CUY-90-14.90

PID 77332/85531

APPENDIX EX-16

CUY-077-1377 PID 0.069
(Reference Document)

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

Innerbelt Bridge
Construction Contract Group 1 (CCG1)

Revision Date: 1963

-0

O-10

MICROFILMED MAY 23 1984

CONVENTIONAL SIGNS

CENTER LINE
FENCE
GUARD RAIL (EXISTING)
GUARD RAIL (PROPOSED)
RAILROAD
UTILITY POLES
TREES & STUMPS (EXISTING)
PROPERTY LINE — P/L
PROPERTY LINE-SAME OWNER CONTIGUOUS PARCELS OF LAND — Z
EXISTING RIGHT OF WAY
LIMITED ACCESS ONLY — LA
RIGHT OF WAY ONLY — R/W
EASEMENT LINES FOR CHANNEL CHANGES, SLOPE & SEWER, & WORKING AGREEMENTS — SL
SUBDIVISION LINE
ORIGINAL LOT LINE — O.L.

INDEX OF SHEETS

LINE DATA

BEGIN PROJECT STA. 199 + 83.68 (BACK) = STA.	45 + 76.05 (AHEAD)	
SUSPEND PROJECT STA. 64+50.00	= 1,873.95	LIN. FT.
RESUME PROJECT STA. 107+77.62		
END PROJECT STA. 130+41.88	= 2,264.26	LIN. FT.
NET LENGTH OF PROJECT	4,138.21	LIN. FT. OR 0.783 MILES
ADD FOR APPROACH WORK		
WILLOW STA. 198 + 03 TO STA. 199 + 83.68	180.68	LIN. FT.
WILLOW STA. 64 + 50 TO STA. 68 + 10	360.00	LIN. FT.
WILLOW STA. 107 + 25 TO STA. 107 + 77.62 (SKEW)	52.62	LIN. FT.
WILLOW STA. 130 + 41.88 TO STA. 130 + 48.5	6.62	LIN. FT.
ADD FOR BROADWAY AVE., STA. 1 + 50 TO STA. 10 + 00	850.00	LIN. FT.
ADD FOR ROAD "A", STA. 0 + 12 TO STA. 6 + 78.96	666.96	LIN. FT.
ADD FOR RELOCATED ORANGE AVE., STA. 2 + 50 TO STA. 12 + 04.4	954.40	LIN. FT.
ADD FOR ROAD "C", STA. 1 + 00 TO STA. 3 + 96.96	296.96	LIN. FT.
ADD FOR ROAD "D", E.34 STA. 7 + 21.21 TO E.32 STA. 8 + 00.39	432.62	LIN. FT.
ADD FOR DILLE RD. SEWER, DILLE RD. STA. 0 - 88 TO TURN BASIN AT CUYAHOGA RIVER, STA. 9 + 95	2,608.00	LIN. FT.
ADD FOR SOUTHERLY INTERCEPTOR, STA. 0 - 15 TO STA. 15 + 85 (SKEW)	1,600.00	LIN. FT.
ADD FOR GALLUP SEWER, STA. 9 + 85 TO STA. 20 + 75	1,090.00	LIN. FT.
ADD FOR BURWELL SEWER, STA. 2 + 52 TO STA. 5 + 43	291.00	LIN. FT.
ADD FOR LIGHTING AND ALARM SYSTEMS WORK KINGSBURY RUN BRIDGE ~ STA. 81+04.50 TO STA.107+77.62	2,073.12	LIN. FT
NET LENGTH OF WORK	15,601.19	LIN. FT. OR 2.954 MILES

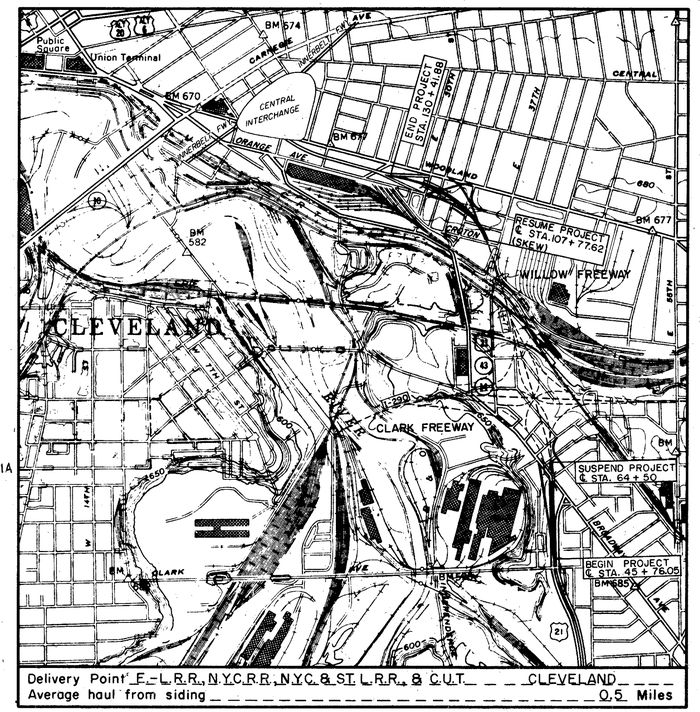
Sheets 194 and 195 revised 7-8-63.
Sheets 174, 175, 176 and 177 are superseded by sheets 174A, 175A, 176A and 177A respectively. 12-2-63

00156RP2

File No.	CUYAHOGA COUNTY	CUY 21—(13.77) (14.94)
	Date of Letting	196
	Contract No.	

CONT. No. 58019 SHEET No. 6001

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
CUY-21-(13.77) (14.94)
CITY OF CLEVELAND
CUYAHOGA COUNTY



Delivery Point F-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

Sheet No. 7? Revised 8-14-63 C.E.H.

LOCATION MAP

SCALE
1/2 0 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

Sheets 143, 203, 204 & 129 Revised 8-23-63 C.E.H.

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS

B-T-70-71	11/15/60	I-8C.B.No.3	2/1/63	I-15 No.1	11/15/60	T-35	1/2/56	AR-1-57	4/2/62
B-T-71R	3/2/53	I-8C.B.No.3-A	2/1/63	I-15 No.2-A	8/17/60	T.J.	9/12/60	FSB-1-62	1/15/63
DR-1	1/3/55	I-8C.B.No.5	2/1/63			L-1	4/1/50	RB-1-55	2/2/59
FACI-1	3/8/63	I-8C.B. No.6	2/1/63	I-21-23	8/1/56	I-12	2/1/63		
FACI-2	3/8/63	I-8 I.No.2-A	2/1/63	L-3	4/1/50	F-1	2/1/63		
G-7.07	6/1/56	I-8 M.H.No.1	2/1/63	L-3-A	4/1/50	F-3	2/1/63		
I-1	11/15/60	I-8 M.H.No.2	2/1/63	L.J.No.1	7/1/55	I-14-G	1/22/62		
I-8C.B.2-2-A & B	2/1/63	I-8 M.H.No.3-A	1/26/59	RI-1	7/15/58				

SUPPLEMENTAL SPECIFICATIONS

CE-101.04	5/22/56	
L-120	1/2/62	
S-207.10	4/25/61	
S-307	8/23/60	
S-101	7/12/62	

I-77-5(5)161
CUY-77-(13.77) (14.94)

MICROFILMED JUN 22 1967

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

1/204

CUYAHOGA COUNTY
CUY - 21 - (13.77) (14.94)

STATE OF OHIO TRYGVE W. HOFF 7785 REGISTERED PROFESSIONAL ENGINEER

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

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

LIMITED ACCESS

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

1963 SPECIFICATIONS

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

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

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

Approved Louis L. Kraslers
Date 3/1/63 Director of Public Service, City of Cleveland

Approved Charles M. Yurick
Date 2-25-63 Division Deputy Director

Approved J. W. Wilson
Date 5-3-63 Deputy Director of Planning & Programming

Approved T. H. Bovard
Date 5-2-63 Deputy Director of Right of Way

Approved D. K. Overman
Date 5-1-63 Engineer of Bridges

Approved R. M. Ristau
Date 5-2-63 Engineer of Location & Design

Approved R. E. Shultz
Date 5-2-63 Deputy Director of Design & Construction

Approved
Date First Ass't. Director

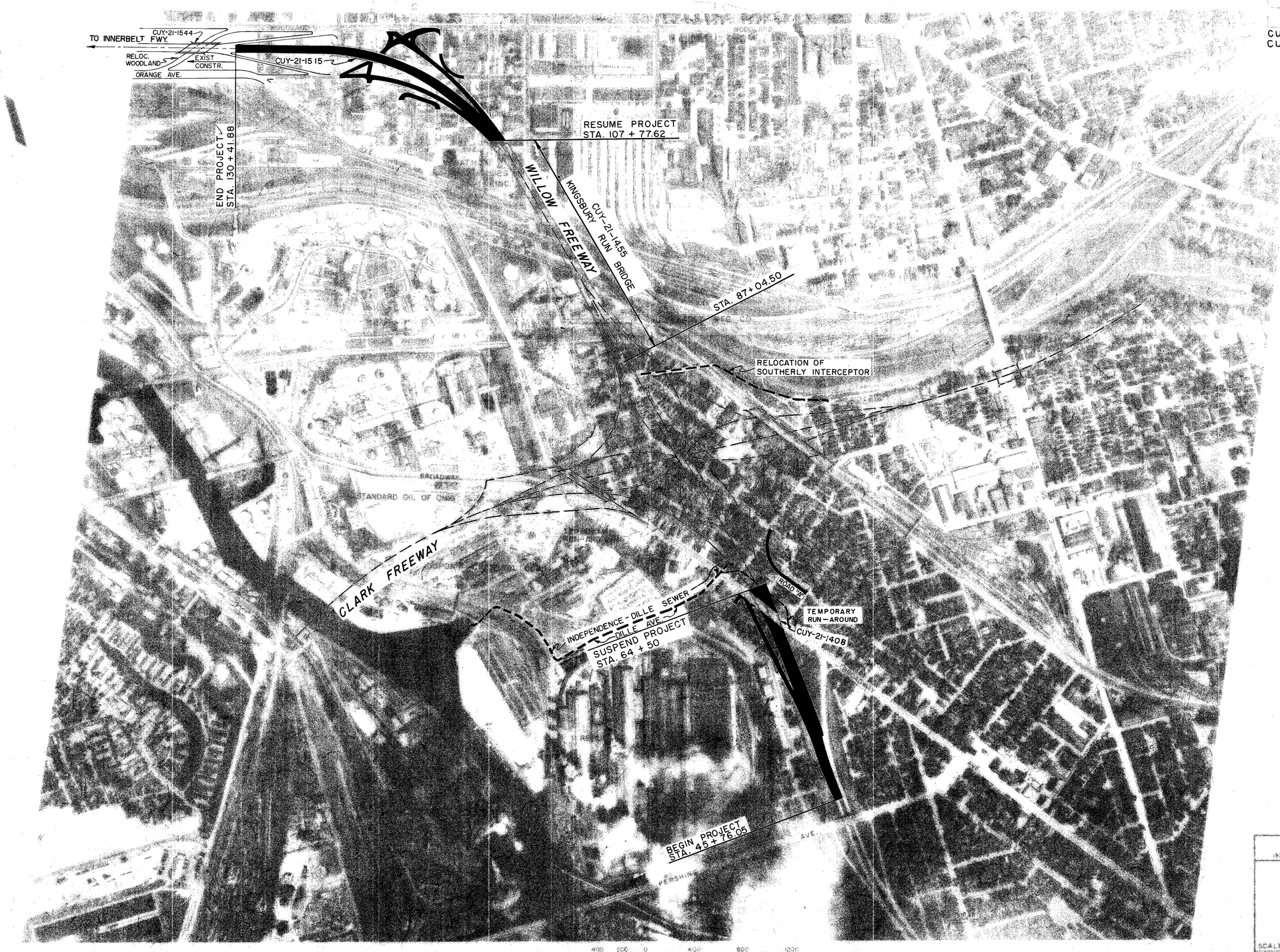
Approved P. G. Masheter
Date 5/13/63 Director of Highways

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

APPROVED:

DIVISION ENGINEER DATE

CUYAHOGA COUNTY
CUY - 21 - (13.77) (14.94)



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

SCHEMATIC PLAN

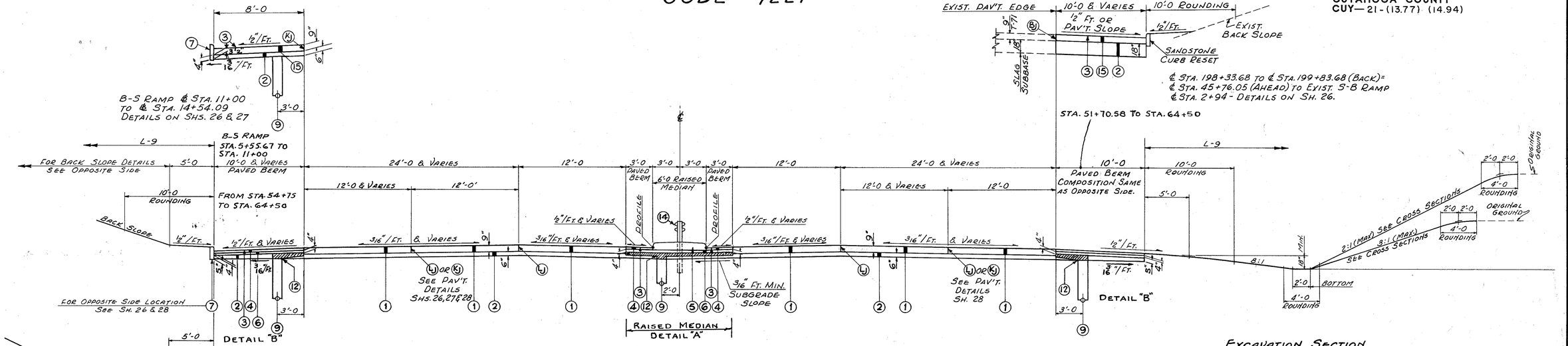
SCALE: AS NOTED			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
CDR	GH		CDR			

TYPICAL SECTIONS TYPE T-71
CODE 7221

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

3/204

CUYAHOGA COUNTY
CUY— 21 - (13.77) (14.94)



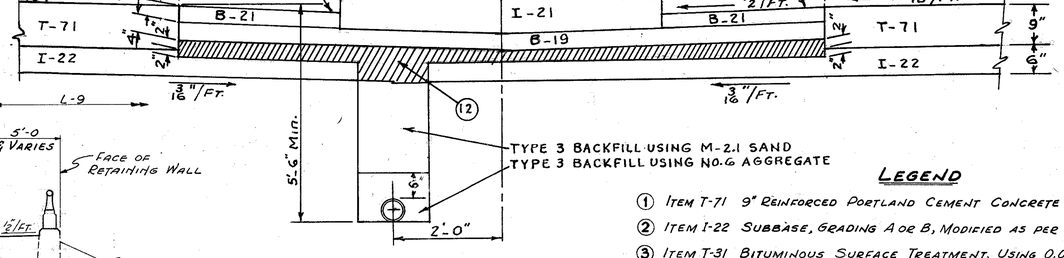
WILLOW FREEWAY

BEGIN PROJECT STA. 45+76.05 TO SUSPEND PROJECT STA. 64+50
1873.95 L.F.

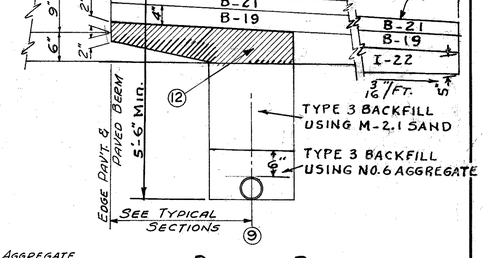
NOTE:— FOR VARIATIONS IN DIMENSIONS & SLOPES INDICATED, ALSO QUANTITIES, SEE SHS. 26, 27 & 28

EXCAVATION SECTION
WITH CURB STA. 45+76.05 TO STA. 52+50 (LEFT SIDE ONLY)

EXCAVATION SECTION
WITHOUT CURB

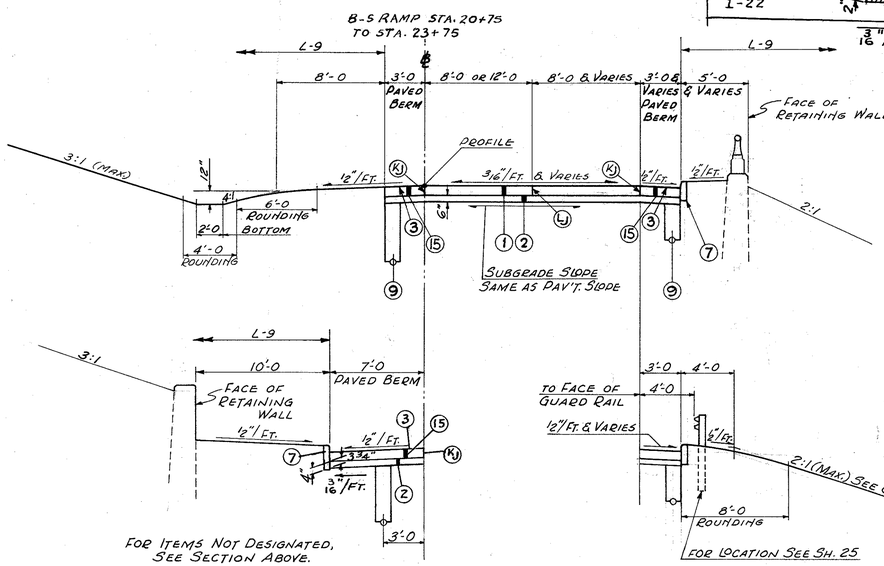


RAISED MEDIAN
DETAIL "A"
NOT TO SCALE



DETAIL B
NOT TO SCALE

B-S RAMP STA. 20+75 TO STA. 23+75



FOR ITEMS NOT DESIGNATED, SEE SECTION ABOVE.
℄ STA. 15+04.09 TO STA. 19+37

FOR ITEMS NOT DESIGNATED, SEE SECTION ABOVE.
℄ STA. 16+54.09 TO STA. 22+63.47

B-S RAMP

NOTE:— FOR VARIATIONS IN DIMENSIONS & SLOPES INDICATED, ALSO QUANTITIES, SEE SHS. 27 & 31

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.) (USE 0.10 GAL. BITUMINOUS MATERIAL WHERE ADDLIED ON T-70)
(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 I-21 PORTLAND CEMENT CONCRETE MEDIAN PAVEMENT. (STD. TYPE 2). SEE JOINT DETAILS, SH. 6
(6) ITEM B-19 AGGREGATE BASE COURSE
(7) ITEM I-11 6" × 18" SANDSTONE CURB.
(8) ITEM I-21 PORTLAND CEMENT CONCRETE MEDIAN PAVEMENT (STD. TYPE 1). SEE JOINT DETAILS, SH. 6
(9) ITEM I-1 6" PIPE CLASS I-3 (FOR LOCATION SEE P/P & DRAINAGE PLAN SHEETS.)
(11) ITEM I-7 REINFORCED CONCRETE APPROACH SLAB.
(12) ITEM SPECIAL + THE SUBBASE SHALL BE REMOVED FOR WIDTHS AND DEPTHS AS SHOWN ON DETAIL "A" AND DETAIL "B" AND REPLACED WITH THE No.6 AGGREGATE MATERIAL IMMEDIATELY PRIOR TO PLACING THE ITEM B-19, AGGREGATE BASE COURSE. THE PAYMENT SHALL BE MADE ON THE BASIS OF THE UNIT PRICE PER CUBIC YARD OF No.6 AGGREGATE MATERIAL IN PLACE WHICH INCLUDES THE FULL COST OF REMOVING THE SUBBASE MATERIAL AND THE HAULING, PLACING AND COMPACTING THE No.6 AGGREGATE MATERIAL. THE CUBIC YARDS OF No.6 AGGREGATE MATERIAL SHALL BE CALCULATED FROM WEIGHT SLIPS USING THE CONVERSION FACTORS GIVEN IN ITEM T-31.
(14) ITEM I-15 GUARD RAIL; STEEL BEAM BARRIER TYPE (DEEP), USING SQUARE SAWED, PRESSURE TREATED WOOD POSTS.
(15) ITEM T-70 9" PORTLAND CEMENT CONCRETE PAVEMENT

JOINT SYMBOLS

(L) STANDARD LONGITUDINAL JOINT.
(K) STANDARD KEY JOINT, WITHOUT TIE BARS.
(B) PLAIN BUTT JOINT.

WORK SHS. 3, 4 & 5 TOGETHER

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

WILLOW FREEWAY
B-S RAMP
TYPICAL SECTION

SCALE 3/16" = 1'-0 DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED
	G.O'C.			

CONT. No. 20019 SHEET ACCT. No. 6236

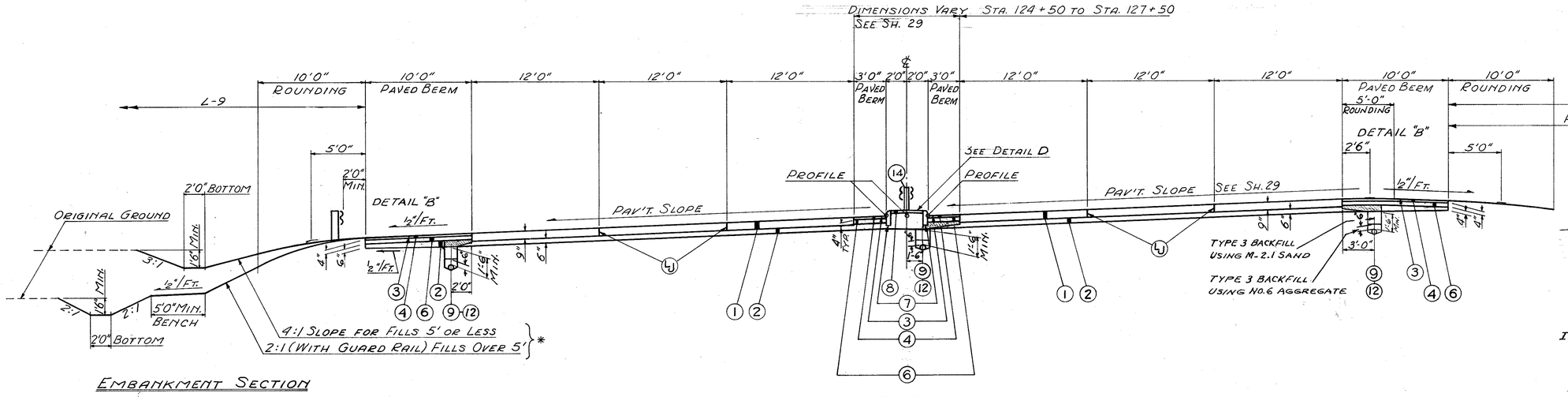
TYPICAL SECTIONS TYPE T-71
CODE 7221

DESIGN SPEED 50 M.P.H.
WITH MAX. SUPERELEVATION = .042'/FT.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

4/204

CUYAHOGA COUNTY
CUY— 21-(13.77) (14.94)



EMBANKMENT SECTION

HALF WIDTH SECTION

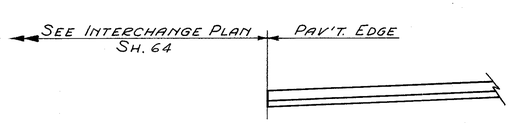
RESUME PROJECT } STA. 107 + 77.62 (SKEW) TO STA. 109 +50.00 — 172.38 LIN. FT.

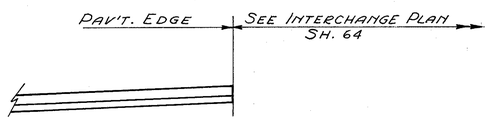
SUPERELEVATED FULL WIDTH SECTION

STA. 115 + 41.00 TO STA. 118+64.71 (SKEW) — 323.71 LIN. FT.
STA. 124 +36.43 (SKEW) TO STA. 127 +50.00 — 313.57 LIN. FT.

HALF WIDTH SECTION

STA. 111 + 13.45 TO STA. 115 + 41.00 — 427.55 LIN. FT.





℄

DETAILS AND DIMENSIONS SAME AS ABOVE, EXCEPT AS NOTED.

HALF WIDTH SECTION

STA. 111 + 13.45 TO STA. 115 +41.00 — 427.55 LIN. FT.

SUPERELEVATED FULL WIDTH SECTION

STA. 109 +50.00 TO STA. 111 + 13.45 — 163.45 LIN. FT.

HALF WIDTH SECTION

STA. 107+77.62 (SKEW) TO STA. 109+50.00 — 172.38 LIN. FT.

NOTE:
* FOR VARIATIONS TO SLOPES, SEE GRADING PLAN & CROSS SECTIONS.
FOR TOP OF PAVEMENT ELEVATIONS, SEE SHEET 29

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.)
⑧ ITEM I-21 PORTLAND CEMENT CONCRETE MEDIAN PAVEMENT (STD. TYPE 1). SEE JOINT DETAILS, SH. 6.
⑥ ITEM B-19 AGGREGATE BASE COURSE
⑦ ITEM I-11 6" x 18" SANDSTONE CURB.
⑨ ITEM I-1 6" PIPE, CLASS I-3 (FOR LOCATION SEE P/P & DRAINAGE PLAN SHEETS.)
⑫ ITEM SPECIAL - THE SUBBASE SHALL BE REMOVED FOR WIDTHS AND DEPTHS AS SHOWN ON MEDIAN TRENCH AND DETAIL "B" (SHEET NO. 3) AND REPLACED WITH NO. 6 AGGREGATE MATERIAL IMMEDIATELY PRIOR TO PLACING ITEM B-19, AGGREGATE BASE COURSE. THE PAYMENT SHALL BE MADE ON THE BASIS OF THE UNIT PRICE PER CUBIC YARD OF NO. 6 AGGREGATE MATERIAL IN PLACE WHICH INCLUDES THE FULL COST OF REMOVING THE SUBBASE MATERIAL AND THE HAULING, PLACING AND COMPACTING THE NO. 6 AGGREGATE MATERIAL. THE CUBIC YARDS OF NO. 6 AGGREGATE MATERIAL SHALL BE CALCULATED FROM WEIGHT SLIPS USING CONVERSION FACTORS GIVEN IN ITEM T-31.
⑭ ITEM I-15 GUARD RAIL; STEEL BEAM BARRIER TYPE (DEEP), USING SQUARE SAWED, PRESSURE TREATED WOOD POSTS.

JOINT SYMBOLS

(LJ) STANDARD LONGITUDINAL JOINT.

WORK SHS. 3, 4 & 5 TOGETHER

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

WILLOW FREEWAY

TYPICAL SECTION

SCALE 3/16" = 1'-0" DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED
GO'C	GO'C		GO'H	

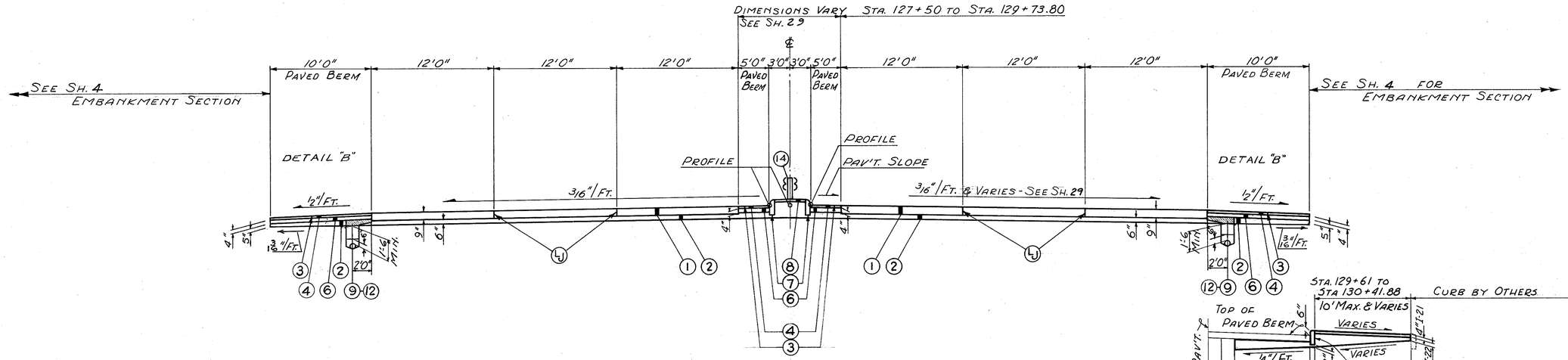
CONT. NO. 5801.9 SHEET ACCT. NO. 6006

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

5
204

CUYAHOGA COUNTY
CUY—21-(13.77) (14.94)

TYPICAL SECTIONS TYPE T-71
CODE 7221



NORMAL SECTION

STA. 127+50.00 TO END PROJECT STA. 130+41.88 291.88 LIN. FT.

FOR DIMENSIONS & DETAILS NOT SHOWN, SEE ABOVE
STA. 129+41.88 TO STA. 130+41.88

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).

(6) ITEM B-19 AGGREGATE BASE COURSE

(7) ITEM I-11 6"x 18" SANDSTONE CURB.

(8) ITEM I-21 PORTLAND CEMENT CONCRETE MEDIAN PAVEMENT (STD. TYPE 1). SEE JOINT DETAILS SH. 6.

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

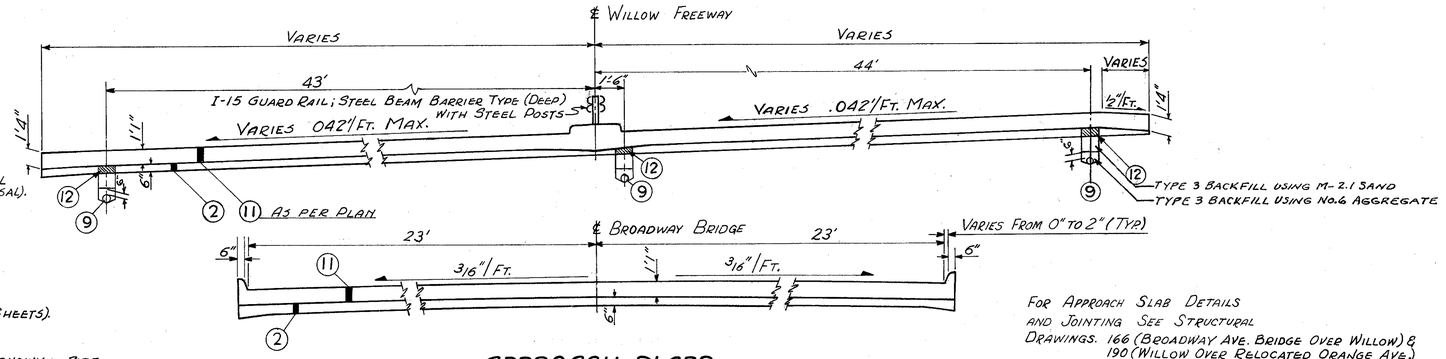
(11) ITEM I-7 REINFORCED CONCRETE APPROACH SLAB.

(12) ITEM SPECIAL ÷ THE SUBBASE SHALL BE REMOVED FOR WIDTHS AND DEPTHS AS SHOWN IN PIPE TRENCHES OF APPROCH SLABS AND DETAIL 'B' (SHEET NO. 3) AND REPLACED WITH NO. 6 AGGREGATE MATERIAL IMMEDIATELY PRIOR TO PLACING ITEM B-19, AGGREGATE BASE COURSE. THE PAYMENT SHALL BE MADE ON THE BASIS OF THE UNIT PRICE PER CUBIC YARD OF NO. 6 AGGREGATE MATERIAL IN PLACE WHICH INCLUDES THE FULL COST OF REMOVING THE SUBBASE MATERIAL AND THE HAULING, PLACING AND COMPACTING THE NO. 6 AGGREGATE MATERIAL. THE CUBIC YARDS OF NO. 6 AGGREGATE MATERIAL SHALL BE CALCULATED FROM WEIGHT SLIPS USING CONVERSION FACTORS GIVEN IN ITEM T-31.

(14) ITEM I-15 GUARD RAIL; STEEL BEAM BARRIER TYPE (DEEP), USING SQUARE SAWED, PRESSURE TREATED WOOD POSTS.

JOINT SYMBOLS

(4) STANDARD LONGITUDINAL JOINT.



APPROACH SLABS

WILLOW	STA. 118+64.71 (SKEW)	TO	STA. 118+89.71 (SKEW)	25.00 LIN. FT.
WILLOW	STA. 124+11.43 (SKEW)	TO	STA. 124+36.43 (SKEW)	25.00 LIN. FT.
				50.00 LIN. FT. WILLOW
BROADWAY BRIDGE	STA. 2+76.41 (SKEW)	TO	STA. 3+06.41 (SKEW)	30.00 LIN. FT.
BROADWAY BRIDGE	STA. 6+16.21 (SKEW)	TO	STA. 6+46.21 (SKEW)	30.00 LIN. FT.
				60.00 LIN. FT. BROADWAY AVE.

FOR APPROACH SLAB DETAILS AND JOINTING SEE STRUCTURAL DRAWINGS. 166 (BROADWAY AVE. BRIDGE OVER WILLOW) & 190 (WILLOW OVER RELOCATED ORANGE AVE.)

WORK SHS. 3, 4, 5 TOGETHER

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

APPROACH SLABS
WILLOW FREEWAY
TYPICAL SECTIONS

SCALE 3/16" = 1'-0" DATE

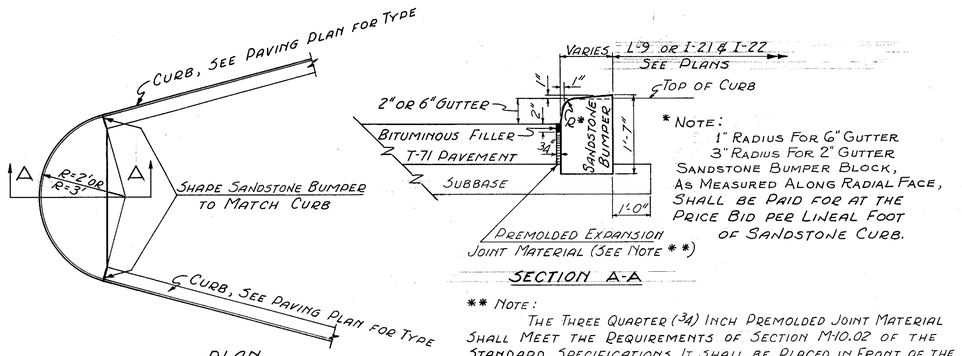
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
GO'C	GO'C		GOH			

CONT. No. 58019 SHEET ACCT. No. 6007

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

6/204

CUYAHOGA COUNTY
CUY— 21-(13.77) (14.94)



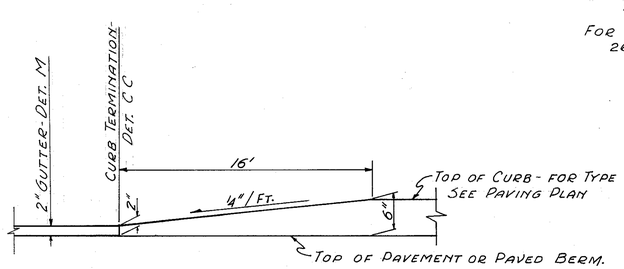
* NOTE:
1" RADIUS FOR 6" GUTTER
3" RADIUS FOR 2" GUTTER
SANDSTONE BUMPER BLOCK, AS MEASURED ALONG RADIAL FACE, SHALL BE PAID FOR AT THE PRICE BID PER LINEAL FOOT OF SANDSTONE CURB.

** 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

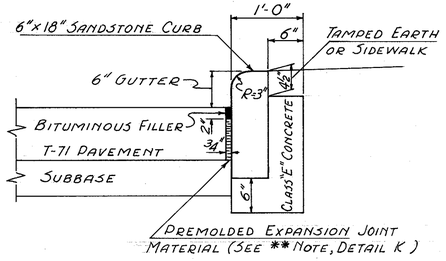
NOT TO SCALE

FOR LOCATION SEE SHS.
26, 64, 65 & 66



DETAILS CC & M
CURB HEIGHT TRANSITION

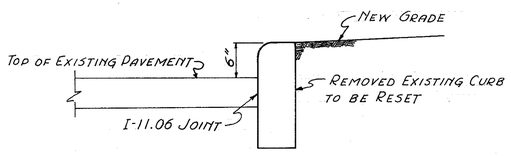
NOT TO SCALE
FOR LOCATION SEE SHS.
26, 28, 30, 64, 65 & 66



NOTE:
THE COST OF THE CLASS "E" CONCRETE TO BE INCLUDED IN PRICE BID PER LINEAL FOOT OF CURB.

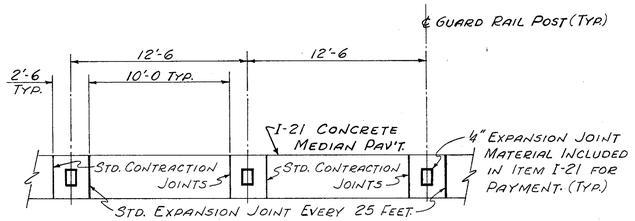
DETAIL B
RADIAL CURB DETAIL

FOR RADII 55' AND LESS
SCALE: 1"=1'-0"
FOR LOCATION SEE SHS.
31, 55, 57, 65, 66 & 74



DETAIL C
HEADER CURB

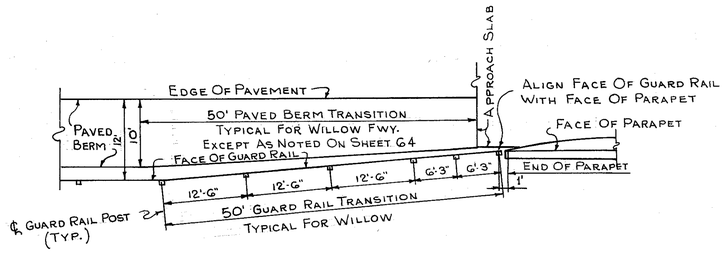
SCALE: 1"=1'-0"
FOR LOCATION SEE SHS. 66 & 74



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.



PAVED BERM - GUARD RAIL DETAILS AT STRUCTURES
SCALE: 3/32" = 1'-0"

CONT. No. 18019 SHEET ACCT. No. 601

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

MISCELLANEOUS ROADWAY & PAVEMENT DETAILS

SCALE AS NOTED DATE

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

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

7/204

CUYAHOGA COUNTY
CUY—21-(13.77) (14.94)

GENERAL

DESIGN SPEED

THE GEOMETRICS FOR THIS PROJECT HAVE BEEN PLANNED FOR A DESIGN SPEED OF 50 MILES PER HOUR.

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 THE FIELD OFFICE DURING THE CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR SHALL ALSO INSTALL WIRING AND OUTLETS SUITABLE FOR CONNECTING TO OFFICE EQUIPMENT, AND PROVIDE 110 VOLT ALTERNATING CURRENT DURING THE CONSTRUCTION OF THIS PROJECT.

TRAFFIC CONTROL SIGNS

ALL CITY TRAFFIC CONTROL SIGNS THAT WILL BE DISTURBED BY THE CONSTRUCTION SHALL BE CAREFULLY REMOVED AND STORED BY THE CONTRACTOR FOR DISPOSAL BY THE OWNER. PAYMENT FOR THIS OPERATION SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ROADWAY EXCAVATION, ITEM E-1.

COOPERATION BETWEEN CONTRACTORS

IN EVENT THE WORK COVERED BY THESE PLANS COINCIDES WITH ANY OTHER WORK, THE CONTRACTOR SHALL PLAN AND COORDINATE HIS WORK WITH THAT OF THE OTHER CONTRACTORS SO THAT A MINIMUM OF INTERFERENCE AND INCONVENIENCE WILL RESULT.
(Continued in 3rd Column)

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 OF QUANTITY AND LOCATION 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 TEMPORARY 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.

TWO WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES ON ALL CITY STREETS EXCEPT FOR THE FOLLOWING:

[CUY-21-13.77]

EXISTING (EXIT) S-B RAMP, WILLOW FREEWAY TO BROADWAY AVENUE

TWO LANE NORTHBOUND TRAFFIC SHALL BE MAINTAINED AT ALL TIMES; SEE CONSTRUCTION PROCEDURE SHEET 10A.

EXISTING (ENTRANCE) S-B RAMP, BROADWAY AVENUE SOUTH TO WILLOW FREEWAY

TWO LANE SOUTHBOUND TRAFFIC SHALL BE MAINTAINED AT ALL TIMES UNTIL THE NEW B-S RAMP, BROADWAY AVENUE SOUTH TO WILLOW FREEWAY, IS OPENED TO TWO LANE TRAFFIC; SEE CONSTRUCTION PROCEDURE SHEET 10A.

BROADWAY AVENUE

TWO LANE (IN EACH DIRECTION) TRAFFIC SHALL BE MAINTAINED AT ALL TIMES.

*EXISTING BROADWAY AVE. AT BROADWAY AVE. OVER WILLOW FREEWAY BRIDGE SITE MAY BE CLOSED TO TRAFFIC AFTER THE CONTRACTOR HAS CONSTRUCTED AND OPENED TO TRAFFIC --

(1) NEW B-S RAMP FROM BROADWAY AVE. SOUTH TO EXISTING WILLOW FREEWAY WITH TWO LANE SOUTHBOUND TRAFFIC.

(2) ROAD "A" WITH ONE LANE (IN EACH DIRECTION) TRAFFIC.

(3) RUN-AROUND AT BROADWAY AVE. WITH TWO LANE (IN EACH DIRECTION) TRAFFIC.

*PARTICULAR ATTENTION IS DIRECTED TO THE NEED FOR MAINTAINING SURFACE DRAINAGE FOR THE AREA SOUTH OF BROADWAY, PRIOR TO INSTALLATION OF THE FREEWAY DRAINAGE SYSTEM BENEATH THE NEW BROADWAY OVER WILLOW BRIDGE. INCLUDE FOR PAYMENT IN THE ASSOCIATED ITEMS OF WORK.

MARTIN AVENUE

TWO WAY THRU TRAFFIC SHALL BE MAINTAINED ON MARTIN AVENUE TO BROADWAY AVENUE AT ALL TIMES, EITHER VIA

(1) BROADWAY AVENUE RUN-AROUND OR
(2) *ROAD "A" AND GALLUP AVENUE
(*UNLESS AUTHORIZED BY CITY, ROAD "A" SHALL BE USED FOR LOCAL ACCESS ONLY)

DOUSE AVENUE

SAME AS MARTIN AVENUE.

GALLUP AVENUE (AT BROADWAY AVENUE)

GALLUP AVENUE, SOUTH OF LESTER AVENUE, SHALL BE CLOSED TO THRU TRAFFIC DURING THE CONSTRUCTION AND SUBSEQUENT REMOVAL OF THAT PORTION OF THE BROADWAY AVENUE RUN-AROUND AT GALLUP, AND THE GALLUP AVENUE NEW PAVEMENT CONSTRUCTION.

[CUY-21-14.94]

FOR MAINTENANCE OF TRAFFIC AND CONSTRUCTION SEQUENCE FOR CUY-21-14.94, SEE SHEET 10.

ATTENTION IS DIRECTED PARTICULARLY TO THE NEED FOR PROVIDING ADEQUATE FACILITIES TO ACCOMMODATE SCHOOL CHILDREN AND OTHER PEDESTRIAN TRAFFIC IN THE VICINITY OF THE PROJECT. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SUCH TEMPORARY BOARD WALKS, CINDER WALKS, HANDRAILS ADJACENT TO EXCAVATIONS, ETC. AS MAY BE NECESSARY TO ACCOMMODATE, IN A REASONABLE AND SAFE MANNER, PEDESTRIAN TRAFFIC IN THE VICINITY OF THE PROJECT; INCLUDE FOR PAYMENT IN THE LUMP SUM BID FOR MAINTAINING TRAFFIC.

TRAFFIC MAINTENANCE

TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES BY USE OF EITHER THE EXISTING PAVEMENT, THE PROPOSED PAVEMENT, OR TEMPORARY ROADWAYS SURFACED WITH T-10 AGGREGATE AND STABILIZED WITH ITEM I-4 CALCIUM CHLORIDE.

ESTIMATED QUANTITIES OF 100 CU.YDS. OF ITEM T-10 AGGREGATE AND 2 TONS OF ITEM I-4 CALCIUM CHLORIDE ARE CARRIED IN THE GENERAL SUMMARY FOR USE ON TEMPORARY ROADS AS DIRECTED BY THE ENGINEER.

LIGHTS AND SIGNS AT ADJACENT ROAD INTERSECTIONS

THE CONTRACTOR SHALL, IN CONJUNCTION WITH AND IN ADDITION TO THE GENERAL REQUIREMENTS OF ITEM I-3 ON THIS PROJECT PERFORM THE FOLLOWING:

(a) PROVIDE, ERECT, AND MAINTAIN MOVABLE GATES ON INTERSECTING ROADS CLOSED TO TRAFFIC AT ALL POINTS WHERE LOCAL TRAFFIC MOVEMENT TERMINATES.

(b) PROVIDE, ERECT, AND MAINTAIN STANDARD 40"x24" SIZE "ROAD CLOSED SIGNS" AND LIGHTS AT THE WORK LIMITS ON ALL INTERSECTING ROADS WHICH REMAIN OPEN TO TRAFFIC.

SIGN SUPPORTS AND LIGHTS FOR "ROAD CLOSED" SIGNS SHALL BE AS DETAILED IN THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES."

PAYMENT FOR PROVIDING, ERECTING, MAINTAINING, AND REMOVING LIGHTS, SIGNS, AND SIGN SUPPORTS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM I-3, MAINTAINING TRAFFIC.

CONTINUITY OF UTILITY SERVICES (SANITARY & STORM SEWERS, WATER, ELECTRICAL, GAS)

IN ADDITION TO THE REQUIREMENTS FOR MAINTAINING TRAFFIC THE CONTRACTOR SHALL PLAN AND COORDINATE HIS OPERATIONS IN SUCH MANNER THAT CONTINUITY OF UTILITY SERVICES (SANITARY AND STORM SEWERS, WATER, ELECTRICAL, GAS, TELEPHONE ETC.) WILL BE MAINTAINED TO THE SATISFACTION OF THE ENGINEER AND RESPECTIVE UTILITIES INVOLVED.

CONSTRUCTION PROCEDURE

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 PERFORMANCE 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.

CONSTRUCTION SECTION CUY-21-13.77.
(BROADWAY AVE. SOUTH TO EXISTING WILLOW FREEWAY):

STORM SEWERS

CONSTRUCT: (a) INDEPENDENCE ROAD - DILLE ROAD STORM SEWER BETWEEN CUYAHOGA RIVER AND BROADWAY AVE.
(b) BROADWAY AVE. STORM SEWER UNDER WILLOW FREEWAY AND BETWEEN DILLE ROAD AND GALLUP.
(c) ROAD "A" STORM SEWER BETWEEN MARTIN AND GALLUP-BROADWAY INTERSECTION.

SANITARY SEWERS

CONSTRUCT: (a) GALLUP AVE. SANITARY SEWER BETWEEN NURSERY STREET AND BROADWAY AVE.
(b) ROAD "A" COMBINED SEWER BETWEEN MARTIN AND GALLUP-BROADWAY INTERSECTION.
(c)* SANITARY SEWER, BETWEEN TRUMBULL AVE. AND CONNECTION TO "SOUTHERLY INTERCEPTOR SEWER" NEAR E. 49TH. ST.
(d)* EAST 45TH. ST. COMBINED SEWER BETWEEN EXISTING WILLOW FREEWAY AND BROADWAY AVE. (NEAR ROSEVILLE)
(e) BURWELL AVENUE COMBINED SEWER BETWEEN EAST 35TH PLACE AND EAST 37TH STREET.
* (c) AND (d) CONSTRUCTION OPERATIONS ARE AT THE OPTION OF THE CONTRACTOR.

WATER

CONSTRUCT: BROADWAY AVE. WATER MAIN UNDER WILLOW FREEWAY BETWEEN GALLUP AVE AND MARTIN.

SEWER AND WATER MAINS MAY BE CONSTRUCTED CONCURRENTLY BUT SHALL BE IN OPERATION PRIOR TO DISCONTINUATION OF SIMILAR SERVICES WHICH MAY RESULT FROM CONSTRUCTION AT BROADWAY AVE. OVER WILLOW FREEWAY BRIDGE SITE.

CONSTRUCTION SECTION CUY-21-14.94
(NORTH OF CROTON AVE.)

FOR CONSTRUCTION PROCEDURE FOR THIS SECTION SEE SHEET 10.

COOPERATION BETWEEN CONTRACTORS (Continued From 1st Column)

THE CONTRACTOR SHALL COOPERATE WITH THE CONTRACTOR OF PROJECT SECTION CUY-21-14.12 AND CUY-254-18.69 DURING CONSTRUCTION OF THE 30" DIAMETER WATER MAIN ACROSS BROADWAY AVE. TEMPORARY RUN-AROUND AND ONE WAY TRAFFIC WILL BE PERMITTED DURING LIMITED PERIODS OF TIME AS APPROVED BY THE ENGINEER.

THE CONTRACTOR SHALL COOPERATE WITH THE CONTRACTOR OF THE SIGNING WORK WHICH MAY BE INSTALLED DURING THE LIFE OF THIS CONTRACT.

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 ROSEVILLE CT. AND BROADWAY AVE., WITHIN THE ACQUIRED RIGHT OF WAY, FACING AND IN VIEW OF SOUTHEASTERLY BOUND TRAFFIC ON BROADWAY AVE.
2. WESTERN SIDE OF GALLUP AVE. BETWEEN THE TEMPORARY RUN-AROUND AND THE RIGHT OF WAY LINE TO THE NORTH, FACING AND IN VIEW OF NORTHWESTERLY BOUND TRAFFIC ON BROADWAY AVE.
3. SOUTHERN SIDE OF WOODLAND AVE., WITHIN THE TRAFFIC ISLAND FORMED BY THE INTERSECTIONS OF RAMP S-30, RELOCATED ORANGE AVE., AND WOODLAND AVE., FACING AND IN VIEW OF WESTERLY BOUND TRAFFIC ON WOODLAND AVE.
4. EASTERN SIDE OF E. 30TH ST. BETWEEN RELOCATED ORANGE AVE. AND THE WILLOW FREEWAY, FACING AND IN VIEW OF NORTH BOUND TRAFFIC ON E. 30TH ST. AND EAST BOUND TRAFFIC ON RELOCATED ORANGE AVE.

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

SIGN DETAILS SHALL BE AS SPECIFIED ON STANDARD DWG. 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 DWG. FAC I-2. ADDITIONAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH NOTES IN THE PROPOSAL.

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.

CONT. NO. 58019 SHEET ACCT. NO 6017

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

GENERAL NOTES

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

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

8/204

CUYAHOGA COUNTY
CUY—21-(13.77) (14.94)

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, (INCLUDING GRANITE CURB) ARE SHOWN ON SHEET NO. 13. PERCENT OF SALVAGABLE CURB WAS ESTIMATED BY VISUAL CHECK AND IS ONLY APPROXIMATE. IF AN ADDITIONAL AMOUNT IS SALVAGABLE AS DETERMINED BY THE ENGINEER, IT IS TO BE SUBSTITUTED IN PLACE OF ITEM I-11, SANDSTONE CURB. SALVAGED CURB FROM CITY STREETS 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. SALVAGED GRANITE CURB WHEN RE-USED SHALL BE RESET AT CURBED INTERSECTIONS AND HEADER CURB LOCATIONS AS SELECTED BY THE ENGINEER.

REMOVAL OF EXISTING NON-RIGID PAVEMENT

COST OF REMOVING NON-RIGID PAVEMENT IS TO BE INCLUDED WITH THE PRICE BID FOR ROADWAY EXCAVATION, ITEM E-1.

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 (Continued in 2nd Column)

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. IN LIEU THEREOF, THEY SHALL BE BROKEN UP IN PLACE INTO PORTIONS NOT TO EXCEED ONE SQUARE FOOT IN AREA PRIOR TO PLACEMENT OF PROPOSED EMBANKMENT. PAYMENT FOR THIS OPERATION SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ROADWAY EXCAVATION, ITEM E-1.

REMOVAL OF EXISTING RAILS, TIES, AND ACCESSORIES IN OR UNDER RIGID PAVEMENT SHALL BE INCLUDED FOR PAYMENT WITH THE APPLICABLE ITEM E-8, REMOVAL AND DISPOSAL OF EXISTING PAVEMENT OR OTHERWISE E-1, ROADWAY EXCAVATION.

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.

GUARD RAIL REMOVED & REBUILT

IF THE STEEL BEAM GUARD RAIL STANDARD TYPE (DEEP) WHEN NO LONGER NEEDED ON THE TEMPORARY RUN-AROUND SH. 53 IS IN THE OPINION OF THE ENGINEER SUITABLE FOR USE AS PERMANENT GUARD RAIL ON THE PROJECT, THE CONTRACTOR SHALL USE ALL OR A PART OF THE SAME IN PLACE OF A LIKE AMOUNT OF NEW GUARD RAIL OF THE SAME TYPE AS CALLED FOR IN THE PLANS. THE COST OF REMOVING, REBUILDING AND RE-INSTALLING THE RAIL SHALL BE PAID FOR UNDER ITEM I-15, "GUARD RAIL REMOVED AND REBUILT."

MEDIAN GUARD RAIL IN APPROACH SLABS

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

ITEM I-15, TEMPORARY GUARD RAIL

SEE NOTE IN PROPOSAL FOR DESCRIPTION OF THIS ITEM. AN ESTIMATED QUANTITY OF 2,000 LINEAR FEET HAS BEEN ENTERED IN THE GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER.

FLARING GUARD RAIL AT BRIDGES

GUARD RAIL ON BRIDGE APPROACHES SHALL BE INSTALLED IN ACCORDANCE WITH DETAIL SHOWN ON SHEET 6.

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 PLACEMENT AND COMPACTION HAVE BEEN COMPLETED.

SEEDING AND PROTECTING

QUANTITIES FOR SEEDING ITEM L-9 ARE CALCULATED FOR SOIL AREAS BETWEEN RIGHT OF WAY LIMITS, AND WITHIN WORK LIMITS FOR AREAS OUTSIDE OF RIGHT OF WAY LINES, COVERED BY WORK AGREEMENT OR SLOPE EASEMENT.

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 THEREFORE 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 MATERIALS

THE LOCATION AND NEED FOR AGRICULTURAL LIMING MATERIALS 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" AND OVER	19

ITEM S.S. CE-101.04

AN ESTIMATED QUANTITY OF 35 HOURS FOR THIS ITEM HAS BEEN INCLUDED 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.

REMOVAL OF EXISTING RIGID PAVEMENT (Continued from 1st Column)

THE EXISTING RAILS, TIES AND ACCESSORIES WHICH ARE REMOVED BY THE CONTRACTOR SHALL BECOME THE PROPERTY OF THE CONTRACTOR FOR HIS DISPOSAL.

SINCE IT IS ANTICIPATED THAT EXISTING TRACK ITEMS WILL BE ENCOUNTERED DURING THE PAVEMENT REMOVALS IN THE FOLLOWING LOCATIONS, THIS LIST HAS BEEN PREPARED FOR THE CONTRACTOR'S USE AND INFORMATION ONLY. ALTHOUGH IT IS BELIEVED THAT THE INFORMATION IS CORRECT THE STATE OF OHIO MAKES NO GUARANTEES AS TO ITS ACCURACY OR COMPLETENESS.

SHEET NO.	DESCRIPTION
54	TWO TRACKS IN THE CENTER OF BROADWAY AVENUE BETWEEN EAST 47TH STREET AND EAST 34TH STREET.
65	TWO TRACKS IN WOODLAND AVENUE BETWEEN EAST 27TH STREET AND EAST 37TH STREET.
66	TWO TRACKS (TIES ONLY) IN 30TH STREET BETWEEN WOODLAND AVENUE AND ORANGE AVENUE.
66	TWO TRACKS (TIES ONLY) IN ORANGE AVENUE BETWEEN EAST 30TH STREET AND EAST 34TH STREET.
74	TWO TRACKS (TIES ONLY) IN EAST 34TH STREET BETWEEN BURWELL AVENUE AND WOODLAND AVENUE.

SEE ITEMS MARKED * SHEET NO. 13 FOR PAVEMENT AREAS INVOLVED.

UTILITIES

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

BUCKEYE PIPELINE COMPANY
MIDWEST PRODUCTS DIVISION
137 W. NORTH STREET
LIMA, OHIO
J. R. ANDERSON, SUPT.
R. E. LANGSTON
2170 DRY DOCK AVENUE
CLEVELAND OHIO
.....CHERRY 1-5853

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 BLDG.,
CLEVELAND 14, OHIO
(WATER) W. J. SWEENEY, -ENG. OF DESIGN
(LIGHT) A. NICHOLS, -CHIEF BUREAU OF STREET LIGHTING

DEPARTMENT OF PUBLIC SERVICE
CITY HALL
CLEVELAND 14, OHIO
(SEWERS) E. C. RICHARDSON, -ENGINEER OF SEWER DESIGN

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, COMM. OF TRAFFIC

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

STANDARD OIL COMPANY
MIDLAND BUILDING
CLEVELAND 15, OHIO
E. J. JIRUS
.....MAIN 1-7400

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

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

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

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

THE RIVER TERMINAL RAILWAY COMPANY
3100 EAST 45TH. STREET
CLEVELAND 27, OHIO
E.J. LISY, ENGINEER, M/W & STRUCTURE
.....771-1400

UTILITY ADJUSTMENTS

THE CONTRACTOR SHALL NOTIFY AT LEAST 48 HOURS 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.

PROJ. NO. 5801 SHEET ACCT. NO. 6018

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

GENERAL NOTES

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

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

9
204

CUYAHOGA COUNTY
CUY— 21—(13.77) (14.94)

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.

EACH STRAND 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 ALL OF THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM L-10, SODDING FOR SPECIAL BERM AND SLOPE PROTECTION.

EROSION CONTROL

ITEMS I-14, L-10 & 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 SHALL 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.

PIPE FOR SUBGRADE DRAINAGE

TEN (10) LINEAL FEET OF 6" CORRUGATED METAL PIPE, CLASS F-1 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.

REINFORCED ENDS ON CORRUGATED METAL PIPE

REINFORCED ENDS SHALL BE PROVIDED FOR ALL CORRUGATED METAL CLASS F-4 PIPE FOR UNDERDRAIN OUTLETS IF THE PIPE ENDS ARE UNPROTECTED BY HEADWALLS, CATCH BASINS OR MANHOLES.

ITEM I-9 STONE UNDERDRAINS, NO. 2

AN ESTIMATED QUANTITY OF 300 LIN. FT. OF ITEM I-9 STONE UNDERDRAINS NO. 2 HAS BEEN PROVIDED FOR MISCELLANEOUS USAGE AS DIRECTED BY THE ENGINEER.

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 SHEET NO. 98 A.

ABANDONING EXISTING MANHOLES AND CATCHBASINS

THE ABANDONING OF EXISTING MANHOLES AND CATCH BASINS SHALL BE IN ACCORDANCE WITH SEC. I-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. I-16.03.

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. THE COST OF SEALING SEWERS OR DRAINS SHALL BE INCLUDED IN THE PRICE BID FOR ITEM E-1, ROADWAY EXCAVATION.

CONNECTIONS TO EXISTING PIPE

AT PLACES WHERE THE PLANS PROVIDE FOR PROPOSED DRAINAGE PIPE TO BE CONNECTED TO EXISTING PIPES, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THE EXISTING PIPE BOTH AS TO LINE AND GRADE BEFORE HE STARTS TO LAY THE PROPOSED PIPE. THE COST OF THIS OPERATION SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT PIPE ITEM.

CONNECTING INTO EXISTING SEWERS

AT PLACES WHERE THE PLANS PROVIDE FOR PROPOSED SEWER PIPE TO BE CONNECTED TO EXISTING PIPES, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THE EXISTING PIPE BOTH AS TO LINE AND GRADE BEFORE HE STARTS TO LAY THE PROPOSED PIPE.

WHERE PROPOSED SEWERS 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.

THE COST OF 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 EXCAVATION. COST OF THIS REMOVAL 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.

REMOVAL OF EXISTING HOUSE DRAINS

THE REMOVAL OF ALL EXISTING HOUSE CONNECTIONS, WHICH INCLUDE SANITARY, YARD, ROOF, BASEMENT OR OTHER SIMILAR PIPE DRAINS WITHIN THE ROADWAY CONSTRUCTION LIMITS SHALL BE PLUGGED WITH CLASS "E" CONCRETE AND PAID FOR AS ITEM E-1, ROADWAY EXCAVATION, UNLESS OTHERWISE ITEMIZED FOR PAYMENT IN THE PLANS.

PROPOSED SEWERS IN EXISTING STREETS

IN AREAS WHERE PROPOSED SEWERS PASS THROUGH EXISTING STREETS OR SIDEWALKS THE CONTRACTOR SHALL REPLACE PAVEMENT REMOVED IN SUCH A MANNER AS IS SATISFACTORY TO THE CITY OF CLEVELAND AND AS DIRECTED BY THE ENGINEER. WHERE INDICATED ON THE PLANS THE REMOVAL AND DISPOSAL OF EXISTING PAVEMENT CURB AND SIDEWALK SHALL BE PAID FOR UNDER ITEM E-8, FOR QUANTITIES SEE PLANS. WHERE INDICATED ON THE PLANS THE PAYMENT FOR REPLACING THE PAVEMENT, CURB AND SIDEWALK SHALL BE UNDER THE RESPECTIVE ITEM OF WORK AS SHOWN.

REPLACEMENT OF UNSATISFACTORY CASTINGS ON MANHOLES ADJUSTED TO GRADE

WHERE IT IS NECESSARY UNDER ITEM I-8 MANHOLES ADJUSTED TO GRADE, TO REPLACE AN UNSATISFACTORY MANHOLE FRAME AND COVER, PAYMENT FOR THE NEW CASTING SHALL BE MADE AT THE UNIT PRICE BID FOR ITEM I-8 MANHOLE FRAME AND COVER, FURNISHED AND PLACED (CITY OF CLEVELAND STANDARD CASTING). PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR FURNISHING, HAULING AND PLACING ALL CASTINGS AND ANY INCIDENTALS NECESSARY TO COMPLETE THE ITEM TO THE SATISFACTION OF THE ENGINEER.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER FOR REPLACING UNSATISFACTORY MANHOLE FRAMES AND COVERS.

ITEM I-8 MANHOLE FRAME AND COVER...............5 EACH

ITEM I-1 ENCASED AS PER PLAN

WHERE CALLED FOR ON THE PLANS, PIPE OF THE CLASS AND SIZE SPECIFIED, SHALL BE ENCASED WITH A MINIMUM OF FIVE (5) INCHES OF CLASS "E" CONCRETE MEETING THE REQUIREMENTS OF ITEM S-1. PAYMENT FOR FURNISHING AND PLACING THE CONCRETE, AND FOR ANY ADDITIONAL EXCAVATION REQUIRED, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT PIPE ITEM.

I-8 SPECIAL

THIS ITEM SHALL CONSIST OF CONNECTING NEW SEWER INTO EXISTING MANHOLES USING DROP AS PER STANDARD NO. 2 MANHOLE AT THE LOCATION AND ELEVATIONS SHOWN ON PLAN. THE WORK INCLUDED IN THIS ITEM SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH, WHICH PRICE AND PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR FURNISHING ALL MATERIALS, LABOR, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THE ITEM TO THE SATISFACTION OF THE ENGINEER.

THE CONTRACTORS SHALL NOTIFY THE CITY OF CLEVELAND AT LEAST 24 HOURS SO THAT INSPECTION CAN BE FURNISHED BY THE CITY AT THE TIME OF THIS OPERATION.

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. .

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; AND
% MR. R.A. BOOTH, ADMINISTRATOR OF CONTRACT SALES, OHIO DEPARTMENTS BLDG., 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. ALL VOIDS BETWEEN THE OUTSIDE OF THE PLATES AND THE UNDISTURBED EARTH SHALL BE COMPACTLY FILLED WITH 1:6 P.C. GROUT.

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 WILL BE INCLUDED IN THE PRICE BID PER LINEAL FOOT OF SEWER.

THE CONCRETE USED IN CONSTRUCTION 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.

THE VITRIFIED LINER PLATES SHALL BE FURNISHED AND INSTALLED UNDER SECTION O-5.2 AND SECTION S10.4.

CONCRETE SEWER CONSTRUCTED IN TUNNEL AS HEREIN SPECIFIED WILL BE PAID FOR AT THE PRICE PER LINEAL FOOT FOR "SEWER IN TUNNEL" AS PER PLAN AND THIS PRICE SHALL INCLUDE ALL EXCAVATION AND REMOVAL OF SURPLUS MATERIAL, FURNISHING AND PLACING ALL CONCRETE, FURNISHING AND PLACING ALL NECESSARY LINER PLATES, TIMBERS, SHEETING, OR OTHER SUPPORTING MATERIALS, THE FURNISHING AND CONSTRUCTION OF VITRIFIED LINER PLATES, AND ALL OTHER ITEMS OF EXPENSE EITHER OF MATERIAL, LABOR, EQUIPMENT OR SUPPLIES NECESSARY TO COMPLETE THE SEWERS IN THE TUNNELS AS SPECIFIED.

AIR PLANT

SPECIAL ATTENTION IS CALLED TO THE PROVISIONS OF SECTION S7.2 OF THE CITY 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.

ITEM I-1, PIPE UNDER RAILROAD

AS A PART OF THIS CONTRACT IT WILL BE NECESSARY TO CONSTRUCT A 60" SEWER IN TUNNEL UNDER THE TRACKS OF THE ERIE-LACKAWANNA RAILROAD AND A 72" SEWER IN TUNNEL UNDER THE TRACKS OF THE BALTIMORE & OHIO RAILROAD AND RIVER TERMINAL RAILWAY. AT EACH OF THESE RAILROADS NO ADJACENT TRENCH EXCAVATION OR EQUIPMENT SHALL BE CLOSER THAN 10'-0" TO THE CENTERLINE OF THE NEAR TRACK; TRENCHES AND SHAFTS SHALL BE ADEQUATELY SUPPORTED.

THE CONTRACTOR SHALL PAY TO THE E.- L.R.R., B.& O.R.R., AND RIVER TERMINAL RAILWAY, HEREAFTER CALLED THE COMPANY(S), ALL COSTS FOR WATCHMEN, FLAGMEN, TEMPORARY TRACK SUPPORTS OR ANY OTHER WORK DEEMED NECESSARY BY THE COMPANY(S) OR OCCASIONED BY THE OPERATIONS OR NEGLIGENCE OF THE CONTRACTOR, OR ANY SUBCONTRACTOR, IN CARRYING FORWARD WORK UNDER RAILROAD TRACKS, OR ON WORK AFFECTING SAFETY OF RAILROAD OPERATIONS. THE CONTRACTOR SHALL FIRST SECURE STATE AND COMPANY(S) APPROVAL OF ANY METHODS OF OPERATION UNDER RAILROAD TRACKS AFFECTING THE SAFETY OF RAILROAD OPERATIONS. THE COMPANY(S) WILL PERFORM ENGINEERING REVIEW OF METHODS OF OPERATIONS AND ENGINEERING SUPERVISION OF CONSTRUCTION WITHOUT COST TO THE CONTRACTOR.

THE CONTRACTOR, BEFORE BIDDING, SHALL CONSULT WITH THE COMPANY(S) AS TO WHEN WATCHMEN TO PROTECT RAILROAD TRAFFIC WILL BE REQUIRED IN VIEW OF THE CONTRACTOR'S OPERATIONS. THE CONTRACTOR SHALL EXECUTE A BOND IN FAVOR OF THE CITY OF CLEVELAND, OHIO, THE STATE AND COMPANY(S) AS REQUIRED BY SECTION 5525-16 OF THE REVISED CODE OF OHIO.

THE CONTRACTOR SHALL COOPERATE WITH THE LOCAL OFFICIALS OF THE E.& L.R.R., B.& O.R.R. AND RIVER TERMINAL RAILWAY IN WORK ADJACENT TO RAILROAD TRACKS, IN ORDER TO AVOID DELAY TO, OR INTERFERENCE WITH RAILROAD TRAFFIC, AND SHALL NOTIFY THE COMPANY(S) FORTY EIGHT (48) HOURS IN ADVANCE OF OPERATIONS THAT WILL OR MIGHT AFFECT SAFETY OF TRAIN OPERATIONS.

FOR ADDITIONAL NOTES:
SEE SHEETS 99 TO 106 FOR WATERWORK
142 & 143 FOR ELECTRICAL
146 & 180 FOR STRUCTURAL

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

GENERAL NOTES

SCALE
DATE

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

58019
6016

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY—21-(13.77) (14.94)

NOTES

See General Notes Sht. No. 7 For Detours And Maintenance Of Traffic.

CONSTRUCTION PROCEDURE

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 PERFORMANCE 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.

PRIORITY I

AREAS DESIGNATED THUS [symbol] SHALL INCLUDE CONSTRUCTION OF THE ROADWAY (AND LATER THE PAVEMENT) TO THE SPILL THRU SLOPE OF THE 30TH STREET BRIDGE ABUTMENT.

PRIORITY II (31ST STREET CLOSED TO THRU TRAFFIC)

AREAS DESIGNATED THUS [symbol] SHALL INCLUDE CONSTRUCTION OF THE BRIDGE AND THE ROADWAY AND PAVEMENT OF SUCH LENGTH OF RELOCATED ORANGE AVENUE AS WILL PERMIT THE CONTINUED FULL WIDTH USE OF EXISTING ORANGE AVENUE AND EXISTING WOODLAND AVENUE.

PRIORITY III (31ST STREET AND EXISTING ORANGE AVE. CLOSED TO THRU TRAFFIC)

AREAS DESIGNATED THUS [symbol] SHALL INCLUDE CONSTRUCTION OF THE ROADWAY AND PAVEMENT AND OPENING RELOCATED ORANGE AVENUE TO THROUGH TRAFFIC.

PRIORITY IV (32ND & 34TH STREETS CLOSED TO THRU TRAFFIC)

AREAS DESIGNATED THUS [symbol] (AFTER OPENING RELOCATED ORANGE AVENUE TO TRAFFIC) SHALL INCLUDE CONSTRUCTION OF THE ROADWAY AND PAVEMENT AND OPENING ROAD "C" AND "D" TO TRAFFIC.

PRIORITY V

AREAS DESIGNATED THUS [symbol] SHALL INCLUDE CONSTRUCTION OF THE ROADWAY AND PAVEMENT ON THE WILLOW FREEWAY AND RAMPS.

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

CONSTRUCTION SEQUENCE
RAMPS S-30 & 30-S
RELOCATED ORANGE AVE.
& LOCAL STREETS

SCALE 1" 50' DATE

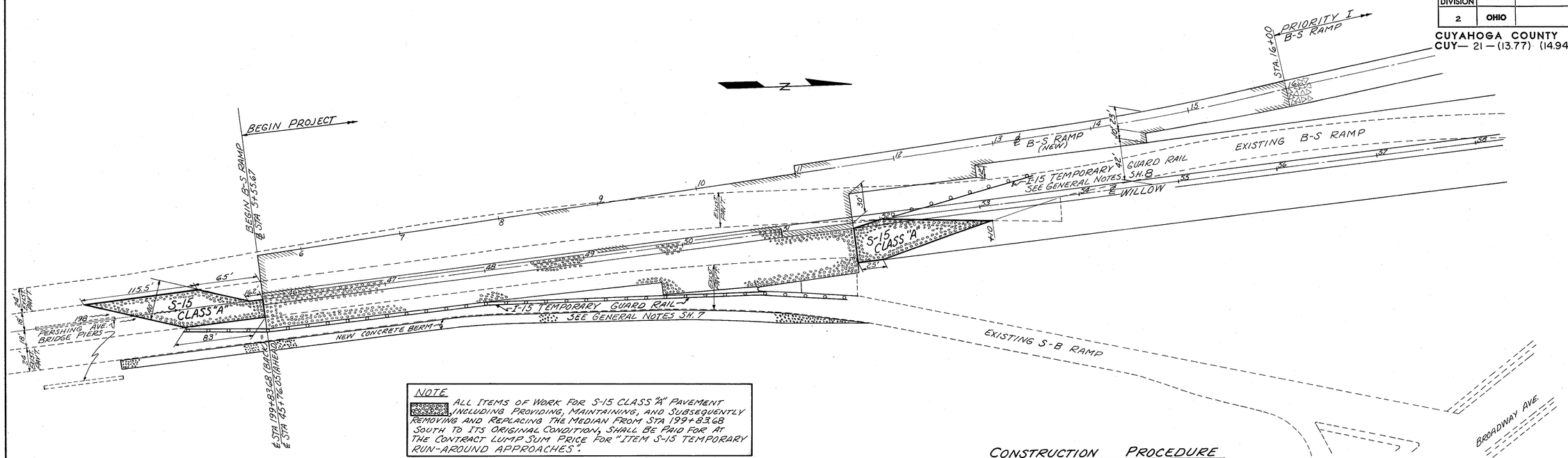
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
A. J. T.L.L.	L.H.		C.D.R.			

CONT. No. 58019 SHEET ACCT. No. 6004

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

10A
204

CUYAHOGA COUNTY
CUY— 21 — (13.77) (14.94)



NOTE

ALL ITEMS OF WORK FOR S-15 CLASS "A" PAVEMENT INCLUDING PROVIDING, MAINTAINING, AND SUBSEQUENTLY REMOVING AND REPLACING THE MEDIAN FROM STA 199+83.68 SOUTH TO ITS ORIGINAL CONDITION, SHALL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "ITEM S-15 TEMPORARY RUN-AROUND APPROACHES".

CLASS "A" PAVEMENT SHALL BE 9" OF PORTLAND CEMENT CONCRETE PAVEMENT, ITEM T-70.

CONSTRUCTION PROCEDURE

THE FOLLOWING PROCEDURE IS SUGGESTED FOR THE CONSTRUCTION OF THIS PORTION OF THE IMPROVEMENT. IF THE CONTRACTOR ELECTS TO FOLLOW A DIFFERENT PROCEDURE, HE SHALL SUBMIT A COMPLETE OUTLINE OF HIS PROPOSED METHOD OF PERFORMANCE 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.

PRIORITY I

AREAS DESIGNATED THUS ▨ SHALL INCLUDE CONSTRUCTION OF THE BROADWAY SOUTH RAMP (INCLUDING SEWERS & RETAINING WALLS) WHICH IS BETWEEN B-S RAMP STA. 16+00 AND BROADWAY, (ALSO INCLUDES CONSTRUCTION OF E. 45TH ST. COMBINED SEWER, SEE SH. 25)

PRIORITY II

AREAS DESIGNATED THUS ▨ SHALL INCLUDE CONSTRUCTION OF THE NEW CONCRETE BERM (INCLUDING DRAINAGE & ADJACENT LIGHTING FACILITIES). DURING THIS CONSTRUCTION, TWO LANE NORTHBOUND TRAFFIC TO BROADWAY SHALL BE MAINTAINED AT ALL TIMES ON THE EXISTING PAVEMENT. THE NEW CONCRETE BERM TOGETHER WITH A PORTION OF THE ADJACENT EXISTING PAVEMENT SHALL THEN BE OPEN TO TWO LANE NORTHBOUND TRAFFIC TO BROADWAY.

PRIORITY III

AREAS DESIGNATED THUS ▨ SHALL INCLUDE CONSTRUCTION OF THE NEW WILLOW FREEWAY PAVEMENT, MEDIAN (INCLUDING DRAINAGE) AND S-15, TEMPORARY RUNAROUND PAVEMENT. THE TWO LANE SOUTHBOUND TRAFFIC ON EXISTING BROADWAY-SOUTH RAMP SHALL THEN BE ROUTED OVER THE COMPLETED PRIORITY III CONSTRUCTION.

PRIORITY IV

AREAS DESIGNATED THUS ▨ SHALL INCLUDE THE CONSTRUCTION OF THE REMAINING PORTION (INCLUDING DRAINAGE & LIGHTING) OF THE SOUTH TERMINAL OF THE NEW BROADWAY-SOUTH RAMP.

PRIORITY V

CLOSE EXISTING BROADWAY-SOUTH RAMP AND OPEN NEW BROADWAY SOUTH RAMP TO TWO LANE SOUTHBOUND TRAFFIC. REMOVE TEMPORARY RUNAROUND PAVEMENT.

WORK THIS SHEET WITH SHEETS 17 & 18

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

CONSTRUCTION SEQUENCE

WILLOW FREEWAY,
B-S & S-B RAMPS

SCALE 1"=50'

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

DATE

6237

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

11/204

CUYAHOGA COUNTY
CUY— 21-(13.77) (14.94)

CALCULATIONS - TYPICAL SECTIONS

SHEET	DESCRIPTION	T-71 9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT	T-31 BITUMINOUS SURFACE TREATMENT BITUMINOUS MATERIAL .25GAL./YD²	T-31 BITUMINOUS SURFACE TREATMENT NO. 6 AGGREGATE .008YD³/YD²	I-22 SUBBASE	I-21 PORTLAND CEMENT CONCRETE MEDIAN PAVEMENT STD. TYPE I	B-19 AGGREGATE BASE COURSE	I-11 6"x18" SANDSTONE CURB	B-21 3" WATER-PROOFED AGGREGATE BASE COURSE	I-7 REINFORCED CONCRETE APPROACH SLAB T=13"
		SQ. YD.	GAL.	CU. YD.	CU. YD.	SQ. YD.	CU. YD.	LIN. FT.	CU. YD.	SQ. YD.
4	WILLOW FREEWAY-SUPERELEVATED									
	FULL WIDTH SECTION 637.28 FT.									
	637.28 × 72 ÷ 9	5098.24								
	[323.71(10+3)/2+313.57(10+3.585)/2]0.25 ÷ 9		470.45							
	[323.71(10+3)/2+313.57(10+3.585)/2]0.008 ÷ 9			15.05						
	(323.71×54.70+313.57×57.36 ÷ 27				1321.97					
	(323.71×3+313.57×4.18) ÷ 9					253.54				
	[323.71(10.0+3)/2+313.57(13.35+13.85)]0.33 ÷ 27						207.11			
	637.28 × 2							1274.56		
	[323.71(10+3)/2+313.57(13.32+13.85)]0.25 ÷ 27								156.82	
	WILLOW FREEWAY-SUPERELEVATED									
	FULL WIDTH SECTION 163.45 FT.									
	163.45 × 72 ÷ 9	1307.60								
	163.45×2×3×0.25 ÷ 9		27.24							
	163.45×2×3×0.008 ÷ 9			0.87						
	163.45×40.84 ÷ 27				283.56					
	163.45×3 ÷ 9					54.48				
	163.45×2×3×0.33 ÷ 27						11.99			
	163.45×2							326.90		
	163.45×2×3×0.25 ÷ 27								9.08	
	WILLOW FREEWAY-SUPERELEVATED									
	LEFT HALF WIDTH SECTION 172.38 FT.									
	172.38 × 36 ÷ 9	689.52								
	172.38×(10+3)0.25 ÷ 9		62.25							
	172.38×(10+3)0.008 ÷ 9			1.99						
	172.38 × 26.74 ÷ 27				170.72					
	172.38 × 1.5 ÷ 9					28.13				
	172.38×(10.0+3.0)0.33 ÷ 27						27.71			
	172.38×1							172.38		
	172.38×(10+3)0.25 ÷ 27								20.75	
	WILLOW FREEWAY-SUPERELEVATED									
	RIGHT HALF WIDTH SECTION 427.55 FT.									
	427.55×36 ÷ 9	1710.20								
	427.55×(10+3)0.25 ÷ 9		154.39							
	427.55×(10+3)0.008 ÷ 9			4.94						
	427.55×27.96 ÷ 27				442.75					
	427.55×1.5 ÷ 9					71.26				
	427.55×(10.0+3.0)×0.33 ÷ 27						67.93			
	427.55×1							427.55		
	427.55×(10+3)0.25 ÷ 27								51.46	
	WILLOW FREEWAY-SUPERELEVATED									
	HALF WIDTH SECTION-LT. 427.55+RT. 172.38=599.93									
	599.93×36 ÷ 9	2399.72								
	599.93×3×0.25 ÷ 9		49.99							
	599.93×3×0.008 ÷ 9			1.60						
	[(427.55×23.55)+(172.38×23.29)] ÷ 27				521.61					
	599.93×1.5 ÷ 9					99.99				
	599.93×3×0.33 ÷ 27						219.97			
	599.93×1							599.93		
	599.93×3×0.25 ÷ 27								16.67	
5	WILLOW FREEWAY - NORMAL									
	FULL WIDTH SECTION 291.88 FT.									
	291.88 × 72 ÷ 9	2335.04								
	291.88×(10+4.91)2×0.35 ÷ 9		241.77							
	291.88×(10+4.91)2×0.008 ÷ 9			7.74						
	[(291.88×58.67)+(100×1.72)] ÷ 27				640.07					
	291.88 × 5 ÷ 9					162.16				
	{[291.88×(10.0+4.91)2×0.33]-[0.105×100]} ÷ 27						105.99			
	291.88 ×2							583.76		
	291.88×(10+4.91)2×0.25 ÷ 27								80.59	
	WILLOW FREEWAY - APPROACH SLABS									
	BRIDGE NO. CUY. 21-15.15									540.00
	BROADWAY AVE-APPROACH SLABS				90.00					
	BRIDGE NO. CUY. 21-14.08									
	SEE SHEET 55									
	SUB-TOTAL-WILLOW FREEWAY	13540.32	1006.09	32.19	3470.68		640.70	3385.08	335.37	
	TOTAL TO SHEET 14					670.16				540.00

SHEET	DESCRIPTION	T-71 9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT	T-31 BITUMINOUS SURFACE TREATMENT BITUMINOUS MATERIAL .25GAL./YD²	T-31 BITUMINOUS SURFACE TREATMENT NO. 6 AGGREGATE .008YD³/YD²	I-22 SUBBASE	B-19 AGGREGATE BASE COURSE	I-11 6"x18" SANDSTONE CURB	B-21 3" WATER PROOFED AGGREGATE BASE COURSE	I-13 4½" CONCRETE SIDEWALK
		SQ. YD.	GAL.	CU. YD.	CU. YD.	CU. YD.	LIN. FT.	CU. YD.	SQ. FT.
59	RAMP S-30-S 300.62 FT.								
	300.62×16 ÷ 9	534.44							
	300.62×(3+3)0.25 ÷ 9		50.10						
	300.62×(3+3)0.008 ÷ 9			1.60					
	300.62×12.0 ÷ 27				133.61				
	300.62×(3.0+3.0)0.33 ÷ 27					22.04			
	300.62×(3+3)0.25 ÷ 27							16.70	
	RAMP S-30-NORMAL WIDTH - 394.37 FT.								
	394.37×16 ÷ 9	701.10							
	394.37×(3+3)0.25 ÷ 9		65.73						
	394.37×(3+3)0.008 ÷ 9			2.10					
	394.37×12.0 ÷ 27				175.28				
	394.37×(3.0+3.0)0.33 ÷ 27					28.92			
	394.37×(3+3)0.25 ÷ 27							21.91	
	RAMP S-30-TRANSITION WIDTH - 267.33 FT.								
	[(200×20)+(67.33×24)] ÷ 9	623.99							
	267.33×(3+3)0.25 ÷ 9		44.56						
	267.33×(3+3)0.008 ÷ 9			1.43					
	[(200×14.0)+(67.33×16.0)] ÷ 27				143.60				
	267.33×(3.0+3.0)0.33 ÷ 27					19.60			
	267.33×(3+3)0.25 ÷ 27							14.85	
	RELOCATED ORANGE AVE. 122.54 FT.								
	122.54×28 ÷ 9	381.24							
	122.54[(28×5)+(5×25)] ÷ 27				64.11				
	122.54×2						245.08		
	122.54×5								612.70
	SUB TOTAL-RAMPS & REL. ORANGE AVE.	2240.77	160.39	5.13	516.60	70.56	245.08	53.46	612.70
	SUB TOTAL-WILLOW FREEWAY	13540.32	1006.09	32.19	3470.68	640.70	3385.08	335.37	
	TOTAL TO SHEET 14	15781.09	1166.48	37.22	3987.28	711.26		388.83	612.70
	TOTAL TO SHEET 13						3630.16		

CONT. No. 58019 SHEET ACCT. No. 6019

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

CALCULATIONS FOR ROADWAY & PAVEMENT QUANTITIES

SCALE DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ANJ GOH		GOH	3-69 GOH			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY— 21-(13.77) (14.94)

EXTRA AREA QUANTITIES

SHEET	LOCATION	T-71 9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT	T-35 ASPHALTIC CONCRETE SURFACE COURSE TYPE C	T-31 BITUMINOUS SURFACE TREATMENT BITUMINOUS MATERIAL 0.25 GAL/YD²	T-31 BITUMINOUS SURFACE TREATMENT No 6 AGGREGATE 0.008 TON/YD²	T-30 BITUMINOUS TACK COAT 0.10 GAL/YD²	I-22 SUBBASE	I-21 PORTLAND CEMENT CONCRETE TRAFFIC ISLAND PAVEMENT 4" DEPTH		B-19 AGGREGATE BASE COURSE	I-13 4½" CONCRETE SIDEWALK	I-12 CONCRETE CURB SPECIAL TYPE A	I-12 CONCRETE CURB SPECIAL TYPE B	I-11 6"×18" SANDSTONE CURB	B-21 3" WATER-PROOFED AGGREGATE BASE COURSE	B-70 PORTLAND CEMENT CONCRETE BASE COURSE	T-70 6" PORTLAND CEMENT CONCRETE PAVEMENT
		SQ. YD.	CU. YD.	GAL.	CU. YD.	GAL.	CU. YD.	SQ. YD.		CU. YD.	SQ. FT.	LIN. FT.	LIN. FT.	LIN. FT.	CU. YD.	CU. YD.	CU. YD.
65	RELOCATED ORANGE - RAMP S-30	2526	8	11	1	8	452	85		6	1659			1577	4	5	
66	RELOCATED ORANGE - RAMP 30-S	3004	4	63	2	6	555	192		6	2245			1206	21	12	
74	ROAD "C"	779					132				806			504			
74	ROAD "D"	1870					316				1596			835			2
64	RAMP S-30 - WILLOW FREEWAY	793		69 ✓	2 ✓		188 ✓	31		44 ✓				206	23 ✓		
64	RAMP 30-S - WILLOW FREEWAY	870		196	7		235	63		117 ✓		181	103		66 ✓		
30	WILLOW FREEWAY - RAMP 30-N						19							100			
	TOTAL TO SHEET 14	9842	12	339	12	14	1897	371		173	6306	181	103		114	17	2
	TOTAL TO SHEET 13													4428			

EARTHWORK & EROSION CONTROL

SHEET	DESCRIPTION	E-1 ROADWAY EXCAVATION METHOD B	ROADWAY EMBANKMENT		EROSION CONTROL L-9 SEEDING AND PROTECTING	EROSION CONTROL L-9 COMMERCIAL FERTILIZER 20 POUNDS/1000 S.F.	EROSION CONTROL L-9 AGRICULTURAL LIMING MATERIAL 100 POUNDS/1000 S.F.
		CU. YD.	CU. YD.		SQ. YD.	TONS	TONS
34	WILLOW FREEWAY	44,964	224		12,222		
37	WILLOW FREEWAY	118,464	0		13,056		
44	WILLOW FREEWAY	393	19,633		5,467		
47	WILLOW FREEWAY	3594	36,057		7,702		
49	WILLOW FREEWAY	427	50,415		8,543		
42	B-S RAMP	14,352	0		6,896		
58	ROAD "A"	1,426	172		1,940		
67	RAMP S-30	4,225	924		2,915		
70	RELOCATED ORANGE AVE.	9,839	1,710		7,102		
	DEDUCT FOR BASEMENTS IN CUT AREAS	- 2,961					
	ADD FOR BASEMENTS IN FILL AREAS		4,544				
	DEDUCT FOR PAV'T. REMOVAL, CUY. 21-13.77	- 1,563					
	TOTAL TO SHEET 14	193,160	113,679		65,843	6	30
	EXCAVATION AVAILABLE FROM ABOVE	193,160					
	PAV'T REMOVED AVAILABLE FOR FILL	3,078					
	EXCAV. FOR TEMP. RUN-AROUND	2,500					
	EXCESS EXCAVA. FROM STRUCT. ITEM E-2	4,620					
	TOTAL EMBANKMENT AVAILABLE	203,378					
	TOTAL EMBANKMENT REQ'D + 18%		134,141				
	TOTAL EXCESS EXCAVATION	69,237					

E-11 WATER

SHT.	DESCRIPTION	QUANTITY
		M. GAL.
12	ROADWAY EMBANKMENT: 134,141 x 5 ÷ 1000	671
14	B-19 : 1725 × 5 ÷ 1000	9
14	I-22 : 11,895 × 5 ÷ 1000	60
	TOTAL TO SHEET 14	740

E-1 COMPACTED SUBGRADE

SHT.	DESCRIPTION	QUANTITY
		SQ. YD.
14	B-21 AREA = 862 × 36/3 =	10,344
14	B-70 AREA = 262 × 36/8 =	1,179
14	E-7 AREA	854
14	E-11 AREA = 14,575 × .5 ÷ 9 =	810
14	I-12 TYPE "A" 181 × 1 ÷ 9 =	20
14	I-12 TYPE "B" = 338 × 12/8 ÷ 9 =	56
14	I-21 STD. TYPE 1 AREA	670
14	I-21 STD. TYPE 2 = 1874 LF × 6 × 9 =	1249
14	I-21 TRAFFIC ISLAND PAV'T AREA	464
14	T-70 AREA = 503 × 36/9	2,012
14	T-71 AREA	48,520
	TOTAL TO SHEET 14	66,178

CONT. No. 58019 SHEET ACCT. No. 6020

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

CALCULATIONS FOR ROADWAY & PAVEMENT QUANTITIES

SCALE DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
ARJ GOH		GOC	GOH JRG			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY— 21-(13.77) (14.94)

E-8 REMOVAL OF EXISTING CURB & SIDEWALK

SHEET	LOCATION CUY 21-14.94	SIDE	FROM	TO	LENGTH	SIDEWALK WIDTH	SIDEWALK: REMOVAL AND DISPOSAL OF EXISTING SIDEWALK	CURB: REMOVAL FOR RE-USE OF EXISTING CURB	CURB: REMOVAL AND DISPOSAL OF EXISTING CURB
					FT.	FT.	SQ. FT.	LIN. FT.	LIN. FT.
65	WOODLAND AVE.	S	E. 34 ST.	6+80.76	406	18	7308	406	
	E. 34 ST.	W	WOODLAND AVE	13+06	67	12	804	67	
66	ORANGE AVE.	N	14+00	E. 30 ST.	355	6	2130	355	
	ORANGE AVE.	S	14+00	E. 30 ST.	160	6	960	385	
	E. 31 ST.	E	9+60	ORANGE AVE.	16 & VARIES	6 & VARIES	124		
	E. 31 ST.	W	9+55	ORANGE AVE.	10 & VARIES	7 & VARIES	158		
	E. 31 ST.	E/W	9+61.72	ORANGE AVE.				34	
	E. 31 ST.	E/W	ORANGE AVE.	12+25	404	6	2424		
	E. 31 ST.	E/W	ORANGE AVE.	12+25				412	
	E. 30 ST.	E	9+57	ORANGE AVE.	30	6	180		
	E. 30 ST.	E	9+67.43	ORANGE AVE.				15	
	E. 30 ST.	E	ORANGE AVE.	10+54.97	45	6	270	50	
	E. 30 ST.	W	11+53	12+60	107	6	642		
74	ORANGE AVE	N	8+88.00	10+50	121	6	726	174	
	ORANGE AVE	S	7+99.17	10+50	210	6	1260	210	
	E. 34 ST.	W	7+21.21	8+20	99	7	693	99	
	E. 34 ST.	E	7+65	8+20	55	6	330	55	
	E. 34 ST.	W	ORANGE AVE.	11+66.79	133	6	798	133	
	E. 34 ST.	E	ORANGE AVE.	11+40±	117	9	1053	123	
	E. 32 ST.	E	8+00.39	9+40	140	6	840	140	
	E. 32 ST.	W	9+12.	9+40	28	6	168		
	E. 32 ST.	W	8+00.39	9+40				140	
	LOCATION CUY 21-13.77								
17	EXISTING SOUTH BOUND WILLOW	L	45+76.05	53+80.00 (SKEW)	805			805 *	
25	EXISTING B-S RAMP	L&R	1+49.80	8+84.57 (SKEW)	735			1506 *	
25	E. 45TH ST.	R	13+07	15+30	234	4.5	1053		
54	GALLUP AVE	L&R	10+23	11+50	127	5	(L) 625		(L&R) 260
	GALLUP AVE.	R	10+23	10+95	72	5	350		
	GALLUP AVE.	L	13+09	13+64	55	5	200		55
56	DOUSE AVE.	L&R	9+93	13+44.31	351	5	3385		702
	MARTIN AVE.	C&R	9+93	15+21.22	528	5	5230		1056
54	BROADWAY AVE.	L	1+50	7+25	763	8	6104		
	BROADWAY AVE	R	1+52	10+00	499	6	2994		730
	BROADWAY AVE.	L	1+65	7+25					450
25	ROSEVILLE CT.	R	9+58	10+03	13	4	156		45
26	EXIST. WILLOW	R	198+33.68	199+83.68				150 *	
	EXIST. WILLOW	R	45+76.05	2+94 (S-B RAMP)				754 *	
	TOTAL TO SHEET 14						40,965	6,013	3298

* CURB TO BE RESET ALONG WILLOW FWY. SOUTH OF BROADWAY AVE.

I-11

6"x18" SANDSTONE CURB & SANDSTONE CURB RESET

SANDSTONE CURB REQUIRED (SHEET 11)	3630 L.F.
SANDSTONE CURB REQUIRED (SHEET 12)	4428 L.F.
TOTAL	8058 L.F.
EXISTING CURB REMOVED FOR REUSE (SHEET 13)	6,013 L.F.
**I-11 SANDSTONE CURB RESET: 40% x 6013 =	2,405 L.F. TO SH. 14
I-11 SANDSTONE CURB REQ'D 8,058-2,405 = 5,653 L.F. TOTAL TO SH. 14	

** FIELD INSPECTED, ESTIMATED 40% WAS SAVAGABLE FOR REUSE

E-8 REMOVAL OF EXISTING PAVEMENT

	SHEET	LOCATION CUY-21-14.94	FROM	TO	LENGTH	PAVEMENT WIDTH	REMOVAL AND DISPOSAL OF EXISTING PAVEMENT
					FT.	FT.	SQ. YD.
*	65	WOODLAND AVE.	2+60.85	6+29.08	368.23	VARIABLE	1170
*		WOODLAND AVE.	6+58.76	6+80.76	22.00	2	5
		WOODLAND AVE.	5+04	5+23			14
*	66	E. 30 ST.	ORANGE AVE.	10+54.97	EXTRA	AREA	168
		ORANGE AVE.	14+00.00	18+44.35	444.35	36	1798
		E. 31 ST.	9+61.72	ORANGE AVE.	EXTRA	AREA	74
		E. 31 ST.	ORANGE AVE.	12+25.00	EXTRA	AREA	705
		E. 30 ST.	9+67.43	ORANGE AVE.	EXTRA	AREA	50
*	74	E. 34 ST.	7+21.21	8+20.00	98.79	38	417
		E. 34 ST.	ORANGE AVE.	11+66.79	EXTRA	AREA	720
		E. 32 ST.	8+00.39	9+40.00	139.61	32	496
		ORANGE AVE.	7+99.17	10+50.00	250.83	34	948
		LOCATION CUY21-13.77					
	26	EXISTING NORTH BOUND WILLOW	45+76.05	49+73.11	397.06	12	529
			49+73.11	51+67.00	193.89	24	517
			50+70.58	51+67.00	96.42	VARIABLE	95
	17	EX. SOUTH BOUND WILLOW	45+76.05	53+80.00	803.95	24	2144
		ACCELERATION LANE EXIST. RAMP	45+76.05	53+80.00	803.95	VARIABLE	1130
	25	EXISTING B-S RAMP	1+49.80	8+84.57 (SKEW)	734.77	24 & VARIES	2057
	54	GALLUP AVE.	10+23	11+50	127	28 & VARIES	413
		GALLUP AVE.	13+09	13+64	55	2	12
	56	DOUSE AVE.	9+93	13+44.31	351	24 & VARIES	943
		MARTIN AVE.	9+93	15+21.22	528	26 & VARIES	1539
*	54	BROADWAY AVE	1+98 (SKEW)	7+16 (SKEW)	518	46	2648
		BROADWAY AVE	7+65	7+85	20	3 (R. SIDE)	7
	25	ROSEVILLE CT.	9+82.64	9+91	8.4	0 TO 2	2
		TOTAL TO SHEET 14					18,601

* TRACK ITEMS MAY BE ENCOUNTERED WITH REMOVAL OF EXISTING PAVEMENT, SEE SHEET NO. 8 FOR TRACK LOCATIONS AND DESCRIPTION.

E-8 REMOVAL OF EXISTING WEARING COURSE

SHEET	LOCATION	FROM	TO	LENGTH	PAVEMENT WIDTH	REMOVAL AND DISPOSAL OF EXISTING WEARING COURSE
				FT.	FT.	SQ. YD.
65	WOODLAND AVE.	2+50.85	2+60.85	10	52	58
54	BROADWAY AVE.	1+92 (SKEW)	1+98 (SKEW)	3	89	30
	BROADWAY AVE.	7+16 (SKEW)	7+24 (SKEW)	3	129	43
	TOTAL TO SHEET 14					131

ITEM SPECIAL, Nº 6 AGGREGATE, AS PER PLAN
(See Reference (12) on Typical Sections)

Estimated Quantity carried to General Summary, Sheet 15 = 742 Cu. Yds.

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

CALCULATIONS
FOR
ROADWAY & PAVEMENT
QUANTITIES

SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
A.H.J.		G.O.C.	S.P.G.			

NO. 58019 SHEET ACCT. NO. 6021

GENERAL SUMMARY

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY— 21 — (13.77) (14.94)

ITEM	SHEET NUMBER 7	8	10-A	11	12	13	17	18	22	23	24	25	26	27	28	31	19	21	53	54	55	56	57	60	61	62	93	75	76	78	197	ITEM	TOTAL QUAN.	UNIT	CODE 7221 DESCRIPTION
																																			ROADWAY
E-1					193,160																										E-1	193,160	C.Y.	ROADWAY EXCAVATION, METHOD B AS PER PLAN
E-1					66,178																										E-1	66,178	S.Y.	COMPACTED SUBGRADE
CE-101.04		35																													CE-101.04	35	HRS.	COMPACTION USING HEAVY PNEUMATIC-TIRED ROLLER
E-8						18,601																					97	429	961		E-8	20,088	S.Y.	REMOVAL & DISPOSAL OF EXISTING PAVEMENT
E-8						131																									E-8	131	S.Y.	REMOVAL & DISPOSAL OF EXISTING WEARING COURSE
E-8						40,965																									E-8	40,965	S.F.	REMOVAL & DISPOSAL OF EXISTING SIDEWALK
E-8						3,298																									E-8	3,298	L.F.	REMOVAL & DISPOSAL OF EXISTING CURB
E-8						6,013										111															E-8	6,124	L.F.	REMOVAL FOR RE-USE OF EXISTING CURB
E-9		19																													E-9	19	EA.	REMOVAL OF TREES AND STUMPS
E-11					740																										E-11	740	M-GAL.	WATER
I-4																															I-4	100	M-GAL.	WATER FOR DUST CONTROL
I-8								1	1	3	1	2								1		2		5	2	4					I-8	22	EA.	MONUMENT ASSEMBLIES, STANDARD
I-8							1																								I-8	1	EA.	MONUMENT ASSEMBLIES ADJUSTED TO GRADE
Special																										1					SPECIAL	1	EA.	MOORING PILE AS PER PLAN
I-13				613	6,306							1,053				342					4,432		4,410								I-13	17,156	S.F.	4-1/2" PORTLAND CEMENT CONCRETE SIDEWALK, AS PER PLAN
I-15								364	1,321	1,194.5	568	162.5								100		300		479	150	37.5					I-15	4,676.5	L.F.	GUARD RAIL, STEEL BEAM STANDARD TYPE (DEEP)
I-15							1,247.7	439.8	596	775	399																				I-15	3,457.5	L.F.	GUARD RAIL, STEEL BEAM BARRIER TYPE (DEEP)
I-15							80					400																			I-15	480	L.F.	GUARD RAIL, REMOVED & REBUILT
I-15	2,000																														I-15	2,000	L.F.	GUARD RAIL, TEMPORARY
L-9					6																										L-9	6	TONS	COMMERCIAL FERTILIZER (12-12-12)
L-9					30																										L-9	30	TONS	AGRICULTURAL LIMING MATERIAL AS PER PLAN
L-9					65,843																										L-9	65,843	S.Y.	SEEDING AND PROTECTING
I-4																															I-4	7	TONS	CALCIUM CHLORIDE FOR DUST CONTROL
T-10	2																														T-10	100	C.Y.	TRAFFIC COMPACTED SURFACE COURSE
SPECIAL	100																												LUMP		SPECIAL	LUMP	LUMP	REMOVAL OF STORED MATERIAL AS PER PLAN
I-26																														9314	I-26	9314	L.F.	FENCE, GALVANIZED STEEL CHAIN LINK
I-26																														9	I-26	9	EA.	14' FENCE GATES, GALVANIZED STEEL CHAIN LINK
L-10																		715													L-10	715	S.Y.	SODDING
L-10																		143													L-10	143	S.Y.	SODDING FOR SPECIAL BERM & SLOPE PROTECTION, AS PER PLAN
L-120								399									266														L-120	665	S.Y.	JUTE MATTING
S-15			LUMP																LUMP												S-15	LUMP	LUMP	TEMPORARY RUN-AROUND ROAD USING CLASS A PAVEMENT AS PER PLAN
																																			PAVEMENT
B-21				389	114								75	134	150																B-21	862	C.Y.	WATERPROOFED AGGREGATE BASE COURSE
B-70					17																5							240			B-70	262	C.Y.	PORTLAND CEMENT CONCRETE BASE COURSE
B-19				712	173								207	330	303																B-19	1,725	C.Y.	AGGREGATE BASE COURSE
I-7				540																	314										I-7	854	S.Y.	REINFORCED CONCRETE APPROACH SLABS (T = 13")
I-11						5,653							826	1,046	855	843					742		1,342								I-11	11,307	L.F.	6" x 18" SANDSTONE CURB
I-11						2,405							763			100															I-11	3,268	L.F.	SANDSTONE CURB RESET
I-12					181																										I-12	181	L.F.	CONCRETE CURB, SPECIAL TYPE A, AS PER PLAN
I-12					103									235																	I-12	338	L.F.	CONCRETE CURB, SPECIAL TYPE B, AS PER PLAN
I-21				670																											I-21	670	S.Y.	4" PORTLAND CEMENT CONC. MEDIAN PAV'T, STD. TYPE 1, AS PER PLAN
I-21													109	108	108	11															I-21	336	C.Y.	PORTLAND CEMENT CONC. MEDIAN PAV'T, STD. TYPE 2, AS PER PLAN
I-21					371								33	11		49															I-21	464	C.Y.	4" PORTLAND CEMENT CONC. TRAFFIC ISLAND PAV'T, AS PER PLAN
I-22				3,988	1,897								1,587	1,481	1,446	317					200		722				16	81	160		I-22	11,895	C.Y.	SUBBASE; GRADING A OR B, AS PER PLAN
T-30					14																10								96		T-30	120	GAL.	BITUMINOUS TACK COAT: SEC. M-5.5, MS-2, OR RS-1; OR SEC. M-5.2, RC-1 OR RC-2, AS PER SEC. T-30.02
T-31				1,167	339								303	463	450	44															T-31	2,766	GAL.	BITUMINOUS SURFACE TREATMENT, BITUMINOUS MATERIAL
T-31				38	12								14	18	15	4															T-31	101	C.Y.	BITUMINOUS SURFACE TREATMENT, AGGREGATE
T-35					12																4								34		T-35	50	C.Y.	ASPHALTIC CONCRETE SURFACE COURSE, TYPE C (70-85)
T-70					2								131	149		133											24	64			T-70	503	C.Y.	PORTLAND CEMENT CONCRETE PAVEMENT, AS PER PLAN
T-71				15,781	9,842								5,300	6,275	6,375	1,467					1,136		2,173					171			T-71	48,520	S.Y.	9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT

CONT. No. 58019 SHEET ACCT. No. 6032

GENERAL SUMMARY

FED. RD. DIVISION	STATE	PROJECT	
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CUYAHOGA COUNTY
CUY— 21— (13.77) (14.94)

CONT. No. 58019 SHEET ACCT. No. 6322

ITEM	CODE Y060 SANITARY SEWER SHEET NUMBER 76	80	CODE 7221 COMBINATION SEWER SHEET NUMBER 56	75	76	82	CODE 7221 STORM SEWER SHEET NUMBER 9	18	19	21	23	24	56	77	78	95	93	13	ITEM	SANITARY CODE Y060	COMBINATION CODE 7221	STORM CODE 7221	TOTAL QUAN.	UNIT	DESCRIPTION
																									DRAINAGE
I-1										94		40							I-1			134	134	L.F.	6" PIPE CLASS A-1 SEC. M-6.6(b) OR M-6.8(b)
I-1								220	170	230	30		40						I-1			650	650	L.F.	6" PIPE OUTLET CLASS F-4
I-1								2703	3158	5975	464	761	829						I-1			13930	13930	L.F.	6" PIPE CLASS I-3
I-1															56				I-1			56	56	L.F.	8" PIPE CLASS A-1 SEC. M-6.8(b)
I-1										20		20				80			I-1			120	120	L.F.	8" PIPE CLASS F-4 SEC. M-6.4(c)
I-1				290					798	685	209	31	24		24				I-1		290	1771	2061	L.F.	12" PIPE CLASS A-1 SEC. M-6.6(a) OR SEC. M-6.8(b)
I-1									73	155			42						I-1			270	270	L.F.	12" PIPE CLASS A-1 SEC. M-6.6(b) OR SEC. M-6.8(b)
I-1									166	814	128								I-1			1108	1108	L.F.	12" PIPE CLASS E-1
I-1											48								I-1			48	48	L.F.	12" PIPE CLASS F-4
I-1									426	193									I-1			619	619	L.F.	15" PIPE CLASS A-1 SEC. M-6.6(a) OR SEC. M-6.8(b)
I-1									90	593									I-1			683	683	L.F.	15" PIPE CLASS A-1 SEC. M-6.6(b) OR SEC. M-6.8(b)
I-1									105										I-1			105	105	L.F.	15" PIPE CLASS E-1
I-1									138	127									I-1			265	265	L.F.	18" PIPE CLASS A-1 SEC. M-6.6(a) OR SEC. M-6.8(b)
I-1										35									I-1			35	35	L.F.	18" PIPE CLASS A-1 SEC. M-6.6(b) OR SEC. M-6.8(b)
I-1	987																		I-1	987			987	L.F.	18" PIPE CLASS A-1 SEC. M-6.6(c) SANITARY
I-1									135	133									I-1			268	268	L.F.	18" PIPE CLASS E-1
I-1									300										I-1			300	300	L.F.	24" PIPE CLASS A-1 SEC. M-6.6(a) OR SEC. M-6.8(b)
I-1		946																	I-1	946			946	L.F.	24" PIPE CLASS A-1 SEC. M-6.8(a) SANITARY ENCASED AS PER PLAN
I-1			336						190										I-1		336	190	526	L.F.	27" PIPE CLASS A-1 SEC. M-6.6(b) OR SEC. M-6.8(b)
I-1									207										I-1			207	207	L.F.	30" PIPE CLASS A-1 SEC. M-6.6(a) OR SEC. M-6.8(b)
I-1			292						141										I-1		292	141	433	L.F.	30" PIPE CLASS A-1 SEC. M-6.6(b) OR SEC. M-6.8(b)
I-1						1147			259										I-1		1147	259	1406	L.F.	42" PIPE CLASS A-1 SEC. M-6.6(b)
I-1									75										I-1			75	75	L.F.	42" PIPE CLASS B-1 SEC. M-6.6(c)
I-1					88														I-1		88		88	L.F.	48" PIPE CLASS A-1 SEC. M-6.6(b)
I-1									292										I-1			292	292	L.F.	48" PIPE CLASS A-1 SEC. M-6.6(d)
I-1					271				35										I-1		271	35	306	L.F.	54" PIPE CLASS A-1 SEC. M-6.6(b)
Special														861					Special			861	861	L.F.	60" DIA. TUNNEL SECTION AS PER PLAN
I-1														336	1214				I-1			1550	1550	L.F.	72" PIPE CLASS A-1 SEC. M-6.6(b)
Special															151				Special			151	151	L.F.	72" DIA. TUNNEL SECTION UNDER RAILROAD AS PER PLAN
I-1																800			I-1			800	800	L.F.	6" INTERCEPTING DRAINS CLASS I-3 SEC. M-6.4(h)
I-5																8			I-5			8	8	EA.	6" PIPE SPECIALS SEC. M-6.4(h), Class I-3
I-5								2	1	11		4	1						I-5			19	19	EA.	6" PIPE SPECIALS CLASS I-3
I-6														70					I-6			70	70	L.F.	RELAYING 8" CAST IRON PIPE AS PER PLAN
Special		620																	Special	620			620	L.F.	60" DIA. TUNNEL SECTION UNDER RAILROAD, SANITARY, AS PER PLAN
I-8									12	2	2	1							I-8			17	17	EA.	PAVED SHOULDER INLET STD. NO. 2-6
I-8									4										I-8			4	4	EA.	PAVED SHOULDER INLET STD. NO. 2-8
I-8									5	1									I-8			6	6	EA.	PAVED SHOULDER INLET STD. NO. 2-10
I-8									1										I-8			1	1	EA.	PAVED SHOULDER INLET STD. NO. 2-14
I-8										6									I-8			6	6	EA.	CATCH BASIN STD. NO. 2-2-A MODIFIED AS PER PLAN
I-8										1									I-8			1	1	EA.	CATCH BASIN STD. NO. 2-2-B
I-8										3									I-8			3	3	EA.	CATCH BASIN STD. NO. 3
I-8										11			2						I-8			13	13	EA.	CATCH BASIN STD. NO. 3-A
I-8									6										I-8			6	6	EA.	CATCH BASIN STD. NO. 5
I-8										1									I-8			1	1	EA.	CATCH BASIN STD. NO. 6
I-8										1									I-8			1	1	EA.	CATCH BASIN ADJUSTED TO GRADE
I-8				2						12	2								I-8		2	14	16	EA.	MANHOLE STD. NO. 1 W/SPEC. FRAME & COVER AS PER PLAN
I-8		1		1					1										I-8	1	1	1	3	EA.	MANHOLE STD. NO. 2 W/SPEC. FRAME & COVER AS PER PLAN
I-8	3	2	5		3					2									I-8	5	8	2	15	EA.	MANHOLE STD. NO. 2 W/SPEC. FRAME & COVER W/O DROP AS PER PLAN
I-8									1										I-8			1	1	EA.	MANHOLE STD. NO. 3-A
I-8									2	2									I-8			4	4	EA.	MANHOLE SPECIAL TYPE "A" AS PER PLAN
I-8						7			5										I-8		7	5	12	EA.	MANHOLE SPECIAL TYPE "B" AS PER PLAN
I-8														2	5				I-8			7	7	EA.	MANHOLE SPECIAL TYPE "C" AS PER PLAN
I-8		2							1	3									I-8	2		4	6	EA.	JUNCTION MANHOLE AS PER PLAN
I-8					1														I-8		1		1	EA.	INTERCEPTING MANHOLE AS PER PLAN
I-8	1								1										I-8	1		1	2	EA.	BAFFLE MANHOLE AS PER PLAN
I-8									1	1									I-8			2	2	EA.	MANHOLE ADJUSTED TO GRADE
I-8							5												I-8			5	5	EA.	MANHOLE FRAME & COVER AS PER PLAN
I-8															1				I-8			1	1	EA.	SPECIAL CONNECTING NEW SEWER USING DROP PER #2 MH
Special																	742		Special			742	742	C.Y.	NO. 6 AGGREGATE AS PER PLAN
I-9							300												I-9			300	300	L.F.	STONE UNDERDRAIN NO. 2
I-14										100									I-14			100	100	L.F.	PAVED GUTTER SPECIAL TYPE "A" AS PER PLAN
I-16									2	19									I-16			21	21	EA.	CATCH BASIN ABANDONED, AS PER PLAN
I-16				1					5	7									I-16		1	12	13	EA.	MANHOLE ABANDONED, AS PER PLAN
S-24									LUMP										S-24			LUMP	LUMP	LUMP	REMOVAL OF EXISTING STRUCTURES
E-2																	300		E-2			300	300	C.Y.	EXCAVATION FOR STRUCTURES, UNCLASSIFIED
S-1																	29		S-1			29	29	C.Y.	CONCRETE FOR STRUCTURES, CLASS "C"
S-4																	3735		S-4			3735	3735	LBS.	REINFORCING STEEL
S-7																	2600		S-7			2600	2600	LBS.	STRUCTURAL STEEL(INCLUDING FIELD WELDING)
S-7																	LUMP		S-7			LUMP	LUMP	LUMP	BURN, REMOVE, AND DISPOSE OF EXIST. SHEET PILING

GENERAL SUMMARY

		SHEET NO.	ITEM	TOTAL QUAN.	UNIT	DESCRIPTION
		107				
						CODE Y060 WATERWORK
		111	Special	111	L.F.	6" CEMENT LINED CAST IRON PIPE & FITTINGS
		2158	"	2158	L.F.	8" CEMENT LINED CAST IRON PIPE & FITTINGS
		68	"	68	L.F.	12" CEMENT LINED CAST IRON PIPE & FITTINGS
		160	"	160	L.F.	16" CEMENT LINED CAST IRON PIPE & FITTINGS
		150	"	150	L.F.	12" EXTRA HEAVY GALVANIZED WROUGHT IRON or DUCTILE IRON PIPE
		452	"	452	L.F.	16" EXTRA HEAVY GALVANIZED WROUGHT IRON or DUCTILE IRON PIPE
		3	"	3	EACH	FLUSHING PIPE AND VALVE FURNISHED AND INSTALLED
		1	"	1	EACH	6"x6" BRANCH SLEEVE AND VALVE
		7	"	7	EACH	6" VALVE
		6	"	6	"	6" INSERTING VALVE
		7	"	7	"	8" VALVE
		1	"	1	"	8" INSERTING VALVE
		1	"	1	"	8"x8" BRANCH SLEEVE AND VALVE
		1	"	1	EACH	16" VALVE
		2	"	2	EACH	16"x8" BRANCH SLEEVE AND VALVE
		8	"	8	EACH	NO.2 VALVE BOX, AS PER PLAN
		17	"	17	"	NO.3 VALVE BOX, AS PER PLAN
		1	"	1	EACH	NO.4 VALVE BOX, AS PER PLAN
		3	"	3	"	NO.7 VALVE BOX, AS PER PLAN
		7	"	7	EACH	PLUGGING EXIST. 6" MAINS
		2	"	2	"	PLUGGING EXIST. 8" MAINS
		11	"	11	EACH	RECONNECTING EXIST. HOUSE CONNECTIONS
		32	"	32	"	PLUGGING EXIST. HOUSE CONNECTIONS AT MAIN
		7	"	7	EACH	FURNISHING AND SETTING 6" HYDRANTS AS PER PLAN
		8	"	8	EACH	4" HYDRANT REMOVED
		2	"	2	EACH	4" VALVE AND VALVE BOX REMOVED
		1	"	1	EACH	6" HYDRANT REMOVED
		2	"	2	EACH	6" VALVE AND VALVE BOX REMOVED
		1	"	1	EACH	8" VALVE AND VALVE BOX REMOVED
						B-5 RAMP RETAINING WALL, SEE SHEET 178
						ELECTRICAL
			S-25			ELECTRICAL EQUIPMENT, SEE SHEET 129
						STRUCTURES OVER 20 FEET
						BRIDGE NO. CUY-21-14 04, SEE SHEET 146
						BRIDGE NO. CUY-21-15 15, SEE SHEET 180
				Lump	Lump	Construction Layout Stakes
			I-3	Lump	Lump	Maintaining Traffic

GENERAL SUMMARY (CONT'D)

PARCEL NO.	ITEM	TOTAL QUAN.	UNIT	DESCRIPTION
822-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 2 STORY FRAME RESIDENCE AND STORE (1) CONCRETE BLOCK GARAGE
852-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 2-1/2 STORY BRICK BUILDING (1) 1 STORY CONCRETE BLOCK GARAGE (1) 3 STORY BRICK BUILDING AND GARAGE
855-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 1 STORY BRICK BUILDING (1) 1 STORY CONCRETE BUILDING (1) 1 STORY BRICK BUILDING
856-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 2 STORY BRICK BUILDING (1) 1 STORY BRICK BUILDING
871-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 3 STORY BRICK BUILDING (FIRE HOUSE)
904-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 2 STORY BRICK BUILDING
913-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 1 STORY BRICK BUILDING (1) 2 STORY FRAME RESIDENCE
915-LA	E-10	LUMP	LUMP	REMOVAL OF (2) 1 STORY BRICK COMMERCIAL BUILDINGS
921-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 1-1/2 STORY FRAME RESIDENCE AND SHED
926-LA	E-10	LUMP	LUMP	REMOVAL OF (2) 1 STORY BRICK BUILDINGS (COMMERCIAL
1512-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 1 STORY BRICK BUILDING (1) 2-1/2 STORY FRAME RESIDENCE (1) 1-1/2 STORY FRAME GARAGE
1551-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 2-1/2 STORY FRAME BUILDING (1) 3 STORY FRAME BUILDING WITH FIRST STORY BRICK FRONT (1) 1 STORY CONCRETE BLOCK BUILDING (3) 1 STORY BRICK BUILDINGS (1) BRICK GARAGE (1) 2 STORY FRAME HOUSE
1552-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 2 STORY FRAME RESIDENCE AND STORE (1) 1 STORY CONCRETE BLOCK BUILDING
1559-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 2 STORY FRAME RESIDENCE (1) FRAME GARAGE (1) FRAME SHED
1560-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 1-1/2 STORY FRAME RESIDENCE (1) 1 STORY FRAME RESIDENCE (1) SHED
1564-WD	E-10	LUMP	LUMP	REMOVAL OF (1) 1-1/2 STORY-1 STORY FRAME RESIDENCE (1) 1-1/2 STORY FRAME RESIDENCE
1565-WL	E-10	LUMP	LUMP	REMOVAL OF (1) 1-1/2 STORY-1 STORY FRAME RESIDENCE (1) FRAME THREE CAR GARAGE (1) SHED
1567-WD	E-10	LUMP	LUMP	REMOVAL OF (1) 2-1/2 STORY FRAME RESIDENCE (1) FRAME GARAGE
1569-WD	E-10	LUMP	LUMP	REMOVAL OF (1) 1-1/2 STORY-1 STORY FRAME RESIDENCE (2) SHEDS
1602-LA	E-10	LUMP	LUMP	REMOVAL OF (1) 2 STORY FRAME RESIDENCE (1) FRAME GARAGE
1611-WL	E-10	LUMP	LUMP	REMOVAL OF (1) 2 STORY FRAME RESIDENCE (1) FRAME GARAGE (1) SHED
1613-WD	E-10	LUMP	LUMP	REMOVAL OF (1) 2 STORY FRAME RESIDENCE (1) 1 STORY FRAME RESIDENCE
1616-WD	E-10	LUMP	LUMP	REMOVAL OF (1) 1-1/2 STORY FRAME RESIDENCE (REAR)
1617-WD	E-10	LUMP	LUMP	REMOVAL OF (1) 2 STORY FRAME RESIDENCE (1) FRAME TWO CAR GARAGE
1653-WL	E-10	LUMP	LUMP	REMOVAL OF (1) 1 STORY BRICK TAVERN
1655-WL	E-10	LUMP	LUMP	REMOVAL OF (1) 2-1/2 STORY FRAME RESIDENCE (1) 2-1/2 STORY FRAME BARN (1) FRAME THREE CAR GARAGE (1) CONCRETE BLOCK THREE CAR GARAGE

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FED. RD. DIVISION	STATE	PROJECT	
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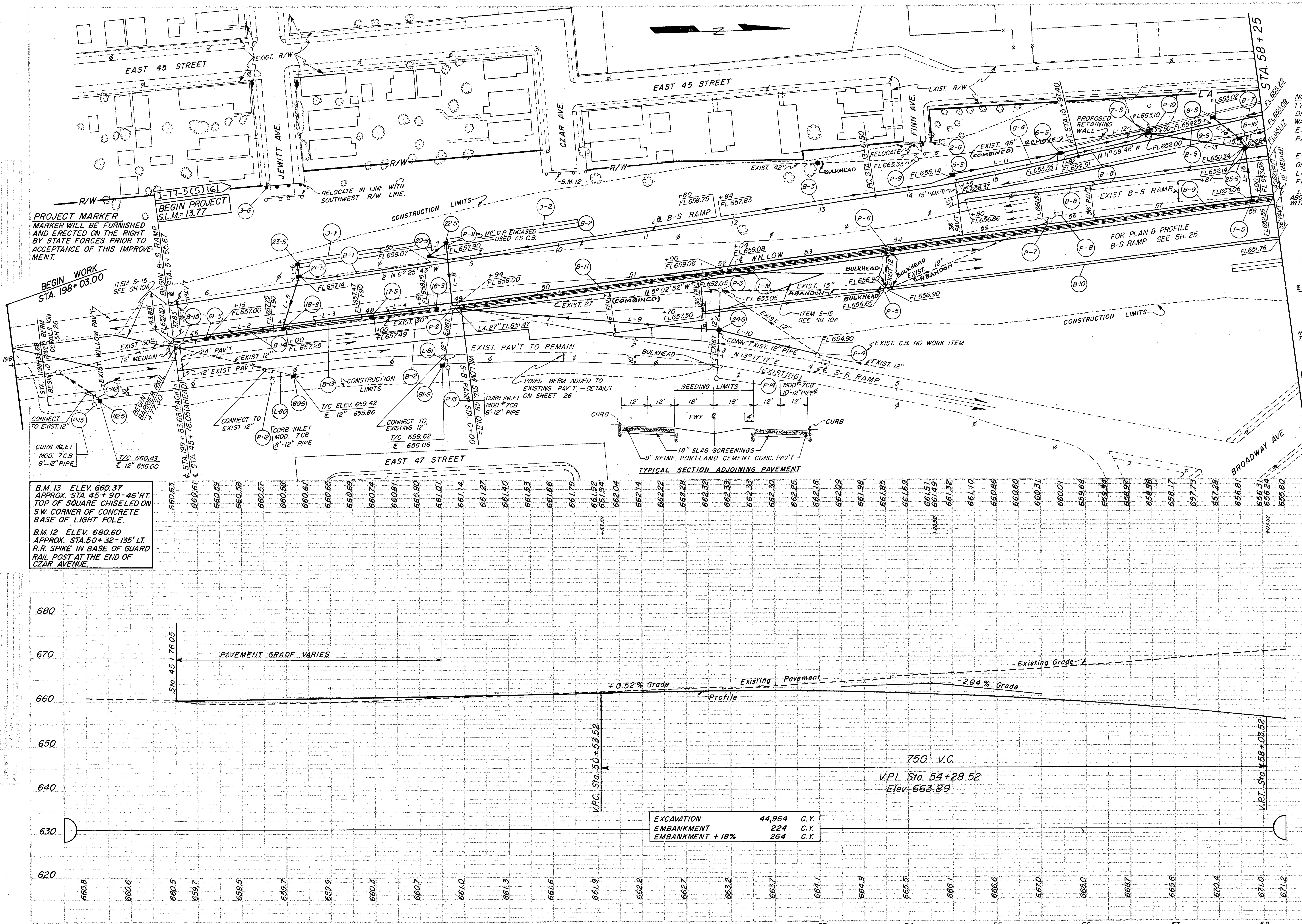
CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

NOTES:
- TYPICAL SECTION . . . . SEE SHEET . 3
- DRAINAGE QUANTITIES . . 19 . . . SEWER PROFILES . . 83&84
- WATERWORK PLAN 108
- EXISTING UTILITIES . . . . 121 TO 125
- PAVEMENT DETAILS & QUANTITIES . . . . 26 & 27
- E-8 REMOVAL ITEMS 13
- GRADING PLAN & CROSS SECTION KEY PLAN . . 32 & 33
- LIGHTING PLAN . . . . 126 & 127
- FENCE LOCATION . . . . 197 & 198

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



B.M. 13 ELEV. 660.37
APPROX. STA. 45+90-46' RT. TOP OF SQUARE CHISELED ON S.W. CORNER OF CONCRETE BASE OF LIGHT POLE.

B.M. 12 ELEV. 680.60
APPROX. STA. 50+32-135' LT. R.R. SPIKE IN BASE OF GUARD RAIL POST AT THE END OF CZAR AVENUE.

EXCAVATION	44,964	C.Y.
EMBANKMENT	224	C.Y.
EMBANKMENT + 18%	264	C.Y.

ROADWAY & PAVEMENT QUANTITIES

REFERENCE NO.	LOCATION	SIDE	I-8 MONUMENT ASSEMBLY USING SALVAGED FRAME & COVER (EACH)	I-15 GUARD RAIL, REMOVED & REBUILT (L.F.)	I-15 GUARD RAIL, STEEL BEAM BARRIER TYPE (DEEP) (L.F.)
1-M	STA. 52+31.71	℄	1		
1-G	STA. 45+77.30 TO STA. 58+25	℄			1247.70
2-G	FINN AVE.			40	
3-G	JEWITT AVE.			40	
TOTALS			1	80	1247.70

PLAN & PROFILE STA. 45+76.05 TO STA. 58+25

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CUYAHOGA COUNTY
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NOTES:

DRAINAGE QUANTITIES

MARK NO.	LOCATION	I-1 6" UNDERDRAIN CLASS 1-3	I-1 6" OUTLET PIPE CLASS F-4	I-5 6" - 60° BEND	I-5 6" TEE	L-120 JUTE MATTING Sq. Yd.
B-17	B-S RAMP 19+55 TO 23+75	400	20	1		
B-18	B-S RAMP 18+08 TO 19+65	147	10			
B-19	B-S RAMP 18+09 TO 22+60	441	10			
B-20	WILLOW 58+25 TO 59+25	90	10			
B-21	WILLOW 59+25 TO 61+25	180	20			
B-22	WILLOW 61+25 TO 62+00	55	20			
B-23	WILLOW 62+00 TO 62+73	63	10			
B-24	WILLOW 62+67 TO RAMP W-S 23+75	150	20			
B-25	WILLOW 63+10 TO 64+50	120	20			
B-26	WILLOW 61+50 TO 63+06	146	10			
B-27	WILLOW 60+04 TO 61+50	136	10			
B-28	WILLOW 58+25 TO 60+00	155	20			
B-29	WILLOW 58+25 TO 59+25	100	10	1		
B-30	RAMP S-E 0+15 TO 5+35	520	30		1	
J-3	WILLOW 57+73 TO 59+23					133
J-4	B-S RAMP 19+57 TO 21+07					133
J-5	WILLOW 62+02 TO 63+52					133
	TOTALS	2703	220	1	1	399

ROADWAY & PAVEMENT QUANTITIES

REFERENCE NO.	LOCATION	SIDE	1-8 MONUMENT ASSEMBLIES EACH	1-15 GUARD RAIL, STD. TYPE (DEEP) STEEL BEAM L.F.	1-15 GUARD RAIL, STEEL BEAM BARRIER TYPE (DEEP) L.F.
1-M	STA. 59+19.51	℄	1		314.80
1-G	STA. 58+25 TO STA. 61+39.80	℄		364	
2-G	STA. 61+39.80 TO STA. 63+20.90	L. & R.			125.00
3-G	STA. 63+20.90 TO STA. 64+45.90	℄			
	TOTALS		1	364	439.80

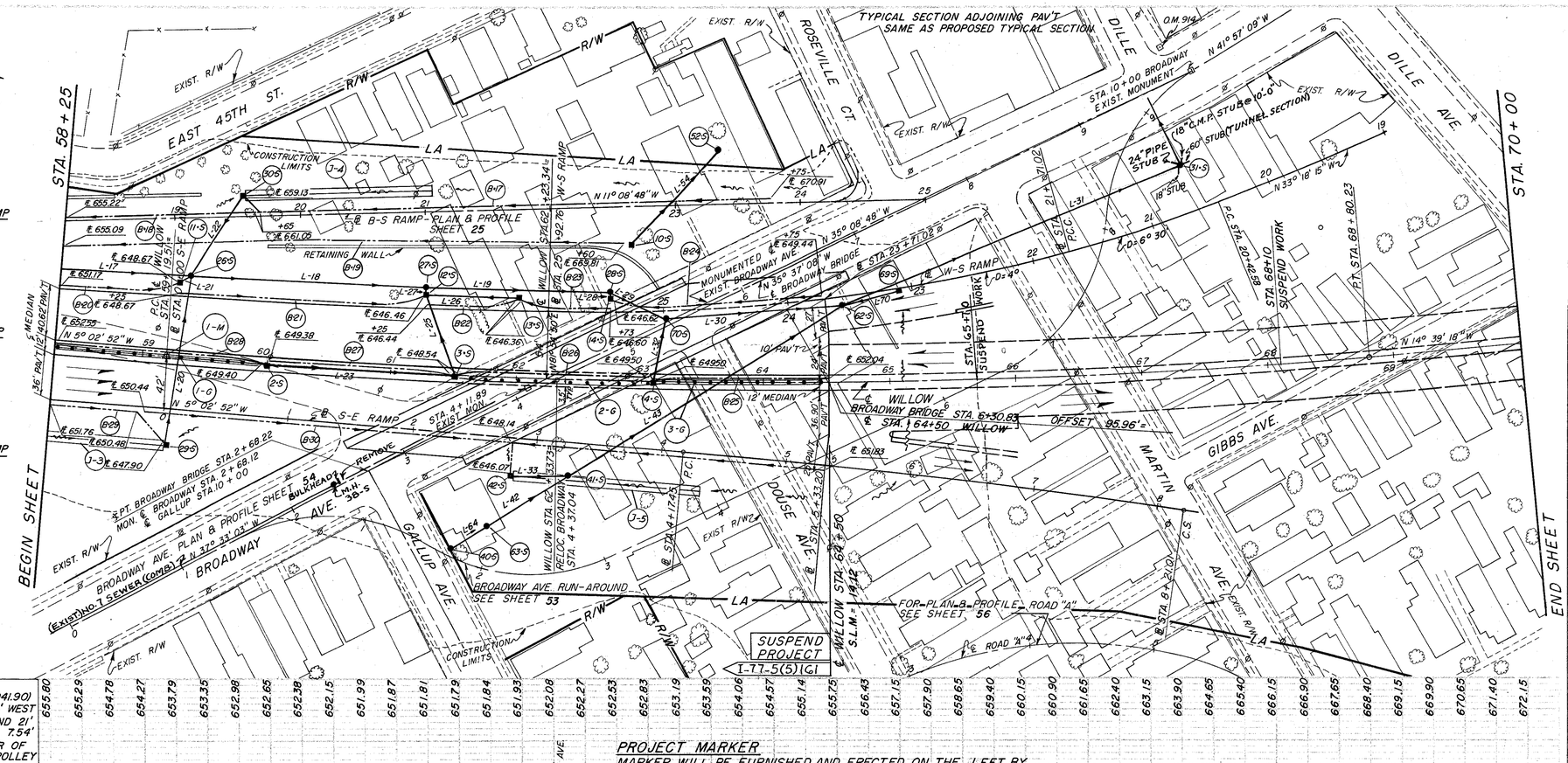
BENCH MARK
O.M. 914 (N-8128483)-(E-9494190)
ELEV. 674.095 APPROX. 28' WEST OF THE ℄ OF BROADWAY AND 21' NORTH OF THE ℄ OF DILLE. 7.54' SOUTHEAST OF S.E. CORNER OF BLDG. 7.46' S.W. OF IRON TROLLEY POLE #23/129.

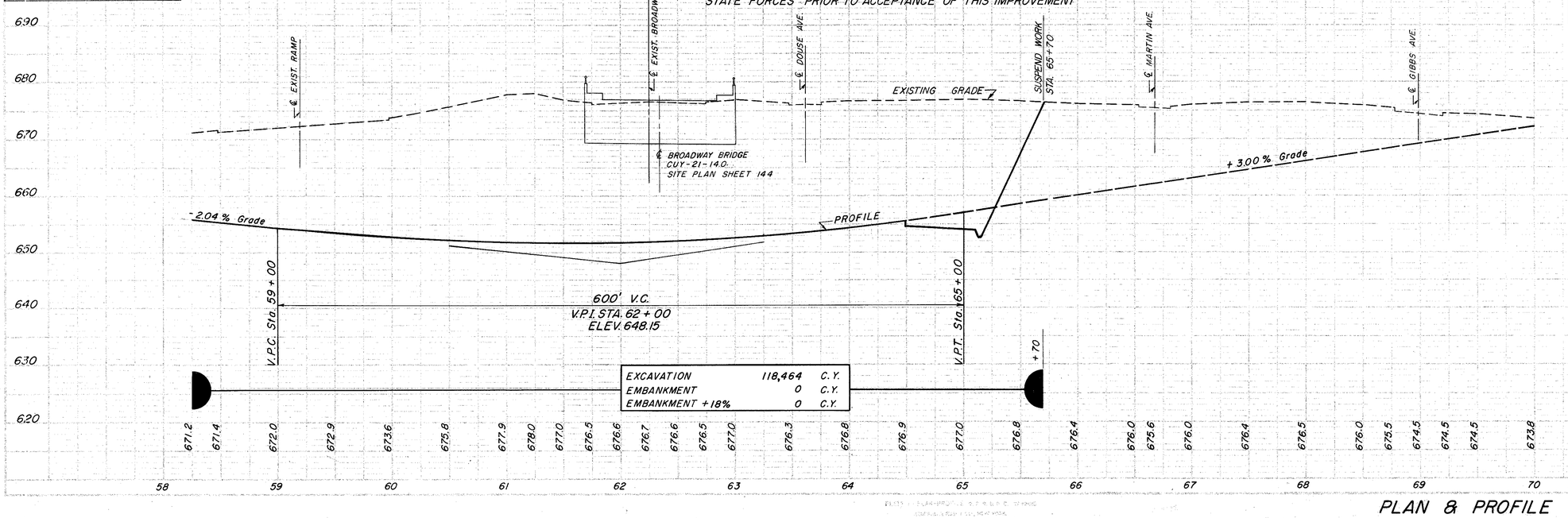
CURVE DATA - ℄ WILLOW
P.I. STA. 64 + 01.00
Δ = 9° 36' 26"
D = 1° 00' 00"
R = 5,729.58'
T = 481.49'
L = 960.72'
e = 0.024 FT./FT.

CURVE DATA - ℄ W-S RAMP
P.I. STA. 23 + 83.42
Δ = 16° 52' 10"
D = 4° 00' 00"
R = 1,432.39'
T = 212.40'
L = 421.74'
e = 0.42 FT./FT.

CURVE DATA - ℄ W-S RAMP
P.I. STA. 21+06.91
Δ = 8° 20' 55"
D = 6° 30' 00"
R = 881.47'
T = 64.33'
L = 128.44'
e = 0.42 FT./FT.

CURVE DATA - ℄ S-E RAMP
P.I. STA. 6+19.31
Δ = 4° 02' 08"
D = 1° 00' 00"
R = 5,729.58'
T = 201.86'
L = 403.56'
e = 0.017 FT./FT.





PLAN & PROFILE STA. 58 + 25 TO STA. 70 + 00

SUMMARY OF DRAINAGE QUANTITIES

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

19
204

CUYAHOGA COUNTY
CUY— 21—(13.77)—(14.94)

SHEET No.	MARK No.	LOCATION	I-8 PAVED SHOULDER INLET STD. 2-6 EACH	I-8 PAVED SHOULDER INLET STD 2-8 EACH	I-8 PAVED SHOULDER INLET STD. 2-10 EACH	I-8 PAVED SHOULDER INLET STD. 2-14 EACH	I-8 CATCH BASIN STD #5 EACH	I-8 MANHOLE STD # 5-A EACH	I-8 MANHOLE SPECIAL TYPE A AS PER PLAN EACH.	I-8 MANHOLE SPECIAL TYPE B AS PER PLAN EACH	I-8 BAFFLE MANHOLE AS PER PLAN EACH	I-8 JUNCTION MANHOLE AS PER PLAN EACH	I-8 MANHOLE STD #2 W/SPECIAL FRAME & COVER PLAN EACH
17	1-S	WILLOW STA. 58+00	1										
	5-S	Ramp B-S STA. 14+50			1								
	6-S	Ramp B-S STA. 15+75			1								
	7-S	Ramp B-S STA 16+75	1										
	8-S	Ramp B-S STA. 17+50	1										
	9-S	Ramp B-S STA. 17+75		1									
	16-S	Willow ℄ STA. 48+75	1										
	17-S	Willow ℄ STA. 48+00	1										
	18-S	Willow ℄ STA. 47+00	1										
	19-S	Willow ℄ STA 46+12						1					
	20-S	Willow LT. STA. 48+75	1										
	21-S	Willow LT. STA. 47+25	1										
	22-S	Willow 72' LT. STA. 48+92					1						
	23-S	Willow 72' LT STA. 47+25					1						
	24-S	Willow 67' Rt. STA. 51+87							1				
	25-S	Willow 63' LT. STA. 58+00							1				
	80-S	Willow RT STA. 47+05	1										
	81-S	Willow RT. STA. 48+72	1										
	82-S	Willow RT.	1										
		TOTAL SHEET 17	11	1	2		2	1	2				
18	2-S	Willow ℄ STA. 60+00		1									
	3-S	Willow ℄ STA 61+50		1									
	4-S	Willow ℄ STA. 63+10			1								
	10-S	Ramp B-S STA. 22+65	1										
	11-S	Willow LT STA. 59+25			1								
	12-S	Willow LT. STA. 61+25			1								
	13-S	Willow LT. STA 62+00		1									
	14-S	Willow LT STA 62+67				1							
	26-S	Willow 68' LT. STA. 59+35							1				
	27-S	Willow 72' LT STA. 61+25							1				
	28-S	Willow 74' LT. STA. 62+67							1				
	29-S	Willow RT. STA. 59+25					1						
	30-S	Ramp B-S STA. 19+55					1						
	31-S	Ramp W-S 35' RT. STA. 20+60								1			
	41-S	Willow 70' Rt. STA. 62+45							1				
	42-S	Willow 76' Rt. STA. 62+00					1						
	62-S	W-S Ramp 6' LT. STA 23+57								1			
	63-S	Gallup 65' LT. STA 10+81									1		
	69-S	W-S Ramp					1						
	70-S	W-S Ramp 6' LT. STA 24+97							1				
		TOTAL SHEET 18	1	3	3	1	4		5	1	1	1	
		TOTAL QUANTITIES TO SH. 15	12	4	5	1	6	1	2	5	1	1	1

SHEET No.	MARK No.	LOCATION	I-1 6" UNDERDRAIN CLASS I-3 LIN. FT.	I-1 6" OUTLET CLASS F-4 LIN. FT.	I-5 6"-60° BEND EACH	L-120 JUTE MATTING SQ. YD.	I-16 MANHOLE ABANDONED EACH	I-16 INLETS ABANDONED EACH	S-24 REMOVAL OF EXIST. STRUCTURES EACH	I-8 MANHOLE ADJUSTED TO GRADE EACH
17	P-3	Willow 18' RT STA. 51+92					1			
	P-5	Willow 42' Rt. STA. 53+77					1			
	P-6	Willow ℄ STA. 53+85						1		
	P-7	Willow 7' LT. STA. 55+72					1			
	P-8	Willow 14' LT. STA. 55+80						1		
	P-9	B-S Ramp 34' LT. STA. 14+15					1			
	P-10	B-S Ramp 9' LT. STA. 16+86					1			
	P-11	Willow 71' LT. STA. 48+92							1	
	P-2	Willow ℄ STA. 48+92								1
	B-1	Ramp B-S STA. 7+05 To 8+55	140	10						
	B-2	Ramp B-S STA. 8+55 To 11+00	305	20						
	B-3	Ramp B-S STA. 11+84 To 14+50	256	10						
	B-4	Ramp B-S STA. 14+55 To 15+78	113	10						
	B-5	Ramp B-S STA. 15+82 To 16+76	84	10						
	B-6	Ramp B-S STA. 16+76 To 17+50	64	10						
	B-7	Ramp B-S STA. 17+52 To 18+08	46	10						
	B-8	Willow STA 54+80 To 58+25	336	20	1					
	B-9	Willow STA. 52+04 To 58+25	607	10						
	B-10	Willow STA. 51+70 To 58+25	655							
	B-11	Willow STA. 48+92 To 52+00	298	10						
	B-12	Willow STA. 48+00 To 48+66	56	10						
	B-13	Willow STA. 47+00 To 47+90	80	10						
	B-14	Willow STA. 46+15 To 46+90	65	10						
	B-15	Willow STA. 45+76 To 46+18	29	10						
	B-16	Ramp B-S 17+75 To 18+05	24	10						
	J-1	STA. 47+25 To 48+75				133				
	J-2	STA. 48+92 To 50+42				133				
	P-12	Willow RT STA. 46+80								1
	P-13	Willow RT STA. 48+79								1
	P-14	Willow RT STA. 51+77								1
	P-15	Willow RT.								1
		TOTAL SHEET 17	3158	170	1	266	5	2	5	1
		TOTAL QUANTITIES TO SH. 15	3158	170	1	266	5	2	5	1

Put Sheet 14

SHEET No.	MARK No.	LOCATION	FROM	TO	I-1 12" PIPE CLASS A-1 SEC. M-6.6(B) LIN. FT.	I-1 15" PIPE CLASS A-1 SEC. M-6.6(B) LIN. FT.	I-1 18" PIPE CLASS A-1 SEC. M-6.6(B) LIN. FT.	I-1 24" PIPE CLASS A-1 SEC. M-6.6(B) LIN. FT.	I-1 30" PIPE CLASS A-1 SEC. M-6.6(B) LIN. FT.	I-1 42" PIPE CLASS A-1 SEC. M-6.6(B) LIN. FT.	I-1 48" PIPE CLASS A-1 SEC. M-6.6(B) LIN. FT.	I-1 54" PIPE CLASS A-1 SEC. M-6.6(B) LIN. FT.	I-1 42" PIPE CLASS B-1 SEC. M-6.6(B) LIN. FT.	I-1 15" PIPE CLASS E-1 LIN. FT.	I-1 18" PIPE CLASS E-1 LIN. FT.	I-1 23" PIPE CLASS A-1 SEC. M-6.6(B) M-6.6(B) LIN. FT.	I-1 15" PIPE CLASS A-1 SEC. M-6.6(B) M-6.6(B) LIN. FT.	I-1 12" PIPE CLASS A-1 SEC. M-6.6(B) M-6.6(B) LIN. FT.	I-1 36" PIPE CLASS A-1 SEC. M-6.6(B) M-6.6(B) LIN. FT.	I-1 12" PIPE CLASS E-1 LIN. FT.
17	L-2	WILLOW	18-S	19-S		88															
	L-3	WILLOW	17-S	18-S	100																
	L-4	WILLOW	16-S	17-S	75																
	L-5	WILLOW	21-S	18-S		58															
	L-6	WILLOW LT.	23-S	21-S										12							
	L-7	WILLOW LT.	20-S	22-S																	18
	L-8	WILLOW	22-S	P-2		70															
	L-9	WILLOW RT.	24-S	P-2				300													
	L-10	WILLOW RT.	P-4	24-S																	108
	L-11	WILLOW LT.	5-S	6-S	125																
	L-12	WILLOW LT.	6-S	7-S		100															
	L-13	B-S RAMP	7-S	25-S		110															
	L-14	B-S RAMP	8-S	9-S	36																
	L-15	WILLOW LT.	9-S	25-S																	14
	L-16	WILLOW	1-S	25-S	63																
	L-80	WILLOW RT	80-S	EXIST 12"	30																
	L-81	WILLOW RT.	81-S	EXIST 12"	11																
	L-82	WILLOW RT.	82-S	EXIST 18"	14																
		TOTAL SHEET 17			454	426		300						12							140
18	L-17	WILLOW LT.	25-S	26-S											135						
	L-18	WILLOW LT.	26-S	27-S												190					
	L-19	WILLOW LT.	27-S	28-S																	149
	L-20	WILLOW	29-S	26-S			138														
	L-21	WILLOW LT.	11-S	26-S																	12
	L-22	B-S RAMP	30-S	26-S														73			
	L-23	WILLOW	2-S	3-S	150																
	L-25	WILLOW	3-S	12-S	69																
	L-26	WILLOW LT.	13-S	12-S	72																
	L-27	WILLOW LT.	12-S	27-S																	7
	L-28	WILLOW LT.	14-S	28-S																	7
	L-29	WILLOW LT.	28-S	70S																	58
	L-30	WILLOW LT.	70S	G2-S				141													
	L-31	B-S RAMP LT	G2-S	31-S						292											
	L-32	WILLOW	4-S	70S	53																
	L-33	WILLOW RT	42-S	41-S										47							
	L-42	WILLOW RT.	G3-S	41-S									75								
	L-43	WILLOW	41-S	G2-S					259												
	L-54	B-S RAMP	10-S	52-S													90				
	L-G4	GALLUP	40-S	G3-S								35									
	L-70	W-S RAMP	69-S	G2-S										46							
		TOTAL SHEET 18			344		138		141	259	292	35	75	93	135	190	90	73	207	26	
		TOTAL QUANTITIES TO SH. 15			798	426	138	300	141	259	292	35	75	105	135	190	90	73	207	166	

CONT. No. 58019 SHEET ACCT. No. 6318

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

SUMMARY OF DRAINAGE QUANTITIES
SHEETS 17 & 18

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

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

20/204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)

LEGEND

EXISTING SEWER	No. 4
EXISTING CATCH BASIN OR INLET	
EXISTING MANHOLE	
PROPOSED SEWER	
PROPOSED CATCH BASIN OR INLET	
PROPOSED MANHOLE	
UNDERDRAIN	FL 701.10
EXISTING SEWER TO BE ABANDONED	

NOTES:

EXISTING MANHOLES & CATCH BASINS, NOT MARKED, TO REMAIN UNDISTURBED.
FOR SEWER PROFILES, SEE SH. 87, 88, 89 & 89A
FOR LOCATION OF UNDERDRAINS SEE TYPICAL SECTIONS.
FOR DETAILS OF UNDERDRAIN OUTLETS SEE SH. 97
WORK SHEETS 20 & 21 TOGETHER
WORK M.H. A-67 & A-68 WITH SH. 195

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

DRAINAGE PLAN

RAMPS S-30 & 30-S & LOCAL STREETS

SCALE 1" = 50' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
J.W.P.	G.O'C.		J.W.P.			

CONT. No. 58019 SHEET ACCT. No. 6089

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

21/204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)

SHEET NO.	MARK NO.	LOCATION	I-1 FROM	I-1 TO	I-1 12" PIPE CLASS A-1 SEC. M-6.6(a) or M-6.6(b) LIN. FT.	I-1 12" PIPE CLASS A-1 SEC. M-6.6(b) or M-6.6(a) LIN. FT.	I-1 12" PIPE CLASS E-1 LIN. FT.	I-1 15" PIPE CLASS A-1 SEC. M-6.6(a) LIN. FT.	I-1 15" PIPE CLASS A-1 SEC. M-6.6(b) LIN. FT.	I-1 18" PIPE CLASS A-1 SEC. M-6.6(a) or M-6.6(b) LIN. FT.	I-1 18" PIPE CLASS A-1 SEC. M-6.6(b) or M-6.6(a) LIN. FT.	I-1 18" PIPE CLASS E-1 LIN. FT.
20	P-1	WILLOW FREEWAY	A-1	A-2	55							
	P-2	WILLOW FREEWAY	A-2	A-4	124							
	P-3	WILLOW FREEWAY	A-3	A-4	126							
	P-4	WILLOW FREEWAY	A-4	A-5					137			
	P-5	RT. OF S-30	A-6	A-5			35					
	P-6	RT. OF S-30	A-5	A-8					456			
	P-9	LT. OF WILLOW	A-9	A-10			66					
	P-10	LT. OF WILLOW	A-10	A-63			355					
	P-13	ROAD "D"	A-15	A-16	62							
	P-14	LT. OF 30-S	A-17	A-18			17					
	P-15	RAMP 30-S	A-18	A-13		73						
	P-16	E. 31ST ST.	A-20	A-21	30							
	P-17	E. 31ST ST.	A-21	A-22	40							
	P-18	RAMP 30-S	A-23	A-22	38							
	P-19	RELOC. ORANGE	A-24	A-25				36				
	P-20	RELOC ORANGE	A-25	A-28				42				
	P-21	RELOC. ORANGE	A-26	A-28				115				
	P-22	RT. OF 30-S	A-27	A-28			47					
	P-23	RAMP 30-S	A-28	A-22						50		
	P-25	LT. OF REL. ORADGE	A-30	A-32			77					
	P-26	LT. OF S-30	A-31	A-32								88
	P-27	RT. OF S-30	A-33	A-34			77					
	P-28	RELOC. ORANGE	A-34	A-36	97							
	P-29	RAMP S-30	A-35	A-36	80							
	P-30	RELOC. ORANGE	A-32	A-36						77		
	P-31	RT. OF REL. ORANGE	A-36	A-65								45
	P-32	RT. OF REL. ORANGE	A-37	A-66		43						
	P-33	E 34th ST.	A-38	A-39		39						
	P-34	RAMP 30-S	A-42	A-51	26							
	P-53	RELOC. ORANGE	A-29	A-64	7							
	P-54	RT. OF REL. ORANGE	A-65	A-66							35	
	P-55	RT. OF REL. ORANGE	A-68	A-67			123					
	P-56	RT. OF REL. ORANGE	A-67	A-24			17					
		TOTAL SHEET 20			685	155	814	193	593	127	35	133

MARK NO.	LOCATION	I-8 STD. NO. 2-6 PAVED SHOULDER INLET EACH	I-8 STD. NO. 2-10 PAVED SHOULDER INLET EACH	I-8 STD. NO. 2-2-A CATCH BASIN MODIFIED AS PER PLAN EACH	I-8 STD. NO. 2-2-B CATCH BASIN EACH	I-8 STD. NO. 3 CATCH BASIN EACH	I-8 STD. NO. 3-A CATCH BASIN EACH	I-8 STD. NO. 6 CATCH BASIN EACH	I-8 MANHOLE, SPECIAL TYPE "A" PER PLAN EACH	I-8 STD. NO. 1 MANHOLE WITH SPECIAL FRAME & COVER AS PER PLAN EACH	I-8 STD. NO. 2 MANHOLE WITH SPECIAL FRAME & COVER AS PER PLAN W/O DROP EACH	I-8 JUNCTION MANHOLE AS PER PLAN EACH	I-14 PAVED GUTTER, SPECIAL TYPE A LIN. FT.	L-10 SODDING SQ. YD.	L-10 SODDING, SPECIAL BERM AND SLOPE PROTECTION AS PER PLAN SQ. YD.
A-1	STA. 113+72.78 46' LT.							1							
A-2	STA. 113+47 ℄	1													
A-3	STA. 110+97 ℄	1													
A-4	STA. 112+23.37 ℄		1												
A-5	RAMP S-30 5+00 40' RT.									1					
A-6	RAMP S-30 5+33 33.6' RT.			1									10	3.3	
A-9	STA. 112+65 99' LT.			1									10	3.3	
A-10	STA. 112+00 79' LT.									1					
A-14	ROAD "D" 0+00 ℄									1					
A-15	ROAD "D" 2+75.5 6' LT.					1									
A-16	E. 32ND ST. 8+32 ℄									1					
A-17	E. 32ND ST. 9+11 16' LT.						1								
A-18	STA. 117+50 138' LT.			1									20	6.7	
A-19	EX. ORANGE AVE. 13+24 ℄										1				
A-20	E. 31ST ST. 9+53 16' LT.						1								
A-21	E. 31ST ST. 9+53 16' RT.						1								
A-22	EX. ORANGE AVE. 13+76 ℄											1			
A-23	RAMP 30-S 11+19.74 8' LT.							1							
A-24	RELOC. ORANGE 9+40 ℄							1							
A-25	RELOC. ORANGE 9+40 34' LT.							1							
A-26	RELOC. ORANGE 8+30.29 ℄					1									
A-27	RAMP 30-S 10+74 44' RT.			1									20	6.7	
A-28	RAMP 30-S 11+19 40' RT.											1			
A-29	RAMP 30-S 13+69.43 12' LT.							1							
A-30	RELOC. ORANGE 6+50 28' LT.						1								
A-31	RAMP S-30 10+61.47 15' LT.			1									20	6.7	
A-32	RAMP S-30 11+50 13' LT.									1					
A-33	RAMP S-30 10+61.47 47' LT.			1									20	6.7	
A-34	RELOC. ORANGE 4+45 35.6' LT.							1							
A-35	RAMP S-30 12+45 15' LT.							1							
A-36	RELOC. ORANGE 5+26 20' RT.									1					
A-37	RELOC. ORANGE 5+00 40' RT.				1										
A-38	E. 34th ST. 11+36 40' RT.							1		1					
A-39	E. 34th ST 11+36 ℄									1					
A-40	EX ORANGE AVE. 8+50 ℄										1				
A-41	E. 31ST ST. 12+40 ℄									1					
A-42	RAMP 30-S 12+26 18' RT							1							
A-50	E. 35TH PL. 0+60 ℄									1					
A-51	RAMP 30-S 12+43 ℄									1					
A-64	RAMP 30-S 13+69.43 ℄									1					
A-65	RELOC. ORANGE 5+10 68' RT.									1					
A-66	WOODLAND AVE 5+08 4' RT.											1			
F-1	STA. 108+12 TO STA. 110+00 RT.													70	
F-2	STA. 108+62 TO STA. 111+50 LT.													124	
F-3	RAMP S-30 STA. 4+50 TO 11+85 LT.													316	
F-4	STA. 117+00 TO STA. 117+38 RT.													13	
F-5	STA. 116+60 TO STA. 119+40 LT.													117	
F-6	RELOC. ORANGE 7+35 TO 8+50 LT.													42	
A-67	RELOC. ORANGE 9+38 17' RT.								1						
A-68	RELOC. ORANGE 10+55 76' RT.								1						
	TOTAL SHEET 20	2	1	6	1	3	11	1	2	12	2	3	100	715	193

MARK NO.	LOCATION	I-1 6" PIPE CLASS I-3 LIN. FT.	I-1 6" PIPE OUTLET CLASS F-4 LIN. FT.	I-1 6" PIPE CLASS A-1 SEC. M-6.6(a) or M-6.6(b) LIN. FT.	I-1 8" PIPE OUTLET CLASS F-4 SEC. M-6.9(c) LIN. FT.	I-5 PIPE SPECIAL 6"-90° BEND	I-5 PIPE SPECIAL 6" WYE	I-5 PIPE SPECIAL 6"x6"x6" TEE
U-1	WILLOW STA. 108+86 to 110+97 ℄	201	10					
U-2	WILLOW STA. 108+866 30-S 6+98	648	-		10			1
U-3	WILLOW STA. 111+05 to 112+23	108	10					
U-4	WILLOW STA. 112+23 to 113+47	114	10					
U-5	WILLOW STA. 113+47 to 118+87	530	10					
U-6	WILLOW STA. 113+73 to 116+70	301	10				2	
U-7	WILLOW STA. 116+78 to 119+13	246			10	1		
U-8	S-30 STA. 2+81. to 11+54	873	10					1
U-9	ROAD "C" STA. 1+60 to 3+60	166	10					
U-10	RELOC. ORANGE STA. 2+73 To 4+45	153	10					
U-11	REL ORANGE 4+50 to 5+30 10+42	110	10					1
U-12	RAMP S-30 12+45 To WOODLAND 6+81	94	10					
U-13	RAMP S-30 12+45 to REL ORA. 6+50	75		30	1			
U-14	RELOC. ORANGE 5+69 to 6+50	70	10					
U-15	RELOC. ORANGE 6+50 to 7+00	40	10					
U-16	RELOC. ORANGE 7+00 to 8+30	120	10					
U-17	RELOC. ORANGE 8+30 to 9+35	95	10					
U-18	RELOC. ORANGE 9+40 to 11+70	225	10					
U-19	RAMP 30-S 12+10 to 13+69.5	150	10					
U-20	RAMP 30-S 7+02 to 11+19.7	420	10			2		
U-21	ROAD "D" 3+00 to E 32ND ST 9+11	57	10					
U-22	E. 32ND ST. 8+00 to 9+11	101	10					
U-23	ROAD "D" 2+75.5 to E 32ND ST. 8+00	57	10					
U-24	ROAD "D" 1+20 to 2+75.5	145	10					
U-25	E. 34TH ST. 7+21 to ROAD "D" 1+15	116		24				1
U-26	WILLOW STA. 111+15 TO STA. 118+57 RT.	760	20	40			1	
	TOTAL SHEET 20	5975	230	94	20	6	1	4

MARK NO.	LOCATION	I-8 CATCH BASIN ADJUST TO GRADE EACH	I-8 MANHOLE ADJUST TO GRADE EACH	I-16 CATCH BASIN ABANDONED EACH	I-16 MANHOLE ABANDONED EACH
B-1	E. 34th ST. 13+50 ℄	1			
B-2	RELOC. ORANGE. 2+94 25' RT.			1	
B-3	E. 34th ST. 11+34 2' LT. of ℄			1	
B-4	E. 34th ST. 10+42 3' RT. of ℄				1
B-5	EX. ORANGE 8+95 18' RT.			1	
B-6	EX. ORANGE 9+49 19' RT.			1	
B-7	EX. ORANGE 9+42 ℄				1
B-8	EX. ORANGE 9+63 16' LT.			1	
B-9	EX. ORANGE 10+27 ℄				1
B-10	EX ORANGE 10+38 18' LT.			1	
B-11	EX. ORANGE 10+40 18' RT.			1	
B-12	EX. ORANGE 12+73 ℄				1
B-13	EX. ORANGE 12+73 18' LT.			1	
B-14	EX. ORANGE 13+18 18' RT.			1	
B-15	E. 32nd ST. 9+51 17' LT.			1	
B-16	RAMP 30-S 11+33 21' RT.			1	
B-17	RAMP 30-S 11+45 18' LT.			1	
B-18	RAMP 30-S 11+82 35' LT.			1	
B-19	RELOC. ORANGE 9+44 20' LT.				1
B-20	RAMP 30-S 12+08 16' RT.			1	
B-21	RAMP 30-S 12+08 19' LT.			1	
B-23	RAMP 30-S 13+87 31' RT.			1	
B-24	RAMP 30-S 14+14 ℄		1		
B-25	RAMP 30-S 13+85 20' LT.			1	
B-26	RAMP 30-S 5+55 ℄				1
B-27	WILLOW 110+69 12' RT.			1	
B-28	WILLOW 110+37 27' RT.				1
B-29	WILLOW 109+98 118' RT.			1	
	TOTAL SHEET 20	1	1	19	7

WORK SHEETS 20 & 21 TOGETHER

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

DRAINAGE QUANTITIES

FOR SHEET 20

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

CONT. No. 590/9 SHEET ACCT. No. 609/

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

22 / 204

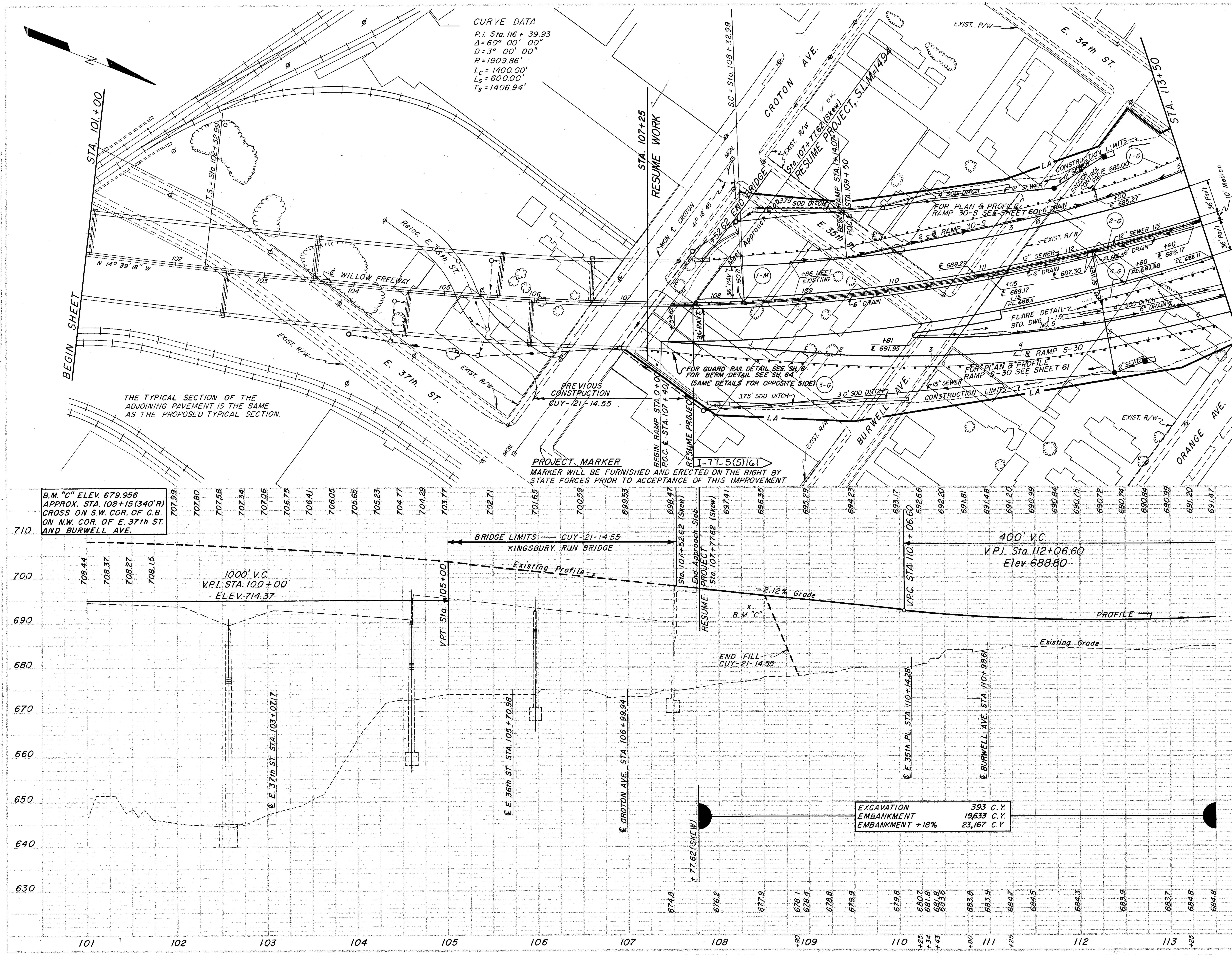
CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

NOTES:

TYPICAL SECTION . . . . SEE SHEET . . 4 & 5
DRAINAGE PLAN & QUANTITIES . . . . 20 & 21
WATERWORK PLAN 113
EXISTING UTILITIES . . . . 121 TO 125
TOP OF PAVEMENT ELEVATIONS 29

E-8 REMOVAL ITEMS 13
GRADING PLAN & CROSS SECTION KEY PLAN 43
ROADWAY & PAVEMENT QUANTITIES . . . . . . 11, 12 & 13
LIGHTING PLAN 128
FENCE LOCATION 200

NOTE:
6" x 15.5 #WF x 6'-0" GALVANIZED STEEL BARRIER POSTS IN PLACE IN EXISTING APPROACH SLAB WERE INSTALLED UNDER PRECEDING CONTRACT PROJECT I-77-5(2)162, SECTION CUY-21-14.55. STEEL BEAM GUARD RAIL BARRIER TYPE (DEEP) SHALL BE INSTALLED ON THE EXISTING STEEL BARRIER POSTS IN THIS CONTRACT.



CURVE DATA
P.I. Sta. 116 + 39.93
Δ = 60° 00' 00"
D = 3° 00' 00"
R = 1909.86'
Lc = 1400.00'
Ls = 600.00'
Ts = 1406.94'
STA. 101+00
BEGIN SHEET
STA. 107+25
RESUME WORK
CROTON AVE.
E. 34th ST.
STA. 113+50
END SHEET
N 14° 39' 18" W
℄ WILLOW FREEWAY
Reloc. E. 36th ST.
E. 37th ST.
E. 35th PL.
BURWELL AVE.
ORANGE AVE.
EXIST. R/W
CONSTRUCTION LIMITS
℄ RAMP 30-S
℄ RAMP S-30
FOR PLAN & PROFILE RAMP 30-S SEE SHEET 60
FOR PLAN & PROFILE RAMP S-30 SEE SHEET 61
FOR GUARD RAIL DETAIL SEE SH. 6
FOR BERM DETAIL SEE SH. 64
(SAME DETAILS FOR OPPOSITE SIDE)
FLARE DETAIL STD. DWG. F-15 NO. 5
THE TYPICAL SECTION OF THE ADJOINING PAVEMENT IS THE SAME AS THE PROPOSED TYPICAL SECTION.
PREVIOUS CONSTRUCTION CUY-121-14.55
BEGIN RAMP STA. 0+00 P.O.C. ℄ STA. 107+40
RESUME PROJECT
I-77-5(5)161
PROJECT MARKER
MARKER WILL BE FURNISHED AND ERECTED ON THE RIGHT BY STATE FORCES PRIOR TO ACCEPTANCE OF THIS IMPROVEMENT.
B.M. "C" ELEV. 679.956
APPROX. STA. 108+15 (340' R)
CROSS ON S.W. COR. OF C.B. ON N.W. COR. OF E. 37th ST. AND BURWELL AVE.
BRIDGE LIMITS — CUY-21-14.55
KINGSBURY RUN BRIDGE
Existing Profile
1000' V.C.
V.P.I. STA. 100+00
ELEV. 714.37
V.P.T. Sta. 105+00
Sta. 107+52.62 (Skew) End Approach Slab
RESUME PROJECT Sta. 107+77.62 (Skew)
−2.12% Grade
B.M. "C"
END FILL CUY-21-14.55
400' V.C.
V.P.I. Sta. 112+06.60
Elev. 688.80
V.P.C. STA. 110+06.60
PROFILE
Existing Grade
℄ E. 37th ST. STA. 103+07.17
℄ E. 36th ST. STA. 105+70.98
℄ CROTON AVE. STA. 106+99.94
℄ E. 35th PL. STA. 110+14.28
℄ BURWELL AVE. STA. 110+98.61
EXCAVATION 393 C.Y.
EMBANKMENT 19,633 C.Y.
EMBANKMENT +18% 23,167 C.Y.
+77.62 (SKEW)

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-G	WILLOW STA. 107+90 TO RAMP 30-S STA. 5+04	LT.		546	
2-G	WILLOW STA. 107+54.62 TO STA. 113+50	℄			596
3-G	WILLOW STA. 107+32 TO RAMP S-30 STA. 6+14	RT.		625	
4-G	WILLOW STA. 112+10 TO STA. 113+50	RT.		150	
1-M	WILLOW STA. 108+32.99	℄	1		
	TOTALS		1	1,321	596

ROADWAY & PAVEMENT QUANTITIES

PLAN & PROFILE STA. 101+00 TO STA. 113+50

58019 6245

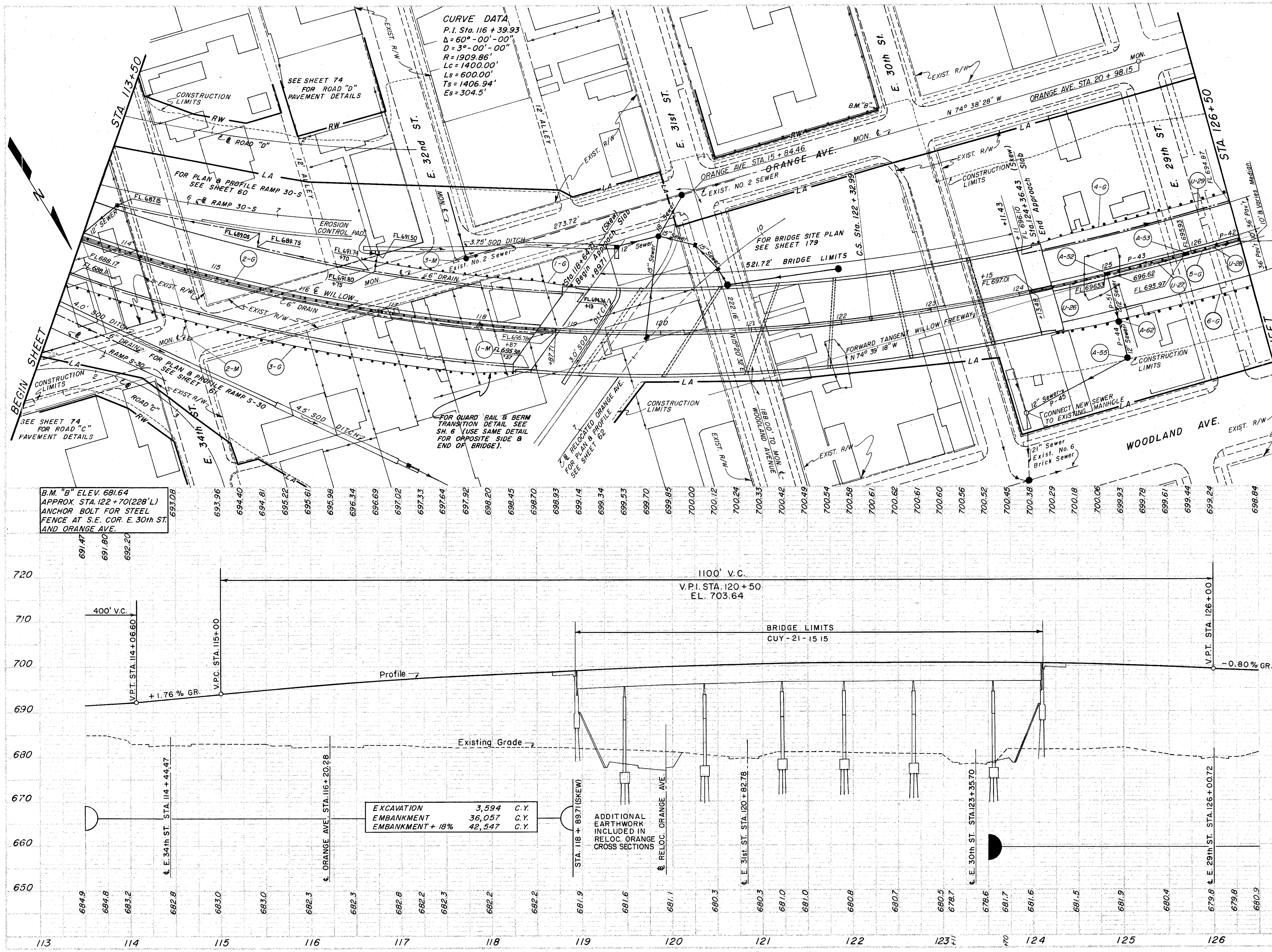
FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

CUYAHOGA COUNTY
CUY - 21 - (13.77) - (14.94)

NOTES:

TYPICAL SECTION . . . . SEE SHEET 4 & 5
ADDITIONAL DRAINAGE DETAILS & QUANTITIES . . . 20 & 21
WATERWORK PLAN 113
EXISTING UTILITIES 121-125
TOP OF PAVEMENT ELEVATIONS 29
MEDIAN TRANSITION & PAVEMENT DETAILS 30

E-8 REMOVAL ITEMS 13
GRADING PLAN & CROSS SECTION KEY PLAN 43
ROADWAY & PAVEMENT QUANTITIES . . . . 11, 12 & 13
LIGHTING PLAN 128, 129
FENCE LOCATION . . . . 200, 201 & 201A



DRAINAGE QUANTITIES

REFERENCE NO.	LOCATION	I-8 STD. NO. 2-6 PAVED SHOULDER INLET (EACH)	I-8 STD. NO. 1 MANHOLE WITH SPECIAL FRAME & COVER AS PER PLAN (EACH)	I-1 12" PIPE CL. A-1 SEC. M-6.6(a) or M-6.8(b) (L.F.)	I-1 12" PIPE CLASS E-1 (L.F.)	I-1 12" PIPE CLASS F-4 (L.F.)	I-1 6" PIPE CLASS I-3 (L.F.)	I-1 6" PIPE OUTLET CLASS F-4 (L.F.)
A-52	STA. 124 + 94.50 ℄	1						
A-53	STA. 125 + 93.10 ℄	1						
A-55	STA. 124+99 96.5' RT.		1					
A-62	STA. 124+97 53' RT.		1					
P-42	WILLOW 126+50 TO A-53			57				
P-43	WILLOW A-53 TO A-52			99				
P-44	FROM A-62 TO A-55					48		
P-45	FROM A-55 TO B-32				128			
P-51	FROM A-52 TO A-62			53				
U-26	WILLOW 124+15 TO 124+94.5						69	10
U-27	WILLOW 125+00 TO 125+93						83	10
U-28	WILLOW 125+98 TO 126+81						73	10
U-29	WILLOW 124+11 TO 126+50						239	
	TOTALS	2	2	209	128	48	464	30

ROADWAY & PAVEMENT QUANTITIES

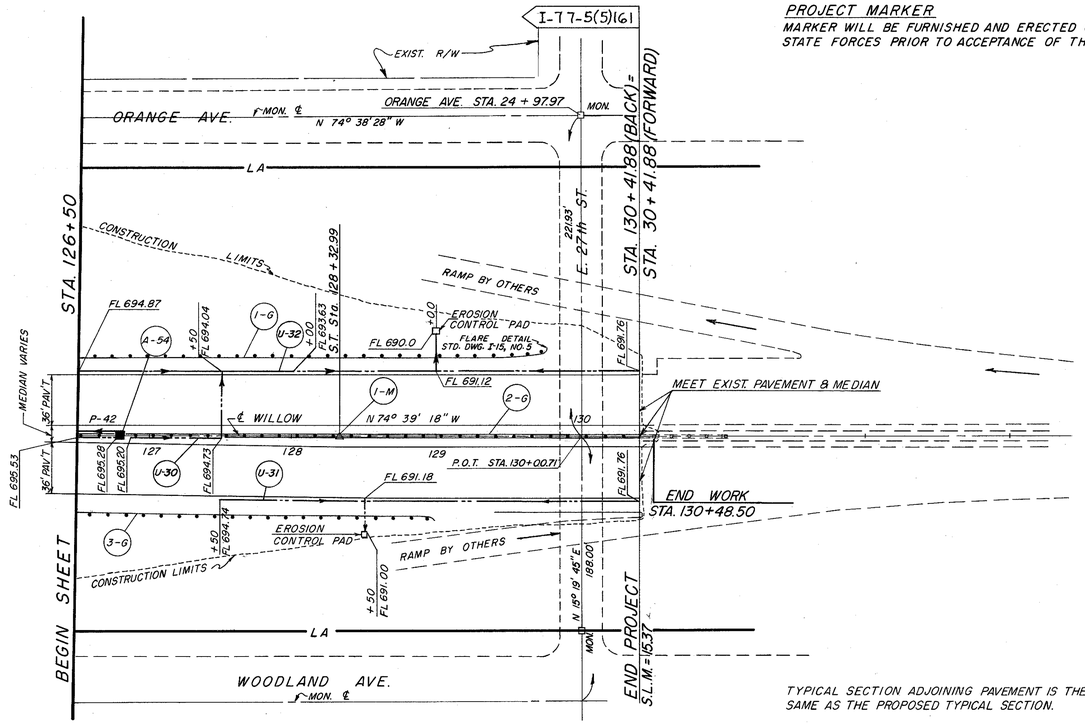
REFERENCE NO.	LOCATION	SIDE	I-8 MONUMENT ASSEMBLIES (EACH)	I-15 GUARD RAIL STEEL BEAM STD. TYPE (DEEP) (L.F.)	I-15 GUARD RAIL STEEL BEAM BARRIER TYPE (DEEP) (L.F.)
1-M	STA. 118 + 00	℄	1		
2-M	MON. ℄ ORANGE AVE. STA. 10+00= MON. ℄ E. 34 ST. STA. 10+00		1		
3-M	MON. ℄ ORANGE AVE. STA. 13+10.74= ℄ E. 32 ST. STA. 10+00		1		
1-G	STA. 116+62 TO STA. 119+05			237.5	
2-G	STA. 113+50 TO STA. 118+87.71				538
3-G	STA. 113+50 TO STA. 118+42			500	
4-G	STA. 124+24 TO STA. 126+50			226	
5-G	STA. 124+13.43 TO STA. 126+50				237
6-G	STA. 124+32 TO STA. 126+50			231	
	TOTALS		3	1,194.5	775

PLAN & PROFILE STA. 113 + 50 TO STA. 126 + 50

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

24
204

CUYAHOGA COUNTY
CUY - 21 - (13.77) - (14.94)



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

TYPICAL SECTION ADJOINING PAVEMENT IS THE SAME AS THE PROPOSED TYPICAL SECTION.

ROADWAY & PAVEMENT QUANTITIES

REFERENCE NO.	LOCATION	SIDE	I-8 MONUMENT ASSEMBLIES	I-15 GUARD RAIL STEEL BEAM STD. TYPE (DEEP)	I-15 GUARD RAIL STEEL BEAM BARRIER TYPE (DEEP)
			EACH	L.F.	L.F.
1-M	STA. 128+32.99	℄	1		
1-G	STA. 126+50 TO STA. 129+74	LT.		324	
2-G	STA. 126+50 TO STA. 130+48.50	℄			399
3-G	STA. 126+50 TO STA. 128+94	RT.		244	
	TOTALS		1	568	399

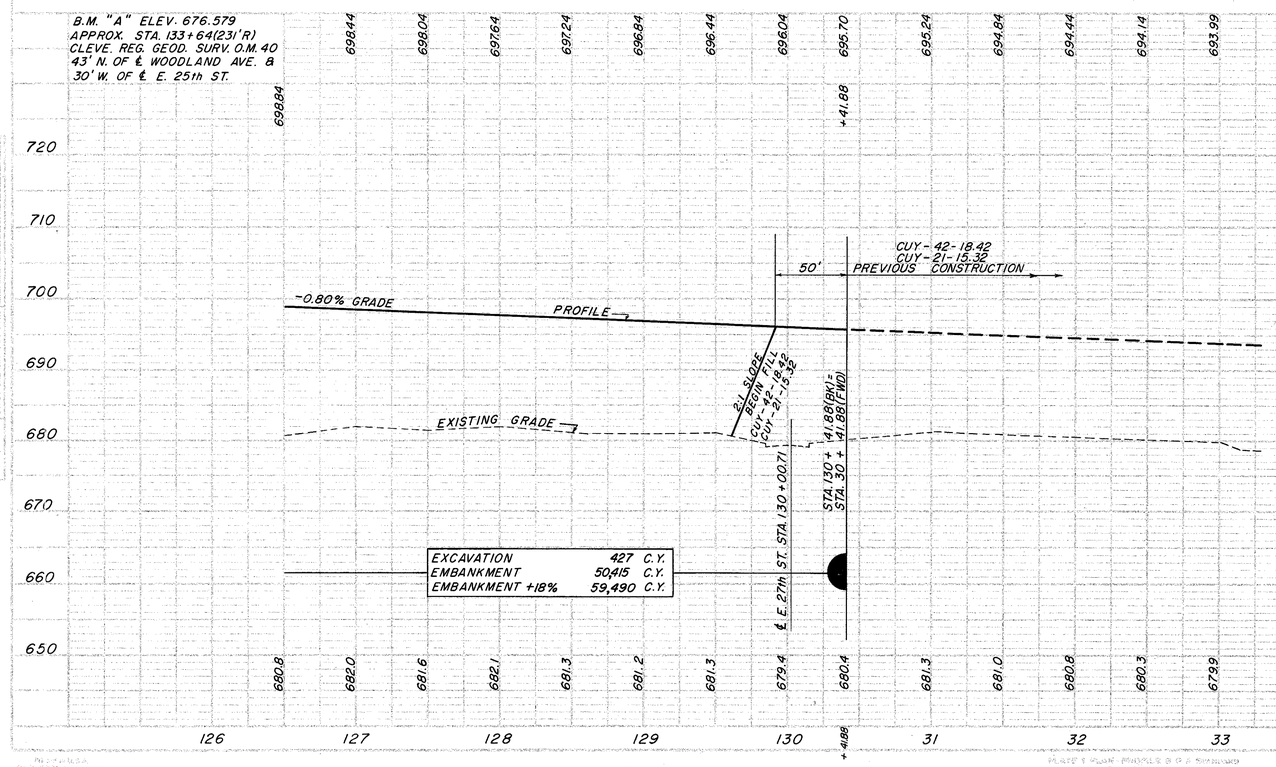
DRAINAGE QUANTITIES

REFERENCE NO.	LOCATION	I-8 STD. 2-6 PAVED SHOULDER INLET	I-1 12" PIPE CL. A or I SEC. M-6.01(a) or M-6.01(b)	I-1 6" PIPE CLASS 13	I-1 8" PIPE OUTLET F.A. CLASS M-6.01(a) SEC. M-6.01(a) or M-6.01(b)	I-1 6" PIPE OUTLET F.A. CLASS M-6.01(a) SEC. M-6.01(a) or M-6.01(b)	I-5 6" 90° BEND	I-5 6"x 6"x 6" TEE
		EACH	L.F.	L.F.	L.F.	L.F.	EACH	EACH
A-54	STA. 126+81 ℄	1						
R42	FROM A-54 TO 126+50		31					
U-30	126+85 TO 127+50			65		40	1	1
U-31	127+50 TO 130+42			304	10			1
U-32	126+50 TO 130+42			392	10			1
	TOTALS	1	31	761	20	40	1	3

SEWER PROFILE SH. 89A

NOTES:

B.M. "A" ELEV. 676.579
APPROX. STA. 133+64(231'R)
CLEVE. REG. GEOD. SURV. O.M. 40
43' N. OF ℄ WOODLAND AVE. &
30' W. OF ℄ E. 25th ST.



PLAN & PROFILE STA. 126+50 TO STA. 130+41.88

SHEET CT. No. 6039

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

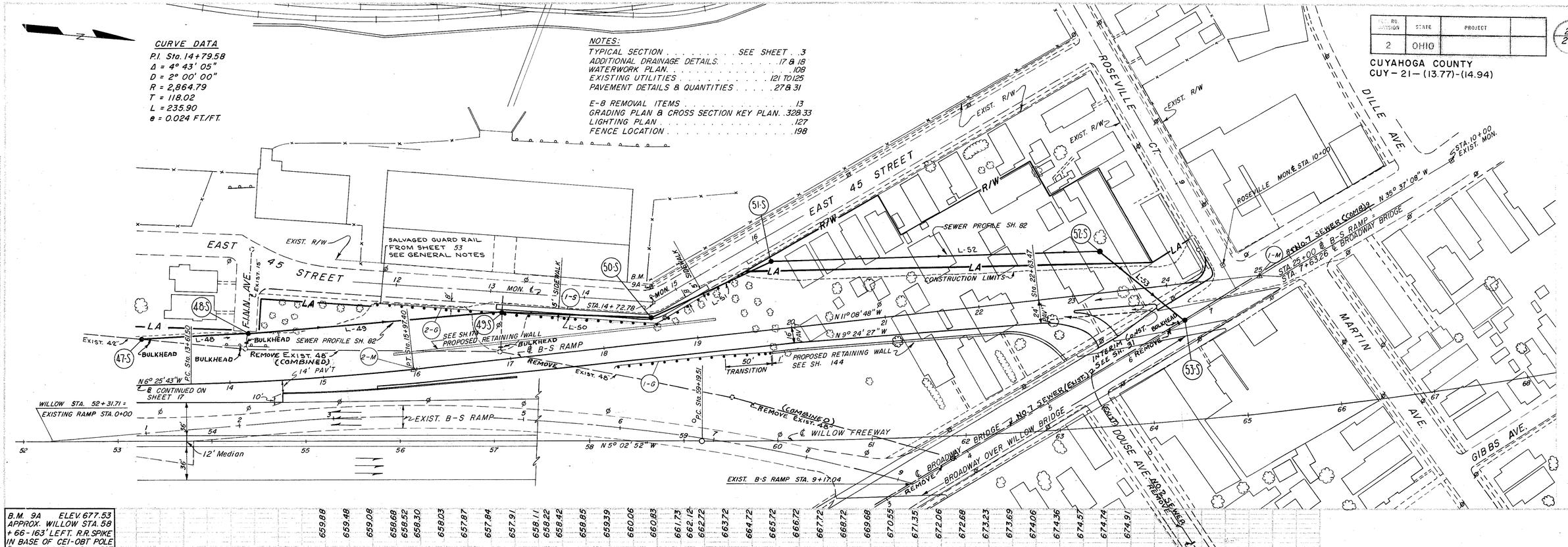
25
204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

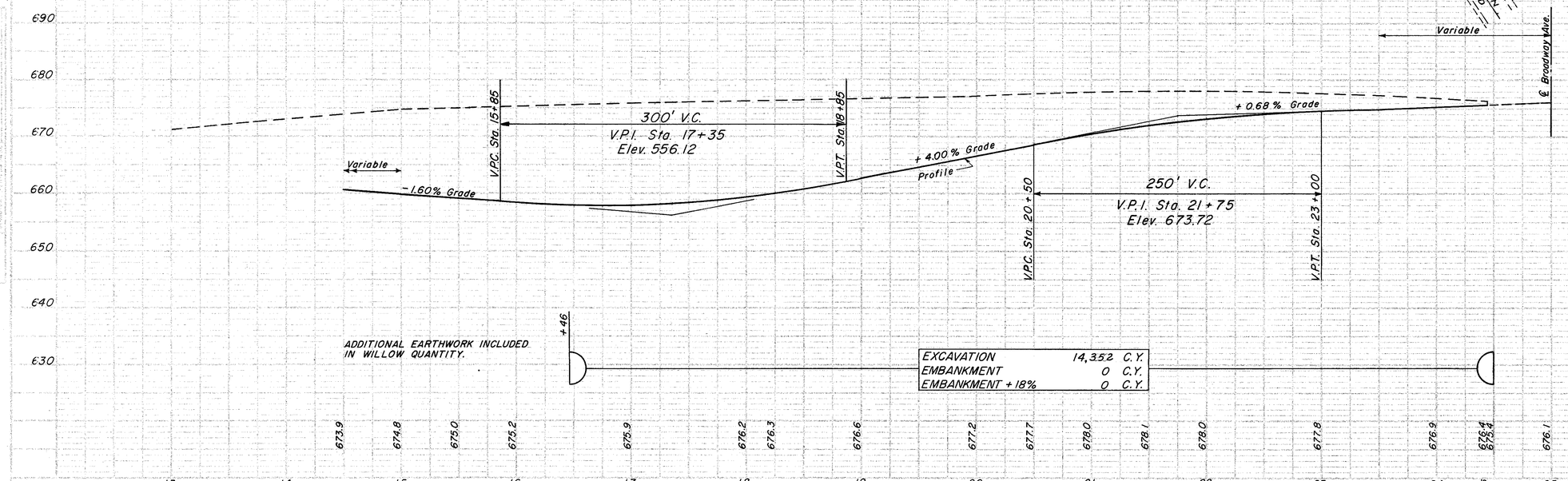
CURVE DATA
P.I. Sta. 14+79.58
Δ = 4° 43' 05"
D = 2° 00' 00"
R = 2,864.79
T = 118.02
L = 235.90
e = 0.024 FT./FT.

NOTES:

TYPICAL SECTION	SEE SHEET 3
ADDITIONAL DRAINAGE DETAILS	17 & 18
WATERWORK PLAN	108
EXISTING UTILITIES	121 TO 125
PAVEMENT DETAILS & QUANTITIES	27 & 31
E-8 REMOVAL ITEMS	13
GRADING PLAN & CROSS SECTION KEY PLAN	328 & 33
LIGHTING PLAN	127
FENCE LOCATION	198



B.M. 9A ELEV. 677.53
APPROX. WILLOW STA. 58 + 66 - 163' LEFT. R.R. SPIKE IN BASE OF CEI-OBT POLE #34511 LOCATED ON WEST SIDE OF E. 45 STREET



ADDITIONAL EARTHWORK INCLUDED IN WILLOW QUANTITY.

+46

EXCAVATION	14,352 C.Y.
EMBANKMENT	0 C.Y.
EMBANKMENT + 18%	0 C.Y.

ROADWAY & PAVEMENT QUANTITIES

REFERENCE NO.	LOCATION	SIDE		MONUMENT ASSEMBLIES 1-8 EACH	4-1/2" P.C.C. SIDEWALK 1-13 SQ.FT.	GUARD RAIL STEEL BEAM STD. TYPE (DEEP) 1-15 LIN.FT.	GUARD RAIL REMOVED & REBUILT 1-15 LIN.FT.
1-M	RAMP STA. 25+00	℄		1			
2-M	RAMP STA. 15+97.40	℄		1	1053		
1-S	E. 45 ST. STA. 13+07 TO STA. 15+30	RT.					
1-G	℄ STA. 18+12.5 TO L STA. 19+75	RT.				162.5	
2-G	E. 45 ST. STA. 11+77 TO STA. 15+65	RT.					400
	TOTALS			2	1053	162.5	400

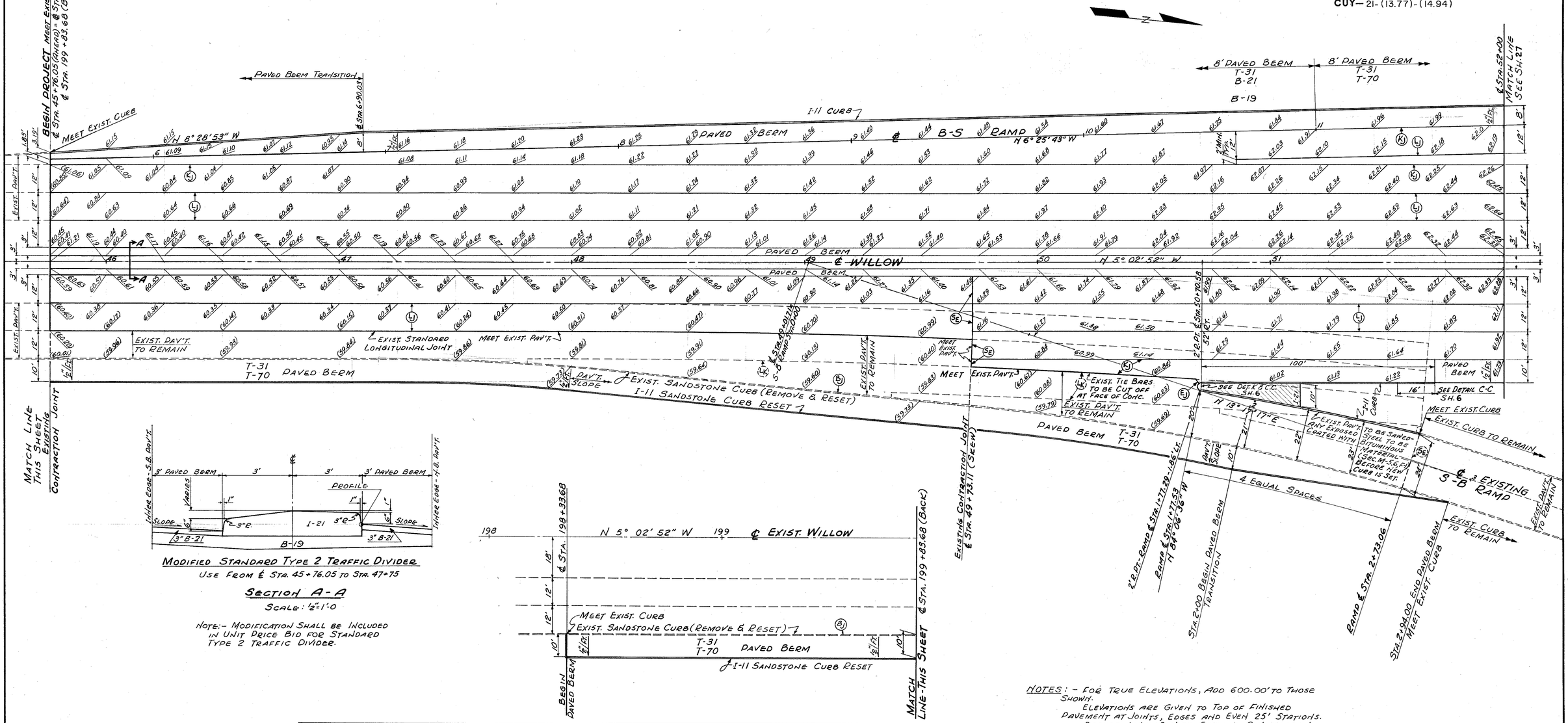
PLAN & PROFILE B-S RAMP

SHEET NO. 6273
6210

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

26/204

CUYAHOGA COUNTY
CUY—21-(13.77)-(14.94)



MODIFIED STANDARD TYPE 2 TRAFFIC DIVIDER
USE FROM ℄ STA. 45+76.05 TO STA. 47+75

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

NOTE:- MODIFICATION SHALL BE INCLUDED IN UNIT PRICE BID FOR STANDARD TYPE 2 TRAFFIC DIVIDER.

QUANTITIES

T-70 Portland Cement Concrete Pavement	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 (0.009 C.Y./S.Y.)	B-21 3" 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-11 Sandstone Curb Reset
Cu. Yd.	Sq. Yd.	Cu. Yd.	Gal.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Sq. Yd.	Sq. Yd.	L.F.		L.F.
131	5300	1587	303	14	75	207	109	33	826		763

*0.10 GAL. S.Y. WHERE APPLIED ON T-70

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.
DASHED LINES DENOTE EXISTING CONSTRUCTION.
TOP OF EXISTING PAVEMENT ELEVATIONS ARE SHOWN IN PARENTHESES.
T-31 BITUMINOUS SURFACE TREATMENT (IN PAVED BERM AREAS, CONSTRUCTED OF T-70) SHALL BE PERFORMED ONLY AFTER THE WILLOW FREEWAY, NORTH OF BROADWAY AVE. IS OPEN TO THROUGH TRAFFIC.

JOINT SYMBOLS
(LJ) STANDARD LONGITUDINAL JOINT.
(KJ) STANDARD KEY JOINT, WITHOUT TIE BARS.
(EJ) STANDARD EXPANSION JOINT, WITHOUT DOWELS.
(SE) STANDARD EXPANSION JOINT.
(LK) STANDARD LONGITUDINAL KEY JOINT.
(BJ) PLAIN BUTT JOINT.

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

PAVEMENT DETAILS

WILLOW ℄ STA. 45+76.05 TO STA. 52+00
S-B RAMP ℄ STA. 0+00 TO STA. 2+73.06
B-S RAMP ℄ STA. 5+55.67 TO STA. 11+80

SCALE 1"=20'

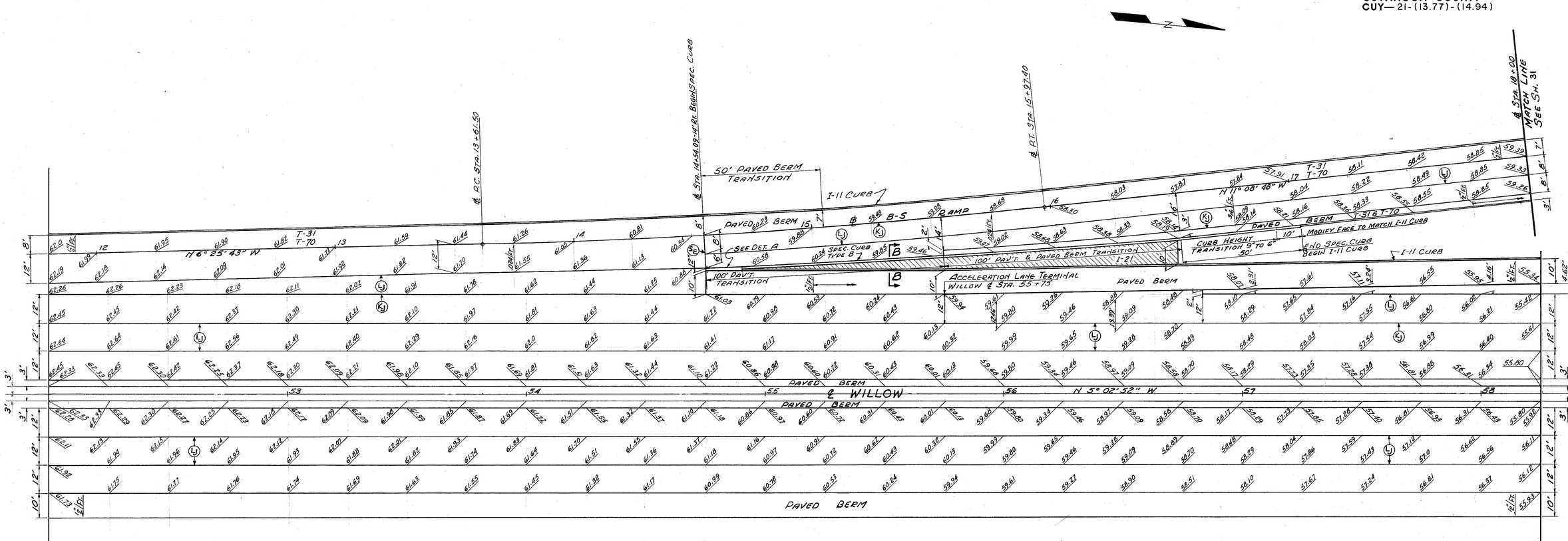
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.D.R.	G.O'C.		F.T. C.D.R.			

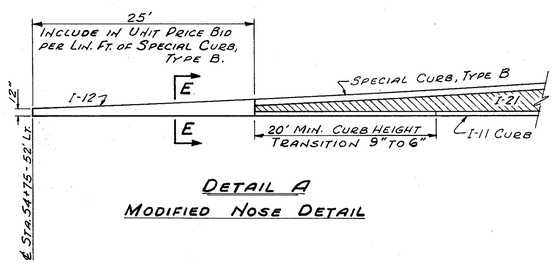
CONT. No. 58019 SHEET ACCT. No. 6285

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

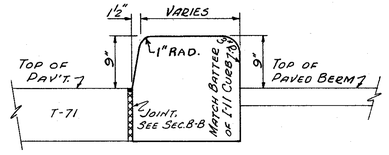
27
204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)

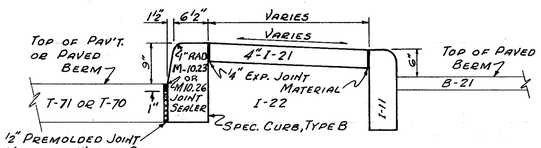




DETAIL A
MODIFIED NOSE DETAIL



SECTION E-E



SECTION B-B

½" Premolded Joint Material Where Curb is Adjacent to Concrete Pav't. Included, With Sealer, in Unit Price Bid for Special Curb.

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.
T-31 Bituminous Surface Treatment (in paved berm areas constructed of T-70) shall be performed only after the Willow Freeway North of Broadway Ave. is open to through traffic.

QUANTITIES

	T-71 9" Reinforced Portland Cement Concrete Pavement	I-22 Subbase	T-31 Bituminous Surface Treatment: Bituminous Material @ .25 Gal./S.Y.	T-31: No 6 Aggregate @ .008 C.Y./S.Y.	B-21 3" 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 Special Type B		T-70 Portland Cement Concrete Pavement
	Sq. Yd.	Cu. Yd.	Gal.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Sq. Yd.	L.F.	L.F.		Cu. Yd.
Total This Sh.	6275	1481	463	18	134	330	108	11	1046	235		149

*0.1 Gal./S.Y. Where Applied on T-70.

JOINT SYMBOLS
(LJ) Standard Longitudinal Joint.
(KJ) Standard Key Joint, Without Tie Bars.
(SE) Standard Expansion Joint.
(EJ) Standard Expansion Joint, Without Dowels.

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

PAVEMENT DETAILS

Willow ℄ Sta. 52+00 to Sta. 58+25
B-S Ramp ℄ Sta. 11+80 to Sta. 18+00

SCALE 1"=20' DATE

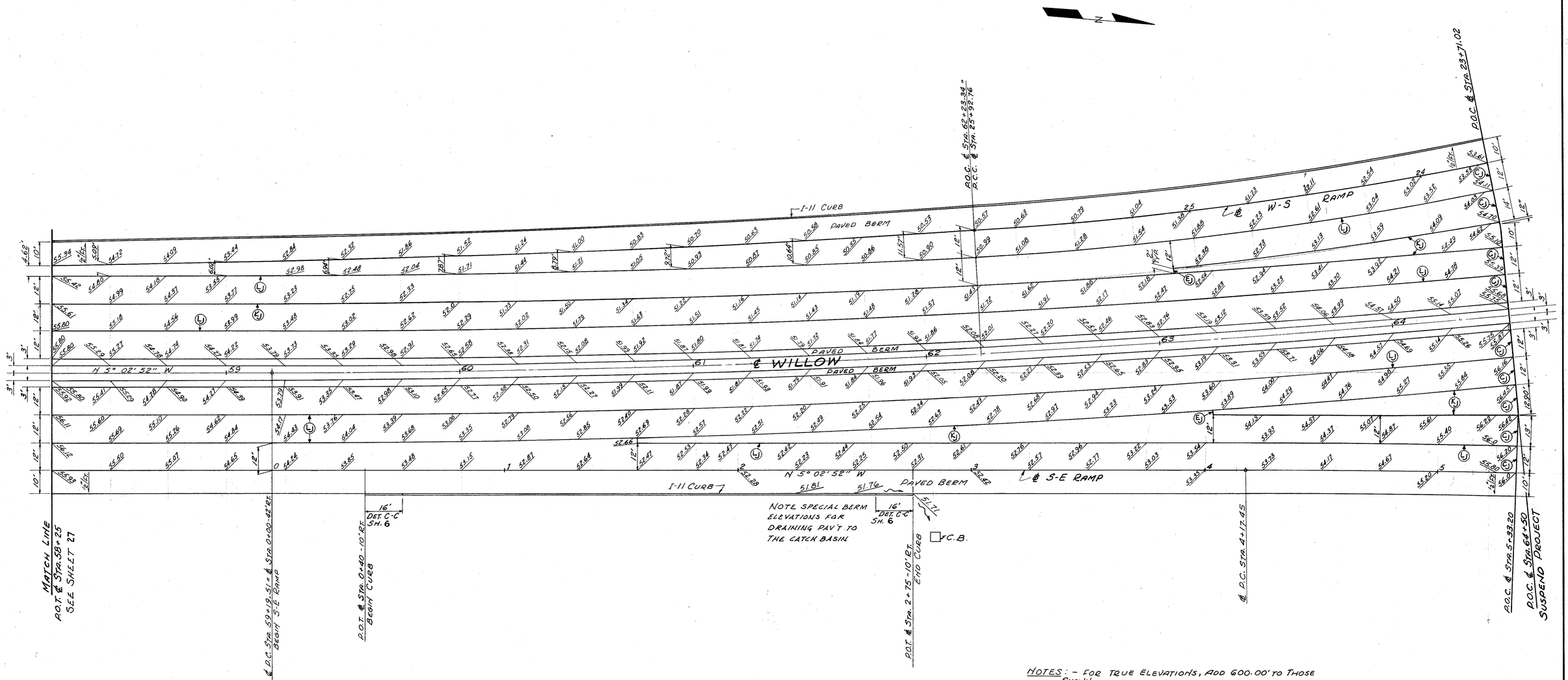
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.D.R.	G.O'C.		F.T. C.D.R.			

CONT. No. 58019 SHEET ACCT. No. 6286

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

28
204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)



CONT. No. 58019 SHEET ACCT. No. 6287

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 TO BE PLACED WITH EXPOSED ENDS PROTECTED.

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 3" Waterproofed Aggregate Base Course	B-19 Aggregate Base Course	I-21 Portland Cement Concrete Median Pavement Standard Type 2	I-11 Sandstone Curb 6" x 18"	
	Sq. Yo.	Cu. Yo.	Gal.	Cu. Yo.	Cu. Yo.	Cu. Yo.	Cu. Yo.	L.F.	
Total This Sh.	6375	1446	450	15	150	303	108	855	

JOINT SYMBOLS

- (LJ) Standard Longitudinal Joint.
- (KJ) Standard Key Joint, Without Tie Bars.
- (EJ) Standard Expansion Joint, Without Dowels.
- (CJ) Standard Construction Joint.

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

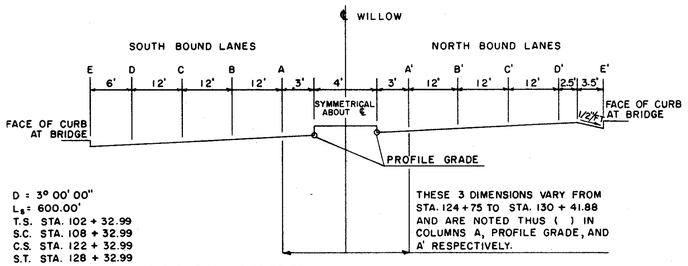
PAVEMENT DETAILS

Willow ℄ Sta. 58+25 to Sta. 64+50
S-E Ramp ℄ Sta. 0+00 to Sta. 5+33.20
W-S Ramp ℄ Sta. 23+71.02 to Sta. 25+92.76

SCALE 1" = 20'

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

CUYAHOGA COUNTY
CUY— 21 — (13.77)-(14.94)



D = 3° 00' 00"
L_s = 600.00'
T.S. STA. 102 + 32.99
S.C. STA. 108 + 32.99
C.S. STA. 122 + 32.99
S.T. STA. 128 + 32.99
MAXIMUM RATE OF SUPERELEVATION = 0.42 FT./FT.

THESE 3 DIMENSIONS VARY FROM STA. 124 + 75 TO STA. 130 + 41.88 AND ARE NOTED THUS ( ) IN COLUMNS A, PROFILE GRADE, AND A' RESPECTIVELY.

NOTE:
ALL ELEVATIONS SHOWN ARE TO THE TOP OF FINISHED PAVEMENT

STATION	D	C	B	A	PROFILE GRADE	A'	B'	C'	D'
107 + 50	697.09	697.52	697.94	698.37	698.47	698.58	699.00	699.43	699.85
107 + 75	696.50	696.94	697.39	697.83	697.94	698.05	698.50	698.94	699.38
108 + 00	695.90	696.37	696.83	697.30	697.41	697.53	697.99	698.46	698.20
108 + 25	695.31	695.79	696.28	696.76	696.88	697.00	697.49	697.97	698.46
108 + 50	694.71	695.22	695.72	696.23	696.35	696.48	696.98	697.49	697.99
108 + 75	694.18	694.69	695.19	695.70	695.82	695.95	696.45	696.96	697.46
109 + 00	693.65	694.16	694.66	695.17	695.29	695.42	695.92	696.43	696.93
109 + 25	693.12	693.63	694.13	694.64	694.76	694.89	695.39	695.90	696.40
109 + 50	692.59	693.10	693.60	694.11	694.23	694.36	694.86	695.37	695.87
109 + 75	692.06	692.57	693.07	693.58	693.70	693.83	694.33	694.84	695.34
110 + 00	691.53	692.04	692.54	693.05	693.17	693.30	693.80	694.31	694.81
110 + 25	691.02	691.52	692.03	692.53	692.66	692.78	693.29	693.79	694.30
110 + 50	690.56	691.07	691.57	692.08	692.20	692.33	692.83	693.34	693.84
110 + 75	690.17	690.67	691.18	691.68	691.81	691.93	692.44	692.94	693.45
111 + 00	689.84	690.34	690.84	691.35	691.48	691.60	692.10	692.61	693.11
111 + 25	689.56	690.07	690.57	691.08	691.20	691.33	691.83	692.34	692.84
111 + 50	689.35	689.86	690.36	690.86	690.99	691.12	691.62	692.12	692.63
111 + 75	689.20	689.70	690.21	690.71	690.84	690.96	691.47	691.97	692.48
112 + 00	689.11	689.61	690.12	690.62	690.75	690.87	691.38	691.88	692.38
112 + 25	689.08	689.58	690.08	690.59	690.72	690.84	691.34	691.85	692.35
112 + 50	689.11	689.61	690.12	690.62	690.74	690.87	691.38	691.88	692.38
112 + 75	689.20	689.70	690.20	690.71	690.84	690.96	691.46	691.97	692.47
113 + 00	689.35	689.85	690.36	690.86	690.99	691.11	691.62	692.12	692.62
113 + 25	689.56	690.06	690.57	691.07	691.20	691.32	691.83	692.33	692.84
113 + 50	689.83	690.34	690.84	691.34	691.47	691.60	692.10	692.60	693.11
113 + 75	690.17	690.67	691.17	691.68	691.80	691.93	692.43	692.94	693.44
114 + 00	690.56	691.06	691.57	692.07	692.20	692.32	692.83	693.33	693.84
114 + 25	691.00	691.51	692.01	692.52	692.64	692.77	693.27	693.78	694.28

TRANSITION — FULL SUPERELEVATION

STATION	E	D	C	B	A	PROFILE GRADE	A'	B'	C'	D'	E'
114 + 50		691.44	691.95	692.45	692.96	693.08	693.21	693.71	694.22	694.72	
114 + 75		691.88	692.39	692.89	693.40	693.52	693.65	694.15	694.66	695.16	
115 + 00		692.32	692.83	693.33	693.84	693.96	694.09	694.59	695.10	695.60	
115 + 25		692.76	693.26	693.77	694.27	694.40	694.52	695.03	695.53	696.03	
115 + 50		693.18	693.68	694.18	694.69	694.81	694.94	695.44	695.95	696.45	
115 + 75		693.58	694.08	694.59	695.09	695.22	695.34	695.85	696.35	696.86	
116 + 00		693.97	694.47	694.98	695.48	695.61	695.73	696.24	696.74	697.24	
116 + 25		694.34	694.85	695.35	695.86	695.98	696.11	696.61	697.12	697.62	
116 + 50		694.70	695.21	695.71	696.22	696.34	696.47	696.97	697.48	697.98	
116 + 75		695.05	695.55	696.06	696.56	696.69	696.81	697.32	697.82	698.32	
117 + 00		695.38	695.88	696.39	696.89	697.02	697.14	697.65	698.15	698.66	
117 + 25		695.70	696.20	696.70	697.21	697.33	697.46	697.96	698.47	698.97	
117 + 50		696.00	696.50	697.01	697.51	697.64	697.76	698.27	698.77	699.27	
117 + 75		696.28	696.79	697.29	697.80	697.92	698.05	698.55	699.06	699.56	
118 + 00		696.56	697.06	697.57	698.07	698.20	698.32	698.83	699.33	699.83	
118 + 25		696.82	697.32	697.82	698.33	698.45	698.58	699.08	699.59	700.09	
118 + 50		697.06	697.56	698.07	698.57	698.70	698.82	699.33	699.83	700.34	
118 + 75	697.04	697.29	697.79	698.30	698.80	698.93	699.05	699.56	700.06	700.56	700.52
119 + 00	697.25	697.50	698.01	698.51	699.02	699.14	699.27	699.77	700.28	700.78	700.74
119 + 25	697.45	697.70	698.21	698.71	699.22	699.34	699.47	699.97	700.48	700.98	700.94
119 + 50	697.64	697.89	698.39	698.90	699.40	699.53	699.65	700.16	700.66	701.16	701.12
119 + 75	697.81	698.06	698.56	699.07	699.57	699.70	699.82	700.33	700.83	701.34	701.30
120 + 00	697.96	698.22	698.72	699.22	699.73	699.85	699.98	700.48	700.99	701.49	701.45
120 + 25	698.11	698.36	698.86	699.37	699.87	700.00	700.12	700.63	701.13	701.63	701.59
120 + 50	698.23	698.48	698.99	699.49	700.00	700.12	700.25	700.75	701.26	701.76	701.72
120 + 75	698.35	698.60	699.10	699.61	700.11	700.24	700.36	700.87	701.37	701.87	701.83
121 + 00	698.44	698.70	699.20	699.70	700.21	700.33	700.46	700.96	701.47	701.97	701.93
121 + 25	698.53	698.78	699.28	699.79	700.29	700.42	700.54	701.05	701.55	702.06	702.02
121 + 50	698.60	698.85	699.35	699.86	700.36	700.49	700.61	701.12	701.62	702.12	702.08
121 + 75	698.73	698.97	699.45	699.94	700.42	700.54	700.67	701.17	701.67	702.17	702.12
122 + 00	698.82	699.06	699.52	700.00	700.46	700.58	700.71	701.20	701.69	702.18	702.13
122 + 25	698.90	699.13	699.58	700.04	700.49	700.61	700.72	701.20	701.67	702.15	702.10
122 + 50	698.99	699.20	699.64	700.08	700.51	700.62	700.73	701.19	701.65	702.11	702.06
122 + 75	699.06	699.27	699.68	700.10	700.51	700.61	700.72	701.15	701.59	702.03	701.98
123 + 00	699.13	699.32	699.72	700.11	700.50	700.60	700.70	701.12	701.53	701.94	701.89
123 + 25	699.19	699.37	699.74	700.10	700.47	700.56	700.66	701.05	701.44	701.83	701.77

TRANSITION — FULL SUPERELEVATION

STATION	E	D	C	B	A	PROFILE GRADE	A'	B'	C'	D'	E'
123 + 50	699.23	699.40	699.74	700.09	700.43	700.52	700.61	700.98	701.35	701.71	701.65
123 + 75	699.26	699.42	699.74	700.05	700.37	700.45	700.54	700.88	701.22	701.57	701.50
124 + 00	699.27	699.42	699.72	700.01	700.30	700.38	700.46	700.78	701.10	701.43	701.35
124 + 25	699.26	699.40	699.67	699.95	700.22	700.29	700.36	700.66	700.96	701.26	701.18
124 + 50		699.37	699.62	699.87	700.12	700.18	700.25	700.52	700.80	701.08	
124 + 75		699.32	699.55	699.78	(2.95) 700.00	(4.20) 700.06	(2.91) 700.12	700.38	700.63	700.88	
125 + 00		699.25	699.45	699.66	(3.00) 699.87	(4.42) 699.93	(2.89) 699.99	700.22	700.45	700.68	
125 + 25		699.13	699.33	699.52	(3.14) 699.72	(4.62) 699.78	(2.90) 699.84	700.04	700.25	700.46	
125 + 50		698.98	699.17	699.36	(3.35) 699.56	(4.82) 699.61	(2.97) 699.66	699.85	700.03	700.21	
125 + 75		698.81	699.00	699.19	(3.57) 699.38	(5.04) 699.44	(3.05) 699.49	699.65	699.81	699.97	
126 + 00		698.62	699.80	698.99	(3.83) 699.18	(5.24) 699.24	(3.16) 699.28	699.42	699.56	699.70	
126 + 25		698.41	698.60	698.79	(4.08) 698.98	(5.44) 699.04	(3.29) 699.07	699.19	699.31	699.42	
126 + 50		698.21	698.40	698.59	(4.32) 698.77	(5.64) 698.84	(3.44) 698.87	698.96	699.06	699.15	
126 + 75		698.01	698.20	698.38	(4.50) 698.57	(5.86) 698.64	(3.57) 698.66	698.73	698.80	698.87	
127 + 00		697.81	697.99	698.18	(4.66) 698.37	(6.00) 698.44	(3.75) 698.45	698.50	698.55	698.60	
127 + 25		697.61	697.79	697.98	(4.82) 698.17	(6.00) 698.24	(3.99) 698.25	698.27	698.30	698.32	
127 + 50		697.40	697.59	697.78	(4.92) 697.96	(6.00) 698.04	(4.21) 698.04	698.04	698.05	698.05	
127 + 75		697.20	697.39	697.58	(4.97) 697.76	(6.00) 697.84	(4.42) 697.83	697.82	697.80	697.79	
128 + 00		697.00	697.19	697.38	(5.00) 697.56	(6.00) 697.64	(4.60) 697.63	697.59	697.56	697.52	
128 + 25		696.80	696.99	697.17	(5.00) 697.36	(6.00) 697.44	(4.74) 697.42	697.37	697.32	697.27	
128 + 50		696.60	696.79	696.97	(5.00) 697.16	(6.00) 697.24	(4.85) 697.21	697.14	697.08	697.01	
128 + 75		696.40	696.59	696.77	(5.00) 696.96	(6.00) 697.04	(4.92) 697.00	696.92	696.83	696.75	
129 + 00		696.20	696.39	696.57	(5.00) 696.76	(6.00) 696.84	(4.97) 696.80	696.69	696.59	696.49	
129 + 25		696.00	696.19	696.37	(5.00) 696.56	(6.00) 696.64	(4.99) 696.59	696.47	696.35	696.22	
129 + 50		695.80	695.99	696.17	(5.00) 696.36	(6.00) 696.44	(5.00) 696.38	696.24	696.10	695.97	
129 + 75		695.60	695.79	695.97	(5.00) 696.16	(6.00) 696.24	(5.00) 696.17	696.02	695.86	695.71	
130 + 00		695.40	695.59	695.77	(5.00) 695.96	(6.00) 696.04	(5.00) 695.97	695.79	695.62	695.44	
130 + 25		695.20	695.39	695.57	(5.00) 695.76	(6.00) 695.84	(5.00) 695.76	695.57	695.39	695.20	
130 + 41.88		695.06	695.26	695.44	(5.00) 695.62	(6.00) 695.70	(5.00) 695.62	695.44	695.26	695.06	

TRANSITION — 3/16"/FT. PAV'T SLOPE

CONT. No. 58019 SHEET ACCT. No. 6031

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

SUPERELEVATION TABLE

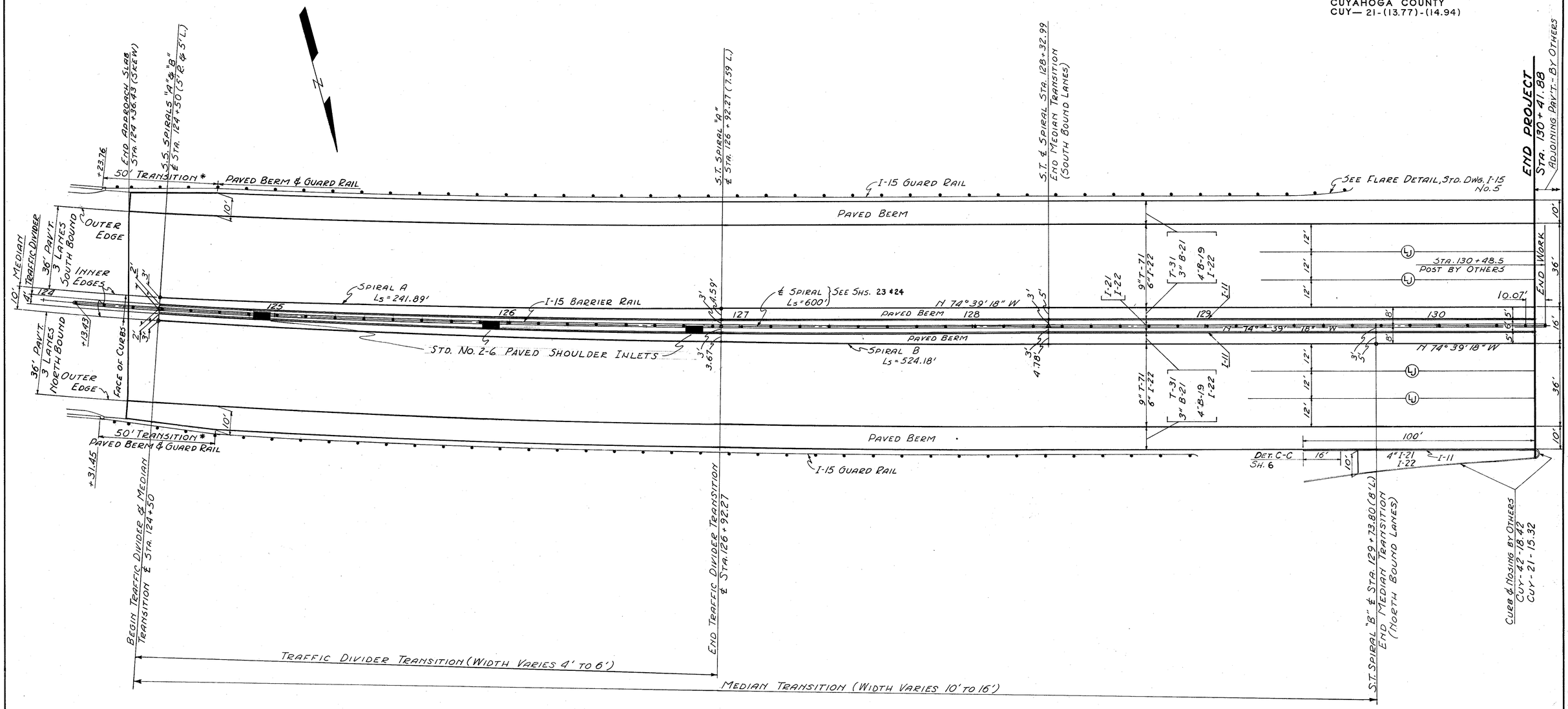
WILLOW ℄ STA. 107 + 50 TO STA. 130 + 41.88

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

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

30
204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)



SPIRAL DATA

	SPIRAL A	SPIRAL B
L_S	241.89'	524.18'
θ_S	3°40'01"	3°40'01"
L.T.	161.30'	349.53'
S.T.	80.66'	174.80'
L.C.	241.85'	524.08'
Xc	241.79'	523.96'
Yc	5.16'	11.81'

NOTE:
UNLESS OTHERWISE SPECIFIED THE FOLLOWING NOTES APPLY—
DIMENSIONS ARE GIVEN TO JOINTS, EDGE OF PAVEMENT OR FACE OF CURBS.
ALL RADII GIVEN TO FACE OF CURB OR EDGE OF PAVEMENT.
* VARY PAVED BERM ELEVATIONS TO MATCH APPROACH SLAB.

REFERENCE DRAWINGS

SH. 29	TOP OF PAVEMENT ELEVATIONS (INCLUDING VARIABLE MEDIAN WIDTHS).
SH. 4 & 5	TYPICAL SECTIONS
SH. 11 & 12	QUANTITY CALCULATIONS
SH. 23 & 24	DRAINAGE

JOINT SYMBOL

(LJ) STANDARD LONGITUDINAL JOINT.

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

MEDIAN TRANSITION & PAVEMENT DETAILS

STA. 124+36.43 (SKEW) TO STA. 130+41.88

SCALE 1"=20' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
AHJ	GOK		GOH			

CONT. NO. 58019 SHEET ACCT. NO. 6015

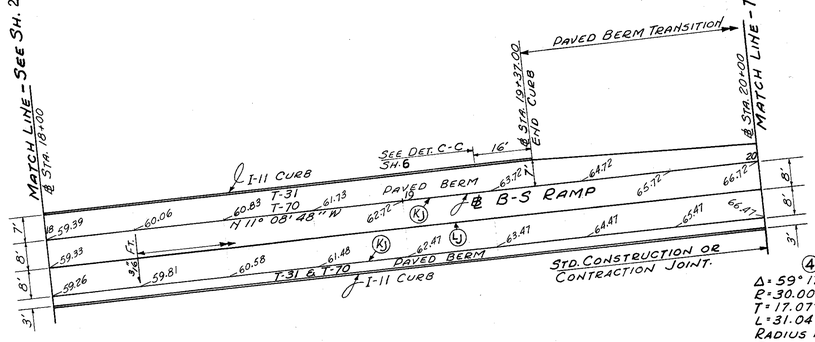
6015 58019

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

31
204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)

CONT. No. 88019 SHEET ACCT. No. 6289



CURVE DATA

① Δ = 149° 59' 14" R = 2.00' L = 5.24' RADIUS PT.: ℄ STA 23+68.38 29' RT.

② Δ = 113° 44' 15" R = 20.00' T = 30.64' L = 39.70'

③ Δ = 21° 44' 33" R = 100.00' T = 19.20' L = 37.95'

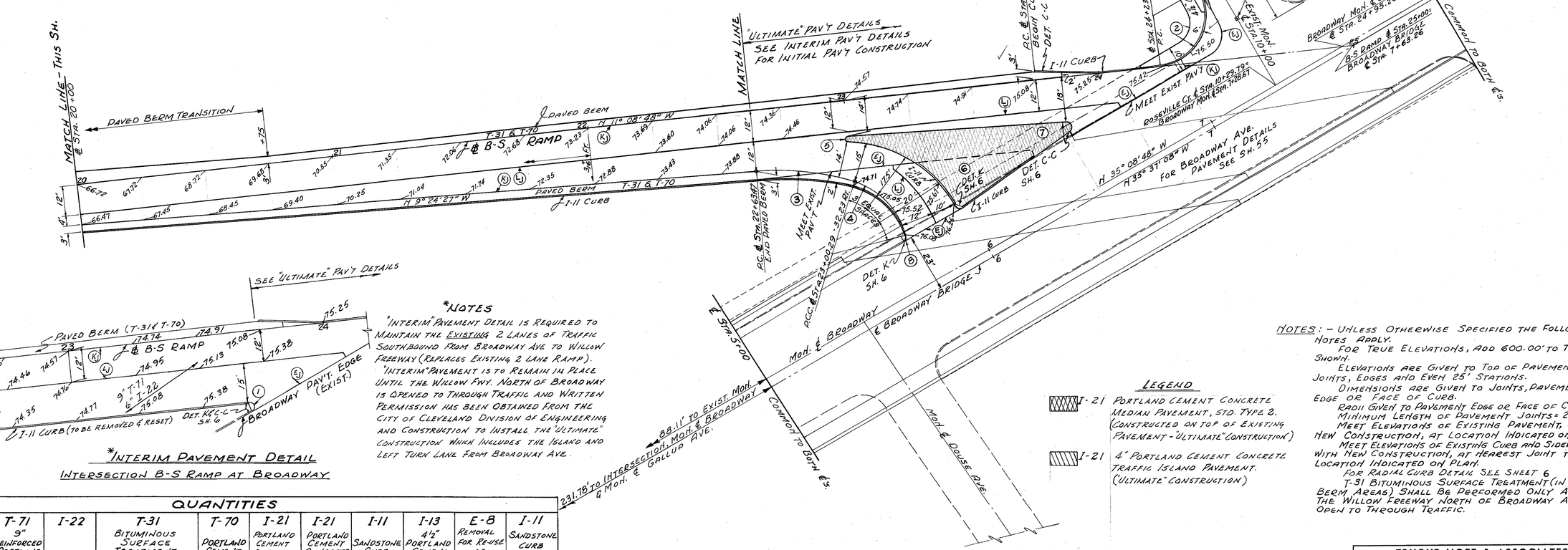
④ Δ = 59° 17' 22" R = 30.00' T = 17.07' L = 31.04' RADIUS PT: BROADWAY BRIDGE ℄ STA. 5+45.85 33.30' LT.

⑤ Δ = 163° 52' 59" R = 1.00' L = 2.86' RADIUS PT.: ℄ STA. 22+97.25 15' RT.

⑥ Δ = 104° 22' 56" R = 2.00' L = 3.64' RADIUS PT.: BROADWAY BRIDGE ℄ STA. 5+99.21 25' LT.

⑦ Δ = 147° 26' 12" R = 2.00' L = 5.15' RADIUS PT.: BROADWAY BRIDGE ℄ STA. 6+49.62 29.89' LT.

⑧ Δ = 72° 45' 24" R = 2.00' L = 2.54' RADIUS PT: BROADWAY BRIDGE ℄ STA. 5+72.59 25.00' LT.



*INTERIM PAVEMENT DETAIL
INTERSECTION B-S RAMP AT BROADWAY

*NOTES

"INTERIM" PAVEMENT DETAIL IS REQUIRED TO MAINTAIN THE EXISTING 2 LANES OF TRAFFIC SOUTHBOUND FROM BROADWAY AVE TO WILLOW FREEWAY (REPLACES EXISTING 2 LANE RAMP). "INTERIM" PAVEMENT IS TO REMAIN IN PLACE UNTIL THE WILLOW FWY. NORTH OF BROADWAY IS OPENED TO THROUGH TRAFFIC AND WRITTEN PERMISSION HAS BEEN OBTAINED FROM THE CITY OF CLEVELAND DIVISION OF ENGINEERING AND CONSTRUCTION TO INSTALL THE "ULTIMATE" CONSTRUCTION WHICH INCLUDES THE ISLAND AND LEFT TURN LANE FROM BROADWAY AVE.

QUANTITIES

	T-71 9" Reinforced Portland Cement Concrete Pavement	I-22 Subbase	T-31 Bituminous Surface Treatment: Bituminous Material 0.10 Gal./Sy.	T-31: No 6 Aggregate 0.008 C.Y./S.Y.	T-70 Portland Cement Concrete Pavement	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-13 4½" Portland Cement Concrete Sidewalk	E-8 Removal for Reuse of Existing Curb	I-11 Sandstone Curb Reset
	Sq. Yo.	Cu. Yo.	Gal.	Cu. Yo.	Cu. Yo.	Cu. Yo	Sq. Yo.	L.F.	Sq. Ft.	L.F.	L.F.
TOTAL THIS SH.	1467	317	44	4	133	11	49	843	342	111	100

NOTES: - UNLESS OTHERWISE SPECIFIED THE FOLLOWING NOTES APPLY.
FOR TRUE ELEVATIONS, ADD 600.00' TO THOSE SHOWN.
ELEVATIONS ARE GIVEN TO TOP OF PAVEMENT AT JOINTS, EDGES AND EVEN 25' STATIONS.
DIMENSIONS ARE GIVEN TO JOINTS, PAVEMENT EDGE OR FACE OF CURB.
RADII GIVEN TO PAVEMENT EDGE OR FACE OF CURB.
MINIMUM LENGTH OF PAVEMENT JOINTS = 2'-0
MEET ELEVATIONS OF EXISTING PAVEMENT, WITH NEW CONSTRUCTION, AT LOCATION INDICATED ON PLAN.
MEET ELEVATIONS OF EXISTING CURB AND SIDEWALK, WITH NEW CONSTRUCTION, AT NEAREST JOINT TO LOCATION INDICATED ON PLAN.
FOR RADIAL CURB DETAIL SEE SHEET 6.
T-31 BITUMINOUS SURFACE TREATMENT (IN PAVED BERM AREAS) SHALL BE PERFORMED ONLY AFTER THE WILLOW FREEWAY NORTH OF BROADWAY AVE. IS OPEN TO THROUGH TRAFFIC.

LEGEND

I-21 PORTLAND CEMENT CONCRETE MEDIAN PAVEMENT, STD. TYPE 2. (CONSTRUCTED ON TOP OF EXISTING PAVEMENT - "ULTIMATE" CONSTRUCTION)

I-21 4" PORTLAND CEMENT CONCRETE TRAFFIC ISLAND PAVEMENT. ("ULTIMATE" CONSTRUCTION)

JOINT SYMBOLS

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

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

B-S RAMP PAVEMENT DETAILS
℄ STA. 18+00 TO STA. 25+00

SCALE 1"=20' DATE

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

6.0

0-10

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

32
204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)

N

E. 45TH ST.

JEWETT AVE.

CZAR AVE.

FIFTH AVE.

PERSHING AVE.

BEGIN PROJECT

680
670
660

PAVED BERM

10

50

℄ WILLOW

55

℄ RETAINING WALL

℄ B-S RAMP

PAVED BERM

SKEW LINE

15

45+76.05
46+00
47+00
48+00
49+00
50+00
51+00
52+00
53+00
54+00
55+00
55+98
56+69
57+50
58+25

EXISTING RAMP

CONTINUED ON SH. 33

WILLOW CROSS SECTIONS SHS. 34 TO 37
B-S RAMP CROSS SECTIONS SH. 42

E. 47TH ST.

JEWETT AVE.

CZAR AVE.

FIFTH AVE.

BROADWAY AVE.

EXISTING CONTOURS
LOCATION OF CROSS SECTIONS

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

GRADING & CROSS SECTION KEY PLAN

WILLOW & STA. 45+76.05 TO STA. 58+25

SCALE 1"= 50'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	G.O'C.		C.D.K.			

DATE

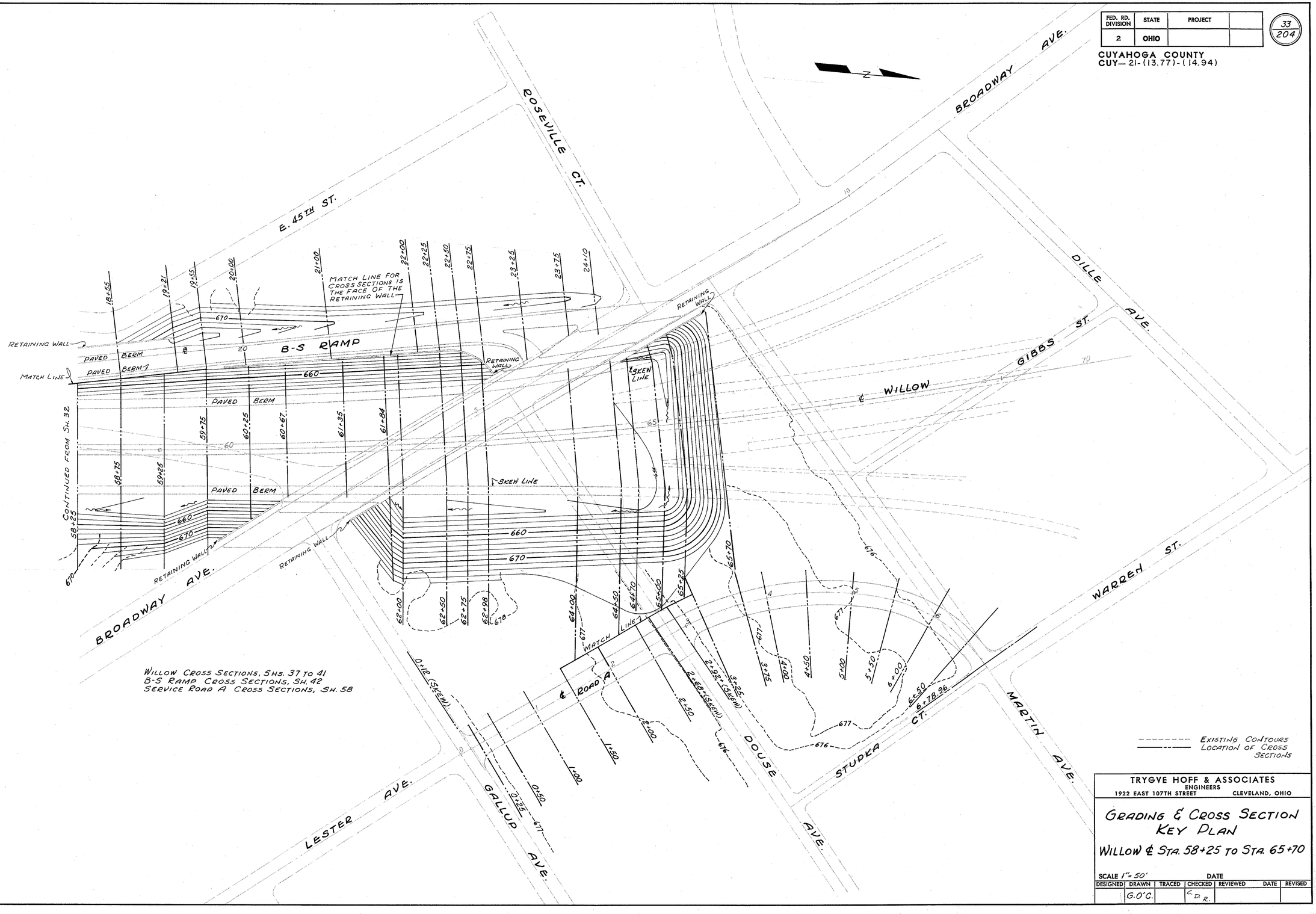
CONT. NO. 58019

6220

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

33
204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)



Willow Cross Sections, Shs. 37 to 41
B-S Ramp Cross Sections, Sh. 42
Service Road A Cross Sections, Sh. 58

Existing Contours
Location of Cross Sections

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

Grading & Cross Section Key Plan

Willow & Sta. 58+25 to Sta. 65+70

SCALE 1"= 50' DATE

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

38019 6221

CUYAHOGA COUNTY
CUY - 21 - (13.77) - (14.94)

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

STA. 48+92 72' LT.
MOD. STD. # 5 C.B.
GRATE ELEV. 659.38
℄ 12" 655.57

TEMPORARY SLOPE FOR N.B. WILLOW CONSTRUCTION

EXIST. PAV'T. TO REMAIN

660.74
48+00
660.3

STA. 47+25 72' LT.
MOD. STD. # 5 C.B.
GRATE ELEV. 658.85
℄ ELEV. 15" 656.63

660.58
47+00
659.8

660.61
46+00
659.7

AHEAD
BACK

TEMPORARY SLOPE FOR N.B. WILLOW CONSTRUCTION

EXIST. PAV'T. TO REMAIN

660.63
45+76.05 (AHEAD) = 199+83.68 (BACK)
BEGIN PROJECT
659.8

EXIST. PAV'T. TO REMAIN

SEED 10' OUTSIDE OF WORK LIMITS

659.94
198+33.68
BEGIN PAVED BERM

SEE CROSS SECTION KEY PLAN SHEET 32133

44,964 C.Y.
224 C.Y.
12,222 S.Y.
EXCAVATION
EMBANKMENT
SEEDING

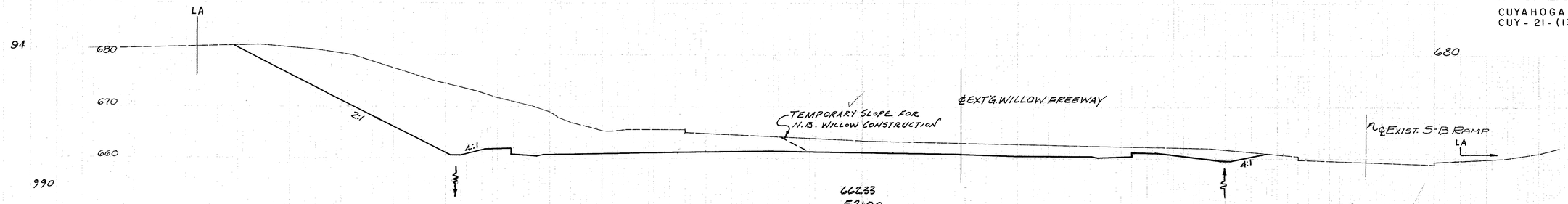
140 130 120 110 100 90 80 70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80 90 100 110 120

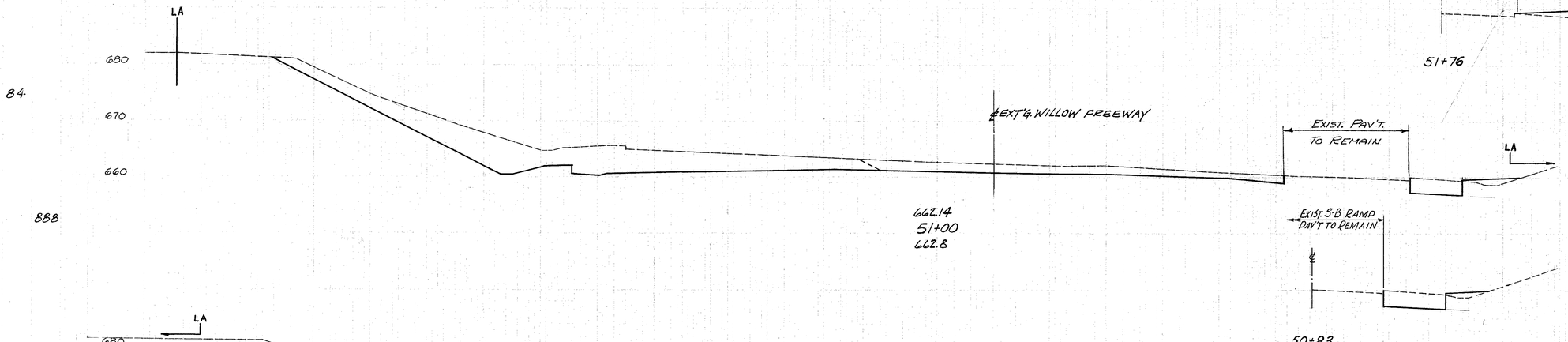
STA. 45+76.05 TO STA. 48+92

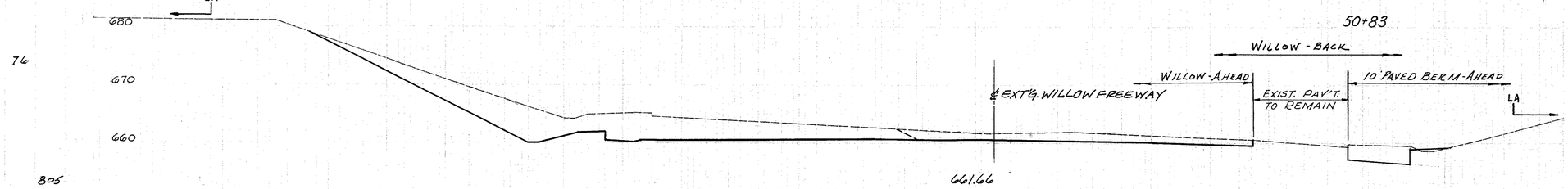
CONT. NO. 58019
SHEET ACCT. NO. 6/12

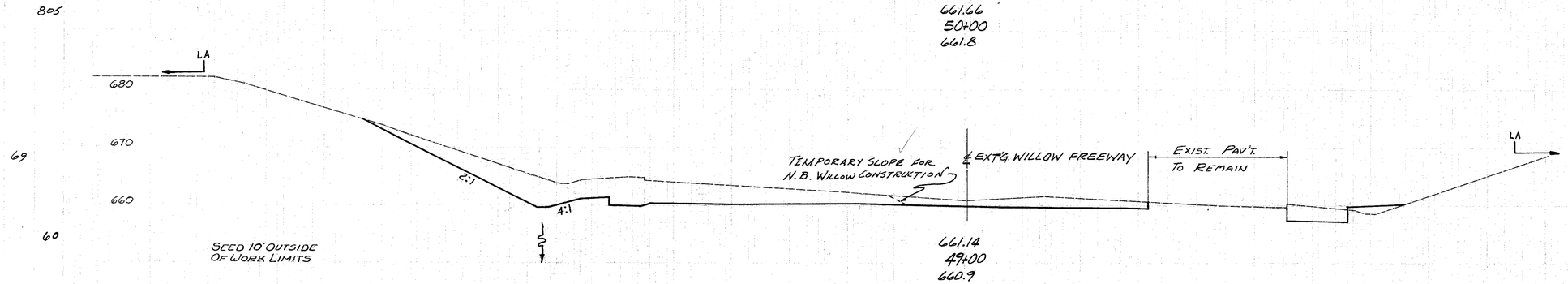
CUYAHOGA COUNTY
CUY - 21 - (13.77) - (14.94)

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







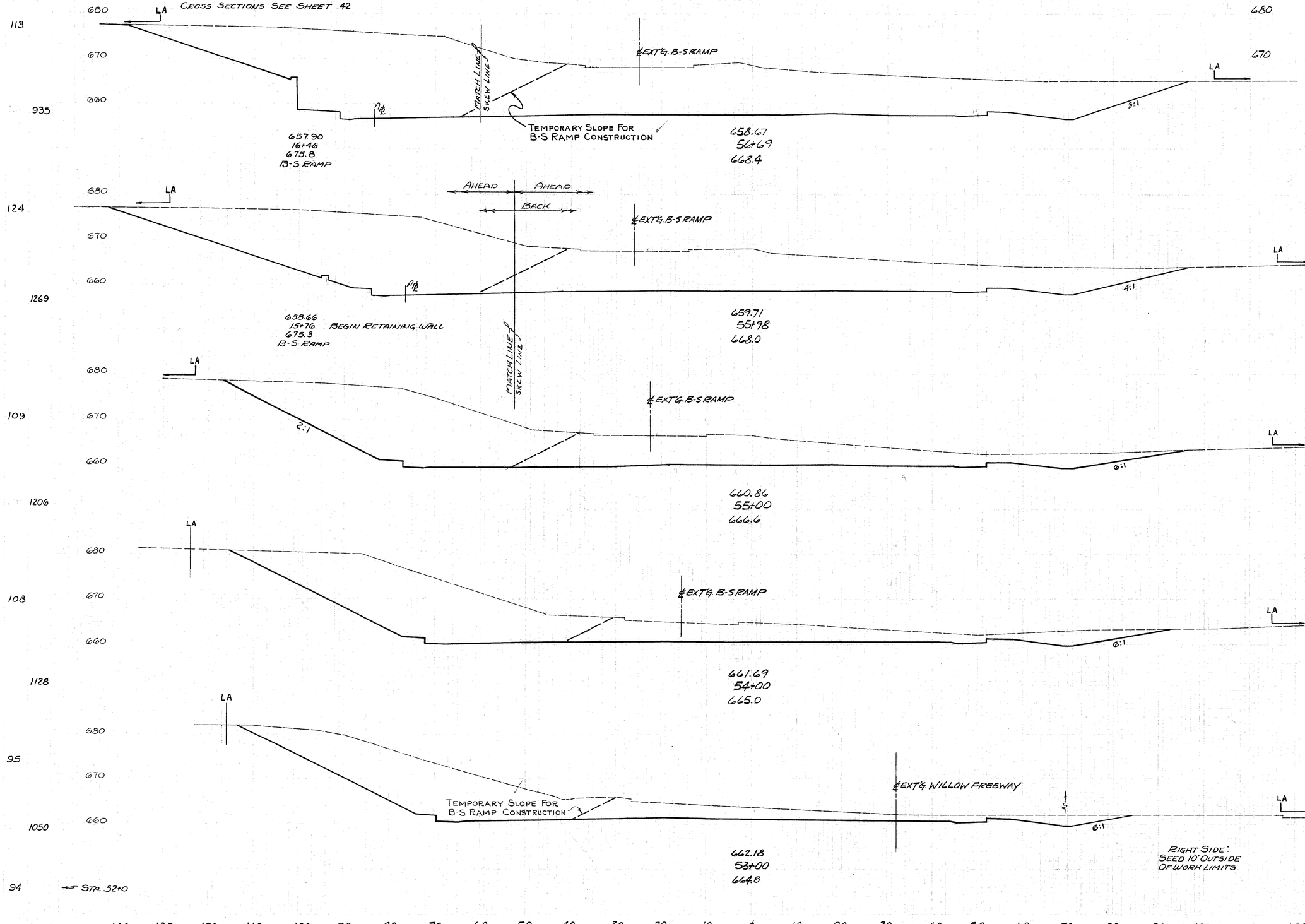


140 130 120 110 100 90 80 70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80 90 100 110 120 130 STA. 49+0 TO STA. 52+0

CONST. NO. 58019
SUPPT. AGMT. NO. 6176

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

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



660		
B-S RAMP	374	0
WILLOW	1400	0
		2611 0
B-S RAMP		3237 0
WILLOW		
AHEAD	1012	0
B-S RAMP		
670		
AHEAD	1063	0
WILLOW		
660		
BACK	2075	0
		6301 0
670		
660	1397	0
		4689 0
670		
660	1135	0
		1008 0 3733 0
670		
660	882	0
		3619 0
STA. 52+0	1072	0

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 STA. 53+0 TO STA. 56+69

CUYAHOGA COUNTY
CUY - 21 - (13.77) - (14.94)

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

680 / 670 / 660 / 650

110 — 605

MATCH LINE B-S RAMP ⇄ CROSS SECTIONS

℄ EXT'G. B-S RAMP

TEMPORARY SLOPE FOR B-S RAMP CONSTRUCTION

2:1

653.79
59+25
672.5

680 LA

670 — 4074 0
660
650 — 7020 0

680 / 670 / 660 / 650

108 — 542

℄ EXT'G. B-S RAMP

654.78
58+75
671.3

LA

680 — 3508 0
670
660
650 — 5793 0

118,464 C.Y.
0 C.Y.
13,056 S.Y.
EXCAVATION
EMBANKMENT
SEEDING

680 / 670 / 660 / 650

87 — 754

℄ EXT'G. B-S RAMP

3:1

655.80
58+25
671.2

LA

680
670 — 2748 0
660
650 — 6586 0

670 / 660 / 650

94 — 931

MATCH LINE B-S RAMP ⇄ CROSS SECTIONS

℄ EXT'G. B-S RAMP

TEMPORARY SLOPE FOR B-S RAMP CONSTRUCTION

657.28
57+50
670.1

LA

670
660 — 1993 0
650 — 5088 0

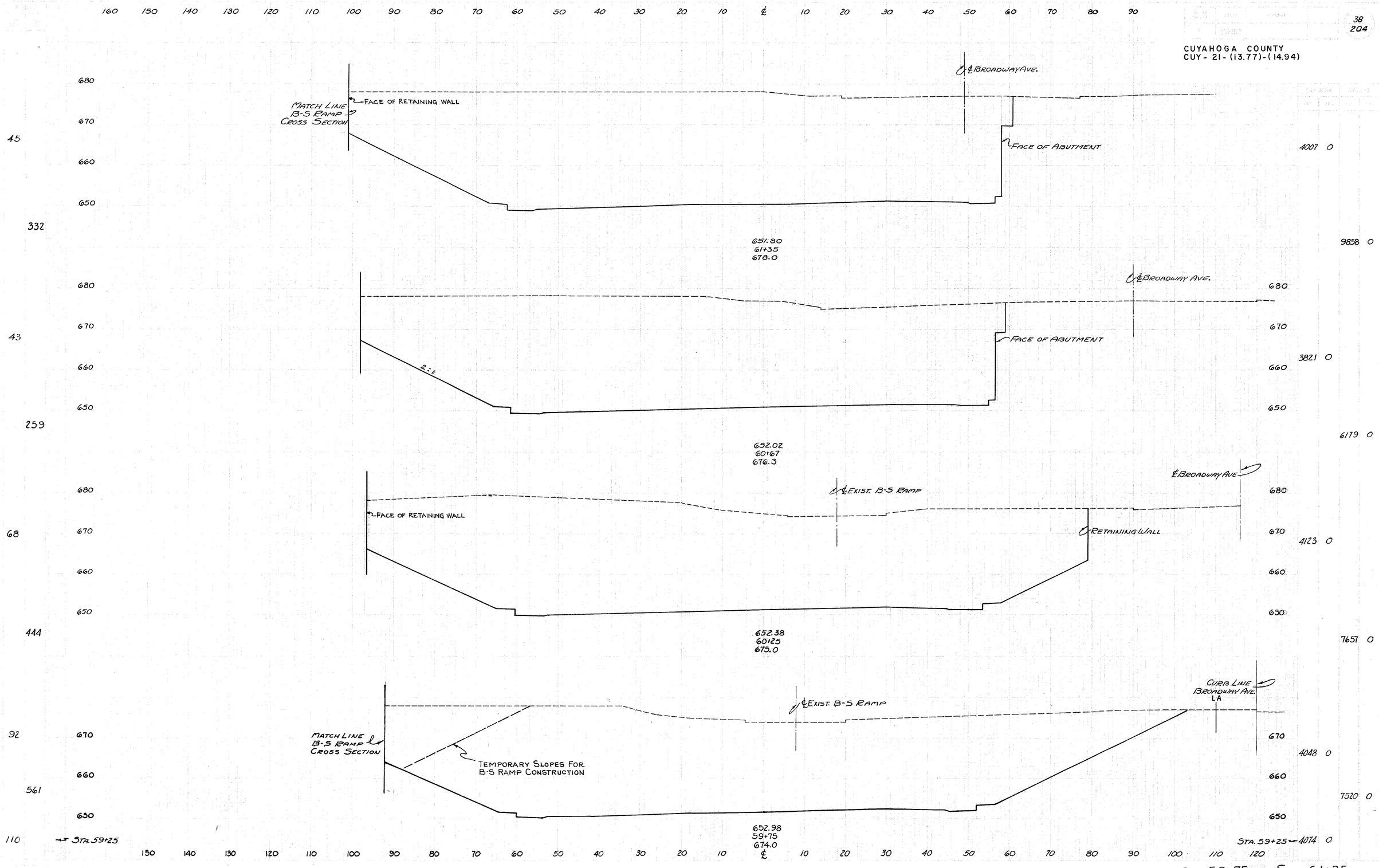
RIGHT SIDE:
SEED 10' OUTSIDE WORK LIMITS

113 — STA. 56+69 ⇄ STA. 56+69 — 1400 0

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

STA. 57+50 TO STA. 59+25

CUYAHOGA COUNTY
CUY - 21 - (13.77) - (14.94)



STA. 59+75 TO STA. 61+35

CONT. NO. 58019

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

℄ BROADWAY AVE.

FACE OF RETAINING WALL

MATCH LINE B-S RAMP CROSS SECTIONS

168

680 670 660 650

2:1

442
391 ← AREA TO BE SEEDED BETWEEN L/A LINE, R/W LINE & GALLUP AVE.

652.53
62+75
676.7

SKEW LINE

LA

℄ RUN AROUND

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

SEED TO R/W LINE 185' RT.

660 5588 0

650

SEED TO R/W LINE 200' RT. 5228 0

℄ BROADWAY AVE.

160

680 670 660 650

900

652.27
62+50
676.7

℄ RUN AROUND

LA

680 670 5704 0 660 650

10,514 0

SEED TO GALLUP 230' RT.

℄ BROADWAY AVE.

164

680 670 660 650

283

651.93
62+00
676.8

BEGIN SKEW LINE

8:1

3:1

℄ RUN AROUND

LA

680 670 5717 0 660 650

FROM STA. 62+0 FORWARD, BACK SLOPES ARE SHOWN NORMAL TO THE ℄ OF THE S-E RAMP

SEED TO GALLUP 216' RT. 3310 0

℄ BROADWAY AVE.

AHD.
154
45
BK.

680 670 660 650

245

AHEAD
BACK

FACE OF ABUTMENT

FACE OF RETAINING WALL

MATCH LINE 13-S RAMP CROSS SECTIONS

2:1

651.87
61+84
676.5

℄ RUN AROUND

LA

680 670 AHD. 5456 0 660 BACK 4062 0 650

941 7321 0

QUANTITY BETWEEN BROADWAY BRIDGE WING WALL & STA. 61+84

170 ← SEEDING AREA BETWEEN BROADWAY BRIDGE, GALLUP AVE. & STA. 61+84

45 ← STA. 61+35

STA. 61+35 → 4007 0

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

STA 61+84 TO STA. 62+75

CONT. No. 580/9

SHEET ACCT. NO. 9-LL

CUYAHOGA COUNTY
CUY - 21 - (13.77) - (14.94)

STA. 62+98 TO STA. 64+70

CONT. NO. 58019

SHEET ACCT. NO. 6182

CUYAHOGA COUNTY
CUY- 21-(13.77)-(14.94)

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

EARTHWORK QUANTITY
REMOVED UNDER S-13 ⇝ MINUS 2500
(FOR BROW'Y. RUN AROUND)

680
300 ℄ RUN AROUND
670
65+70
676.4
MEET EXISTING

680 0 0
670

1733 AREA TO BE SEEDED BETWEEN
L/A LINE & ROAD "A"
FROM STA. 63+00 TO 65+70

1540 3660 0

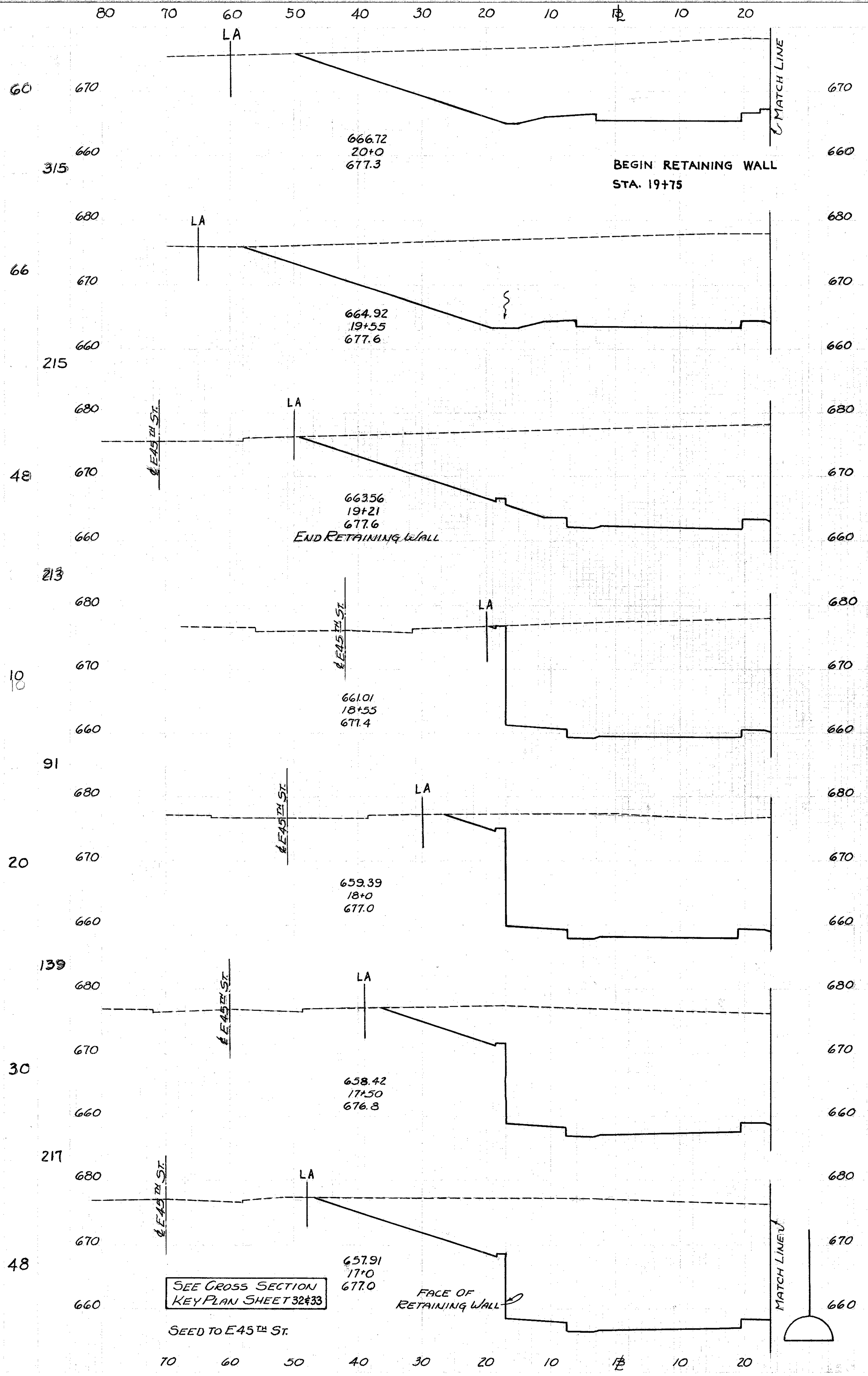
680 CURB LINE BROADWAY
316 670 FACE OF RETAINING WALL
660 2:1
650 SKEW LINE
862 65+25
677.0
℄ RUN AROUND
SKEW LINE
B
680
670
B
4788 0
660
650
B
680
60:1
670
B
TRAVERSE DRAINAGE DITCH
BETWEEN STA. 65+00 & 65+25
MATCH LINE
ROAD "A" CROSS SECTIONS
4633
29

680 CURB LINE BROADWAY
305 670 FACE OF RETAINING WALL
660 2:1
967 650 SKEW LINE
274 ⇝ STA. 64+70
65+0
677.0
℄ RUN AROUND
SKEW LINE
A
680
670 5224 0
A
3:1
LA
CURB LINE DOUGE
12:1
60:1
A
5626 0
MATCH LINE
ROAD "A" CROSS SECTIONS
STA. 64+70
4903 0

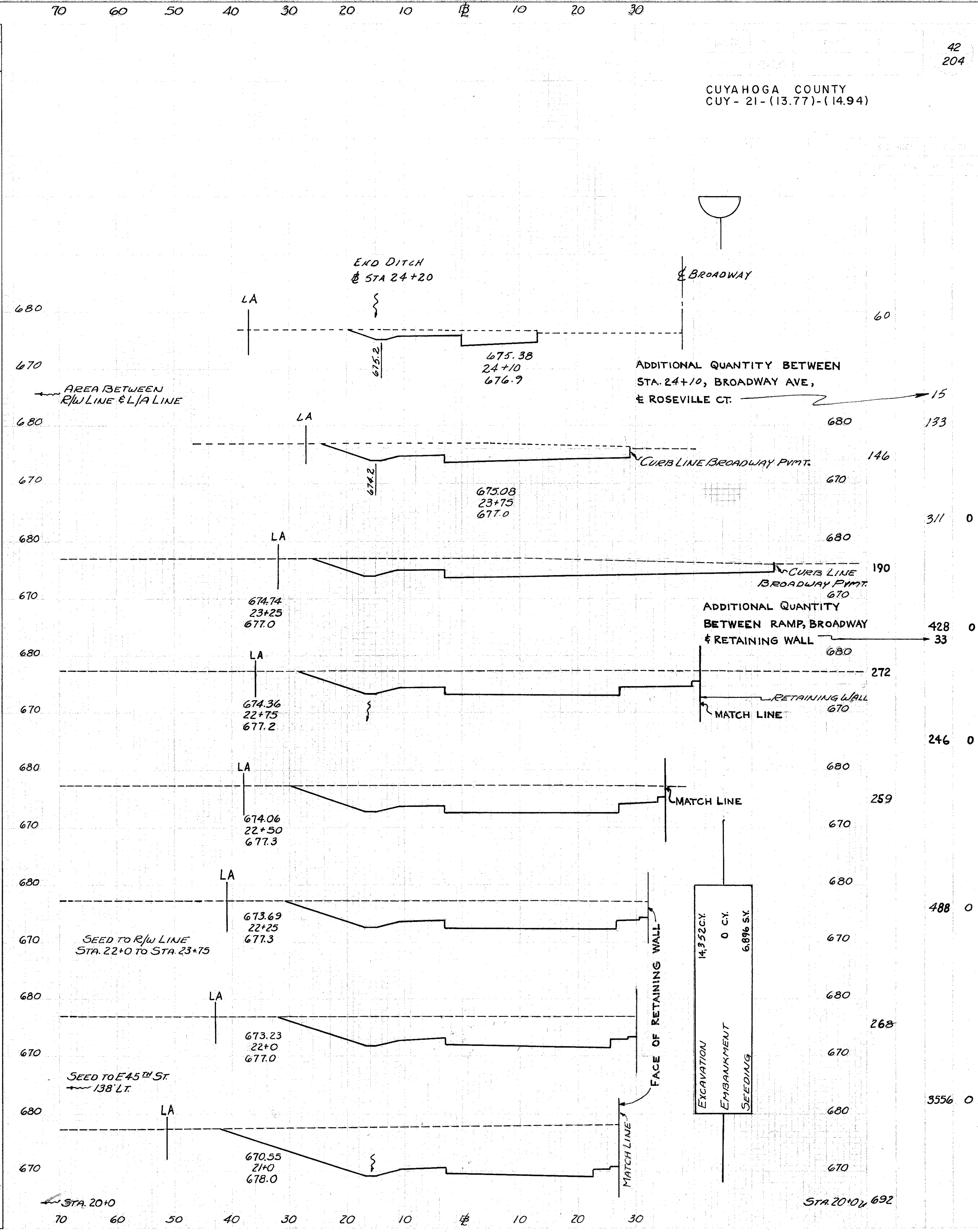
120 110 100 90 80 70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170

STA. 65+0 TO STA. 65+70

CUYAHOGA COUNTY
CUY - 21 - (13.77) - (14.94)



END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL	SEEDING END WIDTH	SEEDING SQ. YDS.
692	0				
		1312	0		
883	0				
					3670
818		3030	0		
				20	
					167
				40	
754	0				
					311
		1585	0	72	
					169
802	0				
				50	
		1528	0		128
				42	
849	0			42	117
		1687	0	42	
					522
973	0				
				52	
					622
				60	



B-S RAMP STA. 17+0 TO STA. 23+75

CONT. NO. 58019

SHEET ACCT. NO. 6179

CONT. No. 58019 SHEET ACCT. No. 6010

STA. 108+80

10

67

10

167

10

BEGIN FILL SECTION STA. 108+80

APPROACH FILL CUY 21-14.55

LA

ORIGINAL EXIST. GROUND ELEV.

LA

G80 0 0

G96.35

108+50

G77.80

APPROACH FILL CUY 21-14.55

MATCH LINE
STA. 107+77.62 (SKEW)
CROSS SECTION

LA

ORIGINAL EXIST. GROUND ELEV.

LA

G80 0 0

G97.41

108+00

G77.1

APPROACH FILL CUY 21-14.55

	Cu. Yds.	Cu. Yds.	Sq. Yds.
EXCAVATION	393	19,633	5,467
EMBANKMENT			
SEEDING			

LA

ORIGINAL EXIST. GROUND ELEV.

LA

G80 0 0

SEE CROSS SECTIONS
KEY PLAN SHEET 43

G97.91

107+77.62 SKEW

G77.0

BEGIN PROJECT & WORK

234 120 100 80 60 40 20 ℄ 20 40 60 80 100 120

CONT. NO. 58019 SHEET ACCT. NO. 6100

WILLOW

STA. 107+52.62 TO STA. 108+50

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

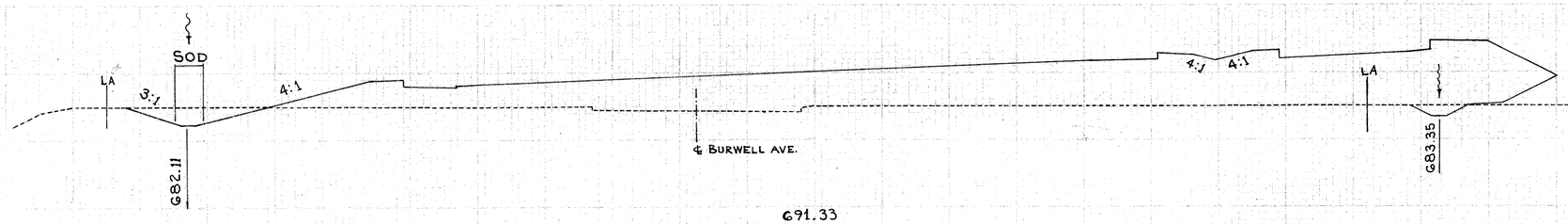
44
204

VOLUME
CUT FILL

45
204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

106
749

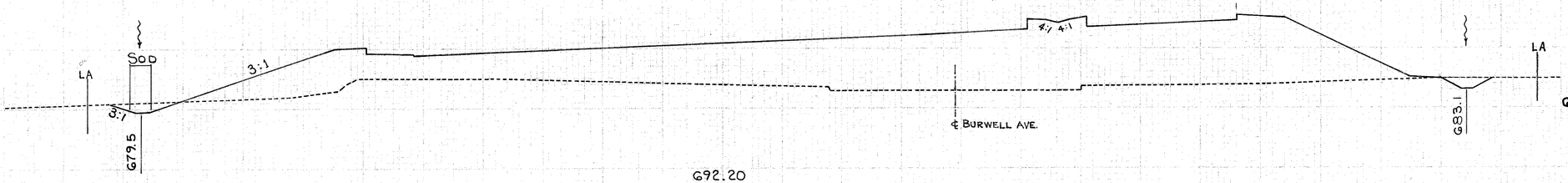


G91.33
111+13.56
G84.9

G70

42 1123

106 AHEAD
32 ESTIMATED ADDITIONAL QUANTITY BETWEEN STA. 110+00 & STA. 110+50
96 BACK
544



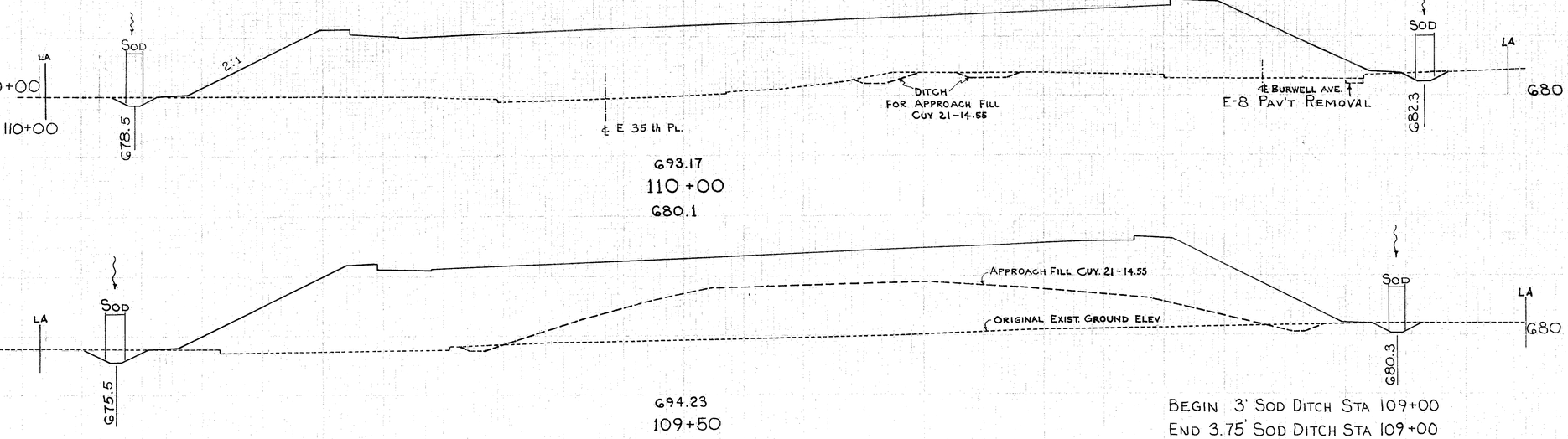
75 3077

G92.20
110+50
G83.9

22 1491

END 3' SOD DITCH STA 110+00 RT.

100 AHEAD
96 BACK
BEGIN 4' SOD DITCH STA. 110+00
END 3.75' SOD DITCH STA. 110+00
605
122



36 3225

17 1994

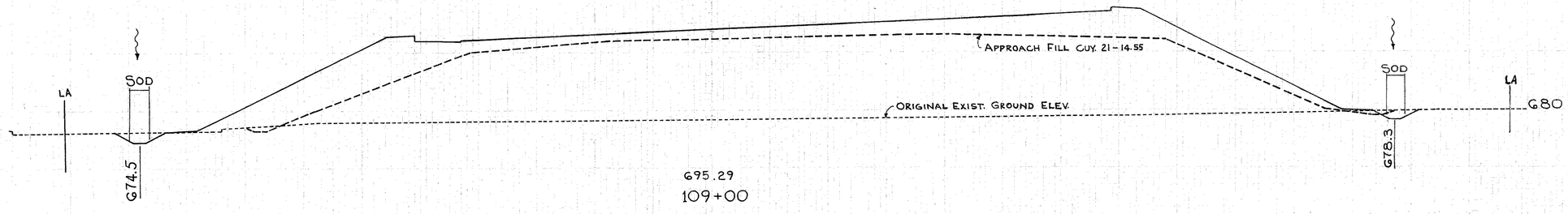
G93.17
110+00
G80.1

37 3336

23 1609

BEGIN 3' SOD DITCH STA 109+00
END 3.75' SOD DITCH STA 109+00

733
140
167



G94.23
109+50
G79.3

35 2211

15 779

G95.29
109+00
G78.4

14 289

10
STA. 108+80

STA. 108+80 0 0

120 100 80 60 40 20 ℄ 20 40 60 80 100 120

STA. 109+00 TO STA. 111+13.56

CONT. NO. 53019 SHEET ACCT. NO. 6101

12830

WILLOW

46
204
CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)
"A"
Estimated Additional Quantity
At E.34TH St. & Road "D"
E-8 Pav't. Removal
LA
3:1
Variable
Match Line
Ramp S-30
Cross Sections
681.45
691.48
113+50
685.0
670
Estimated Additional Quantity
At E.34TH St. & Road "D"
For Additional Earthwork
And Seeding Quantities See
Cross Sections Ramp S-30
Sheet 67
4:1
681.20
690.99
113+00
684.0
680
Std 2-2-A CB
Sta 112+65 99.5' LT.
Grate El 681.02
683.0
690.74
112+50
684.3
Ahead
Back
4:1
684.0
690.75
112+00
684.3
683.7
Ahead
Back
End 4' Sod Ditch Sta. 111+50
Sod
683.6
℄ Burwell Ave.
683.5
690.99
111+50
685.0
403
69
453
94
450
68
361
62
11.3
317
101
419
106
71 853
3 0
83 1614
19 890
23 1453
6 679
6 1234
0 654
7 922
33 1769
29 989
48 1425
42 1123
Sta. 111+13.56
120
100
80
60
40
20
℄
Sta. 111+50 to Sta. 113+50
Cont. No. 58019

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

"E" "E" LA 4:1 2:1 G91.0 G82.25 ℄ ORANGE AVE. MATCH LINE RAMP S-30 CROSS SECTIONS G70
132 R/W 675 "E" G80 "E" G95.61 116+00 G82.0 185 1927

"D" "D" LA 4:1 2:1 G82.45 ℄ ORANGE AVE. MATCH LINE RAMP S-30 CROSS SECTIONS G80
111 AHEAD 101 BACK 21 ESTIMATED ADDITIONAL QUANTITY "D" BETWEEN STA. 115+00 & STA. 115+50 R/W "D" G80 G94.81 115+50 G83.1 324 3299 165 1636

"C" "C" LA G82.20 MATCH LINE RAMP S-30 CROSS SECTIONS E-8 PAV'T REMOVAL G80
544 95 R/W "C" G80 G93.96 115+00 G83.0 285 2913 143 1510

"B" "B" LA G81.95 ℄ E. 34 ST. MATCH LINE RAMP S-30 CROSS SECTIONS E-8 PAV'T. REMOVAL G80
86 R/W 453 "B" G80 G93.08 114+50 G82.2 232 2638 108 1339

"A" "A" LA G81.70 E-8 PAV'T. REMOVAL ℄ E 34 th ST. MATCH LINE RAMP S-30 CROSS SECTIONS G80
77 R/W 406 "A" G80 G92.21 114+00 G83.6 192 2316 99 1162 157 1866

69 STA. 113+50 120 100 80 60 40 20 ℄ 20 40 60 80 100 120 STA. 113+50 71 853

FOR ADDITIONAL EARTHWORK AND SEEDING QUANTITIES SEE CROSS SECTIONS RAMP S-30 SHEETS 67 & 68

EXCAVATION	3,594 Cu. YDS.
EMBANKMENT	34,057 Cu. YDS.
SEEDING	7,702 Sq. YDS.

CONT. NO. 58018 SHEET NUMBER 6103

WILLOW

STA. 114+00 TO STA. 116+00

48
204
CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)
MATCH LINE
STA. 118+64.71 (SKEW)
CROSS SECTION
SOD
1"/FT.
LA
77
681.0
684.1
℄ ORANGE AVE
670
124 ESTIMATED ADDITIONAL QUANTITY
BETWEEN STA. 118+00 & STA. 118+50
698.70
118+50
682.00
13 1493
428
SOD
1"/FT.
LA
3:1
3:1
MATCH LINE
STA. 118+64.71 (SKEW)
CROSS SECTION
38 3530
680
77 AHEAD
139 BACK
680.75
685.7
℄ ORANGE AVE
288 ESTIMATED ADDITIONAL QUANTITY
BETWEEN STA. 117+50 & STA. 118+00
698.20
118+00
682.70
28 2319
STD 2-2-A CB
STA 117+50 138' LT.
GRATE EL 680.50
744
SOD
1"/FT.
LA
ESTIMATED ADDITIONAL QUANTITY
BETWEEN STA. 117+50 & STA. 118+00
68 0
271 4273
680
129 AHEAD
188 BACK
680.50
684.9
MATCH LINE
RAMP S-30
CROSS SECTIONS
FOR ADDITIONAL EARTHWORK AND SEEDING QUANTITIES SEE CROSS SECTIONS RAMP S-30 SHEETS 68 & 69
697.64
117+50
682.00
265 2296
END 3' SOD DITCH STA 117+38.5
980
SOD
"B"
SOD
1"/FT 2:1
165
"B"
688.8
"B"
LA
℄ ORANGE AVE.
621 4093
680
681.75
680
"B"
MATCH LINE
RAMP S-30
CROSS SECTIONS
697.02
117+00
682.70
878
BEGIN 3.75' SOD DITCH STA 116+60
406 2124
BEGIN 3' SOD DITCH STA. 117+00
"A"
LA
4:1
2:1
℄ ORANGE AVE.
ESTIMATED ADDITIONAL QUANTITY
AT E. 32ND ST. & ROAD "D"
40 0
713 3822
151 AHEAD
155 BACK
"A"
682.0
690.2
680
MATCH LINE
RAMP S-30
CROSS SECT.
447 ESTIMATED ADDITIONAL QUANTITY AT E. 32ND ST. & ROAD "D"
"A"
696.34
116+50
682.00
797
680
"A"
364 2004
508 3640
STA. 116+00
185 1927
132 STA 116+00
120
100
80
60
40
20
℄
20
40
60
80
100
120
STA. 116+50 TO STA. 118+50
58019
6104

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

154 — ¼"/FT. — PREVIOUS CONSTRUCTION

700.18
124+50
681.0

238 — ¼"/FT. — 162 — PREVIOUS CONSTRUCTION

700.24
124+36.43 SKEW
681.5

444 — 158 — PREVIOUS CONSTRUCTION

700.34
124+11.43 SKEW
681.5

1237 ESTIMATED ADDITIONAL QUANTITY AT ABUTMENT. Nº 2

STD. 2-2-A CB
STA. 119+53 96' LT.
GRATE EL 677.49

END 3.75' SOD DITCH STA. 119+41.5

"B" — ℄ ORANGE AVE. — E-8 PAV'T. REMOVAL — SOD — GT9.39

NORMAL TO ℄ WILLOW

75 — LA — 681.19 — "B"

217 — "A" — ℄ ORANGE AVE. — E-8 PAV'T. REMOVAL — SOD — 681.06

81 — 65

92 ESTIMATED ADDITIONAL QUANTITY BETWEEN STA. 118+50 & STA 118+64.71

322 — LA — 681.14 — "A"

51 — STA. 118+50

NORMAL TO ℄ WILLOW

BACK
AHEAD

699.06
118+89.71 SKEW
682.0

698.83
118+64.71 SKEW
682.0

PREVIOUS CONSTRUCTION
CUY 42 -18.42
CUY 21 -15.32

	C.Y.	S.Y.
EXCAVATION	427	
EMBANKMENT	5645	
SEEDING		8543

ESTIMATED ADDITIONAL QUANTITY AT ABUTMENT No. 2
FOR CROSS SECTIONS SEE SHEET 52

MATCH LINE RELOCATED ORANGE AVE. CROSS SECTIONS

MATCH LINE RAMP S-30 CROSS SECTIONS

670		0	2690
680		3	1310
680		10	2512
680		9	2198
680		10	2236
			401 917
680		43	2520
			123 1999
680			
AHEAD	273	2754	
BACK	11	345	
			22 1668
STA. 118+50		13	1493

STA. 118+64.71 TO STA. 118+89.71
STA. 124+11.43 TO STA. 124+50

120 100 80 60 40 20 ℄ 20 40 60 80 100 120

WILLOW

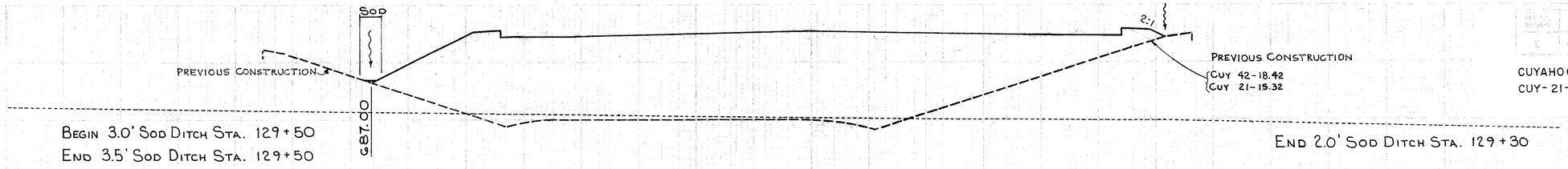
SHEET ACCT No. 6105
CONT. No. 58019

2550

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

STA. 125+00 TO STA. 127+00

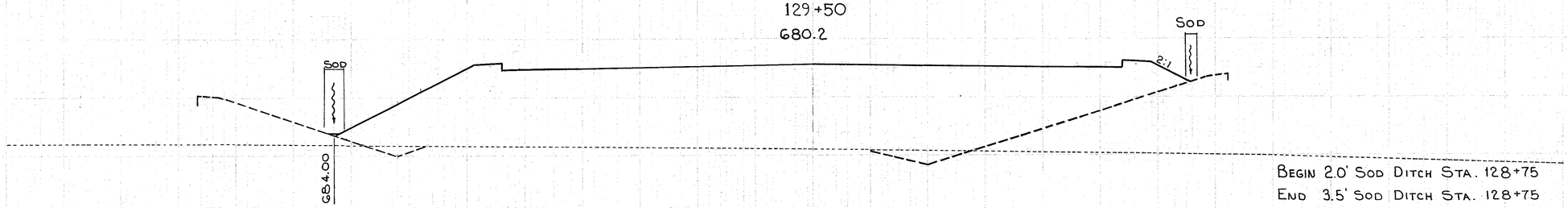
CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)



32 — G70 — 0 1648

211

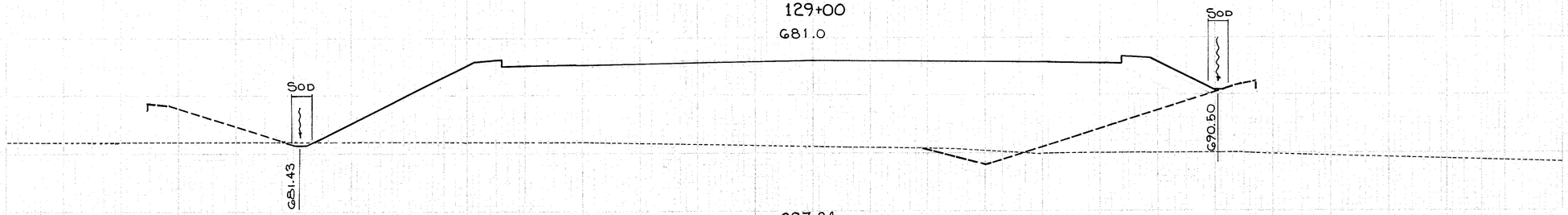
G96.44
129+50
G680.2



44 — G80 — 0 3168

G96.84
129+00
G681.0

278

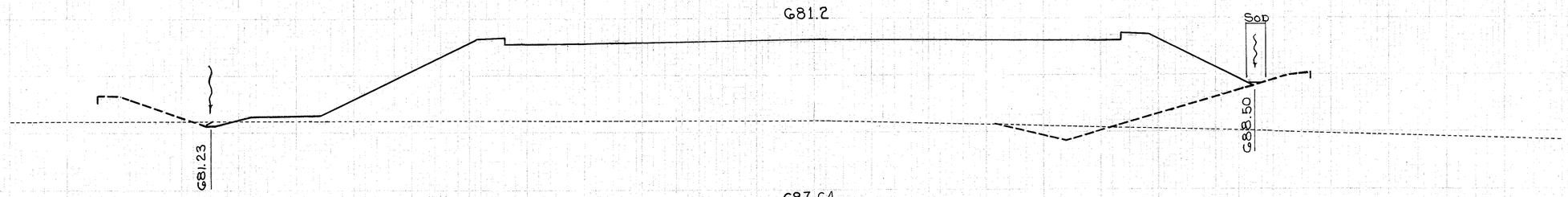


56 — G80 — 0 3444

372 — G80 — 0 1946

G97.24
128+50
G681.2

78

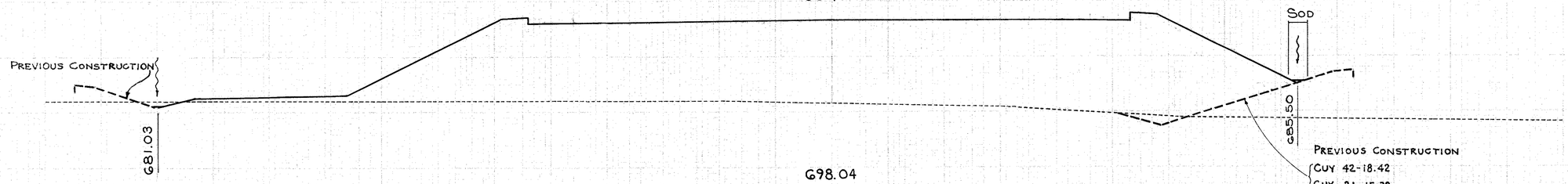


G80 — 3 3731

500 — G80 — 3 2083

G97.64
128+00
G682.0

102



G80 — 3 4075

617 — 0 2318

G98.04
127+50
G681.6

0 4365

120 STA. 127+00 — STA 127+00 — 0 2396

120 100 80 60 40 20 ℄ 20 40 60 80 100 120

STA. 127+50 TO STA. 129+50

CONT. NO. 58019 SHEET ACCT. No. 6107

1978

WILLOW

FED. RD. DIVISION	STATE		
2	OHIO		

52
204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

58019 SHEET ACCT. No. 6108

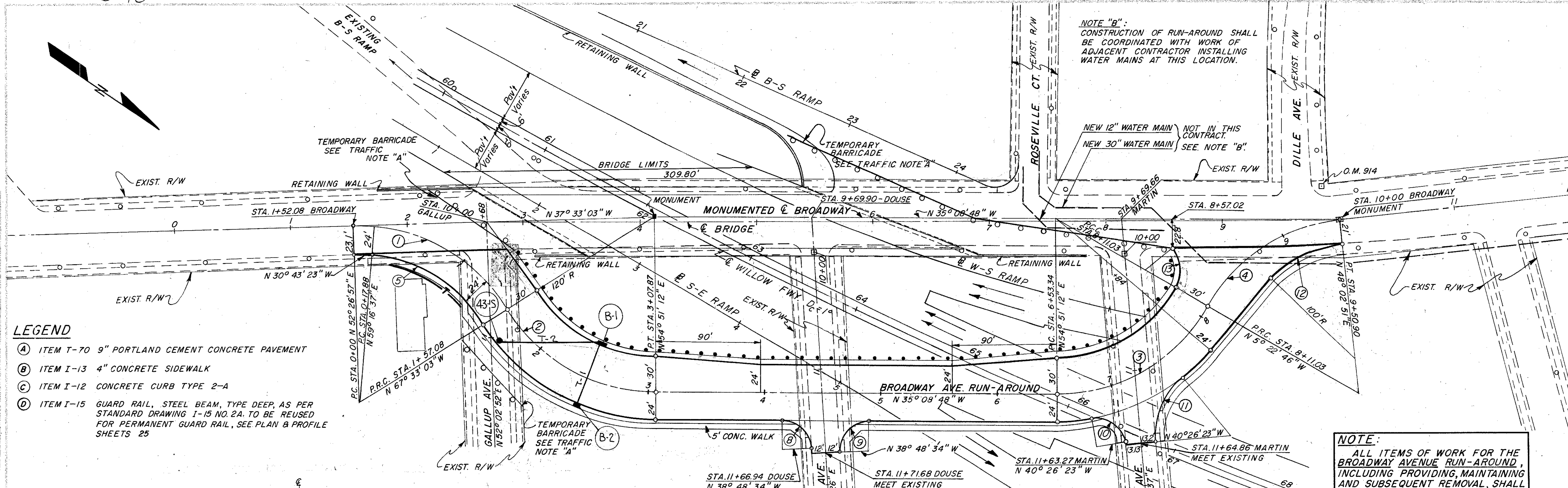
STA. 130+00 TO STA. 130+41.88

O-10

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

53
204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)



NOTE "B":
CONSTRUCTION OF RUN-AROUND SHALL BE COORDINATED WITH WORK OF ADJACENT CONTRACTOR INSTALLING WATER MAINS AT THIS LOCATION.

LEGEND

- (A) ITEM T-70 9" PORTLAND CEMENT CONCRETE PAVEMENT
- (B) ITEM I-13 4" CONCRETE SIDEWALK
- (C) ITEM I-12 CONCRETE CURB TYPE 2-A
- (D) ITEM I-15 GUARD RAIL, STEEL BEAM, TYPE DEEP, AS PER STANDARD DRAWING I-15 NO. 2A. TO BE REUSED FOR PERMANENT GUARD RAIL, SEE PLAN & PROFILE SHEETS 25

RUN-AROUND ℄ CURVE DATA

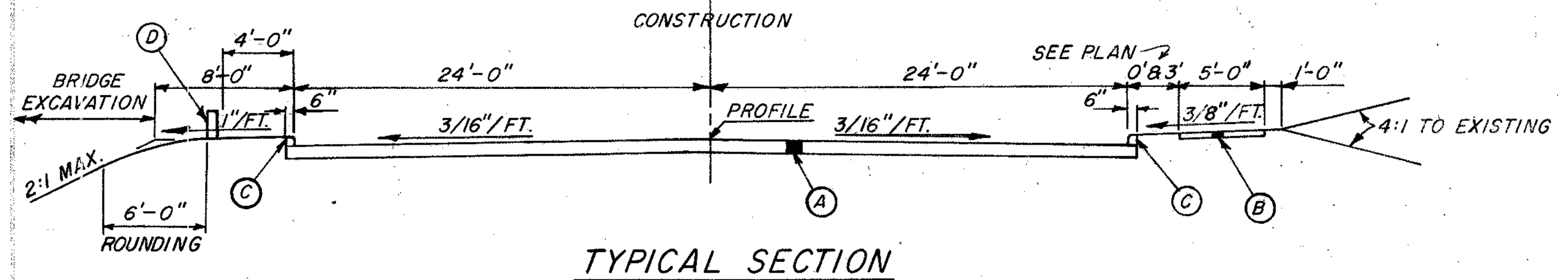
	R	Δ	Dc	T	L
1	150'	60° 00' 00"	38° 11' 50"	86.60'	157.08'
2	150'	57° 35' 45"	38° 11' 50"	82.46'	150.79'
3	150'	60° 13' 58"	38° 11' 50"	87.01'	157.69'
4	150'	53° 25' 37"	38° 11' 50"	75.49'	139.87'

TURNOUT CURVE DATA

	R	Δ	Dc	T	L
5	126'	53° 10' 20"	45° 28' 22"	63.06'	116.93'
8	25'	86° 20' 14"	229° 11' 00"	23.45'	37.67'
9	25'	93° 39' 46"	229° 11' 00"	26.65'	40.87'
10	25'	94° 09' 09"	229° 11' 00"	26.88'	41.08'
11	65'	56° 50' 12"	88° 08' 51"	35.17'	64.48'
12	100'	40°			69.8'
13	30'	69° +			

NOTE:
ALL ITEMS OF WORK FOR THE BROADWAY AVENUE RUN-AROUND, INCLUDING PROVIDING, MAINTAINING AND SUBSEQUENT REMOVAL, SHALL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "ITEM S-15 TEMPORARY RUN-AROUND, BRIDGE AND APPROACHES."

NOTE:
SEE SHEET 13 FOR E-8 PAVEMENT REMOVALS
121 TO 125 EXISTING UTILITIES.

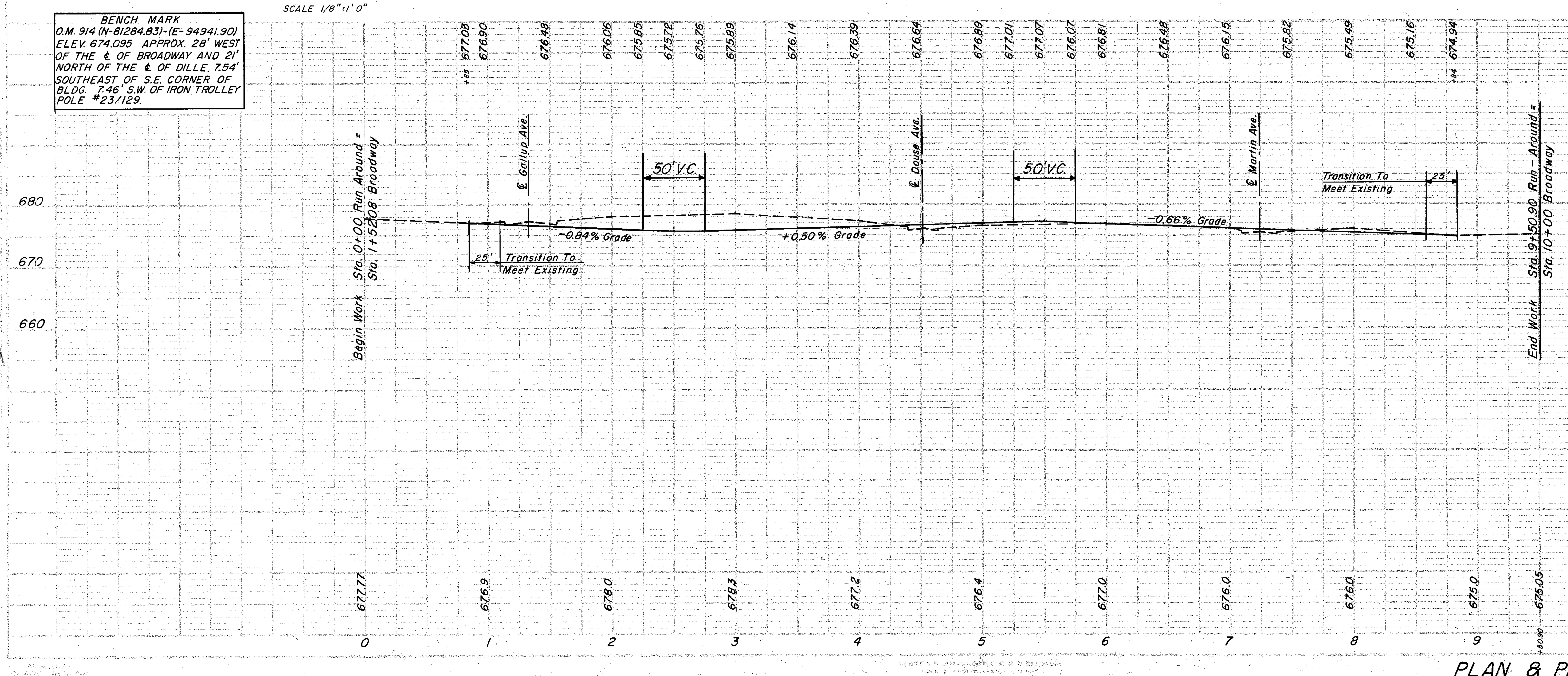


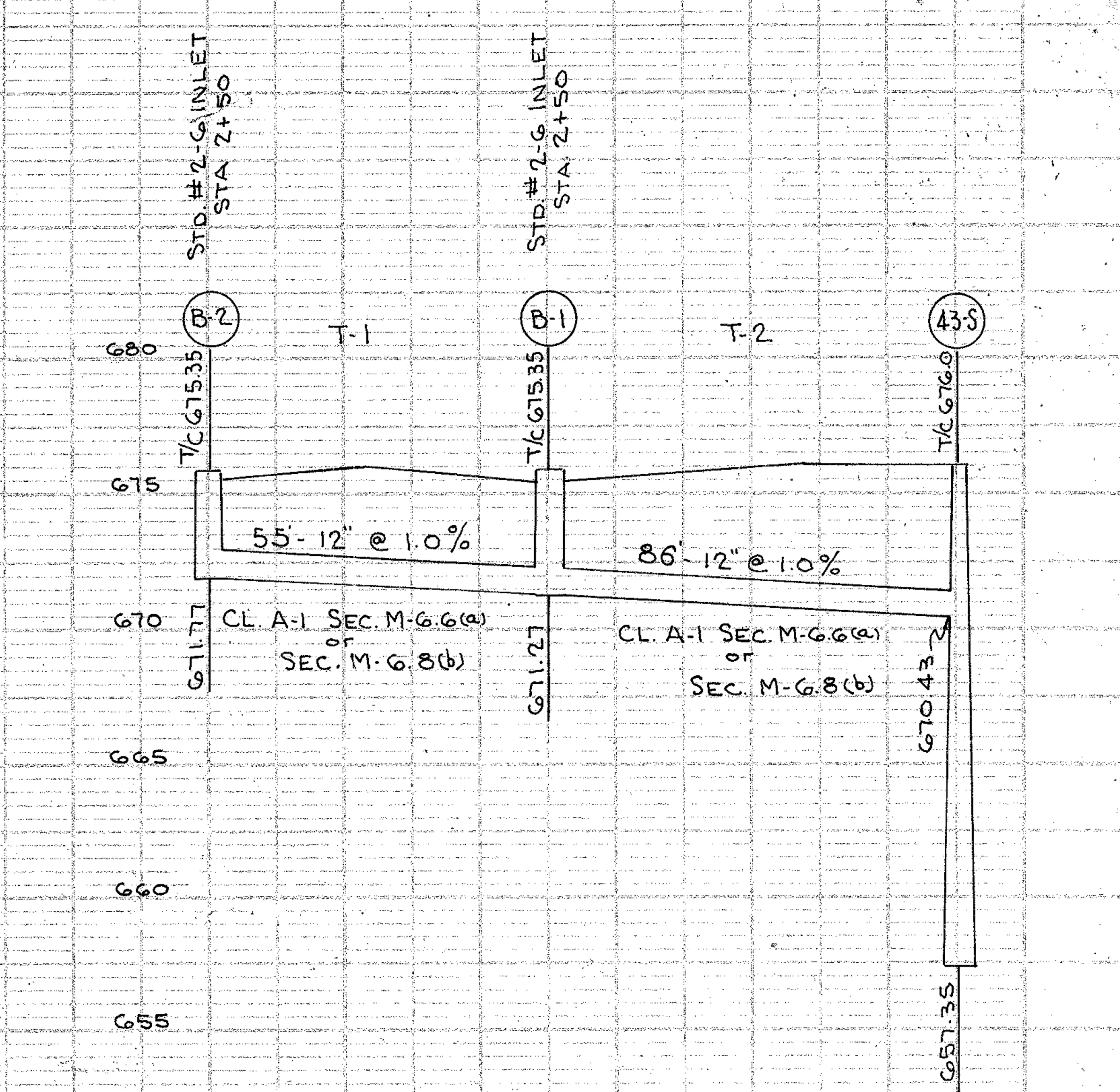
TYPICAL SECTION

SCALE 1/8"=1'0"

TRAFFIC NOTE "A"
TEMPORARY BARRICADES LOCATED AS REQUIRED BY CITY OF CLEVELAND DIVISION OF TRAFFIC TO BE CONSTRUCTED OF SAND FILLED 50 GALLON DRUMS WITH SINGLE GUARD RAIL MOUNT. TO BE PAID FOR AT UNIT PRICE BID FOR ITEM I-15 TEMPORARY GUARD RAIL, SEE NOTE IN PROPOSAL.

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. 7.54' SOUTHEAST OF S.E. CORNER OF BLDG. 7.46' S.W. OF IRON TROLLEY POLE #23/129.



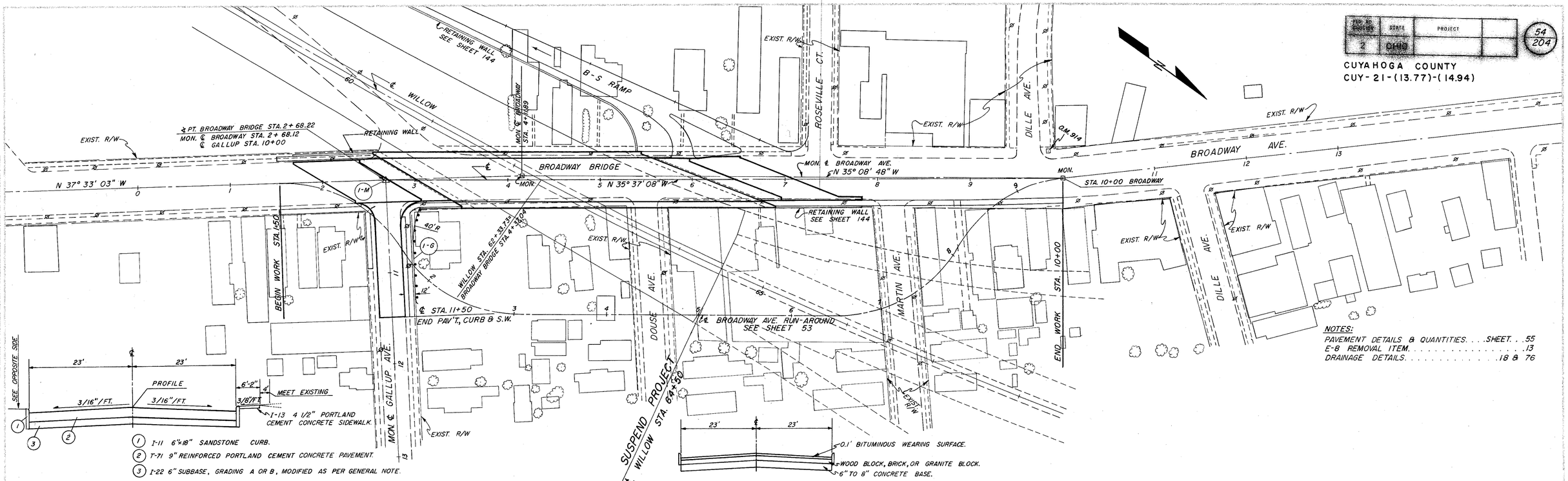


PLAN & PROFILE - BROADWAY AVE. RUN-AROUND

FED. AID PROJECT	STATE	PROJECT		
2	OHIO			

54
204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

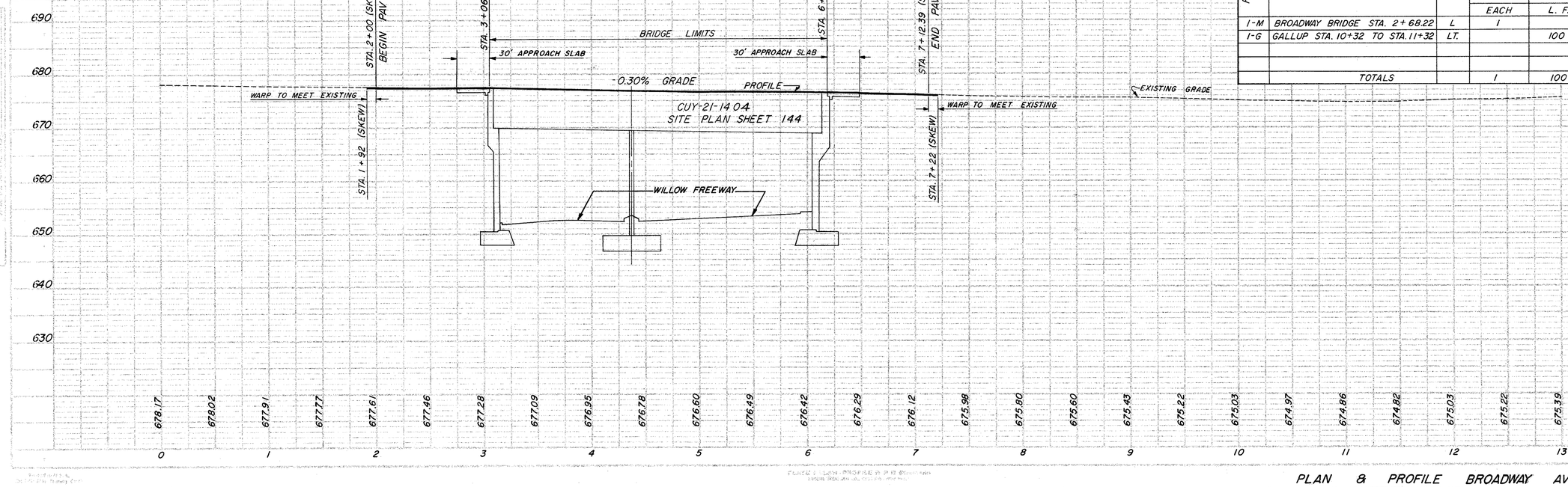


NOTES:
PAVEMENT DETAILS & QUANTITIES. . . . SHEET. . 55
E-8 REMOVAL ITEM. 13
DRAINAGE DETAILS. . . . . 18 & 76

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. 7.54' SOUTHEAST OF S.E. CORNER OF BLDG. 7.46' S.W. OF IRON TROLLEY POLE #231129.

ROADWAY & PAVEMENT QUANTITIES

REFERENCE NO.	LOCATION	SIDE	I-8 MONUMENT ASSEMBLIES	I-15 GUARD RAIL, STEEL BEAM STD. TYPE (DEEP)
			EACH	L. F.
I-M	BROADWAY BRIDGE STA. 2+68.22	L	1	
I-6	GALLUP STA. 10+32 TO STA. 11+32	LT.		100
	TOTALS		1	100



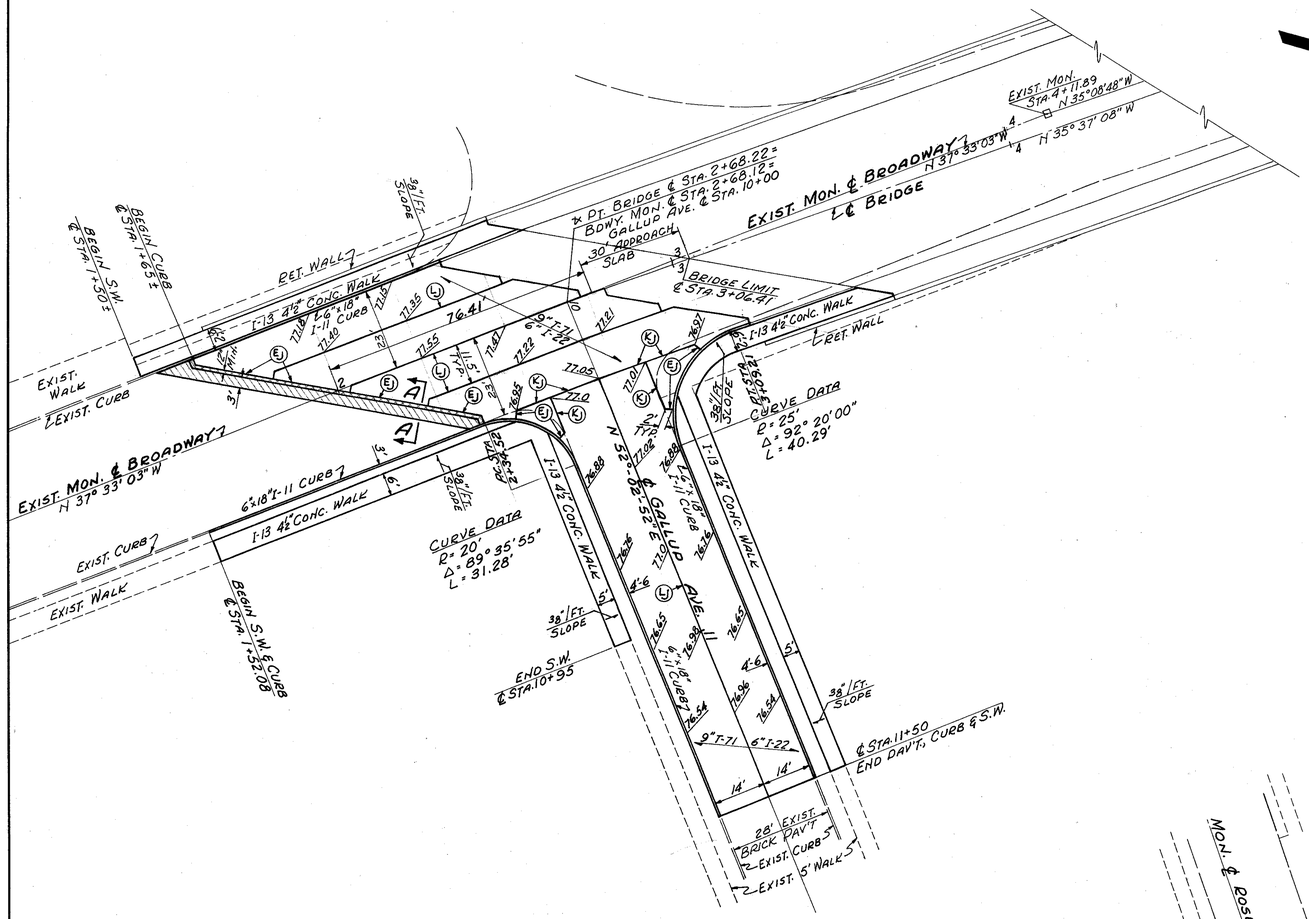
PLAN & PROFILE BROADWAY AVE.

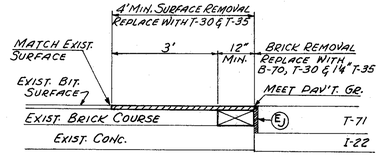
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

55
204

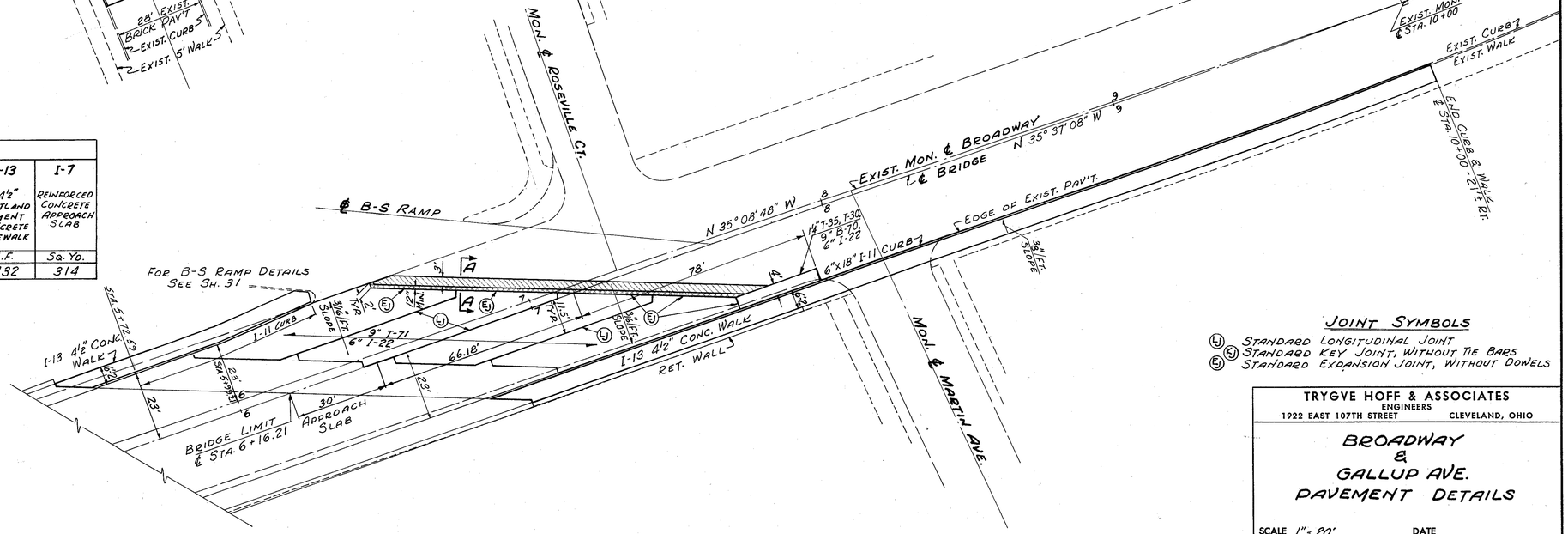
CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)

NOTES: - FOR TRUE ELEVATIONS, ADD 600.00' TO THOSE SHOWN.
ELEVATIONS ARE GIVEN TO TOP OF PAVEMENT AT JOINTS, EDGES AND EVEN 25' STATIONS.
DIMENSIONS ARE GIVEN TO JOINTS, PAVEMENT EDGE OR FACE OF CURB.
MINIMUM LENGTH OF PAVEMENT JOINTS = 2'-0
MEET ELEVATIONS OF EXISTING PAVEMENT, WITH NEW CONSTRUCTION, AT LOCATION INDICATED ON PLAN.
MEET ELEVATIONS OF EXISTING CURB AND SIDEWALK, WITH NEW CONSTRUCTION, AT NEAREST JOINT TO LOCATION INDICATED ON PLAN.
FOR RADIAL CURB DETAIL, SEE SH. 6.





SECTION A-A
SCALE: ½"=1'-0



JOINT SYMBOLS
(LJ) STANDARD LONGITUDINAL JOINT
(EJ) STANDARD KEY JOINT, WITHOUT TIE BARS
(EJ) STANDARD EXPANSION JOINT, WITHOUT DOWELS

QUANTITIES

	T-71 9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT	B-70 PORTLAND CEMENT CONCRETE BASE COURSE	I-22 SUBBASE	T-35 ASPHALTIC CONCRETE SURFACE COURSE	T-30 BITUMINOUS PRIME COAT 0.1 GAL./S.Y.	I-11 SA. JOSTONE CURB 6"x18"	I-13 4½" PORTLAND CEMENT CONCRETE SIDEWALK	I-7 REINFORCED CONCRETE APPROACH SLAB
	Sq. Yd.	Cu. Yd.	Cu. Yd.	Cu. Yd.	Gal.	L.F.	S.F.	Sq. Yd.
TOTAL THIS SH.	1136	5	200	4	10	742	4432	314

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

BROADWAY & GALLUP AVE. PAVEMENT DETAILS

SCALE 1"=20' DATE

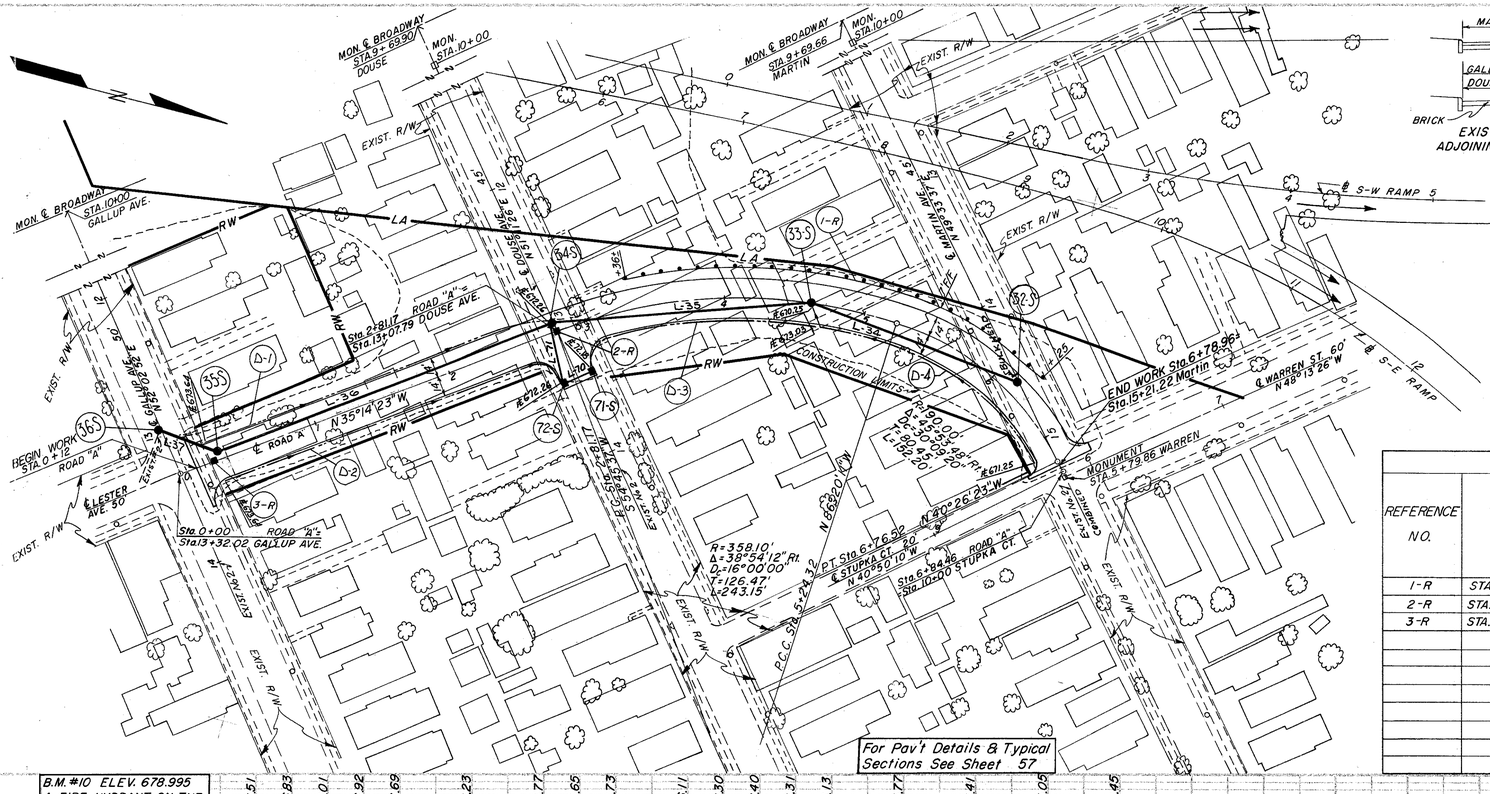
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
G.O'C.	G.O'C.		RLH			

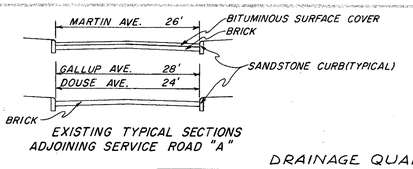
CONT. No. 58019 SHEET ACCT. No. 6282

FED. AID DIVISION	STATE	PROJECT	
2	OHIO		

56
204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14,94)





EXISTING TYPICAL SECTIONS ADJOINING SERVICE ROAD "A"

DRAINAGE QUANTITIES

MARK NO.	LOCATION	I-1 6" UNDERDRAIN CLASS I-3 L.F.	I-1 6" OUTLET PIPE CLASS F-4 L.F.	I-5 6"-60° BEND EA.		
D-1	ROAD "A" STA. 0+25 TO 34-S	243	10			
D-2	ROAD "A" STA. 0+25 TO 72-S	246	10			
D-3	ROAD "A" STA. 4+65 TO 71-S	160	10			
D-4	ROAD "A" STA. 6+70 TO 33-S	180	10	1		
	TOTAL	829	40	1		

ROADWAY & PAVEMENT QUANTITIES

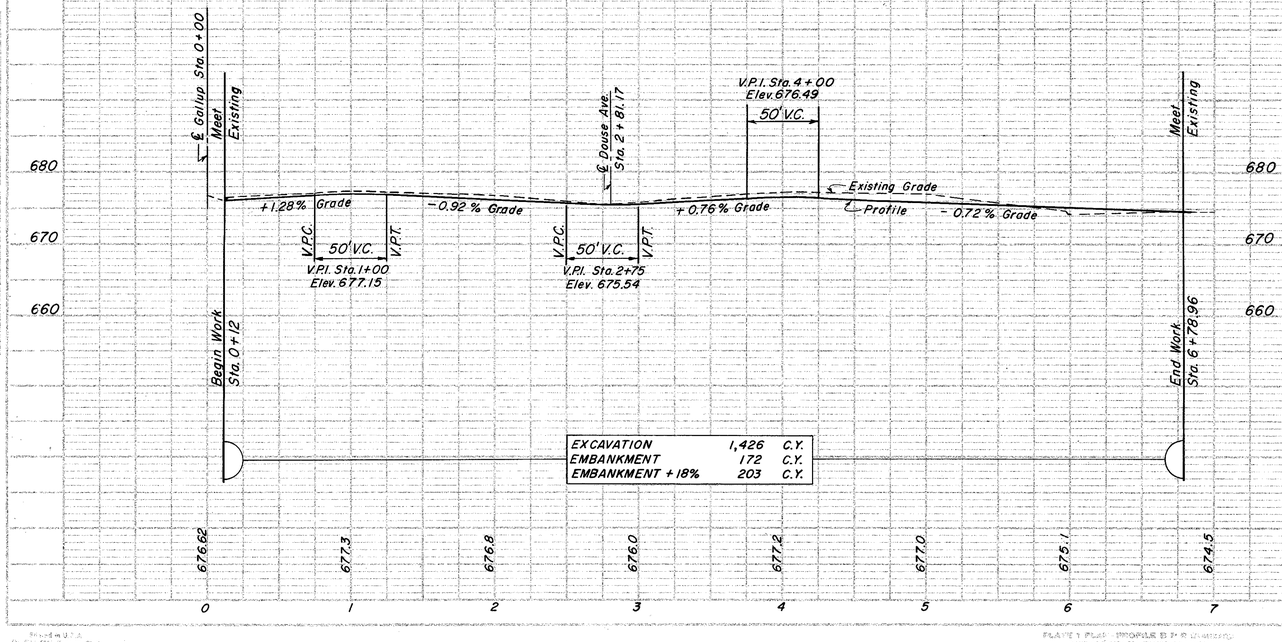
REFERENCE NO.	LOCATION	SIDE	I-15 GUARD RAIL, STEEL BEAM STD. TYPE (DEEP) L. F.	I-8 MONUMENT ASSEMBLIES EACH
1-R	STA. 3+36 TO STA. 6+25	LT.	300	
2-R	STA. 2+81.17	℄		1
3-R	STA. 0+25.00	℄		1
	TOTALS		300	2

NOTES:

DRAINAGE QUANTITIES

MARK No.	LOCATION	I-8 MANHOLE STD #2, W/SPECIAL FRAME & COVER AS PER PLANS WITHOUT DROP EACH	I-8 CATCH BASIN STD No. 3-A EACH	I-1 30" PIPE, CLASS A-1 Sec. M-6.6(b), M-6.8(b) L.F.	I-1 57" PIPE, CLASS A-1 Sec. M-6.6(b), M-6.8(b) L.F.	I-1 12" PIPE CLASS A-1 Sec. M-6.6(a), M-6.8(a) L.F.	I-1 12" PIPE CLASS A-1 Sec. M-6.6(b), M-6.8(b) L.F.
32-S	MARTIN AVE. STA. 14+57	1					
33-S	ROAD "A" STA. 4+60	1					
34-S	ROAD "A" SLT STA. 2+81	1					
35-S	ROAD "A" SLT STA. 0+30	1					
36-S	GALLUP STA. 13+00	1					
L-34	FROM 32-S TO 33-S				154		
L-35	FROM 33-S TO 34-S				182		
L-36	FROM 34-S TO 35-S			250			
L-37	FROM 35-S TO 36-S			42			
71-S	DOUSE AVE. STA. 13+42, 12' LT.		1				
72-S	DOUSE AVE. STA. 13+42, 12' RT.		1				
L-70	FROM 71-S TO 72-S					24	
L-71	FROM 72-S TO 34-S						42
	TOTAL	5	2	292	336	24	42

B.M. #10 ELEV. 678.995
A FIRE HYDRANT ON THE NORTHEAST CORNER OF LESTER & GALLUP TOP OF LETTER "C" IN THE WORD "CO."



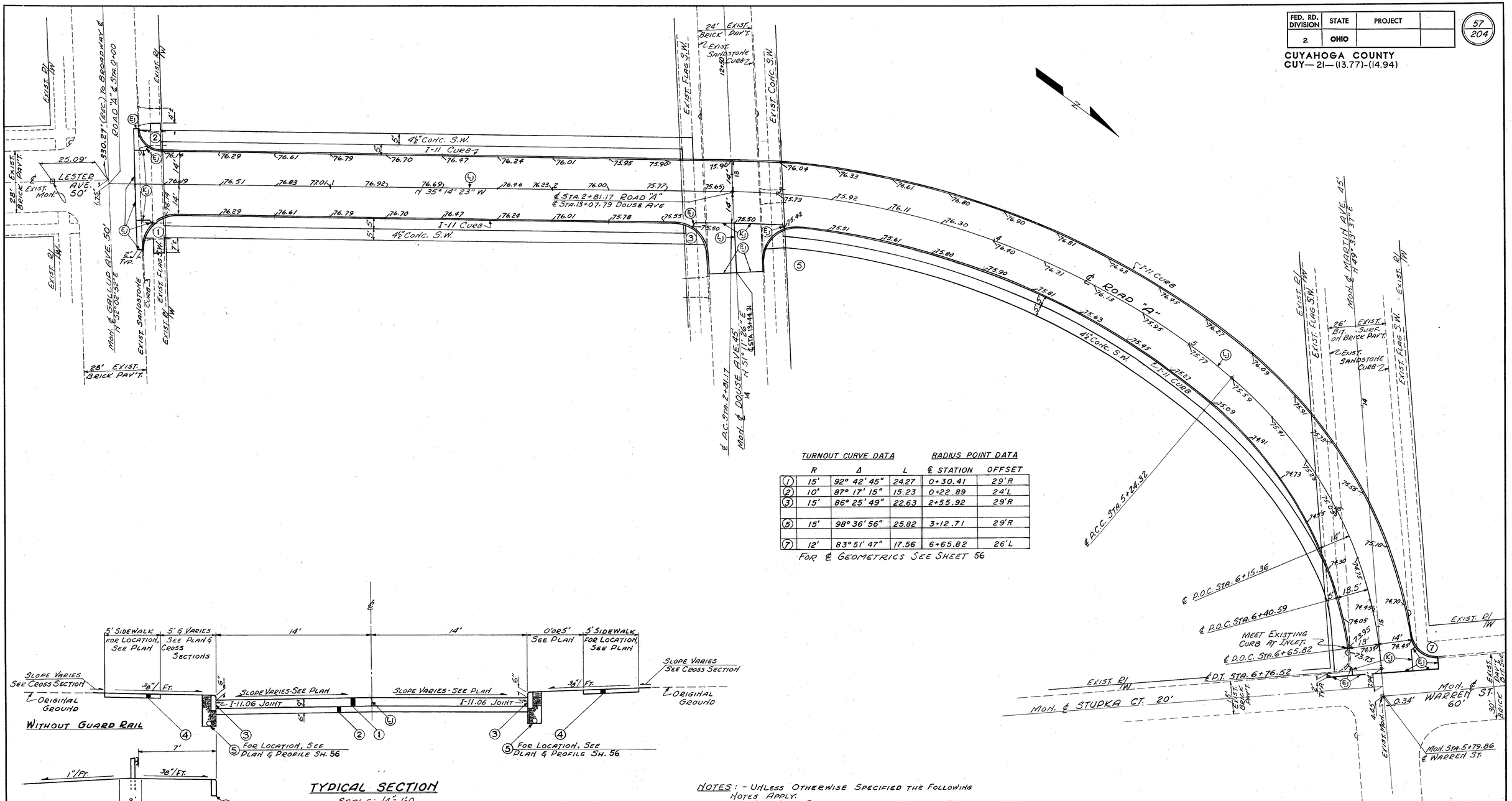
EXCAVATION	1,426	C.Y.
EMBANKMENT	172	C.Y.
EMBANKMENT +18%	203	C.Y.

PLAN & PROFILE ROAD "A"

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

57
204

CUYAHOGA COUNTY
CUY— 21— (13.77)-(14.94)



TURNOUT CURVE DATA / RADIUS POINT DATA

	R	Δ	L	℄ STATION	OFFSET
(1)	15'	92° 42' 45"	24.27	0+30.41	29'R
(2)	10'	87° 17' 15"	15.23	0+22.89	24'L
(3)	15'	86° 25' 49"	22.63	2+55.92	29'R
(5)	15'	98° 36' 56"	25.82	3+12.71	29'R
(7)	12'	83° 51' 47"	17.56	6+65.82	26'L

FOR ℄ GEOMETRICS SEE SHEET 56

TYPICAL SECTION

SCALE: 1⅛" = 1'-0

LEGEND

			QUANTITIES	
①	ITEM T-71	9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT	2173	S.Y.
②	ITEM I-22	6" SUBBASE	722	C.Y.
③	ITEM I-11	6" x 18" SANDSTONE CURB	1342	L.F.
④	ITEM I-13	4½" CONCRETE SIDEWALK	4410	S.F.
⑤	ITEM I-1	6" PIPE CLASS I-3		

NOTES: - UNLESS OTHERWISE SPECIFIED THE FOLLOWING NOTES APPLY.

FOR TRUE ELEVATIONS, ADD 600.00 TO THOSE SHOWN.

ELEVATIONS ARE GIVEN TO TOP OF PAVEMENT AT JOINTS, EDGES AND EVEN 25' STATIONS.

DIMENSIONS ARE GIVEN TO JOINTS AND FACE OF CURB.

ALL RADII GIVEN TO FACE OF CURB.

MINIMUM LENGTH OF PAVEMENT JOINTS = 2'-0

MEET ELEVATIONS OF EXISTING PAVEMENT, WITH NEW CONSTRUCTION, AT LOCATION INDICATED ON PLAN.

MEET ELEVATIONS OF EXISTING CURB AND SIDEWALK, WITH NEW CONSTRUCTION, AT NEAREST JOINT TO LOCATION INDICATED ON PLAN.

FOR PLAN & PROFILE SEE SHEET 56
FOR CROSS SECTIONS SEE SHEET 58
RADIAL CURB DETAIL SEE SHEET 6

JOINT SYMBOLS

(L) STANDARD LONGITUDINAL JOINT.
(K) STANDARD KEY JOINT, WITHOUT TIE BARS.
(E) STANDARD EXPANSION JOINT, WITHOUT DOWELS.

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

ROAD "A" PAVEMENT DETAILS & TYPICAL SECTION

SCALE 1" = 20'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
E.B. R.L.H.	G.O'C.		R.B. R.L.H.			

DATE

CONT. NO. 58012 SHEET ACCT. NO. 6283

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

40 20 0 ℄ 20 40

MATCH LINE WILLOW CROSS SECTIONS

15 — L/A R/W 76'L 1"/FT. — SEEDING LIMIT — NORTH CURB LINE-DOUSE 2+92± SKEW 675.2 — 670 — 40 ← ESTIMATED

15 — L/A R/W 81'L 1"/FT. — SOUTH CURB LINE-DOUSE 2+68± SKEW 675.2 — SEEDIND LIMIT — 670 — 31 ← ESTIMATED

16 — L/A R/W 87'L — R/W — BLD'G. — 675.77 2+50 676.2 — 670 — 89

16 — L/A R/W 113'L — R/W — BLD'G — 676.23 2+00 676.8 — 670 — 89

WILLOW CROSS SECTIONS

16 — L/A R/W 138'L — R/W — BLD'G — MATCH LINE WILLOW CROSS SECTIONS — 676.69 1+50 677.5 — 670 — 81

13 — R/W — R/W — 677.01 1+00 677.3 — 670 — 64

10 — BLD'G. — R/W — R/W — BLD'G. — 676.51 0+50 677.1 — 670 — 28

10 — R/W — R/W — SEEDING LIMIT — SEEDING LIMIT — 676.19 0+25 677.0 — 670 — 7 ← ESTIMATED

BEGIN WORK
0+12 (SKEW)
MEET EXISTING

670

SEE CROSS SECTION KEY PLAN SHEET 33

END AREA		VOLUME		SEEDING	
CUT	FILL	CUT	FILL	END WIDTH	SQ. YDS.
30	20				
670					
ESTIMATED →		25	18	24	← ESTIMATED
30	18			15	
670					
ESTIMATED →		31	6	167	
62	—			45	
		120	—	231	
68	—			38	
		126	—	200	
68	—			34	
		120	—	183	
62	—			32	
		120	—	200	
68	—			40	
		56	—	122	
54	—			48	
				239	
ESTIMATED →		25	—	(38 AH.)	
				(64 BK.)	
				145	
				15	
				STA 2+92±	

	CUT	FILL
EXCAVATION	1426	172 C.Y.
EMBANKMENT		1940 C.Y.
SEEDING		

℄ MARTIN

L/A R/W 120'L — END WORK MEET EXISTING 6+78.96 — 670 — ESTIMATED → 20 3

SEEDING LIMIT — 1"/FT. — ℄ MARTIN — R/W — BLD'G. — L/A R/W 80'L — 674.45 6+50 674.4 — SEEDING LIMIT — 670 — ESTIMATED → 21 5 60 45

SEEDING LIMIT — ℄ MARTIN — L/A R/W — R/W — 675.05 6+00 675.1 — 670 — 44 44 106 48

℄ MARTIN — SEEDING LIMIT — L/A R/W — R/W — 675.41 5+50 676.3 — 670 — 70 8 131 9

L/A R/W — R/W — 675.77 5+00 677.0 — 670 — 72 2 131 3

L/A R/W — R/W — 676.13 4+50 677.1 — 670 — 70 1 120 5

L/A R/W — R/W — 676.40 4+00 677.2 — 670 — 60 4 58 5

L/A R/W — R/W — 676.30 3+75 677.1 — 670 — 65 6 131 13

SEEDING LIMIT — L/A R/W — MATCH LINE WILLOW CROSS SECTIONS — SEEDING BACK LIMIT — MATCH LINE — R/W — SEEDING LIMIT — 675.92 3+25 676.3 — 670 — AHEAD 77 BACK 46 8 — ESTIMATED → 46 17 30 20

NOTE
EXISTING GRADE SHOWN IN AREAS OF BUILDINGS IS THAT OF THE GROUND LINE AT THE FOUNDATION. AN ESTIMATED QUANTITY IS PROVIDED FOR FILLING OF BASEMENTS, SEE SHEET 12

SCALE
1" = 10' HORIZONAL
1" = 10' VERTICAL

STA 2+92±

40 20 0 ℄ 20 40

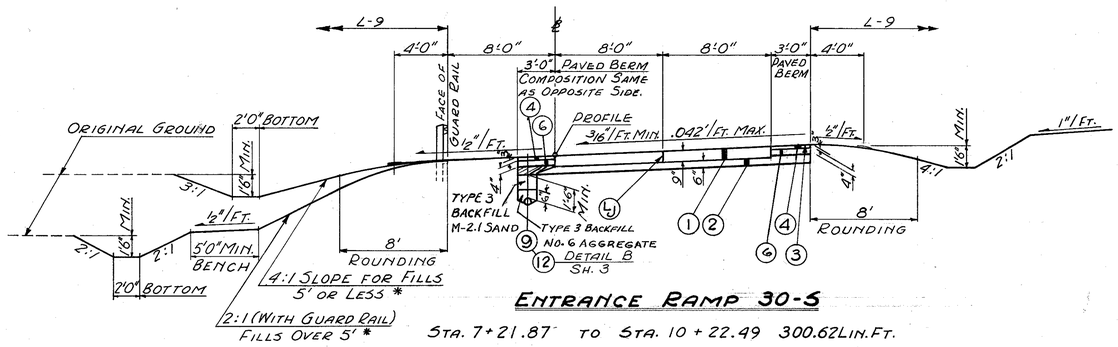
ROAD "A" CROSS SECTIONS

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

59
204

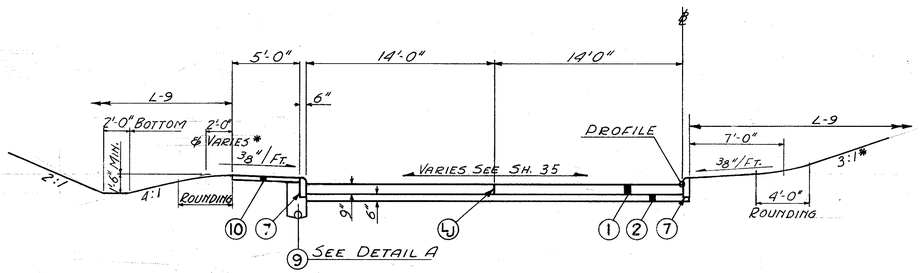
CUYAHOGA COUNTY
CUY— 21 (13.77)-(14.94)

TYPICAL SECTIONS TYPE T-71
CODE 7221



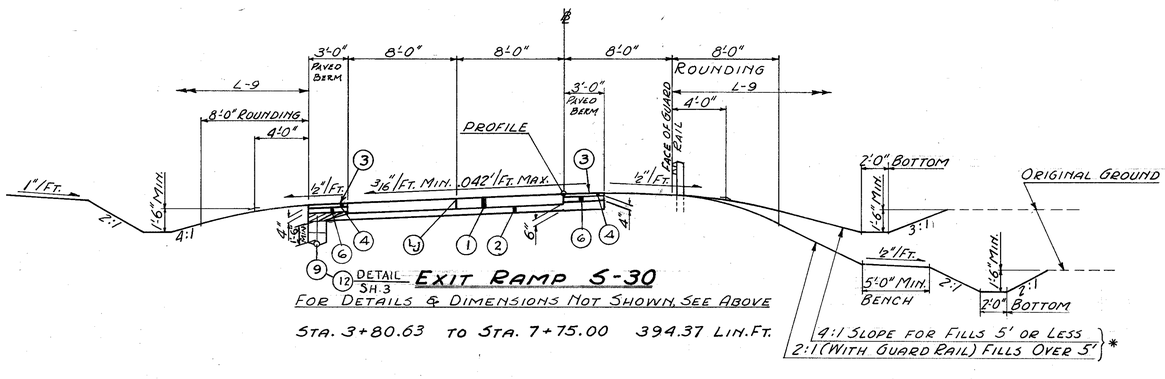
ENTRANCE RAMP 30-S

STA. 7+21.87 TO STA. 10+22.49 300.62 LIN. FT.



RELOCATED ORANGE AVENUE

STA. 6+65.73 TO STA. 7+88.27 122.54 LIN. FT.

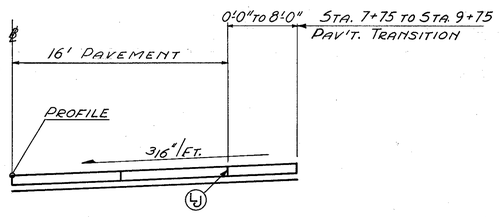


DETAIL SH. 3

EXIT RAMP S-30

FOR DETAILS & DIMENSIONS NOT SHOWN, SEE ABOVE

STA. 3+80.63 TO STA. 7+75.00 394.37 LIN. FT.

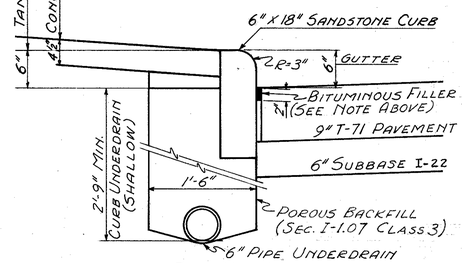


EXIT RAMP S-30

FOR DETAILS & DIMENSIONS NOT SHOWN, SEE ABOVE

STA. 7+75.00 TO STA. 10+42.33 267.33 LIN. FT.

NOTE: IF PAVEMENT IS BUILT BEFORE CURB IS PLACED, IT SHALL BE BUILT FULL WIDTH AND ANY OPENING BETWEEN CURB AND PAVEMENT SHALL BE FILLED WITH DRY SAND 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. SAND TO MEET THE REQUIREMENTS OF SECTION M-2.1. THE COST OF JOINT TO BE INCLUDED IN THE PRICE BID PER LINEAL FOOT OF CURB.



DETAIL A
STRAIGHT CURB DETAIL
SCALE: 1"=1'-0"

JOINT SYMBOL

(LJ) STANDARD LONGITUDINAL JOINT.

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.)

(6) ITEM B-19 AGGREGATE BASE COURSE

(9) ITEM I-1 6" PIPE CLASS I-3 (FOR LOCATION SEE P/P & DRAINAGE PLAN SHS).

(10) ITEM I-13 4½" CONCRETE SIDEWALK

(7) ITEM I-11 6" X 18" SANDSTONE CURB.

(12) ITEM SPECIAL - THE SUBBASE SHALL BE REMOVED FOR WIDTHS AND DEPTHS AS SHOWN ON DETAIL "B" (SHEET 3) AND REPLACED WITH NO.6 AGGREGATE MATERIAL IMMEDIATELY PRIOR TO PLACING THE ITEM B-19, AGGREGATE BASE COURSE. THE PAYMENT SHALL BE MADE ON THE BASIS OF THE UNIT PRICE PER CUBIC YARD OF NO.6 AGGREGATE MATERIAL IN PLACE WHICH INCLUDES THE FULL COST OF REMOVING THE SUBBASE MATERIAL AND THE HAULING, PLACING AND COMPACTING THE NO.6 AGGREGATE MATERIAL.

NOTE:
* FOR VARIATIONS TO SLOPES, SEE GRADING PLAN & CROSS SECTIONS.
FOR TOP OF PAVEMENT ELEVATIONS, SEE SHEET 63

THE CUBIC YARDS OF NO.6 AGGREGATE MATERIAL SHALL BE CALCULATED FROM WEIGHT SLIPS USING THE CONVERSION FACTORS IN ITEM T-31. INSERT

CONT. No. 5'80.0 SHEET ACCT. No. 6008

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

RAMPS & RELOCATED ORANGE AVE. TYPICAL SECTIONS

SCALE 3/16" = 1'-0" DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
GO'C	GO'C		GOH			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

60
204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

NOTES:

CURVE DATA
P.I. Sta. 4+25.88
Δ = 11°-33'-31"
D = 6°-00'-00"
R = 954.93'
L = 192.64'
T = 96.65'
E = 4.88'

CURVE DATA
P.I. Sta. 8+98.42
Δ = 29°-27'-25.7"
D = 4°-00'-00"
R = 1432.39'
L = 736.43'
T = 376.55'
E = 48.67'

B.M. "B" ELEV. 681.64
APPROX. RAMP STA. 13+85(34'L)
ANCHOR BOLT ON STEEL FENCE
S.E. COR. E. 30th & ORANGE AVE.

REF NO	ROADWAY & PAVEMENT QUANTITIES	I-15 GUARD RAIL, STEEL BEAM STD TYPE (BEEP)	I-8 MONUMENT ASSEMBLIES
		EACH	EACH
1-G	STA. 5+04 TO STA. 9+83 LEFT SIDE	479 L.F.	5
1-M	STA. 5+21.87 ℄ RAMP		1
2-M	STA. 12+58.30 ℄ RAMP		1
3-M	ROAD D STA. 0+00 = MON. ℄ E. 34 ST. STA. 7+40		1
4-M	ROAD D STA. 3+33.22 = MON. ℄ E. 32 ST. STA. 8+75		1
5-M	MON. ℄ E. 31 ST. STA. 10+00 = MON. ℄ ORANGE AVE. STA. 15+84.46		1
	TOTALS	479 L.F.	5

RAMP 30-S & SERVICE RD. "D" EARTHWORK INCLUDED IN WILLOW QUANTITIES

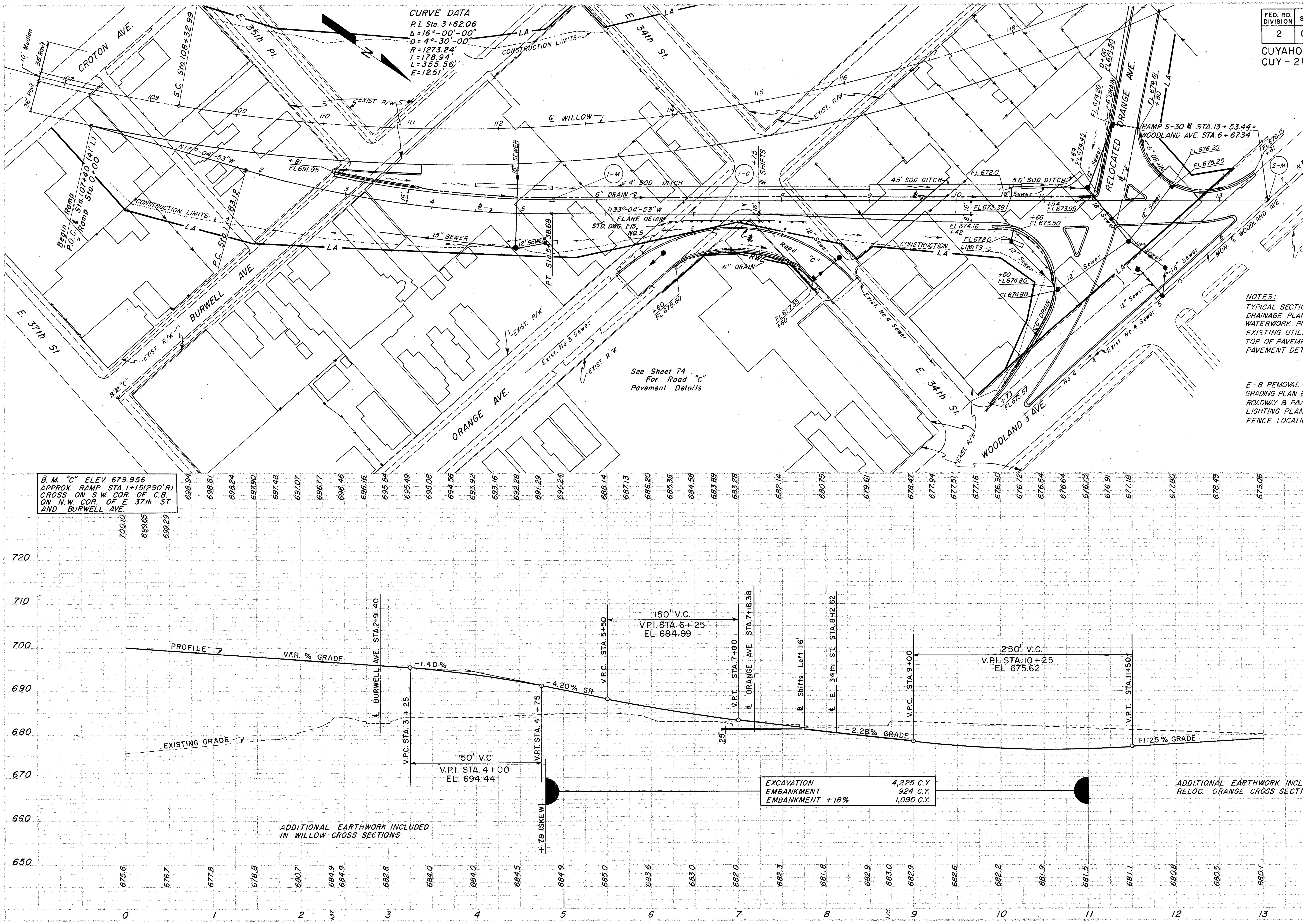
PLAN & PROFILE RAMP 30-S

CONT. NO. 58019 SHEET ACCT. NO. 6047

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

61/204

CUYAHOGA COUNTY
CUY - 21 - (13.77) - (14.94)



EXCAVATION	4,225 C.Y.
EMBANKMENT	924 C.Y.
EMBANKMENT + 18%	1,090 C.Y.

NOTES:
TYPICAL SECTION . . . . SEE SHEET . . 59
DRAINAGE PLAN & QUANTITIES . . . . 20 & 21
WATERWORK PLAN 113
EXISTING UTILITIES . . . . 121 TO 125
TOP OF PAVEMENT ELEVATIONS 63
PAVEMENT DETAILS . . . . 64 & 65

E-8 REMOVAL ITEMS 13
GRADING PLAN & CROSS SECTION KEY PLAN 43
ROADWAY & PAVEMENT QUANTITIES . . . . 11, 12 & 13
LIGHTING PLAN 128
FENCE LOCATION . . . . 200 & 201

ROADWAY & PAVEMENT QUANTITIES

REFERENCE NO.	LOCATION	SIDE	I-8 MONUMENT ASSEMBLIES (EACH)	I-15 GUARD RAIL STEEL BEAM STD. TYPE (DEEP) (L.F.)
1-M	STA. 5+38.68	16' LT.	1	
2-M	RAMP STA. 13+53.44 = MON. ℄ WOODLAND AVE. STA. 6+67.34		1	
1-G	STA. 6+75 TO STA. 8+25	RT.		150
	TOTALS		2	150

PLAN & PROFILE RAMP S-30

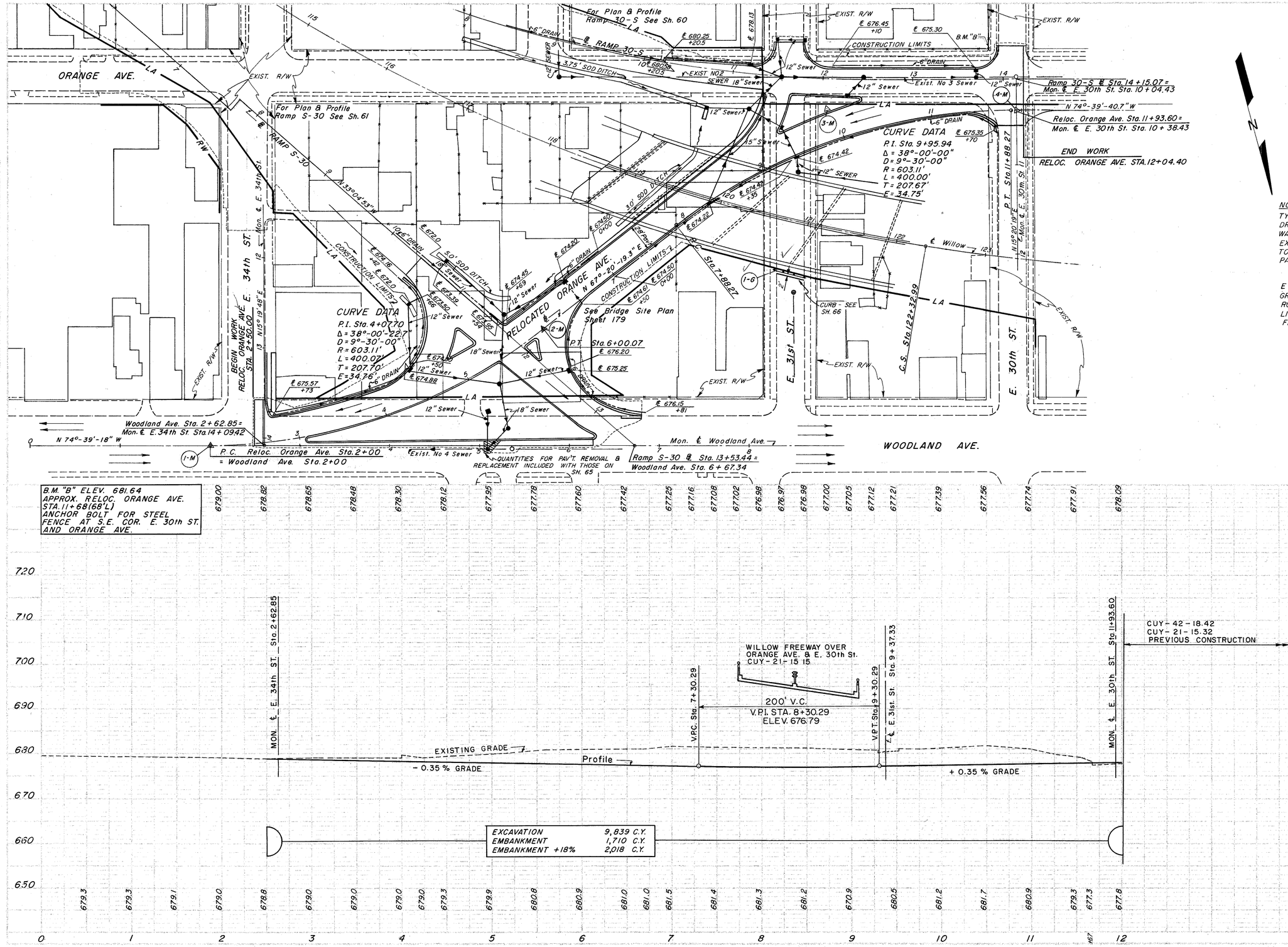
CONT. No. 58019 SHEET 6045

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

62
204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

NOTES:



B.M. "B" ELEV. 681.64
APPROX. RELOC. ORANGE AVE. STA. 11+68(68'L)
ANCHOR BOLT FOR STEEL FENCE AT S.E. COR. E. 30th ST. AND ORANGE AVE.

679.00 678.82 678.65 678.48 678.30 678.12 677.95 677.78 677.60 677.42 677.25 677.16 677.08 677.02 676.98 676.97 676.98 677.00 677.05 677.12 677.21 677.39 677.56 677.74 677.91 678.09

679.3 679.3 679.1 679.0 678.8 679.0 679.0 679.0 679.0 679.3 679.9 680.8 680.9 681.0 681.0 681.5 681.4 681.3 681.2 670.9 680.5 681.2 681.7 680.9 679.3 677.3 677.8

0 1 2 3 4 5 6 7 8 9 10 11 12

REFERENCE NO.	LOCATION	SIDE	1'-8" MONUMENT ASSEMBLIES EACH	1'-15" GUARD RAIL STEEL BEAM STD. TYPE (DEEP) L. F.
1-M	RELOC. ORANGE AVE. STA. 2+00 MON. ℄ WOODLAND AVE. STA. 2+00	℄	1	
2-M	STA. 6+00.07	℄	1	
3-M	P.I. STA. 9+95.94		1	
4-M	RELOC. ORANGE AVE. STA. 11+93.60 = MON. ℄ E. 30 ST STA. 10+38.43	℄	1	
1-6	EAST 31 STREET			37.5
	TOTALS		4	37.5

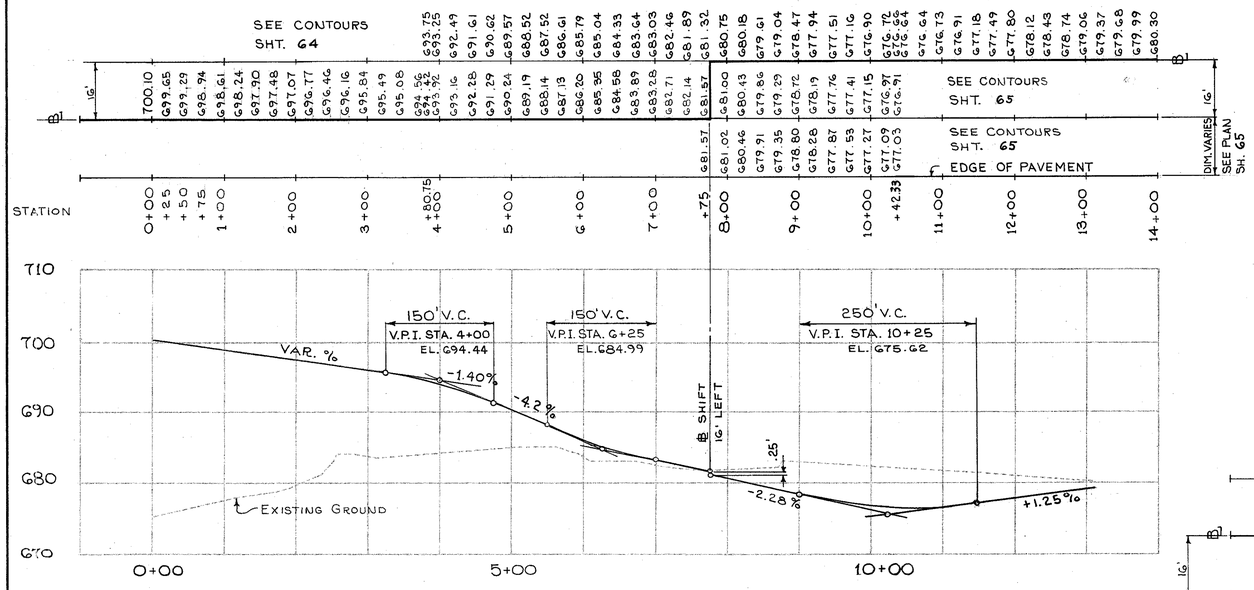
PLAN & PROFILE RELOCATED ORANGE AVENUE

CONT. No. 58019

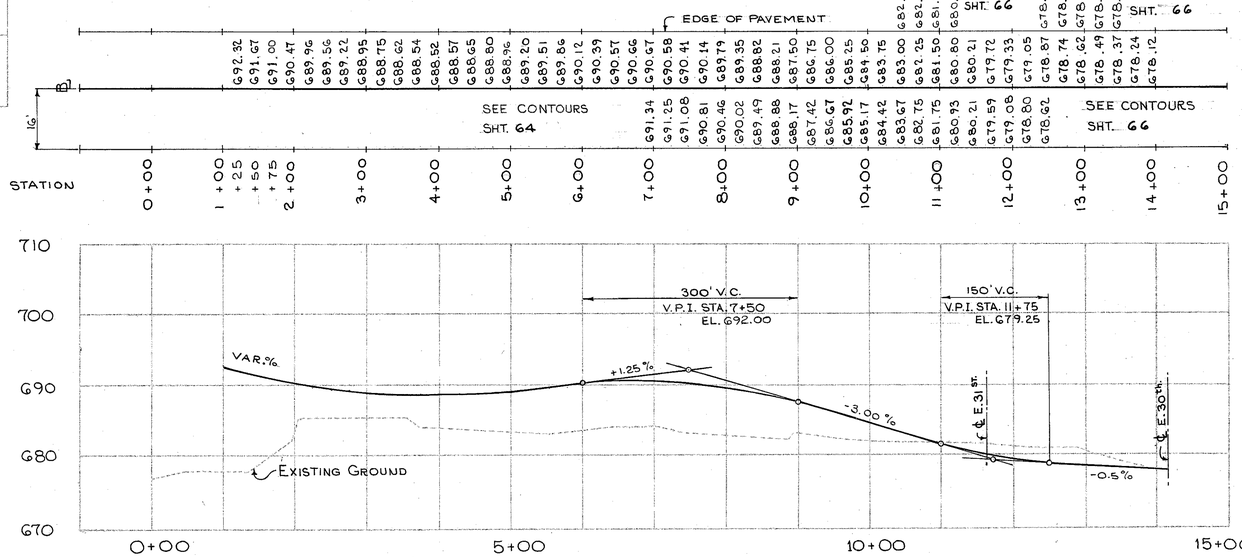
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

63
204

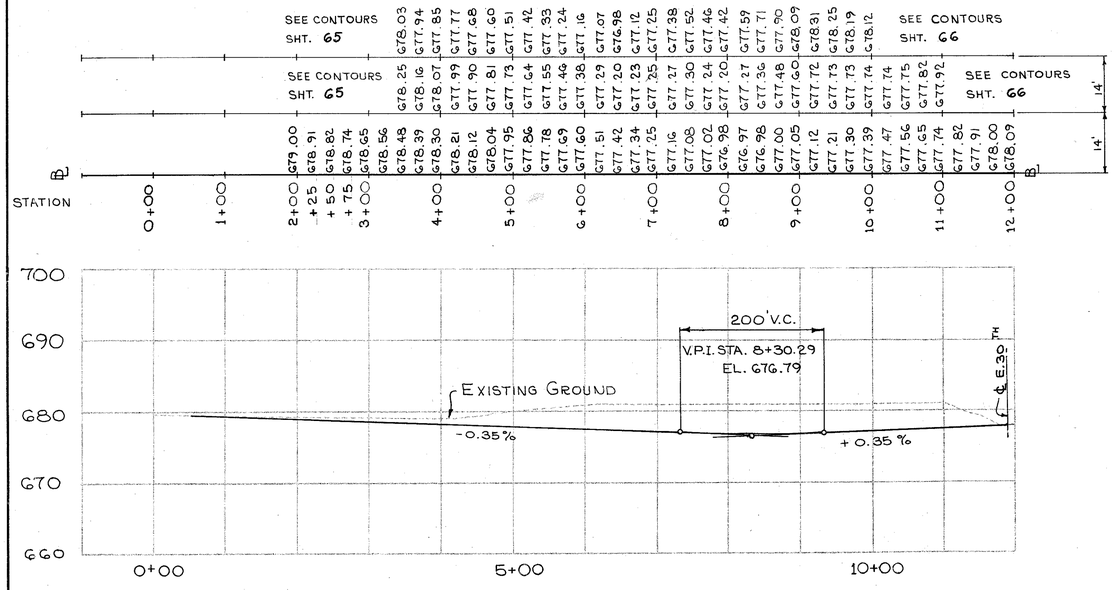
CUYAHOGA COUNTY
CUY—21-(13.77)-(14.94)



EXIT RAMP S-30



ENTRANCE RAMP 30-S



RELOCATED ORANGE AVE

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

PROFILE & TOP OF PAVEMENT ELEVATIONS RAMPS S-30, 30-S & RELOCATED ORANGE AVE.

SCALE HOR. 1"= 100' VERT. 1"= 10' DATE

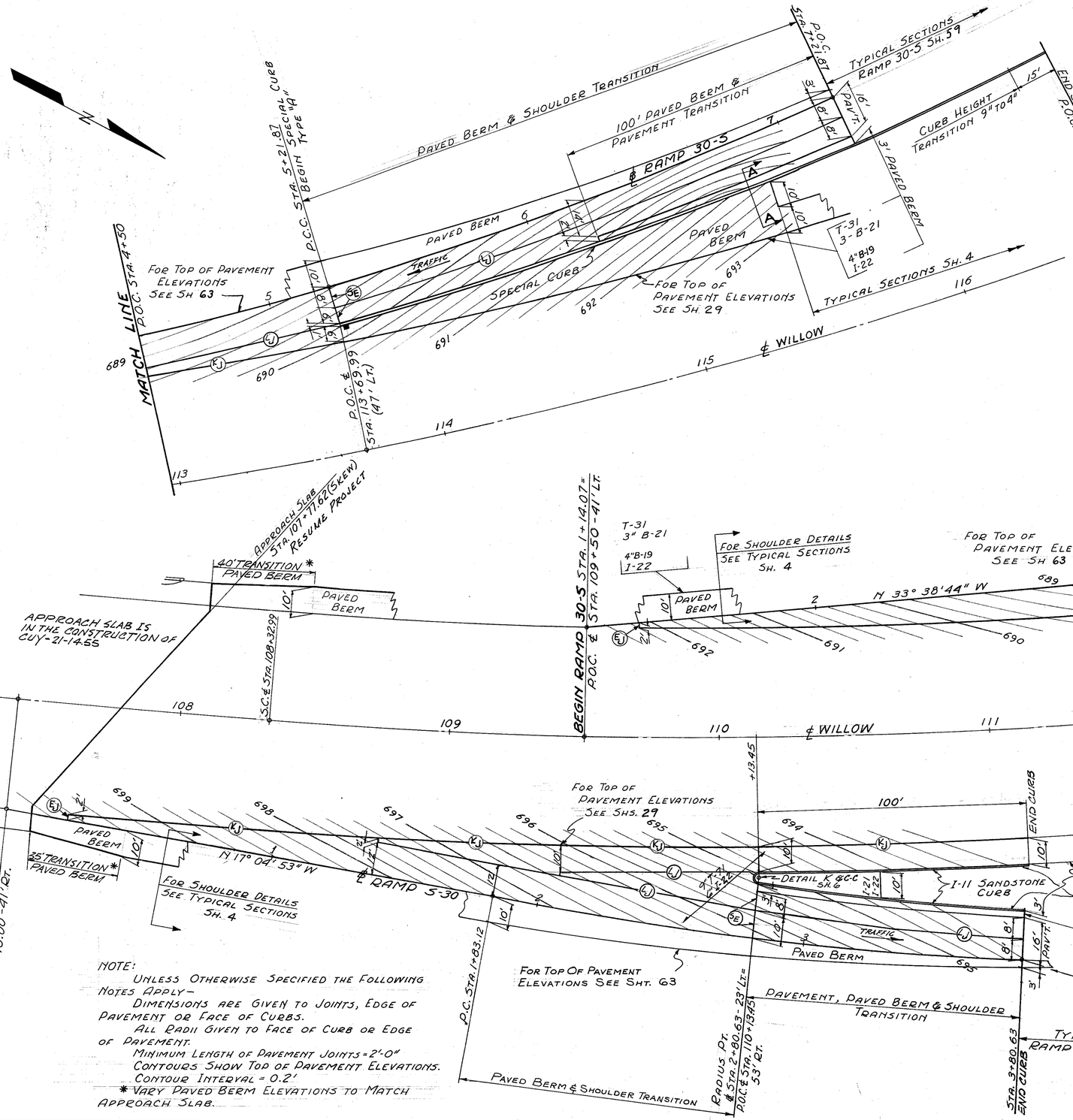
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
AHJ	JLB		AHJ			

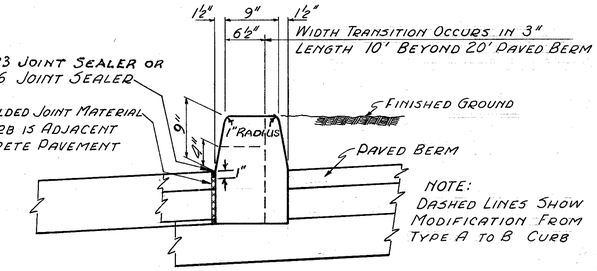
CONT. No. 58019 SHEET ADCT. No. 6022

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

64
204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)





SPECIAL PORTLAND CEMENT CONCRETE CURB DETAIL SECTION A-A

SCALE: 1" = 1'-0"

INCLUDE COST OF JOINT SEALER & MATERIAL WITH PRICE BID FOR SPECIAL CURB.

NOTE:
UNLESS OTHERWISE SPECIFIED THE FOLLOWING NOTES APPLY—
DIMENSIONS ARE GIVEN TO JOINTS, EDGE OF PAVEMENT OR FACE OF CURBS.
ALL RADII GIVEN TO FACE OF CURB OR EDGE OF PAVEMENT.
MINIMUM LENGTH OF PAVEMENT JOINTS = 2'-0"
CONTOURS SHOW TOP OF PAVEMENT ELEVATIONS.
CONTOUR INTERVAL = 0.2'
* VARY PAVED BERM ELEVATIONS TO MATCH APPROACH SLAB.

NOTE: SEE SHEET 20 FOR DRAINAGE
PAV'T QUANTITIES ON SHEET 12

JOINT SYMBOLS

- (LJ) STANDARD LONGITUDINAL JOINT
- (KJ) STANDARD LONGITUDINAL KEY JOINT, WITHOUT DOWELS
- (SE) STANDARD EXPANSION JOINT
- (EJ) STANDARD EXPANSION JOINT, WITHOUT DOWELS

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

RAMP 5-30 & 30-5 PAVEMENT DETAILS

SCALE 1" = 20'

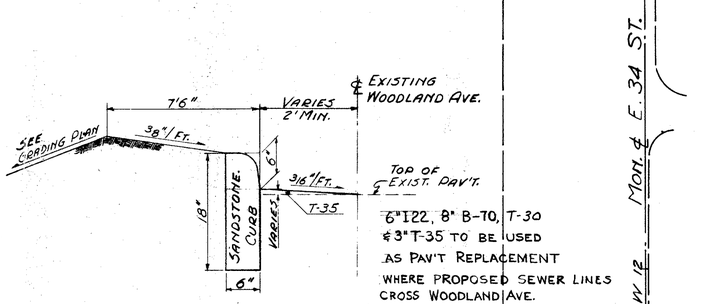
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
AHJ	GOC		GOH			

CONT. No. 58019 SHEET ACCT. No. 6048

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

65
204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)

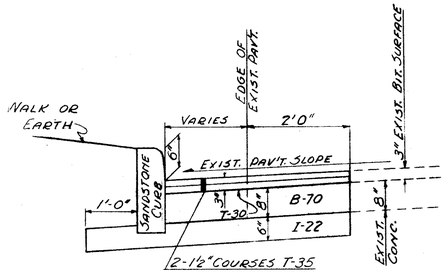


6"I22, 8" B-70, T-30
& 3" T-35 TO BE USED
AS PAV'T REPLACEMENT
WHERE PROPOSED SEWER LINES
CROSS WOODLAND AVE.

NOTE: COST OF REMOVING BELOW GRADE TRACK CONSTRUCTION (IF ANY) IN THIS AREA TO BE INCLUDED IN PRICE BID PER SQ. YD. PAVEMENT REMOVAL.

SECTION A-A

NOT TO SCALE



SECTION B-B

NOT TO SCALE

CURVE DATA - ISLAND NOSINGS

CURVE	NOSE DETAIL	RADIUS (FEET)	Δ	LGTH. (FEET)	RADIUS POINT LOCATION: RELOCATED ORANGE AVE. ℄ STATIONS	EXISTING WOODLAND AVE. ℄ STATIONS	RAMP S-30 ℄ STATIONS
Ra		3	158° 32' 34"	8.30	P.O.C. 3+03.77 (3' R)	P.O.T. 3+03.79 (5.96' L)	
Rb		3	73° 39' 44"	3.86	P.O.C. 5+37.77 (5' R)		P.O.T. 11+87.15 (30' R)
Rc		3	156° 06' 22"	8.18		P.O.T. 6+26.08 (8' L)	
Rd		2	138° 53' 28"	4.85	P.O.C. 4+89.70 (30' L)		
Re		3	129° 12' 12"	6.77			P.O.T. 11+24.47 (32' R)
Rf		3	107° 30' 09"	5.63	P.O.C. 5+25.51 (31' L)		P.O.T. 11+49.22 (31' R)
Rg		3	102° 55' 44"	5.39	P.O.C. 5+73.66 (5' R)		P.O.T. 11+96.23 (5' L)
Rh		3	130° 08' 24"	6.81	P.O.C. 5+86.38 (5' R)		
Rj		2	141° 51' 04"	4.95			P.O.T. 12+18.73 (2' L)

NOTE: SEE SHEET 20 FOR DRAINAGE DETAILS
PAV'T QUANTITIES ON SHEET 12

NOTE:
UNLESS OTHERWISE SPECIFIED THE FOLLOWING NOTES APPLY- FOR TRUE ELEVATIONS ADD 600.00 TO THOSE SHOWN.
ELEVATIONS ARE GIVEN TO TOP OF PAVEMENT AT JOINTS, EDGE OF PAVEMENT OR FACE OF CURBS.
CONTOURS SHOW TOP OF PAVEMENT ELEVATIONS.
CONTOUR INTERVALS = 0.2'.
DIMENSIONS ARE GIVEN TO JOINTS, EDGE OF PAVEMENT OR FACE OF CURBS.
ALL RADII GIVEN TO FACE OF CURB OR EDGE OF PAVEMENT.
MINIMUM LENGTH OF PAVEMENT JOINTS = 2'-0"
CURBS TO BE 6" × 18" SANDSTONE
FOR RADIAL CURB DETAIL SEE SHEET 6

JOINT SYMBOLS

- (LJ) STANDARD LONGITUDINAL JOINT
- (KJ) STANDARD LONGITUDINAL KEY JOINT, WITHOUT TIE BARS
- (SE) STANDARD EXPANSION JOINT
- (EJ) STANDARD EXPANSION JOINT, WITHOUT DOWELS
- (BJ) PLAIN BUTT JOINT

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

INTERSECTION PAVEMENT DETAILS
E. 34 ST., RAMP S-30, WOODLAND AVE., & RELOCATED ORANGE AVE.

SCALE 1" = 20' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
AHJ	GOL		GOH			

CONT. No. 58019 SHEET ADST. No. 6042

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

66 / 204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)

CURVE DATA-ISLAND NOSINGS

CURVE	RADIUS (FEET)	Δ	LGTH. (FEET)	RADIUS POINT LOCATION: RELOCATED ORANGE AVE. ℄ STATIONS	RADIUS POINT LOCATION: RAMP 30-S ℄ STATIONS	NOSE DETAIL
Rk	3	83° 13' 22"	4.36		P.O.C. 11+70.74 (21' R.)	K
Rl	3	64° 51' 20"	8.63	P.O.C. 10+33.23 (34' L.)	P.O.C. 12+47.91 (21' R.)	K
Rm	2	43° 16' 43"	5.00	P.O.C. 9+37.48 (30' L.)		K

TYPICAL SECTION B

NOT TO SCALE

FOR DETAILS NOT SHOWN SEE DETAIL A, SH. 59.

I-1 6" PIPE CLASS I-3 FOR LOCATION SEE SH. 20

NOTE:

UNLESS OTHERWISE SPECIFIED THE FOLLOWING NOTES APPLY-
FOR TRUE ELEVATIONS ADD 600.00 TO THOSE SHOWN.
ELEVATIONS ARE GIVEN TO TOP OF PAVEMENT AT JOINTS, EDGE OF PAVEMENT OR FACE OF CURBS.
CONTOURS SHOW TOP OF PAVEMENT ELEVATIONS.
CONTOUR INTERVALS = 0.2'.
DIMENSIONS ARE GIVEN TO JOINTS, EDGE OF PAVEMENT OR FACE OF CURBS.
ALL RADII GIVEN TO FACE OF CURB OR EDGE OF PAVEMENT.
MINIMUM LENGTH OF PAVEMENT JOINTS = 2'-0"
SANDSTONE CURB TO BE 6" x 18"
ALIGNMENT & GRADE OF NEW CONSTRUCTION TO MATCH ADJOINING EXISTING PAVEMENT, SIDEWALK, CURB, ETC.
SEE SHEET 6 FOR RADIAL CURB DETAIL

NOTE: SEE SHEET 20 FOR DRAINAGE DETAILS
PAV'T QUANTITIES ON SHEET 12

JOINT SYMBOLS

- (LJ) STANDARD LONGITUDINAL JOINT
- (KJ) STANDARD LONGITUDINAL KEY JOINT, WITHOUT TIE BARS
- (SE) STANDARD EXPANSION JOINT
- (EJ) STANDARD EXPANSION JOINT, WITHOUT DOWELS
- (BJ) PLAIN BUTT JOINT

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

INTERSECTION
PAVEMENT DETAILS
E. 30 ST., E. 31 ST.,
RAMP 30-S,
& RELOCATED ORANGE AVE.

SCALE 1" = 20' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
AHJ	GO'C		GO'H			

CONT. No. 58019 SHEET ACCT. No. 6043

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

10

SOD

LA 3"/FT.

R/W

E-8 PAVEMENT REMOVAL

MATCH LINE
WILLOW FWY CROSS SECTIONS

G82.14

7+50

G82.4

86

SOD

4:1 3:1 3"/FT

21

G82.02

E-8 PAVEMENT REMOVAL

LA

G83.28

7+00

G82.0

147

SOD

LA

32

G81.90

E-8 PAVEMENT REMOVAL

G84.58

6+50

G83.2

211

SOD

186 ESTIMATED ADDITIONAL QUANTITY
AT ORANGE AVE. & SERVICE ROAD "C"

4:1

LA

3:1

44

G81.77

℄ ORANGE AVE.

ESTIMATED ADDITIONAL QUANTITY
AT ORANGE AVE. & SERVICE ROAD "C"

18 ESTIMATED ADDITIONAL QUANTITY
BETWEEN STA. 5+33 SKEW & STA. 6+00

G86.20

6+00

G83.0

354

SOD

3:1 NORMAL 3:1

LA

51

℄ ORANGE AVE.

306 BEGIN 4' SOD DITCH
STA. 4+50

MATCH LINE
WILLOW FWY CROSS SECTIONS

G88.85

5+33 (SKEW)

G85.0

G81.6

STD. NO. 2-2-A CB
STA. 5+33 33.6' RT.
GRATE EL. 681.60

SEE CROSS SECTION
KEY PLAN SHEET 43

51 STA. 112+00

STA. 112+00

	Cu. Yds.	Cu. Yds.	Sq. Yds.
EXCAVATION	4,225		
EMBANKMENT	924		
SEEDING	2,915		

670	84	0
680	131	25
680	58	27
680	110	43
680	61	19
680	14	0
	64	117
680	8	107
680	55	309
	36	142
	40	380
	7	268

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

RAMP S-30

STA. 5+33 TO STA. 7+50

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

MATCH LINE
WILLOW FWY CROSS SECTIONS

43 225

SOD — LA — G75.08 — G75.4

G76.90
10+00
G82.0

G70

400 0

38 208

SOD — LA — G75.72 — G76.0

G77.51
9+50
G82.0

℄ E. 34 ST.

G80

694 0

350 0

37

BEGIN 4.5' SOD DITCH
STA 9+00

END 4.0' SOD DITCH
STA 9+00

SOD — LA — G76.68 — G77.0

G78.47
9+00
G83.0

℄ E. 34 ST.

G80

587 0

284 0

194 ESTIMATED ADDITIONAL QUANTITY
AT E. 34TH ST. & ROAD "C"

189

28 ESTIMATED ADDITIONAL QUANTITY
BETWEEN STA. 8+50 & STA 9+00

ESTIMATED ADDITIONAL QUANTITY AT
E. 34TH ST. & ROAD "C"

6 0

31

SOD — LA — ½"/FT. — ⅜"/FT. — 4:1 — 2:1 — G78.0

E-8 PAV'T. REMOVAL

G79.61
8+50
G81.9

G80

450 18

202 19

131

SOD — 4:1 — 2:1 — LA — ⅜"/FT. — R/W — G80.0

E-8 PAV'T. REMOVAL

MATCH LINE
WILLOW FWY CROSS SECTIONS

G80.75
8+00
G81.8

G80

272 25

92 8

163 7

16

72

10 STA. 7+50

80 60 40 20 ℄ 20 40 60 80 100 120 140 160 180 200 STA. 7+50

84 0

RAMP S-30

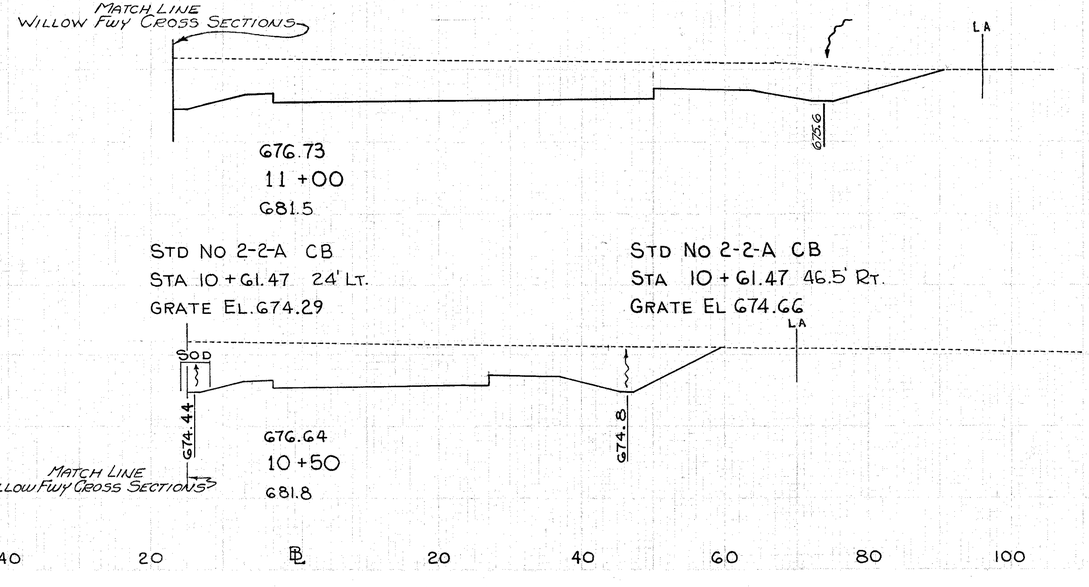
STA. 8+00 TO STA. 10+00

SHEET ACCT No. 6111

CONT No. 58019

1047

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)



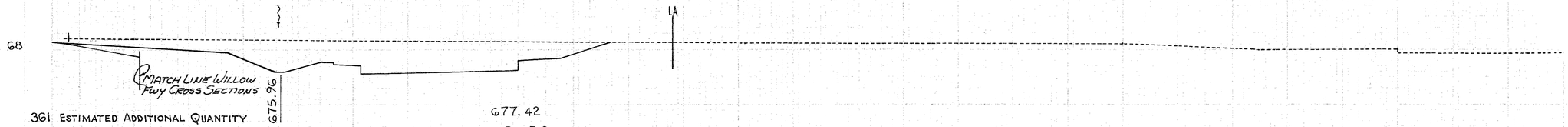
STA. 10+50 TO STA. 11+00

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

Reloc. Orange

Cont. No. 58019 Sheet Acct. No. 6113

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)



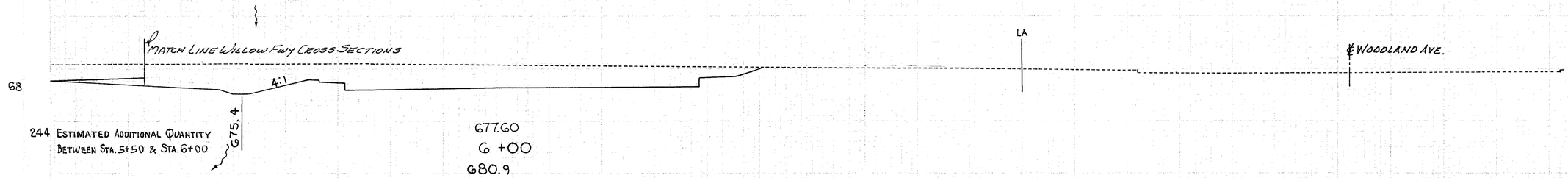
361 ESTIMATED ADDITIONAL QUANTITY
BETWEEN STA. G+00 & STA. G+50

378

G77.42
G +50
G81.5

G70

370 0



244 ESTIMATED ADDITIONAL QUANTITY
BETWEEN STA. 5+50 & STA. 6+00

281 BEGIN 5' SOD DITCH STA 5+85

G77.60
G +00
G80.9

G80

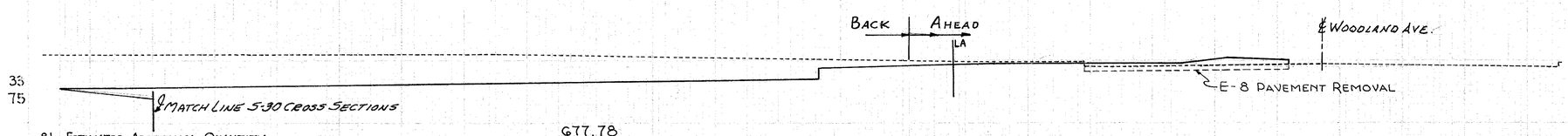
887 0

588 0

ESTIMATED ADDITIONAL QUANTITIES AT INTERSECTION OF RAMP S-30 & WOODLAND AVE. 58 25

ESTIMATED ADDITIONAL QUANTITIES BETWEEN STA. 5+50 & STA. 6+00 & WILLOW STA. 118+89.71 25 0

1100 51



33
75

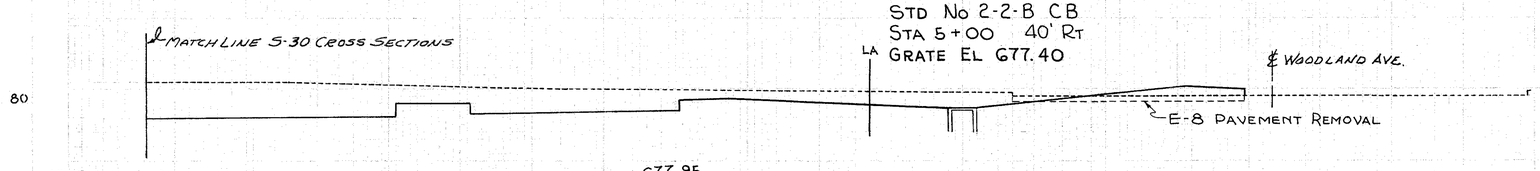
81 ESTIMATED ADDITIONAL QUANTITY
BETWEEN STA. 5+00 & STA. 5+50

435

G77.78
5 +50
G80.9

G80

600 55



80

42 ESTIMATED ADDITIONAL QUANTITY
BETWEEN STA. 4+50 & STA. 5+00

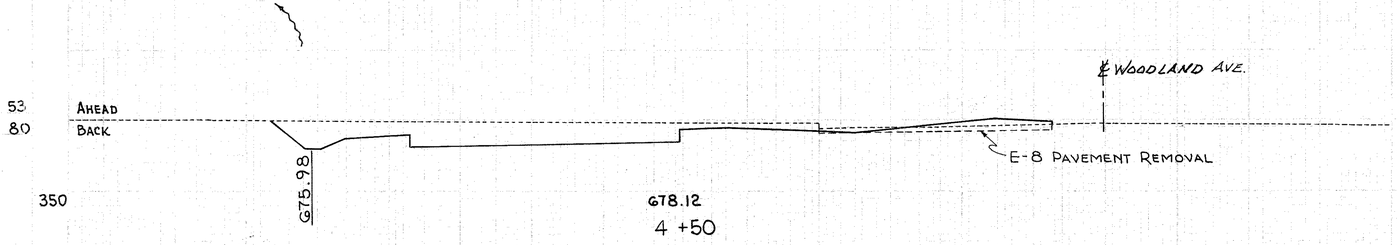
369

G77.95
5 +00
G79.9

G80

921 92

395 44



350

G78.12
4 +50
G79.8

G80

551 75

200 37

282 82

46 STA. 4+00

STA. 4+00 105 52

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

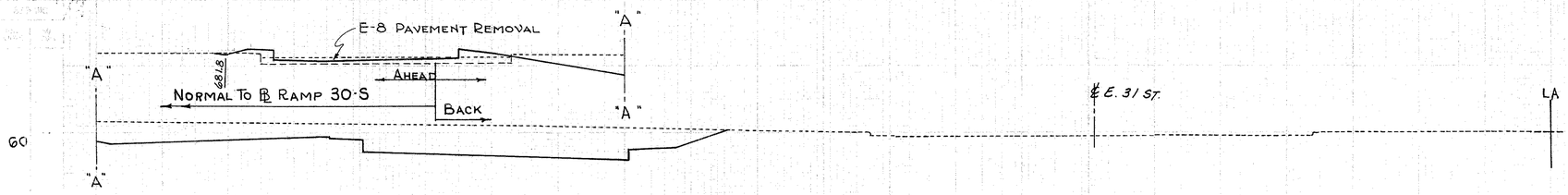
STA. 4+50 TO STA. 6+50

CONT. NO. 5801-9 SHEET ACCT. No. 6114

RELOC. ORANGE

2541

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)



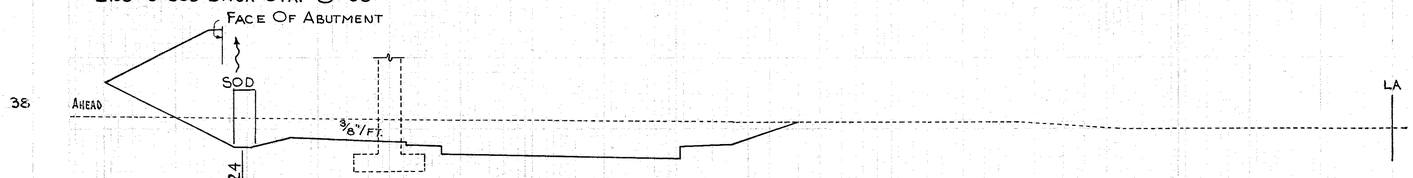
164 ESTIMATED ADDITIONAL QUANTITY
BETWEEN STA. 8+50 & STA. 9+00

G77.05
9+00
G80.8

G70

BACK 349 22

272 END 3' SOD DITCH STA. 8+50



ESTIMATED ADDITIONAL QUANTITIES BETWEEN STA. 8+50 & STA. 9+00 & WILLOW STA. 118+89.71 120 120
617 20

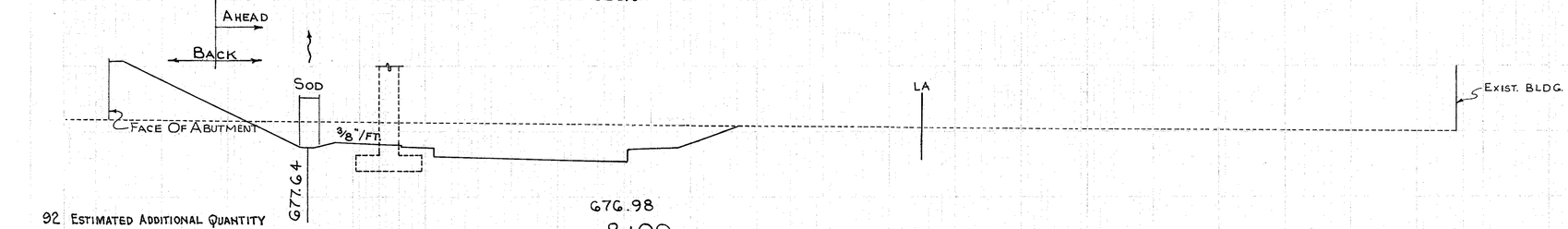
G80

AHEAD 317 0

BACK 334 169

33 ESTIMATED ADDITIONAL QUANTITY BETWEEN STA. 8+00 & STA. 8+50
NORMAL TO SLOPE

G77.24



G76.98
8+50
G81.1

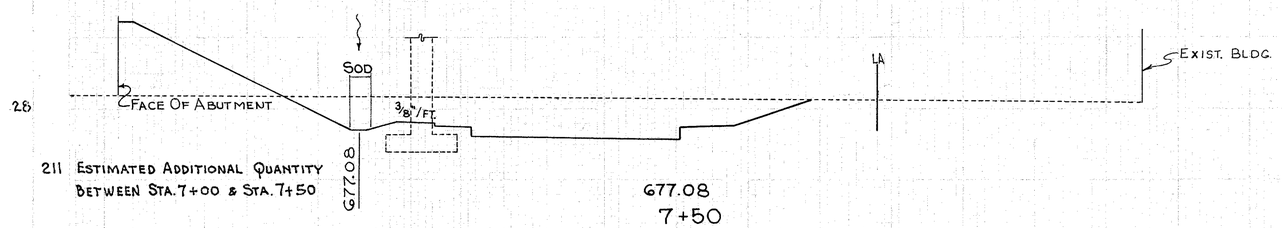
573 256

G80

92 ESTIMATED ADDITIONAL QUANTITY
BETWEEN STA. 7+50 & STA. 8+00

G76.98
8+00
G81.0

285 108



545 220

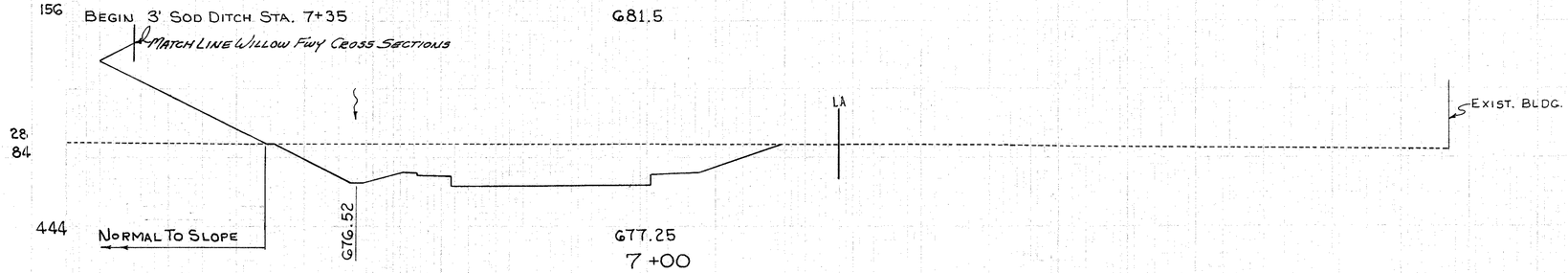
G80

211 ESTIMATED ADDITIONAL QUANTITY
BETWEEN STA. 7+00 & STA. 7+50

G77.08
7+50
G81.5

304 130

156 BEGIN 3' SOD DITCH STA. 7+35



G77.25
7+00
G81.9

592 319

G80

335 214

653 198

76 STA. 6+50

STA. 6+50 370 0

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

STA. 7+00 TO STA. 9+00

CONT. NO. 58019 SHEET ACCT. NO. 6115

RELOC. ORANGE

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

STA. 9+50 TO STA. 11+50

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

74 / 204

CUYAHOGA COUNTY
CUY—21-(13.77)-(14.94)

NOTE:
UNLESS OTHERWISE SPECIFIED THE FOLLOWING NOTES APPLY-
FOR TRUE ELEVATIONS ADD 600.00 TO THOSE SHOWN.
ELEVATIONS ARE GIVEN TO TOP OF PAVEMENT AT JOINTS, EDGE OF PAVEMENT OR FACE OF CURBS.
CONTOURS SHOW TOP OF PAVEMENT ELEVATIONS.
CONTOUR INTERVALS = 0.2'.
DIMENSIONS ARE GIVEN TO JOINTS, EDGE OF PAVEMENT OR FACE OF CURBS.
ALL RADII GIVEN TO FACE OF CURB OR EDGE OF PAVEMENT.
MINIMUM LENGTH OF PAVEMENT JOINTS = 2'-0"
SANDSTONE CURB TO BE 6" x 18"
SEE SHEET 20 FOR DRAINAGE DETAILS
SEE SHEET 6 FOR RADIAL CURB DETAILS
SEE SHEET 12 FOR PAV'T QUANTITIES

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

PAVEMENT DETAILS
ROADS "C" & "D"

SCALE 1" = 20'

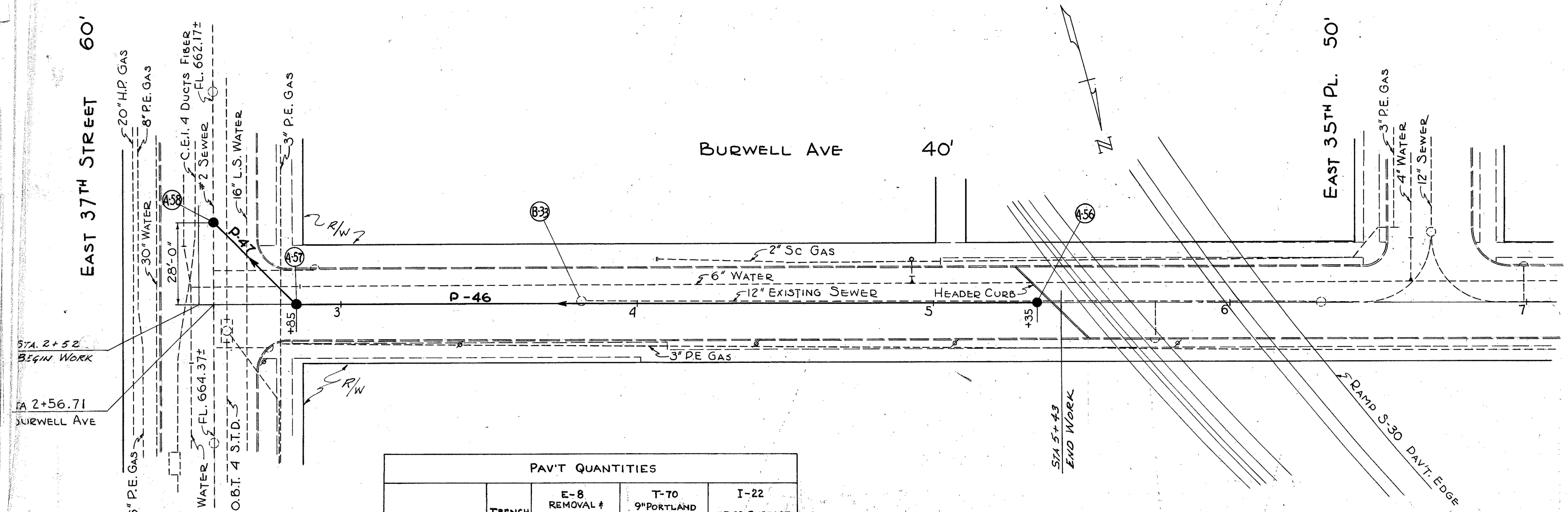
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
AHJ	GO'C		C.D.R.			

CONT. No. 58019 SHEET ACCT. No. 6044

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

75/204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)



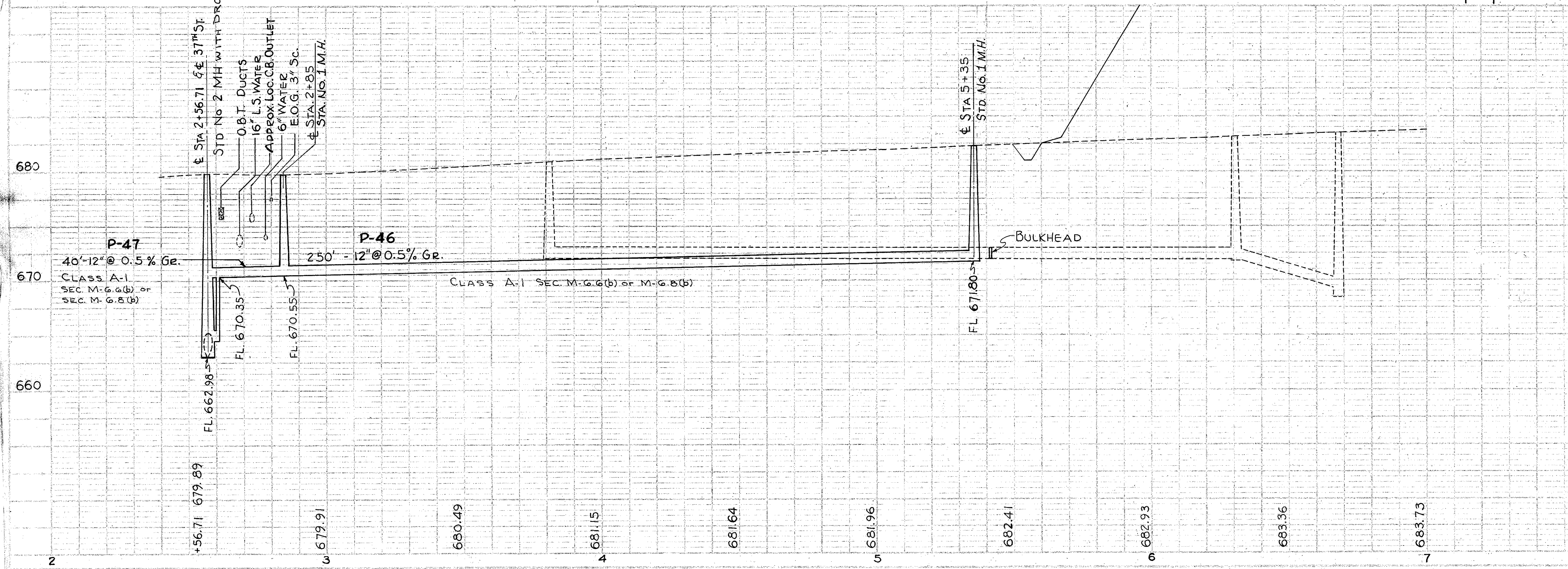
NOTE: COST OF ALL WORK & MATERIALS REQUIRED TO REMOVE PART OF EXISTING SEWER, INCLUDING MANHOLE, CONSTRUCTION OF BULKHEAD & THE CONNECTIONS OF EXISTING SEWER LINES TO NEW SEWER SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM I-1-12" PIPE SEC. M-6.8(b) CLASS A-1.

RECONNECT ALL EXISTING CONNECTIONS TO NEW SEWER.

FOR LEGEND SEE SH. 20

PAV'T QUANTITIES				
LOCATION	TRENCH WIDTH L.F.	E-8 REMOVAL & DISPOSAL OF EXISTING PAV'T S.Y.	T-70 9" PORTLAND CEMENT CONCRETE PAV'T C.Y.	I-22 6" I-22 SUBBASE C.Y.
A-58 TO A-56	3.0	97	24	16

MARK NO.	DRAINAGE QUANTITIES	I-8		I-16	I-1
	LOCATION	STD. NO 1 MANHOLE WITH SPEC. FRAME & COVER AS PER PLAN EACH	STD. NO 2 MANHOLE WITH SPECIAL FRAME & COVER AS PER PLAN EACH	MANHOLE ABANDONED EACH	12" PIPE CLASS A-1 SEC. M-6.6(a) or M-6.8(b) LIN. FT.
A-56	BURWELL STA. 5+35 ℄	1			
A-57	BURWELL STA. 2+85 ℄	1			
A-58	BURWELL STA. 2+56.71 28' LT.		1		
B-33	BURWELL 3+81 ℄			1	
P-46	BURWELL FROM A-56 TO A-57				250
P-47	BURWELL FROM A-57 TO A-58				40
	TOTAL	2	1	1	290



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

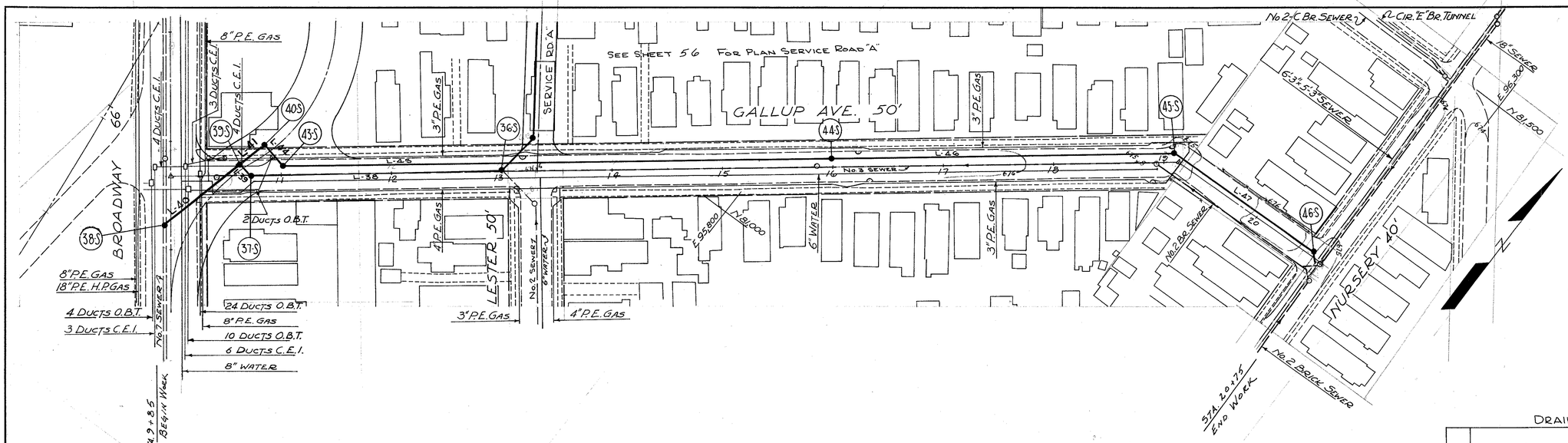
BURWELL AVENUE

COMBINATION SEWER

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

76
204

CUYAHOGA COUNTY
CUY— 21— (13.77)-(14.94)



DRAINAGE QUANTITIES

MARK No.	LOCATION	I-8 BAFFLE MANHOLE AS PER PLAN EACH	I-8 MANHOLE STEPS WITH FRAME & COVER EACH	I-8 INTERCEPTING MANHOLE AS PER PLAN EACH	I-1 18" PIPE CLASS A-1 SEC. M-G.6(c) LIN. FT.	I-1 48" PIPE CLASS A-1 SEC. M-G.6(b) LIN. FT.	I-1 54" PIPE CLASS A-1 SEC. M-G.6(b) LIN. FT.
** 37-S	GALLUP STA. 10+72		1				
** 38-S	BROADWAY STA. 2+25		1				
** 39-S	GALLUP 12' LT. STA. 10+60		1				
** 40-S	GALLUP 30' LT. STA. 10+85			1			
* 43-S	GALLUP 8' LT. STA. 11+00		1				
* 44-S	GALLUP 8' LT. STA. 16+00		1				
** 45-S	GALLUP 8' LT. STA. 19+05		1				
* 46-S	GALLUP 8' LT. STA. 20+60	1					
** L-38	FROM 36-S TO 37-S						228
** L-39	FROM 37-S TO 39-S						15
** L-40	FROM 38-S TO 39-S					88	
** L-41	FROM 39-S TO 40-S						28
* L-44	FROM 40-S TO 43-S				25		
* L-45	FROM 43-S TO 44-S				497		
* L-46	FROM 44-S TO 45-S				310		
* L-47	FROM 45-S TO 46-S				155		
		1	6	1	987	88	271

See Sheet 81 For Sewer Profile L-38 & L-39
See Sheet 95 For Details of Intercepting Manhole 40-S
See Sheet 90 For Details of Baffle Manhole 46-S

* Denotes Sanitary Sewer
** Denotes Combination Sewer

LOCATION	TRENCH WIDTH	E-8 REMOVAL & DISPOSAL OF EXISTING PAVEMENT	PAVEMENT REPLACEMENT I-22 6" SUBBASE	PAVEMENT REPLACEMENT T-71 9" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT	PAVEMENT REPLACEMENT T-70 9" PORTLAND CEMENT CONCRETE PAVEMENT
GALLUP AVE.	FT.	SQ. YD.	CU YD.	SQ. YD.	CU. YD.
STA. 11+50 TO STA. 13+08	13	171	38	171	
STA. 13+08 TO STA. 20+73	3	258	43		64
TOTAL	16	429	81	171	64

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

GALLUP AVE.
SANITARY SEWER

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

CONT. NO. 58019 SHEET ACCT. No. 6307

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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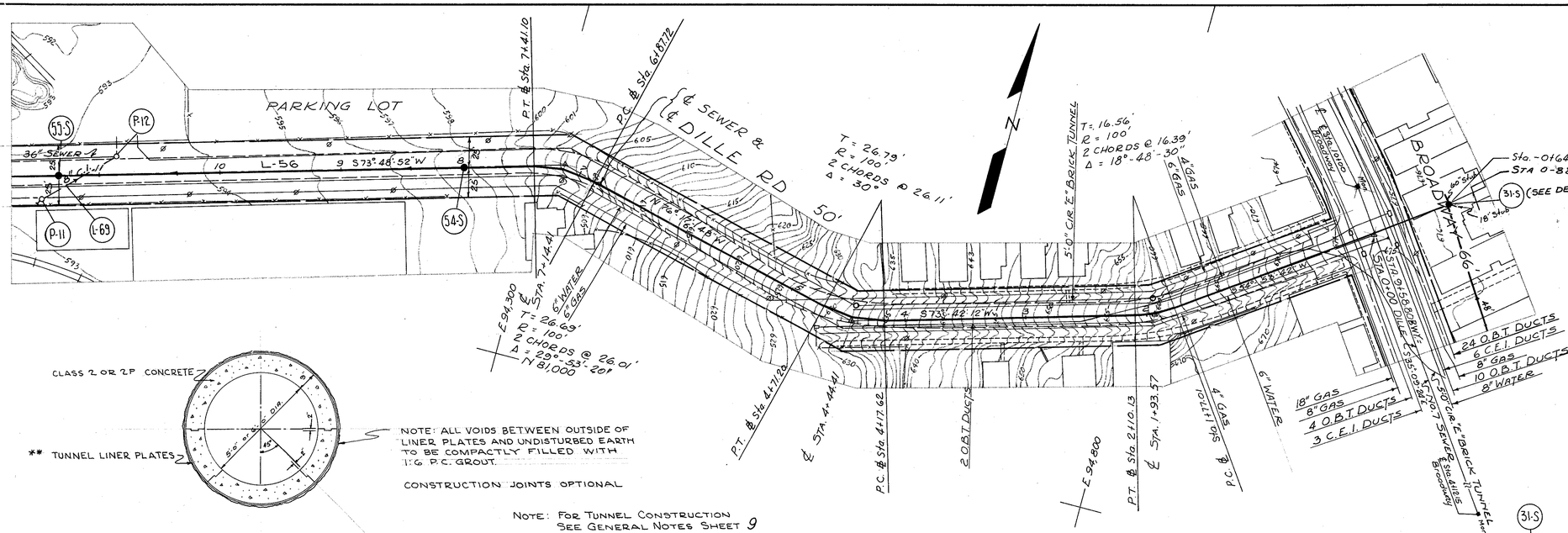
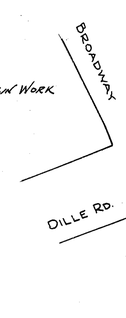
204

CUYAHOGA COUNTY
CUY— 21— (13.77)-(14.94)





DETAIL

TYPICAL SECTION
SEWER IN TUNNEL

Note: For Tunnel Construction
See General Notes Sheet 9

SOIL BORINGS NO. B-81 & B-82 HAVE BEEN TAKEN IN THE VICINITY OF THIS SEWER. THIS INFORMATION IS AVAILABLE AT THE OHIO STATE HIGHWAY TESTING LABORATORY, 1620 W. BROAD ST., COLUMBUS 15, OHIO.

55-S

** Sta. -0+64 To Sta. 8+00 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.

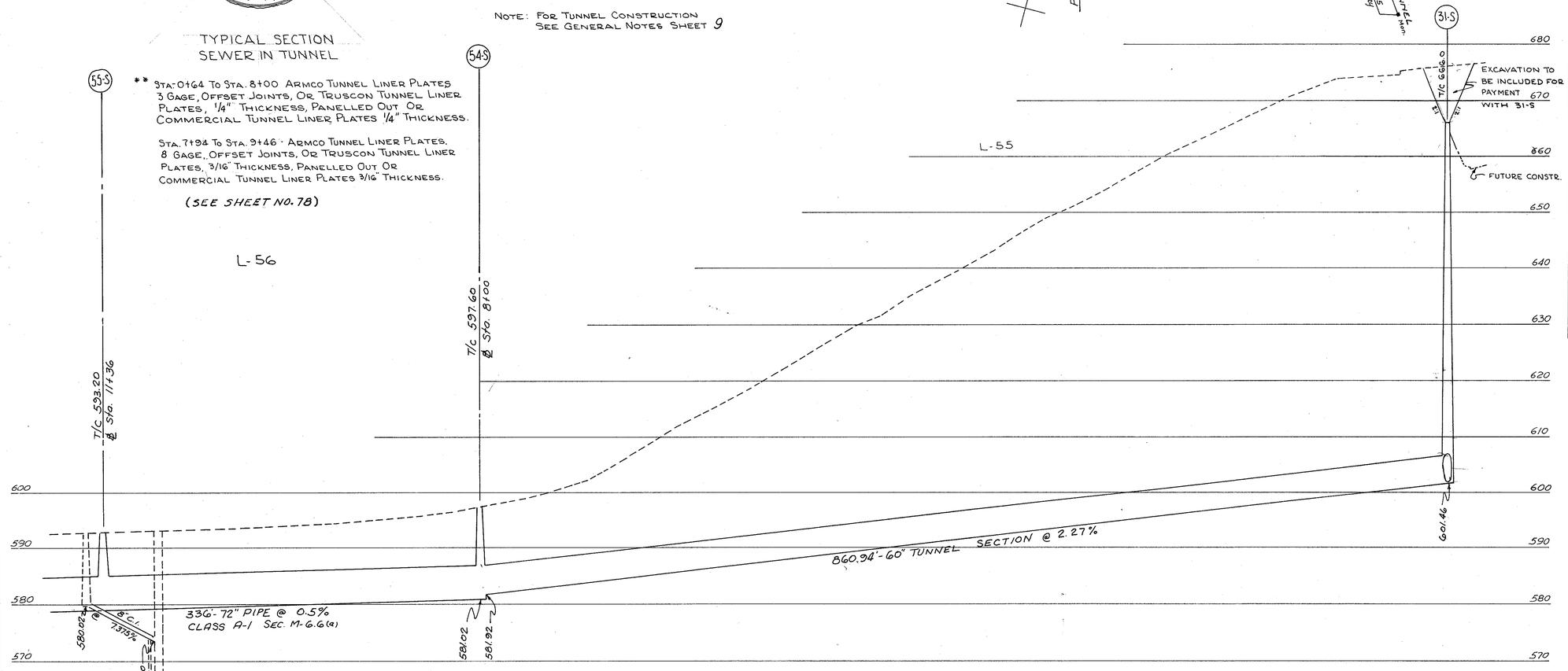
Sta. 7+94 To Sta. 9+46 - Armco Tunnel Liner Plates, 8 Gage, Offset Joints, Or Truscon Tunnel Liner Plates, 3/16" Thickness, Panelled Out Or Commercial Tunnel Liner Plates 3/16" Thickness.

(SEE SHEET NO. 78)

54-S

L-56

L-55



DRAINAGE QUANTITIES

MARK No.	LOCATION	I-8 MANHOLE SPECIAL TYPE AS PER PLAN EACH	I-1 72" PIPE CLASS A-1 SEC. M-6.6(a) LIN. FT.	SPL SECTION 60" PIPE TUNNEL SECTION AS PER PLAN LIN. FT.	I-6 RELAYING 8" C.I. PIPE AS PER PLAN LIN. FT.
54-S	Dille Rd. STA 8+00 ℄	1			
55-S	Dille Rd. STA. 11+36 ℄	1			
L-55	From 31-S To 54-S			861	
L-56	From 54-S To 55-S		336		
L-69	From P.11 To P.12				70
	TOTAL	2	336	861	70

Note: Work This Sheet With Sheet 78

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

STORM SEWER
DILLE ROAD

SCALE 1"=50' Horz. 1"=10' Vert.

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	CR		RMR			

CONT. No. 58019 SHEET ACCT. No. 6138

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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204

CUYAHOGA COUNTY
CUY— 21— (13.77)-(14.94)

DRAINAGE QUANTITIES

MARK NO	LOCATION	I-8 MANHOLE SPECIAL TYPE C AS PER PLAN EACH	I-8 SPECIAL (CONNECT NEW SEWER TO EXIST MH STR #72 M.H.) EACH	I-1 72" PIPE CLASS A-1 SEC. M-6.6(B) LIN. FT.	SPL 72" TUNNEL SECTION AS PER PLAN LIN. FT.	I-1 12" PIPE CLASS A-1 SEC. M-6.6(A) LIN. FT.	I-1 8" PIPE CLASS A-1 SEC. M-6.6(A) LIN. FT.
56-S	DILLE RD. STA. 15+30	1					
57-S	INDEPENDENCE RD. 20 RT 0136	1					
58-S	" " 15 RT 2174	1				8	
59-S	" " 15 RT 4182	1				8	
60-S	" " 15 RT 7430	1				8	
L-57	FROM 55-S TO 56-S			395			
L-58	" 56-S " 57-S			38			
L-59	" 57-S " 58-S			246			
L-60	" 58-S " 59-S			214			
L-61	" 59-S " 60-S			256			
L-62	" 60-S " BULKHEAD			65	151		
L-72	" EXIST 8" PIPE TO P-20						56
P-20	INDEPENDENCE RD. 8+21		1				
	TOTAL	5	1	1214	151	24	56

NOTE—
REMOVAL OF STORED MATERIAL:
THE CONTRACTOR, BEFORE BIDDING AND AFTER VISITING THE SITE OF THE BOX CULVERT AT TURN BASIN, SHALL CONSULT WITH THE PROPERTY OWNER (REPUBLIC STEEL CO.) TO DETERMINE THE AMOUNT OF MATERIAL NOW STORED IN THE CONSTRUCTION AREA AND INGRESS AND EGRESS AREA, AS SHOWN ON SHEET NO. 204, THAT MUST BE REMOVED IN ORDER TO CARRY ON THE CONTRACTOR'S OPERATIONS.
THE REMOVAL, TEMPORARY STORAGE AND SUBSEQUENT RETURN OF THIS MATERIAL SHALL BE PERFORMED BY THE PROPERTY OWNER AT THE CONTRACTOR'S EXPENSE.
THE LUMP SUM BID PRICE FOR "ITEM SPECIAL, REMOVAL OF STORED MATERIAL" SHALL CONSTITUTE FULL PAYMENT TO THE CONTRACTOR FOR THE COST OF PERFORMING THE ABOVE WORK AS WELL AS ANY REMOVAL AND REPLACEMENT OF FENCES AND REHABILITATION OF THE CONSTRUCTION AND ACCESS AREAS.

NOTE:
ALL WORK PERFORMED ON REPUBLIC STEEL CO. PROPERTY SHALL BE IN CONFORMANCE WITH REPUBLIC'S PLANT AND PROTECTION RULES, SAFETY RULES GSO-2 AND GSO-18 AND UNDER ANY DIRECTIONS OF REPUBLIC'S CLEVELAND DISTRICT CHIEF ENGINEER. COPIES OF THESE RULES ARE ON FILE AT THE DIVISION 12 OFFICE OF THE OHIO DEPARTMENT OF HIGHWAYS, THE OFFICE OF CONTRACT SALES, COLUMBUS, OHIO; OR THE GENERAL OFFICES OF REPUBLIC STEEL CORPORATION, REPUBLIC BUILDING, CLEVELAND 1, OHIO.
ALL OPEN EXCAVATIONS SHALL BE PROTECTED BY BARRICADES AND APPROPRIATE WARNING LIGHTS.

SHEET	LOCATION	TRENCH WIDTH	E-8 REMOVAL & DISPOSAL OF EXISTING PAVEMENT	I-22 6" SUBBASE	B-70 9" PORTLAND CEMENT CONCRETE BASE COURSE	T-35 1½" ASPHALTIC CONCRETE SURFACE COURSE	T-30 BITUMINOUS TACK COAT 0.10 GAL/S.Y.
			S.Y.	C.Y.	C.Y.	C.Y.	GAL.
77&78	54 S – 55 S	9.66'	361	60	90	12	36
78	55 S – 56 S	9.66'	424	71	106	15	42
78	56 S – EDGE	9.66'	19	3	5	1	2
78	59 S – 60 S	VARIES	157	26	39	6	16
	TOTAL		961	160	240	34	96

NOTE: SEE SHEET 77 FOR TUNNEL SECTION

* NOTE: THE CONTRACTORS PARTICULAR ATTENTION IS CALLED TO THE EXISTENCE OF 2-6" AND 1-8" STANDARD OIL COMPANY PIPE LINES CARRYING FUEL OIL AND GASOLINE IN THE VICINITY OF INDEPENDENCE ROAD AND DILLE ROAD; ALSO 2-12" AND 2-8" STANDARD OIL COMPANY PIPE LINES NEAR THE CUYAHOGA RIVER TURN BASIN. CONTRACTOR SHALL NOTIFY STANDARD OIL COMPANY 24 HOURS IN ADVANCE OF PERFORMING ANY WORK IN THESE AREAS AND SHALL USE SUCH PRECAUTIONARY MEASURES THAT ARE NECESSARY TO PROTECT THESE AND OTHER EXISTING LINES.
THE COST OF THIS OPERATION SHALL BE INCLUDED IN THE UNIT PRICE FOR THE PERTINENT ITEM.

NOTE: WORK THIS SHEET WITH SHEET 77

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

STORM SEWER
DILLE ROAD

SCALE 1" = 50' HORZ. 1" = 10' VERT.
DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED

REV. 5-20-63

CONT. No. 58019 SHEET ACCT. No. 6137

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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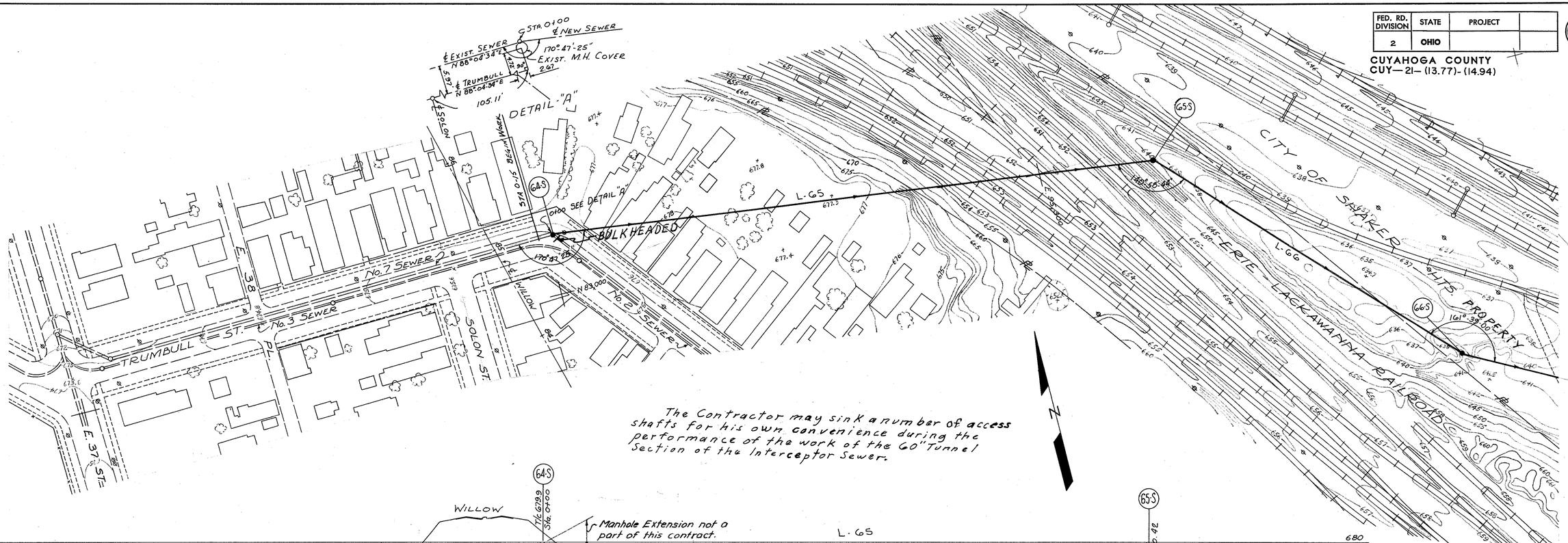
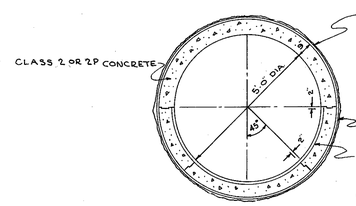
204

CUYAHOGA COUNTY
CUY— 21— (13.77)- (14.94)

CONT. No. 58019 SHEET ACCT. No. 6134





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

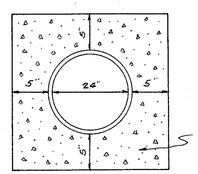
CONSTRUCTION JOINTS OPTIONAL

ARMCO TUNNEL LINER PLATES, 8 GAGE, OFFSET JOINTS, OR TRUSCON TUNNEL LINER PLATES, 3/16" THICKNESS, PANELLED OUT OR COMMERCIAL TUNNEL LINER 3/16" THICKNESS.

CITY OF CLEVELAND STANDARD SPECIFICATIONS FOR CONSTRUCTION OF PAVEMENTS, SIDEWALKS AND SEWERS (JANUARY 1950)- SECTION 0-5.2 VITRIFIED LINER PLATES.

TYPICAL SECTION
SEWER IN TUNNEL

Note: For Tunnel Construction See General Notes Sheet 9



TYPICAL SECTION
SEC. M-6.8(a) ENCASED
SEE GENERAL NOTES

SOIL BORINGS NO. B-78, B-79, B-80 & B-84 HAVE BEEN TAKEN IN THE VICINITY OF THIS SEWER. THIS INFORMATION IS AVAILABLE AT THE OHIO STATE HIGHWAY TESTING LABORATORY, 1620 W. BROAD ST., COLUMBUS 15, OHIO.

For Quantities See Sheet 80
Work This Sheet With Sheet 80

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

RELOCATION OF SOUTHERLY INTERCEPTOR

SANITARY SEWER

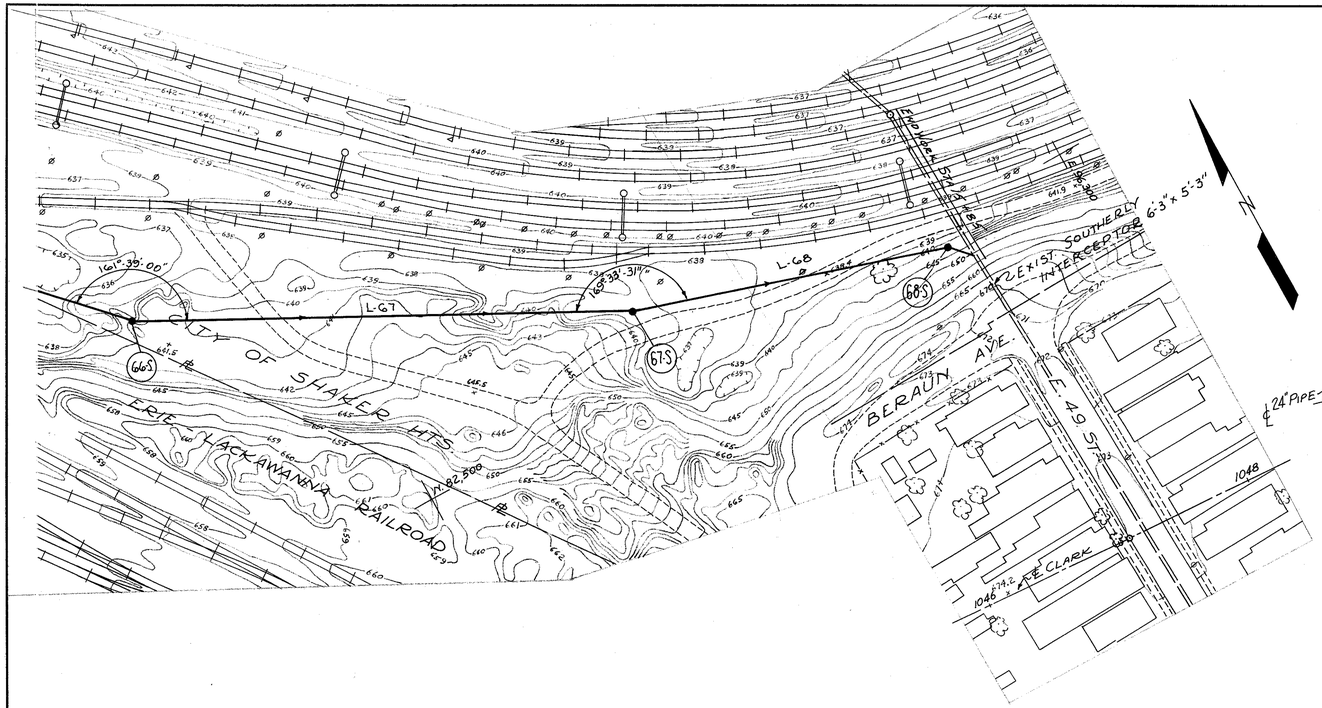
SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.R.		R.M.R.			

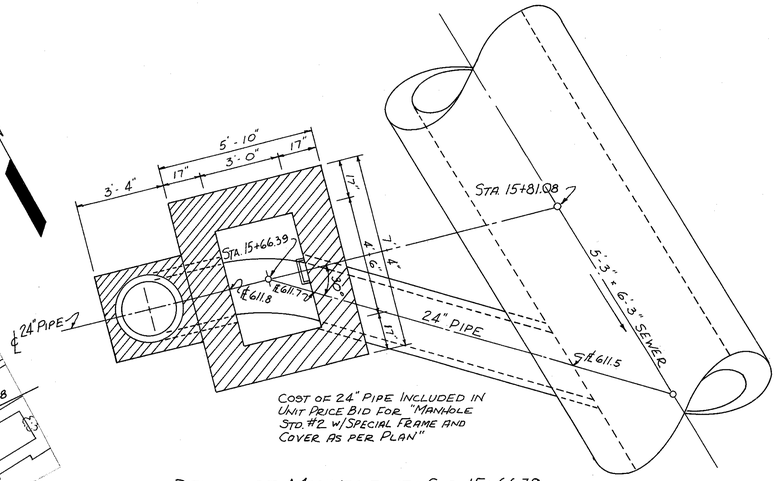
Rev. 8-14-63 C.E.H.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

80
204

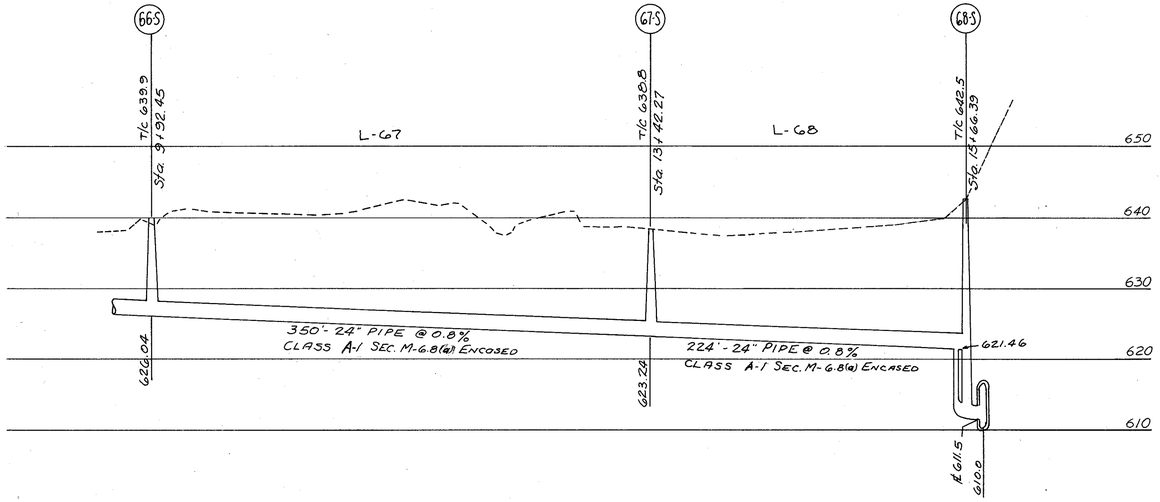
CUYAHOGA COUNTY
CUY— 21— (13.77)- (14.94)





COST OF 24" PIPE INCLUDED IN UNIT PRICE BID FOR "MANHOLE STD. #2 W/SPECIAL FRAME AND COVER AS PER PLAN"

DETAIL OF MANHOLE AT STA. 15+66.39
AND CONNECTION TO SOUTHERLY INTERCEPTOR



DRAINAGE QUANTITIES

MARK NO	LOCATION	I-8			I-1	SPL
		MANHOLE STD #2 W/SPECIAL FRAME & COVER AS PER PLAN WITHOUT DROP EACH	JUNCTION MANHOLE AS PER PLAN EACH	MANHOLE STD #2 W/SPECIAL FRAME & COVER AS PER PLAN EACH	24" PIPE CLASS A-1 SEC M-6.8(a) ENCASED AS PER PLAN LIN. FT.	60" PIPE TUNNEL SECTION AS PER PLAN LIN. FT.
G4-S	SOUTHERLY INTERCEPTOR STA. 0+00		1			
G5-S	" " STA. 6+20		1			
G6-S	" " STA. 9+92	1				
G7-S	" " STA. 13+42	1				
G8-S	" " STA. 15+66			1		
L-G5	FROM G4-S TO G5-S					620
L-G6	FROM G5-S TO G6-S				372	
L-G7	FROM G6-S TO G7-S				350	
L-G8	FROM G7-S TO G8-S				224	
	TOTAL	2	2	1	946	620

WORK THIS SHEET WITH SHEET 79

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

RELOCATION OF
SOUTHERLY INTERCEPTOR
SANITARY SEWER

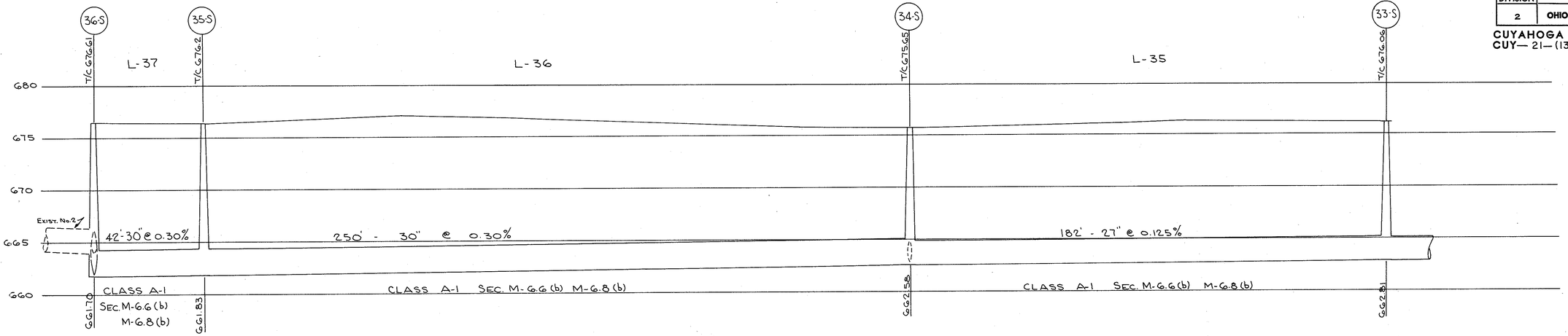
SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.R.		R.M.R.			

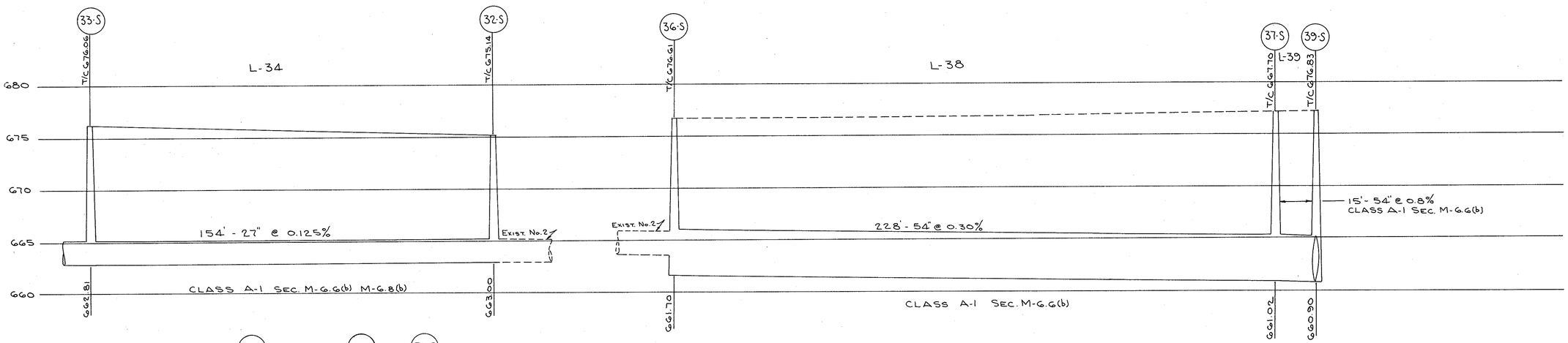
CONT. No. 58019 SHEET ACCT. No. 6/35

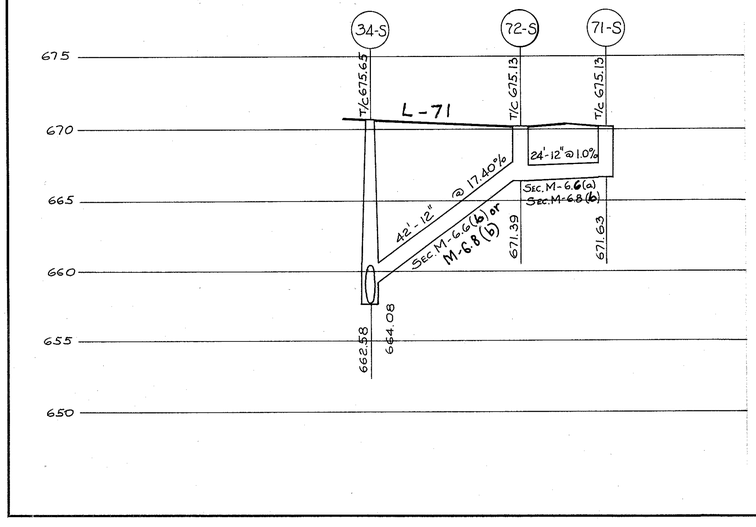
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

81
204

CUYAHOGA COUNTY
CUY— 21— (13.77)-(14.94)







SEE SHEET 56 & 76 FOR PLAN

CONT. No. 58019 SW-7 ACCT No. 6310

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

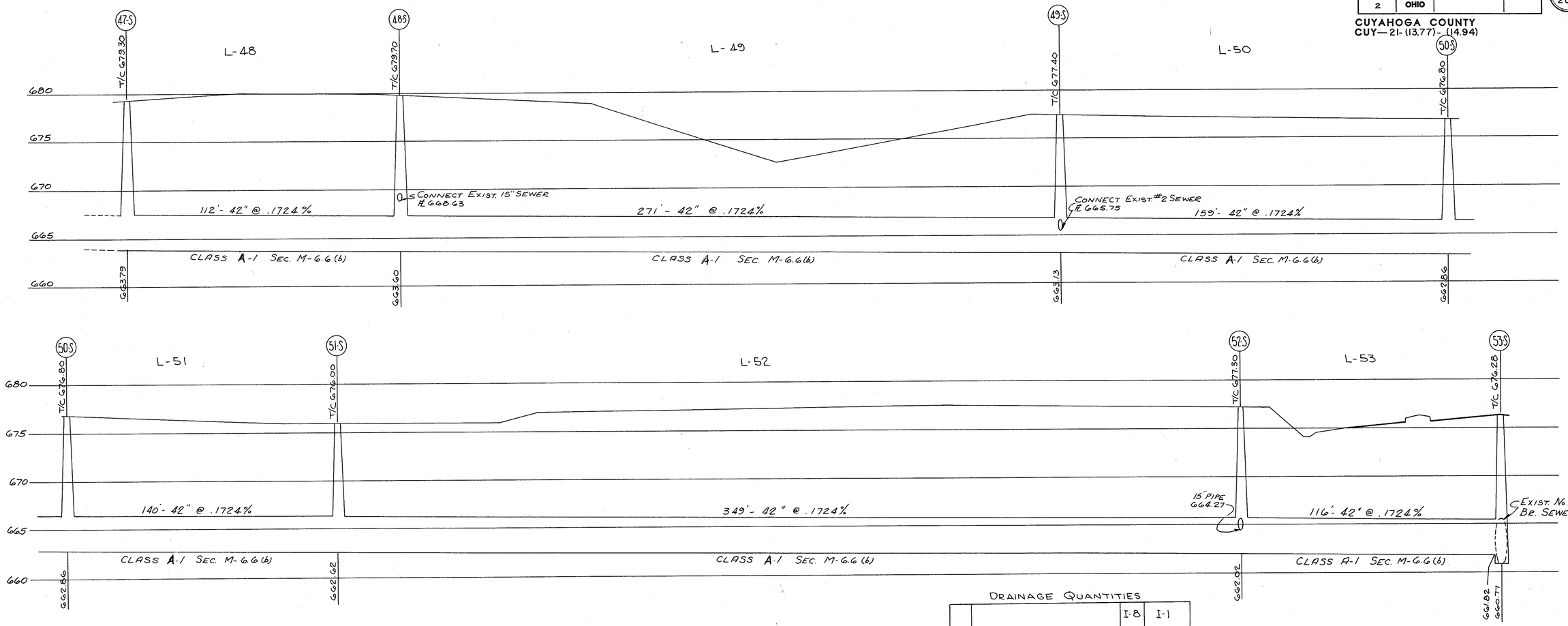
SEWER PROFILE
ROAD "A"

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

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

82
204

CUYAHOGA COUNTY
CUY— 21- (13.77) - (14.94)



DRAINAGE QUANTITIES

MARK No.	LOCATION	I-8 MANHOLE SPECIAL TYPE B AS PER PLAN EACH	I-1	I-1 42" PIPE CLASS A-1 SEC M-6.6 (b) LIN. FT.
47-S	Ramp B-S 47 LT. STA. 13+06	1		
48-S	Ramp B-S 50 LT. STA. 14+19	1		
49-S	Ramp B-S 54 LT. STA. 16+96	1		
50-S	Ramp B-S 25 LT. STA. 18+53	1		
51-S	Ramp B-S 71 LT. STA. 19+86	1		
52-S	Ramp B-S 44 LT. STA. 23+34	1		
53-S	Broadway ℄ STA. 6+70	1		
L-48	From 47-S To 48-S			112
L-49	From 48-S To 49-S			271
L-50	From 49-S To 50-S			159
L-51	From 50-S To 51-S			140
L-52	From 51-S To 52-S			349
L-53	From 52-S To 53-S			116
	TOTAL	7		1147

SEE SHEET 25 FOR PLANS

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

SEWER PROFILES

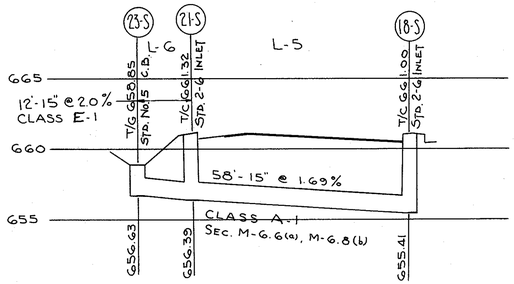
SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.R.		R.M.R.			

CONT. No. 58019 SHEET ACCT. No. 6304

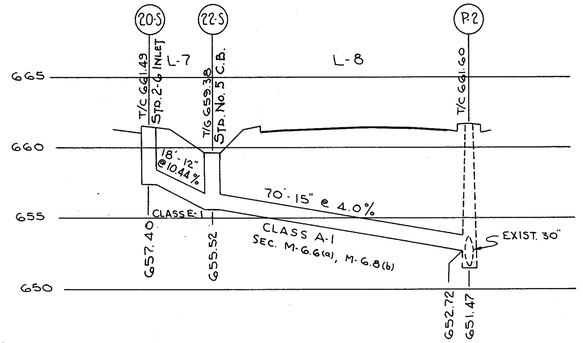
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

83
204

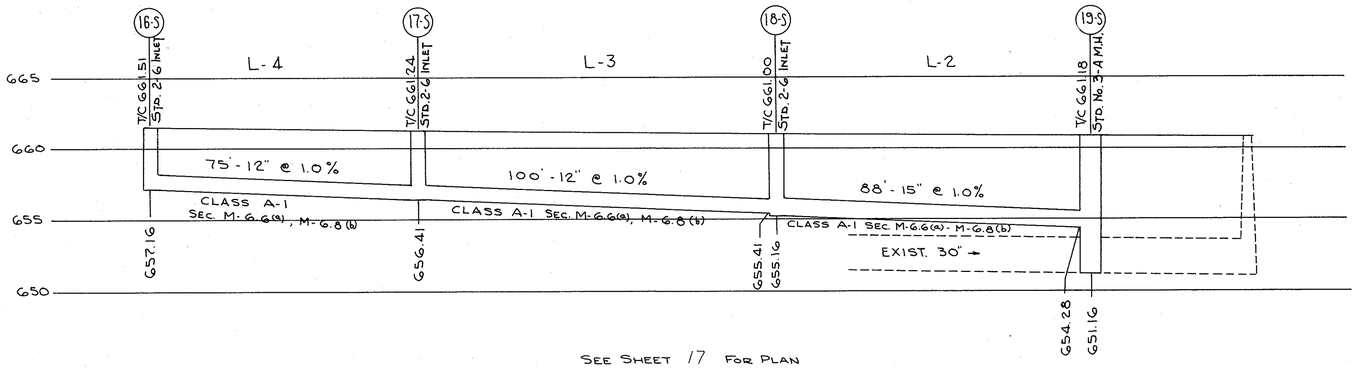
CUYAHOGA COUNTY
CUY— 21— (13.77)-(14.94)



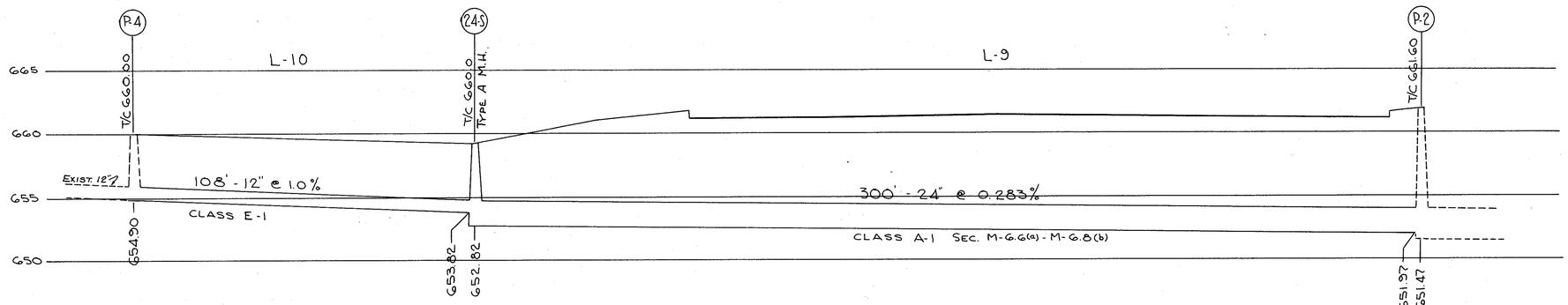
SEE SHEET 17 FOR PLAN



SEE SHEET 17 FOR PLAN



SEE SHEET 17 FOR PLAN



SEE SHEET 17 FOR PLAN

CONT. NO. 58019 SHEET ACCT. NO. 63-A

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

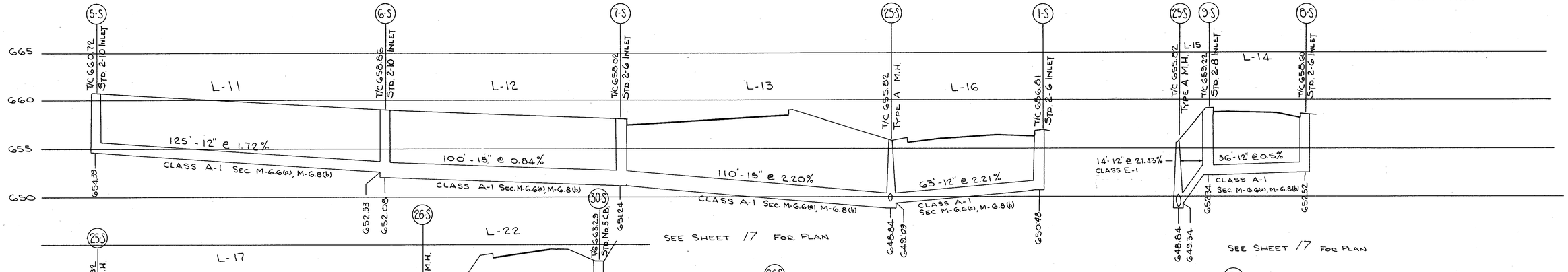
SEWER PROFILES

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

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

84
204

CUYAHOGA COUNTY
CUY— 21—(13.77)-(14.94)



CONT. No. 58019 SHEET NOT. No. 6305

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

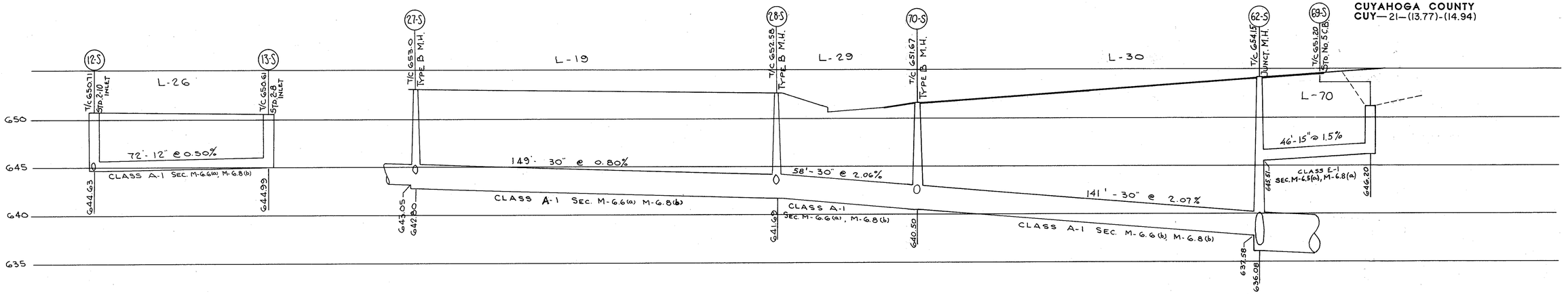
SEWER PROFILES

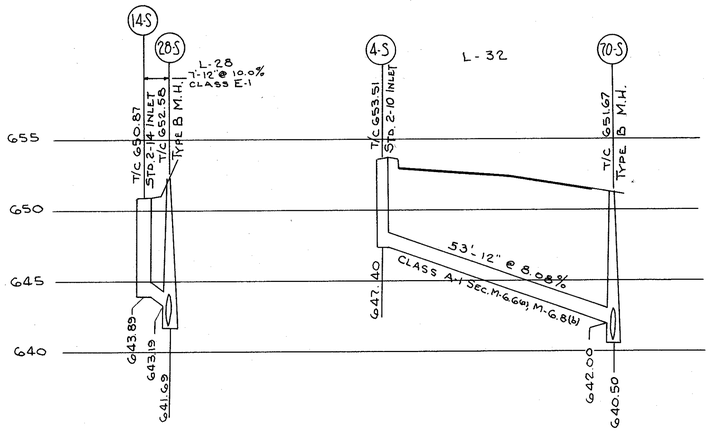
SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.R.		R.M.R.			

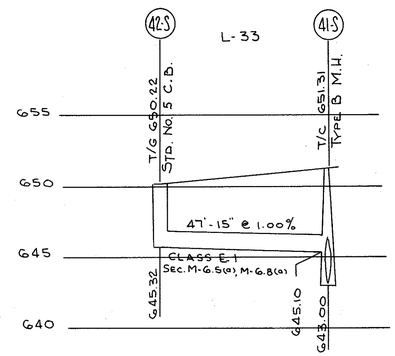
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

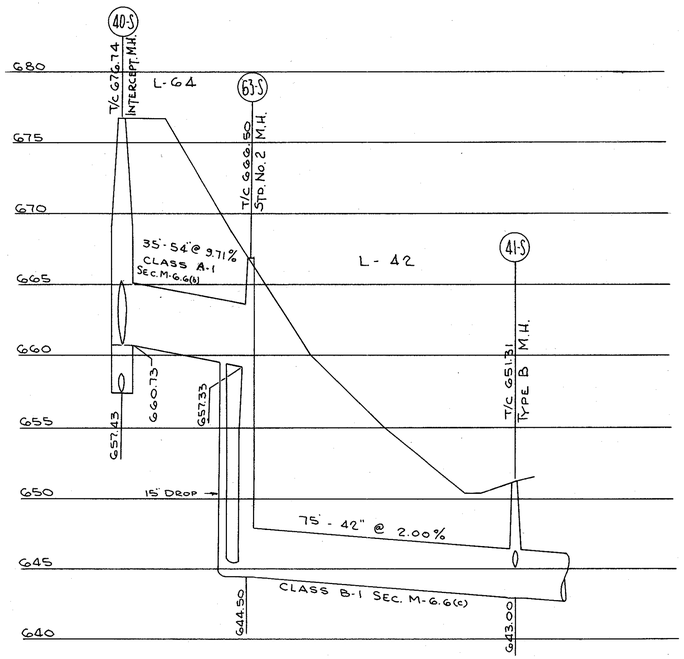
85
204

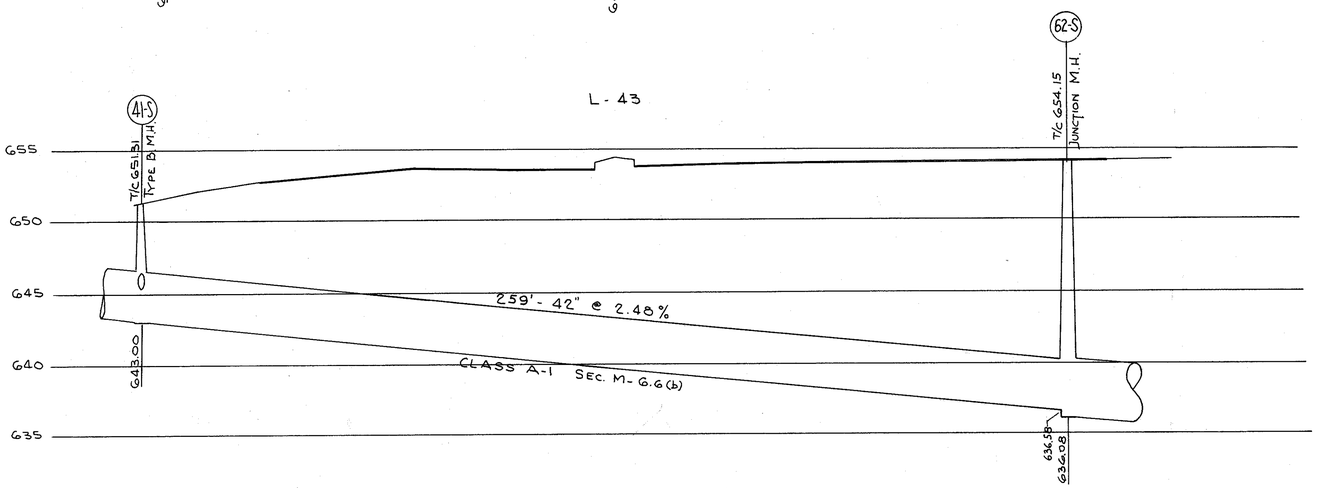
CUYAHOGA COUNTY
CUY— 21—(13.77)-(14.94)











SEE SHEET 18 FOR PLAN

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

SEWER PROFILES

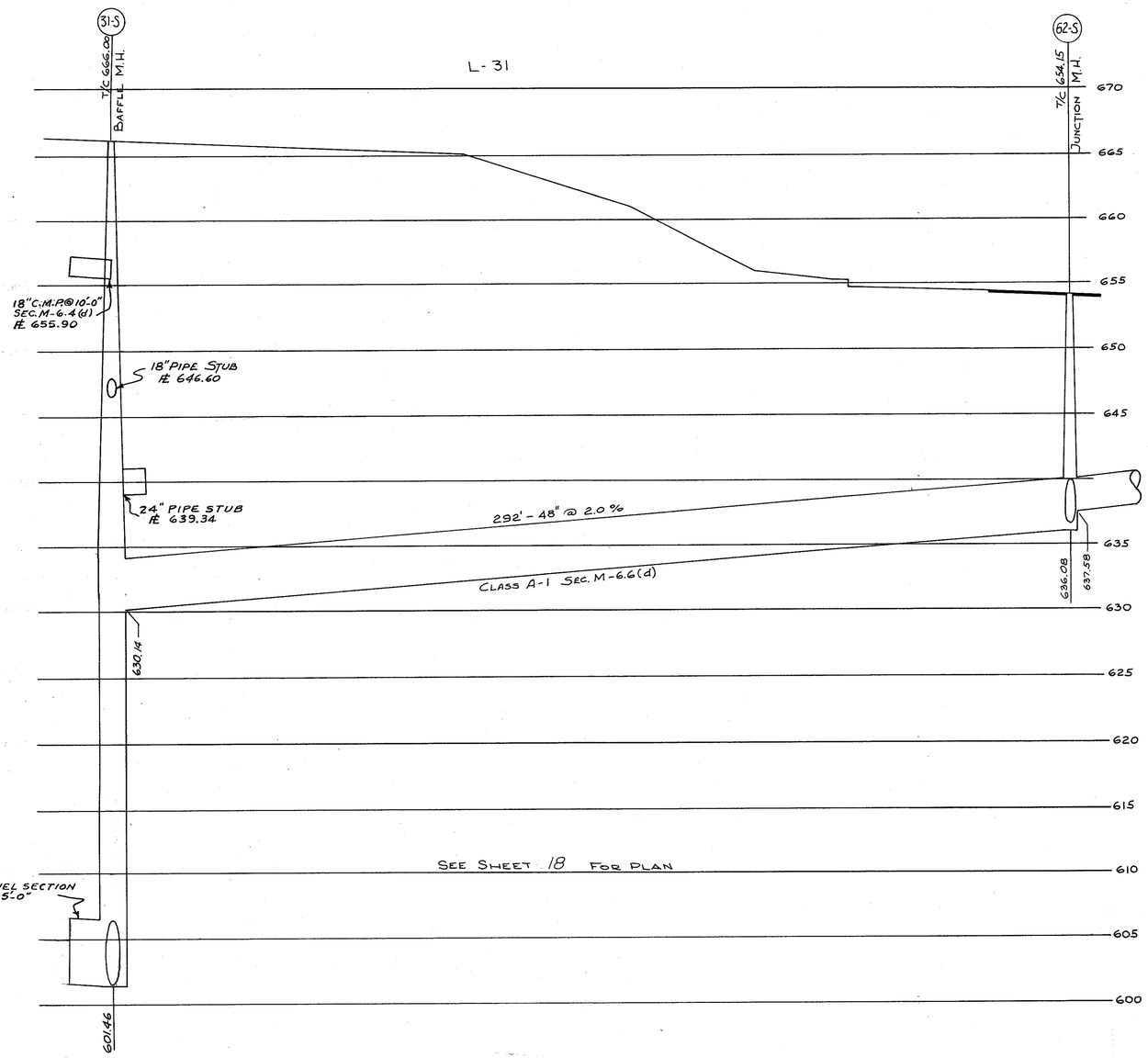
SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.R.		R.M.R.			

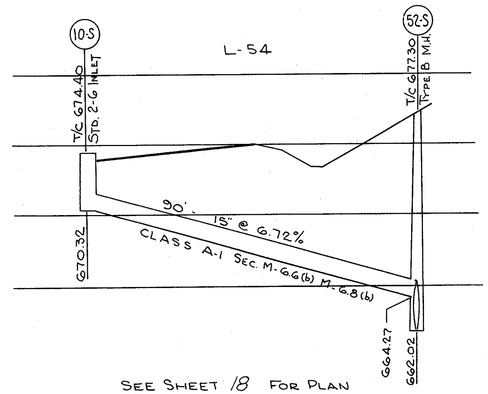
CONST. NO. 58019 SHEET SHEET NO. 63/5

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

86
204

CUYAHOGA COUNTY
CUY— 21—(13.77)-(14.94)





SEE SHEET 18 FOR PLAN

CONT. NO. 58019 SH. 1 ACCT. NO. 63/6

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

SEWER PROFILES

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

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)

LEGEND

N/G = NORMAL GUTTER
T/G = TOP OF GRATE
T/C = TOP OF COVER

NOTE :- FOR PLAN SEE SH. 20

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

SEWER PROFILES

SCALE
DATE

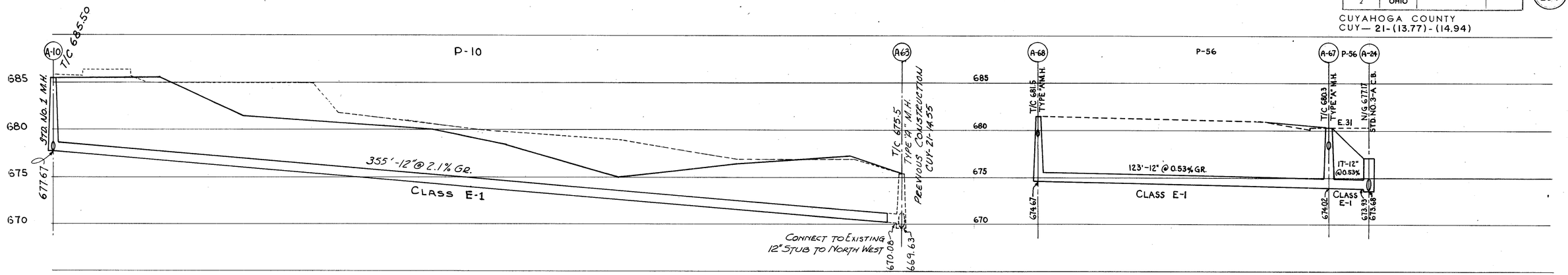
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	J.W.P.	G.O'C.	J.W.P.			

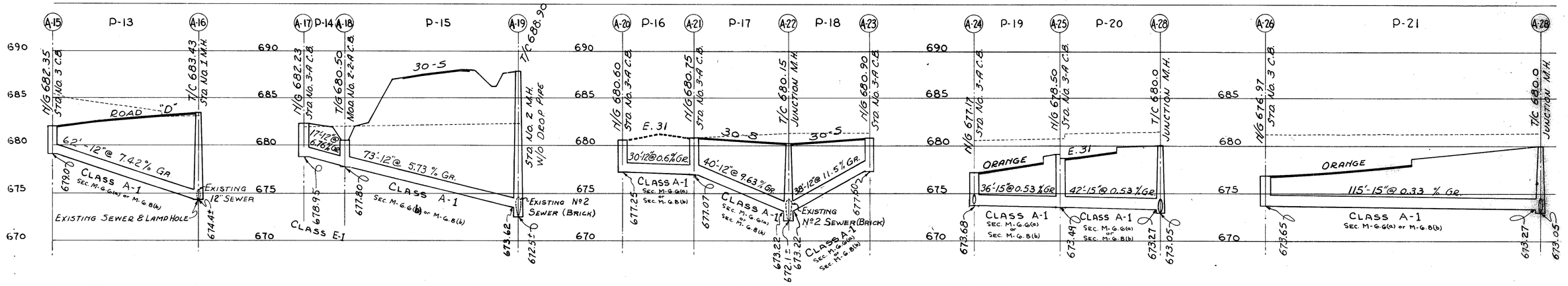
SHEET ACCT. No. 6093
CONT. No. 58019

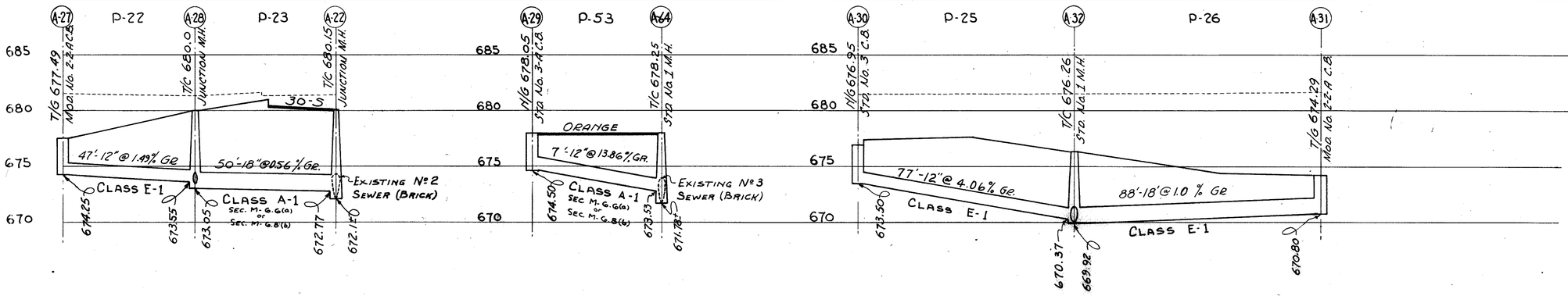
FED. RD DIVISION	STATE	PROJECT	
2	OHIO		

88
204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)







FOR LEGEND SEE SH. 87

NOTE:- FOR PLAN SEE SH. 20

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

SEWER PROFILES

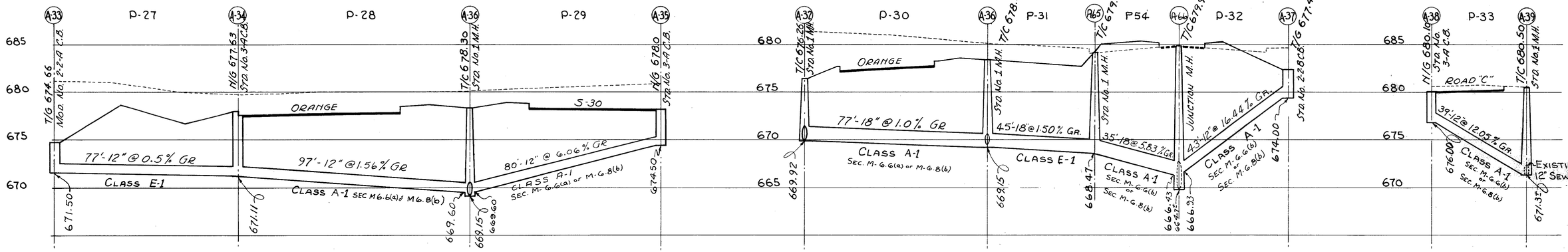
SCALE				DATE		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	J.W.P.	G.O.C.	J.W.P.			

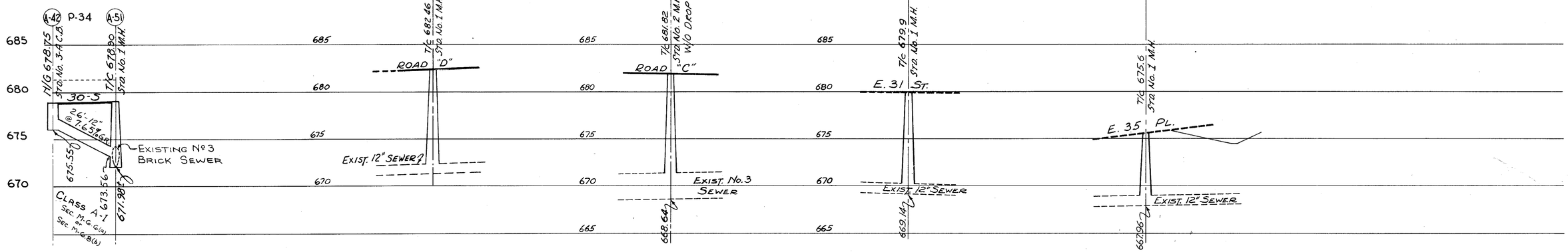
CONT. No. 58019 SHEET ACCT No. 6094

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

89
204

CUYAHOGA COUNTY
CUY—21-(13.77)-(14.94)





FOR LEGEND SEE SH. 87

NOTE:- FOR PLAN SEE SH. 20

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

SEWER PROFILES

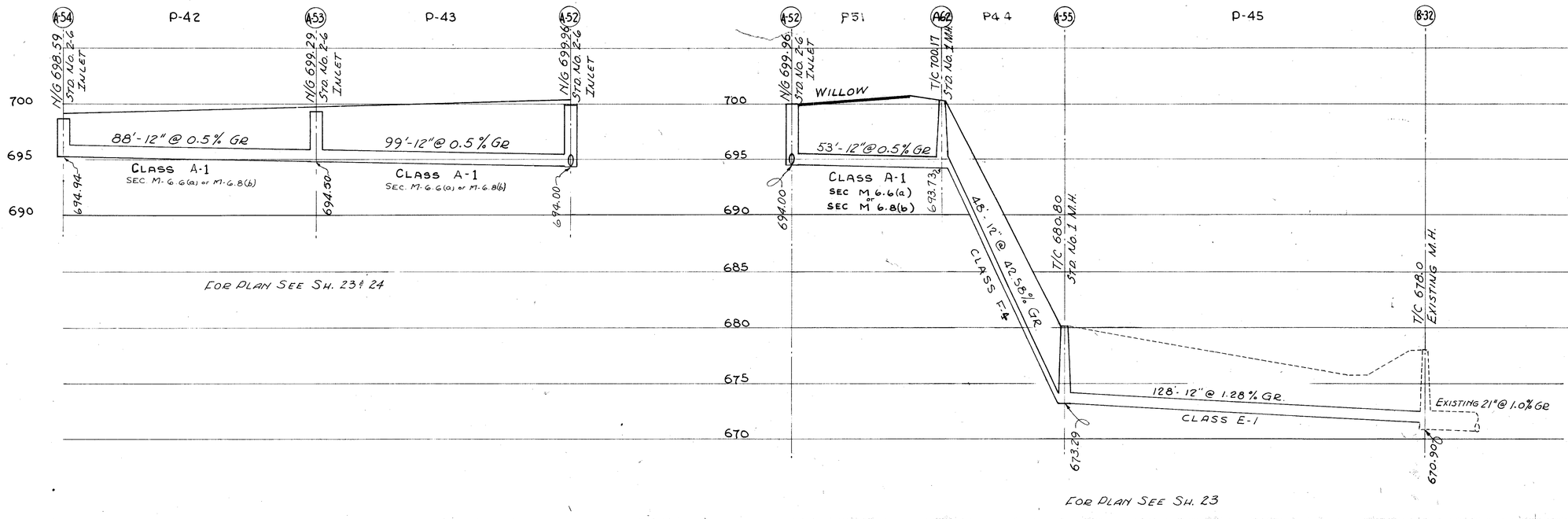
SCALE				DATE		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	JWP	G.O.C.	J.W.P.			

CONT. No. 5801/9 SHEET ACCT. No. 6095

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

994
204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)



FOR LEGEND SEE SH. 87

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

SEWER PROFILES

SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
		JWD	GOC	JWP			

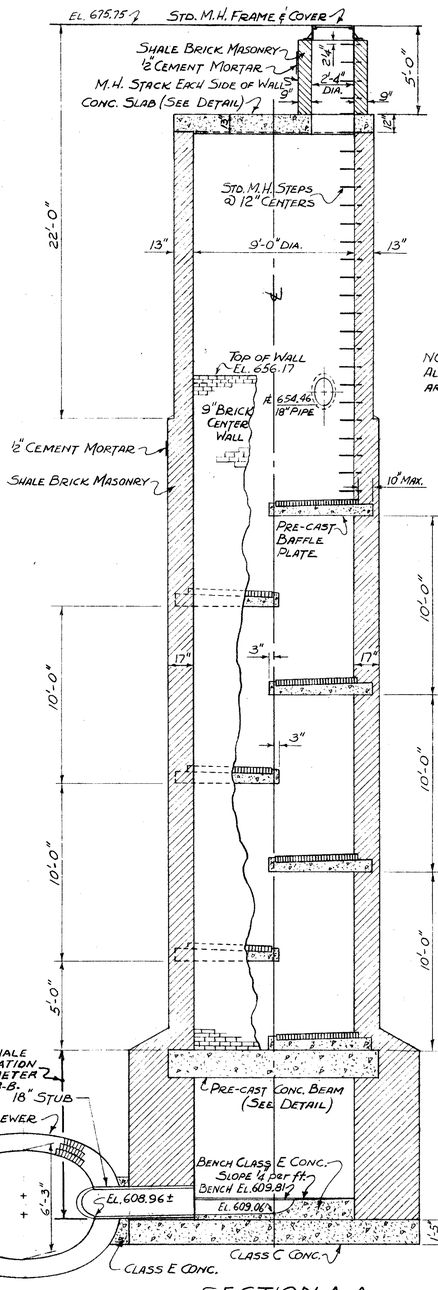
DATE

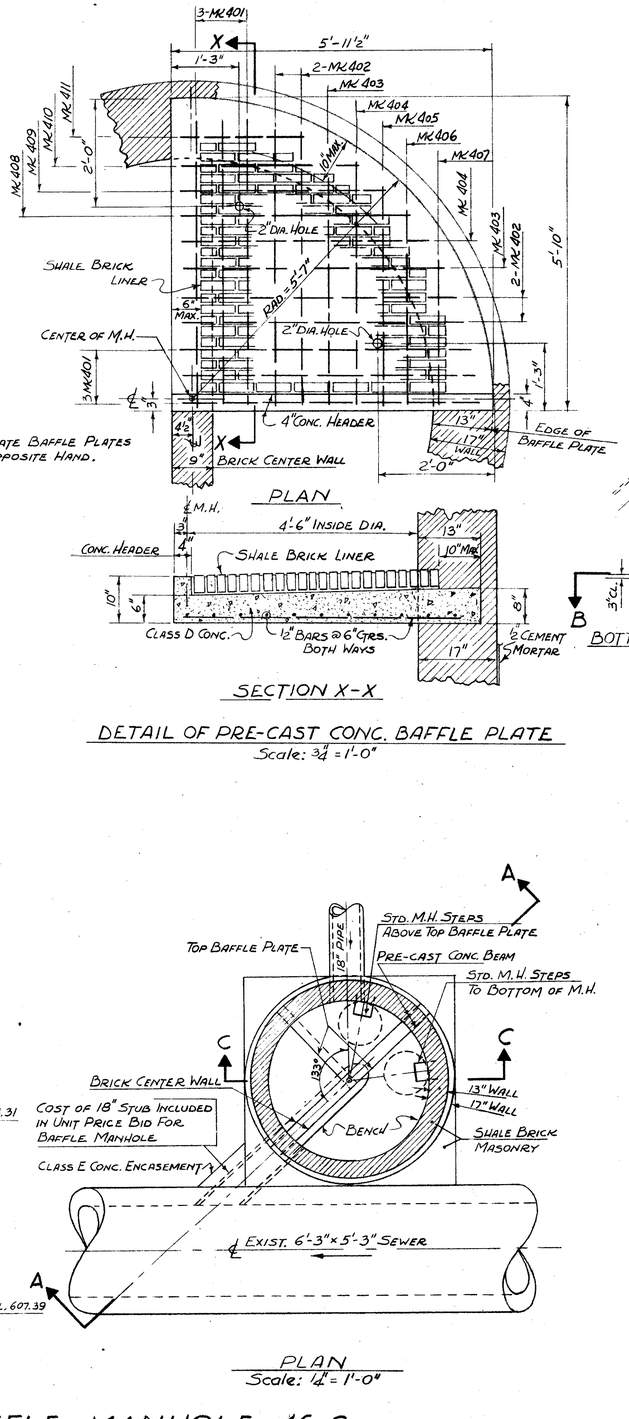
SHEET ACCT. No. 6097
CONT. No. 58019

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY— 21 — (13.77) — (14.94)

90
204



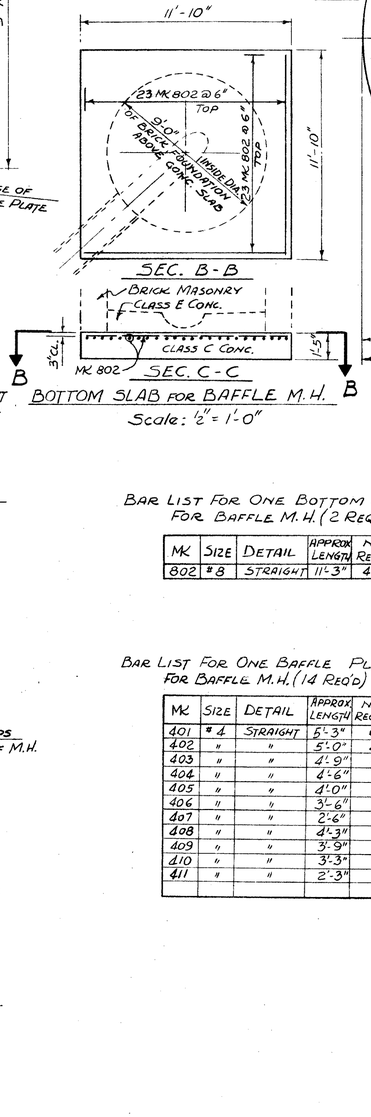


NOTE:
ALTERNATE BAFFLE PLATES ARE OPPOSITE HAND.

PLAN

SECTION X-X

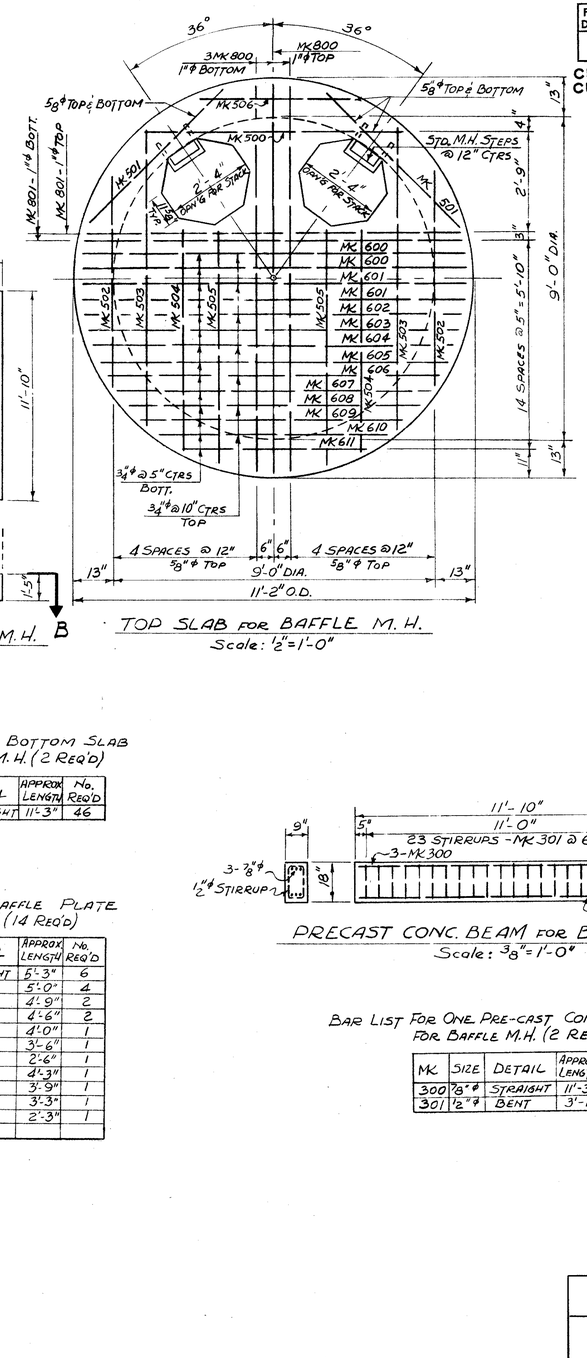
DETAIL OF PRE-CAST CONC. BAFFLE PLATE
Scale: 3/4" = 1'-0"



SEC. B-B

SEC. C-C

BOTTOM SLAB FOR BAFFLE M.H.
Scale: ½" = 1'-0"



TOP SLAB FOR BAFFLE M.H.
Scale: ½" = 1'-0"

BAR LIST FOR ONE TOP SLAB FOR BAFFLE M.H. (2 REQ'D)

MK	SIZE	DETAIL	APPROX LENGTH	No. REQ'D
800	1"ϕ	STRAIGHT	10'-9"	4
801	1"ϕ	"	10'-6"	3
600	¾"ϕ	"	10'-9"	3
601	"	"	10'-10"	3
602	"	"	10'-8"	2
603	"	"	10'-6"	1
604	"	"	10'-2"	2
605	"	"	9'-10"	1
606	"	"	9'-6"	2
607	"	"	9'-0"	1
608	"	"	8'-4"	2
609	"	"	7'-7"	1
610	"	"	6'-7"	2
611	¾"ϕ	"	5'-6"	1
500	5/8"ϕ	"	7'-2"	2
501	"	"	5'-3"	4
502	"	"	6'-2"	2
503	"	"	8'-4"	2
504	"	"	6'-1"	2
505	"	"	6'-6"	2
506	5/8"ϕ		4'-1"	2

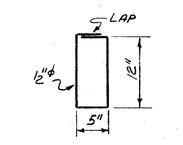
BAR LIST FOR ONE BOTTOM SLAB FOR BAFFLE M.H. (2 REQ'D)

MK	SIZE	DETAIL	APPROX LENGTH	No. REQ'D
802	#8	STRAIGHT	11'-3"	46

BAR LIST FOR ONE BAFFLE PLATE FOR BAFFLE M.H. (14 REQ'D)

MK	SIZE	DETAIL	APPROX LENGTH	No. REQ'D
401	#4	STRAIGHT	5'-3"	6
402	"	"	5'-0"	4
403	"	"	4'-9"	2
404	"	"	4'-6"	2
405	"	"	4'-0"	1
406	"	"	3'-6"	1
407	"	"	2'-6"	1
408	"	"	4'-3"	1
409	"	"	3'-9"	1
410	"	"	3'-3"	1
411	"	"	2'-3"	1

PRECAST CONC. BEAM FOR BAFFLE M.H.
Scale: ⅜" = 1'-0"



STIRRUP DETAIL

BAR LIST FOR ONE PRE-CAST CONCRETE BEAM FOR BAFFLE M.H. (2 REQ'D)

MK	SIZE	DETAIL	APPROX LENGTH	No. REQ'D
300	⅞"ϕ	STRAIGHT	11'-3"	6
301	½"ϕ	BENT	3'-1"	23

SECTION A-A
Scale: ¼" = 1'-0"

PLAN
Scale: 1" = 1'-0"

BAFFLE MANHOLE 46-S

SEE SHEET 76 FOR PLAN AND LOCATION

CONT. No. 5801J SHEET ACCT. No. - 6321

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

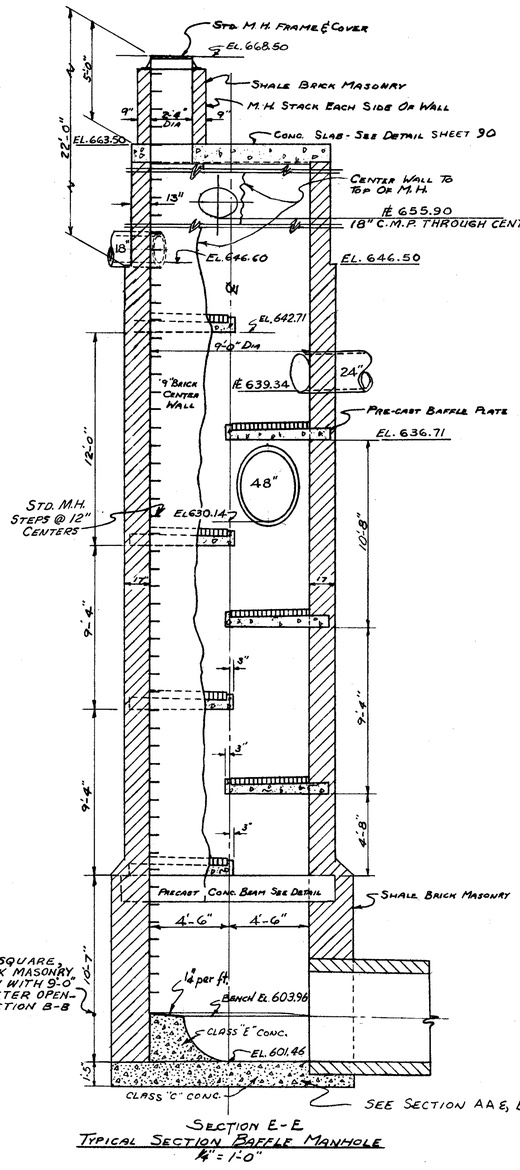
TYPICAL DETAILS
DILLE RD. SEWER MANHOLES

SCALE AS NOTED	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.R.		R.R.	T.L.L.	4/25/63	

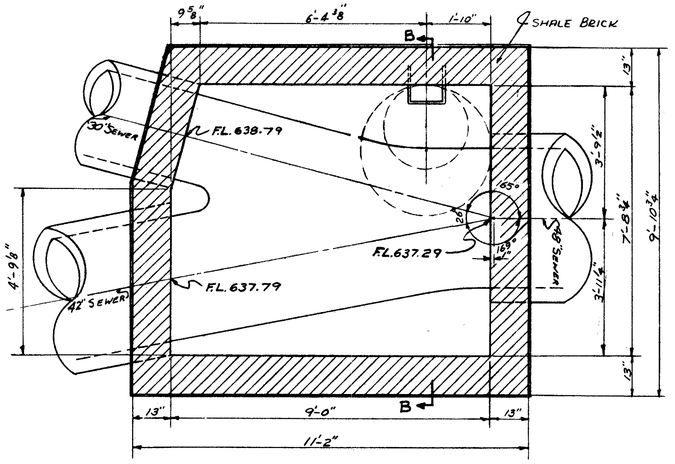
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

91
204

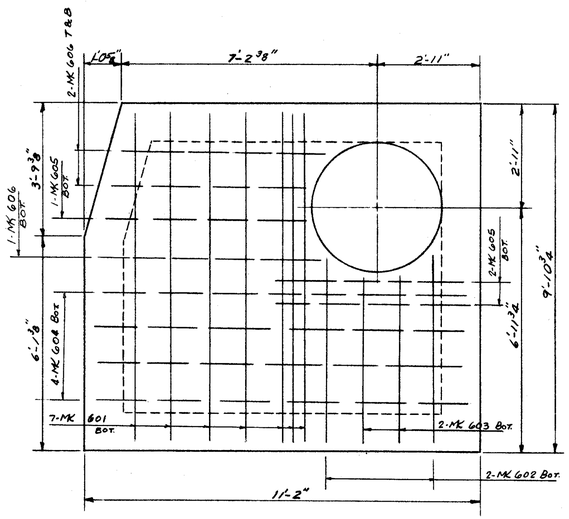
CUYAHOGA COUNTY
CUY—21—(13.77)—(14.94)



Section E-E
Typical Section Baffle Manhole
1/4" = 1'-0"

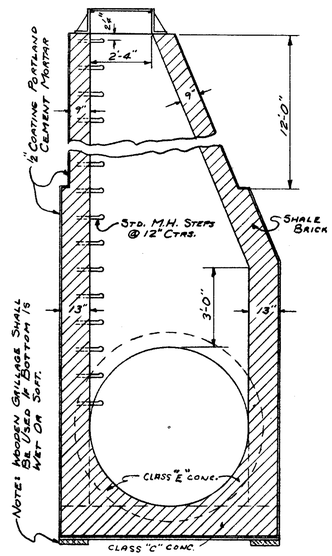


Sectional Plan A
1/2" = 1'-0"

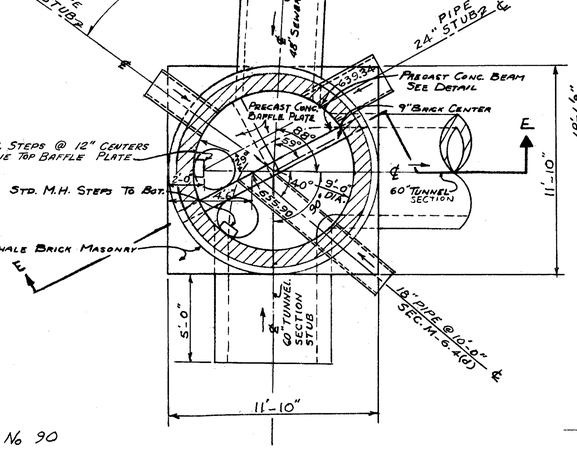


Section C-C
1/2" = 1'-0"

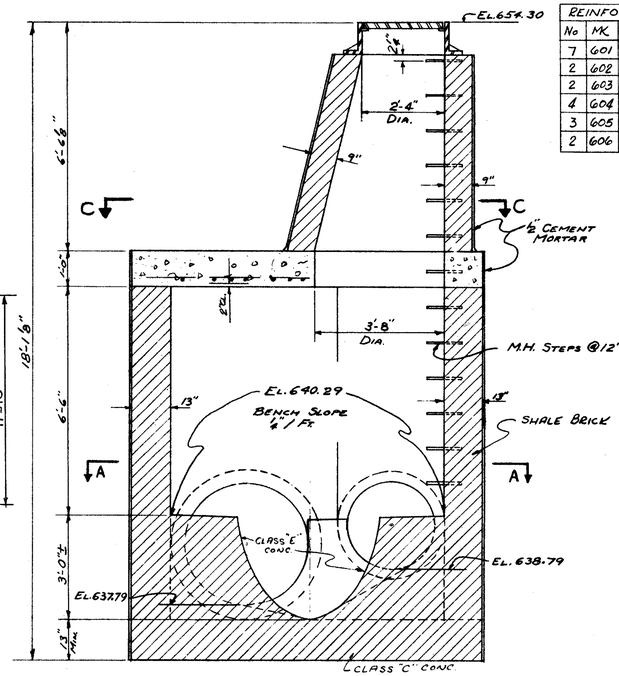
REINFORCING STEEL					
No	MK.	SIZE	LG	TYPE	WT
7	601	#6	9-6	STR	99
2	602		5-3		15
2	603		4-9		14
4	604		10-9		65
3	605		5-9		26
2	606	#6	5-6	STR	17



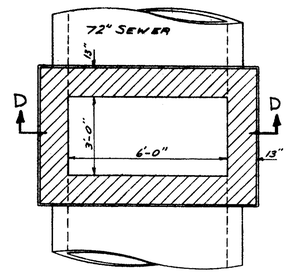
Section D-D
3/8" = 1'-0"



Detail Plan Of Baffle Manhole
1/4" = 1'-0"



Section B-B
1/2" = 1'-0"



Plan Of Special Manhole Type C
3/8" = 1'-0"

NOTE: FOR DETAILS OF CONC. BEAM & BAFFLE PLATE SEE SHEET 90

BAFFLE MANHOLE 31-S SEE SHEET 18 FOR PLAN
SEE SHEET 19 FOR LOCATION

JUNCTION MANHOLE 62-S

SEE SHEET 18 FOR PLAN
SEE SHEET 19 FOR LOCATION

CONT. No. 58019 SHEET ACCT. No. 6317

6317

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

TYPICAL DETAILS

DILLE RD. SEWER MANHOLES

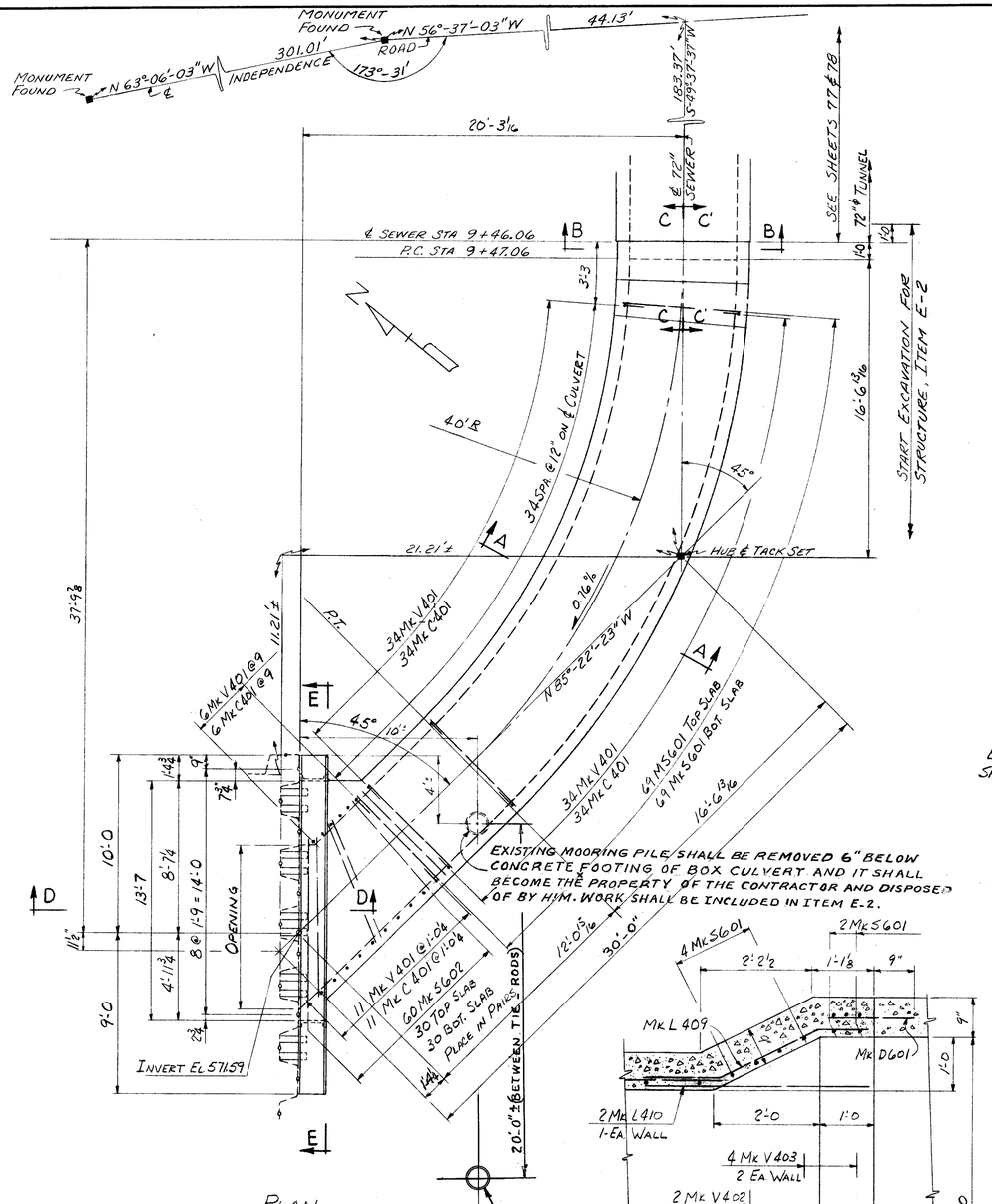
SCALE AS NOTED DATE

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

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

92
204

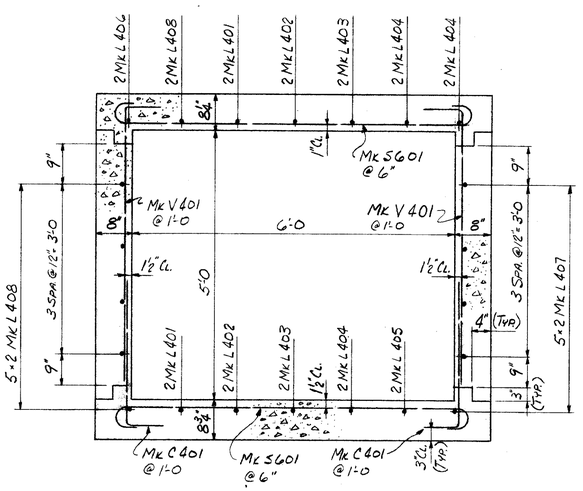
CUYAHOGA COUNTY
CUY— 21 — (13.77) - (14.94) .



PLAN

FOR LOCATION SEE SHEET NO. 78

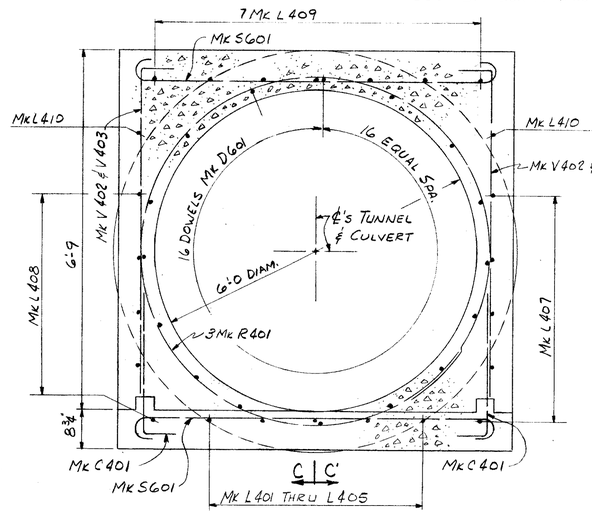
THE NEW MOORING PILE SHALL BE INSTALLED BETWEEN THE TIE-RODS FOR THE BULKHEAD AT THE LOCATION TO BE DETERMINED AT THE TIME OF CONSTRUCTION. SEE CONSTRUCTION DETAIL OF NEW MOORING PILE ON SHEET NO. 93.



SECTION A-A

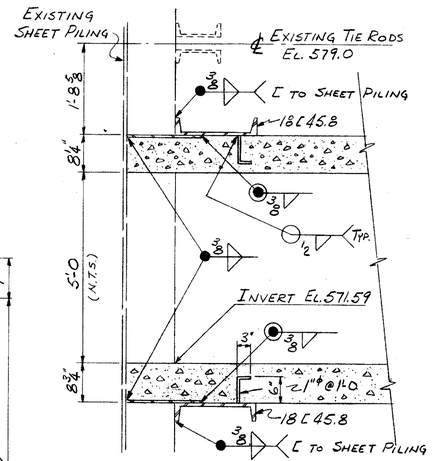
TYPICAL CULVERT CROSS SECTION

SPACING SHOWN IS THE NOMINAL SPACING ALONG THE CENTER LINE OF CULVERT.



SECTION B-B

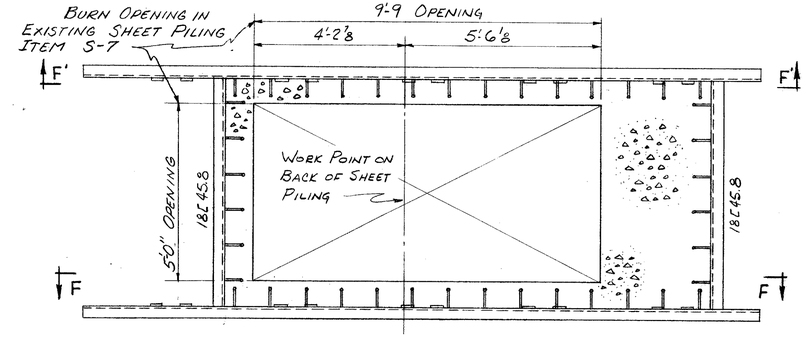
NOTE SEE SHEETS 77 & 78



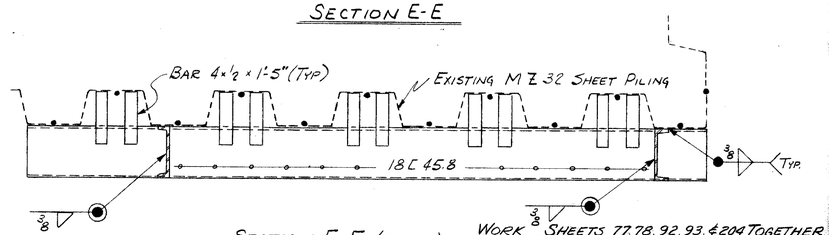
SECTION D-D

SECTION C-C (SHOWN)

SECTION C'-C' (OPP. HAND)



SECTION E-E



SECTION F-F (SHOWN)

SECTION F'-F' (SIMILAR)

FOR GENERAL NOTES AND REINFORCING STEEL BAR SCHEDULE SEE SHEET 93

WORK SHEETS 77, 78, 92, 93, & 204 TOGETHER

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

DILLE - INDEPENDENCE RD. SEWER
BOX CULVERT AT TURN BASIN
PLAN AND SECTIONS

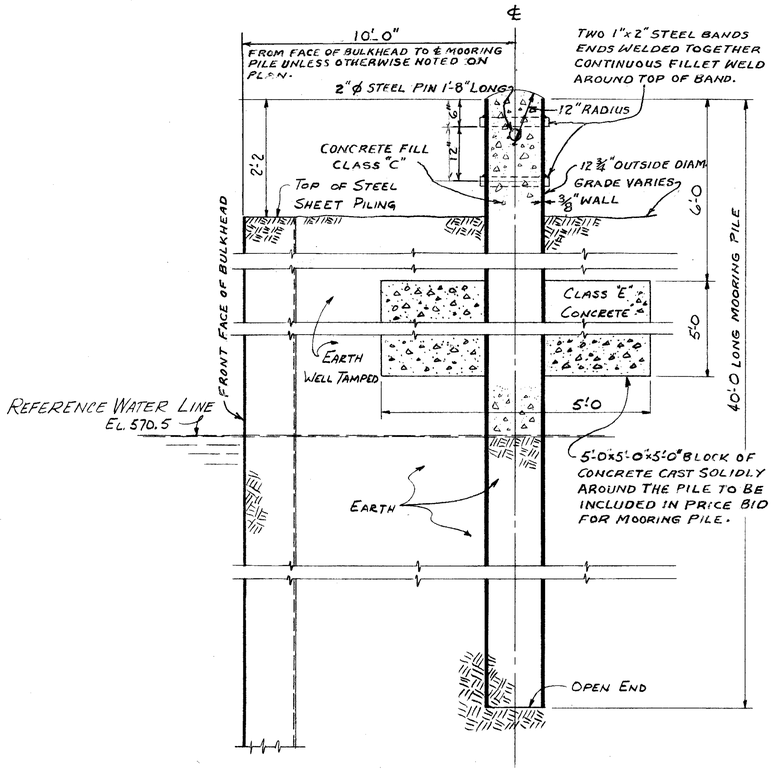
SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	R.D.H.		CB			

CONT. No. 58019-12 SHEET ACCT. No. 6328

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

93/204

CUYAHOGA COUNTY
CUY— 21 — (13.77)-(14.94)



CROSS SECTION THROUGH MOORING PILE
(SHOW DEPTH OF CONCRETE FILL AND CONCRETE ANCHOR)

ITEM SPECIAL - MOORING PILE

WORK INCLUDED - THE CONTRACTOR UNDER THIS ITEM SHALL FURNISH, DRIVE, AND CONSTRUCT THE MOORING PILE COMPLETE IN PLACE AS SHOWN ON THE CONSTRUCTION PLAN.

CONSTRUCTION - THE MATERIAL USED UNDER THIS ITEM SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

(a) THE STEEL PIPE SHALL BE NEW ELECTRICALLY WELDED PIPE MADE FROM STEEL HAVING A MINIMUM TENSILE STRENGTH OF 60,000 #/SQ.IN.

(b) THE MOORING PILE SHALL SHALL HAVE AN OUTSIDE DIAMETER OF 12¾" AND A WALL THICKNESS OF ⅜"; IN ADDITION, MATERIAL SHALL CONTAIN NOT LESS THAN 0.20 % COPPER.

(c) CONCRETE USED SHALL BE CLASS "C" AND CLASS "E".

(d) THE MOORING PILE SHALL BE DRIVEN BEFORE THE BACKFILLING IS BEING PLACED OVER THE ANCHOR RODS. THE PILE HEAD SHALL BE SHAPED AND FINISHED AS SHOWN.

(e) BACKFILLING WITHIN A RADIUS OF 10' FROM THE MOORING PILE SHALL BE OF SELECT MATERIAL THOROGHLY COMPACTED IN A MANNER SATISFACTORY TO THE ENGINEER.

PAINTING - THE MOORING PILE SHALL BE GIVEN TWO COATS OF PAINT AT THE TIME OF INSTALLATION. THE TOP 6 FEET OF THE PILE SHALL BE PAINTED ON THE OUTSIDE BY THE APPLICATION OF HEAVY DUTY COAL TAR PAINT. THIS COATING SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE PILE CUT OFF OR WHERE THE PAINT IS DAMAGED THROUGH DRIVING SHALL BE REPAINTED OVER THE DAMAGED AREA WITH TWO COATS OF THE SAME PAINT. ADEQUATE DRYING SHALL BE ALLOWED SO THAT THE PAINT SHALL BE THOROUGHLY DRY TO RESIST DAMAGE IN DRIVING.

PAYMENT - THE UNIT PRICE BID FOR EACH MOORING PILE UNDER THIS ITEM SHALL INCLUDE FURNISHING, DRIVING, FILLING WITH CONCRETE, 5'-0" x 5'-0" x 5'-0" CONCRETE BLOCK IN PLACE, PAINTING, AND BACKFILLING TOGETHER WITH THE FURNISHING OF ALL LABOR, TOOLS, MATERIALS AND EQUIPMENT NECESSARY TO COMPLETE THIS ITEM AS SPECIED.

GENERAL NOTES:

CONCRETE FOR CULVERT SHALL BE CLASS "C"

THE CONSTRUCTION SHALL BE PERFORMED IN SUCH A MANNER THAT NEITHER THE STRUCTURAL STRENGTH OF THE EXISTING SHEET PILING AND ANCHORAGE WILL BE IMPAIRED, NOR THE SERVICE OF ANY UNDERGROUND PIPE LINE INTERRUPTED.

BACKFILL SHALL BE PLACED SYMMETRICALLY ON BOTH SIDES OF THE CULVERT & PREFERABLY SIMULTANEOUSLY ALONG ITS ENTIRE LENGTH AND SHALL NOT BE PLACED UNTIL AFTER THE UPPER SLAB IS IN PLACE.

STRUCTURAL STEEL SHALL CONFORM TO ITEM M-7 SEC. M-7.4 (b) OF THE CONSTRUCTION & MATERIALS SPECIFICATION & SHALL ALSO CONFORM TO ASTM A-373.

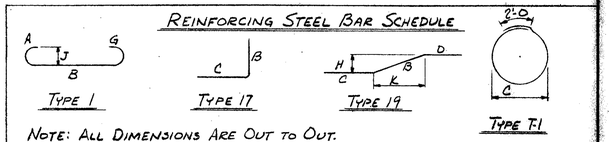
WELDING OF STRUCTURAL STEEL SHALL BE CLASS "A" WITH SPECIAL CARE TAKEN WITH PREPARATION & WELDING IN FIELD FOR MOISTURE CONDITIONS.

ESTIMATED QUANTITIES

ITEM		
*E-2	EXCAVATION FOR STRUCTURES, UNCLASSIFIED	300 CU.YDS.
S-1	CONCRETE FOR STRUCTURES, CLASS "C"	29 CU.YDS.
S-4	REINFORCING STEEL	3735 LBS.
S-7	STRUCTURAL STEEL (INCLUDING FIELD WELDING)	2600 LBS
S-7	BURN, REMOVE, AND DISPOSE OF EXISTING SHEET PILING	LUMP SUM

* THE REMOVAL AND DISPOSAL OF THE EXISTING MOORING PILE SHALL BE INCLUDED IN THE COST OF ITEM E-2.

REINFORCING STEEL BAR SCHEDULE



NOTE: ALL DIMENSIONS ARE OUT TO OUT.

MARK	No REQ'D	LENGTH	TYPE	BENDING DIMENSIONS A OR H	B	C	G OR K	J OR D	WEIGHT
C401	91	3'-8	17		2'-5"	1'-3			223#
V401	85	6'-5	17		5'-2	1'-3			365
V402	2	6'-9	17		5'-6	1'-3			9
V403	4	7'-5	17		6'-2	1'-3			20
R401	3	21'-10¾	T-1			6'-4			44
L401	4	21'-0	STRAIGHT						56
L402	4	22'-0	"						59
L403	4	22'-9	"						61
L404	6	24'-0	"					•	96
L405	2	25'-6	"						34
L406	2	19'-0	"						25
L407	10	25'-9	"						172
L408	12	20'-0	"						160
L409	7	5'-3	19	1'-0	2'-3	2'-0	2'-0	1'-0	25
L410	2	5'-0	STRAIGHT						7
D-601	16	1'-6	STRAIGHT						36
S601	150	8'-0	1	7	6'-10		7	5¼	1802
S602	60	6'-0	1	7	5'-5		7	5¼	541
								TOTAL	3735#

NOTE: BAR SIZE IS INDICATED IN THE BAR MARK BY THE FIRST DIGIT. FOR EXAMPLE, V 401 IS A No 4 BAR.

WORK SHEETS 77, 78, 92, 93, & 204 TOGETHER

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

DILLE-INDEPENDENCE RD. SEWER BOX CULVERT AT TURN BASIN

GENERAL NOTES - REINFORCING BAR SCHEDULE
RELOCATED MOORING PILE

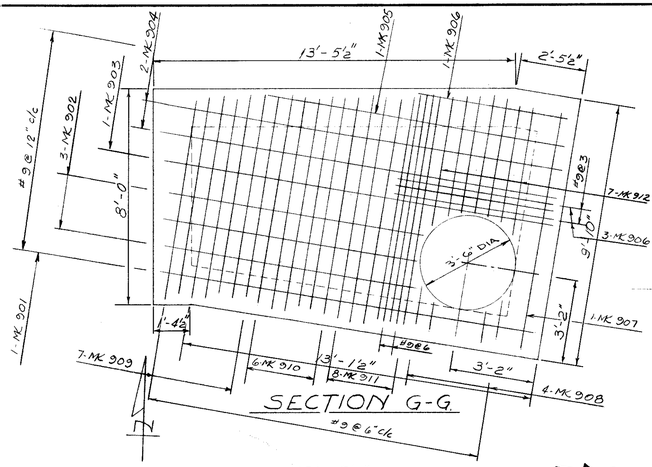
SCALE	DESIGNED	DRAWN	TRACED	DATE CHECKED	REVIEWED	DATE	REVISED
		E.D.H.		CB			

CONT. NO. 58019-12 SHEET ACCT. No. 6324

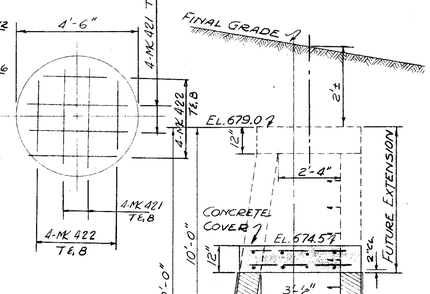
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

94
204

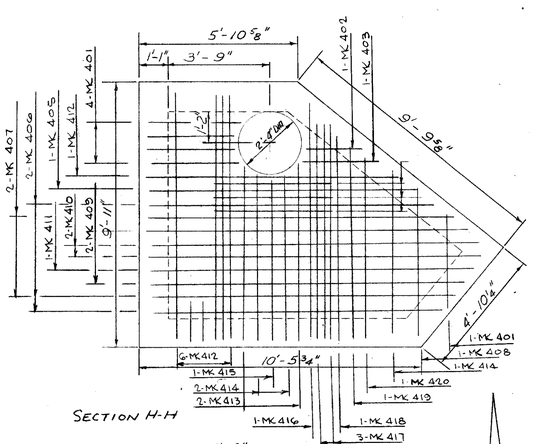
CUYAHOGA COUNTY
CUY— 21—(13.77)-(14.94)



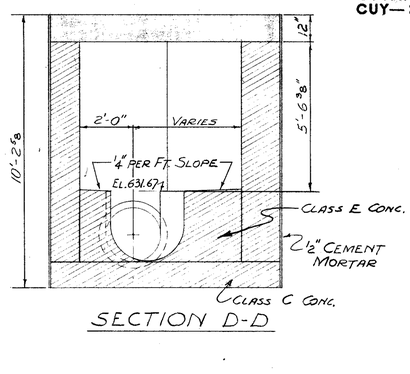
SECTION G-G.



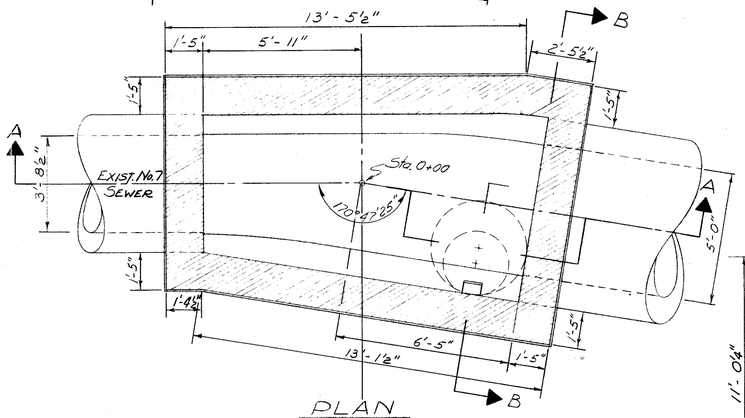
SECTION B-B
(64-S)



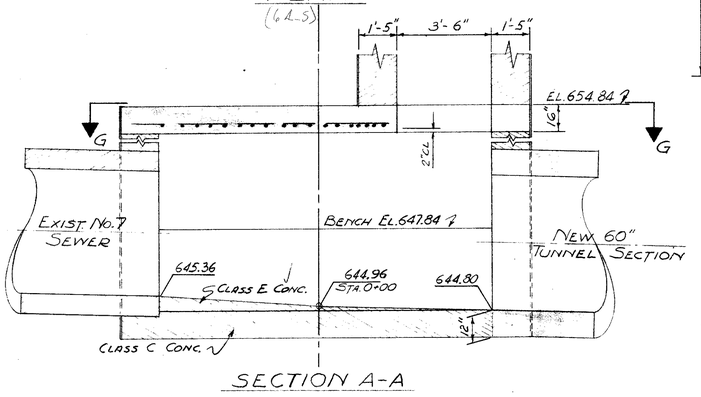
SECTION H-H



SECTION D-D



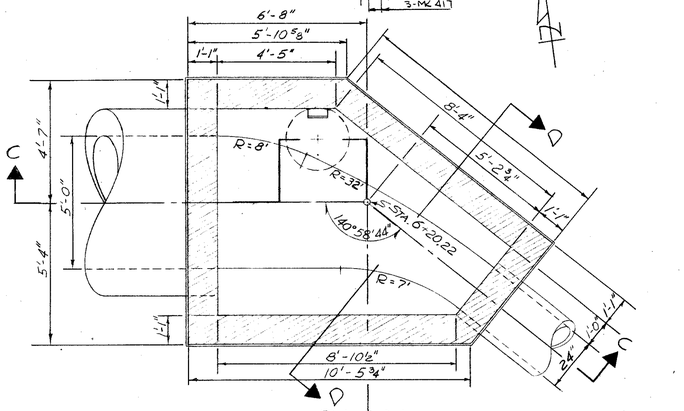
PLAN
(64-S)



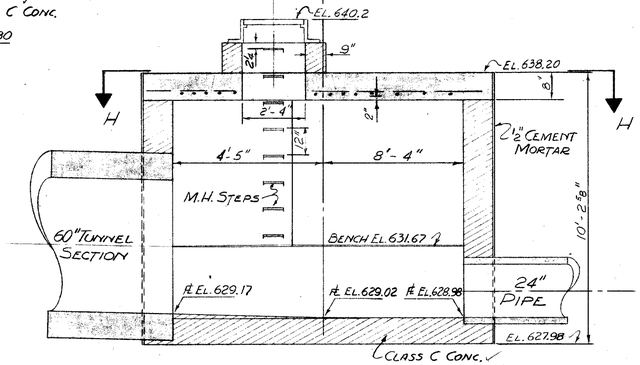
SECTION A-A

JUNCTION CHAMBER (64-S)
AT ANGLE POINT IN TRUMBULL, STA. 0+00

SEE SHEET 79 FOR PLAN & LOCATION



PLAN



SECTION C-C

JUNCTION CHAMBER
ON ERIE-LACKAWANNA PROPERTY, STA. 6+20.22

SEE SHEET 79 FOR PLAN & LOCATION

NOTE: FOR MANHOLE FRAME & COVER SEE SHEET No. 98A
FOR MANHOLE STEP SEE SHEET 98

REINFORCING STEEL

No.	Size	MARK	LENGTH	TYPE	WT.
1	#9	901	14-3	STR.	48
3		902	9-9		99
1		903	14-9		50
2		904	15-0		102
1		905	11-3		38
4		906	5-6		75
1		907	3-0		31
4		908	1-3		17
7		909	7-6		179
6		910	8-0		163
8		911	8-6		231
7	#9	912	4-6	STR.	107
8	#4	421	4-0	STR	21
8	#4	422	2-9	STR	15
5	#4	401	3-6	STR	12
1		402	2-0		1
1		403	3-0		2
3		404	4-6		9
1		405	10-3		7
2		406	11-0		15
2		407	11-6		15
1		408	5-6		4
2		409	12-0		16
2		410	12-6		17
1		411	12-3		8
7		412	9-6		44
2		413	6-6		9
3		414	6-3		13
1		415	6-0		4
1		416	8-9		6
3		417	8-3		17
1		418	8-0		5
1		419	7-6		5
1	#4	420	7-3	STR	5

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

SANITARY SEWERS
CONNECTION TO SOUTHERLY INTERCEPTOR
DETAILS

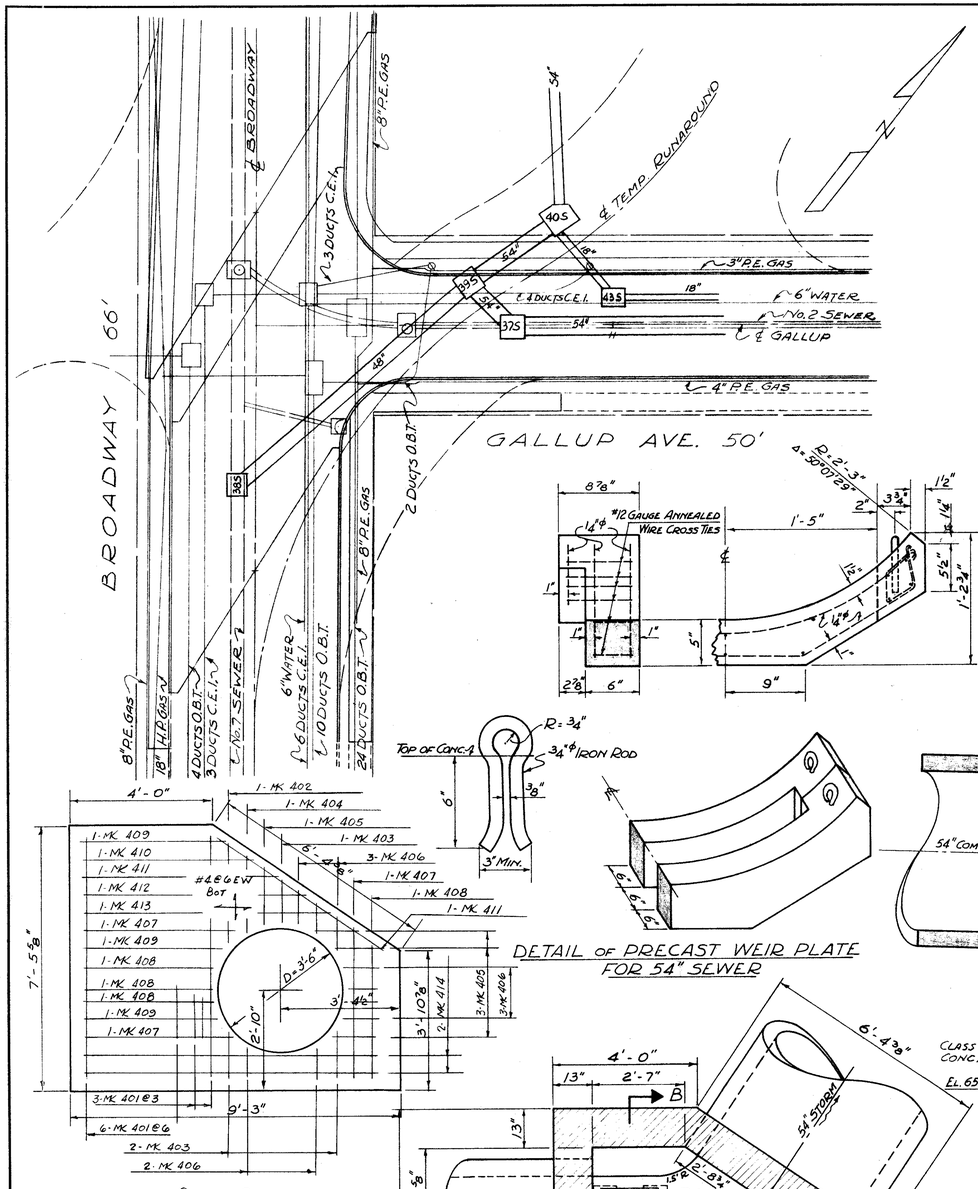
SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RMR	C.R.		RMR			

CONT. No. 58019 SHEET ACCT. No. 6/36

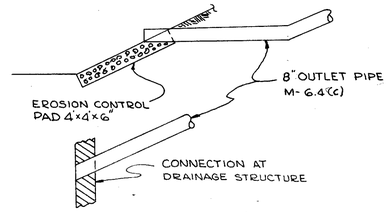
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

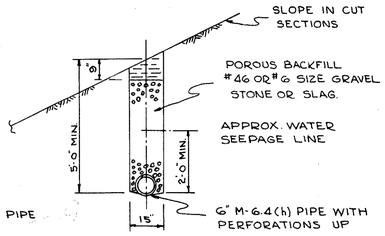
95
204

CUYAHOGA COUNTY
CUY— 21— (13.77)-(14.94)



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





DETAIL FOR INTERCEPTING DRAIN

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) CL. I-3	800 LIN. FT
ITEM	I-1	8"	SEC. M-6.4(c) CL. F-4	80 LIN. FT.
ITEM	I-5	6"	PIPE SPECIALS SEC. M-6.4(h)	8 EACH

To General Summary Sheet No. 15

REINFORCING STEEL					
No.	SIZE	MARK	LENGTH	TYPE	WEIGHT
9	#4	401	6'-9"	STR.	41
1	(	402	2'-9"		2
3	(	403	1'-3"		3
1	(	404	2'-0"		1
4	(	405	1'-6"		4
8	(	406	1'-0"		5
3	(	407	4'-3"		9
4	(	408	3'-9"		10
3	(	409	4'-0"		8
1	(	410	4'-9"		3
2	(	411	5'-6"		7
1	(	412	6'-3"		4
1	\	413	7'-0"		5
2	#4	414	8'-3"	STR.	11

CONT. No. 580/9 SHEET ACCT. No. 63/3

DETAILS OF INTERCEPTING MANHOLE AT BROADWAY AND GALLUD

SEE SHEET 76 FOR PLAN & LOCATION

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

TYPICAL DETAILS

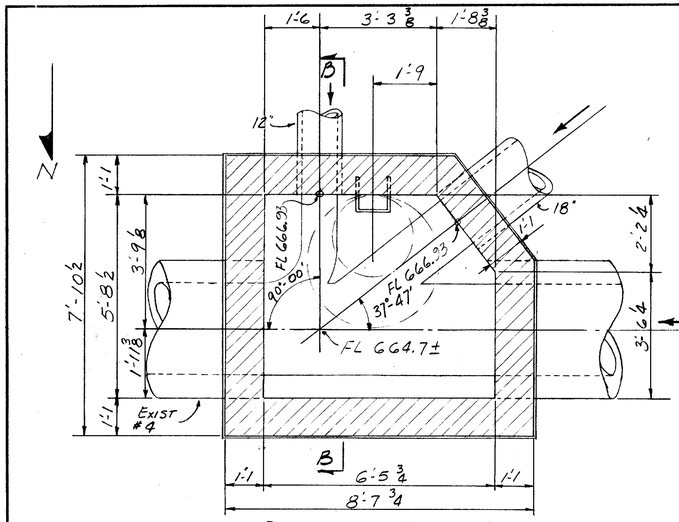
SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.R.					

TYPICAL DETAILS

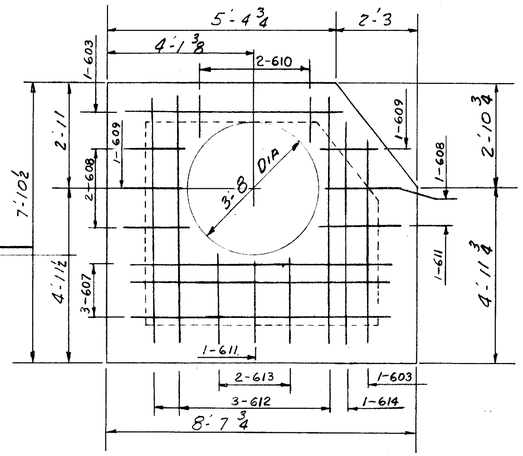
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

96
204

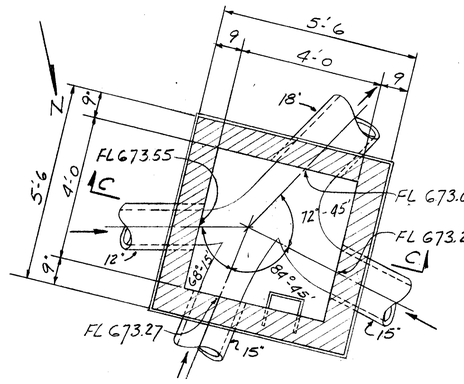
CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)



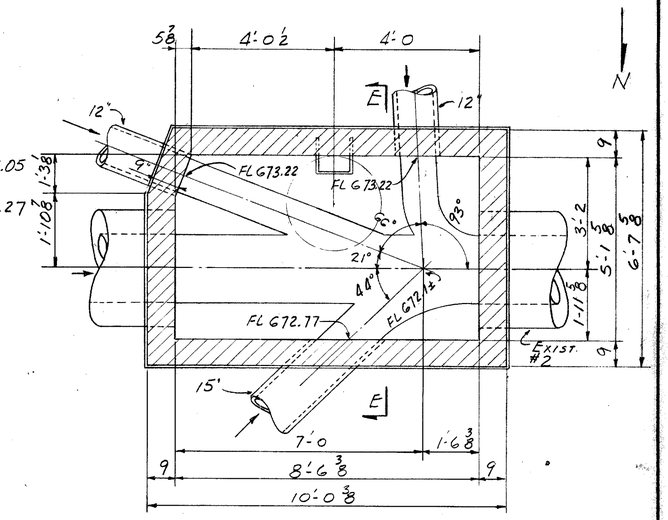
SECTIONAL PLAN A



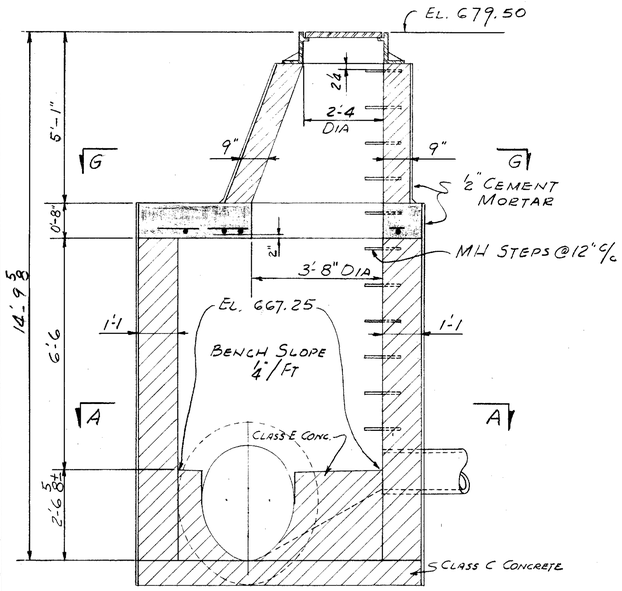
SECTION G



SECTIONAL PLAN D



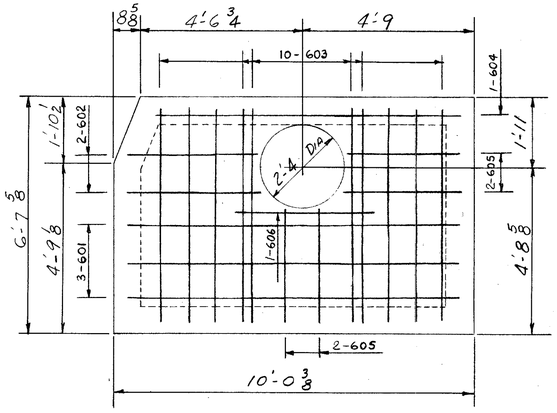
SECTIONAL PLAN F



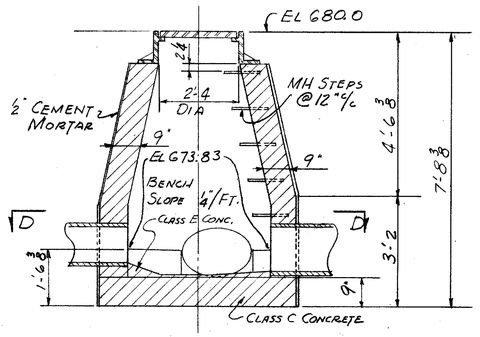
SECTION B

DETAIL OF JUNCTION MANHOLE A-66

WOODLAND AVE.



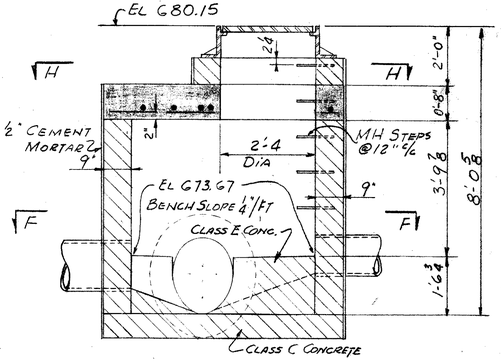
SECTION H



SECTION C

DETAIL OF JUNCTION MANHOLE A-28

RAMP 30-S STA. 11+19



SECTION E

DETAIL OF JUNCTION MANHOLE A-22

ORANGE AVE. STA. 15+76

REINFORCING STEEL					
Nº	SIZE	MK	LENGTH	TYPE	WT.
3	#6	601	9-8	STR.	44
2	"	602	3-9	"	11
12	"	603	6-3	"	113
1	"	604	8-6	"	13
4	"	605	3-4	"	20
1	"	606	4-0	"	6
3	"	607	8-3	"	37
3	"	608	2-0	"	9
2	"	609	1-9	"	5
2	"	610	1-3	"	4
2	"	611	2-6	"	7
3	"	612	7-6	"	34
2	"	613	2-9	"	8
1	"	614	6-9	"	10
				TOTAL	321

NOTE: FOR MANHOLE FRAME & COVER SEE SHEET No. 98A
FOR MANHOLE STEP SEE SHEET No. 98

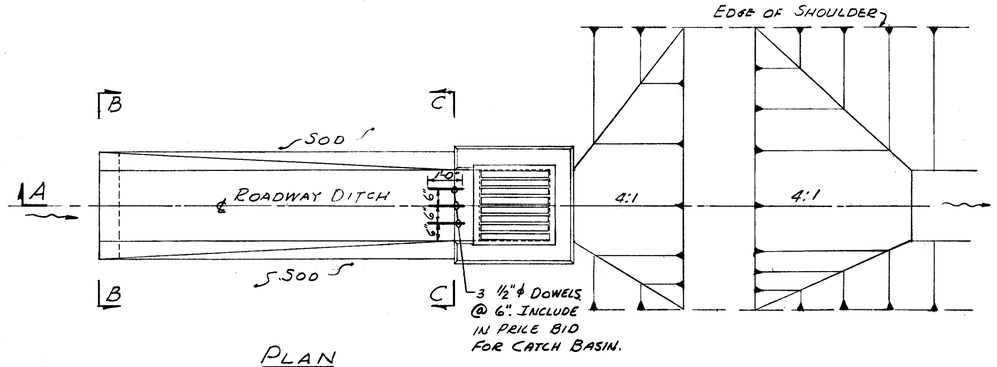
TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

TYPICAL DETAILS

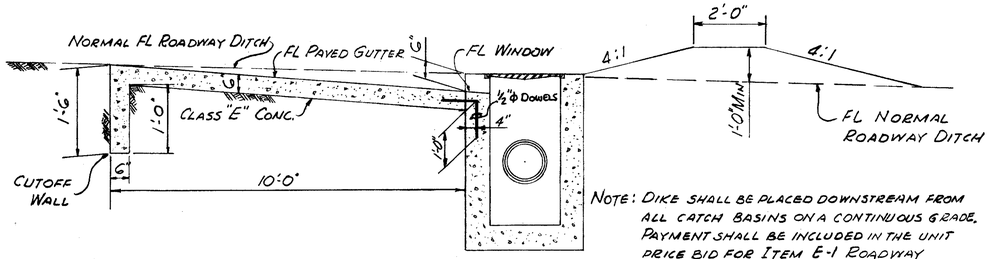
SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RMR	C.R.		R.M.R.			

CONT. No. 58019 SHEET ACCT. No. 6080

TYPICAL DETAILS

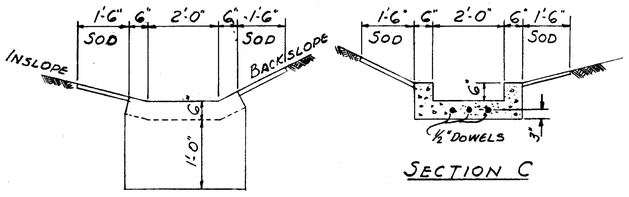


PLAN



NOTE: DIKE SHALL BE PLACED DOWNSTREAM FROM ALL CATCH BASINS ON A CONTINUOUS GRADE. PAYMENT SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM E-1 ROADWAY EXCAVATION.

SECTION A

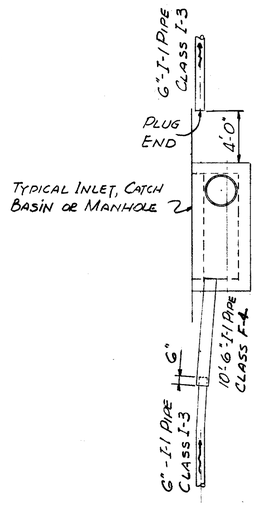


SECTION B

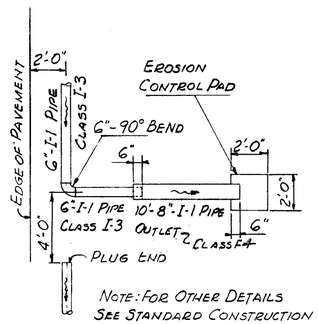
SECTION C

DETAIL OF STANDARD NO. 2-2-A CATCH BASIN AND PAVED GUTTER SPECIAL TYPE A AND DIKE

NOTE: TWO WINDOWS & TWO PAVED GUTTERS SHALL BE CONSTRUCTED AT LOCATIONS SHOWN DRAINAGE PLAN & PLAN-PROFILE SHEETS.
FOR DETAILS OF CATCH BASIN NOT SHOWN ON THIS SHEET SEE STANDARD DWG. I-8 CB 2-2-A
PAVED GUTTER & SOD ARE SEPARATE PAY ITEMS SEE SUMMARY OF DRAINAGE QUANTITIES SHEET NO 15

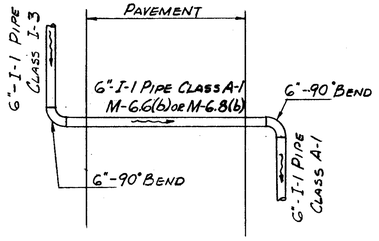


UNDERDRAIN OUTLET DETAIL DB

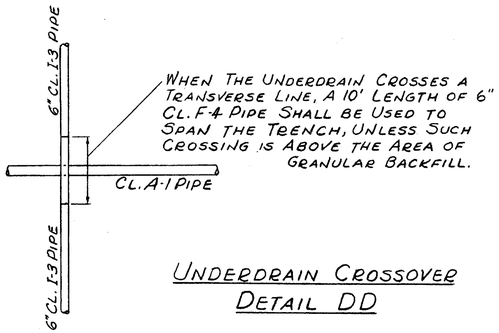


NOTE: FOR OTHER DETAILS SEE STANDARD CONSTRUCTION DWG. I-1

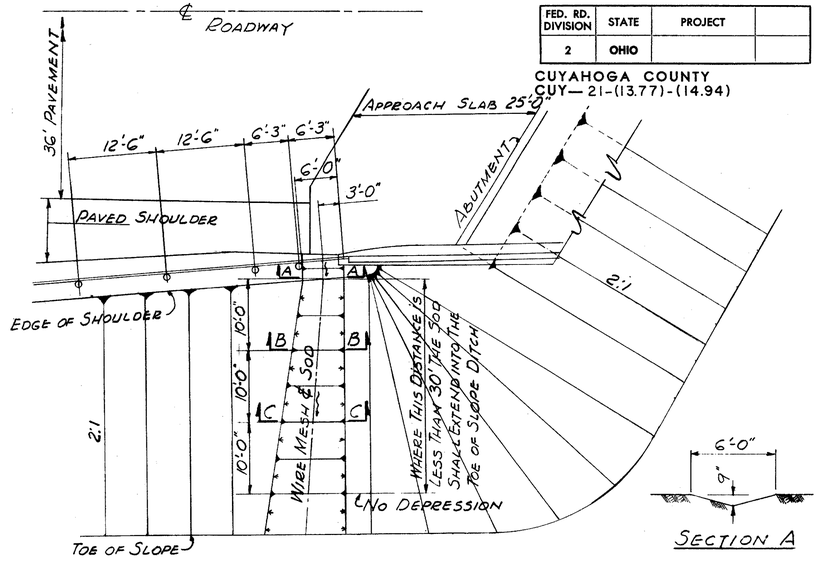
UNDERDRAIN OUTLET DETAIL DA



UNDERDRAIN CROSSOVER DETAIL DC



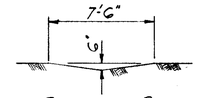
UNDERDRAIN CROSSOVER DETAIL DD



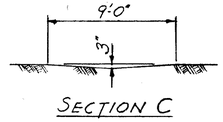
DETAIL OF EROSION CONTROL AT APPROACH SLAB

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

SECTION A



SECTION B



SECTION C

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

97/204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)

CONT. No. 58019 SHEET ACCT. No. 6022

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

TYPICAL DETAILS

SCALE NOT TO SCALE DATE

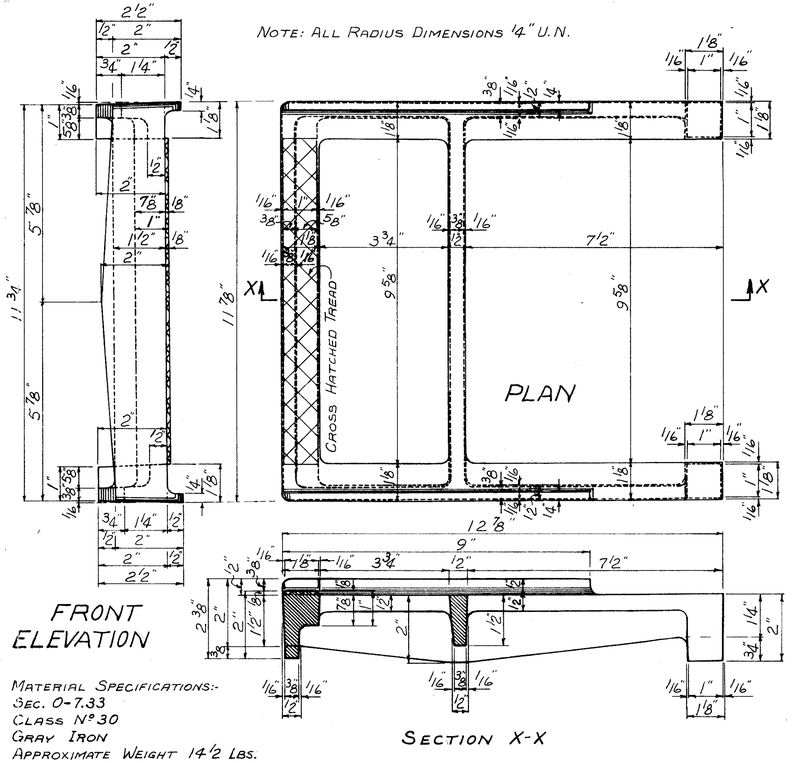
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	JWP		P.M.R.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

98
204

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)

TYPICAL DETAILS

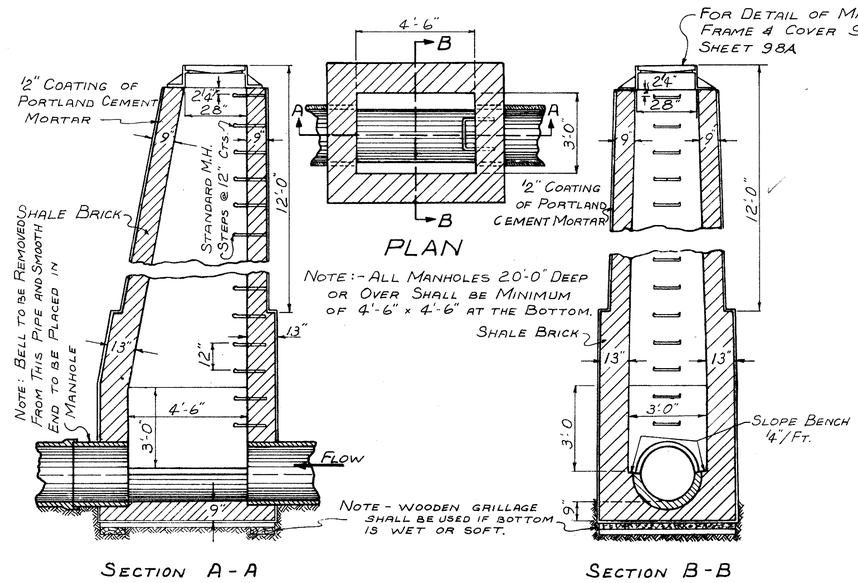


MATERIAL SPECIFICATIONS:-
SEC. 0-7.33
CLASS Nº 30
GRAY IRON
APPROXIMATE WEIGHT 14½ LBS.

DETAIL OF CITY OF CLEVELAND STANDARD CAST IRON MANHOLE STEP

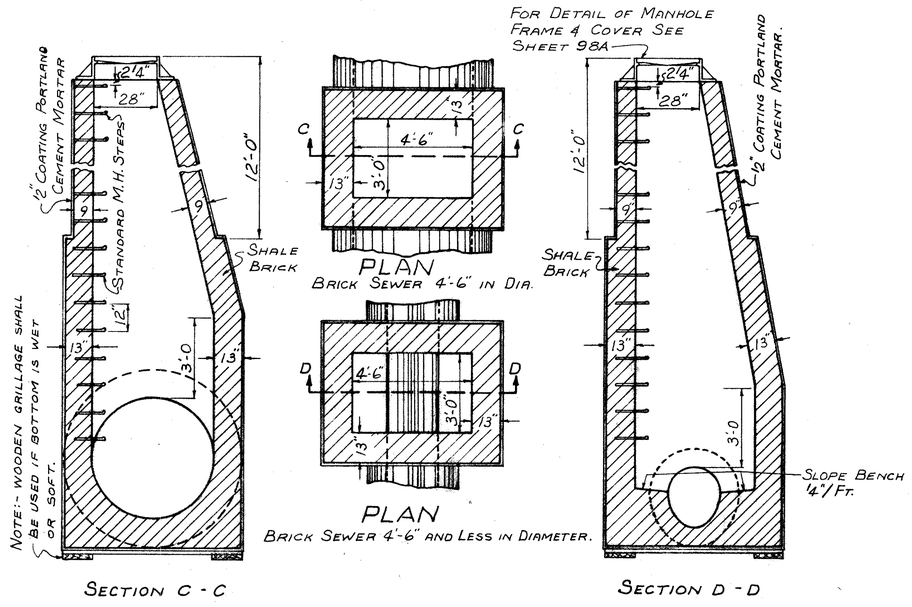
THE ABOVE IS A CITY OF CLEVELAND STANDARD AS SHOWN ON DWG. Nº 104 ME (CITY OF CLEVELAND DWG.)

NOTE: THE ABOVE MANHOLE STEP IS TO BE USED IN ALL MANHOLES ON THIS PROJECT, INCLUDING OHIO HIGHWAY DEPARTMENT STANDARD MANHOLES.



DETAIL OF SPECIAL MANHOLE TYPE A

NOTE:- ABOVE DETAIL IS CITY OF CLEVELAND STANDARD MANHOLE FOR PIPE SEWERS AS SHOWN ON FILE Nº D51 (CITY OF CLEVELAND DWG.)



DETAIL OF SPECIAL MANHOLE TYPE B

NOTE:- ABOVE DETAIL IS CITY OF CLEVELAND STANDARD MANHOLE FOR BRICK SEWER 4'-6" DIA. OR LESS AS SHOWN ON FILE Nº D-53 (CITY OF CLEVELAND DWG.)

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

TYPICAL DETAILS

SCALE None.	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	W.F.E.		R.M.R.			

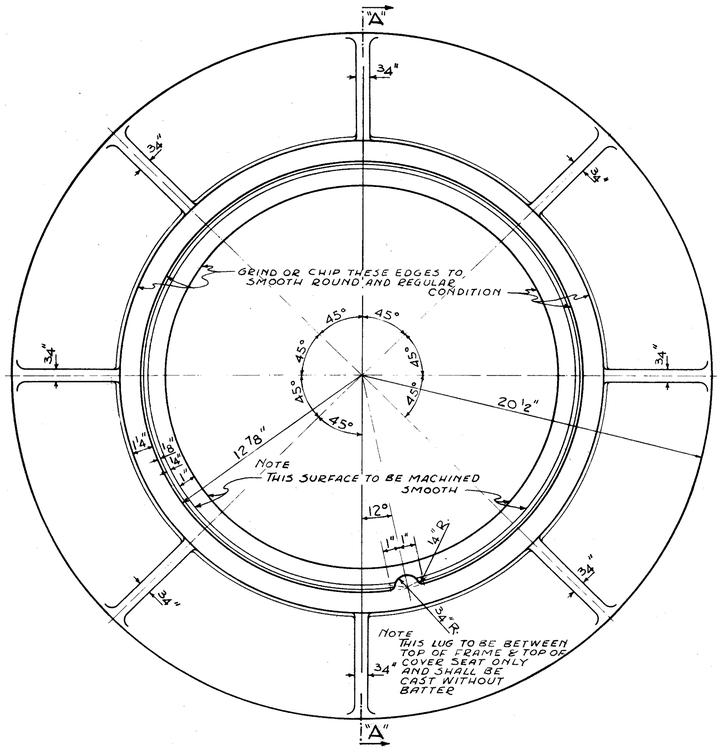
CONT. No. 580/3 SHEET ACCT. No. 6298

TYPICAL DETAILS

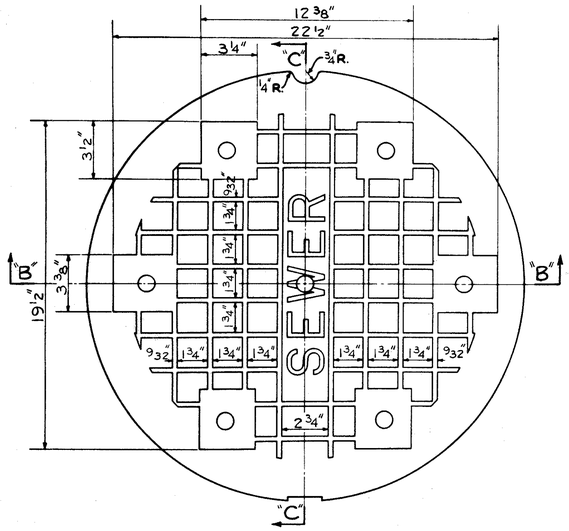
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

98A
204

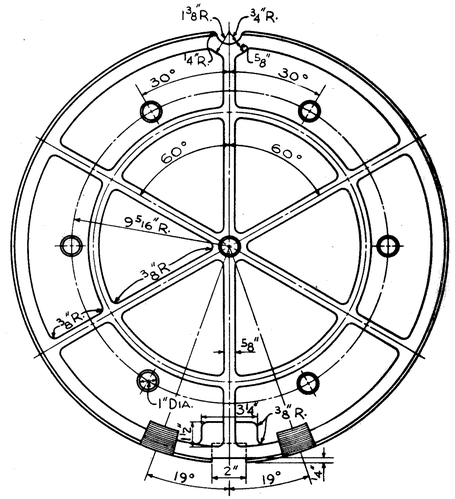
CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)



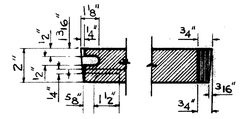
PLAN



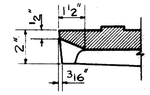
PLAN OF TOP



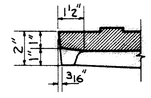
PLAN OF BOTTOM



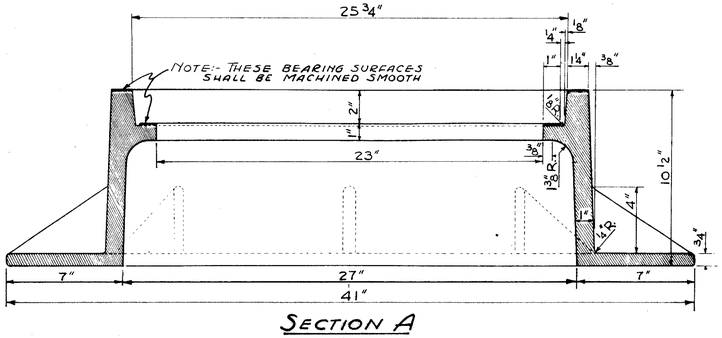
SECTION C



SECTION D



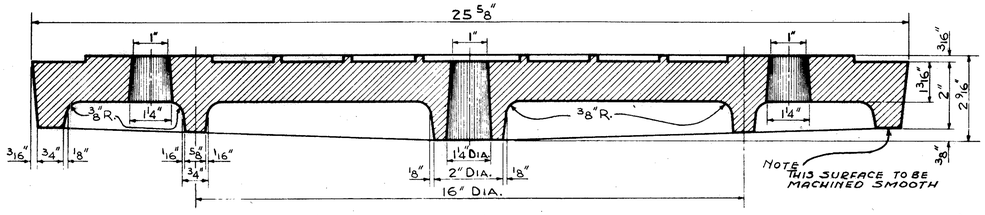
SECTION E



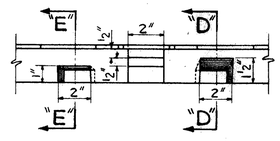
SECTION A

DETAIL OF CITY OF CLEVELAND STANDARD MANHOLE FRAME

WEIGHT OF FRAME = 400 LBS.



SECTION B



SIDE ELEVATION OF NOTCHES

DETAIL OF CITY OF CLEVELAND STANDARD MANHOLE COVER

WEIGHT OF COVER = 195 LBS.

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.P.			

CONT. No. 58019 SHEET ACCT. No. 6144

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

99
204

CUYAHOGA COUNTY
CUY— 21—(13.77)-(14.94)

WATERWORK NOTES

SCOPE OF WORK

THE WORK CONTEMPLATED UNDER THIS CONTRACT COMPRISES THE FURNISHING AND INSTALLING OF CEMENT LINED CAST IRON PIPE WITH ALL APPURTENANCES, COMPLETE IN ALL DETAILS, TESTED AND READY FOR OPERATION. THE CONTRACTOR SHALL DO ALL THE WORK AND FURNISH ALL THE LABOR AND MATERIALS NECESSARY FOR THE PROPER AND FINAL COMPLETION OF THIS CONTRACT IN THE MANNER AND UNDER THE CONDITIONS HEREIN SPECIFIED AND PROVIDED, AND IN ACCORDANCE WITH THE CONTRACT DRAWINGS.

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

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

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

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

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

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

TESTS, INSPECTION AND REPORTS

THE CONTRACTOR SHALL PROVIDE AND PAY THE COST OF SHOP INSPECTION OF ALL MATERIALS. THIS INSPECTION SHALL BE DONE BY A RECOGNIZED INSPECTION LABORATORY APPROVED BY THE CITY OF CLEVELAND.

WORK TO BE DONE BY THE CITY

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

(B) - THE CLEVELAND WATER DEPARTMENT WILL INSTALL ALL BRANCH SLEEVES AND VALVES, BUT THE CONTRACTOR SHALL SUPPLY THE BRANCH SLEEVES AND VALVES, LEAD, AND DO ALL THE NECESSARY EXCAVATION, BACKFILLING AND REPAVING REQUIRED THEREFOR.
TO COVER LABOR AND INSTALLATION COSTS, THE CITY WILL CHARGE THE FOLLOWING FLAT RATES FOR THE INSTALLATION OF TAPPING SLEEVES AND VALVES. IN ADDITION TO THE ABOVE REQUIREMENTS, THE CONTRACTOR SHALL FURNISH ALL AIR COMPRESSORS REQUIRED FOR THE WORK.

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

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

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

CHANGES IN WATER PIPES

(A) - WHEREVER IT BECOMES NECESSARY IN THE OPINION OF THE DIRECTOR OF PUBLIC UTILITIES OF THE CITY OF CLEVELAND TO CHANGE THE LOCATION OF HOUSE CONNECTIONS, SUCH CHANGES WILL BE MADE BY THE CITY AT NO EXPENSE TO THE CONTRACTOR. 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 PER FOOT FOR THE SIZE OF MAIN BEING INSTALLED.

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

HANDLING PIPE AND ACCESSORIES

(A) - 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.

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 ENOUNTERED IN THE WORK AND SHALL INCLUDE ALL PUMPING, BAILING, DRAINING, SHEETING AND BRACING. MOREOVER, THE CONTRACTOR MUST ASSUME ALL RESPONSIBILITY FOR ANY ADDED EXPENSE OR OTHER LIABILITY WHICH MAY ARISE BY MEANS OF QUICKSAND, OBSTACLES OR CONDITIONS FORESEEN OR UNFORESEEN AND ENCOUNTERED IN THE WORK OF THIS CONTRACT.

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

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

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

(E) - THE TRENCH WIDTH MAY VARY WITH AND DEPEND UPON THE DEPTH OF TRENCH AND THE NATURE OF THE EXCAVATED MATERIAL ENOUNTERED; 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 THEN THE OUTSIDE DIAMETER OF THE PIPE FOR CONCRETE PIPE AND EIGHTEEN (18) INCHES FOR CAST IRON AND STEEL PIPE, EXCEPT BY CONSENT OF THE ENGINEER; THE MAXIMUM CLEAR WIDTH OF TRENCH SHALL BE NOT MORE THAN TWO (2) FEET GREATER THAN THE OUTSIDE PIPE DIAMETER. WHEN SHEETING AND BRACING IS USED, THE TRENCH WIDTH SHALL BE INCREASED ACCORDINGLY.

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

CONT. No. 58019 SHEET ACCT. No. 6122

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 1963.

W. M. DeMatteo — DIRECTOR OF PUBLIC UTILITIES
J. S. Mather — COMMISSIONER OF WATER AND HEAT
Arnold Brotzel — COMMISSIONER-DIVISION OF UTILITIES ENGINEERING
T. R. Connor — ENGINEER OF CONSTRUCTION & SURVEYS
William J. Sweeney — and ENGINEER OF DESIGN

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

WATERWORK NOTES

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

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

100/204

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

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

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

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

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

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

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

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

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

SHEETING AND BRACING

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

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

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

REMOVAL OF EXCAVATED MATERIAL

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

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

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

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

LAYING PIPE

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

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

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

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

BLOCKING AND WEDGES

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

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

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

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

(E) - BEFORE LAYING CONCRETE PIPE, THE PIPE ENDS SHALL BE MADE SMOOTH WITH EMERY CLOTH, FILE OR OTHER APPROVED MEANS, WIRE BRUSHED AND WIPED UNTIL CLEAN AND DRY. PIPE ENDS SHALL BE KEPT CLEAN UNTIL JOINTS ARE MADE. AFTER CLEANING AND DRYING, ALL CONTACT SURFACES OF THE GASKETS AND STEEL JOINT RINGS SHALL BE COATED WITH AN APPROVED FLAX SOAP BEFORE ENTERING THE SPIGOT AND INTO THE SOCKET. IMMEDIATELY AFTER THE JOINT IS PULLED TOGETHER THE PIPE SHALL BE BLOCKED WITH WOOD BLOCKING. A SURCINGLE SHALL BE INSTALLED AROUND THE JOINT AND PIPE SHALL BE SECURED THERE WITH EARTH OR SAND AS REQUIRED, CAREFULLY TAMPED UNDER AND ON EACH SIDE OF IT UP TO THE SPRING LINE 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, ETS., SHALL BE LAID IN SUCH A MANNER AS TO LEAVE ALL JOINTS WATERTIGHT. AFTER THE PIPE IS LAID, AND BEFORE BACKFILLING IS PLACED AROUND THE JOINTS, SUCH LENGTHS OF THE WATER MAIN AS THE ENGINEER MAY DETERMINE, SHALL BE TESTED UNDER A HYDROSTATIC PRESSURE OF SEVENTY-FIVE (75) POUNDS PER SQUARE INCH ABOVE THE STATIC PRESSURE, BUT NOWHERE LESS THAN 100 POUNDS PER SQUARE INCH.

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

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

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

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

(F) - AS AN ALTERNATE FOR TESTING CONCRETE AND 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 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, SIDEWALKS AND DRIVEWAYS WITHIN THE LIMITS OF THE WORK SHALL BE TEMPORARILY SURFACED, MAINTAINED AND FINALLY REPLACED OR REPAVED AS SET FORTH ELSEWHERE IN THESE NOTES.

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

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

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

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

CONT. No. 58019 SHEET ACCT. No. 6123

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 1963.

DIRECTOR OF PUBLIC UTILITIES

COMMISSIONER OF WATER AND HEAT

COMMISSIONER-DIVISION OF UTILITIES ENGINEERING

ENGINEER OF CONSTRUCTION & SURVEYS

ENGINEER OF DESIGN

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

WATERWORK NOTES

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

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

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

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

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

ROAD SURFACES, SIDEWALKS, DRIVEWAYS, AND CURBING

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

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

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

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

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

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

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

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

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

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

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

LIST AND INVOICES

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

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

CAST IRON PIPE AND FITTINGS

WORK INCLUDED

(A) - THE CONTRACTOR SHALL FURNISH, 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. 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. LUGGED PIPE AND FITTINGS SHALL BE PIT CAST AND SHALL BE USED WHERE "TIED DISTANCES" ARE SHOWN OR WHERE SPECIFICALLY NOTED ON THE ALIGNMENT DRAWINGS.

(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 A21.6-952 AND ALL SUBSEQUENT AMENDMENTS THERETO.

(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"	200	.56	25
12"	250	.56	24
16"	200	.60	25
16"	250	.68	25
		.73	26

(2) - ALL FITTINGS, SUCH AS BENDS, TEES, CROSSES, OFFSETS, HYDRANT BRANCHES, ETC., SHALL HAVE 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 LACING 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.

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 1963.

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

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

WATERWORK NOTES

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

CONT. No. 58019 SHEET ACCT. No. 6124

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

102
204

CUYAHOGA COUNTY
CUY— 21—(13.77)—(14.94)

CONT. No. 58019 SHEET ACCT. No. 6125

CEMENT LINING

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

MARKING

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

FACING AND DRILLING

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

LAYING

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

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

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

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

CUTTING PIPE

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

JOINTS

(A) - FLANGED JOINTS

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

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

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

SIZE OF PIPE	DEPTH OF LEAD
4 - 20 (BOTH INCLUSIVE)	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 CENTER LINE OF MAINS AND THE ACTUAL LENGTH OF EXISTING MAIN ORDERED TO BE REMOVED TO MAKE THE CONNECTION.

PAYMENT

(A) - THE UNIT PRICE STIPULATED TO BE PAID FOR EACH LINEAL FOOT OF CAST IRON 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

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. 119

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.

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 1963.

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

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

WATERWORK NOTES

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

FED. RD. DIVISION	STATE	PROJECT	
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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.

2-INCH GALVANIZED WROUGHT IRON AND BRASS PIPE

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL THE MATERIALS FOR AND SHALL PROPERLY CONNECT IN PLACE AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS ORDERED, ALL 2-INCH EXTRA STRONG BRASS PIPE AND FITTINGS AND ALL 2-INCH EXTRA HEAVY GALVANIZED WROUGHT IRON PIPE AND FITTINGS RESPECTIVELY, WHICH ARE NECESSARY FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

BRASS PIPE AND FITTINGS

ALL BRASS PIPE AND FITTINGS SHALL BE EXTRA STRONG, 2-INCH PIPE SIZE AND THE PIPE SHALL CONFORM TO ASTM 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.

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.

ERECTION

ALL PIPE SHALL BE CAREFULLY PLACED TO THE PROPER LINES AND GRADES AND SHALL BE CONNECTED UP, UNLESS OTHERWISE SHOWN, WITH SCREW FITTINGS. SCREW JOINTS SHALL BE MADE TIGHT WITH A GRAPHITE PASTE AND SCREWED HOME. A LIBERAL NUMBER OF UNIONS SHALL BE USED TO PERMIT THE READY REMOVAL OF ANY SECTION.

TESTING

AFTER ALL PIPING HAS BEEN CONNECTED UP IN PLACE, IT SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SECTION "TESTING MAINS" OF THESE NOTES.

MEASUREMENT

THE LENGTHS OF 2-INCH EXTRA STRONG BRASS PIPE AND FITTINGS AND 2-INCH EXTRA HEAVY GALVANIZED WROUGHT IRON PIPE AND FITTINGS TO BE PAID FOR SHALL BE THE LENGTH ACTUALLY FURNISHED AND PLACED IN ACCORDANCE WITH THESE SPECIFICATIONS, MEASURED ALONG THE AXIS AFTER PIPE AND FITTINGS HAVE BEEN CONNECTED UP IN PLACE. NO SEPARATE PAYMENT WILL BE MADE FOR FITTINGS AND JOINT MATERIALS, BUT THE COST SHALL BE INCLUDED IN THE PRICE BID PER LINEAL FOOT OF PIPE.

PAYMENT

THE UNIT PRICE STIPULATED PER LINEAL FOOT FOR 2-INCH EXTRA STRONG BRASS PIPE AND FITTINGS AND FOR 2-INCH EXTRA HEAVY GALVANIZED WROUGHT IRON PIPE AND FITTINGS SHALL INCLUDE THE FURNISHING, PLACING, CONNECTING AND TESTING OF THE PIPE AND FITTINGS AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

VALVES

WORK INCLUDED

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

AIR COCKS

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

GATE VALVES

(A) - TYPE OF VALVES: THE GATE VALVES SHALL BE MANUFACTURED IN FULL COMPLIANCE WITH THE STANDARD SPECIFICATIONS FOR GATE VALVES FOR ORDINARY WATER WORKS SERVICE OF THE AMERICAN WATER WORKS ASSOCIATION AWWA C 500-52 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	BODY RINGS THICKNESS AT BASE OF THREADS	GATE RINGS FACE THICKNESS	GATE RINGS FACE	GATE RINGS 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

LOW SERVICE DISTRICT

DEPARTMENT OF PUBLIC UTILITIES
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APPROVED FEB. 26, 1963.

DIRECTOR OF PUBLIC UTILITIES

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1922 EAST 107TH STREET CLEVELAND, OHIO

WATERWORK NOTES

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

CONT. No. 58019 SHEET ACCT. No. 6126

FED. RD. DIVISION	STATE	PROJECT	
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CUY— 21—(13.77)–(14.94)

(R) - WRENCH CAPS: THE WRENCH CAPS AND RETAINING NUTS ON HEADS OF VALVE STEMS AND PINION SHAFTS SHALL BE OF GRADE THREE BRONZE. ON VALVES 24 IN. AND OVER, WRENCH CAPS SHALL BE 2 IN. SQUARE AND 2 IN. DEEP. ON VALVES 4 IN. TO 20 IN. INCLUSIVE, THEY SHALL BE 1-3/4 IN. SQUARE ON TOP, 1-7/8 IN. SQUARE AT BASE, AND 1-3/4 IN. DEEP. ON 3 IN. VALVES AND UNDER, THEY SHALL BE 1-1/4 IN. SQUARE ON TOP, 1-3/8 IN, SQUARE AT BASE AND 1-1/2 IN, DEEP. MACHINED WRENCH CAPS FOR VALVES 3 IN. TO 48 IN. INCLUSIVE SHALL BE FITTED TO A MACHINED SQUARE STEM OR PINION SHAFT AND HELD IN PLACE BY A RETAINING NUT. WRENCH CAPS SHALL HAVE A CUT-AWAY SKIRT TO PERMIT EASY ACCESS TO GLAND BELTS.

(S) - VALVES TO OPEN CLOCKWISE, EXCEPT 2 IN. AND UNDER
ALL GATE VALVES 3 IN. AND OVER, INCLUDING BY-PASS VALVES, SHALL BE MADE TO OPEN BY TURNING IN A CLOCKWISE DIRECTION. VALVES 2 IN. AND UNDER SHALL BE MADE TO OPEN BY TURNING IN A COUNTER-CLOCKWISE DIRECTION. ALL VALVES TO BE SO MADE THAT THEY CAN BE EASILY OPERATED.

(T) - FACING OF GATES: ALL DISCS OR GATES AND THREADS FOR SEAT RINGS IN THE BODY SHALL BE MACHINED TRUE AND A GROOVE OR GROOVES SHALL BE MACHINED IN EACH DISC OR GATE FOR THE RECEPTION OF THE FACE RING. THE DISC AND SEAT RINGS SHALL BE SECURELY AND RIGIDLY ATTACHED TO THE DISCS OR BODY SEATS IN A MANNER APPROVED BY THE 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.

CONT. No. 5801.9 ... SHEET ACCT. No. 6127

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 OUT 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 STRENG TH	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 FEB. 26, 1963.

DIRECTOR OF PUBLIC UTILITIES

COMMISSIONER OF WATER AND HEAT

COMMISSIONER-DIVISION OF UTILITIES ENGINEERING

ENGINEER OF CONSTRUCTION & SURVEYS

and ENGINEER OF DESIGN

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

WATERWORK NOTES

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

FED. RD. DIVISION	STATE	PROJECT	
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CHEMICAL COMPOSITION

COPPER, PERCENT	56.0 TO 62.0
LEAD, PERCENT	0.5 TO 1.5
TIN, MAXIMUM PERCENT	1.5
MANGANESE, MAXIMUM PERCENT	1.5
ALUMINUM, MAXIMUM PERCENT	1.5
IRON, MAXIMUM PERCENT	2.0
ZINC	REMAINDER

GRADE THREE CAST IRON BRONZE SHALL CONFORM TO THE PROPERTIES OF ASTM B 132 ALLOY B.

PHYSICAL PROPERTIES

MINIMUM TENSILE STRENGTH	80,000 PSI
MINIMUM YIELD STRENGTH	32,000 PSI
MINIMUM ELONGATION IN 2 INCHES, PERCENT	15

CHEMICAL COMPOSITION

COPPER, PERCENT	55.0 TO 60.0
LEAD, PERCENT	0.5 TO 1.5
TIN, MAXIMUM PERCENT	1.5
MANGANESE, MAXIMUM PERCENT	3.5
ALUMINUM, MAXIMUM PERCENT	3.0
IRON, MAXIMUM PERCENT	3.0
ZINC	REMAINDER

GRADE FOUR ROLLED BRONZE SHALL CONFORM TO THE PROPERTIES OF ASTM B 21, ALLOY A (ONE-HALF HARD).

PHYSICAL PROPERTIES

DIAMETER OR THICKNESS, IN.	MIN TENSILE STRENGTH PSI	MIN. YIELD STRENGTH PSI	MINIMUM ELONGATION IN 4X DIA. OR THICKNESS OF SPECIMEN, PERCENT
1/2 AND UNDER	60,000	27,000	22
OVER 1/2 TO 1 INC.	60,000	27,000	25
OVER 1 TO 2-1/2 INC.	58,000	26,000	25
OVER 2-1/2 TO 3-1/2 INC.	54,000	25,000	27
OVER 3-1/2	54,000	22,000	30

CHEMICAL COMPOSITION

COPPER, PERCENT	59.0 TO 62.0
TIN, PERCENT	0.5 TO 1.0
LEAD, MAXIMUM PERCENT	0.20
ZINC, PERCENT	REMAINDER
IRON, MAXIMUM PERCENT	0.10
ELEMENTS OTHER THAN COPPER, TIN, IRON, LEAD AND ZINC, MAXIMUM PERCENT	0.10

GRADE FIVE BRONZE SHALL BE SUFFICIENTLY MALLEABLE TO CONFORM TO DOVETAILED GROOVES WHEN PEENED OR ROLLED, AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH, WITHOUT DEFORMATION OF 4000 PSI, AND SHALL HAVE THE FOLLOWING CHEMICAL COMPOSITION:

COPPER, PERCENT	91.0
TIN, PERCENT	0.0
ZINC, PERCENT	5.0
LEAD, PERCENT	4.0

SILICON BRONZE

THIS BRONZE SHALL CONFORM TO ASTM SPECIFICATION B-98, ALLOY A.

PHYSICAL PROPERTIES

MINIMUM TENSILE STRENGTH	85,000
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" AND 4" 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, 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 EIGHT ADDITIONAL PRINTS, SIX (6) ON PAPER AND TWO (2) ON CLOTH, OF EACH DRAWING. NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED.

PAYMENT

THE UNIT PRICE STIPULATED FOR VALVES SHALL INCLUDE THE FURNISHING, PLACING, TESTING AND PAINTING OF THE AIR COCKS, DRAIN VALVES, CHECK AND GATE VALVES, INCLUDING BY-PASS VALVES, OPERATING NUTS AND OTHER ACCESSORIES AND APPURTENANCES AND THE FURNISHING OF ALL LABOR, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

BRANCH SLEEVE AND VALVES

WORK INCLUDED

(A) - THE CONTRACTOR SHALL FURNISH THE BRANCH SLEEVE AND VALVES FOR THE LOCATIONS SHOWN ON THE DRAWINGS OR ON WORKING DRAWINGS FURNISHED BY THE ENGINEER OR AS DIRECTED OF THE SIZES SHOWN OR REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

(B) - IN GENERAL, THE WORK OF THIS ITEM CONTEMPLATES THE FURNISHING AND DELIVERY OF THE MATERIAL TO THE PROPER LOCATION ON THE JOB. THE DIVISION OF WATER WILL INSTALL THE BRANCH SLEEVES AND VALVES, BUT THE CONTRACTOR SHALL DO ALL THE NECESSARY EXCAVATION AND BACKFILLING REQUIRED THEREFOR AND REPAVING IF SO NOTED ON THE CONTRACT DRAWINGS.

QUALITY OF VALVES

THE BRANCH SLEEVE AND VALVES SHALL BE A.P. SMITH MFG. CO. OR APPROVED EQUAL. ALL SLEEVES SHALL BE OF THE CLASS AND SIZE AS SHOWN OR AS DIRECTED AND SHALL CONFORM FOR MATERIALS, TESTS, PAINTING, DRAWINGS, ETC. TO THE REQUIREMENTS OF THE ITEM CAST IRON PIPES AND FITTINGS OF THESE SPECIFICATIONS INSOFAR AS THEY APPLY. THE VALVES FURNISHED AND USED UNDER THIS ITEM SHALL COMPLY WITH THE REQUIREMENTS OF THE ITEM VALVES OF THIS CONTRACT WHENEVER THE SAME MAY BE PERTINENT. THE PROVISIONS OF THE SECTIONS (U), (V), AND (W) OF THE ITEM ON VALVES PERTAINING TO GREASE CASES SHALL APPLY TO THE BRANCH SLEEVES AND VALVES.

PAYMENT

THE UNIT PRICE STIPULATED FOR EACH BRANCH SLEEVE AND VALVE FURNISHED UNDER THIS ITEM, SHALL INCLUDE THE FURNISHING AND DELIVERY TO THE PROPER LOCATION, AND SHALL INCLUDE ALL EXCAVATION, SHEETING AND SHORING, BACKFILLING, SAND BACKFILLING, SEEDING AND SODDING AND REPAVING, IF SO NOTED ON THE CONTRACT DRAWINGS, AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

VALVE BOXES

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

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 1963.

DIRECTOR OF PUBLIC UTILITIES

COMMISSIONER OF WATER AND HEAT

COMMISSIONER-DIVISION OF UTILITIES ENGINEERING

ENGINEER OF CONSTRUCTION & SURVEYS

and
ENGINEER OF DESIGN

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

WATERWORK NOTES

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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.

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 RE-PAVING 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 AND VALVE BOX AT THE LOCATIONS SHOWN ON THE PLANS. THIS WORK SHALL INCLUDE EXCAVATING, REMOVING, STORING, BACKFILLING, SEEDING AND SODDING, AND REPAVING REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

4" HYDRANTS AND VALVES AND VALVE BOXES WILL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED AND DISPOSED OF BY HIM.

6" AND OVER HYDRANTS AND VALVES AND VALVE BOXES SHALL BE REMOVED AND STORED ON THE RIGHT-OF-WAY BY THE CONTRACTOR FOR DISPOSAL BY THE CITY OF CLEVELAND.

METHOD OF MEASUREMENT

THE PAY QUANTITIES FOR THIS ITEM SHALL BE DETERMINED AFTER ALL OF THE REQUIREMENTS OF THIS ITEM SHALL HAVE BEEN PERFORMED. THE HYDRANTS AND VALVES AND VALVE BOXES REMOVED TO BE PAID FOR SHALL BE THE ACTUAL NUMBER OF EACH REMOVED IN ACCORDANCE WITH THE REQUIREMENTS OF THIS ITEM.

BASIS OF PAYMENT

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

16" AND 12" WROUGHT IRON PIPE

WORK INCLUDED

THE CONTRACTOR SHALL, UNDER ITEM 11 FURNISH ALL THE MATERIALS FOR AND SHALL PROPERLY CONNECT IN PLACE AT THE LOCATION SHOWN ON THE DRAWINGS OR AS ORDERED, ALL 16-INCH AND 12-INCH EXTRA STRONG GALVANIZED WROUGHT IRON PIPE AND FITTINGS INCLUDING ALL EXCAVATION WORK, SAND BACKFILL, ALL AS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT.

WROUGHT IRON PIPE AND FITTINGS

ALL GALVANIZED WROUGHT IRON PIPE AND FITTINGS SHALL BE EXTRA STRONG GALVANIZED WROUGHT IRON PIPE AND SHALL MEET THE REQUIREMENTS OF THE "STANDARD SPECIFICATIONS FOR WELDED WROUGHT IRON PIPE, A.S.T.M. DESIGNATION: A 72-45."

LAYING PIPE

ALL GALVANIZED IRON PIPE SHALL BE CAREFULLY PLACED TO THE PROPER LINES AND GRADES AND SHALL BE CONNECTED UP, UNLESS OTHERWISE SHOWN, WITH SCREWED FITTINGS. SCREW JOINTS SHALL BE MADE TIGHT WITH A GRAPHITE PASTE AND SCREWED HOME. IF WELDING IS USED TO MAKE THE SCREWED JOINTS WATERTIGHT, THE DAMAGED GALVANIZING SHALL BE REPAINTED AND WRAPPED WITH NO. X-1031 (20 mil) "SCOTCHRAP" AS MANUFACTURED BY THE MINNESOTA MINING AND MFG. CO. OR APPROVED EQUAL.

TESTING

AFTER PIPING HAS BEEN CONNECTED UP IN PLACE, IT SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THESE SPECIFICATIONS.

MEASUREMENT

THE LENGTH OF THE 16-INCH GALVANIZED WROUGHT IRON PLAIN END PIPE, AND THE 12-INCH EXTRA STRONG GALVANIZED WROUGHT IRON PIPE AND FITTINGS TO BE PAID FOR UNDER ITEMS 11A AND 11B, 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 LINEAR FOOT OF PIPE.

PAYMENT

THE UNIT PRICE STIPULATED PER LINEAR FOOT FOR THE 16-INCH AND 12-INCH GALVANIZED WROUGHT IRON PIPE AND FITTINGS UNDER ITEM 11 SHALL INCLUDE THE FURNISHING, LAYING, CONNECTING, PAINTING, TESTING, THE EXCAVATION, SHEETING AND SHORING, BACKFILLING, SAND BACKFILL, AND THE FURNISHING OF ALL LABOR, MATERIALS, TOOLS, APPLIANCES AND EQUIPMENT TO COMPLETE THE WORK AS SPECIFIED, SHOWN OR ORDERED.

IN LIEU OF THE WROUGHT IRON PIPE ABOVE THE CONTRACTOR WILL BE PERMITTED TO FURNISH DUCTILE IRON PIPE. ALL DUCTILE IRON PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH A.S.A. A21.6 OF FEDERAL SPECIFICATIONS WWP-421 B. 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 MIN- OF 60,000 PSI. ULTIMATE STRENGTH, 40,000 PSI. YIELD POINT, 10% ELONGATION AND HARDNESS ROCKWELL B-90 MAXIMUM. THE CHEMICAL ANALYSIS SHALL BE AS FOLLOWS: CARBON 3% MINIMUM, PHOSPHORUS .08% MAXIMUM, AND SILICON 2.75% MAXIMUM. ALL PIPE SHALL HAVE A THIN BITUMINOUS COATED CEMENT LINING (ENAMELENE OR APPROVED EQUAL) COMPLYING WITH A.S.A. A21.4 SPECIFICATIONS EXCEPT AS TO THICKNESS AND WITH AN OUTSIDE COATING OF BITUMASTIC ENAMEL OR APPROVED EQUAL. ALL PIPE SHALL BE PROVIDED WITH EITHER MECHANICAL JOINT ENDS MADE IN ACCORDANCE WITH A.S.A. A21.11 OR THE SINGLE RUBBER GASKET JOINT, SIMILAR TO THE BELL-TITE JOINT AS MANUFACTURED BY THE JAMES B. CLOW AND SONS. ALL FITTINGS SHALL BE CLASS 250 CAST IRON WITH MECHANICAL JOINT ENDS MADE IN ACCORDANCE WITH A.S.A. A21.11.

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 19 63.

	DIRECTOR OF PUBLIC UTILITIES
	COMMISSIONER OF WATER AND HEAT
Arnold Bowker	COMMISSIONER-DIVISION OF UTILITIES ENGINEERING
J. R. Connor	ENGINEER OF CONSTRUCTION & SURVEYS
William J. Sweeney	and ENGINEER OF DESIGN

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

WATERWORK NOTES

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

SUMMARY OF WATERWORK QUANTITIES

CODE Y060

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY—21—(13.77)—(14.94)

107
204

SHEET No.	LOCATION	SIDE	6" CEMENT LINED CAST IRON PIPE & FITTINGS L.F.	8" CEMENT LINED CAST IRON PIPE & FITTINGS L.F.	12" CEMENT LINED CAST IRON PIPE & FITTINGS L.F.	16" CEMENT LINED CAST IRON PIPE & FITTINGS L.F.	12" EXTRA HEAVY GALVANIZED WROUGHT IRON PIPE L.F.	16" EXTRA HEAVY GALVANIZED WROUGHT IRON PIPE L.F.	FLUSHING PIPE AND VALVE FURNISHED AND INSTALLED EA.	6" VALVE EA.	6" INSERTING VALVE EA.	8" VALVE EA.	8" INSERTING VALVE EA.	16" VALVE EA.	No. 2 VALVE BOX, AS PER PLAN EA.	No. 3 VALVE BOX, AS PER PLAN EA.	No. 7 VALVE BOX, AS PER PLAN EA	PLUGGING EXIST. 6" MAINS EA.	PLUGGING EXIST. 8" MAINS EA.	RECONNECTING EXISTING HOUSE CONNECTIONS EA.	PLUGGING EXIST. HOUSE CONNECTIONS AT MAIN EA.	FURNISHING AND SETTING 6" HYDRANTS AS PER PLAN EA.	HYDRANTS, VALVES AND BOXES RECONNECTED EA.	4" HYDRANTS REMOVED EA.	No. 4 VALVE BOX, AS PER PLAN EA.	16"x8" BRANCH SLEEVE & VALVE EA.	8"x8" BRANCH SLEEVE & VALVE EA.	6"x6" BRANCH SLEEVE & VALVE EA.	4" Valves and Boxes Removed EA.	6" Hydrants Removed EA.	6" Valves and Boxes Removed EA.	8" Valves and Boxes Removed EA.
108	E. 45 St. From Finn to Roseville	Rt.																1			7											
108	Gallup from Broadway to Lester	Rt.																			2											
110	Broadway	Rt.	16			160		452		1				1	2			1	1		2	1		2	1			1					
109	Finn Ave.			68			150																									
111	Rd. "A" from Gallup to Douse	Rt.	13	309						1	3	2			1	5					4	1		1					1			
112	Rd. "A" from Douse to Martin	Lt.		302					1								1	1														
113	E. 35 Place at Croton	℄																	1													1
↑	Burwell Ave.	℄							1								1	1			1			1								
	Orange Ave. Sta. 12+00 to 14+00	℄																			6											
	E. 34 St. at Rd. "D"	Rt.																						1								
	Woodland Ave.	℄																			8											
↓	E. 31 St. from Orange to Woodland	℄							1								1	1														
114	Road "C"	Lt.	26	458						2		1	1		2	3		1		2	1	2		1		1			1	1	1	
115	Road "D"	Lt.	25	400						2	2	1			2	3		1		3	1	2		1							1	
116	Road "D"	Lt.	31	277						1	1	1			1	2				6		1		1								
117	E. 30 St.	Rt.		412								2				4										1	1					
	Totals to Sheet 16		111	2158	68	160	150	452	3	7	6	7	1	1	8	17	3	7	2	11	32	7		8	1	2	1	1	2	1	2	1

CONT. No. 58019 SHEET ACCT. No. 6337

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 1963.

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

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

SUMMARY OF WATERWORK QUANTITIES

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

6-0

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

108
204

CUYAHOGA COUNTY
CUY— 21—(13.77)—(14.94)

E. 45 ST.
ROSEVILLE CT.
DILLE AVE.
BROADWAY
MARTIN AVE.
GIBBS ST.
FINN AVE.
GALLUP AVE.
LESTER ST.
ROAD "A"
DOUSE AVE.
WARREN ST.
STUPKA CT.

New 12" W.M. For Details See Sh. 169
Abandon 12" W.M.
Retaining Wall
Plug Exist. House Connections at Main
New 16" W.M. For Details See Sh. 170
Abandon 8" W.M.
Abandon 6" W.M.
New 8" W.M. For Details See Sh. 111 & 112
8" Plug w/Clamps
Plug at Main
6" Inserting Valve No. 3 Valve Box
Cut Off Exist. House Connections at Curb

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 1963.

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

LEGEND

- 6" — Existing Water Main
- 8" X 8" — Exist. Water Main to be Abandoned
- 8" — New Water Main
- Connections to be Plugged with C.I. Plugs or Cars and w/Clamps where noted
- Exist. 4" Hydrant and Valve
- Exist. 6" Hydrant and Valve
- New 6" Hydrant and Valve

For Connections, See Roll Maps Nos. 3550, 3149, 2340, 732-A, 1238, 1224 & 1484 of the City of Cleveland

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

WATER MAINS GENERAL PLAN

CONSTR. SECT. CUY-21-13.77

SCALE 1" = 50'

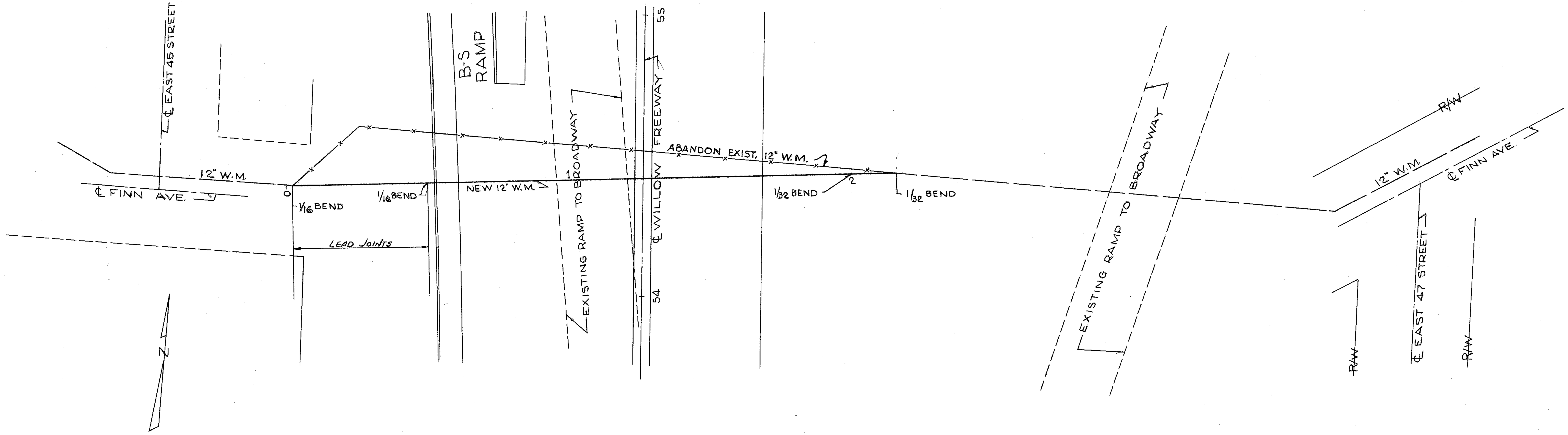
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.R.		R.M.R.			

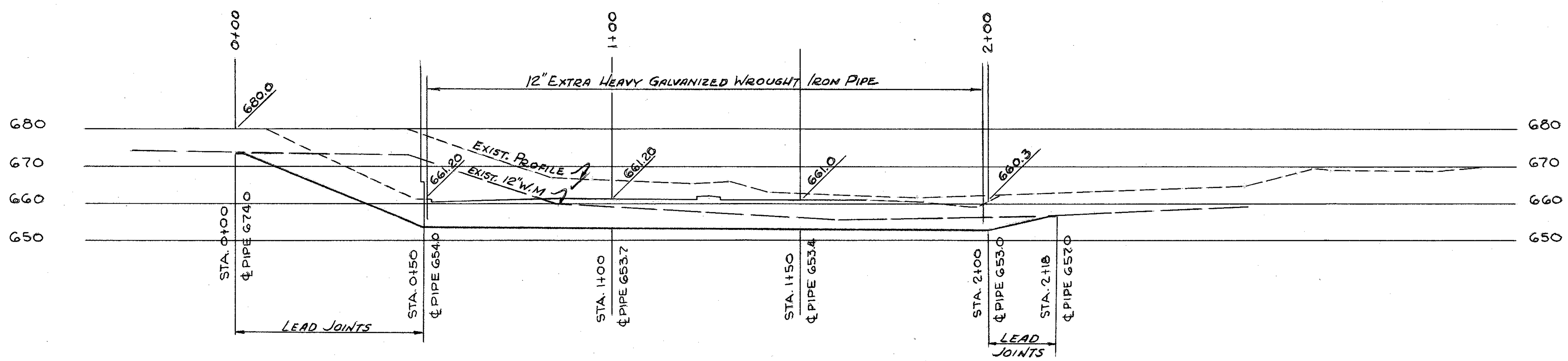
CONT. NO. 58019 SHEET ACCT. NO. 6338

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

109/204

CUYAHOGA COUNTY
CUY— 21—(13.77)-(14.94)





NOTES:

1. ALL CAST IRON PIPE TO BE CLASS 25, CLASS D FITTINGS.
2. ALL PIPE SHALL HAVE BELL AND SPIGOT ENDS FOR CAST LEAD JOINTS OR SLIP-ON TYPE JOINTS WITH COMPRESSED RUBBER RING INSERTS.
3. ALL FITTINGS SHALL HAVE BELL AND BELL OR BELL AND SPIGOT ENDS WITH CAST LEAD JOINTS
4. ALL PIPE AND FITTINGS TO BE CEMENT LINED.

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 19 63.

[signature] DIRECTOR OF PUBLIC UTILITIES
[signature] COMMISSIONER OF WATER AND HEAT
[signature] COMMISSIONER-DIVISION OF UTILITIES ENGINEERING
[signature] ENGINEER OF CONSTRUCTION & SURVEYS
[signature] asst. ENGINEER OF DESIGN

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

WATER MAIN
NEW 12" WATER MAIN
FINN AVE.

SCALE DATE

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

CONT. No. 58019 SHEET ACCT. No. 6340

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

110 / 204

CUYAHOGA COUNTY
CUY—21—(13.77)—(14.94)

BROADWAY
RAMP B-S
ROSEVILLE CT.
30" WATER MAIN
ABANDON
8" P.E. GAS
18" H.P. GAS
3 DUCTS C.E.I.
4 O.B.T. DUCTS
4 DUCTS O.B.T.
16"x16"x16" TEE (3 BELLS)
0+00
16" PLUG W/CLAMP
16"x8" REDUCER
CONC. PIER TYPE A
8" WATER
6 C.E.I. DUCTS
10 O.B.T. DUCTS
℄ BRIDGE
Abandon 8" WATER MAIN
REMOVE 4" HYDRANT
16" OFFSET
6" PLUG
RET. WALL
20 DUCTS O.B.T.
4 DUCTS A.T.&T.
1/8 BEND, CONC. PIER TYPE B
1/8 BEND, CONC. PIER TYPE B
1/16 BEND W/LUGS SOCKET CLAMPS W/TIE RODS
LEAD JOINTS
PROPOSED 16" WATER MAIN
REMOVE EXIST. 4" HYDRANT
8" P.E. GAS
8" PLUG W/CLAMPS
6 DUCTS C.E.I.
3 DUCTS A.T.&T.
7 DUCTS O.B.T.
4 M.H. 6 - S.T.D.
16"x16" TEE
2 - 16"x8" REDUCERS
CONC. PIER TYPE B
6+33 = STA. 8+50 ℄ BRIDGE
TO BE CONSTRUCTED IN PART III
16" HUB VALVE
No. 4 VALVE BOX
6 DUCTS C.E.I.
20 DUCTS O.B.T.
4 DUCTS A.T.&T.
PLUG AT MAIN
RET. WALL FOUNDATION
1/8 BEND, CONC. PIER TYPE B
42"
54"
48"
30"
15"
RAMP W-S
1/8 BEND W/LUGS SOCKET CLAMPS W/TIE RODS
LEAD JOINTS
ABANDON
6"x6" BRANCH SLEEVE & VALVE, No 2 VALVE BOX
6" VALVE, No. 2 VALVE BOX
6" HYDRANT
GALLUP AVE.
DOUSEL AVE.
Abandon EXIST. 6" W.M.
SUSPENDED PROJECT
℄ WILLOW FREEWAY
MARTIN AVE.
30" WATER MAIN
6" WATER

LEAD JOINTS
16" EXTRA HEAVY GALVANIZED WROUGHT IRON PIPE
LEAD JOINTS
℄ BROADWAY
EXIST. 8" W.M. ℄ EL. 670.8±
℄ WILLOW
PROPOSED 42" PIPE TOP OF PIPE EL. 642.81
EXIST. 8" W.M. ℄ EL. 671.2
EXIST. GRADE ON ℄
GRADE ON ℄ (PART II)
FUTURE GRADE ON ℄ (PART III)
PROPOSED 16" WATER MAIN
16" TEE ℄ EL. 670.8
16" OFFSET 1/8 EL 669.3
16"-1/8 BEND ℄ EL. 670.20
16"-1/8 BEND ℄ EL. 668.70
16"-1/8 BEND ℄ EL. 643.75
2" BOSSED PIPE TAP W/ PLUG
42" PIPE ℄ 638.93
16" W.M. ℄ EL. 647.00
16"-1/8 BEND ℄ EL. 650.00
16"-1/8 BEND ℄ EL. 666.50
16"x16" TEE ℄ EL. 669.12
0+12
0+32
0+45
0+37
3+13
5+49
5+99
6+24

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 1963.

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

NOTES:

1. ALL CAST IRON PIPE TO BE CLASS 25, CLASS D FITTINGS.
2. ALL PIPE SHALL HAVE BELL AND SPIGOT ENDS FOR CAST LEAD JOINTS OR SLIP-ON TYPE JOINTS WITH COMPRESSED RUBBER RING INSERTS.
3. ALL FITTINGS SHALL HAVE BELL AND BELL OR BELL AND SPIGOT ENDS WITH CAST LEAD JOINTS.
4. ALL PIPE AND FITTINGS TO BE CEMENT LINED
5. COST OF CONCRETE PIERS SHALL BE INCLUDED IN UNIT PRICE BID FOR 16" CAST IRON PIPE AND FITTINGS

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

WATER MAINS
NEW 16" WATER MAIN
BROADWAY

SCALE 1" = 20' DATE

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

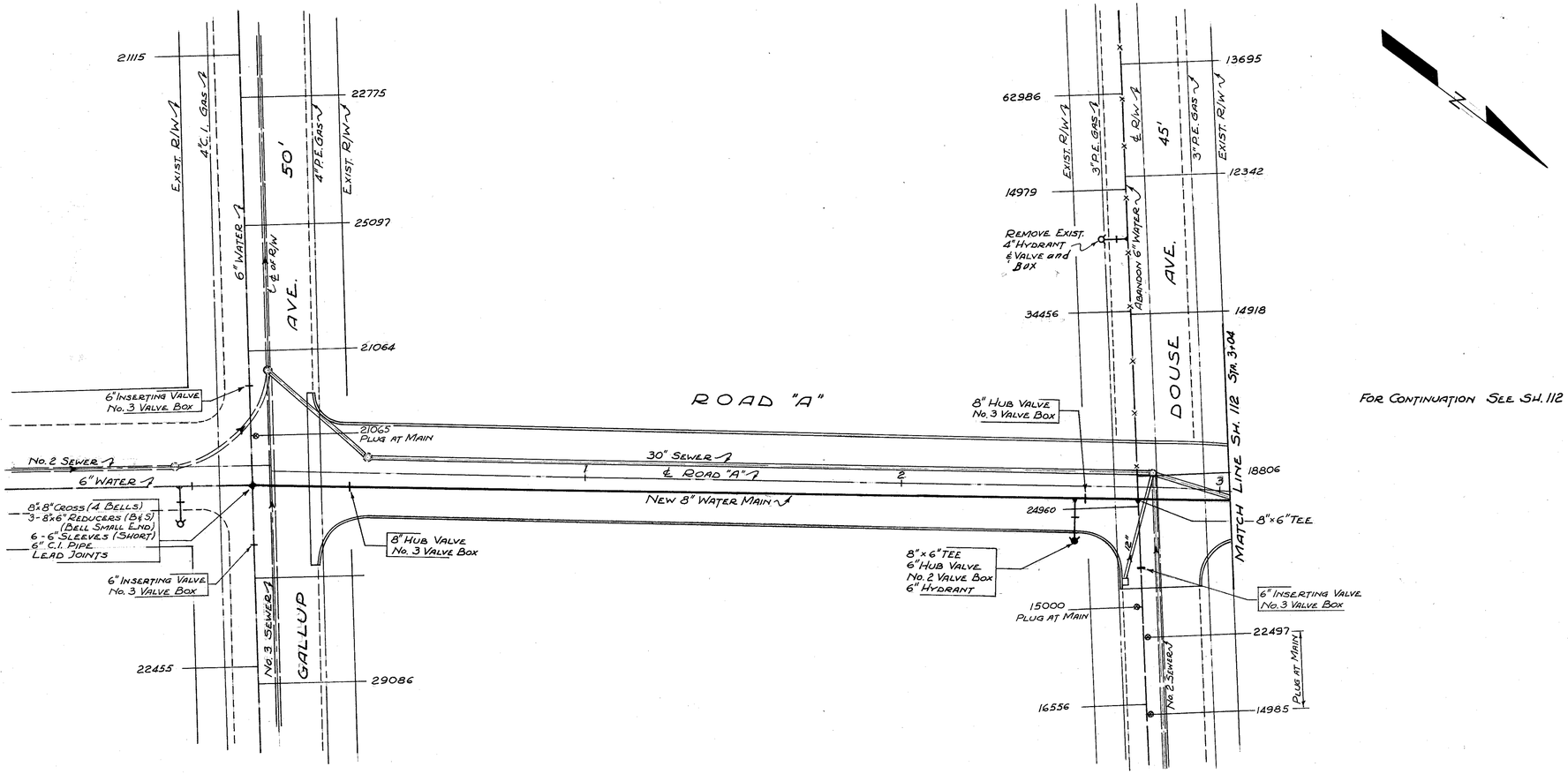
6339

58019

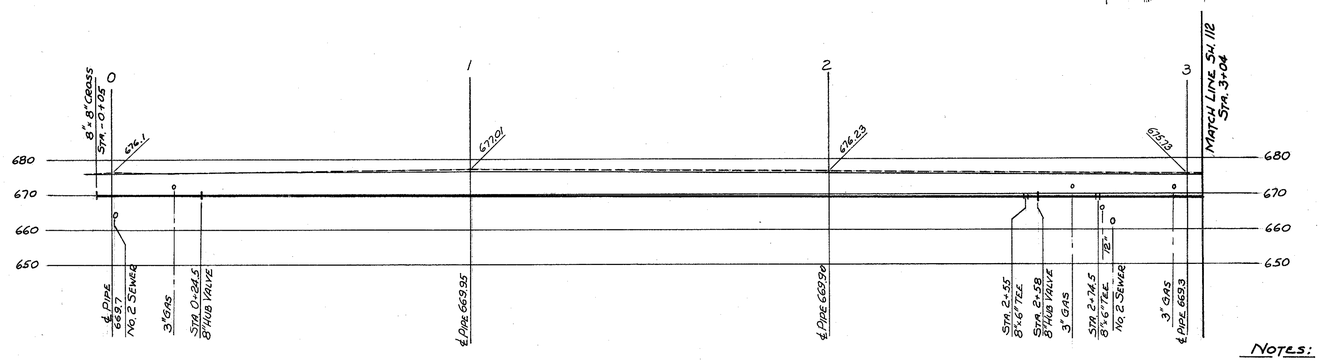
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

111
204

CUYAHOGA COUNTY
CUY— 21—(13.77)-(14.94)



FOR CONTINUATION SEE SH. 112



Notes:

1. All cast iron pipe to be Class 25, Class D fittings.
2. All pipe shall have bell and spigot ends for cast lead joints or slip-on type joints with compressed rubber ring inserts.
3. All fittings shall have bell and bell or bell and spigot ends with cast lead joints.
4. All pipe and fittings to be cement lined.

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 19 63.

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

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

WATER MAINS
NEW 8" WATER MAIN ROAD "A"

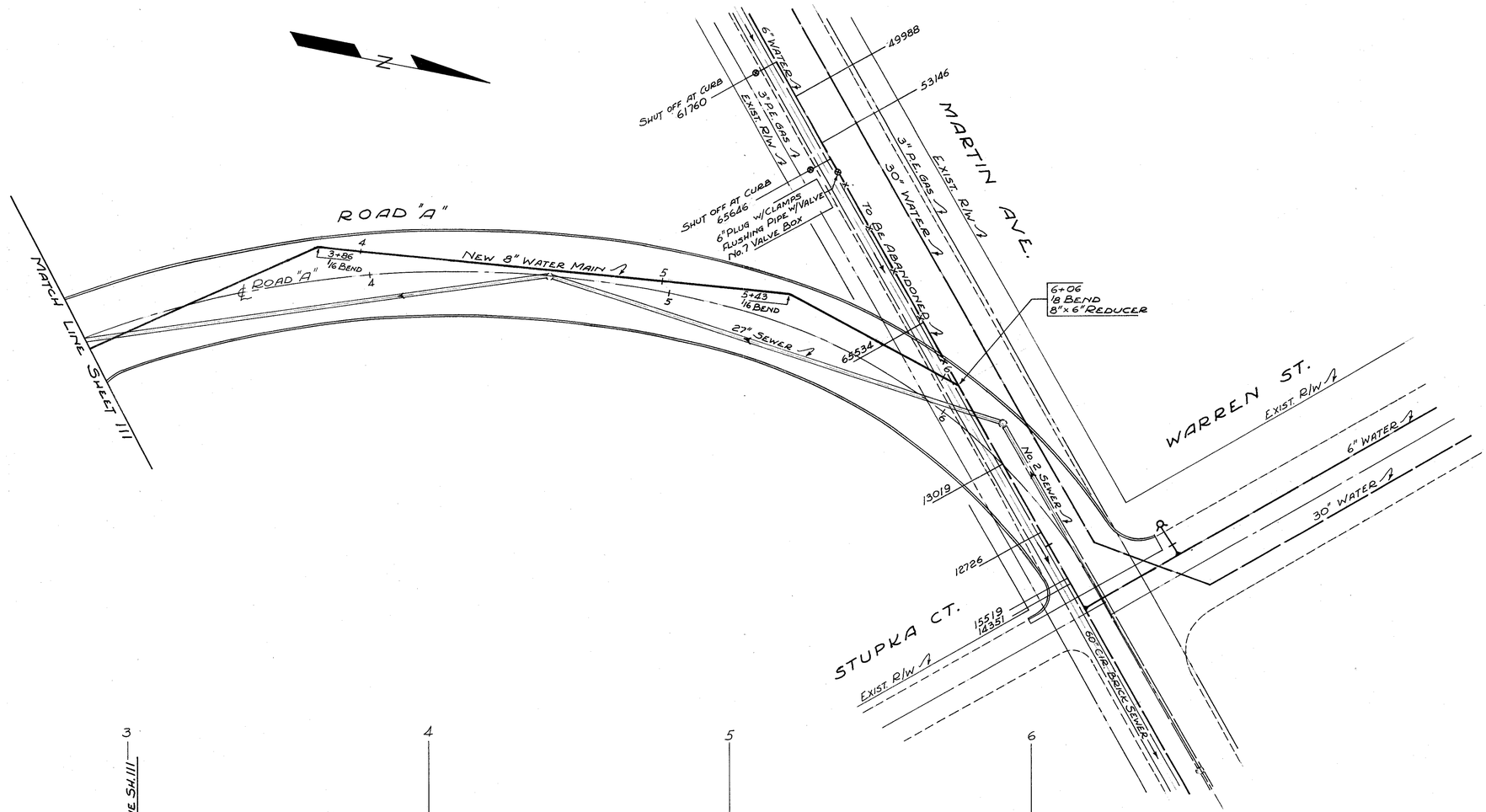
SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.R.	C.R.		BMR			

CONT. NO. 58019 SHEET NO. 6341

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

112/204

CUYAHOGA COUNTY
CUY— 21—(13.77)-(14.94)



LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 1963.

DIRECTOR OF PUBLIC UTILITIES

COMMISSIONER OF WATER AND HEAT

COMMISSIONER-DIVISION OF UTILITIES ENGINEERING

ENGINEER OF CONSTRUCTION & SURVEYS

ENGINEER OF DESIGN

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

Notes

1. All Cast Iron Pipe to be Class 25, Class D Fittings.
2. All Pipe Shall Have Bell and Spigot Ends for Cast Lead Joints or Slip-on Type Joints with Compressed Rubber Ring Inserts.
3. All Fittings Shall Have Bell and Bell or Bell and Spigot Ends with Cast Lead Joints.
4. All Pipe and Fittings to be Cement Lined.

WATER MAINS
NEW 8" WATER MAIN
ROAD "A"

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

6342

58019

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

113
204

CUYAHOGA COUNTY
CUY— 21—(13.77)—(14.94)

SHEET ACCT. No. 6349

No. 58019

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 19 63.

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

LEGEND

- NEW WATER MAIN
- EXISTING WATER MAIN
- " " " ABANDON
- CONNECTIONS TO BE PLUGGED WITH C.I. PLUGS OR CAPS & W/CLAMPS WHERE NOTED
- HYDRANT NEW
- " EXISTING

FOR CONNECTIONS, SEE ROLL MAPS NOS. 1583, 1202, 2312, 1529, 2807, 1523-B, 583, G70, G70-A, OF THE CITY OF CLEVELAND

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

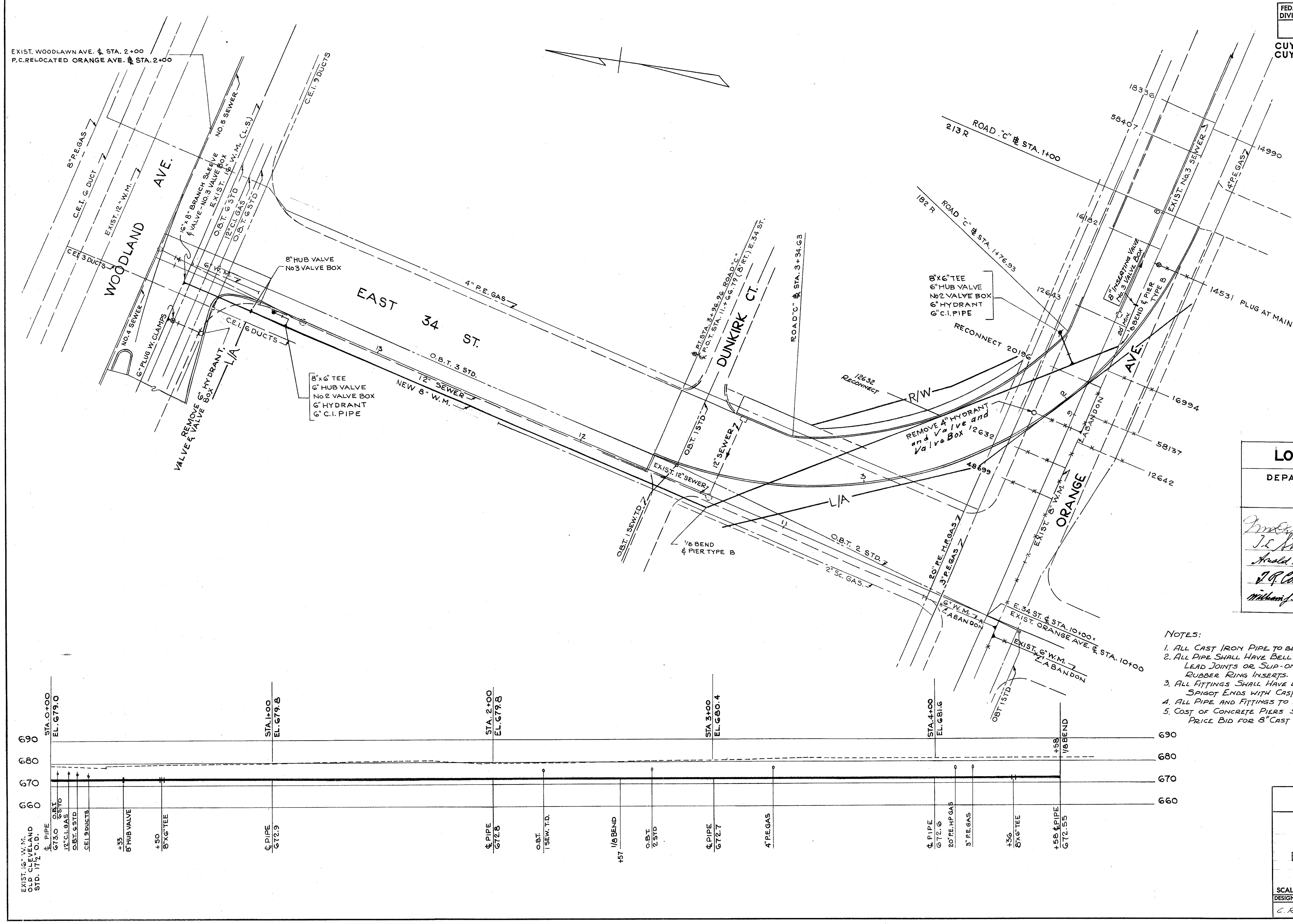
GENERAL PLAN
WATER MAINS
CONSTR. SECT. CUY-21-14.94

SCALE:		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	W.F.E.		J.P.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

114/204

CUYAHOGA COUNTY
CUY—21—(13.77)-(14.94)



LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 1963.

Signature	Title
[signature]	DIRECTOR OF PUBLIC UTILITIES
[signature]	COMMISSIONER OF WATER AND HEAT
Arnold [signature]	COMMISSIONER-DIVISION OF UTILITIES ENGINEERING
J. R. Connor	ENGINEER OF CONSTRUCTION & SURVEYS
William J. Sweeney	asst. ENGINEER OF DESIGN

NOTES:

1. ALL CAST IRON PIPE TO BE CLASS 25, CLASS D FITTINGS.
2. ALL PIPE SHALL HAVE BELL AND SPIGOT ENDS FOR CAST LEAD JOINTS OR SLIP-ON TYPE JOINTS WITH COMPRESSED RUBBER RING INSERTS.
3. ALL FITTINGS SHALL HAVE BELL AND BELL OR BELL AND SPIGOT ENDS WITH CAST LEAD JOINTS.
4. ALL PIPE AND FITTINGS TO BE CEMENT LINED
5. COST OF CONCRETE PIERS SHALL BE INCLUDED IN UNIT PRICE BID FOR 8" CAST IRON PIPE AND FITTINGS.

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

WATER MAINS
NEW 8" WATER MAIN
EAST 34TH STREET AND ROAD "C"

SCALE 1" = 20' DATE

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

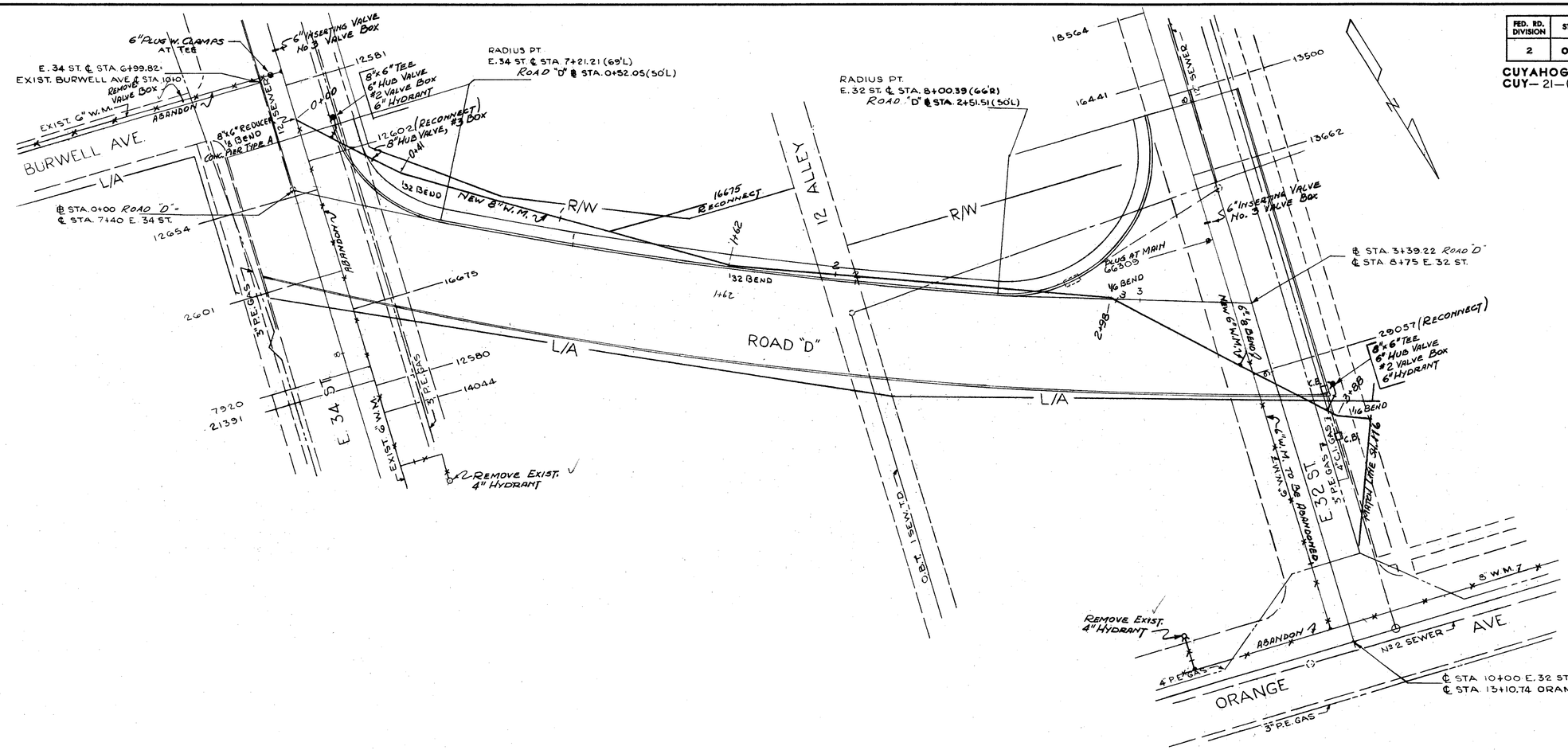
CONT. No. 58019 SHEET ACCT. No. 6348

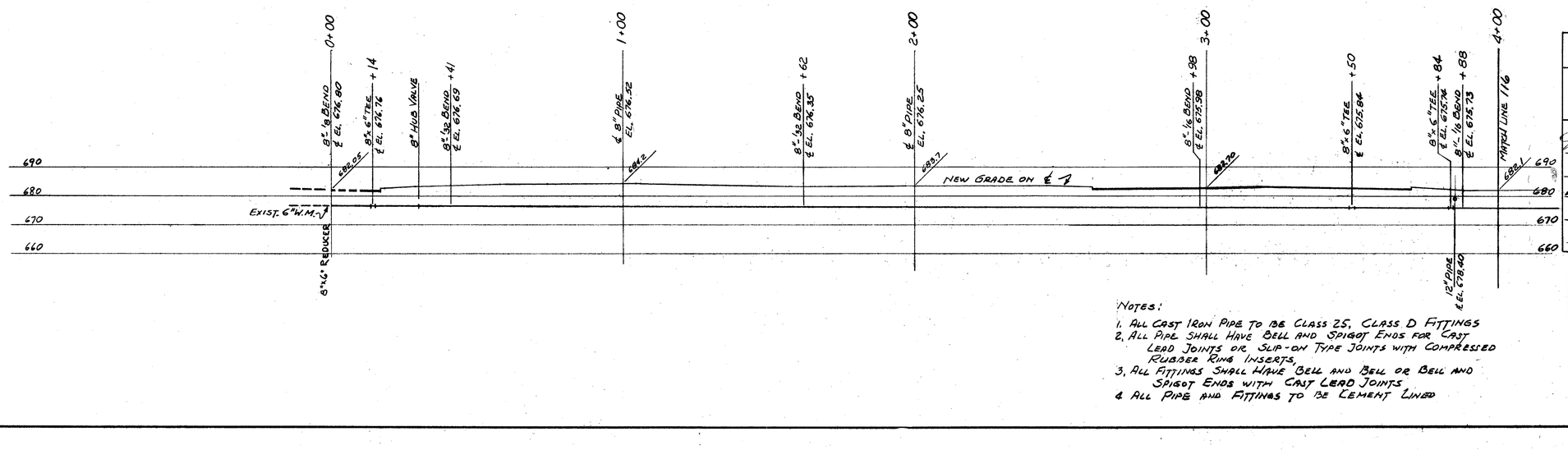
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

115/204

CUYAHOGA COUNTY
CUY— 21—(13.77)—(14.94)

CONT. No. 58019 SHEET ACCT. No. 6347





NOTES:
1. ALL CAST IRON PIPE TO BE CLASS 25, CLASS D FITTINGS
2. ALL PIPE SHALL HAVE BELL AND SPIGOT ENDS FOR CAST LEAD JOINTS OR SLIP-ON TYPE JOINTS WITH COMPRESSED RUBBER RING INSERTS.
3. ALL FITTINGS SHALL HAVE BELL AND BELL OR BELL AND SPIGOT ENDS WITH CAST LEAD JOINTS.
4. ALL PIPE AND FITTINGS TO BE CEMENT LINED

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 1963

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

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

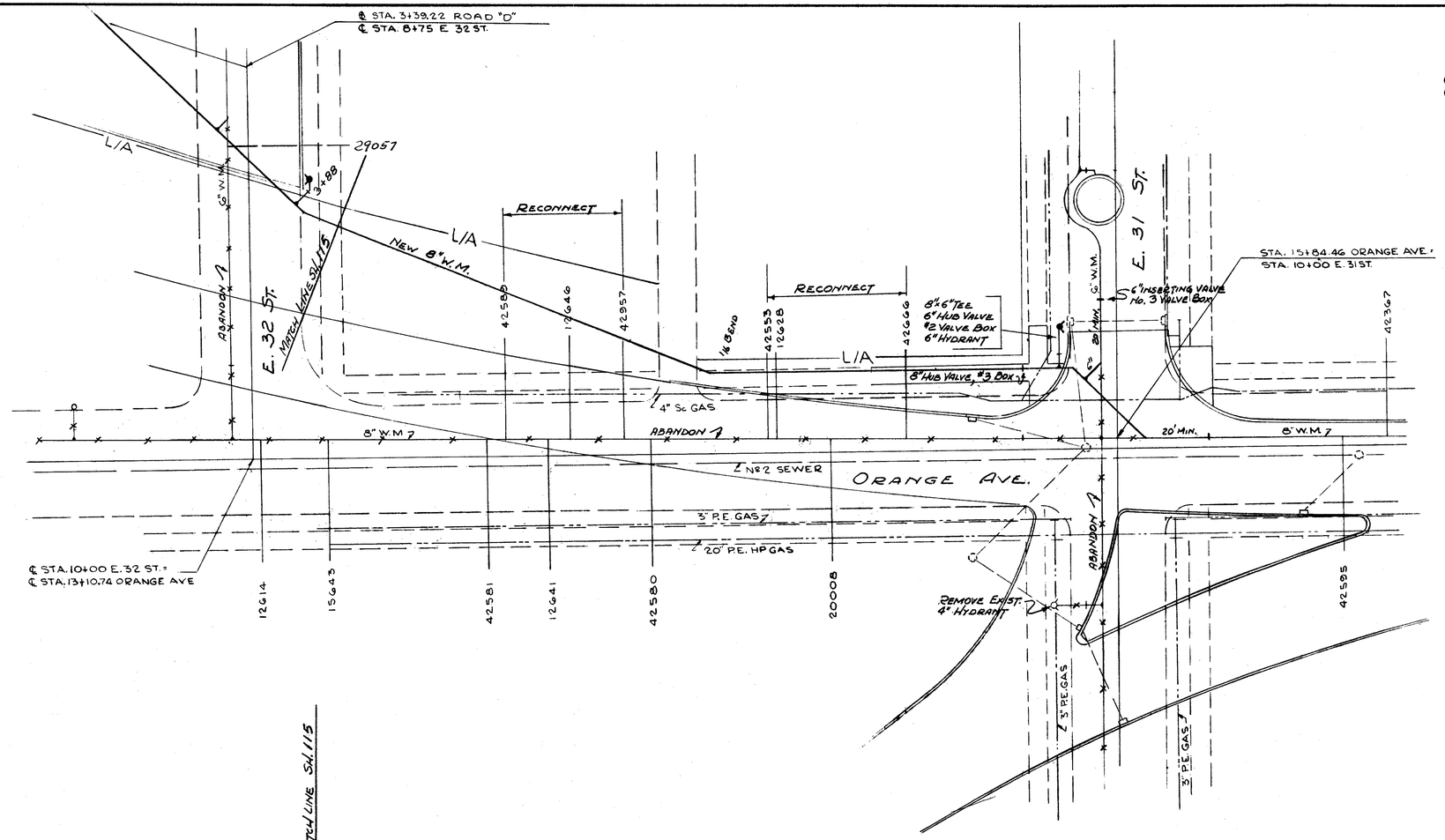
WATER MAINS
NEW 8" WATER MAIN. ROAD "D"

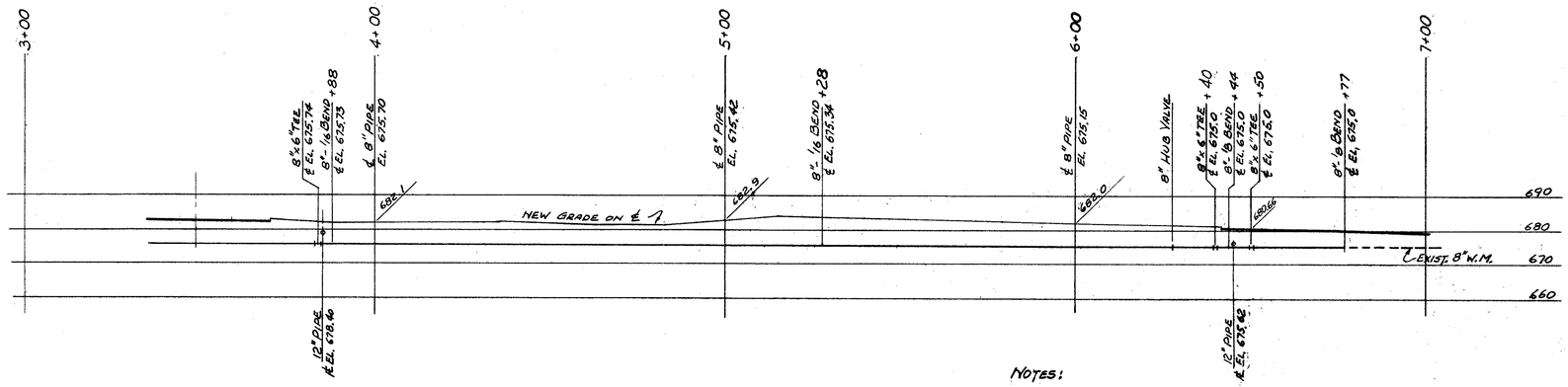
SCALE				DATE	
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	RMR		C.R.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

116
204

CUYAHOGA COUNTY
CUY—21—(13.77)—(14.94)





NOTES:
1. ALL CAST IRON PIPE TO BE CLASS 25, CLASS D FITTINGS
2. ALL PIPE SHALL HAVE BELL AND SPIGOT ENDS FOR CAST LEAD JOINTS OR SLIP-ON TYPE JOINTS WITH COMPRESSED RUBBER RING INSERTS.
3. ALL FITTINGS SHALL HAVE BELL AND BELL OR BELL AND SPIGOT ENDS WITH CAST LEAD JOINTS
4. ALL PIPE AND FITTINGS TO BE CEMENT LINED

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 1963.

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

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

WATER MAINS
NEW 8" WATER MAIN ROAD "D"

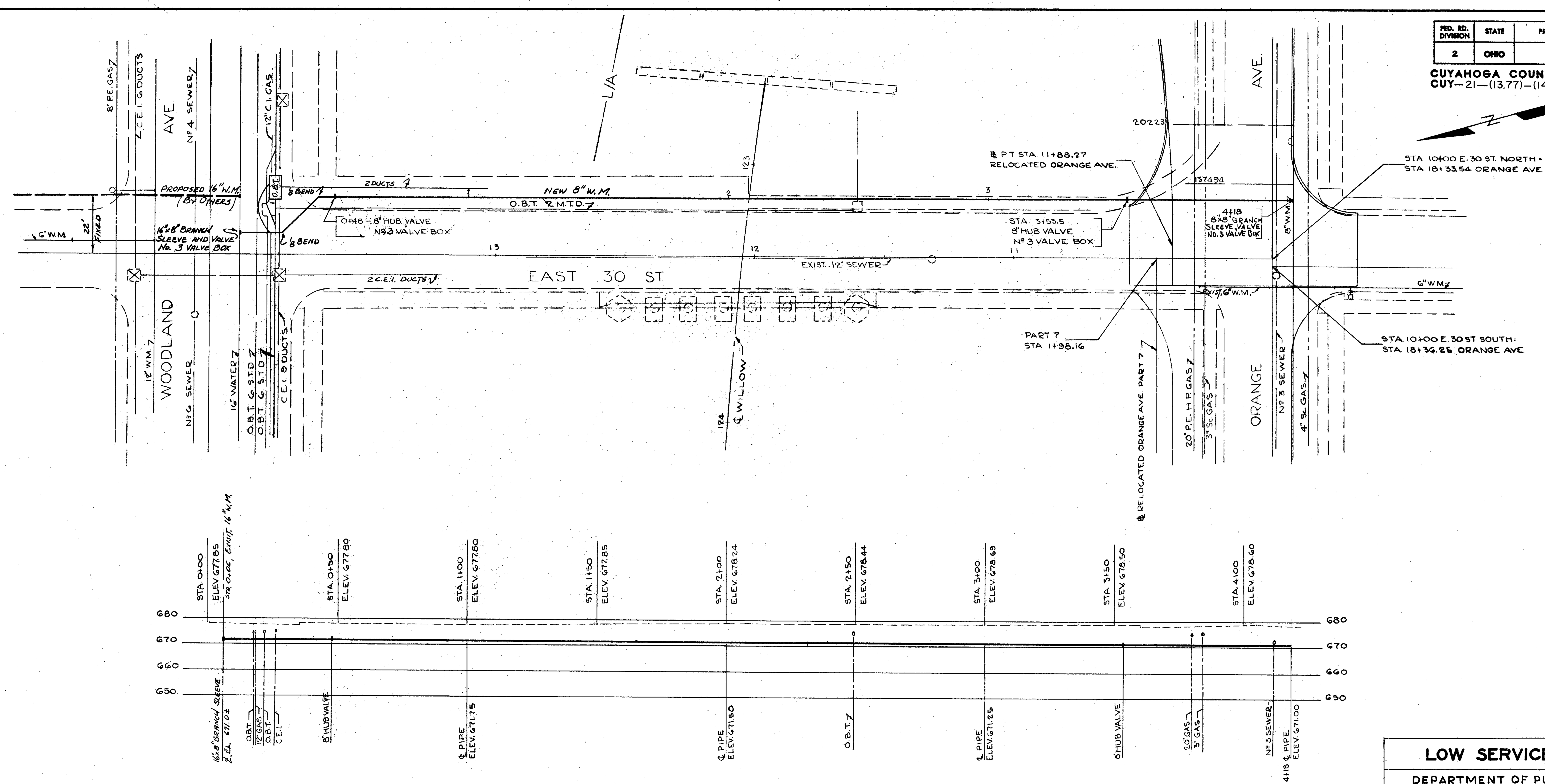
SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
		RMR		C.R.			

CONT. No. 58019 SHEET ACCT. No. 6346

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

117/204

CUYAHOGA COUNTY
CUY—21—(13.77)—(14.94)



LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 19 63.

DIRECTOR OF PUBLIC UTILITIES
COMMISSIONER OF WATER AND HEAT
COMMISSIONER-DIVISION OF UTILITIES ENGINEERING
J. R. Conner — ENGINEER OF CONSTRUCTION & SURVEYS
William J. Sweeney — Asst. ENGINEER OF DESIGN

NOTES:

1. ALL CAST IRON PIPE TO BE CLASS 25, CLASS D FITTINGS
2. ALL PIPE SHALL HAVE BELL AND SPIGOT ENDS FOR CAST LEAD JOINTS OR SLIP-ON TYPE JOINTS WITH COMPRESSED RUBBER RING INSERTS,
3. ALL FITTINGS SHALL HAVE BELL AND BELL OR BELL AND SPIGOT ENDS WITH CAST LEAD JOINTS,
4. ALL PIPE AND FITTINGS TO BE CEMENT LINED.

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

WATER MAINS
NEW 8" WATER MAIN
EAST 30TH ST.

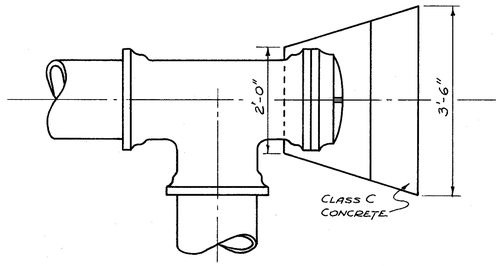
SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	RMR		C.R.			

DWG. No. 58019 SHEET ACCT. No. 6345

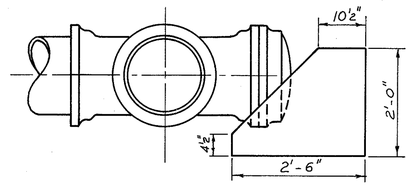
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

118
204

CUYAHOGA COUNTY
CUY— 21 — (13.77)-(14.94)

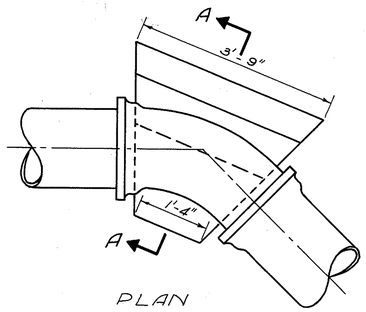


PLAN

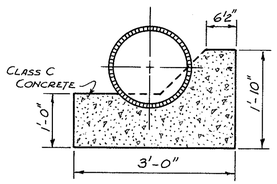


ELEVATION

CONCRETE PIER TYPE "A"
FOR 16" WATER MAIN
Scale: ¾" = 1'-0"



PLAN



SECTION A-A

CONCRETE PIER TYPE "B"
FOR 16" WATER MAIN
Scale: ¾" = 1'-0"

CONT. No. 58019 SHEET ACCT. No. 6336

LOW SERVICE DISTRICT

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

APPROVED FEB. 26, 1963.

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

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

WATERWORKS TYPICAL DETAILS

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

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			119/204

CUYAHOGA COUNTY
CUY—21—(13.77)-(14.94)

CONT. No. 58019 SHEET ACCT. No. 6145

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

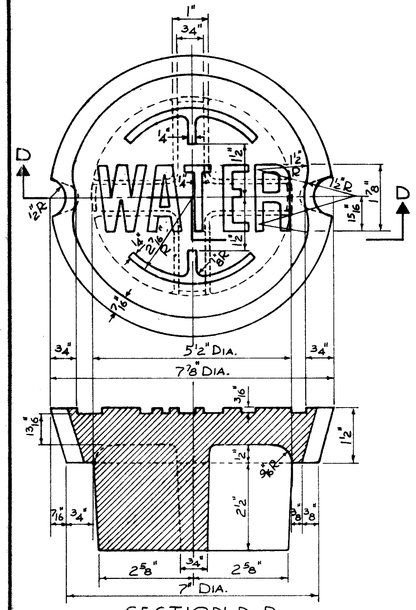
TYPICAL WATERWORK DETAILS
STANDARD 6" HYDRANT

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

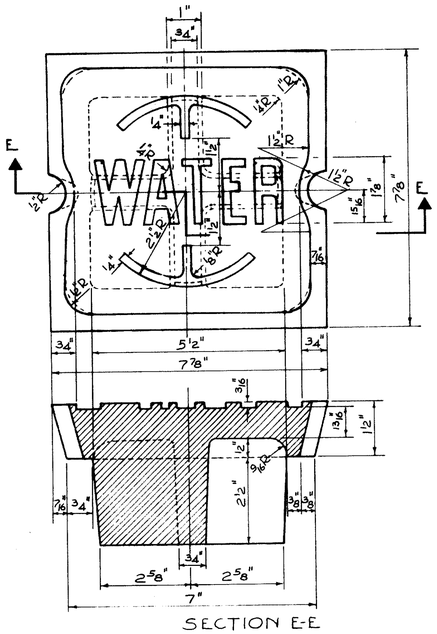
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

120
204

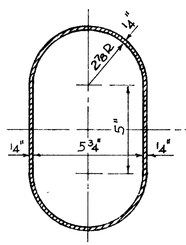
CUYAHOGA COUNTY
CUY— 21—(13.77)-(14.94)

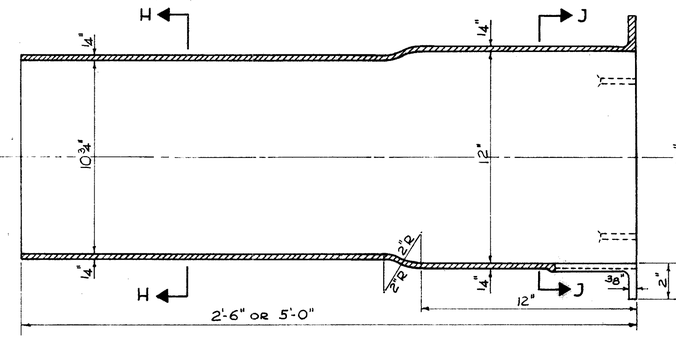


DETAIL OF ROUND COVER FOR No.1 AND 2 TOP
E.ST. WT. 20#

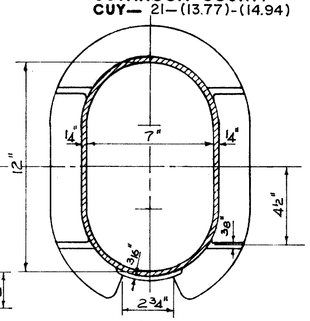


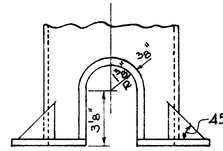
DETAIL OF SQUARE COVER FOR No.3 AND 4 TOP
E.ST. WT. 23#

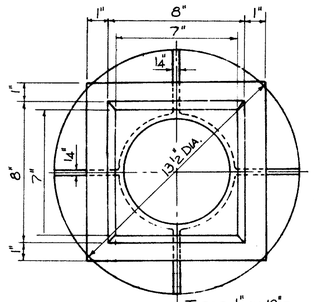

SECTION H-H

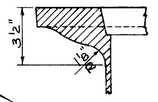


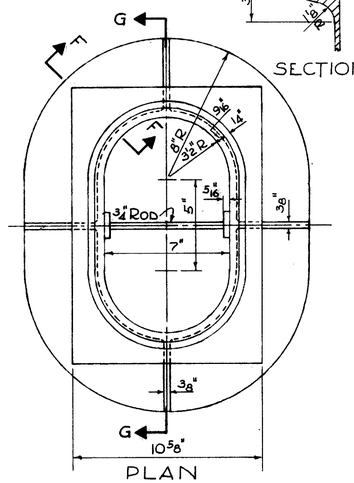
BASE
E.ST. WEIGHT 2'-6" LONG = 70#
E.ST. WEIGHT 5'-0" LONG = 126#

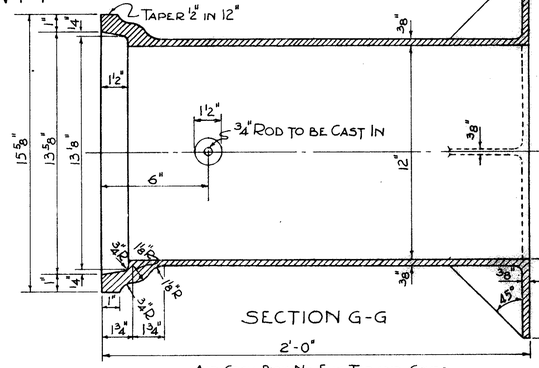

SECTION J-J


THIS OPENING TO BE IN 5'-0" BASE ONLY



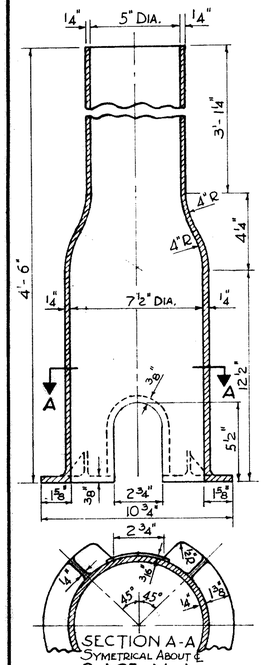

SECTION F-F


PLAN

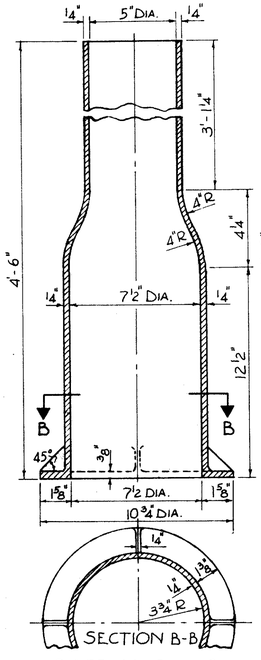


AIR COCK BOX No.5 IS TOP AND COVER
AIR COCK BOX No.6 IS TOP, BASE 2'-6" LONG AND COVER
FLUSHING BOX No.7 IS TOP, BASE 5'-0" LONG AND COVER

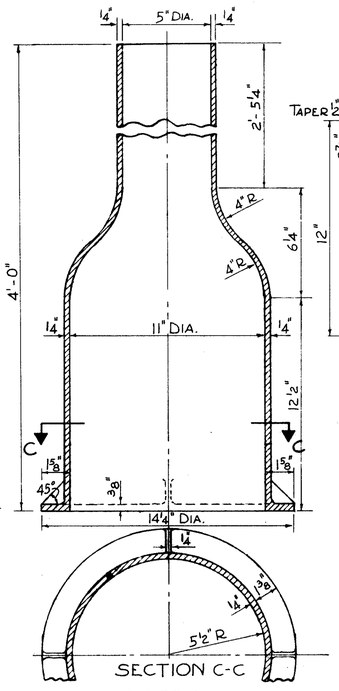
TOP
E.ST. WEIGHT 128#



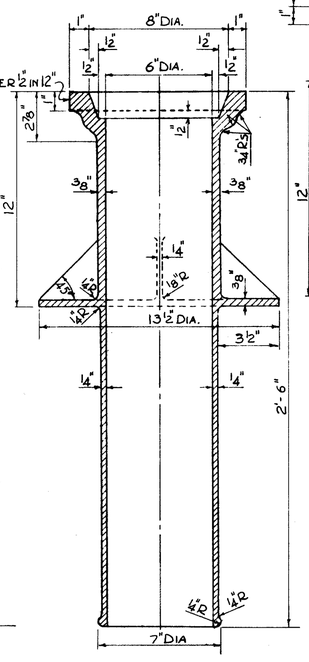
BASE No.1
FOR 1½" AND 2" VALVES
E.ST. WEIGHT 69#



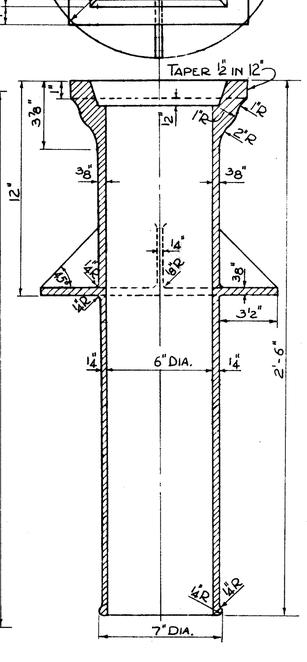
BASE No. 2 AND 3
FOR 3", 4", 6" AND 8" VALVES
E.ST. WEIGHT 71#



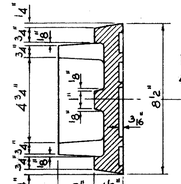
BASE No.4
FOR 10", 12" AND 16" VALVES
E.ST. WEIGHT 79#



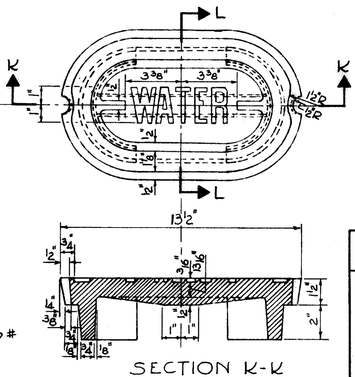
TOP WITH ROUND HEAD No.1 AND 2
E.ST. WEIGHT 73#



TOP WITH SQUARE HEAD No. 3 AND 4
E.ST. WEIGHT 85#


SECTION L-L

COVER
E.ST. WEIGHT 37#



DETAIL OF AIR COCK BOX No.5 AND 6
AND FLUSHING BOX No 7

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

TYPICAL WATERWORK DETAILS
VALVE BOXES

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

CONT. No. 58019 SHEET ACCT. No. 6146

CONT. No. 58019 SHEET ACCT. No. 1092

FED. RD DIVISION	STATE	PROJECT	
2	OHIO		

122/204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

CONT. No. 58019 SHEET ACCT. No. 1091

FOR CONTINUATION SEE DWG. 121

DILLE AVE. (EXIST. R/W)

ROSEVILLE CT.

BROADWAY AVE.

EXISTING R/W

GEAUGA AVE.

SVOBODA ST.

DILLE AVE.

MARTIN ST.

GIBBS ST.

WARREN CT.

SCHOOL PL.

MALEK PL.

DOUSE AVE.

STUPKA CT.

WILLOW FREEWAY EXTENSION

WILLOW OVER CLARK BRIDGE

CLARK FREEWAY

RAMP W-S

RAMP E-S

RAMP S-W

RAMP S-E

RAMP W-N

RAMP N-E

ROAD "A"

NOTE:
FOR LEGEND, ABBREVIATIONS, AND NOTES, SEE DRAWING 123

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.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

123/204

CUYAHOGA COUNTY
CUY - 21 - (13.77) - (14.94)

LEGEND

HYDRANT	
VENT PIPES	o V
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)

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.

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
	C.A.T.		WF			

SHEET ACCT. No. 1086
CONT. No. 58019

CONT. No. 58019 SHEET ACCT. No. 1087

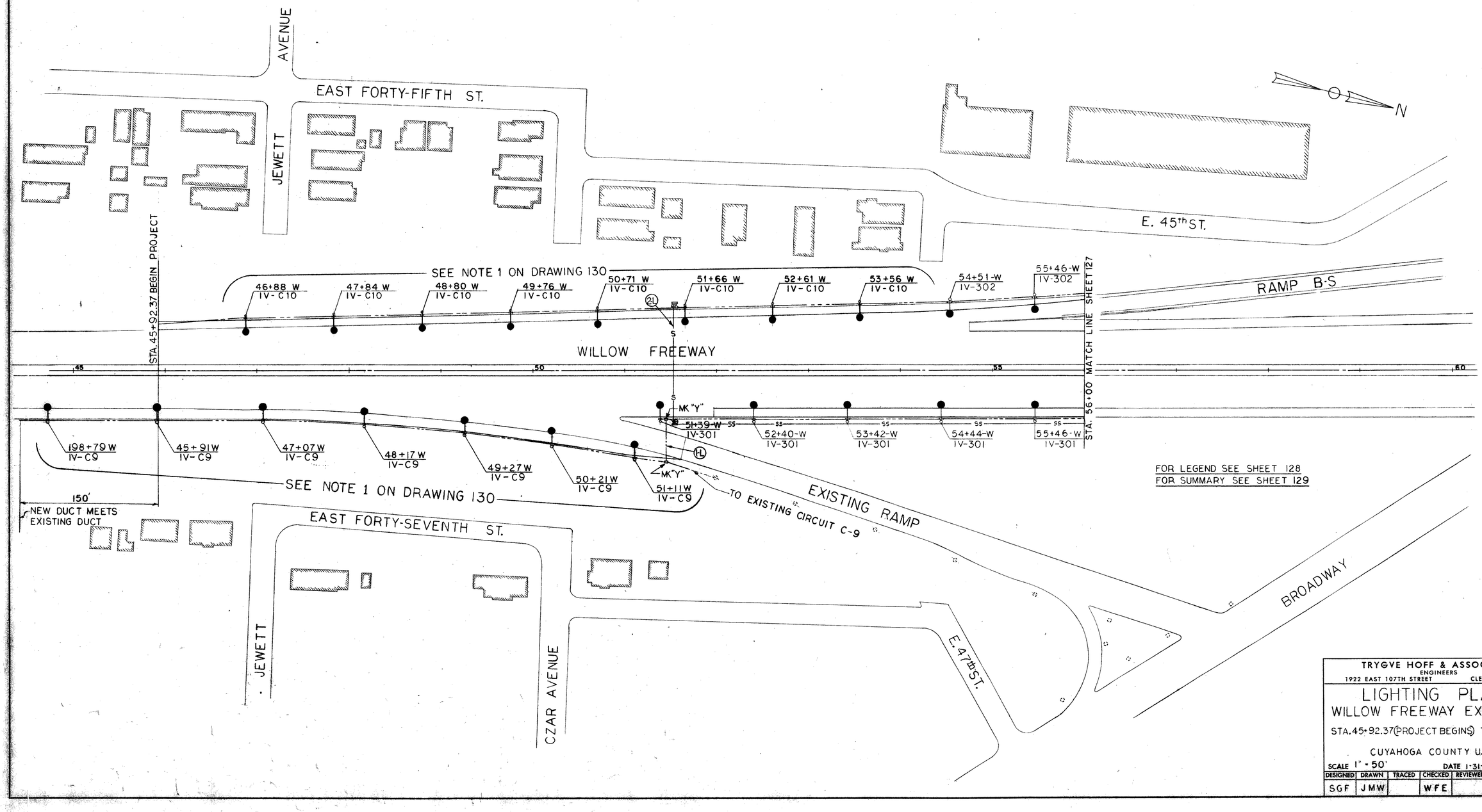
CONT. No. 58019 SHEET ACCT. No. 1088

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

126
204

CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)

PAVEMENT CROSSOVERS			
ITEM	LOCATION	TYPE	LENGTH
1 L	FREEWAY, STA. 51+45	B	48 FT.
2 L	FREEWAY, STA. 51+52	AE	130 FT.



FOR LEGEND SEE SHEET 128
FOR SUMMARY SEE SHEET 129

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

LIGHTING PLAN
WILLOW FREEWAY EXTENSION

STA. 45+92.37 (PROJECT BEGINS) TO STA. 56+00

CUYAHOGA COUNTY U.S.R. 21

SCALE 1" = 50' DATE 1-31-63

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	JMW		WFE			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

127
204

CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)

PAVEMENT CROSSOVER			
ITEM	LOCATION	TYPE	LENGTH
1-L	FREEWAY STA 59+65	C	120 FT.
2-L	FREEWAY STA. 56+56	AE	115 FT.
3-L	RAMP BS STA. 15+84	B	28 FT.

N

E. 45 ST.

ROSEVILLE CT.

DILLE

BROADWAY

STA. 64-50 END PROJECT.

RAMP W-S

RAMP S-E

RAMP BS

WILLOW FREEWAY

OHIO BELL DUCT

STA 56+00 MATCH LINE SHEET 126

16+27 BS III-C-10
17+19 BS III-C-10
18+11 BS III-C-10
19+03 BS III-C-10
19+95 BS III-C-10
20+87 BS III-C-10
21+79 BS III-C-10
22+71 BS III-C-10
23+63 BS III-C-10

56+48 W IV-302
57+50 W IV-302
58+52 W IV-302
59+53 W IV-302 MK"Y"
60+51 W IV-302
61+41 W IV-302
62+31 W IV-302

56+48 W IV-301
57+50 W IV-301
58+52 W IV-301
59+53 W IV-301 MK"Y"
60+51 W IV-301
62+46 W IV-301
63+26 W IV-301
64+06 W IV-301
63+66 W IV-301
64+46 W IV 301

59+75 W 65 RT. ℄ ALARM MH. MK"BC"
SEE NOTE.
6" DRAINPIPE
OHIO BELL EXISTING MANHOLE
TOP MANHOLE "3" EL 677-0
℄ MANHOLE 148

3+02 SRA II-CS-9
4+20 SRA II-CS-9
5+40 SRA II-CS-9
6+60 SRA II-CS-9
1+62 SRA II-CS-9
0+24 SRA II-CS-9

SERVICE ROAD "A"

LESTER
GALLUP
DOUSE
STUPKA CT.
MARTIN

FOR LEGEND SEE SHEET 128
FOR SUMMARY SEE SHEET 129

MK"Y" DENOTES DOUBLE PULLBOX

NOTE

OHIO BELL WILL EXPOSE TWO 3 1/2" FIBER DUCTS WITH ℄ AT EL. 661.67', APPROX., AND STA. 59+70 W 84' RT. THESE TWO DUCTS WILL BE ON TOP OF MAIN DUCTS RUNNING 60' FROM ℄ BROADWAY AS THEY PROCEED NORTHWEST FROM OHIO BELL MANHOLE AT STA. 59+23 W 114' RT.
CONTRACTOR WILL MAKE CONNECTION TO EXPOSED CONDUITS, WITH NECESSARY BENDS TO FOLLOW STA. 59+75 W ℄, TO ALARM SYSTEM MANHOLE, BY MEANS OF MK"BB" DUCT. SEE SHEET 133 AND 143.

ALARM MANHOLE TO BE 5'x8' SIZE AS SHOWN ON SHEET 138. TOP OF COVER AT EL. 659.5'. INVERT FOR DRAIN AT EL 648.75 (APPROX.), DRAINAGE TO CONTINUE THROUGH 50' OF 6" PIPE TO SEWER MANHOLE 29-S AT INVERT EL. 648.0'.

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

LIGHTING PLAN
WILLOW FREEWAY EXTENSION
STA. 56+00 TO STA. 64+50
INCLUDING SERVICE ROAD "A"

CUYAHOGA COUNTY U.S.R. 21
SCALE 1" = 50' DATE 1-31-63

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	SGF		WFE			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

128
204

CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)

PAVEMENT CROSSOVERS			
ITEM	LOCATION	TYPE	LENGTH
1-L	FREEWAY, STA. 108+90	C	120 FT.
2-L	RAMP S-30, STA. 3+86	B	40 FT.
3-L	RAMP 30-S, STA. 7+58	B	45 FT.
4-L	RAMP 30-S, STA. 12+05	A	45 FT.
5-L	RELOC. ORANGE AV. CONN.	A	78 FT.
6-L	RELOC. ORANGE AV.	A	78 FT.
7-L	EAST 31ST STREET	A	75 FT.
8-L	RAMP S-30, STA. 11+45	A	40 FT.
9-L	FREEWAY, STA. 116+06	AE	112 FT.
10L	RAMP S-30, STA. 3+73	AE	40 FT.
11-L	RAMP S-30, STA. 8+68	BE	45 FT.
12-L	FREEWAY, STA. 111+00	AE	123 FT.
13L	RAMP 30-S STA. 11+20	A	60 FT.

SYMBOL LEGEND

- ROADWAY LIGHTING UNIT 400 WATT 22500 LUMEN LAMP 17'-0" BRACKET ARM DETAIL ON SHEET 133
- STRUCTURE LIGHTING UNIT 400 WATT 22500 LUMEN LAMP 10'-0" BRACKET ARM DETAIL ON SHEET 140
- RAMP LIGHTING UNIT 400 WATT 22500 LUMEN LAMP 10'-0" BRACKET ARM DETAIL ON SHEET 134
- STREET LIGHTING UNIT 250 WATT 12000 LUMEN LAMP 8'-0" BRACKET ARM DETAIL ON SHEET 135
- STREET LIGHTING UNIT 10000 LUMEN LAMP 10'-0" BRACKET ARM DETAIL ON SHEET 135
- STREET LIGHTING UNIT 4000 LUMEN LAMP 8'-0" BRACKET ARM DETAIL ON SHEET 135
- COMBINATION POLICE CALLBOX & FIRE ALARM STATION DETAIL ON SHEET 133A
- SMALL SQUARES ALONG DUCT LINE INDICATE PRESENCE OF GUARD RAIL.
- TYPE "A" DUCT ONE 2" CONDUIT (——S—— "AE" FOR ALARM SYSTEM)
- TYPE "B" DUCT TWO 2" CONDUITS (——SS—— "BE" FOR ALARM SYSTEM)
- TYPE "C" DUCT TWO 2" & ONE 4" CONDUITS
- TYPE "D" DUCT FOUR 2" & ONE 4" CONDUITS
- TYPE "E" DUCT THREE 2" CONDUITS
- NON METALLIC 2" CONDUIT FOR ROADWAY STRUCTURE
- 116+16-W / IV-101 — TOP LINE ℄ OR Ⓑ STATION-INITIAL OF ROADWAY; BOT. LINE ASA/IES DISTRIBUTION TYPE-CIRCUIT NO.

OTHER SYMBOLS ARE IDENTIFIED WHERE SHOWN

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

LIGHTING PLAN
WILLOW FREEWAY EXTENSION
STA. 107+52.62 (SKEW) TO STA. 118+00

CUYAHOGA COUNTY U.S.R. 21

SCALE 1" = 50' DATE 1-31-63

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	JMW		WFE			

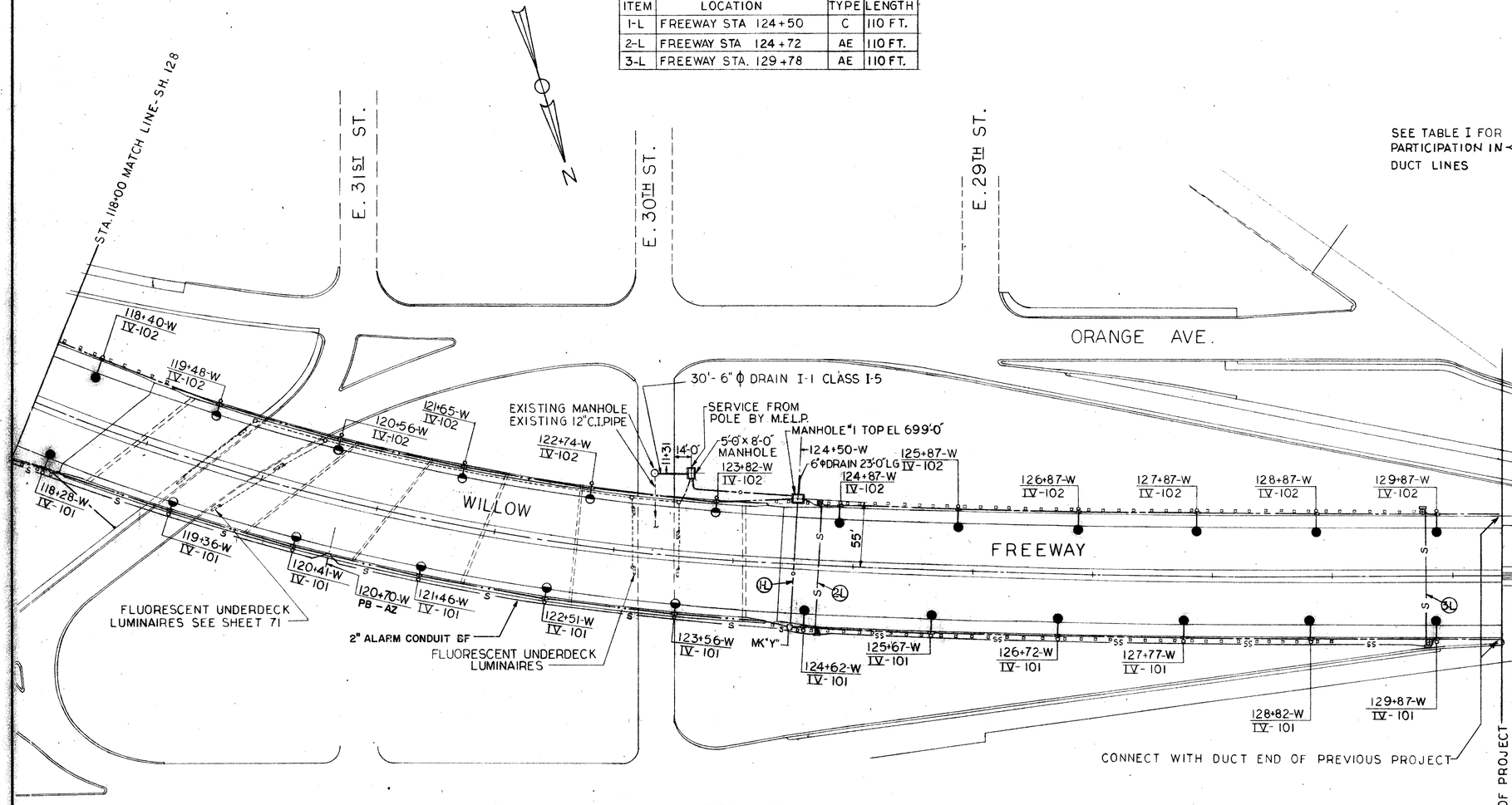
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

129
204

CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)
Normal Participation except as noted

TYPE CODE 7221

PAVEMENT CROSSOVER			
ITEM	LOCATION	TYPE	LENGTH
1-L	FREEWAY STA 124+50	C	110 FT.
2-L	FREEWAY STA 124+72	AE	110 FT.
3-L	FREEWAY STA. 129+78	AE	110 FT.



SEE TABLE I FOR PARTICIPATION IN DUCT LINES

ROADWAY SUMMARY OF MATERIAL (S-25 ELECTRICAL)

MK NO.	DESCRIPTION	SH126	SH127	SH128	SH129	UNIT	TOTAL
A	TYPE "A" DUCT	20	1550	2835	150	LIN.FT	4865
B	TYPE "B" DUCT	1360	30	1800	1350	LINFT	4540
C	TYPE "C" DUCT	—	120	125	210	LINFT	455
D	TYPE "D" DUCT	—	70	—	—	LINFT	70
E	TYPE "E" DUCT	900	1720	420	—	LINFT	3040
F	F'W'Y-TYPE STD SINGLE-ARM	22	15	21	14	EACH	72
G	F'W'Y-TYPE STD DOUBLE-ARM	—	2	—	—	EACH	2
H	RAMP TYPE STD	—	—	26	—	EACH	26
I	STRUCTURE TYPE STD.	BRIDGE ONLY	—			EACH	
J	SERVICE-ROAD TYPE STD.	—	6	6	—	EACH	12
K	SPECIAL STD. RAMP "BS"	—	9	—	—	EACH	9
L	POLE BASE FOUNDATION 5'-0"	—	15	32	—	EACH	47
② M	POLE BASE FOUNDATION 8'-0"	22	17	21	14	EACH	77
③ N_1	LUMINAIRE-M400 TYPE IV	22	19	21	14	EACH	76
④ N_2	LUMINAIRE-M400 TYPE III	—	—	26	—	EACH	26
O	LUMINAIRE-250W MERCURY	—	—	6	—	EACH	6
P	LUMINAIRE-4000LUM.INCAND	—	6	—	—	EACH	6
Q	LUMINAIRE-10000LUM.INCAND	—	9	—	—	EACH	9
⑤ R_1	UNDERDECK LIGHTING COMPL FOR WILLOW/ORANGE-E.30	—	—	—	—	LUMP	
⑥ R_2	UNDERDECK LIGHTING COMPL FOR BROADWAY/WILLOW	—	—	—	—	LUMP	
W	UNIT LIGHTING-KINGSBURY	—	—	—	—	LUMP	
⑦ X	SINGLE PULLBOX (LIGHTING)	22	32	57	15	EACH	134
Y	DOUBLE PULLBOX	2	4	5	1	EACH	12
⑧ Z	BOX 24x12x12	—	—	—		EACH	
AA	TRANSFORMER MH 8'0"x22'0"	—	1	—	—	EACH	1
AB	TRANSFORMER MH 8'0"x11'0"	—	—	1	1	EACH	2
AC	MANHOLE 5'0"x8'0"	—	—	—	1	EACH	1
* AD	FIRE & POLICE ALARM	2	2	4	4	EACH	12
AE	TYPE "A" DUCT FOR ALARM	140	120	600	300	LIN.FT	1160
⑨ AF	NON-METALLIC 2C. RDWY STRUC	—	—	—		LIN.FT	
⑩ AG	WIRE No.4 600V	1400	10000	12500	3400	LIN.FT	27300
AH	WIRE No.6 600V	2850	6400	6000	3800	LIN.FT	19050
AI	WIRE No.8 5KV	4000	3300	400	300	LIN.FT	8000
② AJ	SPEC. STD. BR'DW'Y O'RPASS	—	—	—	—	EACH	3
AL	FOUNDATION FOR CALL-BOX	2	2	4	4	EACH	12
⑫ AM	WIRE, ALARM CIRCUIT	470	1000	1320	1250	LIN.FT.	—
⑫ AN	SERVICE CABLE	150	150	400	300	LIN.FT.	—
AX	SINGLE PULLBOX (ALARM)	2	2	8	4	EACH	16
AZ	BOX 30X12X12	—	—	—		EACH	
BB	SPECIAL DUCT	—	20	—	—	LIN.FT.	20
BC	MANHOLE (ALARM SYSTEM)	—	1	—	—	EACH	1
BE	TYPE "B" DUCT FOR ALARM	460	900	1020	550	LIN.FT.	2930
BF	NON-MET. 2" COND. (ALARM)	—	—	—		LIN.FT.	
	SUMMARY OF MATERIAL (1-9 = DRAINAGE)						
AK	STONE UNDERDRAIN, 1-9 NO. 2	3	12	—	80	LIN.FT.	95

STA 130+41.88 END OF PROJECT

BRIDGE SUMMARY OF MATERIAL (S-25 ELECTRICAL)

	MK No.	DESCRIPTION	CUY-21-14.04 (BROADWAY)	CUY-21-14.55 (KINGSBURY RUN)	CUY-21-15.15 (ORANGE & E.30th)	UNIT
③	N_1	LUMINAIRES M-400 type IV		41	10	EA.
④	N_2	LUMINAIRES M-400 type III		5		EA.
⑤	R_1	UNDERDECK LIGHTING			LUMP	LUMP
⑥	R_2	UNDERDECK LIGHTING	LUMP			LUMP
⑧	Z	BOX 24 X 12 X 12	7		10	EA.
⑨	AF	NON-METALLIC COND. 2"	660		2300	LIN.FT.
⑩	AG	WIRE No. 4 600 V		12600	3600	LIN.FT.
	I	LIGHT POLE 10' ARM			10	EA.
②	AJ	LIGHT POLE 10' ARM	10			EA.
	W	UNIT LIGHTING (WIRING)		LUMP		LUMP
	AZ	BOX 30 X 12 X 12			1	EA.
	BF	2" ALARM CONDUIT			620	LIN.FT.
		ELECTRICAL GROUNDS	LUMP		LUMP	LUMP

FOR LEGEND SEE SHEET 128

TABLE-I
NORMAL PARTICIPATING DUCT LINES

SHEET	126	127	128	129	TOTAL	Total 100% city Participation
TYPE A		405	1021		1426	3439
TYPE B	48	28	1665	1170	2911	1629
TYPE C		120	120	110	350	105
TYPE D						70
TYPE E		300	400		700	2340

DUCT LINES COVERED BY ABOVE QUANTITIES ARE ADJACENT TO GUARD RAIL, ALONG AN UNDERPASS, IN ROADWAY CROSSING, OR UNDER CENTER ISLAND.

THE DIFFERENCE BETWEEN TABLE I *Sheet totals* and ROADWAY SUMMARY *Sheet totals (A-E)* ARE 100% CITY PARTICIPATION.

BRIDGE SUMMARY TOTAL

③ 41 REQ'D FOR KINGSBURY RUN
④ 5 REQ'D FOR KINGSBURY RUN
⑤ SEE SHEET 141
⑥ SEE SHEET 139

⑧ 7 REQ'D BROADWAY OVERPASS SHEET 145
⑨ 660FT. REQ'D BROADWAY OVERPASS SHEET 145
⑩ 12600FT. REQ'D KINGSBURY RUN

⑫ NOT PART OF THIS CONTRACT (ITEMS AM & AN).

ROADWAY SUMMARY TOTAL

② 3 REQ'D BROADWAY OVERPASS, Sheet 145 (On Approaches)

⑦ 8 REQ'D BROADWAY OVERPASS Sheet 145 (On Approaches)

* 14 100% City Participation

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

LIGHTING PLAN
WILLOW FREEWAY EXTENSION
STA 118+00 TO END OF PROJECT

CUYAHOGA COUNTY U.S.R. 21

SCALE 1"=50' DATE 1-31-63

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	JMW	JMW	WFE			

Rev.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

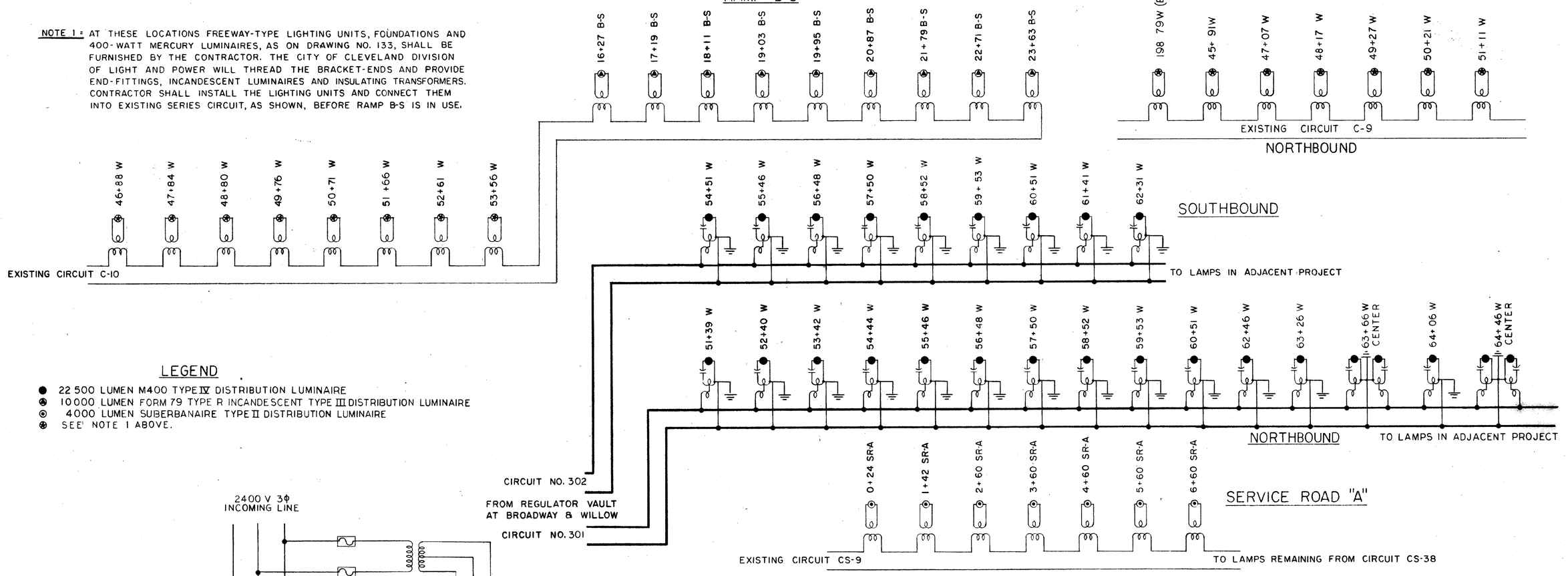
130
204

CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)

NOTE 1 = AT THESE LOCATIONS FREEWAY-TYPE LIGHTING UNITS, FOUNDATIONS AND 400-WATT MERCURY LUMINAIRES, AS ON DRAWING NO. 133, SHALL BE FURNISHED BY THE CONTRACTOR. THE CITY OF CLEVELAND DIVISION OF LIGHT AND POWER WILL THREAD THE BRACKET-ENDS AND PROVIDE END-FITTINGS, INCANDESCENT LUMINAIRES AND INSULATING TRANSFORMERS. CONTRACTOR SHALL INSTALL THE LIGHTING UNITS AND CONNECT THEM INTO EXISTING SERIES CIRCUIT, AS SHOWN, BEFORE RAMP B-S IS IN USE.

LEGEND

- ● 22 500 LUMEN M400 TYPE IV DISTRIBUTION LUMINAIRE
- ▲ 10000 LUMEN FORM 79 TYPE R INCANDESCENT TYPE III DISTRIBUTION LUMINAIRE
- ◉ 4000 LUMEN SUBERBANAIRE TYPE II DISTRIBUTION LUMINAIRE
- ⊛ SEE NOTE 1 ABOVE.



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

LIGHTING SCHEMATIC
WILLOW FREEWAY EXTENSION

CUYAHOGA COUNTY U.S.R. 21

SCALE NOT TO SCALE DATE 1-30-63

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	JMW		WFE			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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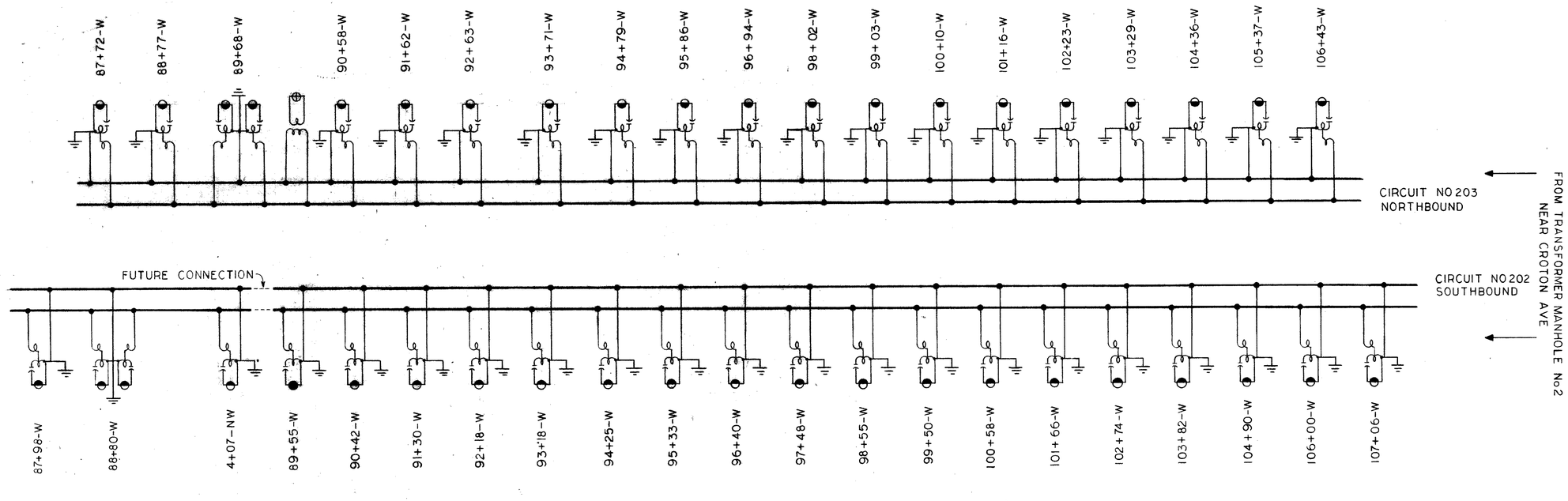
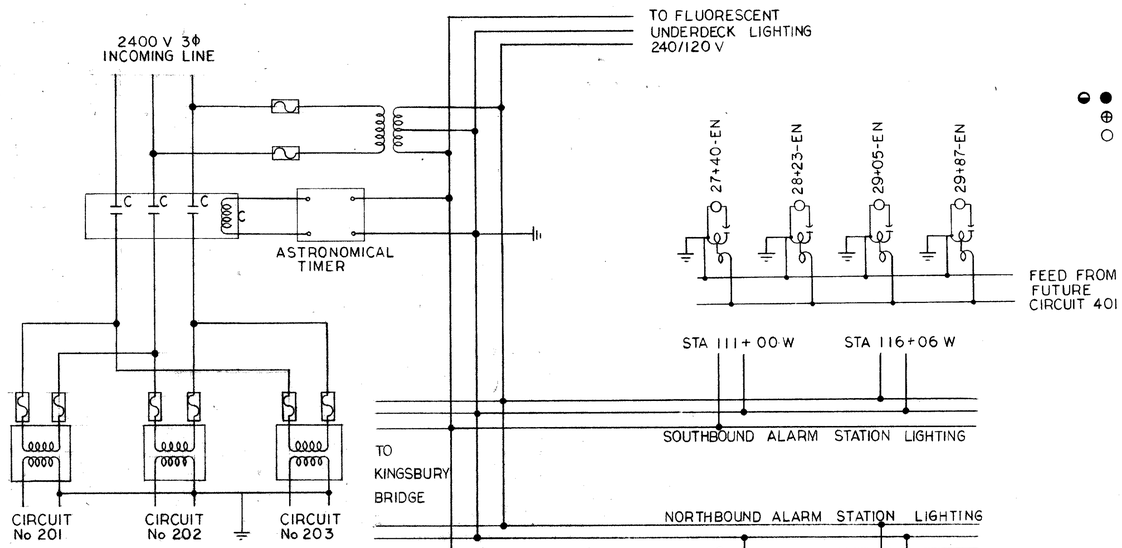
204

CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)





POWER FEED AT MANHOLE No 2

ALARM STATION LIGHTING CIRCUIT

LEGEND

- ◒ ● 22 500 LUMEN M400 TYPE IV DISTRIBUTION LUMINAIRE
- ⊕ 100 WATT INCANDESCENT LAMP ON ALARM STATION
- ○ 22 500 LUMEN M400 TYPE III DISTRIBUTION LUMINAIRE

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

LIGHTING SCHEMATIC

BRIDGE NO CUY 21 14 55
WILLOW FREEWAY OVER KINGSBURY RUN
CUYAHOGA COUNTY U.S.R. 21

SCALE NONE DATE 1-30-63

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	JMW		WFE			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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204

CUYAHOGA COUNTY
CUY—21-(13.77) (14.94)

CIRCUIT NO.102
SOUTHBOUND

123+82-W 122+74-W 121+65-W 120+56-W 119+48-W 118+40-W 117+32-W 116+24-W

124+87-W 125+87-W 126+87-W 127+87-W 128+87-W 129+87-W 7+49-30-S

115+16-W 114+16-W 113+16-W 112+16-W 111+16-W 110+16-W 109+16-W 108+16-W

8+39-30-S 9+29-30-S 10+19-30-S 11+09-30-S 9+10-RO 11+99-30-S 9+90-RO 12+89-30-S

3+20-SRD 2+20-SRD 1+20-SRD 0+20-SRD

13+77-30-S

CIRCUIT NO 201
SOUTHBOUND
FROM TRANSFORMER
MANHOLE #2 NEAR
CROTON AVE.

FROM TRANSFORMER MANHOLE #1
ON EAST 30 STREET

CIRCUIT NO.101
NORTHBOUND

123+56-W 122+51-W 121+46-W 120+41-W 119+36-W 118+28-W 117+20-W 116+16-W 115+16-W 114+16-W 113+16-W 112+16-W 111+16-W

124+62-W 125+67-W 126+72-W 127+77-W 128+82-W 129+87-W

110+33-W 109+35-W 108+37-W 107+40-W

7+20-RO 6+20-RO 4+42-RO 3+22-RO

3+92-S-30 4+75-S-30 5+58-S-30 6+41-S-30 7+24-S-30 8+07-S-30 8+90-S-30 9+73-S-30 10+56-S-30 11+34-S-30 12+12-S-30 12+90-S-30

1+69-SRC 2+79-SRC 3+89-SRC

CIRCUIT NO 103
NORTHBOUND
FROM TRANSFORMER
MANHOLE #1 ON EAST
30 STREET

LEGEND

- ● = 22 500 LUMEN M400 TYPE IV DISTRIBUTION LUMINAIRE
- ○ = 22 500 " " TYPE III " "
- ◎ = 12 000 " M250 TYPE II " "
- ⊕ = 100 WATT INCANDESCENT LAMP ON ALARM STATION
- ◓ = 22 500 LUMEN M400 TYPE IV DISTRIBUTION LUMINAIRE (ON STRUCTURE)

2400 V 3Φ
INCOMING LINE

C C C C

ASTRONOMICAL
TIMER

2400/480 V 1Φ
15KV TRANSFORMER

CIRCUIT
No 101

CIRCUIT
No 102

CIRCUIT
No 103

TO FLUORESCENT
UNDERDECK LIGHTING
240/120 V

STA. 124+72-W STA. 129+78-W

SOUTHBOUND ALARM STATION LIGHTING

NORTHBOUND ALARM STATION LIGHTING

STA. 124+72-W STA 129+79-W

ALARM STATION LIGHTING CIRCUIT

POWER FEED AT MANHOLE No 1

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

LIGHTING SCHEMATIC
WILLOW FREEWAY EXTENSION

CUYAHOGA COUNTY U.S.R. 21

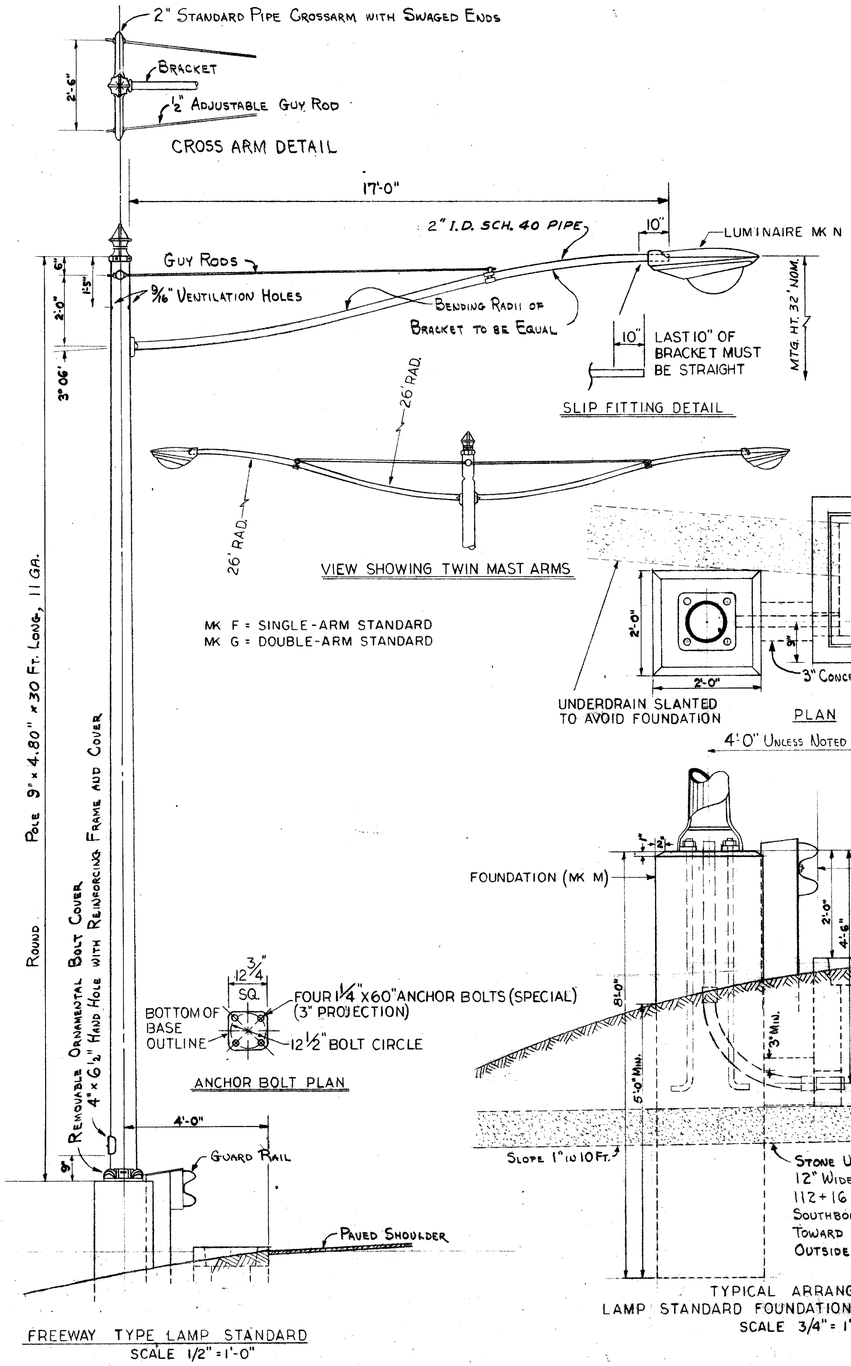
SCALE NONE DATE 1-30-63

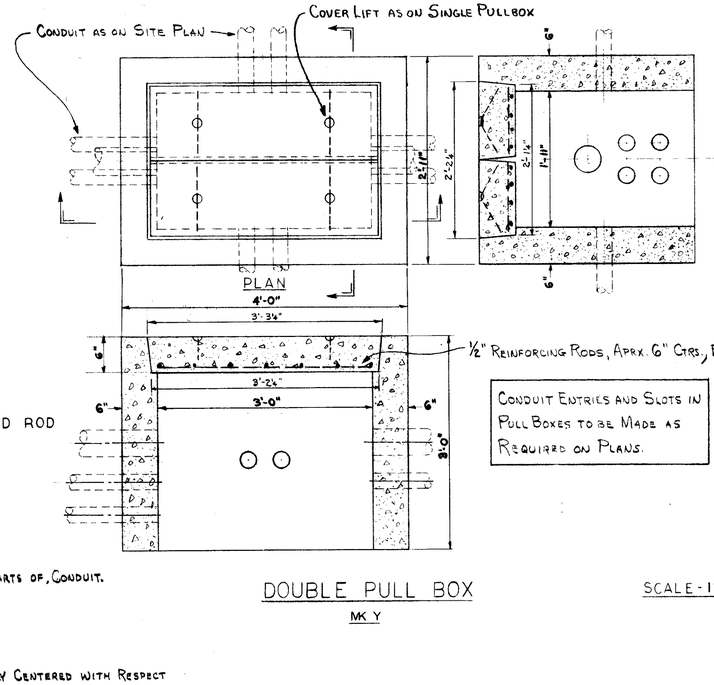
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
S.G.F.	J.M.W.		W.F.E.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

133
204

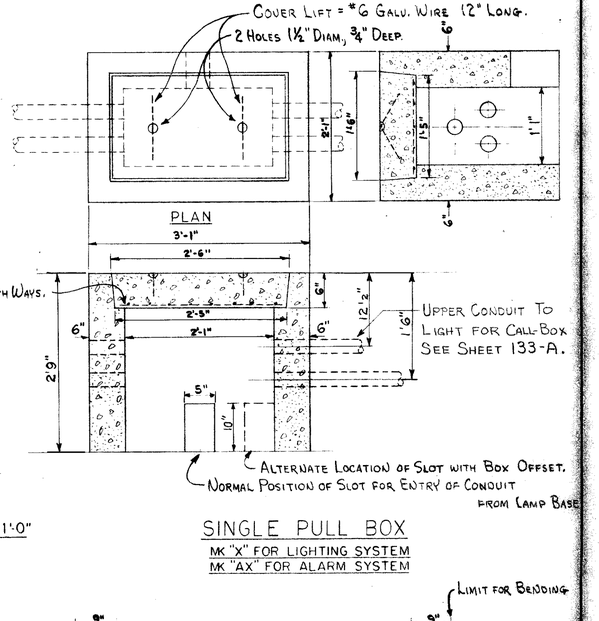
CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)



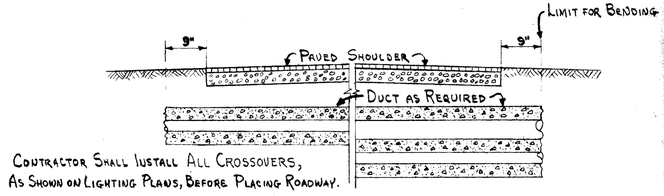


DOUBLE PULL BOX
MK Y

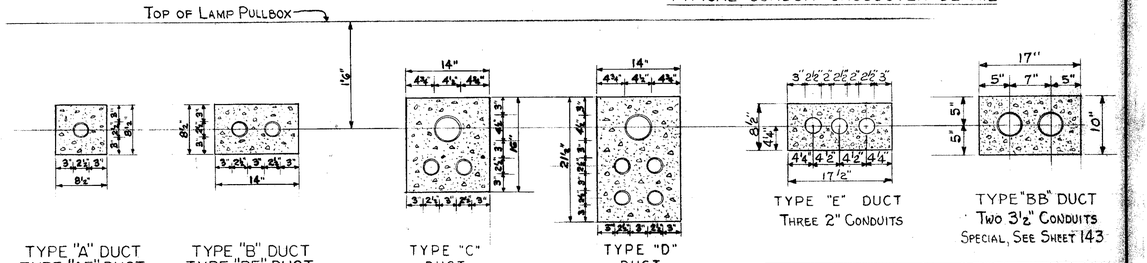
SCALE - 1" = 1'-0"



SINGLE PULL BOX
MK "X" FOR LIGHTING SYSTEM
MK "AX" FOR ALARM SYSTEM



TYPICAL CONDUIT CROSSOVER DETAIL



SCALE OF DUCT SECTIONS 1" = 1'-0"

MK NOS. REFER TO PAY QUANTITY ITEMS ON SHEET 143

REFER TO DIVISION OF LIGHT AND POWER, CITY OF CLEVELAND, DRAWING NO. 5028

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

LIGHTING DETAILS
WILLOW FREEWAY EXTENSION
FREEWAY LIGHTING

CUYAHOGA COUNTY U.S.R. 21

SCALE AS NOTED DATE 1-29-63

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	JMW		SGF			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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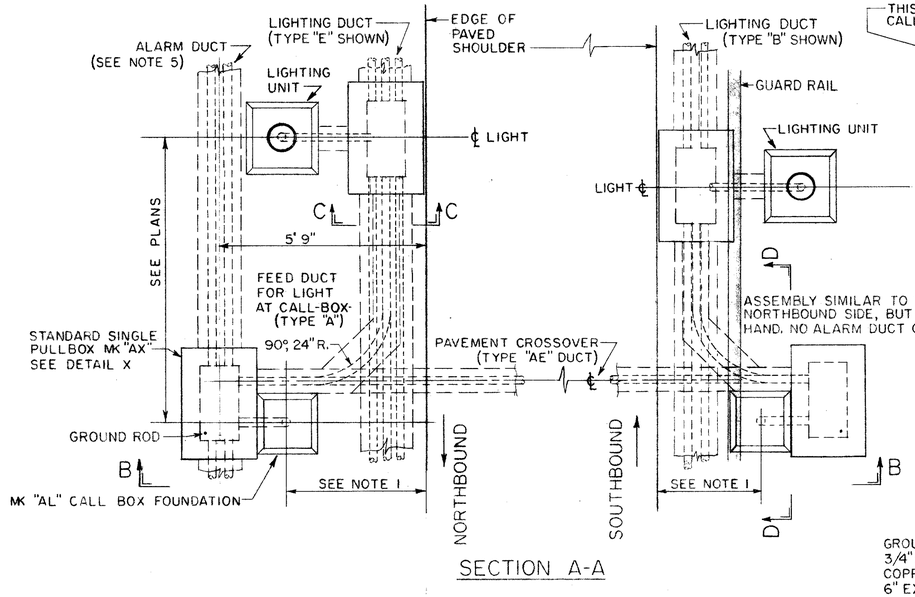
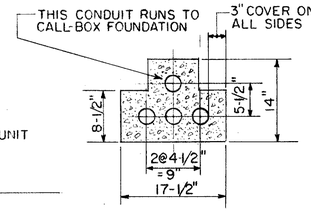
204

CUYAHOGA COUNTY
CUY— 21 – (13.77) (14.94)

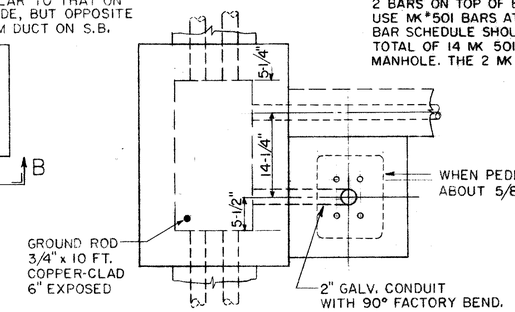


SECTION A-A

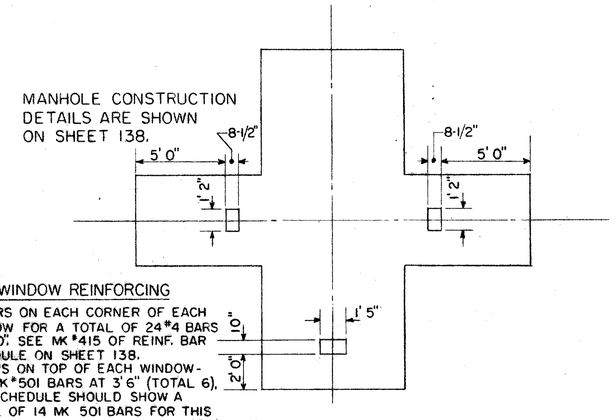
FOR DETAILS OF LIGHTING SYSTEM SEE SHEET 133



SECTION C-C
SCALE 1" = 1'-0"



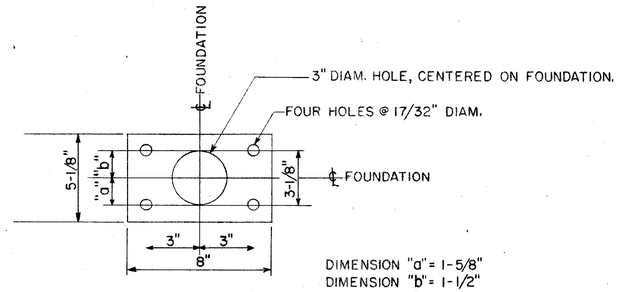
DETAIL X
SCALE 1" = 1'-0"



WINDOW REINFORCING

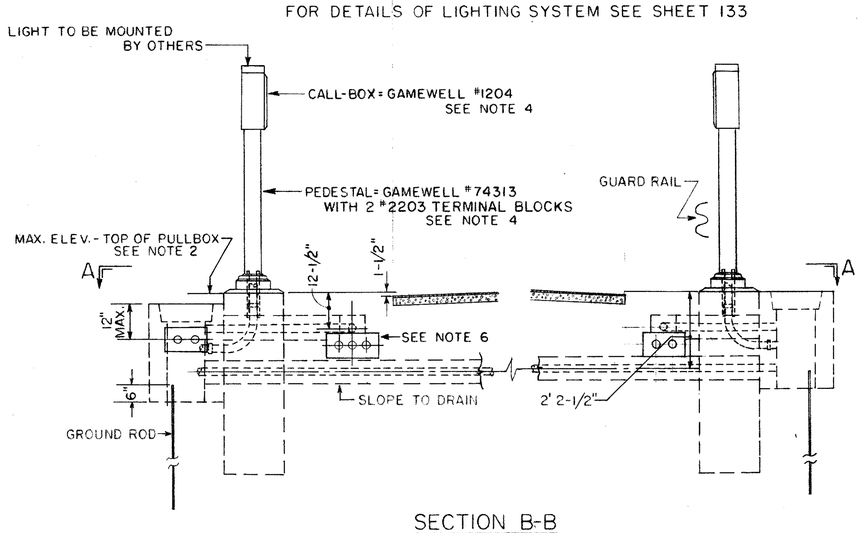
2 BARS ON EACH CORNER OF EACH WINDOW FOR A TOTAL OF 24 #4 BARS AT 2' 0". SEE MK #415 OF REINF. BAR SCHEDULE ON SHEET 138.
2 BARS ON TOP OF EACH WINDOW - USE MK #501 BARS AT 3' 6" (TOTAL 6), BAR SCHEDULE SHOULD SHOW A TOTAL OF 14 MK 501 BARS FOR THIS MANHOLE. THE 2 MK 502 BARS ARE OMITTED.

MK "BC" MANHOLE - EXPLODED PLAN VIEW
SHOWING WINDOWS FOR DUCT ENTRANCE
SCALE 1/4" = 1' 0"



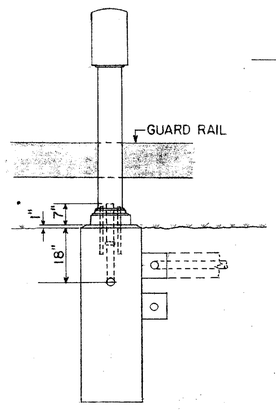
DIMENSION "a" = 1-5/8"
DIMENSION "b" = 1-1/2"

USE TEMPLATE FURNISHED WITH PEDESTAL TO LOCATE ANCHOR BOLTS IN FOUNDATION. IF NO TEMPLATE IS FURNISHED, MAKE ONE OF #10 GAUGE SHEET STEEL WITH HOLES AS INDICATED ABOVE.

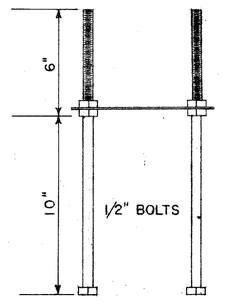


SECTION B-B

TYPICAL ALARM CALL-BOX STATION
SCALE 1/2" = 1' 0"



SECTION D-D



ANCHOR BOLT LOCATION
SCALE 3" = 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 "B" OR TYPE "E", AS CALLED FOR ON LIGHTING PLANS.

CONT. No. 58019 SHEET ACCT. NO. 5042

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

ELECTRICAL DETAILS
WILLOW FREEWAY EXTENSION
ALARM SYSTEM DETAILS

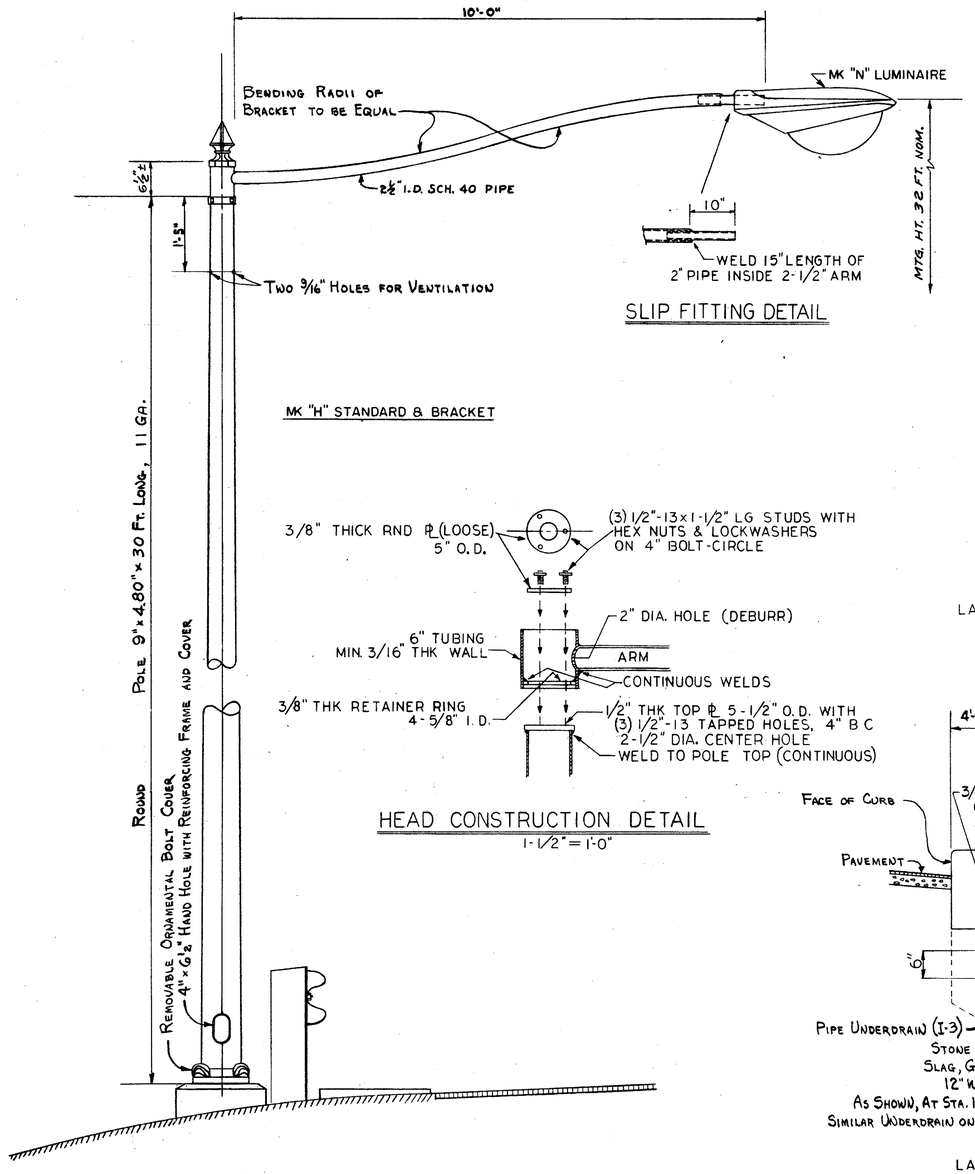
CUYAHOGA COUNTY U.S.R. 21
SCALE AS NOTED DATE JAN. 21, 1963

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	SGF		WFE			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

134
204

CUYAHOGA COUNTY
CUY—21-(13.77)(4.94)

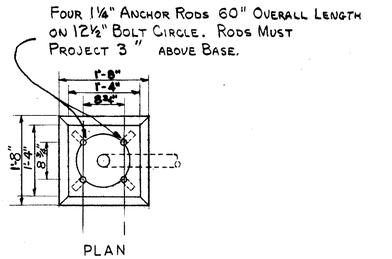


MK "H" STANDARD & BRACKET

TYPICAL LAMP STANDARD
SCALE 3/4" = 1'-0"

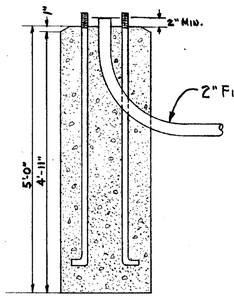
HEAD CONSTRUCTION DETAIL
1-1/2" = 1'-0"

REFER TO:
DIVISION OF LIGHT AND POWER
CITY OF CLEVELAND
DRAWING NO. 4954

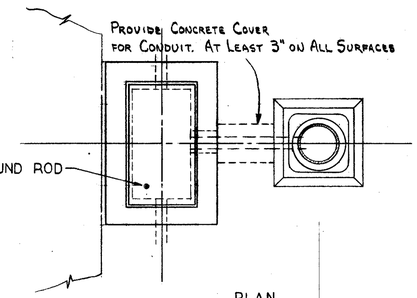


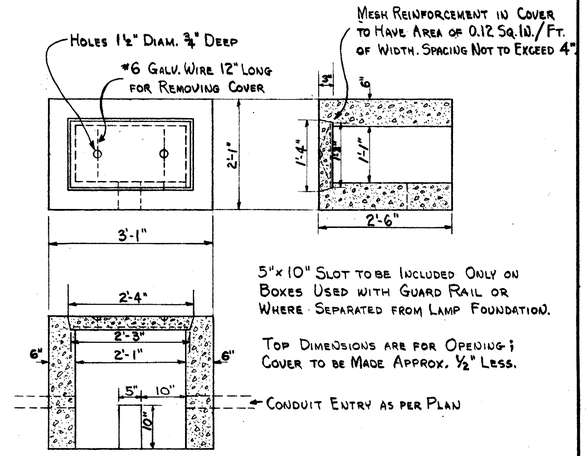
PLAN

SLIP FITTING DETAIL



SECTION
LAMP STANDARD FOUNDATION
(MK "L")
SCALE 3/4" = 1'-0"

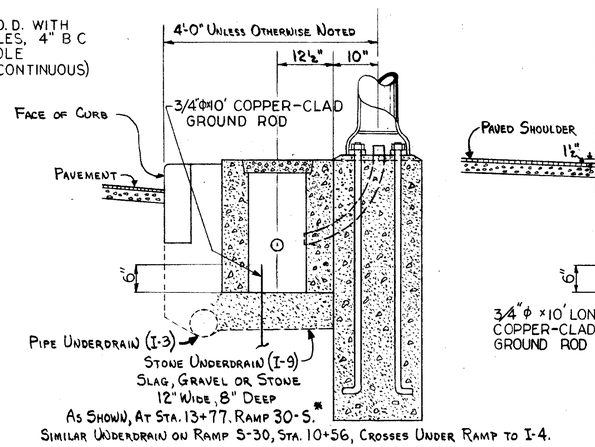




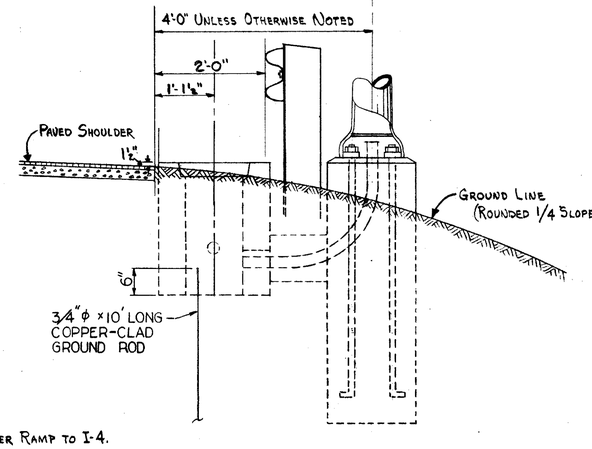
5"x 10" SLOT TO BE INCLUDED ONLY ON BOXES USED WITH GUARD RAIL OR WHERE SEPARATED FROM LAMP FOUNDATION.

TOP DIMENSIONS ARE FOR OPENING; COVER TO BE MADE APPROX. ½" LESS.

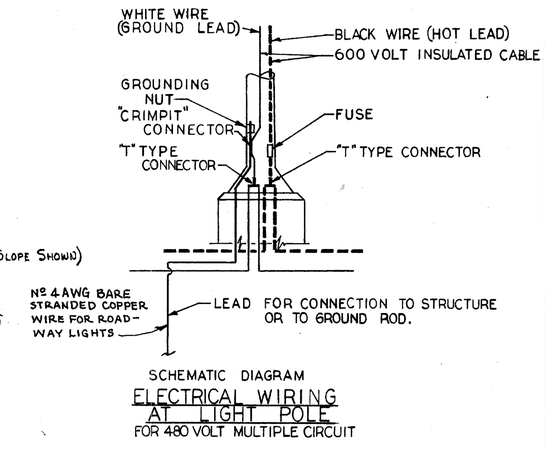
SINGLE PULLBOX (MK "X") DETAILS
SCALE 3/4" = 1'0"



TYPICAL ARRANGEMENT
LAMP STANDARD AND PULLBOX
WITH CURB
SCALE 3/4" = 1'-0"



TYPICAL ARRANGEMENT
LAMP STANDARD AND PULLBOX
WITH GUARD RAIL
SCALE 3/4" = 1'-0"



SCHEMATIC DIAGRAM
ELECTRICAL WIRING AT LIGHT POLE
FOR 480 VOLT MULTIPLE CIRCUIT

*ALSO AT STA. 47+84 AND 61+41 ON SOUTHBOUND SIDE OF WILLOW FREEWAY, STA. 60+51 AND 62+46 ON NORTHBOUND, STA. 63+66 AT CENTER OF FREEWAY, AND STA. 16+27 ON RAMP B-S.

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

LIGHTING DETAILS
WILLOW FREEWAY EXTENSION RAMPS
CUYAHOGA COUNTY U.S.R. 21

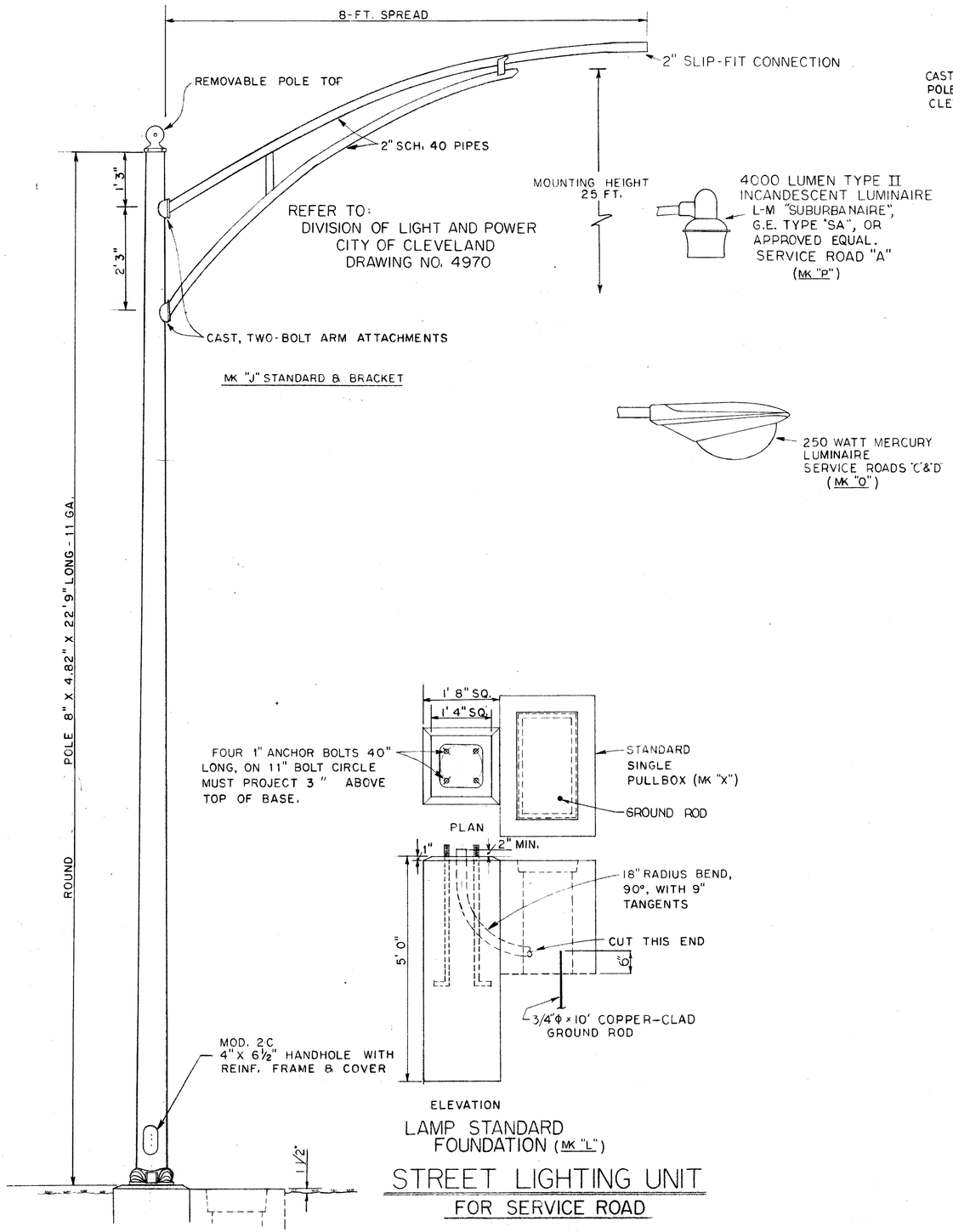
SCALE AS NOTED DATE 1-31-63

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	JMW		SGF			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

135
204

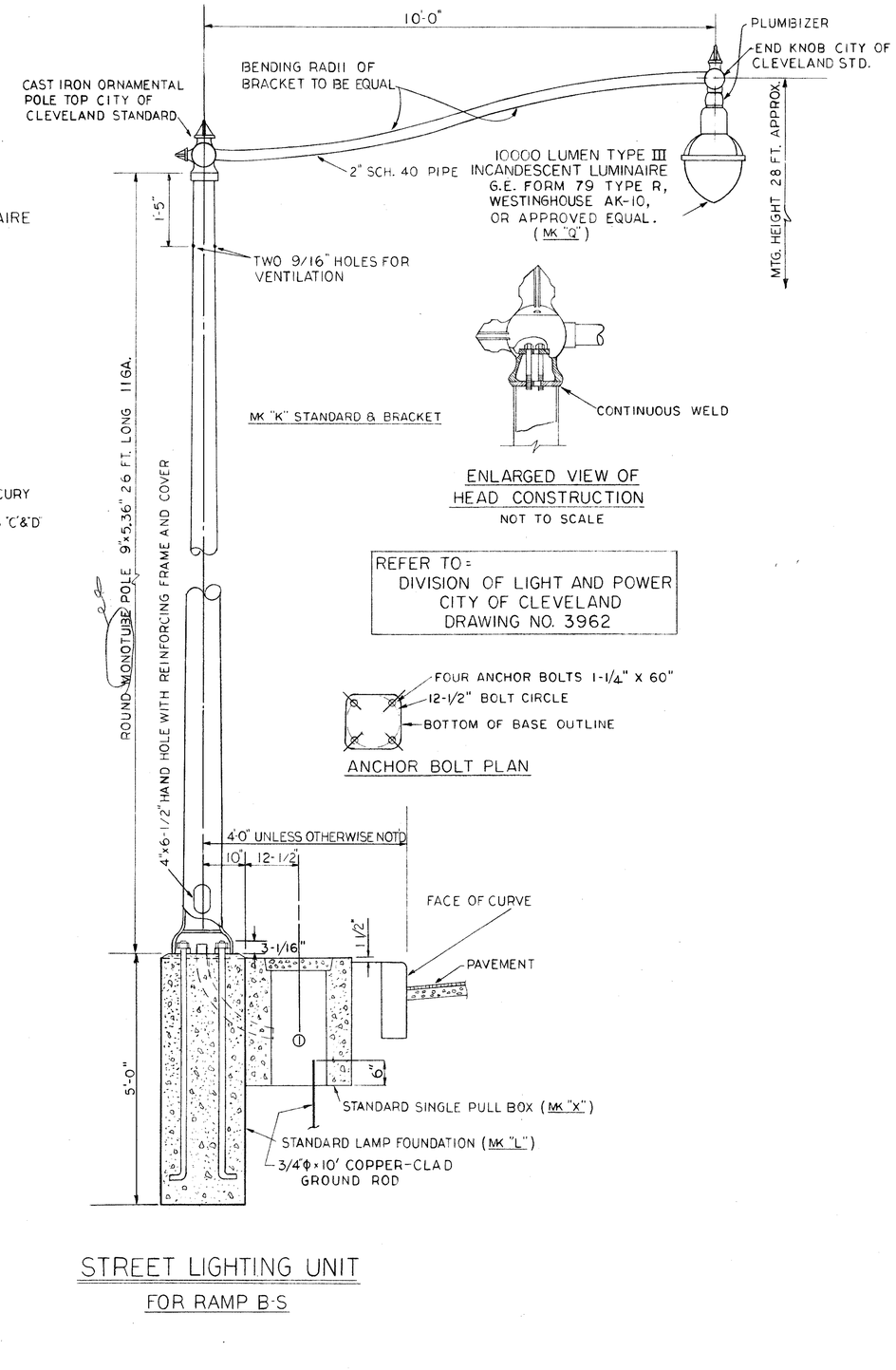
CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)



LAMP STANDARD
FOUNDATION (MK "L")

STREET LIGHTING UNIT

FOR SERVICE ROAD



STREET LIGHTING UNIT

FOR RAMP B-S

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

LIGHTING DETAILS
WILLOW FREEWAY EXTENSION
SPECIAL LIGHTING UNITS

CUYAHOGA COUNTY U.S.R. 21

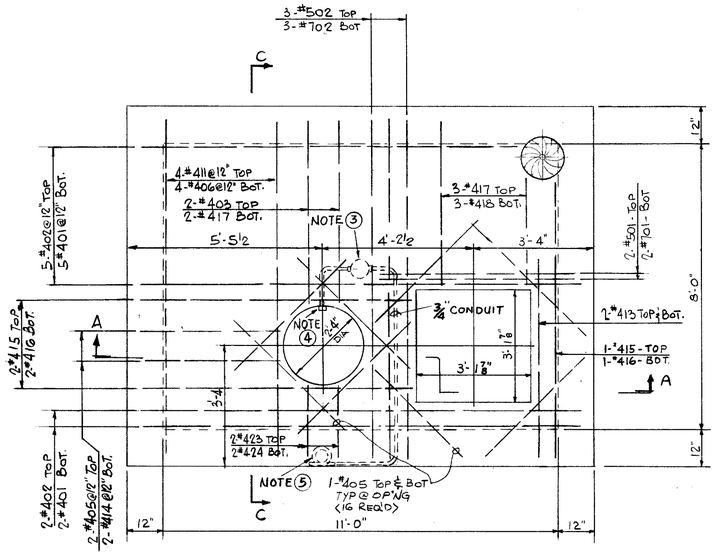
SCALE 3/4" = 1'-0" DATE 1-31-63

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	PC		SGF			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

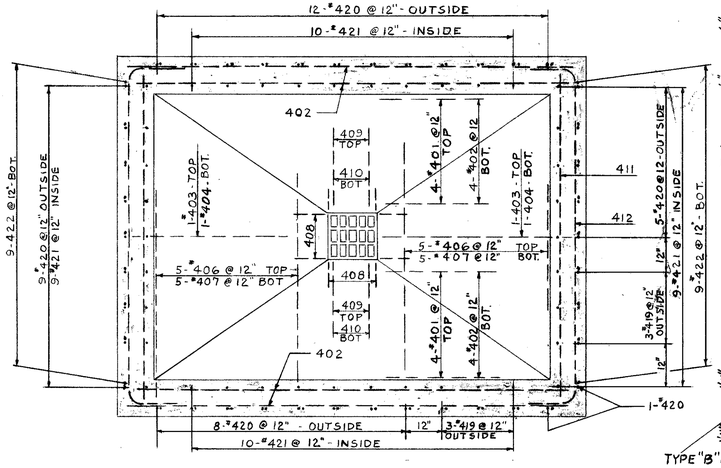
136
204

CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)

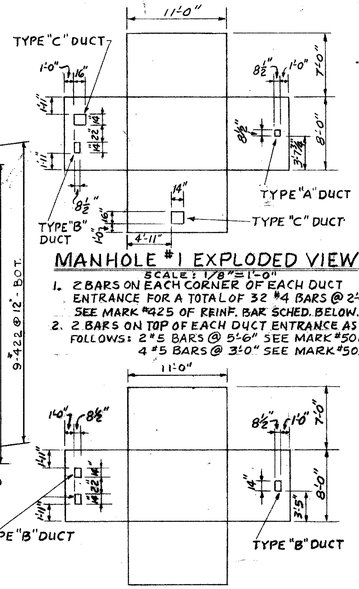


PLAN (MANHOLE №1 & №2)

DESIGN L.L. 250#/ft² OR 8000# WHEEL LOAD

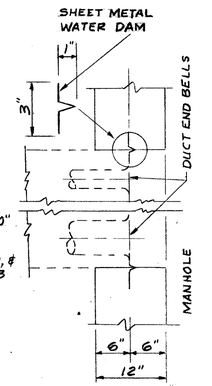


SECTION B-B

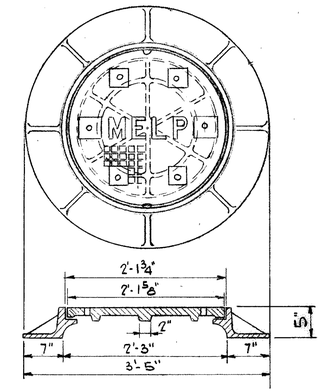


MANHOLE #1 EXPLODED VIEW
SCALE: 1/8"=1'-0"

1. 2 BARS ON EACH CORNER OF EACH DUCT ENTRANCE FOR A TOTAL OF 32 #4 BARS @ 2'-0" SEE MARK #425 OF REINF. BAR SCHED. BELOW.
2. 2 BARS ON TOP OF EACH DUCT ENTRANCE AS FOLLOWS: 2 #5 BARS @ 5'-6" SEE MARK #501, & 4 #5 BARS @ 3'-0" SEE MARK #503



DETAIL OF DUCT OPENING
NO SCALE



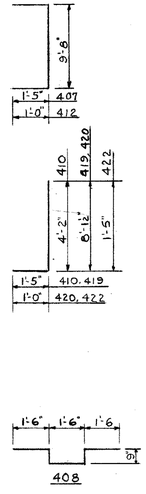
STANDARD CI MANHOLE DETAIL
SIDEWALK TYPE RING & COVER

MANHOLE #2 EXPLODED VIEW SCALE 1/8"=1'-0"

1. 2 BARS ON EACH CORNER OF EACH DUCT ENTRANCE FOR A TOTAL OF 24 #4 BARS @ 2'-0" SEE MARK #425 OF REINF. BAR SCHED. BELOW.
2. 2 BARS ON TOP OF EACH DUCT ENTRANCE AS FOLLOWS: 2 #5 BARS @ 5'-6" SEE MARK #501, & 2 #5 BARS @ 3'-0" SEE MARK #503

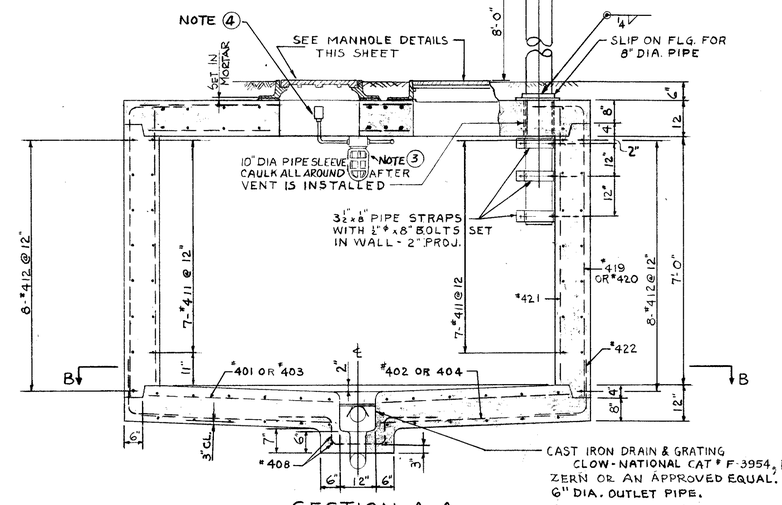
REINFORCING BAR SCHEDULE

MARK	SIZE	No. REQD	L'GTH	TYPE	WGT	BENDING DIAGRAMS
401	#4	15	11-8	STR	117	
402		45	12-8	STR	381	
403		4	5-2	STR	14	
404		2	5-8	STR	8	
405		18	4-0	STR	48	
406		14	8-8	STR	81	
407		10	12-6	B	84	
408		4	6-0	B	16	
409		4	3-8	STR	10	
410		4	5-7	B	15	
411		18	9-8	STR	116	
412		16	11-8	B	125	
413		2	5-6	STR	7	
414		2	3-6	STR	5	
415		3	7-9	STR	16	
416		3	7-3	STR	15	
417		5	4-9	STR	16	
418		3	4-3	STR	9	
419		6	9-6½	B	38	
420		36	9-1½	B	219	
421		38	7-9½	STR	197	
422		18	2-5	B	29	
423		2	2-0	STR.	3	
424	#4	2	1-6	STR.	2	
425	#4	56	2'-0	STR.	75	
501	#5	6	5-6	STR	34	
502	#5	3	9-8	STR	30	
503	#5	6	3'-0	STR	19	
701	#7	2	5-6	STR	22	
702	#7	3	8-8	STR	53	
			TOTAL		1804	

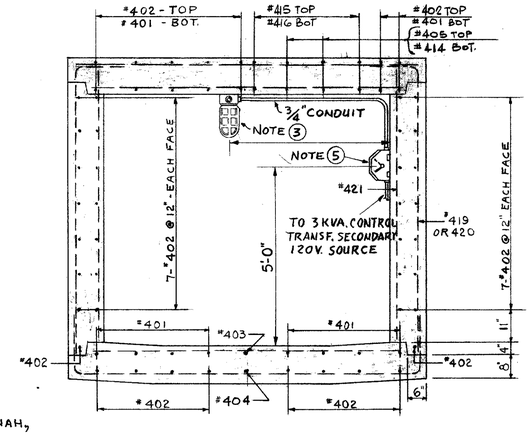


STRUCTURAL NOTES

CONCRETE SHALL BE CLASS C OR CLASS E AT THE OPTION OF THE CONTRACTOR.
REINFORCING STEEL SHALL BE 2" CLEAR FROM FACE OF CONCRETE UNLESS NOTED OTHERWISE.
SEE DWG. #138 FOR WATERPROOFING NOTE.



SECTION A-A



SECTION C-C

NOTES

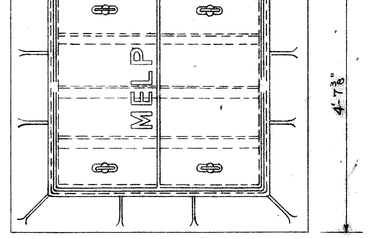
① FOR GROUNDING, 2-1" DIAM. X 10'-0" LONG COPPER-CLAD GROUND RODS SHALL BE PLACED IN DIAGONALLY OPPOSITE CORNERS OF THE VAULT, WITH 6" OF THE ROD EXTENDING ABOVE THE FLOOR. ADDITIONAL GROUND RODS SHALL BE USED, IF REQUIRED, TO INSURE NOT OVER 5 OHMS RESISTANCE TO GROUND.

② THE TOP AND SIDES OF THE VAULT SHALL BE PROVIDED WITH TYPE "B" WATERPROOFING ACCORDING TO OHIO STANDARD CONSTRUCTION AND MATERIAL SPECIFICATIONS. FOR THE FLOOR VAPOR BARRIER A 0.004 POLYETHYLENE FILM SHALL BE APPLIED OVER THE SUB-GRADE. THE FILM SHALL BE LAPPED NOT LESS THAN 6" WITH THE TOP LAP PLACED IN THE DIRECTION OF THE SPREADING OF THE CONCRETE.

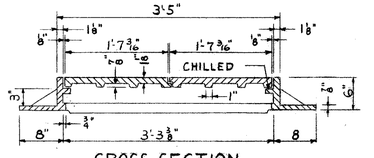
③ VAPORTIGHT LIGHT FIXTURE; APPLETON CAT. # VC-2075 G, KILLARK CAT # VUC GG-2-200, OR APPROVED EQUAL.

④ WEATHERPROOF TOGGLE SWITCH; APPLETON CAT. # REA-1PS, KILLARK CAT # REA-E1, OR APPROVED EQUAL.

⑤ CIRCUIT BREAKER CONDULET; CROUSE HINDS CAT # EFDC 2515 G, KILLARK CAT # XCBRT-218-215, OR APPROVED EQUAL.



PLAN



CROSS SECTION

STANDARD SQUARE MANHOLE
SIDEWALK TYPE COVER AND FRAME

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

LIGHTING DETAILS
WILLOW FREEWAY EXTENSION
TRANSFORMER MANHOLE 8' X 11'
(MK "AB")
CUYAHOGA COUNTY U.S.R. 21

SCALE 1/2" = 1'-0" UNLESS N.T.D. DATE AUG. 10, 1962

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
A.D.H.	L.E.S		S.G.F.			

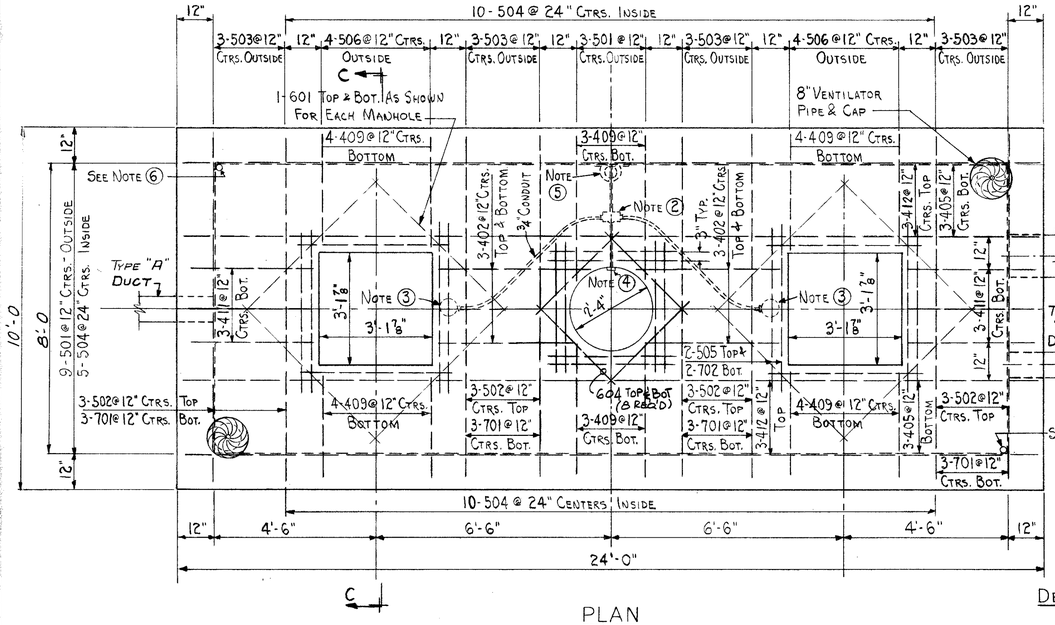
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

137
204

CUYAHOGA COUNTY
CUY—21-(13.77)(4.94)

NOTES

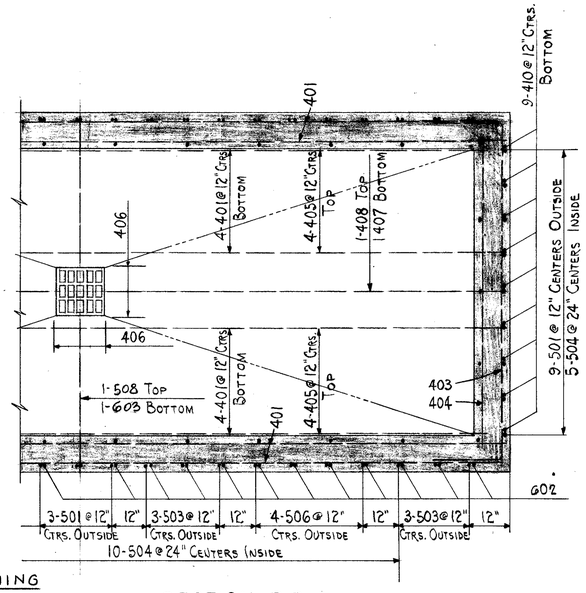
1. WHERE INITIAL USE OF INDICATED DUCT BANKS IS NOT REQUIRED (SEE PLANS) EXTEND THE DUCTS THROUGH THE WALLS 18" MIN. AND CAP ON OUTSIDE ENDS FOR FUTURE USE.
2. CONDULET BOX, GASKET AND COVER – APPLETON FSX-1-75, ADALET FSX-31, OR APPROVED EQUAL.
3. VAPORTIGHT LIGHT FIXTURE – APPLETON V-2075G, ADALET VWC-327, OR APPROVED EQUAL.
4. WEATHERPROOF SWITCH & BOX WITH ¾" TO 1'2" ADAPTOR – APPLETON REA-IPS, KILLARK REA-E1, OR APPROVED EQUAL
5. CIRCUIT BREAKER; EXPLOSION PROOF, DUST TIGHT, WEATHER TIGHT, CR. HINDS FLB-171-DT-15-1, APPLETON CB1E1W15, OR APPROV. EQUAL
6. FOR GROUNDING, 2-1" DIAM. × 10'-0" LONG COPPERWELD GROUND RODS SHALL BE PLACED IN DIAGONALLY OPPOSITE CORNERS OF THE VAULT, WITH 6" OF THE ROD EXTENDING ABOVE THE FLOOR. ADDITIONAL GROUND RODS SHALL BE USED, IF REQUIRED, TO INSURE NOT OVER 5 OHMS RESISTANCE TO GROUND.
7. THE TOP AND SIDES OF THE VAULT SHALL BE PROVIDED WITH TYPE "B" WATERPROOFING ACCORDING TO OHIO STANDARD CONSTRUCTION AND MATERIAL SPECIFICATIONS. FOR THE FLOOR VAPOR BARRIER A 0.004 POLYETHYLENE FILM SHALL BE APPLIED OVER THE SUB-GRADE. THE FILM SHALL BE LAPPED NOT LESS THAN 6" WITH THE TOP LAP PLACED IN THE DIRECTION OF THE SPREADING OF THE CONCRETE.



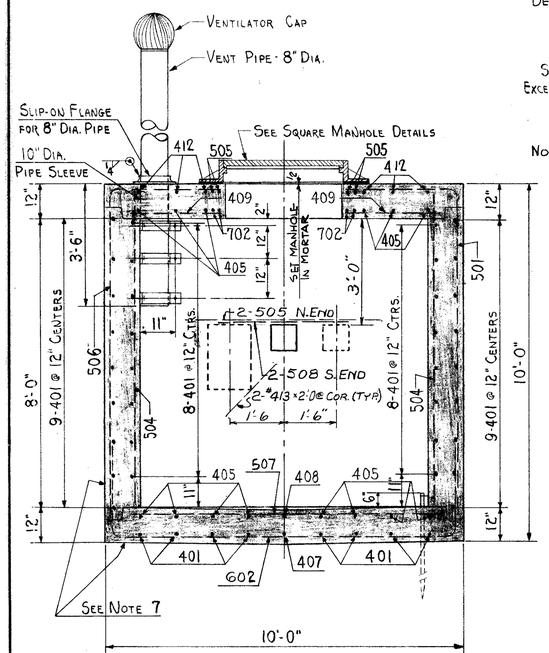
PLAN

DESIGN L.L. 250#/ft² OR 8000# WHEEL LOAD

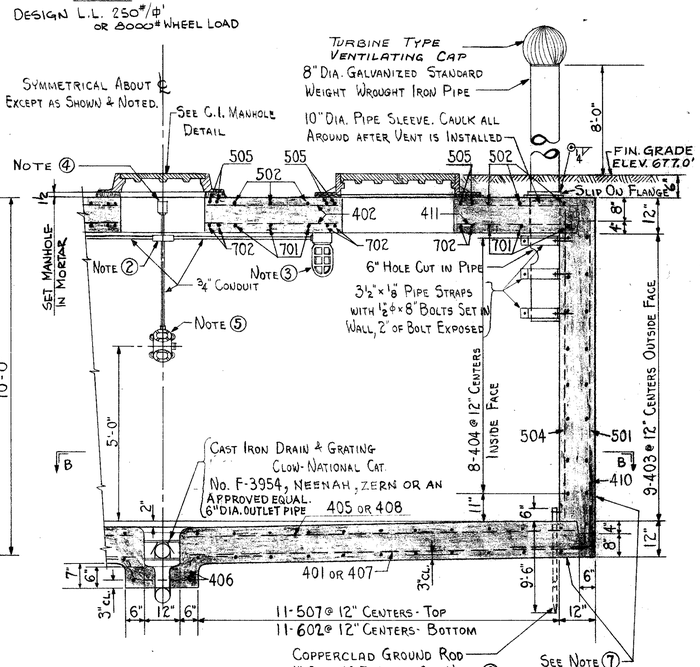
DETAIL OF DUCT OPENING



SECTION B-B



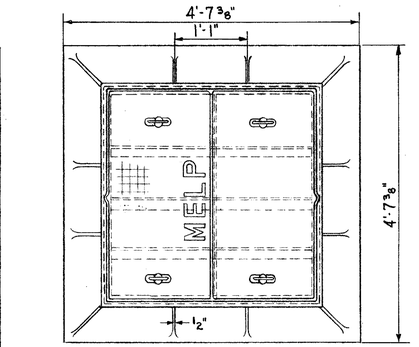
SECTION C-C



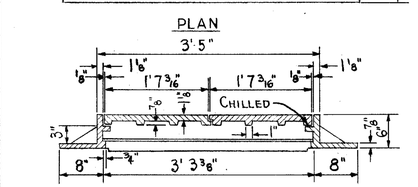
PART SECTION A

REINFORCING BAR SCHEDULE

Mark	Size	No. Req'd	Ligth	Type	Weht	Bending Diagrams
401	4	48	23'-8"	Str.	665	
402	4	12	3'-9"	Str.	30	
403	4	18	13'-8"	B	165	
404	4	16	9'-8"	Str.	103	
405	4	14	22'-8"	Str.	212	
406	4	4	6'-6"	B	17	
407	4	2	11'-3"	Str.	15	
408	4	2	10'-9"	Str.	14	
409	4	22	2'-9"	Str.	40	
410	4	18	5'-1⅛"	B	62	
411	4	6	3'-3"	Str.	13	
412	4	6	19'-2	Str.	77	
413	4	24	2'-0	Str.	32	
501	5	24	12'-7⅛"	B	316	
502	5	12	6'-10"	Str.	86	
503	5	24	11'-9⅛"	B	296	
504	5	30	8'-10"	Str.	277	
505	5	26	5'-6"	Str.	150	
506	5	16	12'-2½"	B	204	
507	5	22	6'-8"	Str.	200	
508	5	4	3'-8"	Str.	16	
601	6	16	5'-0"	Str.	120	
602	6	22	14'-8"	B	484	
603	6	2	6'-7"	B	20	
604	6	8	5'-6"	Str.	42	
701	7	12	8'-8"	Str.	213	
702	7	24	5'-6"	Str.	270	
			Total		4,139	



PLAN

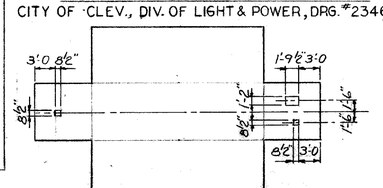


CROSS SECTION

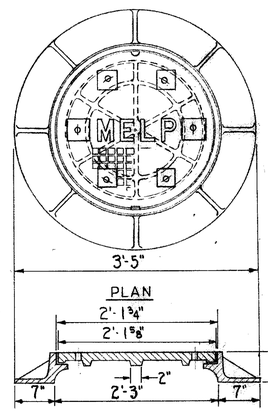
STANDARD SQUARE MANHOLE

SIDEWALK TYPE COVER AND FRAME

CITY OF CLEV., DIV. OF LIGHT & POWER, DRG. #2346



EXPLODED PLAN VIEW



STANDARD CI MANHOLE DETAILS

SIDEWALK TYPE RING & COVER

CITY OF CLEVELAND, DIVISION OF LIGHT & POWER DRAWING Nº 2371.

STRUCTURAL DETAIL NOTES

CONCRETE SHALL BE CLASS C OR CLASS E AT THE OPTION OF THE CONTRACTOR.
REINFORCING STEEL SHALL BE 2" CLEAR FROM FACE OF CONCRETE UNLESS NOTED OTHERWISE.
REINFORCING BAR SIZE; THE FIRST DIGIT OF THE MARK NUMBER INDICATES THE SIZE IN EIGHTHS OF AN INCH.

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

LIGHTING DETAILS
WILLOW FREEWAY EXTENSION
TRANSFORMER MANHOLE 8'0"x22'0" (MK "AA")

CUYAHOGA COUNTY U.S.R. 21

SCALE 1/2" = 1'0" UNLESS NTD. DATE AUG. 15, 1962

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
A.D.H.	L.E.S.		S.G.F.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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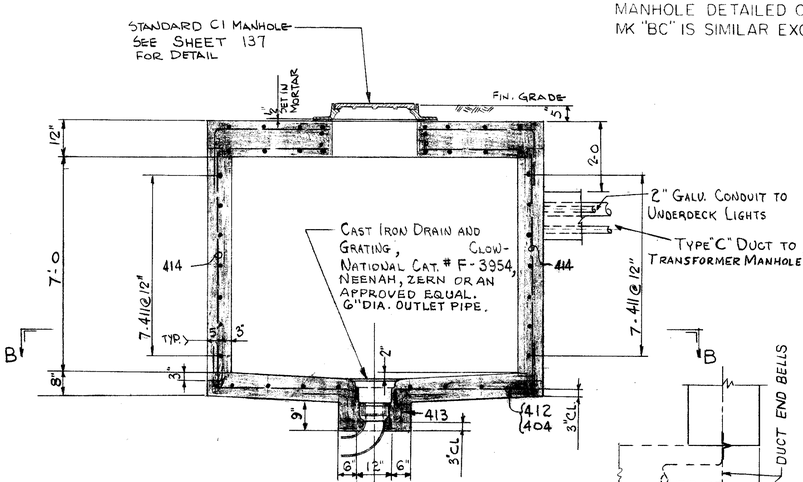
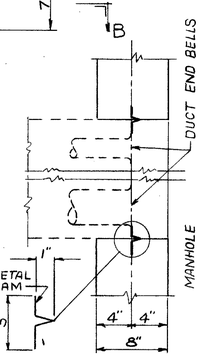
204

CUYAHOGA COUNTY
CUY—21-(13.77) (14.94)

MANHOLE DETAILED ON THIS SHEET IS MK "AC".
MK "BC" IS SIMILAR EXCEPT FOR WINDOWS. SEE SHEET 133A.



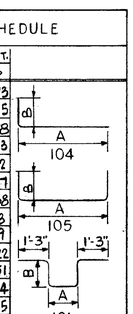
SECTION A-A



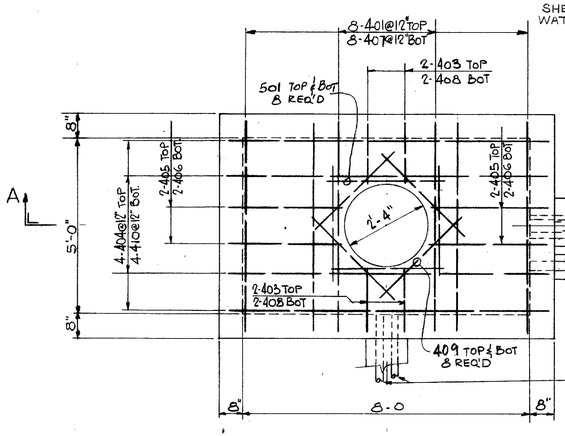
DETAIL OF DUCT OPENING
SCALE 1½" = 1'-0"

REINFORCING BAR SCHEDULE

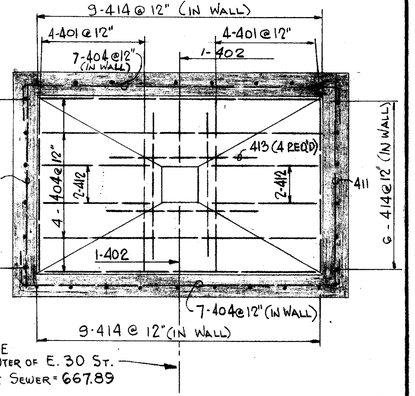
MARK	NO.	LENGTH	TYPE	DIMENSIONS A	DIMENSIONS B	WT. LB
401	16	8'-9"	105	5'-9"	1'-6"	93
402	2	3'-9"	104	2'-3"	1'-6"	5
403	4	3'-0"	104	1'-6"	1'-6"	8
404	22	11'-9"	105	8'-9"	1'-6"	173
405	4	4'-6"	104	3'-0"	1'-6"	12
406	4	2'-9"	STR.			7
407	8	5'-3"	STR.			38
408	4	1'-3"	STR.			3
409	8	3'-6"	STR			19
410	4	6'-3"	STR.			22
411	14	5'-6"	STR.			51
412	4	5'-3"	104	3'-9"	1'-6"	14
413	4	5'-10"	121	1'-6"	11"	15
414	30	7'-3"	STR.			145
415	24	2'-0"	STR			32
* 501	10	3'-6"	STR			37
* 502	2	4'-6"	STR			10
						684 TOTAL



* MK "BC" MANHOLE USES 14 MK #501 BARS (52 LBS.) AND NO MK #502 BARS, TOTAL REINF. WT. = 689 LBS.



PLAN

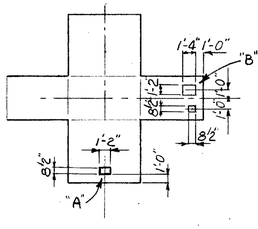


TYPE "B" DUCT
2-2" DUCTS FROM UTILITY POLE
TOP OF DUCT BANK 2'-0" BELOW FIN. GRADE
& 6" V.C. PIPE TO MANHOLE IN CENTER OF E. 30 ST.
APPROX. 20 FT. FLOW LINE AT SEWER = 667.89

SECTION B-B

MANHOLE 5' x 8'

SCALE ½" = 1'-0"



EXPLODED PLAN VIEW
SCALE: ⅛" = 1'-0"

1. 2 BARS ON EACH CORNER OF EACH DUCT ENTRANCE FOR A TOTAL OF 24 BARS @ 2'-0" SEE MARK #415 OF REINF. BAR SCHED. THIS DWG.
2. 2 BARS ON TOP OF EACH DUCT ENTRANCE;
   AT "A" = 2 #5 BARS @ 3'-6" SEE MARK #501.
   AT "B" = 2 #5 BARS @ 4'-6" SEE MARK #502.

NOTES

CONCRETE SHALL BE CLASS C OR CLASS E AT THE OPTION OF THE CONTRACTOR.

REINFORCING STEEL SHALL BE 2" CLEAR FROM FACE OF CONCRETE UNLESS NOTED OTHERWISE.

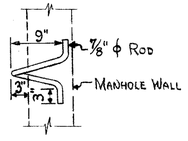
DESIGN L.L. = 250 LBS./SQ. FT. OR 8000 LB. WHEEL LOAD.

THE TOP AND SIDES OF THE MANHOLE SHALL BE PROVIDED WITH TYPE "B" WATERPROOFING ACCORDING TO OHIO STANDARD CONSTRUCTION AND MATERIALS SPECIFICATIONS. FOR THE FLOOR VAPOR BARRIER A 0.004" POLYETHYLENE FILM SHALL BE APPLIED OVER THE SUB-GRADE. THE FILM SHALL BE LAPPED NOT LESS THAN 6".

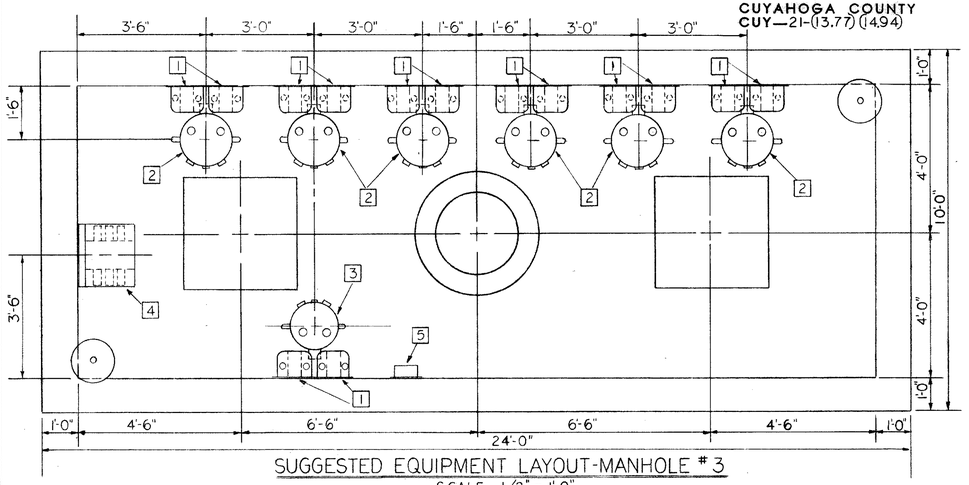
A 1" ϕ x 10'-0" GROUND ROD SHALL BE PLACED IN ONE CORNER OF THE MANHOLE, WITH 6" OF THE ROD EXTENDING ABOVE THE FLOOR, FOR A MAXIMUM OF 5 OHMS TO GROUND.

INSTALL ONE PULLING IRON (SEE DETAIL "A") OPPOSITE EACH DUCT ENTRANCE.

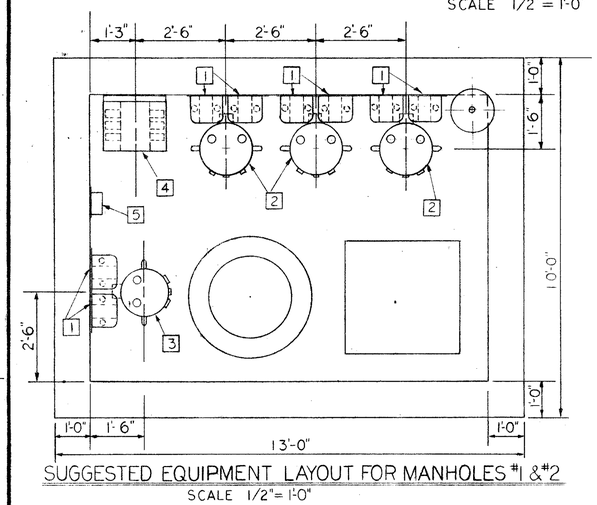
LOCATION OF MANHOLE STA. 11+31 E. 30 ST., 14 FT. W. OF W. CURB LINE.



DETAIL "A"
PULLING IRON
NOT TO SCALE



SUGGESTED EQUIPMENT LAYOUT-MANHOLE #3
SCALE 1/2" = 1'-0"

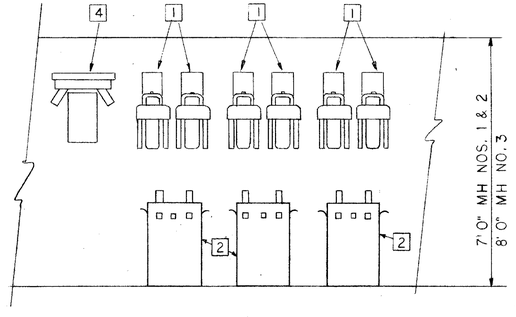


SUGGESTED EQUIPMENT LAYOUT FOR MANHOLES #1 & #2
SCALE 1/2" = 1'-0"

EQUIPMENT LEGEND

1. OIL CUTOUT SUBWAY-TYPE 100 A. 5.2 KV. WITH EXPANSION CHAMBER AND DETACHABLE WIPING SLEEVE BUSHING FOR LEAD-COVERED CABLE. (REQ'D; 8 EACH FOR M.H. NOS. 1 & 2, 14 FOR M.H. NO. 3) SEE NOTE 1
2. 25 KVA. SINGLE PHASE SUPER STANDARD DISTRIBUTION TRANSFORMER. OIL FILLED. 2400-240/480 VOLT. 60 CYCLE. WITH 2-1/2 PERCENT TAPS ABOVE AND BELOW NORMAL (REQ'D; 3 EACH FOR M.H. NOS. 1 & 2, 6 FOR M.H. NO. 3)
3. 15 K.V.A. SINGLE PHASE CONTROL TRANSFORMER OIL FILLED 2400-120/240 VOLT, 60 CYCLE, WITH 2-1/2 PERCENT TAPS ABOVE AND BELOW NORMAL. (REQ'D; ONE FOR EACH MANHOLE) SEE NOTE 1.
4. OIL SWITCH, 3 POLE 2500 VOLT 60 AMP., SOUTH BEND CPM-3-120 SPEC. Nº 6069A, (REQ'D; ONE FOR EACH MANHOLE) SEE NOTE 1
5. TIMER - SANGAMO ELECTRIC WZGL 21, TORK 7200ZL, OR APPROVED EQUAL; WITH RESERVE MAIN SPRING OPERATION TO PROVIDE ACCURATE TIMING DURING POWER OUTAGES UP TO 10 HOURS DURATION WITH ASTRONOMICAL DIAL, AND ADJUSTED FOR CLEVELAND LATITUDE. (REQ'D; ONE FOR EACH MANHOLE) SEE NOTE 1.

NOTE 1; THE CONTROL TRANSFORMER [3], OIL SWITCH [4], TIMER [5], AND TWO OF THE OIL CUTOUTS [1], ARE TO BE FURNISHED BUT NOT MOUNTED BY THE CONTRACTOR



SUGGESTED EQUIPMENT ELEVATION FOR MANHOLES #1, #2, & #3

SCHEMATICS ON DRG. NOS. 130, 131, 132

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

LIGHTING DETAILS
WILLOW FREEWAY EXTENSION
MANHOLE DETAILS
CUYAHOGA COUNTY U.S.R. 21

SCALE AS NOTED DATE JAN. 31, 1963

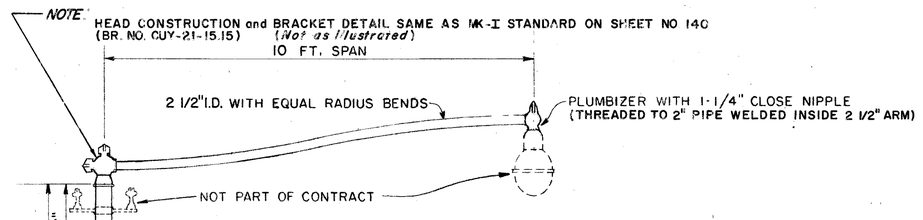
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
S.G.F.	P.C.		S.G.F.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

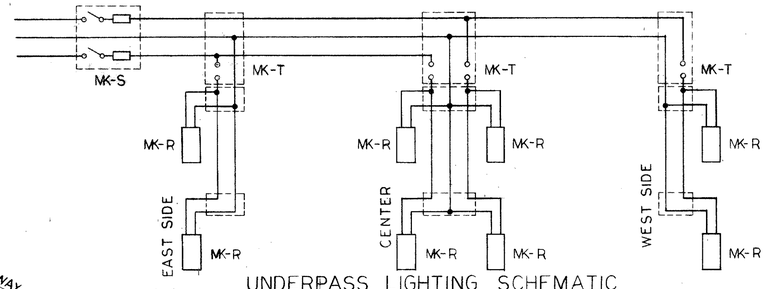
139
204

CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)

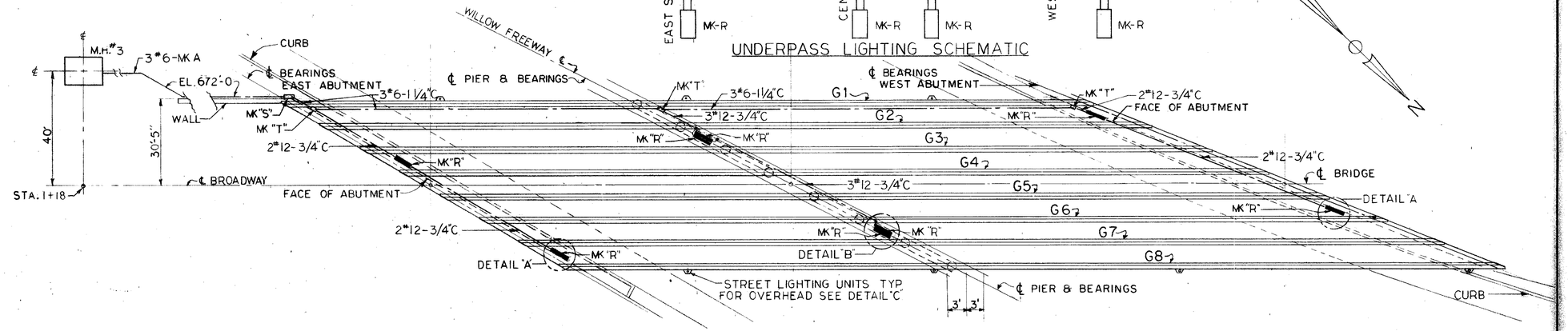
NOTE
HEAD CONSTRUCTION and BRACKET DETAIL SAME AS MK-I STANDARD ON SHEET NO 140
(BR. NO. CUY-21-15.15) (Not as Illustrated)



MK "AJ" STANDARD & BRACKET

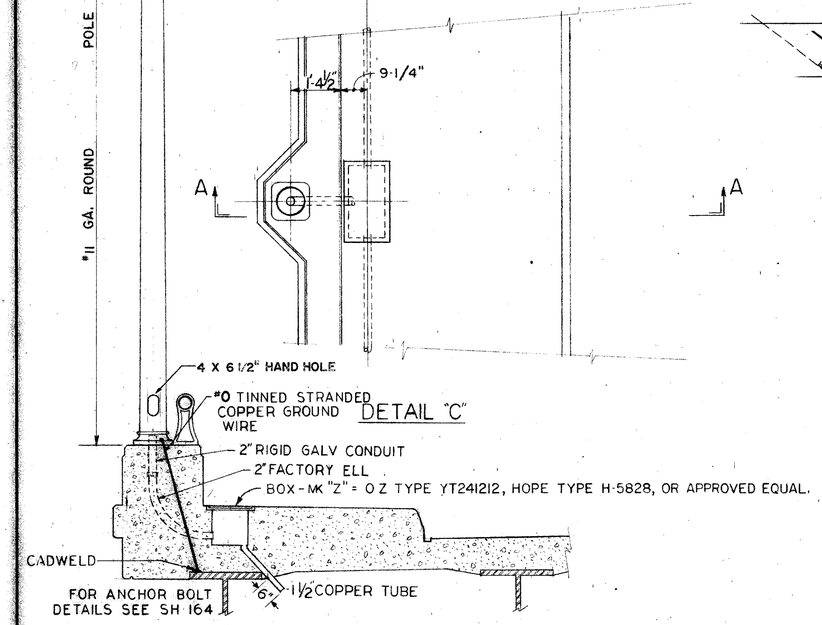


UNDERPASS LIGHTING SCHEMATIC



UNDERDECK LIGHTING PLAN
SCALE 1" = 20 FT.

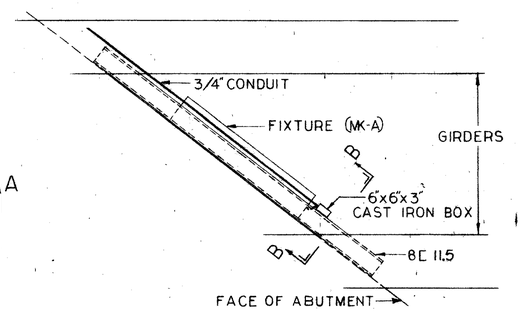
MK NOS. ARE DESCRIBED ON SHEETS 141 & 143



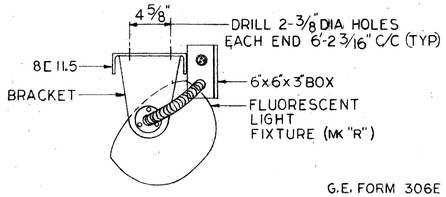
SECTION A-A

STREET LIGHTING UNIT

SCALE 1/2" = 1' 0"
FOR LOCATION SEE SHEET 145

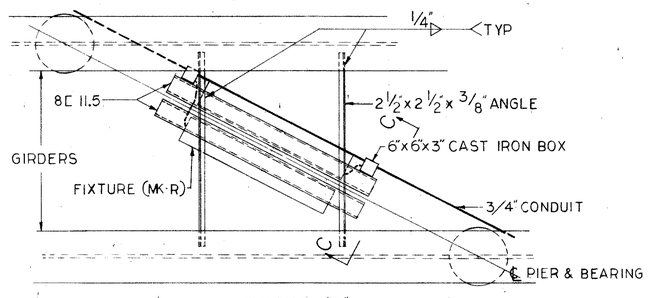


DETAIL "A"

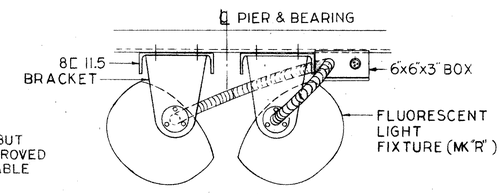


FIXTURE MOUNTING DETAIL
SCALE 1 1/2" = 1'-0"
VIEW B-B

G.E. FORM 306E LUMINAIRE IS DETAILED, BUT WESTINGHOUSE TYPE FU72 OR OTHER APPROVED EQUAL MAY BE SUBSTITUTED, WITH SUITABLE CHANGES IN MOUNTING ARRANGEMENTS.



DETAIL "B"



FIXTURE MOUNTING DETAIL
SCALE 1 1/2" = 1'-0"
VIEW C-C

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

STREET AND UNDERDECK LIGHTING
BRIDGE NO. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY
CUYAHOGA COUNTY U.S.R. 21

SCALE AS NOTED DATE 1-31-63

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
S.G.F.	S.G.F.		W.F.E.			

J.E.W.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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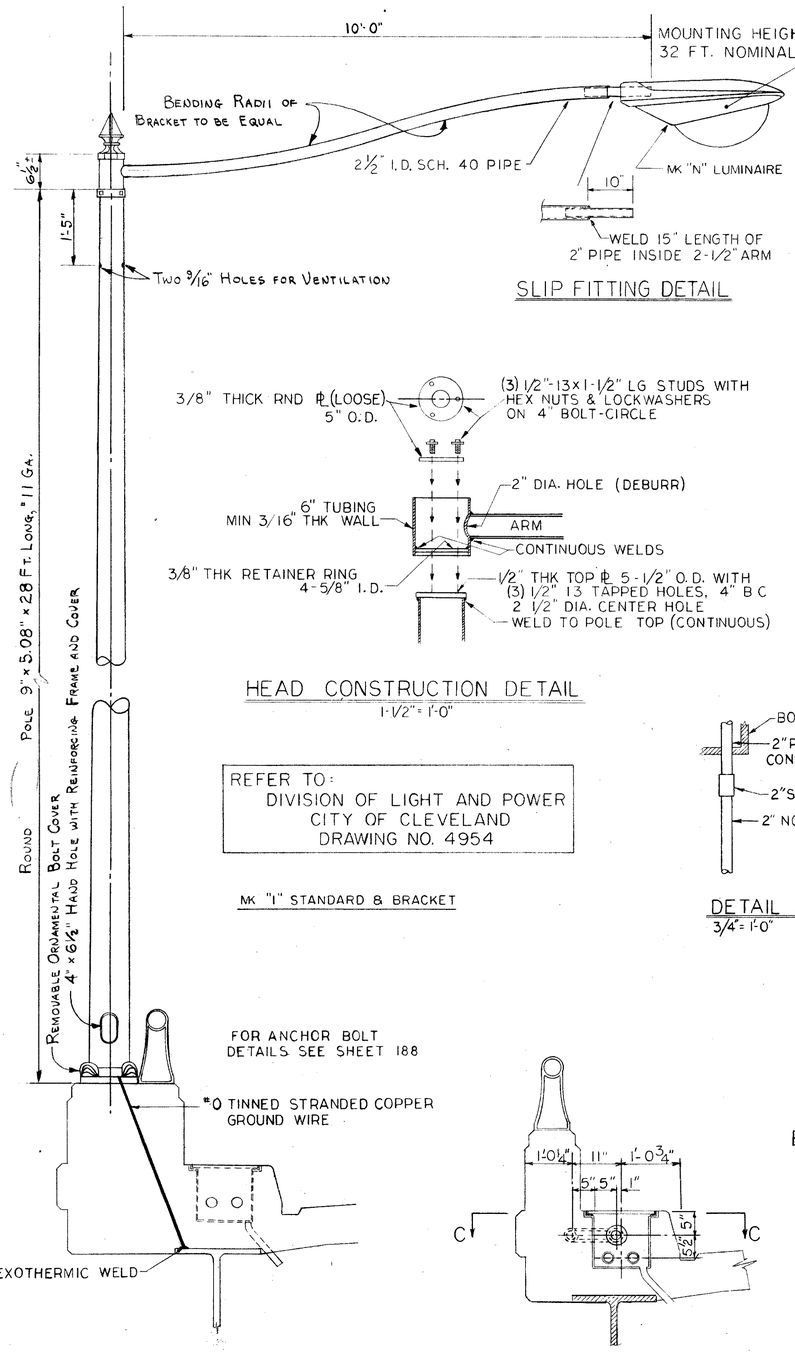
CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)



SLIP FITTING DETAIL

TYPICAL LAMP STANDARD

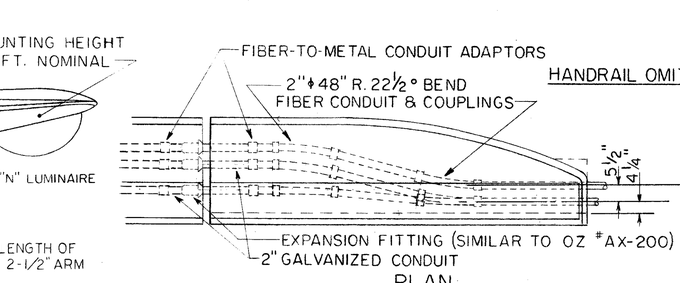
MK I AS USED ON STRUCTURE

HEAD CONSTRUCTION DETAIL
1-1/2" = 1'-0"

REFER TO:
DIVISION OF LIGHT AND POWER
CITY OF CLEVELAND
DRAWING NO. 4954

MK "1" STANDARD & BRACKET

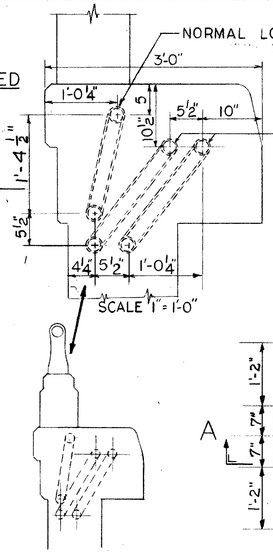
SECTION B-B
3/4" = 1'-0"



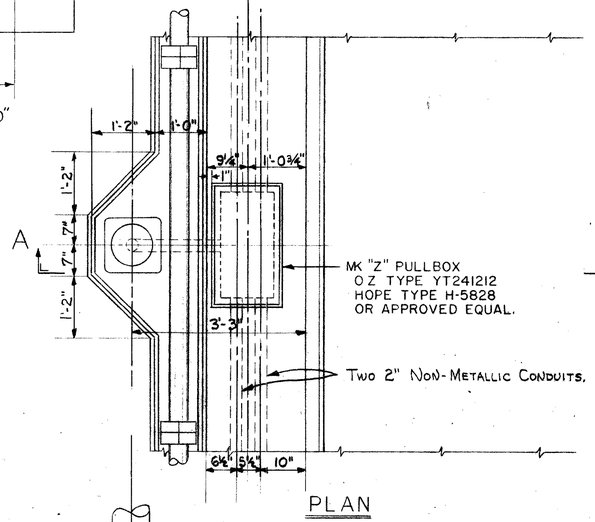
PLAN

ELEVATION

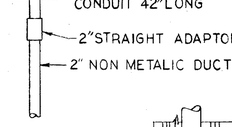
TYPICAL CONDUIT RUN THRU ABUTMENT
SCALE: 1/2"=1'-0"



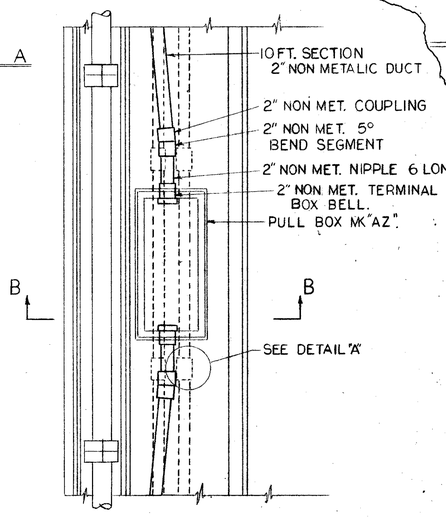
END VIEW



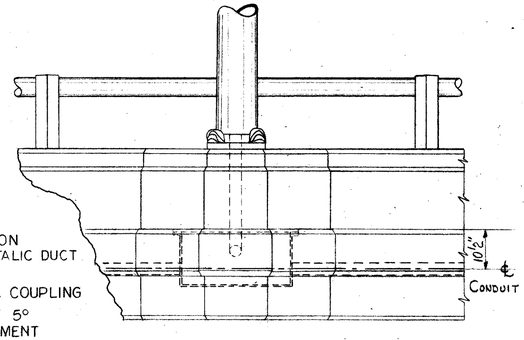
PLAN



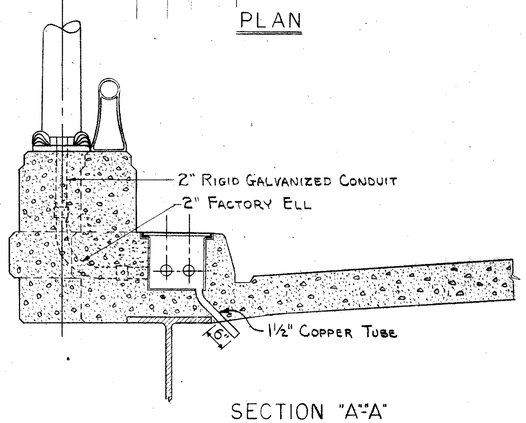
DETAIL A
3/4" = 1'-0"



PLAN SECTION "C C"
3/4"=1'-0"



ELEVATION



SECTION "A"-"A"

TYPICAL LAMP AND CONDUIT LOCATION DETAILS

ALL CONDUIT IS 2" NON-METALLIC UNLESS NOTED OTHERWISE

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

LIGHTING DETAILS

BRIDGE NO. CUY-21-1515
WILLOW FREEWAY/ORANGE & E.30
CUYAHOGA COUNTY U.S.R. 21

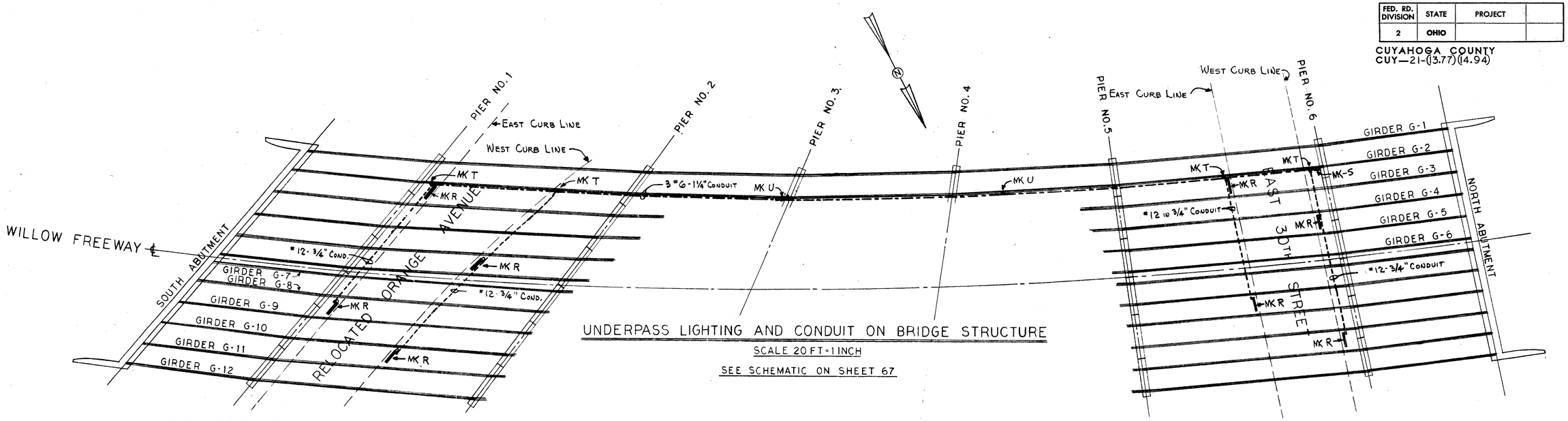
SCALE ¾"=1:0" DATE 9-23-59

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
S.G.F.	J.M.W.		S.G.F.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

141
204

CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)



UNDERPASS LIGHTING AND CONDUIT ON BRIDGE STRUCTURE

SCALE 20 FT = 1 INCH

SEE SCHEMATIC ON SHEET 67

SYMBOL LEGEND FOR PAY ITEMS R-1 & R-2

MK R LUMINAIRE, FLUORESCENT, UNDERPASS TYPE, WITH INTERNALLY-MOUNTED 115-VOLT DUAL BALLAST. GENERAL ELECTRIC FORM 306E WITH TWO F-72PGI7/CW LAMPS, WESTINGHOUSE TYPE FU72 WITH TWO F-72TI2/CW/SHO LAMPS, OR APPROVED EQUAL. ITEM TO INCLUDE A 6"x6"x3" CAST IRON, WATERTIGHT JUNCTION BOX WITH 3/4" VINYL-JACKETED FLEXIBLE CONDUIT TO LUMINAIRE.

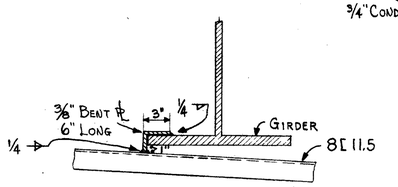
MK S SERVICE BOX, 12"x12"x10", CAST IRON, WATERTIGHT, WITH 2-POLE, 240 V., 30 AMP. FUSIBLE SAFETY SWITCH.

MK T DISTRIBUTION BOX, 8"x6"x6", CAST IRON, WATERTIGHT, WITH BOLT-ON TYPE 2-POLE, 120/240 VOLT, 15 AMP. CIRCUIT BREAKER.

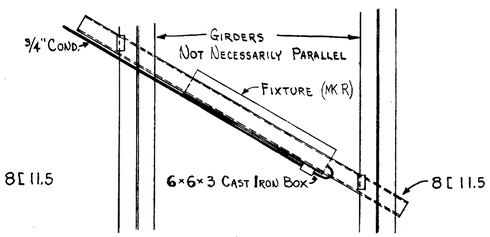
MK U INTERMEDIATE PULLBOX, 6"x6"x3", CAST IRON, WATERTIGHT.

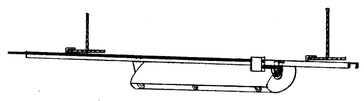
MK V SERVICE TO FLUORESCENT LIGHTS, AS SHOWN.

ABOVE BOXES TO BE O Z TYPE YS, HOPE TYPE H-1200, OR APPROVED EQUAL.



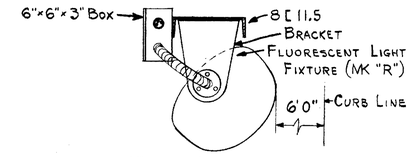
SUPPORT CHANNEL MOUNTING DETAIL
SCALE 1½" = 1'-0"



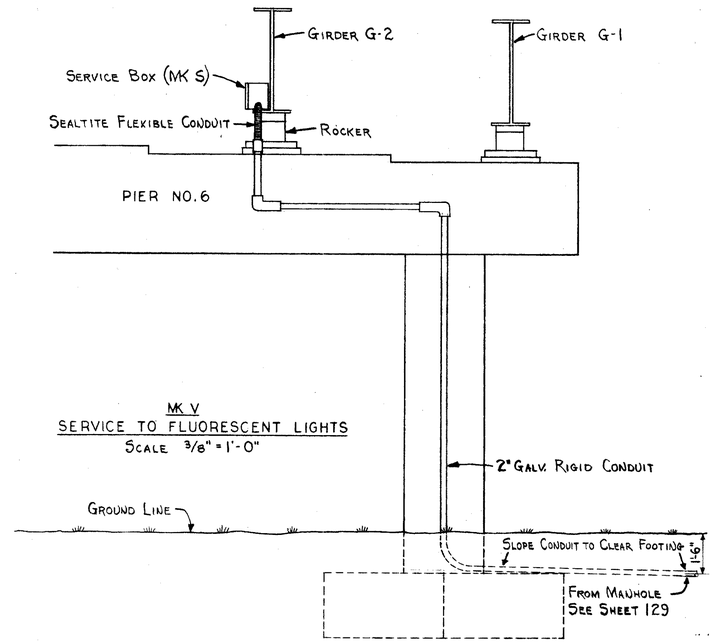


FLUORESCENT FIXTURE MOUNTING ASSEMBLY
SCALE 3/8" = 1'-0"

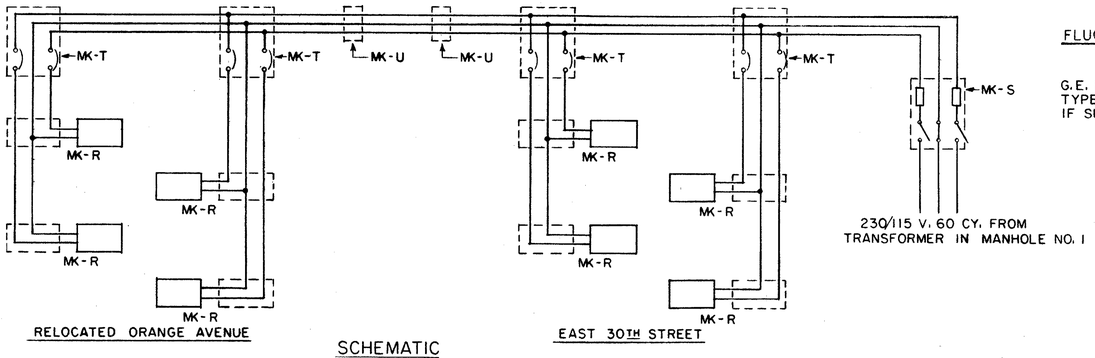
G.E. FORM 306E LUMINAIRE IS DETAILED, BUT WESTINGHOUSE TYPE FU72 OR OTHER APPROVED EQUAL MAY BE SUBSTITUTED IF SUITABLE MOUNTING ARRANGEMENTS ARE MADE.



FIXTURE MOUNTING DETAIL
SCALE 1½" = 1'-0"



MK V
SERVICE TO FLUORESCENT LIGHTS
SCALE 3/8" = 1'-0"



SCHEMATIC

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

UNDERDECK LIGHTING & DETAILS
BRIDGE NO. CUY-21-1515
WILLOW FREEWAY / ORANGE & E.30
CUYAHOGA COUNTY U.S.R. 21

SCALE AS NOTED DATE 1-31-63

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGF	SGF		W.F.E.			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

142
204

CUYAHOGA COUNTY
CUY— 21—(13.77)—(14.94)

ELECTRICAL NOTES

GENERAL

THIS SPECIFICATION SHALL SUPPLEMENT THE STATE OF OHIO CONSTRUCTION AND MATERIAL SPECIFICATIONS DATED JANUARY 1, 1961, FOR THE MATERIALS USED AND FOR THE INSTALLATION OF ROADWAY LIGHTING, UNDERDECK LIGHTING AND A POLICE AND FIRE ALARM SYSTEM FOR THE WILLOW FREEWAY.

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.

SERVICE ROAD "A" AND RAMP B-S WILL BE PROVIDED WITH INCANDESCENT LIGHTING AND CIRCUITRY AS PART OF THIS PROJECT. SPECIAL PROCEDURE FOR THE SOUTHERN TIP OF THE PROJECT IS DESCRIBED IN NOTE 1 ON SHEET 130. LIGHTING STANDARDS AND CONDUIT SYSTEM FOR THE BROADWAY BRIDGE OVER THE FREEWAY WILL BE FURNISHED AS PART OF THIS PROJECT, BUT THE LUMINAIRES AND WIRING WILL BE PROVIDED BY THE CITY OF CLEVELAND.

FOR SERVICE ROADS "C" AND "D," 250 WATT MERCURY LUMINAIRES ARE TO BE INSTALLED AS INDICATED ON THE DRAWINGS, AND WILL OPERATE FROM THE ROADWAY LIGHTING CIRCUITS AS SHOWN ON THE SCHEMATIC DIAGRAMS.

THE UNDERDECK LIGHTING FOR THE BROADWAY OVERPASS AND THE ORANGE AVENUE AND 30TH STREET UNDERPASSES WILL BE FLUORESCENT, AND WILL BE FURNISHED COMPLETE AS SHOWN ON THE DRAWINGS.

400 WATT LUMINAIRES WILL BE FURNISHED, AS A PART OF THIS PROJECT, FOR THE WILLOW FREEWAY OVER KINGSBURY RUN BRIDGE, CUY-21-14.55. POWER FEED AND WIRING TO THESE LAMPS WILL BE FURNISHED AS A PART OF THIS PROJECT, EXCEPT THAT THE LAMPS AT 87 + 98 AND 88 + 80 ON THE SOUTHBOUND SIDE OF WILLOW FREEWAY; AT 4 + 07 ON RAMP N-W; AND AT 27 + 40, 28 + 23, 29 + 05 AND 29 + 87 ON RAMP E-N, CANNOT BE WIRED AT THIS TIME. SEE DRAWING NO. 131.

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.

FOUR MAIN TYPES OF ROADWAY LIGHTING UNITS WILL BE REQUIRED. THEY WILL BE REFERRED TO AS:

FREEWAY TYPE, DETAILED ON SHEET 133
RAMP TYPE, DETAILED ON SHEET 134
STRUCTURE TYPE, DETAILED ON SHEET 140
SERVICE ROAD TYPE, DETAILED ON SHEET 135

IN ADDITION, SPECIAL LIGHTING UNITS WILL BE USED ON:
RAMP B-S, DETAILED ON SHEET 135
BROADWAY BRIDGE, DETAILED ON SHEET 139

THE LIGHTING UNITS SHALL CONFORM TO THE SPECIFICATIONS GIVEN ON THE DETAIL SHEETS, AND TO THE SPECIFICATIONS FOLLOWING.

LIGHT POLES SHALL BE ROUND TAPERED STEEL POLES, THE SHAFT SHALL BE FABRICATED FROM NOT LESS THAN NO. 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
SERVICE ROAD	8.0" x 4.82" x 22'-9"	11	1.25	681	9.01	.50	1022	14.56	1.78
~~BROADWAY BRIDGE~~	~~9.0" x 8.36" x 26'-0"~~	~~0~~	~~0.54~~	~~1893~~	~~10.72~~	~~.50~~	~~2839~~	~~17.36~~	~~2.03~~
RAMP B-S	9.0" x 5.36 x 26'-0"	11	1.35	753	10.67	.50	1130	17.29	2.03

IF THE ROUND TAPERED STEEL SHAFTS OF THE LIGHTING POLES ARE MANUFACTURED BY OTHER MEANS THAN THAT SPECIFIED ABOVE, ALTERNATES WILL BE ACCEPTED, PROVIDED THE SHAFTS BE TAPERED THEIR FULL LENGTH AND HAVE A TRUE ROUND CROSS SECTION AND BE MADE OF STEEL HAVING A MINIMUM YIELD STRENGTH OF 48,000 P.S.I. AND A MINIMUM THICKNESS OF #11 OR #0 GAUGE (U.S. STD.), AS TABULATED ABOVE. ALTERNATES MUST ALSO MEET THE PERMANENT SET AND DEFLECTIONS SPECIFICATIONS TABULATED FOR EACH OF THE POLE SIZE IN THE TABLE. 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, TYPICAL YIELD STRENGTH 55,000 P.S.I. THIS SPECIFICATION IS IDENTICAL TO ASTM A107, GRADE 1035 SPECIAL QUALITY.

ANCHOR U-BOLTS FOR FOUNDATIONS ON STRUCTURES ARE INCLUDED WITH ITEM S-7 FOR PAYMENT AS SHOWN ON SHEETS 164 AND 188, SPECIFICATIONS SAME AS ANCHOR RODS ABOVE.

EACH FREEWAY-TYPE STANDARD SHALL HAVE A BRACKET ARM MADE OF STANDARD PIPE OF THE SIZE AND LENGTH SHOWN ON DRAWING NO. 133. 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.

EACH RAMP-TYPE AND STRUCTURE-TYPE STANDARD SHALL HAVE A BRACKET ARM MADE OF STANDARD PIPE OF THE SIZE AND LENGTH SHOWN ON DRAWINGS NO. 134 AND 140, 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.

EACH SERVICE-ROAD-TYPE STANDARD SHALL HAVE A BRACKET ARM ASSEMBLY, MADE OF STANDARD PIPE, AS SHOWN ON DRAWING NO. 135. THE BRACKET ARM AND THE SUPPORT ARM SHALL BE ATTACHED TO THE POLE AS SHOWN ON THE DRAWING.

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.

THE LIGHT STANDARD FOR RAMP B-S IS DETAILED ON SHEET 135. IT SHALL BE EQUIPPED WITH AN ORNAMENTAL POLE TOP. THE BRACKET ARM SHALL BE 10 FEET IN LENGTH, MADE OF STANDARD PIPE OF THE SIZE SHOWN ON THE PLANS. THE INNER END OF THE BRACKET ARM SHALL BE WELDED TO A CAST STEEL HEAD BLOCK SO DESIGNED THAT THE ARM CAN BE BOLTED, THROUGH A CAST IRON NECK PIECE, TO A PLATE WELDED TO THE TOP OF THE POLE, TO PERMIT RADIAL ADJUSTMENT OF THE BRACKET ARM. THE ORNAMENTAL CASTING WELDED TO THE OUTER END OF THE BRACKET ARM SHALL BE ARRANGED WITH A PLUMBIZER, AND SHALL BE TAPPED FOR A 1-1/4" PIPE CONNECTION.

THE LIGHT STANDARD FOR USE ON THE BROADWAY BRIDGE IS DETAILED ON SHEET 139. THIS STANDARD AND BRACKET SHALL BE OF SIMILAR CONSTRUCTION TO THE STANDARD FOR BR. NO. CUY-21-15.15 DESCRIBED ABOVE.
THE BRACKET ARM SHALL BE 10 FEET LONG, WITH A THREADED 2" TENON AND PLUMBIZER.

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 APPROPRIATE 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 OBSTRUCTION. 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.

UNDERDECK LUMINAIRES OF SUITABLE CONSTRUCTION FOR UNDERPASS MOUNTING SHALL BE USED. EACH LUMINAIRE SHALL BE EQUIPPED WITH TWO F72PG17/CW FLUORESCENT LAMPS, AND SHALL INCLUDE AN INTERNALLY MOUNTED 115-VOLT DUAL BALLAST. A 6" x 6" x 3" CAST IRON WATERTIGHT JUNCTION BOX SHALL BE FURNISHED WITH EACH LUMINAIRE.

METAL CONDUIT FOR UNDERDECK LIGHTS SHALL BE RIGID, GALVANIZED INSIDE AND OUTSIDE. CONDUIT SHALL BE FURNISHED WITH TAPERED FITTINGS AS REQUIRED, AND WITH NECESSARY SUPPORTS AND FASTENERS.

MERCURY LUMINAIRES SHALL BE EQUAL TO GENERAL ELECTRIC M400 OR M250, WESTINGHOUSE OV25 (400 OR 250 WATT), OR LINE MATERIAL UNISTYLE (400 OR 250 WATT).

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 SYSTEM 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 EACH 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. PAYMENT FOR STRUCTURE GROUNDS WILL BE MADE UNDER ITEM S-25 ELECTRICAL GROUNDS.

POWER LINE CONNECTIONS FOR LIGHTING UNITS EQUIPPED WITH MERCURY LUMINAIRES ARE SHOWN ON SHEET 134. THE GROUND WIRE IS RUN DIRECTLY TO THE STRUCTURAL STEEL IF THE LIGHTING UNIT IS ON A STRUCTURE. IF THE LIGHTING UNIT IS NOT ON A STRUCTURE, THE GROUND WIRE IS RUN DOWN THROUGH THE FEED DUCT TO THE PULLBOX, WHERE IT IS BRAZED OR EXOTHERMICALLY WELDED TO A COPPER-CLAD GROUND ROD. GROUNDING IS SHOWN ON THE DETAIL DRAWING FOR EACH TYPE OF STANDARD, EXCEPT FOR STRUCTURE CUY-21-14.04 BOTH TYPES OF GROUNDING WILL BE REQUIRED.

IN THE CASE OF LAMP STANDARDS FOR INCANDESCENT LIGHTING, CONNECTION TO THE POWER LINE IS THROUGH THE INSULATING TRANSFORMER, IN THE PULLBOX. THE FUSE WILL NOT BE USED ON THE INCANDESCENT LAMP POLE WIRE. INSULATING TRANSFORMERS SHALL BE AS DETAILED ON DIVISION OF UTILITIES ENGINEERING, CITY OF CLEVELAND, DRAWING NO. 3863. TANKS SHALL BE WELDED STEEL, HOT-DIP GALVANIZED INSIDE AND OUTSIDE. AFTER GALVANIZING, OUTSIDE OF TANK SHALL BE PROPERLY TREATED AND TWO COATS OF WEATHER-RESISTANT PAINT APPLIED. ALUMINUM TANKS WILL NOT BE ACCEPTED.

CONT. No. 58019 SHEET NO. 5008

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

ELECTRICAL NOTES
WILLOW FREEWAY EXTENSION

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	L.H.		S.G.F.			

FED. RD. DIVISION	STATE	PROJECT		143 204
2	OHIO			

CUYAHOGA COUNTY
CUY— 21—(13.77)-(14.94)

PAYMENT FOR ELECTRICAL EQUIPMENT - 525

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 133) PER LINEAL FOOT, SHALL INCLUDE NECESSARY FIBER OR TRANSITE CONDUIT, CONCRETE AND FORMWORK, END BELTS, 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 133A.

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 133.

C. TYPE "C" DUCT, PER LINEAL FOOT, SHALL INCLUDE THE NECESSARY COMPONENTS AND WORK AS DESCRIBED UNDER "A," BUT IN QUANTITIES AND SIZES REQUIRED FOR TYPE "C" DUCT AS SHOWN IN THE APPROPRIATE FIGURE ON DRAWING 133.

D. TYPE "D" DUCT, PER LINEAL FOOT, SHALL INCLUDE THE NECESSARY COMPONENTS AND WORK AS DESCRIBED UNDER "A," BUT IN QUANTITIES AND SIZES REQUIRED FOR TYPE "D" DUCT AS SHOWN IN THE APPROPRIATE FIGURE ON DRAWING 133.

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 133.

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.

G. FREEWAY-TYPE STANDARD, DOUBLE ARM, SHALL BE THE SAME AS ITEM F, EXCEPT THAT TWO 17 FOOT STEEL BRACKET ARMS SHALL BE SUPPLIED.

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.

J. SERVICE-ROAD-TYPE STANDARD SHALL INCLUDE 22 FOOT 9 INCH POLE, BRACKET ATTACHMENTS, 8 FOOT STEEL BRACKET ARM WITH TWO ATTACHED MEMBERS, 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.

K. SPECIAL STANDARD FOR RAMP B-S SHALL INCLUDE 26 FOOT POLE, BRACKET ATTACHMENTS, 10 FOOT STEEL BRACKET ARM, END KNOB WITH PLUMBIZER ATTACHMENT, NECESSARY SINGLE-CONDUCTOR NO. 12 AWG 600 VOLT POLE AND BRACKET CABLE, ALL CONNECTIONS AND SPLICING, SCREWS, BOLTS, NUTS, WASHERS, AND ALL MODIFICATIONS SHOWN ON THE PLANS, INCLUDING GROUNDING.

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, BACKFILLING, 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. 22,500 LUMEN LAMPS, ASA CODE H33-1GL/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. SHIPPING CARTON SHALL BE MARKED TO SHOW DISTRIBUTION TYPE.~~ VOID — See note in Proposal

O. LUMINAIRE, MERCURY, 250 WATT, SHALL CONSIST OF 2 INCH SLIPFITTER, REFLECTING-HOUSING ASSEMBLY, HINGED REFRACTOR, COMPLETE WITH INTERNAL BALLAST, AND ARRANGED FOR TYPE II I.E.S./A.M.A. LIGHT DISTRIBUTION. 12,000 LUMEN LAMPS, ASA CODE H37-5KC/W, ARE TO BE INCLUDED. THE BALLAST SHALL BE AS OUTLINED IN THE PRECEDING PARAGRAPH.

P. LUMINAIRE, 4,000, SHALL INCLUDE 4,000 LUMEN LAMP, REFLECTOR, GLOBE REFRACTOR, LAMP RECEPTACLE, CORROSION-RESISTANT FITTINGS, LATCHES, SAFETY CHAIN, GASKETS, AND INSULATING TRANSFORMER. SHALL BE LINE MATERIAL "SUBURBANAIRE", G.E. TYPE SA OR APPROVED EQUAL, WITH A.S.A./I.E.S. TYPE II LIGHT DISTRIBUTION.

Q. LUMINAIRE, 10,000, SHALL INCLUDE 10,000 LUMEN LAMP, REFLECTOR, GLOBE REFRACTOR, LAMP RECEPTACLE, CORROSION RESISTANT FITTINGS, LATCHES, SAFETY CHAIN, GASKETS, AND INSULATING TRANSFORMER. SHALL BE GENERAL ELECTRIC 79-R, WESTINGHOUSE TYPE AK 10 OR APPROVED EQUAL, WITH A.S.A./I.E.S. TYPE III LIGHT DISTRIBUTION.

R-1 UNDERDECK LIGHTING, COMPLETE, FOR WILLOW OVER ORANGE-E. 30TH, SHALL CONSIST OF UNDERDECK LUMINAIRES, PULL-BOXES, SAFETY SWITCH, BREAKERS, AND POWER SERVICE, AS SPECIFIED UNDER ITEMS R, S, T, U, AND V ON DRAWING NO. 141, TOGETHER WITH ALL MOUNTINGS, CONDUIT, INTERCONNECTING WIRING, TERMINALS, SPLICES, ADAPTORS, LOCKNUTS, BUSHINGS, BOLTS, NUTS, WASHERS AND SPACERS SHOWN ON THE DRAWING, OR 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," ABOVE.

R-2 UNDERDECK LIGHTING, COMPLETE, FOR BROADWAY OVER WILLOW, SHALL CARRY THE SAME GENERAL SPECIFICATIONS AS GIVEN FOR ITEM R-1, EXCEPT THAT THE ITEMS AND QUANTITIES SHALL BE AS SPECIFIED ON DRAWING NO. 139.

W. UNIT LIGHTING FOR KINGSBURY VIADUCT SHALL INCLUDE THE NECESSARY SINGLE CONDUCTOR NO. 12 AWG 600 VOLT POLE AND BRACKET CABLE, AND ALL CONNECTIONS AND SPLICING REQUIRED TO PLACE INTO OPERATION THE LIGHTING ON THE KINGSBURY VIADUCT. THE CONDUIT, PULL-BOXES AND LAMP STANDARDS WERE FURNISHED AS PART OF THE PREVIOUS PROJECT, AND THE LUMINAIRES AND THE CONDUIT AND PULL-BOX WIRING ARE INCLUDED IN OTHER ITEMS OF THE PRESENT PROJECT. REFER TO GENERAL SPECIFICATION ON SHEET 142.

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.

Z. BOX 24" x 12" x 12", CAST IRON, WATERTIGHT, WITH CHECKERED COVER. 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 NOS. 139 AND 140.

AA. TRANSFORMER MANHOLE 8 x 22 SHALL INCLUDE REQUIRED EXCAVATION, FORMWORK, CONCRETE, REINFORCING STEEL, MANHOLE FRAMES AND COVERS, BOLTS, AND FASTENINGS FOR HOLDING MANHOLE FRAMES DOWN, CAST IRON DRAIN AND GRATING, 6 INCH DIAMETER VITREOUS CLAY PIPE DRAIN LINE TO EDGE OF SLOPE, LIGHTING DUCTS, END BELLS, VENTILATION COMPLETE WITH VENT CAP, FASTENINGS, ANCHOR INSERTS FOR MOUNTING OF EQUIPMENT, FITTINGS AND STRAPS, GROUNDING, WATERPROOFING, BACKFILLING, TAMPING, COMPACTING AND REMOVAL OF WASTE. ELECTRICAL EQUIPMENT, CONSISTING OF OIL SWITCH, TIMER, CONTROL TRANSFORMER, OIL CUTOUTS AND DISTRIBUTION TRANSFORMERS SPECIFIED ON DRAWING NO. 138 ARE TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR, WHO SHALL ALSO MAKE LOW VOLTAGE CONNECTIONS ONLY TO THE DESIGNATED LIGHTING CIRCUITS. MANHOLE CONSTRUCTION IS SHOWN ON DRAWING NO. 137.

AB. TRANSFORMER MANHOLE 8 x 11 SHALL INCLUDE ALL OF THE ITEMS MENTIONED UNDER "TRANSFORMER MANHOLE 8 x 22," WITH THE NECESSARY DIFFERENCES IN SIZE AND AMOUNT. SEE DRAWINGS 136 AND 138.

AC. MANHOLE, PER EACH, SHALL INCLUDE REQUIRED EXCAVATION FOR 5 FT. BY 8 FT. MANHOLE, FORMS, REINFORCING STEEL, CONCRETE, MANHOLE FRAMES AND COVERS, BOLTS AND FASTENINGS FOR HOLDING MANHOLE FRAME DOWN, END BELLS FOR DUCTS, PULLING IRONS, GROUND ROD, TERMINALS, SPLICING, BACKFILLING, TAMPING, COMPACTING, REMOVAL OF WASTE, CAST IRON DRAIN AND GRATING, 6 INCH DIAMETER VITREOUS CLAY PIPE, CONNECTION TO EXISTING SEWER MANHOLE AND WATERPROOFING. CONTRACTOR WILL MAKE ONLY THE LOW VOLTAGE CONNECTIONS IN THIS MANHOLE.

AD. EMERGENCY ALARM STATION SHALL INCLUDE FURNISHING AND MOUNTING PEDESTAL AND CALL-BOX ASSEMBLY AS SHOWN ON SHEET 133A.

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 Z.

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 1.

AH. WIRE, NO. 6 GAUGE, 600 VOLT, PER LINEAR FOOT, EXCEPT FOR SIZE, SHALL CARRY THE SAME SPECIFICATIONS AS ITEM AG. SEE NOTE 1.

AI. WIRE, NO. 8 GAUGE, 5 KV, PER LINEAL FOOT, EXCEPT FOR SIZE AND INSULATION, SHALL CARRY THE SAME SPECIFICATIONS AS ITEM AG. SEE NOTE 1.

AJ. SPECIAL STANDARD FOR BROADWAY OVERPASS SHALL INCLUDE 28 FOOT POLE, BRACKET ATTACHMENTS, 10 FOOT STEEL BRACKET ARM WITH THREADED TENON TO ACCOMMODATE. THE END KNOB AND PLUMBIZER ATTACHMENT, NECESSARY SINGLE-CONDUCTOR NO. 8 A.W.G. 600 VOLT POLE CABLE, NO. 12 ASBESTOS COVERED BRACKET WIRE, ALL CONNECTIONS AND SPLICING, SCREWS, BOLTS, NUTS, WASHERS, AND ALL MODIFICATIONS SHOWN ON THE PLANS, INCLUDING GROUNDING.

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 PULLBOX AND WITH THE LIGHTING CIRCUITS. SEE DETAILS ON SHEET 133A.

AM. WIRE, ALARM CIRCUITS, PER LINEAR FOOT, SHALL INCLUDE ONE MULTI-CONDUCTOR CABLE TO BE PLACED IN CONDUIT AND PULLBOXES 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 PULLBOXES, 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, WESTERN ELECTRIC TYPE BHBA OR APPROVED EQUAL. NOT PART OF THIS CONTRACT.

AN. SERVICE CABLE FOR CONNECTION FROM ALARM PULLBOX 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. NOT PART OF THIS CONTRACT.

AX. SINGLE PULLBOX FOR ALARM SYSTEM SHALL CARRY THE SAME SPECIFICATIONS AS ITEM "X", WITH PROPER CONDUIT ENTRIES.

AZ. BOX 30" x 12" x 12", CAST IRON, WATERTIGHT, WITH CHECKERED COVER. OZ TYPE YT301212, HOPE TYPE 5836 OR APPROVED EQUAL. SEE SHEET 140. BOX TO BE FURNISHED WITH NECESSARY CONDUIT ENTRIES AND BOSSES, AND 1-1/2" COPPER TUBE DRAIN.

BB. SPECIAL DUCT TO MATCH OHIO BELL TELEPHONE COMPANY CONSTRUCTION. TO INCLUDE TWO 3-1/2" BERMICO FIBER CONDUITS AS DESCRIBED ON SHEET 127, AND AS SHOWN IN CROSS SECTION ON SHEET 140.

BC. MANHOLE, FOR ALARM SYSTEM, TO CARRY SAME SPECIFICATIONS AS ITEM AC, EXCEPT FOR 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 140.

NOTE 1:

ALL NO. 4, 6 AND 12, 600 VOLT WIRE SHALL BE FAA SPEC. L-824, TYPE A (SEVEN STRAND).
ALL NO. 8, 5,000 VOLT WIRE SHALL BE FAA SPEC. L-824, TYPE B (19 STRAND).

All references to 22,500 Lumen appearing throughout these plans shall be considered to read 11,900 Lumen

Rev. 8-23-63 C.E.H.

CONT. No. 58019 SHEET ACCT. No. 5009

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

ELECTRICAL NOTES
WILLOW FREEWAY EXTENSION

SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DATE		L.H.		S.G.F.			

0.9

0-10

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2	OHIO		

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CUYAHOGA COUNTY
CUY - 21 - (18.77)(14.94)

MICROFILMED MAY 23 1984

B-S RAMP

W-S RAMP

S-E RAMP

BROADWAY N 37° 33' 03" W

AVE. N 35° 08' 48" W

GALLUP AVE. N 52° 02' 52" E

DOUSE AVE. N 52° 11' 26" E

ROSEVILLE CT. 40'

RAMP B.L. STA. 0+00

RAMP B.L. N 11° 08' 48" W

℄ WILLOW DATA:
Δ = 9° 36' 26"
D = 1° 00' 00"
R = 5729.58'
T = 481.49'
L = 960.72'
E = 20.20'

℄ BRIDGE N 35° 37' 08" W

TANGENT N 54° 52' 52" W

TANGENT N 14° 39' 18" W

PARALLEL TO TANGENT

TYPICAL SECTION OF EXISTING BROADWAY PVMT.

TYPICAL SECTION OF PROPOSED APPROACH PAVEMENT ON BROADWAY

CRITICAL CLEARANCE PT. "A" (EAST EDGE OF FLG.) CLEARANCE = 15.28'

FOUNDATION SOUNDINGS:-
FOUNDATION DESIGN & FOUNDATION QUANTITIES ARE BASED ON A STUDY OF ROD SOUNDINGS (AND/OR 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.

PROPOSED STRUCTURE

TYPE: CONT. WELDED STEEL GIRDER WITH REINF. CONC. DECKS & SUBSTRUCTURE
℄ SPANS: 125.63 & 171.66'
ROADWAY: 46'-0" f/f OF 6'-2" SIDEWALKS
LOAD FREQUENCY: CF=400 (57)
SKEW: 62°-34'-27.5" (AV.) R.F.
WEARING SURFACE: 1" MONOLITHIC CONC.
APPROACH SLABS: SPECIAL (30 FT. LONG)
ALIGNMENT: TANGENT

SECTION ON ℄ BRIDGE

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

SITE PLAN

BRIDGE NO. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE
CUYAHOGA COUNTY U.S.R.-21

SCALE DATE 10-13-61

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
—	VPK		BMC	CWT	10-26-62	

CONT. NO. 58019 SHEET

RECEIVED
MAY 23 1984

FED. RD. DIVISION	STATE	PROJECT	
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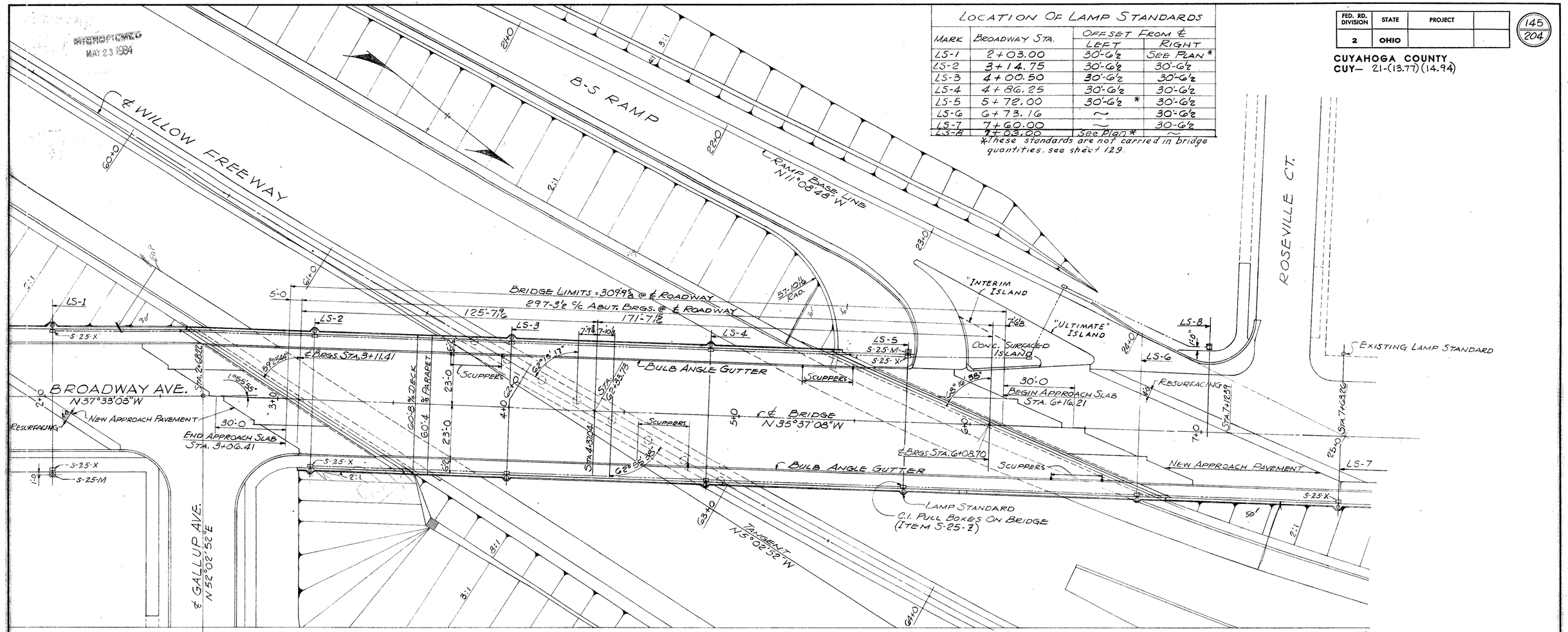
CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)

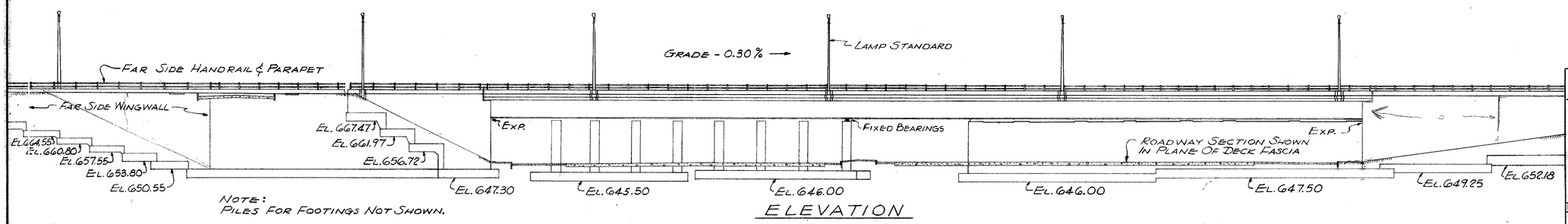
LOCATION OF LAMP STANDARDS

MARK	BROADWAY STA.	OFFSET FROM ℄ LEFT	RIGHT
LS-1	2+03.00	30'-6½	SEE PLAN *
LS-2	3+14.75	30'-6½	30'-6½
LS-3	4+00.50	30'-6½	30'-6½
LS-4	4+86.25	30'-6½	30'-6½
LS-5	5+72.00	30'-6½ *	30'-6½
LS-6	6+73.16	~	30'-6½
LS-7	7+60.00	~	30'-6½
LS-8	7+03.00	SEE PLAN *	~

*THESE STANDARDS ARE NOT CARRIED IN BRIDGE QUANTITIES, SEE SHEET 129.



GENERAL PLAN



NOTE:
PILES FOR FOOTINGS NOT SHOWN.

ELEVATION

NOTES

1-ELECTRICAL POWER SUPPLY FOR LIGHTING ORIGINATES FROM CLEVELAND MUNICIPAL SYSTEM.
2-LEGEND FOR POWER SUPPLY LINES:
—·—·— TYPE "A" ELECTRICAL DUCT (OFF BRIDGE)
—·—·— 2" NON-MET. CONDUIT IN SIDEWALK (ON BRIDGE)
⊡ LIGHT STANDARD ON CONCRETE BLOCK FOUNDATION ITEM S 25M (OFF BRIDGE)
□ SINGLE PULL BOX, CONCRETE TYPE, ITEM S 25-X (OFF BRIDGE)
FOR GENERAL NOTES SEE DWG. 146
FOR SUPERSTRUCTURE DETAILS SEE DWG. 169

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

GENERAL PLAN & ELEVATION
BRIDGE NO. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE
CUYAHOGA COUNTY U.S.R. 21

SCALE	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DESIGNED	C.A.T.		V.P.K.	CWT	10-26-62	

CONT. NO. 58019 SHEET CT. NO. 1630

MICROFILMED MAY 23 1984

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	SUPERSTR.	ABUT.	PIERS	GENERAL
E-2	6,715	CU. YD.	UNCLASSIFIED EXCAVATION		6390	325	
E-2	875	SQ. FT.	STEEL SHEET PILING LEFT IN PLACE (MIN. SECT. MOD. = 7.0 IN³ PER FT. OF WALL)		875		
E-2	838	SQ. FT.	STEEL SHEET PILING LEFT IN PLACE (MIN. SECT. MOD. = 10.7 IN³ PER FT. OF WALL)		838		
E-2	2,425	SQ. FT.	STEEL SHEET PILING LEFT IN PLACE (MIN. SECT. MOD. = 15.3 IN³ PER FT. OF WALL)		2425		
E-2	132	SQ. FT.	STEEL SHEET PILING LEFT IN PLACE (MIN. SECT. MOD. = 19.0 IN³ PER FT. OF WALL)		132		
E-2	294	SQ. FT.	STEEL SHEET PILING LEFT IN PLACE (MIN. SECT. MOD. = 30.2 IN³ PER FT. OF WALL)		294		
E-2		LUMP SUM	COFFERDAMS, CRIBS & SHEETING				LUMP
S-1	667	CU. YD.	CLASS "C" CONCRETE, SUPERSTRUCTURE	667			
S-1	55	CU. YD.	CLASS "C" CONCRETE, PIER COLUMNS			55	
S-1	1,210	CU. YD.	CLASS "E" CONCRETE, PIER & ABUTMENT FOOTINGS		1010	200	
S-1	1,240	CU. YD.	CLASS "E" CONCRETE, ABUTMENT WALLS, INCL. WING WALLS		1240		
S-3	530	LIN. FT.	WATERPROOFING, PREMOLDED SEALING STRIP		530		
S-4	347,495	LBS.	REINFORCING STEEL	145,027	168,637	33,831	
S-7*	1,180,371	LBS.	STRUCTURAL STEEL	1,180,371			
S-8*	1,180,371	LBS.	FIELD PAINTING OF STRUCTURAL STEEL, AS PER PLAN	1,180,371			
S-9	352	SQ. FT.	1" PREFORMED EXPANSION JOINT FILLER		352		
S-14	849.98	LIN. FT.	RAILING (ALUMINUM RAIL TYPE "C" & SUPPORTS, CONCRETE PARAPET)	606.75	243.23		
S-14	324.02	LIN. FT.	RAILING (ALUMINUM RAIL TYPE "A" & SUPPORTS, CONCRETE PARAPET)		324.02		
S-16		LUMP SUM	FIRST TEST PILE				LUMP
S-17		LUMP SUM	FIRST PILE TEST LOAD				LUMP
S-18	30,450	LIN. FT.	12" DIA. CAST IN PLACE REINFORCED CONCRETE PILES		22,500	3,600	
S-25			LIGHTING QUANITIES (SEE SHEET 129)				
S-29	975	CU. YD.	POROUS BACKFILL		975		
S-29	75	LIN. FT.	10" DIA. BITUMINOUS COATED CORRUGATED METAL PIPE (INCL. SPECIALS)		75		
S-29	84	LIN. FT.	8" DIA. PERFORATED BITUMINOUS COATED CORR. METAL PIPE (INCL. SPECIALS)		84		
S-29	684	LIN. FT.	10" DIA. PERFORATED BITUMINOUS COATED CORR. METAL PIPE (INCL. SPECIALS)		684		
S-29	24	LIN. FT.	10" DIA. CONCRETE PIPE		24		
S-29	153	LIN. FT.	4" DIA. GALVANIZED STANDARD STEEL PIPE		153		
S-29	8	EACH	SCUPPERS, INCLUDING SUPPORTS	8			
S-29		LUMP SUM	TROUGH HORIZONTAL CONDUCTORS	LUMP			
S-29	227	LIN. FT.	8" DIA. STD. PIPE DOWNSPOUTS, INCLUDING SPECIALS	227			
S-101	667	EACH	WATER-REDUCING, SET-RETARDING ADMIXTURE	667			
S-17	2	EACH	SUBSEQUENT PILE TEST LOAD, AS PER PLAN				2

CONT. NO. 58019 SHEET CT. NO. 177

FED. RD. DIVISION	STATE	PROJECT	
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146/204

CUYAHOGA COUNTY
CUY- 21-(13.77)(14.94)

GENERAL NOTES

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.

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:
AR-1-57 DATED 4-2-62
FSB-1-62 " 1-15-63

AND TO SUPPLEMENTAL SPECIFICATIONS:
S-307 " 8-23-60
S-101 " 7-12-62

PILES IN PIERS & ABUTMENTS ARE DESIGNED FOR A LOAD OF 40 TONS. HOWEVER, BECAUSE OF GROUP ACTION, THE PILES SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 47.5 TONS EACH. ESTIMATED LENGTH PER PILE IS 70 FT.

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 SIDE WALKS AND ROADWAYS.
B. THE ENTIRE EXPOSED SURFACE OF PIERS AND ABUTMENTS EXCEPT BRIDGE SEATS, BACKWALLS.

UTILITY ADJUSTMENTS: 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 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 THE OWNERS, UNLESS OTHERWISE NOTED ON THESE PLANS. "

PILE TEST LOADS: FOR TEST LOADING 3R EQUALS 142.5 TONS.

SUBSEQUENT PILE TEST LOADS: ONE TEST LOAD SHALL BE APPLIED THREE DAYS AFTER THE PILES HAVE BEEN DRIVEN AS PER THE CONSTRUCTION AND MATERIALS SPECIFICATIONS, AND ONE TEST LOAD SHALL BE APPLIED TEN DAYS AFTER THE PILES HAVE BEEN DRIVEN. THE TEN DAY LOADING CAN BE ACCOMPLISHED BY LOADING A SEPARATE PILE OR BY LOADING THE SAME PILE AFTER A LAPSE OF SEVEN DAYS FROM THE END OF THE FIRST SUBSEQUENT TEST LOAD

STRUCTURAL STEEL SHALL BE COPPER BEARING AND SHALL CONFORM TO ITEM M-7, SECT. M-7.4 (b) OF THE CONSTRUCTION AND MATERIALS SPECIFICATIONS.

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.

BUTT WELDS SHALL BE RADIOGRAPHICALLY EXAMINED AS REQUIRED AND IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION NO. S-307, DATED 8-23-60

PAINTING OF STRUCTURAL STEEL: ALL PAINTING SHALL CONFORM, BOTH AS TO MATERIALS AND APPLICATION, WITH THE STANDARD SPECIFICATIONS OF THE CITY OF CLEVELAND FOR PAINTING. SEE PROPOSAL NOTE.

WATER CURING OF DECK SLAB:
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.

MACHINE FINISH: AT THE CONTRACTOR'S OPTION THE CONCRETE DECK MAY BE FINISHED BY THE USE OF A FINISHING MACHINE.

SHEET LEAD SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION B29 WITHOUT RESTRICTION TO THE COMMON DESILVERIZED TYPE.

ERECTION BOLTS: TACK WELD NUTS IF LEFT IN PLACE.

SHOP PAINTING STEEL: THE SURFACE PREPARATION OF ALL STEEL, REQUIRING SHOP PAINTING AS PER THE PLANS AND SPECIFICATIONS, SHALL BE ACCOMPLISHED BY BLAST CLEANING OR POWER TOOL CLEANING, EXCEPT AS NOTED IN THE SPECIFICATIONS REGARDING THE USE OF CHROMATE PRIMERS.

FOR ADDITIONAL NOTES SEE SHEETS #169 & 170

* CLEVELAND ILLUMINATING COMPANY TO PAY FOR 740 LBS., AND EAST OHIO GAS COMPANY TO PAY FOR 740 LBS.

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

GENERAL NOTES-QUANTITIES
BRIDGE NO. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY
CUYAHOGA COUNTY U.S.R. 21

SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
		CLS		RHF	CWT 10-24-62		

FED. RD. DIVISION	STATE	PROJECT
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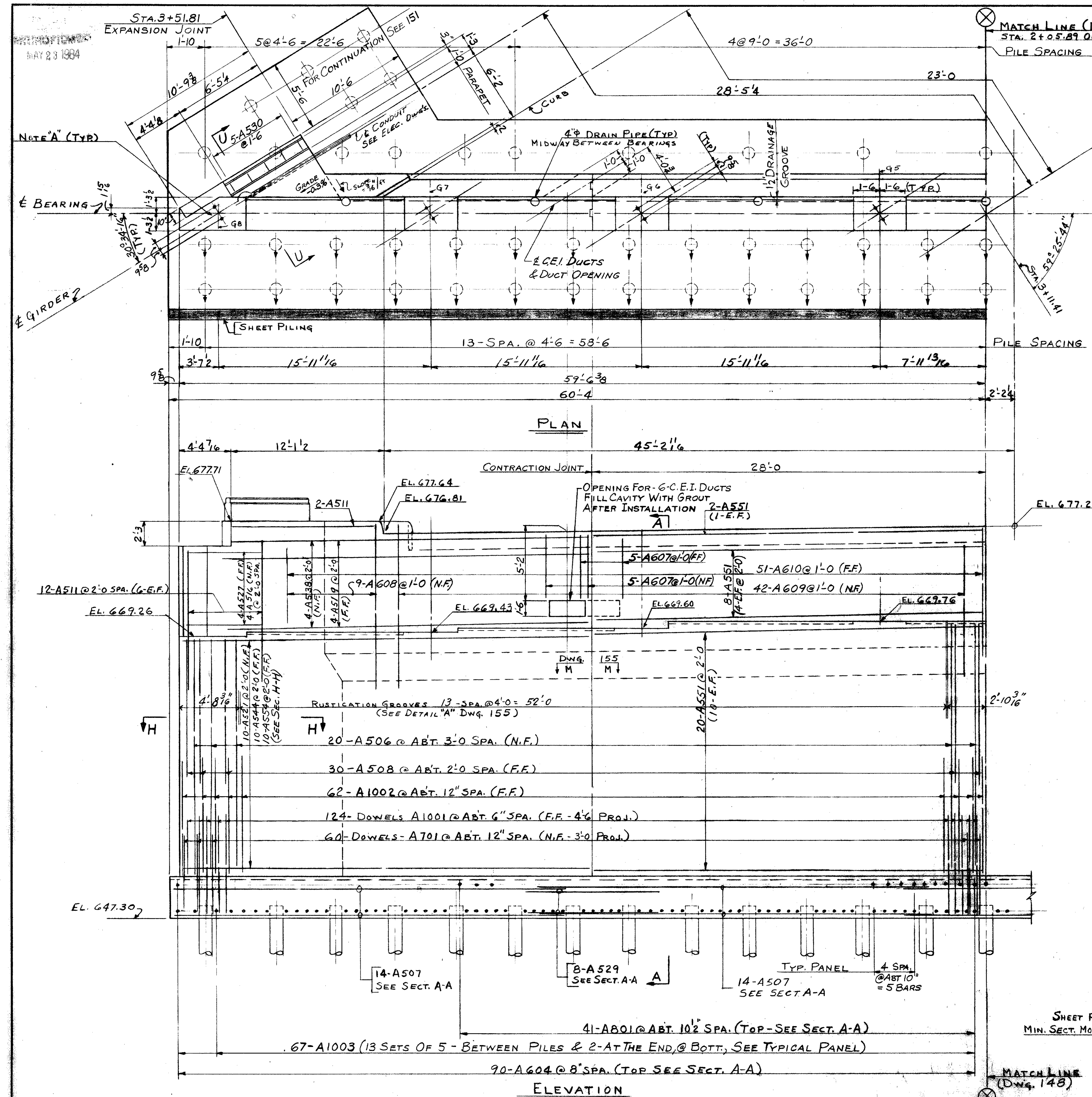
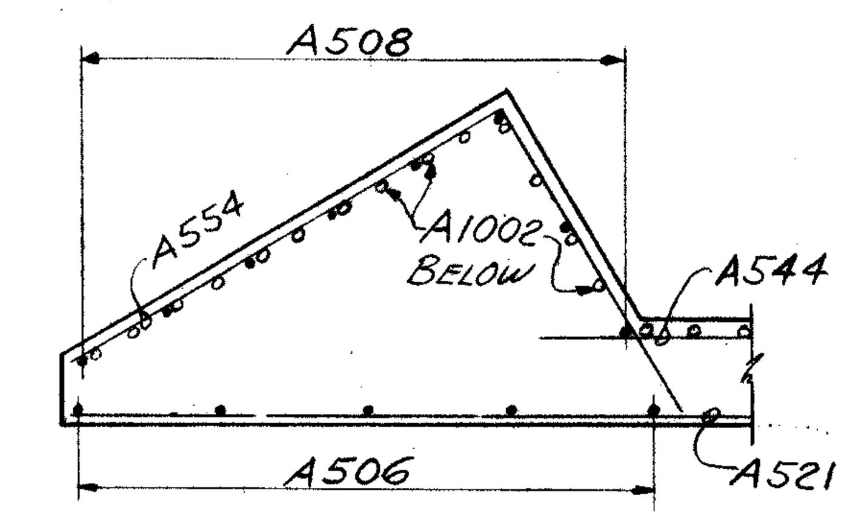
CUYAHOGA COUNTY
CUY–21–(13.77)–(14.94)



NOTE "A"

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'-4 DEEP)



SECTION H-H

GENERAL NOTES FOR SUBSTRUCTURE

CONCRETE IN ABUTMENT 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.

POROUS BACKFILL SHALL BE TWO FEET THICK FOR FULL LENGTH OF ABUTMENTS AND WINGS AND SHALL EXTEND UP TO THE UNDERSIDE OF THE APPROACH SLAB, SIDEWALK, OR TO FINISHED GROUND SURFACE.

ALL ABUTMENT CONCRETE SHALL BE CLASS "E" EXCEPT PARAPET.

EXPOSED CORNERS SHALL BE CHAMFERED ¾ INCHES.

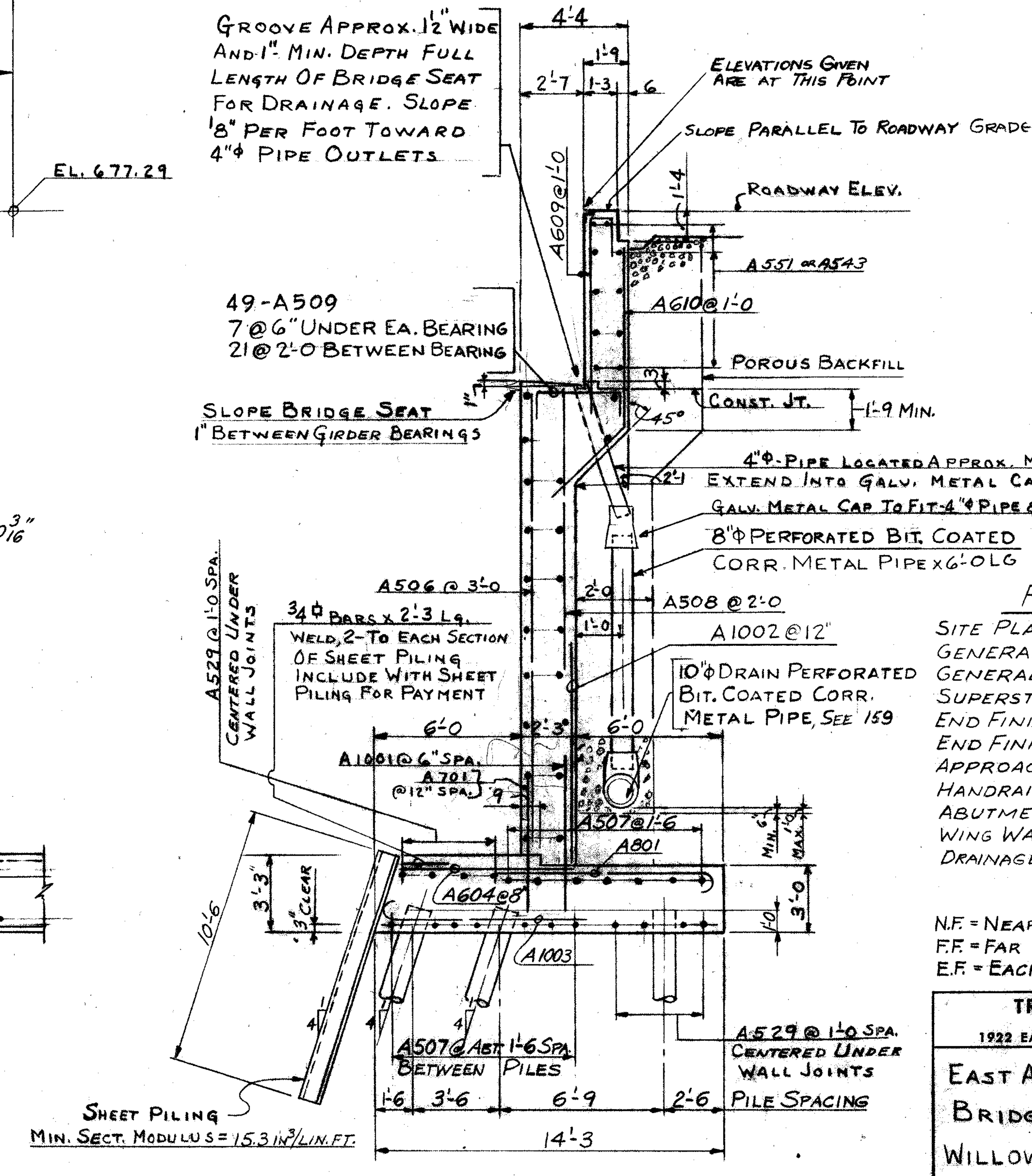
PARAPET CONCRETE AND BARS ENTIRELY IN PARAPET SHALL BE INCLUDED WITH RAILING FOR PAYMENT.

REINFORCING STEEL SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF TWO INCHES FROM THE FACE OF CONCRETE UNLESS NOTED EXCEPT FOR BOTTOM STEEL OF FOOTERS WHICH SHALL HAVE THREE INCHES CLEARANCE.

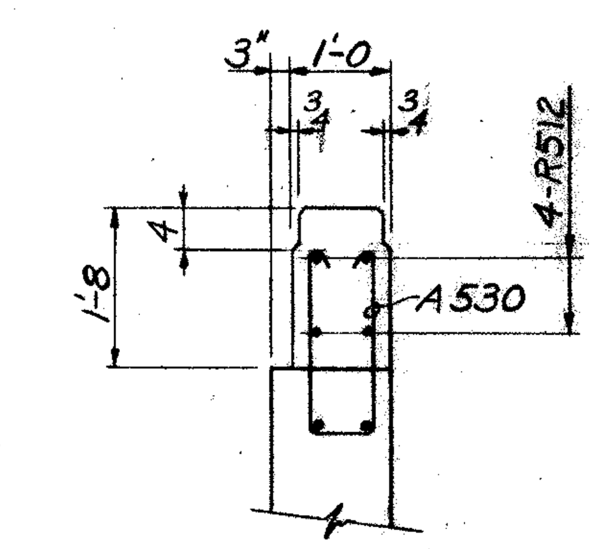
STEEL SHEET PILING LEFT IN PLACE MAY BE USED PILING IN GOOD CONDITION.

EXCAVATION QUANTITY COMPRISES MATERIAL BETWEEN BOTTOM OF FOOTER AND ROADWAY EXCAVATION

PILE DESIGNATION
○-PLUMB PILE
○-BATTERED PILE



SECTION A-A



SECTION U-U

REFERENCE DRAWINGS

N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE

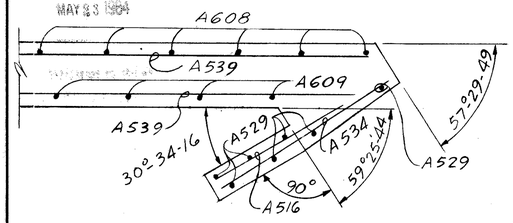
TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

EAST ABUTMENT-WEST BOUND LANE
BRIDGE Nº CUY.-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE
CUYAHOGA COUNTY U.S.R. 21

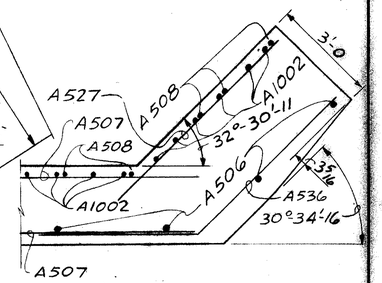
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

148/204

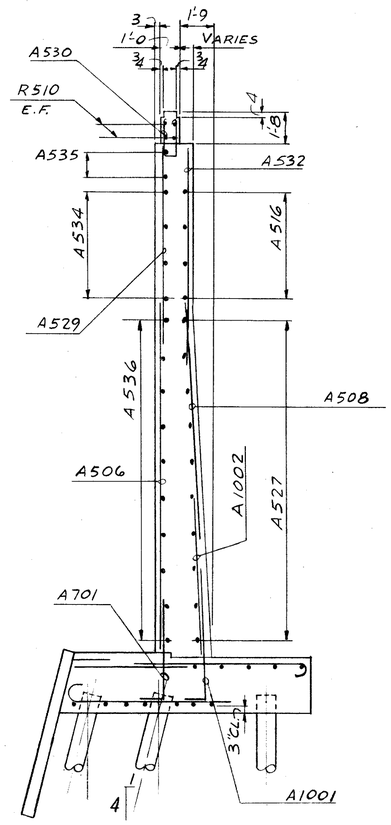
CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)



SECTION B-B



SECTION C-C



SECTION D-D

ELEVATION

NOTE "A"
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 5/8ø X 1'-4 DEEP)

NOTES

ABBREVIATIONS:
N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE

REINFORCING IN BACKWALL SHALL BE SPACED AROUND PIPE SLEEVE AND NO MORE THAN THREE VERT. BARS SHALL BE CUT IN EACH FACE TO CLEAR SLEEVE.

REFERENCE DRAWINGS

GENERAL NOTES	146, 147
FOR REFERENCES	147
BAR LIST	160

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

EAST ABUTMENT EAST BOUND LANE
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
	CJ AFR		RJY	CWT 10-84		

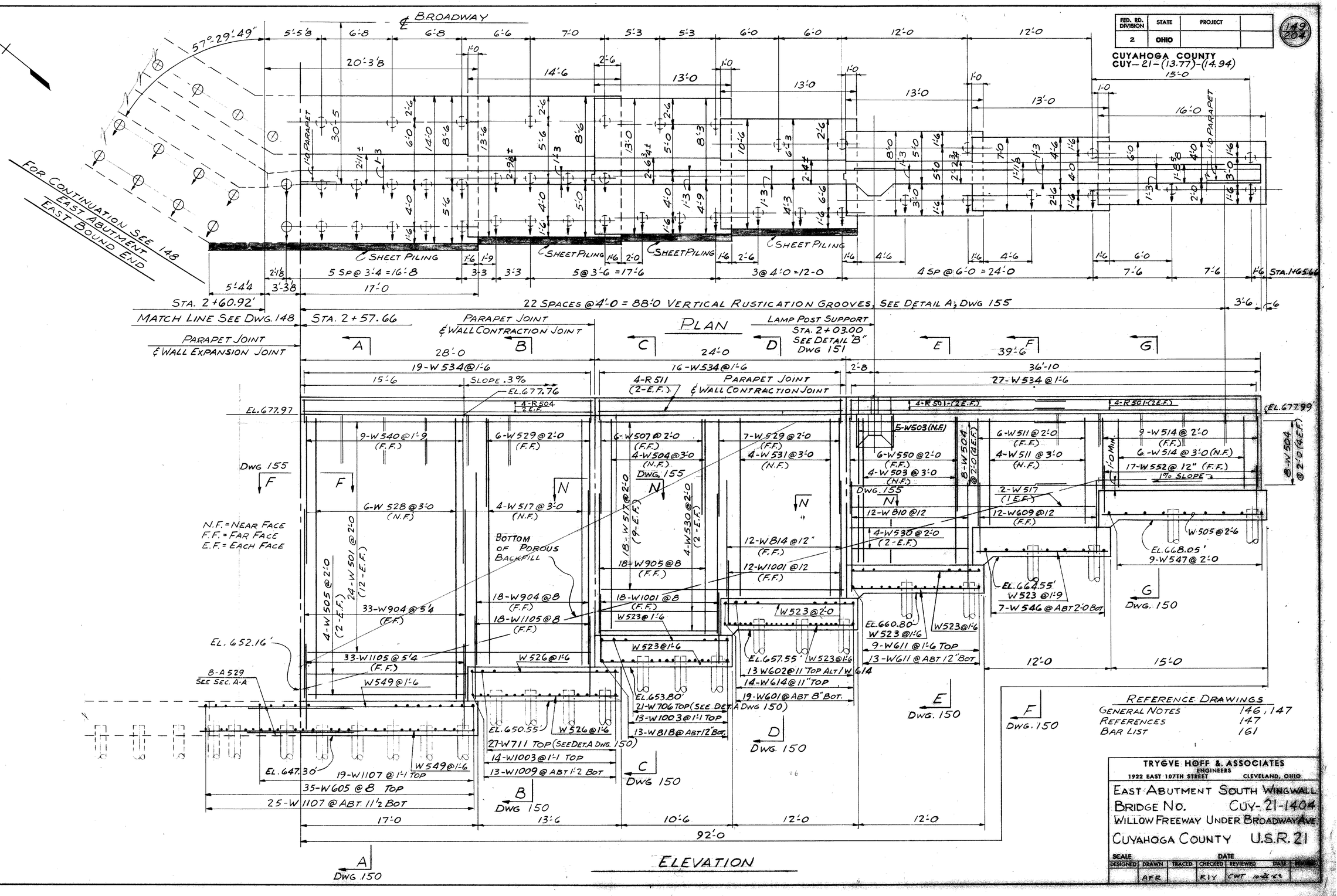
CONT. No. 58019 SHEET ACCT. No. 1639

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

149
204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

RECEIVED
MAY 23 1984



REFERENCE DRAWINGS

GENERAL NOTES	146, 147
REFERENCES	147
BAR LIST	161

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

EAST ABUTMENT SOUTH WINGWALL
BRIDGE NO. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE
CUYAHOGA COUNTY U.S.R. 21

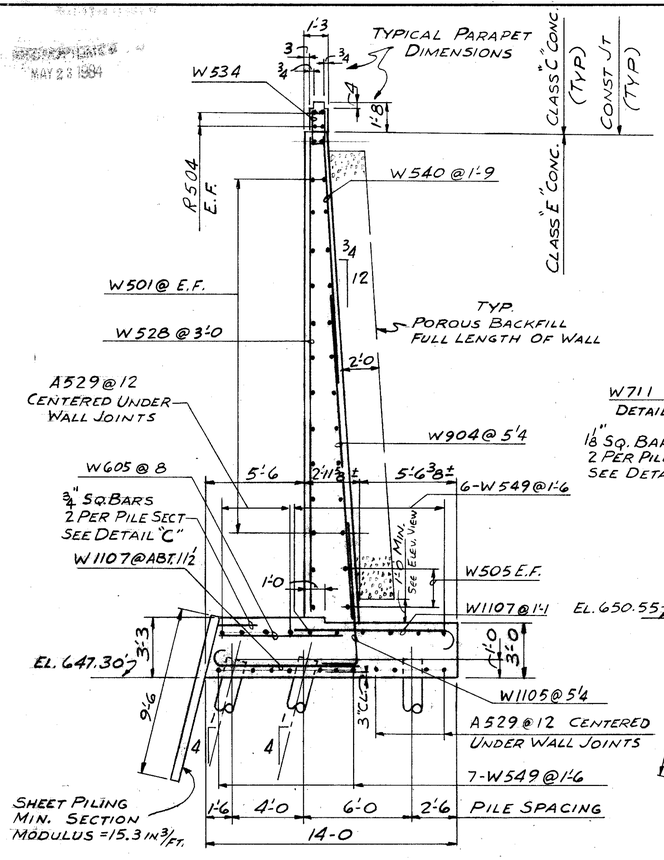
SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	AFR		RIY	CWT 10-22-84		

CONT. NO. 58019 SHEET ACCT. NO. 1640

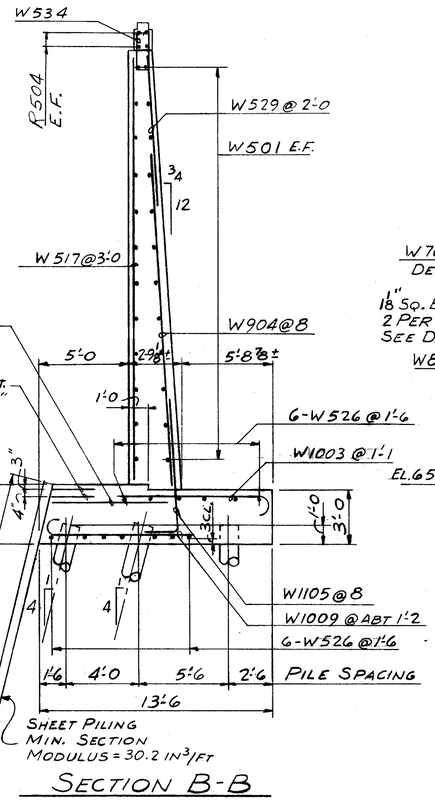
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

150
204

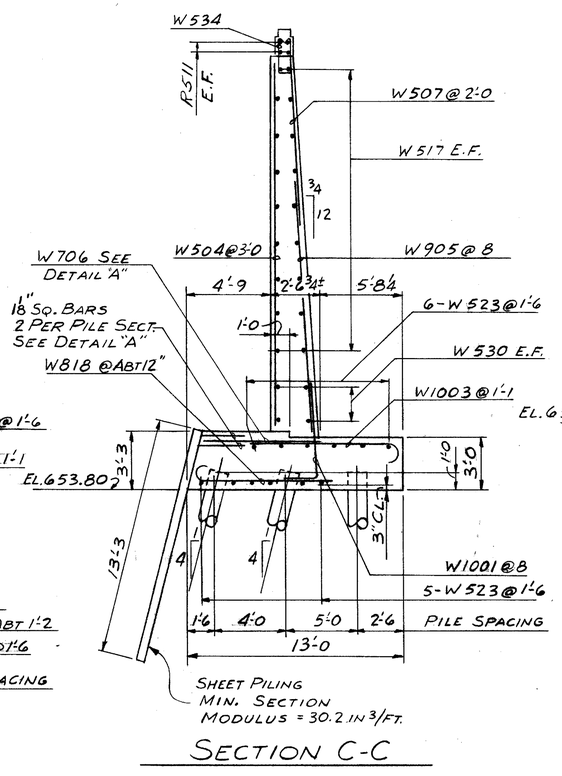
CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)



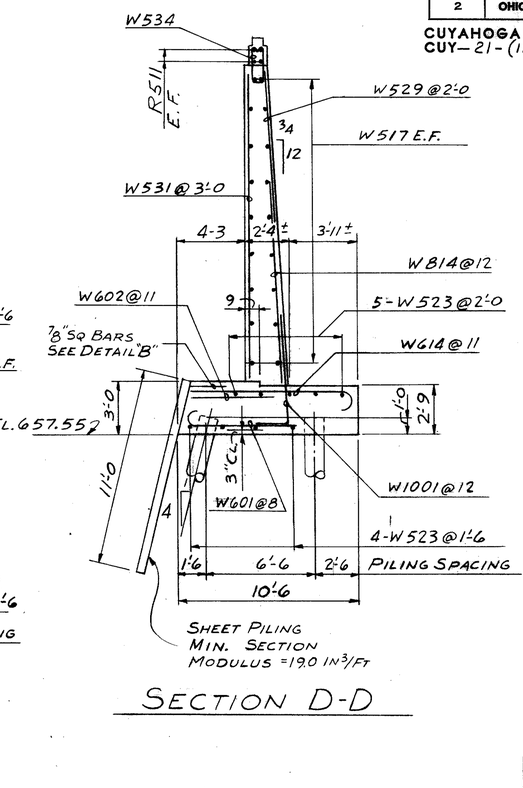
SECTION A-A



SECTION B-B

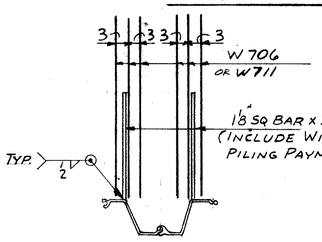


SECTION C-C

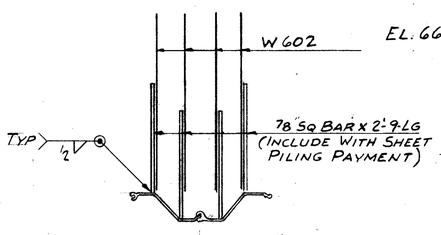


SECTION D-D

N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE



DETAIL "A"



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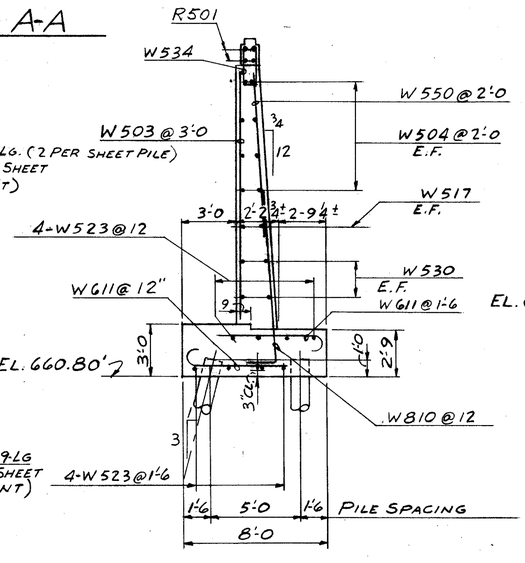
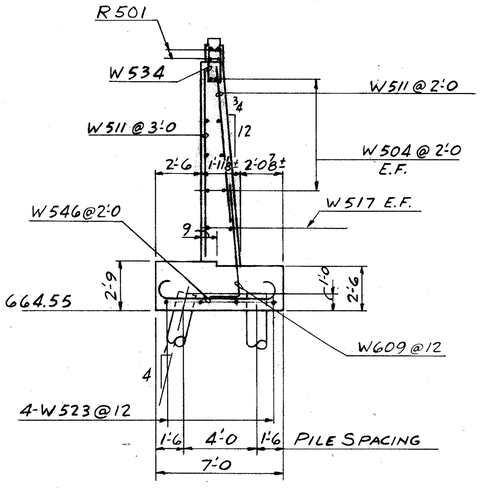
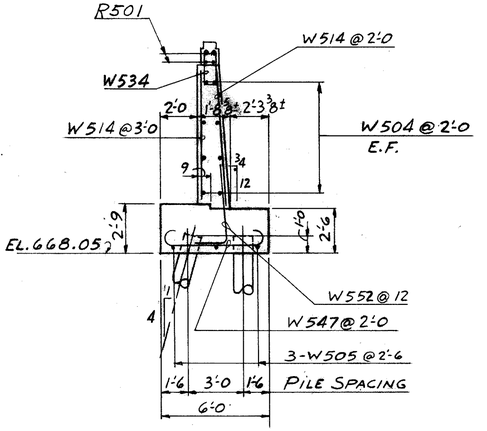


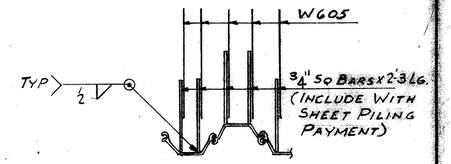
SECTION E-E



SECTION F-F



SECTION G-G



DETAIL "C"

REFERENCE DRAWINGS

GENERAL NOTES	146, 747
REFERENCES	147
BAR LIST	161

WORK THIS DWG WITH 149

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

SECTIONS
EAST ABUTMENT SOUTH WINGWALL
BRIDGE NO. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE
CUYAHOGA COUNTY U.S.R. 21

SCALE	DESIGNED	DRAWN	TRACED	DATE CHECKED	REVIEWED	DATE	REVISED
		AFR		RLY			

SHEET ADDT. NO. 1759
CONT. NO. 58016

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

151/204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

REFERENCE DRAWINGS

GENERAL NOTES	146, 147
FOR REFERENCES	147
BAR LIST	161

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

EAST ABUTMENT - NORTH WINGWALL
BRIDGE NO. CUY-21-1404
BROADWAY AVE. OVER WILLOW FREEWAY
CUYAHOGA COUNTY - USR-21

SCALE			DATE		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
	SCA		RJY	CWF	

SHEET NO. 58019 — SHEET TOT. NO. 1751

CONT. No. 38019 SHEET ACCT. No. 1641

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

153/204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

MAY 28 1964

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

WEST ABUTMENT WEST BOUND LANE
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
	CJ		RLY	CWT	10-26-62	

CONT. No. 58019 SHEET ACCT. No. 1642

RECEIVED MAY 23 1967

REFERENCE DRAWINGS

GENERAL NOTES	146, 147
REFERENCES	147
BAR LISTS	161

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

154/204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

N

PILE SPACING

℄ BROADWAY

FOR CONTINUATION SEE DWG. 153
WEST ABUTMENT
WEST BOUND END

STA. 6+90.77
EXPANSION JOINT

STA. 6+85.79

STA. 7+60.00

STA. 7+81.00

STA. 8+43.00

℄ LAMP POST SUPPORT
SEE DETAIL "B" DWG 151

SHEET PILING

PLAN

NOT INCLUDED IN THIS CONTRACT:

N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE

37-SPA. @ 4'-0 = 148'-0 VERTICAL RUSTICATION GROOVES (SEE DETAIL "A" DWG. 155)

PARAPET JOINT
CONTRACTION JOINT

PARAPET JOINT
EXPANSION JOINT

EL. 676.62 — 23-W534 @ 1'-6 SPA. — 4-R503 (2-E.F.) — A
EL. 676.29 — 19-W534 @ 1'-6 SPA. — 4-R504 (2-E.F.) — B
EL. 676.18 — 19-W534 @ 1'-6 SPA. — 4-R504 (2-E.F.) — C
EL. 676.07 — 19-W534 @ 1'-6 SPA. — 4-R504 (2-E.F.) — D
EL. 675.95 — 23-W534 @ 1'-6 SPA. — 4-R505 (2-E.F.) — E
EL. 675.82

18-W525 @ ABT. 2'-0 SPA. (F.F.)
24-W541 @ 2'-0 (12-E.F.)
12-W517 @ ABT. 3'-0 SPA. (N.F.)
35-W904 @ ABT. 1'-0 SPA. (F.F.)
34-W902 @ ABT. 1'-0 SPA. (F.F.) (SPACE ALTERNATE WITH W904)
69-W1004 @ 6" SPA. (F.F. - 4'-6 PROJ.)
11-W513 @ ABT. 2'-0 SPA.

15-W529 @ ABT. 2'-0 SPA. (F.F.)
22-W540 @ 2'-0 (11-E.F.)
10-W504 @ ABT. 3'-0 SPA. (N.F.)
15-W905 @ ABT. 2'-0 SPA. (F.F.)
28-W906 @ ALTERNATE 8" & 1'-4 SPA. (F.F.)
43-W1001 @ 8" SPA. (F.F. - 4'-0 PROJ.)

15-W507 @ 2'-0 (F.F.)
5-W505 (N.F.)
18-W501 @ 2'-0 (9-E.F.)
10-W505 @ ABT. 3'-0 SPA. (N.F.)
15-W803 @ ABT. 2'-0 SPA. (F.F.)
15-W804 @ ABT. 2'-0 SPA. (F.F.)
29-W1005 @ 12" SPA. (F.F. - 3'-0 PROJ.)

15-W507 @ ABT. 2'-0 SPA. (F.F.)
14-W501 @ 2'-0 (7-E.F.)
10-W540 @ ABT. 3'-0 SPA. (N.F.)
29-W808 @ 12" SPA. (F.F. - 5'-0 PROJ.)

18-W514 @ ABT. 2'-0 SPA. (F.F.)
10-W540 @ 2'-0 (5-E.F.)
12-W514 @ ABT. 3'-0 SPA. (N.F.)
18-W608 @ 2'-0 SPA. (F.F. - 3'-6 PROJ.)
3" CLEAR (TYP.)
W541 @ 2'-0

EL. 647.50
EL. 649.25 — W539 @ 1'-6 — A
EL. 652.18 — W502 @ 1'-6 (TOP & BOTT) — B
EL. 657.08 — W502 @ 1'-6 (TOP) — W502 @ 1'-6 (BOTT) — C
EL. 661.48 — W502 @ 1'-6 TOP — W502 @ 1'-6 BOTT. — D
EL. 665.75 — E

55-W605 @ ABT. 8" (TOP)
40-W806 @ ABT. 10'2" SPA. (TOP)
52-W806 @ ABT. 8'2" SPA. (BOTT.)

42-W613 @ ABT. 8" SPA. (TOP)
26-W801 @ ABT. 1'-1 SPA. (TOP)
28-W801 @ ABT. 12" SPA (BOTT.)

42-W602 @ ABT. 8" SPA. (TOP)
19-W601 @ ABT. 1'-6 SPA. (TOP)
40-W601 @ ABT 9" SPA (BOTT.)

16-W509 @ ABT. 2'-0 SPA. (TOP)
30-W509 @ ABT. 12" SPA. (BOTT)

18-W546 @ ABT. 2'-0 SPA. (BOTT)

ELEVATION

(FOR ALL SECTIONS SEE DWG. 155)

NOT INCLUDED IN THIS CONTRACT:
STA. 7+83.00

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

WEST ABUTMENT - NORTH WINGWALL
BRIDGE Nº CUY.-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE
CUYAHOGA COUNTY U.S.R. 21

SCALE	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DESIGNED	CJ		RIV	CWT 10-26-67		

CONT. No. 58019 SHEET ACCT. No. 1643

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

155/204

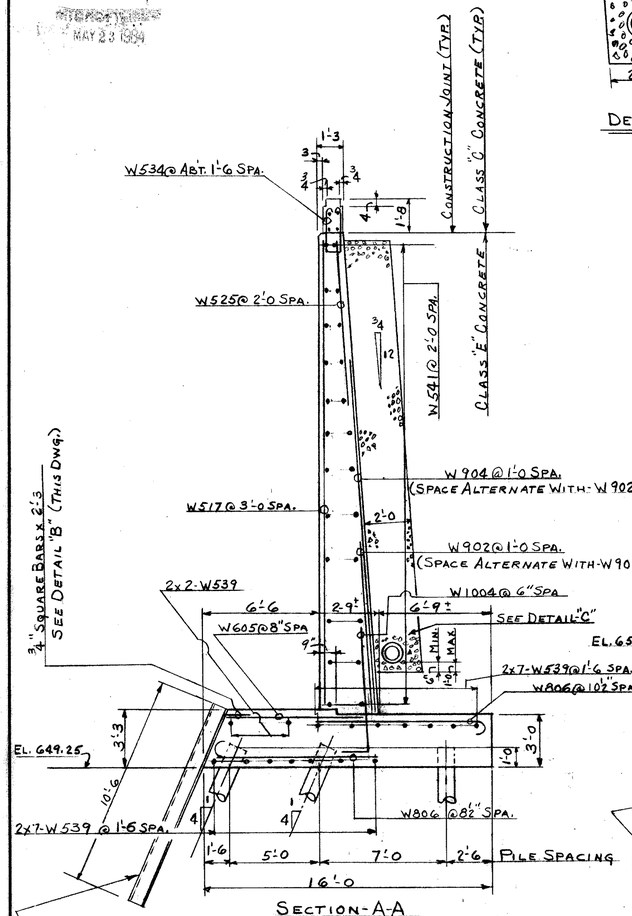
CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

10"ϕ CORRUGATED PIPE PERFORATED, BITUMASTIC COATED (FULL LENGTH OF WALL) SEE DRAINAGE PLAN,-DWG. 159
POROUS BACK FILL FULL LENGTH OF WALL

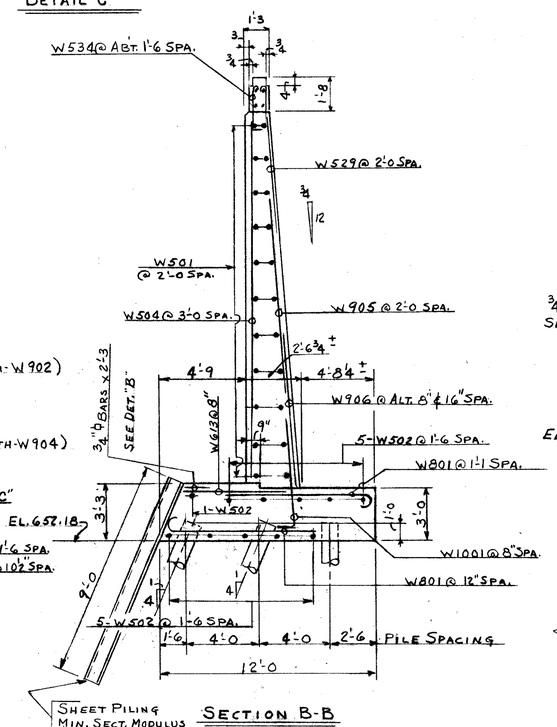
DETAIL "C"

¾" SQUARE BARS x 2'-3 LONG POSITION NEAR BEND IN SHEET PILE SECTION,- 2- REQ'D. PER SECTION (INCLUDE BARS WITH SHEET PILING FOR PAYMENT)

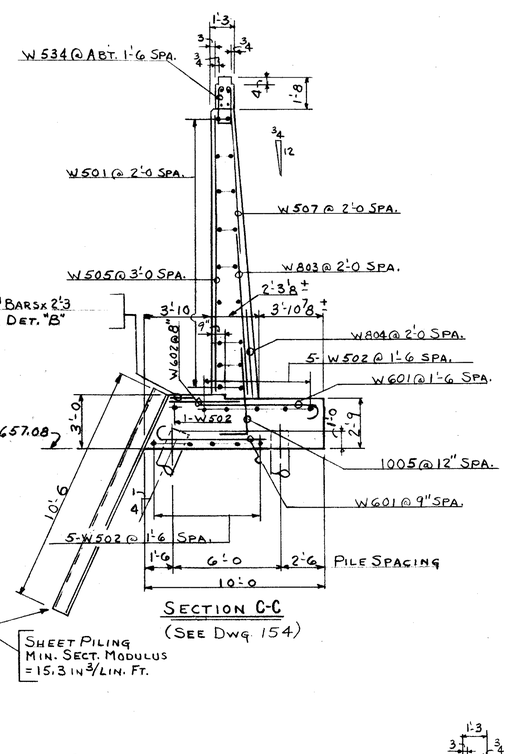
DETAIL "B"



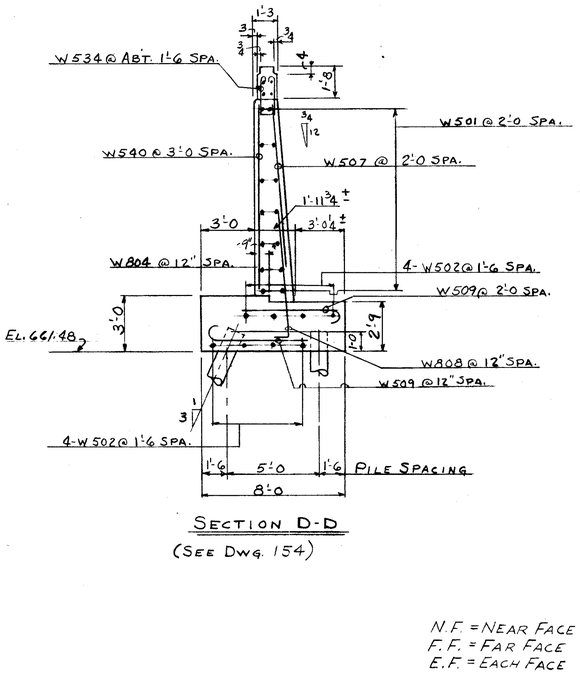
SECTION-A-A
(SEE DWG. 154)



SECTION B-B
(SEE DWG. 154)

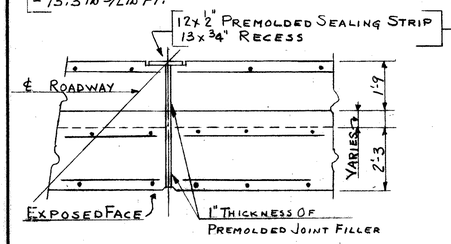


SECTION C-C
(SEE DWG 154)

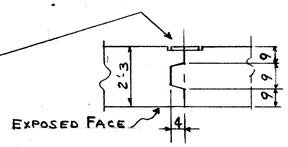


SECTION D-D
(SEE DWG. 154)

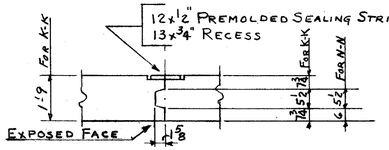
N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE



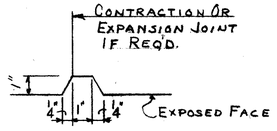
SECTION G-G (@ EXPANSION JOINT)



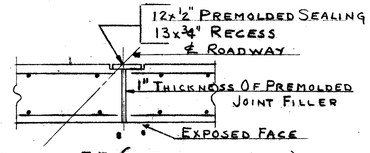
SECTION M-M (@ CONTRACTION JOINT)



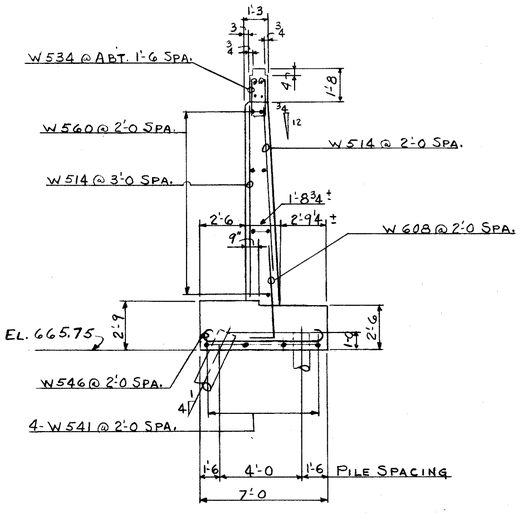
SECTION K-K (@ CONTRACTION JOINT)
SECTION N-N (@ CONTRACTION JOINT)



DETAIL "A"
TYPICAL RUSTICATION GROOVE



SECTION F-F (@ EXPANSION JOINT)



SECTION E-E
(SEE DWG. 154)

REFERENCE DRAWINGS

GENERAL NOTES	146, 147
REFERENCES	147
BAR LIST	161

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

SECTIONS
WEST ABUTMENT - NORTH WINGWALL
BRIDGE Nº CUY - 21- 1404
WILLOW FREEWAY UNDER BROADWAY AVE
CUYAHOGA COUNTY U.S.R. 21

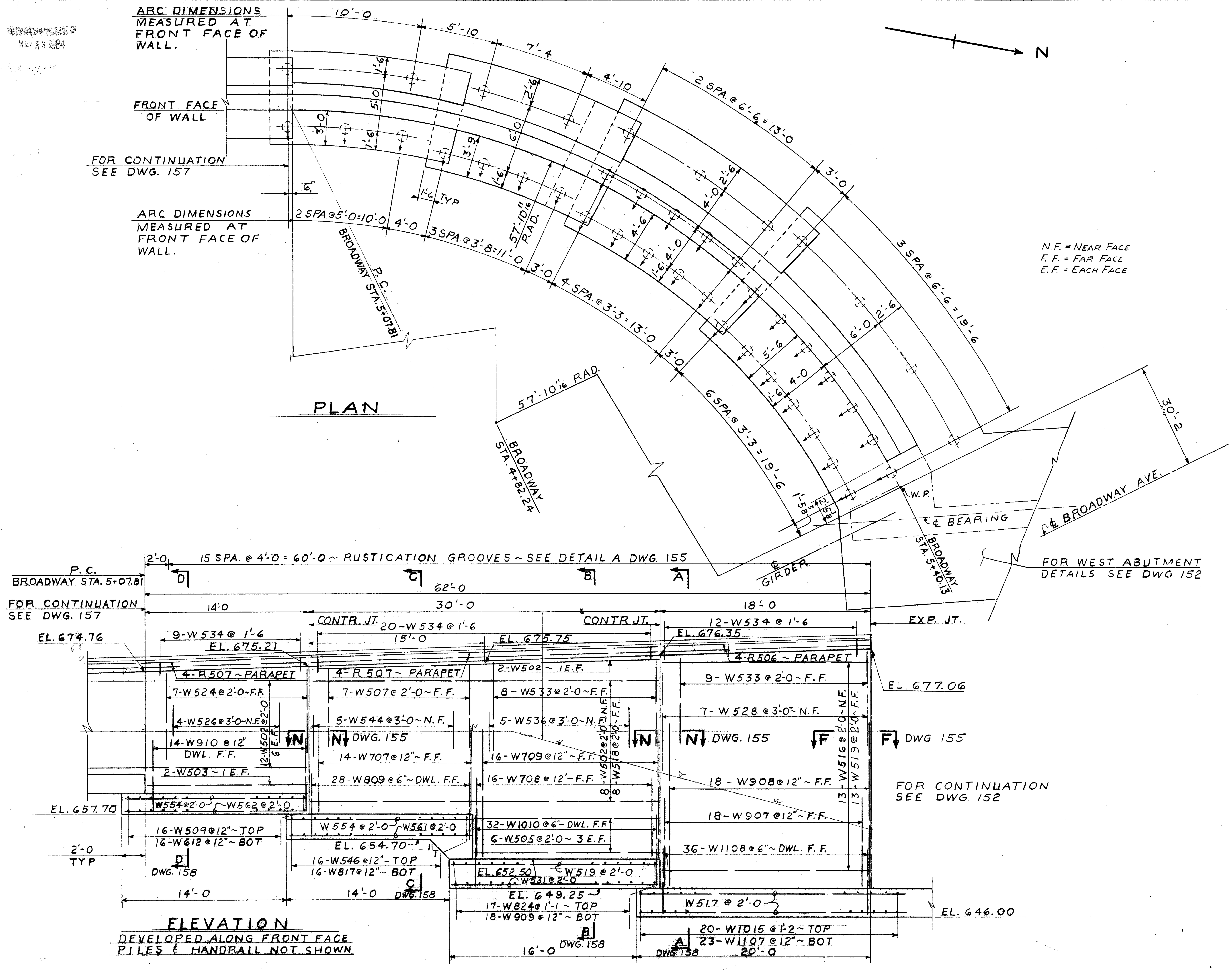
SCALE	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DESIGNED	CJ		RIY	CWT	10-26-62	

SHEET ACCT. No. 1644
CONT. No. 38019

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

156/204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)



ARC DIMENSIONS MEASURED AT FRONT FACE OF WALL.
FRONT FACE OF WALL
FOR CONTINUATION SEE DWG. 157
2 SPA.@5'-0=10'-0
4'-0
3 SPA.@3'-8=11'-0
3'-0
4 SPA.@3'-3=13'-0
6 SPA.@3'-3=19'-6
2 SPA.@6'-6=13'-0
3 SPA.@6'-6=19'-6
10'-0
5'-10
7'-4
4'-10
1'-6 TYP
57'-10 1/16" RAD.
P.C. BROADWAY STA. 5+07.81
BROADWAY STA. 4+82.24
N
N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE
30'-2
W.P.
℄ BEARING
℄ BROADWAY AVE.
℄ GIRDER
BROADWAY STA. 5+40.13
FOR WEST ABUTMENT DETAILS SEE DWG. 152
PLAN
15 SPA. @ 4'-0 = 60'-0 ~ RUSTICATION GROOVES ~ SEE DETAIL A DWG. 155
62'-0
14'-0
30'-0
18'-0
CONTR. JT.
EXP. JT.
EL. 674.76
EL. 675.21
EL. 675.75
EL. 676.35
EL. 677.06
9-W534 @ 1'-6
20-W534 @ 1'-6
12-W534 @ 1'-6
4-R507 ~ PARAPET
4-R506 ~ PARAPET
7-W524 @ 2'-0~F.F.
7-W507 @ 2'-0 ~ F.F.
8-W533 @ 2'-0 ~ F.F.
9-W533 @ 2'-0 ~ F.F.
4-W526 @ 3'-0~N.F.
5-W544 @ 3'-0 ~ N.F.
5-W536 @ 3'-0 ~ N.F.
7-W528 @ 3'-0 ~ N.F.
14-W910 @ 12" DWL. F.F.
14-W707 @ 12" ~ F.F.
16-W709 @ 12" ~ F.F.
18-W908 @ 12" ~ F.F.
18-W907 @ 12" ~ F.F.
2-W503 ~ 1 E.F.
2-W502 ~ 1 E.F.
28-W809 @ 6" ~ DWL. F.F.
16-W708 @ 12" ~ F.F.
32-W1010 @ 6" ~ DWL. F.F.
6-W505 @ 2'-0 ~ 3 E.F.
36-W1108 @ 6" ~ DWL. F.F.
FOR CONTINUATION SEE DWG. 152
EL. 657.70
W554 @ 2'-0 W562 @ 2'-0
W554 @ 2'-0 W561 @ 2'-0
16-W509 @ 12" ~ TOP
16-W612 @ 12" ~ BOT
EL. 654.70
16-W546 @ 12" ~ TOP
16-W817 @ 12" ~ BOT
EL. 652.50
W519 @ 2'-0
W531 @ 2'-0
EL. 649.25
17-W824 @ 1'-1 ~ TOP
18-W909 @ 12" ~ BOT
W517 @ 2'-0
EL. 646.00
20-W1015 @ 1'-2 ~ TOP
23-W1107 @ 12" ~ BOT
14'-0
14'-0
16'-0
20'-0
2'-0 TYP
DWG. 155
DWG 155
DWG. 158
ELEVATION
DEVELOPED ALONG FRONT FACE
PILES & HANDRAIL NOT SHOWN

REFERENCE DRAWINGS

GENERAL NOTES	146, 147
REFERENCES	147
BAR LIST	161

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

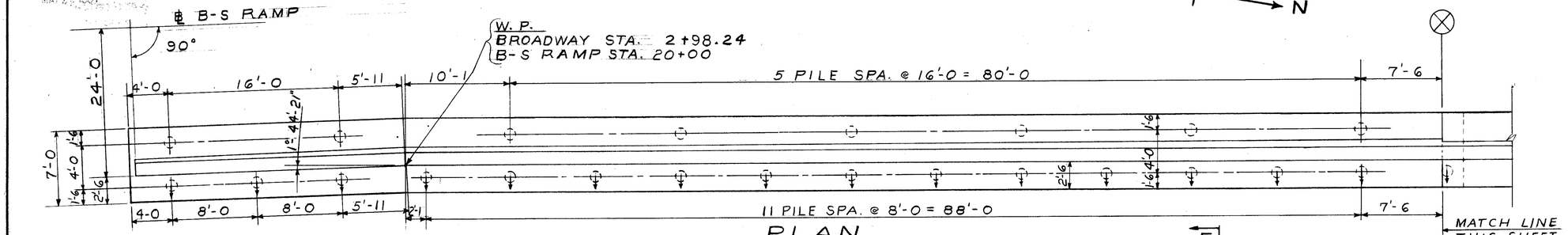
WEST ABUTMENT SOUTH WINGWALL
BRIDGE NO. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY U.S.R. 21

SCALE				DATE		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RJB	RJB		CES	CWT 10-26-62		

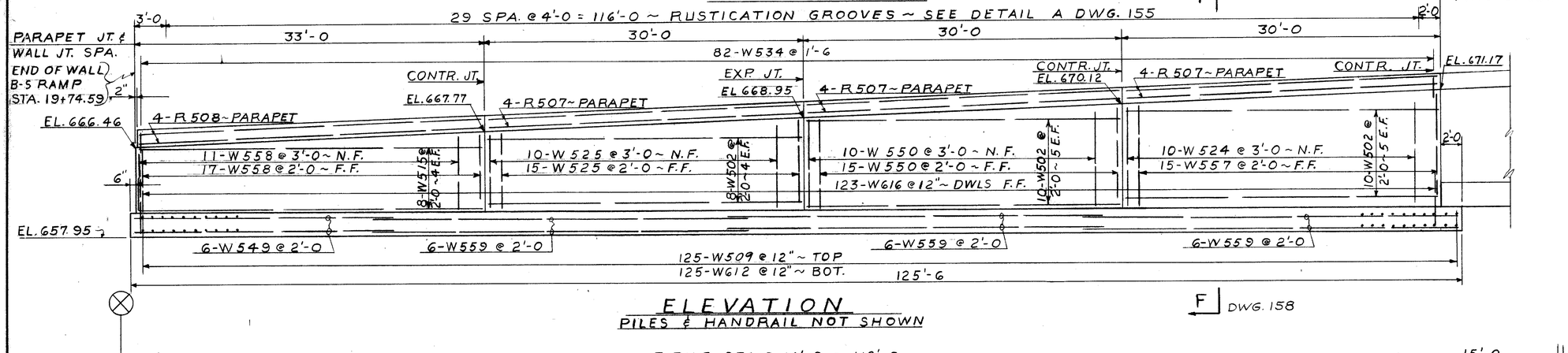
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

157/204

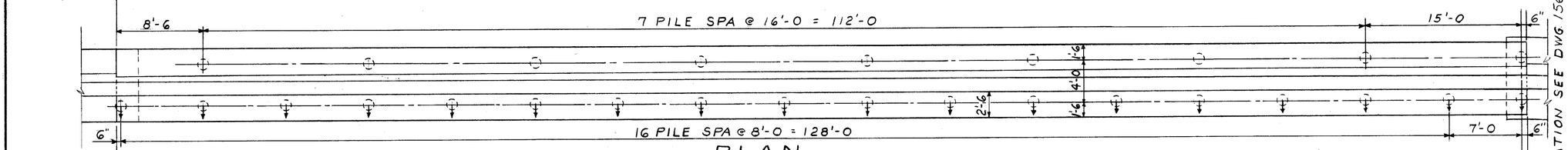
CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)



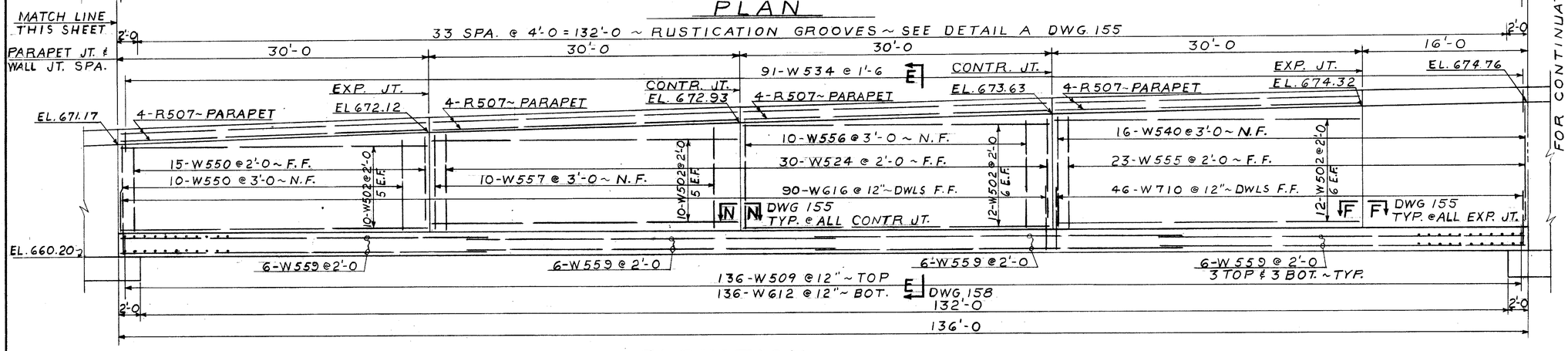
PLAN



ELEVATION
PILES & HANDRAIL NOT SHOWN



PLAN



ELEVATION
PILES & HANDRAIL NOT SHOWN

N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE

REFERENCE DRAWINGS

GENERAL NOTES	146, 147
REFERENCES	147
BAR LIST	161

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

WEST ABUTMENT - SOUTH WINGWALL
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.J.B.	R.J.B.		CWS	CWT	10-26-82	

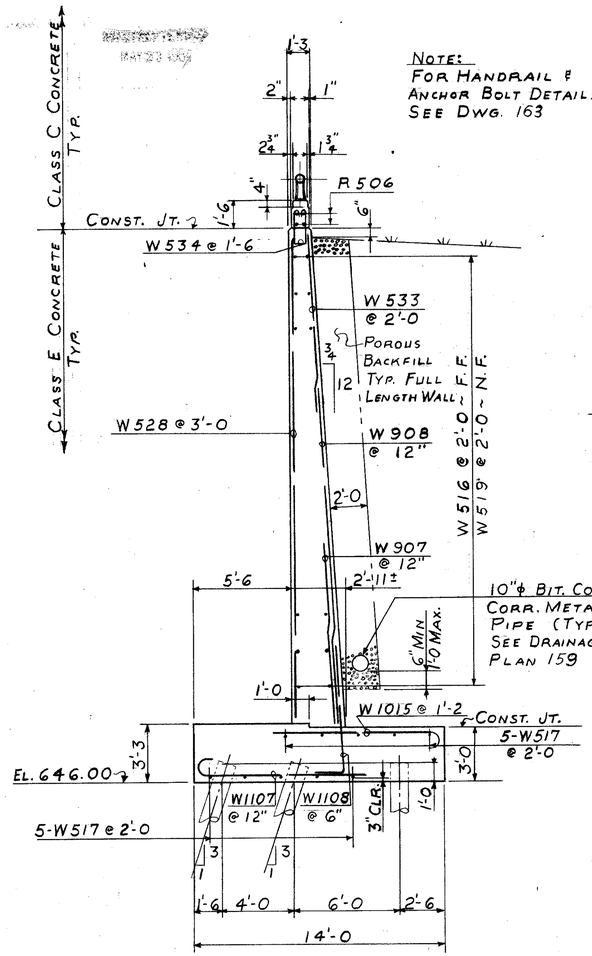
CONT. No. 53019 SHEET ACCT. No. 1753

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

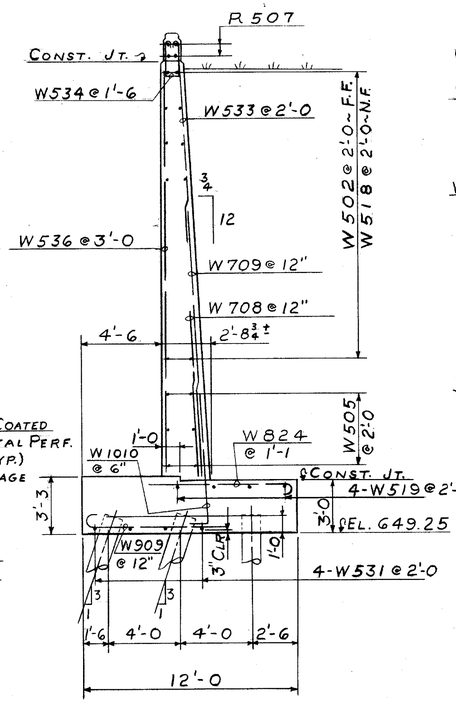
158
204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

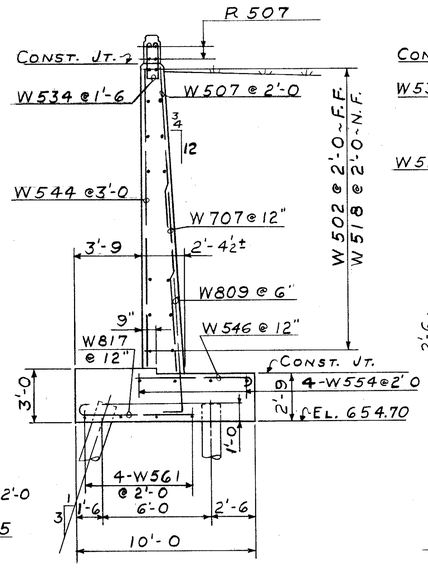
NOTE:
FOR HANDRAIL & ANCHOR BOLT DETAILS SEE DWG. 163



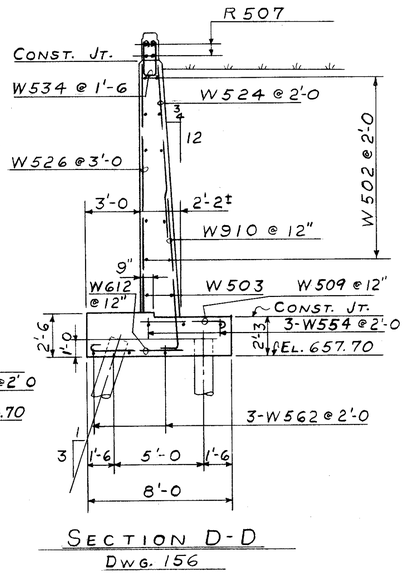
SECTION A-A
DWG. 156



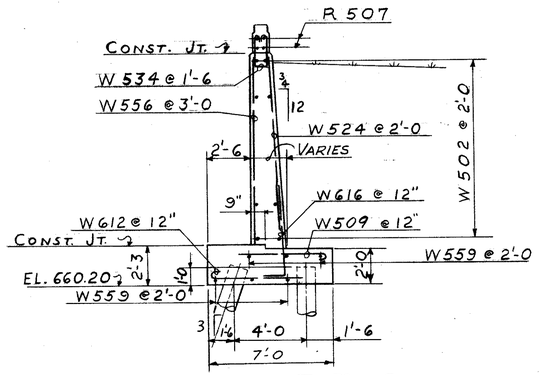
SECTION B-B
DWG. 156



SECTION C-C
DWG. 156



SECTION D-D
DWG. 156



SECTION E-E SHOWN
SECTION F-F SIMILAR
DWG 157

N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE

REFERENCE DRAWINGS

GENERAL NOTES	146, 147
REFERENCES	147
BAR LIST	161

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

SECTIONS
WEST ABUTMENT-SOUTH WINGWALL
BRIDGE No. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY U.S.R. 21

SCALE

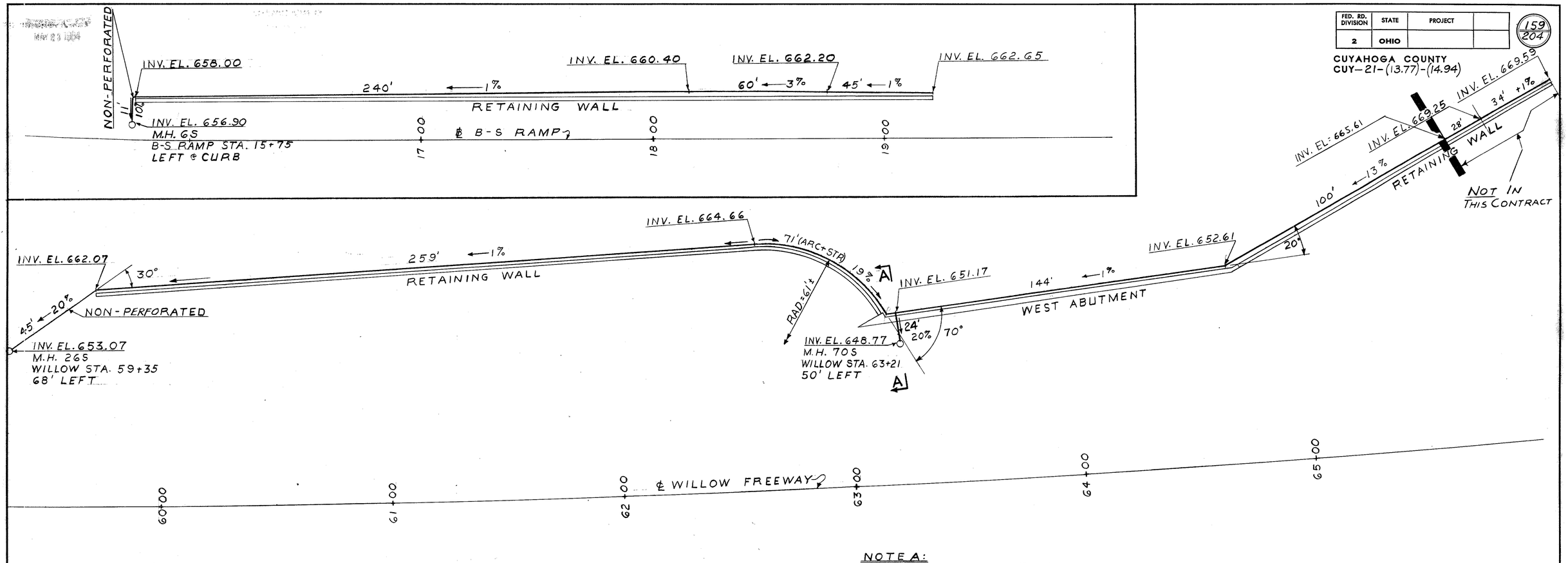
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RJB	RJB		CWT	CWT 10-26-62		

CONT. No. 58019 SHEET ADST. No. 1254

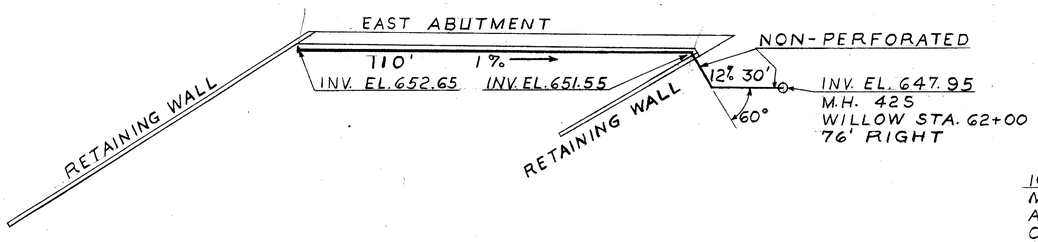
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

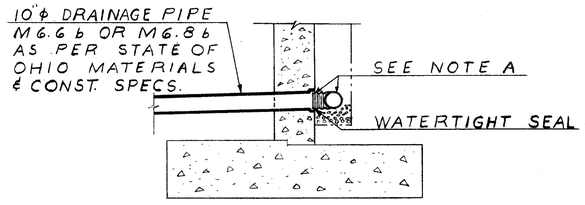
159/204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)



NOTE A:
ALL DRAINAGE PIPE IS 10"℄ BITUM. COATED CORR. METAL & PERFORATED UNLESS NOTED.





SECTION A-A

REFERENCE DRAWINGS

144	SITE PLAN ~ WILLOW FREEWAY
174	SITE PLAN ~ B-S RAMP
147,148	EAST ABUTMENT
152,153	WEST ABUTMENT
149,150	EAST ABUTMENT SOUTH WINGWALL
151	EAST ABUTMENT NORTH WINGWALL
154,155	WEST ABUTMENT NORTH WINGWALL
156,157,158	WEST ABUTMENT NORTH WINGWALL
175,176,177	B-S RAMP
146	GENERAL NOTES

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

DRAINAGE 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
R.J.B.	R.J.B.		C.L.S.	CWT 10-26-62		

CONT. No. 58019 SHEET ACCT. No. 1761

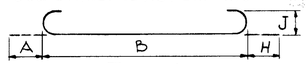
REINFORCING STEEL BAR SCHEDULE

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

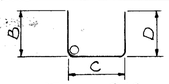
CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)

160
204

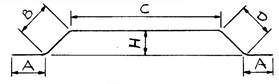
"J" USE STANDARD AS PER OHIO



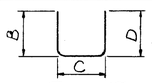
TYPE 1



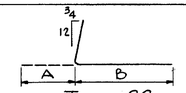
TYPE S12



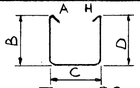
TYPE 14



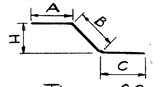
TYPE 17



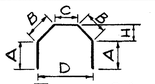
TYPE 22



TYPE S3



TYPE 23



TYPE 24

MARK	No. REQUIRED EAST ABUTMENT	No. REQUIRED WEST ABUTMENT	TOTAL	LENGTH	TYPE	A	B	C	D	H	WEIGHT
			-								
A502	-	18	18	17'-2	STR.						322
A503	-	14	14	17'-8	STR.						258
A505	-	106	106	5'-11	17		1'-0	4'-2	1'-0		654
A506	42	32	74	19'-0	STR.						1466
A507	76	14	90	29'-6	STR.						2769
A508	62	-	62	11'-9	STR.						760
A509	98	-	98	5'-7	17		1'-0	3'-10	1'-0		571
A511	14	-	14	11'-0	STR.						161
			-								-
			-								-
A514	-	7	7	9'-6	STR.						69
A515	-	4	4	6'-0	STR.						25
A516	8	22	30	4'-6	STR.						140
A517	-	2	2	16'-9	STR.						35
A518	-	2	2	23'-6	STR.						49
A519	4	3	7	25'-9	STR.						188
A520	-	3	3	7'-0	STR.						22
A521	10	42	52	31'-0	STR.						1681
A522	-	10	10	12'-6	STR						130
A523	-	10	10	11'-6	14		2'-0	9'-6		0'-9	120
A524	-	28	28	28'-0	STR.						818
A525	-	2	2	27'-0	STR.						56
			-								-
A527	28	-	28	8'-6	STR						248
			-								-
A529	33	62	95	10'-0	STR.						990
A530	8	10	18	4'-11	53	0'-5	1'-10	0'-8	1'-10	0'-5	92
			-								-
			-								-
A534	4	13	17	5'-6	STR.						98
A535	2	-	2	3'-7	17		2'-6	1'-1			7
A536	10	-	10	7'-9	14		2'-0	5'-9		1'-2	81
A537	-	60	60	27'-9	STR.						1736
A538	4	-	4	28'-9	STR.						120
A539	10	-	10	33'-6	STR.						349
A540	-	20	20	22'-0	STR.						459
A541	-	5	5	30'-9	STR.						160
A542	-	5	5	29'-0	STR.						151
A543	30	10	40	22'-6	STR.						940
A544	10	4	14	21'-6	STR.						314
A545	-	16	16	18'-6	STR.						309
A546	-	2	2	16'-0	STR.						33
A548	-	3	3	25'-6	STR.						80
A549	-	8	8	7'-6	STR.						63
A550	-	4	4	4'-6	STR.						19
A551	30	-	30	32'-9	STR.						1025
A552	-	30	30	36'-0	STR.						1126
A553	-	30	30	19'-6	STR.						610

MARK	No. REQUIRED EAST ABUTMENT	No. REQUIRED WEST ABUTMENT	TOTAL	LENGTH	TYPE	A	B	C	D	H	WEIGHT
A554	10	-	10	17'-3	17		10'-0	7'-3			180
								SUBTOTAL			19484
A601	-	65	65	11'-6	STR.						1123
A602	-	157	157	12'-3	14		4'-3	8'-0		3'-0	2889
A604	166	260	426	7'-0	STR.						4479
A607	10	14	24	4'-6	STR						162
A608	20	32	52	15'-3	17		11'-0	1'-3	3'-3		1191
A609	92	126	218	12'-9	17		10'-0	0'-9	2'-3		4175
A610	110	-	110	11'-10	14		4'-3	7'-7		3'-0	1955
								SUBTOTAL			15974
A701	124	-	124	7'-4	17		6'-0	1'-6			1854
								SUBTOTAL			1854
A801	107	211	308	10'-1	1	1'-1	9'-0				8289
								SUBTOTAL			8289
A902	-	72	72	9'-0	STR.						2203
A903	-	184	184	10'-3	1	1'-3	9'-0				6412
A904	-	63	63	8'-0	17		6'-3	2'-0			1714
A905	-	3	3	19'-0	STR.						194
A906	-	2	2	10'-6	STR.						71
								SUBTOTAL			10594
A1001	249	142	391	9'-0	17			7'-3	2'-1		15142
A1002	125	-	125	9'-0	STR.						4841
A1003	132	-	132	10'-5	1	1'-5	9'-0				5917
								SUBTOTAL			25900
A1103	-	57	57	10'-0	STR.						3028
A1104	-	113	113	9'-3	17			7'-3	2'-4		5553
A1105	-	5	5	9'-9	22	2'-6	7'-3				259
								SUBTOTAL			8840
				ABUTMENTS GRAND TOTAL							90935

MARK	SUPERSTRUCTURE No. REQUIRED	LENGTH	TYPE	A	B	C	D	H	WEIGHT
S500	112	40'-0	STR.						4673
S501	480	4'-0	STR.	1'-8	1'-4	1'-0		1'-3¾	2003
S502	597	7'-8	53	0'-5	3'-2	0'-8	3'-2	0'-5	4774
S503	1-SERIES OF 5	12'-2 TO 16'-10	STR.		VARY	BY	14"		76
S504	489	6'-9	STR.						3443
S505	2	11'-7	STR.						24
S506	14	4'-0	STR.						58
S507	8	26'-0	STR.						217
S508	1-SERIES OF 5	30'-10 TO 35'-7	STR.		VARY	BY	14¼"		173
S509	2	16'-1	STR.						34
S510	21	7'-9	14	1'-0	2'-5½	0'-10	2'-5½	1'-8¾	170
S511	3	12'-5	STR.						39
S512	14	12'-4	24	4'-6	1'-3	0'-10	2'-8	0'-11	180
S513	3	35'-10	STR.						112
							SUBTOTAL		15976
R500	132	14'-0	STR.						
R501	4	18'-9	STR.						
R502	8	14'-9	STR.						
R503	8	19'-6	STR.						*
R504	8	13'-6	STR.						
R505	4	18'-0	STR.						
R506	14	7'-9	14	1'-0	2'-5½	0'-10	2'-5½	1'-8¾	
S600	663	40'-0	STR.						39833
S601	39	26'-0	STR.						1523
S602	394	26'-6	STR.						15682
S603	1-SERIES OF 19	14'-0 TO 33'-11	STR.		VARY	BY	13¾"		683
S604	589	31'-0	STR.						27425
S605	848	18'-9	STR.						23882
S606	40	28'-0	STR.						1682
S607	1-SERIES OF 44	10'-0 TO 31'-0	STR.		VARY	BY	5⅞"		1355
S608	1-SERIES OF 55	3'-1 TO 29'-8	STR.		VARY	BY	5⅞"		1353
S609	1-SERIES OF 41	2'-6 TO 17'-3	STR.		VARY	BY	4⅜"		608
S610	1-SERIES OF 65	2'-6 TO 26'-0	STR.		VARY	BY	4⅜"		1391
S611	1-SERIES OF 24	10'-0 TO 18'-5	STR.		VARY	BY	4⅜"		512
S612	1-SERIES OF 24	12'-7 TO 37'-1	STR.		VARY	BY	12¾"		895
S613	1-SERIES OF 18	15'-1 TO 33'-11	STR.		VARY	BY	13¾"		662
S614	1-SERIES OF 61	2'-6 TO 17'-4	STR.		VARY	BY	3"		915
S615	1-SERIES OF 97	2'-6 TO 26'-3	STR.		VARY	BY	3"		2094
S616	1-SERIES OF 37	9'-8 TO 18'-7	STR.		VARY	BY	3"		786
S617	2	12'-5	STR.						38
S618	2	35'-10	STR.						108
S619	1-SERIES OF 24	11'-7 TO 37'-0	STR.		VARY	BY	13¾"		876
S620	1-SERIES OF 65	9'-7 TO 30'-9	STR.		VARY	BY	4"		1969
S621	28	6'-4	512		3'-2	3'-2			266
S622	1-SERIES OF 82	2'-6 TO 29'-5	STR		VARY	BY	4"		1966
S623	20	34'-0	STR						1021
S624	107	9'-6	STR						1526
							SUBTOTAL		129,255
							SUPERSTRUTURE TOTAL		145,027

MARK	EAST & WEST APPROACH SLABS NO. REQUIRED	LENGTH	TYPE	A	B	C	D	H	WEIGHT
AS501	48	32'-3	STR.						
AS502	4	22'-3	STR.						
AS503	4	30'-3	STR.						
AS504	20	4'-0	STR.						
AS505	56	23'-9	STR.						
AS801	78	30'-1	1	1'-1	29'-0				
AS802	1	14'-10	1	1'-1	13'-9				
AS803	2-SERIES OF 5	26'-1 TO 28'-5	1	1'-1	*SEE *NOTE	VARY	BY	7"	
AS804	2-SERIES OF 3	32'-4 TO 34'-10	1	1'-1	*SEE *NOTE	VARY	BY	15"	
AS805	37	28'-10	1	1'-1	27'-9				
AS806	1-SERIES OF 4	32'-4 TO 34'-10	1	1'-1	*SEE *NOTE	VARY	BY	10"	
AS807	246	1'-6	STR.						
AS808	1-SERIES OF 5	32'-6 TO 34'-10	1	1'-1	*SEE *NOTE	VARY	BY	7"	
AS809	1-SERIES OF 5	25'-11 TO 27'-7	1	1'-1	*SEE *NOTE	VARY	BY	5"	
AS810	1-SERIES OF 4	29'-4 TO 30'-10	1	1'-1	*SEE *NOTE	VARY	BY	10"	
AS811	1-SERIES OF 4	31'-4 TO 33'-10	1	1'-1	*SEE *NOTE	VARY	BY	10"	
AS812	2-SERIES OF 5	31'-10 TO 33'-6	1	1'-1	*SEE *NOTE	VARY	BY	5"	
AS813	37	30'-5	1	1'-1	29'-4				
AS814	1-SERIES OF 5	27'-10 TO 29'-6	1	1'-1	*SEE *NOTE	VARY	BY	5"	
	BARS WITH PREFIX "AS" TO BE INCLUDED WITH APPROACH SLABS FOR PAYMENT								

REPLACEMENT BARS ⊗

MARK	No REQD	LENGTH	TYPE
RE.500	4	5'-7	STR.
RE.600	8	5'-11	(
RE.700	1	6'-3	(
RE.800	2	6'-6	(
RE.900	2	6'-10	(
RE.1000	2	7'-2	(
RE.1100	1	7'-6	STR.
RSP5	1	5'-7	

⊗ FOR SHTS. 160, 161 & 162 COMBINED

PARAPET BARS

MARK	No REQUIRED EAST ABUT.	No REQUIRED WEST ABUT.	TOTAL	LENGTH	TYPE	A	B	C	D	H	WEIGHT
R509	-	4	4	4'-0	STR.						*
R510	4	-	4	2'-9	STR.						*
R512	4	-	4	6'-1	STR.						*
R513	-	4	4	4'-8	STR.						*
R514	-	4	4	2'-1	STR.						*

BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST ONE OR TWO DIGITS INDICATES THE BAR SIZE. FOR EXAMPLE; AG01 IS A NUMBER 6 SIZE BAR AND A1101 IS A NUMBER 11 SIZE BAR.

* INCLUDED WITH RAILING FOR PAYMENT

REFERENCE DWGS:
BAR SCHEDULES SHTS. 161 & 162

NOTE:
WHERE DIMENSION "B" IS MARKED WITH *, BOTH DIMENSION "B" & LENGTH VARY BY RECORDED INCREMENT. TO OBTAIN DIMENSION "B", DEDUCT DIMENSION "A" FROM LENGTH.

CONT. No. 58019 SHEET CT. No. 1651

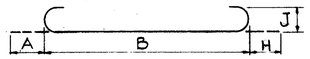
TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

BAR SCHEDULE
BRIDGE NO. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY U.S.R.-21

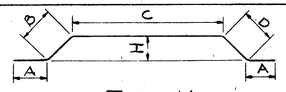
SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	V.C. CJ		V.P.K. RIY	CWT	10-26-62	

REINFORCING STEEL BAR SCHEDULE

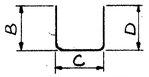
"J" USE STANDARD AS PER OHIO



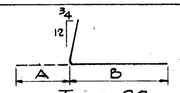
TYPE 1



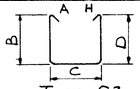
TYPE 14



TYPE 17



TYPE 22



TYPE S3

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

161
204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

MARK	No. Required EAST ABUT. N.W.	EAST ABUT. S.W.	WEST ABUT. N.W.	WEST ABUT. S.W.	TOTAL	LENGTH	TYPE	A	B	C	D	H	WEIGHT
W501	-	24	40	-	64	27'-6	STR.						1836
W502	-	-	22	94	116	29'-6	STR.						3569
W503	-	9	-	2	11	13'-6	STR.						154
W504	-	20	10	-	30	20'-6	STR.						641
W505	-	7	15	6	28	15'-6	STR.						453
					-								-
W507	12	6	15	7	40	9'-0	STR.						376
W508	43	-	-	-	43	12'-0	STR.						538
W509	26	-	46	277	349	5'-7	1	0'-7	5'-0				2031
W511	16	10	-	-	26	10'-6	STR.						285
					-								-
W513	-	-	11	-	11	5'-0	STR.						57
W514	17	15	-	-	32	7'-0	STR.						234
W515	-	-	-	8	8	32'-6	STR.						271
W516	6	-	-	13	19	17'-6	STR.						347
W517	-	24	12	10	46	23'-6	STR.						1127
W518	-	-	-	8	8	30'-6	STR.						254
W519	4	-	-	17	21	18'-0	STR.						394
W520	28	-	-	-	28	4'-6	1	0'-7	3'-11				131
W521	6	-	-	-	6	13'-0	STR.						81
W522	4	-	-	-	4	3'-0	STR.						13
W523	-	32	-	-	32	12'-6	STR.						417
W524	6	-	-	47	53	9'-9	STR.						539
W525	22	-	18	25	65	7'-6	STR.						508
W526	-	12	-	4	16	14'-0	STR.						234
					-								-
W528	-	6	-	7	13	26'-9	STR.						363
W529	-	21	15	-	36	8'-3	STR.						310
W530	-	8	-	-	8	11'-6	STR.						96
W531	4	4	-	4	12	17'-0	STR.						213
					-								-
W533	-	-	-	17	17	10'-0	STR.						177
W534	28	62	61	214	365	4'-11	53	0'-5	1'-10	0'-8	1'-10	0'-5	1873
					-								-
W536	8	-	-	5	13	22'-6	STR.						305
W537	4	4	4	-	12	6'-4	14		2'-10	3'-6		2'-0	79
W538	4	4	4	-	12	3'-0	14	1'-0	2'-7	0'-10	2'-7	1'-10	100
W539	-	-	32	-	32	21'-6	STR.						718
W540	-	9	-	16	25	11'-0	STR.						287
W541	-	-	24	-	24	33'-6	STR.						839
					-								-
					-								-
W544				5	5	16'-9	STR						87
													-
W546	-	7	-	16	23	7'-9	1	0'-7	6'-7			0'-7	186
W547	-	9	-	-	9	6'-9	1	0'-7	5'-7			0'-7	63
W549	-	13	-	6	19	24'-6	STR.						486
W550	-	6	-	50	56	8'-6	STR.						496
					-								-
W552	-	17	-	-	17	5'-6	22	1'-3	4'-3				98

MARK	No. Required EAST ABUT. N.W.	EAST ABUT. S.W.	WEST ABUT. N.W.	WEST ABUT. S.W.	TOTAL	LENGTH	TYPE	A	B	C	D	H	WEIGHT
W554	-	-	-	7	7	15'-9	STR.						115
W555	-	-	-	23	23	11'-3	STR.						270
W556	-	-	-	10	10	10'-3	STR.						107
W557	-	-	-	25	25	9'-6	STR.						247
W558	-	-	-	28	28	6'-0	STR.						176
W559	-	-	-	42	42	35'-6	STR.						1555
					-								-
W561	-	-	-	4	4	15'-0	STR.						62
W562	-	-	-	3	3	15'-3	STR.						48
W563	10	-	-	-	10	8'-0	STR.						83
W564	18	-	-	-	18	18'-6	STR.						347
												SUBTOTAL	24276
W601	12	19	59	-	90	6'-8	1	0'-8	6'-0				711
W602	-	13	42	-	55	5'-6	STR.						454
					-								-
W605	5	35	55	-	95	7'-6	STR.						1070
W606	6	-	-	-	6	11'-6	STR.						104
					-								-
W608	13	-	-	-	13	7-0	22	1'-3	5'-9				137
W609	-	12	-	-	12	8'-6	22	1'-3	7'-3				153
W610	12	-	-	-	12	16'-0	STR.						288
W611	-	22	-	-	22	5'-5	1	0'-8	4'-9				179
W612	-	-	-	277	277	5'-9	1	0'-8	5'-1				2392
W613	-	-	42	-	42	6'-0	STR.						378
W614	-	14	-	-	14	10'-2	1	0'-8	9'-6				214
W616	-	-	-	213	213	6'-6	22	1'-3	5'-3				2079
												SUBTOTAL	8159
W701	15	-	-	-	15	6'-9	1	0'-10	5'-11				207
					-								-
					-								-
					-								-
					-								-
W706	-	21	-	-	21	6'-6	STR.						279
W707	-	-	-	14	14	11'-0	STR.						315
W708	-	-	-	16	16	11'-6	STR.						376
W709	-	-	-	16	16	17'-0	STR.						556
W710	-	-	-	46	46	8'-3	22	1'-6	6'-9				776
W711	-	27	-	-	27	7'-3	STR.						400
												SUBTOTAL	2909

MARK	No. Required EAST ABUT. N.W.	EAST ABUT. S.W.	WEST ABUT. N.W.	WEST ABUT. S.W.	TOTAL	LENGTH	TYPE	A	B	C	D	H	WEIGHT
W801	-	-	54	-	54	8'-1	1	1'-1	7'-0				1165
W803	-	-	15	-	15	9'-0	STR.						360
W804	-	-	15	-	15	5'-6	STR.						220
					-								-
W806	-	-	92	-	92	10'-1	1	1'-1	9'-0				2476
W807	21	-	-	-	21	8'-3	22	1'-9	6'-6				463
					-								-
W809	11	-	-	28	39	10'-3	22	1'-9	8'-6				1067
W810	-	12	-	-	12	12'-3	22	1'-9	10'-6				392
					-								-
					-								-
					-								-
W814	-	12	-	-	12	11'-6	STR.						368
					-								-
					-								-
W817	-	-	-	16	16	7'-6	1	1'-1	6'-5				320
W818	-	13	-	-	13	8'-6	1	1'-1	7'-5				295
					-								-
					-								-
					-								-
					-								-
					-								-
W824	-	-	-	17	17	9'-1	1	1'-1	8'-0				412
												SUBTOTAL	7538
W902	-	-	34	-	34	9'-0	STR.						1040
													-
W904	-	51	35	-	86	18'-3	STR.						5336
W905	-	18	15	-	33	14'-0	STR.						1571
W906	-	-	28	-	28	10'-0	STR.						952
W907	-	-	-	18	18	10'-6	STR.						643
W908	-	-	-	18	18	19'-0	STR.						1163
W909	-	-	-	18	18	9'-0	1	1'-3	7'-9				551
W910	-	-	-	14	14	12'-0	22	2'-0	10'-0				571
												SUBTOTAL	11827

MARK	No. Required EAST ABUT. N.W.	EAST ABUT. S.W.	WEST ABUT. N.W.	WEST ABUT. S.W.	TOTAL	LENGTH	TYPE	A	B	C	D	H	WEIGHT
W1001	-	30	43	-	73	9'-0	22	2'-3	6'-9				2827
W1002	10	-	-	-	10	18'-0	STR.						775
W1003	-	27	-	-	27	10'-5	1	1'-5	9'-0				1211
W1004	-	-	69	-	69	9'-6	22	2'-3	7'-3				2821
W1005	-	-	29	-	29	8'-0	22	2'-3	5'-9				998
W1006	9	-	-	-	9	9'-0	STR.						349
W1009	-	13	-	-	13	10'-2	1	1'-5	8'-9				569
W1010	-	-	-	32	32	12'-0	22	2'-3	9'-9				1652
W1015	-	-	-	20	20	10'-8	1	1'-5	9'-3				918
												SUBTOTAL	12120
W1102	19	-	-	-	19	9'-9	22	2'-6	7'-3				984
W1103	19	-	-	-	19	10'-6	1	1'-7	8'-11				1060
					-								-
W1105	-	51		-	51	11'-3	22	2'-6	8'-9				3048
					-								-
W1107	-	44	-	23	67	11'-0	1	1'-7	9'-5				3916
W1108	-	-	-	36	36	9'-9	22	2'-6	7'-3				1865
												SUBTOTAL	10873
												GRAND TOTAL - 77,702	
R501	-	8	-	-	8	20'-6	STR.						*
R502	4	-	-	-	4	22'-6	STR.						*
R503	-	-	4	-	4	33'-9	STR.						*
R504	-	4	8	-	12	27'-6	STR.						*
R505	4	-	-	-	4	14'-1	STR.						*
R506	-	-	-	4	4	17'-6	STR.						*
R507	-	-	-	36	36	29'-6	STR.						*
R508	-	-	-	4	4	32'-3	STR.						*
					-								
R511	-	4	-	-	4	23'-6	STR.						*

N.W. MEANS NORTH WINGWALL
S.W. MEANS SOUTH WINGWALL
BAR SIZE IS INDICATED IN THE BAR MARK.
THE FIRST ONE OR TWO DIGITS INDICATES THE BAR SIZE. FOR EXAMPLE; W601 IS A NUMBER 6 SIZE BAR AND W1101 IS A NUMBER 11 SIZE BAR.
* INCLUDED WITH RAILING FOR PAYMENT

NOTE: REFERENCE DRAWINGS;
WORK THIS DWG. WITH DWG'S. 149 THRU 158

THAT PORTION OF WEST ABUTMENT, NORTH WING, SHT 154 LABELLED AS NOT IN THIS CONTRACT IS NOT BILLED ON THIS OR ANY OTHER QUANTITY LIST FOR THIS CONTRACT.

CONT. NO. 58019 SHEET ACCT. NO. 1652

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

BAR SCHEDULE-WINGWALLS
BRIDGE NO. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY U.S.R.-21

SCALE	DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
		CJ		RIY	CWT	10-26-62	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

162/204

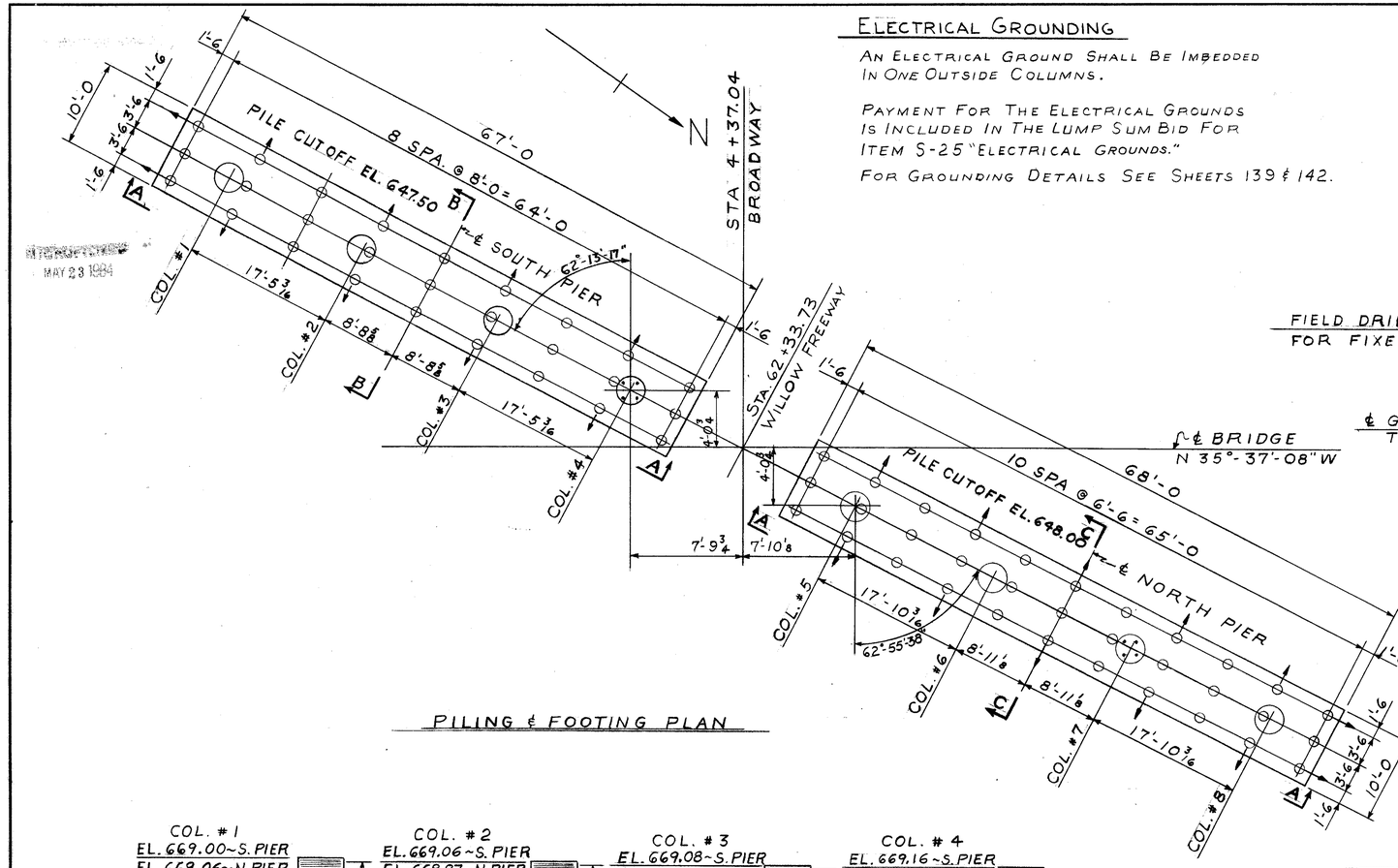
CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

ELECTRICAL GROUNDING

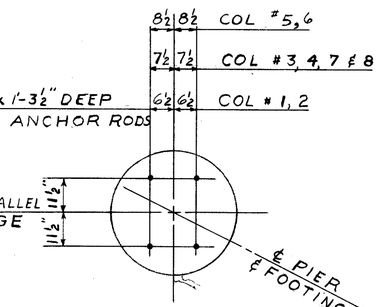
AN ELECTRICAL GROUND SHALL BE IMBEDDED IN ONE OUTSIDE COLUMNS.

PAYMENT FOR THE ELECTRICAL GROUNDS IS INCLUDED IN THE LUMP SUM BID FOR ITEM S-25 "ELECTRICAL GROUNDS."

FOR GROUNDING DETAILS SEE SHEETS 139 & 142.



PILING & FOOTING PLAN



ANCHOR BOLT PLAN
TYPICAL

N.F. = NEAR FACE
F.F. = FAR FACE
E.F. = EACH FACE

REINFORCING STEEL LIST

MARK	NO.	LENGTH	WEIGHT	SHP.	BENDING DIAG.
P601	76	9'-6	1084#	STR	P602 9'-6
P602	76	10'-10	1236	BNT	
P603	12	34'-6	622	STR	
P604	26	35'-0	1367	STR	P803 5'-9
P801	72	18'-9	3605	STR	
P802	72	18'-0	3460	STR	
P803	144	6'-9	2595	BNT	P1101 35'-5
P1101	36	37'-0	7077	BNT	
P1102	32	37'-6	6376	BNT	P1102 35'-11
		TOTAL	27422#		

SPIRAL DATA

MARK	NO.	LENGTH FEET	PITCH INCHES	TURNS	CORE DIA % SPIRAL	WEIGHT LBS
SP501	1	19'-5 7/8	3 1/4	75	38"	815
SP502	1	19'-5	3 1/4	75	38	815
SP503	1	19'-4 3/4	3 1/4	75	38	815
SP504	1	19'-4	3 1/4	75	38	815
SP505	1	18'-10 3/4	3 1/4	73	38	797
SP506	1	18'-8 1/2	3 1/4	72	38	786
SP507	1	18'-6 5/8	3 1/4	72	38	786
SP508	1	18'-4 3/8	3 1/4	71	38	774
					TOTAL	6403

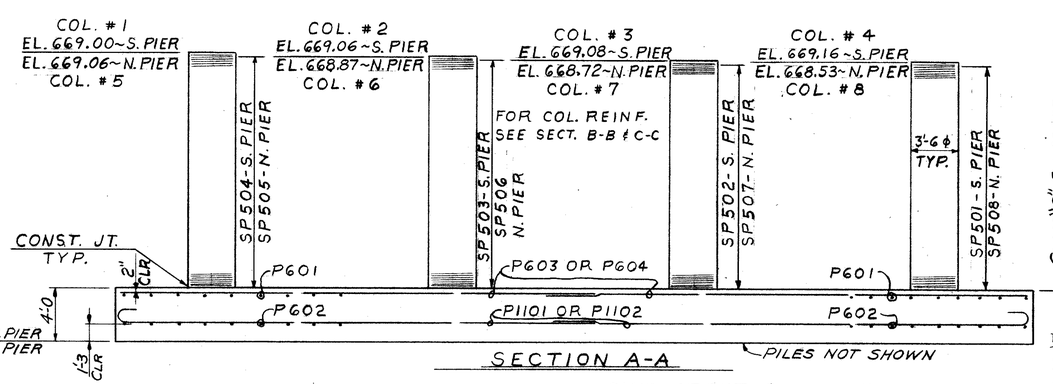
BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST ONE OR TWO DIGITS INDICATE THE BAR SIZE. FOR EXAMPLE, P601 IS A NUMBER 6 SIZE BAR AND P1101 IS A NUMBER 11 SIZE.

SPIRAL REINFORCING BARS: THE LENGTH SHOWN IN THE STEEL LIST FOR THE SPIRAL BARS IS THE DISTANCE FROM THE TOP OF THE FOOTING TO THE TOP OF COLUMN MINUS 2 INCHES FOR COVER.

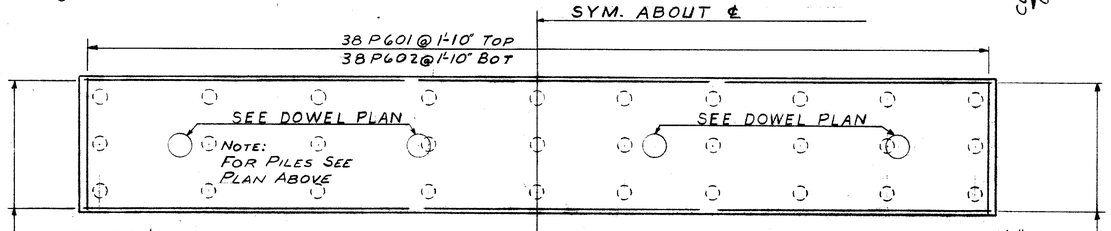
THE "NUMBER OF TURNS" SHOWN IS THE "LENGTH" DIVIDED BY THE PITCH, PLUS 3 TURNS (TOTAL NUMBER OF CLOSED COILS), EXPRESSED AS THE NEAREST WHOLE NUMBER. SPIRAL REINFORCING BARS SHALL NOT HAVE DEFORMATIONS BUT SHALL IN OTHER RESPECTS CONFORM TO ITEM 544. 1 1/2 CLOSED COILS SHALL BE PROVIDED AT THE ENDS OF EACH SPIRAL UNIT.
FOUR STEEL CHANNEL, TEE OR ANGLE SPACERS, WEIGHING APPROXIMATELY 0.68 LB. PER LIN. FT. OF SPACER, SHALL BE PROVIDED FOR EACH SPIRAL UNIT. THEY SHALL BE EQUALLY SPACED ALONG THE PERIPHERY OF THE COIL. THE NUMBER OF POUNDS OF THESE SPACERS, BASED ON 0.68 LB. PER LIN. FT., WILL BE PAID FOR AS REINFORCING STEEL AND IS INCLUDED IN THE TABULATED QUANTITY OF SPIRAL BARS.

REFERENCE DRAWINGS

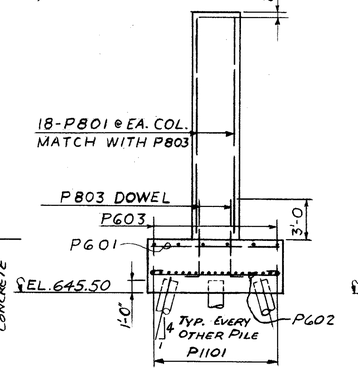
GENERAL NOTES	146, 147
REFERENCES	147



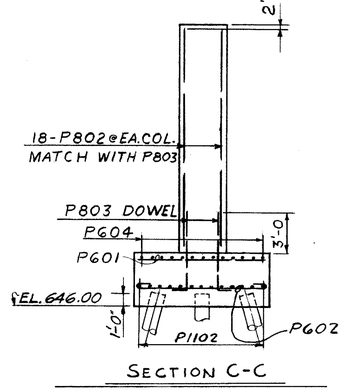
SECTION A-A



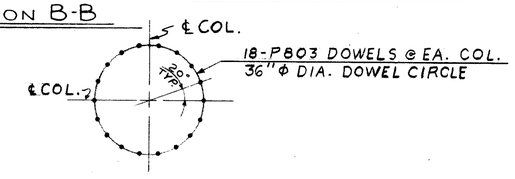
FOOTING HALF PLAN SOUTH PIER | FOOTING HALF PLAN NORTH PIER



SECTION B-B



SECTION C-C



DOWEL PLAN
TYPICAL

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

PIERS

BRIDGE Nº CUY-21-1404
WILLOW FRWY. UNDER BROADWAY AVE.
CUYAHOGA COUNTY USR-21

SCALE DATE 4-25-62

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
RJB	RJB		CJ	CWT	10-25-62	

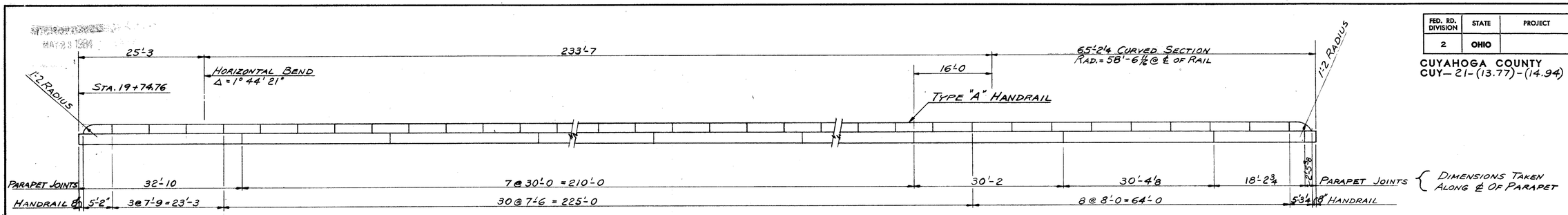
RECEIVED MAY 23 1984

CONT. NO. 58019 SHEET ACCT. NO. 1637

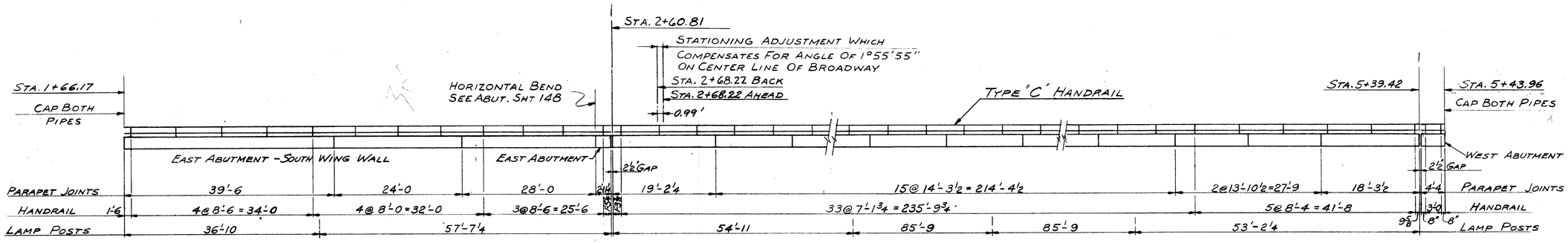
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)

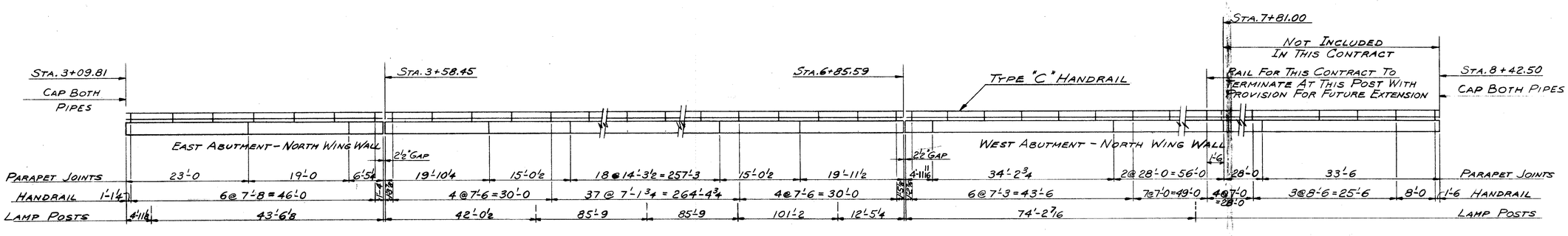
163
204



PARAPET ON WEST ABUTMENT - SOUTH WINGWALL
(ALONG B-S RAMP)



SOUTH PARAPET



NORTH PARAPET

REFERENCE DRAWINGS:

164, 165	- DECK DETAILS
156, 157	- WEST ABUTMENT - SOUTH WING WALL
149	- EAST ABUTMENT - SOUTH WING WALL
148	- EAST ABUTMENT
142	- WEST ABUTMENT
151	- EAST ABUTMENT - NORTH WING WALL
154	- WEST ABUTMENT - NORTH WING WALL

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

HANDRAIL & PARAPET
BRIDGE NO. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY
CUYAHOGA COUNTY USR-21

SCALE				DATE		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	CLS		RIY	CWT	10-26-62	

CONT. NO. 58019 SHEET ACCT. NO. 1260

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

164/204

CUYAHOGA COUNTY
CUY- 21 - (13.77)(14.94)

NOTES:
1. ALL CONCRETE IN DECK TO BE CLASS "C"
2. LAP BARS 30 DIAMETERS

REFERENCE DWGS:

GENERAL NOTES & QUANTITIES SHT.	146
GENERAL PLAN & ELEVATION	145
SUPERSTRUCTURE DETAILS	170
BAR SCHEDULE	160

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

DECK DETAILS - EAST HALF
BRIDGE Nº CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY
CUYAHOGA COUNTY USR-21

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
A.S.R.	V.C.		V.P.K.	CWT	10-26-62	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

165
204

CUYAHOGA COUNTY
CUY—21- (13.77)(14.94)

BROADWAY STA. 4+37.04 =
WILLOW FREEWAY STA. 62+33.73

MATCH LINE SEE SHT. 164

102'-4⅝ | 69'-3¼

122-SP. @10 = 101'-8 — 123 - S604
163-SP. @7½ = 101'-10½ — 164 - S605

81-SP. @10 = 67'-6 SERIES - S622
60-SP. @7½ = 37'-6
1-SERIES - S614

TOP OF ROADWAY SLAB
BOT. OF ROADWAY SLAB

81-SP. @1'-3 = 101'-3 — 80 - S504 + 2-S506 OPP. LAMPS - TOP OF SIDEWALK

4 @ 14'-3½ = 57'-2 — 4 SETS OF 4-R500 — 2@13'-10½ = 27'-9 — 18'-3½

4 SETS OF 14-S502 @ 1'-0 4

2 SETS OF 4-R504 & 2 SETS OF 14-S502 @ 1'-0

10-S504 (FAN) 1-SET OF 4-R505 & 1-SET OF 18-S502 @ 1'-0

PARAPET PANELS

SETS OF 3-S500 IN FASCIA
SETS OF 2-S600 BOT. OF PARAPET STIRRUPS. SEE SHT. 164

℄ BEARINGS

DETAIL "C"
1-S509 TOP SIDEWALK

96-SP. @ 7½ = 60'-0" 1-SERIES S615
BOT. OF ROADWAY SLAB

1'-0 PARAPET
1'-2
EDGE OF SIDEWALK SLAB

SETS OF 5-S500 TOP OF SIDEWALK
SEE SHT. 164

82-S501 @ 1'-3

10-S501 FANNED — FACE OF CURB

STA. 6+08.70

6'-2
23'-0
29'-2

TYPICAL FOR LONGIT. BAR SPLICES

68°16'36"

225 - SP. @ 7½ = 140'-7½ — 226-S602 BOTTOM OF ROADWAY SLAB

W.P. = INTERSECTION OF ℄ BRIDGE & ℄ WILLOW FREEWAY

76'-10¾

162'-0

℄ BRIDGE

5-SETS OF 2-S623 TOP
5-SETS OF 2-S623 BOT.

℄ BAR SPLICES S500 & S600

SETS OF 43 - S600 TOP ℄ — SETS OF 42 - S600 BOT.
SEE SHT. 164

20-S600 & 20-S606 TOP OVER PIER. SEE DIAGRAM OF LAP STAGGER, THIS SHT.

SEE SHT. 164 FOR ADDITIONAL TOP BARS OVER PIER.

185 - S501 @ 1'-3 FACE OF CURB

1-S509 TOP SIDEWALK

7 SETS OF 5 - S500 TOP OF SIDEWALK

℄ GIRDERS

7'-10⅛ | 47'-8¼ | ℄ NORTH PIER | C SHT. 164 | EDGE OF SIDEWALK SLAB | DETAIL "D"

7-SETS OF 3-S500 IN FASCIA
7-SETS OF 2-S600 BOT. OF PARAPET STIRRUPS

15 @ 14'-3½ = 214'-4½ — 15 SETS OF 4-R500 & 15 SETS OF 14-S502 @ 1'-0

1-SET OF 4-R502 & 1-SET OF 15-S502 @ 1'-0 — 15'-0½

19'-11½ — 1-SET OF 4-R503 & 1-SET OF 20-S502 @ 1'-0 — 12-S504 (FAN)

185-SP. @ 1'-3 = 231'-3 — 180 - S504 + 6-S506 OPP. LAMPS - TOP OF SIDEWALK

205-SP. @ 10 = 170'-10 — 206 - S604

323-SP. @ 7½ = 201'-10½ — 324 - S605

64 SP. @ 10 = 53'-4 1-SERIES S620

36 SP. @ 7½ = 22'-6 1-SERIES - S616

22'-2 27-S624 EVEN SPACED - FAN

22'-7 36-S624 EVEN SPACED-FAN

12'-5¼

LAMP POSTS

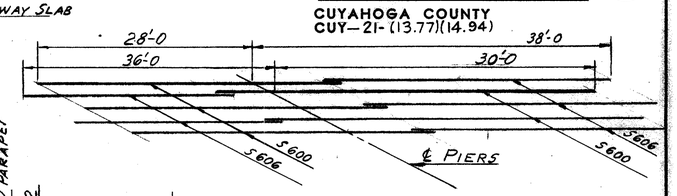
49'-2⅜ | 85'-9 | 101'-2

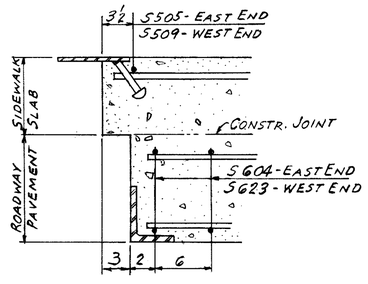
248'-6⅝

PARAPET 1'-0 | 1'-2 | TOP OF RDWY. SLAB | BOT. OF RDWY. SLAB

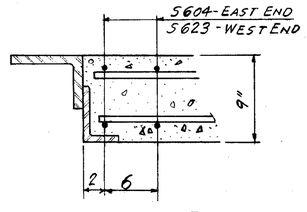
DIAGRAM SHOWING STAGGER OF ADDITIONAL BARS S600 & S606 OVER PIERS

ALSO SEE "TYPICAL BRIDGE CROSS SECTION" SHT. 170

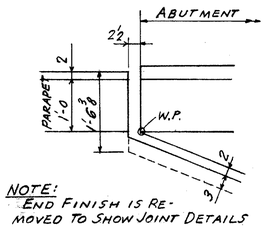




SECTION A-A



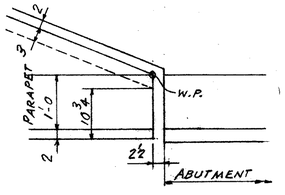
SECTION B-B



NOTE: END FINISH IS REMOVED TO SHOW JOINT DETAILS.

DETAIL "C"

NOTE: END FINISH IS REMOVED TO SHOW JOINT DETAILS.



DETAIL "D".

FOR NOTES AND REFERENCE DRAWINGS SEE SHT. 164

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

DECK DETAILS - WEST HALF
BRIDGE Nº CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY
CUYAHOGA COUNTY USR-21

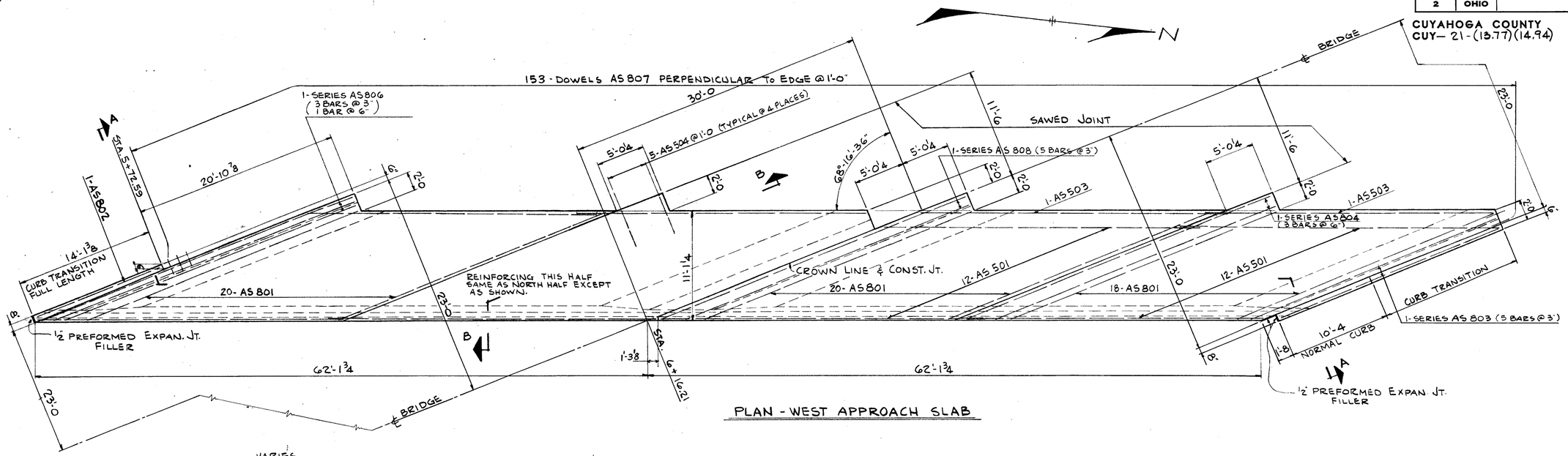
SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
A.S.R.	V.C.		V.P.K.	CWF	10-21-62	

CONT. No. 58019 SHEET A Tr. No. 1650

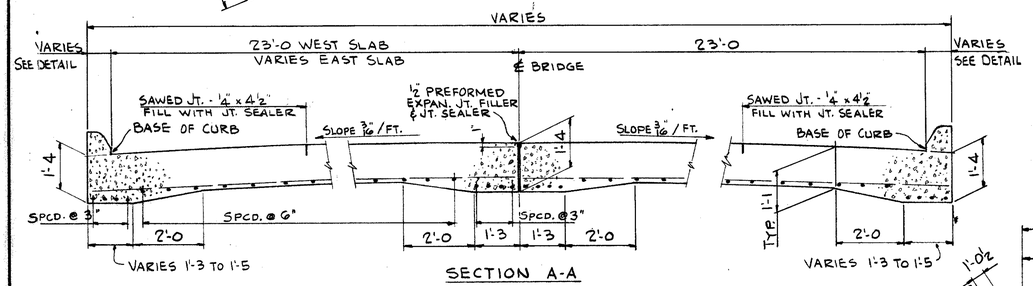
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

166/204

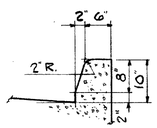
CUYAHOGA COUNTY
CUY– 21-(13.77)(14.94)



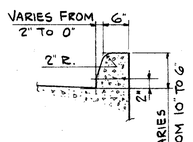
PLAN - WEST APPROACH SLAB



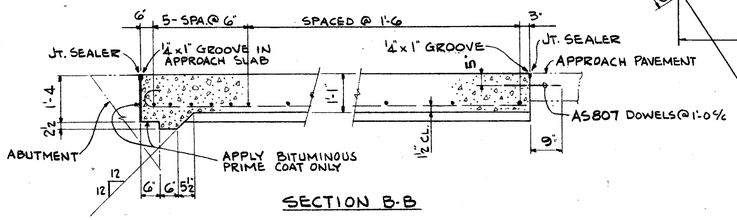
SECTION A-A



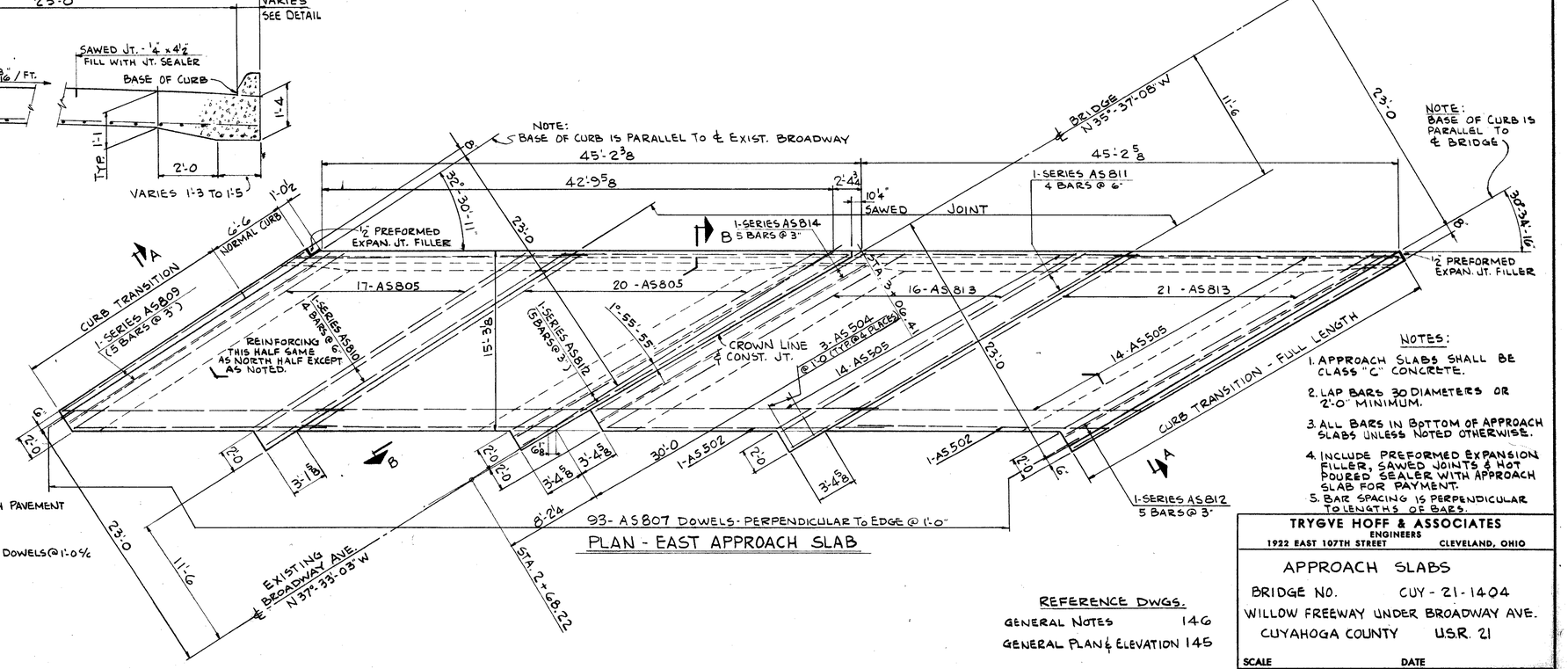
NORMAL CURB



TRANSITIONAL CURB



SECTION B-B



PLAN - EAST APPROACH SLAB

NOTES:

1. APPROACH SLABS SHALL BE CLASS "C" CONCRETE.
2. LAP BARS 30 DIAMETERS OR 2'-0" MINIMUM.
3. ALL BARS IN BOTTOM OF APPROACH SLABS UNLESS NOTED OTHERWISE.
4. INCLUDE PREFORMED EXPANSION FILLER, SAWED JOINTS & HOT POURED SEALER WITH APPROACH SLAB FOR PAYMENT.
5. BAR SPACING IS PERPENDICULAR TO LENGTHS OF BARS.

REFERENCE DWGS.

GENERAL NOTES 146
GENERAL PLAN & ELEVATION 145

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

APPROACH SLABS
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
	D.F.		V.P.K.	CWT	10-26-62	

CONT. No. 58019 SHEET ACCT. No. 1633

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

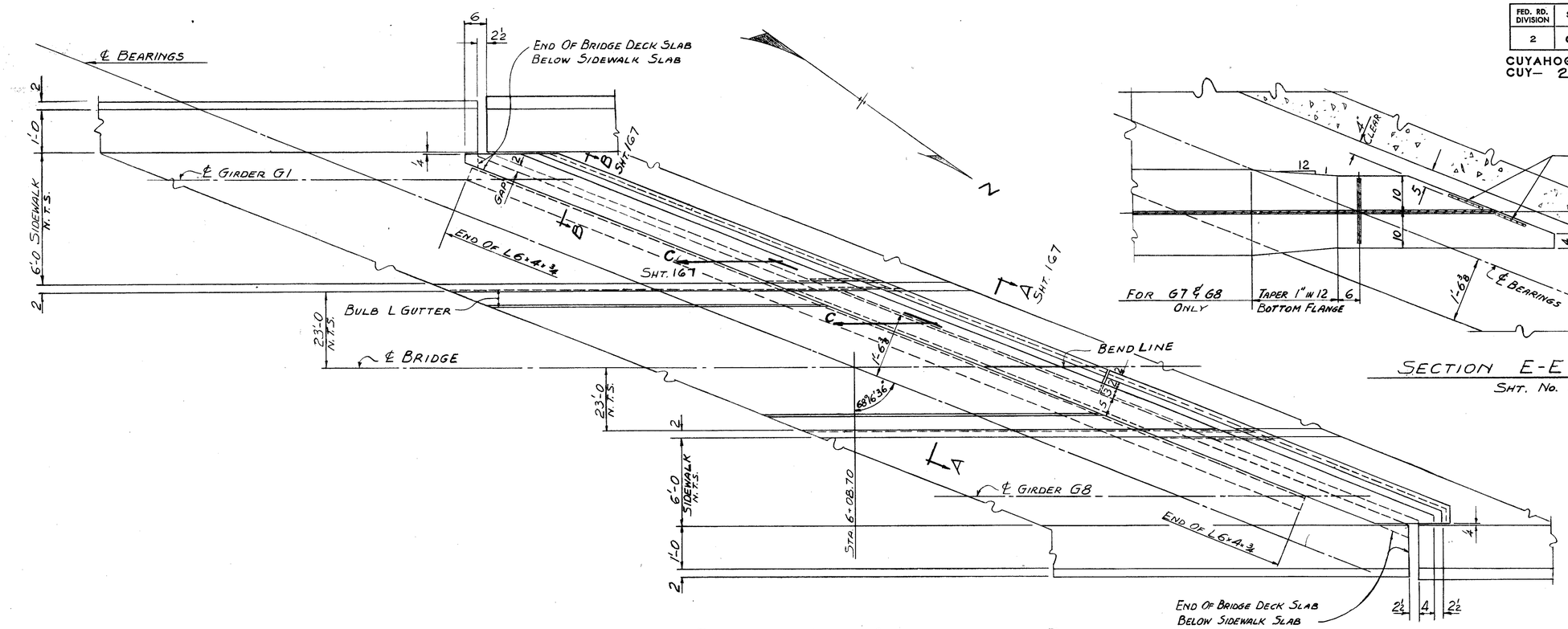
END DAM - EAST ABUTMENT
BRIDGE No. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY USR-21

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
C.G.C.	CAT V.C.		V.P.K.		10-26-6?

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

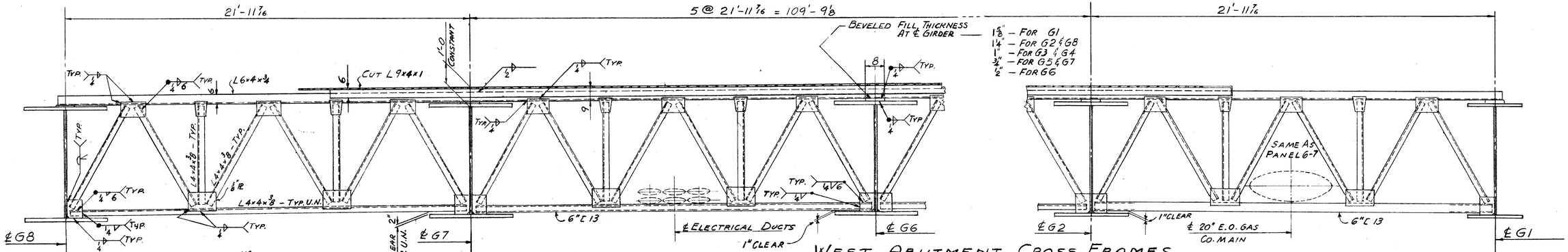
168/204

CUYAHOGA COUNTY
CUY– 21-(13.77)(14.94)



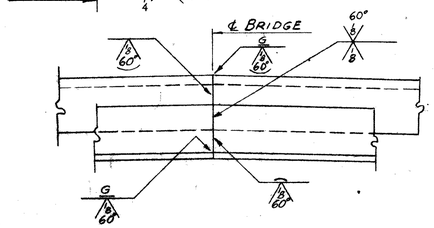
SECTION E-E WEST ABUTMENT
SHT. No. 167

PLAN OF WEST ABUTMENT END DAM



WEST ABUTMENT CROSS FRAMES
LOOKING AWAY FROM ABUTMENT

FOR REFERENCE DRAWINGS SEE SHT. 167.



WELDED BUTT JOINT IN END DAM ANGLES AT ℄ ROADWAY

CONT. NO. 5801 9 SHEET CT. NO. 1635

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

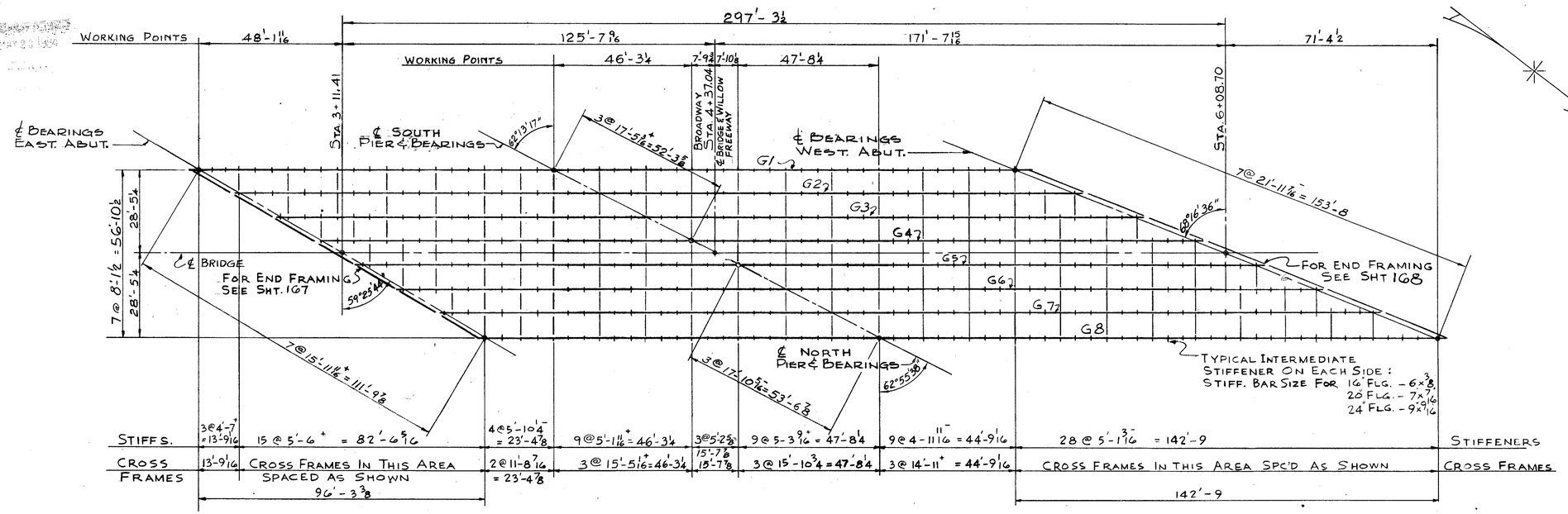
END DAM – WEST ABUTMENT
BRIDGE N² CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY USR-21

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.C.C.	V.C.		V.P.K.	CWT	10-26-62	

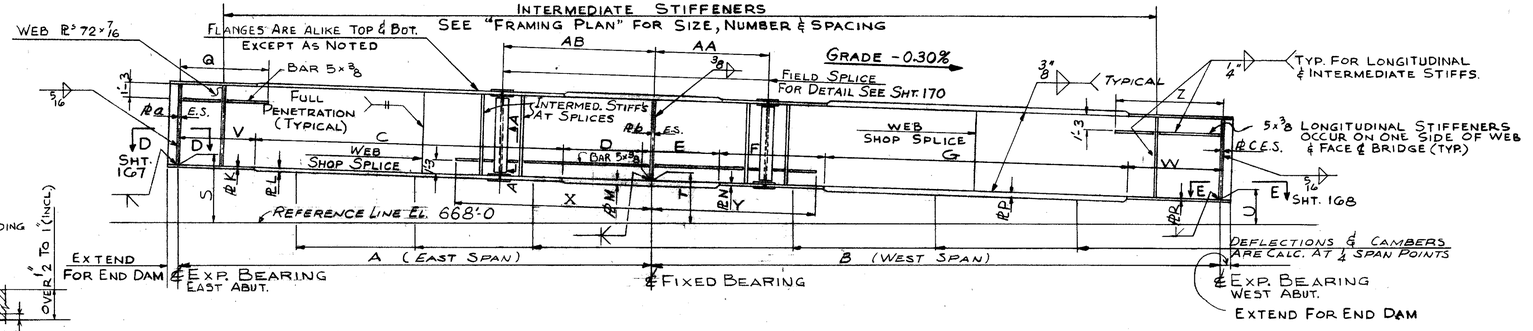
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

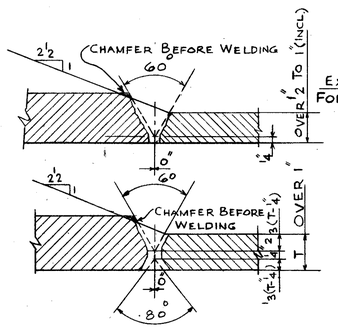
169/204

CUYAHOGA COUNTY
CUY– 21-(13.77)(14.94)

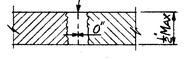


STEEL FRAMING PLAN





SHOP FLANGE SPLICES
(TYPICAL)



SHOP WEB SPLICE

GIRDER DETAILS

GIRDER	A	B	C	D	E	F	G	℄K	℄L	℄M	℄N	℄P	℄R	S	T	U	V	W	+Q	+X	+Y	+Z	AA	AB	℄a	℄b	℄c	EXP. BRG. EAST ABUT.	FIXED BRG. CENTER PIER	EXP. BRG. WEST ABUT.
G1	119'-8¼	154'-4⅛	95'-3¼	24'-5	17'-6	34'-6	76'-9½	——	16×⅞	24×2	16×1⅜	24×1½	16×1⅜	1'-11¹³/₁₆	1'-7½	1'-2	——	25'-6¹⁵/₁₆	–	39'-11	54'-8½	19'-10¾	33'-5	48'-2	7×⅝	11×1½	7×⅝	E-100	F-400 ⊗	E-150
G2	121'-4⅞	159'-4⅛	76'-9½	26'-2½	17'-8	36'-0	79'-8½	16×⅜	16×⅞	24×2¼	20×1¾	24×2⅛	20×1⅜	2'-0⅞	1'-8½	1'-2¾	18'-4⅝	25'-11⅞	11'-0	44'-4	62'-4¾	35'-3⅜	38'-8	47'-1	7×⅝	11×1½	9×⅞	E-150	F-400 ⊗	E-200
G3	123'-0⅞	164'-3¹¹/₁₆	75'-6	29'-1	17'-10	37'-6½	81'-7	16×⅜	16×⅜	24×2¼	20×2⅛	24×2⅝	20×2	2'-1⅞	1'-9⅞	1'-3⁹/₁₆	18'-5⅝	27'-4¾	19'-3	54'-3	73'-5½	50'-8¾	39'-0	51'-4	7×⅝	11×1½	9×⅞	E-150	F-450 ⊗	E-250
G4	124'-8⅝	169'-3⅝	74'-3½	32'-0	18'-0	39'-1	84'-1	16×⅜	16×1¼	24×2⅝	20×2½	24×2¾	20×2	2'-2⁹/₁₆	1'-10⁹/₁₆	1'-4⁵/₁₆	18'-4⅞	28'-1⅞	22'-0	57'-11¾	73'-3½	50'-11¾	39'-6	49'-2	7×⅝	11×1½	9×⅞	E-150	F-450 ⊗	E-250
G5	126'-7⅞	174'-0⅛	73'-0	34'-9½	18'-0	40'-4½	86'-8½	16×⅜	16×1¼	24×2⅞	20×2½	24×3	20×2¼	2'-2⁷/₁₆	1'-9⅞	1'-3⅝	18'-9⅛	28'-11⅞	19'-3	56'-9½	77'-6¼	50'-11¾	39'-9	49'-1	7×⅝	11×1½	9×⅞	E-150	F-500 ⊗	E-250
G6	128'-8⅜	178'-6⅛	71'-1	38'-9½	18'-0	42'-2	89'-2½	16×⅜	16×1¼	24×3	24×2¾	24×3¼	20×2½	2'-0⅜	1'-7¾	1'-1⅜	18'-10⅜	29'-1⅝	16'-6	57'-3	81'-7½	50'-11¾	39'-3	49'-6	7×⅝	11×1½	9×⅞	E-150	F-500 ⊗	E-250
G7	130'-10⅝	183'-0⅛	70'-2½	41'-3½	18'-0	43'-2	91'-5	16×⅜	16×⅞	24×3	24×2¾	24×3⅜	24×2¼	1'-10⅜	1'-5¹¹/₁₆	0'-11¹/₁₆	19'-4⅝	30'-5⅛	8'-3	57'-7⅜	81'-0	50'-11¾	38'-3	50'-0	7×⅝	11×1½	9×⅞	E-150	F-450 ⊗	E-250
G8	133'-0⅛	187'-6⅛	68'-5⅛	44'-7	18'-0	44'-7	92'-6	——	16×⅜	24×3⅜	24×1¾	24×2⅞	24×1¾	1'-8⅜	1'-3⁹/₁₆	0'-8¹³/₁₆	——	32'-5¹/₁₆	–	47'-8¼	75'-4¼	35'-8¼	42'-2	50'-6	7×⅝	11×1½	9×⅞	E-100	F-450 ⊗	E-200

FOOT NOTES:
* WIDTH OF BOT. ℄ "R" IS REDUCED OVER EXP. BRGS. (SEE END DAM DETAILS)
\+ LENGTH OF LONGITUDINAL STIFFS. GIVEN TO ℄ OF TRANSVERSE STIFFS AT END OF LONGIT. STIFFS. (TO NEAREST 1")

⊗ SPECIAL FIXED BEARINGS.

DEFLECTION AND CAMBER

SPAN	EAST SPAN																						WEST SPAN																					
GIRDER	G1			G2			G3			G4			G5			G6			G7			G8		G1			G2			G3			G4			G5			G6			G7			G8		
POINT (FROM EXP. BRG.)	¼	½	¾	¼	½	¾	¼	½	¾	¼	½	¾	¼	½	¾	¼	½	¾	¼	½	¾	¼	½	¾	¼	½	¼	¾	½	¼	¾	½	¼	¾	½	¼	¾	½	¼	¾	½	¼	¾	½	¼
DEFLECTION DUE TO WEIGHT OF STEEL	1/8	8	–	1/8	1/16	–	1/8	1/16	–	1/16	1/16	-1/16	1/16	1/16	-1/16	1/16	1/16	-1/16	1/16	1/16	-1/16	1/16	1/16	-1/16	3/8	11/16	9/16	7/16	3/4	5/8	1/2	7/8	11/16	1/2	15/16	3/4	9/16	1/16	13/16	5/8	1/8	15/16	11/16	1/4	1	13/16	1/16	1/8
DEFLECTION DUE TO REMAINING DEAD LOAD	5/16	5/16	–	1/4	1/4	–	1/4	3/16	–	3/16	1/8	-1/8	3/16	1/8	-1/8	3/16	1/16	-1/8	3/16	1/16	-1/8	3/16	1/16	-1/8	5/16	2 3/8	1/8	1/4	2 1/4	1/16	3/16	2 1/16	1/8	1/16	2 3/16	1/4	1/4	2 1/4	1/16	5/16	2 3/8	1/8	1/16	2 3/16	1/4	1/4	2 1/2	1/16
SUM OF DEFLECTION	7/16	7/16	–	3/8	5/16	–	3/8	1/4	–	1/4	3/16	-3/16	1/4	3/16	-3/16	1/4	1/8	-3/16	1/4	1/8	-3/16	1/4	1/8	-1/4	11/16	3 1/16	2 7/16	11/16	3	2 7/16	15/16	2 15/16	2 5/16	1 1/16	3	2 7/16	1 1/16	2 15/16	2 5/16	1 1/16	3	2 7/16	1 1/16	3	2 7/16	1 1/16	3	2 7/16
CAMBER REQUIRED	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 3/4	3	2 1/2	1 3/4	3	2 1/2	1 3/4	3	2 1/4	1 3/4	3	2 1/4	1 3/4	3	2 1/2	1 3/4	3	2 1/4	1 3/4	3	2 1/4	1 3/4	3	2 1/2

NOTES:
1. SHOP SPLICES:- IF ADDITIONAL SHOP SPLICES ARE NECESSARY, THEIR LOCATION AND DETAIL SHALL BE SUBMITTED TO THE DIRECTOR FOR APPROVAL PRIOR TO ORDERING MATERIAL.
2. FIELD SPLICE TO BE MADE WITH 1" ϕ High Strength Bolts.
3. ERECTION PROCEDURE:- THREE PRINTS OF THE PROPOSED ERECTION PROCEDURE SHALL BE SUBMITTED TO THE DIRECTOR FOR APPROVAL.
4. ABBREVIATIONS:- E.S. = EACH SIDE

REFERENCE DWGS:

GENERAL NOTES & QUANTITIES	SHT. 146
GENERAL PLAN & ELEVATION	" 145
SUPERSTRUCTURE DETAILS	" 170
END DAM - EAST ABUTMENT	" 167
END DAM - WEST ABUTMENT	" 168
SPECIAL FIXED BEARINGS	" 171
STANDARD FIXED & SLIDING BEARINGS	OHIO STD. FSB-1-62

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

SUPERSTRUCTURE DETAILS

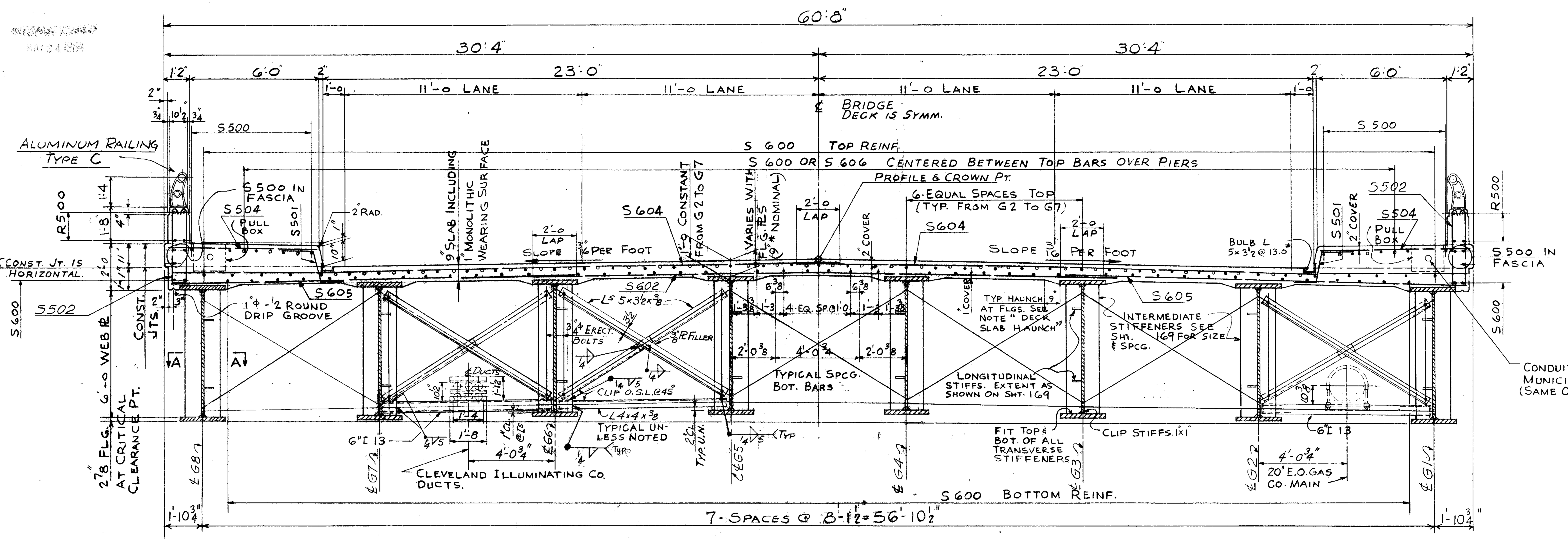
BRIDGE Nº CUY-21-1404
WILLOW FRWY UNDER BROADWAY AVE.
CUYAHOGA COUNTY U.S.R.-21

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
B. McW V.P.K.	V.C. S.P.G.		V.P.K.	GMT	10-26-62	

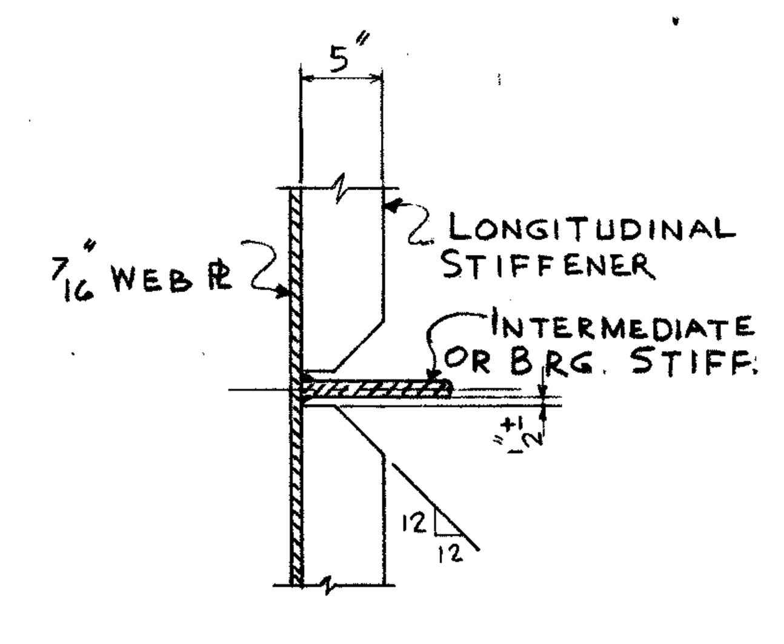
CONT. NO. 58019 SHEET CT. NO. 1631

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

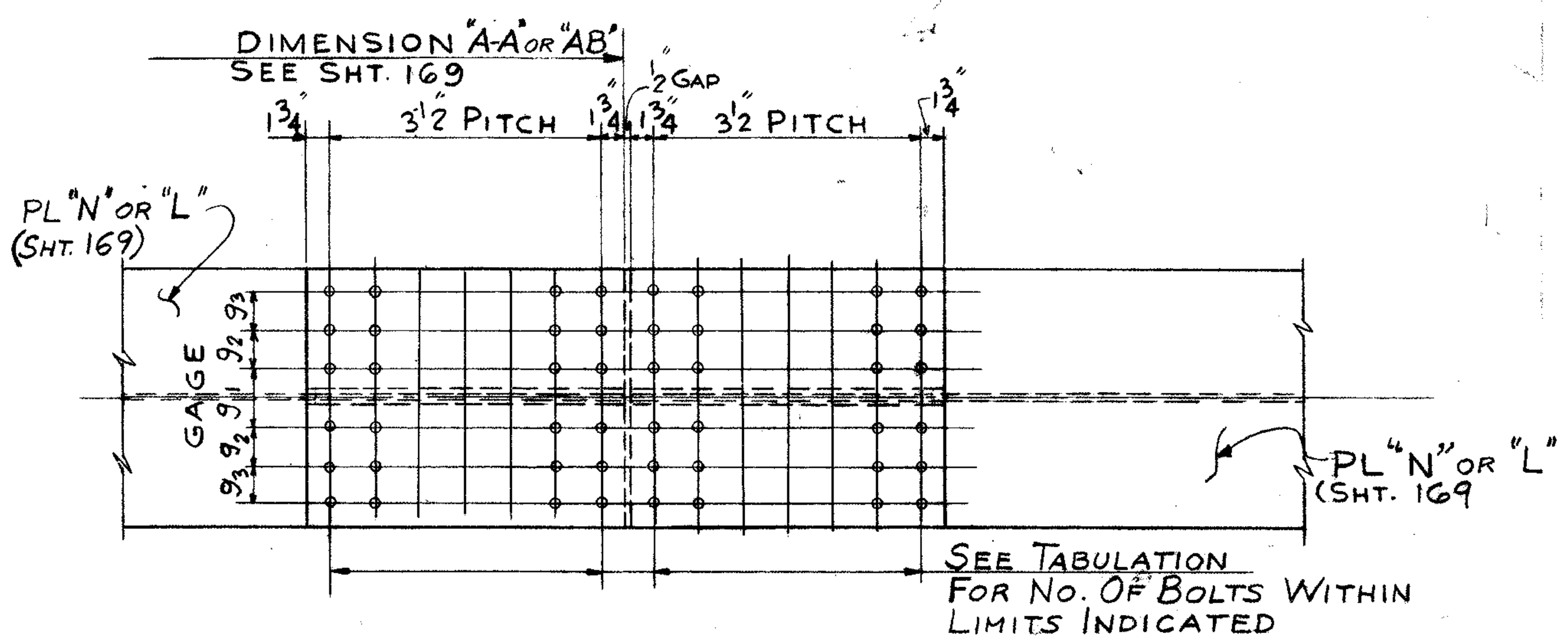
CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)

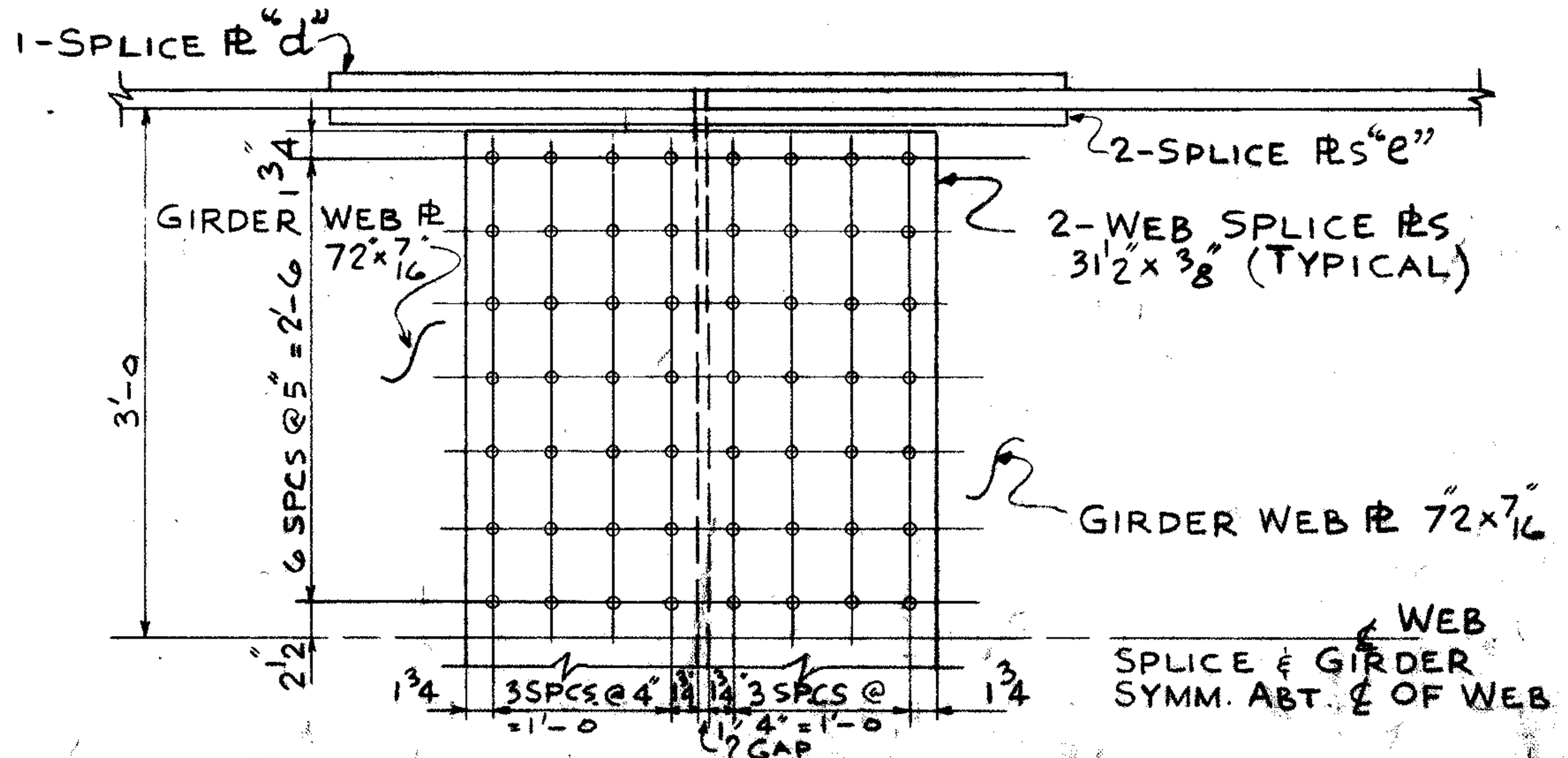


TYPICAL BRIDGE CROSS SECTION
(LOOKING EAST)



SECTION A-A
(TYPICAL)





GIRDER FIELD SPLICE DETAIL

FLANGE SPLICE DATA						
	SPLICE PLATES			GAGE		
GIRDER	PL "d"	PL "e"	NO. OF BOLTS EACH SIDE OF JOINT	g_1	g_2	g_3
G 1	16 x 3/4	7 x 7/8	16	5 1/2	3 1/2	0
G 2	20 x 7/8	9 x 1	24	6	5	0
G 3	20 x 1 1/8	9 x 1 1/4	32	6	5	0
G 4	20 x 1 1/8	9 x 1 1/4	32	6	5	0
G 5	20 x 1 1/4	9 x 1 1/2	40	6	5	0
G 6	24 x 1 1/8	11 x 1 1/4	42	5 1/2	3 3/4	3 3/4
G 7	24 x 1 1/8	11 x 1 1/4	42	5 1/2	3 3/4	3 3/4
G 8	24 x 7/8	11 x 1	30	5 1/2	3 3/4	3 3/4

NOTES:

DECK SLAB HAUNCH: — THE HAUNCH IN THE DECK SLAB ADJACENT TO THE TOP OF THE STEEL GIRDERS, WHICH IS SHOWN AS 9" WIDE, MAY VARY FROM THIS DIMENSION BETWEEN THE LIMITS OF 6" & 12", EXCEPT THAT THE MAXIMUM SLOPE SHALL NOT EXCEED 3" PER FOOT. PAYMENT FOR THE DECK SLAB CONCRETE SHALL BE BASED ON THE 9" WIDTH.

ASTERISK (*) SIGNIFIES SLAB THICKNESS 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 TOP FLANGE OF GIRDER MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE.

SUPPLY & INSTALLATION OF DUCTS: — ALL ELECTRICAL CONDUITS IN BRIDGE SHALL BE IN PLACE BEFORE CONCRETE IS POURED.

REFERENCE DWGS:

GENERAL NOTES & QUANTITIES	146
GENERAL PLAN & ELEVATION	145
SUPERSTRUCTURE DETAILS	169
DECK DETAILS	164, 165

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

SUPERSTRUCTURE DETAILS

BRIDGE No. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY
CUYAHOGA COUNTY U.S.R. 21

SCALE DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
V.C.	S.P.G.		VRK	CWT	

CONT. No. 58019 SHEET CT. No. 1500

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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CUYAHOGA COUNTY
CUY—21- (13.77) (14.94)

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.

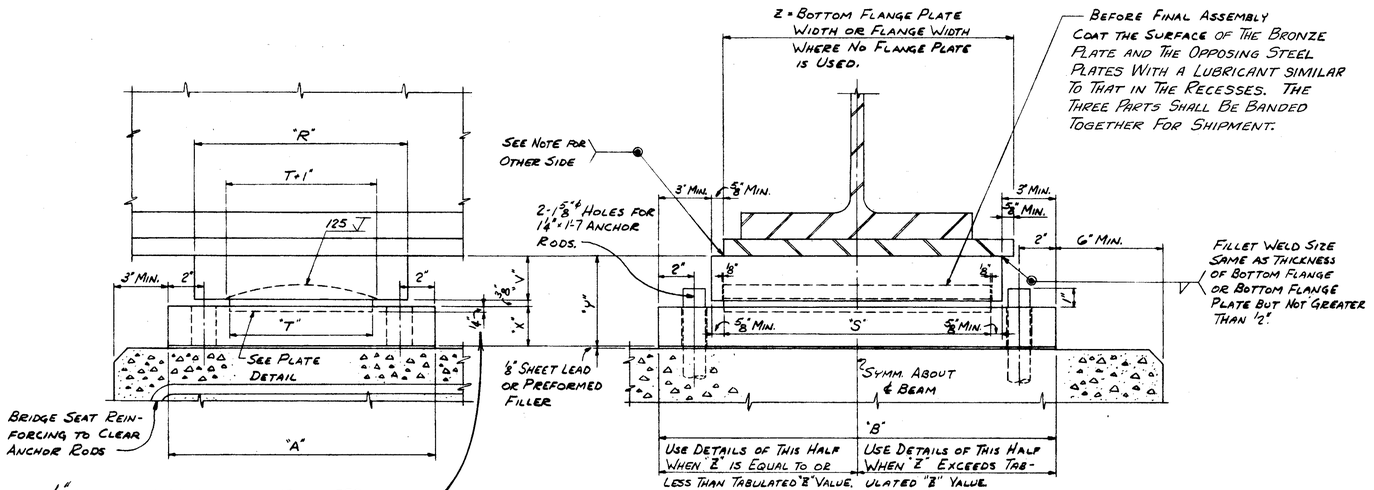
(c) The Recesses for the Lubricant Shall Consist of Either Annular Rings With or Without Central Circular Recess With a Depth at Least Equal to the Width of the Ring or Diameter of Hole or Circular Recesses Approximately 5/16" in Diameter and 3/16" to 1/4" Deep.

(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.

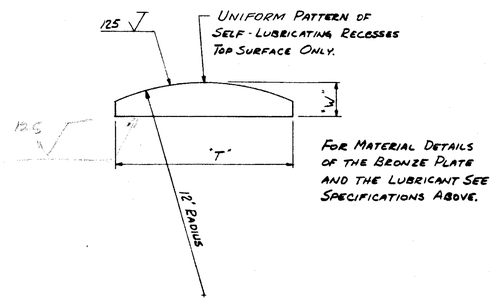
(g) The Coefficient of Friction Between the Bronze Self-Lubricating Plates and the Steel Plates in Contact With Them Shall Not Exceed 0.10 When Subjected to the Design Loading.



Fixed Bearing
(See Table for Additional Dimensions)

Fixed Bearing No.	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 7/8	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 & Rods Shall Conform to ASTM Designation A-36-62T.

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-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY USR-21

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	R.D.N.		D.W.M.	C.W.T.	10-26-62	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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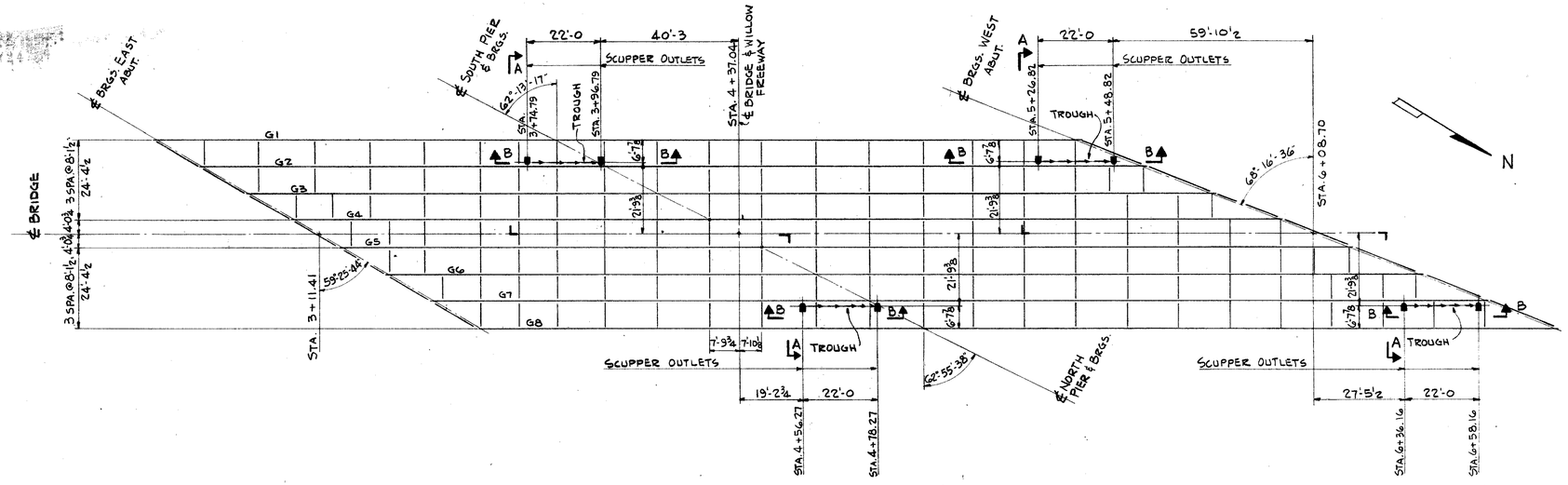
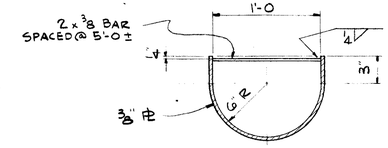
204

CUYAHOGA COUNTY
CUY– 21 - (13.77)(14.94)



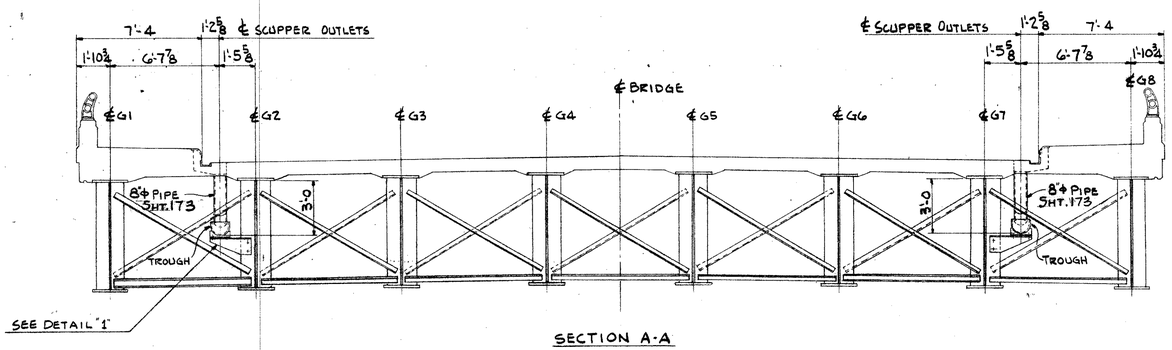
PLAN OF SCUPPER & TROUGH LOCATIONS



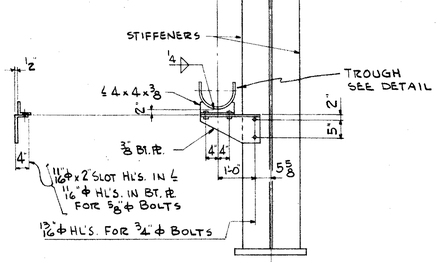
TROUGH DETAIL

NOTES:

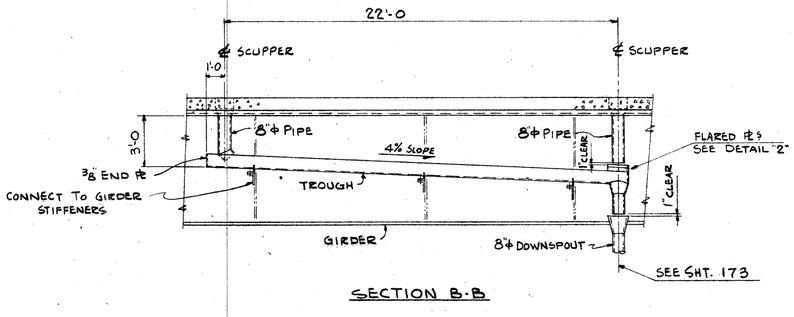
1. MILLED JOINTS WILL BE PERMITTED IN BULB ANGLE GUTTERS, BUT INDIVIDUAL LENGTHS SHALL BE MADE AS LONG AS PRACTICABLE. SUPPORTS SHALL BE PLACED 6" TO 9" ON EACH SIDE OF JOINTS.
2. GUTTERS SHALL BE ACCURATELY ADJUSTED FOR ALIGNMENT & GRADE, WITH ALLOWANCE FOR DEAD LOAD DEFLECTION, BEFORE CONCRETE IS PLACED.
3. TROUGHS SHALL BE WROUGHT IRON OR HOT-DIPPED GALVANIZED STEEL.
4. DOWNSPOUTS SHALL BE STANDARD WROUGHT IRON OR HOT DIPPED GALVANIZED STEEL PIPE. JOINTS SHALL BE MADE BY WELDING OR BY VICTAULIC COUPLINGS OR BY AN APPROVED EQUIVALENT. ANY WELDING SHALL BE DONE BEFORE GALVANIZING. BRACKETS AND BOLTS FOR MOUNTING DOWNSPOUTS SHALL BE GALVANIZED STEEL. GALVANIZING FOR BOLTS PER SECTION M-10.30 WILL BE CONSIDERED SUFFICIENT. PIPE SPECIALS SHALL BE WROUGHT IRON OR HOT DIPPED GALVANIZED STEEL.



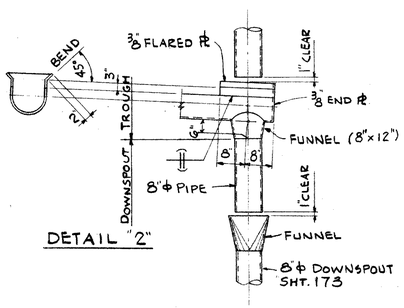
SECTION A-A



DETAIL "1"



SECTION B-B



DETAIL "2"

REFERENCE DWGS.

GENERAL NOTES & QUANTITIES	SHT	146
GENERAL PLAN & ELEVATION	"	145
SUPERSTRUCTURE DETAILS	"	170
SUPERSTRUCTURE DETAILS	"	169
SCUPPER & DOWNSPOUT DETAILS	"	173

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

DECK DRAINAGE SYSTEM
PLAN - SECTIONS & DETAILS
BRIDGE NO. CUY-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY U.S.R. 21

SCALE
DATE

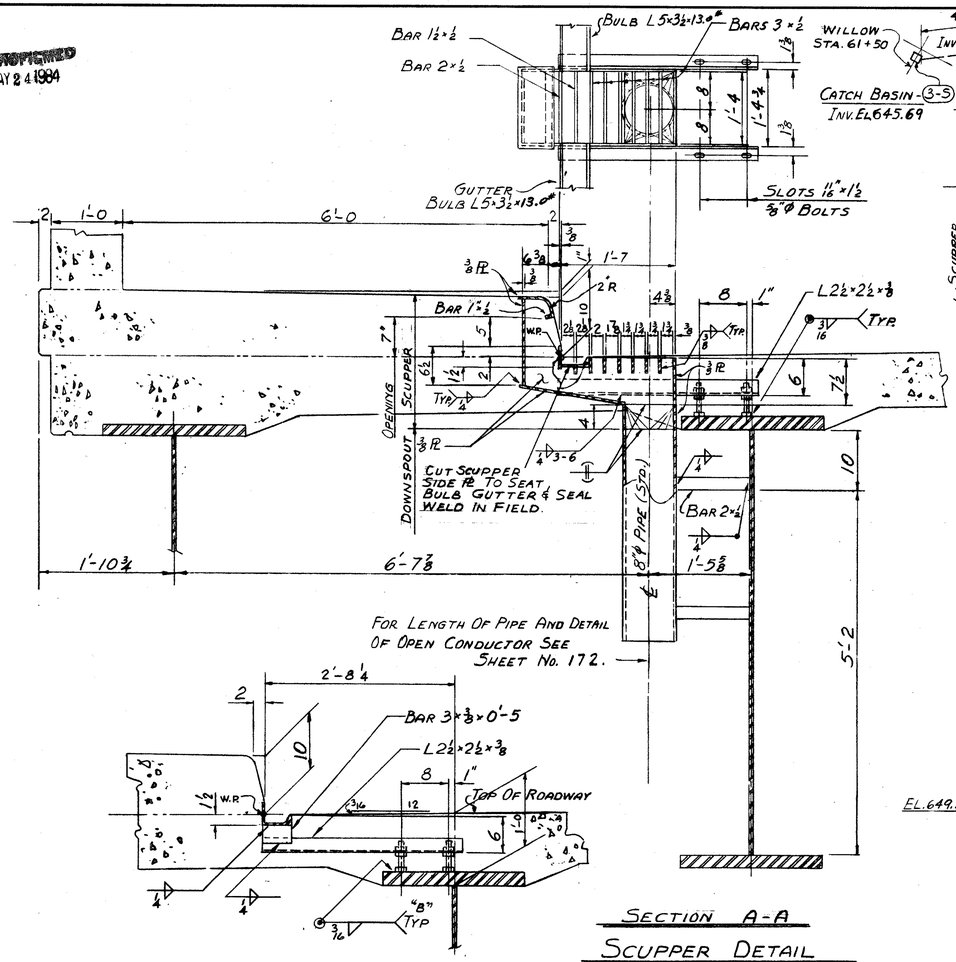
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
D.F.	D.F.		V.P.K.	CWF	10-25-67	

CONT. NO. 15019 SHEET CONT. NO. 1738

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

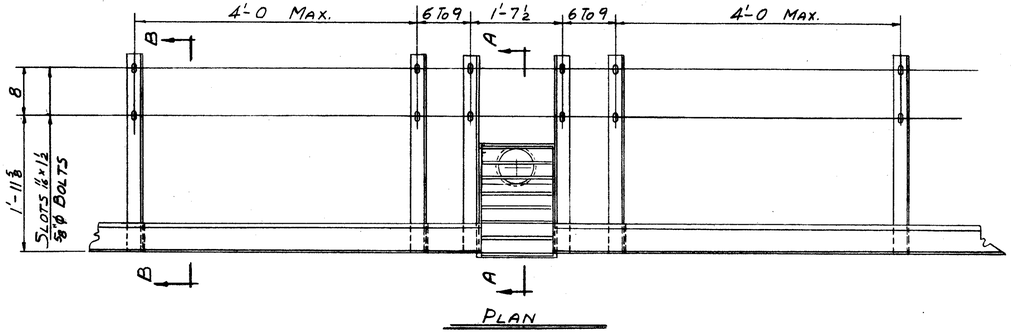
173
204

CUYAHOGA COUNTY
CUY– 21 - (13.77)(14.94)



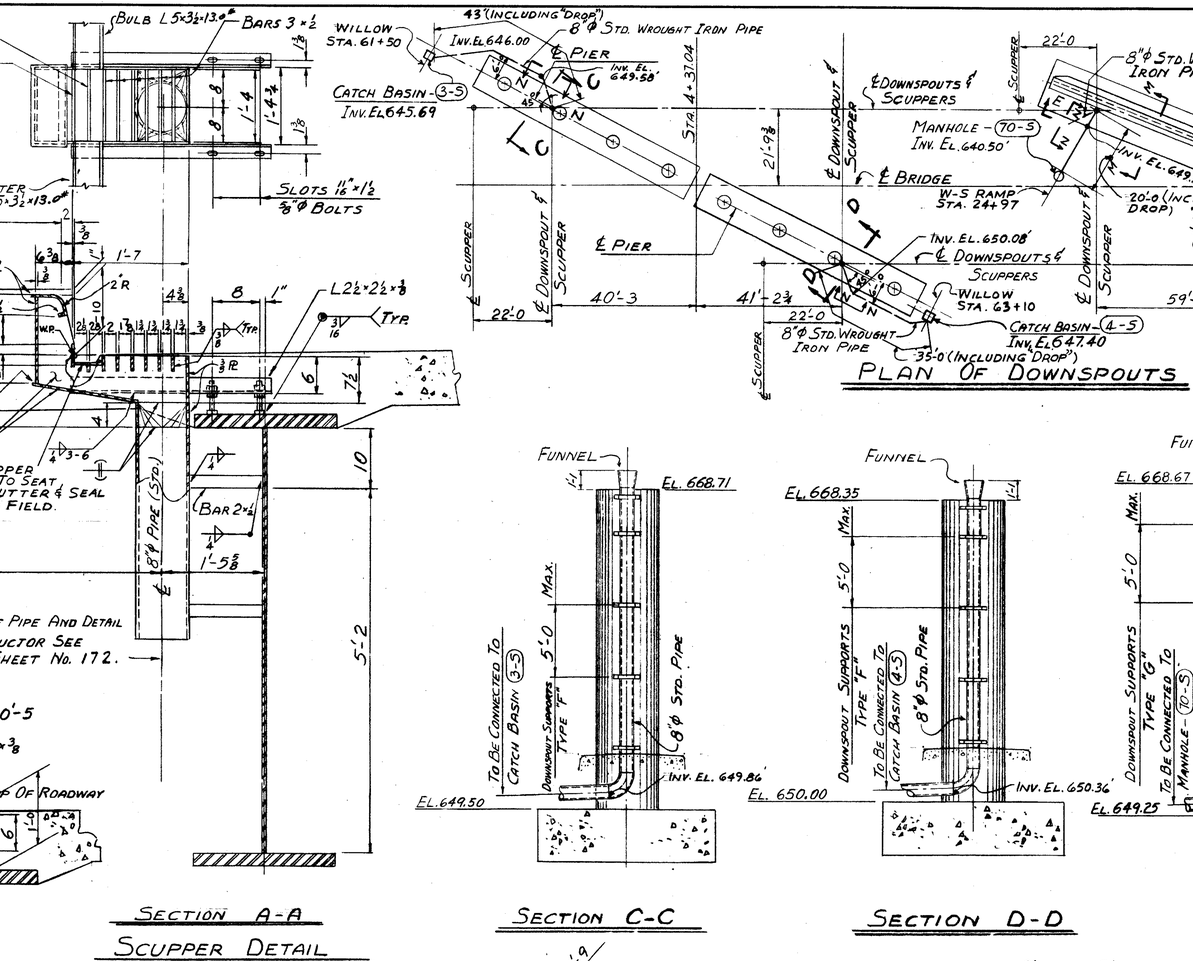
SECTION A-A
SCUPPER DETAIL

SECTION B-B



PLAN

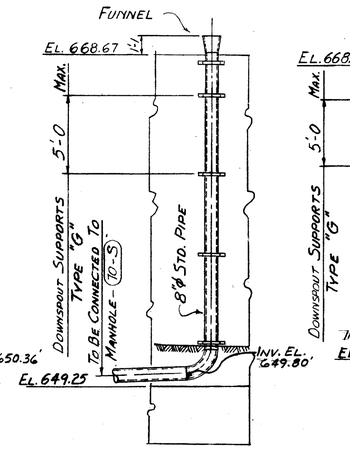
GUTTER SUPPORT DETAIL



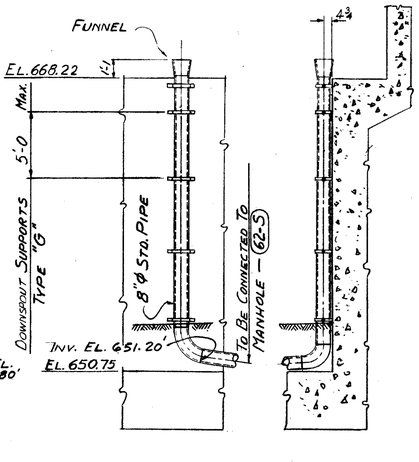
PLAN OF DOWNSPOUTS

SECTION C-C

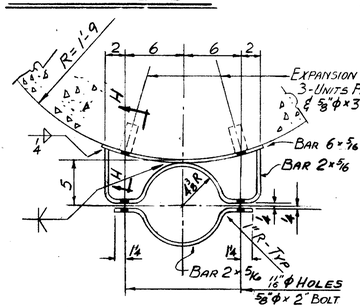
SECTION D-D

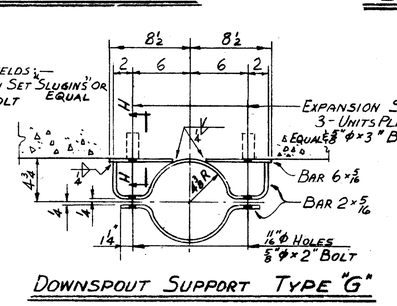


SECTION E-E

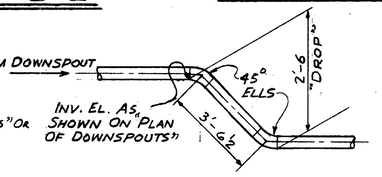


SECTION M-M



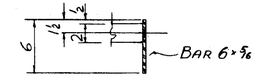


DOWNSPOUT SUPPORT TYPE "G"

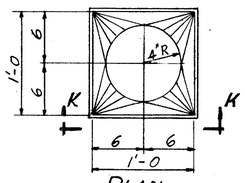


TYPICAL SECT. N-N

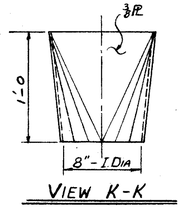
NOTE :-
FOR NOTES AND REFERENCE DWGS. SEE SHT. NO. 172



SECTION H-H



PLAN



VIEW K-K

DOWNSPOUT SUPPORT TYPE "F"

FUNNEL DETAIL

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

SCUPPER AND DOWNSPOUT DETAILS
BRIDGE No. CUY.-21-1404
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY USR-21

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	V.C.		V.P.K.	CWT 10-24-67		

CONT. NO. 38019 - SHEET ACCT. NO. 1036

FED. RD. DIVISION 2
STATE OHIO
PROJECT
174
204
CUYAHOGA COUNTY
CUY- 21-(13.77)(14.94)
FOUNDATION SOUNDINGS:
FOUNDATION DESIGN AND FOUNDATION QUANTITIES ARE BASED ON A STUDY OF ROD SOUNDINGS (AND/OR 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.
REPUBLIC STEEL CORP. OFFICE BLDG.
TYPICAL CROSS SECTION THRU PROPOSED RETAINING WALL
EDGE OF RAMP "B5" PVMT.
ORIGINAL GROUND LINE
3:1 NORMAL
POROUS BACKFILL
PERFORATED PIPE
PROPOSED RELOCATION OF 48" SEWER
EL. 662±
¢ MONUMENTED E 45TH STREET
N
EAST 45TH
MONUMENTED ¢
STREET
CURB LINE
SIDEWALK
BRG. N 0°-59'-29" W
30" WATER
6" WATER
4" C.I. GAS
12" SEWER
N-35°-08'-12" W
TO BROADWAY SEWER
PROPOSED GUARD RAIL
EXISTING LAWN SPRINKLER SYSTEM
COMBINED FLOW FROM PERSHING AVE NORTH
PROPOSED RELOCATION OF 48" SEWER
EXIST. SIDEWALK EXTENSION TO BE REMOVED
FLAG POLE TO BE REMOVED
TRANSITION FROM 3:1 TO 0:0 AT TOP OF WALL
PROPOSED WALL
FACE OF WALL
HIGH PT. OF WALL 18+56
TRANSITION TO 2:1 SLOPE
EXIST. 48" CONC. SEWER
EXISTING 48" CONC. SEWER
STA. 18+31.74
RAMP BASE LINE N 11° 08' 48" W
BERM TRANSITION
B-S RAMP
3' PAVED BERM
6" CURB
RETAINING WALL W/PARAPET & ALUM. H.R.
7' PAVED BERM
12" DIVIDER CURB
TRANSITION IN SLOPE
10' PAVED BERM
DITCH
¢ WILLOW
¢ WILLOW DATA:
Δ = 9°-36'-26"
D = 1°00'00"
R = 5729.58'
T = 481.49'
L = 960.72'
E = 20.20'
TANGENT N 5°-02'-52" W
PAVED BERM
12" V.S.P.
12" SEWER
M.H.
PC. STA. 59+95.51
PAVEMENT VARIES
This sheet is superseded by sheet no. 174A. 12-2-63
ELEVATION OF RETAINING WALL
WALL STATIONING ON RAMP BASE LINE
50' V.C. TOP OF WALL
EL. 678.7 P.V.C.
EL. 666.6' TOP OF WALL
EL. 662.3 TOP OF WALL
EL. 655.0
EL. 656.0'
EL. 657.0
EL. 659.0
GROUND LINE ALONG FACE OF WALL
E 45TH STREET BERM LINE
RAMP BERM LINE
BOT. OF DITCH
INV. OF SEWER
TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO
SITE PLAN
B-S RAMP RETAINING WALL
VICINITY OF
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY U.S.R. 21
SCALE
DATE 10-17-61
DESIGNED DRAWN TRACED CHECKED REVIEWED
CONT. NO. 58019
SHEET / T. NO. 1658

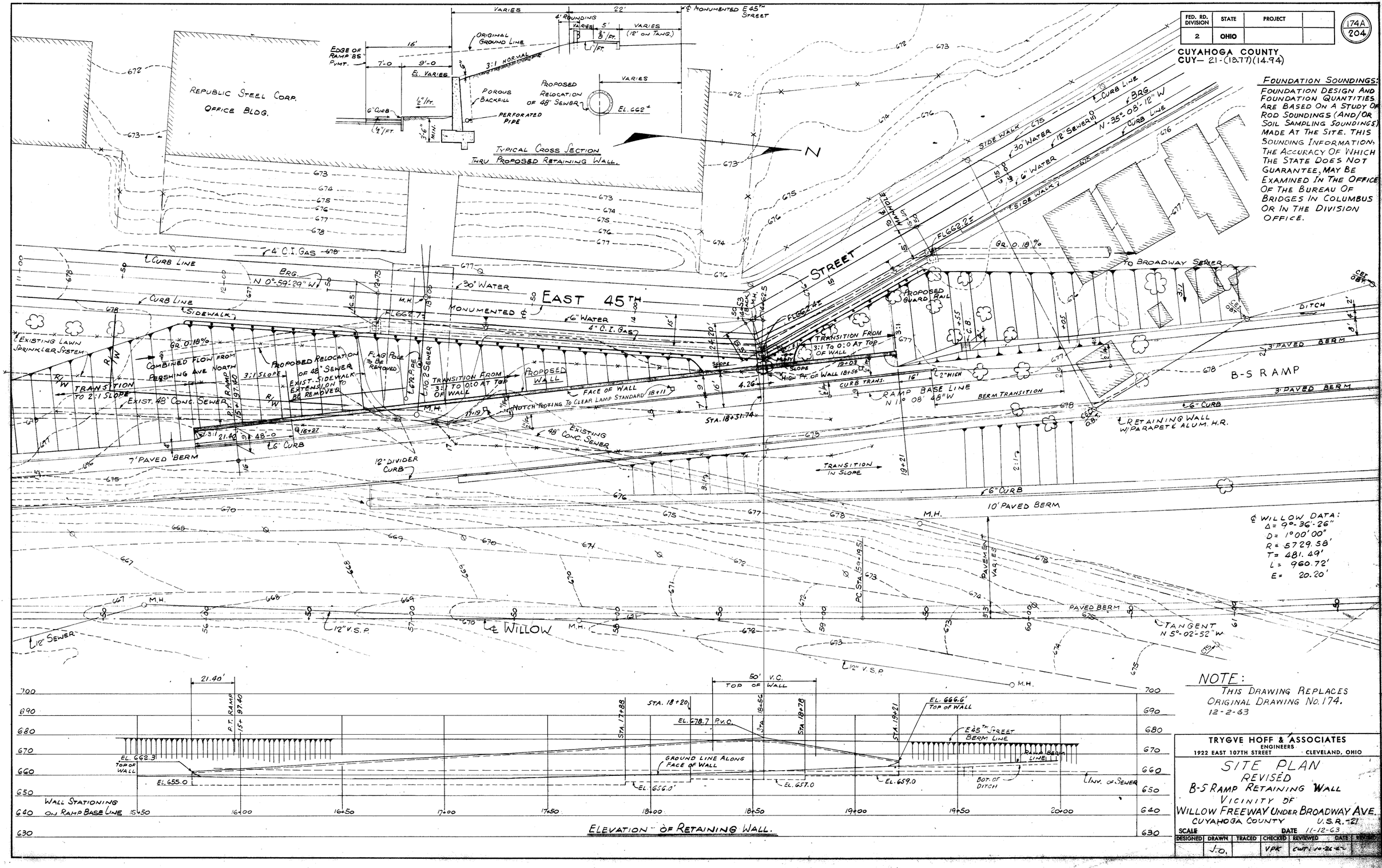
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

174A
204

CUYAHOGA COUNTY
CUY– 21-(18.77)(14.94)

FOUNDATION SOUNDINGS:

FOUNDATION DESIGN AND FOUNDATION QUANTITIES ARE BASED ON A STUDY OF ROD SOUNDINGS (AND/OR 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:
THIS DRAWING REPLACES ORIGINAL DRAWING NO. 174.
12-2-63

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

SITE PLAN
REVISED
B-5 RAMP RETAINING WALL
VICINITY OF
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY U.S.R. 721

SCALE
DATE 11-12-63

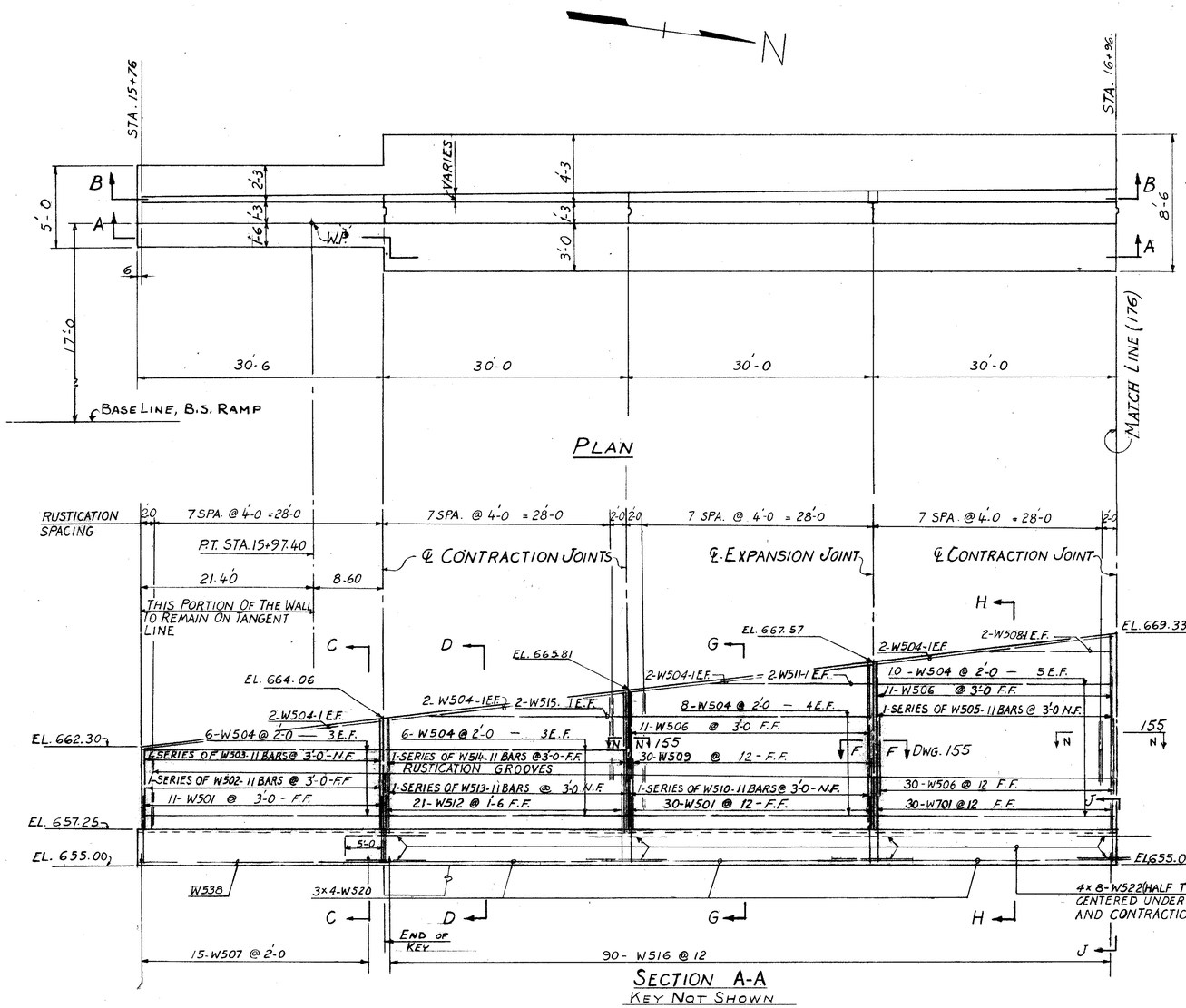
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	J.O.		VPK	CWT 10-26-64		

CONT. NO. 58019 SHEET NO. 1 OF 1 SHEETS NO. 1658

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

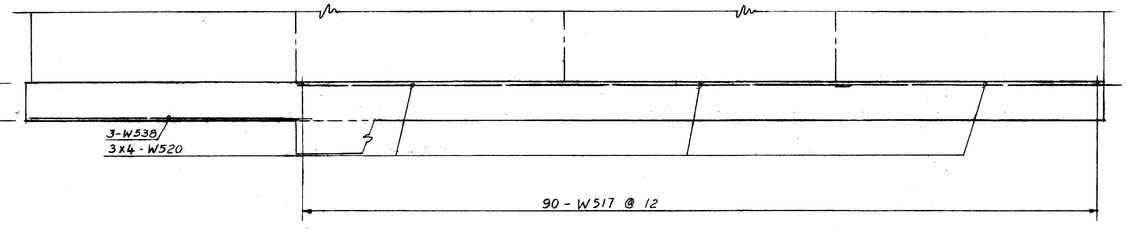
175
204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

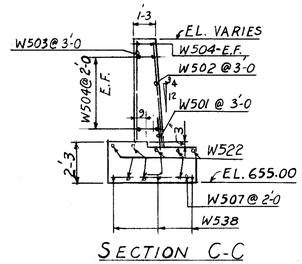


PLAN

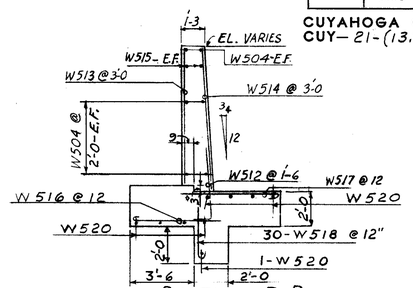
SECTION A-A
KEY NOT SHOWN



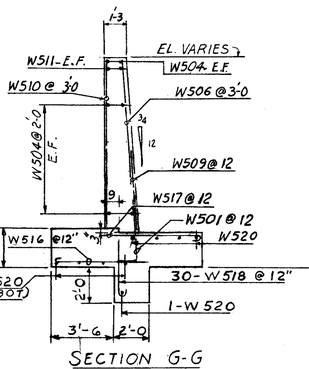
SECTION B-B
KEY NOT SHOWN



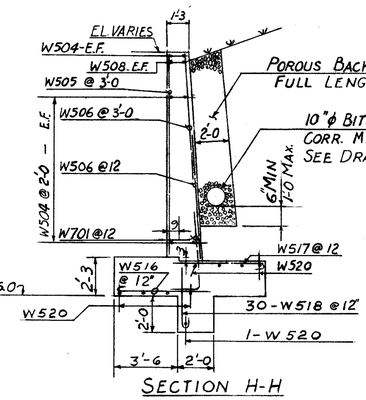
SECTION C-C



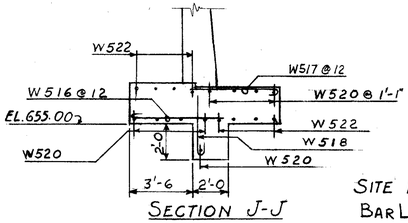
SECTION D-D



SECTION G-G



SECTION H-H



SECTION J-J

This sheet is superseded by sheet no. 175 A. 12-2-63

REFERENCE DWGS.

SITE PLAN	174
BAR LIST & QUANTITIES	178
DETAILS & SECTIONS	155

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

B.S. RAMP RETAINING WALL.
VICINITY OF
WILLOW FREEWAY UNDER BROADWAY AVE
CUYAHOGA COUNTY - U.S.R. 21

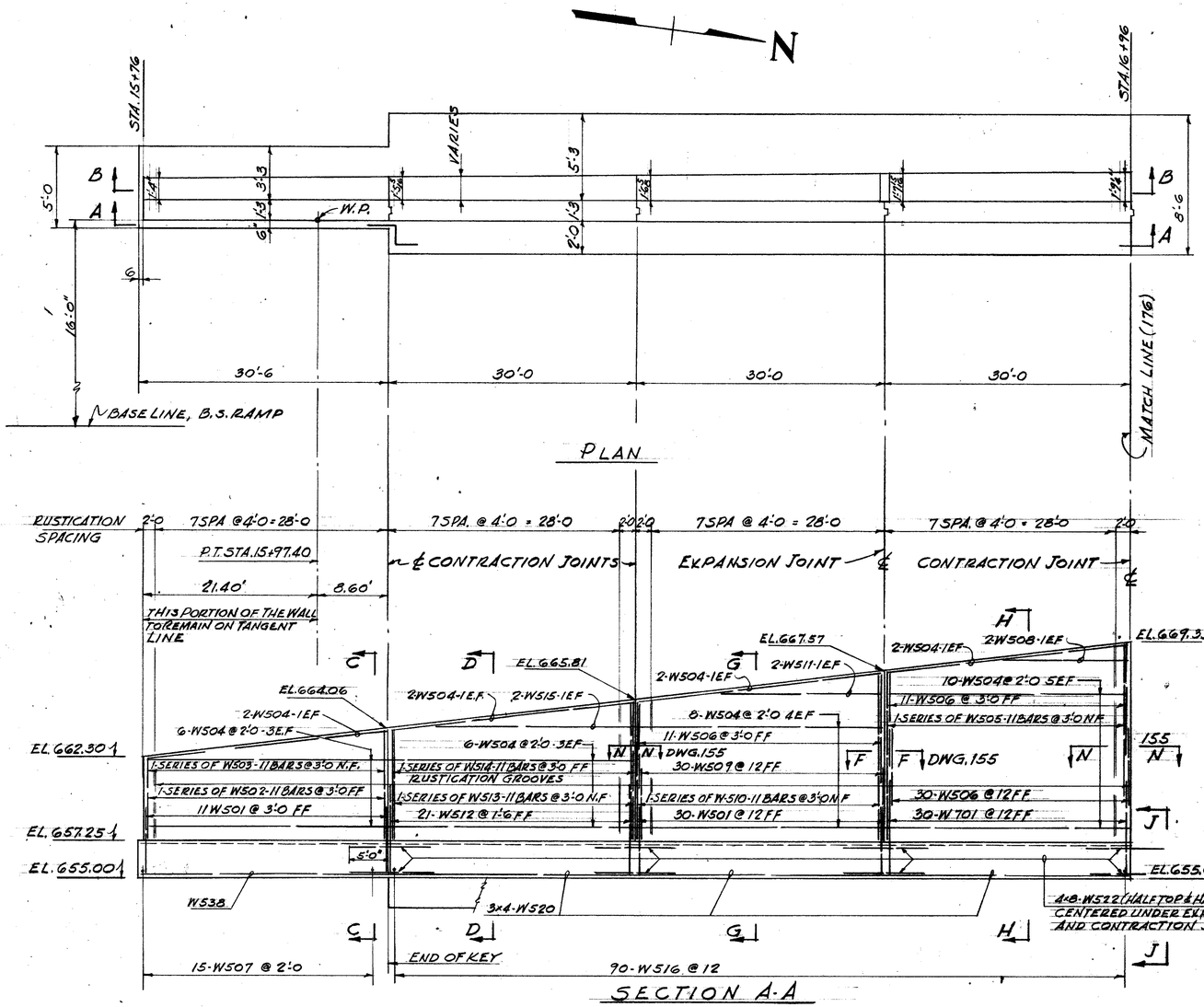
SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SGA	SGA		SAE	CWT	10-22-62	

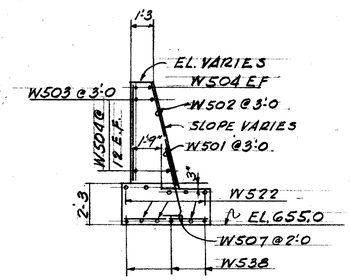
CONT. NO. 58219 SHEET ACCT. NO. 1255

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

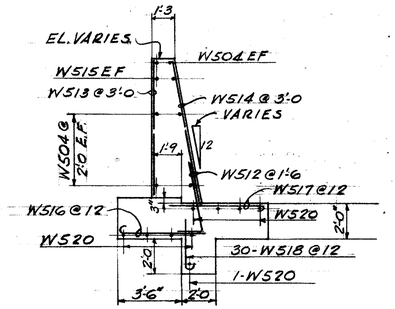
175A
204

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

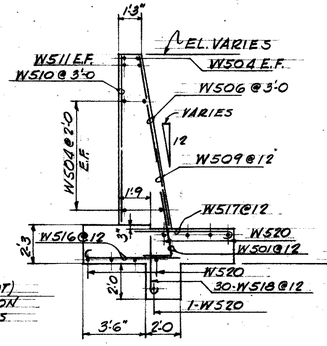




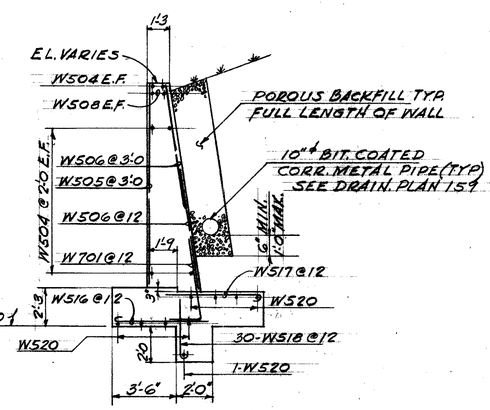
SECTION C-C



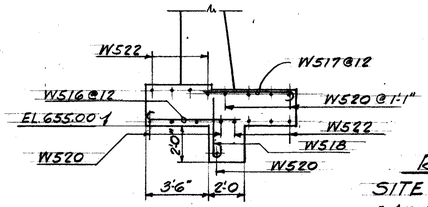
SECTION D-D



SECTION G-G



SECTION H-H



SECTION J-J

REFERENCE DWGS.

SITE PLAN	174A
BAR LIST & QUANTITIES	178
DETAILS & SECTIONS	155

NOTE-
THIS SHEET REPLACES ORIGINAL SHEET No 175
12-2-63

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

REVISED B.S. RAMP RETAINING WALL
VICINITY OF
WILLOW FREEWAY UNDER BROADWAY AVE.
CUYAHOGA COUNTY USR 21

SCALE
DATE 11-12-63

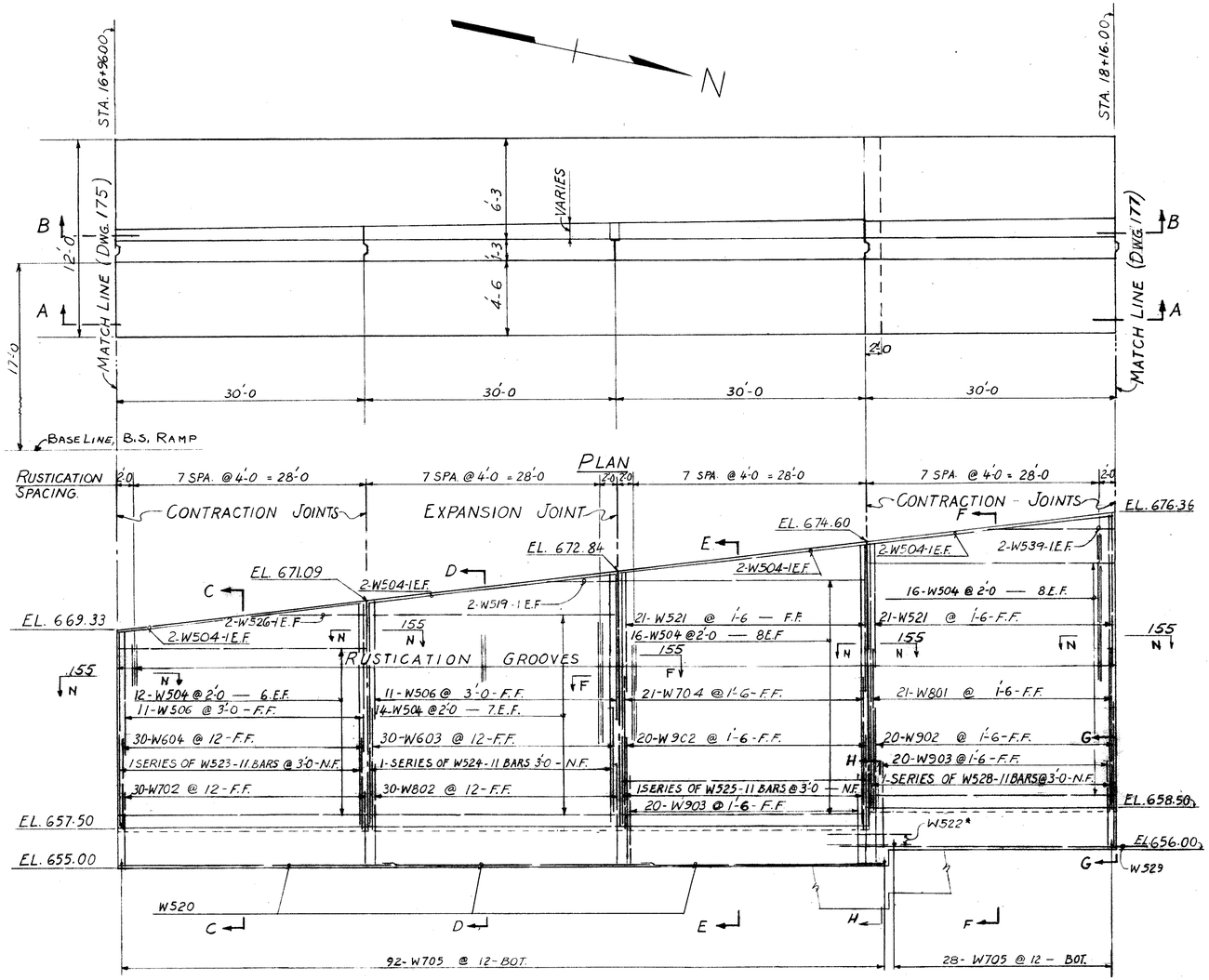
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	WSS		DWM			

CONT. No. 63058 SHEET ACCT. No. 1001

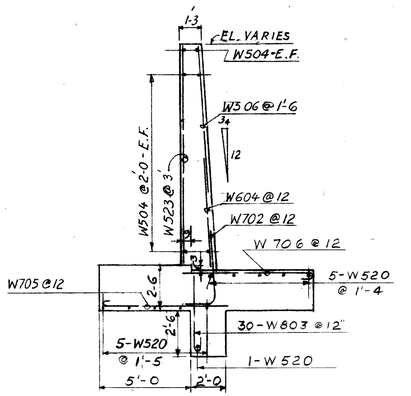
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY—21-(13.77)-(14.94)

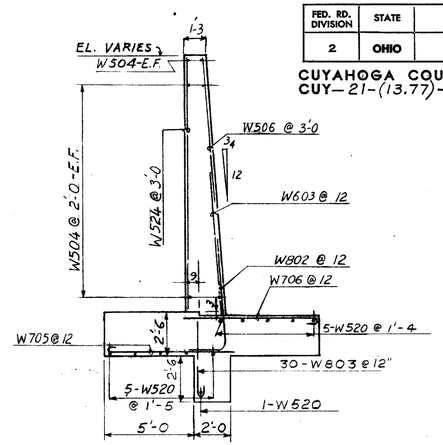
176
204



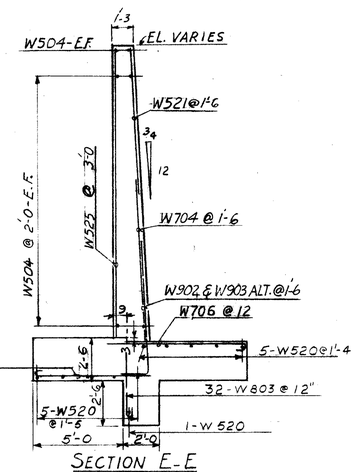
SECTION A-A
KEY NOT SHOWN



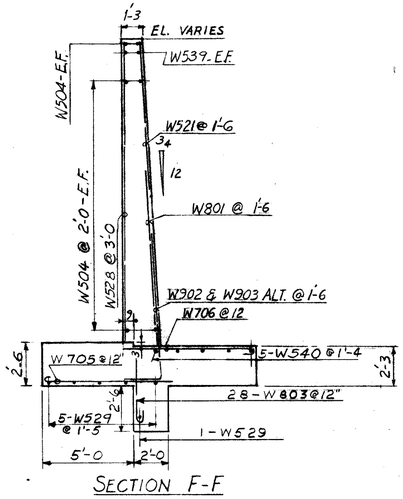
SECTION C-C



SECTION D-D



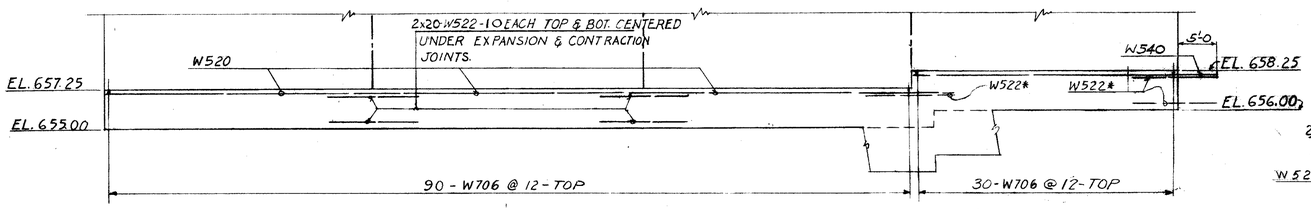
SECTION E-E



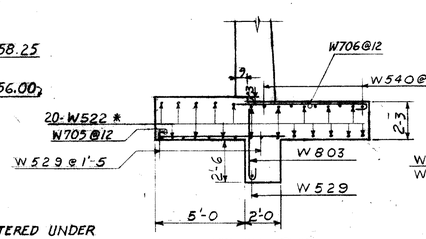
SECTION F-F

REFERENCE DRAWINGS

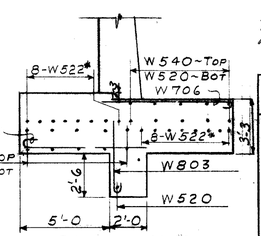
SITE PLAN	174
BAR LIST & QUANTITIES	178
DETAILS & SECTIONS	155



SECTION B-B
KEY NOT SHOWN



SECTION G-G



SECTION H-H

*CENTERED UNDER CONTRACTION & EXPANSION JOINT

(TYPICAL SECTION UNDER EXPANSION & CONTRACTION JOINTS)

This sheet is superseded by sheet no. 176 A. 12-2-63

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

B.S. RAMP RETAINING WALL
VICINITY OF
WILLOW FREEWAY UNDER BROADWAY AVE
CUYAHOGA COUNTY — U.S.R 21

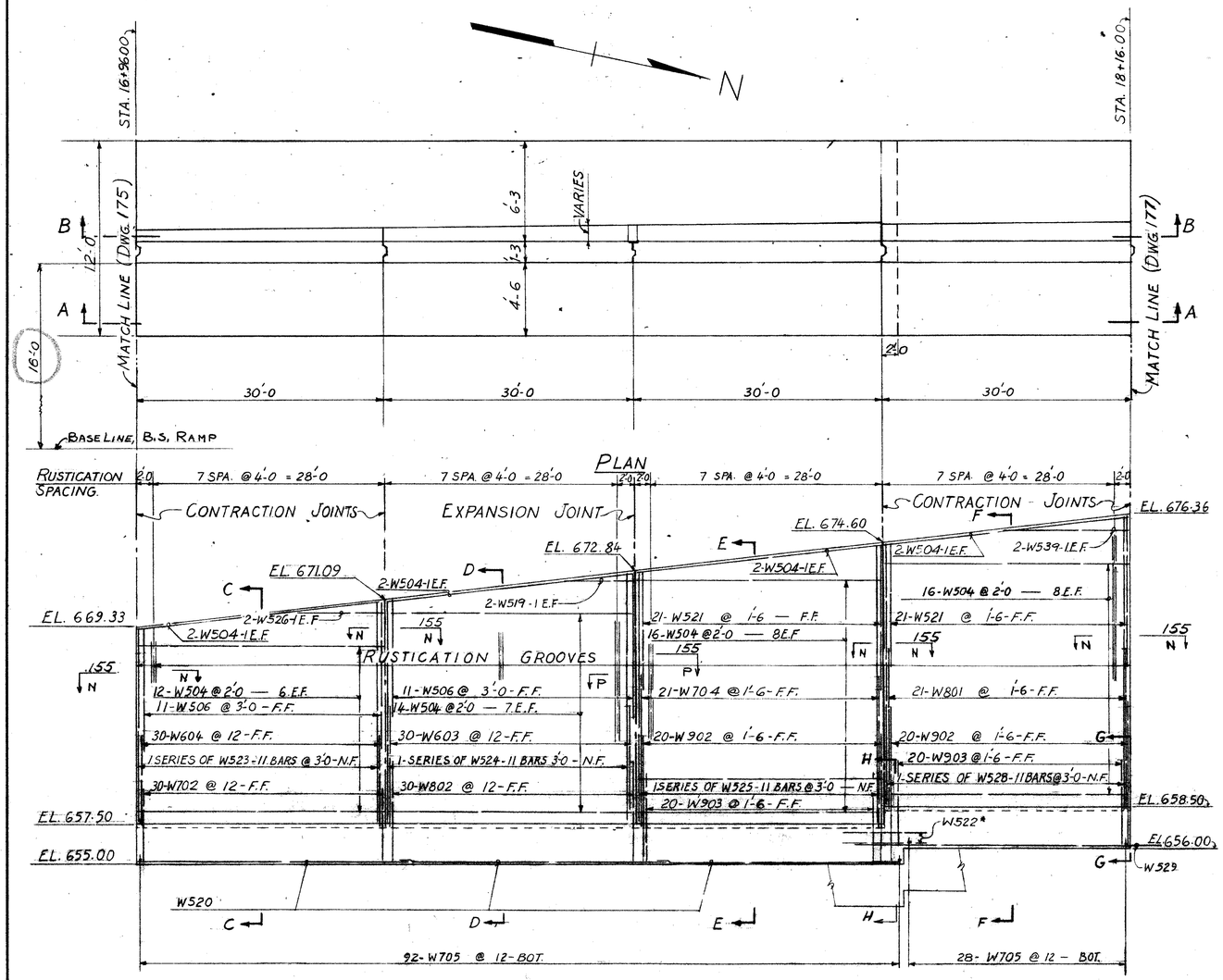
SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SCA	SCA			SAE EWT 10-26-62		

CONT. No. 58019 SHEET ACCT. No. 1755

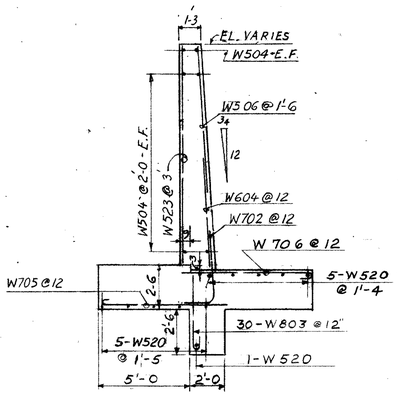
FED. RD. DIVISION	STATE	PROJECT	.
2	OHIO		

176A
204

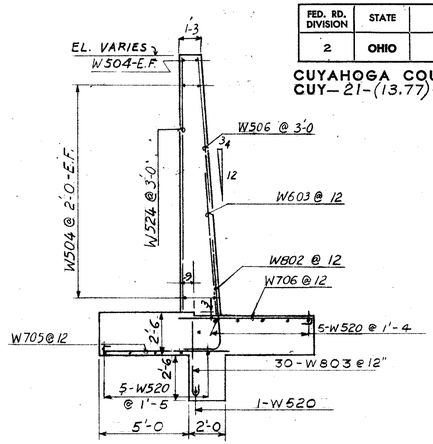
CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)·



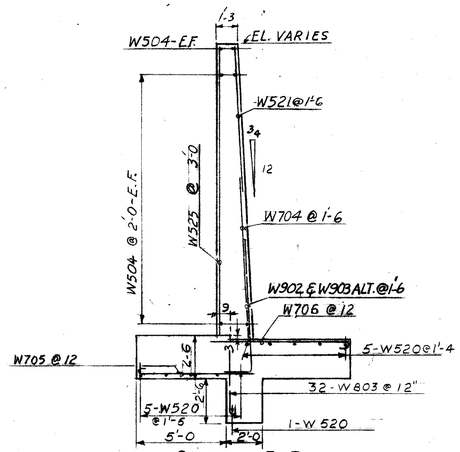
SECTION A-A
KEY NOT SHOWN



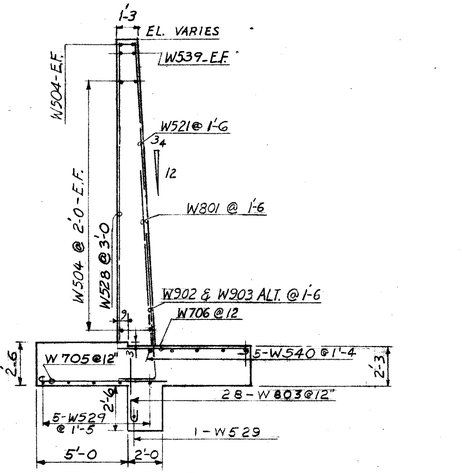
SECTION C-C



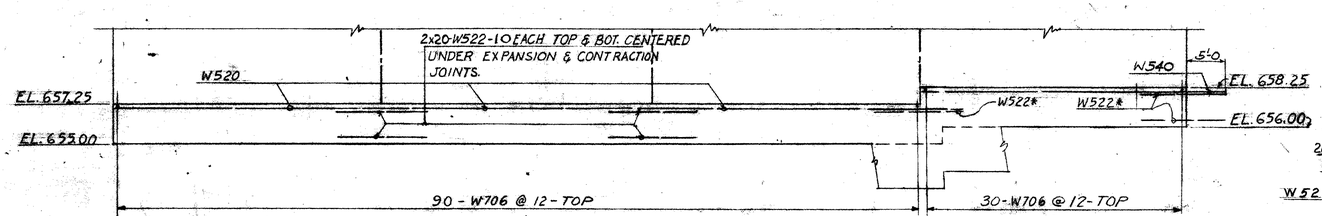
SECTION D-D



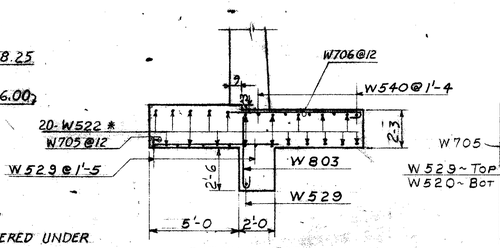
SECTION E-E



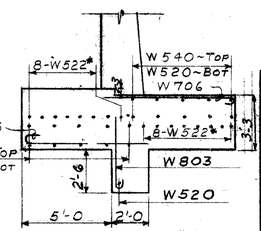
SECTION F-F



SECTION B-B
KEY NOT SHOWN



SECTION G-G



SECTION H-H

*CENTERED UNDER CONTRACTION & EXPANSION JOINT

(TYPICAL SECTION UNDER EXPANSION & CONTRACTION JOINTS)

REFERENCE DRAWINGS

SITE PLAN	174A
BAR LIST & QUANTITIES	178
DETAILS & SECTIONS	155

NOTE:
THIS DRAWING REPLACES ORIGINAL DRAWING No. 176 12-2-63

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

B.S. RAMP RETAINING WALL
VICINITY OF
WILLOW FREEWAY UNDER BROADWAY AVE
CUYAHOGA COUNTY — U.S.R.21

SCALE DATE 11-12-63

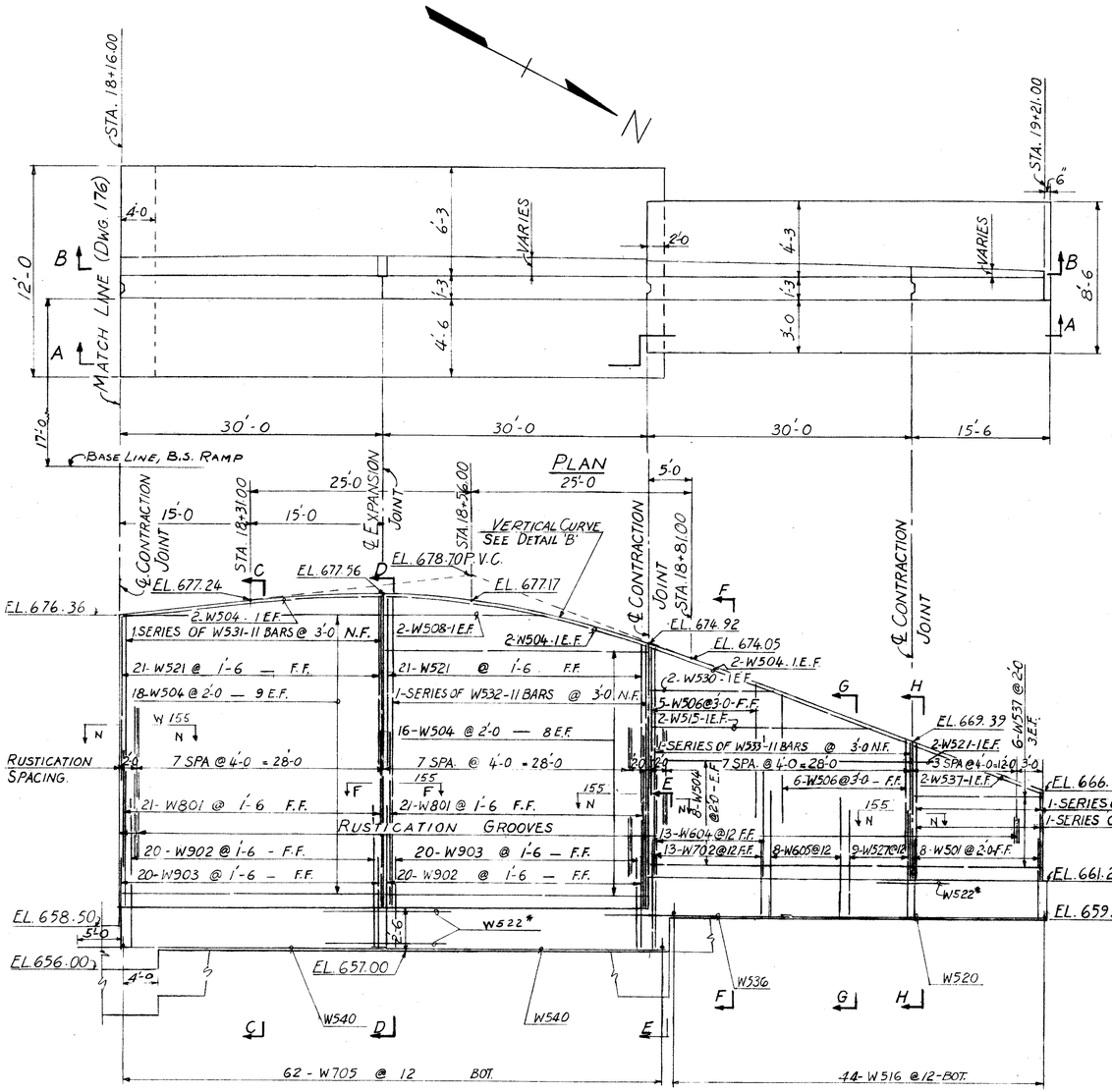
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SCA	SCA		S.A.F.	CWT 10-26-64		

CONT. No. 58019 — FED. ACCT. No. 1756

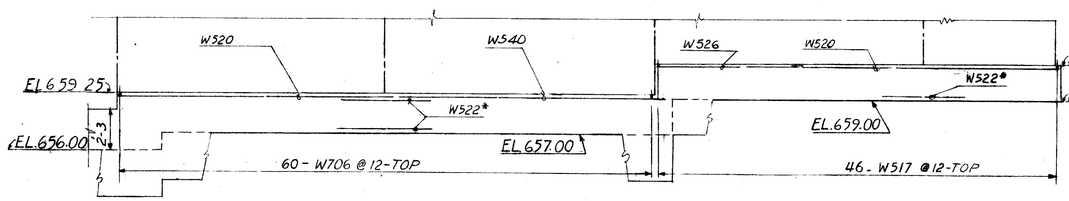
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

177
204

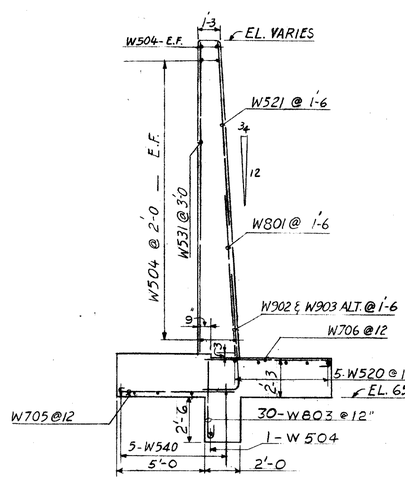
CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)



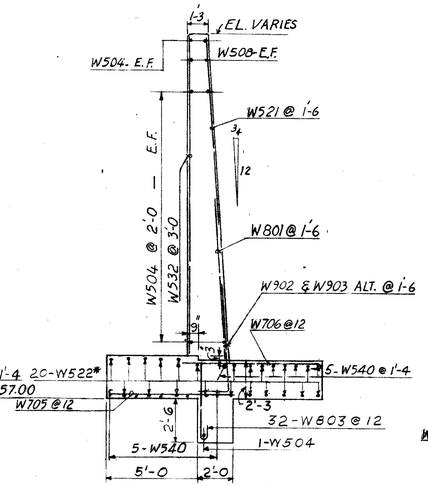
SECTION A-A
KEY NOT SHOWN



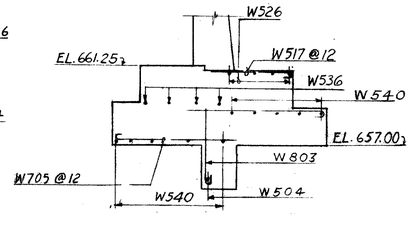
SECTION B-B
KEY NOT SHOWN



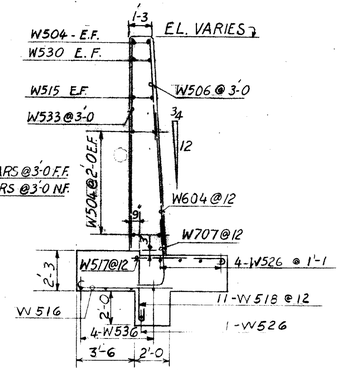
SECTION C-C



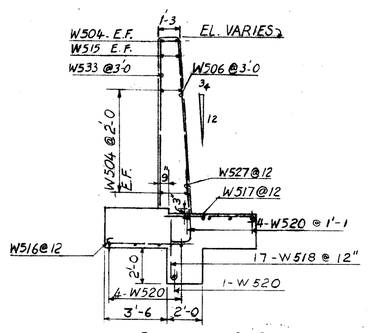
SECTION D-D



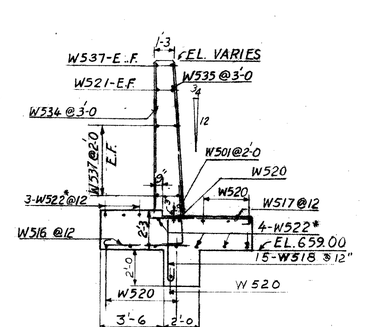
SECTION E-E



SECTION F-F

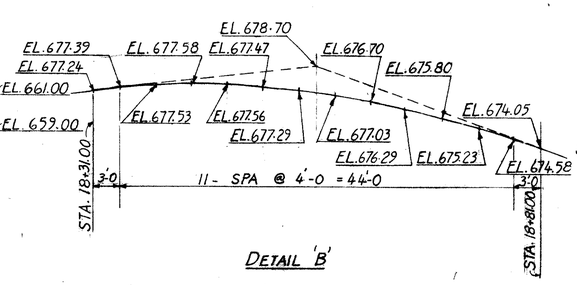


SECTION G-G



SECTION H-H

* CENTERED UNDER EXPANSION & CONTRACTION JOINTS



DETAIL 'B'

REFERENCE DRAWINGS

SITE PLAN	174
BAR LIST & QUANTITIES	178
DETAILS & SECTIONS	155

This sheet is superseded by sheet no. 177A. 12-2-63

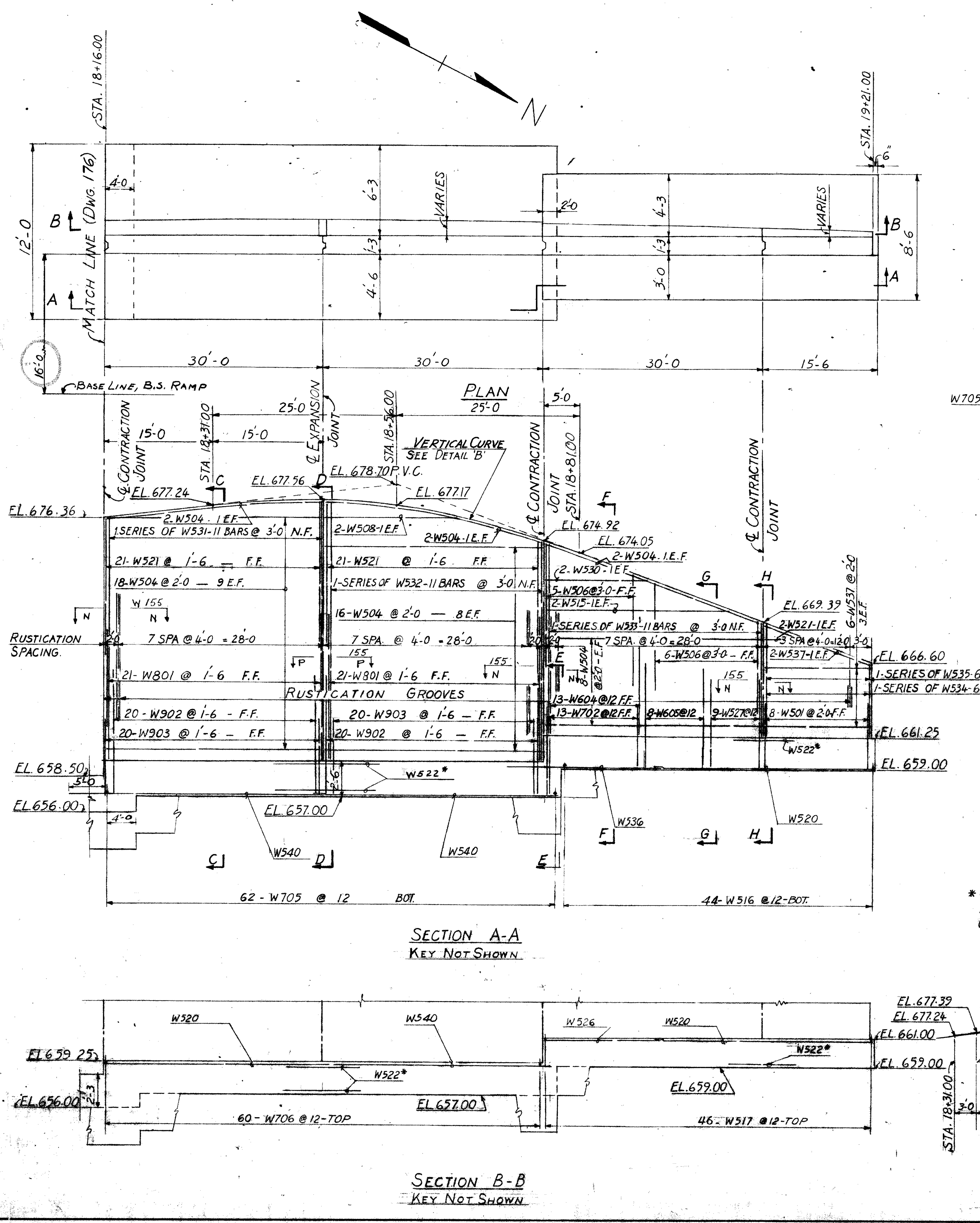
TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

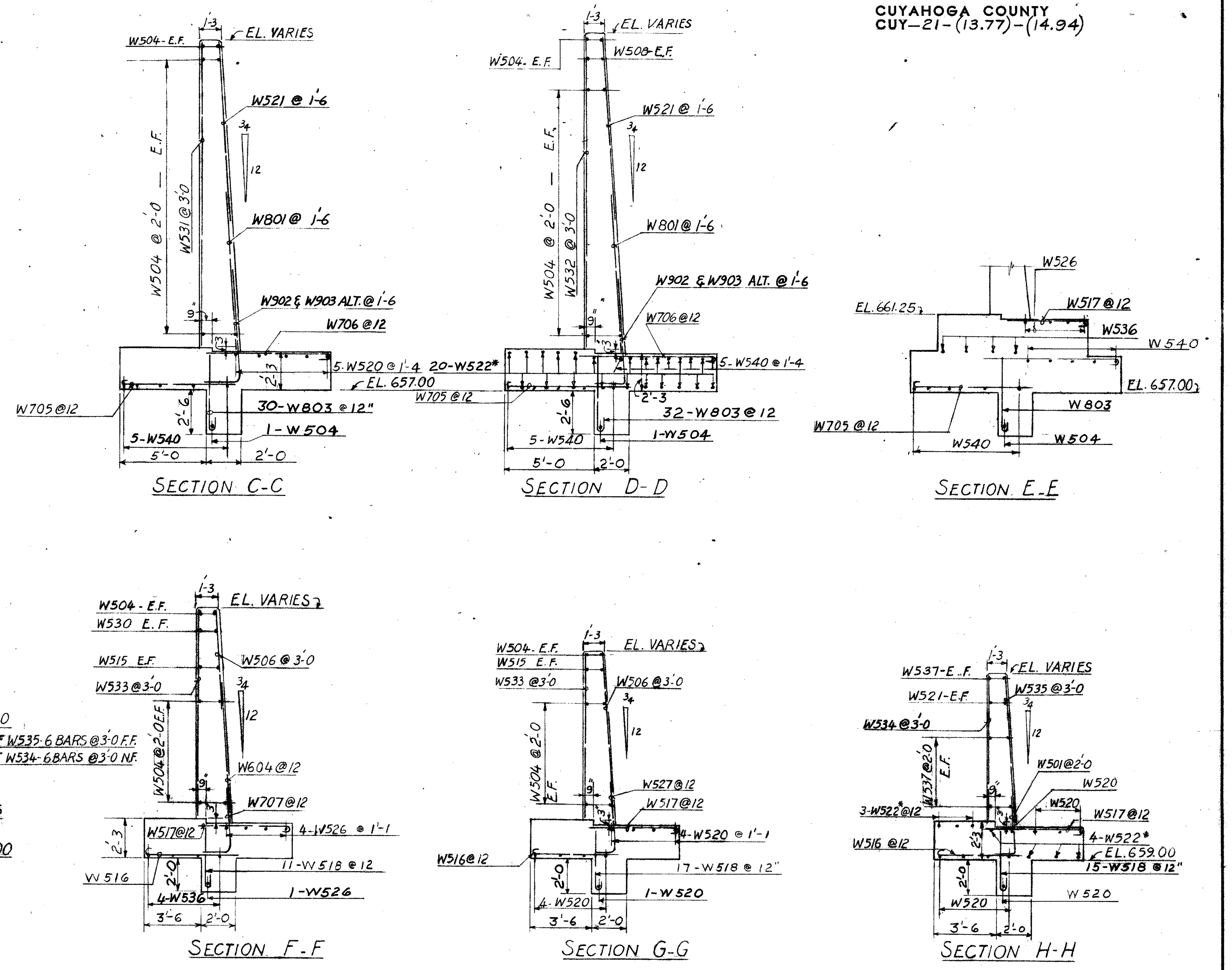
B.S. RAMP RETAINING WALL
VICINITY OF
WILLOW FREEWAY UNDER BROADWAY AVE
CUYAHOGA COUNTY - U.S.R. 21

SCALE			DATE		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SCA	SCA		S.A.F.	CWT	10-24-62	

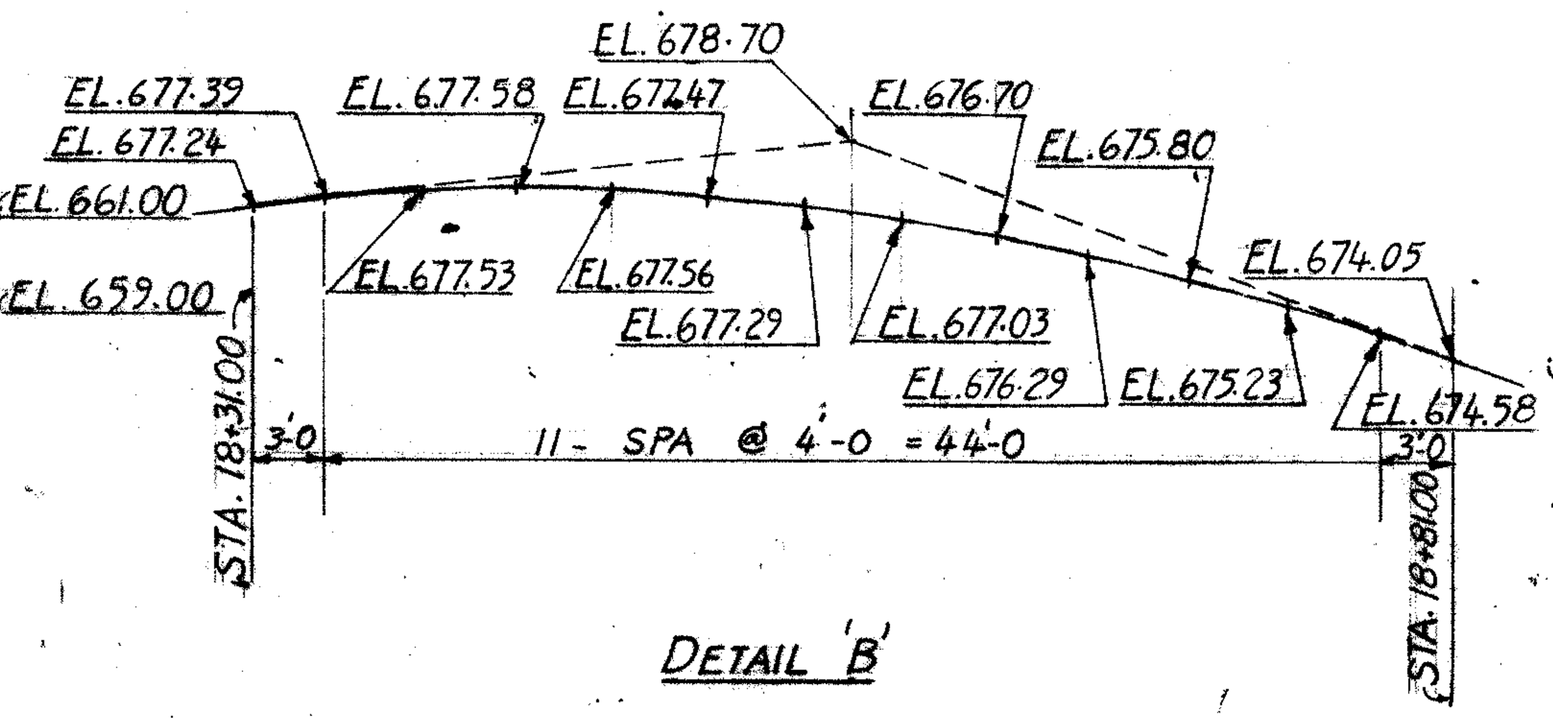
CONT. NO. 58019 SHEET ACCT. NO. 1752

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)





* CENTERED UNDER EXPANSION & CONTRACTION JOINTS



NOTE:
THIS DRAWING REPLACES ORIGINAL DRAWING No. 177. 12-2-63

REFERENCE DRAWINGS

SITE PLAN	174 A
BAR LIST & QUANTITIES	178
DETAILS & SECTIONS	155

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

B. S. RAMP RETAINING WALL
VICINITY OF
WILLOW FREEWAY UNDER BROADWAY AVE
CUYAHOGA COUNTY - U.S.R. 21

SCALE
DATE 11-12-63

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
SCA	SCA		S.A.E.	CWT 10-26-62		

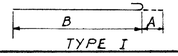
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

178
204

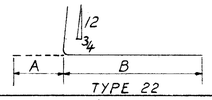
CUYAHOGA COUNTY
CUY—21—(13.77)—(14.94)

REINFORCING STEEL BAR SCHEDULE

SEE DET. DWGS 175, 176, & 177



TYPE 1



TYPE 22

MARK	NO. REQD.	LENGTH	TYPE	A	B	C	D	E	WEIGHT
W501	49	4'-9	22	1'-0	3'-9				243
W502	1-SERIES OF 11	5'-2 TO 6'-11	ST.	VARY BY 2"					69
W503	1-SERIES OF 11	4'-11 TO 6'-8	ST.	VARY BY 2"					66
W504	154	29'-8	ST.						4766
W505	1-SERIES OF 11	10-2 TO 11'-1	ST.	VARY BY 2"					170
W506	85	7'-0	ST.						835
W507	15	4'-7	ST.						96
W508	4	24'-0	ST.						100
W509	30	5'-0	ST.						156
W510	1-SERIES OF 11	8'-5 TO 10'-2	ST.	VARY BY 2"					107
W511	2	26'-0	ST.						54
W512	21	6'-5	22	1'-0	5'-5				141
W513	1-SERIES OF 11	6'-8 TO 8'-5	ST.	VARY BY 2"					87
W514	1-SERIES OF 11	6'-11 TO 8'-8	ST.	VARY BY 2"					89
W515	4	28'-0	ST.						117
W516	134	5'-7	I	7"	5'-0				780
W517	136	6'-0	I	7"	5'-5				851
W518	133	4'-0	I	7"	3'-5				555
W519	2	11'-0	ST.						23
W520	74	31'-9	ST.						2451
W521	86	9'-6	ST.						852
W522	135	10'-0	ST.						1408
W523	1-SERIES OF 11	11'-8½ TO 13'-5½	ST.	VARY BY 2"					144
W524	1-SERIES OF 11	13'-5½ TO 15'-2½	ST.	VARY BY 2"					164
W525	1-SERIES OF 11	15'-2½ TO 16'-11½	ST.	VARY BY 2"					185
W526	7	16'-0	ST.						117
W527	9	7'-0	22	1'-0	6'-0				66
W528	1-SERIES OF 11	15'-2½ TO 16'-11½	ST.	VARY BY 2"					193
W529	6	37'-0	ST.						232
W530	2	17'-0	ST.						35
W531	1-SERIES OF 11	16'-9 TO 17'-11	ST	VARIES, SEE VERT. CURVE					199
W532	1-SERIES OF 11	15'-3 TO 17'-1	ST.						190
W533	1-SERIES OF 11	8'-0 TO 13'-6	ST.	VARY BY 6"					123
W534	1-SERIES OF 6	5'-3 TO 8'-0	ST.	VARY BY 6½"					41
W535	1-SERIES OF 6	5'-6 TO 8'-3	ST.	VARY BY 6½"					43
W536	4	20'-4	ST.						85
W537	8	14'-9	ST.						123
W538	3	32'-3	ST.						101
W539	2	20'-0	ST.						42
W540	20	34'-10	ST.						727
							SUBTOTAL		16826
W603	30	9'-6	ST.						428
W604	43	8'-0	ST.						517
W605	8	8'-9	22	1'-3	7'-6				105
							SUBTOTAL		1050

MARK	NO. REQD.	LENGTH	TYPE	A	B	C	D	E	WEIGHT
W701	30	5'-8	22	1'-5	4'-3				348
W702	43	6'-5	22	1'-5	5'-0				564
W704	21	9'-0	ST.						386
W705	182	8'-0	I	10"	7'-2				2976
W706	180	8'-6	I	10"	7'-8				3127
							SUBTOTAL		7401
W801	63	10'-0	ST.	10'-0					1682
W802	30	8'-0	22	1'-8	6'-4				641
W803	182	5'-6	I	1'-1	4'-5				2673
							SUBTOTAL		4996
W902	80	10'-2	22	1'-8	8'-6				2765
W903	80	7'-0	22	1'-8	5'-4				1904
							SUBTOTAL		4669
							GRAND TOTAL		34,942

REPLACEMENT BARS

MARK	NO REQD	LENGTH	TYPE
RE.500	1	5'-7	STR
RE600	1	5'-11	
RE700	1	6'-3	
RE800	1	6'-6	
RE900	1	6-10	STR
RE1000			
RE1100			

ESTIMATED QUANTITIES

Normal Particip.

ITEM	TOTAL	UNIT	DESCRIPTION CODE 7221
E-2	1690	CU. YDS.	UNCLASSIFIED EXCAVATION
E-2		LUMP SUM	COFFERDAMS CRIBS & SHEETING
S-1	274	CU. YDS.	CLASS "E" CONCRETE ~ RETAINING WALLS
S-1	346	CU. YDS.	CLASS "E" CONCRETE ~ FOOTING
S-3	150	LIN. FT.	WATERPROOFING, PREMOLDED SEALING STRIP
S-4	34942	LBS.	REINFORCING STEEL
S-9	78	SQ. FT.	1" PREFORMED EXPANSION JOINT FILLER
S-29	290	CU. YDS.	POROUS BACKFILL
S-29	240	LIN. FT.	10" DIA. PERF. CORR. BIT. COATED PIPE INCL. SPEC.
S-29	11	LIN. FT.	10" DIA. CORR. BIT. COATED PIPE INCL. SPECIALS

GENERAL NOTES

SURFACE FINISH OF CONCRETE: THE REQUIREMENTS OF SEC. S-1.22, RUBBED FINISH, SHALL APPLY TO THE ENTIRE EXPOSED SURFACE OF THE RETAINING WALL.

REFERENCE DWGS
SITE PLAN . . . 174
DETAILS 175, 176, 177

BARS SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT OR THE FIRST TWO DIGITS INDICATE THE BAR SIZE NUMBER. FOR EXAMPLE: W500 IS A NO. 5 SIZE BAR AND W1000 IS A NO. 10 SIZE BAR.

CONT. No. 58019 SHT. ACCT. No. 1758

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

BAR LIST-GENERAL NOTES-QUANTITIES
B-S RAMP RETAINING WALL
VICINITY OF
WILLOW FREEWAY UNDER BROADWAY
CUYAHOGA COUNTY. U.S.R.-21

SCALE	DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE / REVISED
	SCA		S.A.E.	CWT	10-26-67

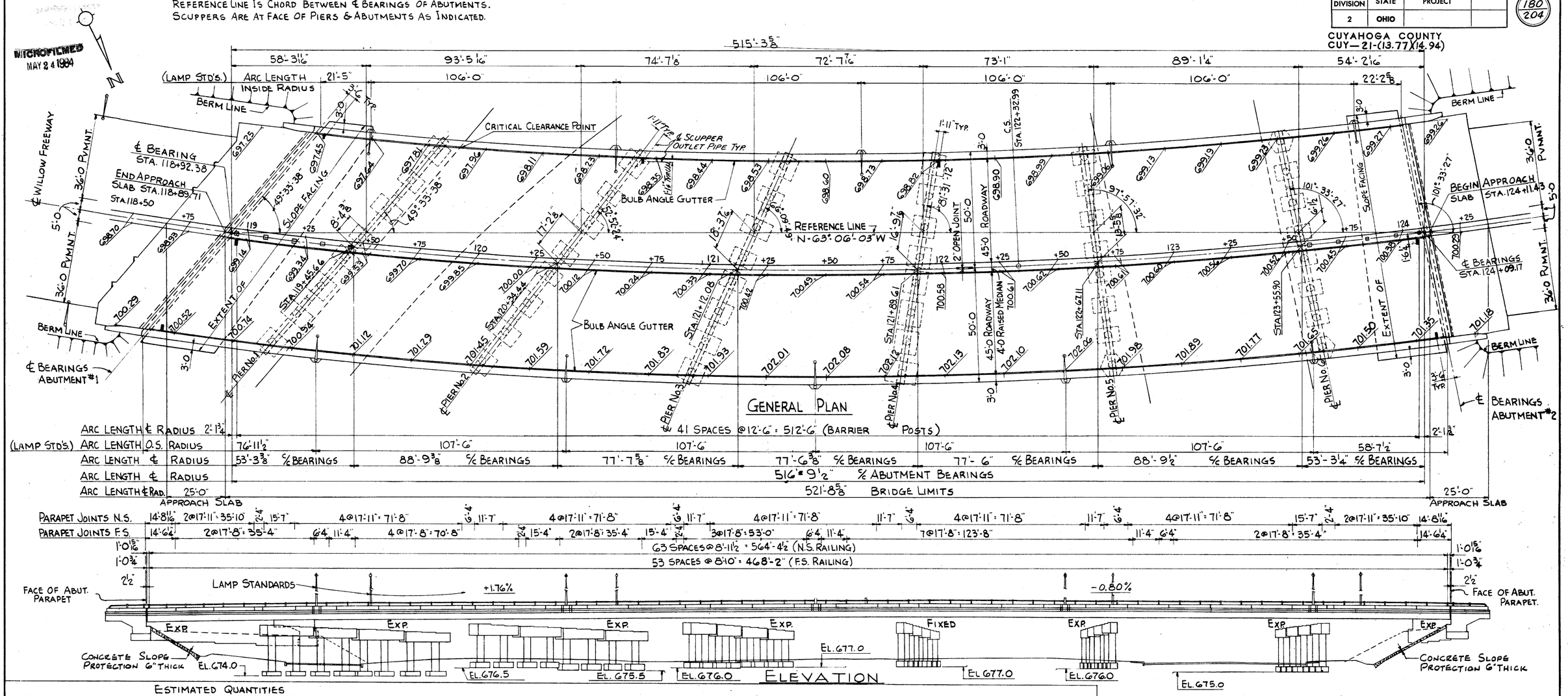
CONT. No. 58019(28) SHEET ACCT. No. 1502

NOTE:
REFERENCE LINE IS CHORD BETWEEN ℄ BEARINGS OF ABUTMENTS.
SCUPPERS ARE AT FACE OF PIERS & ABUTMENTS AS INDICATED.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

180/204

CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)



ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	SUPERSTR.	ABUT.	PIERS	GENERAL
E-2	1540	CU.YD.	UNCLASSIFIED EXCAVATION		540	1,000	
S-1	1600	CU.YD.	CLASS "C" CONCRETE, SUPERSTRUCTURE	1600			
S-1	220	CU.YD.	CLASS "E" CONCRETE, ABUT. ABOVE FOOTINGS		220		
S-1	510	CU.YD.	CLASS "E" CONCRETE, PIER & ABUT. FOOTINGS		170	340	
S-1	430	CU.YD.	CLASS "C" CONCRETE, PIER CAPS & COLUMNS			430	
S-3	50	LIN.FT.	WATERPROOFING, PREMOLDED SEALING STRIP		50		
S-4	663,480	LB.	REINFORCING STEEL	493,280	24,850	145,350	
S-7	1699,000	LB.	STRUCTURAL STEEL	1699,000			
S-8	1699,000	LB.	FIELD PAINTING OF STRUCTURAL STEEL, AS PER PLAN	1699,000			
S-9	60	SQ.FT.	1" PREFORMED EXPANSION JOINT FILLER		60		
S-14	1098.99	LIN.FT.	RAILING (ALUMINUM RAIL-SUPPORTS & CONCRETE PARAPET)	1037.66	61.33		
S-14	521.72	LIN.FT.	GUARD RAIL, STEEL BEAM, BARRIER TYPE (DEEP) W/STEEL POST-AS PER PLAN	521.72			
S-16	LUMP	SUM	FIRST TEST PILE				LUMP
S-17	LUMP	SUM	FIRST PILE TEST LOAD				LUMP
S-17	ONE	EACH	SUBSEQUENT PILE TEST LOAD			ONE	
S-18	27,480	LIN.FT.	12" CAST-IN-PLACE, REINFORCED CONC. PILES		6080	21,400	
S-25			LIGHTING DETAILS (SHEET 129)				
S-29	7	EACH	SCUPPERS, INCLUDING SUPPORTS	7			
S-29	66	LIN.FT.	8" STD. PIPE DOWNSPOUT, W.I. OR GALVANIZED STL. INCLUDING SPECIALS	66			

ITEM	TOTAL	UNIT	DESCRIPTION	SUPERSTR.	ABUT.	PIERS	GENERAL
S-29	110	CU.YD.	POROUS BACKFILL		110		
S-101	1600	EACH.	WATER-REDUCING, SET-RETARDING ADMIXTURE	1600			
1-10	860	SQ.YD.	CONCRETE SLOPE PROTECTION, INCLUDING EXCAV. REQD.				860

CONT. No. 5-80.19 (28) SHEET ACCT. 1935

GENERAL NOTES

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.

REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:

AR-1-57	DATED	4-2-62
RB-1.55	DATED	2-2-59
I-15 2A	DATED	8-17-60

REFERENCE SHALL BE MADE TO SUPPLEMENTAL SPECIFICATIONS:

S-101	DATED	7-12-62
S-307	DATED	8-23-60

PILES: SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 42 TONS PER PILE FOR THE ABUTMENTS AND PIERS.

SURFACE FINISH OF CONCRETE: THE PIER CAPS AND COLUMNS ADJACENT TO EAST 30 STREET AND RELOCATED ORANGE AVE. SHALL RECEIVE A RUBBED SURFACE FINISH. ALL OTHER EXPOSED SURFACES SHALL BE GOVERNED BY PROVISIONS OF ITEM S-1

MAINTENANCE AND PROTECTION OF TRAFFIC: TWO LANES OF TRAFFIC WITH A MINIMUM HORIZONTAL WIDTH OF 26.0 FT. SHALL BE MAINTAINED ON EAST 30 STREET AT ALL TIMES. THE CONTRACTOR SHALL SAFEGUARD THE TRAVELING PUBLIC BY PROVIDING PLATFORMS, NETS OR OTHER SUITABLE PROTECTION ABOVE THE TRAVELED LANES. A MINIMUM VERTICAL CLEARANCE OF 14.0 FT. SHALL BE PROVIDED AT ALL TIMES.

UTILITY ADJUSTMENTS: THE CONTRACTOR SHALL NOTIFY AT LEAST 48 HOURS BEFORE BREAKING GROUND ALL SERVICE CORPORATIONS HAVING WIRES, 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

GENERAL NOTES (CONT):
AT THE EXPENSE OF THE OWNERS, UNLESS OTHERWISE NOTED ON THESE PLANS.

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

GENERAL PLAN-ELEVATION-QUANTITIES

BRIDGE NO. CUY-21-1515
WILLOW FREEWAY over ORANGE & E. 30
CUYAHOGA COUNTY U.S.R. 21

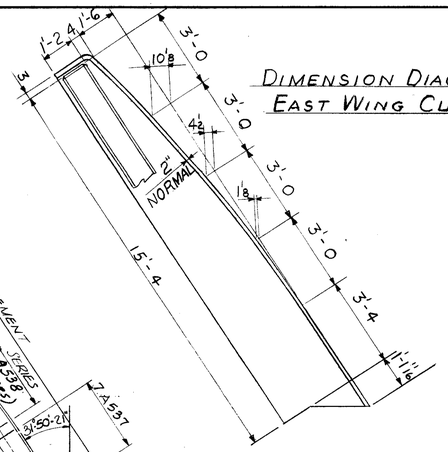
SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	D.F.			CB 8-10-62		

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

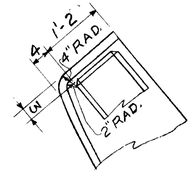
181/204

CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)

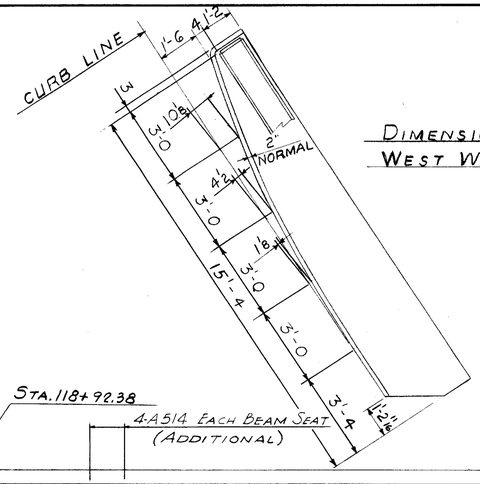
DIMENSION DIAGRAM EAST WING CURB



WING CURB CORNER DETAIL TYPICAL



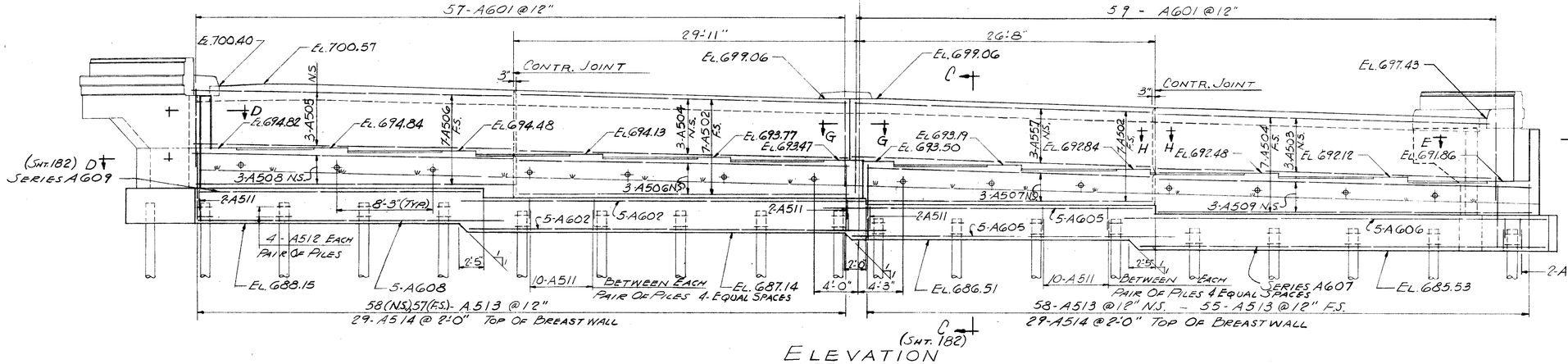
DIMENSION DIAGRAM WEST WING CURB



PLAN

N.S. = NEAR SIDE
F.S. = FAR SIDE

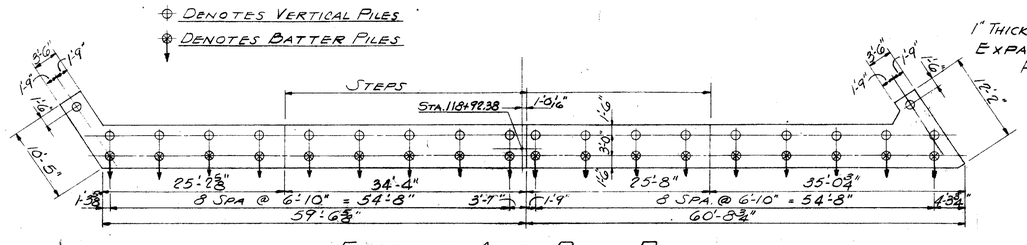
ELEVATION



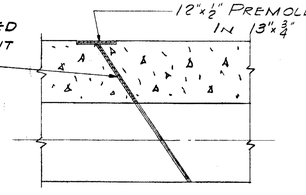
FOR REINFORCING BAR SCHEDULE SEE SHEET 191

FOR SECTIONS AND ELEVATIONS SEE SHEET 182

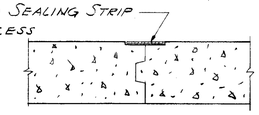
FOOTING AND PILES PLAN



SECTION G-G



SECTION H-H



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

ABUTMENT NO.1

BRIDGE NO. CUY-21-1515

WILLOW FREEWAY OVER ORANGE & E.30
CUYAHOGA COUNTY U.S.R. 21

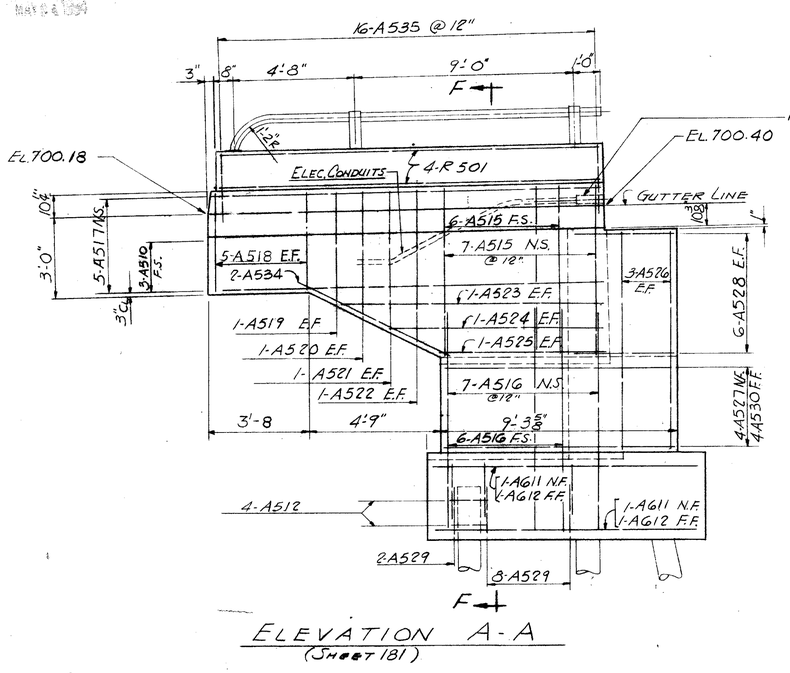
SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.A.T.	C.A.T.		CWT	CB 8-2-68		

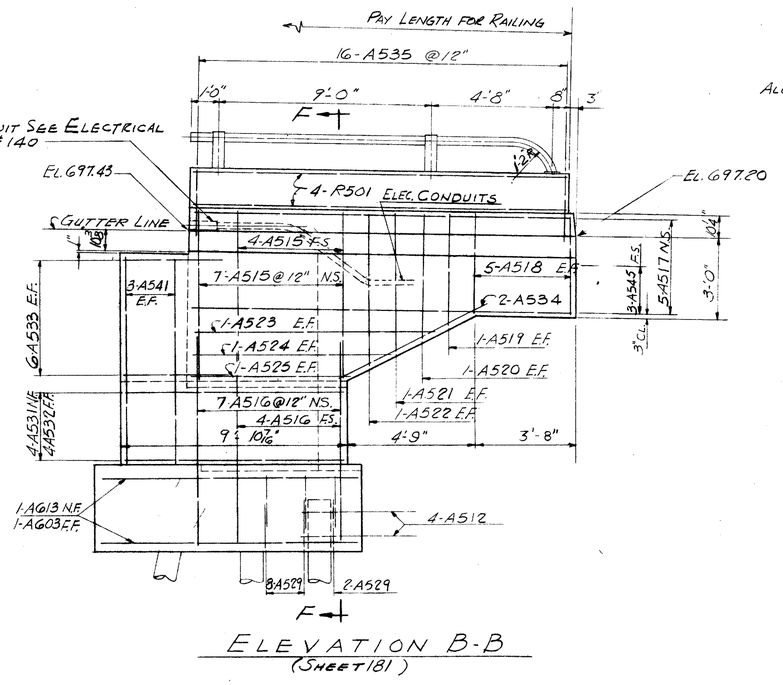
CONT. No. 5801928 SHEET ACCT. No. 1528

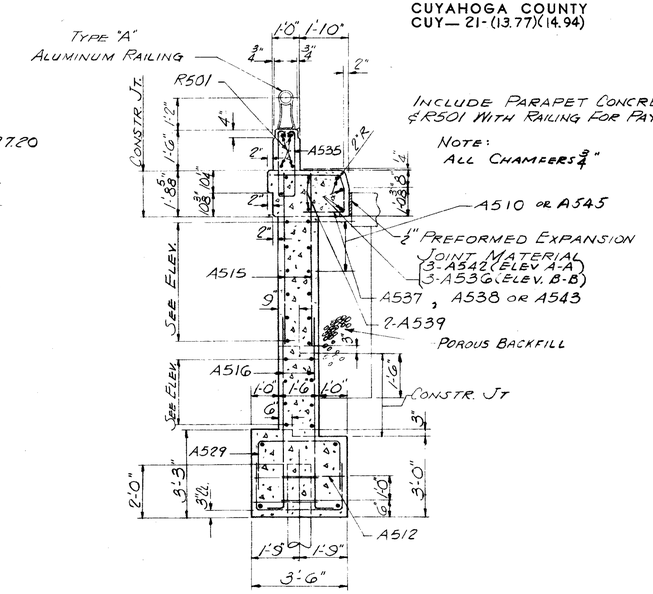
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

182
204

CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)



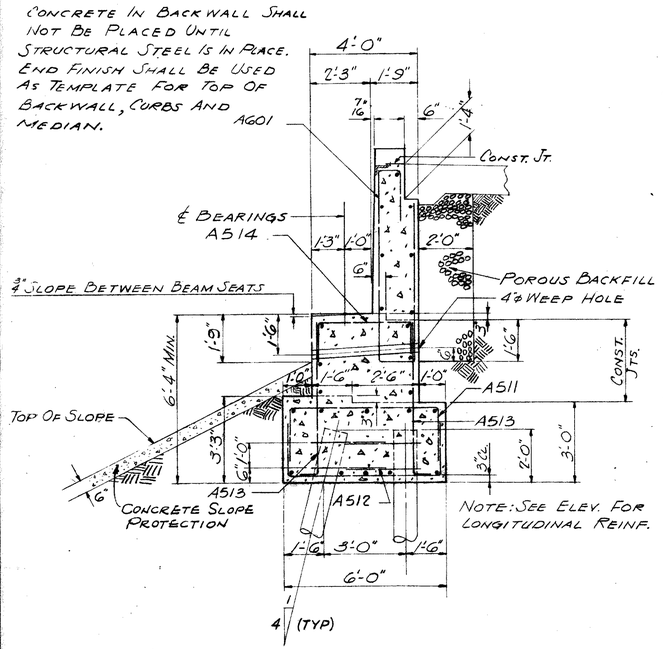


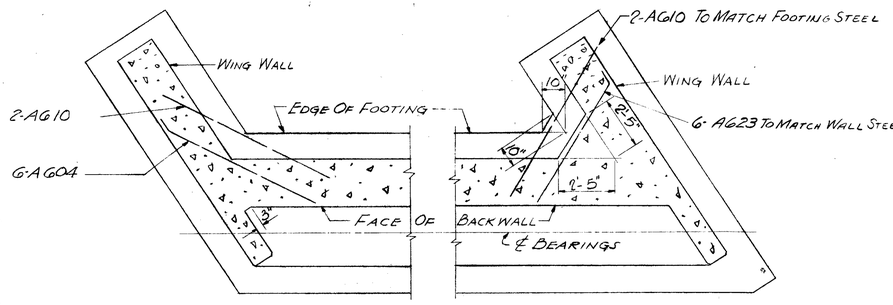


INCLUDE PARAPET CONCRETE & R501 WITH RAILING FOR PAYMENT.

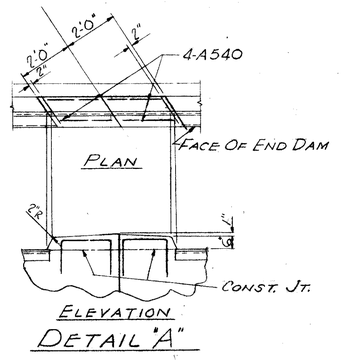
NOTE: ALL CHAMFERS 3/4"

CONCRETE IN BACKWALL SHALL NOT BE PLACED UNTIL STRUCTURAL STEEL IS IN PLACE. END FINISH SHALL BE USED AS TEMPLATE FOR TOP OF BACKWALL, CURBS AND MEDIAN.





F.S. = FAR SIDE
N.S. = NEAR SIDE
E.F. = EACH FACE
F.F. = FAR FACE
N.F. = NEAR FACE



NOTES

PROCEDURE: THE EMBANKMENT SHALL BE PLACED AND COMPACTED UP TO THE FINISHED SPILL-THRU SLOPE AND TO THE LEVEL OF THE SUBGRADE FOR A DISTANCE OF 200 FEET BACK OF THE ABUTMENT. AFTER WHICH EXCAVATION SHALL BE MADE FOR THE ABUTMENT, AND PILES DRIVEN.

POROUS BACKFILL, 2 FEET THICK, FULL LENGTH OF THE ABUTMENT AND WINGS, SHALL EXTEND UP TO THE UNDER SIDE OF THE APPROACH SLAB.

PILES: THE DESIGN LOAD IS 42 TONS FOR THE ABUTMENT PILES. THE ESTIMATED AVERAGE PAY LENGTH OF THE ABUTMENT PILES IS 80'-0". FOR ADDITIONAL DATA SEE SHEET 180.

CONCRETE: ALL ABUTMENT CONCRETE SHALL BE CLASS "E".

EXCAVATION QUANTITY INCLUDES THE REMOVAL OF FILL MATERIAL REQUIRED FOR THE CONSTRUCTION OF THE ABUTMENTS.

FOR REINFORCING BAR SCHEDULE SEE SHEET 191

CONT. NO. 58019 (28) SHEET ADDT. NO. 529

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

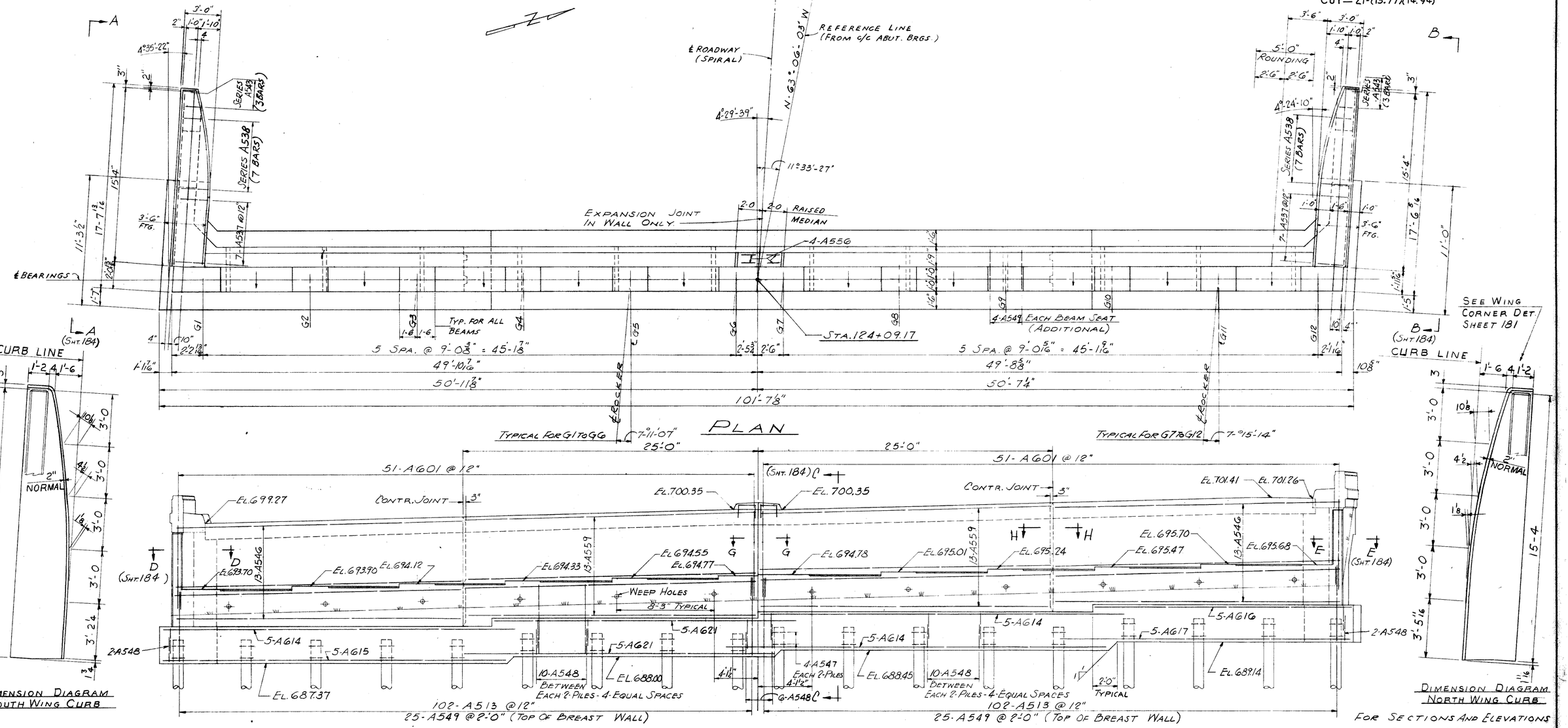
DETAILS-ABUTMENT NO. 1
BRIDGE NO. CUY-21-1515
WILLOW FREEWAY OVER ORANGE ESD
CUYAHOGA COUNTY USR-21

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.A.T.	C.A.T.		CWT	CB	8-2-62	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

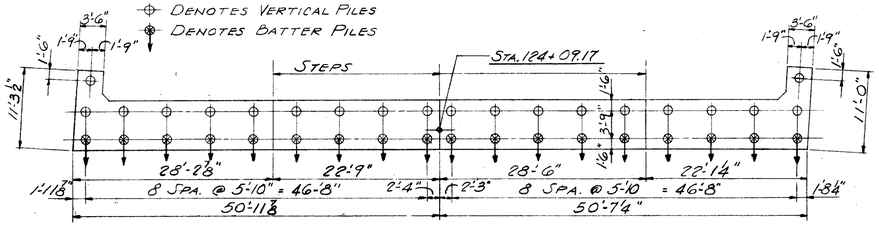
183
204

CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)



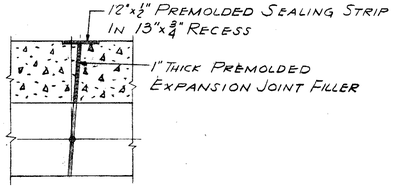
DIMENSION DIAGRAM SOUTH WING CURB

DIMENSION DIAGRAM NORTH WING CURB

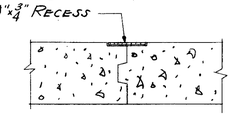


FOOTING AND PILES PLAN

ELEVATION



SECTION G-G



SECTION H-H

FOR SECTIONS AND ELEVATIONS SEE SHEET 184
FOR NOTES SEE SHEET 182
FOR REINFORCING BAR SCHEDULE SEE SHEET 191

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

ABUTMENT NO. 2

BRIDGE NO. CUY-21-1515
WILLOW FREEWAY OVER ORANGE LANE
CUYAHOGA COUNTY U.S.R. 21

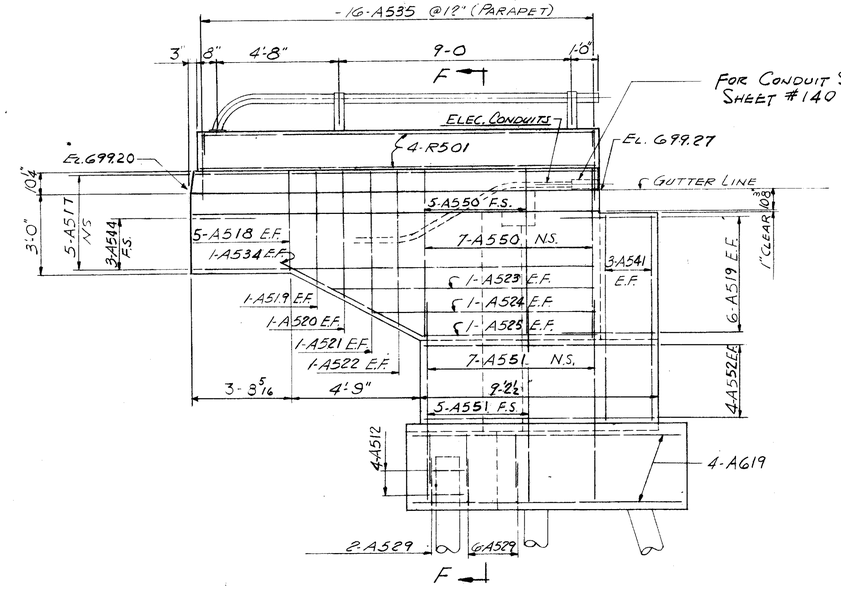
SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.A.T.	C.A.T.		C.W.T.	C.B. 8-2-62		

CONT. No. 5-80-19 (28) SHEET ACCT. No. 1530

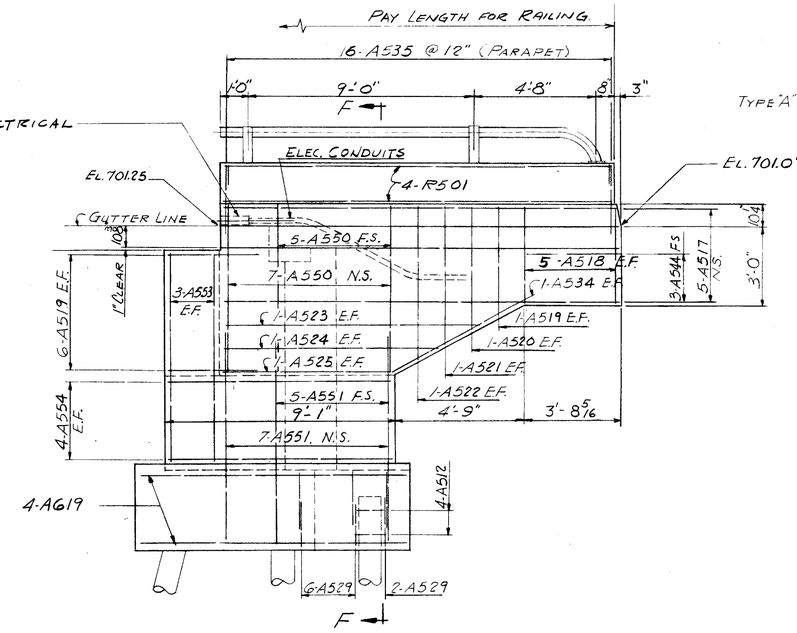
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

184
204

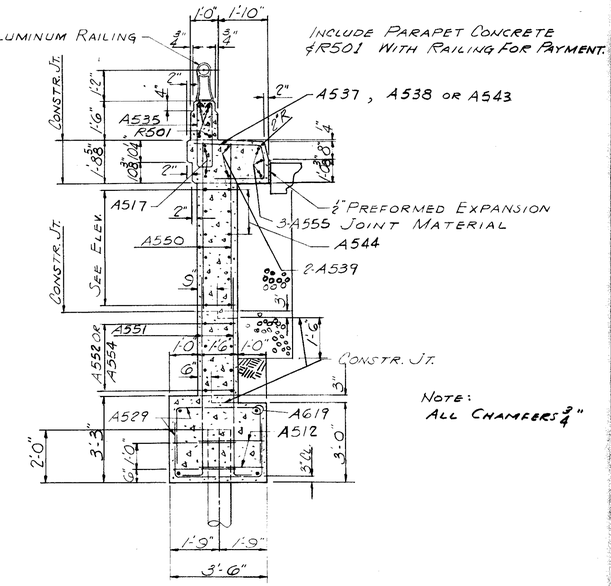
CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)



ELEVATION A-A
(SHEET 183)



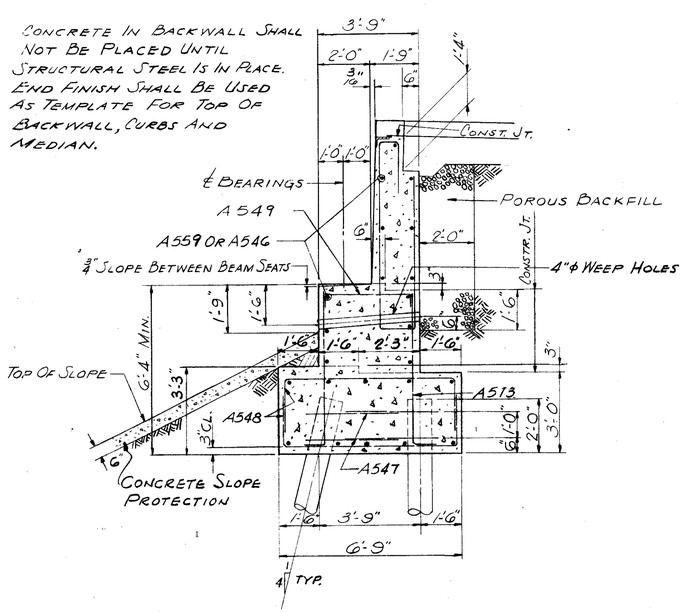
ELEVATION B-B
(SHEET 183)



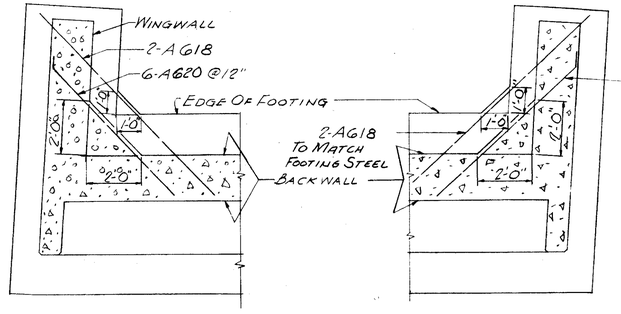
SECTION F-F

NOTE:
ALL CHAMFERS ¾"

CONCRETE IN BACKWALL SHALL NOT BE PLACED UNTIL STRUCTURAL STEEL IS IN PLACE. END FINISH SHALL BE USED AS TEMPLATE FOR TOP OF BACKWALL, CURBS AND MEDIAN.



SECTION C-C
(SHEET 183)



SECTION D-D SECTION E-E
SHOWING CORNER BARS AND FILLET DETAILS
(SHEET 183)

N.S. = NEAR SIDE
F.S. = FAR SIDE
E.F. = EACH FACE

FOR REINFORCING BAR SCHEDULE SEE SHEET 191

CONT. No. 5801(28) SHEET ACCT. No. 1531

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

DETAILS-ABUTMENT NO. 2

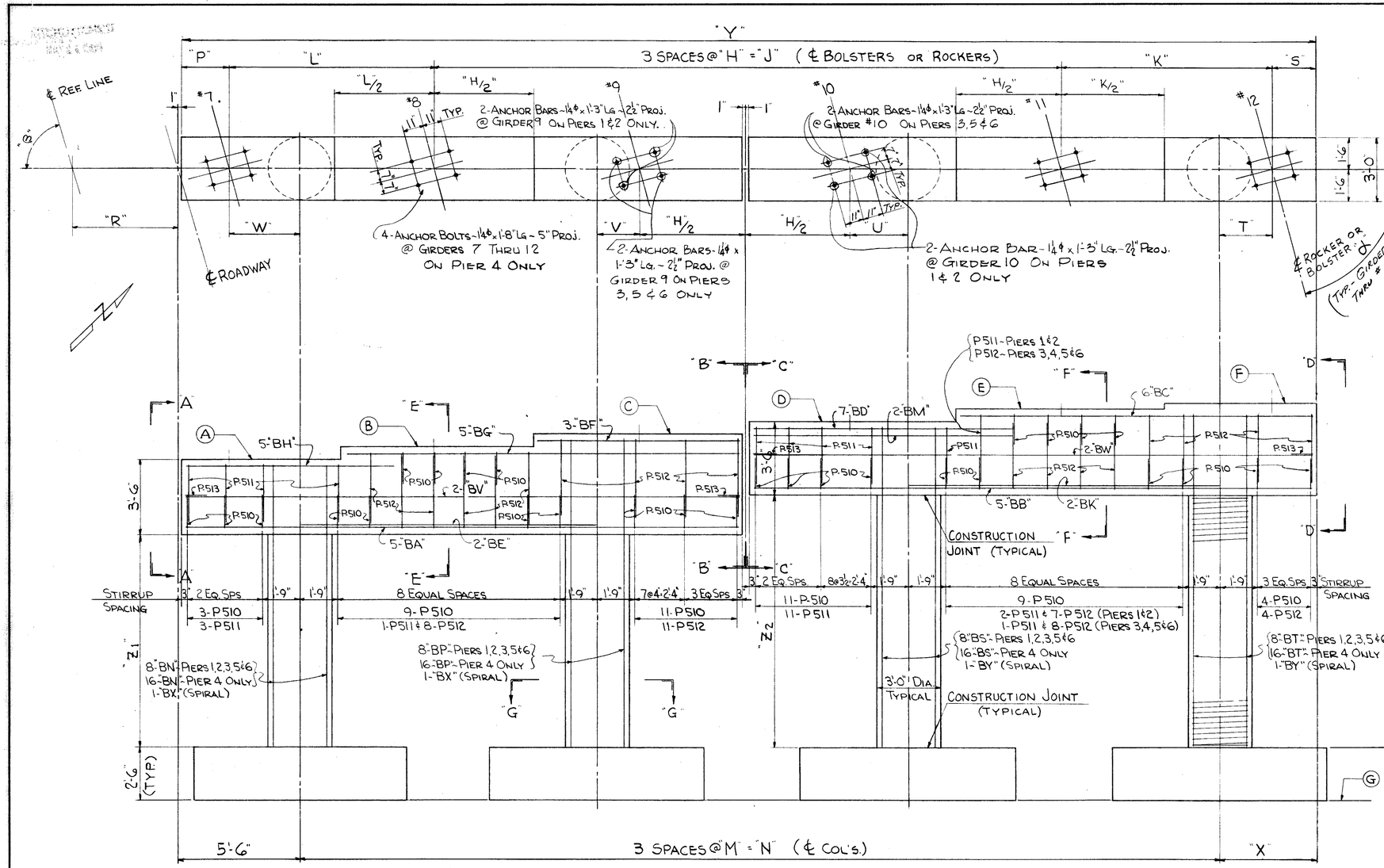
BRIDGE NO. CUY-21-1515
WILLOW FREEWAY OVER ORANGE ℄ E.30
CUYAHOGA COUNTY U.S.R.-21

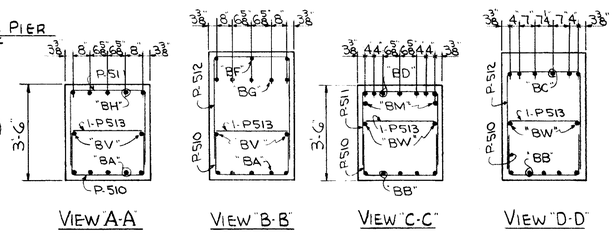
SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
C.A.T.	C.A.T.		CWT	CB	8-2-62	

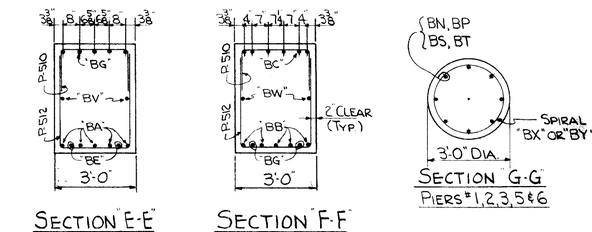
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

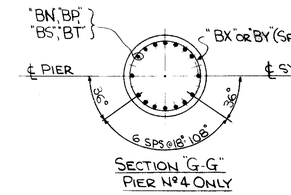
185/204

CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)









NORTHBOUND PIERS

	Reinforcing Bar Marks																	
	BA	BB	BC	BD	BE	BF	BG	BH	BK	BM	BN	BP	BS	BT	BV	BW	BX	BY
Pier Nº 1	P1127	P1106	P1133	P1124	P1123	P1136	P1142	P1121	P806	P810	P1015	P1033	P1017	P1030	P514	P506	SP513	SP514
Pier Nº 2	P1128	P1130	P1110	P1124	P1123	P1137	P1143	P1121	P806	P810	P1016	P1024	P1027	P1031	P515	P517	SP510	SP515
Pier Nº 3	P1129	P1131	P1112	P1117	P1124	P1138	P1144	P1149	P807	P812	P1021	P1025	P1015	P1032	P516	P518	SP511	SP513
Pier Nº 4	P1108	P1132	P1134	P1118	P1125	P1139	P1145	P1148	P808	P814	P1022	P1021	P1028	P1025	P508	P519	SP512	SP516
Pier Nº 5	P1109	P1104	P1135	P1118	P1126	P1140	P1146	P1148	P809	P814	P1027	P1018	P1019	P1026	P509	P504	SP515	SP519
Pier Nº 6	P1104	P1105	P1135	P1118	P1126	P1141	P1147	P1148	P809	P814	P1015	P1026	P1029	P1023	P504	P505	SP513	SP517

	Elevations							Dimensions																	
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	S	T	U	V	W	X	Y	Z_1	Z_2	R	α	ϕ
Pier Nº 1	693.25	693.56	693.91	694.27	694.62	694.60	674.00	11'-6 5/8"	34'-7 1/8"	11'-11 5/8"	11'-11 5/8"	16'-3"	48'-9"	1'-7"	1'-7 7/8"	4'-3 3/4"	2'-1 5/16"	2'-7 1/16"	3'-10"	5'-11 5/8"	60'-1 5/8"	13'-3"	14'-3 1/4"	8'-4 5/8"	52° 17' 50"	49° 33' 38"
Pier Nº 2	693.80	694.14	694.49	694.86	695.21	695.22	676.50	11'-1 3/8"	33'-4 3/8"	11'-1 3/8"	11'-1 3/8"	16'-1 1/4"	48'-3 3/4"	2'-0 9/16"	2'-1 5/16"	3'-10 5/8"	2'-3 3/16"	2'-8 1/16"	3'-4 15/16"	5'-11 5/8"	59'-8 3/8"	11'-3 1/2"	12'-4 1/4"	17'-2 5/8"	54° 16' 44"	52° 52' 24"
Pier Nº 3	694.14	694.51	694.88	695.26	695.61	695.66	676.00	9'-9 15/16"	29'-5 13/16"	9'-9 15/16"	9'-9 15/16"	14'-4 3/4"	43'-2 1/4"	2'-4 3/4"	2'-5 13/16"	2'-11 7/16"	2'-3 15/16"	2'-2 5/8"	3'-0 1/4"	5'-5"	54'-0 1/4"	12'-1 5/8"	13'-3 5/8"	18'-3 7/16"	66° 18' 27"	66° 09' 49"
Pier Nº 4	694.35	694.71	695.08	695.46	695.82	695.88	677.00	9'-1 5/8"	27'-3 5/8"	9'-1 5/8"	9'-1 5/8"	13'-4 1/2"	40'-1 1/2"	2'-6 3/8"	2'-7 9/16"	2'-5 1/2"	2'-4 1/4"	1'-11 5/8"	2'-10 3/8"	5'-1 1/16"	50-7 9/16"	11'-4 1/4"	12'-5 1/2"	16'-9 1/16"	80° 23' 38"	81° 31' 12"
Pier Nº 5	694.40	694.73	695.05	695.38	695.71	695.74	676.00	8'-11 11/16"	26'-11 11/16"	8'-11 11/16"	8'-11 11/16"	13'-2 1/2"	39'-7 1/2"	2'-6 5/8"	2'-7 11/16"	2'-4 9/16"	2'-4 5/16"	1'-10 1/2"	2'-10 3/8"	5'-0 1/4"	50-0 3/4"	12'-4 3/4"	13'-4 1/2"	13'-5 5/8"	95° 35' 05"	97° 57' 32"
Pier Nº 6	694.28	694.54	694.81	695.08	695.34	695.34	675.00	9'-0 5/16"	27'-0 15/16"	9'-0 5/16"	9'-0 5/16"	13'-2 3/4"	39'-8 1/4"	2'-5 5/8"	2'-6 9/16"	2'-5 1/16"	2'-3 15/16"	1'-10 1/2"	2'-11 3/8"	5'-0 1/2"	50'-1 3/4"	13'-3 3/8"	14'-1"	6'-1 1/2"	97° 55' 49"	101° 33' 27"

ELECTRICAL GROUNDING

AN ELECTRICAL GROUND SHALL BE IMBEDDED IN THE OUTSIDE COLUMNS (THOSE NEAREST GIRDERS 1 & 12) ON PIER #4 ONLY.

PAYMENT FOR ELECTRICAL GROUNDS IS INCLUDED IN THE LUMP SUM BID FOR ITEM S-25, "ELECTRICAL GROUNDS."

FOR GROUNDING DETAILS SEE SHEET #140 & #142

NOTES:

SPECIAL CARE SHALL BE TAKEN IN PLACING THE REINFORCING STEEL IN THE BRIDGE SEAT SO THAT IT WILL NOT INTERFERE WITH THE DRILLING OF ANCHOR BOLT & SPECIAL ANCHOR BAR HOLES.

PIER CAP & COLUMNS TO BE CLASS "C" CONCRETE.

REFERENCE DWGS:
187 ~ PILE PLAN & FOOTING DETAILS
192 ~ REINFORCING BAR SCHEDULE

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

PIERS - NORTHBOUND

BRIDGE NO. - CUY - 21 - 1515
WILLOW FREEWAY OVER ORANGE & E. 30
CUYAHOGA COUNTY USR-21

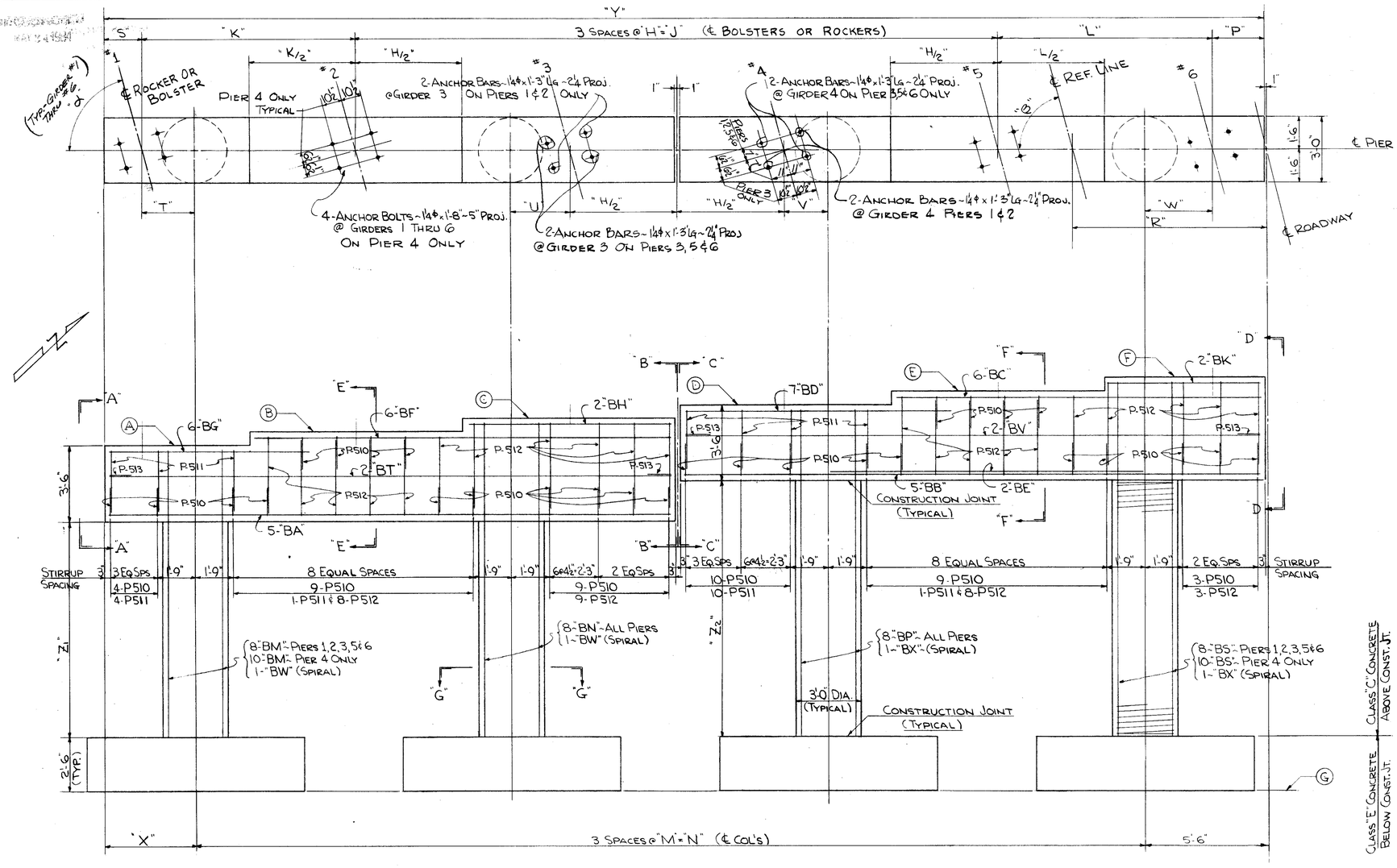
SCALE		DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	D.F.		J.G. JAW		08 8-2-62	

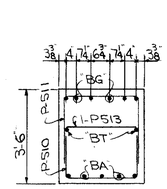
CONT. NO. 5780/9 (28) SHEET ADDT. NO. 1536

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

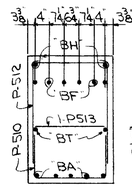
186
204

CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)

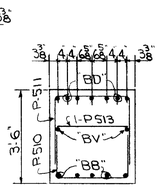




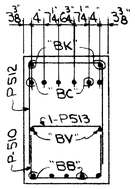
VIEW "A-A"



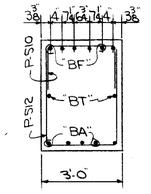
VIEW "B-B"



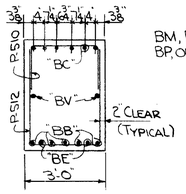
VIEW "C-C"



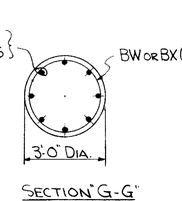
VIEW "D-D"



SECTION "E-E"



SECTION "F-F"



SECTION "G-G"

NOTES:
SPECIAL CARE SHALL BE TAKEN IN PLACING THE REINFORCING STEEL IN THE BRIDGE SEAT SO THAT IT WILL NOT INTERFERE WITH THE DRILLING OF ANCHOR BOLT & SPECIAL ANCHOR BAR HOLES.
PIER CAPS & COLUMNS TO BE CLASS "C" CONCRETE
REFERENCE DWGS:
187 ~ PILE PLAN & FOOTING DETAILS
192 ~ REINFORCING BAR SCHEDULE
185 ~ ELECTRIC GROUNDING NOTE

SOUTHBOUND PIERS

	REINFORCING BAR MARKS																
	BA	BB	BC	BD	BE	BF	BG	BH	BK	BM	BN	BP	BS	BT	BV	BW	BX
PIER Nº1	P1100	P1100	P1110	P1116	P1122	P1151	P1118	P800	P815	P1000	P1005	P1010	P1015	P500	P500	SP500	SP505
PIER Nº2	P1101	P1101	P1111	P1116	P1123	P1152	P1118	P801	P816	P1011	P1016	P1000	P1027	P501	P501	SP506	SP500
PIER Nº3	P1102	P1107	P1112	P1117	P1124	P1153	P1120	P802	P815	P1002	P1007	P1012	P1020	P502	P507	SP502	SP507
PIER Nº4	P1103	P1108	P1113	P1119	P1125	P1145	P1154	P803	P811	P1001	P1006	P1011	P1016	P503	P508	SP518	SP508
PIER Nº5	P1104	P1109	P1114	P1121	P1126	P1146	P1150	P804	P811	P1003	P1008	P1013	P1027	P504	P509	SP501	SP503
PIER Nº6	P1105	P1104	P1115	P1121	P1126	P1147	P1150	P805	P813	P1004	P1009	P1014	P1015	P505	P504	SP504	SP509

	ELEVATIONS							DIMENSIONS																	
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	S	T	U	V	W	X	Y	Z_1	Z_2	R	∝	ß
PIER Nº1	691.61	691.88	692.24	692.59	692.95	693.27	674.00	11'-7⅞"	34'-11⅝"	11'-4"	11'-4"	16'-5¼"	49'-3¾"	1'-7"	1'-7⅞"	4'-5⅞"	2'-0¾"	2'-8⅝"	3'-10"	6'-1¾"	60'-10½"	11'-7⅛"	12'-7"	8'-4⅜"	51°39'-33"	49°33'-38"
PIER Nº2	692.08	692.39	692.75	693.12	693.48	693.83	675.50	11'-2⅛"	33'-7⅛"	11'-2⅛"	11'-2⅛"	16'-3⅛"	48-10⅛"	2'-1⅛"	2'-2⅛"	3'-10⅜"	2'-2⅛"	2'-10¼"	3'-3⅛"	6'-1¼"	60'-4¾"	10'-7"	11'-7½"	17'-2⅛"	53°39'24"	52°52'24"
PIER Nº3	692.46	692.80	693.16	693.46	693.83	694.20	677.00	9'-10⅝"	29'-6⅛"	9'-10⅝"	9'-10⅝"	14'-5½"	43'-4½"	2'-5¼"	2'-6⅛"	2'-11⅝"	2'-3⅜"	2'-3⅜"	2'-11¾"	5'-5¾"	54'-3¼"	9'-5½"	10'-5½"	18'-3⅛"	65°52'08"	66°09'49"
PIER Nº4	692.70	693.03	693.38	693.67	694.02	694.37	677.00	9'-1¼"	27'-3¾"	9'-1¼"	9'-1¼"	13'-4¾"	40'-2¼"	2'-6⅛"	2'-7⅛"	2'-5⅝"	2'-4⅞"	1'-11⅛"	2'-10⅛"	5'-0¾"	50'-8"	9'-8⅜"	10'-8⅛"	16'-9⅛"	80°08'12"	81°31'12"
PIER Nº5	692.80	693.10	693.42	693.75	694.06	694.38	676.00	8'-11⅜"	26'-1⅛"	8'-11⅜"	8'-11⅜"	13'-2⅛"	39'-7½"	2'-6⅜"	2'-7⅛"	2'-4⅛"	2'-4⅞"	1'-10½"	2'-10⅝"	5'-0¼"	50'-0⅞"	10'-9⅝"	11'-9"	13'-5⅜"	95°30'53"	97°57'32"
PIER Nº6	693.00	693.24	693.50	693.75	694.00	694.26	675.00	9'-0⅜"	27'-1⅜"	9'-0⅜"	9'-0⅜"	13'-2¾"	39'-8¼"	2'-5⅛"	2'-6⅛"	2'-6⅛"	2'-3⅛"	1'-10⅛"	2'-11⅛"	5'-0⅛"	50'-1¾"	12'-0"	12'-9"	6'-1½"	97°52'34"	101°33'27"

CONT. No. 5-80.19 (28) SHEET ACCT. No. 1527.

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

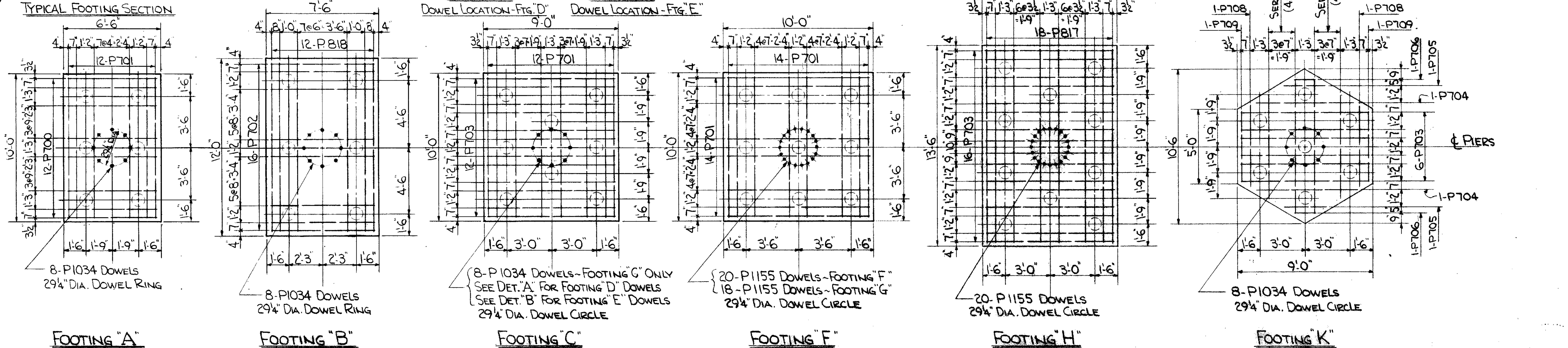
PIERS - SOUTHBOUND
BRIDGE NO. - CUY- 21-1515
WILLOW FREEWAY OVER ORANGE & E. 30
CUYAHOGA COUNTY USR-21

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	W.G.K.		J.G. JAN		08-8-2-62	

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

187 / 204

CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)



NOTES:

THE CORNER PILES AS SHOWN SHALL BE BATTERED IN THE DIRECTION INDICATED. THE VERTICAL BATTER FOR THESE PILES SHALL BE 1:4.

PIER Nº 4 FOOTINGS SHALL HAVE ADDITIONAL BATTER PILES AS INDICATED. THE VERTICAL BATTER FOR THESE PILES SHALL BE 1:20.

ESTIMATED AVERAGE PAY LENGTH OF ALL PIER PILES IS 65'-0"

ALL FOOTING CONCRETE SHALL BE CLASS "E"

REFERENCE DWGS.:

186 SOUTHBOUND PIERS
185 NORTHBOUND PIERS
192 REINFORCING BAR SCHEDULE

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

PILE PLAN & FOOTING DETAILS
BRIDGE Nº CUY. 21-1515
WILLOW FREEWAY OVER ORANGE AVE & E 30TH
CUYAHOGA COUNTY USR-21

SCALE DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	W.G.K.		J.G.	O.S.	8-2-62	

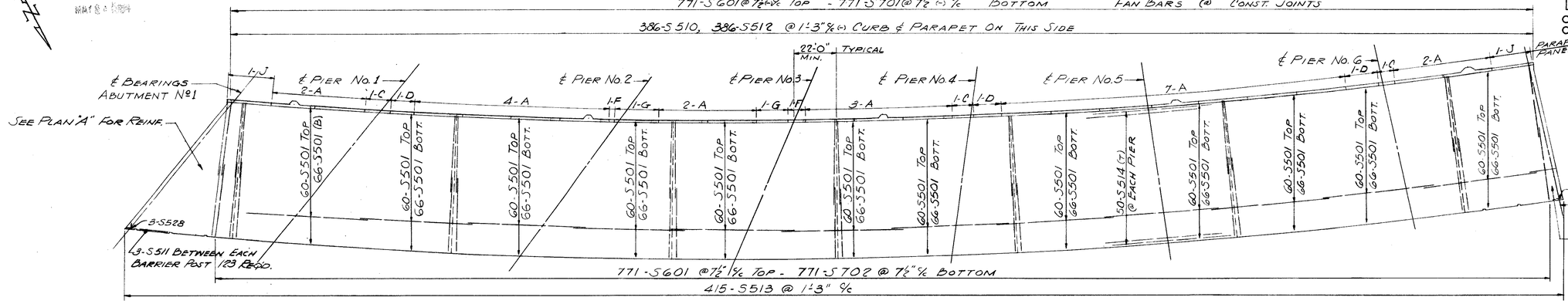
CONT. No. 58019 (28) SHEET ACCT. No. 1610

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

188/204

CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)

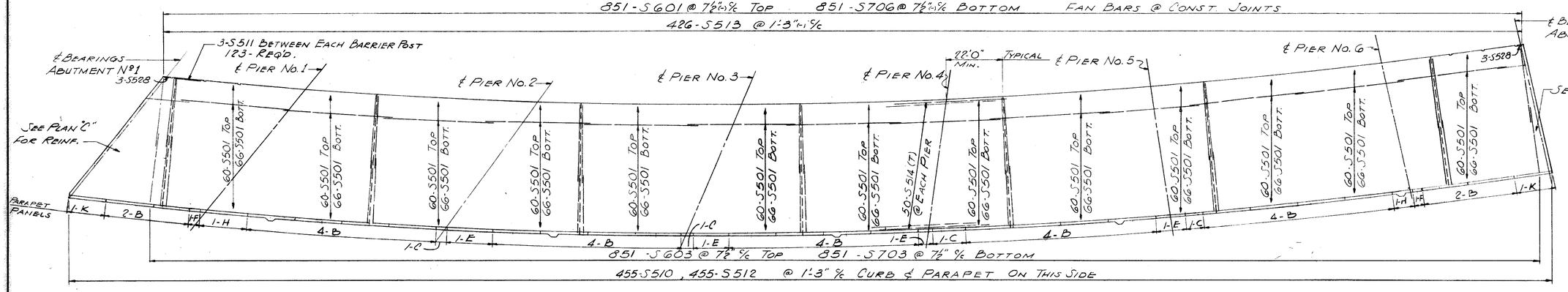
771-S601@7½"(T)% TOP - 771-S701@7½"(T)% BOTTOM FAN BARS @ CONST. JOINTS
386-S510, 386-S512 @1'-3"%(T) CURB & PARAPET ON THIS SIDE



4-R502 EACH A&B PARAPET PANEL
4-R503 EACH C PANEL
4-R504 EACH D&E PANEL
4-R505 EACH F PANEL
4-R506 EACH G&H PANEL
4-R507 EACH J&K PANEL

DECK REINFORCEMENT PLAN
SOUTHBOUND BRIDGE

851-S601@7½"(T)% TOP 851-S706@7½"(T)% BOTTOM FAN BARS @ CONST. JOINTS
426-S513 @1'-3"(T)%



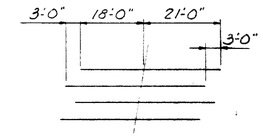
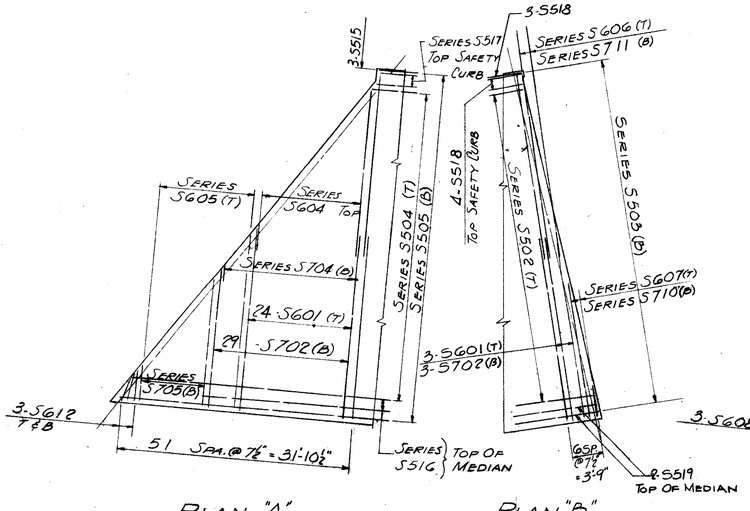
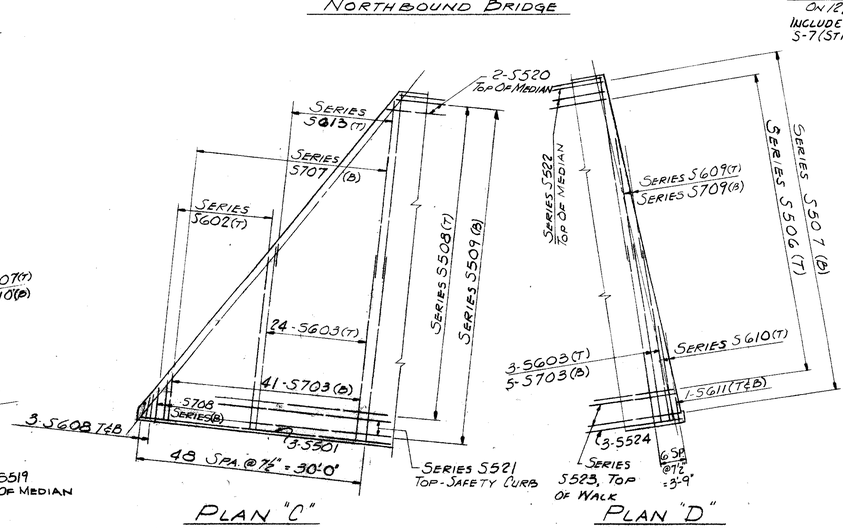


DIAGRAM SHOWING STAGGER OF S514 BARS OVER PIERS

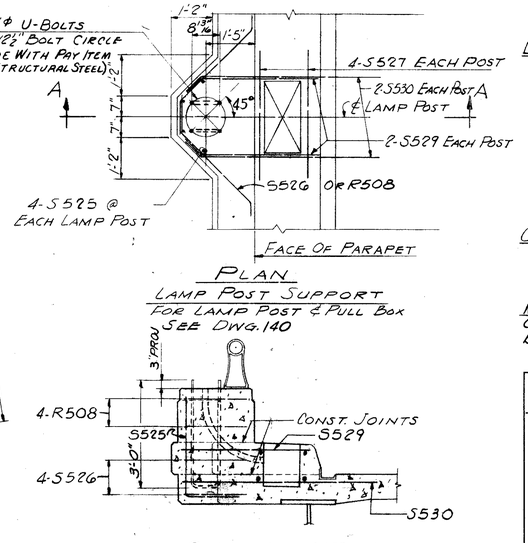
DECK REINFORCEMENT PLAN
NORTHBOUND BRIDGE



PLAN "A" PLAN "B"



PLAN "C" PLAN "D"



PLAN
LAMP POST SUPPORT
FOR LAMP POST & PULL BOX
SEE DWG. 140

SECTION A-A

NOTES

DECK PLACING PROCEDURE: IN PLACING THE DECK CONCRETE, CONSTRUCTION JOINTS WILL BE PERMITTED, PARALLEL TO THE TRANSVERSE REINFORCING STEEL AND NEAR THE MIDDLE OF THE SPAN. BECAUSE OF THE FLOW OF CURING WATER FROM THE PREVIOUSLY PLACED DECK CONCRETE, THE SEQUENCE OF POUR SHALL BE UPGRADE STARTING AT THE LOW ENDS.

CONCRETE: SHALL BE CLASS "Q". SECONDARY REINFORCING SHALL BE APPROXIMATELY PARALLEL TO GIRDERS.

MACHINE FINISH: AT THE CONTRACTORS OPTION, THE CONCRETE DECK MAY BE FINISHED BY THE USE OF A FINISHING MACHINE.

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

DECK PLAN

BRIDGE NO. CUY-21-1515
WILLOW FREEWAY over ORANGE & E.90
CUYAHOGA COUNTY U.S.R. 21

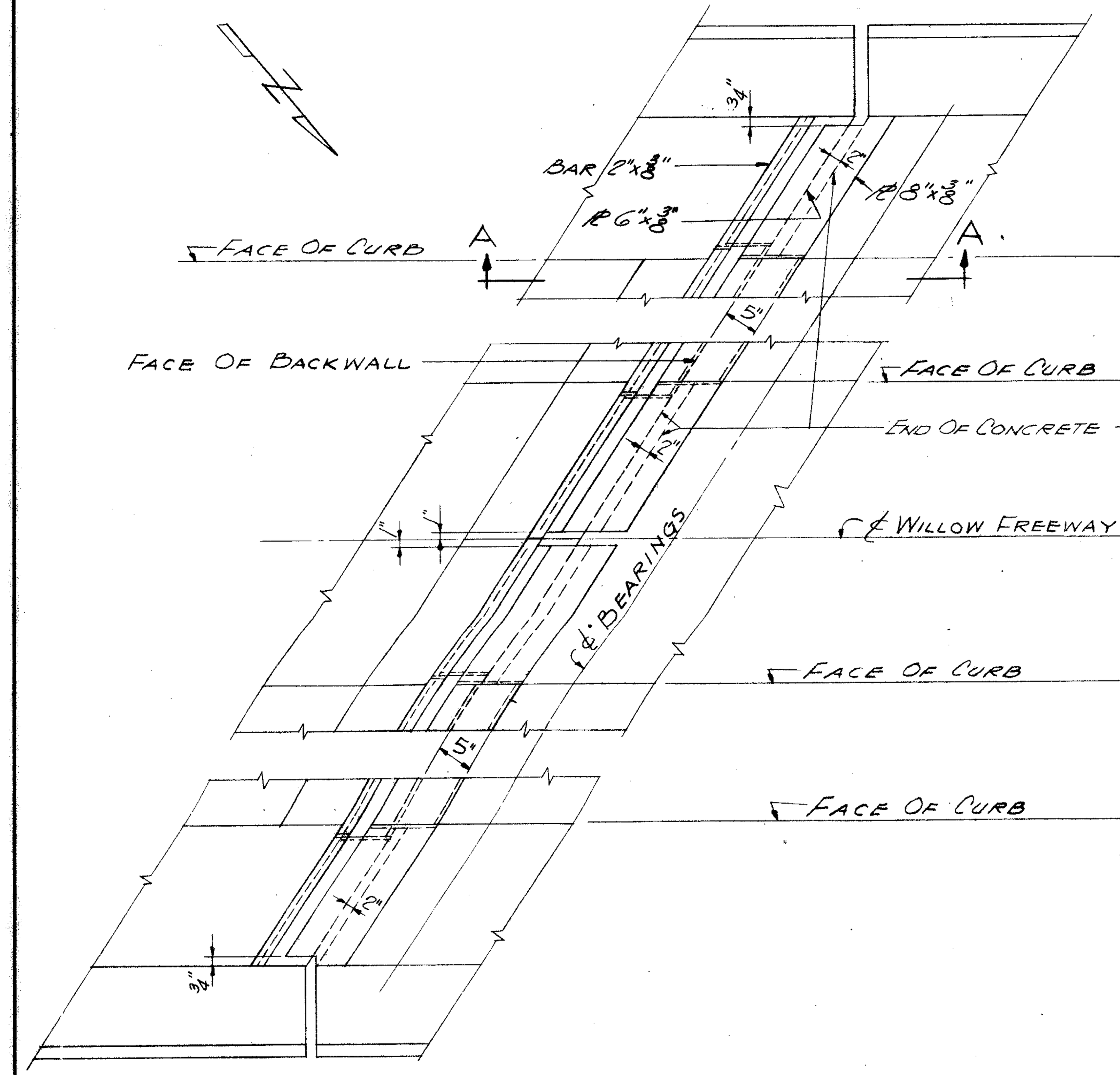
SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.A.T.		CWT	CB 8-8-66		

CONT. No. 58019(28) SHEET ACCT. No. 1534

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

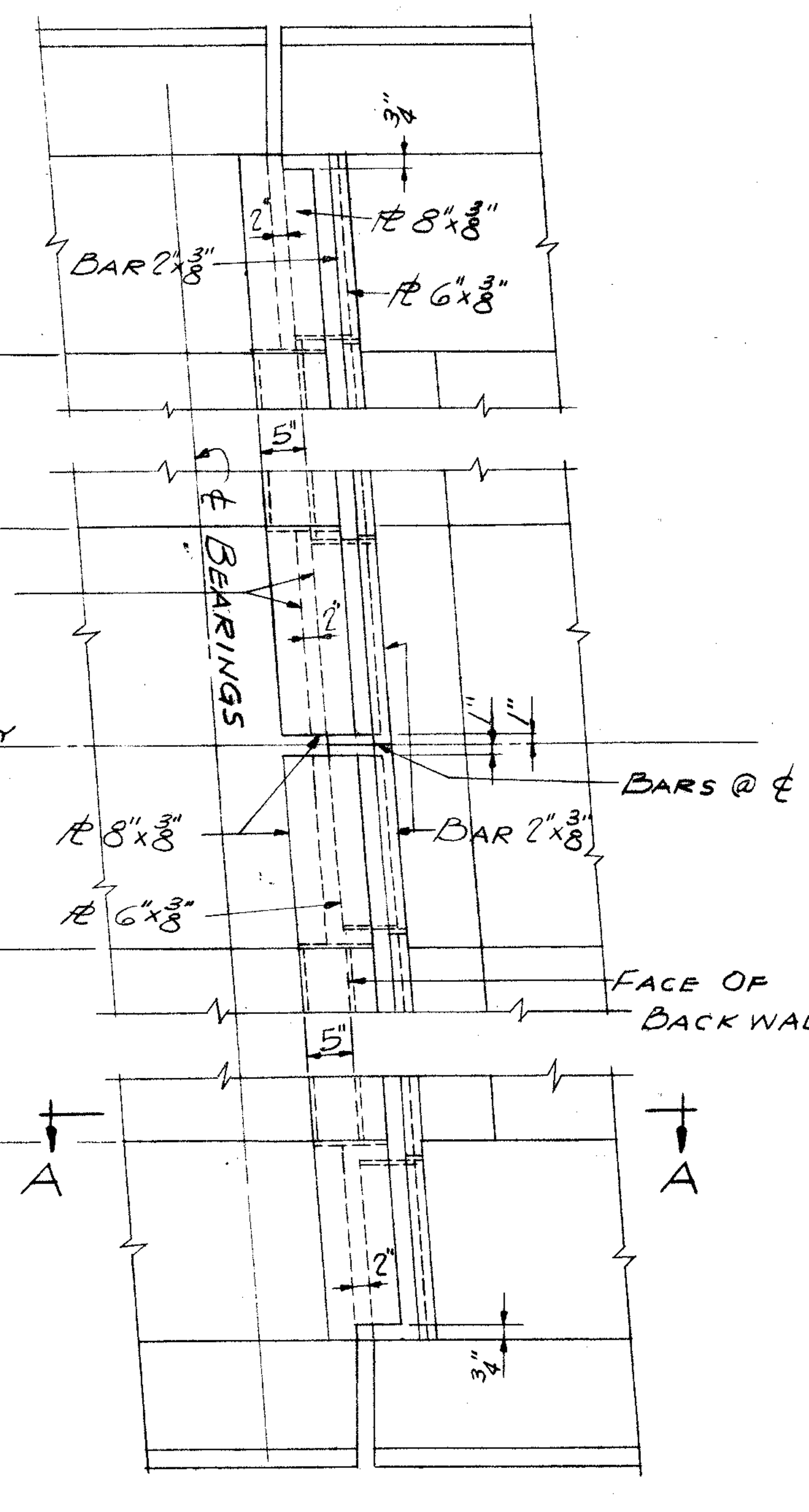
189/204

CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)

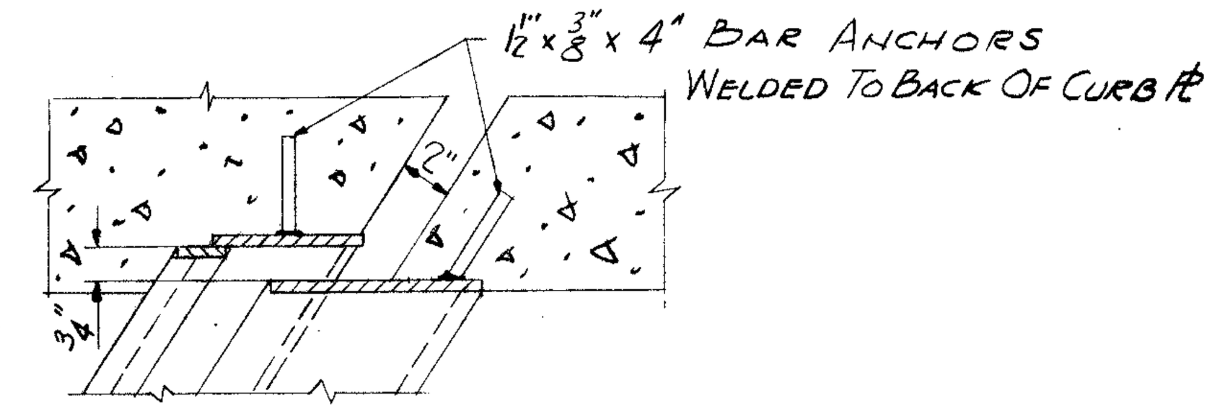


PLAN - END FINISH
ABUTMENT Nº 1

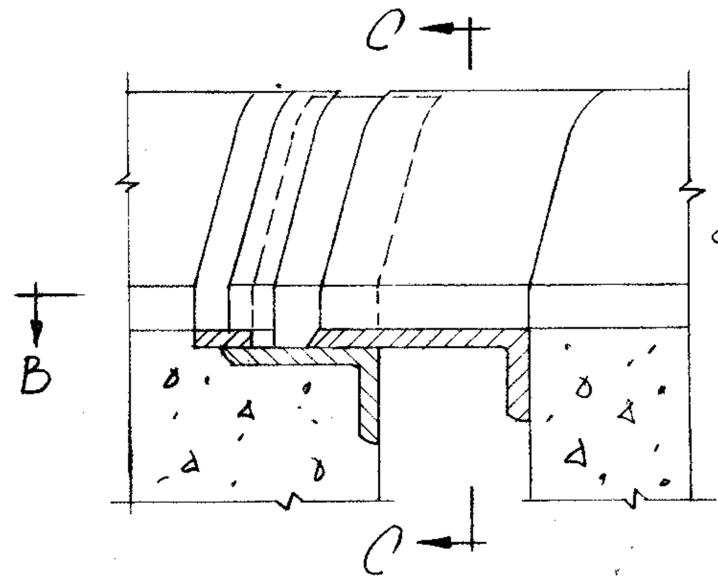
INCLUDE END FINISH WITH STRUCTURAL STEEL FOR PAYMENT



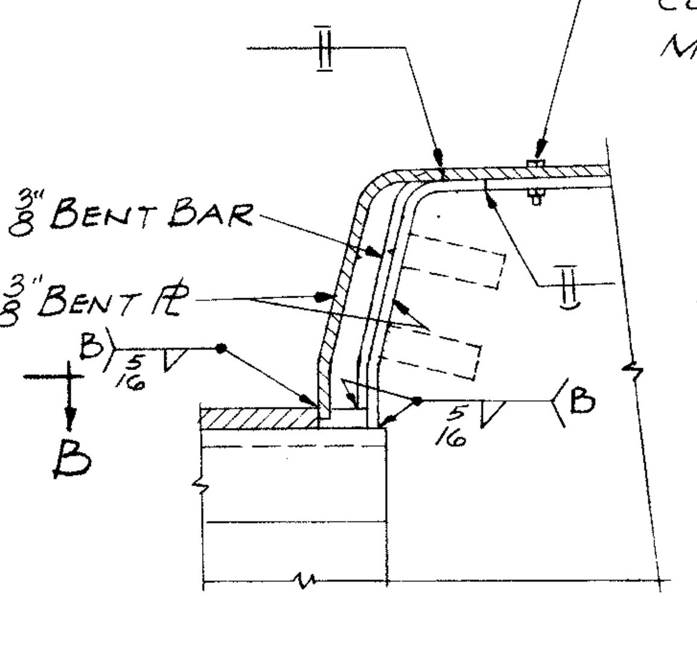
PLAN - END FINISH
ABUTMENT Nº 2



SECTION B-B



SECTION A-A

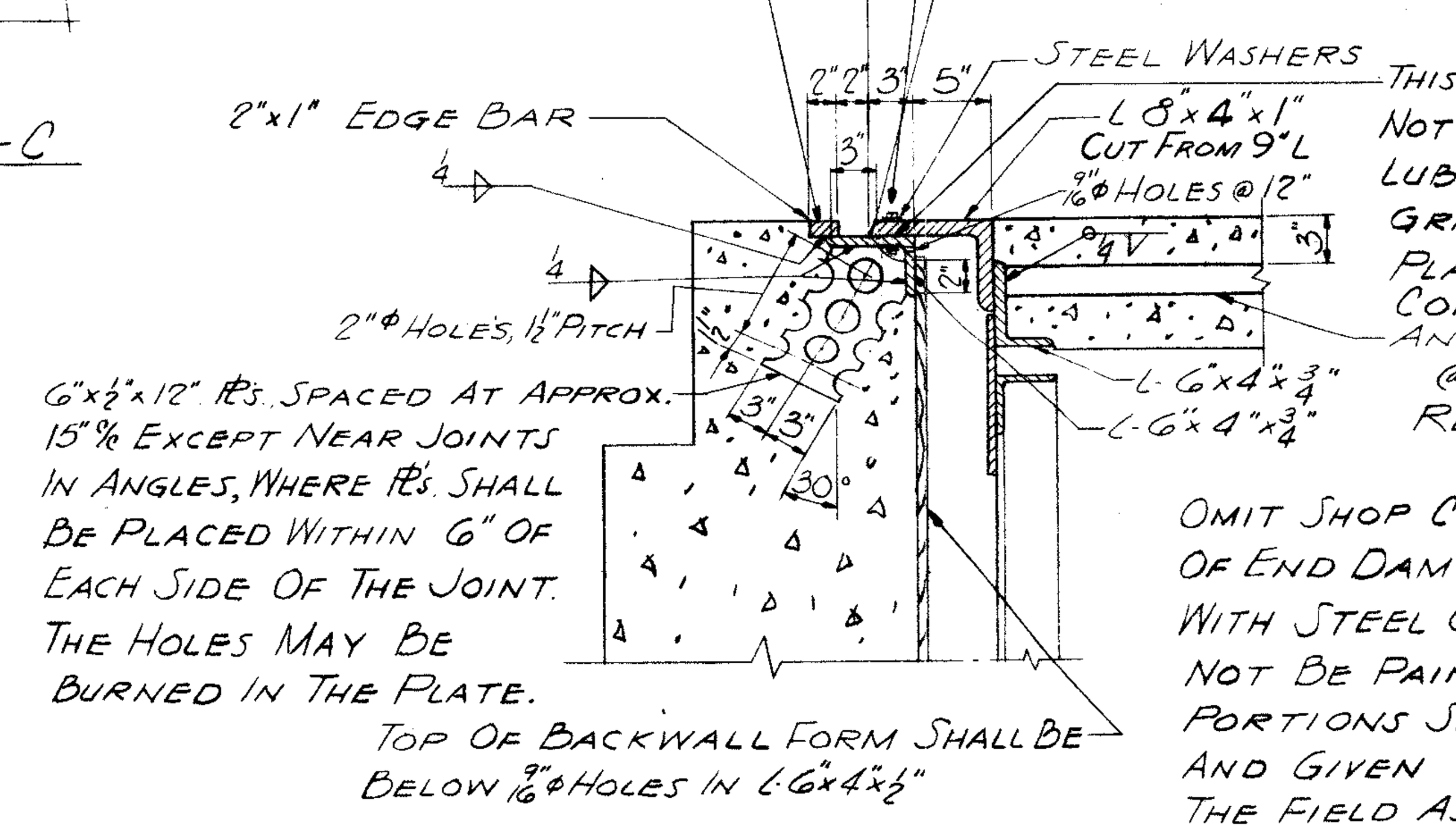


SECTION C-C

2-5/8"φ x 2" BOLTS IN EACH CURB AND EACH HALF OF MEDIAN STRIP. FOR PROCEDURE SEE NOTE "A"

PROVIDE JOINTS IN THE EDGE BAR AND SUPPORTING ANGLE TO MATCH ALL EXP. & CONTRACT. JOINTS IN ABUTMENT BACKWALL. MIN. LENGTH OF ANY PIECE TO BE 6'-0". DO NOT WELD JOINTS.

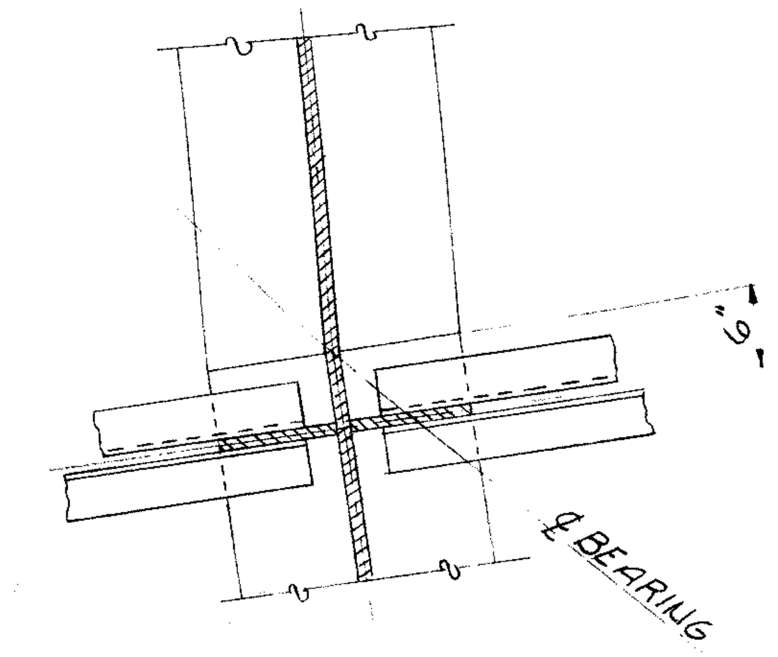
NOTE "A"
5/8"φx2" BOLTS AT NOT MORE THAN 2'-0" % WITH NUTS TACKED-WELDED TO UNDER SIDE OF LOWER ANGLE. 11/16"φ HOLES IN UPPER ANGLE. CENTER 5/8"φ BOLTS IN 11/16"φ HOLES. APPLY FLAKE GRAPHITE BETWEEN WASHERS AND ANGLE. TURN BOLT TIGHT AND RELEASE ONE-HALF TURN. REMOVE BOLT AS SOON AS CONCRETE HAS SET, PREFERABLE WITHIN TWO HOURS AFTER PLACING, TO AVOID DAMAGE DUE TO TEMPERATURE EXPANSION OR CONTRACTION OF SUPERSTRUCTURE. FILL HOLES WITH BITUMINOUS MATERIAL.



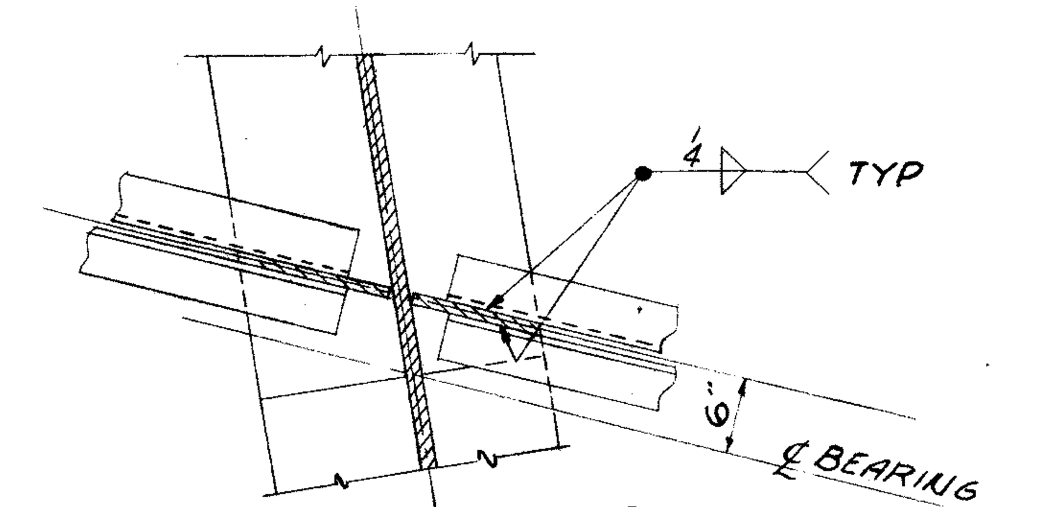
THIS CONTACT SURFACE SHALL NOT BE PAINTED AND SHALL BE LUBRICATED WITH FLAKE GRAPHITE PRIOR TO PLACING OF BACKWALL CONCRETE.

OMIT SHOP COAT ON ALL PORTIONS OF END DAM. PORTIONS IN CONTACT WITH STEEL OR 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.

SECTION D-D



SECTION E-E
@ PIERS #1 & 2



SECTION E-E
@ PIERS #3,4,5 & 6

NOTES

STRUCTURAL STEEL SHALL BE COPPER BEARING AND SHALL CONFORM TO ITEM M-7, SEC. M-7.4(6) OF THE CONSTRUCTION AND MATERIALS SPECIFICATIONS.

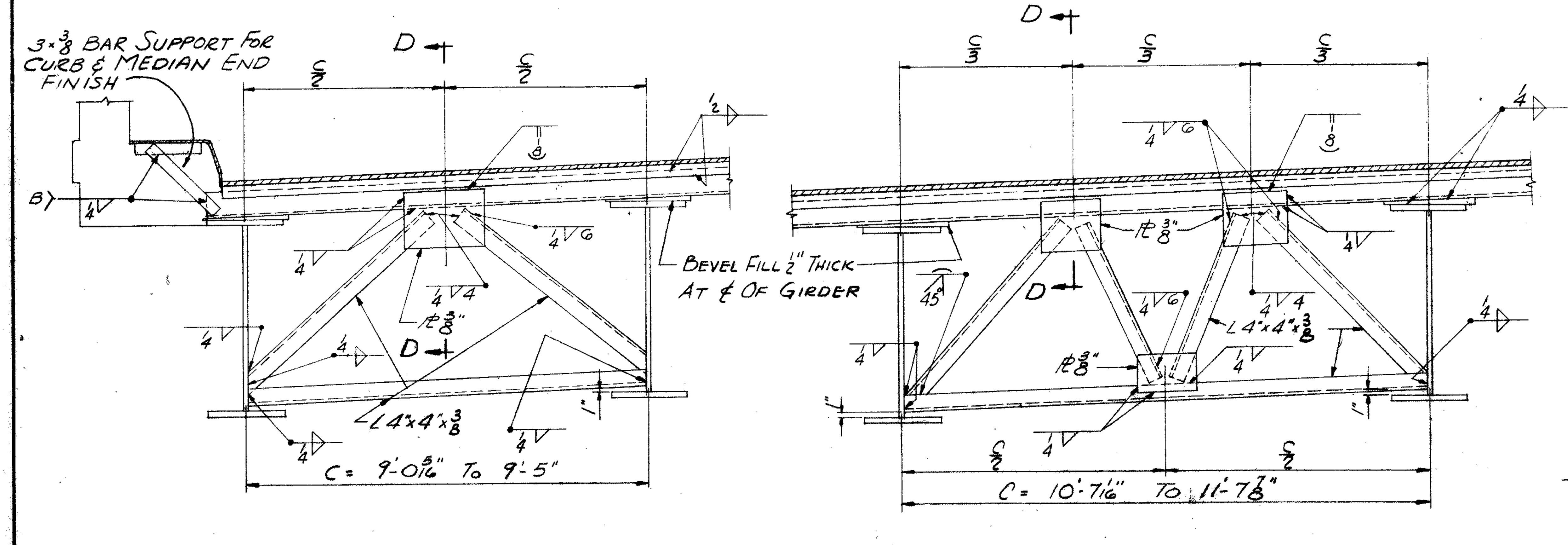
WELDING OF STRUCTURAL STEEL SHALL BE CLASS "A" EXCEPT AS OTHERWISE SHOWN. WELDS SHALL NOT BE PEENED. SHOP WELDING PROCEDURE AND ELECTRODES TO BE USE, SHALL BE SUBMITTED FOR APPROVAL PRIOR TO THE FABRICATION OF STRUCTURAL STEEL.

PAINTING OF STRUCTURAL STEEL (ITEM S-8): MATERIALS AND APPLICATION SHALL CONFORM TO BRIDGE DEPARTMENT, CITY OF CLEVELAND STANDARD SPECIFICATIONS FOR PAINTING STRUCTURAL STEEL (SEE PROPOSAL NOTE).
THE SURFACE PREPARATION OF ALL STEEL, REQUIRING SHOP PAINTING AS PER THE PLANS AND SPECIFICATIONS, SHALL BE ACCOMPLISHED BY BLAST CLEANING OR POWER TOOL CLEANING, EXCEPT AS NOTED IN THE SPECIFICATIONS REGARDING THE USE OF CHROMATE PRIMERS.

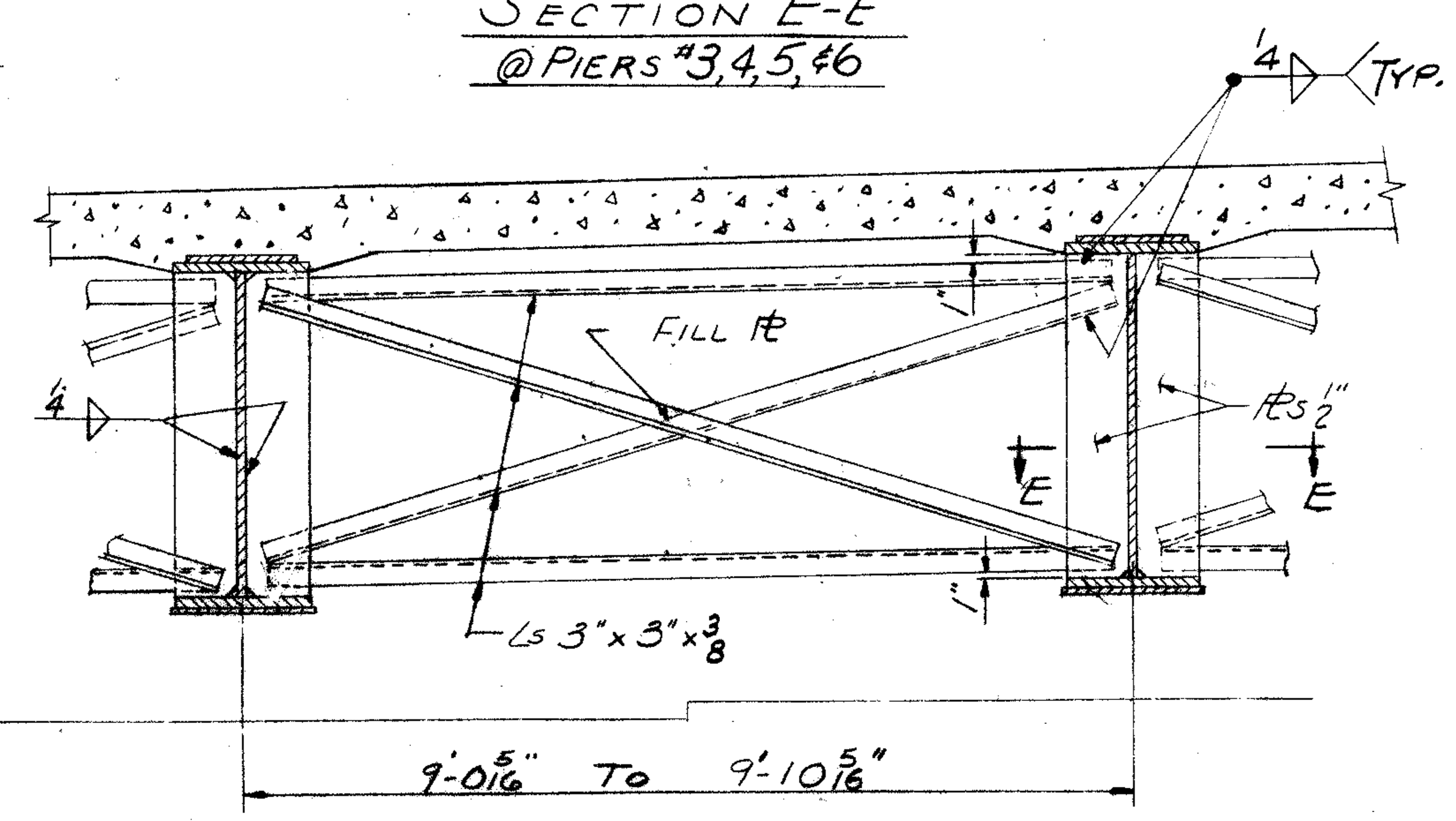
SHEET LEAD SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION B29 WITHOUT RESTRICTION TO THE COMMON DESILVERIZED TYPE.

ERECTION BOLTS: TACKWELD NUTS IF LEFT IN PLACE.

DOWEL HOLES: THE DRILLING OF HOLES IN THE SUBSTRUCTURE FOR ANCHOR DOWEL BARS SHALL BE PAID FOR UNDER ITEM S-7 STRUCTURAL STEEL.



TYPICAL END CROSSFRAMES



SPECIAL CROSSFRAMES
AT PIERS

SHEET No. 58012 (28) SHEET ACCT. No. 1538

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

END FINISH DETAILS

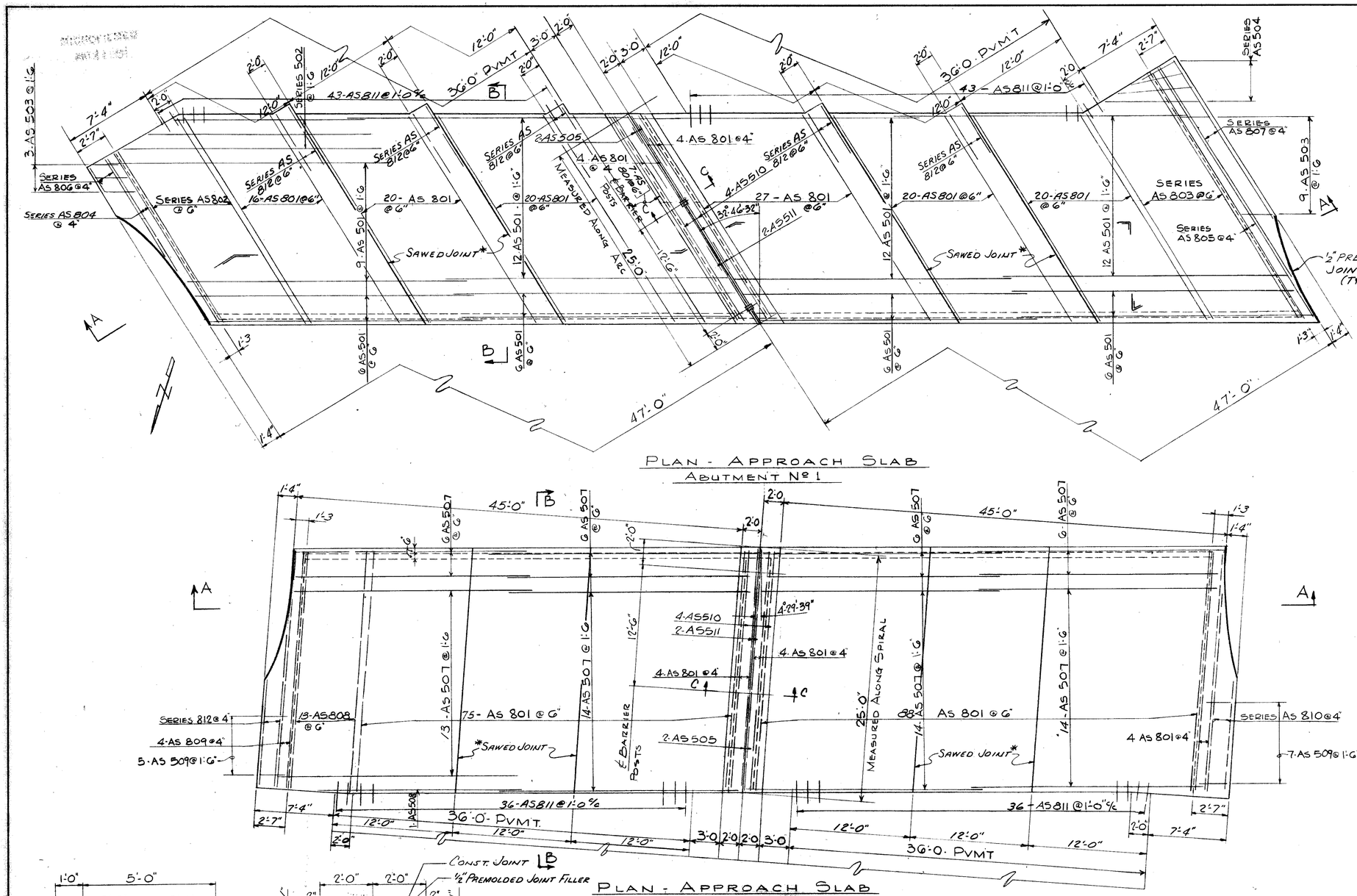
BRIDGE NO. CUY-21-1515
WILLOW FREEWAY OVER ORANGE & E.30
CUYAHOGA COUNTY USR-21

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.A.T.		CWT	CB 8-8-62		

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

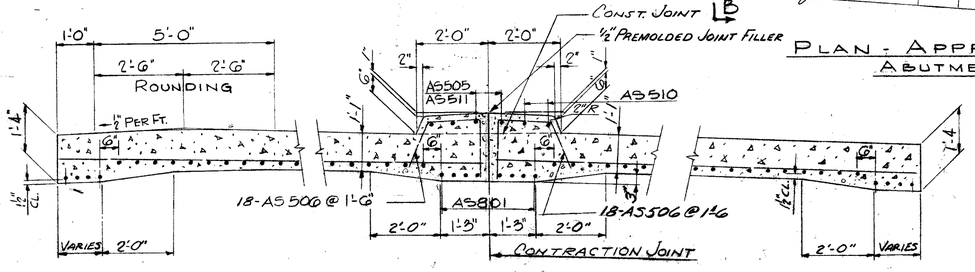
190
204

CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)

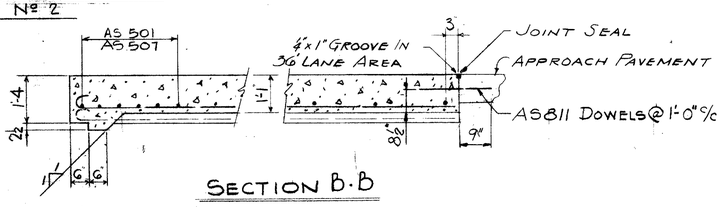


PLAN - APPROACH SLAB
ABUTMENT Nº 1

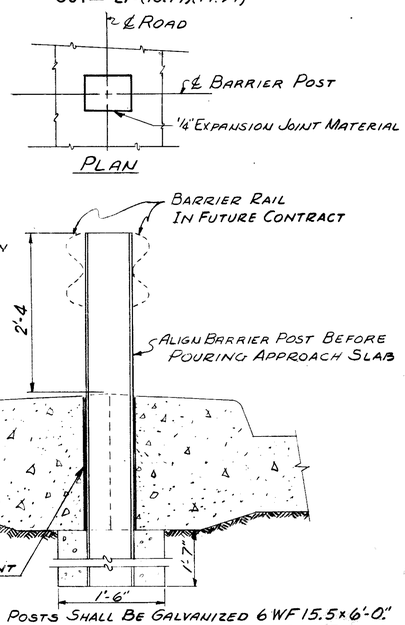
PLAN - APPROACH SLAB
ABUTMENT Nº 2



SECTION A-A



SECTION B-B



NOTE: BARRIER POSTS SHALL BE GALVANIZED 6 WF 15.5 x 6'-0". POSTS TO BE INCLUDED FOR PAYMENT UNDER ITEM S-14 (BARRIER GUARD RAIL)

SECTION C-C
BARRIER POST DETAIL

NOTES
APPROACH SLABS SHALL BE CLASS "C" CONCRETE.
*¼" WIDE BY 4½" DEEP SAWED JOINT. FILL WITH HOT-POURED JOINT SEALER.

FOR REINFORCING BAR SCHEDULE SEE SHEET 191

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

APPROACH SLABS

BRIDGE NO. CUY-21-1515
WILLOW FREEWAY over ORANGE & E.30
CUYAHOGA COUNTY USR-21

SCALE			DATE			
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	SA/CAT		CWT	08	8-8-02	

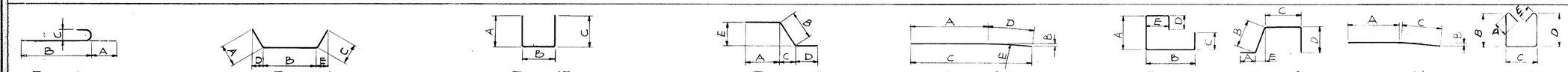
CONT. NO. 58012 (28) SHEET ACCT. NO. 1532

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

191/204

CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)

REINFORCING STEEL BAR SCHEDULE



ABUTMENT Nº 1

MARK	NO.REQD	LENGTH	TYPE	A	B	C	D	E	WEIGHT
A601	116	16'-0"	23	6'-11"	1'-4"	5'-7"	2'-0"	0'-10"	2788
A602	10	36'-10"	STR.						553
A603	2	10'-3"	STR.						31
A604	6	6'-6"	14	0'-6"	6'-0"		0'-5"		59
A605	10	28'-2"	STR.						423
A606	5	37'-8"							283
A607	5	32'-5" TO 36'-1"			1 EACH VARIES BY 1"				257
A608	5	29'-4"							220
A609	5	24'-10" TO 28'-2"			1 EACH VARIES BY 10"				199
A610	4	7'-0"							42
A611	2	10'-1"							30
A612	2	12'-2"							36
A613	2	11'-10"	STR.						35
A623	6	6'-6"	14	1'-6"	5'-0"		0'-8"		59
A502	14	27'-9	STR.						405
A503	3	29'-10"							93
A504	7	28'-10"							211
A505	3	29'-0"							91
A506	10	30'-0"							313
A507	3	25'-6"							80
A508	3	27'-6"							86
A509	3	31'-4"	STR.						98
A510	3	15'-9"	22	13'-6"	0'-6	15'-9"	2'-3	50'-0"	49
A511	168	9'-10'0"	17	2'-3"	5'-8"	2'-3"			1722
A512	80	5'-6"	17	2'-4"	1'-2"	2'-4"			458
A513	228	6'-2"	17	0'-6"	5'-10"				1466
A514	106	6'-6"	17	1'-7"	3'-8"	1'-7"			719
A515	24	6'-1"	STR.						152
A516	24	8'-11"	17	0'-6"	8'-7"				223
A517	10	15'-3"	STR.						159
A518	20	3'-6"							73
A519	4	4'-0"							17
A520	4	4'-6"							19
A521	4	5'-0"							21
A522	4	5'-6"							23
A523	4	10'-6"							44
A524	4	8'-10"							37
A525	4	7'-2"							30
A526	6	8'-0"							50
A527	4	9'-0"							38
A528	12	3'-9"	STR.						47
A529	20	8'-0"	17	2'-7"	3'-2"	2'-7"			167
A530	4	10'-0"	STR.						42
A531	4	9'-7"							40
A532	4	10'-4"							43
A533	12	5'-0"							63
A534	4	6'-6"	STR.						27
A535	32	5'-10"	S3	0'-5"	2'-3"	0'-6"	2'-3"	0'-5	195
A536	3	14'-9"	22	2'-8"	1'-6"	14'-8"	12'-1"	50'-0"	46
A537	13	5'-0"	17	2'-6"	1'-4"	1'-6"			68
A538	14	3'-4" TO 4'-10"	17	1'-8" TO 2'-5"	1'-4"	0'-8" TO 1'-5"	2 EACH A & C VARY BY 1"		59
A539	4	13'-11"	STR.						58
A541	6	7'-7"	STR.						48
A543	6	2'-3" TO 2'-9"	17	1'-4"	1'-7" TO 2'-0"	2 EACH VARY BY 3"			16
A544	6	15'-3"	22	13'-2"	0'-6"	15'-3"	2'-1"	50'-0	94
A546	26	24'-4"	STR.						660
A547	72	7'-0"	17	3'-1"	1'-2"	3'-1"			526
A548	170	10'-7"	17	2'-3"	6'-5"	2'-3"			1876
A549	98	6'-3"	17	1'-7"	3'-5"	1'-7"			639
A550	24	6'-4"	STR.						159
A551	24	7'-4"	17	0'-6"	7'-0"				184
A552	8	8'-8"	STR.						72
A553	6	7'-9"	STR.						48
A554	8	8'-6"	STR.						71
A555	6	15'-3"	22	3'-2"	1'-6"	15'-2"	12'-1"	50'-0"	94
A556	4	4'-4"	17	1'-6"	1'-6"	1'-6"			18
A559	26	24'-6"	STR.						664
A560	4	5'-2"	17	2'-4"	0'-10"	2'-4"			22
R501	8	15'-0"	STR.						*

TOTAL WEIGHT 12,832

ABUTMENT Nº 2

MARK	NO.REQD	LENGTH	TYPE	A	B	C	D	E	WEIGHT
A601	102	16'-0"	23	6'-11"	1'-4"	5'-7"	2'-0"	0'-10"	2451
A614	15	31'-0"	STR.						698
A615	5	29'-2"							219
A616	5	21'-8"							162
A617	5	23'-2"							173
A618	4	10'-0"							60
A619	8	10'-8"	STR.						128
A620	6	7'-6"	14	1'-0"	6'-6"		0'-8"		68
A621	10	25'-4"	STR.						381
A622	6	7'-6"	14	0'-6"	7'-0"		0'-4½		68
A512	8	5-6	17	2'-4"	1'-2"	2'-4"			46
A513	204	6'-2"	17	0'-6"	5'-10"				1312
A517	10	15'-3"	STR.						159
A518	20	3'-6"							73
A519	28	4'-0"							117
A520	4	4'-6"							19
A521	4	5'-0"							21
A522	4	5'-6"							23
A523	4	10'-6"							44
A524	4	8'-10"							37
A525	4	7'-2"	STR.						30
A529	16	8-0	17	2'-7"	3'-2"	2'-7"			134
A534	4	6'-6"	STR.						27
A535	32	5'-10"	S3	0'-5"	2'-3"	0'-6"	2'-3"	0'-5"	195
A537	14	5'-0"	17	2'-6"	1'-4"	1'-6"			73
A538	14	3'-4" TO 4'-10"	17	1'-8" TO 2'-5"	1'-4"	0'-8" TO 1'-5"	2 EACH A & C VARY BY 1"		59
A539	4	13'-11"	STR.						58
A541	6	7'-7"	STR.						48
A543	6	2'-3" TO 2'-9"	17	1'-4"	1'-7" TO 2'-0"	2 EACH VARY BY 3"			16
A544	6	15'-3"	22	13'-2"	0'-6"	15'-3"	2'-1"	50'-0	94
A546	26	24'-4"	STR.						660
A547	72	7'-0"	17	3'-1"	1'-2"	3'-1"			526
A548	170	10'-7"	17	2'-3"	6'-5"	2'-3"			1876
A549	98	6'-3"	17	1'-7"	3'-5"	1'-7"			639
A550	24	6'-4"	STR.						159
A551	24	7'-4"	17	0'-6"	7'-0"				184
A552	8	8'-8"	STR.						72
A553	6	7'-9"	STR.						48
A554	8	8'-6"	STR.						71
A555	6	15'-3"	22	3'-2"	1'-6"	15'-2"	12'-1"	50'-0"	94
A556	4	4'-4"	17	1'-6"	1'-6"	1'-6"			18
A559	26	24'-6"	STR.						664
A560	4	5'-2"	17	2'-4"	0'-10"	2'-4"			22
R501	8	15'-0"	STR.						*

TOTAL WEIGHT 12,026

* INCLUDE WITH RAILING FOR PAYMENT.
FOR NOTES AND REPLACEMENT BARS SEE SHEET 192

SUPERSTRUCTURE

MARK	NO.REQD	LENGTH	TYPE	A	B	C	D	E	WEIGHT
S701	771	30-3	STR.						47,672
S702	803	21'-4"							35,015
S703	897	8'-5"							15,431
S704	29	2'-4" TO 28'-0"			1 EACH VARY BY 11"				900
S705	19	4'-0" TO 20'-6"			1 EACH VARY BY 11"				476
S706	851	45'-6"							79,143
S707	41	2'-4" TO 42'-4"			1 EACH VARY BY 1'-0"				1,872
S708	2	7'-0" TO 8'-0"			1 EACH VARY BY 1'-0"				31
S709	5	5'-2" TO 38'-6"			1 EACH VARY BY 8'-4"				223
S710	3	5'-2" TO 21'-10"			1 EACH VARY BY 8'-4"				83
S711	3	6'-4" TO 23'-0"	STR.		1 EACH VARY BY 8'-4"				90
S601	2420	25'-8"	STR.						93,295
S602	19	7'-0" TO 25'-0"	25	0'-10" TO 18'-10"	0'-3"	6'-2"	1 EACH VARY BY 1'-0"		457
S603	878	25'-8"	25	19'-6"	0'-5"	6'-2"			33,846
S604	24	2'-7" TO 23'-8"	STR.		1 EACH VARY BY 11"				473
S605	24	4'-0" TO 25'-0"			1 EACH VARY BY 11"				523
S606	3	6'-4" TO 23'-0"			1 EACH VARY BY 8'-4"				66
S607	3	5'-2" TO 21'-10"			1 EACH VARY BY 8'-4"				61
S608	6	6'-5"							59
S609	3	4'-2" TO 20'-10"			1 EACH VARY BY 8'-4"				56
S610	2	11'-3" TO 19'-7"			1 EACH VARY BY 8'-4"				47
S611	2	2'-10"							9
S612	6	3'-0"							27
S613	24	2'-0" TO 25'-0"	STR.		1 EACH VARY BY 1'-0"				487
S501	3153	40'-0"	STR.						131,543
S502	52	8'-11" TO 17'-5"			1 EACH VARY BY 2"				714
S503	65	12'-6" TO 17'-10"			1 EACH VARY BY 1"				1,028
S504	52	6'-0" TO 40'-0"			1 EACH VARY BY 8"				1,247
S505	65	2'-8" TO 40'-0"			1 EACH VARY BY 7"				1,446
S506	52	20'-1" TO 28'-9"			1 EACH VARY BY 2"				1,325
S507	65	18'-10" TO 29'-6"			1 EACH VARY BY 2"				1,639
S508	52	4'-8" TO 38'-8"			1 EACH VARY BY 8"				1,174
S509	65	2'-5" TO 39'-9"	STR.		1 EACH VARY BY 7"				1,429
S510	841	7'-2"	S3	0'-5"	2'-11"	0'-6"	2'-11"	0'-5"	6,286
S511	246	11'-8"	STR.						2,994
S512	841	3'-8"	19	2'-6"	1'-4"	0'-3"			3,217
S513	841	3'-6"	24		1'-3"	1'-5"	1'-2"	0'-5"	3,070
S514	600	39'-0"	STR.						24,406
S515	3	2'-9"							9
S516	2	39'-7" TO 40'-0"			1 EACH VARY BY 5"				83
S517	4	2'-8" TO 3'-5"			1 EACH VARY BY 3"				13
S518	7	8'-6"							62
S519	2	17'-9"							37
S520	2	3'-1"							7
S521	4	38'-9" TO 39'-9"			1 EACH VARY BY 4"				164
S522	2	18'-6"							39
S523	4	28'-10" TO 29'-4"			1 EACH VARY BY 2"				121
S524	3	29'-6"	STR.						92
S525	40	5'-6"	17	2'-11"	2'-9"				230
S526	40	4'-5"	19	1'-0"	2'-7"	1'-10"	1'-0"	1'-10"	185
S527	40	3'-5"	STR.						143
S528	12	2'-3"	STR.						28
S529	20	3'-6"	14	0'-6"	3'-0"		0'-4"		73
S530	20	6'-3"	14	0'-6"	5'-9"		0'-4"		130
R502	176	17'-5"	STR.						*
R503	28	6'-0"							*
R504	28	11'-1"							*
R505	16	2'-0"							*
R506	16	15'-1"							*
R507	16	14'-1"	STR.						*
R508	40	4'-5"	19	1'-0"	2'-7"	1'-10"	1'-0"	1'-10"	*

TOTAL WEIGHT 493,276

APPROACH SLAB AT ABUTMENT Nº 1

MARK	NO.REQD	LENGTH	TYPE	A	B	C	D	E	WEIGHT
A5801	138	25'-5"	1	0'-11"	24'-6"	0'-8"			
A5802	13	21'-7" TO 25'-1"	1	0'-11"	20'-8" TO 24'-2"	0'-8"	EACH VARY BY 3 1/4"		
A5803	13	25'-8" TO 28'-11"	1	0'-11"	24'-9" TO 28'-0"	0'-8"	EACH VARY BY 3 1/4"		
A5804	4	19'-10" TO 20'-4"	STR.		1 EACH VARY BY 2"				
A5805	4	28'-6" TO 29'-0"			1 EACH VARY BY 2"				
A5806	4	5'-3" TO 12'-0"			1 EACH VARY BY 2'-3"				
A5807	4	18'-3" TO 25'-0"			1 EACH VARY BY 2'-3"				
A5811	86	1'-6"	STR.						
A5812	20	25'-7" TO 26'-7"	1	0'-11"	24'-8" TO 25'-8"	0'-8"	1 EACH VARY BY 2"		
A5501	69	28'-8"	STR.						
A5502	3	21'-6" TO 26'-2"			1 EACH VARY BY 2'-4"				
A5503	12	4'-0"							
A5504	4	3-9 TO 8'-9"			1 EACH VARY BY 1'-8"				
A5505	2	10'-0"	STR.						
A5506	36	4'-0"	24		1'-4"	1'-5"	1'-7"	0'-6"	
A5510	4	24'-6"	STR.						
A5511	2	11'-5"	STR.						

APPROACH SLAB AT ABUTMENT Nº 2

MARK	NO.REQD	LENGTH	TYPE	A	B	C	D	E	WEIGHT
A5801	175	25'-5"	1	0'-11"	24'-6"	0'-8"			
A5808	13	24'-11"	1	0'-11"	24'-0"	0'-8"			
A5809	4	24'-9"	1	0'-11"	23'-10"	0'-8"			
A5810	4	12'-3" TO 19'-0"	STR.		1 EACH VARY BY 2'-3"				
A5811	72	1'-6"	STR.						
A5812	4	10'-9" TO 17'-6"	STR.		1 EACH VARY BY 2'-3"				
A5505	2	10'-0"	STR.						
A5506	36	4'-0"	24		1'-4"	1'-5"	1'-7"	0'-6"	
A5507	79	24'-3"	STR.						
A5508	1	17'-2"							
A5509	12	3'-7"							
A5510	4	24'-6"	STR.						
A5511	2	11'-5"	STR.						

BARS WITH PREFIX AS TO BE INCLUDED WITH APPROACH SLAB FOR PAYMENT.

CONT NO. 580-19 (28) SHEET ACCT. No. 559

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

BAR SCHEDULE
BRIDGE NO. CUY-21-1515
WILLOW FREEWAY OVER ORANGE-E.30
CUYAHOGA COUNTY USR-21

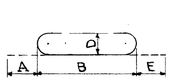
SCALE	DATE				
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE REVISED
	C.A.T.		CWT	CB	8-8-62

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

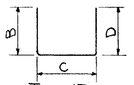
192/204

CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)

REINFORCING STEEL BAR SCHEDULE



TYPE 1



TYPE 17

TYPE S10

TYPE 26

PIERS

MARK	Nº REQ'D	LENGTH	TYPE	A	B	C	D	E	WEIGHT
P1100	10	29'-11"	STR.						1590
P1101	10	29'-9"	STR.						1581
P1102	5	26'-9"	STR.						711
P1103	5	24'-11"	STR.						662
P1104	20	24'-7"	STR.						2615
P1105	10	24'-8"	STR.						1313
P1106	5	29'-8"	STR.						788
P1107	5	26'-8"	STR						708
P1108	10	24'-10"	STR.						1319
P1109	10	24'-6"	STR						1302
P1110	12	18'-4"	STR						1169
P1111	6	18'-7"	STR						592
P1112	12	16'-10"	STR						1073
P1113	6	15'-10"	STR						505
P1114	6	15'-8"	STR						499
P1115	6	15'-7"	STR						497
P1116	14	14'-10"	STR						1103
P1117	14	13'-4"	STR						993
P1118	33	12'-4"	STR						2165
P1119	7	12'-2"	STR						452
P1120	6	11'-5"	STR						364
P1121	24	12'-0"	STR						1530
P1122	2	16'-5"	STR						174
P1123	6	16'-3"	STR						518
P1124	18	14'-6"	STR						1388
P1125	4	13'-5"	STR						285
P1126	8	13'-3	STR						563
P1127	5	29'-7"	STR						786
P1128	5	29'-4	STR						779
P1129	5	26'-6"	STR						704
P1130	5	29'-5"	STR						782
P1131	5	26'-7"	STR						707
P1132	5	24'-11"	STR						662
P1133	6	18'-2"	STR						579
P1134	6	15'-11"	STR						507
P1135	12	15'-9"	STR						1004
P1136	3	11'-1"	STR						177
P1137	3	10'-8"	STR						170
P1138	3	9'-4"	STR						149
P1139	3	8'-8"	STR						138
P1140	3	8'-6"	STR						135
P1141	3	8'-7"	STR						137
P1142	5	22'-5"	STR						596
P1143	5	21'-9"	STR						578
P1144	5	19'-2"	STR						509
P1145	11	17'-9"	STR						1037
P1146	11	17'-6"	STR						1023
P1147	11	17'-7"	STR						1027
P1148	15	11'-0"	STR						877
P1149	5	11'-3"	STR						299
P1150	12	10'-6"	STR						669
P1151	6	22'-8"	STR						723
P1152	6	21'-11"	STR						699
P1153	6	19'-3"	STR						614
P1154	6	10'-9"	STR						343
P1155	120	7'-6	17		1'-4"	6'-2"			4787

PIERS

MARK	Nº REQ'D	LENGTH	TYPE	A	B	C	D	E	WEIGHT
P1000	16	14'-11"	STR.						1026
P1001	10	12'-11"	STR						555
P1002	8	12'-9"	STR						439
P1003	8	14'-1"	STR						485
P1004	8	15'-4"	STR						527
P1005	8	15'-6"	STR						534
P1006	8	13'-7"	STR						468
P1007	8	13'-5"	STR						462
P1008	8	14'-9"	STR						508
P1009	8	15'-10"	STR						545
P1010	8	15'-11"	STR						548
P1011	16	13'-11"	STR						958
P1012	8	13'-8"	STR						470
P1013	8	15'-1"	STR						520
P1014	8	16'-1"	STR						554
P1015	40	16'-7"	STR						2854
P1016	26	14'-7"	STR						1631
P1017	8	17'-7"	STR						605
P1018	8	16'-4"	STR						563
P1019	8	16'-8"	STR						574
P1020	8	14'-5"	STR						496
P1021	24	15'-5"	STR						1592
P1022	16	14'-8"	STR						1010
P1023	8	17'-8"	STR						608
P1024	8	15'-3"	STR						525
P1025	24	16'-2"	STR						1670
P1026	16	17'-1"	STR						1176
P1027	32	15'-8	STR						2156
P1028	16	15'-9"	STR						1086
P1029	8	17'-5"	STR						600
P1030	8	17'-11"	STR						617
P1031	8	16'-0"	STR						551
P1032	8	17'-0"	STR						585
P1033	8	17'-3"	STR						594
P1034	320	7'-0"	17		1'-4"	5'-8"			9639
P800	2	11'-2"	STR						60
P801	2	10'-9"	STR						57
P802	2	9'-5"	STR						50
P803	2	8'-8	STR						46
P804	2	8'-6	STR						45
P805	2	8'-7	STR						46
P806	4	16'-3"	STR						174
P807	2	14'-6	STR						77
P808	2	13'-6"	STR						72
P809	4	13'-3"	STR						142
P810	4	14'-6"	STR						155
P811	4	6'-8"	STR						71
P812	2	13'-4"	STR						71
P813	2	6'-7"	STR						35
P814	6	12'-4"	STR						198
P815	4	6'-11"	STR						74
P816	2	7'-5"	STR						40
P817	18	15'-4"	1	1'-1"	13'-2"		0'-10"	1'-1"	737
P818	72	13'-10"	1	1'-1"	11'-8"		0'-10"	1'-1"	2659

PIERS

MARK	Nº REQ'D	LENGTH	TYPE	A	B	C	D	E	WEIGHT
P700	264	7'-10"	1	0'-10"	6'-2"		0'-7"	0'-10"	4227
P701	504	11'-4"	1	0'-10"	9'-5"		0'-7"	0'-10"	11672
P702	96	8'-10"	1	0'-10"	7'-2"		0'-7"	0'-10"	1734
P703	190	10'-4	1	0'-10"	8'-8"		0'-7"	0'-10"	4013
P704	6	8'-8"	1	0'-10"	7'-0"		0'-7"	0'-10"	107
P705	6	4'-10"	1	0'-10"	3'-2"		0'-7"	0'-10"	60
P706	6	1'-10"	STR						23
P707	24	6 EACH - VARY BY 9" FROM 6'-9 TO 11'-0"	1	0'-10"	VARIES BY 9" 7'-1" TO 9'-4"		0'-7"	0'-10"	485
P708	6	7'-4"	1	0'-10"	5'-8"		0'-7"	0'-10"	90
P709	6	6'-7"	1	0'-10"	4'-11"		0'-7"	0'-10"	80
P500	4	29'-11"	STR						125
P501	4	29'-9"	STR						124
P502	2	26'-9"	STR						56
P503	2	24'-11"	STR						52
P504	8	24'-7"	STR						205
P505	4	24'-8"	STR						103
P506	2	29'-8"	STR						62
P507	2	26'-8"	STR						56
P508	4	24'-10"	STR						104
P509	4	24'-6"	STR						102
P510	546	6'-0"	S10		1'-8"	2'-8"	1'-8"		3417
P511	194	7'-10"	S10		2'-7"	2'-8"	2'-7"		1584
P512	352	9'-4"	S10		3'-4"	2'-8"	3'-4"		3425
P513	48	4'-6"	17		1'-0"	2'-6"	1'-0"		225
P514	2	29'-7"	STR						62
P515	2	29'-4"	STR						61
P516	2	26'-6"	STR						55
P517	2	29'-5"	STR						61
P518	2	26'-7"	STR						55
P519	2	24'-11"	STR						52

TOTAL FOR PIERS = 122,504

REPLACEMENT BARS (FOR SHEETS 191 & 192 COMBINED)

MARK	Nº REQD.	LENGTH	TYPE	WEIGHT
RE1100	3	7'-6"	STR.	
RE1000	2	7'-2"	STR.	
RE800	1	6'-6"	STR.	
RE700	11	6'-2"	STR.	
RE600	7	5'-11"	STR.	
RE500	11	5'-7"	STR.	
RESP5	2	5'-7"	26	

PIERS-SPIRAL BARS

MARK	Nº REQD	LENGTH	PITCH	Nº TURNS	CORE DIA (O/O SPIRAL)	WEIGHT
SP500	4	11'-7	3"	49	32"	1840
SP501	2	10'-9"	3"	46	32"	863
SP502	2	9'-5"	3"	41	32"	766
SP503	2	11'-9"	3"	50	32"	938
SP504	2	12'-0"	3"	51	32"	956
SP505	2	12'-7"	3"	53	32"	1004
SP506	2	10'-7"	3"	45	32"	843
SP507	2	10'-5"	3"	45	32"	843
SP508	2	10'-8"	3"	46	32"	862
SP509	2	12'-9"	3"	54	32"	1013
SP510	2	11'-3"	3"	48	32"	899
SP511	2	12'-1"	3"	51	32"	956
SP512	2	11'-4"	3"	48	32"	900
SP513	6	13'-3"	3"	56	32"	3152
SP514	2	14'-3"	3"	60	32"	1125
SP515	4	12'-4"	3"	52	32"	1950
SP516	2	12'-5"	3"	53	32"	993
SP517	2	14'-1"	3"	59	32"	1107
SP518	2	9'-8"	3"	42	32"	786
SP519	2	13'-4"	3"	56	32"	1052

TOTAL FOR SPIRALS = 22,848

SPIRAL REINFORCING BARS:

THE LENGTH SHOWN IN THE BAR LIST FOR THE SPIRAL BARS IS THE DISTANCE FROM THE TOP OF THE FOOTING TO THE BOTTOM OF THE PIER CAP. THE "Nº OF TURNS" SHOWN IS THE "LENGTH" DIVIDED BY THE "PITCH", PLUS 3 TURNS (TOTAL NUMBER OF CLOSED COILS), EXPRESSED AS THE NEAREST WHOLE NUMBER. SPIRAL REINFORCING BARS SHALL NOT HAVE DEFORMATIONS BUT SHALL IN OTHER RESPECTS CONFORM TO ITEM S-4. 1½ CLOSED COILS SHALL BE PROVIDED AT THE ENDS OF EACH SPIRAL UNIT.

FOUR STEEL CHANNEL, TEE, OR ANGLE SPACERS, WEIGHING APPROX. 0.68 LBS PER LIN. FT. SHALL BE PROVIDED FOR EACH SPIRAL UNIT. THEY SHALL BE EQUALLY SPACED ALONG THE PERIPHERY OF THE COIL. THE NUMBER OF POUNDS OF THESE SPACERS, BASED ON 0.68 LBS PER LIN. FT., WILL BE PAID FOR AS REINFORCING STEEL, AND IS INCLUDED IN THE TABULATED QUANTITY OF SPIRAL BARS.

BAR SIZE:

THE BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST DIGIT WHERE THREE ARE USED, AND THE FIRST TWO DIGITS WHERE FOUR ARE USED, INDICATE THE BAR SIZE NUMBER. FOR EXAMPLE, A 501 IS A Nº 5 SIZE BAR AND A 1114 IS A Nº 11 SIZE BAR.

CONT. NO. 5803(28) SHEET ADDT. NO. 1611

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

BAR SCHEDULE
BRIDGE Nº CUY-21-1515
WILLOW FREEWAY OVER ORANGE & E 30
CUYAHOGA COUNTY USR-21

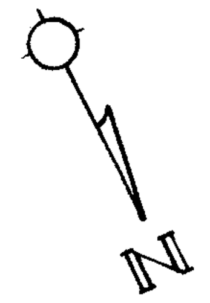
SCALE			DATE		
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	W.G.K.		J.G.	CB 8-8-62		

1611

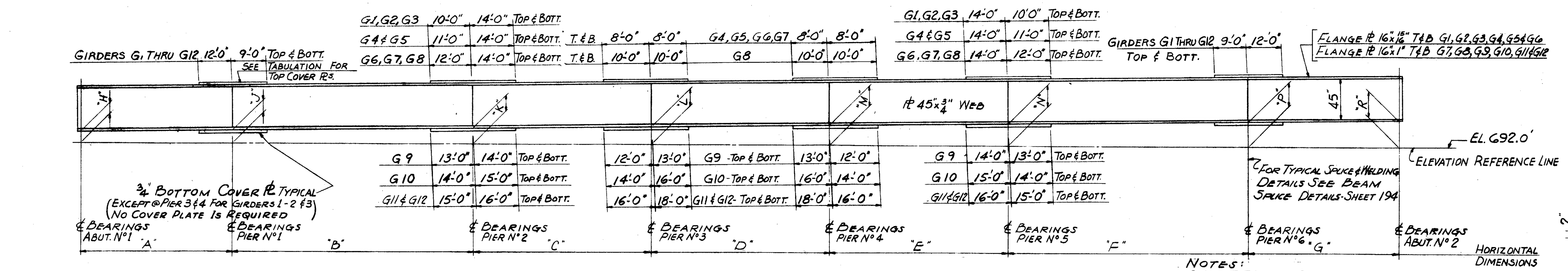
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)

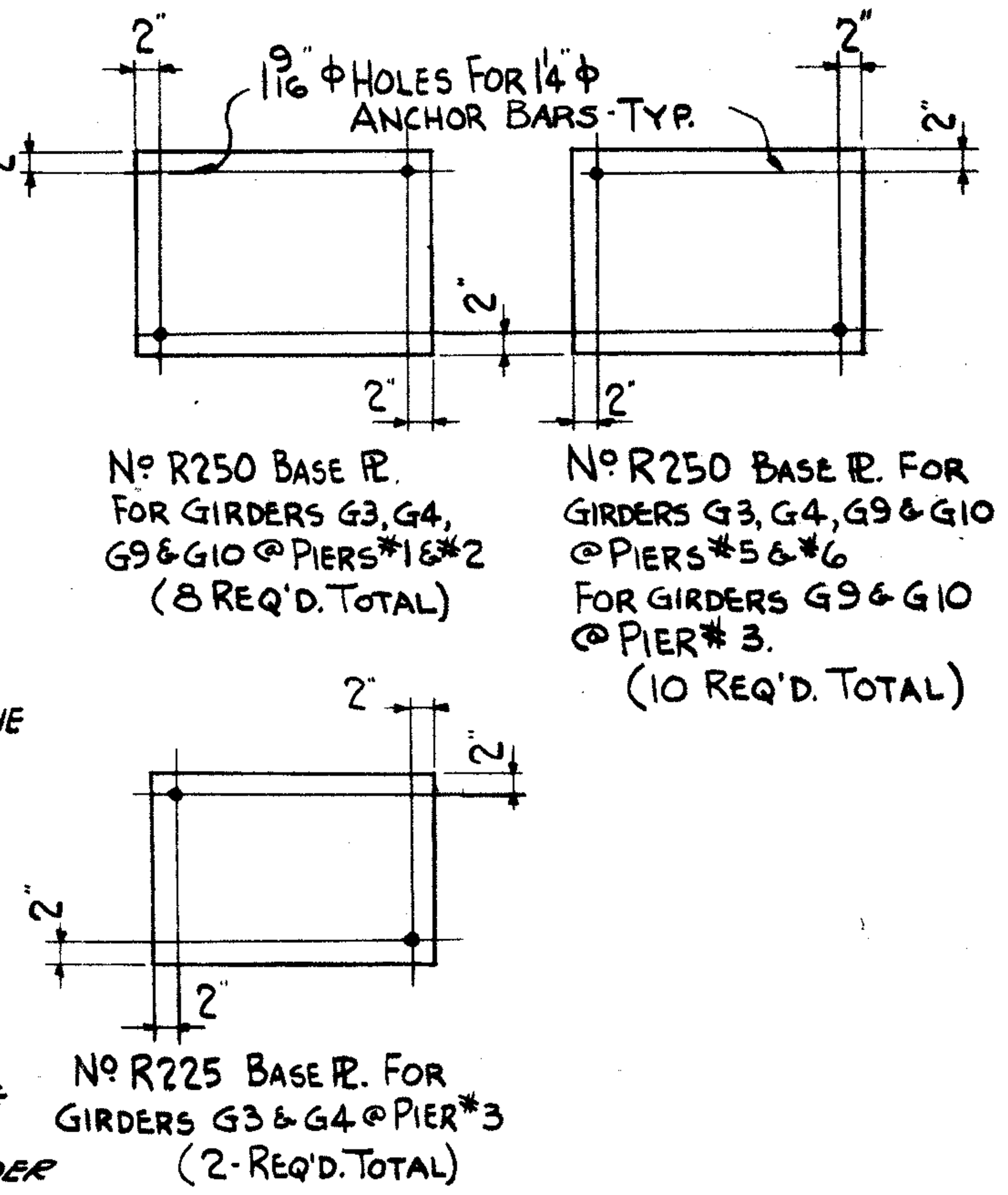
BEARING NOTE:
FOR POSITIONING OF BEARINGS SEE ABUTMENT AND PIER SHEETS 181, 183, 185 & 186



STEEL FRAMING PLAN



GIRDER ELEVATION



ROCKER BASE PLATE ALTERATIONS
SEE STANDARD DRAWING RB-1-55 FOR DETAILS NOT SHOWN

GIRDER DETAILS

GIRDER	"A"	"B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"	"L"	"M"	"N"	"P"	"R"	Δ1	Δ2	Δ3	Δ4	Δ5	Δ6
G1	54'-8 3/16	85'-4 5/8	63'-4 13/16	63'-8 1/4	63'-9 9/16	85'-9 5/16	53'-3 7/16	0'-9"	1'-1 13/16"	1'-7 1/2"	1'-10 9/16"	2'-1 7/16"	2'-4 1/8"	2'-6 1/2"	2'-7"	00°38'22"	2°11'00"	2°09'19"	2°08'58"	2°14'04"	1°44'08"
G2	53'-7 1/16	85'-11 15/16	66'-2 1/8	66'-3 15/16	66'-4 11/16	86'-4 1/8	53'-3 7/16	1'-0 1/4"	1'-5 1/8"	1'-11 13/16"	2'-2 9/16"	2'-5 7/16"	2'-7 3/4"	2'-9 3/8"	2'-9 7/16"	2°07'39"	2°21'34"	2°09'19"	2°08'58"	2°14'04"	1°44'08"
G3	53'-7 1/16	86'-9 9/16	68'-11 1/16	68'-11 5/8	68'-11 3/4	86'-11	53'-3 7/16	1'-4 1/2"	1'-9 3/8"	2'-3 1/2"	2'-6 7/8"	2'-9 5/8"	2'-11 9/16"	3'-0 5/16"	3'-0"	2°07'39"	2°21'34"	2°09'19"	2°08'58"	2°14'04"	1°44'08"
G4	53'-7 1/16	87'-7 3/16	71'-8 3/4	71'-7 3/8	71'-6 13/16	87'-5 13/16	53'-3 7/16	1'-8 13/16"	2'-1 5/8"	2'-7 13/16"	2'-11 5/16"	3'-1 13/16"	3'-3 7/16"	3'-3 1/2"	3'-2 5/8"	2°07'39"	2°21'34"	2°09'19"	2°08'58"	2°14'04"	1°44'08"
G5	53'-7 1/16	88'-4 13/16	74'-6 1/16	74'-3 1/16	74'-1 7/8	88'-0 5/8	53'-3 7/16	2'-1 1/16"	2'-5 7/8"	3'-0 1/8"	3'-3 11/16"	3'-6"	3'-7 1/8"	3'-6 9/16"	3'-5 3/16"	2°07'39"	2°21'34"	2°09'19"	2°08'58"	2°14'04"	1°44'08"
G6	53'-3 3/16	89'-0 1/8	77'-3 3/8	76'-10 3/4	76'-8 15/16	88'-7 7/16	53'-3 7/16	2'-4 3/4"	2'-9 3/4"	3'-4 5/16"	3'-8 1/8"	3'-10 1/4"	3'-10 7/8"	3'-9 5/8"	3'-7 3/4"	2°28'35"	2°31'41"	2°09'19"	2°08'58"	2°14'04"	1°44'08"
G7	53'-3 3/16	88'-7 9/16	77'-11 1/16	78'-1 13/16	78'-2 7/8	88'-11 1/8	53'-3 5/16	2'-4 7/16"	2'-9 7/16"	3'-4 1/16"	3'-8 3/16"	3'-10 11/16"	3'-11 5/16"	3'-9 13/16"	3'-7 15/16"	1°51'34"	2°20'20"	2°31'22"	2°31'05"	2°25'41"	1°43'24"
G8	52'-11 5/8	89'-2"	80'-8"	80'-9 3/8	80'-9 15/16	89'-5 15/16	53'-3 5/16	2'-8"	3'-1 9/16"	3'-8 3/16"	4'-0 5/8"	4'-3 1/16"	4'-3 1/4"	4'-1"	3'-10 11/16"	2°06'40"	2°34'01"	2°31'22"	2°31'05"	2°25'41"	1°43'24"
G9	52'-11 5/8	89'-11 7/16	83'-4 7/8	83'-4 15/16	83'-4 15/16	90'-0 3/4	53'-3 5/16	3'-0 5/16"	3'-5 7/16"	4'-0 1/2"	4'-5 1/16"	4'-7 1/2"	4'-7 3/16"	4'-4 3/16"	4'-1 7/16"	2°06'40"	2°34'01"	2°31'22"	2°31'05"	2°25'41"	1°43'24"
G10	52'-11 5/8	90'-8 7/8	86'-1 3/4	86'-0 1/2	86'-0"	90'-7 9/16	53'-3 5/16	3'-4 9/16"	3'-9 3/4"	4'-4 3/4"	4'-9 7/16"	4'-11 5/16"	4'-11 1/8"	4'-7 3/8"	4'-4 3/16"	2°06'40"	2°34'01"	2°31'22"	2°31'05"	2°25'41"	1°43'24"
G11	52'-11 5/8	91'-6 5/16	88'-10 5/8	88'-8 1/16	88'-7"	91'-2 3/8	53'-3 5/16	3'-8 7/8"	4'-2"	4'-9 1/16"	5'-1 7/8"	5'-4 3/8"	5'-3"	4'-10 5/8"	4'-6 15/16"	2°06'40"	2°34'01"	2°31'22"	2°31'05"	2°25'41"	1°43'24"
G12	51'-11 11/16	92'-0 3/4	91'-7 1/2	91'-3 5/8	91'-2 1/16	91'-9 3/16	53'-3 5/16	3'-8 9/16"	4'-1 3/4"	4'-9 1/4"	5'-2 7/16"	5'-5 1/8"	5'-3 1/2"	4'-10 5/8"	4'-6 11/16"	3°36'54"	2°47'12"	2°31'22"	2°31'05"	2°25'41"	1°43'24"

TOP COVER PLATES

GIRDER	PIER Nº 1 & 6	PIER Nº 2 & 5	PIER Nº 3 & 4
G1	14 1/2" x 1 1/16"	14 1/2" x 1 1/16"	NONE
G2	14 1/2" x 1 1/16"	14 1/2" x 1 1/16"	NONE
G3	14 1/2" x 1 1/16"	14 1/2" x 1 1/16"	NONE
G4	14 1/2" x 1 1/16"	14 1/2" x 1 1/16"	14 1/2" x 1 1/16"
G5	14 1/2" x 1 1/16"	14 1/2" x 1 1/16"	14 1/2" x 1 1/16"
G6	14 1/2" x 1 1/16"	14 1/2" x 1 1/16"	14 1/2" x 1 1/16"
G7	14 1/2" x 1 1/16"	14 1/2" x 1 1/16"	14 1/2" x 1 1/16"
G8	14 1/2" x 1 1/16"	14 1/2" x 1 1/16"	14 1/2" x 1 1/16"
G9	14 1/2" x 1 1/16"	14 1/2" x 1 3/16"	14 1/2" x 1 1/16"
G10	14 1/2" x 1 1/16"	14 1/2" x 1 3/16"	14 1/2" x 1 1/16"
G11	14 1/2" x 1 1/16"	14 1/2" x 1 5/16"	14 1/2" x 1 3/16"
G12	14 1/2" x 1 1/16"	14 1/2" x 1 5/16"	14 1/2" x 1 3/16"

NOTES:

SHOP DRAWINGS FOR THE GIRDERS SHALL INCLUDE AN OVERALL LAYOUT WITH DIMENSION SHOWING THE RELATIVE UNLOADED VERTICAL POSITION OF EACH GIRDER OR GIRDER SEGMENT WITH RESPECT TO THE OTHERS IN THE SAME GIRDER LINE AND WITH RESPECT TO A FULL BASE OR WORK LINE TAKING INTO ACCOUNT THE PROFILE OF THE HIGHWAY AND CAMBER.

SHOP ASSEMBLY REFERENCE PARAGRAPH 4, SEC. S-7-12 OF THE CONSTRUCTION & MATL. SPECIFICATIONS. FOR THE PURPOSE OF CHECKING THE FIT-UP OF WELD JOINT PREPARATION AS SHOWN ON THE SHOP DRWG. LAYOUT REQUIRED IN THE ABOVE NOTE. ONLY TWO ADJACENT BEAMS NEED BE SHOP ASSEMBLED AT A TIME IN THEIR CORRECT, UNLOADED POSITIONS. ALL BEAMS SHALL BE ASSEMBLED & MATCH MARKED. FOR ADDITIONAL NOTES SEE DWG. #189

SHOP SPLICES: IF SHOP SPLICES ARE NECESSARY, THEIR LOCATION AND DETAIL SHALL BE SUBMITTED TO THE DIRECTOR FOR APPROVAL PRIOR TO ORDERING OF MATERIAL

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

STEEL FRAMING

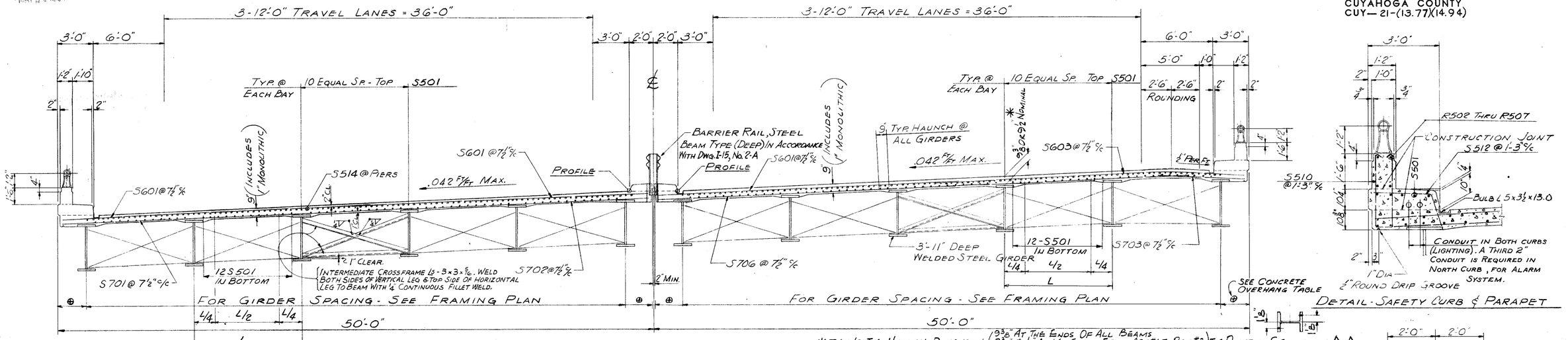
BRIDGE NO. CUY.-21-1515
WILLOW FREEWAY over ORANGE & E. 30TH
CUYAHOGA COUNTY U.S.R. 21

SCALE		DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED	
	C.A.T. D.F.		[illegible]	CS 8-6-62			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

194
204

CUYAHOGA COUNTY
CUY— 21-(13.77)(14.94)



DETAIL - SAFETY CURB & PARAPET

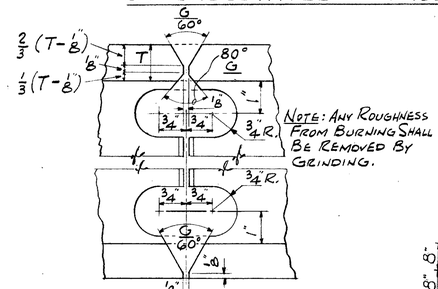
NOTE: ONLY THE GIRDERS IN SPANS 2 & 6 REQUIRE CAMBER. FOR OTHER SPANS, NO CAMBER IS REQUIRED. A "0" VALUE IN DEFLECTION TABLE DENOTES A NEGLIGIBLE VALUE UNDER 1/16".

DEFLECTION AND CAMBER

GIRDER	SPAN Nº 1	SPAN Nº 2				SPAN Nº 3	SPAN Nº 4	SPAN Nº 5	SPAN Nº 6				SPAN Nº 7	
	DEFLECTION DUE TO WT. OF STEEL	DEFLECTION DUE TO REMAINING DEAD LOAD	DEFLECTION DUE TO WT. OF STEEL	DEFLECTION DUE TO REMAINING DEAD LOAD	CONVEXITY REQUIRED FOR VERTICAL CURVE	SUM OF DEFLECTION & CONVEXITY	REQUIRED CAMBER	DEFLECTION DUE TO WT. OF STEEL	DEFLECTION DUE TO REMAINING DEAD LOAD	DEFLECTION DUE TO WT. OF STEEL	DEFLECTION DUE TO REMAINING DEAD LOAD	CONVEXITY REQUIRED FOR VERTICAL CURVE	SUM OF DEFLECTION & CONVEXITY	REQUIRED CAMBER	DEFLECTION DUE TO WT. OF STEEL	DEFLECTION DUE TO REMAINING DEAD LOAD
G1	0	0	5/8"	7/16"	5/16"	7/8"	1"	0	0	1/16"	3/16"	0	0	1/16"	0	0
G2	0	0	5/8"	1/2"	1/16"	11/16"	1"	0	0	1/16"	3/16"	0	0	1/16"	0	0
G3	0	0	5/8"	1/2"	1/16"	11/16"	1"	0	0	1/16"	3/16"	0	0	1/16"	0	0
G4	0	0	5/8"	1/2"	1/16"	11/16"	1"	0	1/16"	1/16"	3/16"	0	1/16"	1/16"	0	0
G5	0	0	5/8"	9/16"	1/16"	3/4"	1"	0	1/16"	1/16"	3/16"	0	1/16"	1/16"	0	0
G6	0	0	5/8"	1/2"	1/4"	3/8"	1"	0	1/16"	1/16"	3/16"	0	1/16"	1/16"	0	0
G7	0	0	5/8"	1/2"	5/16"	15/16"	1"	1/16"	1/8"	1/16"	1/4"	1/16"	1/8"	1/16"	0	0
G8	0	0	5/8"	1/2"	1/16"	11/16"	1"	1/16"	3/16"	1/16"	5/16"	1/16"	3/16"	1/16"	0	0
G9	0	0	5/8"	1/2"	1/16"	11/16"	1"	1/16"	3/16"	1/16"	5/16"	1/16"	3/16"	1/16"	0	0
G10	0	0	5/8"	1/2"	1/16"	11/16"	1"	1/16"	4"	1/16"	5/16"	1/16"	4"	5/8"	1/2"	1/16"	0	0
G11	0	0	5/8"	1/2"	1/16"	1¼"	1"	1/16"	4"	1/16"	3/8"	1/16"	1/4"	5/8"	1/2"	1/16"	0	0
G12	0	0	5/8"	3/8"	5/16"	13/16"	1"	1/16"	1/4"	1/16"	5/16"	1/16"	1/4"	5/8"	3/8"	5/16"	0	0

GIRDER	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12
R_1 (AT PIER Nº 5)	7/8"	11/16"	1¼"	1 7/16"	1 5/8"	1 13/16"	2 1/16"	2 5/16"	2 2/16"	2 3/4"	3"	3 4/16"
R_2 (AT PIER Nº 2)	5/8"	3/4"	15/16"	1 1/16"	1 3/16"	1 5/16"	1¼"	1 1/16"	1 1/16"	2"	2 8/16"	2 5/16"
R_3 (AT PIER Nº 6)	1 5/8"	1¾"	1 8/16"	2"	2 2/16"	2 4/16"	2 5/16"	2 3/16"	2 3/16"	2 7/16"	2 12/16"	2 14/16"
R_4 (AT PIER Nº 1)	1 5/8"	1¾"	1 8/16"	1 5/16"	2 1/16"	2 3/16"	2 1/16"	2 5/16"	2 5/16"	2 8/16"	2 7/16"	2 7/16"
R_5 (AT ABUT. Nº 2)	11/16"	11/16"	11/16"	3/4"	3/4"	13/16"	13/16"	3/4"	3/4"	3/4"	11/16"	11/16"
R_6 (AT ABUT. Nº 1)	11/16"	11/16"	11/16"	3/4"	3/4"	13/16"	13/16"	3/4"	3/4"	3/4"	11/16"	11/16"

SUPERELEVATED CROSS SECTION



NOTE: ANY ROUGHNESS FROM BURNING SHALL BE REMOVED BY GRINDING.

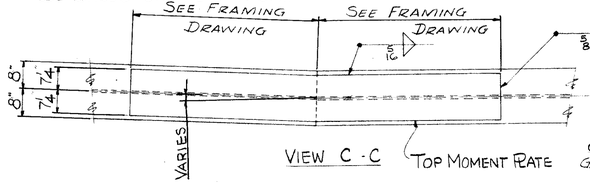
DETAIL "1"

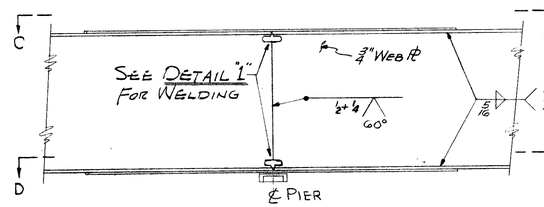
BEAM SPLICE WELDING PROCEDURE:

1- RAISE END OF BEAM AT PIER Nº 5 "R" (SEE TABLE)
2- BUTT-WELD BEAM FLANGES AND WEB AT PIER Nº 4, 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 PIER Nº 4. WELD SPECIAL CROSS-FRAMES AT PIERS IN PLACE.
4- LOWER END OF BEAM AT PIER Nº 5.
5 MAKE SPLICE AT PIER Nº 3, THEN PIERS Nº 5, 2, 6 AND 1 IN THAT ORDER, IN THE SAME MANNER RAISING THE END OF THE BEAMS "R" AS LISTED IN THE TABLE FOR EACH GIRDER. PROCEED WITH WELDING AS INDICATED, INCLUDING THE WELDING OF THE SPECIAL CROSS-FRAMES BEFORE LOWERING THE ENDS OF THE BEAMS.
6. Field Butt welds in girder flanges and webs shall be radiographed except those welds that occur in the bottom flange over the bearing device.

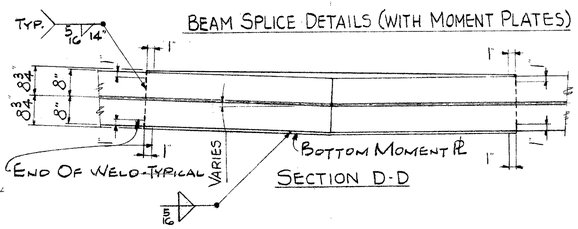
*THIS IS THE NOMINAL DIMENSION. (9 3/8" AT THE ENDS OF ALL BEAMS; 9 3/8" ± 1/16" AT MID SPANS FROM ABT. #1 TO PIER #3; 9½" ± 3/16" AT MID SPANS FROM PIER #3 TO ABT. #2) THE QUANTITY OF DECK CONCRETE TO BE PAID FOR SHALL BE BASED ON THIS DIMENSION, EVEN THOUGH DEVIATION FROM IT MAY BE NECESSARY BECAUSE THE TOP FLANGE OF THE BEAM MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE.

DECK SLAB HAUNCH: THE HAUNCH IN THE SUPERELEVATED 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" ON THE LOW SIDE AND BETWEEN 9" AND 12" ON THE HIGH SIDE. EXCEPT THAT 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.

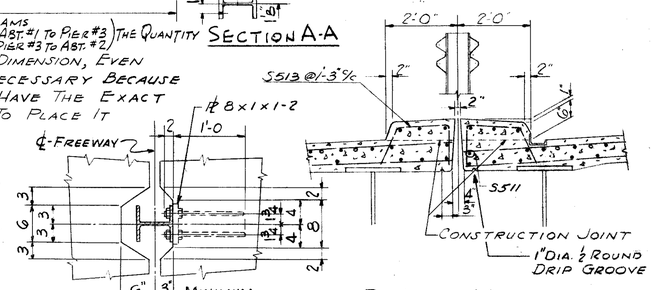




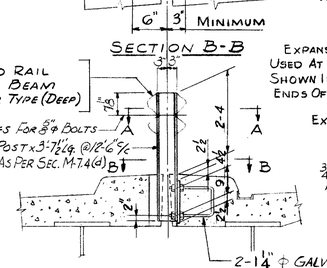
BEAM SPLICE DETAILS (WITH MOMENT PLATES)



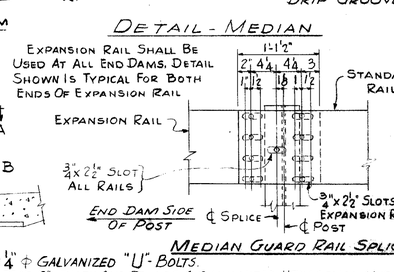
SECTION A-A



SECTION B-B



DETAIL - MEDIAN



MEDIAN GUARD RAIL SPLICE

DETAIL - BARRIER POST

⊕ CONCRETE OVERHANG FROM GIRDER ℄	GIRDER #1	GIRDER #6	GIRDER #7	GIRDER #12
ABUT. #1	2'-6"	1'-4 3/4"	1'-4 3/4"	2'-6 1/2"
PIER #1	1'-4 1/4"	1'-4 1/2"	1'-4 1/2"	1'-4 3/4"
PIER #2	1'-10"	1'-10 1/4"	1'-9"	1'-9 1/4"
PIER #3	2'-3 3/4"	2'-4"	2'-3 1/2"	2'-3 1/2"
PIER #4	2'-6 3/4"	2'-7"	2'-7"	2'-7"
PIER #5	2'-7 1/4"	2'-7 1/4"	2'-7 1/2"	2'-6 3/4"
PIER #6	2'-6 1/2"	2'-6 1/2"	2'-6 1/2"	2'-5 1/2"
ABUT. #2	2'-6"	2'-5 3/4"	2'-6"	2'-6"
℄ SPAN #1	1'-8 3/4"	1'-7"	1'-2 1/2"	2'-1 3/4"
℄ SPAN #2	1'-1 1/4"	2'-1 3/4"	1'-0 1/2"	2'-1 1/2"
℄ SPAN #3	1'-9 3/4"	2'-5 3/4"	1'-7 1/2"	2'-6 3/4"
℄ SPAN #4	2'-2"	2'-10"	2'-0 1/2"	2'-11 3/4"
℄ SPAN #5	2'-3 3/4"	2'-11 3/4"	2'-2 1/2"	3'-1 1/2"
℄ SPAN #6	2'-1"	3'-1"	2'-4"	3'-0 1/2"
℄ SPAN #7	2'-4"	2'-8 1/4"	2'-4"	2'-8"

NOTE:
FOR STIFFENERS AND CROSS-FRAMES AT PIERS SEE SHEET #189

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

SUPERSTRUCTURE DETAILS

BRIDGE NO. CUY-21-1515
WILLOW FREEWAY OVER ORANGE & E.30
CUYAHOGA COUNTY U.S.R. 21

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	C.T.		J.G.		8-9-02	7-8-02

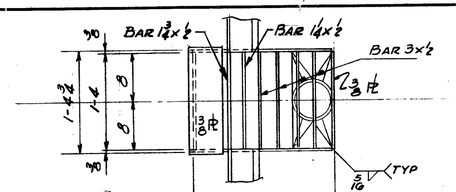
CONT. No. 58019 (28) SHEET ACCT. No. 1510

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

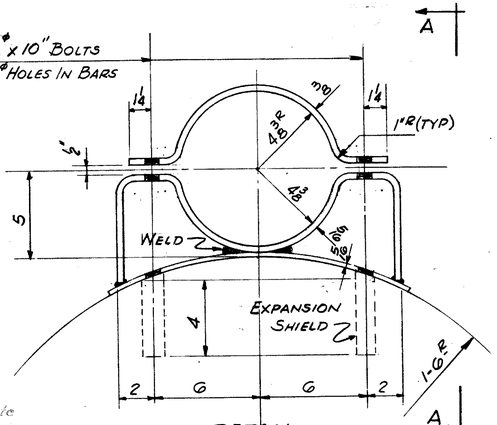
195/204

CUYAHOGA COUNTY
CUY—21-(13.77)(14.94)

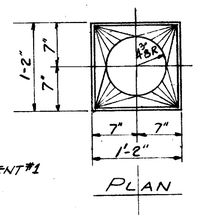
MICROFILMED MAY 24 1984

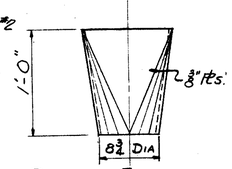


DETAIL - SCUPPER

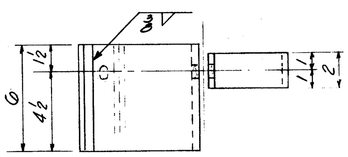


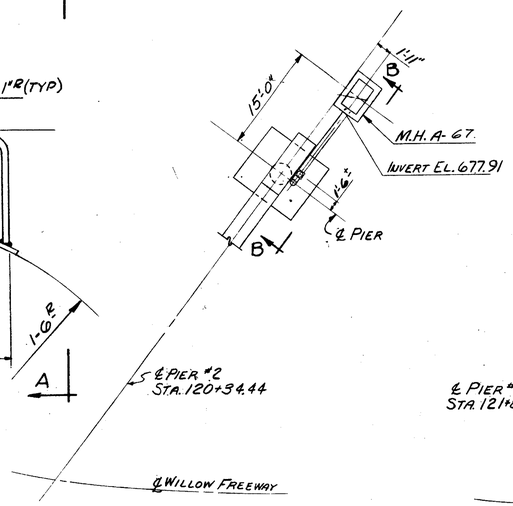
DETAIL
DOWNSPOUT SUPPORT
(PIPE SPECIAL)



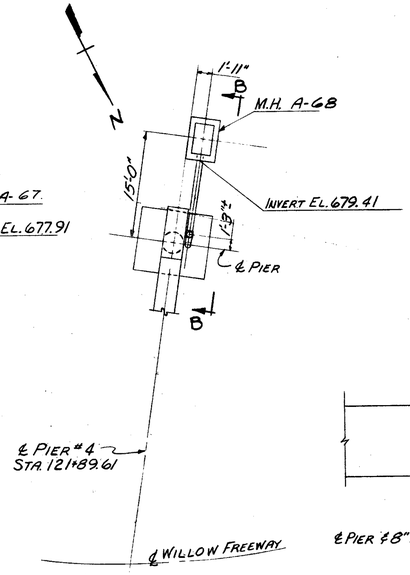


DETAIL - FUNNEL
(PIPE SPECIAL)

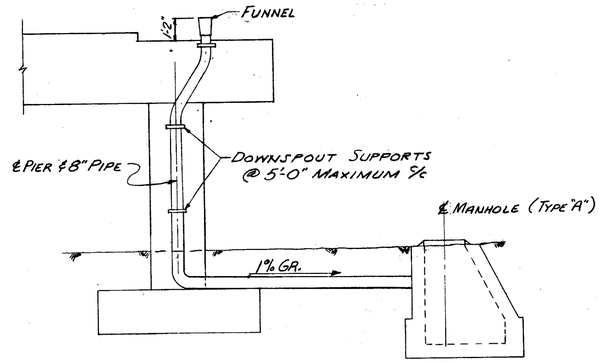




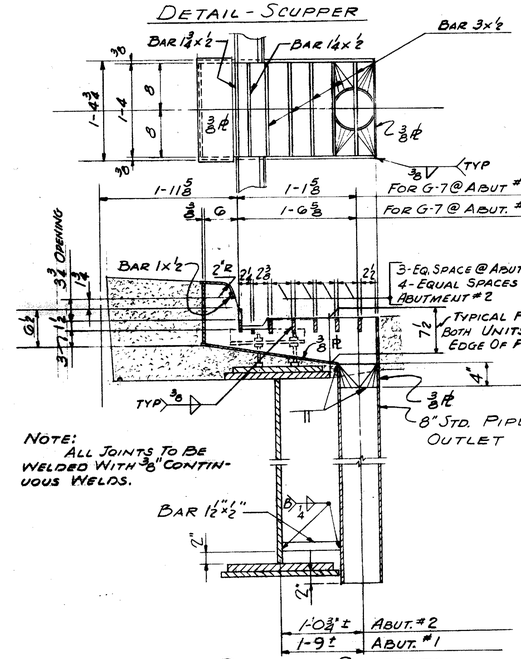
PLAN @ PIER - STA. 120+34.44



PLAN @ PIER - STA. 121+89.61

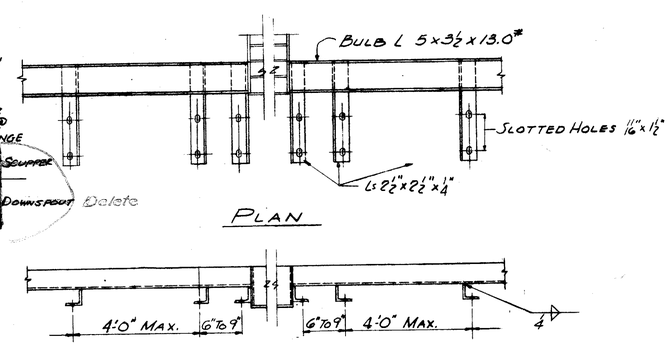


SECTION B-B

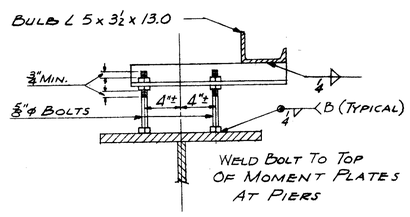


NOTE:
ALL JOINTS TO BE WELDED WITH ⅜" CONTINUOUS WELDS.

DETAIL - SCUPPERS
AT MEDIAN



DETAIL - GUTTER SUPPORT



GUTTER SUPPORT

Delete
INCLUDE SCUPPERS, OUTLET PIPES, BULB ANGLES AND ANGLE SUPPORT WITH STRUCTURAL STEEL FOR PAYMENT.

NOTES:

1 - DOWNSPOUTS SHALL BE 8" DIA. STANDARD WROUGHT IRON PIPE OR HOT DIP GALVANIZED STEEL PIPE. JOINTS SHALL BE MADE BY WELDING OR BY VICTAULIC COUPLINGS OR BY AN APPROVED EQUIVALENT. ANY WELDING SHALL BE DONE BEFORE GALVANIZING. BRACKETS AND BOLTS FOR MOUNTING THE DOWNSPOUTS SHALL BE GALVANIZED STEEL. GALVANIZING FOR BOLTS PER SECTION M-10.30 WILL BE CONSIDERED SUFFICIENT. PIPE SPECIALS SHALL BE WROUGHT IRON OR HOT DIP GALVANIZED STEEL.

2 - DIMENSIONS SHOWING LOCATION OF SCUPPERS AND DOWNSPOUTS MAY BE ADJUSTED TO CLEAR STEEL WORK.

3 - MILLED JOINTS WILL BE PERMITTED IN BULB ANGES, BUT INDIVIDUAL LENGTHS SHALL BE AS LONG AS PRACTICABLE. SUPPORTS SHALL BE PLACED 6" TO 9" ON EACH SIDE OF JOINTS.

4. GUTTERS SHALL BE ACCURATELY ADJUSTED FOR ALIGNMENT AND GRADE, WITH ALLOWANCE FOR DEAD LOAD DEFLECTION, BEFORE CONCRETE IS PLACED.

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

SCUPPER & DOWNSPOUT DETAILS
BRIDGE NO. CUY-21-1515
WILLOW FREEWAY OVER ORANGE & E.30
CUYAHOGA COUNTY USR-21

SCALE DESIGNED	DRAWN	TRACED	DATE CHECKED	REVIEWED	DATE	REVISED
	C.A.T.		J.G.	CB	8-10-62	7-8-63

CONT. No. 5801(28) SHEET ACCT. No. 1585

EE-J

S-33

196
204

OHIO
CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

1/12

PART 2
CUY-77-13.77

TRYGVE HOFF & ASSOCIATES
ENGINEERS
CLEVELAND, OHIO

SCHEMATIC PLAN
SHOWING
ASSEMBLY OF R/W DRAWINGS

SCALE: 1" = 400'± DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
L.K.H.			J.S.P.			

MAR 23 1983

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

196A / 204

CUYAHOGA COUNTY
CUY—21—(13.77)—(14.94)

2 / 12

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' DATE

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	J.S.P.		J.S.P.			

MAR 19 1963

CONT. No. 58019 SHEET A. F. No. 6005

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY— 21— (13.77)-(14.94)

PART 2

196B 204

3 12

PARCEL NO.	ACQUIRED AS PARCEL NO.	OWNER	AREA TO BE ACQUIRED SQ. FT.	EXIST BLDG.	SHEET NO.	RESIDUAL AREA LEFT OF E SQ. FT.	RESIDUAL AREA RIGHT OF E SQ. FT.	REMARKS
822 LA		NED KAMBUROFF	3,291	YES	201	—	3,441	
823 LA		WOODLAND EAST 39TH STREET CORP.	3,747	—	201	—	4,493	
824 LA		BENJAMIN FRIEDMAN	10,510	—	201	—	5,797	
827 LA		CLEVELAND TRUST COMPANY	10,849	—	201	—	—	ALSO OWNER OF PARCEL 830 & 858
828 LA		ERIC A. & MABEL LAWRENCE	1,473	YES	201	—	1,037	
829 LA		F. & B. INCORPORATED	5,020	YES	201	—	—	
830 LA		CLEVELAND TRUST COMPANY	6,275	—	201	—	—	SEE PARCEL 827 LA
852 LA		EDWARD UDELSON	42,123	YES	201	—	26,644	
853 LA		HARRY L. MANHEIM	19,350	YES	201	—	—	
854 LA		JULIUS SIMON	9,259	—	200	—	2,257	
855 LA		LOUIS & ROSE SHUBERT	878	YES	200	—	10,942	
856 LA		ISADORE & RUBIN SACKS	2,357	YES	200	—	5,523	
857 LA		ROSE KREIT, ET AL	8,127	YES	201	—	—	
858 LA		CLEVELAND TRUST COMPANY	8,036	—	201	—	—	SEE PARCEL 827 LA
859 LA		DAVID MOSKOWITZ	4,644	YES	201	—	—	
861 LA		JEAN WEISER	2,607	—	201	—	—	
863 LA		ESTATE OF REGINA SCHLACHET	3,603	—	201	—	—	
864 LA		HOWARD & S. ABRAMS	3,250	YES	201	—	—	
865 LA		JACOB ABRAMS, ET AL	3,250	—	201	—	—	
866 LA		LOUIS & JULIUS CHERRY	6,078	YES	201	—	—	
867 LA		ALEX ZEIDMAN & YETTA Z. OSTROVSKY	4,596	YES	200	—	—	
868 LA		C. & M. ROTHENBERG	9,360	YES	200	—	—	
869 LA		MARJORIE RINI	4,740	—	200	—	—	
871		CITY OF CLEVELAND	1,918	—	200	—	2,800	
871 LA		CITY OF CLEVELAND	82	YES	200	—	—	
872		THE 3500 WOODLAND CORPORATION	350	—	200	—	68,492	
901 LA		ANNA WEISFELD	—	—	201	—	—	L.A. ALONG N. PROPERTY LINE
902 LA		SAM KATZ	—	—	201	—	—	L.A. ALONG N. PROPERTY LINE
903 LA		HAROLD GREENBAUM	3,553	—	201	8,536	—	
904 LA		RINI WINE COMPANY	5,793	YES	201	—	—	
905 LA		RAMUS TRUCKING LINE, INC.	5,793	—	201	—	—	ALSO OWNER OF PARCEL 906 LA
906 LA		RAMUS TRUCKING LINE, INC.	20,639	YES	200	—	—	SEE PARCEL 905 LA
907 LA		SAMUEL B. TILLES	4,080	—	200	—	—	
909		BLORANGE, INCORPORATED	3,526	YES	201	—	—	
910		MICHAEL E. COZZA, ET AL	2,105	YES	200	2,015	—	
911		SAM & MARY CACOLICI	615	—	200	3,505	—	
912 LA		SAM FRIEDMAN	4,323	YES	200	—	—	
913 LA		WESTERN TRADING CORPORATION	55,204	YES	200	—	2,119	
914 LA		MARY LUPICA AKA MARIA LUPICA	4,182	YES	200	—	346	
915 LA		GLADYS DATTILO & BESSIE DATTILO	5,797	YES	200	—	3,258	
916 LA		HILLCOME REALTY COMPANY	1,017	—	200	—	3,511	
917 LA		CHARLES J. VALORE, ET AL, TR.	50	YES	200	—	4,450	
918 LA		KORNEY & P. ZAGORODSKY	1,349	YES	200	—	2,401	
919 LA		EMIL & MARY KOZAK	450	—	200	—	3,300	
921 LA		JOSEPH & LUCIA SUROVI	537	YES	200	3,412	—	
923 LA		WESTERN TRADING CORPORATION	7,708	—	200	500	—	
924 LA		OLGA WAGNER & PAULINE BAUER	2,604	—	200	1,500	—	2501 S.F. RESIDUE VACATED AS
925 LA		EMIL SHIENKARUK, JR., H. SHIENKARUK, ET AL	1,603	YES	200	2,501	—	SHOWN IN VOL. 13158 PG. 685 OF
926 LA		MAX BASSICHIS	653	YES	200	15,763	—	CUYAHOGA COUNTY RECORDS
								SEE R/W SHT. 7.
978 S		ERIE-LACKAWANNA RAILROAD COMPANY	10,184	—	202	—	—	20 FEET SEWER EASEMENT

PARCEL NO.	ACQUIRED AS PARCEL NO.	OWNER	AREA TO BE ACQUIRED SQ. FT.	EXIST BLDG.	SHEET NO.	RESIDUAL AREA LEFT OF E SQ. FT.	RESIDUAL AREA RIGHT OF E SQ. FT.	REMARKS
1511 LA		MILTON & H. BERNS	5,342	YES	199	—	—	
1512 LA		YARO J. & MARY ANN FORTIER	5,215	YES	199	—	—	
1513 WL		KATRINE MALBASA	5,151	YES	199	—	—	
1514 WL		JOSEPHINE MASEK	5,065	YES	199	—	—	
1515 WL		STEVE P. & E. GULYAS	3,574	YES	199	—	—	
1516 WL		VIOLA F. DOERING, ET AL	3,627	YES	199	—	—	
1551 WL		NATIONAL BOX & CAN CO.	24,544	YES	199	—	—	
1552 WL		ALBERT A. LEVIN	8,295	YES	199	—	—	
1553 WL	1553 LA	HARVEY PEKAR	3,615	YES	199	—	—	
1554 WL		RICHARD J. BICAN	4,255	YES	199	—	—	
1555 WL	1555 LA	MARYANNA KALISZEWSKI	4,535	YES	199	—	—	
1556 WL		WILLIE R. & RUTH LEWIS	4,541	YES	199	—	—	
1557 WL		EVA & IGNATZ ZABSKI	3,644	YES	199	—	—	
1558 WL		ELEANOR PANEK	4,564	YES	199	—	—	
1559 WL		ANNA SRBLJANOVICH	4,577	YES	199	—	—	
1560 WL		CARL GRUNWALD	4,586	YES	199	—	—	
1561 WL		FRANK J. TAITL	4,599	YES	199	—	—	
1562 WL		P. & D. OLIVO	4,608	YES	199	—	—	
1563 WL		ANNA L. MALICKY	4,622	YES	199	—	—	
1564 WD		FRANK H. KRETSCHMER, ET AL	2,310	YES	199	—	2,320	
1565 WL		JOS. & ROSE VAN CHATA	142	YES	199	—	—	
1565 WD		JOS. & ROSE VAN CHATA	4,095	YES	199	—	991	
1567 WD		ZYGMUNT & A. GOSZCZYNSKI	1,943	YES	199	—	2,143	
1569 WD		ANTONIA HOLUB - 1/2 Int. STEVE STOYKOTT	772	YES	199	—	3,919	
1601 WL		ANN MOLONE & C. F. DENSE	5,070	YES	198	—	—	
1602 WL		EDWARD F. & ROSE M. CIRK	4,548	YES	198	—	—	
1603 WL		WM. & LOUISE DRAGON	6,022	YES	198	—	—	
1604 WL		ETHEL PLACEK	9,576	—	198	—	—	
1605 WL		NATHAN WOHL	4,079	YES	198	—	—	
1606 WL		ADELAIDE SHEPPARD, ET AL	4,281	—	198	—	—	
1607 WL		MINNIE PAGEL	3,058	YES	198	—	—	
1609 WL		EDITH COERSMEYER	4,088	YES	198	—	—	
1611 WL		GUARANTY MORTGAGE CO. INC.	3,754	YES	198	—	—	
1613 WD		THE FREEWAY INVESTMENT CO.	4,572	YES	198	—	—	
1614 WD		PETER & GRACE WISHNESKY	4,838	YES	198	—	—	
1615 WD		CHARLES & ANNA KRIAK	4,594	YES	198	—	—	
1616 WD		ANDREW & ANNA ESTONA	1,350	—	198	—	3,488	
1617 WD		ROSE HAZLINGER, ET AL	1,590	YES	198	—	3,026	
1653 WL		STANLEY & S. BUGAJ	1,710	YES	198	5,175	—	
1654 WL		MICHAEL R. & J. A. KRONE	8,918	YES	198	—	—	
1655 WL		ANNA & FRANK BENOS	12,735	YES	198	—	—	
1656 WL		JAROSLAV & TILLIE KOUDELA	19,559	YES	198	—	—	
1657 WL		GEORGE A. HECKATHORNE	6,429	YES	198	—	—	
1658 WL		STATE OF OHIO, EAS. PURPOSES	12,789	—	198	—	—	
1664 WL		MIKE & J. ZORICH	2,858	YES	198	—	—	
1665 WL		JADWIGA JAGLA	3,045	YES	198	—	—	
1666 WL		STELLA AWROSKI	2,551	YES	198	—	—	
1667 WL		ANN JINDRA, ET AL - 1/2 INT. IRENE P. MAKAR	6,102	YES	198	—	—	
1668 WL		REPUBLIC STEEL CORP.	26,863	—	198	—	—	
1701 T		STELLA NASTAL	960	—	198	—	9,781	
1910 S		CITY OF SHAKER HEIGHTS	14,058	—	203	—	—	20 FEET SEWER EASEMENT
2051 S		REPUBLIC STEEL CORP.	3,647	—	204	—	—	20 FEET SEWER EASEMENT
AREA OF EASEMENT FROM REPUBLIC STL. CORP. TO B.&O. RAILROAD			547					BREAKDOWN OF PARCEL 2051 S
AREA OF EASEMENT FROM REPUBLIC STL. CORP. TO RIVER TERMINAL R. R.			3,100					
2051 T		REPUBLIC STEEL CORP. 44,141	~~41,164~~	—	204	—	—	TEMPORARY

CONT. No. 58019 SHEET ADDT. No. 6077

A.M.	Parcel 2051-T Acreage changed.	5-24-63
NAME	REVISIONS	DATE

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

SCALE	DATE					
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JSP	PH		JSP			

MAR 19 1963

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CUYAHOGA COUNTY
CUY— 21-(13.77)-(14.94)

197 / 204

4 / 12

SS-18 FENCE & GATE TYPE "C"		
SH. NO.	FENCE L.FT.	GATE NO.
197	2,238	1
198	2,131	2
200	1,993	2
201	2,010	2
201A	942	2
TOTAL	9,314	9

TOTAL LINEAL FEET SS-18 FENCE TYPE "C" & TOTAL NO. SS-18 GATES TYPE "C" CARRIED TO GENERAL SUMMARY SH. 14

LEGEND:
SS-18 FENCE TYPE "C"
C.P.A. DENOTES CORNER POST ASSEMBLY
E.P.A. " END " "
I.A.P.A. " INTERMEDIATE ANCHOR " "

O.L. 282

O.M. STAFORD SUB-DIVISION V.11, P.34
SUB-LOT NOS. 98,99,100,121,122,123,164, 165,166,187,188, & 189

A. A. JEWETT ALLOTMENT
V.22 - P.6
SUB-LOT NOS. 315 THRU 320, 322 & 323

SS-18 FENCE TYPE "C"
FENCE 2238 L.FT.
GATE 1

SEE R/W DWG. 198

EAST 45TH STREET 50'

60' AVE.

50' AVE.

JEWETT

CZAR AVE. 50'

FINN AVE. 40'

EXISTING R/W

BEGIN PROJECT
℄ STA. 45+76.05
CUY-21-(13.77)-(14.94)

EXISTING P.C. STA. 48+01.71

P.C. STA. 59+19.51

℄ WILLOW FREEWAY

N 5° 02' 52" W

℄ STA 199+83.68
CUY-21-13.20

NOTE:- RIGHT OF WAY PURCHASED UNDER PROJECT SECTION CUY-21-13.20

EXISTING RAMP

PERSHING

JEWETT AVE.

CZAR AVE.

℄ E. 47TH ST.

EXISTING R/W

℄ & 14' GATE

E. 47TH ST.

BROADWAY AVE.

NOTE:- THIS DRAWING SHOWS THAT NO ADDITIONAL RIGHT OF WAY IS REQUIRED FOR FREEWAY CONSTRUCTION BETWEEN PERSHING AVE. & FINN AVE.

CONSTRUCTION LIMITS

C.P.A. 169' LT. 198+47.5
E.P.A. 130' LT. 198+33
I.A.P.A. 160' LT. 47+93.5
C.P.A. 161' LT. 50+09
C.P.A. 131' LT. 50+09
I.A.P.A. 130' LT. 51+62
I.A.P.A. 115' LT. 53+05
C.P.A. 120' LT. 54+55
E.P.A. 128' RT. 198+23
C.P.A. 151' RT. 198+34.5
C.P.A. 162' RT. 46+79
C.P.A. 131' RT. 46+80
C.P.A. 162' RT. 50+53
C.P.A. 206' RT. 51+52
C.P.A. 240' RT. 51+51
C.P.A. 202' RT. 50+52
C.P.A. 250' RT. 54+58

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. / G. OR GAR.	CAR / 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

SCALE 1" = 50'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
J.S.P.	G.O'C.		J.S.P.			

DATE

CONT. No. 58019 SHEET ACCT. No. 6061

MAR 19 1963

O.L. 282
BEGIN R/W ACQUISITION CUY-21-(13.77)-(14.94)
THE THOMPSON-POMEROY SUBDIVISION V.28 P.25
SUB-LOT Nos 1 TO 3 & 7 TO 14 INC.
POMEROY & STANLEY'S SUBDIVISION V.12 P.16
LOT No 10 & 17
WM. WARD ET. AL. ALLOT. V.27, P.27
SUB-LOT NOS. 1 & 2
℄ CURVE DATA, WILLOW FREEWAY
R = 5729.58'
Δ = 9° 36' 26"
D = 1° 00' 00"
T = 481.49'
L = 960.72'
FED. RD. DIVISION | STATE | PROJECT
2 | OHIO
198/204
5/12
CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)
Total Residue Acreage along Sewer Easement 10,136 F
B.P.R. Participation Line.
Total Sewer Easement Acreage 14,318 ±
SEE R/W DWG. 197
EXISTING R/W
CONSTRUCTION LIMITS
FINN AVE.
CONSTRUCTION LIMITS FOR SEWER
E. 45 ST. 40'
ROSEVILLE CT.
DILLE AVE.
PROPOSED WALL
EXISTING R/W
℄ B-S RAMP
RETAINING WALL
N 5°02'52"W
NOTE:- RIGHT OF WAY PURCHASED UNDER PROJECT SECTION CUY-21-13.20
EXISTING RAMP
EXISTING R/W
E. 47 ST.
BROADWAY "SEE NOTE" 66'
℄ TEMPORARY RUN-AROUND
℄ WILLOW FREEWAY D=1°00'
SEE R/W DWG. 199
S B S-E RAMP
NOTE
66 FT. WIDTH DEDICATED 8-21-1822
AS PER COUNTY ENGINEER'S
ROAD RECORD BOOK C-196
B.P.R. Participation Line.
ROAD 'A'
CONSTRUCTION LIMITS
SS-18 FENCE TYPE "C"
FENCE 2,13_ L. FT.
GATE 2
GALLUP AVE. 50'
LESTER AVE. 50'
DOUSE AVE.
JABESH GALLUP ALLOT. V.4 P.52
SUB-LOT Nos 1 TO 38
THOMAS S. & MARY L. DOUSE ALLOT. V.8 P.28
SUB-LOT Nos 1 TO 9 INC.
SEE SHEET 197 FOR R/W LEGEND
A.M. | B.P.R. Particip. Line added through Pcl. 1654 to 1666 | 5-23-63
A.M. | B.P.R. Particip. Line added through Pcl. 1613 W.D. | 5-23-63
NAME | REVISIONS | DATE
TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO
R/W PLAN
PARCEL NUMBERS
SERIES 1601
1651
1701
SCALE 1" = 50
DATE
DESIGNED J.S.P. | DRAWN G.O'C. | TRACED | CHECKED J.S.P. | REVIEWED | DATE | REVISED
CONT. No. 58019
SHEET ACCT. No. 6062
MAR 19 1963

CONT. No. 58019 SHEET ACCT. No. 6063

MAR 19 1963

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

200
204

7
12

CUYAHOGA COUNTY
CUY – 21 – (13.77) – (14.94)

HOYT & McLAREN SUBD. V. 2 PG. 48
SUB-LOT NOS. 1 TO 16 INC. AND
55 TO 71 INC.

HOYT & McLAREN SUBD. V. 2 P. 48
SUB-LOT NOS. 1 TO 16 INC. AND
55 TO 71 INC.

O.L. 14
O.L. 15

O.L. 15
O.L. 16

O.L. 16
O.L. 17

CURVE DATA

D = 3°00'
Δ = 42°00'00"
R = 1909.86'
T = 733.13'
L = 1400.0'
E = 135.88'
CH = 1368.87'
N 44°39'18" W

PART OF PARCEL 925 LA VACATED AS SHOWN IN VOL. 13158 PG. 685 OF CUYAHOGA COUNTY RECORDS.

O. CUTTER SUBD. V. 1 P. 22
SUB-LOT NOS 1 TO 16 INC.

SUBSTITUTE CURVE DATA FOR 600.0' SPIRAL

D = 2°14'57.5"
Δ = 09°00'00"
R = 2547.21'
T = 200.47'
L = 400.11'
E = 7.88'
CH = 399.70'
N 19°09'18" W

RESUME R/W ACQUISITION FOR PROJECT SECTION CUY-21-(13.77)-(14.94)

HARVEY RICE ALLOT. V. 1 P. 37
SUB-LOT NOS 1 TO 11 INC.

J.W. SHERMAN ALLOT. V. 4 P. 1
SUB-LOT NOS 1 TO 10 INC.

SS-18 FENCE TYPE "C"
FENCE 1993 L.F.T.
GATE 2

SEE SHEET 197 FOR R/W LEGEND

EAST 34 ST. 60'
EAST 35 PL. 50'
EAST 37 ST. 60'
RD "D"
RAMP 30-5
RAMP 5-30
WILLOW FREEWAY
BURWELL AVE.
ORANGE AVE. 60'
WOODLAND AVE. 99'
DUNLAP COURT 16'
99' JAY AVENUE

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

R/W PLAN

SCALE: 1"=50'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
40H	A.S.		J.S.P.			

CONT. No. 58019 SHEET ACC'T 6066

MAR 19 1968

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

201
204

8
12

CUYAHOGA COUNTY
CUY-21-(13.77)-(14.94)

SUBSTITUTE CURVE DATA FOR 600.0' SPIRAL

D = 2°14'57.5"
Δ = 09°00'00"
R = 2547.21'
T = 200.47'
L = 400.11'
E = 7.88'
CH = 399.70'
N 70°09'18" W

CURVE DATA

D = 3°00'
Δ = 42°00'00"
R = 1909.86'
T = 733.13'
L = 1400.0'
E = 135.88'
CH = 1368.87'
N 44°39'18" W

MAYFLOWER RD. 80'
ORANGE AVE. 60.33'
WOODLAND AVE. 99'
EAST 29 ST. 60'
℄ EAST 30 ST. 50'
EAST 31 ST. 60'
EAST 32 ST. 60'
ERTON AVE. 60'
12' ALLEY
O.L. 12
O.L. 13
O.L. 14
O.L. 15
E. 29 ST.
E. 30 ST.
E. 31 ST.
E. 33 ST.
WILLOW FREEWAY
℄ WILLOW FREE WAY
RELOCATED ORANGE AVE.
RAMP S-30
RAMP 30S
RD. "D"
R/W PURCHASED UNDER PROJECT CUY-42-18.29
SEE R/W DWG. 201A
END R/W ACQUISITION FOR PROJECT SECTION CUY-21-(13.77)-(14.94)
CONSTRUCTION LIMIT
EXISTING LA
CONSTRUCTION LIMITS
10' MEDIAN
3 LANES 36'
4 LANES 36'
S S-18 FENCE TYPE "C"
FENCE 2010 L FT.
14' GATE 2
JOSEPH PERKINS ALLOT. V.2 P.33
SUB-LOT NOS 4 TO 8 INC.
ELISHA TAYLOR & JAMES M. HOYT SUBD. V.1 P.1
SUB-LOT NOS 1 TO 5 INC.
ELISHA TAYLOR & JAMES M. HOYT SUBD.V.1 P.1
SUB-LOT NOS 6 TO 12 INC. AND 40 TO 43 INC.
NOTE: LOCATE FENCE POSTS IN FIELD TO CLEAR PIER FOOTERS.
SEE SHEET 197 FOR R/W LEGEND

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

R/W PLAN

SCALE: 1"=50'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
HH	A.S.		J.S.P.			

CONT. No. 58019 SHEET ACCT. No. 6067

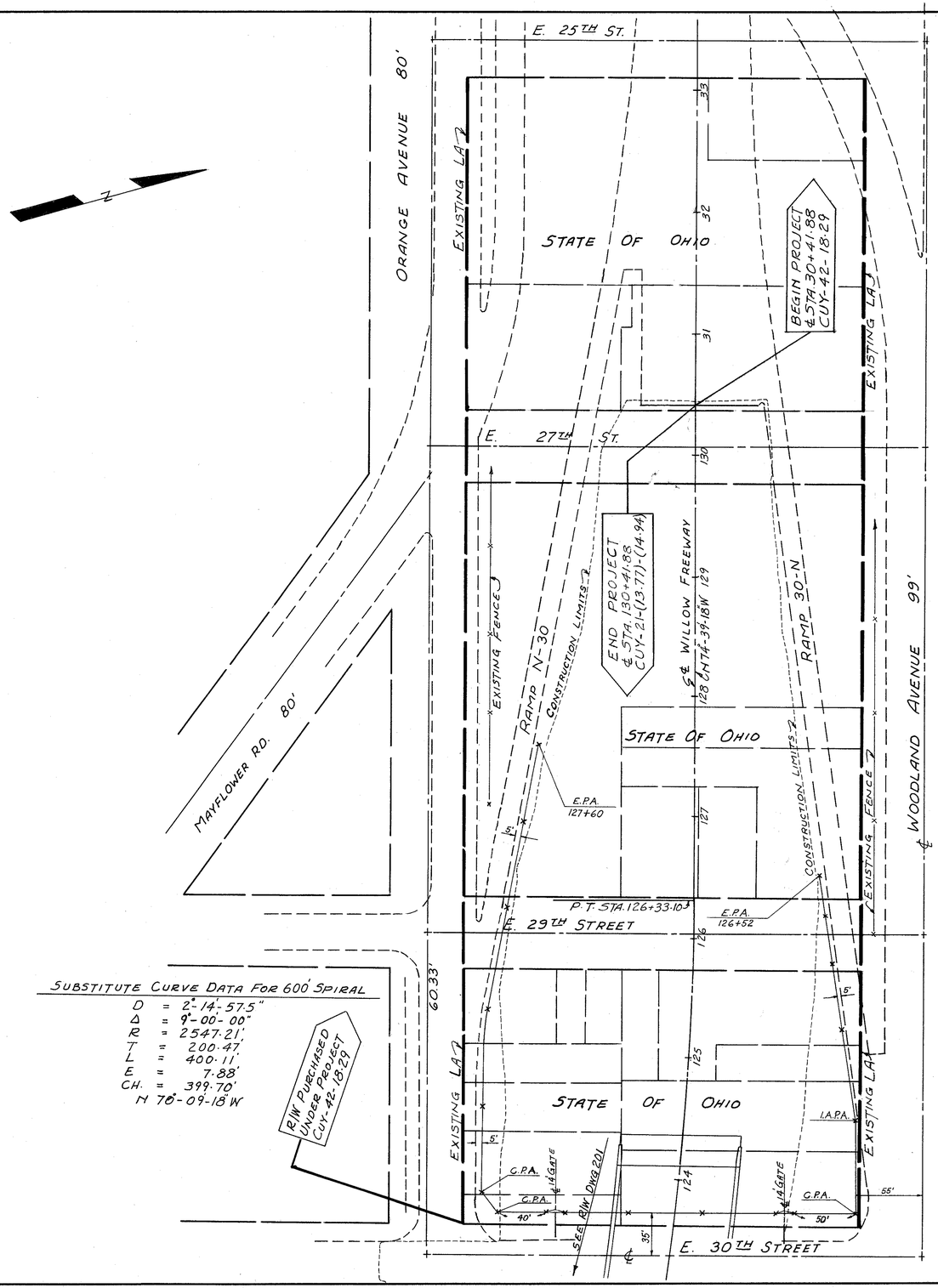
MAR 19 1963

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

201A
204

CUYAHOGA COUNTY
CUY— 21— (13.77)-(14.94)

9
12



SUBSTITUTE CURVE DATA FOR 600' SPIRAL

D	=	2°-14'-57.5"
Δ	=	9°-00'-00"
R	=	2547.21'
T	=	200.47'
L	=	400.11'
E	=	7.88'
CH.	=	399.70'
		N 76°-09-18" W

SS-18 FENCE & GATE TYPE "C"

FENCE	942 L.FT.
14' GATE	2

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

R/W PLAN

SCALE 1" = 50'

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
	JSP L.K.H.		JSP			

DATE

CONT. No. 58019 SHEET ACCT. No. 6081

MAR 19 1963

CONT. No. 58019 SHEET ACCT. No. 6057

MAR 19 1963

CONT. No. 58019 SHEET ACCT. No. 6079

MAR 19 1963

CONT. No. 58019 SHEET ACCT. No. 6046

MAR 19 1963