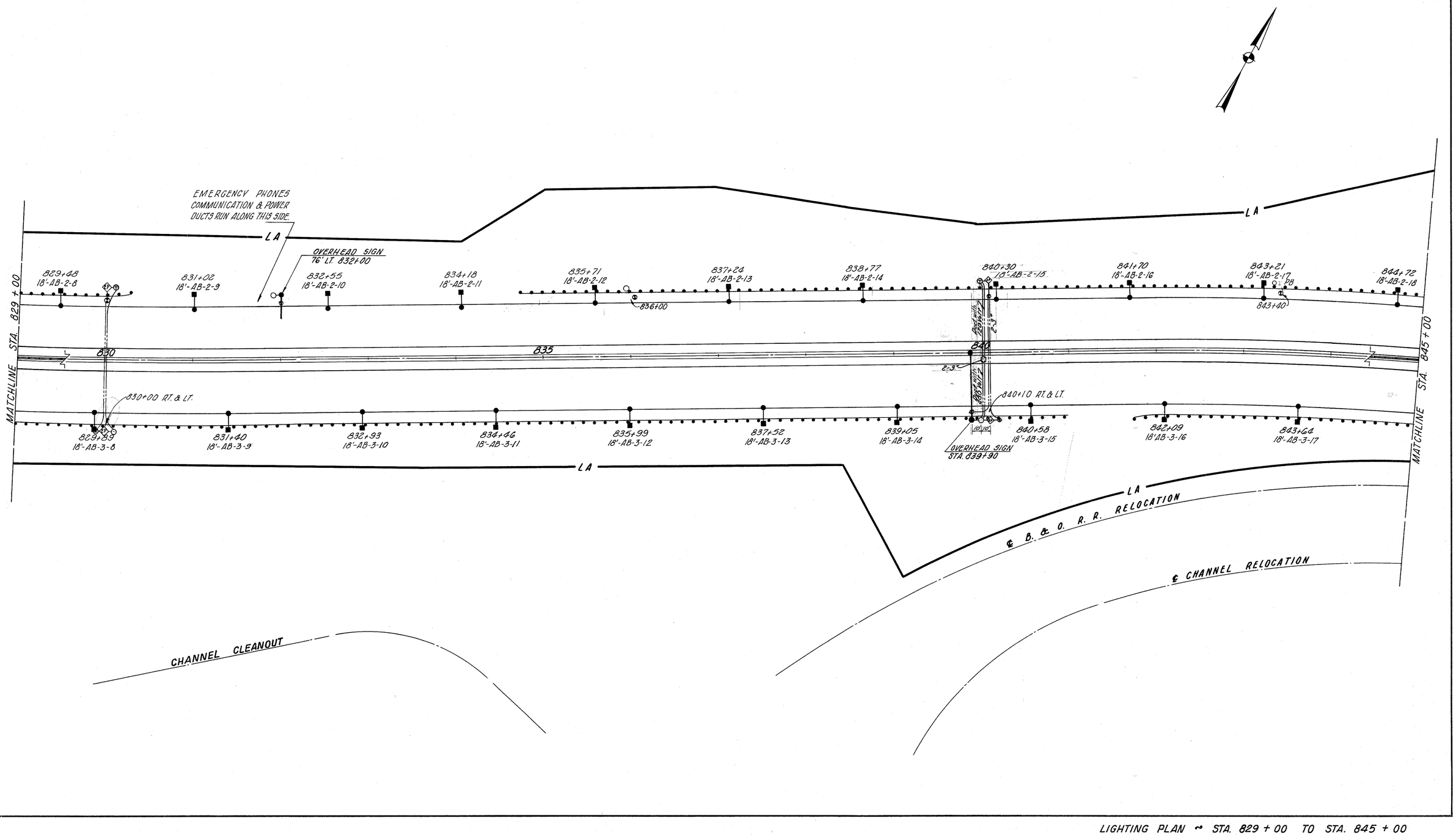


LIGHTING PLAN ~ STA. 813 + 75 TO STA. 829 + 00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

187
279

CUYAHOGA COUNTY
CUY-71-13.68

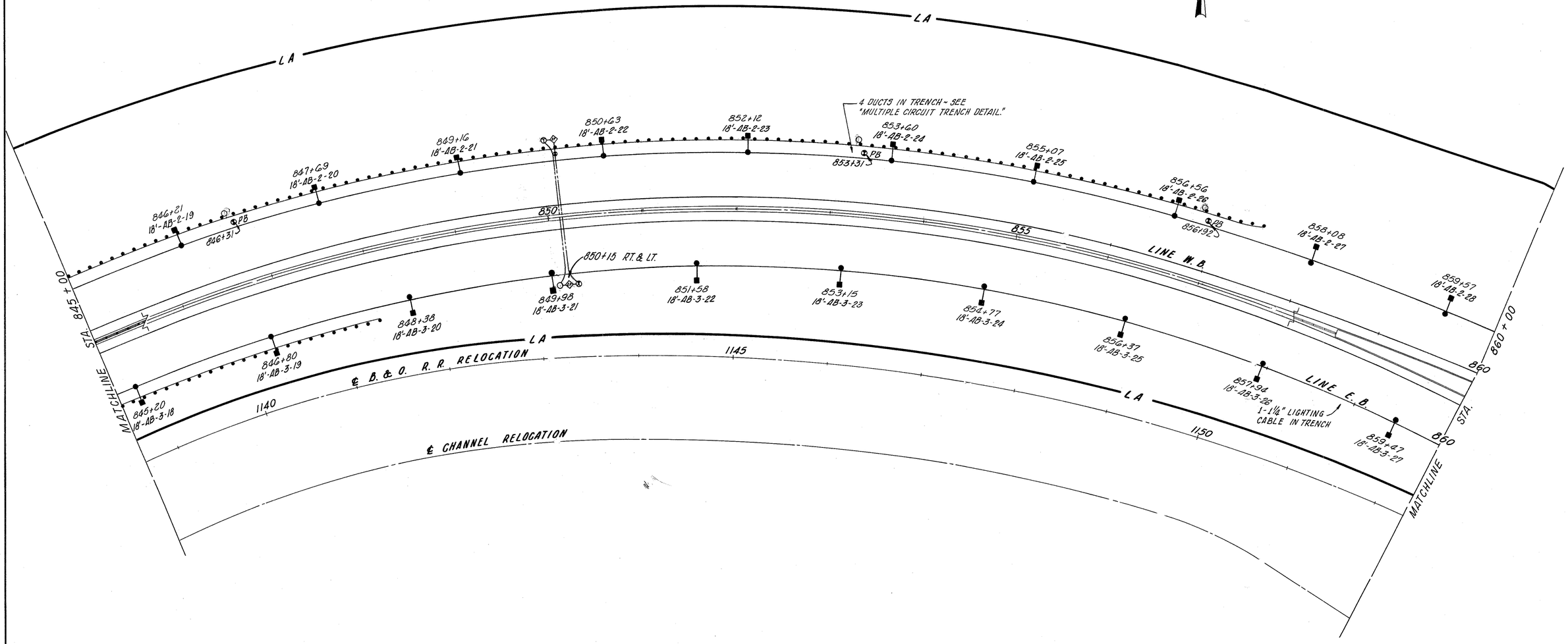


LIGHTING PLAN ~ STA. 829 + 00 TO STA. 845 + 00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

188
279

CUYAHOGA COUNTY
CUY-71-13.68

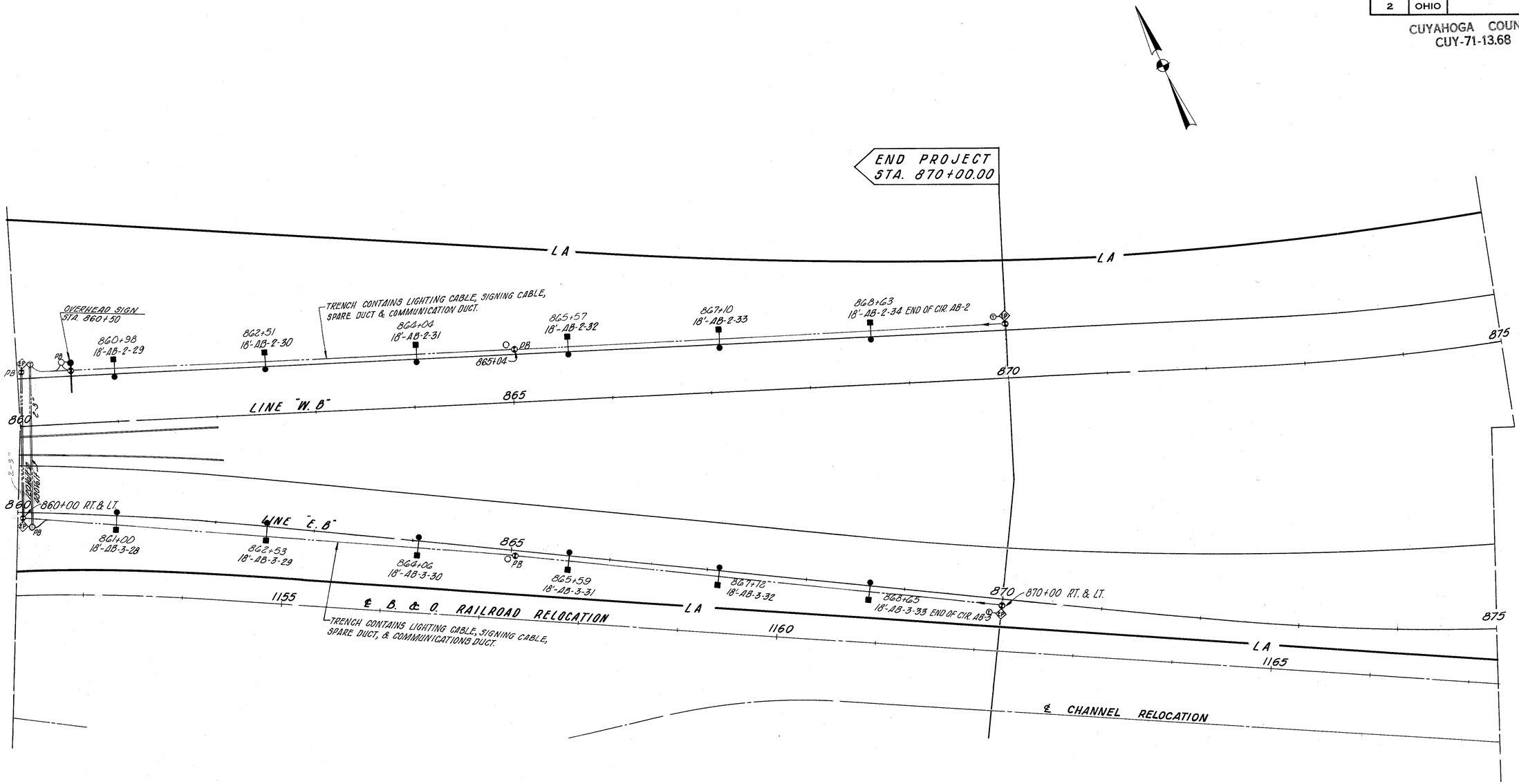


LIGHTING PLAN ~ STA. 845 + 00 TO STA. 860 + 00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

189
279

CUYAHOGA COUNTY
CUY-71-13.68



LIGHTING PLAN ~ STA. 860 + 00 TO STA. 875 + 00

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

190
279

CUYAHOGA COUNTY
CUY-71-13.68

GENERAL NOTES
SIGNS & TRAFFIC SIGNAL

CERTIFICATION AND APPROVAL OF SIGN SUPPORTS AND LIGHTING ITEMS

THE CONTRACTOR SHALL SUBMIT THROUGH PROPER CHANNELS THE DRAWINGS INFORMATION OR SAMPLES AS REQUIRED BELOW:

A. SIX (6) COPIES OF THE FOLLOWING:
SHOP DRAWING AND MATERIAL LIST FOR APPROVAL
1. OVERHEAD SIGN SUPPORTS AND SIGNAL SUPPORTS.
2. SIGN LIGHTING DETAILS
3. CATALOG CUTS. DESCRIPTIONS OR SAMPLES OF FABRICATOR'S STANDARD ITEMS AS SHOWN IN PLANS OR THEIR EQUAL FOR APPROVAL

B. CERTIFICATIONS OR SAMPLES FOR ALL MATERIALS WHICH HAVE BEEN APPROVED UNDER ITEM (A) SHALL BE IN POSSESSION OF THE CONTRACTOR PRIOR TO ANY PURCHASE OR INSTALLATION.

MATERIALS - GENERAL

MATERIALS TO BE FURNISHED MAY BE SPECIFIED IN THE PLANS BY A GIVEN MANUFACTURER'S CATALOG NUMBER OR TYPE. THIS IS FOR DESCRIPTIVE PURPOSES ONLY AND THE CONTRACTOR MAY ASSUME THAT APPROVED EQUAL MATERIALS MAY BE FURNISHED.

ALL MATERIAL, WORKMANSHIP AND CONSTRUCTION METHODS, EXCEPT AS MODIFIED HEREIN, SHALL CONFORM TO THE GENERAL REQUIREMENTS OF THE STATE OF OHIO, DEPARTMENT OF HIGHWAYS, CONSTRUCTION AND MATERIALS SPECIFICATIONS, JANUARY 1, 1963.

I-129 OVERHEAD SIGN SUPPORT MATERIAL

ALL COMPONENTS OF THE OVERHEAD SIGN SUPPORTS, I-129 SHALL BE STEEL, EXCEPT FOR ALUMINUM TRUSS AND COMPONENTS FOR THE NO. 7 SERIES WHICH SHALL BE ALUMINUM TRUSS WITH STEEL END FRAMES. FOR SPECIFIC DETAILS AND MATERIALS SEE SHEET NO. 196 THROUGH 199.

A SCHEDULE FOR SIGN ERECTION SHALL BE SUBMITTED TO THE ENGINEER, BUREAU OF TRAFFIC, 450 E. TOWN STREET, COLUMBUS, OHIO, 60 CALENDAR DAYS PRIOR TO THE START OF ANY SCHEDULED ERECTION WORK. THE SCHEDULE SHALL INCLUDE PROPOSED DATES, TIME AND DELIVERY POINT.

I-129 TRAFFIC SIGN ERECTION

THE CONTRACTOR SHALL ERECT SIGN PANELS FURNISHED BY OTHERS AS NOTED ON THE SCHEMATIC SIGNING LAYOUT SHEET NO 191. THE PANELS SHALL BE MOUNTED ON THE BRACKETS OR BEAM SUPPORTS PROVIDED IN THE PLANS.

THE PRICE BID PER SQUARE FOOT FOR "ITEM I-129 SIGN ERECTION BY TYPE, AS PER PLAN", SHALL INCLUDE ALL NECESSARY EQUIPMENT, MANPOWER, AND TOOLS TO ERECT THE SIGNS NOTED. ALL SIGN MATERIAL AND ACCESSORIES WILL BE FURNISHED AND TRANSPORTED TO A DESIGNATED DELIVERY POINT, ON OR NEAR THE SUBJECT PROJECT, BY OTHERS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE HANDLING AND STORAGE OF THE SIGN PANELS AND ACCESSORIES FROM THE TIME OF ARRIVAL AT THE DELIVERY POINT.

I-129 SWITCH ENCLOSURE MOUNTING BRACKET

MODIFYING SS I-129, SWITCH ENCLOSURE MOUNTING BRACKETS INCLUDING MOUNTING BOLTS AND DRILLED HOLES SHALL BE FURNISHED AND INSTALLED UNDER PAYMENT FOR ITEM I-129 OVERHEAD SIGN SUPPORT STRUCTURES AT THE CONTRACT PRICE PER SUPPORT STRUCTURE TYPE.

I-129 CONCRETE FOR SIGN SUPPORT AND SIGNAL POLE FOUNDATIONS

THE QUANTITY FOR CONCRETE TO BE PAID FOR SHALL BE PER CUBIC YARD BASED ON THE PLAN DIMENSIONS RATHER THAN THE PLAN QUANTITY. ALL CONCRETE SHALL BE CLASS "C".

I-15 GUARDRAIL, STEEL BEAM, STANDARD TYPE (DEEP) AS PER PLAN

GUARDRAIL SHOWN AT SIGN SUPPORTS SHALL BE TYPE DEEP WITH POST SPACING OF 6'-3". DETAILS ARE SHOWN ON SHEET NO. 201.

S-25 ELECTRICAL - GENERAL

THIS ITEM SHALL CONSIST OF FURNISHING ALL NECESSARY MATERIAL, LABOR AND FACILITIES REQUIRED TO COMPLETE THE ELECTRICAL INSTALLATION IN ACCORDANCE WITH THE DESIGNS, DIMENSIONS AND DETAILS SHOWN IN THE PLANS AND DESCRIBED IN THE SPECIFICATIONS.

DURING THE TEST PERIOD ADJUSTMENTS TO FIXTURE AIMING ANGLES SHALL BE MADE AS DIRECTED BY THE ENGINEER TO OBTAIN MAXIMUM UNIFORMITY IN SIGN ILLUMINATION.

S-25 BALLAST TYPE

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING ALL BALLAST TYPES A THROUGH D AS DETAILED AND SPECIFIED ON SHEET 199.

BASIS OF PAYMENT FOR THIS ITEM SHALL BE OF THE CONTRACT UNIT PRICE PER EACH FURNISHED TO THE JOB.

S-25 SIGN WIRING COMPLETE, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING, INSTALLING AND CONNECTING TO THE OPERATIVE ELECTRICAL SERVICE FROM THE EENA CONNECTORS IN PULL BOXES THROUGH THE DISCONNECT SWITCH TO THE PHOTO ELECTRIC CELL AND LIGHT FIXTURES. THIS SHALL INCLUDE FURNISHING AND INSTALLING ALL WIRE, CONDUIT (RIGID AND FLEXIBLE TYPE) CONDULETS, JUNCTION BOXES (AS SPECIFIED ON SHEET 200) FITTINGS, FASTENERS AND INCIDENTALS RELATED HERETO. THIS ITEM SHALL INCLUDE THE INSTALLATION OF LIGHT FIXTURES WITH LAMPS AND BALLASTS.

BASIS OF AFYMENT FOR THIS ITEM SHALL BE AT THE CONTRACT LUMP SUM PRICE FOR SIGN WIRING COMPLETE, WHICH PAYMENT SHALL INCLUDE ALL TOOLS, LABOR, MATERIALS AND EQUIPMENT REQUIRED.

S-25 INSPECTION AND TESTING OF SIGN LIGHTING

THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT NECESSARY TO DEMONSTRATE TO THE SATISFACTION OF THE ENGINEER THAT ALL CIRCUITS ARE FREE FROM SHORT CIRCUITS AND UNSPECIFIED GROUNDS, AND ARE PROPERLY CONNECTED AND OPERABLE BEFORE ACCEPTANCE.

THIS DEMONSTRATION SHALL INCLUDE A MEGGERING TEST TO SHOW THAT ALL CONDUCTORS ARE CLEAR OF GROUNDS AND THAT THE RESISTANCE AT THE GROUND IS NOT MORE THAN 15 OHMS. VOLTAGE AND AMPERAGE TESTS SHALL BE MADE AT THE SERVICE POLE SWITCH AND THE SIGN SUPPORT SWITCH.

AFTER THE SIGN LIGHTING SYSTEM IS COMPLETED, THE ENTIRE SYSTEM SHALL BE OPERATED CONTINUOUSLY EACH NIGHT UNTIL SEVEN (7) CONSECUTIVE DAYS ELAPSE WITHOUT FAILURE OR DEFECT. THE CONTRACTOR SHALL CORRECT ANY DEFECTS WHICH MAY DEVELOP AT NO EXTRA COST TO THE STATE.

S-25 FIXTURES WITH LAMP TYPE

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING ALL LIGHT FIXTURES AND LAMP TYPES AND SIZES AS SPECIFIED ON SHEET 192.

BASIS OF PAYMENT FOR THIS ITEM SHALL BE AT THE CONTRACT UNIT PRICE PER EACH FURNISHED TO THE JOB.

S-25 GROUND ROD AND WIRE CONNECTION

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING GROUND ROD AND WIRE AS DETAILED AND SPECIFIED ON SHEET 195 & 200.

BASIS OF PAYMENT FOR THIS ITEM SHALL BE AT CONTRACT UNIT PRICE PER EACH, WHICH SHALL INCLUDE ALL LABOR, TOOLS, MATERIALS AND EQUIPMENT REQUIRED FOR THE COMPLETE ITEM OF WORK.

S-25 DISCONNECT SWITCH WITH TYPE "Y" OR "Z" ENCLOSURE

THE BASIS FOR PAYMENT FOR THIS ITEM SHALL BE ON A UNIT BID BASIS, COMPLETE AND ACCEPTED.

THE ITEM SHALL INCLUDE FURNISHING OF A 30 AMP 600 VOLT FUSED DISCONNECT SWITCH OF TYPE AND MAKE AS INDICATED ON SHEET200AND SHALL BE MOUNTED IN A NEMA FOUR (4) STAINLESS STEEL ENCLOSURE TYPE "Y" OR "Z" AND ATTACHED TO EACH SIGN SUPPORT BY MEANS OF A MOUNTING BRACKET AS DESCRIBED IN DETAIL ON THE ABOVE SHEET.

UNDER THIS ITEM OF WORK THE CONTRACTOR SHALL FURNISH AND INSTALL ITEMS AS DESCRIBED ABOVE WITH THE EXCEPTION OF THE MOUNTING BRACKET.

S-25 EENA CONNECTORS

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING EENA CONNECTORS OF THE TYPE AND AT THE LOCATION AS DETAILED AND SPECIFIED ON SHEET 200.

BASIS OF PAYMENT FOR THIS ITEM SHALL BE AT A CONTRACT UNIT PRICE PER EACH WHICH SHALL INCLUDE ALL LABOR, TOOLS, MATERIALS AND EQUIPMENT REQUIRED FOR THE COMPLETE ITEM OF WORK.

S-25 TRANSFORMER TYPE

THIS ITEM OF WORK SHALL CONSIST OF FURNISHING AND INSTALLING TRANSFORMERS AS DETAILED AND SPECIFIED ON SHEET 200.

BASIS OF PAYMENT FOR THIS ITEM SHALL BE AT CONTRACT UNIT PRICE PER EACH, WHICH SHALL INCLUDE ALL LABOR, TOOLS, MATERIAL AND EQUIPMENT REQUIRED FOR THIS COMPLETE ITEM OF WORK.

PEDESTRIAN SIGNAL POLE

PEDESTRIAN SIGNAL POLE SHALL BE UNION METAL DESIGN 50201 OR EAGLE UA 236 OR EQUAL.
BASIS OF PAYMENT FOR SIGNAL POLES SHALL BE FOR EACH POLE INSTALLED COMPLETE INCLUDING ANCHOR RODS & NUTS.

TRAFFIC SIGNAL POLES

TRAFFIC SIGNAL POLE SHALL BE ANCHOR BASE TYPE AND SHALL BE CAPABLE OF WITHSTANDING LOADING (APPLIED 18" FROM THE TOP) AS INDICATED BELOW WITHOUT EXCEEDING THE PERMANENT SET AND DEFLECTION (MEASURED IN INCHES 18" FROM THE TOP OF THE POLE) AS INDICATED.

LENGTH	DIAM. AT GROUND LINE	DIAM. AT TOP	BOLT CIRCLE	WALL THICKNESS	NET WEIGHT LBS.	LOAD FOR PERMANENT SET LBS.	DEFLECTION PER 100 LBS.	ANCHOR RODS 2 NUTS TO EACH ROD	POLE TOP	ALLOWABLE BEND MOMENT FT. LBS.
30'	12"	7.8	16"	3GUAGE	1020	3730	0.39"	1 3/4"x96"	ORNAMENTAL	106,200

RODS AND NUTS TO BE GALVANIZED — LOAD YIELD 3730

POLES TO BE GALVANIZED INSIDE AND OUTSIDE

SPECIAL MODIFICATIONS: POLES TO HAVE A 4 INCH X 6/1/2 INCH HANDHOLD WITH REINFORCING FRAME AND COVER. THE CENTER OF HANDHOLE TO BE LOCATED APPROXIMATELY 12 INCHES FROM THE BASE OF POLE.

BASIS OF PAYMENT FOR SIGNAL POLES SHALL BE FOR EACH POLE INSTALLED COMPLETE INCLUDING ANCHOR RODS & NUTS.

LOOP DETECTOR

THE CONTRACTOR SHALL SUPPLY AND INSTALL THE DETECTOR LOOP IN THE PAVEMENT AS PER DETAIL AND ALSO THE WIRE AND CONDUIT TO THE PULL BOX FOR EACH LOOP DETECTOR. THE ROADWAY LOOPS SHALL BE INSULATED #12 TW SOLID WIRE AND PAYMENT SHALL BE PER LIN.FT. OR WIRE COMPLETE AND INSTALLED.
LOOP DETECTOR CONTROL SHALL BE EAGLE E W 50 TYPE OR AUTOMATIC SIGNAL DIVISION MODEL HLS-1 OR EQUAL AND WILL BE FURNISHED AND INSTALLED BY OTHERS.

I-129 CONCRETE FOR PEDESTRIAN SIGNAL POLE FOUNDATION

THE FOUNDATION SHALL BE INSTALLED AS PER PLAN AND BE CONSTRUCTED OF CLASS "C" CONCRETE. PAYMENT SHALL BE FOR EACH FOUNDATION IN PLACE.

S-25 PHOTO ELECTRIC CELLS

PHOTO ELECTRIC CELLS SHALL BE FURNISHED FOR EACH SIGN SUPPORT MOUNTED AT THE TOP OF EACH POLE OR VERTICAL END FRAME OF THE SIGN SUPPORT.

PHOTO CELLS SHALL BE TORK #2000A (1800 WATTS), BRYANT, GENERAL ELECTRIC, OR APPROVED EQUAL

BASIS OF PAYMENT FOR THIS ITEM OF WORK SHALL BE AT THE UNIT PRICE PER EACH PHOTO ELECTRIC CELL FURNISHED AND INSTALLED.

SIGNING LAYOUT PLAN

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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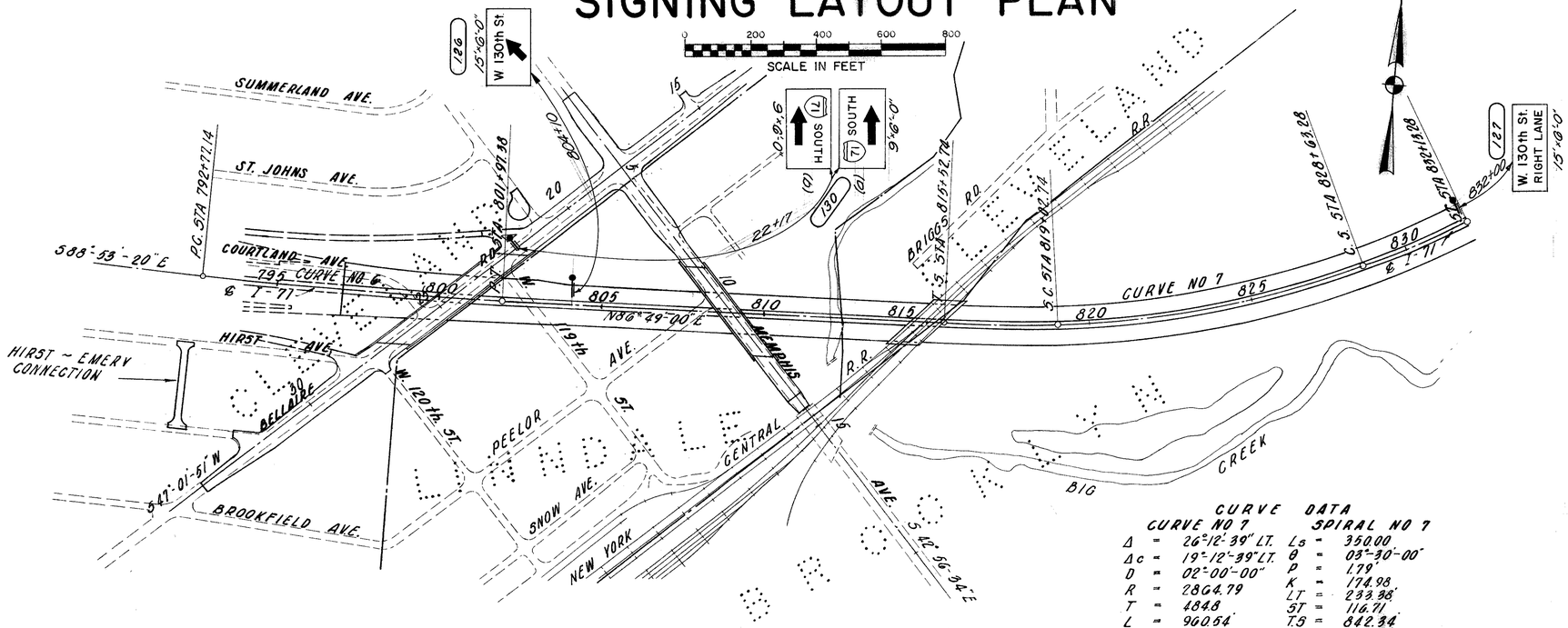
CUYAHOGA COUNTY
CUY-71-13.68

CURVE DATA
CURVE NO. 6
P.I. STA 797+37.47
Δ = 04°17'40"
D = 00°28'00"
R = 12,277.67'
L = 920.24'
T = 460.33'
E = 8.63'



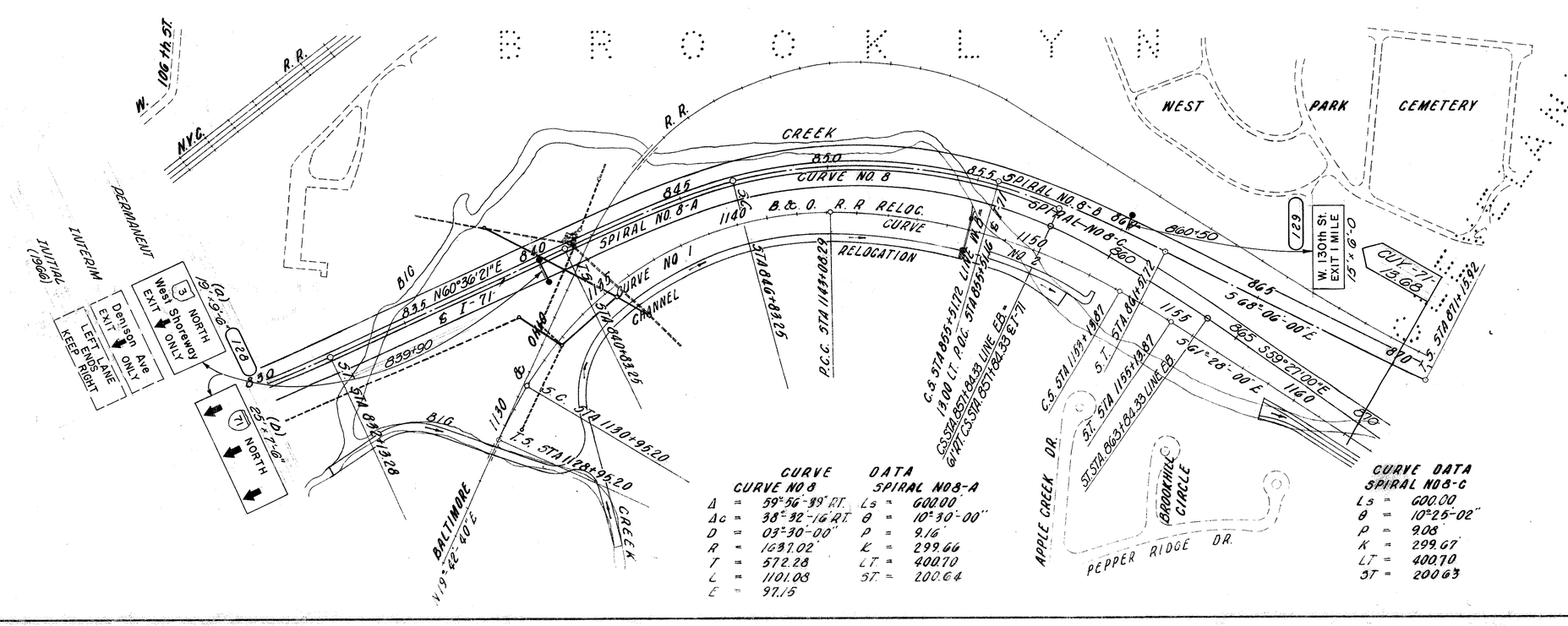
CURVE DATA
CURVE NO 7

Δ	=	26°12'39" LT.	
Δc	=	19°12'39" LT.	
D	=	02°00'00"	
R	=	2864.79	
T	=	484.8	
L	=	960.54	
E	=	40.74	

CURVE DATA
SPIRAL NO 7

Ls	=	350.00
θ	=	03°30'00"
p	=	1.79
K	=	174.98
LT	=	233.38
ST	=	116.71
T.S	=	842.34
Es	=	18.44

Notes:
1. All Signs will be furnished by others.
2. Vertical sign dimensions shown are "Effective Heights", See Sheet No. 198.



CURVE DATA
CURVE NO 8

Δ	=	59°56'-99" RT.
Δc	=	38°32'-16" RT.
D	=	03°30'-00"
R	=	1637.02'
T	=	572.28
L	=	1101.08
E	=	97.15

CURVE DATA
SPIRAL NO 8-A

Ls	=	600.00'
θ	=	10°30'-00"
p	=	9.16'
K	=	299.66
LT	=	400.70
ST	=	200.64

CURVE DATA
CURVE NO. 1 (CHORD DEFINITION)

P.I. STA 1137+65.77		Ls	= 200.00
Δc	= 60°39'-17" RT.	θ	= 05°00'-00"
D	= 05°00'-00"	p	= 1.45
R	= 1146.28'	K	= 99.97'
L	= 1213.09'	LT	= 133.39'
T	= 670.57'	ST	= 66.72'
E	= 181.73'		

CURVE DATA
CURVE NO 2 (CHORD DEFINITION)

P.I. STA 1148+23.09		Ls	= 200.00
Δc	= 30°10'-03" RT.	θ	= 03°00'-00"
D	= 03°00'-00"	p	= 0.87
R	= 1910.08	K	= 99.99'
L	= 1005.58'	LT	= 133.35'
T	= 514.80	ST	= 66.68'
E	= 68.16		

CURVE DATA
SPIRAL NO. 8-B
Ls = 600'
θ = 10°54'-33"
p = 9.51'
K = 299.63'
LT = 400.77'
ST = 200.70'

CURVE DATA
SPIRAL NO 8-C

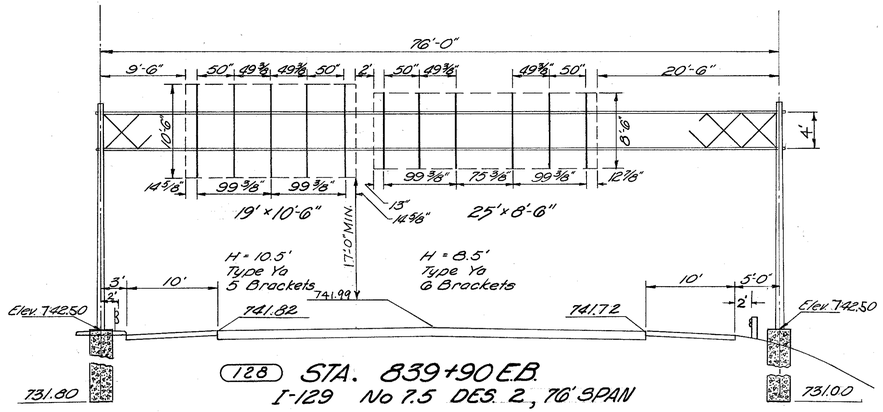
Ls	=	600.00
θ	=	10°25'-02"
p	=	9.08'
K	=	299.67'
LT	=	400.70'
ST	=	200.63'

LAYOUT PLAN SIGNING

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

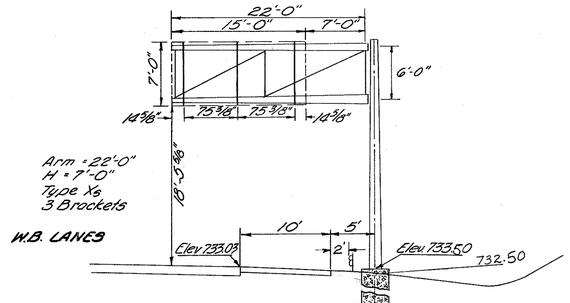
192 / 279

CUYAHOGA COUNTY
CUY-71-13.68



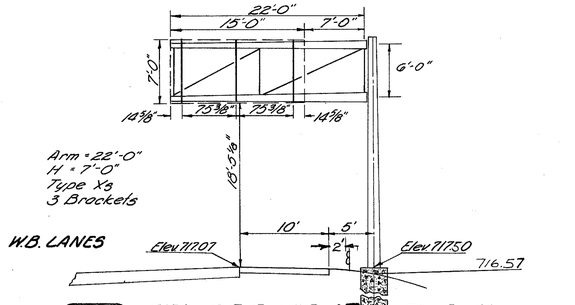
(128) STA. 839+90 E.B.
I-129 No 7.5 DES. 2, 76' SPAN

ROADWAY GUARD RAIL IS SUFFICIENT



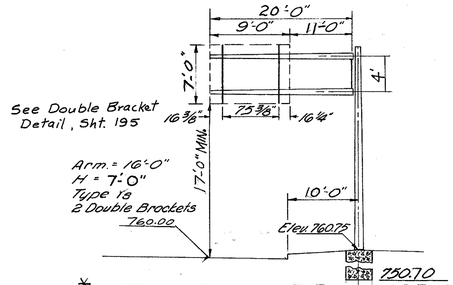
(126) STA 804+10 LT.
I-129 No. 12.24 DES 5
ARM 22'

GUARD RAIL REQ. FOR OVHD. SUP. FROM (STA 804+07 TO 804+57)

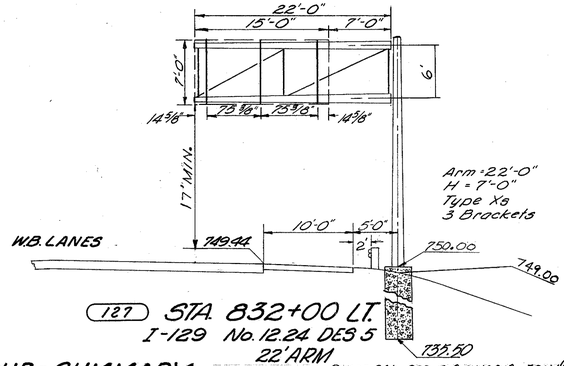


(129) STA. 860+50 LT.
I-129 No. 12.24 DES 5, ARM 22'

GUARD RAIL REQ. FOR OVHD. SUP. FROM (STA 860+47 TO STA 860+97)



* (130) STA. 22+17 BELLAIRE RD.
I-129 No. 12.24 DES. 2, 20' ARM
No GUARDRAIL REQUIRED



(127) STA. 832+00 LT.
I-129 No. 12.24 DES 5
22' ARM

GUARD RAIL REQ FOR OVHD.SUP. FROM (STA 831+97 TO 832+47)

TYPE CODE 7221

SIGN ELECTRICAL SUB-SUMMARY

S-25

SIGN SUPPORT NUMBER	STATION LOCATION	FIXTURE & LAMP 22" HO	FIXTURE & LAMP 22" SHO	FIXTURE & LAMP 36" SHO	BALLAST RATING WATTS +25%	BALLAST TYPE A	B	C	D	TRANSFORMER K.V.A.	III	IV	30A DISCONNECT SWITCH IN ENCLOSURE		GROUND ROD & WIRE CONNECTION	ESNA SPLICE KIT CONNECTORS STYLE 82	83	* PHOTO ELECTRIC CELL	SIGN WIRING COMPLETE As Per Plan
		EA	EA	EA		EA	EA	EA	EA		EA	EA		Y EA	Z EA	EA	EA	EA	EA	LUMP
126	804+10 W.B. LT	2			310		1			0.75	1			1		1	1	1	1	LUMP
127	832+00 W.B. LT	2			310		1			0.75	1			1		1	1	1	1	LUMP
128	839+90 E.B.		1	4	1375			1	2	1.50		1			1	1	1	1	1	LUMP
129	860+50 W.B. LT	2			310		1			0.75	1			1		1	1	1	1	LUMP
130	22+17 BELLAIRE RD.	2			475	2				0.75	1			1		1	1	1	1	LUMP
	TOTALS to Sheet 176	8	1	4		2	3	1	2		4	1		4	1	5	5	5	5	LUMP

* Tork #2000A (1800 watts) or Bryant or General Electric or Equal

GENERAL SUMMARY

TRAFFIC CONTROL TYPE CODE 7221

INSTALLATION NUMBER 126	127	128	129	130	CARRIED FROM SHEET NO 193 (20% City)	194 (North Exit)	ITEM	GRAND TOTAL	UNIT	DESCRIPTION
90	90	308	90	49.5			I-129	687.5	Sq. Ft.	Sign Erection, Overhead Guide Type, as per plan.
		1					I-129	1	Ea.	Overhead Sign Supports No. 7.5 Des. 2 Modified 76' Span.
				1			I-129	1	Ea.	Overhead Sign Supports No. 12.24 Des. 2, 20' Arms.
1	1		1				I-129	3	Ea.	Overhead Sign Supports No. 12.24 Des. 5 22' Arms.
					2	4	I-129	6	Ea.	30' Signal Pole, As Per Plan
					2	3	I-129	5	Ea.	6' Pedestrian Signal Pole, As Per Plan
3.47	3.47	9.54	3.47	2.86			I-129	22.81	Cu. Yds.	Concrete Foundations for Overhead Sign Supports & Signal Pole, as per plan.
					2	3	I-129	5	Ea.	Concrete Foundations for Pedestrian Signals.
50	50		50				I-15	150	LIN. FT	GUARD RAIL, STEEL BEAM, STANDARD TYPE (DEEP) AS PER PLAN

* ILLUMINATED FROM ABOVE WITH 1'-0" GLARE SHIELD, ALL OTHER SIGNS TO BE ILLUMINATED FROM BELOW.

Revised 1-3-66 C.E.H.

SIGN LAYOUT & SIGN & SIGNAL SUMMARY

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY-71-13.68

DESCRIPTION	PLOTTED BY	PLOTTED DATE	INKED BY	INKED DATE	CHECKED BY	CHECKED DATE
TOPOGRAPHY						
PAVEMENT						
DRAINAGE						
R/W						
QUANTITIES						
DRAWN BY						

DRAWING NO. 13

BELLAIRE ROAD
MEMPHIS AVE.
W. 117TH ST.
MATCHLINE 4+00

5' RT. STA 15+50
22' RT. STA 15+50
5' RT. STA 17+21
2' RT. STA 4+20
2+44 18' RT.
22' LT. STA 20+37
3' LT. STA 20+365
14' LT. STA 17+67
5' LT. STA 5+15
3' LT. STA 18+67

2" P.D.
(3" S.C.)
3" S.C. FOR SIGNAL
3" S.C. FOR LIGHTING
3" S.C. FOR SIGNAL CONST. &
2" F.D.
2 L40P5
3 L40P5
PED.
PB

17+40 BELLAIRE RD. 58' LT. INSTALL PEDESTRIAN SIGNAL POLE & FOUNDATION.

17+35 BELLAIRE RD. 54' RT. INSTALL 30' SIGNAL POLE & FOUNDATION. FOUNDATION TOP EL.~756.7

18+52 BELLAIRE RD. 56' LT., INSTALL 30' SIGNAL POLE & FNDTN. FOUNDATION TOP EL.~756.7

18+49 BELLAIRE RD. 57' RT, INSTALL PEDESTRIAN SIGNAL POLE & FOUNDAT'N.

2" P.D. (FROM ROAD #2)
1¼" CABLE-DUCT FOR LIGHTING
QUANTITY TO STA 22+17

~ LEGEND ~

- 2" P.D. — 2" POLYETHELENE DUCT WITH PULLWIRE.
- (3" S.C.) — 3" GALVANIZED STEEL CONDUIT WITH PULLWIRE. INSTALLED FOR SIGNALS.
- 2" F.D. — 2" FIBER DUCT.
- PED. — PEDESTRIAN SIGNAL.
- TRAFFIC SIGNAL.
- SINGLE PULLBOX FOR SIGNAL SYSTEM (SEE LIGHTING DETAILS). WITH LEGEND "POLICE" IMPRINTED ON COVER.
- SINGLE PULLBOX FOR LIGHTING

NOTE: ALL PAVEMENT STRIPING, SIGNAL HEADS, (PEDESTRIAN & TRAFFIC) CONTROLLERS, & WIRE TO BE FURNISHED & INSTALLED BY OTHERS.

FOR ELECTRICAL ITEMS ~ SEE LIGHTING SUMMARY ~ SHEET NUMBER 176.

FOR STRUCTURAL ITEMS ~ SEE SIGNING SUMMARY ~ SHEET NUMBER 192.

* ITEM COVERED WITH FOUNDATION DETAIL.

TRAFFIC SIGNAL LAYOUT ~ BELLAIRE ROAD & MEMPHIS AVENUE

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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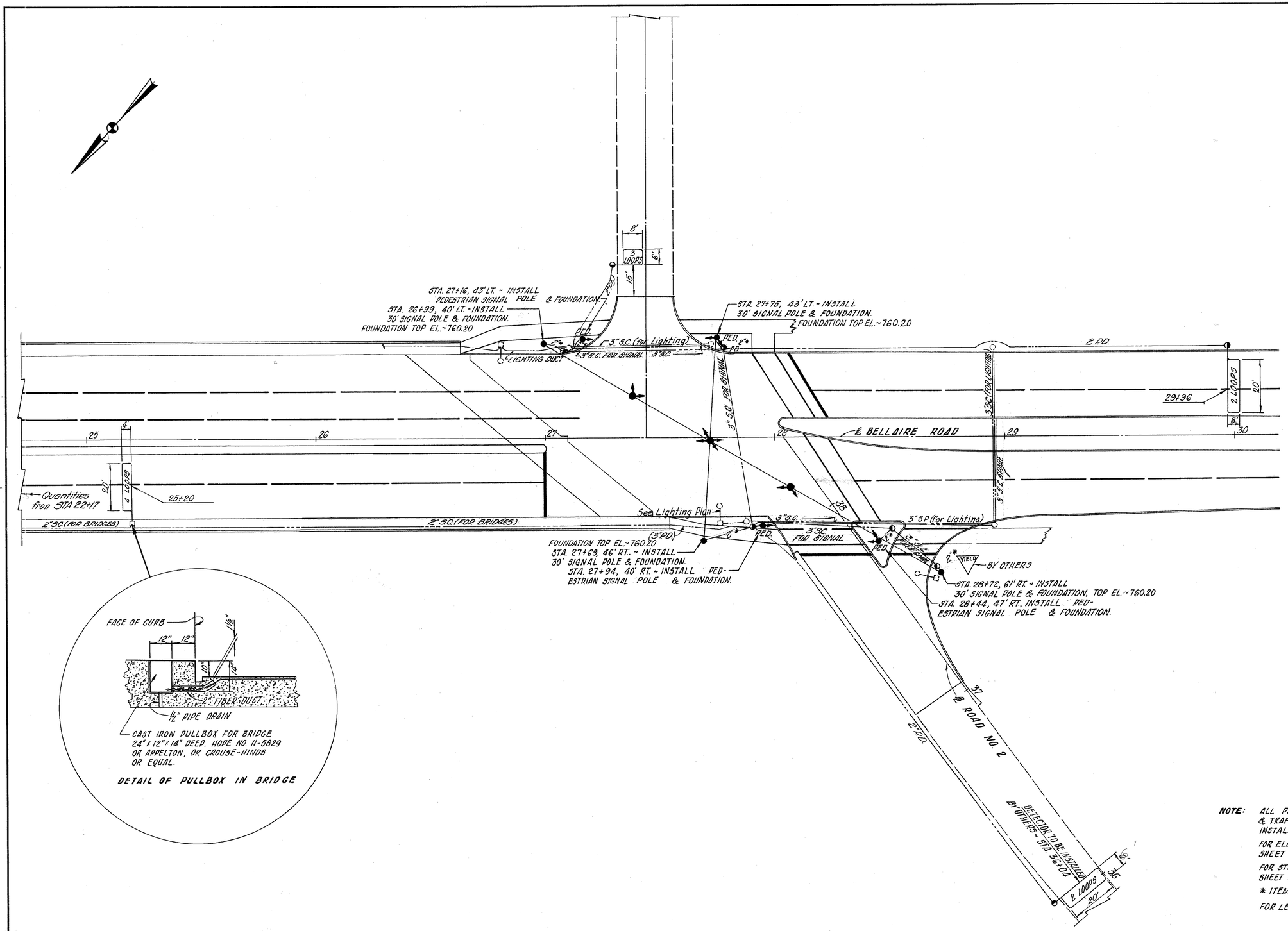
CUYAHOGA COUNTY
CUY-71-13.68

DESCRIPTION	PLOTTED BY	DATE	INKED BY	DATE	CHECKED BY	DATE
TRAFFIC SIGNAL LAYOUT - BELLAIRE ROAD						
FED. ROAD DIVISION NO. 2						
STATE OF OHIO DEPARTMENT OF HIGHWAYS						
DRAWN BY						



DETAIL OF PULLBOX IN BRIDGE

NOTE: ALL PAVEMENT STRIPING, SIGNAL HEADS, (PEDESTRIAN & TRAFFIC) CONTROLLERS, & WIRE TO BE FURNISHED & INSTALLED BY OTHERS.

FOR ELECTRICAL ITEMS - SEE LIGHTING SUMMARY - SHEET NUMBER 176.

FOR STRUCTURAL ITEMS - SEE SIGNING SUMMARY - SHEET NUMBER 192.

* ITEM COVERED WITH FOUNDATION DETAILS.

FOR LEGEND - SEE SHEET NUMBER 193.

TRAFFIC SIGNAL LAYOUT - BELLAIRE ROAD

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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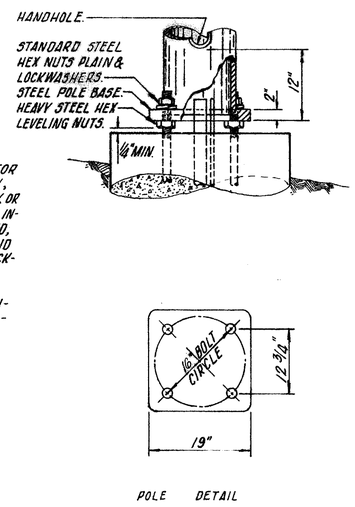
NOTES:

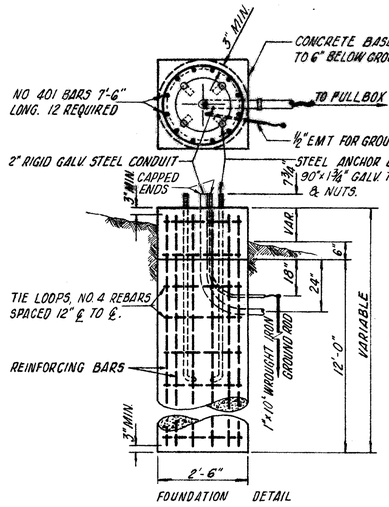
SOILS
THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND & GRAVEL, SANDY CLAY, OR STIFF CLAY). FOR POOR SOIL CONDITIONS, INCREASE DEPTH TO 18' IN DRY OR WET SAND, 19.2' IN SILTY CLAY, 24' IN SOFT CLAY, AND 21' TO 30' IN WET SILT DEPENDING ON QUICK-SAND ACTION.

REINFORCING STEEL
REINFORCING STEEL SHOWN SHALL BE INSTALLED AS SHOWN. THE COST & PLACEMENT SHALL BE INCLUDED IN THE UNIT-PRICE BID FOR ITEM 1-12.9, CONCRETE FOR SIGN SUPPORT FOUNDATION.

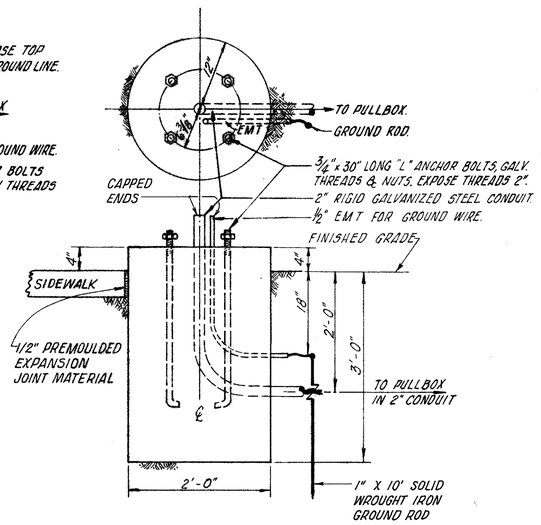
CONCRETE TO BE CLASS "C".

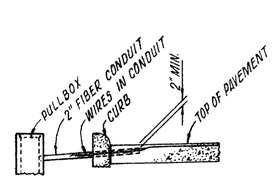


POLE DETAIL

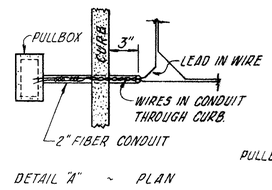


FOUNDATION DETAIL





DETAIL "A" - PROFILE



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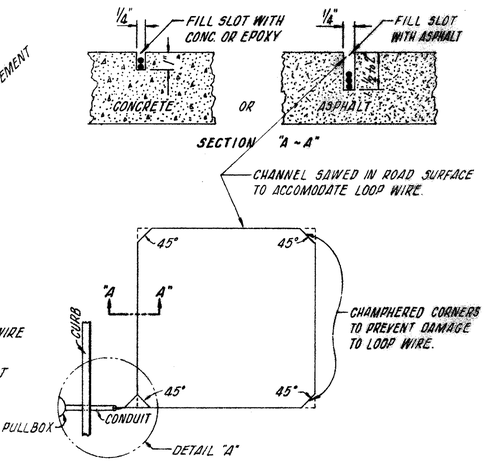
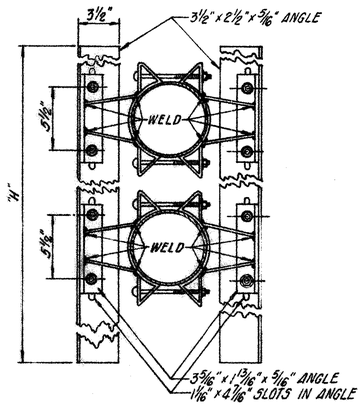


DETAIL "A"

TRAFFIC SIGNAL POLE FOUNDATION DETAILS

PEDESTRIAN SIGNAL FOUNDATION

DETECTOR LOOP DETAILS



DOUBLE SIGN ATTACHMENT DETAIL

FED. RD DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
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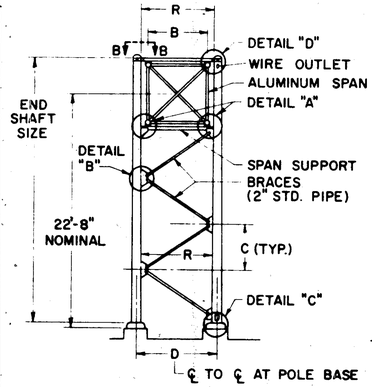
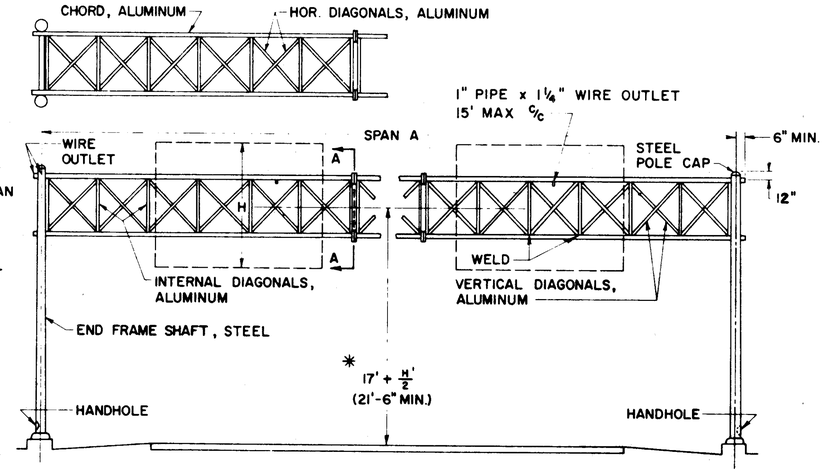
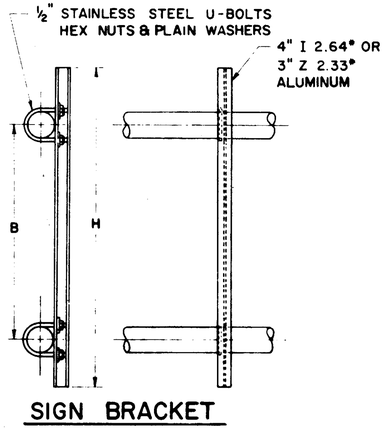
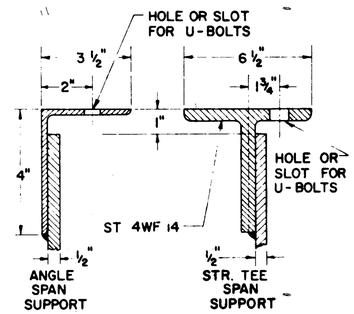






SIGN BRACKET



SECTION D-D

NOTES

MATERIALS

THE OVERHEAD SPAN TRUSS SHALL BE ALUMINUM AND THE END FRAMES SHALL BE STEEL.

SPAN TRUSS AND END FRAMES, INCLUDING HARDWARE, SHALL BE IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION I-129 UNLESS OTHERWISE NOTED.

STEEL POLE BASES AND GUSSETS SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATION A-373.

AFTER FABRICATION THE TAPERED POLES SHALL HAVE A MINIMUM YIELD STRENGTH OF 48,000 PSI.

FABRICATION

THE ENTIRE STEEL END FRAME SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH SEC. M-7.4(d).

MAXIMUM LENGTH OF SPAN SECTIONS IS 30 FT.

ERECTION

USE A MINIMUM OF 1" CAMBER IN SPAN TRUSS MEMBER FOR A 50' SPAN; ADD ¼" OF CAMBER FOR EACH 5' OF INCREASE IN SPAN OVER 50'.

PAYMENT

PAYMENT FOR THE GALVANIZED CONDUIT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OVERHEAD SIGN SUPPORTS.

SOILS

THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND AND GRAVEL, SANDY CLAY, OR STIFF CLAY).

FOR POOR SOIL CONDITIONS, INCREASE "D" MIN. BY: 50% IN DRY OR WET SAND, 60% IN SILTY CLAY, 100% IN SOFT CLAY, AND FROM 75% TO 150% IN WET SILT, DEPENDING ON QUICKSAND ACTION.

REINFORCING STEEL

COST OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM I-129 CONCRETE FOR SIGN SUPPORT FOUNDATIONS.

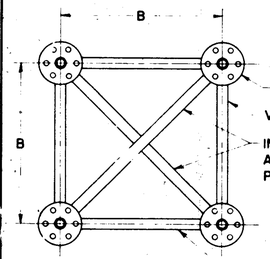
BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER.

*FOUNDATION ELEVATION

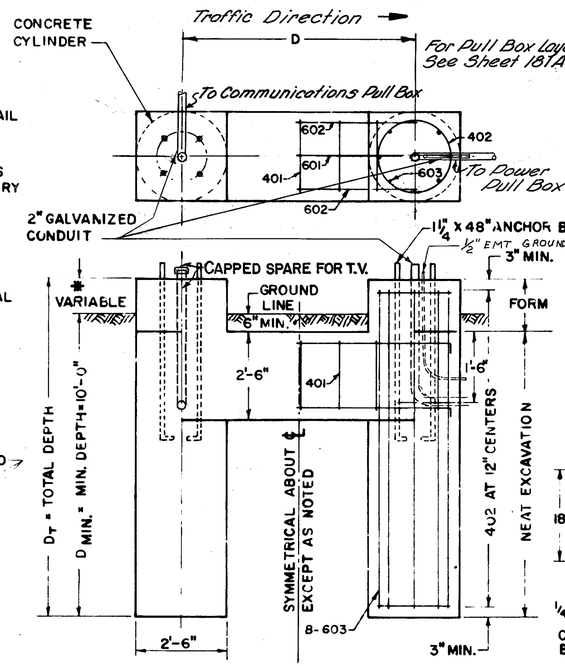
ELEVATION OF TOPS OF FOUNDATIONS SHALL BE BUILT UP SO THAT 17' CLEARANCE IS MAINTAINED OVER THE ENTIRE WIDTH OF PAVEMENT AND SHOULDERS.

DESIGN

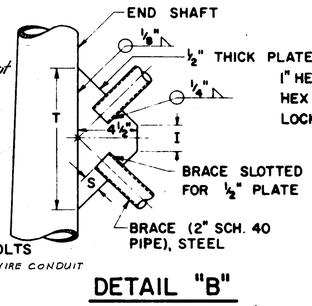
THE DESIGN OF OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.



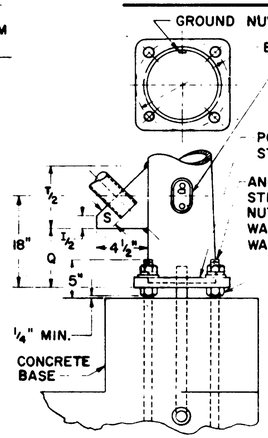
SECTION A-A



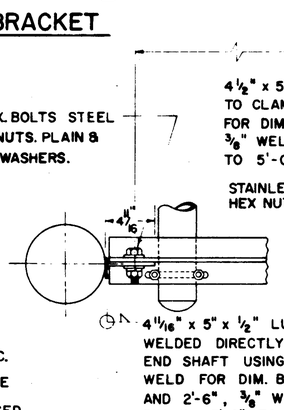
FOUNDATION DETAIL
(RIGHT HAND SHOWN — LEFT HAND OPPOSITE)
(Without Conduit)



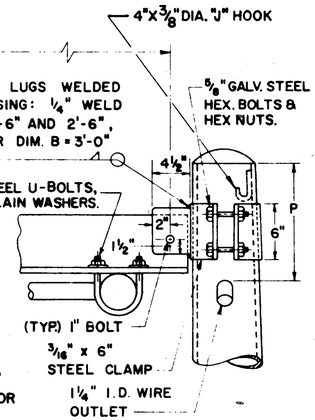
DETAIL "B"



DETAIL "C"
POLE BASE DETAIL

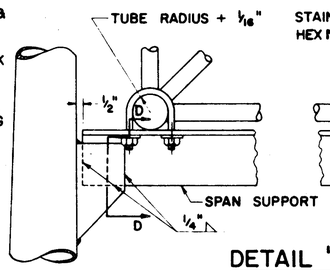


VIEW B-B

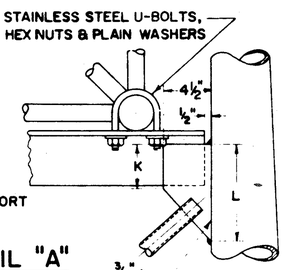


DETAIL "D"

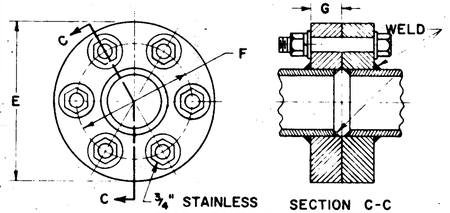
UPPER SPAN SUPPORT (ALTERNATE METHODS)



DETAIL "A"



LOWER SPAN SUPPORT

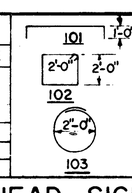


CAST FLANGE, B-26 ALLOY SG 70A-T7 (356-T7)

FLANGE DETAIL

DESIGN NO.	SPAN A	B	C	D	E	END SHAFT	BRACE LENGTH	F	G	I	K	L	P	Q	R	S	T	U BOLTS	V	BOLT CIRCLE	SPAN SUPPORT SECTION D-D	CHORDS	HORIZONTAL AND INTERNAL DIAGONAL	VERTICAL DIAGONAL
1	50' THRU 70'	3'-0"	4'-11¾"	4'-5"	9¼"	8"X4.5"X 25'-0" 3GA	5'-10 3/16"	7 7/16"	1⅜"	3½"	4¾"	8"	12"	6⅝"	3'-9"	1½"	10"	⅝"	3'-3⅝"	11"	SPLIT TEE 3'—8"	4¾"X.188"	1.900"X.145"	1.660"X.140"
2	71' THRU 80'	4'-0"	4'-10¼"	5'-7"	9¼"	8"X6.22"X25'-6" 3GA	6'-7⅛"	7 7/16"	1⅜"	⅝"	4⅜"	7¾"	12"	6¼"	4'-11"	1½"	9½"	⅝"	4'-5⅝"	11"	SPLIT TEE 4'—10"	4¾"X.188"	2" X .188"	1.900"X.145"
3	81' THRU 86'	4'-0"	4'-10¼"	5'-7"	11"	8"X6.22"X25'-6" 3GA	6'-7⅛"	8½"	1½"	5/6"	4⅜"	7¾"	12"	6¼"	4'-11"	1½"	9½"	⅝"	4'-5⅝"	11"	SPLIT TEE 4'—10"	5½"X.250"	2" X .188"	1.900"X.145"
4	86' THRU 110'	5'-0"	4'-8½"	6'-7"	11"	8"X6.18"X26'-0" 3GA	7'-3¼"	8½"	1½"	—	3½"	7¾"	12"	7½"	5'-11"	1¾"	11½"	¾"	5'-5⅝"	11"	SPLIT TEE 5'—10"	5½"X.250"	2½"X.188"	2½"X.188"

REINFORCEMENT SCHEDULE			
MARK	NO.	LENGTH	TYPE
401	12"C/C	8'—6"	102
402	12"C/C	7'—6"	103
601	4	D+4'-0"	101
602	8	D+2'-0"	101
603	32	D_T — 6"	STR.



BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

OVERHEAD SIGN SUPPORTS

I-129 No. 7.5

DATE 5-2-62, 7-25-62, 4-29-64, 11-8-64

APPROVED Robert E. Conner
ENGINEER OF TRAFFIC

500 SQ. FT. SIGN AREA

OVERHEAD SIGN SUPPORT, I-129 NO. 7.5

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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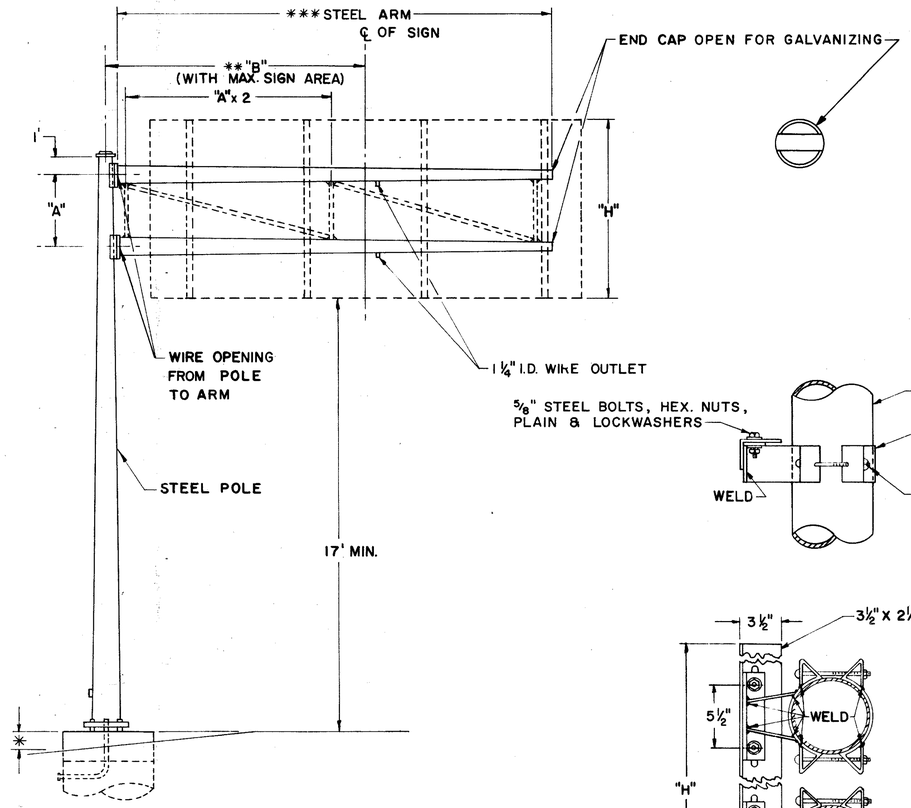
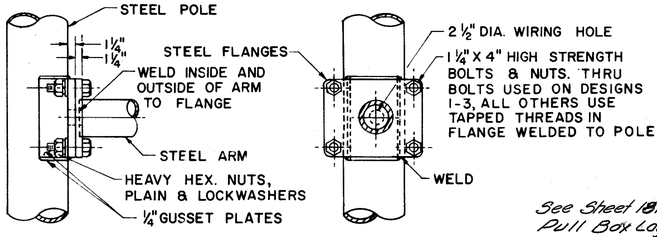
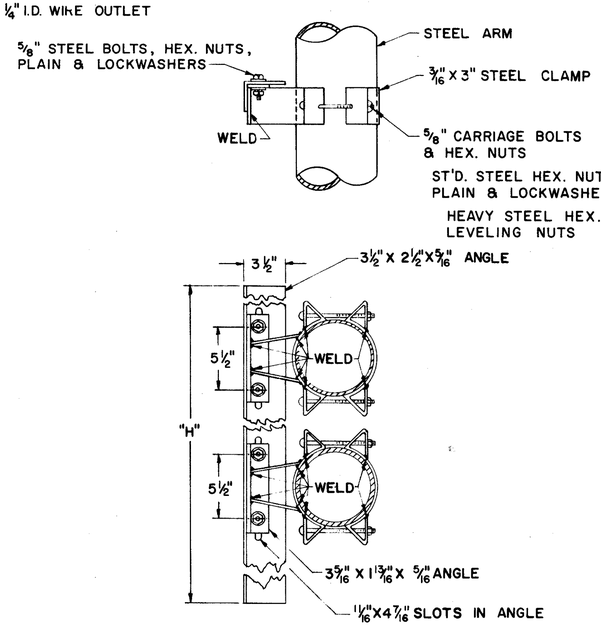
CUYAHOGA COUNTY
CUY-71-13.68

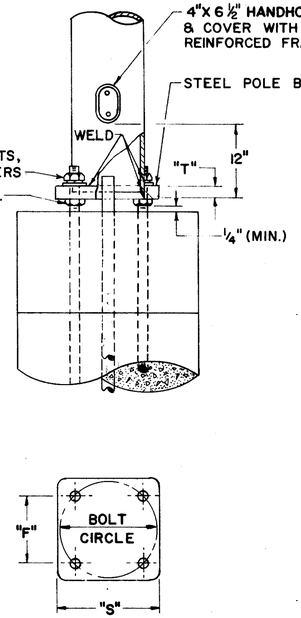




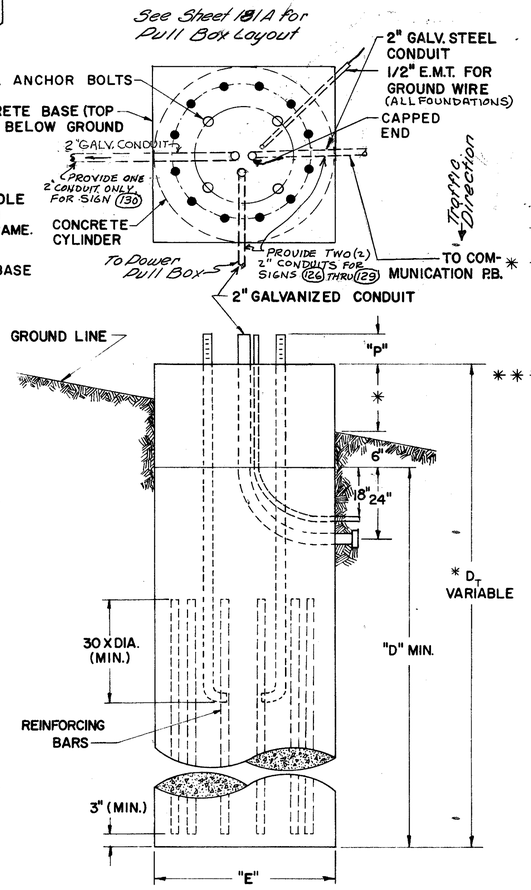
ARM ATTACHMENT



SIGN ATTACHMENT DETAIL



POLE DETAIL



FOUNDATION DETAIL

DESIGN NO.	POLE SIZE	*** ARM SIZE	DIM A	DIM ** B	DIM "D" MIN.	DIM F	DIM F	DIM P	DIM S	DIM T	BOLT CIRCLE	ANCHOR BOLT SIZE	MAX SIGN AREA	REINF. BARS SIZE	REINF. BARS NO.
1	3 Ga, 12" X 8.78" X 23'-0"	7Ga, 6.9"X 4.66"X16'-0"	4'	12'	9'	3'-0"	11 5/16"	7¾"	17"	2"	16"	1¾" X 90"	80	¾"	12
2	3 Ga, 12" X 8.78" X 23'-0"	7 Ga, 8" X 5.2" X 20'-0"	4'	16'	9'	3'-0"	11 5/16"	7¾"	17"	2"	16"	1¾" X 90"	80	¾"	12
3	3 Ga, 15"X 11.5"X 25'-0"	7 Ga, 8.3"X 6.06"X 16'-0"	4'	12'	11'	3'-0"	15½"	8⅜"	23"	2"	22"	2"X 96"	120	1"	12
4	3 Ga, 16"X 12.5"X 25'-0"	3 Ga, 9.2"X 6.40"X 20'-0"	4'	16'	11'	3'-0"	16⅝"	8⅜"	24½"	2"	23½"	2"X 96"	120	1"	12
5	0 Ga, 18"X 14.36"X 26'-0"	7 Ga, 11"X 7.92"X 22'-0"	6'	14'	13'	3'-0"	18"	9⅜"	26½"	2½"	25½"	2¼"X 120"	180	1⅛"	12
6	0 Ga, 18"X 14.36"X 26'-0"	7 Ga, 12.5"X 8.86"X 26'-0"	6'	18'	13'	3'-0"	18"	9⅜"	26½"	2½"	25½"	2¼"X 120"	180	1⅛"	12
7	2 PLY 7 Ga, 18"X 14.36"X 26'-0"	7 Ga, 12.5"X 9.14"X 24'-0"	6'	14'	15'	3'-0"	18"	9¾"	26½"	2½"	25½"	2½"X 144"	240	1¼"	12
8	2 PLY ¼", 18"X 14.36"X 26'-0"	3 Ga, 12.5"X 8.58"X 28'-0"	6'	18'	15'	3'-0"	18"	11¼"	26½"	3"	25½"	3"X 144"	240	1¼"	12

NOTES

FABRICATION - ALL PORTIONS OF THE SIGN SUPPORT, INCLUDING SIGN ATTACHMENTS, SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH THE REQUIREMENTS OF A.S.T.M. DESIGNATIONS A-123 AND A-153. THE CONDUIT SHALL BE GALVANIZED IN ACCORDANCE WITH SEC. S-25.08 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR OVERHEAD SIGN SUPPORTS FOR PAYMENT.

* FOUNDATION - THE TOP ELEVATION OF FOUNDATIONS SHALL BE VARIED SO AS TO MAINTAIN A MINIMUM CLEARANCE OF 17' BETWEEN THE BOTTOM OF THE SIGN AND THE HIGHWAY CROWN.

* * ERECTION - VALUES OF "B" MAY BE EXCEEDED PROVIDED THE PRODUCT OF ACTUAL SIGN AREA TIMES THE DISTANCE FROM ℄ OF POLE TO ℄ OF SIGN DOES NOT EXCEED THE MAX. SIGN AREA TIMES "B".

* * * ARMS 20' LONG OR LONGER ARE TO BE TRUSS TYPE WITH 3" X 3" X ⅜" ANGLES WELDED TO GUSSET PLATES.

MATERIAL - STEEL POLE BASES, FLANGES, AND END CAPS SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATION A 30 GRADE B.
HIGH STRENGTH STEEL BOLTS SHALL CONFORM TO ASTM SPECIFICATION A 193 GRADE B7
AFTER FABRICATION TAPERED POLES AND ARMS SHALL HAVE A MINIMUM YIELD STRENGTH OF 48,000 PSI.

SOILS - THE FOUNDATION DETAILS SHOWN ARE FOR AVERAGE SOIL CONDITIONS (MEDIUM CLAY, CEMENTED SAND AND GRAVEL, SANDY CLAY, OR STIFF CLAY).
FOR POOR SOIL CONDITIONS, INCREASE "D" MIN. BY: 50% IN DRY OR WET SAND, 60% IN SILTY CLAY, 100% IN SOFT CLAY, AND FROM 75% TO 150% IN WET SILT, DEPENDING ON QUICKSAND ACTION.

REINFORCING STEEL - REINFORCING STEEL AS SHOWN IN TABLE SHALL BE INSTALLED WHEN "D_T" EXCEEDS THE ANCHOR BOLT LENGTH BY MORE THAN 3 FT. THE COST AND PLACEMENT OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM I-129 CONCRETE FOR SIGN SUPPORT FOUNDATIONS.

DESIGN

THE DESIGN OF OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

OVERHEAD SIGN SUPPORT

I-129
No. 12.24

DATE
8-18-61
4-11-62
11-8-64

APPROVED Robert E. Comer
ENGINEER OF TRAFFIC

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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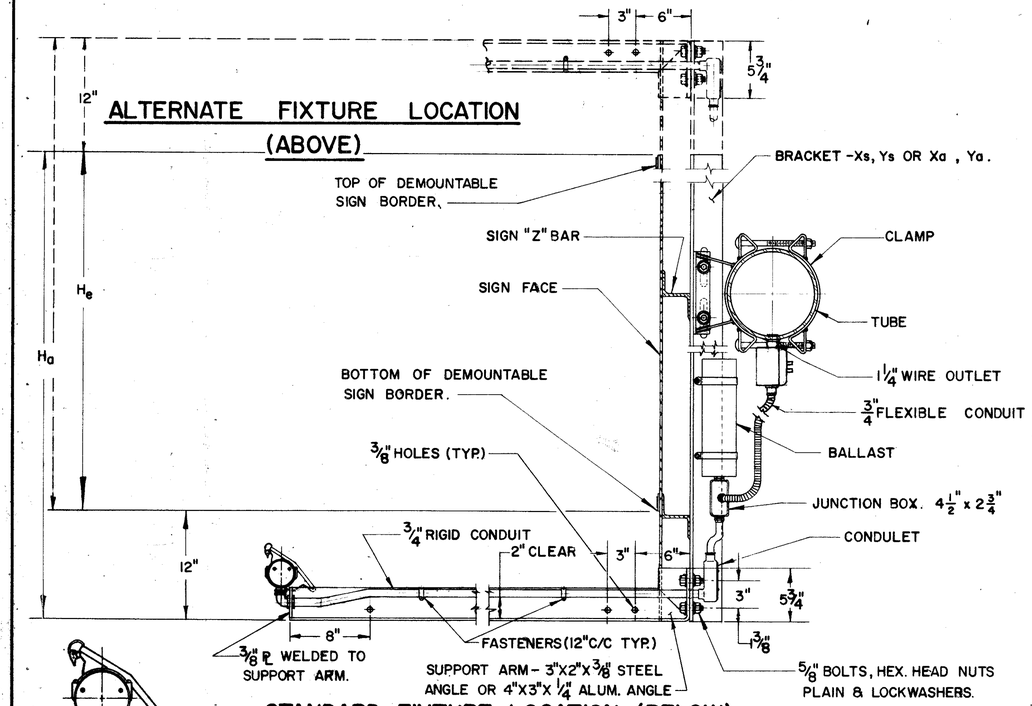
CUYAHOGA COUNTY
CUY-71-13.68



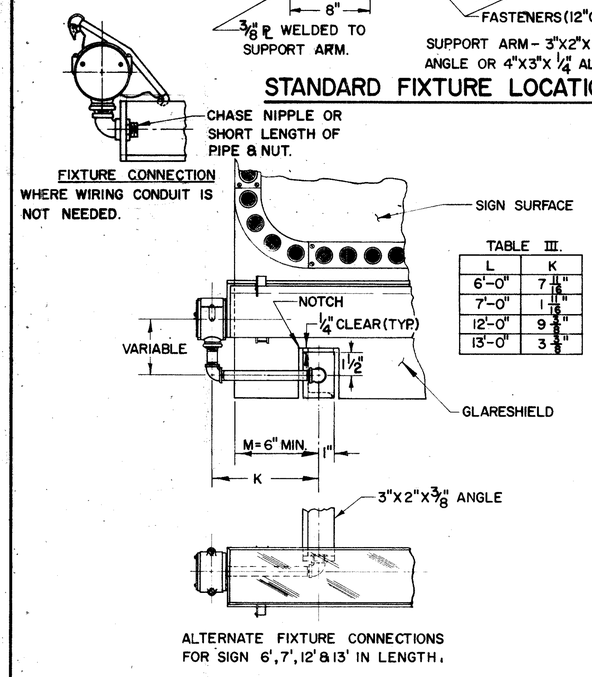
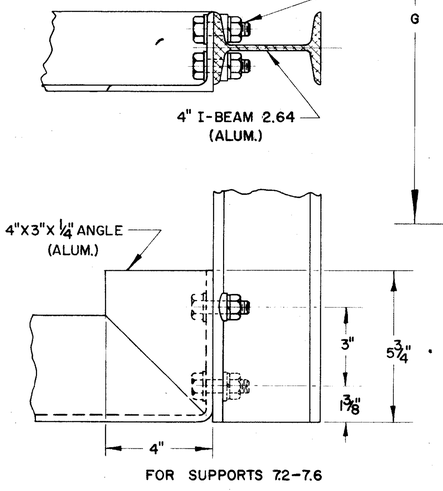


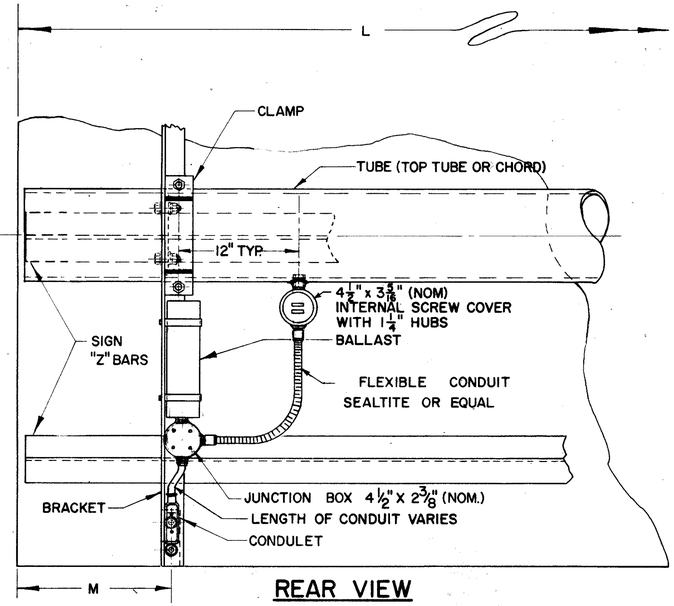
TABLE III.

L	K
6'-0"	7 11/16"
7'-0"	1 15/16"
12'-0"	9 3/16"
13'-0"	3 3/16"

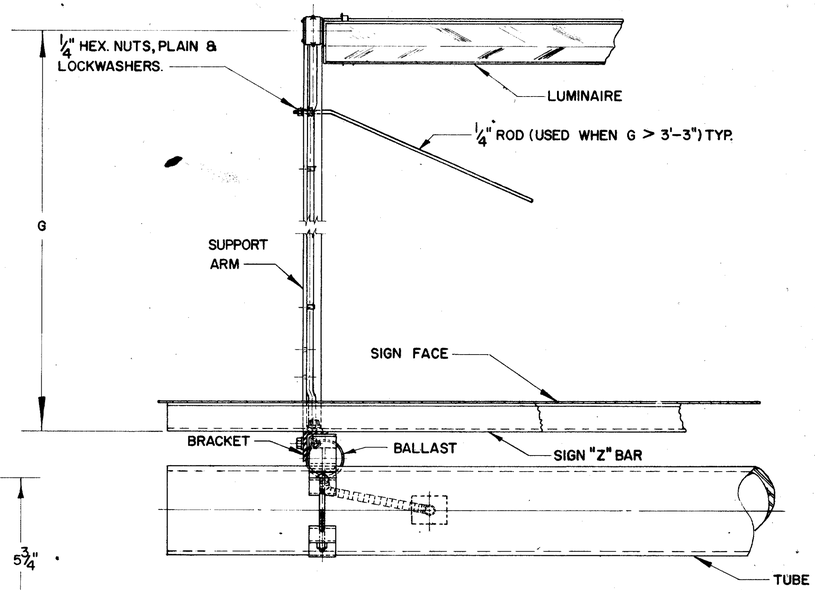
DETAIL A.



DETAIL B.



REAR VIEW



TOP VIEW

FABRICATION — ALL STRUCTURAL COMPONENTS SHOWN ON THIS SHEET SHALL CONFORM TO SUPPLEMENT SPECIFICATIONS I-129.

MATERIALS — THE MATERIALS USED IN THE COMPONENTS SHOWN ON THIS SHEET SHALL BE IN CONFORMANCE WITH THE MATERIALS USED IN THE SIGN SUPPORT.

TABLE I.

"L" SIGN LENGTH A	"L" SIGN LENGTH B	NUMBER OF FIXTURES 75-3/8"	NUMBER OF FIXTURES 99-3/8"	"M" EDGE DISTANCE A LT.	"M" EDGE DISTANCE A RT.	"M" EDGE DISTANCE B LT.	"M" EDGE DISTANCE B RT.	NO. BALLAST
6'-0"	7'-0"	1		6"	6"	6"	6"	1
8'-0"	9'-0"	1		10 3/8"	10 1/4"	16 3/8"	16 1/4"	1
10'-0"	11'-0"		1	10 3/8"	10 1/4"	16 3/8"	16 1/4"	1
12'-0"	13'-0"	2		6"	6	6	6	1
14'-0"	15'-0"	2		8 5/8"	8 5/8"	14 5/8"	14 5/8"	1
16'-0"	17'-0"	1	1	8 5/8"	8 5/8"	14 5/8"	14 5/8"	1
18'-0"	19'-0"		2	8 5/8"	8 5/8"	14 5/8"	14 5/8"	1
20'-0"	21'-0"	3		7"	6 7/8"	13	12 7/8"	2
22'-0"	23'-0"	2	1	7"	6 7/8"	13	12 7/8"	2
24'-0"	25'-0"	1	2	7"	6 7/8"	13	12 7/8"	2
26'-0"	27'-0"		3	7"	6 7/8"	13	12 7/8"	2

Sn = Nominal Fixture Length, 72" & 96" respectively.
Sa = Actual Fixture Length, for mounting purposes, 75-3/8" and 99-3/8" respectively. (Slight variation for different manufacturers.)
M = Distance from edge of sign to ℄ of notch, min. 6". When the length of the sign minus 1'-0" is less than the sum of the actual fixture lengths, an offset "K" is used. For additional details see detail A and table III.

TABLE II

MAX. BRACKET SPACING FOR EXTERNALLY ILLUMINATED SIGNS

ACTUAL SIGN HEIGHT "Ha"	SUPPORT TYPES: 9.12, 11.08, 13.2, 7.2 — SINGLE TUBE DOUBLE TUBE LESS 36" C/C	9.24, 10.48, 12.24, 14.5, 15.8, 7.2 to 7.6 — DOUBLE TUBE C/C 36"-42"	C/C 48"-54"	C/C 60"-72"
	MAXIMUM BRACKET SPACING			
to 5'-0"	6'-4" with X 8'-4" with Y	8'-4" with X	8'-4" with X	8'-4" with X
5'-6" to 8'-0"	6'-4" with Y	4'-2" with X 6'-4" with Y	6'-4" with X 8'-4" with Y	6'-4" with X 8'-4" with Y
8'-6" to 10'-0"	3'-2" with X 4'-2" with Y	6'-4" with Y	6'-4" with Y	8'-4" with Y
10'-6" to 12'-0"	———	4'-2" with Y	6'-4" with Y	6'-4" with Y
12'-6" to 14'-0"	———	3'-2" with Y	3'-2" with Y	4'-2" with Y

Ha = ACTUAL SIGN HEIGHT
He = EFFECTIVE SIGN HEIGHT
BRACKET SIZE: Xs = 3½" X 2½" X 5/16" — L @ 6.1 LB. STEEL } 9.12, 10.48, 11.08, 12.24, 14.5 & 15.8
Ys = 4" X 3 1/16" X 7/16" — Z @ 8.2 LB. STEEL
Xa = 3" X 2 11/32" X ¼" — Z @ 2.33 LB. ALUM. } 7.2 Thru 7.6
Ya = 4" X 2 23/32" X 3/16" — I @ 2.64 LB. ALUM.

WHEN MAX. ALLOWABLE SPACING IS LESS THAN ACTUAL FIXTURE LENGTHS, Sa, ADDITIONAL STANDARD BRACKETS MUST BE FURNISHED, EQUAL IN HEIGHT TO "Ha".

SUPPORTS 7.2 THROUGH 7.6 SHALL HAVE AN ALUMINUM FIXTURE ARM, 4"X3"X¼" ANGLE. SEE DETAIL B. BOLTS AND ACCESSORIES SHALL BE STAINLESS STEEL.

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

STRUCTURAL DETAILS FOR EXTERNALLY ILLUMINATED SIGNS

EI-1

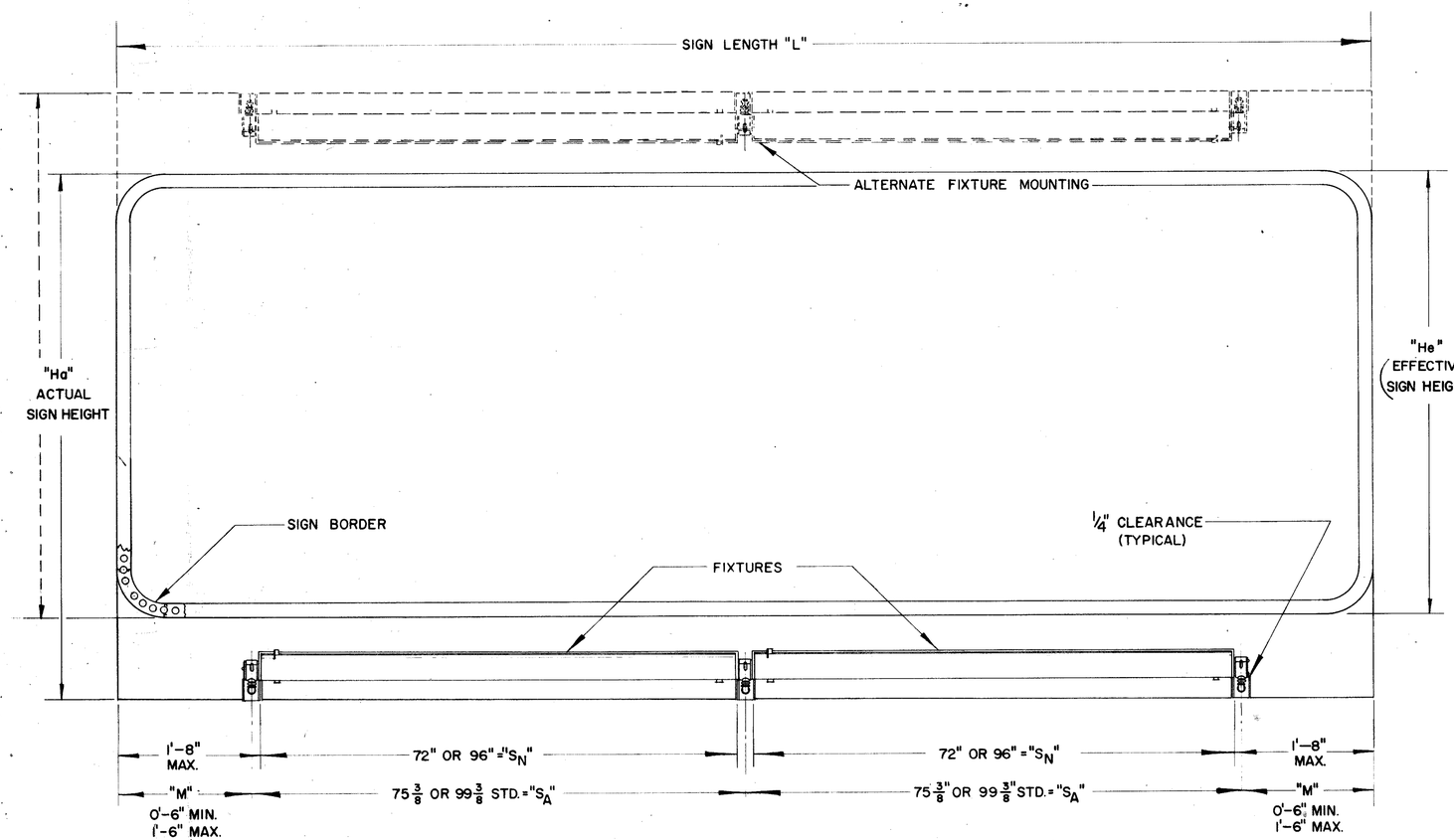
APPROVED Fred C Tarboe
ENGINEER OF TRAFFIC

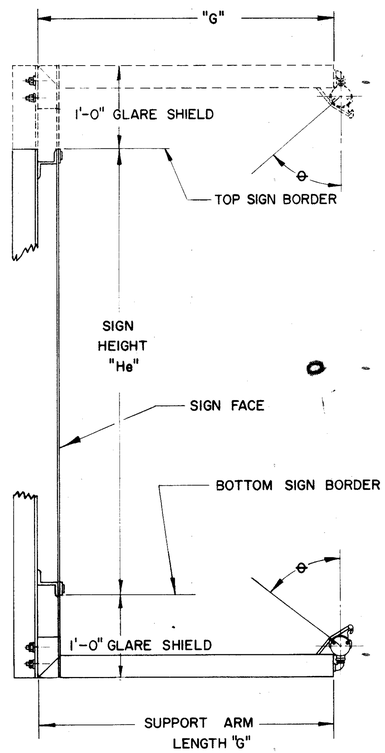
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

199
279

CUYAHOGA COUNTY
CUY-71-13.68

SIGN LIGHTING NOTES





SIGN ILLUMINATION

SIGN ILLUMINATION SHALL BE BY ATTACHED FLUORESCENT FIXTURES AS SHOWN ON ILLUMINATED SIGN DETAIL SHEETS.

LAMPS

LAMPS SHALL BE TYPE F72 OR F96-T12/CW/HO AS MANUFACTURED BY WESTINGHOUSE, GENERAL ELECTRIC OR APPROVED EQUAL FOR SIGNS TO A MAXIMUM HEIGHT OF 6'-6". LAMP TYPE SHALL BE F72 OR F96-T12/CW/SHO AS MANUFACTURED BY WESTINGHOUSE, F72 OR F96-PG17/CW AS MANUFACTURED BY GENERAL ELECTRIC OR APPROVED EQUAL FOR SIGNS THAT ARE 7'-0" OR GREATER IN HEIGHT.

LAMP FIXTURES

LIGHTING FIXTURES SHALL BE CONSTRUCTED OF CORROSION RESISTANT MATERIALS OR WITH HIGH QUALITY CORROSION RESISTANT FINISH. ALL FIXTURES SHALL BE SPECIFICALLY DESIGNED FOR OUTDOOR SIGN LIGHTING SERVICE. MAJOR COMPONENTS SHALL INCLUDE WEATHERPROOF CAST ALUMINUM MOUNTING HUBS DESIGNED TO SECURELY LOCK THE FIXTURES AT ANY ANGLE THROUGH 360 DEGREES. INDICATORS IN 10 DEGREE INCREMENTS SHALL BE STAMPED OR CAST INTO THE HUB TO FACILITATE PROPER AIMING OF THE FIXTURE. FINAL ADJUSTMENT OF FIXTURE SHALL BE DONE AT NIGHT UNDER THE PROJECT ENGINEER'S DIRECTION.

THE BODY DESIGN OF THE FIXTURE SHALL PROVIDE AN ASYMMETRIC SPECULAR ALZAK REFLECTOR TO GIVE A HIGH LEVEL OF UNIFORM ILLUMINATION AND SHALL PROVIDE A WIREWAY FROM END TO END. WHEN ADJACENT FIXTURES ARE WIRED TOGETHER THROUGH THE WIREWAY, WIRE BETWEEN FIXTURES SHALL BE ENTIRELY ENCLOSED.

EXTERIOR FINISH OF THE FIXTURE BODY SHALL BE INTERSTATE GREEN COLOR, HEAT RESISTANT BAKED ENAMEL AS #8950 UNIVERSAL PAINT AND VARNISH INC., OR APPROVED EQUAL. REFLECTOR, LAMP AND SOCKETS SHALL BE PROTECTED BY A HINGED DOOR OF CLEAR ACRYLIC PLASTIC WITH ALUMINUM OR STAINLESS STEEL FRAME AND NEOPRENE GASKETING.

BALLASTS

BALLASTS FOR FIXTURES SHALL BE WEATHER-PROOF OUTDOOR TYPE FOR A 120 VOLT 60 CYCLE SYSTEM AND SHALL PROVIDE LAMP STARTING AT AN AMBIENT TEMPERATURE OF -20°F. BALLASTS SHALL BE MOUNTED ON SIGN BRACKET ONLY. WIRING SHALL BE ACCOMPLISHED IN SUCH A MANNER THAT THE SIGN MAY BE REMOVED WITHOUT DISTURBING THE ELECTRICAL WIRING.

EFFECTIVE SIGN HEIGHT "H"	SUPPORT ARM LENGTH "G"	APPROX. AIMING ANGLE ⊖
3'-0" to 5'-0"	2'-9"	25°
5'-0" to 6'-6"	3'-3"	25°
7'-0" to 10'-0"	4'-3"	17°
10'-6" to 13'-0"	5'-9"	23°

"L" SIGN LENGTH	NO. OF FIXTURES			He=3'-0" to 6'-6" LAMP=T12/cw/ho			He=7'-0" to 13'-0" LAMP=T12/cw/sho		
	72	96		BALLAST NO.	BALLAST TYPE	WATTAGE PER SIGN	BALLAST NO.	BALLAST TYPE	WATTAGE PER SIGN
6'-0" to 7'-0"	1			1	A	190	1	C	250
8'-0" to 9'-0"	1			1	A	190	1	C	250
10'-0" to 11'-0"		1		1	A	190	1	C	250
12'-0" to 13'-0"	2			1	B	250	1	D	425
14'-0" to 15'-0"	2			1	B	250	1	D	425
16'-0" to 17'-0"	1	1		1	B	250	1	D	425
18'-0" to 19'-0"		2		1	B	250	1	D	425
20'-0" to 21'-0"	3			2	A&B	440	2	C&D	675
22'-0" to 23'-0"	2	1		2	A&B	440	2	C&D	675
24'-0" to 25'-0"	1	2		2	A&B	440	2	C&D	675
26'-0" to 27'-0"		3		2	A&B	440	2	C&D	675

BALLASTS

TYPE	MANUFACTURERS		WATTAGE
	G.E.	JEFFERSON	
A	GG 3583	257-151	190
B	GG 3535	257-171	250
C	GG 3585	257-231	250
D	GG 3588	257-181	425

BALLASTS SHALL BE GENERAL ELECTRIC, JEFFERSON AS SPECIFIED ABOVE OR EQUAL.

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OHIO DEPARTMENT OF HIGHWAYS

ELECTRICAL DETAILS FOR EXTERNALLY ILLUMINATED SIGNS

EI-2

DATE
10-31-63
5-6-64
10-29-64

APPROVED Fred C Talbot
ENGINEER OF TRAFFIC

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

200
279

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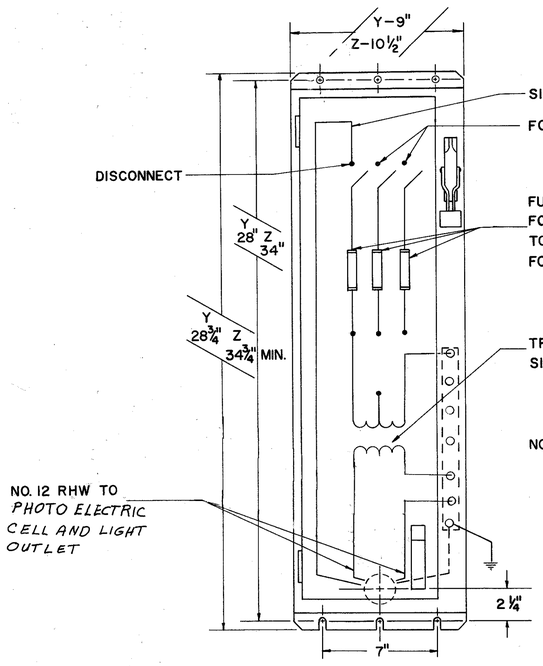
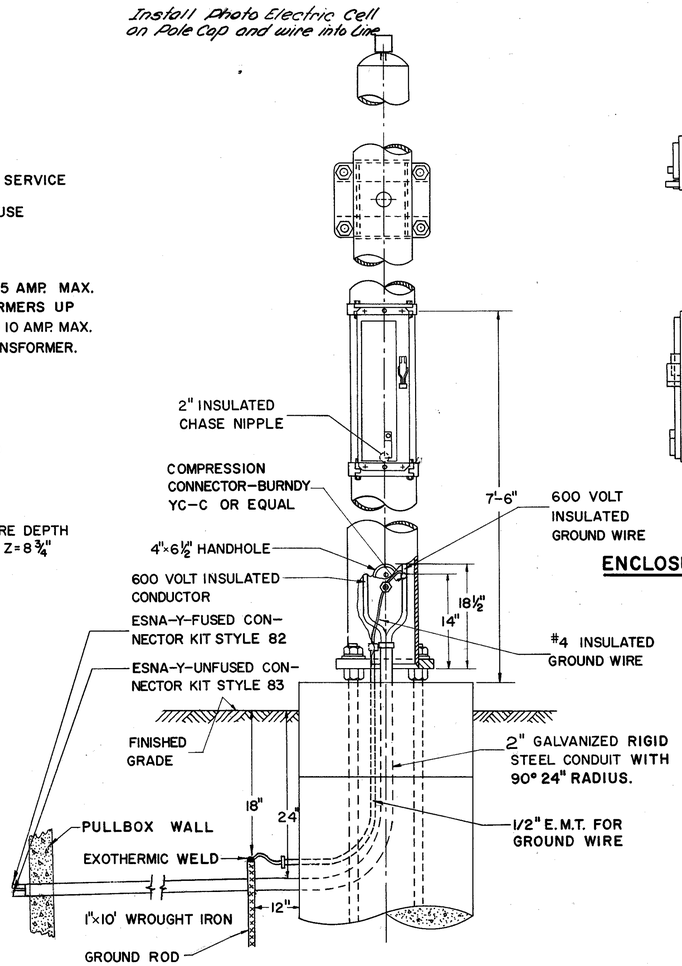
CUY-71-13.68

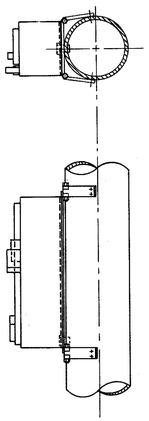


TYPICAL ENCLOSURE DETAIL

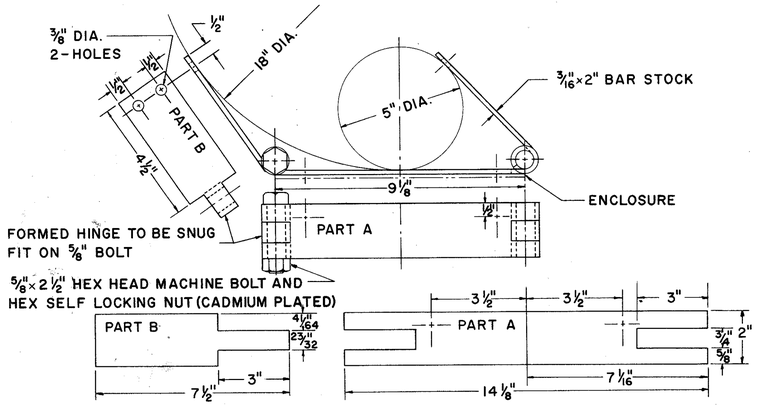
480 VOLT SIGN LIGHTING SERVICE



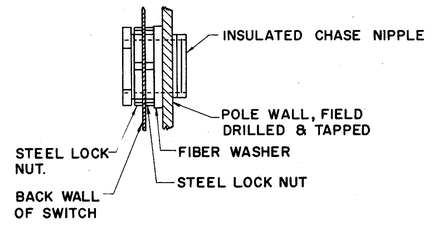
SIGN SUPPORT DETAIL FOR ILLUMINATED SIGNS



ENCLOSURE MOUNTING DETAIL



ENCLOSURE MOUNTING BRACKET



CHASE NIPPLE ASSEMBLY DETAIL

NOTES

GENERAL

DETAILS OF THIS SHEET SHALL APPLY TO EACH OVERHEAD SIGN STRUCTURE TO SUPPORT EXTERNALLY ILLUMINATED SIGNS.

SERVICE

ELECTRIC SERVICE SHALL ENTER THROUGH A 2" GALVANIZED RIGID STEEL CONDUIT INSTALLED IN STRUCTURE FOUNDATION AS PER DETAIL. SIGN SERVICE OR CIRCUITRY SHALL BE CONTROLLED AS REQUIRED BY THE SYSTEM DESIGN AT THE PRIMARY SOURCE.

SERVICE CONDUCTORS SHALL BE THE SIZE AND TYPE AS SPECIFIED.

COMBINATION SWITCH AND TRANSFORMER

(TYPE Y OR Z ENCLOSURE REQUIRED AS PER SCHEDULE ON THIS SHEET)

THIS COMBINATION SHALL BE A 30 OR 60 AMPERE 600 VOLT SWITCH WITH A .25 TO 3.0 KVA TRANSFORMER. THE COMBINATION AND ENCLOSURE SHALL BE AS SQUARE D CLASS 9421, COLUMBUS ELECTRIC WORKS CLASS 101, PANALS INCORPORATED-CLASS 9400, OR APPROVED EQUAL.

TRANSFORMER

THE TRANSFORMER SHALL BE DRY TYPE SINGLE *PHASE* 240/480 VOLT PRIMARY 120/240 VOLT SECONDARY, THE TYPE AND CAPACITY AS SPECIFIED IN DETAILED SCHEDULE ON THIS SHEET.

ENCLOSURE

THE ENCLOSURE SHALL BE NEMA #4 WATER TIGHT .063 GAGE STAINLESS STEEL ASTA 302-303. A DISCONNECT HANDLE SHALL BE FLANGE MOUNTED AND CAPABLE OF BEING LOCKED IN EITHER POSITION. THE ENCLOSURE SHALL BE EQUIPPED WITH A DOOR LOCKING MECHANISM WITH A DEFEATER THAT NECESSITATES TWO HANDS TO OPERATE MECHANISM WITH THE SWITCH IN OFF POSITION. SPACE FOR A 2" INSULATED CHASE NIPPLE SHALL BE PROVIDED APPROXIMATELY 2¼" ABOVE THE CENTER LINE OF THE LOWER MOUNTING SLOT. THIS ENCLOSURE AND STRUCTURE SHALL BE FIELD DRILLED AND TAPPED FOR THE REQUIRED NIPPLE AS SHOWN ON THE DETAIL ON THIS SHEET.

THIS ENCLOSURE SHALL BE FLANGE MOUNTED ON BRACKETS WITH ⅝-18×3¼" HEX HEAD CADMIUM PLATED MACHINE BOLTS. ENCLOSURES SHALL BE TYPE Y OR Z AS SPECIFIED AND DIMENSIONED ON THIS SHEET.

ENCLOSURE MOUNTING BRACKET

THE ENCLOSURE MOUNTING BRACKET SHALL BE FABRICATED THEN GALVANIZED BEFORE ASSEMBLY. THE BRACKET SHALL BE FIELD MOUNTED WITH ⅝" HEX HEAD SELF TAPPING CADMIUM PLATED SCREWS. THE SIGN SUPPORT SHALL BE FIELD DRILLED, AS PER DETAIL.

WIRE AND CABLE

ALL WIRE AND CABLE UP TO AND INCLUDING #4 SHALL COMPLY WITH FAA TYPE A SPECIFICATIONS. #2 OR LARGER WIRE OR CABLE SHALL BE G.E. 58006 OR ANACONDA AP-10711, OR EQUAL. ALL WIRE AND CABLE SHALL BE 600 VOLT.

GROUNDING

EACH SIGN SUPPORT OR STRUCTURE SHALL BE GROUNDED WITH A #4 RUBBER INSULATION AND NEOPRENE JACKETED CONDUCTOR. THE GROUNDING CONDUCTOR SHALL BE CONNECTED TO THE SWITCH THEN TO THE COMPRESSION CONNECTOR IN THE SIGN SUPPORT THEN TO A 1"×10' *SOLID* WROUGHT IRON GROUND ROD. GROUND CONDUCTOR SHALL BE EXOTHERMICALLY WELDED TO GROUND ROD AND THEN TAPED WITH PLASTIC ELECTRICAL TAPE AT EACH EXPOSED PORTION OF CONDUCTOR. THE WELDED CONNECTION AND TAPED PORTION SHALL BE PAINTED 2 COATS OF GLYPTAL INSULATING ENAMEL.

TRANSFORMERS

TYPE	MANUFACTURERS G.E.	MANUFACTURERS JEFFERSON	OUTPUT K.V.A.	SWITCH TRANSFORMER ENCLOSURE
I	9T51Y7	244-241	.25	Y
II	9T51Y8	244-251	.50	Y
III	9T51Y9	244-261	.75	Y
IV	9T51Y10	244-401	1.00	Z
V	9T51Y11	244-411	1.50	Z
VI	9T51Y12	244-421	2.00	Z
VII	9T51Y13	244-431	3.00	Z

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

ELECTRICAL SIGN SERVICE DETAILS 480 VOLT SYSTEM

ES-3A

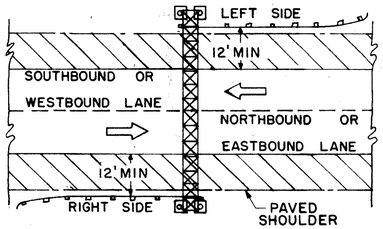
DATE 6-18-64 11-6-64

APPROVED _____
ENGINEER OF TRAFFIC

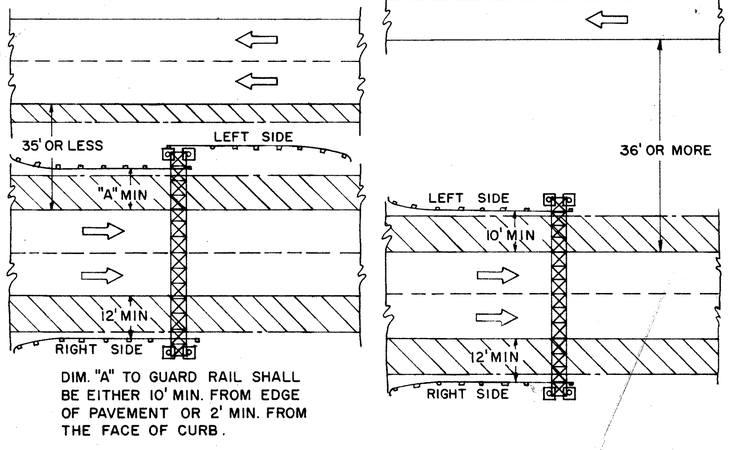
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

201
279

CUYAHOGA COUNTY
CUY-71-13.68

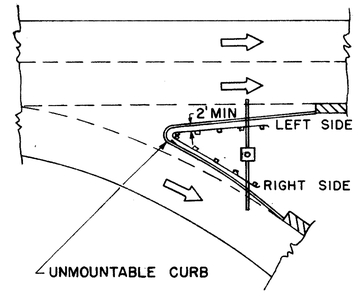


MULTIPLE LANE UNDIVIDED*
(DOES NOT APPLY TO THIS IMPROVEMENT)

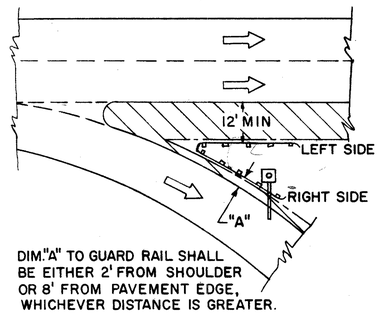


DIM. "A" TO GUARD RAIL SHALL BE EITHER 10' MIN. FROM EDGE OF PAVEMENT OR 2' MIN. FROM THE FACE OF CURB.

FOUR LANE DIVIDED*
(DOES NOT APPLY TO THIS IMPROVEMENT)



(CURB SECTION)



DIM."A" TO GUARD RAIL SHALL BE EITHER 2' FROM SHOULDER OR 8' FROM PAVEMENT EDGE, WHICHEVER DISTANCE IS GREATER.

(SHOULDER SECTION)

BIFURCATION*

NOTES

GENERAL

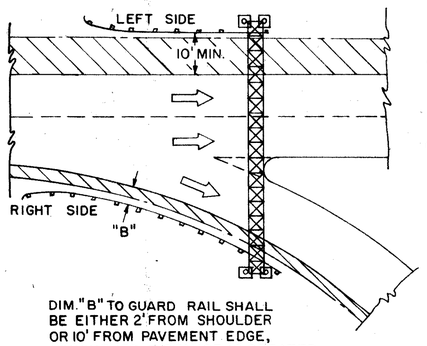
PROTECTIVE GUARD RAIL FOR OVERHEAD SIGN STRUCTURES SHALL CONFORM TO SEC. I-15, FOR STEEL BEAM TYPE (DEEP).

AT LOCATIONS WHERE GUARD RAIL IS IN PLACE, THE SIGN SUPPORT FOUNDATIONS SHALL BE ERECTED BEHIND EXISTING GUARD RAIL.

A MINIMUM OF SIX GUARD RAIL POSTS IS REQUIRED IN ADVANCE OF THE SIGN SUPPORT.

THE LENGTH OF GUARD RAIL DEPENDS ON THE POST SPACING. (EXAMPLE: FOR A SINGLE LINE OF GUARD RAIL IN ADVANCE OF A SIGN SUPPORT, THE MINIMUM LENGTH IS 50 FT. FOR A POST SPACING OF 6'-3", 100 FT. FOR A POST SPACING OF 12'-6".)

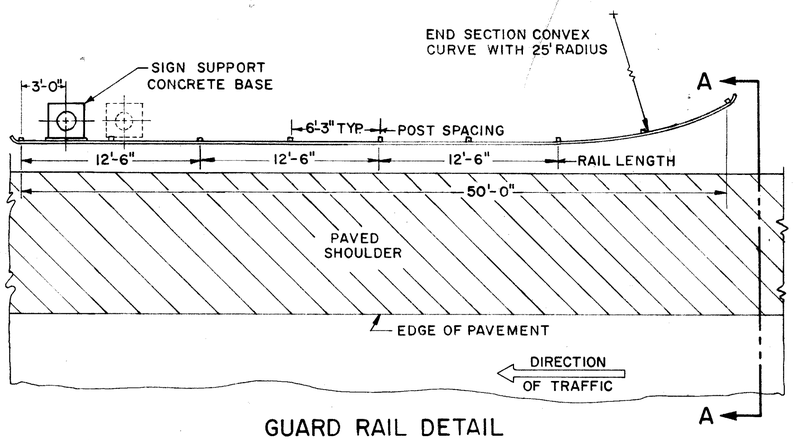
WHERE PROPOSED GUARD RAIL FLARES ARE CONSTRUCTED OF RAIL ELEMENTS WHICH HAVE NOT BEEN FABRICATED EXACTLY TO FIT THE CURVATURE SHOWN ON THE PLANS. THE TWO END POSTS OF EACH FLARED SECTION SHALL BE ENCASED IN A MINIMUM 4" THICKNESS OF CLASS "E" CONCRETE FOR THE FULL DEPTH OF THE POST BELOW THE GROUND LINE. PAYMENT FOR ENCASEMENT, IF REQUIRED, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE GUARD RAIL.



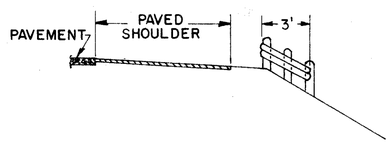
DIM."B" TO GUARD RAIL SHALL BE EITHER 2' FROM SHOULDER OR 10' FROM PAVEMENT EDGE, WHICHEVER DISTANCE IS GREATER.

(ROADWAY SPAN)

BIFURCATION*



GUARD RAIL DETAIL



SECTION A-A

* NOTE:
DOES NOT APPLY TO THIS IMPROVEMENT. SEE MISCELLANEOUS DETAILS FOR MEDIAN GUARDRAIL LAYOUT. ~~SHEET 135~~

DESIGN

THE DESIGN OF GUARD RAIL PROTECTION FOR OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

GUARD RAIL

I-129
I-15

DATE
4-8-60
6-20-60
1-2-62
4-18-62
M.C.H.

APPROVED Robert E. Comer
ENGINEER OF TRAFFIC

GUARD RAIL FOR OVERHEAD SIGN SUPPORTS

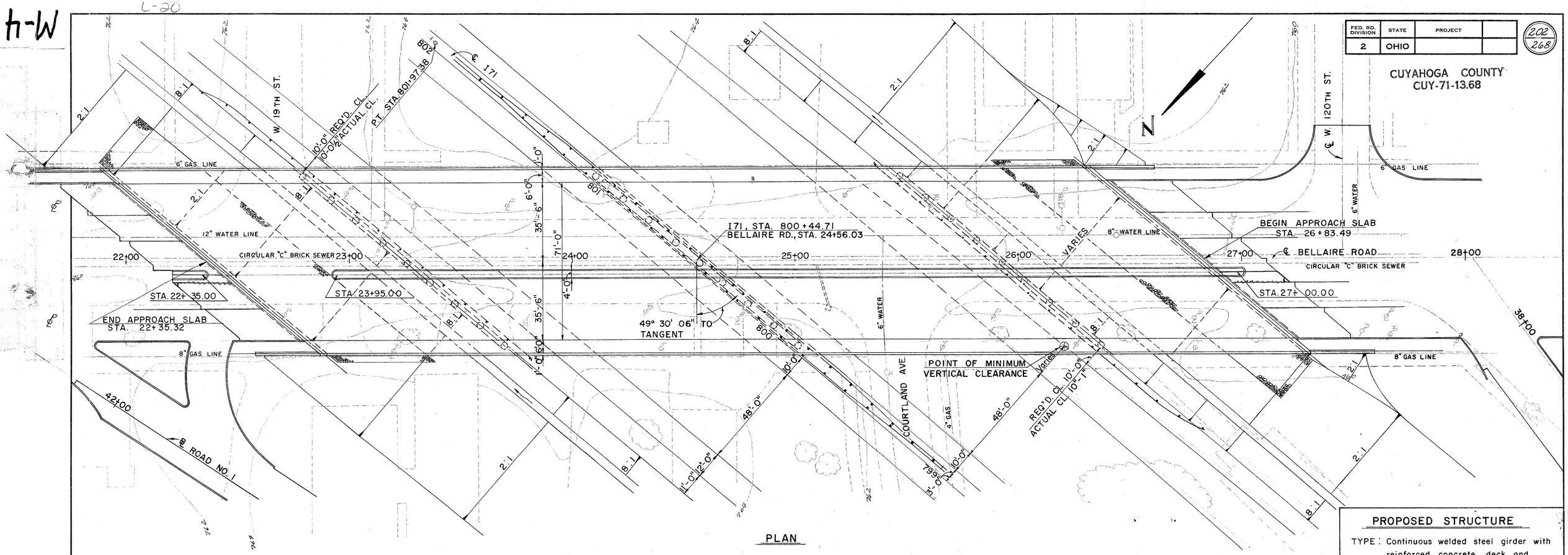
h-W

L-20

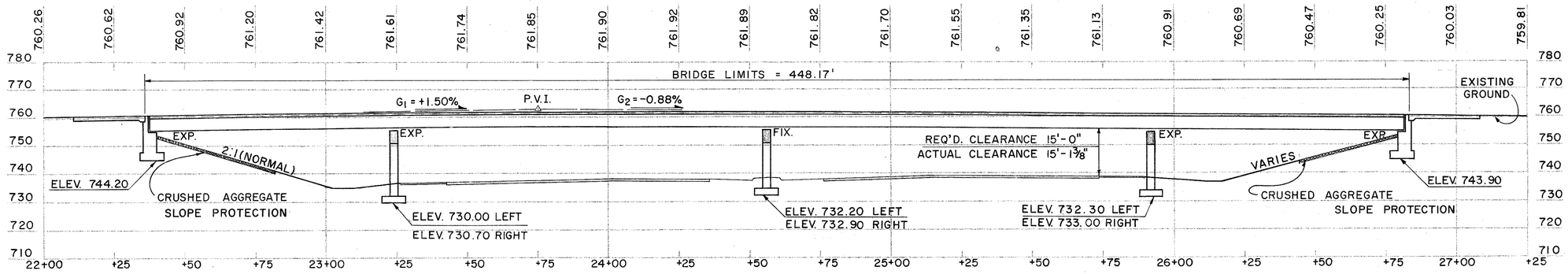
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

202
268

CUYAHOGA COUNTY
CUY-71-13.68



PLAN



PROFILE ALONG ℄ BELLAIRE ROAD

HORIZONTAL CURVE DATA - I 71

P. I. STA. 797 + 37.47
Dc = 0° 28' 00" Lt.
R = 12,277.667'
Δ = 4° 17' 40"
T = 460.33'
Lc = 920.24'
E = 8.63'

VERTICAL CURVE DATA - BELLAIRE ROAD

P. V. I. STA. 23+75, ELEV. = 762.89
G_1 = +1.50% G_2 = -0.88%
V.C. = 350'

ESTIMATED 1975 ADT

	Class A Veh.	Class B Veh.	Total
I 71	70,800	11,940	82,700
BELLAIRE RD.	21,820	2,290	24,110

PROPOSED STRUCTURE

TYPE : Continuous welded steel girder with reinforced concrete deck and substructures.

SPANS : 85'-6", 131'-9", 135'-9" and 88'-3" center to center of bearings.

ROADWAY : 71'-0" face to face of 6'-0" sidewalks.

LOAD FREQUENCY : C F 2000 (57)
(Adequate for AASHO Alternate Loading)

SKEW : 49° 30' 06" RF.

WEARING SURFACE : 1" monolithic concrete.

APPROACH SLAB : AS-1-54 (25'-0" long) and special.

ALIGNMENT : Tangent.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

SITE PLAN

BRIDGE NO. CUY. I 71-1352
I 71 UNDER BELLAIRE ROAD

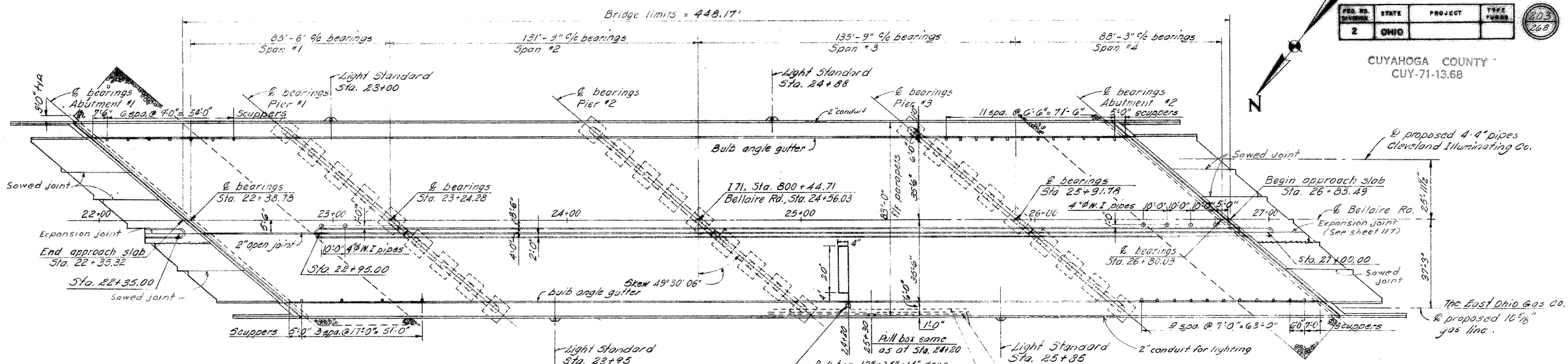
CUYAHOGA COUNTY STA. 800+44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H.H.	E.A. M.R.		S.S.	666	9-18 64	3-26-65

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

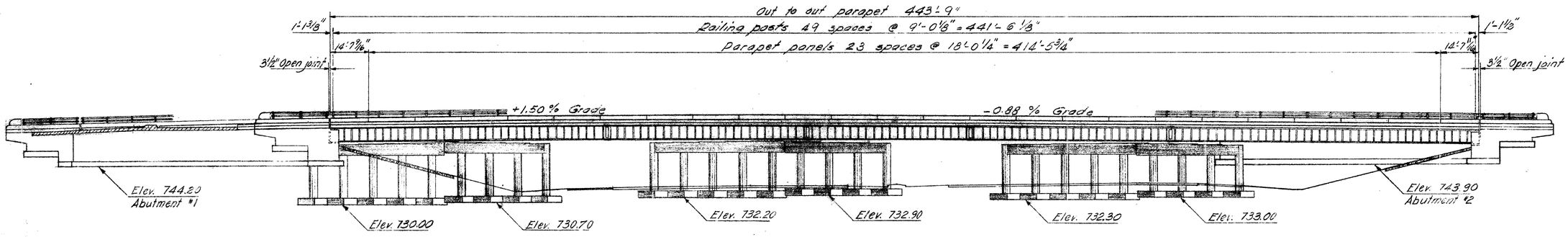
203
268

CUYAHOGA COUNTY
CUY-71-13.68



PLAN

NOTE:
Scupper spacing measured along face of side walk.



ELEVATION

NOTE:
The areas to be covered by crushed aggregate slope protection shall be adjusted in the field as directed by the Engineer.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

GENERAL PLAN AND ELEVATION
BRIDGE NO. CUY I 71-1352
I 71 UNDER BELLAIRE ROAD
CUYAHOGA COUNTY STA. 800+44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H.H.	M.R.		S.S.	~~G.E.~~	9-18-64	3-26-65

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

204
268

CUYAHOGA COUNTY
CUY-71-13.68

GENERAL NOTES

REFERENCE SHALL BE MADE TO:

Standard Drawing SD-1-63, sheets 2, 3 and 4, dated 11-12-63
Standard Drawing RB-1-55, revised 2-2-59
Standard Drawing AR-1-57, revised 4-2-62
Supplemental Specification S-101, dated 7-12-62
Supplemental Specification S-307, dated 10-1-64

DESIGN SPECIFICATIONS: This structure conforms to the requirements of "Design Specifications for Highway Structures" of the State of Ohio, Department of Highways, dated 9-1-57 together with current revisions thereof.

DESIGN LOADING – C F 2000(57)

CONCRETE CLASS C – basic unit stress 1,333 p.s.i.
CONCRETE CLASS E – basic unit stress 1,133 p.s.i.

STRUCTURAL STEEL – ASTM A36 – basic unit stress 20,000 p.s.i. (ASTM A7 and A373 steel not permitted)

REINFORCING STEEL – ASTM A15, A16, A160, Deformed, Intermediate or Hard Grade. Basic unit stress 20,000 p.s.i. Except, spiral reinforcement may be plain, Structural Grade with basic unit stress of 18,000 p.s.i.

CONCRETE DECK PLACING: In order to facilitate water curing of the concrete of the deck slab, the placing of concrete shall progress upgrade. The slab may be placed in sections, between transverse construction joints which are parallel to transverse reinforcing steel and are located near the center of any span.

SURFACE FINISH OF CONCRETE: The requirements of Sec. S-1.22, Rubbed Finish, shall apply to the following exposed concrete surfaces.

a. The entire superstructure except the top and bottom surfaces of sidewalks and roadways.
b. The entire surface of piers and abutments except bridge seats, backwalls and the face of spill-through abutments between outside girders.

MACHINE FINISH: The concrete bridge deck shall be finished by the use of a finishing machine.

FOUNDATION BEARING PRESSURE: Pier footings are designed for a maximum bearing pressure of 6.3 tons sq. ft. and abutment footings are designed for a maximum bearing pressure of 2.6 tons per sq. ft.

UTILITY LINES: All expense involved installing the affected utility lines shall be borne by the owners. The Contractor and owners are requested to cooperate by arranging their work in such a manner that inconvenience to either will be held to a minimum.

ITEM S-7: Under "Item S-7.10, High-Strength Steel Bolts, Nuts and Washers, paragraph two (2) shall be completly revised to read as follows:
In the final assemly of the parts to be bolted, drift pins shall be placed in a sufficient number of holes (not less than 25 percent for field erection) to provide and maintain accurate alignment of holes and parts, and sufficient bolts shall be installed and brought to a snug tight condition to bring the parts into complete contact.
Bolts shall then be installed in any remaining open holes and tightened to a snug tight fit, after which all bolts shall be tightened completely by calibrated wrenches or by the turn-of-nut method. Drift pins shall then be replaced with bolts, tightened in the same manner.
Bolt lengths determined by the use of table no.1 shall be adjusted to the next 1/4 – inch length increment.

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	SUPER.	ABUT.	PIER	GEN.	AS BUILT	
E-2	816	Cu.Yds.	Unclassified excavation		816				
E-2	316	Cu.Yds.	Shale excavation			316			
S-1	1,327	Cu.Yds.	Class "C" concrete, superstructure	1,327					
S-1	280	Cu.Yds.	Class "C" concrete, piers above footings			280			
S-1	181	Cu.Yds.	Class "E" concrete, pier footings			181			
S-1	425	Cu.Yds.	Class "E" concrete, abutments above footings		425				
S-1	152	Cu.Yds.	Class "E" concrete, abutment footings		152				
S-3	26	Lin.Ft.	Waterproofing premolded sealing strip		26				
S-4	436,731	Lbs.	Reinforcing steel	334,926	26,425	75,380			
S-7	1,373,970	Lbs.	Structural steel *	1,373,970					
S-8	1,373,970	Lbs.	Field painting of structural steel *(as per proposal note)*	1,373,970					
S-9	380	Sq. Ft.	1" preformed expansion joint filler	300	80				
S-14	1,001.5	Lin.Ft.	Railing Type "C" (aluminum railing and supports with concrete parapets)	887.5	114.0				
S-25			Electric lighting system — see lighting plans						
S-29	180	Cu.Yds.	Porous backfill		180				
S-29	240	Lin.Ft.	6" perforated helical C.M.P., M-6.4(h), including specials				240		
S-29	236	Lin.Ft.	6" helical C.M.P., M-6.4(h), non perforated				236		
S-29	34	Each	Scuppers, including supports	34					
S-101	1,327	Each	Water-reducing, set-retarding admixture	1,327					
I-10	895	Sq.Yds.	Crushed aggregate slope protection				895		
S-29	6	Each	Scuppers 4" I wrought iron pipe including specials	6					

* 2440 lbs to be paid for by the Cleveland Illuminating Co
630 lbs to be paid for by the East Ohio Gas Co.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

GENERAL NOTES AND ESTIMATED QUANTITIES

BRIDGE NO. CUY-171-1352
171 UNDER BELLAIRE ROAD

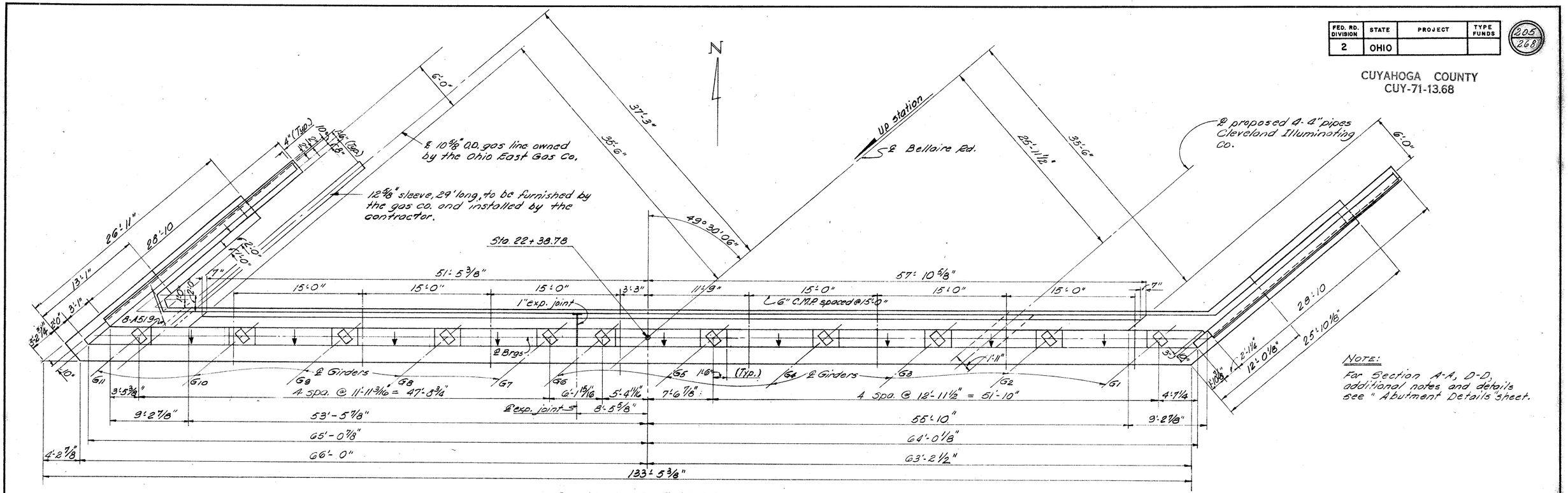
CUYAHOGA COUNTY STA. 800+44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
S. S.	E.D.A.		H. H.	[illegible]	9-18 64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

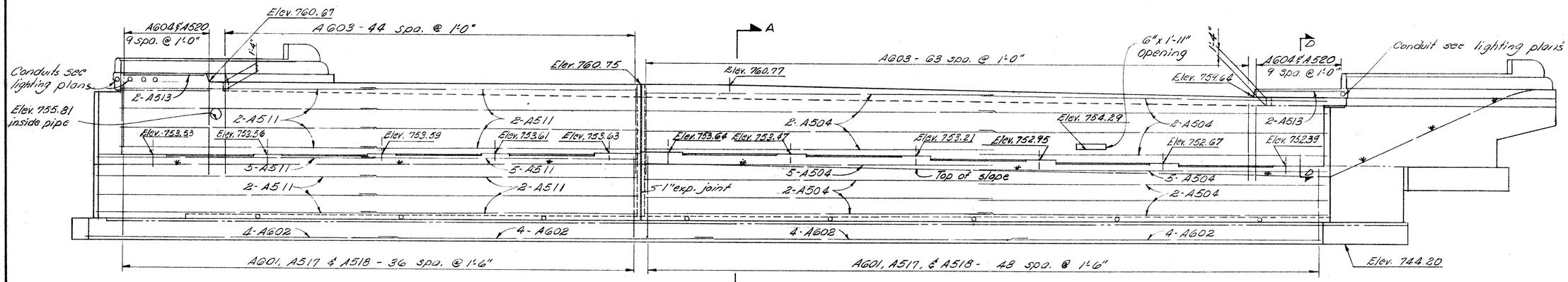
205
268

CUYAHOGA COUNTY
CUY-71-13.68



NOTE:
For Section A-A, D-D, additional notes and details see "Abutment Details" sheet.

PLAN - ABUTMENT NO. 1



ELEVATION - ABUTMENT NO. 1

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

ABUTMENT NO. 1

BRIDGE NO. CUY. 171-1352
171 UNDER BELLAIRE ROAD

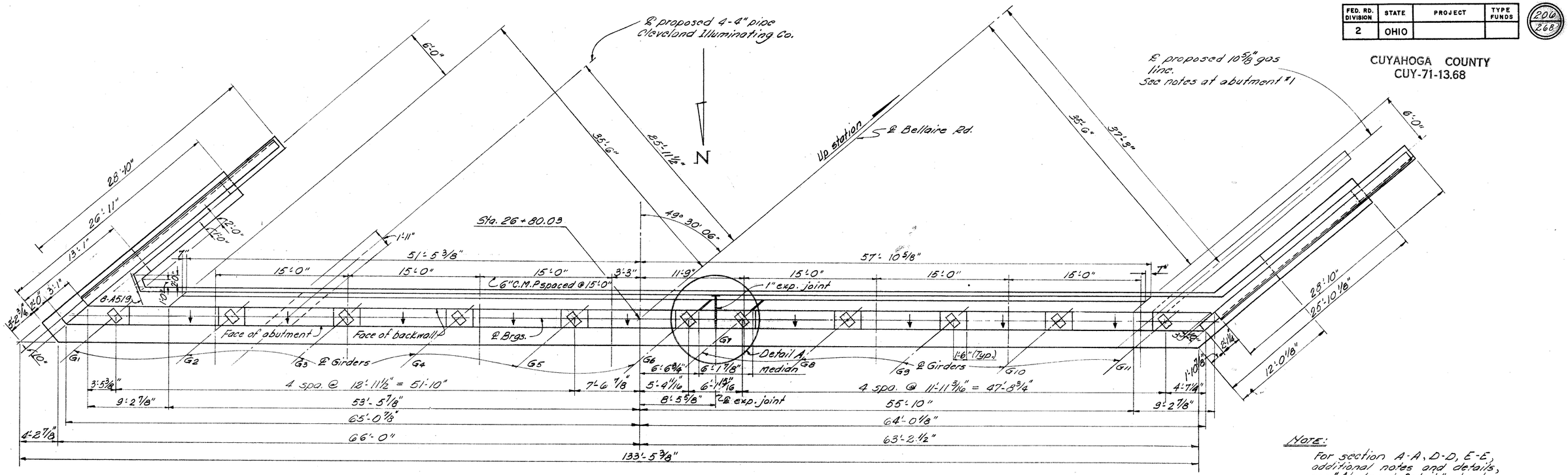
CUYAHOGA COUNTY STA. 800+44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
S.S.	S.S.	E.D.A.	H.H.	668	9-18-64	

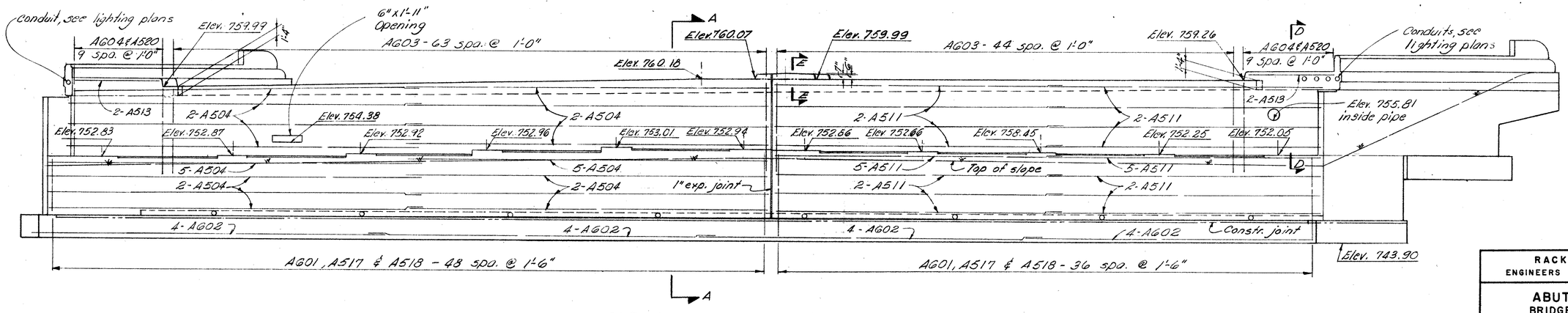
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

200
268

CUYAHOGA COUNTY
CUY-71-13.68



PLAN - ABUTMENT Nº 2



ELEVATION - ABUTMENT NO. 2

Note:
For section A-A, D-D, E-E, additional notes and details, see "Abutment Details" sheet.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

ABUTMENT NO. 2
BRIDGE NO. CUY. I 71-1352
I 71 UNDER BELLAIRE ROAD

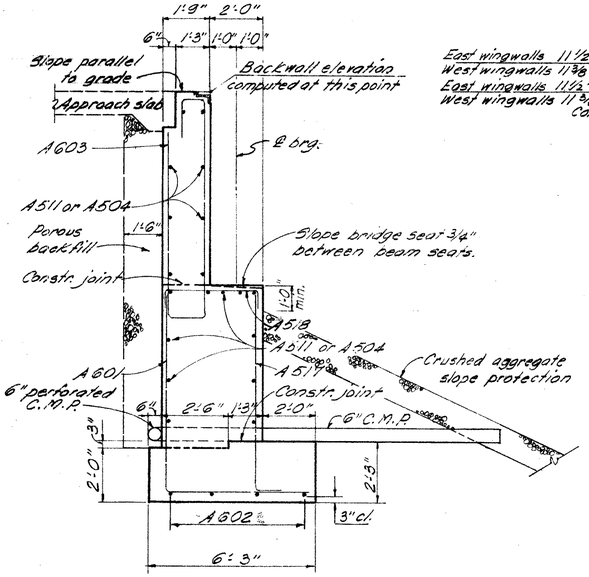
CUYAHOGA COUNTY STA. 800+44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
S.S.	S.S.	E.D.A.	H.H.	666	9-18 64	

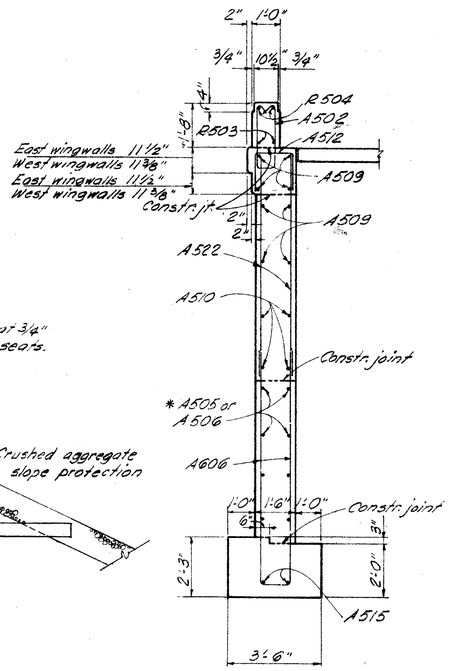
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

207
268

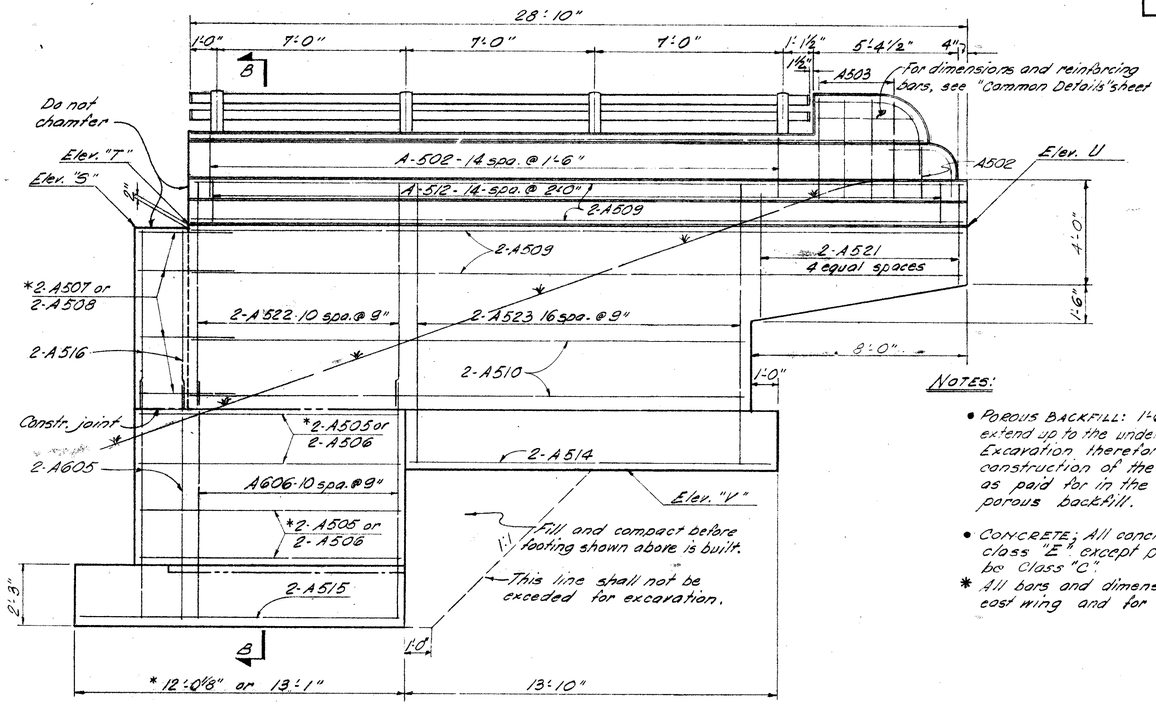
CUYAHOGA COUNTY
CUY-71-13.68



SECTION A-A



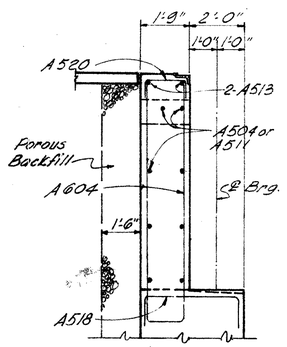
SECTION B-B



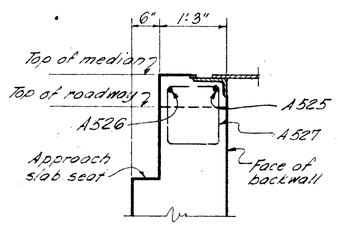
TYPICAL WINGWALL ELEVATION

NOTES:

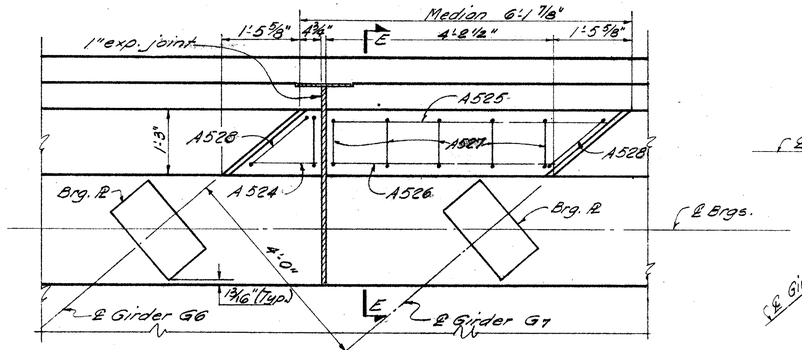
- POROUS BACKFILL: 1'-6" thick full length of abutment shall extend up to the underside of the approach slab and sidewalks. Excavation therefore, in excess of that required for construction of the abutment, shall be considered as paid for in the bid price per cu. yd. paid for porous backfill.
- CONCRETE: All concrete for the abutments shall be class "E" except parapets and end posts which shall be Class "C".
- * All bars and dimensions marked with * for Abutment #1, east wing and for Abutment #2 west wing only.



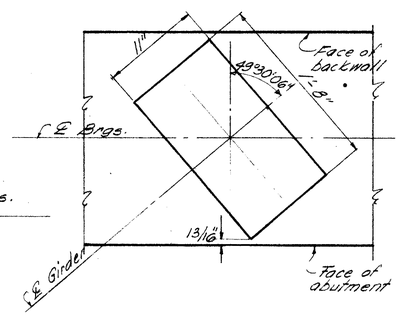
SECTION D-D



SECTION E-E

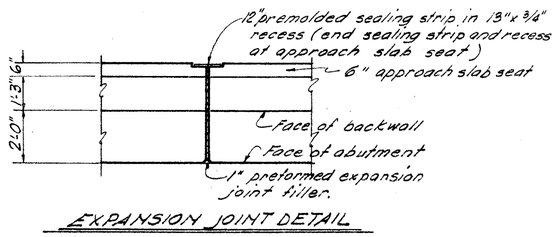


PLAN
DETAIL A



PLAN OF BEARING PLATE

ELEVATIONS								
LOCATIONS	EAST WING				WEST WING			
	S	T	U	V	S	T	U	V
Abutment #1	758.46	758.58	758.15	750.14	759.64	759.78	759.49	751.28
Abutment #2	758.97	759.11	758.85	750.58	758.10	758.24	757.99	749.80



EXPANSION JOINT DETAIL

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

ABUTMENT DETAILS
BRIDGE NO. CUY. I 71-1352
I 71 UNDER BELLAIRE ROAD

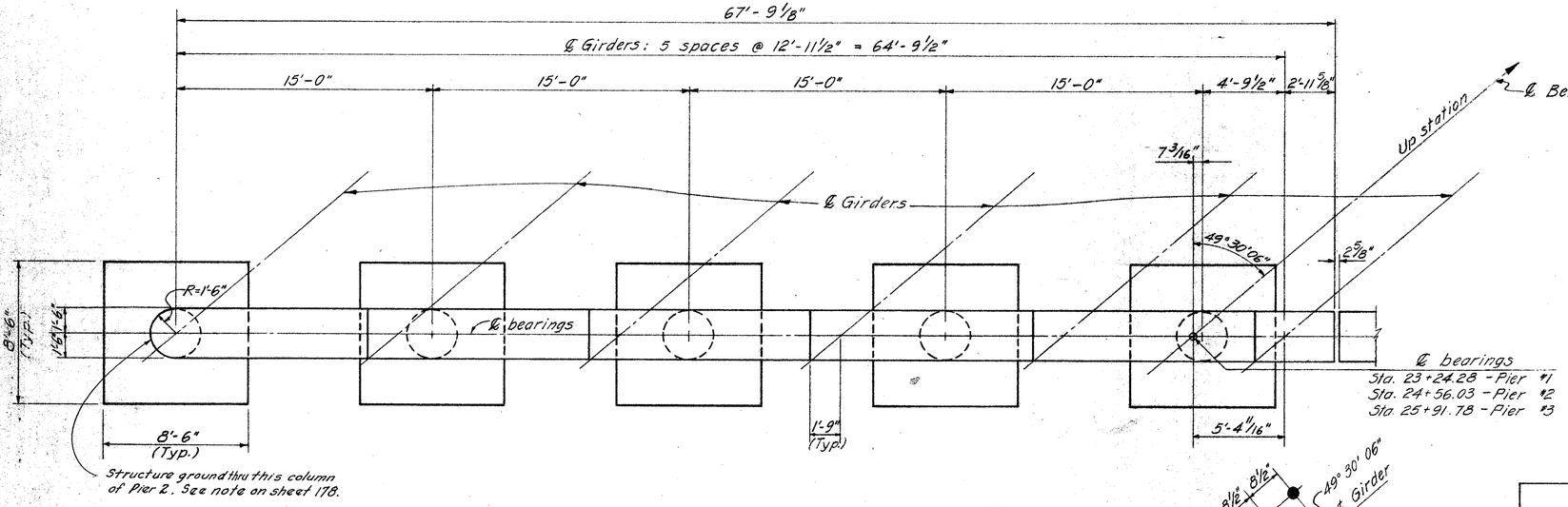
CUYAHOGA COUNTY STA. 800+44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
S.S.	S.S.	G.M.	H.H.	666	9-18 64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

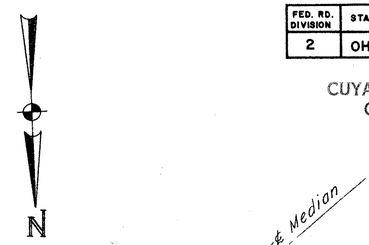
(208 / 268)

CUYAHOGA COUNTY
CUY-71-13.68



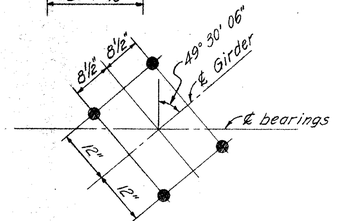
PLAN

℄ bearings
Sta. 23+24.28 - Pier #1
Sta. 24+56.03 - Pier #2
Sta. 25+91.78 - Pier #3



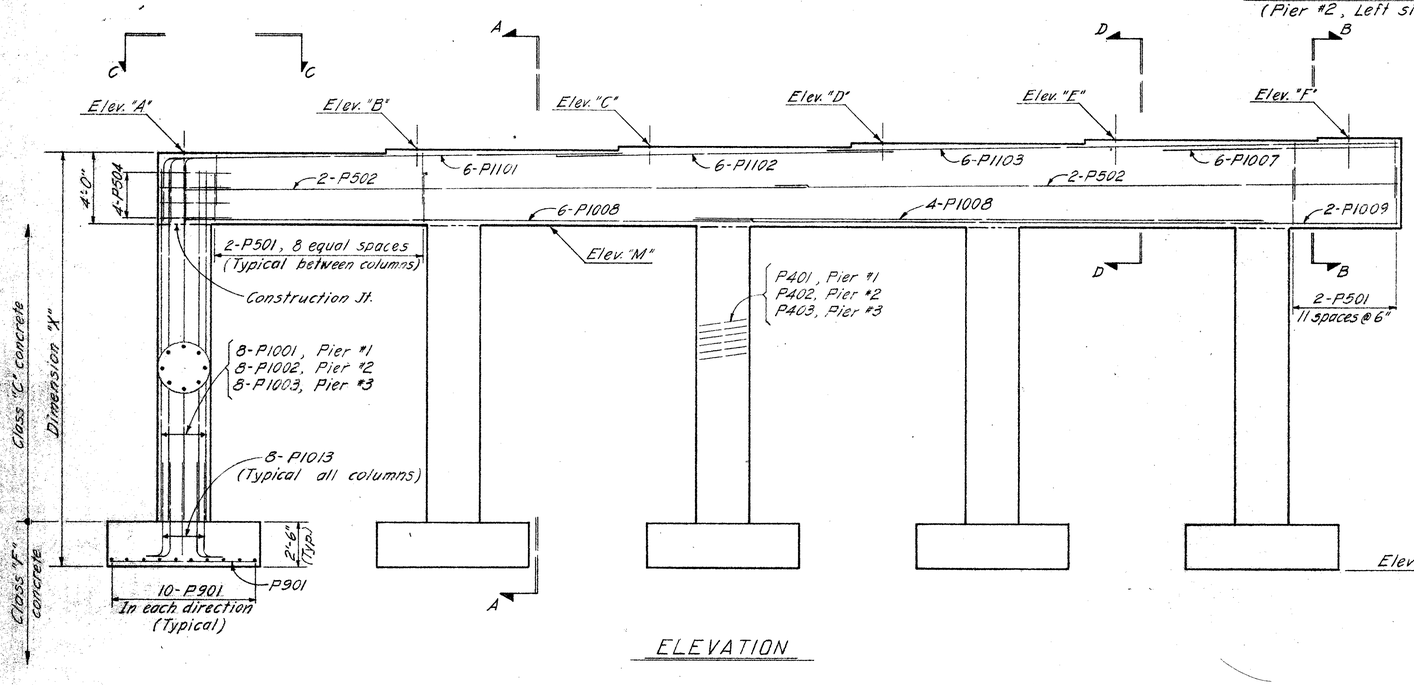
PIER LOCATION PLAN

NOTE:
BRIDGE SEAT REINFORCING: Special care shall be taken in placing reinforcing steel in the vicinity of the bridge seat so as to avoid interference with the drilling of anchor bar holes.

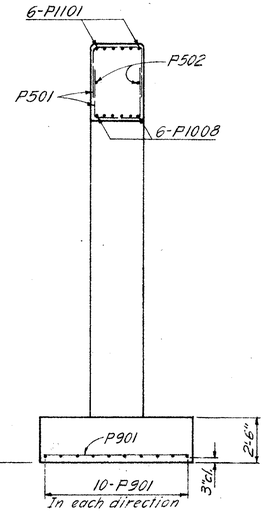


ANCHOR BAR LAYOUT
(Pier #2, Left side)

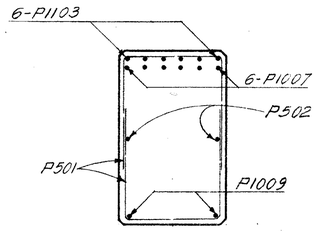
ELEVATION									DIMENSION
LOCATION	"A"	"B"	"C"	"D"	"E"	"F"	"M"	"P"	"X"
Pier #1	752.83	753.05	753.26	753.47	753.68	753.76	748.83	730.00	22'-10"
Pier #2	753.43	753.56	753.69	753.81	753.93	753.93	749.43	732.20	21'-2 3/4"
Pier #3	752.96	753.00	753.04	753.09	753.13	753.07	748.96	732.30	20'-7 7/8"



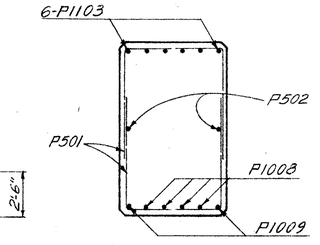
ELEVATION



SECTION A-A



SECTION B-B



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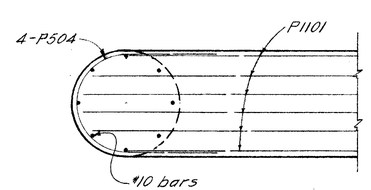


VIEW C-C

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

PIERS LEFT SIDE
BRIDGE NO. CUY. I 71-1352
I 71 UNDER BELLAIRE ROAD

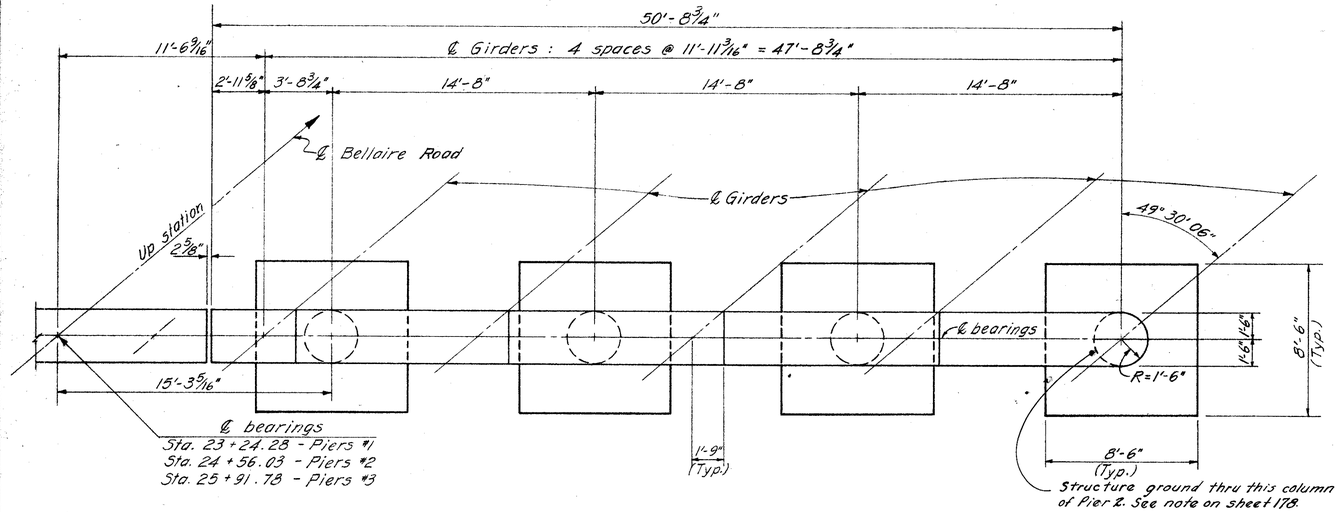
CUYAHOGA COUNTY STA. 800+44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
N.K.	M.R.		S.S.	[illegible]	9-18-64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

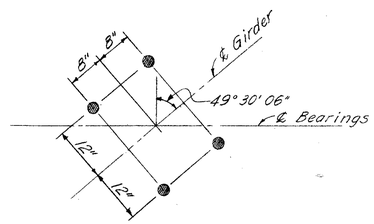
209
268

CUYAHOGA COUNTY
CUY-71-13.68



PLAN

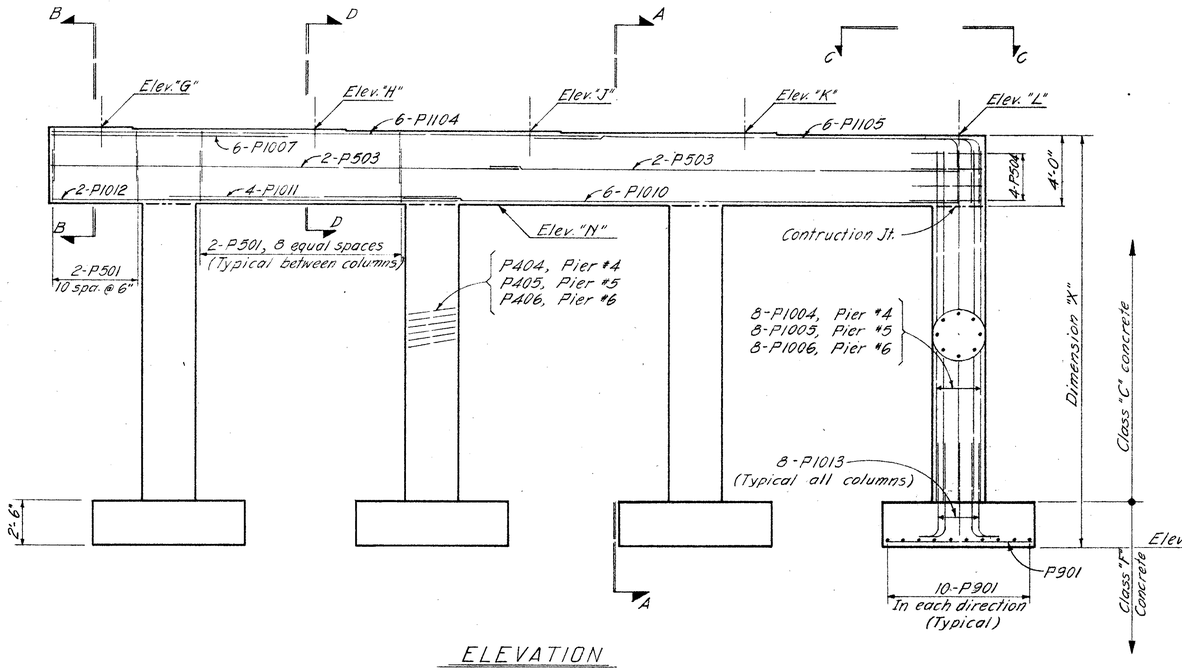
N



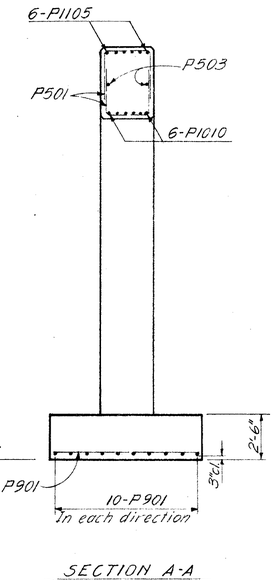
ANCHOR BAR LAYOUT
(Pier #2, Right side)

NOTE:
BRIDGE SEAT REINFORCING:
See "Piers Left Side".

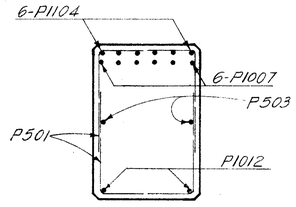
ELEVATION								DIMENSION
LOCATION	"G"	"H"	"J"	"K"	"L"	"N"	"Q"	"X"
Pier #1	753.75	753.68	753.61	753.53	753.44	749.44	730.70	22'-8 1/8"
Pier #2	753.89	753.74	753.59	753.42	753.26	749.26	732.90	20'-4 3/8"
Pier #3	752.99	752.79	752.58	752.38	752.18	748.18	733.00	19'-2 1/8"



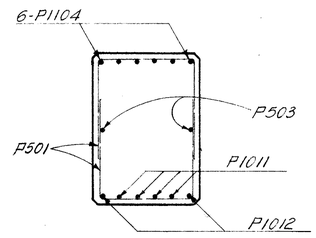
ELEVATION



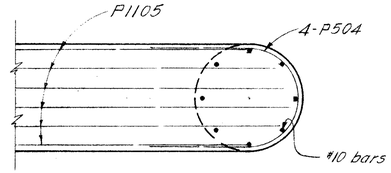
SECTION A-A



SECTION B-B



SECTION D-D



VIEW C-C

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

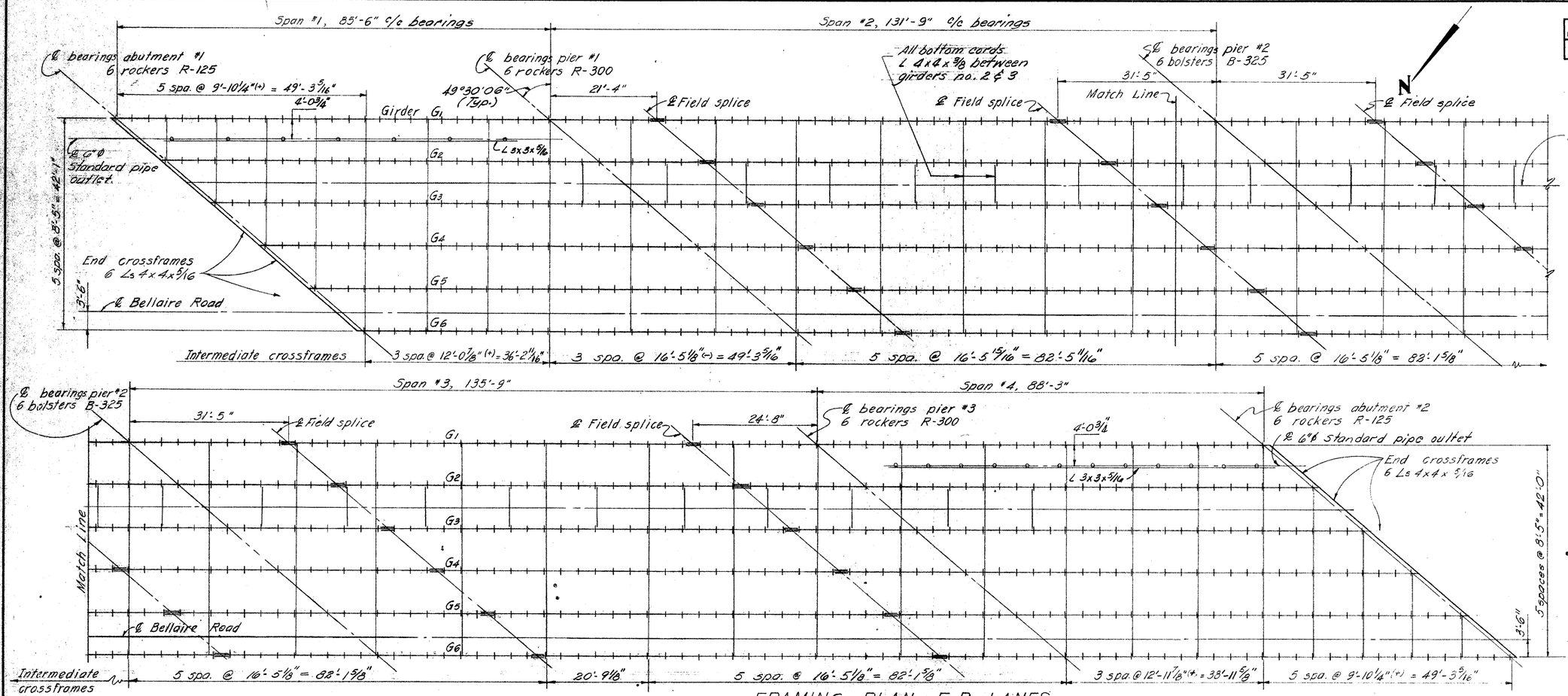
PIERS RIGHT SIDE
BRIDGE NO. CUY. I71-1352
I71 UNDER BELLAIRE ROAD
CUYAHOGA COUNTY STA. 800+44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
N.K.	M.R.		S.S.	[illegible]	9-18 64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

(210) (268)

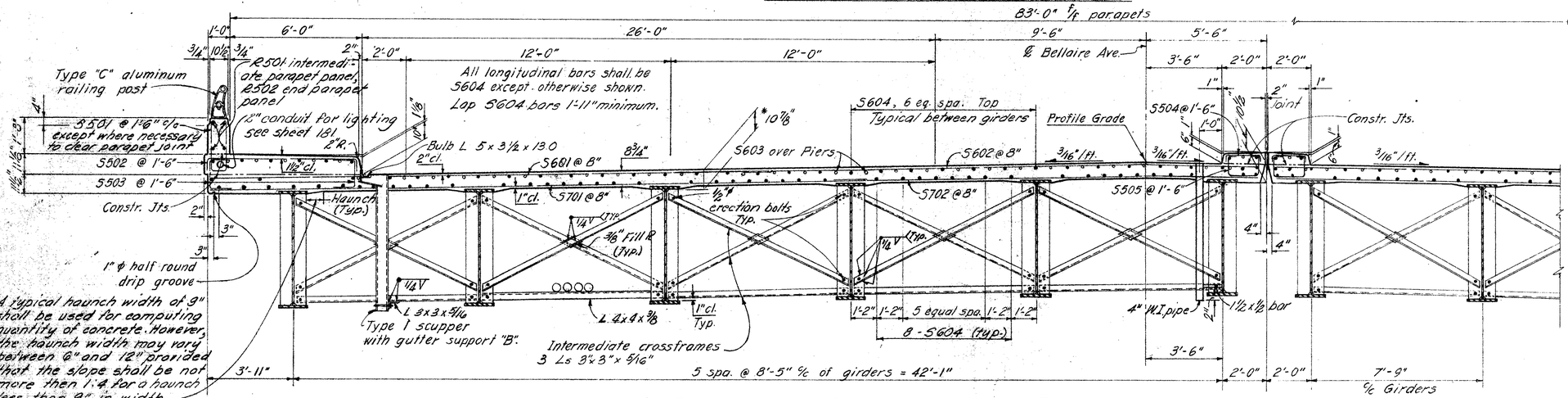
CUYAHOGA COUNTY
CUY-71-13.68



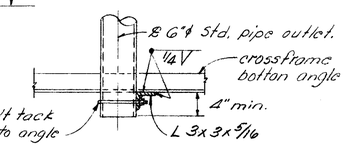
NOTES

- Reference shall be made to the following Standard Drawings:
  SD-1-63 for end dams, end crossframes, scuppers, bulb angle gutter and curb plates.
  RB-1-55 for rockers and bolsters.
  AR-1-57 for type "C" aluminum railing.
- See General Plan for location of railing posts, parapet joints and scuppers.
- Slab thickness includes 1" monolithic wearing surface.
- * This is the nominal dimension. The quantity of deck concrete to be paid for shall be based upon this dimension, even though deviation from it may be necessary because the top flange of the girder may not have the exact camber or conformation required to place it parallel to the finished grade. Deductions shall be made for volume of encased steel plates as per Sec. 5-1.25 of the Construction and Material Specifications.
- Erection bolts left in place on the permanent structure shall be tack welded.

FRAMING PLAN E.B. LANES



TRANSVERSE SECTION E.B. LANES



DETAIL SCUPPER SUPPORT

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS
BRIDGE NO. CUY. I 71-1352
I 71 UNDER BELLAIRE ROAD

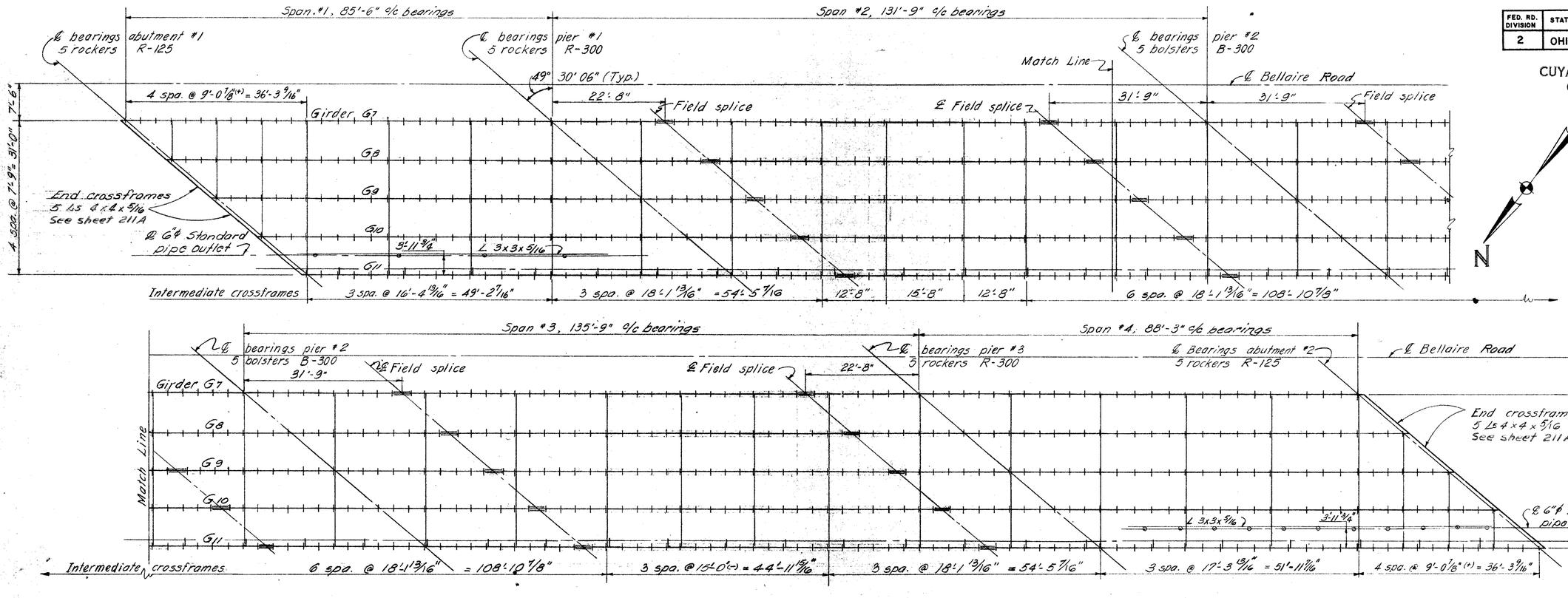
CUYAHOGA COUNTY STA 800 + 44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H. H.	M.R		S.S.	[illegible]	9-18 64	

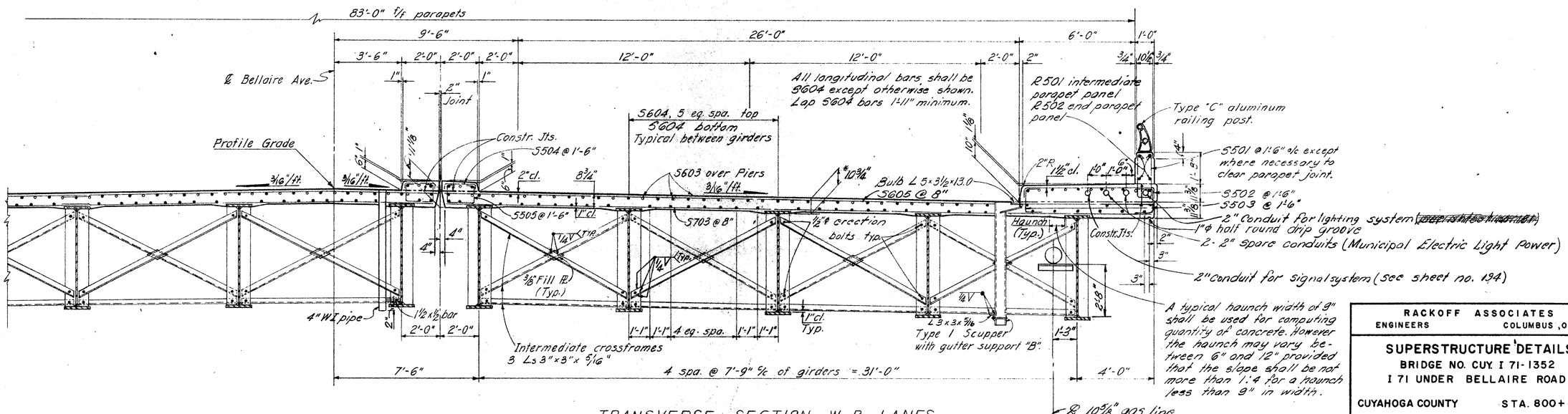
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

211
268

CUYAHOGA COUNTY
CUY-71-13.68



FRAMING PLAN W.B. LANES



TRANSVERSE SECTION W.B. LANES

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

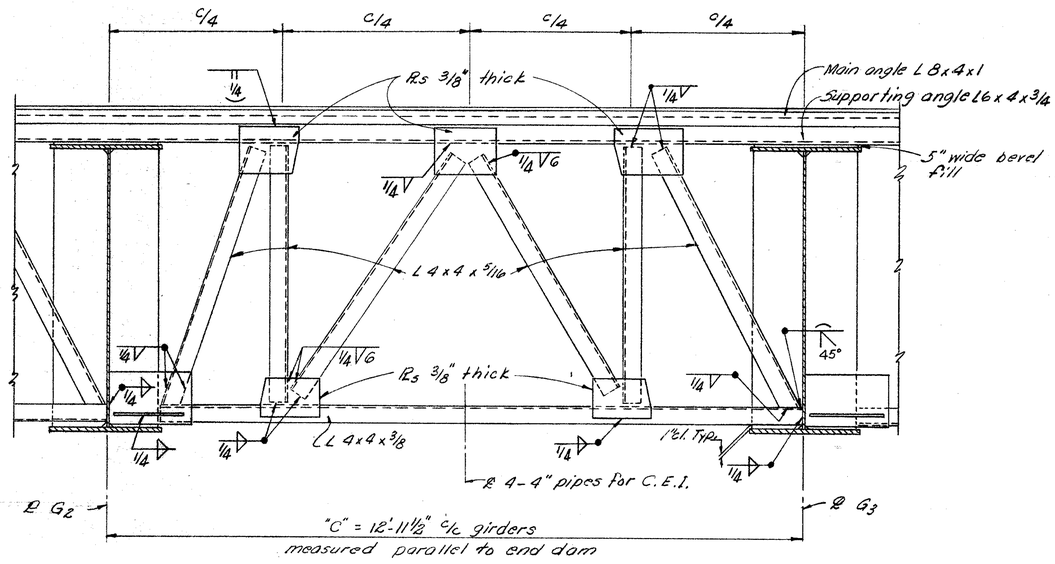
SUPERSTRUCTURE DETAILS
BRIDGE NO. CUY. I 71-1352
I 71 UNDER BELLAIRE ROAD
CUYAHOGA COUNTY STA. 800+44.71

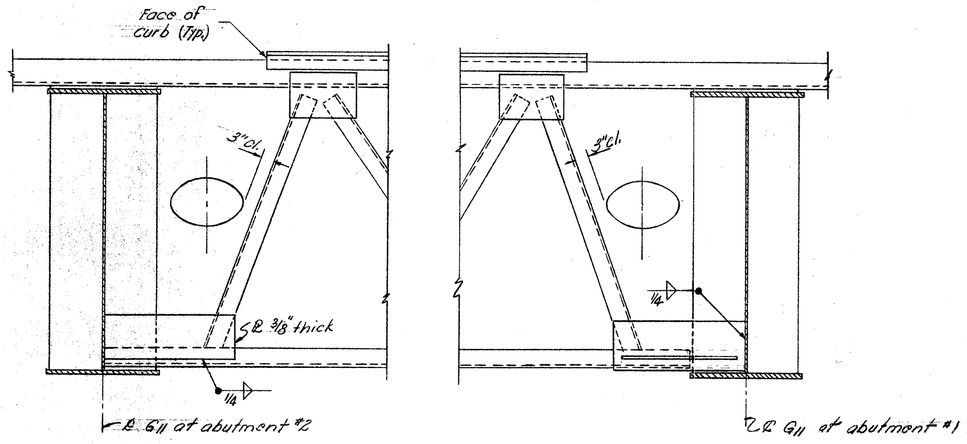
Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H.H.	M.R.		S.S.	℄℄	9-18 64	5-26-65

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

211.A

CUYAHOGA COUNTY
CUY-71-13.68





SPECIAL END CROSS FRAMES

(For details not shown see Standard Drawing SD-1-63 Sheet #2)

This sheet added 3-26-65

RACKOFF ASSOCIATES
ENGINEERS
CLEVELAND, OHIO COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS

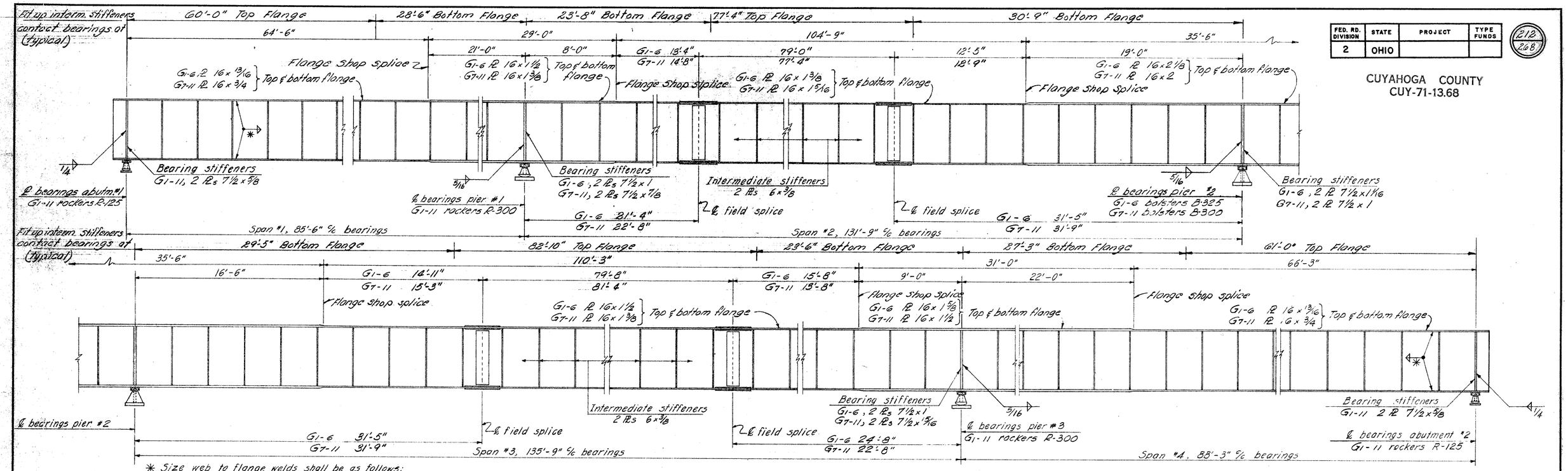
BRIDGE NO. CUY-171-1352
171 UNDER BELLAIRE ROAD
CUYAHOGA COUNTY STA. 800+44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Sections
H. H.	H. H.	E.D.A.	S. S.	[illegible]	3-19-65	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

212
268

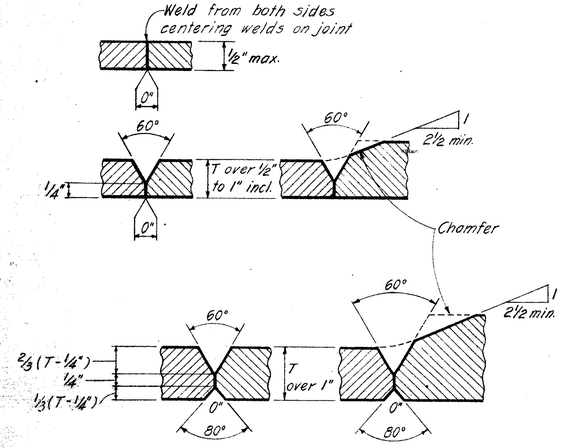
CUYAHOGA COUNTY
CUY-71-13.68



* Size web to flange welds shall be as follows:
3/4 flange plates — 1/4 fillet welds
1 3/16, 1 3/8 and 1 1/2 flange plates — 5/16 fillet welds
1 5/8, 2 and 2 1/8 flange plates — 3/8 fillet welds

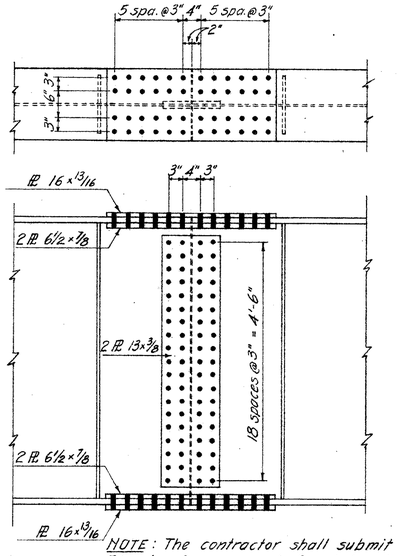
TYPICAL GIRDER ELEVATION

(For intermediate crossframes and stiffeners spacing, see Framing Plan.)



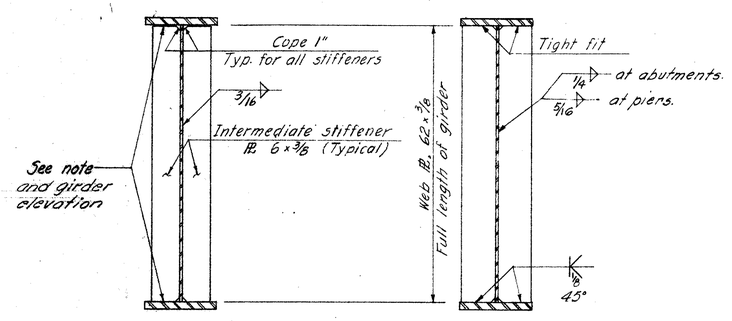
NOTES: Butt welds on girder flange plates shall be ground flush, the finish grinding being parallel to the direction of stress.
The radiographic examination of butt welds is required.
Optional shop splices will be permitted in the web and flanges of girders, but their location shall be submitted to the Director for approval.

TYPICAL SHOP WEB AND FLANGE SPLICE WELDING DETAIL



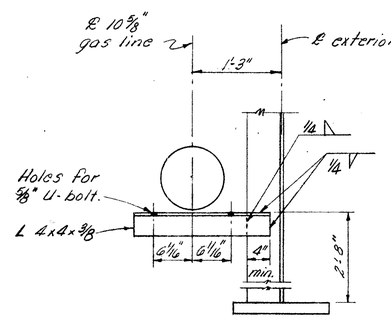
NOTE: The contractor shall submit to the Director, for approval, 3 prints showing his proposed erection procedure for the plate girder.
Splices shall be made with 7/8" high strength bolts.

TYPICAL FIELD SPLICE DETAIL



INTERMEDIATE STIFFENERS BEARING STIFFENERS

NOTE: Supplementary to sec. 5-7.14 of the Construction and Material Specifications, Intermediate stiffeners shall have contact bearing with the compression flange, but may have a clearance of not more than 1/8" from the tension flange. In shop painting, care shall be taken to make certain that paint is forced from one side to the other of the 1/8" opening.



DETAIL OF BRACKETS FOR GAS LINE

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

GIRDER DETAILS
BRIDGE NO. CUY. I 71-1352
I 71 UNDER BELLAIRE ROAD
CUYAHOGA COUNTY STA. 800+44.71

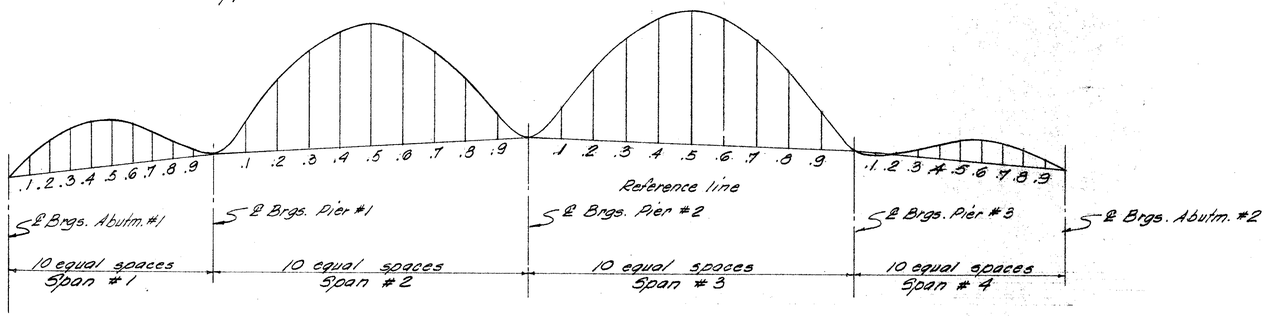
Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H.H.	M.R.		S.S.	666	9-18 64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

213
268

CUYAHOGA COUNTY
CUY-71-13.68

NOTE: Camber measured from reference lines, which are straight lines between the supports.



GIRDER CAMBER DIAGRAM

The required camber is equal to the sum of deflection and convexity

DEFLECTION AND CAMBER FOR GIRDER G1

LOCATION	Span # 1									Span # 2									Span # 3									Span # 4								
	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9
Deflections due to weight of steel	1/32	1/16	3/32	3/32	3/32	1/16	1/32	0	0	1/16	5/32	7/32	9/32	9/32	1/4	3/16	3/32	1/32	1/32	1/8	7/32	5/16	11/32	5/16	1/4	5/32	1/16	0	0	1/32	1/16	3/32	3/32	3/32	3/32	1/32
Deflections due to remaining dead load	3/16	11/32	7/16	15/32	13/32	5/16	5/32	1/32	-1/32	9/32	11/16	1 1/32	1 9/32	1 11/32	1 13/16	2 7/32	1/2	1/8	3/16	1 9/32	1	1 3/8	1 1/2	1 11/16	1 9/32	2 5/32	5/16	-1/16	1/32	5/32	5/16	7/16	1/2	1 5/32	3/8	7/32
Convexity required for vertical curve	9/32	1 5/32	5/8	2 3/32	3/4	2 3/32	5/8	1 5/32	9/32	5/8	1 1/8	1 1/2	1 11/16	1 2 1/32	1 11/16	1 1/2	1 1/8	5/8	11/16	1 3/16	1 9/16	1 25/32	1 27/32	1 3/4	1 1/2	1 1/8	9/16	0	0	0	0	0	0	0	0	0
Sum of deflections and convexity	1/2	7/8	1 5/32	1 9/32	1 1/4	1 3/32	1 3/16	1/2	1/4	2 1/32	1 31/32	2 3/4	3 1/4	3 31/32	3 1/8	2 17/32	1 21/32	1 25/32	2 9/32	2 29/32	2 15/16	3 1/2	3 23/32	3 9/16	3	2 1/8	1 1/16	-1/16	1/32	3/16	3/8	11/32	19/32	9/16	1 5/32	1/4

DEFLECTION AND CAMBER FOR GIRDERS G2 THRU G10

LOCATION	Span # 1									Span # 2									Spa. # 3 (G2, G8 & G4 only)									Span # 4								
	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9
Deflections due to weight of steel	1/32	1/16	3/32	3/32	3/32	1/16	1/32	0	0	1/16	5/32	7/32	9/32	9/32	1/4	3/16	3/32	1/32	1/32	1/8	7/32	5/16	11/32	5/16	1/4	5/32	1/16	0	0	1/32	1/16	3/32	3/32	3/32	3/32	1/32
Deflections due to remaining dead load	1/8	1/4	5/16	11/32	5/16	7/32	1/8	1/32	-1/32	7/32	1/2	3/4	3/32	1	7/8	5/8	11/32	3/32	5/32	7/16	3/4	1	1 1/8	1 1/16	27/32	9/16	1/4	-1/32	1/32	1/8	1/4	5/16	3/8	11/32	9/32	5/32
Convexity required for vertical curve	9/32	15/32	5/8	23/32	3/4	23/32	5/8	15/32	9/32	5/8	1 1/8	1 1/2	1 11/16	1 25/32	1 11/16	1 1/2	1 1/8	5/8	11/16	1 3/16	1 9/16	1 29/32	1 27/32	1 3/4	1 1/2	1 1/8	9/16	0	0	0	0	0	0	0	0	0
Sum of deflections and convexity	7/16	25/32	1 1/32	1 5/32	1 5/32	1	25/32	1/2	1/4	29/32	1 25/32	2 15/32	3 1/16	2 3/16	2 5/16	1 9/16	3/4	7/8	1 3/4	2 17/32	3 1/32	3 5/16	3 1/8	2 19/32	1 27/32	7/8	-1/32	1/32	5/32	5/16	13/32	15/32	7/16	3/8	3/16

DEFLECTION AND CAMBER FOR GIRDERS G2 THRU G10

LOCATION	Span # 3 (G5 only)									Span # 3 (G6 & G7 only)									Span # 3 (G8 & G9 only)									Span # 3 (G10 only)								
	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9
Deflections due to weight of steel	1/32	1/8	7/32	5/16	11/32	5/16	1/4	5/32	1/16	1/32	1/8	7/32	5/16	11/32	5/16	1/4	5/32	1/16	1/32	1/8	7/32	5/16	11/32	11/32	9/32	3/16	1/16	1/32	1/8	7/32	5/16	11/32	11/32	9/32	3/16	1/16
Deflections due to remaining dead load	5/32	7/16	3/4	1	1 1/8	1 1/16	27/32	9/16	1/4	5/32	1/2	13/16	1 1/16	1 3/16	1 1/8	2 29/32	5/8	1/4	5/32	7/16	3/4	1	1 1/8	1 1/16	27/32	9/16	1/4	5/32	7/16	3/4	1	1 1/8	1 1/16	27/32	9/16	1/4
Convexity required for vertical curve	2 1/32	1 3/32	1 13/32	1 9/16	1 5/8	1 15/32	1 13/16	27/32	13/32	19/32	1	1 1/4	1 7/16	1 7/16	1 1/4	15/16	5/8	5/16	1/2	27/32	1 1/16	1 1/8	1	27/32	5/8	13/32	7/32	13/32	1 1/16	25/32	7/8	1 1/16	9/16	13/32	9/32	1/8
Sum of deflections and convexity	27/32	2 1/32	2 3/8	2 7/8	3 3/32	2 27/32	2 9/32	1 9/16	23/32	25/32	1 5/8	2 9/32	2 13/16	2 23/32	2 11/16	2 3/32	1 3/32	5/8	11/16	1 13/32	2 1/32	2 7/16	2 15/32	2 1/4	1 3/4	1 9/32	17/32	19/32	1 1/4	1 3/4	2 3/16	2 5/32	1 31/32	1 17/32	1 1/32	7/16

DEFLECTION AND CAMBER FOR GIRDER G11

LOCATION	Span # 1									Span # 2									Span # 3									Span # 4								
	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9	.1	.2	.3	.4	.5	.6	.7	.8	.9
Deflections due to weight of steel	1/32	1/16	3/32	3/32	3/32	1/16	1/32	0	0	1/16	5/32	7/32	9/32	5/16	1/4	3/16	3/32	0	1/32	1/8	7/32	5/16	11/32	11/32	9/32	3/16	1/16	0	0	1/32	1/16	3/32	1/8	3/32	3/32	1/32
Deflections due to remaining dead load	3/16	3/8	7/16	15/32	7/16	5/16	3/16	1/32	-1/32	5/16	23/32	1 1/16	1 1/32	1 3/8	1 1/32	7/8	1/2	1/8	7/32	21/32	1 1/16	1 15/32	1 5/8	1 3/16	1/4	27/32	11/32	-1/16	1/32	5/32	11/32	15/32	17/32	1/2	13/32	7/32
Convexity required for vertical curve	9/32	15/32	5/8	23/32	3/4	23/32	5/8	15/32	9/32	5/8	1 1/8	1 1/2	1 11/16	1 25/32	1 11/16	1 1/2	1 1/8	5/8	3/8	19/32	21/32	1 3/32	1 15/32	3/8	9/32	3/16	3/32	0	0	0	0	0	0	0	0	0
Sum of deflections and convexity	1/2	29/32	1 15/32	1 9/32	1 3/32	27/32	1/2	1/4	1	2	2 25/32	3 5/16	3 15/32	3 9/32	2 3/16	1 23/32	3/4	5/8	3/8	1 3/8	1 15/16	2 3/8	2 7/16	2 9/32	1 3/16	1 1/32	1/2	-1/16	1/32	3/16	13/32	9/16	2 1/32	19/32	1/2	1/4

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS
BRIDGE NO. CUY. I 71-1352
I 71 UNDER BELLAIRE ROAD

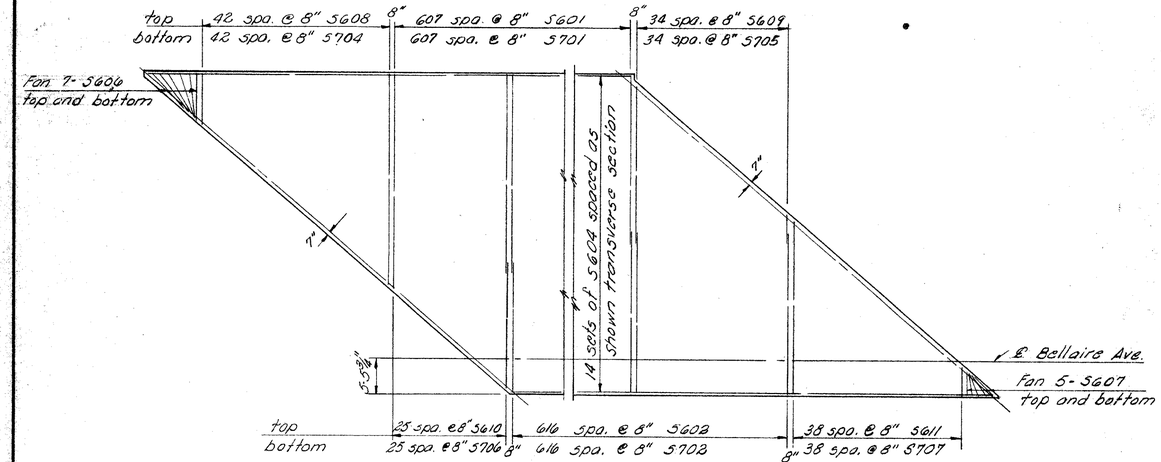
CUYAHOGA COUNTY STA. 800+44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H.H.	G.M.		S.S.	666	9-18 64	

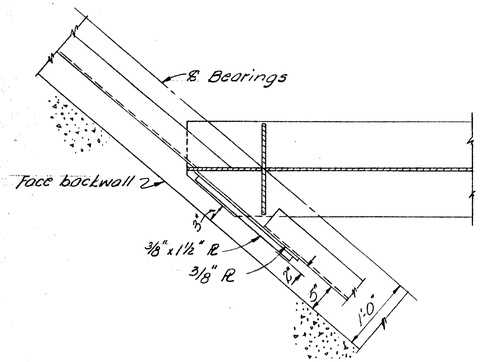
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

214
268

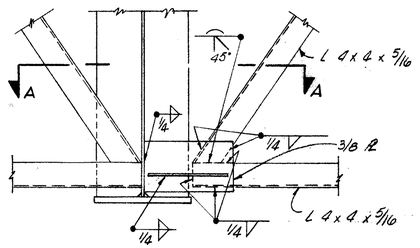
CUYAHOGA COUNTY
CUY-71-13.68



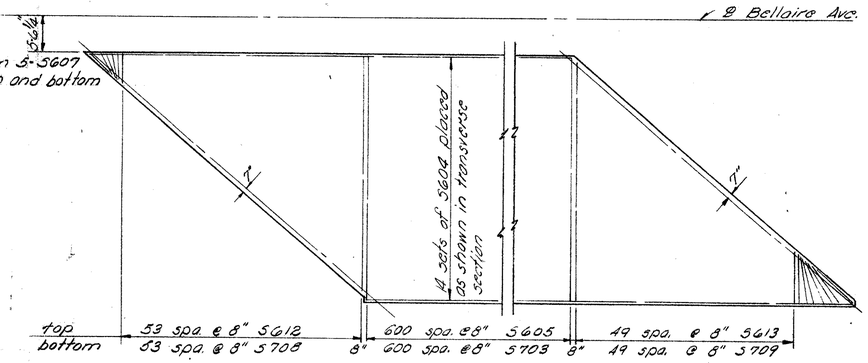
EAST BOUND LANES



SECTION A-A

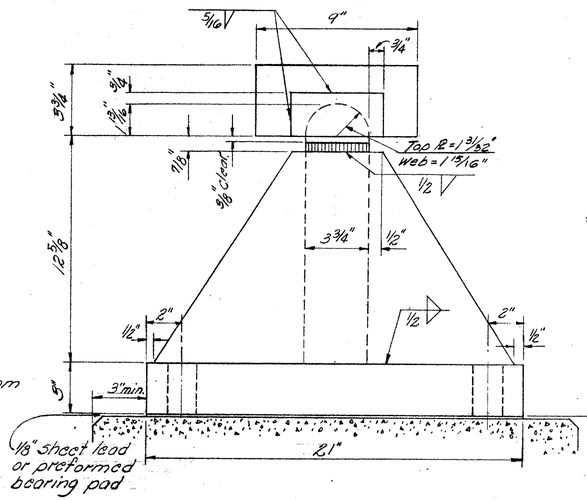


TREATMENT OF
END CROSSFRAME ANGLES

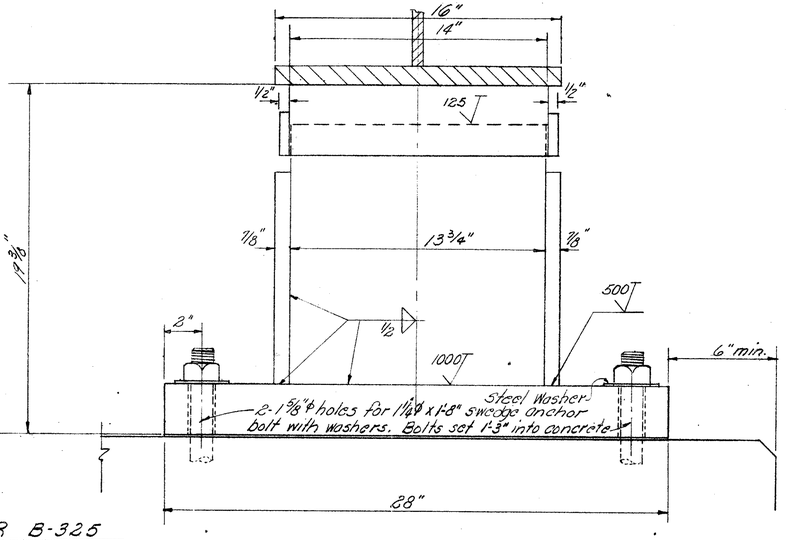


WEST BOUND LANES

PLACEMENT OF SLAB REINFORCING



BOLSTER B-325



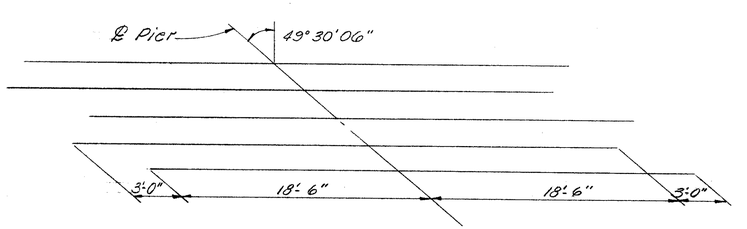
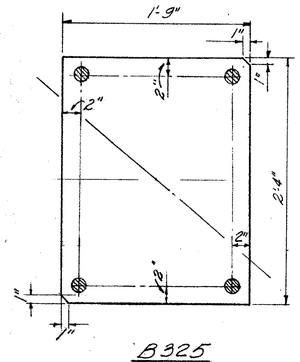


DIAGRAM SHOWING STAGGER OF
S603 BARS OVER PIERS



B325

PLAN OF BEARING PLATE
For details not shown see Standard Drawing RB-1-55

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS
BRIDGE NO. CUY. I 71-1352
I 71 UNDER BELLAIRE ROAD

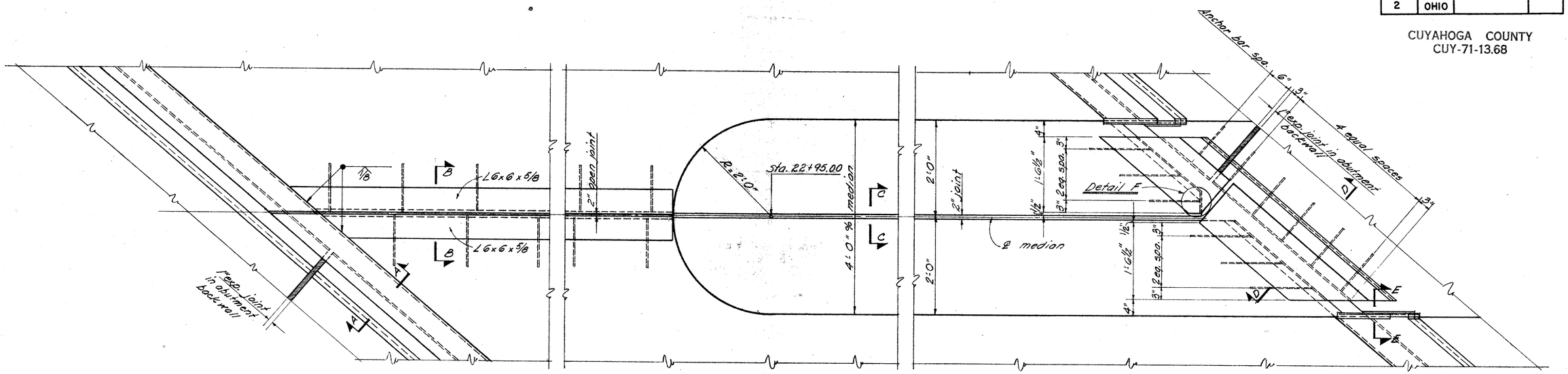
CUYAHOGA COUNTY STA. 800+44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H.H.		E.D.A.	S.S.	-666	9-18 64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

215
268

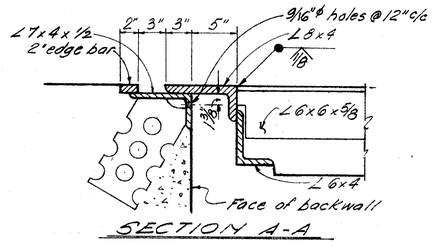
CUYAHOGA COUNTY
CUY-71-13.68



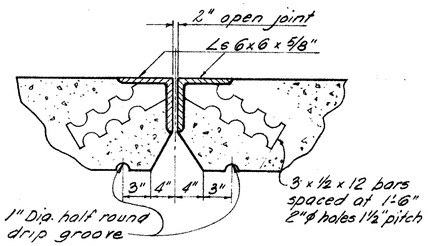
OPEN JOINT END DAM DETAIL
(Abutment # 1)

BEGIN MEDIAN

MEDIAN END DAM DETAIL
(Abutment # 2)



SECTION A-A



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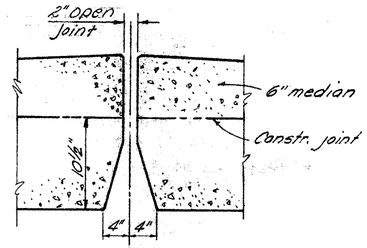

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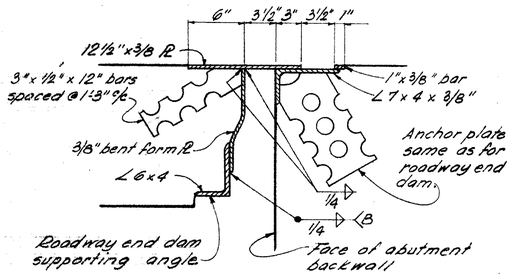

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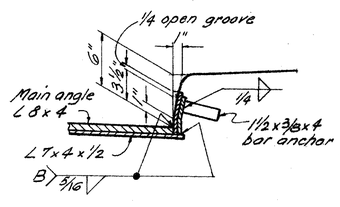
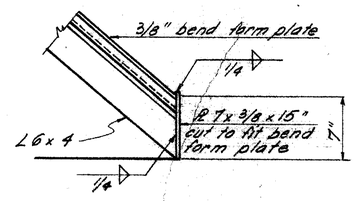


SECTION E-E



DETAIL F
CUT OFF SHARP CORNER

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS

BRIDGE NO. CUY. I 71-1352
I 71 UNDER BELLAIRE ROAD

CUYAHOGA COUNTY STA. 800+44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H.H.	H.H.	G.M.	S.S.	[illegible]	9-18 64	

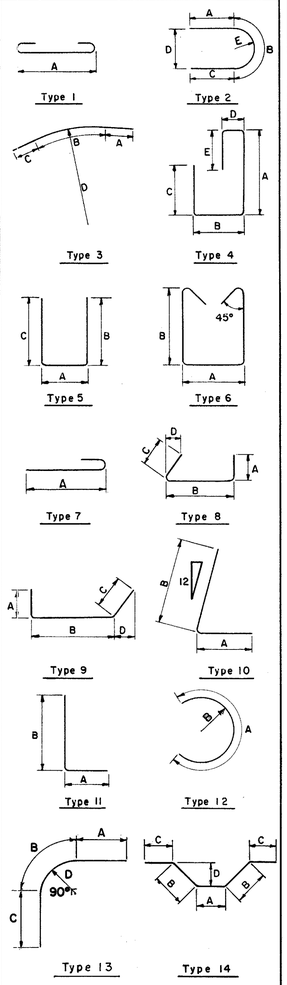
REINFORCING STEEL LIST

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

216
248

CUYAHOGA COUNTY
CUY-71-13.68

BENDING DIAGRAM



S IN THE COLUMN FOR "TYPE" INDICATES STRAIGHT BARS.

ABUTMENTS

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E
A501	8	3-9	31	13	0-10	1-4	1-7	0-10	
A502	64	5-11	395	6	0-8	2-4			
A503	16	8-9	146	6	0-8	3-9	3-9		
A504	76	38-9	3072	S					
A505	16	9-9	163	S					
A506	16	10-6	175	S					
A507	16	3-8	61	S					
A508	16	4-8	78	S					
A509	32	28-6	951	S					
A510	16	20-6	342	S					
A511	76	30-3	398	S					
A512	60	4-1	255	5	1-4	1-6	1-6		
A513	8	9-0	75	S					
A514	8	13-6	113	S					
A515	8	12-8	106	S					
A516	16	5-10	97	S					
A517	172	8-2	1465	11	0-9	7-7			
A518	172	7-8	1375	5	3-5	2-3	2-3		
A519	16	5-0	83	S					
A520	40	2-5	101	5	1-4	0-8	0-8		
A521	40	3-8 to 5-2	184	5	8 sets vary with		4½"	increments	
A522	88	7-10	719	S					
A523	68	20-7	1460	5	1-2	9-10	9-10		
A524	1	1-5	2	S					
A525	1	5-0	5	S					
A526	1	4-0	4	S					
A527	6	3-4	21	4	1-0	1-0	0-5	1-0	0-5
A528	2	3-11	8	4	1-3	1-0	0-7	1-0	0-7
A601	172	12-10	3315	11	5-5	7-7			
A602	32	34-9	1670	S					
A603	218	20-0	6549	4	8-8	1-5	7-2	0-11	2-6
A604	40	20-3	1217	5	1-5	9-7	9-7		
A605	16	11-8	280	11	0-10	11-0			
A606	44	22-10	1509	5	1-2	11-0	11-0		
		TOTAL	26425						

RAILING

R503	8	28-2	—	S					
R504	8	27-2	—	S	Included with railing for payment.				
R505	8	3-10	—	S					
R506	8	6-2	—	13	2-4	2-8	1-2	1-8	

PIERS

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E
P501	516	9-1	4889	5	2-8	3-4	3-4		
P502	12	34-8	434	S					
P503	12	26-2	328	S					
P504	24	7-4	184	2	1-7	4-2	1-7	2-8¼	1-3½
P901	540	8-2	14994	S					
P1001	40	19-10	3414	S					
P1002	40	18-3	3141	S					
P1003	40	17-8	3041	S					
P1004	32	19-9	2719	S					
P1005	32	17-4	2387	S					
P1006	32	16-2	2226	S					
P1007	36	13-0	2014	S					
P1008	30	31-8	4088	S					
P1009	6	39-5	1018	S					
P1010	18	31-0	2401	S					
P1011	12	16-4	843	S					
P1012	6	23-0	594	S					
P1013	216	6-6	6041	11	1-5	5-5			
P1101	18	28-10	2757	11	3-6	25-8			
P1102	18	18-8	1785	S					
P1103	18	32-0	3060	S					
P1104	18	30-6	2917	S					
P1105	18	28-6	2726	11	3-6	25-4			
TOTAL			68001						
SPIRALS			7379						
TOTAL			75380						

SUPERSTRUCTURE

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E
S501	590	5-9	3538	6	0-8	2-3			
S502	590	7-7	4666	5	6-6	0-8	0-8		
S503	1180	2-4	2872	5	1-4	0-8	0-8		
S504	514	1-11	1028	5	1-6	0-4	0-4		
S505	514	4-2	2234	4	1-6	0-11	0-8	0-11	0-8
S601	608	25-10	23591	S					
S602	617	23-10	22087	S					
S603	180	40-0	10814	S					
S604	2124	33-6	106873	S					
S605	601	36-6	32949	S					
S606	28	8-0	336	S					
S607	20	4-4	130	S					
S608	43	32-6 to 8-10½	1336	S	1 each vary with		6¾"	increments.	
S609	35	24-6 to 5-4½	785	S	1 each vary with		6¾"	increments.	
S610	26	23-8 to 9-7¼	650	S	1 each vary with		6¾"	increments.	
S611	39	26-6 to 5-1½	926	S	1 each vary with		6¾"	increments.	
S612	54	35-2 to 5-4½	1644	S	1 each vary with		6¾"	increments.	
S613	50	36-3 to 8-8¼	1687	S	1 each vary with		6¾"	increments.	
S701	608	30-1	37386	S					
S702	617	19-9	24908	S					
S703	601	36-4	44633	S					
S704	43	32-6 to 8-10½	1818	S	1 each vary with		6¾"	increments.	
S705	35	28-10 to 9-8½	1379	S	1 each vary with		6¾"	increments.	
S706	26	19-6 to 5-5¼	663	S	1 each vary with		6¾"	increments.	
S707	39	26-6 to 5-1½	1261	S	1 each vary with		6¾"	increments.	
S708	54	35-2 to 5-4¼	2236	S	1 each vary with		6¾"	increments.	
S709	50	36-3 to 8-8¼	2296	S	1 each vary with		6¾"	increments.	
		TOTAL	334726						
L401	16	5-0	53	11	2-0	3-1			
L402	28	7-10	147	14	1-1	2-8	0-9	1-11	
		TOTAL	334,926						

RAILING

R501	16	18-11	—	Included with railing for payment
R502	184	17-4	—	

REPLACEMENT BARS

RE401	1	5-3	—	12	5-3	1-4	
RE501	2	5-7	—	S			
RE601	11	5-11	—	S			
RE701	6	6-3	—	S			
RE901	1	6-10	—	S			
RE1001	2	7-3	—	S			
RE1101	1	7-7	—	S			

NOTES

BAR SIZE is indicated in bar mark. The first digit where three digits are used, and the first two where four are used indicate the bar size number.

SPIRAL REINFORCING BARS; The "Length" shown in the steel list for the spiral bars is the distance from the top of the footing to the bottom of the pier cap. The "No. of Turns" shown is the "Length" divided by the pitch, plus three turns (total number of closed coils), expressed as the nearest whole number.

Spiral reinforcing bars shall not have deformations but shall in other respects conform to item S-4. 1½ closed coils shall be provided at the ends of each spiral unit. Four steel channel, tee or angle spacers, weighing approximately 0.68 lb. per lin. ft. of spacer, shall be provided for each spiral unit. They shall be equally spaced along the periphery of the coil. The number of pounds of these spacers, based on 0.68 lb. per lin. ft., will be paid for as reinforcing steel and is included in the tabulated quantity of spiral bars.

SPIRAL REINFORCEMENT

MARK	NO.	LENGTH	CORE	PITCH	TURNS	SPACERS	WEIGHT
P401	5	16-4	32	4½	47	4	1520
P402	5	14-9	32	4½	42	4	1357
P403	5	14-2	32	4½	41	4	1324
P404	4	16-3	32	4½	46	4	1190
P405	4	13-10	32	4½	40	4	1033
P406	4	12-8	32	4½	37	4	955
					TOTAL		7379

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

REINFORCING STEEL LIST
BRIDGE NO. CUY. I 71-1352
I 71 UNDER BELLAIRE ROAD

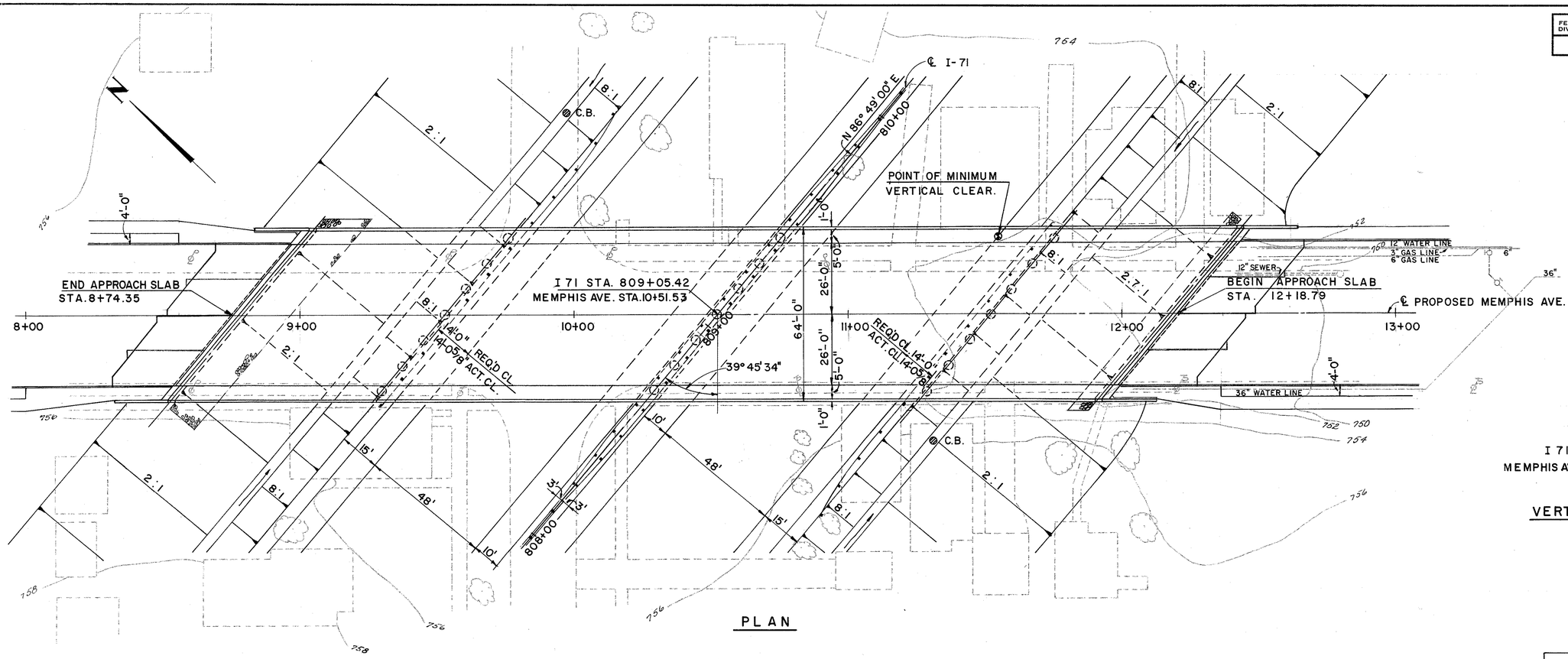
CUYAHOGA COUNTY STA. 800+44.71

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H.H.	G.M.		S.S.		9-18 64	

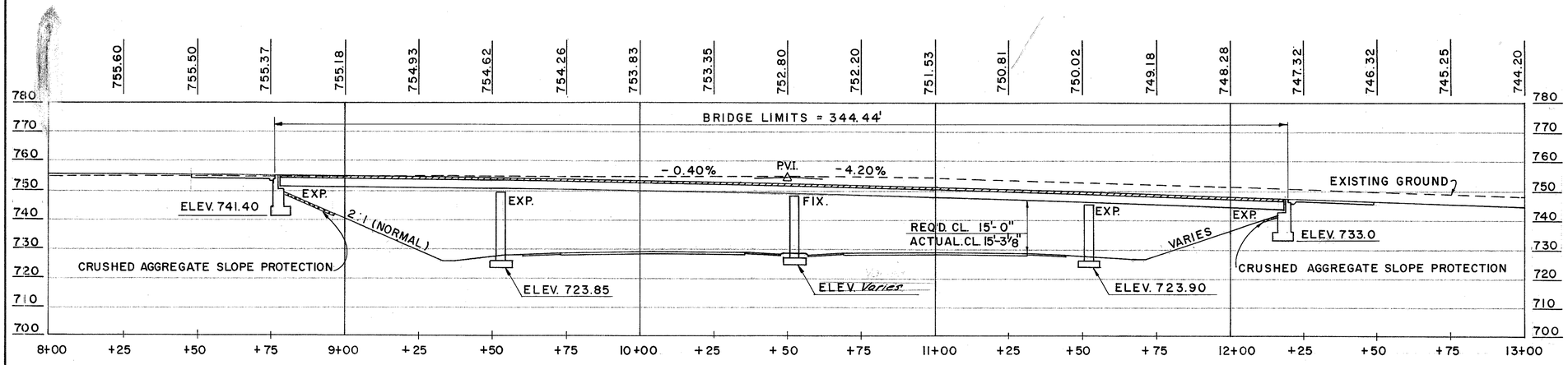
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

217
268

CUYAHOGA COUNTY
CUY-71-13.68



PLAN



PROFILE ALONG ℄ MEMPHIS AVE.

ESTIMATED TRAFFIC 1975 ADT

	Class A Veh.	Class B & C Veh.	Total Veh.
I 71	70,800	11,940	82,700
MEMPHIS AVE.	11,300	1,300	12,600

VERTICAL CURVE DATA - MEMPHIS AVE.

P.V.I. STA. 10+50 ELEV. 754.70
$G_1 = -0.40\%$ $G_2 = -4.20\%$
V.C. = 400'

PROPOSED STRUCTURE

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

SPANS: 74'-8", 99'-7", 99'-7" and 64'-9" center to center of bearings.

ROADWAY: 52'-0" face to face of 5'-0" sidewalk.

LOAD FREQUENCY: C.F. = 400 (57)

SKEW: 39° 45' 34" L.F.

WEARING SURFACE: 1" monolithic concrete

APPROACH SLABS: AS-1-54, 25' long.

ALIGNMENT: Tangent

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

SITE PLAN

BRIDGE NO. CUY-I71-1372
I 71 UNDER MEMPHIS AVE.

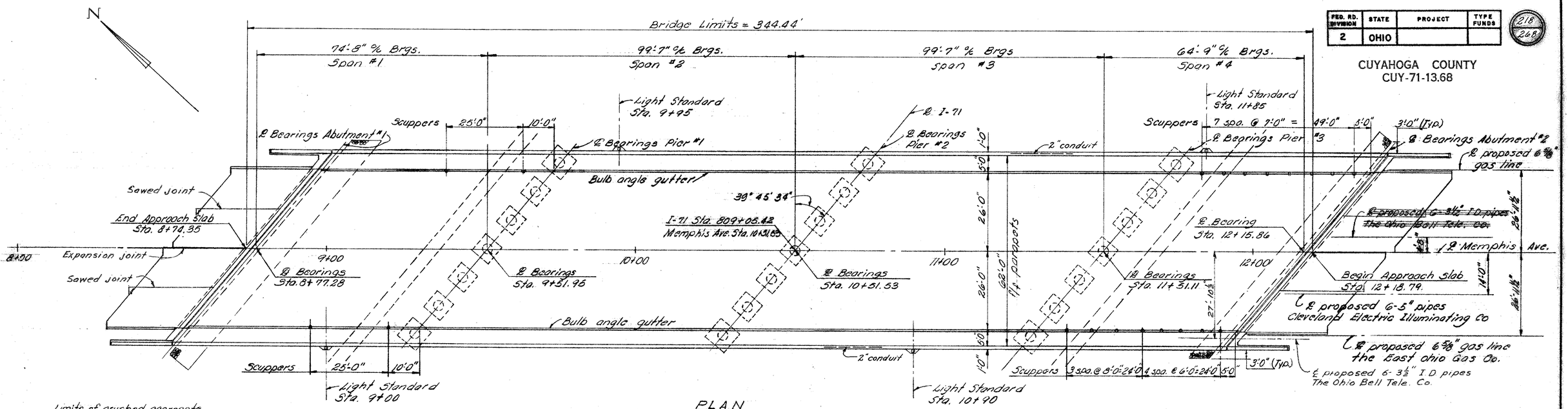
CUYAHOGA COUNTY STA. 809+05.42

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H. H.	E.A.		V.K.	[illegible]	8-26 64	3-26-65

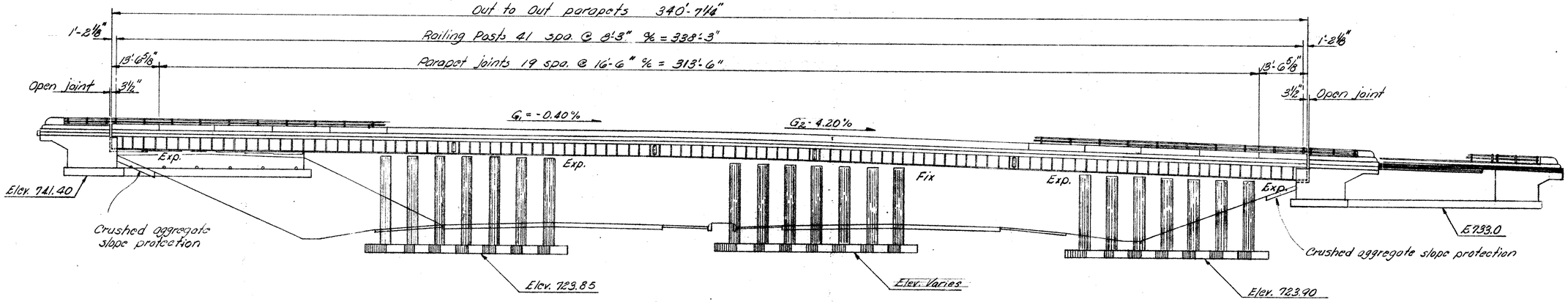
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

218
268

CUYAHOGA COUNTY
CUY-71-13.68



PLAN



ELEVATION

NOTE:
The areas to be covered by crushed aggregate slope protection shall be adjusted in the field as directed by the Engineer.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

GENERAL PLAN AND ELEVATION

BRIDGE NO. CUY. I71-1372
I 71 UNDER MEMPHIS AVE.
CUYAHOGA COUNTY STA. 809+05.42

Designed	Drawn	Traced	Checked	Approved	Date	Revised
H.H.	H.H.	E.B.A.	S.S.	[illegible]	8-26-64	9-28-64

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

219
268

CUYAHOGA COUNTY
CUY-71-13.68

GENERAL NOTES

REFERENCE SHALL BE MADE TO:

Standard Drawing SD-1-63, sheets 2, 3 and 4, dated 11-12-63
Standard Drawing FSB-1-62, revised 1-15-63
Standard Drawing AR-1-57, revised 4-2-62
Supplemental Specification S-101, dated 7-12-62
Supplemental Specification S-307, dated 10-1-64

DESIGN SPECIFICATIONS: This structure conforms to the requirements of "Design Specifications for Highway Structures" of the State of Ohio, Department of Highways, dated 9-1-57 together with current revisions thereof.

DESIGN LOADING - CF 400 (57)

CONCRETE CLASS C - basic unit stress 1,333 p.s.i.
CONCRETE CLASS E - basic unit stress 1,133 p.s.i.

STRUCTURAL STEEL - ASTM A36 - basic unit stress 20,000 p.s.i. (ASTM A7 and A373 steel not permitted)

REINFORCING STEEL - ASTM A15, A16, A160, Deformed, Intermediate or Hard Grade. Basic unit stress 20,000 p.s.i. Except, spiral reinforcement may be plain, Structural Grade with basic unit stress of 18,000 p.s.i.

CONCRETE DECK PLACING: In order to facilitate water curing of the concrete of the deck slab, the placing of concrete shall progress upgrade. The slab may be placed in sections, between transverse construction joints which are parallel to transverse reinforcing steel and are located near the center of any span.

SURFACE FINISH OF CONCRETE: The requirements of Sec. S-1.22, Rubbed Finish, shall apply to the following exposed concrete surfaces.

a. The entire superstructure except the top and bottom surfaces of sidewalks and roadways.
b. The entire surface of piers and abutments except bridge seats, backwalls and the face of spill-through abutments between outside girders.

MACHINE FINISH: The concrete bridge deck shall be finished by the use of a finishing machine.

FOUNDATION BEARING PRESSURE: Pier footings are designed for a maximum bearing pressure of 6.8 tons sq. ft. and abutment footings are designed for a maximum bearing pressure of 1.4 tons per sq. ft.

UTILITY LINES: All expense involved installing the affected utility lines shall be borne by the owners. The Contractor and owners are requested to cooperate by arranging their work in such a manner that inconvenience to either will be held to a minimum.

FOOTINGS shall extend a minimum of 3" into undisturbed rock or to the elevation shown whichever is the lower.

ITEM S-7: Under Item S-7.10, High-Strength Steel Bolts, Nuts and Washers, paragraph two (2) shall be completly revised to read as follows:
In the final assemly of the parts to be bolted, drift pins shall be placed in a sufficient number of holes (not less than 25 percent for field erection) to provide and maintain accurate alignment of holes and parts, and sufficient bolts shall be installed and brought to a snug tight condition to bring the parts into complete contact.
Bolts shall then be installed in any remaining open holes and tightened to a snug tight fit, after which all bolts shall be tightened completely by calibrated wrenches or by the turn-of-nut method. Drift pins shall then be replaced with bolts tightened in the same manner.
Bolt lengths determined by the use of table no 1 shall be adjusted to the next 1/4-inch length incremet.

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	SUPER.	ABUT.	PIER	GEN.	AS BUILT	
E-2	157	Cu.Yds.	Unclassified excavation		157				
E-2	424	Cu.Yds.	Shale excavation		260	164			
S-1	745	Cu.Yds.	Class "C" concrete, superstructure	745					
S-1	112	Cu.Yds.	Class "C" concrete, piers above footings			112			
S-1	104	Cu.Yds.	Class "E" concrete, pier footings			104			
S-1	242	Cu.Yds.	Class "E" concrete, abutments above footings		242				
S-1	95	Cu.Yds.	Class "E" concrete, abutment footings		95				
S-3	21	Lin.Ft.	Waterproofing premolded sealing strip		21				
S-4	259,532	Lbs.	Reinforcing steel	189,676	18,005	51,851			
S-7	(604,815)	Lbs.	Structural steel * 604,375-	604,815					
S-8	(604,815)	Lbs.	Field painting of structural steel * (as per proposal note) 604,375-	604,815					
S-9	67	Sq.Ft.	1" preformed expansion joint filler		67				
S-14	761.87	Lin.Ft.	Railing Type "C" (aluminum railing and supports with concrete parapets)	681.20	80.67				
S-25			Electric lighting system — see lighting plans						
S-29	93	Cu.Yds.	Porous backfill		93				
S-29	146	Lin.Ft.	6" perforated Helical C.M.P., M-6.4(h), including specials		146				
S-29	128	Lin.Ft.	6" Helical C.M.P., M-6.4(h), non-perforated		128				
S-29	20	Each	Scuppers, including supports	20					
S-101	745	Each	Water-reducing, set-retarding admixture	745					
I-10	178	Sq.Yds.	Crushed aggregate slope protection				178		

604,375

2880 - (2570) lbs to be paid for by the Cleveland Electric Illuminating Co.
~~750 lbs to be paid for by the Ohio Bell Telephone Co.~~
495 lbs to be paid for by the East Ohio Gas Co.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

GENERAL NOTES AND ESTIMATED QUANTITIES
BRIDGE NO. CUY-I 71-1372
I 71 UNDER MEMPHIS AVE.
CUYAHOGA COUNTY STA. 809+05.42

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H.H.	E.D.A.		S.S	[illegible]	8-26-64	3-22-65

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

220 / 268

CUYAHOGA COUNTY
CUY-71-13.68

* Shown for abutment #1 only
Similar but on opposite side
for abutment #2

℄ Memphis Ave.

℄ Ohio Bell Telephone Co.
6-4" pipes

℄ Cleveland Electric Illuminating Co.
6-5" pipes *

6 5/8" gas line
The East Ohio Gas Co.

8 5/8" O.D. Sleeve, 29' long,
2 at each abutment, to
be furnished by the E.D.E.
and installed by the
Contractor.

Abut. #1, Sta. 8+77.28
Abut. #2, Sta. 12+15.86

39° 45' 34"

6"C.M.P. spaced @ 15'-0"

℄ Brgs.

8-A520

℄ O.B.J. Co.
6-3½" I.D.

℄ 1" Expansion Joint

℄ Girders

3 spaces @ 12'-1 11/16" = 36'-5 11/16"

40'-6 7/8"
41'-1 7/8"
40'-8 5/8"

41'-1 7/8"
39'-5 7/8"
41'-10 3/8"

85'-5 1/8"

3'-3 7/8"

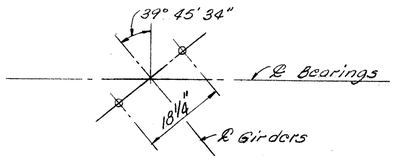
PLAN

NOTES:

POROUS BACKFILL; 1'-6" thick, full length of abutment shall extend up to the underside of the approach slab. Excavation therefor in excess of that required for construction of the abutment shall be considered as paid for in the bid price per cu. yd. paid for porous backfill.

BRIDGE SEAT REINFORCING; Special care shall be taken in placing reinforcing steel in the vicinity of the bridge seat so as to avoid interference with the drilling of anchor bolt holes.

CONCRETE; Concrete for the abutments shall be class "E". Concrete for parapets and end posts shall be class "C" and be included with railing for payment.



ANCHOR BOLT LAY OUT

2" conduit. See lighting plans

A604 & A521
6 spa. @ 1'-0"

2-A504

Elev. "H"

A603 - 66 spaces @ 1'-0" (±)

Elev. "J"

1'-8" x 12" Opening

Elev. "M"

Elev. "A"

Elev. "N"

Elev. "B"

1'-2"

Elev. "C"

Elev. "P"

Elev. "D"

Elev. "E"

Elev. "F"

Elev. "K"

Elev. "L"

Elev. "G"

2-A505

5-A505

2-A505

℄ Top of slope

5-A515

2-A515

4-A602

Abut. #1 Elev. 741.40
Abut. #2 Elev. 733.0

A601, A517 & A518 - 54 spaces @ 1'-6"

ELEVATION

Concrete above this constr. joint included with railing for payment.

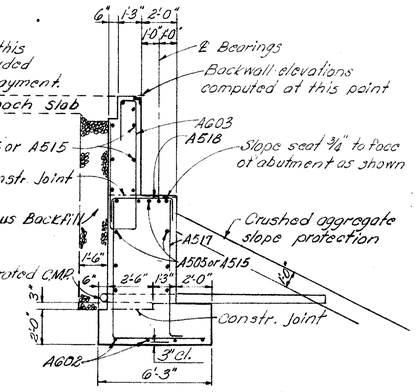
2" conduit. See lighting plans

A505 or A515

Constr. Joint

Porous Backfill

6" Perforated CMP



SECTION A-A

ELEVATIONS														
LOCATION	A	B	C	D	E	F	G	H	J	K	L**	M**	N	P
Abutment #1	749.86	749.97	750.08	750.17	749.97	749.77	749.56	755.08	755.36	754.80	751.69	752.01	950.98	751.02
Abutment #2	741.15	741.61	742.07	742.52	742.67	742.82	742.96	746.36	747.63	748.04	745.11	743.30	742.79	743.52

** Elevations shown are to inside of sleeves.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

ABUTMENT NO.1 AND NO.2

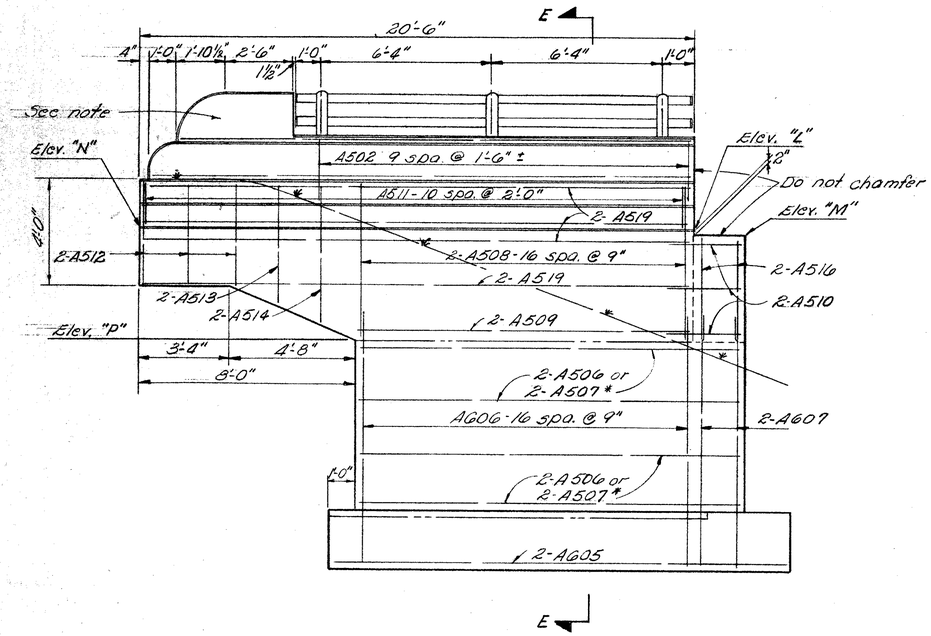
BRIDGE NO. CUY. I 71-1372
I 71 UNDER MEMPHIS AVE.
CUYAHOGA COUNTY STA. 809+05.42

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
S.S.	S.S.	E.D.A.	H.H.	[illegible]	8-26 64	3-26-65

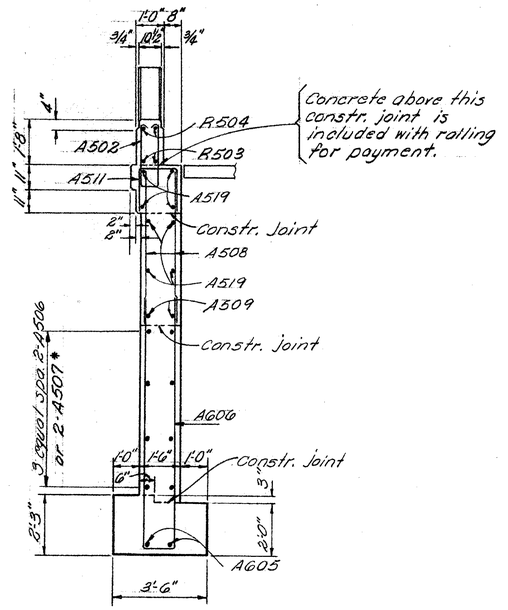
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

221
268

CUYAHOGA COUNTY
CUY-71-13.68



TYPICAL WINGWALL ELEVATION



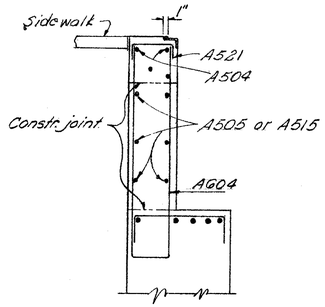
SECTION E-E

ELEVATIONS				
LOCATION	ABUTMENT #1		ABUTMENT #2	
	EAST WING	WEST WING	EAST WING	WEST WING
ELEV. "L"	753.84	754.18	745.27	747.28
ELEV. "M"	753.65	754.00	745.18	747.20
ELEV. "N"	754.01	754.26	744.41	746.51
ELEV. "P"	749.56	749.86	741.15	742.96

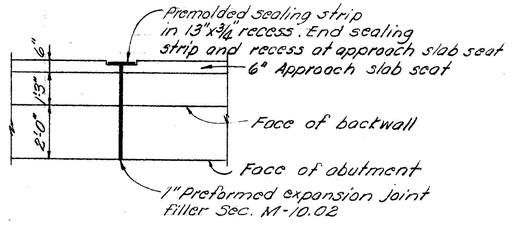
NOTE:

For dimensions and details of end parapets of railing see "Common Details" Sheet.

* Bars marked with * for east wing of Abutment #1 and west wing of Abutment #2.



SECTION D-D



EXPANSION JOINT DETAIL

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

ABUTMENT DETAILS

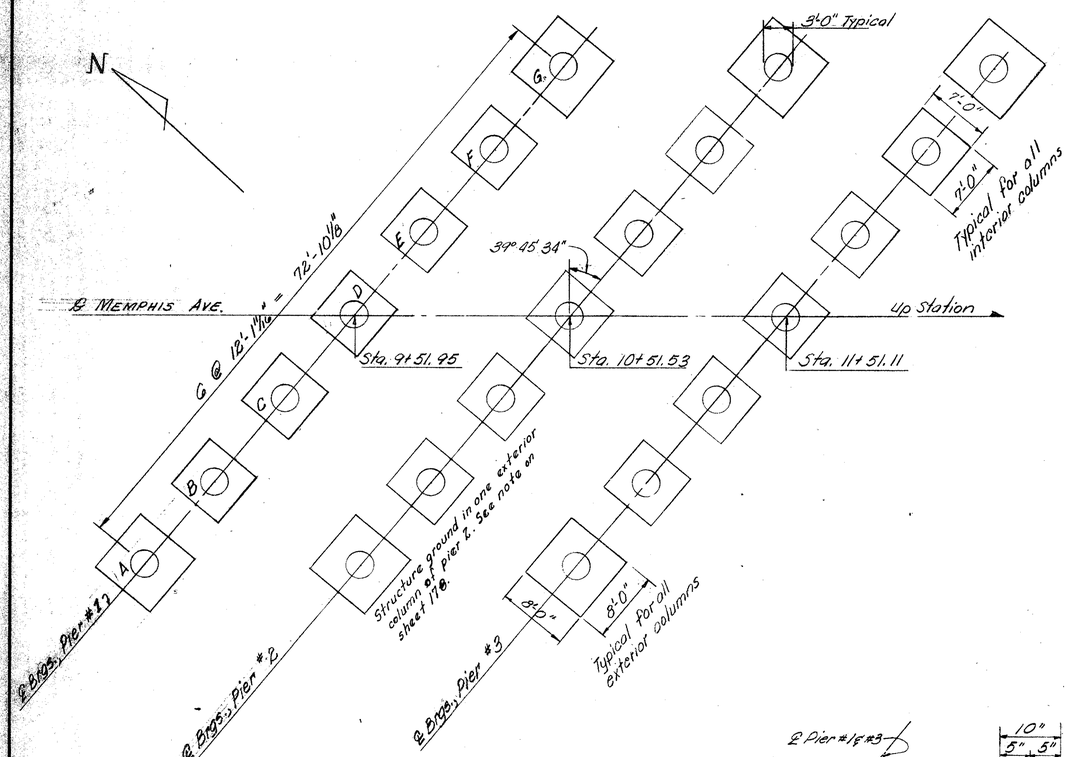
BRIDGE NO. CUY. I 71-1372
I 71 UNDER MEMPHIS AVE.
CUYAHOGA COUNTY STA. 809+05.42

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
S.S.	E.D.A.		H.H.	HH	8-26-64	

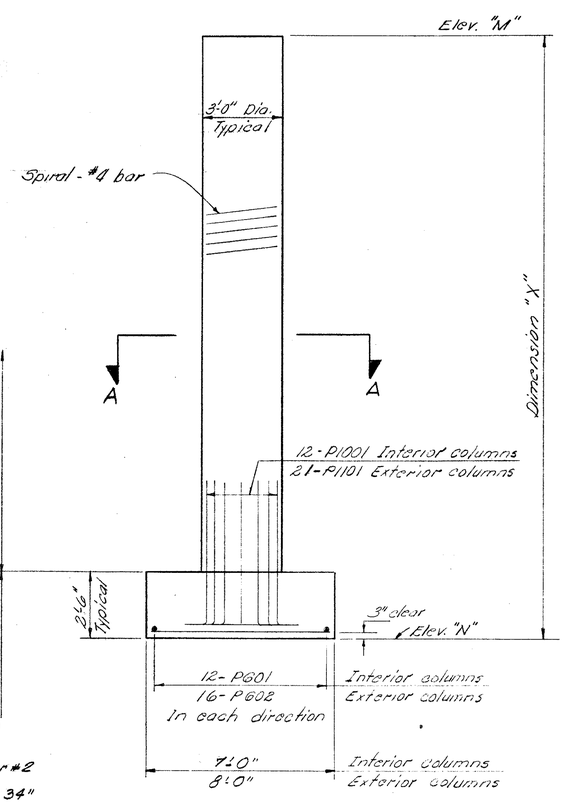
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

222
268

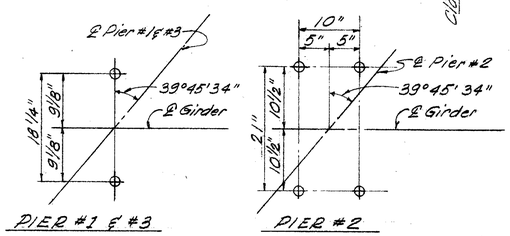
CUYAHOGA COUNTY
CUY-71-13.68



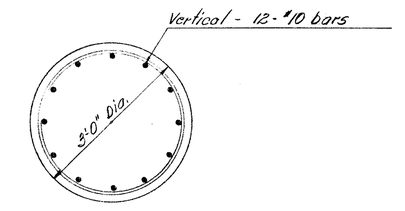
PIER LOCATION PLAN



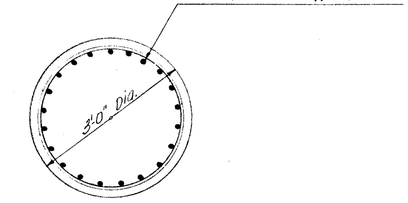
COLUMN SECTION
(Typical)



ANCHOR BAR LAYOUT



SECTION A-A
Typical for all interior columns



SECTION A-A
Typical for all exterior columns

Column Designation	LOCATION									REINFORCING BARS					
	PIER #1			PIER #2			PIER #3			PIER #1		PIER #2		PIER #3	
	Elev. "M"	Elev. "N"	Dimension "X"	Elev. "M"	Elev. "N"	Dimension "X"	Elev. "M"	Elev. "N"	Dimension "X"	Vertical	Spiral	Vertical	Spiral	Vertical	Spiral
A	749.16	723.85	25'-3 3/4"	747.14	724.60	22'-6 1/2"	745.00	723.90	21'-1 1/4"	P1102	P401	P1104	P407	P1106	P411
B	749.21	723.85	25'-4 3/8"	747.12	723.60	23'-6 1/4"	744.91	723.90	21'-0 1/8"	P1002	P401	P1007	P418	P1011	P412
C	749.26	723.85	24'-4 7/8"	747.10	723.60	23'-6"	744.81	723.90	20'-10 7/8"	P1003	P402	P1007	P418	P1012	P413
D	749.30	723.85	25'-5 3/8"	747.07	724.60	22'-5 7/8"	744.71	723.90	20'-9 3/4"	P1004	P403	P1008	P407	P1013	P414
E	749.05	723.85	25'-2 3/8"	746.74	724.60	22'-1 5/8"	744.31	723.90	20'-4 7/8"	P1005	P404	P1009	P408	P1014	P415
F	748.79	723.85	24'-11 1/4"	746.40	724.60	21'-9 5/8"	743.90	723.90	20'-0"	P1006	P405	P1010	P409	P1015	P416
G	748.52	723.85	24'-8"	746.07	724.60	21'-5 5/8"	743.49	723.90	19'-7 1/8"	P1103	P406	P1105	P410	P1107	P417

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

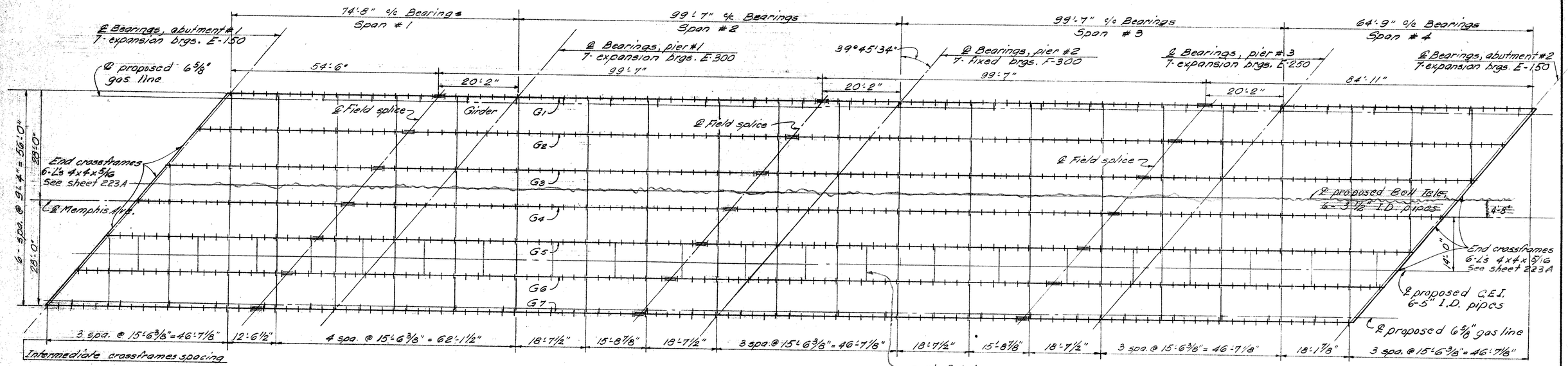
PIER DETAILS
BRIDGE NO. CUY. I71-1372
I 71 UNDER MEMPHIS AVE.
CUYAHOGA COUNTY STA. 809+05.42

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
N.K.	N.K.	E.D.A.	S.S.	[illegible]	8-26 64	

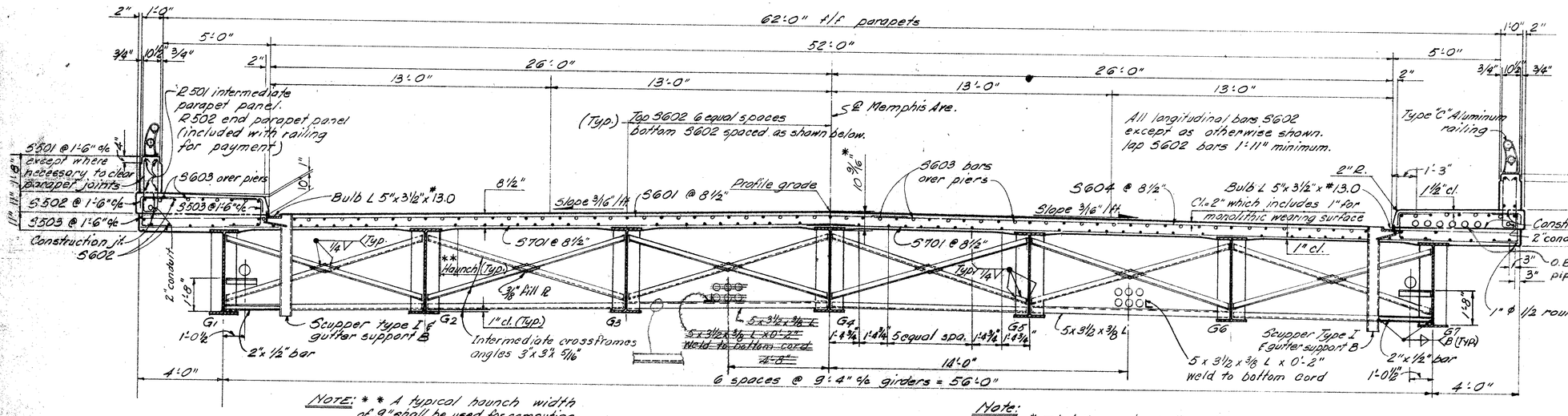
CUYAHOGA COUNTY
CUY-71-13.68

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

223
248



FRAMING PLAN



TRANSVERSE 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.

Note:

* This is the nominal dimension. The quantity of deck concrete to be paid for shall be based upon this dimension, even though deviation from it may be necessary because the top flange of the girder may not have the exact camber or conformation required to place it parallel to finished grade. Deduction shall be made for volume of encased steel plates as per Sec. S-1.25 of the construction and Material Specifications.

NOTES:

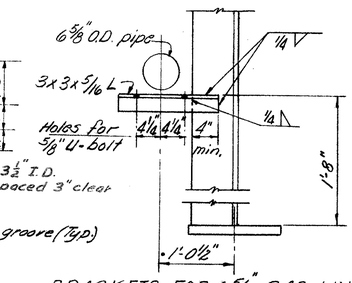
REFERENCE SHALL BE MADE TO:

Standard Drawing S.D.1-63 for end crossframes, end dams, scuppers, curb plates, bulb angle gutters and scupper supports.

Standard Drawing A.R.1-57 for type "C" aluminum railing.

Standard Drawing F.S.B 1-62 for fixed and expansion bearings.

See General Plan and Elevations for location of scuppers, railing posts and parapet joints.



BRACKETS FOR 6⅝" GAS LINES
(at every 4th Stiffener)

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS
BRIDGE NO. CUY. I 71-1372
I 71 UNDER MEMPHIS AVE.

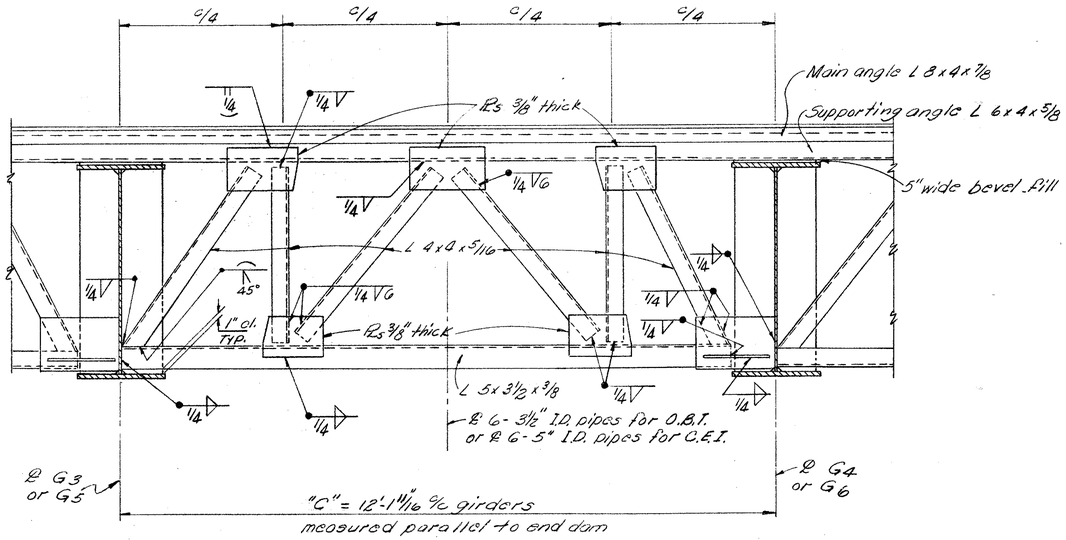
CUYAHOGA COUNTY STA. 809+05.42

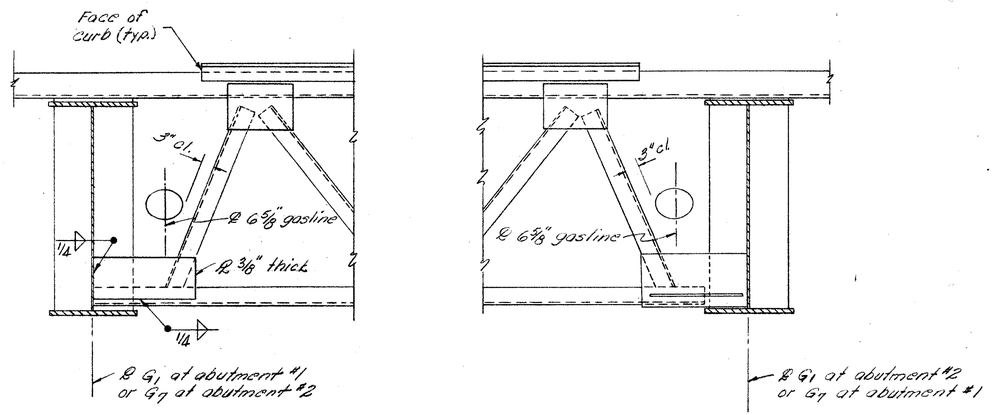
Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H.H.	G.M.		S.S.	686	8-26-64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

(223A)

CUYAHOGA COUNTY
CUY-71-13.68





SPECIAL END CROSSFRAMES

(For details not shown see Standard Drawing SD-1-63 Sheet #2)

This sheet added 3-26-65

RACKOFF ASSOCIATES
ENGINEERS
CLEVELAND, OHIO COLUMBUS, OHIO

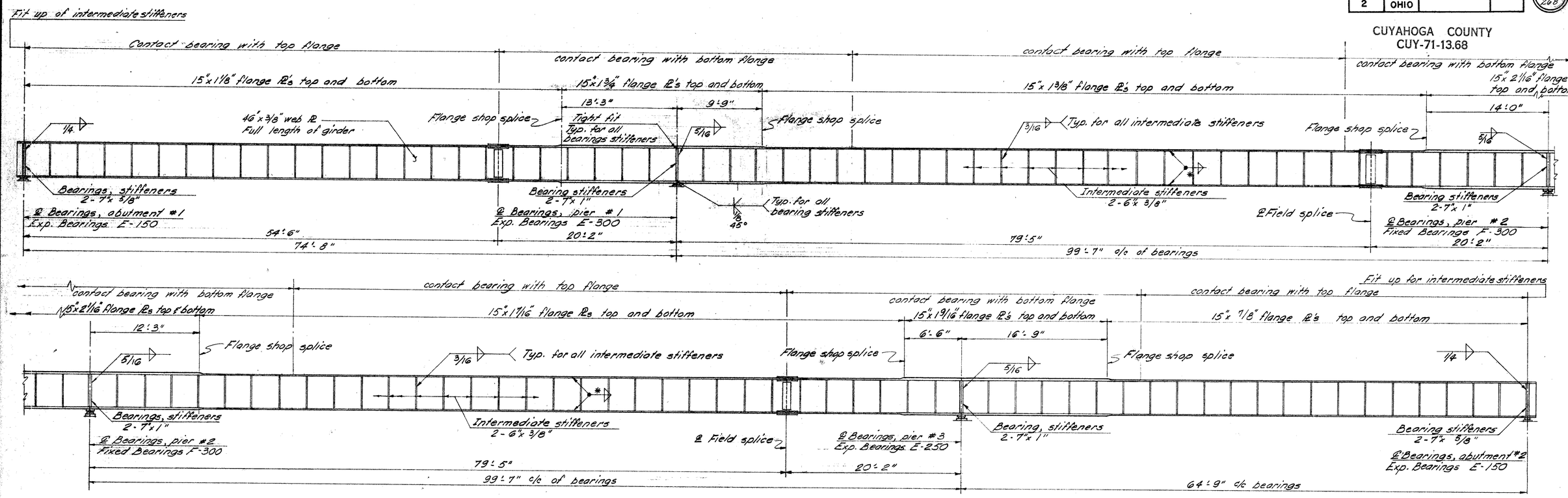
SUPERSTRUCTURE DETAILS
BRIDGE NO. CUY-171-1372
171 UNDER MEMPHIS AVE,
CUYAHOGA COUNTY STA. 809+05.42

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised.
H. H.	H. H.	E.D.A.	S. S.	[illegible]	3-19-65	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

224
268

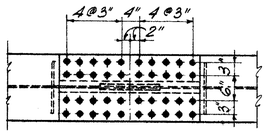
CUYAHOGA COUNTY
CUY-71-13.68

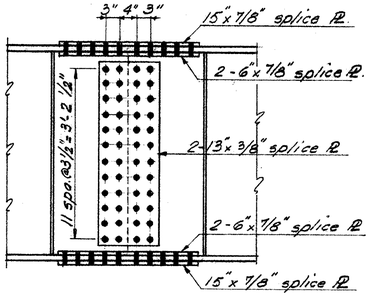


* Size web to flange welds shall be as follows:
1 1/8", 1 3/8", 1 7/16", and 1 3/16" flange plates – 5/16" fillet welds.
1 9/16", 1 3/4" and 2 1/16" flange plates – 3/8" fillet welds.

TYPICAL GIRDER ELEVATION

(For intermediate crossframes and stiffeners spacing see Framing Plan)

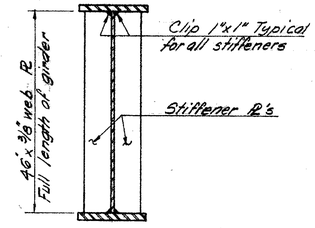




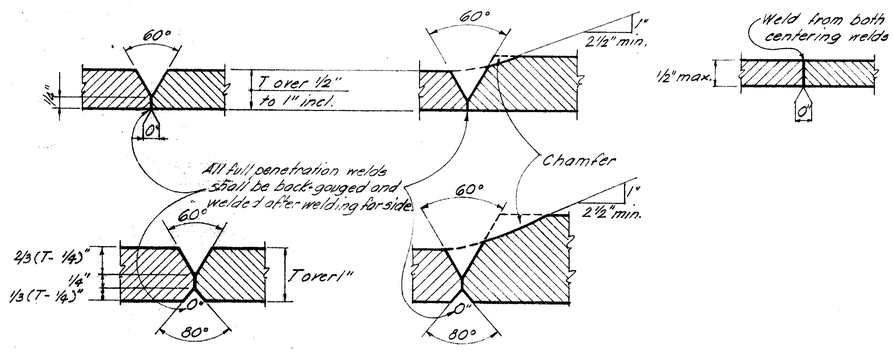
TYPICAL FIELD SPLICE DETAIL

NOTES: The contractor shall submit to the Director, for approval, 3 prints showing his proposed erection procedure for the plate girders.

Splice shall be made with 7/8" high strength bolts.



TYPICAL SECTION THRU GIRDER



TYPICAL WEB AND FLANGE SHOP SPLICE DETAIL

NOTES:

- Supplementary to Sec. 5-7.14 of the Construction and Material Specifications, intermediate stiffeners of welded build up girders shall have contact bearing with the compression flange, but may have a clearance of not more than 1/8 inch from the tension flange. In shop painting, care shall be taken to make certain that paint is forced through from one side to the other of the 1/8 inch opening.
- Butt welds on girder flange plates shall be ground flush, the finish grinding being parallel to the direction of stress.
- The radiographic examination of butt welds is required. (Supplemental Specification No. 5-307, dated 10-1-64)
- Optional shop splices will be permitted in the web and flanges of girders, but their location shall be submitted to the Director for approval.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

GIRDER DETAILS

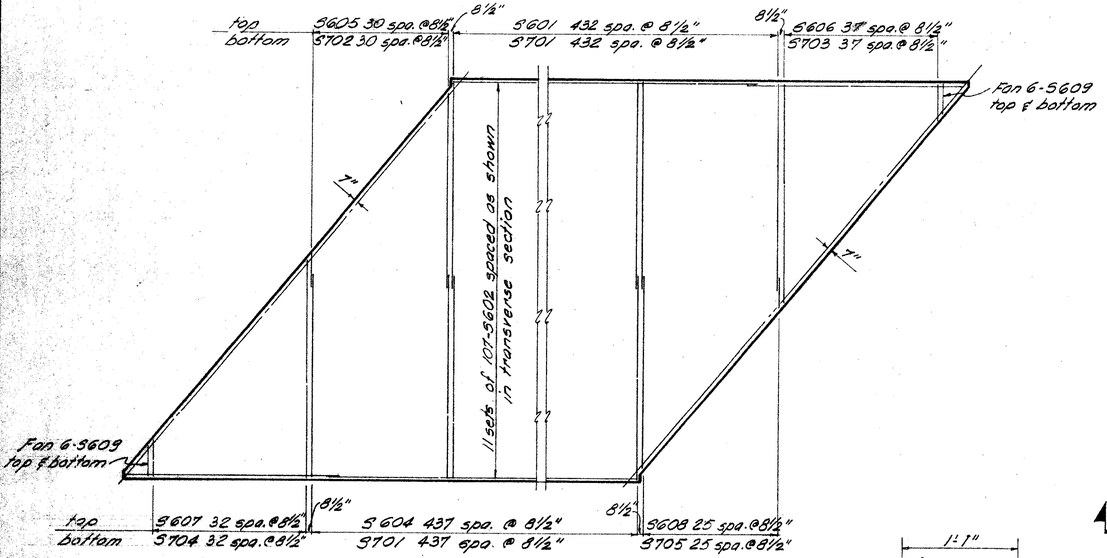
BRIDGE NO. CUY. I 71-1372
I 71 UNDER MEMPHIS AVE.
CUYAHOGA COUNTY STA. 809+05.42

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H. H.		G. M.	S.S.	[illegible]	8-26-64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

285
268

CUYAHOGA COUNTY
CUY-71-13.68



PLACEMENT OF SLAB REINFORCING

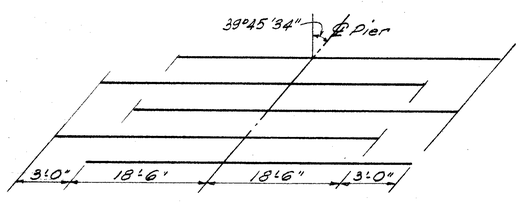
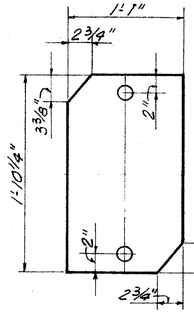
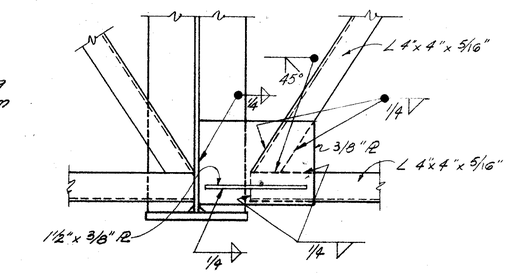


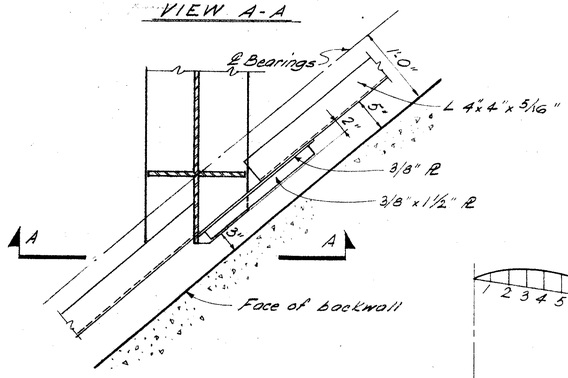
DIAGRAM SHOWING
STAGGER OF 3603 BARS OVER PIERS
(42-3603 at each pier)



PLAN OF E-150 BEARING PLATE
(For details not shown see Standard Drawing F.S.B-1-62)

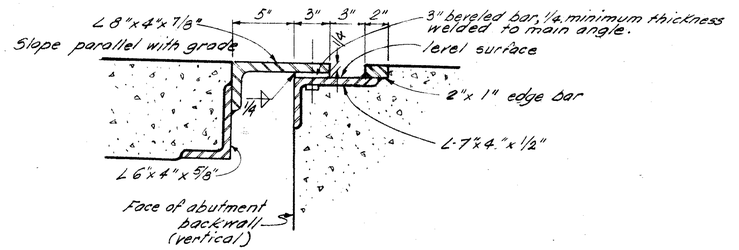


VIEW A-A



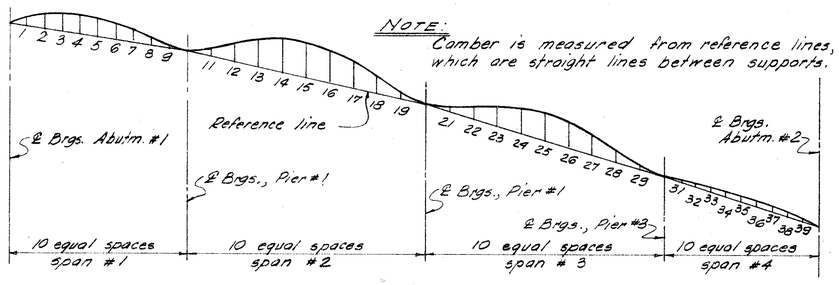
DETAIL "C"

NOTE: For details not shown see Standard Drawing S.D-1-63



SECTION AT FORWARD ABUTMENT THRU ROADWAY END DAM

For details not shown see Standard Drawing S.D-1-63



NOTE:
Camber is measured from reference lines, which are straight lines between supports.

GIRDER CAMBER DIAGRAM

DEFLECTION AND CAMBER FOR GIRDERS G1 & G7

LOCATION	Span #1									Span #2									Span # 3									Span # 4								
	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	21	22	23	24	25	26	27	28	29	31	32	33	34	35	36	37	38	39
Deflection due to weight of steel	1/32	1/16	3/32	3/32	3/32	1/16	1/16	1/32	0	1/32	1/16	3/32	1/8	5/32	1/8	3/32	1/16	0	1/32	1/16	1/8	5/32	5/32	5/32	1/8	3/32	1/32	0	0	1/32	1/32	1/16	1/16	1/16	1/32	1/32
Deflection due to remaining dead load	3/16	11/32	15/32	1/2	15/32	3/8	1/4	1/8	1/32	3/32	5/16	11/32	11/16	23/32	21/32	15/32	1/4	1/16	3/32	11/32	19/32	3/4	27/32	13/16	21/32	7/16	3/16	-1/32	0	3/32	3/16	1/4	9/32	1/4	5/32	1/8
Convexity required for vertical curve	0/32	1/2	21/32	3/4	25/32	3/4	21/32	1/2	9/32	1/2	29/32	1 3/16	1 11/32	1 13/32	1 11/32	1 3/16	29/32	1/2	1/2	29/32	1 3/16	1 11/32	1 13/32	1 11/32	1 3/16	29/32	1/2	7/32	3/8	1/2	3/16	19/32	9/16	1/2	3/8	7/32
Sum of deflection and convexity	1/2	29/32	1 7/32	1 11/32	1 11/32	1 3/16	31/32	21/32	5/16	5/8	1 3/32	1 3/16	2 5/32	2 9/32	2 7/8	1 3/4	1 13/32	9/16	5/8	1 5/16	1 29/32	2 1/4	2 13/32	2 5/16	1 13/32	1 7/16	23/32	3/16	3/8	5/8	25/32	29/32	29/32	13/16	9/16	3/8
Required camber	1/2	15/16	1 3/16	1 3/16	1 3/8	1 3/16	1	11/16	5/16	5/8	1 5/16	1 13/16	2 3/16	2 5/16	2 1/8	1 3/4	1 1/4	9/16	5/8	1 5/16	1 15/16	2 1/4	2 7/16	2 5/16	2	1 7/16	3/4	3/16	3/8	5/8	1 3/16	1 5/16	1 5/16	1 3/16	9/16	3/8

DEFLECTION AND CAMBER FOR GIRDERS G2 THRU G6

LOCATION	Span #1									Span #2									Span # 3									Span # 4								
	1	2	3	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	21	22	23	24	25	26	27	28	29	31	32	33	34	35	36	37	38	39
Deflection due to weight of steel	1/32	1/16	3/32	3/32	3/32	1/16	1/16	1/32	0	1/32	1/16	3/32	1/8	5/32	1/8	3/32	1/16	0	1/32	1/16	1/8	5/32	5/32	5/32	1/8	3/32	1/32	0	0	1/32	1/32	1/16	1/16	1/16	1/32	1/32
Deflection due to remaining dead load	5/32	9/32	3/8	13/32	3/8	5/16	7/32	3/32	1/32	3/32	9/32	7/16	9/16	13/32	17/32	3/8	7/32	1/16	3/32	9/32	1/2	5/8	11/16	21/32	17/32	11/32	5/32	-1/32	0	1/16	5/32	3/16	7/32	7/32	1/8	3/32
Convexity required for vertical curve	9/32	1/2	21/32	3/4	25/32	3/4	21/32	1/2	9/32	1/2	29/32	1 3/16	1 11/32	1 13/32	1 11/32	1 3/16	29/32	1/2	1/2	29/32	1 3/16	1 11/32	1 13/32	1 11/32	1 3/16	29/32	1/2	7/32	3/8	1/2	9/16	13/32	9/16	1/2	3/8	7/32
Sum of deflection and convexity	13/32	27/32	1 1/8	1 1/4	1 1/8	1 5/16	9/8	5/16	5/16	5/8	1 1/4	1 23/32	2 1/32	2 23/32	2	1 21/32	1 3/16	9/16	5/8	1 1/4	1 13/16	2 1/8	2 1/4	2 5/32	1 27/32	1 11/32	11/16	3/16	3/8	19/32	3/4	27/32	27/32	25/32	17/32	11/32
Required camber	1/2	7/8	1 1/8	1 1/4	1 1/4	1 1/8	1 5/16	5/8	5/16	5/8	1 1/4	1 3/8	2 1/16	2 3/16	2	1 11/16	1 3/16	9/16	5/8	1 1/4	1 13/16	2 1/8	2 1/4	2 3/16	1 7/8	1 3/8	1 1/16	3/16	3/8	5/8	3/4	7/8	7/8	13/16	9/16	3/8

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

SUPERSTRUCTURE DETAILS
BRIDGE NO. CUY. I 71-1372
I 71 UNDER MEMPHIS AVE.
CUYAHOGA COUNTY STA. 809+05.42

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H.H.	G.M.	-	S.S.	666	8-26 64	

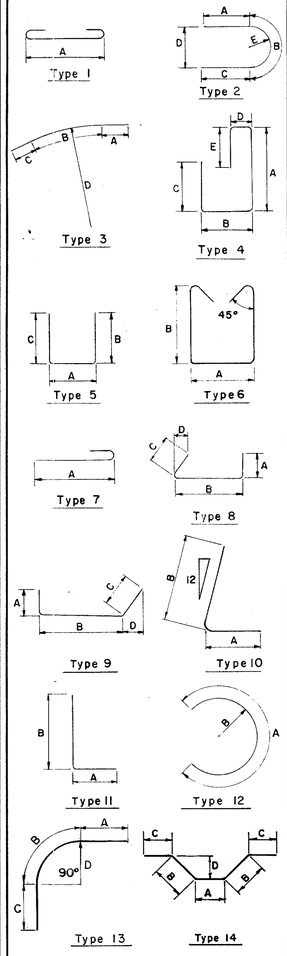
REINFORCING STEEL LIST

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

226
268

CUYAHOGA COUNTY
CUY-71-13.68

BENDING DIAGRAM



S IN THE COLUMN FOR "TYPE" INDICATES STRAIGHT BARS.

ABUTMENTS

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E	F
A501	8	3-9	31	13	0-10	1-4	1-7	0-10		
A502	44	5-11	272	6	0-8	2-4				
A503	16	8-9	146	6	0-8	3-9				
A504	8	6-6	54	S						
A505	76	21-7	1711	S						
A506	16	14-0	234	S						
A507	16	14-8	245	S						
A508	136	5-5	768	S						
A509	8	12-2	102	S						
A510	24	3-6	88	S						
A511	44	4-1	187	5	1-4	1-6	1-6			
A512	24	3-7	90	S						
A513	8	4-3	35	S						
A514	8	4-10	40	S						
A515	76	22-5	1777	S						
A516	16	4-0	67	S						
A517	110	8-3	947	11	0-8	7-9				
A518	110	6-8	765	5	3-5	1-9	1-9			
A519	32	20-2	673	S						
A520	16	5-0	83	S						
A521	28	2-6	73	5	1-5	0-8	0-8			
A601	110	12-11	2134	11	5-4	7-9				
A602	24	29-6	1063	S						
A603	134	16-0	3220	4	6-8	1-5	5-2	0-10	2-7	
A604	28	15-9	662	5	1-5	7-4	7-4			
A605	8	17-7	211	S						
A606	68	20-4	2077	5	1-2	9-9	9-9			
A607	16	10-5	250	11	0-10	9-9				
		TOTAL	18005							

RAILING

R 503	8	19-10	–	S	Included with railing for payment
R 504	8	18-10	–	S	
R 505	8	3-10	–	S	
R 506	8	6-2	–	13	2-4 2-8 1-2 1-8

PIERS

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E	F
P601	360	6-6	3515	S						
P602	192	7-6	2163	S						
P1001	180	6-6	5035	11	1-5	5-5				
P1002	12	22-8	1170	S						
P1003	12	21-9	1123	S						
P1004	12	22-9	1175	S						
P1005	12	22-6	1162	S						
P1006	12	22-3	1149	S						
P1007	24	20-10	2151	S						
P1008	12	19-9	1020	S						
P1009	12	19-5	1003	S						
P1010	12	19-1	985	S						
P1011	12	8-4	947	S						
P1012	12	8-3	942	S						
P1013	12	18-2	938	S						
P1014	12	17-9	917	S						
P1015	12	17-4	895	S						
P1101	126	6-11	4630	11	1-6	5-9				
P1102	21	22-8	2529	S						
P1103	21	22-0	2455	S						
P1104	21	19-10	2213	S						
P1105	21	18-9	2092	S						
P1106	21	18-5	2055	S						
P1107	21	16-11	1887	S						
		TOTAL	44,151							
		SPIRAL	7,700							
		TOTAL	51,851							

REPLACEMENT BARS

RE401	1	5-3	–	12	5-3	1-4
RE501	1	5-7	–	S		
RE601	7	5-11	–	S		
RE701	4	6-3	–	S		
RE1001	2	7-3	–	S		
RE1101	1	7-7	–	S		

SUPERSTRUCTURE

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E	F
S501	454	6-1	2881	6	0-8	2-5				
S502	454	6-9	3196	5	5-8	0-8	0-8			
S503	908	2-6	2368	5	1-5	0-8	0-8			
S601	433	37-6	24389	S						
S602	1177	32-8	57750	S						
S603	126	40-0	7570	S						
S604	438	28-2	18530	S						
S605	31	10-4½ to 36-0	1080	S	1 each vary with 10¼" increments.					
S606	38	8-4¾ to 40-0	1381	S	1 each vary with 10¼" increments.					
S607	33	8-2 to 35-6	1082	S	1 each vary with 10¼" increments.					
S608	26	5-1¾ to 26-6	618	S	1 each vary with 10¼" increments.					
S609	24	7-8	276	S						
S701	871	33-0	58751	S						
S702	31	5-6½ to 31-2	1163	S	1 each vary with 10¼" increments.					
S703	38	8-4¾ to 40-0	1879	S	1 each vary with 10¼" increments.					
S704	33	8-2 to 35-6	1473	S	1 each vary with 10¼" increments.					
S705	26	9-9¾ to 31-2	1089	S	1 each vary with 10¼" increments.					
		TOTAL	189476							
L401	16	5-0	53	11	2-0	3-1				
L402	28	7-10	147	14	1-1	2-8	0-9	1-11		
		TOTAL	189,676							

RAILING

R 501	200	16-2	–	S	included with railing for payment.
R 502	16	13-2	–	S	

SPIRAL REINFORCEMENT

MARK	NO.	LENGTH	CORE	PITCH	TURNS	SPACERS	WEIGHT
P401	2	22-8	32	4½	64	4	830
P402	1	21-9	32	4½	61	4	396
P403	1	22-9	32	4½	64	4	415
P404	1	22-6	32	4½	63	4	409
P405	1	22-3	32	4½	62	4	402
P406	1	22-0	32	4½	62	4	402
P407	2	19-10	32	4½	56	4	726
P408	1	19-6	32	4½	55	4	356
P409	1	19-2	32	4½	54	4	350
P410	1	18-10	32	4½	53	4	343
P411	1	18-5	32	4½	52	4	337
P412	1	18-4	32	4½	52	4	337
P413	1	18-3	32	4½	52	4	337
P414	1	18-2	32	4½	52	4	337
P415	1	17-9	32	4½	51	4	330
P416	1	17-4	32	4½	49	4	317
P417	1	16-11	32	4½	48	4	311
P418	2	20-10	32	4½	59	4	765
					TOTAL		7700

NOTES

BAR SIZE is indicated in bar mark. The first digit where three digits are used and the first two where four are used indicate the bar size number.

SPIRAL REINFORCING BARS; The "Length" shown in the steel list for the spiral bars is the distance from the top of the footing to the top of the pier less 2". The "No. of Turns" shown is the "Length" divided by the pitch, plus three turns (total number of closed coils), expressed as the nearest whole number.

Spiral reinforcing bars shall not have deformations but shall in other respects conform to item S-4. 1½ closed coils shall be provided at the ends of each spiral unit. Four steel channel, tee or angle spacers, weighing approximately 0.68 lb. per lin. ft. of spacer, shall be provided for each spiral unit. They shall be equally spaced along the periphery of the coil. The number of pounds of these spacers, based on 0.68 lb. per lin. ft., will be paid for as reinforcing steel and is included in the tabulated quantity of spiral bars.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

REINFORCING STEEL LIST
BRIDGE NO. CUY. I 71-1372
I 71 UNDER MEMPHIS AVE.

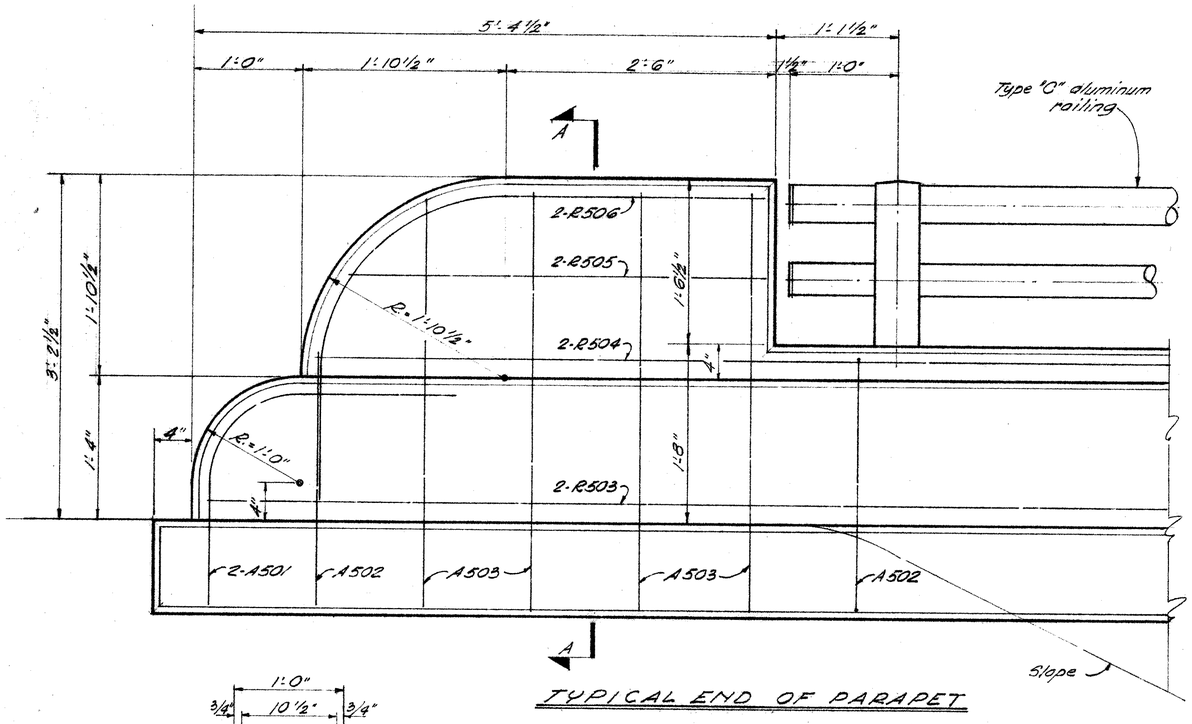
CUYAHOGA COUNTY STA. 809+05.42

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H.H. N.K.	G.M.		S.S. H.H.	[illegible]	8-26 64	

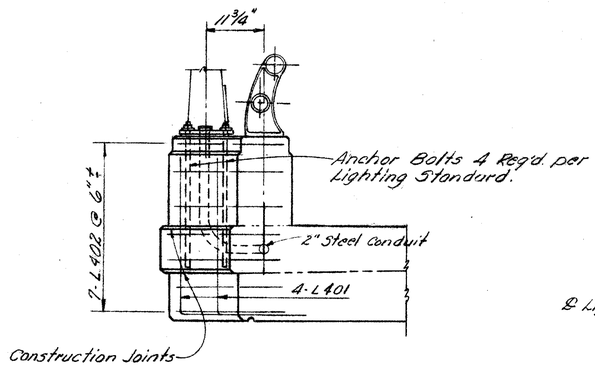
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

287
268

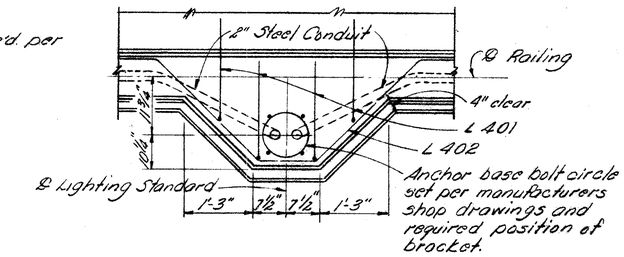
CUYAHOGA COUNTY
CUY-71-13.68



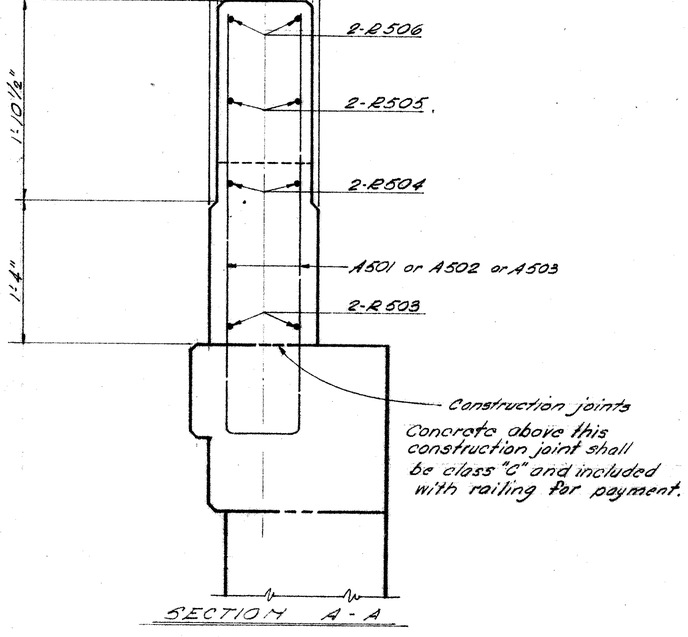
TYPICAL END OF PARAPET



SECTION THRU CURB AT LIGHTING STANDARD
See Lighting Plans for additional notes and details.



VIEW F-F



SECTION A-A

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

COMMON DETAILS
FOR BRIDGES
CUY-171-1352 AND 1372

CUYAHOGA COUNTY

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
H.H.	G.M.		S.S.	bbb	8-26 64	

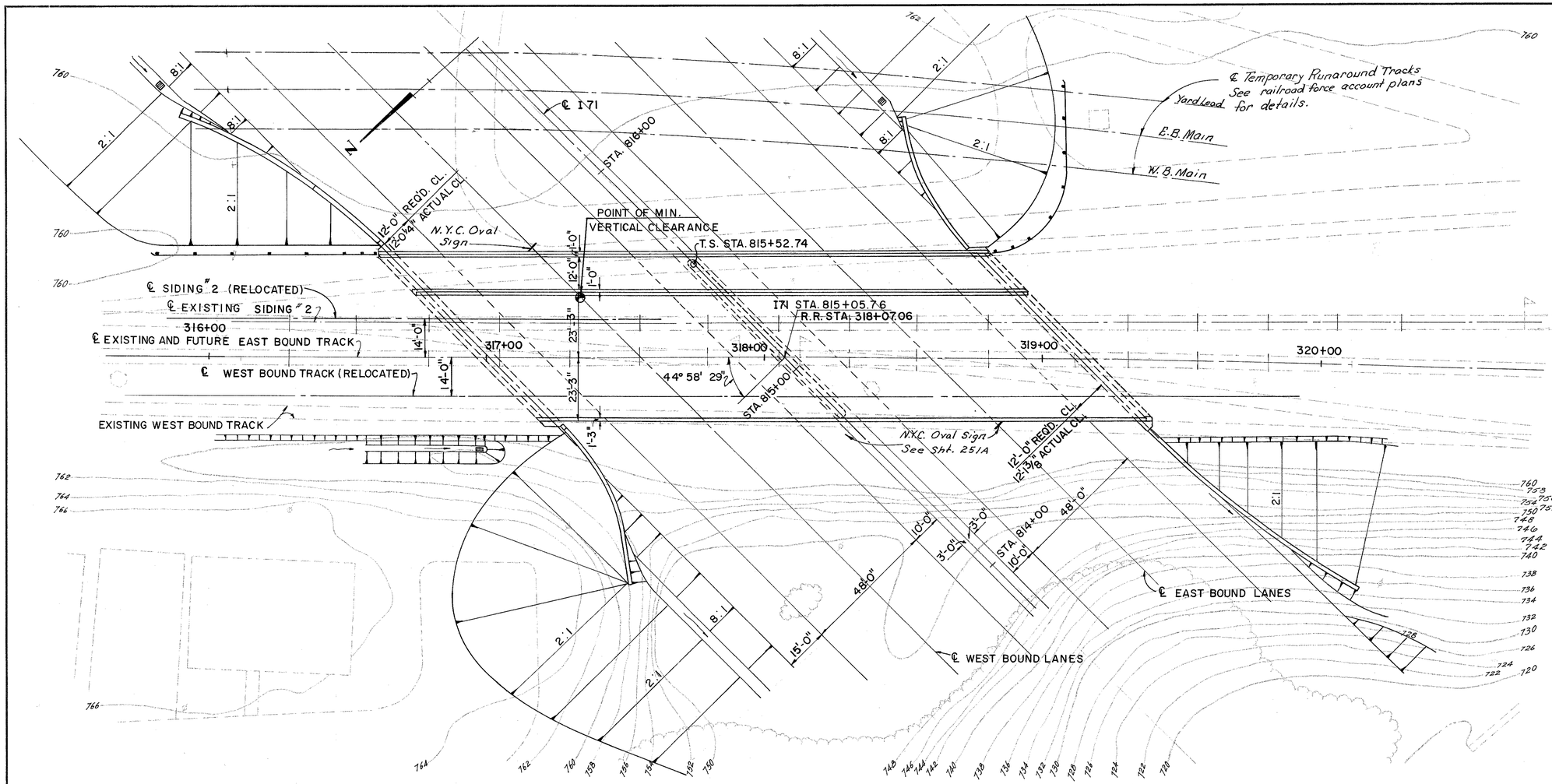
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

228
268

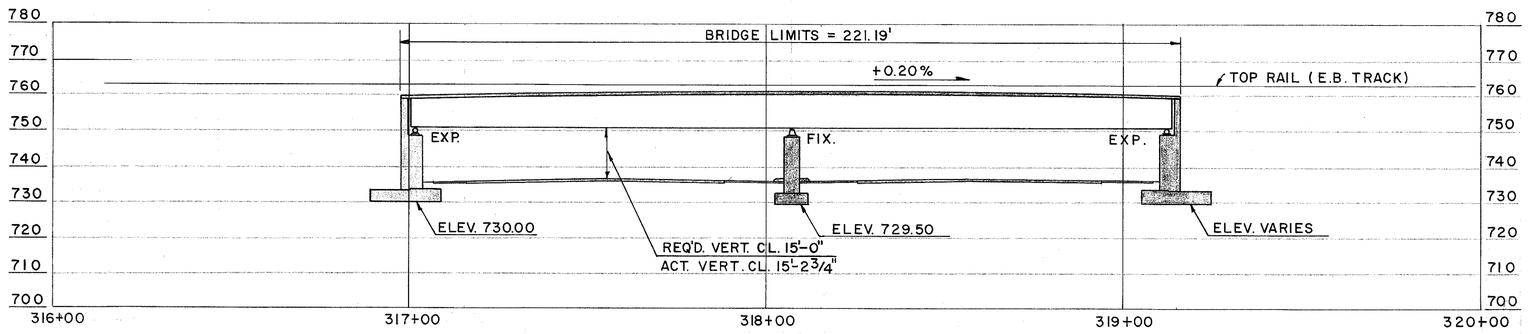
CUYAHOGA COUNTY
CUY-71-13.68

ESTIMATED 1975 ADT

	Class A Veh.	Class B Veh.	Total Veh.
I 71	70,800	11,940	82,700



PLAN



PROFILE ALONG ℄ EAST BOUND TRACK

PROPOSED STRUCTURE

TYPE: Welded continuous steel girders with reinforced concrete slab and reinforced concrete substructure.

SPANS: 106'-0" and 106'-0" center to center of bearings.

LOADING: Cooper E-72 with impact for diesel and electric locomotives.

SKEW: 44° 58' 29" R.F.

ALIGNMENT: Tangent

BRIDGE FOR SERVICE ROAD

TYPE: Welded continuous steel girder with reinforced concrete slab and reinforced concrete substructure.

SPANS: 106'-0" and 106'-0" center to center of bearings.

ROADWAY: 12'-0" face to face of curbs.

LOAD FREQUENCY: CF 130(57)

WEARING SURFACE: 1" monolithic concrete.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

SITE PLAN

BRIDGE NO. CUY.-I 71 - 1381
I 71 UNDER NEW YORK CENTRAL R.R.
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
F.A.	E.D.A.		R.A.K.	[illegible]	9-17 64	

12397 (3)

FED RD DIVISION	STATE	PROJECT		229 / 268
2	OHIO			

CUYAHOGA COUNTY
CUY-71-13.68

DESIGN SPECIFICATIONS

AREA SPECIFICATIONS FOR STEEL RAILWAY BRIDGES, CURRENT EDITION. AWS SPECIFICATIONS FOR WELDED HIGHWAY AND RAILWAY BRIDGES, CURRENT EDITION.

STATE OF OHIO, DEPARTMENT OF HIGHWAYS, DESIGN SPECIFICATIONS FOR HIGHWAY STRUCTURES, DATED 9-1-57 AND CURRENT REVISIONS THEREOF.

CONSTRUCTION SPECIFICATIONS

STATE OF OHIO, DEPARTMENT OF HIGHWAYS, CONSTRUCTION AND MATERIAL SPECIFICATIONS, DATED JANUARY 1, 1963.

SUPPLEMENTAL SPECIFICATIONS
S-101 DATED JULY 12, 1962
S-103 REVISED FEBRUARY 16, 1955
S-107 REVISED FEBRUARY 16, 1955
S-307 REVISED OCTOBER 10, 1964

REFERENCE SHALL BE MADE TO

STATE OF OHIO STANDARD DRAWING NO. AR-1-57, REVISED APRIL 2, 1962.

DESIGN LOADING: COOPER E-72 WITH IMPACT FOR DIESEL AND ELECTRIC LOCOMOTIVES. CF-130 (57)

CONCRETE: CLASS C - BASIC UNIT STRESS 1,333 PSI
CLASS E - BASIC UNIT STRESS 1,133 PSI

STRUCTURAL STEEL: ASTM A36-BASIC UNIT STRESS 20,000 PSI (ASTM A7 AND A373 NOT PERMITTED).

REINFORCING STEEL: ASTM A15, DEFORMED, INTERMEDIATE OR HARD GRADE, BASIC UNIT STRESS 20,000 PSI EXCEPT SPIRAL REINFORCEMENT WHICH MAY BE PLAIN, STRUCTURAL GRADE WITH BASIC UNIT STRESS OF 18,000 PSI.

FOUNDATION BEARING PRESSURE

ABUTMENTS	5.4 TONS PER SQ. FEET
PEDESTALS	8.0 TONS PER SQ. FEET
PIER	6.5 TONS PER SQ. FEET

FOOTINGS AND PEDESTALS

FOOTINGS SHALL EXTEND A MINIMUM OF 3" AND PEDESTALS A MINIMUM OF 6" INTO UNDISTRUBED ROCK OR TO THE ELEVATIONS SHOWN, WHICHEVER IS LOWER. THE CONCRETE AT THE FRONT FACE OF THE FOOTING SHALL BE POURED AGAINST THE UNDISTURBED SHALE, WHICH SHALL BE EXCAVATED AS VERTICAL AS POSSIBLE.

HIGH-STRENGTH STEEL BOLTS, NUTS AND WASHERS:

UNDER ITEM S-7.10, PARAGRAPH TWO (2) SHALL BE COMPLETELY REVISED AND THE LAST SENTENCE OF PARAGRAPH FOUR (4) REVISED TO READ AS FOLLOWS:

"IN THE FINAL ASSEMBLY OF THE PARTS TO BE BOLTED, DRIFT PINS SHALL BE PLACED IN A SUFFICIENT NUMBER OF HOLES (NOT LESS THAN 25 PERCENT FOR FIELD ERECTION) TO PROVIDE AND MAINTAIN ACCURATE ALIGNMENT OF HOLES AND PARTS, AND SUFFICIENT BOLTS SHALL BE INSTALLED AND BROUGHT TO A SNUG TIGHT CONDITION TO BRING THE PARTS INTO COMPLETE CONTACT. BOLTS SHALL THEN BE INSTALLED IN ANY REMAINING OPEN HOLES AND TIGHTENED TO A SNUG TIGHT FIT, AFTER WHICH ALL BOLTS SHALL BE TIGHTENED COMPLETELY BY CALIBRATED WRENCHES OR BY THE TURN-OF-NUT METHOD. DRIFT PINS SHALL THEN BE REPLACED WITH BOLTS, TIGHTENED IN THE SAME MANNER. "

"BOLT LENGTHS DETERMINED BY THE USE OF TABLE NO. 1 SHALL BE ADJUSTED TO THE NEXT 1/4 - INCH LENGTH INCREMENT."

CONCRETE DECK PLACING

INORDER TO FACILITATE WATER CURING OF THE CONCRETE OF THE DECK SLAB, THE PLACING OF THE CONCRETE SHALL PROGRESS UPGRADE. THE SLAB MAY BE PLACED IN SECTIONS, BETWEEN TRANSVERSE CONSTRUCTION JOINTS WHICH ARE PARALLEL TO THE TRANSVERSE REINFORCING STEEL AND ARE LOCATED NEAR THE CENTER OF ANY SPAN.

SURFACE FINISH OF CONCRETE

THE REQUIREMENTS OF SEC.S-1.22 RUBBED FINISH, SHALL APPLY TO THE FOLLOWING SURFACES:
A) THE OUTER SIDES OF THE DECK, EXPOSED PARTS OF THE PARAPETS AND THE CURBS.
B) THE ENTIRE SURFACES OF PIER, ABUTMENTS AND WINGWALLS EXCEPT BRIDGE SEATS AND BACKWALLS.

POROUS BACKFILL

MIN. 2 FT. THICK SHALL EXTEND FROM THE FLOW LINE OF THE DRAIN PIPES UP TO THE RAILROAD BALLAST AND THE IMPERVIOUS MATERIAL BEHIND THE WINGWALLS, THE FULL LENGTH OF THE ABUTMENTS AND WINGWALLS.

BRIDGE DECK DRAINS

SHALL BE ~~ARMCO~~ PERFORATED DECK DRAINS, GALVANIZED BITUMINOUS COATED, ~~OR EQUAL~~.

RUBBER MEMBRANE WATERPROOFING

1. SCOPE
FURNISH AND INSTALL MEMBRANE WATERPROOFING ON THE TOP OF STRUCTURAL DECK AND BALLAST RETAINERS. ALL WORK SHALL BE WATERTIGHT.

2. MATERIALS
WATERPROOFING MATERIALS SHALL BE AS SPECIFIED HEREIN.

A) MEMBRANE SHALL BE 1/16 INCH THICK. IT SHALL BE A COMPOUNDED BUTYL ELASTOMER CONFORMING TO THE FOLLOWING REQUIREMENTS:

COLOR	BLACK	
SPECIFIC GRAVITY	1.20± 3	ASTM D-297-61T
TENSILE STRENGTH	1200 PSI (MIN)	ASTM D-412-61T
MODULUS @ 300% ELONGATION	650 PSI (MIN)	ASTM D-412-61T
ELONGATION	300% (MIN)	ASTM D-412-61T
TEAR RESISTANCE, DIE B	150 PSI (MIN)	ASTM D-624-54
SHORE A HARDNESS	55± 5 WITH 5 SECOND INTERVAL BEFORE READING.	ASTM D-676-59T
OZONE RESISTANCE	NO CRACKS 70 HRS/50 PPHM/100°F/20% EXT.	ASTM D-1149-60T
HEAT AGING	ASTM D-573-53 (ACCELERATED)	
TENSILE RETENTION	75% OF ORIGINAL 7 DAYS/250°F	
ELONGATION RETENTION	75% OF ORIGINAL 7 DAYS/250°F	
BUTYL IDENTIFICATION (TRICRESYL PHOSPHATE IMMERSION)	MAX. VOLUME SWELL 10% 70 HRS/212°F	ASTM D-571-57T
LOW TEMPERATURE FLEXIBILITY	-40°F	ASTM D-746-57T
WATER VAPOR TRANSMISSION		ASTM C-355-59T/80°F
PERMEABILITY, PERMS-MILS	0.15	
PERMEANCE 1/32" SURE SEAL	.005 PERMS	
PERMEANCE 1/16" SURE SEAL	.0025 PERMS	
PERMEANCE 3/32" SURE SEAL	.0017 PERMS	
EXPOSURE TO TEMPERATURES -40°F TO +200°F	LITTLE CHANGE IN PHYSICAL PROPERTIES.	
OUTDOOR AGING	NO APPRECIABLE DETERIORATION AFTER 12 YEARS' EXPOSURE.	
EXPOSURE TO FUNGI, BACTERIA, ETC., IN SOIL OR COMPOST	UNAFFECTED.	

TONGUE AND GROOVE FIELD SPLICE
AVERAGE TESTS:
ORIGINAL LBS. PER INCH OF SPLICE 35 LBS.

	12 DAYS	26 DAYS	104 DAYS
STRENGTH LBS. PER INCH AMBIENT TEMP.	50	75	100

B) ADHESIVE SHALL BE AS RECOMMENDED BY THE MEMBRANE MANUFACTURER. IT SHALL REMAIN ELASTIC AT TEMPERATURES ABOVE MINUS 40°F AND SHALL BE COMPATIBLE WITH THE MEMBRANE WATERPROOFING AND WITH THE MATERIALS TO WHICH IT IS BONDED. BEST RESULTS ARE OBTAINED BY APPLYING CARLISLE'S ADHESIVE AT TEMPERATURES +10°F OR ABOVE; HOWEVER, THE ADHESIVE CAN BE WORKED SATISFACTORILY TO ITS BRITTLE POINT (-40°F).

C) CEMENT FOR SPLICING SHALL BE A BUTYL COMPOUND AS RECOMMENDED BY THE MEMBRANE MANUFACTURER. IT SHALL BE OF SELF-VULCANIZING BUTYL RUBBER CONFORMING TO THE FOLLOWING REQUIREMENTS:

VISCOSITY, #3 ZAHM CUP -------- 100 to 150 SECONDS
TOTAL SOLIDS ---------- 30% MINIMUM
THICKNESS OF CEMENT APPLICATION -- 50 SQUARE FEET PER GALLON

D) BUTYL GUM TAPE FOR SPLICES SHALL BE OF BLACK, UNVULCANIZED BUTYL RUBBER WITH AN 0.008 MIL POLYETHYLENE BACKING. IT SHALL BE .030 MILS (± .004 MILS) THICK, INCLUDING THE BACKING.

3. SHOP DRAWINGS
FURNISH 5 COPIES OF SHOP DRAWINGS FOR THE APPROVAL OF THE ENGINEER AND OBTAIN SUCH APPROVAL BEFORE PROCEEDING WITH THE WORK. THESE DRAWINGS SHALL SHOW EXTENT, SIZES AND COMPLETE DETAILS OF THE MEMBRANE WATERPROOFING.

4. PREPARATION OF SURFACES
SURFACES ON OR AGAINST WHICH MEMBRANE WATERPROOFING IS TO BE APPLIED SHALL BE CLEAN, SMOOTH, DRY, FREE OF FINS, SHARP EDGES, LOOSE AND FOREIGN MATERIALS, OIL AND GREASE. BEOFRE BEGINNING THIS WORK, THE WATERPROOFING CONTRACTOR SHALL CERTIFY THAT THE SURFACES TO BE WATERPROOFED HAVE BEEN EXAMINED AND FOUND SATISFACTORY FOR THE APPLICATION OF THE WATERPROOFING SPECIFIED HEREIN.

5. APPLICATION OF WATERPROOFING

A) APPLY ADHESIVE AS RECOMMENDED BY THE MEMBRANE MANUFACTURER TO BALLAST RETAINERS AND ENDS OF DECK IN A SOLID AREA EXTENDING FROM THE EDGES BACK ABOUT 36 INCHES.
(OPTION) MEMBRANE MAY BE PLACED IN A SOLID APPLICATION OF ADHESIVE RECOMMENDED BY THE MEMBRANE MANUFACTURER.
(OPTION) MEMBRANE MAY BE MOPPED SOLID TO DECK WITH HOT MOP OF TAR, PITCH, OR ASPHALT.

B) PLACE MEMBRANE IN POSITION. DRAW IT TIGHT WITHOUT STRETCHING. CLEAN ALL SEAM, LAP, AND SPLICE AREAS OF MEMBRANE WITH HEPTANE, HEXANE, TOLUENE, TRICHLORETHYLENE, OR WHITE GASOLINE, USING A CLEAN CLOTH, MOP, OR A SIMILAR SYNTHETIC CLEANING DEVICE.

C) SPREAD CEMENT CONTINUOUSLY ON SEAM, SPLICE AND LAP AREAS OF MEMBRANE. APPLY CEMENT WITH A BRUSH AT A UNIFORM COVERAGE RATE OF 50 SQUARE FEET PER GALLON. ALLOW IT TO DRY UNTIL IT DOES NOT STICK TO A DRY FINGER TOUCH.

D) APPLY BUTYL GUM TAPE TO CEMENTED AREAS OF MEMBRANE. EXTEND TAPE AT LEAST 1/8 INCH BEYOND EDGES, SPLICE, AND LAP AREAS. ROLL OR PRESS THE TAPE FIRMLY INTO PLACE. AVOID BRIDGING AND WRINKLING. OBTAIN FULL CONTACT FOR ALL TAPE AREAS.

E) APPLY MEMBRANE--HORIZONTALLY--VERTICALLY. PRESS IT FIRMLY AND UNIFORMLY IN PLACE AGAINST THE PREVIOUSLY APPLIED ADHESIVE. AVOID WRINKLES AND BUCKLES. POSITION EACH SHEET TO FIT THE PREVIOUSLY INSTALLED SHEET. SPLICES SHALL BE--TONGUE-AND-GROOVE--BUTT--LAP TYPE. REINFORCING CORNER SPLICES WITH TWO CONTINUOUS LAYERS OF SURE SEAL MEMBRANE OVER ONE LAYER OF BUTYL TAPE.

F) FLASH ALL PROJECTIONS, PIPES, CONDUITS, SLEEVES, PLUGS, ETC., PASSING THROUGH SURE SEAL MEMBRANE WATERPROOFING, PROVIDING WATERTIGHT CONSTRUCTION. USE PREFABRICATED OR FIELD-FABRICATED BOOTS, FITTED COVERINGS, ETC., AS NECESSARY. USE BUTYL GUM TAPE BETWEEN LAYERS OF MEMBRANE WATERPROOFING.

6. PROTECTION OF WATERPROOFING
PROTECT WATERPROOFING MEMBRANE FROM BALLAST USING ASPHALT MASTIC OR PNEUMATICALLY PLACED CONCRETE.

7. GUARANTEE
WATERPROOFING MEMBRANE SHALL BE GUARANTEED AGAINST DEFECTS AND WORKMANSHIP FOR A PERIOD OF 15 YEARS FROM THE DATE OF APPROVED INSTALLATION.

ASPHALT MASTIC

SHALL BE ACCORDING TO AREA SPECIFICATION CHAPTER 29, PART 2.

WATERPROOFING TYPE B

SHALL BE ACCORDING TO SEC. S-3.

TOPS OF WINGWALLS

SHALL SLOPE 1/4 IN. TO BACK.

SHEETING AND BRACING

BEFORE CONSTRUCTION IS STARTED, EIGHT SETS OF PRINTS SHOWING DETAILS OF THE SHEETING AND BRACING TO BE USED FOR EXCAVATION ADJACENT TO THE RAILROAD TRACKS SHALL BE SUBMITTED TO THE DIRECTOR FOR APPROVAL BY THE DEPARTMENT OF HIGHWAYS AND BY THE RAILROAD COMPANIES.

ALIGNING RAILROAD TRACKS

AFTER THE CONTRACTOR HAS COMPLETED ALL EXCAVATION AND BACKFILL ADJACENT TO THE RAILROAD TRACKS IN COMPLIANCE WITH SEC. E-2.04 AND E-2.08 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS, SUBJECT TO THE SUPERVISION OF THE RAILROAD COMPANIES' NOTHING IN SEC. E-2.04, , E-2.08 OR G-8.07 OF THE SPECIFICATIONS SHALL BE CONSTRUED TO HOLD THE CONTRACTOR LIABLE FOR ALIGNING AND RESURFACING THE RAILROAD TRACKS.

UTILITY LINES

ALL LABOR AND EXPENSE INVOLVED IN RELOCATING THE AFFECTED UTILITY LINES, SHALL BE BORNE BY THE OWNER. THE CONTRACTOR AND OWNER ARE REQUESTED TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE HELD TO A MINIMUM.

RAILROAD AERIAL LINES

SHALL 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 RELOCATION SHALL BE INCLUDED IN THE RAILROAD FORCE ACCOUNT WORK.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

GENERAL NOTES

BRIDGE NO. CUY - I 71 - 1381

I 71 UNDER NEW YORK CENTRAL R.R.

CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
	E.D.A.			GLL	9-17 64	2-3-65 3-26-65

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

230
268

CUYAHOGA COUNTY
CUY-71-13.68

ESTIMATED QUANTITIES									AS BUILT	
ITEM	TOTAL	UNIT	DESCRIPTION	SUPER.	ABUT.	PIER	WING-WALLS	GEN.		
E-2	lump	sum	Cofferdams, cribs and sheeting							
E-2	4,660	cu. yds.	Unclassified excavation		2,979		1,681			
E-2	2,120	cu. yds.	Shale excavation		1,149	95	876			
S-1	539	cu. yds.	Class "C" concrete, superstructure	539						
S-1	95	cu. yds.	Class "C" concrete, piers above footings			95				
S-1	85	cu. yds.	Class "E" concrete, pier footings			85				
S-1	670	cu. yds.	Class "E" concrete, abutments above footings		670					
S-1	460	cu. yds.	Class "E" concrete, abutment footings		460					
S-1	348	cu. yds.	Class "E" concrete, pedestals		98		250			
S-1	405	cu. yds.	Class "E" concrete, wingwalls above footings				405			
S-1	339	cu. yds.	Class "E" concrete, wingwall footings				339			
S-3	39	sq. yds.	Type "B" waterproofing, 36" wide		39					
S-3	197	lin. ft.	Waterproofing, premolded sealing strip		104		93			
S-4	393,770	lbs.	Reinforcing steel	186,040	119,424	29,420	58,886			
S-107	1,187,800	lbs.	Structural steel	1,187,800						
S-8	1,187,800	lbs.	Field painting of structural steel *(as per proposal note)*	1,187,800						
S-9	313	sq.ft.	1" preformed expansion joint filler		313					
S-14	219.19	lin. ft.	Railing, type A, (aluminum railing and supports with concrete parapets)	219.19						
S-14	217.60	lin.ft.	Railing, type A, (aluminum railing and supports)	217.60						
				125						
S-29	654	cu.yds.	Porous backfill		345		309			
S-29	199	lin.ft.	8" ø bituminous coated C.M.P., M-6.4(c) including specials					199		
S-29	328	lin.ft.	8" ø bituminous coated perforated C.M.P., M-6.4(f) including specials					328		
S-29	884	lin.ft.	8" half-round bituminous coated superstructure deck drain					884		
S-101	539	each	Water-reducing, set-retarding admixture	539						
S-4	1,819	sq. ft.	Welded wire mesh	1819						
S-6	1,819	sq.ft.	Pneumatically placed mortar ~~(shotcrete)~~	1819						
S-103	56	cu. yds.	2" asphalt mastic	56						
Special	1215	sq. yds.	1/16" rubber membrane waterproofing	1215						

DESCRIPTION	PLOTTED BY	PLOTTED DATE	IN-ED BY	IN-ED DATE	CHECKED BY
TOPOGRAPHY					
PAVEMENT					
STRUCTURE					
R. O. W.					
QUANTITIES					

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

ESTIMATED QUANTITIES

BRIDGE NO. CUY.-I 71-1381

I 71 UNDER NEW YORK CENTRAL R.R.

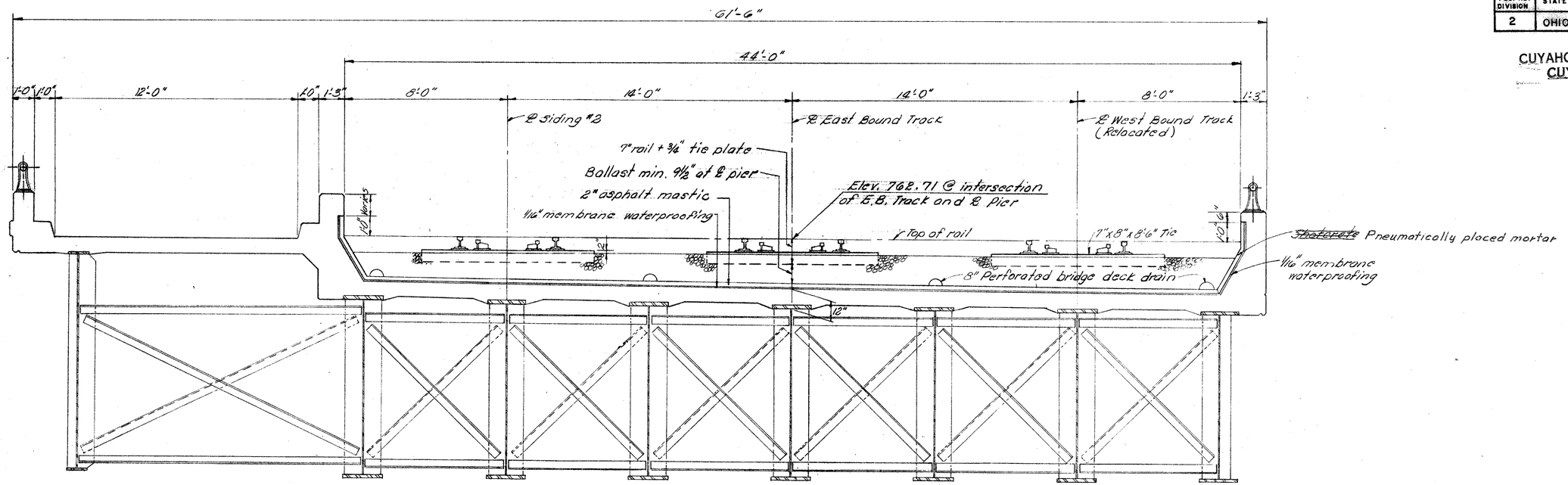
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V. K.	E.D.A.		R.A.K.	-GEB	9-17 64	3-26-65

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

231
268

CUYAHOGA COUNTY
CUY-71-13.68



TYPICAL SECTION THROUGH BRIDGE
See sheet 242 for other deck details.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

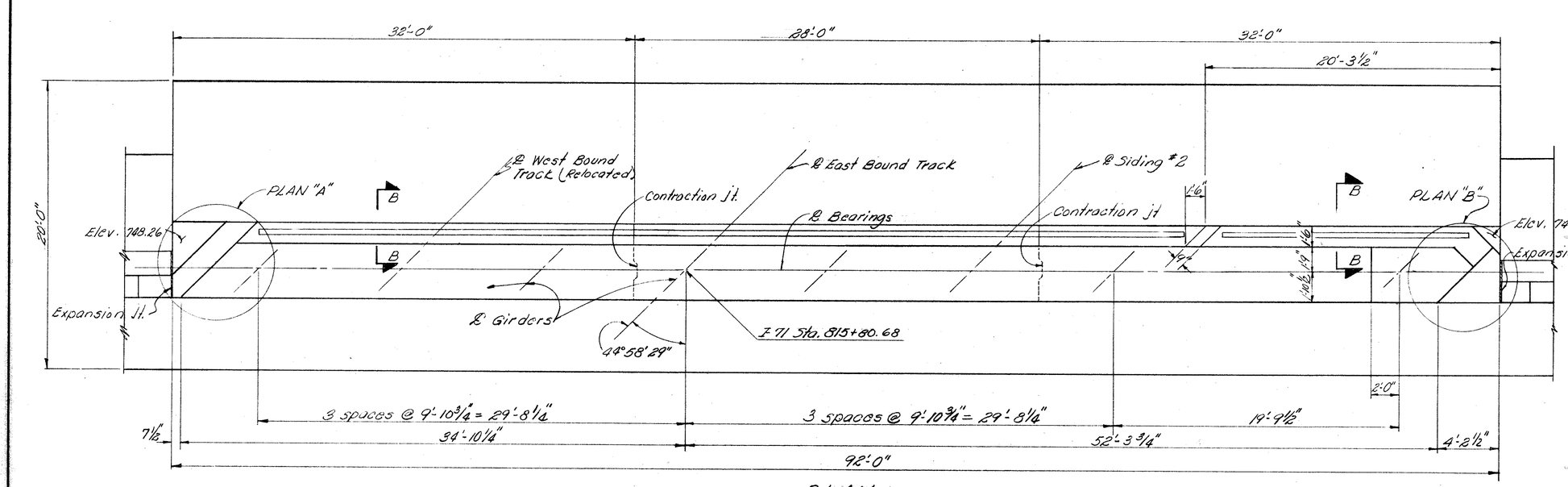
TYPICAL CROSS SECTION
BRIDGE NO. CUY.-I 71-1381
I 71 UNDER NEW YORK CENTRAL R.R.
CUYAHOGA COUNTY STA. 815+05.75

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K.	V.K.	E.A.	R.A.K.	EEE	9-17-64	5-25-65

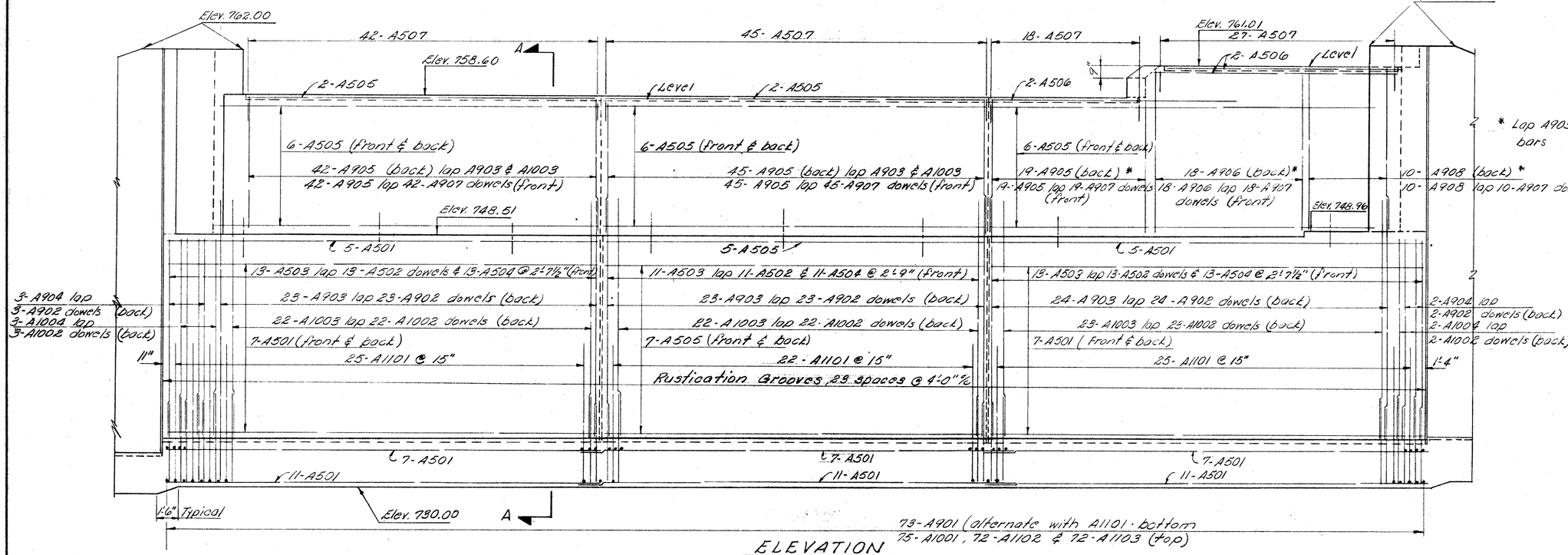
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

232
268

CUYAHOGA COUNTY
CUY-71-13.68



PLAN



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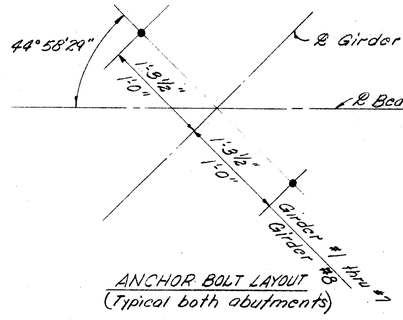

ANCHOR BOLT LAYOUT
(Typical both abutments)

NOTES

POROUS BACKFILL, 2'-0" thick, full length of abutment and wings shall extend up to the bottom of the railroad ballast and to within 2 feet of the finished ground surface on the abutment wingwalls.

BRIDGE SEAT REINFORCING: Special care shall be taken in placing reinforcing steel in the vicinity of the bridge seat so as to avoid interference with the drilling of anchor bolt holes.

PROCEDURE: The top of the backfilling shall not be placed beyond the level of the bridge seat until the superstructure steel has been erected.

RACKOFF ASSOCIATES
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NORTH ABUTMENT DETAILS
BRIDGE NO. CUY-I 71-1381
I-71 UNDER NEW YORK CENTRAL R.R.

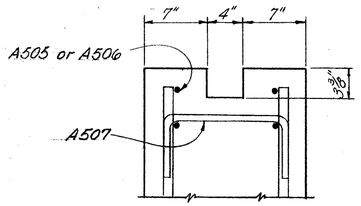
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K.	E.D.A.		R.A.K.	[illegible]	9-17-64	

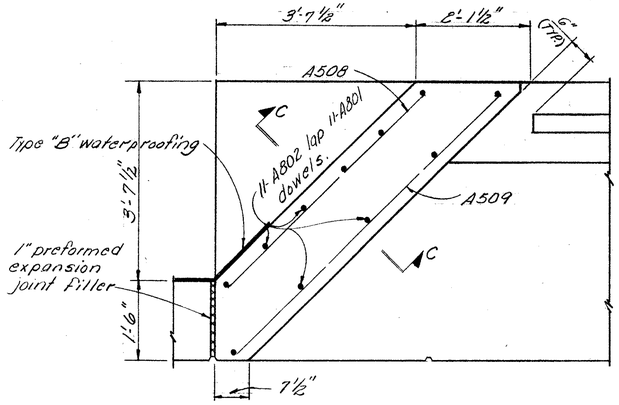
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

233
268

CUYAHOGA COUNTY
CUY-71-13.68



SECTION B-B



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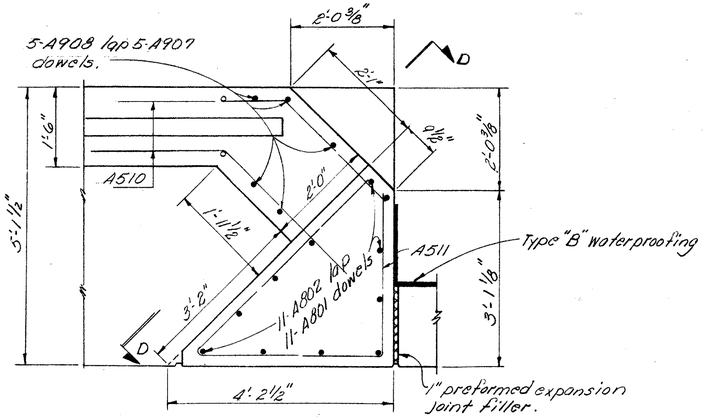

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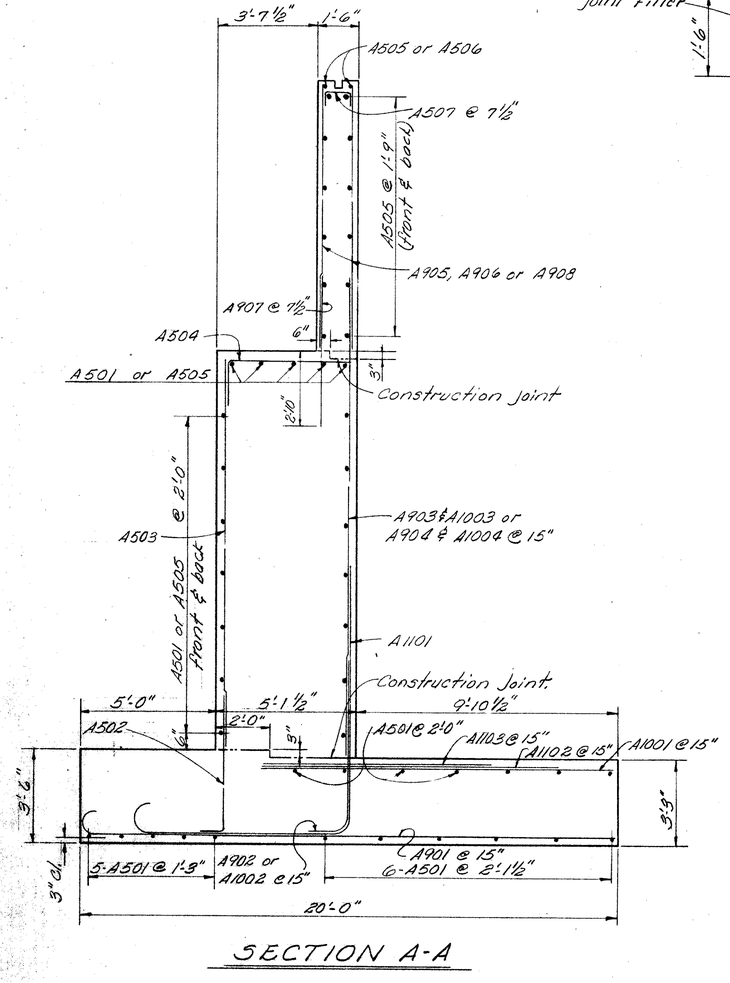

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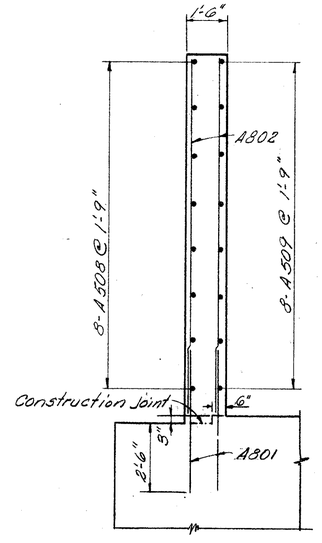

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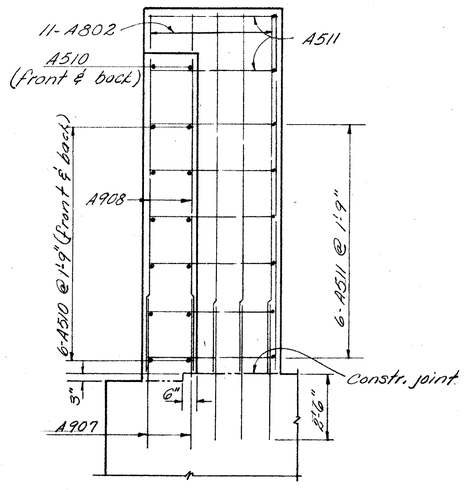
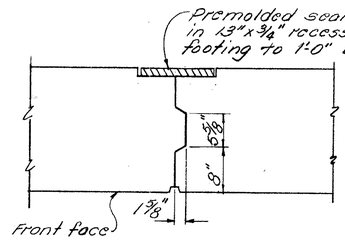
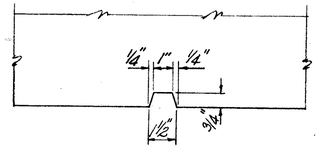


VIEW D-D



CONTRACTION JOINT DETAIL

Typical for both abutments and the wingwalls



VERTICAL RUSTICATION GROOVE

Typical for both abutments and the wingwalls

RACKOFF ASSOCIATES
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NORTH ABUTMENT DETAILS

BRIDGE NO. CUY-171-1381
I-71 UNDER NEW YORK CENTRAL R.R.

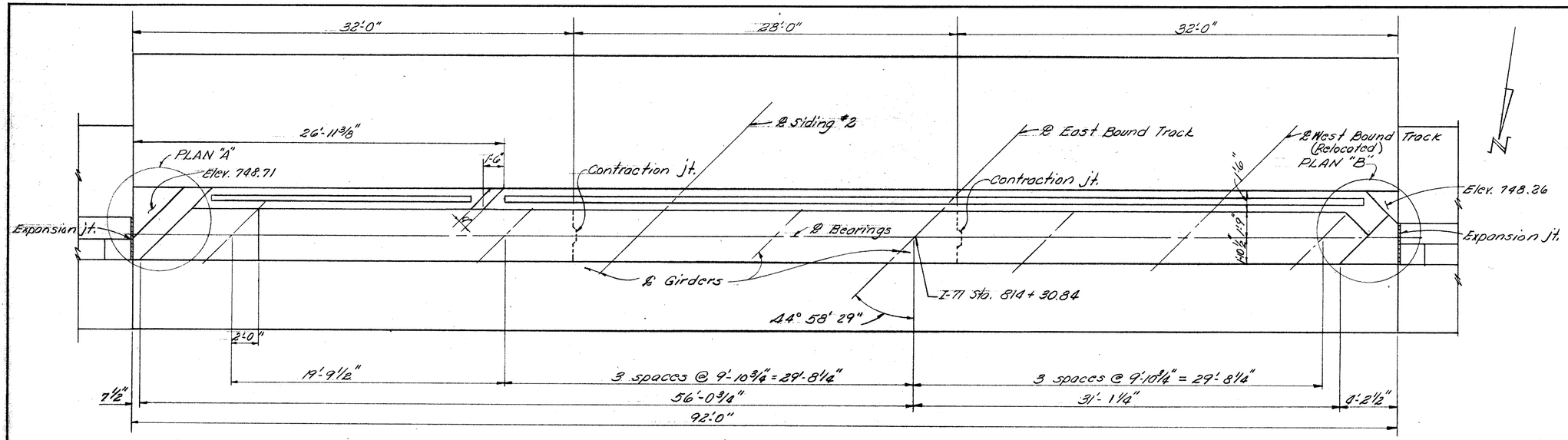
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K.		E.D.A.	R.A.K.	6&2	9-17 64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

234
208

CUYAHOGA COUNTY
CUY-71-13.68



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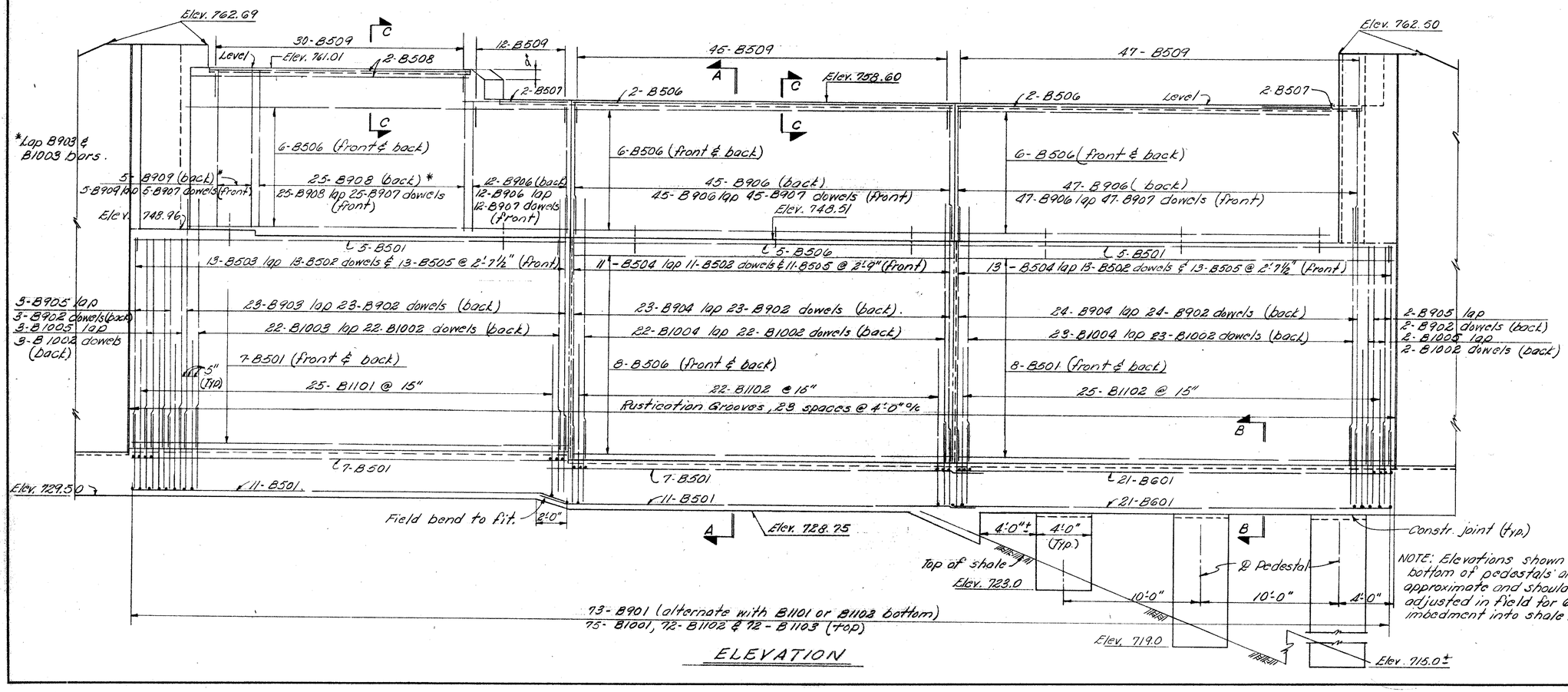

ELEVATION

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ENGINEERS COLUMBUS, OHIO

SOUTH ABUTMENT DETAILS
BRIDGE NO. CUY-171-1381
I-71 UNDER NEW YORK CENTRAL R.R.

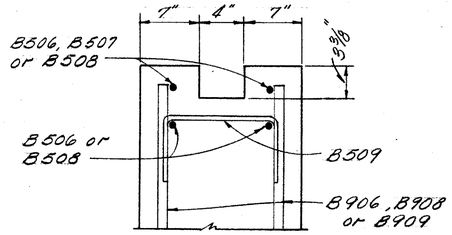
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V. K.		E.D.A.	R.A.K.	[illegible]	9-17-64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

235
268

CUYAHOGA COUNTY
CUY-71-13.68



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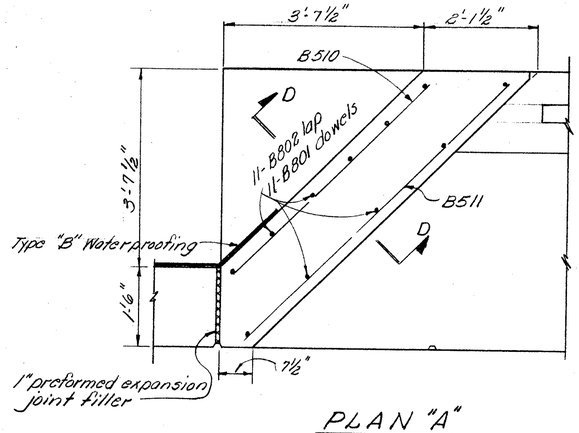

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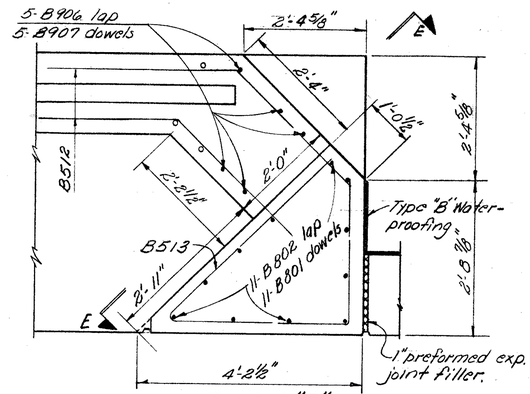

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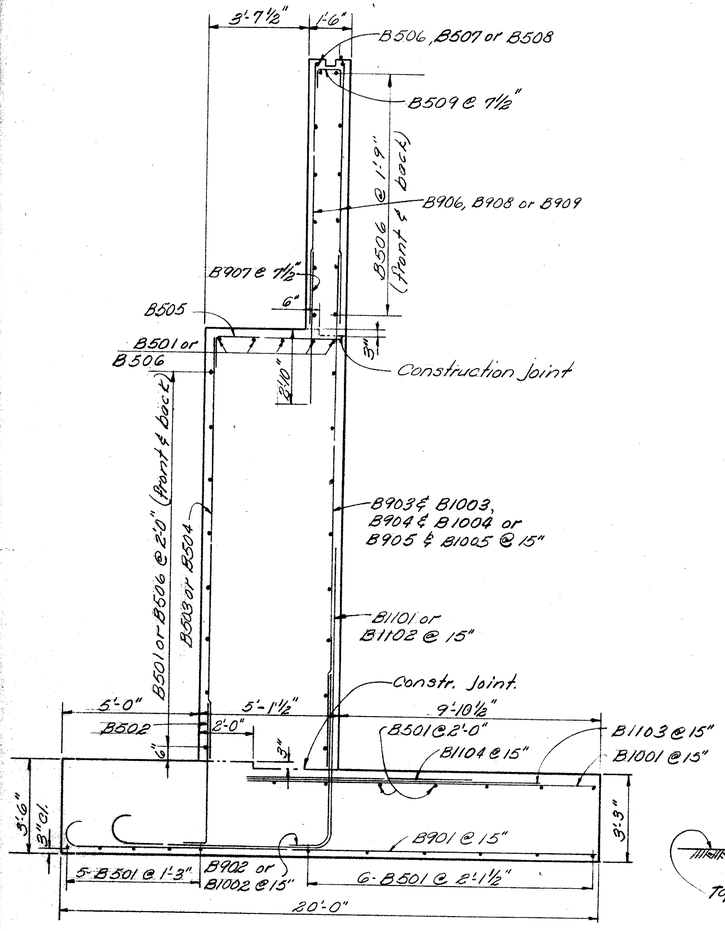
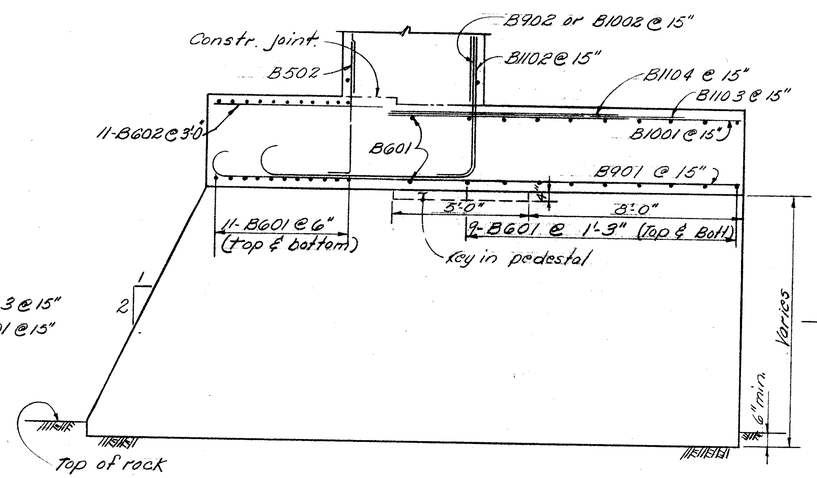
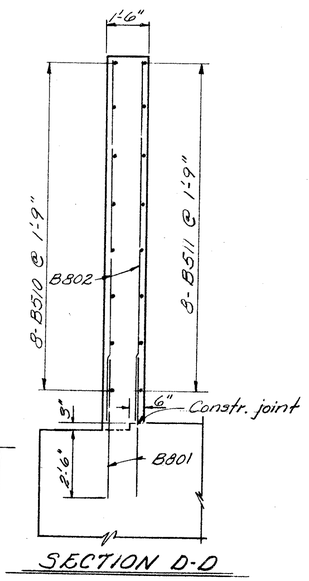


SECTION A-A



SECTION B-B

Dimensions not shown same as in Section A-A



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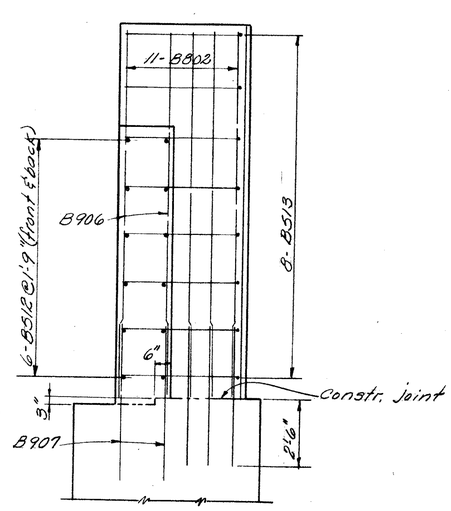

VIEW E-E

RACKOFF ASSOCIATES
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SOUTH ABUTMENT DETAILS
BRIDGE NO. CUY.-171-1381
I-71 UNDER NEW YORK CENTRAL R.R.

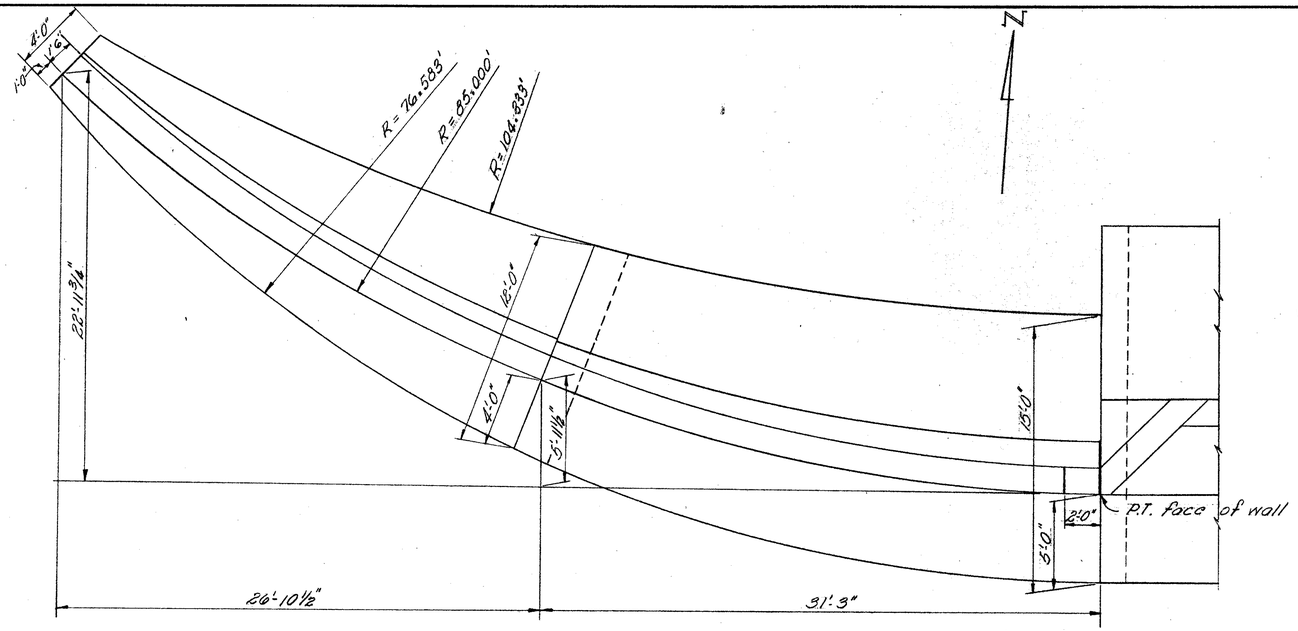
CUYAHOGA COUNTY STA. 815+05.76

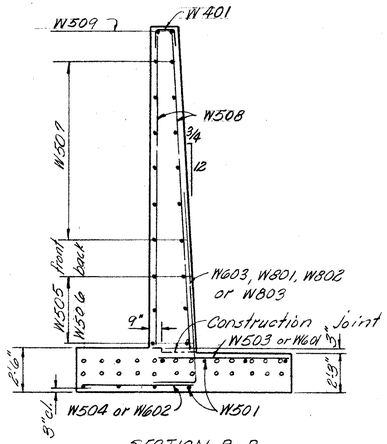
Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K.		E.D.A.	R.A.K.	[illegible]	9-17 64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

236
268

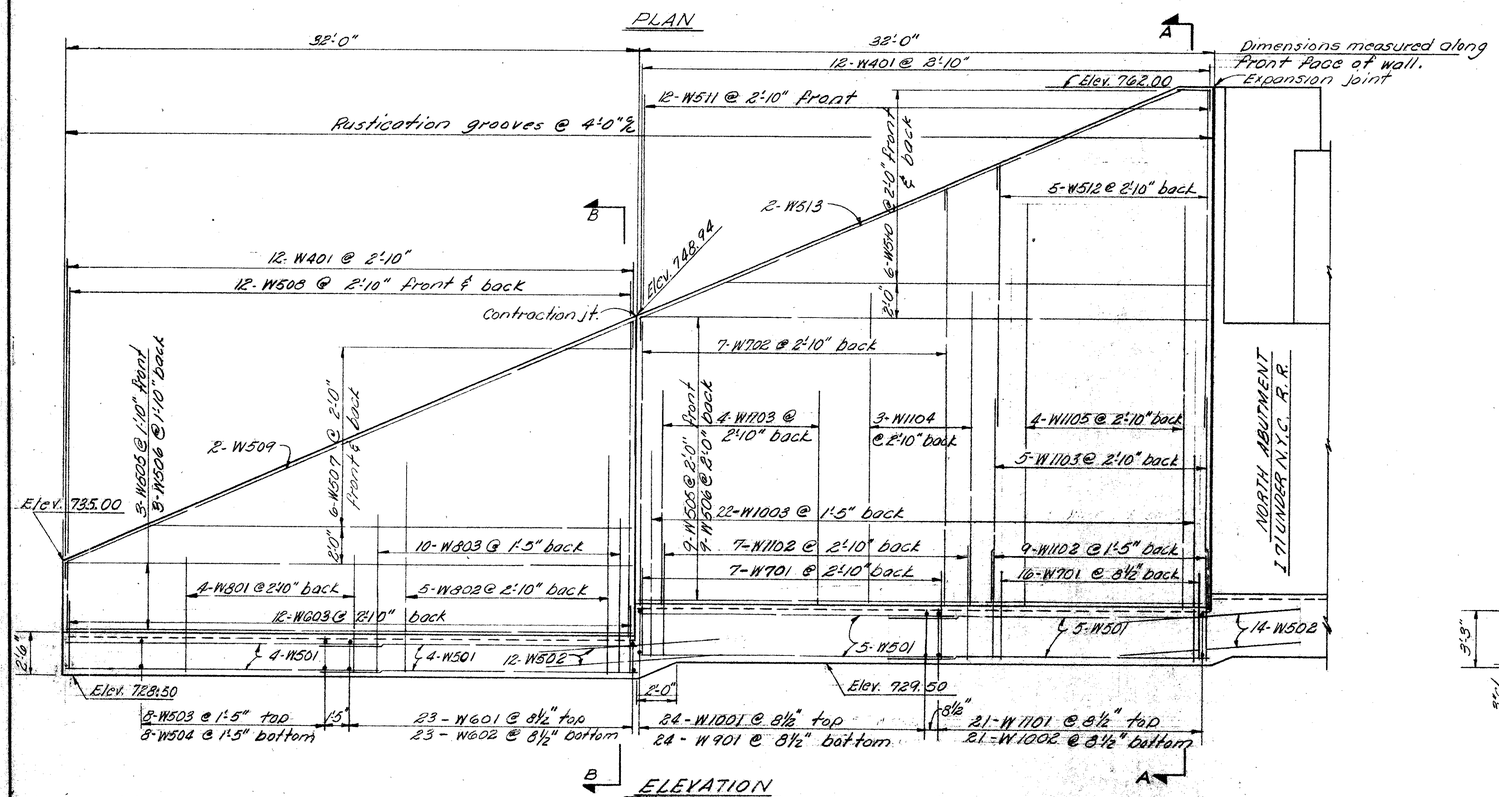
CUYAHOGA COUNTY
CUY-71-13.68



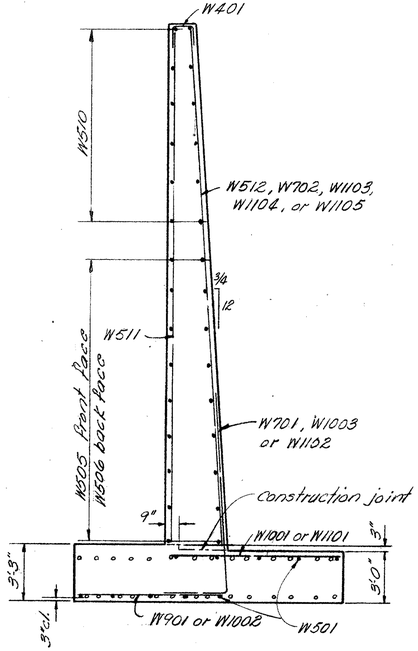


SECTION B-B

PLAN



Dimensions measured along Front face of wall.
Expansion joint



SECTION A-A

FOOTING DOWELS
o - W502 centered under Expansion or Contraction joint

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

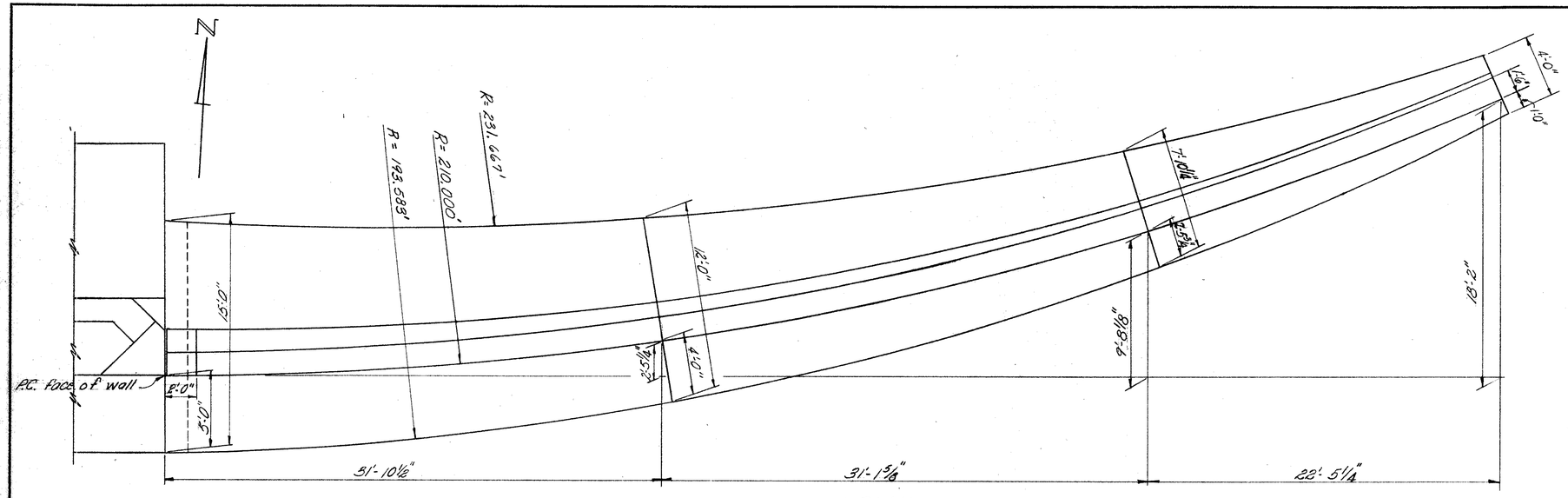
NORTH WEST WINGWALL
BRIDGE NO. CUY-I 71 - 1381
I 71 UNDER NEW YORK CENTRAL R.R.
CUYAHOGA COUNTY STA. 815 + 05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
W.F.		E.D.A.	V.K.	[illegible]	9-17 64	

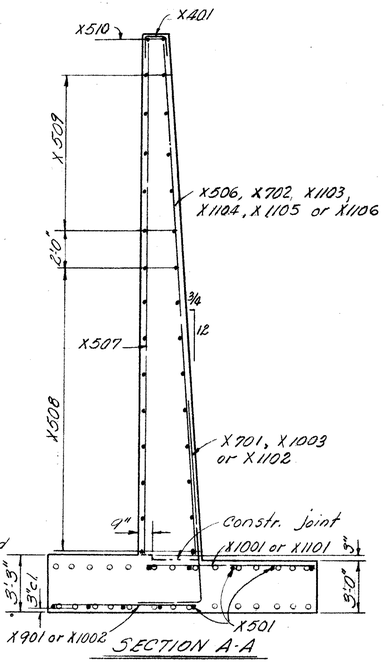
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

237
268

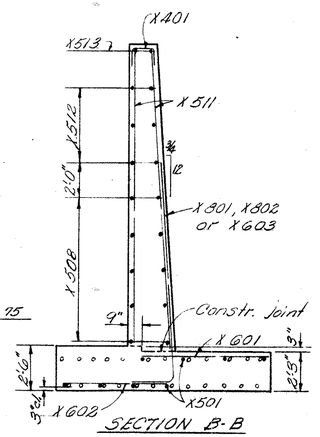
CUYAHOGA COUNTY
CUY-71-13.68



PLAN



SECTION A-A



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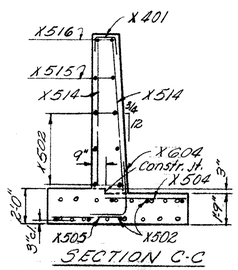
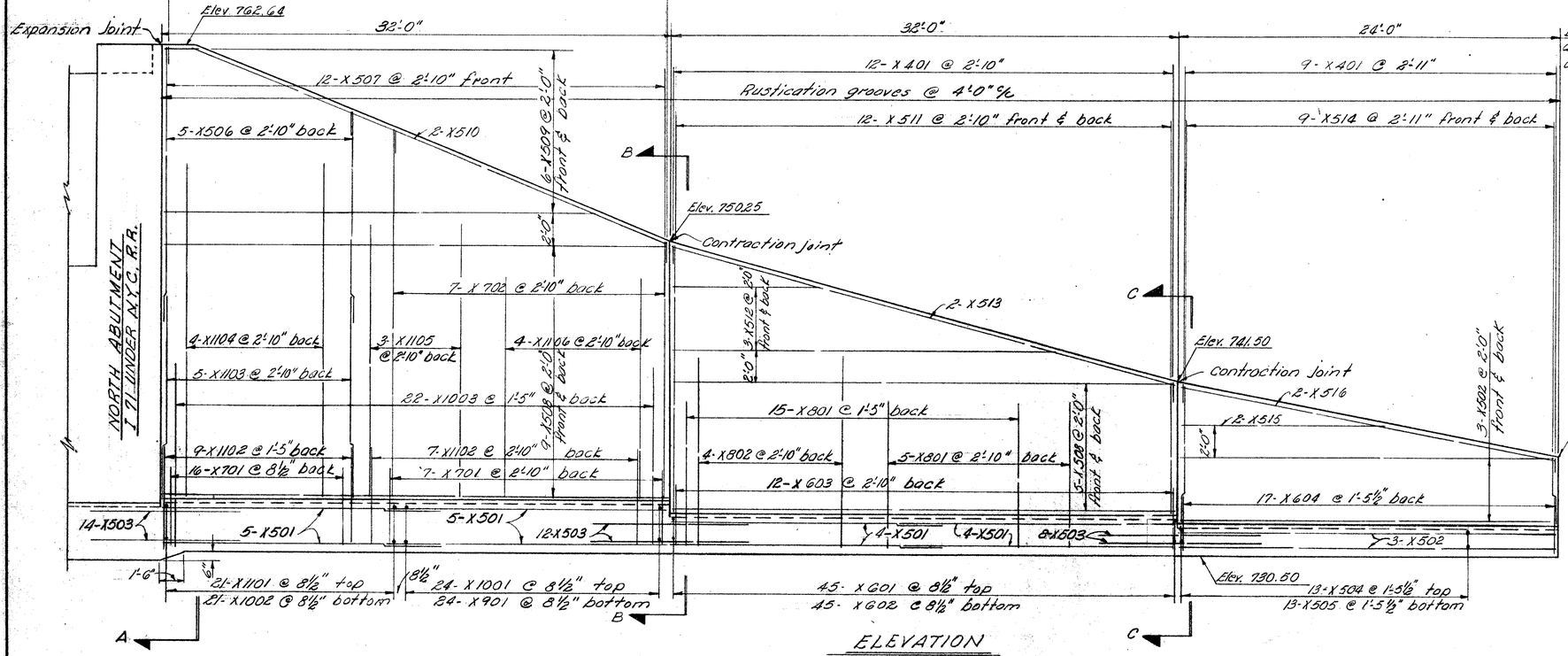


SECTION C-C



ELEVATION

Dimensions measured along front face of wall.

FOOTING DOWELS

○ = X503 centered under expansion or contraction joint.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

NORTHEAST WINGWALL

BRIDGE NO. CUY-I 71-1381
I 71 UNDER NEW YORK CENTRAL R. R.

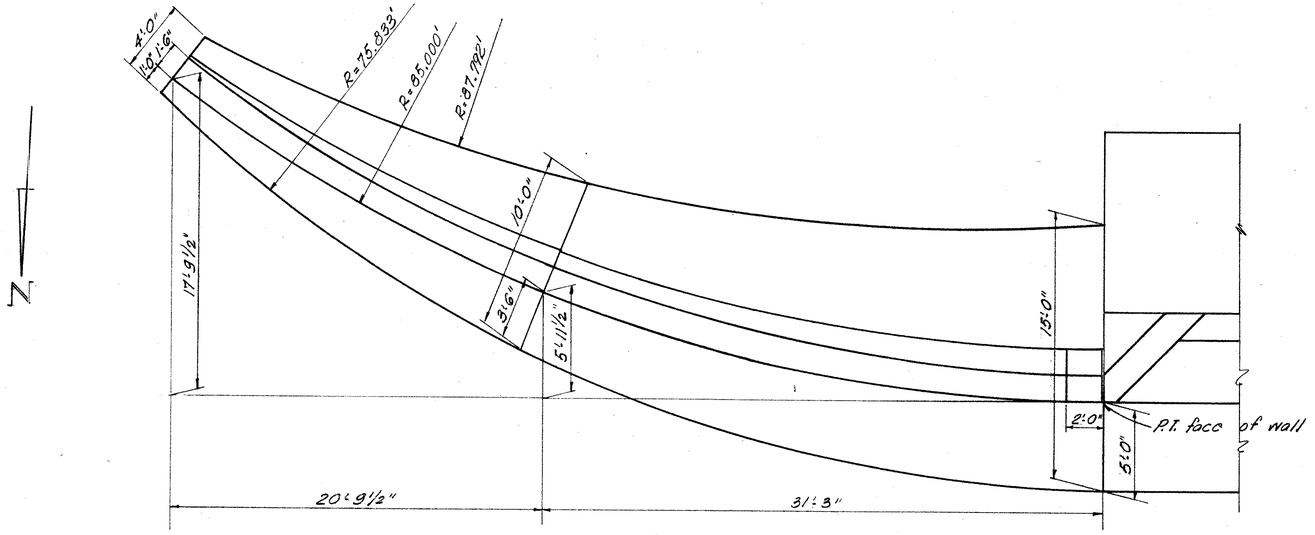
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
W.F.		E.D.A.	V.K.	[illegible]	9-17 64	

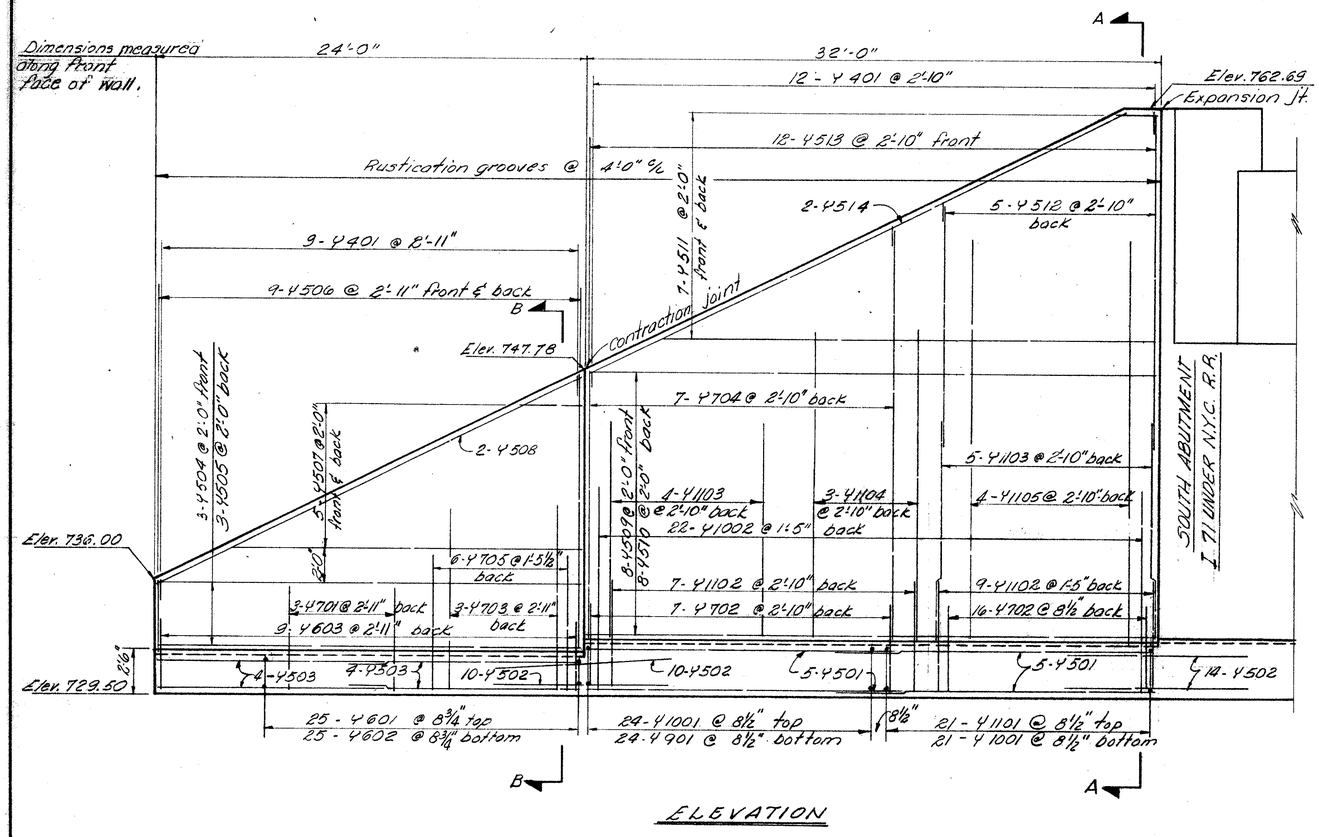
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

238
268

CUYAHOGA COUNTY
CUY-71-13.68



PLAN



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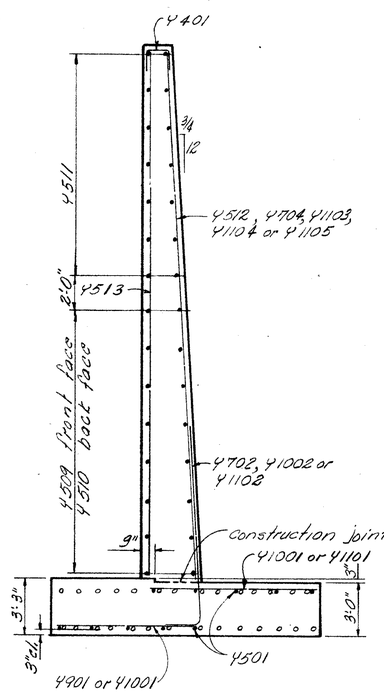
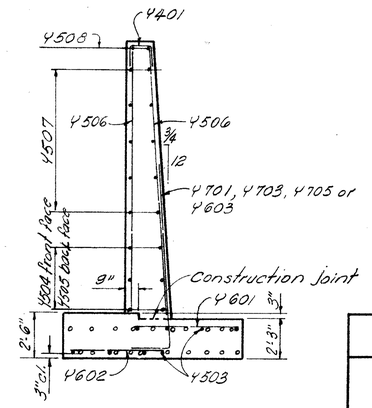


SECTION A-A



SECTION B-B

FOOTING DOWELS

0 - Y 502 centered under expansion or contraction joint.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

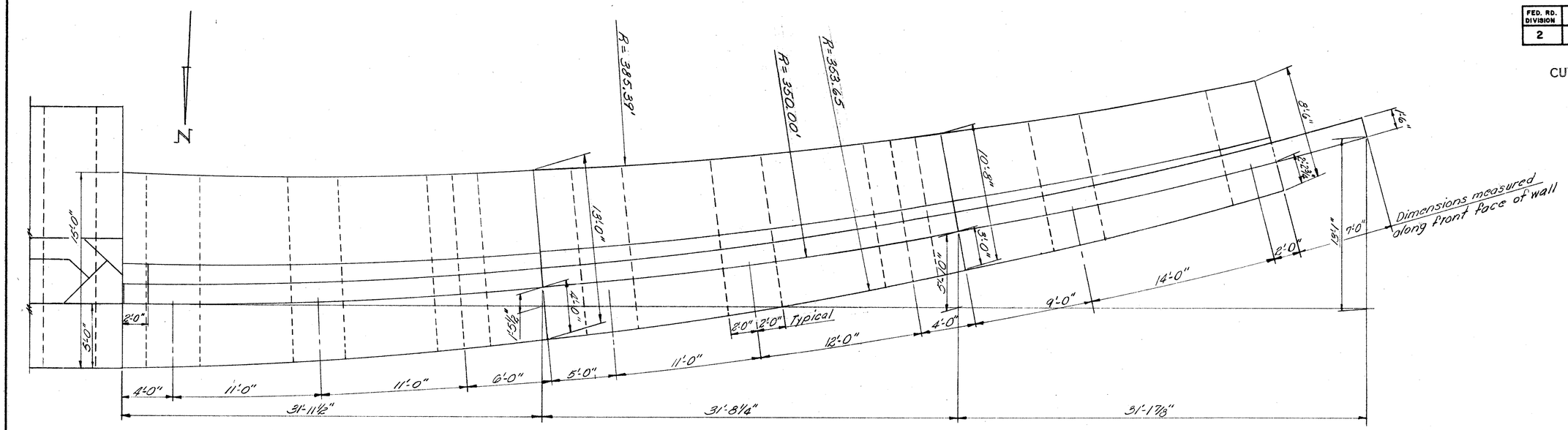
SOUTHEAST WINGWALL
BRIDGE NO. CUY- I 71 - 1381
I 71 UNDER NEW YORK CENTRAL R.R.
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
W.F.		G. M.	V.K.	[illegible]	9-17 64	

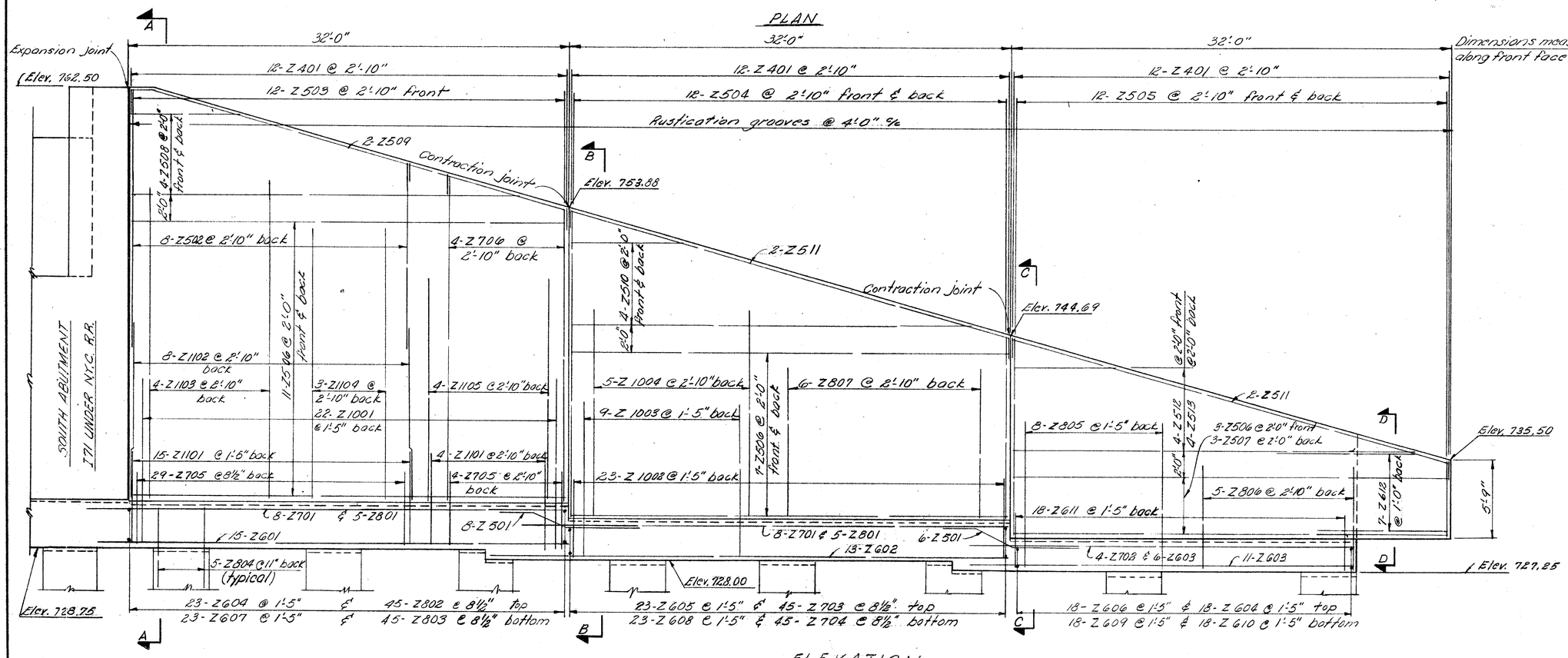
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

239
268

CUYAHOGA COUNTY
CUY-71-13.68



PLAN



ELEVATION

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

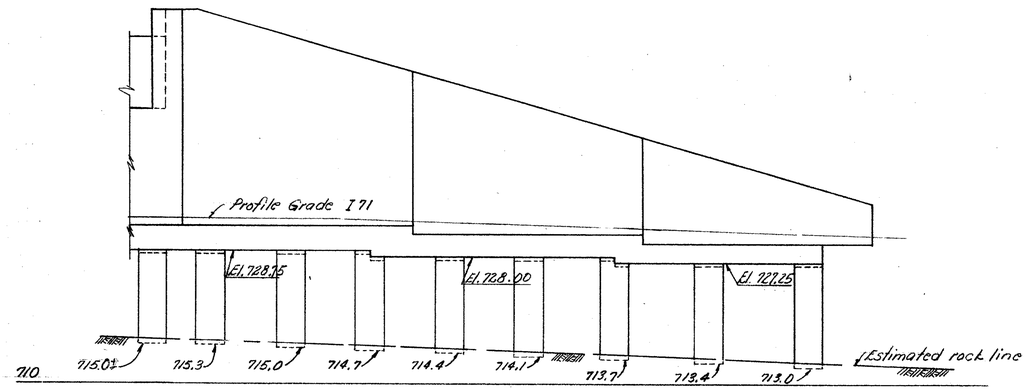
SOUTHWEST WINGWALL
BRIDGE NO. CUY - I 71 - 1381
I 71 UNDER NEW YORK CENTRAL R. R.
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
W.F.		E.D.A.	V.K.	[illegible]	9-17 64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

240
268

CUYAHOGA COUNTY
CUY-71-13.68



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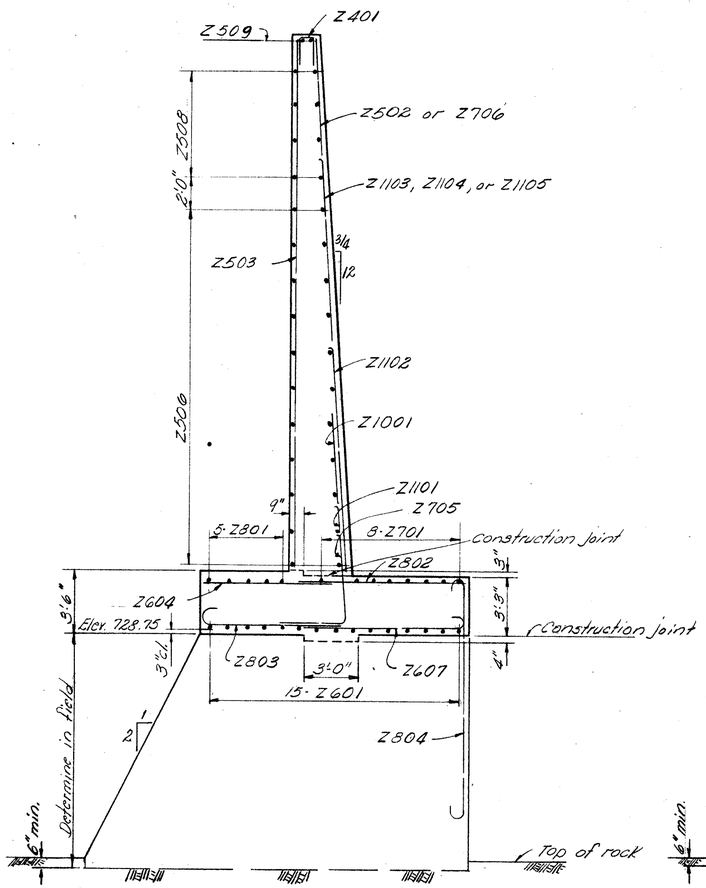
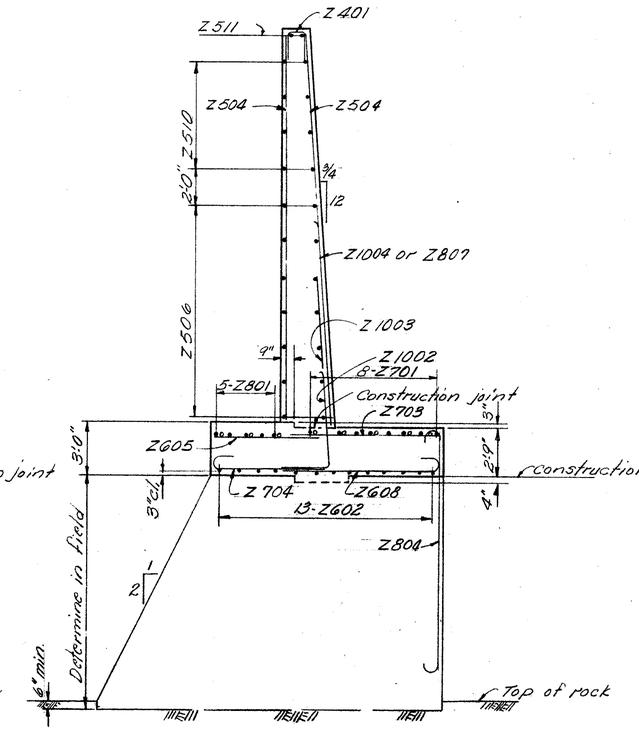
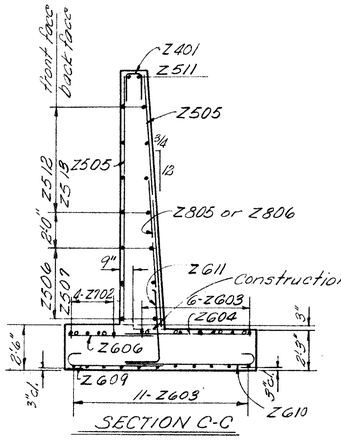


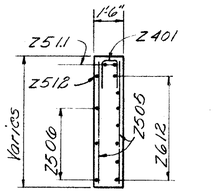
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

FOOTING DOWELS
○ - Z501 centered under contraction joint

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

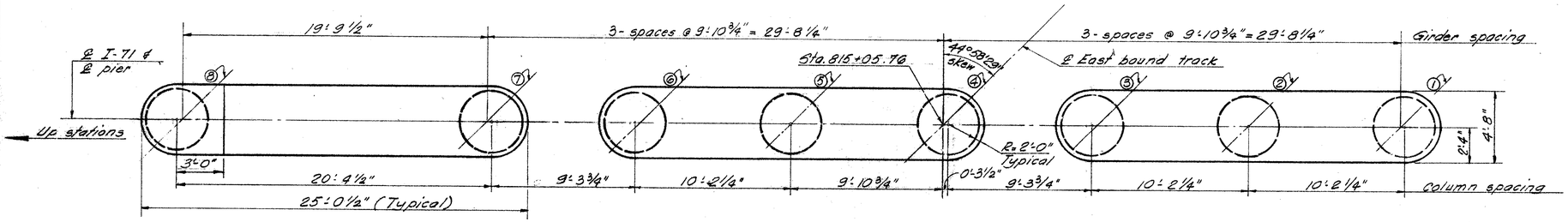
SOUTH WEST WINGWALL
BRIDGE NO. CUY-I 71-1381
I 71 UNDER NEW YORK CENTRAL R.R.
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
W.F.		E.D.A.	V.K.	666	9-17 64	

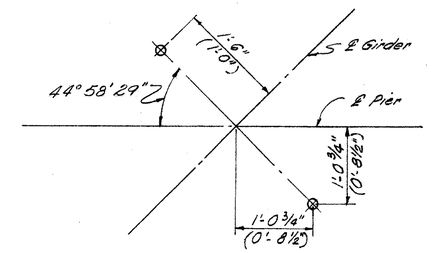
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

241
268

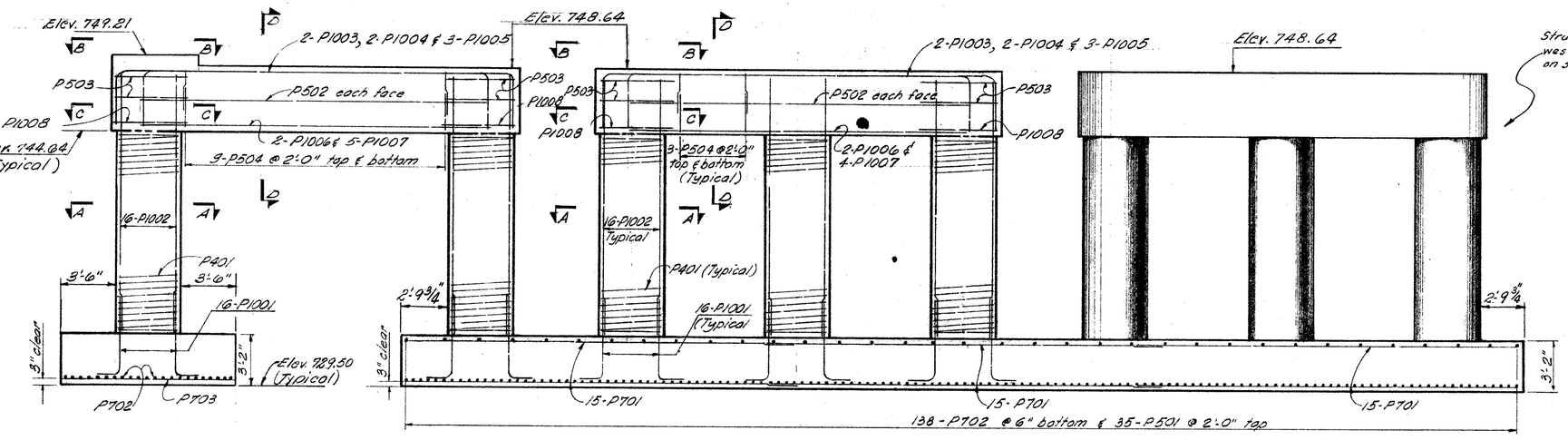
CUYAHOGA COUNTY
CUY-71-13.68



CAP PLAN



ANCHOR BOLT LAYOUT
(Dimensions shown ( ) are for girder B only)



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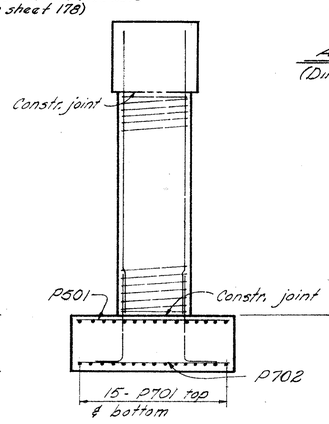
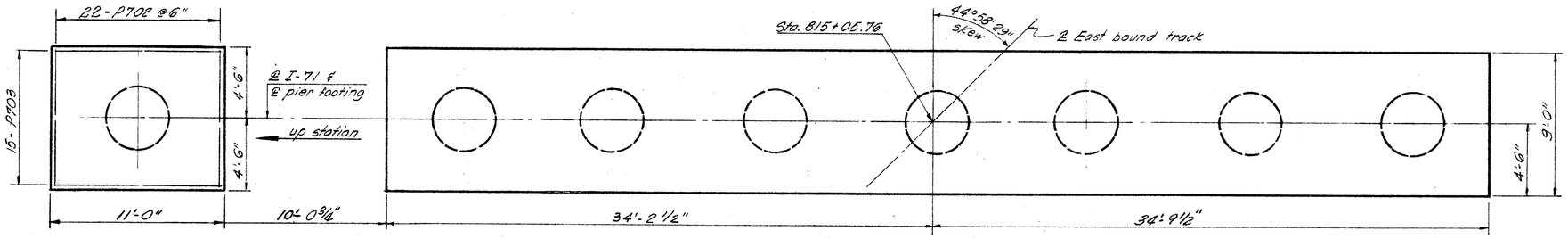
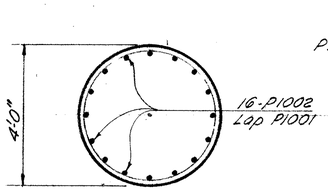


END ELEVATION

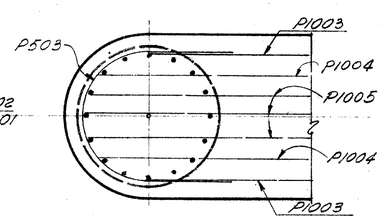


FOOTING PLAN

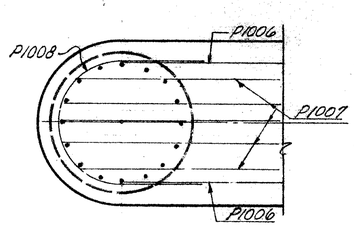
BRIDGE SEAT REINFORCING: Special care shall be taken in placing reinforcing steel in the vicinity of the bridge seat so as to avoid interference with the drilling of anchor bolt holes.



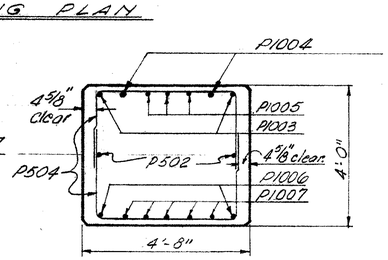
SECTION A-A



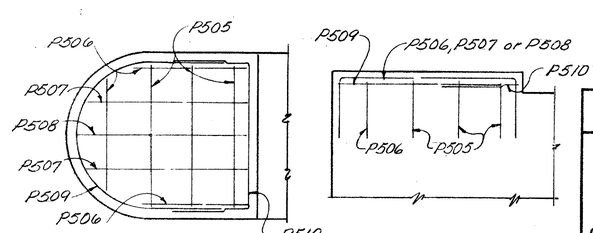
VIEW B-B



SECTION C-C



SECTION D-D



PLAN

ELEVATION

PEDESTAL REINFORCING

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

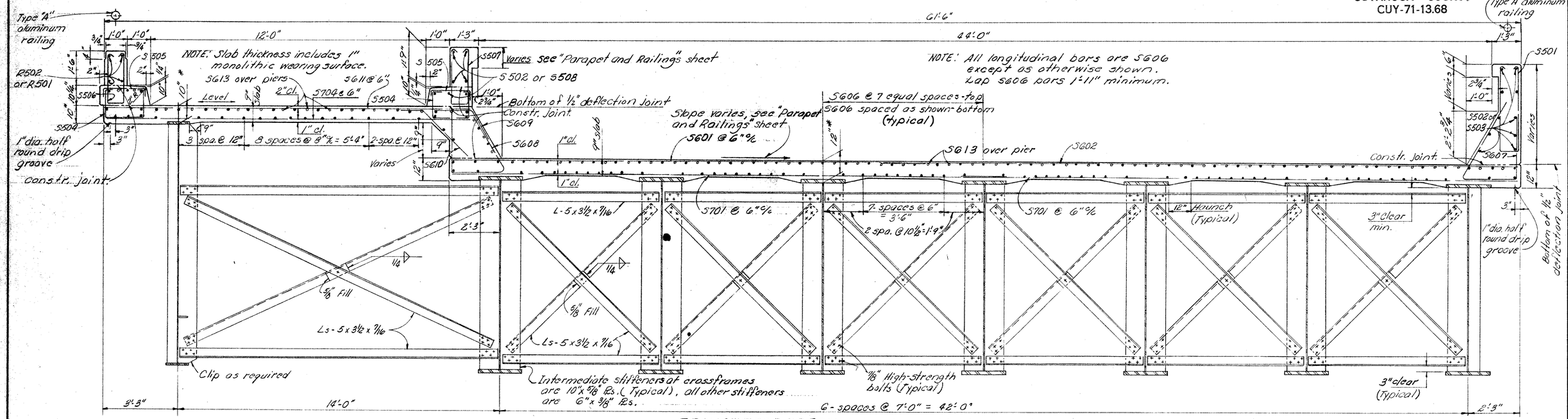
PIER DETAILS
BRIDGE NO. CUY.-I71-1381
I 71 UNDER NEW YORK CENTRAL R.R.
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K.	V.K.	G.M.	L.F.L.	[illegible]	9-17-64	

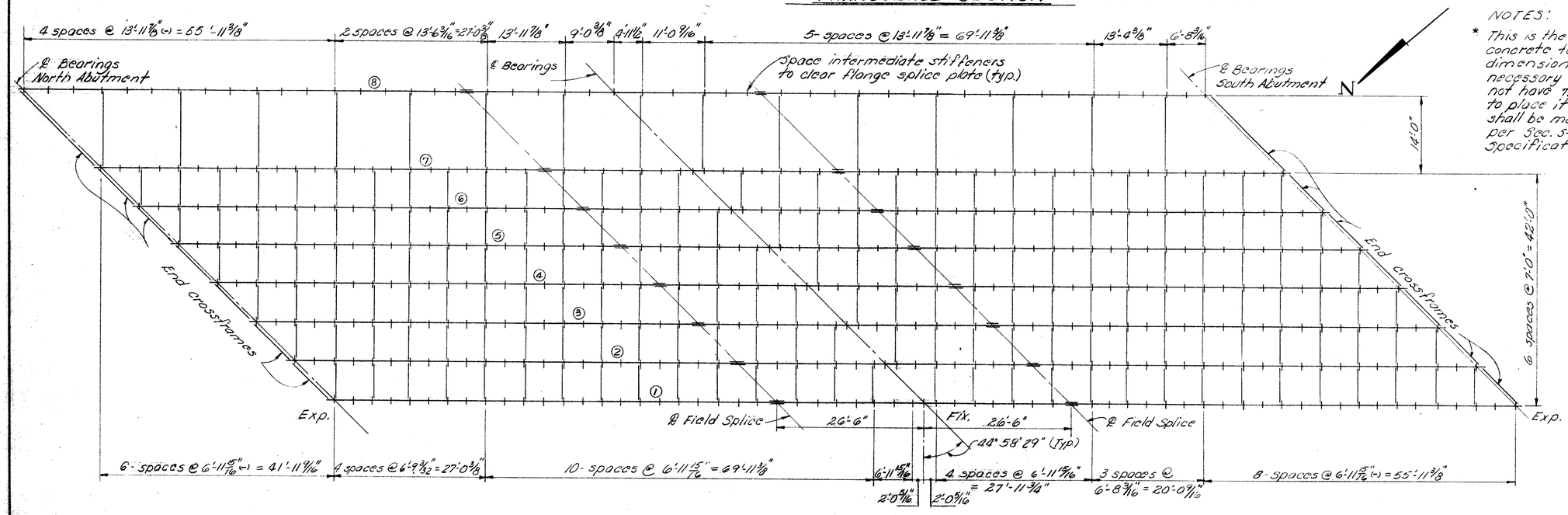
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

242
268

CUYAHOGA COUNTY
CUY-71-13.68



TRANSVERSE SECTION See sheet 231 for other details.



STEEL FRAMING PLAN

NOTES:

* This is the nominal dimension. The quantity of deck concrete to be paid for shall be based on this dimension, even though deviation from it may be necessary because the top flange of the girder may not have the exact camber or conformation required to place it parallel to the finished grade. Deduction shall be made for volume of encased steel plates as per Sec. 5-1.25 of the Construction and Material Specifications.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

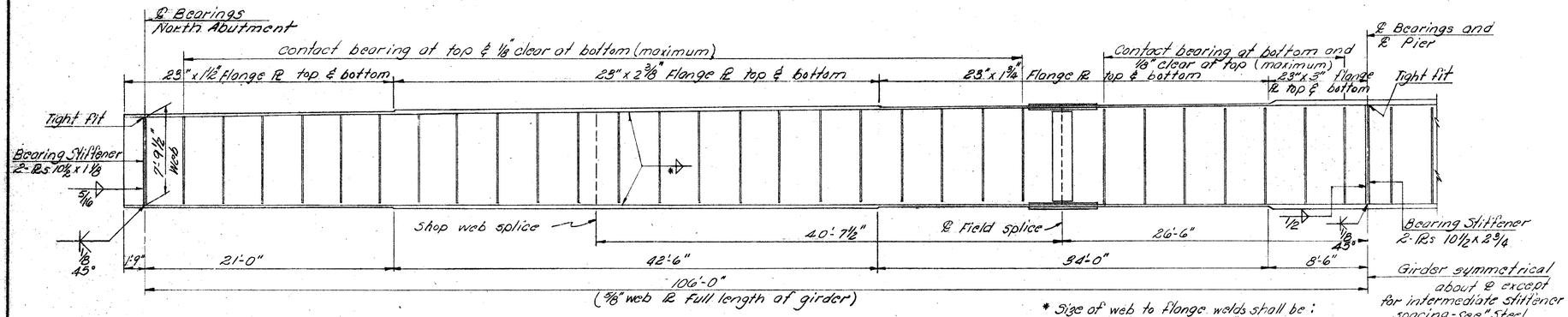
FRAMING PLAN & CROSS SECTION
BRIDGE NO. CUY.-I 71-1381
I 71 UNDER NEW YORK CENTRAL R.R.
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K.	V.K.	E.A.	R.A.K.	[illegible]	9-17 64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

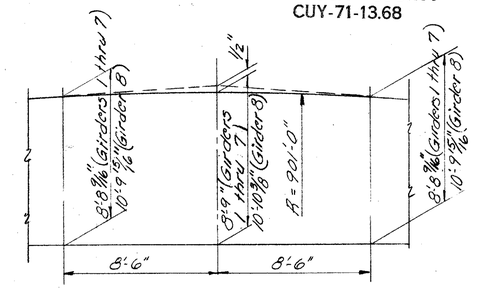
243
268

CUYAHOGA COUNTY
CUY-71-13.68

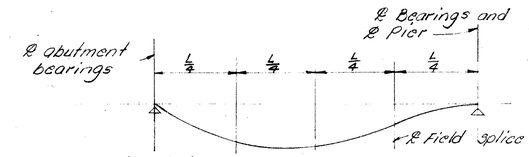


GIRDER HALF-ELEVATION
(TYPICAL GIRDERS 1 THRU 7)

* Size of web to flange welds shall be:
5/16" fillet welds for 1 1/2" flange plates,
3/8" fillet welds for 1 3/4" flange plates,
1/2" fillet welds for 2 3/8" and 3" flange plates.

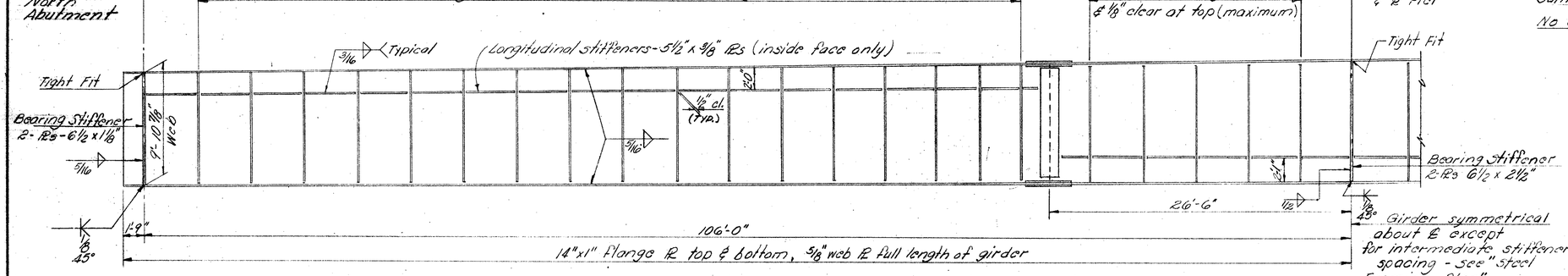


WEB ROUNDING AT PIER

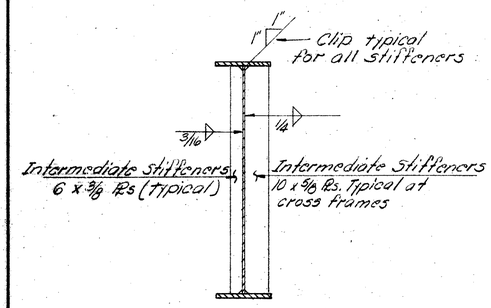


Deflection due to weight of steel	1/16"	1/16"	1/32"
Deflection due to remaining dead load	3/16"	7/32"	3/32"
Sum of deflections	1/4"	9/32"	1/8"
No camber required			

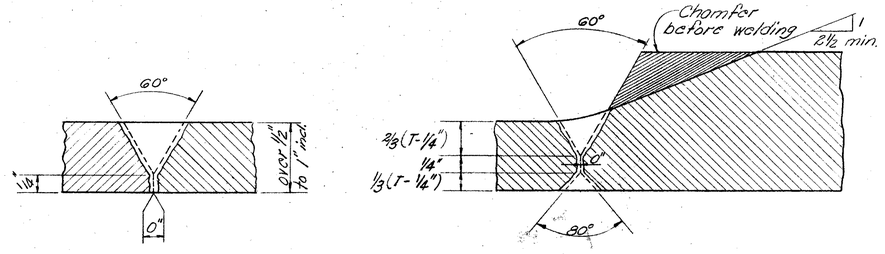
DEFLECTION DIAGRAM



GIRDER 8 HALF ELEVATION



TYPICAL SECTION THRU GIRDER



TYPICAL SHOP WEB & FLANGE SPLICE WELDING DETAILS

NOTE:
Web & flange welds shall be back-gouged and welded after welding far side.
Butt welds on girder flange plates shall be ground flush, the finish grinding being parallel to the direction of stress.

DESIGN DATA

1963 Specification - A.R.E.A.
Impact for diesel and electric locomotives

Cooper E-72 Loading
Dead Load for Interior Girder = 2.86 K/Ft.

MOMENTS & REACTIONS - INTERIOR GIRDER = 1/2 TRACK

	Max. Pos. Moment	Max. Neg. Moment	Reaction @ Abutment	Reaction @ Pier
Dead Load	2,173	4,207	112	383
Live Load	5,010	6,038	250	544
Impact (93.9%)	2,200	2,651	110	239
Total	9,383 Ft-Kips	12,896 Ft-Kips	472 Kips	1166 Kips
Stress	$f_{st.}$ = 13,776 P.S.I.	$f_{st.}$ = 18,562 P.S.I.		

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

GIRDER DETAILS

BRIDGE NO. CUY.-I 71-1381
I 71 UNDER NEW YORK CENTRAL R.R.

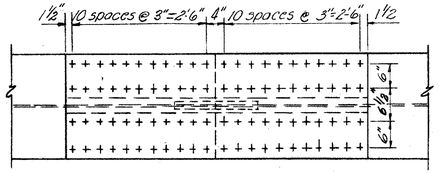
CUYAHOGA COUNTY STA. 815 + 05.76

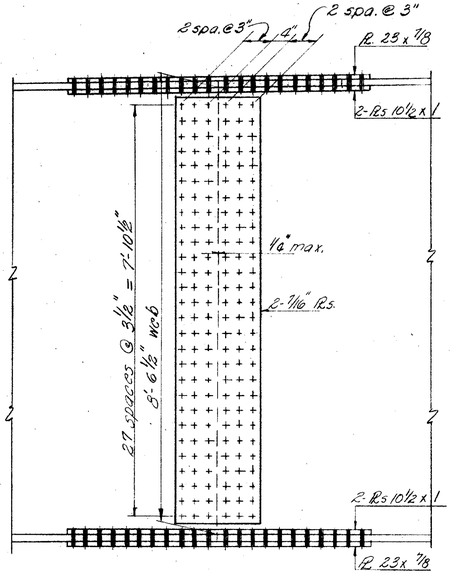
Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K.	V.K.	E.A.	R.A.K.	~~666~~	9-17 64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

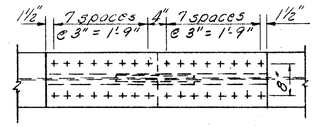
244
268

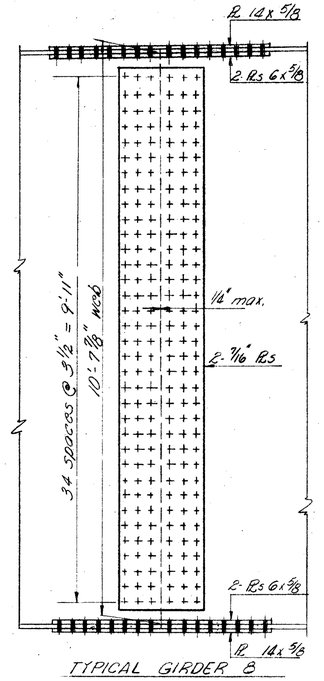
CUYAHOGA COUNTY
CUY-71-13.68





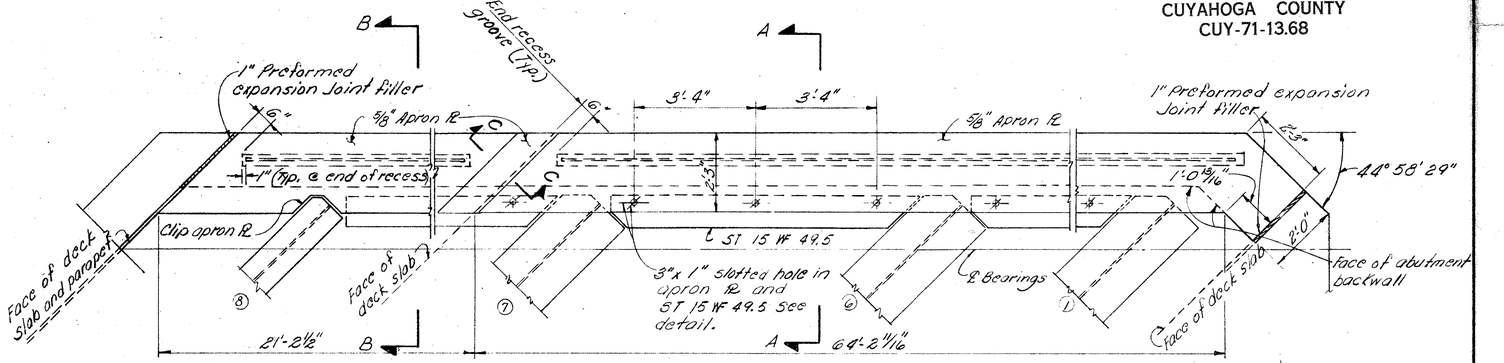
TYPICAL GIRDERS I THRU 7





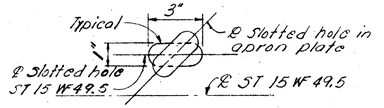
TYPICAL GIRDER B

FIELD SPLICE DETAILS



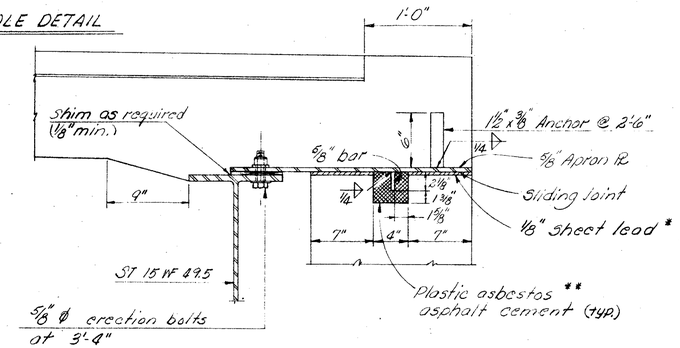
SLIDING JOINT AT BACKWALL

NOTE: Part plan at sliding joint at south abutment backwall shown, North abutment similar.

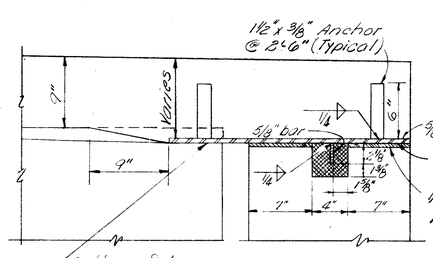


SLOTTED HOLE DETAIL

NOTE: In all field connections use ⅞" ϕ high-strength bolts.

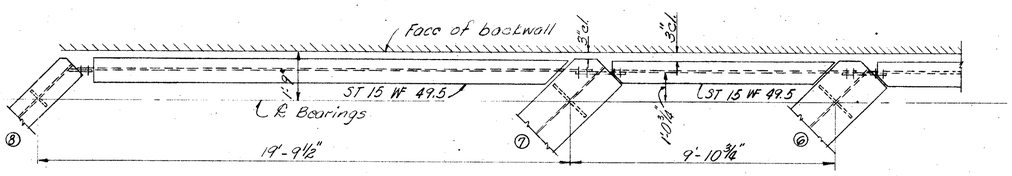


SECTION A-A

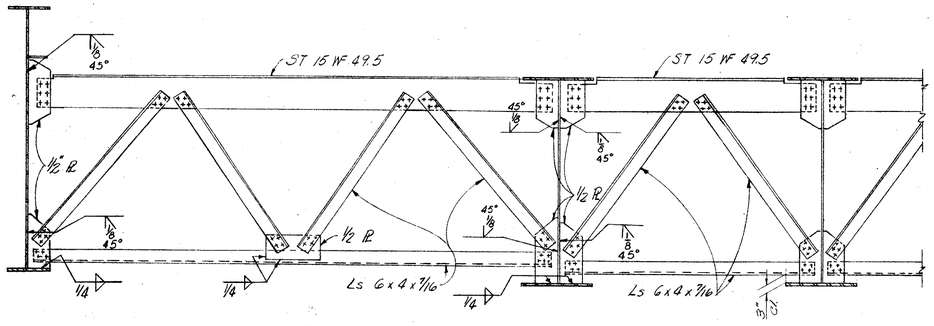


Bottom of top flange of girder 8 and bottom of 5/8" apron PL.

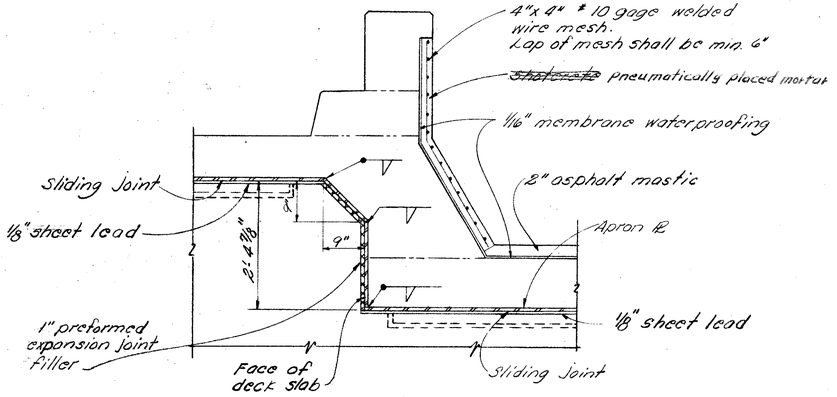
SECTION B-B



PART PLAN - END CROSSFRAME (TYPICAL)



PART ELEVATION - END CROSSFRAME (TYPICAL)



SECTION C-C

NOTES:
* 1/8" sheet lead included with structural steel for payment.
** Included with abutment concrete for payment.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

GIRDER & END DAM DETAILS
BRIDGE NO. CUY.-171-1381
171 UNDER NEW YORK CENTRAL R.R.

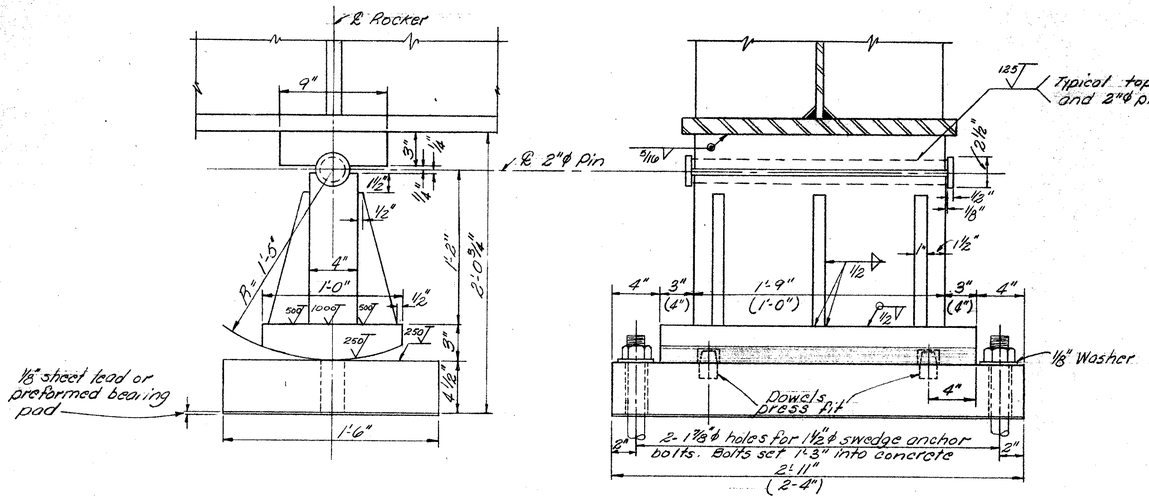
CUYAHOGA COUNTY STA. 815 + 05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K.	V.K.	E.A.	R.A.K.	[illegible]	9-17 64	3-26-65

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

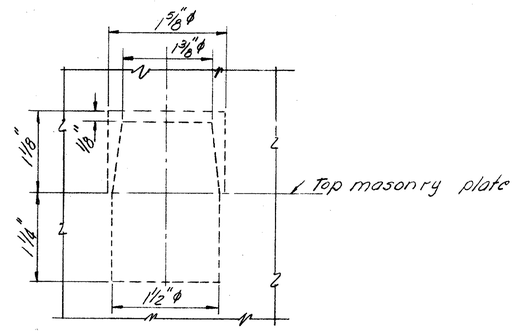
245
268

CUYAHOGA COUNTY
CUY-71-13.68



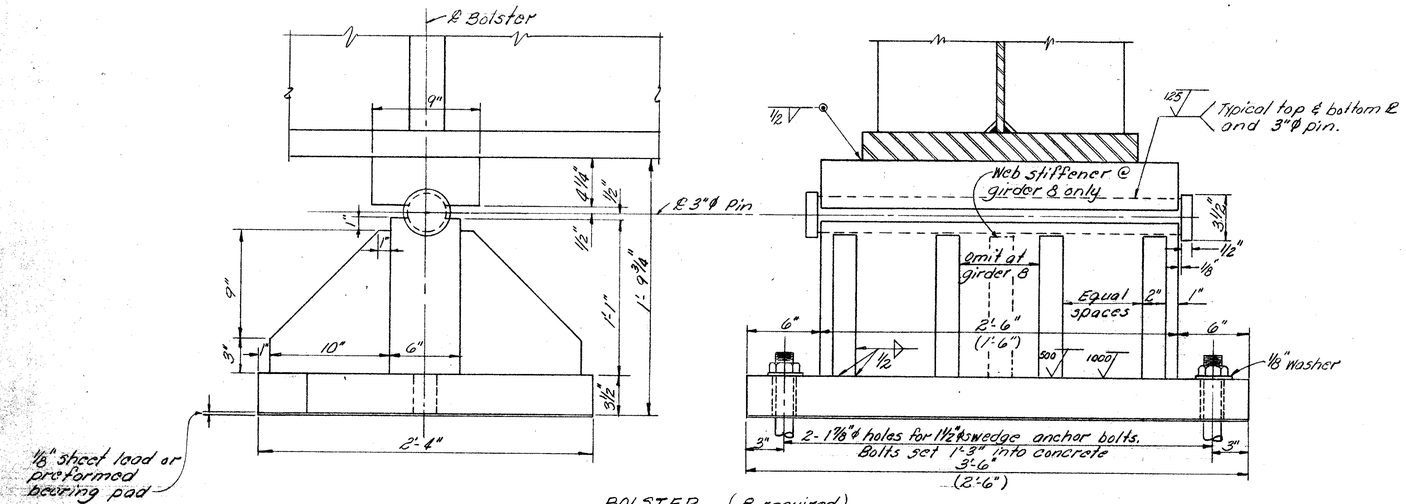
ROCKER (16 required)

Dimensions and details are typical except as shown those ( ) are for girder 8 only



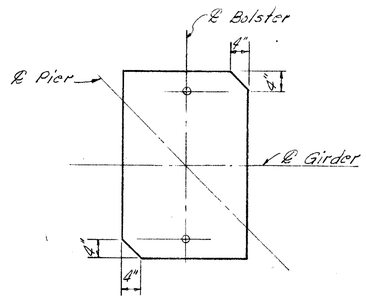
DOWEL DETAIL

NOTE:
Sheet lead included with structural steel for payment.



BOLSTER (8 required)

Dimensions and details are typical except as shown those ( ) are for girder 8 only.



BOLSTER MASONRY ℞
(Girder 1 thru 7 only)

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

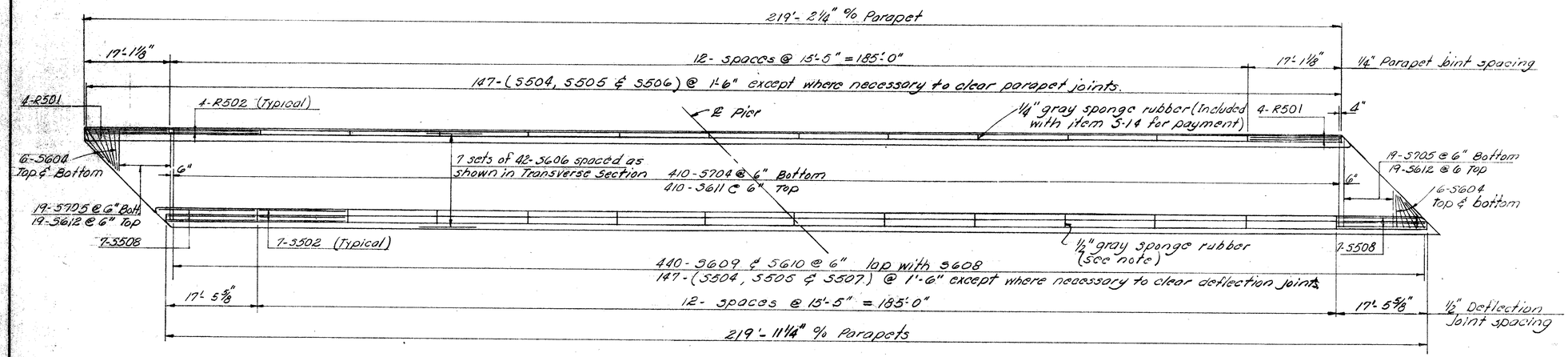
BEARINGS
BRIDGE NO. CUY.-I 71-1381
I 71 UNDER NEW YORK CENTRAL R.R.
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K.	V.K.	E.A.	R.A.K.	~~R.A.K.~~	9-17 64	

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

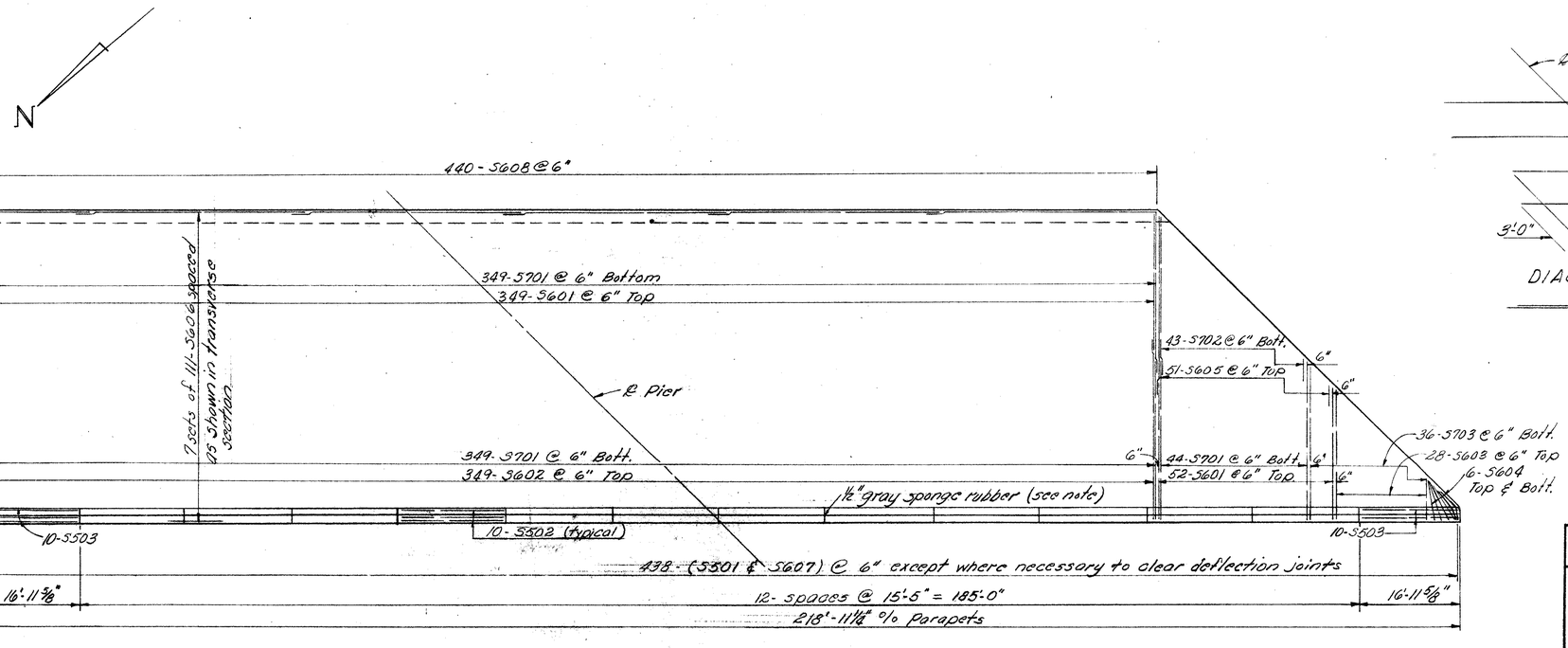
240
208

CUYAHOGA COUNTY
CUY-71-13.68



NOTE: ½" gray sponge rubber preformed expansion joint filler meeting the requirement of Section M-10.02 Type 2, included with parapet concrete for payment.

SERVICE ROAD - DECK REINFORCING PLAN



DECK REINFORCING PLAN

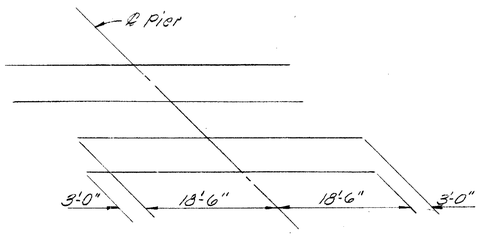


DIAGRAM SHOWING STAGGER OF S613 BARS OVER PIERS

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

CONCRETE DECK
BRIDGE NO. CUY.-I 71-1381
I 71 UNDER NEW YORK CENTRAL R.R

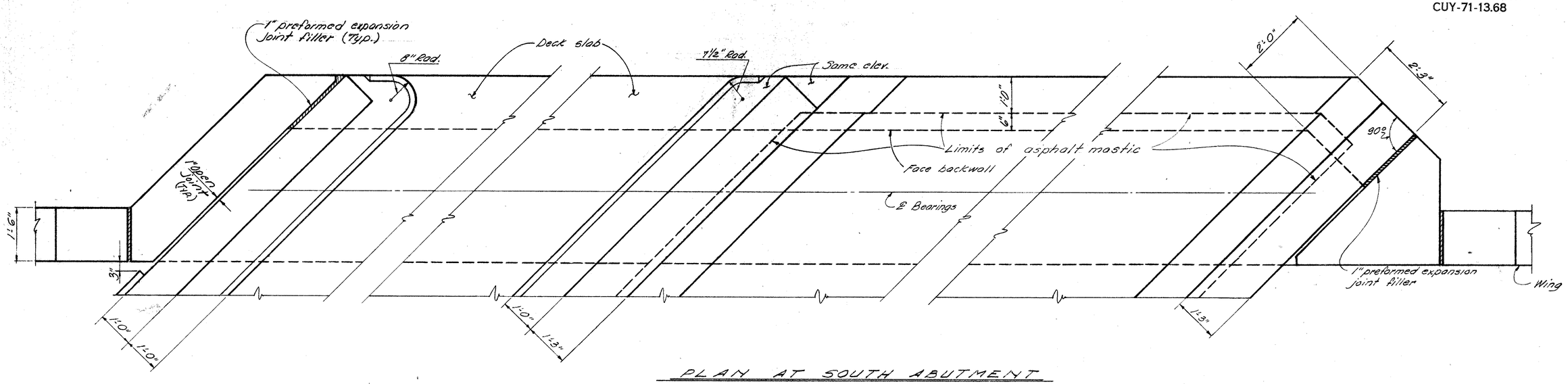
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K.	V.K.	E.A.	R.A.K.	[illegible]	9-17-64	

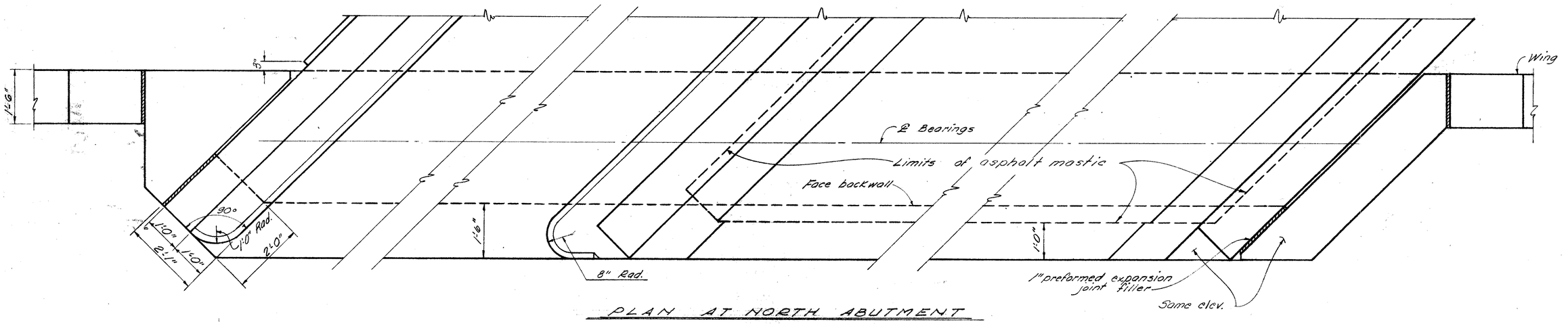
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

247
268

CUYAHOGA COUNTY
CUY-71-13.68



PLAN AT SOUTH ABUTMENT



PLAN AT NORTH ABUTMENT

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

DECK DETAILS

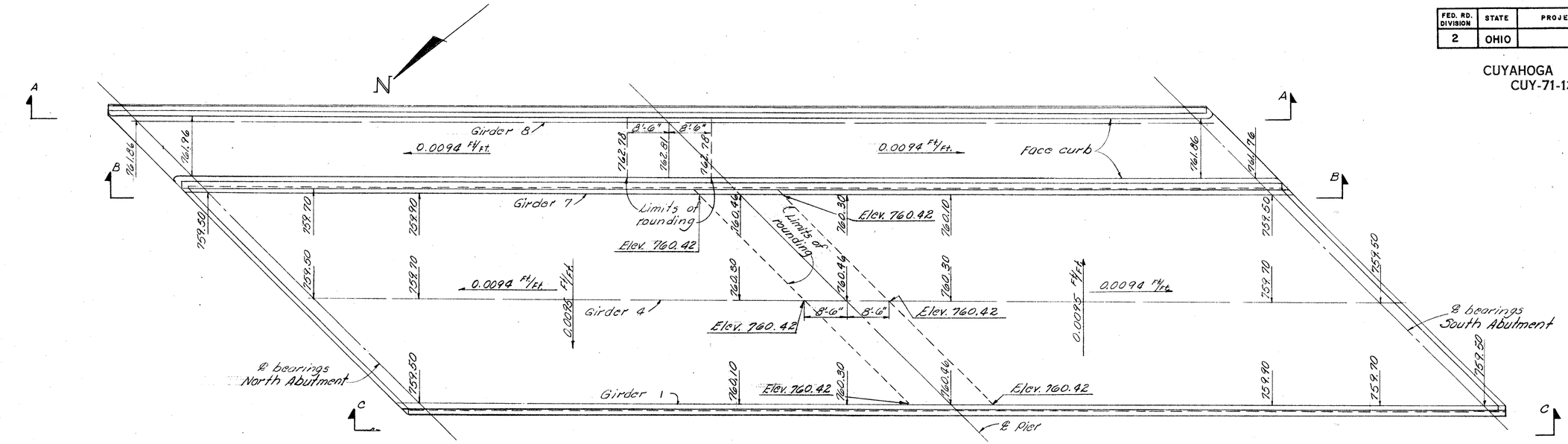
BRIDGE NO. CUY.-I 71-1381
I 71 UNDER NEW YORK CENTRAL R.R.
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised.
R.A.K.	R.A.K.	G. M.	N.K.	[illegible]	9-17 64	

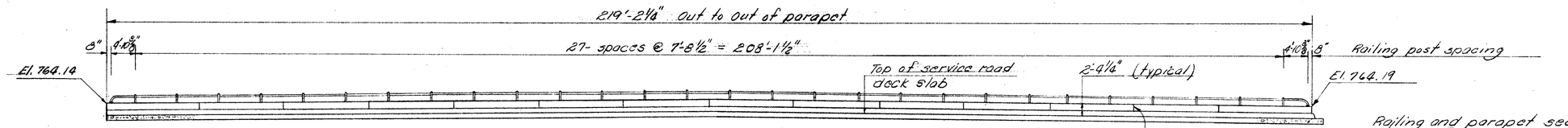
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

248
268

CUYAHOGA COUNTY
CUY-71-13.68



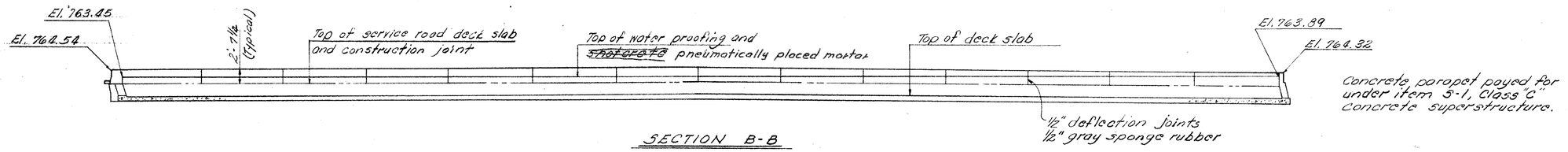
PLAN WITH DECK SLAB ELEVATIONS



Railing and parapet see standard drawing AR-1-57. Railing and parapet payed for under item S-14.

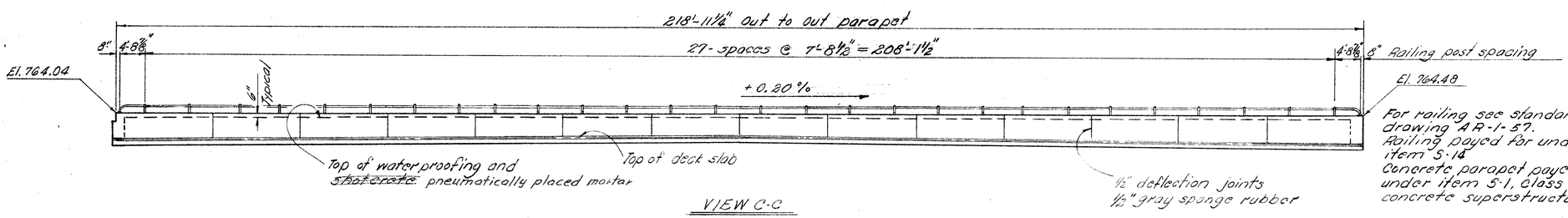
SECTION A-A

(Refer to deck slab reinforcing sheet for details of parapet)



Concrete parapet payed for under item S-1, Class "C" concrete superstructure.

SECTION B-B



For railing see standard drawing AR-1-57. Railing payed for under item S-14
Concrete parapet payed for under item S-1, Class "C" concrete superstructure.

VIEW C-C

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

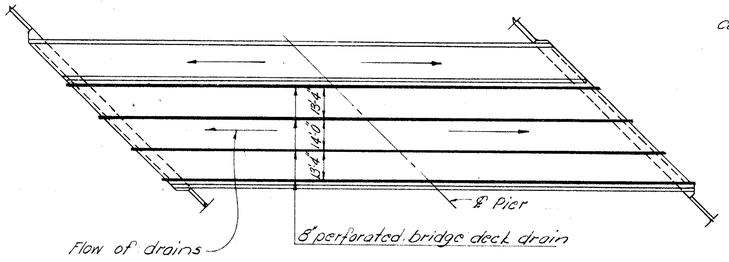
PARAPETS & RAILINGS
BRIDGE NO. CUY-I 71-1381
I 71 UNDER NEW YORK CENTRAL R.R.
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K.	V.K.	E.A.	R.A.K.	[illegible]	9-17 64	3-26-65

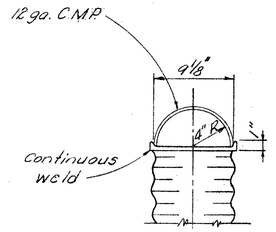
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

249
268

CUYAHOGA COUNTY
CUY-71-13.68

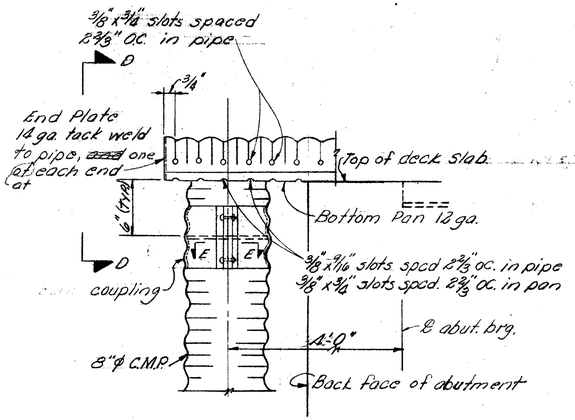


DECK DRAINAGE PLAN



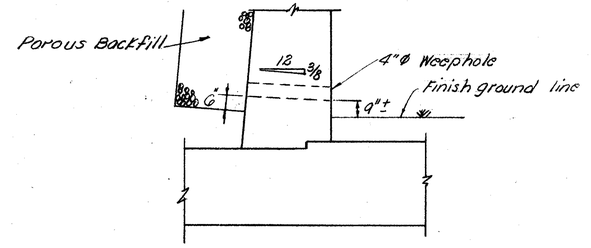
VIEW D-D

SECTION E-E

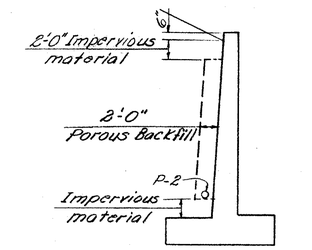


ELEVATION DRAIN DETAILS

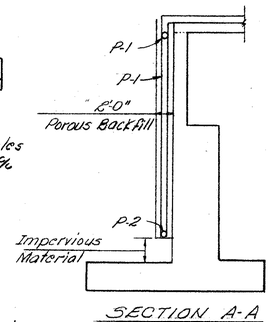
DRAIN DETAILS



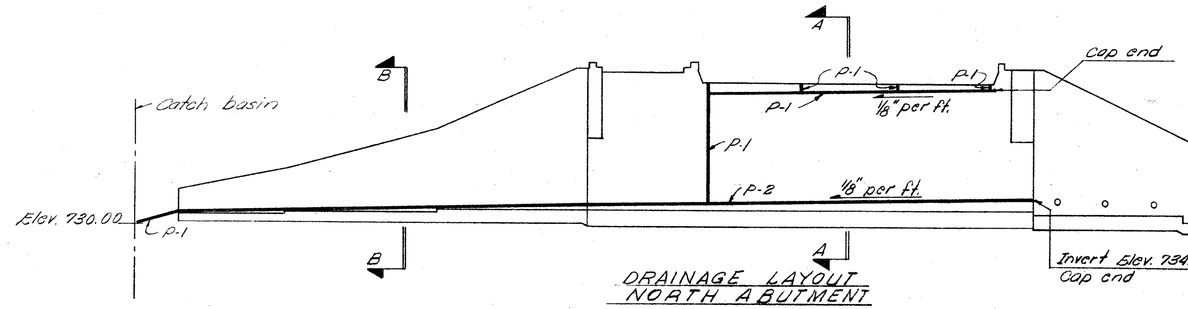
SECTION C-C



SECTION B-B

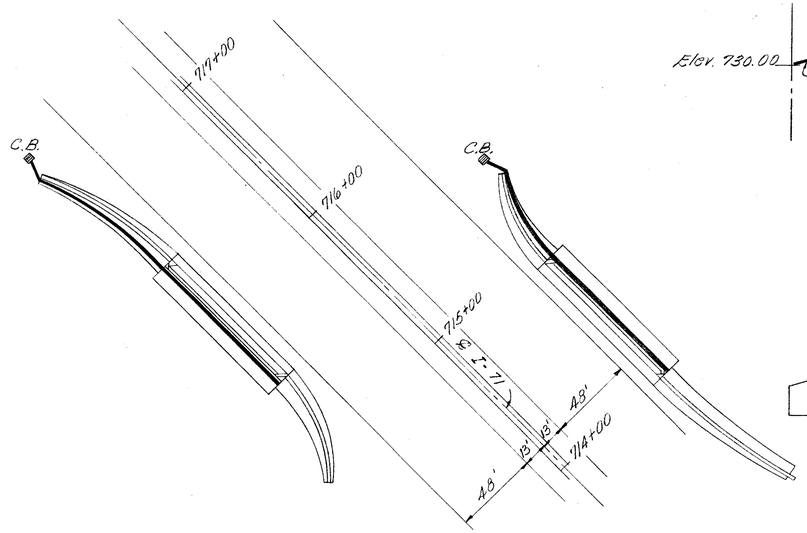


SECTION A-A



DRAINAGE LAYOUT
NORTH ABUTMENT

DRAINAGE LAYOUT
SOUTH ABUTMENT



SUBSTRUCTURE DRAINAGE PLAN

MARK	DESCRIPTION	SPECIFICATION
P-1	8" ø bituminous coated corrugated metal pipe	Ohio Hwy. Dept. M-6.4 (c)
P-2	8" ø bituminous coated perforated corrugated metal pipe.	Ohio Hwy. Dept. M-6.4 (P)

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

DRAINAGE DETAILS
BRIDGE NO. CUY-I 71 - 1381
I 71 UNDER NEW YORK CENTRAL R.R.
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K.		E.D.A.	R.A.K.	[illegible]	9-17 64	3-26-65

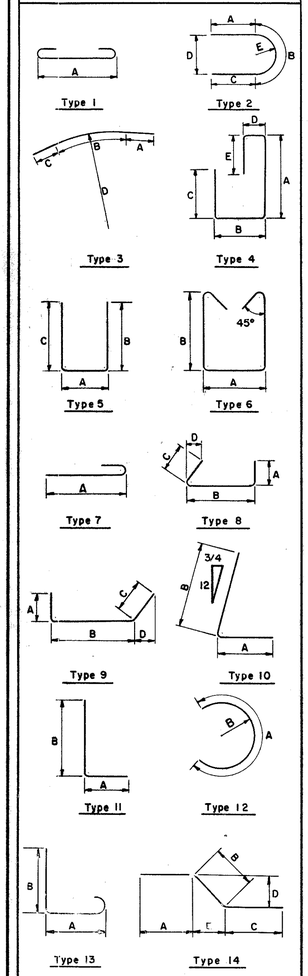
REINFORCING STEEL LIST

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

250
268

CUYAHOGA COUNTY
CUY-71-13.68

BENDING DIAGRAM



S IN THE COLUMN FOR "TYPE" INDICATES STRAIGHT BARS.

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E
		NORTH ABUTMENT							
A501	92	31-8	3039	S					
A502	37	5-3	203	11	0-7½	4-9			
A503	37	14-9	569	S					
A504	37	6-2	238	11	1-7	4-9			
A505	59	27-8	1703	S					
A506	6	16-9	105	S					
A507	132	2-2	298	5	1-2	0-7½	0-7½		
A508	8	5-0	42	S					
A509	8	6-10	57	S					
A510	14	5-6	80	9	0	2-9	2-9	1-11½	
A511	8	10-6	88	8	2-10	3-5	4-5	3-1½	
A801	22	5-3	308	S					
A802	22	13-4	783	S					
A901	73	20-11	5192	7	19-8				
A902	75	6-9	1721	11	1-3	5-9			
A903	70	18-3	4344	S					
A904	5	14-9	251	S					
A905	212	9-11	7148	S					
A906	36	12-4	1510	S					
A907	139	5-8	2678	S					
A908	25	11-10	1006	S					
A1001	75	13-0	4195	S					
A1002	72	7-3	2246	11	1-4½	6-2			
A1003	67	18-3	5261	S					
A1004	5	14-9	317	S					
A1101	72	19-10	7587	13	8-0	10-7			
A1102	72	11-0	4208	S					
A1103	72	8-6	3252	S					
		TOTAL	58429						
		SOUTH ABUTMENT							
B501	76	31-8	2510	S					
B502	37	5-3	203	11	0-7½	4-9			
B503	13	15-3	207	S					
B504	24	16-0	401	S					
B505	37	6-2	238	11	1-7	4-9			
B506	61	27-8	1760	S					
B507	4	7-6	31	S					
B508	4	20-6	86	S					
B509	134	2-2	303	5	1-2	0-7½	0-7½		
B510	8	5-0	42	S					
B511	8	6-10	57	S					
B512	12	6-4	79	9	0	3-2	3-2	2-3	
B513	8	9-9	81	8	2-6	3-5	4-2	2-11½	
B601	42	31-8	1998	S					
B602	11	6-0	99	S					
B801	22	5-3	308	S					
B802	22	13-7	798	S					
B901	73	20-11	5192	7	19-8				
B902	75	6-9	1721	11	1-3	5-9			
B903	23	19-1	1492	S					
B904	47	19-6	3116	S					
B905	5	15-9	268	S					
B906	213	9-11	7182	S					
B907	139	5-8	2678	S					
B908	50	12-3	2082	S					
B909	10	11-10	402	S					

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E
B1001	75	13-0	4195	S					
B1002	72	7-3	2246	11	1-4½	6-2			
B1003	22	19-1	1807	S					
B1004	45	19-10	3840	S					
B1005	5	15-9	339	S					
B1101	25	19-10	2634	13	8-0	10-7			
B1102	47	20-7	5140	13	8-0	11-4			
B1103	72	11-0	4208	S					
B1104	72	8-6	3252	S					
		TOTAL	60,995						
		NORTHWEST WINGWALL							
W401	24	4-0	64	5	1-2	1-6	1-6		
W501	36	17-9	666	S					
W502	52	10-0	542	S					
W503	8	5-0	42	S					
W504	8	4-0	33	S					
W505	12	31-8	396	S					
W506	12	31-0	388	S					
W507	12	3-8 to 27-0	192	S	2 each, vary by	4-8			
W508	24	3-9 to 17-6	266	S	2 each, vary by	1-3			
W509	2	34-6	72	S					
W510	12	1-9 to 26-9	178	S	2 each, vary by	5-0			
W511	12	16-1 to 28-11	282	S	1 each, vary by	1-2			
W512	5	14-10 to 18-10	88	S	1 each, vary by	1-0			
W513	2	32-6	68	S					
W601	23	7-6	259	S					
W602	23	6-0	207	S					
W603	12	5-8	102	10	1-11	3-11			
W701	23	7-0	329	10	2-3	4-11			
W702	7	16-2 to 23-8	285	S	1 each, vary by	1-3			
W801	4	8-9	93	10	2-6	6-6			
W802	5	14-3	190	10	2-6	12-0			
W803	10	11-3	300	10	2-6	9-0			
W901	24	7-6	612	S					
W1001	24	9-9	1007	S					
W1002	21	8-0	723	S					
W1003	22	14-6	1373	10	3-3	11-7			
W1101	21	10-3	1144	S					
W1102	16	9-6	808	10	3-7	6-3			
W1103	9	12-0	574	S					
W1104	3	17-6	279	S					
W1105	4	23-0	489	S					
		TOTAL	12051						
		NORTHEAST WINGWALL							
X401	33	4-0	88	5	1-2	1-6	1-6		
X501	36	17-9	666	S					
X502	12	23-8	296	S					
X503	68	10-0	709	S					
X504	13	4-8	63	S					
X505	13	4-0	54	S					
X506	5	14-0 to 18-0	83	S	1 each, vary by	1-0			
X507	12	16-2 to 29-0	283	S	1 each, vary by	1-2			
X508	28	31-6	920	S					
X509	12	1-10 to 26-10	179	S	2 each, vary by	5-0			
X510	2	32-0	67	S					
X511	24	8-3½ to 17-0	317	S	2 each, vary by	9½			
X512	6	9-0 to 24-0	103	S	2 each, vary by	7-6			
X513	2	32-9	68	S					

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E
X514	18	4-0 to 8-8	119	S	2 each, vary by	0-7			
X515	2	13-0	27	S					
X516	2	24-2	50	S					
X601	45	7-3	490	S					
X602	45	5-9	389	S					
X603	12	5-8	102	10	1-11	3-11			
X604	17	5-2	132	10	1-11	3-5			
X701	23	7-0	329	10	2-3	4-11			
X702	7	16-4 to 23-7	286	S	1 each, vary by	1-2½			
X801	20	11-3	601	10	2-6	9-0			
X802	4	14-3	152	10	2-6	12-0			
X901	24	7-3	592	S					
X1001	24	9-3	955	S					
X1002	21	8-0	723	S					
X1003	22	14-6	1373	10	3-3	11-7			
X1101	21	10-3	1144	S					
X1102	16	9-6	808	10	3-7	6-3			
X1103	5	12-6	332	S					
X1104	4	21-6	457	S					
X1105	5	18-0	287	S					
X1106	4	14-6	308	S					
		TOTAL	13,552						
		SOUTHEAST WINGWALL							
Y401	21	4-0	56	5	1-2	1-6	1-6		
Y501	20	17-9	370	S					
Y502	48	10-0	501	S					
Y503	16	13-0	217	S					
Y504	3	23-8	74	S					
Y505	3	23-0	72	S					
Y506	18	3-8 to 15-4	178	S	2 each, vary by	1-5½			
Y507	10	3-6 to 19-6	120	S	2 each, vary by	4-0			
Y508	2	26-4	55	S					
Y509	8	31-8	264	S					
Y510	8	31-0	259	S					
Y511	14	2-0 to 28-0	219	S	2 each, vary by	4-1			
Y512	5	14-0 to 19-0	86	S	1 each, vary by	1-3			
Y513	12	14-10 to 29-6	277	S	1 each, vary by	1-4			
Y514	2	33-6	70	S					
Y601	25	5-3	197	S					
Y602	25	5-6	207	S					
Y603	9	5-8	77	10	1-11	3-11			
Y701	3	8-0	49	10	2-3	5-11			
Y702	23	7-0	329	10	2-3	4-11			
Y703	3	12-6	77	10	2-3	10-5			
Y704	7	14-10 to 23-7	275	S	1 each, vary by	1-5½			
Y705	6	12-6	153	10	2-3	10-5			
Y901	24	7-3	592	S					
Y1001	45	8-3	1597	S					
Y1002	22	14-6	1373	10	3-3	11-7			
Y1101	21	10-0	1116	S					
Y1102	16	9-6	808	10	3-7	6-3			
Y1103	9	12-6	598	S					
Y1104	3	18-0	287	S					
Y1105	4	23-0	489	S					
		TOTAL	11,042						

NOTES

BAR SIZE is indicated in bar mark. The first digit where three digits are used, and the first two where four are used indicate the bar size number.

SPIRAL REINFORCING BARS; The "Length" shown in the steel list for the spiral bars is the distance from the top of the footing to the bottom of the pier cap. The "No. of Turns" shown is the "Length" divided by the pitch, plus three turns (total number of closed coils), expressed as the nearest whole number.

Spiral reinforcing bars shall not have deformations but shall in other respects conform to item S-4. 1½ closed coils shall be provided at the ends of each spiral unit. Four steel channel, tee or angle spacers, weighing approximately 0.68 lb. per lin. ft. of spacer, shall be provided for each spiral unit. They shall be equally spaced along the periphery of the coil. The number of pounds of these spacers, based on 0.68 lb. per lin. ft., will be paid for as reinforcing steel and is included in the tabulated quantity of spiral bars.

SPIRAL REINFORCEMENT							
MARK	NO.	LENGTH	CORE	PITCH	TURNS	SPACERS	WEIGHT

RACKOFF ASSOCIATES
ENGINEERS
CLEVELAND, OHIO COLUMBUS, OHIO

REINFORCING STEEL LIST

BRIDGE NO CUY-171-1381
I-71 UNDER NEW YORK CENTRAL R R

CUYAHOGA COUNTY STA. 815+05 76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K. W.F.	EDA		RAK	EEE	9-17 64	

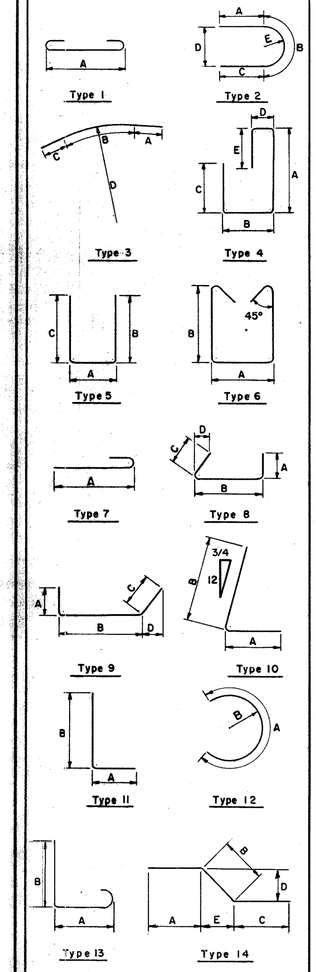
REINFORCING STEEL LIST

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

251
208

CUYAHOGA COUNTY
CUY-71-13.68

BENDING DIAGRAM



S IN THE COLUMN FOR "TYPE" INDICATES STRAIGHT BARS.

SOUTHWEST WINGWALL

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E
Z401	36	4-0	96	5	1-2	1-6	1-6		
Z501	14	10-2	148	14	2-6	2-10	5-0	1-3	2-6
Z502	8	13-9 to 19-0	137	S	1 each, vary by 9"				
Z503	12	20-11 to 30-1	319	S	1 each, vary by 10"				
Z504	24	13-4 to 22-6	448	S	2 each, vary by 10"				
Z505	24	5-7 to 14-9	254	S	2 each, vary by 10"				
Z506	39	31-6	1,281	S					
Z507	3	24-6	77	S					
Z508	8	7-6 to 28-0	148	S	2 each, vary by 6'-10"				
Z509	2	32-6	68	9	0-0	30-10	1-9	1-8	
Z510	8	8-0 to 29-0	154	S	2 each, vary by 7'-0"				
Z511	4	32-10	137	S					
Z512	4	7-3 to 29-3	76	S	1 each, vary by 7'-4"				
Z513	4	7-3 to 24-6	66	S	1 each, vary by 5'-9"				
Z601	15	34-0	766	S					
Z602	13	37-0	722	S					
Z603	17	28-0	715	S					
Z604	41	7-0	431	S					
Z605	23	6-0	207	S					
Z606	18	5-0	135	S					
Z607	23	10-0	345	7	9-4				
Z608	23	9-0	311	7	8-4				
Z609	18	6-0	162	7	5-4				
Z610	18	8-0	216	7	7-4				
Z611	18	5-7	151	10	1-11	3-10			
Z612	7	9-6	100	S					
Z701	16	34-0	1,112	S					
Z702	4	27-0	221	S					
Z703	45	8-6	782	S					
Z704	45	7-0	644	7	6-2				
Z705	33	7-3	489	10	2-3	5-2			
Z706	4	21-8 to 23-11	186	S	1 each, vary by 9"				
Z801	10	34-3	914	S					
Z802	45	9-6	1,141	S					
Z803	45	8-6	1,021	7	7-5				
Z804	40	15-0	1,602	1	12-10				
Z805	8	13-0	278	10	2-6	10-9			
Z806	5	10-0	134	10	2-6	7-9			
Z807	6	11-0	176	S					
Z1001	22	15-0	1,420	10	3-3	12-1			
Z1002	23	8-7	849	10	3-3	5-8			
Z1003	9	14-0	542	10	3-3	11-1			
Z1004	5	15-6	333	S					
Z1101	19	9-9	984	10	3-7	6-6			
Z1102	8	13-0	553	S					
Z1103	4	24-0	510	S					
Z1104	3	20-0	319	S					
Z1105	4	17-0	361	S					
		TOTAL	22,241						

PIER

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E
P501	35	8-8	316	S					
P502	6	20-4	127	S					
P503	12	9-3	116	2	1-9	5-9½	1-9	3-8¼	1-10⅞
P504	42	9-0	394	5	3-10¾	2-8¼	2-8¼		
P505	3	6-6	20	5	4-2¾	1-3½	1-3½		
P506	3	5-6	17	5	3-3	1-3	1-3		
P507	2	6-9	14	5	4-6	1-3	1-3		
P508	1	7-1	7	5	4-10	1-3	1-3		
P509	1	10-10	11	2	2-0	6-10	2-0	4-4	2-2
P510	1	8-7	9	5	4-4	2-3	2-3		
P701	90	24-4	4,476	S					
P702	160	8-8	2,834	S					
P703	15	10-8	327	S					
P1001	128	7-1	3,901	11	1-4½	6-0			
P1002	128	15-6	8,537	S					
P1003	6	26-3	678	5	20-4½	3-3	3-3		
P1004	6	28-8	740	5	22-9½	3-3	3-3		
P1005	9	29-6	1,142	5	23-7½	3-3	3-3		
P1006	6	20-4	525	S					
P1007	15	23-4	1,506	S					
P1008	6	12-6	323	2	3-3	6-0	3-3	3-9½	1-10¾
	SUB	TOTAL	26,020						
		SPIRAL	3,400						
		TOTAL	29,420						

SUPERSTRUCTURE

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E
S501	438	8-1	3,693	6	0-8	3-5			
S502	204	15-1	3,209	S					
S503	20	16-7	346	S					
S504	294	5-0	1,533	4	1-6	1-4	0-8	1-4	0-8
S505	294	2-3	690	5	1-6	0-6	0-6		
S506	147	5-3	805	6	0-8	2-0			
S507	147	5-9	882	6	0-8	2-3			
S508	14	17-1	249	S					
S601	453	20-7	14,005	S					
S602	349	27-6	14,415	S					
S603	56	6-6 to 20-0	1,114	S	2 sets of 28,	vary ea.	in set	by 6"	
S604	48	6-0	433	S					
S605	102	2-6 to 27-6	2,298	S	2 sets of 51,	vary ea.	in set	by 6"	
S606	1071	33 - 3	53,487	S					
S607	438	9-5	6,195	8	3-6	2-3	4-0	2-2½	
S608	440	7-8	5,067	8	2-9	2-3	3-0	1-7	
S609	440	5-0	3,304	9	0-0	2-6	2-6	1-3	
S610	440	4-2	2,754	9	0-0	2-10	1-4	0-8	
S611	410	15-8	9,648	S					
S612	38	6-6 to 15-6	628	S	2 sets of 19,	vary ea.	in set	by 6"	
S613	62	40-0	3,725	S					
S701	786	24-3	38,960	S					
S702	86	3-0 to 24-0	2,373	S	2 sets of 43,	vary ea.	in set	by 6"	
S703	72	6-6 to 24-0	2,244	S	2 sets of 36,	vary ea.	in set	by 6"	
S704	410	15-8	13,129	S					
S705	38	6-6 to 15-6	854	S	2 sets of 19,	vary ea.	in set	by 6"	
		TOTAL	186,040						

RAILING

R501	8	16-9	-	S	Included with railing for payment.
R502	48	15-1	-	S	

REPLACEMENT BARS

RE401	1	4-0	—	5	1-2	1-6	1-6
RE501	2	5-7	—	S			
RE601	7	5-11	—	S			
RE701	4	6-3	—	S			
RE801	1	6-6	—	S			
RE901	3	6-10	—	S			
RE1001	3	7-3	—	S			
RE1101	3	7-7	—	S			

NOTES

BAR SIZE is indicated in bar mark. The first digit where three digits are used, and the first two where four are used indicate the bar size number.

SPIRAL REINFORCING BARS; The "Length" shown in the steel list for the spiral bars is the distance from the top of the footing to the bottom of the pier cap. The "No. of Turns" shown is the "Length" divided by the pitch, plus three turns (total number of closed coils), expressed as the nearest whole number.

Spiral reinforcing bars shall not have deformations but shall in other respects conform to item S-4. 1½ closed coils shall be provided at the ends of each spiral unit. Four steel channel, tee or angle spacers, weighing approximately 0.68 lb. per lin. ft. of spacer, shall be provided for each spiral unit. They shall be equally spaced along the periphery of the coil. The number of pounds of these spacers, based on 0.68 lb. per lin. ft., will be paid for as reinforcing steel and is included in the tabulated quantity of spiral bars.

SPIRAL REINFORCEMENT

MARK	NO.	LENGTH	CORE	PITCH	TURNS	SPACERS	WEIGHT
P401	8	11-11½	44"	3"	51	4	3,400

RACKOFF ASSOCIATES
ENGINEERS
CLEVELAND, OHIO COLUMBUS, OHIO

REINFORCING STEEL LIST
BRIDGE NO. CUY.-I71-1381
I-71 UNDER NEW YORK CENTRAL R.R.

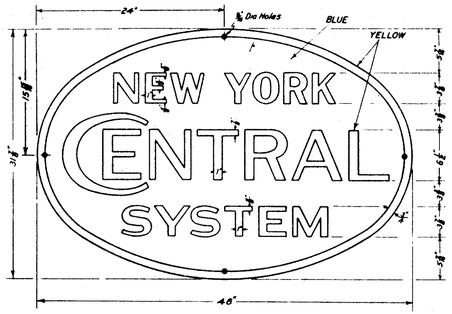
CUYAHOGA COUNTY STA. 815+05.76

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
V.K. W.F.	D.W.M.	—	R.A.K.	[illegible]	9-17-64	

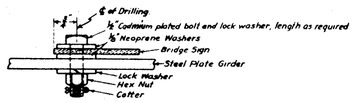
NO. OF JUMPER	STATE	PROJECT	
2	OHIO		

251A

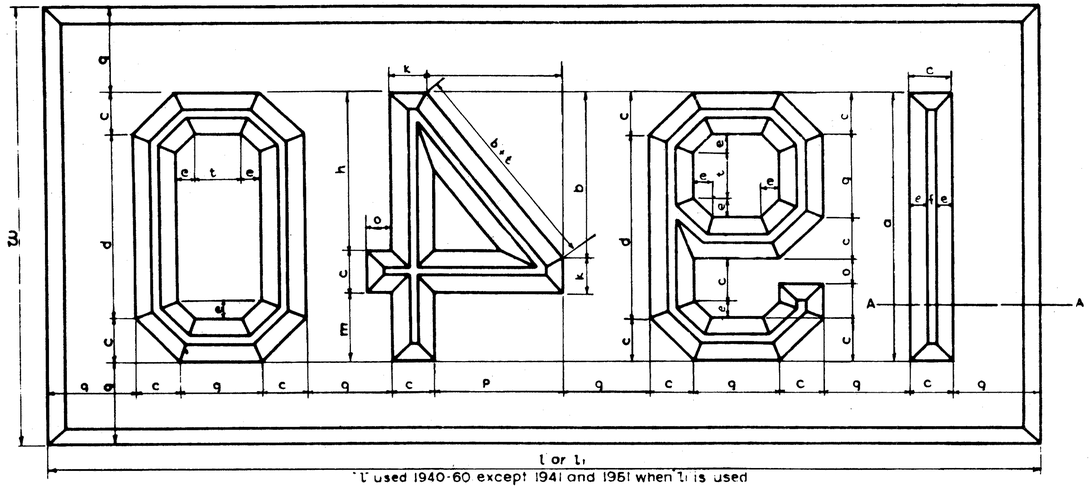
CUYAHOGA COUNTY
CUY-71-13.68



RAILROAD BRIDGE OVAL SIGN
(Drill 4 - ⅞" holes from face side of sign as shown)



TYPICAL SECTION



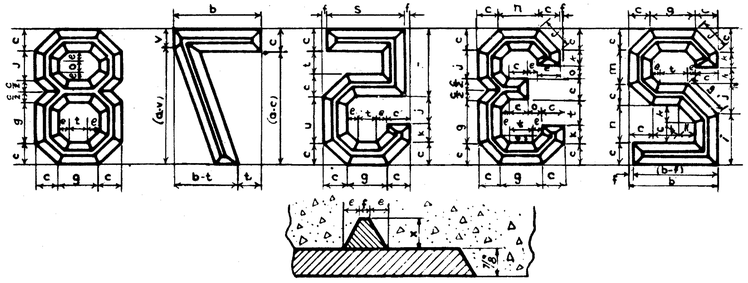
General Notes:

The New York Central Railroad will furnish f.o.b job site - signs and bolt assemblies.

Sign Construction - The sign shall be made of .081"-6061-T6 aluminum sheet. The background of the sign shall be covered with N° 2275 wide angle flat-top, Blue Scotchlite. The letters and border shall be N° 2271 wide angle flat-top, Yellow Scotchlite. Additional details of the oval and letters are shown on Engineer M. of W System plan N° 535-L

Sign Installation - Typical installation detail shown for plate girder bridge. If girder stiffeners interfere with placing of sign as shown, provide structural steel brackets for bolt connections. Bridges on a skew with highway should have brackets so that sign will be at right angles to highway.

The instalation of the signs will be by the Contractor and any brackets necessary for installation will be furnished by the contractor. Payment for the installation and any necessary brackets will be included in Item S-107.



SECTION A-A

DIMENSIONS FOR VARIOUS SIZES OF LETTERS																								
a	b	c	d	e	f	q	h	i	j	k	m	n	o	p	r	s	t	u	v	x	l	l_1	w
8"	5"	1/16"	1 1/2"	1/8"	1/4"	2 1/2"	4 3/4"	3"	1/8"	1"	2"	2 1/2"	3/4"	5 1/4"	4"	4 1/8"	1 1/8"	2 5/8"	1/8"	7/8"	20 3/4"	25"	15"

STANDARD DATE PLATE FORM
For locations of date plates see plans

FINAL REPORT ON MASONRY AS BUILT.

Station and Plus at center of Bridge.
A.F.E. No. _____ Built by _____
Work started _____ Work completed _____

DESCRIPTION	ACTUAL QUANTITIES EAST ABUT.	WEST ABUT.	PIER.			TOTAL QUANTITIES
Grading, Cu. Yards						
Dry Earth Excavated, Cu.Yd.						
Wet Earth Excavated, Cu.Yd.						
Dry Rock Excavated, Cu.Yd.						
Wet Rock Excavated, Cu.Yd.						
Foundation Piling, Lin.-Ft.						
Cofferdam Timber, F. B.M.						
Steel Sheet Piling, left in, Tons						
" " removed, Tons						
Puddle Dam Material, Cu.Yd.						
Reinforcing Bars, Lbs.						
Class 'A' Concrete, Cu.Yd.						
" 'B' " Cu.Yd.						
" 'D' " Cu.Yd.						
Cu.Yd.						
Waterproofing S.F.						
Source, Size, kind, Stone						
" " " Sand						
Brand of Cement						
Elevation Top of Tie						
" " " Coping						
" " " Footing						
" Bott. " "						
Character of Foundation						

Bench mark used in Constr; Location _____ Elevation _____ Sea Level Datum
Bench mark established on Struct. Elevation _____ Sea Level Datum
Remarks _____

I hereby certify that the above information is correct, and that on this print ALL deviations from the plan are correctly shown.
_____ Title _____
_____ Place _____ Date _____
The above information and the changes shown on this print have been recorded on the original drawing this date.
Checked by _____ Draftsman

Highway Bridge No. CUY-71-1.381

N.Y.C. SYSTEM	OFFICE OF CHIEF ENGINEER	CHICAGO, ILL.

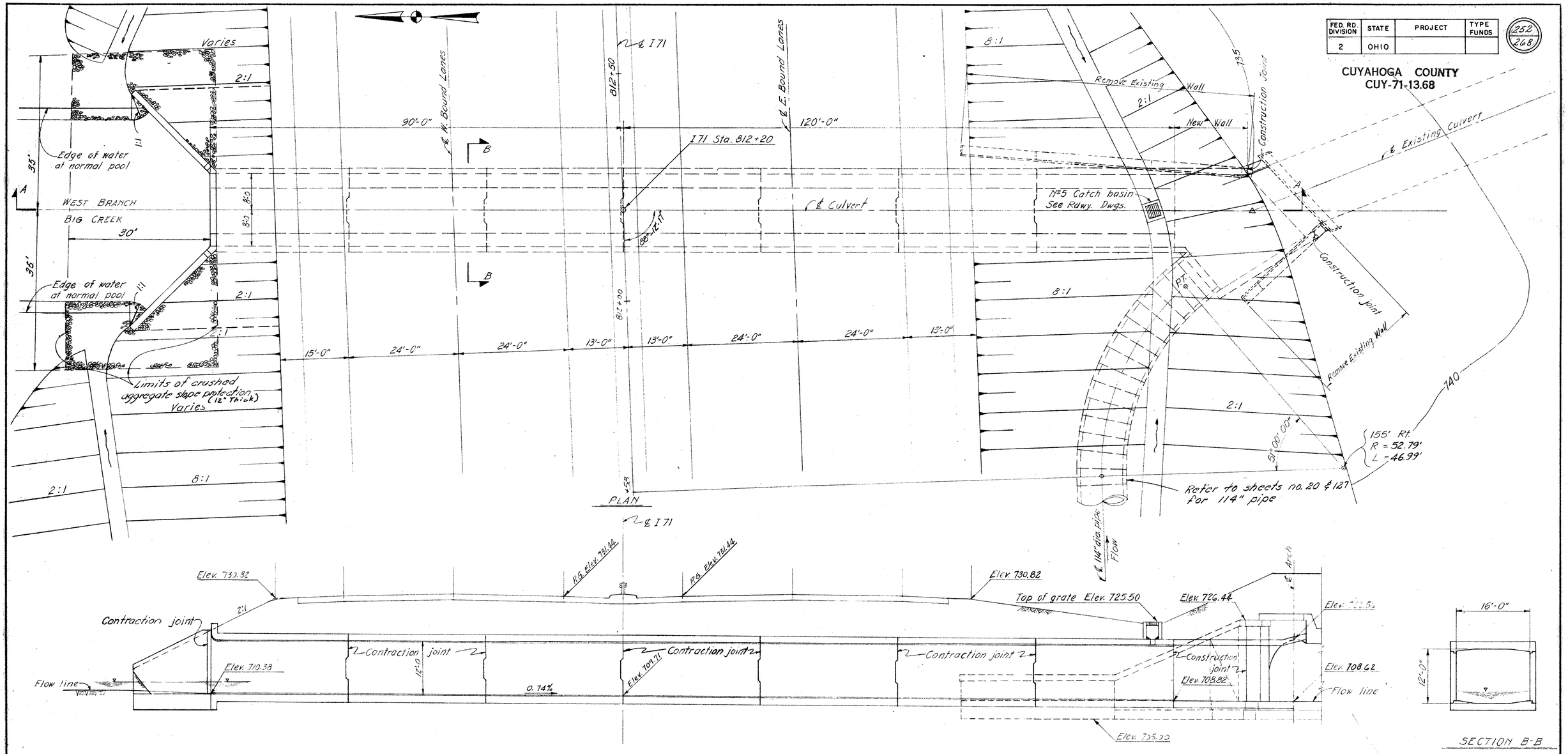
NEW YORK CENTRAL
SIGN AND DATE PLATE PLAN

			PLAN N° 7430
SCALE: As Shown		VAL. SEC.	FILE N° 121-264

FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

252
268

CUYAHOGA COUNTY
CUY-71-13.68



SECTION A-A ALONG ℄ CULVERT

SECTION B-B

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

SITE PLAN

CULVERT UNDER I 71

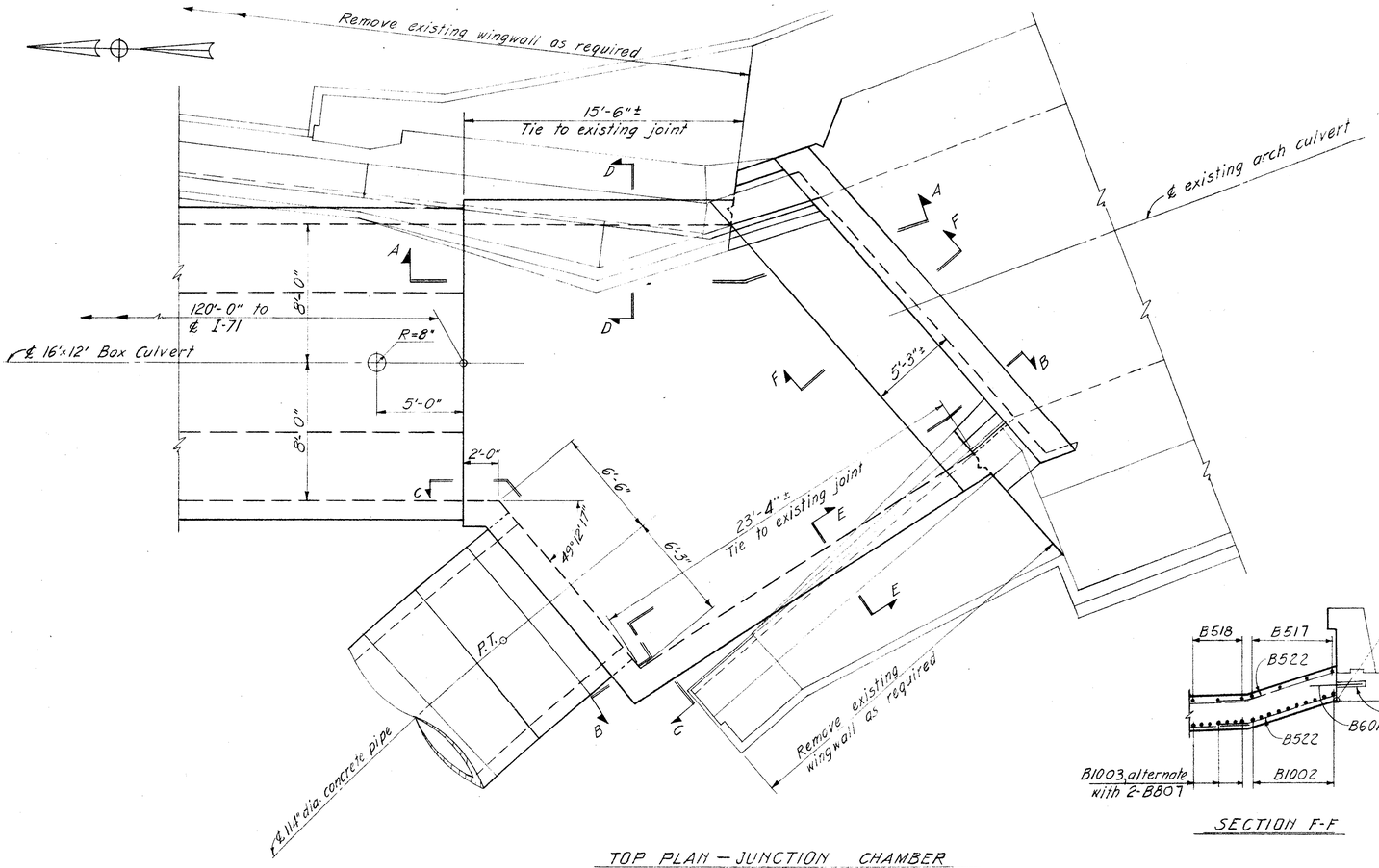
CUYAHOGA COUNTY STA. 812+20

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
W.F.	W.F.	E.D.A.	L.L.	666	10-28-64	

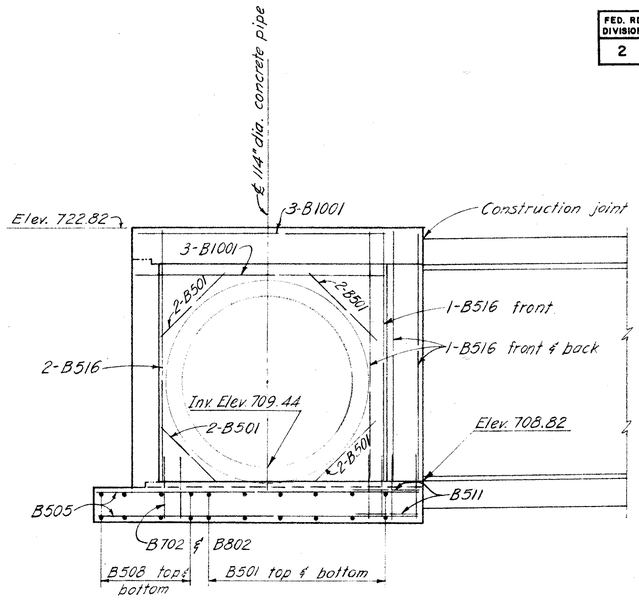
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

(253) (268)

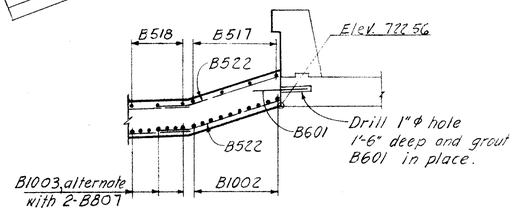
CUYAHOGA COUNTY
CUY-71-13.68



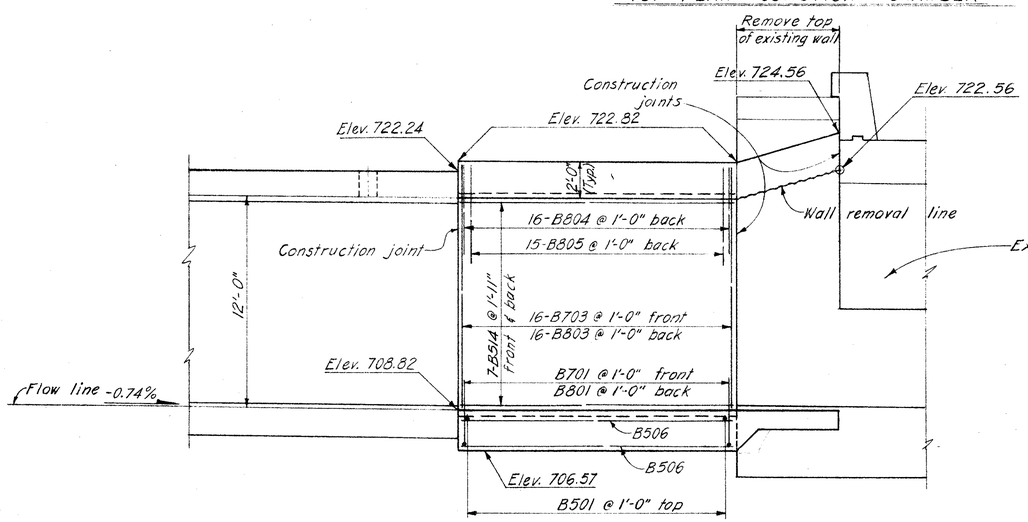
TOP PLAN — JUNCTION CHAMBER



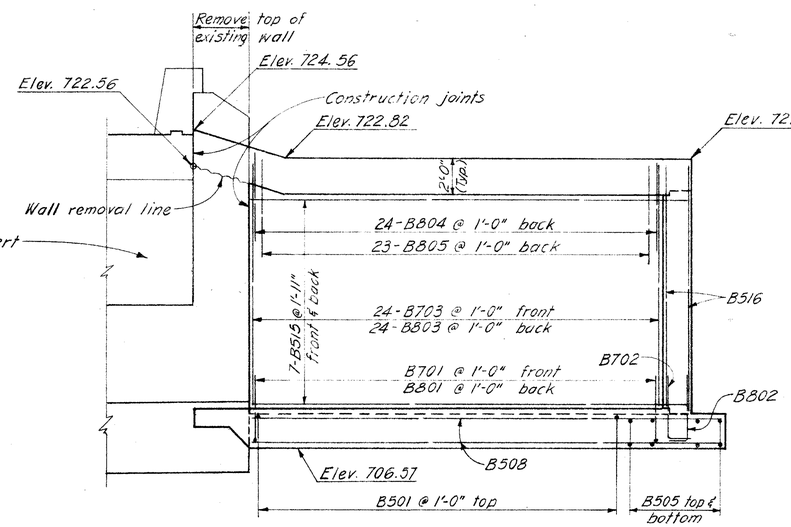
ELEVATION C-C



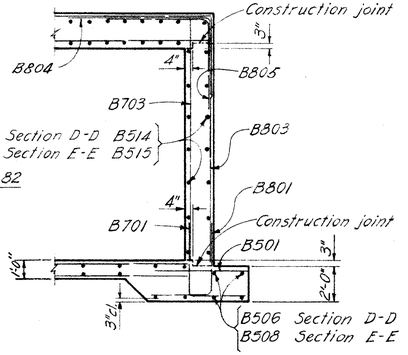
SECTION F-F



ELEVATION A-A



ELEVATION B-B



SECTION D-D, AS SHOWN
SECTION E-E, AS NOTED

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

CULVERT DETAILS

CULVERT UNDER I 71

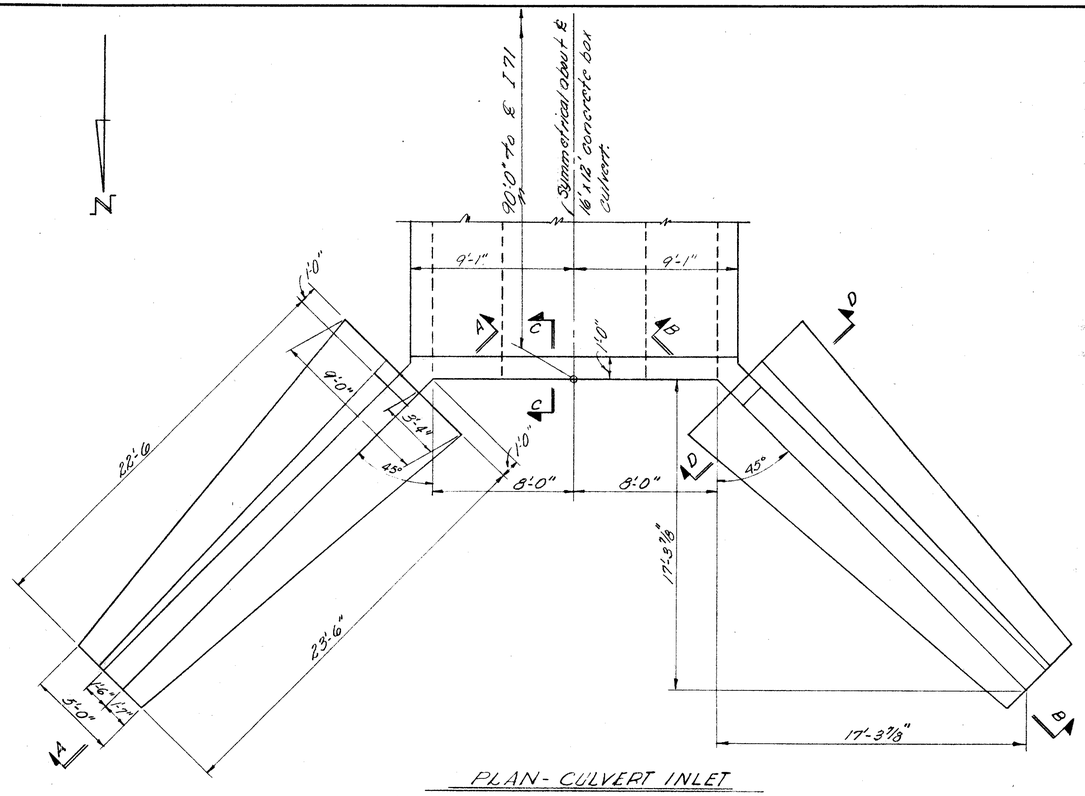
CUYAHOGA COUNTY STA. 812+20

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
W.F.	W.F.	M.R.	R.J.	666	10-28-64	

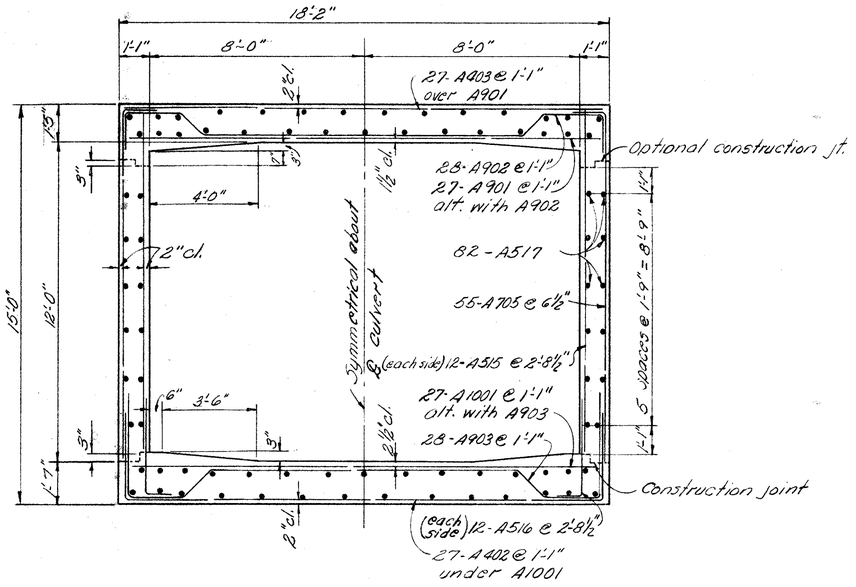
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

254
268

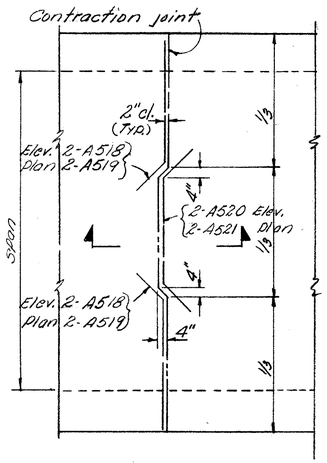
CUYAHOGA COUNTY
CUY-71-13.68



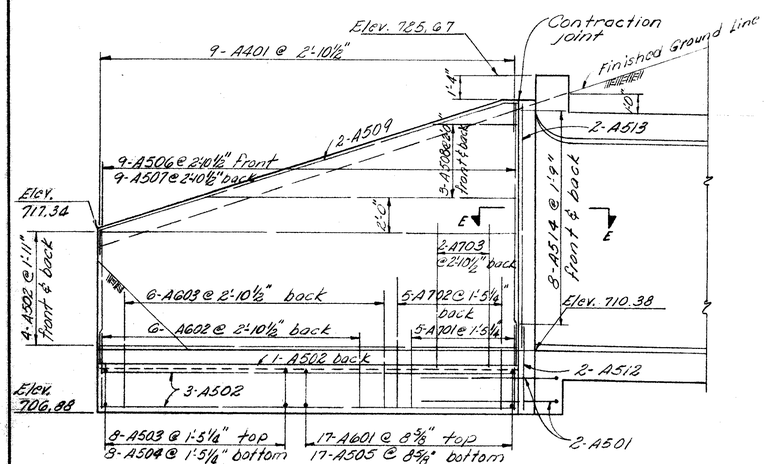
PLAN - CULVERT INLET



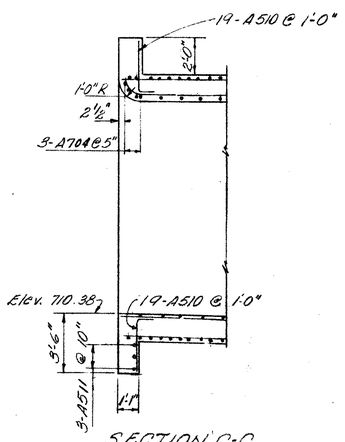
TYPICAL TRANSVERSE SECTION THROUGH CULVERT
(Reinforcing quantities shown are for one 30' long section, (7 sections required)



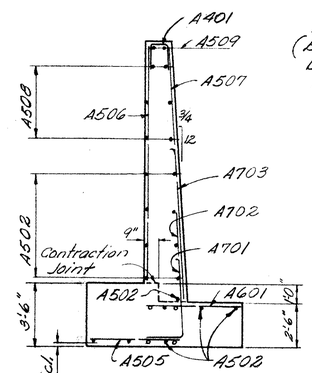
CONTRACTION JOINT DETAIL
ELEVATION VIEW - AS SHOWN
PLAN VIEWS - SIMILAR
(6 Joints)



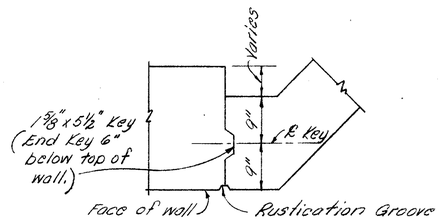
SECTION A-A - AS SHOWN
SECTION B-B - OPPOSITE HAND



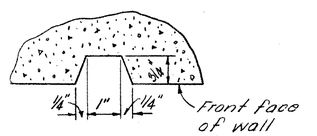
SECTION C-C



SECTION D-D



SECTION E-E



RUSTICATION GROOVE DETAIL

FOOTING DOWELS
o - A501 under expansion joint

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

CULVERT DETAILS

CULVERT UNDER I 71

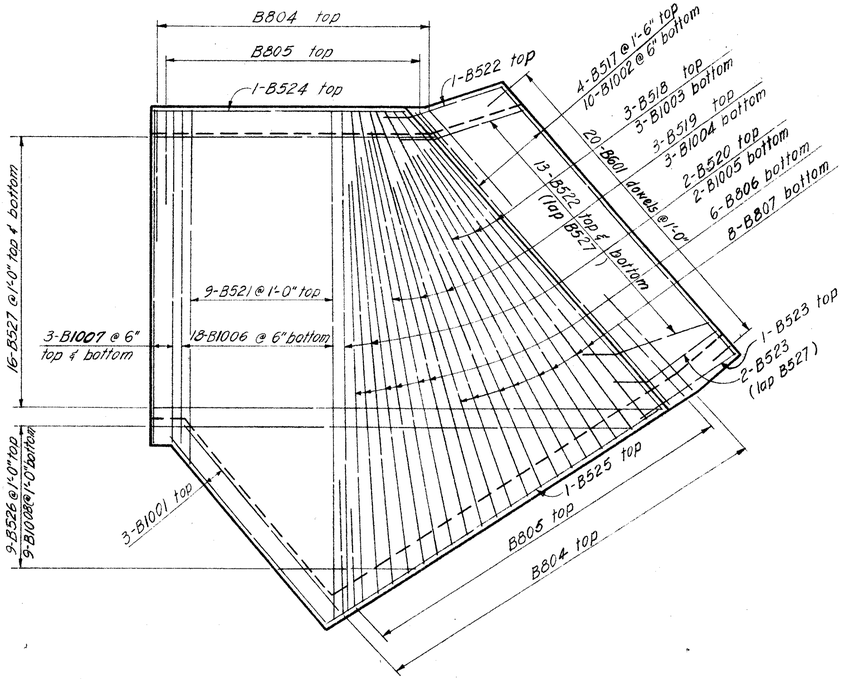
CUYAHOGA COUNTY STA. 812+20

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
W.F.	W.F.	E.D.A.	R.J.	[illegible]	10-28-64	

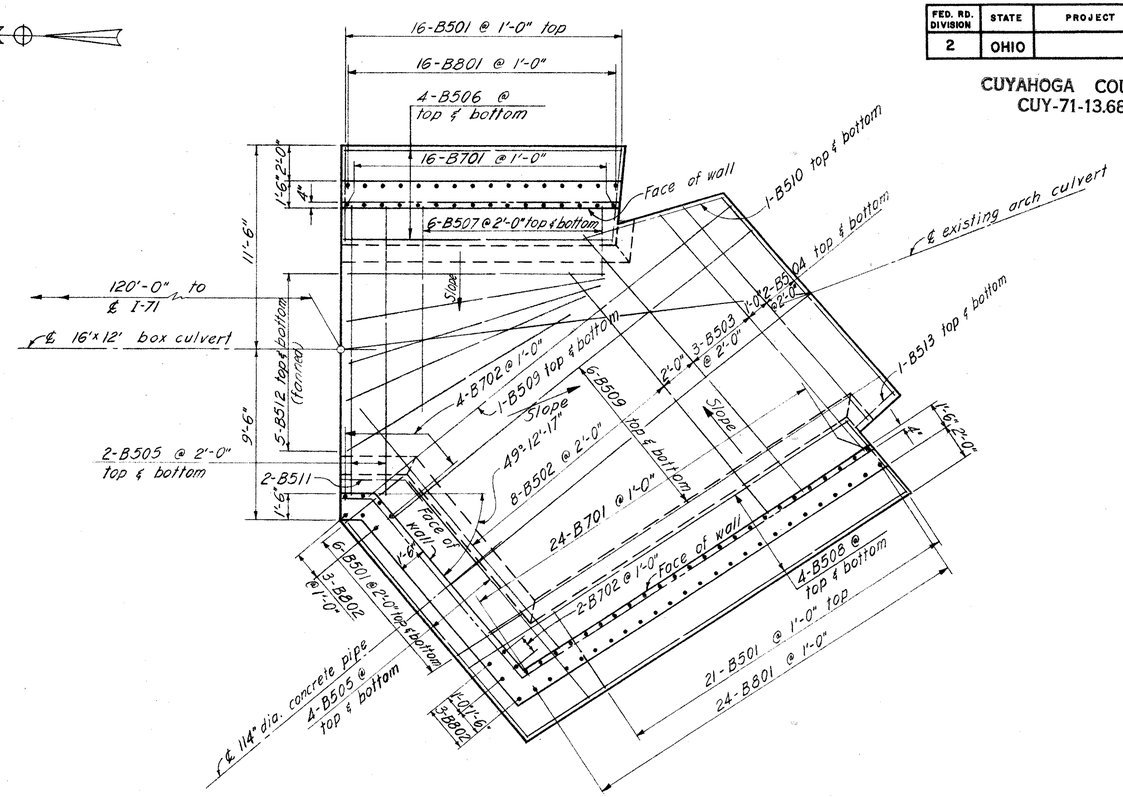
FED. RD. DIVISION	STATE	PROJECT	TYPE FUNDS
2	OHIO		

255
268

CUYAHOGA COUNTY
CUY-71-13.68



ROOF PLAN - REINFORCING
JUNCTION CHAMBER



FLOOR PLAN
JUNCTION CHAMBER

GENERAL NOTES:

DESIGN SPECIFICATION: This structure shall conform to the requirements of "Design Specification for Highway Structures" of the State of Ohio, Department of Highways, dated 9-1-57 together with current revisions there of.

CONCRETE - Class "C" basic unit stress 1,333 psi

REINFORCING STEEL - ASTM A15, A16, A160 Deformed Intermediate or Hard grade. Basic unit stress 20,000 psi

FOUNDATION MATERIAL is assumed to be shale.

EMBANKMENT shall be placed symmetrically on both sides of the culvert after the top slab is in place. The embankment over the barrel shall be placed in horizontal layers, simultaneously with that on each side of the culvert.

BACKFILL is included with highway embankment for payment.

ESTIMATED QUANTITIES				AS BUILT	
ITEM	TOTAL	UNIT	DESCRIPTION		
E-2	Lump	Sum	Cofferdams, cribs and sheeting		
E-2	350	Cu. yds	Excavation for structures (Shale)		
S-1	872	Cu. yds.	Class "C" concrete		
S-4	127,265	lbs.	Reinforcing steel		
S-22	Lump	Sum	Removal of portions of existing structure		
I-10	129	Sq. yds.	12" Crushed aggregate slope protection		

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

GENERAL NOTES, ESTIMATED QUANTITIES
CULVERT DETAILS
CULVERT UNDER I 71

CUYAHOGA COUNTY STA. 812+20

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
W.F.	W.F.	M.R.	R.J.		10-28-64	

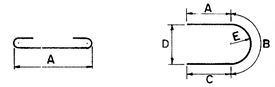
REINFORCING STEEL LIST

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

256
268

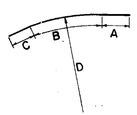
CUYAHOGA COUNTY
CUY-71-13.68

BENDING DIAGRAM



Type 1

Type 2



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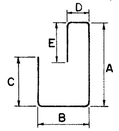

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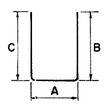

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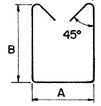

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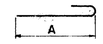

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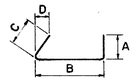

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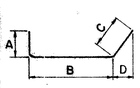

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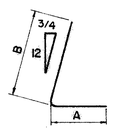

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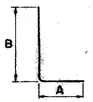

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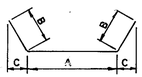

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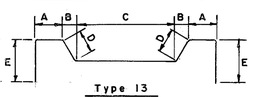


Type 13

S IN THE COLUMN FOR "TYPE" INDICATES STRAIGHT BARS.

CULVERT

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E
A401	18	4-0	47	5	1-2	1-6	1-6		
A402	189	24-1	3041	5	17-10	3-3	3-3		
A403	189	17-9	2241	S					
A501	8	10-0	83	9	0	6-0	4-0	2-10	
A502	30	23-2	725	S					
A503	16	3-9	63	S					
A504	16	4-0	67	S					
A505	34	5-6	195	S					
A506	18	6-10 to 13-10	194	S	2 each, vary by 10½"				
A507	18	7-10 to 14-10	213	S	2 each, vary by 10½"				
A508	12	4-6 to 17-6	138	S	4 each, vary by 6'-6"				
A509	4	23-11	100	9	0	23-2	0-9	0-8½	
A510	38	3-6	139	11	3-0	0-7½			
A511	3	21-4	67	12	17-6	2-0	1-5		
A512	4	5-3	22	11	4-9	0-7½			
A513	4	13-10	58	S					
A514	32	2-7	86	9	0	2-0	0-7	0-5	
A515	168	12-9	2234	S					
A516	168	4-6	788	11	0-10½	3-9			
A517	574	29-8	17,761	S					
A518	48	6-4	317	9	0	4-10	1-6	1-0½	
A519	48	7-4	367	9	0	5-10	1-6	1-0½	
A520	24	7-4	184	12	4-4	1-6			
A521	24	8-4	209	12	5-4	1-6			
A601	34	5-3	268	S					
A602	12	5-10	105	10	1-11	4-1			
A603	12	8-6	153	10	1-11	6-9			
A701	10	6-6	133	10	2-3	4-5			
A702	10	9-6	194	10	2-3	7-5			
A703	4	8-6	69	S					
A704	3	17-10	109	S					
A705	770	14-3	22,428	11	1-2	13-3			
A901	189	17-9	11,406	S					
A902	196	21-0	13,994	13	2-1	1-0½	11-7	1-5¾	1-4¾
A903	196	26-5	17,604	13	2-1	1-1½	11-5	1-7⅛	4-1
A1001	189	17-9	14,435	S					
		TOTAL	110,237						

JUNCTION CHAMBER

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E
B501	57	5-3	312	S					
B502	16	17-6	292	S					
B503	6	17-6 to 19-0	114	S	2 each, vary by 9"				
B504	4	15-0 to 15-9	64	S	2 each, vary by 9"				
B505	12	16-0	200	S					
B506	8	15-0	125	S					
B507	12	4-0 to 11-6	97	S	2 each, vary by 1'-6"				
B508	8	25-0	209	S					
B509	14	25-6	372	S					
B510	2	8-0	17	S					
B511	2	5-4	11	9	0	3-6	1-10	1-3	
B512	10	14-6	151	S					
B513	2	4-6	9	S					
B514	14	15-2	221	S					
B515	14	24-0	350	S					
B516	9	13-9	129	S					
B517	4	19-9 to 21-6	86	S	1 each, vary by 7"				
B518	3	22-3	70	S					
B519	3	23-3 to 25-3	76	S	1 each, vary by 1'-0"				
B520	2	29-9 to 28-3	60	S	1 each, vary by 1'-6"				
B521	9	19-10 to 28-6	227	S	1 each, vary by 1'-1				
B522	27	7-0	197	9	0	1-9	5-3	4-8½	
B523	3	6-9	21	9	0	1-9	5-0	3-11⅝	
B524	1	14-0	15	S					
B525	1	22-0	23	S					
B526	9	7-10 to 26-6	161	S	1 each, vary by 2'-4"				
B527	32	15-1½ to 28-3	724	S	2 each, vary by 0'-10½"				
B601	20	3-0	90	S					
B701	40	7-2	586	11	3-2	4-2			
B702	6	5-0	61	11	1-0	4-2			
B703	40	13-9	1,124	S					
B801	40	7-1	756	11	3-2	4-2			
B802	6	5-0	80	11	1-1	4-2			
B803	40	14-0	1,495	S					
B804	40	12-3	1,308	11	5-0	7-6			
B805	38	10-9	1,091	11	5-6	5-6			
B806	6	22-6	360	S					
B807	8	19-0	406	S					
B1001	6	13-9	355	S					
B1002	10	19-8½ to 21-7	888	S	1 each, vary by 0'-2½"				
B1003	3	22-3	287	S					
B1004	3	22-3 to 25-3	307	S	1 each, vary by 1'-0"				
B1005	2	26-9 to 28-3	237	S	1 each, vary by 1'-6"				
B1006	18	18-10 to 28-9	1,843	S	1 each, vary by 0'-7"				
B1007	6	18-6	478	S					
B1008	9	7-10 to 26-6	665	S	1 each, vary by 2'-4"				
		TOTAL	16,750						

REPLACEMENT BARS

MARK	NO.	LENGTH	WEIGHT	TYPE
RE401	1	5-3	—	S
RE501	2	5-7	—	S
RE601	1	5-11	—	S
RE701	2	6-3	—	S
RE801	1	6-6	—	S
RE901	3	6-10	—	S
RE1001	1	7-3	—	S

MARK	NO.	LENGTH	WEIGHT	TYPE	A	B	C	D	E

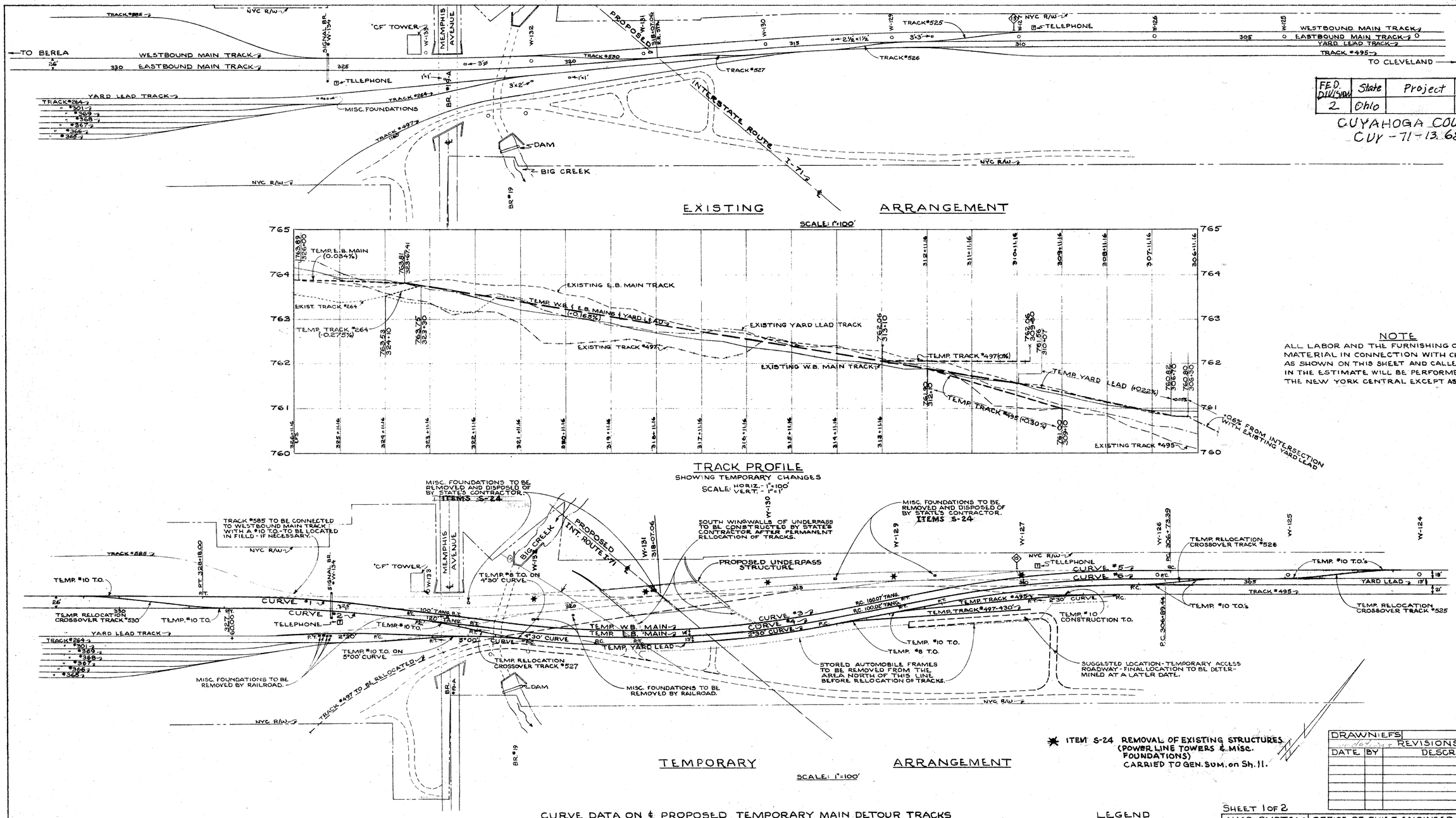
NOTES

BAR SIZE is indicated in bar mark. The first digit where three digits are used, and the first two where four are used indicate the bar size number.

RACKOFF ASSOCIATES
ENGINEERS COLUMBUS, OHIO

REINFORCING STEEL LIST
CULVERT UNDER I 71
CUYAHOGA COUNTY STA. 812+20

Designed	Drawn	Traced	Checked	Reviewed	Date	Revised
W F	E D A.		R J.		10-28-64	



F.E.D. DIVISION	State	Project		257 / 279
2	Ohio			

CUYAHOGA COUNTY
CUY-71-13.68 Y

NOTE

ALL LABOR AND THE FURNISHING OF ALL MATERIAL IN CONNECTION WITH CHANGES AS SHOWN ON THIS SHEET AND CALLED FOR IN THE ESTIMATE WILL BE PERFORMED BY THE NEW YORK CENTRAL EXCEPT AS NOTED.

✱ ITEM S-24 REMOVAL OF EXISTING STRUCTURES (POWER LINE TOWERS & MISC. FOUNDATIONS) CARRIED TO GEN. SUM. on Sh. 11.

CURVE DATA ON & PROPOSED TEMPORARY MAIN DETOUR TRACKS
DESIGN SPEED 50 M.P.H.*

CURVE #1	CURVE #2	CURVE #3	CURVE #4	CURVE #5	CURVE #6
D = 2° 30'	D = 2° 30'	D = 2° 30'	D = 2° 30'	D = 2° 30'	D = 2° 30'
R = 2292.01'	R = 2292.01'	R = 2292.01'	R = 2292.01'	R = 2292.01'	R = 2292.01'
Δ = 7°50'34"	Δ = 6°51'18"	Δ = 18°49'11"	Δ = 17°37'34"	Δ = 10°59'43"	Δ = 10°47'22"
T_S = 232.13'	T_S = 212.29'	T_S = 454.91'	T_S = 430.41'	T_S = 295.63'	T_S = 291.47'
T = 157.14'	T = 137.30'	T = 379.92'	T = 355.42'	T = 220.64'	T = 216.48'
L = 463.73'	L = 424.20'	L = 902.79'	L = 855.04'	L = 589.81'	L = 581.58'
S.ELEV. = 2½"	S.ELEV. = 2½"	S.ELEV. = 2½"	S.ELEV. = 2½"	S.ELEV. = 2½"	S.ELEV. = 2½"
SPIRAL = 150'	SPIRAL = 150'	SPIRAL = 150'	SPIRAL = 150'	SPIRAL = 150'	SPIRAL = 150'
OFFSET = 0.41'	OFFSET = 0.41'	OFFSET = 0.41'	OFFSET = 0.41'	OFFSET = 0.41'	OFFSET = 0.41'

*NOTE: SPEED ON ALL OTHER TRACKS RESTRICTED BY MAXIMUM PERMISSIBLE SPEED THRU SWITCHES INVOLVED, BUT NOT TO EXCEED 25 M.P.H.

LEGEND

O EXISTING POWER LINE TOWER WITH FOUNDATION.

✱ POWER LINE TOWER, INCLUDING CONCRETE FOUNDATION TO BE REMOVED TO OR BELOW THE PERMANENT SUBGRADE ELEVATION OF ADJACENT TRACKS BY THE STATE'S CONTRACTOR, ITEMS S-24 TO BE REMOVED AS FOLLOWS:

✱ AFTER MAIN DETOUR TRACKS ARE OPERATIONAL.

✱ BEFORE CONNECTION OF W.B. MAIN DETOUR TRACK, UNDER RAIL TRAFFIC.

DRAWN: EFS		CHECKED: MJP
REVISIONS		
DATE	BY	DESCRIPTION

Sheet 1 of 2

N.Y.C. SYSTEM | OFFICE OF CHIEF ENGINEER | CHICAGO, ILL.

BRIDGE No 188-B/4 — STATION 318+07.06

PROPOSED UNDERPASS GRADE SEPARATION
TO CARRY
MEDINA FREEWAY - U.S. I-71

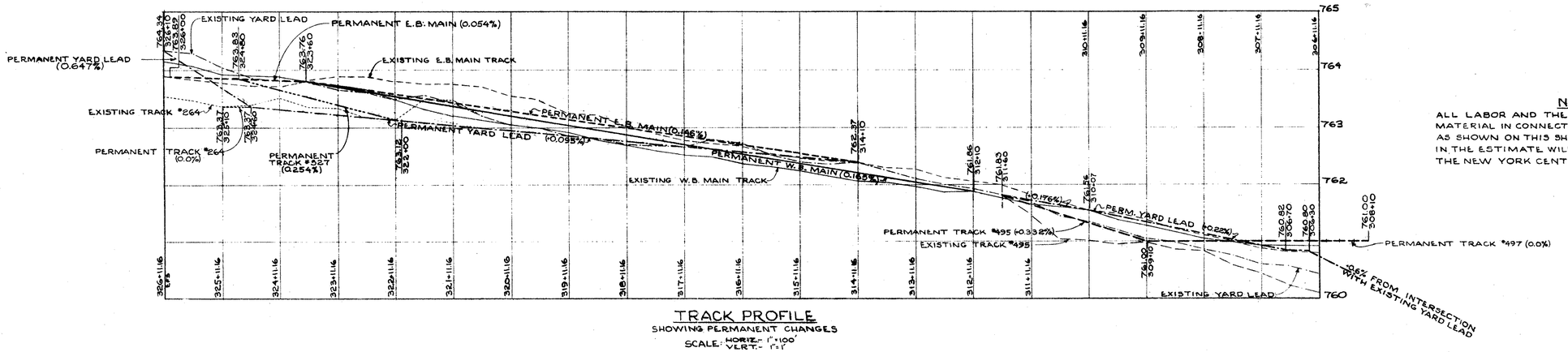
BROOKLYN, OHIO

TEMPORARY AND PERMANENT TRACK PLANS AND PROFILES

WESTERN DIST.	LAKE DIVISION CLEVELAND SUBDIVISION	PLAN No: 7546-A
SCALE: AS SHOWN	MARCH 6, 1964	VAL. SEC. 36 — FILE No: 132-25

FED DIVISION	State	Project.		258 / 279
2	Ohio			

CUYAHOGA COUNTY.
CUY-71-13.68



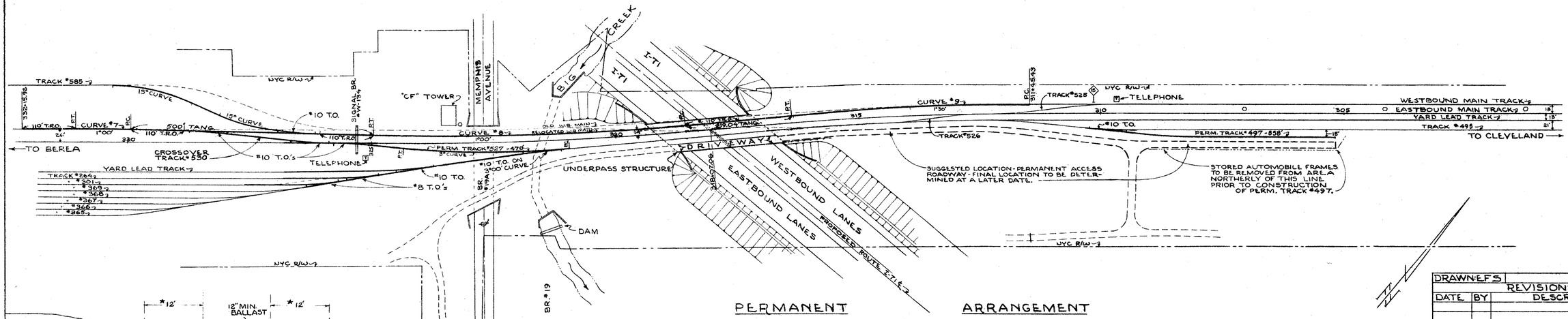
TRACK PROFILE

SHOWING PERMANENT CHANGES

SCALE: HORIZ.- 1"=100'
VERT.- 1"=1'

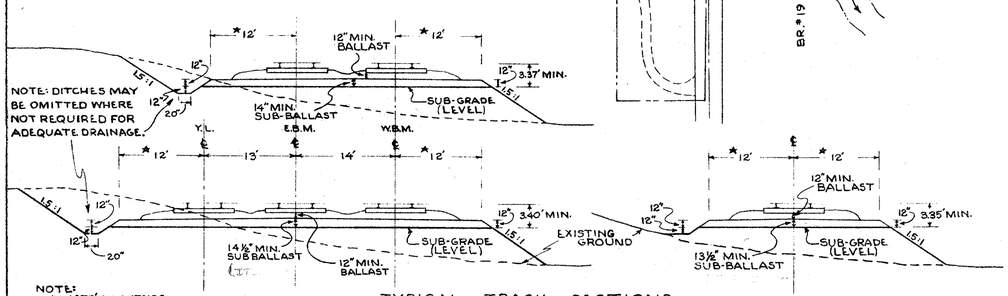
NOTE

ALL LABOR AND THE FURNISHING OF ALL MATERIAL IN CONNECTION WITH CHANGES AS SHOWN ON THIS SHEET AND CALLED FOR IN THE ESTIMATE WILL BE PERFORMED BY THE NEW YORK CENTRAL EXCEPT AS NOTED.



PERMANENT ARRANGEMENT

SCALE: 1"=100'



TYPICAL TRACK SECTIONS

FOR TEMPORARY AND PERMANENT TRACKS

SCALE: 1"=10'

CURVE DATA ON ℄ PROPOSED PERMANENT RELOCATION OF WEST BOUND MAIN TRACK — DESIGN SPEED - 60 M.P.H.*

CURVE #7	CURVE #8	CURVE #9
D= 1°00'	D= 1°00'	D= 1°30'
R= 5729.65'	R= 5729.65'	R= 3819.83'
Δ= 1°07'22"	Δ= 6°22'46"	Δ= 5°16'30"
T= 56.15'	T= 319.31'	T= 245.97'
L= 112.28'	L= 637.94'	T= 175.97'
SUPER ELEVATION = 1¼"	SUPER-ELEVATION = 1½"	L= 491.67'
SPIRAL - NONE REQ'D	SPIRAL - NONE REQ'D	SUPER ELEVATION = 2"
TANGENT RUN-OFF = 110'	TANGENT RUN-OFF = 110'	SPIRAL = 140'
		OFFSET = 0.22'

*NOTE: SPEED ON ALL OTHER TRACKS RESTRICTED BY MAXIMUM PERMISSIBLE SPEED THRU TURNOUTS INVOLVED, BUT NOT TO EXCEED 25 M.P.H.

DRAWN: E.F.S.		CHECKED: M.J.P.
REVISIONS		
DATE	BY	DESCRIPTION

SHEET 2 OF 2

N.Y.C. SYSTEM	OFFICE OF CHIEF ENGINEER	CHICAGO, ILL.
BRIDGE Nº 188-B/4		STATION 318+07.06

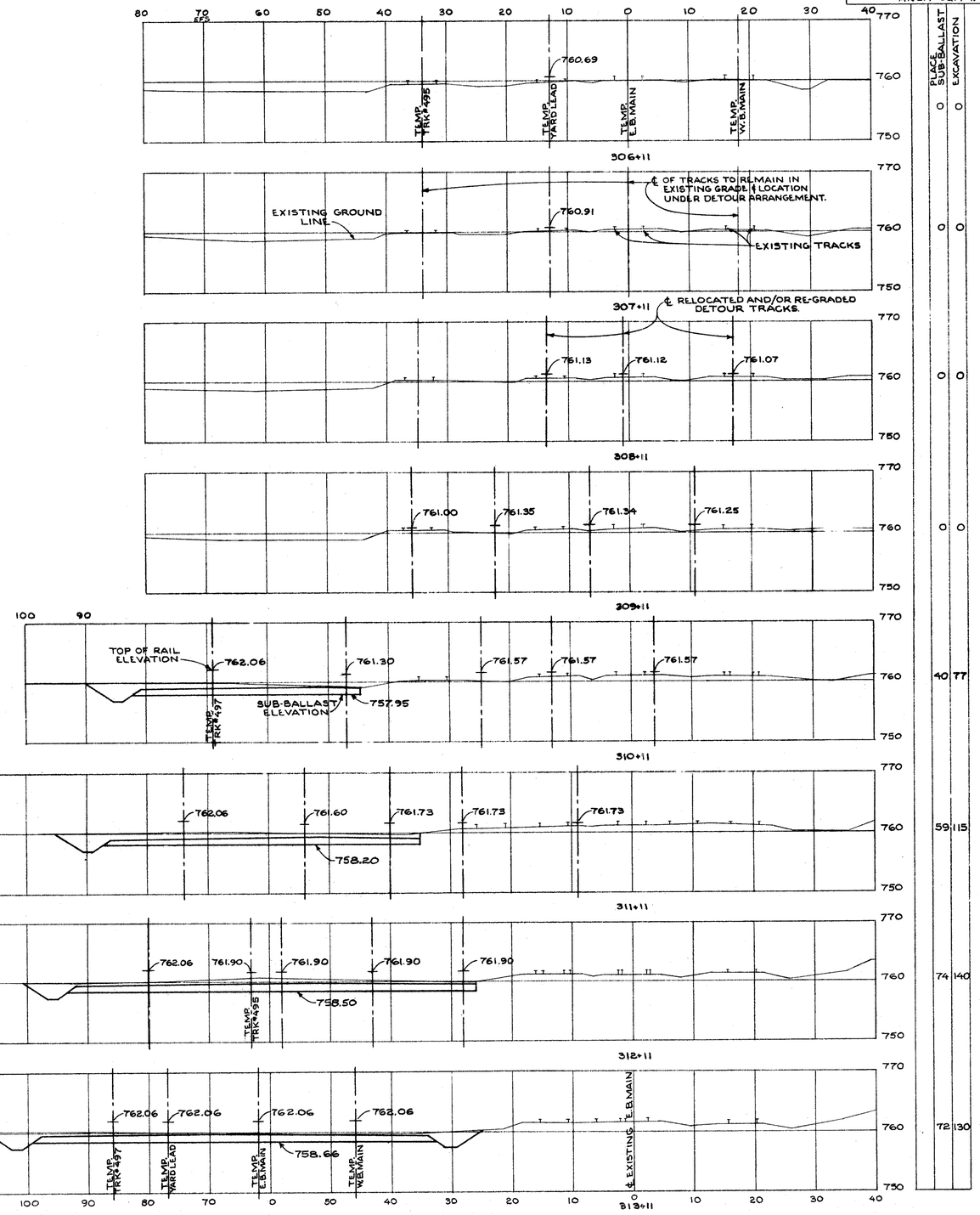
PROPOSED UNDERPASS GRADE SEPARATION TO CARRY MEDINA FREEWAY - U.S. 1-71

BROOKLYN, OHIO

TEMPORARY AND PERMANENT TRACK PLANS AND PROFILES

WESTERN DIST.	LAKE DIVISION CLEVELAND SUBDIVISION	PLAN Nº: 7546-B
SCALE: AS SHOWN	MAR. 6, 1964	VAL. SEC. 36	FILE Nº: 132-25

GRADING QUANTITIES FOR TEMPORARY DETOUR TRACKS.
AREA - SQ. FT.

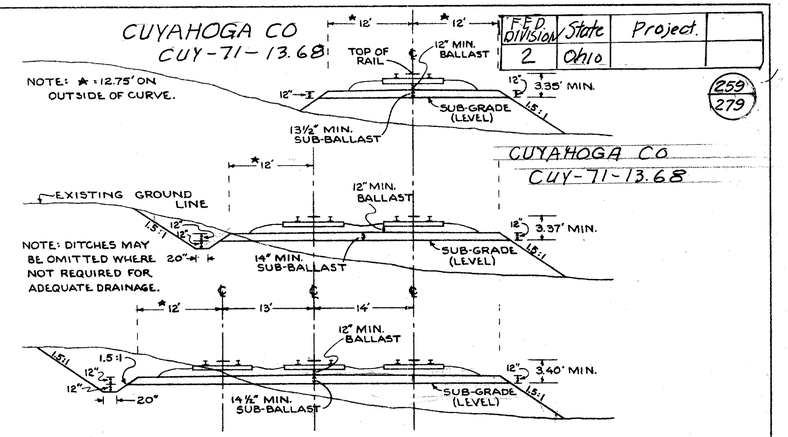


PLACE SUB-BALLAST	EXCAVATION
0	0
0	0
0	0
0	0
40	77
59	115
74	140
72	130

CUYAHOGA CO
CUY-71-13.68

FED. DIVISION	State	Project.	
2	Ohio		

259
279



TYPICAL TRACK SECTIONS
FOR TEMPORARY AND PERMANENT TRACKS

NOTE
STATE'S CONTRACTOR TO PERFORM THE FOLLOWING GRADING WORK: EXCAVATION, REPLACING EXCAVATION, PLACING SUB-BALLAST, REMOVING SUB-BALLAST, AND REMOVING BALLAST PLACED BY RAILROAD FORCES.
RAILROAD FORCES TO PLACE BALLAST.

SUMMARY
GRADING QUANTITIES
TEMPORARY

E-1	EXCAVATION	6700 C.Y.
I-22	SUBBASE (SUB BALLAST)	3500 C.Y.

SUB-BALLAST PLACED	3500 C.Y.
BALLAST PLACED (BY RR FORCES)(4000 N.T.)	2665 C.Y.
TOTAL MATERIAL PLACED	6165 C.Y.
MATERIAL TO BE REGRADED *	5225 C.Y.
E-1 EXCAV.: (MATERIAL TO BE REMOVED)	940 C.Y.

PERMANENT

E-1	EXCAVATION	3060 C.Y.
I-22	SUBBASE (SUB BALLAST)	1982 C.Y.

* IN LIEU OF REMOVING ALL BALLAST AND SUBBALLAST PLACED, AND REPLACING 5225 C.Y. OF EXCAVATION; 5225 C.Y. OF BALLAST AND SUBBALLAST SHALL BE REGRADED TO ORIGINAL GROUND LINE TO THE SATISFACTION OF CHIEF ENGINEER OF RAILROAD. COST OF REGRADING INCLUDED IN PRICE BID PER CU.YD. FOR ITEM E-1, ROADWAY EXCAVATION.

E-1 EXCAVATION = 6700 C.Y. + 940 C.Y. + 3060 C.Y. = 10,700 C.Y. (TO SHEET 14)
I-22 SUBBASE (SUB BALLAST) = 3500 C.Y. + 1982 C.Y. = 5,482 C.Y. (TO SHEET 13)

DRAWN: EFS		CHECKED: MJP
REVISIONS		
DATE	BY	DESCRIPTION

Temporary Tracks
Sheet 1 of 4

N.Y.C. SYSTEM	OFFICE OF CHIEF ENGINEER	CHICAGO, ILL.

BRIDGE No 188-B/4 STATION 318+07.06

PROPOSED UNDERPASS GRADE SEPARATION
TO CARRY
MEDINA FREEWAY - U.S. I-71

BROOKLYN, OHIO

ROADBED SECTIONS FOR TEMPORARY AND PERMANENT TRACKS.

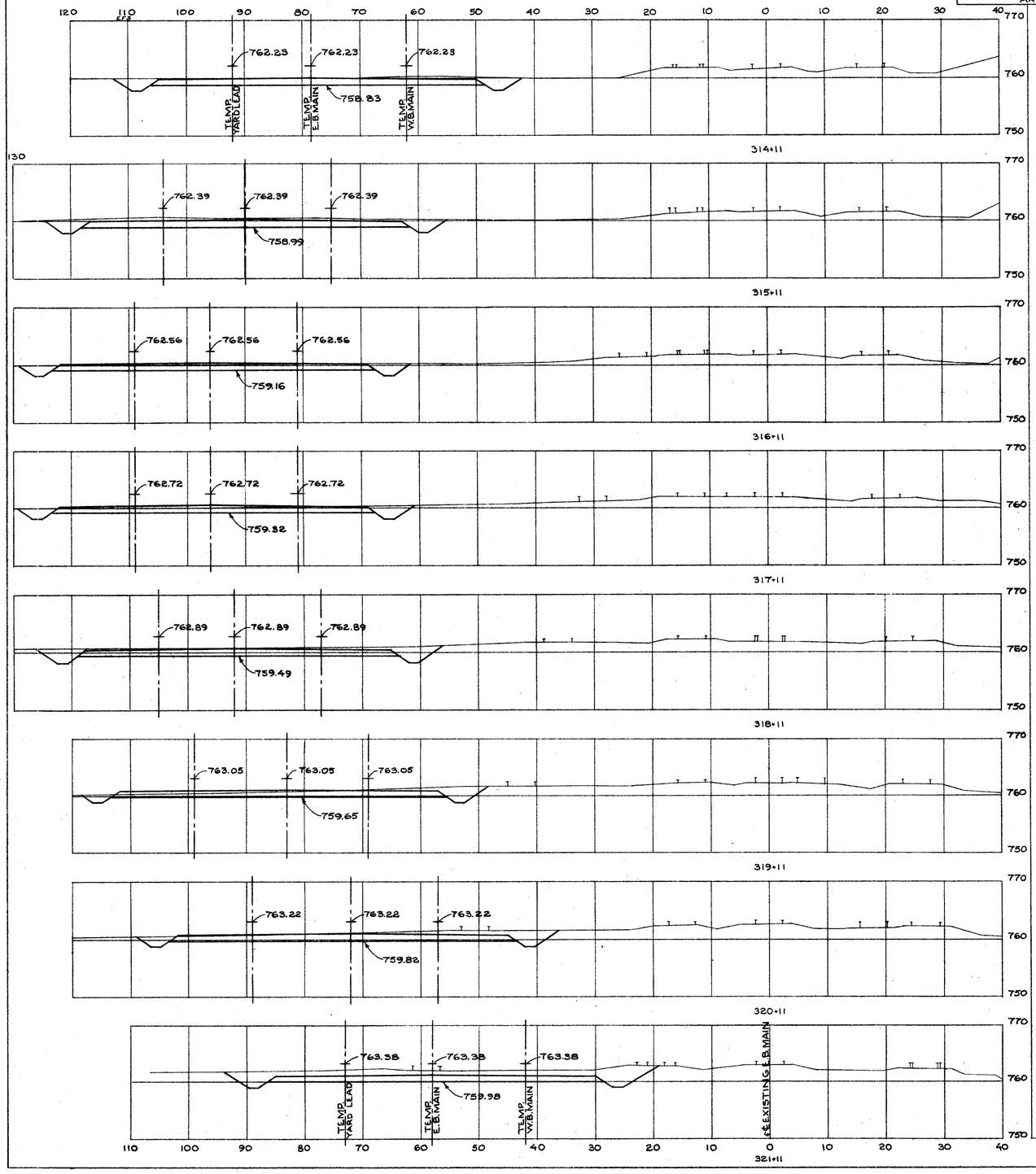
WESTERN DISTRICT	LAKE DIVISION CLEVELAND SUB-DIVISION	PLAN No: 7547-A	
SCALE: 1" = 10'	DEC. 17, 1964	VAL. SEC. 36	FILE No: 132-26

GRADING QUANTITIES FOR TEMPORARY DETOUR TRACKS. AREA - SQ. FT.

CUYAHOGA CO.
CUY-71-13.68

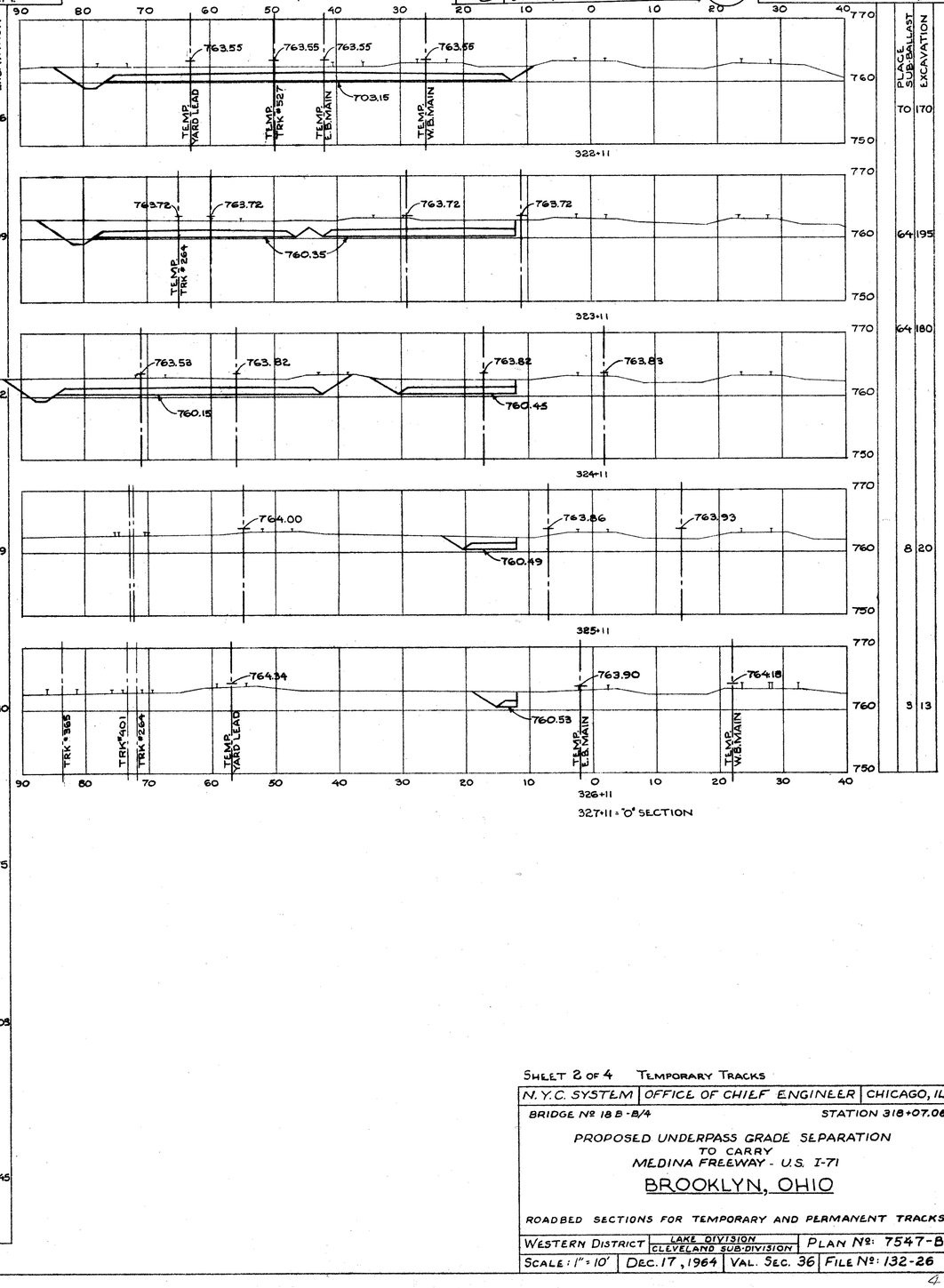
FED Project	State	Project.	
2	Ohio		

260
279



PLACE SUB-BALLAST EXCAVATION

62 86
61 109
60 72
60 69
60 110
62 75
64 103
62 145



PLACE SUB-BALLAST EXCAVATION

70 170
64 195
64 180
8 20
3 13

SHEET 2 OF 4 TEMPORARY TRACKS

N.Y.C. SYSTEM	OFFICE OF CHIEF ENGINEER	CHICAGO, ILL.
BRIDGE Nº 18 B-B/4		STATION 318+07.06

PROPOSED UNDERPASS GRADE SEPARATION
TO CARRY
MEDINA FREEWAY - U.S. I-71

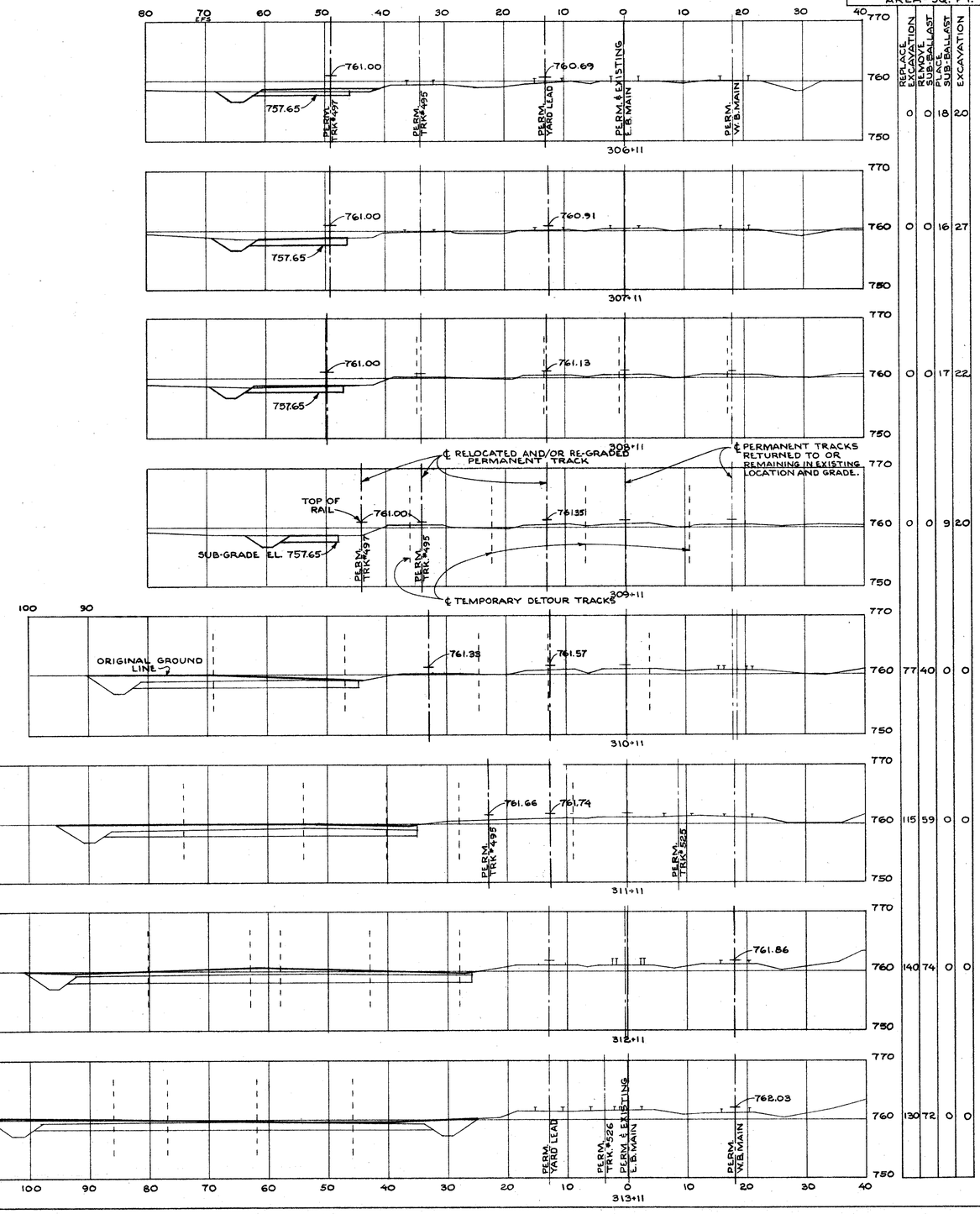
BROOKLYN, OHIO

ROADBED SECTIONS FOR TEMPORARY AND PERMANENT TRACKS.

WESTERN DISTRICT	LAKE DIVISION / CLEVELAND SUB-DIVISION	PLAN Nº: 7547-B
SCALE: 1" = 10'	DEC. 17, 1964	VAL. SEC. 36	FILE Nº: 132-26

4

PERMANENT TRACK #497
BEGINS APPROX. 305+11



GRADING QUANTITIES FOR PERMANENT TRACKS.
AREA - SQ. FT.

REPLACE EXCAVATION	REMOVE SUB-BALLAST	PLACE SUB-BALLAST	EXCAVATION
0	0	18	20
0	0	16	27
0	0	17	22
0	0	9	20
77	40	0	0
115	59	0	0
140	74	0	0
130	72	0	0

F.E.D. Project	State	Project		261 / 279
2	Ohio			

CUYAHOGA CO.
CUY-71-13.68

Sheet 3 of 4 Permanent Tracks

N.Y.C. SYSTEM	OFFICE OF CHIEF ENGINEER	CHICAGO, ILL.

BRIDGE No 18 B-B/4 STATION 318+07.06

PROPOSED UNDERPASS GRADE SEPARATION
TO CARRY
MEDINA FREEWAY - U.S. I-71

BROOKLYN, OHIO

ROADBED SECTIONS FOR TEMPORARY AND PERMANENT TRACKS

WESTERN DIST.	LAKE DIVISION / CLEVELAND SUBDIVISION	PLAN No: 7547-C
SCALE: 1" = 10'	DEC. 17, 1964 / VAL. SEC. 36	FILE No: 132-26

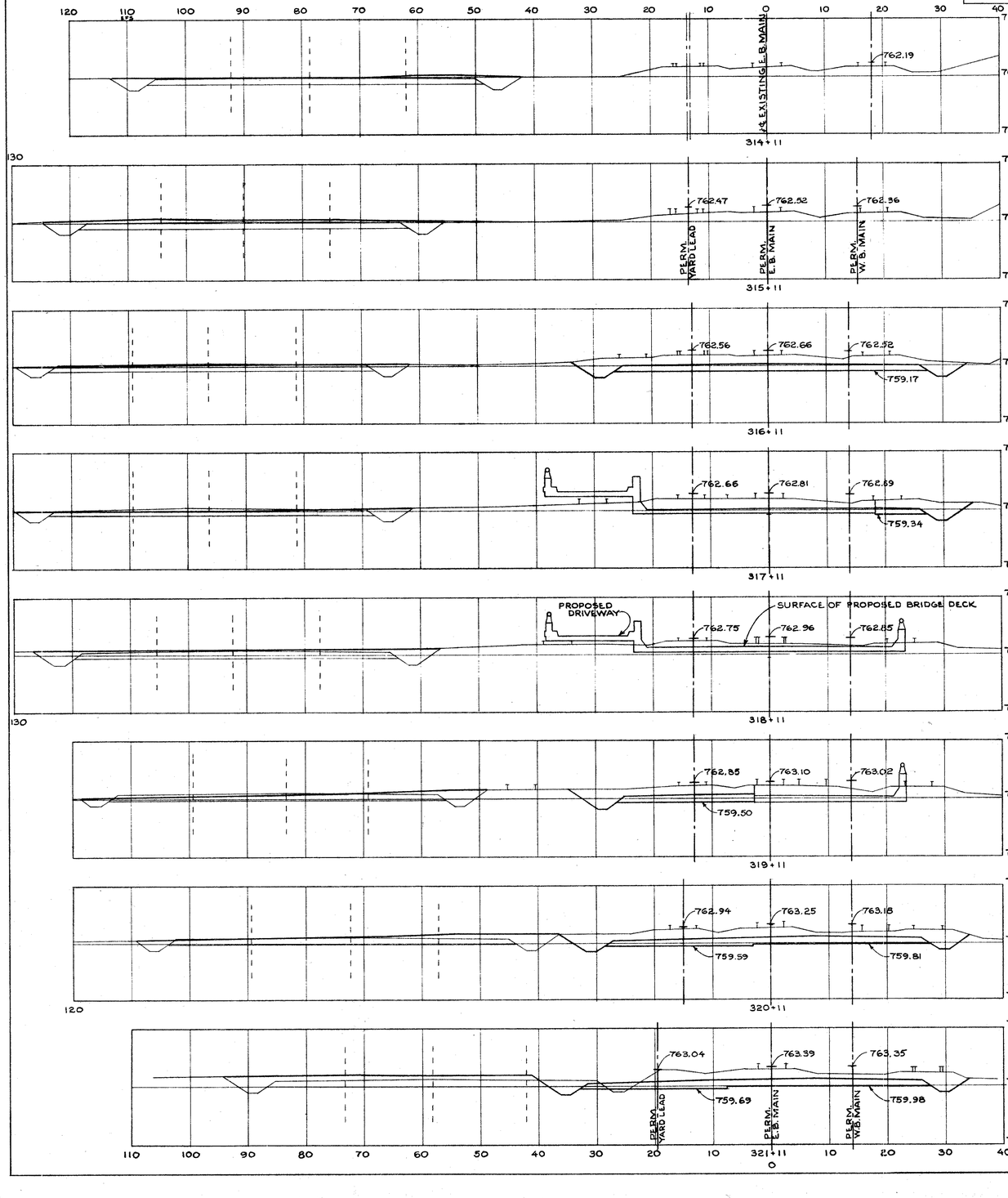
CUYAHOGA CO.
CUY-71-13.68.

Fed. Division	State	Project.		262 / 279
2	Ohio			

GRADING QUANTITIES FOR PERMANENT TRACKS.
AREA - SQ. FT.

	REPLACE EXCAVATION	REMOVE SUB-BALLAST	PLACE SUB-BALLAST	EXCAVATION
314+11	86	62	0	0
315+11	109	61	0	0
316+11	72	60	0	58
317+11	69	60	0	58
318+11	110	60	0	0
319+11	75	62	0	0
320+11	103	64	62	0 178
321+11	103	62	66	153
322+11	82	70	77	190
323+11	71	64	99	157
324+11	58	50	46	84
325+11	6	3	19	54
326+11	5	2	21	60

GRADING QUANTITIES FOR PERMANENT TRACKS
AREA - SQ. FT.



SHEET 4 OF 4 PERMANENT TRACKS

N.Y.C. SYSTEM	OFFICE OF CHIEF ENGINEER	CHICAGO, ILL.
BRIDGE Nº 18B-B/4		STATION 318+07.06

PROPOSED UNDERPASS GRADE SEPARATION
TO CARRY
MEDINA FREEWAY - U.S. I-71

BROOKLYN, OHIO

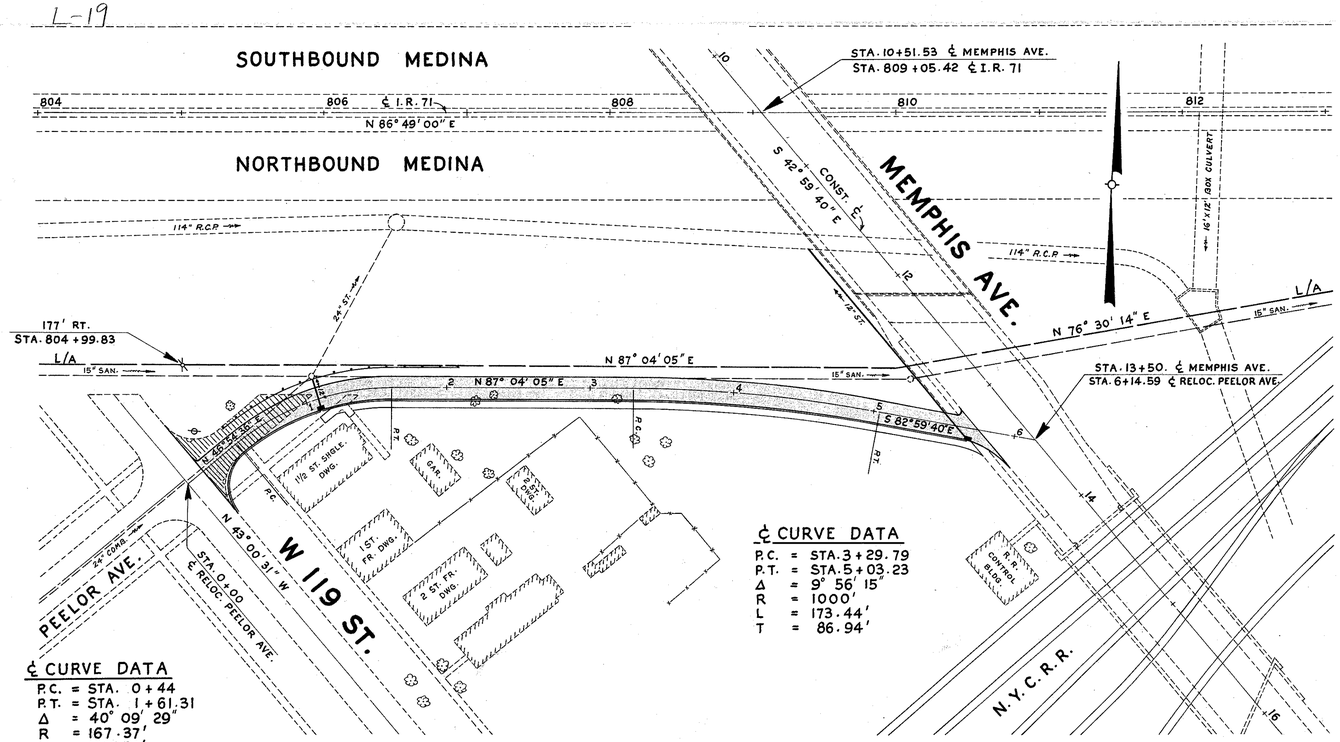
ROADBED SECTIONS FOR TEMPORARY AND PERMANENT TRACKS

WESTERN DIST.	LAKE DIVISION / CLEVELAND SUBDIVISION	PLAN Nº: 7547-D
SCALE: 1" = 10'	DEC. 17, 1964	VAL. SEC 36	FILE Nº: 132-26

EFS

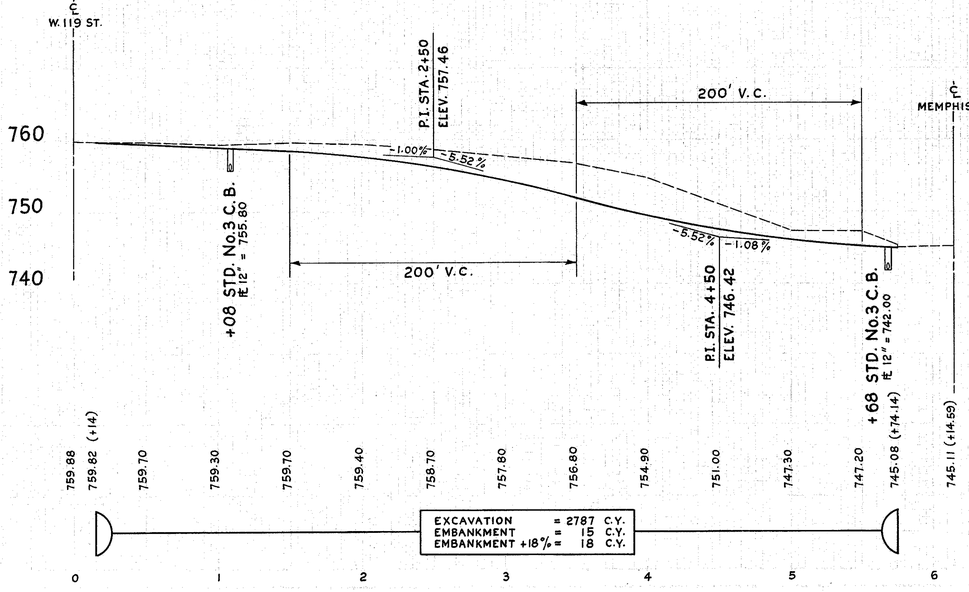
8-W

L-19



℄ CURVE DATA
P.C. = STA. 0+44
P.T. = STA. 1+61.31
Δ = 40° 09' 29"
R = 167.37'
L = 117.31'
T = 61.18'

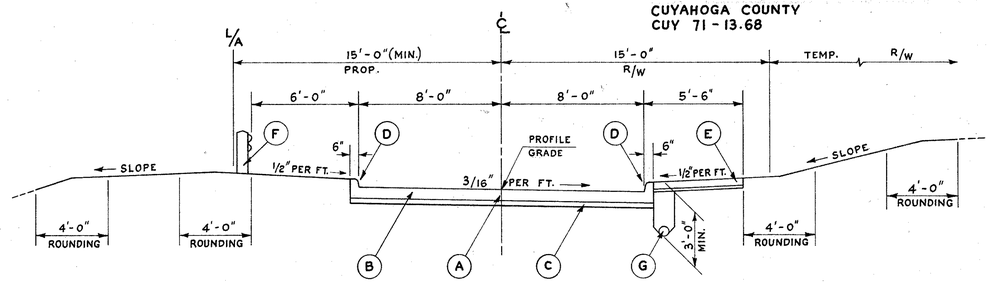
℄ CURVE DATA
P.C. = STA. 3+29.79
P.T. = STA. 5+03.23
Δ = 9° 56' 15"
R = 1000'
L = 173.44'
T = 86.94'



EXCAVATION = 2787 C.Y.
EMBANKMENT = 15 C.Y.
EMBANKMENT +18% = 18 C.Y.

1
3

CUYAHOGA COUNTY
CUY 71-13.68



TYPICAL SECTION PEELOR AVE.

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

NOTES

The Slopes shall be Graded as Indicated on the Cross Sections.

Item I-13 : Concrete Sidewalk shall be Placed from RT. Sta. 1+06 to RT. Sta. 5+72.

Item I-15 : Guard Rail shall be Installed from LT. Sta. 0+44 to LT. Sta. 2+09.

= Pavement Removal

= Proposed Construction

LEGEND

A..... Standard Longitudinal Joint
B..... T-71 ..... 7" Reinforced Port. Cem. Conc. Pavement
C..... I-19 ..... 3" Insulation Course
D..... I-12 ..... Concrete Curb, Standard Type 2-A
E..... I-13 ..... 4½" Conc. Sidewalk on 2" Granulated Slag
F..... I-15 ..... Guard Rail, Steel Beam Std. Type (Deep)
G..... I-1 ..... 6" Pipe, Class I-3, Sec. M-6.8 (e)

ESTIMATED ROADWAY AND PAVEMENT QUANTITIES

LOCATION	E-1 ROADWAY EXCAVATION METHOD "B"	E-1 COMPACTED SUBGRADE	E-8 REM. & DISP. OF EXIST. PAVE.	E-8 REM. & DISP. OF EXIST. SIDEWALK	E-9 REMOVAL OF TREES & STUMPS	I-13 4½" CONC. WALK ON GRAN. SLAG OR SCR.	I-15 GRD. RAIL STL. BEAM STD. TYPE (DEEP)	L-9 SEEDING AND PROTECTING	L-9 COMMERCIAL FERTILIZER	L-9 AGRICULTURAL LIMING MATERIAL		T-71 7" REIN. PORT. CEM. CONC. PAVE.	I-19 3" INSUL. COURSE & SUBBASE COURSE	I-12 CONC. CURB STD. TYPE 2-A
	CU. YDS.	SQ. YDS.	SQ. YDS.	SQ. FT.	LUMP	SQ. FT.	LIN. FT.	SQ. YDS.	TONS	TONS		SQ. YDS.	SQ. YDS.	LIN. FT.
STA. 0+14 to STA. 5+74.14	2787	1094	255	180	LUMP	2350	175	1750	0.16	0.80		1094	1094	1154
TOTALS =	2787	1094	255	180	LUMP	2350	175	1750	0.16	0.80		1094	1094	1154

ESTIMATED DRAINAGE QUANTITIES

LOCATION	I-1 6" PIPE CLASS I-3 M-6.8 (e)	I-1 6" PIPE CLASS F-4	I-1 12" PIPE CLASS J-1	I-1 12" PIPE CLASS F-4	I-5 12" PIPE SPECIAL CLASS F-4	I-8 STD. No. 3 CATCH BASINS	I-16 CATCH BASINS ABANDON
	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH
STA. 0+14 to STA. 1+08	96	10					2
STA. 1+08 to STA. 5+68	446	10					
STA. 1+08			24			1	
STA. 5+68 to OUTLET			132	46	1	1	
TOTALS =	542	20	156	46	1	2	2

ADDITIONAL WORK
PEELOR AVE. RELOCATION

CUY 71-13.68
PROJ. No. 38-65

LOCATION & DESIGN
DIVISION 12

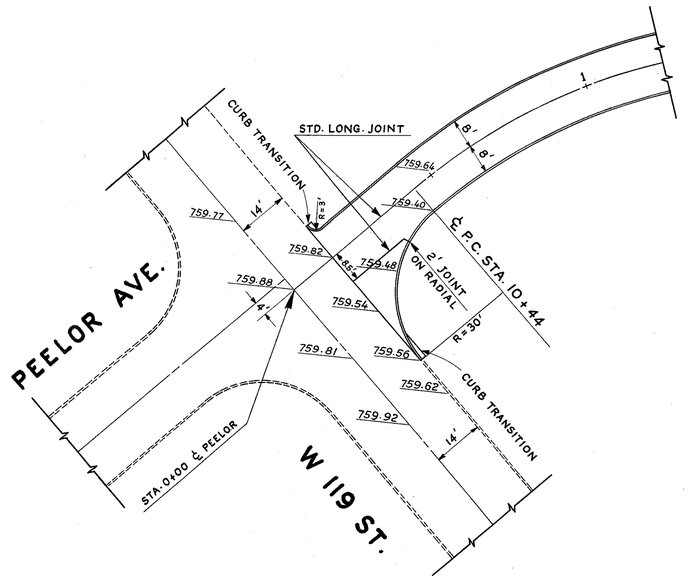
10-4-66

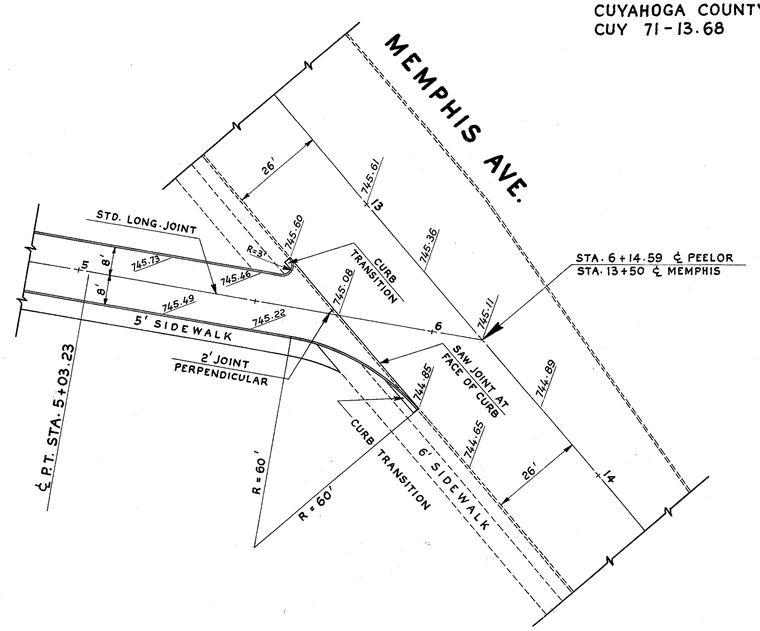
PLAN AND PROFILE ··· PEELOR AVE. RELOCATION

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

2/3

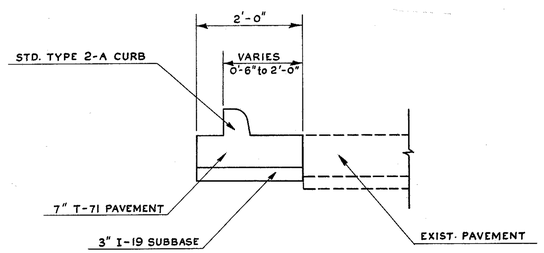
CUYAHOGA COUNTY
CUY 71-13.68





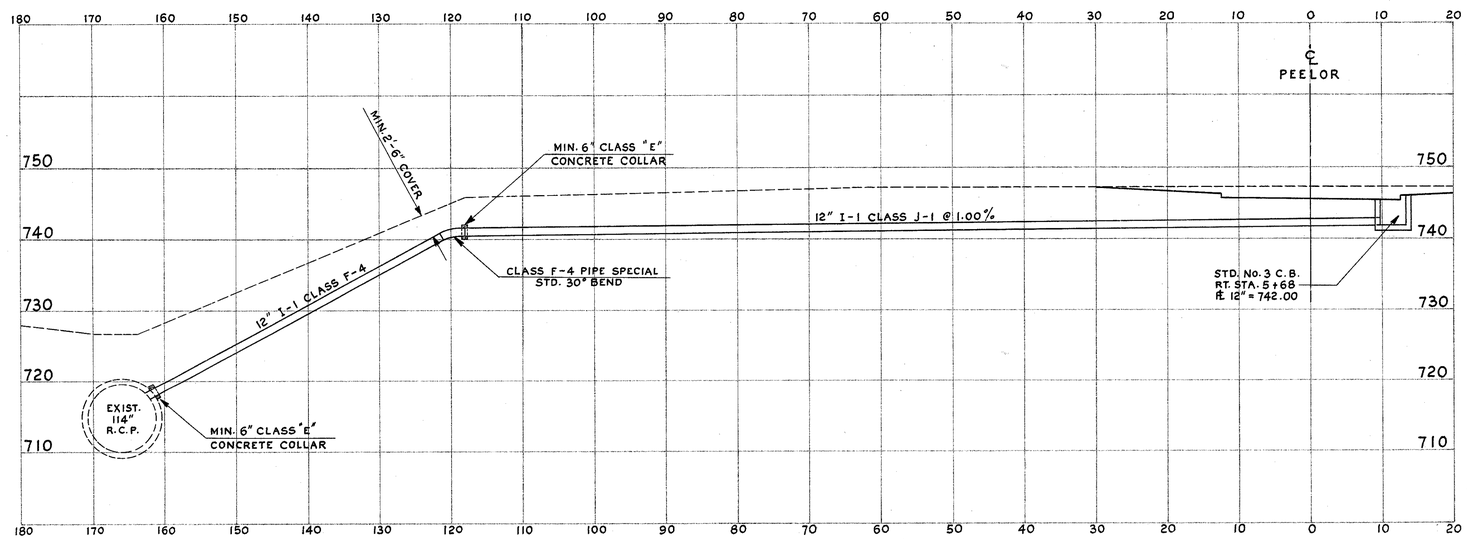
INTERSECTION DETAILS

SCALE : 1" = 20'



CURB TRANSITION DETAIL

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

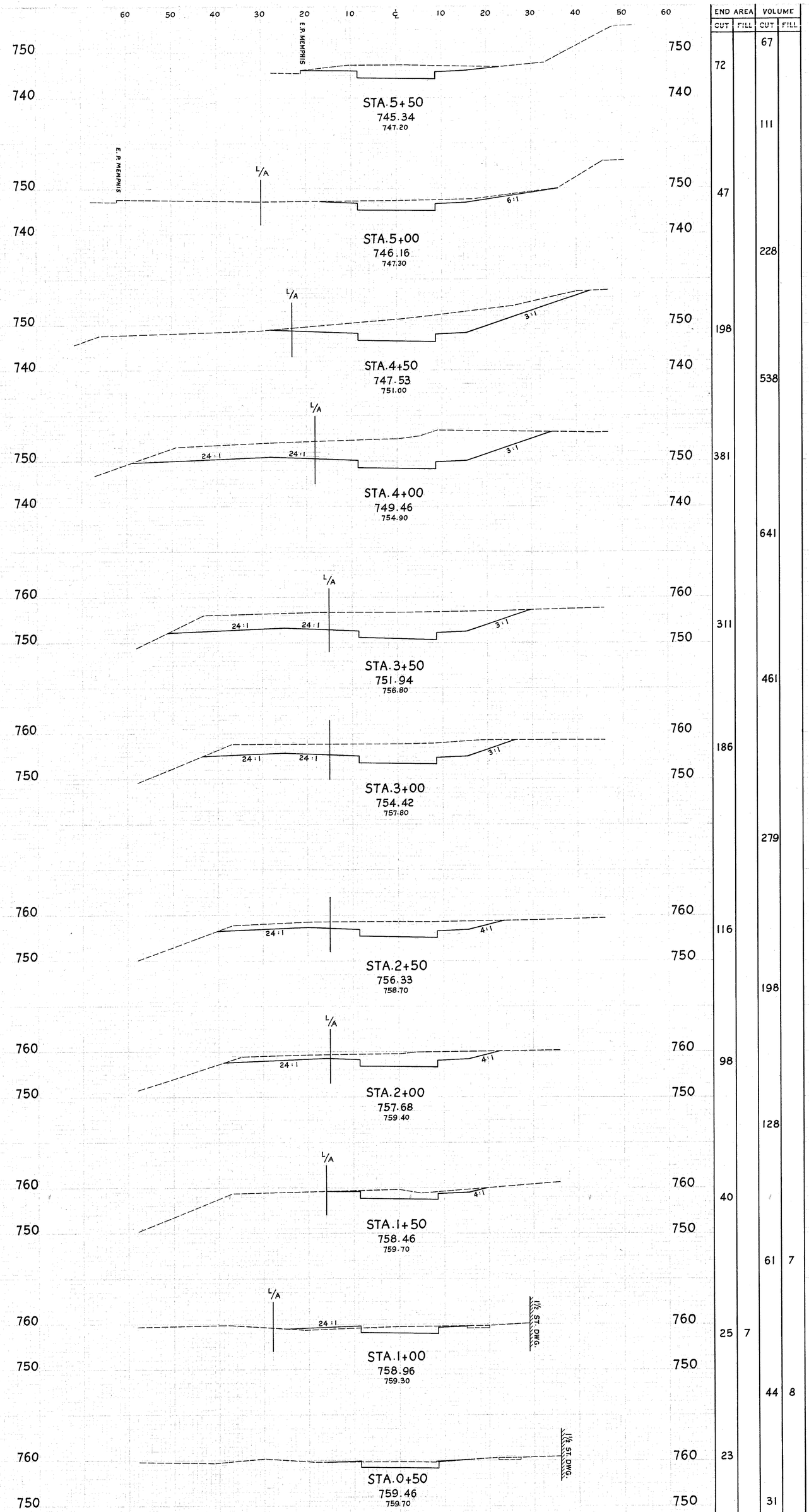


SEWER OUTLET PROFILE LT. STA. 5+68

SCALE : 1" = 10'-0"

MISCELLANEOUS DETAILS ··· PEELOR AVE. RELOCATION

CROSS SECTIONS ... PEELOR AVE. RELOCATION



END AREA		VOLUME	
CUT	FILL	CUT	FILL
72		67	
		111	
47			
		228	
198			
		538	
381			
		641	
311			
		461	
186			
		279	
116			
		198	
98			
		128	
40			
		61	7
25	7		
		44	8
23			
		31	

CUYAHOGA COUNTY
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