CUY-90-14.90

PID 77332/85531

APPENDIX EX-19

CUY-077-1412 PID 0.070
(Reference Document)

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

Innerbelt Bridge
Construction Contract Group 1 (CCG1)

Revision Date: 1962

0-13

D-13

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
CUY-21-14.12

CUY-77-14.12

I-77-5 (6) 161

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	I-77-5 (6) 161	

1/198

CUYAHOGA COUNTY
CUY-21-14.12

CITY OF CLEVELAND
CUYAHOGA COUNTY

TRYGVE W. HOFF
7788

Plans prepared by:
TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

Trygve W. Hoff PRESIDENT
Stig O. Forsmark CHIEF ENGINEER
J. Leslie Lees PROJECT ENGINEER

CONVENTIONAL SIGNS

CENTERLINE	——— — ———
FENCE	—×—×—×—×—×—
GUARD RAIL (EXISTING)	—o—o—o—o—o—o—o—o—o—
GUARD RAIL (PROPOSED)	—●—●—●—●—●—●—●—●—●—
RAILROAD	—+—+—+—+—
UTILITY POLES	ø ø ø ø
TREES & STUMPS (EXISTING)	
PROPERTY LINE	PL
PROPERTY LINE-SAME OWNER CONTIGUOUS PARCELS OF LAND	——— Z ———
EXISTING RIGHT OF WAY	EXIST. R/W
LIMITED ACCESS RIGHT OF WAY ONLY	——— LA ———
RIGHT OF WAY ONLY	——— R/W ———
SUBDIVISION LINE	— — — — — — — — —
ORIGINAL LOT LINE	——— ———

INDEX TO SHEETS

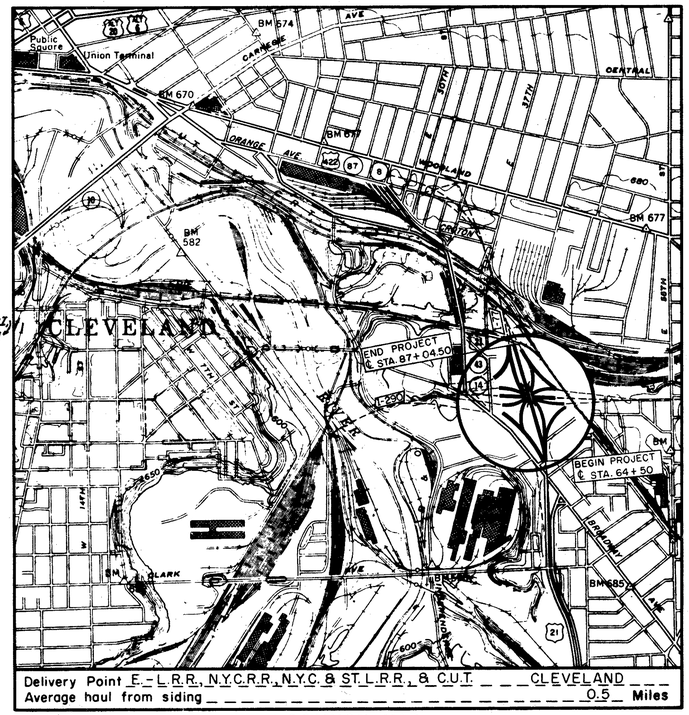
SHEETS 88, 89 & 90 OMITTED

LINE DATA

BEGIN PROJECT STA. 64 + 50.00 TO	
END PROJECT STA. 87 + 04.50	2,254.50 L.F.
NET LENGTH OF PROJECT	2,254.50 L.F. = 0.426 MILES
ADD FOR APPROACH WORK	
WILLOW STA. 48+48.00 TO STA. 64 + 50.00 =	1,602.00 L.F.
*WILLOW STA. 87 + 04.50 TO STA. 32+20.00 =	4,515.50 L.F.
ADD FOR CLARK FREEWAY	
STA. 1028 + 14.00 TO STA. 1042 + 15.00 =	1,401.00 L.F.
NET LENGTH OF WORK . . . . =	9,773.00 L.F. = 1.850 MILES

* STA.130+41.88 BK. = STA. 30+41.88 AH.

Sheet 172 revised 11-27-63
Sheets 100 & 129 revised 12-13-63
Sheet 148 revised 3-3-64
Sheet 148A added 3-3-64
Sheet 141 revised 3-4-64
Sheets 182, 184 and 189 revised 5-5-64
Sheet 189 revised 10-6-64
Sheet 189A added 10-6-64



Delivery Point E.-L.R.R., N.Y.C.R.R., N.Y.C. & ST. L.R.R., & C.U.T. CLEVELAND
Average haul from siding 0.5 Miles

LOCATION MAP

SCALE

1 1/2 0 1 MILE

Portion to be improved	▬▬▬
Federal Roads	═══
State Roads	○ ═══
Other Roads & Streets	═══

SCALE

Plan	1" = 50'	
Profile: Horizontal	1" = 50'	Unless
Profile: Vertical	1" = 10'	Noted
Cross Sections	1" = 10'	
Others	As Noted	

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS									
B-T-70-71	11/15/60	I-1	11/15/60	I-15 No. 1	11/15/60	L-3-A	4/1/50	RB-1-55	2/2/59
B-T-71R	3/2/53	I-8 C.B. No. 5	2/1/63	I-15 No. 2-A	8/17/60	L.J. No. 1	7/1/55		
F-1	2/1/63	I-8 I. No. 2-A	2/1/63	I-15 No. 4	12/1/54	RI-1	7/15/58		
F-3	2/1/63	I-8 M.H. No. 1	2/1/63			T-35	1/2/56		
FACI-1	3/8/63	I-8 M.H. No. 2	2/1/63	I-21-23	8/1/56	T.J.	9/12/60		
FACI-2	3/8/63	I-12	2/1/63	L-1	4/1/50	AR-1-57	4/2/62		
G-7.07	6/1/56			L-3	4/1/50	FSB-1-62	1/15/63		
HW-E	2/1/63	I-8 M.H. No. I-A	2-1-63			AS-1-54	7-5-62		

SUPPLEMENTAL SPECIFICATIONS		
CE-101.04	5/22/56	
L-120	R.- 1/2/62	
S-307	8/23/60	
S-101	7/12/62	
I-212	R. 6-23-61	
I-129	R. 4-5-61	

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 Construction and Material Specifications shall govern this improvement.

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 Louis L. Drasler
Date 6/4/63 Director of Public Service, City of Cleveland

Approved Charles M. Yurick
Date May 31, 1963 Division Deputy Director

Approved J. W. Wilson
Date 9-26-63 Deputy Director of Planning & Programming

Approved T. H. Bobird
Date 9-12-63 Deputy Director of Right of Way

Approved L. H. Overman
Date 9-9-63 Engineer of Bridges

Approved R. N. Ricketts
Date 9-13-63 Engineer of Location & Design

Approved R. E. Shultz
Date 9-16-63 Deputy Director of Design & Construction

Approved
Date 9/26/63 First Ass't. Director

Approved P. E. Masheter
Date 9/26/63 Director of Highways

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED:

DIVISION ENGINEER DATE

00156RP3

File No.	CUYAHOGA COUNTY CUY-21-14.12
	Date of Letting ______ 19
	Contract No. ______

FED RD DIVISION	STATE	PROJECT	
2	OHIO		

2
198

CUYAHOGA COUNTY
CUY-21-14.12

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

SCHEMATIC PLAN

SCALE: DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
CDR	DK		RLH			

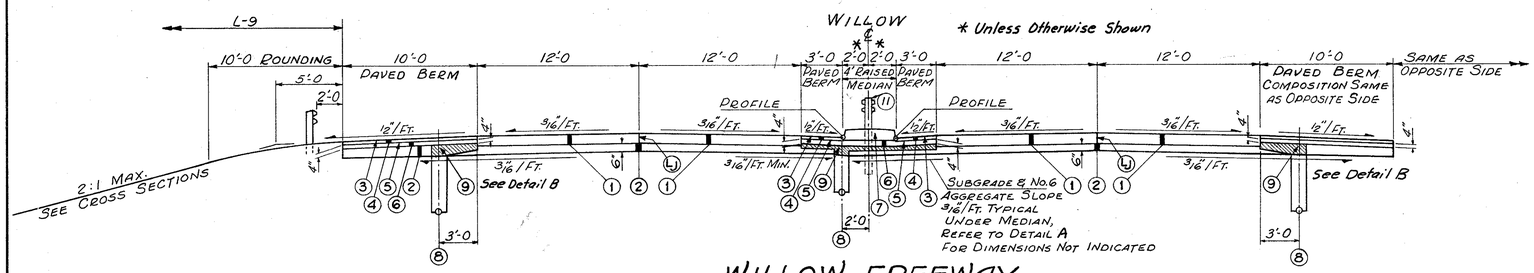
TYPICAL SECTIONS TYPE T-71

CODE 7221

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

3 / 198

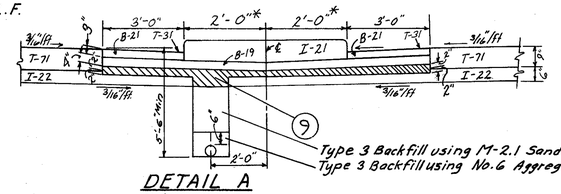
CUYAHOGA COUNTY
CUY— 21 — 14.12



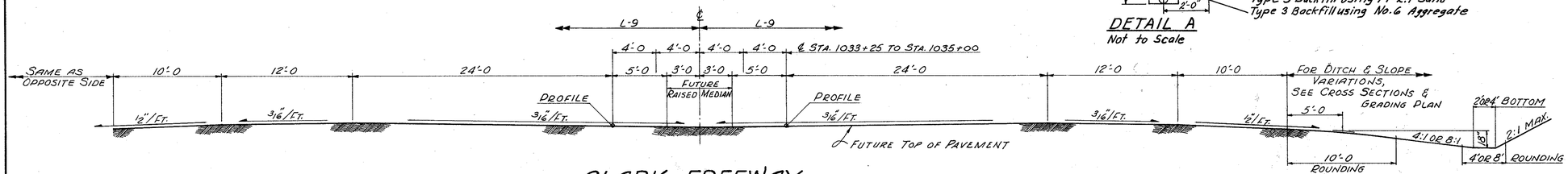
WILLOW FREEWAY

℄ STA. 64+50 (BEGIN PROJECT) TO ℄ STA. 70+50
Median, Pavement and Berm Dimensions and Details as Indicated on Pavement Detail Sheet 28

℄ STA. 70+50 TO ℄ STA. 74+88.27 (SKEW)	= 438.27 L.F.
℄ STA. 79+64.20 (SKEW) TO ℄ STA. 87+04.50 (END PROJECT)	= 740.30 L.F.
	1178.57 L.F.



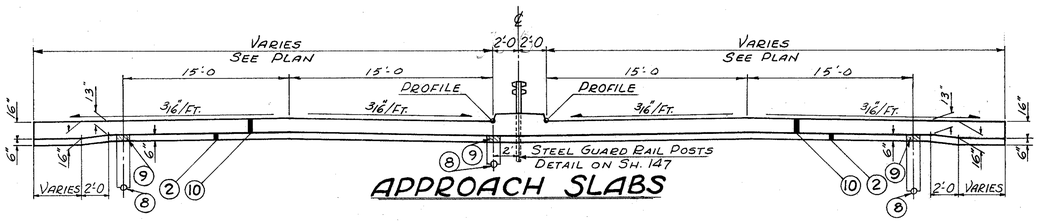
DETAIL A
Not to Scale



CLARK FREEWAY

℄ STA. 1029+75 TO ℄ STA 1034+25
PAV'T. SLOPES AS INDICATED ON SHEET 5

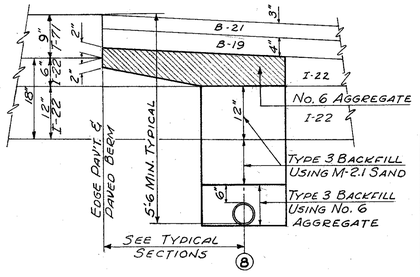
℄ STA. 1034+25 TO ℄ STA. 1041+25 (SKEW) = 700.00 L.F.



APPROACH SLABS

WILLOW ℄ STA. 74+88.27 (SKEW) TO ℄ STA. 75+13.27 (SKEW)	=	25.00 L.F.
WILLOW ℄ STA. 79+39.20 (SKEW) TO ℄ STA. 79+64.20 (SKEW)	=	25.00 L.F.
		50.00 L.F.

For Approach Slab Details See Sh. 147
Bridge Sta. 75+13.27 to Sta. 79+39.20



DETAIL B
NOT TO SCALE

LEGEND

(1) ITEM T-71 9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT.

(2) ITEM I-22 SUBBASE; GRADING A OR B, MODIFIED AS PER GENERAL NOTE.

(3) ITEM T-31 BITUMINOUS SURFACE TREATMENT, USING 0.008 CU. YD. NO.6 AGGREGATE & 0.25 GAL. BITUMINOUS MATERIAL PER SQ. YD. (SEE NOTE IN PROPOSAL.)

(4) ITEM B-21 3" WATERPROOFED AGGREGATE BASE COURSE (TYPE A T-35 MATERIAL MAY BE USED IN CONSTRUCTION OF THIS COURSE - SEE NOTE IN PROPOSAL.) ●

(5) ITEM T-30 BITUMINOUS PRIME COAT, SEC. M-5.7, RT 20&3, APPLIED AT THE RATE OF 0.4 GAL. PER SQ. YD.

(6) ITEM B-19 AGGREGATE BASE COURSE.

(7) ITEM I-21 PORTLAND CEMENT CONCRETE MEDIAN PAVEMENT. (STD. TYPE 2). SEE JOINT DETAILS, SH. 5.

(8) ITEM I-1 6" DIDE CLASS I-3 (FOR LOCATION SEE P/P & DRAINAGE PLAN SHEETS.)

(9) The subbase shall be removed for widths & depths as shown on Details A & B and replaced with the No.6 aggregate material immediately prior to placing the Item B-19, aggregate Base Course. The cost shall be included in the price bid per lin. ft. for Item I-1, Class I-3 which includes the full cost of removing the subbase material & the hauling, placing & compacting the No.6 aggregate material.

(10) ITEM I-7 REINFORCED CONCRETE APPROACH SLAB.

(11) ITEM I-15 GUARD RAIL, STEEL BEAM BARRIER TYPE (DEEP) WITH 6"x8" SQUARE SAWED PRESSURE TREATED WOOD POSTS.

● Thickness shown is "designed" thickness as described in Sec. B-21.01.

JOINT SYMBOLS

(L) STANDARD LONGITUDINAL JOINT.

GRANT No. 58019 SHEET ACCT. No. 6/67

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WILLOW & CLARK FREEWAYS
TYPICAL SECTIONS

SCALE 3/16" = 1'-0 DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.D.R.	G.O.C.		R.L.H.			

TYPICAL SECTIONS TYPE T-71
CODE 7221

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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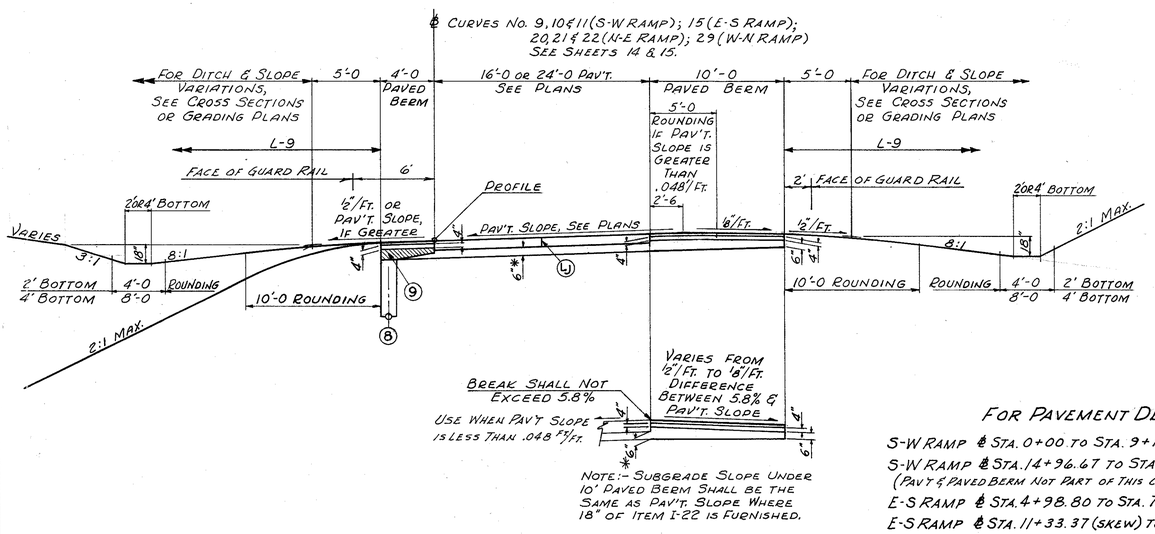
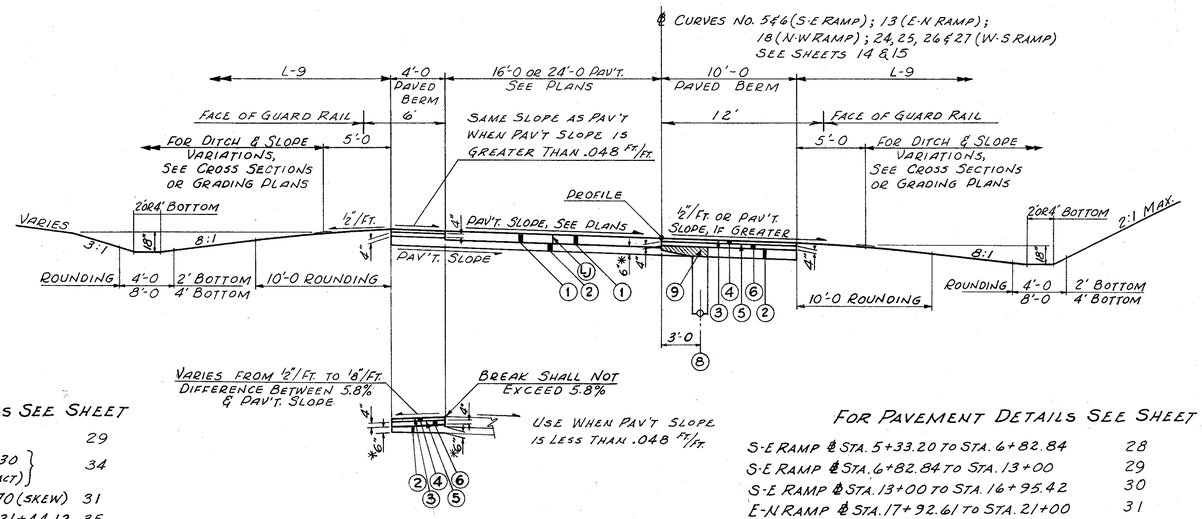
CUYAHOGA COUNTY
CUY— 21-14.12



Superelevated Left

NOTE:- Pavement & Paved Berm Items Not Shown, Are Identical With Those Indicated on Superelevated Right Section.



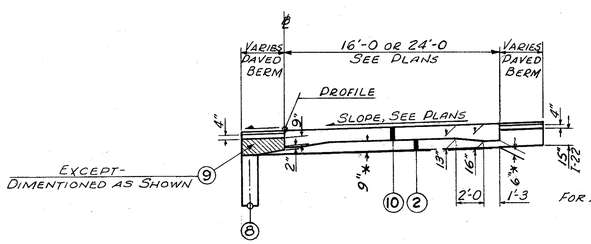
Superelevated Right

For Pavement Details See Sheet

S-W Ramp ℄ Sta. 0+00 to Sta. 9+14.18	29
S-W Ramp ℄ Sta. 14+96.67 to Sta. 17+30 (Pav't & Paved Berm Not Part of this Contract)	34
E-S Ramp ℄ Sta. 4+98.80 to Sta. 7+72.70 (skew)	31
E-S Ramp ℄ Sta. 11+33.37 (skew) to Sta. 21+44.12	35
N-E Ramp ℄ Sta. 0+38.48 to Sta. 7+75.96	33
N-E Ramp ℄ Sta. 13+58.46 to Sta. 17+54.39	30
W-N Ramp ℄ Sta. 4+00 to Sta. 6+43.97 (skew) (Pav't & Paved Berm Not Part of this Contract)	36
W-N Ramp ℄ Sta. 10+03.23 to Sta. 16+94.75	32

For Pavement Details See Sheet

S-E Ramp ℄ Sta. 5+33.20 to Sta. 6+82.84	28
S-E Ramp ℄ Sta. 6+82.84 to Sta. 13+00	29
S-E Ramp ℄ Sta. 13+00 to Sta. 16+95.42	30
E-N Ramp ℄ Sta. 17+92.61 to Sta. 21+00	31
E-N Ramp ℄ Sta. 21+00 to Sta. 24+74.50	32
N-W Ramp ℄ Sta. 4+83.50 to Sta. 8+19.86	33
N-W Ramp ℄ Sta. 8+19.86 to Sta. 12+25 (Pav't & Paved Berm Not Part of this Contract)	34
W-S Ramp ℄ Sta. 12+35 (skew) to Sta. 16+38.21 (Pav't & Paved Berm Not Part of this Contract)	36
W-S Ramp ℄ Sta. 16+38.21 to Sta. 21+71.02	35
W-S Ramp ℄ Sta. 21+71.02 to Sta. 23+71.02	28



For Approach Slab Details See Shs. 168 & 187

Approach Slabs

NOTE:- Paved Berm Items Not Shown, Are Identical to Those Indicated on Superelevated Right Section.

		For Width, Slope & Quantity - See Sheet
S-W Ramp ℄ Sta. 9+14.18 to Sta. 9+39.18	= 25.00 L.F.	29
S-W Ramp ℄ Sta. 14+71.67 to Sta. 14+96.67	= 25.00 L.F.	34
E-S Ramp ℄ Sta. 7+72.70 (skew) to Sta. 8+02.70 (skew)	= 30.00 L.F.	31
E-S Ramp ℄ Sta. 11+08.37 (skew) to Sta. 11+33.37 (skew)	= 25.00 L.F.	35
N-E Ramp ℄ Sta. 7+75.96 to Sta. 8+00.96	= 25.00 L.F.	33
N-E Ramp ℄ Sta. 13+33.46 to Sta. 13+58.46	= 25.00 L.F.	30
W-N Ramp ℄ Sta. 6+43.97 (skew) to Sta. 6+73.97 (skew)	= 30.00 L.F.	36
W-N Ramp ℄ Sta. 9+78.23 (skew) to Sta. 10+03.23 (skew)	= 25.00 L.F.	32
	210.00 L.F.	

Legend

(1) Item T-71 9" Reinforced Portland Cement Concrete Pavement.

(2) Item I-22 Subbase; Grading A or B, Modified as per General Note.

(3) Item T-31 Bituminous Surface Treatment, Using 0.008 Cu. Yd. No. 6 Aggregate & 0.25 Gal. Bituminous Material per Sq. Yd. (See Note in Proposal.)

● (4) Item B-21 6" Waterproofed Aggregate Base Course (Type A T-35 Material May be Used in Construction of This Course - See Note in Proposal)

(5) Item T-30 Bituminous Prime Coat, Sec. M-5.7, RT 2 or 3, Applied at the Rate of 0.4 Gal. per Sq. Yd.

(6) Item B-19 Aggregate Base Course.

(8) Item I-1 6" Pipe Class I-3 (For Location See P/P. & Drainage Plan Sheets.)

(9) The subbase shall be removed for widths & depths as shown on Details A & B and replaced with the No. 6 aggregate material immediately prior to placing the Item B-19, Aggregate Base Course. The cost shall be included in the price bid per lin. ft. for Item I-1, Class I-3 which includes the full cost of removing the subbase material & the hauling, placing & compacting the No. 6 aggregate material.

(10) Item I-7 Reinforced Concrete Approach Slab.

● Thickness shown is "designed" thickness as described in Sec. B-21.01.

Joint Symbols

(4) Standard Longitudinal Joint.

Notes

*An Additional 12" of I-22 is to be Furnished Under Pavement and Berms as Follows:
S-E Ramp ℄ Sta. 5+82.84 to Sta. 16+00
S-W Ramp ℄ Sta. 0+00 to Sta. 14+96.67
E-S Ramp ℄ Sta. 4+98.80 to Sta. 16+12.56
E-N Ramp ℄ Sta. 17+92.61 to Sta. 24+74.50
W-N Ramp ℄ Sta. 9+78.23 to Sta 16+94.75
The Above Locations are also Called Out on the Pavement Detail Sheets.

For Variations to Pavement, Paved Berm, and Slopes See Pavement Detail Sheets.

For Pavement Quantities See Pavement Detail Sheets.

In Areas Where Pavement and Paved Berm are Not Part of this Contract the Top of Finished Ground Shall Conform to the Shoulder Slopes and Be the Top of Pavement Elevations as Indicated on this Sh. and the Pavement Detail Sheets.

Work This Sheet With Sheet 3

CONT. No. 58019 SHEET ACCT. No. 6168

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

INTERCHANGE RAMPS
TYPICAL SECTIONS

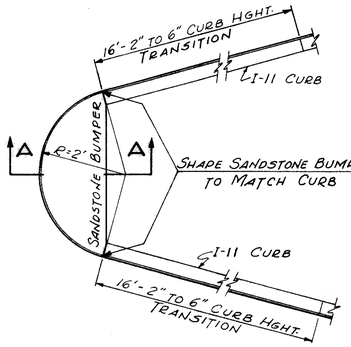
SCALE 3/16" = 1'-0 DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
CDR	G.O'C.		RLH			

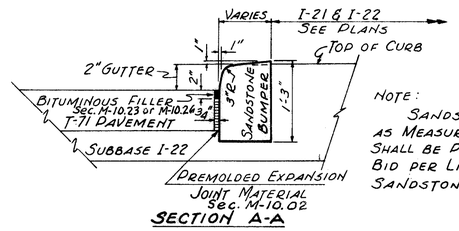
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

5
198

CUYAHOGA COUNTY
CUY— 21-14.12



PLAN



SECTION A-A

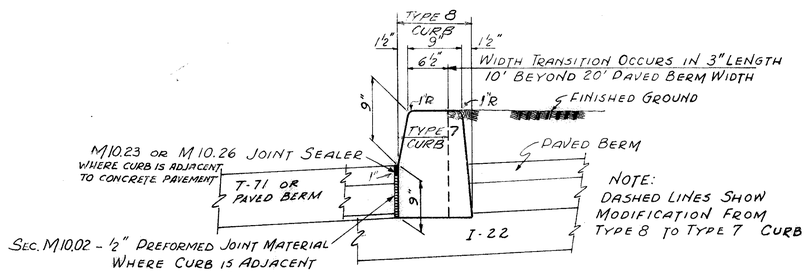
NOTE:
SANDSTONE BUMPER BLOCK, AS MEASURED ALONG RADIAL FACE, SHALL BE PAID FOR AT THE PRICE BID PER LINEAL FOOT OF SANDSTONE CURB.

NOTE:
THE THREE QUARTER (¾) INCH PREMOLDED JOINT MATERIAL SHALL MEET THE REQUIREMENTS OF SECTION M-10.02 OF THE STANDARD SPECIFICATIONS. IT SHALL BE PLACED IN FRONT OF THE BUMPER BLOCK TO WITHIN TWO (2) INCHES OF THE SURFACE. THE REMAINING SPACE SHALL BE FILLED WITH BITUMINOUS FILLER, MEETING THE REQUIREMENTS OF SECTION M-5.6 F1 OF THE STANDARD SPECIFICATIONS. THE COST OF THE JOINT TO BE INCLUDED IN PRICE BID PER LINEAL FOOT OF CURB.

DETAIL K
BUMPER BLOCK AND CURB TERMINATION AT NOSE

NOT TO SCALE

FOR LOCATION SEE SHS. 28, 29, 31 & 33



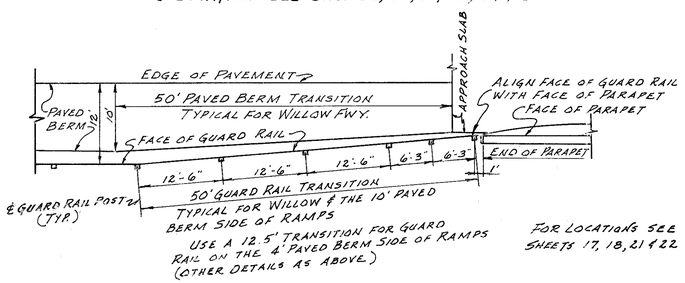
NOTE:
DASHED LINES SHOW MODIFICATION FROM TYPE 8 TO TYPE 7 CURB

FOR ADDITIONAL DETAILS SEE STANDARD CONSTRUCTION DRAWING I-12

DETAIL E
STD. TYPE 7 & TYPE 8 PORTLAND CEMENT CONCRETE CURB

SCALE: 1" = 1'-0"

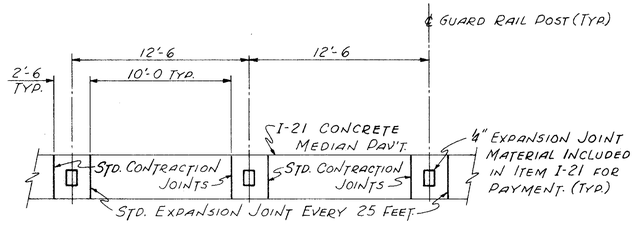
FOR LOCATION SEE SHS. 28, 30, 31, 32, 34 & 35



FOR LOCATIONS SEE SHEETS 17, 18, 21 & 22

PAVED BERM - GUARD RAIL DETAILS AT STRUCTURES

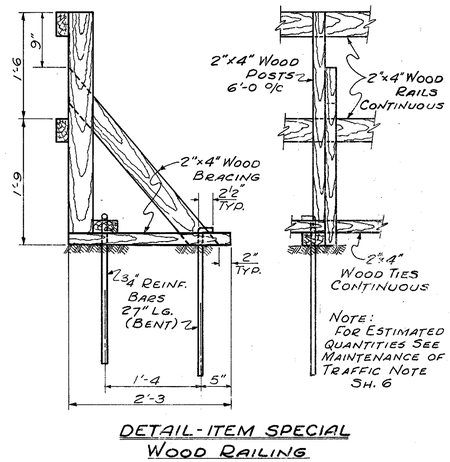
SCALE: 3/32" = 1'-0"



JOINT DETAILS AT BARRIER GUARD RAIL POSTS

NOT TO SCALE.

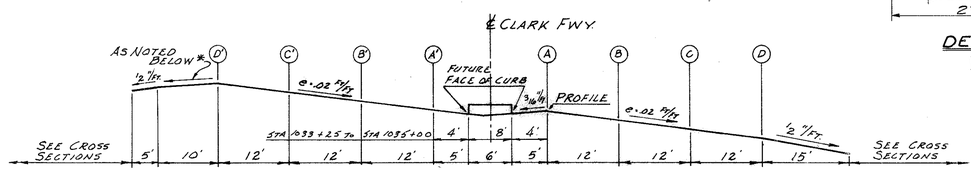
NOTE:- IN LIEU OF SPACING REQUIREMENTS OF STANDARD DRAWING I-21-23, EXPANSION AND CONTRACTION JOINTS SHALL BE PROVIDED IN ITEM I-21 MEDIAN PAVEMENT, AS DETAILED HEREON, WHENEVER GUARD RAIL IS CALLED FOR.



DETAIL - ITEM SPECIAL WOOD RAILING

SCALE: 1" = 1'-0

SUPERELEVATION TABLE - CLARK FWY.



D = 0°-50'-00"
P.T. - ℄ STA. 1030+94.53

WEST BOUND						EAST BOUND				
D'	C'	B'	A'	FACE OF CURB	℄ STATION	FACE OF CURB	A (PROFILE)	B	C	D
631.12	630.88	630.64	630.40	630.30	1029+75	630.30	630.38	630.14	629.90	629.66
630.50	630.26	630.02	629.78	629.68	1030+00	629.68	629.76	629.52	629.28	629.04
629.90	629.66	629.42	629.18	629.08	1030+25	629.08	629.16	628.92	628.68	628.44
629.34	629.10	628.86	628.62	628.52	1030+50	628.52	628.60	628.36	628.12	627.88
628.78	628.55	628.32	628.09	627.99	1030+75	627.99	628.07	627.84	627.61	627.38
628.21	628.00	627.79	627.58	627.49	1031+00	627.49	627.57	627.36	627.15	626.94
627.68	627.50	627.30	627.10	627.02	1031+25	627.02	627.10	626.92	626.74	626.55
627.18	627.04	626.85	626.66	626.58	1031+50	626.58	626.66	626.52	626.38	626.19
626.74	626.64	626.45	626.26	626.18	1031+75	626.18	626.26	626.16	626.07	625.88
626.31	626.26	626.07	625.88	625.80	1032+00	625.80	625.88	625.83	625.78	625.59
625.92	625.92	625.73	625.54	625.46	1032+25	625.46	625.54	625.53	625.52	625.33
625.56	625.61	625.42	625.23	625.15	1032+50	625.15	625.23	625.25	625.28	625.09
625.23	625.33	625.14	624.95	624.87	1032+75	624.87	624.95	625.00	625.06	624.87
624.94	625.08	624.89	624.70	624.62	1033+00	624.62	624.70	624.78	624.87	624.68
624.68	624.86	624.67	624.48	624.40	1033+25	624.40	624.48	624.59	624.70	624.51
624.48	624.67	624.48	624.29	624.21	1033+50	624.21	624.29	624.43	624.56	624.37
624.32	624.51	624.32	624.13	624.05	1033+75	624.05	624.13	624.29	624.44	624.25
624.20	624.39	624.20	624.01	623.93	1034+00	623.93	624.01	624.19	624.36	624.17
624.10	624.29	624.10	623.91	623.83	1034+25	623.83	623.91	624.10	624.29	624.10
624.04	624.23	624.04	623.85	623.77	1034+50	623.77	623.85	624.04	624.23	624.04

* TRANSITION ½"/FT. TO 0.038 FT/FT

* ½"/FT.

FULL SUPERELEVATION

TRANSITION

NORMAL SECTION

NOTE: ALL ELEVATIONS SHOWN ARE TO TOP OF FINISHED GROUND.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

MISCELLANEOUS ROADWAY & PAVEMENT DETAILS

SUPERELEVATION TABLE FOR CLARK FWY.

SCALE	As Shown	DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.D.R.	G.O.C. C.D.R.		F.T. C.D.R.			

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GENERAL

DESIGN SPEED

THE GEOMETRICS FOR THIS PROJECT HAVE BEEN PLANNED FOR A DESIGN SPEED OF 50 MILES PER HOUR FOR THE WILLOW FREEWAY AND CLARK FREEWAY, AND A DESIGN SPEED OF 40 MILES PER HOUR WITH A MAXIMUM SUPERELEVATION RATE OF 0.06 FT. PER FT. (3/4 INCH PER FT.) FOR INTERCONNECTING ROADWAYS.

ELEVATION & COORDINATE DATA

ALL ELEVATIONS AND COORDINATES ARE BASED ON CLEVELAND REGIONAL SURVEY DATA.

FIELD OFFICE

THE CONTRACTOR SHALL PROVIDE A SUITABLE FIELD OFFICE FOR THE EXCLUSIVE USE OF THE STATE EMPLOYEES, IN ACCORDANCE WITH SEC. S-0.01(b), HAVING A MINIMUM OF 500 SQUARE FEET OF FLOOR SPACE. THE CONTRACTOR SHALL HAVE A TELEPHONE INSTALLED AND MAINTAINED IN THIS FIELD OFFICE DURING THE CONSTRUCTION OF THIS PROJECT, AND SHALL ALSO INSTALL WIRING AND OUTLETS SUITABLE FOR CONNECTING TO OFFICE EQUIPMENT, AND PROVIDE 110 VOLT ALTERNATING CURRENT DURING THE CONSTRUCTION OF THIS PROJECT.

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.

DETOURS

TRAFFIC DETOURS SHALL BE AS DIRECTED BY THE CITY OF CLEVELAND, DIVISION OF TRAFFIC ENGINEERING.

MAINTENANCE OF TRAFFIC

WHERE ANY OF THE WORK CALLED FOR UNDER THIS CONTRACT INVOLVES THE CLOSING OF EXISTING ROADS OR STREETS AND/OR THE REROUTING OF TRAFFIC, THE CONTRACTOR FOR THIS PROJECT SHALL NOTIFY AND MEET WITH THE PROJECT ENGINEER AND THE CITY OF CLEVELAND TRAFFIC ENGINEER ONE (1) WEEK IN ADVANCE OF ANY PROPOSED CLOSING OR REROUTING SO AS TO REDUCE TO A MINIMUM THE LENGTH OF TIME THAT THE ROADS (STREETS) WILL BE CLOSED TO TRAFFIC.

THE CONTRACTOR SHALL MAINTAIN LOCAL TRAFFIC AND SAFE SATISFACTORY ACCESS TO ABUTTING PROPERTIES AT ALL TIMES DURING CONSTRUCTION OF THE IMPROVEMENT. THE EXISTING PAVEMENT AND THE PROPOSED PAVEMENT SHALL BE USED TO MAINTAIN TRAFFIC WHEREVER AND WHENEVER POSSIBLE.

BROADWAY AVENUE(INCLUDING BROADWAY AVE. RUN-AROUND)

DURING "PEAK TRAFFIC" HOURS, (7-9:30 A.M. AND 3-6:00 P.M.) FULL WIDTH OF EXISTING PAVEMENT (44 FEET) SHALL BE OPEN TO TRAFFIC. ONE LANE OF TRAFFIC IN EACH DIRECTION SHALL BE OPEN TO TRAFFIC AT ALL OTHER TIMES.

EAST 37TH STREET

ONE LANE TRAFFIC IN EACH DIRECTION SHALL BE MAINTAINED AT ALL TIMES.

TRUMBULL AVENUE

UNLESS OTHERWISE AUTHORIZED BY THE STATE, ACCESS AND UTILITY SERVICES (SEWER, WATER, GAS, ETC.) ALONG TRUMBULL AVENUE SHALL REMAIN UNDISTURBED FOR A PERIOD, NOT TO EXCEED SIX (6) MONTHS SUBSEQUENT TO THE DATE OF LETTING FOR CONTRACT (PENDING AVAILABILITY OF RIGHT OF WAY AT ATLAS STEEL AND SUPPLY CO. PROPERTY).

ATTENTION IS DIRECTED PARTICULARLY TO THE NEED FOR PROVIDING ADEQUATE FACILITIES TO ACCOMMODATE PEDESTRIAN TRAFFIC IN THE VICINITY OF THE PROJECT. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SUCH TEMPORARY WALKS AND HANDRAILS ADJACENT TO EXCAVATIONS, ETC. DURING CONSTRUCTION TO THE SATISFACTION OF THE ENGINEER AS MAY BE NECESSARY TO ACCOMMODATE, IN A REASONABLE AND SAFE MANNER, PEDESTRIAN TRAFFIC IN THE VICINITY OF THE PROJECT. THE FOLLOWING ESTIMATED QUANTITIES ARE PROVIDED IN THE GENERAL SUMMARY FOR USE WHERE AND AS DIRECTED BY THE ENGINEER.

ITEM	DESCRIPTION	QUANTITY
**I-13	3" SIDEWALKS, (CRUSHED STONE, SLAG OR GRAVEL)*	300 S.F.
**I-13	4" SIDEWALKS, PORTLAND CEMENT CONCRETE	300 S.F.
**SPECIAL	WOOD RAILING, AS PER PLAN SHEET 5 (MEASURED ALONG THE RAILING AND BETWEEN THE ℄ OF THE END RAILING POSTS)	200 L.F.

*CRUSHED STONE, SLAG OR GRAVEL SHALL MEET THE GRADING REQUIREMENTS OF SEC. M-2.14.

**PAYMENT, THEREFOR, SHALL CONSTITUTE FULL COMPENSATION FOR FURNISHING, INSTALLING, MAINTAINING AND SUBSEQUENTLY REMOVING THESE ITEMS.

TRAFFIC COMPACTED SURFACE COURSE AND DUST CONTROL

ITEM T-10 AND CALCIUM CHLORIDE ITEM I-4, SHALL BE APPLIED ON TEMPORARY ROADWAYS WHERE DIRECTED AND IN THE AMOUNTS REQUESTED BY THE ENGINEER (SEE GENERAL SUMMARY OF QUANTITIES). PAYMENT FOR CONSTRUCTION, MAINTENANCE, TEMPORARY DRAINAGE STRUCTURES, AND SUBSEQUENT REMOVAL, WHERE REQUIRED, OF TEMPORARY ROADWAYS SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM I-3, MAINTAINING TRAFFIC.

ESTIMATED QUANTITIES OF 400 C.Y. OF ITEM T-10 AGGREGATE AND 20 TONS OF ITEM I-4, CALCIUM CHLORIDE ARE CARRIED IN THE GENERAL SUMMARY FOR USE ON TEMPORARY ROADS.

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.

DUST CONTROL

Item I-4, Water for Dust Control shall be applied at the direction of the Engineer in accordance with Section C-7.14 and shall be paid for at the unit price bid for item I-4 Water for Dust Control.

Estimated Quantity - I-4 = 100 M.-Gal.

CONTINUITY OF UTILITY SERVICES (TELEPHONE, WATER, ELECTRICAL, GAS, ETC.)

IN ADDITION TO THE REQUIREMENTS FOR MAINTAINING TRAFFIC, THE CONTRACTOR SHALL PLAN AND COORDINATE HIS OPERATIONS IN SUCH MANNER THAT CONTINUITY OF UTILITY SERVICES (WATER, ELECTRICAL, GAS, TELEPHONE, ETC.) SHALL BE MAINTAINED TO THE SATISFACTION OF THE ENGINEER AND RESPECTIVE UTILITIES INVOLVED. PAYMENT FOR UTILITY SERVICE MAINTENANCE AS ABOVE OUTLINED SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM I-3, MAINTAINING TRAFFIC.

CONSTRUCTION PROCEDURE

PRIORITY SHALL BE GIVEN TO THE CONSTRUCTION OF THAT PORTION OF THE PROJECT THAT WILL EXPEDITE THE OPENING OF THE WILLOW FREEWAY TO TRAFFIC AT THE EARLIEST POSSIBLE DATE.

ACCORDINGLY, THE FOLLOWING PROCEDURE IS SUGGESTED FOR THE CONSTRUCTION OF THIS IMPROVEMENT. IF THE CONTRACTOR ELECTS TO FOLLOW A DIFFERENT PROCEDURE, HE SHALL SUBMIT A COMPLETE OUTLINE OF HIS PROPOSED METHOD OF PERFORMANCES AND SCHEDULE OF OPERATIONS IMMEDIATELY UPON AWARD OF CONTRACT. IF HIS PROPOSED METHOD DOES NOT MEET WITH THE APPROVAL OF THE DIRECTOR OF HIGHWAYS, THE PROCEDURE AS CALLED FOR HEREIN SHALL BE FOLLOWED.

1) INSTALL AND PUT IN OPERATION THE RELOCATED 30" WATER MAIN BETWEEN TRUMBULL AVENUE AT EAST 37TH STREET, AND BROADWAY AT ROSEVILLE COURT (SEE DRAWING 95).
2) ABANDON EXISTING 30" WATER MAIN (IN TRUMBULL, SOLON, WARREN, AND MARTIN) BETWEEN EAST 37TH STREET AT TRUMBULL, AND BROADWAY AT ROSEVILLE COURT.
3) EXCAVATE INTERCHANGE AREA TO ROUGH GRADE AND INSTALL NECESSARY STORM DRAINAGE TO DRAIN THE INTERCHANGE AREA (SEE COOPERATION BETWEEN CONTRACTORS NOTE AFFECTING DRAINAGE, AND MAINTENANCE OF TRAFFIC NOTE AFFECTING TRUMBULL AVENUE, DRAWING 6).
4) PROVIDE STRUCTURAL EXCAVATION, DRIVE PILING AND POUR CONCRETE FOR ALL STRUCTURAL FOUNDATIONS LYING BENEATH AND WITHIN 70 FEET OF THE CENTERLINE OF WILLOW OVER CLARK BRIDGE (EXCEPTION: FORWARD ABUTMENT OF E-S [2ND LEVEL] RAMP).
5) CONSTRUCT THE ENTIRE SUBSTRUCTURE FOR WILLOW OVER CLARK BRIDGE [4TH LEVEL] AND ALSO THE FOUR (4) CONCRETE COLUMNS SUPPORTING THE STEEL BOX GIRDER PIER CAPS FOR THE [3RD LEVEL] N-E AND S-W RAMPS.
6) ERECT STEEL BOX GIRDER PIER CAPS FOR 3RD LEVEL RAMPS.
7) COMPLETE THE WILLOW OVER CLARK BRIDGE AND CONSTRUCT THE WILLOW FREEWAY ROADWAY AND PAVEMENT COMPLETE WITH LIGHTING, DRAINAGE, GUARD RAIL, ETC.
8) OPEN WILLOW FREEWAY TO TRAFFIC.
9) CONSTRUCT THE REMAINING PORTION OF THE PROJECT.

FEDERAL AID CONSTRUCTION IDENTIFICATION SIGNS

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

1) SOUTHEAST CORNER OF E. 37TH STREET AND TRUMBULL AVENUE, WITHIN THE EXISTING RIGHT OF WAY, FACING AND IN VIEW OF SOUTHEASTERLY BOUND TRAFFIC ON TRUMBULL AVENUE AND SOUTHERLY BOUND TRAFFIC ON E. 37TH STREET.
2) NORTHWEST CORNER OF GALLUP AVENUE AND BROADWAY AVENUE, WITHIN THE ACQUIRED RIGHT OF WAY, FACING AND IN VIEW OF NORTHWESTERLY BOUND TRAFFIC ON BROADWAY AVENUE.
3) NORTHEAST CORNER OF BROADWAY AVENUE AND E. 37TH STREET, WITHIN THE ACQUIRED RIGHT OF WAY, FACING AND IN VIEW OF SOUTHEASTERLY BOUND TRAFFIC ON BROADWAY AVENUE AND SOUTHERLY BOUND TRAFFIC ON E. 37TH STREET.

THE LOCATION OF THESE SIGNS MAY BE ALTERED BY THE PROJECT ENGINEER.

SIGN DETAILS SHALL BE AS SPECIFIED ON STANDARD DRAWING FAC I-1, "CODE N-43(3) 144" WITH THE EXCEPTION THAT THE WORD "COUNTY" SHALL BE REPLACED BY THE WORD "CITY". THE SIGNS SHALL BE ERECTED IN ACCORDANCE WITH STANDARD DRAWING FAC I-2. ADDITIONAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH NOTES IN THE PROPOSAL.

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.

SEQUENCE OF CONSTRUCTION OPERATIONS IN SHOULDER CONSTRUCTION:

Underdrains shall be installed and backfilled to subgrade elevation prior to construction of the subbase, except that installation of the underdrains in the median may be deferred until after the I-71 is placed but shall otherwise be subject to the sequence of construction operations outlined herein.

The subbase shall then be constructed in the concrete pavement area and extended out to cover the porous backfill for the underdrain on the outside edge and to at least one (1) foot beyond edge of pavement at median edge.

The pavement shall then be constructed.

Prior to placing the shoulder pavement the subbase material shall be removed for widths and depths as shown on details A & B on sheet No. 3 of the construction plans and replaced with No. 6 aggregate. Any contaminated backfill over the I-3 drain shall also be removed and replaced with No. 6 aggregate at this time at no additional cost to the State.

The B-19 base course shall then be placed and construction of the waterproofed aggregate course shall follow immediately.

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

GENERAL NOTES

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	L.H.		T.L.L.			

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UTILITIES

AMERICAN TELEPHONE & TELEGRAPH CO.
1538 UNION COMMERCE BUILDING
CLEVELAND 14, OHIO
C.M. BORSON, DIV. PLANT SUPT.
MAIN 2-2807

CITY OF CLEVELAND TOWER 1-4600

DEPARTMENT OF PUBLIC SAFETY
FIRE SIGNAL SYSTEM
310 CARNEGIE AVENUE
CLEVELAND 15, OHIO
(FIRE) F. HUDSON

DEPARTMENT OF PUBLIC UTILITIES
DIV. OF UTILITIES ENGINEERING
600 LINCOLN BUILDING
CLEVELAND 14, OHIO
(WATER) W.J. SWEENEY, ENGINEER OF DESIGN
(LIGHT) A. NICHOLS, CHIEF BUREAU OF STREET LIGHTING

DEPARTMENT OF PUBLIC SERVICE
CITY HALL
CLEVELAND 14, OHIO
(SEWERS) PERRY NUHN, CHIEF DRAFTSMAN

DEPARTMENT OF PUBLIC SAFETY
DIV. OF TRAFFIC ENGINEERING & PARKING
1404 EAST 9TH STREET
CLEVELAND 14, OHIO
R.H. WITT-TRAFFIC ENGINEERING

CLEVELAND POLICE DEPARTMENT
TRAFFIC DIVISION
2001 PAYNE AVENUE
CLEVELAND 14, OHIO
SAM C. SKEROTES, COMMISSIONER OF TRAFFIC

CITY OF SHAKER HEIGHTS
DEPARTMENT OF TRANSPORTATION
3400 LEE ROAD
SHAKER HEIGHTS 20, OHIO
WILLIAM EDWARDS, CHIEF ENGINEER
VU. 3-4874

CLEVELAND TRANSIT SYSTEM
1404 EAST 9TH STREET
CLEVELAND 14, OHIO
RALPH L. WOOD, SUPT. OF ENGINEERING
MAIN 1-9500

CLEVELAND ELECTRIC ILLUMINATING CO.
ILLUMINATING BUILDING
PUBLIC SQUARE
CLEVELAND 15, OHIO
L. A. FICKEN
CHERRY 1-4200

EAST OHIO GAS COMPANY
1717 EAST 9TH STREET
CLEVELAND 14, OHIO
F.J. MERRIMAN, REGIONAL ENGINEER
TOWER 1-2960

OHIO BELL TELEPHONE COMPANY
9801 EUCLID AVENUE, ROOM 202
CLEVELAND 6, OHIO
J.A. BOUGHTON, DISTRICT PLANT SUPT.
421-9905

WESTERN UNION
1205 CARNEGIE AVENUE
CLEVELAND 15, OHIO
ED KOTIS
CHERRY 1-1780

REPUBLIC STEEL CORPORATION
3100 EAST 45TH STREET
CLEVELAND 27, OHIO
R.W. KROEGER, CHIEF ENGINEER
771-1400

ERIE-LACKAWANNA RAILROAD COMPANY
MIDLAND BUILDING
CLEVELAND 15, OHIO
J.S. PARSONS, CHIEF ENGINEER
CHERRY 1-8400

UTILITY ADJUSTMENTS

THE CONTRACTOR SHALL NOTIFY, AT LEAST TWO WORKING DAYS BEFORE BREAKING GROUND, ALL PUBLIC SERVICE CORPORATIONS HAVING WIRE, POLES, PIPE, CONDUITS, MANHOLES OR OTHER STRUCTURES THAT MAY BE AFFECTED BY THIS OPERATION INCLUDING ALL STRUCTURES WHICH ARE AFFECTED AND NOT SHOWN ON THESE PLANS. 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.

UNDERGROUND UTILITIES

THE LOCATIONS OF 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.

ROADWAY

EXISTING GRADE

EXISTING GRADE SHOWN THROUGH BUILDINGS IN THESE PLANS IS THAT OF THE GROUND LINE AT THE FOUNDATION UNLESS OTHERWISE SHOWN.

ROUNDING OF CORNERS ON CROSS SECTIONS

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

REMOVAL OF REFUSE AND DEBRIS

ANY EXISTING REFUSE, DEBRIS OR ANY OTHER UNSUITABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH ITEM E-1. THE QUANTITY OF REFUSE OR DEBRIS, OR OTHER UNSUITABLE MATERIAL REMOVED AND DISPOSED OF WILL BE DETERMINED BY FINAL CROSS SECTIONS, AND THE YARDAGE SO DETERMINED WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR ROADWAY EXCAVATION, ITEM E-1.

SALVAGED CURB

QUANTITIES FOR ITEMS E-8, REMOVAL FOR RE-USE OF EXISTING CURB, AND ITEM I-11, SANDSTONE CURB RESET, ARE SHOWN ON SHEET NO. 10. SALVAGED CURB IS TO BE RESET ONLY WITHIN THE CITY STREET AREAS AFFECTED BY THIS PROJECT AND IN NO CASE SHALL IT BE INTERSPERSED WITH NEW CURB.

AREAS BOUNDED BY RAMPS ETC.

ALL SOIL AREAS BOUNDED BY RAMPS, ROADS OR STREETS, AND AREAS UNDER BRIDGES SHALL BE CLEARED AND SHAPED IN ACCORDANCE WITH ITEM E-1; THE COST THEREFOR SHALL BE INCLUDED FOR PAYMENT IN THE UNIT PRICE BID FOR ITEM E-1, ROADWAY EXCAVATION. SEE SH. 37-39.

REMOVAL OF EXISTING NON-RIGID PAVEMENT

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.

SCARIFICATION OF EXISTING FLEXIBLE PAVEMENT

WITHIN THE LIMITS OF CONSTRUCTION WHERE THE EXISTING FLEXIBLE PAVEMENT WILL HAVE LESS THAN SIX (6) INCHES OF FILL PLACED UPON IT, THE PAVEMENT SHALL BE THOROUGHLY SCARIFIED FOR ITS FULL DEPTH, MIXED WITH SUFFICIENT SOIL AND PROPERLY RECOMPACTED TO INSURE THE ELIMINATION OF ANY PLANES OF SEPARATION BETWEEN IT AND THE EMBANKMENT PLACED THEREON. PAYMENT FOR SCARIFICATION AS DESCRIBED ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM E-1, ROADWAY EXCAVATION.

REMOVAL OF EXISTING RIGID PAVEMENT

EXISTING RIGID TYPE PAVEMENTS SHALL BE REMOVED UNDER ITEM E-8 WHEN THEY ARE LOCATED LESS THAN 3 FEET BELOW THE PROPOSED PAVEMENT SUBGRADE IN PROPOSED PAVEMENT AREAS OR LESS THAN 3 FEET BELOW THE PROPOSED FINISHED SURFACE IN AREAS OUTSIDE THE PROPOSED PAVEMENT.

WHEN EXISTING RIGID TYPE PAVEMENTS LIE BELOW THE ABOVE LIMITS, THEY SHALL NOT BE REMOVED.

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 THE GROUND LINE. PAYMENT FOR ENCASEMENT, IF REQUIRED, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE GUARD RAIL.

ITEM I-15, TEMPORARY GUARD RAIL

THIS ITEM IS TO BE INSTALLED AND MAINTAINED AS DIRECTED BY THE ENGINEER AND UPON COMPLETION OF THE PROJECT, IS TO REMAIN IN PLACE FOR LATER REMOVAL BY OTHERS.

FLARING GUARD RAIL AT BRIDGES

GUARD RAIL ON BRIDGE APPROACHES SHALL BE INSTALLED IN ACCORDANCE WITH DETAIL SHOWN ON SHEET 5.

MEDIAN GUARD RAIL IN APPROACH SLABS

STEEL POSTS SHALL BE USED IN MEDIAN GUARD RAIL ON APPROACH SLABS.

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

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

SEEDING AND PROTECTING

QUANTITIES FOR SEEDING ITEM L-9 ARE CALCULATED FOR SOIL AREAS BETWEEN RIGHT OF WAY LIMITS.

SEED SHALL BE SOWN AT THE RATE OF 3 POUNDS PER 1,000 SQUARE FEET. SEEDING FORMULAS FOR ALL SEEDED AREAS SHALL BE IN ACCORDANCE WITH SEC. L-9.11.

AREAS BOUNDED BY RAMPS, ROADS OR STREETS

THESE AREAS SHALL BE SEEDED IN ACCORDANCE WITH, AND PAYMENT MADE THEREFOR UNDER ITEM L-9, EXCEPT THAT AREAS UNDER BRIDGES SHALL NOT BE SEEDED.

L-9 COMMERCIAL FERTILIZER

ALL AREAS TO BE SEEDED UNDER ITEM L-9 OR SODDED UNDER ITEM L-10 SHALL HAVE COMMERCIAL FERTILIZER 12-12-12, APPLIED AT THE RATE OF TWENTY (20) POUNDS PER 1,000 SQUARE FEET.

AGRICULTURAL LIMING MATERIAL

THE LOCATION AND NEED FOR AGRICULTURAL LIMING MATERIAL WILL BE DETERMINED BY LABORATORY TESTS, AFTER ROUGH GRADING OPERATIONS HAVE BEEN PERFORMED. QUANTITIES OF AGRICULTURAL LIMING MATERIAL AS SHOWN ON THE PLANS ARE SUFFICIENT FOR THE ENTIRE PROJECT, BUT WILL BE NONPERFORMED FOR THE AREAS WHERE TESTS SHOW THAT THE LIMING MATERIAL IS NOT NEEDED.

REMOVAL OF TREES AND STUMPS

ALL TREES AND STUMPS LYING WITHIN THE CONSTRUCTION LIMITS OF THIS PROJECT SHALL BE REMOVED AT THE CONTRACT UNIT PRICE BID PER TREE AND STUMP FOR ITEM E-9, REMOVAL OF TREES AND STUMPS.

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

SIZES	NO. TREES
12" & OVER	48

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, AS DIRECTED BY THE ENGINEER, IN PROOF ROLLING OF ALL SUBGRADE ON THE MAINLINE AND RAMPS, EXCEPT FOR AREAS WHERE ROCK OR SHALE IS ENCOUNTERED. THE PNEUMATIC-TIRED ROLLER SHALL BE OPERATED AT 50-TON GROSS LOAD FOR THE FINAL PROOF ROLLING.

CONSTRUCTION LAYOUT STAKES

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

CONTRACTION AND EXPANSION JOINTS

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

CONST. No. 58019 PROJECT AGMT. No. 6172

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

GENERAL NOTES

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
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DRAINAGE

EROSION CONTROL AT BRIDGES

WHERE CALLED FOR ON PLANS OR AS DIRECTED BY THE ENGINEER, ITEM L-10 SODDING FOR SPECIAL BERM AND SLOPE PROTECTION SHALL BE INSTALLED AS FOLLOWS:

PRIOR TO PLACEMENT OF SOD IN THE BERM AND SLOPE, GALVANIZED POULTRY FENCE SHALL BE PLACED ON THE FINISHED GRADE IN STRANDS WHICH SHALL BE AT RIGHT ANGLES TO THE DIRECTION OF FLOW. EACH STRAND SHALL BE STAKED SECURELY ON TOP AND BOTTOM WITH STAKES SPACED AT FOUR FOOT INTERVALS AND ALTERNATED IN ROWS FOUR FEET APART.

STAKES SHALL BE 1" x 1" x 8" WOOD STAKES AND SHALL BE PERPENDICULAR TO THE GROUND AND FLUSH WITH THE FINISHED GRADE.

THE FENCE SHALL BE STRAIGHT LINE POULTRY FENCE OR EQUIVALENT WITH STRAND WIDTH OF FOUR FEET, HAVING A TWO INCH MESH AND ALL WIRES NO. 20 GAUGE

THE STRANDS OF FENCING SHALL BE FASTENED TOGETHER AT TWELVE INCH INTERVALS BY MEANS OF HOG RINGS.

THE FENCE SHALL BE SECURED TO THE WOOD STAKES BY METAL STAPLES.

SOD SHALL BE LAID IN ACCORDANCE WITH CONSTRUCTION AND MATERIALS SPECIFICATIONS SEC. L-10.07.

PAYMENT FOR THIS ITEM SHALL INCLUDE ALL LABOR AND MATERIAL INCIDENTAL TO COMPLETION OF THIS ITEM AS NOTED ABOVE. FOR LOCATION AND DETAIL SEE SHEETS 17, 21, 22 AND 93.

EROSION CONTROL

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

SPECIAL DITCHES

FOR SPECIAL DITCH GRADES, SEE CROSS SECTIONS AND GRADING PLANS.

PIPE FOR SUBGRADE DRAINAGE

TEN (10) LINEAL FEET OF 6" CORRUGATED METAL PIPE, CLASS F-4 SHALL BE FURNISHED AND PLACED BY THE CONTRACTOR, IN MANHOLES, CATCH BASINS AND OUTLETS FOR EACH SUBGRADE DRAIN, WHERE AND AS DIRECTED BY THE ENGINEER. PAYMENT FOR EACH SHALL BE MADE AT THE PRICE BID PER LINEAL FOOT OF ITEM I-1 PIPE OUTLETS FOR UNDERDRAINS.

SIX (6) INCH DRAIN TILE (SEC. M-6.1 OR M-6.2) SHALL BE FURNISHED AND PLACED BY THE CONTRACTOR, IN MANHOLES AND CATCH BASINS FOR SUBGRADE DRAINAGE, WHERE AND AS DIRECTED BY THE ENGINEER. PAYMENT FOR SUCH DRAIN TILE SHALL BE INCLUDED IN THE BID PRICE FOR EACH MANHOLE OR CATCHBASIN.

MANHOLE FRAME AND COVER CASTINGS

THE CASTINGS USED ON ALL NEW MANHOLES SHALL BE THE CITY OF CLEVELAND STANDARD MANHOLE FRAME AND COVER AS SHOWN IN THE TYPICAL DETAILS. SEE SHEET 94.

ABANDONING EXISTING MANHOLES

THE ABANDONING OF EXISTING MANHOLES SHALL BE IN ACCORDANCE WITH SEC. 1-16.03 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS WITH THE FOLLOWING EXCEPTIONS: (1) THE EXISTING INLET AND OUTLET PIPES SHALL BE SEALED WITH 8" OF BRICK MASONRY. (2) AFTER SEALING OF EXISTING PIPES IS COMPLETED AND THE WALLS ARE REMOVED TO THE REQUIRED DEPTH THE MANHOLE SHALL BE FILLED WITH SAND AND COMPACTED IN ACCORDANCE WITH SEC. 1-16.03. ITEM I-16, MANHOLES ABANDONED . . . . . 3 EACH.

ABANDONED SEWERS AND DRAINS

THE CONTRACTOR SHALL PLUG OR BULKHEAD ALL EXISTING SEWERS OR DRAINS WHICH ARE TO BE ABANDONED. HE SHALL PROVIDE ALL MATERIALS, LABOR AND EQUIPMENT TO SEAL THE SEWERS OR DRAINS IN A MANNER SATISFACTORY TO THE ENGINEER. SEALING SHALL CONSIST OF CONSTRUCTING AN 8" THICK BRICK MASONRY BULKHEAD OR EQUIVALENT INSIDE THE SEWER OR DRAIN. PAYMENT FOR SEALING SEWERS OR DRAINS SHALL BE INCLUDED IN THE PRICE BID FOR ITEM E-1, ROADWAY EXCAVATION.

CONNECTING INTO EXISTING SEWERS

AT PLACES WHERE THE PLANS PROVIDE FOR PROPOSED PIPE TO BE CONNECTED TO EXISTING PIPE, 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.

WHERE PROPOSED PIPES ARE TO BE CONNECTED INTO EXISTING PIPES, THE CONTRACTOR SHALL NOTIFY THE CITY OF CLEVELAND AT LEAST 24 HOURS IN ADVANCE SO THAT INSPECTION CAN BE FURNISHED BY THE CITY AT THE TIME THE CONTRACTOR MAKES THE TAP.

PAYMENT FOR THIS OPERATION SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT PIPE ITEM.

REMOVAL OF EXISTING SEWERS & APPURTENANCES IN EXCAVATION

WHERE EXISTING SEWERS AND SEWER APPURTENANCES ARE ENCOUNTERED IN EXCAVATION LYING ABOVE SUBGRADE OR BACKSLOPES, REMOVAL OF SUCH ITEMS SHALL BE INCLUDED IN ITEM E-1, ROADWAY EXCAVATION.

SEWERS NOT SHOWN

WHERE SEWERS NOT SHOWN ARE ENCOUNTERED, THE SEWER SHALL BE CUT AT THE LIMITS OF CONSTRUCTION AND SEALED OR RECONNECTED AS DIRECTED BY THE ENGINEER. PAYMENT FOR CUTTING AND SEALING IN ACCORDANCE WITH GENERAL NOTE ENTITLED "ABANDONED SEWERS AND DRAINS" SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM E-1, ROADWAY EXCAVATION.

TUNNEL CONSTRUCTION (PER CITY OF CLEVELAND, STANDARD SPECIFICATIONS ON FILE WITH THE OHIO STATE HIGHWAY DEPARTMENT OFFICES IN COLUMBUS AND CLEVELAND)

A COPY OF THE "CITY OF CLEVELAND, DEPARTMENT OF PUBLIC SERVICE, STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PAVEMENTS, SIDEWALKS AND SEWERS, DATED JANUARY, 1950", IS ON FILE AT THE:

DEPARTMENT OF PUBLIC SERVICE, CITY HALL, CLEVELAND, OHIO
OHIO DEPARTMENT OF HIGHWAYS, DIVISION 12, CLEVELAND, OHIO
C/O MR. R.A. BOOTH, ADMINISTRATOR OF CONTRACT SALES,
OHIO DEPARTMENTS BUILDING, COLUMBUS 15, OHIO

THE PROPOSED CONCRETE SEWERS IN TUNNEL SHALL BE CONSTRUCTED AS SHOWN ON THE CONSTRUCTION PLAN. ALL THE PROVISIONS OF SECTION S7 OF THE CITY OF CLEVELAND STANDARD SPECIFICATIONS, EXCEPT AS MODIFIED BY THESE SPECIAL PROVISIONS, SHALL GOVERN THE CONSTRUCTION OF THIS TUNNEL. SPECIAL ATTENTION IS CALLED TO THE PROVISIONS OF SECTION S7.8 OF THE STANDARD SPECIFICATIONS REQUIRING THAT THE COST OF ALL LINER PLATES, BRACES, TIMBERS, SUPPORTING MATERIAL OF WHATEVER NATURE USED IN THE CONSTRUCTION OF THE TUNNEL SHALL BE INCLUDED IN THE PRICE PAID PER LINEAL FOOT OF SEWER COMPLETE IN TUNNEL AS SPECIFIED. ALL SHEETING, BRACING, OR OTHER SUPPORTING DEVICES LEFT IN PLACE ON ORDER FROM THE CITY AT MANHOLES WILL NOT BE PAID FOR AS A SEPARATE ITEM BUT SHALL BE INCLUDED IN THE PRICE PER LINEAL FOOT OF SEWER, SEWER CONNECTIONS AND SEWER APPURTENANCES.

IF TUNNEL LINER PLATES ARE USED, THEY MAY PROJECT INTO THE CONCRETE AND THE THICKNESS OF THE CONCRETE AS SHOWN ON THE PLAN MAY INCLUDE THE FLANGES OF THE LINER PLATES.

THE THICKNESS OF WALLS SHOWN ARE MINIMUM THICKNESS. CONCRETE MUST BE POURED AGAINST SUPPORTING MATERIAL OR UNDISTURBED EARTH. ANY ADDITIONAL CONCRETE OVER THE MINIMUM REQUIRED SHALL BE INCLUDED IN THE PRICE BID PER LINEAL FOOT OF SEWER.

THE CONCRETE USED IN CONSTRUCTING THE CONCRETE SEWER IN TUNNEL SHALL BE EITHER CITY OF CLEVELAND CLASS 2 OR CLASS 2P AND ALL THE PROVISIONS OF SECTION C OF THE STANDARD SPECIFICATIONS SHALL BE COMPLIED WITH.

THE CONCRETE USED IN THE CONSTRUCTION OF THE SEWER SHALL BE VIBRATED IN THE MANNER STATED UNDER SECTION C.8.3A OF THE STANDARD SPECIFICATIONS.

CONCRETE SEWER CONSTRUCTED IN TUNNEL AS HEREIN SPECIFIED WILL BE PAID FOR AT THE PRICE PER LINEAL FOOT FOR *60" DIA. TUNNEL SECTION* AND THIS PRICE SHALL INCLUDE ALL EXCAVATION, REMOVAL OF SURPLUS, FURNISHING AND PLACING ALL CONCRETE, FURNISHING AND PLACING ALL NECESSARY LINER PLATES, TIMBERS, SHEETING, OR OTHER SUPPORTING MATERIALS AND ALL OTHER ITEMS OF EXPENSE NECESSARY TO COMPLETE THE SEWER IN TUNNEL AS SPECIFIED. SEE SHEET 86 FOR ADDITIONAL DETAILS.

AIR PLANT

SPECIAL ATTENTION IS CALLED TO THE PROVISIONS OF SECTION S7.2 OF THE STANDARD SPECIFICATIONS REFERRING TO THE USE OF AN AIR PLANT IF SUCH EQUIPMENT IS FOUND NECESSARY.

SUCH AIR EQUIPMENT, IF FOUND NECESSARY, SHALL BE FURNISHED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE STATE.

FOR ADDITIONAL NOTES:
SEE SHEETS 96 TO 106 FOR WATERWORK
137 & 138 FOR ELECTRICAL
141, 154 & 175 FOR STRUCTURAL

F. No. 58019 SHEET NO. 6173

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

GENERAL NOTES

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	L. H.		RMR			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY— 21 — 14.12

TYPICAL SECTION CALCULATIONS

SHEET	DESCRIPTION WILLOW FWY. - 1178.57 L.F.	T-71 9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT SQ. YD.	I-22 SUBBASE CU. YD.	T-31 BITUMINOUS SURFACE TREATMENT-BITUMINOUS MATERIAL .25GAL/YD² GAL.	T-31 BITUMINOUS SURFACE TREATMENT-No. 6 AGGREGATE .008YD³/YD² CU. YD.	B-21 3" WATER-PROOFED AGGREGATE BASE COURSE CU. YD.	B-19 4" AGGREGATE BASE COURSE CU. YD.	T-30 BITUMINOUS PRIME COAT AT 0.4GAL/S.Y. GAL.	I-21 PORTLAND CEMENT CONCRETE MEDIAN PAVEMENT STD. TYPE 2 SQ.YD.	I-7 REINFORCED CONCRETE APPROACH SLAB T-13" SQ. YD.	
3	PAVEMENT										
	T-71: 1178.57 x 48 ÷ 9 =	6,285.7									
	I-22: 6,285.7 x 4/36 =		1,047.6								
	10' PAVED BERMS										
	2x10 x 1178.57 ÷ 9 = 2619.05 S.Y.										
	ADJUST FOR TRANSITION AT BRIDGE (-37 S.Y.)										
	T-31: 2582 x .25 =			645.5							
	T-31: 2582 x .008 =				20.7						
	B-21: 2582 x 3/36 =					215.2					
	I-18: 2582 x 4/36 =						286.9				
	T-30: 2582 x 0.4 =							1032.8			
	I-22: [(6.5x4.95)+(2.5x1.67)] x (1178.57x2)/27 = 317.3										
	ADJUST FOR TRANSITION AT BRIDGE -5.9		311.4								
	3' PAVED BERMS										
	2 x 3 x 1178.57 ÷ 9 = 785.7 SQ. YD.										
	T-31: 785.7 x .25 =			196.4							
	T-31: 785.7 x .008 =				6.3						
	B-21: 785.7 x 3/36 =					65.5					
	I-18: 785.7 x 4/36 =						87.3				
	T-30: 785.7 x 0.4 =							314.3			
	RAISED MEDIAN - 4' WIDTH										
	I-21: (1178.57 x 4) ÷ 9 =								523.8		
	I-18: 1178.57 x 4 x 4/12 ÷ 27 =						58.2				
	I-22 IN MEDIAN (EDGE TO EDGE of CONC. PAVT) (1178.57 x 9 x 0.333) ÷ 27 =		130.8								
	CONCRETE APPROACH SLABS										
	I-7: 2x25 x 72.67 ÷ 9 = 403.7 SQ. YD.										
	DELETE FOR BRIDGE WING WALLS (-6.75 SQ. YD.)									397	
	I-22: 397 x 6/36 =		66.2								
	TOTALS TO SHEET 11	6286	1,556	842	27	281	433	1347	524	397	

E-11
WATER

SHEET	DESCRIPTION	QUANTITY M. GAL.
10	ROADWAY EMBANKMENT (48,866 x 5) ÷ 1000	244.3
11	B-19 (1567 x 5) ÷ 1000	7.8
11	I-22 (11,244 x 5) ÷ 1000	56.2
	TOTAL TO SHEET 11	308.3

E-1
COMPACTED SUBGRADE

SHEET	DESCRIPTION	QUANTITY SQ. YD.
11	T-71 AREA	24706
11	I-7 AREA	823
11	I-21 AREA	921
11	BERM AREA (T-31: 3393 GALS. ÷ 0.4 GAL/SQ.YD.	8483
	TOTAL TO SHEET 11	34933

CONT. No. 58019 SHEET PCT. No. 6184

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

ROADWAY QUANTITY SUMMARY & CALCULATIONS

SCALE DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RLH	RLH		CDR			

6184

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E-8 REMOVAL ITEMS

SHEET	LOCATION	FROM	TO	PAVEMENT WIDTH FT.	PAVEMENT LENGTH FT.	PAVEMENT REMOVAL & DISPOSAL OF EXISTING RIGID PAVEMENT SQ. YD.	CURB & GUTTER SIDE	CURB & GUTTER LENGTH FT.	CURB & GUTTER REMOVAL & DISPOSAL OF EXISTING CURB & GUTTER L.F.	CURB SIDE	CURB LENGTH FT.	CURB REMOVAL & DISPOSAL OF EXISTING CURB L.F.	SIDEWALK SIDE	SIDEWALK WIDTH FT.	SIDEWALK LENGTH FT.	SIDEWALK REMOVAL & DISPOSAL OF EXISTING SIDEWALK SQ. FT.
16	DILLE AVE.	BROADWAY AVE.	WARREN ST.	28	530	1650 + *8	L&R.	530	1060				L&R.	9 & 6	148 & 876	6588
	GIBBS AVE.	MARTIN AVE.	DILLE AVE.	18	342	694 + *7				L&R.	342	684	L&R.	3.5	325	2276
21 & 22	WARREN ST.	126' N. of MARTIN	SOLON ST.	30	1057	3524				L&R.	1025 & 1030	2055				
	WARREN ST.	MARTIN AVE.	SOLON ST.										L	6	1131	6786
	WARREN ST.	PARCEL 1412 WL	SOLON ST.										R	6	1057	6342
	WARREN ST.	SOLON ST.	14' E. of E. 37TH	30	411	1370				L&R.	387 & 345	732	L&R.	6	572 & 168	4440
22	WARREN ALLEY	WARREN ST.	DEAD END	15	200	334				L&R.	200	400	L&R.	2.5	200	1000
	SCHOOL CT.	TRUMBULL ST.	WARREN ST.	11	377	461 + *4							L&R.	2.5	375 & 362	1843
	MALEK PL.	SCHOOL CT.	WILLOW STA 79+66.59 (P.O.T.)	16	418	743 + *2										
	TRUMBULL ST.	DEAD END	℄ SCHOOL CT.	26	285	823				L&R.	278 & 285	563	L&R.	6 & 5	280 & 192	2640
	TRUMBULL ST.	℄ SCHOOL CT.	WILLOW STA 84+46 (T.P.T.)	26	861	2488				L&R.	838 & 861	1699	L&R.	5	730 & 896	8130
	SOLON PL.	TRUMBULL ST.	21' W. of TRUMBULL ST.	12	21	28 + *3				L&R.	20	40				
21	TRUMBULL ST.	34' W. of SOLON ST.	38' E. of E. 35TH PL.	26	132	382				L&R.	132	264				
	TRUMBULL ST.	34' W. of SOLON ST.	E. 38TH PL.										L	5	163	815
	TRUMBULL ST.	34' W. of SOLON ST.	W. of PARCEL 1006 WL										R	5	127	635
	SOLON ST.	WARREN ST.	82' S. of ℄ TRUMBULL ST.	26	494	1427 + *35				L&R.	490 & 519	1009				
	SOLON ST.	WARREN ST.	24' S. of TRUMBULL										L	6	533	3198
	SOLON ST.	WARREN ST.	96' S. of SOLON PL.										R	6	348	2088
	SVOBODA ST.	DEAD END	14' E. of E. 37TH ST.	20	727	1616				L&R.	695 & 735	1430	L&R.	4	694 & 737	5724
	GEAUGA ST.	BROADWAY AVE.	SVOBODA ST.	18	243	486 + *6				L&R.	239 & 241	480	L&R.	4	123 & 228	1404
	BROADWAY AVE.	STA 10+00	STA 15+15							R	515	515	R	10 & 9	335 & 125	4475
				SUBTOTAL		16016 + *65				SUBTOTAL		9871				
TOTAL QUANTITIES CARRIED TO GENERAL SUMMARY SHEET 11						16081			1060		REMOVAL FOR REUSE**	585				58384
											REMOVAL & DISPOSAL	9286				

* TURNOUTS AT INTERSECTION

** E-8 REMOVAL FOR REUSE OF EXISTING CURB IS THE AMOUNT OF I-11 SANDSTONE CURB RESET, SHEET 11.

EARTHWORK & EROSION CONTROL

SHEET	DESCRIPTION	E-1 ROADWAY EXCAVATION METHOD B CU. YD.	ROADWAY EMBANKMENT CU. YD.		EROSION CONTROL L-9 SEEDING AND PROTECTING SQ. YD.	EROSION CONTROL L-9 COMMERCIAL FERTILIZER 20 POUNDS/1000 S.F. TONS	EROSION CONTROL L-9 AGRICULTURAL LIMING MATERIAL 100 POUNDS/1000 S.F. TONS
37	EXTRA AREA	53033	0		5259		
	EXTRA AREA	55930	1268		2710		
38	EXTRA AREA	20456	0		5521		
	EXTRA AREA	59196	2853		3307		
39	EXTRA AREA	51236	0		9840		
	EXTRA AREA	40586	0		4557		
40	WILLOW FREEWAY	116182	36973		33839		
49	CLARK FREEWAY	535357	0		39091		
64	W-S RAMP	95169	167		17889		
70	S-E RAMP	94376	0		16762		
74	E-N RAMP	79264	39		22429		
78	N-W RAMP	20430	112		9719		
	DEDUCT FOR E-8 PAVEMENT REMOVALS	- 3700					
TOTALS CARRIED TO SHEET 11		1,217,515	41,412		170,923	15.42	77.09

EARTHWORK SUMMARY	CU. YDS.
E-1 ROADWAY EXCAVATION	1,217,515
ROADWAY EMBANKMENT PLUS 18%	-48,866
E-2 STRUCTURAL EXCAVATION (EXCESS)	+ 3640
ADD FOR E-8 PAVEMENT REMOVALS	+ 3700
TOTAL EXCESS EXCAVATION	1,175,989

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

ROADWAY QUANTITY SUMMARY & CALCULATIONS

SCALE NONE DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	RLH		CDR			

GENERAL SUMMARY

FED. RD. DIVISION	STATE	PROJECT	
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CUYAHOGA COUNTY
CUY – 21 – 14.12

TYPE CODE 7221

ITEM	SHEET NUMBER 6	7	9	10	16	17	18	19	21	22	28	29	30	31	32	33	34	35	36	198	1380
E-1				1217515																	
E-1			34933																		
S.S. CE 101.04		18																			
E-8				16081																	
E-8									14												
E-8				58384																	
E-8				9286																	
E-8				1060																	
E-8				585																	
E-9		48																			
E-11			309																		
E-12					44																
I-4	100																				
I-4	20																				
I-8					1	1	1	3													
I-13	300																				
I-13	300																				
I-13					750				1825												
I-15					400		400														
I-15					1000	1172	1260		650	1892.5											350
I-15					754	620	452.5														
I-15							25														
I-15									10												
L-9				15.42																	
L-9				77.09																	
L-9				170923																	
L-10						252			42	89											
L-120							34		2270	2751											
T-10	400																				
I-26																					2749
I-26																					3
SP'L	200																				
B-19			433								232	187	139	98	175	125		178			
B-21			281								215	280	208	146	262	188		268			
B-35									3												
I-7			397									45	45	80	45	45	45	67	54		
I-11											405	206	160	206		106		171			
I-11					150				390	45											
I-12											100				55						
I-12											104		157	28	170			50			
I-21			524								339										
I-21											33	12		13							
I-22			1556								1218	2223	834	1145	1736	440	33	1330	12		
T-30			1347								834	673	501	352	629	451		641			
T-31			842								521	421	313	220	393	282		401			
T-31			27								17	14	10	7	13	9		13			
T-35									1												
T-71			6286								4399	3136	1794	1497	2252	2116		3226			

ITEM	TOTAL QUANT.	UNIT	DESCRIPTION
			ROADWAY
E-1	1217515	CU.YD.	ROADWAY EXCAVATION. METHOD B, AS PER PLAN
E-1	34933	SQ.YD.	COMPACTED SUBGRADE
S.S. CE 101.04	18	HOURS	COMPACTION, USING HEAVY PNEUMATIC TIRED ROLLER
E-8	16081	SQ.YD.	REMOVAL & DISPOSAL OF EXISTING RIGID PAVEMENT
E-8	14	SQ.YD.	REMOVAL & DISPOSAL OF EXISTING ASPHALT & BRICK WEARING COURSE
E-8	58384	SQ.FT.	REMOVAL & DISPOSAL OF EXISTING SIDEWALK
E-8	9286	L.F.	REMOVAL & DISPOSAL OF EXISTING CURB
E-8	1060	L.F.	REMOVAL & DISPOSAL OF EXISTING CURB & GUTTER
E-8	585	L.F.	REMOVAL FOR RE-USE OF EXISTING CURB
E-9	48	EA.	REMOVAL OF TREES & STUMPS
E-11	309	M-GAL.	WATER
E-12	44	L.F.	PIPE REMOVED, 15" AND UNDER
I-4	100	M-GAL.	WATER FOR DUST CONTROL
I-4	20	TONS	CALCIUM CHLORIDE FOR DUST CONTROL
I-8	6	EA.	MONUMENT ASSEMBLIES, STANDARD
I-13	300	S.F.	3" SIDEWALKS (CRUSHED STONE, SLAG, OR GRAVEL.)
I-13	300	S.F.	4" PORTLAND CEMENT CONCRETE SIDEWALK
I-13	2575	S.F.	4 1/2" PORTLAND CEMENT CONCRETE SIDEWALK AS PER PLAN
I-15	800	L.F.	GUARD RAIL, TEMPORARY
I-15	6324.5	L.F.	GUARD RAIL, STEEL BEAM STANDARD TYPE (DEEP), as per plan
I-15	1826.5	L.F.	GUARD RAIL, STEEL BEAM BARRIER TYPE (DEEP), as per plan
I-15	25	L.F.	GUARD RAIL, STEEL BEAM BARRIER TYPE (DEEP), WITHOUT POSTS
I-15	10	EA.	WOOD GUARD RAIL POSTS WITHOUT RAIL
L-9	15.42	TONS	COMMERCIAL FERTILIZER (12-12-12)
L-9	77.09	TONS	AGRICULTURAL LIMING MATERIAL, as per plan
L-9	170923	S.Y.	SEEDING AND PROTECTING
L-10	383	S.Y.	SODDING FOR SPECIAL BERM & SLOPE PROTECTION AS PER PLAN.
L-120	5055	S.Y.	JUTE MATTING
T-10	400	C.Y.	TRAFFIC COMPACTED SURFACE COURSE for Maintaining Traffic
I-26	2749	L.F.	CHAIN LINK FENCE
I-26	3	EA.	CHAIN LINK FENCE GATES (14')
SP'L	200	L.F.	WOOD RAILING.
			PAVEMENT
B-19	1567	C.Y.	AGGREGATE BASE COURSE
B-21	1,848	C.Y.	WATERPROOFED AGGREGATE BASE COURSE
B-35	3	C.Y.	ASPHALTIC CONCRETE LEVELING COURSE (70-85)
I-7	823	S.Y.	REINFORCED CONCRETE APPROACH SLABS (T. 13)
I-11	1254	L.F.	6" x 18" SANDSTONE CURB
I-11	585	L.F.	SANDSTONE CURB RESET AS PER PLAN
I-12	155	L.F.	CONCRETE CURB, STD. TYPE 8,
I-12	509	L.F.	CONCRETE CURB, STD. TYPE 7
I-21	863	S.Y.	PORTLAND CEMENT CONCRETE MEDIAN PAVEMENT, STD. TYPE 2, AS PER PLAN.
I-21	58	S.Y.	4" PORTLAND CEMENT CONCRETE TRAFFIC ISLAND PAVEMENT, AS PER PLAN.
I-22	10,527	C.Y.	SUBBASE GRADING A OR B, AS PER PLAN
T-30	5428	GAL.	BITUMINOUS PRIME COAT, SEC. M-5.7, RT 2 083
T-31	3393	GAL.	Bituminous Surface Treatment-Bituminous Material, as per plan
T-31	110	C.Y.	BITUMINOUS SURFACE TREATMENT, No. 6 Aggregate
T-35	1	C.Y.	ASPHALTIC CONCRETE SURFACE COURSE, TYPE C (70-85)
T-71	24706	S.Y.	9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT

ELECTRICAL EQUIPMENT, SEE SHEET 129

STRUCTURES OVER 20 FEET
BRIDGE NO. CUY-21-1431 SEE SHEET 141
BRIDGE NOS. CUY-21- RAMP N-E & S-W SEE SHEET 154
BRIDGE NOS. CUY-21- RAMP E-S & W-N SEE SHEET 175
EXTENSION OF WING WALL BRIDGE NO. CUY-21-1404 SEE SHEET 190A.

I-3	LUMP	LUMP	MAINTAINING TRAFFIC
	LUMP	LUMP	CONSTRUCTION LAY-OUT STAKES

SHEET ACCT. No. 6.86
UNT. No. 58019

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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GENERAL SUMMARY

CUYAHOGA COUNTY
CUY – 21 – 14.12

TYPE CODE 7221

SHEET NUMBER 138D	8	16	17	18	19	21	22	92	ITEM	QUANT.	UNIT	DESCRIPTION
												DRAINAGE
		185		232	246	106			I-1	769	L.F.	12" PIPE CLASS J-1
		35			66	95			I-1	196	L.F.	12" PIPE CLASS E-1
					76				I-1	76	L.F.	15" PIPE CLASS J-1
					142				I-1	142	L.F.	15" PIPE CLASS J-1 SEC. M-6.6(b) OR M-6.8(b)
					253				I-1	253	L.F.	15" PIPE CLASS B-1 SEC. M-6.6(c)
					214				I-1	214	L.F.	18" PIPE CLASS J-1
		344					90		I-1	434	L.F.	18" PIPE CLASS J-1 SEC. M-6.6(b) OR M-6.8(b)
						150			I-1	150	L.F.	18" PIPE CLASS J-1 SEC. M-6.6(d)
							110		I-1	110	L.F.	18" PIPE CLASS J-1 SEC. M-6.6(c)
					54				I-1	54	L.F.	18" PIPE CLASS C-1 SEC. M-6.4(c)
					150	164			I-1	314	L.F.	18" PIPE CLASS E-1
					42				I-1	42	L.F.	21" PIPE CLASS J-1
					335				I-1	335	L.F.	21" PIPE CLASS B-1 SEC. M-6.6(b) OR M-6.8(b)
					300				I-1	300	L.F.	21" PIPE CLASS E-1
					165				I-1	165	L.F.	24" PIPE CLASS J-1
					40				I-1	40	L.F.	24" PIPE CLASS B-1
					375				I-1	375	L.F.	33" PIPE CLASS D-1
					180				I-1	180	L.F.	33" PIPE CLASS J-1 SEC. M-6.6(a)
					387				I-1	387	L.F.	36" PIPE CLASS J-1
					115				I-1	115	L.F.	42" PIPE CLASS D-1
					140				I-1	140	L.F.	48" PIPE CLASS A-1 SEC. M-6.6(d) OR M-6.4(d) 8 Gage
		30		64		165	80		I-1	339	L.F.	6" PIPE CLASS J-1 SEC. M-6.6(b) OR M-6.8(b)
		3323	1845	2010		1625	3330		I-1	12133	L.F.	6" PIPE CLASS I-3, as per plan
		20			130	20	50	80	I-1	300	L.F.	6" PIPE CLASS F-4
								800	I-1	800	L.F.	6" PIPE CLASS I-3 SEC. M-6.4(h), as per plan
				.3					I-2	.3	C.Y.	MASONRY
		3		2		5	4		I-5	14	EA.	6" PIPE SPECIALS FOR I-3 PIPE
								8	I-5	8	EA.	6" PIPE SPECIALS CLASS F-4
				2	1				I-8	3	EA.	2-A-6 PAVED SHOULDER INLETS MODIFIED AS PER PLAN
					3				I-8	3	EA.	2-A-10 PAVED SHOULDER INLETS MODIFIED AS PER PLAN
		2			15	4	2		I-8	23	EA.	STD. NO. 5 CATCH BASINS
		1			7	1			I-8	9	EA.	STD. NO. 1 MANHOLES
					2	2			I-8	4	EA.	STD. NO. 2 MANHOLES W/O DROP PIPE
					3				I-8	3	EA.	JUNCTION MANHOLES AS PER PLAN
		1							I-8	1	EA.	STD. 2-A-8 PAVED SHOULDER INLET
		1							I-8	1	EA.	STD. 2-A-10 PAVED SHOULDER INLET
				1					I-8	1	EA.	Manhole Reconstructed to Grade, as per plan
				5					I-10	5	C.Y.	DUMPED ROCK CHANNEL PROTECTION
	3								I-16	3	EA.	MANHOLES ABANDONED, AS PER PLAN
		LUMP	LUMP				Lump		S-24	LUMP	LUMP	REMOVAL OF EXISTING STRUCTURES
						936			SPL	936	L.F.	60" Dia. TUNNEL SECTION
												SIGN SUPPORTS
1									I-129	1	Ea.	Overhead Sign Support No. 12.24, Design No. 1, 16' Arm, as per
1									I-129	1	Ea.	Overhead Sign Support No. 12.24, Design No. 5, 22' Arm, as per
1									I-129	1	Ea.	Overhead Sign Support No. 12.24, Design No. 6, 22' Arm, as per
2									I-129	2	Ea.	Overhead Sign Support No. 12.24, Design No. 8, 26' Arm, as per
1									I-129	1	Ea.	Overhead Sign Support No. 7.3, Design No. 2, 60' Span, as per
1									I-129	1	Ea.	Overhead Sign Support No. 7.4, Design No. 1, 57' Span, as per
1									I-129	1	Ea.	Overhead Sign Support No. 7.4, Design No. 1, 75' Span, as per
1									I-129	1	Ea.	Overhead Sign Support No. 7.4, Design No. 1, 51'-0½" Span, as per
1									I-129	1	Ea.	Overhead Sign Support No. 7.4, Design No. 1, 65' Span, as per
1									I-129	1	Ea.	Overhead Sign Support No. 7.4, Design No. 3, 90' Span, as per
1									I-129	1	Ea.	Overhead Sign Support No. 7.5, Design No. 1, 70' Span, as per
2									I-129	2	Ea.	Overhead Sign Support No. 7.5, Design No. 2, 80' Span, as per
1									I-129	1	Ea.	Overhead Sign Support No. 7.5, Design No. 2, 73' Span, as per
1									I-129	1	Ea.	Overhead Sign Support No. 7.5, Design No. 4, 100' Span, as per
99.9									I-129	99.9	Cu. Yd.	Concrete for Sign Support Foundations, as per plan
5									S-25	5	Ea.	Sign switch and Enclosure "Y"
11									S-25	11	Ea.	Sign Switch and Enclosure "Z"
16									S-25	16	Ea.	Ground Wire and Wire Connection

9-24-63 9-26-63

CONT. No. 58019 SHEET AC. No. 6188

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY— 21-14.12

GENERAL SUMMARY

PARCEL NUMBER	ITEM	TOTAL QUAN	UNIT	DESCRIPTION
				REMOVAL OF BUILDINGS TYPE CODE 7221
1030 WL	E-10	LUMP	LUMP	REMOVAL OF (1) 2 STORY FRAME RESIDENCE, (3) FRAME SHEDS & (1) FRAME PRIVY
1032 WL				REMOVAL OF (2) 1 STORY FRAME RESIDENCES, (3) FRAME SHED & (1) FRAME PRIVY
~~1034 WL~~				~~REMOVAL OF (1) 2 STORY FRAME RESIDENCE~~
1035 WL				REMOVAL OF (1) 2½ STORY BRICK RESIDENCE & (2) FRAME SHEDS
1038 WL				REMOVAL OF (1) 1 STORY BRICK INDUSTRIAL BUILDING & (1) Truck Loading Platform
1040 WL				REMOVAL OF (1) 1 STORY FRAME RESIDENCE
1116 WL				REMOVAL OF (1) 2 STORY FRAME AND ATTACHED 1 STORY FRAME RESIDENCES & (1) FRAME SHED
~~1120 WL~~				~~REMOVAL OF (1) 1½ STORY FRAME RESIDENCE~~
1132 WL				REMOVAL OF (1) 1½ STORY FRAME RESIDENCE
~~1138 WL~~				~~REMOVAL OF (1) 2½ STORY FRAME AND ATTACHED 1 STORY FRAME RESIDENCES, (1) 2 CAR FRAME GARAGE, (1) FRAME SHED & (1) Brick Bread Oven~~
~~1151 WL~~				~~REMOVAL OF (1) 2 STORY FRAME AND ATTACHED 1 STORY FRAME RESIDENCES, & (1) 1 CAR FRAME GARAGE~~
1202 WL				REMOVAL OF (1) 1 STORY FRAME RESIDENCE & (1) 1 CAR FRAME GARAGE
~~1203 WL~~				~~REMOVAL OF (1) 2 STORY FRAME AND ATTACHED 1 STORY FRAME RESIDENCES~~
~~1204 WL~~				~~REMOVAL OF (1) 1 STORY FRAME RESIDENCE~~
1206 WL				REMOVAL OF (1) 2 STORY FRAME AND 2 ATTACHED 1 STORY FRAME RESIDENCES, WITH ATTACHED FRAME SHED & (1) 2 CAR FRAME GARAGE
~~1212 WL~~				~~REMOVAL OF (1) 1 STORY FRAME RESIDENCE, (1) FRAME SHED & (1) 2 CAR FRAME GARAGE~~
1219 WL				REMOVAL OF (1) 1½ STORY FRAME RESIDENCE & (1) 1 CAR FRAME GARAGE
~~1220 WL~~				~~REMOVAL OF (1) 1 STORY FRAME RESIDENCE & (1) FRAME SHED~~
1223 WL				REMOVAL OF (1) 2 STORY FRAME AND ATTACHED 1 STORY FRAME RESIDENCES & (2) FRAME SHEDS
1224 WL				REMOVAL OF (2) 1 STORY FRAME RESIDENCES & (1) FRAME SHED
1227 WL				REMOVAL OF (1) 1½ STORY FRAME AND ATTACHED 1 STORY FRAME RESIDENCES, (1) FRAME SHED & (1) 1 CAR FRAME GARAGE
1229 WL				REMOVAL OF (1) 2 STORY FRAME RESIDENCE, (1) 1½ STORY FRAME RESIDENCE, (1) FRAME SHED & (1) 1 CAR FRAME GARAGE
1230 WL				REMOVAL OF (1) 1 STORY FRAME RESIDENCE & (3) FRAME SHEDS & (1) 2 Story Frame Residence
~~1232 WL~~				~~REMOVAL OF (1) 1½ Story Frame Shack and Shed~~
1253 WL				REMOVAL OF (1) 1½ STORY FRAME RESIDENCE, (1) 1½ STORY FRAME SHED & (1) 2 CAR FRAME GARAGE
1260 WL				REMOVAL OF (1) 1½ STORY FRAME RESIDENCE, (1) FRAME SHED & (1) 3 CAR FRAME GARAGE
1261 WL				REMOVAL OF (1) 1½ STORY FRAME AND ATTACHED 1 STORY FRAME RESIDENCES & (2) FRAME SHEDS
1264 WL				REMOVAL OF (1) 1½ STORY FRAME RESIDENCE, (1) 1 STORY FRAME BARN WITH ATTACHED FRAME SHED & (2) 2 CAR FRAME GARAGES
1265 WL				REMOVAL OF (1) 1½ STORY FRAME RESIDENCE, (1) 1 CAR FRAME GARAGE
~~1266 WL~~				~~REMOVAL OF (1) 1 STORY FRAME AND ATTACHED 1½ STORY BRICK RESIDENCES, (1) FRAME SHED & (1) 1 CAR FRAME GARAGE~~
1267 WL				REMOVAL OF (1) 1 STORY FRAME AND ATTACHED 2 STORY FRAME RESIDENCES, (1) 1 CAR FRAME GARAGE & (1) FRAME SHED
~~1270 WL~~				~~REMOVAL OF (1) 1½ STORY FRAME RESIDENCE~~
1271 WL				REMOVAL OF (1) Brick SHED
1272 WL				REMOVAL OF (1) 2 STORY FRAME RESIDENCE
1274 WL				REMOVAL OF (1) 1½ STORY FRAME RESIDENCE, (1) FRAME SHED & (1) 2 CAR FRAME GARAGE
1275 WL				REMOVAL OF (1) 2 STORY FRAME RESIDENCE, (1) 2 CAR FRAME GARAGE & (2) FRAME SHEDS
1305 WL				REMOVAL OF (2) 1½ STORY FRAME RESIDENCES, (1) 3 CAR FRAME GARAGE, (1) FRAME SHEDS & (1) 1 STORY FRAME RESIDENCE
1316 WL				REMOVAL OF (1) 1½ STORY FRAME AND ATTACHED 1 STORY FRAME RESIDENCES & (1) FRAME SHED
1317 WL				REMOVAL OF (1) 2 STORY FRAME RESIDENCE & (1) FRAME SHED
1318 WL				REMOVAL OF (1) 2 STORY FRAME RESIDENCE, (1) 1½ STORY FRAME RESIDENCE & (2) 1 CAR FRAME GARAGES
~~1323 WL~~				~~REMOVAL OF (1) 1½ STORY FRAME RESIDENCE~~
~~1335 A WL~~				~~REMOVAL OF (1) 2 STORY FRAME RESIDENCE, & (1) 1 STORY CONCRETE BLOCK SHED~~
~~1351 WL~~				~~REMOVAL OF (1) 2 STORY FRAME AND BRICK INDUSTRIAL BUILDING & (1) 1 STORY FRAME and CONCRETE BLOCK INDUSTRIAL BUILDING~~
~~1351 WL~~			√	~~REMOVAL OF (1) 1 STORY CONCRETE BLOCK SHOP~~
1354 WL				REMOVAL OF (1) 1 STORY BRICK AND CONCRETE BLOCK INDUSTRIAL BUILDING & 1 Shed
1356 WL				REMOVAL OF (1) 2½ STORY FRAME STORE AND RESIDENCE, (1) 1 STORY FRAME RESIDENCE, (1) 2 CAR FRAME GARAGE, (1) 2 CAR FRAME GARAGE WITH ATTACHED FRAME SHED
~~1361 WL~~				~~REMOVAL OF (1) 2 STORY FRAME RESIDENCE, & (1) 1 CAR FRAME GARAGE WITH 2 ATTACHED SHEDS~~
~~1362 WL~~				~~REMOVAL OF (1) 2 STORY FRAME RESIDENCE & (1) 1 CAR FRAME GARAGE~~
~~1371 WL~~				~~REMOVAL OF (1) BRICK AND STONE CHURCH & (1) 2 STORY FRAME AND ATTACHED 1 STORY FRAME SCHOOL BUILDING~~
1372 WL				REMOVAL OF (1) 2 STORY FRAME RESIDENCE, (1) 2 STORY FRAME AND ATTACHED 1½ STORY FRAME RESIDENCE, (1) 2 CAR FRAME GARAGE & (1) 2 CAR FRAME GARAGE WITH 2 ATTACHED FRAME SHEDS
1373 WL				REMOVAL OF (1) 1 STORY CONCRETE BLOCK WITH BRICK FACADE INDUSTRIAL BUILDING
1374 WL				REMOVAL OF (1) 2 STORY, 1½ STORY AND 1 STORY ATTACHED FRAME RESIDENCES & Store
1375 WL				REMOVAL OF (1) 2 STORY BRICK AND FRAME, AND 1½ STORY FRAME ATTACHED RESIDENCES
~~1377 WL~~				~~REMOVAL OF (1) 2 STORY FRAME RESIDENCE, (1) 1½ STORY FRAME RESIDENCE, (1) 1½ STORY FRAME SCHOOL BUILDING & (1) 2 CAR FRAME GARAGE WITH ATTACHED FRAME SHED~~
1378 WL				REMOVAL OF (1) 1½ STORY FRAME RESIDENCE WITH ATTACHED SHED
1379 WL				REMOVAL OF (1) 2 STORY, 1½ STORY AND 1 STORY, ATTACHED FRAME RESIDENCES WITH 2 ATTACHED FRAME SHEDS, (1) 1½ STORY FRAME RESIDENCE, (1) FRAME SHED & (1) FRAME PRIVY
~~1380 WL~~				~~REMOVAL OF (1) 1½ STORY FRAME RESIDENCE~~
~~1380 A WL~~				~~REMOVAL OF (1) 1½ STORY FRAME RESIDENCE WITH ATTACHED SHED & (1) 1 CAR FRAME GARAGE WITH ATTACHED SHED~~
~~1401 WL~~				~~REMOVAL OF (1) 3 STORY BRICK SCHOOL BUILDING~~
~~1408 WL~~				~~REMOVAL OF (1) 2 STORY AND 1 STORY ATTACHED FRAME RESIDENCES & (1) 3 CAR FRAME GARAGE~~
1409 WL				REMOVAL OF (1) STRUCTURAL STEEL FRAME-METAL SIDING WAREHOUSE WITH ATTACHED 1 STORY METAL BUILDING, (1) 1 STORY 2 CAR BRICK GARAGE WITH ATTACHED LOCKER ROOM, (2) 1½ STORY AND 1 STORY BRICK POWERHOUSES, (1) 1 STORY FRAME SHED, Brick Shed, (1) TRUCK SCALE, (1) 2 STORY BRICK OFFICE BUILDING WITH ATTACHED FRAME SHED, (1) 1½ Story Frame Residence, (1) 20 Ton Overhead Crane, (3) 10 Ton Overhead Crane, (1) SHEET METAL SHED, (1) ROOF OVER SCRAP Baling Yard, (2) Large Baling Machines and (1) Shearing Machine
1409-A WL				REMOVAL OF (3) 1½ STORY FRAME RESIDENCES, (2) 1 CAR FRAME GARAGES, (2) FRAME SHEDS, (1) 1 STORY SHEET METAL GAS STORAGE HOUSE,
1467 WL				REMOVAL OF (1) 1½ STORY FRAME RESIDENCE & (1) 2 CAR BRICK GARAGE WITH ATTACHED BRICK SHED
~~1503 WL~~	E-10	LUMP	LUMP	~~REMOVAL OF (1) 1 STORY FRAME, WITH BRICK FACE, Tavern~~

GENERAL SUMMARY CODE Y-060

SHEET NUMBER	CITY ITEM	ITEM	TOTAL QUAN.	UNIT	DESCRIPTION
107					
					WATERWORK
40	1A	SPL	40	L.F.	6" CEMENT LINED CAST IRON PIPE & FITTINGS
170	1B	SPL	170	L.F.	12" CEMENT LINED CAST IRON PIPE & FITTINGS
13	1C	SPL	13	L.F.	16" CEMENT LINED DUCTILE IRON PIPE & FITTINGS
1	2A	SPL	1	EA.	FURNISHING & SETTING 6" HYDRANT
6	3A	SPL	6	L.F.	2" EXTRA STRONG BRASS PIPE & FITTINGS
48	3B	SPL	48	L.F.	2" EXTRA HEAVY GALVANIZED WROUGHT IRON PIPE & FITTINGS
1	4A	SPL	1	EA.	2" BRASS VALVE - STRAIGHT - THREADED ENDS
8	4B	SPL	8	EA.	2" BRASS VALVES - ANGLE - THREADED ENDS
3	4C	SPL	3	EA.	6" GATE VALVES - FLANGED ENDS
1	4D	SPL	1	EA.	12" GATE VALVE - FLANGED ENDS
1	4E	SPL	1	EA.	12" GATE VALVE - BELL ENDS
1	4F	SPL	1	EA.	16" GATE VALVE - FLANGED ENDS
3	4G	SPL	3	EA.	24" GATE VALVES - VICTAULIC ENDS
30	6	SPL	30	C.Y.	BRICK MASONRY
84	7	SPL	84	C.Y.	CONCRETE MASONRY
15400	8	SPL	15400	LB.	MISCELLANEOUS METAL WORK
2300	9	SPL	2300	L.F.	30" PRESTRESSED CONCRETE CYLINDER PIPE AND FITTINGS
10	10	SPL	10	EA.	EXTRA 30" CONCRETE CYLINDER PIPE FITTINGS
10	SPL	SPL	10	EA.	RELOCATE & RECONNECT HOUSE WATER SERVICE CONNECTIONS
44	SPL	SPL	44	EA.	PLUG HOUSE WATER SERVICE CONNECTIONS
6	SPL	SPL	6	EA.	PLUG EXISTING 6" WATER MAINS
2	SPL	SPL	2	EA.	INSTALL FLUSHING VALVE ASSEMBLY
2	SPL	SPL	2	EA.	6"X6" BRANCH SLEEVE AND VALVE

CONT. NO. 58019 SHEET NO. 6.89

9-24-63

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

GENERAL SUMMARY

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	G.O.C. R.M.P.		C.D.R. C.R.			

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
CUY— 21 — 14.12

WORK DWGS. 14 & 15 TOGETHER

NOTES:

▲ DENOTES EXISTING STREET MONUMENT

▲ O.M. - DENOTES CLEVELAND REGIONAL GEODETIC SURVEY MONUMENT

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1932 EAST 107TH STREET CLEVELAND, OHIO

GEOMETRIC LAYOUT
FOR
INTERCHANGE AREA

SCALE 1" = 100' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
G.O.W. C.D.R.	R.B.		C.D.R. J.S.P.			

MICROFILMED
MAR 6 1984

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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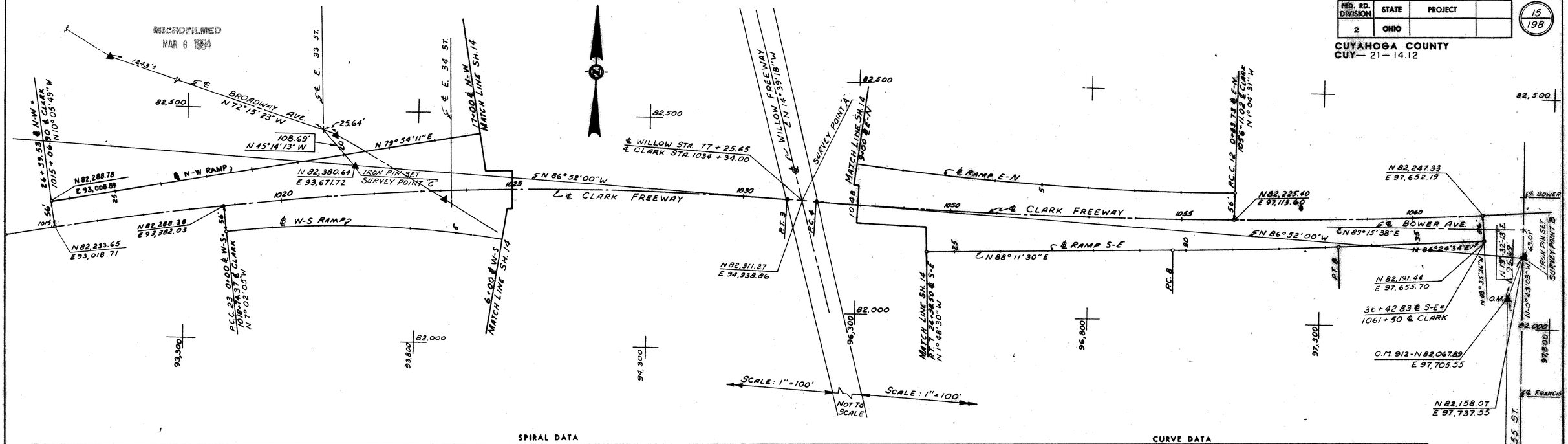
CUYAHOGA COUNTY
CUY— 21 — 14.12



SPIRAL DATA / CURVE DATA

CURVE NO.	TANGENT TO SPIRAL STATION	TANGENT TO SPIRAL N	TANGENT TO SPIRAL E	SPIRAL TO CURVE STATION	SPIRAL TO CURVE N	SPIRAL TO CURVE E	POINT OF INTERSECTION STATION	POINT OF INTERSECTION N	POINT OF INTERSECTION E	CURVE TO SPIRAL STATION	CURVE TO SPIRAL N	CURVE TO SPIRAL E	SPIRAL TO TANGENT STATION	SPIRAL TO TANGENT N	SPIRAL TO TANGENT E	Δ	℄	L_s	T_s	L.C.	X_c	Y_c	Δ_c	D_c	R	T	L_c	REMARKS	CURVE NO.
5	*4+17.45	80,967.44	95,322.03	10+71.01	81,619.39	95,317.14				8+21.01	81,370.35	95,300.70				17° 09' 38"	13° 07' 30"	250'	——	249.42	248.69	19.02	4° 02' 08"	1° 00' 00"	5729.58	201.86	403.56	℄ Ramp S-E	5
6				10+71.01	81,619.39	95,317.14				17+00.74	82,066.22	95,719.82	20+00.74	82,110.74	96,015.66	74° 04' 28"	14° 15' 00"	300'	——	299.18	298.15	24.76	59° 49' 28"	9° 30' 00"	603.11	346.97	629.73	℄ Ramp S-E	6
13	14+69.63	82,419.77	95,736.70	17+19.63	82,481.69	95,494.84	19+08.65	82,503.75	95,305.79	20+59.07	82,672.66	95,218.06	23+09.07	82,876.80	95,074.33	47° 09' 18"	10° 00' 00"	250'	439.02	249.66	249.24	14.51	27° 09' 18"	8° 00' 00"	716.20	172.97	339.44	℄ Ramp E-N	13
15	3+20.09	82,423.85	95,590.28	6+20.09	82,452.67	95,292.78	16+84.04	82,684.75	94,251.52	15+29.16	81,795.24	94,840.45	18+29.16	81,527.69	94,973.70	132° 59' 51"	16° 30' 00"	300'	1363.95	298.90	297.52	28.63	99° 59' 51"	11° 00' 00"	520.87	620.72	909.07	℄ Ramp E-S	15
18	5+32.48	83,214.27	94,590.94	8+32.48	82,915.37	94,590.37	11+68.41	82,581.14	94,650.66	13+07.86	82,549.99	94,312.47	16+07.86	82,469.65	94 024.58	85° 17' 29"	16° 30' 00"	300'	635.93	298.90	297.52	28.63	52° 17' 29"	11° 00' 00"	520.87	255.69	475.38	℄ Ramp N-W	18
29	1+87.21	82,195.64	94,295.70	4+87.21	82,166.92	94,593.21	15+46.31	81,936.03	95,629.77	13+94.75	82,822.99	95,045.77	16+94.75	83,090.91	94,913.24	132° 49' 46"	16° 30' 00"	300'	1359.10	298.90	297.52	28.63	99° 49' 46"	11° 00' 00"	520.87	618.88	907.54	℄ Ramp W-N	29

*Tangent to Curve

CURVE DATA

CURVE NO.	BEGINNING OF CURVE STATION	BEGINNING OF CURVE N	BEGINNING OF CURVE E	P. I. OF CURVE STATION	P. I. OF CURVE N	P. I. OF CURVE E	END OF CURVE STATION	END OF CURVE N	END OF CURVE E	Δ	D	R	T	L	REMARKS
1	59+19.51	80,547.91	95,316.92	64+01.00	81,027.54	95,274.56	68+80.23	81,493.37	95,152.74	9° 36' 26"	1° 00' 00"	5729.58	481.49	960.72	℄ Willow Freeway
3							1030+94.53	82,329.85	94,599.89		0° 50' 00"	6875.49			℄ Clark Freeway
4	1047+09.17	82,241.59	96,212.11								0° 28' 00"	12,277.67			℄ Clark Freeway
7	23+38.51	82,133.20	96,352.68	23+88.51	82,136.53	96,402.57	24+38.50	82,138.11	96,452.55	2° 00' 16"	2° 00' 17"	2858.04	50.00	99.99	℄ Ramp S-E
8	29+71.30	82,154.93	96,985.10	31+49.54	82,160.55	97,163.24	33+27.74	82,171.71	97,341.13	1° 46' 56"	0° 30' 00"	11,459.16	178.24	356.44	℄ Ramp S-E
9	2+52.90	81,483.93	95,270.27	5+06.99	81,737.80	95,259.66	7+55.86	81,972.53	95,162.37	20° 07' 06"	4° 00' 00"	1432.39	254.09	502.96	℄ Ramp S-W
10	7+55.86	81,972.53	95,162.37	12+47.72	82,426.91	94,974.05	16+41.65	82,473.91	94,484.44	62° 00' 18"	7° 00' 00"	818.51	491.86	885.79	℄ Ramp S-W
11	16+41.65	82,473.91	94,484.44	18+25.46	82,491.47	94,301.47	20+07.27	82,462.26	94,120.00	14° 37' 30"	4° 00' 00"	1432.39	183.81	365.62	℄ Ramp S-W
12	0+83.73	82,281.39	97,112.55	6+91.14	82,269.99	96,505.24	12+94.04	82,386.18	95,909.05	12° 06' 11"	1° 00' 00"	5729.58	607.41	1210.31	℄ Ramp E-N
14	28+10.35	83,302.75	94,810.05	30+04.36	83,467.61	94,707.77	31+96.02	83,653.73	94,653.02	15° 25' 37"	4° 00' 00"	1432.39	194.01	385.67	℄ Ramp E-N
16	19+65.83	81,411.75	95,046.06	20+55.09	81,336.03	95,093.32	21+44.12	81,255.10	95,130.98	7° 00' 51"	3° 56' 03"	1456.39	89.26	178.29	℄ Ramp E-S
17	0+00.00	83,741.63	94,522.42	1+16.09	83,629.32	94,551.79	2+31.67	83,513.75	94,562.69	9° 16' 00"	4° 00' 00"	1432.39	116.09	231.67	℄ Ramp N-W
19	Not Used														
20	2+22.34	83,033.47	94,632.10	4+27.22	82,829.49	94,651.34	6+29.33	82,639.09	94,726.99	16° 16' 47"	4° 00' 00"	1432.39	204.88	406.99	℄ Ramp N-E
21	6+29.33	82,639.09	94,726.99	10+17.46	82,278.39	94,870.30	13+47.56	82,181.44	95,246.13	53° 52' 01"	7° 30' 00"	763.94	388.13	718.23	℄ Ramp N-E
22	13+47.56	82,181.44	95,246.13	15+52.35	82,130.29	95,444.43	17+54.39	82,136.75	95,649.12	16° 16' 24"	4° 00' 00"	1432.39	204.79	406.83	℄ Ramp N-E
23	0+00.00	82,232.80	93,388.89	4+02.12	82,282.05	93,787.97	7+96.13	82,192.49	94,179.99	19° 54' 12"	2° 30' 00"	2291.83	402.12	796.13	℄ Ramp W-S
24	7+96.13	82,192.49	94,179.99	9+26.18	82,163.52	94,306.78	10+55.13	82,106.88	94,423.86	12° 57' 00"	5° 00' 00"	1145.92	130.05	259.00	℄ Ramp W-S
25	10+55.13	82,106.88	94,423.86	11+98.52	82,044.43	94,552.94	13+38.17	81,937.09	94,648.02	22° 38' 36"	8° 00' 00"	716.20	143.39	283.04	℄ Ramp W-S
26	13+38.17	81,937.09	94,648.02	14+41.27	81,859.92	94,716.38	15+44.02	81,773.75	94,772.99	8° 14' 02"	4° 00' 00"	1432.39	103.10	205.85	℄ Ramp W-S
27	20+42.58	81,357.07	95,046.74	21+06.91	81,303.30	95,082.07	21+71.02	81,244.98	95,109.21	8° 20' 55"	6° 30' 00"	881.47	64.33	128.44	℄ Ramp W-S
28	21+71.02	81,244.98	95,109.21	23+83.42	81,052.41	95,198.83	25+92.76	80,842.12	95,228.71	16° 52' 10"	4° 00' 00"	1432.39	212.40	421.74	℄ Ramp W-S

NOTES

▲ DENOTES EXISTING STREET MONUMENT

▲ O.M. - DENOTES CLEVELAND REGIONAL GEODETIC SURVEY MONUMENT

WORK DWGS. 14 & 15 TOGETHER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

GEOMETRIC LAYOUT FOR INTERCHANGE AREA

SCALE 1" 100' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JSP COR	RB					

CONT. No. 58019 SHEET ACCT. No. 6249

MICROFILMED
MAR 6 1984

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

16/198

CUYAHOGA COUNTY
CUY-21-14.12

PROJECT MARKER
MARKER WILL BE FURNISHED AND ERECTED ON THE RIGHT BY STATE FORCES PRIOR TO ACCEPTANCE OF THIS IMPROVEMENT.

STA. 48+48 TO STA. 64+40
ELECTRICAL WORK & SIGNING
SEE NOTES 1 & 3 SHEET 138
& SCHEMATIC PLAN SHEET 2.
and Sheet 138A

BENCH MARK
O.M. 914 (N-81284.83)-(E-94941.90)
ELEV. 674.095 APPROX. 28' WEST OF THE ℄ OF BROADWAY AND 21' NORTH OF THE ℄ OF DILLE. 754' SOUTHEAST OF S.E. CORNER OF BLDG. 7.46' S.W. OF IRON TROLLEY POLE #23/129.

S.L.M. = 14.12
L-77-5 (6) 161

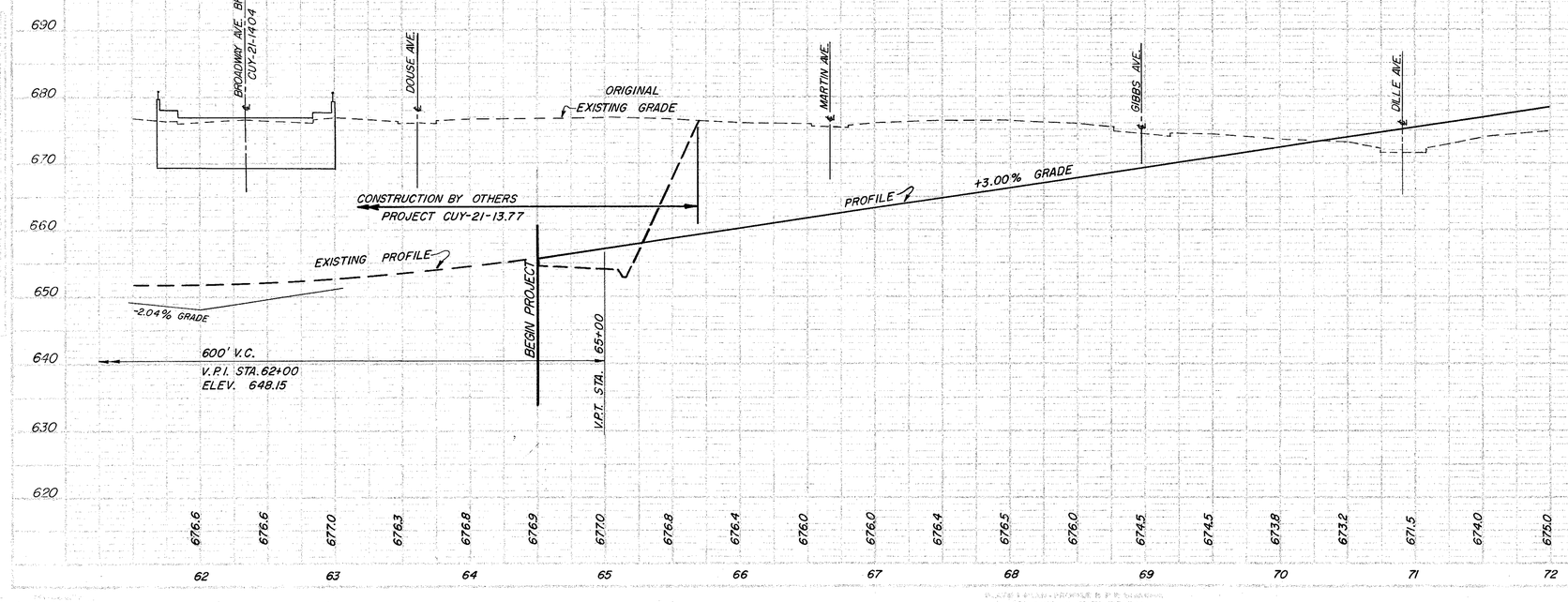
NOTES:

TYPICAL SECTION	SEE SHEETS 3 & 4
SEWER PROFILES	80 & 81
WATERWORK PLAN	95 TO 119
EXISTING UTILITIES	120 TO 124
MEDIAN TRANSITION	28
PAVEMENT DETAILS	28 TO 36
E-8 REMOVAL ITEMS	10
GRADING PLAN & CROSS SECTION KEY PLAN	37, 38 & 39
ROADWAY & PAVEMENT QUANTITIES	9 & 10
LIGHTING PLAN	125 TO 138
FENCE LOCATION	192
GEOMETRIC LAYOUT	14 & 15
DRAINAGE QUANTITIES	20

NOTE:
TYPICAL SECTION EXISTING ADJOINING WILLOW PAVEMENT SAME AS PROPOSED WILLOW TYPICAL SECTION.

ROADWAY & PAVEMENT QUANTITIES

REFERENCE NO.	LOCATION	SIDE	I-8 MONUMENT ASSEMBLIES	I-11 SANDSTONE CURB RESET (6" HIGH)	I-13 4 1/2" P.C.C. SIDEWALK (5" WIDE)	I-15 GUARD RAIL, STEEL BEAM STD. TYPE (DEEP)	I-15 GUARD RAIL, STEEL BEAM BARRIER TYPE (DEEP)	I-15 TEMPORARY GUARD RAIL
			EACH	L.F.	S.F.	L.F.	L.F.	L.F.
1-M	WILLOW P.T. STA. 68+80.23		1					
1-G	WILLOW STA. 67+00 TO STA. 72+00	L.T.				500		
2-G	WILLOW STA. 64+45.90 TO STA. 72+00	℄					754	
3-G	WILLOW STA. 67+00 TO STA. 72+00	RT.				500		
1-S	BROADWAY STA. 10+00 TO STA. 11+50	RT.		150				
2-S	BROADWAY STA. 10+00 TO STA. 11+50	RT.			750			
4-G	WILLOW STA. 61+95 TO STA. 65+95	RT.						400
	TOTALS		1	150	750	1000	754	400



WILLOW PLAN & PROFILE STA. 64+50 TO STA. 72+00

SHEET ACCT. NO. 6244
SHEET NO. 5909

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
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DRAINAGE QUANTITIES			
MARK NO.	LOCATION	L-10 SODDING FOR SPECIAL BERM AND SLOPE PROTECTION S.Y.	S-24 REMOVAL OF EXIST. STRUCTURES L.S.
M-1	WILLOW STA. 75+07	84	
M-2	WILLOW STA. 74+75	42	
M-3	WILLOW STA. 79+80	42	
M-4	WILLOW STA. 79+45	84	
R-1	W-N RAMP STA. 14+20		1
	TOTAL	252	1

DRAINAGE QUANTITIES			
MARK NO.	LOCATION		6" UNDERDRAIN CLASS I-3
C-7	STA. 72+00 TO STA. 75+25	LT.	325 FT.
C-8	STA. 72+00 TO STA. 75+08	℄	308
C-9	STA. 72+00 TO STA. 74+92	RT.	292
C-10	STA. 79+58 TO STA. 82+50	LT.	292
C-11	STA. 79+45 TO STA. 82+50	℄	305
C-12	STA. 79+27 TO STA. 82+50	RT.	323
	TOTAL		1845 FT.

NOTES:

TYPICAL SECTION............SEE SHEET...3 & 4
WATERWORK PLANS...............95 TO 119
EXISTING UTILITIES..............120 TO 124
E-8 REMOVAL ITEMS..............10
GRADING PLAN & CROSS SECTION KEY PLAN...37, 38 & 39
ROADWAY & PAVEMENT QUANTITIES...........9 & 10
LIGHTING PLANS..............125 TO 138
PROPOSED STRUCTURE DATA.........139 TO 190
GEOMETRIC LAYOUT..............14 & 15

B.M. "J" ELEV. 673.66
APPROX. STA. 74+10 (60' R)
R.R. SPIKE IN BASE OF
C.E.I.-O.B.T. POLE NO. 112066
AT INTERSECTION OF
EAST 38 PL. & WARREN ST.

* INCLUDE FOR PAYMENT 6 WF 15.5 × 6'-0" GALVANIZED STEEL BEAM POST (IN LIEU OF WOOD POSTS) FOR THOSE POSTS WHICH FALL IN THE BRIDGE APPROACH SLABS.

ROADWAY & PAVEMENT QUANTITIES					
REFERENCE NO.	LOCATION	SIDE	I-8 MONUMENT ASSEMBLIES EACH	I-15 GUARD RAIL, STEEL BEAM STD. TYPE (DEEP) L.F.	I-15 * GUARD RAIL, STEEL BEAM BARRIER TYPE (DEEP) L.F.
1-M	WILLOW STA. 74+00	℄	1		
1-G	WILLOW STA. 72+00 TO STA. 75+13	LT.		313	
2-G	WILLOW STA. 72+00 TO STA. 75+11.27	℄			311
3-G	WILLOW STA. 72+00 TO STA. 74+75	RT.		275	
4-G	WILLOW STA. 79+77 TO STA. 82+50	LT.		273	
5-G	WILLOW STA. 79+41.20 TO STA. 82+50	℄			309
6-G	WILLOW STA. 79+39.50 TO STA. 82+50	RT.		311	
	TOTALS		1	1172	620

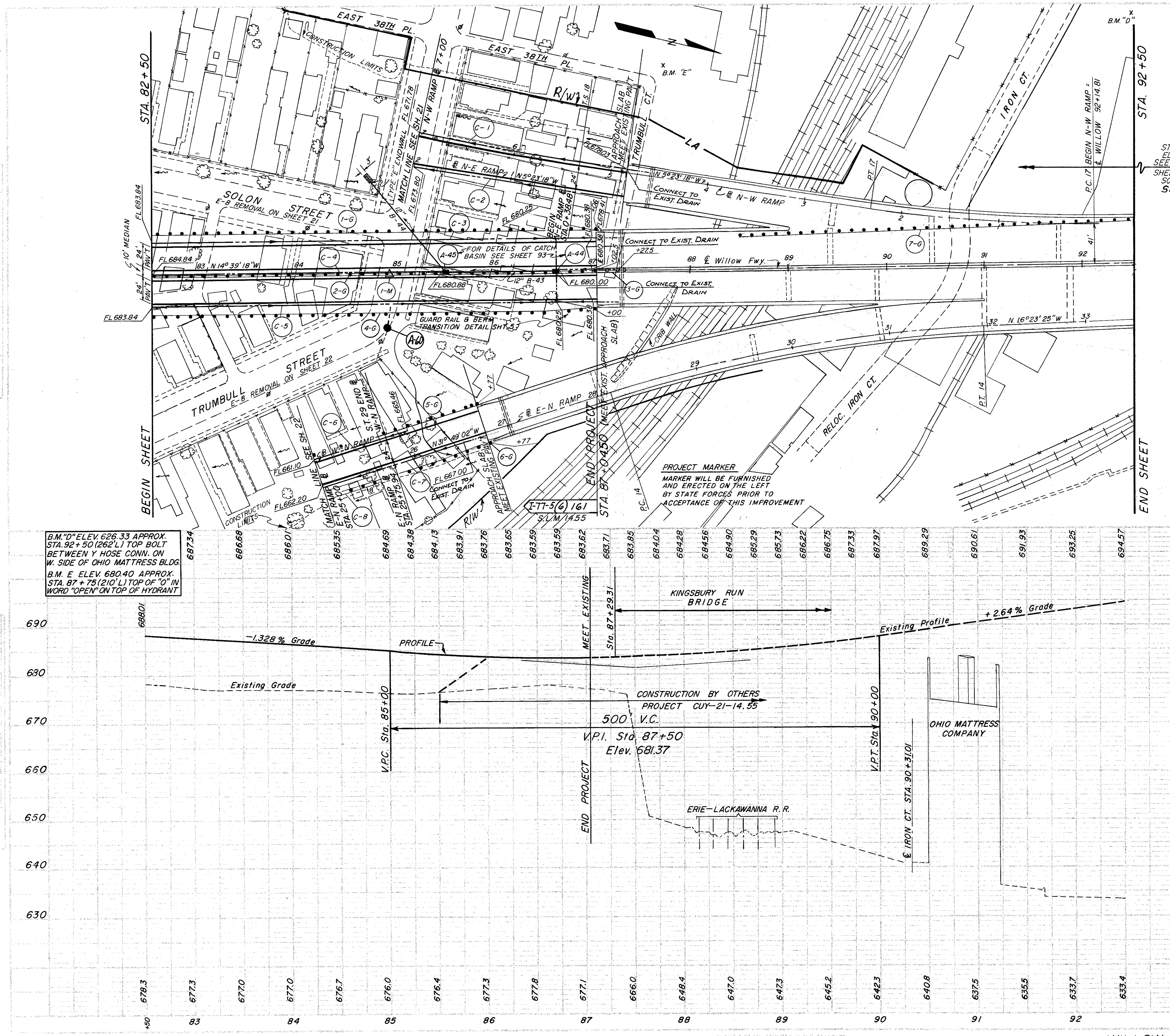
SHEET NO. 6242

58019

WILLOW PLAN & PROFILE STA. 72+00 TO STA. 82+50

FED. RD. DIVISION	STATE	PROJECT		18 / 198
2	OHIO			

CUYAHOGA COUNTY
CUY-21-14.12



NOTES

TYPICAL SECTION .... SEE SHEET .... 3 & 4
SEWER PROFILES 81
WATERWORK PLAN .... 95 TO 119
EXISTING UTILITIES .... 120 TO 124
PAVEMENT DETAILS .... 32 & 33
E-8 REMOVAL ITEMS 10
GRADING PLAN & CROSS SECTION KEY PLAN 38
ROADWAY & PAVEMENT QUANTITIES .... 9 & 10
LIGHTING PLAN .... 125 TO 138
FENCE LOCATION 192

GEOMETRIC LAYOUT .... 14 & 15

DRAINAGE QUANTITIES

MARK NO.	LOCATION	I-8 2-A-6 PAVED SHOULDER INLET MODIFIED AS PER PLAN (EA.)	I-1 12" PIPE CLASS J-1 (L.F.)	I-1 6" UNDERDRAIN CLASS I-3 (L.F.)	I-1 6" UNDERDRAIN CLASS J-1 SEC. M-6.6(b) OR SEC. M-6.8(b) (L.F.)	I-5 6" x 6" TEE (EA.)	I-2 MASONRY CLASS "C" (C.Y.)	I-10 DUMPED ROCK CHANNEL PROTECTION (C.Y.)	SP'L JUTE MATTING (S.Y.)	I-8 Manhole Reconstruct. To Grade, as per plan See Sh. No. 91 (Ea.)
A-44	STA. 86 + 62	1								
A-45	STA. 85 + 50	1								
B-43	WILLOW ℄		112							
B-44	WILLOW LT.		120				.3	5		
C-1	STA. 4+85 TO 7+00 NW RAMP			215						
C-2	STA. 0+00 TO 2+00 NE RAMP			215						
C-3	STA. 82+50 TO 87+00 WILLOW			450	32	1				
C-4	STA. 82+50 TO 87+00 ℄			430						
C-5	STA. 82+50 TO 87+00 WILLOW			450	32	1				
C-6	WN RAMP			100						
C-7	EN RAMP			150						
C-8	STA. 25+00 TO 25+50 EN RAMP								34	
A-60	Sta. 84+86± 60'± Rt.									1
	TOTAL	2	232	2010	64	2	.3	5	34	1

ROADWAY & PAVEMENT QUANTITIES

REFERENCE NO.	LOCATION	SIDE	I-8 MONUMENT ASSEMBLIES (EA.)	I-15 GUARD RAIL, STEEL BEAM STD. TYPE (DEEP) (L.F.)	I-15 GUARD RAIL, STEEL BEAM BARRIER TYPE (DEEP) (L.F.)	I-15 GUARD RAIL, STEEL BEAM BARRIER TYPE (DEEP) WITHOUT POSTS (L.F.)	I-15 TEMPORARY GUARD RAIL (L.F.)
1-M	WILLOW STA. 84+92.29	℄	1				
1-G	WILLOW STA. 82+50 TO STA. 87+06	LT.		456			
2-G	WILLOW STA. 82+50 TO STA. 87+02.5	℄			452.5		
3-G	WILLOW STA. 87+02.5 TO STA. 87+27.5	℄				25	
4-G	WILLOW STA. 82+50 TO STA. 87+00	RT.		450			
5-G	E-N RAMP STA. 25+00 TO STA. 26+77	LT.		177			
6-G	E-N RAMP STA. 25+00 TO STA. 26+77	RT.		177			
7-G	WILLOW STA. 88+50 TO STA. 92+50	LT.					400
	TOTALS		1	1260	452.5	25	400

WILLOW PLAN & PROFILE STA. 82+50 TO STA. 92+50

FED. RD. DIVISION	STATE	PROJECT	
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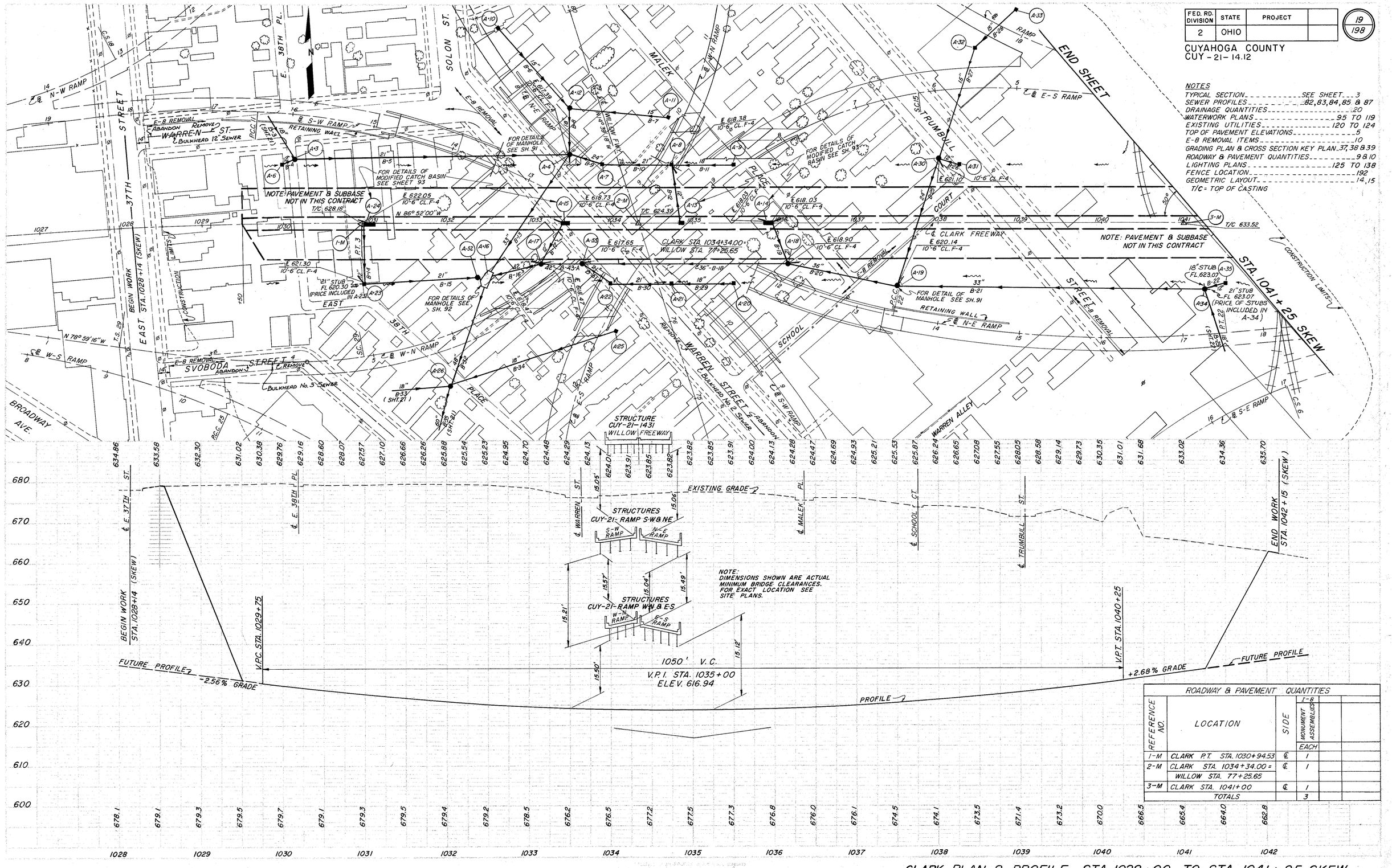
CUYAHOGA COUNTY
CUY-21-14.12

NOTES

T/C = TOP OF CASTING



ROADWAY & PAVEMENT QUANTITIES

REFERENCE NO.	LOCATION	SIDE	I-8 MONUMENT ASSEMBLIES EACH		
1-M	CLARK P.T. STA. 1030+94.53	℄	1		
2-M	CLARK STA. 1034+34.00 = WILLOW STA. 77+25.65	℄	1		
3-M	CLARK STA. 1041+00	℄	1		
	TOTALS		3		

CLARK PLAN & PROFILE STA. 1028+00 TO STA. 1041+25 SKEW

CONT. NO. 58019 SHEET ACCT. NO. 6247

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
CUY—21—14.12

SUMMARY OF DRAINAGE QUANTITIES

Sheet No.	Mark No.	Location	I-8: 2A-6 Paved Shoulder Inlet Modified as per Plan (Ea.)	I-8: 2A-10 Paved Shoulder Inlet Modified as per Plan (Ea.)	I-8: Std. #5 Catch Basin (Ea.)	I-8: Std. #1 Manhole (Ea.)	I-8: Std. #2 Manhole 1/6 Drop (Ea.)	I-8: Junction Manhole as per Plan (Ea.)	I-8: 2A-8 Paved Shoulder Inlet (Ea.)	I-8: 2A-10 Paved Shoulder Inlet (Ea.)	I-1: 6" Pipe Outlet Class F-4 (L.F.)	E-12: Removal of Exist. 12" Pipe (L.F.)	S-24: Removal of Existing Structures (#5 C.B.) (Lump)
19	A-3	Sta. 1030+15 Clark 80' Lt.				1							
	A-4	Sta. 1033+50 Clark 85' Lt.						1			10		
	A-6	Sta. 1030+00 Clark 73' Lt.			1								
	A-7	Sta. 1033+90 Clark 73' Lt.			1								
	A-8	Sta. 1034+75 Clark 73' Lt.			1						10		
	A-9	Sta. 1035+50 Clark 73' Lt.			1								
	A-10	Sta. 7+25 NE Ramp 17' Lt.			1								
	A-11	Sta. 10+10 WN Ramp 17' Lt.			1								
	A-12	Sta. 1033+50 Clark 145' Lt.					1						
	A-13	Sta. 1034+84 Clark ℄	1										
	A-14	Sta. 1036+00 Clark ℄		1							20		
	A-15	Sta. 1033+50 Clark ℄		1							10		
	A-16	Sta. 1032+50 Clark 65' Rt.						1					
	A-17	Sta. 1033+15 Clark 49' Rt.				1					20		
	A-18	Sta. 1036+15 Clark 49' Rt.				1					10		
	A-19	Sta. 1037+50 Clark 78' Rt.						1			10		
	A-20	Sta. 1035+50 Clark 73' Rt.			1								
	A-21	Sta. 1034+75 Clark 73' Rt.			1								
	A-22	Sta. 1034+00 Clark 73' Rt.			1								
	A-23	Sta. 1031+00 Clark 73' Rt.			1						10		
	A-24	Sta. 1031+00 Clark ℄		1							10		
	A-25	Sta. 11+17 ES Ramp 17' Lt.			1								
	A-26	Sta. 5+75 WN Ramp 60' Rt.					1						
	A-30	Sta. 1038+00 Clark 80' Lt.				1					10		
	A-31	Sta. 1038+25 Clark 73' Lt.			1								
	A-32	Sta. 5+50 ES Ramp 50' Rt.			1								
	A-33	Sta. 18+25 EN Ramp 25' Rt.			1								
	A-34	Sta. 1041+25 Clark 80' Rt.				1							
	A-35	Sta. 1041+50 Clark 73' Rt.			1								
	A-52	Sta. 1032+39.5 Clark 65' Rt.				1							
	A-55	Sta. 1033+65 49' Rt.				1					10		
		Total Sheet	1	3	15	7	2	3			130		
16	A-38	Sta. 3+25 SW Ramp 25' Lt.			1								
	A-39	Sta. 69+50 Willow ℄							1				
	A-40	Sta. 20+75 ES Ramp 10' Lt.				1							
	A-41	Sta. 21+00 ES Ramp 25' Lt.			1								
	A-42	Sta. 66+50 Willow ℄								1			
	A-43	Willow Lt.										44	Lump
		Total Sheet			2	1			1	1		44	Lump
		TOTAL	1	3	17	8	2	3	1	1	130	44	Lump

Sheet No.	Mark No.	Location	From	To	I-1: 12" Pipe Class J-1 (L.F.)	15" Pipe Class J-1 Sec. M-6.6(b) or M-6.8(b) (L.F.)	12" Pipe Class E-1 (L.F.)	15" Pipe Class B-1 Sec. M-6.6(c) (L.F.)	15" Pipe Class J-1 (L.F.)	42" Pipe Class D-1 (L.F.)	18" Pipe Class J-1 (L.F.)	18" Pipe Class J-1 Sec. M-6.6(b) or M-6.8(b) (L.F.)	18" Pipe Class C-1 Sec. M-6.4(c) (L.F.)	18" Pipe Class E-1 (L.F.)	21" Pipe Class B-1 Sec. M-6.6(b) or M-6.8(b) (L.F.)	21" Pipe Class J-1 (L.F.)	21" Pipe Class E-1 (L.F.)	24" Pipe Class J-1 (L.F.)	24" Pipe Class B-1 (L.F.)	33" Pipe Class D-1 (L.F.)	33" Pipe Class J-1 Sec. M-6.6(a) (L.F.)	36" Pipe Class J-1 (L.F.)	48" Pipe Class A-1 Sec. M-6.4(d) or M-6.6(d) (L.F.)	6" Underdrain Class J-1 Sec. M-6.6(b) or M-6.8(b) (L.F.)	6" Underdrain Class I-3 (L.F.)	6" Outlet Class F-4 (L.F.)	I-5 for I-3: 6"-45° Bend (Ea.)	I-5 for I-3: 6"x6" Tee (Ea.)
19	B-4	Clark Lt.	A-6	A-3			16																					
	B-5	Clark Lt.	A-3	A-4											335													
	B-6	NE Ramp Lt.	A-10	A-12				130																				
	B-7	WN Ramp Lt.	A-11	A-12				123																				
	B-8	Clark Lt.	A-12	A-4									54															
	B-9	Clark Lt.	A-7	A-4															40									
	B-10	Clark Lt.	A-8	A-7													85											
	B-11	Clark Lt.	A-9	A-8										75														
	B-12	Clark Lt.	A-13	A-8	72																							
	B-13	Clark	A-4	A-16																	180							
	B-14	Clark Rt.	A-24	A-23	70																							
	B-15	Clark Rt.	A-23	A-52													140											
	B-16	Clark Rt.	A-17	A-16						65																		
	B-17	Clark	A-15	A-17	54																							
	B-18	Clark Rt.	A-18	A-55																		252						
	B-19	Clark	A-14	A-18	50																							
	B-20	Clark Rt.	A-19	A-18																		135						
	B-21	Clark Rt.	A-34	A-19																375								
	B-22	Clark Rt.	A-35	A-34			25																					
	B-25	Clark	A-30	A-19														165										
	B-26	Clark Lt.	A-31	A-30			25																					
	B-27	ES Ramp	A-32	A-30		142																						
	B-28	EN Ramp	A-33	A-32					76																			
	B-29	Clark Rt.	A-20	A-21										75														
	B-30	Clark Rt.	A-21	A-22													75											
	B-31	Clark Rt.	A-22	A-55												42												
	B-32	WN Ramp	A-16	A-26																			140					
	B-34	ES Ramp	A-25	A-26							214																	
	B-43	Clark Rt.	A-55	A-17						50																		
		Total Sheet			246	142	66	253	76	115	214		54	150	335	42	300	165	40	375	180	387	140					
16	B-38	Willow	A-38	A-40								262																
	B-39	Willow	A-42	A-41	77																							
	B-40	Willow Lt.	A-41	A-40			35																					
	B-41	WS Ramp	A-40	31-S								82																
	B-42	Willow	A-39	A-38	108																							
	C-1	Sta. 19+00 to 23+75 WS Ramp																							475			
	C-2	Sta. 65+00 to 72+00 Willow Lt.																							730	10	1	
	C-3	Sta. 64+50 to 72+00 Willow Lt.																							724			
	C-4	Sta. 66+00 to 72+00 Willow Rt.																						30	600			1
	C-5	Sta. 1+00 to 3+25 SW Ramp																							330	10		1
	C-6	Sta. 5+33 to 10+00 SE Ramp																							464			
		Total Sheet			185		35					344												30	3323	20	1	2
		TOTAL			431	142	101	253	76	115	214	344	54	150	335	42	300	165	40	375	180	387	140	30	3323	20	1	2

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1932 EAST 107TH STREET CLEVELAND, OHIO

DRAINAGE QUANTITIES
FOR
SHEET 16 AND 19

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.R.		R.R.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY—21— 14.12

B.M. "F" ELEV. 678.02
APPROX. STA. 75+00(680'L)
S.E. CORNER OF BASE OF LIGHT POLE ARCHED OVER DRIVEWAY INTO TRUCK GAS STOP ON WEST SIDE OF BROADWAY AT EAST 37th STREET INTERSECTION.

REMOVE CROWN IN BROADWAY
E-8 REMOVAL & DISPOSAL OF EXISTING ASPHALT & BRICK WEARING COURSE.
B-35 ASPHALTIC CONCRETE LEVELING COURSE.
T-35 1 1/2" ASPHALTIC CONCRETE SURFACE COURSE.

BROADWAY AVE. — EAST 37 STREET — EAST 38 PL. — EAST 38 — SVOBODA STREET — WILLOW FREEWAY — WARREN ST. — SOLON ST. — DILLE AVE. — GIBBS ST. — TRUMBULL ST.

℄ CLARK FREEWAY — ℄ WILLOW FREEWAY

WILLOW STA. 77+25.65
CLARK STA. 1034+34.00

MATCH LINE SEE SH. 19
W-S STA. 19+00

MATCH LINE - SEE SHEET 22

No. 12 For Details See Sh. Nos. 138A thru 138J.

NOTES:

TYPICAL SECTION	SEE SHEET 4
SEWER PROFILES	82, 86 & 87
WATERWORK PLAN	95 TO 119
EXISTING UTILITIES	120 TO 124
PAVEMENT DETAILS	33 & 35
E-8 REMOVAL ITEMS	10
GRADING PLAN & CROSS SECTION KEY PLAN	37, 38 & 39
ROADWAY & PAVEMENT QUANTITIES	9 & 10
LIGHTING PLANS	125 TO 138
FENCE LOCATION	192
PROPOSED STRUCTURE DATA	139 TO 190
GEOMETRIC LAYOUT	14, 15
DRAINAGE QUANTITIES	23
RAMP PROFILES	24 TO 27

ROADWAY & PAVEMENT QUANTITIES

REFERENCE NO.	LOCATION	SIDE	I-15 GUARD RAIL, STEEL BEAM STD. TYPE (DEEP) L.F.	I-11 SANDSTONE CURB RESET L.F.	I-13 4 1/2" P.C.C. SIDEWALK (5' WIDE) S.F.	E-8 REMOVAL & DISPOSAL OF EXIST WEARING COURSE S.Y.	T-35 ASPHALTIC CONCRETE SURFACE COURSE, TYPE C C.Y.	B-35 ASPHALTIC CONCRETE LEVEL COURSE C.Y.	I-15 WOOD GUARD RAIL POSTS WITHOUT RAIL EACH
1-G	N-E RAMP STA. 4+95 TO STA. 7+87	RT.	300.0						
2-G	N-E RAMP STA. 4+82 TO STA. 7+84	LT.	300.0						
3-G	WILLOW STA. 83+00	280' LT.	25.0						
4-G	WILLOW STA. 85+35	210' LT.	25.0						
1-S	BROADWAY STA. 11+50 TO STA. 15+15	RT.		365					
2-S	BROADWAY STA. 11+50 TO STA. 15+15	RT.			1825.				
3-S	WILLOW STA. 85+35	210' LT.		25					
1-R	BROADWAY STA. 14+72 TO STA. 15+15	RT.				14			
2-R	BROADWAY STA. 14+72 TO STA. 15+15	RT.						3	
3-R	BROADWAY STA. 14+72 TO STA. 15+15	RT.					1		
5-G	SVOBODA ST.								5
6-G	WARREN ST.								5
	TOTALS		650.0	390	1825	14	1	3	10

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PLAN

RAMPS WEST OF WILLOW FREEWAY

SCALE 1" = 50' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
G.O.H. E.D.R.	D.K.		E.D.R.			

CONT. No. 58019 SHEET ACCT. No. 6250

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY—21— 14.12

REFERENCE NO.	LOCATION	SIDE	I—15 GUARD RAIL STEEL BEAM STD. TYPE (DEEP) L. F.	J-11 SANDSTONE CURB RESET L. F.	S-24 Removal of Exist. Structures Lump	
1-G	WARREN ST. NEAR MARTIN AVE.	RT.&LT.	37.5			
2-G	S-W RAMP STA. 6+22 TO STA. 9+25	LT.	300.0			
3-G	S-W RAMP STA. 6+30 TO STA. 9+21	RT.	300.0			
4-G	N-E RAMP STA 13+45 TO 17+54.39	LT.	409.0			
5-G	E-S RAMP STA. 4+74 TO STA. 7+78	LT.	300.0			
6-G	E-S RAMP STA. 5+50 TO STA. 8+32	RT.	300.0			
7-G	W-N RAMP STA. 14+97 TO 16+19	LT.	123.0			
8-G	E-N RAMP STA. 23+77 TO 25+00	RT.	123.0			
1-B	WARREN ST.	RT.&LT.		45		
1-R	S-E Ramp Sta. 18+25	Rt.			Lump	
2-R	S-E Ramp Sta 16+10	Rt.&Lt.			Lump	
3-R	Clark Sta. 1041+25	Lt.			Lump	
	TOTALS		1892.5	45		

B.M. "G" ELEV. 676.665
APPROX. CLARK STA. 1042 + 75 (540' R)
TOP OF LETTERS PA. ON HEAD OF FIRE HYDRANT ON SOUTH SIDE OF MARTIN AVE. WEST OF TRACK ROAD.

B.M. "H" ELEV. 658.825
APPROX. CLARK STA. 1039 + 65 (380' L)
TOP OF STUD ON N.W. CORNER OF CONCRETE BASE OF RAILROAD VERTICAL SIGNAL.

NOTES:

TYPICAL SECTION __________ SEE SHEET ______ 4
SEWER PROFILES ______________________ 85
WATERWORK PLAN ___________________ 95 TO 119
EXISTING UTILITIES _________________ 120 TO 124
PAVEMENT DETAILS _________________ 29,30,31 & 32
E-8 REMOVAL ITEMS ___________________ 10
GRADING PLAN & CROSS SECTION KEY PLAN ___ 37,38 & 39
ROADWAY & PAVEMENT QUANTITIES ___________ 9 & 10
LIGHTING PLANS ____________________ 125 TO 138
FENCE LOCATION _______________________ 192
PROPOSED STRUCTURE DATA ____________ 139 TO 190
GEOMETRIC LAYOUT ____________________ 14, 15
DRAINAGE QUANTITIES __________________ 23
RAMP PROFILE ______________________ 24 TO 27

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PLAN

RAMPS EAST OF WILLOW FREEWAY

SCALE 1" = 50' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
G.O'H. C.D.R.	D.K.		RLH CDR			

CONT. No. 58019 SHEET ACCT. No. 6251

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY— 21—14.12

SUMMARY OF DRAINAGE QUANTITIES

SHEET No. 21

MARK No.	LOCATION	I-8 Std. #5 Catch Basin	I-8 Std. #2 Manhole "A" Drop	I-8 Std. #1 Manhole	I-1 12" Pipe Class J-1	I-1 12" Pipe Class E-1	I-1 18" Pipe Class J-1 Sec. M-6.6(a)	I-1 18" Pipe Class E-1	I-1 6" Underdrain Class J-1 Sec. M-6.6(b) or M-6.8(b)	I-1 6" Underdrain Class 1-3	I-1 6" Outlet Class F-4	I-5 6"-45° Bend	I-5 6"×6" Tee	I-5 6" Wye	Special Jute Matting	Special 60" Pipe Tunnel Sec.	L-10 Sodding for Special Berm and Slope Protection
		Ea.	Ea.	Ea.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	Ea.	Ea.	Ea.	S.Y.	L.F.	S.Y.
A-1	Sta. 12+00 NW Ramp	1															
A-2	Sta. 12+00 NW Ramp 75' Lt.		1														
A-5	Sta. 17+25 SW Ramp 40' Rt.	1															
A-27	Sta. 4+15 WN Ramp 45' Rt.	1															
A-28	Sta. 13+00 WS Ramp 25' Rt.	1															
A-29	Sta. 13+50 WS Ramp 35' Rt.		1														
A-55	NW Ramp Sta. 7+00 45' Rt.			1													
B-1	From A-1 to A-2				106												
B-2	From A-5 to A-2					45											
B-3	From A-2 to A-3						150										
B-33	From A-27 to A-26							164									
B-35	From A-26 to A-29															230	
B-36	From A-28 to A-29					50											
B-37	From A-29 to 31-S															706	
C-1	NW Ramp Sta. 7+00 to 8+05								80	105		1		1			
C-2	NE Ramp Sta. 2+00 to 7+75									575	10		1				
C-3	WS Ramp Sta. 19+00 to 16+75								85	225		1		1			
C-4	ES Ramp Sta. 18+50 to 11+40									720	10						
M-5	WN Ramp Sta. 6+35															42	
J-10	WS Ramp Sta. 16+50 to 11+36														428		
J-11	WN Ramp Sta. 4+23 to 5+62														116		
J-12	ES Ramp Sta. 17+00 to 12+80														350		
J-13	Clark Sta. 1029+75 to 1030+94														99		
J-14	Clark Sta. 1032+47 to 1034+57														175		
J-15	Clark Sta. 1032+48 to 1034+12														137		
J-16	SW Ramp Sta. 15+80 to 17+30														125		
J-17	NW Ramp Sta. 10+80 to 12+48														140		
J-18	NW Ramp Sta. 7+80 to 11+98														348		
J-19	NE Ramp Sta. 3+00 to 7+22														352		
	Total Sheet	4	2	1	106	95	150	164	165	1625	20	2	1	2	2270	936	42

SHEET No. 22

MARK No.	LOCATION	I-1 18" Pipe Class J-1 Sec. M-6.6(c)	I-1 18" Pipe Class J-1 Sec. M-6.6(b) or M-6.8(b)	I-1 6" Underdrain Class J-1 Sec. M-6.6(b) or M-6.8(b)	I-1 6" Underdrain Class 1-3	I-1 6" Outlet Class F-4	I-5 6"-45° Bend	I-5 6"×6" Tee	I-5 6" Wye	Spl. Jute Matting	I-8 Std. #5 Catch Basin	L-10 Sodding for Special Berm and Slope Protection
		L.F.	L.F.	L.F.	L.F.	L.F.	Ea.	Ea.	Ea.	S.Y.	Ea.	
A-36	SE Ramp Sta. 16+50 45' Lt.										1	
A-37	SE Ramp Sta. 17+00 30' Rt.										1	
B-23	From A-36 to A-34	110										
B-24	From A-37 to A-36		90									
C-5	WN Ramp Sta. 16+20 to 10+20				610	10	1					
C-6	EN Ramp Sta. 17+90 to 25+00				720	10		1				
C-7	ES Ramp Sta. 7+80 to 5+00			40	280	10		1				
C-8	SW Ramp Sta. 9+35 to 3+25				610							
C-9	NE Ramp Sta. 14+60 to 17+50			40	430	10			1			
C-10	SE Ramp Sta. 10+00 to 16+70				680	10						
J-1	WN Ramp Sta. 9+90 to 16+20									525		
J-2	EN Ramp Sta. 25+00 to 18+25									563		
J-3	ES Ramp Sta. 5+50 to 7+00									125		
J-4	Clark Sta. 1037+05 to 1034+15									242		
J-5	Clark Sta. 1040+00 to 1034+60									450		
J-6	SE Ramp Sta. 13+80 to 16+45									221		
J-7	SE Ramp Sta. 12+50 to 17+00									375		
J-8	SW Ramp Sta. 4+75 to 3+25									125		
J-9	Clark Sta. 1038+25 to 1039+75									125		
M-6	SW Ramp Sta. 9+22											6
M-7	ES Ramp Sta. 7+68											33
M-8	NE Ramp Sta. 14+90											50
	Total Sheet	110	90	80	3330	50	1	2	1	2751	2	89

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

DRAINAGE QUANTITIES
FOR
SHEET 21 AND 22

SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
		C.R.		RR			

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

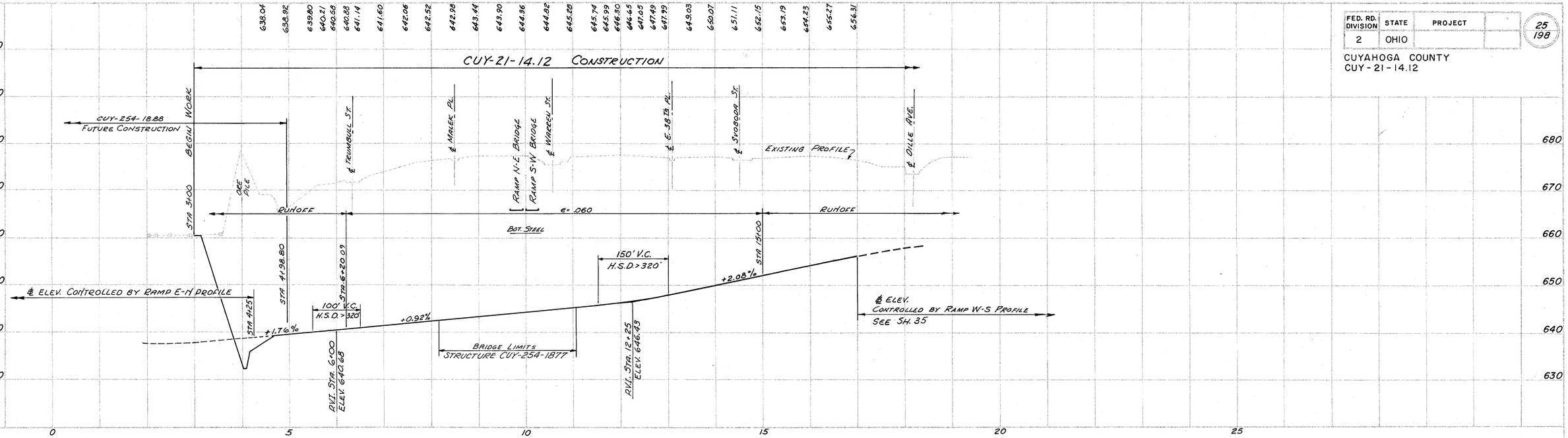
CUYAHOGA COUNTY
CUY - 21 - 14.12

SHEET ACCT. No. 6260
58019
CONT. No. 60029

RAMP PROFILES S-E, S-W

FED. RD. DIVISION	STATE	PROJECT		25 198
2	OHIO			

CUYAHOGA COUNTY
CUY-21-14.12



E-S RAMP

E-N RAMP

RAMP PROFILES E-S, E-N

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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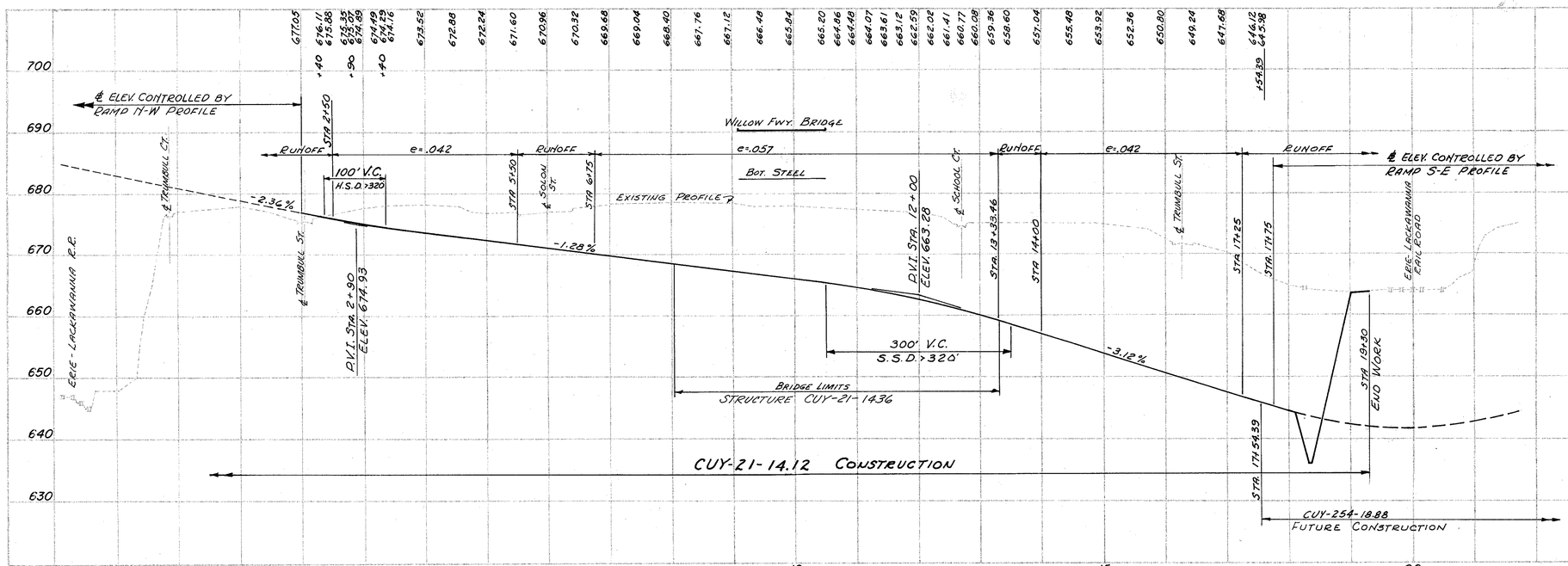
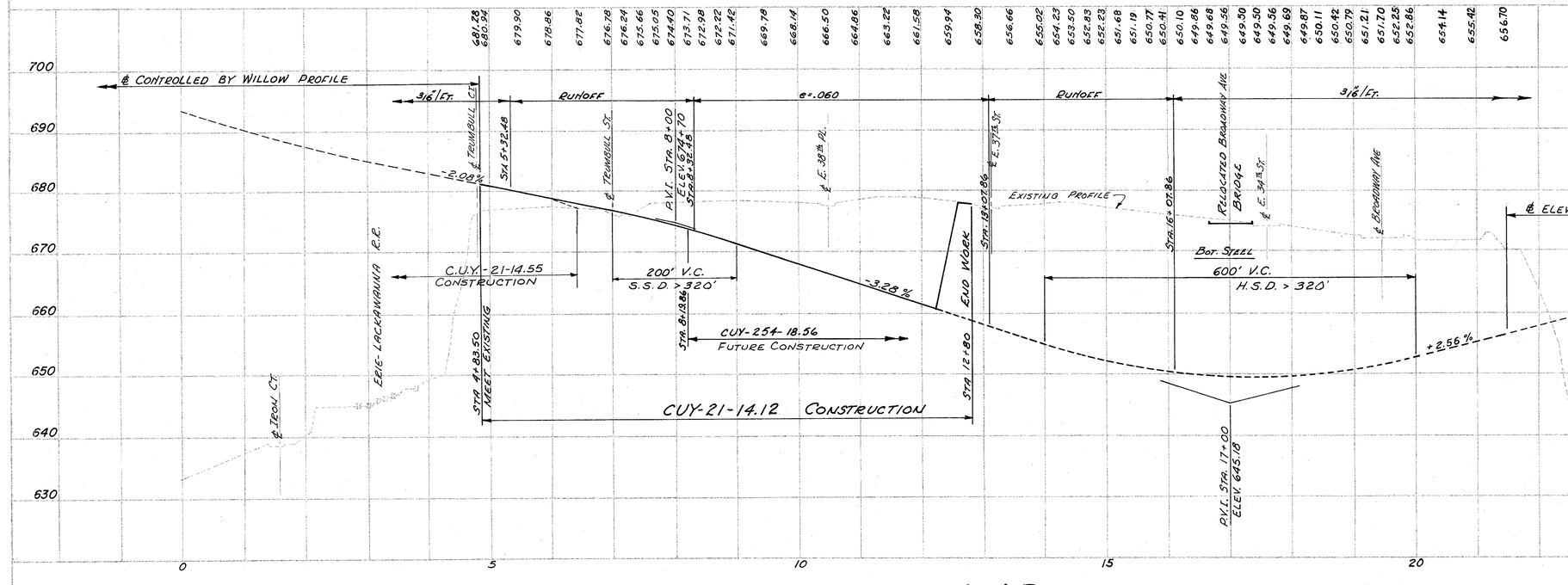
CUYAHOGA COUNTY
CUY - 21 - 14.12



N-E RAMP



N-W RAMP

RAMP PROFILES N-E, N-W

SHEET ACCT No. 6202
5819

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY - 21 - 14.12

646.24 644.90 643.56 642.92 642.32 641.78 641.30 640.86 640.48 640.15 639.87 639.64 639.46 639.34 639.27 639.25 639.28 639.37 639.51 639.70 639.94 640.23 640.58 640.97 641.42 641.93 642.48 643.64 644.80 645.96 647.12 648.28 649.44 650.60 651.76 652.92 654.08 654.66 655.22 655.74 656.21 656.64 657.04 657.39 657.69 657.96 658.18 658.36 658.50 658.60 658.66 658.67 658.64 658.57 658.46 658.31 658.11 657.88 657.60 657.27 656.91

CUY-21-14.12 CONSTRUCTION

℄ BROADWAY AVE. — RELOCATED BROADWAY AVE. BRIDGE — ℄ E. 37TH ST. — BEGIN WORK — GERAGA ST. — ℄ DILLE AVE. — ℄ MARTIN AVE. — ℄ BROADWAY AVE.

EXISTING PROFILE

e=.037 | RUNOFF | e=.050 | RUNOFF | e=.058 | RUNOFF | e=.042 | RUNOFF | 3/16"/FT. | RUNOFF | e=.042

656.51 656.06 655.97 655.08 654.04 653.61

Bot. Steel

STA 7+50 | STA 8+25 | STA 10+00 | STA 10+75 | STA 13+00 | STA 14+00 | STA 15+25 | STA 16+50 | STA 19+25 P.V.I. STA. 19+50 ELEV 662.20 | STA 21+00 | EXISTING STA 23+71.02

℄ ELEV. CONTROLLED BY CLARK PROFILE

STA 4+48.14

-2.62%

600' V.C.
H.S.D. > 320'

+2.32%

650' V.C.
S.S.D. > 320'

-2.04 %

℄ ELEV. CONTROLLED BY WILLOW PROFILE
CUY-21-(13.77)-(14.94) CONSTRUCTION
MEET

CUY-254-18.56
FUTURE CONSTRUCTION

STA 16+38.21

P.V.I. STA 8+00
ELEV. 635.52

700 690 680 670 660 650 640 630

0 5 10 15 20

W-S RAMP

+.75 640.67 640.88 641.24 641.60 641.96 642.32 642.68 643.04 643.40 643.76 644.12 644.48 644.84 645.20 645.56 645.92 646.13 646.40 646.74 647.13 647.59 648.11 648.68 649.33 650.03 650.79 651.62 652.50 653.45 654.46 655.50

CUY-21-14.12 CONSTRUCTION

℄ E. 37TH ST. BEGIN WORK STA 2+50 — ℄ SVEGOON ST. — ℄ WARREN ST. — ℄ MACEK PL. — ℄ TRUMBULL ST.

EXISTING PROFILE

RUNOFF | e=.060 | RAMP S-W BRIDGE | RAMP N-E BRIDGE | ℄ ELEV. CONTROLLED BY E-N RAMP PROFILE SEE SH. 32 | RUNOFF

Bot. Steel

STA 4+87.21

STA 13+75 | STA 18+94.75

350' V.C.
H.S.D. > 320'

+4.16%

℄ ELEV. CONTROLLED BY RAMP W-S PROFILE
SEE SH. 36

STA 2+75

+0.72%

STA 6+43.97 APPROACH SLAB

BRIDGE LIMITS
STRUCTURE CUY-21-1877

CUY-254-18.56
FUTURE CONSTRUCTION

P.V.I. STA 11+75
ELEV 647.18

700 690 680 670 660 650 640 630

0 5 10 15 20

W-N RAMP

CONT. No. 35013 60029 SHEET ACCT. No. 6263

RAMP PROFILES W-S, W-N

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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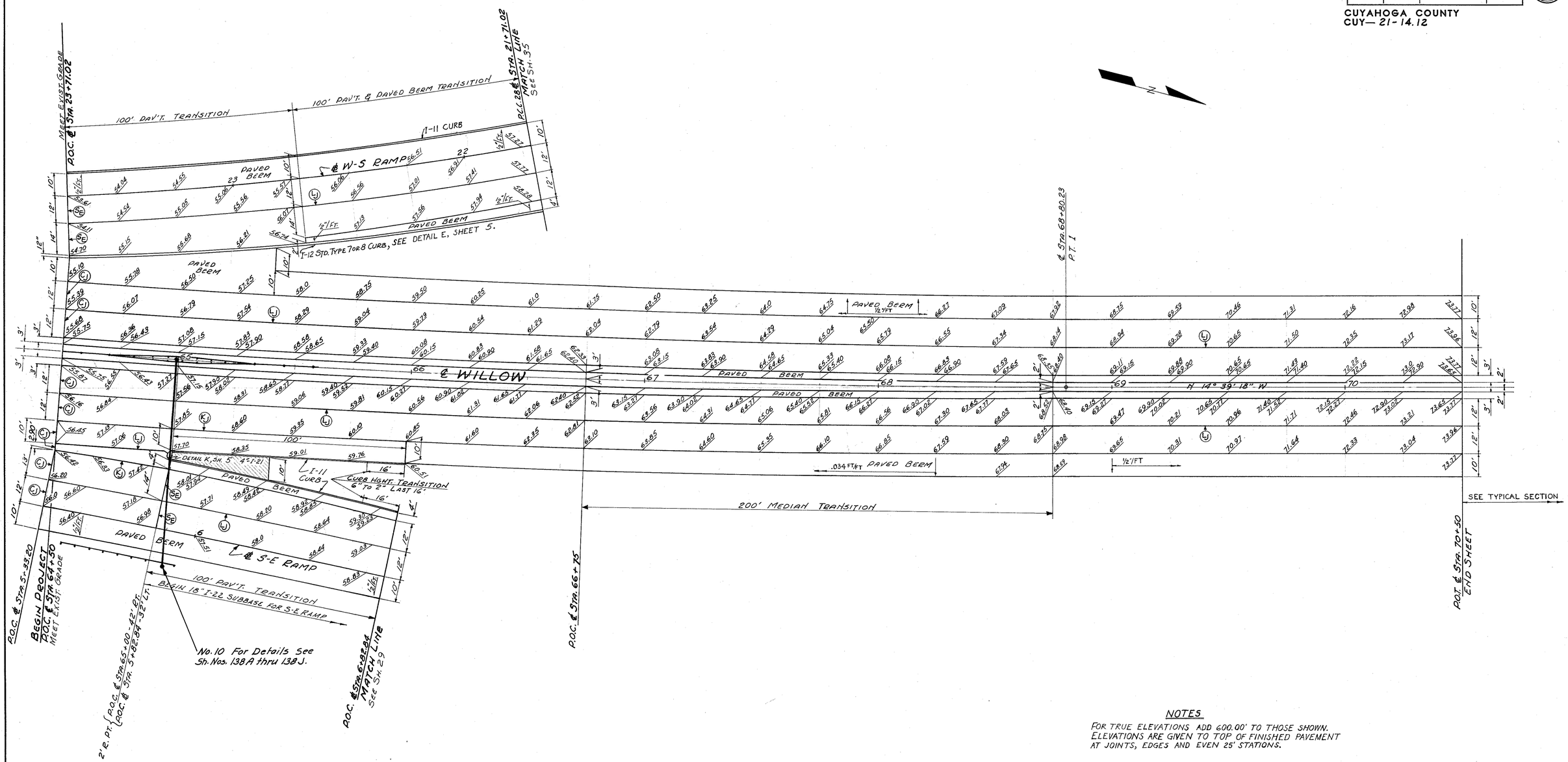
CUYAHOGA COUNTY
CUY— 21-14.12



NOTES

FOR TRUE ELEVATIONS ADD 600.00' TO THOSE SHOWN. ELEVATIONS ARE GIVEN TO TOP OF FINISHED PAVEMENT AT JOINTS, EDGES AND EVEN 25' STATIONS.

QUANTITIES

	T-71 9" Reinforced Portland Cement Concrete Pavement	I-22 Subbase	T-31 Bituminous Surface Treatment: Bituminous Material 0.25 Gal./S.Y.	T-31 Bituminous Surface Treatment: No 6 Aggregate 0.008 C.Y./S.Y.	B-21 Waterproofed Aggregate Base Course	B-19 Aggregate Base Course	I-21 Portland Cement Concrete Median Pavement Standard Type 2	I-21 Portland Cement Concrete Traffic Island Pavement 4" Depth	I-11 Sandstone Curb 6" x 18"	I-12 Concrete Curb Standard Type 8	I-12 Concrete Curb Standard Type 7	T-30 Bituminous Prime Coat 0.4 Gal./S.Y.			
	Sq. Yo.	Cu.Yo.	Gal.	Cu.Yo.	Cu.Yo.	Cu.Yo.	Sq. Yo.	Sq.Yo.	L.F.	L.F.	L.F.	Gal.			
Total This Sh.	4399	1218	521	17	215	232	339	33	405	100	104	834			

JOINT SYMBOLS

(LJ) STANDARD LONGITUDINAL JOINT.
(KJ) STANDARD KEY JOINT, WITHOUT TIE BARS.
(SE) STANDARD EXPANSION JOINT.
(CJ) STANDARD CONSTRUCTION JOINT.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PAVEMENT DETAILS

WILLOW ℄ STA. 64+50 TO STA. 70+50
S-E RAMP ℄ STA. 5+33.20 TO STA. 6+82.84
W-S RAMP ℄ STA. 21+71.02 TO STA. 23+71.02

SCALE 1" = 20'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.D.R.	G.O'C.		F.T. C.D.R.			

CONT. No. 58019 SHEET ACCT. No. 6288

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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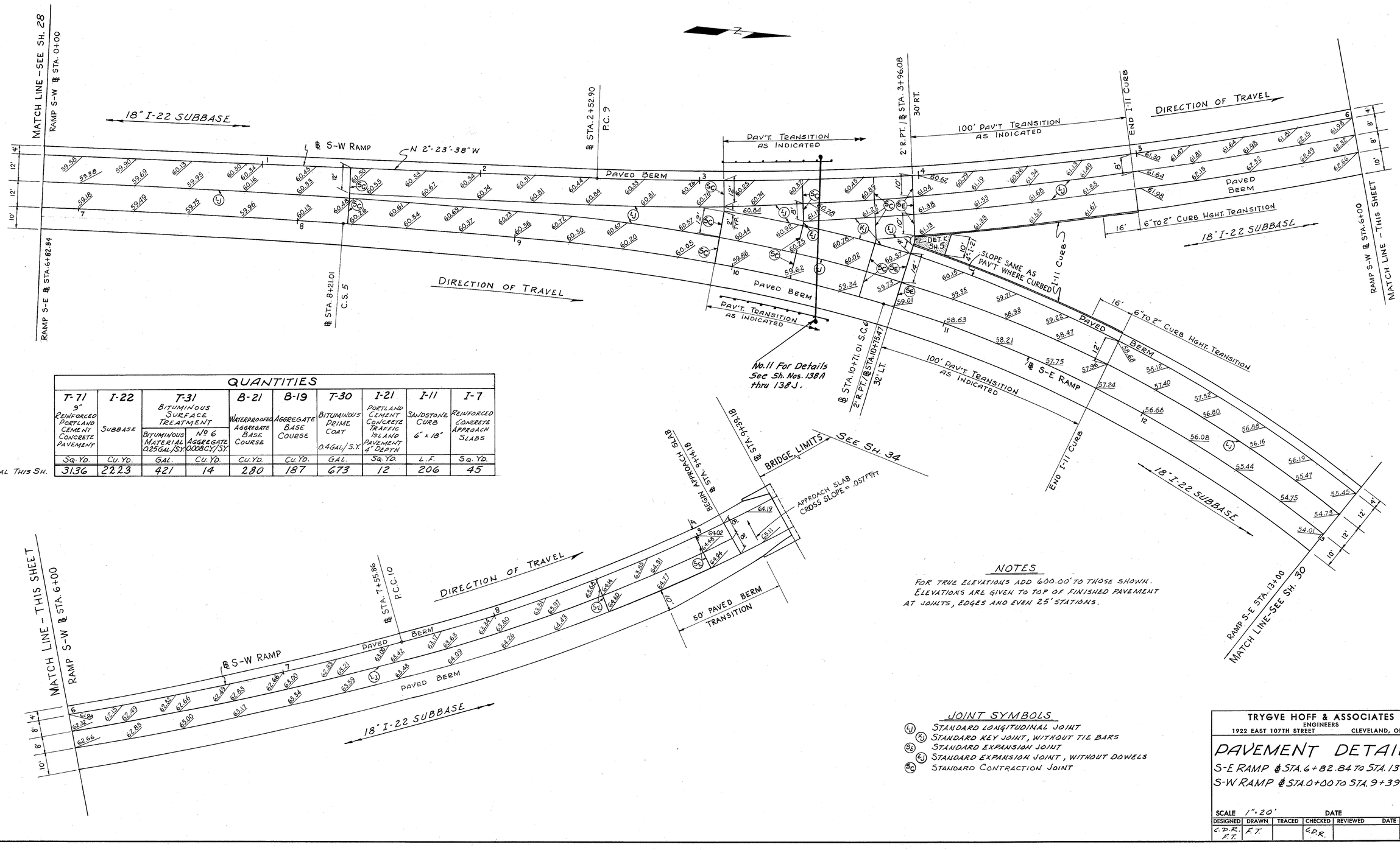
CUYAHOGA COUNTY
CUY– 21 - 14.12



QUANTITIES

T-71 9" Reinforced Portland Cement Concrete Pavement	I-22 Subbase	T-31 Bituminous Surface Treatment: Bituminous Material .025 Gal./S.Y.	T-31 Bituminous Surface Treatment: No 6 Aggregate .0008 Cy./S.Y.	B-21 Waterproofed Aggregate Base Course	B-19 Aggregate Base Course	T-30 Bituminous Prime Coat .04 Gal./S.Y.	I-21 Portland Cement Concrete Traffic Island Pavement 4" Depth	I-11 Sandstone Curb 6" x 18"	I-7 Reinforced Concrete Approach Slabs
Sq. Yd.	Cu. Yd.	Gal.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Gal.	Sq. Yd.	L. F.	Sq. Yd.
3136	2223	421	14	280	187	673	12	206	45

TOTAL THIS SH.

NOTES

FOR TRUE ELEVATIONS ADD 600.00' TO THOSE SHOWN. ELEVATIONS ARE GIVEN TO TOP OF FINISHED PAVEMENT AT JOINTS, EDGES AND EVEN 25' STATIONS.

JOINT SYMBOLS

- (LJ) STANDARD LONGITUDINAL JOINT
- (KJ) STANDARD KEY JOINT, WITHOUT TIE BARS
- (SE) STANDARD EXPANSION JOINT
- (EJ) STANDARD EXPANSION JOINT, WITHOUT DOWELS
- (SC) STANDARD CONTRACTION JOINT

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PAVEMENT DETAILS

S-E RAMP ℄ STA. 6+82.84 TO STA. 13+00
S-W RAMP ℄ STA. 0+00 TO STA. 9+39.18

SCALE 1" = 20' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.D.R. F.T.	F.T.		G.D.R.			

CONT. No. 58019 SHEET ACCT. No. 6290

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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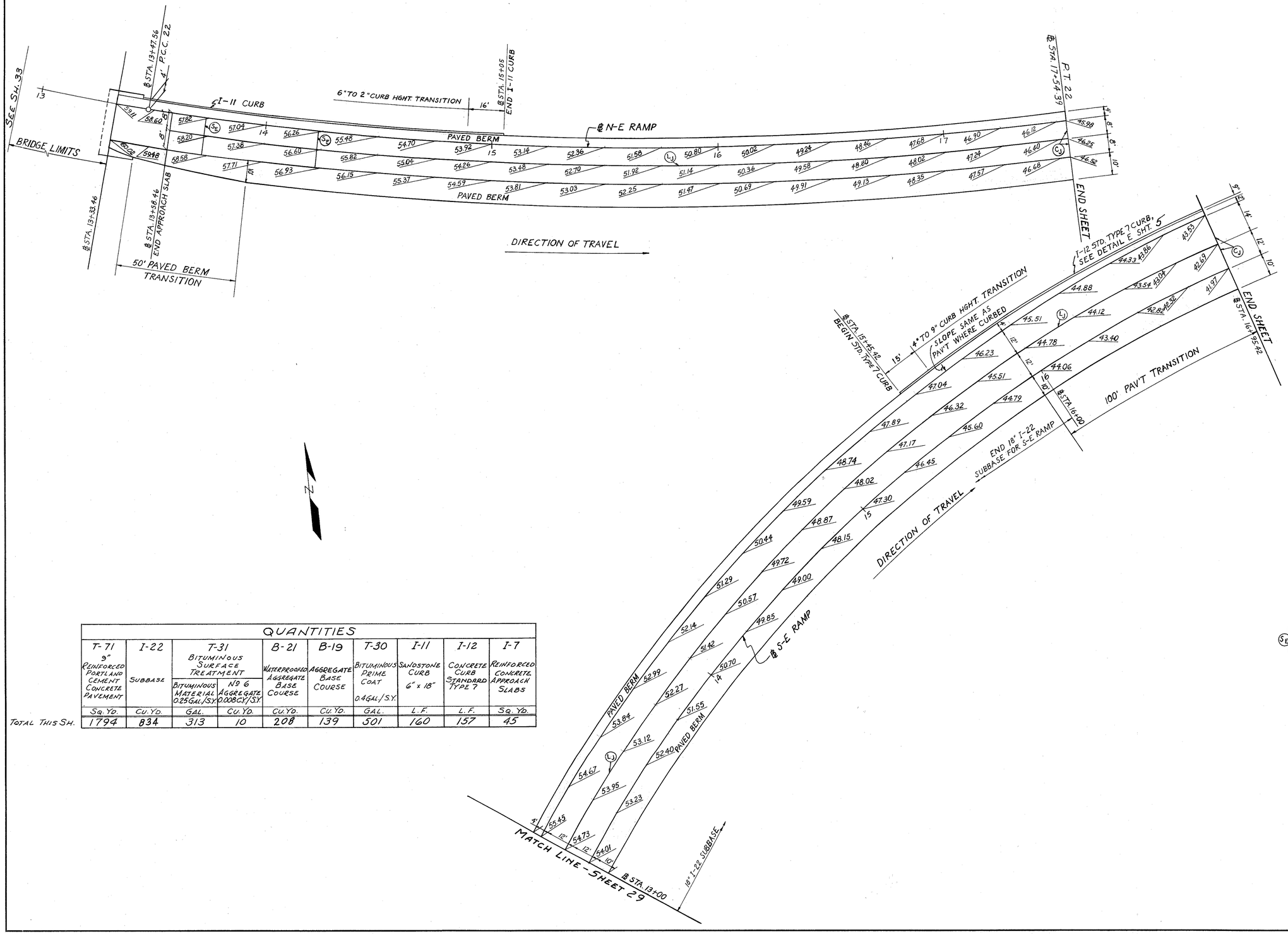
CUYAHOGA COUNTY
CUY— 21-14.12



QUANTITIES									
T-71 9" Reinforced Portland Cement Concrete Pavement	I-22 Subbase	T-31 Bituminous Surface Treatment		B-21 Waterproofed Aggregate Base Course	B-19 Aggregate Base Course	T-30 Bituminous Prime Coat	I-11 Sandstone Curb 6" x 18"	I-12 Concrete Curb Standard Type 7	I-7 Reinforced Concrete Approach Slabs
		Bituminous Material 0.25 Gal./S.Y.	No 6 Aggregate 0.008 C.Y./S.Y.			0.4 Gal./S.Y.			
Sq. Yo.	Cu. Yo.	Gal.	Cu. Yo.	Cu. Yo.	Cu. Yo.	Gal.	L.F.	L.F.	Sq. Yo.
TOTAL THIS SH. 1794	834	313	10	208	139	501	160	157	45

NOTES
FOR TRUE ELEVATIONS ADD 600.00 TO THOSE SHOWN.
ALL ELEVATIONS SHOWN ARE TO THE TOP OF FINISHED PAVEMENT AND ARE GIVEN AT PAVEMENT JOINTS, EDGES AND 25' STATIONS.
CONSTRUCTION JOINT BARS TO BE PLACED WITH EXPOSED ENDS PROTECTED.

LEGEND
(LJ) STANDARD LONGITUDINAL JOINT
(SE) STANDARD EXPANSION JOINT
(CJ) STANDARD CONSTRUCTION JOINT.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PAVEMENT DETAILS

S-E RAMP ℄ STA. 13+00 TO STA. 16+95.42
N-E RAMP ℄ STA. 13+33.46 TO STA. 17+54.39

SCALE 1" = 20' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.D.R. F.T.	F.T. J.S.P.		C.D.R.			

CONT. No. 58019 SHEET ACCT. No. 629

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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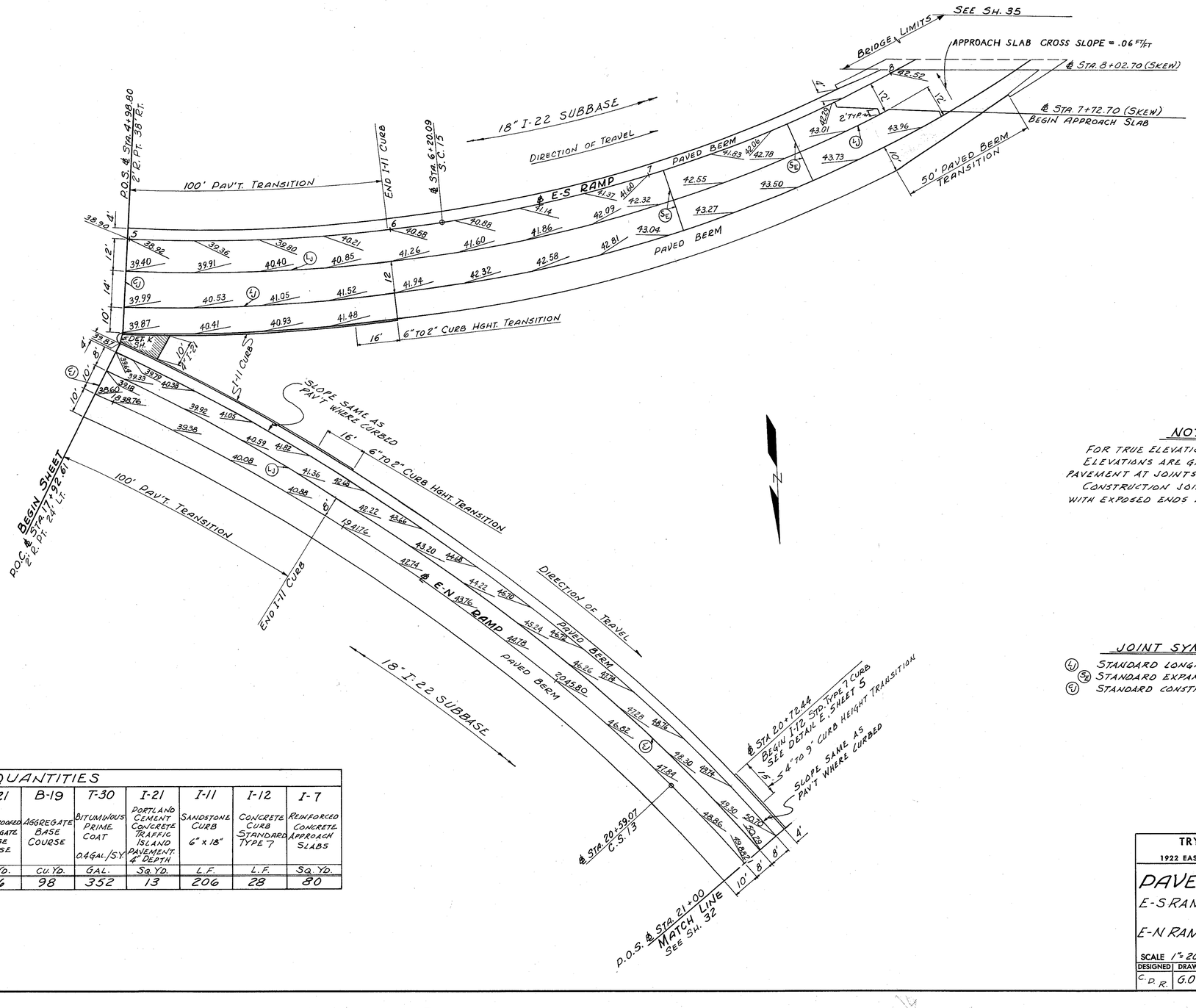
CUYAHOGA COUNTY
CUY— 21-14.12



NOTES

FOR TRUE ELEVATIONS ADD 600.00' TO THOSE SHOWN. ELEVATIONS ARE GIVEN TO TOP OF FINISHED PAVEMENT AT JOINTS, EDGES AND EVEN 25' STATIONS. CONSTRUCTION JOINT BARS ARE TO BE PLACED WITH EXPOSED ENDS PROTECTED.

JOINT SYMBOLS

- (LJ) STANDARD LONGITUDINAL JOINT
- (SE) STANDARD EXPANSION JOINT
- (CJ) STANDARD CONSTRUCTION JOINT

QUANTITIES

	T-71 9" Reinforced Portland Cement Concrete Pavement	I-22 Subbase	T-31 Bituminous Surface Treatment		B-21 Waterproofed Aggregate Base Course	B-19 Aggregate Base Course	T-30 Bituminous Prime Coat 0.4 Gal./S.Y.	I-21 Portland Cement Concrete Traffic Island Pavement, 4" Depth	I-11 Sandstone Curb 6" x 18"	I-12 Concrete Curb Standard Type 7	I-7 Reinforced Concrete Approach Slabs
			Bituminous Material 0.25 Gal./S.Y.	No 6 Aggregate 0.008 C.Y./S.Y.							
	Sq. Yd.	Cu. Yd.	Gal.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Gal.	Sq. Yd.	L.F.	L.F.	Sq. Yd.
Total This Sh.	1497	1145	220	7	146	98	352	13	206	28	80

CONT. No. 58019 SHEET ACCT. No. 6294

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PAVEMENT DETAILS

E-S RAMP ℄ STA. 4+98.80 TO STA. 8+02.75 (SKEW)

E-N RAMP ℄ STA. 17+92.61 TO STA. 21+00

SCALE 1" = 20'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.D.R.	G.O'C.		F.T. C.D.R.			

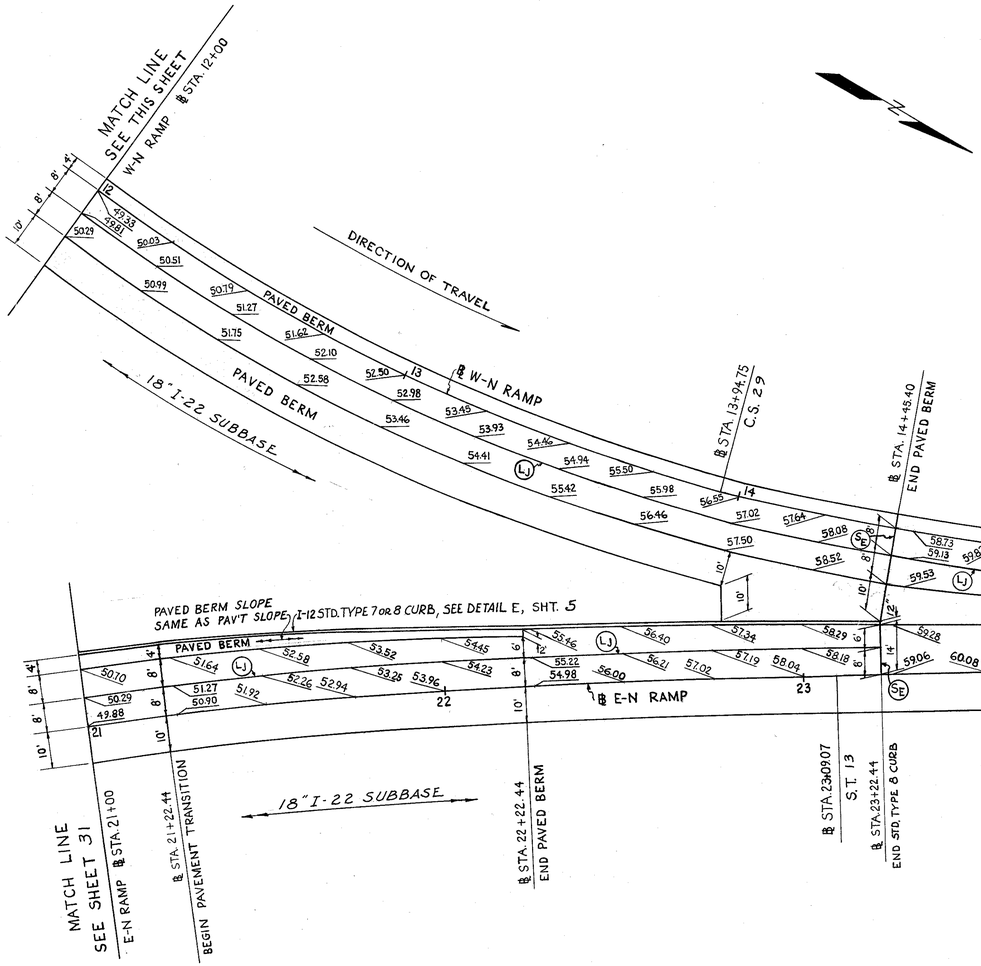
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

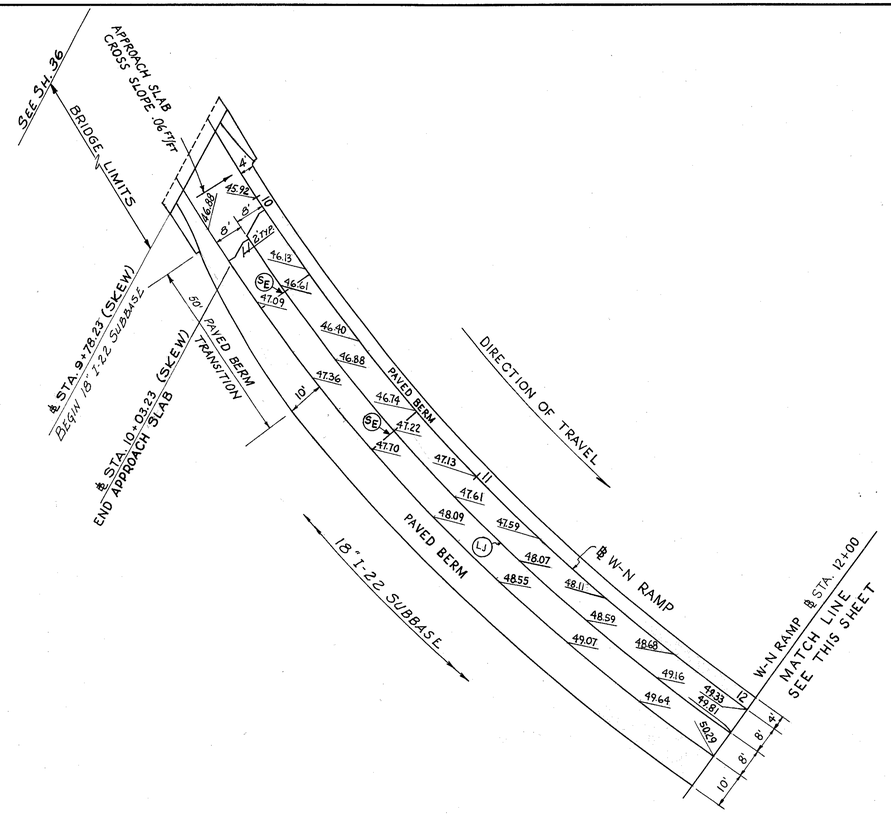
32/198

CUYAHOGA COUNTY
CUY– 21-14.12

QUANTITIES

	T-71 9" Reinforced Portland Cement Concrete Pavement	I-22 Subbase	T-31 Bituminous Surface Treatment		B-21 Waterproofed Aggregate Base Course	B-19 Aggregate Base Course	I-12		T-30	I-7
			Bituminous Material 0.25 Gal./S.Y.	No 6 Aggregate 0.008 C.Y./S.Y.			Concrete Curb Standard Type 8	Concrete Curb Standard Type 7	Bituminous Prime Coat 0.4 Gal./S.Y.	Reinforced Concrete Approach Slabs
	Sq. Yd.	Cu. Yd.	Gal.	Cu. Yd.	Cu. Yd.	Cu. Yd.	L. F.	L. F.	Gal.	Sq. Yd.
TOTAL THIS SH.	2252	1736	393	13	262	175	55	170	629	45





NOTES:

1. FOR TRUE ELEVATIONS ADD 600.00 TO THOSE SHOWN.
2. ALL ELEVATIONS SHOWN ARE TO THE TOP OF FINISHED PAVEMENT AND ARE GIVEN AT PAVEMENT JOINTS, EDGES AND EVEN 25' STATIONS.

LEGEND:

- (LJ) STANDARD LONGITUDINAL JOINT
- (KJ) STANDARD LONGITUDINAL KEY JOINT, WITHOUT TIE BARS
- (SE) STANDARD EXPANSION JOINT
- (EJ) STANDARD EXPANSION JOINT, WITHOUT DOWELS
- (SC) STANDARD CONTRACTION JOINT

CONT. No. 58019 SHEET ACCT. No. 6295

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PAVEMENT DETAILS

E-N RAMP ℄ STA. 21+00 TO STA. 26+74.50
W-N RAMP ℄ STA. 9+78.23 (SKEW) TO STA. 16+94.75

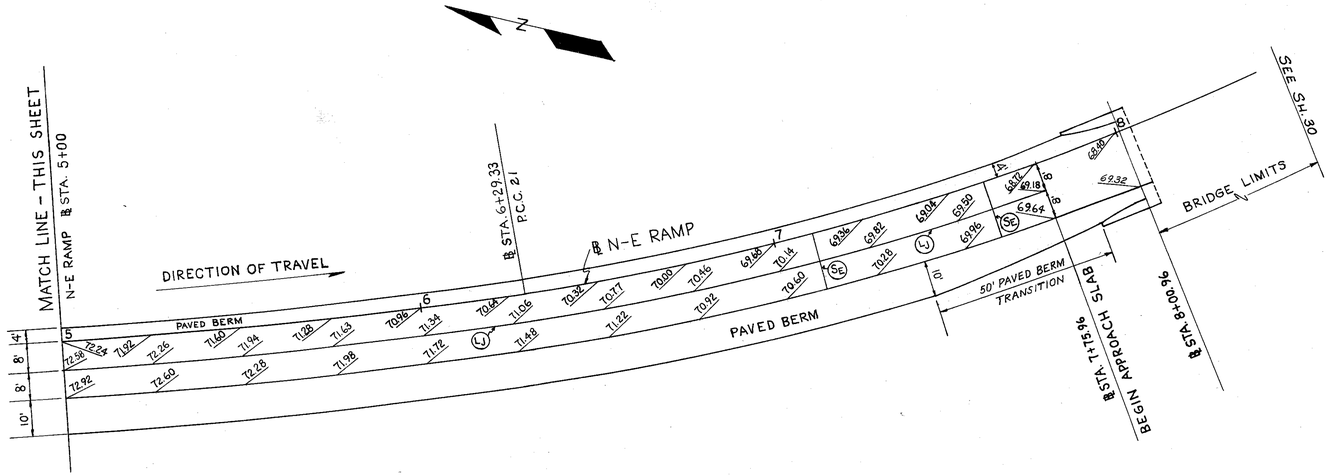
SCALE 1" = 20'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.D.R.	F.T.		C.D.R.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

33
198

CUYAHOGA COUNTY
CUY– 21-14.12

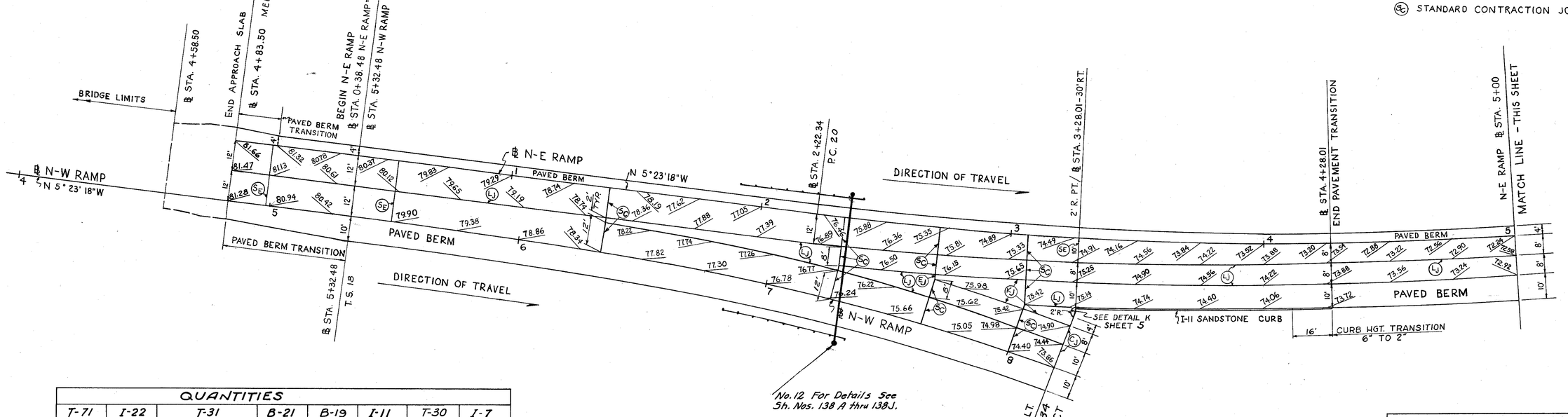


NOTES:

1. FOR TRUE ELEVATIONS ADD 600.00 TO THOSE SHOWN.
2. ALL ELEVATIONS SHOWN ARE TO THE TOP OF FINISHED PAVEMENT AND ARE GIVEN AT PAVEMENT JOINTS, EDGES AND EVEN 25' STATIONS.
3. CONSTRUCTION JOINT BARS TO BE PLACED WITH EXPOSED ENDS PROTECTED.

LEGEND:

- (LJ) STANDARD LONGITUDINAL JOINT
- (KJ) STANDARD LONGITUDINAL KEY JOINT, WITHOUT TIE BARS
- (SE) STANDARD EXPANSION JOINT
- (EJ) STANDARD EXPANSION JOINT, WITHOUT DOWELS
- (CJ) STANDARD CONSTRUCTION JOINT.
- (SC) STANDARD CONTRACTION JOINT.



No. 12 For Details See Sh. Nos. 138 A thru 138 J.

QUANTITIES

	T-71 9" Reinforced Portland Cement Concrete Pavement	I-22 Subbase	T-31 Bituminous Surface Treatment: Bituminous Material 0.25 Gal./S.Y.	T-31 Bituminous Surface Treatment: No 6 Aggregate 0.008 C.Y./S.Y.	B-21 Waterproofed Aggregate Base Course	B-19 Aggregate Base Course	I-11 Sandstone Curb 6" x 18"	T-30 Bituminous Prime Coat 0.4 Gal./S.Y.	I-7 Reinforced Concrete Approach Slabs
	Sq. Yd.	Cu. Yd.	Gal.	Cu. Yd.	Cu. Yd.	Cu. Yd.	L.F.	Gal.	Sq. Yd.
TOTAL THIS SH.	2116	440	282	9	188	125	106	451	45

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PAVEMENT DETAILS

N-W RAMP ℄ STA. 4+83.50 TO STA. 8+19.86

N-E RAMP ℄ STA. 0+38.48 TO STA. 8+00.96

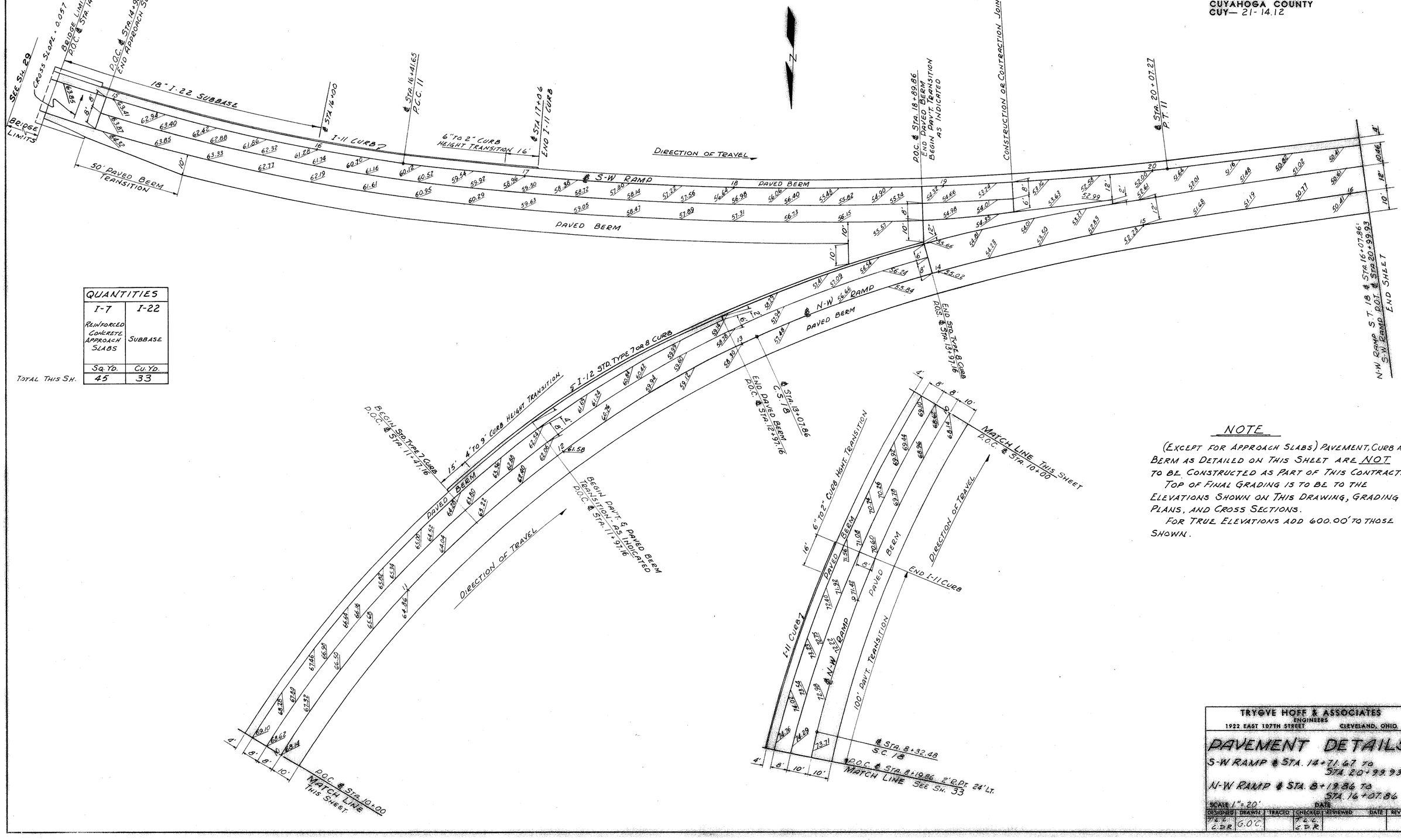
SCALE 1" = 20'	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.D.R. F.T.	F.T.		C.D.R.			

CONT. No. 58019 SHEET ACCT. No. 6296

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

34
196

CUYAHOGA COUNTY
CUY— 21- 14.12



QUANTITIES	
I-7	I-22
REINFORCED CONCRETE APPROACH SLABS	SUBBASE
SQ. YD.	CU. YD.
TOTAL THIS SH. 45	33

NOTE

(EXCEPT FOR APPROACH SLABS) PAVEMENT, CURB AND BERM AS DETAILED ON THIS SHEET ARE NOT TO BE CONSTRUCTED AS PART OF THIS CONTRACT.

TOP OF FINAL GRADING IS TO BE TO THE ELEVATIONS SHOWN ON THIS DRAWING, GRADING PLANS, AND CROSS SECTIONS.

FOR TRUE ELEVATIONS ADD 600.00' TO THOSE SHOWN.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PAVEMENT DETAILS

S-W RAMP @ STA. 14+71.67 TO STA. 20+99.93

N-W RAMP @ STA. 8+19.86 TO STA. 16+07.86

SCALE 1"=20' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
T.E.H. C.D.R.	G.O.C.		T.E.H. C.D.R.			

CONT. No. 58012 SHEET ACCT. No. 6297

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

35
198

CUYAHOGA COUNTY
CUY— 21-14.12

QUANTITIES

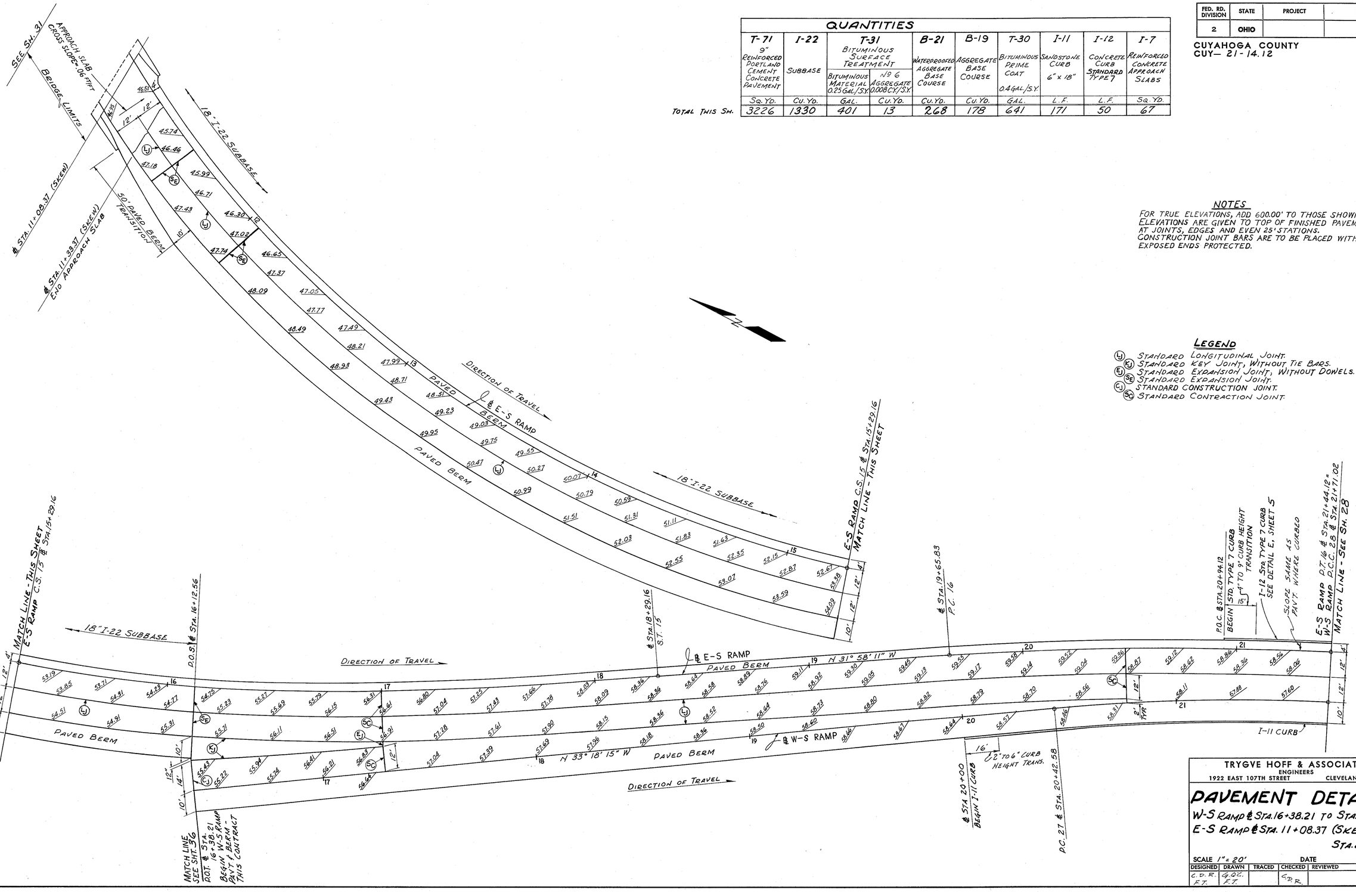
	T-71 9" Reinforced Portland Cement Concrete Pavement	I-22 Subbase	T-31 Bituminous Surface Treatment: Bituminous Material 0.25 Gal./S.Y.	T-31 Bituminous Surface Treatment: No 6 Aggregate (0.008 C.Y./S.Y.)	B-21 Waterproofed Aggregate Base Course	B-19 Aggregate Base Course	T-30 Bituminous Prime Coat 0.4 Gal./S.Y.	I-11 Sandstone Curb 6" x 18"	I-12 Concrete Curb Standard Type 7	I-7 Reinforced Concrete Approach Slabs
	Sq. Yd.	Cu. Yd.	Gal.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Gal.	L.F.	L.F.	Sq. Yd.
TOTAL THIS SH.	3226	1330	401	13	268	178	641	171	50	67

NOTES

FOR TRUE ELEVATIONS, ADD 600.00' TO THOSE SHOWN.
ELEVATIONS ARE GIVEN TO TOP OF FINISHED PAVEMENT AT JOINTS, EDGES AND EVEN 25' STATIONS.
CONSTRUCTION JOINT BARS ARE TO BE PLACED WITH EXPOSED ENDS PROTECTED.

LEGEND

- (LJ) STANDARD LONGITUDINAL JOINT.
- (KJ) STANDARD KEY JOINT, WITHOUT TIE BARS.
- (EJ) (SE) STANDARD EXPANSION JOINT, WITHOUT DOWELS.
- (EJ) STANDARD EXPANSION JOINT.
- (CJ) STANDARD CONSTRUCTION JOINT.
- (SC) STANDARD CONTRACTION JOINT.



CONT. NO. 58013 SHEET NO. 6298

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PAVEMENT DETAILS

W-S RAMP ℄ STA. 16+38.21 TO STA. 21+71.02
E-S RAMP ℄ STA. 11+08.37 (SKEW) TO STA. 21+44.12

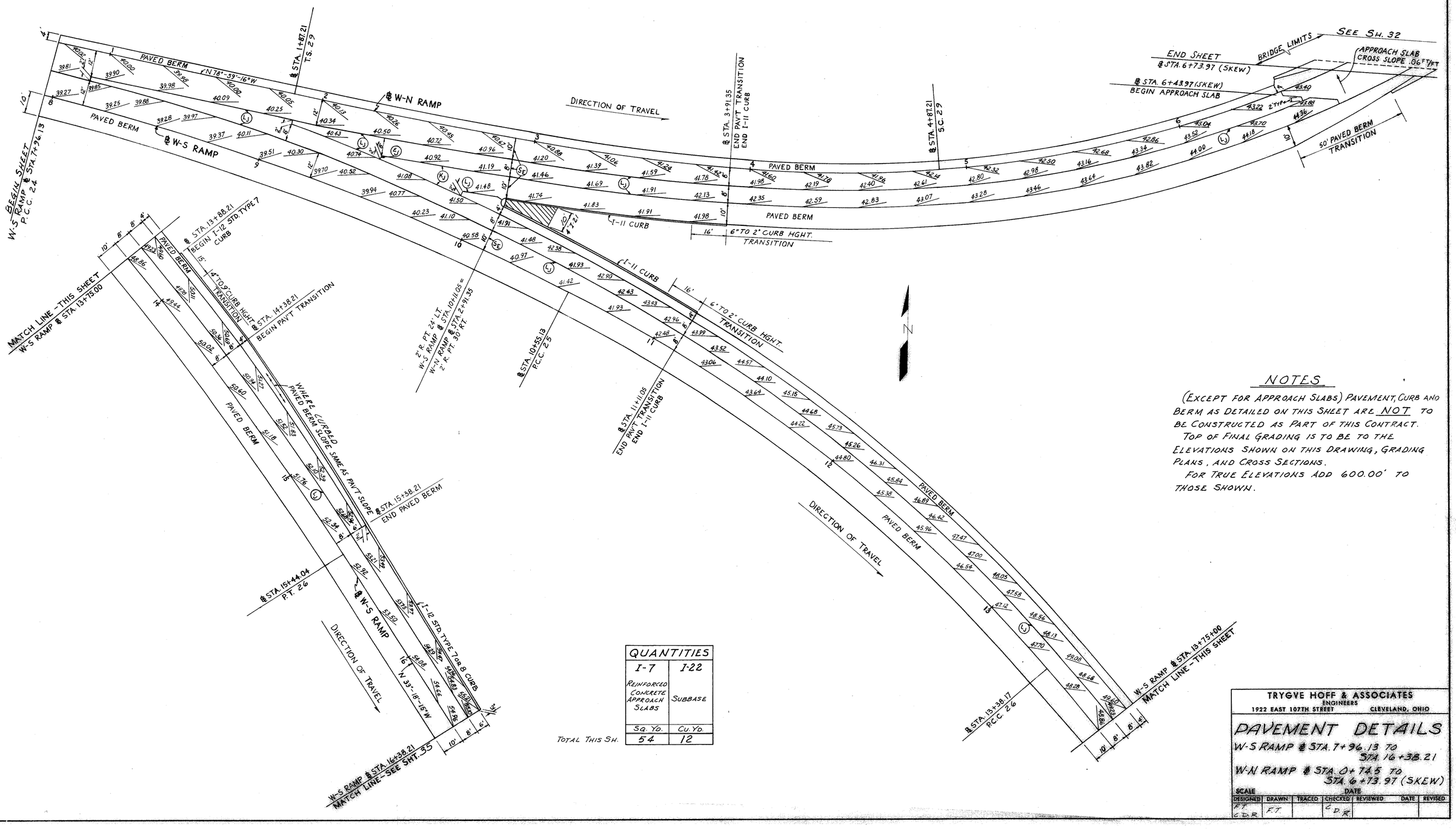
SCALE 1" = 20' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.D.R. F.T.	G.O.C. F.T.		C.D.R.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

35
96

CUYAHOGA COUNTY
CUY— 21-14.12



QUANTITIES		
	I-7	I-22
	REINFORCED CONCRETE APPROACH SLABS	SUBBASE
	SQ. YD.	CU. YD.
TOTAL THIS SH.	54	12

NOTES

(EXCEPT FOR APPROACH SLABS) PAVEMENT, CURB AND BERM AS DETAILED ON THIS SHEET ARE NOT TO BE CONSTRUCTED AS PART OF THIS CONTRACT.

TOP OF FINAL GRADING IS TO BE TO THE ELEVATIONS SHOWN ON THIS DRAWING, GRADING PLANS, AND CROSS SECTIONS.

FOR TRUE ELEVATIONS ADD 600.00' TO THOSE SHOWN.

CONT. No. 58019 SHEET ACCT. No. 6232

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PAVEMENT DETAILS

W-S RAMP @ STA. 7+96.13 TO STA. 16+38.21
W-N RAMP @ STA. 0+74.5 TO STA. 6+73.97 (SKEW)

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
F.T. C.D.R.	F.T.		C.D.R.			

E1-0

0-13

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

37/198

CUYAHOGA COUNTY
CUY— 21—14.12

NOTES AND LEGEND

MATCH LINE AND OR SKEW LINE — ℄ MATCH LINE 7 ℄

STATION AT WHICH CROSS SECTION IS TAKEN — 15+00

EXISTING CONTOURS — 76 75

PROPOSED CONTOURS — 42 40

PROPOSED ELEVATIONS (FINISHED GRADE) 60.58

FOR C.R.S. EL. DATUM ADD 600.00 TO ELEVATIONS SHOWN.

CATCH BASIN ■

DIRECTION OF SURFACE WATER FLOW

DITCH WIDTH

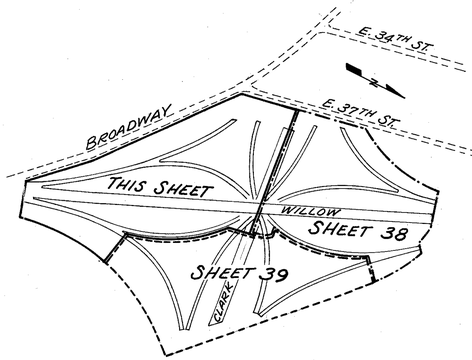
SLOPE LINE 2:1

FUTURE EDGES OF PAVEMENT AND PAVED BERMS GRADED, BUT NOT CONSTRUCTED UNDER THIS CONTRACT.

FOR CRUSHED AGGREGATE SLOPE PROTECTION AT BRIDGES, SEE BRIDGE PLANS.
WORK GRADING PLANS WITH BRIDGE PLANS.

WORK GRADING PLANS WITH CROSS SECTIONS.

FOR CROSS SECTIONS	SEE SHEETS
WILLOW	40 - 48
CLARK	49 - 63
W-S RAMP	64 - 69
S-E RAMP	70 - 73
E-N RAMP	74 - 77
N-W RAMP	78 - 79



ASSEMBLY PLAN
OF
GRADING PLAN SHEETS 37,38,39

BROADWAY
E. 37 ST.
E. 38TH PL.
DILLE AVE.
ROSEVILLE CT.
GEAUGA ST.
SVOBODA ST.
WARREN ST.
SOLON ST.
MALEK PL.
SCHOOL CT.
DOUSE AVE.
ROAD "A"
MARTIN AVE.
GIBBS
PROJECT BEGIN
B-S RAMP
℄ W-S RAMP
16 E-S RAMP
℄ S-E RAMP
℄ S-W RAMP
℄ WILLOW
℄ MATCH LINE
SKEW LINE
PAVED BERM
EXIST. RET. WALL
EXIST. MANHOLE
EXIST. CONSTRUCTION
℄ MATCH LINE - CONTINUED ON SH. 39

CROSS SECTIONS BEGIN W-S RAMP STA 10+98

CROSS SECTIONS BEGIN CLARK STA 1028+50

CROSS SECTIONS E-S RAMP BEGIN STA 22+50 WILLOW STA 65+78

CROSS SECTIONS BEGIN S-E RAMP STA 6+62.50 WILLOW STA 65+78

EXCAVATION 53,033 C.Y.
EMBANKMENT 0 C.Y.
SEEDING 8259 S.Y.

EXCAVATION 55980 C.Y.
EMBANKMENT 1268 C.Y.
SEEDING 2710 S.Y.

1029+00
1029+50
1029+75
1030+25
1031+00
1031+50
1032+28
1033+21
1034+12
STA 1034+34 SKEW
1034+175
1035+41
1036+25

WORK SHEETS 37,38,39 TOGETHER.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

GRADING & CROSS SECTION KEY PLAN

SCALE 1" = 50' DATE

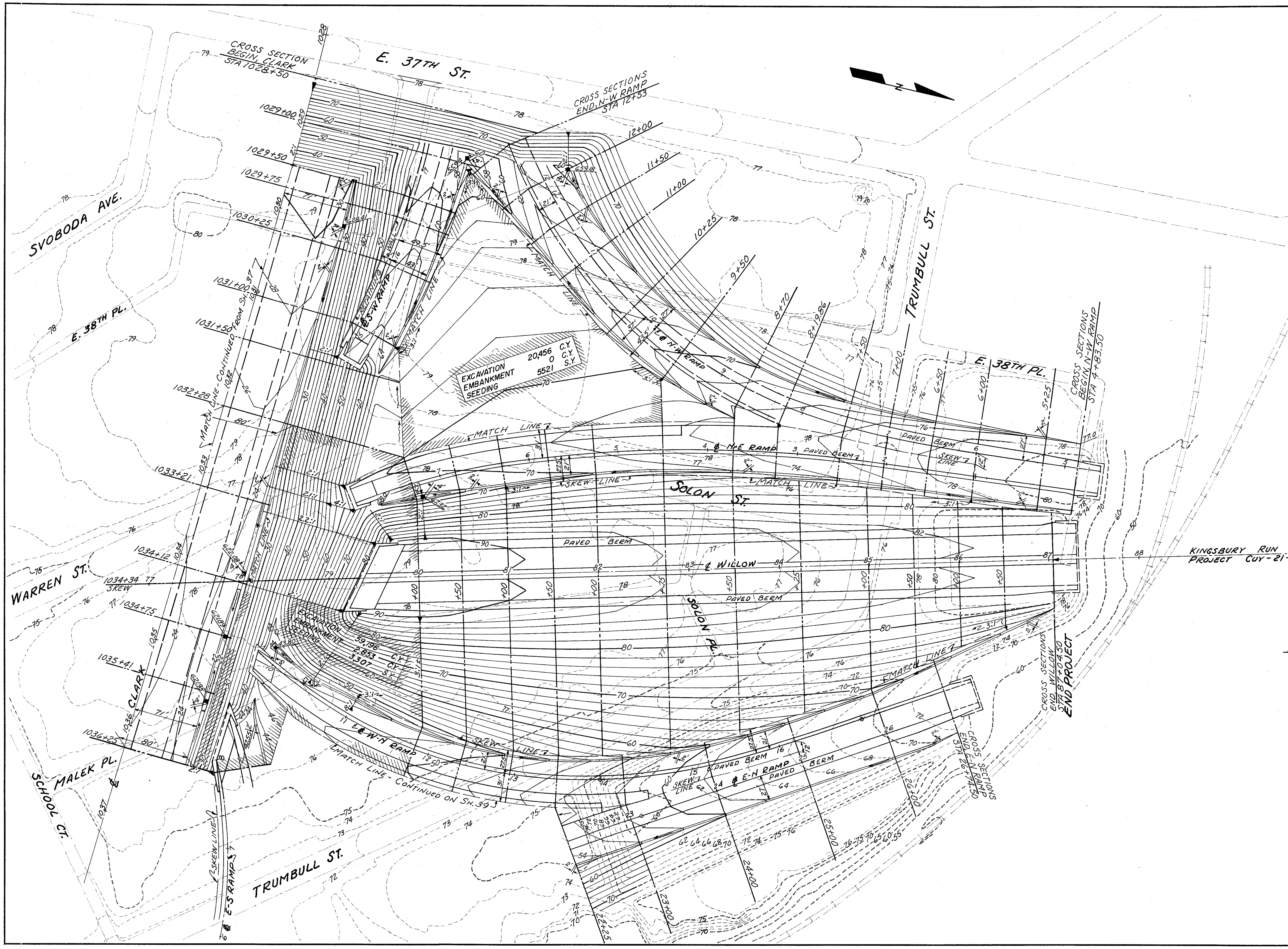
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RLH	RLH		TLL			

6270

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

38/198

CUYAHOGA COUNTY
CUY—21—14.12



E. 37TH ST.
CROSS SECTION BEGIN, CLARK STA 1028+50
CROSS SECTIONS END, N-W RAMP STA 12+53
SVOBODA AVE.
E. 38TH PL.
TRUMBULL ST.
EXCAVATION 20,456 C.Y.
EMBANKMENT 0 C.Y.
SEEDING 5521 S.Y.
CROSS SECTIONS BEGIN, N-W RAMP STA 4+83.50
MATCH LINE-CONTINUED FROM SH. 37
SOLON ST.
¢ WILLOW
SOLON PL.
KINGSBURY RUN BRIDGE PROJECT CUY-21-14.55
WARREN ST.
EXCAVATION 59,196 C.Y.
EMBANKMENT 2,853 C.Y.
SEEDING 3,307 S.Y.
¢ N-E RAMP
¢ W-N RAMP
¢ E-N RAMP
¢ E-S RAMP
MATCH LINE-CONTINUED ON SH. 39
CROSS SECTIONS END, E-N RAMP STA 26+74.50
CROSS SECTIONS END WILLOW STA 87+04.50 END PROJECT
MALEK PL.
SCHOOL CT.
CLARK
TRUMBULL ST.

NOTE
FOR GRADING PLAN NOTES AND LEGEND SEE SHEET 37.

WORK SHEETS 37,38,39 TOGETHER.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

GRADING & CROSS SECTION
KEY PLAN

SCALE 1" = 50' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RLH	RLH		T.L.L.			

1129

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

39
198

CUYAHOGA COUNTY
CUY— 21—14.12

NOTE FOR GRADING PLAN NOTES AND LEGEND SEE SHEET 37.

WORK SHEETS 37, 38, 39 TOGETHER.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

GRADING & CROSS SECTION
KEY PLAN

SCALE 1" = 50' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RLH	RLH		T.L.L.			

6272

CUYAHOGA COUNTY
CUY-21-14.12

110 100 90 80 70 60 50 40 30 20 10 ℄ WILLOW 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

AHEAD
SEE W-S RAMP
CROSS SECTIONS

AHEAD
SEE S-E RAMP
CROSS SECTIONS

680
RETAINING WALL
660 2:1
1½"/FT
℄CURB
650
1450 ESTIMATED
W-S RAMP
℄
22+50
CURB
VARIES
SKEW LINE
3:1
MATCH LINE
657.2
659.49
65+78
676.8
CURB
MATCH LINE
659.15
℄CURB
S-E RAMP
℄
6+62
8:1
3:1
C
C
160 170 180 190
680
670
660
680
C
C
12:1
RD "A"
℄CURB LINE
670 170 180 190 200 210

ESTIMATED 7625 95

670
FACE OF
RETAINING WALL
660
650
W-S RAMP
℄
℄CURB
SKEW LINE
CURB
SKEW LINE
S-E RAMP
℄
657.15
65+00
653.8
945 ESTIMATED
B
B
680
670
660
680
B
B
RD. "A" 650
CURB LINE
670 180 190 200 210 220 230 240

ESTIMATED 350

NOTE
FOR CROSS SECTION KEY
PLAN SEE SHEET 37.

EXCAVATION 116182 CY
EMBANKMENT 36973 CY
SEEDING 33839 SY

℄BROADWAY
680
670
660
650
BROADWAY
BRIDGE
ABUTMENT
W-S RAMP
℄
℄CURB
SKEW LINE
CURB
SKEW LINE
S-E RAMP
℄
A
A
680
670
660
680
A
A
RD. "A"
CURB LINE
670 180 190 200 210 220 230 240 250 260

BEGIN PROJECT
655.75
64+50

6360

110 100 90 80 70 60 50 40 30 20 10 ℄ WILLOW 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190

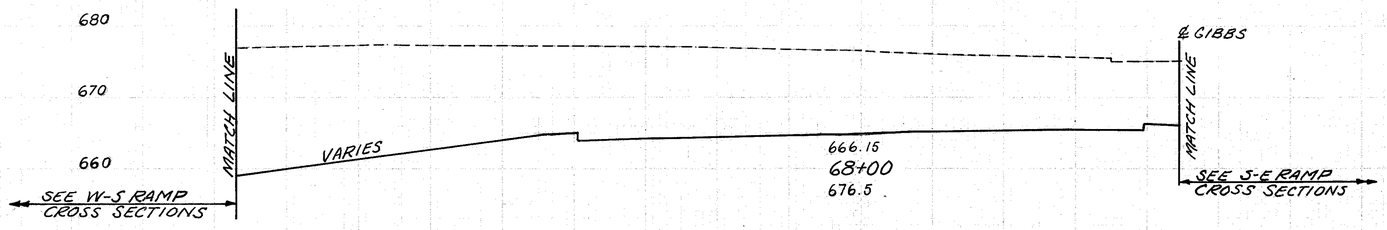
BEGIN CROSS SECTIONS WILLOW STA 64+50 TO STA 65+78

RLH

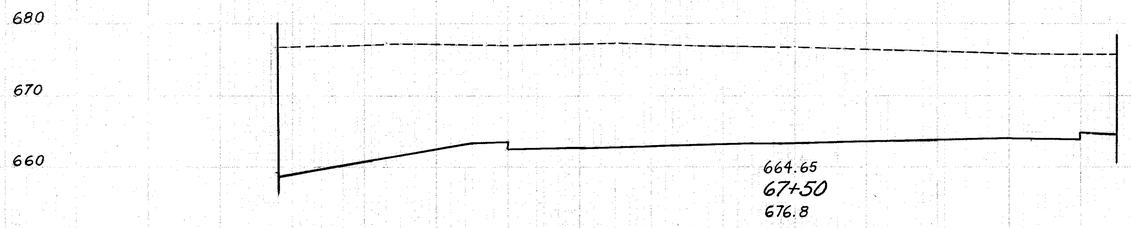
CUYAHOGA COUNTY
CUY-21-14.12

WILLOW

100 90 80 70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80 90 100



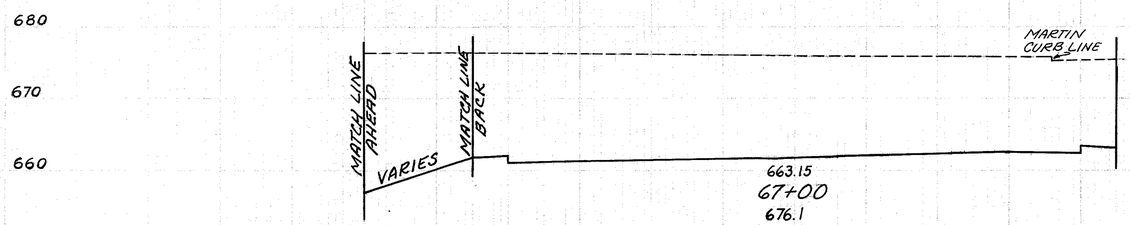
53 1675 0



253 3052 0

38 1621 0

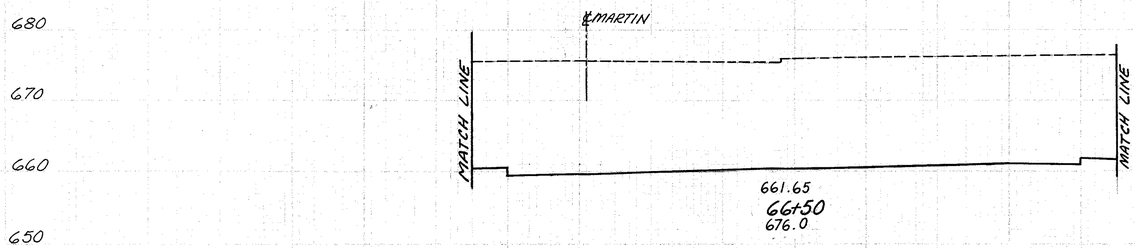
178 2907 0



26 AHEAD
10 BACK

1519 0 AHEAD
1264 0 BACK

56 2459 0



10 1391 0

80 3988 0

10 STA 65+78 1600 STA 65+78

10 90 80 70 60 50 40 30 20 10 ℄ WILLOW 10 20 30 40 50 60 70 80 90 100

WILLOW STA 66+50 TO STA 68+00

RLH

6361

CUYAHOGA COUNTY
CUY-21-14.12

42
198

WILLOW

170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80 90

680 / 670 / 660

228 1525

MATCH LINE — VARIES — ℄ DILLE — VARIES — B B

SEE W-S RAMP CROSS SECTIONS

673.65
70+50
673.2

680 / 670 / 660 / 650

B B — SKEW LINE — 3:1 — 8:1 — S-W RAMP ℄ — MATCH LINE

SEE EXTRA AREA GRADING PLAN

90 100 110 120 130 140 150 160 170 180

2337 20

5867 23

680 / 670 / 660

20! AHEAD
112 BACK

MATCH LINE — DILLE CURB LINE ℄ — ℄ GIBBS — MATCH LINE BACK — VARIES — SKEW LINE — A A

671.73
69+86
673.8

680 / 670 / 660 / 650

A — S-W RAMP ℄ — 3:1 — 8:1 — A — MATCH LINE AHEAD

SEE S-E RAMP CROSS SECTIONS

100 110 120 130 140 150 160 170

2613 0 AHEAD
1161 0 BACK

1749 0

424

680 / 670 / 660

MATCH LINE — ℄ GIBBS — MATCH LINE

670.65
69+50
674.4

680 / 670 / 660

100 511

1462 0

2862 0

680 / 670 / 660

84

℄ GIBBS

669.15
69+00
674.5

1629 0

3046 0

680 / 670 / 660

425

℄ GIBBS

MATCH LINE — VARIES — MATCH LINE

667.65
68+50
675.8

680 / 670 / 660

69 339

1661 0

3089 0

53

STA 68+00

170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ℄ WILLOW 10 20 30 40 50 60 70 80 90 100 110 120

STA 68+00

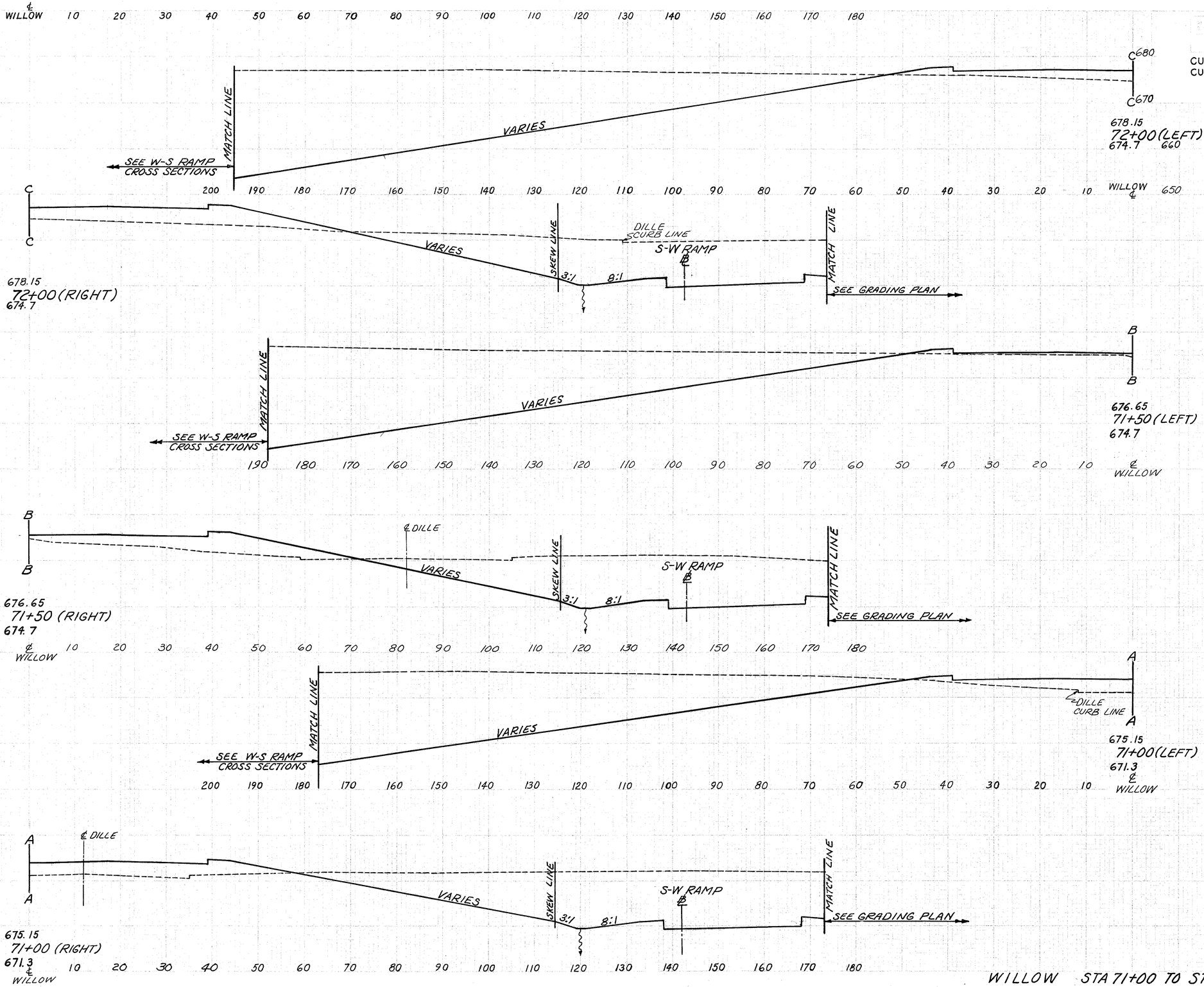
1675 0

6362

WILLOW STA 68+50 TO STA 70+50

RLH

CUYAHOGA COUNTY
CUY-21-14.12

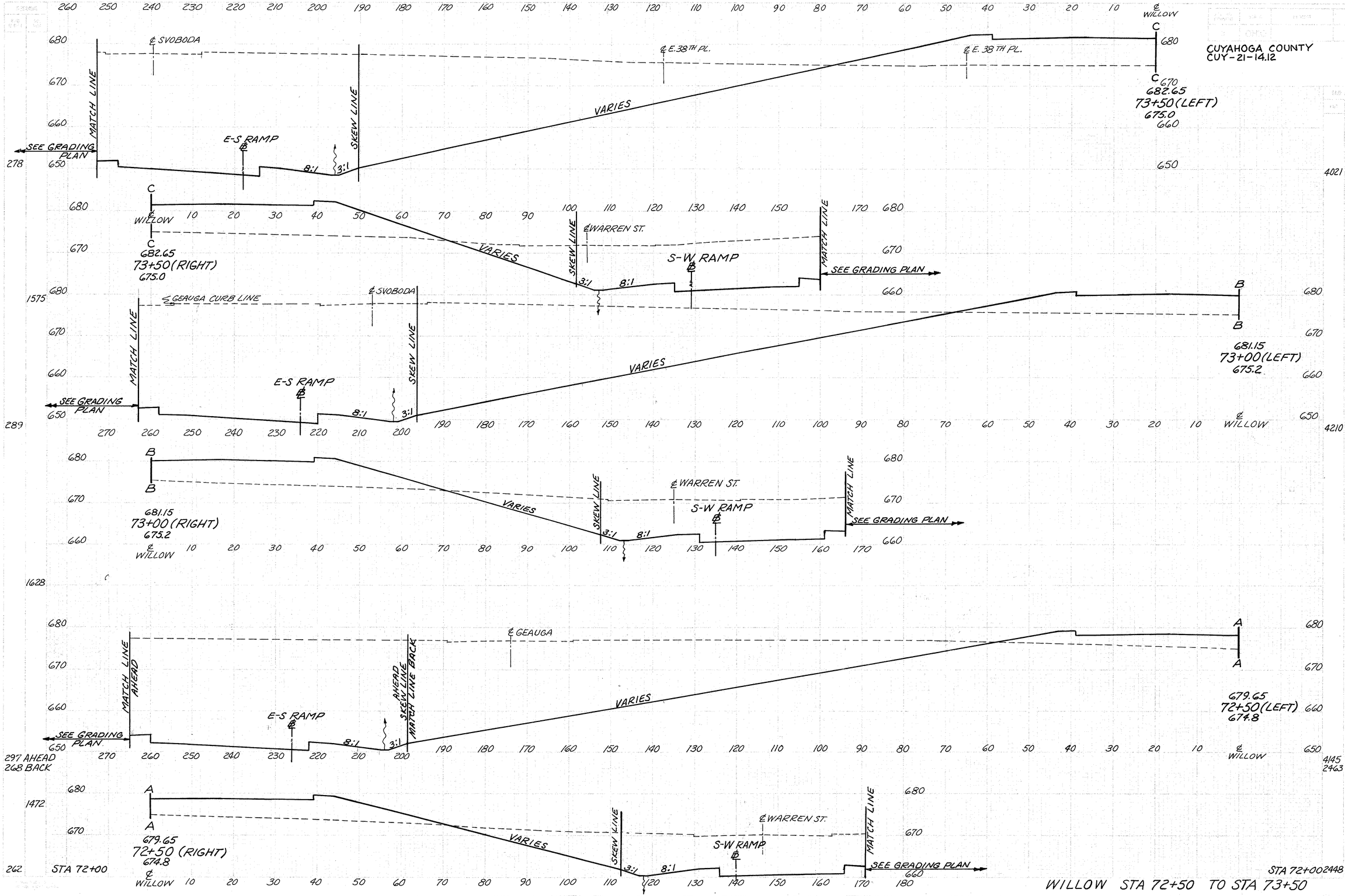


WILLOW STA 71+00 TO STA 72+00

RLH

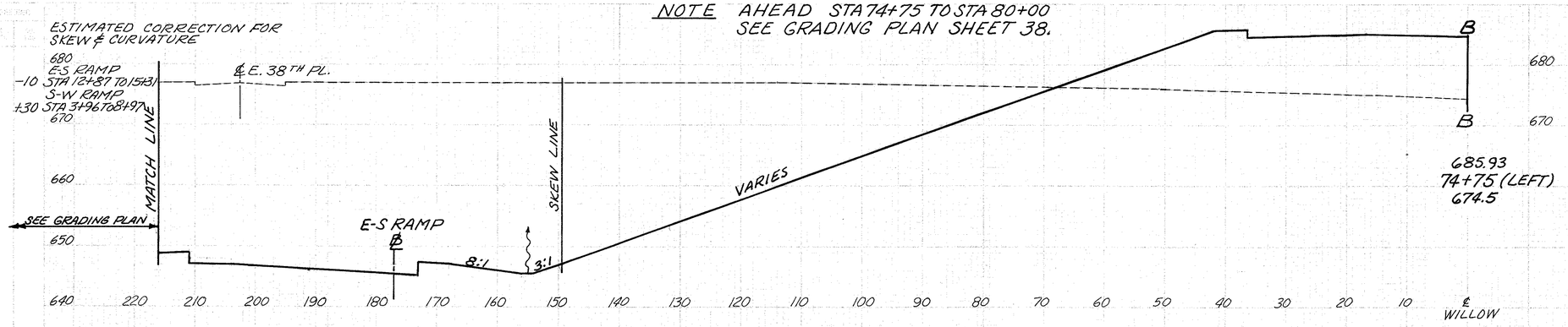
6363

CUYAHOGA COUNTY
CUY-21-14.12



NOTE AHEAD STA 74+75 TO STA 80+00
SEE GRADING PLAN SHEET 38.

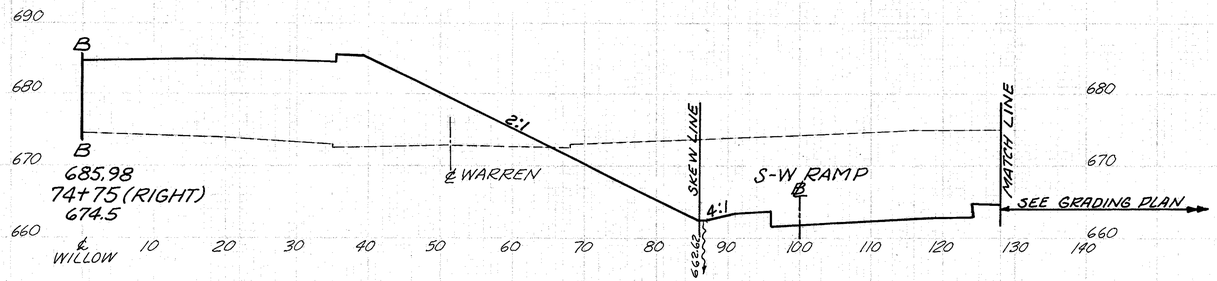
CUYAHOGA COUNTY
CUY - 21 - 14.12



ESTIMATED CORRECTION FOR SKEW & CURVATURE

E-S RAMP STA 12+87 TO STA 15+31	+1459
S-W RAMP STA 3+96 TO STA 8+97	+302

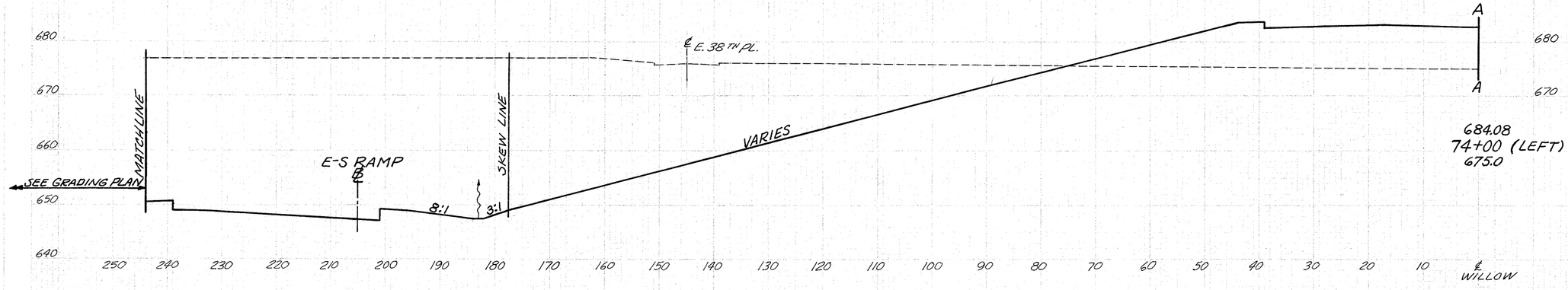
219



3836 1124

2025

10874 2938

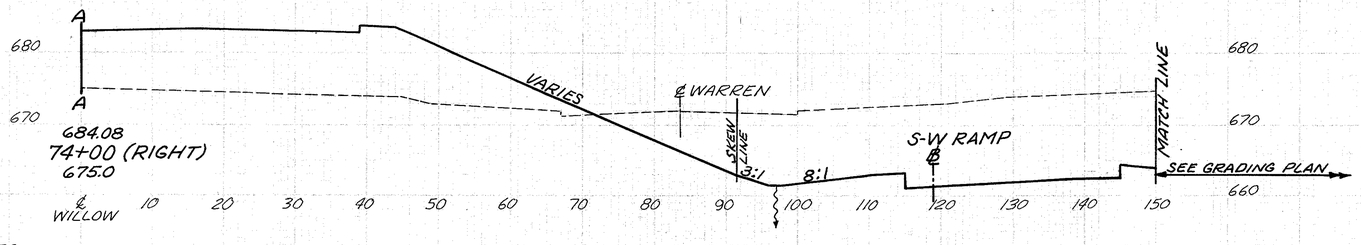


267

3993 991

1514

7420 1687



278 STA 73+50

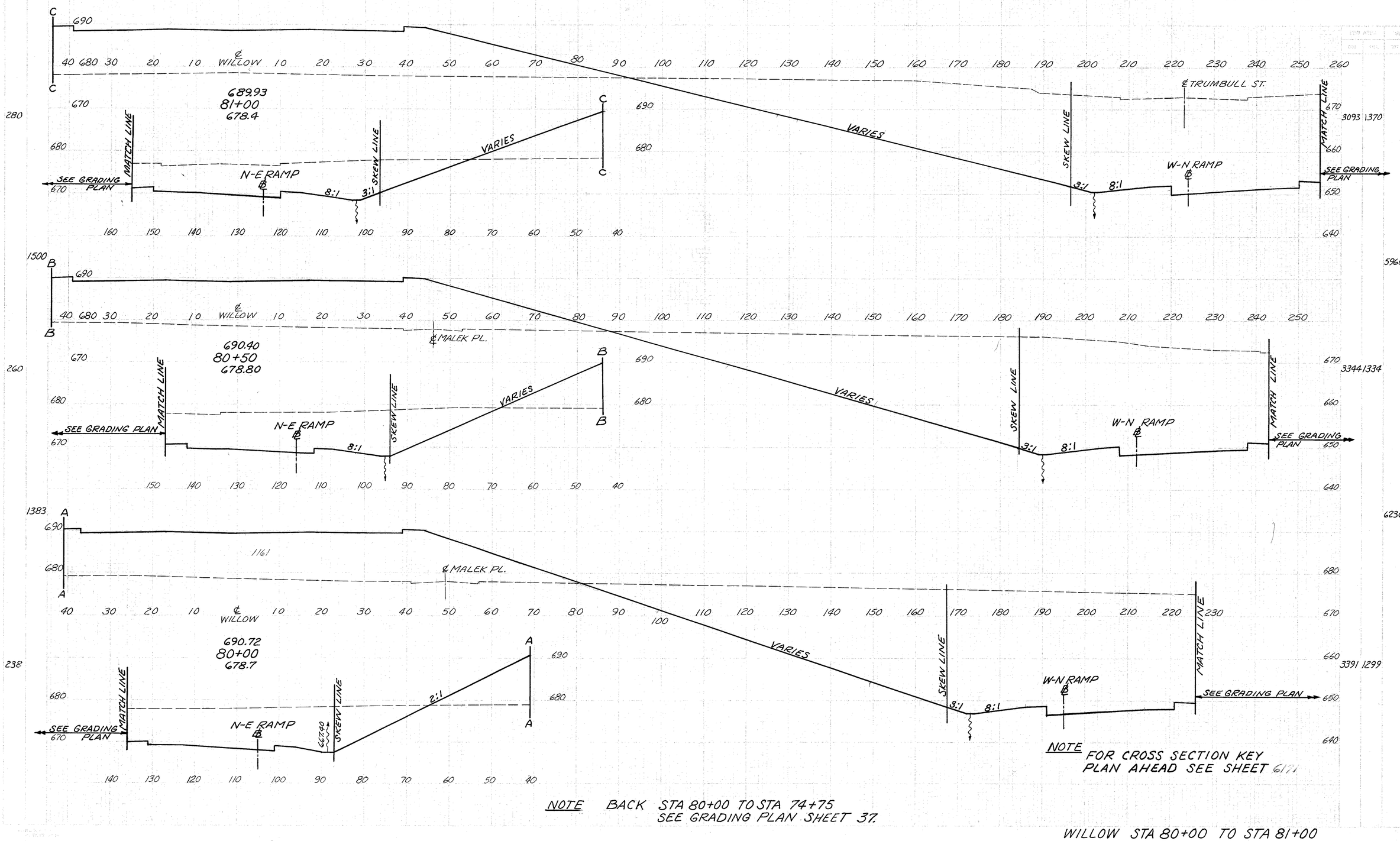
STA 73+50 4021 831

6365

WILLOW STA 74+00 TO STA 74+75

RLH

CUYAHOGA COUNTY
CUY - 21 - 14.12



NOTE FOR CROSS SECTION KEY PLAN AHEAD SEE SHEET 61?1

NOTE BACK STA 80+00 TO STA 74+75 SEE GRADING PLAN SHEET 37.

WILLOW STA 80+00 TO STA 81+00

6367

RLH

CUYAHOGA COUNTY
CUY - 21 - 14.12

WILLOW

686.68
83+50
677.0

687.67
82+75
677.0

688.67
82+00
678.0

689.34
81+50
678.0

SEE N-W RAMP CROSS SECTIONS
SEE N-W RAMP CROSS SECTIONS
SEE N-W RAMP CROSS SECTIONS
SEE GRADING PLAN
SEE GRADING PLAN

SEE E-N RAMP CROSS SECTIONS
SEE E-N RAMP CROSS SECTIONS
SEE E-N RAMP CROSS SECTIONS
SEE E-N RAMP CROSS SECTIONS

SKEW LINE BACK MATCH LINE AHEAD
MATCH LINE BACK
SKEW LINE
MATCH LINE
MATCH LINE BACK
SKEW LINE
MATCH LINE
SKEW LINE
MATCH LINE
SKEW LINE
MATCH LINE BACK
SKEW LINE
MATCH LINE
MATCH LINE BACK
SKEW LINE
MATCH LINE
SKEW LINE
MATCH LINE
SKEW LINE
AHEAD MATCH LINE SKEW LINE BACK
MATCH LINE BACK
MATCH LINE
SKEW LINE
MATCH LINE
SKEW LINE

℄ SOLON VARIES
℄ SOLON
℄ SOLON
℄ SOLON
℄ MALEK PL.
℄ MALEK PL.
℄ TRUMBULL
℄ TRUMBULL
℄ TRUMBULL
℄ TRUMBULL

℄ N-E RAMP 8:1 3:1
N-E RAMP
N-E RAMP
N-E RAMP
W-N RAMP

VARIES
VARIES
VARIES
VARIES
VARIES
VARIES
VARIES
VARIES

442 1372
1843 3867
885 1412
3003 3824
1277 1341
2607 2549
1539 1412 AHEAD
2754 1412 BACK
5414 2576
1466 690
1583
262 AHEAD
290 BACK
2083
2192
266
240
260

ESTIMATED CORRECTION FOR SKEW & CURVATURE
+27 W-N RAMP STA 11+85 TO 13+48
-11 N-E RAMP STA 3+74 TO 7+33

ESTIMATED CORRECTION FOR SKEW & CURVATURE
660 W-N RAMP STA 11+85 TO 13+48 +120
N-E RAMP STA 3+74 TO 7+33 +120

STA 81+00
STA 81+50 TO STA 83+50
STA 81+00 3093 1370

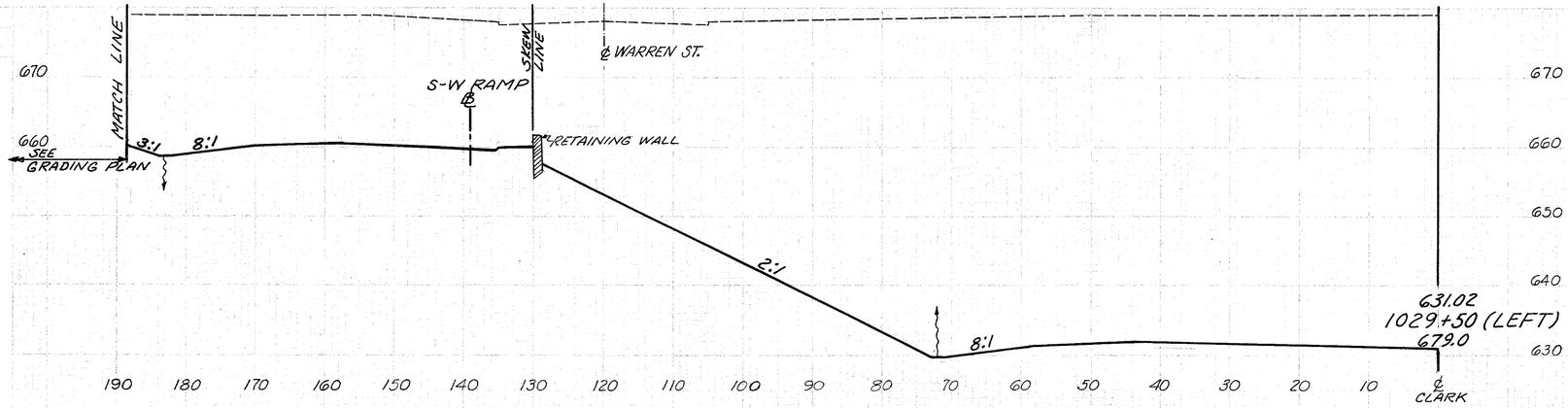
RLH
6369

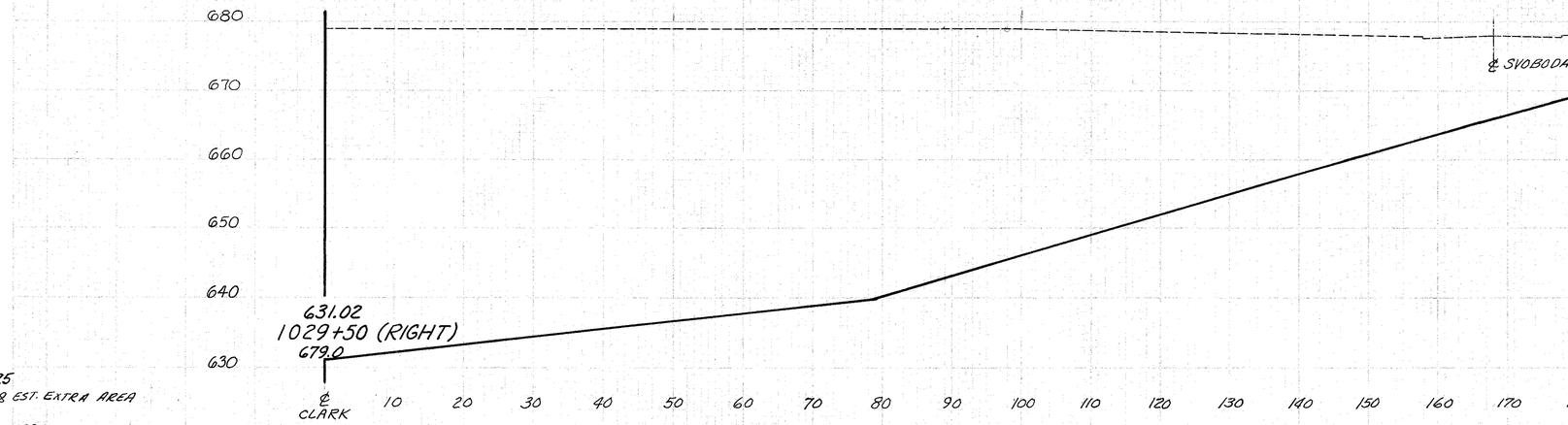
CUYAHOGA COUNTY
CUY-21-14.12

END CROSS SECTIONS WILLOW STA 84+25 TO STA 87+04.50

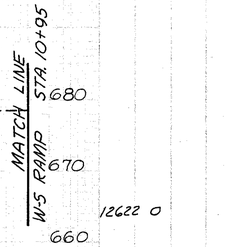
RLH

CUYAHOGA COUNTY
CUY-21-14.12



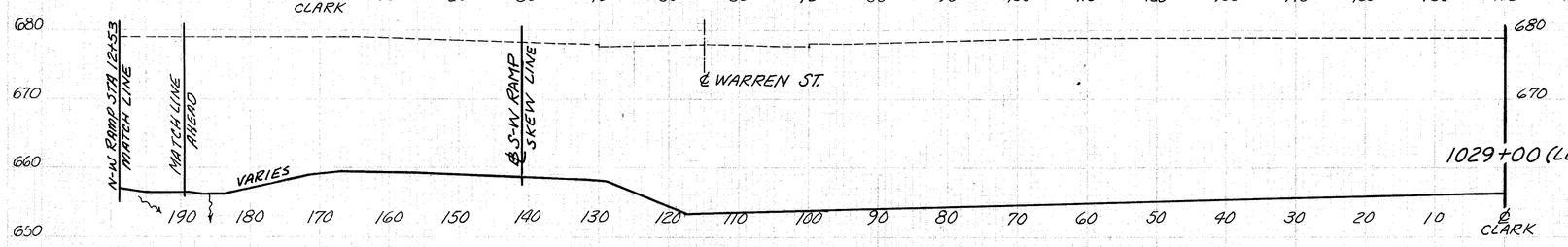


436



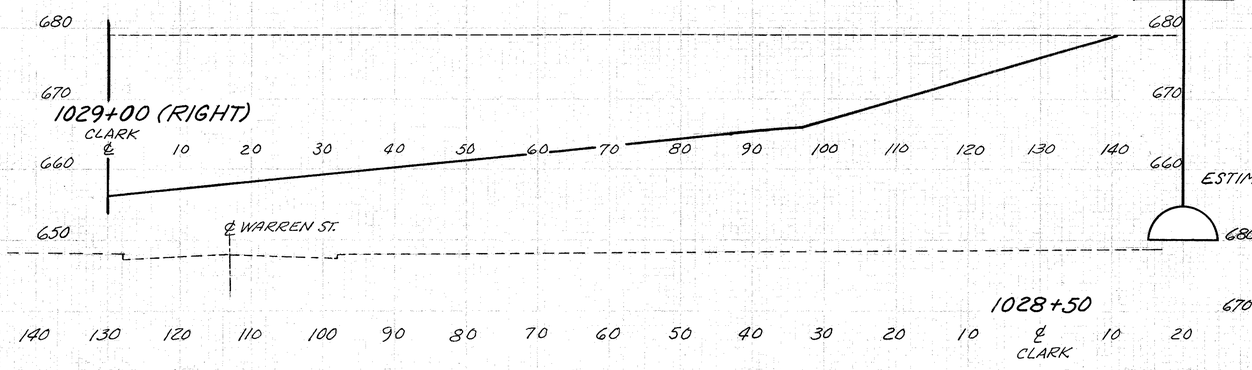
ESTIMATED ADJUSTMENT
FOR CURVATURE S-W RAMP +203 0

2525
8 EST. EXTRA AREA

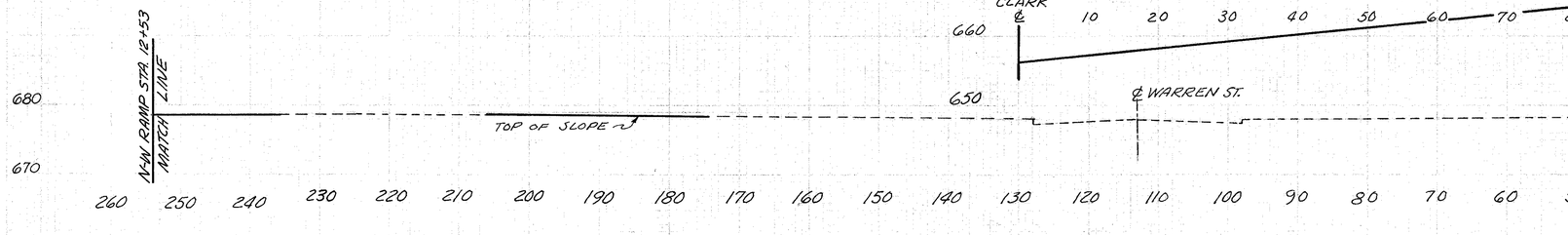


473

NOTE
FOR CROSS SECTION KEY
PLAN SEE SHEETS 37,38,39



2828



545

1028+50
℄ CLARK

EXCAVATION	535357	C.Y.
EMBANKMENT	0	C.Y.
SEEDING	39091	S.Y.

17548 0
+ EST. EXTRA AREA 70 0

6331 0

ESTIMATED 4643 0

BEGIN CROSS SECTIONS

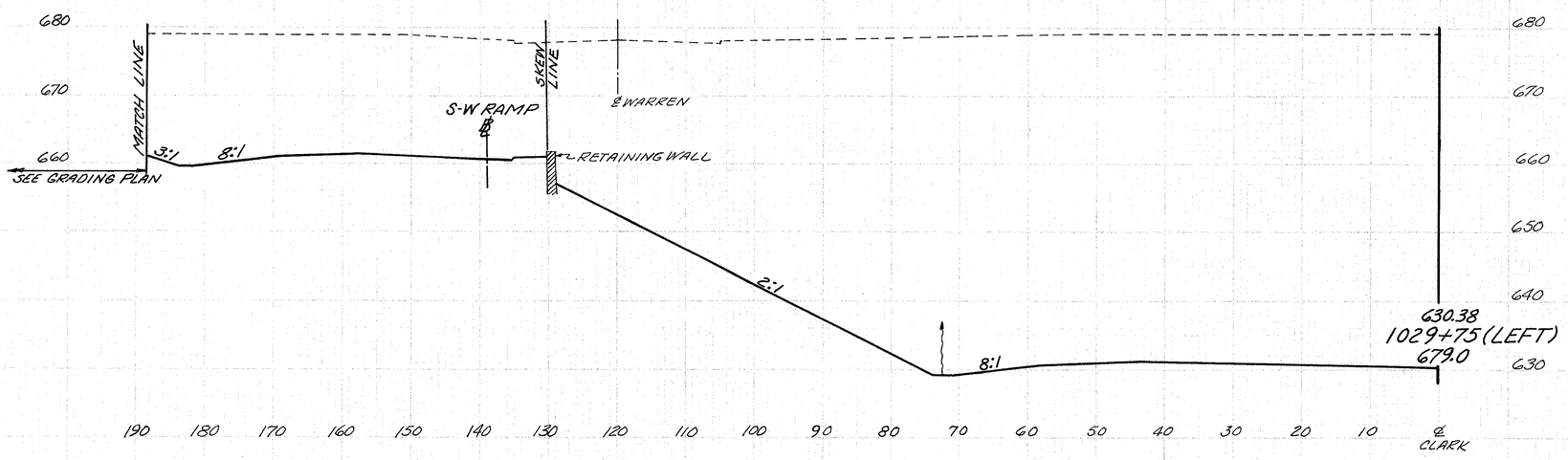
CLARK STA 1028+50 TO STA 1029+50

RLH

6388

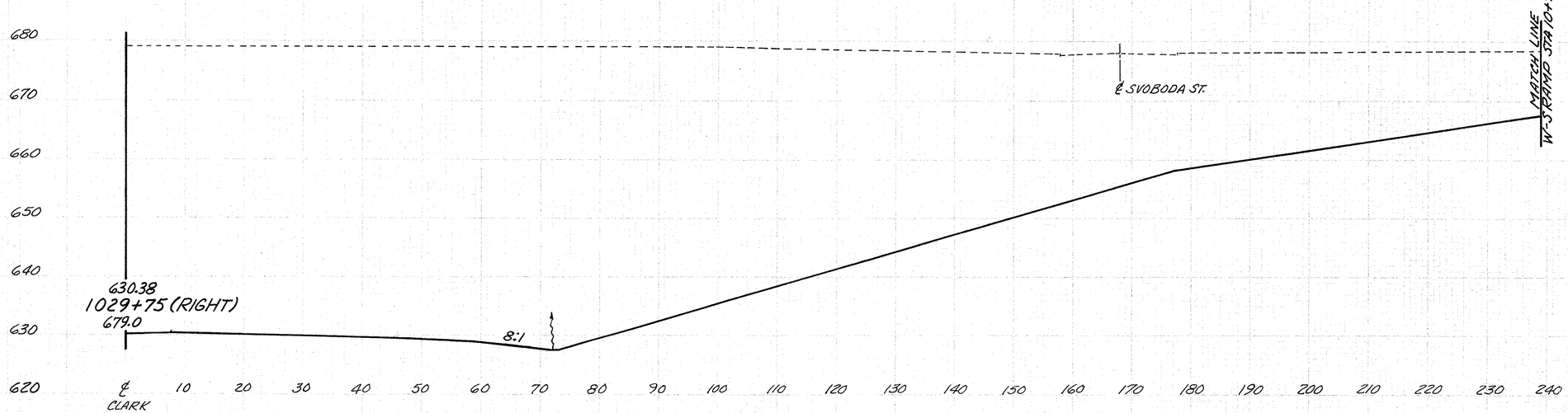
50
198

CUYAHOGA COUNTY
CUY-21-14.12



436

1211



14784-0

12688 0

436 STA 1029+50

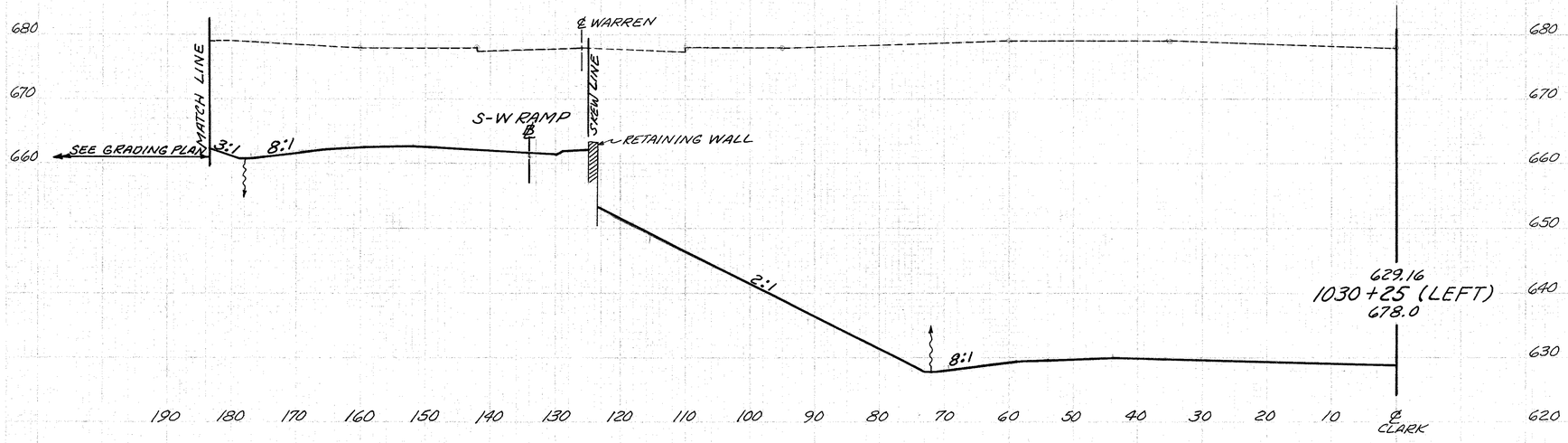
STA 1029+50 12622 0

CLARK STA 1029+75

RLH

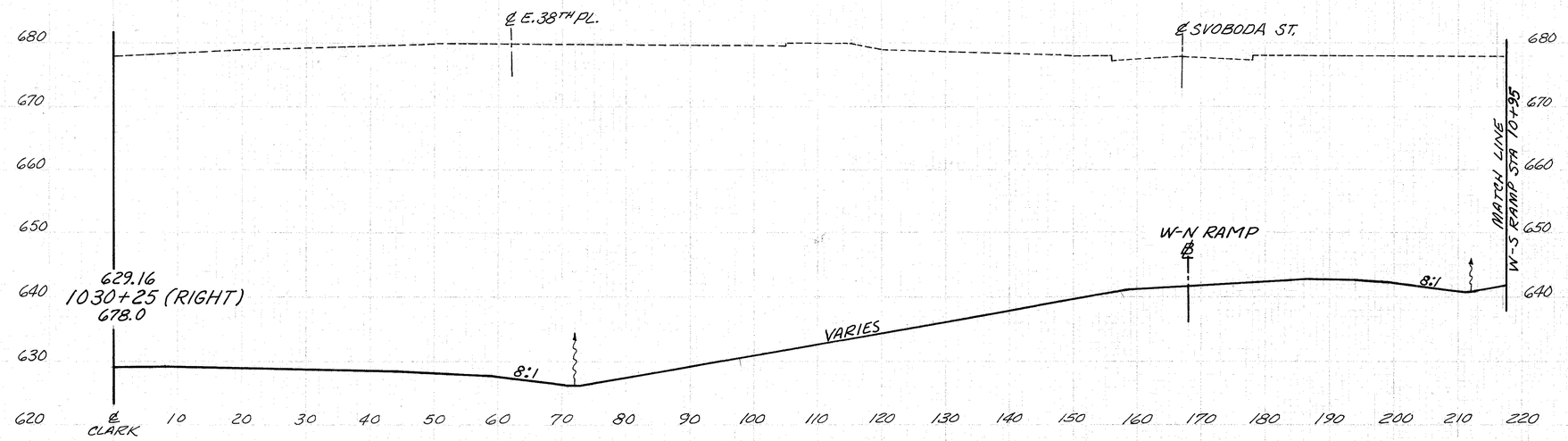
51
198

CUYAHOGA COUNTY
CUY-21-14.12



406

16169 0



2339

28660 0

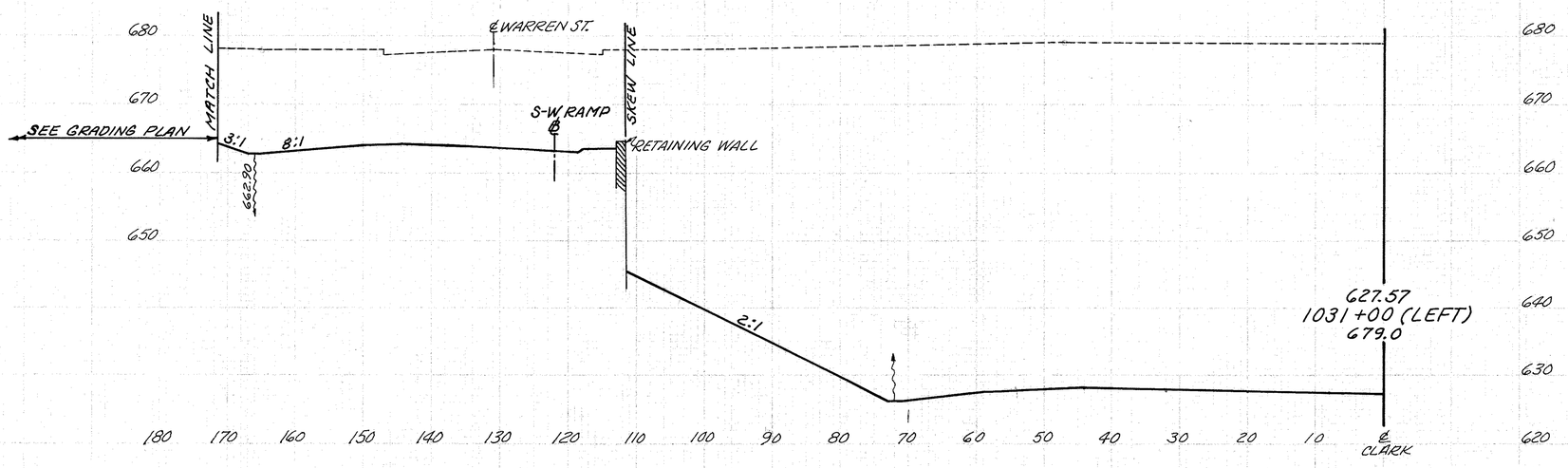
436 STA 1029+75

STA 1029+75 14784 0

CLARK STA 1030+25

RLH

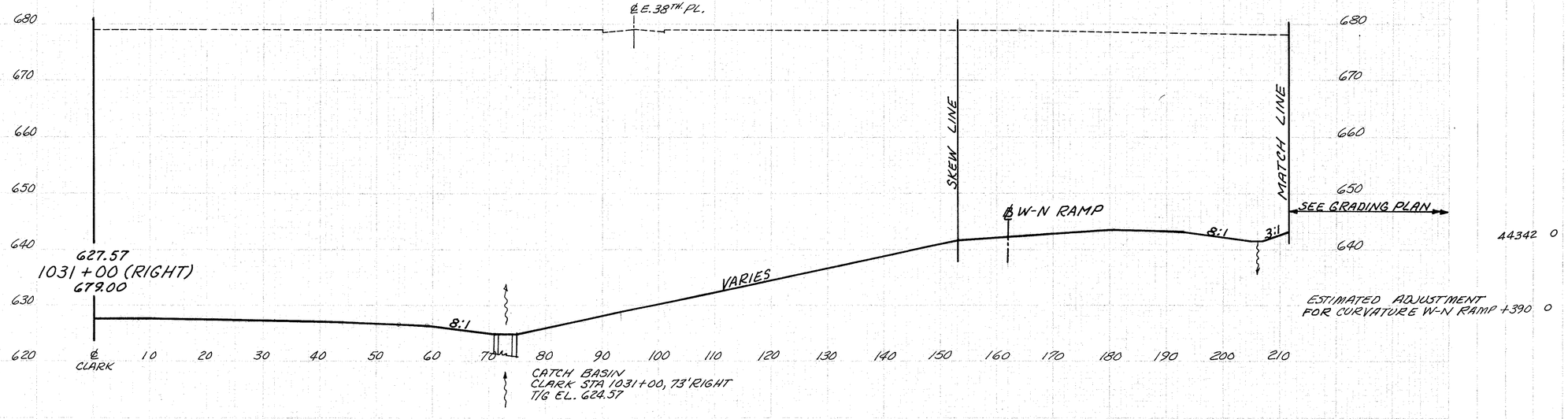
CUYAHOGA COUNTY
CUY-21-14.12



390

+ 70 ESTIMATED ADJUSTMENT FOR CURVATURE W-N RAMP AND S-W RAMP.

15757



3317

44342 0

ESTIMATED ADJUSTMENT FOR CURVATURE W-N RAMP +390 0

406 STA 1030+25

STA 1030+25 16169 0

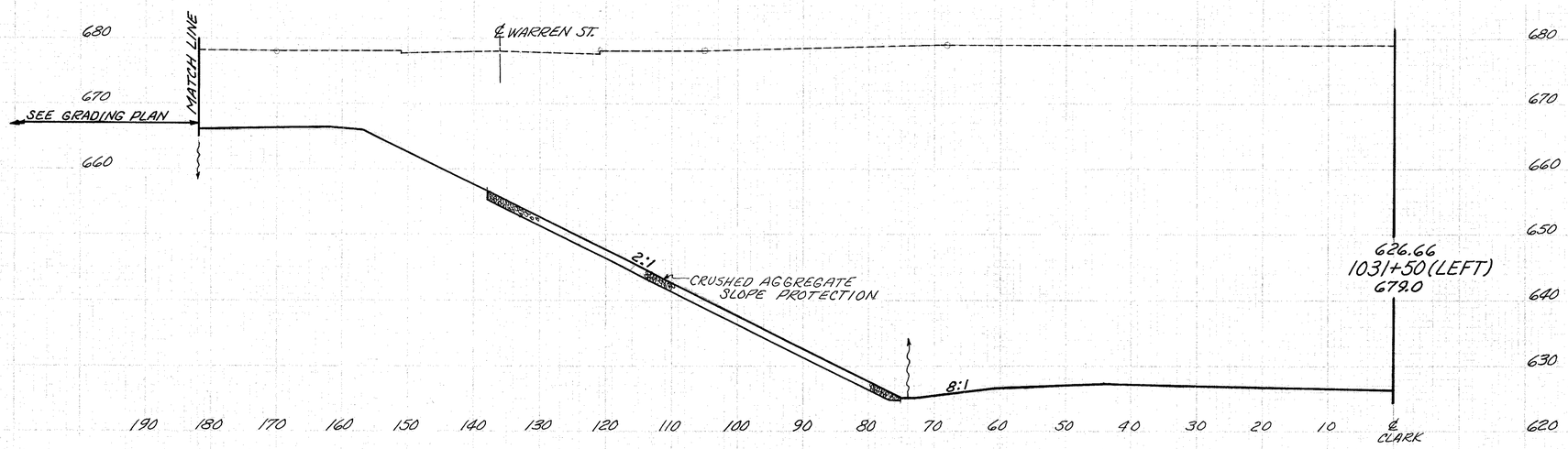
CLARK STA 1031+00

RLH

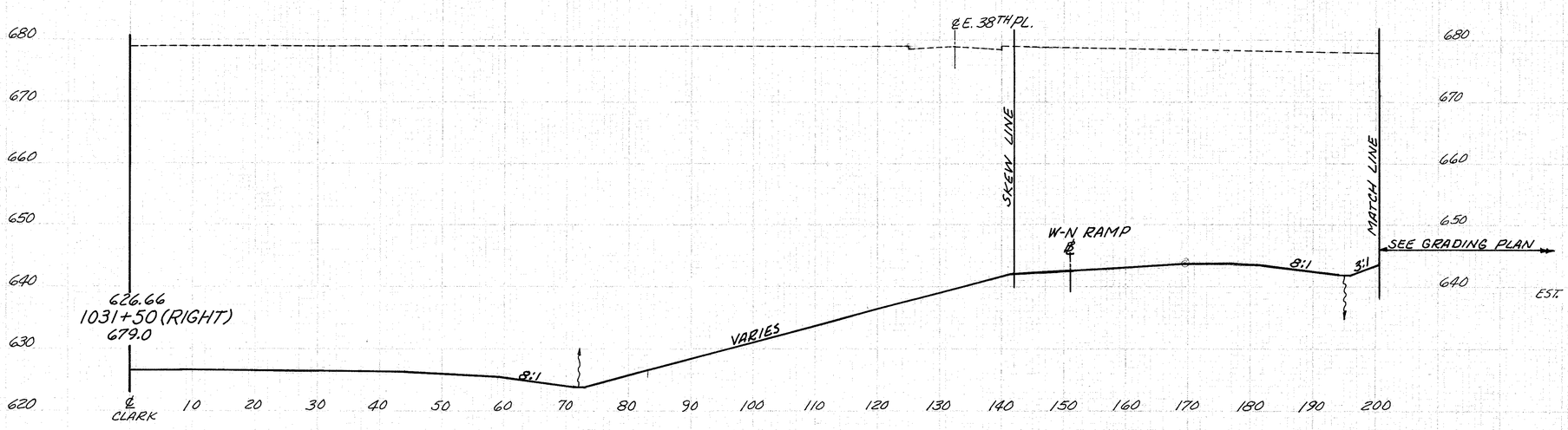
6390

53
198

CUYAHOGA COUNTY
CUY-21-14.12



394



15965 0

2178
-30 EST. AREA OF SLOPE PROTECTION

29372 0

EST. ADJUSTMENT - 218 0

390 STA 1031+00

STA 1031+00 15757 0

CLARK STA 1031+50

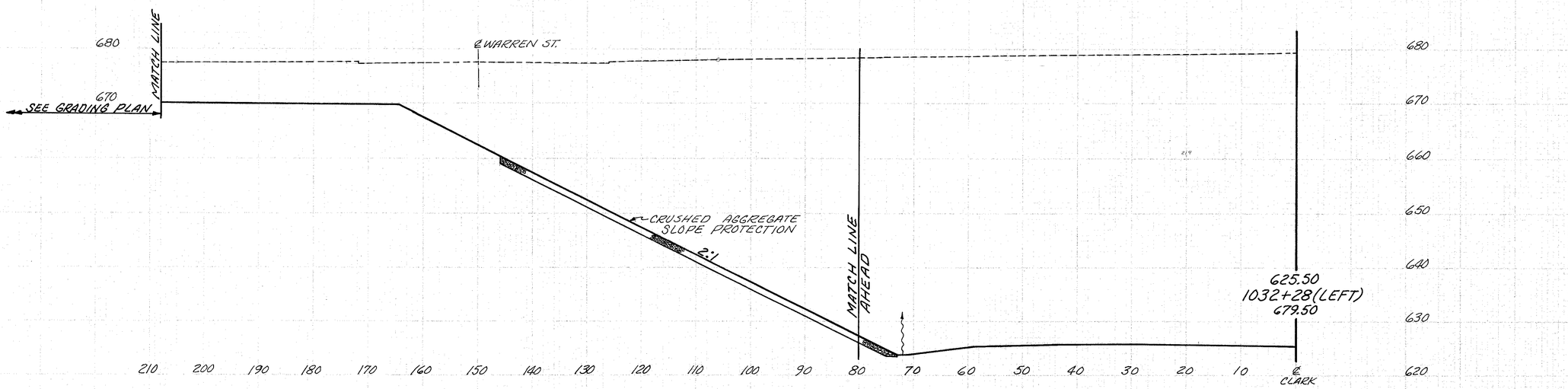
RLH

6/83

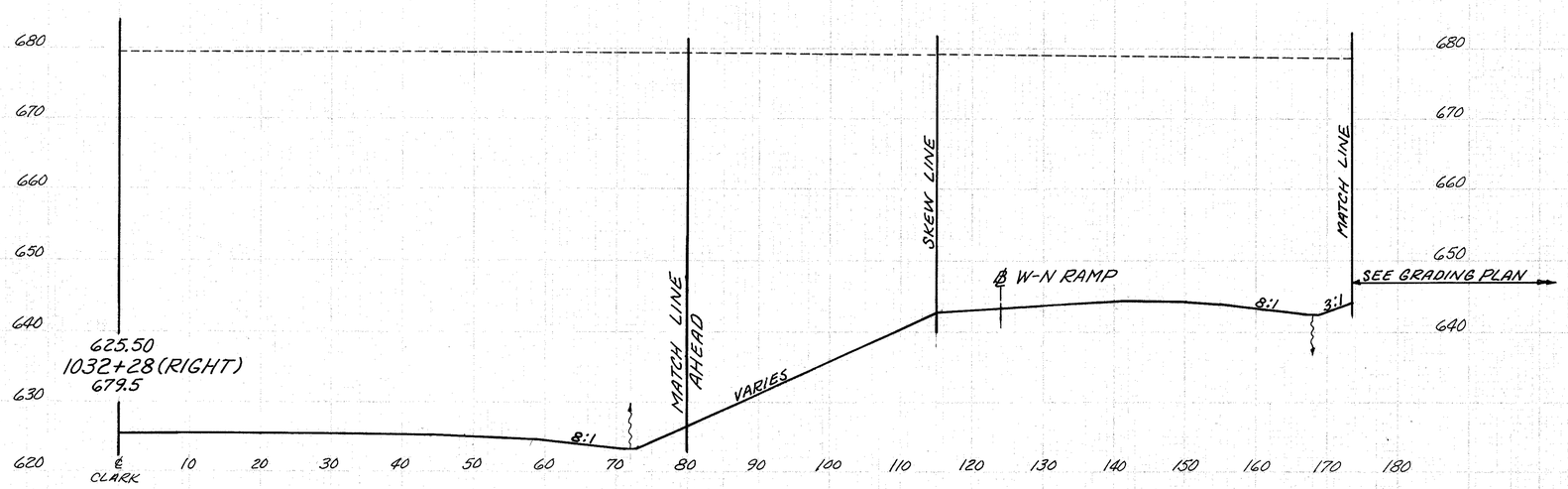
NOTE AHEAD STA 1032+28 TO STA 1036+25
SEE GRADING PLANS AND CROSS SECTIONS

54
198

CUYAHOGA COUNTY
CUY - 21 - 14.12



316



2769

16137 0

46370 0

6392

323 STA 1031+50

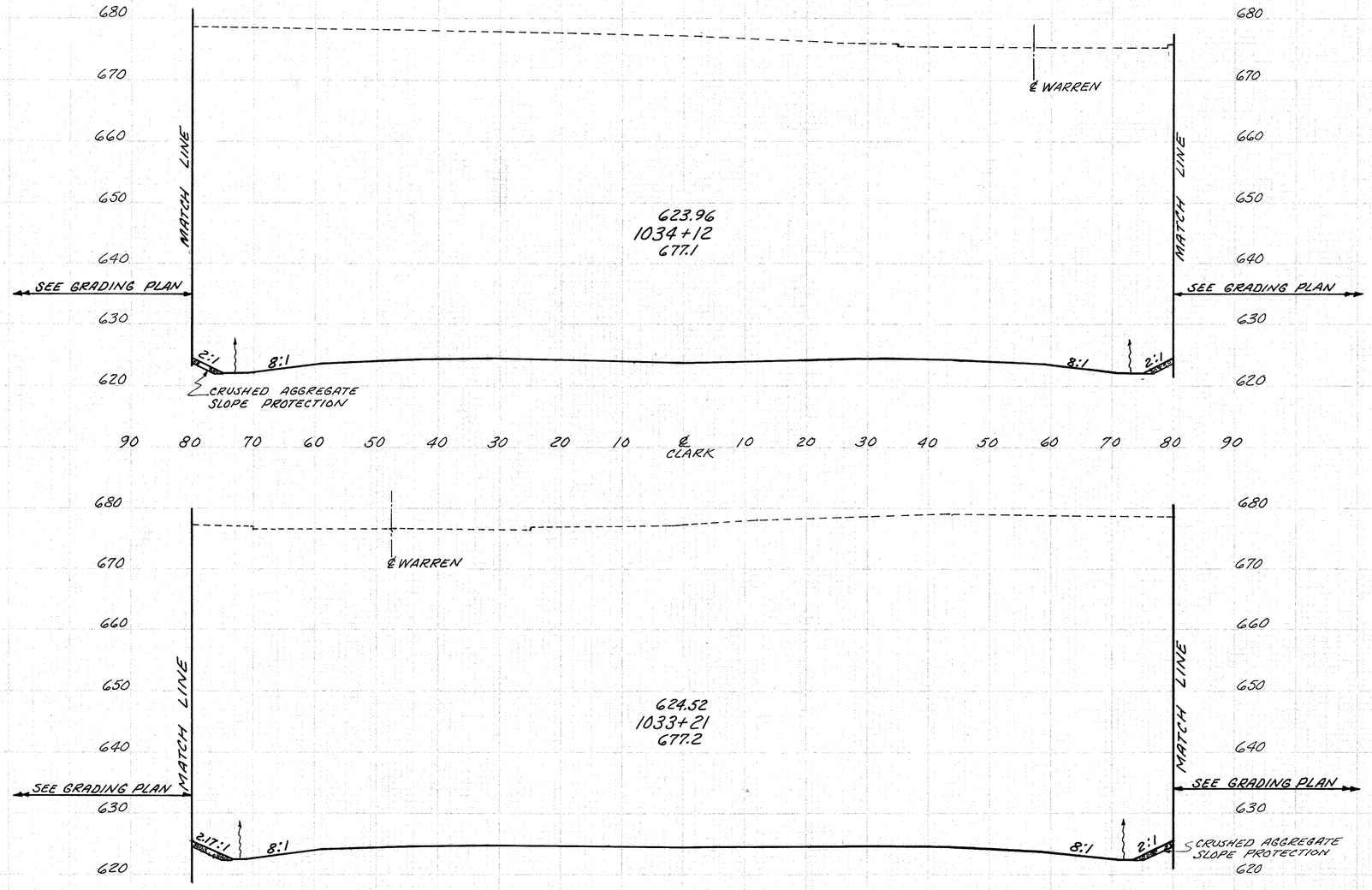
STA 1031+50 15965 0

CLARK STA 1032+28

RLH

55
198

CUYAHOGA COUNTY
CUY-21-14.12



150 1507 148 1555 153 STA 1032+28

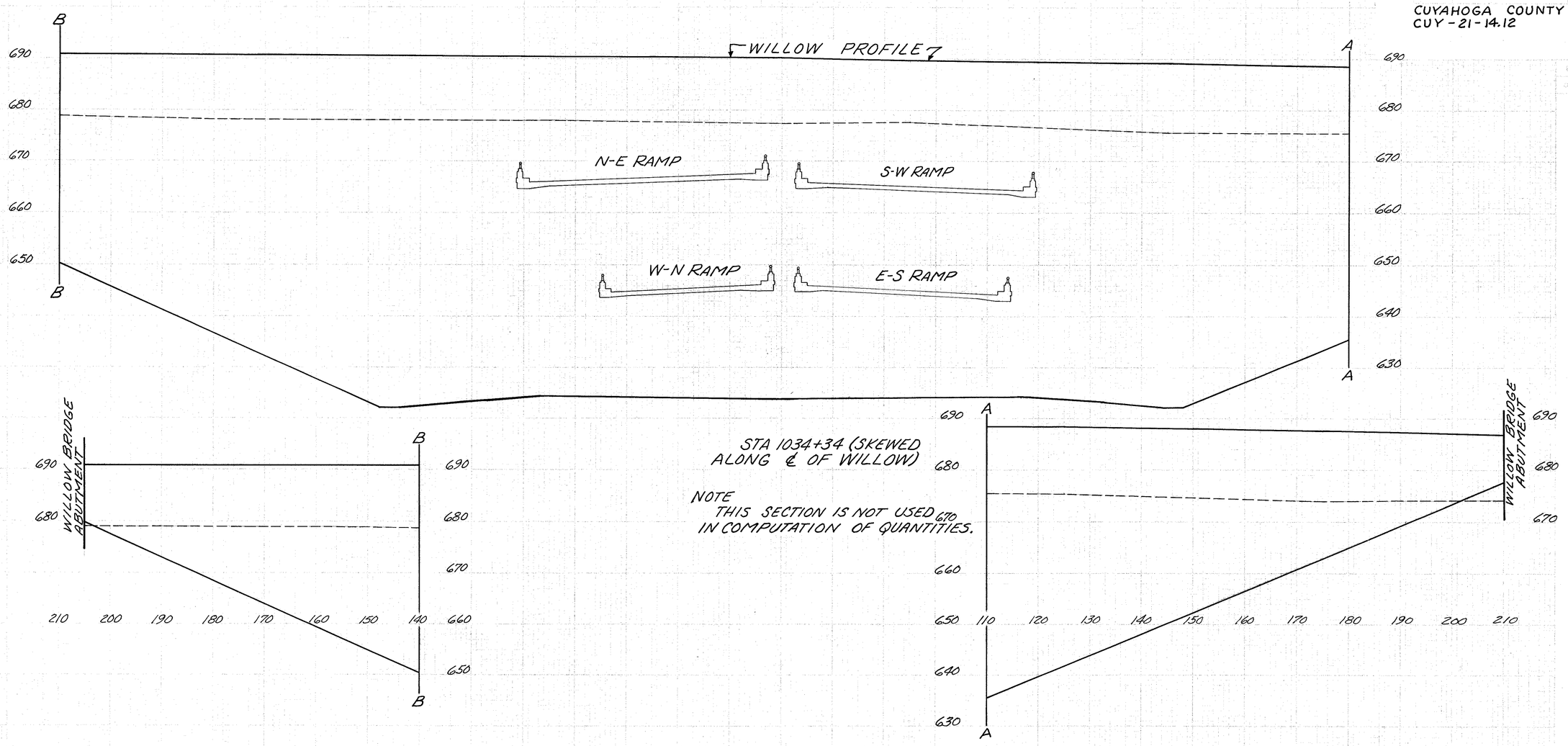
8526 0 28842 0 8589 0 29714 0 8664 0 STA 1032+28

CLARK STA 1033+21 TO STA 1034+12

RLH

1049

CUYAHOGA COUNTY
CUY-21-14.12



STA 1034+34 (SKEWED ALONG ℄ OF WILLOW)

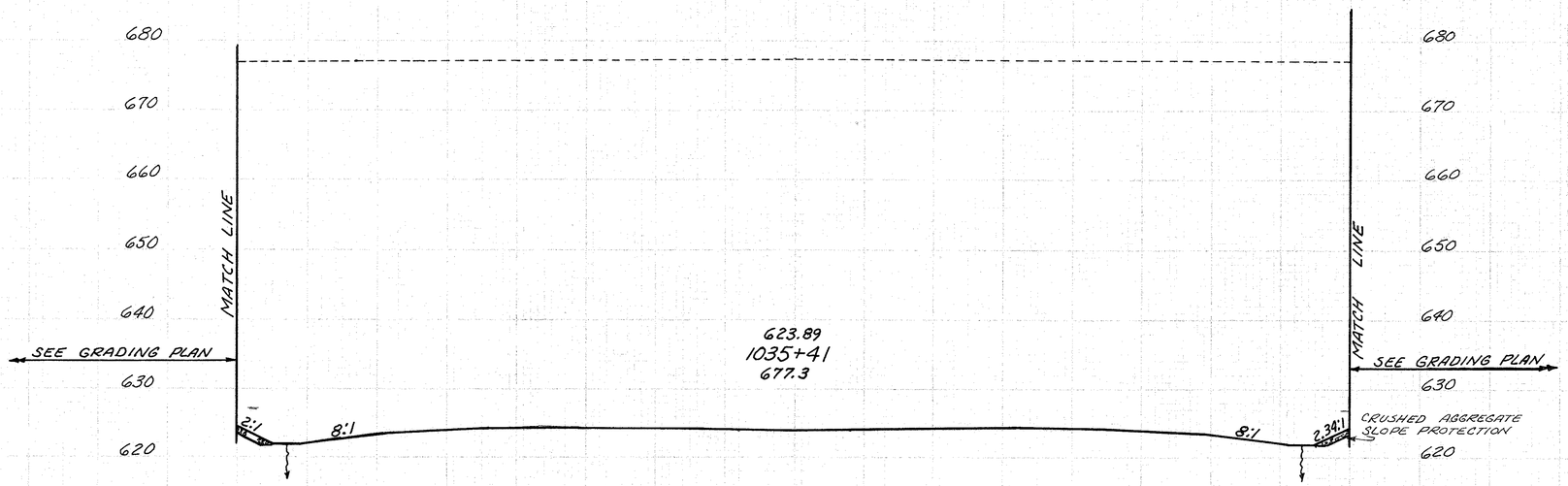
NOTE
THIS SECTION IS NOT USED IN COMPUTATION OF QUANTITIES.

CLARK STA 1034+34 SKEW

6669

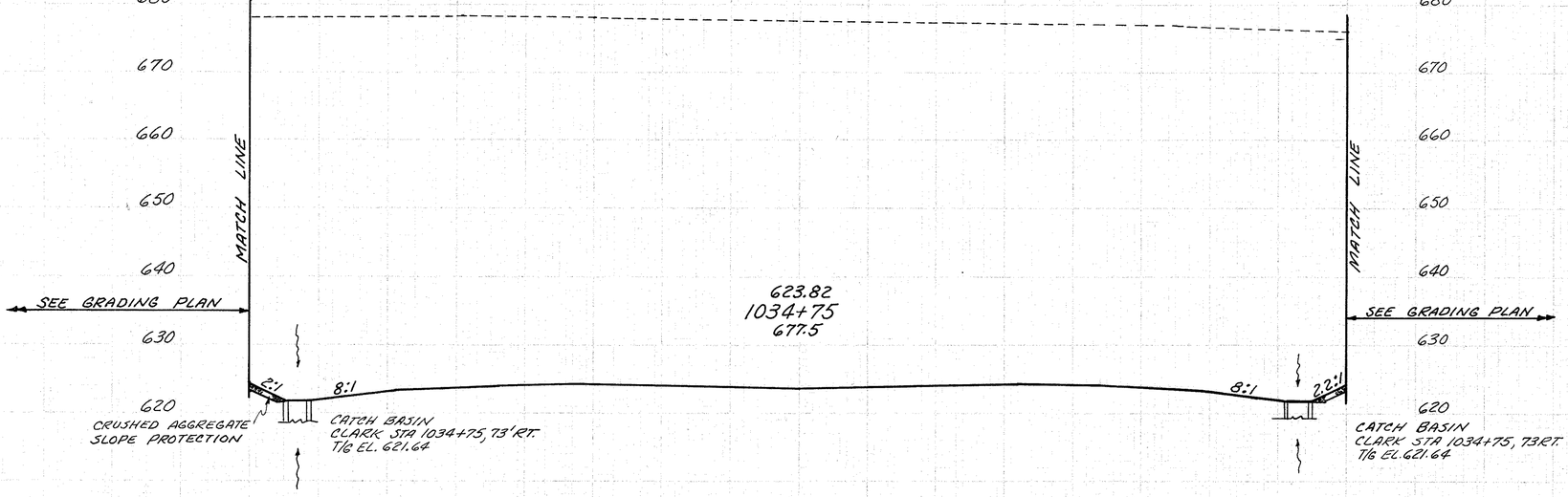
CUYAHOGA COUNTY
CUY-21-14.12

150



8576 0

1100



21034 0

150

8634 0

1050

20020 0

6402

150 STA 1034+12 BACK

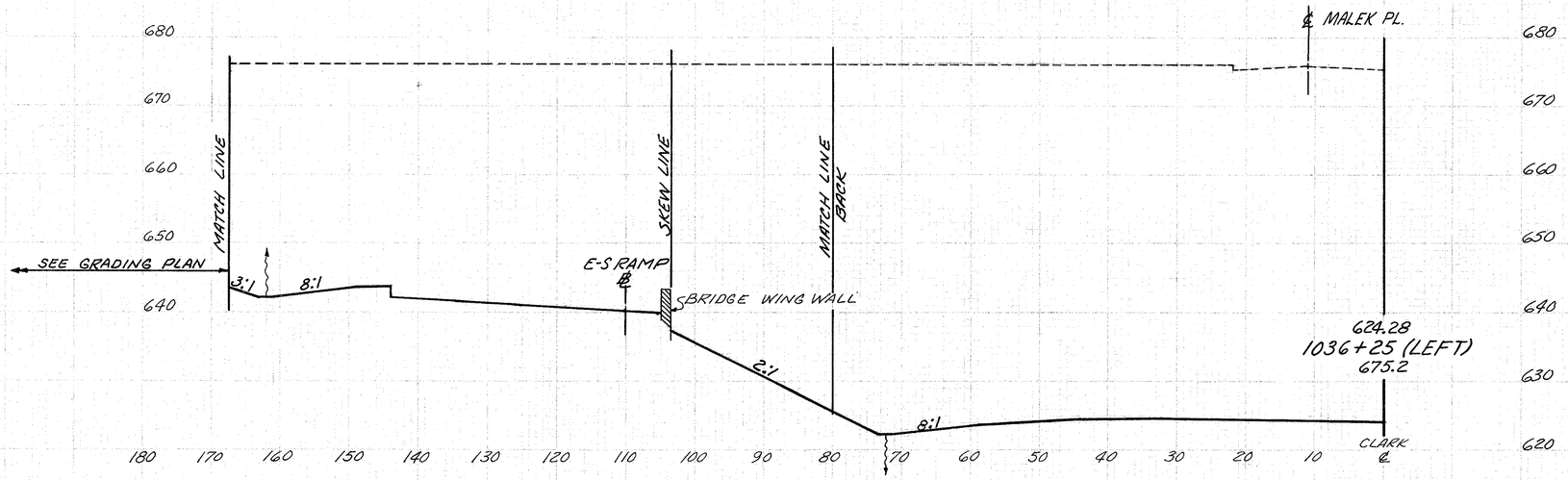
BACK STA 1034+12 8526 0

CLARK STA 1034+75 TO STA 1035+41

RLH

58
198

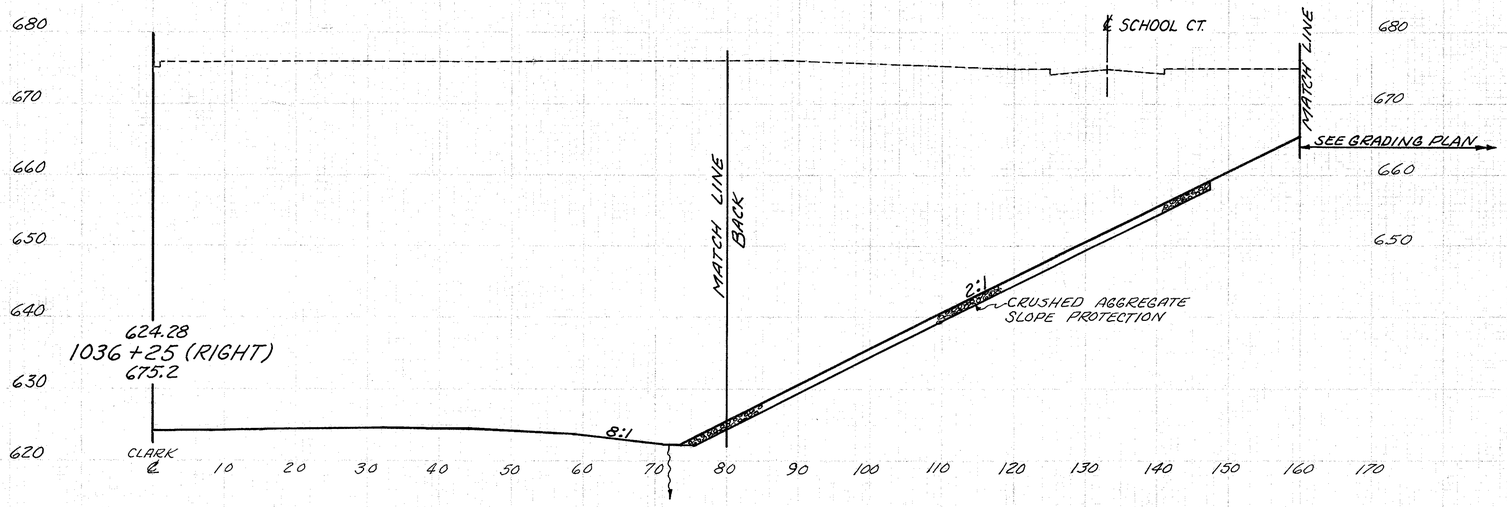
CUYAHOGA COUNTY
CUY-21-14.12



154 BACK

1419

150 STA 1035+41



8327 0 BACK

26294 0

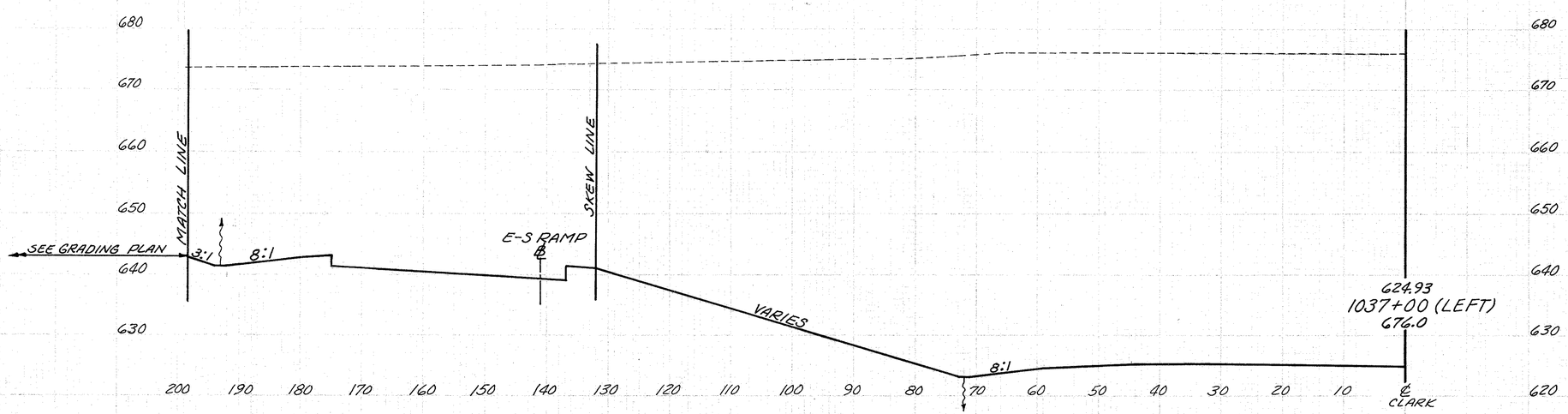
8576 0 STA 1035+41

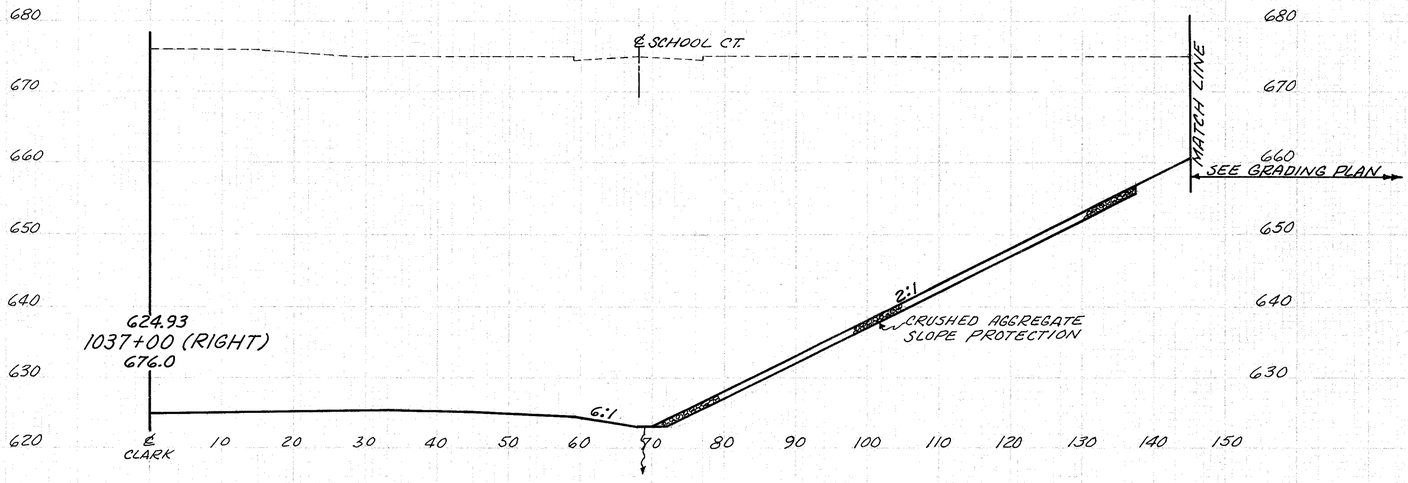
CLARK STA 1036+25

RLH

59
198

CUYAHOGA COUNTY
CUY-21-14.12





244 0

1925

218 STA 1036+25

13991 0

38811 0

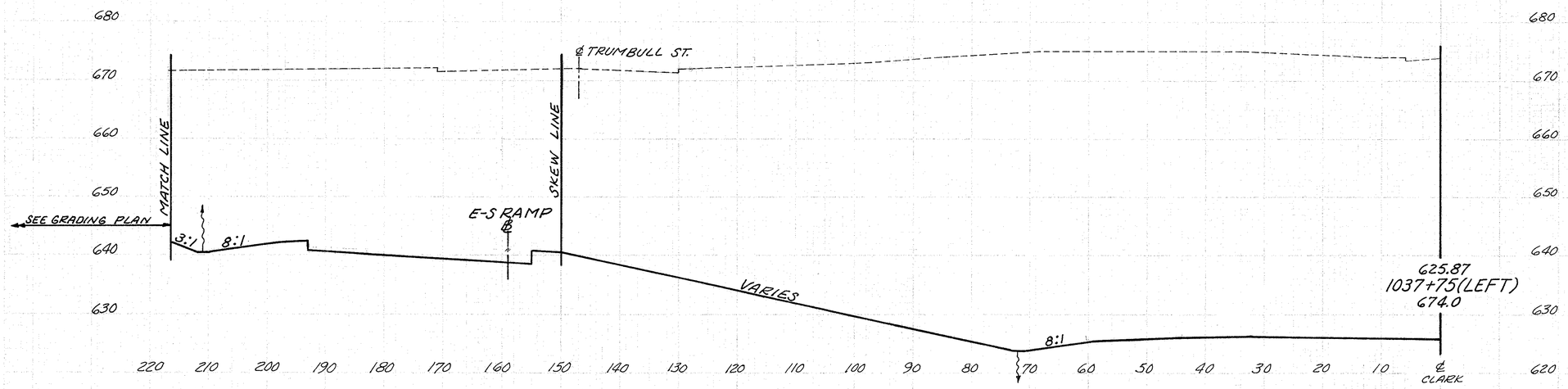
STA 1036+25 13953 0

CLARK STA 1037+00

RLH

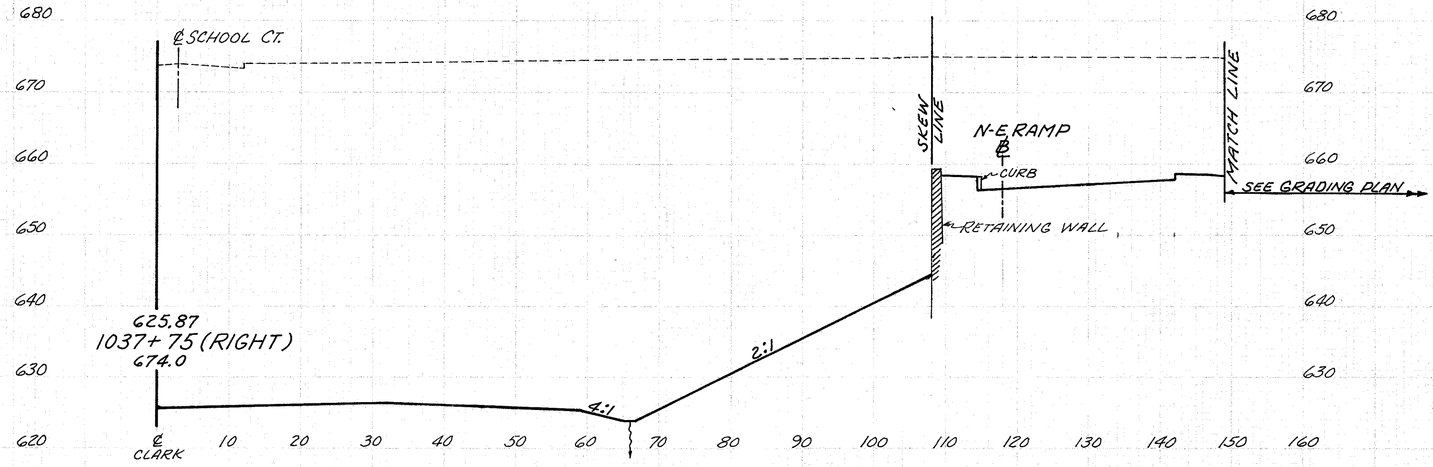
6394

CUYAHOGA COUNTY
CUY - 21 - 14.12



306

14374 0



2604
-235 DEDUCT AREA OF CRUSHED AGGREGATE SLOPE PROTECTION

39396 0

EST. ADJUSTMENT FOR SKEW & MATCH LINE ON THE N-E RAMP -247

319 STA 1037+00

STA 1037+00 13991 0

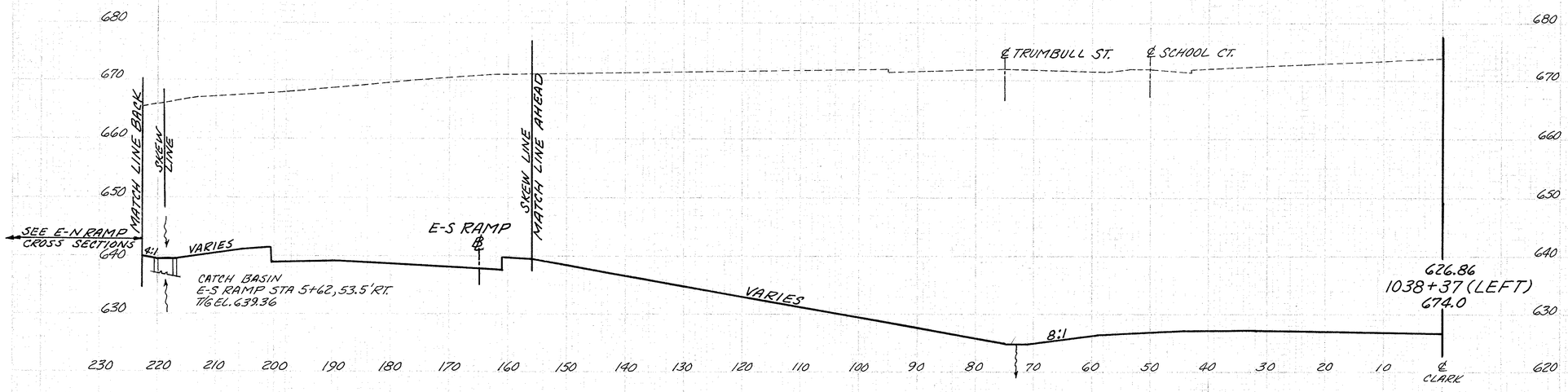
CLARK STA 1037+75

RLH

6395

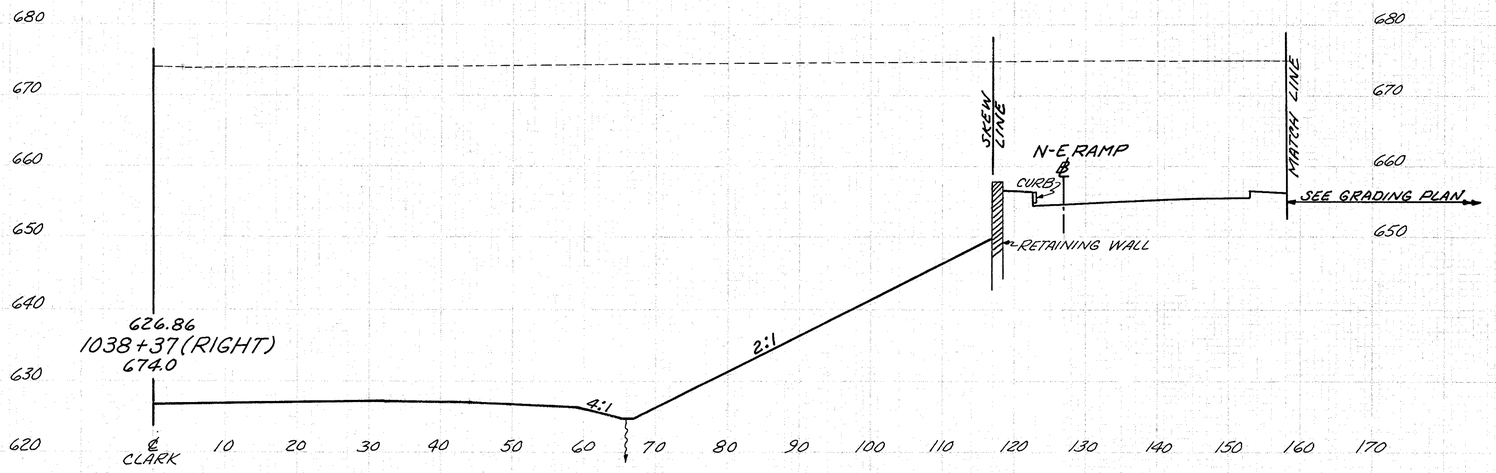
61
198

CUYAHOGA COUNTY
CUY - 21 - 14.12



324

14260



2170
+12 EST. ADJUSTMENT FOR CURVATURE E-3 RAMP

32876 0
EST. ADJUSTMENT FOR CURVATURE ON E-3 RAMP + 790 0

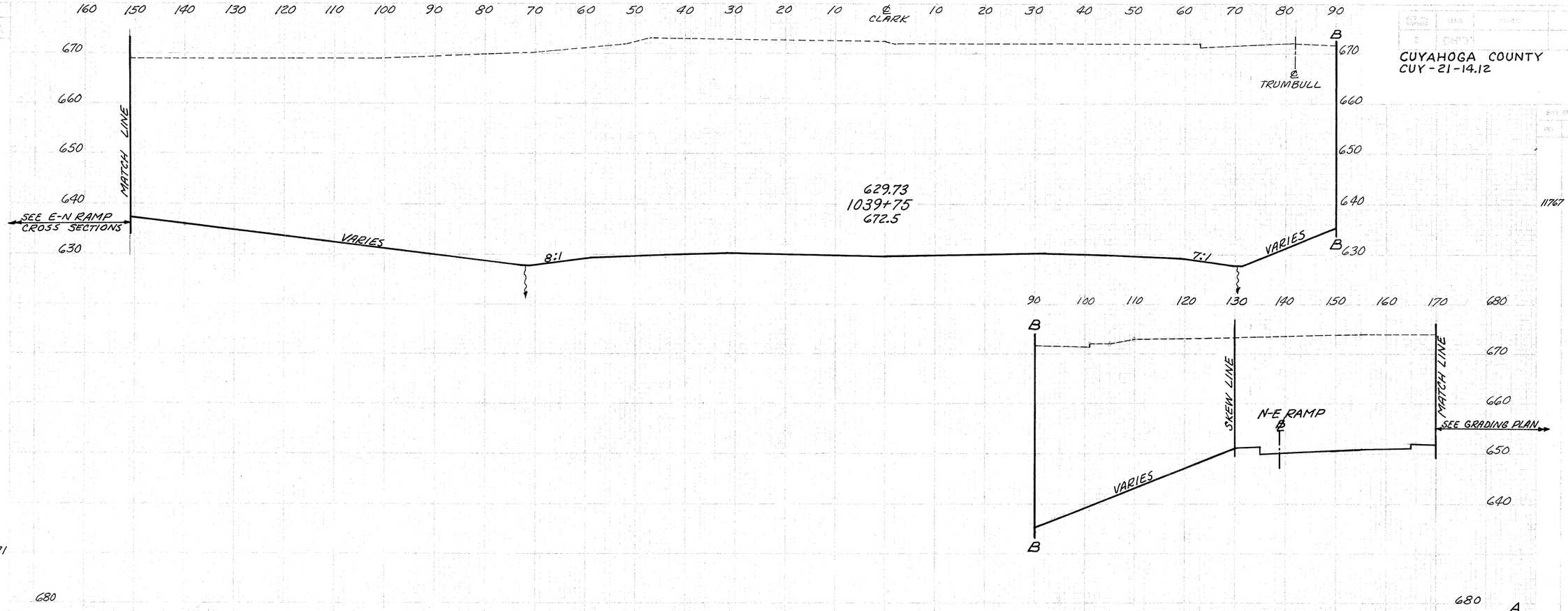
306 STA 1037+75

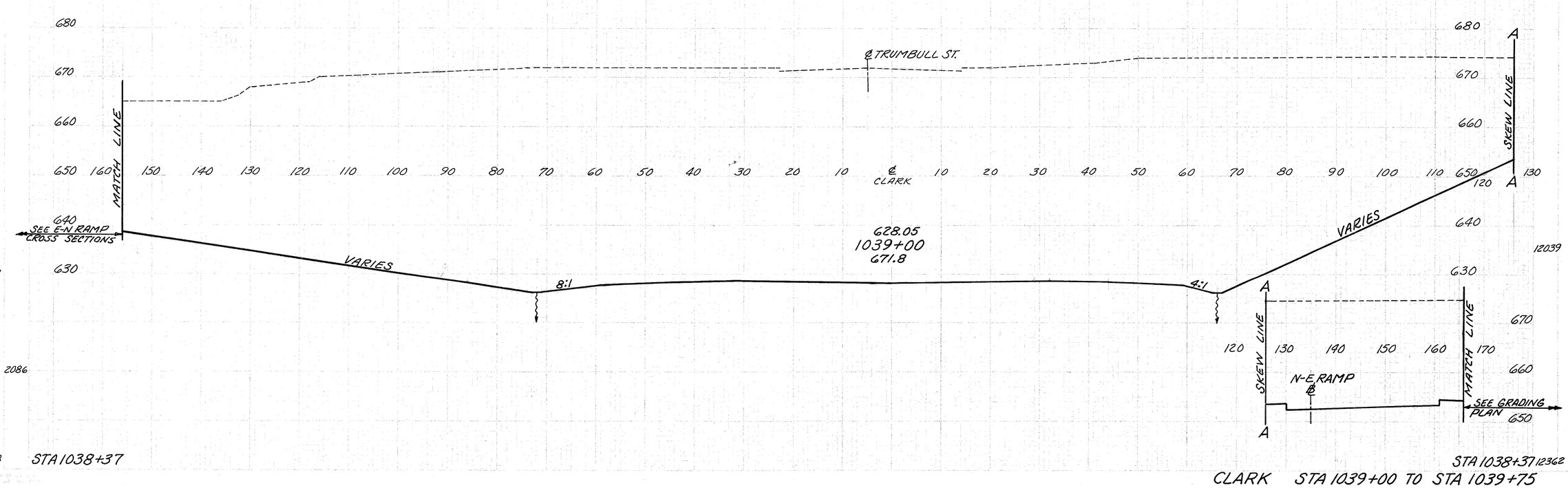
STA 1037+75 14374

CLARK STA 1038+37

RLH

9625





CUYAHOGA COUNTY
CUY-21-14.12

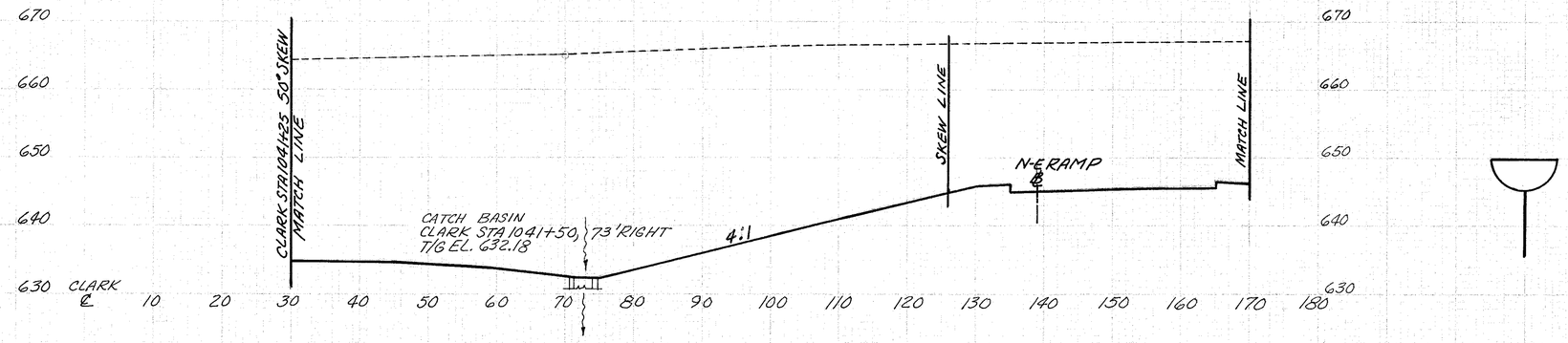
62
198

11767 0

NOTE AHEAD SEE S-E AND E-N RAMP CROSS SECTIONS

63
198

CUYAHOGA COUNTY
CUY-21-14.12

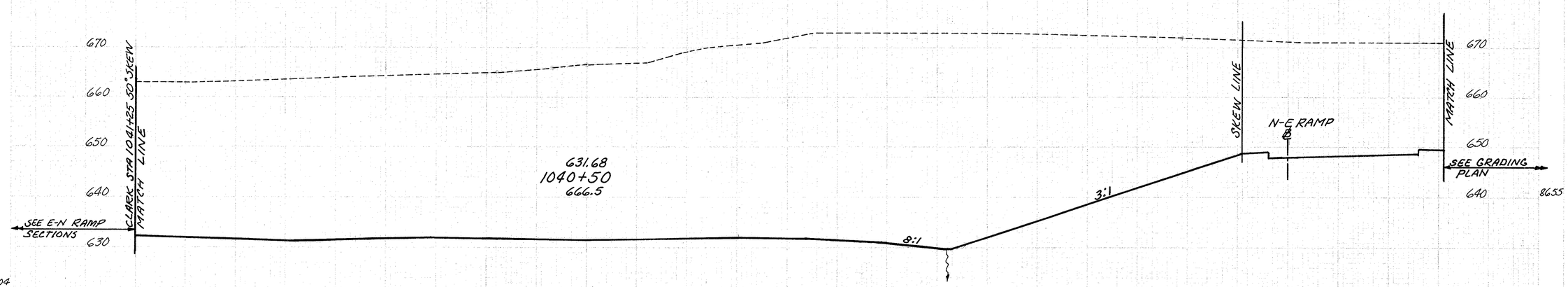


1041+50

112

3731

1922
+6 EST. ADJUSTMENT FOR CURVATURE N-E RAMP



234

2204
+80 ADJUSTMENT EXTRA AREA ON LEFT

295 STA 1039+75

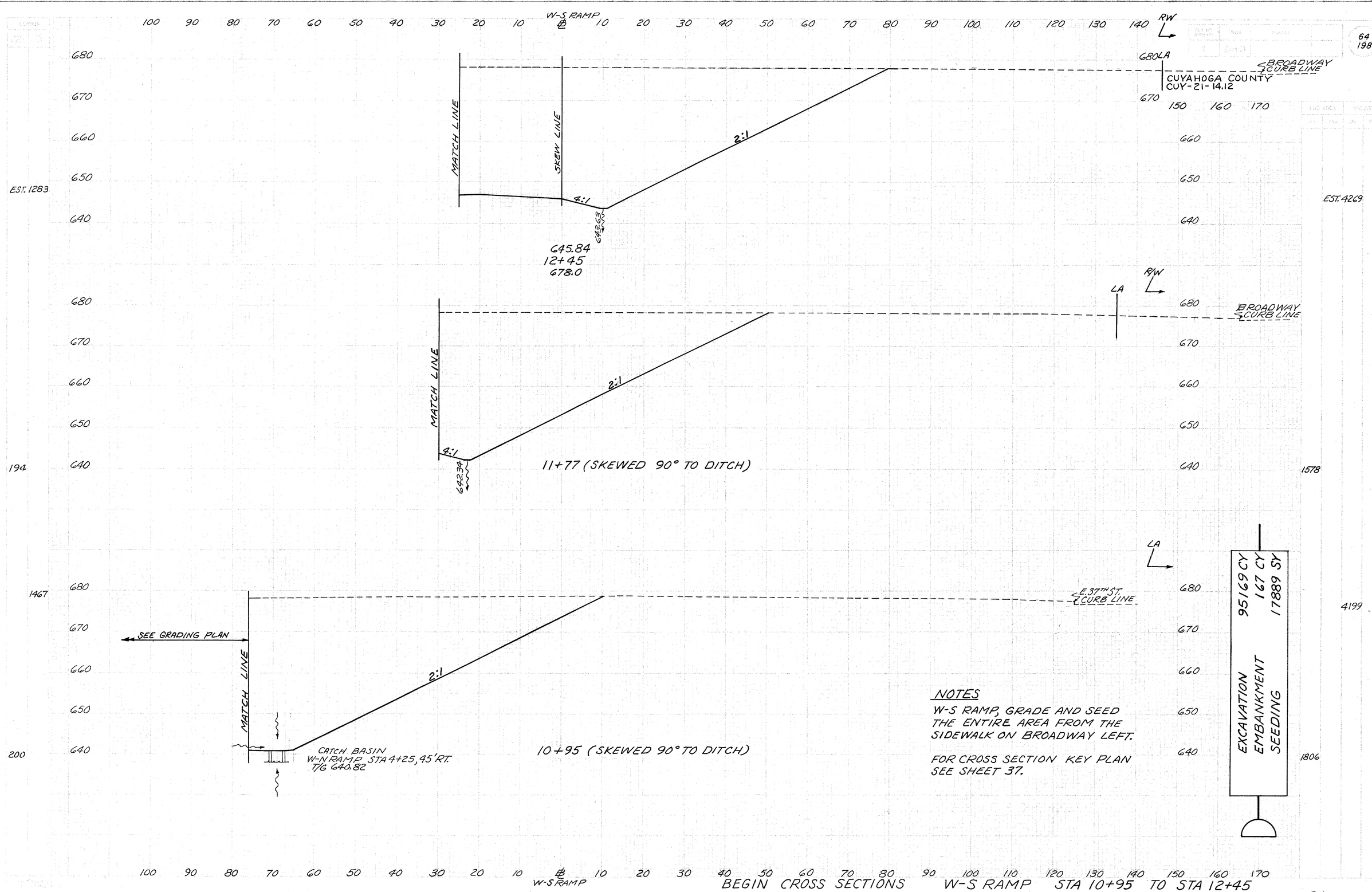
22937 0
EST. ADJUSTMENT FOR CURVATURE N-E RAMP +148 0
8655 0
28364 0
ADJUSTMENT EXTRA AREA ON LEFT + 778 0
STA 1039+75 11767 0

6369

END CROSS SECTIONS

CLARK STA 1040+50 TO STA 1041+50

RLH



NOTES

W-S RAMP, GRADE AND SEED THE ENTIRE AREA FROM THE SIDEWALK ON BROADWAY LEFT.

FOR CROSS SECTION KEY PLAN SEE SHEET 37.

BEGIN CROSS SECTIONS W-S RAMP STA 10+95 TO STA 12+45

RLH

CUYAHOGA COUNTY
CUY - 21 - 14.12

W-S RAMP

30 20 10 ℄ 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 R/W 160 170 180 190

184

925

186

1149

190

EST. 487

EST. 890

STA 12+45

680 670 660 650

MATCH LINE

649.44
14+00
677.0

8:1

3:1

LA

BROADWAY
℄ CURB LINE

2765 13

4733 16

℄ CURB

648.40
13+55
677.0

DITCH TRANSITION
4' TO 2' IN 50'

647.12
13+00
677.2

2.5:1

CATCH BASIN
STA 13+00, 29 RT
T/G EL. 644.52

2940 0

5963 6

R/W

SEE GRADING PLAN

DITCH TRANSITION
2' TO 4' IN 50'

646.70
12+82
677.6

644.58

SKEW LINE

2:1

680 670 660 650 640

EST. 1957 0

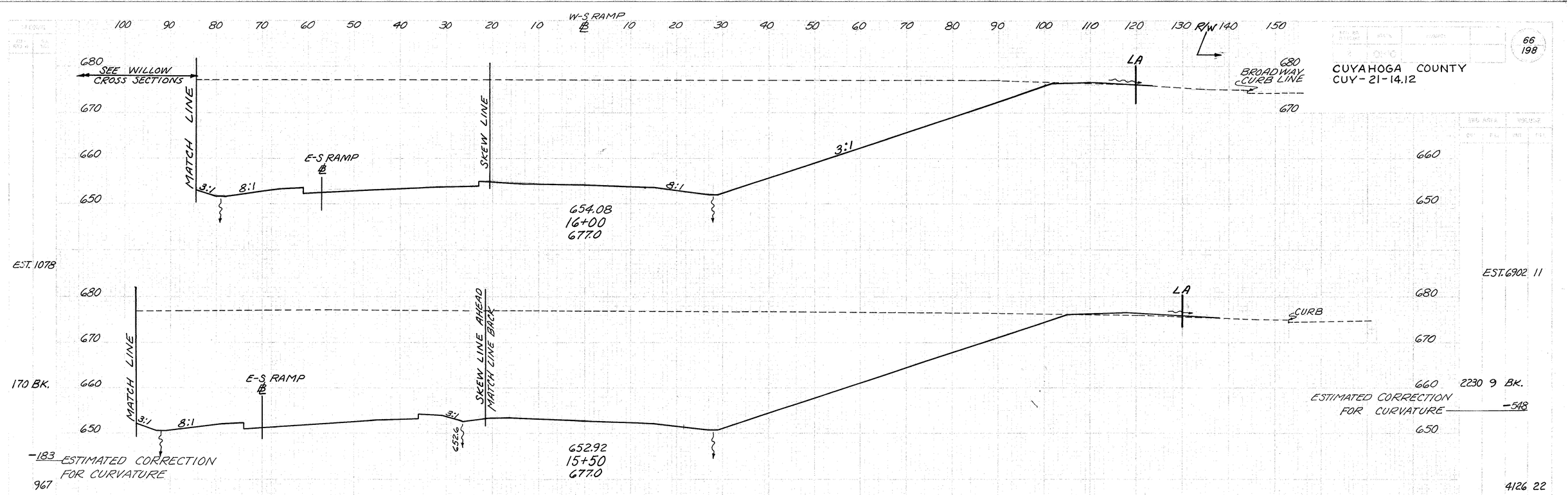
EST. 3832

6372

STA 12+45

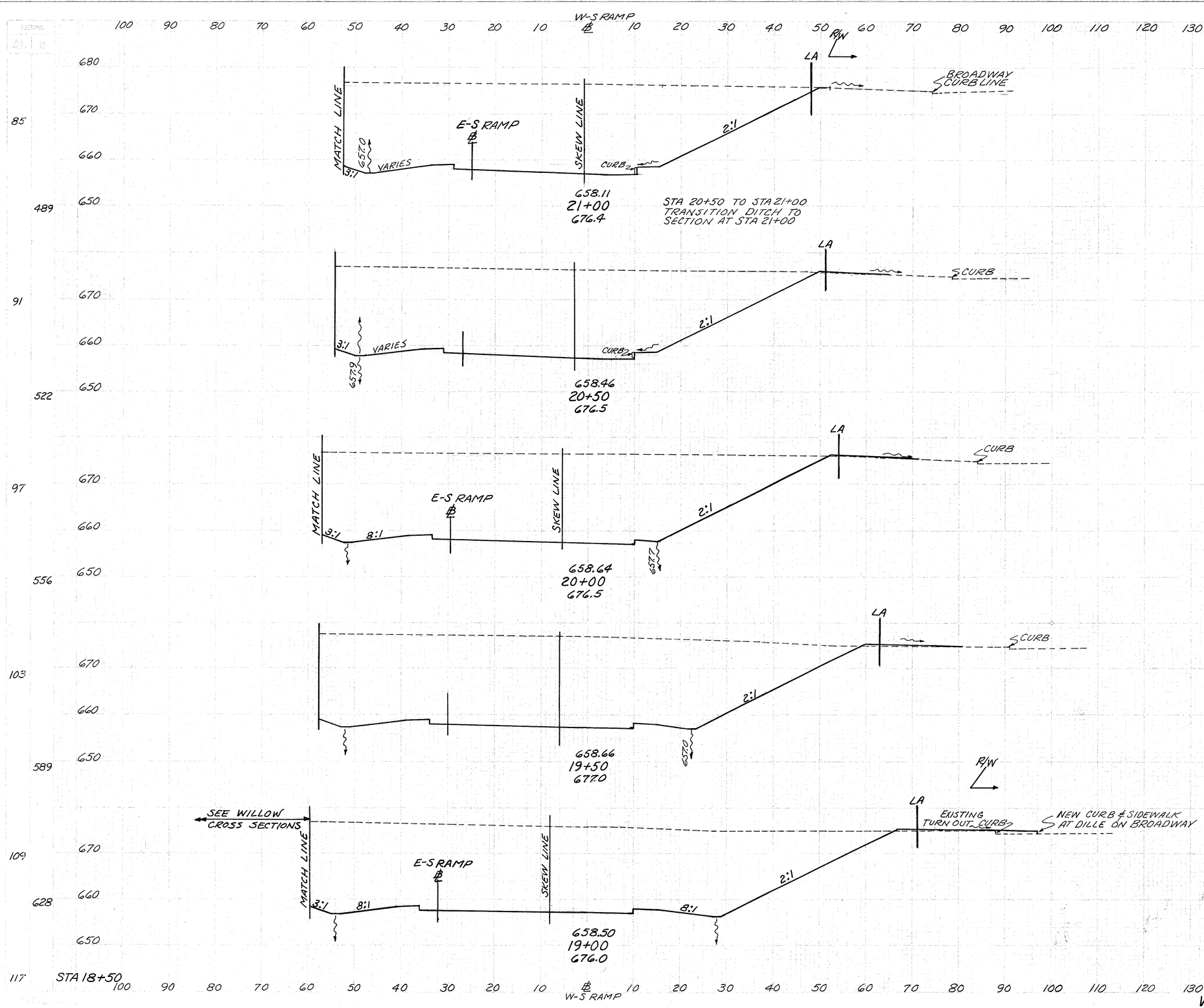
30 20 10 ℄ W-S RAMP 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190

W-S RAMP STA 12+82 TO STA 14+00


100 90 80 70 60 50 40 30 20 10 ℄ W-S RAMP 10 20 30 40 50 60 70 80 90 100 110 120 130 R/W 140 150
680
670
660
650
SEE WILLOW CROSS SECTIONS
MATCH LINE
3:1
8:1
E-S RAMP ℄
SKEW LINE
8:1
3:1
654.08
16+00
677.0
LA
680
BROADWAY CURB LINE
670
CUYAHOGA COUNTY
CUY-21-14.12
660
650
EST. 1078
680
670
170 BK.
660
650
MATCH LINE
3:1
8:1
E-S RAMP ℄
SKEW LINE AHEAD
MATCH LINE BACK
3:1
652.6
652.92
15+50
677.0
LA
CURB
EST. 6902 11
680
670
660 2230 9 BK.
ESTIMATED CORRECTION FOR CURVATURE -548
650
-183 ESTIMATED CORRECTION FOR CURVATURE
967
4126 22
680
670
178
660
650
GEAUGA ST. CURB LINE
651.76
15+00
677.0
LA
CURB
680
670
660 2926 15
650
1005
R/W
4688 31
680
LA
BROADWAY CURB LINE
SEE GRADING PLAN
670
MATCH LINE
184
660
3:1
8:1
650
1020
650.60
14+50
677.0
680
670
660 2637 19
650
5002 30
184 STA 14+00 100 90 80 70 60 50 40 30 20 10 ℄ W-S RAMP 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 STA 14+00 2765 13
W-S RAMP STA 14+50 TO STA 16+00
RLH


CUYAHOGA COUNTY
CUY-21-14.12
67
198
W-S RAMP
℄ DILLE
℄ CURB
BROADWAY ℄ CURB LINE
R/W
LA
MATCH LINE
SKEW LINE
E-S RAMP ℄
3:1
8:1
2:1
2.5:1
658.18
18+50
673.6
657.69
18+00
674.7
657.04
17+50
676.2
656.21
17+00
677.0
654.96
16+38.21
677.0
SEE WILLOW CROSS SECTIONS
117
660
121
690
127
EST. 726
EST. 937
EST. 750
1846 2
3661 7
2108 6
4294 6
2530 0
EST. 4928
EST. 7034
EST. 4637 3
6374
STA 16+00
W-S RAMP STA 16+38.21 TO STA 18+50
RLH

CUYAHOGA COUNTY
CUY-21-14.12



680			
670			
660	1574	0	
650			
	2940	0	
DEDUCT EST. VOLUME AT EXIST. MANHOLE SEE PLAN		-	96
670			
660	1601	0	
650			
	3041	0	
670			
660	1682	0	
650			
	3317	6	
670			
660	1900	6	
650			
	3604	13	
670			
660	1992	8	
650			
	3554	9	
	1846	2	

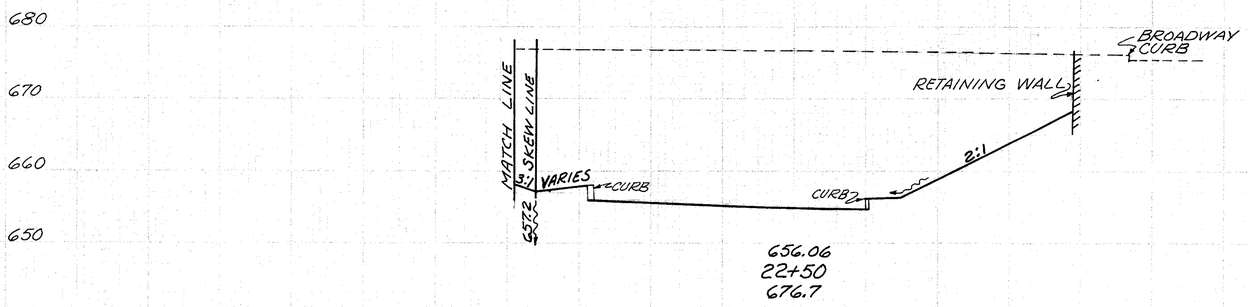
6375

RLH

CUYAHOGA COUNTY
CUY-21-14.12

80 70 60 50 40 30 20 10 ℄ W-S RAMP 10 20 30 40 50 60 70 80 90 100

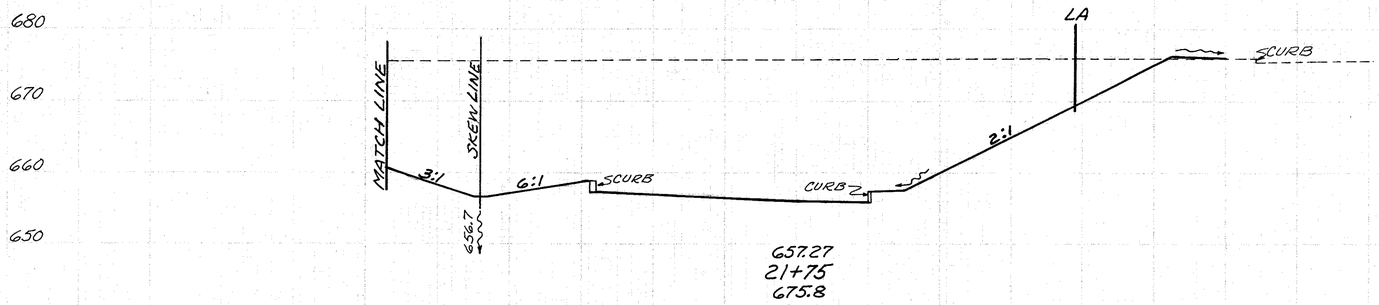
NOTE
FOR CONTINUATION SEE WILLOW CROSS SECTIONS



656.06
22+50
676.7

EST 532

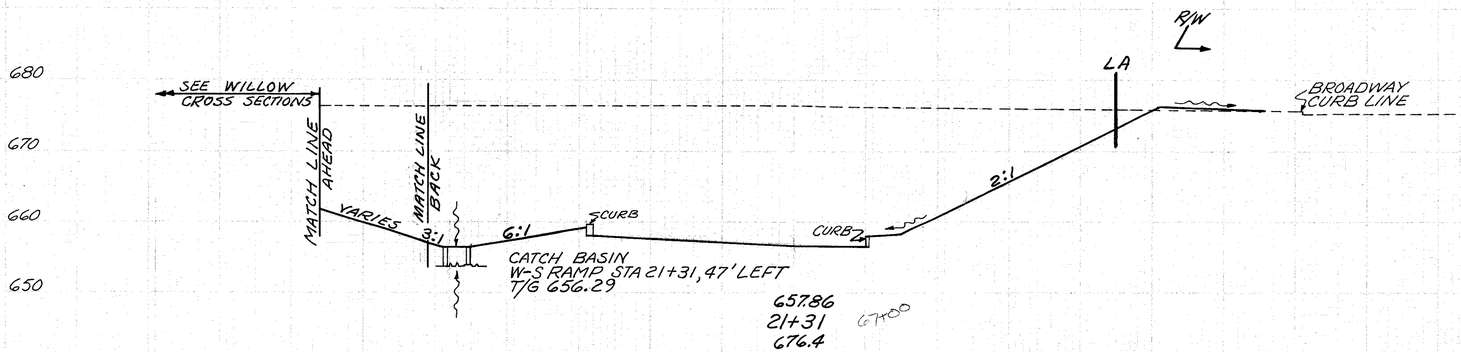
EST. 4472 1



657.27
21+75
675.8

EST 438

EST. 2843 4



657.86
21+31
676.4

80 BK.

284

1591 4 BK.

1817 2

6376

85' STA 21+00

80 70 60 50 40 30 20 10 ℄ W-S RAMP 10 20 30 40 50 60 70 80 90 100

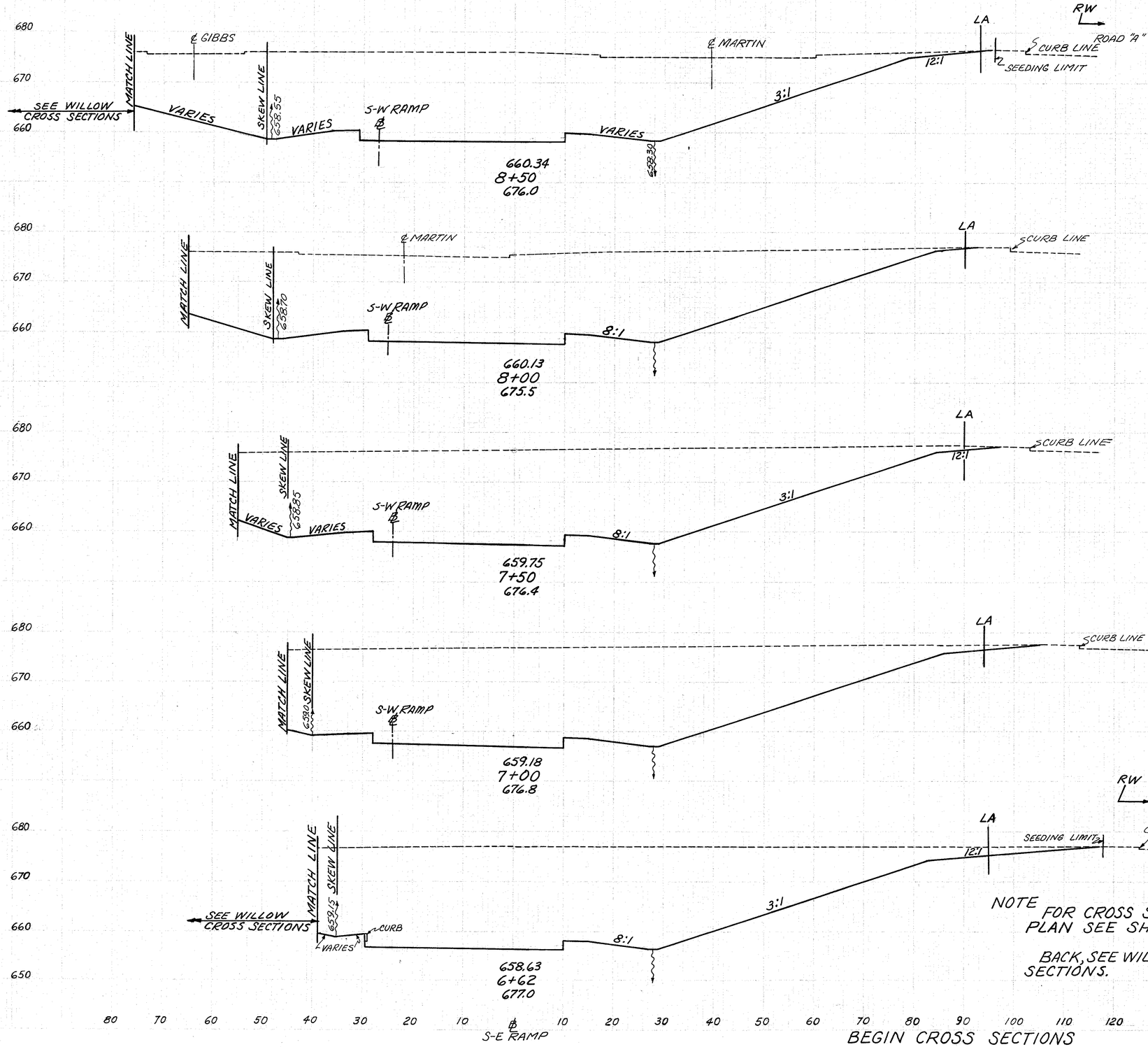
STA 21+00 1574 0

END CROSS SECTIONS W-S RAMP STA 21+31 TO STA 22+50

CUYAHOGA COUNTY
CUY-21-14.12

S-E RAMP

80 70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80 90 100 110 120 130 140



2124	0
3856	0
2040	0
3808	0
2073	0
3812	0
2044	0
2844	0
1997	0

EXCAVATION	94376 C.Y.
EMBANKMENT	0 C.Y.
SEEDING	16762 S.Y.

NOTE
FOR CROSS SECTION KEY PLAN SEE SHEETS 37 & 39.

BACK, SEE WILLOW CROSS SECTIONS.

80 70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80 90 100 110 120 130 140
S-E RAMP

BEGIN CROSS SECTIONS S-E RAMP STA 6+62 TO STA 8+50

RLH

6377

CUYAHOGA COUNTY
CUY-21-14.12

S-E RAMP ℄

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80 90 100

680
670
660
650

MATCH LINE BACK
SEE WILLOW CROSS SECTIONS BACK
VARIES
SKEW LINE
3:1
8:1
S-W RAMP ℄
AHEAD SEE WILLOW CROSS SECTIONS
AHEAD MATCH LINE SKEW LINE BACK
659.01
10+75.47
675.0
8:1
2:1
18:1
LA
110 RW 120 130 140
WARREN CURB LINE
SEEDING LIMIT

176

2919 0

680
670
660
650

MATCH LINE
VARIES
SKEW LINE
3:1
6:1
S-W RAMP ℄
SKEW LINE
CATCH BASIN
S-W RAMP STA 3+19, 23' LEFT
T/G EL. 657.85
659.86
10+00
676.0
2.5:1
24:1
LA
SEEDING LIMIT

1685

8003 0
RD "A" ℄ CURB

226

2807 0

680
670
660
650

MATCH LINE
VARIES
SKEW LINE
℄ 658.25
VARIES
S-W RAMP ℄
SKEW LINE
660.20
9+50
676.0
8:1
3:1
18:1
LA
℄ CURB LINE
ROAD "A"

1153

5035 0

189

2631 0

680
670
660
650

MATCH LINE
SEE WILLOW CROSS SECTIONS
GIBBS CURB LINE
VARIES
SKEW LINE
℄ 658.40
VARIES
S-W RAMP ℄
SKEW LINE
660.36
9+00
676.0
VARIES
℄ 658.30
3:1
12:1
LA
RW
MARTIN CURB LINE
℄ CURB LINE
ROAD "A"
SEEDING LIMIT

955

4584 0

155

2320 0

800

4115 0

133

STA 8+50 2124 0

STA 8+50

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80 90 100 110 120 130 140

S-E RAMP

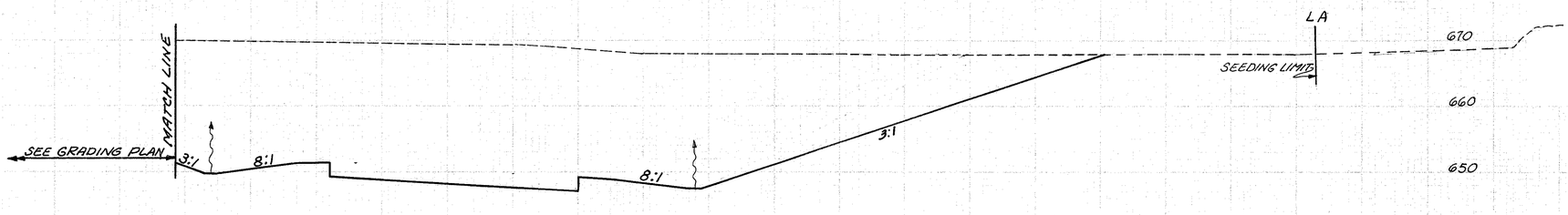
S-E RAMP STA 9+00 TO STA 10+75.47

RLH

6378

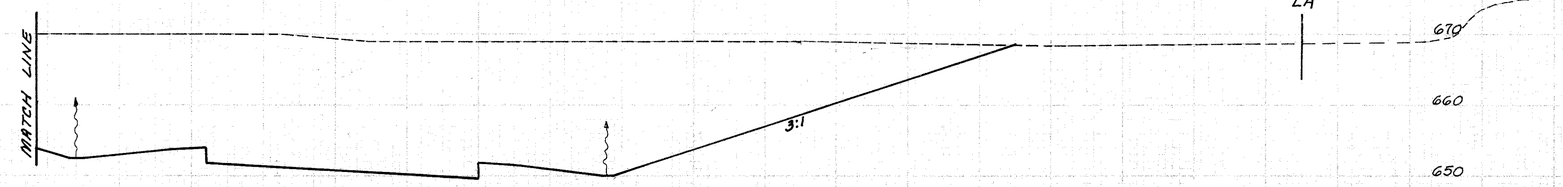
S-E RAMP

100 90 80 70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80 90 100 110 120



649.85
14+25
669.5

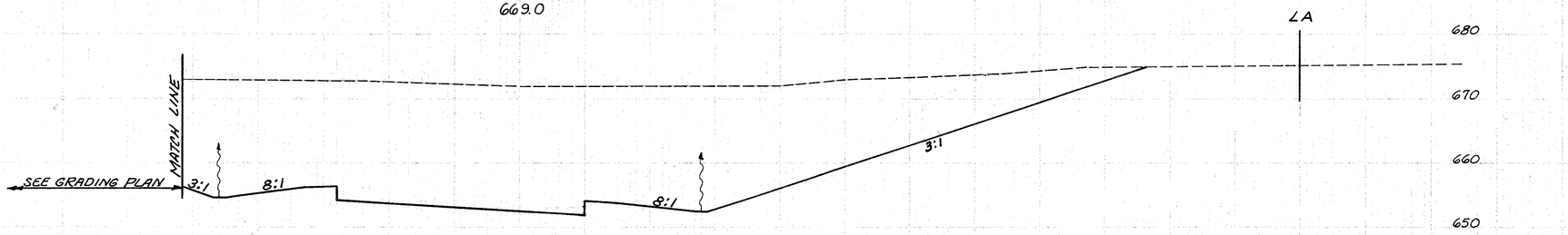
140



652.40
13+50
669.0

1171

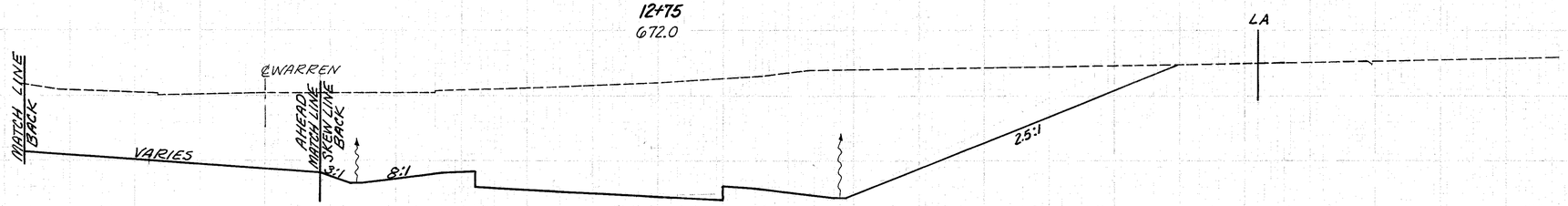
141



654.75
12+75
672.0

1162

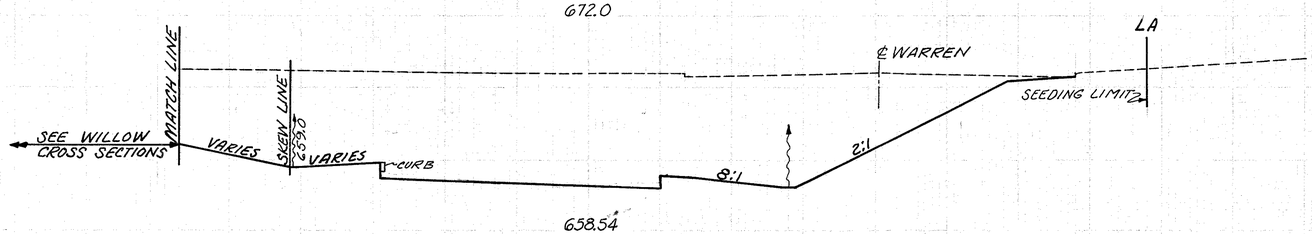
138



656.68
12+00
672.0

1033

110 AHEAD
155 BACK



658.54
11+40
672.0

850

100

678

89

STA 10+75.47

100 90 80 70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80 90 100 110 120

S-E Ramp

CUYAHOGA COUNTY
CUY-21-14.12

72
198

	AREA		VOLUME	
	CUT	FILL	CUT	FILL
			2300	0
			5960	0
			1991	0
			5754	0
			2152	0
			5481	0
			1794	0 AHEAD
			2286	0 BACK
			4152	0
			1453	
			3425	0
			1413	0

STA 10+75.47

S-E RAMP STA 11+40 TO STA 14+25

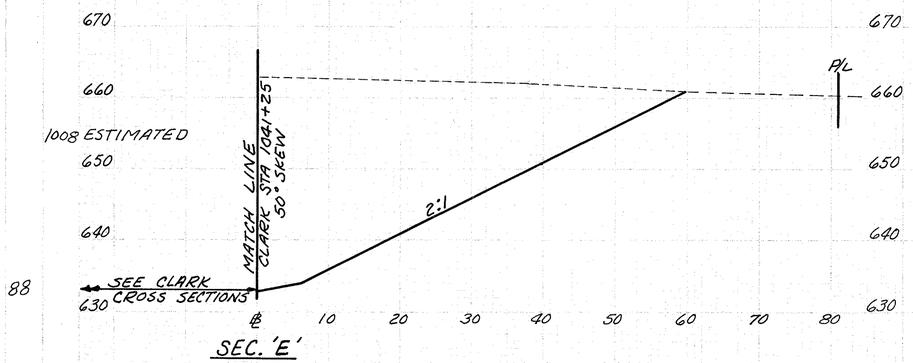
RLH

6379

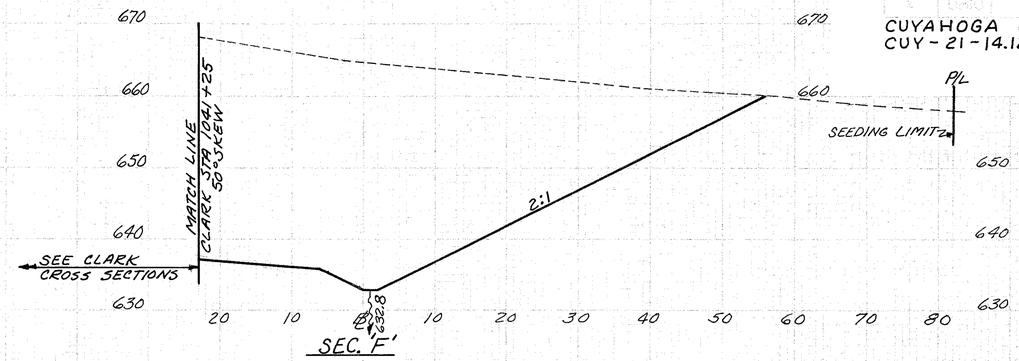

73
198
CUYAHOGA COUNTY
CUY-21-14.12
S-E RAMP ℄
NOTE
AHEAD, SEE E-N RAMP CROSS SECTIONS
CLARK STA 1041+25 50° SKEW MATCH LINE
SKEW LINE
VARIES
2:1 SKEW
8:1
2:1
SEEDING LIMIT
LA
CATCH BASIN
S-E RAMP STA 17+00, 29' RIGHT
T/G EL. 639.25
641.90
17+00
665.5
1411 ESTIMATED
ESTIMATED 10627 0
BUILDING
N-E RAMP ℄
SEE CLARK CROSS SECTIONS
AHEAD SKEW LINE MATCH LINE BACK
4:1
CATCH BASIN
S-E RAMP STA 16+50, 44' LEFT
T/G EL. 642.00
642.82
16+50
666.0
246 AHEAD
136 BACK
6527 0 AHEAD
2809 0 BACK
CLARK STA 1041+25 50° SKEW MATCH LINE AHEAD
CATCH BASIN
CLARK STA 1041+50, 73' RIGHT
T/G EL. 632.18
1242
9142 0
MATCH LINE AHEAD
MATCH LINE BACK
VARIES
3:1
CURB
STA. 15+40 — 2:1 SLOPE
644.79
15+75
668.3
162 AHEAD
109 BACK
3773 0 AHEAD
2591 0 BACK
992
7091 0
SEEDING LIMIT
MATCH LINE
SEE GRADING PLAN
8:1
2.5:1
STA. 14+65 — 3:1 SLOPE
647.3
15+00
669.0
129
1121
140
2515 0
6687 0
2300 0
STA 14+25
STA 14+25
END CROSS SECTIONS
S-E RAMP STA 15+00 TO STA 17+00
RLH
6380

74
198

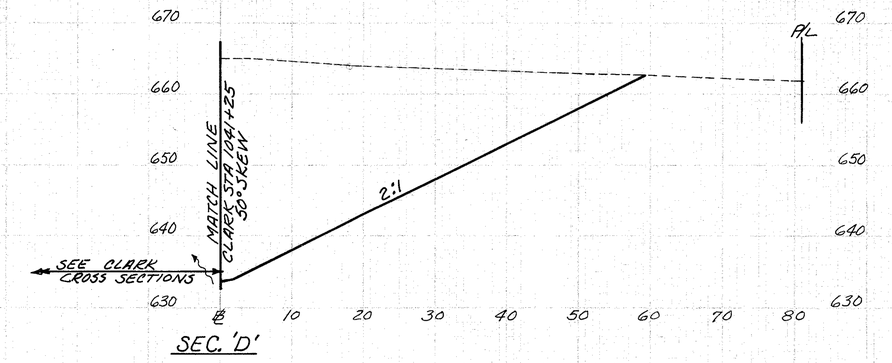
CUYAHOGA COUNTY
CUY - 21 - 14.12



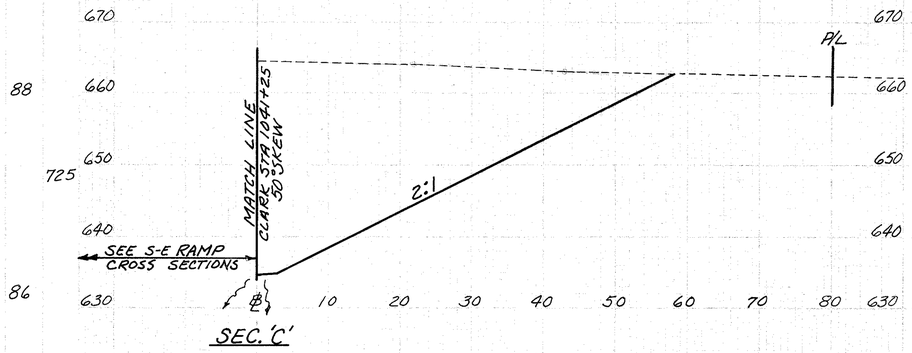
SEC. 'E'



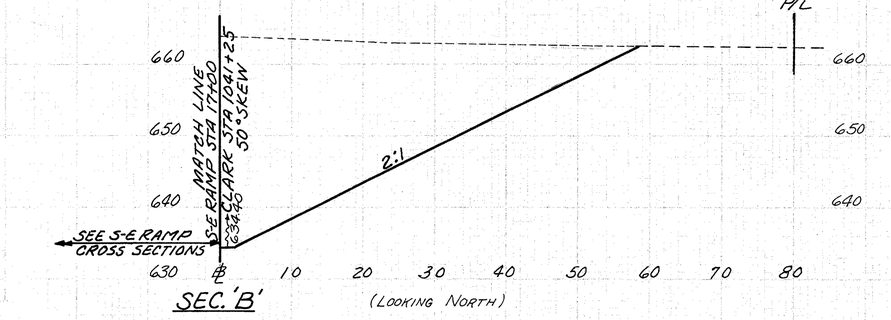
SEC. 'F'



SEC. 'D'

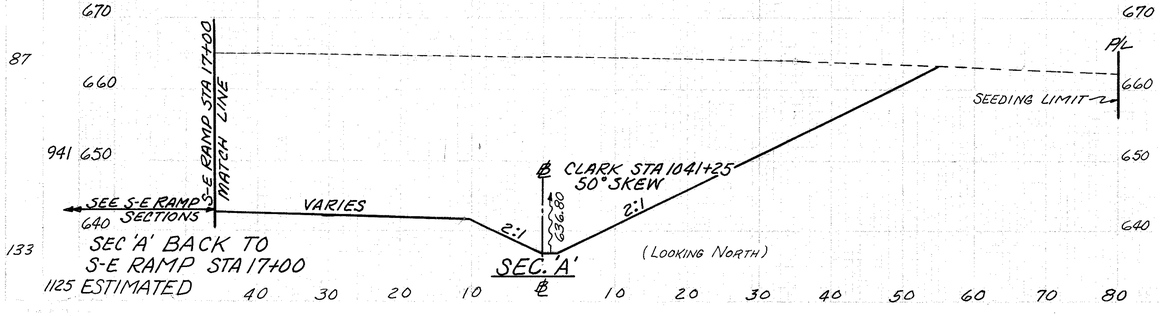


SEC. 'C'



SEC. 'B'

(LOOKING NORTH)



SEC 'A' BACK TO
S-E RAMP STA 17+00
1125 ESTIMATED

SEC. 'A'

(LOOKING NORTH)

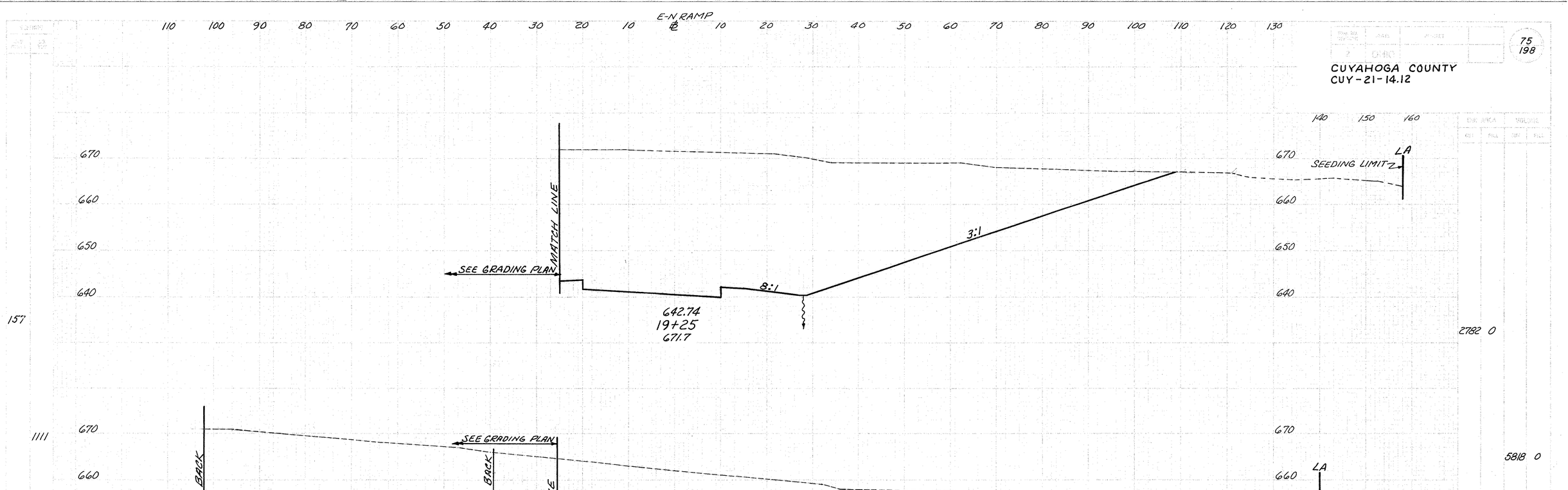
NOTE
FOR CROSS SECTION KEY
PLAN SEE SHEETS 38 & 39

	EXCAVATION	EMBANKMENT	SEEDING
SEC 'A' BACK TO S-E RAMP STA 17+00 ESTIMATED	79264 C.Y.	39 C.Y.	22429 S.Y.

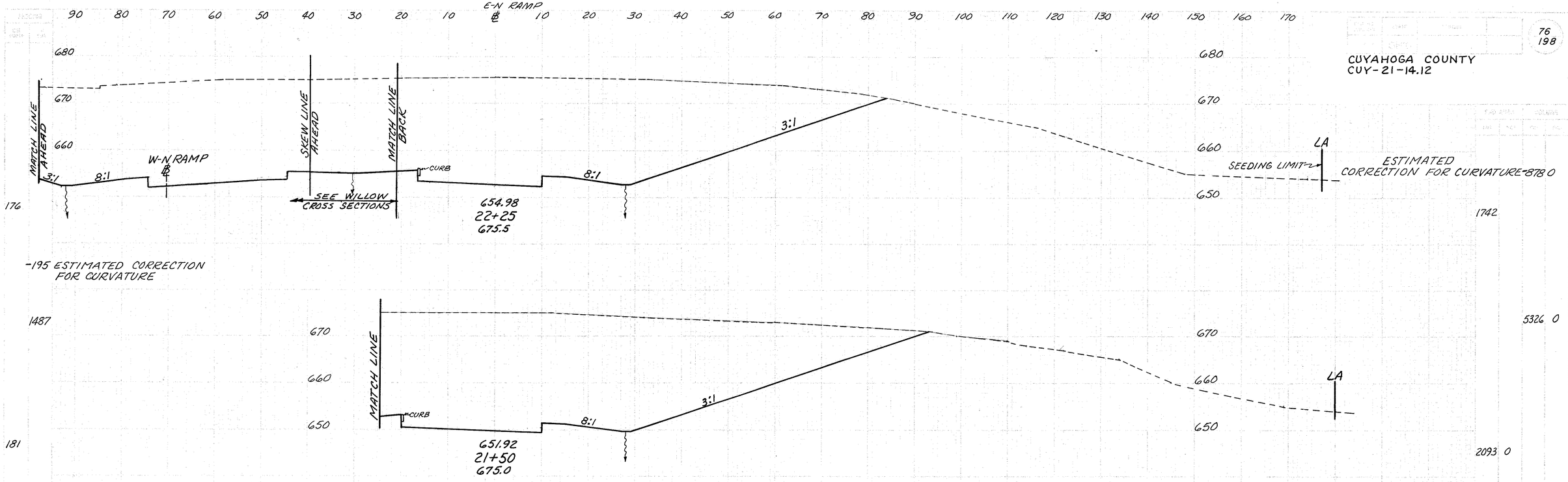
BEGIN CROSS SECTIONS E-N RAMP SEC. 'A' TO SEC. 'F'

RLH

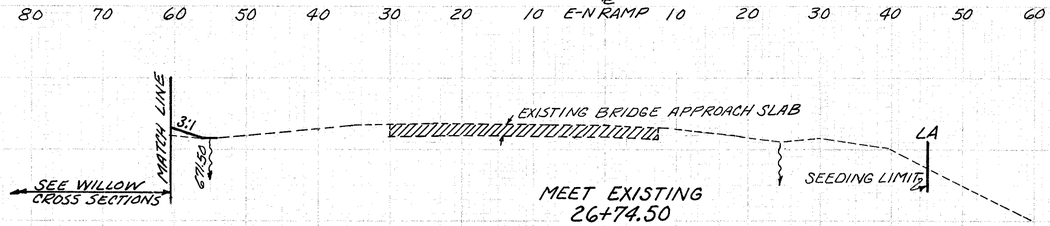
CUYAHOGA COUNTY
CUY-21-14.12

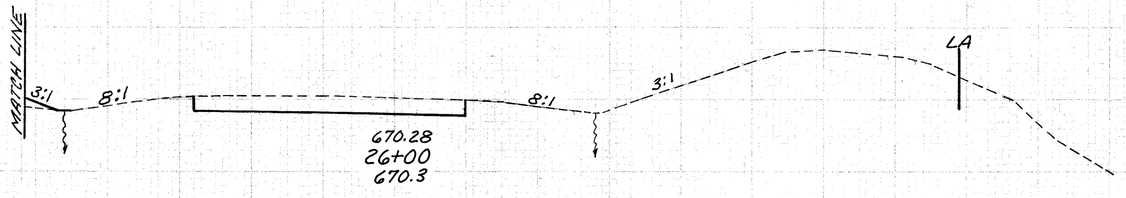


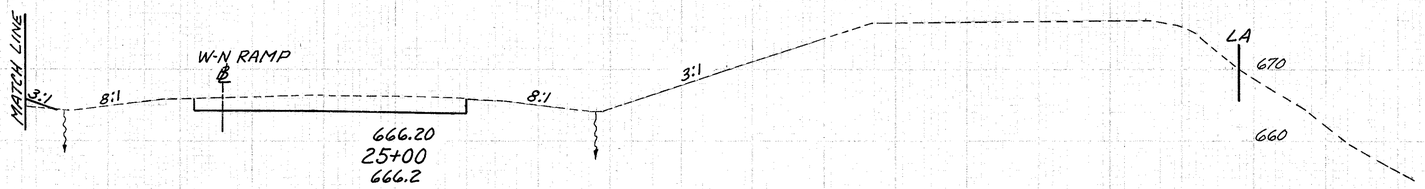
CUYAHOGA COUNTY
CUY-21-14.12

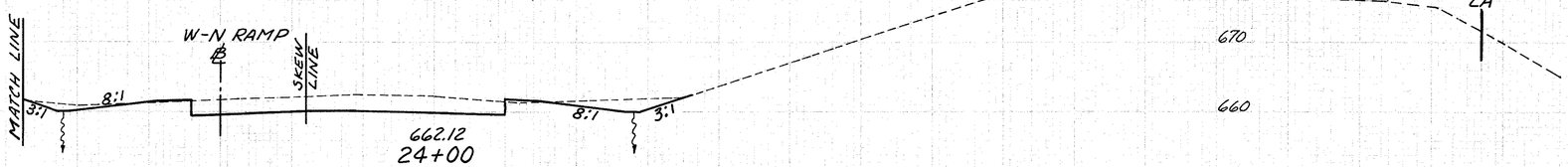


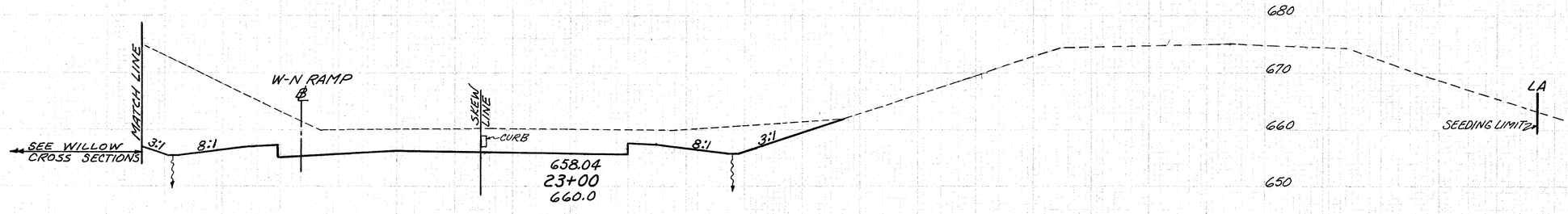
CUYAHOGA COUNTY
CUY-21-14.12











1760 ESTIMATED

STA 22+25

℄ E-N RAMP

END CROSS SECTIONS

E-N RAMP STA 23+00 TO STA 26+74.50

ESTIMATED 6750 0

STA 22+25

RLH

6385

CUYAHOGA COUNTY
CUY-21-14.12

N-W RAMP

100 90 80 70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80 90 100

680
670

99 1192 108 511 76 422 76 419 75 621 74 337 72

MATCH LINE | N-E RAMP ℄ | SKEW LINE | LA | SEEDING LIMITS

SEE WILLOW CROSS SECTIONS

3:1 8:1 VARIES 670.88 3:1

673.86
8+19.86
678.5

3:1 8:1 4:1 672.16 3:1

675.66
7+50
677.6

3:1 8:1 4:1 673.08 3:1

676.78
7+00
675.2

3:1 8:1 4:1 674.06 3:1

677.82
6+50
677.0

3:1 8:1 4:1 675.02 3:1

678.86
6+00
677.6

VARIES 672.89 8:1 4:1 676.47 3:1

680.42
5+25
679.3

VARIES 4:1 677.32

681.28
4+83.50
680.2

SEE WILLOW CROSS SECTIONS

100 90 80 70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80 90 100
N-W RAMP

BEGIN CROSS SECTIONS

NOTE FOR CROSS SECTION KEY PLAN SEE SHEET 38.

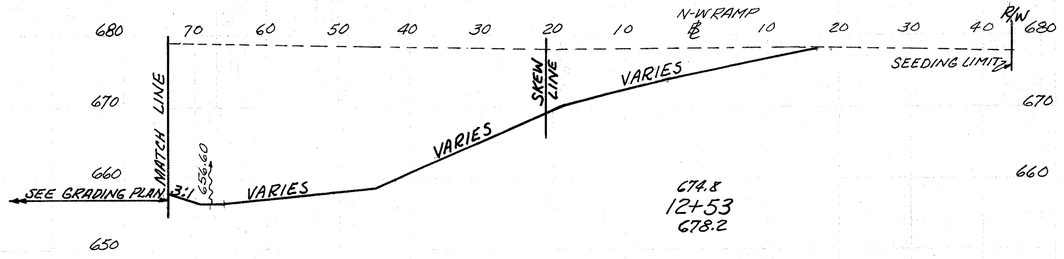
EXCAVATION	20430 C.Y.
EMBANKMENT	112 C.Y.
SEEDING	9719 S.Y.

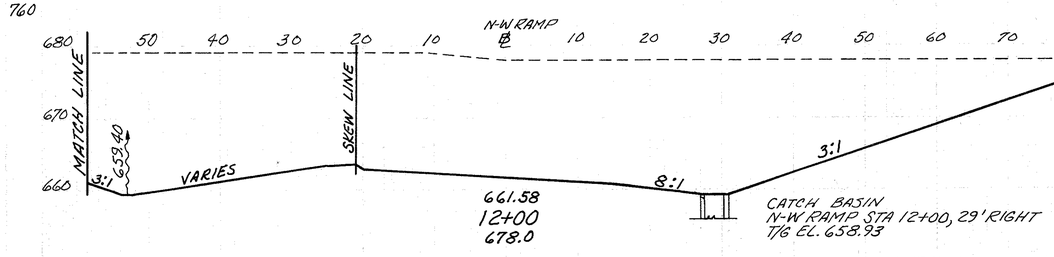
658	0
1304	0
350	0
344	39
21	42
47	56
30	18
57	17
32	0
65	0
15	0
12	0
0	0

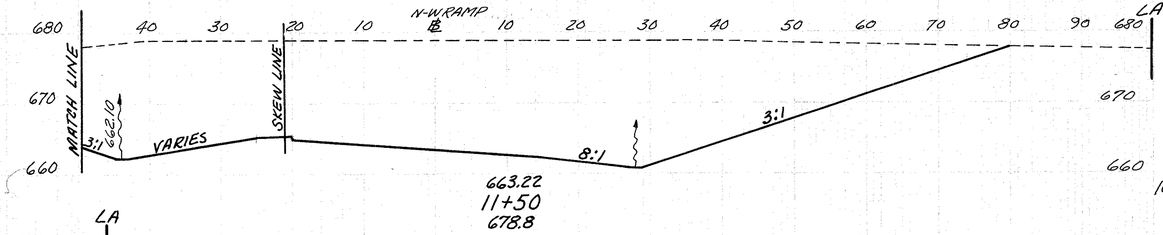
6986

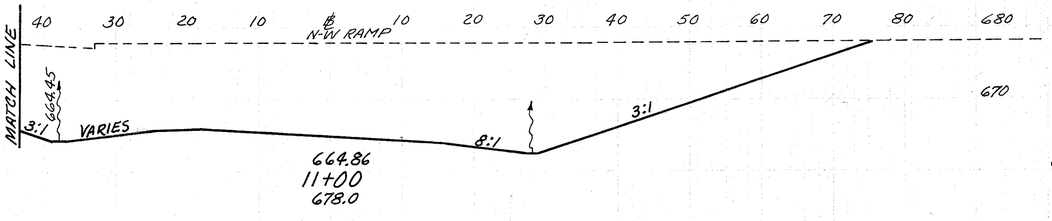
N-W RAMP STA 4+83.50 TO STA 8+19.86 RLH

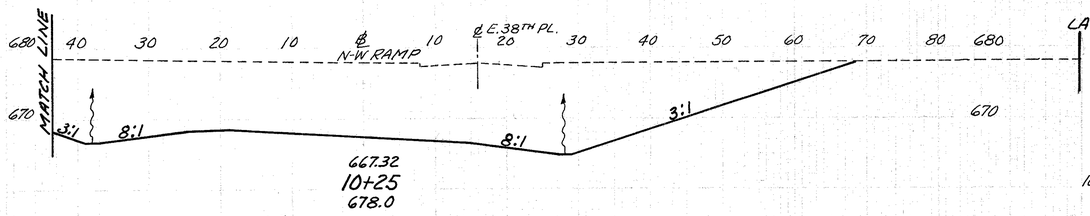
NOTE AHEAD SEE CLARK CROSS SECTIONS

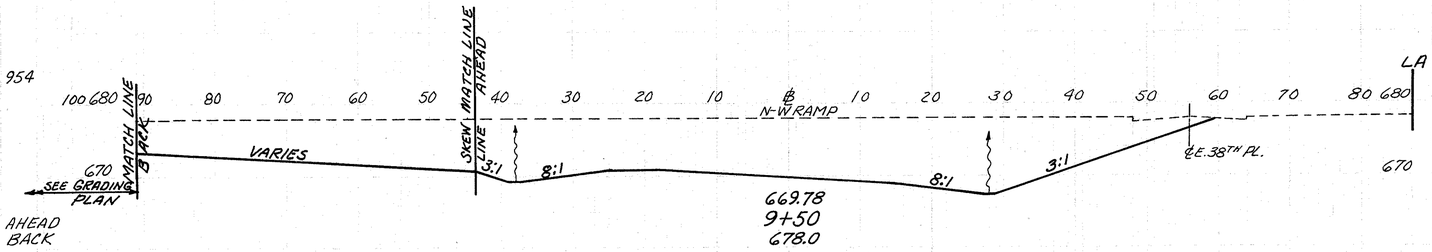


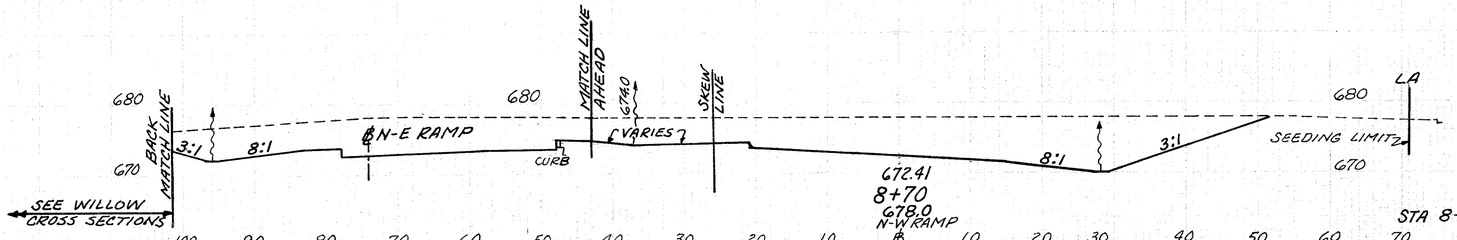












END CROSS SECTIONS

N-W RAMP STA 8+70 TO STA 12+53

CUYAHOGA COUNTY
CUY-21-14.12

79
198

121
760
137
722
123
683
123
1000
117
954
102 AHEAD
149 BACK
1480
84 AHEAD
123 BACK
618
99 STA 8+19.86

1115 0
3116 0
2060 0
3472 0
1690 0
2687 0
1320
3285 0
1045 0
2514 0
765 0 AHEAD
1060 0 BACK
2252 0
460 0 AHEAD
715 0 BACK
1275 0
658 0 STA 8+19.86

RLH

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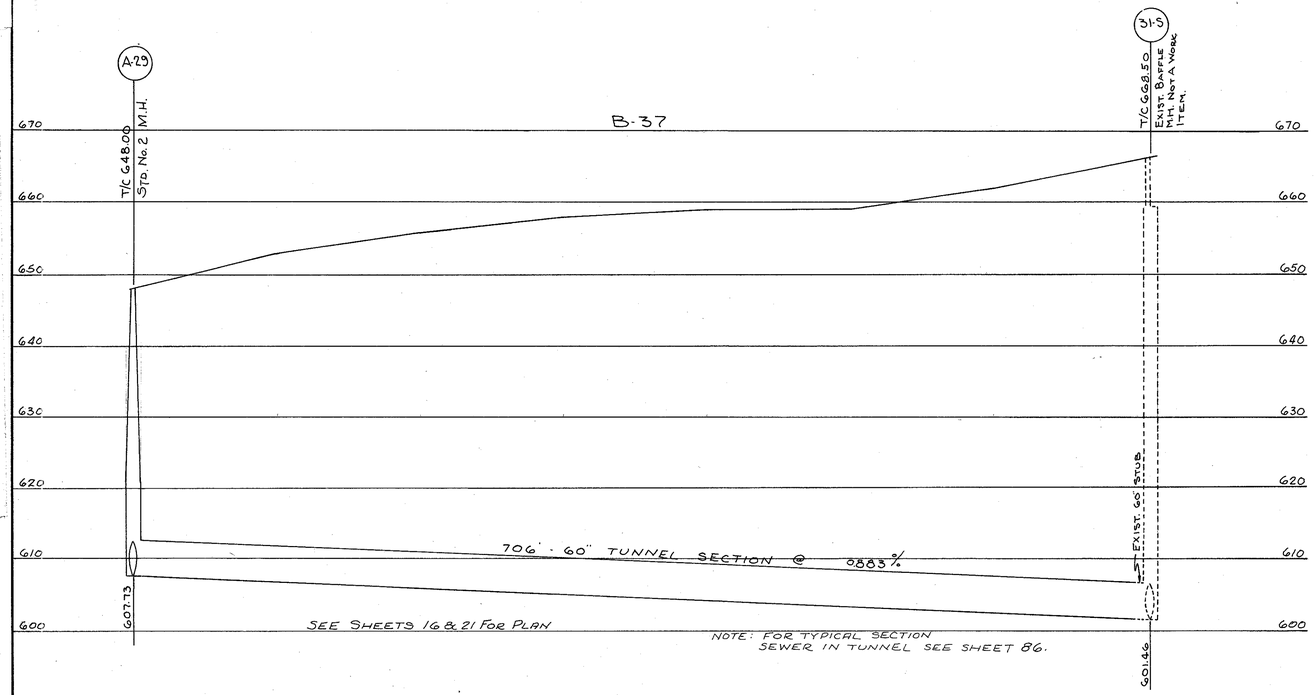
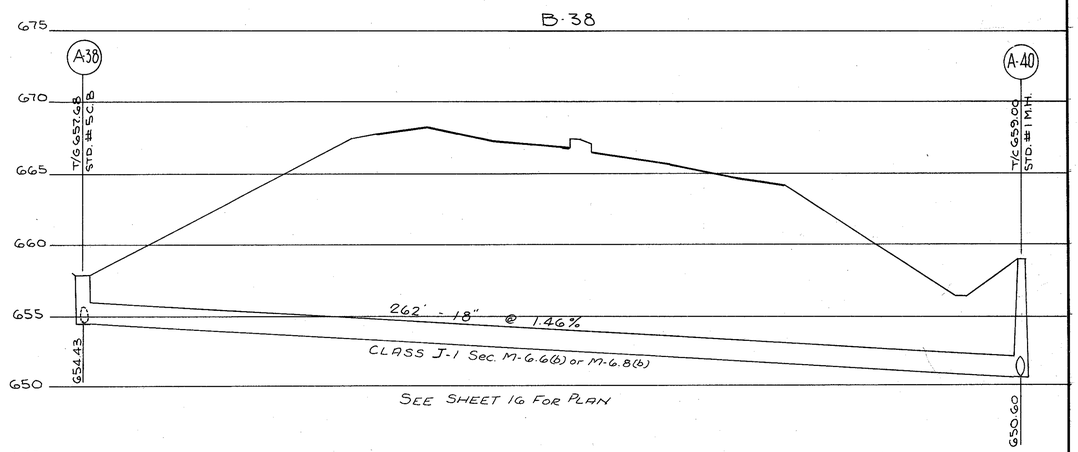
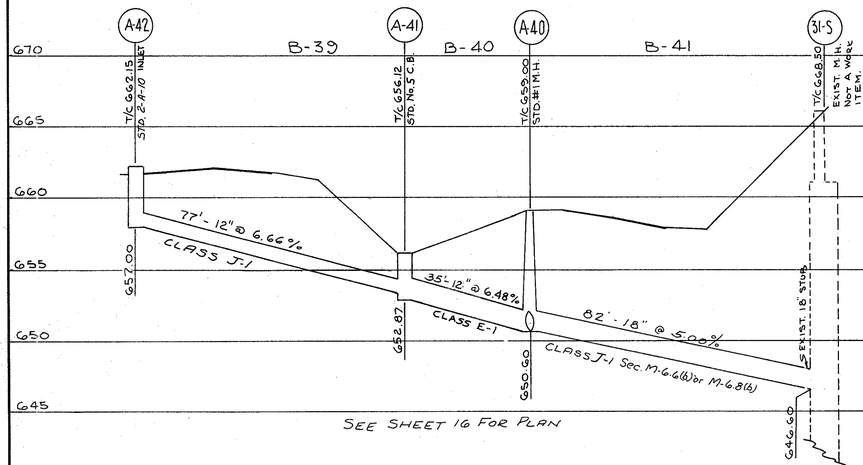
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

80
198

CUYAHOGA COUNTY
CUY— 21 — 14.12







TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

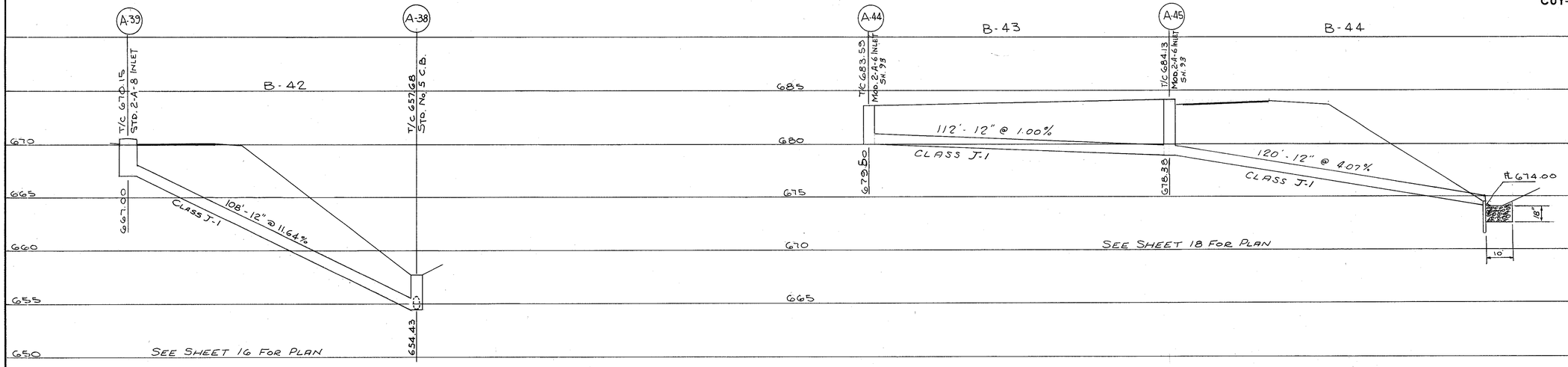
SEWER PROFILES

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	RR		RR			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

81
198

CUYAHOGA COUNTY
CUY— 21—14.12



TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

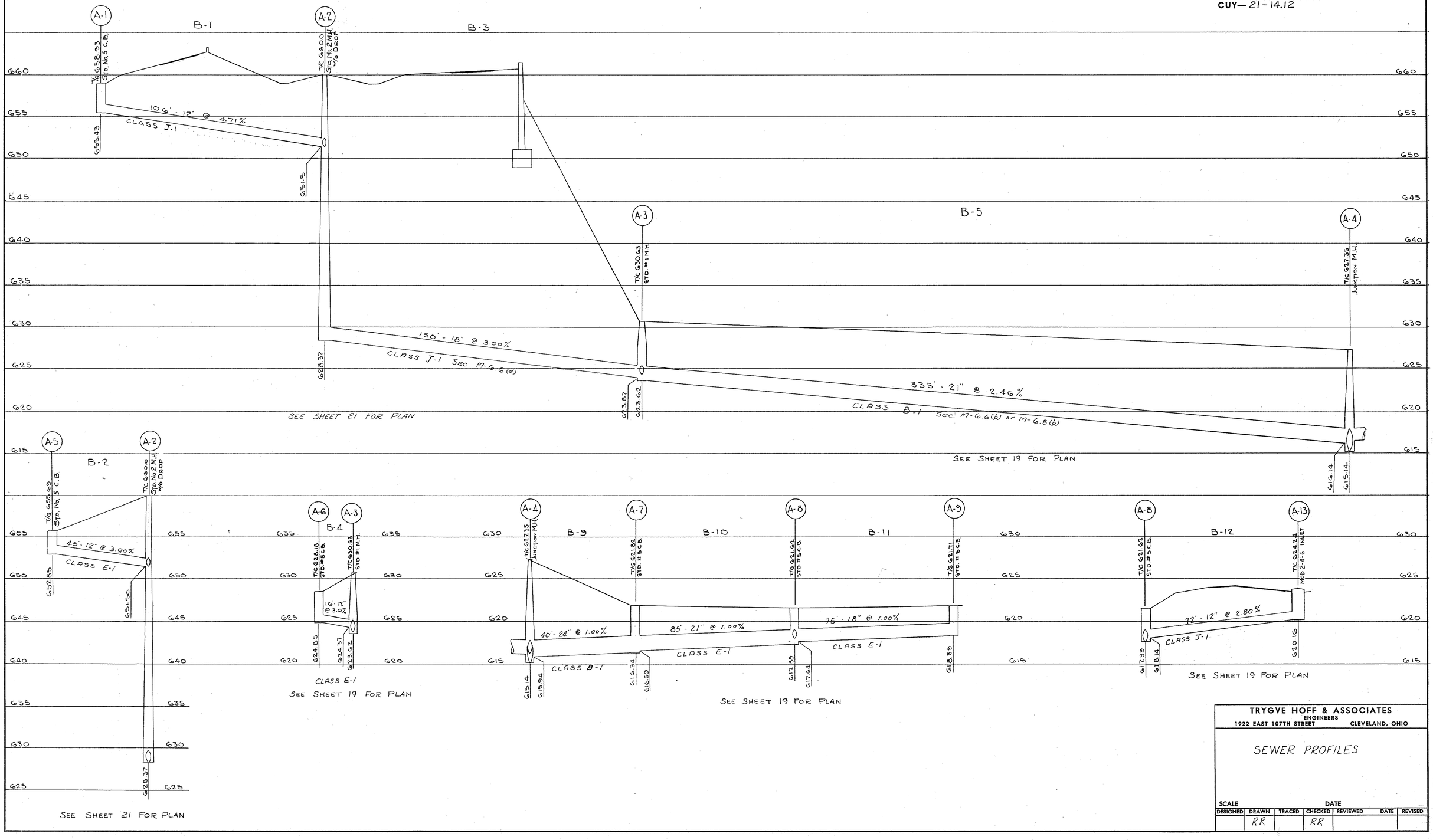
SEWER PROFILES

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	RR		RR			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

82
198

CUYAHOGA COUNTY
CUY— 21 - 14.12



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ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

SEWER PROFILES

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
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8.50

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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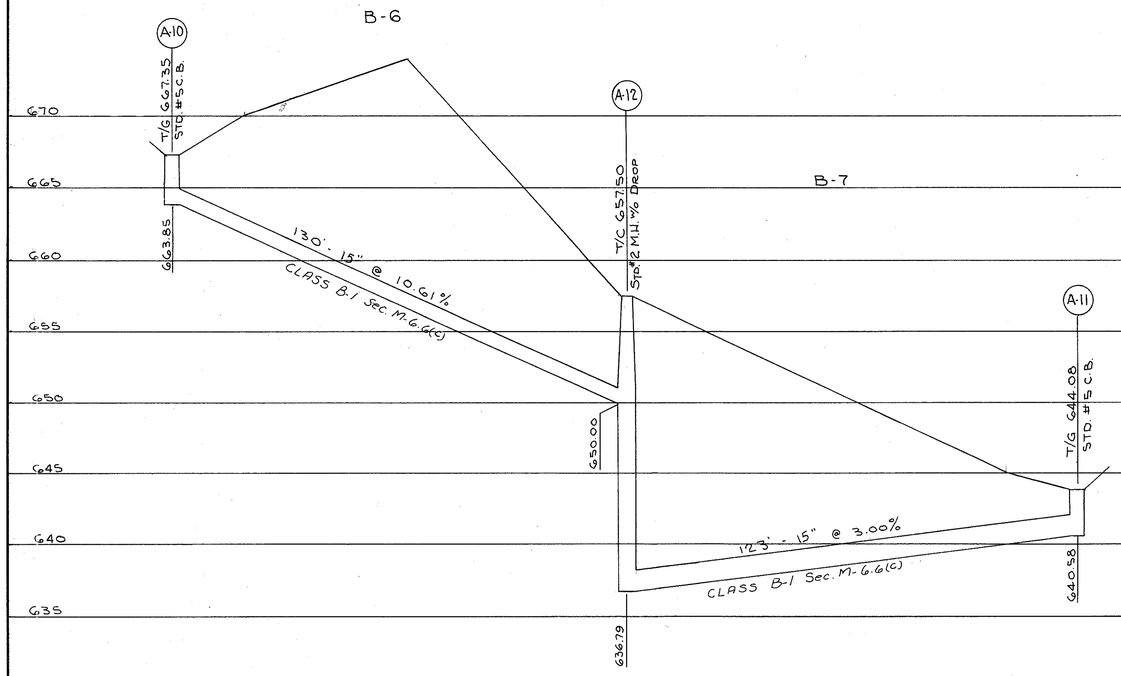
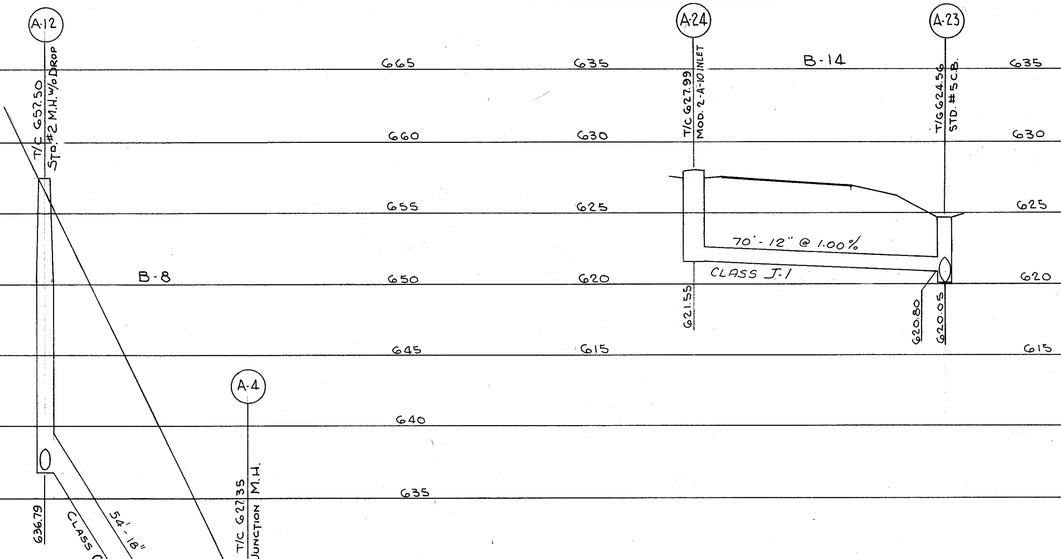
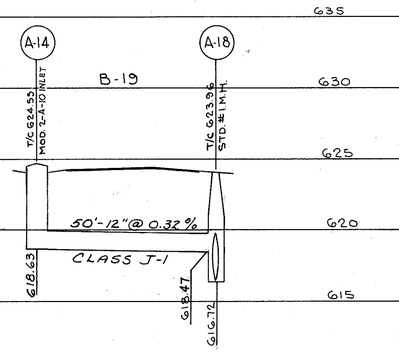
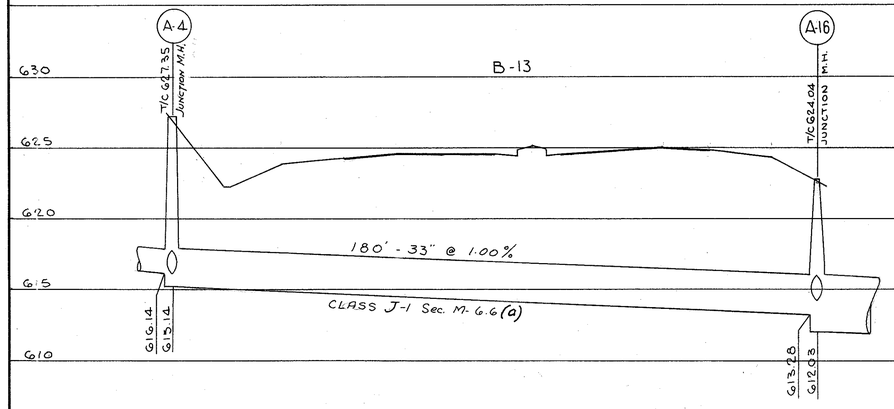
198

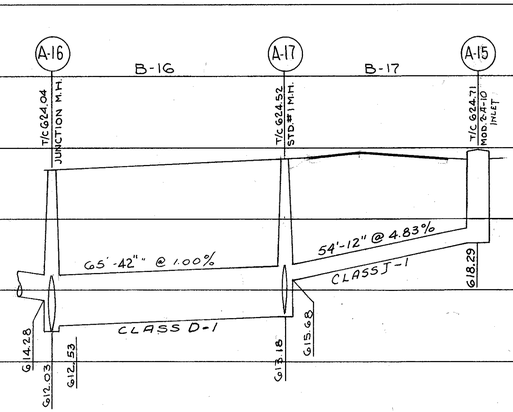
CUYAHOGA COUNTY
CUY— 21—14.12











SEE SHEET 19 FOR PLAN

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

SEWER PROFILES

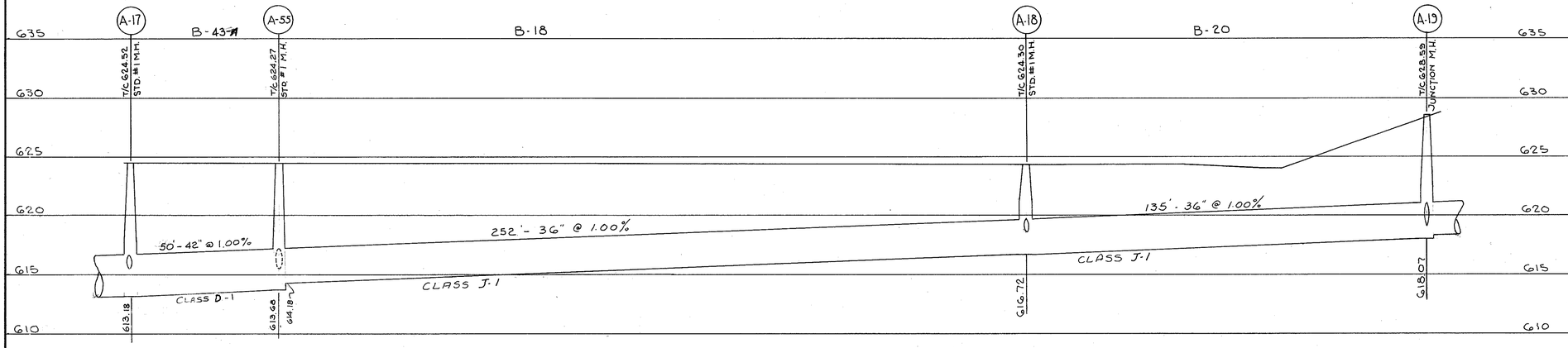
SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	RR		RR			

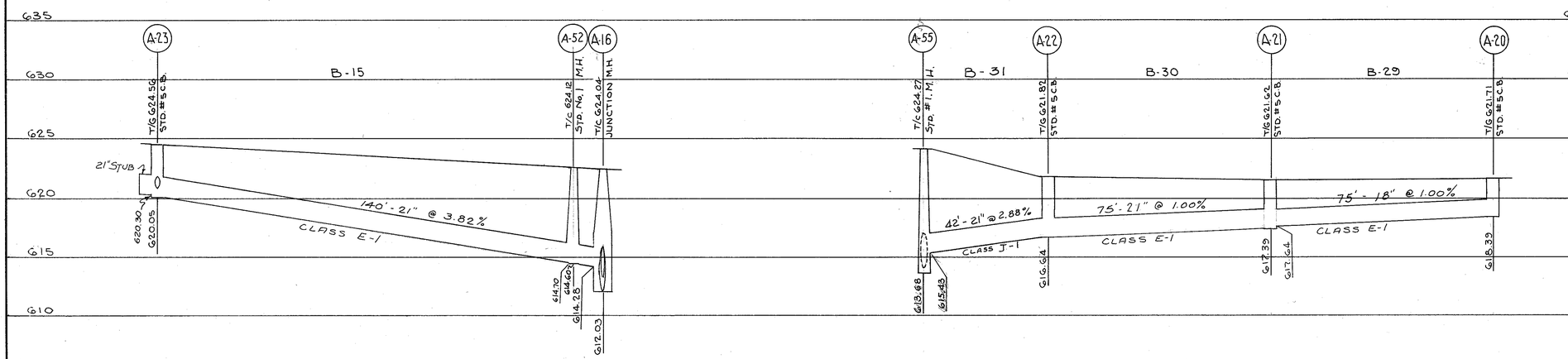
6351

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

84
198

CUYAHOGA COUNTY
CUY— 21-14.12





SEE SHEET 19 FOR PLAN

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

SEWER PROFILES

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	RR		RR			

6352

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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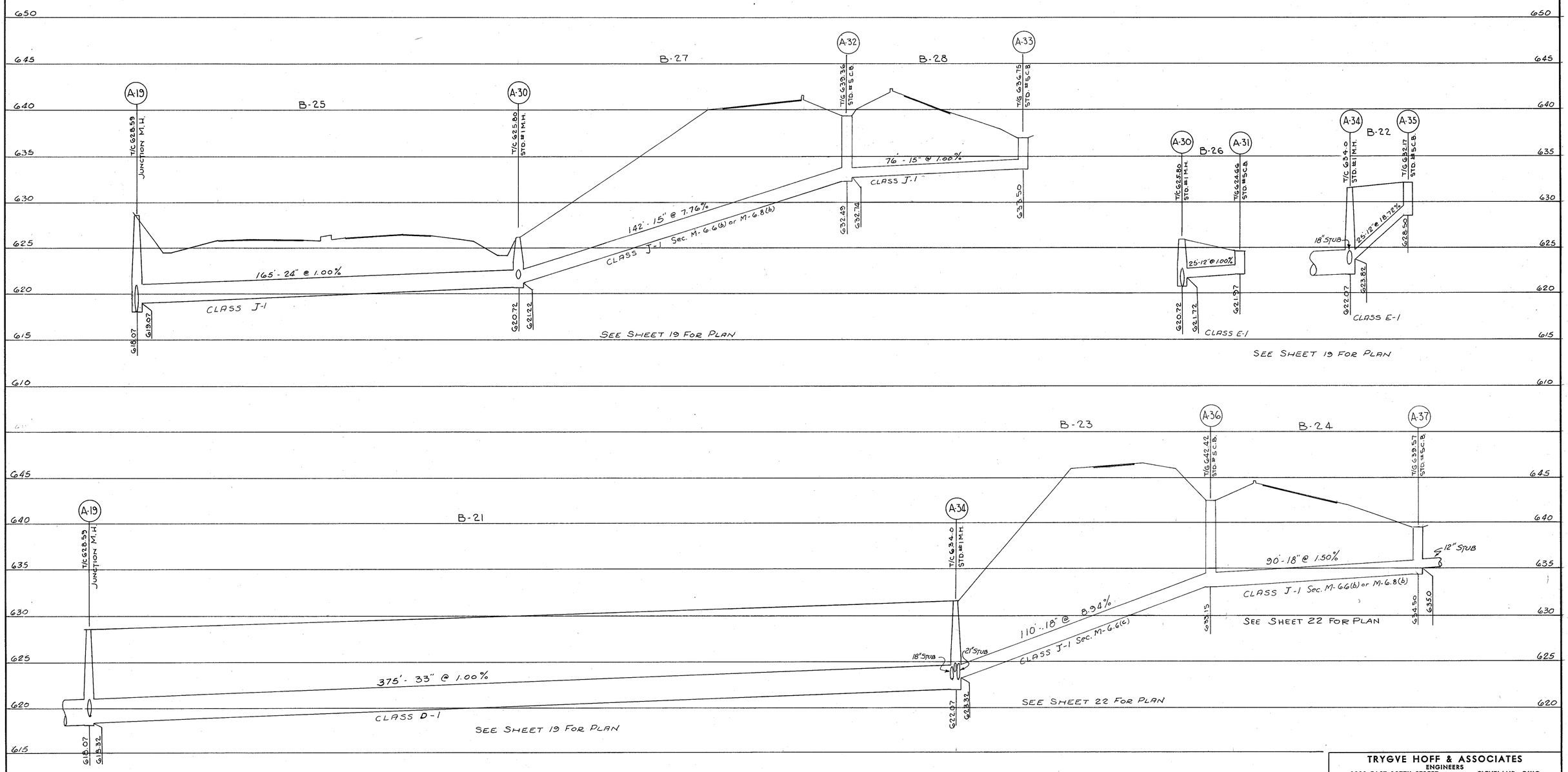
198

CUYAHOGA COUNTY
CUY— 21 — 14.12



TRYGVE HOFF & ASSOCIATES
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1922 EAST 107TH STREET CLEVELAND, OHIO

SEWER PROFILES

SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
		RR		RR			

6355

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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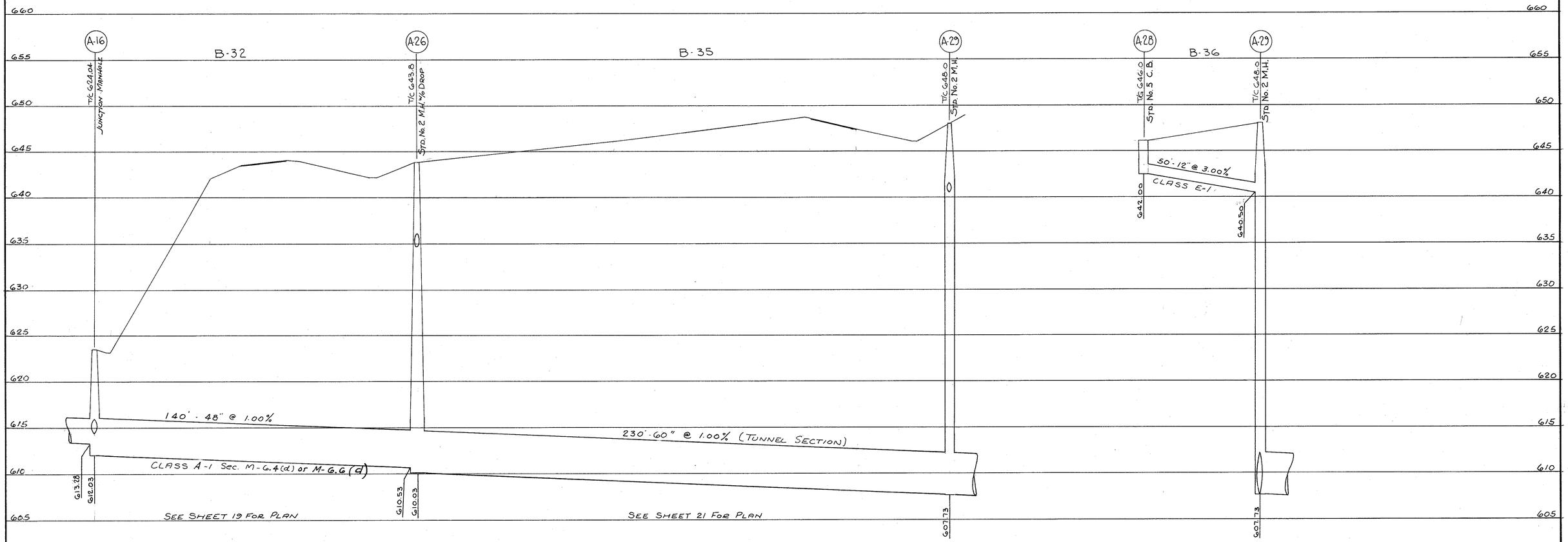
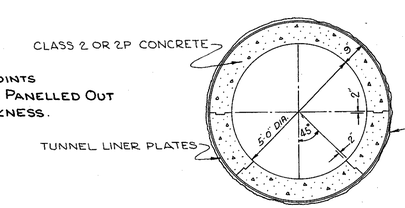
198

CUYAHOGA COUNTY
CUY— 21—14.12



ARMCO TUNNEL LINER PLATES 3 GAGE OFFSET JOINTS
OR TRUSCON TUNNEL LINER PLATES, 1/4" THICKNESS PANELLED OUT
OR COMMERCIAL TUNNEL LINER PLATES 1/4" THICKNESS.
or approved Equal



TYPICAL SECTION
SEWER IN TUNNEL

NOTE: ALL VOIDS BETWEEN OUTSIDE OF LINER PLATES AND UNDISTURBED EARTH SHALL BE COMPACTLY FILLED WITH 1:6 P.C. GROUT.

CONSTRUCTION JOINTS OPTIONAL

NOTE: FOR TUNNEL CONSTRUCTION SEE GENERAL NOTES SHEET 8.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

SEWER PROFILES

SCALE			DATE		
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	RR		RR			

G553

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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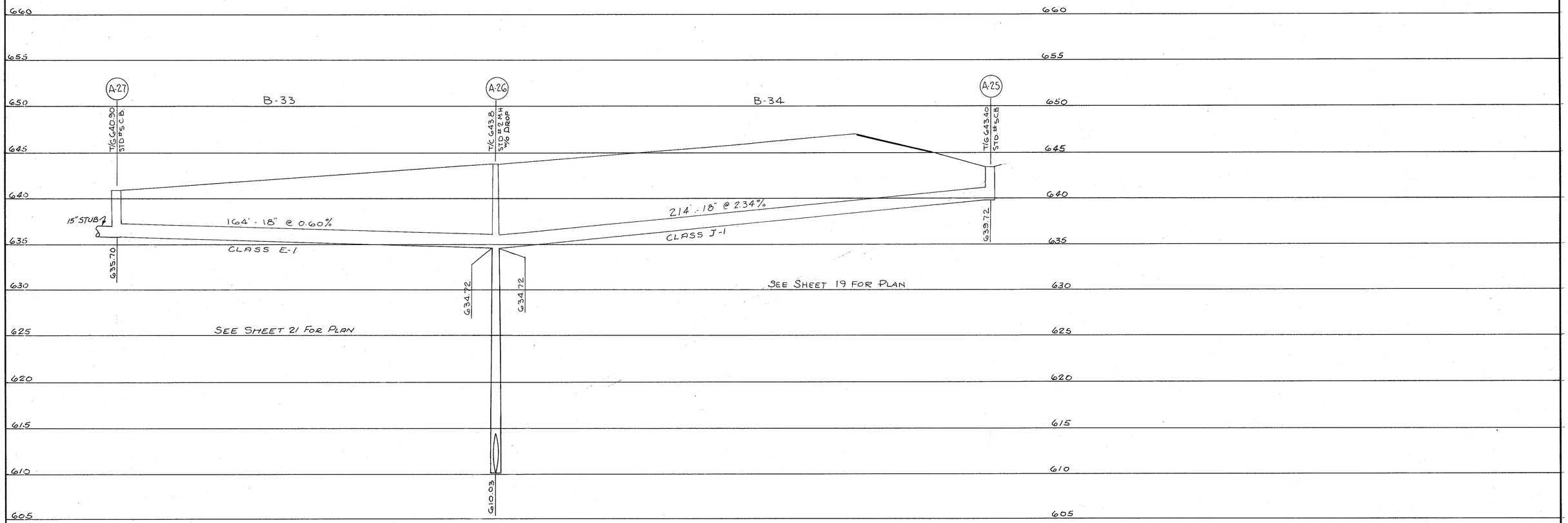
CUYAHOGA COUNTY
CUY— 21 — 14.12



TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

SEWER PROFILES

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	RR		RR			

G354

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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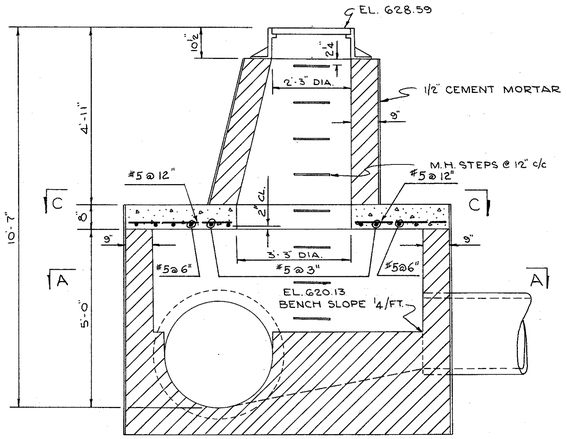
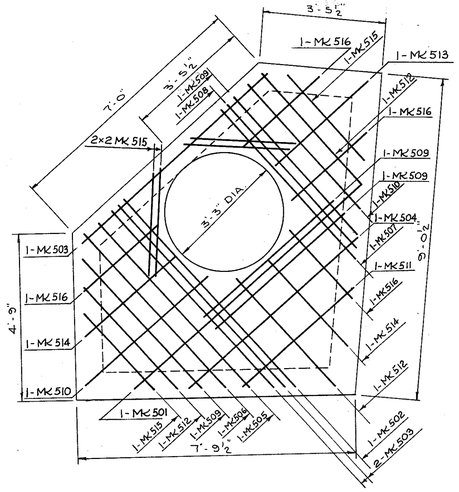
CUYAHOGA COUNTY
CUY— 21—14.12



SECTION - B



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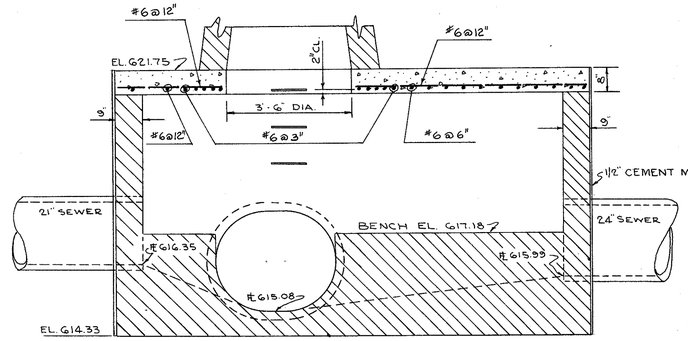

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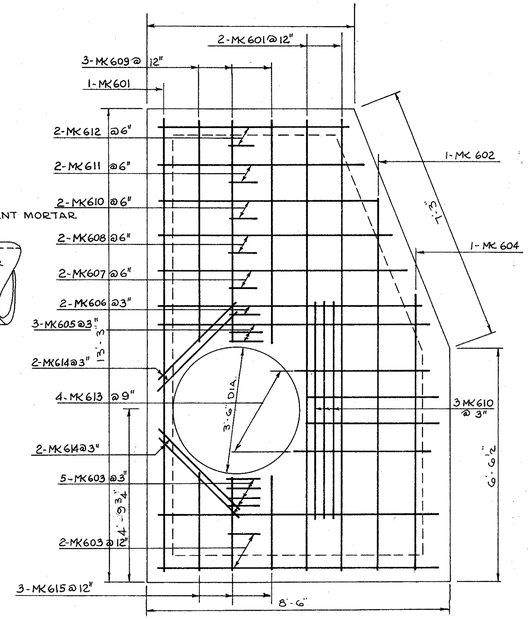
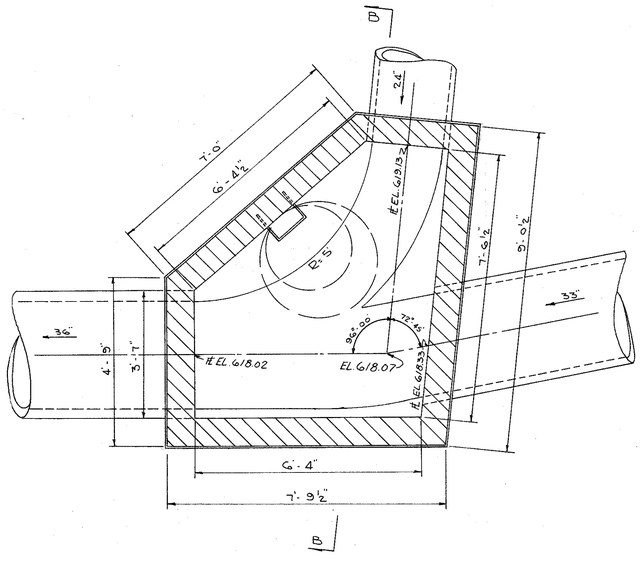


CONCRETE SLAB



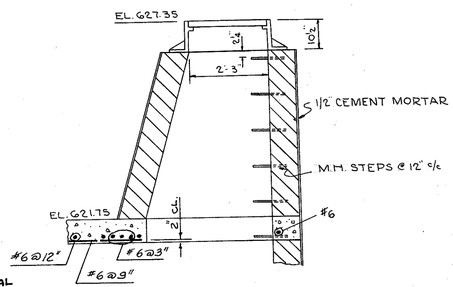
SECTIONAL PLAN A

DETAIL OF JUNCTION MANHOLE A-19
STA. 1037+50 CLARK 78' RT.

REINFORCING BAR SCHEDULE

	MARK	SIZE	NO. REQ'D	LENGTH	TYPE	WEIGHT
JUNCTION M.H. A-4	601	#6	3	12'-9"	STR.	57#
	602		1	10'-6"		16
	603		7	8'-0"		84
	604		1	7'-9"		12
	605		3	7'-6"		34
	606		2	7'-3"		22
	607		2	6'-9"		20
	608		2	6'-6"		20
	609		3	6'-3"		28
	610		5	6'-0"		45
	611		2	5'-9"		17
	612		2	5'-3"		16
	613		4	3'-9"		23
	614		4	3'-0"		18
	615	#6	3	2'-6"	STR	11
	TOTAL					423
JUNCTION M.H. A-19	501	#5	1	8'-6"	STR.	9
	502		1	7'-0"		7
	503		3	6'-9"		21
	504		1	6'-6"		7
	505		1	6'-3"		7
	506		1	5'-9"		6
	507		1	5'-6"		6
	508		1	5'-3"		5
	509		4	5'-0"		21
	510		2	4'-6"		9
	511		1	4'-3"		4
	512		3	4'-0"		13
	513		1	3'-6"		4
	514		2	3'-3"		7
	515		4	3'-0"		13
	516	#5	4	2'-9"	STR.	11
	TOTAL					150

DETAIL OF JUNCTION MANHOLE A-4
Sta. 1033+50 Clark 85' Lt.



SECTION C

DETAIL MH A-60 RECONSTRUCTED TO GRADE
WILLOW STA. 84+86 ± 60' ± RT.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

TYPICAL DETAILS JUNCTION MANHOLE A-4 & A-19 & MANHOLE A-60

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RR			RR			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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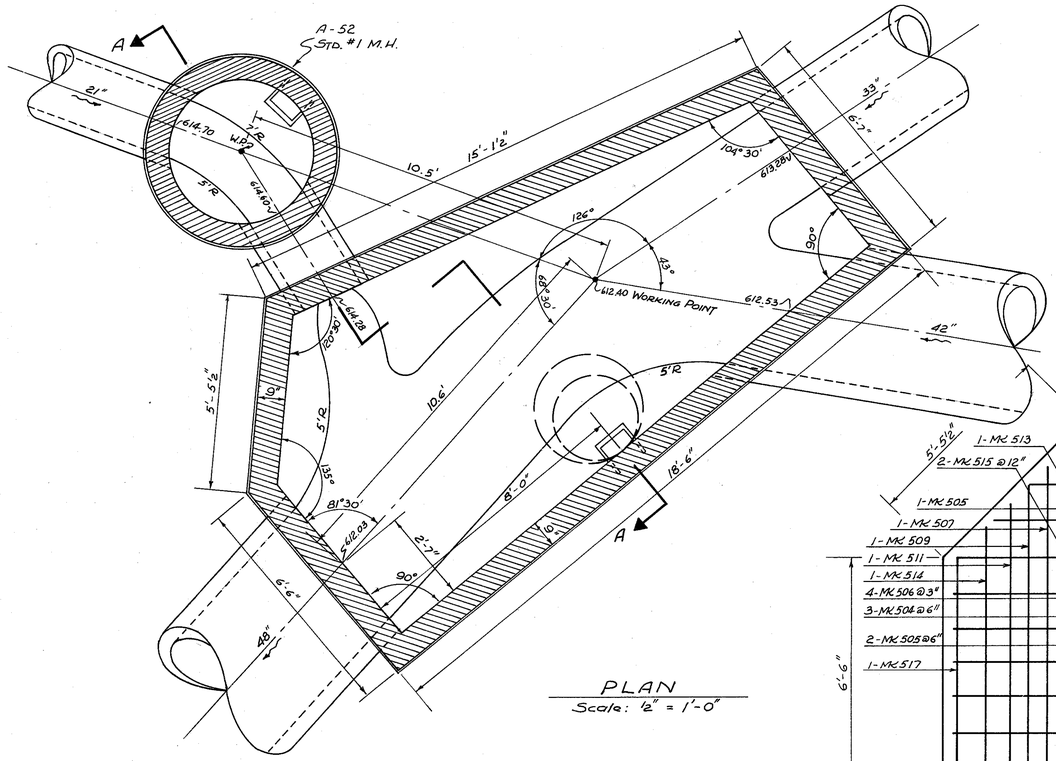
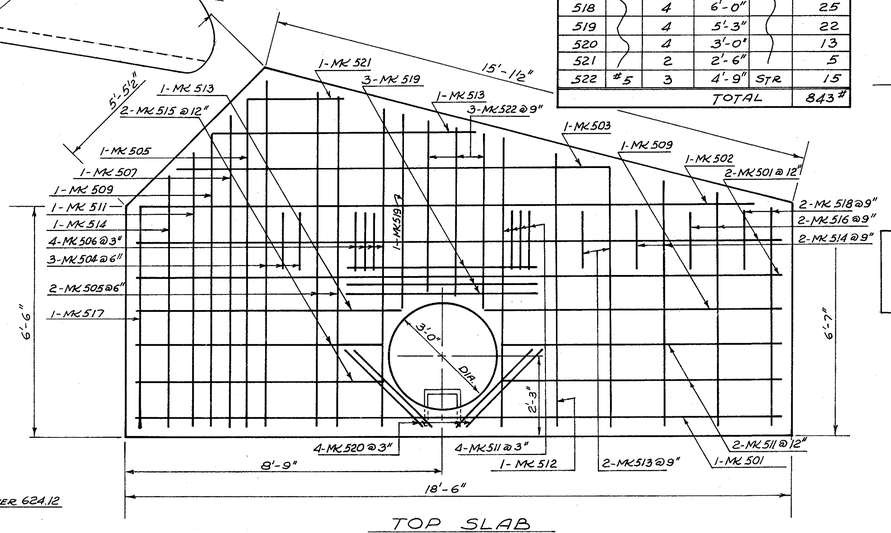
CUYAHOGA COUNTY
CUY— 21—14.12



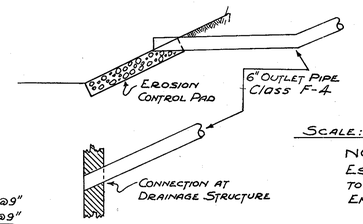
PLAN
Scale: 12" = 1'-0"

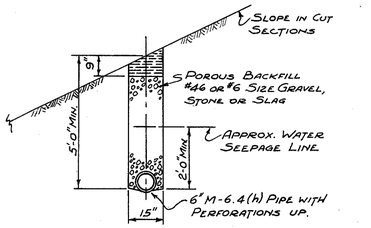
REINFORCING BAR SCHEDULE					
MARK	SIZE	NO. REQD	LENGTH	TYPE	WEIGHT
501	#5	9	18'-0"	STR.	169#
502		2	17'-0"		35#
503		2	12'-0"		25
504		6	9'-6"		59
505		6	9'-3"		58
506		6	9'-0"		56
507		4	8'-9"		37
508		2	8'-6"		18
509		5	8'-3"		43
510		2	8'-0"		17
511		8	7'-9"		65
512		3	7'-6"		23
513		8	7'-3"		60
514		5	7'-0"		37
515		3	6'-9"		21
516		4	6'-6"		27
517		2	6'-3"		13
518		4	6'-0"		25
519		4	5'-3"		22
520		4	3'-0"		13
521		2	2'-6"		5
522	#5	3	4'-9"	STR	15
			TOTAL		843#



TOP SLAB
Scale: 12" = 1'-0"

NOTE:
OUTLET INTERCEPTING DRAINS EITHER INTO DITCH DRAINAGE STRUCTURE OR ONTO AN EROSION CONTROL PAD AT ROADWAY DITCH LINE.





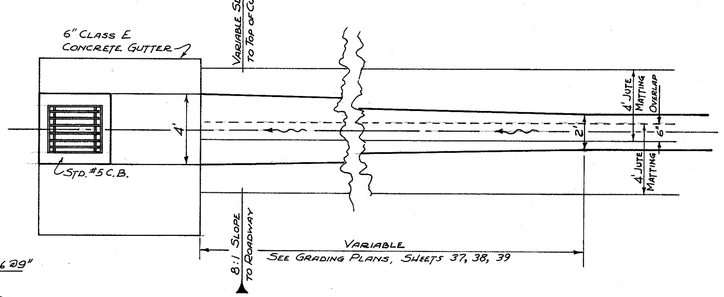
SCALE: 3/8" = 1'-0"

NOTE:
ESTIMATED QUANTITIES LISTED BELOW ARE TO BE USED AT LOCATIONS AS DIRECTED BY THE ENGINEER TO DRAIN SEEPAGE IN CUT SLOPES

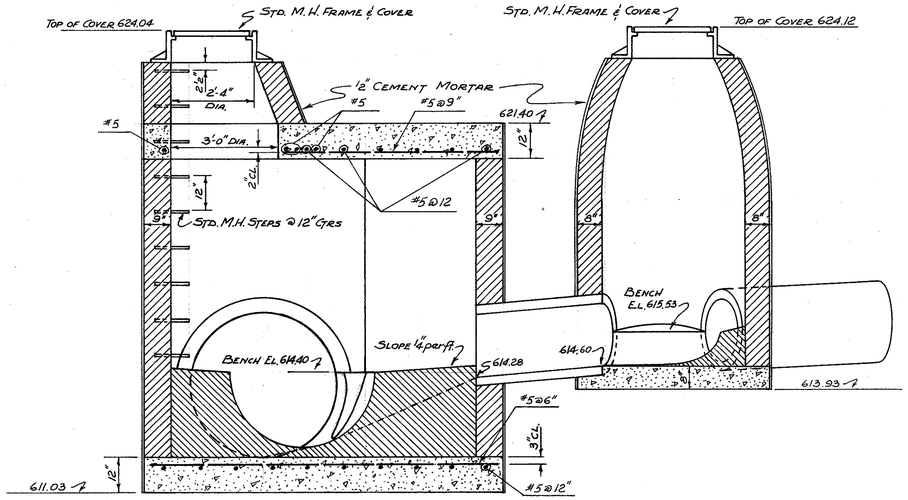
ESTIMATED QUANTITIES

ITEM.... I-1...6" INTERCEPTING DRAINS SEC. M-6.4(h) CLASS I-3 (AS PER PLAN). ....800 LIN. FT.
ITEM.... I-1...6" CLASS F-4 ..... 80 LIN. FT.
ITEM.... I-5...6" PIPE SPECIALS CLASS F-4 ..... 8 EACH.

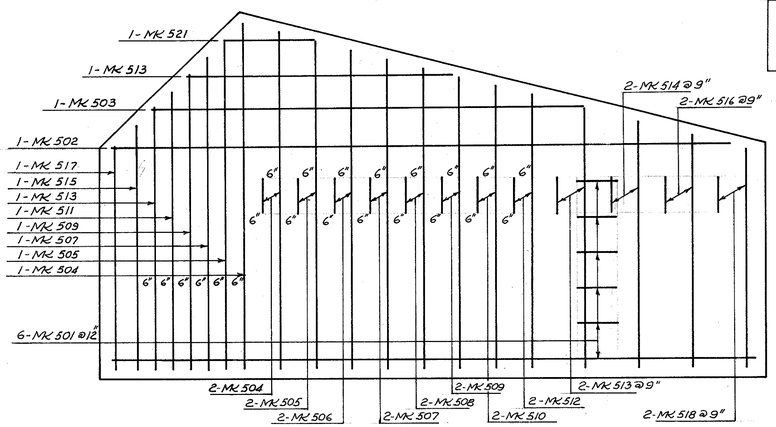
DETAIL FOR INTERCEPTING DRAIN



TRANSITION FROM 4' TO 2' DITCH



SECTION A-A
Scale: 12" = 1'-0"



BOTTOM SLAB
SAME DIMENSIONS AS TOP SLAB

JUNCTION MANHOLE A-16

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

TYPICAL DRAINAGE DETAILS

SCALE As Noted DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.R.		RR			

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2	OHIO		

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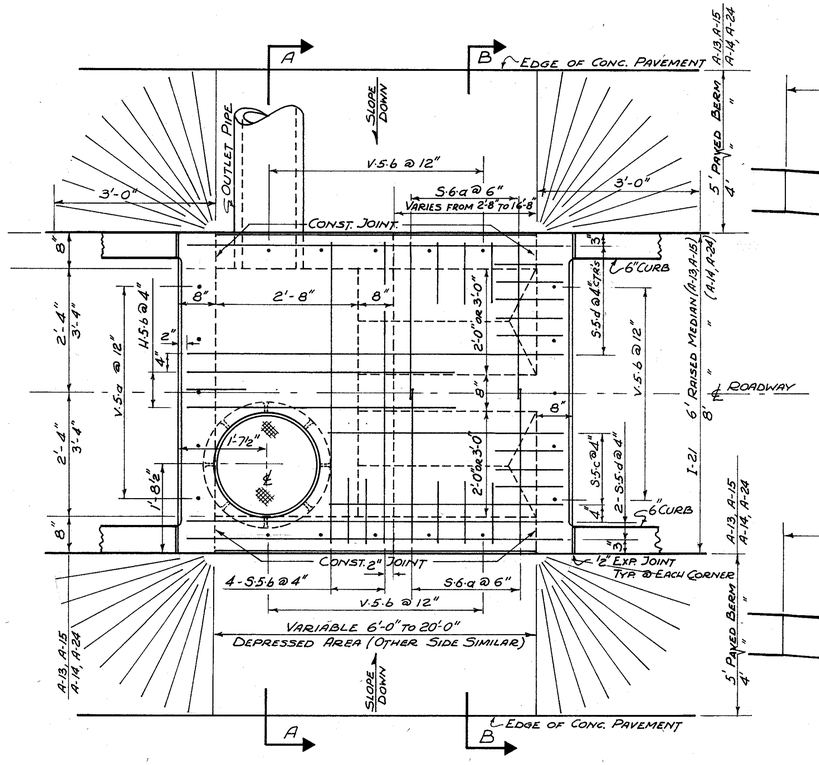
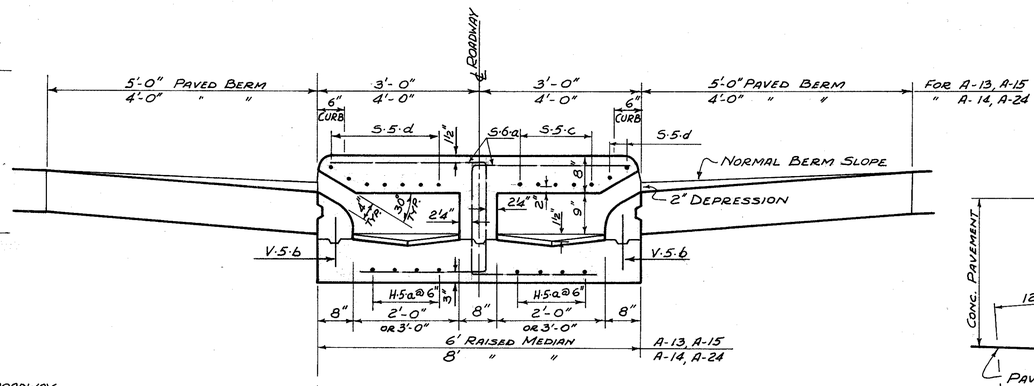
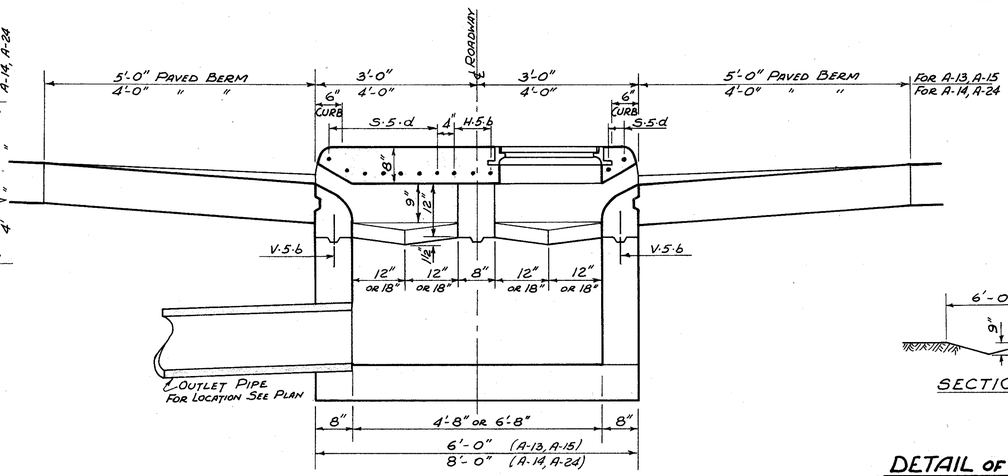
CUYAHOGA COUNTY
CUY— 21 — 14.12



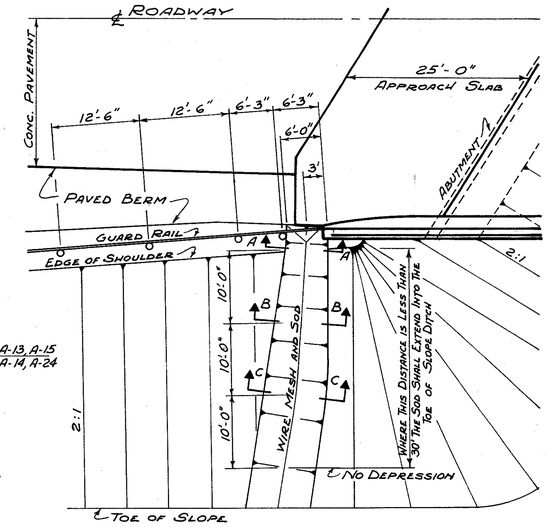
PLAN

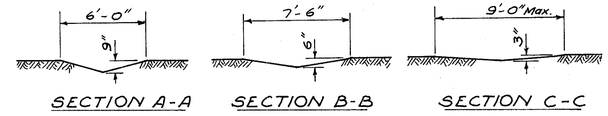


SECTION B-B



SECTION A-A

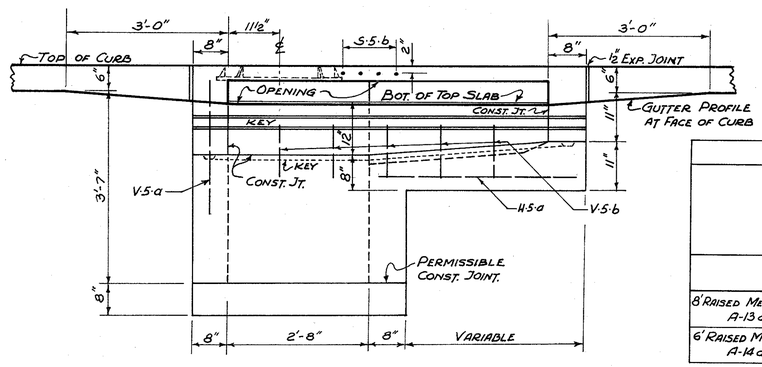




SECTION A-A SECTION B-B SECTION C-C

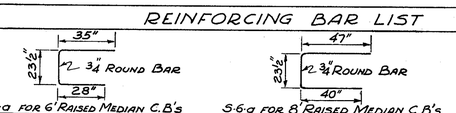
DETAIL OF EROSION CONTROL AT APPROACH SLAB

NOTE: FOR DETAILS OF SOD & WIRE MESH PLACEMENT SEE GENERAL NOTES: "EROSION CONTROL AT BRIDGES"



FRONT ELEVATION

REINFORCING BAR LIST



5·6·a FOR 6' RAISED MEDIAN C.B's

5·6·a FOR 8' RAISED MEDIAN C.B's

5·5·b, 5·5·c, 5·5·d, H·5·a, H·5·b
V·5·a, V·5·b — STRAIGHT ⅝" ROUND BARS

	CURB OPENING	5·6·a No. REQ'D	5·6·a LENGTH	5·5·b No. REQ'D	5·5·b LENGTH	5·5·c No. REQ'D	5·5·c LENGTH	5·5·d No. REQ'D	5·5·d LENGTH	No. REQ'D	LENGTH	H·5·a No. REQ'D	H·5·a LENGTH	H·5·b No. REQ'D	H·5·b LENGTH	V·5·a No. REQ'D	V·5·a LENGTH	V·5·b No. REQ'D	V·5·b LENGTH
8' RAISED MEDIAN C.B's A-13 and A-15	6'-0"	10	9'-2½"	4	7'-7"	5	4'-4"	12	7'-0"			12	3'-8"	6	5'-0"	7	2'-6"	17	1'-0"
	10'-0"	26	9'-2½"	4	7'-7"	5	8'-4"	12	11'-0"			12	7'-8"	6	5'-0"	7	2'-6"	25	1'-0"
6' RAISED MEDIAN C.B's A-14 and A-24	10'-0"	26	7'-2½"	4	5'-7"	5	8'-4"	9	11'-0"			8	7'-8"	3	5'-0"	5	2'-6"	23	1'-0"

DETAIL OF MODIFIED No. 2-A-6 TO 2-A-20 PAVED SHOULDER INLET

FOR NOTES, DIMENSIONS AND DETAILS SEE STD. CONSTRUCTION DWG. I-8 I No. 2-A

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

DETAIL OF MODIFIED No. 2-A-6 TO 2-A-20
PAVED SHOULDER INLET
AND
EROSION CONTROL AT APPROACH SLAB

SCALE	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DESIGNED	C.R.	C.R.	R.R.			

CONT. No. 58019 SHEET ACCT. No. 6306

TYPICAL DETAILS

FED. RD. DIVISION	STATE	PROJECT	
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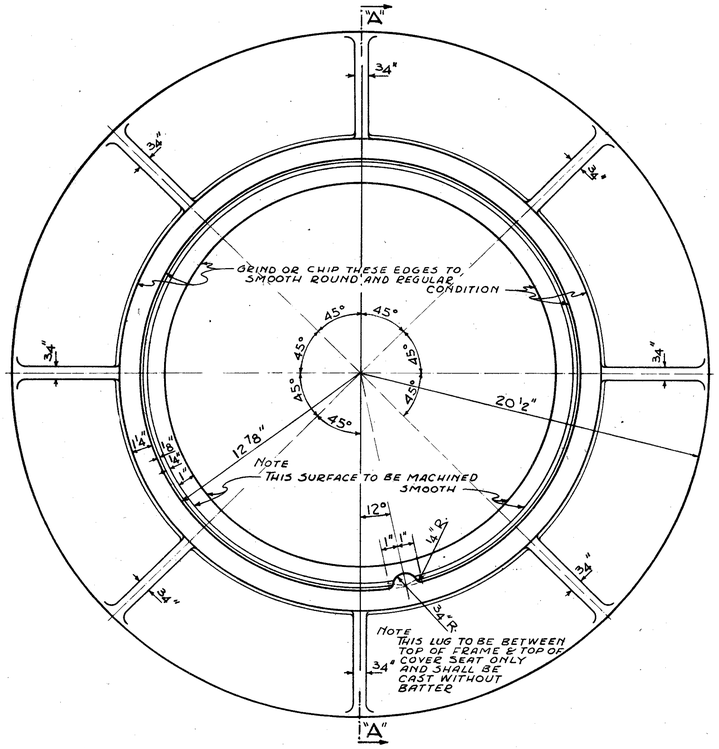
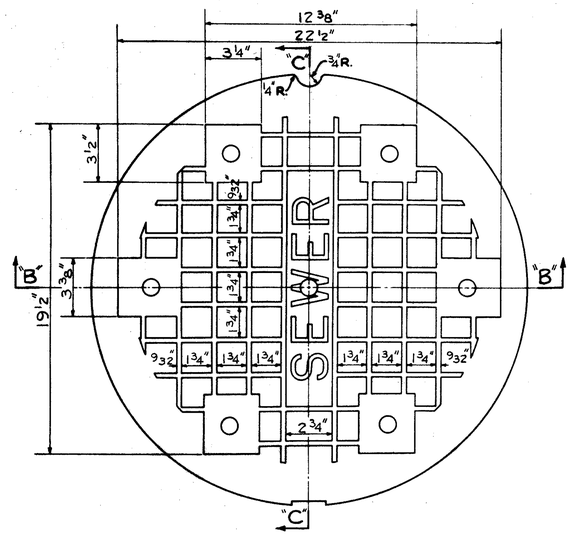
CUYAHOGA COUNTY
CUY—21—14.12



PLAN



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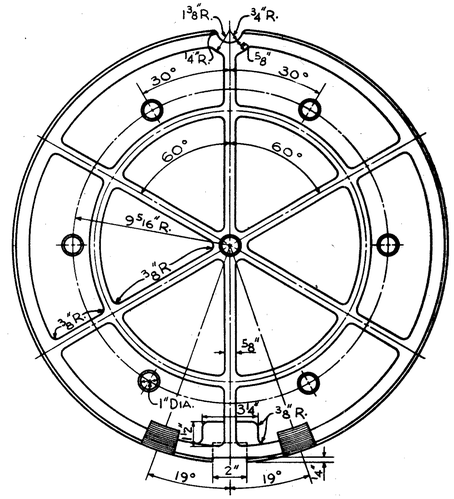

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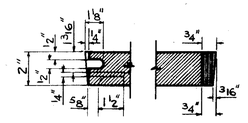
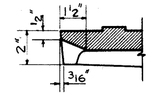
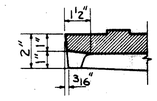


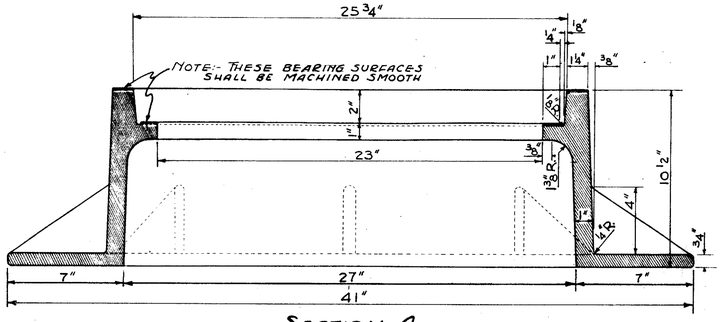
SECTION C



SECTION D



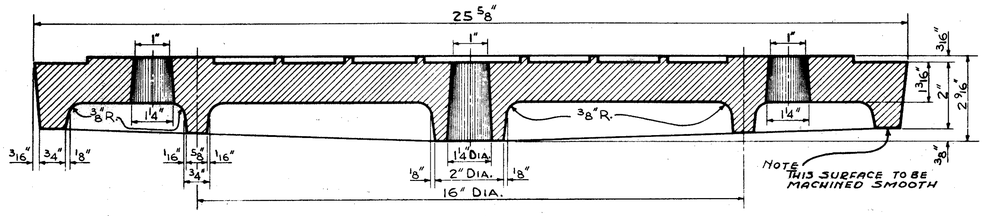
SECTION E



SECTION A

DETAIL OF CITY OF CLEVELAND STANDARD MANHOLE FRAME

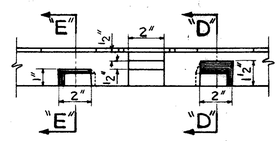
WEIGHT OF FRAME = 400 LBS.



SECTION B

DETAIL OF CITY OF CLEVELAND STANDARD MANHOLE COVER

WEIGHT OF COVER = 195 LBS.



SIDE ELEVATION OF NOTCHES

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

TYPICAL DETAILS

SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
		G.O.C.	J.W.D.			

CONT. No. 58019 SHEET ACCT. No. 6144

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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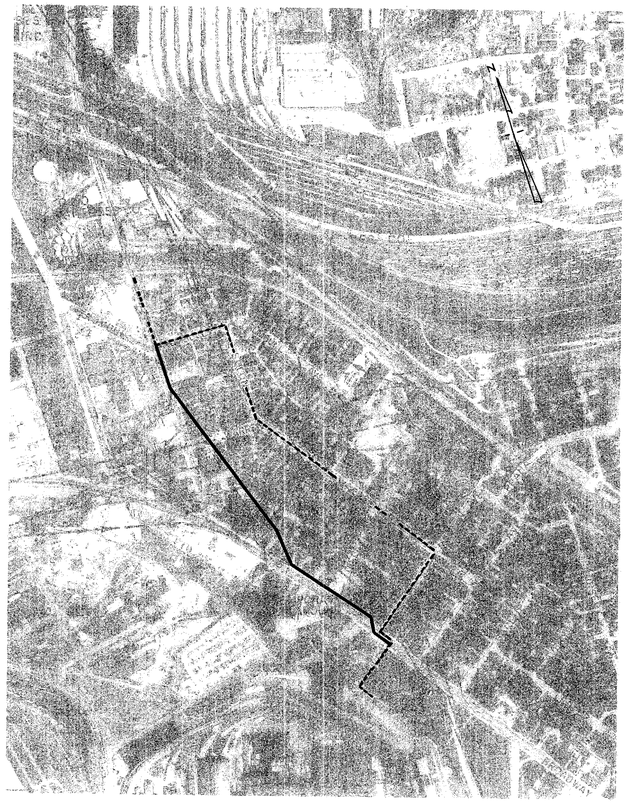
CUYAHOGA COUNTY
CUY—21—14.12

RELOCATION OF E. 37 STREET 30" WATER MAIN

ROSEVILLE COURT TO TRUMBULL AVENUE



LOCATION MAP

SCALE 1"= 400'

LEGEND

----- EXISTING 30" WATER MAIN

——— RELOCATION OF 30" WATER MAIN

CONT. No. 58019 SHEET ACCT. No. 6334

LIST OF DRAWINGS

NOTES FOR CAST IRON WATER MAIN

ALL 12" CAST IRON CONNECTIONS BETWEEN LARGE AND SMALL MAINS IN THIS CONTRACT TO HAVE CLASS-B PIPE AND CLASS-D FITTINGS OR CLASS-25 AND FITTINGS CLASS-250.

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.

NOTES FOR PRE-STRESSED CONCRETE CYLINDER WATER MAIN

THE 30" CONCRETE WATER MAIN IS TO BE OF THE TYPE KNOWN AS PRE-STRESSED CONCRETE CYLINDER PIPE AND WILL BE FOR WORKING PRESSURE OF 200 FT. HEAD.

TYPICAL FIELD JOINTS SHALL BE OF THE SELF CENTERING EXPANSION JOINT TYPE SEALED WITH RUBBER STRIP.

CLOSURE PIECES TO BE FURNISHED TO SUIT ACTUAL MEASUREMENT IN THE FIELD, THE CALCULATED LENGTH SHALL NOT BE LESS THAN 8'—0".

FOR CONCRETE DETAILS AND FUTHER DESCRIPTION SEE DWGS. NOS. 113, 114, 115, 116 & 117.

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

SEE SPECIFICATIONS.

·GENERAL NOTES FOR 30" WATER MAIN·

ELEVATIONS ARE BASED ON SEA LEVEL DATUM. BENCHMARK O.M. 914—ELEV. 674.095—OF THE CLEVELAND REGIONAL GEODETIC SURVEY, LOCATED NEAR THE INTERSECTION OF BROADWAY AVE. AND DILLE AVE.

THE STATIC HEAD TO BE USED FOR BOTH DESIGN AND TESTING SHALL BE MEASURED FROM ELEV. 803.0. 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.

THE 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.

ELEVATIONS ARE BASED ON SEA LEVEL DATUM.

BENCH MARK REFERENCES ARE NOTED ON ALIGNMENT DRAWINGS.

SURFACE ELEVATIONS SHOWN ON ALIGNMENT DRAWINGS ARE CENTER OF STREET WHERE MAIN IS IN THE PAVEMENT AND ON ℄ OF PIPE IN RIGHT OF WAY.

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

OPENING OF JOINTS IN CONCRETE PIPE, TO ELIMINATE ANGLE SECTIONS WILL NOT BE PERMITTED IF SUCH CHANGES CAUSE INTERFERENCE WITH HOUSE CONNECTIONS.

LOCATION OF CLOSURES ARE INDICATED ON THE ALIGNMENT DRAWINGS.

AT SEVERAL LOCATIONS, CONTROL POINTS ARE NECESSARY TO AVOID UNDUE CREEPAGE, HOWEVER THE CONTRACTOR MAY SUGGEST THE ELIMINATION OF ANY CLOSURE INDICATED, SUBJECT TO APPROVAL, OR MAY FURNISH ADDITIONAL CLOSURES IN ORDER TO EXPEDITE THE WORK AND TO PROVIDE FOR THE SATISFACTORY INSTALLATION OF THE WATER MAIN.

UNDER SIDEWALKS AND DRIVEWAYS, BACKFILL TO BE MADE WITH SATISFACTORY MATERIAL IN 6" LAYERS, TAMPED WITH PNEUMATIC TOOLS, TO ACHIEVE A 90% COMPACTION.

FLANGE, VICTAULIC, DRESSER AND LEAD JOINTS ARE REQUIRED AT CERTAIN LOCATIONS, CLASS OF WHICH ARE REFERRED TO ON ALIGNMENT DRAWING.

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

SAND BACKFILL REQ'D. UNDER ALL PAVEMENTS.

FOR WATER CONNECTIONS SEE ROLL MAPS NO. 732-A AND 1985-A. OF THE CITY OF CLEVELAND

LOW SERVICE DISTRICT

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

APPROVED 5-8- 19 63

	DIRECTOR OF PUBLIC UTILITIES
	COMMISSIONER OF WATER & HEAT
Arnold Bothel	COMMISSIONER - DIVISION OF UTILITIES ENGINEERING
	ENGINEER OF CONSTRUCTION & SURVEYS
	ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

EAST 37 STREET 30" WATER MAIN
RELOCATION

LOCATION MAP—INDEX—NOTES

SCALE: AS SHOWN DATE:

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

96/198

CUYAHOGA COUNTY
CUY— 21 — 14.12

WATERWORK NOTES

SCOPE OF WORK

THE WORK CONTEMPLATED UNDER THIS CONTRACT COMPRISES THE FURNISHING AND INSTALLING OF 30" PRESTRESSED CONCRETE CYLINDER PIPE BEGINNING AT THE INTERSECTION OF TRUMBULL AND EAST 37TH STREET; THENCE SOUTH IN EAST 37TH STREET AND CROSSING THROUGH THE WILLOW-CLARK INTERCHANGE; THENCE IN THE NORTHEAST EDGE OF BROADWAY TO THE INTERSECTION OF ROSEVILLE AND BROADWAY; ALSO THE REPLACEMENT OF AN EXISTING 8" WATER LINE WITH A 12" WATER LINE IN BROADWAY AND ROSEVILLE. 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.

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 OF EXPENSE TO THE STATE AND CITY, ALL NECESSARY ASSISTANCE TO THE ENGINEER AND DIRECTOR WHEN REQUIRED FOR INSPECTION OR VERIFICATION OF WORK DONE.

DIMENSIONS, DETAILED DRAWINGS AND ELEVATIONS

(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 MY 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. 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 CLEAN AND WELL PAINTED AT THE COMPLETION OF THE CONTRACT. UNLESS OTHERWISE SPECIFIED, THE PROTECTION SHALL BE AT LEAST THAT GIVEN BY THREE (3) COATS OF APPROVED PAINT. THE FIRST COAT IS TO BE APPLIED AT THE SHOP BEFORE THE METAL HAS RUSTED AND AFTER ALL GREASE, DIRT AND SCALE HAS BEEN REMOVED. BOLTS AND NUTS SHALL NOT BE SHOP COATED, BUT SHALL RECEIVE THREE (3) COATS OF APPROVED PAINT AFTER INSTALLATION.

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

TESTS, INSPECTION AND REPORTS.

NOTWITHSTANDING THE REQUIREMENTS OF ANY OTHER PROVISIONS OF THESE SPECIFICATIONS, THE CONTRACTOR SHALL ARRANGE FOR AND PAY ALL COSTS INVOLVED FOR SHOP INSPECTION OF ALL MATERIALS FURNISHED, MANUFACTURE OF ALL PIPE, VALVES, FITTINGS, ETC., FIELD AND SHOP WELDS AND WELDING, AND FURNISH TO THE STATE AND THE CITY OF CLEVELAND COPIES OF ALL SHOP, FABRICATION, MANUFACTURE AND OTHER RELATED INSPECTION REPORTS OF MATERIALS FURNISHED. THIS INSPECTION SHALL BE DONE BY A RECOGNIZED INSPECTION LABORATORY APPROVED BY THE CITY OF CLEVELAND.

HANDLING PIPE AND ACCESSORIES

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

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

(C) - PROTECTION OF PIPE COATING: PIPE SHALL BE HANDLED IN SUCH MANNER THAT A MINIMUM AMOUNT OF DAMAGE TO THE COATING WILL RESULT. ANY CAST IRON PIPE OR FITTING, THE 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.

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

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

CHANGES IN WATER PIPES

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

(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.

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"	50.00

EXCAVATION

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

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

CONT. No. 58019 SHEET ACCT. No. 6405

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 1963
DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER & HEAT
COMMISSIONER - DIVISION OF UTILITIES ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WATERWORK NOTES
WILLOW FREEWAY EXTENSION

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	P.H.		R.R.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY— 21 — 14.12

EXCAVATION (CONT'D)

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

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

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

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

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

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

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

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

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

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

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

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

SHEETING AND BRACING

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

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

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

REMOVAL OF EXCAVATED MATERIAL

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

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

(E) - BEFORE LAYING 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 OF 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

(G) - PREPARATION OF PIPE ENDS FOR STEEL PIPE SHALL BE IN ACCORDANCE WITH THE A.W.W.A. SPECIFICATIONS C 201-50 AND C 202-49 FOR, ELECTRIC FUSION WELDED STEEL WATER PIPE.

FLOATING

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

TESTING MAINS

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

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

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

(D) - AFTER A SECTION OF THE WATER MAIN HAS BEEN TESTED, THE CONTRACTOR SHALL DRAIN SAME. 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 STEEL MAINS OTHER THAN BY THE PRECEDING METHOD, THE CONTRACTOR MAY CHOOSE THE FOLLOWING PROCEDURE:
THE WATER MAIN SHALL BE TESTED UNDER THE SAME HYDROSTATIC PRESSURE AS PREVIOUSLY NOTED. THE TEST PRESSURE SHALL BE MAINTAINED FOR A PERIOD OF TWO (2) HOURS BY PUMPING ADDITIONAL WATER INTO THE MAIN, IF NECESSARY. THE QUANTITY OF WATER THUS PUMPED INTO THE MAIN MULTIPLIED BY TWELVE (12) SHALL BE TAKEN AS THE LEAKAGE PER TWENTY-FOUR (24) HOURS.

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

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

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

(J) - IN ORDER TO BE ABLE TO MAKE PROPER ALLOWANCES FOR LEAKAGE AT VALVES, ETC., PREVIOUSLY NOTED, ONLY SUCH SECTIONS OF WATER MAIN MAY BE SELECTED FOR TEST AS WILL HAVE SUCH VALVES, REMOVABLE 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. CONCRETE PIERS SHALL BE PLACED WHEN CALLED FOR ON THE CONTRACT DRAWINGS, OR ORDERED BY THE ENGINEER.

BACKFILLING

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

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

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

(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.

CONT. No. 58019 SHEET ACCT. No. 6406

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8-1963
DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER & HEAT
COMMISSIONER - DIVISION OF UTILITIES ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WATERWORK NOTES
WILLOW FREEWAY EXTENSION

SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DATE		P.H.		R.R.			

(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.

(C) - 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.

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

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

(F) - 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. HE SHALL THEN BACKFILL WITH SAND PROPERLY RAMMED AND REPLACE THE FINAL PAVEMENT OR ROAD SURFACE.

(G) - 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 SIDEWALKS, DRIVEWAYS OR CURBS, TO REPLACE THOSE REMOVED OR INJURED. AT INTERSECTING WALKS, DRIVES, ETC., ADDITIONAL CONCRETE SLABS BEYOND THE EXCAVATION LIMITS SHALL BE REMOVED AND REPLACED WITH NEW MATERIAL, IN ORDER TO AVOID HAVING MORE JOINTS THAN IN THE ORIGINAL WORK. ALL SLABS REPLACED SHALL BE OF FULL WIDTH. THE CONTRACTOR SHALL FURNISH, PLACE AND MAINTAIN, WHEREVER THE SIDEWALK HAS BEEN REMOVED OR DAMAGED BY HIM, A TEMPORARY SIDEWALK SO AS TO PROVIDE A SAFE AND PASSABLE SIDEWALK UNTIL SUCH TIME AS THE FINAL SIDEWALK IS COMPLETED.

(H) - 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.

(I) - 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.

(J) - 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 CONRECTE, RAMMED IN PLACE.

(K) - 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.

(L) - 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
ITEM - 1

WORK INCLUDED

(A) - THE CONTRACTOR SHALL FURNISH, UNDER ITEM 1, 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 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 AS WORK TO BE DONE BY THE CITY. 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) - ALL PIT CAST PIPE SHALL BE MANUFACTURED IN ALL RESPECTS IN ACCORDANCE WITH, AND SHALL MEET THE REQUIREMENTS OF THE LATEST "STANDARD SPECIFICATIONS FOR CAST IRON PIPE AND SPECIAL FITTINGS" AS ADOPTED BY THE AMERICAN WATER WORKS ASSOCIATION WHICH SPECIFICATIONS EXCEPT AS HEREIN MODIFIED ARE MADE A PART OF THESE SPECIFICATIONS.

(B) - ALL PIT CAST PIPE AND FITTINGS SHALL BE CEMENT LINED AND OF THE SIZE AND CLASSES NOTED ON THE RESPECTIVE CONTRACT DRAWINGS.

(C) - IN LIEU OF PIT CAST PIPE ABOVE THE CONTRACTOR WILL BE PERMITTED TO FURNISH EITHER CENTRIFUGAL OR HIGH STRENGTH CEMENT LINED PIPE. THE METAL SHALL HAVE A MODULUS OF RUPTURE OF NOT LESS THAN 40,000 POUNDS AND A TENSILE STRENGTH OF NOT LESS THAN 18,000 POUNDS AND SHALL BE FOR CLASS NOTED ON THE CONTRACT DRAWINGS. PIPE MAY BE FURNISHED IN 12, 16, or 18 FOOT LENGTHS. THE CENTRIFUGALLY CAST PIPE SHALL CONFORM TO THE AMERICAN STANDARD SPECIFICATIONS A21.6-1952 AND ALL SUBSEQUENT AMENDMENTS THERETO.

WHEN NOTED ON THE CONTRACT DRAWINGS DUCTILE IRON PIPE SHALL BE SUPPLIED. ALL DUCTILE IRON PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH A.S.A. A21.6 OF FEDERAL SPECIFICATION WWP-421B. ALL DUCTILE IRON FITTINGS SHALL BE MANUFACTURED IN ACCORDANCE WITH A.S.A. A21.10 OR AWWA C 100-08. DUCTILE IRON SHALL HAVE A MINIMUM OF 60,000 PSI. ULTIMATE TENSILE STRENGTH, 40,000 PSI. YIELD POINT AND 10% ELONGATION. THE CHEMICAL ANALYSIS SHALL BE AS FOLLOWS: CARBON 3% MINIMUM, PHOSPHORUS .08% MAXIMUM AND SILICON 2.75% MAXIMUM.

(C) - (1) - THE THICKNESS OF THE CENTRIFUGALLY CAST 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"	200	.56	24
12"	250	.60	25
16"	200	.68	25
16"	250	.73	26

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

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

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

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

(G) - WHEREVER CHANGES IN LINE AND GRADES OF THE MAIN AS SHOWN ON THE DRAWINGS ARE NOT STANDARD FITTING DEFLECTIONS, THE CONTRACTOR WILL BE PERMITTED TO SUBMIT DETAILS USING COMBINATIONS OF STANDARD FITTINGS AND SMALL DEFELCTIONS (NOT TO EXCEED A MAXIMUM OF ONE HALF (1/2) INCH JOINT OPENING) IN THE ADJOINING LENGTHS OF PIPE. PIPE TO BE INSTALLED WITH AIR COCKS OR DRAINS SHALL BE CAST WITH BOSSES THEREON, AND DRILLED AND TAPPED FOR TWO (2) INCH CONNECTIONS, AND PLUGGED IN THE 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.

CONT. No. 58019 SHEET ACCT. No. 4402

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 19 63

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

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WATERWORK NOTES
WILLOW FREEWAY EXTENSION

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	PH		RR			

CONT. No. 58019 SHEET ACCT. No. 6408

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.

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)	2-1/2 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 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, 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 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 CENTERLINE 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 PIPE LINE AND CONNECTIONS SHALL INCLUDE THE FURNISHING, LAYING, CONNECTING, PAINTING AND TESTING OF CAST 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 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
ITEMS 2A AND 2B

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL HYDRANTS, CAULKING MATERIAL, LABOR, TOOLS AND EQUIPMENT FOR AND SHALL PROPERLY CONNECT AT THE LOCATION SHOWN ON THE CONTRACT DRAWINGS 6" HYDRANTS, COMPLETE, AS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

HYDRANTS

THE 6" HYDRANTS SHALL CONFORM TO DETAIL ON SHEET NO. 119A.

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.

(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 OF 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.

(H) - CLEANING: HYDRANT SHALL BE THOROUGHLY CLEANED OF DIRT OR FOREIGN MATTER BEFORE SETTING.

(I) - ALL 4" WATER MAIN ITEMS ENCOUNTERED WILL BECOME PROPERTY OF CONTRACTOR AND BE REMOVED BY HIM.

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.

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 1963
DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER & HEAT
COMMISSIONER - DIVISION OF UTILITIES ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WATERWORK NOTES
WILLOW FREEWAY EXTENSION

SCALE

DATE						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	P.H.		R.R.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

100
198

CUYAHOGA COUNTY
CUY— 21—14.12

2-INCH GALVANIZED WROUGHT IRON AND BRASS PIPE
ITEMS 3A AND 3B

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 SPECIFICATIONS B 43-42, AND BE EQUAL TO REVERE RED BRASS PIPE AS MANUFACTURED BY REVERE COPPER AND BRASS INCORPORATED. (FITTINGS) SHALL BE EXTRA STRONG WEIGHT AND SHALL HAVE SOUND WELL FITTING THREADS. — or the Grinnell Company.

GALVANIZED WROUGHT IRON PIPE AND FITTINGS

ALL GALVANIZED WROUGHT IRON PIPE, NIPPLES AND FITTINGS SHALL BE EXTRA HEAVY GENUINE WROUGHT IRON PIPE OF THE A.M. BYERS MAKE, OR EQUAL. 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. — or the Grinnell Company

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 LINEAR FOOT FOR 2 INCH EXTRA STRONG BRASS PIPE AND FITTINGS AND FOR 2 INCH EXTRA HEAVY GALVANIZED WROUGHT IRON PIPE AND FITTINGS UNDER ITEMS 3A AND 3B RESPECTIVELY 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
ITEM-4

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL THE MATERIALS FOR AND SHALL PROPERLY SET IN PLACE AND CONNECT AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED, ALL AIR COCKS, DRAIN VALVES, AND GATE VALVES OF THE VARIOUS SIZES AND TYPES SPECIFIED OR ORDERED ALL AS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

AIR COCKS

ALL AIR COCKS OR AIR VENT VALVES SHALL BE 2 INCH BRASS ANGLE TYPE GLOBE VALVES. 2 INCH AIR COCKS SHALL BE EQUAL IN ALL RESPECTS TO THE FARNAN "CLEVELAND STANDARD" BRASS AIR BENT VALVE NO. W-4695 AS MANUFACTURED BY THE FARNAN BRASS WORKS.

GATE VALVES

(A) - TYPE OF VALVES: THE GATE VALVES SHALL BE MANUFACTURED IN FULL COMPLIANCE WITH THE STANDARD SPECIFICATIONS FOR GATE VALVES FOR ORDINARY WATER WORKS SERVICE OF THE AMERICAN WATER WORKS ASSOCIATION AWWA C 500-52 T OR LATEST REVISION THEREOF AND IN ADDITION SHALL COMPLY WITH THE FOLLOWING SUPPLEMENTARY REQUIREMENTS. ALL GATE VALVES 16 IN. AND UNDER IN SIZE SHALL BE DOUBLE DISC PARALLEL OR TAPERED SEAT BOTTOM WEDGE OR SIDE WEDGE TYPE. ALL GATE VALVES 20 IN. AND OVER IN SIZE SHALL BE DOUBLE DISC PARALLEL SEAT BOTTOM WEDGE OR SIDE WEDGE TYPE AND SHALL INCLUDE BY-PASS VALVES ATTACHED THERETO. IN CLOSING THE VALVE, THE DISCS WHEN OPPOSITE THE PORTS, SHALL BE PRESSED FIRMLY AGAINST THE BODY SEATS BY WEDGES OR SOME OTHER DEVICE EQUALLY SUITABLE TO THE ENGINEER.

(B) - VALVES WITH STATIONARY STEMS: ALL GATE VALVES, UNLESS OTHERWISE ORDERED, SHALL BE MADE WITH SINGLE, NON-RISING STEMS.

(C) - 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.

MECHANICAL JOINT ENDS: THE BELL DIMENSIONS SHALL CONFORM TO TABLE 11.1 OF ASA A-21.11 (AWWA C111). "A MECHANICAL JOINT FOR CAST IRON PRESSURE PIPE AND FITTINGS."

(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 ENGINEER. 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 LBS. 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 ENGINEER. 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 ENGINEER. THE RINGS SHALL BE FIRMLY SECURED IN PLACE BY AN APPROVED DEVICE WHICH WILL PREVENT THEM FROM WORKING LOOSE, PARTICULARLY WHEN THE VALVE IS LEFT PARTLY OPEN. DIMENSIONS OF THE BRONZE SEAT AND GATE RINGS FOR GATE VALVES SHALL BE NOT LESS THAN THAT SPECIFIED IN THE FOLLOWING TABLES BODY SEAT RINGS SHALL BE MADE OF GRADE ONE BRONZE. GATE SEAT RINGS SHALL BE MADE OF GRADE FIVE BRONZE.

BODY AND GATE RINGS
BOTTOM WEDGE

VALVE SIZE	BODY RINGS FACE	BODY RINGS DEPTH	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 WEDGE

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

Rev 12-13-63

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 19 63
DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER & HEAT
COMMISSIONER - DIVISION OF UTILITIES ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WATERWORK NOTES
WILLOW FREEWAY EXTENSION

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	P.H.		R.R.			

CONT. No. 58019 SHEET ACCT. No. 6409

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY— 21— 14.12

(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 BOLTS.

(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 ENGINEER. 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 I 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 ENGINEER, 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 SUFFICENT 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.

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 HINGES, TO 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 PARAGRAPH (P) SEAT AND GATE RINGS 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 FURNISHED WITH SCREW ENDS WHENEVER REQUIRED BY THE ENGINEER. 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 ENGINEER.

(D) - BOLT HOLES: ALL BOLT HOLES SHALL BE ACCURATELY DIRLLED 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 ENGINEER, 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 ENGINEER, 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 SHIPPED BY HAND WITH DUE EASE. A BLOW FROM A HAMMER SHALL PRODUCE AN INDENTATION ON THE EDGE OF THE CASTING WITHOUT FLAKING THE METAL.

(2) - TESTS: BARS FROM THE MOLTEN METAL FROM WHICH THE VALVES ARE BEING MADE SHALL BE TESTED AT SUCH TIME AND IN SUCH MANNER, AS THE ENGINEER MAY REQUIRE. THE REQUIREMENTS OF 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

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 1963
DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER & HEAT
COMMISSIONER - DIVISION OF UTILITIES ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WATERWORK NOTES
WILLOW FREEWAY EXTENSION

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	P.H.		R.R.			

CONT. No. 580/9 PROJECT ACCT. No. 6410

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

102
198

CUYAHOGA COUNTY
CUY— 21—14.12

CONT. No. 58019 SHEET ACCT. No. 691

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 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
MINIMUM YIELD STRENGTH	50,000
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 ENGINEER.

(N) - CHEMICAL ANALYSIS: CHEMICAL ANALYSIS OF THE MATERIAL USED SHALL BE FURNISHED BY THE CONTRACTOR WHENEVER REQUIRED BY THE ENGINEER.

(O) - CLEANING OF CASTINGS: ALL IRON CASTINGS SHALL BE THOROUGHLY CLEANED ON THE OUTSIDE AND INSIDE SURFACES AND PROTECTED FROM RAIN OR MOISTURE UNTIL THEY ARE PAINTED.

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 FURNISHING AND SETTING 6" (SIX INCH) HYDRANTS AND 2-INCH GALVANIZED WROUGHT IRON PIPE AND BRASS PIPE AND AS SHOWN ON THE VALVE SCHEDULE.

(B) - AFTER THE VALVES ARE SET IN PLACE AND READY TO OPERATE, THE CONTRACTOR SHALL TEST THEM UNDER WORKING PRESSURE AND CONDITIONS HEREIN SPECIFIED UNDER THE SPECIFICATION TESTING MAINS AND ANY VALVE FOUND TO LEAK SHALL BE MADE WATER-TIGHT AND, IF FOUND TO BE OF FAULTY DESIGN, SHALL BE SATISFACTORILY REPAIRED OR REPLACED BY THE CONTRACTOR.

PAINTING

(A) - IRON BODY VALVES SHALL EITHER BE DIPPED IN ASPHALT PAINT AND ALL BRONZE PARTS CLEANED, OR ALL IRON CASTINGS SHALL BE PAINTED INSIDE, BEFORE ASSEMBLING, WITH TWO (2) COATS OF AN APPROVED PAINT, AND, AFTER PASSING THE HYDRAULIC TEST, SHALL BE GIVEN AT LEAST TWO (2) COATS OF APPROVED PAINT OUTSIDE.

(B) - AFTER ERECTION, ALL EXPOSED METAL SURFACES OF VALVES EXCEPT BRASS OR BRONZE SHALL BE PAINTED WITH TWO (2) FIELD COATS OF COAL TAR PITCH PAINT EQUAL TO INERTOL 66 OR KOPPERS BITUMASTIC 50.

INSPECTION

THE ENGINEER, OR HIS AUTHORIZED DESIGNATE, WILL INSPECT THE MATERIAL AND WORK DONE AS THE INTERESTS OF THE RESPECTIVE CITIES OR STATE MAY REQUIRE. SUCH OFFICER SHALL HAVE UNRESTRICTED ACCESS TO THE CONTRACTOR'S PLANT, AND TO ALL PARTS OF THE WORK AND OTHER PLACES AT WHICH THE PREPARATION OF THE MATERIAL AND THE CONSTRUCTION OF THE DIFFERENT PARTS OF THE WORK TO BE DONE UNDER THESE SPECIFICATIONS ARE CARRIED ON AND HE SHALL RECEIVE ALL FACILITIES AND ASSISTANCE TO CARRY OUT HIS WORK OF INSPECTION AND TESTING IN A MANNER SATISFACTORY TO THE ENGINEER. SUCH INSPECTION SHALL NOT RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM SAID WORK STRICTLY IN ACCORDANCE WITH THE SPECIFICATIONS, OR ANY MODIFICATIONS THEREOF AS HEREIN PROVIDED AND WORK NOT SO CONSTRUCTED SHALL BE REMOVED AND MADE GOOD BY THE CONTRACTOR AT HIS OWN EXPENSE.

DRAWINGS

(A) - PRIOR TO THE MANUFACTURE OF ANY VALVES, THE CONTRACTOR SHALL SUBMIT FOR THE APPROVAL OF THE ENGINEER AND DIRECTOR OF PUBLIC UTILITIES OF THE CITY OF CLEVELAND, COMPLETE WORKING, DETAIL, AND DIMENSION DRAWINGS SHOWING THICKNESSES AND KINDS OF MATERIAL AND SIMILAR INFORMATION.

(B) - ONE PRINT OF EACH OF THE DRAWINGS SUBMITTED WILL BE RETURNED WITH THE CRITICISMS OR APPROVAL OF THE ENGINEER. IN CASE THE DRAWINGS ARE NOT APPROVED, THE CONTRACTOR SHALL AGAIN SEND FOR APPROVAL, DUPLICATE REVISED PRINTS OF THE DRAWINGS TO TAKE CARE OF THE CRITICISMS NOTED, AND AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED, THE CONTRACTOR SHALL AGAIN FURNISH TO THE ENGINEER FOURTEEN ADDITIONAL PRINTS. TWELVE (12) ON PAPER AND TWO (2) ON CLOTH, ONE OF WHICH SHALL BE FURNISHED TO THE DIRECTOR OF PUBLIC UTILITIES OF THE CITY OF CLEVELAND, OF EACH DRAWING. NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED.

PAYMENT

THE UNIT PRICE STIPULATED FOR VALVES SHALL INCLUDE THE FURNISHING, PLACING, TESTING AND PAINTING OF THE AIR 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 CITY OF CLEVELAND DIVISION OF WATER WILL INSTALL THE BRANCH SLEEVES AND VALVES, BUT THE CONTRACTOR SHALL DO ALL THE NECESSARY EXCAVATION AND BACKFILLING REQUIRED THEREFOR AND REPAVING IF SO NOTED ON THE CONTRACT DRAWINGS AND PAY FOR THE WORK IN ACCORDANCE WITH SPECIFIED SCHEDULE.

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.

VALVE BOXES

MATERIALS AND SPECIFICATIONS SHALL CONFORM TO STATE OF OHIO SPECIFICATION 1-8.

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 SUFFICENT 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.

(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.

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 1963

DIRECTOR OF PUBLIC UTILITIES

COMMISSIONER OF WATER & HEAT

COMMISSIONER - DIVISION OF UTILITIES ENGINEERING

ENGINEER OF CONSTRUCTION & SURVEYS

ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WATERWORK NOTES
WILLOW FREEWAY EXTENSION

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	P.H.		R.R.			

2" WATER LINE TAPS

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL THE MATERIALS FOR AND SHALL PROPERLY CONNECT IN PLACE AT THE LOCATIONS SHOWN ON THE DRAWINGS 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. THE CONTRACTOR SHALL MAKE THE NECESSARY TRENCH EXCAVATION, BACKFILL AND SEEDING AS MAY BE REQUIRED.

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. ON THE 2" PIPE A SHUT OFF VALVE SHALL BE CONNECTED, MOUNTED ON A BLOCKING OF STONE, BRICK OR CONCRETE TO RESIST SETTLEMENT.

MEASUREMENT

THE 2" WATER LINE TAPS 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 2" WATER TAP CONNECTED UNDER THIS ITEM SHALL INCLUDE THE FURNISHING AND DELIVERY TO THE PROPER LOCATION, EXCAVATION, BACKFILLING, SEEDING, 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".

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 REPAVING AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

HYDRANTS AND VALVES AND BOXES RELOCATED

WORK INCLUDED

THE CONTRACTOR SHALL REMOVE THE HYDRANTS AND VALVES AND BOXES AND PROPERLY SET IN PLACE AND CONNECT AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER. THIS SHALL INCLUDE ALL EXCAVATING, BACKFILLING, SEEDING AND SODDING, AND REPAVING REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

MATERIALS

ALL HYDRANTS AND VALVES AND BOXES TO BE RELOCATED MUST BE IN GOOD CONDITION. ALL OTHER MATERIALS AND APPURTENANCES NECESSARY FOR THE PROPER COMPLETION OF THIS ITEM SHALL BE OF THE KIND AND GRADE CALLED FOR IN THESE NOTES FOR THE PARTICULAR KIND OF CONSTRUCTION IN WHICH THE MATERIALS ARE TO BE USED.

CONSTRUCTION METHODS

THE CONSTRUCTION METHODS SHALL CONFORM TO THE REQUIREMENTS OF THE ITEM "FURNISHING AND SETTING 6" AND 4" HYDRANTS" FOR HYDRANTS AND THE ITEM "VALVES" FOR VALVES AND BOXES AS SET FORTH ELSEWHERE IN THESE NOTES

METHOD OF MEASUREMENT

THE HYDRANTS AND VALVES AND BOXES 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 HYDRANT AND VALVE AND BOX RELOCATED UNDER THIS ITEM SHALL INCLUDE REMOVING, RECONNECTING ACCORDING TO THE PROVISIONS OF THESE SPECIFICATIONS FOR THE PARTICULAR TYPE OF CONSTRUCTION CALLED FOR ON THE PLANS, AND FOR ALL EXCAVATION, BACKFILLING, SEEDING AND SODDING AND REPAVING, AND THE FURNISHING OF ALL MATERIAL, LABOR, EQUIPMENT, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

HYDRANTS AND VALVES REMOVED

WORK INCLUDED

THE CONTRACTOR SHALL PERFORM ALL OPERATIONS NECESSARY TO THE PROPER REMOVAL OF THE HYDRANT AND VALVE AT THE LOCATIONS SHOWN ON THE PLANS. THIS WORK SHALL INCLUDE EXCAVATING, REMOVING, BACKFILLING, SEEDING AND SODDING, AND REPAVING REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

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 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 MEASURED AS PROVIDED ABOVE SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR "HYDRANTS AND VALVES REMOVED FOR STORAGE" OR "HYDRANTS AND 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.

BRICK AND PLAIN CONCRETE MASONRY

ITEMS 6 AND 7

UNDER THESE ITEMS THE CONTRACTOR SHALL FURNISH ALL NECESSARY LABOR, MATERIALS, TOOLS AND EQUIPMENT FOR THE CONSTRUCTION, COMPLETE, OF ALL MISCELLANEOUS MASONRY STRUCTURES, AND INCLUDING ALL WATER MAIN DRAIN AND PITOMETER VAULTS, ACCESS AND ANCHORAGE MANHOLES, VALVE CHAMBERS, SEWER MANHOLES, CATCH BASINS, ANCHORS, PIERS AT PIPE BENDS AND UNDER LINE VALVES, FLOORS FOR DRAIN AND VALVE VAULTS, AND OTHER APPURTENANT WORK TOGETHER WITH THE HAULING, MIXING, PLACING, FORMS, SCAFFOLDING, SHEETING AND BRACING, GROUTING, PLASTERING, CURING, ETC., ALL AS SPECIFIED, REQUIRED OR SHOWN ON THE CONTRACT DRAWINGS.

BRICK AND MASONRY MATERIAL

(A) - THE MATERIAL FURNISHED BY THE CONTRACTOR FOR THE VARIOUS KINDS OF MASONRY CONSTRUCTION TO BE CONSTRUCTED SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:

(B) - ALL BRICK FURNISHED AND USED SHALL BE NO.2 SHALE BRICK AND SHALL COMPLY WITH THE REQUIREMENTS FOR "GRADE SA" ASTM DESIGNATION: C 32-42.

(C) - ALL CEMENT USED SHALL CONFORM TO "STANDARD SPECIFICATIONS FOR PORTLAND CEMENT, ASTM DESIGNATION: C 150-44T."

(D) - ALL CONCRETE SAND SHALL BE CLEAN, FREE FROM DIRT, LOAM, VEGETABLE OR OTHER ORGANIC MATTER. SAND SHALL NOT CONTAIN MORE THAN THREE (3%) PER CENT BY WEIGHT OF LOAM OR CLAY AND IN NO CASE SHALL SAND BE USED IF ITS GRAINS ARE COATED WITH THESE SUBSTANCES. FINE AGGREGATE SHALL BE WELL GRADED FROM COARSE TO FINE AND WHEN TESTED BY MEANS OF LABORATORY SIEVES SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

RETAINED ON	PERCENTAGE BY WEIGHT
3/8" SIEVE	0.0
4 SIEVE	0-10
16 SIEVE	20-55
50 SIEVE	70-95
100 SIEVE	92-100

SILT NOT TO EXCEED THREE (3%) PER CENT.

(E) - ALL STONE OR SLAG SHALL BE CLEAN, HARD AND WELL GRADED FROM FINE TO COARSE AND BE FREE FROM FOREIGN SUBSTANCES AND SHALL PASS THROUGH A 1-1/2 INCH RING AND BE RETAINED ON A 1/2 INCH RING.

(F) - THE CRUSHED SLAG SHALL BE COMPOSED OF CLEAN, SOUND, DURABLE AND WELL SEASONED AIR COOLED BLAST FURNACE SLAG, WEIGHING, COMPACTED NOT LESS THAN SEVENTY (70) POUNDS PER CUBIC FOOT, REASONABLY UNIFORM IN DENSITY AND REASONABLY FREE FROM THIN, ELONGATED OR GLASSY PIECES.

(G) - ALL WATER SHALL BE CLEAN AND ACCURATELY MEASURED FOR EACH BATCH OF CONCRETE.

(H) - ALL PLAIN CONCRETE SHALL BE MIXED IN THE PROPORTION OF ONE (1) PART OF CEMENT, TWO (2) PARTS OF SAND AND FOUR (4) PARTS OF COARSE AGGREGATE.

(I) - ALL CEMENT MORTAR SHALL BE MIXED IN THE PROPORTION OF ONE (1) PART OF CEMENT TO THREE (3) PARTS OF SAND, EXCEPT THE MORTAR FOR BRICK CATCH BASINS AND SEWER MANHOLES WHICH SHALL BE 1:2 MIX.

MANHOLE CONSTRUCTION

(A) - ALL BRICK MANHOLES, BRICK NECKS AND EXTENSIONS SHALL BE BUILT IN ACCORDANCE WITH THE CONTRACT DRAWINGS.

(B) - THE WALLS OF MANHOLES SHALL BE BUILT OF NO. 2 SHALE BRICK LAID IN 1:3 PORTLAND CEMENT MORTAR, WITH BRICK ARRANGED RADIALLY AS HEADERS, FORMING A WALL NINE 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-EIGHTS 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

NO SEPARATE PAYMENT WILL BE MADE FOR BRICK OR PLAIN CONCRETE MASONRY. PAYMENT WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE ITEM IN WHICH IT IS USED. PAYMENT FOR CONCRETE PIERS IS TO BE INCLUDED IN THE PRICE BID FOR THE PIPE.

MISCELLANEOUS METAL WORK

ITEM - 8

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 A 7-46. ALL BRONZE BOLTS AND NUTS SHALL CONFORM TO U.S. STANDARD SIZES, AND SHALL BE CLEAN CUT AND HAVE WELL FITTED THREADS. ALL BRONZE BOLTS AND NUTS SHALL BE OF 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.

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 1963

DIRECTOR OF PUBLIC UTILITIES

COMMISSIONER OF WATER & HEAT

COMMISSIONER - DIVISION OF UTILITIES ENGINEERING

ENGINEER OF CONSTRUCTION & SURVEYS

ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WATERWORK NOTES
WILLOW FREEWAY EXTENSION

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	P.H.		R.R.			

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COATING

EACH CASTING SHALL BE SPRAYED OR BRUSHED INSIDE AND OUT WITH ONE COAT OF ASPHALTIC COMPOUND VARNISH. THE VARNISH SHALL BE MADE OF HIGH GRADE ASPHALT FLUXED AND BLENDED WITH PROPERLY TREATED DRYING OILS AND THINNED TO A PROPER CONSISTENCY WITH A VOLATILE SOLVENT. THE VARNISH SHALL BE EQUAL TO BLACK ASPHALT VARNISH AS MANUFACTURED BY THE EXCELSIOR VARNISH WORKS, INCL, CLEVELAND 2, OHIO. 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 VALVE NUTS, AND SHALL BE SET PLUMB AND TRUE TO ELEVATION AS REQUIRED.

DETAILED DRAWINGS

COMPLETE DETAILED DRAWINGS OF MISCELLANEOUS METAL WORK SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL, PRIOR TO THE MANUFACTURE OF ANY WORK TO BE FURNISHED UNDER THIS ITEM, IN ACCORDANCE WITH THESE SPECIFICATIONS.

PAINTING

ALL MISCELLANEOUS METAL WORK NOT GALVANIZED SHALL BE THOROUGHLY CLEANED AND GIVEN THREE (3) FIELD COATS OF COAL TAR PITCH EQUAL TO INERTOL 50 OR BITUMASTIC 50.

PAYMENT

PAYMENT FOR MISCELLANEOUS METAL WORK WILL BE INCLUDED IN THE PRICE BID FOR THE ITEM IN WHICH IT IS USED.

PRESTRESSED CONCRETE CYLINDER PIPE
ITEM -9

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL THE MATERIALS, LABOR, TOOLS AND EQUIPMENT FOR AND SHALL PROPERLY CONSTRUCT AND CONNECT IN PLACE THE WATER MAIN AT LOCATIONS SHOWN ON THE DRAWINGS, OR AS DIRECTED, USING PRESTRESSED CONCRETE CYLINDER PIPE AND FITTINGS AND INCLUDING ALL EXCAVATION WORK, BACKFILLING, SAND BACKFILL, REPAVING, CONCRETE CYLINDER FITTINGS, CAST IRON PIPE AND FITTINGS, VICTAULIC AND DRESSER COUPLINGS, ETC., ALL AS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

DEFINITIONS

WHENEVER THE WORKS "CONCRETE PIPE" OR "PRESTRESSED CONCRETE CYLINDER PIPE" ARE USED, THEY SHALL REFER TO AND MEAN "PRESTRESSED STEEL CYLINDER REINFORCED CONCRETE PRESSURE PIPE."

PRESTRESSED CONCRETE CYLINDER PIPE

(A) - ALL PRESTRESSED CONCRETE PIPE TO BE FURNISHED SHALL CONFORM TO THESE SPECIFICATIONS AND SHALL CONFORM TO THE LATEST AWWA C 301-58 "STANDARD SPECIFICATIONS FOR REINFORCED CONCRETE WATER PIPE-STEEL CYLINDER TYPE, PRESTRESSED."

(B) - THE PRESTRESSED CONCRETE CYLINDER PIPE SHALL BE FURNISHED IN UNIFORM LENGTH OF NOT LESS THAN SIXTEEN FEET FOR THE PIPE EXCEPT THAT SHORTER LENGTHS MAY BE USED TO MEET SPECIAL CONDITIONS. THE NOMINAL THICKNESS OF THE CORE AND THE NOMINAL THICKNESS OF THE MORTAR COATING SHALL NOT BE LESS THAN THAT GIVEN IN THE FOLLOWING TABLE:

(B) - CONTINUED

NOMINAL INSIDE DIAMETER	CORE THICKNESS	MINIMUM MORTAR COATING
16"	1"	3/4"
20"	1-1/4"	3/4"
24"	1-1/2"	3/4"
30"	1-7/8"	3/4"
36"	2-1/4"	3/4"
42"	2-5/8"	3/4"
48"	3"	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) PER CENT. THE ENDS OF PIPE SHALL BE AT RIGHT ANGLES TO THE PIPE AXIS. PIPES MAY BE BEVELED TO FORM CURVES. THE CONCRETE USED TO LINE THE STEEL CYLINDERS SHALL BE MADE FROM SUITABLE AGGREGATES COMPOSED OF HARD, DURABLE PARTICLES, CLEAN AND FREE FROM LOAM OR ORGANIC MATERIAL. CEMENT SHALL FULFILL THE REQUIREMENTS OF ASTM DESIGNATION: C 150-52, "STANDARD SPECIFICATIONS FOR PORTLAND CEMENT." IT IS THE INTENT OF THIS PSECIFICATION TO PRODUCE A CONCRETE HAVING A 28-DAY STRENGTH OF 4500 OR A 7-DAY STRENGTH OF 3000 POUNDS PER SQUARE INCH FOR STANDARD 6" x 12" TEST CYLINDERS WHICH SHALL BE CURED IN THE SAME MANNER AS THE PIPE. CONCRETE FOR WHICH 28-DAY STRENGTH TESTS SHALL SHOW STRENGTHS OF LESS THAN 4500 POUNDS PER SQUARE INCH MAY BE USED PROVIDING THAT THE MAXIMUM DESIGN COMPRESSIVE STRESSES IN THE CONCRETE SHALL NOT EXCEED FORTY (40%) PER CENT OF THE STRENGTH OF THE CONCRETE AT THE TIME OF WRAPPING.

(C) - THE CONCRETE LINING OF THE STEEL CYLINDER MAY BE PLACED VERTICALLY BY THE USE OF INTERIOR FORMS OR MAY BE PLACED BY THE CENTRIFUGAL PROCESS. WHEN THE CENTRIFUGAL PROCESS IS USED, THE CYLINDER SHALL BE HELD SECURELY IN SPINNING FRAMES AND THE FRAMES PLACED HORIZONTALLY IN A MACHINE WHICH WILL CAUSE THEM TO ROTATE RAPIDLY ABOUT THEIR LONGITUDINAL AXIS AT A RIM SPEED SUFFICIENT TO INSURE GOOD COMPACTION OF THE CONCRETE. THE CONCRETE SHALL BE PLACED IN THE STEEL CYLINDERS WHILE THEY ARE REVOLVING IN SUCH MANNER THAT THE ROTATION SHALL EVENLY DISTRIBUTE THE CONCRETE ALONG THE ENTIRE LENGTH OF THE PIPE. AFTER THE CONCRETE HAS BEEN DEPOSITED, THE FRAMES SHALL CONTINUE TO REVOLVE UNTIL THE EXCESS WATER HAS COME TO THE SURFACE AND THE CONCRETE HAS BECOME THOROUGHLY COMPACTED. THE INTERIOR SURFACE OF THE PIPE MAY BE FINISHED EITHER WHILE IT IS STILL IN THE CENTRIFUGAL MACHINE OR BY MEANS OF A HONING OPERATION AFTER THE CONCRETE HAS SET. WHEN THE SPINNING OF THE CONCRETE IS COMPLETED, THE LINED CYLINDERS SHALL BE REMOVED FROM THE MACHINE AND PLACED IN A VERTICAL POSITION FOR CURING. AFTER THE CONCRETE HAS TAKEN ITS FINAL SET, THE PIPES SHALL BE KEPT IN A WARM ATMOSPHERE FOR CURING.

(D) - WHEN THE CONCRETE LINING IS PLACED BY A VERTICAL CASTING, THE STEEL CYLINDER SHALL BE PLACED VERTICALLY ABOUT AN INTERIOR MOLD AND THE MOLD AND CYLINDER SHALL BE HELD IN CIRCULAR AND CONCENTRIC POSITION BY TOP AND BOTTOM RINGS OF STEEL OR CAST IRON. WHILE THE CONCRETE IS BEING PLACED, 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 ATTAINING THE REQUIRED STRENGTH.

(H) - THE CEMENT MORTAR COATING SHALL BE APPLIED TO THE CORES AFTER THEY HAVE BEEN WRAPPED UNDER TENSION WITH HIGH TENSILE WIRE. THE MORTAR USED FOR THIS COATING SHALL CONSIST OF ONE PART OF CEMENT TO NOT MORE THAN THREE PARTS OF FINE AGGREGATE, MEASURED BY VOLUME. THE MORTAR SHALL BE PLACED ON THE PIPE BY A MACHINE IN WHICH THE MORTAR, PREVIOUSLY MIXED, IS DRIVEN AGAINST THE EXTERIOR SURFACE OF THE CORE SO AS TO PRODUCE A DENSE COATING AROUND THE PIPE AND COVERING THE STEEL REINFORCING. UPON COMPLETION OF THE COATING OPERATION, THE PIPES SHALL BE PLACED WHERE THEY ARE PROTECTED FROM SUN, WIND AND RAIN AND AFTER THE MORTAR HAS HARDENED SUFFICIENTLY IT SHALL BE KEPT MOIST WITH WATER OR STEAM UNTIL THE FOLLOWING DAY OR FOR A PERIOD OF NOT LESS THAN TWELVE HOURS, AT WHICH TIME THE PIPES MAY BE PLACED IN THE STORAGE YARD. IF WATER IS USED FOR CURING, THE PIPES SHALL BE KEPT MOIST BY PERIODIC SPRINKLING FOR AN ADDITIONAL 3 DAYS AFTER BEING PLACED IN STORAGE. IN LIEU OF THE MOIST CURING METHOD, THE MANUFACTURER MAY USE CONCRETE CURING COMPOUNDS OF THE EMULSIFIED ASPHALT OR SYNTHETIC RESIN TYPE, PROVIDED THAT SUCH COMPOUNDS MUST BE APPLIED TO THE MORTAR AT SUCH TIME AS TO ASSURE THE RETENTION OF ADEQUATE MOISTURE FOR THE PROPER HYDRATION OF THE CEMENT

(I) - THE PIPE SHALL BE REINFORCED WITH A CONTINUOUS WELDED STEEL CYLINDER OF HOT ROLLED STEEL SHEETS NOT LIGHTER THAN 16 U.S. GAGE AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION: A245-52T, BRADE B, SPECIFICATIONS FOR "HEAVY GAGE STRUCTURAL QUALITY FLAT HOT-ROLLED CARBON STEEL OPEN HEARTH," OR ANY SUBSEQUENT AMENDMENTS THERETO, AND ASTM DESIGNATION: A242-52T, SPECIFICATIONS FOR "LOW-ALLOY STRUCTURAL STEEL" OR ANY SUBSEQUENT AMENDMENTS THERETO. EITHER OPEN HEARTH OR BESSEMER SHEETS HAVING PHYSICAL AND CHEMICAL QUALITIES EQUIVALENT TO THOSE MENTIONED MAY BE USED. WHERE THE PIPES ARE DESIGNED FOR SPECIAL CONDITIONS OR FOR HIGH OPERATING PRESSURES, THE CYLINDERS MAY BE MADE FROM HOT-ROLLED SHEETS OF SPECIAL ALLOY STEEL HAVING HIGHER ELASTIC LIMIT AND ULTIMATE STRENGTH THAN THOSE SPECIFIED. IN SUCH CASE THE SHEETS SHALL BE OF GOOD WELDING QUALITY AND SHALL CONFORM TO THE STEEL MANUFACTURER'S PUBLISHED SPECIFICATIONS FOR THE SPECIAL GRADE OF STEEL BEING SUPPLIED. EACH COMPLETED CYLINDER WITH JOINT RINGS WELDED TO IT SHALL BE SUBJECTED TO A HYDROSTATIC TEST BY CLOSING THE ENDS AT THE JOINT RINGS, FILLING WITH WATER IN CONTACT AT ALL POINTS WITH WELDS, AND RAISING THE WATER PRESSURE TO STRESS THE CYLINDER TO A FIBRE STRESS OF 25,000 POUNDS PER SQUARE INCH. WHILE UNDER PRESSURE TEST, ALL WELDS SHALL BE THOROUGHLY INSPECTED. IF ANY LEAKS ARE FOUND, THEY SHALL BE REPAIRED AND THE CYLINDER SHALL BE 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 TENSILE WIRE USED FOR CIRCUMFERENTIAL REINFORCEMENT SHALL BE OF HIGH TENSILE PROPERTIES EITHER COLD DRAWN OF HIGH CARBON MB BASIC, UNTEMPERED ACCORDING TO THE DIAMETER OF THE PIPE AND THE PRESSURE FOR WHICH IT IS DESIGNED. THE TYPE OF WIRE TO BE USED SHALL BE DETERMINED BY THE MANUFACTURER AND SHALL CONFORM TO THE APPROPRIATE ASTM SPECIFICATIONS AS FOLLOWS:

ASTM DESIGNATION	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 245-44T, GRADE B, SPECIFICATION FOR "LIGHT GAGE STRUCTURAL QUALITY FLAT HOT-ROLLED CARBON STEEL" OR A 283-46T, GRADE A, SPECIFICATION FOR "STRUCTURAL QUALITY LOW AND INTERMEDIATE TENSILE STRENGTH CARBON STEEL PLATES," OR ANY SUBSEQUENT AMENDMENTS THERETO.

(N) - FITTINGS OR SPECIALS SHALL BE FURNISHED AND INSTALLED AS SHOWN ON THE DRAWINGS FOR CONCRETE CYLINDER PIPE OR AS REQUIRED AND 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 THAN THAT FOR THE ADJOINING STRAIGHT PIPE IF SUCH STRAIGHT PIPE WERE DESIGNED AS CONCRETE CYLINDER PIPE.

(P) - THE OPENINGS IN THE SPECIAL MAY BE FORMED BY STEEL RINGS OR CASTINGS OF SUITABLE DESIGN SECURELY WELDED TO THE CYLINDER AND REINFORCING CAGE. ALL BENDS AND SPECIAL PIECES SHALL BE PROVIDED WITH JOINT RINGS CORRESPONDING TO THOSE IN THE STRAIGHT PIPE.

CONT. No. 58019 SHEET ACCT. No. 6413

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 1963

DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER & HEAT
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ENGINEER OF CONSTRUCTION & SURVEYS
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1922 EAST 107TH STREET CLEVELAND, OHIO

WATERWORK NOTES
WILLOW FREEWAY EXTENSION

SCALE	DATE					
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(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 EQUAVALENT 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 COUBLE 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) - TESTING BULKHEADS SHALL BE FURNISHED AND INSTALLED FOR TESTING ANY COMPLETED SECTIONS OF THE PRESTRESSED CONCRETE CYLINDE R 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.

(DD) - CLOSURE PIECES WITH DRESSER COUPLING JOINTS WITH STOPS REMOVED, SHALL BE PROVIDED AS ARE NECESSARY FOR THE PROPER CONSTRUCTION OF THE WATER MAINS. MEASUREMENTS FOR LENGTH OF CLOSURE PIECES WILL BE MADE IN THE FIELD BY THE CONTRACTOR AFTER ADJACENT PIPE SECTIONS ARE IN PLACE IN THE TRENCH.

(EE) - TESTS, INSPECTION, REPORTS AND ANALYSES OF TESTS OF SAMPLES FOR ALL MATERIALS SHALL BE FURNISHED IN ACCORDANCE WITH PREVIOUS INSTRUCTIONS IN THESE NOTES.

MARKING

EACH PIPE AND SPECIAL SHALL HAVE CONSPICUOUSLY PAINTED IN BLACK ON THE INSIDE, A SERIAL NUMBER FOR THE PURPOSE OF IDENTIFICATION. SERIAL NUMBERS SHALL AGREE WITH LISTS TO BE FURNISHED TO THE ENGINEER. THE TOP CENTER LINE OF ALL SPECIAL FITTINGS AND EACH PIPE THAT HAS A BEVELED END SHALL HAVE A WHITE RING PAINTED IN THE SHOP AROUND THE MARK BOTH ON THE INSIDE AND OUTSIDE OF THE PIPE.

TYPICAL FIELD JOINTS FOR CONCRETE PIPE

THE CONTRACTOR SHALL MAKE ALL TYPICAL FIELD JOINTS AND WELDED TIED JOINTS MARKED "X", "Y" AND "Z" AS SHOWN ON THE CONTRACT DRAWINGS OR AS REQUIRED AND AS SPECIFIED IN THE SECTION OF THESE NOTES TITLED LAYING PIPE AND SHALL PROPERLY MAKE ALL FIELD WELDS FOR THE ABOVE TIED JOINTS. THE ANNULAR RECESSES AT THE JOINT, BOTH INSIDE AND OUTSIDE OF THE PIPE SHALL BE FILLED WITH CEMENT MORTAR MIXED IN A PROPORTION OF NOT LESS THAN ONE PART OF CEMENT TO TWO PARTS OF SAND.

FLANGED JOINTS

(A) - FLANGED JOINTS SHALL BE INSTALLED AS SHOWN ON THE DRAWINGS. FLANGES SHALL BE EITHER CAST STEEL, FORGED OR ROLLED STEEL, OR PROPERLY WELDED AND MACHINE FABRICATED STEEL PLATES, WELDED TO PIPE WITH TWO CONTINUOUS WELDS. THEY SHALL HAVE PLAIN FACES AND SHALL BE FACED TRUE AND SMOOTH AT RIGHT ANGLES TO THE AXIS OF THE PIPE AND SHALL BE SPOT FACED ON THE BACK. DRILLING SHALL CONFORM TO "AMERICAN 1928 STANDARD."

FLANGED JOINTS (CONT'D)

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 307-52T."

(B) - ALL BOLTS USED IN THE FINISHED WORK FOR FLANGES AND TIED JOINTS FOR CONCRETE PIPE SHALL BE OF MEDIUM OPEN HEARTH STEEL. THE ENDS OF ALL BOLTS MUST BE FINISHED TO STANDARD RADIUS IN ACCEPTABLE MANNER. ALL SCREW THREADS SHALL BE AMERICAN STANDARD 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.

(C) - IN PLACE OF FLANGED JOINTS, ON CONCRETE PIPE BETWEEN VERTICAL BENDS ON TIED DISTANCES, AND ELSEWHERE AS SHOWN ON THE DRAWINGS, THE USE OF BUTT WELDED JOINTS WILL BE PERMITTED, UNLESS SPECIFICALLY PROHIBITED ON THE DRAWINGS. THE STEEL CYLINDER SHALL BE REINFORCED HAVING A THICKNESS OF NOT LESS THAN THAT CALLED FOR IN DETAIL Z. THE ENDS OF THE STEEL CYLINDERS SHALL BE BEVELED. THE WELD MATERIAL AND THE WELDING PROCEDURE SHALL CONFORM TO THE AWWA C 206-50 "TENTATIVE STANDARD SPECIFICATIONS FOR FIELD WELDING OF STEEL WATER PIPE JOINTS: AND ANY SUBSEQUENT AMENDMENTS THERETO. THE ANNULAR RECESSES AT THE JOINT, BOTH INSIDE AND OUTSIDE OF THE PIPE SHALL BE PROTECTED AGAINST CORROSION BY AN APPROVED METHOD. ALL EXPOSED STEEL SURFACES BOTH INSIDE AND OUTSIDE OF THE PIPE SHALL BE COATED IN ACCORDANCE WITH THE COATING REQUIREMENTS OF THESE SPECIFICATIONS.

LEAD JOINTS

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

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

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

VICTAULIC TYPE COUPLINGS 414

(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 AN ASSEMBLY PLAN FOR THE ENTIRE LENGTH OF THE PIPE LINE FOR WHICH CONCRETE PIPE IS FURNISHED UNDER THE APPROPRIATE ITEMS. THIS ASSEMBLY PLAN SHALL ALSO SHOW THE CORRECT LOCATION OF ALL FITTINGS FURNISHED.

(C) - ONE PRINT OF EACH OF THE DRAWINGS SUBMITTED WILL BE RETURNED WITH THE CRITICISMS OR APPROVAL OF THE DIRECTOR. IN CASE THE DRAWINGS ARE NOT APPROVED, THE CONTRACTOR SHALL AGAIN SEND FOR APPROVAL, DUPLICATE REVISED PRINTS OF THE DRAWINGS TO TAKE CARE OF THE CRITICISMS NOTED, AND AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED, THE CONTRACTOR SHALL AGAIN FURNISH TO THE DIRECTOR TEN ADDITIONAL PRINTS, EIGHT (8) ON PAPER AND TWO (2) ON CLOTH, OF EACH DRAWING. NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED.

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

EXPERIENCE QUALIFICATIONS

ALL BIDDERS WILL BE REQUIRED TO SHOW TO THE SATISFACTION OF THE DIRECTOR THAT THE TYPE AND SIZE OF PIPE AND FITTINGS HE 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 9 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.

CONT. No. 58019 SHEET ACCT. No. 6414

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES.
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 1963

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

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WATERWORK NOTES
WILLOW FREEWAY EXTENSION

SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED

PAYMENT

(A) - THE UNIT PRICE STIPULATED TO BE PAID FOR EACH LINEAR FOOT OF WATER MAIN UNDER ITEM 9 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) - ALL CAST IRON PIPE AND FITTINGS WILL BE PAID FOR UNDER ITEM 1. ALL 2-INCH BRASS AND GALVANIZED WROUGHT IRON PIPE WILL BE PAID UNDER ITEM 3. ALL VALVES WILL BE PAID FOR UNDER ITEM 4. ALL VITRIFIED PIPE AND SPECIALS WILL BE PAID FOR UNDER ITEM 5. BRICK MASONRY, CONCRETE AND MISCELLANEOUS METAL WILL BE PAID UNDER ITEMS 6, 7 AND 8 RESPECTIVELY.

EXTRA CONCRETE PRESSURE PIPE FITTINGS
ITEM 10

WORK INCLUDED

(A) - THE CONTRACTOR SHALL, UNDER ITEM 10, 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 UNDER ITEM 10, 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 UNDER ITEM 10 FOR EXTRA FITTINGS WHICH ARE INSTALLED FOR THE CONVENIENCE OF THE CONTRACTOR WITHOUT SPECIFIC ORDERS FROM THE DIRECTOR.

PLUGGING EXISTING WATER MAINS & BRANCHES AND PLUGGING SERVICE CONNECTIONS

WORK INCLUDED

THE CONTRACTOR SHALL UNDER THIS ITEM, FURNISH ALL THE MATERIALS, LABOR, TOOLS AND EQUIPMENT REQUIRED FOR THE PLUGGING OF EXISTING WATER MAINS AND BRANCHES, AND THE PLUGGING OF SERVICE CONNECTIONS AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS ORDERED, INCLUDING CAST IRON PLUGS OR CAPS WITH CLAMPS AND CONCRETE PIERS, ALL EXCAVATION, SAND BACKFILL, BACKFILL, TEMPORARY REPAVING AND PERMANENT REPAVING, ALL AS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

(A) PLUGGING MAINS AND BRANCHES

WHEN INDICATED ON THE PLANS OR AS ORDERED, THE CONTRACTOR SHALL PLUG OR CAP MAINS, TEES OR CROSSES, PLUG CONNECTIONS AT MAIN OR BRANCHES, SHALL DO ALL THE EXCAVATING, BACKFILLING AND REPAVING, ALL AS REQUIRED.

(B) PLUGGING SERVICE CONNECTIONS

THE CONTRACTOR SHALL DO ALL NECESSARY EXCAVATION, SHEETING AND SHORING, SAND BACKFILLING, BACKFILLING AND REPAVING REQUIRED FOR THIS ITEM, BUT THE CLEVELAND WATER DEPARTMENT WILL PLUG THE SERVICE CONNECTIONS.

THE CONTRACTOR SHALL ARRANGE WITH THE CLEVELAND WATER DEPARTMENT FOR THE NECESSARY WORK UNDER THIS ITEM AND SHALL PAY THE CLEVELAND WATER DEPARTMENT THE TOTAL COST REQUIRED FOR THE WORK BEFORE THE WORK IS PERFORMED. THE CITY WILL CHARGE THE CONTRACTOR FOR THE MATERIAL AND LABOR FURNISHED IN PLUGGING THE SERVICE CONNECTIONS, AND COSTS THEREOF SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "PLUGGING SERVICE CONNECTIONS."

MEASUREMENT

THE EXISTING WATER MAINS AND BRANCHES PLUGGED OR SERVICE CONNECTIONS PLUGGED TO BE PAID FOR SHALL BE THE ACTUAL NUMBER OF EACH LISTED AND ESTIMATED SEPARATELY, COMPLETED AND ACCEPTED.

BASIS OF PAYMENT

THE UNIT PRICE STIPULATED FOR (A), PLUGGING ENDS OF EXISTING WATER MAINS AND BRANCHES AND (B), PLUGGING OF SERVICE CONNECTIONS SHALL INCLUDE THE FURNISHING OF CAST IRON PLUGS OR CAPS, WITH CLAMPS, LEAD, CONCRETE PIERS, LAYING, CAULKING, PAINTING, TESTING, THE EXCAVATION, SHEETING AND SHORING, BACKFILLING, SAND BACKFILL, TEMPORARY REPAVING AND PERMANENT REPAVING WHERE INDICATED ON THE PLANS AND THE FURNISHING OF ALL LABOR, MATERIAL, TOOLS, APPLIANCES AND EQUIPMENT TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

CONT. No. 58019 SHEET ACCT. No. 615

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 1963
DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER & HEAT
COMMISSIONER - DIVISION OF UTILITIES ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WATERWORK NOTES
WILLOW FREEWAY EXTENSION

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	L.H.					

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

107/198

CUYAHOGA COUNTY
CUY— 21— 14.12

SUMMARY OF WATERWORK QUANTITIES
CODE Y 060

SHEET NO.	LOCATION	ITEM 1A - 6" CEMENT LINED CAST IRON PIPE AND FITTINGS	ITEM 1B - 12" CEMENT LINED CAST IRON PIPE AND FITTINGS	ITEM 1C - 16" CEMENT LINED DUCTILE IRON PIPE AND FITTINGS	ITEM 3A - 2" EXTRA STRONG BRASS PIPE AND FITTINGS	ITEM 3B - 2" EXTRA HEAVY GALVANIZED WROUGHT IRON PIPE & FITTINGS	ITEM 4A - 2" BRASS VALVES - STRAIGHT, THREADED ENDS	ITEM 4B - 2" BRASS VALVES - ANGLE, THREADED ENDS	ITEM 4C - 6" GATE VALVES FLANGED ENDS	ITEM 4D - 12" GATE VALVES FLANGED ENDS	ITEM 4E - 12" GATE VALVES BELL ENDS	ITEM 4F - 16" GATE VALVE FLANGED ENDS	ITEM 4G - 24" GATE VALVE VICTAULIC ENDS	ITEM 6 - BRICK MASONRY	ITEM 7 - CONCRETE MASONRY	ITEM 8 - MISCELLANEOUS METAL WORK	ITEM 9 - 30" PRESTRESSED CONC. CYLINDER PIPE & FITTINGS	ITEM 10 - EXTRA 30" CONCRETE CYLINDER PIPE FITTINGS	SPECIAL - RELOCATE & RECONNECT HOUSE WATER SERVICE CONN'S.	SPECIAL - PLUG HOUSE WATER SERVICE CONNECTIONS	SPECIAL - PLUG EXISTING 6" WATER MAINS	SPECIAL - INSTALL FLUSHING VALVE ASSEMBLY	SPECIAL - 6"x6" BRANCH SLEEVE AND VALVE	ITEM 24 - FURNISHING AND SETTING 6" HYDRANTS
		L.F.	L.F.	L.F.	L.F.	L.F.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	C.Y.	C.Y.	LBS.	L.F.	EA.	EA.	EA.	EA.	EA.	EA.	EA.
108																								
109	FROM INTERSECTION OF E. 37 ST. & TRUMBULL TO	30		13	6	48	1	8	3	1		1	3	30	82	14795	2300	10	9	27	2		1	
110	INTERSECTION OF BROADWAY & ROSEVILLE																							
111																								
119	AT BROADWAY AND ROSEVILLE		170								1				2	205			1					
118	E. 37 ST. FROM WARREN TO BROADWAY																			11	2			
117	AT E. 37 ST. AND TRUMBULL	10														195				6	1	1	1	1
117	WARREN AT MARTIN															205					1	1		
	TOTALS	40	170	13	6	48	1	8	3	1	1	1	3	30	84	15400	2300	10	10	44	6	2	2	1

CONT. No. 58019 SHEET ACCT. No. 6368

LOW SERVICE DISTRICT	
DEPARTMENT OF PUBLIC UTILITIES DIVISION OF WATER AND HEAT CLEVELAND, OHIO	
	APPROVED MAY-8- 1963
	DIRECTOR OF PUBLIC UTILITIES
	COMMISSIONER OF WATER & HEAT
	COMMISSIONER - DIVISION OF UTILITIES ENGINEERING
J.R. Connor	ENGINEER OF CONSTRUCTION & SURVEYS
William J. Sweeney	ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

SUMMARY OF WATERWORK QUANTITIES

SCALE	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	tdk		C.R.			

CUYAHOGA COUNTY
CUY— 21— 14.12

IN CASE OF INTERFERENCE, HOUSE WATER SERVICE CONNECTIONS SHALL BE RELOCATED AND RECONNECTED TO SUIT FIELD CONDITIONS. CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE CITY OF CLEVELAND FOR DISCONNECTING, RELOCATING AND RE-CONNECTING ANY SERVICE LINES, AND THE WORK SHALL BE DONE IN FULL ACCORDANCE WITH CITY WATER DEPT. POLICY.
FOR DISPOSITION OF EXISTING WATER SERVICE CONNECTIONS WITHIN L.A. LINE SEE DWG. 117
REMOVE EXIST. 30" W.M. AND PLUG ABANDONED END WITH CONCRETE SEE NOTE "A" SH. 111
ABANDON EXIST. 30" W.M.
EXIST. 24" VALVE & VAULT
EXIST. 2" DRAIN
58.99 M.T.S.
STA. 0+62.00 ℄ 30" = STA. 20+07.82, 12' RT. E. 37 ST.
STA. 5+29.78 ℄ 30" W.M. = STA. 12+45.93 RAMP N-W
STA. 4+15.00 H.P.I. Δ = 22°15'20" LT.
STA. 16+54.82 E. 37 ST.
MATCH LINE STA. 5+58 SH. 109
E. 37 ST.
TRUMBULL
ST.
18" P.E. H.P. GAS
8" P.E. GAS
6" WATER
12" WATER
No. 10 SEWER
4 STD. O.B.T.
4 DUCTS STD. O.B.T.
3" P.E. GAS
No. 7 SEWER
No. 3 SEWER
No. 2 SEWER
6" WATER
8" P.E. GAS
TEST BULKHEAD
CONC. PIER SEE SH. 113
CONC. PIER
ACCESS M.H. TYPE C
2" AIR COCK
24" VALVE & CHAMBER
ACCESS M.H. TYPE A
VERT. BEND
L/A
RAMP N-W
SERVICE RD. B
DITCH
CURB
16" FLANGE OUTLET
16" FLANGE VALVE
NO. 4 VALVE BOX
16"×6" REDUCER BELL AND LARGE END
6" SLEEVE (SHORT)
6"×6" BRANCH SLEEVE AND VALVE
16" DUCTILE IRON PIPE
LEAD JOINTS
EXISTING GROUND
PROFILE PART 3
CLOSURE PIECE
UNDERDRAIN
6" SEWER CONNECTIONS
STA. 0+05± CONNECT TO EXIST. 30" STEEL MAIN SEE NOTE "A" SH. 111
STA. 0+20 HOR. BEND
STA. 0+72.0 V.P.I. Δ = 9°28'
STA. 0+92 V.P.I. Δ = 10°15'
22' MIN.
24" VICTAULIC VALVE & CHAMBER STA. 3+75.0
STA. 4+46 16" FLANGE OUTLET
STA. 4+53.50 V.P.I. Δ = 32°42'
STA. 4+96.30 V.P.I. Δ = 32°00'
42' MIN.
TIED DISTANCE SEE DETAIL "Y" SH. 115
FOR DETAILS SEE SH. 115 & 116
MATCH LINE SH. 109
680 670 660 650 640 630 620
PIPE SECTION LENGTHS AND DEFLECTION ANGLES FOR HOR. BENDS BETWEEN THESE POINTS TO BE DETERMINED IN FIELD TO SUIT ACTUAL CONDITIONS. SEE NOTE "A" SH. 111

LOW SERVICE DISTRICT

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

APPROVED MAY-8- 19 63

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

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WILLOW FREEWAY EXTENSION

30" WATER MAIN RELOCATION

FROM STA. 0+05 TO STA. 5+58

SCALE 1" = 20' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C. RALYS	C. RALYS	R. M. R.			

CONT. No. 58019 SHEET ACCT. No. 6325

6325

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

109
198

CUYAHOGA COUNTY
CUY— 21 — 14.12

MATCH LINE SH. 108

STA. 5+58

A-2 ℄ 651.50

A-3

A-6

A-5 ℄ 652.85

A-23 ℄ 620.30

A-27 635.70

℄ RAMP S-W

℄ RAMP W-S

℄ RAMP W-N

℄ CLARK

RETAINING WALL

DITCH

EDGE OF SHOULDER

FUTURE 21" PIPE

VERT. BEND

18"

21"

12"

1030

1029

STA. 6+41.63 ℄ 30" =
= STA. 17+14.15 ℄ RAMP S-W

STA. 7+99.16 ℄ 30" =
= STA. 1029+71.50 CLARK

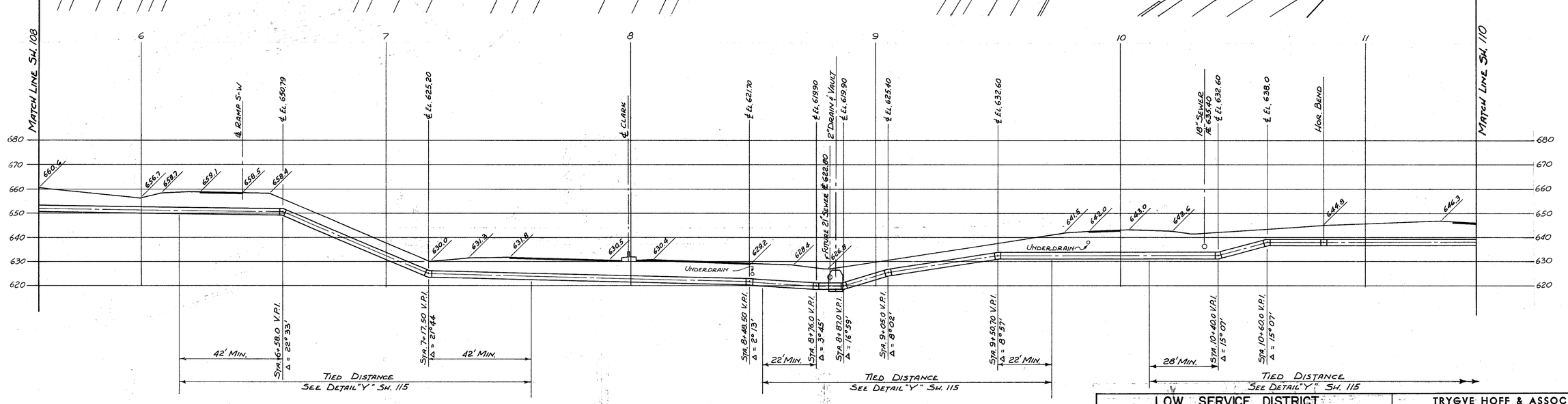
STA. 8+84
2" DRAIN & VAULT
TERMINATE CASTING 1' BELOW GRADE
SEE SH. 113 FOR DETAILS

STA. 10+83.00 ℄ 30"
Δ = 42°20'59" Rt.

℄ CONC. PIER
SEE SH. 113

STA. 11+45

MATCH LINE SH. 110



LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 19 63

DIRECTOR OF PUBLIC UTILITIES

COMMISSIONER OF WATER & HEAT

COMMISSIONER-DIVISION OF UTILITIES ENGINEERING

ENGINEER OF CONSTRUCTION & SURVEYS

ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WILLOW FREEWAY EXTENSION

30" WATER MAIN RELOCATION

FROM STA. 5+58 TO STA. 11+45

SCALE 1"=20' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C. RALYS	C. RALYS	R.M.R.			

CONT. No. 58019 SHEET ACCT. No. 6326

6326

CUYAHOGA COUNTY
CUY— 21 — 14.12

MATCH LINE SH. 109
STA. 11+45 ℄ 30" W.M.
STA. 11+52.44 ℄ 30" = STA. 12+32.48 ℄ RAMP W-S
EDGE OF SHOULDER
PAVED BERM
℄ RAMP W-S
DITCH
VERT. BEND
RELOC. 30" W.M.
STA. 12+92.80 ℄ 30" Δ = 30°00'00" Lt.
STA. 13+34.81 ℄ 30" Δ = 30°00'00" Lt.
CONC. PIER SEE SH. 113
24" VALVE & CHAMBER STA. 13+74.0
ACCESS M.H. TYPE A
ACCESS M.H. TYPE C (SEE SH. 116)
GEAUGA
ABANDON 6" W.M.
BROADWAY
LA
R/W
20 DUCTS O.B.T. 4 DUCTS A.T.&T.
7 DUCTS O.B.T. 3 DUCTS A.T.&T.
6 DUCTS C.E.I.
8" W.M.
8" P.E. GAS
6" PLUG W/CLAMPS STA. 14+96.10
4 M.T.D.
18" P.E. H.P. GAS
8" P.E. GAS
STA. 16+65.51
STA. 18+40 BW'Y
MATCH LINE SH. 118
MATCH LINE SH. 111
STA. 16+98 ℄ 30" W.M.
MATCH LINE STA. 11+45
MATCH LINE STA. 16+98
SEE SH. 115 FOR DETAILS
HOR. BEND
2" AIR COCK
EXISTING GROUND
PROFILE PART 3
FINAL PROFILE
STA. 11+52.44 V.P.I. Δ = 1°07'
STA. 11+83.0 V.P.I. Δ = 16°17'
STA. 12+87 V.P.I. Δ = 17°24'
24" VICTAULIC VALVE & CHAMBER
STA. 14+65.0 V.P.I. Δ = 0°17'
TIED DISTANCE, SEE DETAIL "Y" SH. 115

LEGEND

- 6" W.M. — EXISTING WATER MAIN.
- —×— EXISTING WATER MAIN TO BE ABANDONED.
- PLUG EXIST. WATER MAIN AT MAIN.
- SHUT OFF HOUSE CONNECTION AT CURB BOX. BOX TO REMAIN.

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 1963
DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER & HEAT
COMMISSIONER-DIVISION OF UTILITIES ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WILLOW FREEWAY EXTENSION
30" WATER MAIN RELOCATION
FROM STA. 11+45 TO STA. 16+98

SCALE 1"=20' DATE

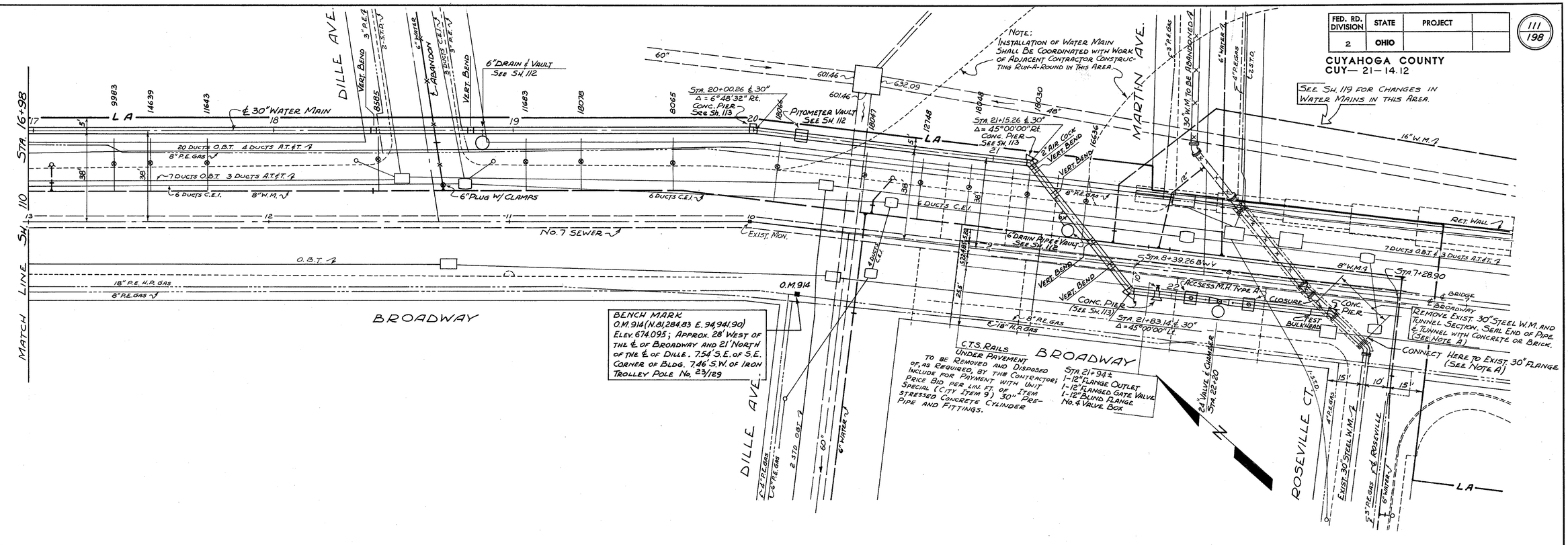
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C. R.	C. RALYS	RMR			

CONT. No. 58019 SHEET ACCT. No. 6327

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

111
198

CUYAHOGA COUNTY
CUY— 21—14.12

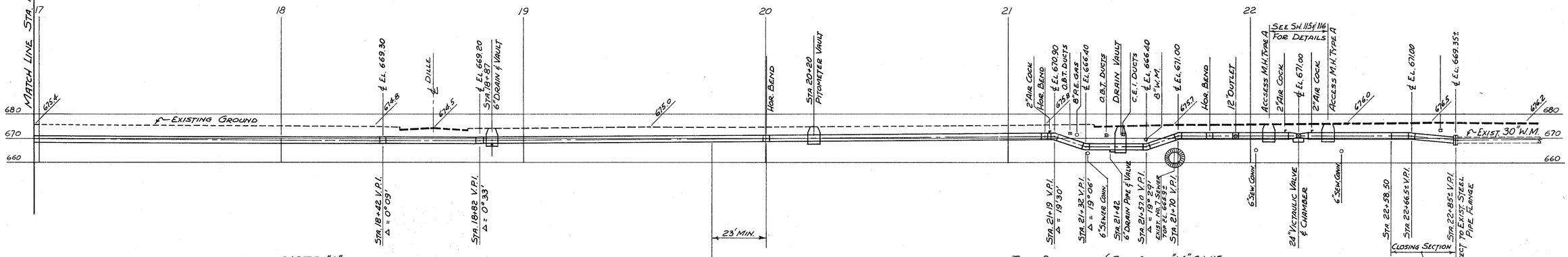


BENCH MARK
O.M. 914 (N. 81,284.83 E. 94,941.90)
Elev. 674.095; Approx. 28' West of the ℄ of Broadway and 21' North of the ℄ of Dille. 7.54' S.E. of S.E. Corner of Bldg. 7.46' S.W. of Iron Trolley Pole No. 23/129

NOTE:
INSTALLATION OF WATER MAIN SHALL BE COORDINATED WITH WORK OF ADJACENT CONTRACTOR CONSTRUCTING RUN-A-ROUND IN THIS AREA.

SEE SH. 119 FOR CHANGES IN WATER MAINS IN THIS AREA.

C.T.S. RAILS UNDER PAVEMENT TO BE REMOVED AND DISPOSED OF, AS REQUIRED, BY THE CONTRACTOR; INCLUDE FOR PAYMENT WITH UNIT PRICE BID PER LIN. FT. OF ITEM SPECIAL (CITY ITEM 9) 30" PRE-STRESSED CONCRETE CYLINDER PIPE AND FITTINGS.



Pipe Section Lengths and Deflection Angles for Hor. & Vert. Bends Between These Points to be Determined in Field to Suit Actual Conditions. (See Note "A")

NOTE "A"

1. The Existing 30" Water Main Shall Not Be Disturbed or Shut Off Before December 1, 1963 or After April 15, 1964 Without Authorization of the Commissioner of Water and Heat of the City of Cleveland.
2. The Contractor Shall Notify the City of Cleveland, Director of Public Utilities and the Commissioners of Water and Heat and Utilities Engineering as to the Proposed Time of Reconnection and Delay the Work of Reconnecting Until Such Time as Approved By the Division of Water and Heat.
3. The Contractor Shall Make All Arrangements with the Division of Water and Heat for Closing All Necessary Valves and Shall Pay all Charges for Such Work.
4. The Existing 30" Water Main Shall Remain in Continuous Service Until All Special Pipe and Fittings Have Been Fabricated and are at the Place of Reconnection and Approved by the Engineer and Director of Public Utilities.
5. When the Existing Water Main Has Been Shut Off for Disconnecting and Reconnecting, the Contractor shall Pursue the Work 24 Hours a Day without Let Up Until the Reconnection is Satisfactorily Completed and the Relocated Water Main Placed in Service.

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 1963
DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER & HEAT
COMMISSIONER—DIVISION OF UTILITIES ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WILLOW FREEWAY EXTENSION
30" WATER MAIN RELOCATION
FROM STA. 16+98 TO STA. 22+85

SCALE 1" = 20'

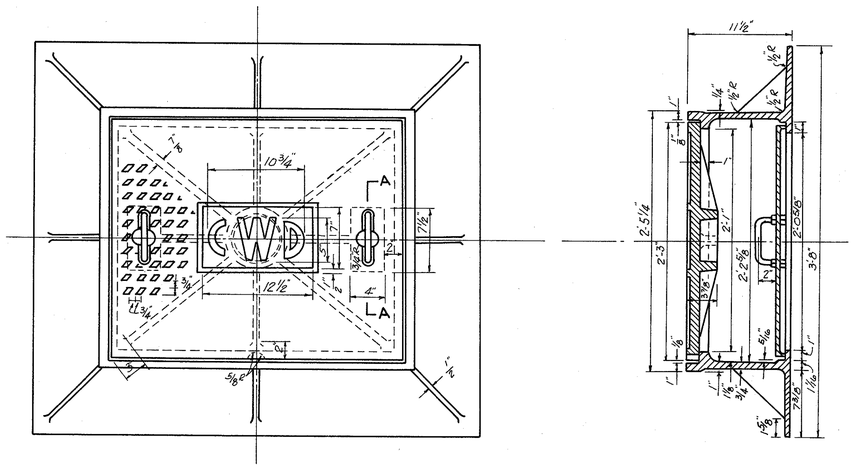
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C. Rahys	C. Rahys	R.M.R.			

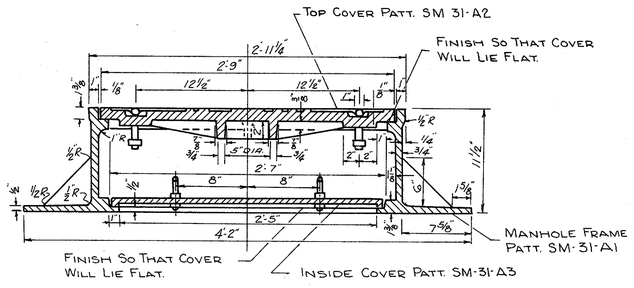
CONT. No. 58019 SHEET ACCT. No. 6331

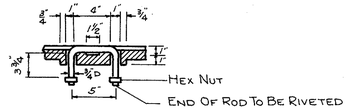
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

112
198

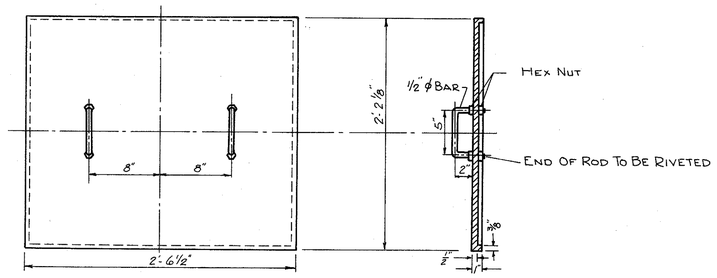
CUYAHOGA COUNTY
CUY— 21—14.12







SECTION A-A

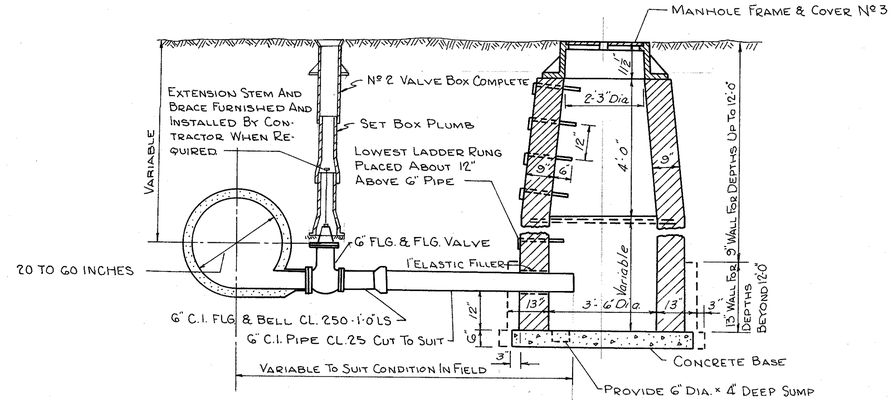


INSIDE COVER (C.I.) PATT. SM-31-A3

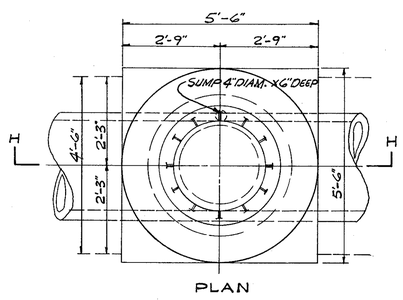
MANHOLE FRAME AND COVERS MARK SM-31A

CONSISTING OF
C.I. MANHOLE FRAME PATT. SM-31-A-1
C.I. TOP COVER PATT. SM-31-A-2
C.I. INSIDE COVER PATT. SM-31-A3

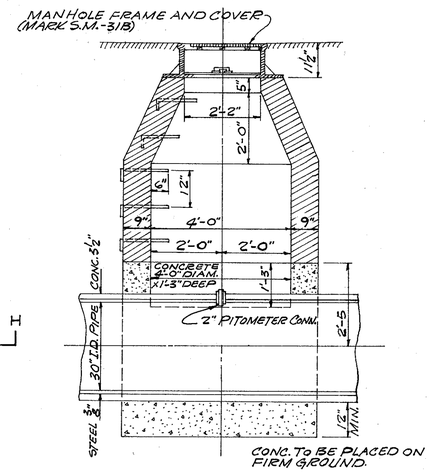
APPROXIMATE WEIGHT = 1166#



DETAIL OF 6" DRAIN AND DRAIN VAULT



PLAN



SECTION H-H

PITOMETER VAULT

LOW SERVICE DISTRICT

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

APPROVED MAY-8- 1963

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

WATER MAIN DETAILS

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	RR		CG			

CONT. No. 5801/9 SHEET CONT. No. 6358

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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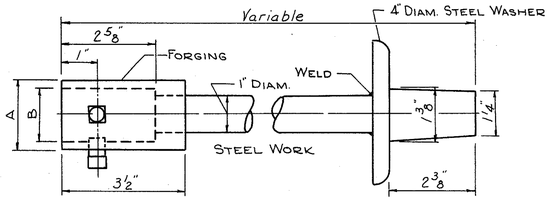
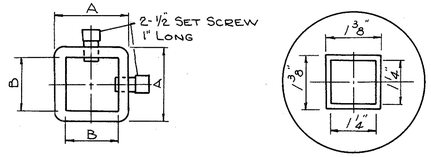
198

CUYAHOGA COUNTY
CUY— 21—14.12



DETAIL OF VALVE EXTENSION STEM

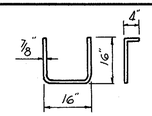


BOTTOM

TOP

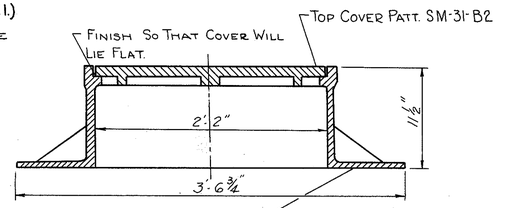
NOTE: VALVE NUT TO BE COUNTERSUNK 1/8" TO RECEIVE SET SCREWS

VALVE SIZE	A	B
2" AND SMALLER	2"	1 1/2"
4" TO 20"	2 1/2"	2"



DETAIL OF MANHOLE STEP (W.I.)

NUMBER REQUIRED DEPENDS ON THE DEPTH OF VAULT.

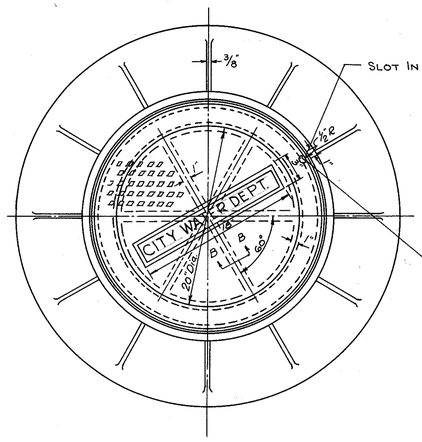


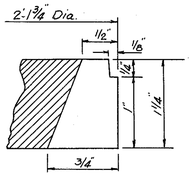
MANHOLE FRAME AND COVER MARK NO.3

CONSISTING OF
- C.I. MANHOLE FRAME PATT. SM-31-C1
- C.I. TOP COVER PATT. SM-31-B2

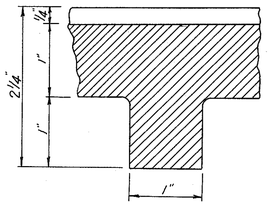
DIMENSIONS NOT GIVEN ARE THE SAME AS THOSE SHOWN FOR MANHOLE FRAME PATT. MARK SM-31-B1

APPROXIMATE WEIGHT = 602#

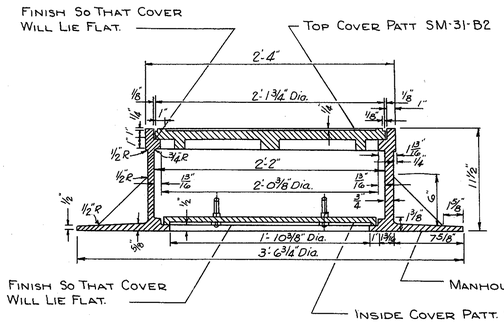


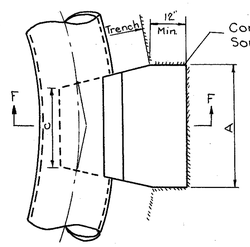


FULL SIZE SECTION AT SLOT

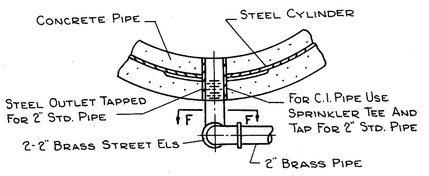


FULL SIZE SECTION AT B-B

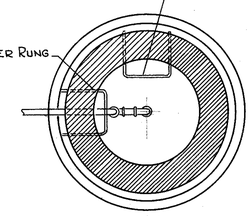




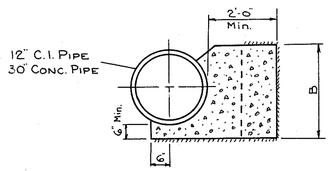
PLAN



ENLARGED DETAIL SHOWING DRAIN CONNECTION
FURNISH WITH 2" MALLEABLE IRON PLUG

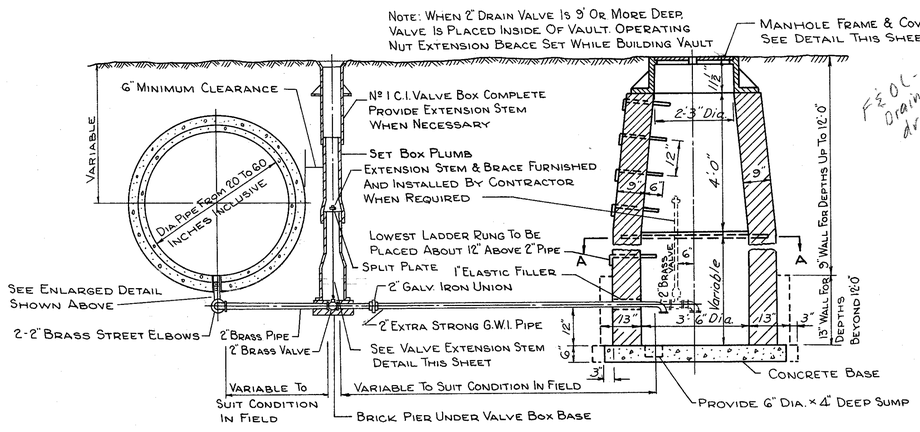


SECTION A-A



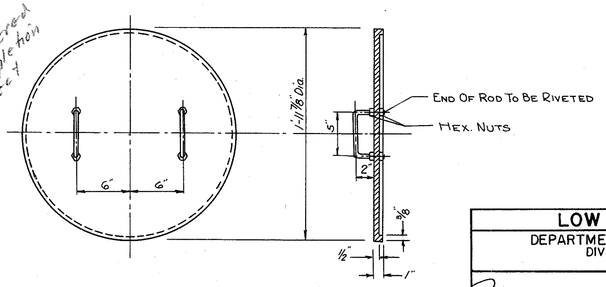
SECTION-FF
CONCRETE PIER FOR BENDS

DIMENSIONS OF PIERS FOR BENDS			
SIZE & ANGLE	A	B	C
12"	2'	2'	2'
30°-0°-15°	3'	3'-6"	2'
30°-16°-30°	4'	4'-6"	2'
30°-31°-45°	5	4'-6"	2'



F.S.O.C. - Drain Vault to be drained and covered before completion of Project

DETAIL OF 2" DRAIN AND DRAIN VAULT



INSIDE COVER (C.I.) PATT. SM-31-B3

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 = 766#

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 19 63

	DIRECTOR OF PUBLIC UTILITIES
	COMMISSIONER OF WATER & HEAT
	COMMISSIONER—DIVISION OF UTILITIES ENGINEERING
J. P. Connor	ENGINEER OF CONSTRUCTION & SURVEYS
William J. Sweeney	ASSISTANT DESIGN ENGINEER

WATER MAIN DETAILS

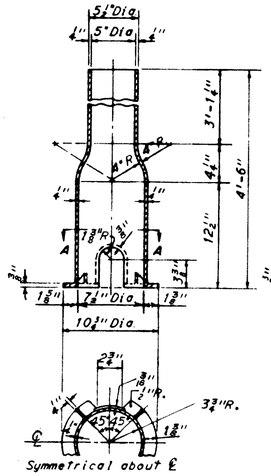
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	R.R.		CG			

CONT. NO. 58019 SHEET AGT. No. 6335

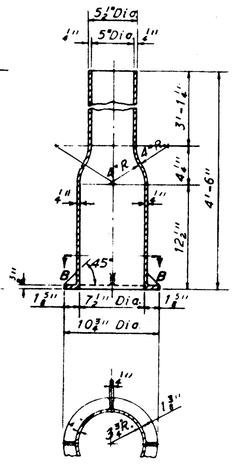
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

114
198

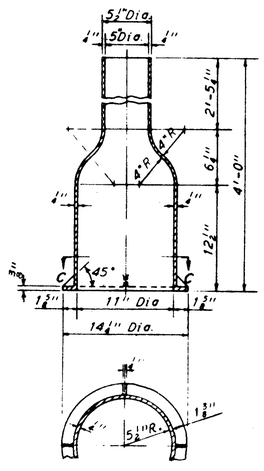
CUYAHOGA COUNTY
CUY—21—14.12



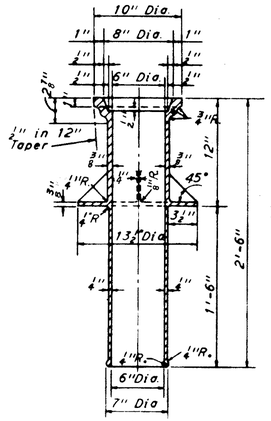
SECTION A-A
Base No. 1 for 1½" and 2" Valves
Est. Wt. 69#



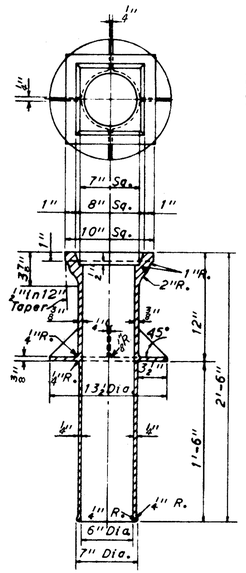
SECTION B-B
Base No. 2 and 3 for 3", 4", 6" and 8" Valves
Est. Wt. 71#



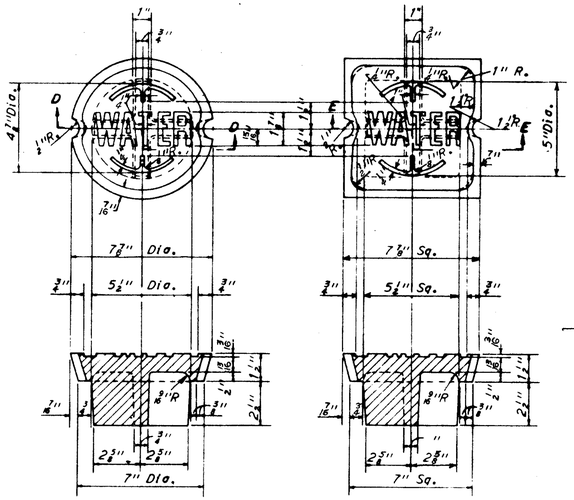
SECTION C-C
Base No. 4 for 10", 12" and 16" Valves
Est. Wt. 79#



SECTION OF TOP WITH SQUARE HEAD NO. 1 AND 2
Est. Wt. 73#

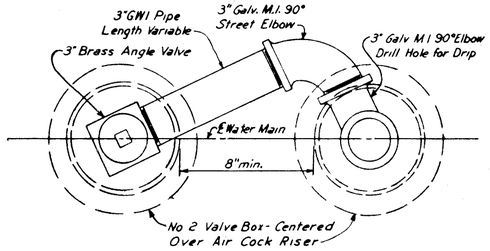


SECTION OF TOP WITH SQUARE HEAD NO. 3 AND 4
Est. Wt. 85#

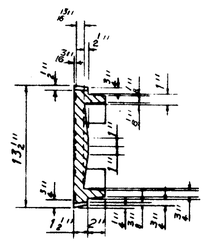


SECTION D-D
Detail of round cover for No. 1 and 2 Top
Est. Wt. 20#

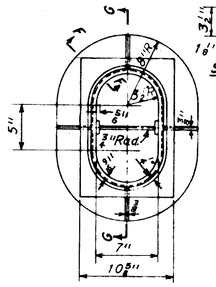
SECTION E-E
Detail of square cover for No. 3 and 4 Top
Est. Wt. 23#



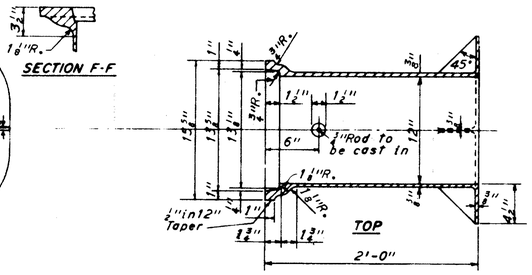
SECTION A-A



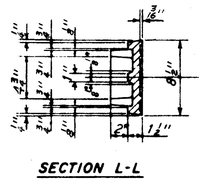
SECTION K-K
Est. Wt. 37#



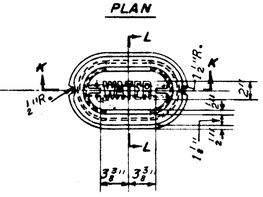
PLAN



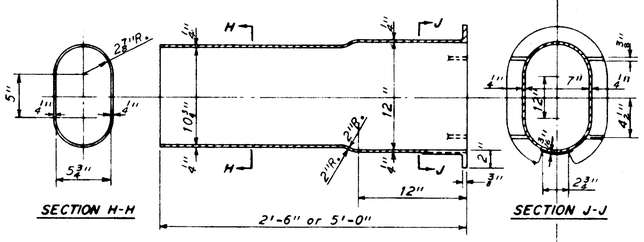
SECTION G-G
Air Cock Box No.5 is Top and Cover
Air Cock Box No.6 is Top, Base 2'-6" Long and Cover
Flushing Box No.7 is Top, Base 5'-0" Long and Cover
Est. Wt. 128#



SECTION L-L



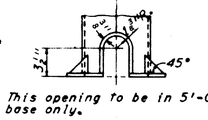
COVER



SECTION H-H

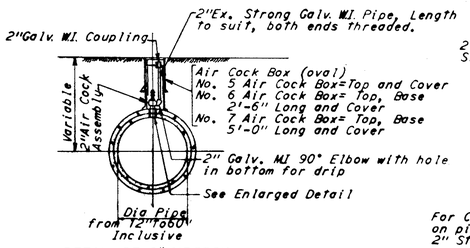
SECTION J-J

BASE
Est. Weight 2'-6" Long= 70#
Est. Weight 5'-0" Long= 126#

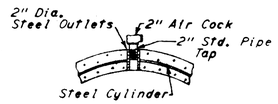


This opening to be in 5'-0" base only.

STANDARD DETAILS - VALVE AND AIR COCK BOXES



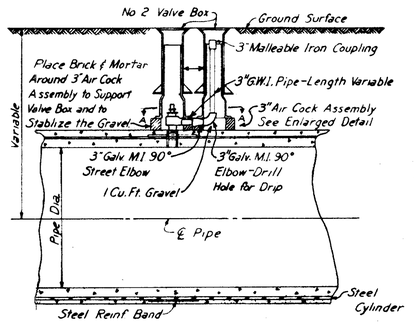
DETAIL OF 2" AIRCOCK INSTALLATION FOR CONCRETE MAINS



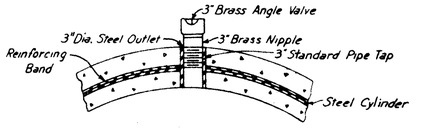
ENLARGED DETAIL SHOWING CONNECTION FOR AIRCOCK OR PITOMETER

For C.I. Pipe, boss will be cast on pipe and tapped at foundry for 2" Standard pipe.

For W.I. Pipe, W.I. forgings shall be welded to pipe and tapped for 2" Standard Pipe.



DETAIL OF 3" AIR COCK INSTALLATION FOR PRESTRESSED CONC. MAINS-30"



ENLARGED DETAIL SHOWING CONNECTION FOR AIR COCK OR PITOMETER
(Furnished With 3" Malleable Iron Plug)

Note:

Details of 2" outlets for C.I. pipe and W.I. pipe shall be fabricated so that the air cock connections can be made as shown for concrete pipe.
Details as drawn are for Concrete Pipe.

LOW SERVICE DISTRICT	
DEPARTMENT OF PUBLIC UTILITIES	
DIVISION OF WATER AND HEAT	
CLEVELAND, OHIO	
APPROVED MAY-8-1963	
	DIRECTOR OF PUBLIC UTILITIES
	COMMISSIONER OF WATER & HEAT
	COMMISSIONER-DIVISION OF UTILITIES ENGINEERING
	ENGINEER OF CONSTRUCTION & SURVEYS
	ASSISTANT DESIGN ENGINEER

WATER MAIN DETAILS						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
			RR			

CONT. No. 58019 SHEET ACCT. No. 6254

FED. RD. DIVISION	STATE	PROJECT	
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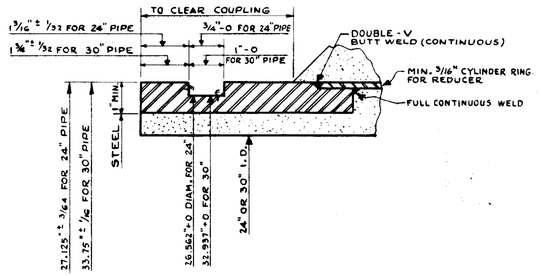
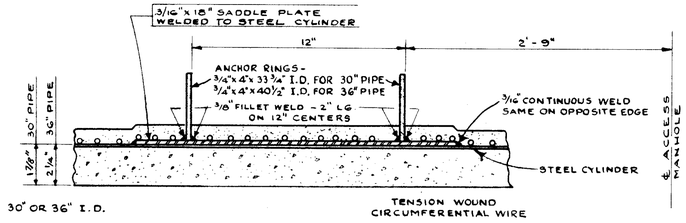
CUYAHOGA COUNTY
CUY—21—14.12

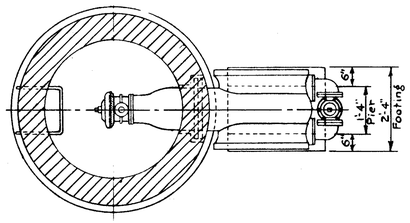


DETAIL "A"

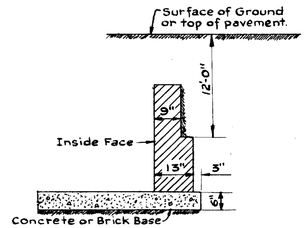
FOR 24" OR 30" VICTAULIC COUPLINGS



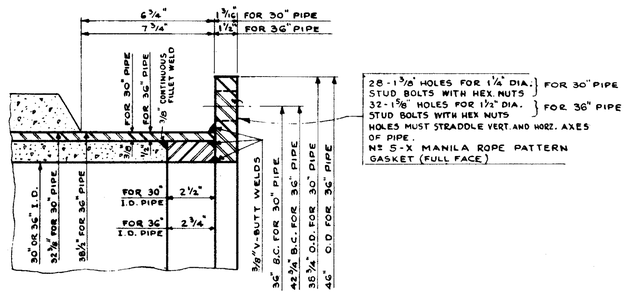
ANCHORAGE DETAILS FOR 30" AND 36" FOR PRESTRESSED CONC. CYLINDER PIPE FOR MANHOLE TYPES "A" & "B"



SECTION B-B

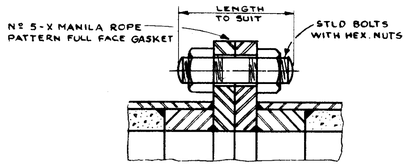


TYPICAL SECTION OF CHAMBER WALL WHEN DEPTH EXCEEDS 12'-0"

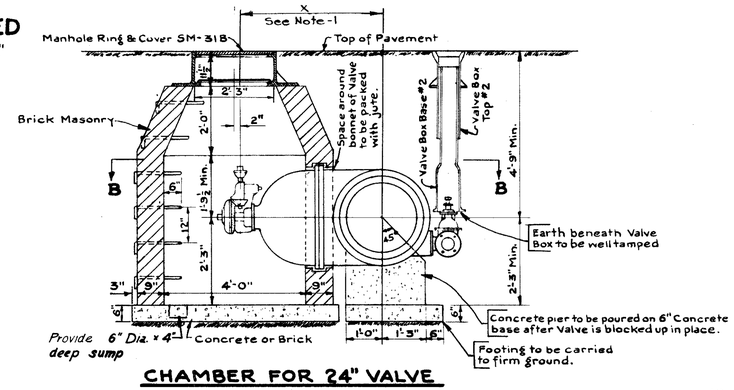


NOTE: CAST, FORGED OR ROLLED STEEL FLANGES MAY BE USED INSTEAD OF FABRICAT STEEL.

DETAIL OF 30" AND 36" FABRICATED STEEL FLANGES

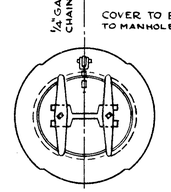


SECTION THROUGH ℄ SHOWING TYPICAL DETAIL OF FLANGE CONNECTIONS



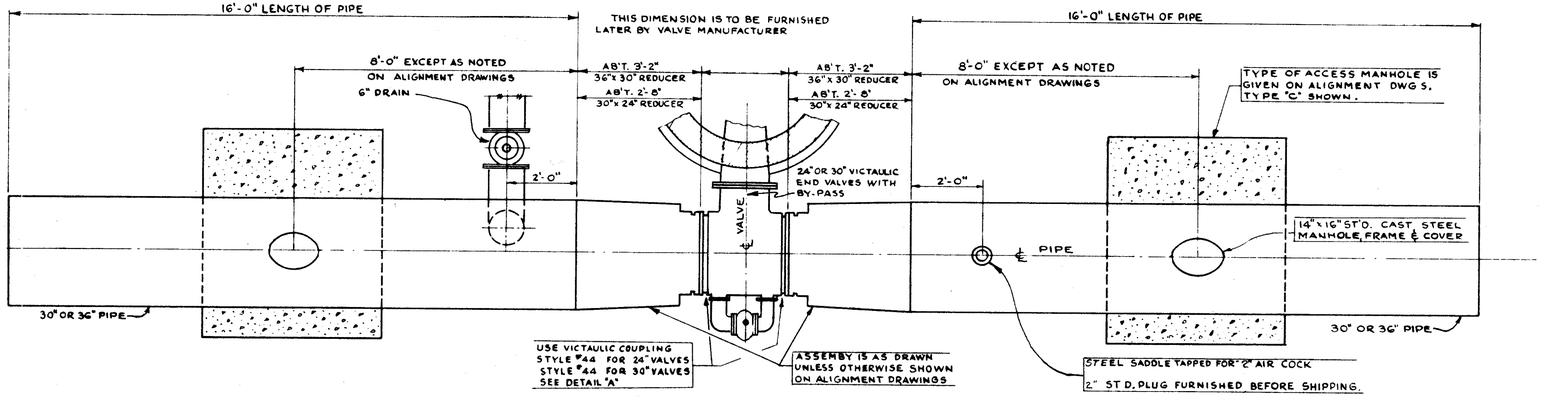
CHAMBER FOR 24" VALVE

LOW SERVICE DISTRICT	
DEPARTMENT OF PUBLIC UTILITIES DIVISION OF WATER AND HEAT CLEVELAND, OHIO	
	APPROVED MAY-8- 19 63
	DIRECTOR OF PUBLIC UTILITIES
	COMMISSIONER OF WATER & HEAT
Arnold Grothal	COMMISSIONER—DIVISION OF UTILITIES ENGINEERING
T. G. Conner	ENGINEER OF CONSTRUCTION & SURVEYS
William J. Sweeney	ASSISTANT DESIGN ENGINEER

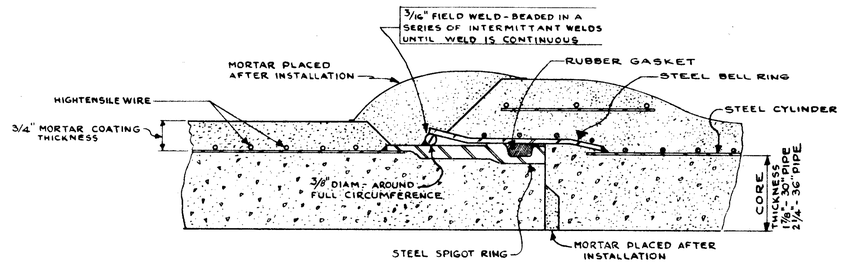


14" x 16" ST'D. MANHOLE FRAME AND COVER

(FRAME, COVER, & YOKES TO BE CAST STEEL)



TYPICAL VALVE ASSEMBLIES FOR 30" AND 36" CONCRETE PIPE



DETAIL "Y"

PRESTRESSED CONCRETE CYLINDER PIPE WITH RUBBER AND STEEL JOINT SHOWING WELDED TYPE TIED JOINT
(SAME TYPE OF WELD FOR REINFORCED CONCRETE CYLINDER PIPE)

CONT. No. 59019 SHEET ACCT. No. 6255

WATER MAIN DETAILS						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
			RR			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY—21—14.12

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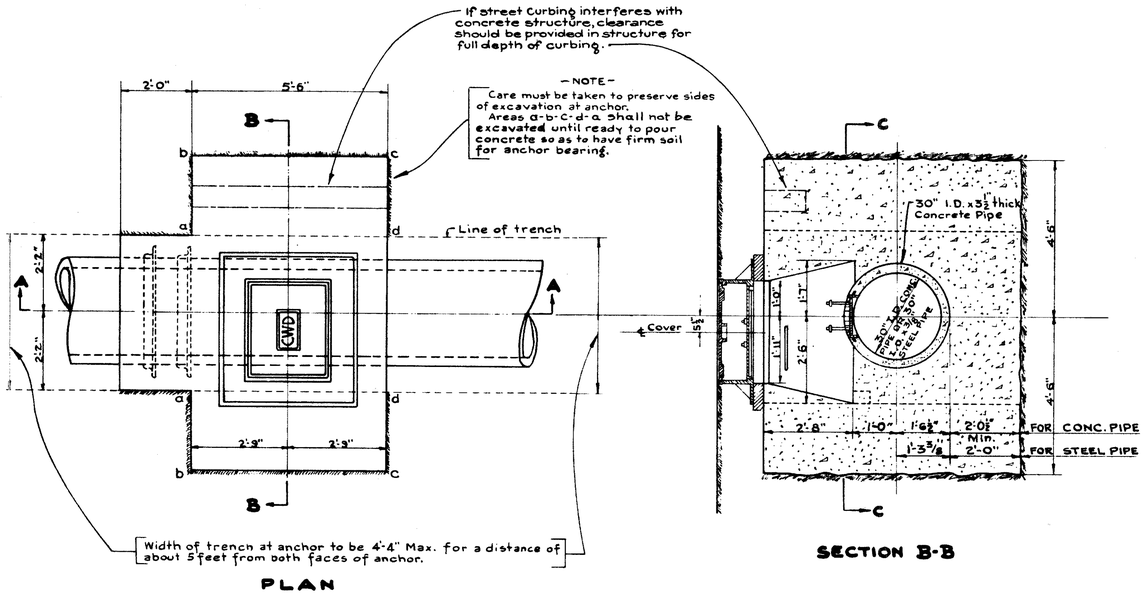
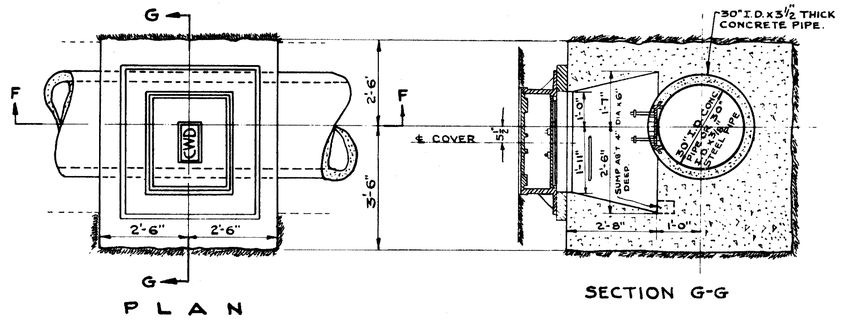
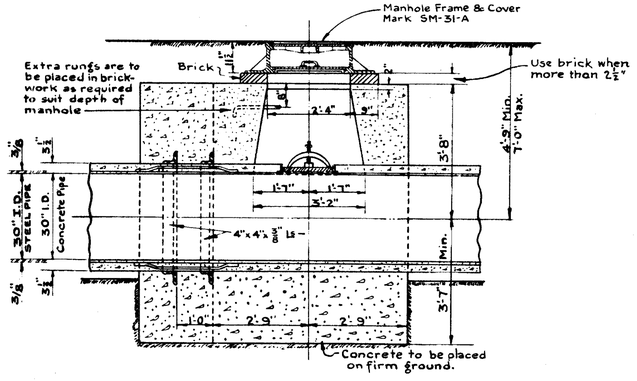
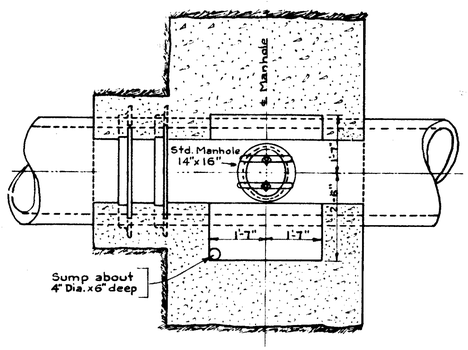
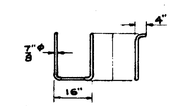
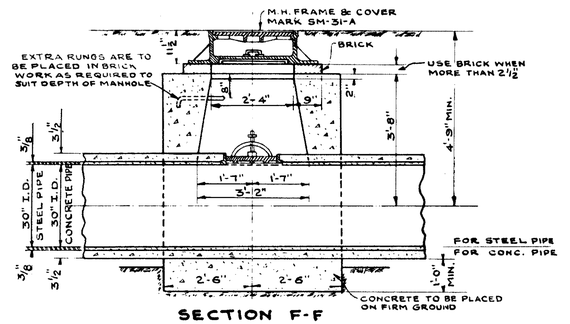






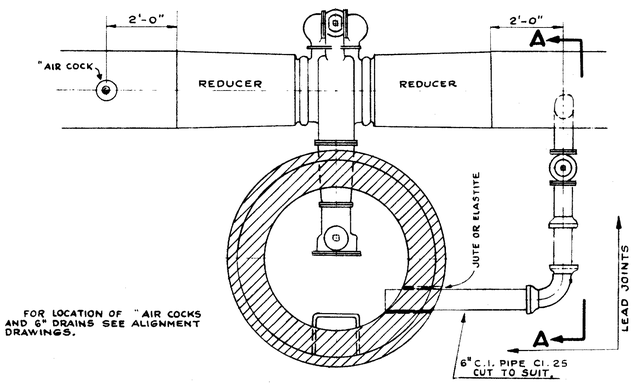






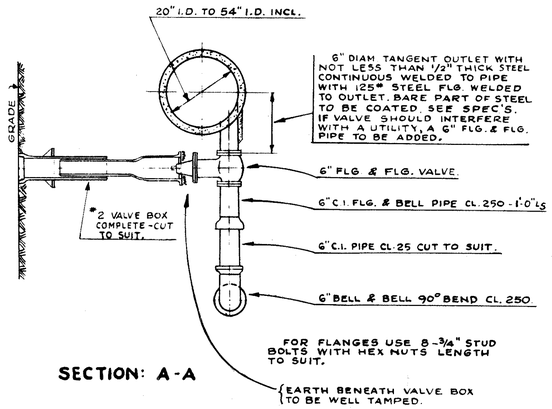
ACCESS MANHOLE TYPE "C"
SCALE:- 1"/2 = 1'-0"

ACCESS MANHOLE AND ANCHORAGE
TYPE "A"
Scale:- 1"/2 = 1'-0"



FOR LOCATION OF "AIR COCKS AND 6" DRAINS SEE ALIGNMENT DRAWINGS.

PLAN



TYPICAL DETAIL SHOWING 6" DRAIN FROM WATER MAIN TO VALVE CHAMBER

DETAIL SHOWN FOR 24" PIPE & 20" VALVE.

SCALE: 1/2" = 1 FT.

LOW SERVICE DISTRICT	
DEPARTMENT OF PUBLIC UTILITIES DIVISION OF WATER AND HEAT CLEVELAND, OHIO	
APPROVED MAY-8- 19 63	
	DIRECTOR OF PUBLIC UTILITIES
	COMMISSIONER OF WATER & HEAT
	COMMISSIONER—DIVISION OF UTILITIES ENGINEERING
	ENGINEER OF CONSTRUCTION & SURVEYS
	ASSISTANT DESIGN ENGINEER

WATER MAIN DETAILS						
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
			RR			

CONT. No. 5819 SHEET ACCT. No. 6253

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY— 21— 14.12

(ABANDON) 12891
ABANDON 6" W.M.
6" PLUG W/CLAMPS
INSTALL FLUSHING PIPE & VALVE
No. 7 VALVE BOX
L/A
11481
73161 PLUG AT MAIN
6"x6" BRANCH SLEEVE AND VALVE
6" C.I. PIPE
No. 2 VALVE BOX
6" HYDRANT
6" WATER
E. 38 PL.
73160
6" WATER
30" WATER
TRUMBULL ST.
10270
No. 7 SEWER
℄ No. 3 SEWER
Z
L/A
SHUT OFF EXISTING HOUSE CONNECTIONS AT CURB
AND DISCONNECT. CURB BOX TO REMAIN
℄ 30" W. M. RELOCATION
14103
10269
33683
10268
14760
10235
10236
37123
14899
30906
10239
14037
17392
18" P.E. H.P. GAS
8" P.E. GAS
18" P.E. H.P. GAS
8" P.E. GAS
℄ 30" W.M. RELOCATION
6" WATER
20
19
No. 10 SEWER
18
17
16
15
STA. 15+00
12" WATER
12" WATER
4 STD O.B.T.
6" GAS
4 DUCTS STD O.B.T.
3" P.E. GAS
E. 37 ST.
L/A
℄ SERVICE RD. B
(CONSTRUCTION IN PART II)
MATCH LINE SH. 118
No. 7 SEWER
No. 2 SEWER
6" WATER
8" P.E. GAS
TRUMBULL ST.
RAMP S. E
16746 PLUG AT MAIN
16832 PLUG AT MAIN
12729 PLUG AT MAIN
LA
6" WATER
ABANDON 6" W.M.
MARTIN
STURKA CT.
6" WATER
AVE.
12728
24556
15832
12740 RECONNECT
LA
6" PLUG W/CLAMPS
INSTALL FLUSHING PIPE & VALVE
No 7 VALVE BOX
WARREN ST.
SCALE 1" = 50'

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 1963
DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER & HEAT
COMMISSIONER – DIVISION OF UTILITIES ENGINEERING
ENGINEER OF CONSTRUCTION & SURVEYS
ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WILLOW FREEWAY EXTENSION

WATERWORK
TRUMBULL ST. & E. 37 ST.

SCALE - 1" = 20' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.R.	C. RALYS	R.M.R.			

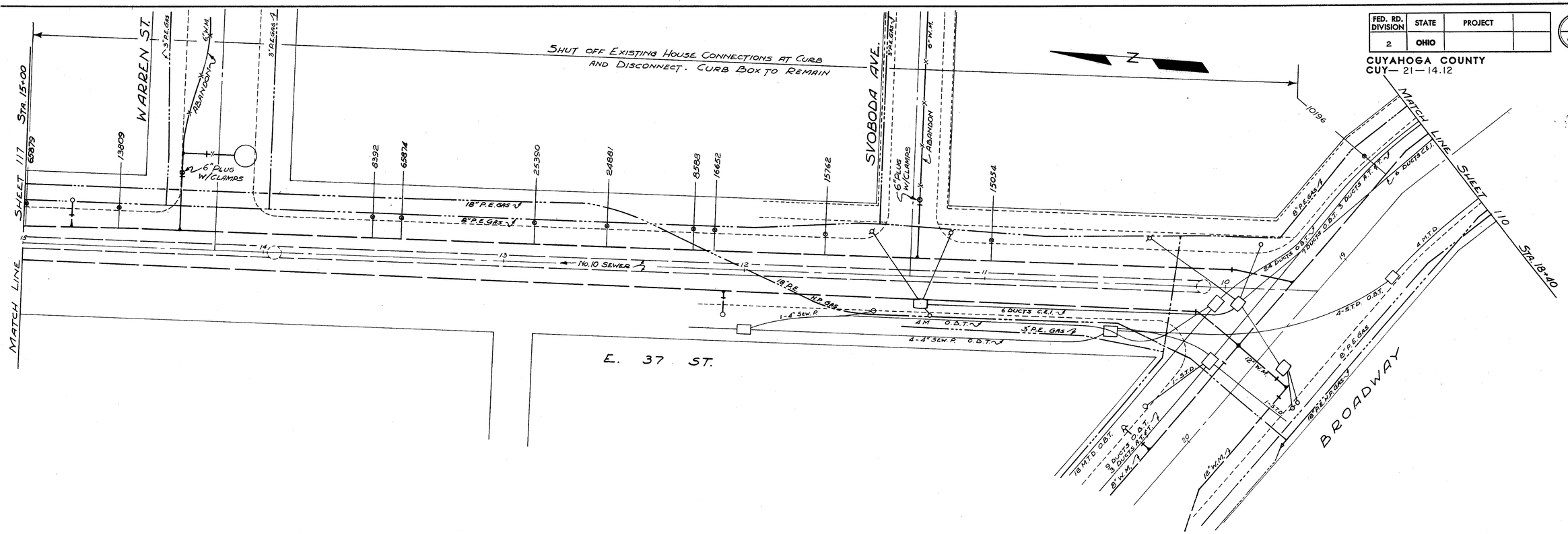
6366

CONT. No. 58019 SHEET ACCT. No. 6366

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

118
198

CUYAHOGA COUNTY
CUY— 21—14.12



CONT. No. 58019 SHEET ACCT. No. 6359

LOW SERVICE DISTRICT	
DEPARTMENT OF PUBLIC UTILITIES DIVISION OF WATER AND HEAT CLEVELAND, OHIO	
APPROVED MAY-8- 19 63	
	DIRECTOR OF PUBLIC UTILITIES
	COMMISSIONER OF WATER & HEAT
	COMMISSIONER-DIVISION OF UTILITIES ENGINEERING
	ENGINEER OF CONSTRUCTION & SURVEYS
	ASSISTANT DESIGN ENGINEER

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WILLOW FREEWAY EXTENSION
WATERWORK
E. 37 ST.

SCALE 1" = 20'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.R.		RMR			

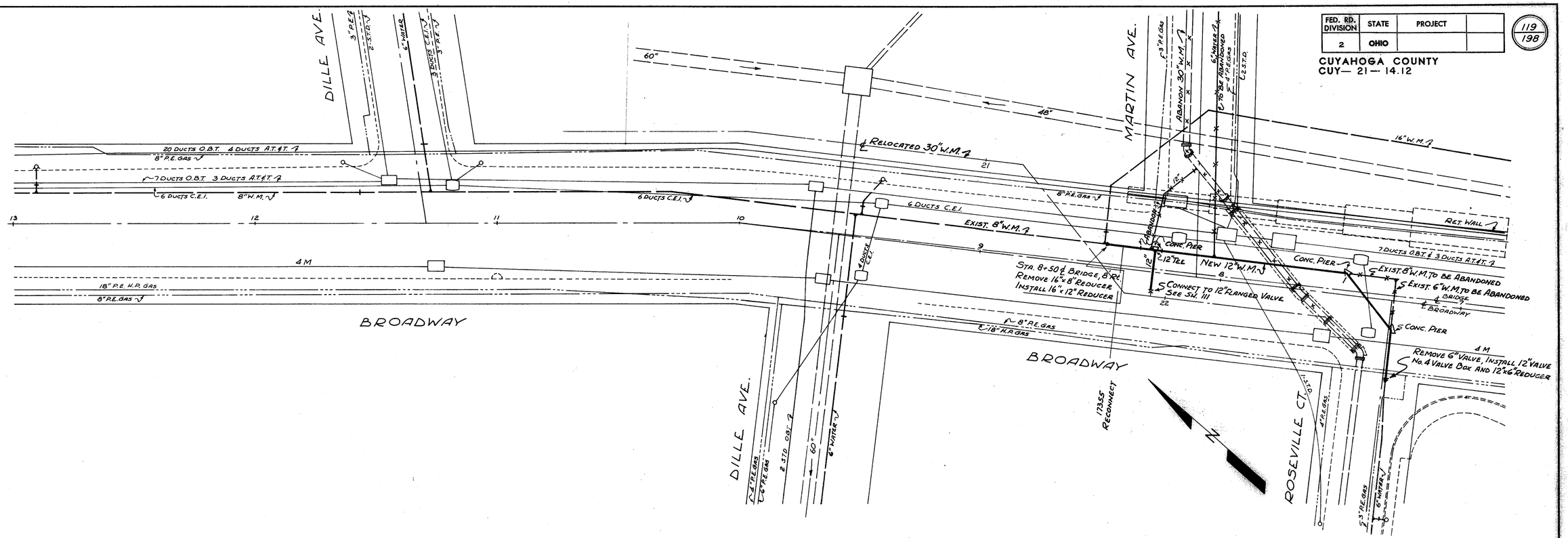
DATE

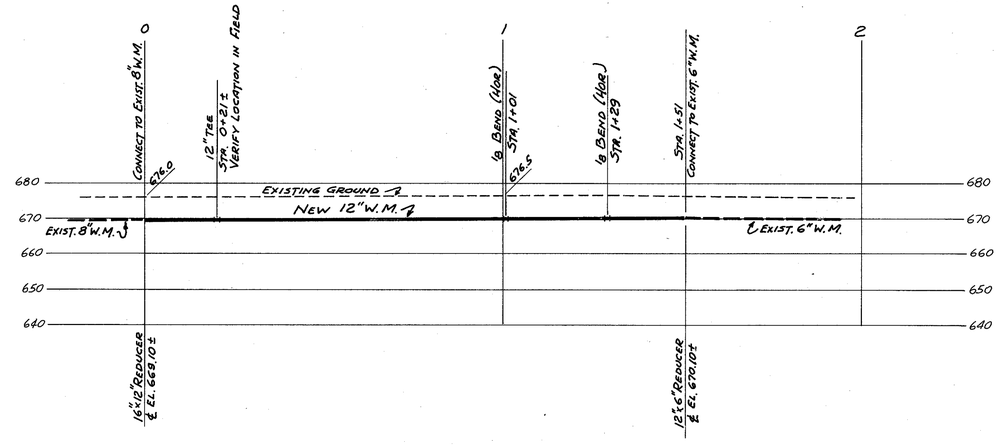
6359

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

119
198

CUYAHOGA COUNTY
CUY— 21— 14.12





CONT. No. 58019 SHEET ACCT. No. 6332

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF WATER AND HEAT
CLEVELAND, OHIO

APPROVED MAY-8- 19 63

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

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

WILLOW FREEWAY EXTENSION

NEW 12" WATER MAIN AT BROADWAY AND ROSEVILLE

SCALE 1"=20'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C. RALYS	C. RALYS	R.M.K.			

DATE

6332

FIVE SIDED NUT
CENTRIFUGALLY CAST
STEEL TOP SECTION HYDRANT STEM
BRONZE BOTTOM SECTION HYDRANT STEM
6"-PIPE CONNECTION
BRONZE STUFFING BOX NUT
6-THREADS PER 1" NOZZLE 4 1/8" O.D.
NOT LESS THAN 3/8
BRONZE BUSHING
FLAX PACKING
O-RINGS
VALVE OPENING
CAST IRON SLIP FLANGE BREAKABLE TYPE
BRASS LINED WASTE HOLES
BRONZE BUSHING SCREWED IN PLACE
BOTTOM OF TRENCH
6-1/2" x 2" HEX. HD. BOLTS & NUTS
6-5/8" x 3 1/4" HEX. HD. BOLTS & NUTS
WITH EITHER FLAX TYPE OR O-RING PACKING AS REQUIRED
PLAN VIEW
OPEN
LEVEL OF PAVEMENT
6'-6" TRENCH
6'-7 1/16"
18"
18 5/8"
SECTION A-A
2 1/2" DIA. HOSE 3.078" +.000" -.012" O.D. 8 THDS. PER 1"
10 1/2
9 5/16"

FED. RD. DIVISION | STATE | PROJECT
2 | OHIO |

119A
198

CUYAHOGA COUNTY
CUY— 21 — 14.12

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

TYPICAL WATERWORK DETAILS

STANDARD 6" HYDRANT

SCALE | DATE
DESIGNED | DRAWN C.R. | TRACED | CHECKED J.W.P. | REVIEWED | DATE | REVISED

CONT. No. 58019 SHEET ACCT. # 6145

FED. RD. DIVISION
STATE
OHIO
PROJECT
120
198
CUYAHOGA COUNTY
CUY-21-14.12
N
CZAR AVE.
FINN AVE.
E. 45 ST.
ROSEVILLE CT.
E. 47 ST.
BROADWAY AVE.
GALLUP AVE.
DOUSE AVE.
LESTER ST.
CZAR AVE.
FINN AVE.
(CHAMPA)
(BROADWAY OVER WILLOW BRIDGE)
WILLOW FREEWAY EXTENSION
ROAD "A"
4" C.I. GAS
42" CONC. (COMBINED)
48" CONC.
48" CONC. SEWER (COMBINED)
30" WATER
6" WATER
24" C.I. GAS
12" SEWER
15" V.S.P. (COMBINED)
12" SEWER (COMBINED)
12" V.S.P.
15" V.S.P.
27" CONC.
No. 7 SEWER (COMBINED)
No. 3 SEWER (COMBINED)
No. 2 SEWER (COMBINED)
OBT. 24 DUCTS (4 DUCTS A.T.&T.) (20 DUCTS O.B.T.)
O.B.T. - 12 DUCTS (9 DUCTS O.B.T., 3 DUCTS A.T.&T.)
O.B.T. - 10 DUCTS (7 DUCTS O.B.T., 3 DUCTS A.T.&T.)
C.E.I. - 6 DUCTS
C.E.I. - 3 DUCTS
C.E.I. - 4 DUCTS
8" P.E. GAS
18" P.E. H.P. GAS
8" WATER
RAMP W-S
RAMP E-S
RAMP S-W
RAMP S-E
ONE FIRE SIGNAL CABLE IN OBT DUCTS
FIRE AND POLICE SIGNAL 2 CABLES IN OBT DUCTS
POLICE EMERGENCY TELEPHONE
FOR CONTINUATION SEE SH. 121
95800 E

ABBREVIATIONS

O.B.T. - OHIO BELL TELEPHONE CO.
C.E.I. - CLEVELAND ELECTRIC ILLUMINATING CO.
C.T.S. - CLEVELAND TRANSIT SYSTEM
MUNY - MUNICIPAL LIGHT & POWER CO.
R/W - RIGHT OF WAY
Sc. - SCREW END (PIPE)
P.E. - PLAIN END (PIPE)
P.E.H.P. - PLAIN END HIGH PRESSURE
M.H. - MANHOLE

NOTES:

1. OWNERSHIP OF POLES IN PATH OF FREEWAY CONSTRUCTION IS DESIGNATED THUS: CEI
2. SEWER DESIGNATIONS ARE CITY OF CLEVELAND STANDARDS, AND ARE COMBINED SEWERS, SUCH AS No2, No7 ETC.

LEGEND

HYDRANT
VENT PIPES
WATER METER VAULT
POLE
CURB — CATCH BASIN
SEWER — M.H.
GAS
WATER
O.B.T. (UNDERGROUND) — M.H.
C.E.I. (UNDERGROUND) — M.H.
MUNY ELEC. (UNDERGROUND) — M.H.
R/W
R.R.
MISCELLANEOUS (TYPE & OWNER AS NOTED ON PLAN)

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

EXISTING UTILITIES
WILLOW FREEWAY EXTENSION

SCALE: 1" = 50' DATE:

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	WF		C.A.T.			

SHEET ACCT. No. 1092
CONT. No. 58019

FED. RD. DIVISION	STATE	PROJECT	
	OHIO		

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CUYAHOGA COUNTY
CUY-21-14.12

FOR CONTINUATION SEE SH 120

ROSEVILLE CT.

DILLE AVE.

BROADWAY AVE.

GEAUGA AVE.

SVOBODA ST.

DILLE ST.

MARTIN ST.

GLOBE ST.

WARREN AVE.

WILLOW FREEWAY EXTENSION

WILLOW OVER CLARK BRIDGE

CLARK FREEWAY

38 PL.

E. 54 ST.

DOUSE AVE.

STUPKA CT.

ROAD "A"

SCHOOL CT.

MALEK PL.

WARREN CT.

RAMP W-S

RAMP E-S

RAMP S-W

RAMP S-E

RAMP W-N

RAMP S-N

RAMP N-E

RAMP E-S

8" PE GAS

8" WATER

No. 7 SEWER (COMB)

C.E.I. 6 DUCTS

18" PE HP GAS

60" SEWER (SAN.)

C.E.I. 4 DUCTS

4 STD O.B.T.

4 PE GAS

30" WATER

18" SEWER (COMBINED)

3" RE GAS

6" WATER

No. 3 SEWER (COMBINED)

3" PE GAS

No. 2 SEWER (COMBINED)

60" CIR'E DR SEWER IN TUNNEL (SAN.)

60" SEWER (SAN.)

20" BRICK SEWER (COMB.)

C.E.I. 2 DUCTS

12" SEWER (COMBINED)

No. 2 SEWER (COMB.)

No. 7 SEWER

12" SEWER

(4 DUCTS O.B.T. 20 AT & T - 20 O.B.T. 24 DUCTS O.B.T.
(7 DUCTS O.B.T. 3 AT & T) -10 DUCTS O.B.T.
8" P.E. GAS
C.E.I. 6 DUCTS

Phone Box

Fire Box #3138

15" V.S.P.

2 WIRES (FIRE DEPT.)

C.E.I. 3 DUCTS

C.E.I. 2 DUCTS

C.E.I. O.B.T.

MUNY

MUNY (W.D.)

Note: For Legend, Abbreviations, and Notes, see sheet 120

Check 20" Brick Sewer Probably should be a 10 2"

CONT. No. 58-0.9 SHEET ACCT. No. 1091

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

EXISTING UTILITIES
WILLOW FREEWAY EXTENSION

SCALE: 1"=50' DATE:

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	WF		C.A.T.			


FOR CONTINUATION SEE SH. 123.
FOR CONTINUATION SEE SH. 121.
FOR CONTINUATION SEE SH. 124
SVOBODA AVE.
WARREN
CLARK FREEWAY
E. 38 ST.
E. 37 ST.
SOLON ST.
SOLON PL.
PL.
TRUMBULL CT.
TRUMBULL
MALEK PL.
SCHOOL CT.
IRON CT.
WILLOW FREEWAY EXTENSION
WILLOW OVER CLARK BRIDGE
RAMP N-W
RAMP N-E
RAMP S-W
RAMP W-S
RAMP W-N
RAMP E-N
RAMP E-S
No. 10 SEWER (COMBINED)
No. 2 SEWER (COMBINED)
No. 7 SEWER (SAN.)
No. 3 SEWER (COMBINED)
12" WATER
6" WATER
30" WATER
3" P.E. GAS
4-STD. O.B.T.
E.O.G. VAULT
15" VIT. PIPE (SAN.)
18" P.E. H.P. GAS
8" P.E. GAS
4'-0 SEWER (COMB.)
BUCKEYE PIPE LINE CO. 8" REFINED PRODUCTS 6" CRUDE OIL
THE STANDARD OIL CO. (OHIO) LINES 12" WATER MAIN & 6" PARAFFIN DISTILLATE IN SAME TRENCH
POLICE DEPT. AND FIRE DEPT. 4-WIRES
FIRE BOX 3195-22A
PROPOSED RELOCATED IRON CT.
N.Y.C. & ST. L. R.R.
SHAKER RAPID
C.T.S. RAPID
NOTE: FOR LEGEND, ABBREVIATIONS, AND NOTES, SEE SHEET 120.

FED. RD. DIVISION	STATE	PROJECT		
	OHIO			

122/198

CUYAHOGA COUNTY
CUY-21-14.12

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

EXISTING UTILITIES

WILLOW FREEWAY EXTENSION

SCALE: 1" = 50' DATE:

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	WF		C.A.T.			

CONT. No. 58019 SHEET ACCT. No. 1085

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

123
198

CUYAHOGA COUNTY
CUY—21—14.12

BROADWAY AVE.

CLARK FREEWAY

E. 33 ST.

E. 34 ST.

E. 37 ST.

RELOC. BROADWAY

℄ ROAD "B"

BROADWAY OVER CLARK BRIDGE

WARREN ST.

SVOBODA ST.

(E. 36 PL)

LANE N-W

LANE S-W

LANE W-S

LANE W-N

(MUNY STREET LIGHTS ON BROADWAY TO E. 34 ST.)

FOR CONTINUATION SEE SH. 122

FOR CONTINUATION SEE DWG. 121

NOTE:
FOR LEGEND, ABBREVIATIONS, AND NOTES, SEE SHEET 120.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

EXISTING UTILITIES

CLARK FREEWAY NEAR WILLOW

SCALE 1" = 50'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	HHB		WF			

CONT. No. 58019 SHEET ACCT. No. 1713

1713

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY—21—14.12

N
C.T.S. RAPID
MATCH LINE
R.C.C. CLARK STA. 1056+11.02 LANE E-N STA. 0+83.13
4" PE. GAS
NO. 2 SEWER (COMB.)
BOWER AVE.
BRAGG RD.
E. 53 ST. ? OR
4" C.I. GAS
18" SEWER
5'-0 CIR. SEWER
6" WATER
NO. 3 SEWER (COMB)
5'-0 CIR. SEWER (SAN)
6" WATER
5'-0 CIR. SEWER SAN.
E. 54 ST.
3" PE. GAS
15" SEWER
E. 55 ST.
N.Y.C. R.R. YARD
℄ RAMP E-S
SCHOOL CT.
BUCKEYE PIPE LINES
NICKEL PLATE & ERIE R.R. INTERCHANGE TRKS.
℄ RAMP E-N
TRUMBULL ST.
℄ CLARK FREEWAY
ERIE R.R. OVER CLARK BRIDGE
BERAUN AVE.
℄ RAMP N-E
℄ RAMP S-E
ERIE R.R.
15'-8 CIR. SEWER
6'-3 x 5'-3 SOUTHERLY INTERCEPTOR
15" PIPE SEWER
E. 49 ST.
E. 50 ST.
3½ x 3½ CONCRETE SEWER
THE STD. OIL CO. LINES 12" WATER MAIN AND 6" PARAFFIN DISTILLATE
MARTIN AVE.
PRAHA AVE.
BRIDGE
NO. 7 SEWER
3" PE. GAS
15" SEWER
4" C.I. GAS
6" WATER
18" SEWER
5'-0 CIR. SEWER
4" PE. GAS

FOR CONTINUATION SEE SH. 122

FOR CONTINUATION SEE SH. 121

NOTE:
FOR LEGEND, ABBREVIATIONS, AND NOTES, SEE SHEET 120.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

EXISTING UTILITIES

CLARK FREEWAY NEAR WILLOW

SCALE 1" = 50'   DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	HHB		WF.			

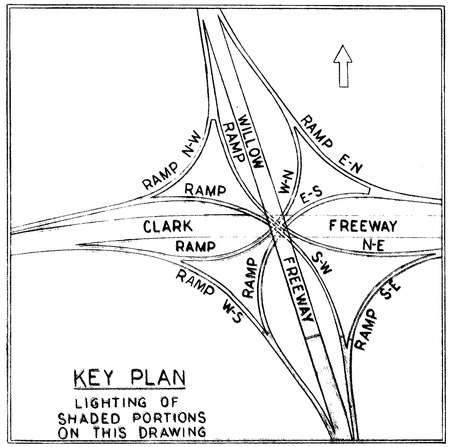
CONT. No. 58019   SHEET ACCT. No. 1712

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

125/198

CUYAHOGA COUNTY
CUY— 21-14.12

PAVEMENT CROSSOVERS			
ITEM	LOCATION	TYPE	LENGTH
1-L	FREEWAY STA. 65+58.5	A	40 FT.
2-L	RAMP S-E STA. 6+42.5	B	50 FT.
3-L	RAMP W-S STA. 22+60.5	B	50 FT.
4-L	RAMP W-S STA. 15+69	B	39 FT.
5-L	RAMP S-E STA. 11+19	B	65 FT.
6-L	RAMP S-E STA. 6+46	BE	50 FT.
7-L	FREEWAY STA. 65+62	AE	93 FT.
8-L	RAMP W-S STA. 22+57	BE	53 FT.



KEY PLAN
LIGHTING OF SHADED PORTIONS ON THIS DRAWING

ROSEVILLE
DILLE
BROADWAY
WILLOW FREEWAY
RAMP W-S
RAMP E-S
RAMP S-W
RAMP S-E
GALLUP
SERVICE ROAD "A"
DOUSE
STUPKA CT.
MARTIN

STA. 64+50 BEGIN PROJECT
STA. 74+00 END PROJECT
STA. 13+00 MATCH LINE SHEET 128
STA. 14+00 MATCH LINE SHEET 126
STA. 7+50 MATCH LINE SHEET 127
STA. 12+00 MATCH LINE SHEET 129

64+86-W III-302
65+56-W III-302
66+67-W III-302
67+95-W III-302
69+22-W III-302
70+49-W III-302
71+76-W III-302
73+03-W III-302
64+86-W III-301
65+56-W III-301
66+56-W III-301
67+79-W III-301
69+02-W III-301
70+25-W III-301
71+49-W III-301
72+73-W III-301
73+96-W III-301
6+40 S-E III-301
7+26 S-E III-305
8+17 S-E III-305
9+08 S-E III-305
9+99 S-E III-305
10+90 S-E III-305
11+81 S-E III-305
22+63 W-S III-304
21-82 W-S III-304
20+97 W-S III 304
20+07 W-S III-304
19+17 W-S III-304
18+27 W-S III-304
17+37 W-S III-304
16+57 W-S III-304
15+82 W-S III-304
14+83 W-S III-304
13+83 W-S III-304
17+27
15+55 E-S III-303
14+65 E-S III-303
4+40 S-W III-306
5+26 S-W III-306
6+13 S-W III-306
7+00 S-W III-306
10+80
70+40

MK "Y"
MK "AY"

Sign No. 10 ~ Sta 64+98
Install Type A Duct into Pull Box at Sta. 64+86

Sign No 11 ~ Sta. 10+40
Install Type A Duct into Pull Box at Sta. 9+99

SEE ENLARGED PLAN OF THIS AREA ON SHEET 133

SYMBOL LEGEND

- ROADWAY LIGHTING UNIT 400 WATT 11,400 LUMEN LAMP 17'-0" BRACKET ARM DETAIL ON SHEET 132.
- STRUCTURE LIGHTING UNIT 400 WATT 11,400 LUMEN LAMP 10'-0" BRACKET ARM DETAIL ON SHEET 135.
- RAMP LIGHTING UNIT 400 WATT 11,400 LUMEN LAMP 10'-0" BRACKET ARM DETAIL ON SHEET 133.
- ⊕ COMBINATION POLICE CALLBOX & FIRE ALARM STATION, DETAIL ON SHEET 134.
- A — TYPE "A" DUCT, ONE 2" CONDUIT (—— s ——— "AE" FOR ALARM SYSTEM).
- B — TYPE "B" DUCT, TWO 2" CONDUIT (—— ss ——— "BE" FOR ALARM SYSTEM).
- E — TYPE E DUCT, THREE 2" CONDUIT.

NOTE: WHEN CONDUIT SYMBOLS APPEAR ON STRUCTURE THEY REPRESENT ITEM "AF" OR ITEM "AM" CONDUIT.

116+16-W / III-101 — TOP LINE ℄ OR ℔ STATION - INITIAL OF ROADWAY; BOT. LINE A.S.A./I.E.S. DISTRIBUTION TYPE - CIRCUIT NO.

SMALL SQUARES ALONG DUCT LINE INDICATE PRESENCE OF GUARD RAIL.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

LIGHTING PLAN
WILLOW-CLARK INTERCHANGE

STA 64+50 TO STA 74+00 WILLOW FREEWAY AND RADIATING RAMPS

SCALE 1" = 50' DATE 12-5-62

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	JMW		WFE			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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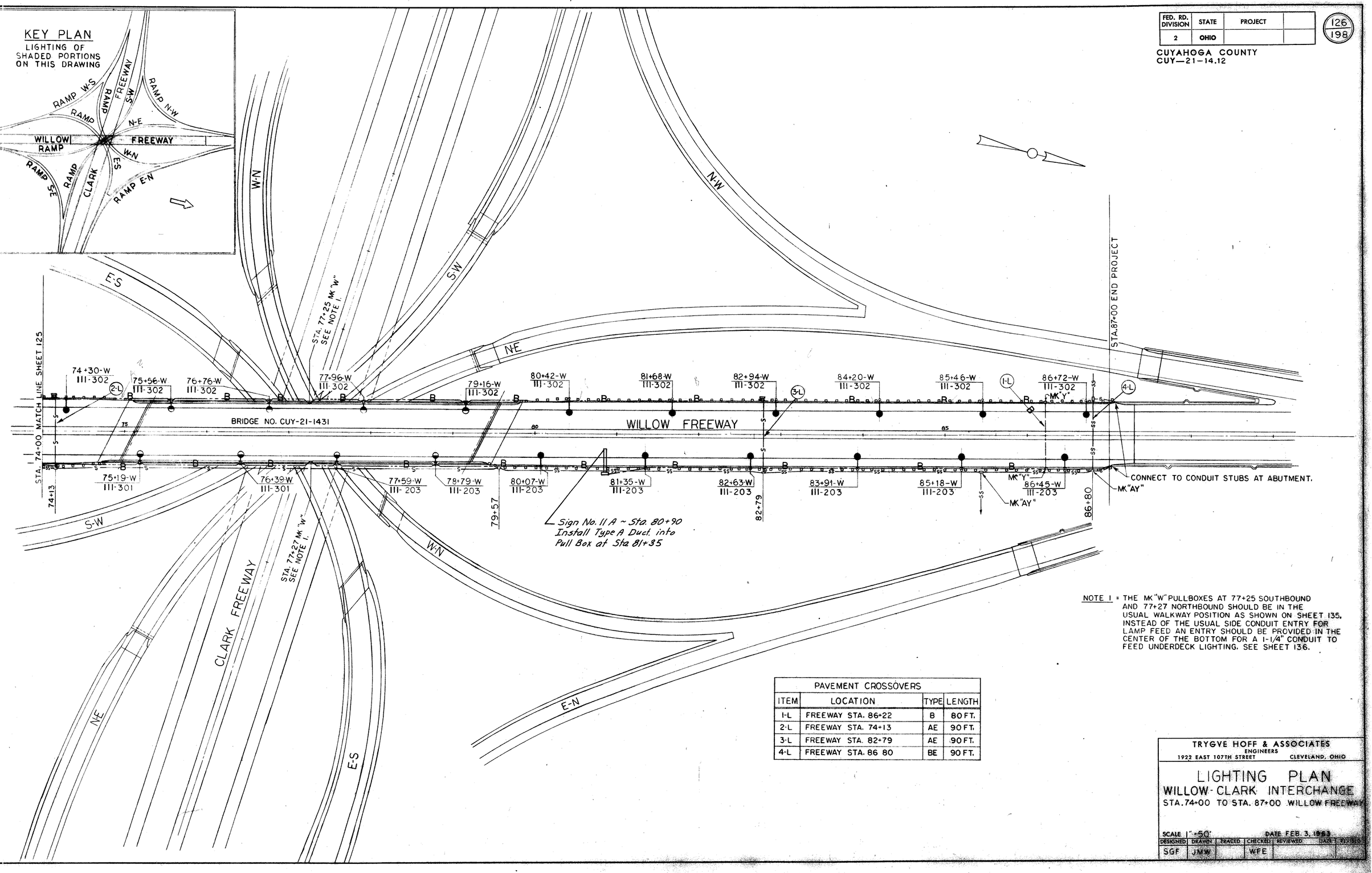
198

CUYAHOGA COUNTY
CUY—21—14.12

KEY PLAN
LIGHTING OF SHADED PORTIONS ON THIS DRAWING



NOTE 1 = THE MK "W" PULLBOXES AT 77+25 SOUTHBOUND AND 77+27 NORTHBOUND SHOULD BE IN THE USUAL WALKWAY POSITION AS SHOWN ON SHEET 135, INSTEAD OF THE USUAL SIDE CONDUIT ENTRY FOR LAMP FEED AN ENTRY SHOULD BE PROVIDED IN THE CENTER OF THE BOTTOM FOR A 1-1/4" CONDUIT TO FEED UNDERDECK LIGHTING. SEE SHEET 136.

PAVEMENT CROSSOVERS

ITEM	LOCATION	TYPE	LENGTH
1-L	FREEWAY STA. 86+22	B	80 FT.
2-L	FREEWAY STA. 74+13	AE	90 FT.
3-L	FREEWAY STA. 82+79	AE	90 FT.
4-L	FREEWAY STA. 86 80	BE	90 FT.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

LIGHTING PLAN
WILLOW-CLARK INTERCHANGE
STA. 74+00 TO STA. 87+00 WILLOW FREEWAY

SCALE 1" = 50' DATE FEB. 3, 1983

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	JMW		WFE			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

127
198

CUYAHOGA COUNTY
CUY—21-14.12

KEY PLAN
LIGHTING OF SHADED PORTIONS ON THIS DRAWING

RAMP W-S · RAMP · FREEWAY · S-W · RAMP N-W · WILLOW · RAMP · N-E · FREEWAY · RAMP S-E · RAMP · CLARK · S-E · W-N · RAMP E-N

NOTE 1 : THE MK "W" PULLBOX AT STA. 11+25 S-W SHOULD BE IN THE USUAL WALKWAY POSITION AS SHOWN ON SHEET 135. INSTEAD OF THE USUAL SIDE CONDUIT ENTRY FOR LAMP FEED AN ENTRY SHOULD BE PROVIDED IN THE BOTTOM FOR A 1-1/4" CONDUIT TO FEED UNDERDECK LIGHTING. SEE SHEET 136.

= LUMINAIRE WITH GLARE SHIELD. (Sheets No. 127, 128 and 129)

N

Sign No. 12 ~ Sta. 7+30
Install Type A Duct into
Pull Box at Sta. 7+58

CONNECT TO CONDUIT STUB AT ABUTMENT

END PROJECT AT KINGSBURY VIADUCT ABUTMENTS

CONNECT TO CONDUIT STUB AT ABUTMENT

STA 12+00 N-W END PROJECT
11+29 N-W III-306
STA. 11+20
10+35 N-W III-306
9+40 N-W III-306
8+45 N-W III-306
STA. 7+70
7+58 N-W III-202
6+69 N-W III-202
5+79 N-W III-202
4+89 N-W III-202
MK "AY"
RAMP N-W
WILLOW FREEWAY
RAMP N-E
STA. 16+00 S-W END PROJECT
15+50 S-W III-306
14+50 S-W III-306
13+56 S-W III-306
12+61 S-W III-306
MK "W" AT STA. 11+25 S-W SEE NOTE 1.
7+31 N-E III-305
6+39 N-E III-305
5+47 N-E III-306
4+56 N-E III-306
3+65 N-E III-306
8+23 N-E III-305
9+18 N-E III-305
11+07 N-E III-305
10+56 S-W III-306
9+61 S-W III-306
12+01 N-E III-305
8+74 S-W III-306
7+87 S-W III-306
12+96 N-E III-305
13+91 N-E III-305
14+83 N-E III-305
15+75 N-E III-305
16+67 N-E III-305
STA 17+00 N-E END PROJECT
STA. 7+50 MATCH LINE SHEET 125
RAMP W-N
RAMP E-S
CLARK FREEWAY
STA. 11+00 MATCH LINE SHEET 128
11+08 W-N III-304
12+00 W-N III-304
12+92 W-N III-304
13+84 W-N III-304
RAMP E-N
22+08 E-N III-401
22+97 E-N III-401
23+75
23+86 E-N III-401
24+75 E-N III-401
25+64 E-N III-401
26+53 E-N III-401
MK "AY"
21+19 E-N III-401
20+30 E-N III-401
19+41 E-N III-401
18+52 E-N III-401
17+63 E-N III-401
17+53
STA. 5+50 MATCH LINE SHT. 128
5+40 E-S III-303
STA 17+50 E-N END PROJECT

PAVEMENT CROSSOVERS			
ITEM	LOCATION	TYPE	LENGTH
1-L	RAMP N-W STA 8+65	A	54 FT
2-L	RAMP N-W STA 5+15	B	40 FT
3-L	RAMP E-N STA 18+36	A	56 FT
4-L	RAMP E-N STA 22+51	A	45 FT
5-L	RAMP E-N STA 26+40	BE	45 FT
6-L	RAMP N-W STA. 5+36	BE	45 FT

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

LIGHTING PLAN
WILLOW-CLARK INTERCHANGE
RAMP N-E & S-W UNDER WILLOW
RAMP E-N, W-N & N-W

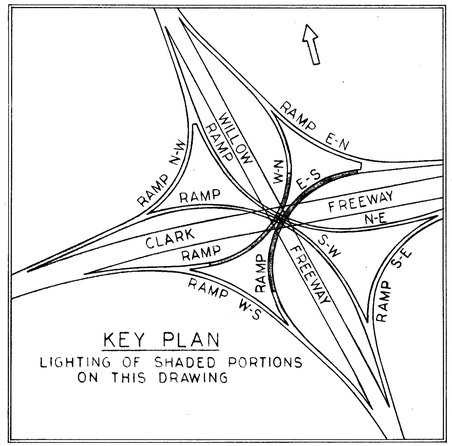
SCALE 1"=50' DATE FEB. 4, 1963

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	JMW		WFE			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

128
198

CUYAHOGA COUNTY
CUY-21-14.12



KEY PLAN
LIGHTING OF SHADED PORTIONS ON THIS DRAWING

N

RAMP N-W 10+00

RAMP 5+00

WILLOW RAMP 10+00

STA. 11+00 MATCH LINE SHEET 127

6+20 S-E
111-303

7+01 S-E
111-303

7+81-E-S
111-303

10+16-W-N
111-304

8+62 E-S
111-303

9+26 W-N
111-304

9+49 E-S
111-303

RAMP S-W 15+00

15+00

1030+00

1035+00

10+00

N-E

7+97 W-N
111-304

MK "W" AT STA. 9+98 E-S
SEE NOTE 1.

10+00

11+03 E-S
111-303

7+02 W-N
111-304

11+95-E-S
111-303

1025+00

STA. 5+00 END PROJECT

5+00

W-N

6+10 W-N
111-304

RAMP

5+18 W-N
111-304

RAMP E-S

12+85-E-S
111-303

13+75-E-S
111-303

STA. 14+00 E-S MATCH LINE SHEET 125

FREEWAY

5+00

10+00

RAMP W-S

15+00

STA. 5+50 MATCH LINE SHEET 127

NOTE 1 = THE MK "W" PULLBOX AT STA. 9+98 E-S SHOULD BE IN THE USUAL WALKWAY POSITION AS SHOWN ON SHEET 135. INSTEAD OF THE USUAL SIDE CONDUIT ENTRY FOR LAMP FEED AN ENTRY SHOULD BE PROVIDED IN THE BOTTOM FOR A 1-1/4" CONDUIT TO FEED UNDERDECK LIGHTING. SEE SHEET 136.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

LIGHTING PLAN

WILLOW CLARK INTERCHANGE
RAMPS WN & ES OVER CLARK

SCALE 1"-50'-0" DATE FEB. 4, 1963

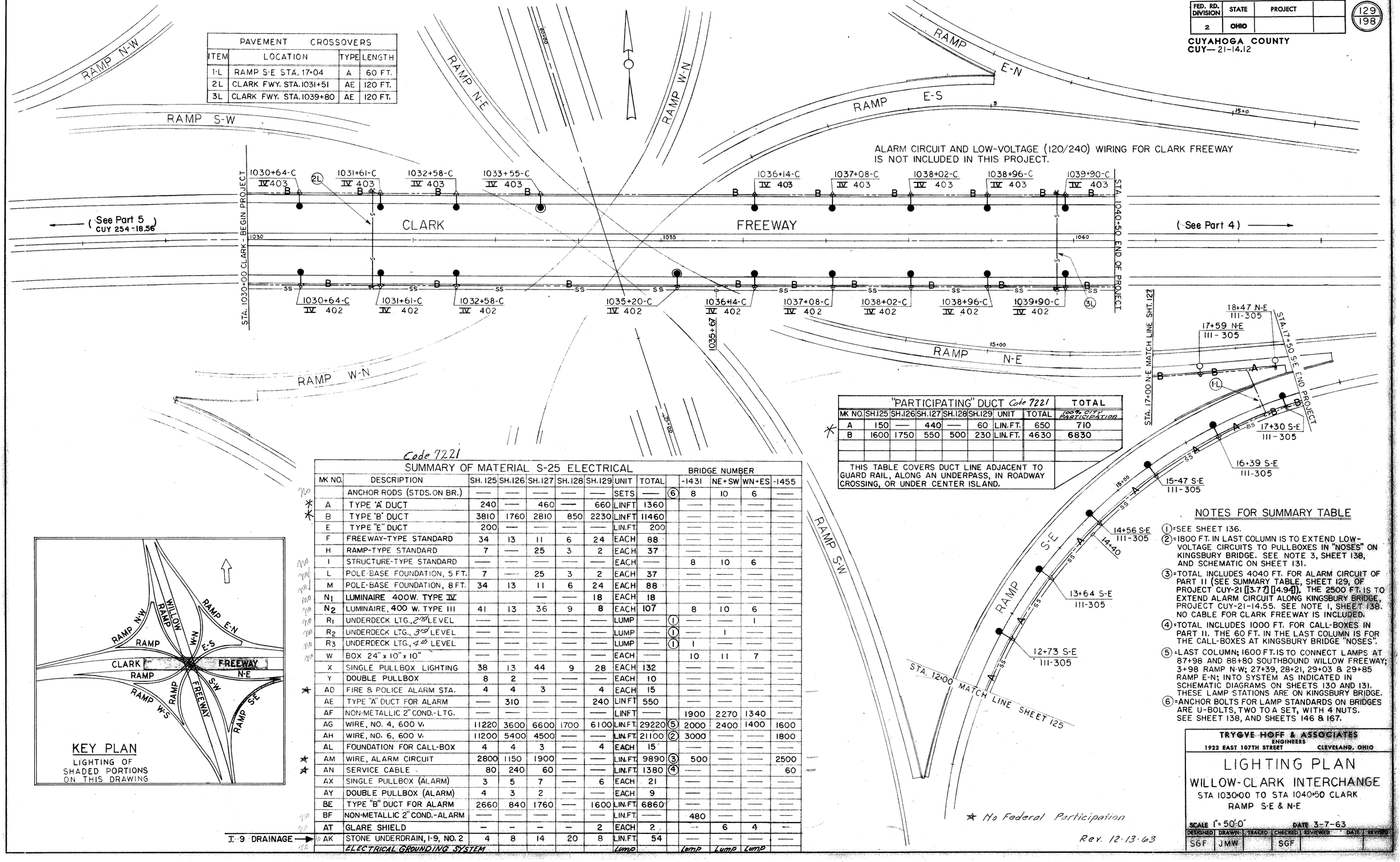
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	JMW		WFE			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

129/198

CUYAHOGA COUNTY
CUY— 21-14.12

PAVEMENT CROSSOVERS			
ITEM	LOCATION	TYPE	LENGTH
1-L	RAMP S-E STA. 17+04	A	60 FT.
2L	CLARK FWY. STA. 1031+51	AE	120 FT.
3L	CLARK FWY. STA. 1039+80	AE	120 FT.



ALARM CIRCUIT AND LOW-VOLTAGE (120/240) WIRING FOR CLARK FREEWAY IS NOT INCLUDED IN THIS PROJECT.

"PARTICIPATING" DUCT Code 7221								TOTAL
MK NO.	SH.125	SH.126	SH.127	SH.128	SH.129	UNIT	TOTAL	100% CITY PARTICIPATION
A	150	—	440	—	60	LIN. FT.	650	710
B	1600	1750	550	500	230	LIN. FT.	4630	6830

THIS TABLE COVERS DUCT LINE ADJACENT TO GUARD RAIL, ALONG AN UNDERPASS, IN ROADWAY CROSSING, OR UNDER CENTER ISLAND.

Code 7221

SUMMARY OF MATERIAL S-25 ELECTRICAL

MK NO.	DESCRIPTION	SH. 125	SH.126	SH.127	SH.128	SH.129	UNIT	TOTAL		BRIDGE NUMBER -1431	NE+SW	WN+ES	-1455
	ANCHOR RODS (STDS. ON BR.)	—	—	—	—	—	SETS	—	(6)	8	10	6	—
A	TYPE 'A' DUCT	240	—	460	—	660	LIN FT	1360		—	—	—	—
B	TYPE 'B' DUCT	3810	1760	2810	850	2230	LIN FT	11460		—	—	—	—
E	TYPE "E" DUCT	200	—	—	—	—	LIN. FT.	200		—	—	—	—
F	FREEWAY-TYPE STANDARD	34	13	11	6	24	EACH	88		—	—	—	—
H	RAMP-TYPE STANDARD	7	—	25	3	2	EACH	37		—	—	—	—
I	STRUCTURE-TYPE STANDARD	—	—	—	—	—	EACH	—		8	10	6	—
L	POLE-BASE FOUNDATION, 5 FT.	7	—	25	3	2	EACH	37		—	—	—	—
M	POLE-BASE FOUNDATION, 8 FT.	34	13	11	6	24	EACH	88		—	—	—	—
N_1	LUMINAIRE 400W. TYPE IV			—	—	18	EACH	18			—	—	—
N_2	LUMINAIRE, 400 W. TYPE III	41	13	36	9	8	EACH	107		8	10	6	—
R_1	UNDERDECK LTG., 2ND LEVEL	—	—	—	—	—	LUMP	—	(1)	—	—	1	—
R_2	UNDERDECK LTG., 3RD LEVEL	—	—	—	—	—	LUMP	—	(1)	—	1	—	—
R_3	UNDERDECK LTG., 4TH LEVEL	—	—	—	—	—	LUMP	—	(1)	1	—	—	—
W	BOX 24" x 10" x 10"	—	—	—	—	—	EACH	—		10	11	7	—
X	SINGLE PULLBOX LIGHTING	38	13	44	9	28	EACH	132		—	—	—	—
Y	DOUBLE PULLBOX	8	2	—	—	—	EACH	10		—	—	—	—
AD	FIRE & POLICE ALARM STA.	4	4	3	—	4	EACH	15		—	—	—	—
AE	TYPE "A" DUCT FOR ALARM	—	310	—	—	240	LIN FT	550		—	—	—	—
AF	NON-METALLIC 2" COND.-LTG.	—	—	—	—	—	LIN FT	—		1900	2270	1340	—
AG	WIRE, NO. 4, 600 V.	11220	3600	6600	1700	6100	LIN. FT.	29220	(5)	2000	2400	1400	1600
AH	WIRE, NO. 6, 600 V.	11200	5400	4500	—	—	LIN. FT.	21100	(2)	3000	—	—	1800
AL	FOUNDATION FOR CALL-BOX	4	4	3	—	4	EACH	15		—	—	—	—
AM	WIRE, ALARM CIRCUIT	2800	1150	1900	—	—	LIN. FT.	9890	(3)	500	—	—	2500
AN	SERVICE CABLE	80	240	60	—	—	LIN. FT.	1380	(4)	—	—	—	60
AX	SINGLE PULLBOX (ALARM)	3	5	7	—	6	EACH	21		—	—	—	—
AY	DOUBLE PULLBOX (ALARM)	4	3	2	—	—	EACH	9		—	—	—	—
BE	TYPE "B" DUCT FOR ALARM	2660	840	1760	—	1600	LIN. FT.	6860		—	—	—	—
BF	NON-METALLIC 2" COND.-ALARM	—	—	—	—	—	LIN. FT.	—		480	—	—	—
AT	GLARE SHIELD	—	—	—	—	2	EACH	2		—	6	4	—
AK	STONE UNDERDRAIN, I-9, NO. 2	4	8	14	20	8	LIN. FT.	54		—	—	—	—
	ELECTRICAL GROUNDING SYSTEM						Lump			Lump	Lump	Lump	

I-9 DRAINAGE

KEY PLAN
LIGHTING OF SHADED PORTIONS ON THIS DRAWING

NOTES FOR SUMMARY TABLE

(1) =SEE SHEET 136.

(2) =1800 FT. IN LAST COLUMN IS TO EXTEND LOW-VOLTAGE CIRCUITS TO PULLBOXES IN "NOSES" ON KINGSBURY BRIDGE. SEE NOTE 3, SHEET 138, AND SCHEMATIC ON SHEET 131.

(3) =TOTAL INCLUDES 4040 FT. FOR ALARM CIRCUIT OF PART II (SEE SUMMARY TABLE, SHEET 129, OF PROJECT CUY-21 [3.72] [4.94]). THE 2500 FT. IS TO EXTEND ALARM CIRCUIT ALONG KINGSBURY BRIDGE, PROJECT CUY-21-14.55. SEE NOTE 1, SHEET 138. NO CABLE FOR CLARK FREEWAY IS INCLUDED.

(4) =TOTAL INCLUDES 1000 FT. FOR CALL-BOXES IN PART II. THE 60 FT. IN THE LAST COLUMN IS FOR THE CALL-BOXES AT KINGSBURY BRIDGE "NOSES".

(5) =LAST COLUMN; 1600 FT. IS TO CONNECT LAMPS AT 87+98 AND 88+80 SOUTHBOUND WILLOW FREEWAY; 3+98 RAMP N-W; 27+39, 28+21, 29+03 & 29+85 RAMP E-N; INTO SYSTEM AS INDICATED IN SCHEMATIC DIAGRAMS ON SHEETS 130 AND 131. THESE LAMP STATIONS ARE ON KINGSBURY BRIDGE.

(6) =ANCHOR BOLTS FOR LAMP STANDARDS ON BRIDGES ARE U-BOLTS, TWO TO A SET, WITH 4 NUTS. SEE SHEET 138, AND SHEETS 146 & 167.

* No Federal Participation

Rev. 12-13-63

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

LIGHTING PLAN
WILLOW-CLARK INTERCHANGE
STA 1030+00 TO STA 1040+50 CLARK
RAMP S-E & N-E

SCALE 1"=50'-0" DATE 3-7-63

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	JMW		SGF			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	-	

130/198

CUYAHOGA COUNTY
CUY– 21-14.12

CIRCUIT #301 NORTH BOUND

64+86-W 6+40 S-E 65+56-W 66+56-W 67+79-W 69+02-W 70+25-W 71+49-W 72+73-W 73+96-W 75+19-W 76+39-W 77+27-W

UNDERDECK LIGHTING (4TH LEVEL) N.E. RAMP CIRCUIT SEE SHEET Nº 131.

AWG NO. 6

77+59-W 78+79-W 80+07-W 81+35-W 82+63-W 83+91-W 85+18-W 86+45-W

CIRCUIT #203 NORTH BOUND FROM PREVIOUS PROJECT

CIRCUIT #202 SOUTH BOUND FROM PREVIOUS PROJECT

CIRCUIT #302 SOUTH BOUND

64+86-W 22+63 W-S 65+56-W 66+67-W 67+95-W 69+22-W 70+49-W 71+76-W 73+03-W 74+30-W 75+56-W 76+76-W 77+25 W

AWG NO.6

UNDERDECK LIGHTING S.W. RAMP CIRCUIT SEE SHEET Nº 131. (4TH LEVEL)

77+96-W 79+16-W 80+42-W 81+68-W 82+94-W 84+20-W 85+46-W 86+72-W

7+58-NW 6+69-NW 5+79-NW 4+89-NW 3+98-N-W 87+98-W 88+80-W

CIRCUIT #303

15+55-E-S 14+65-E-S 13+75-E-S 12+85-E-S 11+95-E-S 11+03-E-S 9+98 E-S 9+49 E-S 8+62 E-S 7+81 E-S 7+01 E-S 6+20 E-S 5+40 E-S

UNDERDECK LIGHTING CLARK FREEWAY (2ND LEVEL) FOR CIRC'T SEE SH'T Nº 131.

AWG NO. 6

CIRCUIT #304

21+82-W-S 20+97-W-S 20+07-W-S 19+17-W-S 18+27-W-S 17+37-W-S 16+57-W-S 15+82-W-S 14+83-W-S 13+83-W-S 5+18-W-N 6+10-W-N 7+02-W-N 7+97-W-N 9+26-W-N 10+16-W-N 11+08-W-N 12+00-W-N 12+92-W-N 13+84-W-N

CIRCUIT #305

7+26-S-E 8+17-S-E 9+08-S-E 9+99-S-E 10+90-S-E 11+81-S-E 12+73-S-E 13+64-S-E 14+56-S-E 15+47-S-E 16+39-S-E 17+30-S-E 18+47-N-E 17+59-N-E 16+67-N-E 15+75-N-E 14+83-N-E 13+91-N-E 12+96-N-E 12+01-N-E 11+07-N-E 9+18-N-E 8+23-N-E 7+31-N-E 6+39-N-E

CIRCUIT #306

4+40-S-W 5+26-S-W 6+13-S-W 7+00-S-W 7+87-S-W 8+74-S-W 9+61-S-W 10+56-S-W 11+25 S-W 12+61-S-W 13+56-S-W 14+50-S-W 15+50-S-W 11+29-N-W 10+35-N-W 9+40-N-W 8+45-N-W 3+65-N-E 4+56-N-E 5+47-N-E

AWG NO.6

UNDERDECK LIGHT'G W.N. & E.S. RAMPS FOR CIRCUIT SEE SHEET Nº 131. (3RD LEVEL)

ALL CIRCUIT CABLE ON THIS SHEET IS NO. 4 AWG UNLESS INDICATED OTHERWISE.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

LIGHTING SCHEMATIC
WILLOW-CLARK INTERCHANGE
CIRCUITS 301 TO 306
+202 & 203
CUYAHOGA COUNTY U.S.R. 21

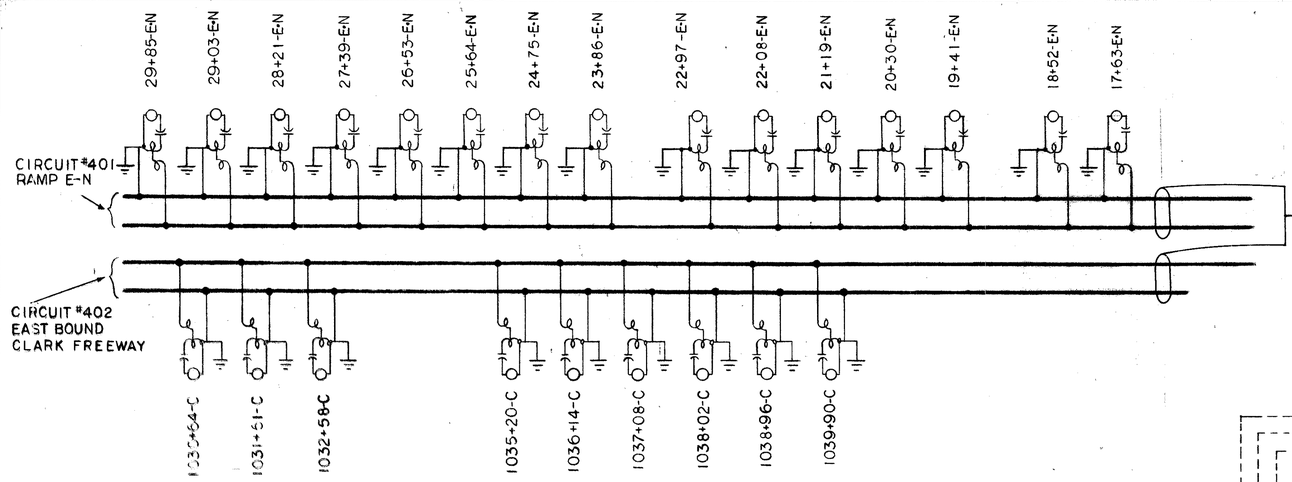
SCALE NONE DATE DEC. 18, 1962

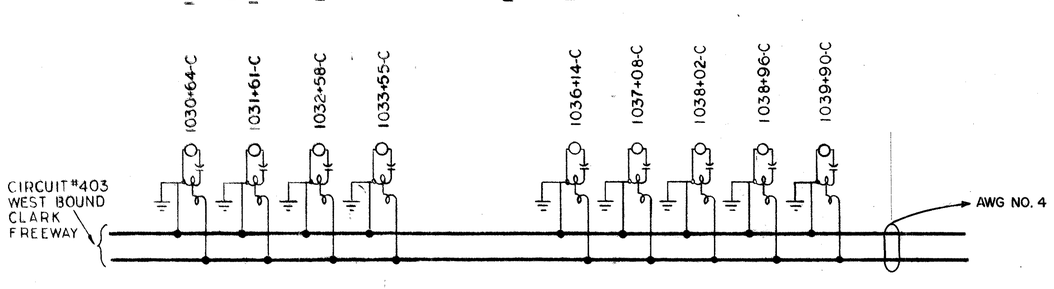
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	PC		WFE			

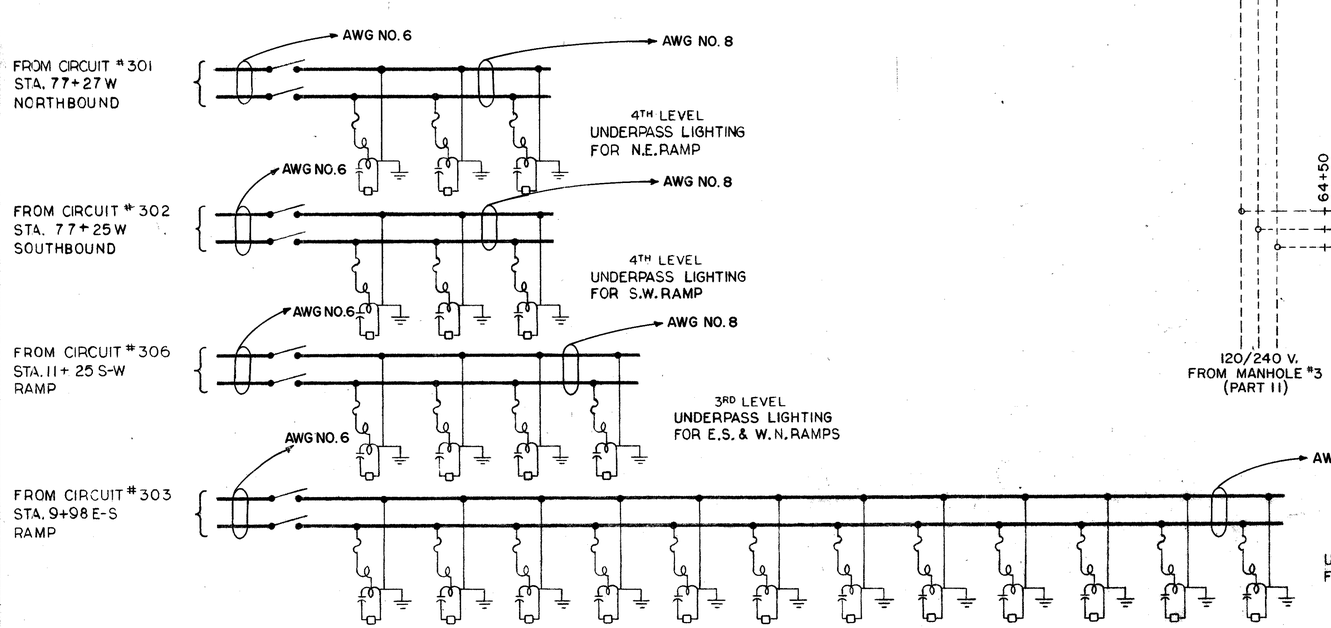
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

131
198

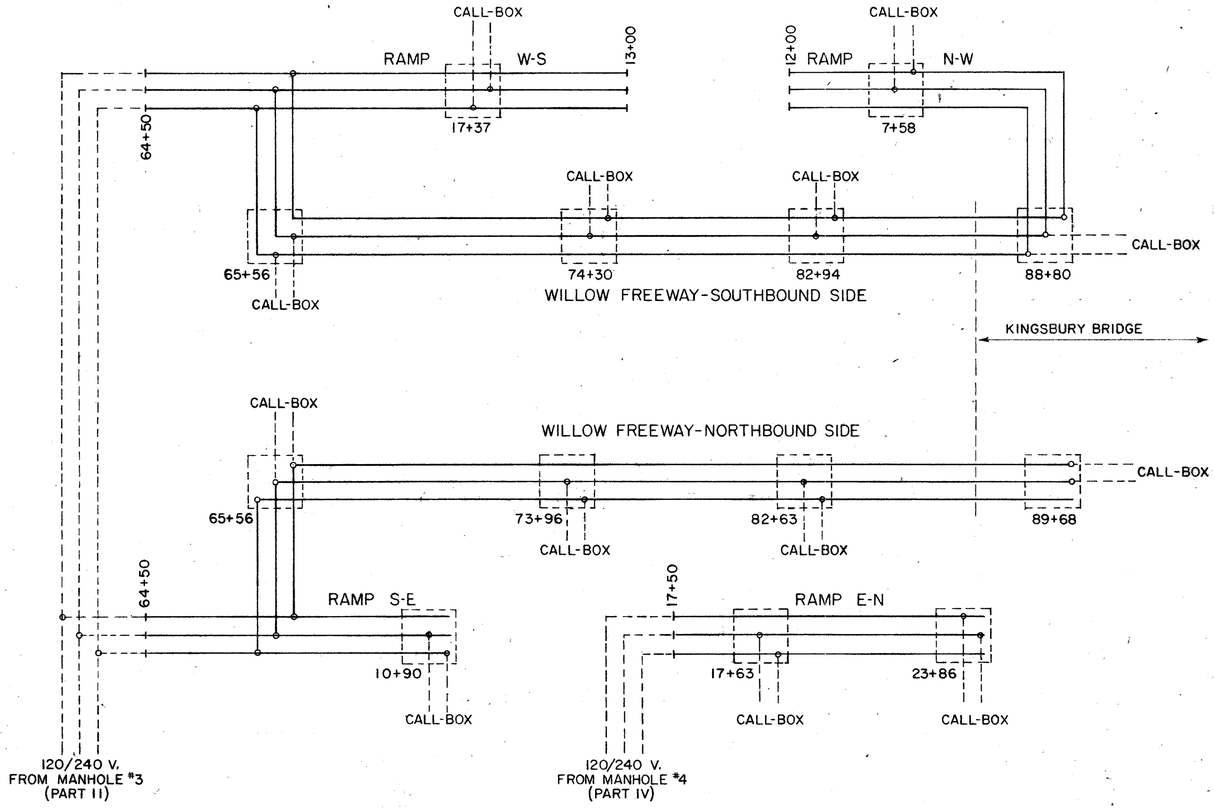
CUYAHOGA COUNTY
CUY—21-14.12







480-VOLT CIRCUITRY



LOW-VOLTAGE CIRCUITRY
(ALL CABLE AWG NO. 6)

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

LIGHTING SCHEMATIC
WILLOW CLARK INTERCHANGE
CIRCUITS 401 TO 403
UNDERDECK LIGHTING AND LOW-VOLTAGE

CUYAHOGA COUNTY U.S.R. 21

SCALE NONE DATE DEC. 11, 1962

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	PC		SGF			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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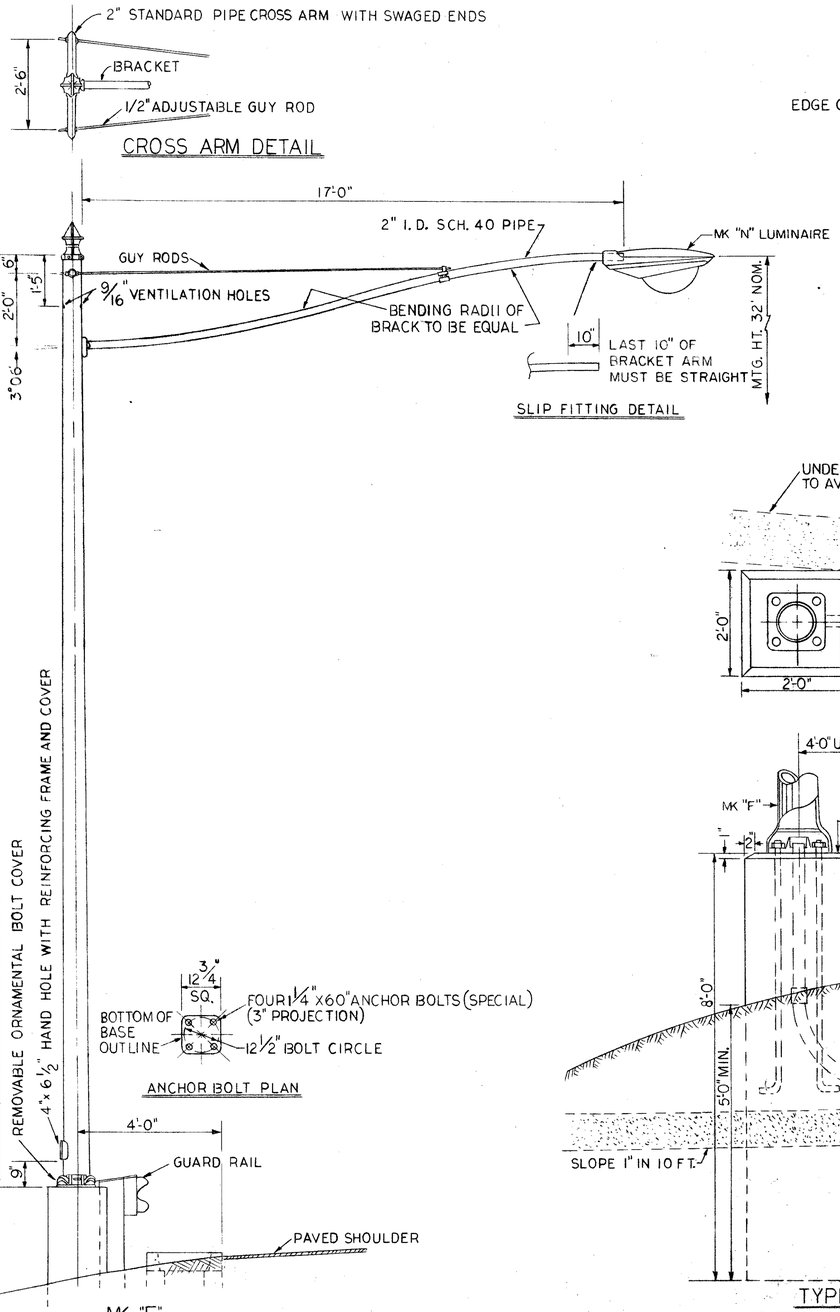
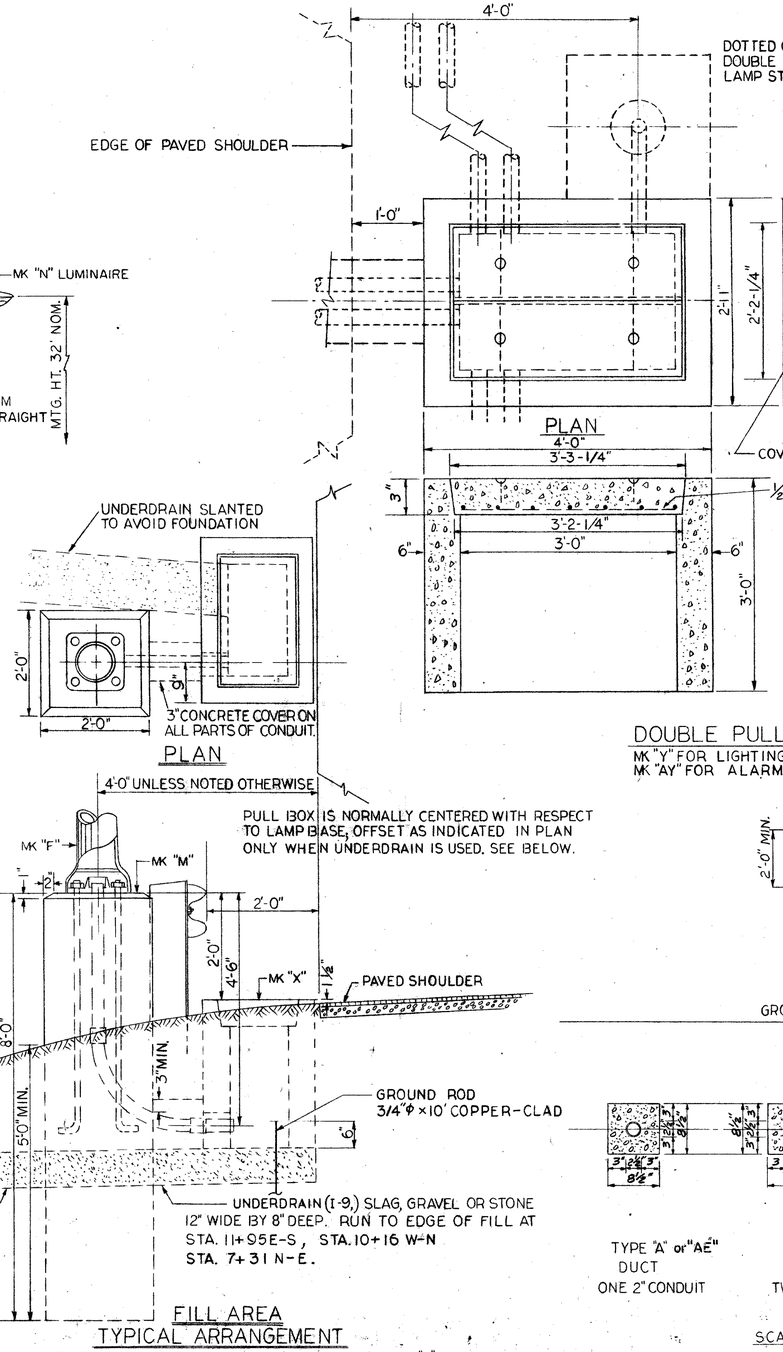
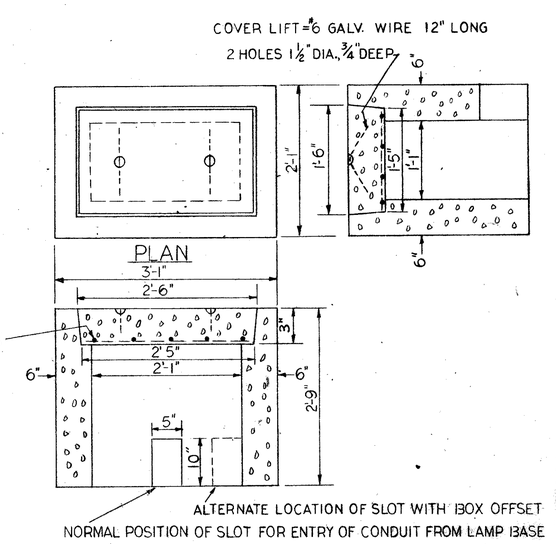
198

CUYAHOGA COUNTY
CUY— 21-14.12



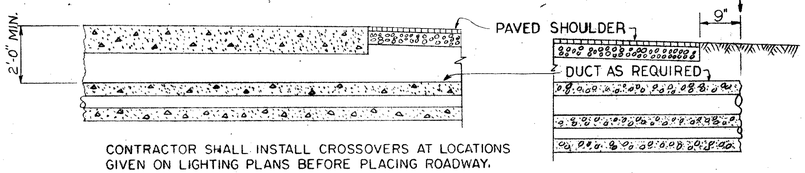




DOUBLE PULLBOX
MK "Y" FOR LIGHTING SYSTEM
MK "AY" FOR ALARM SYSTEM

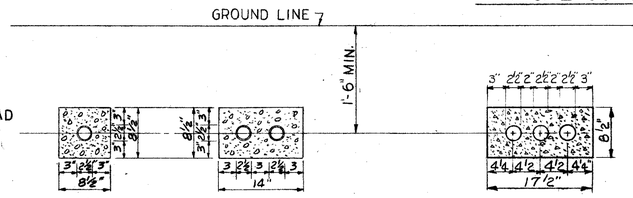
SCALE 1"= 1'-0"

SINGLE PULLBOX
MK "X" FOR LIGHTING SYSTEM
MK "AX" FOR ALARM SYSTEM



CONTRACTOR SHALL INSTALL CROSSOVERS AT LOCATIONS GIVEN ON LIGHTING PLANS BEFORE PLACING ROADWAY.

TYPICAL CONDUIT CROSSOVER



TYPE "A" or "AE" DUCT ONE 2" CONDUIT

TYPE "B" or "BE" DUCT TWO 2" CONDUIT

TYPE "E" DUCT THREE 2" CONDUIT

SCALE OF DUCT SECTIONS 1"= 1'-0"

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

LIGHTING DETAILS
WILLOW-CLARK INTERCHANGE FREEWAY LIGHTING

CUYAHOGA COUNTY U.S.R. 21

SCALE AS NOTED DATE FEB. 11, 1963

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	PC		WFE			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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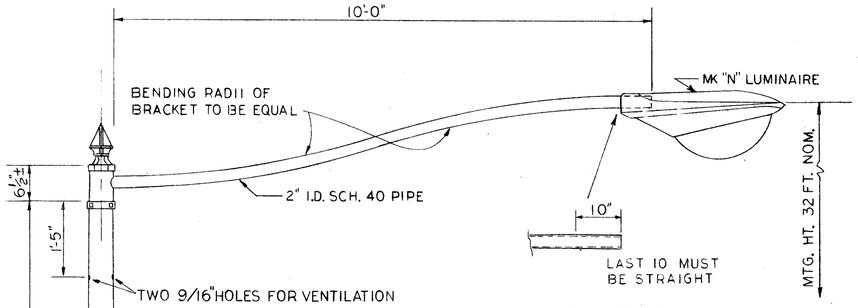
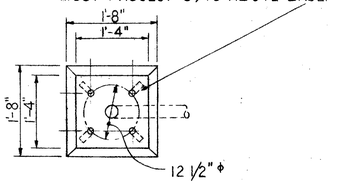
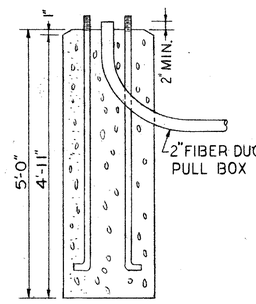
CUYAHOGA COUNTY
CUY—21-14.12



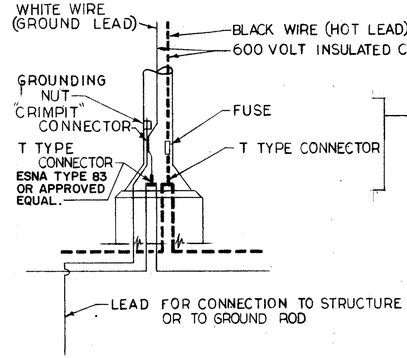
SLIP FITTING DETAIL



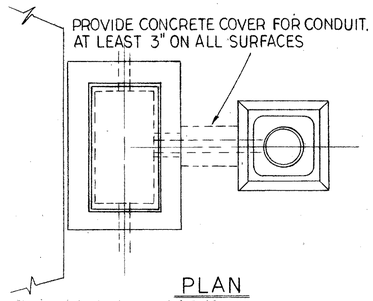
PLAN



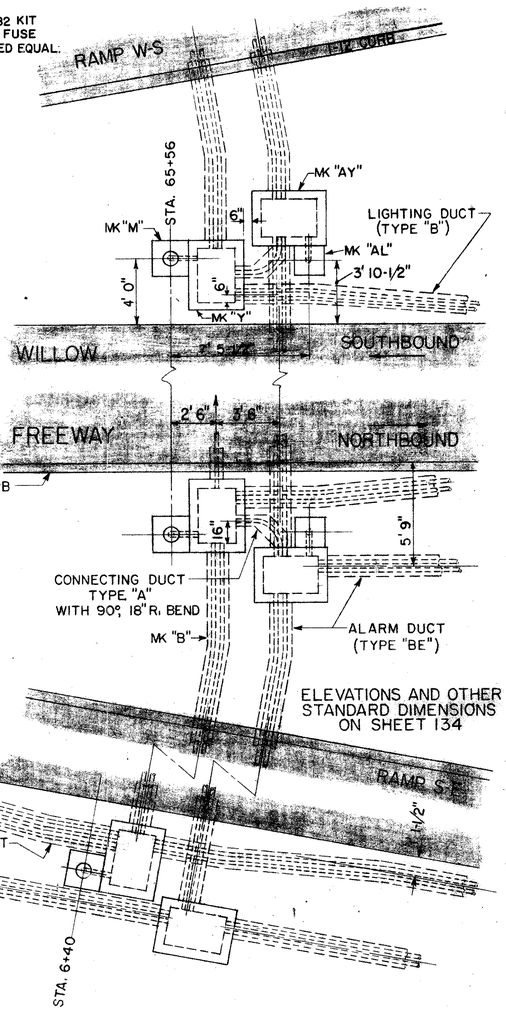
SECTION
LAMP STANDARD FOUNDATION MK "L"
SCALE: 3/4"=1'-0"



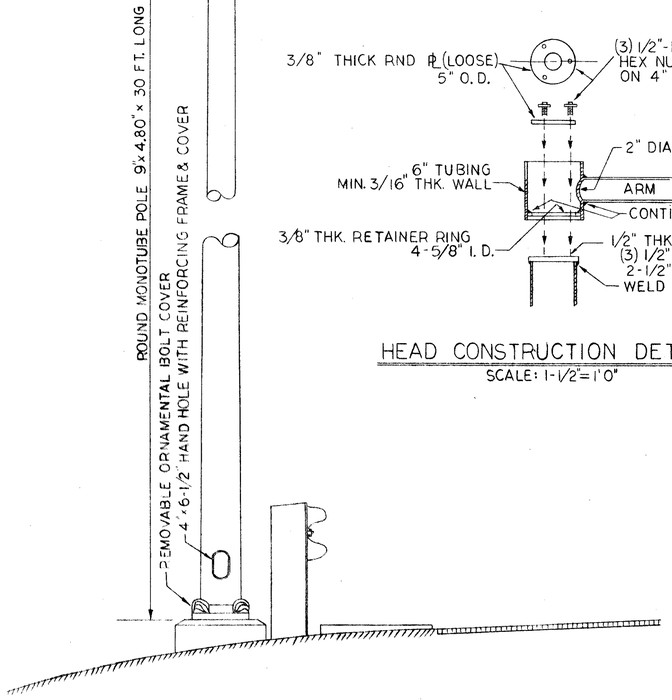
SCHEMATIC DIAGRAM
ELECTRICAL WIRING AT LIGHT POLE
FOR 480 VOLT MULTIPLE CIRCUIT



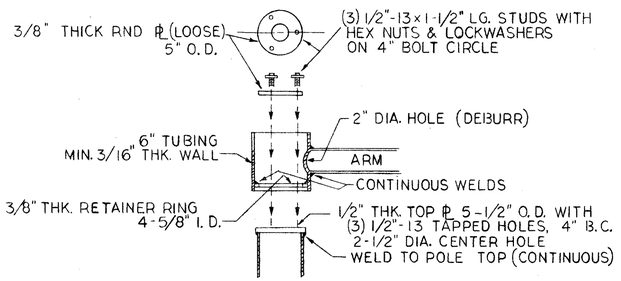
PLAN



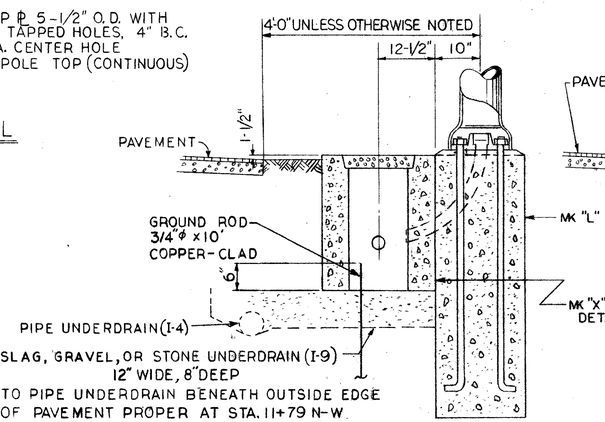
DETAIL PLAN OF CROSSOVERS AT INTERCHANGE
NORTH OF BROADWAY OVERPASS
FROM SHEET 125
SCALE 1/4" = 1'-0"



TYPICAL LAMP STANDARD
MK "H"
SCALE: 3/4"=1'-0"

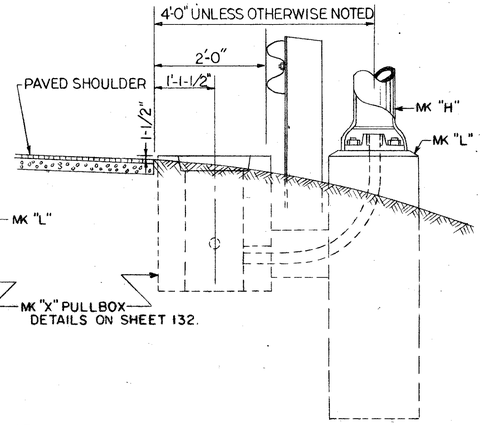


HEAD CONSTRUCTION DETAIL
SCALE: 1-1/2"=1'0"



TO PIPE UNDERDRAIN BENEATH OUTSIDE EDGE OF PAVEMENT PROPER AT STA. 11+79 N-W SOUTHBOUND STA. 64+86 W & STA. 86+72 W, NORTHBOUND STA. 86+45 W WESTBOUND STA. 1033+55 C, EASTBOUND STA. 1035+20 C.

TYPICAL ARRANGEMENT-LAMP STANDARD & PULLBOX IN CUT AREA
SCALE: 3/4"=1'-0"



TYPICAL ARRANGEMENT-LAMP STANDARD & PULLBOX WITH GUARD RAIL
SCALE: 3/4"=1'-0"

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

LIGHTING DETAILS
WILLOW-CLARK INTERCHANGE RAMP LIGHTING

CUYAHOGA COUNTY U.S.R. 21

SCALE AS NOTED DATE FEB. 11, 1963

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	PC		SGF			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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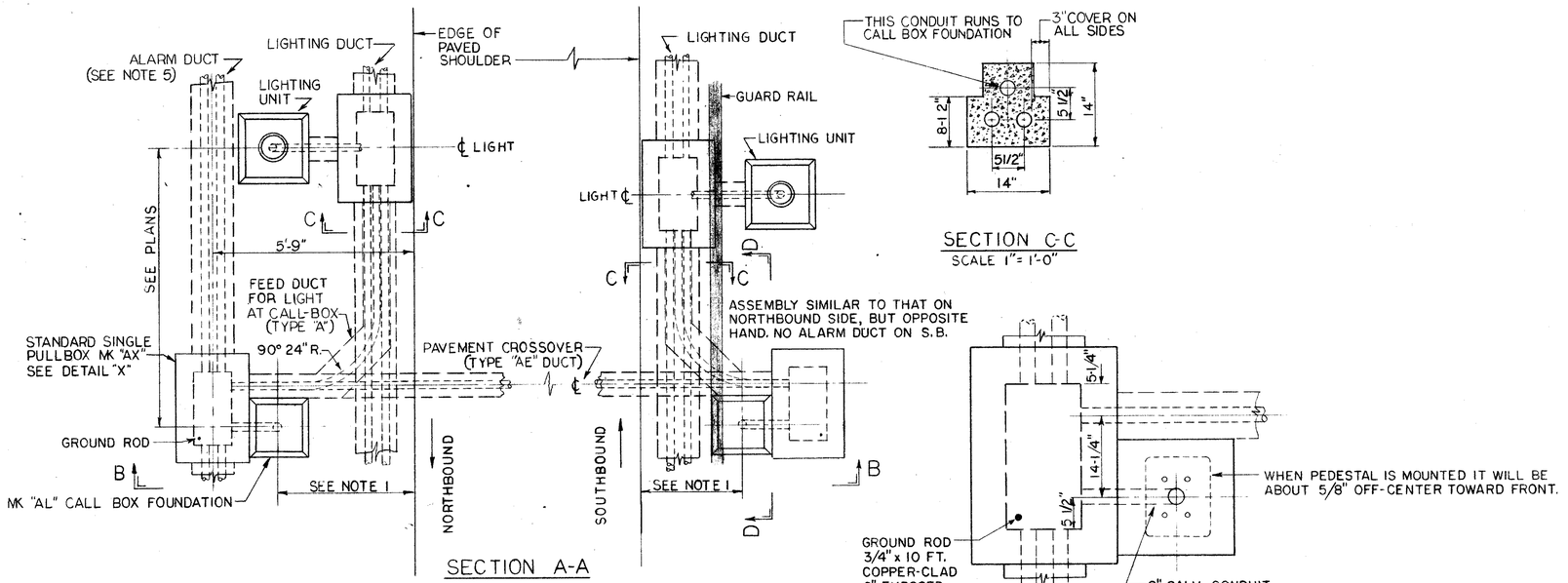
CUYAHOGA COUNTY
CUY— 21-14.12

SHEET ACCT. No. 5043

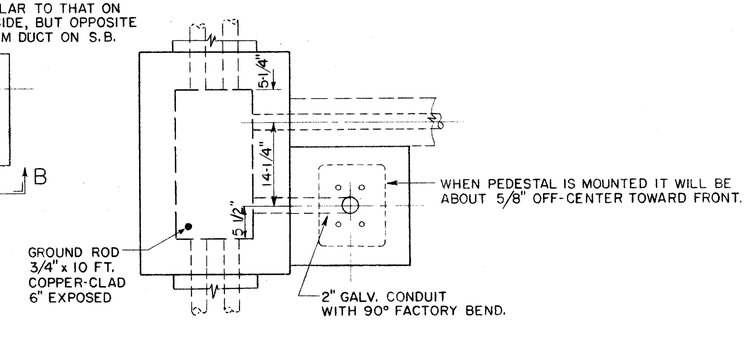
CONT. No. 58019-14



SECTION A-A

FOR DETAILS OF LIGHTING SYSTEM SEE SHEET 132

SECTION C-C
SCALE 1"= 1'-0"



DETAIL "X"
SCALE 1"= 1'-0"

NOTE 1 : CALL BOX TO BE LOCATED 3' 10-1/2" FROM EDGE OF PAVED SHOULDER IF NOT BEHIND GUARD RAIL OR 2' 10-1/2" IF BEHIND GUARD RAIL LATERAL POSITION OF PULLBOX DOES NOT CHANGE ON NORTHBOUND SIDE.

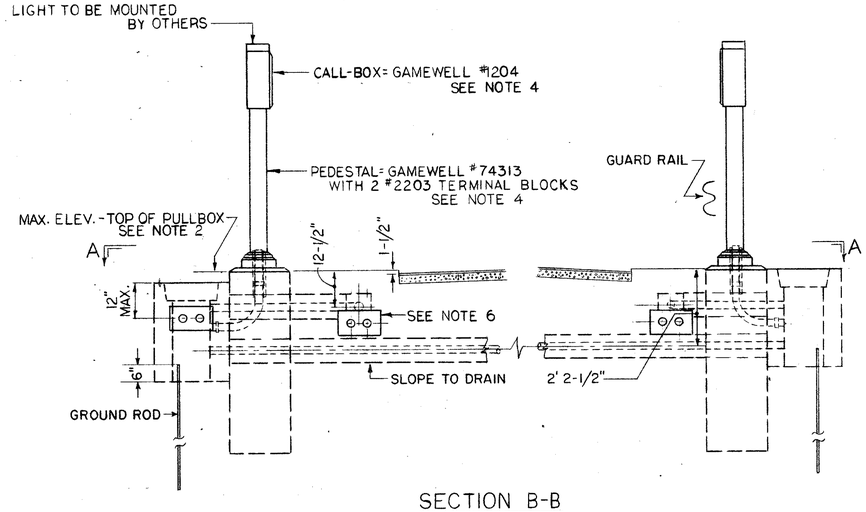
NOTE 2 : ELEVATION OF TOP OF PULLBOX DEPENDS ON TERRAIN, EXCEPT THAT IT CANNOT BE HIGHER THAN THE EDGE OF THE CALL-BOX FOUNDATION PULLBOX MAY BE BELOW TOP OF FOUNDATION TO PROVIDE COVER FOR ALARM DUCT IN FILL AREAS.

NOTE 3 : FREEWAY ℄ STATION OF PAVEMENT CROSSOVER, AS GIVEN ON LIGHTING PLAN DETERMINES LOCATION OF CALL-BOXES ON BOTH SIDES OF FREEWAY.

NOTE 4 : ASSEMBLY OF CALL-BOX AND PEDESTAL IS MK "AD"

NOTE 5 : ALARM DUCT MAY BE TYPE "AE" OR TYPE "BE" AS CALLED FOR ON LIGHTING PLANS (TYPE "BE" IS SHOWN)

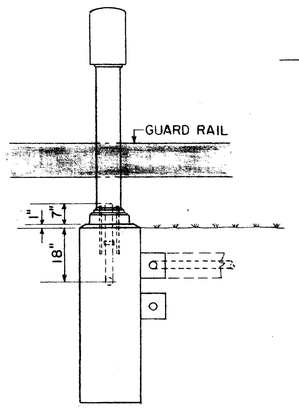
NOTE 6 : LIGHTING DUCT MAY BE TYPE "A" OR TYPE "B" AS CALLED FOR ON LIGHTING PLANS. (TYPE "B" IS SHOWN)



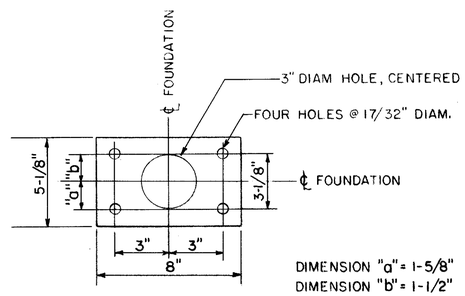
SECTION B-B

TYPICAL ALARM CALL-BOX STATION

SCALE 1/2"= 1'-0"

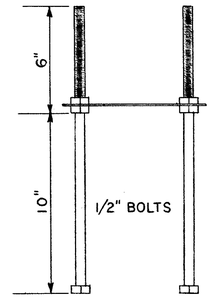


SECTION D-D



DIMENSION "a"= 1-5/8"
DIMENSION "b"= 1-1/2"

USE TEMPLATE FURNISHED WITH PEDESTAL TO LOCATE ANCHOR BOLTS IN FOUNDATION. IF NO TEMPLATE IS FURNISHED, MAKE ONE OF 10 GUAGE SHEET STEEL, WITH HOLES AS INDICATED ABOVE.



ANCHOR BOLT LOCATION
SCALE 3"= 1' 0"

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

ELECTRICAL DETAILS
WILLOW CLARK INTERCHANGE
ALARM SYSTEM DETAILS

CUYAHOGA COUNTY U.S.R. 21

SCALE AS NOTED DATE FEB. 6, 1963

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF		W.F.E.	WFE			

RECEIVED MAR 6 1964

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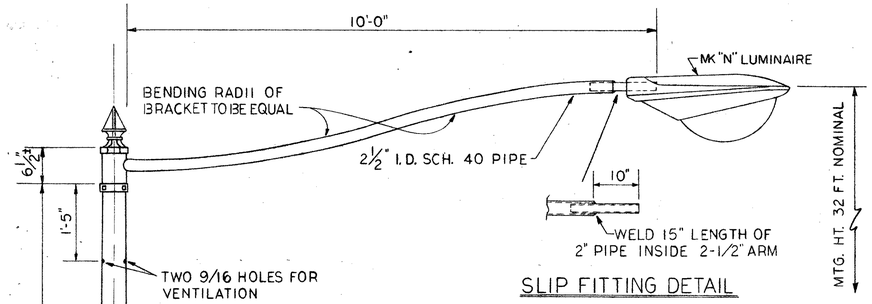
CUYAHOGA COUNTY
CUY— 21-14.12

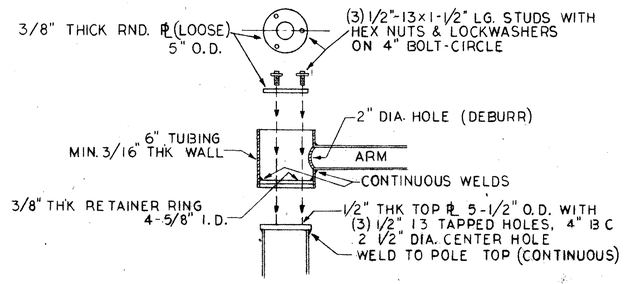
SHEET ACCT. No. 5026

CONT. No. 58019-14

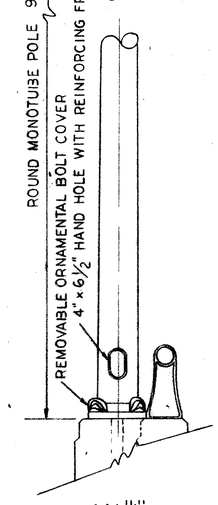
ALL CONDUIT IS 2" NON-METALLIC UNLESS OTHERWISE NOTED.



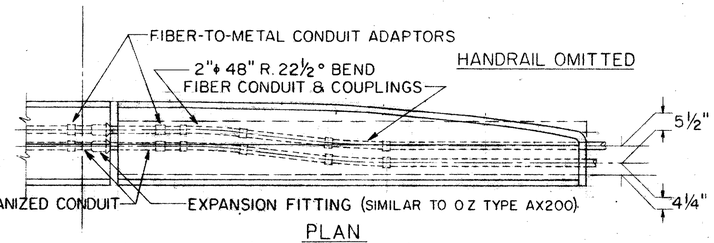
SLIP FITTING DETAIL



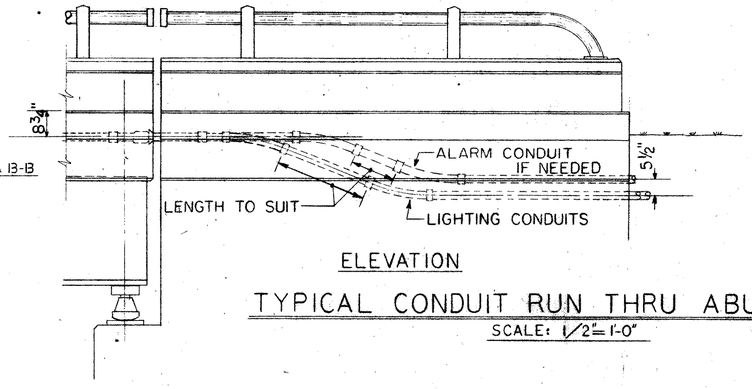
HEAD CONSTRUCTION DETAIL
1-1/2"= 1'-0"



MK "I"
TYPICAL LAMP STANDARD
FOR FOUNDATION DETAILS SECTIONS A-A & B-B
SCALE 3/4"=1'-0"

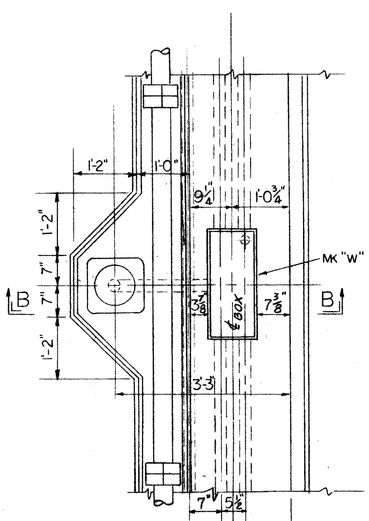


PLAN
(NO ALARM CONDUIT)

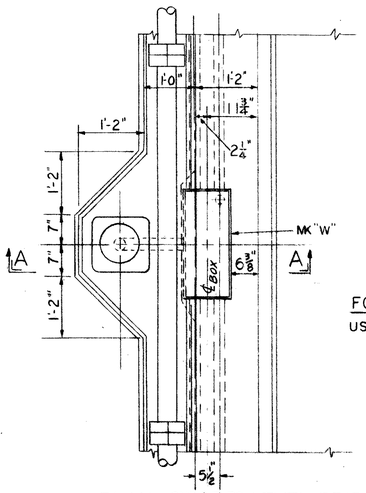


ELEVATION

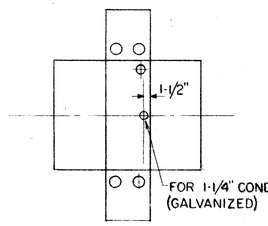
TYPICAL CONDUIT RUN THRU ABUTMENT
SCALE: 1/2"= 1'-0"



PLAN - 4TH LEVEL BRIDGE
SCALE 3/4"=1'-0"

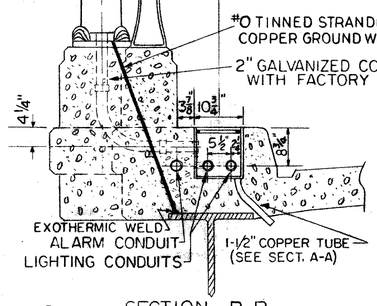


PLAN - 2ND & 3RD LEVEL BRIDGES
SCALE 3/4"=1'-0"

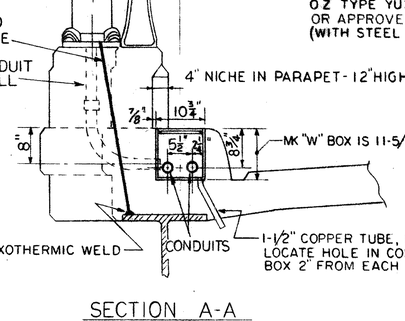


MODIFIED MK "W" PULLBOX
FOR UNDERDECK LIGHTING FEED
USE AT STA. 77+25 WILLOW S.B.
STA. 77+27 WILLOW N.B.
STA. 11+25 S-W
STA. 9+98 E-S

MK "W" = PULLBOX, 24" x 10" x 10", CAST IRON, WEATHERPROOF.
OZ TYPE YU241010, HOPE TYPE 6200, OR APPROVED EQUAL.
(WITH STEEL CHECKERED COVER)

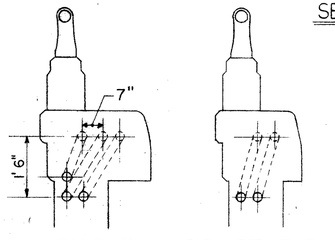


SECTION B-B



SECTION A-A

ALARM CONDUIT IS USED ONLY IN EAST SIDE OF 4TH LEVEL BRIDGE



4TH LEVEL 2ND & 3RD LEVEL
END VIEW

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

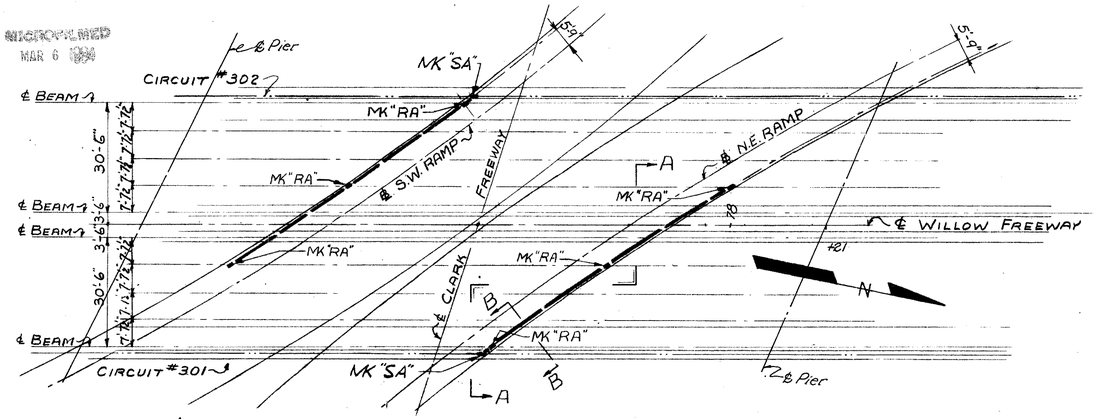
LIGHTING DETAILS
WILLOW-CLARK INTERCHANGE

BRIDGE NO. CUY-21-1431 4TH LEVEL
BRIDGE NO. CUY-21-1436 3RD LEVEL
BRIDGE NO. CUY-254-1877 2ND LEVEL

SCALE AS NOTED DATE 12-4-62

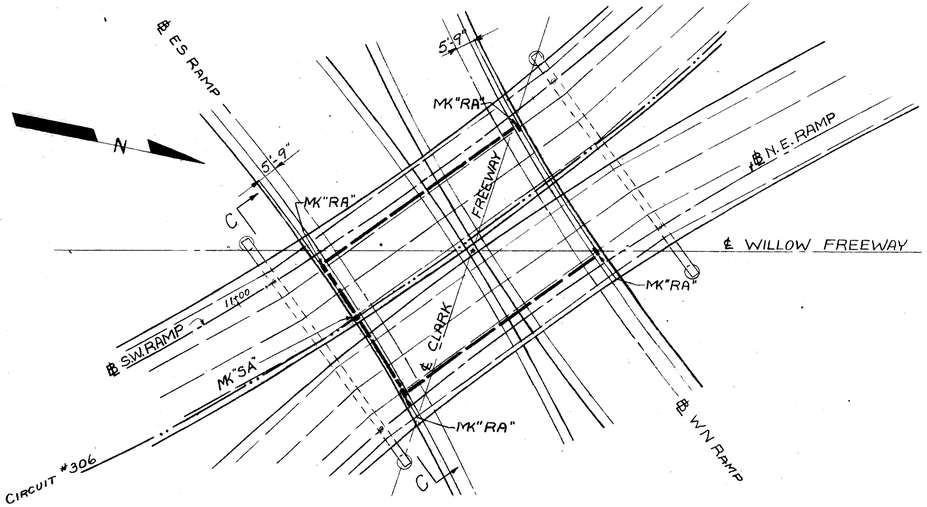
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	PC		SGF			

MICROFILMED
MAR 6



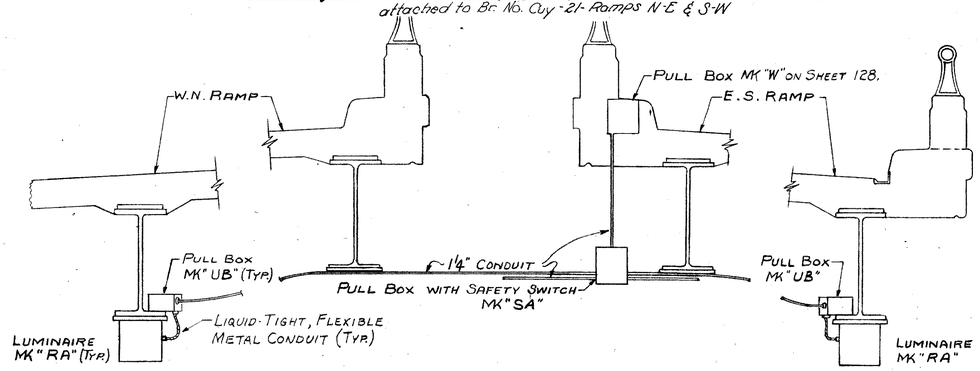
4th Level PLAN, UNDERPASS LIGHTING FOR S.W. RAMP & N.E. RAMP

attached to Br. No. Cuy-21-1431 1431



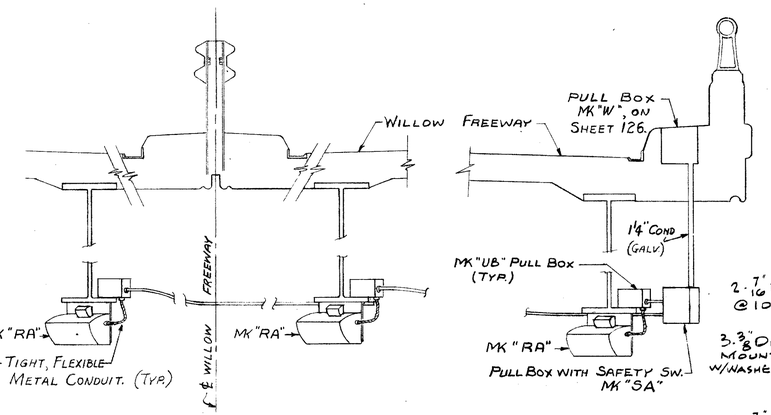
3rd Level PLAN, UNDERPASS LIGHTING FOR W.N. RAMP & E.S. RAMP

attached to Br. No. Cuy-21- Ramps N-E & S-W



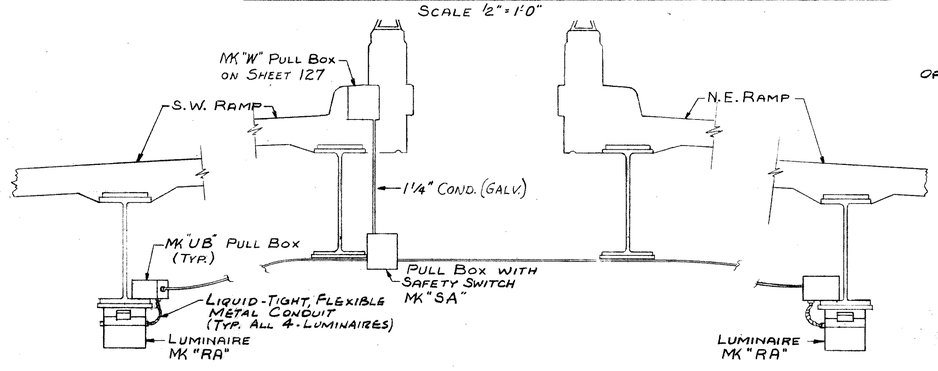
SECTION D-D FOR CLARK FREEWAY LIGHTING

SCALE 2" = 1'-0



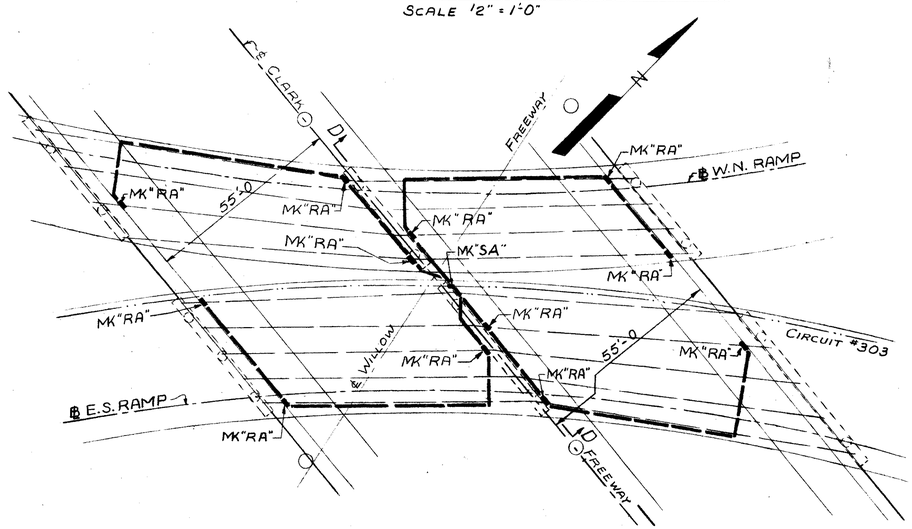
SECTION A-A FOR N.E. RAMP & TYPICAL S.W. RAMP OPPOSITE DIRECTION

SCALE 2" = 1'-0"



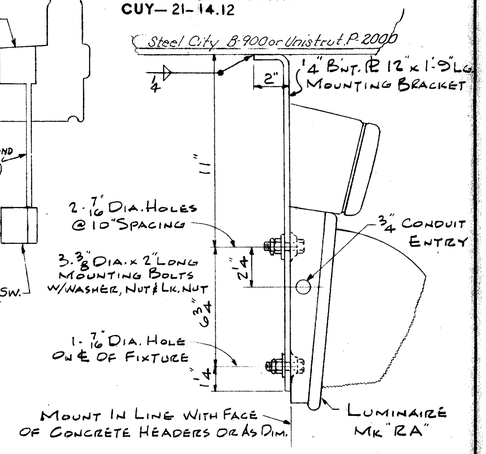
SECTION C-C FOR W.N. RAMP & E.S. RAMP

SCALE 2" = 1'-0"



2nd Level PLAN, UNDERPASS LIGHTING FOR CLARK FREEWAY

attached to Br. No. Cuy-21- Ramps E-S & W-N



VIEW B-B

(TYPICAL FOR ALL UNDERPASS LIGHTING)

SCALE 3" = 1'-0"

SYMBOL LEGEND FOR PAY ITEMS R-1, R-2 & R-3

MK "RA" = LUMINAIRE, MERCURY-VAPOR, WIDE-SPREAD, UNDERPASS TYPE WITH 250-WATT LAMP, TYPE H37-5KC/W. TO INCLUDE 3/4" VINYL-JACKETED FLEXIBLE CONDUIT CONNECTION FROM MK "UB".

MK "SA" = SERVICE BOX 16"x12"x8" CAST-IRON WATERTIGHT, OZ TYPE YS161208, HOPE TYPE H-1295, OR APPROVED EQUAL, TO INCLUDE TWO-POLE, 480V., 30AMP. FUSIBLE SAFETY SWITCH.

MK "UB" = PULLBOX 8"x6"x3", CAST-IRON WATERTIGHT, OZ TYPE YS080603, HOPE TYPE H-1264 OR APPROVED EQUAL.

Notes:

SERVICE BOXES and Pull Boxes shall not be fastened to beam or girder flange by welding.

UNDERPASS LUMINAIRES (MK's. RA) shall be welded, to the structural column, parallel to the roadway which is to be lighted. The structural column shall be Steel City B-900, Unitrust P-2000 or approved equal held at right angles to overhead beam by approved beam clamps.

ALL CONDUIT FOR UNDERDECK LIGHTING IS RIGID GALVANIZED, UNLESS NOTED.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY-21-14.12

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

LIGHTING DETAILS

BRIDGE Nos. CUY-21-1431; 21-1436 & 254-1877

WILLOW-CLARK INTERCHANGE

SCALE AS NOTED DATE FEB. 11, 1963

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
W.F.E.	W.F.E.		SGF			

SHEET ACCT. No. 5038

JNT. No. 58019

ELECTRICAL NOTES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY— 21—14.12

GENERAL

THIS SPECIFICATION SHALL SUPPLEMENT THE STATE OF OHIO CONSTRUCTION AND MATERIAL SPECIFICATIONS DATED JANUARY 1, 1963, FOR THE MATERIALS USED AND FOR THE INSTALLATION OF ROADWAY LIGHTING, UNDERDECK LIGHTING AND A POLICE AND FIRE ALARM SYSTEM FOR THE WILLOW-CLARK INTERCHANGE.

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.

FOR THE ROADWAY LIGHTING, 400 WATT MERCURY LUMINAIRES ARE TO BE INSTALLED AS INDICATED ON THE DRAWINGS, AND ARE TO OPERATE FROM 480 VOLT SINGLE PHASE CIRCUITS AS SHOWN ON THE SCHEMATIC DIAGRAM.

S-25.05 WORKING PLANS. THE CONTRACTOR, BEFORE ORDERING ANY ELECTRICAL MATERIALS, SHALL SUBMIT TO THE DIRECTOR, FOR HIS APPROVAL, DETAIL PLANS, DRAWINGS, PHOTOGRAPHS, and SPECIFICATIONS OF ALL APPARATUS and EQUIPMENT HE PROPOSES TO FURNISH. ETC.

THE ELECTRICAL WORK SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF THE A.I.E.E. STANDARDS AND PRACTICES, I.E.S./A.S.A. STANDARDS, N.E.M.A. CODE, AND THE NATIONAL FIRE CODE, AND SHALL ALSO CONFORM TO ALL LOCAL AND SPECIAL LAWS AND/OR ORDINANCES. SHOULD THE PLANS AND DETAIL SPECIFICATIONS BE IN CONFLICT WITH THESE REQUIREMENTS, THROUGH ERROR OR OMISSION, THE CONTRACTOR SHALL CALL SUCH CONFLICT TO THE ATTENTION OF THE ENGINEER AND SHALL MAKE THE NECESSARY CORRECTIONS AS DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL CONSULT AND COOPERATE WITH THE CLEVELAND DIVISION OF LIGHT AND POWER AND THE CLEVELAND CITY POLICE AND FIRE DEPARTMENTS.

MATERIALS AND EQUIPMENT

ALL BOLTS, NUTS, STUDS, WASHERS, PINS, TERMINALS, SPRINGS, AND SIMILAR FASTENINGS AND FITTINGS SHALL BE, WHERE PRACTICABLE, OF AN APPROVED CORROSION-RESISTING MATERIAL SUCH AS BRASS OR BRONZE, OR OF A MATERIAL TREATED IN AN APPROVED MANNER TO RENDER IT ADEQUATELY RESISTANT TO CORROSION, HOT-DIP GALVANIZING WILL BE CONSIDERED SUCH APPROVED TREATMENT. ALL MATERIALS FURNISHED SHALL BE NEW, SHALL BE OF THE BEST QUALITY AND WORKMANSHIP, SHALL BE THE BEST STANDARD PRODUCT OF A MANUFACTURER REGULARLY ENGAGED IN THE PRODUCTION OF THIS TYPE OF EQUIPMENT AND SHALL BE OF THE MANUFACTURER'S LATEST APPROVED DESIGN.

LIGHT STANDARDS SHALL CONFORM TO THE SPECIFICATION GIVEN ON SHEETS 132, 133, AND 135, AND TO THE SPECIFICATIONS FOLLOWING.

LIGHT POLES SHALL BE ROUND TAPERED STEEL POLES, THE SHAFT SHALL BE FABRICATED FROM NOT LESS THAN #11 MANUFACTURERS STANDARD GAUGE, 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 ROUND TAPERED SHAFT, HAVING A TAPER OF APPROXIMATELY .14" PER FOOT. NO OTHER CROSS-SECTIONAL SHAPE SHALL BE PERMITTED.

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.

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.

USE	POLE SIZE	GA.	ELASTIC DEFL. RATE IN. PER 100 LB.	AT 2/3 YIELD STR. LOAD 18" DOWN LB.	AT 2/3 YIELD STR. TOTAL DEFL. IN.	AT 2/3 YIELD STR. PERM. SET IN.	AT YIELD STRENGTH LOAD 18" DOWN LB.	AT YIELD STRENGTH TOTAL DEFL. IN.	AT YIELD STRENGTH PERM. SET IN.
FREEWAY & RAMP	9.0" x 4.80" x 30'-0"	11	2.30	647	15.38	.50	971	25.06	2.73
STRUCTURE	9.0" x 5.08" x 28'-0"	11	1.77	696	12.82	.50	1045	20.85	2.35

IF THE ROUND 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 GAUGE (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 IN TABLE ABOVE. ALSO SUCH POLES SHALL BE SHOT BLASTED TO REMOVE MILL SCALE AND WELD SLAG PREPARATORY TO PAINTING.

ANCHOR BASES SHALL BE ONE-PIECE CAST STEEL CONFORMING TO ASTM DESIGNATION A27, GRADE 65-35, HAVING A MINIMUM YIELD OF 35,000 P.S.I., AND SCALLOPED 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 AT THE TOP OF THE BASE. THE TWO WELDS SHALL BE NOT LESS THAN 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 HOLE, 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 WITH GALVANIZING EXTENDING NO MORE THAN 2" BEYOND THREAD. THE ANCHOR BOLTS SHALL BE CAPABLE OF RESISTING AT YIELD STRENGTH STRESS THE BENDING MOMENT OF THE SHAFT AT ITS YIELD STRENGTH STRESS. ANCHOR BOLTS SHALL BE FABRICATED FROM STEEL, AISI C1035, HOT ROLLED SPECIAL QUALITY, MINIMUM YIELD STRENGTH 46,000 P.S.I. THIS SPECIFICATION IS IDENTICAL TO ASTM A107. GRADE 1035 SPECIAL QUALITY.

ANCHOR RODS FOR LAMP STANDARDS ON BRIDGES ARE TO BE AS DESCRIBED UNDER NOTE 4, SHEET 138.

EACH FREEWAY-TYPE STANDARD SHALL HAVE A BRACKET ARM MADE OF STANDARD PIPE OF THE SIZE AND LENGTH SHOWN ON SHEET NO. 132. THE INNER END OF THE BRACKET ARM SHALL BE WELDED TO A PRESSED STEEL MAST ARM PLATE HAVING A RAISED SURFACE EXCEEDING 1/2 INCH IN HEIGHT ON EITHER SIDE, GIVING A SCALLOPED WELD LINE SO THAT THE WELD DOES NOT LIE IN ONE (1) CIRCUMFERENTIAL PLANE. THE POLE PLATE AND ARM PLATE SHALL BE SUCH THAT THEY ARE INTER-CHANGEABLE WITH EXISTING CITY OF CLEVELAND DESIGNS PREVIOUSLY INSTALLED. THIS MAST ARM CONSTRUCTION IS SHOWN ON CITY OF CLEVELAND, DIVISION OF LIGHT AND POWER DRAWING NO. 5028.

EACH RAMP-TYPE AND STRUCTURE-TYPE STANDARD SHALL HAVE A BRACKET ARM MADE OF STANDARD PIPE OF THE SIZE AND LENGTH SHOWN ON SHEETS NO. 133 AND 135, RESPECTIVELY. THE INNER END OF THE BRACKET ARM SHALL BE WELDED TO A TUBULAR HEAD, AS SHOWN, SO A BLOCK CAN BE BOLTED THROUGH THE HEAD-PIECE TO A PLATE WELDED TO THE TOP OF THE POLE TO PERMIT RADIAL ADJUSTMENT OF THE BRACKET ARM.

IN EACH OF THE ABOVE TYPES OF STANDARD, PROVISION SHALL BE MADE TO PERMIT PASSAGE OF CONCEALED WIRES TO THE BRACKET ARM, AND THE OUTER END OF THE BRACKET ARM SHALL END IN 2" STANDARD PIPE SLIPFITTER, AS SHOWN ON THE DRAWINGS.

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.

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 5% 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.

THE TOP ELEVATION OF POLE FOUNDATIONS SHALL BE SET TO PROVIDE THE SPECIFIED MOUNTING HEIGHT OF LUMINAIRES ABOVE TOP OF PAVEMENT.

CONCRETE FOR POLE BASE FOUNDATIONS, DUCT LINES AND PULL BOXES SHALL BE CLASS C CONCRETE USING #4 AGGREGATE UNLESS OTHERWISE SHOWN.

WIRING FOR LIGHT STANDARDS SHALL BE CARRIED OUT AS DESCRIBED UNDER "CONSTRUCTION METHODS."

A SET OF "U" SHAPED SHIMS OF PROPER DIMENSIONS TO FIT AROUND 1-1/4 INCH DIAMETER ANCHOR RODS SHALL BE FURNISHED WITH EACH POLE FOR USE IN THE PROPER ALIGNMENT OF THE POLE. THESE SHIMS SHALL BE GALVANIZED.

STANDARDS AND BRACKETS SHALL BE PAINTED WITH A FIRST AND SECOND SHOP COAT OF RED LEAD PAINT, AND TWO FIELD COATS OF GREEN ENAMEL, AS RECOMMENDED IN STANDARD SPECIFICATIONS, PARAGRAPH S-25.10, EXCEPT WHEN MOUNTED ON STRUCTURES.

STANDARDS AND BRACKETS USED ON STRUCTURES SHALL BE PAINTED WITH A FIRST AND SECOND SHOP COAT OF RED LEAD PAINT, AS NOTED ABOVE, BUT AFTER THE STANDARDS HAVE BEEN ERECTED, THE EXPOSED SURFACES SHALL BE GIVEN TWO COATS OF ALUMINUM PAINT INSTEAD OF THE GREEN ENAMEL RECOMMENDED IN S-25.10.

NON-METALLIC CONDUIT SHALL BE USED IN DUCT LINES, AND IN STRUCTURE CONCRETE. SUCH CONDUIT SHALL BE ASBESTOS CEMENT TYPE I PER FEDERAL SPECIFICATION WC-571-b, OR FIBER TYPE I PER FEDERAL SPECIFICATION WC-581-c. THE WALLS SHALL BE COMPACT AND INCAPABLE OF SEPARATION INTO LAYERS WHEN HEATED TO 212 DEGREES FAHRENHEIT. THE FINISHED CONDUIT SHALL NOT BE AFFECTED BY MOISTURE OR ACIDS PRESENT IN THE CONCRETE. THE INNER SURFACE OF THE CONDUIT SHALL BE FREE FROM DENTS OR OBSTRUCTIONS. THE HARRINGTON OR THE TAPERED SLEEVE TYPE OF JOINT, OR APPROVED EQUAL, SHALL BE USED. THE CONTACT SURFACES OF THE CONDUIT AND COUPLINGS SHALL BE ACCURATELY MACHINED TO INSURE TIGHT JOINTS.

METAL CONDUIT FOR UNDERDECK LIGHTS SHALL BE RIGID AND GALVANIZED. CONDUIT SHALL BE FURNISHED WITH TAPERED FITTINGS AS REQUIRED, AND WITH NECESSARY SUPPORTS AND FASTENERS.

ROADWAY LUMINAIRES SHALL BE EQUAL TO GENERAL ELECTRIC M-400, WESTINGHOUSE OV 25 (400 WATT) OR LINE MATERIAL UNISTYLE (400 WATT).

UNDERDECK LUMINAIRES SHALL BE 250 WATT MERCURY TYPE INTEGRAL BALLAST AND INSECT-PROOF GASKET, STAINLESS STEEL HINGES AND LATCHES, WEATHERPROOF CAST ALUMINUM HOUSING AND DOOR, ANODIZED ALUMINUM VISOR, ASYMMETRIC ALUMINUM REFLECTOR, ONE PIECE PRISMATIC HEAT AND SHOCK RESISTANT BOROSILICATE CRYSTAL GLASS REFRACTOR. INTEGRAL BALLASTS SHALL BE RATED 480 VOLTS WITH TWO UNDERVOLTAGE TAPS FOR 440 V. and 460 V. OPERATION, -20° F. STARTING. LUMINAIRES SHALL BE HOLOPHANE TYPE 588 OR APPROVED EQUAL.

CONSTRUCTION METHODS

THE INSTALLATION AS A WHOLE SHALL BE CARRIED OUT IN CONFORMANCE WITH THE REQUIREMENTS HEREIN STATED AND IMPLIED, AND UPON COMPLETION OF THE WORK SHALL PRESENT A NEAT AND WORKMANLIKE FINISHED APPEARANCE. SAFE CONSTRUCTION AND OPERATING PRACTICES MEETING THE REQUIREMENTS OF THE NATIONAL ELECTRIC SAFETY CODE SHALL BE MAINTAINED.

AFTER THE LUMINAIRES ARE ATTACHED, THE POLES SHALL BE SET AS NEARLY VERTICAL AS POSSIBLE, USING THE SHIMS AS REQUIRED.

ALL PARTS OF SUPERSTRUCTURE STEELWORK AND ALL COMPONENTS OF THE LIGHTING SYSTEMS ON STRUCTURES SHALL BE THOROUGHLY GROUNDED AT PIER SHAFTS. A 7-STRAND, NO. 0 BARE, SOFT-ANNEALED COPPER WIRE ELECTRICAL GROUND SHALL BE EMBEDDED IN THE OUTSIDE CONCRETE COLUMN AT ONE FIXED PIER* THE LOWER END OF THIS WIRE SHALL BE BRAZED TO THE STEEL SHELL OF ONE OF THE PILES, AND THE UPPER END SHALL EXTEND SUFFICIENTLY ABOVE THE TOP OF THE CONCRETE TO PROVIDE FOR A SUITABLE SPLICE TO THE SUPERSTRUCTURE CONNECTION. THIS CONNECTION SHALL BE A NO. 0 BARE, STRANDED, TINNED COPPER WIRE BRAZED OR BOLTED TO A BEAM OR GIRDER FLANGE.

POWER-LINE CONNECTIONS FOR ALL LAMPS SHALL BE AS SHOWN ON SHEET 133, THIS SHEET ALSO SHOWS THE METHOD OF GROUNDING OF ROADWAY LAMPS. FOR LAMPS ON STRUCTURES, THE METHOD IS SIMILAR, EXCEPT THAT THE LOWER END OF THE GROUND CONNECTION SHALL BE BRAZED OR EXOTHERMICALLY WELDED TO THE SUPERSTRUCTURE STEEL, AS SHOWN ON SHEET 135.

* OF EACH SUPERSTRUCTURE UNIT.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

ELECTRICAL NOTES
WILLOW-CLARK INTERCHANGE

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED

CONTR. No. 58019 SHEET ACCT. No. 5039

ELECTRICAL NOTES

FED. RD. DIVISION	STATE	PROJECT	
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CUYAHOGA COUNTY
CUY— 21—14.12

PAYMENT FOR ELECTRICAL EQUIPMENT-S25

PAYMENT FOR THE ROADWAY AND UNDERDECK LIGHTING SHALL BE MADE AT THE CONTRACT UNIT PRICE BID FOR ITEMS AS INDICATED IN THE SUMMARY OF QUANTITIES, WHICH PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR FURNISHING ALL MATERIALS, LABOR, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY, WHETHER SPECIFICALLY MENTIONED OR NOT, TO COMPLETE THE ENTIRE WORK, INSTALLED AND IN OPERATING CONDITION, ACCORDING TO THE PLANS AND SPECIFICATIONS. PAYMENT WILL BE MADE AS FOLLOWS:

A. TYPE "A" DUCT (AS SHOWN IN THE APPROPRIATE FIGURE ON DRAWING 132 PER LINEAL FOOT, SHALL INCLUDE NECESSARY FIBER OR TRANSITE CONDUIT, CONCRETE AND FORMWORK, END BELLS, NO. 9 A.W.G. GALVANIZED IRON PULL WIRE, AND SHALL ALSO INCLUDE THE PLUGGING AND CONDITIONING OF DUCTS AND SEALING AROUND DUCTS WHERE THEY ENTER MANHOLES OR PULLBOXES. ITEM "A" INCLUDES LIGHTING FEED DUCT TO ALARM CALL-BOXES SHOWN ON SHEET 134.

B. TYPE "B" DUCT, PER LINEAL FOOT, SHALL INCLUDE THE NECESSARY COMPONENTS AND WORK AS DESCRIBED UNDER "A", BUT IN QUANTITIES REQUIRED FOR TYPE "B" DUCT AS SHOWN IN THE APPROPRIATE FIGURE ON DRAWING 132.

E. TYPE "E" DUCT, PER LINEAL FOOT, SHALL INCLUDE THE NECESSARY COMPONENTS AND WORK AS DESCRIBED UNDER "A", BUT IN QUANTITIES AND SIZES REQUIRED FOR TYPE "E" DUCT AS SHOWN IN THE APPROPRIATE FIGURE ON DRAWING 132.

F. FREEWAY-TYPE STANDARD, SINGLE ARM, SHALL INCLUDE 30 FOOT POLE, BRACKET ATTACHMENTS, 17 FOOT STEEL BRACKET ARM WITH TWO 1/2 INCH GUY RODS, NECESSARY SINGLE-CONDUCTOR NO. 12 AWG 600 VOLT POLE AND BRACKET CABLE, ALL CONNECTIONS AND SPLICING, FUSING, BOLTS, NUTS, WASHERS, AND ALL MODIFICATIONS SHOWN ON THE PLANS, INCLUDING GROUNDING.

H. RAMP-TYPE STANDARD SHALL INCLUDE A 30 FOOT POLE, BRACKET ATTACHMENTS, 10 FOOT STEEL BRACKET ARM ARRANGED FOR 2" SLIP-FIT LUMINAIRE, NECESSARY SINGLE-CONDUCTOR NO. 12 AWG 600 VOLT POLE AND BRACKET CABLE, ALL CONNECTIONS AND SPLICING, FUSING, BOLTS, NUTS, WASHERS, AND ALL MODIFICATIONS SHOWN ON THE PLANS, INCLUDING GROUNDING.

I. STRUCTURE-TYPE STANDARD SHALL BE THE SAME AS ITEM H, EXCEPT THAT A 28 FOOT POLE SHALL BE USED.

L. POLE BASE FOUNDATION, 5 FT., SHALL INCLUDE EXCAVATION, FORMWORK, CONCRETE, REINFORCING STEEL, 90 DEGREE CONDUIT BEND, ANCHOR RODS, NUTS, SHIMS AND WASHERS, AND PLACING OF CONDUIT THROUGH BASE TO PULL BOX FOR WIRING, BACK-FILLING, TAMPING, AND REMOVAL OF WASTE.

M. POLE BASE FOUNDATION, 8 FT., SHALL INCLUDE THE SAME COMPONENTS AS IN ITEM "L" ABOVE, BUT IN AMOUNTS NECESSARY FOR THE LARGER BASE.

N. LUMINAIRE, MERCURY, 400 WATT, SHALL CONSIST OF 2 INCH SLIPFITTER, REFLECTING-HOUSING ASSEMBLY, HINGED REFRACTOR, COMPLETE WITH INTERNAL BALLAST, AND ARRANGED FOR EITHER TYPE III OR TYPE IV I.E.S./A.M.A. LIGHT DISTRIBUTION, AS CALLED FOR ON THE PLANS. 11,400 LUMEN LAMP A.S.A. CODE H37-5KC/W, ARE TO BE INCLUDED. THE BALLAST SHALL BE HIGH-POWER-FACTOR, REGULATOR TYPE, RATED AT 460 PRIMARY VOLTS, PROVIDING PROPER LAMP OPERATION WITHIN ±13% OF RATED PRIMARY VOLTAGE, AND STARTING AT -20 DEGREE FAHRENHEIT. (N_1 = A.S.A. TYPE IV N_2 = A.S.A. TYPE III).

R-1 UNDERDECK LIGHTING, COMPLETE, FOR THE FOURTH LEVEL OF THE WILLOW-CLARK OVERPASS, SHALL CONSIST OF MERCURY LUMINAIRES, PULLBOXES, SAFETY SWITCHES, BREAKERS, AND POWER SERVICE, AS SHOWN AND SPECIFIED ON THE DETAIL DRAWING, SHEET 136. INCLUDED SHALL BE ALL MOUNTINGS, CONDUIT, INTERCONNECTING WIRING, TERMINALS, SPLICES, ADAPTORS, LOCKNUTS, BUSHINGS, BOLTS, NUTS, WASHERS AND SPACERS NECESSARY TO COMPLETE THE JOB. BOXES SHALL BE PROVIDED WITH NECESSARY CONDUIT ENTRANCE HOLES AND BOSSES. ALL FIXTURES AND BOXES SHALL BE GROUNDED TO THE STRUCTURE, AND THE STRUCTURE SHALL BE GROUNDED AS SPECIFIED UNDER "METHODS OF CONSTRUCTION," SHEET 137.

R-2 UNDERDECK LIGHTING, COMPLETE, FOR THE THIRD LEVEL OF THE WILLOW-CLARK OVERPASS, SHALL CARRY THE SAME SPECIFICATIONS AS ITEM R-1 ABOVE.

R-3 UNDERDECK LIGHTING, COMPLETE, FOR THE SECOND LEVEL OF THE WILLOW-CLARK OVERPASS, SHALL CARRY THE SAME SPECIFICATIONS AS ITEM R-1 ABOVE.

W. BOX 24" x 10" x 10", CAST IRON, WATERTIGHT. BOX TO BE FURNISHED WITH NECESSARY CONDUIT ENTRIES AND BOSSES, 1-1/2" COPPER TUBE DRAIN, AND WITH 2" GALVANIZED CONDUIT RUN TO BASE OF LAMP STANDARD, AS SHOWN ON DRAWING NO. 135.

X. SINGLE PULL BOX SHALL INCLUDE EXCAVATION, FORMWORK, CONCRETE, REINFORCING STEEL, CONDUIT STUBS THROUGH WALLS, BACKFILLING, TAMPING AND REMOVAL OF WASTE, AS REQUIRED ON PLANS.

Y. DOUBLE PULL BOX SHALL INCLUDE EXCAVATION, FORMWORK, CONCRETE, REINFORCING STEEL, CONDUIT STUBS THROUGH WALLS, BACKFILLING, TAMPING AND REMOVAL OF WASTE, AS REQUIRED ON PLANS.

AD. EMERGENCY ALARM STATION SHALL INCLUDE FURNISHING AND MOUNTING PEDESTAL AND CALL-BOX ASSEMBLY AS SHOWN ON SHEET 134.

AE. TYPE "A" DUCT FOR ALARM CIRCUIT SHALL CARRY THE SAME SPECIFICATIONS AS TYPE "A" DUCT IN ITEM "A" ABOVE.

AF. NON-METALLIC CONDUIT, 2", FOR BRIDGE LIGHTING CIRCUITS, SHALL INCLUDE THE FURNISHING AND PLACING OF SUCH CONDUIT, WITH THE NECESSARY COUPLINGS, BENDS, EXPANSION COUPLINGS AND SPECIAL FITTINGS MENTIONED IN THE PLANS. THIS ITEM SHALL INCLUDE ALL ENTRIES INTO PULL BOXES EXCEPT THOSE SPECIFIED UNDER ITEM "W".

AG. WIRE, NO. 4 GAUGE, 600 VOLT, PER LINEAL FOOT, SHALL INCLUDE ONE SINGLE CONDUCTOR CABLE TO BE PLACED IN DUCTS AND PULL BOXES AS REQUIRED, WITH NECESSARY SPLICING, TERMINALS, CONNECTIONS AND TESTING. MEASUREMENT FOR CABLE SHALL BE THE LENGTH OF EACH SINGLE RUN OF CABLE TIMES THE NUMBER OF CABLES IN EACH CONDUIT. SEE NOTE 2.

AH. WIRE, NO. 6 GAUGE, 600 VOLT, PER LINEAR FOOT, EXCEPT FOR SIZE, SHALL CARRY THE SAME SPECIFICATIONS AS ITEM "AG". SEE NOTES 2 AND 3.

AK. STONE UNDERDRAIN NO. 2 (ITEM 1-9), PER LINEAL FOOT, SHALL INCLUDE EXCAVATING THE TRENCH, BACKFILLING, DISPOSAL OF SURPLUS EXCAVATION AND DISCARDED MATERIAL, FURNISHING AND PLACING OF ALL MATERIAL, AND ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THIS ITEM. THE NUMBER OF LINEAL FEET SHOWN ON THE SUMMARY INCLUDES ONE EXTRA LINEAL FOOT FOR EACH PULL BOX SO DRAINED TO PROVIDE A PRACTICALLY COMPLETE DRAINAGE FLOOR FOR THE PULL BOX.

AL. FOUNDATION FOR CALL-BOX SHALL CARRY THE SAME SPECIFICATIONS AS ITEM "L", EXCEPT THAT THE NECESSARY CONDUIT SHALL BE CAST INTO THE CONCRETE TO CONNECT WITH THE ALARM CIRCUIT PULL BOX AND WITH THE LIGHTING CIRCUITS. SEE DETAILS ON SHEET 134.

AM. WIRE, ALARM CIRCUITS, PER LINEAR FOOT, SHALL INCLUDE ONE MULTI-CONDUCTOR CABLE TO BE PLACED IN CONDUIT AND PULL BOXES AS REQUIRED, NO CONNECTIONS OR SPLICING WILL BE MADE BY THE CONTRACTOR, BUT THE CABLE RUNS SHOULD HAVE SUFFICIENT EXTRA LENGTH TO ASSURE EASE OF SPLICING OF TYPE "AN" SERVICE CABLE AT PULL BOXES, AND TO THE EXISTING SYSTEM. CABLE TO BE 25 PAIR, 19 GAUGE, P.I.C. INSULATED PLASTIC WIRE AND CABLE COMPANY TYPE 200, NO. 627-925 OR WESTERN ELECTRIC TYPE BHBA, OR APPROVED EQUAL. SEE NOTE 1.

AN. SERVICE CABLE FOR CONNECTION FROM ALARM PULL BOX TO CALL-BOX. NO. 20 GAUGE, 2 PAIR, ANNEALED COPPER-COVERED STEEL PLASTIC UNDERGROUND SERVICE WIRE. USE ALPHADUCT WIRE AND CABLE COMPANY. NO. VA-204-TSCW, TO MATCH EXISTING INSTALLATIONS. SEE NOTE 1.

AX. SINGLE PULL BOX FOR ALARM SYSTEM SHALL CARRY THE SAME SPECIFICATIONS AS ITEM "X", WITH PROPER CONDUIT ENTRIES.

AY. DOUBLE PULL BOX FOR ALARM SYSTEM SHALL CARRY THE SAME SPECIFICATION AS ITEM "Y" WITH PROPER CONDUIT ENTRIES.

BE. TYPE "B" DUCT FOR ALARM SYSTEM, SHALL CARRY THE SAME SPECIFICATIONS AS TYPE "B" DUCT.

BF. NON-METALLIC 2" CONDUIT, FOR ALARM SYSTEM IN BRIDGE. SHALL INCLUDE FURNISHING AND PLACING OF SUCH CONDUIT, WITH NECESSARY COUPLINGS, BENDS, EXPANSION COUPLINGS AND SPECIAL FITTINGS MENTIONED IN THE PLANS. SEE SHEET 135.

NOTE 1 ITEMS "AM" AND "AN" ARE TO INCLUDE ADDITIONAL QUANTITIES TO COMPLETE THE ALARM SYSTEM FOR PARTS I AND II OF THE WILLOW FREEWAY, SO THAT WHEN THE PRESENT CONTRACT IS COMPLETED THE ALARM CABLE WILL BE CONTINUOUS FROM STA. 51 + 52 TO STA. 129 + 78. SEE SHEET 129.

NOTE 2 ALL NO. 4, 6, 8, & 12 600 VOLT WIRE SHALL BE FAA SPEC. L-824, TYPE A (SEVEN STRAND).

NOTE 3 ITEM "AH" SHOULD INCLUDE AN ADDITIONAL QUANTITY TO EXTEND THE CIRCUITS FROM STA. 87 + 00 WILLOW, ON BOTH SIDES, TO THE ALARM STATIONS IN THE "NOSES" OF RAMPS EN AND NW ON THE KINGSBURY VIADUCT. THIS IS INDICATED IN SCHEMATIC, SHEET 131, AND INCLUDED IN THE QUANTITY TABLE, SHEET 129.

NOTE 4 ANCHOR RODS FOR LAMP STANDARDS ON BRIDGES SHALL BE "U" BOLTS, TWO FOR EACH STANDARD. THESE RODS SHALL BE MADE FROM STEEL, AISI-C 1035, HOT ROLLED SPECIAL QUALITY; MINIMUM YIELD STRENGTH 46,000 P.S.I. (THIS SPECIFICATION IS IDENTICAL TO ASTM A107, GRADE 1035 SPECIAL QUALITY). ANCHOR RODS SHALL BE CAPABLE OF RESISTING AT YIELD STRENGTH STRESS THE BENDING MOMENT OF THE SHAFT AT ITS YIELD STRENGTH STRESS. ANCHOR RODS SHALL BE THREADED AT THE ENDS, AND THREADED ENDS AND ALL NUTS SHALL BE GALVANIZED, WITH THE GALVANIZING EXTENDING NO MORE THAN 2 INCHES BEYOND THE THREAD. FOUR HEX NUTS SHALL BE FURNISHED FOR EACH SET OF TWO RODS. DIMENSIONS FOR THESE RODS ARE ON SHEETS 146 AND 167.

AT. GLARE SHIELDS SHALL BE INSTALLED AT LOCATIONS SHOWN ON THE PLANS AND SHALL BE ALUMINUM, ONE PIECE DESIGN OF THE SAME MANUFACTURE AS THE LUMINAIRE AND SHALL REDUCE OVERALL LUMINAIRE OUTPUT BY NOT MORE THAN TWO PER CENT.

CONT. No. 58019 SHEET No. 5040

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

ELECTRICAL NOTES
WILLOW-CLARK INTERCHANGE

SCALE	DATE					
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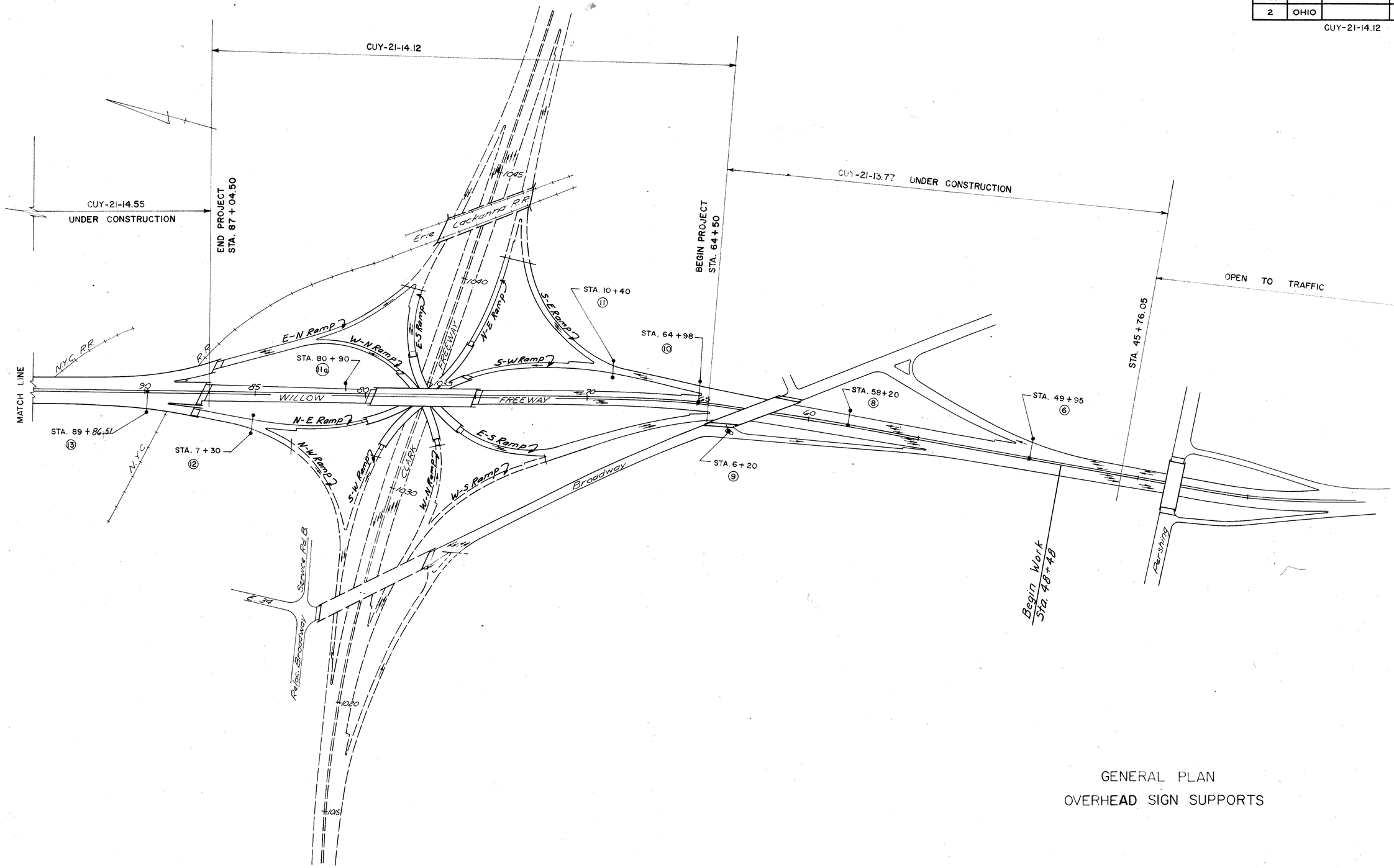

GENERAL PLAN
OVERHEAD SIGN SUPPORTS

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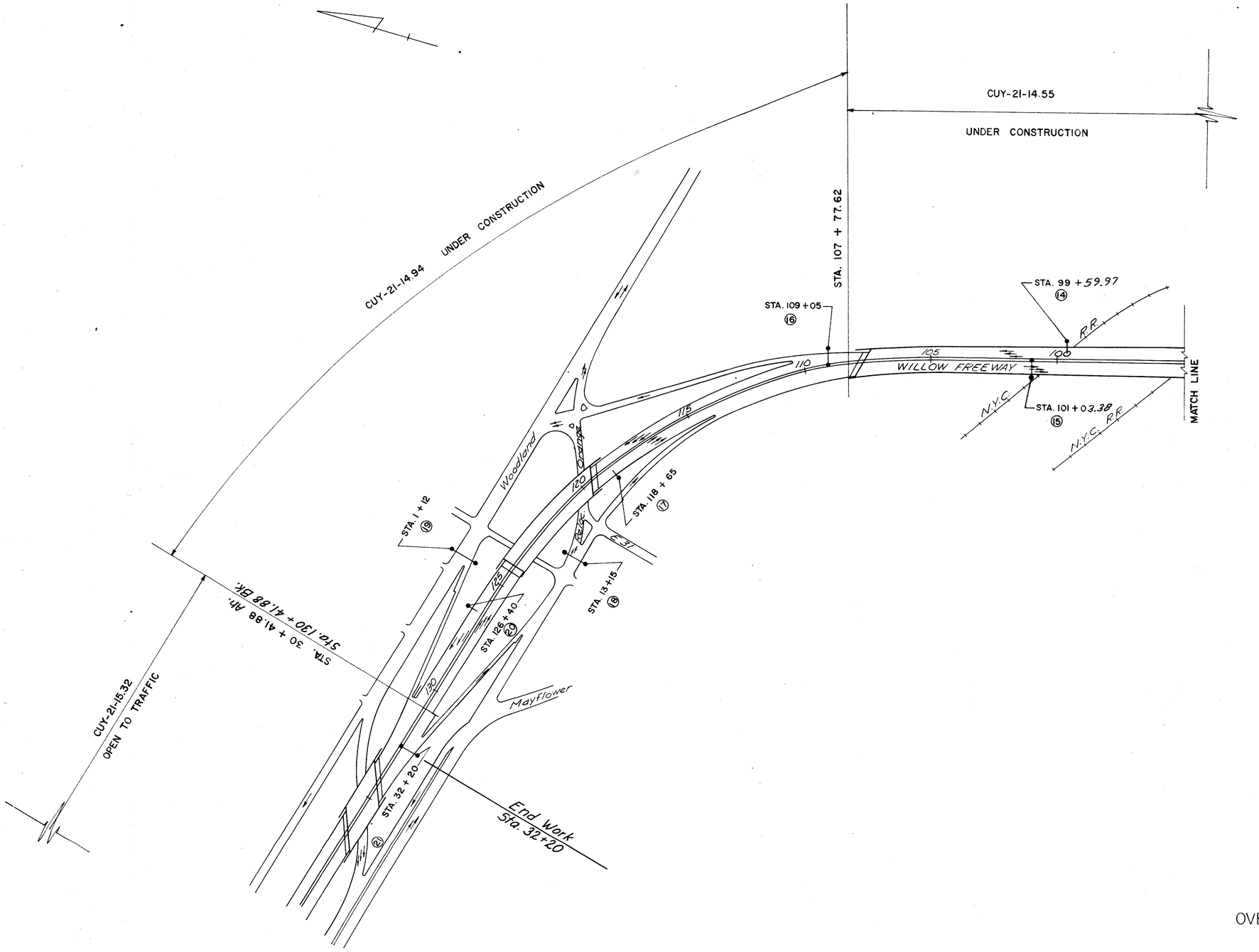

GENERAL PLAN
OVERHEAD SIGN SUPPORTS

FED. RD. DIVISION	STATE	PROJECT	
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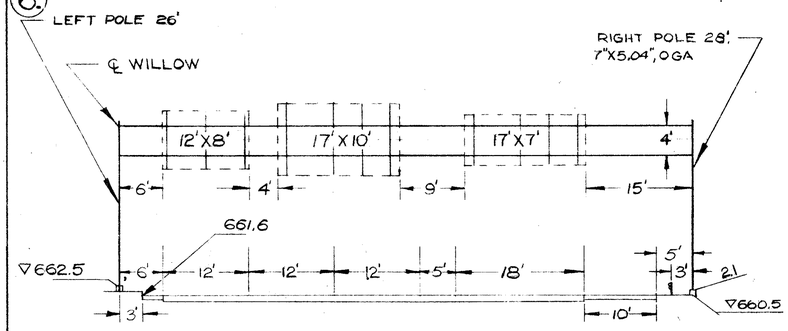
6.



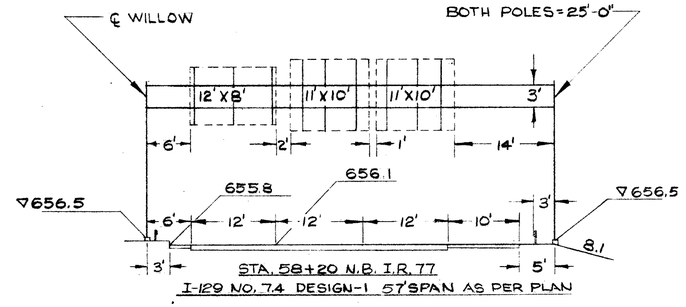
STA. 49+95 N.B. I.R.77
I-129 NO.7.5 DESIGN 2 80'SPAN AS PER PLAN

12'X8'=96"
SPACING — 6", 5'6", 5'6", 6"
NO. OF BR. 3
TYPE: Xa HEIGHT: 8'

17'X10'=170"
SPACING — 1'-3¾", 6'-2¼", 4'-1⅛", 4'-1⅛", 1'-3¾"
NO. OF BR. 4
TYPE: Ya HEIGHT: 10'

17'X7'=119"
SPACING — 1'-3¾", 6'-2¼", 4'-1⅛", 4'-1⅛", 1'-3¾"
NO. OF BR. 4
TYPE: Ya HEIGHT: 7'

8.



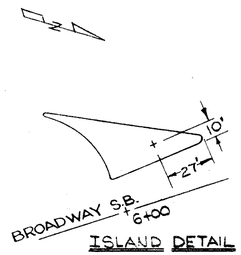
STA. 58+20 N.B. I.R.77
I-129 NO.7.4 DESIGN-1 57'SPAN AS PER PLAN

12'X8'=96"
SPACING: 6", 5'-6", 5'-6", 6"
NO. OF BR.—3
TYPE: Ya HEIGHT: 8'

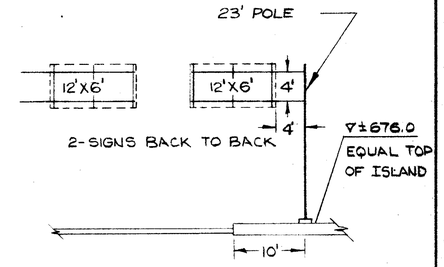
11'X10'=110"
SPACING: 1'-4⅞", 4'-1⅛", 4'-1⅛", 1'-4⅞"
NO. OF BR.—3
TYPE: Ya HEIGHT: 10'

11'X10'=110"
SPACING: 1'-4⅞", 4'-1⅛", 4'-1⅛", 1'-4⅞"
NO. OF BR.—3
TYPE: Ya HEIGHT: 10'

9.



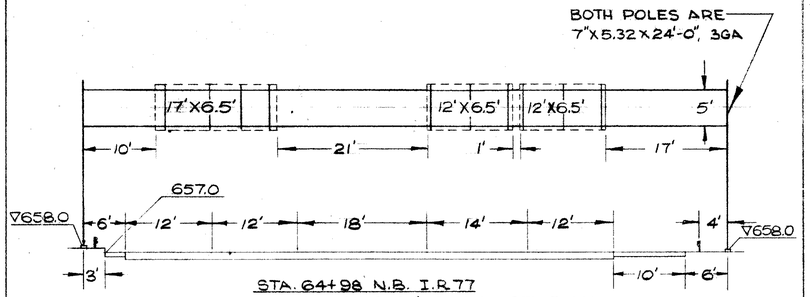
ISLAND DETAIL



STA. ±6+20 S.B. BROADWAY
I-129 NO.12.24 DESIGN-1 16'ARM LENGTH AS PER PLAN

12'X6'=72"
SPACING: 6", 5'-6", 5'-6", 6"
NO. OF BR.—3 NOTE: BACK TO BACK BRACKETS (SPECIAL)
TYPE: X HEIGHT: 6'

10.



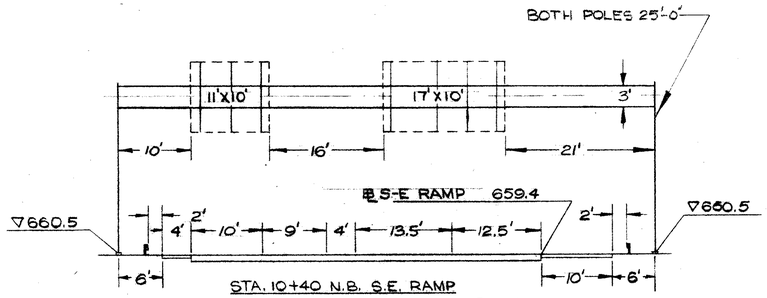
STA. 64+98 N.B. I.R.77
I-129 NO.7.4 DESIGN-3 90'SPAN AS PER PLAN

17'X6.5'=110"
SPACING: 1'-3¾", 6'-2¼", 4'-1⅛", 4'-1⅛", 1'-3¾"
NO. OF BR.—4
TYPE: Xa HEIGHT: 6.5'

12'X6.5'=78"
SPACING: 6', 5'-6", 5'-6", 6'
NO. OF BR.—3
TYPE: Xa HEIGHT: 6.5'

12'X6.5'=78"
SPACING: 6, 5'-6", 5'-6", 6'
NO. OF BR.-3
TYPE: Xa HEIGHT: 6.5'

11.

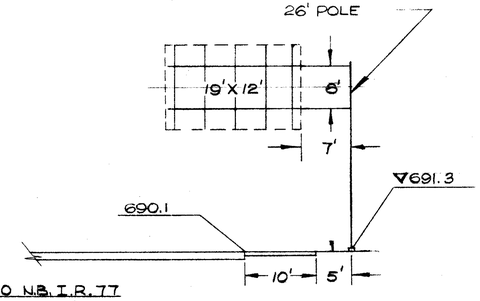


STA. 10+40 N.B. S.E. RAMP
I-129 NO.7.4 DESIGN-1 75'SPAN AS PER PLAN

11'X10'=110"
SPACING: 1'-4⅞", 4'-1⅛", 4'-1⅛", 1'-4⅞"
NO. OF BR.—3
TYPE: Xa HEIGHT: 10'

17'X10'=170"
SPACING: 1'-3¾", 6'-2¼", 4'-1⅛", 4'-1⅛", 1'-3¾"
NO. OF BR.—4
TYPE: Xa HEIGHT: 10'

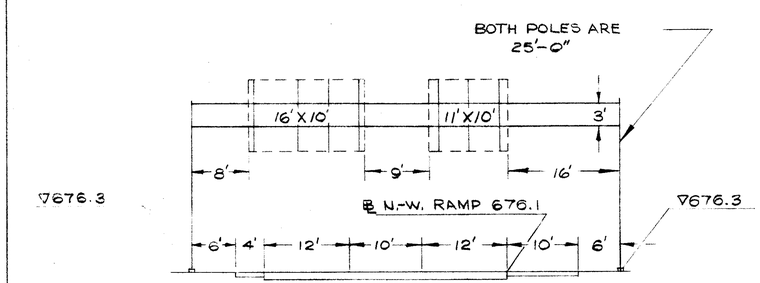
11a



STA. 80+90 N.B. I.R.77
I-129 NO. 12.24 DESIGN-8 26'ARM AS PER PLAN

19'X12'=228"
SPACING: 1'-3¾", 4'-1⅛", 4'-1⅛", 4'-1⅛", 4'-1⅛", 1'-3¾"
NO. OF BR.— 5
TYPE: Y HEIGHT: 12'

12.

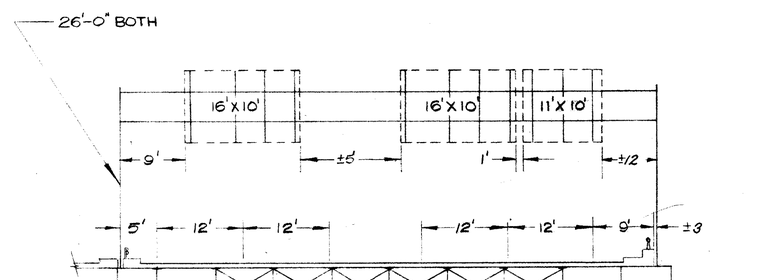


STA. 7+30 S.B. N-W. RAMP
I-129 NO.7.3 DESIGN-2 60'SPAN AS PER PLAN

6'X10'=160"
SPACING: 9¾", 6'-2¼", 4'-1⅛", 4'-1⅛"-9¾"
NO. OF BR — 4
TYPE: Ya HEIGHT: 10'

11'X10'=110"
SPACING: 1'-4⅞", 4'-1⅛", 4'-1⅛", 1'-4⅞"
NO. OF BR.—3
TYPE: Ya HEIGHT: 10'

13.



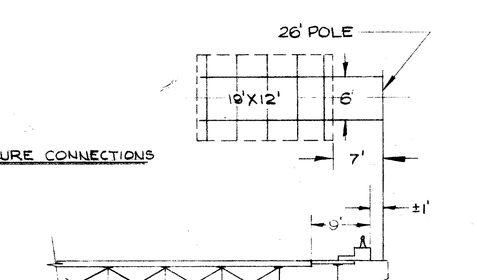
STA 89+86.51 S.B. I.R.77
I-129 NO.7.5 DESIGN-1 70' SPAN AS PER PLAN

2@16'X10'=160"
SPACING: 9¾", 6'-2¼", 4'-1⅛", 4'-1⅛", 9¾"
NO. OF BR.—4
TYPE: Ya HEIGHT: 10'

11'X10'=110"
SPACING: 1'X4⅞", 4'-1⅛", 4'-1⅛", 1'X4⅞"
NO. OF BR.—3
TYPE: Ya HEIGHT: 10'

ANCHOR BOLTS & STRUCTURE CONNECTIONS BY OTHERS

14.



ANCHOR BOLTS & STRUCTURE CONNECTIONS BY OTHERS.

±STA 99+59.97 I.R.77
I-129 NO.12.24 DESIGN-8 26'ARMS AS PER PLAN

19'X12'=228"
SPACING: 1'-3¾", 4'-1⅛", 4'-1⅛", 4'-1⅛", 4'-1⅛", 1'-3¾"
NO. OF BR.— 5
TYPE: Y HEIGHT: 12'

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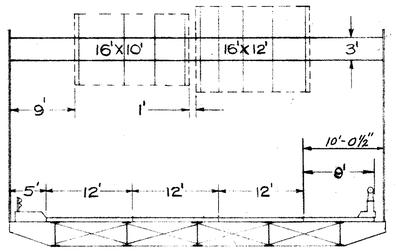


± STA. 101+03.38 S.B. I.R. 77

I-129 NO. 7.4 DESIGN-1 51'-0½" SPAN AS PER PLAN

16'X10'=160°°

SPACING: 9¾", 6'-1¼", 4'-1¼", 4'-1¼", 9¾"

NO. OF BR.=4

TYPE: Ya HEIGHT: 10'

16'X12'=192°°

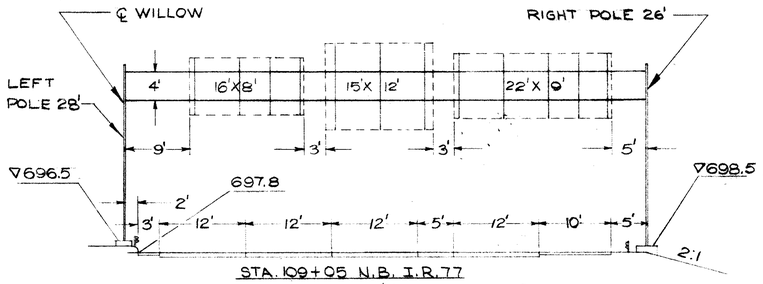
SPACING: 9¾", 6'-1¼", 4'-1¼", 4'-1¼", 9¾"

NO. OF BR.=4

TYPE: Ya HEIGHT: 12'

ANCHOR BOLT AND STRUCTURE CONNECTION BY OTHERS

16.



STA. 109+05 N.B. I.R. 77

I-129 NO. 7.5 DESIGN-2 73' SPAN AS PER PLAN

16'X8'=128°°

SPACING: 9¾", 6'-2¼", 4'-1⅛", 4'-1⅛", 9¾"

NO. OF BR.=4

TYPE: Xa HEIGHT: 8'

15'X12'=180°°

SPACING: 1'-3¾", 6'-2¼", 6'-2¼", 1'-3¾"

NO. OF BR.=3

TYPE: Ya HEIGHT: 12'

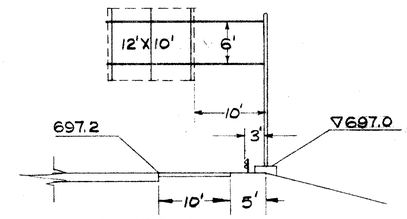
22'X9'=198°°

SPACING: 8⅝", 6'-2¼", 6'-2¼", 4'-1⅛", 4'-1⅛", 8⅝"

NO. OF BR.=5

TYPE: Ya HEIGHT: 9'

17.



STA. 118+65 S.B. I.R. 77

I-129 NO. 12.24 DESIGN-5 22' ARM AS PER PLAN

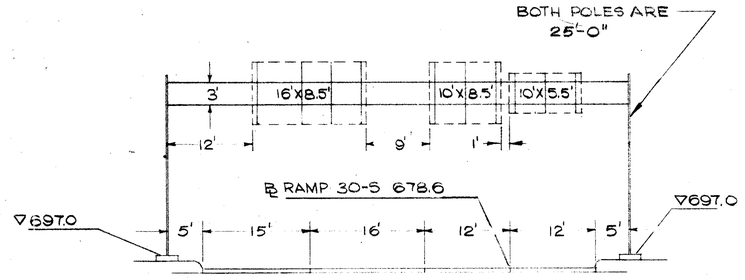
12'X10'=120°°

SPACING: 6", 5'-6", 5'-6", 6"

NO. OF BR.=3

TYPE: Y HEIGHT: 10'

18.



STA. 13+15 ℄ RAMP 30-S

I-129 NO. 7.4 DESIGN-1 65' SPAN AS PER PLAN

16'X8.5'=136°°

SPACING: 9¾", 6'-2¼", 4'-1⅛", 4'-1⅛", 9¾"

NO. OF BR.=4

TYPE: Ya HEIGHT: 8.5

10'X8.5'=85°°

SPACING: 10⅞", 4'-1⅛", 4'-1⅛", 10⅞"

NO. OF BR.=3

TYPE: Ya HEIGHT: 8.5'

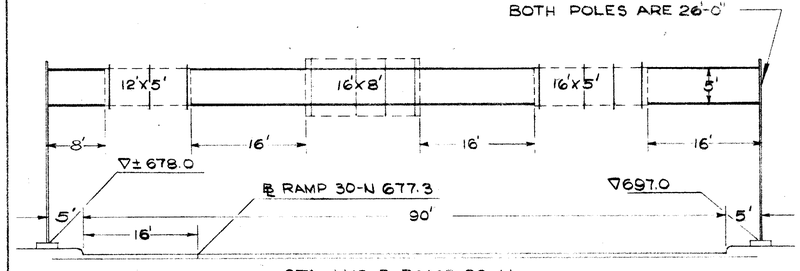
10'X5.5'=55°°

SPACING: 10⅞", 4'-1⅛", 4'-1⅛", 10⅞"

NO. OF BR.=3

TYPE: Ya HEIGHT: 5.5'

19.



STA. 1+12 ℄ RAMP 30-N

I-129 NO. 7.5 DESIGN-4 100' SPAN AS PER PLAN

12'X5'=60°°

SPACING: 6", 5'-6", 5'-6", 6"

NO. OF BR.=3

TYPE: Xa HEIGHT: 8'*

16'X8'=128°°

SPACING: 9¾", 6'-2¼", 4'-1⅛", 4'-1⅛", 9¾"

NO. OF BR.=4

TYPE: Xa HEIGHT: 8'

16'X5'=80°°

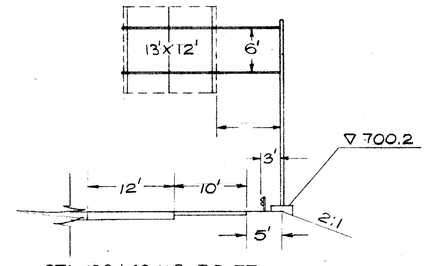
SPACING: 9¾", 6'-1¼", 4'-1¼", 4'-1¼", 9¾"

NO. OF BR.=4

TYPE: Xa HEIGHT: 6'*

*MINIMUM SIGN BRACKET HEIGHT WITH A 5' TRUSS IS 6'-0"

20.



STA. 126+40 N.B. I.R. 77

I-129 NO. 12.24 DESIGN-6 22' ARMS AS PER PLAN

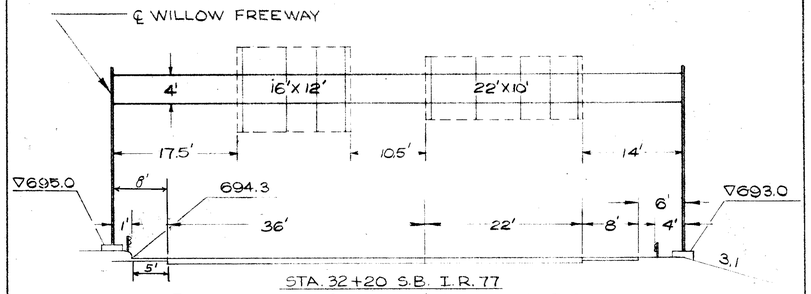
13'X12'=156°°

SPACING: 6", 6', 6", 6"

NO. OF BR.=3

TYPE: Y HEIGHT: 12'

21.



STA. 32+20 S.B. I.R. 77

I-129 NO. 7.5 DESIGN-2 80' SPAN AS PER PLAN

16'X12'=192°°

SPACING: 9¾", 6'-2¼", 4'-1⅛", 4'-1⅛", 9¾"

NO. OF BR.=4

TYPE: Ya HEIGHT: 12'

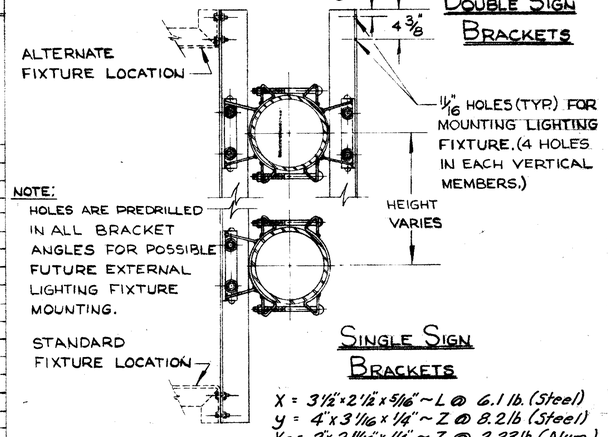
22'X10'=220°°

SPACING: 8⅞", 6'-2¼", 6'-2¼", 4'-1⅛", 4'-1⅛", 8⅞"

NO. OF BR.=4

TYPE: Ya HEIGHT: 10'

REFERENCE NO.	S-25 Sign Switch and 2" Enclosure EA.	S-25 GROUND WIRE & WIRE CONNECTION EA.	I-129 7.3 DES. 2 60' SPAN	I-129 7.4 DES. 1 57' SPAN	I-129 7.4 DES. 1 75' SPAN	I-129 7.4 DES. 1 51'-0½" SPAN	I-129 7.4 DES.3 85' SPAN	I-129 7.5 DES. 1 90' SPAN	I-129 7.5 DES. 2 73' SPAN	I-129 7.5 DES. 2 80' SPAN	I-129 7.5 DES. 4 100' SPAN	I-129 12.24 DES. 1 16' ARM	I-129 12.24 DES. 5 22' ARM	I-129 12.24 DES. 6 22' ARM	I-129 12.24 DES. 8 26' ARM	I-15 CONCRETE FOR SIGN SUPPORT FOUNDATION CU. YDS.	I-15 GUARD RAIL STD. TYPE DELP AS PER PLAN LIN. FT.	S-25 Sign Switch and 4" Enclosure EA.	See Sheet No.
6.	1	1								1						9.6	50'		
8.	1	1		1												9.3	50'		
9.	1	1										1				3.0		1	
10.	1	1					1									9.6	50'		16&28
11.	1	1		1												9.3	100'		22&29
11a.	1	1													1	4.6		1	17
12.	1	1	1													8.5	100'		21&33
13	1	1						1											
14.	1	1													1	-		1	
15.	1	1			1														
16.	1	1							1							9.6			
17.	1	1											1			4.1		1	
18.	1	1				1										9.3			
19.	1	1									1					9.3			
20.	1	1												1		4.1		1	
21.	1	1							1							9.6			
TOTAL	11	16	1	4		1		1	3		1	1	1	1	2	99.9	350'	5	



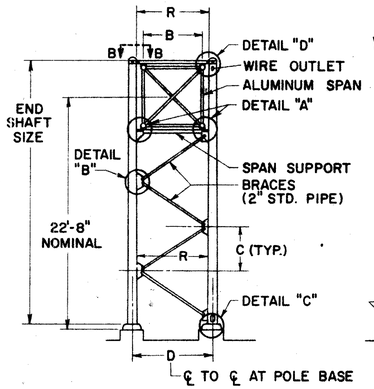
9-24-63

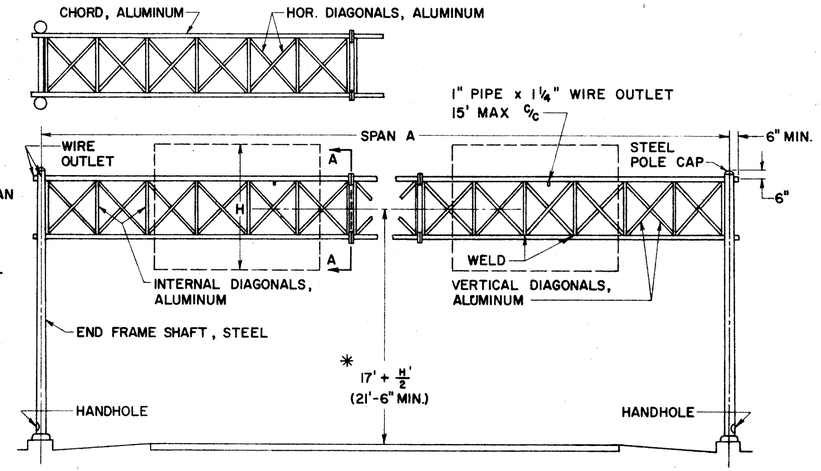
Mega-Flex Tracing.

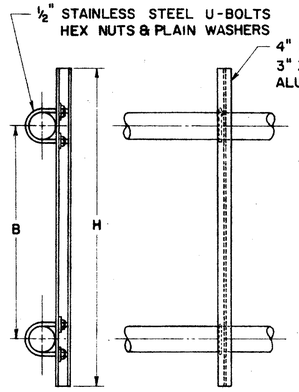
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUY-2[-14.12

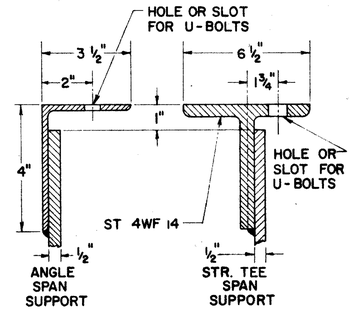
138E 198



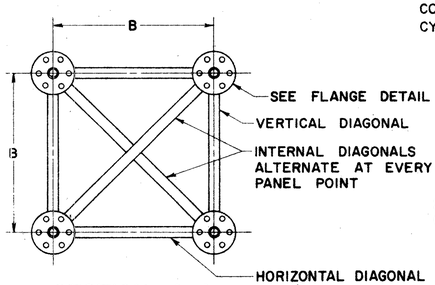




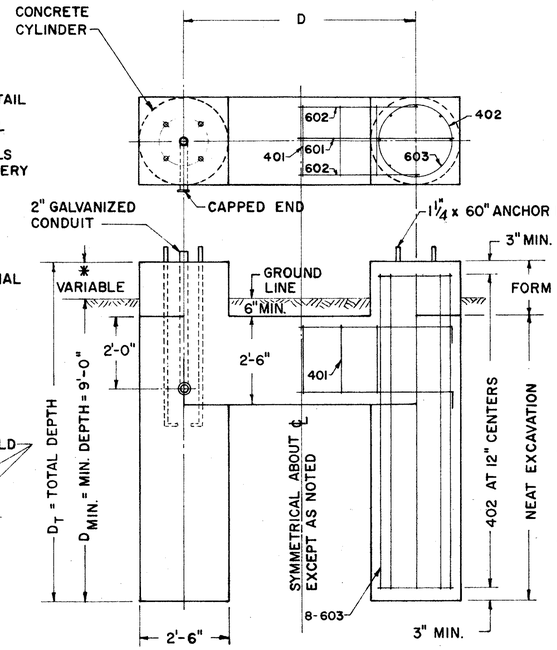
SIGN ATTACHMENT



SECTION D-D



SECTION A-A

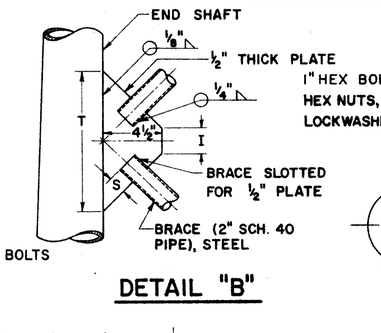


FOUNDATION DETAIL

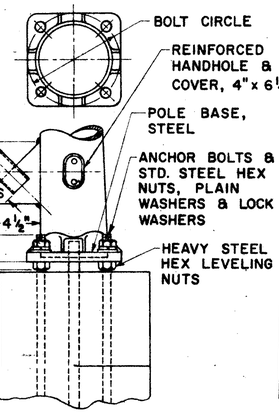
(RIGHT HAND SHOWN - LEFT HAND OPPOSITE)

CAST FLANGE, B-26 ALLOY SG 70A-T7 (356-T7)

FLANGE DETAIL

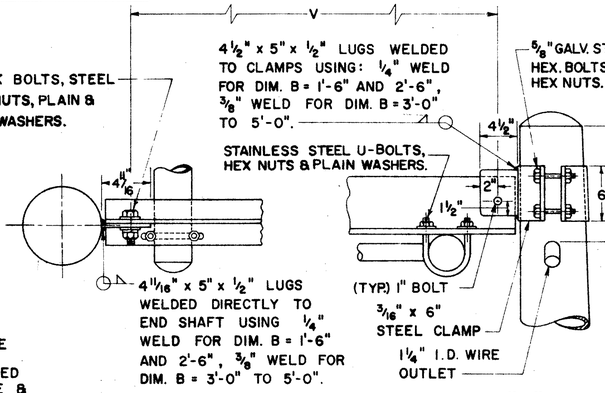


DETAIL "B"



DETAIL "C"

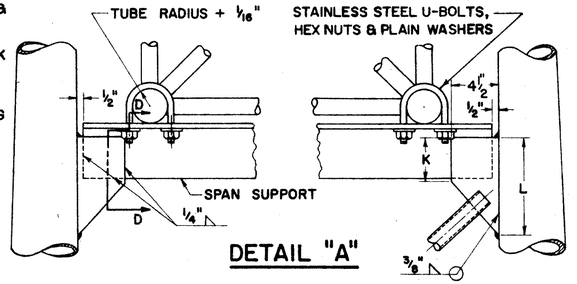
POLE BASE DETAIL



VIEW B-B

DETAIL "D"

UPPER SPAN SUPPORT (ALTERNATE METHODS)



DETAIL "A"

LOWER SPAN SUPPORT

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

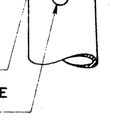
ELEVATION OF TOPS OF FOUNDATIONS SHALL BE BUILT UP SO THAT 17' CLEARANCE IS MAINTAINED OVER THE ENTIRE WIDTH OF THE PAVEMENT AND SHOULDERS.

DESIGN

THE DESIGN OF OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.

DESIGN NO.	SPAN A	B	C	D	E	END SHAFT	BRACE LENGTH	F	G	I	K	L	P	Q	R	S	T	U BOLTS	V	BOLT CIRCLE	SPAN SUPPORT SECTION D-D	CHORDS	HORIZONTAL AND INTERNAL DIAGONAL	VERTICAL DIAGONAL
1	50'Thru 55'	3'-0"	4'-11¾"	4'-5"	7"	8"x4.5"x25'-0"3GA	5'-10 13/16"	5½"	1¼"	3½"	4¾"	8"	12"	6⅝"	3'-9"	1½"	10"	⅝"	3'-3⅝"	11"	SPLIT TEE 3'-8"	3½" x .188"	1.660"x .140"	1.660"x .140"
2	60'Thru 80'	3'-0"	4'-11¾"	4'-5"	9¼"	8"x4.5"x25'-0"3GA	5'-10 13/16"	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"
3	85'Thru 90'	4'-0"	4'-10¼"	5'-6"	9¼"	7"x5.18"x26'-0"3GA	6'-7⅛"	7 7/16"	1⅜"	⅝"	4⅜"	7¾"	18"	6¼"	4'-11"	1½"	9½"	⅝"	4'-5⅝"	10"	SPLIT TEE 4'-10"	4¾" x .188"	1.900"x .145"	1.900"x .145"
4	95'Thru 105'	4'-0"	4'-10¼"	5'-6"	9¼"	7"x5.18"x26'-0"3GA	6'-7⅛"	7 7/16"	1⅜"	⅝"	4⅜"	7¾"	18"	6¼"	4'-11"	1½"	9½"	⅝"	4'-5⅝"	10"	SPLIT TEE 4'-10"	4¾" x .188"	2"x .188"	1.900"x .145"

REINFORCEMENT SCHEDULE			
MARK	NO.	LENGTH	TYPE
401	12"C/C	8'-6"	102
402	12"C/C	7'-6"	103
601	4	D+ 4'-0"	101
602	8	D+ 2'-0"	101
603	32	D_T - 6"	STR.



BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

OVERHEAD SIGN SUPPORTS

I-129 No. 7.3

DATE 7-25-62

APPROVED Robert P. Lamar
ENGINEER OF TRAFFIC

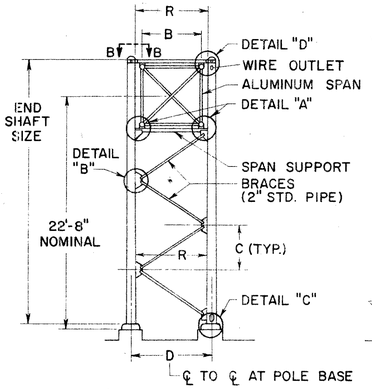
300 SQ. FT. SIGN AREA

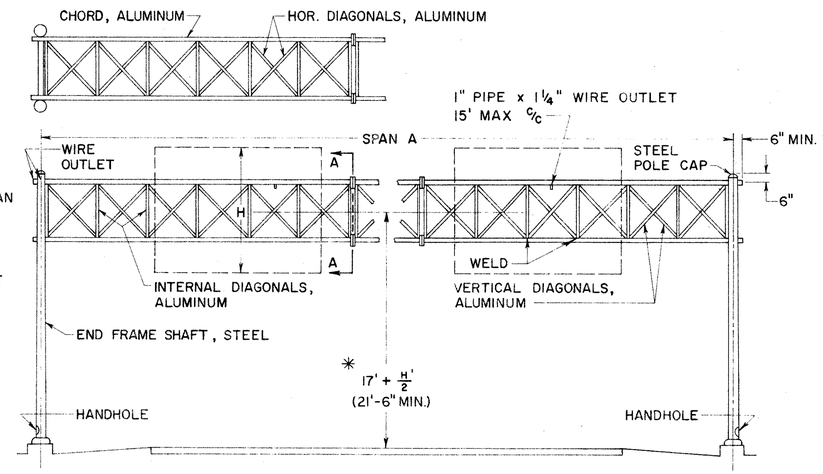
OVERHEAD SIGN SUPPORT, I-129 NO. 7.3

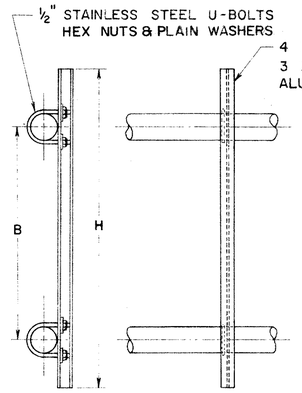
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

138F
198

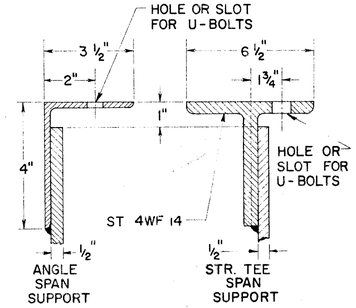
CUY-21-14.12







SIGN ATTACHMENT



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

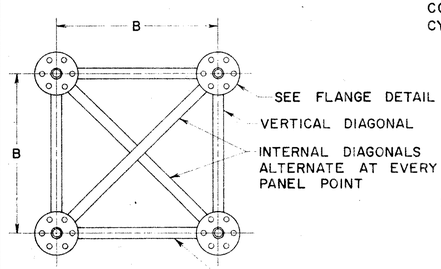
COST OF REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE FOR ITEM I-129 CONCRETE FOR SIGN SUPPORT FOUNDATIONS. BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER.

*FOUNDATION ELEVATION

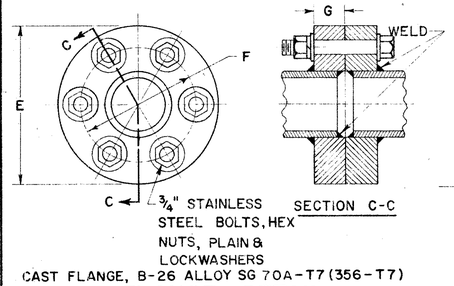
ELEVATION OF TOPS OF FOUNDATIONS SHALL BE BUILT UP SO THAT 17' CLEARANCE IS MAINTAINED OVER THE ENTIRE WIDTH OF THE PAVEMENT AND SHOULDERS.

DESIGN

THE DESIGN OF OVERHEAD SUPPORTS IS IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATION FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, ADOPTED JUNE 12, 1961.

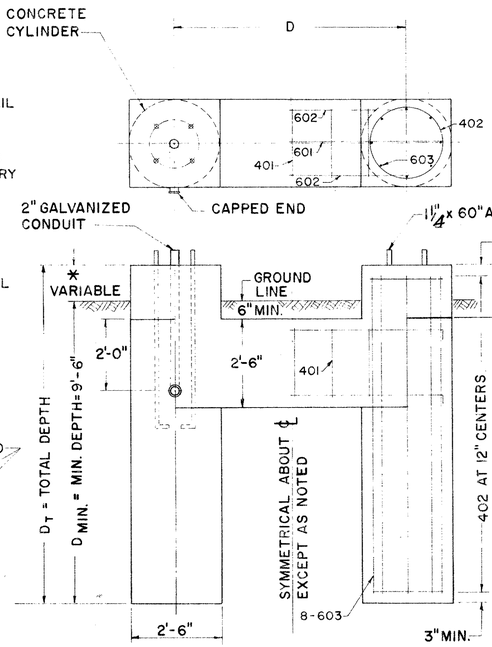


SECTION A-A



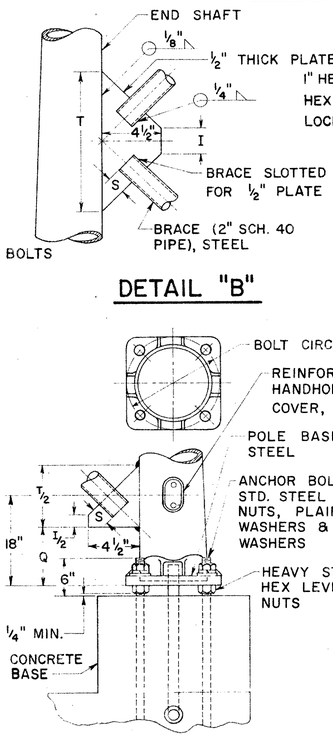
CAST FLANGE, B-26 ALLOY SG 70A-T7 (356-T7)

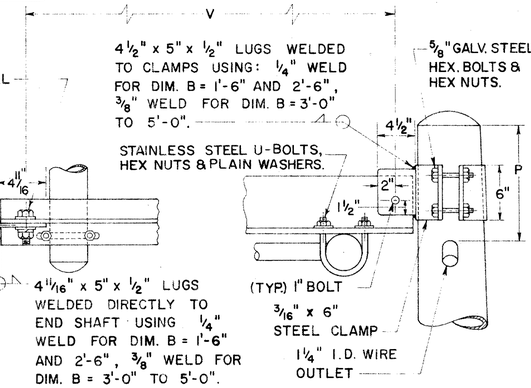
FLANGE DETAIL



FOUNDATION DETAIL

(RIGHT HAND SHOWN — LEFT HAND OPPOSITE)

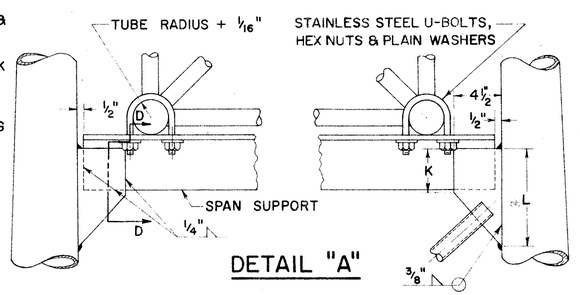




VIEW B-B

DETAIL "D"

UPPER SPAN SUPPORT (ALTERNATE METHODS)

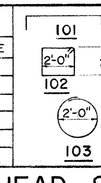


DETAIL "A"

LOWER SPAN SUPPORT

DESIGN NO.	SPAN A	B	C	D	E	END SHAFT	BRACE LENGTH	F	G	I	K	L	P	Q	R	S	T	U BOLTS	V	BOLT CIRCLE	SPAN SUPPORT SECTION D-D	CHORDS	HORIZONTAL AND INTERNAL DIAGONAL	VERTICAL DIAGONAL
1	50' thru 75'	3'-0"	4'-11¾"	4'-5"	9¼"	8"x4.5"x25'-0", 3 GA.	5'-10 13/16"	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	80' thru 85'	4'-0"	4'-10¼"	5'-6"	9¼"	7"x5.18"x26'-0", 3GA.	6'-7⅛"	7 7/16"	1⅜"	⅝"	4⅜"	7¾"	18"	6¼"	4'-11"	1½"	9½"	⅝"	4'-5⅝"	10"	SPLIT TEE 4'-10"	4¾" x .188"	2" x .188"	1.900" x .145"
3	90'	4'-0"	4'-10¼"	5'-6"	11"	7"x5.18"x26'-0", 3GA.	6'-7⅛"	8½"	1½"	⅝"	4⅜"	7¾"	18"	6¼"	4'-11"	1½"	9½"	⅝"	4'-5⅝"	10"	SPLIT TEE 4'-10"	5½ x .250"	2" x .188"	1.900" x .145"
4	95' thru 110'	5'-0"	4'-8½"	6'-6"	11"	7"x5.18"x26'-0", 3GA.	7'-3¼"	8½"	1½"	—	3½"	7¾"	12"	7¼"	5'-11"	1¾"	11¼"	¾"	5'-5⅝"	10"	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.7.4

DATE 5-2-62 7-25-62

APPROVED Robert E. Comer
ENGINEER OF TRAFFIC

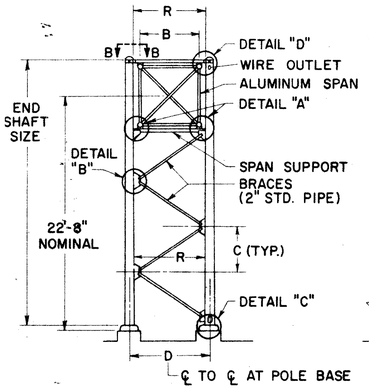
400 SQ. FT. SIGN AREA

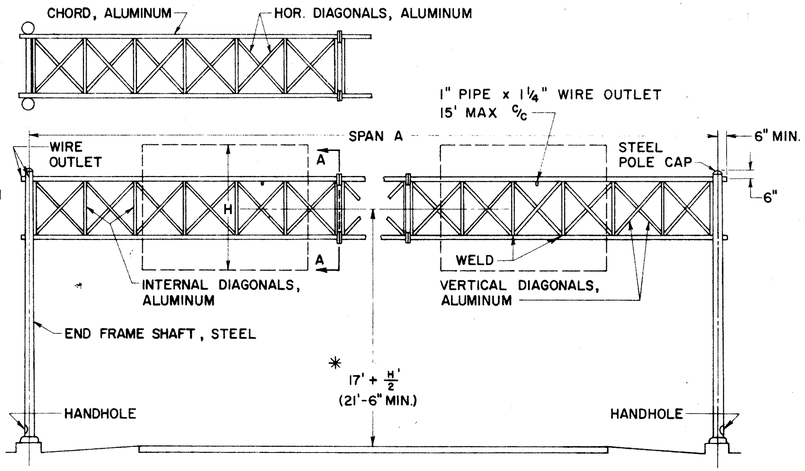
OVERHEAD SIGN SUPPORT, I-129 NO.7.4

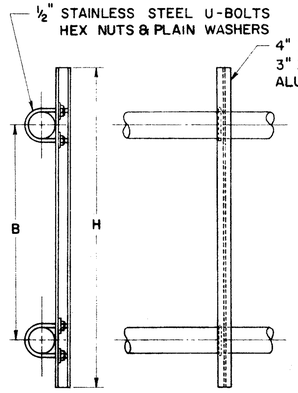
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

138G/198

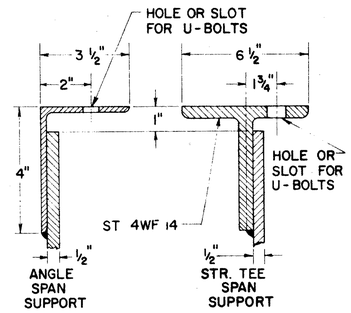
CUY-21-14.12







SIGN ATTACHMENT



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.

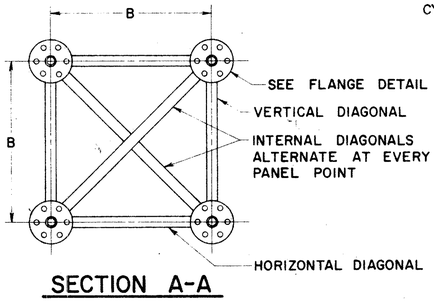
BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER.

*FOUNDATION ELEVATION

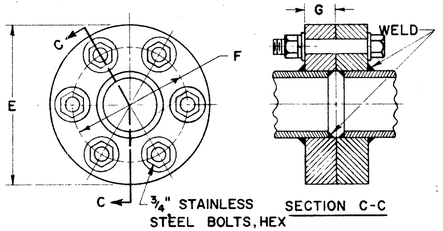
ELEVATION OF TOPS OF FOUNDATIONS SHALL BE BUILT UP SO THAT 17' CLEARANCE IS MAINTAINED OVER THE ENTIRE WIDTH OF PAVEMENT AND SHOULDERS.

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.

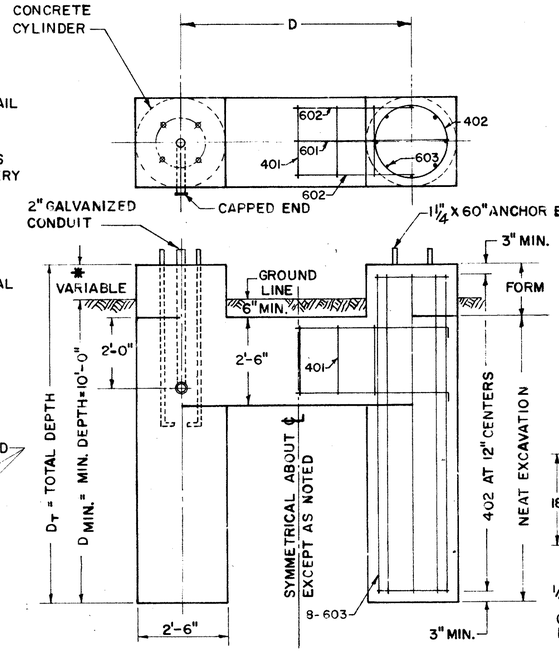


SECTION A-A



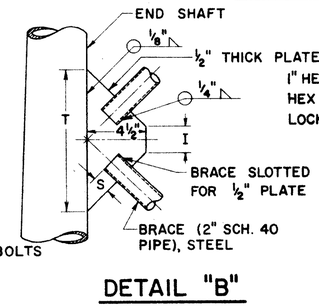
CAST FLANGE, B-26 ALLOY SG 70A-T7 (356-T7)

FLANGE DETAIL

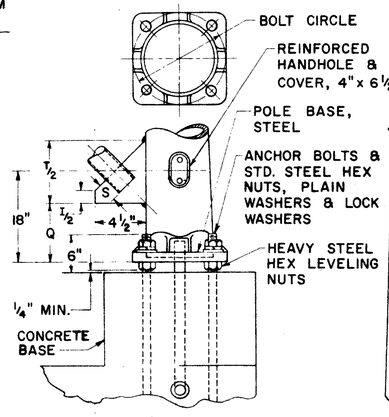


FOUNDATION DETAIL

(RIGHT HAND SHOWN — LEFT HAND OPPOSITE)

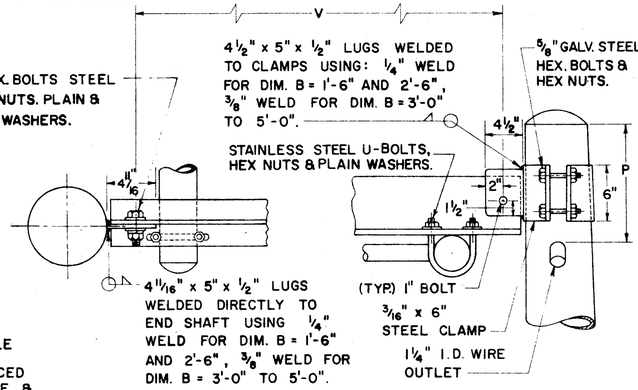


DETAIL "B"



DETAIL "C"

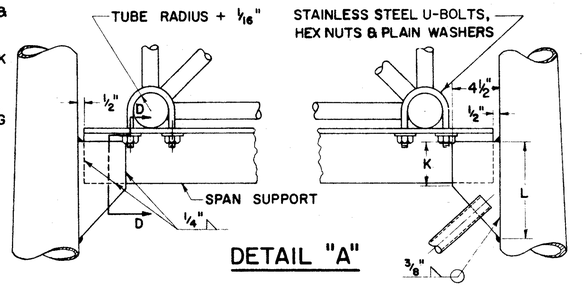
POLE BASE DETAIL



VIEW B-B

DETAIL "D"

UPPER SPAN SUPPORT (ALTERNATE METHODS)

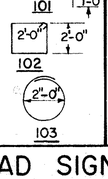


DETAIL "A"

LOWER SPAN SUPPORT

DESIGN NO.	SPAN A	B	C	D	E	END SHAFT	BRACE LENGTH	F	G	I	K	L	P	Q	R	S	T	U BOLTS	V	BOLT CIRCLE	SPAN SUPPORT SECTION D-D	CHORDS	HORIZONTAL AND INTERNAL DIAGONAL	VERTICAL DIAGONAL
1	50' THRU 70'	3'-0"	4'-1¾"	4'-5"	9¼"	8"X 4.5"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	75' THRU 80'	4'-0"	4'-10¼"	5'-6"	9¼"	7"X 5.18"X 26'-0", 3GA	6'-7⅛"	7 7/16"	1⅜"	⅝"	4⅜"	7¾"	18"	6¼"	4'-11"	1½"	9½"	⅝"	4'-5⅝"	10"	SPLIT TEE 4'—10"	4¾"X .188"	2" X .188"	1.900"X .145"
3	85'	4'-0"	4'-10¼"	5'-6"	11"	7"X5.18"X26'-0", 3GA	6'-7⅛"	8½"	1½"	5/16"	4⅜"	7¾"	18"	6¼"	4'-11"	1½"	9½"	⅝"	4'-5⅝"	10"	SPLIT TEE 4'—10"	5½"X .250"	2" X .188"	1.900"X .145"
4	90' THRU 110'	5'-0"	4'-8½"	6'-6"	11"	7"X5.18"X26'-0", 3GA	7'-3¼"	8½"	1½"	—	3½"	7¾"	12"	7¼"	5'-11"	1¾"	11¼"	¾"	5'-5⅝"	10"	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

APPROVED Robert E. Comer ENGINEER OF TRAFFIC

500 SQ. FT. SIGN AREA

OVERHEAD SIGN SUPPORT, I-129 NO. 7.5

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUY-21-14.12

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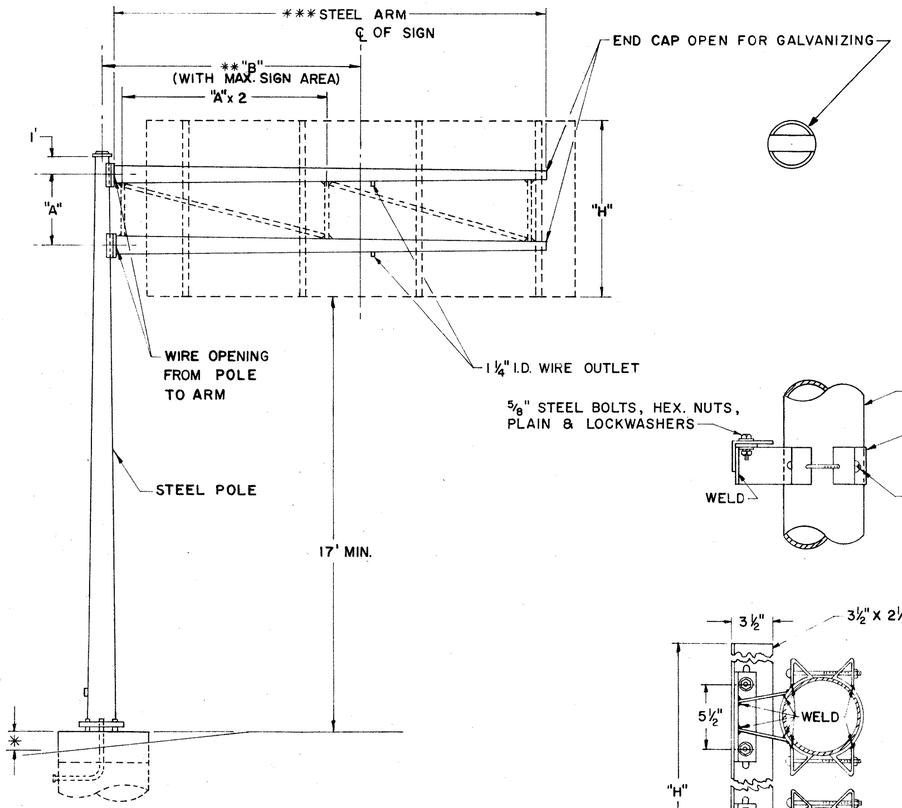
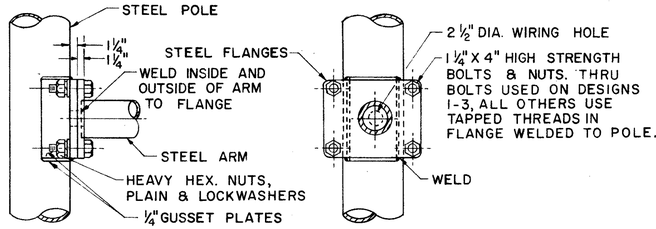
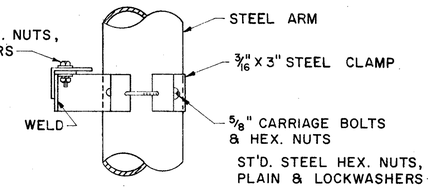
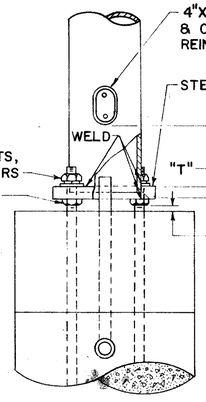
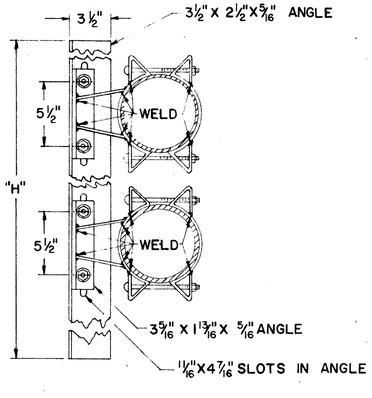


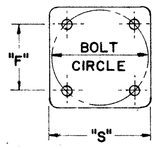


ARM ATTACHMENT

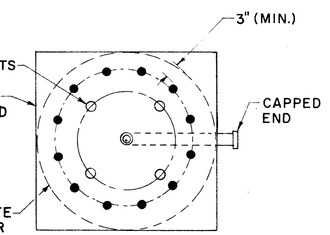


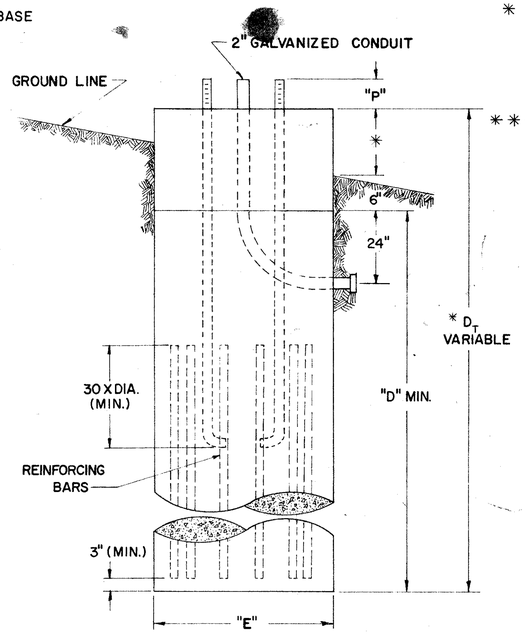






POLE DETAIL





FOUNDATION DETAIL

SIGN ATTACHMENT DETAIL

DESIGN NO.	POLE SIZE	*** ARM SIZE	DIM A	DIM ** B	DIM "D" MIN.	DIM E	DIM F	DIM P	DIM "S"	DIM T	BOLT CIRCLE	ANCHOR BOLT SIZE	MAX SIGN AREA	REINF. BARS SIZE	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"	16 5/16"	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

APPROVED Robert E. Comer
ENGINEER OF TRAFFIC

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUY-21-14.12

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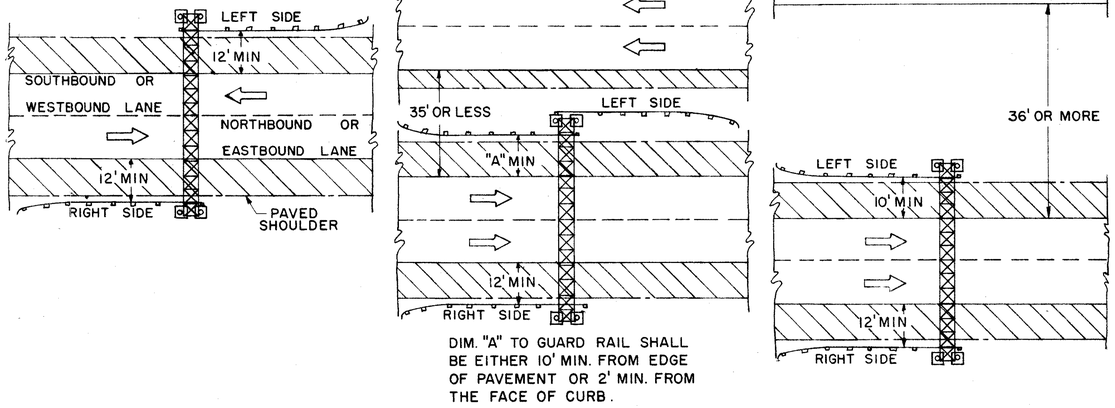
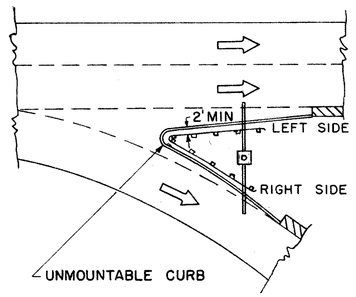


DIM. "A" TO GUARD RAIL SHALL BE EITHER 10' MIN. FROM EDGE OF PAVEMENT OR 2' MIN. FROM THE FACE OF CURB.

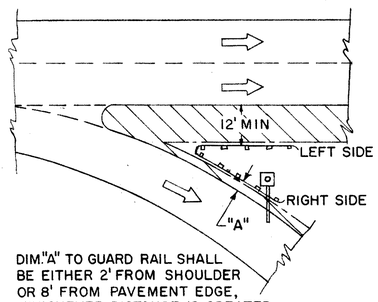
MULTIPLE LANE UNDIVIDED

FOUR LANE DIVIDED

BIFURCATION



(CURB SECTION)



DIM."A" TO GUARD RAIL SHALL BE EITHER 2' FROM SHOULDER OR 8' FROM PAVEMENT EDGE, WHICHEVER DISTANCE IS GREATER.

(SHOULDER SECTION)

NOTES

GENERAL

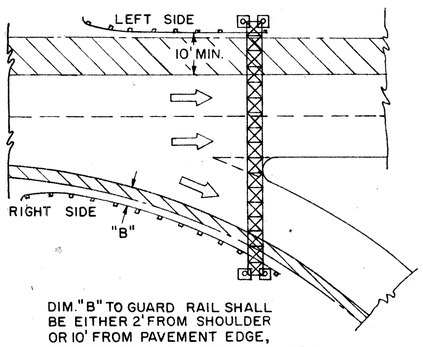
PROTECTIVE GUARD RAIL FOR OVERHEAD SIGN STRUCTURES SHALL CONFORM TO SEC. I-15, FOR STEEL BEAM TYPE (DEEP).

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".)

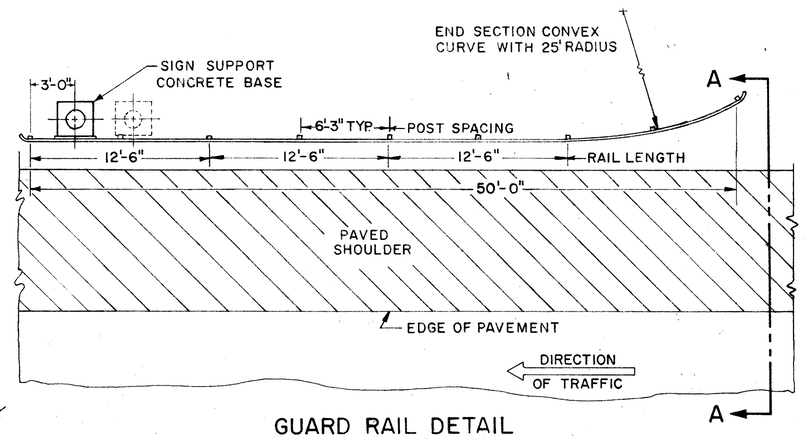
WHERE PROPOSED GUARD RAIL FLARES ARE CONSTRUCTED OF RAIL ELEMENTS WHICH HAVE NOT BEEN FABRICATED EXACTLY TO FIT THE CURVATURE SHOWN ON THE PLANS. THE TWO END POSTS OF EACH FLARED SECTION SHALL BE ENCASED IN A MINIMUM 4" THICKNESS OF CLASS "E" CONCRETE FOR THE FULL DEPTH OF THE POST BELOW THE GROUND LINE. PAYMENT FOR ENCASEMENT, IF REQUIRED, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE GUARD RAIL.



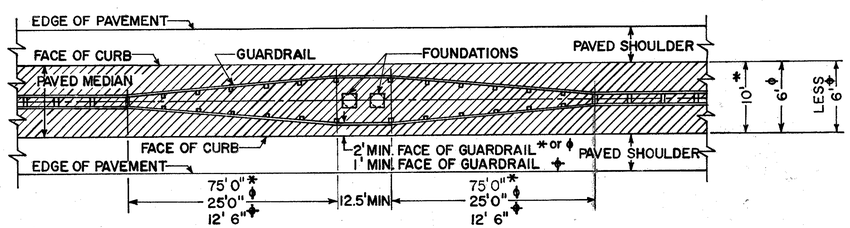
DIM."B" TO GUARD RAIL SHALL BE EITHER 2' FROM SHOULDER OR 10' FROM PAVEMENT EDGE, WHICHEVER DISTANCE IS GREATER.

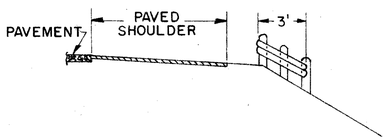
(ROADWAY SPAN)

BIFURCATION



GUARD RAIL DETAIL





SECTION A-A

BARRIER GUARDRAIL AT SIGN SUPPORTS MAY BE MOUNTED ON ONE POST WITH BLOCKS WHEN SPREAD IS 2'-0" OR LESS FACE TO FACE. FOR SPREADS OVER 2'-0", TWO POSTS MUST BE USED.

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

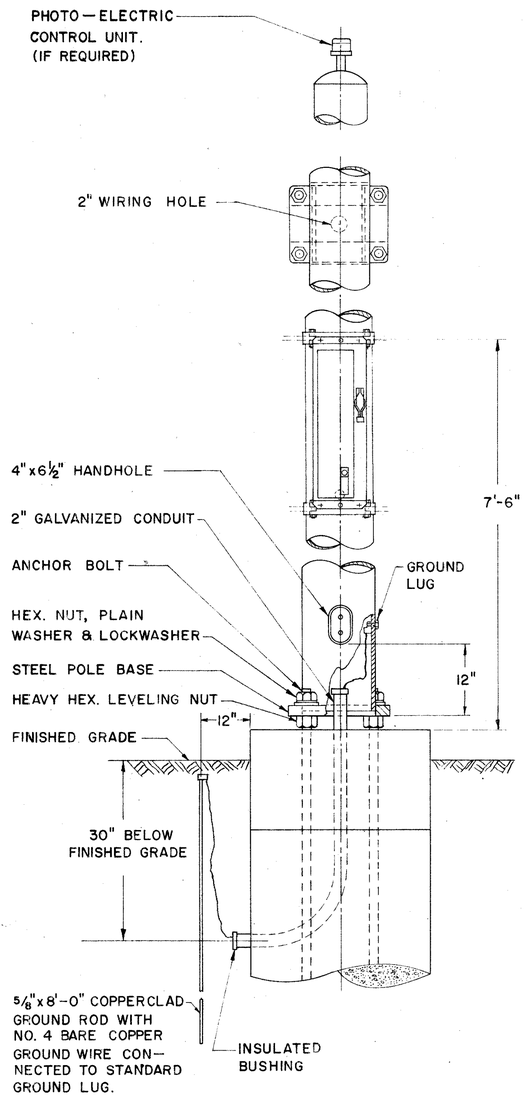
APPROVED Robert E. Comer
ENGINEER OF TRAFFIC

GUARD RAIL FOR OVERHEAD SIGN SUPPORTS

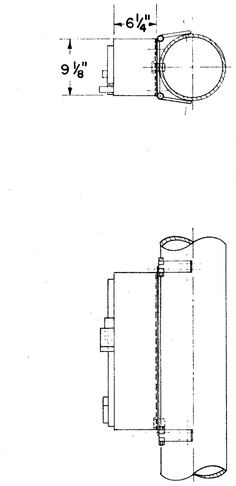
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

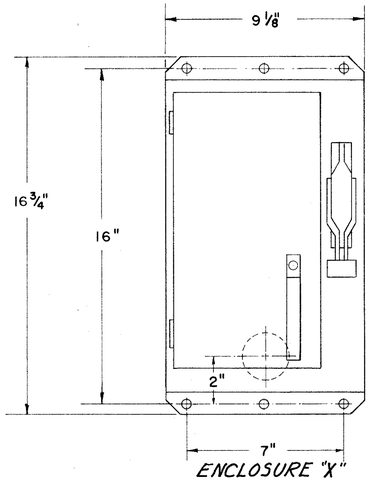
CUY-21-14.12

(138J 198)

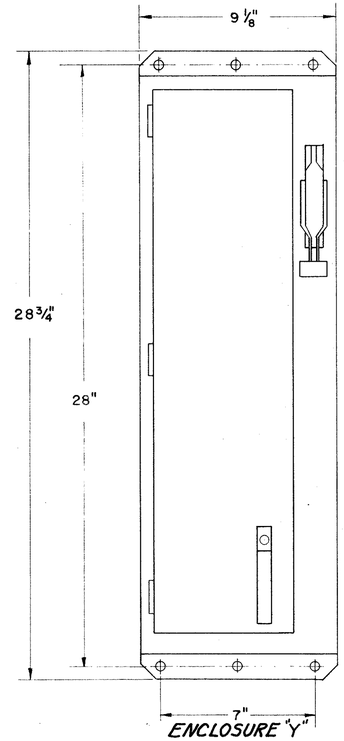


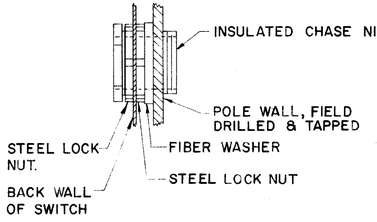
STRUCTURE DETAIL FOR ILLUMINATED SIGNS





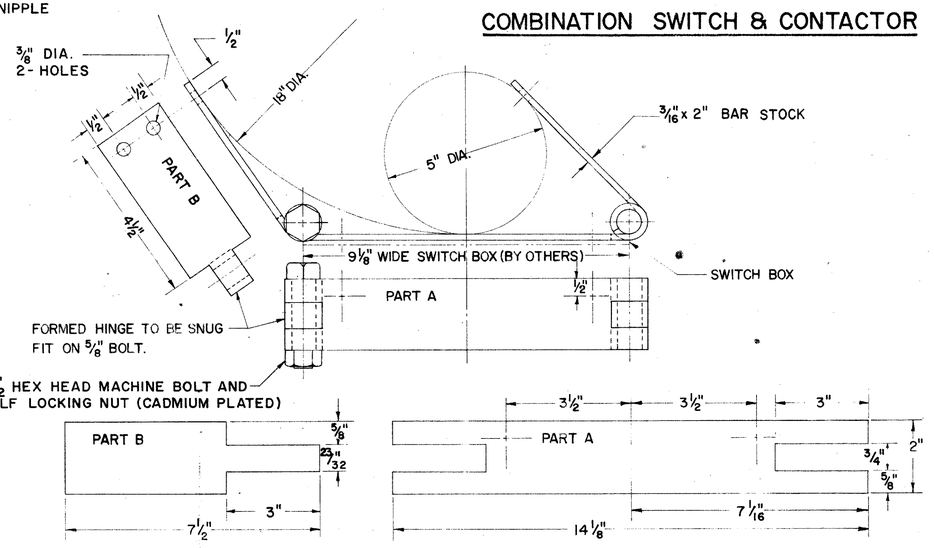
SWITCH DETAIL





CHASE NIPPLE ASSEMBLY DETAIL

COMBINATION SWITCH & CONTACTOR



SWITCH BOX MOUNTING BRACKET

NOTES

GENERAL

DETAILS ON THIS SHEET SHALL APPLY TO EACH OVERHEAD SIGN STRUCTURE TO SUPPORT ILLUMINATED SIGNS. ELECTRIC SERVICE SHALL ENTER THE STRUCTURE THROUGH A 2" RIGID STEEL GALVANIZED CONDUIT PLACED IN THE STRUCTURE FOUNDATION. SERVICE WIRES SHALL ENTER THE DISCONNECT SWITCH OR COMBINATION SWITCH CONTACTOR THROUGH AN INSULATED CHASE NIPPLE TO BE FIELD INSTALLED AS SHOWN IN DETAIL. FIELD DETERMINE SIZE OF NIPPLE. SIGN LOAD WIRES AND CONTROL WIRES (IF REQUIRED) SHALL ENTER SIGN STRUCTURE AND CONTINUE UPWARD TO PROPER OUTLET. CONTROL PILOT DEVICE SHALL BE A PHOTO-ELECTRIC CELL UNIT AS SPECIFIED IN THE ELECTRICAL NOTES AND INSTALLED ON THE CAP OF THE UPRIGHT STRUCTURE MEMBER.

CONTROLLER

SIGN CIRCUIT SHALL BE CONTROLLED AS REQUIRED BY THE SYSTEM DESIGN, EITHER AT THE PRIMARY SOURCE OR AT THE STRUCTURE LOCATION. A DISCONNECTING MEANS MUST BE PROVIDED AT EACH STRUCTURE FOR MAINTENANCE AND CIRCUIT PROTECTION. CONTROLLERS SHALL HAVE NEMA TYPE IV, WATERTIGHT STAINLESS STEEL ENCLOSURES FURNISHED WITHOUT HUBS. DISCONNECT MECHANISM SHALL BE FLANGE MOUNTED TO REMAIN IN OPERATING POSITION WHEN COVER IS OPEN. DEVICES SHALL HAVE ALL DESIGN FEATURES AS SQUARE "D" FUSIBLE DISCONNECT SWITCH CLASS 9421, TYPE W999FA221A AND SQUARE "D" COMBINATION SWITCH AND CONTACTOR CLASS 8903, TYPE W939FA600 SERIES. CONTROLLER SHALL BE MOUNTED WITH 5/16"-18 X ¾" HEX. HEAD CADMIUM PLATED MACHINE BOLTS. ALL MOUNTING BOLT HOLES TO BE FIELD DRILLED AND TAPPED.

MOUNTING BRACKET

THE SWITCH BOX MOUNTING BRACKET SHALL FIRST BE FABRICATED THEN GALVANIZED BEFORE ASSEMBLY.

THE BRACKET SHALL BE FIELD MOUNTED WITH 5/16" HEX. HEAD SELF-TAPPING CADMIUM PLATED SCREWS. HOLES IN POLE TO BE FIELD DRILLED.

ENCLOSURE "Z"

Enclosure "Z" shall be NEMA 4, stainless steel box similar to "X" & "Y" and with demensions: 34¾" x 10⅝" x 6¼"

BUREAU OF TRAFFIC OHIO DEPARTMENT OF HIGHWAYS		
ILLUMINATED SIGN DETAILS	ES-3	DATE 10-18-62
APPROVED Robert E. Conner ENGINEER OF TRAFFIC		

9-24-63

FED. RD. DIVISION 2
STATE OHIO
PROJECT
139
198
CUYAHOGA COUNTY
CUY— 21-14.12
MICROFILMED
MAR 6 1984
BROADWAY
DILLE
WARREN ST.
TRUMBULL ST.
MALEK PL.
SOLON
E-S (2ND. LEVEL)
N-E (3RD. LEVEL)
S-W (3RD. LEVEL)
W-N (2ND. LEVEL)
℄ WILLOW (4TH LEVEL)
N 14°39'18" W
℄ CLARK (1ST LEVEL) N 86°52'00" W
℄ STA. 77+25.63
℄ STA. 1034+34
RADIAL LINE R=818.51' 7° CURVE
RADIAL LINE R=520.87' 11° CURVE
RADIAL LINE R=763.94' 7°30' CURVE
LIMITS OF CRUSHED AGGREGATE SLOPE PROTECTION
RETAINING WALL
VARIES
53°53'39"
32°17'13"
31°55'59"
14'-0 MIN. CL.
⌀ DRIVE SAMPLE BORINGS
⌀ PRESS-DRIVE SAMPLE BORINGS
FOUNDATION SOUNDINGS:
FOUNDATION DESIGN AND FOUNDATION QUANTITIES ARE BASED ON A STUDY OF ROD SOUNDINGS AND SOIL SAMPLING SOUNDINGS MADE AT THE SITE.
THIS SOUNDING INFORMATION, THE ACCURACY OF WHICH THE STATE DOES NOT GUARANTEE, MAY BE EXAMINED IN THE OFFICE OF THE BUREAU OF BRIDGES IN COLUMBUS OR THE DIVISION OFFICE.
N
FOR SITE PLAN OF
WILLOW FREEWAY OVER CLARK FRWY.-SEE SHT. NO 140
RAMP N-E UNDER WILLOW FREEWAY-SEE SHT. NO 152
RAMP S-W UNDER WILLOW FREEWAY-SEE SHT. NO 153
RAMP E-S OVER CLARK FREEWAY-SEE SHT. NO 173
RAMP W-N OVER CLARK FREEWAY-SEE SHT. NO 174
FOR EXISTING UTILITIES SEE SHT. NO 121 & 122
TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO
GENERAL SITE PLAN
BRIDGES NO. CUY-21-1431; CUY-21-RAMP S-W; RAMP N-E; RAMP W-N; & RAMP E-S
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY
SCALE
DATE
DESIGNED W.P.H.
DRAWN CAT.
TRACED J.B.
CHECKED D.W.M.
REVIEWED D.M.
DATE 1-8-63
REVISED

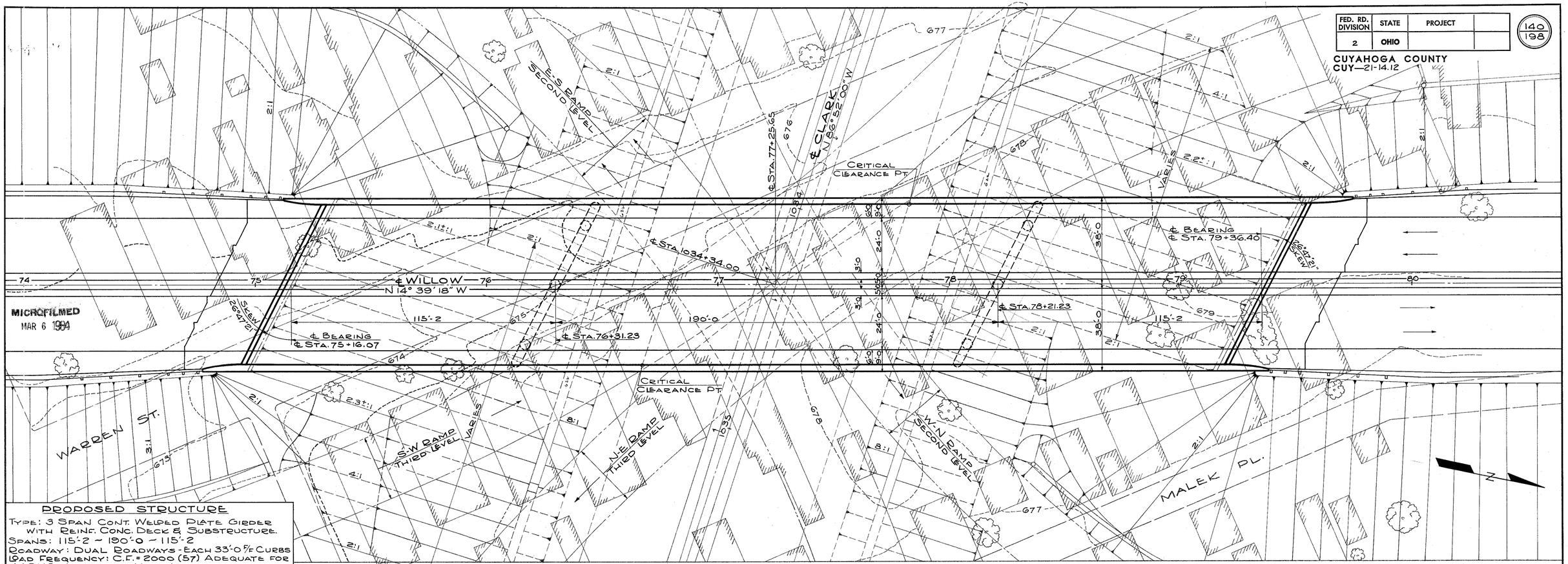
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

140
198

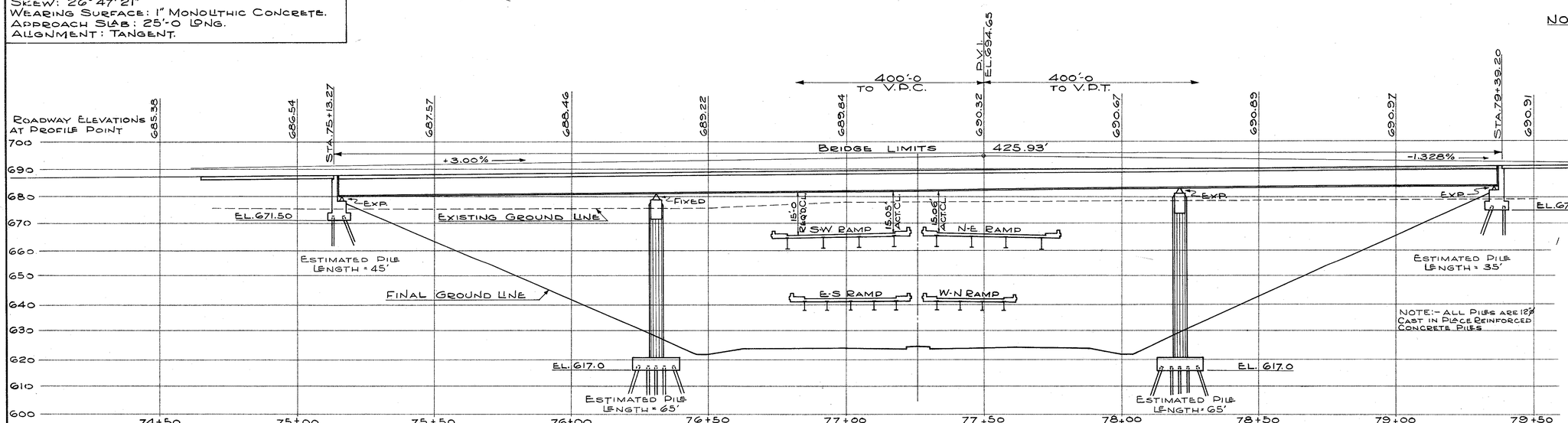
CUYAHOGA COUNTY
CUY—21-14.12

PROPOSED STRUCTURE

TYPE: 3 SPAN CONT. WELDED PLATE GIRDER WITH REINF. CONC. DECK & SUBSTRUCTURE.
SPANS: 115'-2 – 190'-0 – 115'-2
ROADWAY: DUAL ROADWAYS - EACH 33'-0" CURBS
LOAD FREQUENCY: C.F.=2000 (57) ADEQUATE FOR AASHO ALTERNATE LOADING.
SKEW: 26° 47' 21"
WEARING SURFACE: 1" MONOLITHIC CONCRETE.
APPROACH SLAB: 25'-0 LONG.
ALIGNMENT: TANGENT.



NOTE:
FOR PLAN OF INTERCHANGE SEE SH. 139
FOR EXISTING UTILITIES SEE SHS. 121 & 122



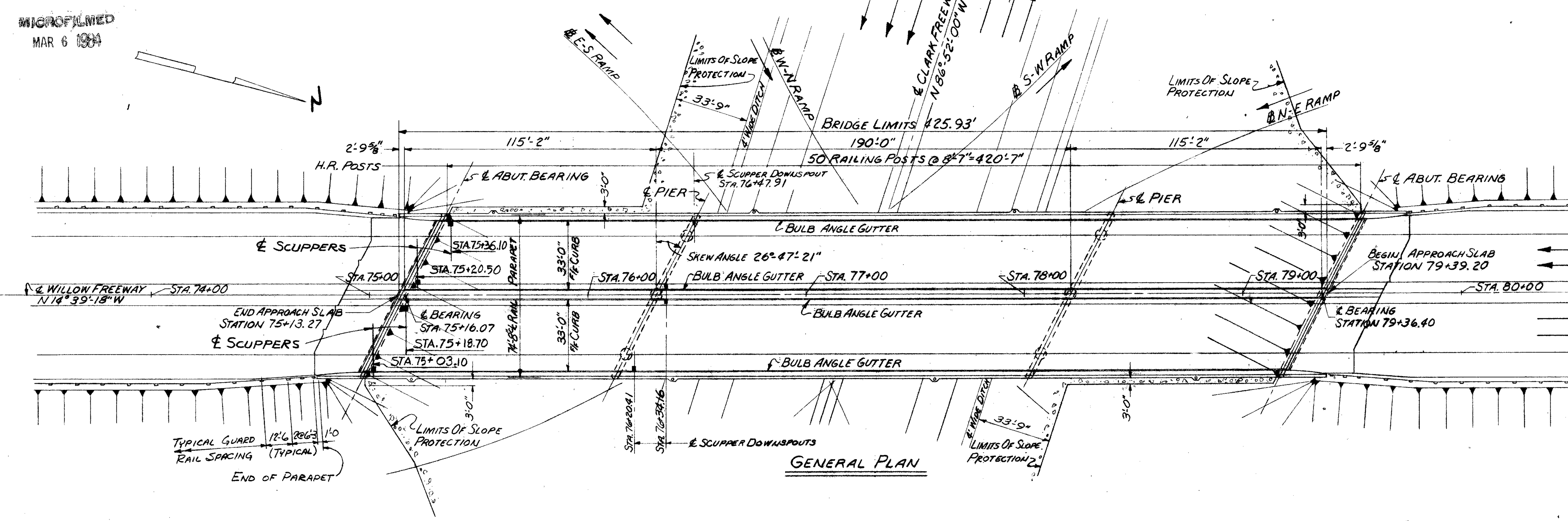
NOTE:- ALL PILES ARE 12" CAST IN PLACE REINFORCED CONCRETE PILES

FOUNDATION SOUNDINGS:
FOUNDATION DESIGN AND FOUNDATION QUANTITIES ARE BASED ON A STUDY OF ROD SOUNDINGS AND SOIL SAMPLING SOUNDINGS MADE AT THE SITE. THIS SOUNDING INFORMATION, THE ACCURACY OF WHICH THE STATE DOES NOT GUARANTEE, MAY BE EXAMINED IN THE OFFICE OF THE BUREAU OF BRIDGES IN COLUMBUS OR THE DIVISION OFFICE.

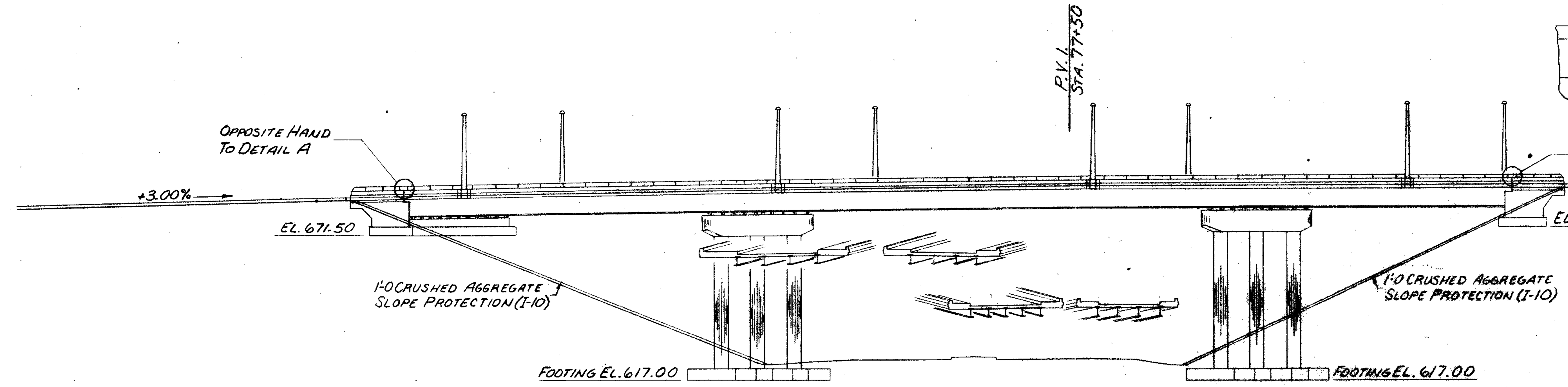
TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

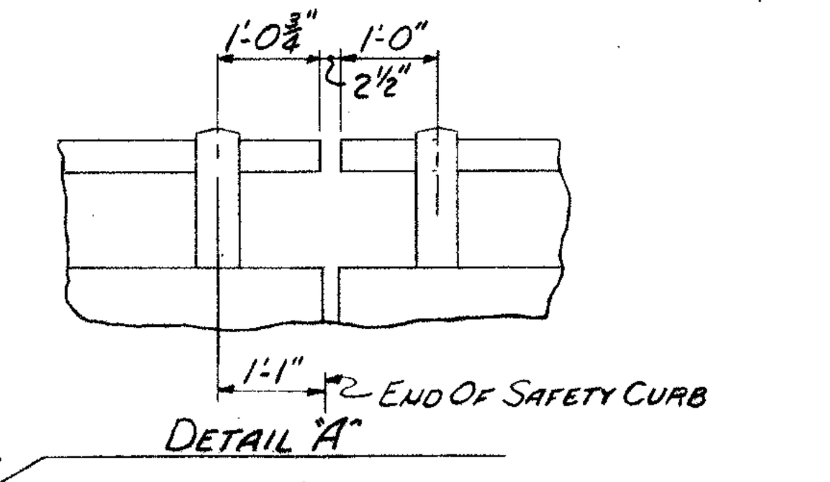
SITE PLAN
BRIDGE NO. CUY-21-1431
WILLOW FREEWAY OVER CLARK FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY ℄ STA. 75+13.27 TO 79+39.20

SCALE		DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	CAT/GM	G.O'C.	D.W.M.		11-28-62	



GENERAL PLAN





DETAIL "A"

ELEVATION

15. SUBSEQUENT PILE TEST LOADS: may be applied at any of the bridges in this contract. At the discretion of the Engineer, one of the subsequent pile test loads shall be applied after a time lapse of ten days instead of three as required by Sect. S-17 of the specifications.

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	SUPER.	ABUT.	PIERS	GEN'L.
E-2	1360	CU.YDS.	UNCLASSIFIED EXCAVATION		210	1150	
E-2		LUMP SUM	COFFERDAMS, CRIBS & SHEETING				
S-1	1122	CU.YDS.	CLASS "C" CONCRETE, SUPERSTRUCTURE	1122			
S-1	380	CU.YDS.	CLASS "C" CONCRETE, PIERS ABOVE FOOTINGS			380	
S-1	462	CU.YDS.	CLASS "E" CONCRETE, PIER & ABUTMENT FOOTINGS		160	302	
S-1	240	CU.YDS.	CLASS "E" CONCRETE, ABUTMENTS ABOVE FOOTINGS		240		
S-3	70	LIN. FT.	WATERPROOFING, PREMOLDED SEALING STRIP		70		
S-4	445,562	LBS.	REINFORCING STEEL	279,820	38,334	127,408	
S-7	1,549,000 (1521,000)	LBS.	STRUCTURAL STEEL 1,549,000	(1,521,000)			
S-8	1,549,000 (1,521,000)	LBS.	FIELD PAINTING OF STRUCTURAL STEEL, as per plan	(1,521,000)			
S-9	103	SQ. FT.	1" PREFORMED EXPANSION JOINT FILLER		103		
S-14	924.08	LIN. FT.	RAILING (ALUMINUM RAIL & SUPPORTS, CONCRETE PARAPET, TYPE A)	846.25	77.83		
S-14	425.93	LIN. FT.	RAILING (Type I-15.11 rails WITH GALV. STL. POSTS & BOLTS)	425.93			
S-16		LUMP SUM	FIRST TEST PILE				
S-17		LUMP SUM	FIRST PILE TEST LOAD				
S-17	4	EACH	SUBSEQUENT PILE TEST LOAD			4	
S-18	11,920	LIN. FT.	12" CAST-IN-PLACE REINFORCED CONCRETE PILES		2,560	9,360	
S-25			LIGHTING DETAILS (SEE SHT. No. 125 TO 138)				
S-29	140	CU.YDS.	POROUS BACKFILL		140		
S-29	8	EACH	SCUPPERS, including supports	8			
S-29	109	LIN. FT.	8" DIA. STD. W.I. OR GALV. ST'L. PIPE DOWNSPOUTS, INCLUDING SPECIALS	109			
S-29	80	LIN. FT.	10" DIA. BITUMINOUS COATED CORRUGATED METAL PIPE, INCL. SPECIALS	80			
S-101	1122	EACH	WATER-REDUCING, SET RETARDING ADMIXTURE	1122			
I-10	3,280	SQ. YDS.	CRUSHED AGGREGATE SLOPE PROTECTION				3,280

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

141/198

CUYAHOGA COUNTY
CUY-21-14.12

GENERAL NOTES:

1. 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.
2. REFERENCE SHALL BE MADE TO STANDARD DRAWINGS FSB-1-62, AR-1-57 AND I-15 No. 2-A DATED 1-15-63, 4-2-62 AND 8-17-60 RESPECTIVELY, AND TO SUPPLEMENTAL SPECIFICATIONS No. S-307 DATED 8-23-60, AND S-101 DATED 7-12-62.
3. PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 40 TONS PER PILE.
4. STRUCTURAL STEEL SHALL BE COPPER BEARING AND SHALL CONFORM TO ITEM M-7, SECTION M-7.4(b) OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS.
5. WELDING OF STRUCTURAL STEEL SHALL BE CLASS "A" EXCEPT AS OTHERWISE SHOWN. WELDS SHOWN AS FIELD WELDS MAY, AT THE OPTION OF THE CONTRACTOR, BE MADE IN THE SHOP.
6. BUTT WELDS SHALL BE RADIOGRAPHICALLY EXAMINED AS REQUIRED AND IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION No. S-307, DATED 8-23-60.
7. PAINTING OF STRUCTURAL STEEL (ITEM S-8): ALL PAINTING SHALL CONFORM BOTH AS TO MATERIALS AND APPLICATION WITH THE STANDARD SPECIFICATIONS OF THE CITY OF CLEVELAND FOR PAINTING STRUCTURAL STEEL. SEE PROPOSAL NOTE.
8. THE DRILLING OF HOLES IN THE SUBSTRUCTURE FOR ANCHOR RODS SHALL BE PAID FOR UNDER ITEM S-7.
9. 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.
10. 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 SAFETY CURBS, MEDIANS AND ROADWAYS.
    B. THE ENTIRE EXPOSED SURFACE OF PIERS AND ABUTMENTS EXCEPT BRIDGE SEATS, BACKWALLS AND THE FACE OF ABUTMENTS BETWEEN OUTSIDE GIRDERS.
11. MACHINE FINISH: THE CONCRETE BRIDGE DECK SHALL BE FINISHED BY THE USE OF A FINISHING MACHINE.
12. UTILITY LINES: ALL EXPENSE INVOLVED IN RELOCATING 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.
13. FIRST TEST PILE: PAYMENT WILL BE MADE FOR ONLY ONE FIRST TEST PILE, ITEM S-16. IT MAY BE DRIVEN AT ANY OF THE BRIDGES IN THE INTERCHANGE.
14. FIRST PILE TEST LOAD
    LOAD: PAYMENT WILL BE MADE FOR ONLY ONE FIRST PILE TEST LOAD AND
    IT MAY BE TESTED AT ANY OF THE BRIDGES IN THE INTERCHANGE.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

GENERAL PLAN

BRIDGE No. CUY-21-1431
WILLOW FREEWAY OVER CLARK FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY STA. 75+13.27 TO 79+39.20

SCALE DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	RAB.		RIY.		11-28-63	3-4-64

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY– 2I-14.12

PILE DESIGNATION

○ = PLUMB PILE

⊗ = BATTERED PILE
ARROW INDICATES DIRECTION OF BATTER

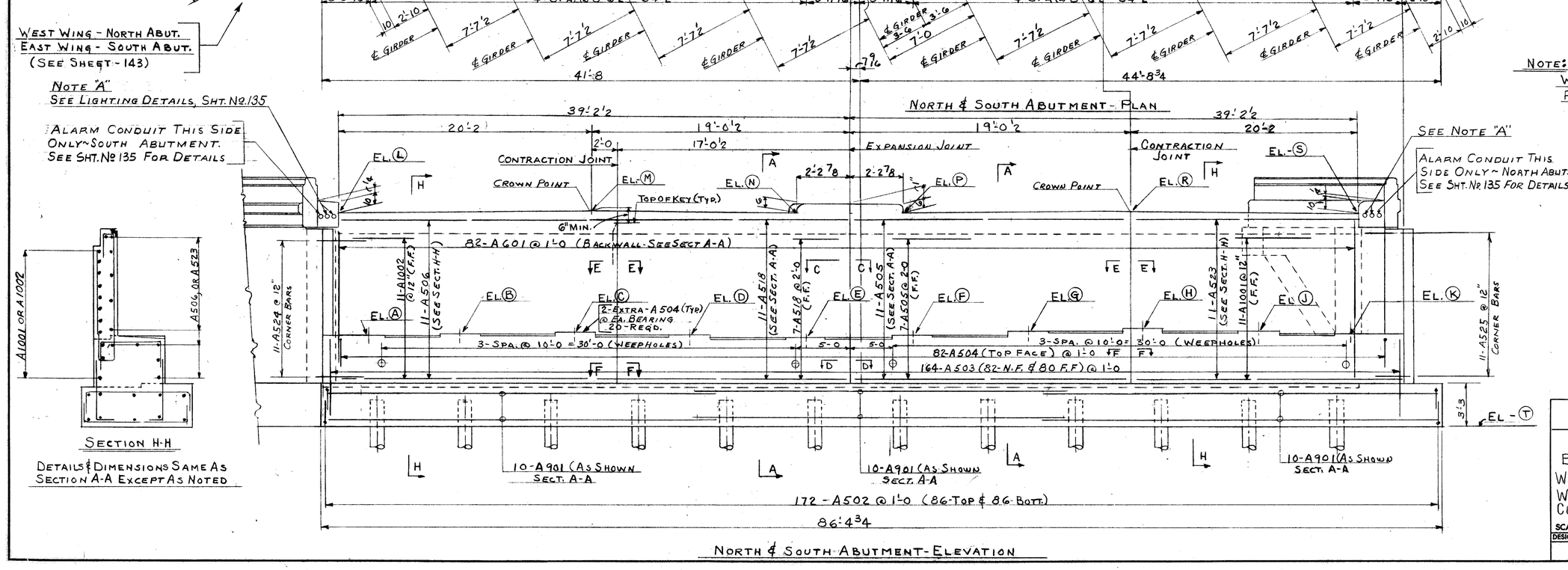
NOTE "B"
REINFORCING STEEL MUST BE PLACED SO AS TO INSURE DRILLING CLEARANCE FOR 1⅛"x1'7" ANCHOR BARS, 3¼ PROJECTION.

EAST WING - NORTH ABUT.
WEST WING - SOUTH ABUT.
(SEE SHEET-143)

WEST WING - NORTH ABUT.
EAST WING - SOUTH ABUT.
(SEE SHEET-143)

NOTE "A"
SEE LIGHTING DETAILS, SHT. NO. 135

ALARM CONDUIT THIS SIDE ONLY~SOUTH ABUTMENT. SEE SHT. NO. 135 FOR DETAILS



SECTION H-H

DETAILS & DIMENSIONS SAME AS SECTION A-A EXCEPT AS NOTED

NORTH & SOUTH ABUTMENT - PLAN

NORTH & SOUTH ABUTMENT - ELEVATION

NOTE:
WORK THIS DWG. WITH SHEET 143
FOR GENERAL NOTES SEE SHEET 141

ELEVATIONS

	NORTH ABUT.	SOUTH ABUT.
A	682.70	678.32
B	683.04	678.73
C	683.17	678.93
D	683.11	678.95
E	683.00	678.91
F	683.01	678.99
G	683.13	679.19
H	683.20	679.33
J	683.09	679.29
K	682.76	679.04
L	690.85	686.43
M	691.15	686.90
N	690.94	686.84
P	690.94	686.88
R	691.18	687.27
S	690.91	687.17
T	675.75	671.50

N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE

REFERENCE DRAWINGS

SUPERSTRUCTURE DETAILS	SHT. NO. 148
SITE PLAN	" 140
BAR SCHEDULE	" 145

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

NORTH & SOUTH ABUTMENT
BRIDGE NO. CUY.-21-1431
WILLOW FREEWAY OVER CLARK FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE	DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED, DATE	REVISED
	CJ		RIY	11-28-62	

SHEET ACCT. NO. 1802
5809-27

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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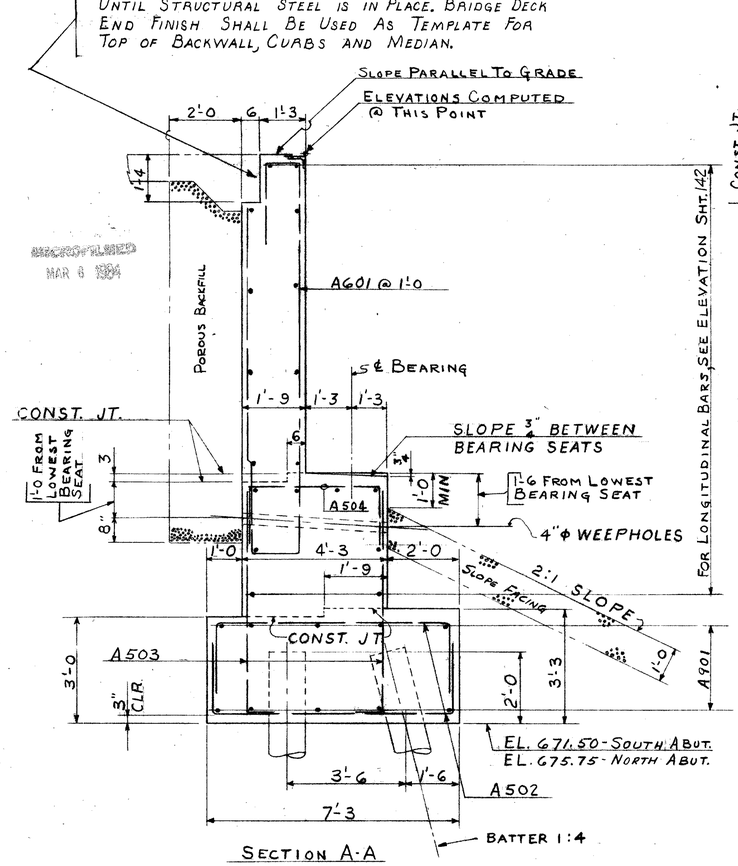
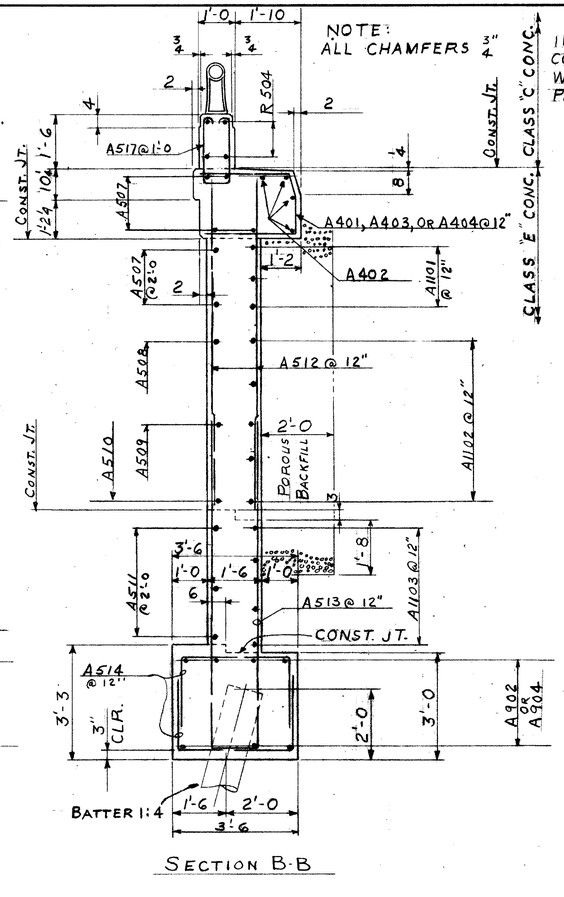
CUYAHOGA COUNTY
CUY-21-14.12

CONCRETE IN BACKWALL SHALL NOT BE PLACED UNTIL STRUCTURAL STEEL IS IN PLACE. BRIDGE DECK END FINISH SHALL BE USED AS TEMPLATE FOR TOP OF BACKWALL, CURBS AND MEDIAN.



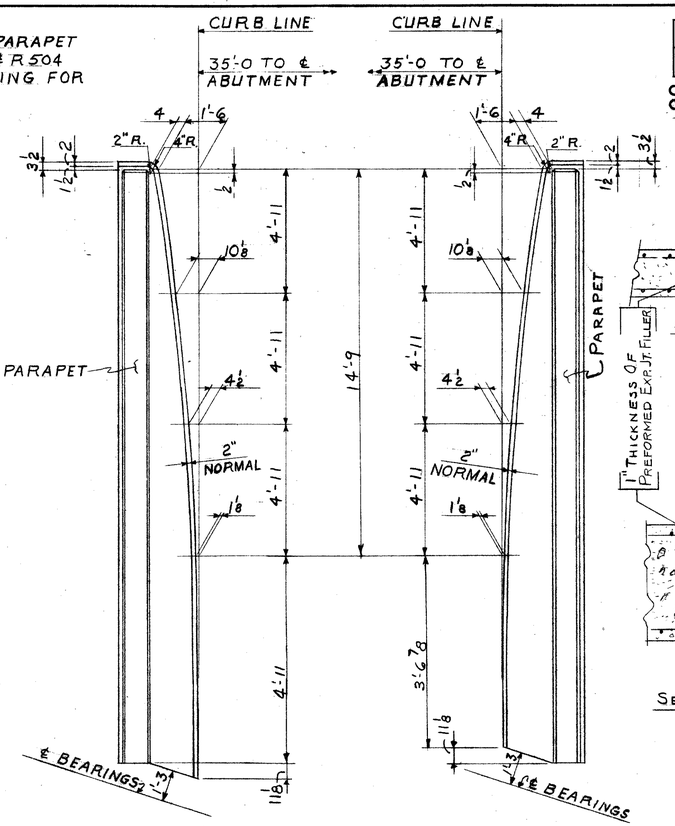
SECTION A-A



SECTION B-B

FOR LONGITUDINAL BARS, SEE ELEVATION SHT. 142

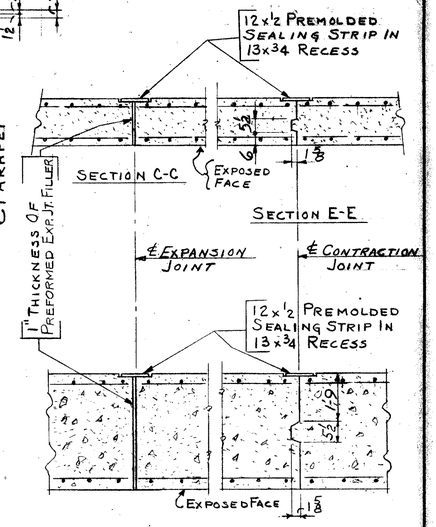
INCLUDE PARAPET CONCRETE ℄ R.504 WITH RAILING FOR PAYMENT.

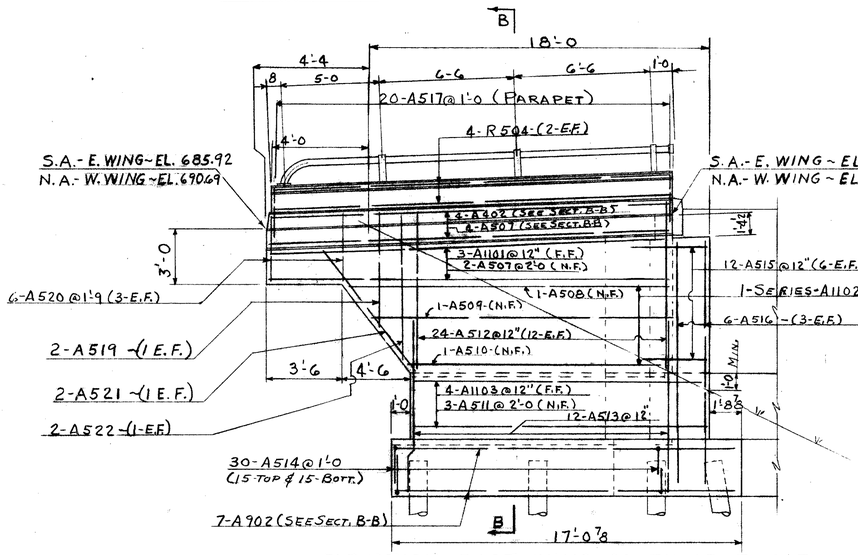


EAST WING SOUTH ABUTMENT
WEST WING NORTH ABUTMENT

WEST WING SOUTH ABUTMENT
EAST WING NORTH ABUTMENT

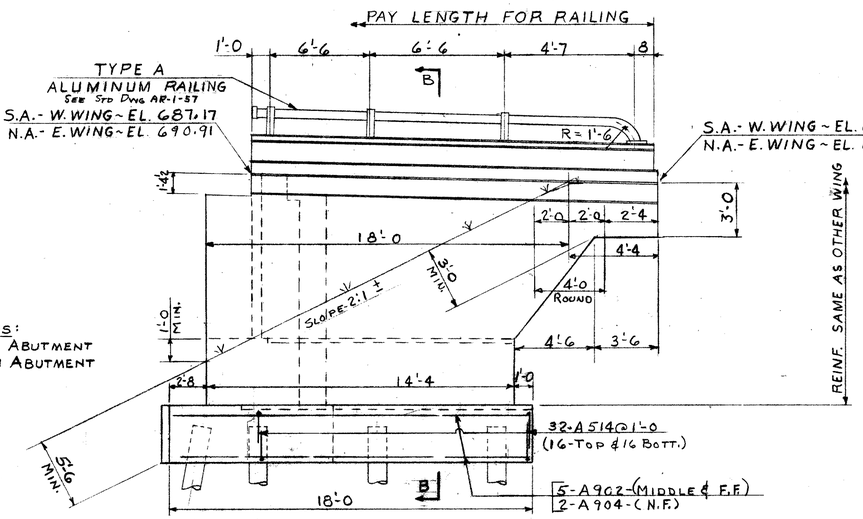
DIMENSION DIAGRAM OF WING CURBS





ELEVATION EAST WING SOUTH ABUTMENT
ELEVATION WEST WING NORTH ABUTMENT

ABBREVIATIONS:
S.A. = SOUTH ABUTMENT
N.A. = NORTH ABUTMENT



ELEVATION WEST WING SOUTH ABUTMENT
ELEVATION EAST WING NORTH ABUTMENT

NOTE:
WORK THIS DWG. WITH SHEET 142

GENERAL NOTES:

POROUS BACKFILL: 2 FEET THICK FULL LENGTH OF THE ABUTMENT AND WINGS, SHALL EXTEND UP TO THE UNDER SIDE OF THE APPROACH SLAB.

EXCAVATION QUANTITY: FOR ABUTMENTS COMPRISES MATERIAL BETWEEN BOTTOM OF FOOTERS AND ORIGINAL GROUND LINE.

CONCRETE: ALL ABUTMENT CONCRETE SHALL BE CLASS "E", EXCEPT FOR RAILING PARAPET WHICH SHALL BE CLASS "C".

FOR FURTHER NOTES SEE SHEET 141

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

NORTH & SOUTH ABUTMENT
BRIDGE NO. CUY-21-1431
WILLOW FREEWAY OVER CLARK FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	CJ RJB			RIY	11-28-62	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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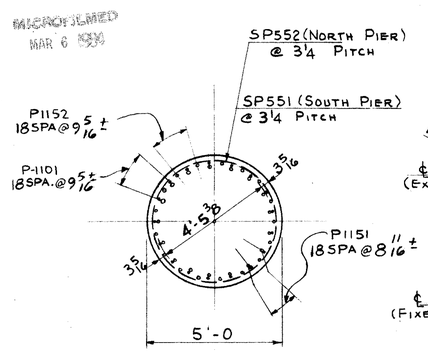
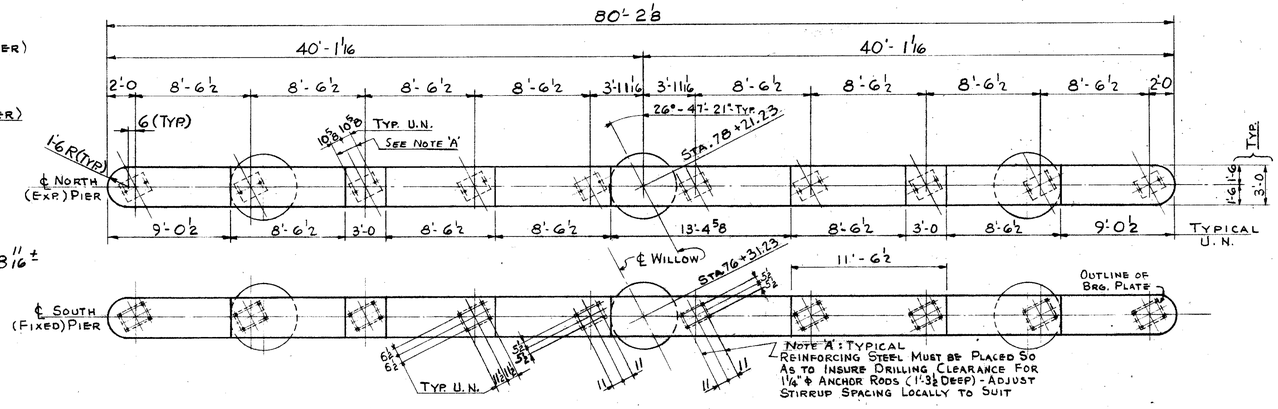
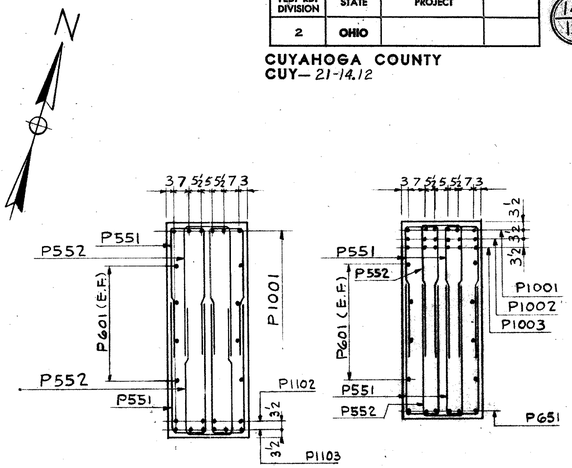
CUYAHOGA COUNTY
CUY— 21-14.12



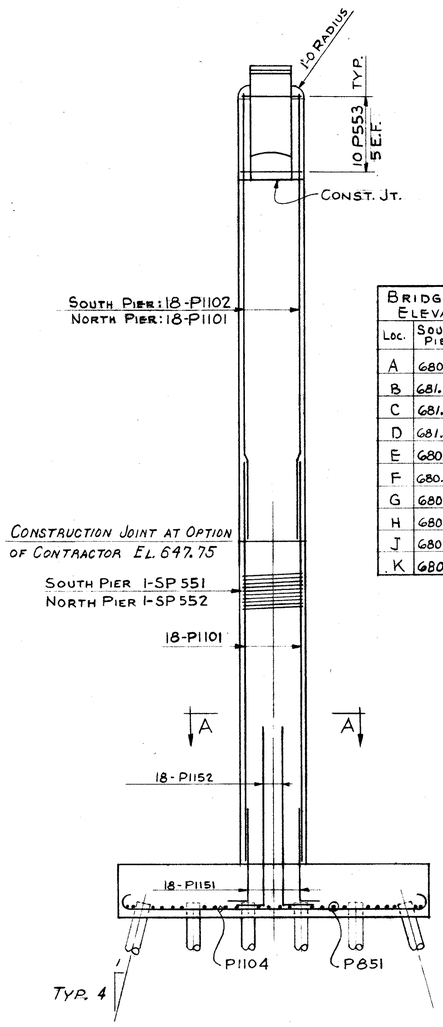


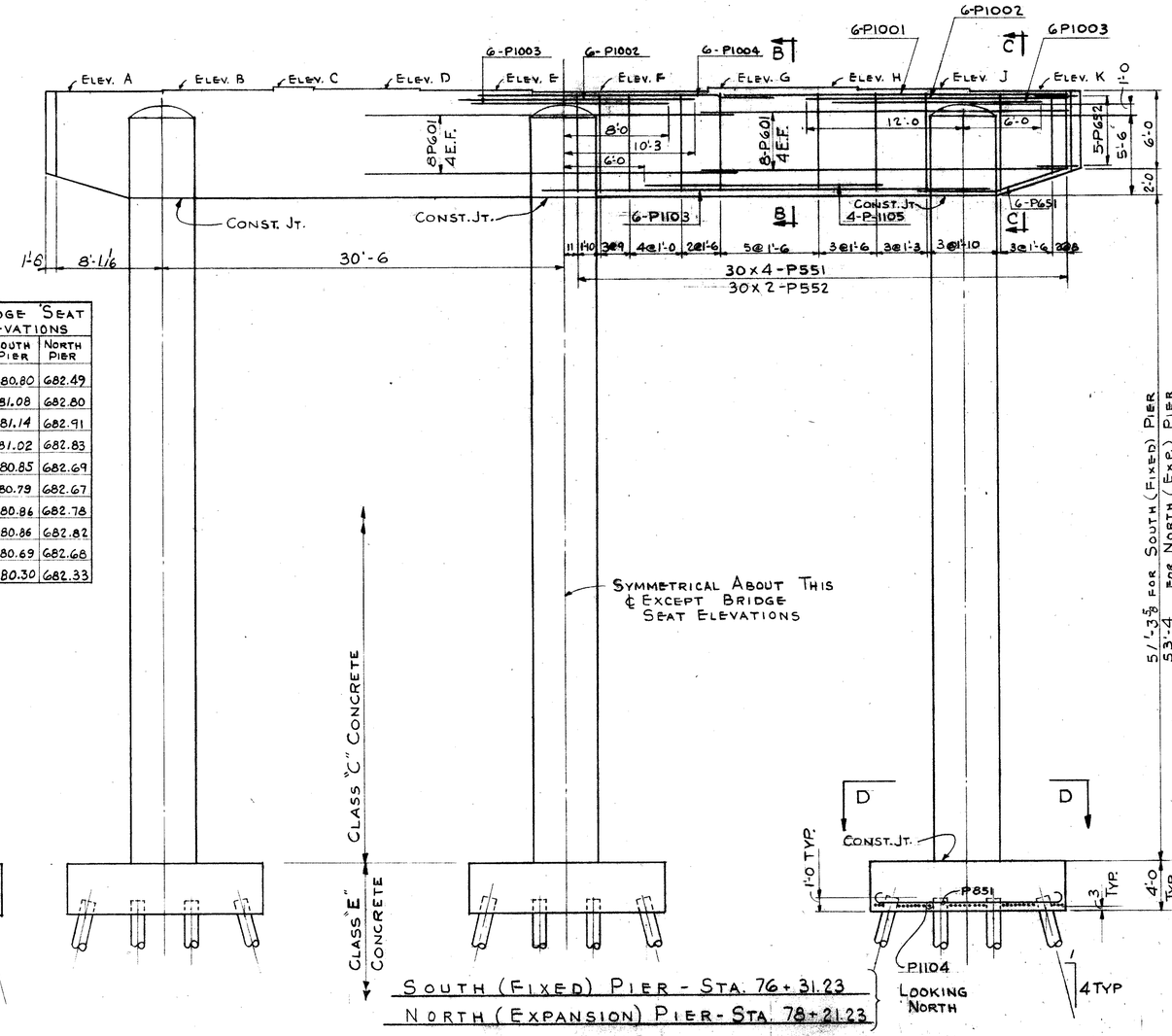


SECTION B-B

SECTION C-C

SECTION A-A





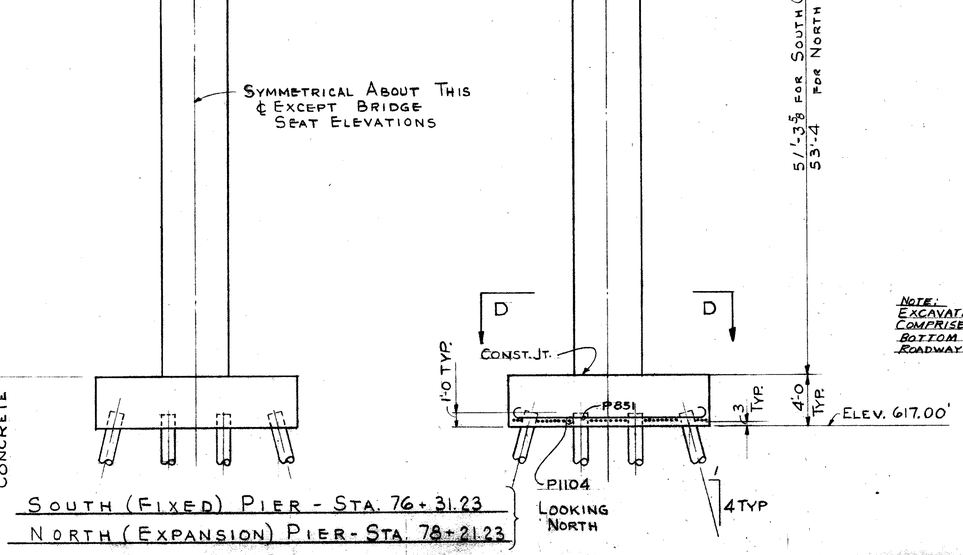
BRIDGE SEAT ELEVATIONS		
Loc.	South Pier	North Pier
A	680.80	682.49
B	681.08	682.80
C	681.14	682.91
D	681.02	682.83
E	680.85	682.69
F	680.79	682.67
G	680.86	682.78
H	680.86	682.82
J	680.69	682.68
K	680.30	682.33

SYMMETRICAL ABOUT THIS ℄ EXCEPT BRIDGE SEAT ELEVATIONS

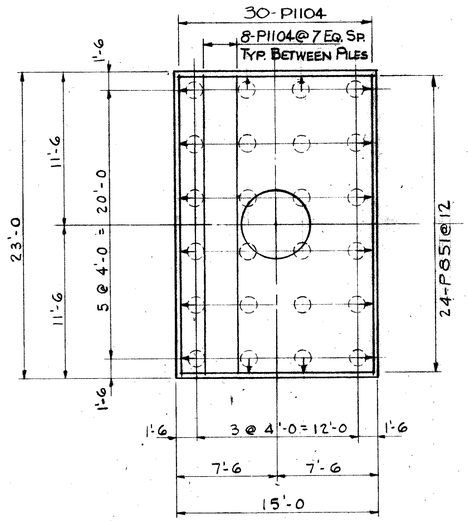
CLASS "C" CONCRETE

CLASS "E" CONCRETE

5'-1-3⅜ FOR SOUTH (FIXED) PIER
53'-4 FOR NORTH (EXP.) PIER



SOUTH (FIXED) PIER - STA. 76+31.23
NORTH (EXPANSION) PIER - STA. 78+21.23



SECTION D-D - TYPICAL

NOTE:
EXCAVATION QUANTITY FOR PIERS COMPRISES MATERIAL BETWEEN BOTTOM OF FOOTINGS AND BOTTOM OF ROADWAY EXCAVATION.

FOR GENERAL NOTES SEE SHEET 141
FOR ELECTRICAL GROUNDING INSTRUCTIONS SEE SHEET 137

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PIER DETAILS

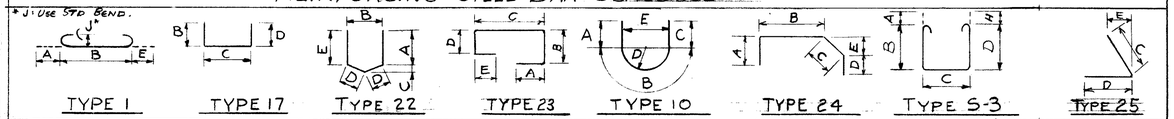
BRIDGE NO. CUY-21-1431
WILLOW FREEWAY OVER CLARK FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RC	RC			RJB	11-28-62	

JOINT. No. 58013-27 SHEET ACCT. No. 1804

REINFORCING STEEL BAR SCHEDULE

* J: USE STD BEND.



PIERS — DWG 144

MARK	NO REQD	LENGTH	TYPE	A	B	C	D	E	WEIGHT
P551	480	11'-0	17		5'-0	1'-3	5'-0		5507
P552	240	11'-4	17		5'-0	1'-7	5'-0		2836
P553	60	10'-0	10	1'-4	7'-4	1'-4	2'-4	4'-8	626
P601	48	27'-0	STR						1944
P651	24	9'-3	19		6'-3	3'-0		0'-11	333
P652	20	8'-6	10	2'-3	4'-1	2'-3	1'-3½	2'-7	256
P851	144	16'-10	1	1'-1	14'-8			1'-1	6471
P1001	24	26'-0	STR						2685
P1002	36	20'-6	STR						3176
P1003	36	16'-0	STR						2479
P1004	12	34'-0	STR						1756
P1101	162	32'-0	STR						27543
P1102	54	29'-6	S						8464
P1103	24	35'-6	STR						4527
P1104	180	25'-10	1	1'-7	22'-8			1'-7	24702
P1105	16	18'-6	STR						1573
P1151	108	9'-3	17		2'-7	7'-0			5308
P1152	108	15'-0	17		2'-7	12'-9			8607

SPIRALS

	NO REQ'D	LENGTH	PITCH	NO TURNS	CORE DIA OUT TO OUT	
SP551	3	51'-3⅜	3¼"	192	56"	9105
SP552	3	53'-4	3¼"	200	56"	9510
					TOTAL	127,408 LBS

NOTES

"LENGTH" SHOWN FOR SPIRAL BARS IS THE DISTANCE FROM TOP OF FOOTING TO BOTTOM OF PIER CAP

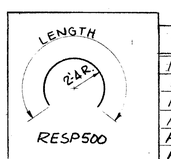
"NO. TURNS" IS "LENGTH" DIVIDED BY "PITCH" PLUS 3 TURNS (TOTAL NUMBER OF CLOSED COILS) TO NEAREST WHOLE NUMBER. SPIRAL REINFORCING BARS SHALL NOT HAVE DEFORMATIONS BUT SHALL IN OTHER RESPECTS CONFORM TO ITEM S.4. 1½ CLOSED COILS SHALL BE PROVIDED AT ENDS OF EACH UNIT.

FOUR STEEL CHANNEL, TEE OR ANGLE SPACERS @ APPROX. 0.68 POUNDS/LIN. FOOT OF SPACER SHALL BE PROVIDED FOR EACH UNIT AND SHALL BE EQUALLY SPACED ALONG THE COIL PERIPHERY. SPACERS WILL BE PAID FOR AS REINF. STEEL & THEIR WEIGHT (BASED ON 0.68#/LIN. FT.) INCLUDED IN TABULATED QUANTITY OF SPIRAL BARS.

ABUTMENTS — DWG. 142 & 143

MARK	NO. REQ'D	LENGTH	TYPE	A	B	C	D	E	WEIGHT
A401	24	6'-5	24	2'-6	1'-1	0'-6	2'-6	0'-1½	103
A402	16	20'-6	STR						219
A403	16	5'-1	24	1'-10	1'-1	0'-6	1'-10	0'-1½	54
A404	28	3'-11	24	1'-3	1'-1	0'-6	1'-3	0'-1½	73
A502	344	11'-0	17		2'-3	6'-9	2'-3		3947
A503	328	7'-3	17		6'-4	1'-0			2480
A504	204	8'-9	17		2'-6½	3'-11	2'-6½		1862
A505	36	18'-9	STR						704
A506	22	23'-9	(						545
A507	12	19'-6							244
A508	4	15'-6							65
A509	4	13'-6							56
A510	4	11'-6							48
A511	12	14'-0	)						175
A512	96	7'-9	STR						776
A513	48	19'-11	17		9'-6	1'-2	9'-6		997
A514	124	6'-10	17		2'-0	3'-1	2'-0		883
A515	48	5'-0	STR						250
A516	24	12'-6	STR						313
A517	40	4'-7	S-3	0'-5	1'-8	0'-8	1'-8	0'-5	191
A518	36	16'-9	STR.						629
A519	8	4'-9	STR						40
A520	24	3'-6	(						88
A521	8	9'-0							75
A522	8	6'-9							56
A523	22	22'-9	STR						522
A524	22	4'-0	24			2'-0	2'-0	1'-0	92
A525	22	4'-0	25			2'-0	2'-0	1'-0	92
A601	164	23'-6	23	8'-8	1'-5	10'-2	0'-11	3'-0	5,789
A901	60	31'-0	STR						6,324
A902	24	16'-9	(						1,367
A903	8	6'-0							163
A904	4	17'-6	STR						238
A1001	22	21'-10	STR						2,127
A1002	22	25'-2	STR.						2,322
A1101	12	19'-6	STR						1,243
A1102	2 SERIES OF 5	11'-6 TO 15'-6	(			VARIES BY 1'-0			717
A1103	16	14'-0							1,190
A1104	48	5'-0	STR						1,275
								TOTAL	38,334 #
R504	16	19'-0	STR						WITH RAILING

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. FOR EXAMPLE, A700 IS A NO.7 SIZE BAR AND A1014 IS A NO.10 SIZE.



REPLACEMENT BARS

MARK	NO REQ'D	LENGTH	TYPE
RE400	1	5'-3	STR
RE500	2	5'-7	(
RE600	1	5'-11	
RE 800	1	6'-6	
RE 900	1	6'-10	
RE 1000	1	7'-2	)
RE 1100	5	7'-6	STR
RESP500	1	5'-7	SEE DETAIL

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

BAR SCHEDULE
BRIDGE NO. CUY-21-1431
WILLOW FREEWAY OVER CLARK FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
		A.F.B.		RIV		11-28-62	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY— 21-14.12

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CONT. NO. 58019-27 SHEET ACCT. NO. 1893

MICROFILMED MAR 6 1963

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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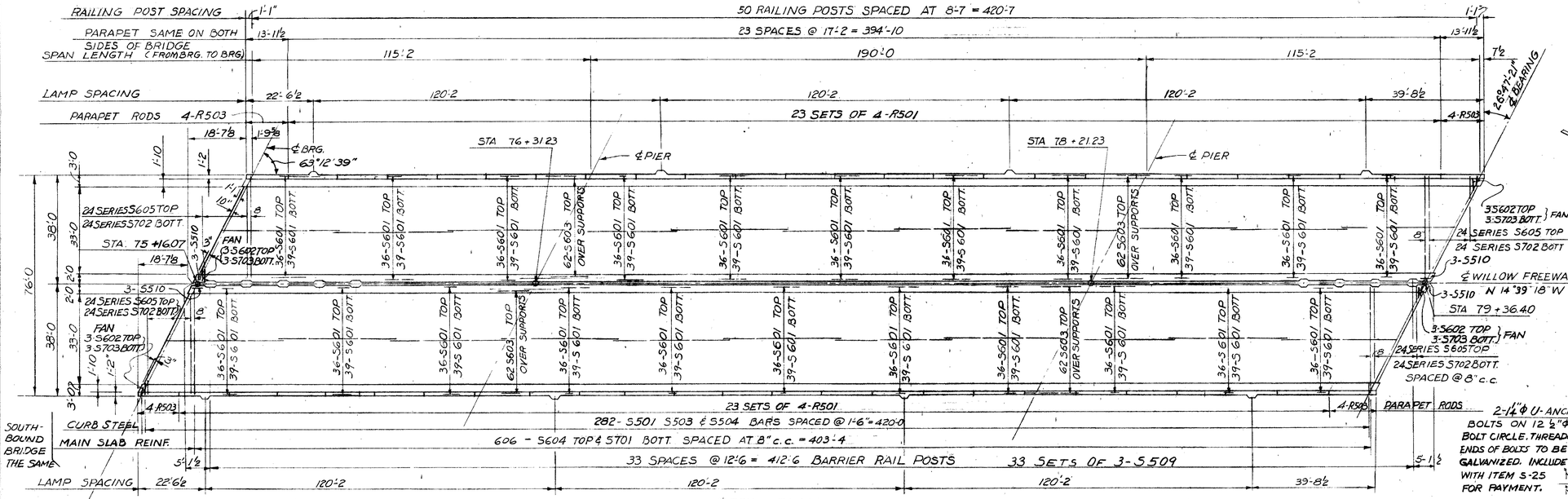
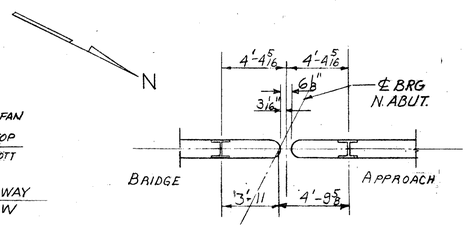
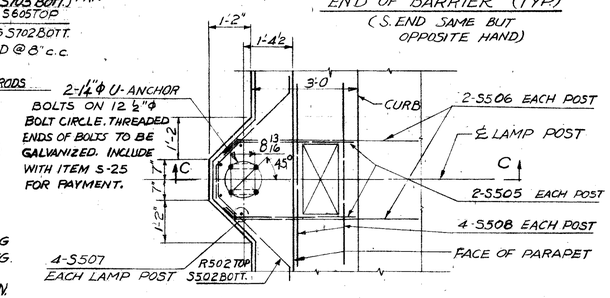
CUYAHOGA COUNTY
CUY—21-14.12



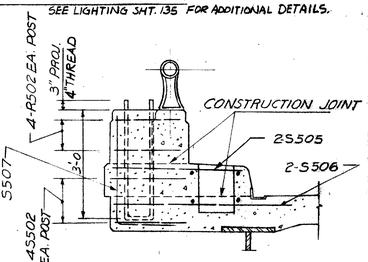
DECK PLAN



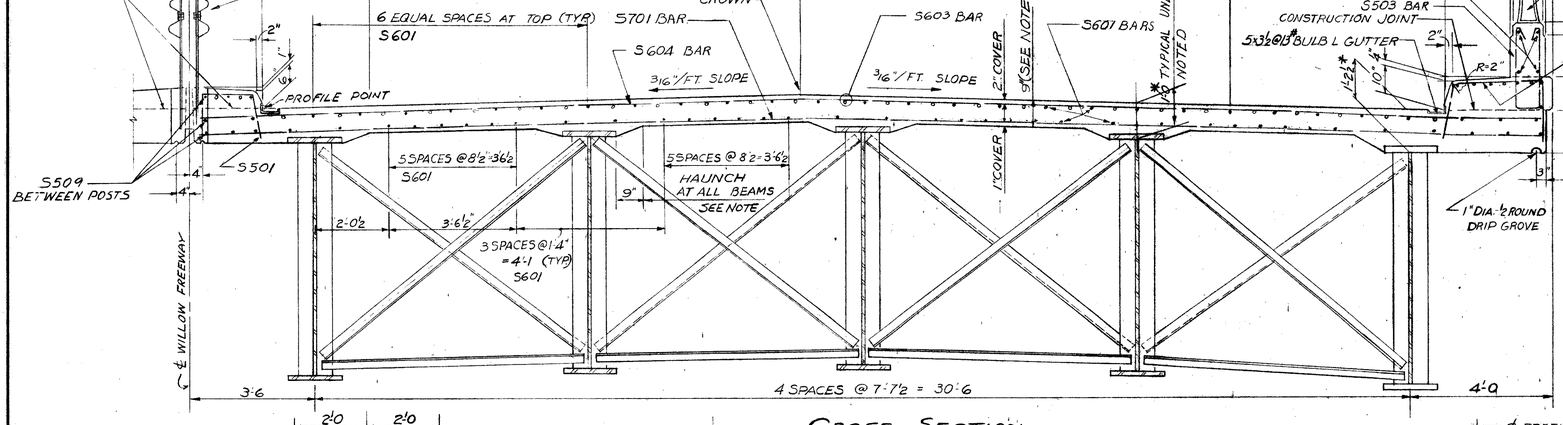


2-¼"ϕ U-ANCHOR BOLTS ON 12½"ϕ BOLT CIRCLE. THREADED ENDS OF BOLTS TO BE GALVANIZED. INCLUDE WITH ITEM S-25 FOR PAYMENT.

LAMP POST SUPPORT - PLAN
SEE LIGHTING SHT. 135 FOR ADDITIONAL DETAILS.



SECTION C-C



NOTE
DECK SLAB HAUNCH: THE HAUNCH IN THE DECK SLAB ADJACENT TO THE TOP OF STEEL GIRDERS, WHICH IS SHOWN AS 9" WIDE MAY VARY FROM THIS DIMENSION BETWEEN THE LIMITS OF 6" AND 12" EXCEPT THAT THE MAXIMUM SLOPE SHALL NOT EXCEED 3 INCHES PER FOOT. PAYMENT FOR DECK SLAB CONCRETE SHALL BE BASED ON THE 9" WIDTH. SLAB THICKNESS SHOWN INCLUDES 1" FOR MONOLITHIC WEARING SURFACE.

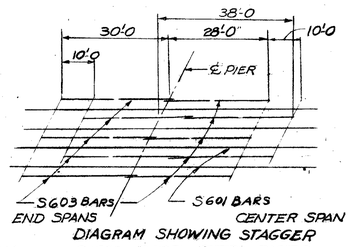
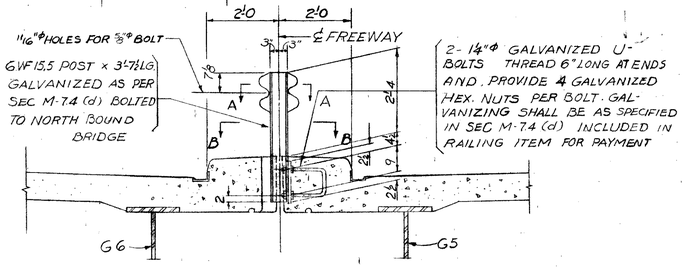


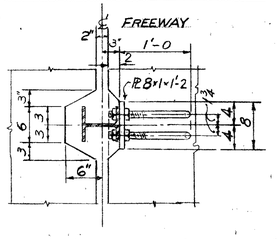
DIAGRAM SHOWING STAGGER S603 BARS OVER PIERS

NOTES.
1. FOR DIMENSION MARKED WITH AN ASTERISK (*), THIS IS A 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 GIRDER MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE.
2. REINFORCEMENT BARS TO BE 1½" CLEAR UNLESS OTHERWISE NOTED.
3. LAP BARS 30 DIAMETERS AT SPLICES.
4. CONCRETE FOR THE DECK SHALL BE CLASS "C".
5. FOR ADDITIONAL NOTES SEE SHEET No. 141
6. FOR BAR SCHEDULE SEE SHEET No. 147

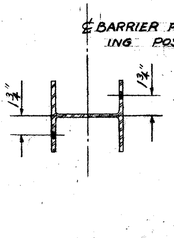


BARRIER POST DETAIL

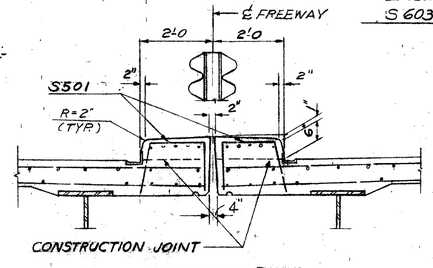
CROSS SECTION



SECTION B-B



SECTION A-A



MEDIAN DETAILS

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

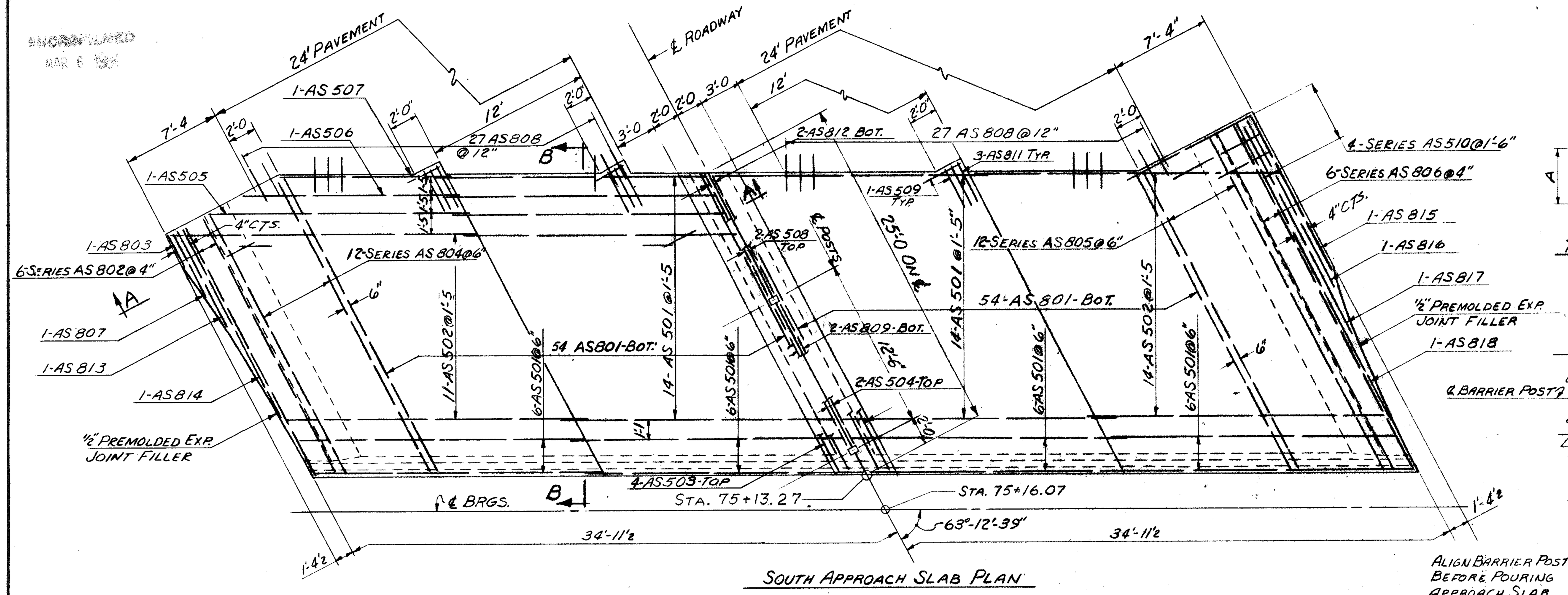
DECK DETAILS
BRIDGE No. CUY-21-1431
WILLOW FREEWAY OVER CLARK FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

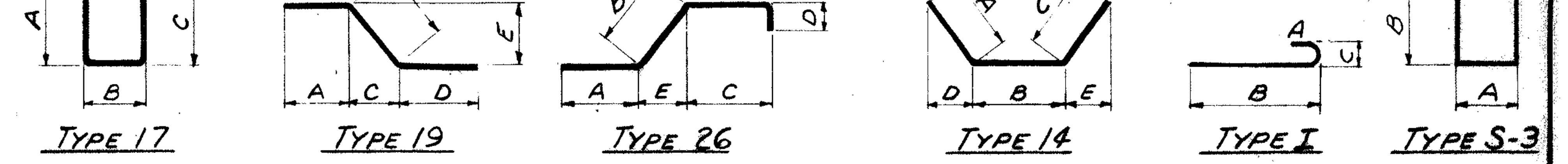
SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	V.C. S.C.H.			D.W.M.	11-28-62	

CONTR. NO. 58019-27 SHEET ACCT. No. 1807

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

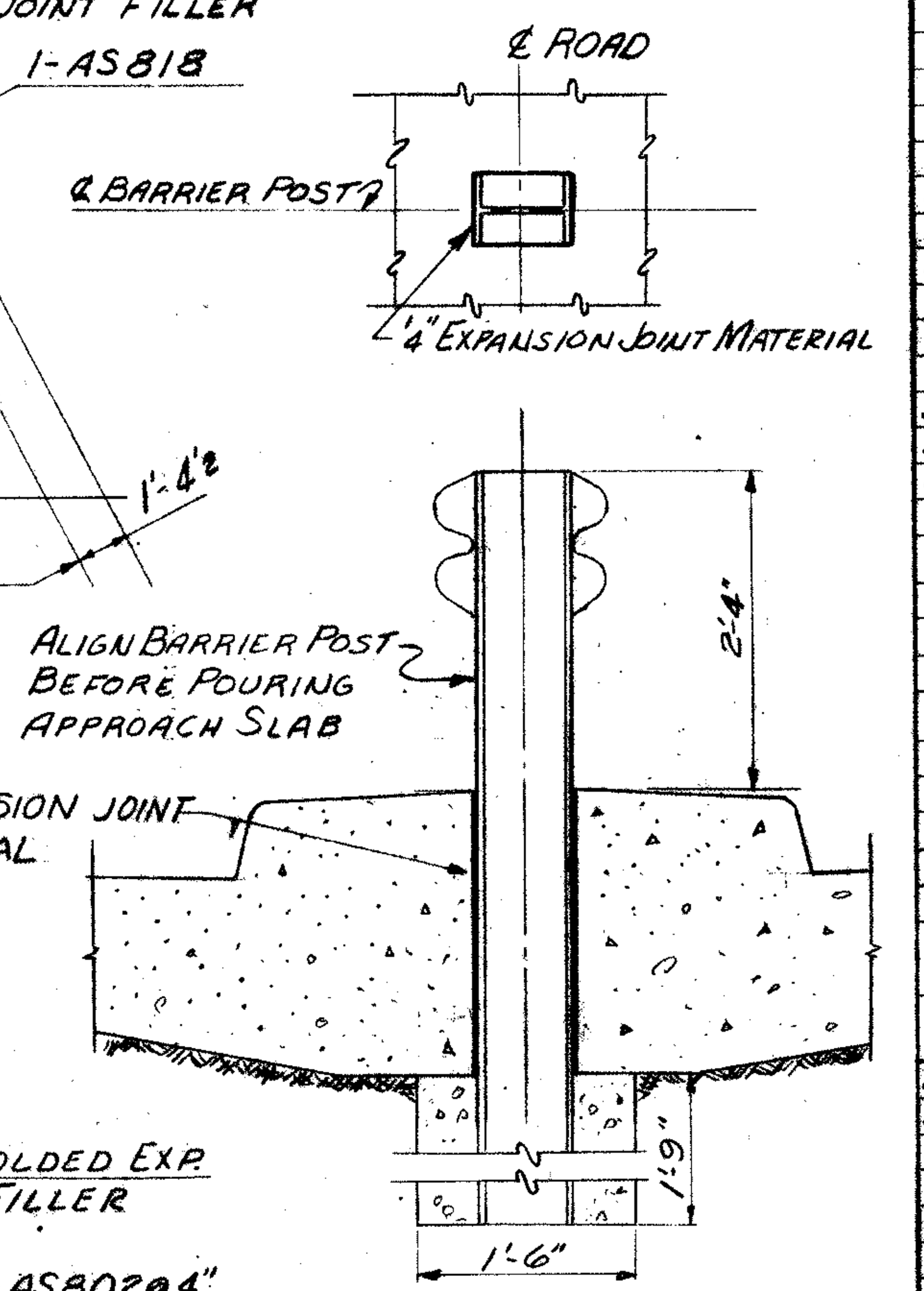
CUYAHOGA COUNTY
CUY— 21-14.12





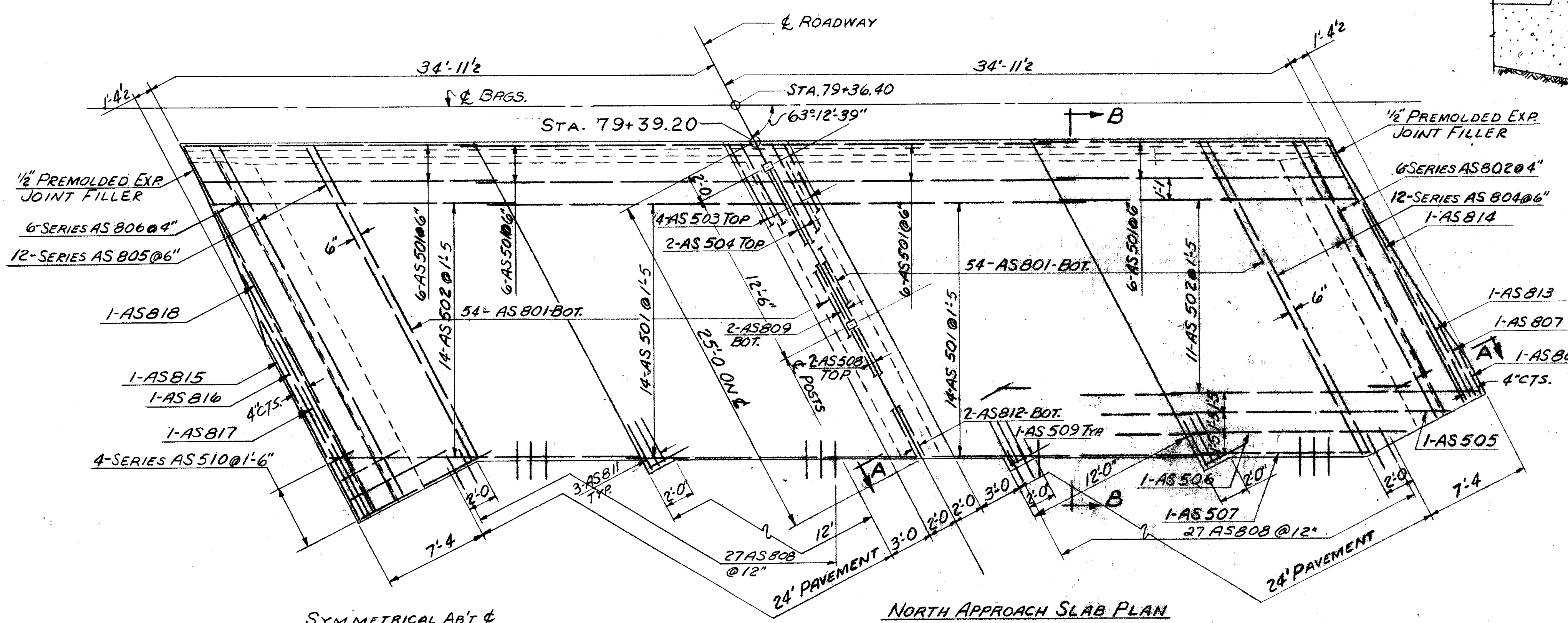
MARK	NO. REQ'D	LENGTH	TYPE	A	B	C	D	E	WEIGHT #
	BRIDGE DECK REINFORCING STEEL								
S501	564	3'-7"	26	—	1'-3"	1'-5"	1'-2"	5"	2,108
S502	32	4'-3"	19	11"	2'-7"	1'-10"	11"	1'-10"	142
S503	564	5'-8"	S-3	8"	2'-2"	5"			3,333
S504	564	5'-1"	26	—	1'-6"	2'-4"	1'-6"	4"	2,990
S505	16	3'-6	14	6"	3'-0"	—	4"		58
S506	16	5'-6	14	6"	5'-0"	—	4"		92
S507	32	4'-10½	17	3'-0"	2'-0"	—			162
S508	32	5'-0	STR.						170
S509	198	11'-4"	STR.						2,340
S510	12	4'-6"	STR.						56
S601	1650	40'-0"	STR.						99,132
S602	12	5'-6"	STR.						99
S603	248	30'-0"	STR.						1,117
S604	1212	37'-5"	STR.						68,120
S605	96	5'-5" TO 36'-1"	STR.	4 SERIES OF 24-4 EACH VARY BY 1'-4"					2,992
S701	1212	37'-5"	STR.						92,702
S702	96	5'-5" TO 36'-1"	STR.	4 SERIES OF 24-4 EACH VARY BY 1'-4"					4,072
S703	12	5'-6"							135
								TOTAL WEIGHT	279,820
R501	184	16'-9"	STR.						
R502	32	4'-3"	19	11"	2'-7"	1'-0"	11"	1'-10"	
R503	16	13'-6"	STR.						
	BARS MARKED WITH THE PREFIX "R" ARE TO BE PAID FOR UNDER ITEM S-14 RAILING								
	APPROACH SLABS REINFORCING STEEL								
AS501	104	20'-3"	STR.						
AS502	50	22'-3"	"						
AS503	8	24'-6"	"						
AS504	4	11'-8"	"						
AS505	2	18'-2"	"						
AS506	2	14'-10"	"						
AS507	2	11'-6"	"						
AS508	4	9'-11"	"						
AS509	6	3'-0"	"						
AS510	8	2'-4" TO 10'-10"	"	2 SERIES OF 4 - 2 EACH VARY BY 2'-10"					
AS511	68	4'-0"	26	—	1'-3"	1'-6"	1'-6¼"	0'-5"	
AS801	216	25'-7"	I	1'-1"	24'-6"	9"			
AS802	12	21'-8" TO 22'-6"	I	1'-1"	20'-7" TO 21'-5"	9"	2 SERIES OF 6 - 2 EACH VARY BY 2"		
AS803	2	2'-10"	I	1'-1"	1'-9"	9"			
AS804	24	22'-9" TO 25'-6"	I	1'-1"	21'-8" TO 24'-5"	9"	2 SERIES OF 12 - 2 EACH VARY BY 3"		
AS805	24	25'-10" TO 28'-7"	I	1'-1"	24'-9" TO 27'-6"	9"	2 SERIES OF 12 - 2 EACH VARY BY 3"		
AS806	12	28'-11" TO 29'-9"	I	1'-1"	27'-10" TO 28'-8"	9"	2 SERIES OF 6 - 2 EACH VARY BY 2"		
AS807	2	5'-8"	I	1'-1"	4'-7"	9"			
AS808	108	1'-6"	STR.						
AS809	4	11'-8"	STR.						
AS811	18	3'-0"	STR.						
AS812	4	9'-11"	STR.						
AS813	2	8'-10"	I	1'-1"	7'-9"	9"			
AS814	2	13'-5"	I	1'-1"	12'-4"	9"			
AS815	2	13'-4"	I	1'-1"	12'-3"	9"			
AS816	2	15'-5"	I	1'-1"	14'-4"	9"			
AS817	2	17'-7"	I	1'-1"	16'-6"	9"			
AS818	2	21'-0"	I	1'-1"	19'-11"	9"			
RE500	1	5'-7"	STR	REPLACEMENT BARS					
RE600	9	5'-11"	STR						
RE700	5	6'-3"	STR						

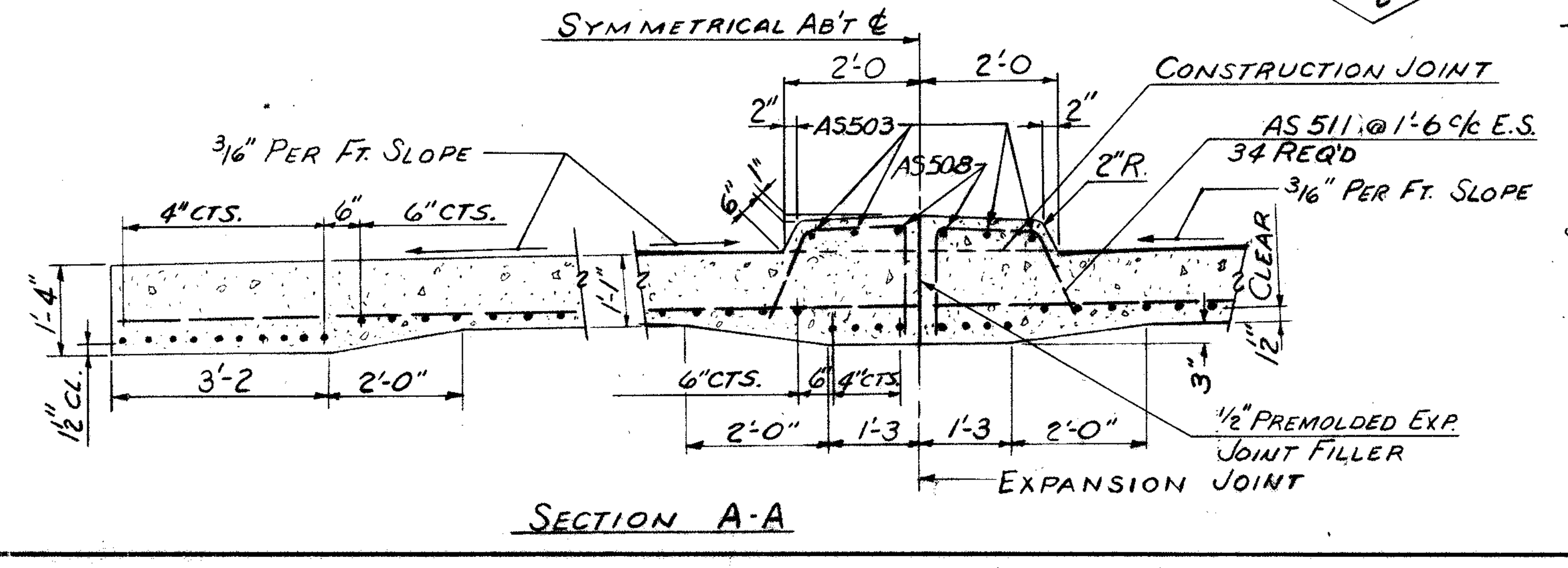
BARS MARKED WITH THE PREFIX "AS" ARE TO BE PAID FOR UNDER ITEM I-7 REINFORCED CONCRETE APPROACH SLABS



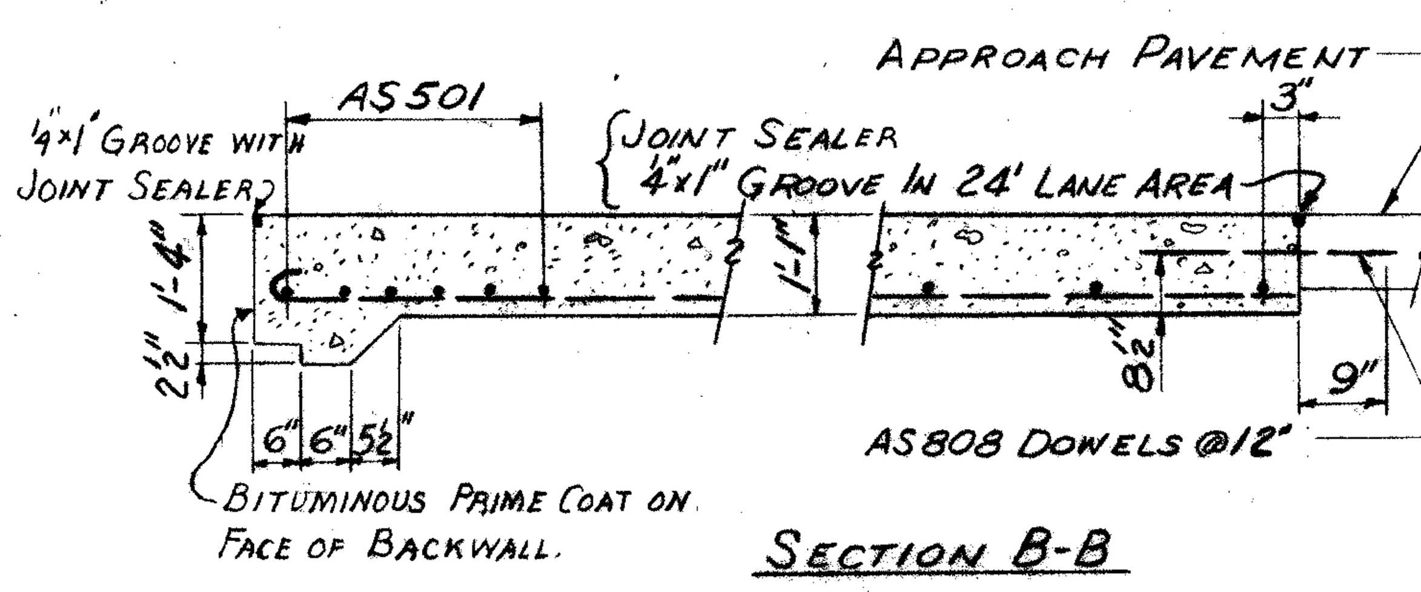
BARRIER POST DETAIL

NOTE
BARRIER POST SHALL BE GALVANIZED 6WF 15.5 × 6'-0". POSTS TO BE INCLUDED FOR PAYMENT UNDER ITEM NO. I-15 GUARD RAIL.





SECTION A-A



SECTION B-B

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT INDICATES THE BAR SIZE NUMBER.
FOR EXAMPLE: S 601 IS A NO. 6 SIZE BAR.
CONCRETE IN APPROACH SLABS SHALL BE CLASS "C"

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

APPROACH SLAB & BAR SCHEDULE

BRIDGE NO. CUY-21-1431
WILLOW FREEWAY OVER CLARK FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE			DATE		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE / REVISED
	C.A.B.		S.C.H. D.W.M.		11-28-62

CONT. NO. 58019-27 SHEET ACCT. NO. 1810

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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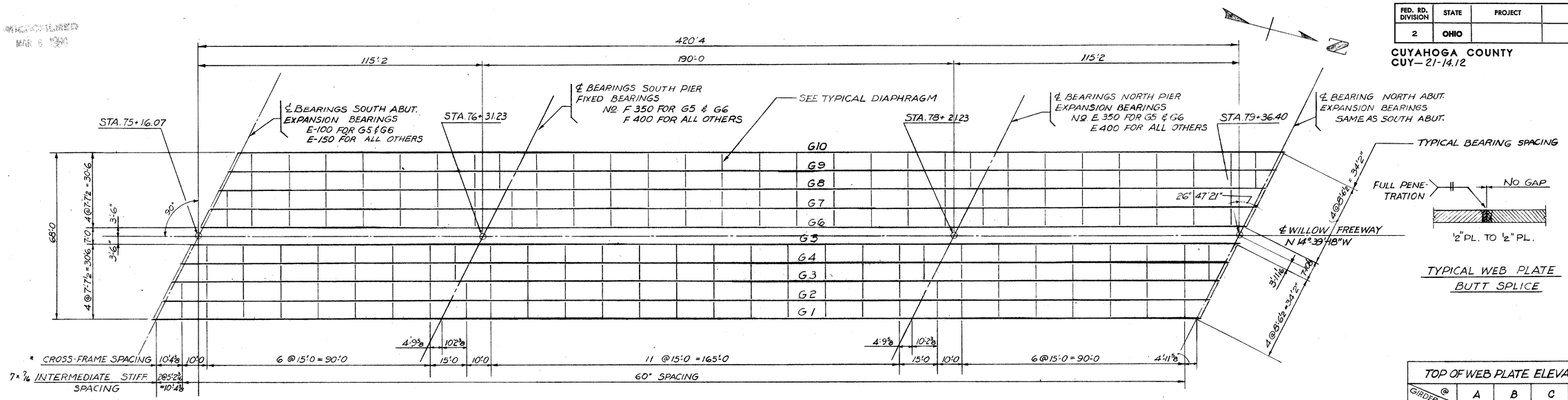
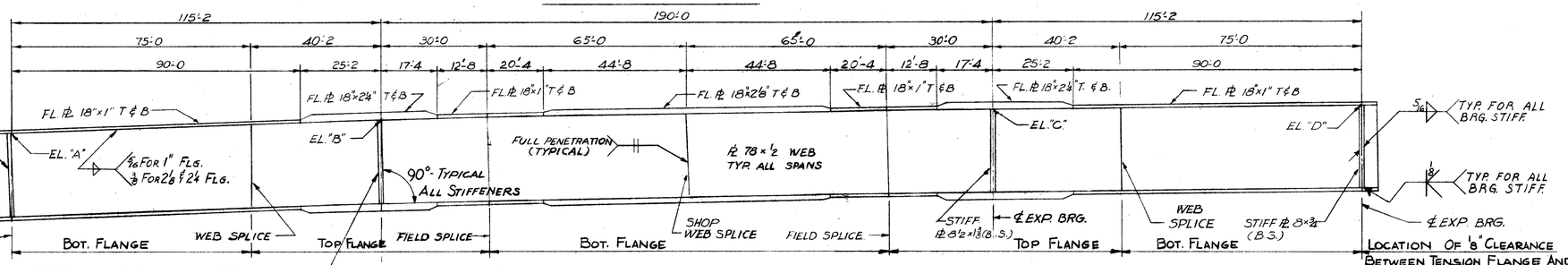
CUYAHOGA COUNTY
CUY—21-14.12



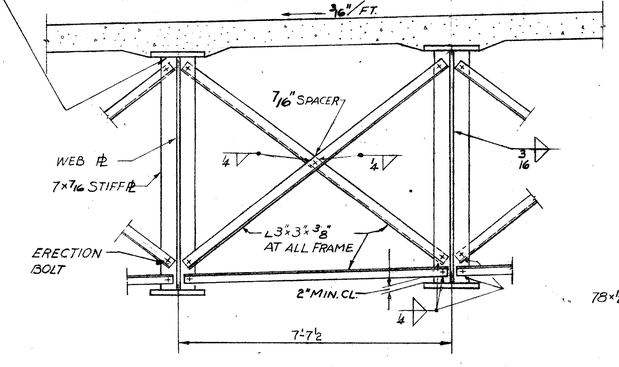
TYPICAL WEB PLATE BUTT SPLICE

NOTE *
THE SPACING IS THE SAME FOR SOUTH BOUND BRIDGE BUT OPPOSITE HAND FROM THAT SHOWN.

STEEL FRAMING PLAN

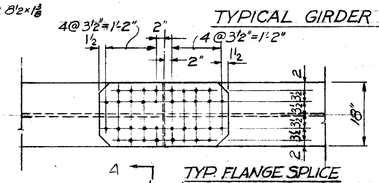


SUPPLEMENTARY TO SECTION S-7.14 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS, INTERMEDIATE STIFFENERS OF WELDED, BUILT-UP GIRDERS SHALL HAVE CONTACT BEARING WITH THE COMPRESSION FLANGE, BUT MAY HAVE A CLEARANCE OF NOT MORE THAN ⅛ INCH FROM THE TENSION FLANGE AT THE LOCATIONS SHOWN. IN SHOP PAINTING, CARE SHALL BE TAKEN TO MAKE CERTAIN THAT PAINT IS FORCED THROUGH FROM ONE SIDE TO THE OTHER OF THE ⅛" OPENING.

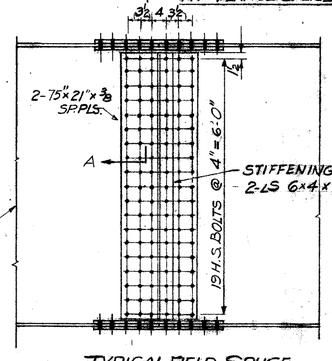


TYPICAL DIAPHRAGM
(See sheet 148 A for revised detail)

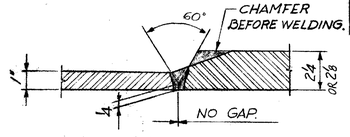
TYPICAL GIRDER ELEVATION



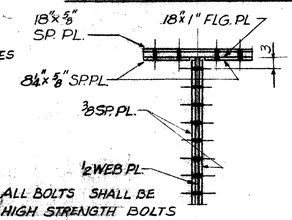
TYP. FLANGE SPLICE



TYPICAL FIELD SPLICE

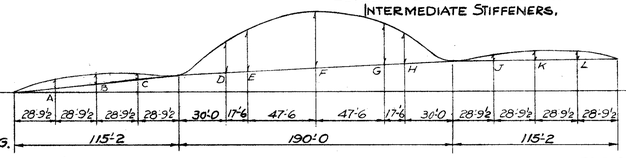


TYPICAL FLANGE SPLICE (SHOP)



NOTE: ALL BOLTS SHALL BE ⅞" ℄ HIGH STRENGTH BOLTS

SECTION A-A



DEFLECTION AND CAMBER
(SEE TABLE BELOW)

DEFLECTION AND CAMBERS

GR.	DESCRIPTION	A℄L	B℄K	C℄J	D℄H	E℄G	F
G1 & G10	DEFLECTION DUE TO STEEL WT.	1⅞"	—	—	¼"	7/16"	¾"
	" DUE TO REMAINING D.L.	1¼"	1⅜"	—	⅞"	1⅝	2⅝
	VERTICAL CURVE	⅞"	1⅛"	⅞"	1⅝"	2¼"	2⅞
	SUM OF DEFLECTION	1¼"	1⅜"	⅞"	2¾"	4⅝	6⅜
	CAMBER REQUIRED	1¼"	1⅜"	⅞"	2¾"	4¼"	6¼
G2 & G3 & G4 & G5 & G6	DEFLECTION DUE TO STEEL WT.	1⅞"	—	—	¼"	7/16	¾
	" DUE TO REMAINING D.L.	1¼"	1¼"	—	⅝"	1 3/16	1⅞
	VERTICAL CURVE	⅞"	1⅛	⅞"	1⅝"	2¼	2⅞
	SUM OF DEFLECTION	1¼"	1⅜"	⅞"	2½"	3⅞	5½
	CAMBER REQUIRED	1¼"	1⅜"	⅞"	2½	3⅞	5½
G5 & G6	DEFLECTION DUE TO STEEL WT.	1⅞"	—	—	¼	7/16	¾
	" DUE TO REMAINING D.L.	1¼"	1¼"	—	¾	1⅜	2 3/16
	VERTICAL CURVE	⅞"	1⅛"	⅞"	1⅝	2¼	2⅞
	SUM OF DEFLECTION	1¼"	1⅝	⅞"	2⅝	4 1/16	5 13/16
	CAMBER REQUIRED	1¼"	1⅜"	⅞"	2⅝	4	5¾

TOP OF WEB PLATE ELEVATIONS

GIRDER @	A	B	C	D
G-10	686.00	687.95	689.61	689.66
G-9	686.25	688.23	689.92	690.00
G-8	686.29	688.29	690.03	690.13
G-7	686.15	688.17	689.95	690.07
G-6	685.95	688.00	689.81	689.96
G-5	685.87	687.94	689.79	689.97
G-4	685.91	688.01	689.90	690.09
G-3	685.89	688.01	689.94	690.16
G-2	685.69	687.84	689.80	690.05
G-1	685.28	687.45	689.45	689.72

All full penetration welds shall be back-gouged and welded after welding far side.

Butt welds on beam and girder flange plates shall be ground flush, the finish grinding being parallel to the direction of stress.

FOR DETAILS OF BEARINGS E-100, E-150, E-350 & E-400 SEE STD. DWG. FSBI-62, DATED 1-1-63
FOR DETAILS OF BEARING F-350 & F-400 SEE SHT. NO. 149
SHOPSPLICE: IF ADDITIONAL SHOP SPLICES ARE NECESSARY, THEIR LOCATION AND DETAIL SHALL BE SUBMITTED TO THE DIRECTOR FOR APPROVAL PRIOR TO ORDERING OF MATERIAL.
ERECTION PROCEDURE. CONTRACTOR SHALL SUBMIT TO THE DIRECTOR FOR APPROVAL THREE (3) PRINTS SHOWING HIS PROPOSED ERECTION PROCEDURE.
TACK WELD NUTS OF ERECTION BOLTS IF THEY ARE LEFT IN PLACE
FOR ADDITIONAL NOTES SEE SHEET No. 141

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

STEEL FRAMING

BRIDGE NO. CUY-21-1431
WILLOW FREEWAY OVER CLARK FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

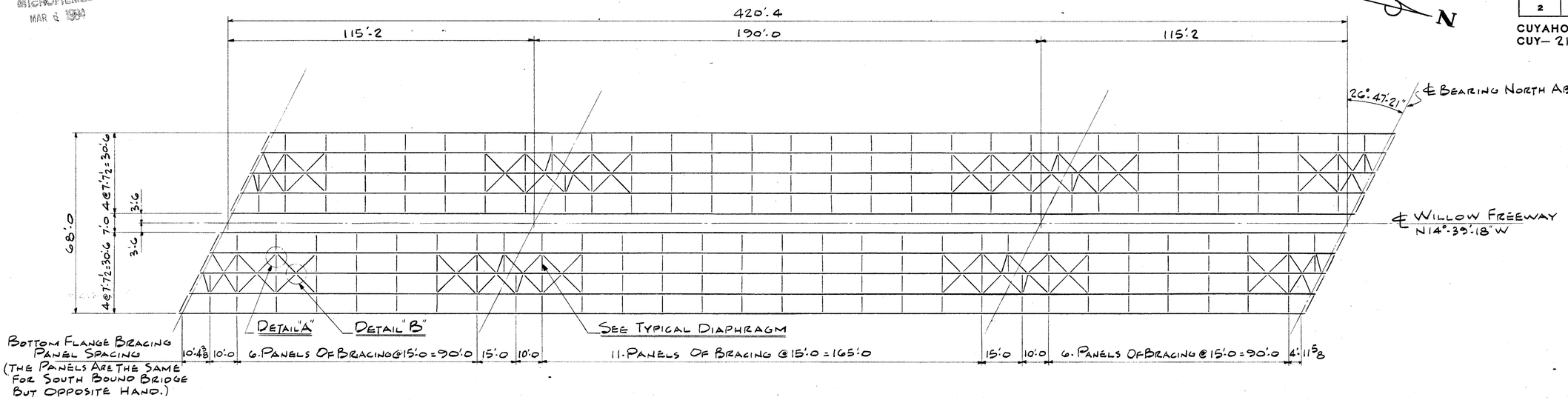
SCALE	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DESIGNED						
R.D.H.	V.C.		S.C.N.			3-3-64
	S.C.N.		D.W.M.		11-28-62	

CONTRACT NO. 58013-27 — SHEET ACCT. NO. 1808

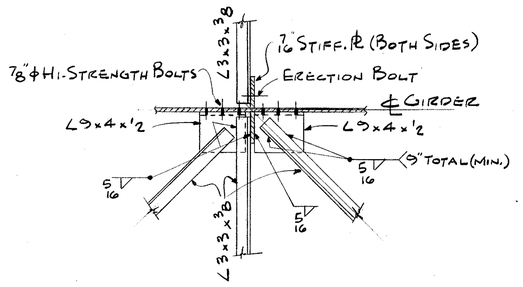
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

148A / 198

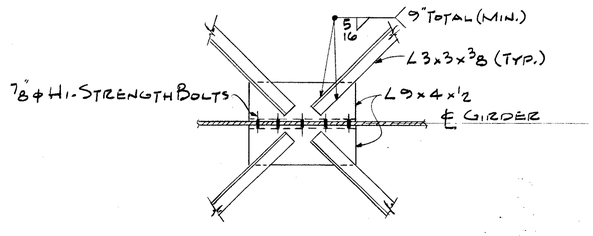
CUYAHOGA COUNTY
CUY-21-14.12



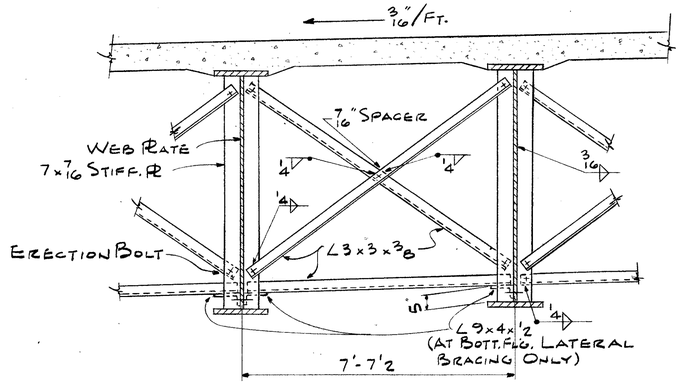
Bottom Flange Bracing Plan



Detail "A"
¾" = 1'-0"



Detail "B"
¾" = 1'-0"



Typical Diaphragm
½" = 1'-0"

For General Notes See Drwgs. No 141 & 148

Work This Drwg. With Drwg. No 148

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

Steel Framing

Bridge No CUY-21-1431
Willow Freeway Over Clark Freeway
Willow-Clark Interchange
Cuyahoga County

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	W.P.H.		D.W.M.			3-3-64

Cont. No 58019 67 Sheet Agt. No 1812

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

149
198

CUYAHOGA COUNTY
CUY— 21-14.12

Specification for Self-Lubricating Bronze Bearing Plates

Self-Lubricating Bronze Bearing Plates Shall be Made by an Established Manufacturer of These Products and Shall Conform to the Following Requirements.

(a) Cast Phosphor Bronze Shall Conform to Sec. M-7.11 of the Construction and Material Specifications, ASTM Designation B22, Alloy B, and Shall Have an Allowable Unit Stress of 2,500 psi in Compression.

(b) The Lubricant Shall be of the Solid Type and Shall Consist of Graphite, Metallic Substances Having Lubricating Properties and a Lubricating Binder. Materials Which do not Have Lubricating Qualities or Which Promote Chemical or Electrolytic Reactions, Will not be Acceptable. The Lubricant Shall be Compressed Into the Lubrication Recesses With Hydraulic Pressure of at Least Five Times the Design Unit Loading to Form a Dense, Non-Plastic Lubricant.

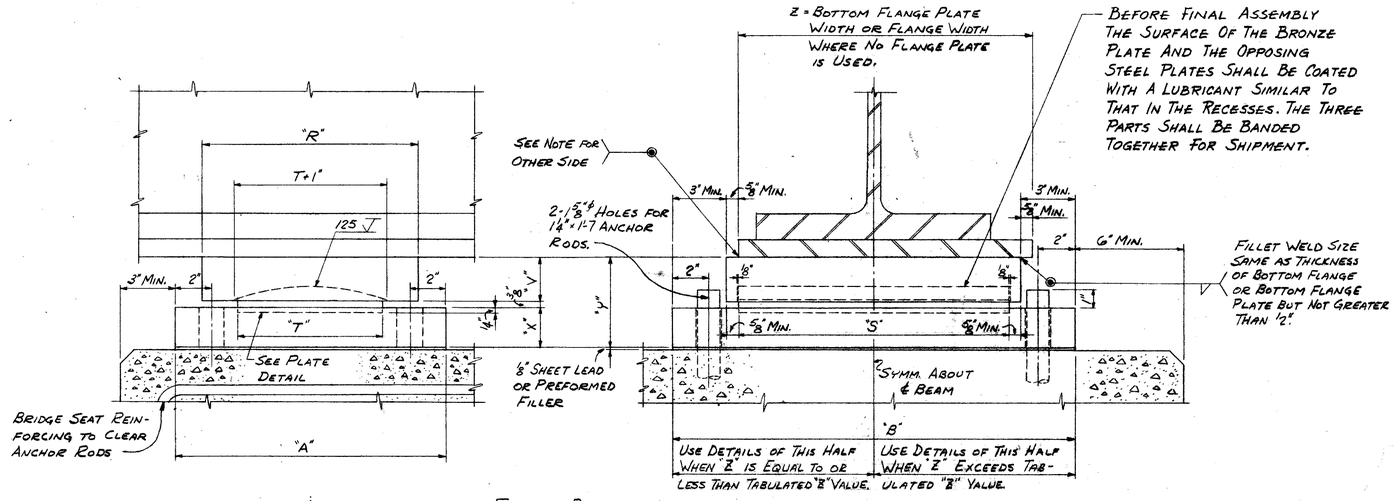
(c) The Recesses for the Lubricant Shall Consist Either (1) of Annular Rings With or Without Central Circular Recess With a Depth at Least Equal to the Width of the Ring or Diameter of Hole or (2) of Circular Recesses Approximately 5/16" in Diameter and 3/16" to 1/4" Deep.

(d) The Recesses Shall be Arranged in a Geometric Pattern Such That Successive Rows Shall Overlap in the Direction of Motion and the Distance Between Extremities of Recesses Shall be Closer in the Direction of Motion Than That Perpendicular to Motion. The Entire Bearing Area of All Surfaces Which Have Provision for Motion Shall be Lubricated by Means of These Lubricant Filled Recesses. The Total Area of These Recesses Shall Comprise Not Less Than 25 Per Cent nor More Than 35 Per Cent of the Total Bearing Area of the Plate.

(e) Bearing Surfaces of the Bronze Bearing Plates and Opposing Steel Plates Shall be Machine Finished to the Surface Roughness Shown on This Drawing. The Lay of the Tool Marks Shall be in the Direction of Motion. All Machine Surfaces Shall be Flat Within 0.005 Inch Per Inch of Length and Width.

(f) For Mating Curved Surfaces of Steel and Bronze, the Concave Surface Shall Have a Positive Tolerance Not Exceeding .010 Inch and the Convex Surface a Negative Tolerance of 0.010 Inch.

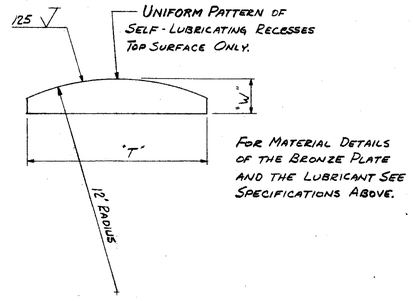
(g) The Coefficient of Friction Between the Bronze Self-Lubricating Plates and the Steel Plates in Contact With Them Shall Not Exceed 0.10 When Subjected to the Design Loading.



Fixed Bearing
(See Table for Additional Dimensions)

Fixed Bearing No.	Fixed Bearings Dimensions (Inches) A	B	R	S	T	V	W	X	Y	Z	Weight Ea. (Lb.)	Maximum Load (Lb.)
① F-350	15	26	12	16	9	2 1/2	1 3/4	2 1/2	5 3/8	18 1/2		350,000
① F-400	17	27	12	17	10	2 1/2	1 15/16	2 1/2	5 3/8	19 1/2		400,000
① F-450	19	27	14	17	11	3	2 1/4	2 1/2	5 3/8	19 1/2		450,000
① F-500	21	27	14	17	12	3 1/4	2 9/16	2 1/2	6 1/8	19 1/2		500,000

① Bearing Stiffeners Are Required.



Self-Lubricating Bronze Plate Detail

Design Specifications: This Drawing Conforms to the Requirements of "Design Specifications for Highway Structures" of the State of Ohio, Department of Highways, Dated September 1, 1957, Together With Revisions Thereof Dated February 21, 1958, and February 15, 1961.

Steel: Plates and Rods Shall Conform to ASTM Designation A36-62T.

Limitations: When the Roadway Gradient at a Bearing is Over 4.0%, the Top of the Upper Steel Plate Shall be Beveled to Match the Roadway Gradient.

Lateral Expansion: All Bearings Must be Accurately Placed in Order That Proper Clearance Will be Provided at All Bearings for Lateral Expansion of the Superstructure.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

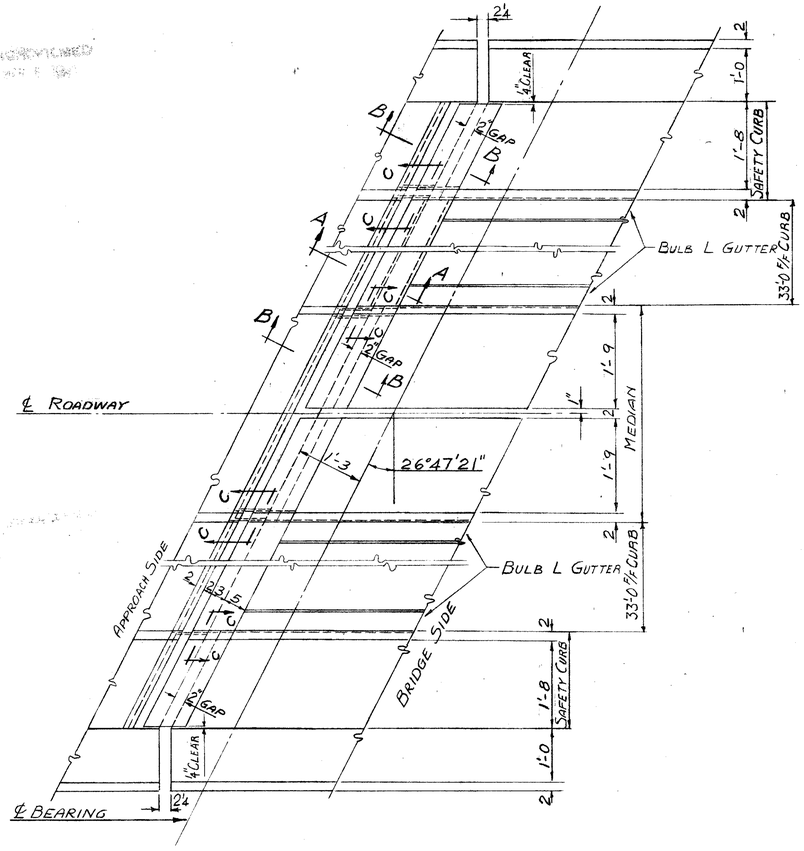
Special Fixed Bearing
Bridge Nº Cuy-21-1431
Willow Freeway Over Clark Freeway
Willow-Clark Interchange
Cuyahoga County

SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	R.D.N.		DWM	GCH	11-28-62	

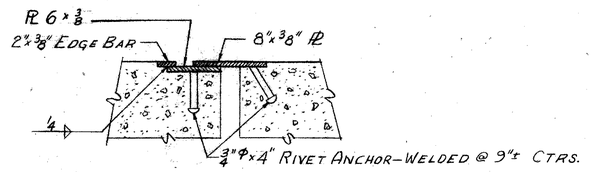
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

150
198

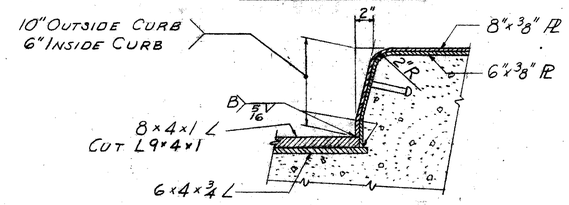
CUYAHOGA COUNTY
CUY-21-14.12



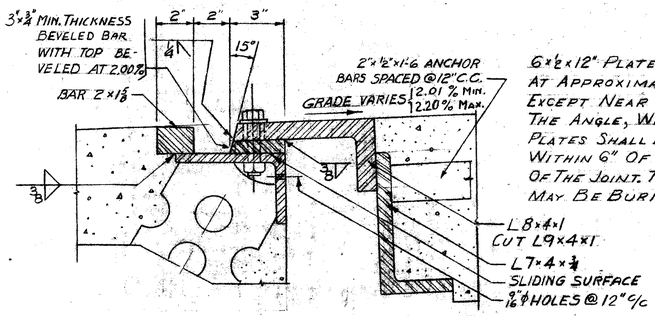
PLAN OF ABUTMENT END FINISH



SECTION B-B



SECTION C-C

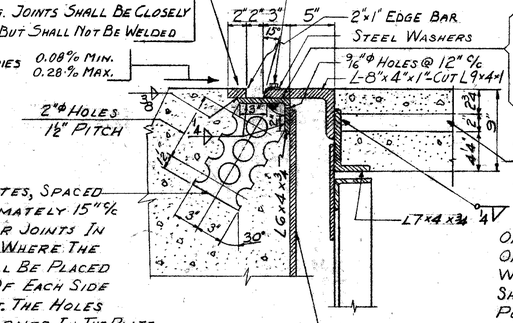


MODIFIED SECTION E-E FOR SOUTH ABUTMENT
FOR DIMENSIONS & DETAILS NOT SHOWN SEE SECT. E-E

PROVIDE JOINTS IN EDGE BAR & SUPPORTING ANGLE AT ℄ ROADWAY, JOINTS IN ABUTMENT, & AT CHANGE IN GRADE. ADDITIONAL JOINTS MAY BE USED AT NOT LESS THAN 6'-0 SPACING. JOINTS SHALL BE CLOSELY BUTTED BUT SHALL NOT BE WELDED

GRADE VARIES 0.08% MIN. 0.28% MAX.

5/8" ϕ x 2" BOLTS AT NOT MORE THAN 2'-0 c/c WITH NUTS TACK-WELDED TO UNDER SIDE OF LOWER ANGLE. 1 1/16" ϕ HOLES IN UPPER ANGLE. CENTER 5/8" ϕ BOLTS IN 1 1/16" ϕ HOLES. APPLY FLAKE GRAPHITE BETWEEN WASHERS AND ANGLES. TURN BOLTS TIGHT AND RELEASE ONE-HALF TURN. REMOVE BOLTS AS SOON AS CONCRETE HAS SET, PREFERABLY WITHIN TWO HOURS AFTER PLACING, TO AVOID DAMAGE DUE TO TEMPERATURE EXPANSION OR CONTRACTION OF SUPERSTRUCTURE. FILL HOLES WITH LEAD.



THIS CONTACT SURFACE SHALL NOT BE PAINTED AND SHALL BE LUBRICATED WITH FLAKE GRAPHITE PRIOR TO PLACING OF BACKWALL CONCRETE.

ANCHOR BARS 2 x 1/2 x 1'-6 @ 12" c/c PLACED PARALLEL WITH LONGITUDINAL REINFORCING STEEL.

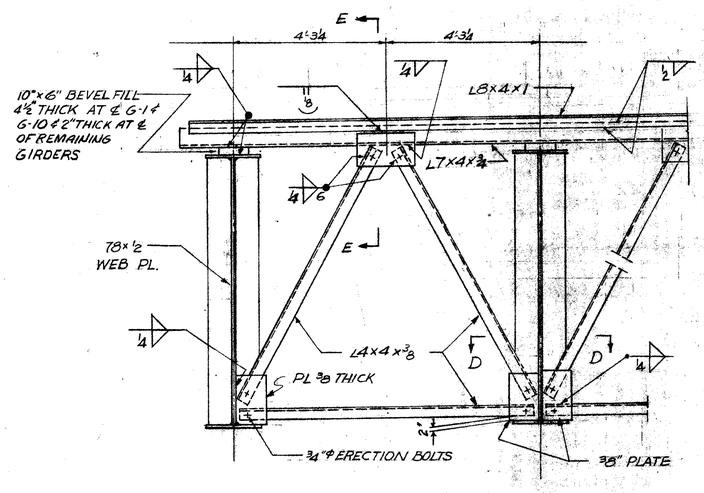
OMIT SHOP COAT ON ALL PORTIONS OF END DAM. PORTIONS IN CONTACT WITH STEEL OR WITH CONCRETE SHALL NOT BE PAINTED. ALL OTHER PORTIONS SHALL BE CLEANED AND GIVEN THE SHOP COAT IN THE FIELD AS WELL AS THE TWO FIELD COATS.

6 x 1/2 x 12" PLATES, SPACED AT APPROXIMATELY 15" c/c EXCEPT NEAR JOINTS IN THE ANGLE, WHERE THE PLATES SHALL BE PLACED WITHIN 6" OF EACH SIDE OF THE JOINT. THE HOLES MAY BE BURNED IN THE PLATE.

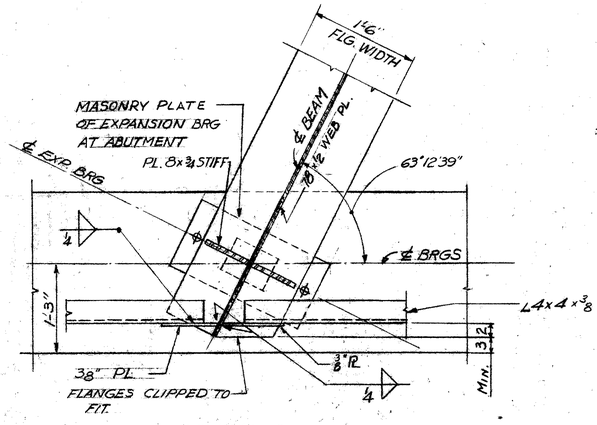
TOP OF BACKWALL FORM SHALL BE BELOW 9/16" ϕ HOLES IN L-6 x 4 x 3/4

SECTION E-E FOR NORTH ABUTMENT

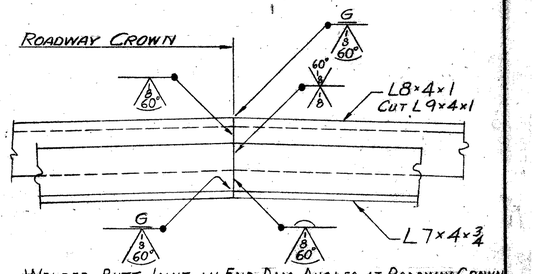
SECTION A-A



TYPICAL ABUT. CROSS FRAME



SECTION D-D



WELDED BUTT JOINT IN END DAM ANGLES AT ROADWAY CROWN

FOR GENERAL NOTES SEE SHEET No. 141

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

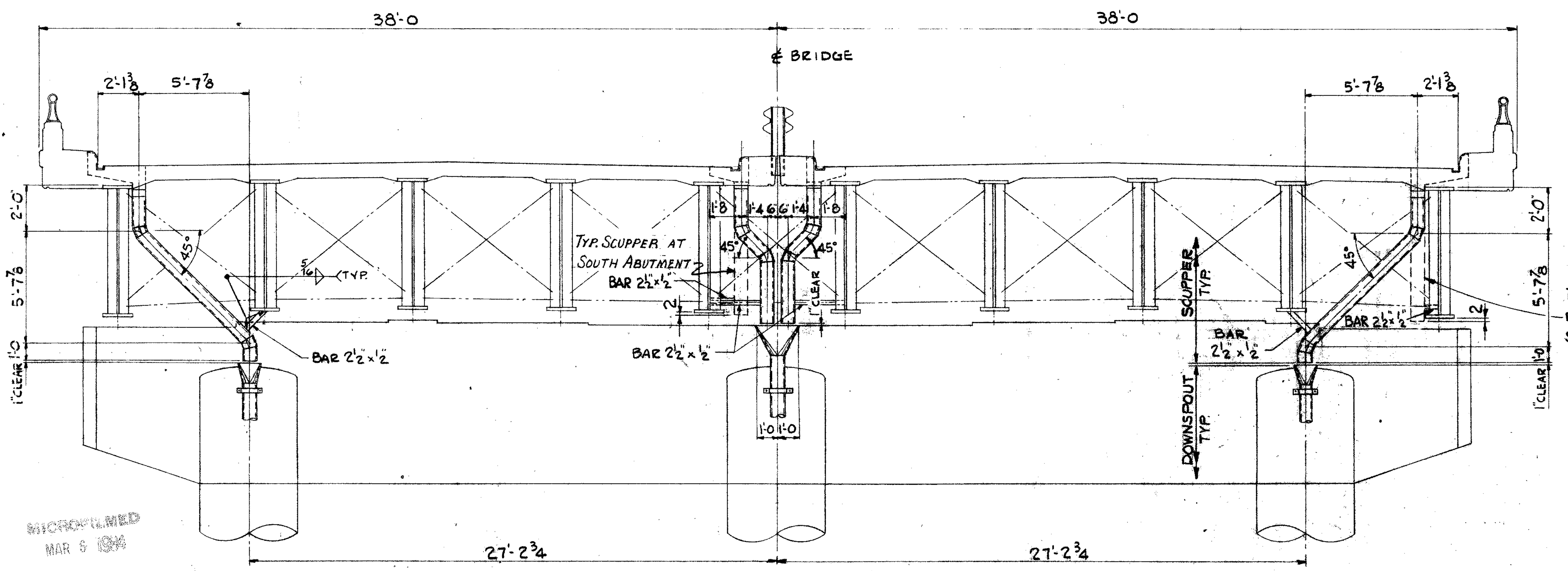
END FINISH

BRIDGE No. CUY-21-1431
WILLOW FREEWAY OVER CLARK FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

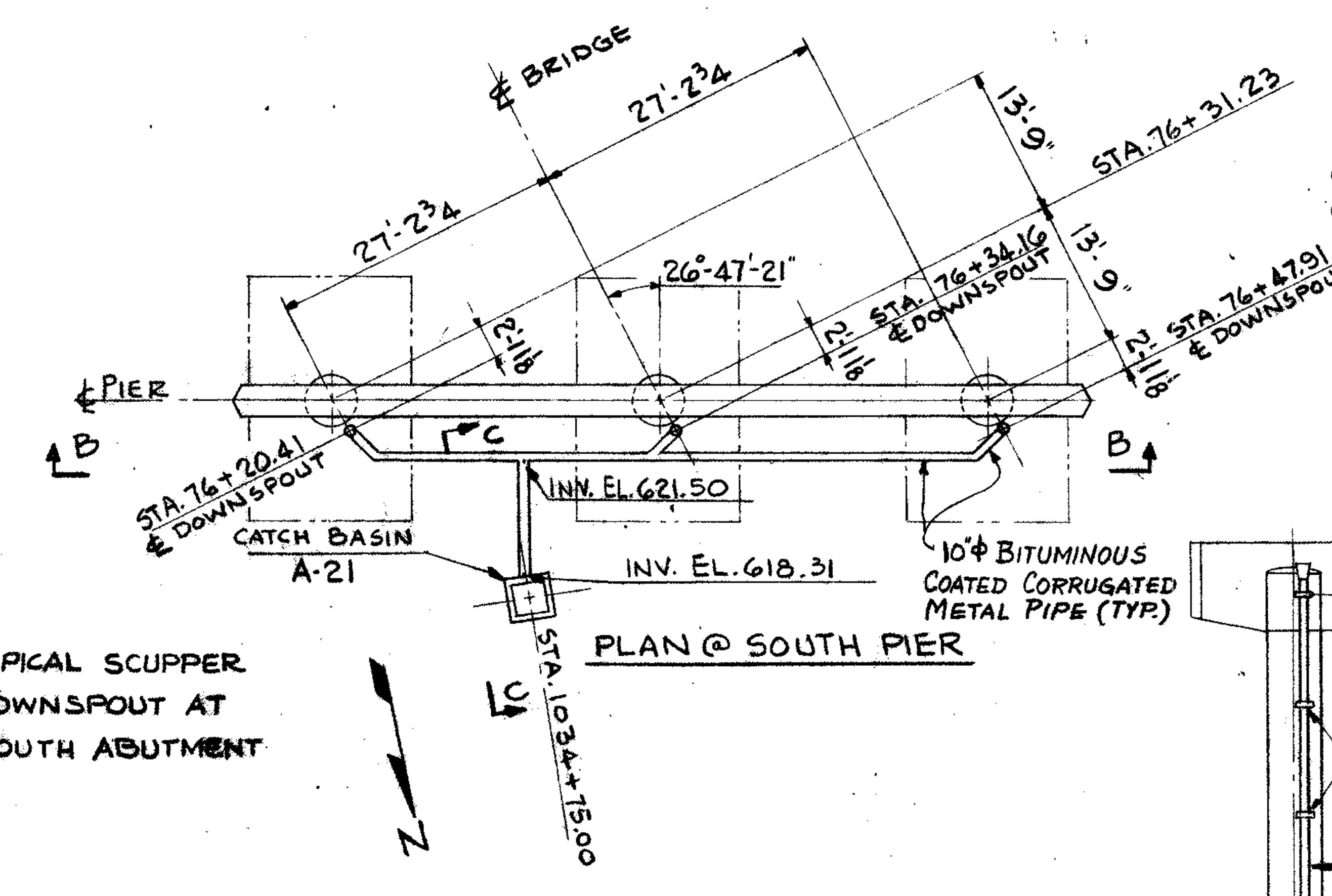
SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	APPROVED
		N.N.		DWM		11-22-62	

CONT. No. 58019-22 SHEET ACCT. No. 1029

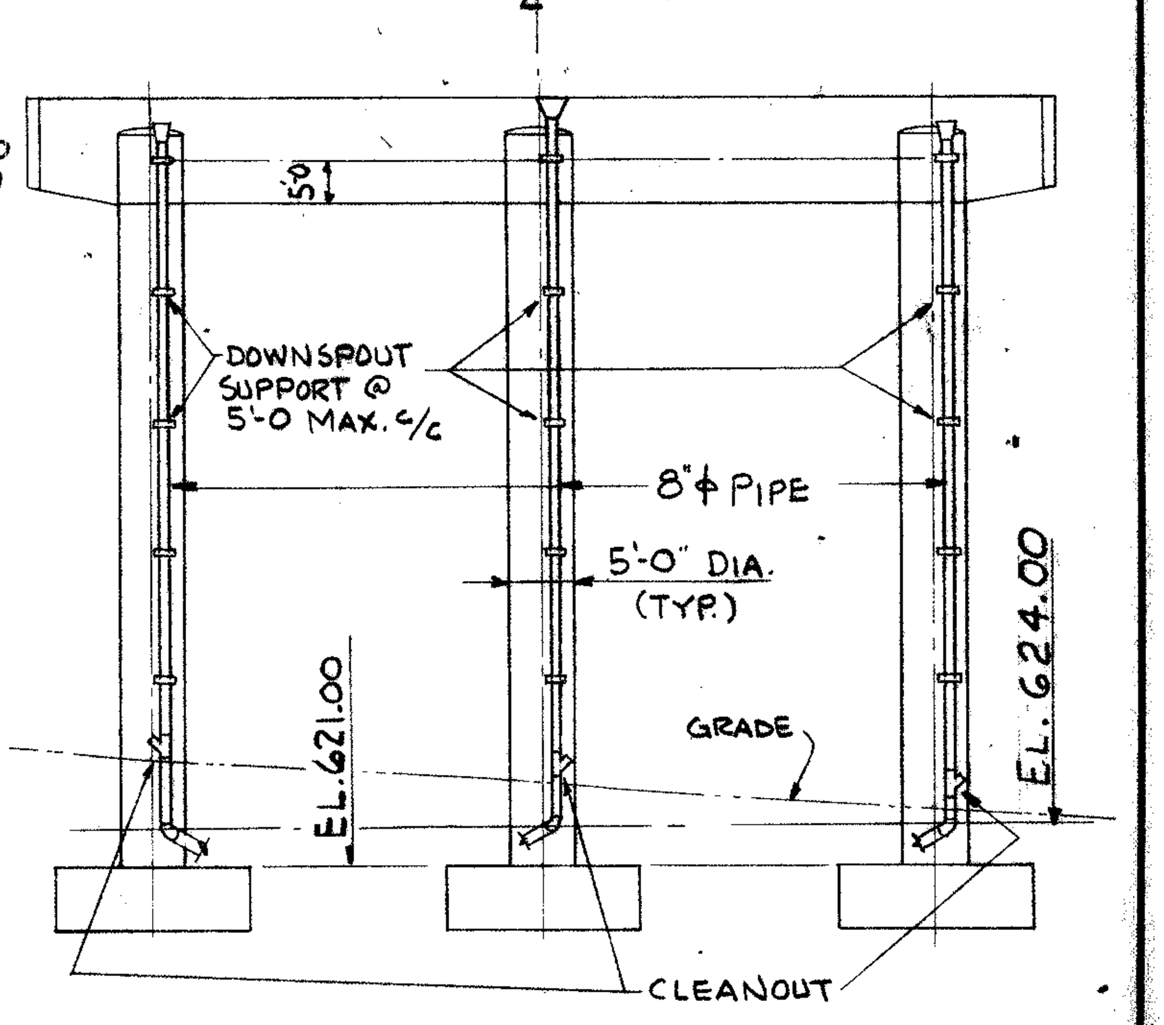
CUYAHOGA COUNTY
CUY— 21-14.12



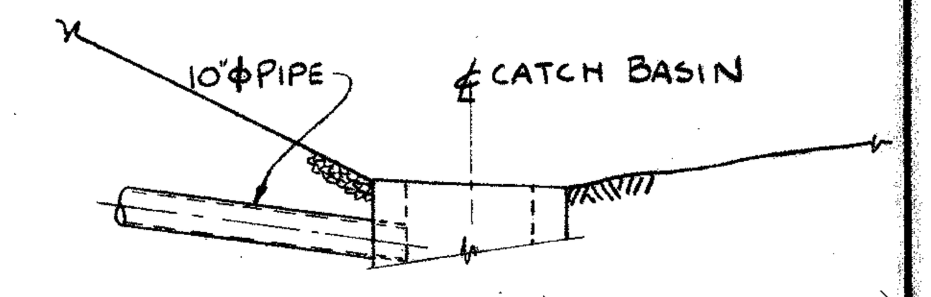
ELEVATION OF SCUPPER OUTLETS
(NORMAL TO ℄ BRIDGE)



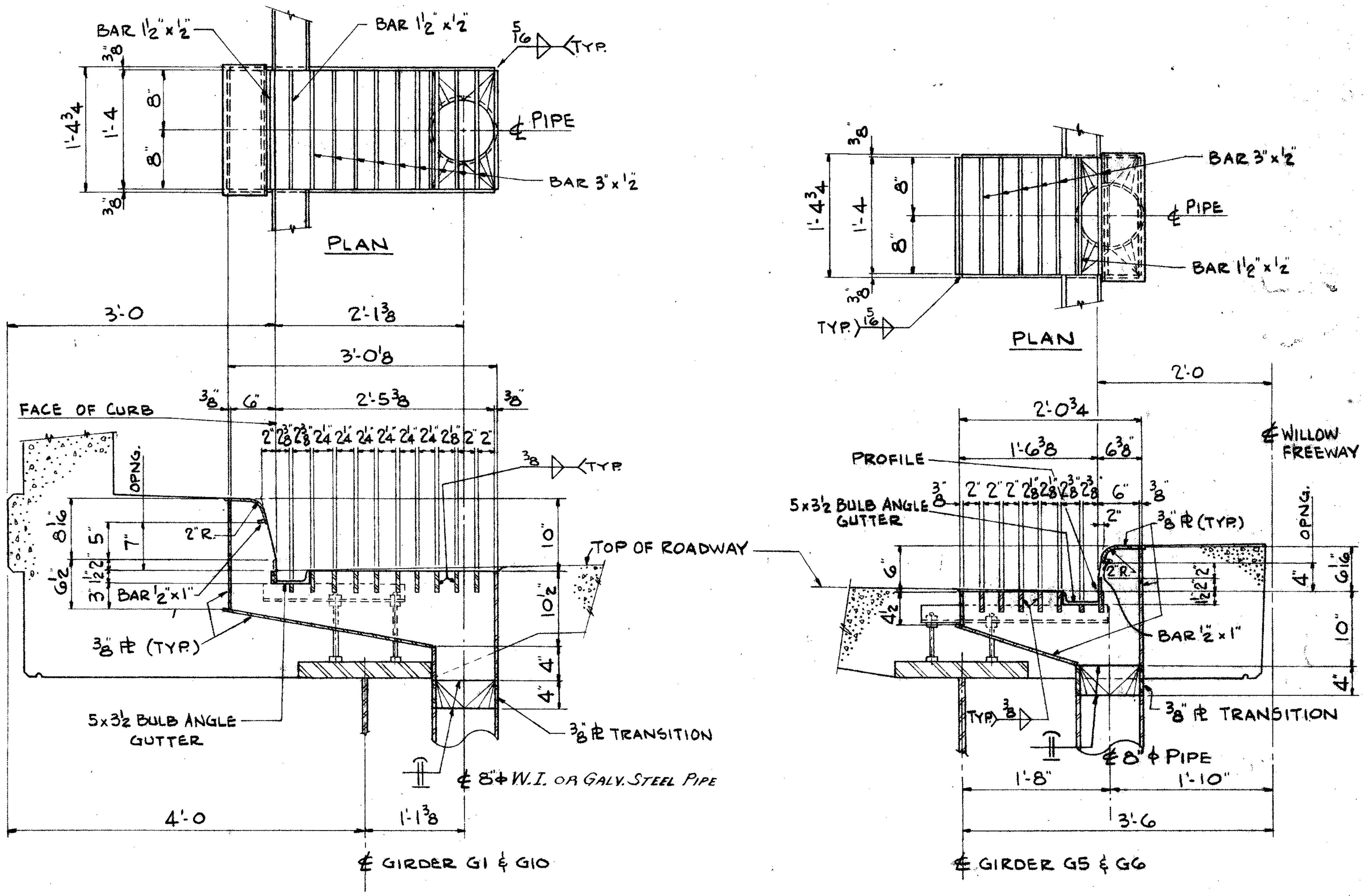
PLAN @ SOUTH PIER



VIEW B-B

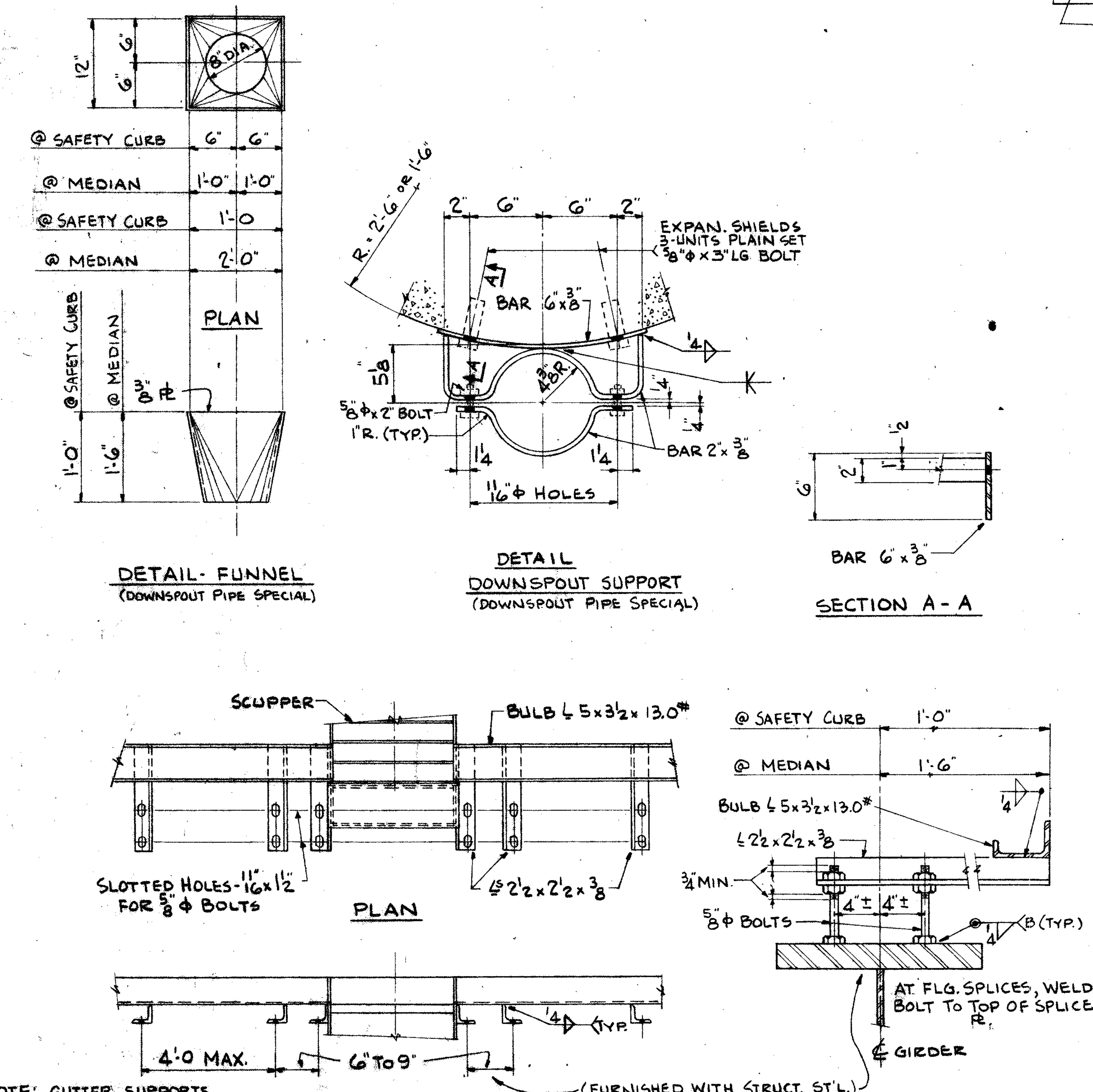


SECTION C-C



DETAIL - SCUPPER @ SAFETY CURB

DETAIL - SCUPPER @ MEDIAN



DETAIL - FUNNEL
(DOWNSPOUT PIPE SPECIAL)

DETAIL DOWNSPOUT SUPPORT
(DOWNSPOUT PIPE SPECIAL)

SECTION A - A

NOTE: GUTTER SUPPORTS ARE NOT SUFFICIENT TO SUPPORT A FINISHING MACHINE.

DETAIL - GUTTER SUPPORT

GUTTER SUPPORT

NOTES:

1. MILLED JOINTS WILL BE PERMITTED IN BULB ANGLE GUTTERS, BUT INDIVIDUAL LENGTHS SHALL BE MADE AS LONG AS PRACTICABLE. SUPPORTS SHALL BE PLACED 6" TO 9" ON EACH SIDE OF JOINTS.
2. GUTTERS SHALL BE ACCURATELY ADJUSTED FOR ALIGNMENT & GRADE, WITH ALLOWANCE FOR DEAD LOAD DEFLECTION, BEFORE CONCRETE IS PLACED.
3. DOWNSPOUTS, INCLUDING PIPE SPECIALS, SHALL BE STANDARD WROUGHT IRON OR HOT-DIP GALVANIZED STEEL PIPE. JOINTS SHALL BE MADE BY WELDING OR BY THE USE OF A CLAMP-TYPE COUPLING WITH A RING GASKET. ANY WELDING SHALL BE DONE BEFORE GALVANIZING. BRACKETS & BOLTS FOR MOUNTING DOWNSPOUTS SHALL BE GALVANIZED STEEL OR WROUGHT IRON. GALVANIZING FOR BOLTS PER SECTION M-10.30 WILL BE CONSIDERED SUFFICIENT.

REFERENCE DWGS.
FOR LOCATION OF SCUPPERS & GENERAL NOTES SEE GENERAL PLAN - SHT. 141

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

BRIDGE DRAINAGE
BRIDGE NO. CUY-21-1431
WILLOW FREEWAY OVER CLARK FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE			DATE		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE REVISED
D.F.	D.F.		DWM		11-28-62

CONT. No. 58019-27 SHEET ACCT. No. 811

0-13

CUYAHOGA COUNTY
CUY–21–14.12

RAMP N-E THIRD LEVEL
WARREN ST.
℄ WILLOW FREEWAY N 14°39'18" W
RAMP W-N SECOND LEVEL
RAMP E-S SECOND LEVEL
℄ CLARK FREEWAY N 36°52'00" W
CRITICAL CLEARANCE POINTS
W.P. STA. 10+17.23
℄ PIER STA 8+77.88
STA. 9+71.21
STA. 10+67.21
℄ PIER STA. 11+63.21
℄ PIER STA. 12+56.54
℄ BRG. STA. 13+31.21
RETAINING WALL
16'-0 LANE
CURB
BASE LINE
℄ ROADWAY
ROUNDING LINE
RADIAL LINE
RAMP S-W THIRD LEVEL
VARIES
RAMP N-E ℄ CURVE DATA
P.I. = STA. 10+17.46
D = 7°30'00"
Δ = 53°52'01"
R = 763.94'
T = 388.13'
L = 718.23'
MICROFILMED MAR 6 1984
ROADWAY ELEV. AT PROFILE POINT
STA. 8+00.96
EXISTING GROUND LINE
WILLOW-SOUTH
WILLOW-NORTH
532.50 BRIDGE LIMITS
150'-0
150'-0
-1.28 %
-3.12 %
STA. 13+33.46
EL. 656.25
EST. PILE LENGTH 25'
RAMP W-N
RAMP E-S
FINAL GROUND LINE
EL. 636.00
EL. 623.00
EL. 617.50
EL. 617.50
EL. 617.25
EL. 623.00
EST. PILE LENGTH 65'
EST. PILE LENGTH 60'
EST. PILE LENGTH 60'
EST. PILE LENGTH 60'
EST. PILE LENGTH 65'
EST. PILE LENGTH 65'

PROPOSED STRUCTURE

TYPE: 6 SPAN CONT. ROLLED BEAMS WITH REINF. CONC. DECKS & SUBSTRUCTURE
℄ SPANS: 74'-8 ~ 93'-4 ~ 96'-0 ~ 96'-0 ~ 93'-4 ~ 74'-8
ROADWAY: 26'-6 F/F PARAPET
LOAD FREQUENCY: CF = 2000 (57) "ADEQUATE FOR A.A.S.H.O. ALTERNATE LOADING."
WEARING SURFACE: 1" MONOLITHIC CONC.
APPROACH SLAB: 25'-0 LONG
ALIGNMENT: 7°30' CURVE
SUPERELEVATION: .057"/FT.

FOUNDATION SOUNDINGS: FOUNDATION DESIGN AND FOUNDATION QUANTITIES ARE BASED ON A STUDY OF ROD SOUNDINGS AND SOIL SAMPLE SOUNDINGS MADE AT THE SITE. THIS SOUNDING INFORMATION, THE ACCURACY OF WHICH THE STATE DOES NOT GUARANTEE, MAY BE EXAMINED IN THE OFFICE OF THE BUREAU OF BRIDGES IN COLUMBUS OR IN THE DIVISION OFFICE.

NOTE: PILES ARE 12" CAST-IN-PLACE REINFORCED CONCRETE PILES.

FOR PLAN OF INTERCHANGE SEE DWG. NO. 139
FOR EXISTING UTILITIES SEE SHT. NOS. 121 & 122

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

N-E SITE PLAN

BRIDGE No. CUY-21 - RAMP N-E
RAMPS N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY STA. 8+00.96 TO 13+33.46

SCALE		DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
	CAT		DWM		5-15-63

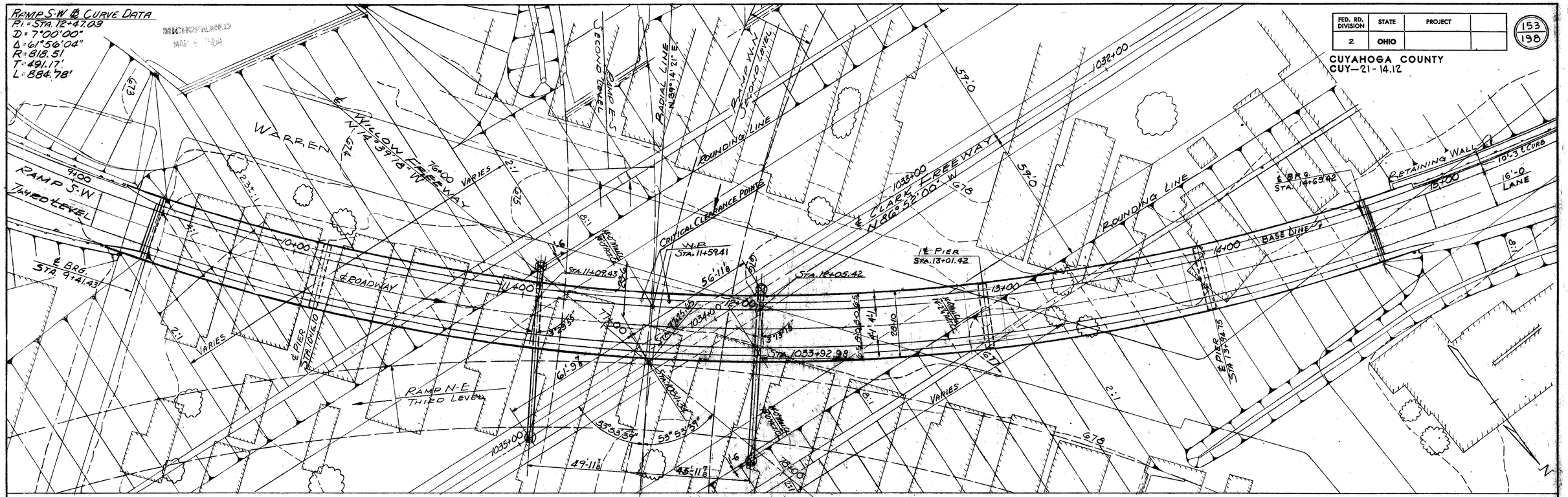
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

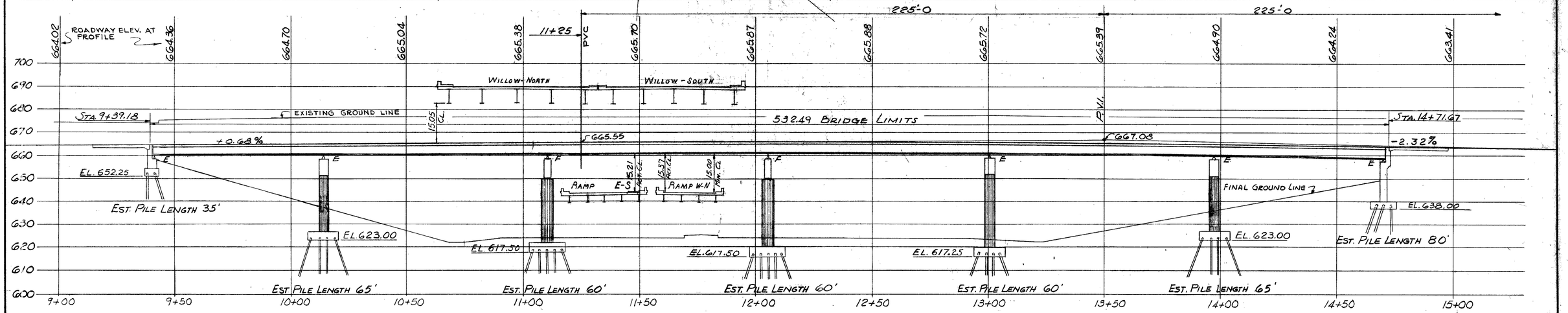
153
198

CUYAHOGA COUNTY
CUY-21-14.12

RAMP S-W & CURVE DATA
P.I. = STA. 12+47.03
D = 7°00'00"
Δ = 61°56'04"
R = 818.51'
T = 491.17'
L = 884.78'

MICROFILMED





PROPOSED STRUCTURE

TYPE: 6 SPAN CONT. ROLLED BEAMS WITH REINF. CONC. DECKS & SUBSTRUCTURE
℄ SPANS: 74'-8 - 93'-4 - 95'-11⅞ - 96'-0 - 93'-4 - 74'-8
ROADWAY: 26'-6 F/F PARAPET
LOAD FREQUENCY: CF = 2000 (57) "ADEQUATE FOR A.A.S.H.O. ALTERNATE LOADING"
WEARING SURFACE: 1" MONOLITHIC CONC.
APPROACH SLAB: 25'-0 LONG
ALIGNMENT: 7°00'00"
SUPERELEVATION: 0.057'/FT.

FOR PLAN OF INTERCHANGE SEE DWG. NO. 139
FOR EXISTING UTILITIES SEE SHT. NOS. 121 & 122

NOTE: ALL PILES ARE 12ϕ CAST-IN-PLACE REINFORCED CONCRETE PILES.

FOUNDATION SOUNDINGS: FOUNDATION DESIGN AND FOUNDATION QUANTITIES ARE BASED ON A STUDY OF ROD SOUNDINGS AND SOIL SAMPLING SOUNDINGS MADE AT THE SITE. THIS SOUNDING INFORMATION, THE ACCURACY OF WHICH THE STATE DOES NOT GUARANTEE, MAY BE EXAMINED IN THE OFFICE OF THE BUREAU OF BRIDGES AT COLUMBUS OR IN THE DIVISION OFFICE.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

S-W SITE PLAN
BRIDGE No. CUY-21-RAMP S-W
RAMPS NE & SW UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY STA. 9+39.18 To 14+71.67

SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	CAT		DWM		5-15-63	

SHEET ACCT. No. 1212
58019-26

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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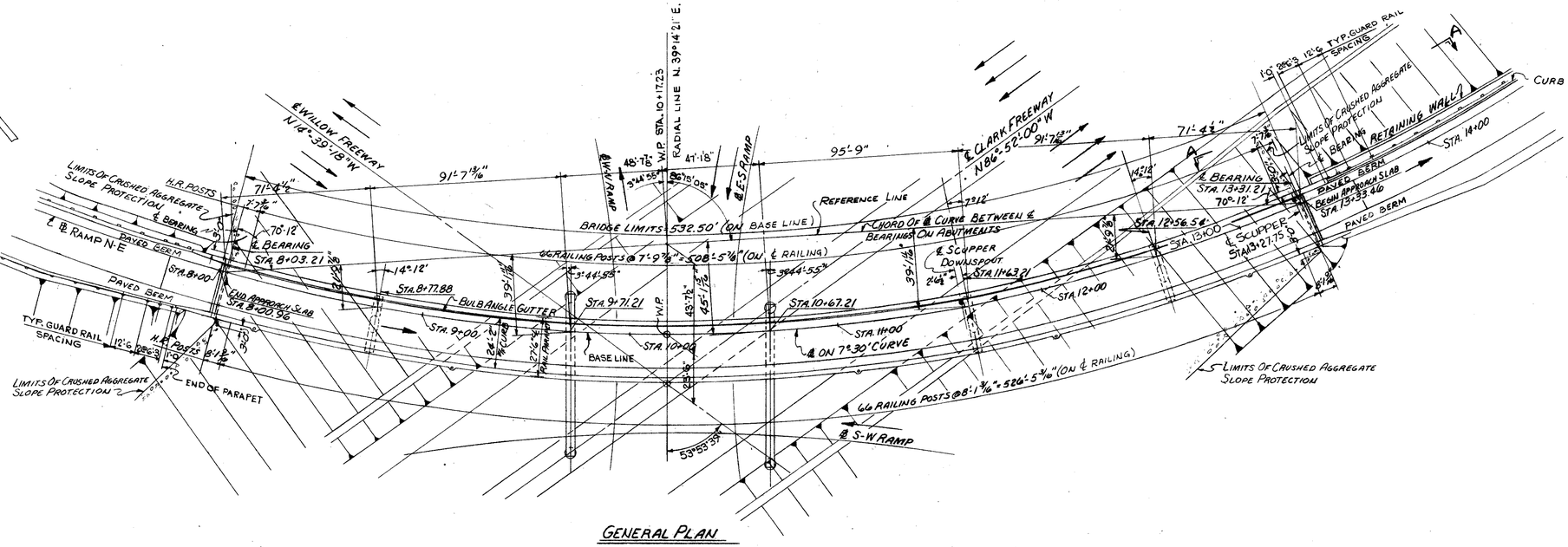
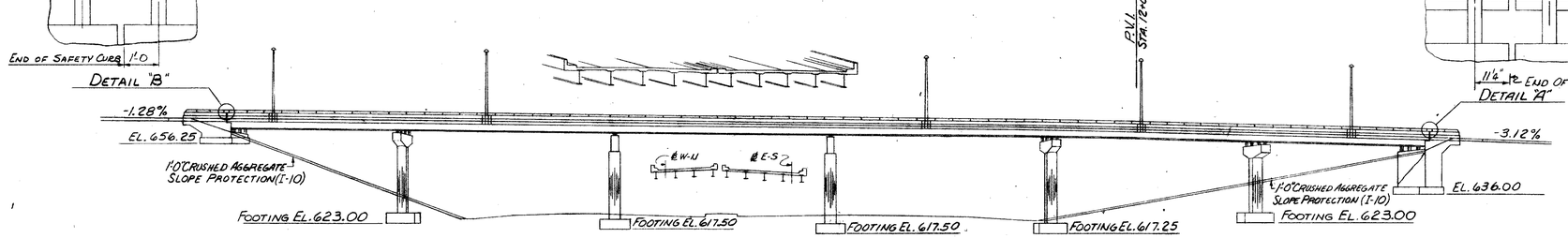
198

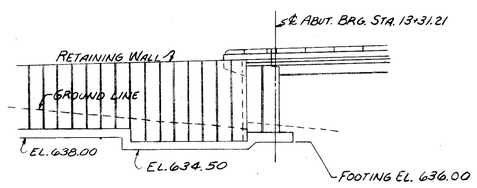
CUYAHOGA COUNTY
CUY– 21- 14.12



GENERAL PLAN



ELEVATION



ELEVATION A-A

GENERAL NOTES:

1. 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.
2. REFERENCE SHALL BE MADE TO STANDARD DRAWINGS RB-1-55 AND AR-1-57 DATED 2-2-59 AND 4-2-62 RESPECTIVELY, AND TO SUPPLEMENTAL SPECIFICATION NO. S-101 DATED 7-12-62.
3. PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 40 TONS PER PILE.
4. STRUCTURAL STEEL SHALL BE COPPER BEARING AND SHALL CONFORM TO ITEM M-7, SECTION M-7.4(b) OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS.
5. CONTINUOUS BEAM SHOP ASSEMBLY: REFERENCE PARAGRAPH 4, SEC. S-7.12 OF THE CONSTRUCTION AND MATERIAL SPECIFICATION FOR THE PURPOSE OF CHECKING FIT-UP OF WELD JOINT PREPARATION, ONLY TWO ADJACENT BEAMS NEED BE SHOP ASSEMBLED AT A TIME IN THEIR CORRECT, UNLOADED POSITIONS. ALL BEAMS SHALL BE ASSEMBLED AND MATCH MARKED.
6. CONTINUOUS BEAM SPLICES: IF BEAMS HAVING DEPTHS DIFFERING BY MORE THAN ⅛" ARE TO BE SPLICED BY BUTT WELDING, THE DEPTH OF THE SMALLER DEPTH BEAM SHALL BE INCREASED BY SPLITTING THE WEB LONGITUDINALLY AT A DISTANCE OF 1½" BELOW THE BOTTOM OF THE TOP FLANGE AND FOR A DISTANCE SUFFICIENT TO ALLOW THE FLANGE TO BE BENT UP AT A SLOPE OF NOT MORE THAN 3/16" PER FOOT, AFTER WHICH THE SPLIT IN THE WEB SHALL BE COMPLETELY WELDED WITH FULL DEPTH PENETRATION AND GROUND FLUSH.
7. WELDING OF STRUCTURAL STEEL SHALL BE CLASS "A" EXCEPT AS OTHERWISE SHOWN. WELDS SHOWN AS FIELD WELDS MAY, AT THE OPTION OF THE CONTRACTOR, BE MADE IN THE SHOP.
8. PAINTING OF STRUCTURAL STEEL (ITEM S-8): ALL PAINTING SHALL CONFORM BOTH AS TO MATERIALS AND APPLICATION WITH THE STANDARD SPECIFICATIONS OF THE CITY OF CLEVELAND FOR PAINTING STRUCTURAL STEEL. SEE PROPOSAL NOTE.
9. 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.
10. 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 SAFETY CURBS, MEDIAN AND ROADWAYS.
    B. THE ENTIRE EXPOSED SURFACE OF PIERS AND ABUTMENTS EXCEPT BRIDGE SEATS, BACKWALLS AND THE FACE OF ABUTMENTS BETWEEN OUTSIDE GIRDERS.
11. MACHINE FINISH: AT THE CONTRACTORS OPTION, THE CONCRETE DECK MAY BE FINISHED BY THE USE OF A FINISHING MACHINE.
12. UTILITY LINES: ALL EXPENSE INVOLVED IN RELOCATING 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.

ESTIMATED QUANTITIES FOR THE TWO THIRD LEVEL BRIDGES (RAMP N-E & RAMP S-W)

ITEM	TOTAL	UNIT	DESCRIPTION	GEN'L	SUPER.	ABUT.	PIERS	RET. WALLS
E-2	3,900	CU. YDS.	UNCLASSIFIED EXCAVATION			900	1,020	1,980
E-2		LUMP SUM	COFFERDAMS, CRIBS & SHEETING					
S-1	1,113	CU. YDS.	CLASS "C" CONCRETE, SUPERSTRUCTURE		1,113			
S-1	394	CU. YDS.	CLASS "C" CONCRETE, PIERS ABOVE FOOTINGS				394	
S-1	800	CU. YDS.	CLASS "E" CONCRETE, FOOTINGS			140	360	300
S-1	262	CU. YDS.	CLASS "E" CONCRETE, ABUTMENTS ABOVE FOOTINGS			262		
S-1	315	CU. YDS.	CLASS "E" CONCRETE, RETAINING WALLS ABOVE FOOTINGS					315
S-3	135	LIN. FT.	WATERPROOFING, PREMOLDED SEALING STRIP					135
S-4	506,012	LBS.	REINFORCING STEEL		284,817	32,305	137,406	51,484
S-7	1,504,500	LBS.	STRUCTURAL STEEL		1,292,500		212,000	
S-8	1,504,500	LBS.	FIELD PAINTING OF STRUCTURAL STEEL, as per plan		1,292,500		212,000	
S-9	92	SQ. FT.	1" PREFORMED EXPANSION JOINT FILLER					92
S-14	2,280.10	LIN. FT.	RAILING, (ALUMINUM RAIL & SUPPORTS, CONCRETE PARAPET, TYPE "A")		2139.77	140.33		
S-18	26,450	LIN. FT.	12" CAST-IN-PLACE REINFORCED CONCRETE PILES			3,695	14,160	8,595
S-25			LIGHTING DETAILS (SEE SHT. Nº 125 TO 138)					
S-29	360	CU. YDS.	POROUS BACKFILL			110		250
S-29	4	EACH	SCUPPERS, including supports		4			
S-29	42	LIN. FT.	8" DIA. STD. W.I. OR GALV. ST'L. PIPE DOWNSPOUTS, INCL. SPECIALS		42			
S-29	20	LIN. FT.	10" DIA. BITUMINOUS COATED CORRUGATED METAL PIPE, INCL. SPECIALS		20			
1-10	3,680	SQ. YDS.	CRUSHED AGGREGATE SLOPE PROTECTION	3,680				
S-101	1,113	EACH	WATER-REDUCING, SET-RETARDING ADMIXTURE		1,113			

GENERAL NOTES (CONT.)

13. FIRST TEST PILE & FIRST AND SUBSEQUENT PILE TEST LOADS: ITEMS S-16 AND S-17 IN THE ESTIMATED QUANTITIES FOR CUY-21-1431 MAY BE DRIVEN AND TESTED AT ANY OF THE BRIDGES IN THE INTERCHANGE.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET · CLEVELAND, OHIO

N-E GENERAL PLAN

BRIDGE No. CUY-21- RAMP N-E
RAMPS N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY STA. 8+00.96 To 13+33.46

SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	R.M.S.		D.W.M.		5-15-63	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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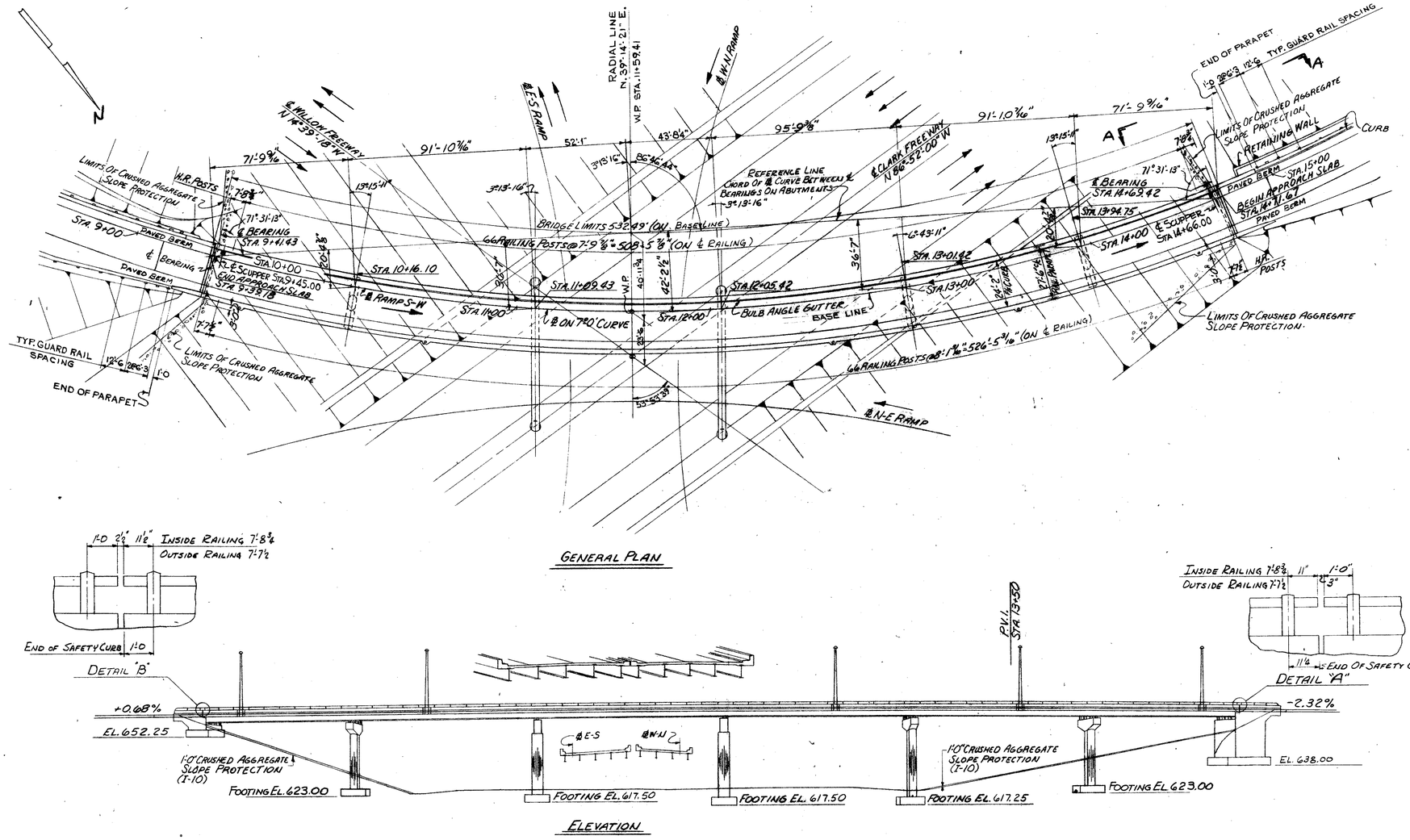
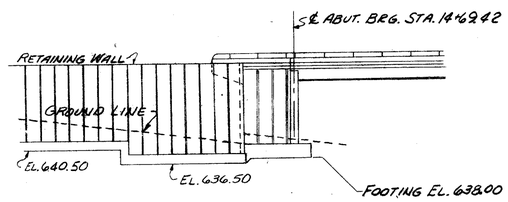
198

CUYAHOGA COUNTY
CUY— 21 - 14.12



GENERAL PLAN

ELEVATION



ELEVATION A-A

For General Notes See Sheet No. 154

For Quantities See Sheet No. 154

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

S-W GENERAL PLAN
BRIDGE No. CUY-21- RAMP S-W
RAMPS N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY STA. 9+39.18 To 14+71.67

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	R.A.B.		D.W.M.		5-15-63	

CONTR. NO. 580/19-26 SHEET ACCT. No. 1832

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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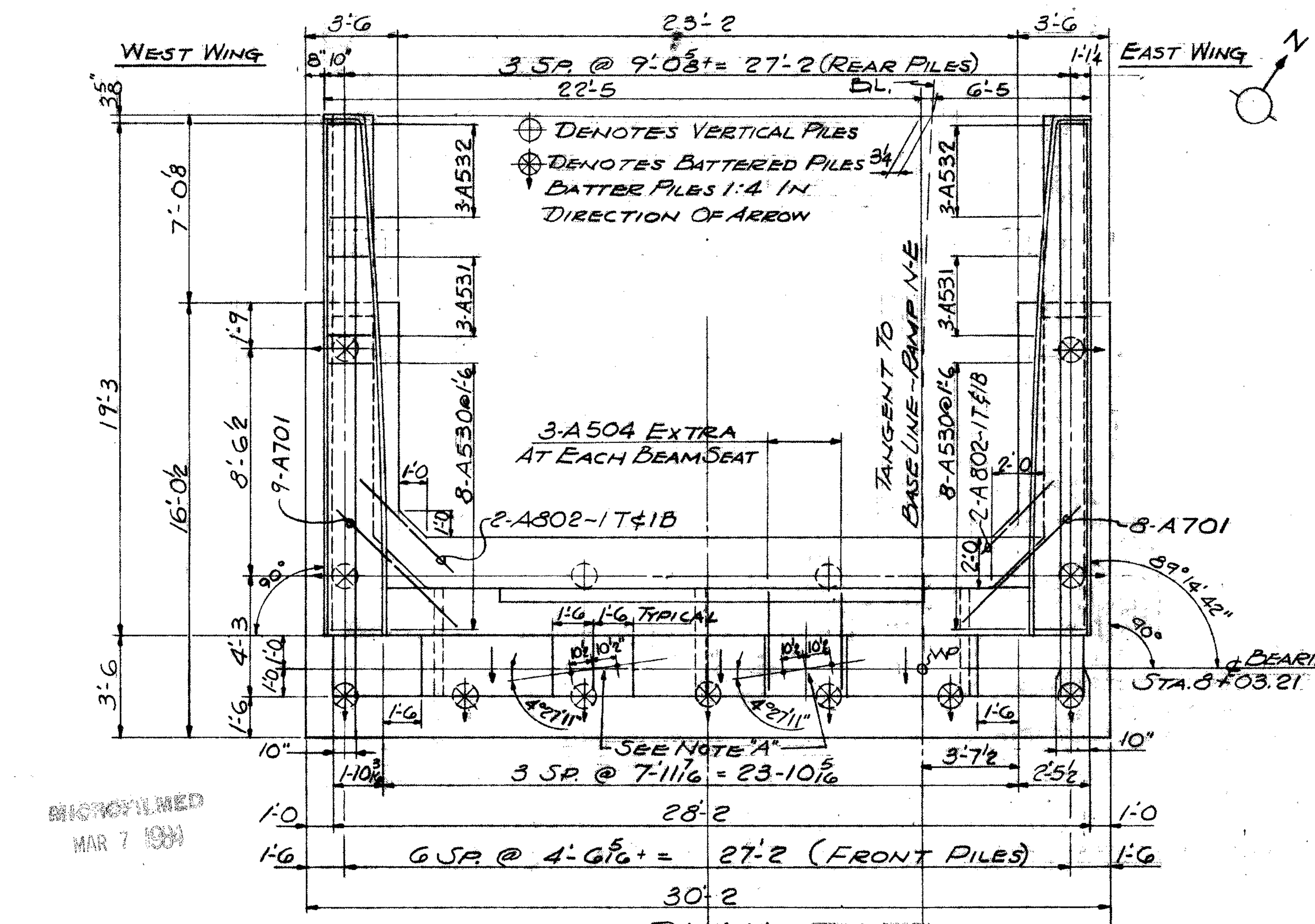
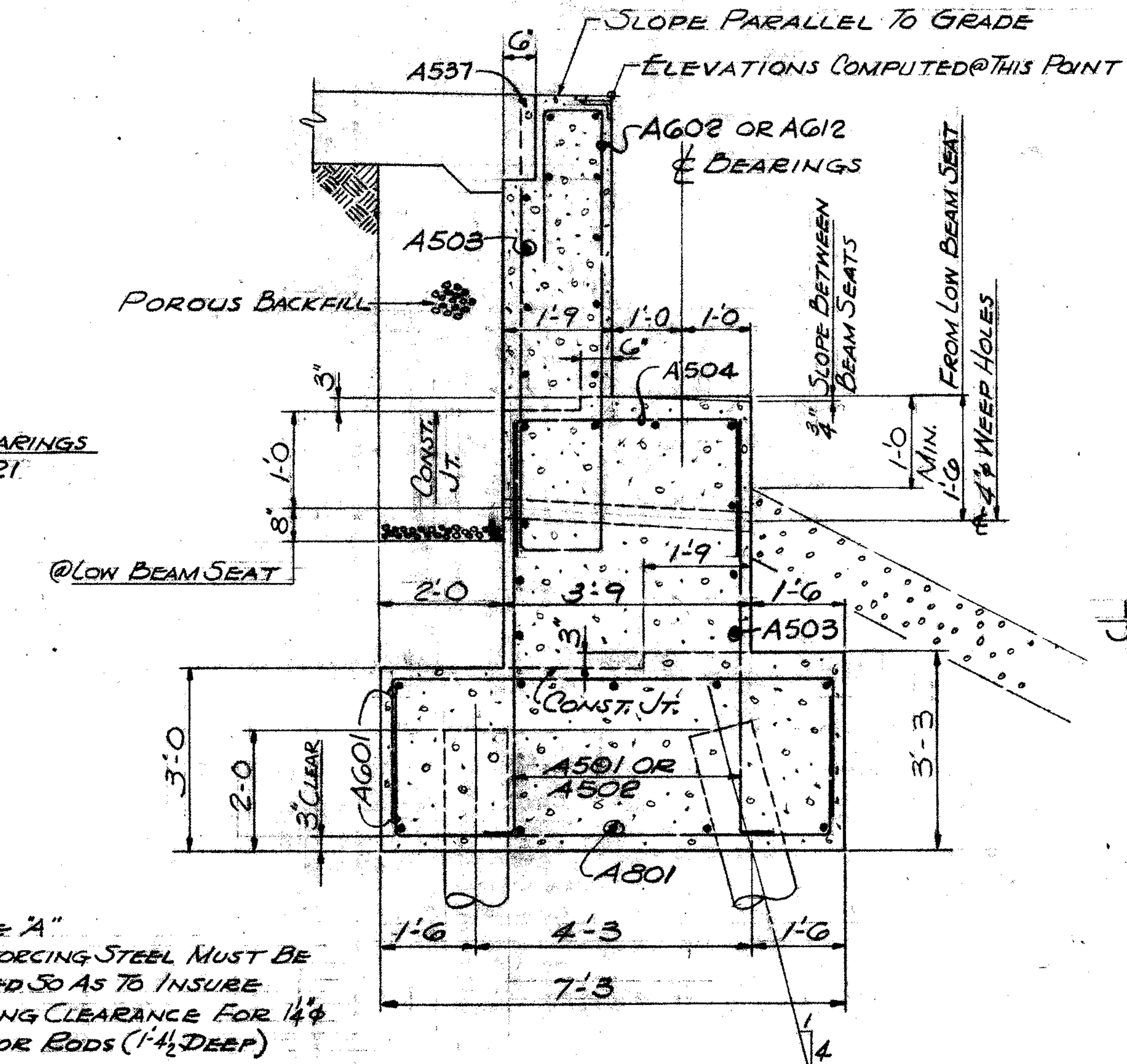
CUYAHOGA COUNTY
CUY-21-14.12



PLAN

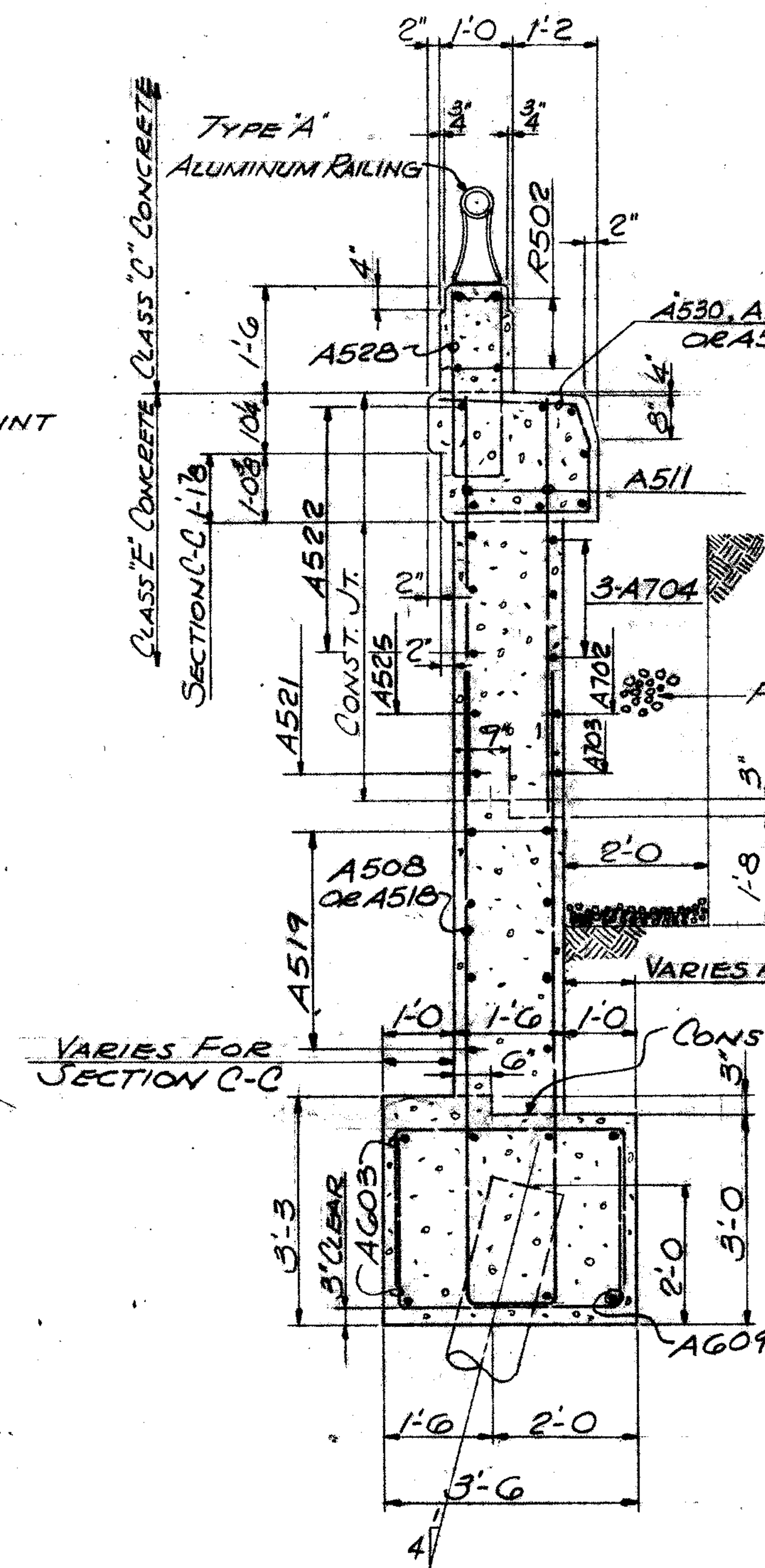
CONCRETE IN BACKWALL SHALL NOT BE PLACED UNTIL STRUCTURAL STEEL IS IN PLACE. BRIDGE DECK END FINISH SHALL BE USED AS TEMPLATE FOR TOP OF BACKWALL & CURB.

NOTE "A"
REINFORCING STEEL MUST BE PLACED SO AS TO INSURE DRILLING CLEARANCE FOR 1¼" ANCHOR RODS (1'-4½" DEEP)



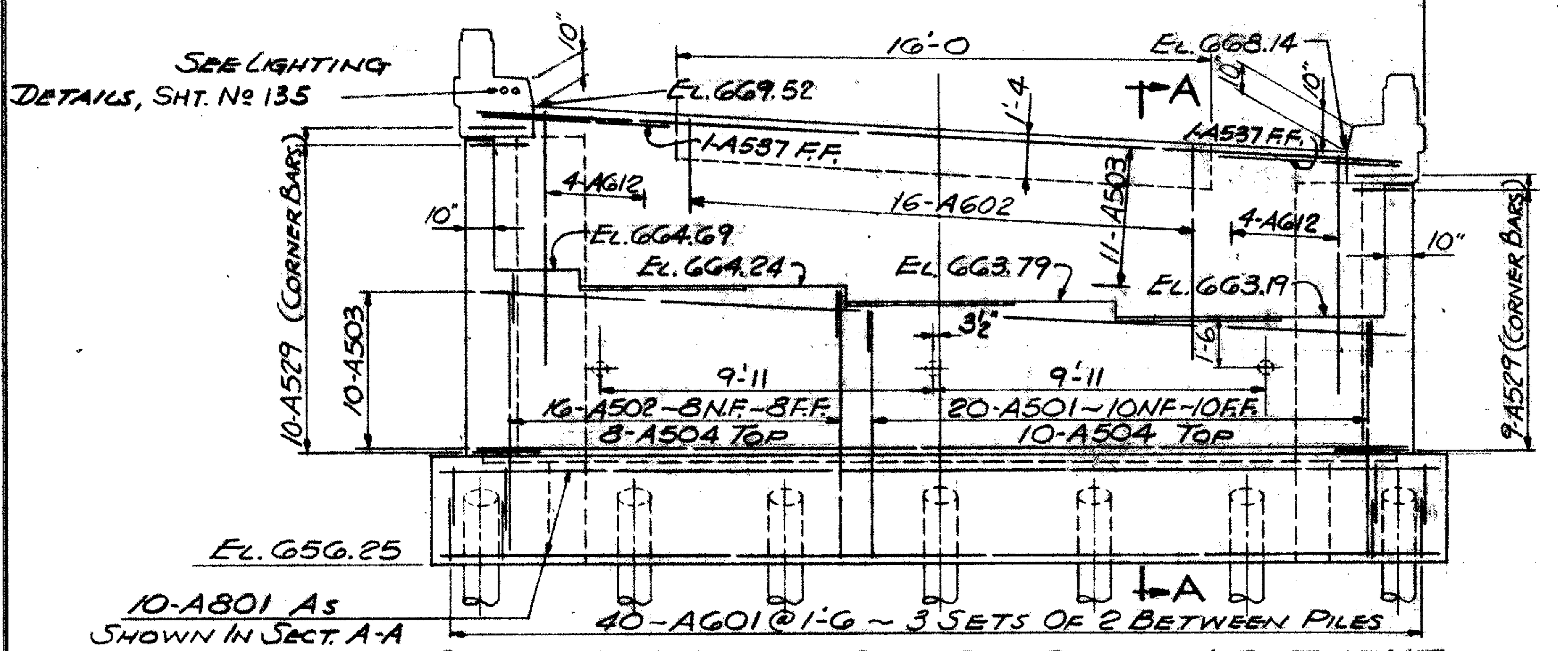
SECTION A-A

NOTE:
INCLUDE PARAPET CONCRETE & R502 WITH RAILING FOR PAYMENT.
ALL CHAMFERS ¾".

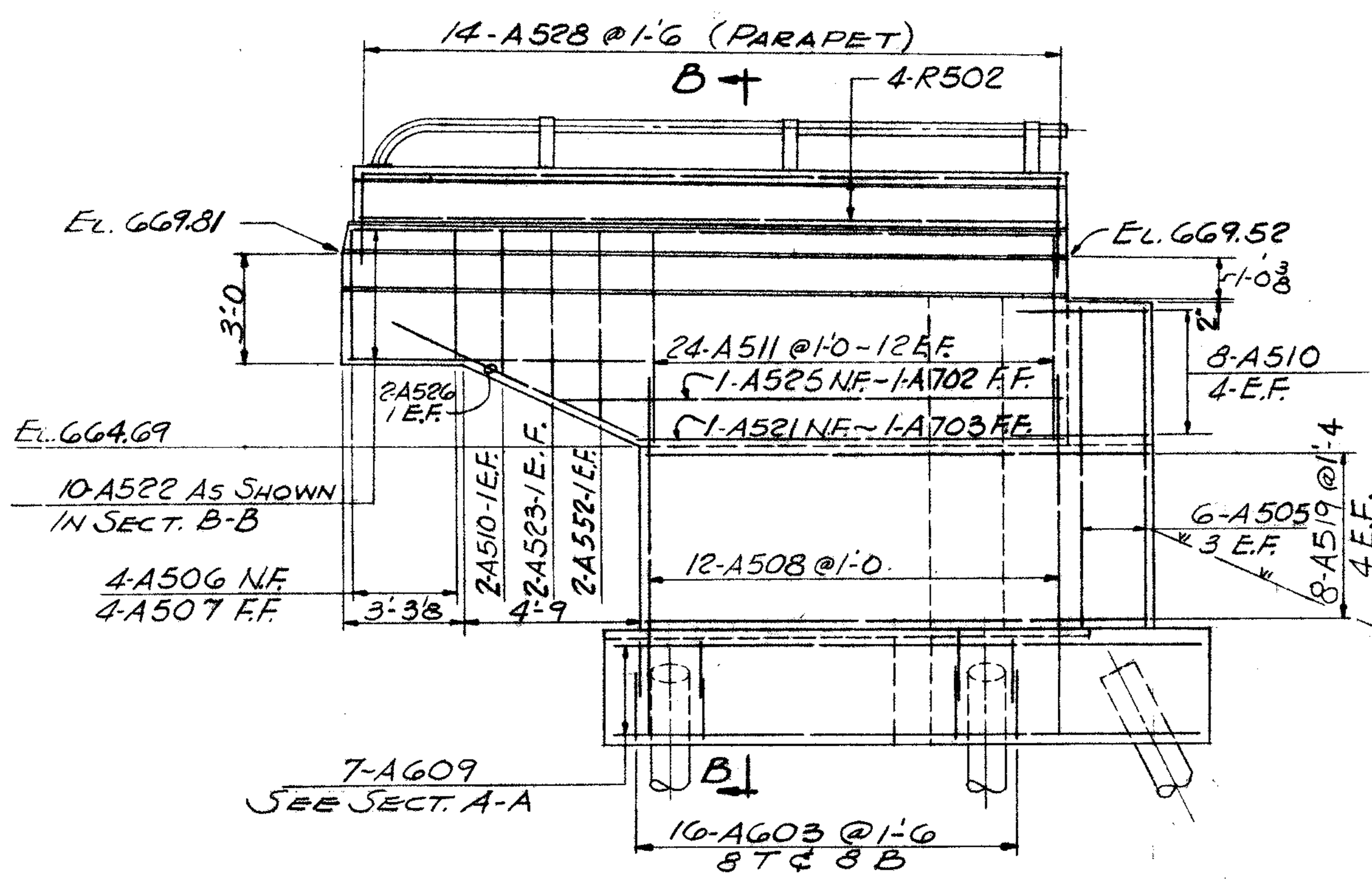


SECTION B-B (SHOWN)
SECTION C-C (SIMILAR EXCEPT AS NOTED)

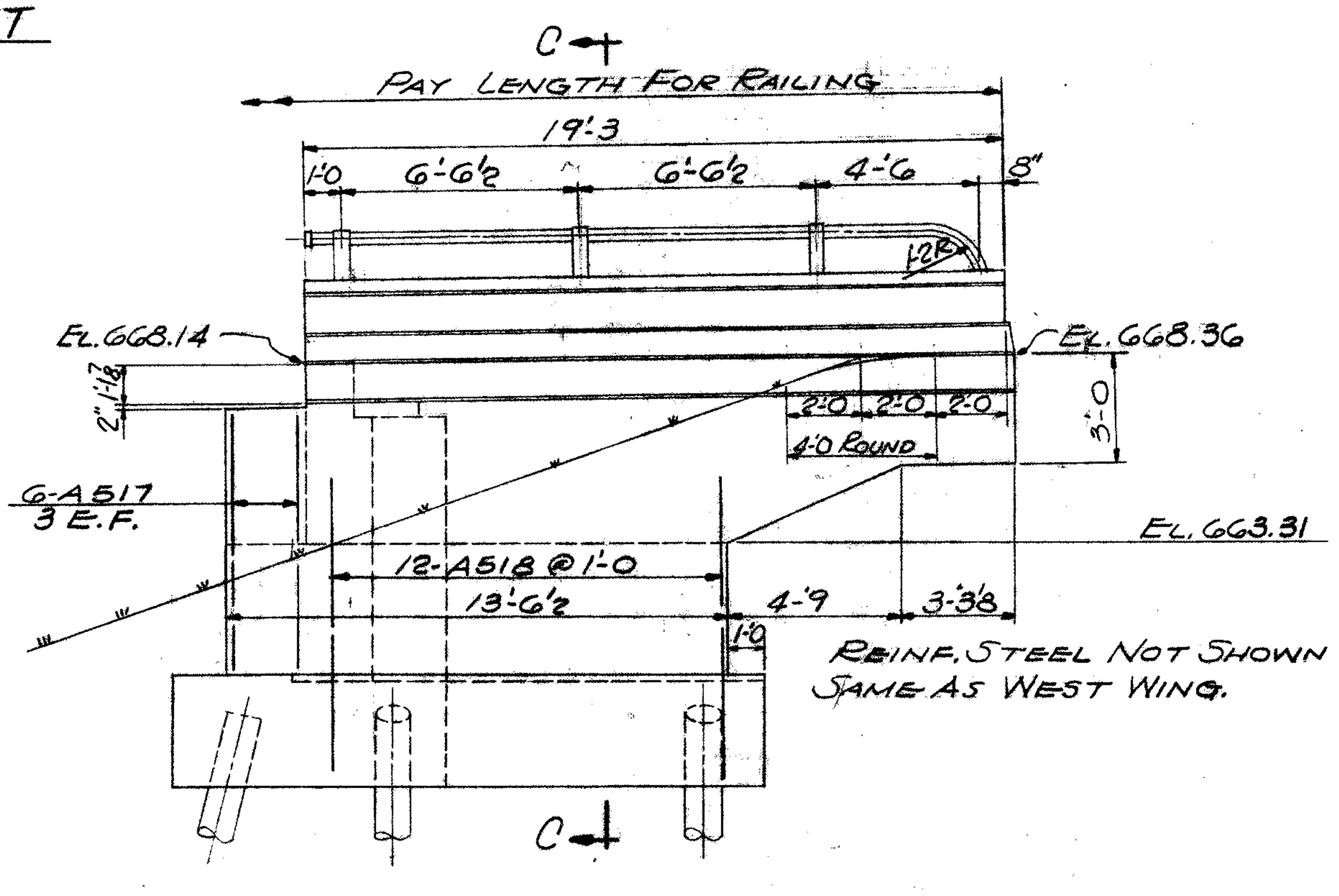
FOR GENERAL NOTES SEE SHT. No 154 & 160



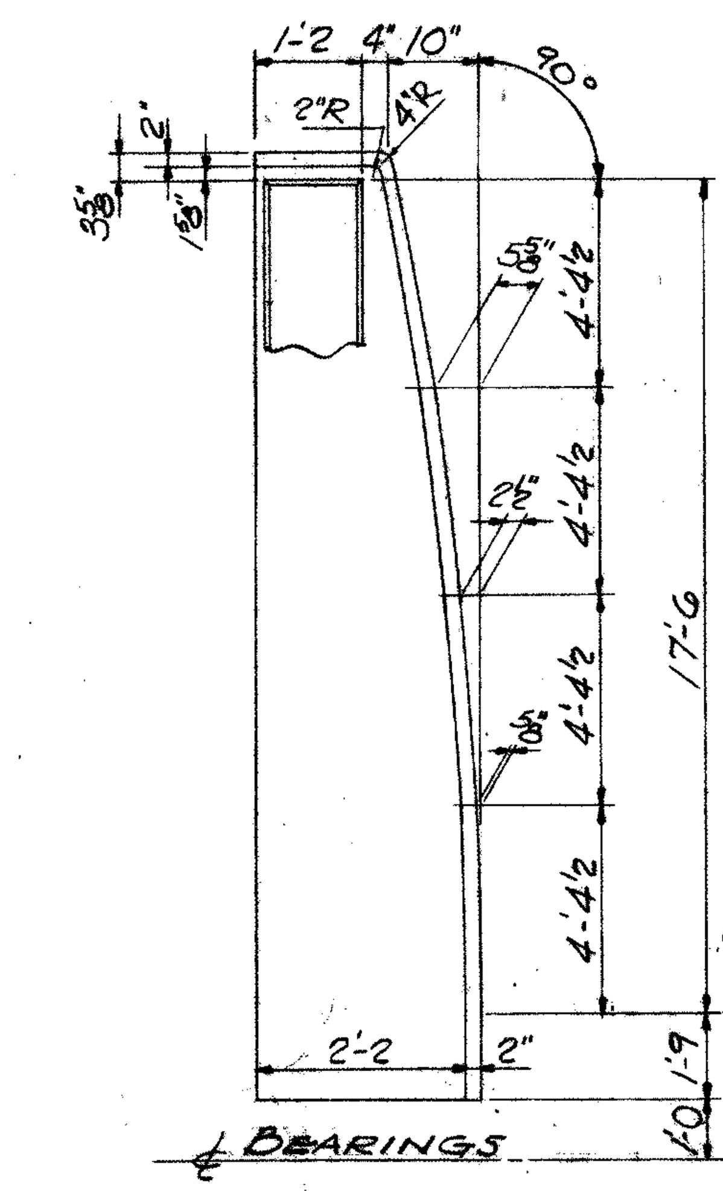
ELEVATION - N-E RAMP - REAR ABUTMENT



ELEVATION ~ WEST WING



ELEVATION ~ EAST WING



DIMENSION DIAGRAM OF WEST WING CURB. EAST WING CURB OPPOSITE

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

REAR ABUTMENT-RAMP N-E
BRIDGE NO. CUY-21-RAMP N-E
RAMP N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
CAT	CAT		S.A.E.		5-15-63	

FED. RD. DIVISION 2 | STATE OHIO | PROJECT
157
198
CUYAHOGA COUNTY
CUY- 21- 14.12
MICROFILMED MAR 7 1984
PLAN
ELEVATION
ELEVATION ~ NORTH WING
ELEVATION ~ SOUTH WING
NORTH CURB
SOUTH CURB
SECTION D-D
SECTION E-E
SECTION A-A
SECTION B-B
SECTION C-C
RUSTICATION DETAIL
FOR CONTINUATION SEE SHEET 158
NORTH WING
SOUTH WING
DENOTES VERTICAL PILES
DENOTES BATTERED PILES. BATTER PILES 1:4 IN. DIRECTION OF ARROW
TANGENT TO BASE LINE RAMP N-E
3 SP. @ 9'-0⅝" = 27'-2 (REAR PILES)
BEARINGS STA. 13+31.21
NOTE "A" REINFORCING STEEL MUST BE PLACED SO AS TO INSURE DRILLING CLEARANCE FOR 1¼"φ ANCHOR RODS. (1'-4½ DEEP)
PAY LENGTH FOR RAILING
SEE SECTION L-L SHEET 159
EL. 636.00
EL. 634.50
SEE LIGHTING DETAILS SHT. No 135
CONCRETE IN BACKWALL SHALL NOT BE PLACED UNTIL STRUCTURAL STEEL IS IN PLACE. BRIDGE DECK END FINISH SHALL BE USED AS TEMPLATE FOR TOP OF BACKWALL & CURB.
ELEVATIONS COMPUTED AT THIS POINT
SLOPE PARALLEL TO GRADE
POROUS BACKFILL
SLOPE BETWEEN BEAM SEATS
CRUSHED AGGREGATE SLOPE FACING
& 4"φ WEEP HOLE
CONST. JT.
CLASS "C" CONCRETE
CLASS "E" CONCRETE
TYPE "A" ALUMINUM RAILING. (TYPICAL)
NOTE: INCLUDE PARAPET CONCRETE & R504 WITH RAILING FOR PAYMENT. ALL CHAMFERS ¾"
31-A515 @ 1'-0 TOP
26-A706 ~ 6 SETS OF 4 BETWEEN PILES
FOR GENERAL NOTES SEE SHT. 154 & 160
TRYGVE HOFF & ASSOCIATES ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO
FORWARD ABUTMENT-RAMP N-E
BRIDGE NO. CUY-21-RAMP N-E
RAMP N-E & S.W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY
DESIGNED CAT | DRAWN CAT | CHECKED S.A.E. | DATE 5-15-63
CONT. No. 58019-26 SHEET ACCT. No. 1836

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

158
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CUYAHOGA COUNTY
CUY— 21-14.12

PILE DESIGNATION:
PLUMB PILES
BATTER PILES, BATTER IN DIRECTION OF ARROW.

7°30' CURVE 4° CURVE

PLAN.

FOR ABUTMENT WING WALL SEE 157

FOR GENERAL NOTES SEE SHT. 154 & 160

NOTE:-
WORK THIS SHEET WITH SHEET 159

DEVELOPED ELEVATION.

DIMENSIONED ON EXPOSED FACE OF WALL

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

RETAINING WALL - RAMP N-E
BRIDGE NO. CUY-21-RAMP N-E
RAMP N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE
DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
S.A.E.	J.O.		S.A.E.		5-15-63	

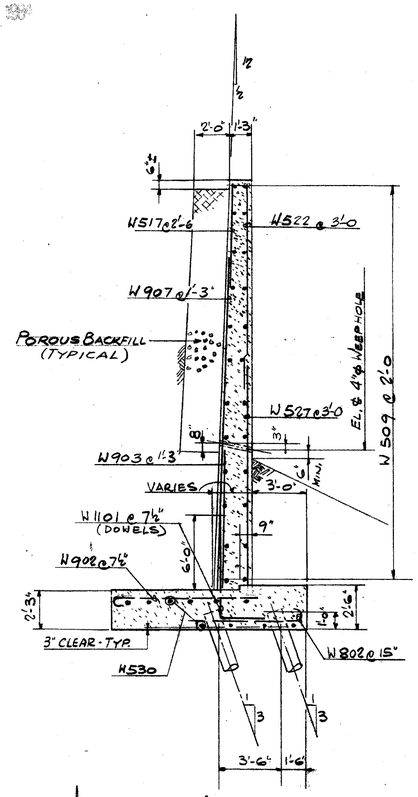
CONT. N 58019-26 SHEET . ST. No. 1880

MICROFILMED
MAR 7 '80

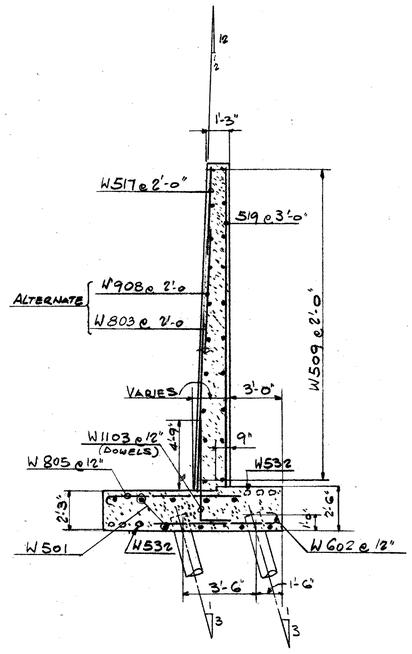
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

159
198

CUYAHOGA COUNTY
CUY— 21-14.12



SECTION A-A



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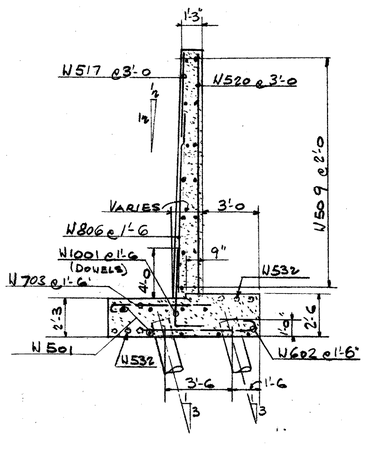
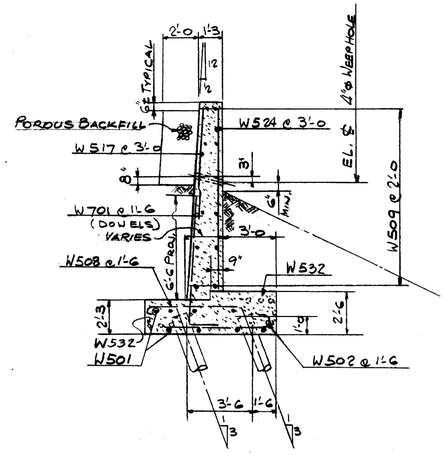


SECTION C-C.



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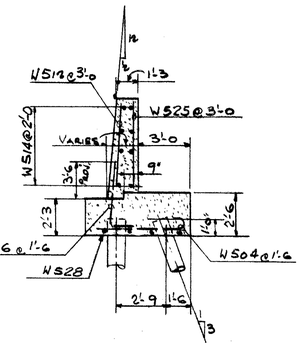
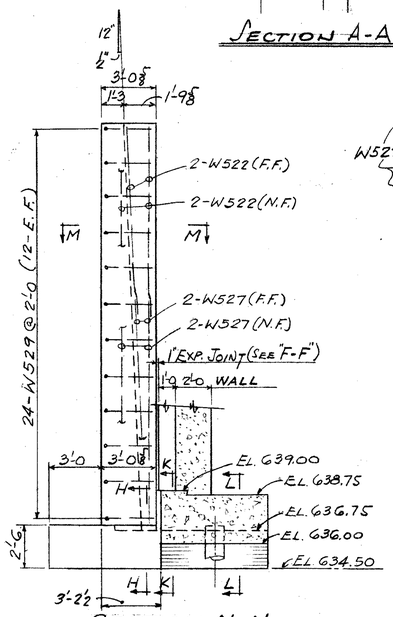
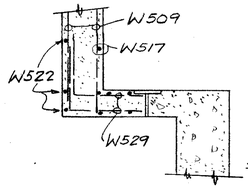


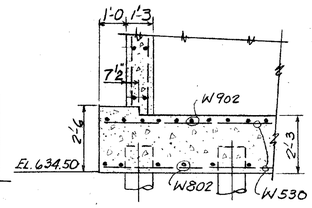
SECTION E-E



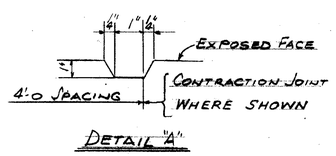
SECTION N-N



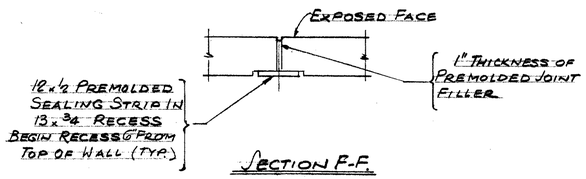
SECT. M-M



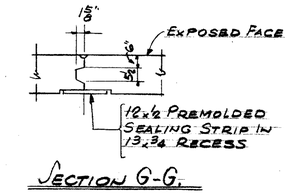
SECT. H-H



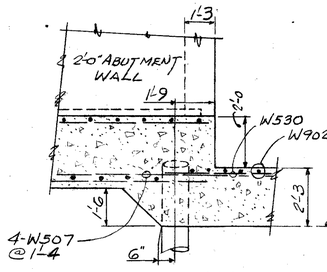
DETAIL "A"



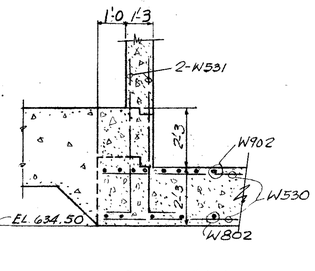
SECTION F-F.



SECTION G-G.



SECT. L-L



SECT. K-K

NOTE:-
WORK THIS SHEET WITH SHEET 158

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

RETAINING WALL - RAMP N-E
BRIDGE NO. CUY-21- RAMP N-E
RAMP N-E & S.W. UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

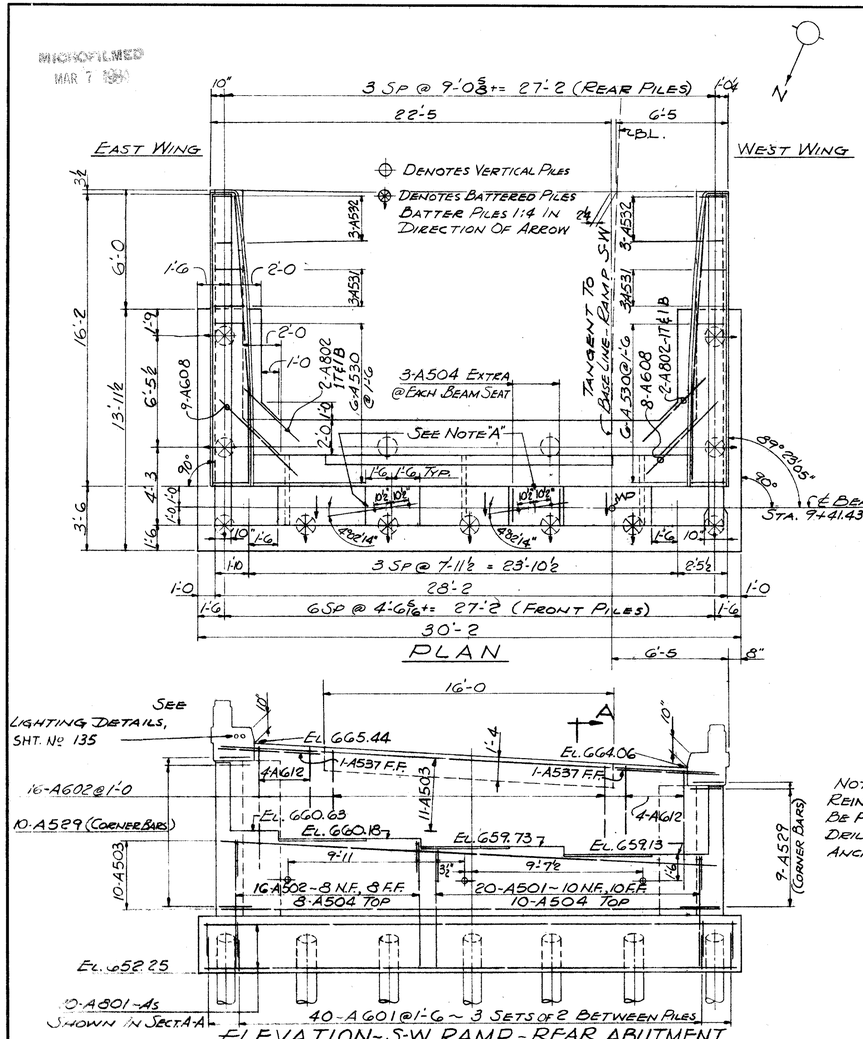
SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SAE	J.O.		S.A.E.	[illegible]	5-15-43	

CONT. No. 58019-26 · SHEET ACCT. No. 1881

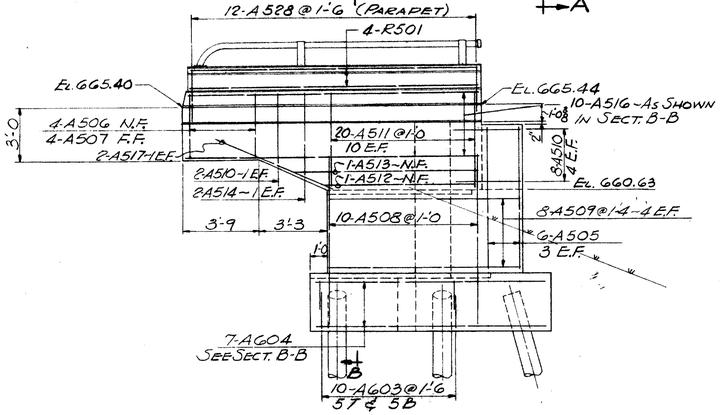
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

160
198

CUYAHOGA COUNTY
CUY— 21-14.12

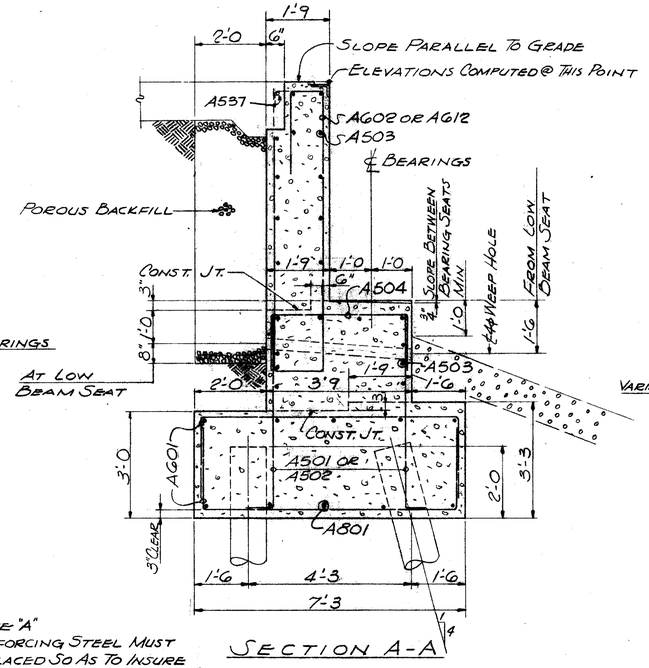


ELEVATION - S-W RAMP - REAR ABUTMENT



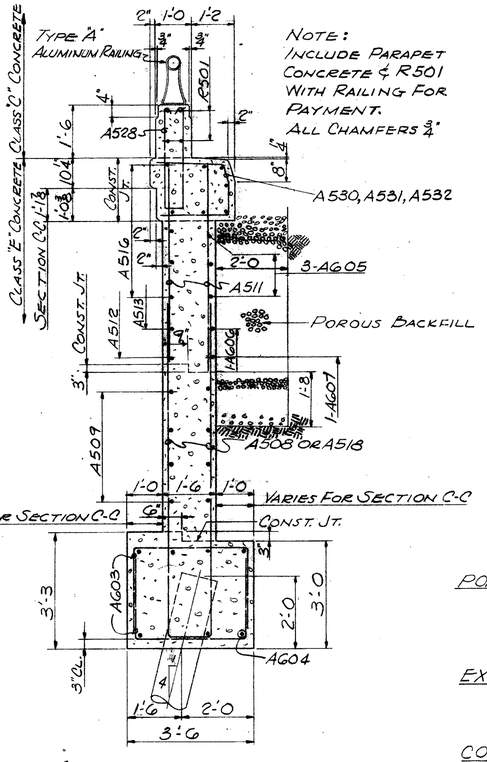
ELEVATION - EAST WING

CONCRETE IN BACK WALL SHALL NOT BE PLACED UNTIL STRUCTURAL STEEL IS IN PLACE. BRIDGE DECK END FINISH SHALL BE USED AS TEMPLATE FOR TOP OF BACK WALL & CURB.



SECTION A-A

NOTE "A"
REINFORCING STEEL MUST BE PLACED SO AS TO INSURE DRILLING CLEARANCE FOR 1 1/4" ANCHOR RODS (1'-4 1/2" DEEP)



NOTE:
INCLUDE PARAPET CONCRETE & R501 WITH RAILING FOR PAYMENT.
ALL CHAMFERS 3/4"

SECTION B-B (SHOWN)
SECTION C-C (SIMILAR EXCEPT AS NOTED)

GENERAL NOTES

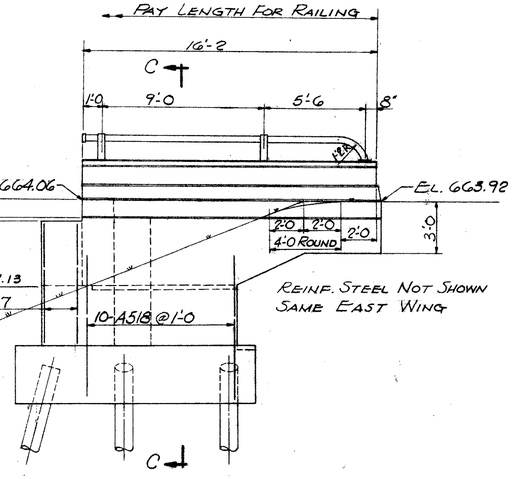
POROUS BACKFILL: 2 FEET THICK FULL LENGTH OF THE ABUTMENT AND WINGS, SHALL EXTEND UP TO THE UNDER SIDE OF THE APPROACH SLAB.

EXCAVATION: QUANTITY: COMPRISES MATERIAL BETWEEN BOTTOM OF FOOTING AND ROADWAY EXCAVATION.

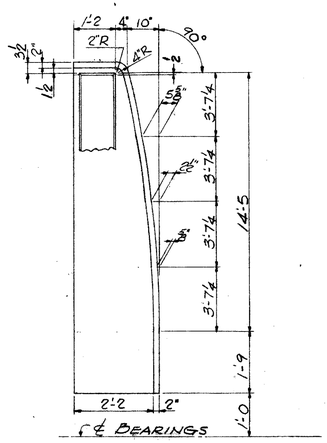
CONCRETE: ALL ABUT. & RET. WALL CONCRETE SHALL BE CLASS "E", EXCEPT FOR RAILING. PARAPET WHICH SHALL BE CLASS "C".

RAILING: TO BE TYPE "A" ALUMINUM HANDRAIL SEE STD. DWG. AR-1-57 SEE SHT. № 154 FOR ADDITIONAL NOTES.

N.F. ~ NEAR FACE
F.F. ~ FAR FACE
E.F. ~ EACH FACE



ELEVATION - WEST WING



DIMENSION DIAGRAM OF EAST WING CURB. WEST WING CURB OPPOSITE

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

REAR ABUTMENT-RAMP S-W
BRIDGE NO. CUY-21- RAMP S-W
RAMP N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
CAT	CAT		S.A.E.	[illegible]	5-15-63	

COMM. NO. 58019-26 SHEET ACCT. NO. 1933

FED. RD. DIVISION 2 | STATE OHIO | PROJECT
161 / 198
CUYAHOGA COUNTY
CUY- 21-14.12
PLAN
E-ELEVATION ~ WEST WING
ELEVATION ~ EAST WING
WEST CURB
EAST CURB
ELEVATION F-F
SECTION A-A
SECTION B-B
SECTION C-C
SECTION D-D
SECTION E-E
RUSTICATION DETAIL
PAY LENGTH FOR RAILING
WEST WING
EAST WING
DENOTES VERTICAL PILES
DENOTES BATTERED PILES: BATTER PILES 1:4 IN DIRECTION OF ARROW
TANGENT TO BASE LINE - RAMP S-W
FOR CONTINUATION OF FOOTING ~ SEE SHT. 162
BEARINGS STA. 14+69.42
SEE NOTE "A"
NOTE "A" REINFORCING STEEL MUST BE PLACED SO AS TO INSURE DRILLING CLEARANCE FOR 1¼"ϕ ANCHOR RODS (1'-4½" DEEP)
CONCRETE IN BACKWALL SHALL NOT BE PLACED UNTIL STRUCTURAL STEEL IS IN PLACE. BRIDGE DECK END FINISH SHALL BE USED AS TEMPLATE FOR TOP OF BACKWALL & CURB.
SEE LIGHTING DETAILS SHT. № 135
SEE SECTION G-G SHEET 162
ELEVATION COMPUTED AT THIS POINT.
SLOPE PARALLEL TO GRADE
POROUS BACKFILL
CRUSHED AGGREGATE SLOPE FACING
4"ϕ WEEP HOLE
SLOPE BETWEEN BEAM SEATS
TYPE "A" ALUMINUM RAILING
NOTE: INCLUDE PARAPET CONCRETE & R503 WITH RAILING FOR PAYMENT. ALL CHAMFERS ¾"
CLASS "E" CONCRETE
CLASS "C" CONCRETE
CURB TRANSITION FROM 10" TO 6"
FOR GENERAL NOTES SEE SHT. 154 & 160
TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO
FORWARD ABUTMENT - RAMP S-W
BRIDGE NO. CUY-21-RAMP S-W
RAMP N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY
SCALE
DATE
DESIGNED CAT. | DRAWN CAT. | TRACED | CHECKED S.A.E. | REVIEWED | DATE 5-15-63 | REVISED
MICROFILMED MAR 7 1984
SHEET ACCT. No. 1834
58019-26

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

162
198

CUYAHOGA COUNTY
CUY– 21-14.12

FOR CONTINUATION SEE SHEET 163

RECONSTRUCTED MAR 7 1963

ARC DIMENSIONS TAKEN ALONG FACE OF WALL

9-SPA. @ 3'-6 = 31'-6 | 8-SPA. @ 4'-0 = 32'-0 | 4'-6 | 4'-7 | 4'-7 | 4'-7 | 4'-7 | 2@4'-7 = 9'-2 | RADIAL LINE

23-SPA. @ 4'-0 (SEE DETAIL "A" SHEET 163)

VERTICAL RUSTICATION GROOVES IN NEAR SIDE FACE OF WALL

℄ BEARING STA. 14+69.92

RADIAL LINE

R=80.82'

TANGENT

BASE LINE ℄ CURVE

℄ WEEP HOLE EL. 643.30 | EL. 644.80 | EL. 646.10 | EL. 647.40 | EL. 648.70 | EL. 649.80 | EL. 650.90 | EL. 651.90 | EL. 652.90

ALTERNATE W904@1'-6 / W903@1'-6

W517@3'-0 | W526@3'-0 | W509@2'-0 | VARIES | 3'-0 | W1103@9" (DOWELS) | W902@9" | W532 | W501 | W802@1'-5 | 4'-0 | 1'-6

SECTION B-B

FOR ABUTMENT WINGWALL SEE SHEET-161

SECTION H-H: W1102 & W1104 | EL. 639.00 | EL. 638.75 | W530 | EL. 636.50 | W704

SECTION K-K: EL. 641.00 | 2-W531 | W1102 & W1104 | EL. 638.75 | W530 | EL. 636.50 | W704

SECTION G-G: 2'-0 ABUT. WALL | EL. 640.75 | EL. 638.0 | W1102 & W1104 | EL. 638.75 | W530 | 5-W507@1'-4 | EL. 636.50

W517@2'-0 | W523@3'-0 | W804@2'-0 | VARIES | 3'-0 | W803@2'-0 | W1001@1'-0 (DOWELS) | W705@1'-0 | W532 | W501 | W601@1'-0 | 4'-0 | 1'-6

SECTION C-C

W517@8" | W527@3'-0 | W905@1'-0 | POROUS BACKFILL | ℄ 4" WEEP HOLE | W527@3'-0 | W906@1'-0 | VARIES | 3'-0 | W1101@6" (DOWELS) 5'-0 | W1105@1'-0 W1106@1'-0 (ALTERNATE) | W530 | W704@10" | 3'-6 | 3'-6 | 1'-6

SECTION A-A

PILE DESIGNATION
- PLUMB PILES
- BATTER PILES. BATTER IN DIRECTION OF ARROW.

SECTION W-W: 2-W527(F.F.) | 2-W527(N.F.) | W509 | W517 | EXPANSION JOINT | W527 | W529

SECTION D-D: 2-W527 (F.F.) | 2-W527 (N.F.) | 1" EXP. JOINT SEE SECTION F-F SHEET 163. | 28-W529@2'-0 (14-E.F.) | 3'-0 | 1'-0 WALL | EL. 641.0 | EL. 639.00 | EL. 640.75 | EL. 638.75 | EL. 638.00 | EL. 636.50

DEVELOPED ELEVATION

CONTRACTION JOINT | EL. 664.32 | 1'-0 RETURN WALL | 4'-9 | 28-W509@2'-0 (14-E.F.) | EL. 664.21 | 24-W509@2'-0 (12-E.F.) | CONTRACTION JOINT | EL. 663.46 | 20-W509@2'-0 (10-E.F.) | EXPANSION JOINT | EL. 662.71

11-W517@3'-0 (N.F.) | 1-SERIES OF 12-W526@3'-0 F.F. | 1-SERIES OF 12-W523@3'-0 F.F. | 17-W517@2'-0 (N.F.) | SHT. 163 E | SHT. 163 F

11-W527@3'-0 (F.F.) | 1-W527(F.F.) | 11-W527@3'-0 (F.F.)

ALTERNATE: 22-W904@1'-6 (N.F.) | 21-W903@1'-6 SPA. (N.F.) | 43-W1103@9" DOWELS (N.F.) | 4-W507

ALTERNATE: 17-W804@2'-0 (N.F.) | 16-W803@2'-0 (N.F.) | 33-W1001@1'-0 DOWELS (N.F.) | 4-W507

32-W905 @1'-0 (N.F.) - ALTERNATE WITH W906 | 32-W906 @1'-0 (N.F.) - ALTERNATE WITH W905 | 4-W507 | 64-W1101@6" DOWELS (N.F.) | 4-W507 | 3-W532 | EL. 647.00

5-W532 | 5-W532 | 12-W530 | EL. 636.50 | 9-W501 | EL. 640.50 | 3-W532 | EL. 644.00 | 9-W501

ALTERNATE {17-W1104@1'-0 / 17-W1102@1'-0} TOP | ALTERNATE {16-W1106@1'-0 / 16-W1105@1'-0} TOP | 43-W902@9" (TOP) | 24-W802@1'-5 (BOT.) | 33-W705@1'-0 (TOP) | 33-W601@1'-0 (BOT.) | 40-W704@10" (BOT.)

35'-6 | 32'-0 | 32'-0 | 32'-0 | 32'-0 | 1'-0 | 2'-6 | 96'-0

NOTE:- WORK THIS SHEET WITH SHEET 163

FOR GENERAL NOTES SEE SHT. 154 & 160

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

RETAINING WALL-RAMPS-W

BRIDGE NO. CUY-21- RAMPS-W
RAMP N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
S.A.E.	C.T. C.J.		S.A.E.	[illegible]	5-15-63	

COMP. NO. 58019-26 SHEET ADDT. NO. 1879

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

163
198

CUYAHOGA COUNTY
CUY—21-14.12

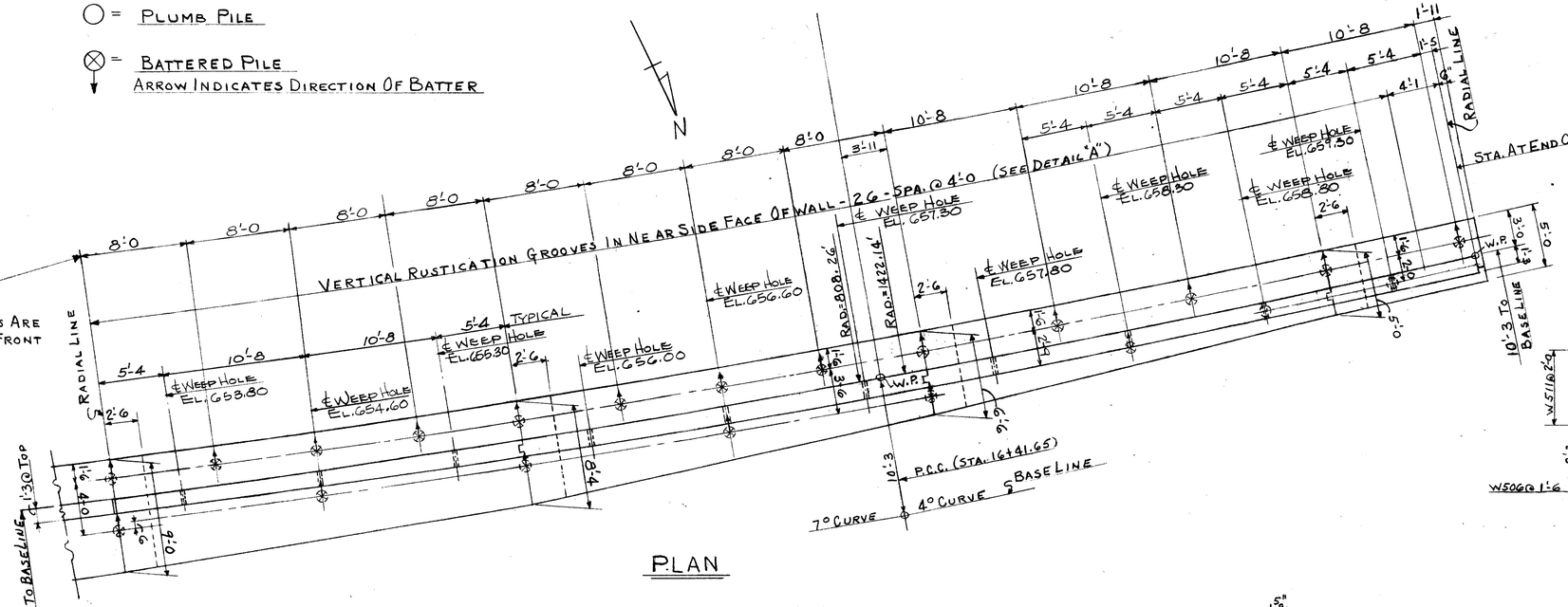
RECEIVED
MAR 7 1963

PILE DESIGNATION

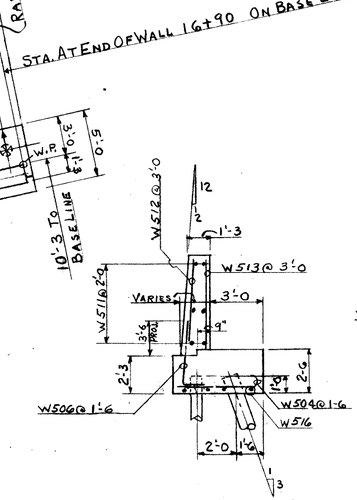
○ = PLUMB PILE

⊗ = BATTERED PILE
ARROW INDICATES DIRECTION OF BATTER

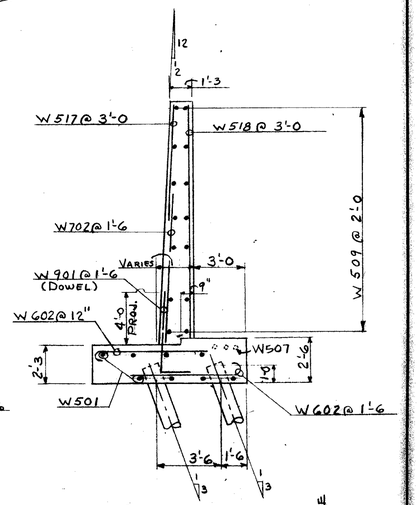
NOTE:
ARC DIMENSIONS ARE MEASURED ALONG FRONT FACE OF WALL



PLAN



SECTION P-P

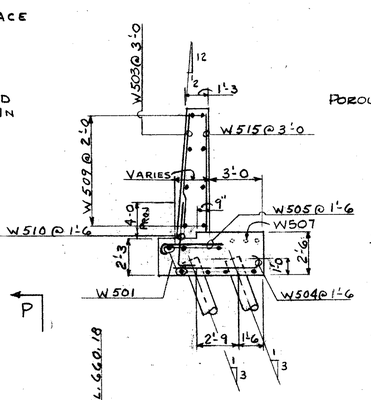


SECTION L-L

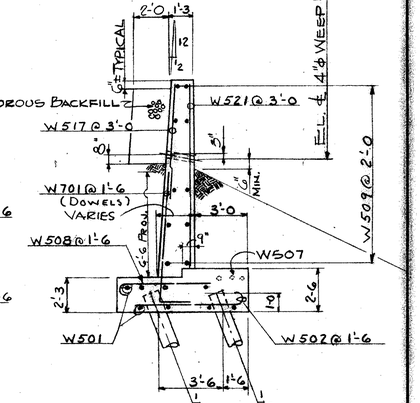
DETAIL "A"

SECTION F-F

SECTION E-E

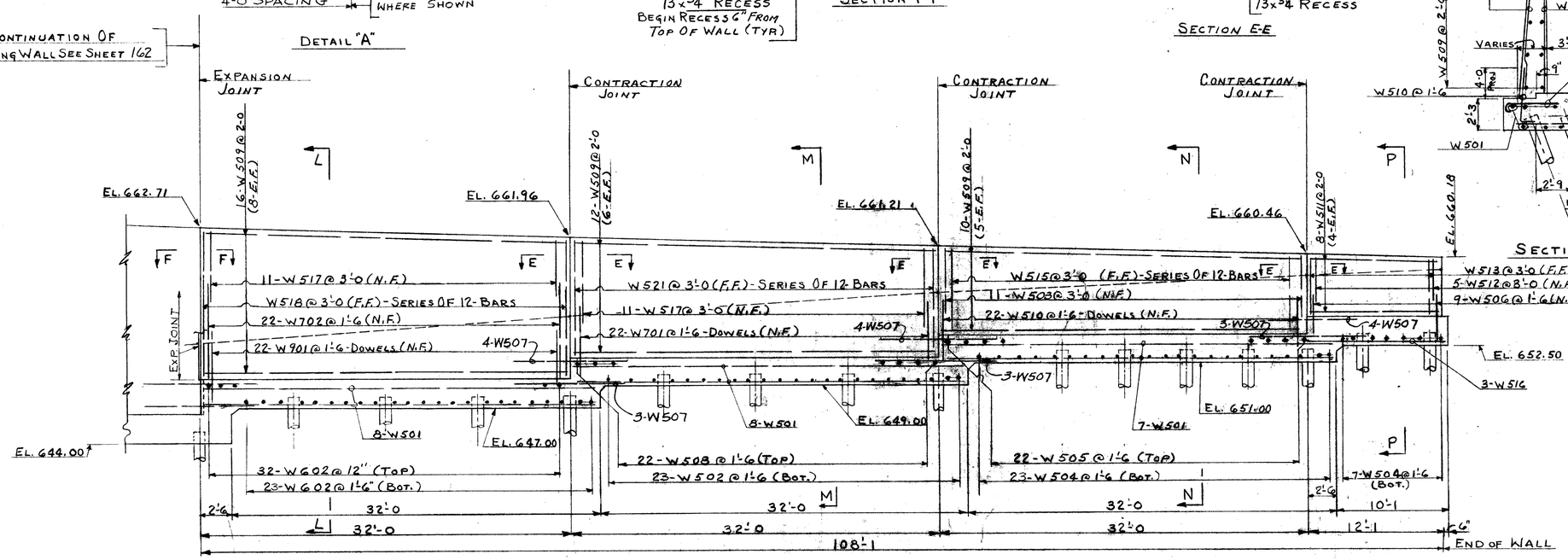


SECTION N-N



SECTION M-M

FOR CONTINUATION OF RETAINING WALL SEE SHEET 162



DEVELOPED ELEVATION

NOTE:-
WORK THIS SHEET WITH SHEET 162

FOR GENERAL NOTES SEE SHT. 154 & 160

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

RETAINING WALL - RAMP S-W

BRIDGE NO. CUY-21-RAMP S-W
RAMP N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DESIGNED						
SAE	C.T. CJ		SAE	GHH	5-15-63	

CONT. NO. 58019-26 SHEET ACCT. NO. 1878

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

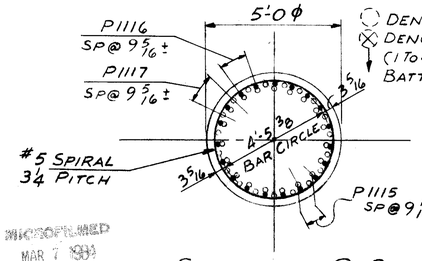
164
198

CUYAHOGA COUNTY
CUY— 21 - 14.12

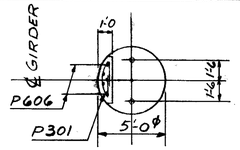
ELEV. *	A	B	C	D	E	F	G	H	K	M	N
VIEW A-A	659.20	659.82	660.29	660.72	661.18	660.76	660.30	659.67	660.65	651.18	650.00
VIEW B-B	660.11	660.72	661.17	661.61	661.92	661.49	661.05	660.44	661.38	652.18	651.00

* ELEVATIONS GIVEN ARE FOR THE FINAL POSITION OF THE GIRDER AFTER COMPLETE DEFLECTION FROM ALL SUPERSTRUCTURE DEAD LOADS.

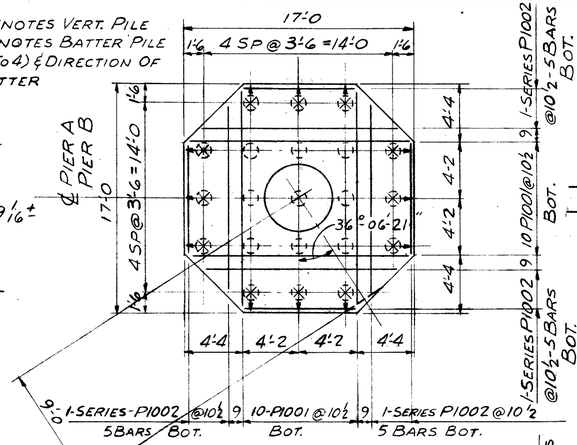
DEFLECTION AND CAMBER		
DESCRIPTION	LOCATION	
	¼ PT.	℄
DEFLECTION DUE TO GIRDER DEAD LOAD	0	1/16
DEFLECTION DUE TO SUPERSTRUCTURE STEEL	1/8	1/8
DEFLECTION DUE TO SLAB, CURB & PARAPET	5/16	1/16
TOTAL DEFLECTION & REQUIRED CAMBER	7/16	5/8

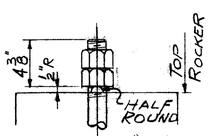


SECTION C-C

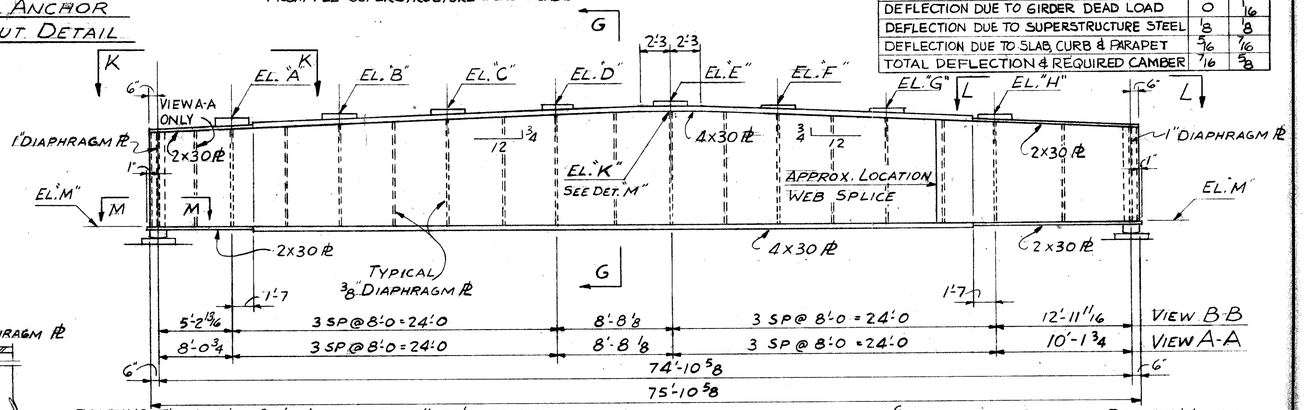


SECTION S-S
SECTION P-P (OPP. HAND)



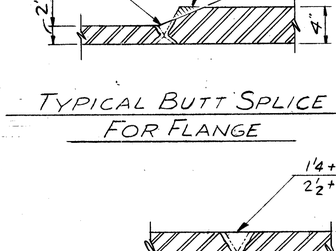


DETAIL "R"
TYPICAL ANCHOR BOLT NUT DETAIL



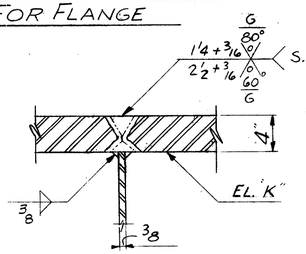
PAINTING: The inside of steel pier caps will not require any third or fourth coats as specified in the Proposal, but the two coats of red lead paint are required and both shall be applied in the shop.

VIEW A-A
VIEW B-B



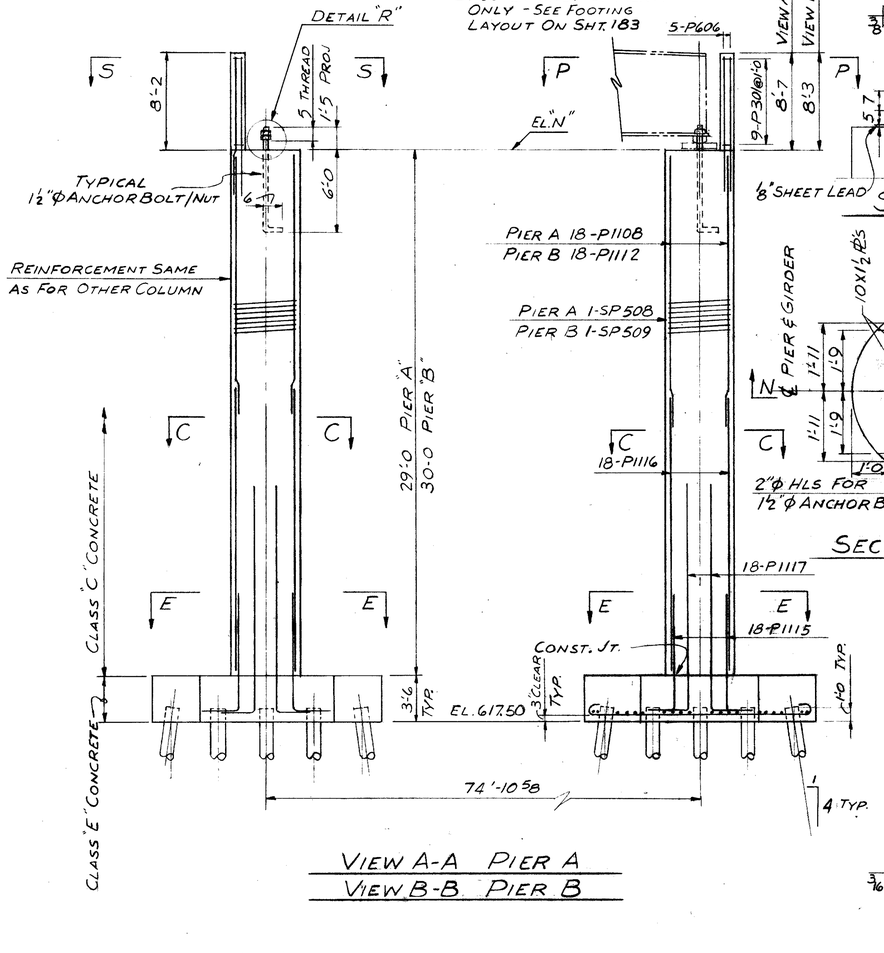
S.A. = AUTOMATIC SUBMERGED ARC PROCESS

TYPICAL BUTT SPLICE FOR FLANGE

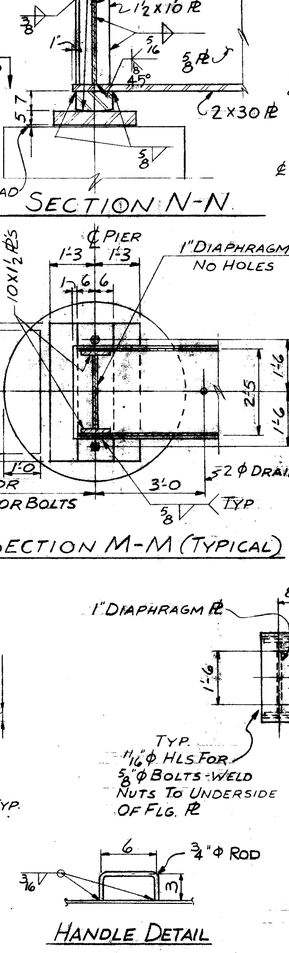


DETAIL "M"

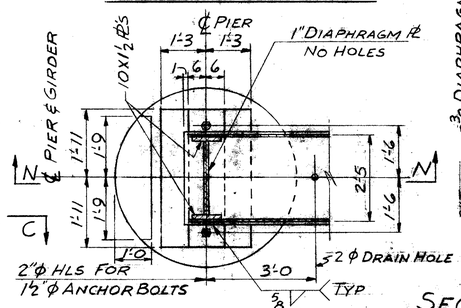
NOTE: ALL OF THE ABOVE FULL PENETRATION WELDS SHALL BE BACK-GOUGED & WELDED AFTER WELDING FAR SIDE.
Butt welds on beam and girder flange plates shall be ground flush, the finish grinding being parallel to the direction of stress
FOR GENERAL NOTES SEE SHT. 154 & 160
FOR ELECTRICAL GROUNDING INSTRUCTIONS SEE SHT. 137



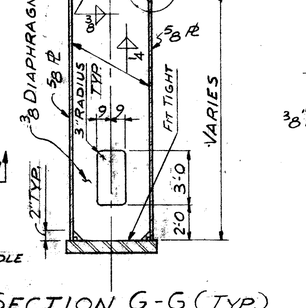
VIEW A-A PIER A
VIEW B-B PIER B



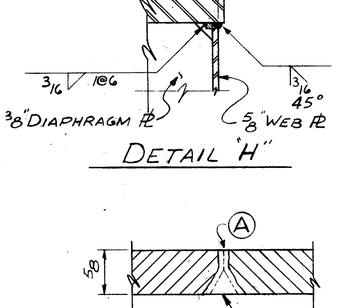
SECTION N-N



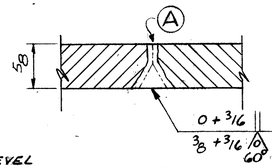
SECTION M-M (TYPICAL)



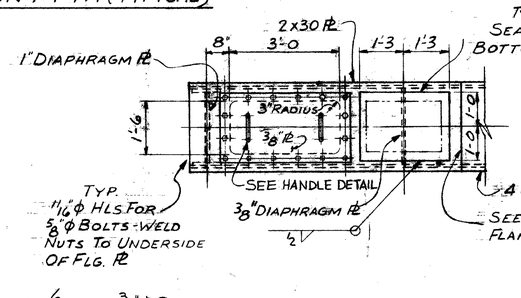
SECTION G-G (TYP.)

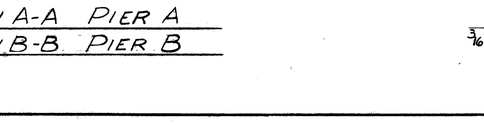


DETAIL "H"



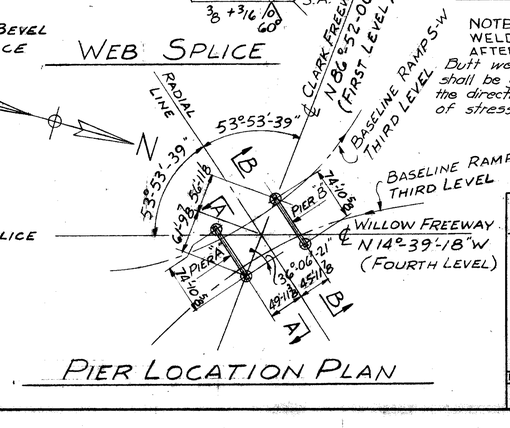
WEB SPLICE





HANDLE DETAIL

PLAN "K"
PLAN "L" (OPP. HAND)



PIER LOCATION PLAN

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PIER DETAILS

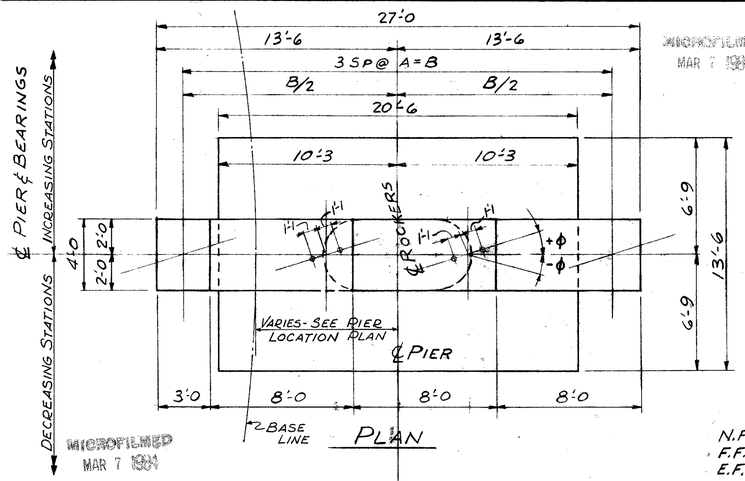
BRIDGE NO. CUY-21- RAMP N-E & RAMPS W
RAMPS N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	AFR		RIY		5-15-63	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

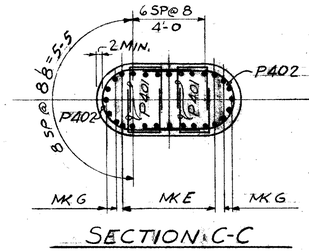
165/198

CUYAHOGA COUNTY
CUY– 21-14.12



MICROFILMED MAR 7 1984

MICROFILMED MAR 7 1984

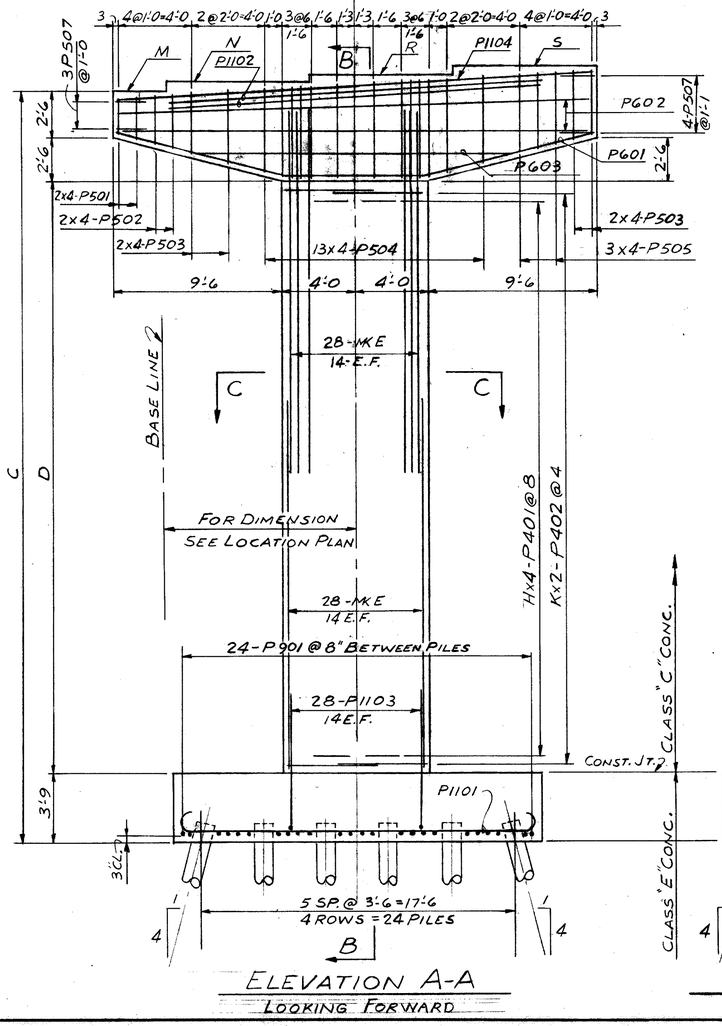


SECTION C-C

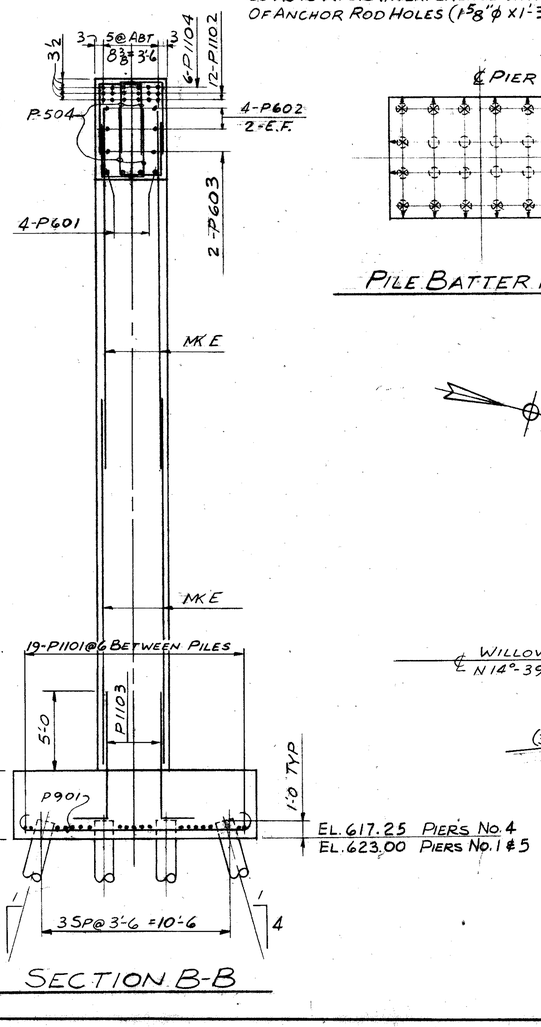
N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE

NOTE: SPECIAL CARE SHALL BE TAKEN IN PLACING REINFORCING STEEL IN VICINITY OF BRIDGE SEAT SO AS TO AVOID INTERFERENCE WITH THE DRILLING OF ANCHOR ROD HOLES ($1\frac{5}{8}$"ϕ x 1'-3" DEEP)

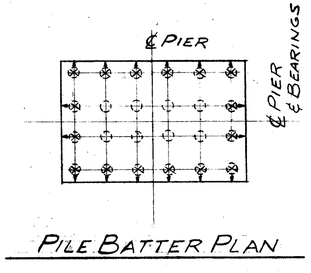
	PIER No. STA.	DIMENSIONS A	B	C	D	ELEVATIONS M	N	R	S	BAR MARKS E		BAR QUANTITIES H	K	ϕ
RAMP N.E.	#1 8+77.88	7-11½	23'-10½	38'-7½	29'-10½	661.63	662.24	662.69	663.13	P1105		45	89	+1°21'45"
	#4 11+63.21	7-11⅜	23'-10⅛	40-4⅛	31'-7⅛	657.59	658.21	658.66	659.09	P1107		48	94	-1°14'47"
	#5 12+56.54	7-11⅜	23'-10⅛	32'-5¾	23'-8¾	655.48	656.10	656.56	656.98	P1109		36	72	-2°29'33
RAMP S.W.	#1 10+16.10	7-11½	23'-10½	36'-0½	27'-3½	659.04	659.66	660.11	660.54	P1111		41	82	+1°13'01"
	#4 13+01.42	7-11⅝	23'-10⅞	42-8¼	33-11¼	659.94	660.56	661.00	661.44	P1113		52	102	-1°09'41"
	#5 13+94.75	7-11⅝	23'-10⅞	36'-2¼	27'-5¼	659.19	659.80	660.25	660.69	P1111		41	82	-2°23'15"



ELEVATION A-A
LOOKING FORWARD

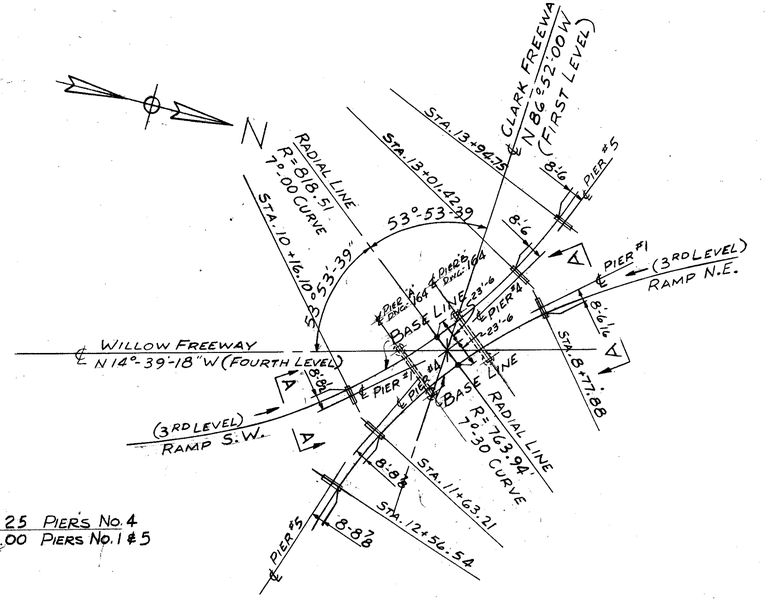


SECTION B-B



PILE BATTER PLAN

PILE DESIGNATION
- ○ DENOTES PLUMB PILE
- ⊗ DENOTES 1 TO 4 BATTER PILE
- ARROW INDICATES DIRECTION OF BATTER



PIER LOCATION PLAN

FOR GENERAL NOTES SEE SHT. 154 & 160

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PIER DETAILS
BRIDGE No. CUY-21-RAMP N-E & RAMP S-W
RAMPS N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DESIGNED	AER		CJ	GAH	5-15-83	

CONTR. NO. 58019-26 SHEET ACCT. No. 1837

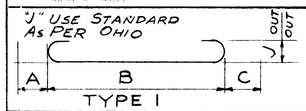
REINFORCING STEEL BAR SCHEDULE

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

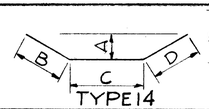
166
198

CUYAHOGA COUNTY
CUY– 21-14.12

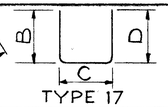
"J" USE STANDARD AS PER OHIO



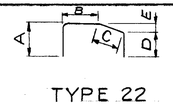
TYPE 1



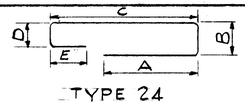
TYPE 14



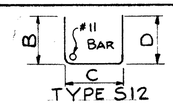
TYPE 17



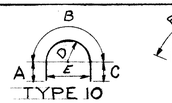
TYPE 22



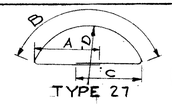
TYPE 24



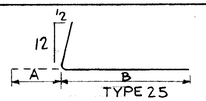
TYPE S12



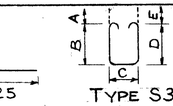
TYPE 10



TYPE 27



TYPE 25



TYPE S3

PIERS

MARK	No. REQ'D. 165	164	TOTAL	LENGTH	TYPE	A	B	C	D	E	WEIGHT
P301		36	36	7'-5	27	2'-1	3'-5	2'-1	2'-3 3/4		100
P401	1052		1052	6'-5	S-12		2'-6	1'-7	2'-6		4,509
P402	1042		1042	11'-3	10	2'-9	5'-9	2'-9	1'-10	3'-8	7,831
P501	48		48	6'-2	S-12		2'-0	2'-4	2'-0		309
P502	48		48	6'-10			2'-4		2'-4		342
P503	96		96	7'-8			2'-9		2'-9		768
P504	312		312	9'-4			3'-7		3'-7		3,037
P505	72		72	8'-6	S-12		3'-2		3'-2		638
P507	42		42	8'-5	17		2'-6	3'-8	2'-6		370

SPIRALS

			LENGTH	PITCH	NO. TURNS	CORE DIA. OUT TO OUT	
SP508	2	2	28'-10	3 1/4"	110	56"	3,482
SP509	2	2	29'-10	3 1/4"	114	56"	3,614

NOTES: "LENGTH" SHOWN FOR SPIRAL BARS IS THE DISTANCE FROM TOP OF FOOTING TO TOP OF COL MINUS 2"
NO TURNS IS "LENGTH" DIVIDED BY "PITCH" PLUS 3 TURNS TOTAL (NUMBER OF CLOSED COILS) TO 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 ENDS OF EACH UNIT.
FOUR STEEL CHANNEL, TEE OR ANGLE SPACERS @ APPROX. 0.68 POUNDS/LIN. FOOT OF EACH SPACER SHALL BE PROVIDED FOR EACH UNIT AND SHALL BE EQUALLY SPACED ALONG THE COIL PERIPHERY. SPACERS WILL BE PAID FOR AS REINF. STEEL & THEIR WEIGHT (BASED ON 0.68 #/LIN FT.) INCL. IN TABULATED QUANTITY OF SPIRAL BARS.

P601	24		24	27'-0	14		9'-7	7'-10	9'-7	2'-6	973
P602	24		24	26'-6	STR						955
P603	12		12	17'-6	STR						315
P606		20	20	10'-6	STR						315
P901	144		144	15'-6	1	1'-3	13'-0	1'-3			7,589
P1001		80	80	19'-4	1	1'-5	16'-6	1'-5			6,655
P1002		16 SERIES OF 5	16 SERIES OF 5	11'-2 TO 18'-2	1	1'-5	8'-4 TO 15'-4	1'-5	VARY BY 1'-9		5,049
P1101	114		114	23'-2	1	1'-7	20'-0	1'-7			14,032
P1102	72		72	20'-0	STR						7,651
P1103	168		168	10'-8	17		8'-6	2'-6			9,521
P1104	36		36	26'-6	STR						5,069
P1105	56		56	19'-0							5,653
P1107	56		56	19'-9							5,876
P1108		36	36	15'-6							2,965
P1109	56		56	16'-0							4,760
P1111	112		112	17'-9							10,562
P1112		36	36	16'-3							3,108
P1113	56		56	21'-0	STR						6,248
P1115		72	72	9'-6	17		7'-6	2'-4			3,634
P1116		72	72	18'-0	STR						6,886
P1117		72	72	12'-0	17		10'-0	2'-4			4,590
										TOTAL FOR PIERS	137,406

RETAINING WALLS

MARK	No. REQ'D. 162 163	158 159	TOTAL	LENGTH	TYPE	A	B	C	D	E	WEIGHT
W501	41	25	66	34'-0	STR.						2340
W502	23	23	46	6'-7 TO 6'-0	1	0'-7	6'-0				316
W503	11		11	5'-6	STR.						63
W504	30	13	43	5'-1 TO 4'-7	1	0'-7	4'-6				218
W505	22		22	4'-7 TO 4'-0	1	0'-7	4'-0				105
W506	9	14	23	6'-8 TO 5'-9	24	1'-0	5'-9				160
W507	50	34	84	10'-0	STR.						876
W508	22	22	44	6'-0 TO 5'-5	1	0'-7	5'-5				275
W509	110	72	182	31'-9	STR.						6027
W510	22		22	6'-11 TO 6'-0	24	1'-0	6'-0				159
W511	8		8	11'-10	STR						99
W512	5	7	12	5'-3 TO 5'-3	VARY BY 1/2"						66
W513	1 SERIES OF 5			5'-0 TO 5'-3							27
W514		8	8	20'-3 TO 7'-7	VARY BY 3"+						170
W515	1 SERIES OF 12			6'-10 TO 7'-7							90
W516	3		3	17'-6 TO 13'-1	VARY BY 3/4"+						55
W517	61	52	113	6'-0 TO 13'-1							707
W518	1 SERIES OF 12			12'-4 TO 13'-1	VARY BY 3/4"+						159
W519		1 SERIES OF 12		17'-4 TO 18'-3	VARY BY 1"						223
W520		1 SERIES OF 12		12'-10 TO 13'-9	VARY BY 1"						165
W521	1 SERIES OF 12			9'-7 TO 10'-4	VARY BY 3"+						125
W522		16	16	16'-0							267
W523	1 SERIES OF 12			16'-1 TO 16'-10	VARY BY 3/4"+						206
W524		1 SERIES OF 12		8'-10 TO 9'-9	VARY BY 1"						116
W525		1 SERIES OF 12		5'-8 TO 6'-3	VARY BY 1/2"						75
W526	1 SERIES OF 12			20'-4 TO 21'-1	VARY BY 3/4"+						259
W527	32	16	48	13'-6 TO 20'-9							676
W528		4	4	20'-9	STR						87
W529	28	24	52	4'-7	17		2'-8	2'-0			249
W530	12	10	22	35'-0	STR						803
W531	2	2	4	6'-11	17		6'-0	1'-0			29
W532	18	18	36	5'-0	STR						188
W601	33		33	7'-2	1	0'-8	6'-6				355
W602	55	55	110	6'-8	1	0'-8	6'-0				1101
W701	22	22	44	9'-10	24	1'-6	8'-6				884
W702	22		22	9'-0	STR						404
W703		22	22	6'-4	1	0'-10	5'-6				285
W704	40		40	9'-10	1	0'-10	9'-0				884
W705	33		33	7'-10	1	0'-10	7'-0				352
W802	24	31	55	7'-7	1	1'-1	6'-6				1114
W803	16	16	32	8'-0	STR						684
W804	17		17	13'-0	STR						590
W805		33	33	8'-6	1	1'-1	7'-5				573
W806		22	22	9'-8	STR						568
W901	22		22	7'-5	24	1'-8	6'-0				555
W902	43	53	96	10'-3	1	1'-3	9'-0				3346
W903	21	25	46	10'-0	STR						1564
W904	22		22	17'-3							1290
W905	32		32	21'-0							2285
W906	32		32	11'-0							1197
W907		26	26	18'-3							1613
W908	17	17	17	12'-7	STR						1594
W1001	33	22	55	7'-6	24	1'-10	6'-0				1775
W1101	64	51	115	9'-8	24	2'-0	8'-0				5906
W1102	17		17	13'-7	1	1'-7	12'-0				1227
W1103	43	33	76	8'-5	24	2'-0	6'-9				3399
W1104	17		17	7'-0	STR						632
W1105	16		16	11'-8	1	1'-7	10'-5				1417
W1106	16		16	6'-0	STR						510
										TOTAL FOR RET. WALLS	51,484

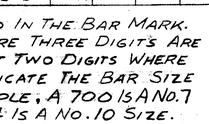
ABUTMENTS

MARK	No. REQ'D 160	161	156	157	TOTAL	LENGTH	TYPE	A	B	C	D	E	WEIGHT
A501	20		20		40	7-3	17		6-6	0-10			302
A502	16		16		32	8-3	17		7-6	0-10			275
A503	21	25	21	22	89	27-9							2,576
A504	30		30		60	8-2	17		2-6	3-5	2-6		511
A505	6		6		12	8-7	STR						107
A506	8	1	8		17	3-8	S						65
A507	8	1	8	1	18	2-8	STR						50
A508	10		12		22	21-0	17		10-0	1-2	10-0		482
A509	16			8	24	10-5	STR						261
A510	20	16	20	16	72	4-0							300
A511	40	35	48	23	146	5-7							850
A512	2	4			6	9-3							58
A513	2				2	11-3							24
A514	4			4	8	4-9	STR						40
A515		30		31	61	7-4	1	0-7	6-9				467
A516	20			6	26	16-0	STR						434
A517	10		6		16	7-1	STR						118
A518	10		12		22	18-0	17		8-6	1-2	8-6		413
A519			16		16	13-0	STR						217
A520				10	10	29-9							310
A521			2		2	11-0							23
A522			20		20	19-0							396
A523		3	4		7	4-6	STR						33
A524				6	6	5-7	1	0-7	5-0				35
A525		2	2		4	13-6	STR						56
A526			4	3	7	7-6	STR						55
A527		10			10	14-0	STR						146
A528	24	30	28	20	102	7-6	5-3	0-8	2-10	0-8	2-10	0-8	798
A529	19	31	19	27	96	3-11	17		2-0	2-0			392
A530	12	9	16	3	40	4-6	24	1-7	1-1	0-6	1-7	0-2	188
A531	6	3	6		15	4-0	24	1-4	1-1	0-6	1-4	0-2	63
A532	6	4	6	3	19	3-8	24	1-2	1-1	0-6	1-2	0-2	73
A533		14		12	26	4-9	24	1-9	1-0	0-6	1-9	0-2	129
A534		17			17	19-4	STR						343
A535		14			14	21-0							307
A536		32		3	35	15-6							566
A537	2	2	2	4	10	5-10							61
A538		17			17	21-8							384
A539		2		2	4	3-6							15
A540		1		1	2	3-4							7
A541		2		1	3	3-0							9
A542		3			3	3-10							12
A543		3		3	6	4-2	STR						26
A544		7		4	11	11-0	17		5-0	1-2	5-0		126
A545		3			3	17-7	STR						55
A546		3			3	18-2							57
A547		4			4	18-8							78
A548				3	3	14-10							46
A549				8	8	15-9							131
A550				11	11	16-9							192
A551				26	26	9-6							258
A552	8	4	8		20	5-0	STR						104
A553		11			11	8-4	1	0-7	7-9				96
A554		7			7	29-3	STR						214
A555		2		2	4	4-6	24	1-9	0-9	0-6	1-9	0-2	19
A556		5			5	17-10							93
A557		5		8	13	18'-5							250
A558		6			6	18'-10							118
A559		1			1	28'-6							30

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. FOR EXAMPLE, A 700 IS A NO.7 SIZE BAR AND A 1014 IS A NO.10 SIZE.

DRAWING LIST

164 - PIERS
165 - PIERS
162 & 163 - RETAINING WALL @ S.W. RAMP
158 & 159 - RETAINING WALL @ N.E. RAMP
160 - REAR ABUT. S.W. RAMP
161 - FORWARD ABUT. S.W. RAMP
156 - REAR ABUT. N.E. RAMP
157 - FORWARD ABUT. N.E. RAMP



ABUTMENTS

MARK	No. REQ'D 160	161	156	157	TOTAL	LENGTH	TYPE	A	B	C	D	E	WEIGHT
A560		1			1	26-9	STR						28
A561		27		27	54	6-2	17		1-6	3-5	1-6		347
A562		14		12	26	6-4	23		1-6	2-7	0-8	2-0	172
A563				19	19	13-0	STR						258
A564				5	5	15-0	STR						78
A601	40		40		80	11-1	17		2-3	6-11	2-3		1,332
A602	16		16		32	16-4	23	5-8	1-5	7-0	0-11	2-0	785
A603	20	18	32	12	82	7-4	17		2-3	3-2	2-3		903
A604	14				14	13-6	STR						284
A605	6				6	16-0							144
A606	2			7	9	11-3							152
A607	2				2	9-3							28
A608	17	17		14	48	6-6							469
A609		7	14		21	15-6	STR						489
A610				4	4	6-10	1	0-8	5-6	0-8			41
A611		3			3	21-8	STR						98
A612	8		8		16	16-8	23	7-0	1-5	7-0	1-5	0-6	400
A613		13		7	20	6-7	17		5-9	1-0			198
A614		1			1	18-8	STR						28
A615		1			1	14-8	STR						22
A616		16		16	32	9-2	17		6-6	0-11	2-0		441
A617		1 SERIES OF 16		1 SERIES OF 16	2 SERIES OF 16	9-2 TO 9-11	14	2-7	3-8	3-8 TO 5-3	VARY BY 1/2"		459
A618		8		8	16	9-9	17		6-6	1-5	2-0		234
A619		4		4	8	11-4	14	2-7	3-8	7-8			136
A620		4		4	8	10-1	14	2-7	3-8	6-5			121
A701			17		17	6-6	STR						226
A702			2		2	13-6							55
A703			2		2	11-0							45
A704		6			6	19-0							233
A705		15		12	27	27-6	STR						1,518
A706				26	26	7-10	1	0-10	7-0				416
A707		9			9	9-5	1	0-10	7-9	0-10			173
A801	10		10		20	29-9	STR						1,589
A802	4		4		8	6-0	STR						128
A803		26			26	8-1		1-1	7-0				561
A804				18	18	10-0	STR						481
A805		15		12	27	7-0							505
A806		14			14	12-0							449
A807			15		15	9-6							380
A808			3		3	13-0							104
A809			1		1	7-6	STR						20
A901		29		36	65	8-6	17		7-9	1-0			1,879
A902		19			19	15-6	STR						1,001
A903		6			6	12-0							245
A904		3			3	21-8							221
A905		1			1	18-8							64
A906		1			1	14-8	STR						50
A1001		13			13	8-5	17		7-9	1-0			471

PARAPET BARS (INCLUDE WITH RAILING FOR PAYMENT)

R501	8			8	15-10	STR	
R502		8		8	19-0	STR	
R503	8			8	21-4	STR	
R504			8	8	12-8	STR	

TOTAL FOR ABUTS. 32,305

REPLACEMENT BARS

MARK	No REQ'D	LENGTH	TYPE
RESP500	1	5'-7	SEE DETAIL
RE 300	1	5-0	STR
RE 400	1	5-3	
RE 500	3	5-7	
RE600	1	5-11	
RE 700	1	6-3	
RE 800	1	6-6	
RE900	2	6-10	
RE1000	1	7-2	
RE1100	6	7-6	STR

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

BAR SCHEDULE

BRIDGE NO. CUY-21-RAMP N-E & RAMP S-W
RAMPS N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	RIY		S.A.E. RIY	[signature]	5-15-63	

CONT. No. 58019-26 SHEET ACCT. No. 1882

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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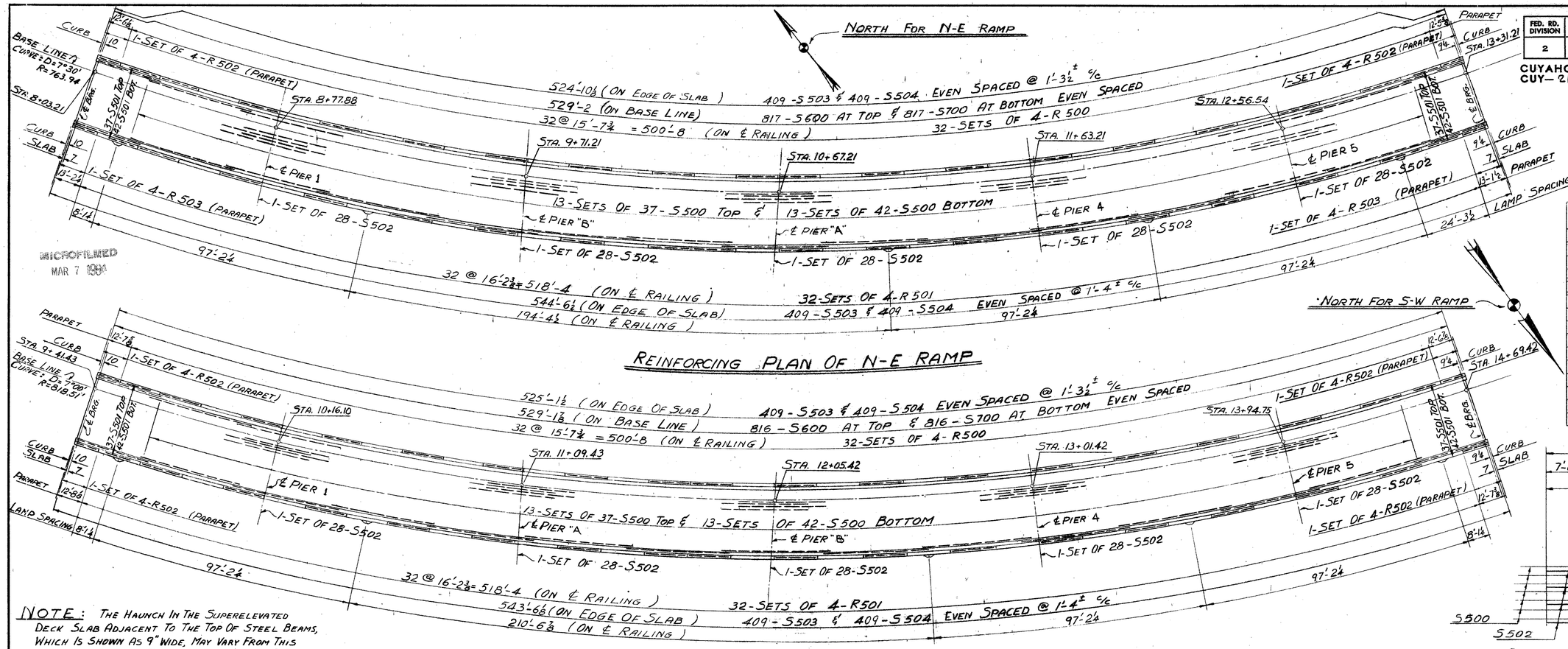
CUYAHOGA COUNTY
CUY— 21 - 14.12

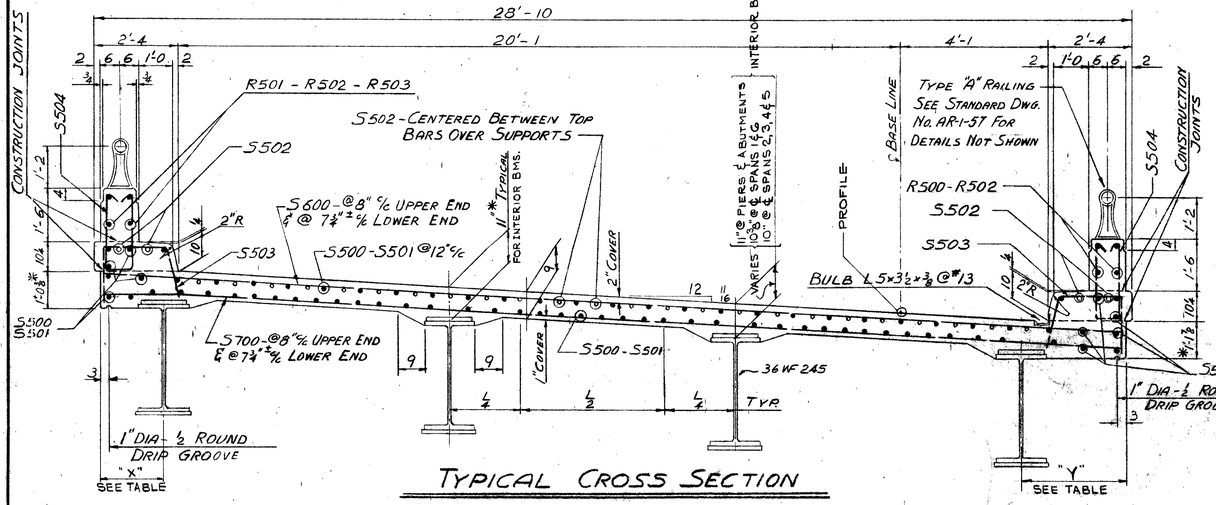


MICROFILMED
MAR 7 1994

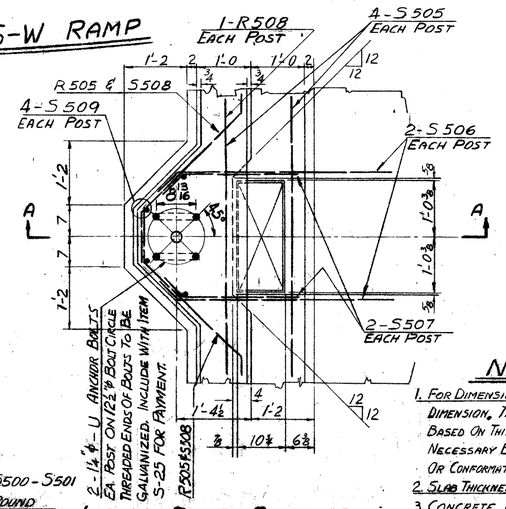
REINFORCING PLAN OF N-E RAMP

REINFORCING PLAN OF S-W RAMP

NOTE: THE HAUNCH IN THE SUPERELEVATED DECK SLAB ADJACENT TO THE TOP OF STEEL BEAMS, WHICH IS SHOWN AS 9" WIDE, MAY VARY FROM THIS DIMENSION BETWEEN THE LIMITS OF 6" AND 12" ON THE LOW SIDE AND BETWEEN 9" AND 12" ON THE HIGH SIDE. EXCEPT ON THE HIGH SIDE, THE MAXIMUM SLOPE SHALL NOT EXCEED 3 INCHES PER FOOT. PAYMENT FOR DECK SLAB CONCRETE SHALL BE BASED ON THE 9" WIDTH.

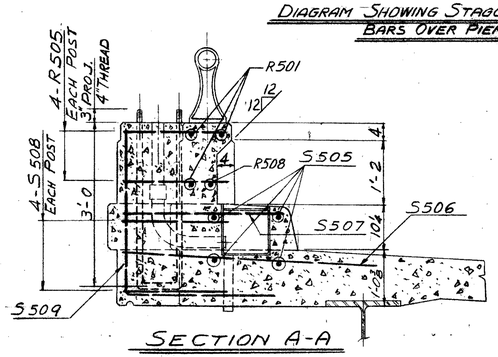


TYPICAL CROSS SECTION



LAMP POST SUPPORT

SEE LIGHTING SHT. Nº. 135 FOR ADDITIONAL DETAILS



SECTION A-A

DIMENSIONS FOR SLAB OVERHANG

LOCATION	RAMP N-E		RAMP S-W	
	X	Y	X	Y
REAR ABUT.	2'-0	2'-7½	2'-0	2'-7½
℄ SPAN #1	2'-10¼	1'-9⅝	2'-8	1'-11⅝
PIER #1	1'-9¾	2'-9¾	1'-7¼	3'-0¼
℄ SPAN #2	3'-3⅛	1'-4¾	2'-11½	1'-8¼
PIER "B"	1'-9¾	2'-9¾		
PIER "A"			1'-7¼	3'-0¼
℄ SPAN #3	3'-0¾	1'-5¼	3'-0⅝	1'-6
PIER "A"	1'-7⅛	3'-0¾		
PIER "B"			1'-9¾	2'-9⅝
℄ SPAN #4	3'-1½	1'-6¾	3'-3⅛	1'-4¾
PIER #4	1'-7⅛	3'-0¾	1'-9¾	2'-9⅝
℄ SPAN #5	3'-0½	1'-7¾	3'-2⅛	1'-5⅝
PIER #5	1'-7⅛	3'-0¾	1'-9¾	2'-9⅝
℄ SPAN #6	2'-8¾	1'-11⅛	2'-9⅝	1'-10¼
FORWARD ABUT.	2'-0	2'-7½	2'-0	2'-7½

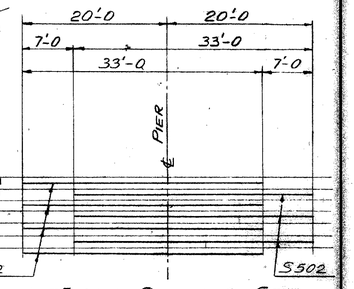


DIAGRAM SHOWING STAGGER OF S502 BARS OVER PIERS

NOTES:

1. FOR DIMENSION MARKED WITH AN ASTERISK (*), THIS IS A 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 GIRDER MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE.
2. SLAB THICKNESS SHOWN INCLUDES 1" FOR MONOLITHIC WEARING SURFACE.
3. CONCRETE FOR THE DECK SHALL BE CLASS "C".
4. THE COVER ON REINFORCEMENT BARS, UNLESS OTHERWISE NOTED, SHALL BE 1½".
5. FOR BAR SCHEDULE SEE SHEET No. 168
6. FOR ADDITIONAL NOTES SEE SHEET No. 154

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

N-E & S.W. DECK DETAILS
BRIDGE No. CUY-21- RAMP N-E & RAMP S-W
RAMPS N-E & S-W UNDER WILLOW FREEWAY
WILLOW - CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	M.G.		DWM	GHH	6-15-63	

CONTR. RTE. S8019-26 SHEET ACCT. No. 1841

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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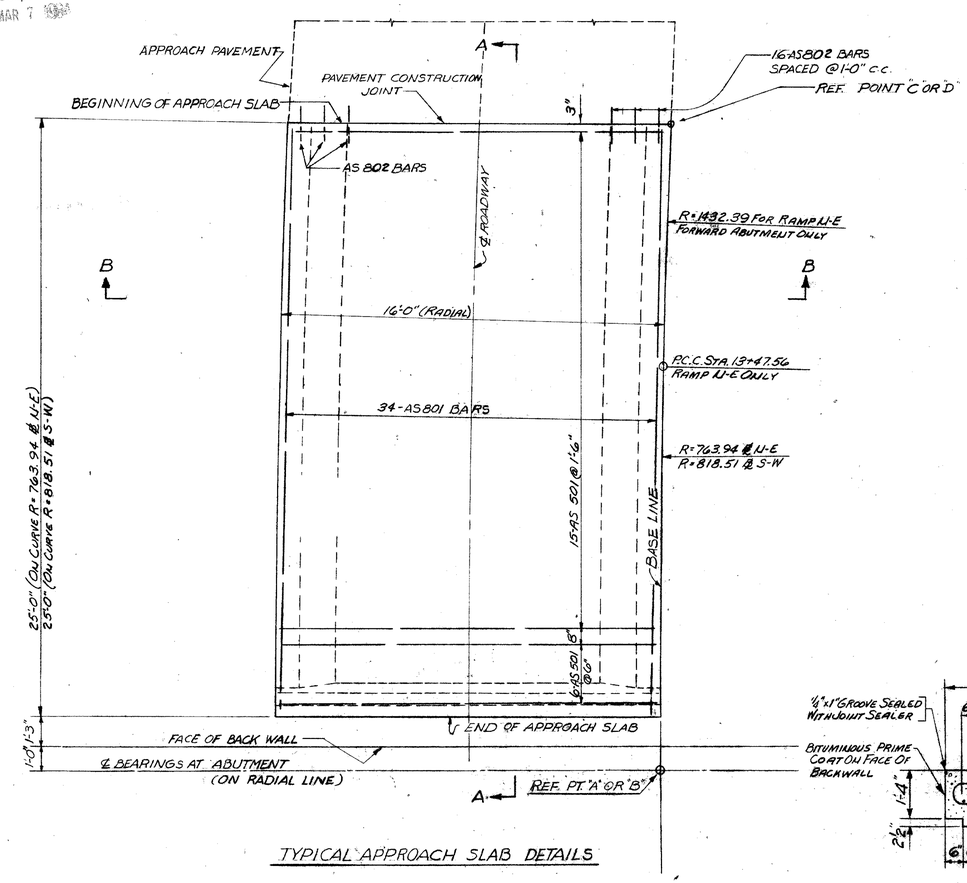
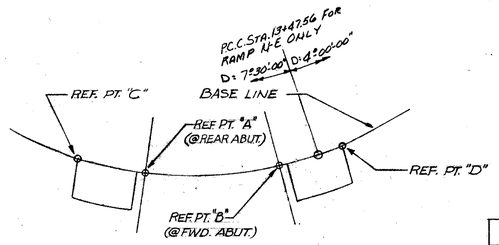
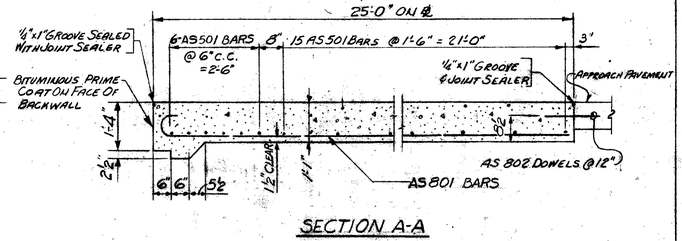
CUYAHOGA COUNTY
CUY-21-14.12



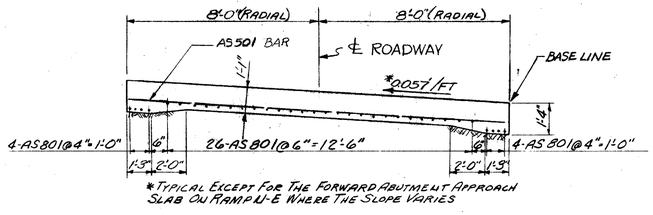
TYPICAL APPROACH SLAB DETAILS



	"C"	"A"	"B"	"D"
RAMP N-E	7+75.96	8+03.21	13+31.21	13+58.46
RAMP S-W	9+14.18	9+41.43	14+69.42	14+96.67



SECTION A-A



*TYPICAL EXCEPT FOR THE FORWARD ABUTMENT APPROACH SLAB ON RAMP N-E WHERE THE SLOPE VARIES

SECTION B-B

NOTES

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED. INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, S700 IS A No.7 SIZE BAR.

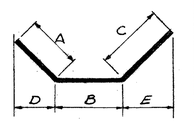
TRANSVERSE BARS ARE PLACED PARALLEL TO THE FACE OF BACK WALL.

LONGITUDINAL BARS ARE PLACED PARALLEL TO A ℄ ROADWAY CHORD WHICH EXTENDS FROM BEGINNING TO END OF APPROACH SLAB.

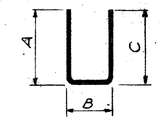
FOUR UNITS OF APPROACH SLABS ARE REQUIRED FOR RAMPS N-E & S-W. ALL ARE SIMILAR IN DETAILS EXCEPT SLIGHTLY DIFFERENT IN CURVATURE. TYPICAL DETAILS SHOWN ARE FOR THE ONE IN REAR ABUTMENT SIDE. FORWARD SIDE ONES ARE SIMILAR BUT OPPOSITE-HAND.

CONCRETE FOR THE APPROACH SLAB SHALL BE CLASS "C"

BENDING DIAG.



TYPE 14



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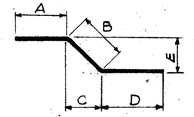
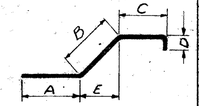
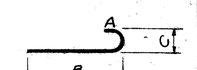


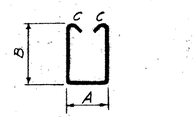
TYPE 19



TYPE 26



TYPE I



TYPE S-3

REINFORCING STEEL BAR SCHEDULE

MARK	NO. REQ.	NET LENGTH	TYPE	A	B	C	D	E	WEIGHT
BRIDGE DECK REINFORCING STEEL									
S500	2054	40'-0"	STR						85,693#
S501	316	23'-3"	STR						7,643
S502	280	33'-0"	STR						9,637
S503	1436	4'-7"	26	——	1'-6"	1'-9"	1'-7"	3½"	7,881
S504	1436	5'-8"	5-3	8"	2'-2"	5"			9,669
S505	40	5'-4"	STR.						223
S506	20	4'-6"	14	6"	4'-0"	——	4"	——	94
S507	20	2'-6"	14	6"	2'-0"	——	4"	——	52
S508	40	4'-3"	19	11"	2'-7"	1'-10"	11"	1'-10"	177
S509	40	4'-10½	17	3'-0"	2'-0"	——			203
S600	1633	28'-3"	STR.						69,291
S700	1633	28'-3"	STR.						94,294
								TOTAL WEIGHT =	284,817#
R500	256	15'-6"	STR						
R501	256	18'-10"	STR						
R502	24	12'-3"	STR.						
R503	8	12'-11"	STR.						
R505	40	4'-3"	19	11"	2'-7"	1'-10"	11"	1'-10"	
R508	10	5'-4"	STR.						
BARS MARKED WITH THE PREFIX "R" ARE TO BE PAID FOR UNDER ITEM S-14 RAILING									
APPROACH SLAB REINFORCING STEEL									
AS501	84	15'-9"	STR.						
AS801	136	25'-7"	I	1'-1"	24'-6"	9"			
AS802	64	1'-6"	STR.						
BARS MARKED WITH THE PREFIX "AS" ARE TO BE PAID FOR UNDER ITEM I-7 REINFORCED CONCRETE APPROACH SLABS									
REPLACEMENT BARS									
RE500	7	5'-7"	STR						
RE600	4	5'-11"	STR.						— REPLACEMENT BARS —
RE700	5	6'-3"	STR.						

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

N-E & S.W. APPROACH SLAB & BAR SCHEDULE
BRIDGE No. CUY-21- RAMP N-E & RAMP S-W
RAMPS N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE	1	DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	RAB		D.W.M.		5-15-63	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY-21-14.12

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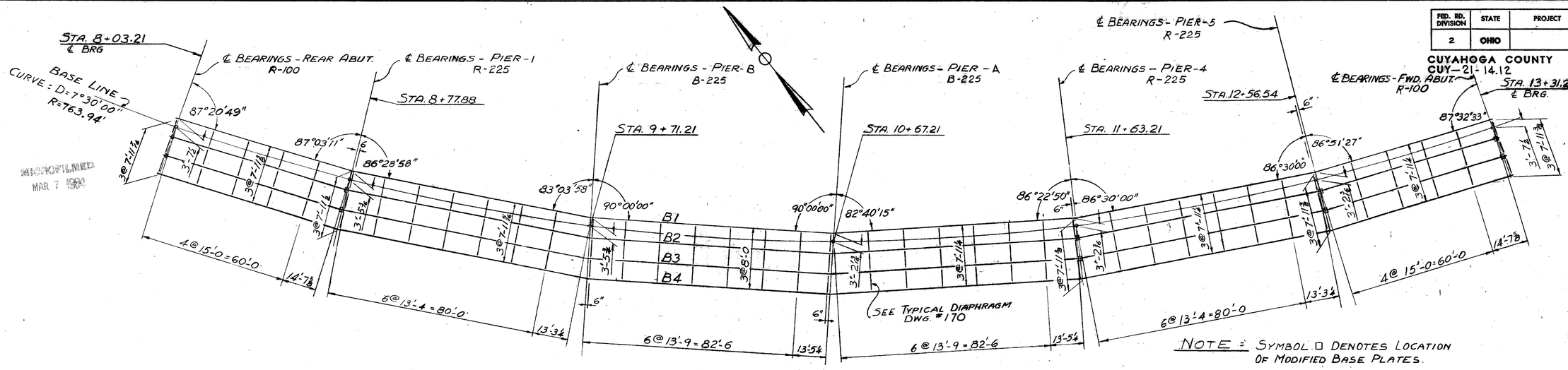
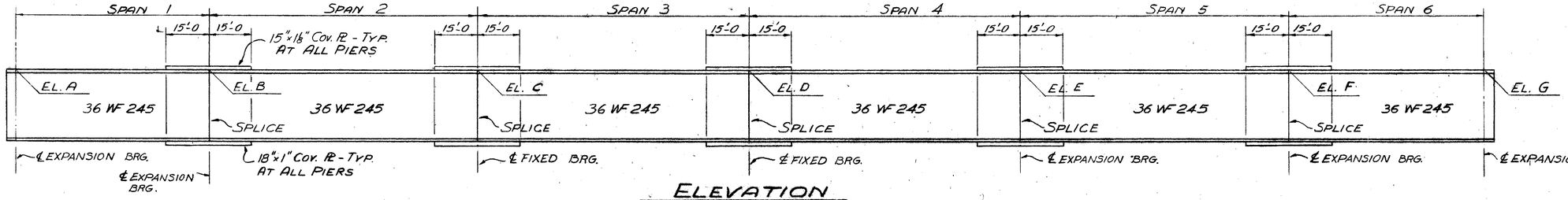


NOTE = SYMBOL □ DENOTES LOCATION OF MODIFIED BASE PLATES.

STEEL FRAMING PLAN



ELEVATION

BEAM DETAILS

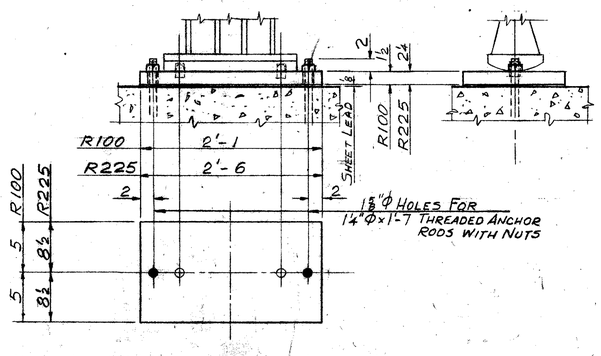
BEAM	SPAN — C-C. BEARINGS						ELEVATIONS						
	1	2	3	4	5	6	A	B	C	D	E	F	G
B1	74'-3½	92'-7 11/16	95'-11¼	95'-3⅜	92'-10⅝	74'-3 11/16	667.09	666.13	664.94	663.70	662.09	659.98	657.91
B2	75'-0⅜	94'-1⅛	95'-11¼	96'-10⅛	93'-10¼	75'-1	667.69	666.74	665.55	664.32	662.71	660.60	658.51
B3	75'-10⅛	95'-6⅛	95'-11¼	98'-4 7/16	94'-9⅞	75'-10⅞	668.14	667.19	665.99	664.79	663.16	661.06	658.96
B4	76'-7⅞	97'-0	95'-11¼	99'-10 11/16	95'-9 9/16	76'-7 11/16	668.59	667.63	666.42	665.22	663.59	661.48	659.41

CAMBERING OF BEAMS IS REQUIRED IN ACCORDANCE WITH THE FOLLOWING TABLE.

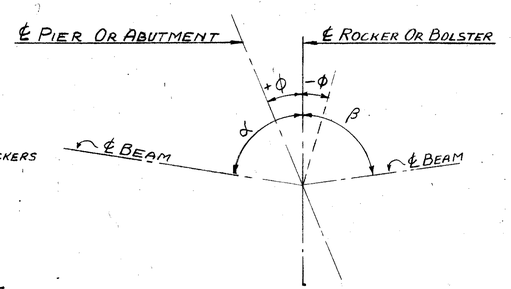
DEFLECTION AND CAMBER

SPAN	1	2	3	4	5	6
DEFLECTION DUE TO WEIGHT OF STEEL	1"	1"	1"	1"	1"	1"
	8	4	4	4	4	8
DEFLECTION DUE TO REMAINING DEAD LOAD	1/2"	5/8"	5/8"	3/4"	5/8"	1/2"
VERTICAL CURVE	0	0	0	7/8"	7/8"	1/2"
SUM OF DEFLECTIONS	5/8"	7/8"	7/8"	1 7/8"	1 3/4"	1 1/8"
CAMBER REQUIRED	0	7/8"	7/8"	1 7/8"	1 3/4"	1 1/8"

FOR REMAINING DIMENSIONS & DETAILS OF ROCKERS SEE STANDARD DRAWING NO. RB-1-55 DATED 2-2-59



MODIFIED ROCKER BASE PLATE



BEARINGS DATA

LOCATION	α	β	Φ
R. ABUT.	——	91°48'00"	-4°27'11"
PIER 1.	85°41'26"	87°50'43"	-1°21'45"
PIER B.	86°31'59"	86°31'59"	+3°28'01"
PIER A.	86°20'08"	86°20'07"	-3°39'52"
PIER 4.	87°37'37"	85°15'13"	+1°14'47"
PIER 5	88°59'33"	84°21'54"	+2°29'33"
F. ABUT.	93°41'27"	——	+6°08'54"

NOTES =

1. FOR BEAM SPLICE WELDING PROCEDURE - SEE SHEET NO. 170.
2. FOR SPLICE DETAILS - SEE SHEET NO. 170.
3. FOR TYPICAL DIAPHRAGM - SEE SHEET NO. 170.
4. FOR ADDITIONAL NOTES - SEE SHEET NO. 154.
5. FOR DETAILS OF BOLSTERS AT PIERS NO. A & B SEE SHEET NO. 170.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

N-E STEEL FRAMING

BRIDGE NO. CUY-21-RAMP N-E
RAMPS N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
S.E.N.	H.G.		D.W.M.		5-15-69	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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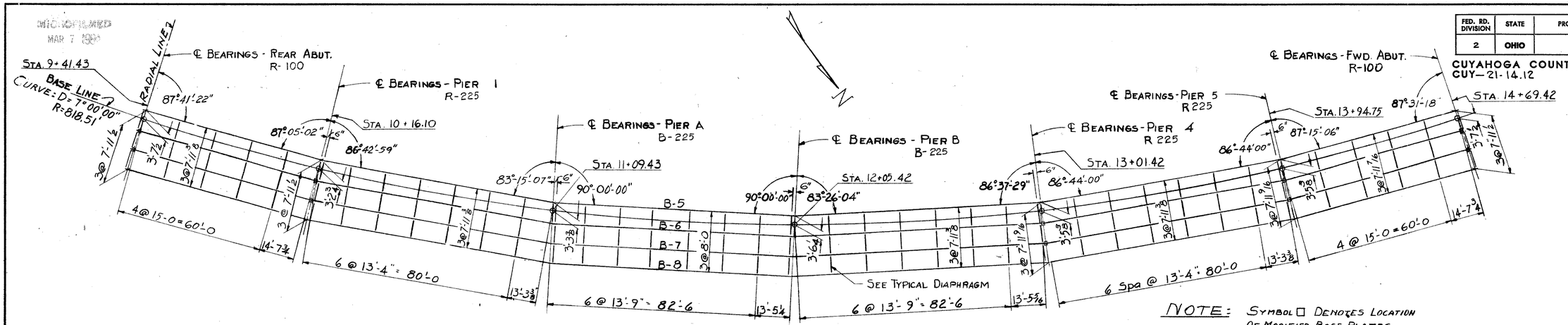
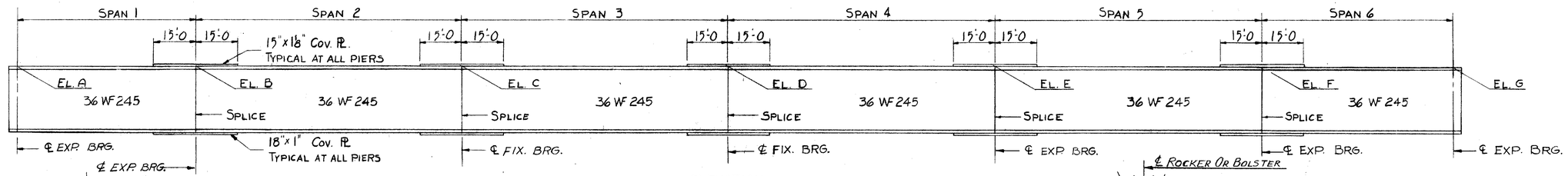
CUYAHOGA COUNTY
CUY—21-14.12

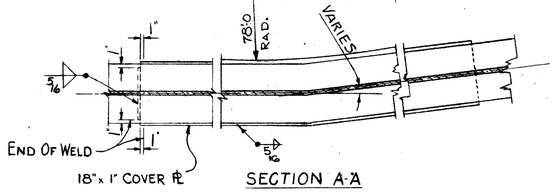


STEEL FRAMING PLAN

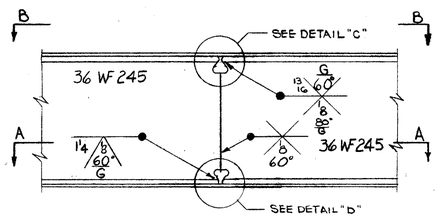
NOTE: SYMBOL □ DENOTES LOCATION OF MODIFIED BASE PLATES



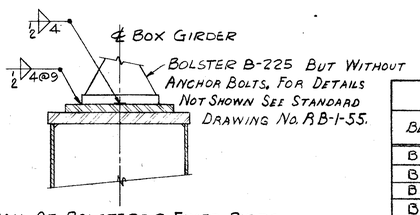
ELEVATION



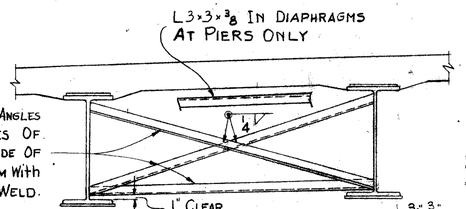
SECTION A-A



BEAM SPLICE DETAIL

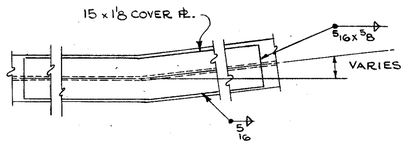


DETAIL OF BOLSTERS @ FIXED PIERS

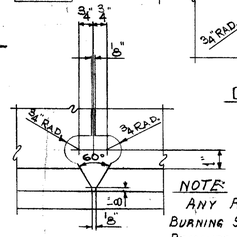


INTERMEDIATE CROSSFRAME ANGLES 3"x3"x3/8". WELD BOTH SIDES OF VERTICAL LEG AND TOP SIDE OF HORIZONTAL LEG TO BEAM WITH 1/4" CONTINUOUS FILLET WELD.

TYPICAL DIAPHRAGM

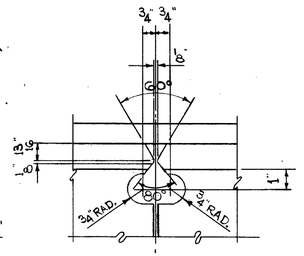


SECTION B-B

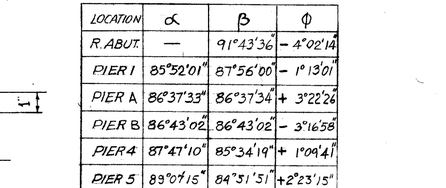


NOTE: ANY ROUGHNESS FROM BURNING SHALL BE REMOVED BY GRINDING

DETAIL "D"



DETAIL "C"



BEARINGS DATA

LOCATION	α	β	ϕ
R. ABUT.	—	91°43'36"	− 4°02'14"
PIER 1	85°52'01"	87°56'00"	− 1°13'01"
PIER A	86°37'33"	86°37'34"	+ 3°22'26"
PIER B	86°43'02"	86°43'02"	− 3°16'58"
PIER 4	87°47'10"	85°34'19"	+ 1°09'41"
PIER 5	89°07'15"	84°51'51"	+2°23'15"
F. ABUT.	93°22'20"	—	+ 5°51'02"

BEAM SPLICE WELDING PROCEDURE.

1. RAISE END OF BEAMS AT PIERS Nº 1 & 4; 6 3/8 INCHES & 7 INCHES RESPECTIVELY.
2. BUTT-WELD BEAM FLANGES AND WEB AT PIERS Nº A & B USING THE FOLLOWING SEQUENCE: MAKE ONE PASS ON EACH FLANGE, THEN TWO ON THE WEB; REPEAT, USING ONE PASS AT EACH LOCATION UNTIL WELDS ARE COMPLETED.
3. WELD TOP AND BOTTOM FLANGE MOMENT PLATES AT PIERS A & B
4. LOWER END OF BEAM AT PIERS 1 & 4
5. MAKE SPLICES AT PIERS Nº 1, 4 & 5, IN THAT ORDER, IN THE SAME MANNER RAISING THE END OF THE BEAMS AT REAR ABUT., PIER 5 & FWD. ABUT., 2 3/4, 5 5/8 & 2 1/4 INCHES RESPECTIVELY.

NOTES
1. FOR DETAILS OF MODIFIED ROCKER BASE PLATES SEE SH. No. 169.
2. FOR DETAILS OF STANDARD ROCKERS & BOLSTERS SEE STANDARD DRAWING No. RB-1-55, DATED 2-2-54.
3. FOR ADDITIONAL NOTES SEE SHEET No. 154.

BEAM DETAILS

BEAM	SPAN C-C. BEARINGS 1	2	3	4	5	6	ELEVATIONS A	B	C	D	E	F	G
B-5	74'-4	92'-8 1/2	95'-11 1/4	95'-4 9/16	92'-10 5/8	74'-3 7/8	663.03	663.54	664.17	664.61	664.44	663.89	662.87
B-6	75'-0 1/16	94'-1 1/4	95'-11 1/4	96'-8 9/16	93'-9 1/2	75'-0 3/8	663.63	664.16	664.80	665.22	665.06	664.30	663.27
B-7	75'-9 1/16	95'-6	95'-11 1/4	98'-1 3/8	94'-8 3/8	75'-9 1/4	664.08	664.61	665.28	665.67	665.50	664.75	663.72
B-8	76'-6 1/8	96'-10 3/4	95'-11 1/4	99'-6	95'-7 1/4	76'-6	664.53	665.04	665.68	666.11	665.94	665.19	664.17

CAMBERING OF BEAMS IS REQUIRED IN ACCORDANCE WITH THE FOLLOWING TABLE

DEFLECTION AND CAMBER

SPAN	1	2	3	4	5	6
DEFLECTION DUE TO WEIGHT OF STEEL	1/8"	1/4"	1/4"	1/4"	1/4"	1/8"
DEFLECTION DUE TO REMAINING DEAD LOAD	1/2"	5/8"	5/8"	3/4"	5/8"	1/2"
VERTICAL CURVE	—	—	7/8"	7/8"	7/8"	1/2"
SUM OF DEFLECTIONS	5/8"	7/8"	1 3/4"	1 7/8"	1 3/4"	1 1/8"
CAMBER REQUIRED	0	7/8"	1 3/4"	1 7/8"	1 3/4"	1 1/8"

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

S-W STEEL FRAMING
BRIDGE No. CUY-21-RAMP S-W
RAMPS N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	S.C.H.	V.C. S.C.H.		D.W.M.		5-15-63	

CONT. No. 55019-26 SHEET ADST. No. 12-47

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
CUY-21-14.12

ANGLE	E-S	W-N
A	63°-41'-50"	63°-34'-51"
B	61°-55'-14"	62°-14'-30"
C	33°-53'-43"	33°-01'-06"
D	28°-08'-56"	28°-37'-59"

KEY FOR SKEW ANGLES

SEE DETAIL SECTION "J" & "K"

RAMP	DETAIL "J"				DETAIL "K"			
	REAR ABUT.		FWD ABUT.		REAR ABUT.		FWD. ABUT.	
	"t1"	"b"	"t1"	"b"	"t2"	"b"	t2	"b"
E-S	3/8	1 3/4	13/16	13/16	1 1/16	1/2	1 1/4	1 3/16
W-N	3/8	1 3/4	7/8	3/4	1 3/16	13/16	1 1/4	1 1/16
N-E	7/8	15/16	11/16	1 5/16	1 1/8	15/16	1 3/8	1 5/16
S-W	7/8	7/8	11/16	1 1/4	1 1/8	7/8	1 5/16	1 1/4

NOTES:

1. CENTER 5/8"Φ BOLTS IN 1 1/16"Φ HOLES. APPLY FLAKE GRAPHITE BETWEEN WASHERS & ANGLES. TURN BOLTS TIGHT AND RELEASE 1/2 TURN. REMOVE BOLTS AS SOON AS CONCRETE HAS SET, PREFERABLY WITHIN 2 HOURS AFTER PLACING, TO AVOID DAMAGE DUE TO TEMPERATURE CHANGES. FILL HOLES WITH LEAD.
2. STEEL IN CONTACT WITH STEEL OR WITH CONCRETE SHALL NOT BE PAINTED. ALL OTHER PORTIONS SHALL BE CLEANED AND GIVEN THE SHOP COAT IN THE FIELD AS WELL AS TWO FIELD COATS.
3. PROVIDE JOINTS IN ABUT. ANGLE AND EDGE BAR AT JOINTS IN ABUTMENT. ADDITIONAL JOINTS MAY BE USED AT NOT LESS THAN 6'-0" SPCG. JOINTS SHALL BE CLOSELY BUTTED BUT SHALL NOT BE WELDED.

REFERENCES:
FOR BRIDGE FRAMING SEE SUPERSTRUCTURE SHEET NO'S.-
RAMP "N-E" SHT. NO. 169
RAMP "S-W" 170
RAMP "E-S" 188
RAMP "W-N" 189

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

RAMP END FINISH
BRIDGE NO. CUY-21- RAMP N-E & RAMP S-W
RAMPS N-E & S-W UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE				DATE		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	V.C.		V.P.K.	[illegible]	5-4-63	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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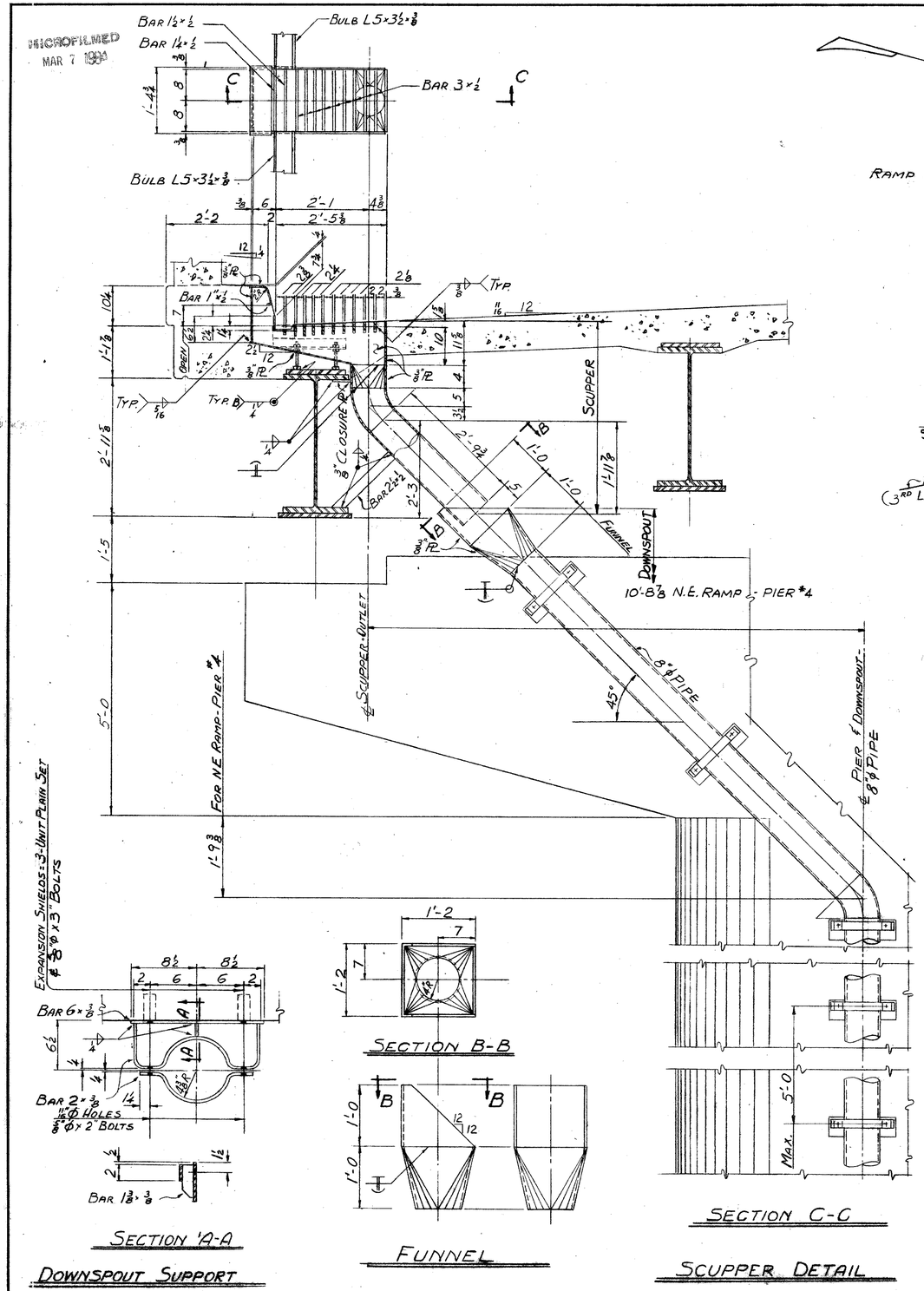
CUYAHOGA COUNTY
CUY-21-14.12



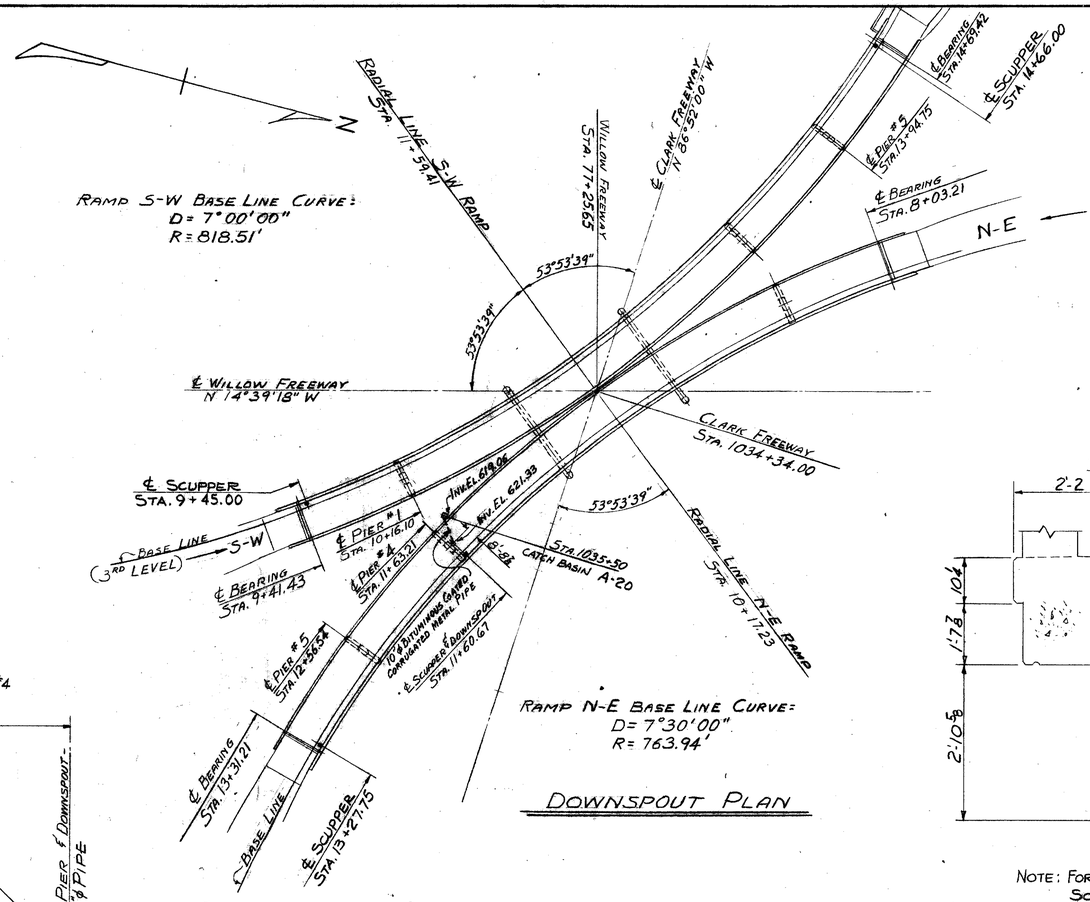
SECTION 'A-A'

DOWNSPOUT SUPPORT

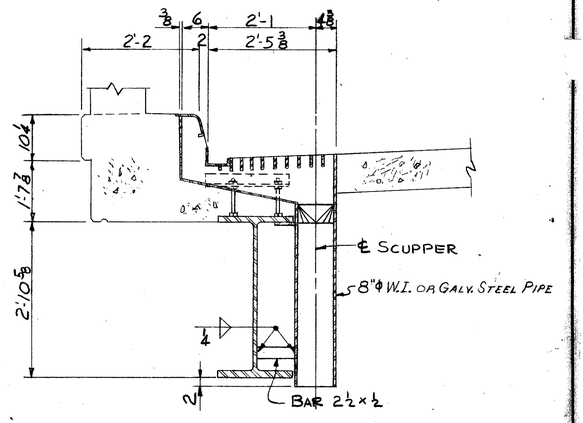
SECTION B-B

FUNNEL

SCUPPER DETAIL



DOWNSPOUT PLAN



NOTE: FOR ADDITIONAL INFORMATION, SEE SCUPPER DETAIL, THIS SHEET.

DETAIL OF SCUPPERS AT ABUTMENTS

Furnish cleanout in downspout similar to that shown on page 151, View B-B

FOR NOTES SEE SHT. 151

FOR BULB ANGLE GUTTER SUPPORTS SEE SHT. 190

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

N-E & S-W BRIDGE DRAINAGE
BRIDGE NO. CUY-21- RAMP N-E & RAMP S-W
RAMPS N-E & S-W UNDER WILLOW FREEWAY
WILLOW CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	V.C.		D.W.M.		5-15-63	11-27-63

CONT. NO. 68019 SHEET ACCT. NO. 185

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY– 21-14.12

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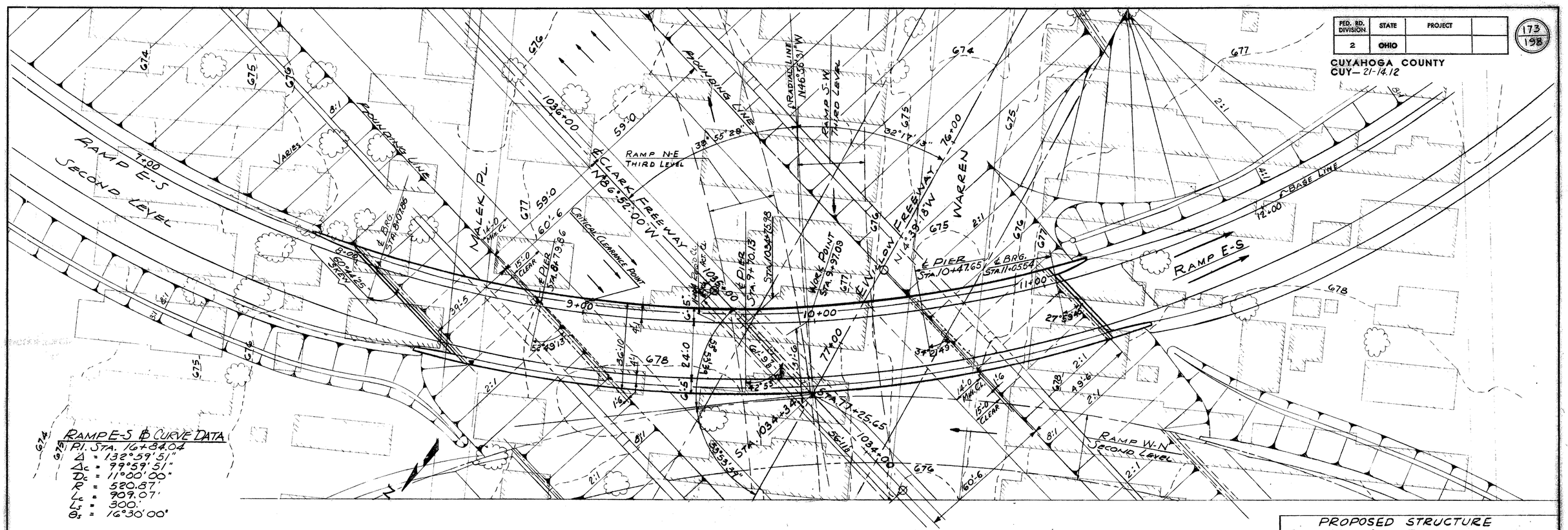
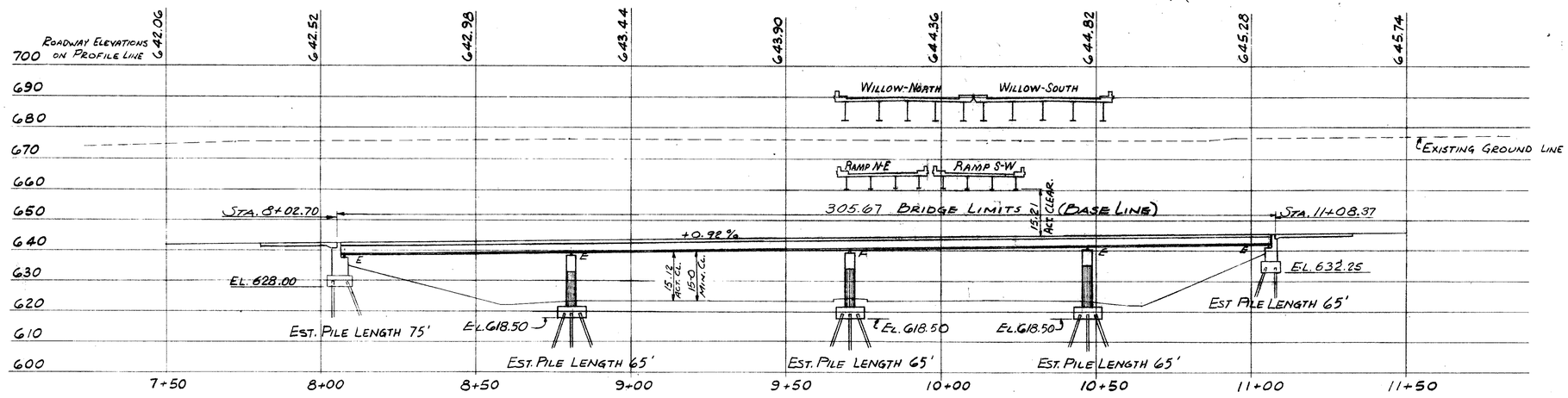


RAMP E-5 & CURVE DATA

P.I. STA. 16+84.04
Δ = 132°59'51"
Δ_c = 99°59'51"
D_c = 11°00'00"
R = 520.87'
L_c = " = 909.07'
L_s = " = 300'
θ_s = 16°30'00"



PROPOSED STRUCTURE
TYPE: 4 SPAN CONT. ROLLED BEAM WITH REINF. CONC. DECKS & SUBSTRUCTURE
@ SPANS: 72.00 – 90.27 – 77.52 – 57.89
ROADWAY: 34'-6" F/F PARAPET
LOAD FREQUENCY: CF = 2000 (57) ADEQUATE FOR, AASHO ALTERNATE LOADING
WEARING SURFACE: 1" MONOLITHIC CONCRETE
APPROACH SLAB: 25'-0 & 30'-0 LONG.
ALIGNMENT: 11°00'00" CURVE
SUPERELEVATION: .06'/FT.

NOTE:
FOR PLAN OF INTERCHANGE SEE SHT. NO. 139.
FOR EXISTING UTILITIES SEE SHT. NO. 121 & 122.

FOUNDATION SOUNDINGS: FOUNDATION DESIGN AND FOUNDATION QUANTITIES ARE BASED ON A STUDY OF ROD SOUNDINGS AND SOIL SAMPLING SOUNDINGS MADE AT THE SITE. THIS SOUNDING INFORMATION, THE ACCURACY OF WHICH THE STATE DOES NOT GUARANTEE, MAY BE EXAMINED IN THE OFFICE OF THE BUREAU OF BRIDGES IN COLUMBUS OR IN THE DIVISION OFFICE.

NOTE: ALL PILES ARE 12"ϕ CAST-IN-PLACE REINFORCED CONCRETE PILES.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

E-S SITE PLAN

BRIDGE NO. CUY-21- RAMP E-S
RAMPS E-S & W-N UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY STA. 8+08.26 TO 11+

SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
		CAT/WB		DWM		5-20-63	

SHEET ACCT. No. 1720
DRAWING No. 58019-25
1720

RAMP W-N ℄ CURVE DATA

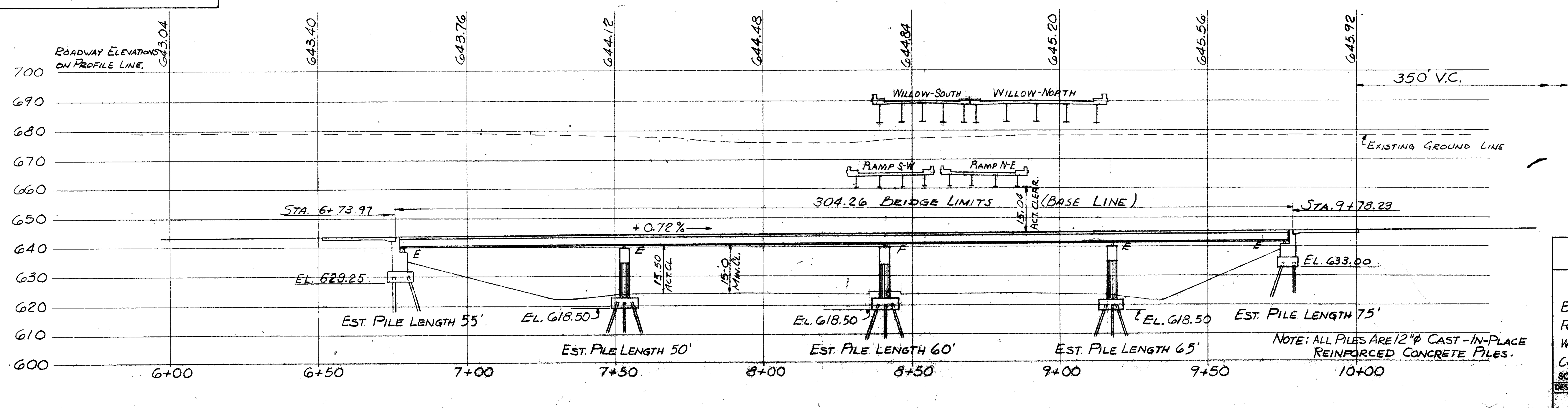
P.I. STA. 15+46.31
Δ = 132°49'46"
Δ_c = 99°49'46"
D_c = 11°00'00"
R = 520.87'
L_c = 907.54'
L_s = 300'
θ_s = 16°30'00"

PROPOSED STRUCTURE

TYPE: 4 SPAN CONT. ROLLED BEAM WITH REINF. CONC. DECK & SUBSTRUCTURE
℄ SPANS: 72.00 ~ 89.54 ~ 77.12 ~ 57.69
ROADWAY: 26'-6 F/F PARAPET
LOAD FREQUENCY: CF = 2000 (57) ADEQUATE FOR AASHO ALTERNATE LOADING
WEARING SURFACE: 1" MONOLITHIC CONC.
APPROACH SLAB: 25'-0 & 30'-0 LONG.
ALIGNMENT: 11°00'00" CURVE
SUPERELEVATION: .060'/FT.

NOTE:
FOR PLAN OF INTERCHANGE SEE SHT. No 139.
FOR EXISTING UTILITIES SEE SHT. No 121 & 122

FOUNDATION SOUNDINGS: FOUNDATION DESIGN AND FOUNDATION QUANTITIES ARE BASED ON A STUDY OF ROD SOUNDINGS AND SOIL SAMPLING SOUNDINGS MADE AT THE SITE. THIS SOUNDING INFORMATION, THE ACCURACY OF WHICH THE STATE DOES NOT GUARANTEE, MAY BE EXAMINED IN THE OFFICE OF THE BUREAU OF BRIDGES IN COLUMBUS OR IN THE DIVISION OFFICE.



NOTE: ALL PILES ARE 12"φ CAST-IN-PLACE REINFORCED CONCRETE PILES.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

W-N SITE PLAN
BRIDGE NO. CUY-21- RAMP W-N
RAMPS E-S & W-N UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY STA. 6+74.52 TO 9+77.95

SCALE				DATE	
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE REVISED
	CAT		DWM		5-20-63

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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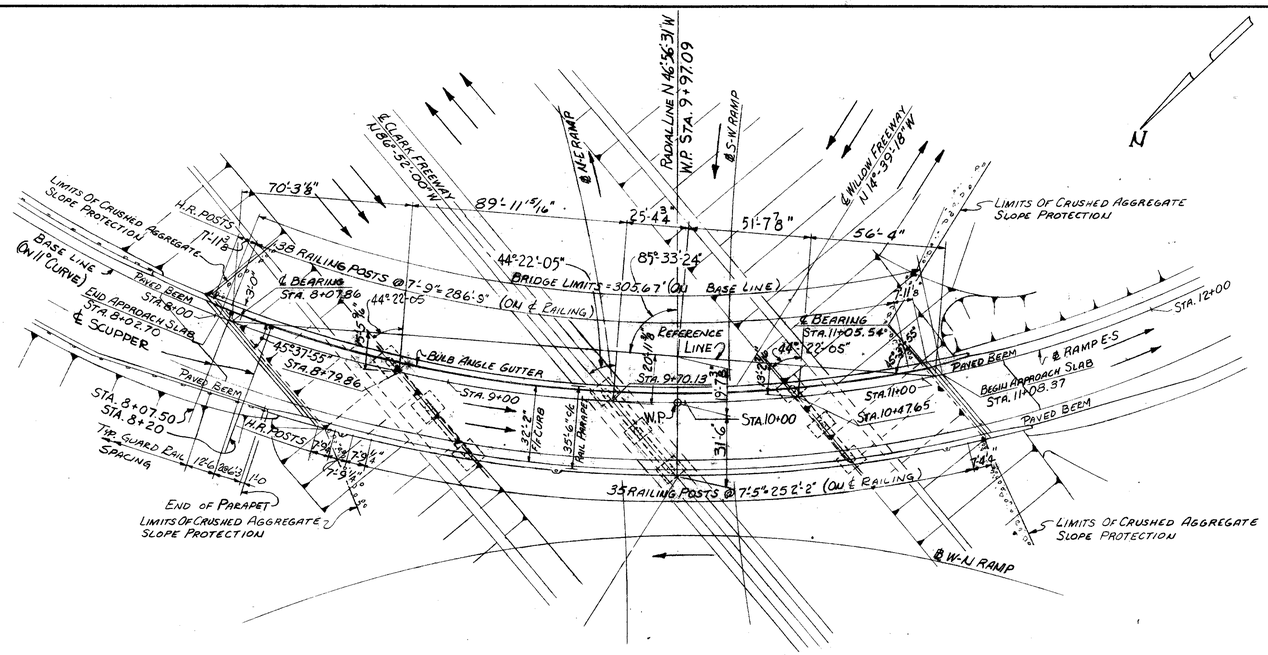
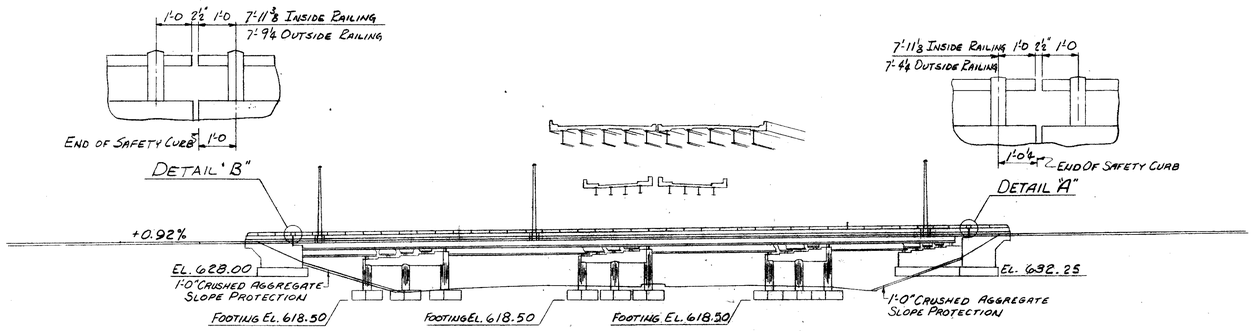
CUYAHOGA COUNTY
CUY— 21-14.12

NOTE:
REFERENCE LINE ~ CHORD OF ℄ CURVE BETWEEN ℄ BEARINGS ON ABUTMENT.



GENERAL PLAN



ELEVATION

ESTIMATED QUANTITIES FOR THE TWO SECOND LEVEL BRIDGES (RAMPS E-S & W-N)

ITEM	TOTAL	UNIT	DESCRIPTION	SUPER.	ABUT.	PIERS	GEN'L.
E-2	1420	CU. YDS.	UNCLASSIFIED EXCAVATION		1070	350	
S-1	705	CU. YDS.	CLASS "C" CONCRETE, SUPERSTRUCTURE	705			
S-1	190	CU. YDS.	CLASS "C" CONCRETE, PIERS ABOVE FOOTINGS			190	
S-1	347	CU. YDS.	CLASS "E" CONCRETE, PIER & ABUTMENT FOOTINGS		224	123	
S-1	366	CU. YDS.	CLASS "E" CONCRETE, ABUTMENT ABOVE FOOTINGS		366		
S-3	20	LIN. FT.	WATERPROOFING, PREMOLDED SEALING STRIP		20		
S-4	287,544	LBS.	REINFORCING STEEL	177,831	40,439	69274	
S-7	735,400	LBS.	STRUCTURAL STEEL	735,400			
S-8	735,400	LBS.	FIELD PAINTING OF STRUCTURAL STEEL, as per plan	735,400			
S-9	37	Sq. Ft.	1" PREFORMED EXPANSION JOINT FILLER		37		
S-14	1430.37	LIN. FT.	RAILING (ALUMINUM RAIL & SUPPORTS, CONCRETE PARAPET, TYPE "A")	1181.48	248.89		
S-18	12,635	LIN. FT.	12" CAST-IN-PLACE REINFORCED CONCRETE PILES		5585	7050	
S-25			LIGHTING DETAILS (SEE SHT. NOS. 125 To 138)				
S-29	135	CU. YDS.	POROUS BACKFILL		135		
S-29	4	EACH	SCUPPERS, including supports	4			
S-101	705	EACH	WATER-REDUCING SET-RETARDING ADMIXTURE	705			
1-10	1070	SQ.YDS.	CRUSHED AGGREGATE SLOPE PROTECTION				1070

GENERAL NOTES:

1. 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.
2. REFERENCE SHALL BE MADE TO STANDARD DRAWINGS RB-1-55 & A.R-1-57 DATED 2-2-59 & 4-2-62 RESPECTIVELY, AND TO SUPPLEMENTAL SPECIFICATION S.101 DATED 7-12-62.
3. PILES SHALL BE DRIVEN TO A MIN. BEARING CAPACITY OF 40 TONS PER PILE
4. STRUCTURAL STEEL SHALL BE COPPER BEARING AND SHALL CONFORM TO ITEM M-7, SECTION M-7.4(b) OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS.
5. CONTINUOUS BEAM SHOP ASSEMBLY: REFERENCE PARAGRAPH 4, SEC. S-7.12 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS FOR THE PURPOSE OF CHECKING FIT-UP OF WELD JOINT PREPARATION, ONLY TWO ADJACENT BEAMS NEED BE SHOP ASSEMBLED AT A TIME IN THEIR CORRECT, UNLOADED POSITIONS. ALL BEAMS SHALL BE ASSEMBLED AND MATCH MARKED.
6. CONTINUOUS BEAM SPLICES: IF BEAMS HAVING DEPTHS DIFFERING BY MORE THAN ½" ARE TO BE SPLICED BY BUTT WELDING, THE DEPTH OF THE SMALLER-DEPTH BEAM SHALL BE INCREASED BY SPLITTING THE WEB LONGITUDINALLY AT A DISTANCE OF 1½" BELOW THE BOTTOM OF THE TOP FLANGE AND FOR A DISTANCE SUFFICIENT TO ALLOW THE FLANGE TO BE BENT UP AT A SLOPE OF NOT MORE THAN 3/8" PER FOOT, AFTER WHICH THE SPLIT IN THE WEB SHALL BE COMPLETELY WELDED WITH FULL DEPTH PENETRATION AND GROUND FLUSH.
7. WELDING OF STRUCTURAL STEEL SHALL BE CLASS "A" EXCEPT AS OTHERWISE SHOWN. WELDS SHOWN AS FIELD WELDS MAY, AT THE OPTION OF THE CONTRACTOR, BE MADE IN THE SHOP.
8. PAINTING OF STRUCTURAL STEEL (ITEM S-8): ALL PAINTING SHALL CONFORM BOTH AS TO MATERIALS AND APPLICATION WITH THE STANDARD SPECIFICATIONS OF THE CITY OF CLEVELAND FOR PAINTING STRUCT. STEEL. SEE PROPOSAL NOTE
9. 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.
10. 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 SAFETY CURBS, MEDIAN AND ROADWAYS.
    B. THE ENTIRE EXPOSED SURFACE OF PIERS AND ABUTMENTS EXCEPT BRIDGE SEATS, BACKWALLS AND THE FACE OF ABUTMENTS BETWEEN OUTSIDE BEAMS.
11. MACHINE FINISH: AT THE CONTRACTORS OPTION, THE CONCRETE DECK MAY BE FINISHED BY THE USE OF A FINISHING MACHINE.
12. UTILITY LINES: ALL EXPENSE INVOLVED IN RELOCATING 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.
13. FIRST TEST PILE & FIRST AND SUBSEQUENT TEST PILE LOADS: SEE NOTE ON SHT. NO. 154.

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

E-S GENERAL PLAN

BRIDGE NO. CUY-21 - RAMP E-S
RAMPS ES & WN UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY STA. 8+03.26 TO 11+08.09

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	CAG		DWM		5-20-63	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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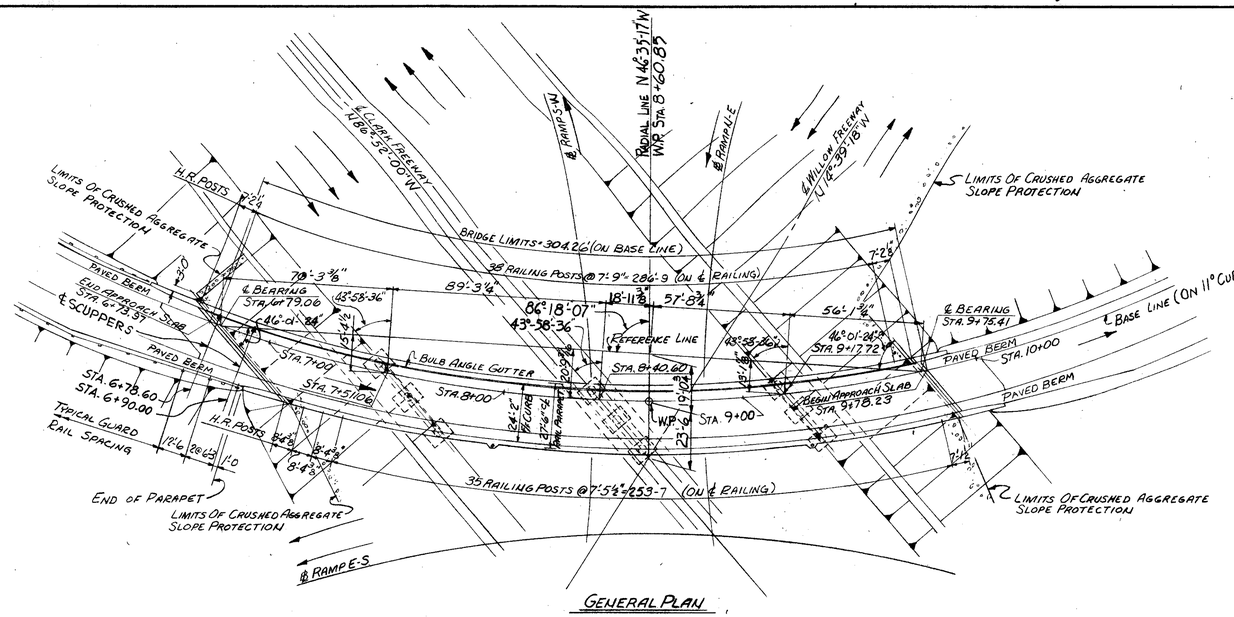
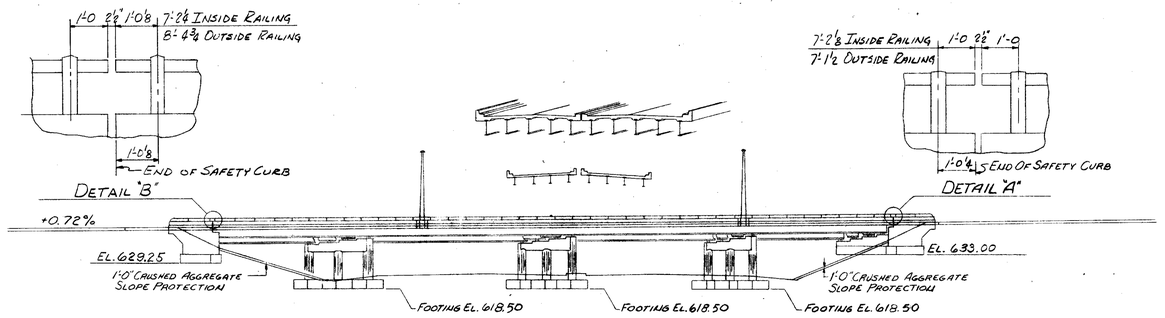
CUYAHOGA COUNTY
CUY— 21-14.12

NOTE:
REFERENCE LINE ~ CHORD OF ℄ CURVE BETWEEN ℄ BEARINGS ON ABUTMENT.



GENERAL PLAN



ELEVATION

FOR GENERAL NOTES AND QUANTITIES SEE SHEET Nº 175

CONTR. NO. 58019 SHEET ADST. No. 1861

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

W-N GENERAL PLAN
BRIDGE No. CUY-21- RAMP W-N
RAMPS ES & WN UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY STA. 6+74.52 TO 9+77.95

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	R.A.B.		DWM	GCH	5-20-63	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

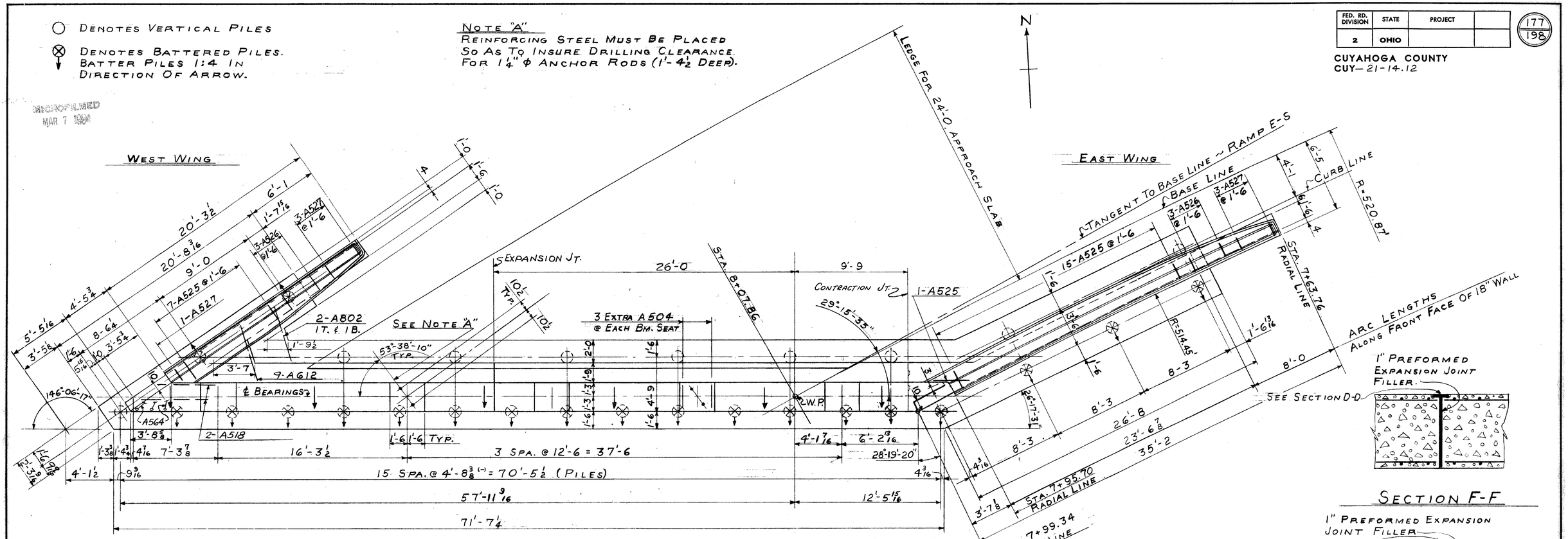
177/198

CUYAHOGA COUNTY
CUY-21-14.12

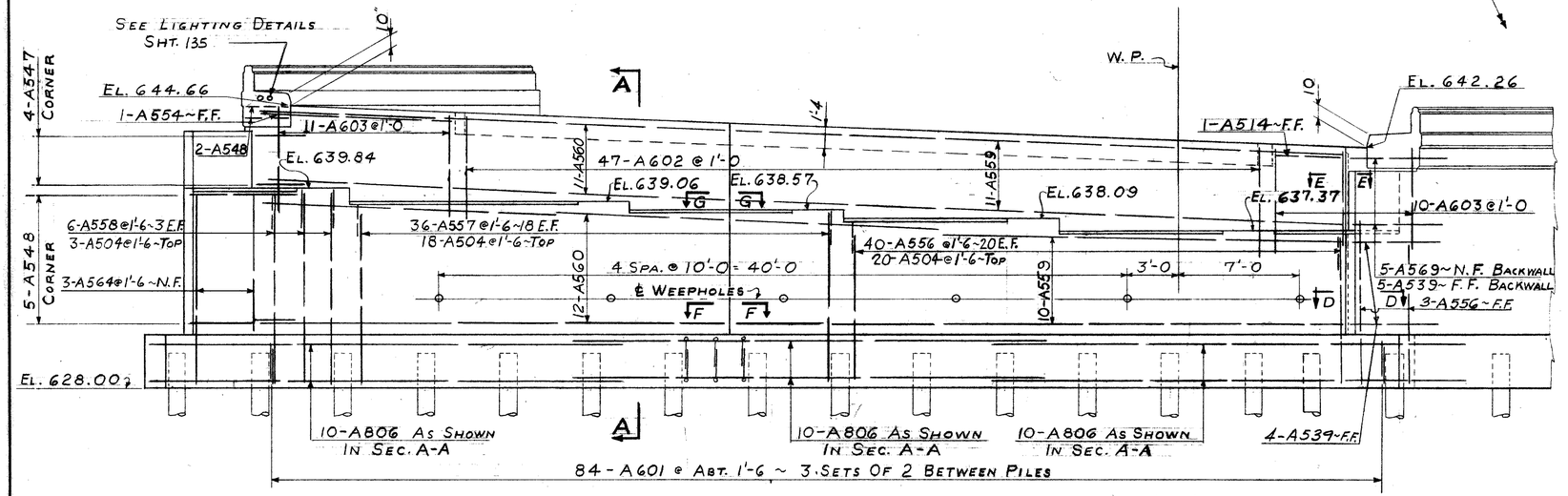
○ DENOTES VERTICAL PILES

⊗ DENOTES BATTERED PILES. BATTER PILES 1:4 IN DIRECTION OF ARROW.

NOTE "A"
REINFORCING STEEL MUST BE PLACED SO AS TO INSURE DRILLING CLEARANCE FOR 1¼" ϕ ANCHOR RODS (1'-4½ DEEP).



PLAN



ELEVATION

SECTION F-F

1" PREFORMED EXPANSION JOINT FILLER
SEE SECTION E-E

SECTION G-G

12 x ½ PREMOLDED SEALING STRIP IN 13 x ¾ RECESS

SECTION D-D

12 x ½ PREMOLDED SEALING STRIP IN 13 x ¾ RECESS

SECTION E-E

N. F. ~ NEAR FACE
F. F. ~ FAR FACE
E. F. ~ EACH FACE

FOR GENERAL NOTES SEE SHT. 175 & 182

WORK THIS SHEET WITH SHT. 178

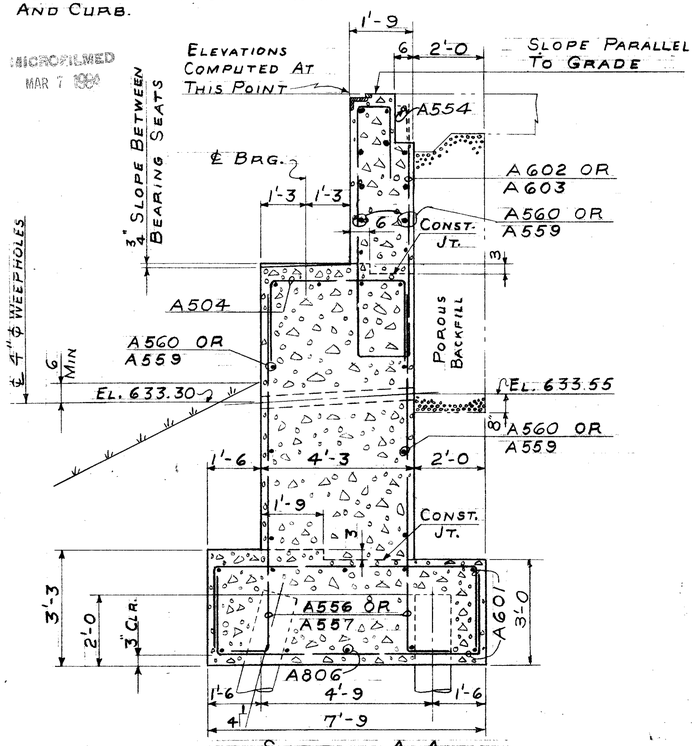
CONT. No. 5801-2.5 SHEET ACCT. No. 1863

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

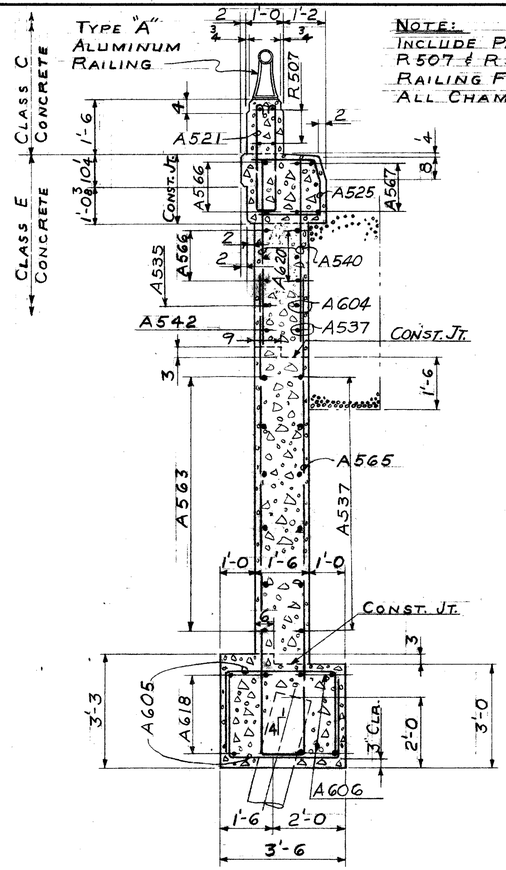
REAR ABUTMENT-RAMP E-S
BRIDGE NO. CUY-21-RAMP E-S
RAMP E-S & W-N UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RJB	RJB		S.A.E.	[illegible]	5-20-63	

CONCRETE IN BACKWALL SHALL NOT BE PLACED UNTIL STRUCTURAL STEEL IS IN PLACE. BRIDGE DECK END FINISH SHALL BE USED AS TEMPLATE FOR TOP OF BACKWALL AND CURB.

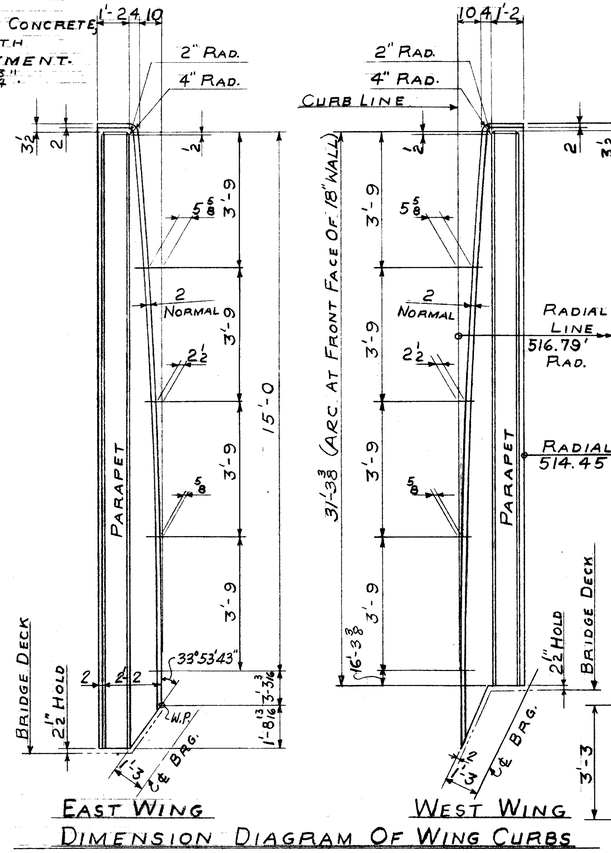


SECTION A-A

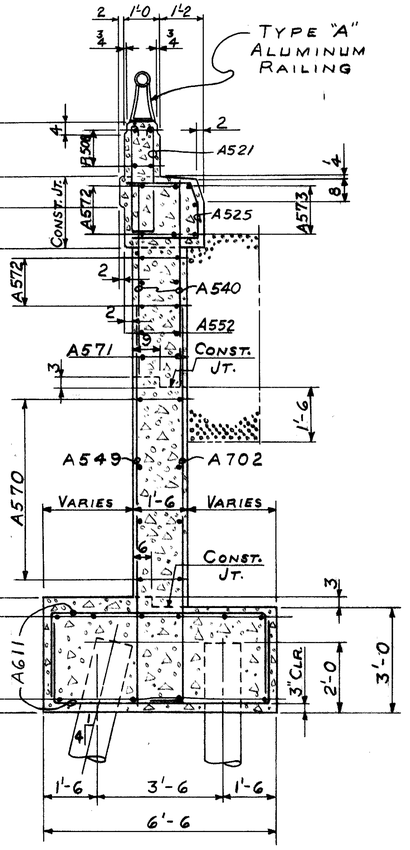


SECTION B-B

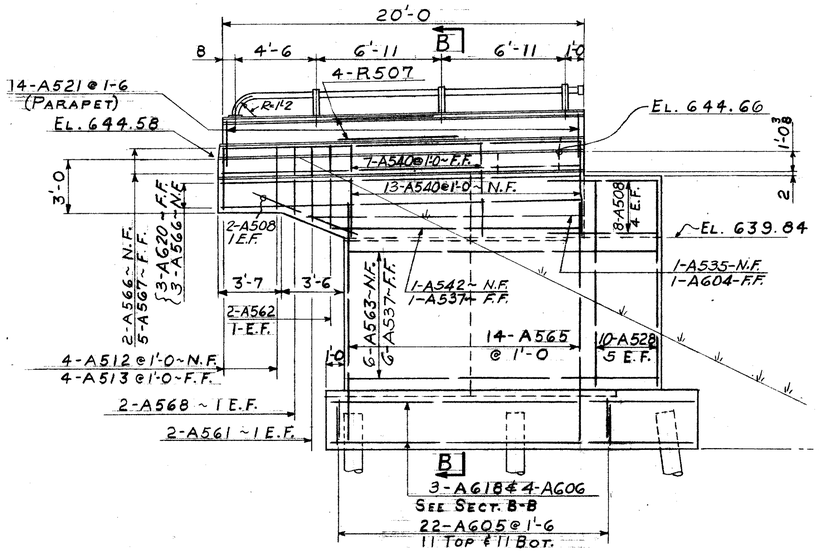
NOTE:
INCLUDE PARAPET CONCRETE R 507 & R 508 WITH RAILING FOR PAYMENT.
ALL CHAMFERS ¾".



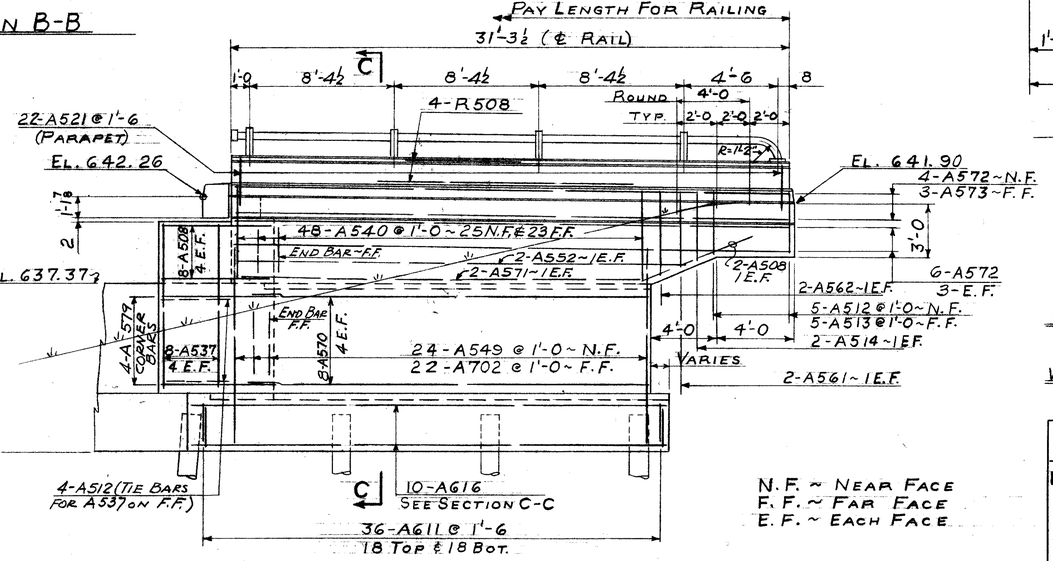
DIMENSION DIAGRAM OF WING CURBS



SECTION C-C



ELEVATION - WEST WING



ELEVATION - EAST WING

N. F. ~ NEAR FACE
F. F. ~ FAR FACE
E. F. ~ EACH FACE

FOR GENERAL NOTES SEE SHT. 175 & 182

WORK THIS SHEET WITH SHT 177

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

178 / 198

CUYAHOGA COUNTY
CUY-21-14.12

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

REAR ABUTMENT - RAMP E-S
BRIDGE No. CUY.-21- RAMP E-S
RAMP E-S & W-N UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RJB	RJB		S.A.E.		5-20-65	

CONT. No. 58019-25 SHEET ACCT. No. 1886

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

179
198

CUYAHOGA COUNTY
CUY—21-14.12

○ DENOTES VERTICAL PILES.
⊗ DENOTES BATTERED PILES. BATTER PILES 1:4 IN DIRECTION OF ARROW.

NOTE A
REINFORCING STEEL MUST BE PLACED SO AS TO INSURE DRILLING CLEARANCE FOR 1¼" ϕ ANCHOR RODS (1'-4½ DEEP).

CONCRETE IN BACKWALL SHALL NOT BE PLACED UNTIL STRUCTURAL STEEL IS IN PLACE. BRIDGE DECK END FINISH SHALL BE USED AS TEMPLATE FOR TOP OF BACKWALL & CURB.

EAST WING

WEST WING

LEDGE FOR 24'-0 ROADWAY

TANGENT TO BASE LINE RAMP E-S

3-A504~EXTRA @ EACH BEAM SEAT

PLAN

STA. 11+05.54

4 SPA. @ 9'-0 1/6" = 36'-0 1/4"

8 SPA. @ 4'-11 3/4" = 39'-6 1/16" (PILES)

33'-6 13/16"

63°41'-50"

32°00'-15" TYP.

SEE LIGHTING DETAILS SHT. 135

ELEVATION

ELEVATION—EAST WING

ELEVATION—WEST WING

SECTION A-A

SECTION B-B (SHOWN)

SECTION C-C (SIMILAR)

SECTION F F

DIMENSION DIAGRAM OF WING CURBS

NOTE:
INCLUDE PARAPET CONCRETE, R 501 & R 502 WITH RAILING FOR PAYMENT.
ALL CHAMFERS ¾".

FOR GENERAL NOTES SEE SHEETS 175 & 182

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

FORWARD ABUTMENT-RAMP E-S
BRIDGE NO. CUY-21-RAMP E-S
RAMPS E-S & W-N UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RJB	RJB		SAE RJT		5-20-63	

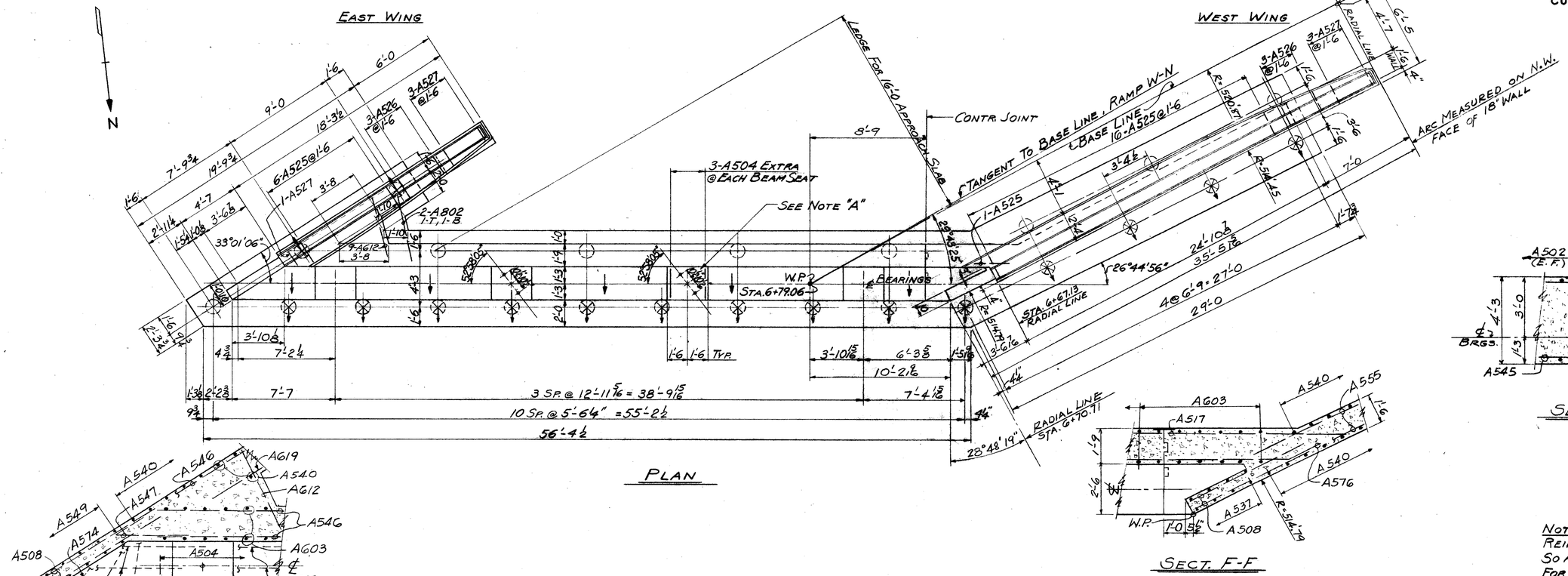
CONT. No. 5809-25 SHEET ACCT. No. 1864

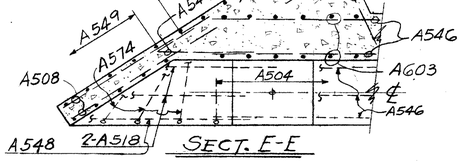
MICROFILMED
MAR 7 1963

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

180
198

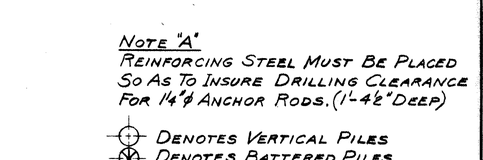
CUYAHOGA COUNTY
CUY—21-14.12



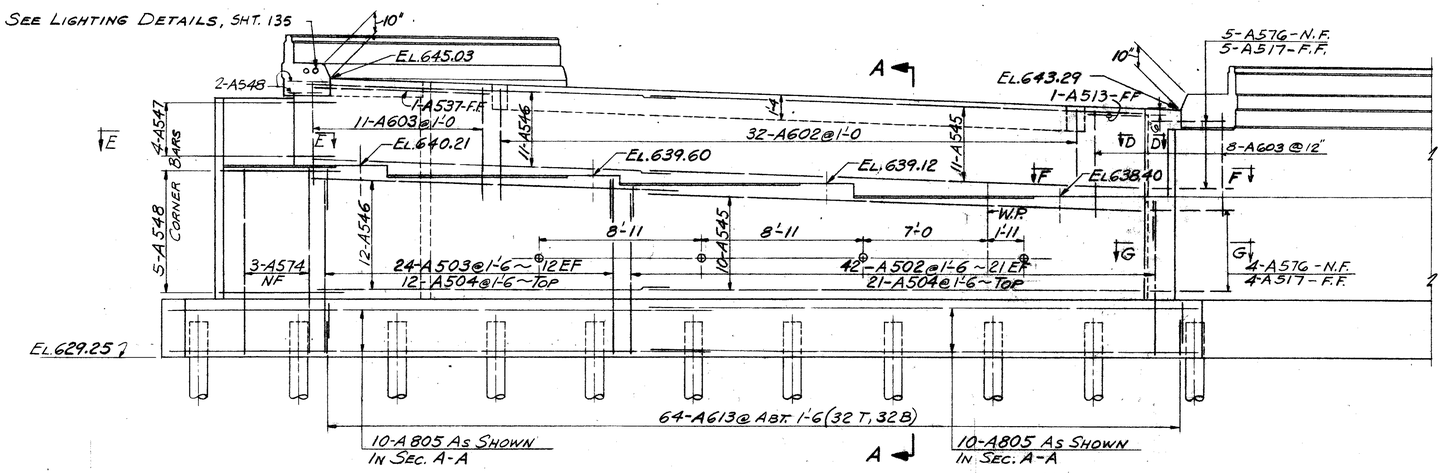


SECT. E-E

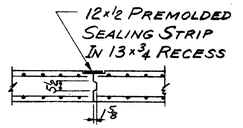
SECT. F-F



SECT. G-G



ELEVATION



SECTION D-D

NOTE "A"
REINFORCING STEEL MUST BE PLACED SO AS TO INSURE DRILLING CLEARANCE FOR 14"ϕ ANCHOR RODS. (1'-4½" DEEP)

⊕ DENOTES VERTICAL PILES
⊗ DENOTES BATTERED PILES
BATTER PILES 1:4 IN DIRECTION OF ARROW

FOR GENERAL NOTES SEE SHEET 175 & 182

NOTE:-
WORK THIS SHEET WITH SHEET 181

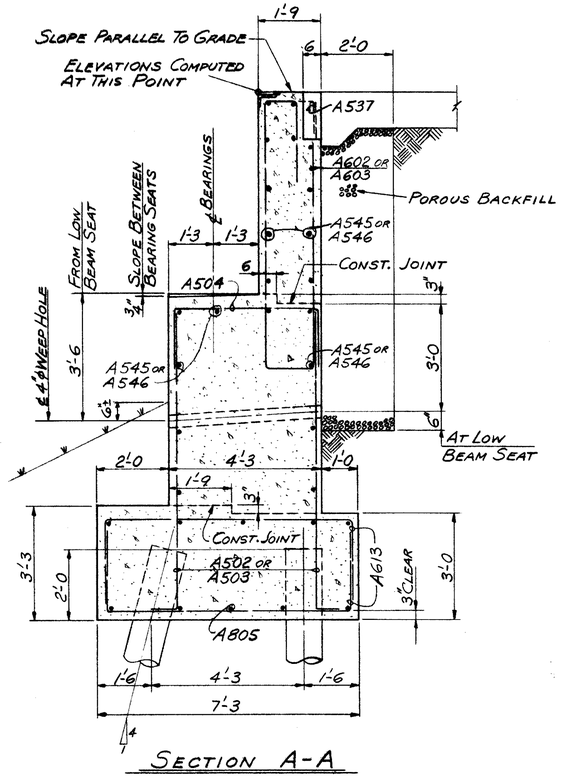
CONT. No. 58019-25 SHEET ACCT. No. 1866

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

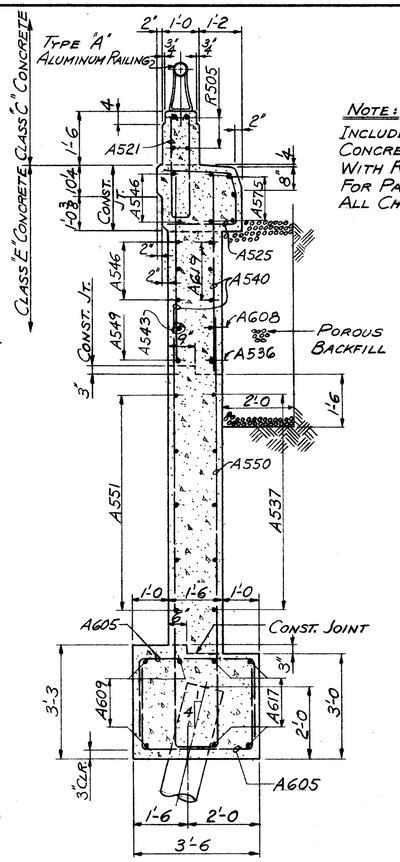
REAR ABUTMENT - RAMP W-N
BRIDGE NO. CUY-21-RAMP W-N
RAMP E-S & W-N UNDER WILLOW FREEWAY
WILLOW CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
R.T.Y.	C.L.S. S.A.E.			S.A.E.	5-20-63	

CONCRETE IN BACK WALL SHALL NOT BE PLACED UNTIL STRUCTURAL STEEL IS IN PLACE. BRIDGE DECK END FINISH SHALL BE USED AS TEMPLATE FOR TOP OF BACKWALL & CURB

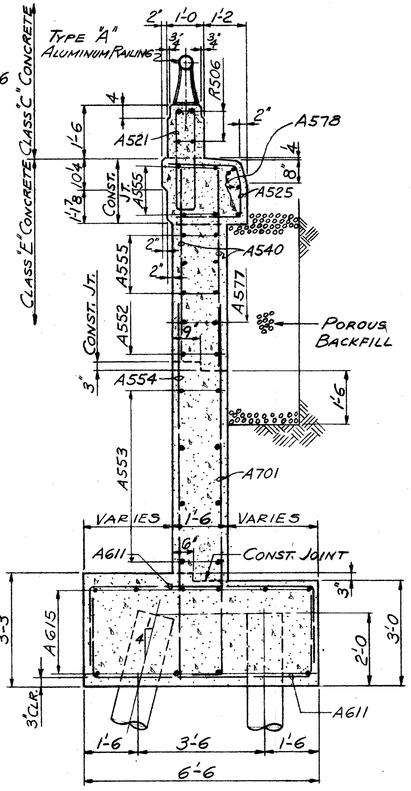


SECTION A-A

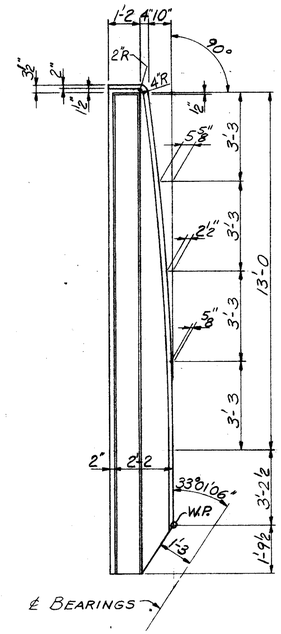


SECTION B-B

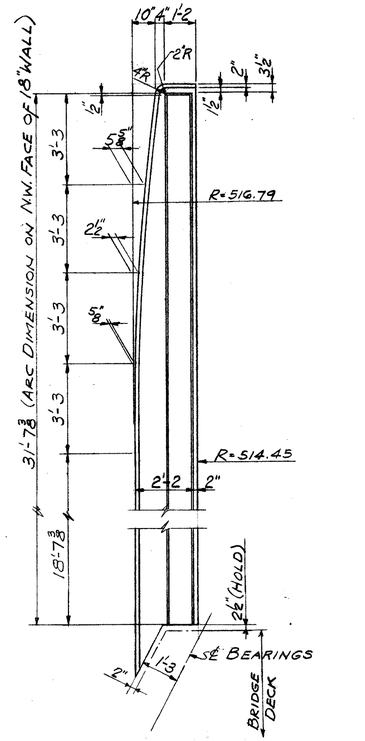
NOTE:
INCLUDE PARAPET CONCRETE, R505 & R506 WITH RAILING FOR PAYMENT. ALL CHAMFERS 3/4"



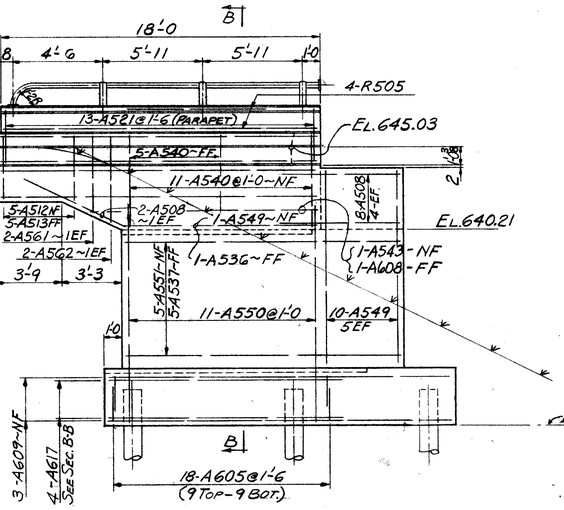
SECTION C-C



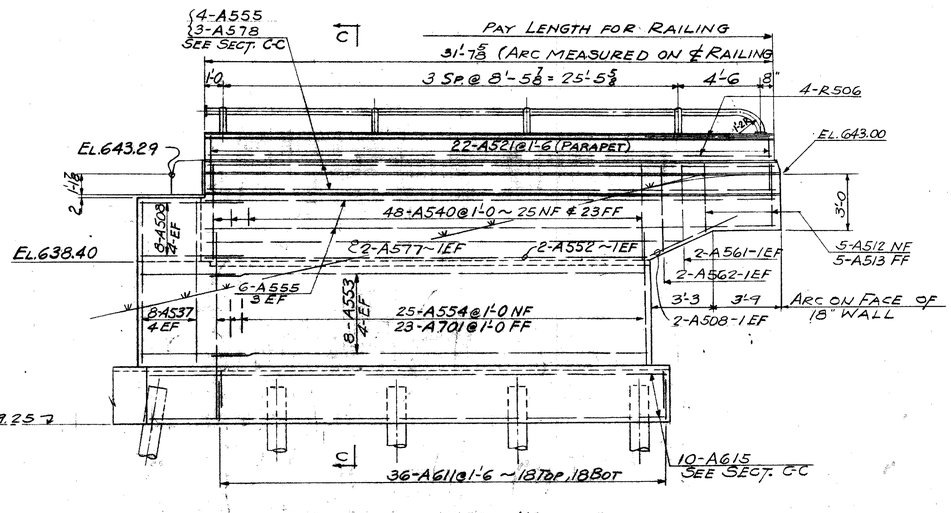
EAST WING
DIMENSION DIAGRAM OF WING CURBS



WEST WING



ELEVATION - EAST WING



ELEVATION - WEST WING
(DEVELOPED)

WORK THIS SHEET WITH SHEET 180

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

181
198

CUYAHOGA COUNTY
CUY-21-14.12

CONT. No. 506 SHEET ACCT. No. 987

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

REAR ABUTMENT - RAMP W-N
BRIDGE NO. CUY-21-RAMP W-N
RAMP E-S & W-N UNDER WILLOW FREEWAY
WILLOW CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
R.I.Y.	CLS		S.A.C.	C.O.H.	5-20-63	

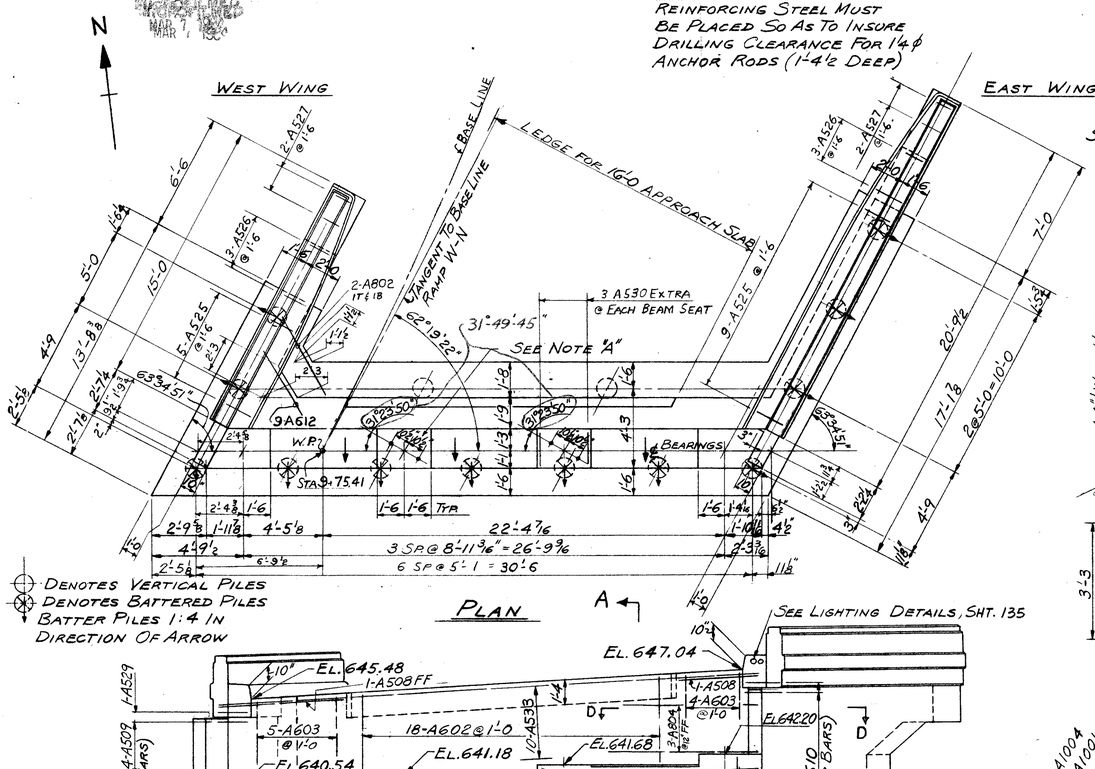
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

182
198

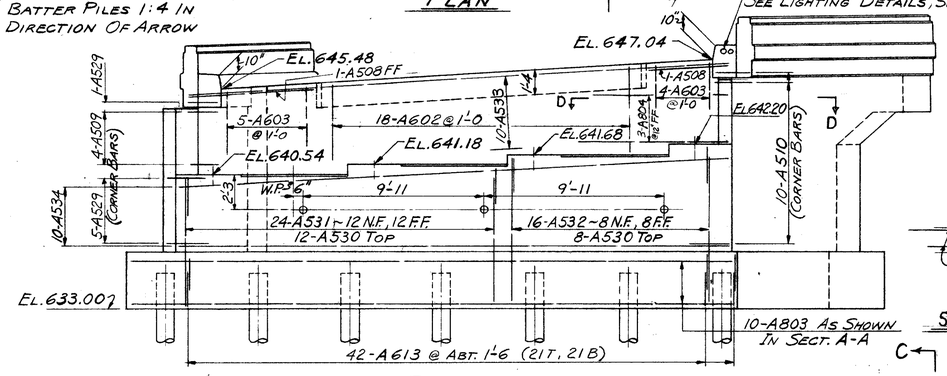
CUYAHOGA COUNTY
CUY-21-14.12

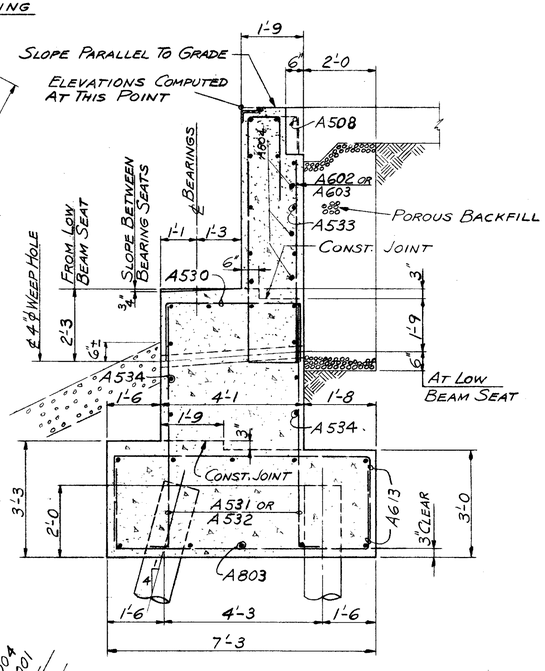
NOTE "A"
REINFORCING STEEL MUST BE PLACED SO AS TO INSURE DRILLING CLEARANCE FOR 1¼ ϕ ANCHOR RODS (1'-4½ DEEP)

CONCRETE IN BACK WALL SHALL NOT BE PLACED UNTIL STRUCTURAL STEEL IS IN PLACE. BRIDGE DECK END FINISH SHALL BE USED AS TEMPLATE FOR TOP OF BACKWALL & CURB

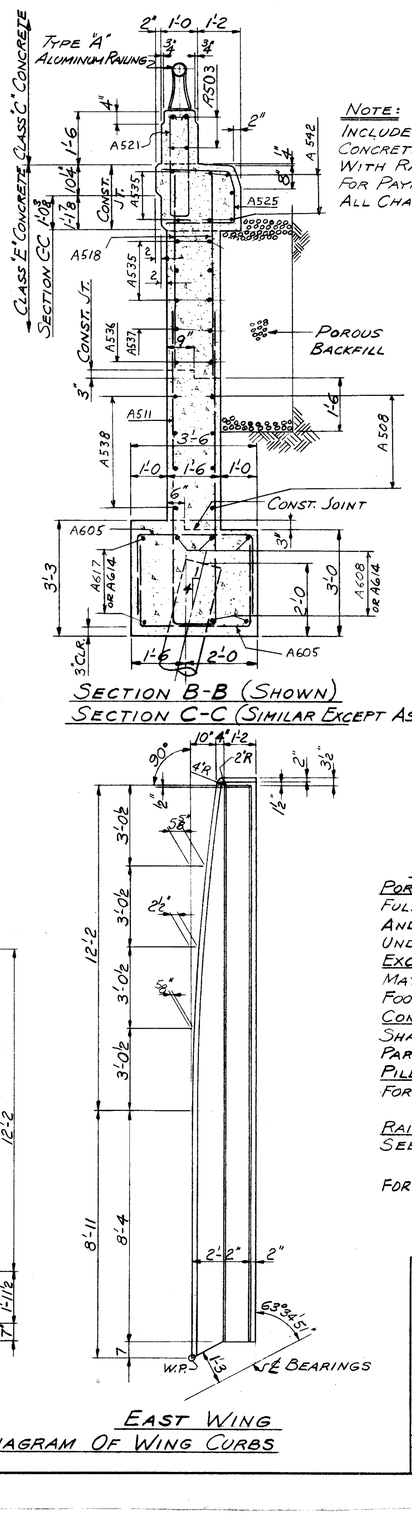


PLAN





SECTION A-A

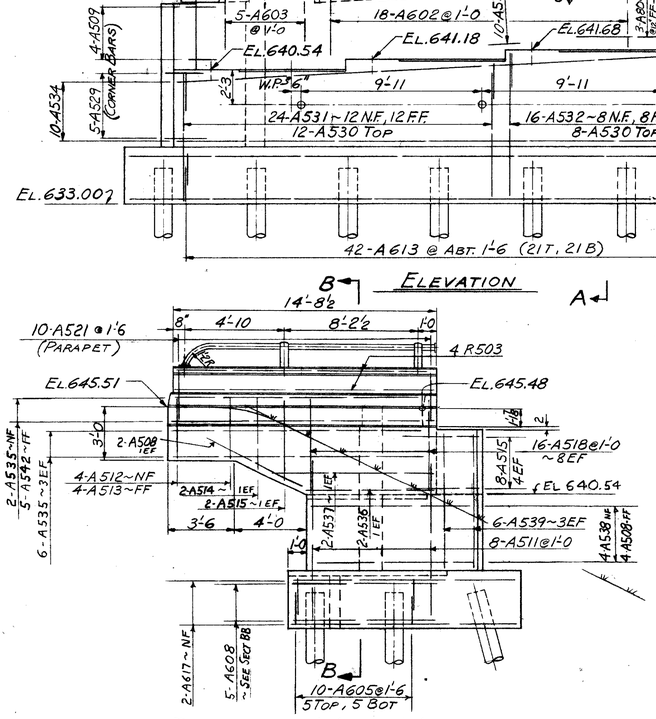


NOTE:
INCLUDE PARAPET CONCRETE & R503 & R504 WITH RAILING FOR PAYMENT
ALL CHAMFERS ¾

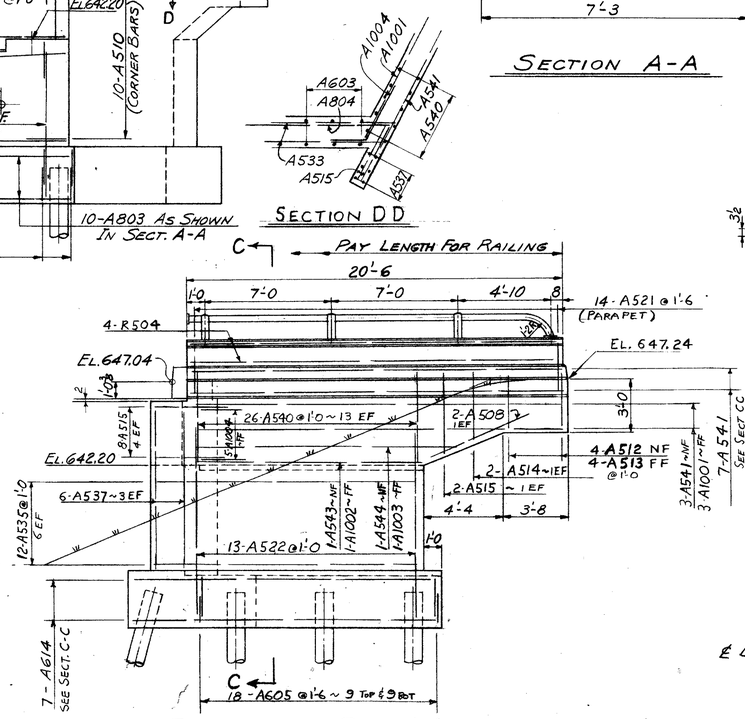
SECTION B-B (SHOWN)
SECTION C-C (SIMILAR EXCEPT AS NOTED)

SECTION D-D

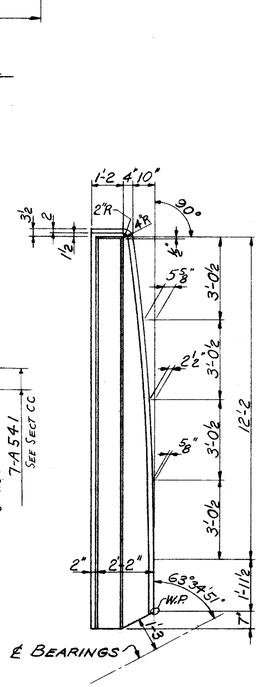
ELEVATION



ELEVATION - WEST WING



ELEVATION - EAST WING



WEST WING
DIMENSION DIAGRAM OF WING CURBS

EAST WING

GENERAL NOTES

POROUS BACKFILL: 2 FEET THICK FULL LENGTH OF THE ABUTMENT AND WINGS, SHALL EXTEND UP TO THE UNDERSIDE OF THE APPROACH SLAB.
EXCAVATION QUANTITY: COMPRISES MATERIAL BETWEEN BOTTOM OF FOOTING AND ROADWAY EXCAVATION.
CONCRETE: ALL ABUTMENT CONCRETE SHALL BE CLASS "E", EXCEPT FOR RAILING PARAPET, WHICH SHALL BE CLASS 'C'
PILES: THE DESIGN LOAD IS 40 TONS FOR THE ABUTMENT PILES.

RAILING: TO BE TYPE 'A' ALUMINUM HANDRAIL SEE STD. DRAWING: AR-1-57

FOR ADDITIONAL NOTES SEE SHT. 175

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

FORWARD ABUTMENT - RAMP W-N
BRIDGE NO. CUY-21- RAMP W-N
RAMP E-S & W-N UNDER WILLOW FREEWAY
WILLOW CLARK INTERCHANGE
CUYAHOGA COUNTY

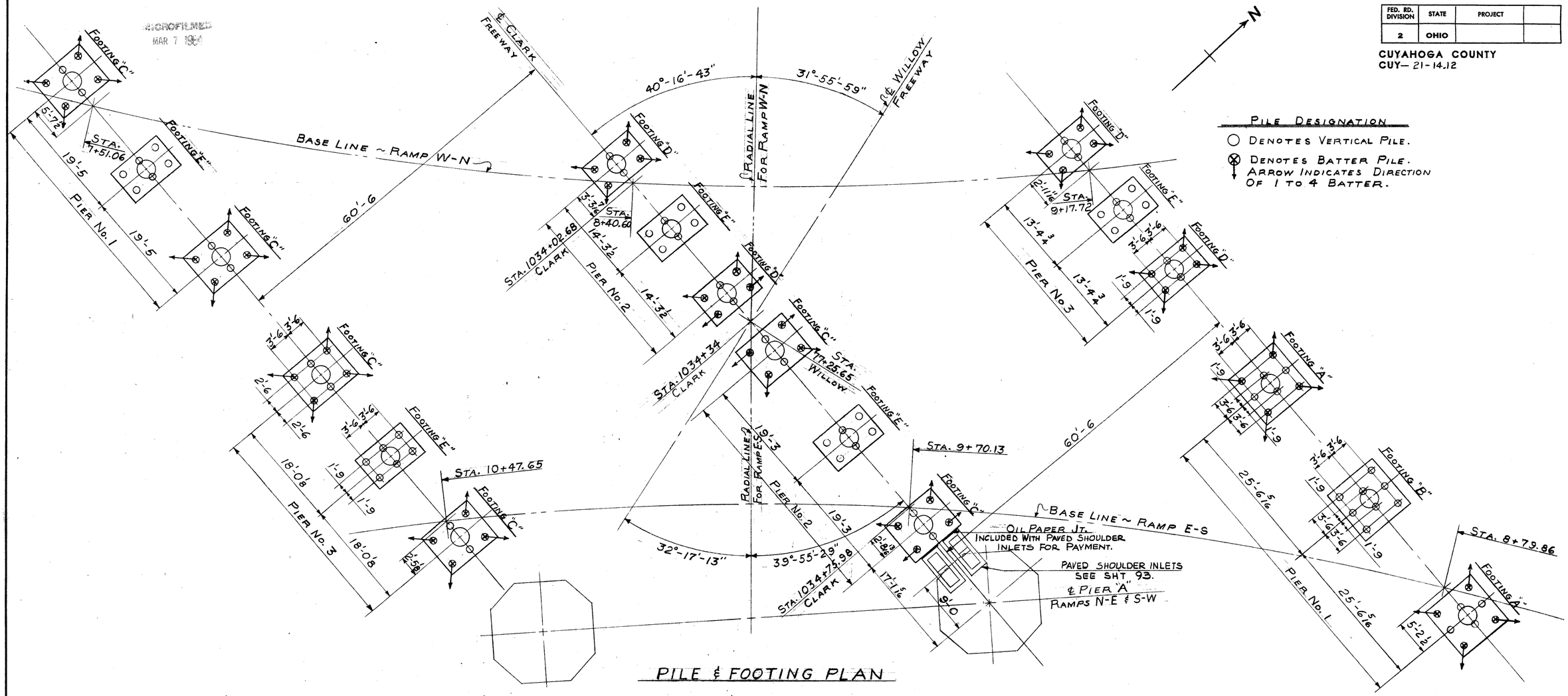
SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
CLS	CLS		RIY SAE		5-2063	5-5-64

CONT. NO. 58019-2.5 SHEET ACCT. No. 1865

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

183
198

CUYAHOGA COUNTY
CUY– 21-14.12

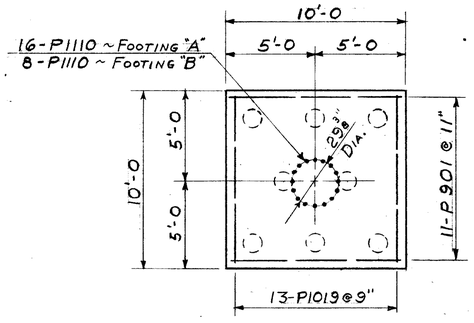


PILE DESIGNATION

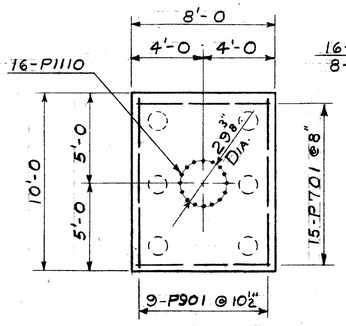
○ DENOTES VERTICAL PILE.

⊗ DENOTES BATTER PILE. ARROW INDICATES DIRECTION OF 1 TO 4 BATTER.

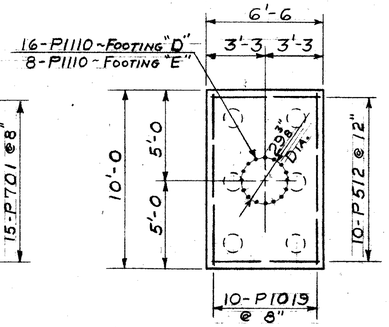
PILE & FOOTING PLAN



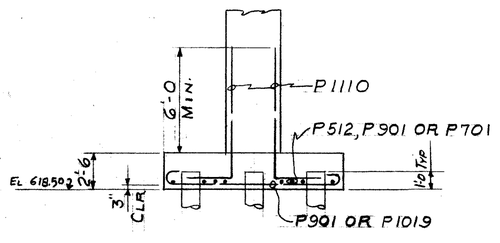
FOOTING "A"
FOOTING "B"



FOOTING "C"



FOOTING "D"
FOOTING "E"



TYPICAL FOOTING SECTION

FOR PIERS ABOVE FOOTINGS SEE SHT. 184.

FOR GENERAL NOTES SEE SHT. 175 & 182

ALL FOOTINGS TO BE CLASS "E" CONCRETE

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PILE PLAN & FOOTING DETAILS
BRIDGE NO. CUY-21-RAMP E-S & RAMP W-N
RAMPS E-S & W-N UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

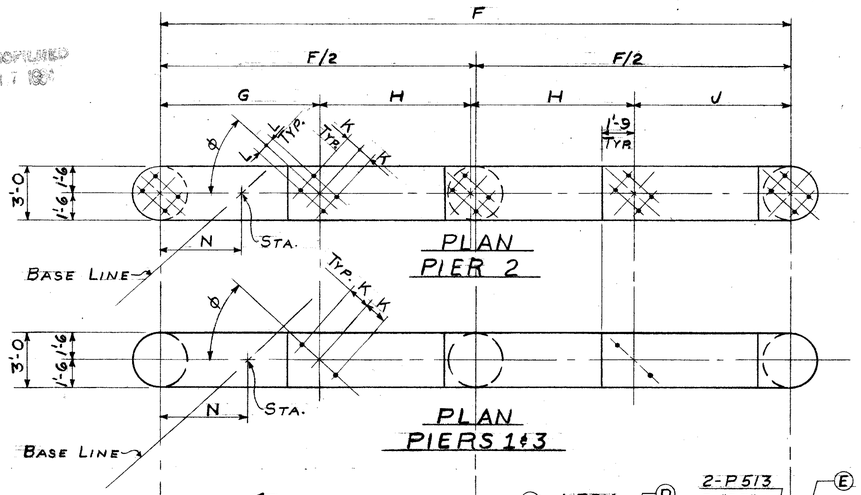
SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RIY RJB	RJB		RIT	RIT	5-20-63	

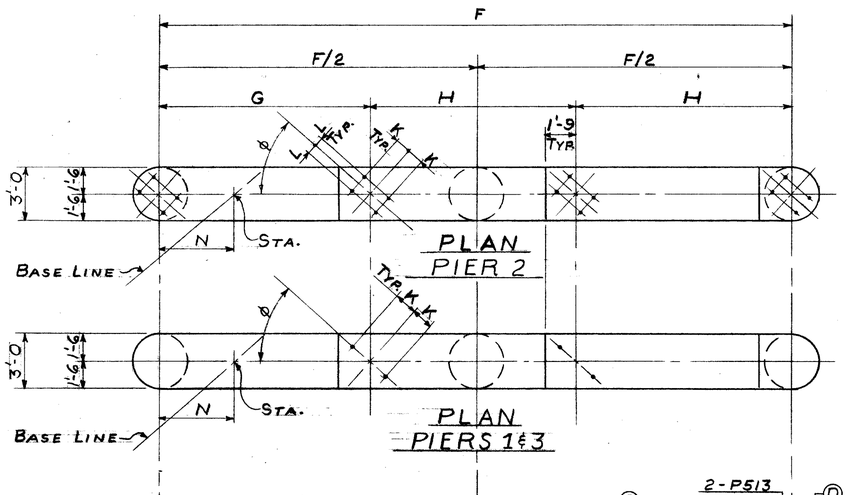
CONT. No. 58019-25 SHEET ACCT. No. 183

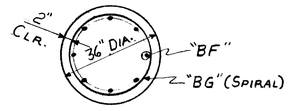
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

184 / 198

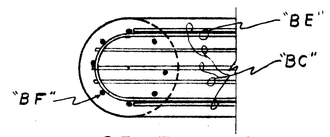
CUYAHOGA COUNTY
CUY—21-14.12



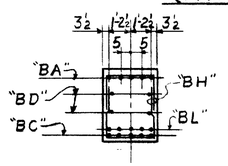




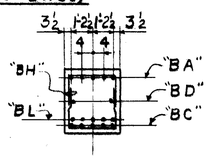
SECTION A-A
(TYP. @ ALL COLS.)



SECTION B-B
(TYP. @ ENDS)



SECTION C-C



SECTION D-D

NOTE:

1. SPECIAL CARE SHALL BE TAKEN IN PLACING REINFORCING STEEL IN VICINITY OF BRIDGE SEAT SO AS TO AVOID INTERFERENCE WITH THE DRILLING OF ANCHOR ROD HOLES 1⅝" ϕ x 1'-3 DEEP. ADJUST STIRRUP SPA. TO SUIT.
2. FOR FOOTING DETAILS & REINFORCING SEE SHT. 183
3. FOR GENERAL NOTES SEE SHT. 175 & 182
4. FOR ELECTRICAL GROUNDING INSTRUCTIONS SEE SHT. 137

LOCATION	STA.	ELEVATIONS ~ ADD 600.00 A	B	C	D	E	DIMENSIONS F	G	H	J	K	L	M	N	ANGLE ϕ	QUANTITY P	R	REINFORCING BAR MARKS BA	BB	BC	BD	BE	BF	BG	BH	BJ	BK	BL
RAMP E-S																												
PIER No. 1	8+79.86	37.46	38.23	38.79	39.35	39.87	51'-0⅝	13'-6⅝	12'-6	12'-6	1'-1	—	12'-5½	5'-2½	49°-09'-54"	18	—	P1101	P1102	P1103	P501	P1106	P1104	SP501	P505	P503	—	P1105
PIER No. 2	9+70.13	38.31	39.01	39.47	39.93	40.60	38'-6⅛	9'-0⅛	9'-0⅛	11'-5⅞	0'-10½	0'-6½	13'-3½	2'-8⅛	42°-05'-10"	14	—	P1001	P1002	P1003	P504	P1005	P1107	SP502	P505	P503	—	P1004
PIER No. 3	10+47.65	39.07	39.81	40.30	40.80	41.30	36'-04	9'-0⅛	9'-0⅛	9'-0⅛	1'-0½	—	14'-0⅞	2'-5⅛	35°-39'-22"	12	—	P1006	P1007	P1008	P506	P1005	P1108	SP503	P505	P503	—	P1009
RAMP W-N																												
PIER No. 1	7+51.06	38.34	39.06	39.61	40.13	—	38'-9⅝	12'-11⅝	12'-11⅝	—	1'-1	—	13'-10¼	5'-7½	49°-09'-40"	10	28	P1010	P1011	P1003	P507	P1005	P1107	SP504	P508	P505	P509	P1009
PIER No. 2	8+40.60	39.00	39.75	40.19	40.71	—	28'-6⅞	10'-8⅛	8'-11⅜	—	0'-10½	0'-6½	14'-6⅛	3'-3¼	(41°-26'-18")	8	20	P1013	P1014	P1015	P510	P1005	P1108	SP505	P508	P505	P509	—
PIER No. 3	9+17.72	39.60	40.30	40.78	41.28	—	26'-9⅛	8'-11⅞	8'-11⅞	—	1'-0½	—	15'-1⅜	2'-11¼	(33°-47'-52")	8	16	P1016	P1017	P1018	P511	P1005	P1109	SP506	P508	P505	P509	—

34°-47'-55" 42°-00'-05"

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

PIER DETAILS

BRIDGE NO. CUY-21-RAMP E-S & RAMP W-N
RAMPS E-S & W-N UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

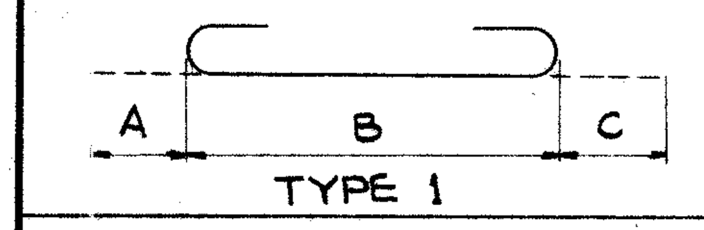
SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RJY RJB	RJB			R.I.Y.	5-20-63	5-5-69

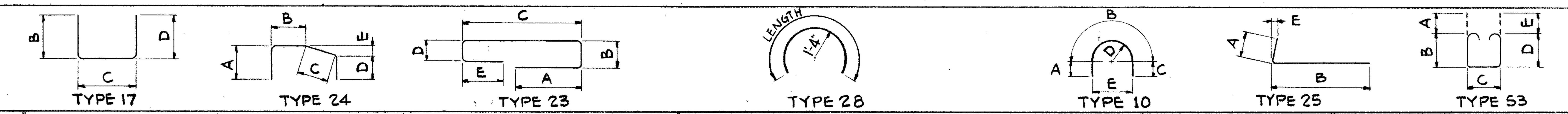
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
CUY– 21-14.12

REINFORCING STEEL BAR SCHEDULE

NOTE: USE OHIO STANDARD BENDS.





PIERS

MARK	NO. REQ'D. SHT. 184	NO. REQ'D. SHT. 183	NO. REQ'D. TOTAL	LENGTH	TYPE	A	B	C	D	E	WEIGHT
P501	8		8	26'-6	STR.						221
P503	44		44	10'-5	17		4'-0	2'-8	4'-0		478
P504	8		8	20'-3	STR.						169
P505	108		108	8'-5	17		3'-0	2'-8	3'-0		948
P506	8		8	19'-0	STR.						159
P507	4		4	20'-6	STR.						86
P508	26		26	7'-5	17		2'-6	2'-8	2'-6		201
P509	26		26	9'-5	17		3'-6	2'-8	3'-6		255
P510	4		4	15'-3	STR.						64
P511	4		4	14'-6	STR.						60
P512		90	90	7'-2	1	7"	6'-0	7"			673
P513	24		24	14'-5	10	5'-0	4'-2	5'-0	1'-4	2'-8	361
P514	15		15	12'-5	17		5'-0	2'-8	5'-0		194
P701		90	90	9'-2	1	10"	7'-6	10"			1686
P901		87	87	12'-0	1	1'-3	9'-6	1'-3			3550
P1001	5		5	29'-9	17		3'-0	27'-1			640
P1002	5		5	32'-0	17		5'-3	27'-1			688
P1003	20		20	22'-3	STR.						1915
P1004	10		10	11'-0	STR.						473
P1005	20		20	11'-8	10	4'-0	3'-8	4'-0	1'-2	2'-4	1004
P1006	5		5	28'-9	17		3'-0	26'-1			619
P1007	5		5	31'-3	17		5'-6	26'-1			672
P1008	10		10	21'-0	STR.						904
P1009	20		20	14'-0	STR.						1205
P1010	5		5	28'-9	17		2'-6	26'-7			619
P1011	5		5	30'-9	17		4'-6	26'-7			662
P1013	5		5	23'-9	17		2'-6	21'-7			511
P1014	5		5	25'-9	17		4'-6	21'-7			554
P1015	10		10	17'-6	STR.						753
P1016	5		5	23'-0	17		2'-6	20'-10			495
P1017	5		5	25'-0	17		4'-6	20'-10			538
P1018	10		10	16'-6	STR.						710
P1019		129	129	12'-4	1	1'-5	9'-6	1'-5			6846
P1101	5		5	37'-6	17		3'-0	34'-10			996
P1102	5		5	40'-3	17		5'-9	34'-10			1069
P1103	10		10	28'-9	STR.						1527
P1104	24		24	16'-3	STR.						2072
P1105	10		10	15'-0	STR.						797
P1106	4		4	12'-2	10	4'-3	3'-8	4'-3	1'-2	2'-4	259
P1107	48		48	17-0	STR.						4335
P1108	48		48	17'-9	STR.						4527
P1109	24		24	18'-3	STR.						2327
P1110		240	240	10'-6	17		2'-7	8'-3			13,389

SPIRALS

MARK	SHT. 184	SHT. 183	TOTAL	LENGTH	PITCH	NO. TURNS	CORE DIA. (OUT TO OUT)	WEIGHT
SP501	3		3	12'-4	3¼"	49	32"	1367
SP502	3		3	13'-1	3¼"	51	32"	1445
SP503	3		3	13'-11	3¼"	54	32"	1532
SP504	3		3	13'-8	3¼"	53	32"	1506
SP505	3		3	14'-4	3¼"	56	32"	1576
SP506	3		3	14'-11	3¼"	58	32"	1637
						TOTAL FOR PIERS		69,274*

ABUTMENTS

MARK	SHT. 177	SHT. 178	SHT. 179	SHT. 180	SHT. 181	SHT. 182	TOTAL	LENGTH	TYPE	A	B	C	D	E	WEIGHT
A501			30				30	8'-3	17		1'-0	7'-4			258
A502			30	45			75	9'-6	17		1'-0	8'-7			743
A503			4	24			28	10'-6	17		1'-0	9'-7			307
A504	56		47	45			148	8'-8	17		2'-6	3'-11	2'-6		1338
A505			21				21	21'-0	STR.						460
A506			6				6	18'-9	STR.						117
A507			17				17	20'-3	STR.						359
A508		20	7		20	10	57	6'-3	STR.						372
A509			4			4	8	4'-0	25	2'-1	2'-1			11"	33
A510			11			10	21	4'-0	24			2'-0	2'-0	11"	88
A511			7			8	15	20'-0	17		9'-6	1'-2	9'-6		313
A512		13	8	4	10	8	43	3'-6	STR.						157
A513		9	8	1	10	8	36	2'-8	STR.						100
A514	1	2	4			4	11	4'-0	STR.						46
A515			20			20	40	4'-6	STR.						188
A516			23				23	13'-5	STR.						322
A517			1	9			10	8'-6	STR.						89
A518	2		40	2		16	60	5'-9	STR.						360
A519			6				6	8'-1	STR.						51
A520			8				8	9'-0	STR.						75
A521		36	23		35	24	118	7'-6	S-3	8"	2'-10	8"	2'-10	8"	923
A522			13			13	26	24'-4	17		11'-8	1'-2	11'-8		660
A523			10				10	18'-9	STR.						196
A524			6				6	10'-3	STR.						64
A525	23		13	23		14	73	4'-6	24	1'-7	1'-1	6"	1'-7	2"	343
A526	6		6	6		6	24	4'-0	24	1'-4	1'-1	6"	1'-4	2"	100
A527	7		4	7		4	22	3'-8	24	1'-2	1'-1	6"	1'-2	2"	84
A528		10	1				11	19'-9	STR.						227
A529			6			6	12	4'-7	24	1'-6	7"	2'-9		1'-3	57
A530						32	32	8'-6	17		2'-6	3'-9	2'-6		284
A531						24	24	7'-11	17		1'-0	7'-0			198
A532						16	16	8'-11	17		1'-0	8'-0			149
A533						10	10	30'-6	STR.						318
A534						10	10	30'-0	STR.						313
A535		1				20	21	14'-6	STR.						318
A536					1	2	3	7'-3	STR.						23
A537		15		1	13	8	37	9'-3	STR.						357
A538						4	4	9'-9	STR.						41
A539	9					6	15	7'-9	STR.						121
A540		68			64	26	158	5'-6	STR.						906
A541						10	10	20'-4	STR.						212
A542		1				5	6	14'-0	STR.						88
A543					1	1	2	12'-6	STR.						26
A544						1	1	15'-0	STR.						16
A545				21			21	30'-7	STR.						669
A546				23	5		28	17'-9	STR.						518
A547	4			4			8	4'-10	25	1'-6	3'-6			1'-3	40
A548	7			7			14	8'-5	24	1'-6	7"	6'-6		5'-4	123
A549		24			11		35	11'-2	STR.						408
A550					11		11	25'-5	17		12'-3	1'-2	12-3		292
A551					5		5	15'-6	STR.						81
A552		2			2		4	24'-7	STR.						103
A553					8		8	24'-3	STR.						202
A554	1				25		26	10'-6	STR.						285
A555					10		10	31'-7	STR.						329
A556	43						43	9'-9	17		1'-0	8'-10			437
A557	36						36	11'-0	17		1'-0	10'-1			413
A558	6						6	12'-3	17		1'-0	11'-4			77
A559	21						21	35'-5	STR.						776
A560	23						23	26'-4	STR.						632

ABUTMENTS

MARK	SHT. 177	SHT. 178	SHT. 179	SHT. 180	SHT. 181	SHT. 182	TOTAL	LENGTH	TYPE	A	B	C	D	E	WEIGHT
A561		4			4		8	4'-3	STR.						35
A562		4			4		8	4'-9	STR.						40
A563		6					6	17'-0	STR.						106
A564	3						3	15'-7	17		1'-0	11'-4	3'-6		49
A565		14					14	27'-9	17		13'-5	1'-2	13'-5		405
A566		5					5	19'-9	STR.						103
A567		5					5	18'-6	STR.						96
A568		2					2	3'-9	STR.						8
A569	5						5	6'-6	24		5'-3	1'-4		7"	34
A570		8					8	23'-0	STR.						192
A571		2					2	24'-0	STR.						50
A572		10					10	31'-3	STR.						326
A573		3					3	33'-0	STR.						103
A574				3			3	14'-9	17		1'-0	10'-6	3'-6		46
A575					5		5	16'-4	STR.						85
A576				9			9	7'-3	24		6'-0	1'-4		7"	68
A577					2		2	26'-0	STR.						54
A578					3		3	33'-3	STR.						104
A579		4					4	7'-4	25	1'-6	6'-0			9"	31
A601	84		66				150	11'-7	17		2'-3	7'-5	2'-3		2610
A602	47		27	32		18	124	16'-4	23	5'-8	1'-5	7'-0	11"	2'-0	3042
A603	21		10	19		9	59	16'-8	23	7'-0	1'-5	7'-0	1'-5	6"	1477
A604		1	7				8	11'-0	STR.						132
A605		22	28		18	28	96	7'-4	17		2'-3	3'-2	2'-3		1057
A606		4	7				11	16'-3	STR.						268
A607			1				1	6'-3	STR.						9
A608			1		1	5	7	8'-6	STR.						89
A609					3		3	19'-0	STR.						86
A610			3				3	13'-4	STR.						60
A611		36			36		72	10'-4	17		2'-3	6'-2	2'-3		1117
A612	9		9	9		9	36	5'-0	STR.						270
A613				64		42	106	11'-1	17		2'-3	6'-11	2'-3		1765
A614						7	7	16'-9	STR.						176
A615					10		10	29'-0	STR.						436
A616		10					10	26'-6	STR.						398
A617					4	2	6	13'-0	STR.						117
A618		3					3	20'-3	STR.						91
A619					3		3	13'-6	STR.						61
A620		3					3	15'-0	STR.						68
A701					23		23	11'-6	17		1'-0	10'-8			541
A702		22					22	12'-0	17		1'-0	11'-2			540
A801			20				20	22'-0	STR.						1175
A802	2		2	2		2	8	5'-0	STR.						107
A803						10	10	33'-3	STR.						888
A804			3			3	6	12'-0	STR.						192
A805				20			20	30'-0	STR.						1602
A806	30						30	25'-6	STR.						2043

ABUTMENTS

MARK	SHT. 177	SHT. 178	SHT. 179	SHT. 180	SHT. 181	SHT. 182	TOTAL	LENGTH	TYPE	A	B	C	D	E	WEIGHT
A901			3				3	18'-9	STR.						191
A902			1				1	13'-3	STR.						45
A903			1				1	11'-9	STR.						40
A904			5				5	6'-3	24			2'-6	4'-0	1'-1	106
A1001						3	3	20'-6	STR.						265
A1002						1	1	12'-6	STR.						54
A1003						1	1	15'-0	STR.						65
A1004						5	5	6'-4	24			2'-6	4'-0	1'-1	136
									TOTAL FOR ABUTMENTS -						40,439*
R501			4				4	13'-4	STR.						
R502			4				4	18'-8	STR.						
R503						4	4	14'-3	STR.						
R504						4	4	20'-0	STR.						
R505					4		4	17'-8	STR.						
R506					4		4	31'-4	STR.						
R507		4					4	19'-8	STR.						
R508		4					4	31'-0	STR.						

BARS MARKED WITH THE PREFIX "R" ARE TO BE PAID FOR UNDER ITEM S-14 RAILING

REPLACEMENT BARS

MARK	TOTAL	LENGTH	TYPE
RE500	2	5'-7	STR.
RE600	1	5'-11	STR.
RE700	1	6'-3	STR.
RE800	1	6'-6	STR.
RE900	1	6'-10	STR.
RE1000	1	7'-3	STR.
RE1100	2	7'-7	STR.
RESP500 (PLAIN)	1	5'-7	28

NOTE: "LENGTH" SHOWN FOR SPIRAL BARS IS THE DISTANCE FROM TOP OF FOOTING TO THE TOP OF COL. MINUS 2"±.

"NO. TURNS" IS "LENGTH" DIVIDED BY "PITCH" PLUS 3 TURNS (TOTAL NUMBER OF CLOSED COILS) TO 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 ENDS OF EACH UNIT.

FOUR STEEL CHANNEL, TEE OR ANGLE SPACERS @ APPROX. 0.63 POUNDS/LIN. FOOT OF EACH SPACER SHALL BE PROVIDED FOR EACH UNIT AND SHALL BE EQUALLY SPACED ALONG THE COIL PERIFERY. SPACERS WILL BE PAID FOR AS REINF. STEEL AND THEIR WEIGHT (BASED ON 0.68#/LIN.FT.) INCLUDED IN TABULATED WEIGHT OF SPIRAL BARS.

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. FOR EXAMPLE, A700 IS A № 7 SIZE BAR AND A1014 IS A №10 SIZE BAR.

DRAWING LIST

- 183 - PIER DETAILS
- 184 - PIER DETAILS
- 177 - REAR ABUTMENT - RAMP E-S
- 178 - REAR ABUTMENT - RAMP E-S
- 179 - FORWARD ABUTMENT - RAMP E-S
- 180 - REAR ABUTMENT - RAMP W-N
- 181 - REAR ABUTMENT - RAMP W-N
- 182 - FORWARD ABUTMENT - RAMP W-N

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

BAR SCHEDULE
BRIDGE NO. CUY-21-RAMP E-S & RAMP W-N
RAMPS E-S & W-N UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

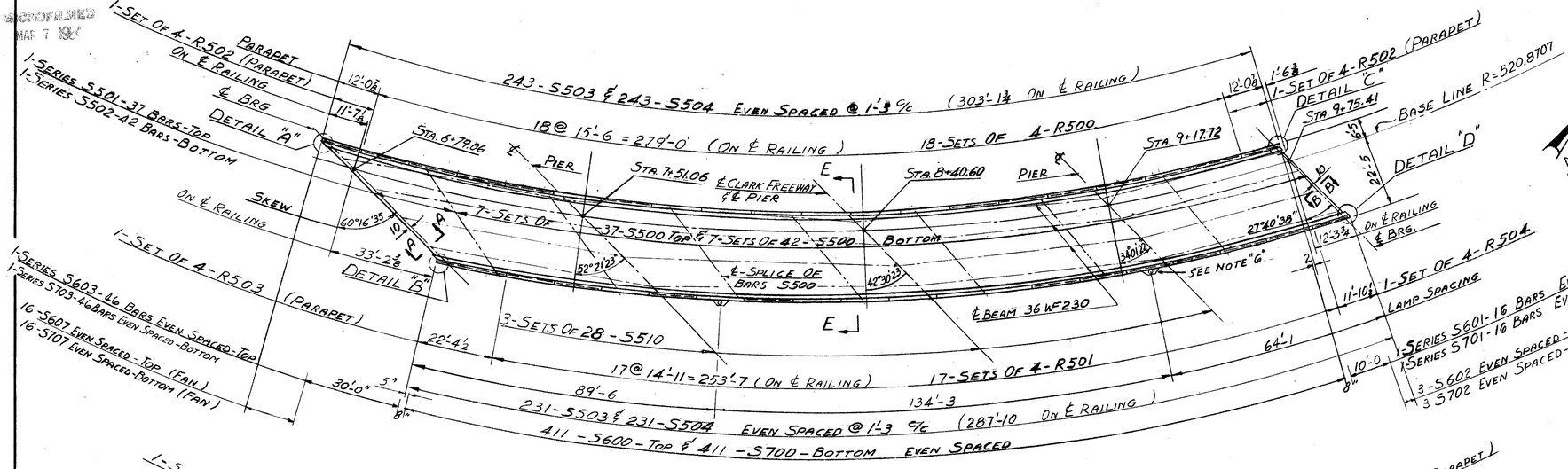
SCALE DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	D.F.		RTM	[signature]	5-20-63	

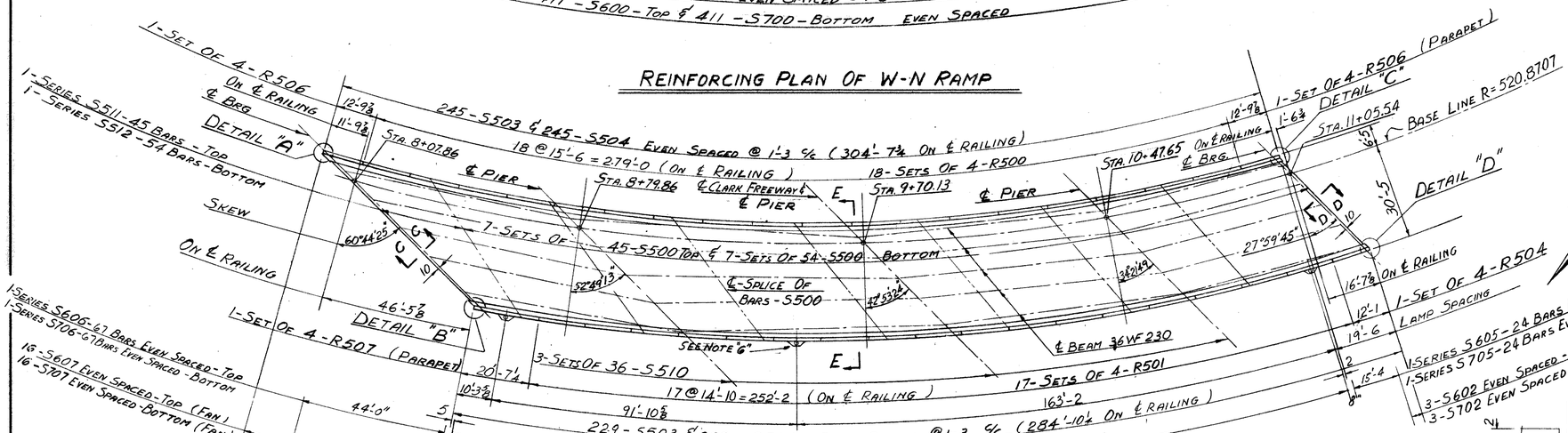
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY– 21– 14.12

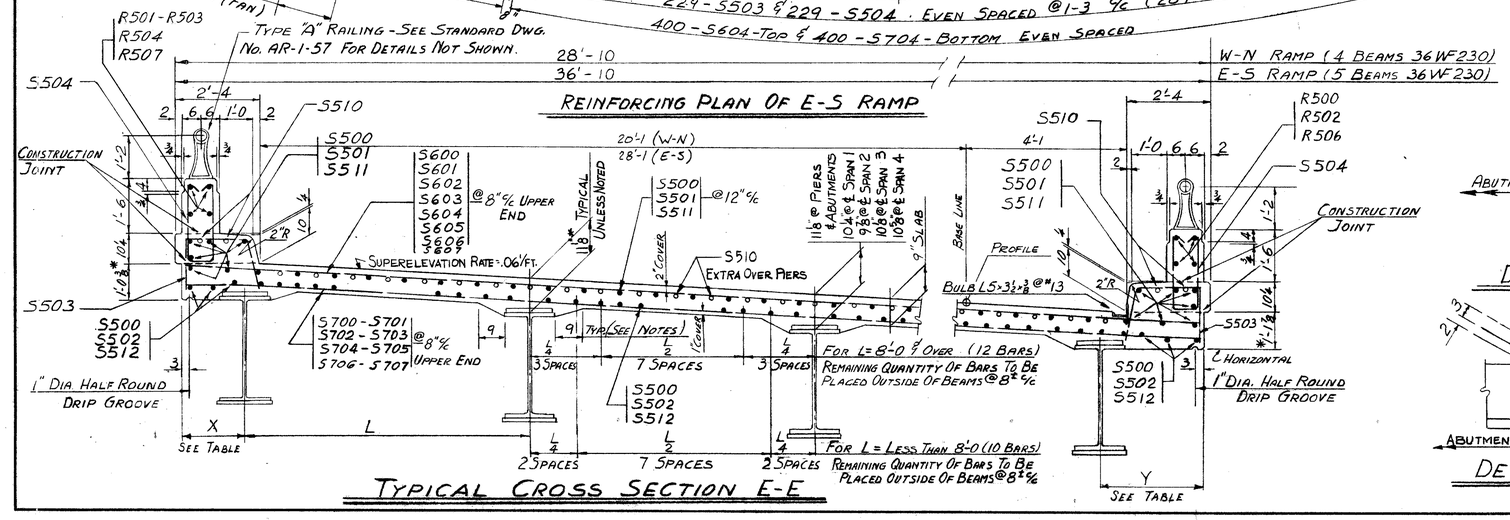
186
198



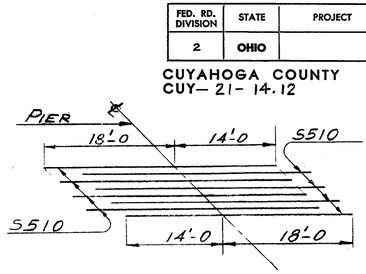
Reinforcing Plan Of W-N Ramp



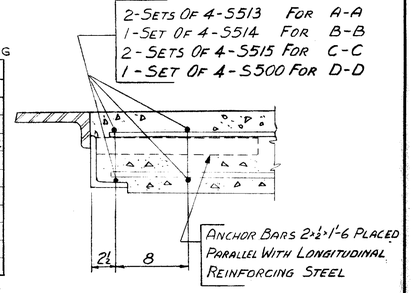
Reinforcing Plan Of E-S Ramp



Typical Cross Section E-E



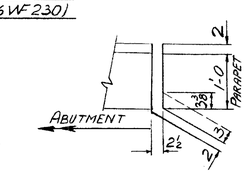
Stagger Of S510 Bars Over Piers

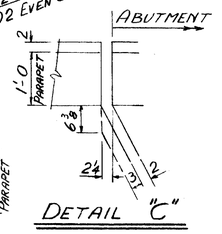


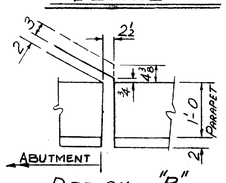
Section A-A, B-B, C-C & D-D

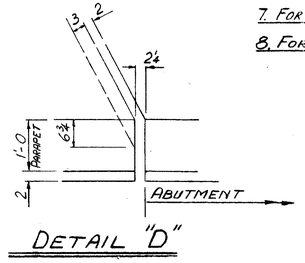
DIMENSIONS FOR SLAB OVERHANG

LOCATION	RAMP W-N X	RAMP W-N Y	RAMP E-S X	RAMP E-S Y
REAR ABUT.	4'-1	4'-4	4'-3	4'-3
℄ SPAN # 1	3'-10½	2'-5	4'-0	2'-5
PIER # 1	1'-4	2'-10	1'-4	2'-11½
℄ SPAN # 2	4'-1	1'-4¼	4'-2	1'-7¼
PIER # 2	3'-4	3'-10	3'-6	4'-3
℄ SPAN # 3	4'-3½	2'-4⅜	4'-3⅜	2'-10
PIER # 3	2'-4	3'-9½	2'-2¼	4'-3
℄ SPAN # 4	3'-1⅞	2'-3½	3'-0½	2'-6
FORWARD ABUT.	2'-4	2'-4	2'-3	2'-3









Notes:

1. The Haunch In The Superelevated Deck Slab Adjacent To The Top Of Steel Beams, Which Is Shown As 9" Wide, May Vary From This Dimension Between The Limits Of 6" And 12" On The Low Side And Between 9" And 12" On The High Side, Except On The High Side The Maximum Slope Shall Not Exceed 3 Inches Per Foot. Payment For Deck Slab Concrete Shall Be Based On The 9" Width.
2. For Dimension Marked With An Asterisk (*). This Is A 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 Girder May Not Have The Exact Camber Or Conformation Required To Place It Parallel To The Finished Grade.
3. Slab Thickness Shown Includes 1" For Monolithic Wearing Surface.
4. Concrete For The Deck Shall Be Class "C".
5. The Cover On Reinforcement Bars, Unless Otherwise Noted, Shall Be 1½".
6. For Lamp Post Support Reinforcing Details See Sheet No. 167
7. For Bar Schedule See Sheet No. 187
8. For Additional Notes See Sheet No. 175

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

E-S & W-N Deck Details
Bridge No. CUY-21-Ramp E-S & Ramp W-N
Ramps E-S & W-N under Willow Freeway
Willow-Clark Interchange
Cuyahoga County

SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
		V.C.		V.P.K.		5-20-63	

CONT. No. 58 '9-25 SHEET ACCT. N 1872

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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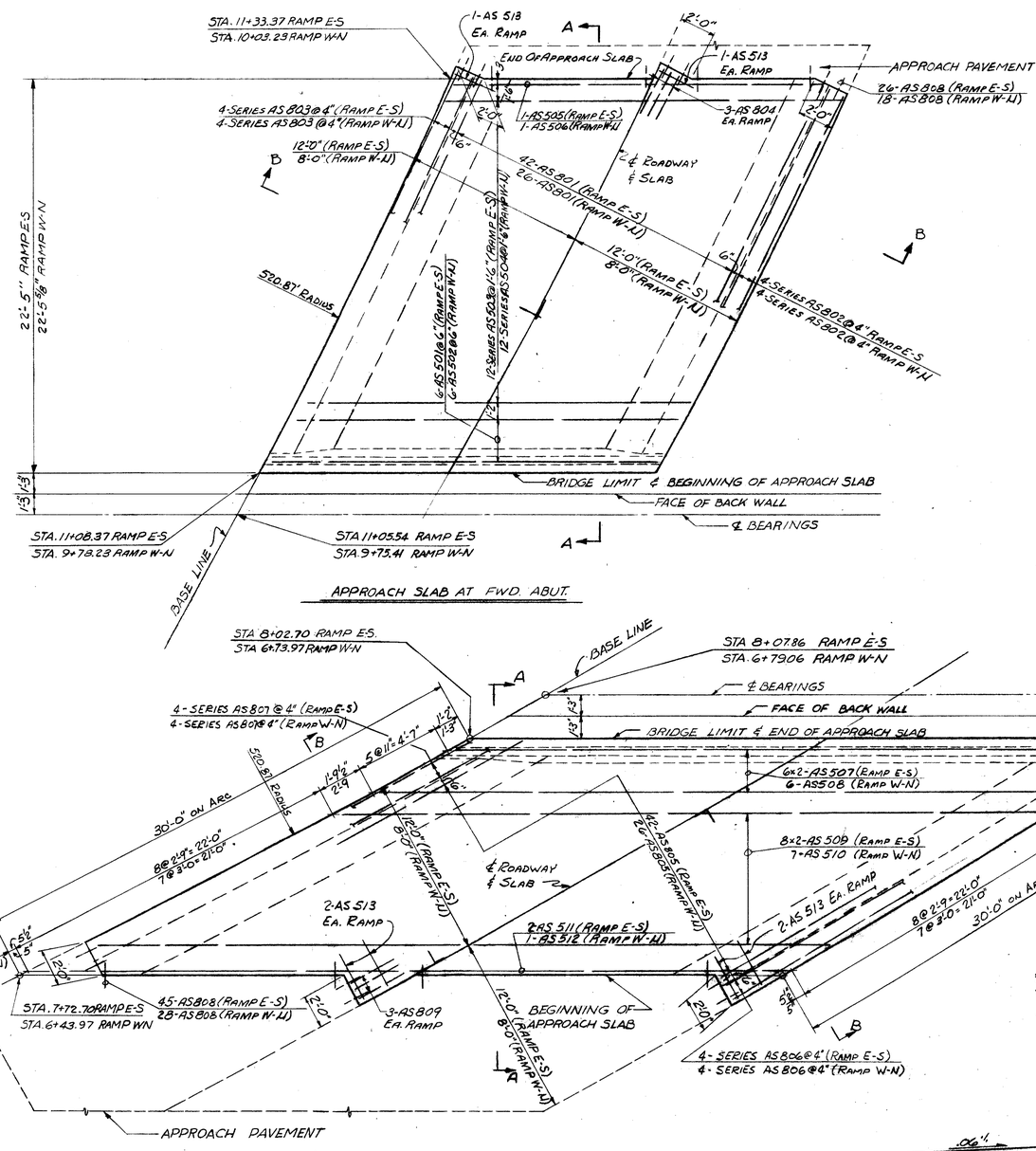
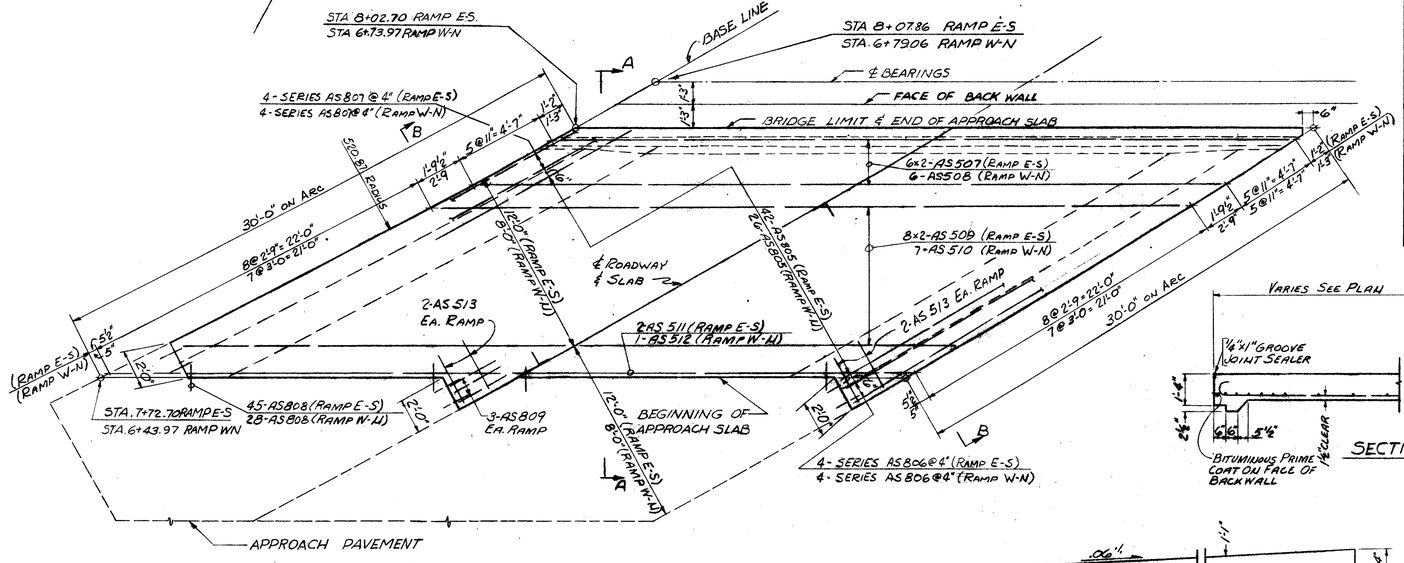
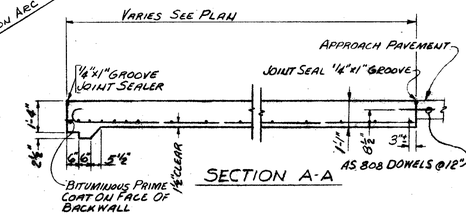
CUYAHOGA COUNTY
CUY— 21-14.12

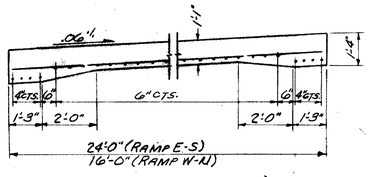


APPROACH SLAB AT FWD. ABUT.



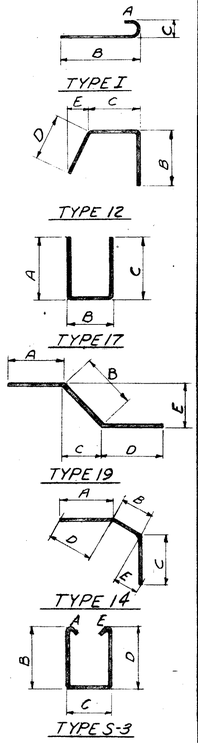
APPROACH SLAB AT REAR ABUT.





SECTION B-B

BENDING DIAGRAM



REINFORCING STEEL BAR SCHEDULE

MARK	WAREQ'D	NET LENGTH	TYPE	A	B	C	D	E	WEIGHT
BRIDGE DECK REINFORCING STEEL									
S500	1250	40'-0"	STR.						52,150#
S501	37	18'-7" TO 34'-0"	STR.	1 SERIES OF 37 - EACH VARY BY 5"					1,015
S502	42	18'-7" TO 34'-0	STR.	1 SERIES OF 42 EACH VARY BY 4 3/8"					1,151
S503	948	4'-7	12		1'-7	1'-9	1'-6	3'-2	4,332
S504	948	5'-8"	S-3	5	2'-2"	8	2'-2	5	5,603
S505	20	5'-4"	STR.						111
S506	10	4'-6	14	6"	4'-0		4"		47
S507	10	2'-6	14	6"	2'-0		4"		26
S508	20	4'-3	19	11"	2'-7"	1'-10"	11"	1'-10"	89
S509	20	4'-10 1/2	17	3'-0	2'-0				102
S510	192	32'-0"	STR.						6,408
S511	45	16'-0 TO 34'-9	STR.	1 SERIES OF 45 - EACH VARY BY 5					1,191
S512	54	16'-0 TO 34'-9	STR.	1 SERIES OF 54 - EACH VARY BY 4 1/8					1,429
S513	8	28'-0"	STR.						238
S514	4	31'-0"	STR.						129
S515	8	35'-6"	STR.						296
S600	411	28'-3"	STR.						17,440
S601	16	6'-6" TO 25'-10	STR.	1 SERIES OF 16 - EACH VARY BY 1'-2 1/2"					389
S602	6	5'-9"	STR.						52
S603	46	8'-6 TO 26'-9	STR.	1 SERIES OF 46 - EACH VARY BY 4 3/4"					1,218
S604	400	36'-3	STR.						21,779
S605	24	8'-0 TO 34'-0"	STR.	1 SERIES OF 24 - EACH VARY BY 1'-1					757
S606	67	8'-4 TO 26'-4	STR.	1 SERIES OF 67 - EACH VARY BY 4 3/4"					1,744
S607	32	8'-0	STR.						385
S700	411	28'-3"	STR.						23,793
S701	16	6'-6" TO 25'-10	STR.	1 SERIES OF 16 - EACH VARY BY 1'-2 1/2"					529
S702	6	5'-9"	STR.						71
S703	46	8'-6 TO 26'-9	STR.	1 SERIES OF 46 - EACH VARY BY 4 3/4"					1,657
S704	400	36'-3	STR.						29,638
S705	24	8'-0 TO 34'-0	STR.	1 SERIES OF 24 EACH VARY BY 1'-1					1,030
S706	67	8'-4 TO 26'-4	STR.	1 SERIES OF 67 - EACH VARY BY 4 3/4"					2,373
S707	32	8'-0	STR						523
R500	144	15'-3"	STR.						
R501	136	14'-7"	STR.				TOTAL	WEIGHT	177,831 #
R502	8	11'-9"	STR.						
R503	4	22'-0	STR.						
R504	3	11'-6"	STR.						
R505	20	4'-3	19	11"	2'-7"	1'-10"	11"	1'-10"	
R506	8	12'-6"	STR.						
R507	4	20'-9"	STR.						
R508	5	5'-4	STR.						

BARS MARKED WITH PREFIX "R" ARE TO BE PAID FOR UNDER ITEM S-14 "RAILING"

APPROACH SLAB REINFORCING STEEL

AS501	6	24'-7"	STR.						
AS502	6	17'-7"	STR.						
AS503	12	26'-0 1/2" TO 26'-6"	STR.	1-SERIES OF 12 - EACH VARY BY 1/2"					
AS504	12	17'-1 1/2" TO 17'-7"	STR.	1-SERIES OF 12 - EACH VARY BY 1/2"					
AS505	1	24'-5"	STR.						
AS506	1	15'-9"	STR.						
AS507	12	24'-0"	STR.						
AS508	6	31'-0"	STR.						
AS509	16	24'-7"	STR.						
AS510	7	31'-3"	STR.						
AS511	2	22'-9"	STR.						
AS512	1	28'-0"	STR.						
AS513	12	31'-6	STR.						
AS801	68	25'-7"	1	1'-1"	24'-6"	9"			
AS802	8	24'-8" TO 25'-2"	1	1'-1"	23'-7" TO 24'-1"	9"			2 SERIES OF 4 - EACH VARY BY 1/2"
AS803	8	25'-11" TO 26'-5"	1	1'-1"	24'-10" TO 25'-4"	9"			2 SERIES OF 4 - EACH VARY BY 1/2"
AS804	6	3'-0"	STR.						
AS805	68	30'-7	1	1'-1"	29'-6	9"			
AS806	8	31'-9" TO 33'-6"	1	1'-1"	30'-8 TO 32'-5"	9"			2 SERIES OF 4 - EACH VARY BY 1/2"
AS807	8	27'-6" TO 29'-4"	1	1'-1"	26'-5" TO 28'-3	9"			2 SERIES OF 4 - EACH VARY BY 1/2"
AS808	117	1'-6"	STR.						
AS809	6	5'-6"	STR.						
RE500	4	5'-7	STR.						
RE600	3	5'-11	STR.	- REPLACEMENT BARS FOR BRIDGE DECK REINFORCING					
RE700	3	6'-3	STR.						

BARS MARKED WITH PREFIX "AS" ARE TO BE PAID FOR UNDER ITEM S-7.1 REINFORCED CONCRETE APPROACH SLABS

NOTES:

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE DIGITS ARE USED INDICATES THE BAR SIZE NUMBER. FOR EXAMPLE, S 700 IS A NO. 7 SIZE BAR.

TRANSVERSE BARS ARE PLACED PARALLEL TO THE FACE OF BACKWALL IN THE APPROACH SLABS AT THE FORWARD ABUTMENT AND AS DIMENSIONED IN THE APPROACH SLABS AT THE REAR ABUTMENTS.

LONGITUDINAL BARS ARE PLACED ON THE CHORDS OF THEIR ARCS.

CONCRETE IN APPROACH SLABS SHALL BE CLASS "C".

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

E-S & W-N APPROACH SLAB & BAR SCHEDULE
BRIDGE NO. CUY-21-RAMP E-S & RAMP W-N
RAMPS E-S & W-N UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DESIGNED	C.A.B.		V.A.K. D.W.M.	G.H.	5-20-63	

CONT. NO. 58019-25 BRIDGE NO. 1873

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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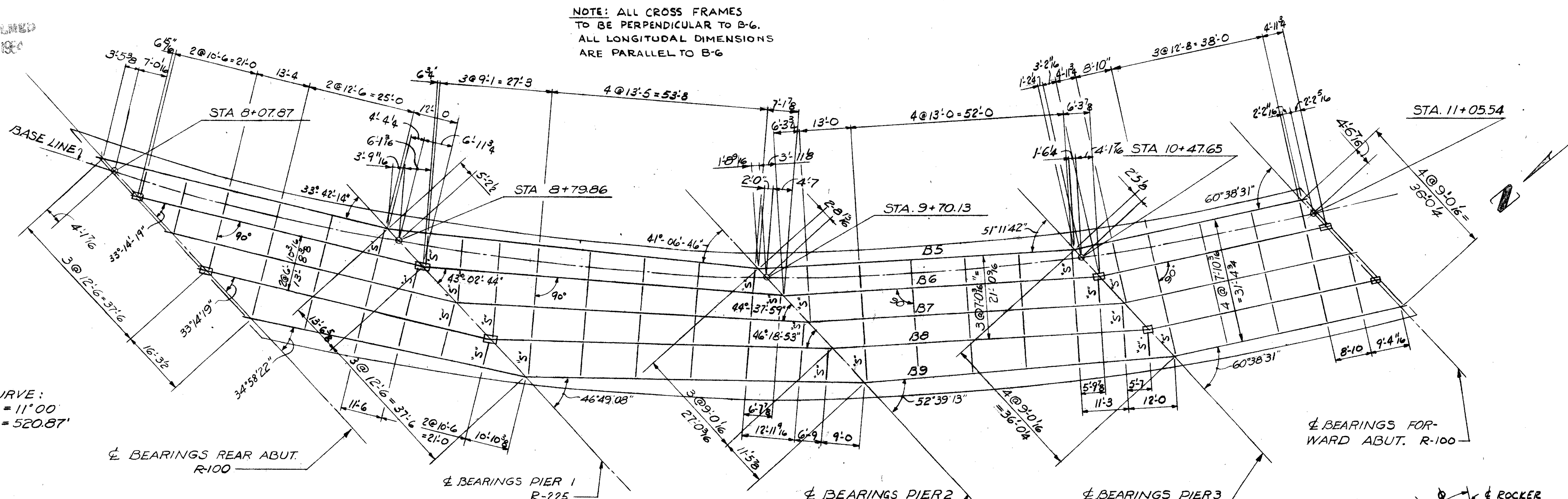
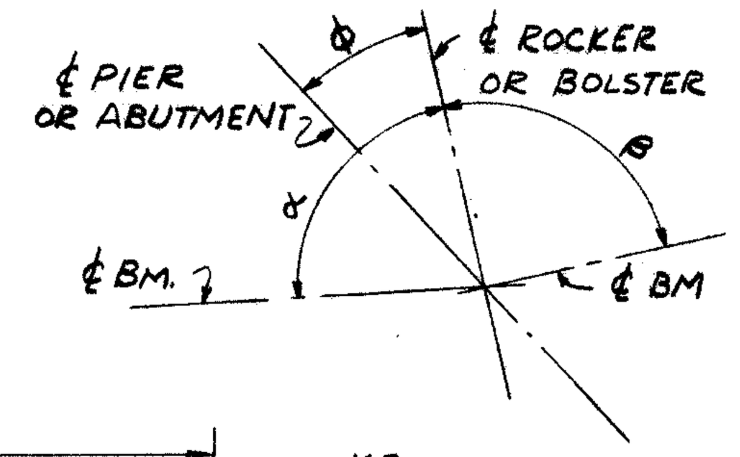
CUYAHOGA COUNTY
CUY— 21-14.12

NOTE: ALL CROSS FRAMES TO BE PERPENDICULAR TO B-6. ALL LONGITUDAL DIMENSIONS ARE PARALLEL TO B-6



NOTE: THIS SYMBOL (▭) INDICATES LOCATION OF MODIFIED BASE PLATE. CROSS FRAMES MARKED "S" ARE SPECIAL CROSS FRAMES. SEE TYPICAL DIAPHRAGM DETAIL ON SHEET Nº 189

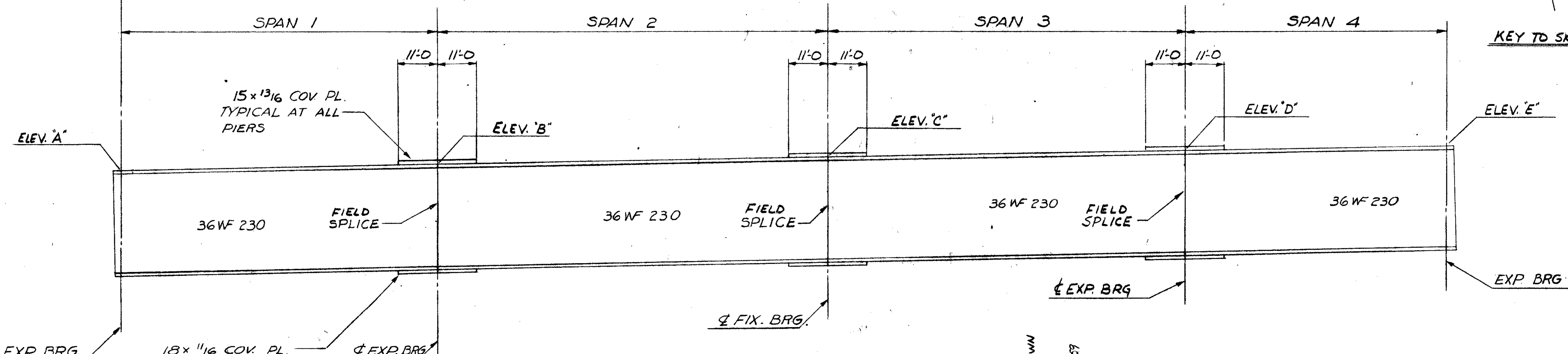
STEEL FRAMING PLAN



KEY TO SKEW ANGLES

BEAM DETAILS				
BEAM	SPAN C TO C. BEARINGS.			
	1	2	3	4
B 5	71'-0 3/8	92'-0 1/8	77'-7 5/8	56'-9 1/2
B 6	71'-10 15/16	88'-7 5/8	77'-7 5/8	56'-9 1/2
B 7	71'-10 5/16	86'-1 3/8	77'-7 5/8	56'-9 1/2
B 8	71'-10 5/16	83'-7 15/16	77'-7 5/8	56'-9 1/2
B 9	68'-9 3/16	82'-11 5/8	76'-1 1/4	56'-9 1/2

SKEW ANGLES				
LOCATION		Φ	α	β
REAR ABUT.	B5	53°38'-10"	—	92°-39'-36"
	B6 → B8		—	93°-07'-31"
	B9		—	91°-23'-28"
PIER 1	B5	49°09'-54"	82°-52'-08"	89°-43'-20"
	B6		82°-24'-13"	87°-47'-22"
	B7		82°-24'-13"	86°-12'-07"
	B8		82°-24'-13"	84°-31'-13"
	B9		84°-08'-16"	84°-00'-58"
PIER 2	B5	42°-05'-10"	83°-11'-56"	86°-43'-08"
	B6		85°-07'-54"	86°-43'-08"
	B7		86°-43'-09"	86°-43'-08"
	B8		88°-24'-03"	86°-43'-08"
	B9		88°-54'-18"	85°-15'-37"
PIER 3	B5 → B8	35°-39'-22"	86°-51'-04"	83°-42'-07"
	B9		88°-18'-35"	83°-42'-07"
FWD. ABUT.	B5 → B9	32°-05'-13"	92°-43'-44"	—



ELEVATION

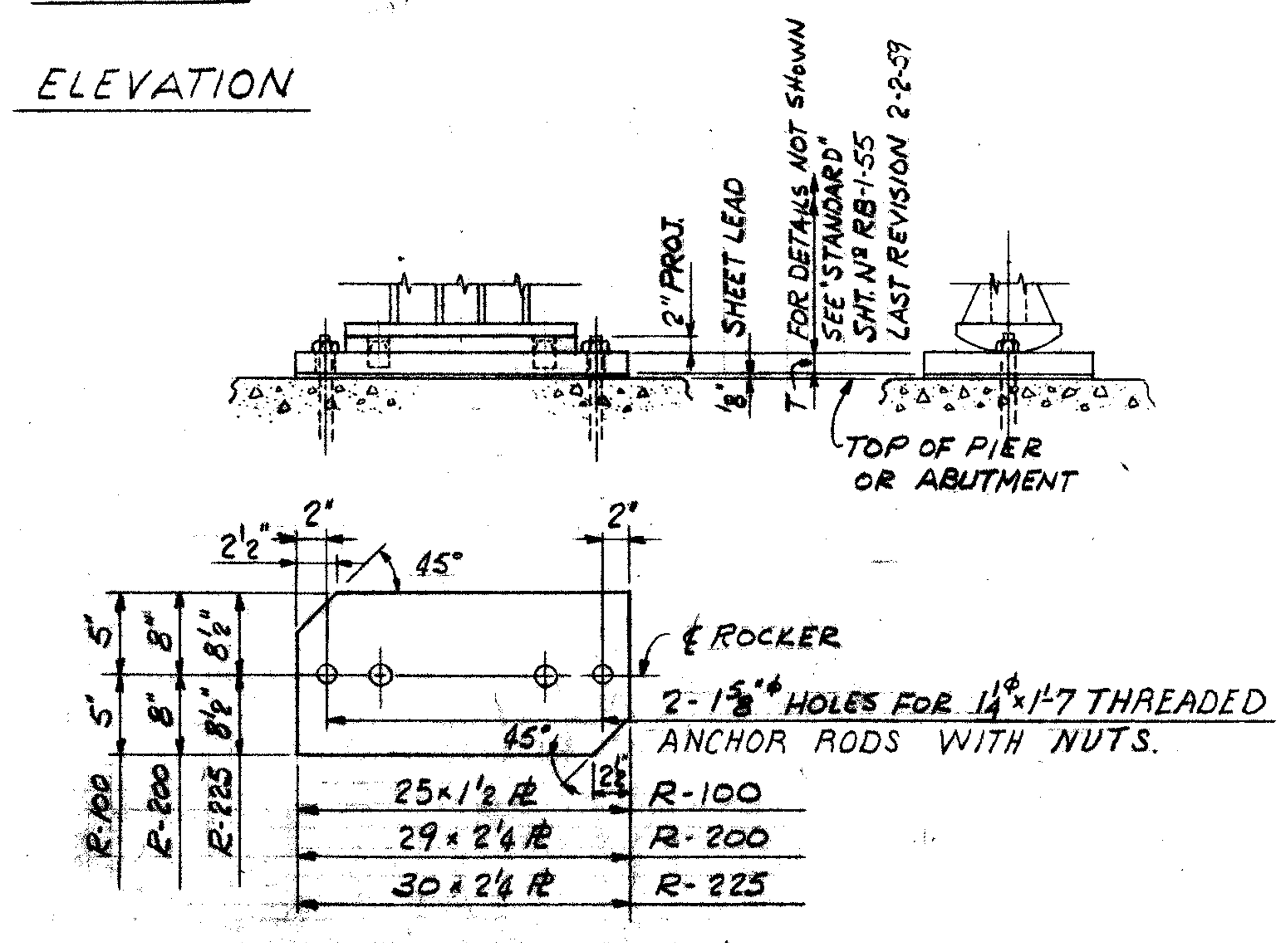
NOTE:
1. FOR TYPICAL DIAPHRAGM , SEE SHT. Nº 189
2. FOR SPLICE DETAIL SEE SHT. Nº 189
3. FOR DETAILS OF END CROSS FRAMES & END FINISH SEE SHT. Nº 171.
4. ALL THE ℄'S OF BEARING ON ABUTMENTS OR PIERS ARE PARALLEL AND HAVE A BEARING OF N 86°-52'-00" W.
5. FOR ADDITIONAL NOTES SEE SHT. Nº 175

BEAM SPLICE WELDING:
1. RAISE END OF BEAMS AT REAR ABUTMENT AND PIER Nº 3 2 7/8" AND 3 3/8 RESPECTIVELY.
2. BUTT-WELD BEAM FLANGES AND WEB AT PIERS Nº 1 & 2 USING THE FOLLOWING SEQUENCE: MAKE ONE PASS ON EACH FLANGE, THEN TWO ON THE WEB; REPEAT, USING ONE PASS AT EACH LOCATION UNTIL WELDS ARE COMPLETED.
3. WELD TOP AND BOTTOM FLANGE MOMENT PLATES AT PIERS Nº 1 & 2.
4. LOWER END OF BEAMS AT REAR ABUTMENT AND PIER Nº 3.
5. MAKE SPLICES AT PIER Nº 3 IN THE SAME MANNER, RAISING THE END OF BEAMS AT FORWARD ABUTMENT BY 1 1/16" AND LOWER DOWN AFTER COMPLETION.

CAMBERING OF BEAMS IS REQUIRED IN ACCORDANCE WITH THE FOLLOWING TABLE.

DEFLECTION AND CAMBER				
SPAN	1	2	3	4
DEFLECTION DUE TO WEIGHT OF STEEL	1/8	1/8	1/16	1/16
DEFLECTION DUE TO REMAINING DEAD LOAD	3/8	5/8	1/4	3/16
VERTICAL CURVE	0	0	0	0
SUM OF DEFLECTIONS	+1/2	+3/4	+5/16	+1/4
CAMBER REQUIRED	0	3/4	0	0

ELEVATIONS					
BEAM	A	B	C	D	E
B 5	641.26	641.92	642.77	643.49	644.01
B 6	641.98	642.69	643.47	644.23	644.66
B 7	642.46	643.25	643.93	644.72	645.17
B 8	642.95	643.81	644.39	645.22	645.69
B 9	643.73	644.33	645.06	645.72	646.22



MODIFIED ROCKER BASE ℙ
USE WHERE INDICATED FOR RAMPS W-N & E-S

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

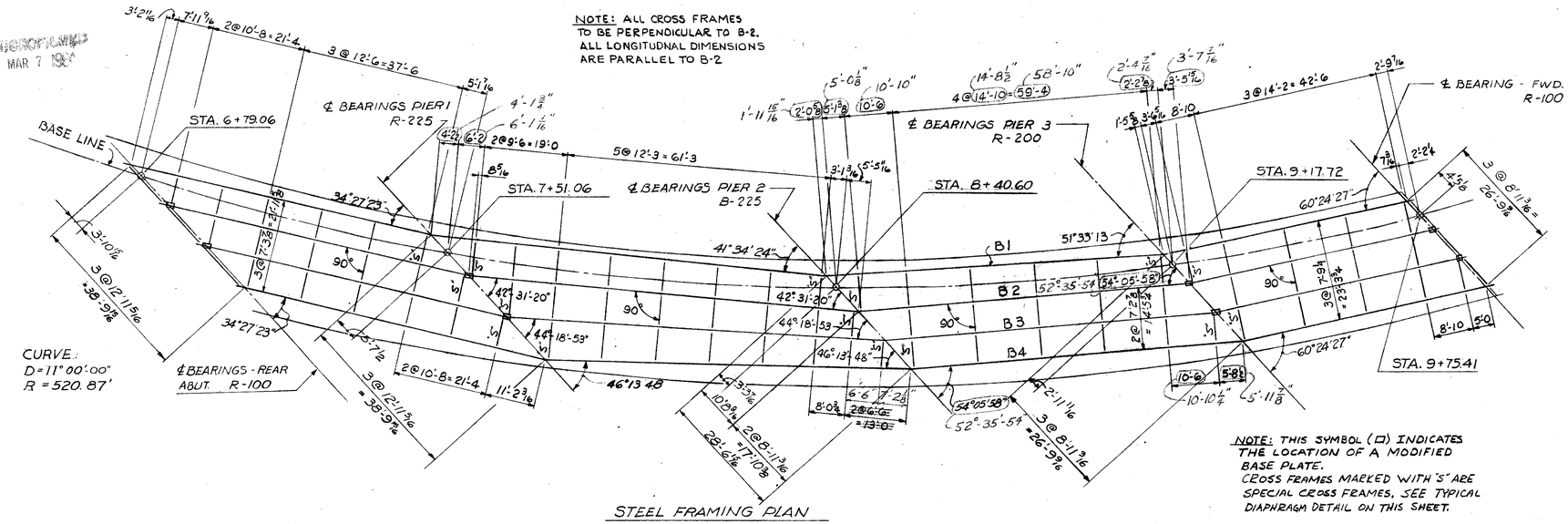
E-S STEEL FRAMING
BRIDGE NO. CUY-21-RAMP E-S
RAMPS E-S & W-J UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE			DATE		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
SCH	SCH		R.D.H. DWM		5-20-63

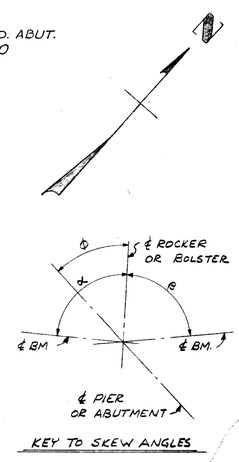
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

(189 / 198)

CUYAHOGA COUNTY
CUY— 21-14.12



NOTE: THIS SYMBOL (□) INDICATES THE LOCATION OF A MODIFIED BASE PLATE.
CROSS FRAMES MARKED WITH "S" ARE SPECIAL CROSS FRAMES, SEE TYPICAL DIAPHRAGM DETAIL ON THIS SHEET.

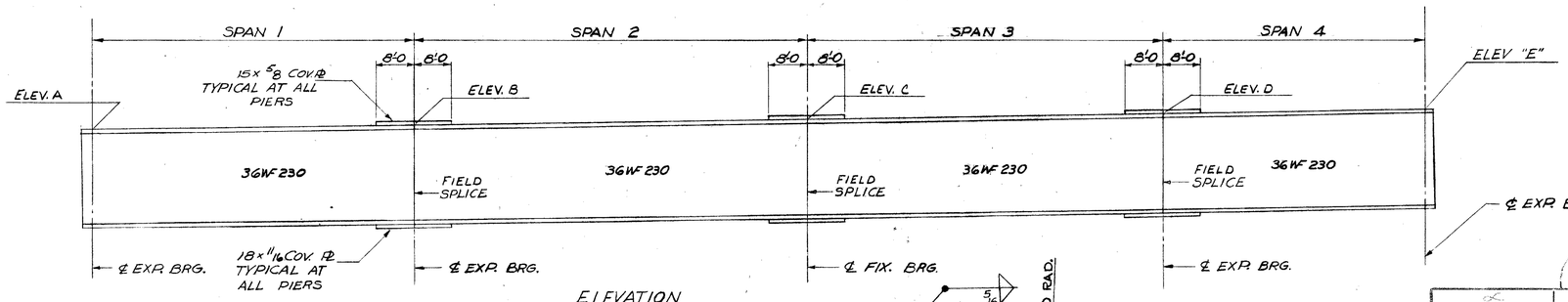


SKEW ANGLES FOR BEAMS & BRG. PLATES

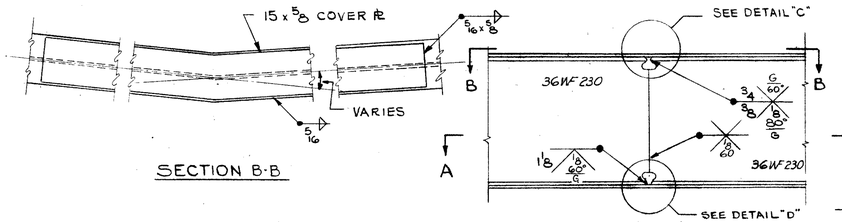
LOCATION		ϕ	∝	β
REAR ABUT.		52° 58'-05"	—	92°-34'-32"
PIER 1	B1	49° 09'-40"	83°-37'-03"	89°-15'-56"
	B2		83°-37'-03"	88°-19'-00"
	B3		83°-37'-03"	86°-31'-27"
	B4		83°-37'-03"	84°-36'-32"
PIER 2	B1	41°-26'-18" 42°-00'-05"	83°-00'-42"	87°-00'-28"
	B2		83°-57'-38"	84°-27'-44"
	B3		85°-45'-11"	84°-27'-44"
	B4		87°-40'-06"	84°-27'-44"
PIER 3	B1	33°-47'-52" 34°-47'-55"	85°-21'-05"	85°-47'-41"
	B2		87°-53'-50"	85°-47'-41"
	B3		87°-53'-50"	85°-47'-41"
	B4		87°-53'-50"	85°-47'-41"
FWD. ABUT.		31°-23'-56" 31°-49'-45"	91°-48'-17" 92°-14'-12"	—

BEAM DETAILS

BEAM	SPAN 1	SPAN 2	SPAN 3	SPAN 4
B - 1	70'-6 1/4	91'-2 1/16	77'-2 15/16	56'-11'8
B - 2	70'-6 1/4	89'-6 3/16	76'-1 7/8	56'-11'8
B - 3	70'-6 1/4	86'-7 1/4	76'-1 7/8	56'-11'8
B - 4	70'-6 1/4	83'-9 3/8	76'-1 7/8	56'-11'8

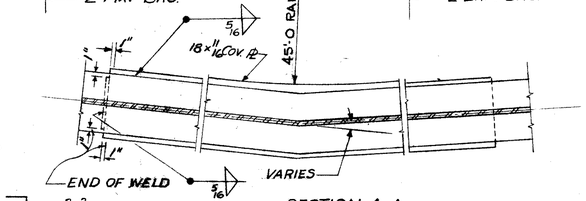


ELEVATION

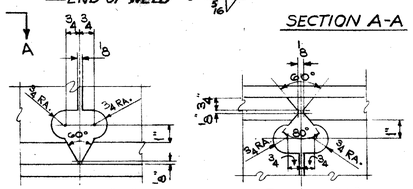


SECTION B-B

BEAM SPLICE DETAIL



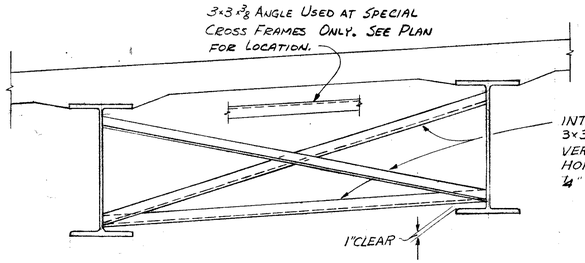
SECTION A-A



∝	β
83°-34'-29"	86°-26'-42"
84°-31'-25"	85°-24'-01"
86°-18'-56"	85°-24'-01"
88°-13'-53"	85°-24'-01"
86°-21'-08"	84°-47'-38"
87°-23'-49"	84°-47'-38"
87°-23'-49"	84°-47'-38"
87°-23'-49"	84°-47'-38"

BEAM SPLICE WELDING PROCEDURE

1. RAISE END OF BEAMS AT PIER NO. 3 & REAR ABUTMENT 3 3/8" AND 2 3/8" RESPECTIVELY
2. BUTT-WELD BEAM FLANGES AND WEB AT PIERS NO. 1 & 2 USING THE FOLLOWING SEQUENCE.: MAKE ONE PASS ON EACH FLANGE; THEN TWO ON THE WEB. REPEAT USING ONE PASS AT EACH LOCATION UNTIL WELDS ARE COMPLETED
3. WELD TOP AND BOTTOM FLANGE MOMENT PLATES AT PIERS NO. 1 & 2
4. LOWER END OF BEAMS AT PIER NO. 3 & REAR ABUTMENT.
5. MAKE SPLICES AT PIER NO. 3, IN THE SAME MANNER RAISING THE END OF THE BEAMS AT THE FORWARD ABUTMENT 1 5/16".



INTERMEDIATE CROSSFRAME ANGLES 3x3x5/16. WELD BOTH SIDES OF VERTICAL LEG AND TOP SIDE OF HORIZONTAL LEG TO BEAM WITH 1/4" CONTINUOUS FILLET WELD.

TYPICAL DIAPHRAGM

See sheet 189A for additional details

ELEVATIONS

BEAM	A	B	C	D	E
B-1	642.29	642.80	643.46	644.02	644.43
B-2	643.01	643.51	644.21	644.72	645.07
B-3	643.49	644.07	644.65	645.20	645.57
B-4	644.10	644.59	645.17	645.70	646.09

CAMBERING OF BEAMS IS REQUIRED IN ACCORDANCE WITH THE FOLLOWING TABLE.

DEFLECTION AND CAMBER

SPAN	1	2	3	4
DEFLECTION DUE TO WEIGHT OF STEEL	1/8	1/8	—	1/16
DEFLECTION DUE TO REMAINING DEAD LOAD	3/8	5/8	3/16	3/16
VERTICAL CURVE	0	0	0	0
SUM OF DEFLECTIONS	+1/2	+3/4	+3/16	+1/4
CAMBER REQUIRED	0	+3/4	0	0

ALL THE ℄S OF BEARING ON ABUTMENT OR PIERS ARE PARALLEL AND HAVE A BEARING OF N 86°-52'-00"W.
FOR DETAILS OF MODIFIED BASE PLATE SEE SHT. NO 188
FOR DETAILS OF END CROSS FRAMES & END FINISH SEE SHT. NO 171
FOR ADDITIONAL NOTES SEE SHT. NO 175

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

W-U STEEL FRAMING

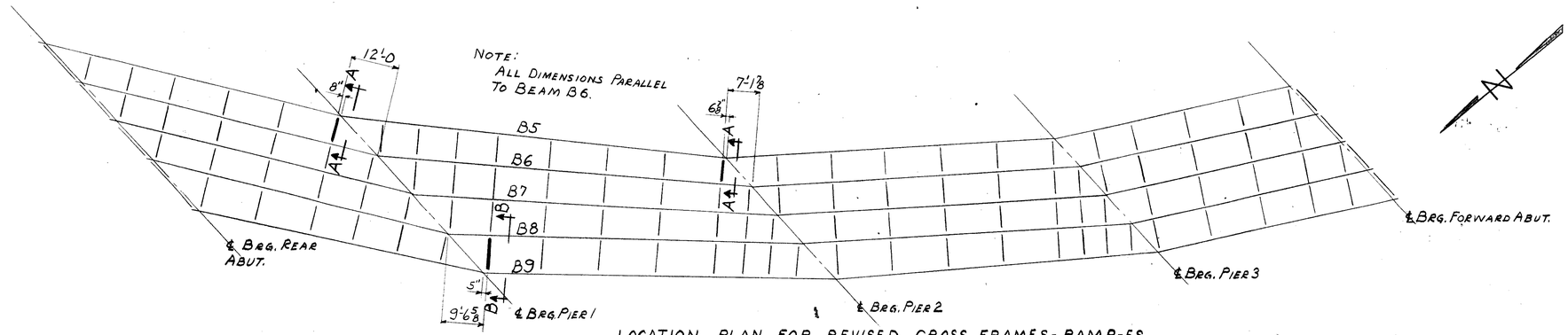
BRIDGE NO. CUY-21- RAMP W-N
RAMPS E-S & W-N UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SCH	SCH		R.D.H. DWM	5-20-63		6-5-63 10-6 63

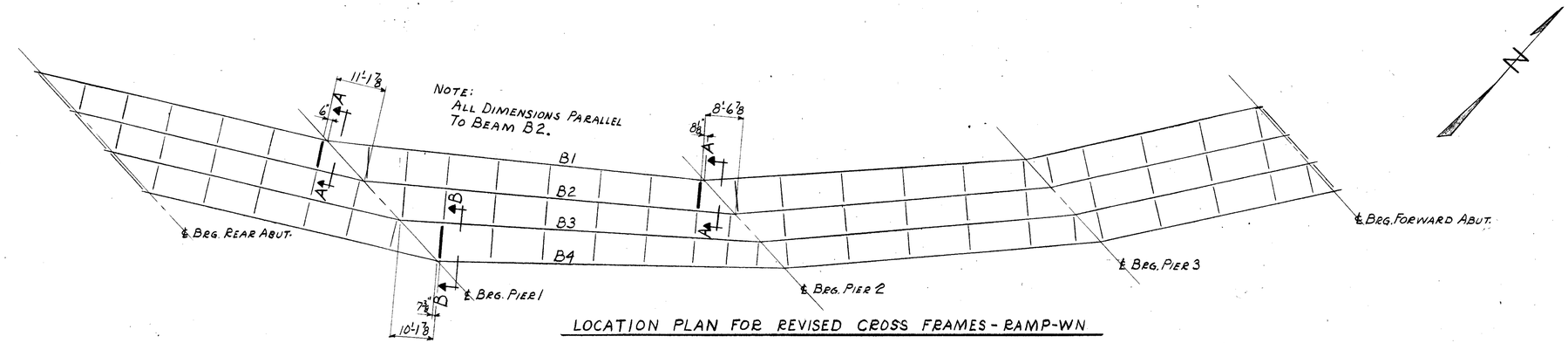
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

189A

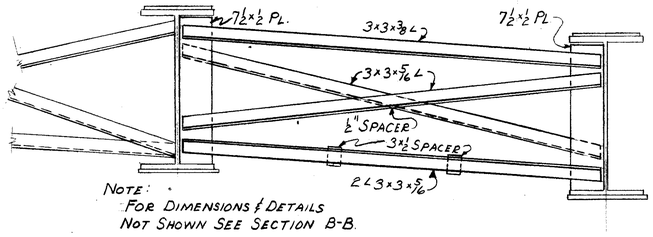
CUYAHOGA COUNTY
CUY-21-14.12



LOCATION PLAN FOR REVISED CROSS FRAMES - RAMP-ES

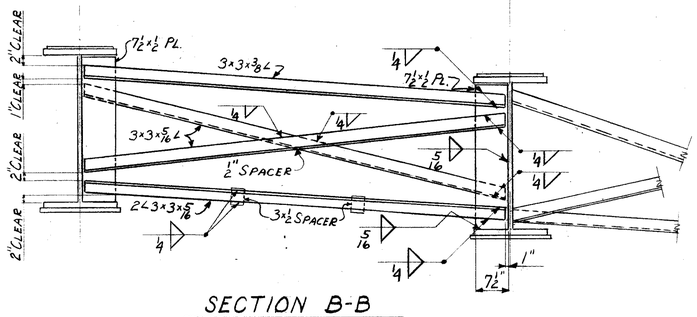


LOCATION PLAN FOR REVISED CROSS FRAMES - RAMP-WN



NOTE:
FOR DIMENSIONS & DETAILS
NOT SHOWN SEE SECTION B-B.

SECTION A-A



SECTION B-B

NOTE:
EXISTING CROSS FRAMES CONSIST OF 1∠3x3x3/8 & 3∠3x3x5/16. THESE ∠s SHOULD BE REVISED TO CONFORM TO THE NEW DETAIL. AN ADDITIONAL 3x3x5/16 ∠, 2-7 1/2 x 1/2 PL. & 3-1/2" SPACERS ARE REQUIRED FOR EACH CROSS FRAME.

This sheet added 10-6-64

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

REVISIONS TO CROSS FRAMES

BRIDGE NO. CUY-21-RAMP E-S & RAMP W-N
RAMPS E-S & W-N UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

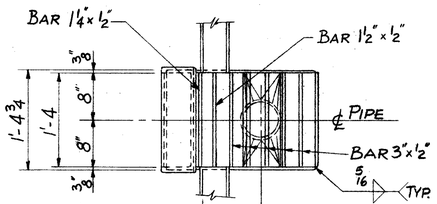
SCALE	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DESIGNED						
DWM		DWM				

CONT. No. 58019-25 - SHEET ACCT. No. 1905

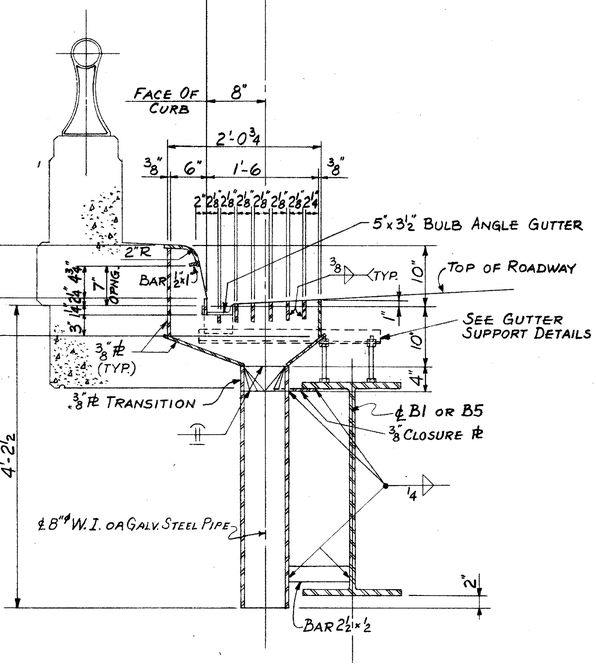
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

190
198

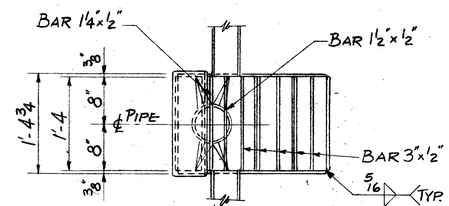
CUYAHOGA COUNTY
CUY– 21-14.12



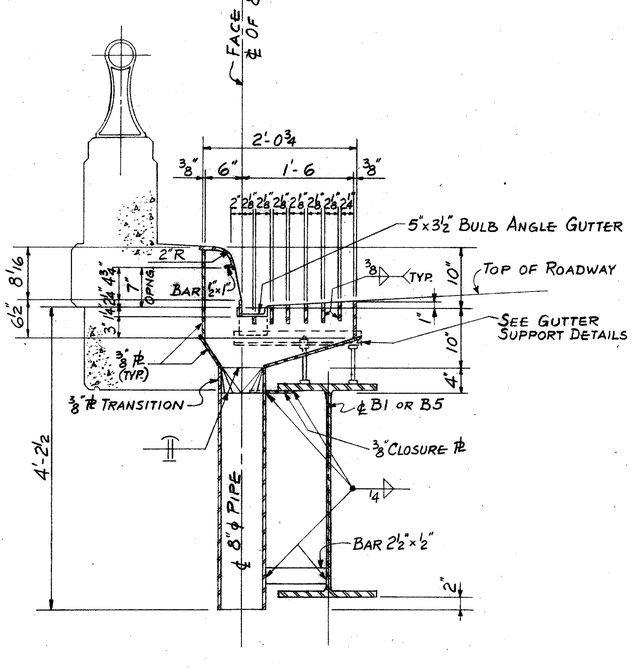
PLAN



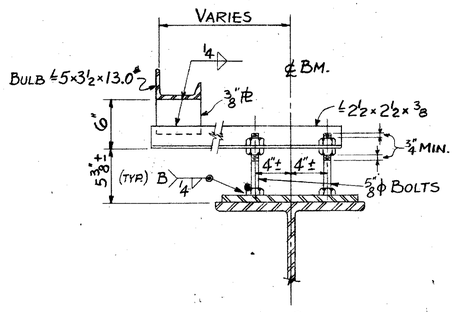
SCUPPER DETAIL
AT E-S STA. 8+07.50
℄ W-N STA. 6+78.60



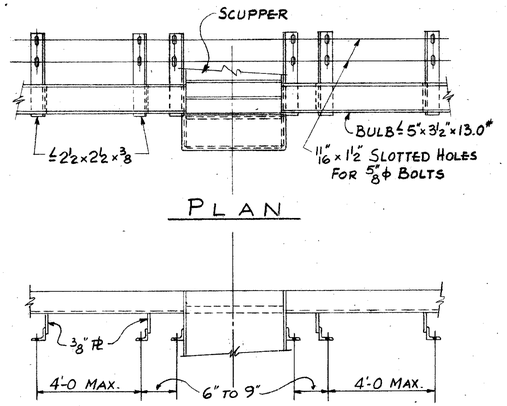
PLAN



SCUPPER DETAIL
AT E-S STA. 8+20
℄ W-N STA. 6+90



GUTTER SUPPORT
(FURNISHED WITH STRUCT. STEEL.)



PLAN

GUTTER SUPPORTS ARE NOT SUFFICIENT TO SUPPORT A FINISHING MACHINE.

DETAIL - GUTTER SUPPORT
(FURNISHED WITH STRUCT. ST'L.)

FOR NOTES SEE SH. No. 151.
FOR LOCATION OF SCUPPERS & GENERAL NOTES SEE SH. No. 175 & 176.

CONT. 58019-25 SHEET CONT. No. 1874

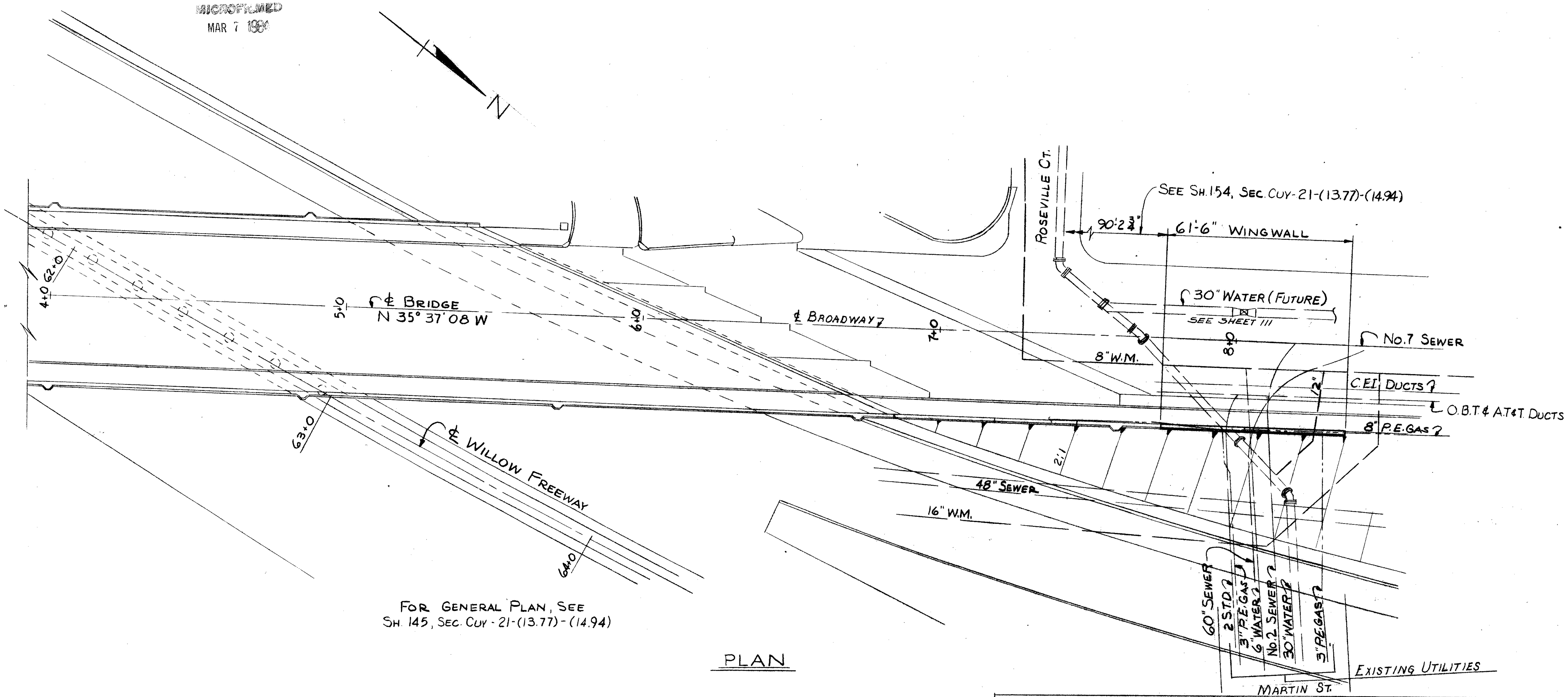
TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

E-S & W-N BRIDGE DRAINAGE

BRIDGE No. CUY-21-RAMP E-S & RAMP W-N
RAMPS E-S & W-N UNDER WILLOW FREEWAY
WILLOW-CLARK INTERCHANGE
CUYAHOGA COUNTY

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
D.F.	D.F.	S.G.F.	D.W.M		5-20-63	

CUYAHOGA COUNTY
CUY– 21-14.12



PLAN

NOTES

PILES:
PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 40 TONS EACH. THE ESTIMATED LENGTH PER PILE IS 60 FT.

SURFACE FINISH OF CONCRETE:
THE REQUIREMENTS OF SEC. S-1.22, RUBBED SURFACE FINISH, SHALL APPLY TO THE EXPOSED CONCRETE SURFACES.

UTILITY REQUIREMENTS:
THE CONTRACTOR SHALL NOTIFY, AT LEAST 48 HOURS BEFORE BREAKING GROUND, ALL SERVICE CORPORATIONS HAVING WIRE, POLES, PIPE, CONDUITS, MANHOLES, OR OTHER STRUCTURES THAT MAY BE AFFECTED BY THIS OPERATION, INCLUDING STRUCTURES WHICH ARE AFFECTED AND NOT SHOWN ON THESE PLANS. ANY AND ALL WORK REQUIRED FOR PUBLIC AND PRIVATE UTILITIES WILL BE DONE BY AND AT THE OWNERS EXPENSE UNLESS OTHERWISE NOTED ON THESE PLANS.

POROUS BACKFILL:
POROUS BACKFILL SHALL BE AT LEAST TWO FEET THICK FOR THE FULL LENGTH OF THE WING-WALL.

CONCRETE:
RETAINING WALL CONCRETE SHALL BE CLASS "E" AND PARAPET CONCRETE SHALL BE CLASS "C".

PARAPET:
PARAPET CONCRETE AND BARS ENTIRELY IN PARAPET SHALL BE INCLUDED WITH RAILING FOR PAYMENT.

EXCAVATION:
EXCAVATION QUANTITY CONSISTS OF MATERIAL BETWEEN THE BOTTOM OF FOOTING AND ROADWAY EXCAVATION.

TABLE OF ESTIMATED QUANTITIES

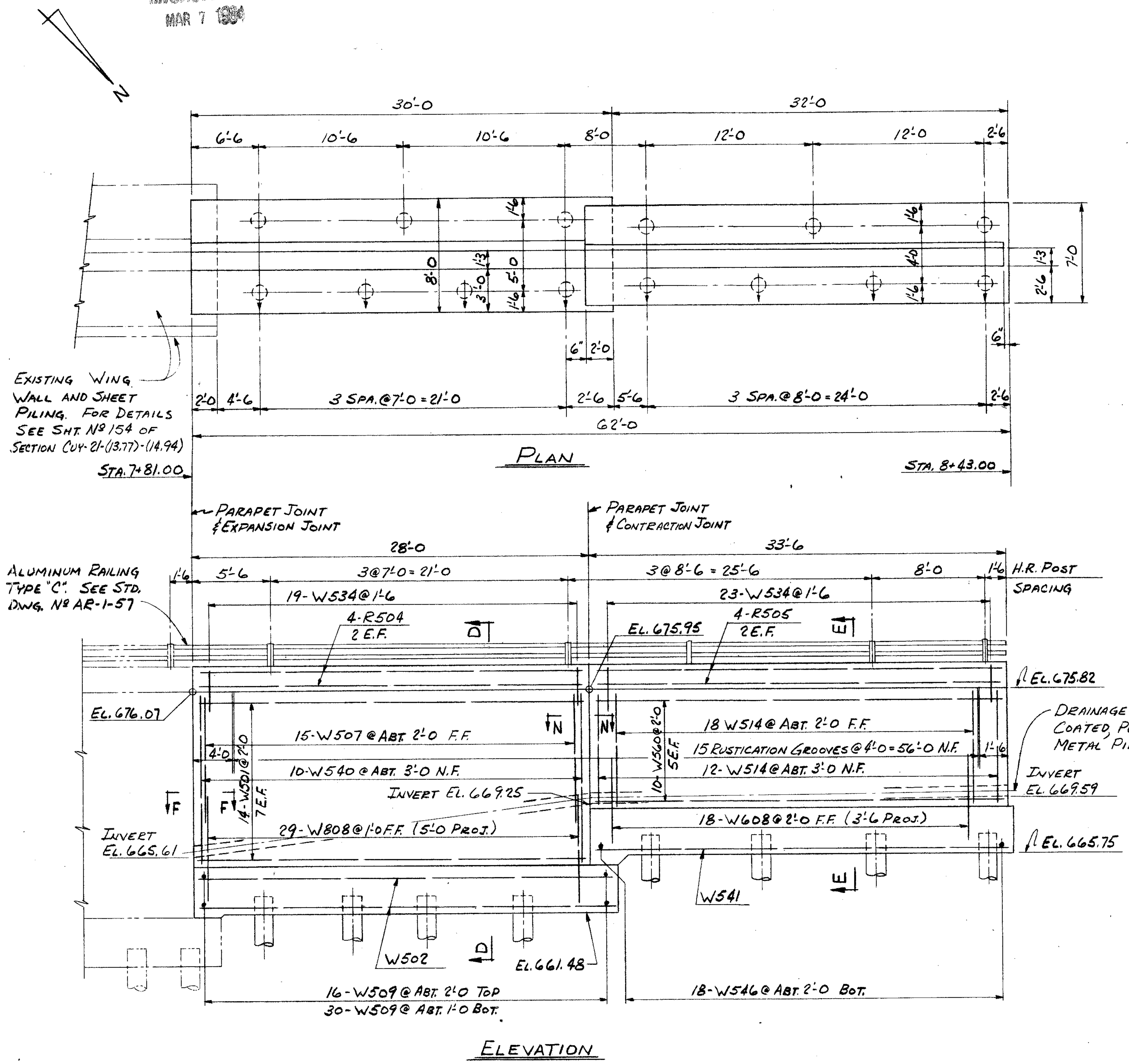
ITEM	TOTAL	UNIT	DESCRIPTION
E-2	203	CU.YDS	UNCLASSIFIED EXCAVATION
E-2	Lump	SUM	COFFERDAMS, CRIBS AND SHEETING.
S-1	50	CU.YDS	CLASS "E" CONCRETE, FOOTINGS
S-1	34	CU YDS	CLASS "E" CONCRETE, ABOVE FOOTINGS (Walls)
S-3	20	LIN.FT.	WATERPROOFING, PREMOLDED SEALING STRIP
S-4	3044	LBS.	REINFORCING STEEL
S-9	29	SQ.FT.	1" PREFORMED EXPANSION JOINT FILLER
S-14	61.5	LIN.FT.	RAILING (ALUMINUM RAIL TYPE "C", SUPPORTS & CONCRETE PARAPET)
S-18	840	LIN.FT.	12" CAST-IN-PLACE REINFORCED CONCRETE PILES
S-29	20	CU.YDS	POROUS BACKFILL
S-29	62	LIN.FT.	10" DIA. PERFORATED BITUMINOUS COATED CORR. METAL PIPE (INCLUDES SPECIALS)
S-16	Lump	Sum	First Test Pile

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

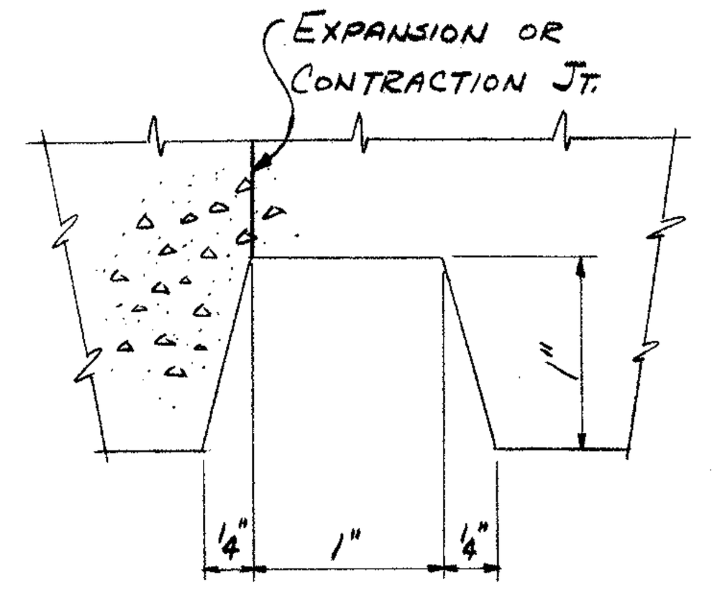
EXTENSION OF NORTH WINGWALL
WEST ABUTMENT - GENERAL PLAN

BRIDGE NO. CUY. - 21-1404
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY U.S.R. 21

SCALE				DATE		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	OAM		R.D.H.		5-20-63	



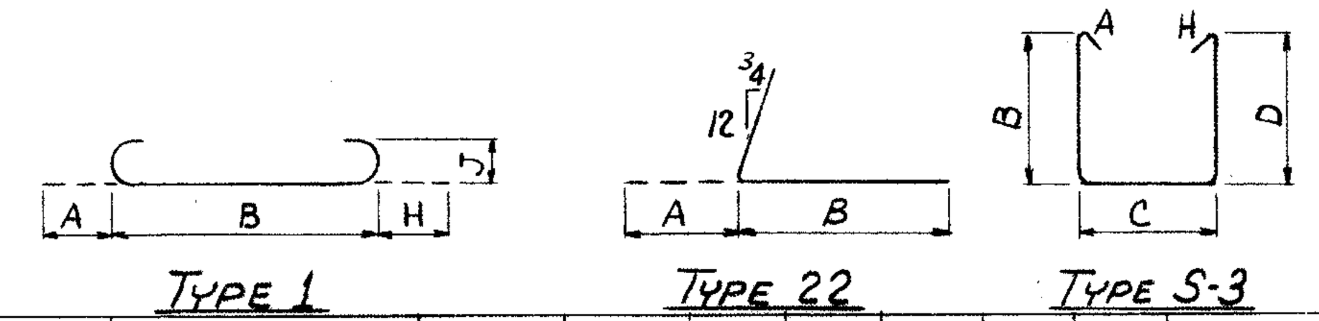
ELEVATION



RUSTICATION JOINT DETAIL

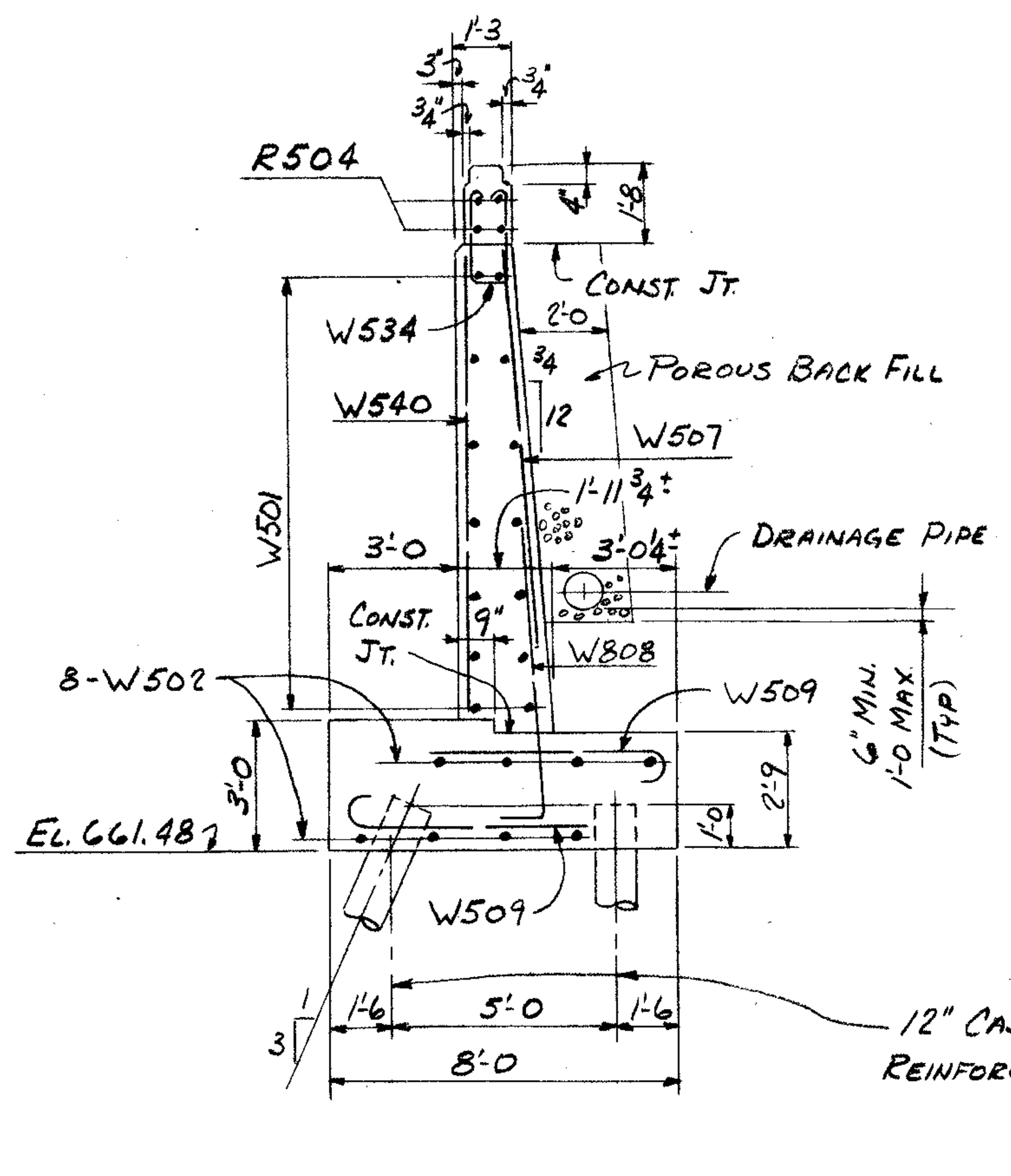
REINFORCING BAR SCHEDULE

NOTE: "J" - USE STANDARD AS PER OHIO.

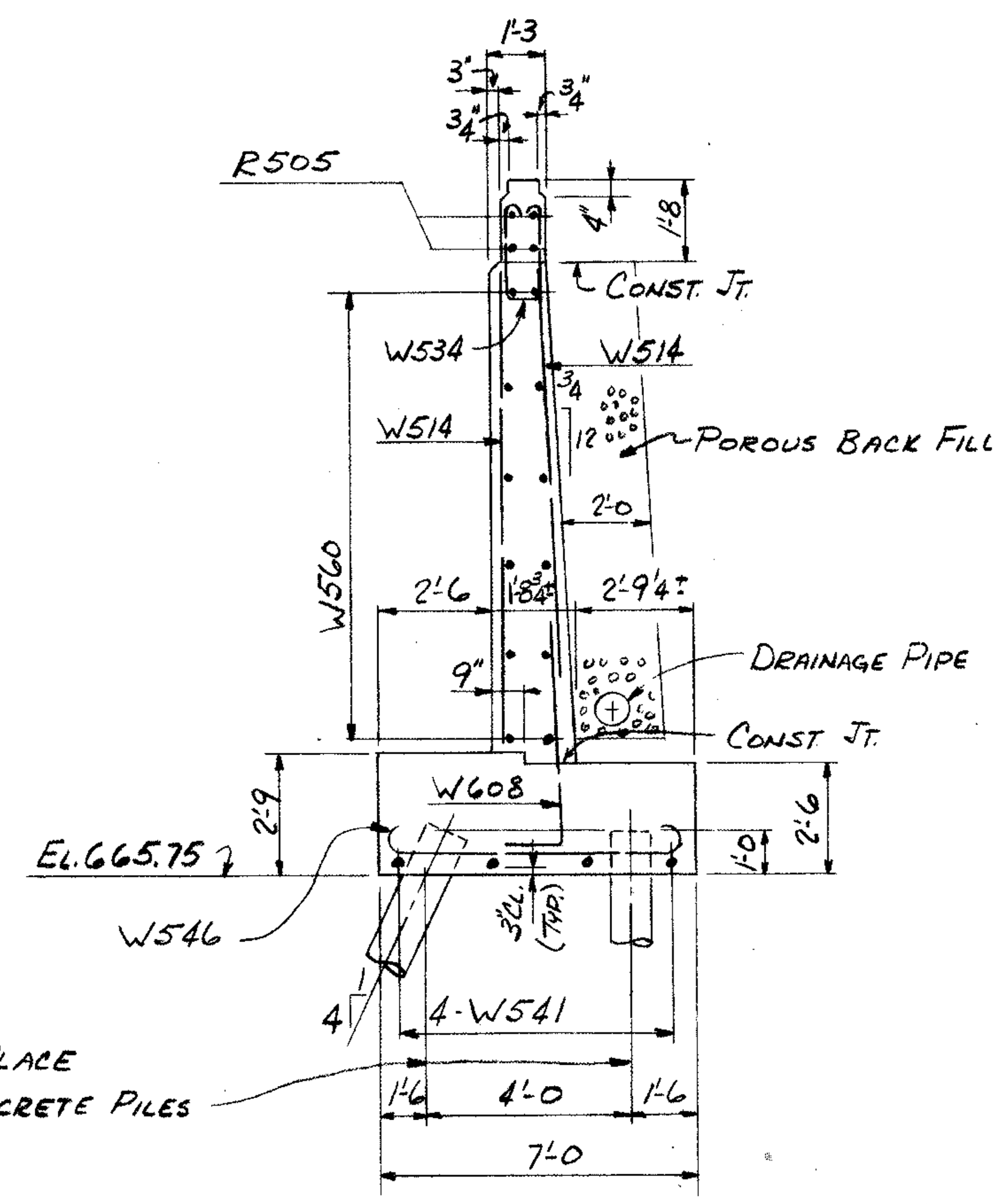


MARK	Nº REQ'D	LENGTH	TYPE	A	B	C	D	H	WEIGHT
W501	14	27'-6	STR.						402#
W502	8	29'-6	STR.						246
W507	15	9'-0	STR.						141
W509	46	5'-7	1	7	5'-0				268
W514	30	7'-0	STR.						219
W534	42	4'-11	S-3	5	1'-10	8	1'-10	5	216
W540	10	11'-0	STR.						115
W541	4	33'-6	STR.						140
W546	18	7'-9	1	7	6'-7			7	145
W560	10	33'-0	STR.						344
W608	18	7'-0	22	1'-3	5'-9				189
W808	29	8'-0	22	1'-3	6'-9				619
							TOTAL		3044#
R504	4	27'-6	STR.						*
R505	4	33'-0	STR.						*

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT INDICATES THE BAR SIZE. FOR EXAMPLE; W608 IS A NUMBER 6 SIZE BAR.
* INCLUDED WITH RAILING FOR PAYMENT.



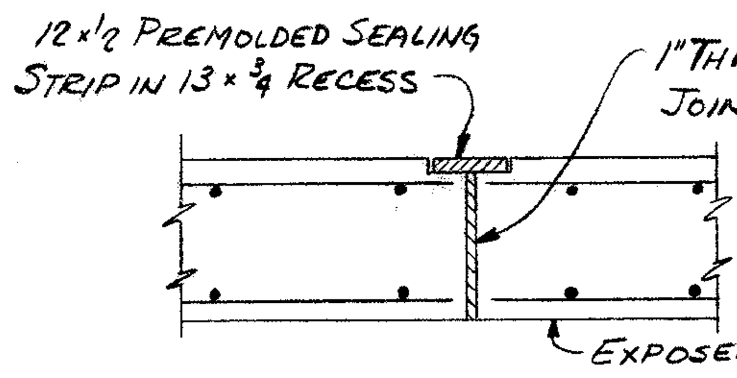
SECTION D-D



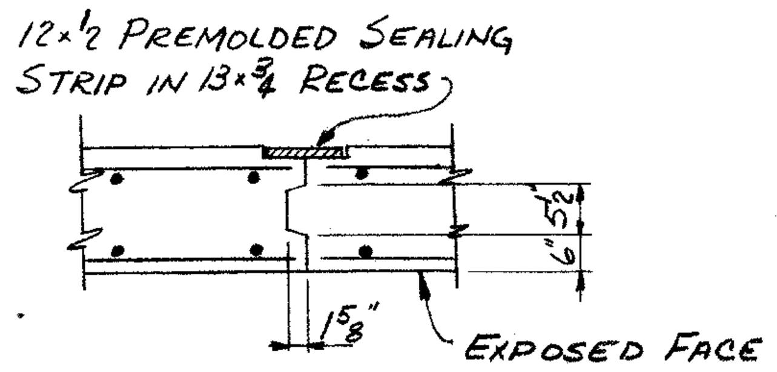
SECTION E-E

N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE

WORK THIS SHT. WITH SHT. Nº 190A



SECTION F-F



SECTION N-N

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

EXTENSION OF NORTH WINGWALL
WEST ABUTMENT – DETAILS
BRIDGE Nº CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY U.S.R. 21

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	R.D.H.		OAM		5-20-63	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

191
198

1
8

CUYAHOGA COUNTY
CUY— 21—14.12

PART I CUY-21-14.55
PART II . . . . CUY-21-(13.77)-(14.94)
PART III CUY-21-14.12
PART IV CUY-254-18.88
PART V CUY-254-18.56

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

SCHEMATIC PLAN
SHOWING
ASSEMBLY OF R/W DRAWINGS

SCALE: 1" = 200' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	J.S.P.		J.S.P.			

JUL 3 1963

CONT. No. 38019 SHEET No. 6266

EE-5

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
CUY-21-14.12

CITY OF CLEVELAND
CUYAHOGA COUNTY

CUY-77-14.12

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	I-77-5( )161	

191A 198

CUYAHOGA COUNTY
CUY-21-14.12
PART-3

Plans prepared by:
TRYGVE HOFF & ASSOCIATES ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

_____ PRESIDENT _____ CHIEF ENGINEER
_____ _____ PROJECT ENGINEER

CONVENTIONAL SIGNS

CENTERLINE
FENCE
GUARD RAIL (EXISTING)
GUARD RAIL (PROPOSED)
RAILROAD
UTILITY POLES
TREES & STUMPS (EXISTING)
PROPERTY LINE — PL
PROPERTY LINE-SAME OWNER CONTIGUOUS PARCELS OF LAND — 7
EXISTING RIGHT OF WAY — EXIST. R/W
LIMITED ACCESS RIGHT OF WAY ONLY — LA
RIGHT OF WAY ONLY — R/W
SUBDIVISION LINE
ORIGINAL LOT LINE

INDEX TO SHEETS

LINE DATA

BEGIN PROJECT STA. 64 + 50.00 TO
END PROJECT STA. 87 + 04.50 . . . . . 2,254.50 L.F.
NET LENGTH OF PROJECT . . . . . 2,254.50 L.F. = 0.427 MILES

ADD FOR APPROACH WORK
WILLOW STA. 51 + 40.00 TO STA. 64 + 50.00 = 1,310.00 L.F.
WILLOW STA. 87 + 04.50 TO STA. 129 + 90.00 = 4,285.50 L.F.
ADD FOR CLARK FREEWAY
STA. 1028 + 14.00 TO STA. 1042 + 15.00 = 1,401.00 L.F.
NET LENGTH OF WORK . . . . . = 9,251.00 L.F. = 1.752 MILES

LOCATION MAP

SCALE
1/2 0 1 MILE

Portion to be improved
Federal Roads
State Roads
Other Roads & Streets

SCALE

Plan	1" = 50'
Profile: Horizontal	1" = 50' Unless
Profile: Vertical	1" = 10' Noted
Cross Sections	1" = 10'
Others	As Noted

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 Construction and Material Specifications shall govern this improvement.

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

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

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

Approved _____
Date _____ Director of Public Service, City of Cleveland

Approved _____
Date _____ Division Deputy Director

Approved _____
Date _____ Deputy Director of Planning & Programming

Approved _____
Date _____ Deputy Director of Right of Way

Approved _____
Date _____ Engineer of Bridges

Approved _____
Date _____ Engineer of Location & Design

Approved _____
Date _____ Deputy Director of Design & Construction

Approved _____
Date _____ First Ass't. Director

Approved _____
Date _____ Director of Highways

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED:

_____ _____
DIVISION ENGINEER DATE

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS									
B-T-70-71	11/15/60	I-1	11/15/60	I-15 No. 1	11/15/60	L-3-A	4/1/50	RB-1-55	2/2/59
B-T-71R	3/2/53	I-8C.B.No.5	2/1/63	I-15 No. 2-A	8/17/60	L.J. No. 1	7/1/55		
F-1	2/1/63	I-81. No. 2-A	2/1/63	I-15 No. 4	12/1/54	RI-1	7/15/58		
F-3	2/1/63	I-8M.H. No. 1	2/1/63	I-15 No. 5A	2/1/63	T-35	1/2/56		
FACI-1	3/8/63	I-8M.H. No. 2	2/1/63	I-21-23	8/1/56	T.J.	9/12/60		
FACI-2	3/8/63	I-12	2/1/63	L-1	4/1/50	AR-1-57	4/2/62		
G-7.07	6/1/56	I-14 G.	1/22/52	L-3	4/1/50	FSB-1-62	1/15/63		
HW-E	2/1/63								

SUPPLEMENTAL SPECIFICATIONS		
CE-101.04	5/22/56	
L-120	1/2/62	
S-307	8/23/60	
S-101	7/12/62	

File No.	CUYAHOGA COUNTY CUY-21-14.12
	Date of Letting _____ 19
	Contract No. _____

SHEET ACCT. No. 6165

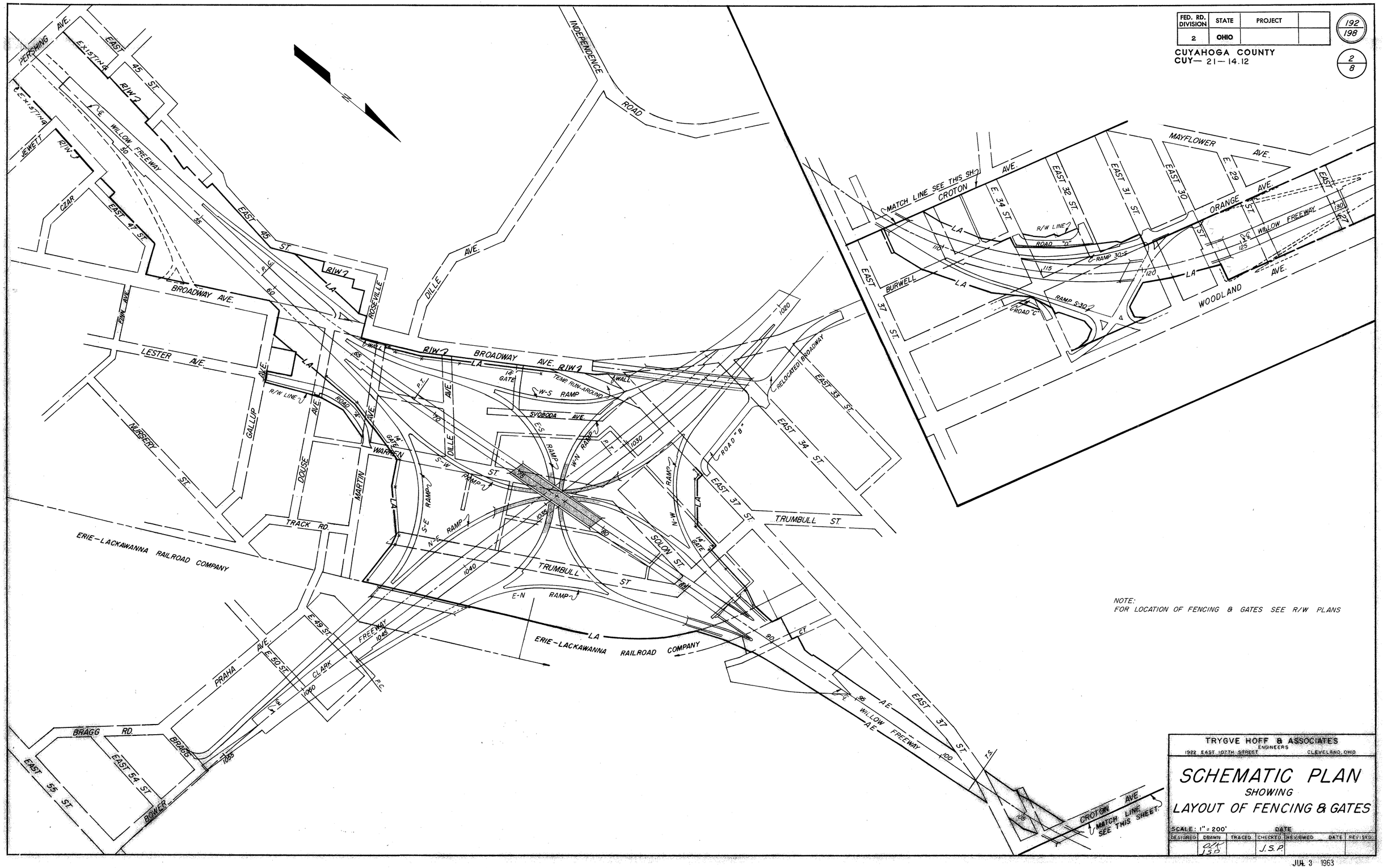
CONT. No. 58019

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY— 21— 14.12

192
198

2
8



NOTE:
FOR LOCATION OF FENCING & GATES SEE R/W PLANS

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

SCHEMATIC PLAN
SHOWING
LAYOUT OF FENCING & GATES

SCALE: 1" = 200'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	O.K. J.S.D.		J.S.P.			

DATE
JUL 3 1963

CONT. No. 58019 SHEET No. 4005

TOTAL NO. OF OWNERS 224
TOTAL NO. OF PARCELS 229

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY— 21 — 14.12 PART 3

193/198

3/8

PARCEL NO.	ACQUIRED AS PARCEL NO.	OWNER	AREA TO BE ACQUIRED SQ.FT.	EXIST BLDG.	SHEET NO.	RESIDUAL AREA LEFT OF ℄ SQ.FT.	RESIDUAL AREA RIGHT OF ℄ SQ.FT.	REMARKS
1030 WL		MIKE ZORICH	7,962	YES	197	NO	NO	
1031 WL		THOMAS & ANGELA POPEKA	7,962	"	"			
1032 WL		HENRY CERNY	7,982	"	"			
1033 WL		ANDREW & MARY & MIKE BENYO	7,941	"	"			
1034 WL		FRIEDA BLOOM	7,903	"	"			
1035 WL		KOSCO & ANNIE FEDORIGA	7,869	"	"			ALSO OWNER OF PARCEL 1206 WL
1036 WL		ALOIS MASIN	7,832	"	"			
1038 WL		OCO WASTE PAPER CO.	53,773	YES	197			
1040 WL		EDWARD VOSMIK et al	7,529	YES	197			
1101 LA		LOTTIE LUBOSKI	4,678	YES	198			
1102 W L	1102 LA	JOE & LILLIAN TEKIEN	3,834	"	"			
1103 WL	1103 LA	MIKE & HELEN FEREK	1,604	"	"			
1104 WL	1104 LA	PATSY YANNACO	1,808	"	"			
1105 WL		JOHN JR. & LOIS E. STUCKO	3,442	—	"			
1106 WL		JOHN JR. & LOIS E. STUCKO	2,535	YES	"			
1107 WL	1107 LA	NICK & C. LaVECCHIA	2,902	YES	"			
1108 WL	1108 LA	MELVIN M. & W. HAMPTON	3,269	YES	"			
1109 WL	1109 LA-WD	LILLIE OLIVO	3,636	YES	"			
1110 WL	1110 LA	FLORENCE DYCHKO	4,004	YES	"			
1111 WL	1111 LA	WALTER & F. F. PRZERACKI	4,218	YES	"			
1112 WL	1112 LA	MARION & T. KACZMARSKI	4,893	YES	"			
1113 WL	1113 LA	CHAS. W. & S. BLUE	4,901	YES	"			
1114 WL	1114 LA	STANLEY & BERTHA KUPCAK	4,087	YES	"			
1115 WL	1115 LA-WD	GEORGE J. SKALA	5,544	YES	"			
1116 WL		CHAS. F. & AGNES MALEK	5,754	YES	"			
1117 WL	1117 LA	JOSEPH & MARY WOLNER	5,453	YES	"			
1118 WL	1118 LA	FRANK KOZEL	2,549	YES	"			
1119 WL	1119 LA	ALBERT & ANN GLONTZ	2,904	YES	"			
1120 LA		CZESLAW PLOSKI	5,453	YES	"			
1121 WL	1121 LA	LEO O. WEBER	5,453	YES	"			
1122 WL	1122 LA	WALTER & JULIA JANDZISZAK	5,453	YES	"			
1123 WL	1123 LA	WOJCICH KABAT	5,453	YES	"			
1124 WL		ANNIE M. TIGHE	5,453	YES	"			
1125 WL	1125 LA	ANNA DURSA	5,453	YES	"			
1126 WL		HARRY & EVA GULA	3,473	YES	"			
1127 WL	1127 LA	HENRY R. & M.M. PLAGA	3,960	YES	"			SEE PARCEL 1007 WL
1128 WL	1128 LA	JOSEPH PONIKVAR	3,473	YES	"			
1129 WL		SUSIE KEKELIS	5,453	YES	"			
1130 WL	1130 LA-WD	KURT PROCHOWNICK	5,453	YES	"			
1131 WL	1131 LA	MARY GALATI	5,453	YES	"			
1132 LA		SYLVIA FAUST	2,521	YES	"			
1133 WL	1133 LA	JOS. J. TAROCSI	2,866	YES	"			
1134 WL		CLARA RABINOVITZ	3,211	YES	"			
1135 WL	1135 LA	JOS. R. & MARY BRONSON	3,556	YES	"			
1136 WL		ANNA V. BUTOR et al	3,902	YES	"			
1137 WL		STELLA PICHA et al	4,247	YES	"			
1138 WL		ANNA FEDORIGA	4,592	YES	"			ALSO OWNER OF PARCEL 1207 WL
1139 WL		JOHN ED. NOWACKI	4,937	YES	"			
1140 WL		STELLA R. & FRANK ANDEL	5,281	YES	"			
1141 WL		JOSEF & MARY PETR	5,453	YES	"			
1142 WL		J. J. LEJCAR & M. & L. LADISLAUS	5,453	YES	"			
1143 WL		MICHAEL HUSS et al	5,453	YES	"			
1144 WL		MARY H. TIHANSKY	5,453	YES	"			
1145 WL		BERTHA ZAK	5,453	YES	"			
1146 WL		MARTIN & HELEN KRAL	5,453	YES	"			
1147 WL		JOHN GADOMSKI	2,277	YES	"			
1148 WL		EMIL D. & MATILDA D'AVILA	3,176	YES	"			
1149 WL		BARBARA KASPERSKI	5,453	YES	"			
1150 WL		THE FREEWAY INV. CO.	5,453	YES	"			
1151 WL		BERTHA ONDRUSKO	5,453	YES	"			
1152 WL		ANDREW J. KRISKA JR.	5,453	YES	"			
1153 WL		ROBY REID	5,453	YES	"			
1154 WL		FLORENCE OBREMSKI	5,453	YES	"			
1201 WL		CELIA T. DARDZINSKI	3,308	YES	198			
1202 WL		JOHN REDD	2,145	YES	"			
1203 WL		NICCOLI ROSALINE et al	3,300	YES	"			
1204 WL		JENNIE MOLNAR	2,153	YES	"			
1205 WL		CHARLOTTE CHERNY	5,453	YES	"			
1206 WL		KOSCO & ANNIE FEDORIGA	5,453	YES	"			SEE PARCEL 1035 WL
1207 WL		ANNA FEDORIGA	5,453	—	"			SEE PARCEL 1138 WL
1208 WL		WM. PONIKVAR	5,453	YES	"			
1209 WL		ANNA KUPCHIK	5,453	YES	"			
1210 WL		MARIE J. KEHDE	5,453	YES	"			
1211 WL		GEO. J. & ROSE J. SHEFFERLE	10,907	YES	"			
1212 WL		PAULINE KALBERG & T. BARNIAK	5,453	YES	"			
1213 WL		ANIELA GASOWSKI	5,453	YES	"			
1214 WL		WM. J. & EVA KRISTANKO	5,453	YES	"			
1215 WL		STEPHEN & L. ZAWADA	5,453	YES	"			
1216 WL		MARY BENDER	3,275	YES	"			
1217 WL		RICHARD J. URBAN	3,275	YES	"			
1218 WL		R. F. SR. & MARY J. SYKORA	2,178	YES	"			
1219 WL		CAROLINE WASKIEWICZ	2,178	YES	"			
1220 WL		JOHN & MARY MIHALIK	4,356	YES	"	NO	NO	

ORNT. No. 58019 SHEET ACCT. No. 6072

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
J.S.P.	L.K.H.		J.S.P.			

JUL 3 1963

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY— 21 — 14.12

194
198

4
8

PARCEL NO.	ACQUIRED AS PARCEL NO.	OWNER	AREA TO BE ACQUIRED SQ. FT.	EXIST BLDG.	SHEET NO.	RESIDUAL AREA LEFT OF ℄ SQ. FT.	RESIDUAL AREA RIGHT OF ℄ SQ. FT.	REMARKS
1221 WL		MARIE GRIES	3,275	YES	198	NO	NO	
1222 WL		ANDREW & ANNA KICHKA	3,275	"	"	"		
1223 WL		JOE & TETYANNA BARNIAK	5,453	"	"	"		
1224 WL		THEODORE BARNIAK	5,453	"	"	"		
1225 WL		BUILDERS STRUCTURAL STEEL CORP.	5,453	"	"	"		SEE PARCEL 1017 WL
1226 WL		JOS. & P. MEDRICKA	5,453	"	"	"		
1227 WL		P. KOLBERG	5,453	"	"	"		
1228 WL		ANDI & ZUZANNA BELICZA	3,964	"	"	1,489		
1229 WL		CEDOMIR VICENTIJEVIC	2,966	"	"	2,487		
1230 WL		JOSEPHINE KAWECKI	1,968	"	"	3,486		
1231 WL		BLDRS. STRUCT. STL. CORP.	1,080	—	"	9,826		
1251 WL	1251 LA	EDWARD BLAZEK	2,739	YES	195	NO		
1252 WL		CHAS. & MARY JIROUSEK	2,710	"	"			
1253 WL		ROGER FOSTER	5,589	"	"			
1254 WL	1254 LA	ALICE CAMPBELL	5,728	"	"			
1255 WL	1255 LA	JOS. & VERA HOBZEK	5,868	"	"			
1256 WL	1256 LA	FRANK & JULIA MATUSZNY	6,006	"	"			
1257 WL	1257 LA	CHARLES & SOPHIC L. CIUNI	6,146	"	"			
1258 WL	1258 LA	DANIEL & MARGARET M. EIBEN	6,286	"	"			
1259 WL	1259 LA	RUDOLPH C. JELINECK	6,426	"	"			
1260 WL		MARY ANDRES	3,925	"	"			
1261 WL		JAN & KATHERINA WALLACH	2,640	"	"			
1262 WL		HARRY PROTIVA	6,708	"	"			
1263 WL		FLORENCE F. SHAPIRO	6,845	"	"			
1264 WL		STEPHEN & MAGDALENA PACANOUSKY	6,984	"	"			
1265 WL		FRANK J. HENDRICKS et al	7,124	"	"			
1266 WL		MILE DUKIC	3,963	"	"			
1267 WL		R. PAULOVIC	3,300	"	"			
1268 WL		FRANK & MILDRED KROFTS, JR.	2,915	"	"			
1269 WL		LULA M. SWANSON	2,474	"	"			
1270 WL		LETTIE & L. C. HARDIN	2,000	"	"			
1271 WL		C. E. BAILEY	2,502	"	"			
1272 WL		FRANK SZALAY, JR.	3,700	"	"			
1273 WL		J. C. DASHNER	3,781	"	"			
1274 WL		RUDOLPH W. GUSLEY	6,169	"	"			
1275 WL		KATHERINE GUSLEY	6,202	"	"			
1276 WL		ALICE TURNER	6,202	"	"			
1301 WL	1301 LA	ETHEL FREDRICY	6,005	YES	195			
1302 WL		MILUM DJOKOVIC	5,864	"	"			
1303 WL	1303 LA	FRANK D. ZUPANCIC	4,817	"	"			
1304 WL	1304 LA	FRANCIS MENDZAK	4,725	"	"			
1305 WL		JAMES MALY, JR.	8,730	"	"			
1306 WL	1306 LA	JOSEPH VAN CHATA & HAROLD HOUSKA	3,934	"	"			
1307 WL	1307 LA	JOHN & E. TOBOLSKI	3,934	"	"			
1308 WL	1308 LA	ALFRED H. KUKLINSKI	3,934	"	"			
1309 WL		TOM & LILLIE OLIVO	3,934	"	"			
1310 WL		RUDOLF & GEO. KASPAR	3,934	"	"			
1311 WL		DIMITRIJE DREGIC	3,934	"	"			
1312 WL		DIMITRIJE DREGIC	3,394	"	"			
1313 WL		JOE & CHRISTIE ZARGEL	3,934	"	"			
1314 WL		HARRY M. & S. PATRICK	3,711	"	"			
1315 WL		MILENKO JANKOVIC	3,091	"	"			
1316 WL		RUDOLPH D. MATUSZNY	2,566	"	"			
1317 WL		FRANK & JULIA MATUSZNY	2,400	"	"			
1318 WL		CLARA RABINOVITZ	5,867	"	"			Also Owner of Parcel 1333 & 1356
1319 WL		B. H. WELTMAN REALTY CO.	3,383	—	"			
1320 WL		EDWARD J. & STELLA WOJNIAK	3,520	YES	"			
1321 WL		CHARLES J. JIROUSEK	2,000	"	"			
1322 WL		DANIEL & I. STEELE	2,000	"	"			
1323 WL		MILUTIN GUBERINIC	2,400	"	"			
1324 WL		H. WLASOW	2,120	"	"			
1325 WL		JOHN & Z. BUTVIN	2,080	"	"			
1326 WL		DANIEL & DOLLIE HALL SALINAS	2,200	"	"			
1327 WL		CARL & MARY ORESKOVIC	2,400	"	"			
1328 WL		VERNON E. & ANNE M. SVATOS	2,400	"	"			
1329 WL		RICHARD & V. E. JOHNSON	2,400	"	"			
1330 WL		JEAN WEISER et al	2,400	—	"			
1331 WL		HELEN LAYMAN	2,400	YES	"			
1332 WL		A. & BESSIE MAZZA	2,400	"	"			
1333 WL		C. RABINOVITZ	2,348	"	"			See Parcel 1318 WL
1334 WL		ALEE & JOSIE B. GLASS	2,453	"	"			
1351 WL		STERLING PLATE GLASS & PT. CO.	9,183	YES	195			
1351A WL		EMMA KELLY	4,260	"	"			
1353 WL		JOSEPH & E. M. HARBIE et al	3,927	"	"			
1354 WL		LOUIS & RUTH JACOBSON	5,776	"	"			
1355 WL		ANTON KISLEY	5,821	"	"			
1356 WL		CLARA RABINOVITZ	11,558	"	"			See Parcel 1318 W
1357 WL		CHESTER LENKIEWICZ	3,294	"	"			
1358 WL		NICK RUKAVINA	3,038	"	"	NO	NO	

PARCEL NO.		OWNER	AREA TO BE ACQUIRED SQ. FT.	EXIST BLDG.	SHEET NO.	RESIDUAL AREA LEFT OF ℄ SQ. FT.	RESIDUAL AREA RIGHT OF ℄ SQ. FT.	REMARKS
1359 WL		MARY BAJC	2,974	YES	195	NO	NO	
1360 WL		EMMA KARLOVSKY	4,181	"	"			
1361 WL		MARY S. & C. AUGUSTINE	3,191	"	196			
1362 WL		STANISLAW PAWLINA	3,131	"	"			
1363 WL		BUDIMIR & HELEN BUZICIC	3,074	"	"			
1364 WL		HARRY C. PFEFFER	3,016	"	"			
1365 WL		MARY ZAK & MATHEW VALACH	2,958	"	"			
1366 WL		JOSEPH & STELLA KNEZEAK	2,901	"	"			
1367 WL		ANNA KARLAK	2,843	"	"			
1368 WL		JAKUP & MARIJE VAVRUS	2,783	"	"			
1369 WL		MICHAEL & MARY VAVRUS	2,725	"	"			
1370 WL		JANKO KRCIJEVIC	2,666	"	"			
1371 WL		E. F. HOBAN - BISHOP	31,578	"	"			Also, Owner of Parcel 1377 WL
1372 WL		JOHN J. KUBU	7,020	"	"			
1373 WL		ROGER REALTY CO.	14,040	"	"			
1374 WL		ELEANOR F. PEKAREK	7,020	"	"			
1375 WL		JOHN C. & ELENORE PEKAREK	3,510	"	"			
1376 WL		DECEASED - LUBESHKOFF (TRUSTEE)	3,510	"	"			
1377 WL		E. F. HOBAN - BISHOP	16,906	"	"			See Parcel 1371 WL.
1378 WL		SOPHIA E. MACHA	5,453	"	"			
1379 WL		PAUL & MARIE KULLA	5,453	"	"			
1380 WL		ROBERTO & CATALINA NIEVES	2,497	"	"			
1380 A WL		ALICE TURNER	2,734	"	"			
1380 B WL		JOHN W. & JUNE E. SMITH	2,230	"	"			
1381 WL		NANCY PANKRATZ	4428	"	"			
1401 WL		BOARD OF EDUCATION - WARREN SCHOOL	65,835	YES	195			
1402 WL		JOE J. & FRANCES MUCHA	2,225	"	"			
1403 WL		CELIA VANICEK	4,174	"	"			
1404 WL		KODA BRONZA	2,357	"	"			
1405 WL		GERALD & FRANCES WELCH	3,077	"	"			
1406 WL		GEO. J. LHOTA & A. K. HRICOVSKY	3,797	"	"			
1408 WL		L. MARVIN & ANNA B. MARVIN	7,920	"	"			
1409 WL		THE ATLAS STEEL & SUPPLY CO.	124,335	"	197			ALSO OWNER OF PARCEL 1808 WL
1409 A WL		" " " "	82,167	"	"			
1409 EL		THE ATLAS STEEL & SUPPLY CO.	59,517	YES	197			
1410 WL		EVELYN VERN	3,960	YES	195			
1411 WL		ELSIE K. MITRISIN	3,960	"	"			
1412 WL		EDWARD J. & H. M. SWATEK	3,751	"	"			
1451 WL		JOS. & E. KICHKA	3,398	YES	195			
1452 WL		HOWARD W. & J. ZIMMER	3,298	"	"			
1453 WL		JOHN & MARY LADUZKA	3,298	"	"			
1454 WL	1454 LA	COLETA & FRED DOUBEK	3,098	"	"			
1455 WL	1455 LA	BIAGIO & BENEDETTA CICERO	3,098	"	"			
1456 WL	1456 LA	CARL J. HLAVKA & ELISE M. HLAVKA	3,098	"	"			
1457 WL	1457 LA	ZIVAN BRKUSANIN & E. SCHALUS	3,098	"	"			
1458 WL	1458 LA	OLDELIA HLAVKA et al	3,519	"	"			
1459 WL	1459 LA	EDWARD & B. TRISKA	3,616	"	"			
1460 WL	1460 LA	BLANCHE C. McCURDY	3,813	"	"			
1461 WL	1461 LA	L. & ANNA B. MARVIN	4,689	"	"			
1462 WL		DRAGMUTIH NICOLIC & ELISAVETTA FREISLER	5,280	"	"			
1463 WL		MAX SABLACK	5,280	—	"			
1464 WL		RAY & BETTY BARTON	2,772	YES	"			
1465 WL		WILLIAM JR. & J. A. TORRES	2,508	"	"			
1466 WL		ANTON STIPEK	5,280	"	"			
1467 WL		ANNE JARVS	5,280	"	"			
1468 WL		ANNA HRABEK	5,280	"	"			
1469 WL		STANISLAW PRESZTO et al	5,280	"	"			SOLD DATE OF TRANSFER RECORDED IN Vol. 8 PG. 301
1470 WL		CAROLINE KARNAFEL	5,211	"	"			
1501 WL	1501 LA	AD. A. & E. K. BLAZEK	3,411	YES	195			
1502 WL		CHAS. J. & B. M. FOWLER	3,291	"	"			
1503 WL		LOTTIE PAVLAK	12,832	"	"			
1504 WL	1504 LA	ELIZABETH DJUKIC	2,748	"	"			
1505 WL	1505 LA	STANLEY & MARY BARTUNEK	2,748	"	"			
1506 WL	1506 LA	BERTHA ROCH	2,748	"	"			
1507 WL		JOSEFA & MARIE HEROUT	2,743	"	"			
1508 WL	1508 LA	EDWARD J. & PAULINE A. OTTO	3,398	"	"			
1509 WL	1509 LA	F. D. & M. H. JUPANCIC	3,298	"	"			
1510 WL	1510 LA	JOHN G. ZOMJRAK	3,298	"	"	NO	NO	

W.F.T. Added to Remarks Pcl. 1469 EL — 3-91
BY — DESCRIPTION — DATE

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
J.S.P.	L.K.H.		J.S.P.			

JUL 3 1963

SHT. NO. 58019 STREET ACCT. No. 6076

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

195
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CUYAHOGA COUNTY
CUY - 21 - 14.12

℄ CURVE DATA, WILLOW FREEWAY
R = 5729.58
Δ = 9° 36' 26"
D = 1° 00' 00"
T = 481.49'
L = 960.72'

BEGIN R/W ACQUISITION CUY-21-14.12

END R/W ACQUISITION CUY-21-(13.77)-(14.94)

BEGIN PROJECT STA. 64+50

HELEN DOUSE'S RE-SUBDIVISION V.13 P.24 SUB-LOT Nos. 46 TO 51 INC.

HELEN DOUSE'S ALLOTMENT V.11 P.39 SUB-LOT Nos 26 TO 45 INC.

BROADWAY AVE. 66' (SEE NOTE ON SH. 196)

GEISSENDORFER SUBDIVISION V.4 P.31 SUB-LOT Nos. 1 TO 16 INC.

ELIZABETH BARKWILL'S SUBDIVISION V.11 P.24 SUB-LOT Nos 1 TO 5 INC.

STAFFORD SUBDIVISION V.4 P.38 SUB-LOT Nos. 6 TO 19

FRED K. KINSMAN RE-SUB. V.3 P.30 SUB-LOT Nos 14 TO 33 INC.

SEE R/W SH. 196

ROSEVILLE CT.

DILLE AVE.

CLAUGA AVE.

SVOBODA ST. 30'

PCC STA. 16+20.64

4°C

7°C

WARREN ST. 60'

EXISTING R/W

CONSTRUCTION LIMITS

℄ Temporary Run Around

E.P.A.

PCC STA. 21+71.02

PCC STA. 20+28.98

DILLE AVE 50'

GIBBS RD. 50'

DOUSE LA.

LA MARTIN AVE

STUPKA CT 20'

WARREN CT.

SCHOOL CT. 16'

MALEK PL. 16'

TRUMBULL ST 60'

WILLOW FREEWAY

℄ S-W RAMP

℄ N-E RAMP

℄ W-N RAMP

℄ E-S RAMP

℄ CLARK FREEWAY

SEE R/W SH. 198

SEE R/W SH. 197

O.L. 282
O.L. 279

℄ ROAD "A" EXISTING R/W

E.D.A. EXISTING

℄ 14 GATE

℄ CONSTRUCTION LIMITS

BEGIN R/W ACQUISITION CUY-21-14.12

END R/W ACQUISITION CUY-21-(13.77)-(14.94)

THOMAS S. & MARY L. DOUSE ALLOT. V.8 P. 28 SUB-LOT Nos 37 TO 60 INC.

GILLSON SUBDIVISION V.4 P.30 SUB-LOT Nos 1 TO 9 & 12 TO 24

M. KREGIE ALLOTMENT Vol. 5 PAGE 15 SUB-LOT Nos. 1 TO 5 INC.

WARREN SCHOOL 3 ST. BR.

SCHOOL PLAY GROUND AREA

EXCESS LAND PARCEL SOLD BY STATE

I-26 CHAIN LINK FENCE

FENCE	1,324 L.FT.
GATE	1

NOTE:
FENCE GATES ARE FOR MAINTENANCE PURPOSES.

R/W LEGEND

ST.	STORY
F. OR FR.	FRAME
BR.	BRICK
BLK.	CONCRETE BLOCK
DR.	DRIVE
I.P.F.	IRON PICKET FENCE
S.W.F.	STEEL WIRE FENCE
S.C.L.F.	STEEL CHAIN LINK FENCE
C.S.	COMPOSITION SHINGLE SIDING
W.S.	WOOD SHINGLE SIDING
AL. S.	ALUMINUM SIDING
A.B.S.	ASPHALT BRICK TYPE SIDING
A.S.	ASPHALT SIDING
C.	CAR
G. OR GAR.	GARAGE } 2 C.G. (2 CAR GARAGE)
SH.	SHED
#	HOUSE NUMBER
IND.	INDUSTRY
U.T.	UNDERGROUND TANK

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

R/W PLAN

PARCEL NUMBERS
SERIES 1251 1451
1301 1501
1401 1551

SCALE: 1" = 50' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JSP	G.O.C.		JSP			

JUL 3 1963

SHEET ACCT. No. 6063
CONT. No. 59019

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY—21—14.12

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℄ CURVE DATA, CLARK FREEWAY
R = 6875.49'
Δ = 27° 30' 00"
D = 0° 50' 00"
T = 1682.42'
L = 3300'

N

O.L. 279
O.L. 278

LA WARREN ST

EAST 37TH STREET

EAST 34TH STREET

EAST 33RD STREET

ST STA 16+07.86

℄ N-W RAMP

℄ S-W RAMP

PT STA. 20+24.23

℄ RELOCATED BROADWAY

℄ W-N RAMP

℄ W-S RAMP

P.C.C. STA 7+96.13

BROADWAY 66' (SEE NOTE)

FREDK KINSMAN RE-SUB.
V. 3, P. 30
SUBLOTS 8 TO 13

PT STA 1030+94.53
S.C. STA 4+87.21

JONAS STAFFORD SUBDIVISION V.3, P.38
SUBLOTS 1 TO 5 & 20 TO 41

SEE R/W SH. 195

O.L. 279
O.L. 282

SVOBODA STREET 30'

GEAUGA STREET 30'

P.C.C. STA 10+55.13

ST. WENCESLAUS CHURCH BRICK & STONE EDIFICE

1 ST. CONC. BLOCK INDUSTRIAL BLDG BRICK FACADE

PARKING AREA GRAVEL SURFACING

CONSTRUCTION LIMITS

PT STA 15+48.15

℄ 14 GATE

THE STANDARD OIL COMPANY

℄ CLARK FREEWAY

BROADWAY - BLANCHE CORPORATION

1ST COND. BLK GAS STATION

SAVRANSKY REALTY COMPANY

ADVERTISING BILLBOARD

CONCRETE PAVED AREA

1 ST. BR. GAS STATION

GRAVEL DRIVEWAY & PARKING AREA

BI-LO STATIONS INC.

TRAILER BODY

℄ W-B RAMP

E. I. DUPONT DENEMOURS COMPANY

NOTE – 66FT. WIDTH DEDICATED 8-21-1822
AS PER COUNTY ENGINEER'S ROAD
RECORD BOOK C-196

ROBERT DAVIES SUB.
V. 3, P. 39
SUB LOTS 77 TO 88

J. JANAUCH ALLOT.
V. 4, P. 6
SUB LOTS 1 TO 8

I-26 CHAIN LINK FENCE

FENCE	111	L.FT.
GATE	1	

NOTE:
FENCE GATES ARE FOR MAINTENANCE PURPOSES

O.L. 278
O.L. 281

O.L. 282
O.L. 281

SEE SHEET 195 FOR R/W LEGEND

CONT. No. 58019 SHEET ACCT. No. 6074

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

R/W PLAN

PARCEL NUMBERS
SERIES 1361

SCALE 1" = 50'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JSP	H.J.S.		JSP			

DATE

JUL 8 1963

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY— 21—14.12

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CONT. No. 58019 SHEET ACCT. No. 6069

R/W PLAN

PARCEL NUMBERS
SERIES 1030 AND
PARCEL 1409

SCALE 1" = 50'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
J.S.P.	H.J.S.		J.S.P.			

DATE

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

I-26 CHAIN LINK FENCE
FENCE 510 L. FT.

SEE SHEET 195 FOR R/W LEGEND

JUL 3 1963

FED. RD. DIVISION 2
STATE OHIO
PROJECT
198
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CUYAHOGA COUNTY
CUY-21-14.12
8
8
O.L. 278
O.L. 279
END R/W ACQUISITION CUY-21-14.12
BEGIN R/W ACQUISITION CUY-21-14.55
CONSTRUCTION LIMITS
C.S. STA. 13+07.86
P.C.C. STA. 10+55.13
SEE R/W SH. 196
SEE R/W SH. 195
SEE R/W SH. 197
SEE R/W SH. 195
℄ W-S RAMP 11
℄ CLARK FREEWAY
S.C. STA. 4+87.21
FRED. K. KINSMAN RE-SUB. V.3 P.30
SUB-LOTS 34 TO 48 INC. 54 TO 72 INC.
103 TO 132 INC.
EAST 37 ST. 60'
EAST 38 ST.
WARREN ST. 60'
SOLON ST. 60'
TRUMBULL ST. 60'
TRUMBULL CT.
MALEK PL. 16'
#2877 CUYAHOGA BOX CO. 1 ST. BR. & BLK.
BLK WALL
87+52.44 153.60'
87+58.29 152.28'
88+48.47 101.06'
EXISTING AE
E.P.A.
C.P.A.
℄ E-S RAMP 12
℄ W-N RAMP
℄ N-W RAMP
℄ WILLOW FREEWAY
℄ N-E RAMP 13
P.C.C. STA. 13+41
℄ E-N RAMP 21
S.C. STA. 6+20.09
STA. 86+91.14 118.86'
END PROJECT ℄ STA. 87+04.50
FRED K. KINSMAN RE-SUB V.3 P.30
SUB-LOTS
88 TO 102 INC.-150 AND 184
END R/W ACQUISITION CUY-21-14.12
BEGIN R/W ACQUISITION CUY-21-14.55

I-26 CHAIN LINK FENCE		
SH. NO.	FENCE L.FT.	GATE NO.
195	1,324	1
196	111	1
197	510	—
198	804	1
TOTAL	2,749	3

TOTAL LINEAL FEET I-26 CHAIN LINK FENCE & TOTAL NO. I-26 CHAIN LINK FENCE GATES CARRIED TO GENERAL SUMMARY SH. 11

LEGEND:

I-26 CHAIN LINK FENCE

C.P.A. DENOTES CORNER POST ASSEMBLY
E.P.A. " END " "
I.A.P.A. " INTERMEDIATE ANCHOR " "

NOTE:

FENCE GATES ARE FOR MAINTENANCE PURPOSES

I-26 CHAIN LINK FENCE

FENCE	804	L. FT.
GATE	1	

SEE SHEET 195 FOR R/W LEGEND

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

R/W PLAN

PARCEL NUMBERS
SERIES 1001
1101
1201

SCALE: 1"=50'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
404	G.O.C.		J.S.P.			

JUL 3 1963

CONT. No. 58019 SUBJECT ACCT. No. 6064