



CUY-90-14.90

PID 77332/85531

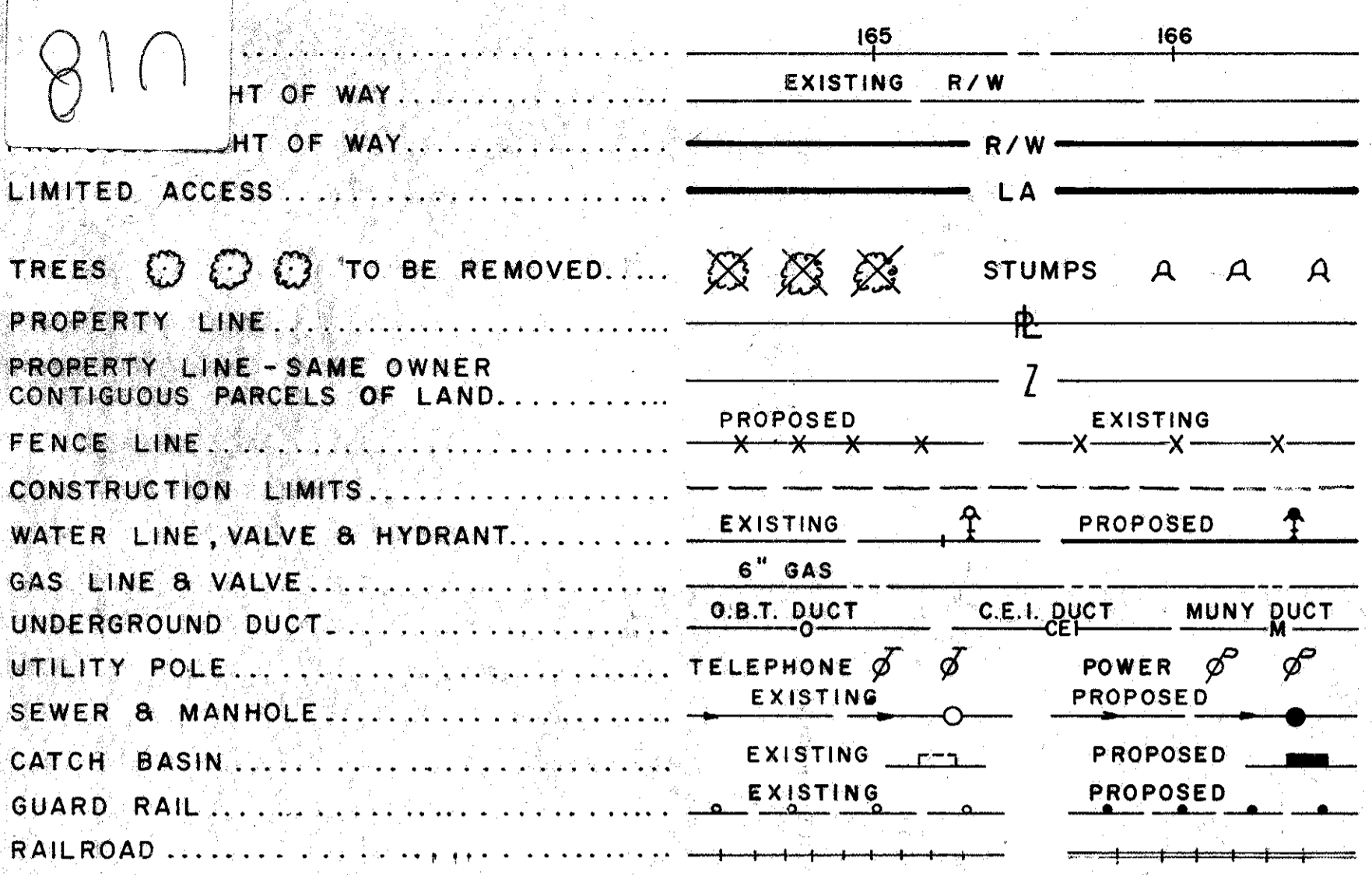
APPENDIX EX-41

CUY-490-0169 PID 0.072

(Reference Document)

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

**Innerbelt Bridge
Construction Contract Group 1 (CCG1)**



| DESIGN DESIGNATION | |
|--------------------|---------|
| ADT 1985..... | 30,537 |
| ADT 2005..... | 41,415 |
| DHV..... | 10% ADT |
| DIR. DIST. | 60%-40% |
| TRUCK TRAFFIC..... | 5% |
| DESIGN SPEED..... | 70 MPH |

UNDERGROUND UTILITIES
48 HOURS BEFORE YOU DIG
 Call 800-362-2764 (Toll Free)
 OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS MUST BE CALLED DIRECTLY

STATE OF OHIO
 DEPARTMENT OF TRANSPORTATION
CUY-490-1.69
 CITY OF CLEVELAND
 COUNTY OF CUYAHOGA

OHIO
 FHWA REGION 5
 FEDERAL PROJECT
CUY-490-1.69
I-IR490-3(9)29

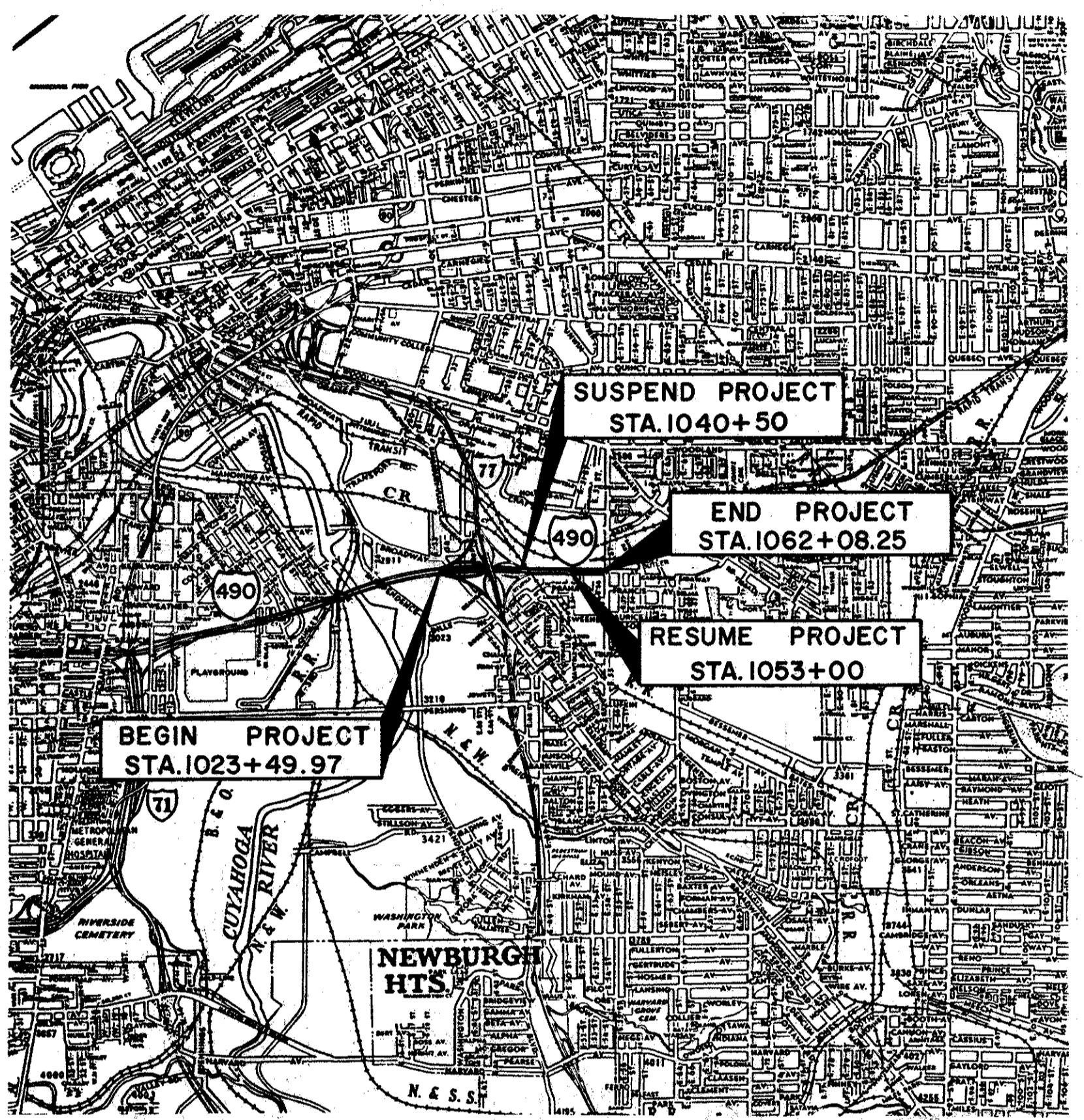
The above section designation shall govern in lieu of CUY.490-1.49 shown throughout the plans

1983 SPECIFICATIONS
LIMITED ACCESS

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

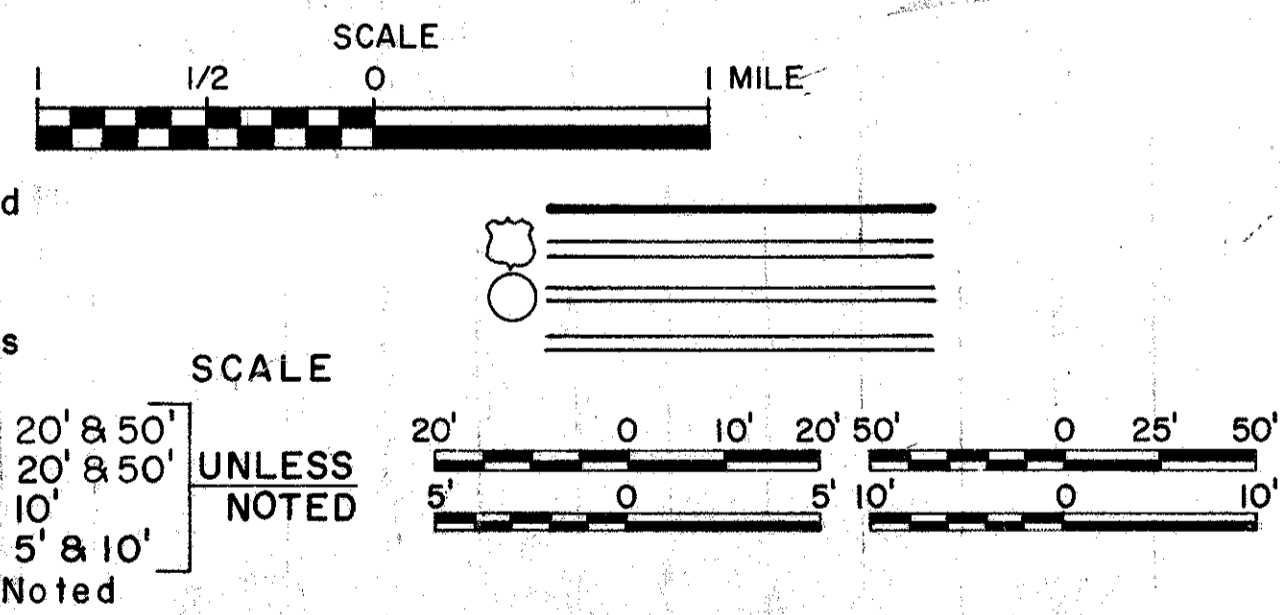
The standard specifications of the State of Ohio, Department of Transportation, including changes and supplemental specifications listed in the proposal shall govern this improvement.

I hereby approve these plans and declare that the making of this improvement will not require the closing 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.

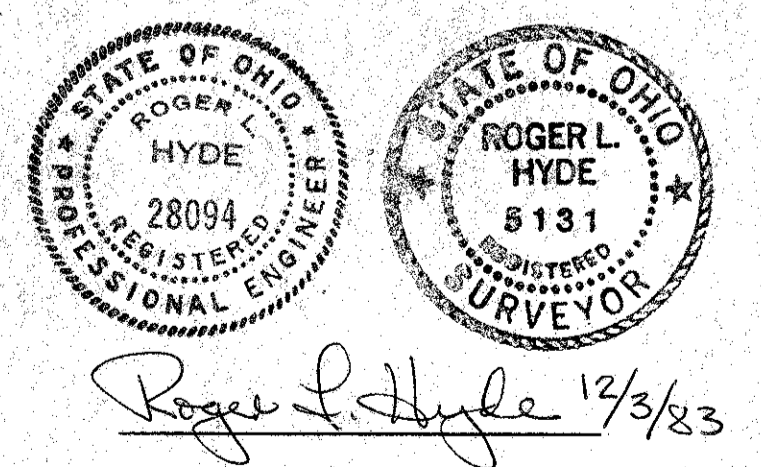


| LINE DATA | | | |
|--|-----------------------|-------------------|---------------|
| I-490 | STA. 1023 + 49.97 To | STA. 1040 + 50 | 1,700.03 L.F. |
| I-490 | STA. 1053 + 00.00 To | STA. 1062 + 08.25 | 908.25 L.F. |
| LENGTH OF PROJECT 2,608.28 L.F. or 0.494 Miles | | | |
| ADD FOR APPROACHES | | | |
| I-490 | STA. 1021 + 61.56 To | STA. 1022 + 51.53 | 89.97 L.F. |
| I-490 | STA. 1040 + 50.00 To | STA. 1053 + 00.00 | 1,250.00 L.F. |
| BROADWAY | STA. (-) 6 + 10.00 To | STA. 38 + 00.00 | 4,410.00 L.F. |
| DILLE AVENUE | STA. 5 + 00.00 To | STA. 9 + 77.00 | 477.00 L.F. |
| E. 55th STREET | STA. 0 + 35.00 To | STA. 21 + 65.00 | 2,130.00 L.F. |
| I-77 | STA. 130 + 30.00 To | STA. 131 + 30.00 | 100.00 L.F. |
| I-77 | STA. 162 + 65.00 To | STA. 163 + 65.00 | 100.00 L.F. |
| I-77 | STA. 176 + 60.00 To | STA. 177 + 60.00 | 100.00 L.F. |
| I-77 | STA. 189 + 75.00 To | STA. 190 + 75.00 | 100.00 L.F. |
| I-77 | STA. 49 + 45.00 To | STA. 50 + 45.00 | 100.00 L.F. |
| I-77 | STA. 55 + 75.00 To | STA. 62 + 23.00 | 648.00 L.F. |
| I-77 | STA. 64 + 48.00 To | STA. 65 + 48.00 | 100.00 L.F. |
| I-77 | STA. 89 + 40.00 To | STA. 90 + 40.00 | 100.00 L.F. |
| I-77 | STA. 100 + 50.00 To | STA. 101 + 50.00 | 100.00 L.F. |
| I-77 | STA. 118 + 15.00 To | STA. 119 + 15.00 | 100.00 L.F. |
| I-77 | STA. 32 + 00.00 To | STA. 33 + 00.00 | 100.00 L.F. |
| I-77 STATIONING | | | |
| RAMP N-W | 90 + 15.00 To | 81 + 20.00 | 895.00 L.F. |
| RAMP N-E | 86 + 65.00 To | 72 + 10.00 | 1,455.00 L.F. |
| RAMP E-N | 72 + 40.00 To | 87 + 00.00 | 1,460.00 L.F. |
| RAMP W-N | 78 + 65.00 To | 84 + 90.00 | 625.00 L.F. |
| RAMP W-S | 62 + 23.00 To | 79 + 30.00 | 1,707.00 L.F. |
| RAMP S-W | 65 + 90.00 To | 80 + 90.00 | 1,500.00 L.F. |
| RAMP E-S | 75 + 15.00 To | 66 + 30.00 | 885.00 L.F. |
| RAMP S-E | 65 + 90.00 To | 71 + 20.00 | 530.00 L.F. |
| TOTAL LENGTH OF APPROACHES 19,061.97 L.F. or 3.610 Miles | | | |
| TOTAL LENGTH OF WORK 21,670.25 L.F. or 4.104 Miles | | | |

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Portion to be improved
 Federal Roads
 State Roads
 Other Roads & Streets



PLANS PREPARED BY
WESTON
 DESIGNERS-CONSULTANTS
 A BUSINESS TRUST
 3659 GREEN ROAD
 CLEVELAND, OHIO 44122

PROJECT: **CUY-490-1.69**
 Date of Letting _____ 19____
 Contract No. _____

| SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS | | | | | | | | | | | |
|---|----------|------------------------------|----------|--------------------------|----------|----------|---------|----------|----------|----------|---------|
| BP-1 | 6-1-65 | F-3 | 5-1-76 | MC-1 | 6-13-69 | HL-5 | 9-6-73 | TC-16.20 | 3-1-79 | TC-41.41 | 8-2-79 |
| BP-2 | 12-6-76 | F-4 | 11-10-83 | | | HL-6 | 3-22-77 | TC-18.26 | 5-31-79 | TC-42.10 | 8-19-77 |
| BP-3 | 12-6-76 | | | MC-4 | 7-26-76 | HL-7 | 1-21-76 | TC-21.10 | 5-24-79 | TC-42.20 | 3-26-79 |
| BP-4 | 7-16-81 | GR-1 | 2-5-82 | MC-5 | 6-12-75 | HL-8 | 1-21-76 | TC-21.20 | 5-31-79 | TC-51.10 | 3-30-79 |
| BP-5 | 7-16-81 | GR-2B | 2-5-82 | MC-6 | 6-1-65 | HL-9 | 3-22-77 | TC-21.40 | 3-1-79 | TC-51.11 | 4-3-79 |
| BP-6 | 6-1-65 | GR-3 | 2-5-82 | MC-7 | 10-15-76 | HL-10 | 6-1-79 | TC-21.41 | 3-1-79 | TC-52.10 | 4-3-79 |
| BP-7 | 12-6-76 | GR-3A | 2-5-82 | MC-9 | 11-1-77 | HL-11 | 6-1-79 | TC-22.10 | 3-1-79 | TC-52.20 | 4-3-79 |
| BP-10 | 1-3-75 | GR-4 | 2-5-82 | MC-9A | 5-1-81 | HL-12 | 4-6-73 | TC-22.20 | 3-1-79 | TC-61.10 | 4-5-82 |
| | | GR-4A | 2-5-82 | MC-11 | 8-1-78 | HL-15 | 1-21-76 | | | TC-71.10 | 4-9-79 |
| BP-12 | 7-7-81 | GR-5 | 2-5-82 | MH-1 | 6-12-75 | HL-16 | 4-6-73 | TC-31.21 | 3-6-79 | TC-72.20 | 2-26-82 |
| BP-D | 12-6-76 | GR-6 | 2-5-82 | MH-3 | 6-12-75 | HL-19 | 3-22-77 | TC-32.10 | 3-8-79 | TC-81.10 | 4-10-79 |
| CB-3 | 5-1-79 | HW-4A | 4-1-80 | MH-5 | 6-12-75 | | | TC-32.11 | 3-21-79 | TC-83.10 | 4-13-79 |
| CB-3A | 5-1-79 | HW-4B | 4-1-80 | SD-149 sat. 3.14 6.12.60 | | | | TC-35.10 | 10-5-77 | TC-83.20 | 4-17-79 |
| CB-5 | 11-10-83 | AS-1-81 sat. 1 of 3 11-27-81 | | HL-1 | 9-6-73 | HL-22 | 11-9-77 | TC-41.10 | 12-23-81 | TC-84.20 | 4-17-79 |
| CB-6 | 5-1-79 | 1-2A | 5-1-79 | HL-2 | 7-27-73 | TC-7.65 | 3-1-79 | TC-41.20 | 3-26-79 | TC-85.10 | 4-18-79 |
| | | 1-3A & B | 4-1-80 | HL-3 | 7-27-73 | TC-9.30 | 4-24-80 | TC-41.40 | 6-18-79 | TC-85.20 | 4-18-79 |
| F-1 | 11-10-83 | LA-1 | 6-1-79 | HL-4 | 1-21-76 | TC-12.30 | 6-10-81 | | | | |

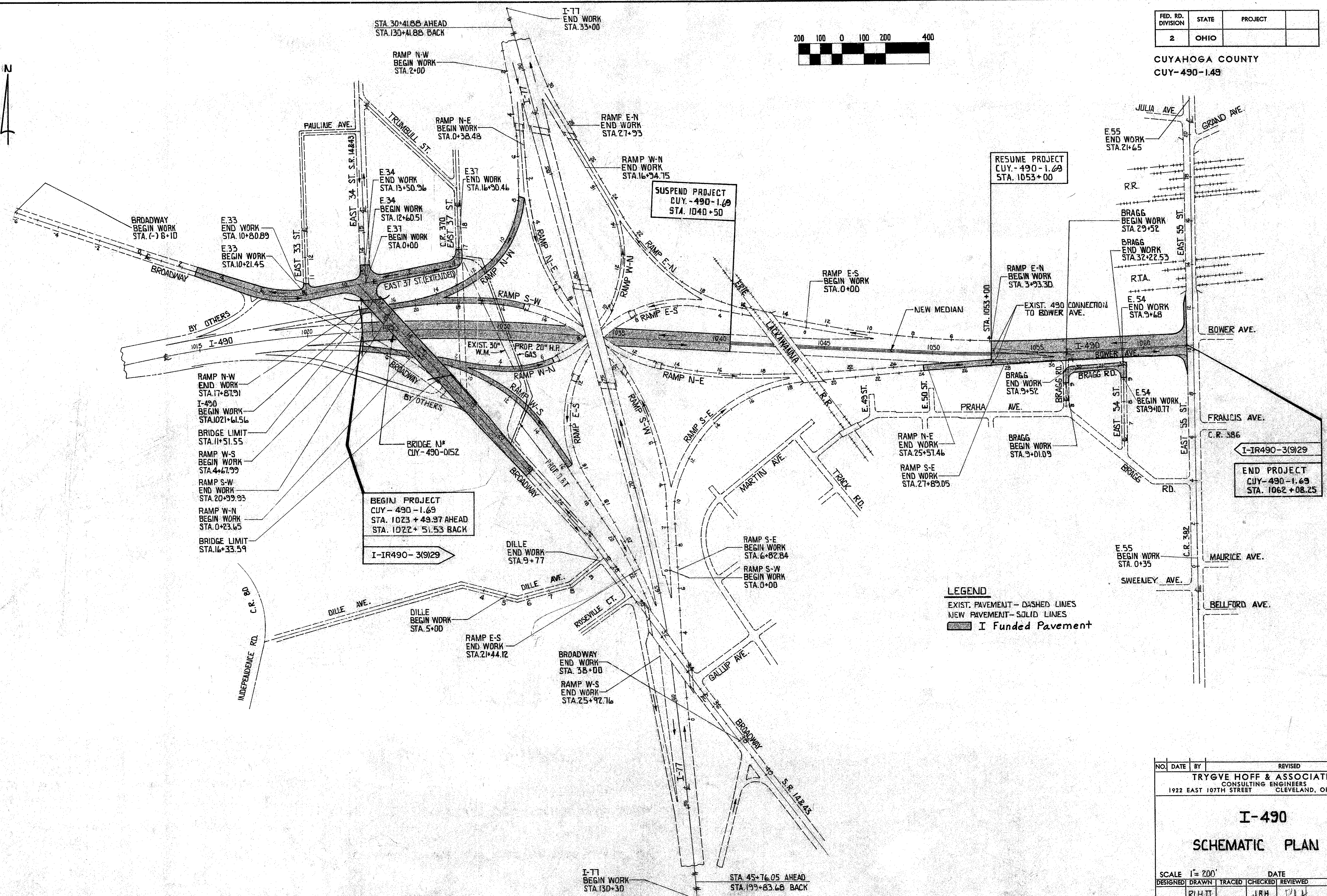
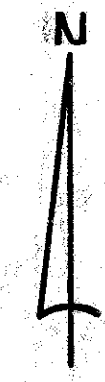
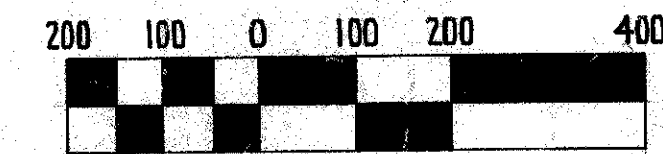
| SUPPLEMENTAL SPECIFICATIONS | |
|-----------------------------|----------|
| 834 | 3-12-75 |
| 839 | 11-25-70 |
| 861 | 9-9-83 |
| 845 | 1-13-84 |
| 849 | 10-10-81 |
| 853 | 6-26-78 |
| 939 | 6-28-82 |
| 953 | 8-21-80 |
| 956 | 6-26-78 |
| 603 | 5-27-83 |
| 961 | 9-9-83 |
| 948 | 2-19-74 |
| 824 | 10-8-82 |

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
 APPROVED: _____
 DIVISION ADMINISTRATOR DATE

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

2
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CUYAHOGO COUNTY
CUY-490-149



LEGEND
 EXIST. PAVEMENT - DASHED LINES
 NEW PAVEMENT - SOLID LINES
 I Funded Pavement

SHEET ACCT. No.
CONT. No.

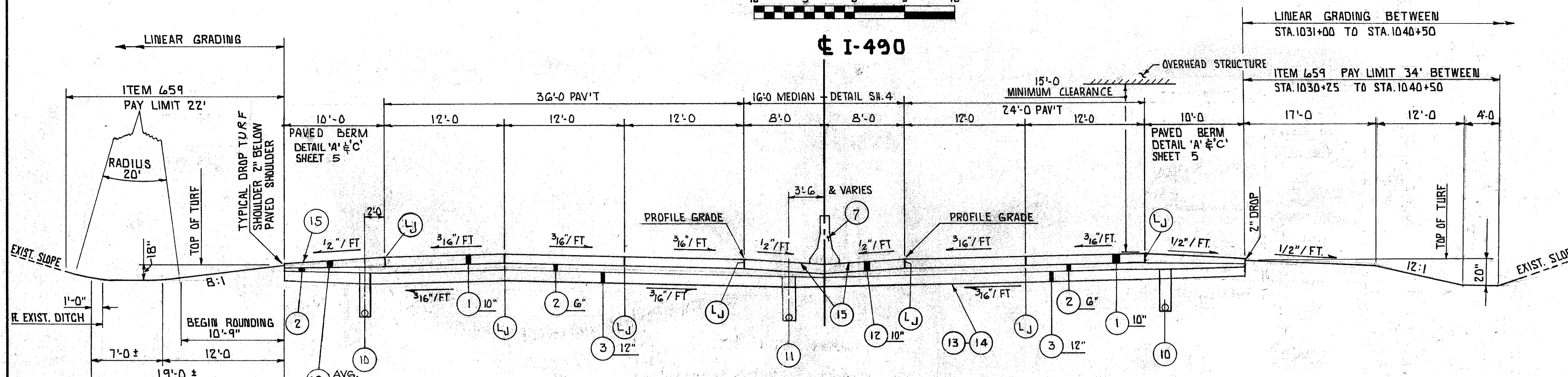
| | | | |
|---|-----------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| I-490 SCHEMATIC PLAN | | | |
| SCALE | 1" = 200' | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| REVIEWED | | | |
| | RLH,II | JRH | RLH |

TYPICAL SECTIONS

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

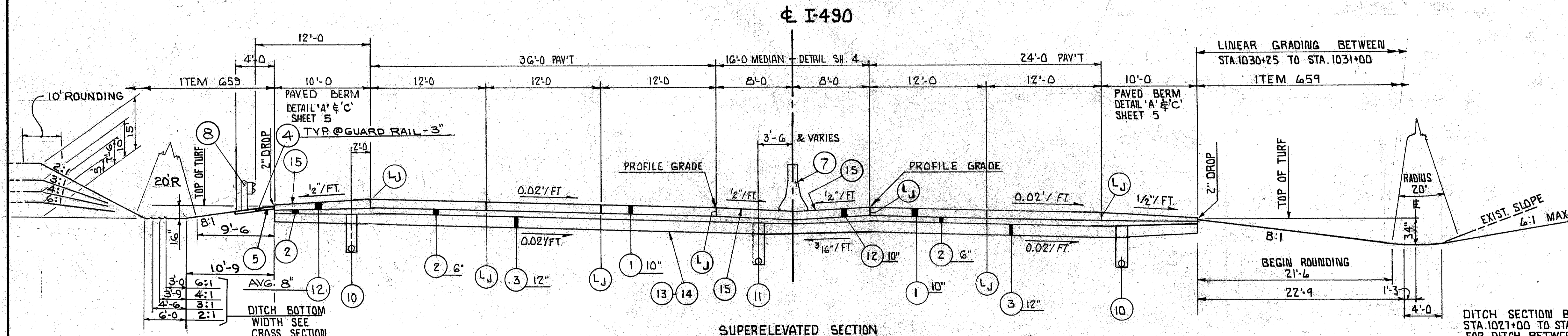
3
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CUYAHOGA COUNTY
CUY-490-1.49



NORMAL SECTION
 STA. 1034+25 TO STA. 1040+50 = 625 LF.
 STA. 1040+50 MEET EXIST. PAV'T.
 FOR BARRIER & PAV'T. VARIATIONS-SEE PAV'T. DETAILS, SHT. 30 & 31
 FOR QUANTITIES, SEE SHT. 39A

DITCH SECTION BETWEEN
STA. 1030+25 TO STA. 1040+50



SUPERELEVATED SECTION
 BEGIN PROJECT STA. 1023+49.97 TO STA. 1034+25 = 1075.03 L.F.
 STA. 1023+49.97 TO STA. 1030+50 (SUPERELEVATED)=700.03 L.F.
 STA. 1030+50 TO STA. 1034+25 (TRANSITION)=375 L.F.
 FOR PAV'T. & BARRIER VARIATIONS SEE
 PAV'T. DETAILS, SHEETS 29 & 30
 FOR QUANTITIES, SEE SHEET 39A

DITCH SECTION BETWEEN
STA. 1023+49.97 TO STA. 1030+25

LINEAR GRADING
 RT. & LT. STA. 1030+25 TO STA. 1040+50 = 1025 LF = 10.25 STATIONS

NOTE:
 UNDER PREVIOUS CONTRACT THE PAVEMENT AND PAVED BERM AREA HAVE BEEN GRADED TO THE PLANNED PROFILE TOP OF PAVEMENT GRADE.
 THE LINEAR GRADING INDICATED HERE IS THE AREA OUTSIDE THE PAVEMENT AND PAVED BERM AREA. THIS AREA IS THE EXISTING DITCH AREA AND THE LINEAR GRADING IS TO CLEAN AND RE-SHAPE THE EXISTING DITCH TO THE PROPER PLAN SECTION.

LEGEND

| ITEM | UNIT | DESCRIPTION |
|------|--------------|--|
| 1 | 451 S.Y. | REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT |
| 2 | 310 C.Y. | SUBBASE, TYPE II |
| 3 | 310 C.Y. | SUBBASE, TYPE I |
| 4 | 301 C.Y. | BITUMINOUS AGGREGATE BASE; AC 20, RT-11 OR RT-12 |
| 5 | SPECIAL S.Y. | HERBICIDE FOR WEED CONTROL |
| 7 | 622 L.F. | CONCRETE BARRIER, TYPE B50 MODIFIED AS PER PLAN (SHT. 4) |
| 8 | 606 L.F. | GUARDRAIL, TYPE 5 |

| ITEM | UNIT | DESCRIPTION |
|------|--------------|---|
| 10 | 605 L.F. | 6" DEEP PIPE UNDERDRAINS (50" BOTTOM 6" SUBBASE TO CROWN OF PIPE - USE FOR EXTERIOR UNDERDRAINS, IN EARTH CUT ONLY) AS PER PLAN. |
| 11 | 605 L.F. | 6" SHALLOW PIPE UNDERDRAINS (50" BOTTOM 6" SUBBASE TO CROWN OF PIPE - USE FOR ALL UNDERDRAINS IN FILL AND ALL INTERIOR UNDERDRAINS) AS PER PLAN. (SEE DETAIL 'A' SHEET NO. 5) |
| 12 | 452 S.Y. | PLAIN PORTLAND CEMENT CONCRETE PAVEMENT, AS PER PLAN |
| 13 | 203 S.Y. | SUBGRADE COMPACTION |
| 14 | 203 HR. | PROOF ROLLING |
| 15 | SPECIAL S.Y. | RUMBLE STRIPS SAWED INTO EXISTING CONCRETE BERM. |
| 16 | 609 L.F. | CURB, TYPE 6 |

JOINT SYMBOLS

| | |
|------|-------------------------------|
| (LJ) | STANDARD LONGITUDINAL JOINT |
| (SJ) | STANDARD EXPANSION BOLT JOINT |

| | | | |
|--|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

TYPICAL SECTIONS
I - 490

| | |
|----------|---------|
| SCALE | DATE |
| DESIGNED | DRAWN |
| TRACED | CHECKED |
| REVIEWED | DATE |
| C.D.R. | LV/ |
| | JRH |

SHEET ACCT. No. CONT. No.

TYPICAL SECTIONS

TYPE 451 ON 310

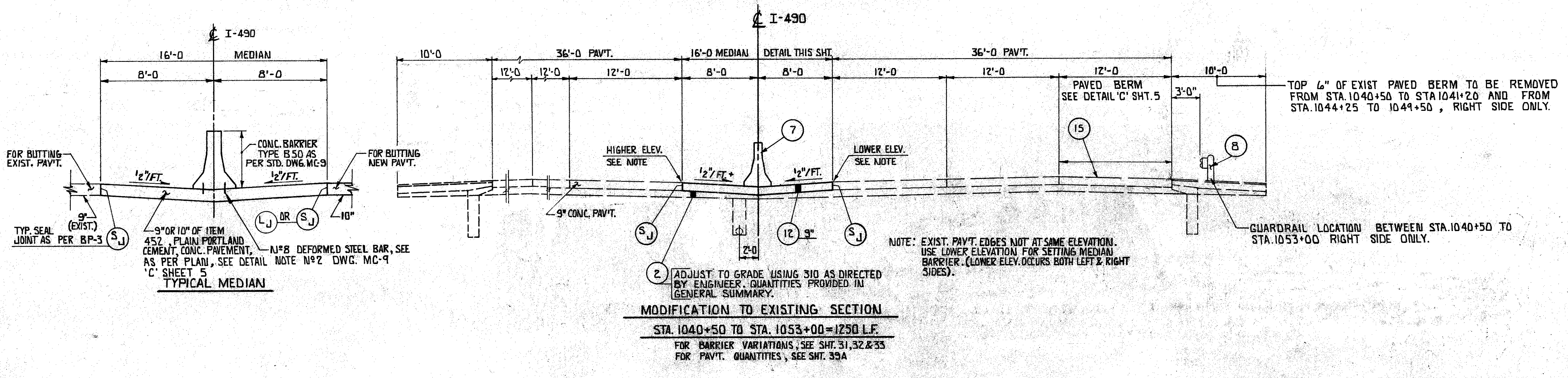
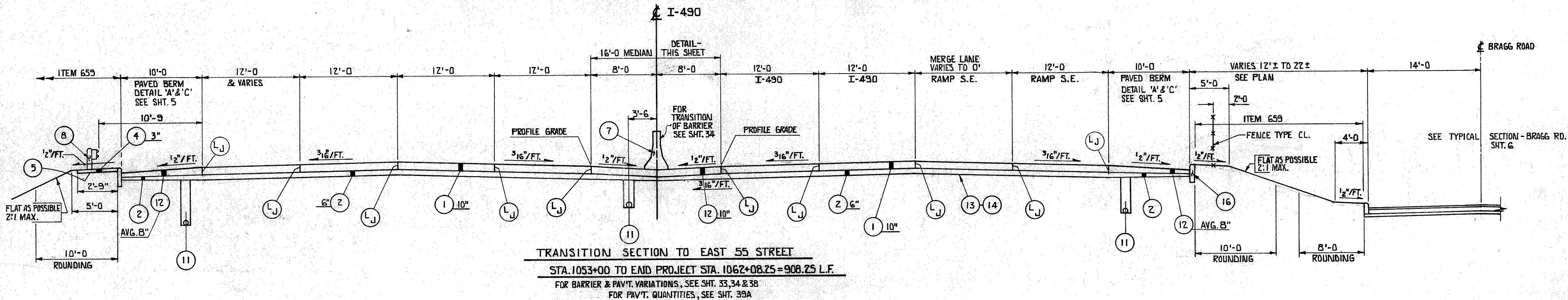
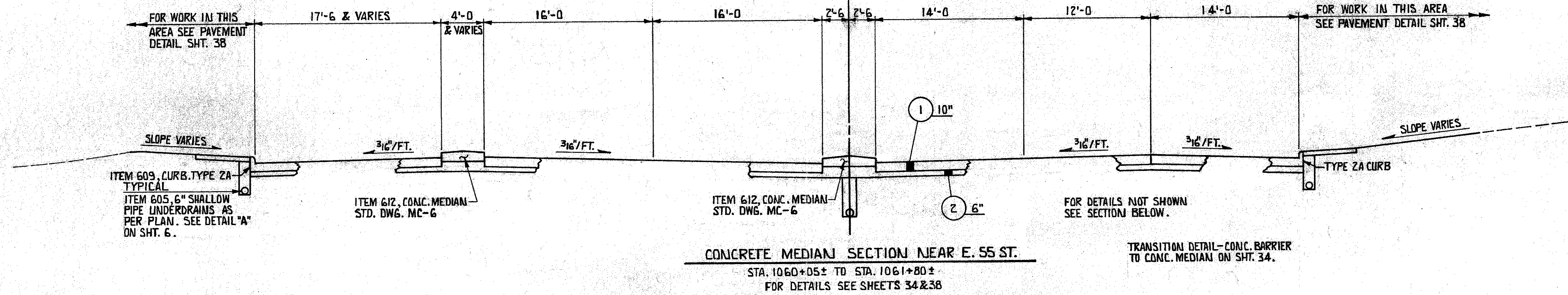


I-490

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

4
261

CUYAHOGA COUNTY
CUY-490-1.49



NOTE: FOR NOTES & LEGEND SEE SHEET 3

SHEET ACCT. No. CONT. No.

NO. DATE BY REVISED

TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET
CLEVELAND, OHIO 44106

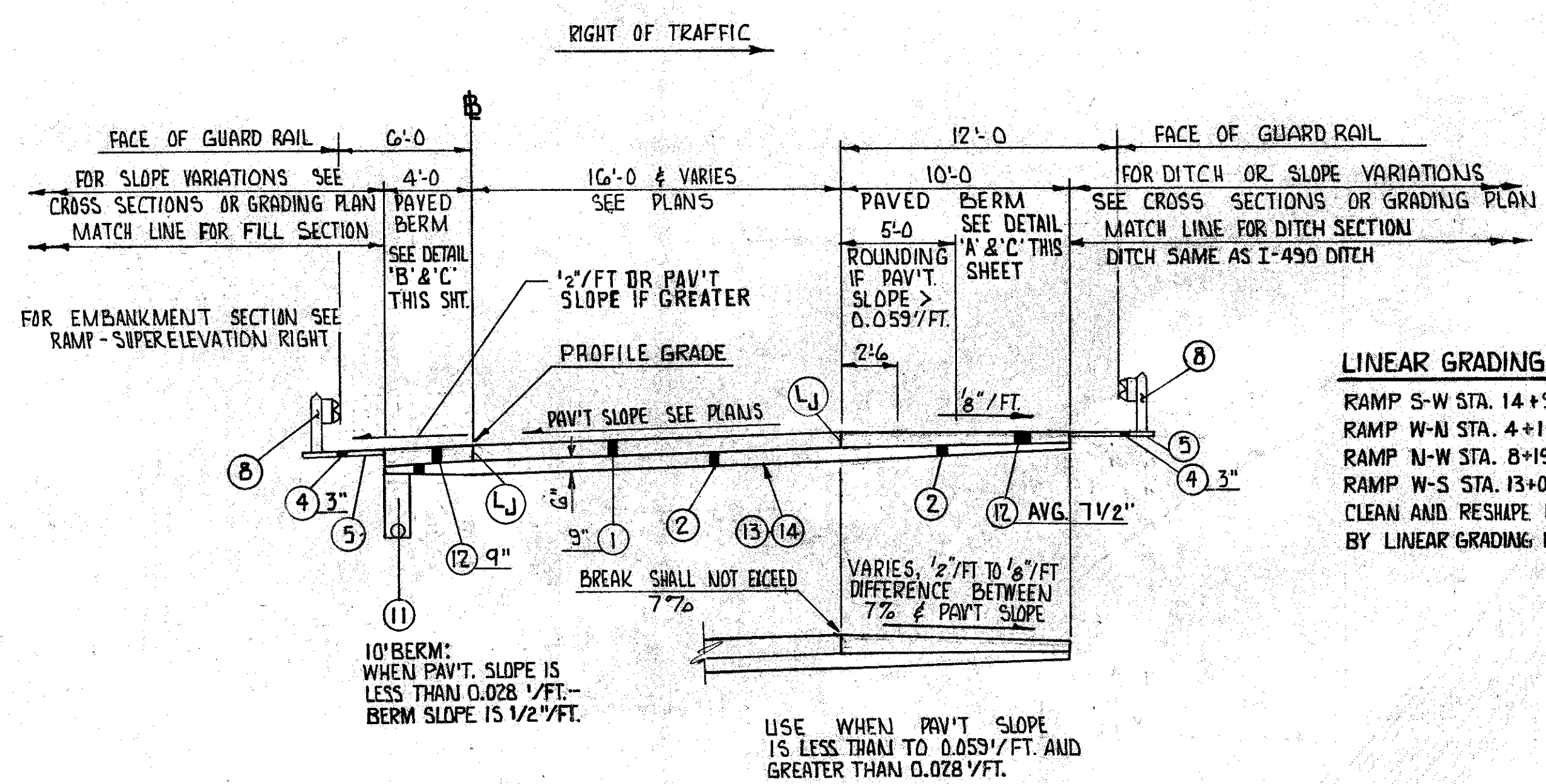
TYPICAL SECTIONS
I-490

| | |
|----------|----------|
| SCALE | DATE |
| DESIGNED | DRAWN |
| DRAWN | TRACED |
| TRACED | CHECKED |
| CHECKED | REVIEWED |
| REVIEWED | DATE |
| C DR | RH/LV |
| JRH | |

TYPICAL SECTIONS

TYPE 451 ON 310

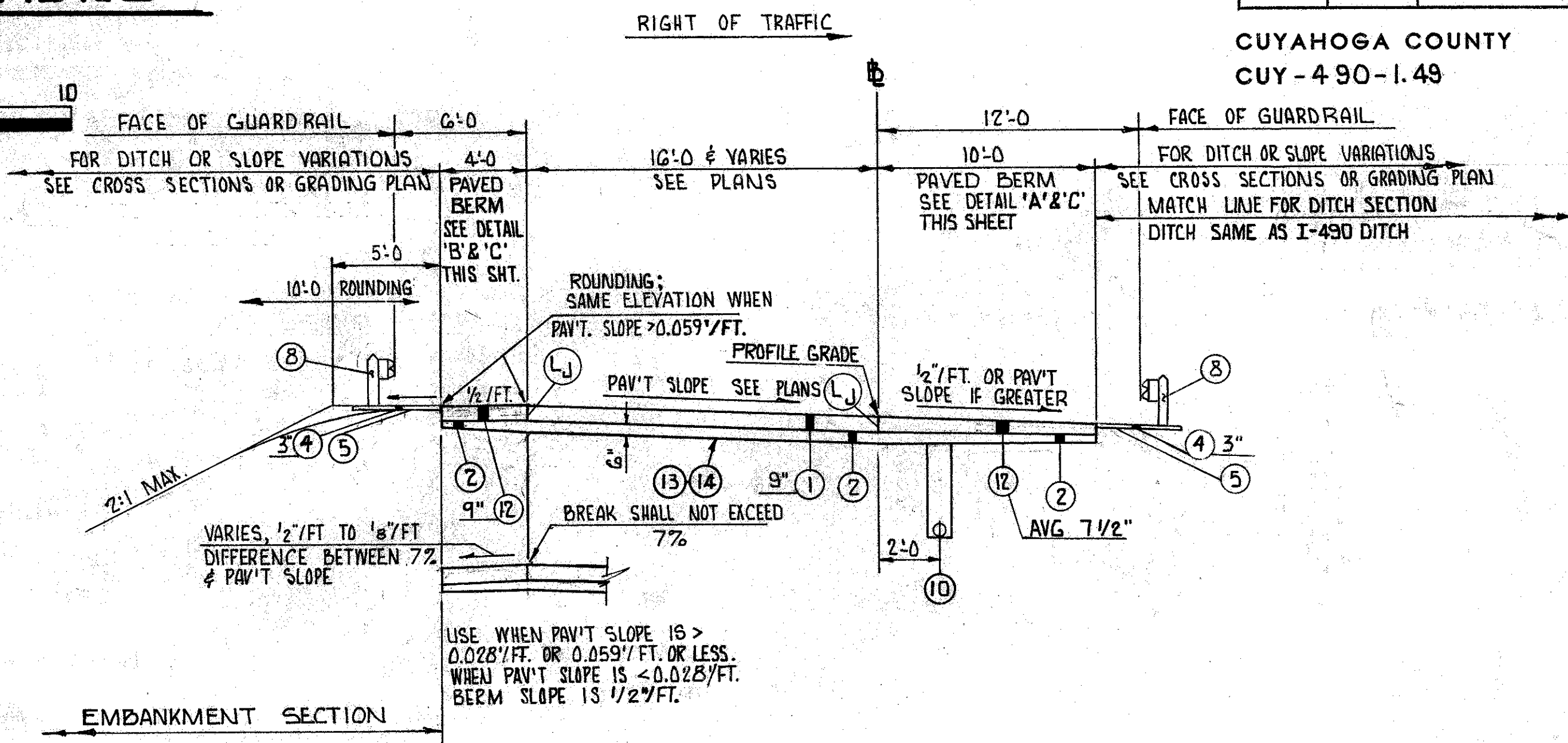
CUYAHOGA COUNTY
CUY-490-1.49



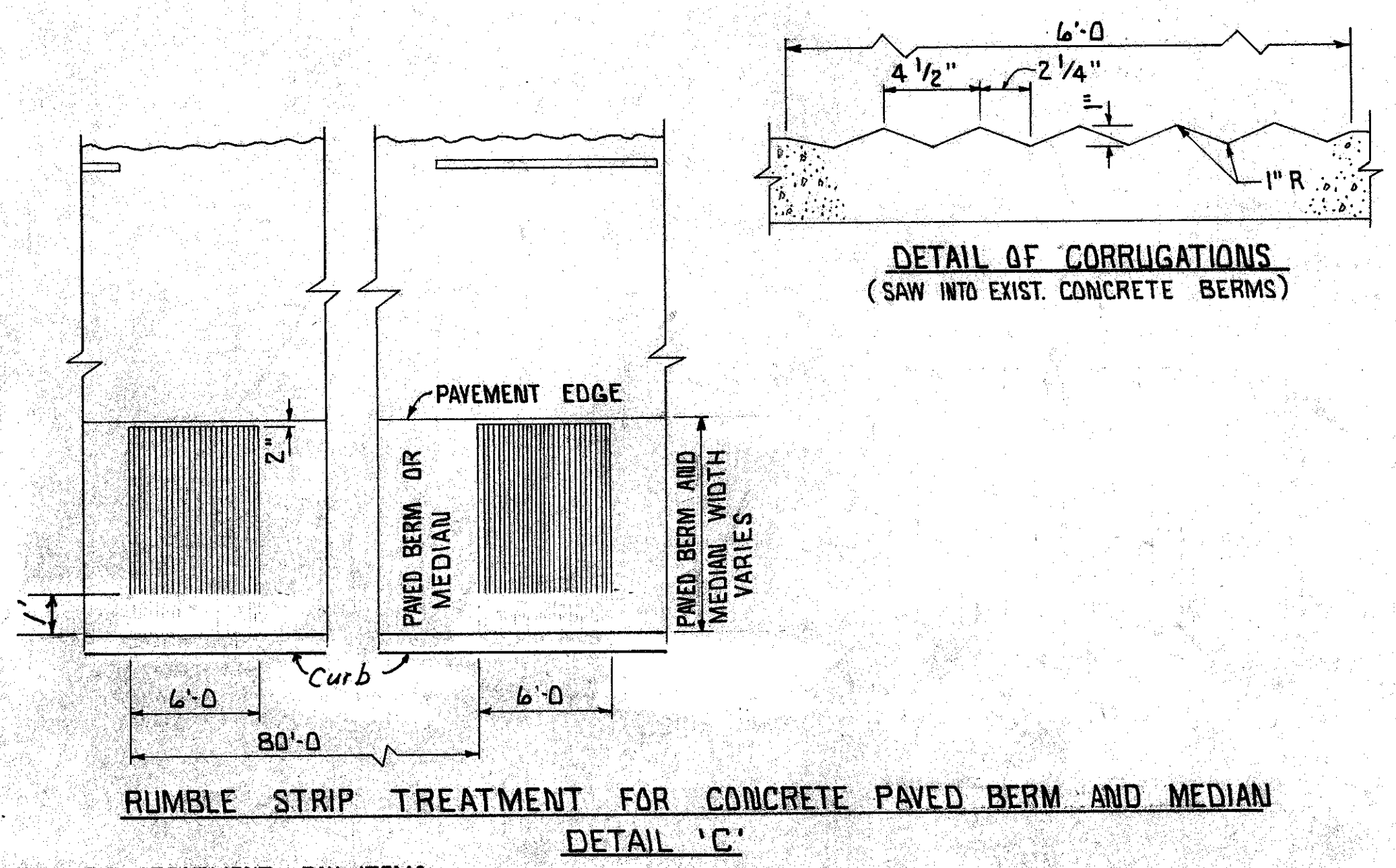
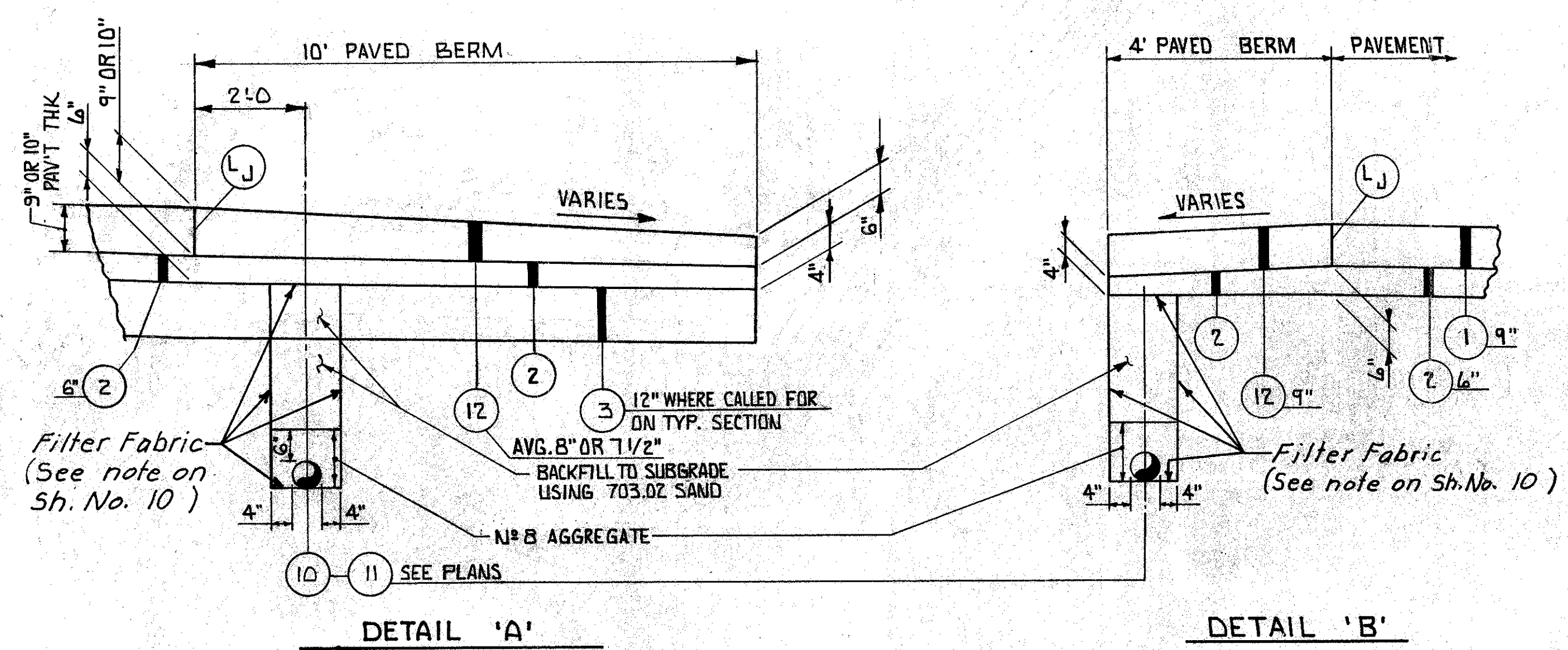
RAMP - SUPERELEVATED LEFT
 RAMP S-W STA. 14+96.67 TO STA. 20+99.93 = 603.26 L.F.
 FOR VARIATIONS SEE PAV'T DETAIL SH. 36.
 RAMP W-N STA. 0+00 TO STA. 6+43.97 = 643.97 L.F.
 FOR VARIATIONS SEE PAV'T DETAIL SHS. 29 & 35.

NOTE:
 ADDITIONAL 1/2" OF ITEM 310 TO BE FURNISHED UNDER RAMP S-W BETWEEN STA. 14+96.67 & STA. 16+00
 6" PAVED BERM REQUIRED ON LEFT HAND SIDE OF RAMP S-W BETWEEN STA. 14+92 & STA. 16+90, SEE DETAIL ON SH. 36.

LINEAR GRADING (RT. & LT.)
 RAMP S-W STA. 14+96.67 TO STA. 17+20 = 223.33 L.F. = 2.23 STATIONS
 RAMP W-N STA. 4+15 TO STA. 6+43.97 = 228.97 L.F. = 2.29 STATIONS
 RAMP N-W STA. 8+19.86 TO STA. 12+00 = 380.14 L.F. = 3.80 STATIONS
 RAMP W-S STA. 13+00 TO STA. 16+38.21 = 338.21 L.F. = 3.38 STATIONS
 CLEAN AND RESHAPE EXISTING DITCHES AS INDICATED BY LINEAR GRADING DETAIL ON SHEET 3.



RAMP - SUPERELEVATED RIGHT
 RAMP N-W STA. 8+19.86 TO STA. 17+88 = 968.14 L.F.
 FOR VARIATIONS SEE PAV'T DETAIL SHS. 29 & 36
 RAMP W-S STA. 4+67.99 TO STA. 16+38.21 = 1,570.22 L.F.
 FOR VARIATIONS SEE PAV'T DETAIL SHS. 29 & 35
 RAMP S-E STA. 24+19± TO STA. 27+89.05 = 370± L.F.
 FOR VARIATIONS SEE PAV'T DETAIL SH. 33



RUMBLE STRIP TREATMENT PAY ITEMS:
 1. IN EXISTING CONCRETE BERMS, "ITEM SPECIAL, RUMBLE STRIPS SAWS INTO EXISTING CONCRETE BERM"
 2. IN NEW CONCRETE PAVED BERMS AND MEDIAN, "ITEM 452, PLAIN PORTLAND CEMENT CONCRETE PAVEMENT, AS PER PLAN"
 NOTE: THE LOCATION OF RUMBLE STRIPS SHALL BE BETWEEN TRANSVERSE JOINTS.

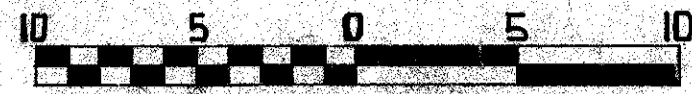
FOR LEGEND SEE SH. 3
 FOR NOTES SEE SH. 3

| | | | |
|---|--------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| TYPICAL SECTIONS RAMPS | | | |
| SCALE | DATE | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDP | W/RHII | | JRH |

SHEET ACCT. No. CONT. No.

TYPICAL SECTIONS

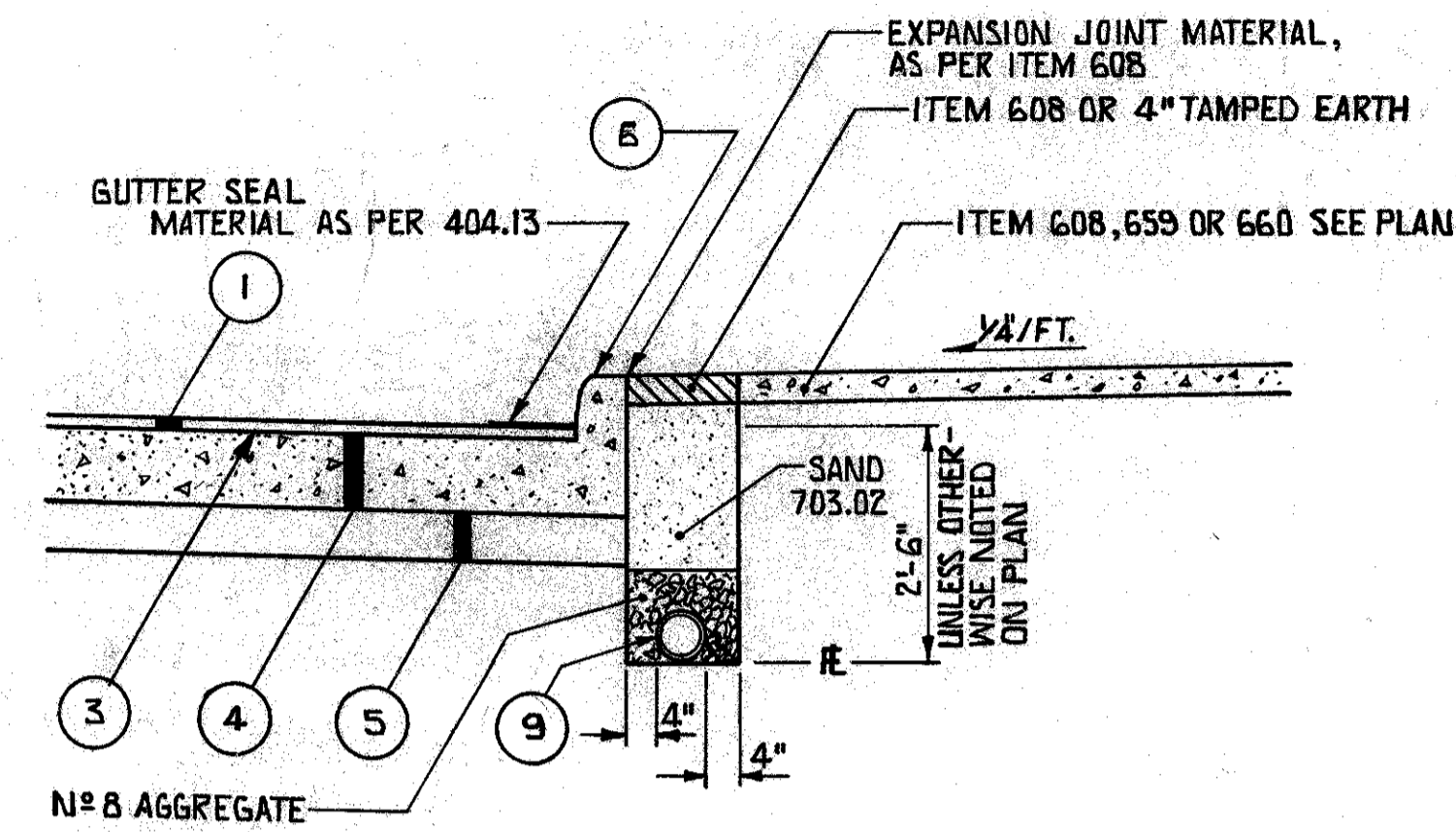
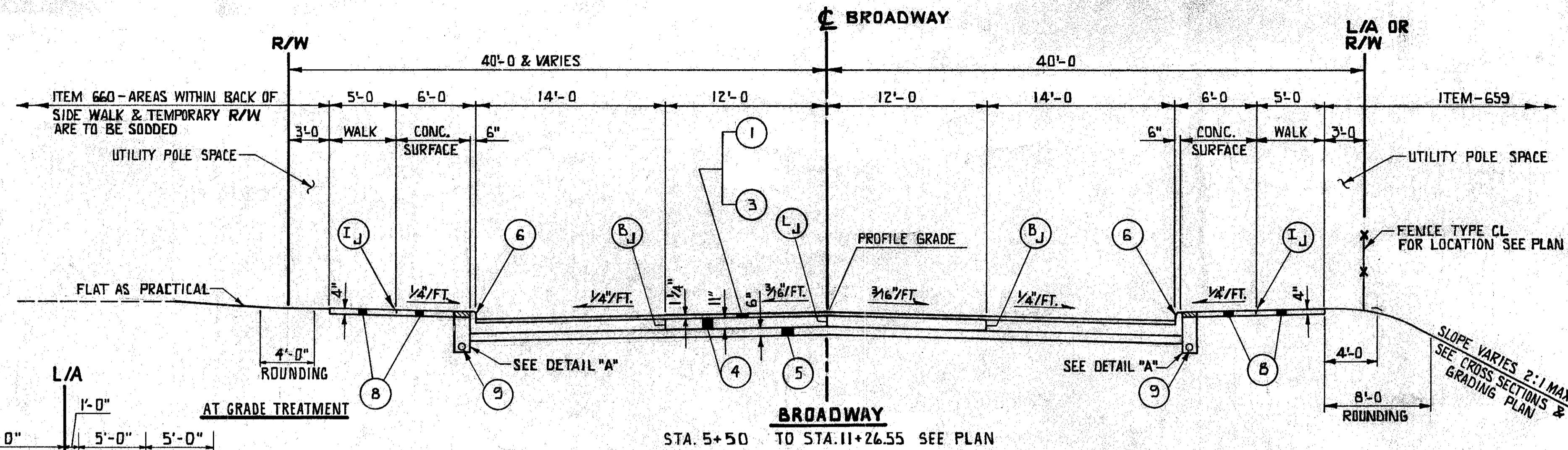
TYPE 404 ON 305 ON 310



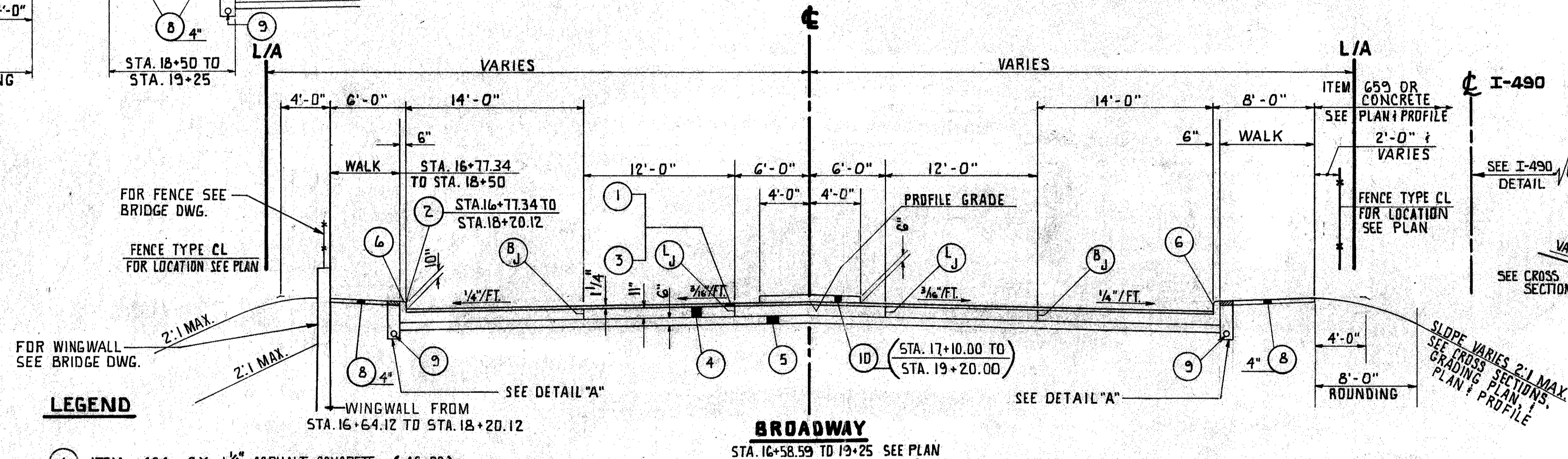
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|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 2 | OHIO | |

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CUYAHOGA COUNTY
CUY-490-1.49

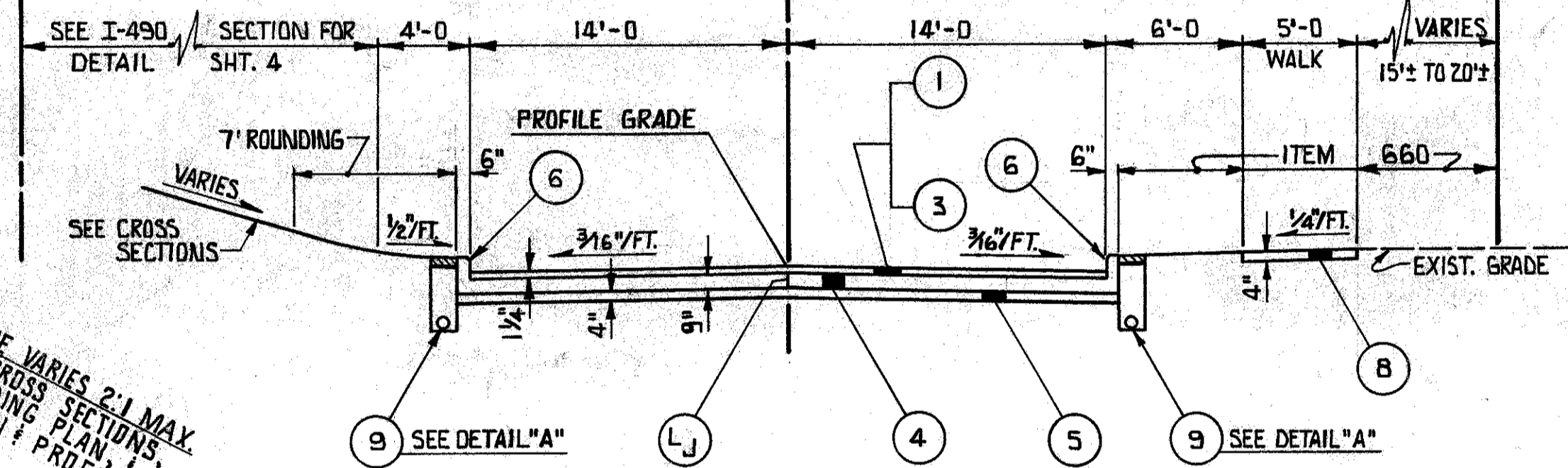


DETAIL "A"



I-490

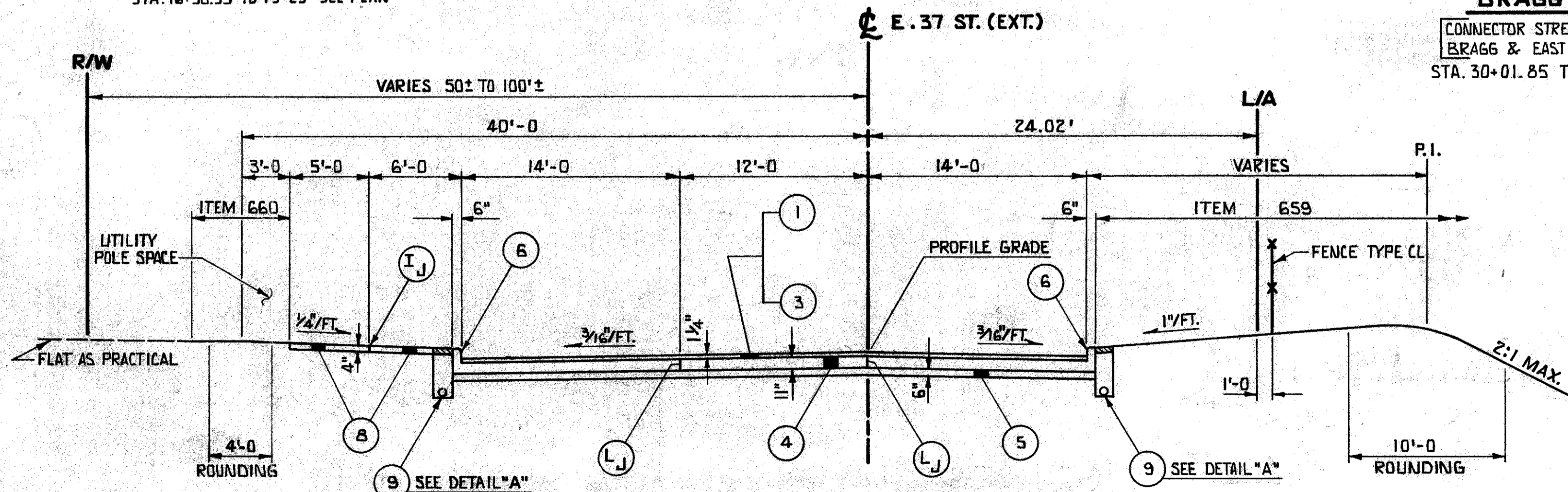
BRAGG ROAD



BRAGG ROAD
CONNECTOR STREET BETWEEN
BRAGG & EAST 54 STREET
STA. 30+01.85 TO 31+66.08

LEGEND

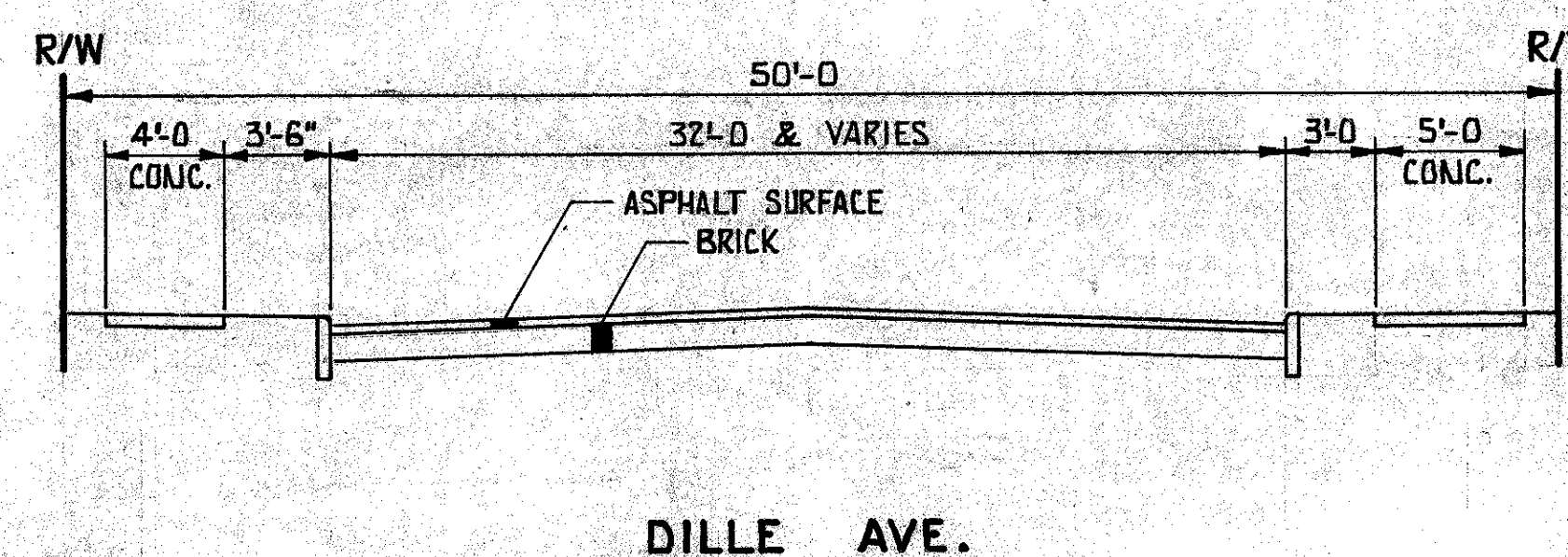
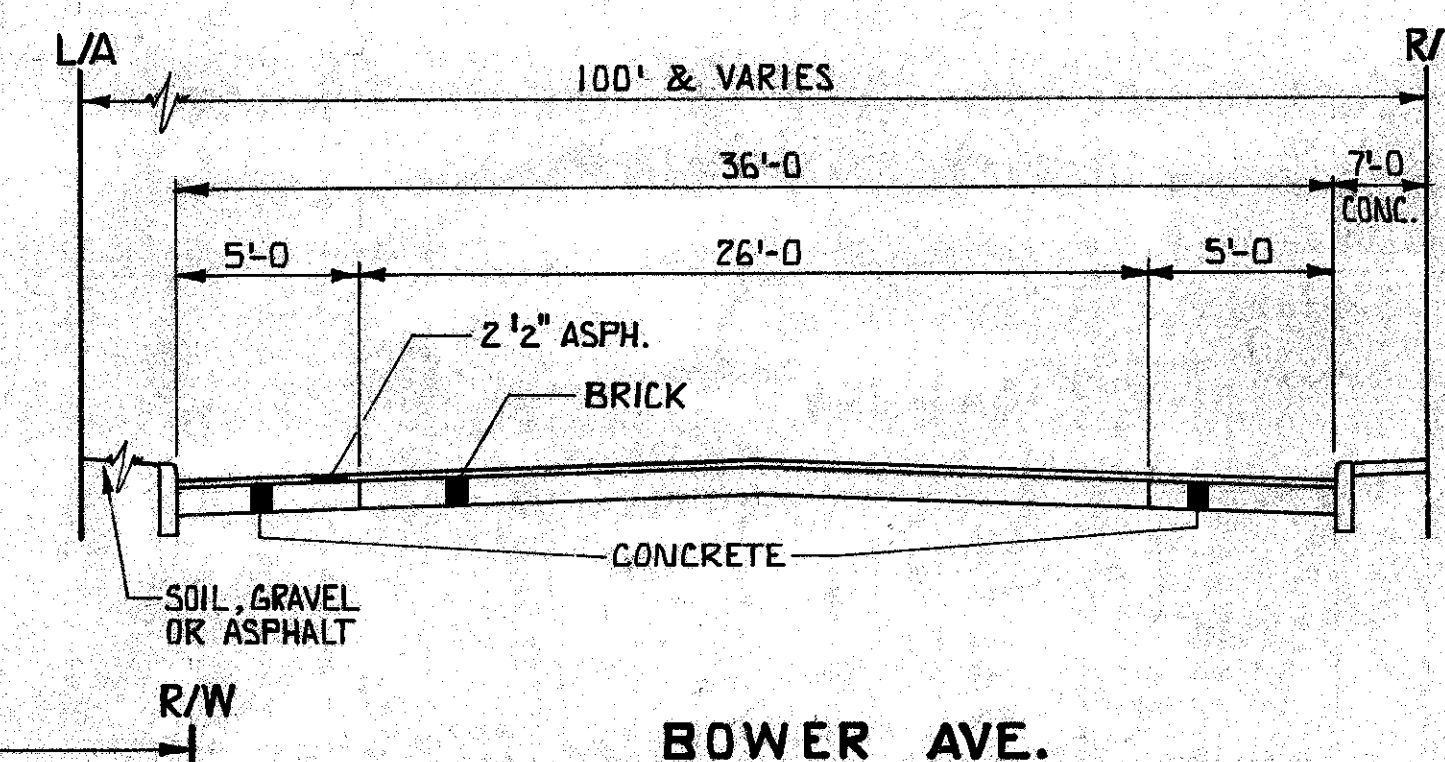
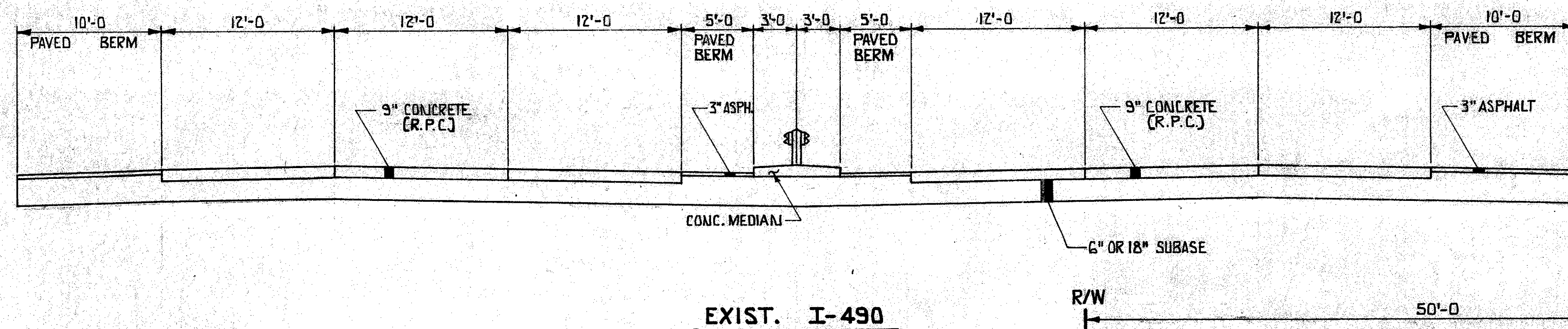
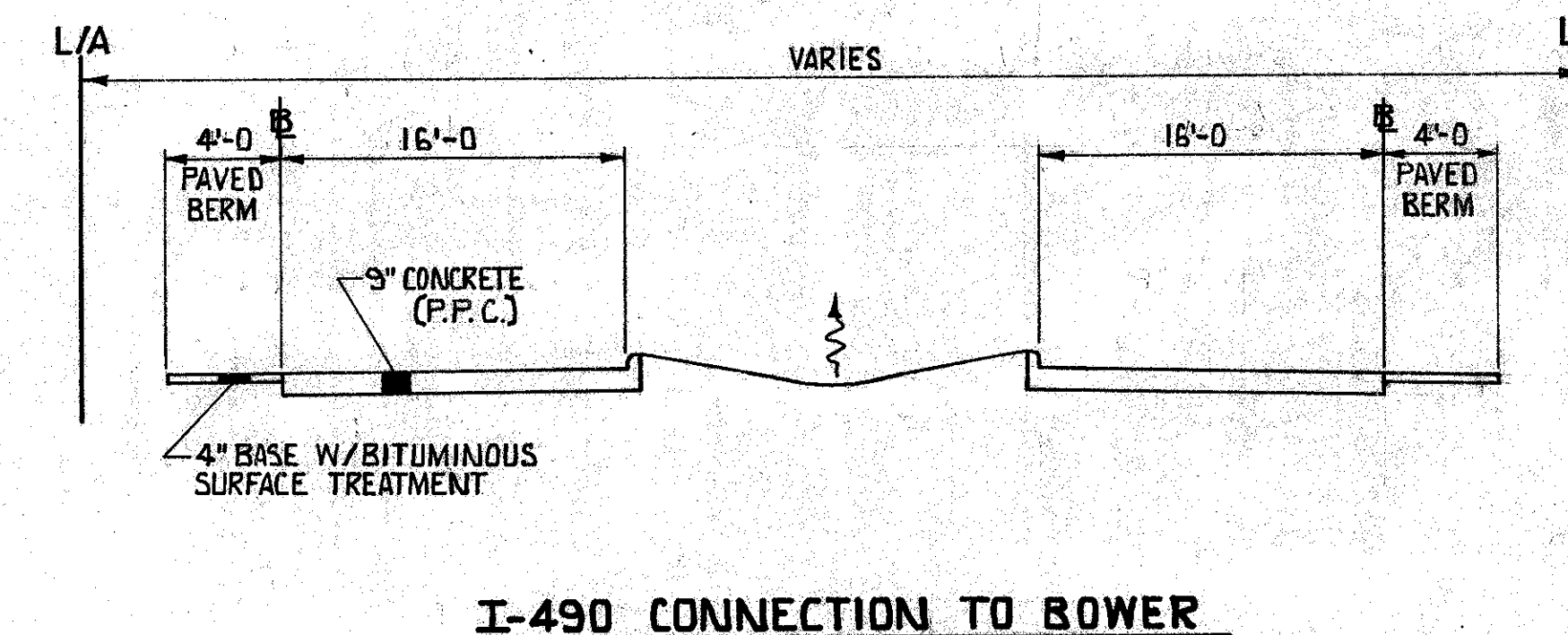
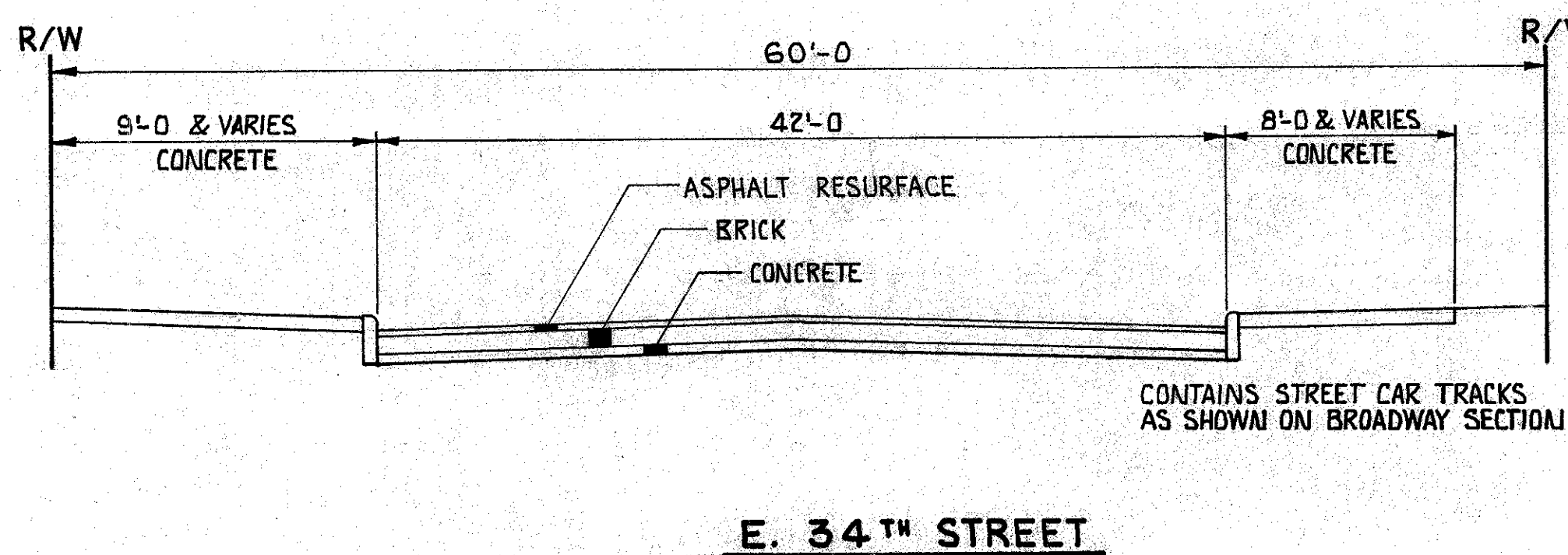
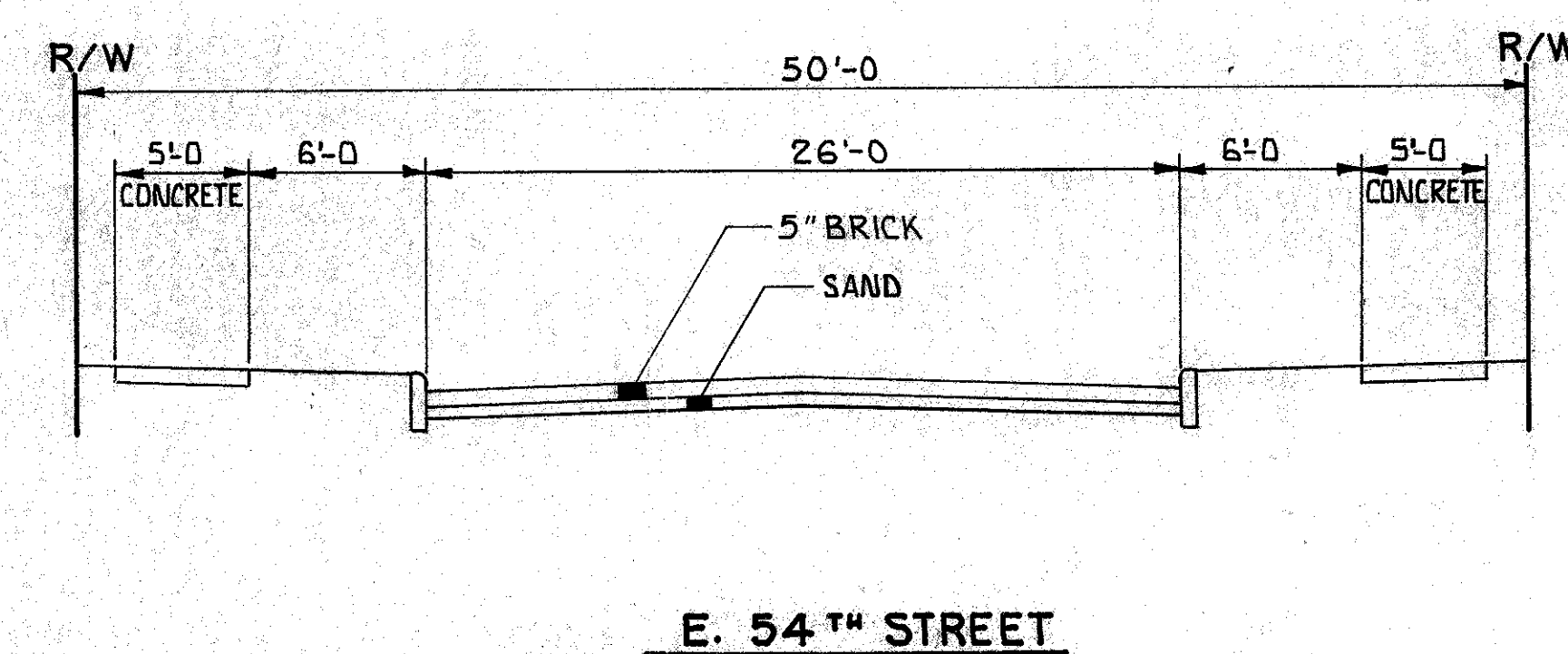
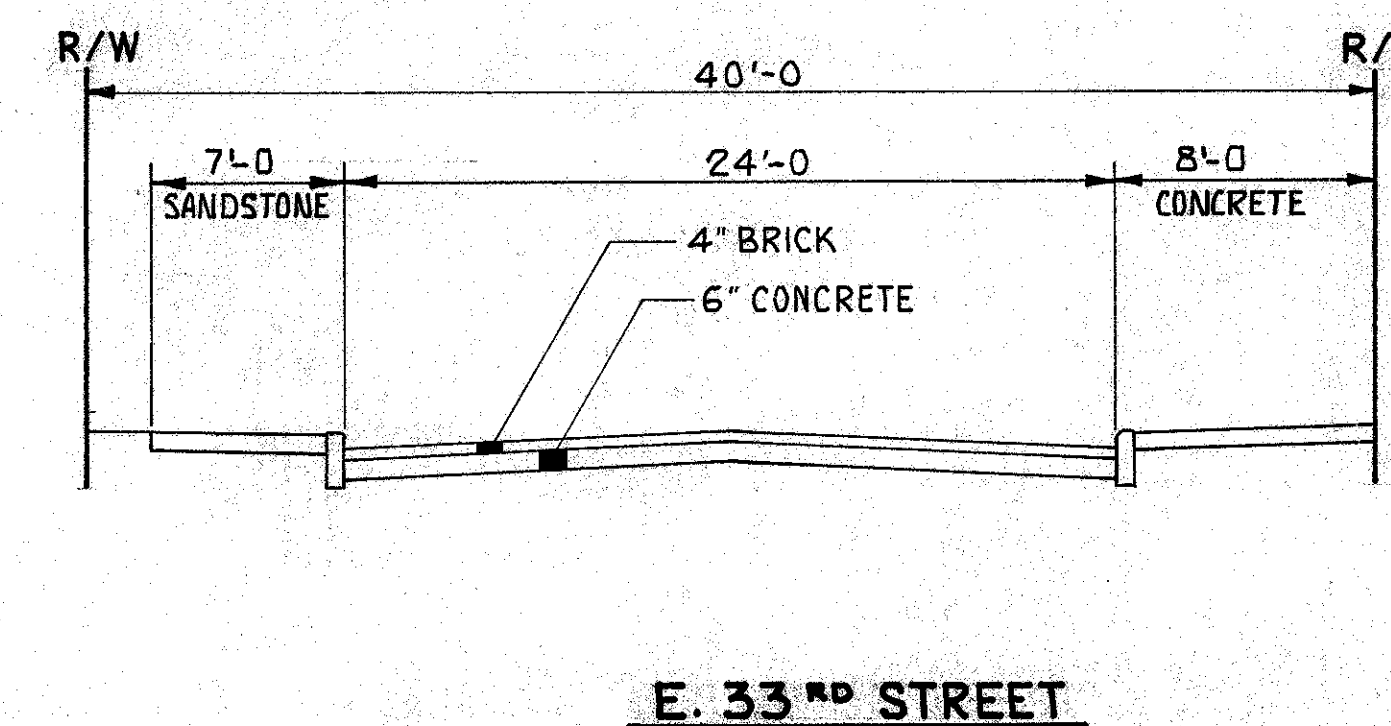
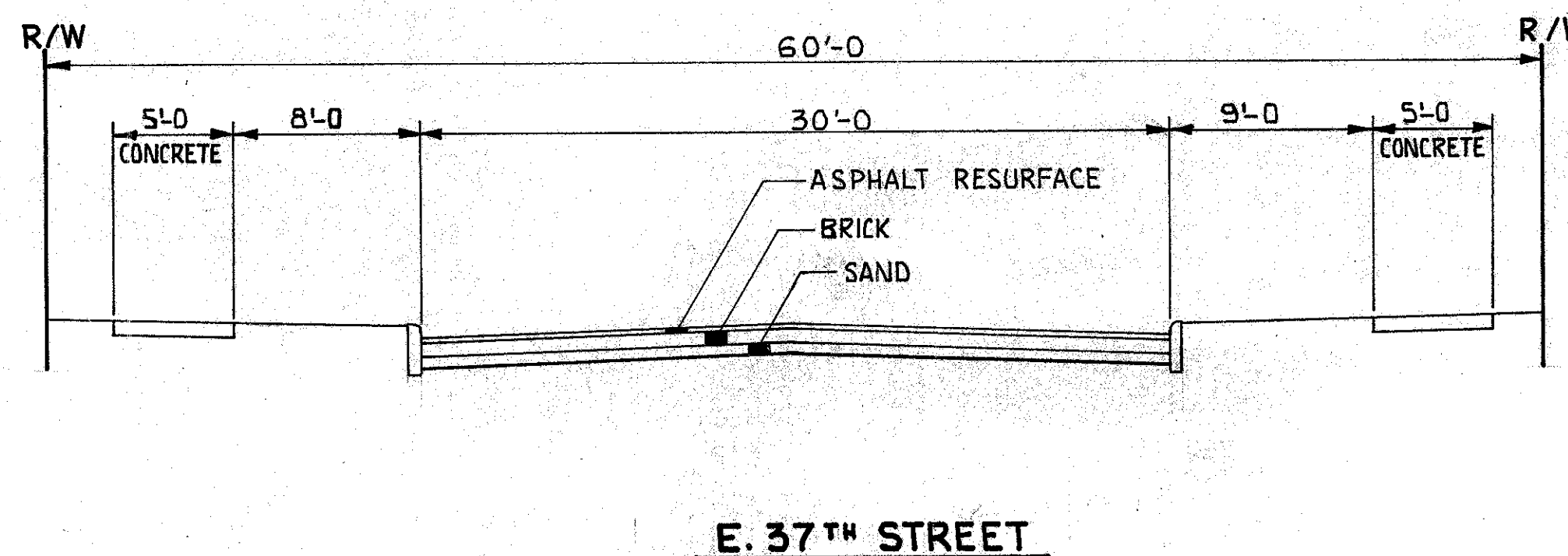
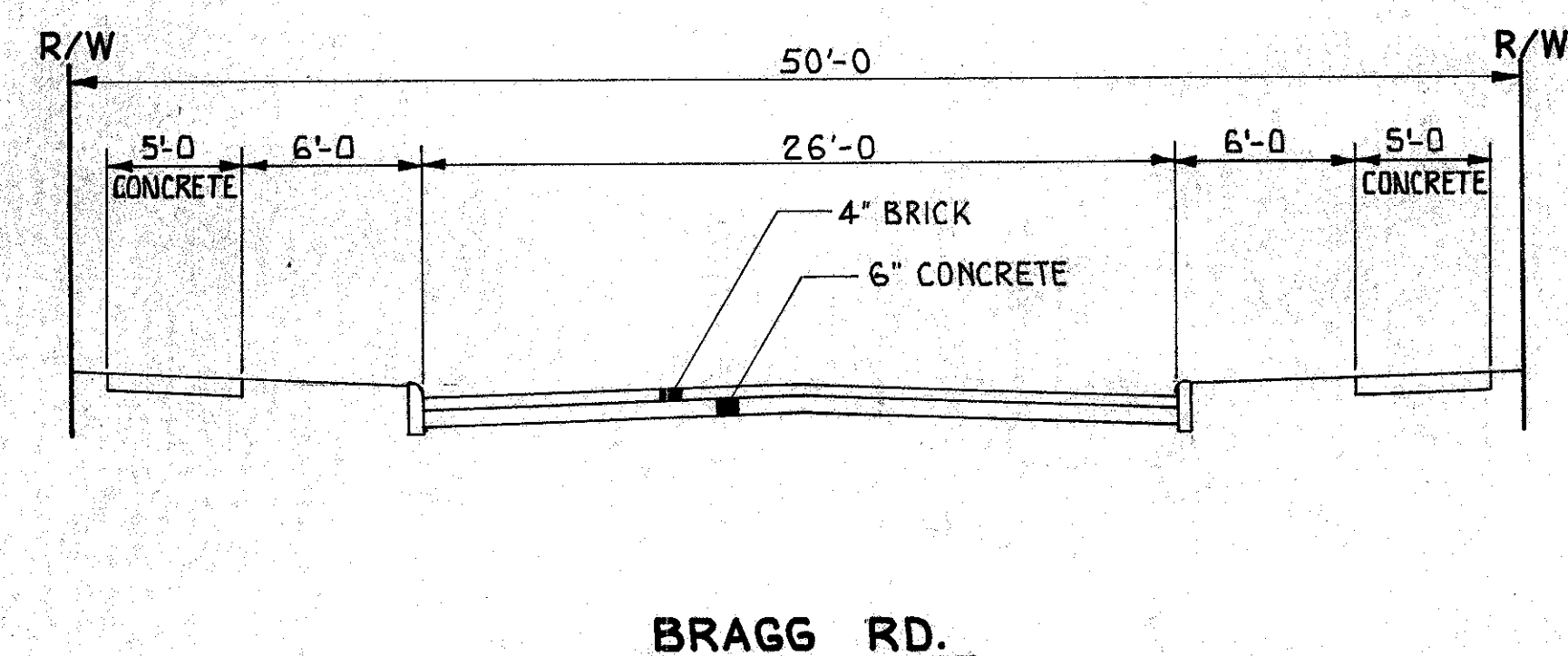
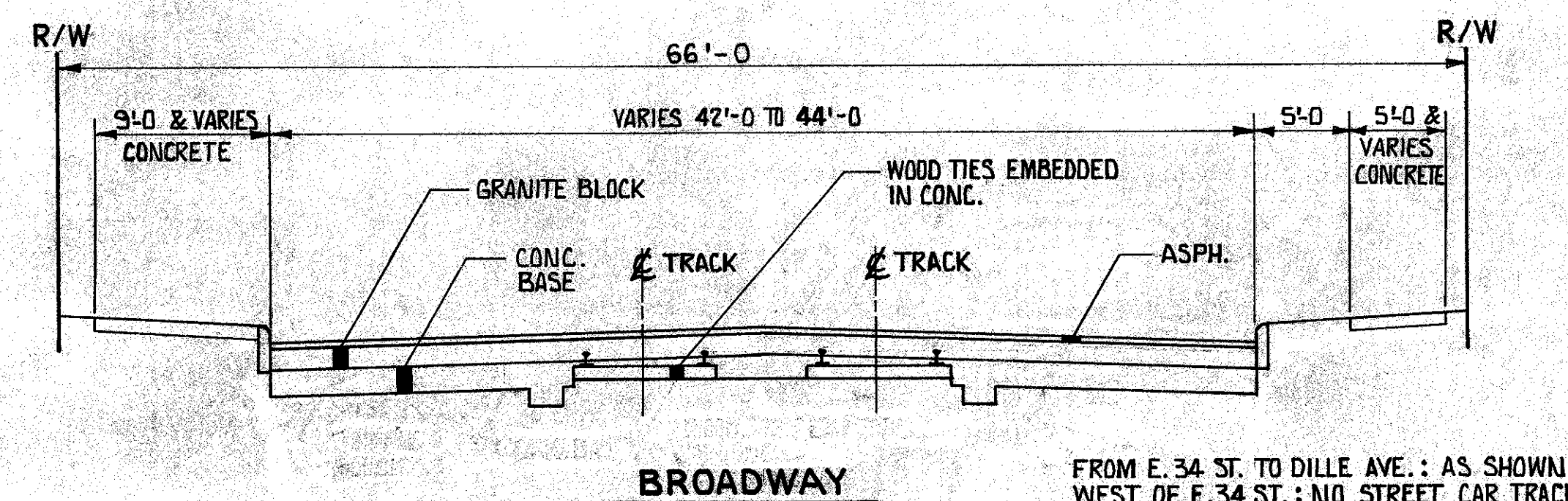
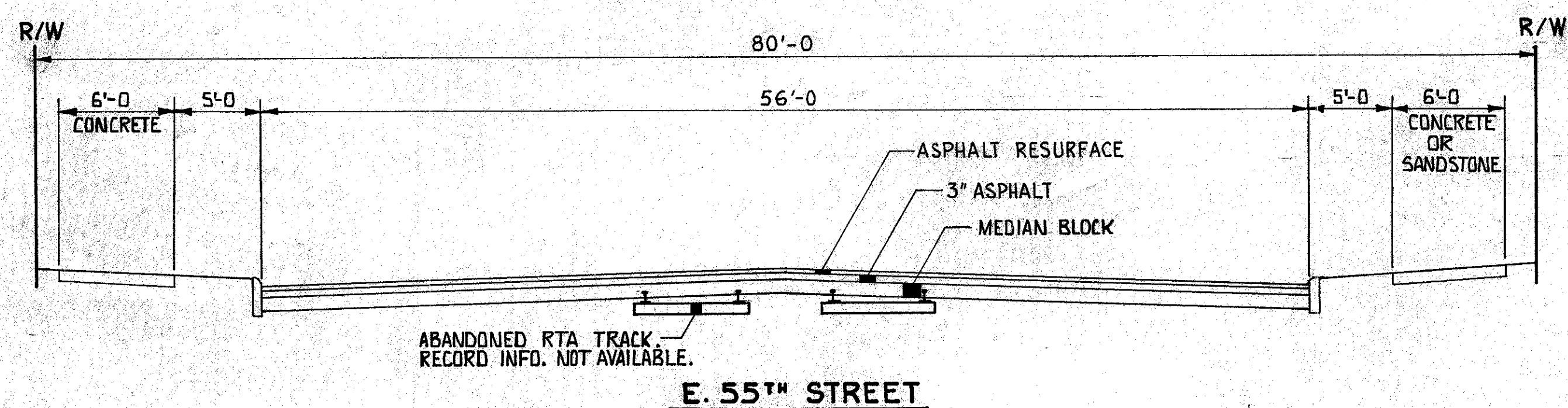
- ① ITEM 404 C.Y., 1 1/2" ASPHALT CONCRETE (AC-20)
- ② ITEM 609 L.F., CURB TYPE 2B AS PER PLAN
- ③ ITEM 407 GAL., TACK COAT
- ③ ITEM 407 TON, COVER AGGREGATE
- ④ ITEM 305 S.Y., PORTLAND CEMENT CONCRETE BASE
- ⑤ ITEM 310 C.Y., SUBBASE, TYPE II
- ⑥ ITEM 609 L.F., CURB TYPE 2B
- ⑧ ITEM 608 S.F., CONCRETE WALK
- ⑨ ITEM 605 L.F., 6" SHALLOW PIPE UNDERDRAIN AS PER PLAN
- ⑩ ITEM 612 S.Y., CONCRETE MEDIAN AS PER PLAN
- LJ STANDARD LONGITUDINAL JOINT
- IJ IMPRESSED JOINT
- BJ STANDARD LONGITUDINAL BUTT JOINT



EAST 37 STREET (EXTENDED)
CONNECTOR BETWEEN E. 34 ST. & E. 37 ST.
STA. 0+84.20 TO STA. 3+92.08

| | | | |
|--|----------|----------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| TYPICAL SECTIONS BROADWAY BRAGG ROAD EAST 37 STREET | | | |
| SCALE | DESIGNED | DRAWN | TRACED |
| DATE | CHECKED | REVIEWED | DATE |
| | CDR | LV/RH | JRH |

SHEET ACCT. No.
CONT. No.



- NOTES**
1. MOST CURB IS SANDSTONE.
 2. CURB ON RADIUS ARE GRANITE OR CONCRETE.

| | | | |
|-----|------|----|---------|
| NO. | DATE | BY | REVISED |
| | | | |

TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

EXISTING TYPICAL SECTIONS

| | | | | |
|------------|-------|---------|----------|------|
| SCALE NONE | DATE | | | |
| DESIGNED | DRAWN | CHECKED | REVIEWED | DATE |
| LV | JRH | RJB | | |

SHEET ACCT. No.
CONT. No.

GENERAL NOTES

QUANTITIES CARRIED TO
GENERAL SUMMARY

DUST CONTROL

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER FOR DUST CONTROL:

| | | |
|----------------------|------------|--|
| 616 WATER | 1 FUNDS | |
| 616 CALCIUM CHLORIDE | 50 M. GAL. | |
| | 30 TON | |

ITEM 659 - SEEDING AND MULCHING

ITEM 660 - SODDING

SOD ALL SOIL AREAS DISTURBED ON THE STREET LEVEL WITHIN THE EXISTING, PROPOSED OR TEMPORARY RIGHT-OF-WAY. SEED AND MULCH ALL DISTURBED AREAS ON THE I-490 AND RAMP LEVEL AND THEIR BACKSLOPES. GENERALLY, STREET LEVEL AREAS ADJACENT TO I-490 ARE TO BE SEEDED --SEE CROSS SECTIONS. SODDING AND SEEDING QUANTITIES HAVE BEEN CALCULATED FOR THE ABOVE AREAS AS FURTHER DEFINED BELOW.

IN THE AREAS OF LINEAR GRADING PAY LIMITS FOR SEEDING HAVE BEEN NOTED ON THE TYPICAL SECTIONS. IN THE AREAS WHERE THE CONSTRUCTION WAS PREVIOUSLY COMPLETED ANY SEEDING REQUIRED FOR WORK UNDER THIS CONTRACT IS DEFINED WITH THAT WORK (FOR EXAMPLE, TOWER LIGHTING). FOR THE AREA NORTH OF I-490 BETWEEN STATION 1053 + 00 AND 1060 + 60 PAY LIMITS HAVE BEEN NOTED ON THE CROSS SECTIONS. AREAS RECEIVING CROWNVEATCH AS SHOWN IN THE PLANS ARE NOT TO BE SEEDED. WITH THESE EXCEPTIONS, ALL AREAS WITHIN THE RIGHT OF WAY ARE TO BE SEEDED (OR SODDED).

THE ENGINEER WILL ADJUST AREAS TO BE SEEDED TO FIT THE FIELD CONDITIONS AT THE TIME OF CONSTRUCTION.

ITEM 659 - CROWNVEATCH SEEDING & MULCHING

THE PH OF THE SOIL TO BE SEEDED SHALL BE ADJUSTED TO 6.5-7.0 BY LIMING IN ACCORDANCE WITH ITEM 659.08. NON-PERFORMANCE OF PH ADJUSTMENT MAY BE STIPULATED AS INDICATED BY SOIL TESTING.

ALL AREAS TO BE SEEDED SHALL BE FERTILIZED IN ACCORDANCE WITH ITEM 659, COMMERCIAL FERTILIZER, AS PER PLAN, WHICH WILL CONSIST OF TWO FORMULAS, (18-46-0) APPLIED AT FIFTEEN (15) POUNDS PER 1,000 SQ. FT. DURING CROWNVEATCH SEEDING OPERATION AND (38-0-0 SLOW RELEASE UREAFORM) AT THE RATE OF FIVE (5) POUNDS PER 1,000 SQ. FT. APPLIED AFTER THE SEEDING OPERATION AND WITHIN THE 30 DAY PERIOD PRIOR TO PROJECT COMPLETION.

ALL AREAS TO BE SEEDED WILL BE AS SPECIFIED ON THE PLANS. THE SEEDING SHALL MEET THE REQUIREMENTS OF ITEM 659 EXCEPT AS FOLLOWS:

1. SEED MIXTURE SHALL BE CROWNVEATCH (CORONILLA VARIA) AND PERENNIAL RYE (LOLIUM PERENE).
2. CROWNVEATCH SHALL BE SOWN AT THE RATE OF ONE-HALF (1/2) POUND PER 1,000 SQ. FT. AND PERENNIAL RYE SHALL BE SOWN AT THE RATE OF ONE (1) POUND PER 1,000 SQ. FT. THE CROWNVEATCH SEED MAY BE SOWN DRY OR HYDRAULICALLY AFTER THE FERTILIZER AND/OR LIMING MATERIALS HAVE BEEN INCORPORATED INTO THE SOIL. SEEDING WILL NOT BE PERMITTED DURING SEPTEMBER AND OCTOBER EXCEPT THE RYE-GRASS PORTION WHICH MAY BE APPLIED DURING SEPTEMBER AND OCTOBER AS SOIL AREAS ARE PREPARED, WITH THE CROWNVEATCH SEED PORTION APPLIED (OVERSEEDED). AFTER OCTOBER 31.

THE INOCULANT FOR TREATING CROWNVEATCH SEEDS SHALL BE A PURE CULTURE OF NITROGEN-FIXING BACTERIA SELECTED FOR MAXIMUM VITALITY, NOT MORE THAN ONE YEAR OLD. THE INOCULANT SHALL BE THE PROPER CULTURE FOR CROWNVEATCH SEED. SEED SHALL BE INOCULATED IN ACCORDANCE WITH 659.07. WHEN SEED IS APPLIED BY HYDRAULIC SEEDERS, FOUR TIMES THE MANUFACTURER'S RECOMMENDED RATE SHALL BE UTILIZED AND THE MANUFACTURER'S RECOMMENDED PROCEDURES FOR INOCULATING WILL NOT APPLY.

MULCH SHALL BE WHEAT OR OAT STRAW, AS SPECIFIED UNDER 659.09 AND SHALL BE APPLIED IMMEDIATELY AFTER SOWING OF THE SEED.

PAYMENT FOR ACCEPTED QUANTITIES WILL BE MADE AT CONTRACT PRICES FOR:

| | | |
|---|-------|--------------|
| ITEM 659 - CROWNVEATCH SEEDING AND MULCHING | | SQUARE YARDS |
| ITEM 659 - COMMERCIAL FERTILIZER, AS PER PLAN | | TONS |

EROSION CONTROL

ITEMS 601, 660, 661 AND 662 ARE PROVIDED IN THE PLANS FOR EROSION CONTROL. ROCK OF A STABLE NATURE WILL NOT BE REMOVED IN ORDER TO PLACE ANY OF THESE ITEMS, AND TURF OF A STABLE NATURE WILL NOT BE REMOVED IN ORDER TO PLACE 660. THE ENGINEER SHALL CHECK AND NON-PERFORM QUANTITIES OR ADJUST LOCATIONS AND QUANTITIES FOR THESE ITEMS WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION.

ITEM 660 - SODDING, AS PER PLAN

WHERE THIS ITEM IS CALLED FOR ON THE PLAN, ANY ONE OF ITEMS 660 "SODDING; ITEM 667 "SEEDING AND JUTE MATTING" OR ITEM 668 "SEEDING AND EXCELSIOR MATTING" MAY BE USED.

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

PRIOR TO PLACING THE ITEM 301 BITUMINOUS AGGREGATE, AN APPLICATION OF PRINCE P 80W, OR AMISINE OR AN APPROVED EQUAL, SHALL BE APPLIED TO THE SHOULDER BED. THE RATE AND METHOD OF APPLICATION SHALL BE IN STRICT CONFORMANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

PAYMENT SHALL BE MADE AT THE CONTRACT UNIT PRICE BID PER SQUARE YARD, "ITEM SPECIAL-HERBICIDES FOR WEED CONTROL," WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR ALL LABOR, MATERIALS, TOOLS, EQUIPMENT AND WATER REQUIRED TO COMPLETE THIS ITEM OF WORK.

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

COST OF ALL MATERIALS, EQUIPMENT, AND LABOR NECESSARY TO ACCOMPLISH THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICES BID FOR ITEM 301 "BITUMINOUS AGGREGATE BASE (WEED CONTROL)" AND ITEM SPECIAL "HERBICIDES FOR WEED CONTROL".

ITEM 203, LINEAR GRADING

THIS WORK SHALL CONSIST OF PREPARING A SUBGRADE FOR THE SHOULDER PAVING BY EXCAVATING THE EXISTING SHOULDER MATERIAL TO THE DEPTH SHOWN IN THE PLAN, OR AS DIRECTED BY THE ENGINEER, TO REMOVE ANY UNSTABLE MATERIAL AND BY SHAPING AND COMPACTING THE SUBGRADE. THE UNSOUND OR BROKEN EDGE OF BITUMINOUS PAVEMENTS SHALL FIRST BE TRIMMED TO A LINE ESTABLISHED BY THE ENGINEER. THE EXISTING SHOULDER THEN SHALL BE EXCAVATED AND THE SUBGRADE SHAPED AND COMPACTED. COMPACTATION SHALL BE CARRIED OUT TO THE SATISFACTION OF THE ENGINEER BY MEANS OF A TRENCH ROLLER, 401.11. AREAS GRADED IN EXCESS OF DEPTHS SPECIFIED OR DIRECTED BY THE ENGINEER SHALL BE BACKFILLED TO DESIRED GRADE USING 617 COMPACTED AGGREGATE AT THE CONTRACTOR'S EXPENSE. EXCAVATED MATERIAL SHALL BE DISPOSED OF AS INDICATED IN THE PLAN.

ITEM SPECIAL - IMPACT ATTENUATOR ASSEMBLY, SAND BARREL SYSTEM

THIS WORK SHALL CONSIST OF AN IMPACT ATTENUATOR COMPOSED OF FRANGIBLE PLASTIC BARRELS FILLED WITH SAND IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND PLACED IN CONFORMITY WITH THE DESIGN SHOWN ON THE PLANS.

THE BARRELS SHALL BE AS SUPPLIED BY FIBCO, INC. ONE BOSTON PLACE, BOSTON, MASS. (FITCH BARRELS) OR ENERGY ABSORPTION SYSTEMS, INC., ONE IBM PLAZA, CHICAGO, ILL. (ENERGITE BARRELS).

EACH MODULE SHALL BE PLACED AS PER LOCATION AND DIMENSIONS SHOWN ON THE PLANS. THE CONTRACTOR SHALL, PRIOR TO FILLING THE BARRELS, OUTLINE IN YELLOW SPRAY-TYPE PAINT, THE LOCATION OF EACH MODULE AND PAINT THE RESPECTIVE SAND WEIGHTS (MINIMUM HEIGHT OF NUMBERS - 6") INSIDE SAID OUTLINE AS INDICATED ON THE PLAN SHEETS. TO FACILITATE LID INSTALLATION, THERE SHALL BE A 1" CLEARANCE BETWEEN ADJACENT BARRELS. THE CONTRACTOR SHALL DRILL HOLES IN THE RIM AND BARREL AT FOUR EQUI-DISTANT POINTS AND POP-RIVET THE TOP TO THE BARREL.

THE CONTRACTOR SHALL PREGRADE THE ASSEMBLY LOCATION TO ACHIEVE A RELATIVELY FLAT BASE AREA AND TO FORM A DRAINAGE SWALE AROUND THE PROPOSED ASSEMBLY.

THE EXPOSED PORTION OF EACH OUTSIDE BARREL, EXCEPT THOSE ON THE INSIDE AT THE REAR, SHALL BE MARKED WITH TWO 6" HORIZONTAL STRIPES OF WHITE REFLECTIVE MATERIAL. THE FIRST STRIPE SHALL BE PLACED 4" FROM TOP OF BARREL AND THE SECOND 14" FROM TOP OF BARREL.

THE SAND PLACED IN THE PLASTIC BARRELS SHALL BE APPROVED BY THE ENGINEER BEFORE USE. THE CONTRACTOR SHALL USE WASHED CONCRETE SAND, SPEC. 703.02 (GRADATION ONLY) WITH A WATER CONTENT BY WEIGHT OF 5 PERCENT OR LESS. SAND PLACED WITHIN THE BARRELS SHALL HAVE A DENSITY BETWEEN 90-100 LBS. PER CU. FT. TO DETER FREEZING OF SAND IN THE BARRELS, A SALT BRINE SOLUTION SHALL BE ADDED UNIFORMLY TO THE SAND FOLLOWING EACH LAYER OF SAND OF A MAXIMUM HEIGHT OF 6.5 INCHES. THE SOLUTION SHALL CONTAIN SALT DISSOLVED IN WATER AT THE RATE OF ONE POUND OF SALT (97% PURE SODIUM CHLORIDE) FOR EVERY 5 POUNDS OF WATER. EQUAL AMOUNTS OF SAID SOLUTION SHALL BE ADDED TO EACH LAYER OF SAND PLACED IN THE BARRELS. THE TOTAL AMOUNT OF SALT BRINE SOLUTION ADDED TO EACH BARREL SHALL BE 5% OF THE SAND WEIGHT PER RESPECTIVE BARREL. THE SALT BRINE SOLUTION SHALL BE UNIFORMLY SPRINKLED OR SPRAYED OVER THE SURFACE OF EACH LAYER OF SAND. AN ALTERNATIVE METHOD WOULD BE TO PREMIX, WITH THE SAME PROPORTIONS AS STATED ABOVE, THE SAND AND SALT BRINE SOLUTION BY AGITATION OR OTHER METHODS WHICH WOULD ACHIEVE A THOROUGH BLEND OF MATERIALS.

THE ACCEPTED QUANTITY OF IMPACT ATTENUATORS WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH LOCATION WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING AND PLACING ALL MATERIALS IN ACCORDANCE WITH THE PLAN DETAIL SHEETS, INCLUDING ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO CONSTRUCT A COMPLETE AND FUNCTIONAL SAND BARREL IMPACT ATTENUATOR, IN PLACE.

OHIO BELL TELEPHONE AND EAST OHIO GAS FACILITIES

OHIO BELL TELEPHONE COMPANY AND EAST OHIO GAS COMPANY HAVE MAJOR PROPOSED RELOCATIONS OF THEIR FACILITIES IN THE AREA OF THE PROJECT. THE UTILITIES PLAN TO COMPLETE THEIR RELOCATIONS PRIOR TO THE SALE OF THIS PROJECT. AVAILABLE INFORMATION OF THE PROPOSED ROUTINGS HAS BEEN SHOWN ON THE PLAN. THE CONTRACTOR SHALL OBTAIN RECORD DRAWING OF THEIR ACTUAL RELOCATIONS PRIOR TO STARTING CONSTRUCTION TO OBTAIN THE LOCATION OF THE RELOCATED FACILITIES.

ITEM 601 ROCK CHANNEL PROTECTION WITH FILTER

Where this item is called for on the plans, the quantities shown are based on the dimensions of the rock only and do not include the volume of a 6" stone filter bed. The cost of the filter (either fabric or stone) shall be included in the unit price bid for Item 601 Rock Channel Protection with Filter.

Where the fabric filter option is used the fabric shall meet the requirements of Supplemental Specification 93D Type B.

The surface to receive the fabric shall be prepared to a relatively smooth surface free of obstruction and debris. The fabric shall be placed with the long dimension parallel to the direction of flow and shall be laid loosely but without wrinkles and creases. Where joints are necessary, strips shall be placed to provide a 12" minimum overlap with the upstream strip overlapping the downstream strip. Securing pins with washers shall be placed at 2' minimum intervals along joints and at (2', 3' or 5')** intervals elsewhere to prevent slippage of the fabric. The securing pins shall be 3/16" diameter of steel pointed at one end and fabricated with a head to retain a steel washer having an outside diameter not less than 1/2". Pin lengths shall be greater than or equal to 18".

** 2' for flow direction slopes steeper than 3:1, 3' for slopes 3:1 to 4:1 and 5' for slopes less steep than 4:1.

TRAFFIC CONTROL

FOR TRAFFIC CONTROL GENERAL NOTES AND SUMMARY, SEE SHEETS 184-188.

MAINTENANCE OF TRAFFIC

FOR MAINTENANCE OF TRAFFIC GENERAL NOTES AND SUMMARY, SEE SHEETS 94-96.

LIGHTING

FOR LIGHTING GENERAL NOTES AND SUMMARY, SEE SHEETS 140-144.

MELP

FOR MELP GENERAL NOTES AND SUMMARY, SEE SHEETS 166, 166 A, THRU 1661, 167.

WATERWORK

FOR WATERWORK GENERAL NOTES AND SUMMARY, SEE SHEETS 107-115.

BRIDGE NO. CUY-490-0152

FOR BRIDGE GENERAL NOTES AND SUMMARY, SEE SHEETS 232-233

SUB - SUMMARIES

| | | | | |
|---------------|---------------|-------------------|-------|---------|
| QUANTITIES | | FED. RD. DIVISION | STATE | PROJECT |
| CALC. BY: JRH | DATE: JULY 78 | 2 | OHIO | |
| CKD. BY: CAP | DATE: MAY 82 | | | |

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261

QUANTITIES CARRIED TO
GENERAL SUMMARY CUYAHOGA COUNTY
CUY-490-149

ITEM 203 EMBANKMENT
ITEM 203 EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION

| SHEET | LOCATION | QUANTITY CUBIC YARDS | | | |
|-------|--------------------------------------|----------------------|------------|------------|------------|
| | | I | | | |
| | | EXCAVATION | EMBANKMENT | EXCAVATION | EMBANKMENT |
| 67 | I-490 STA.1021+61.56 TO STA.1053+00 | 212,442 | 0 | | |
| 73 | I-490 STA.1053+00 TO STA.1061+50 | 2,923 | 8,393 | | |
| 78 | RAMP W-S STA.5+68.14 TO STA.16+38.21 | 90,156 | 347 | | |
| 83 | RAMP N-W STA.8+19.86 TO STA.18+40 | 55,299 | 87 | | |
| 87 | BROADWAY STA.2+75 TO STA.22+25 | 2,842 | 260 | | |
| 92 | E.55 ST. STA.8+38.79 TO STA.12+85 | 1,006 | 8 | | |
| — | RAMP OVERLAY AREAS | | 5 | | |
| TOTAL | | 364,668 | 9,100 | | |

ITEM 659 CROWN VETCH SEEDING AND MULCHING

| SHEET | DESCRIPTION | I | | | |
|-------|----------------------------|----------------------------------|---------------------|-----------------------------|---------------------------|
| | | CROWN VETCH SEEDING AND MULCHING | AGRICULTURAL LIMING | COMMERCIAL FERTILIZER | COMMERCIAL FERTILIZER |
| | | S.Y. | TON | (18-46-0) 15#/1000 S.F. TON | (38-0-0) 5#/1000 S.F. TON |
| 17 | I-490, RAMP W-S & RAMP N-W | 1,558 | | | |
| 23 | RAMP W-S | 2,970 | | | |
| 24 | RAMP N-W | 2,463 | | | |
| TOTAL | | 6,991 | 3.1 | 0.5 | 0.2 |

ITEM 659 SEEDING & MULCHING
ITEM 660 SODDING
ITEM 659 EROSION CONTROL

| SHEET | DESCRIPTION | I | | | | | | | |
|------------------|--------------------------------------|-------|-----------------------|---------------------|----------------------|-----------------------|---------------------|------|----------------------|
| | | SOD | COMMERCIAL FERTILIZER | AGRICULTURAL LIMING | SEEDING AND MULCHING | COMMERCIAL FERTILIZER | AGRICULTURAL LIMING | SOD | SEEDING AND MULCHING |
| | | S.Y. | 20#/1000 S.F. TON | 100#/1000 S.F. TON | S.Y. | 20#/1000 S.F. TON | 100#/1000 S.F. TON | S.Y. | S.Y. |
| 67 | I-490 STA.1021+61.56 TO STA.1053+00 | | | | 13,367 | | | | |
| 73 | I-490 STA.1053+00 TO STA.1061+50 | | | | 5,678 | | | | |
| 78 | RAMP W-S STA.5+68.14 TO STA.16+38.21 | | | | 11,712 | | | | |
| 83 | RAMP N-W STA.8+19.86 TO STA.18+40 | | | | 9,797 | | | | |
| 47,48 | BROADWAY STA.18+58 TO STA.22+25 | | | | 408 | | | | |
| — | RAMP OVERLAY AREAS | | | | 224 | | | | |
| 39 | BOWER BRAGG & E.54 | 1,183 | | | | | | | |
| 43,44 | BROADWAY | 485 | | | | | | | |
| 52 | E.37 | 368 | | | | | | | |
| SUB TOTAL | | 2,036 | | | 41,206 | | | | |
| LESS CROWN VETCH | | | | | 6,991 | | | | |
| TOTAL | | 2,036 | 3.1 | 15.4 | 34,215 | | | | |

ITEM 203 SUBGRADE COMPACTION & PROOF ROLLING

| LOCATION | I | | | | |
|---------------------------------------|---------------------|----------------------|---------------------|----------------------|--|
| | SUBGRADE COMPACTION | PROOF ROLLING | SUBGRADE COMPACTION | PROOF ROLLING | |
| | S.Y. | 1 HR./3000 S.Y. HOUR | S.Y. | 1 HR./3000 S.Y. HOUR | |
| I-490 STA.1023+49.97 TO STA.1053+00 | 22,494 | 7.5 | | | |
| I-490 STA.1053+00 TO STA.1062+08.25 | 12,419 | 4.2 | | | |
| RAMP N-W STA.8+00 TO STA.17+87.91 | 3,754 | 1.3 | | | |
| RAMP W-S STA.4+67.99 TO STA.16+80 | 4,592 | 1.5 | | | |
| RAMP W-N STA.0+23.65 TO STA.7+03 | 1,956 | 0.7 | | | |
| RAMP S-W STA.14+96.67 TO STA.20+99.93 | 1,842 | 0.6 | | | |
| ACCES ROAD | 108 | 0.0 | | | |
| E.55 ST. STA.8+38.79 TO STA.12+85 | 122 | 0.0 | | | |
| BRAGG ROAD | 1,262 | 0.4 | | | |
| DRIVE | 400 | 0.1 | | | |
| BROADWAY | 7,387 | 2.5 | | | |
| E.37 STREET STA.1+00 TO END | 1,772 | 0.6 | | | |
| SUB TOTAL | | 58,108 | 19.4 | | |
| TOTAL | | 58,108 | 19.0 | | |

CONT. No. SHEET ACCT. No.

| | | | |
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| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| I-490 | | | |
| SUB - SUMMARIES | | | |
| SCALE | DATE | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CAP | | | JRH |
| REVIEWED | DATE | | |

GENERAL SUMMARY

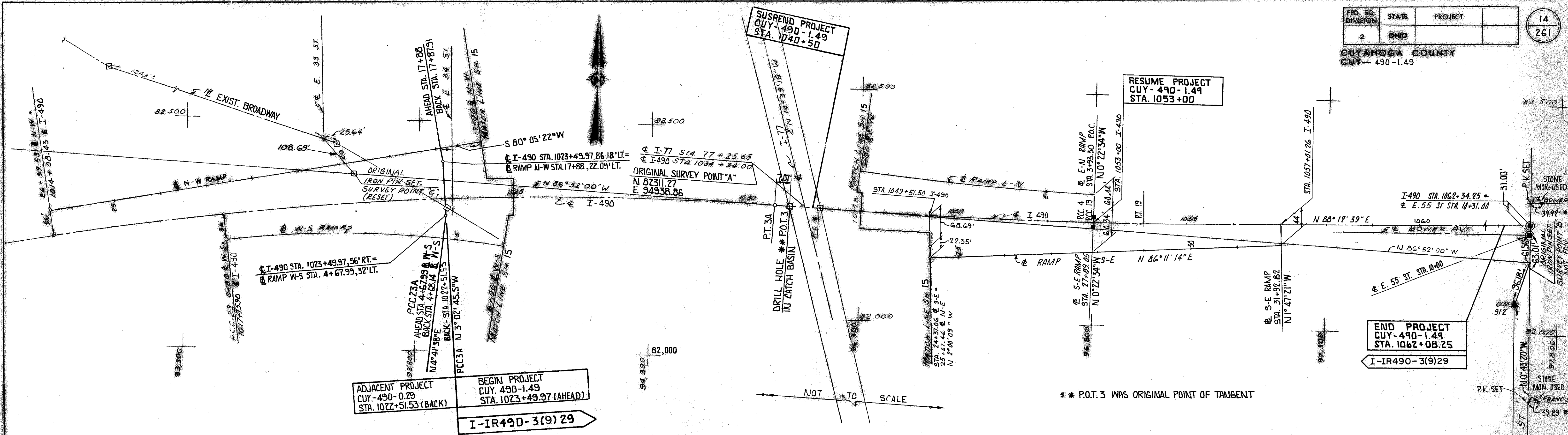
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| QUANTITIES | | FED. RD. DIVISION | STATE | PROJECT |
| CALC. BY: CAP | DATE: 11-83 | 2 | OHIO | |
| CHK'D. BY: RLH | DATE: 11-83 | | | |

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CUYAHOGA COUNTY
CUY-490-1.49

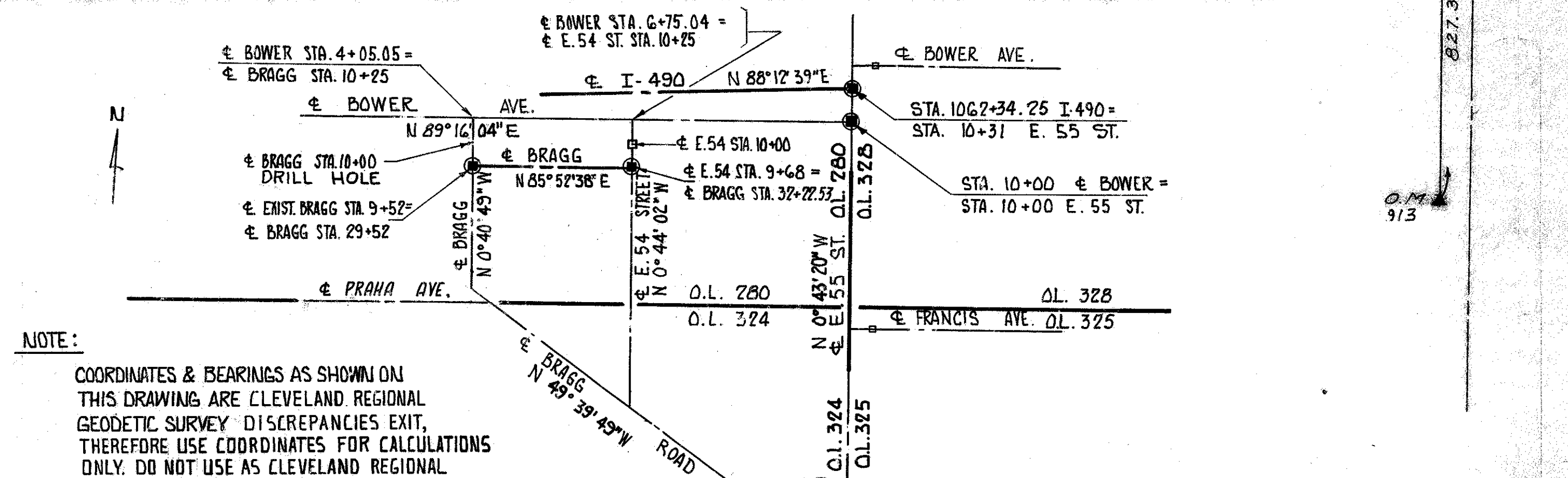
| LINE NO | SHEET NUMBER | | | | | | | | | | | | FUNDS | | TOTAL | ITEM | UNIT | DESCRIPTION | LINE NO |
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| | 8 | 20 | 22 | 26 | 39A | | 60A | | I | IR | | | | | | | | | |
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| 70 | | | | | | | | | | | | | | | | | | | |
| 71 | | | | | | | | | | | | | | | | | | | |
| 72 | | | | | | | | | | | | | | | | | | | |

CONT. No. SHEET ACCT. No.



| CURVE NO. | TANGENT TO SPIRAL | | | SPIRAL TO CURVE | | | POINT OF INTERSECTION | | | CURVE TO SPIRAL | | | SPIRAL TO TANGENT | | | REMARKS | CURVE NO. | | | | | | | | | | | | |
|-----------|-------------------|-----------|-----------|-----------------|-----------|-----------|-----------------------|-----------|-----------|-----------------|-----------|-----------|-------------------|-----------|-----------|--------------|-------------|------|---------|--------|--------|-------------|-------------|-------------|--------|--------|----------|----------|----|
| | STATION | N | E | STATION | N | E | STATION | N | E | STATION | N | E | STATION | N | E | | | | | | | | | | | | | | |
| 5 | 4+17.45 | 80,867.44 | 95,322.03 | 10+71.01 | 81,619.30 | 95,217.14 | 8+21.01 | 81,970.25 | 95,300.70 | 17+09.74 | 82,026.22 | 95,719.82 | 20+00.74 | 82,110.74 | 95,013.95 | 17° 00' 30" | 13° 07' 30" | 250' | 248.42 | 248.42 | 19.02 | 4° 02' 00" | 1° 00' 00" | 378.58 | 301.84 | 403.54 | Ramp S-E | 5 | |
| 6 | 10+71.01 | 81,619.30 | 95,317.14 | 10+71.01 | 81,619.30 | 95,317.14 | 17+09.74 | 82,026.22 | 95,719.82 | 20+00.74 | 82,110.74 | 95,013.95 | 20+00.74 | 82,110.74 | 95,013.95 | 74° 04' 20" | 14° 15' 00" | 300' | 289.18 | 299.15 | 24.76 | 52° 49' 38" | 9° 30' 00" | 603.11 | 346.97 | 629.73 | Ramp S-E | 6 | |
| 13 | 14+69.63 | 82,419.77 | 95,736.70 | 17+19.63 | 82,481.68 | 95,494.84 | 19+08.65 | 82,903.75 | 95,205.79 | 20+59.07 | 82,672.66 | 95,218.08 | 23+09.07 | 82,876.80 | 95,074.33 | 42° 09' 18" | 10° 00' 00" | 250' | 439.02 | 249.26 | 249.24 | 14.51 | 27° 09' 18" | 8° 00' 00" | 714.20 | 172.87 | 339.44 | Ramp E-N | 13 |
| 15 | 3+20.09 | 82,423.85 | 95,590.28 | 6+20.09 | 82,452.67 | 95,292.78 | 16+84.04 | 82,684.75 | 94,251.52 | 15+29.16 | 81,795.24 | 94,840.45 | 18+29.16 | 81,527.69 | 94,973.70 | 132° 59' 51" | 16° 30' 00" | 300' | 1363.95 | 298.90 | 297.52 | 28.63 | 99° 59' 51" | 11° 00' 00" | 530.87 | 630.72 | 909.07 | Ramp E-S | 15 |
| 18 | 5+32.48 | 83,214.27 | 94,590.94 | 8+32.48 | 82,915.37 | 94,590.37 | 11+68.41 | 82,591.14 | 94,680.64 | 13+07.86 | 82,549.99 | 94,312.47 | 16+07.86 | 82,469.65 | 94,024.38 | 85° 17' 29" | 16° 30' 00" | 300' | 635.83 | 268.90 | 297.52 | 28.63 | 52° 17' 29" | 11° 00' 00" | 520.87 | 255.69 | 475.38 | Ramp N-W | 18 |
| 29 | 1+87.21 | 82,195.64 | 94,295.70 | 4+87.21 | 82,166.92 | 94,593.21 | 15+46.31 | 81,936.03 | 95,429.77 | 13+94.75 | 82,022.99 | 95,045.77 | 16+94.75 | 83,080.91 | 94,913.24 | 132° 49' 46" | 16° 30' 00" | 300' | 1359.10 | 298.90 | 297.52 | 28.63 | 99° 49' 46" | 11° 00' 00" | 520.87 | 619.88 | 907.54 | Ramp W-N | 29 |

| CURVE NO. | BEGINNING OF CURVE | | | P. I. OF CURVE | | | END OF CURVE | | | Δ | D | R | T | L | REMARKS |
|-----------|--------------------|-----------|-----------|----------------|-----------|-----------|--------------|-----------|-----------|--------------|--------------|-----------|--------|---------|----------|
| | STATION | N | E | STATION | N | E | STATION | N | E | | | | | | |
| 1 | 39+19.51 | 80,547.91 | 95,316.92 | 64+01.00 | 81,027.54 | 95,274.56 | 68+80.23 | 81,493.37 | 95,132.74 | 9° 30' 26" | 1° 00' 00" | 5729.58 | 481.49 | 960.72 | I-77 |
| 3 | 1047+09.17 | 82,241.59 | 96,212.11 | 1050+04.64 | 82,225.44 | 92,507.15 | 1053+00.00 | 82,223.50 | 96,602.62 | 2° 45' 26" | 0° 30' 00" | 14,227.67 | 295.47 | 590.83 | I-490 |
| 3A | 1023+49.97 | 82,330.80 | 93,855.69 | 1027+19.07 | 82,350.41 | 94,224.28 | 1030+87.46 | 82,330.24 | 94,592.83 | 6° 10' 45.5" | 0° 50' 16.4" | 6,838.15 | 363.10 | 737.45 | I-490 |
| 5 | 2+52.90 | 81,483.23 | 95,270.27 | 5+06.99 | 81,737.30 | 95,259.66 | 7+58.86 | 81,272.53 | 94,162.37 | 20° 07' 04" | 4° 00' 00" | 1432.39 | 294.69 | 502.96 | Ramp S-W |
| 10 | 7+55.84 | 81,972.53 | 95,162.37 | 12+47.72 | 82,423.91 | 94,974.05 | 16+41.65 | 82,473.91 | 94,404.44 | 62° 00' 18" | 7° 00' 00" | 818.51 | 471.86 | 885.79 | Ramp S-W |
| 11 | 16+41.65 | 82,473.91 | 94,404.44 | 18+25.46 | 82,471.47 | 94,301.47 | 20+07.27 | 82,462.26 | 94,120.00 | 14° 37' 30" | 4° 00' 00" | 1432.39 | 183.81 | 385.62 | Ramp S-W |
| 12 | 0+83.73 | 82,281.39 | 97,112.56 | 6+91.14 | 82,269.79 | 96,505.24 | 12+94.04 | 82,386.18 | 95,989.05 | 12° 04' 11" | 1° 00' 00" | 5729.58 | 607.41 | 1210.21 | Ramp E-N |
| 14 | 28+10.35 | 83,302.75 | 94,810.05 | 30+04.36 | 83,467.61 | 94,707.77 | 31+98.69 | 83,453.73 | 94,653.02 | 15° 25' 37" | 4° 00' 00" | 1432.39 | 194.01 | 385.67 | Ramp E-N |
| 16 | 19+65.83 | 81,411.75 | 95,046.06 | 20+55.09 | 81,336.03 | 95,093.32 | 21+44.12 | 81,255.10 | 95,130.98 | 7° 00' 31" | 3° 30' 03" | 1456.39 | 89.26 | 178.29 | Ramp E-S |
| 17 | 0+00.00 | 83,741.63 | 94,522.42 | 1+16.09 | 83,429.32 | 94,531.79 | 2+31.67 | 83,513.75 | 94,582.49 | 9° 16' 00" | 4° 00' 00" | 1432.39 | 116.09 | 201.67 | Ramp N-W |
| 19 | 1053+00.00 | 82,223.50 | 96,602.62 | 1053+54.14 | 82,223.15 | 96,856.75 | 1054+08.26 | 82,224.84 | 96,910.87 | 2° 09' 55" | 2° 00' 00" | 2,864.79 | 54.14 | 108.26 | I-490 |
| 20 | 2+22.34 | 83,030.47 | 94,632.10 | 4+27.22 | 82,899.49 | 94,651.34 | 6+29.33 | 82,439.09 | 94,726.99 | 16° 16' 47" | 4° 00' 00" | 1432.39 | 204.88 | 406.99 | Ramp N-E |
| 21 | 6+29.33 | 82,639.09 | 94,726.99 | 10+17.46 | 82,278.79 | 94,870.30 | 13+47.36 | 82,181.44 | 95,246.13 | 53° 52' 01" | 7° 30' 00" | 764.94 | 388.13 | 718.23 | Ramp N-E |
| 22 | 13+47.36 | 82,181.44 | 95,246.13 | 15+53.35 | 82,130.29 | 95,444.43 | 17+54.39 | 82,136.75 | 95,449.12 | 16° 16' 24" | 4° 00' 00" | 1432.39 | 204.79 | 406.63 | Ramp N-E |
| 24 | 7+96.13 | 82,192.49 | 94,179.99 | 9+26.18 | 82,163.52 | 94,308.78 | 10+55.13 | 82,106.88 | 94,428.86 | 12° 57' 00" | 5° 00' 00" | 1145.92 | 130.05 | 258.00 | Ramp W-S |
| 25 | 10+55.13 | 82,106.88 | 94,428.86 | 11+98.52 | 82,044.40 | 94,552.94 | 13+38.17 | 81,937.09 | 94,648.02 | 22° 38' 36" | 8° 00' 00" | 716.20 | 143.39 | 285.04 | Ramp W-S |
| 26 | 13+38.17 | 81,937.09 | 94,648.02 | 14+41.27 | 81,859.92 | 94,716.38 | 15+44.62 | 81,773.75 | 94,772.99 | 8° 14' 02" | 4° 00' 00" | 1432.39 | 103.10 | 205.85 | Ramp W-S |
| 27 | 20+42.58 | 81,357.07 | 95,046.74 | 21+06.91 | 81,303.30 | 95,082.07 | 21+71.02 | 81,244.98 | 95,189.21 | 8° 20' 56" | 6° 30' 00" | 881.47 | 64.33 | 128.44 | Ramp W-S |
| 28 | 21+71.02 | 81,244.98 | 95,189.21 | 23+83.42 | 81,052.41 | 95,128.89 | 25+92.76 | 80,842.12 | 95,226.71 | 16° 52' 10" | 4° 00' 00" | 1432.39 | 212.40 | 421.74 | Ramp W-S |
| 23A | 4+67.99 | 82,242.98 | 93,856.05 | 6+29.17 | 82,229.79 | 94,016.70 | 7+89.82 | 82,193.30 | 94,173.83 | 8° 10' 29" | 2° 32' 24" | 2,255.65 | 161.18 | 321.82 | RAMP W-S |



NOTE:
COORDINATES & BEARINGS AS SHOWN ON THIS DRAWING ARE CLEVELAND REGIONAL GEODETIC SURVEY DISCREPANCIES EXIST, THEREFORE USE COORDINATES FOR CALCULATIONS ONLY. DO NOT USE AS CLEVELAND REGIONAL GEODETIC REFERENCE.

- NOTES & LEGEND
1. DENOTES EXIST. MONUMENT
 2. O.M. - DENOTES CLEVELAND REGIONAL GEODETIC SURVEY MONUMENT
 3. WORK THIS SHEET WITH SETS. 15 & 16
 4. DENOTES NEW MONUMENT, STD. DWG. MC-1
 5. DENOTES EXIST. MONUMENT, REPLACE WITH STD. MC-1 DATA USED TO ESTABLISH E.55 STREET
 6. DENOTES NEW MONUMENT, STD. DWG. MC-1, USING CITY MONUMENT BOX DETAIL, SEE SHEET 65A

ENLARGED PLAN
E. 55 ST. & I-490
N.T.S.

REVISED BY: MRK / JRH / LV JUNE 78

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

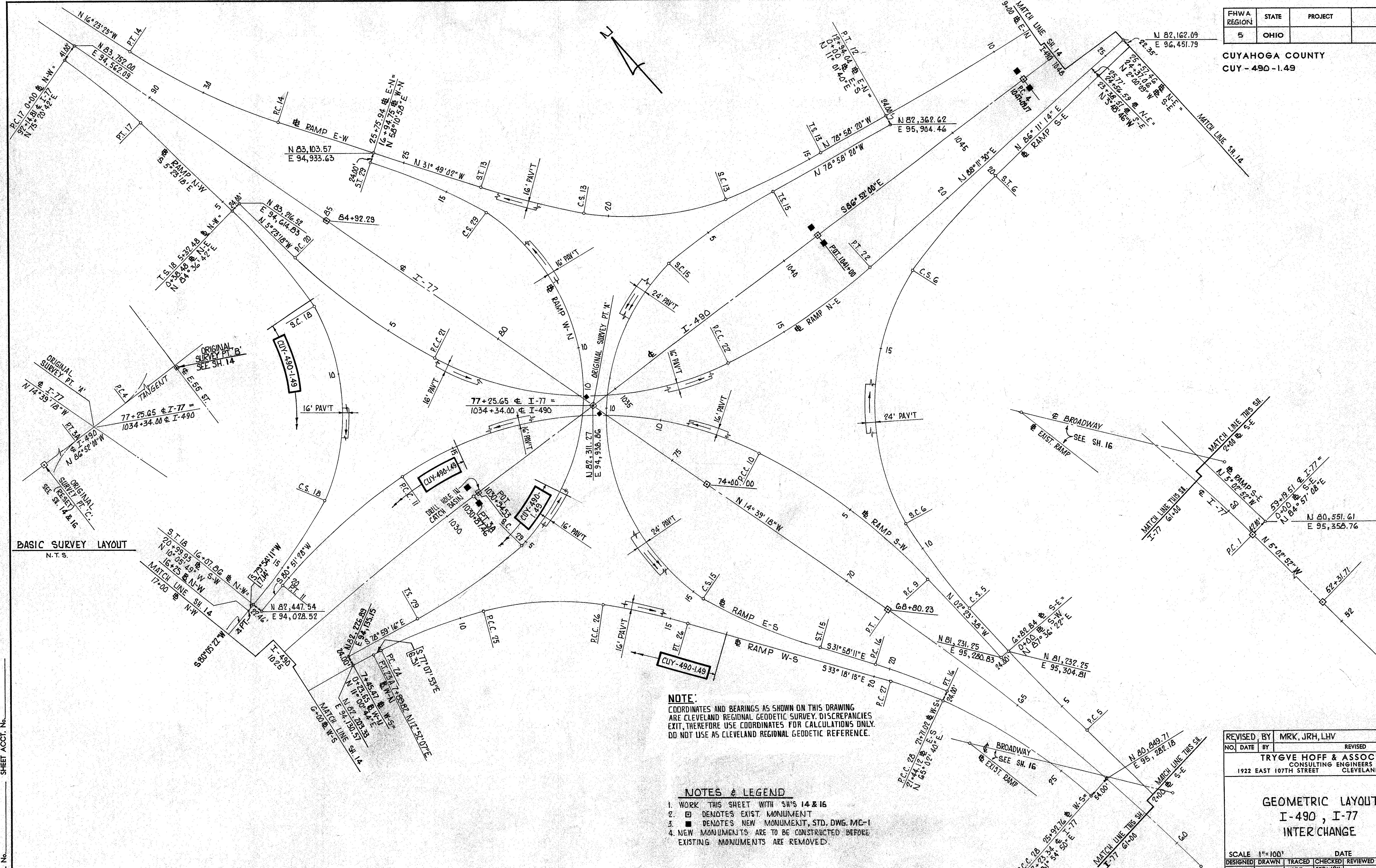
GEOMETRIC LAYOUT FOR INTERCHANGE AREA

| | |
|-----------------|------------------|
| SCALE NONE | DATE |
| DESIGNED: COR | TRACED: RB |
| CHECKED: T.L.L. | REVIEWED: T.L.L. |
| DATE: 8/1/83 | REVISED: |

| | | |
|-------------|-------|---------|
| FHWA REGION | STATE | PROJECT |
| 5 | OHIO | |

15
261

CUYAHOGA COUNTY
CUY-490-1.49



BASIC SURVEY LAYOUT
N.T.S.

NOTE:
COORDINATES AND BEARINGS AS SHOWN ON THIS DRAWING ARE CLEVELAND REGIONAL GEODETIC SURVEY. DISCREPANCIES EXIST, THEREFORE USE COORDINATES FOR CALCULATIONS ONLY. DO NOT USE AS CLEVELAND REGIONAL GEODETIC REFERENCE.

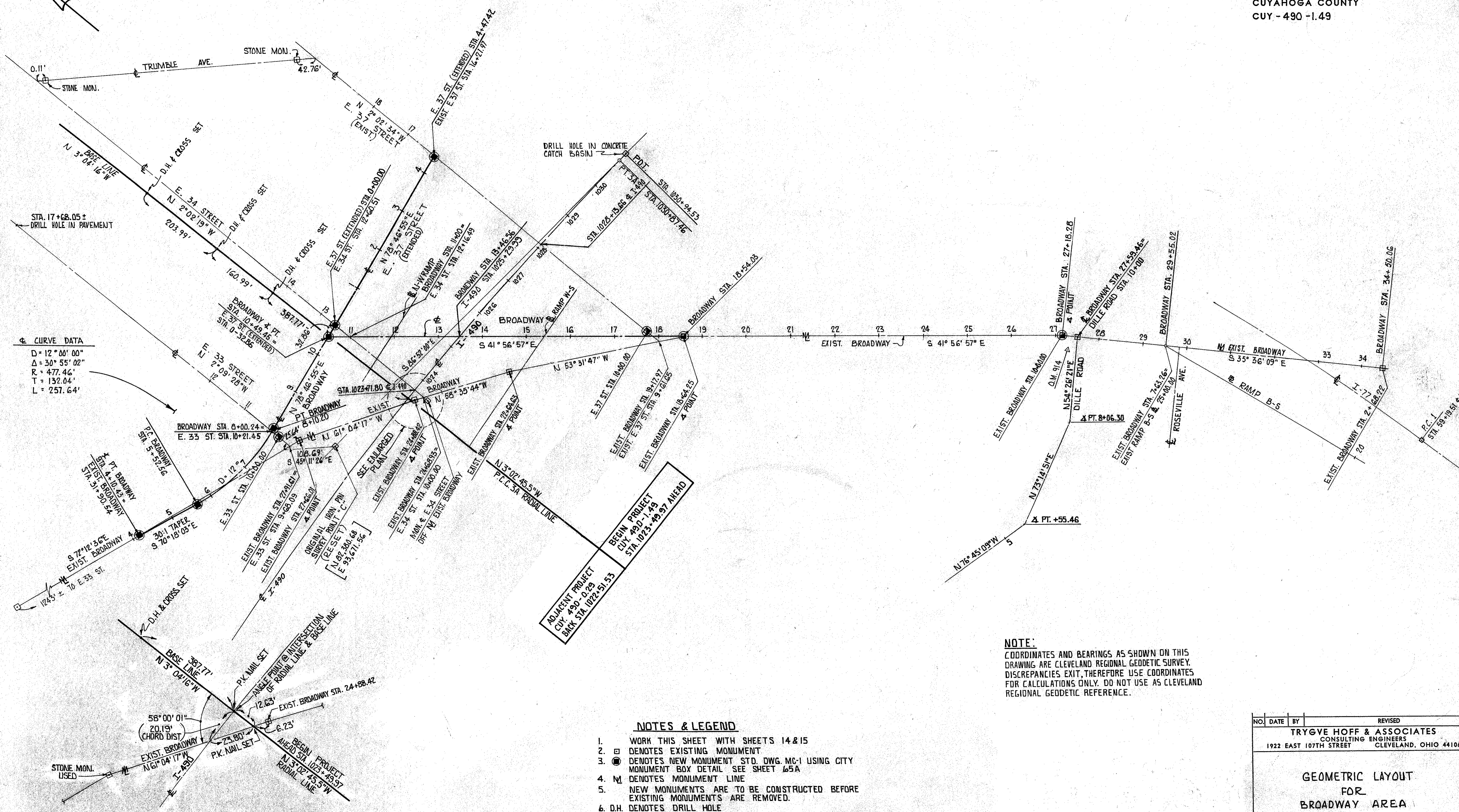
- NOTES & LEGEND**
1. WORK THIS SHEET WITH SH'S 14 & 16
 2. □ DENOTES EXIST. MONUMENT
 3. ■ DENOTES NEW MONUMENT, STD. DWG. MC-1
 4. NEW MONUMENTS ARE TO BE CONSTRUCTED BEFORE EXISTING MONUMENTS ARE REMOVED.

| | | | |
|---|---------------|------|---------|
| REVISED BY | MRK, JRH, LHV | DATE | JUNE 78 |
| NO. | | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

**GEOMETRIC LAYOUT
I-490, I-77
INTER CHANGE**

| | | | |
|----------|---------|----------|---------------|
| SCALE | 1"=100' | DATE | |
| DESIGNED | G.O.H. | TRACED | 1977 |
| DRAWN | R.B. | CHECKED | CDR. JRH |
| | | REVIEWED | USP |
| | | DATE | T.L.L. 8-1-63 |

CONT. No. SHEET ACCT. No.



CURVE DATA
 $D = 12^{\circ} 00' 00''$
 $\Delta = 30^{\circ} 55' 02''$
 $R = 477.46'$
 $T = 132.04'$
 $L = 257.64'$

ADJACENT PROJECT
 CUY. 490-029
 BRK STA. 1022+51.53

BEGIN PROJECT
 CUY. 490-1.49
 STA. 1023+49.97 AHEAD

NOTE:
 COORDINATES AND BEARINGS AS SHOWN ON THIS DRAWING ARE CLEVELAND REGIONAL GEODETIC SURVEY. DISCREPANCIES EXIST, THEREFORE USE COORDINATES FOR CALCULATIONS ONLY. DO NOT USE AS CLEVELAND REGIONAL GEODETIC REFERENCE.

NOTES & LEGEND

1. WORK THIS SHEET WITH SHEETS 14 & 15
2. \square DENOTES EXISTING MONUMENT
3. \bullet DENOTES NEW MONUMENT STD. DWG. MC-1 USING CITY MONUMENT BOX DETAIL SEE SHEET 65A
4. M DENOTES MONUMENT LINE
5. NEW MONUMENTS ARE TO BE CONSTRUCTED BEFORE EXISTING MONUMENTS ARE REMOVED.
6. D.H. DENOTES DRILL HOLE
7. \circ DENOTES EXISTING MONUMENT REPLACED WITH STD. DWG. MC-1 USING CITY MONUMENT BOX DETAIL SEE SHEET 65A

ENLARGED VIEW
 FIELD STAKING RADIAL LINE
 N.T.S.

| NO. | DATE | BY | REVISED |
|--|------|----|---------|
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

GEOMETRIC LAYOUT
 FOR
 BROADWAY AREA

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
|----------|-------|--------|---------|----------|------|
| LV | | | JRH | MRK | |

SHEET ACCT. No. CONT. No.

| | | |
|-------------|-------|---------|
| FHWA REGION | STATE | PROJECT |
| 5 | OHIO | |

17
261

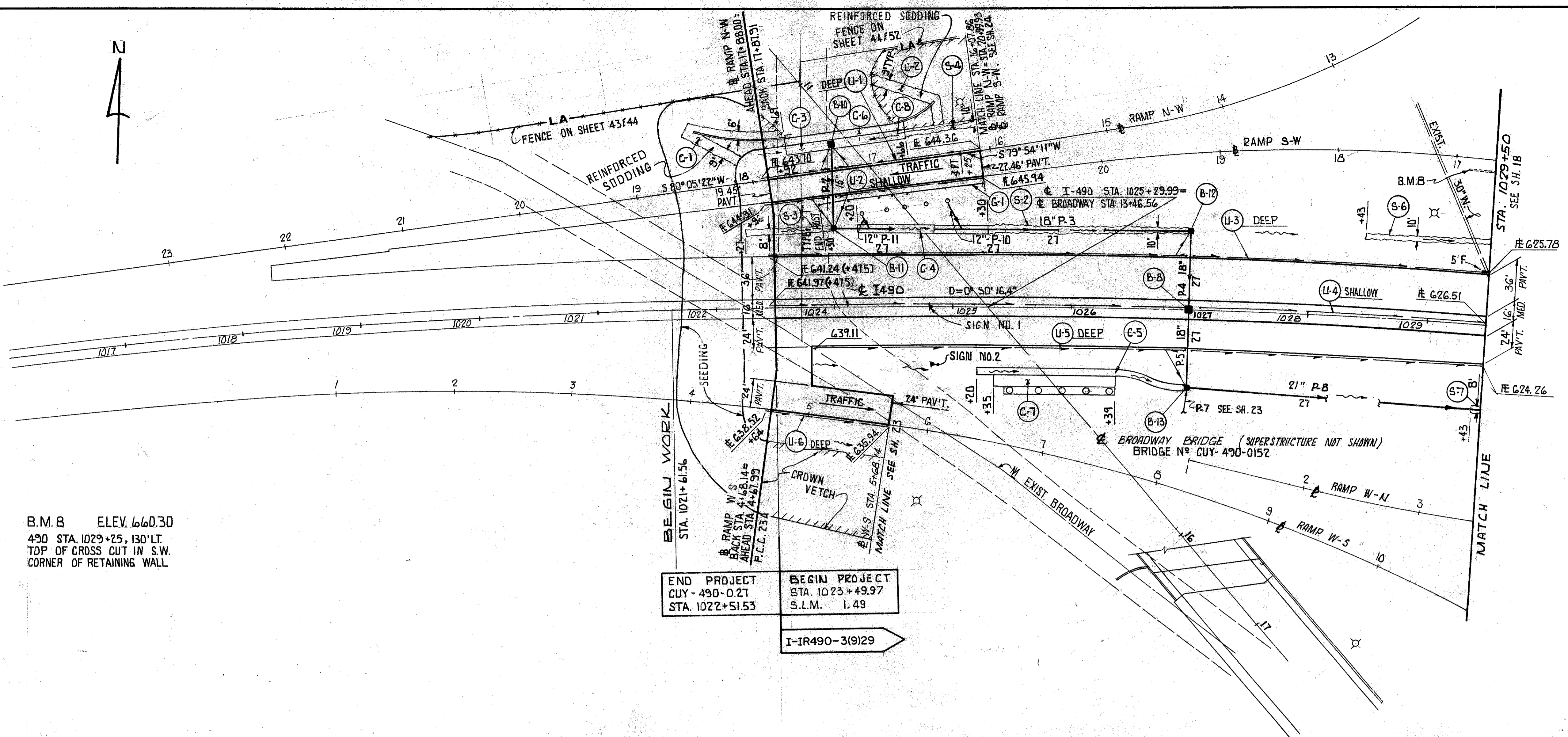
CUYAHOGA COUNTY
CUY-490-1.49

| REFERENCE DWGS | SHEET N° |
|---------------------------------------|------------------------------|
| TYPICAL SECTIONS | 3-7 |
| GEOMETRIC LAYOUT | 14, 15, & 16 |
| BROADWAY PLAN AND PROFILE | 42-45 & 47-49 |
| DRAINAGE & ROADWAY QUANTITIES | 20, 22, 26, 41, 46, 50, & 54 |
| PAVT. DETAILS & QUANTITIES | 29-36, 38, 39, & 39A |
| GRADING PLAN & CROSS SECTION KEY PLAN | 66 |
| SEWER PROFILES & DETAILS | 27, 28 & 40 |
| RAMP PLAN & PROFILES | 23, 24, 24A & 25 |
| TRAFFIC CONTROL | 184-227 |
| LIGHTING PLANS | 140-181 |
| RIGHT OF WAY | 254-261 |

NOTE
FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 43, 44, 47, 48, 121, 122, 123, 124, 126, 150, 151 & 198.

LEGEND
X LIGHT TOWER

BRIDGE N° CUY-490-0152
SITE PLAN ON SHEET 230

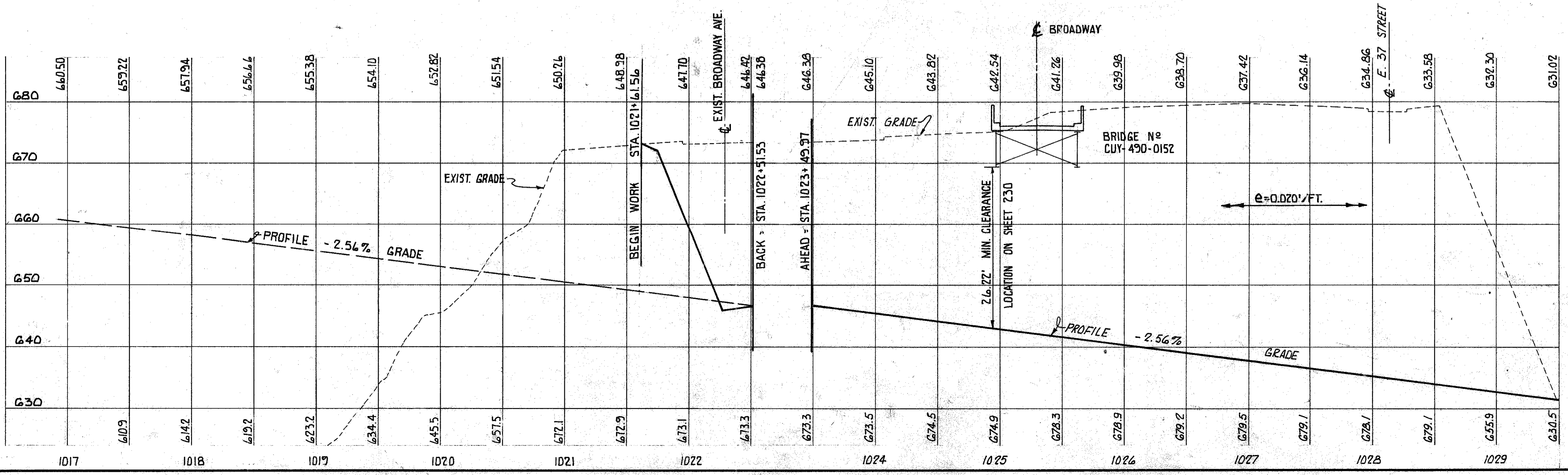


B.M. 8 ELEV. 660.30
490 STA. 1029+25, 130' LT.
TOP OF CROSS CUT IN S.W.
CORNER OF RETAINING WALL

END PROJECT
CUY-490-0.21
STA. 1022+51.53

BEGIN PROJECT
STA. 1023+49.97
S.L.M. 1.49

I-IR490-3(9)29



| NO. | DATE | BY | REVISED |
|---|---------|--------|---------|
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN AND PROFILE I-490 STA. 1017+00 TO STA. 1029+50 | | | |
| SCALE 1"=50' HORZ. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR | LV/RHII | JRH | |

CONT. No. SHEET ACCT. No.

CUYAHOGA COUNTY
CUY-490-1.49

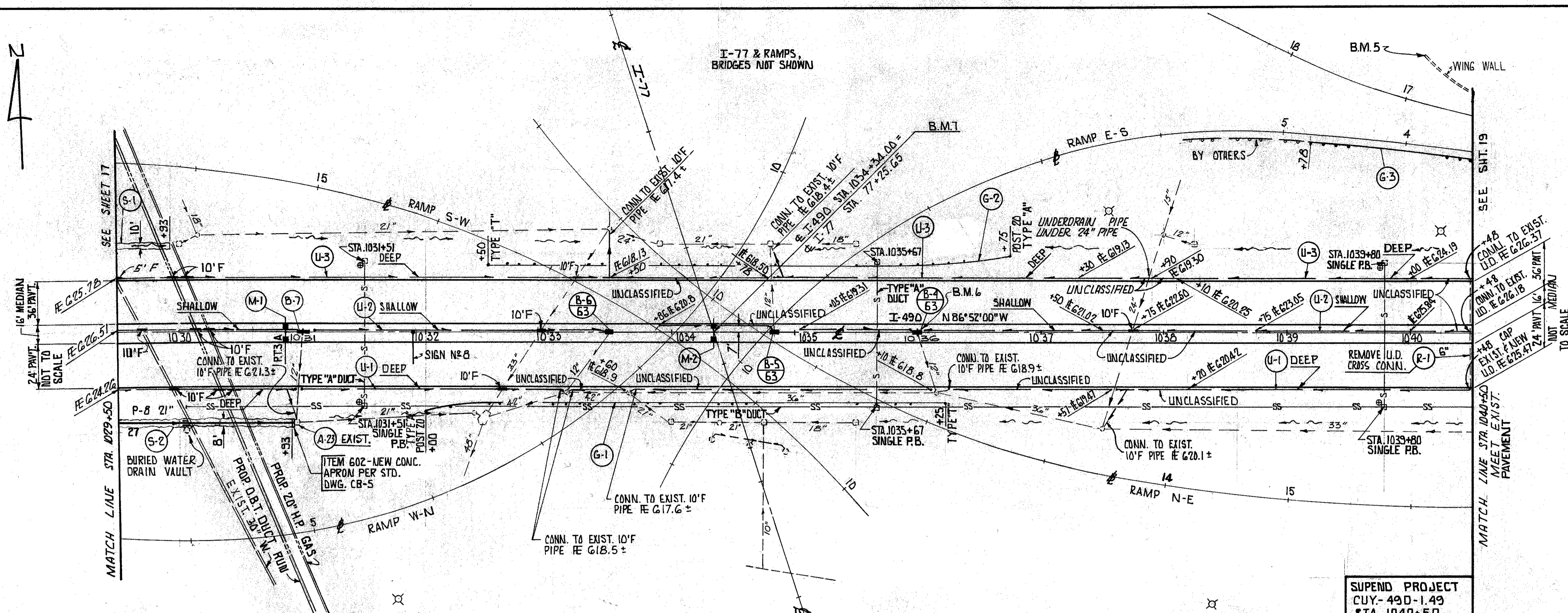
| REFERENCE DWG. | SHEET N ^o |
|---------------------------------------|----------------------|
| TYPICAL SECTIONS | 3 |
| GEOMETRIC LAYOUT | 14 & 15 |
| DRAINAGE & ROADWAY QUANTITIES | 20 |
| PART. DETAILS & QUANTITIES | 23, 30 & 39A |
| GRADING PLAN & CROSS SECTION KEY PLAN | 66 |
| SEWER PROFILES & DETAILS | 27, 30 & 62 |
| RAMP PLANS & PROFILES | 23, 24 & 25 |
| TRAFFIC CONTROL | 138 & 193 |
| LIGHTING PLANS | 150-152 |
| RIGHT OF WAY | 254-261 |

NOTES

1. THERE ARE EXISTING INLETS AT THE SAME LOCATIONS FOR INLETS B-4 THRU B-7. REMOVE INLETS ALONG WITH U.D. OUTLET PIPE - SEE QUANTITY TABLE, SHT. 20 PROFILE ON SHT. 27

LEGEND

⊗ LIGHT TOWER
 □ EXIST. ALARM PULL BOX
 — 1-2" EXIST. DUCTS FOR ALARM SYSTEM
 — 2-2" EXIST. DUCTS FOR ALARM SYSTEM
 P.B. - PULL BOX



B.M. 5 ELEV. 639.92
490 STA. 1040+00, 235' LT.
TOP OF X CUT IN N.W. CORNER
OF BRIDGE WING WALL.

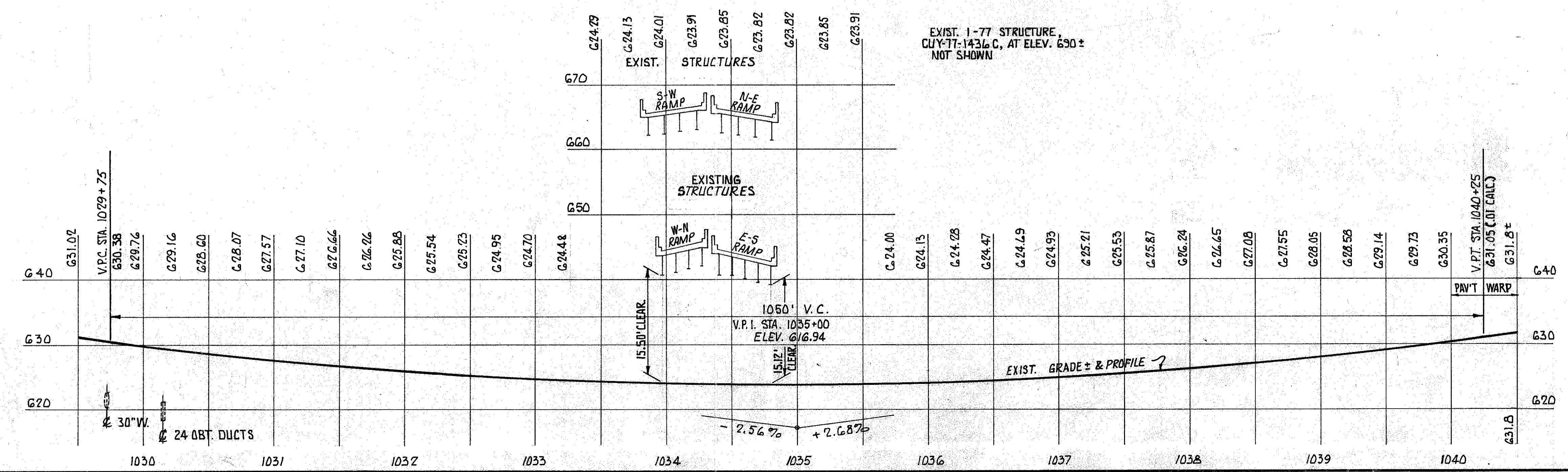
B.M. 6 ELEV. 624.68
490 STA. 1036+00, 3' LT.
TOP OF X CUT IN N.E. CORNER
OF INLET.

B.M. 7 ELEV. 623.58
490 STA. 1034+34, Ⓞ
TOP OF IRON PIN OF SURVEY
MONUMENT.

NOTE

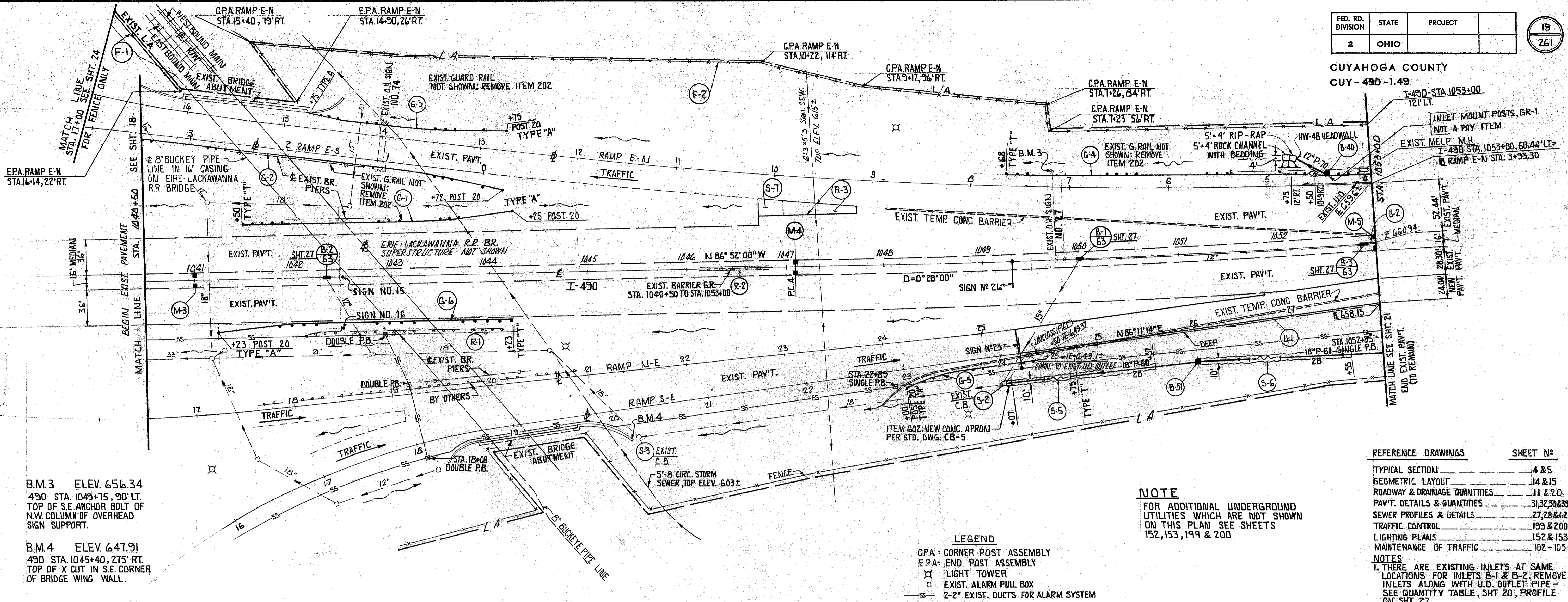
FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 151, 152, 198 & 199.

SUPEND PROJECT
CUY-490-1.49
STA. 1040+50



| NO. | DATE | BY | REVISED |
|---|---------|--------|----------|
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN AND PROFILE I-490 STA. 1029+50 TO STA. 1040+50 | | | |
| SCALE 1" = 50' HOR. | | DATE | |
| SCALE 1" = 10' VERT. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR. | LV/RHII | | JRH |
| | | | REVIEWED |
| | | | DATE |

CONT. No. SHEET ACCT. No.



B.M.3 ELEV. 656.34
 490 STA. 1049+75, 90' LT.
 TOP OF S.E. ANCHOR BOLT OF
 N.W. COLUMN OF OVERHEAD
 SIGN SUPPORT.

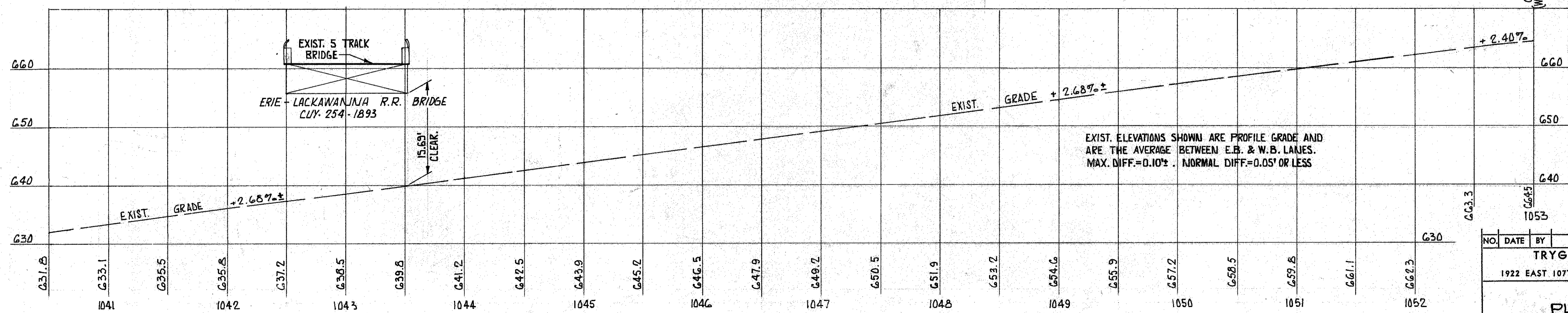
B.M.4 ELEV. 647.91
 490 STA. 1045+40, 275' RT.
 TOP OF X CUT IN S.E. CORNER
 OF BRIDGE WING WALL.

NOTE
 FOR ADDITIONAL UNDERGROUND
 UTILITIES WHICH ARE NOT SHOWN
 ON THIS PLAN SEE SHEETS
 152, 153, 199 & 200

LEGEND
 C.P.A. - CORNER POST ASSEMBLY
 E.P.A. - END POST ASSEMBLY
 X - LIGHT TOWER
 □ - EXIST. ALARM PULL BOX
 SS - 2-2" EXIST. DUCTS FOR ALARM SYSTEM
 P.B. - PULL BOX

| REFERENCE DRAWINGS | SHEET NO. |
|-------------------------------|------------------|
| TYPICAL SECTION | 4 & 5 |
| GEOMETRIC LAYOUT | 14 & 15 |
| ROADWAY & DRAINAGE QUANTITIES | 11 & 20 |
| PAV'T. DETAILS & QUANTITIES | 31, 32, 33 & 39A |
| SEWER PROFILES & DETAILS | 27, 28 & 62 |
| TRAFFIC CONTROL | 199 & 200 |
| LIGHTING PLANS | 152 & 153 |
| MAINTENANCE OF TRAFFIC | 102 - 105 |

NOTES
 1. THERE ARE EXISTING INLETS AT SAME
 LOCATIONS FOR INLETS B-1 & B-2. REMOVE
 INLETS ALONG WITH U.D. OUTLET PIPE -
 SEE QUANTITY TABLE, SHT 20, PROFILE
 ON SHT. 27



EXIST. ELEVATIONS SHOWN ARE PROFILE GRADE AND
 ARE THE AVERAGE BETWEEN E.B. & W.B. LANES.
 MAX. DIFF.=0.10'. NORMAL DIFF.=0.05' OR LESS

CONT. No. SHEET ACCT. No.

| | | | |
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| NO. | DATE | BY | REVISED |
| | | | |

TRYGVE HOFF & ASSOCIATES
 CONSULTING ENGINEERS
 1922 EAST 107TH STREET CLEVELAND, OHIO 44106

PLAN AND PROFILE
 I-490 STA. 1040+50 TO STA. 1053+00

SCALE 1" = 10' VERT.
 1" = 50' HOR.

| | | | | | |
|----------|-------|--------|---------|----------|------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| CDR | LV | | JRH | | |

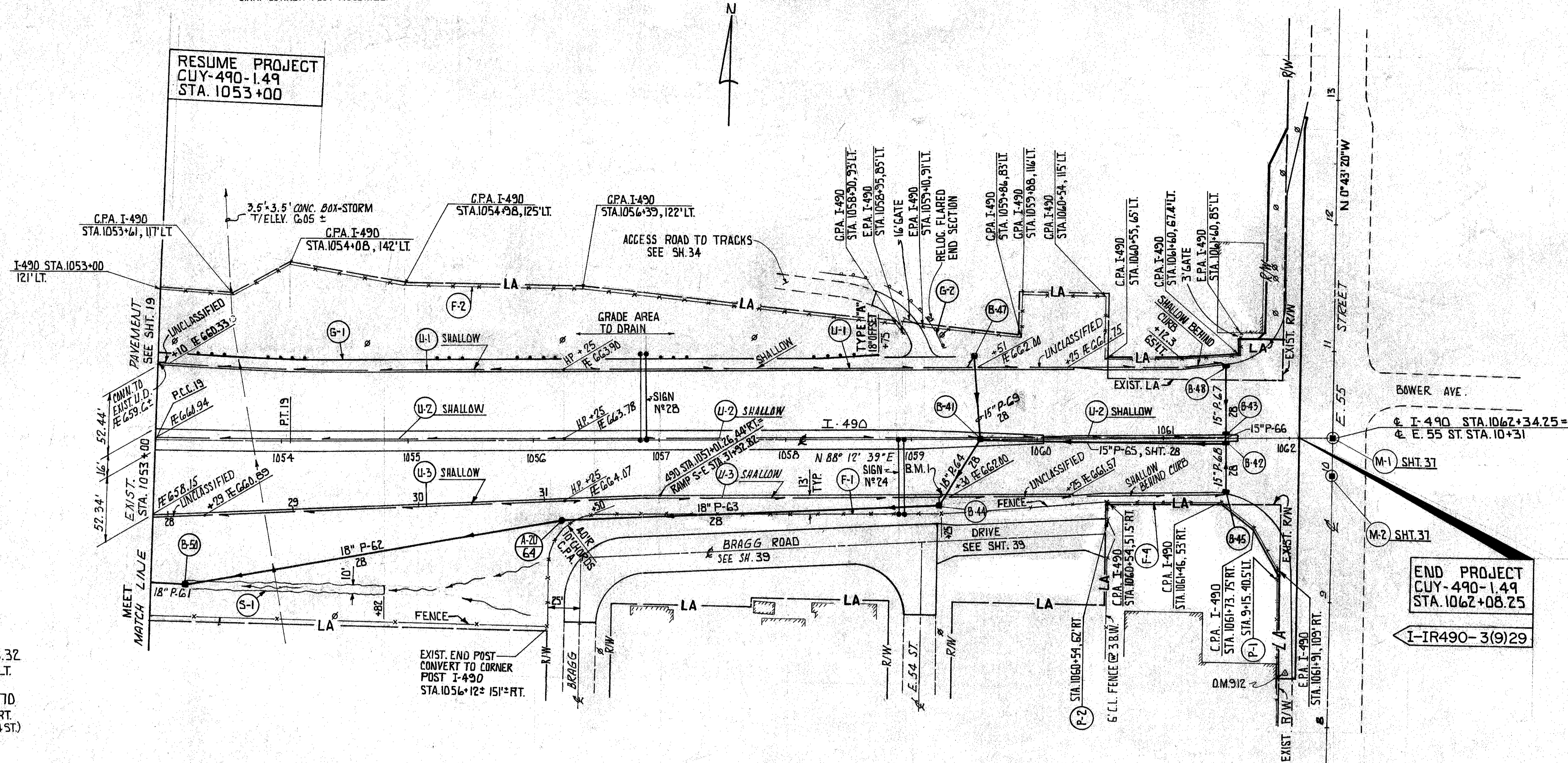
LEGEND
 EPA = END POST ASSEMBLY
 CPA = CORNER POST ASSEMBLY

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

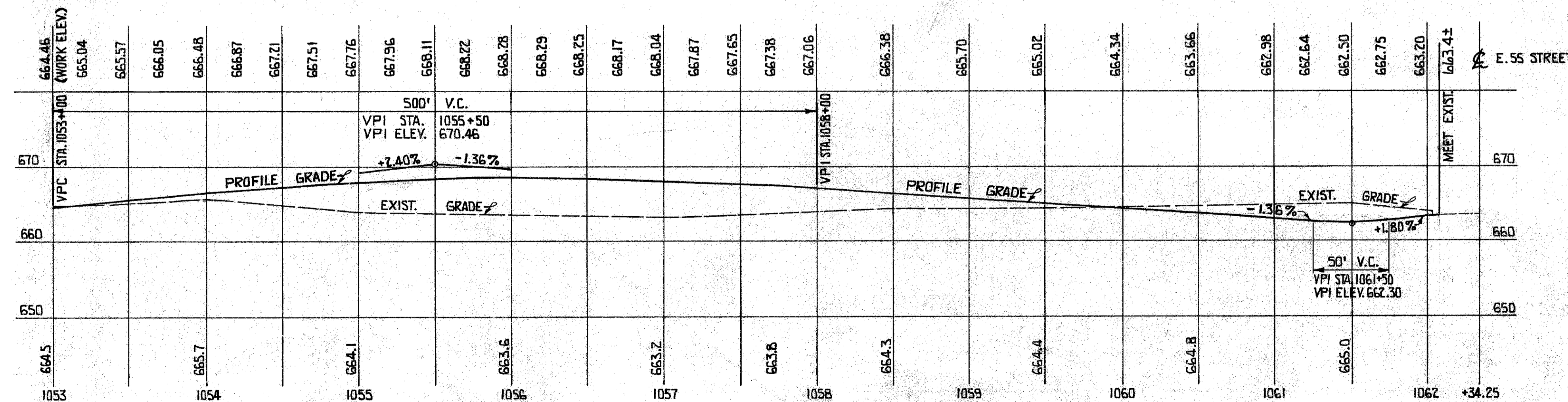
21
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CUYAHOGA COUNTY
 CUY-490-1.49

| REFERENCE DRAWINGS | SHEET N ^o |
|-------------------------------|----------------------|
| TYPICAL SECTIONS | 4&5 |
| GEOMETRIC LAYOUT | 14&15 |
| DRAINAGE & ROADWAY QUANTITIES | 22 |
| PAV'T. DETAILS & QUANTITIES | 33, 34, 38 & 39A |
| CROSS SECTION KEY PLAN | 73 |
| SEWER PROFILES & DETAILS | 28 & 62 |
| TRAFFIC CONTROL | 200 & 201 |
| LIGHTING PLANS | 153 |
| RIGHT OF WAY | 254 - 261 |
| MAINTENANCE OF TRAFFIC | 102 - 105 |



O.M. 912 ELEV. 666.32
 E. 55 ST. STA. 8+48, 33' LT.
 B.M. 1 ELEV. 666.70
 49D STA. 1059+25, 55' RT.
 (S.E. CORNER OF BOWER / E. 54 ST.)
 TOP OF HYDRANT.



NOTE "A"
 ITEM 607 - 6 FT. FENCE, TYPE CL WITH THREE (3) STRAND BARB WIRE.
 THIS NEW FENCE (F-4) IS TO BE INSTALLED BETWEEN POSTS (P-1) AND (P-2) AS SHOWN IN THE PLANS.

NOTE
 FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 37, 39, 121, 128, 153, 169, 170 & 201

| NO. | DATE | BY | REVISED |
|---|-------------|--------|---------|
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN AND PROFILE I-490 STA. 1053+00 TO STA. 1062+34.25 | | | |
| SCALE 1" = 10' VERT. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| C.D.R. | W.H.L./L.Y. | J.R.H. | |

CONT. No. SHEET ACCT. No.

SUB-SUMMARY OF QUANTITIES

| QUANTITIES | | FED. RD. DIVISION | STATE | PROJECT |
|---------------|---------------|-------------------|-------|---------|
| CALC. BY: CDR | DATE: JULY 78 | 2 | OHIO | |
| CK'D BY: CAP | DATE: 4-82 | | | |

QUANTITIES CARRIED TO
GENERAL SUMMARY CUYAHOGA COUNTY
CUY - 490-1.49
ROADWAY

DRAINAGE EROSION CONTROL ROADWAY DRAINAGE

| SHEET NO. | MARK NO. | ITEM | DRAINAGE | | | | | | | | | | SPECIAL | SHEET NO. | MARK NO. | LOCATION | DRAINAGE | | | | ROADWAY | | | | | | | | | |
|----------------|----------|--|----------|----|----|----|----|-----|-----|----|------|----|---------|-----------|----------|----------|----------|-----|-----|----|---------|------|------|------|------|------|------|------|------|------|
| | | | 604 | | | | | 606 | | | | | | | | | 607 | | | | | 603 | | | | 605 | | | | |
| | | | EA | EA | EA | EA | EA | EA | EA | EA | EA | EA | | | | | EA | EA | EA | EA | EA | L.F. | L.F. | L.F. | L.F. | L.F. | L.F. | L.F. | L.F. | L.F. |
| A-20 | 490 | STA. 1056+23, 64' RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B-41 | 490 | STA. 1059+55, 2.5' RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B-42 | 490 | STA. 1061+50, 2.5' RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B-43 | 490 | STA. 1061+50, 2.5' RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B-44 | 490 | STA. 1059+23, 53.6' RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B-45 | 490 | STA. 1061+50, 43' RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B-47 | 490 | STA. 1059+48, 66' LT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B-48 | 490 | STA. 1061+50, 59.5' LT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B-50 | 490 | STA. 1053+25, 114' RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G-1 | 490 | STA. 1053+00 TO 1058+75, LT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G-2 | 490 | STA. 1059+15, LT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F-1 | 490 | STA. 1056+12 TO 1060+54, RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F-2 | 490 | STA. 1053+00 TO 1061+60, LT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F-4 | 490 | STA. 1066+54 RT. TO E. 55 STA. 9+15, LT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S-1 | 490 | STA. 1053+30 TO 1054+82, RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I-FUNDS TOTALS | | | 3 | 1 | 1 | 2 | 1 | 1 | 167 | 25 | 25.0 | 1 | 550 | 1 | 1,474 | 1 | 1 | 180 | 300 | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|-----|------------------------------|----|-----|----|-----|-------|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| P-61 | 490 | STA. 1053+12 RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P-62 | 490 | STA. 1054+75 RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P-63 | 490 | STA. 1057+75 RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P-64 | 490 | STA. 1059+40 RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P-65 | 490 | STA. 1060+50 RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P-66 | 490 | STA. 1061+50 LT. RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P-67 | 490 | STA. 1061+50 LT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P-68 | 490 | STA. 1061+50 RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P-69 | 490 | STA. 1059+50 LT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| U-1 | 490 | STA. 1053+00 TO 1061+50, LT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| U-2 | 490 | STA. 1053+00 TO 1061+50, RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| U-3 | 490 | STA. 1053+00 TO 1061+50, RT. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I-FUNDS TOTALS | | | 58 | 362 | 64 | 628 | 2,782 | 219 | | | | | | | | | | | | | | | | | | | | | | | |

DRAINAGE AND ROADWAY QUANTITIES
CUY. 490 STA. 1053+00 TO STA. 1062+00 (SHEET 21)

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

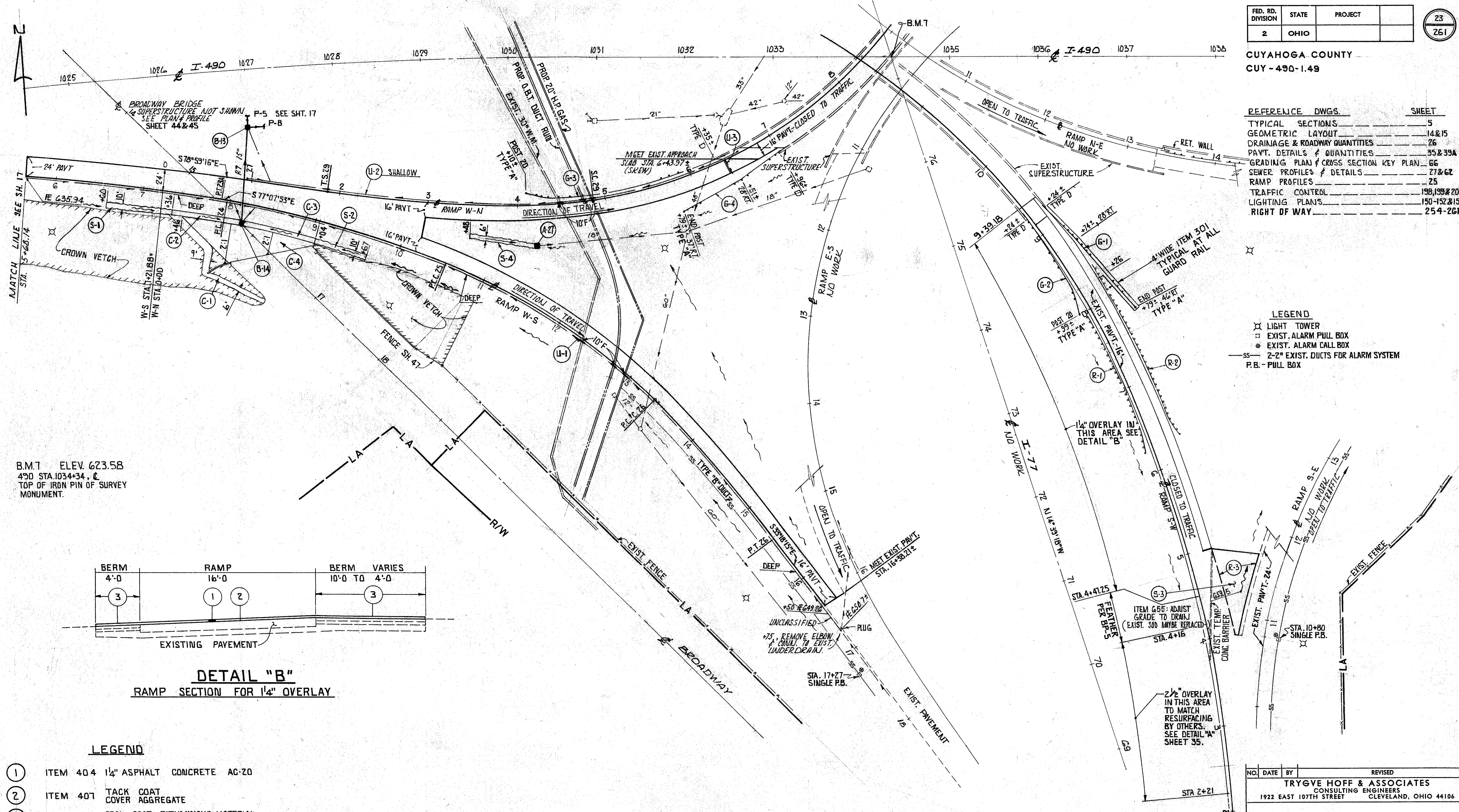
23
261

CUYAHOGA COUNTY
CUY-490-1.49

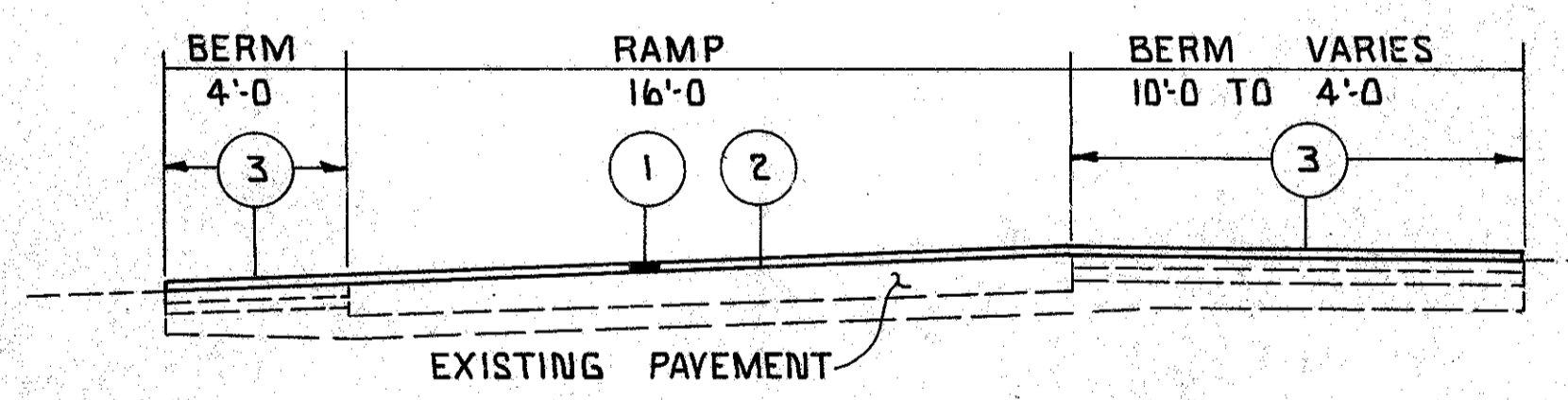
| REFERENCE DWGS. | SHEET |
|---------------------------------------|-------------|
| TYPICAL SECTIONS | 5 |
| GEOMETRIC LAYOUT | 14&15 |
| DRAINAGE & ROADWAY QUANTITIES | 26 |
| PAVT. DETAILS & QUANTITIES | 35&39A |
| GRADING PLAN & CROSS SECTION KEY PLAN | 66 |
| SEWER PROFILES & DETAILS | 27&62 |
| RAMP PROFILES | 25 |
| TRAFFIC CONTROL | 198,199&207 |
| LIGHTING PLANS | 150-152&154 |
| RIGHT OF WAY | 254-261 |

LEGEND

- ⊗ LIGHT TOWER
- ⊠ EXIST. ALARM PULL BOX
- ⊙ EXIST. ALARM CALL BOX
- 2-2" EXIST. DUCTS FOR ALARM SYSTEM
- P.B. - PULL BOX



B.M.7 ELEV. 623.58
490 STA. 1034+34, &
TOP OF IRON PIN OF SURVEY
MONUMENT.



LEGEND

| | |
|---|---|
| ① | ITEM 404 1/4" ASPHALT CONCRETE AC-20 |
| ② | ITEM 407 TACK COAT COVER AGGREGATE |
| ③ | ITEM 409 SEAL COAT BITUMINOUS MATERIAL SEAL COAT COVER AGGREGATE, N°9 |

NOTE
FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 17, 18, 41, 48, 49, 53, 123, 124, 126, 150, 151, 154, 198, 199, 201 & 208

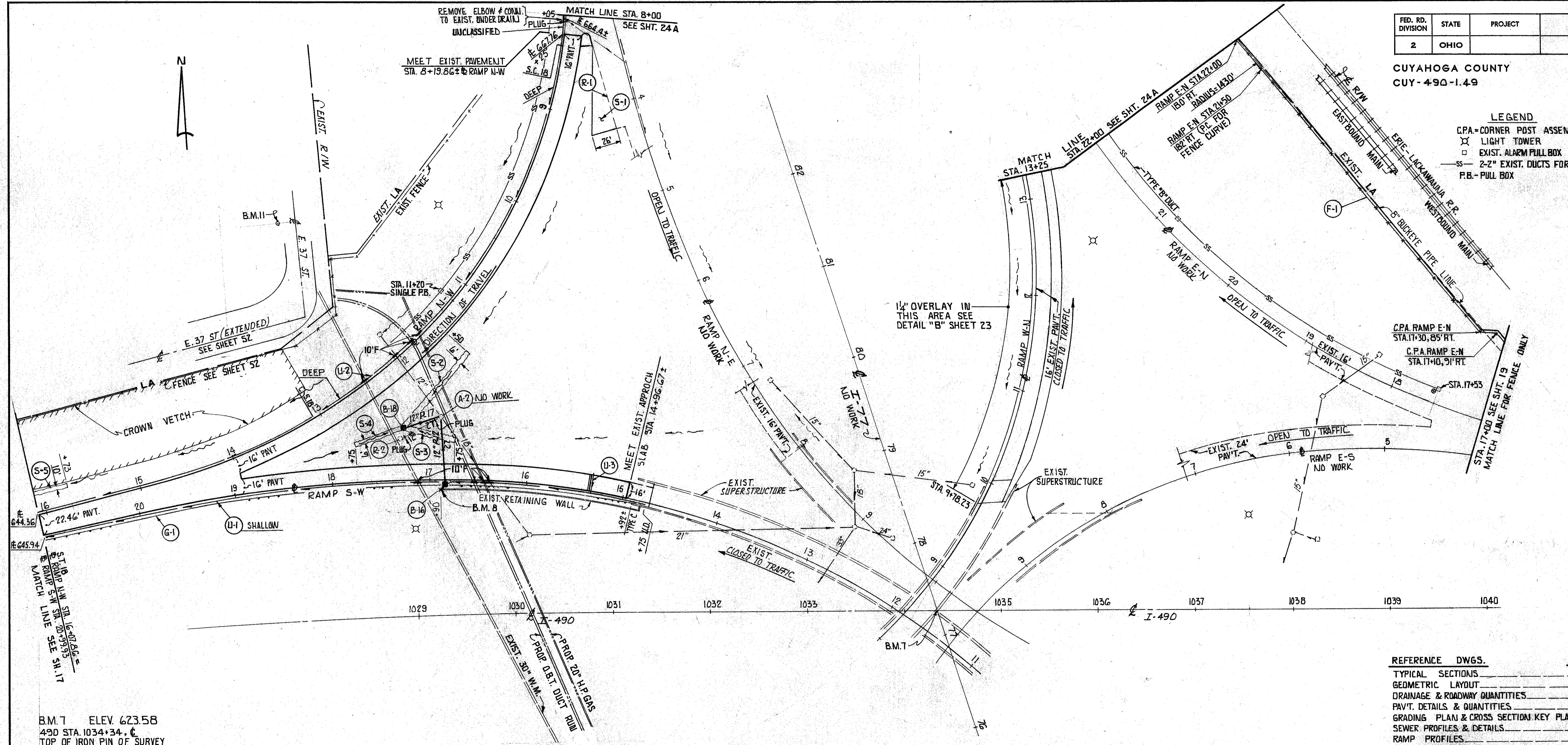
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|--|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

PLAN
RAMPS W-S & W-N
RAMP S-W

| | | | |
|----------|----------|--------|---------|
| SCALE | 1" = 50' | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| C.D.R. | LV/ | | JRH |

SHEET ACCT. No. CONT. No.

LEGEND
 C.P.A. - CORNER POST ASSEMBLY
 X - LIGHT TOWER
 □ - EXIST. ALARM PULL BOX
 -SS- 2-2" EXIST. DUCTS FOR ALARM SYSTEM
 P.B. - PULL BOX



B.M. 7 ELEV. 623.58
 490 STA. 1034+34.0
 TOP OF IRON PIN OF SURVEY MONUMENT.

B.M. 11 ELEV. 680.28
 E. 37 ST. STA. 17+23.17' LT.
 TOP OF HYDRANT

| REFERENCE DWGS. | SHEET |
|---------------------------------------|----------------|
| TYPICAL SECTIONS | 5 |
| GEOMETRIC LAYOUT | 14 & 15 |
| DRAINAGE & ROADWAY QUANTITIES | 26 |
| PAV'T. DETAILS & QUANTITIES | 36 & 39A |
| GRADING PLAN & CROSS SECTION KEY PLAN | 66 |
| RAMP PROFILES | 27 & 62 |
| TRAFFIC CONTROL | 198, 199 & 208 |
| LIGHTING PLANS | 150 - 152 |
| RIGHT OF WAY | 254 - 261 |

NOTE
 FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 17, 18, 52, 53, 125, 126, 150, 151, 198, 199, 207 & 208.

NO. DATE BY REVISED
 TRYGVE HOFF & ASSOCIATES
 CONSULTING ENGINEERS
 1922 EAST 107TH STREET CLEVELAND, OHIO 44106

PLAN
RAMPS N-W & S-W
RAMP E-N FENCE WORK

| | |
|----------------|--------|
| SCALE 1" = 50' | DATE |
| DESIGNED DRAWN | TRACED |
| C.D.R. LV | JRH |

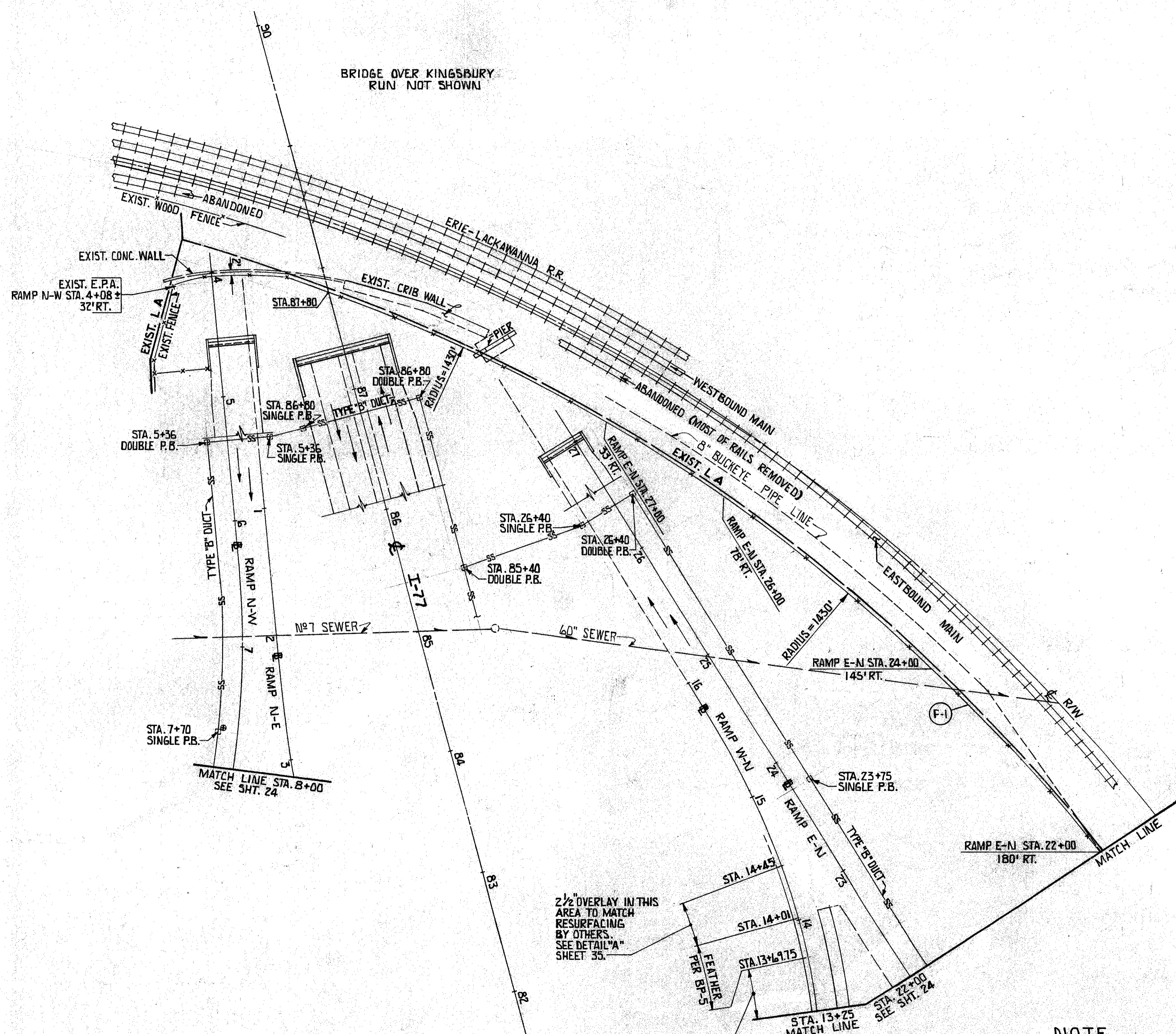
SHEET ACCT. No. CONT. No.

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

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CUYAHOGA COUNTY
CUY-490-1.49

| | |
|--------------------|-------|
| REFERENCE DRAWINGS | SHEET |
| TRAFFIC CONTROL | 208 |



- NOTES**
1. QUANTITY FOR FENCE ON SHEET 26
 2. QUANTITY FOR OVERLAY ON SHEET 33A

- LEGEND**
- E.P.A. - END POST ASSEMBLY
 - - EXIST. ALARM PULL BOX
 - ⊙ - EXIST. ALARM CALL BOX
 - SS— 2-2" EXIST. DUCTS FOR ALARM SYSTEM
 - P.B. - PULL BOX

2 1/2" OVERLAY IN THIS AREA TO MATCH RESURFACING BY OTHERS. SEE DETAIL "A" SHEET 35.

1 1/2" OVERLAY IN THIS AREA. SEE DETAIL "B" SHEET 23.

NOTE
FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 151 & 208.

CONT. No. SHEET ACCT. No.

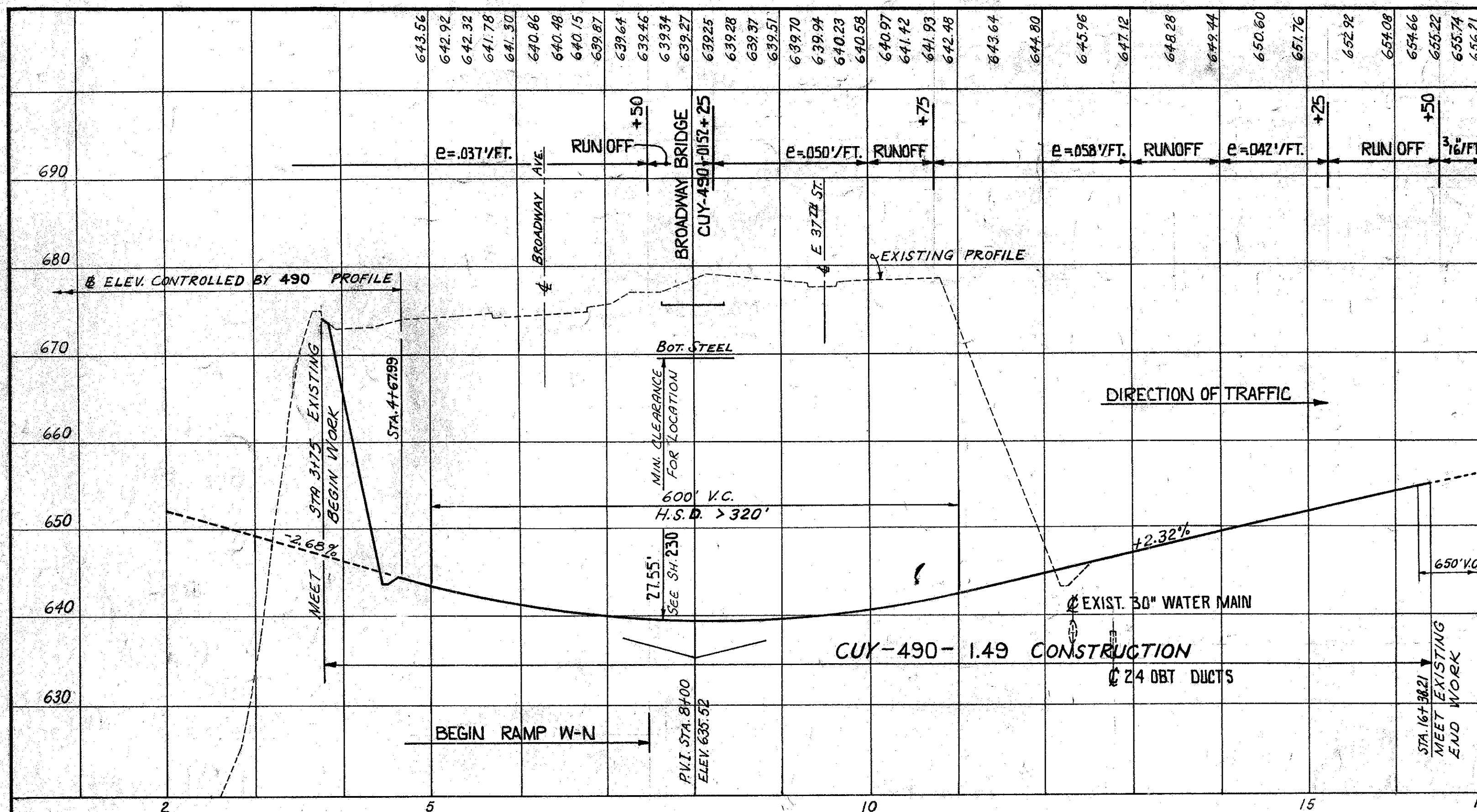
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|---|-------|--------|----------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN | | | |
| RAMPS N-W & E-N | | | |
| SCALE: 1"=50' | | | DATE |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR | RH II | | JRH |
| | | | REVIEWED |
| | | | DATE |

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

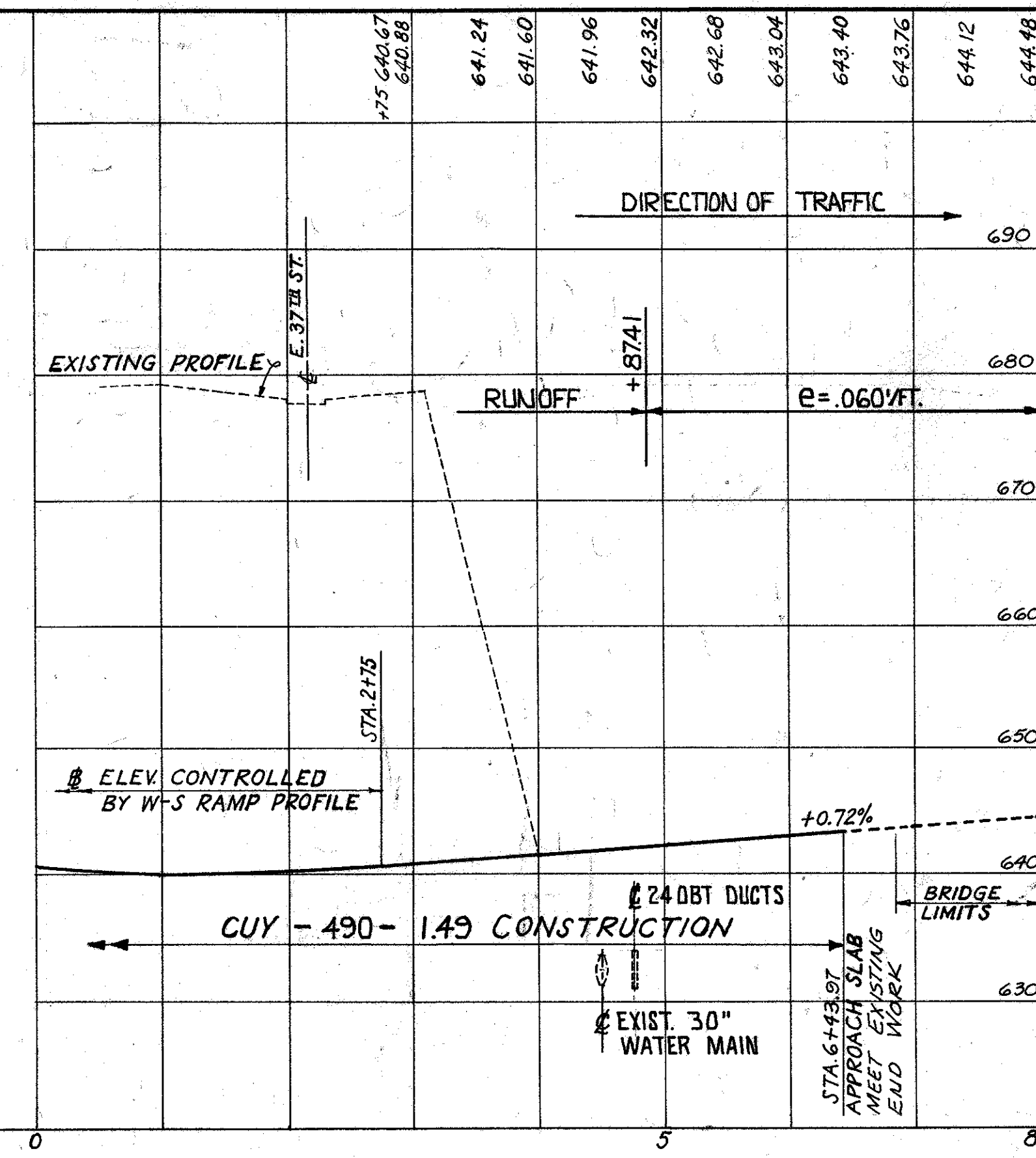
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CUYAHOGA COUNTY
CUY-490-149

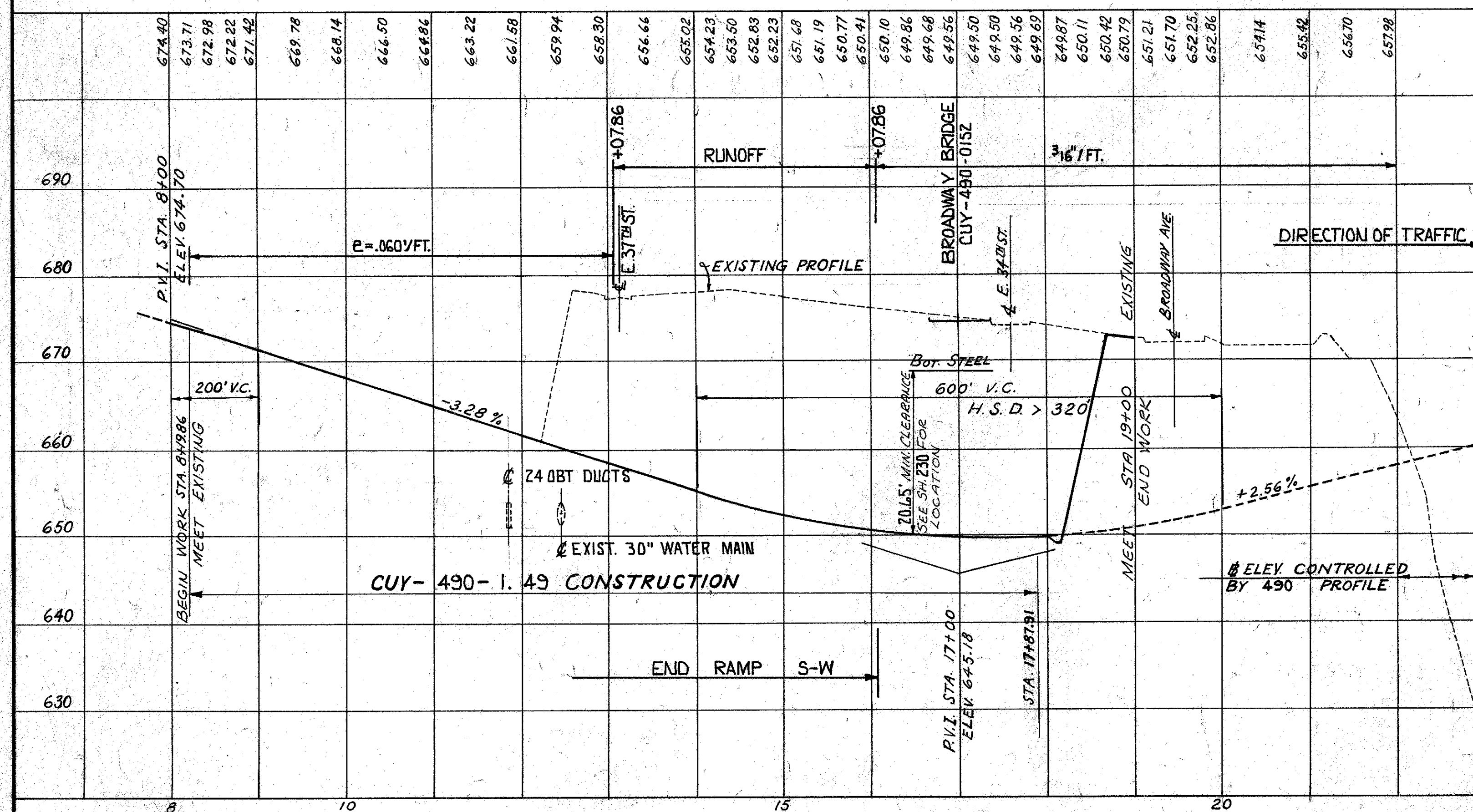
FOR RAMP W-S & W-N PLAN SEE SHEET 23
FOR RAMP S-W & N-W PLAN SEE SHEET 24



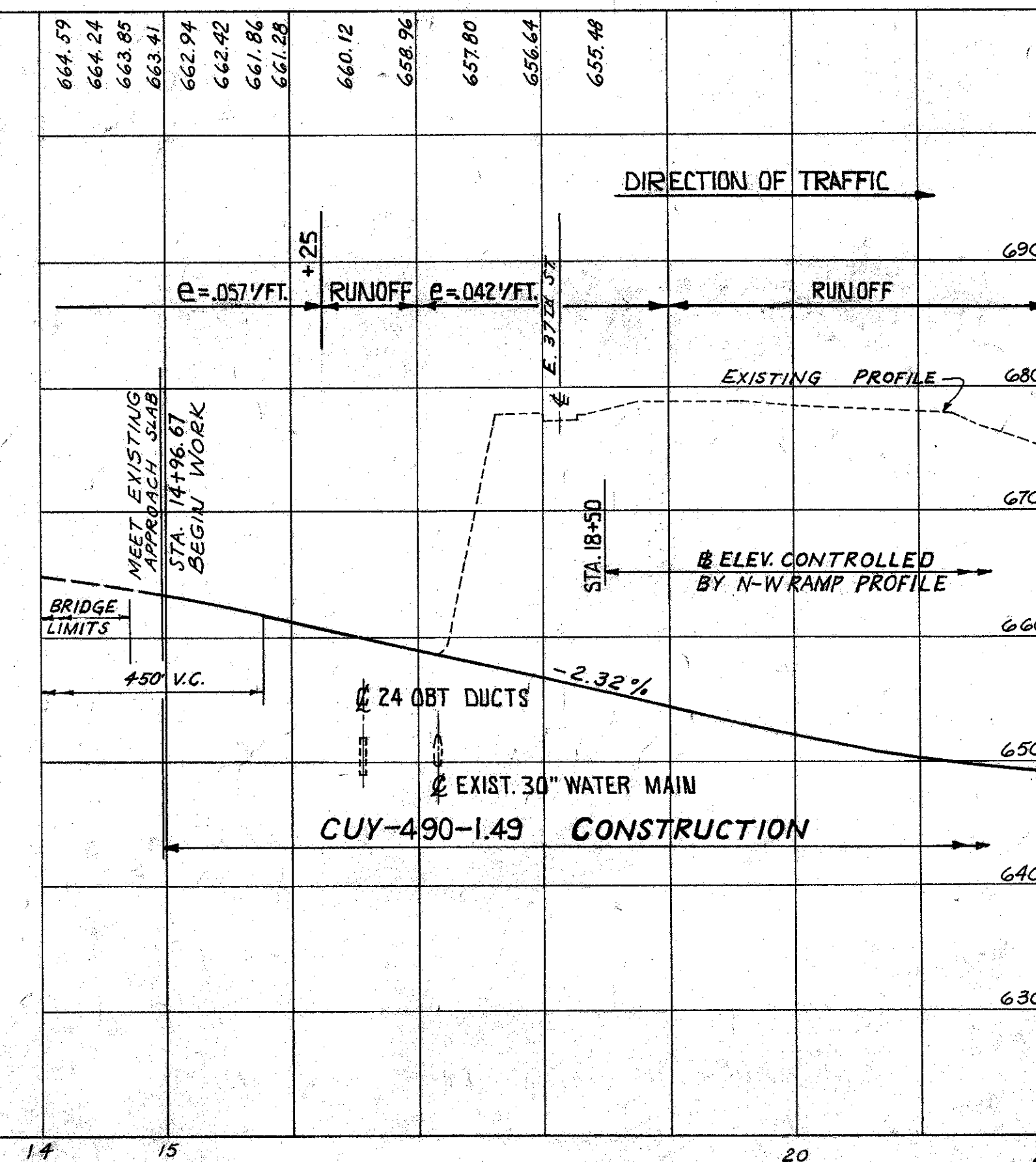
RAMP W-S



RAMP W-N



RAMP N-W



RAMP S-W

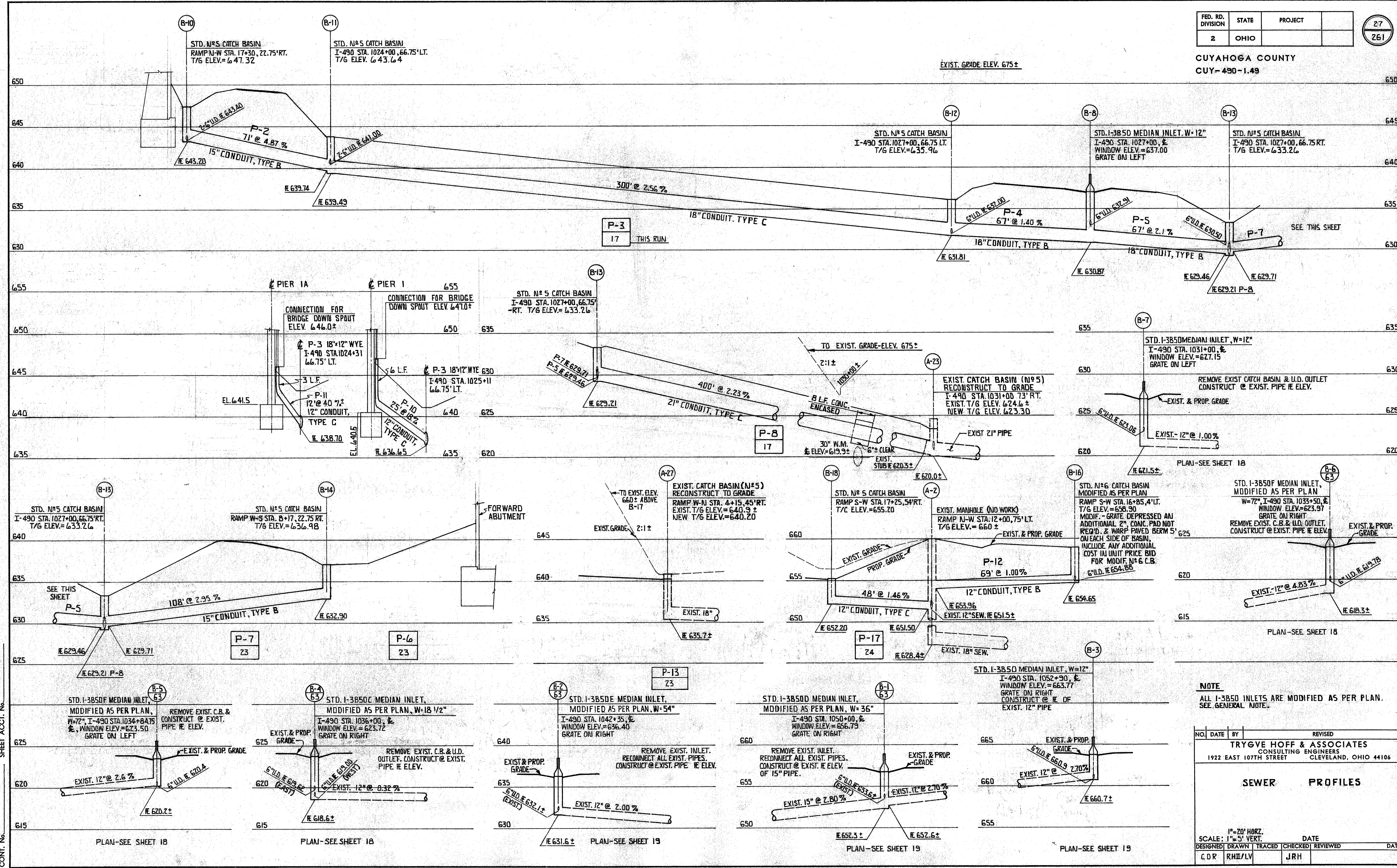
REVISED NOV. 1977 RLHII/CDR

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

W-S · W-N · N-W · S-W
RAMP PROFILES

| | | | | | | |
|----------|-------|--------|---------|----------|---------------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| C.D.R. | FT. | | | F.L. | T.L.L. 8/1/63 | |

CONT. NO. 58019 SHEET ACCT. NO. 6519



NOTE
ALL I-3850 INLETS ARE MODIFIED AS PER PLAN. SEE GENERAL NOTE.

NO. DATE BY REVISED
TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

SEWER PROFILES

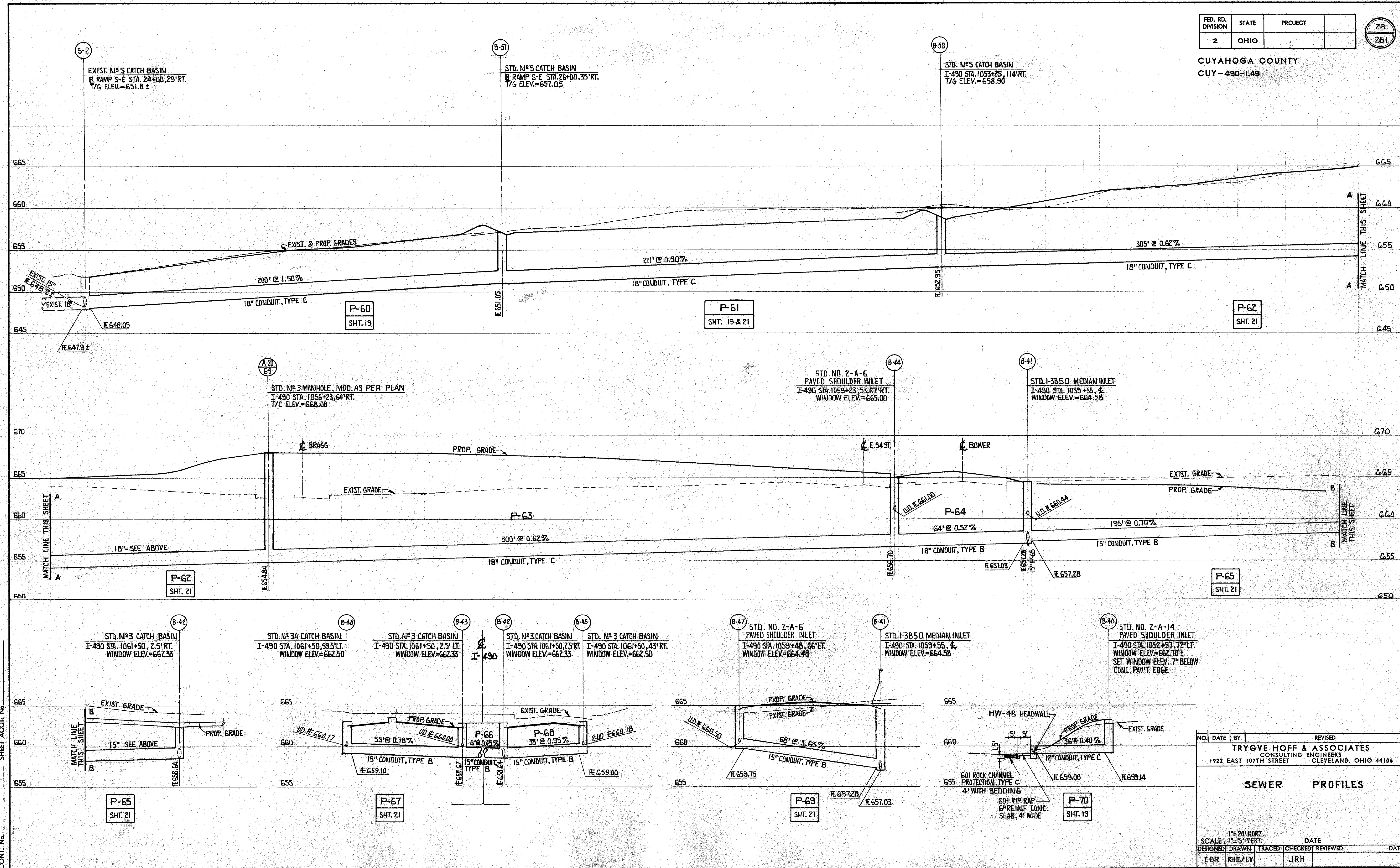
SCALE: 1" = 20' HORIZ.
1" = 5' VERT.
DATE
DESIGNED DRAWN TRACED CHECKED REVIEWED DATE
C DR RHI/LV JRH

SHEET ACCT. No.
CONT. No.

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

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CUYAHOGA COUNTY
CUY-490-1.49



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|---|--------|-----------------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| SEWER | | PROFILES | |
| 1" = 20' HORIZ. SCALE: 1" = 5' VERT. DATE | | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR | RHI/LV | JRH | |
| | | | DATE |

SHEET ACCT. No.
CONT. No.

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

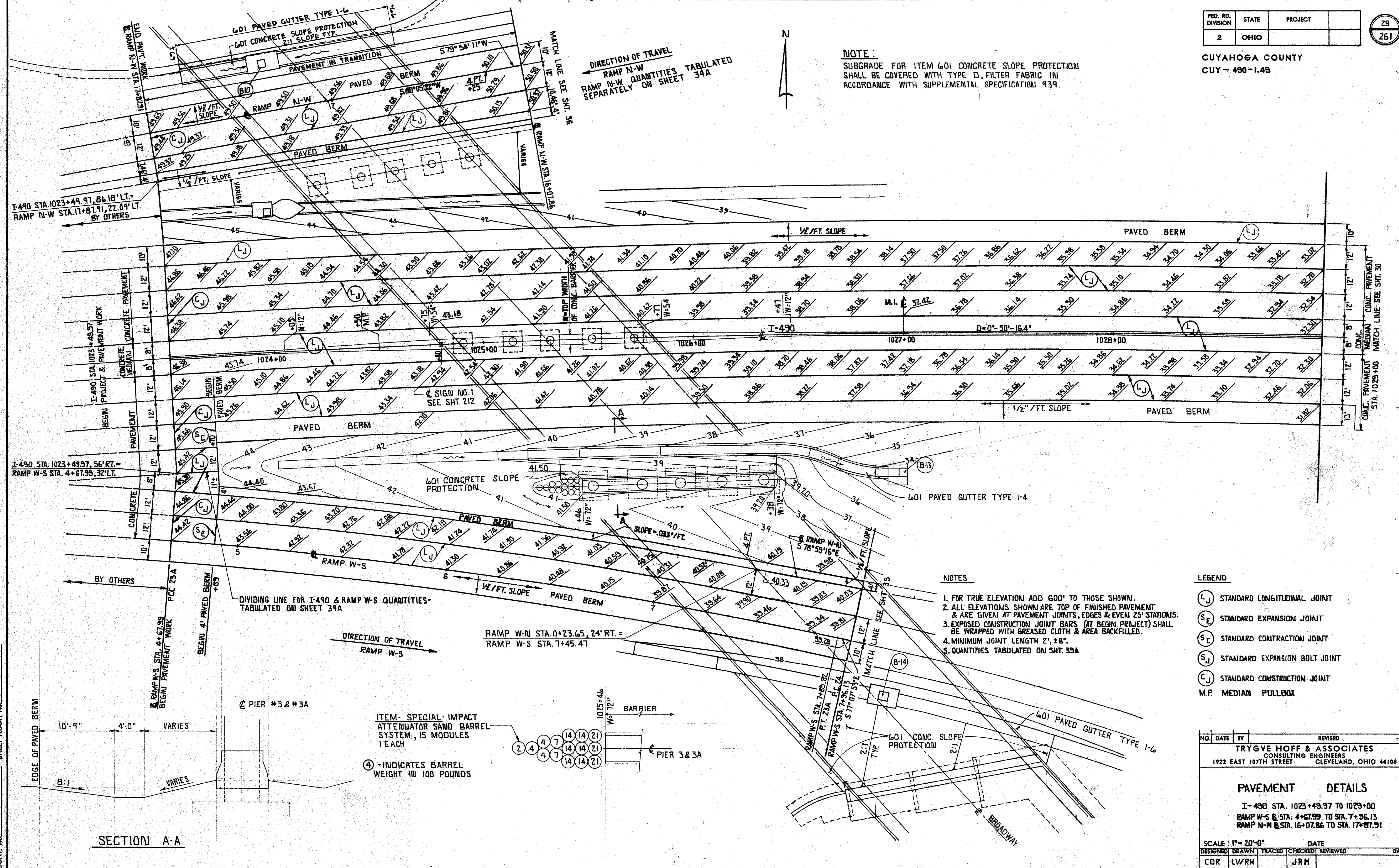
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CUYAHOGA COUNTY
CUY-490-1.49



NOTE:
SUBGRADE FOR ITEM 601 CONCRETE SLOPE PROTECTION SHALL BE COVERED WITH TYPE D, FILTER FABRIC IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION 939.

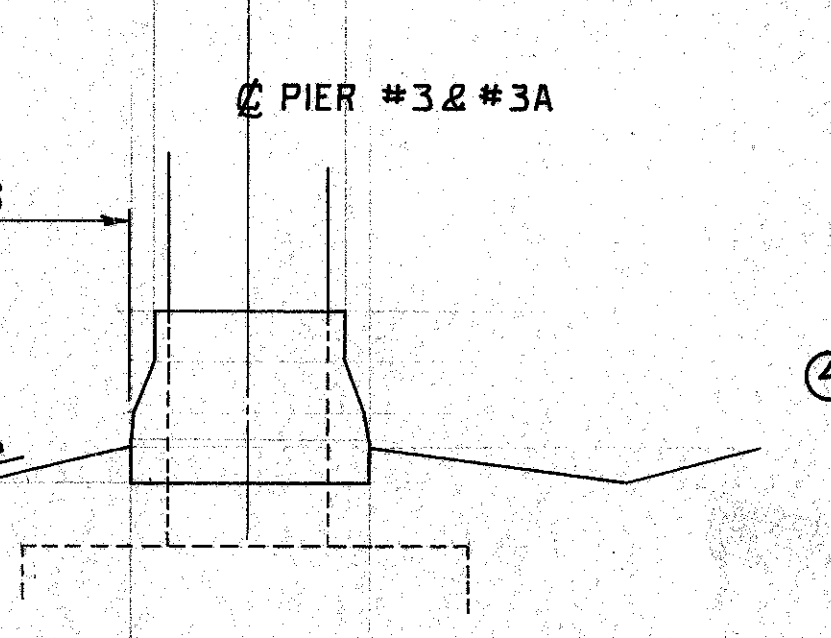
DIRECTION OF TRAVEL
RAMP N-W
RAMP N-W QUANTITIES TABULATED SEPARATELY ON SHEET 39A



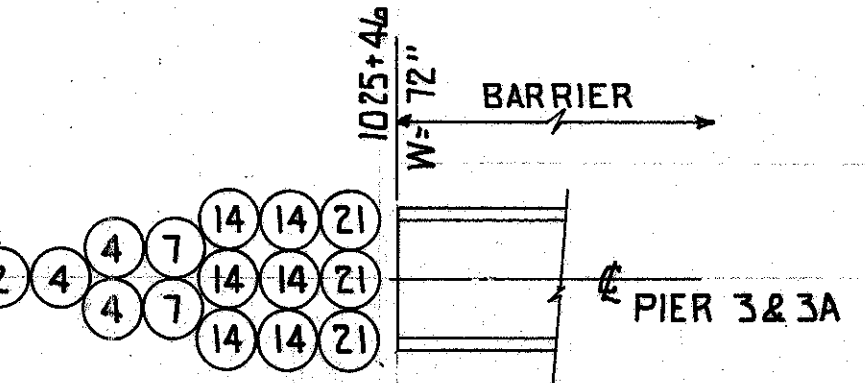
- NOTES**
1. FOR TRUE ELEVATION ADD 600' TO THOSE SHOWN.
 2. ALL ELEVATIONS SHOWN ARE TOP OF FINISHED PAVEMENT & ARE GIVEN AT PAVEMENT JOINTS, EDGES & EVEN 25' STATIONS.
 3. EXPOSED CONSTRUCTION JOINT BARS (AT BEGIN PROJECT) SHALL BE WRAPPED WITH GREASED CLOTH & AREA BACKFILLED.
 4. MINIMUM JOINT LENGTH 2', ±6".
 5. QUANTITIES TABULATED ON SHT. 39A

- LEGEND**
- (L) STANDARD LONGITUDINAL JOINT
 - (E) STANDARD EXPANSION JOINT
 - (C) STANDARD CONTRACTION JOINT
 - (S) STANDARD EXPANSION BOLT JOINT
 - (J) STANDARD CONSTRUCTION JOINT
 - M.P. MEDIAN PULLBOX

SECTION A-A



ITEM- SPECIAL IMPACT ATTENUATOR SAND BARREL SYSTEM, 15 MODULES EACH
④ - INDICATES BARREL WEIGHT IN 100 POUNDS



| | | | |
|---|-------|----------|----------|
| NO. | DATE | BY | REVISION |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PAVEMENT DETAILS I-490 STA. 1023+49.97 TO 1029+00 RAMP W-S & STA. 4+67.99 TO STA. 7+96.13 RAMP N-W & STA. 16+07.86 TO STA. 17+87.91 | | | |
| SCALE: 1" = 20'-0" | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR | LV/RH | JRH | |
| | | REVIEWED | DATE |

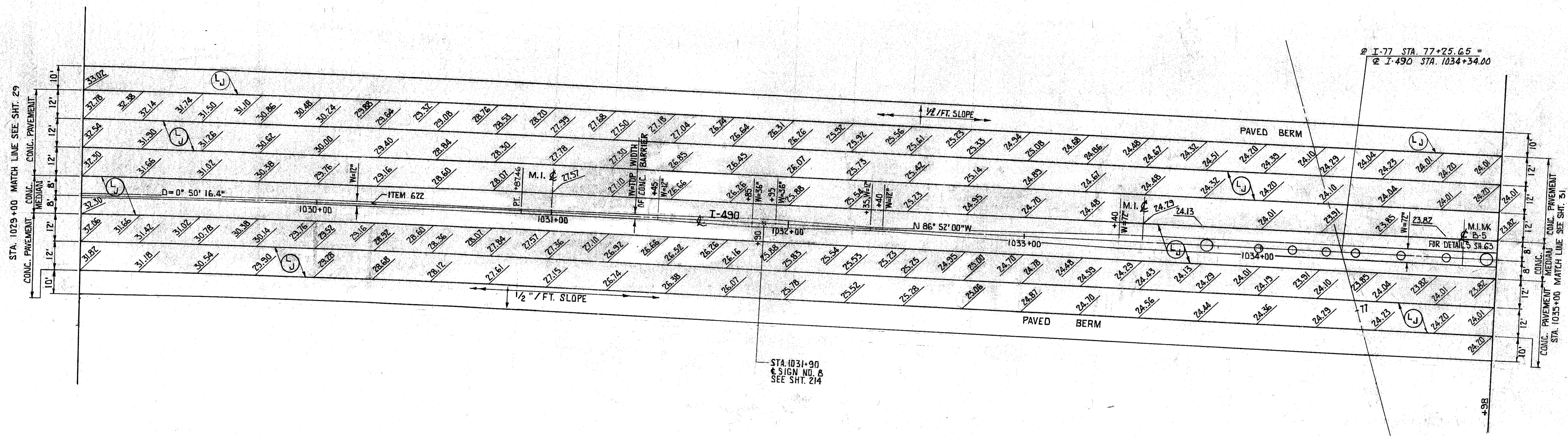
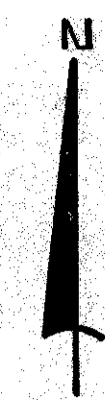
CONT. NO. SHEET ACCT. NO.

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

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CUYAHOGA COUNTY
CUY - 490-1.49

FOR NOTES AND LEGEND SEE SHEET 29.



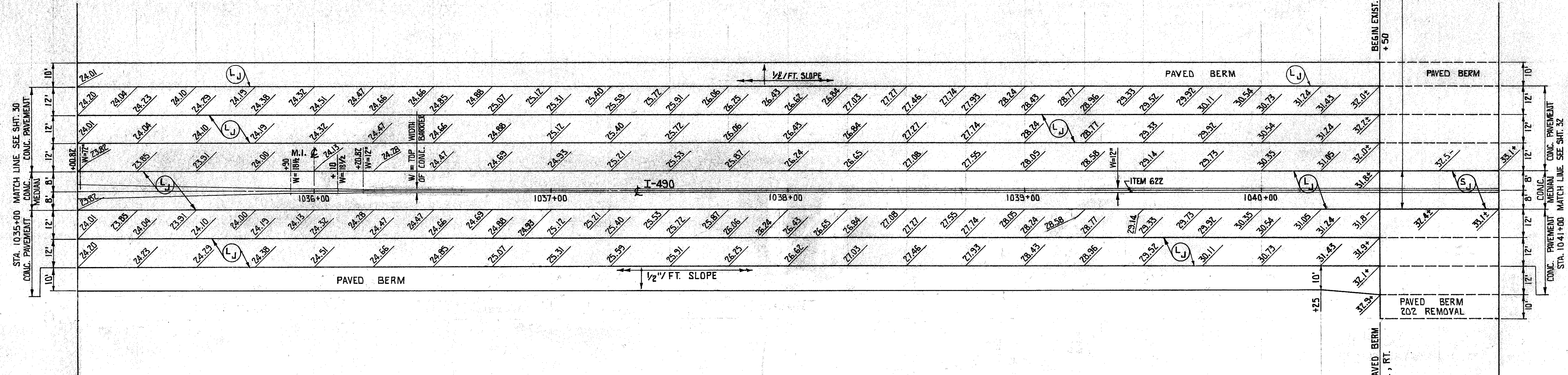
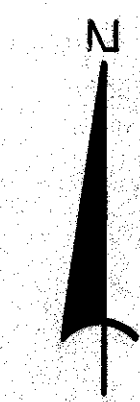
CONT. No. SHEET ACCT. No.

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|---|-------------|--------|----------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PAVEMENT DETAILS I-490 STA. 1029+00 TO 1035+00 | | | |
| SCALE: 1"=20'-0" | | | DATE |
| DESIGNED | DRAWN | TRACED | CHECKED |
| C.D.R. | R.L.H./L.V. | | J.R.H. |
| | | | REVIEWED |
| | | | DATE |

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

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CUYAHOGA COUNTY
CUY-490-1.43



BEGIN EXIST. R.P.C.C. PAVEMENT +50

REMOVE EXIST. GUARD RAIL, CONC. MEDIAN & PAVED BERM. REPLACE WITH CONC. BARRIER. SEE TYPICAL SECTION SHT. 4

BEGIN PAVED BERM REMOVAL, RT.

PAVED BERM 20' REMOVAL

FOR NOTES & LEGEND SEE SHEET 29

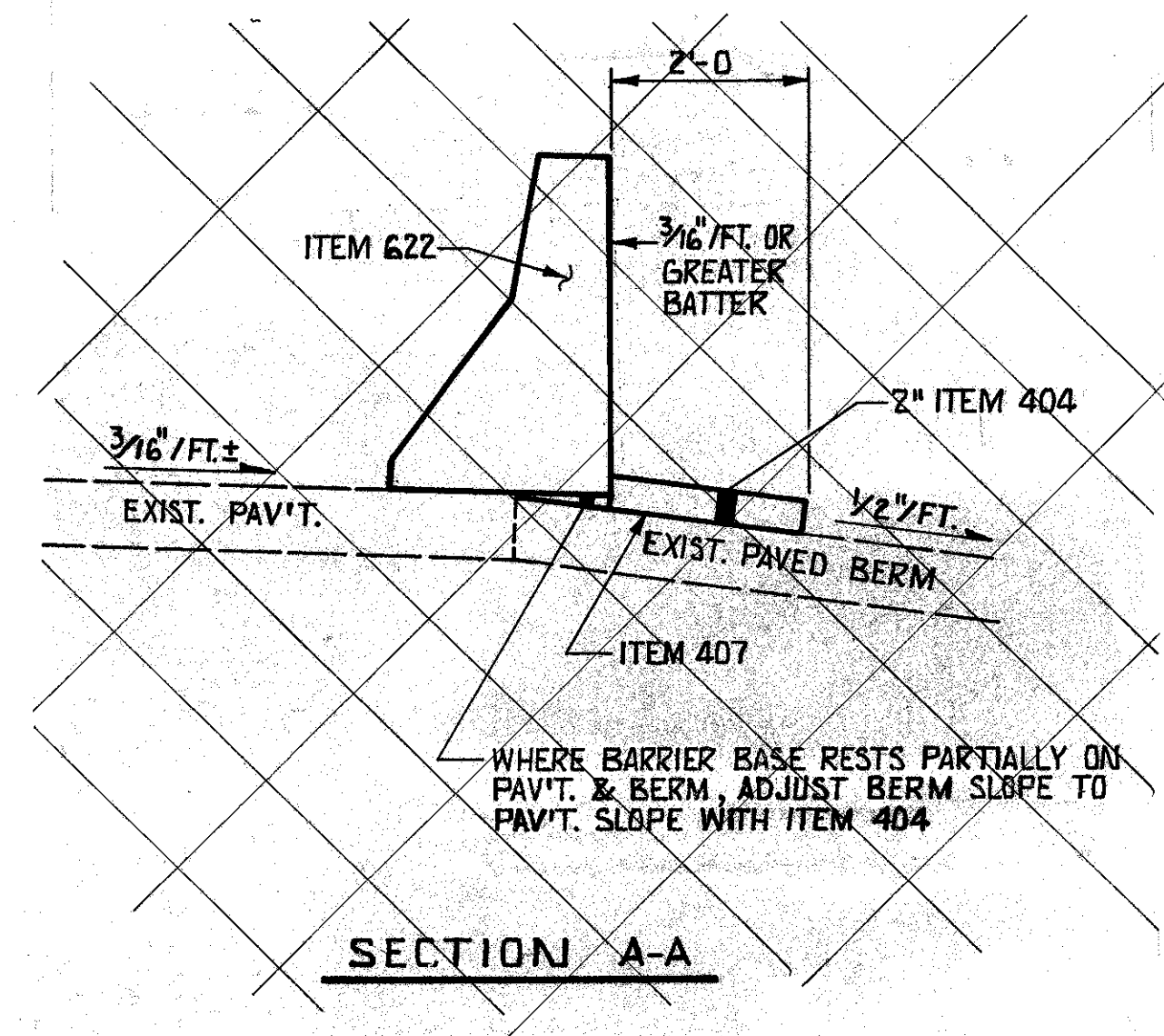
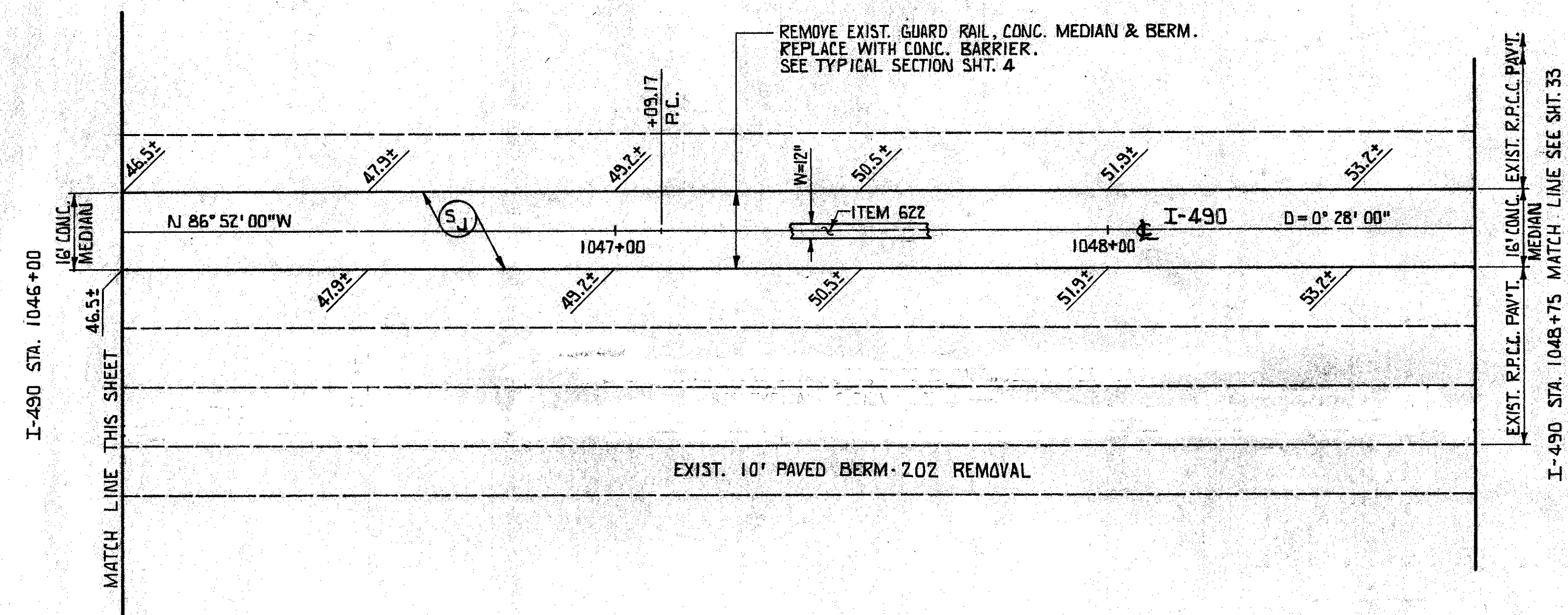
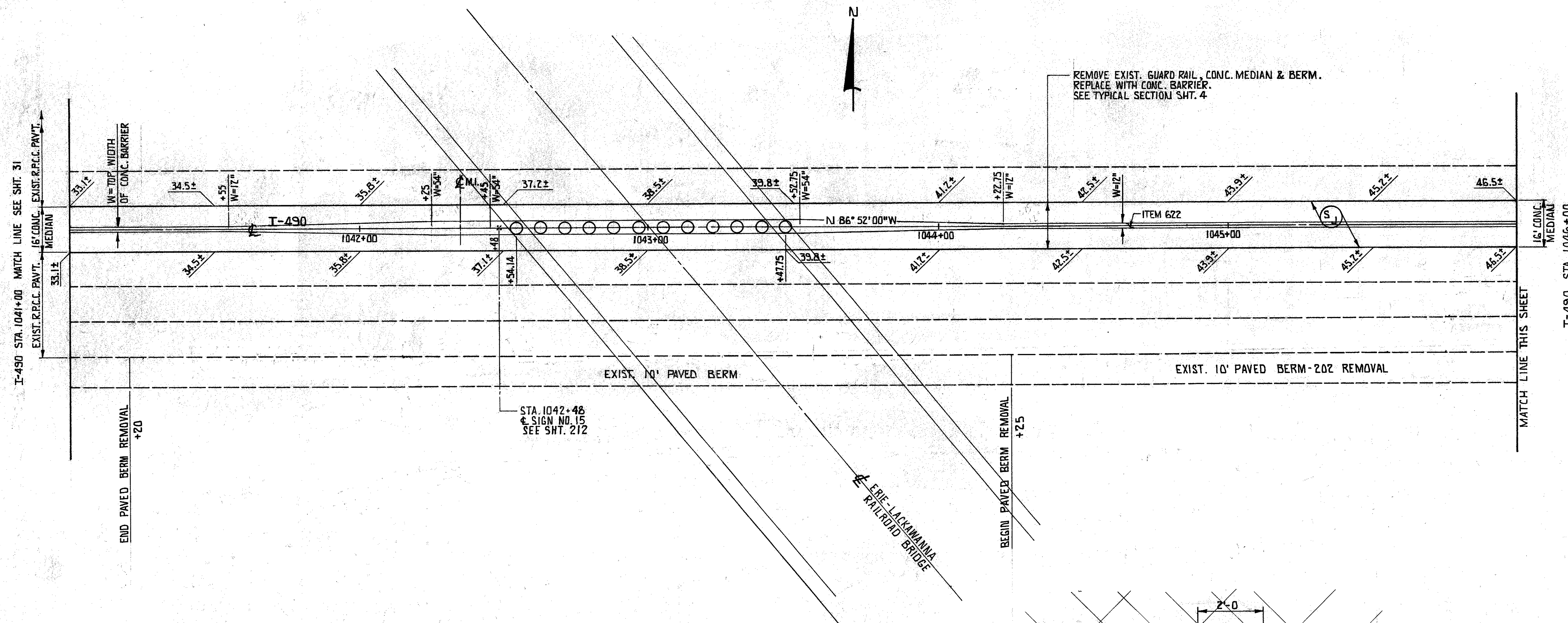
CONT. No. SHEET ACCT. No.

| | | | |
|---|-------|--------|----------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PAVEMENT DETAILS I-490 STA. 1035+00 TO 1041+00 | | | |
| SCALE: 1"=20'-0" | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR | LV/RH | | JRH |
| | | | REVIEWED |
| | | | DATE |

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

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CUYAHOGA COUNTY
CUY - 490-1.49



LEGEND

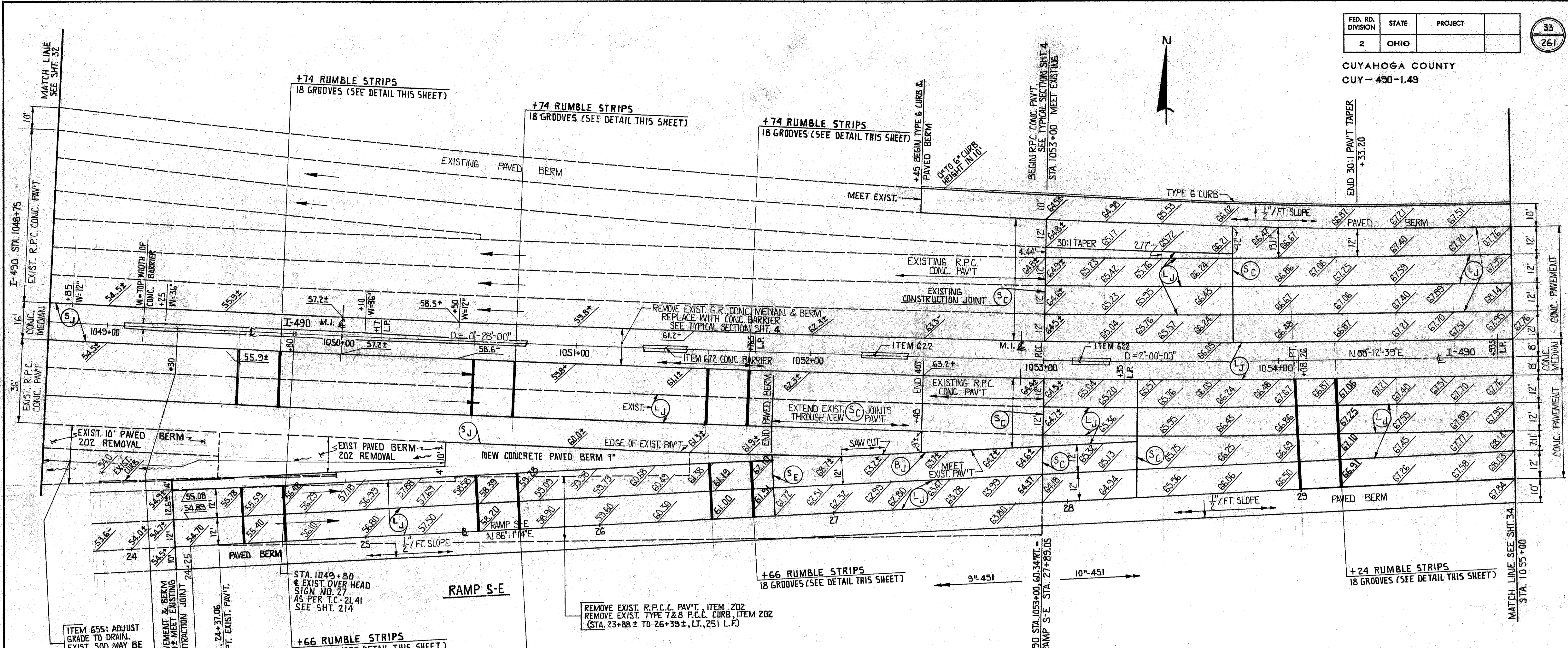
(S₁) STANDARD EXPANSION BOLT JOINT

NOTES

1. QUANTITIES TABULATED ON SHT. 39A
2. FOR NOTES & LEGEND SEE SHT. 29

CONT. No. SHEET ACCT. No.

| NO. | DATE | BY | REVISED |
|--|-------|--------|----------|
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PAVEMENT DETAILS I-490 STA. 1041+00 TO 1048+75 | | | |
| SCALE: 1" = 20'-0" | | | DATE |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR | LV/RH | | JRH |
| | | | REVIEWED |
| | | | DATE |

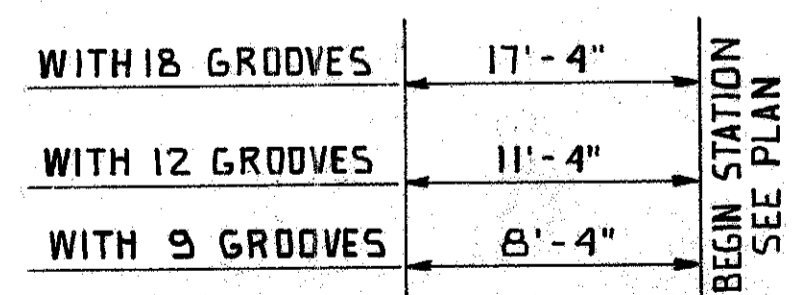


NOTES

- FOR NOTES SEE SHT. 34
- QUANTITIES TABULATED ON SHT. 39A & 11 A

LEGEND

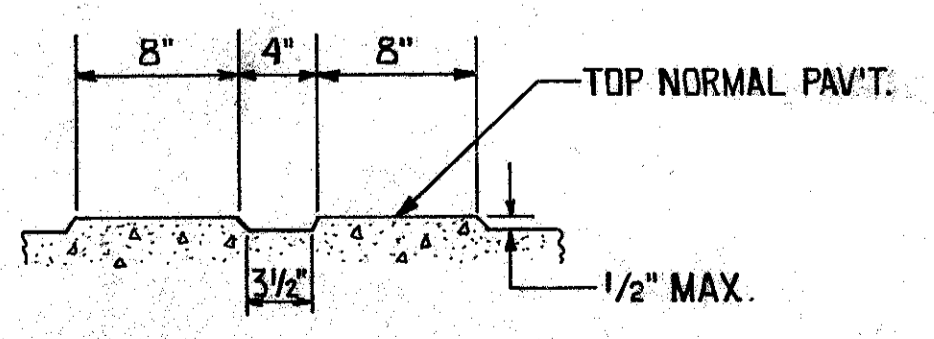
- (L) STANDARD LONGITUDINAL JOINT
- (S_C) STANDARD CONTRACTION JOINT
- (S_E) STANDARD EXPANSION BOLT JOINT
- (B) STANDARD BUTT JOINT
- (S) STANDARD EXPANSION JOINT
- L.P. LIGHT POLE



RUMBLE STRIPS
TYPICAL SECTIONS
N.T.S.

- RUMBLE STRIPS TREATMENT PAY ITEMS:**
- IN EXISTING CONCRETE PAVEMENT, "ITEM SPECIAL, RUMBLE STRIPS SAWED INTO EXISTING CONCRETE PAVEMENT"
 - IN NEW CONCRETE PAVEMENT, "ITEM SPECIAL, RUMBLE STRIPS TREATMENT IN ITEM 451"

CONTINUE GROOVES IN TO MEDIAN CONCRETE (ABOUT 8") AT PAV'T. SLOPE TO PROVIDE DRAINAGE.



RUMBLE STRIP SECTION

| | | | |
|--|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

PAVEMENT DETAILS

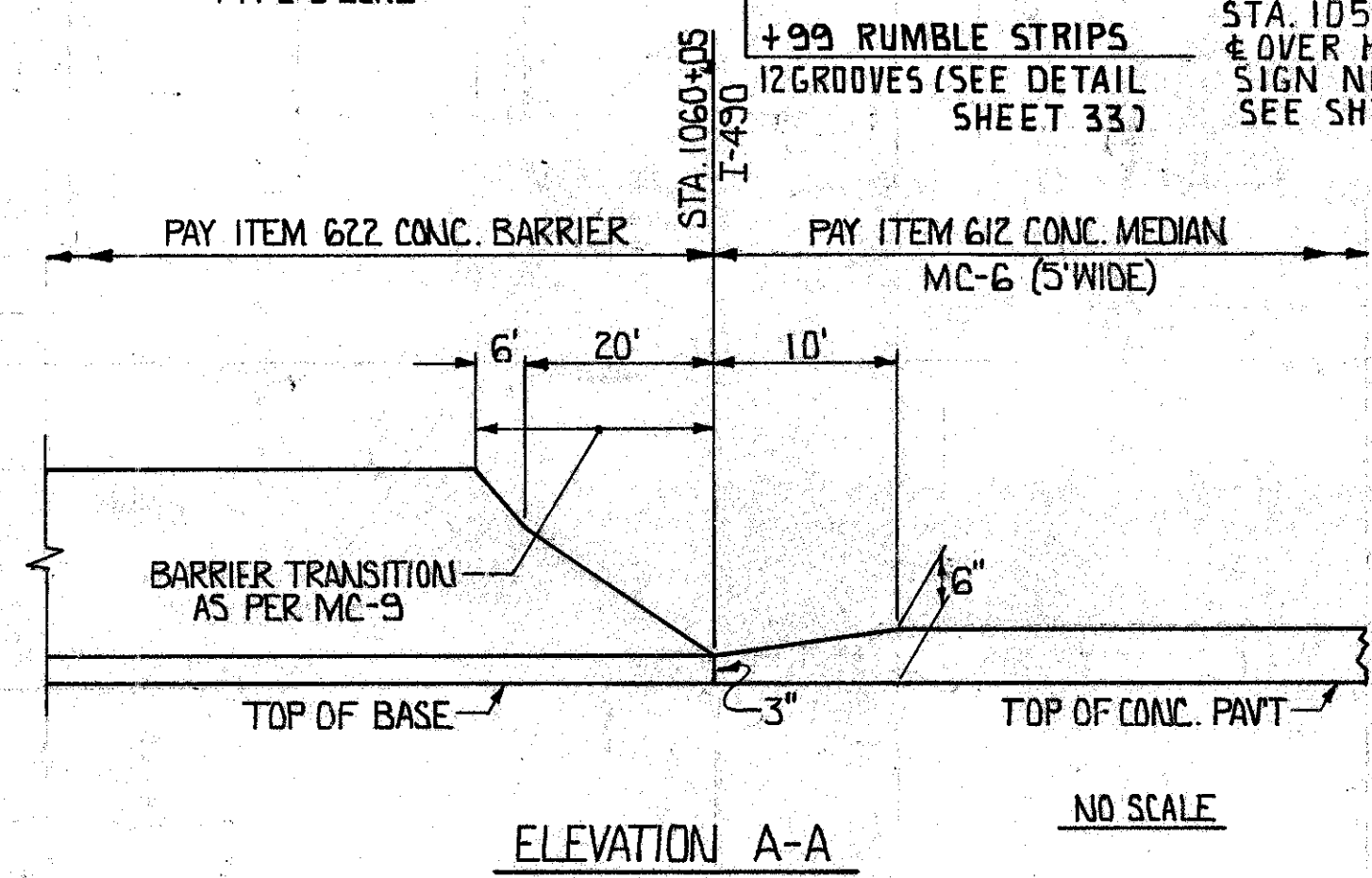
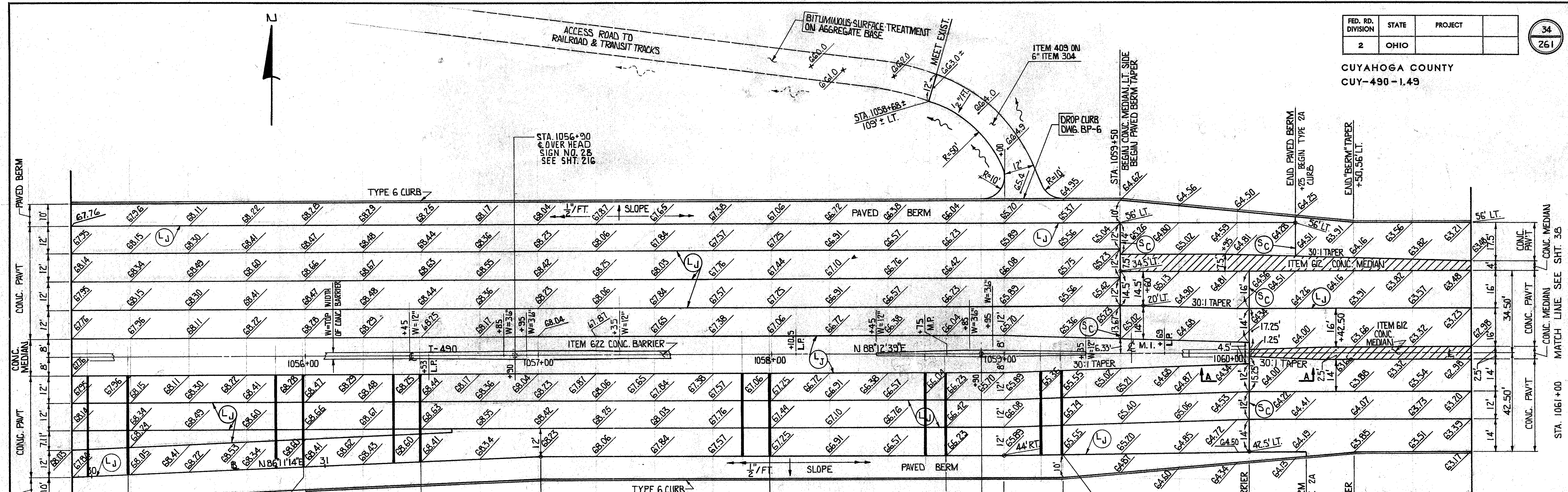
I-490 STA. 1048+75 TO 1055+00
RAMP S-E STA. 23+50 TO 28+00

| | |
|--------------------|----------|
| SCALE: 1" = 20'-0" | DATE |
| DESIGNED DRAWN | TRACED |
| CHECKED | REVIEWED |
| DATE | DATE |
| CDR | RLH/II |
| | JRH |

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

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261

CUYAHOGA COUNTY
CUY-490-1.49



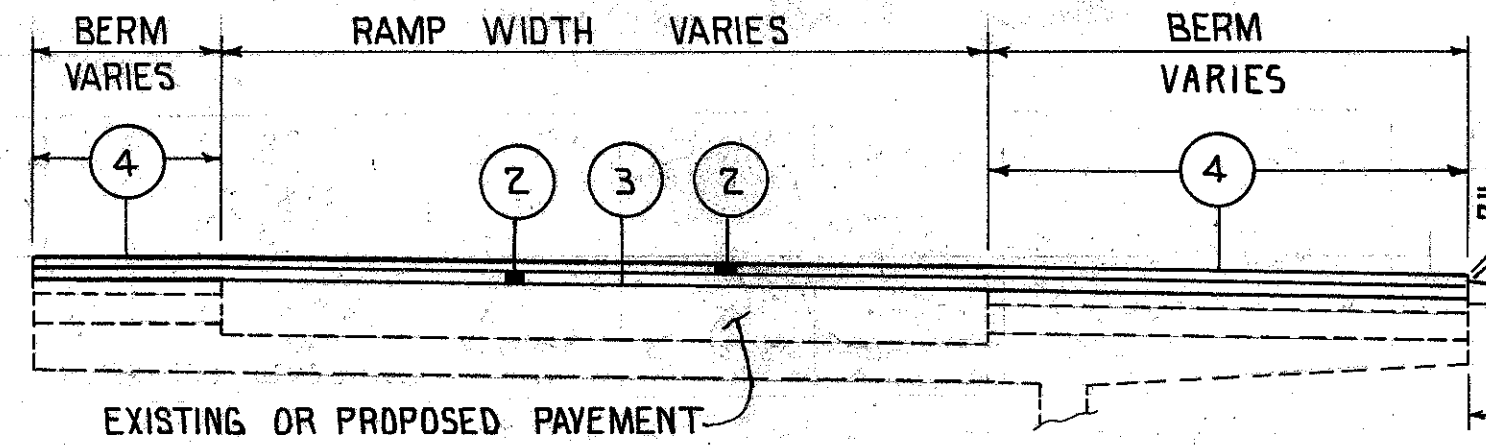
- NOTES**
- FOR TRUE ELEVATION ADD 600.00 TO THOSE SHOWN
 - ELEVATIONS ARE TO THE TOP OF FINISHED PAVEMENT AND ARE GIVEN AT PAVEMENT JOINTS, EDGES, AND EVERY 25' STATIONS
 - MAXIMUM JOINT LENGTH: 2' ± 6"
 - QUANTITIES TABULATED ON SHEET 33A

- LEGEND**
- (L) STANDARD LONGITUDINAL JOINT
 - (C) STANDARD CONTRACTION JOINT
 - M.P. MEDIAN PULLBOX
 - L.P. LIGHT POLE

| | | | |
|--|-------------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PAVEMENT DETAILS I-490 STA. 1055+00 TO 1061+00 | | | |
| SCALE | 1" = 20'-0" | | DATE |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR | R.H./I | | J.R.H. |

CONT. No. SHEET ACCT. No.

NOTE:
WHERE OVERLAY BUTTS EXISTING ASPHALT OVERLAY THE JOINT SHALL BE TREATED AS PER 404.15 AND SEALED AS PER 401.15.



AS PER TYPICAL SECTION FOR PROPOSED PAVEMENT.

ADJUST TO GRADE USING ITEM 203, EMBANKMENT FOR EXISTING PAVEMENT.

FEATHER AS PER BP-5, FEATHER EDGE TYPE.

DETAIL "A"
RAMP SECTION FOR 2 1/2" OVERLAY

1/4" OVERLAY IN THIS AREA TO MATCH RESURFACING BY OTHER SEE DETAIL "B" SHEET 23

MEET EXISTING FEATHER AS PER BP-5

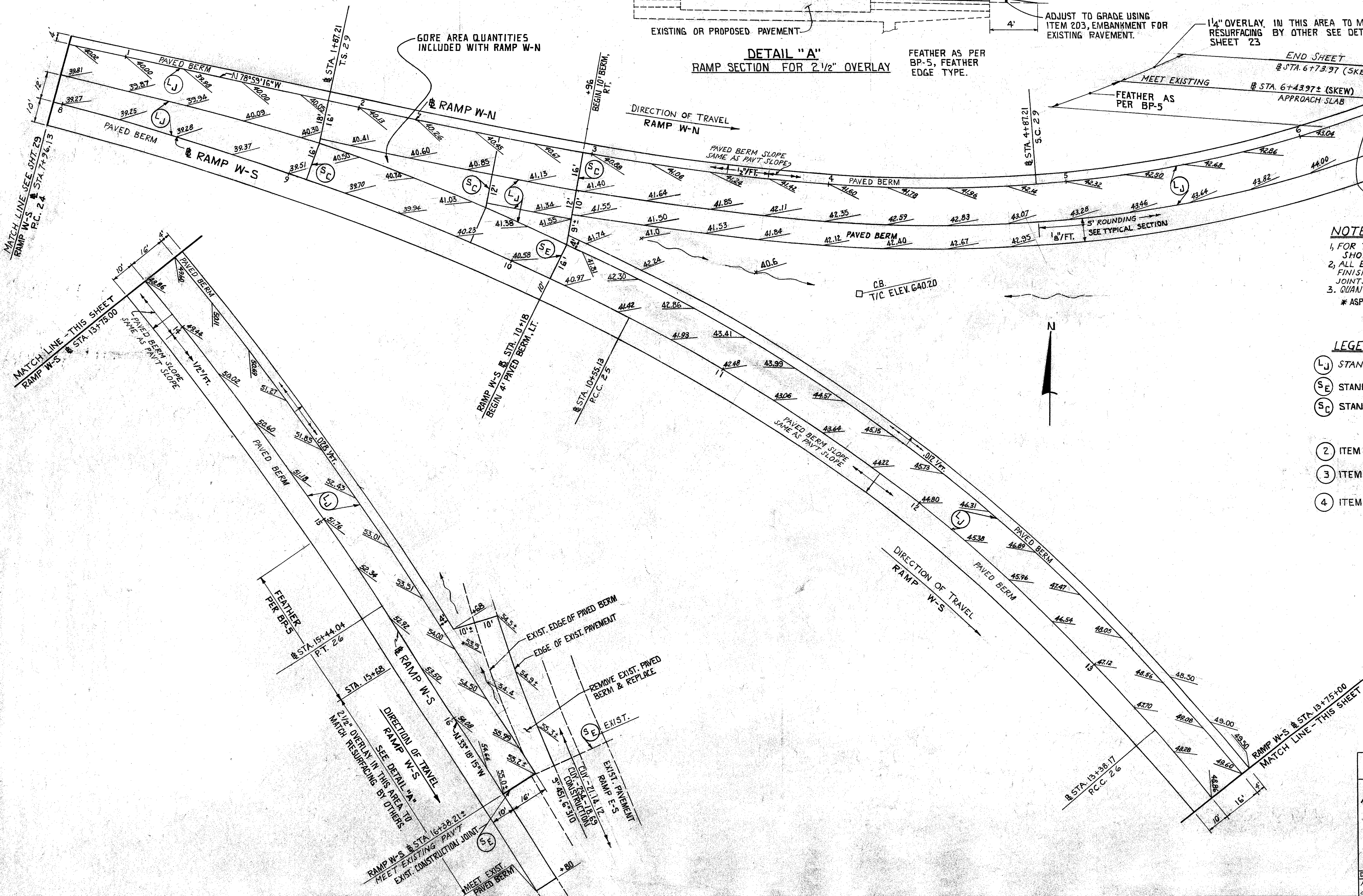
FOR PRESSURE RELIEF JOINT TYPE A, BP-10, PAY LENGTH - 16 L.F. SEE SHEET 23

NOTES:

1. FOR TRUE ELEVATIONS ADD 600' TO THOSE SHOWN.
 2. ALL ELEVATIONS SHOWN ARE TO THE TOP OF FINISHED PAVEMENT AND ARE GIVEN AT PAVEMENT JOINTS, EDGES AND EVEN 25' STATIONS.
 3. QUANTITIES TABULATED ON SHEET 33A.
- * ASPHALT OVERLAY IS ON TOP OF ELEVATIONS SHOWN.

LEGEND:

- (LJ) STANDARD LONGITUDINAL JOINT
- (SE) STANDARD EXPANSION JOINT
- (SC) STANDARD CONTRACTION JOINT
- (2) ITEM 404 1 1/4" ASPHALT CONCRETE AC-20
- (3) ITEM 407 TACK COAT COVER AGGREGATE
- (4) ITEM 405 SEAL COAT BITUMINOUS MATERIAL SEAL COAT COVER AGGREGATE, N° 9



CONT. NO. SHEET ACCT. NO.

REVISED DEC. 1977 RLHII/CDR

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

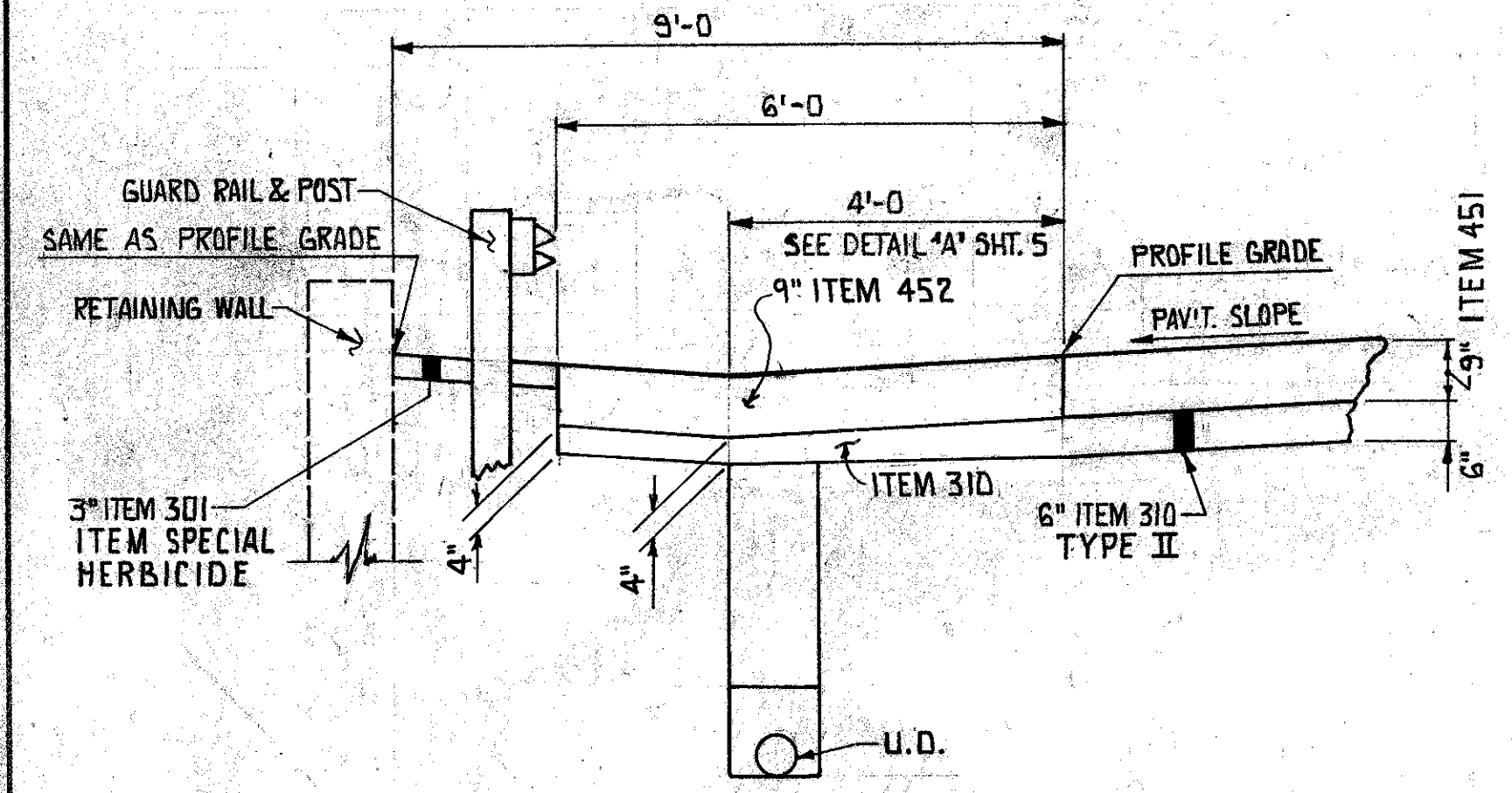
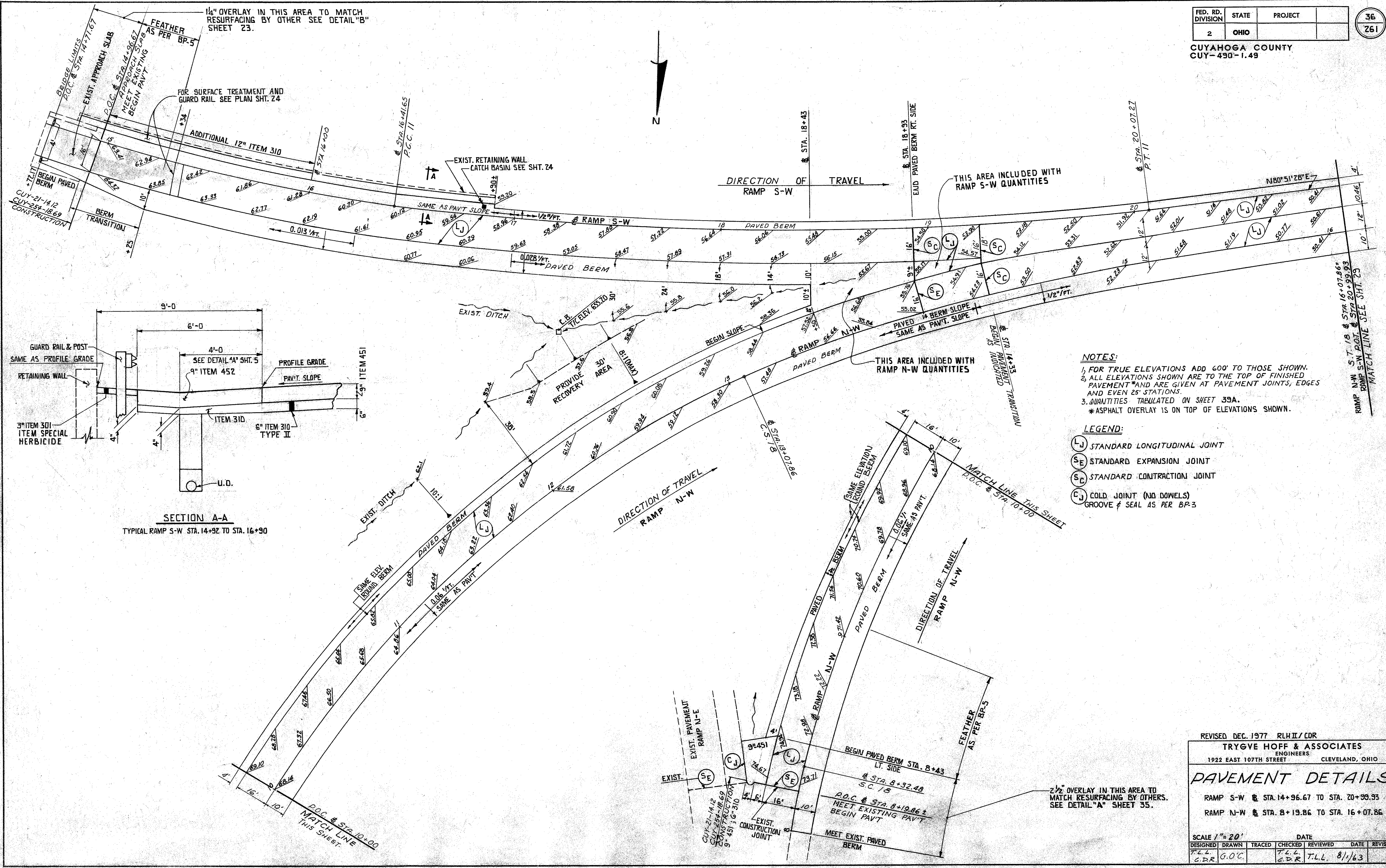
PAVEMENT DETAILS

RAMP W-S @ STA. 7+96.13 TO STA. 16+38.21

RAMP W-N @ STA. 0+74.5 TO STA. 6+43.97 (SKEW)

SCALE: 1" = 20'

DESIGNED: F.T. DRAWN: F.T. TRACED: C.D.R. CHECKED: T.L.L. REVIEWED: DATE: 8/1/63



SECTION A-A
TYPICAL RAMP S-W STA. 14+92 TO STA. 16+90

NOTES:
 1. FOR TRUE ELEVATIONS ADD 600' TO THOSE SHOWN.
 2. ALL ELEVATIONS SHOWN ARE TO THE TOP OF FINISHED PAVEMENT AND ARE GIVEN AT PAVEMENT JOINTS, EDGES AND EVEN 25' STATIONS.
 3. QUANTITIES TABULATED ON SHEET 39A.
 * ASPHALT OVERLAY IS ON TOP OF ELEVATIONS SHOWN.

LEGEND:
 (LJ) STANDARD LONGITUDINAL JOINT
 (SE) STANDARD EXPANSION JOINT
 (SC) STANDARD CONTRACTION JOINT
 (CJ) COLD JOINT (NO DOWELS) GROOVE & SEAL AS PER BP-3

REVISED DEC. 1977 RLH/CDR
TRYGVE HOFF & ASSOCIATES
 ENGINEERS
 1922 EAST 107TH STREET CLEVELAND, OHIO

PAVEMENT DETAILS

RAMP S-W STA. 14+96.67 TO STA. 20+99.93
 RAMP N-W STA. 8+19.86 TO STA. 16+07.86

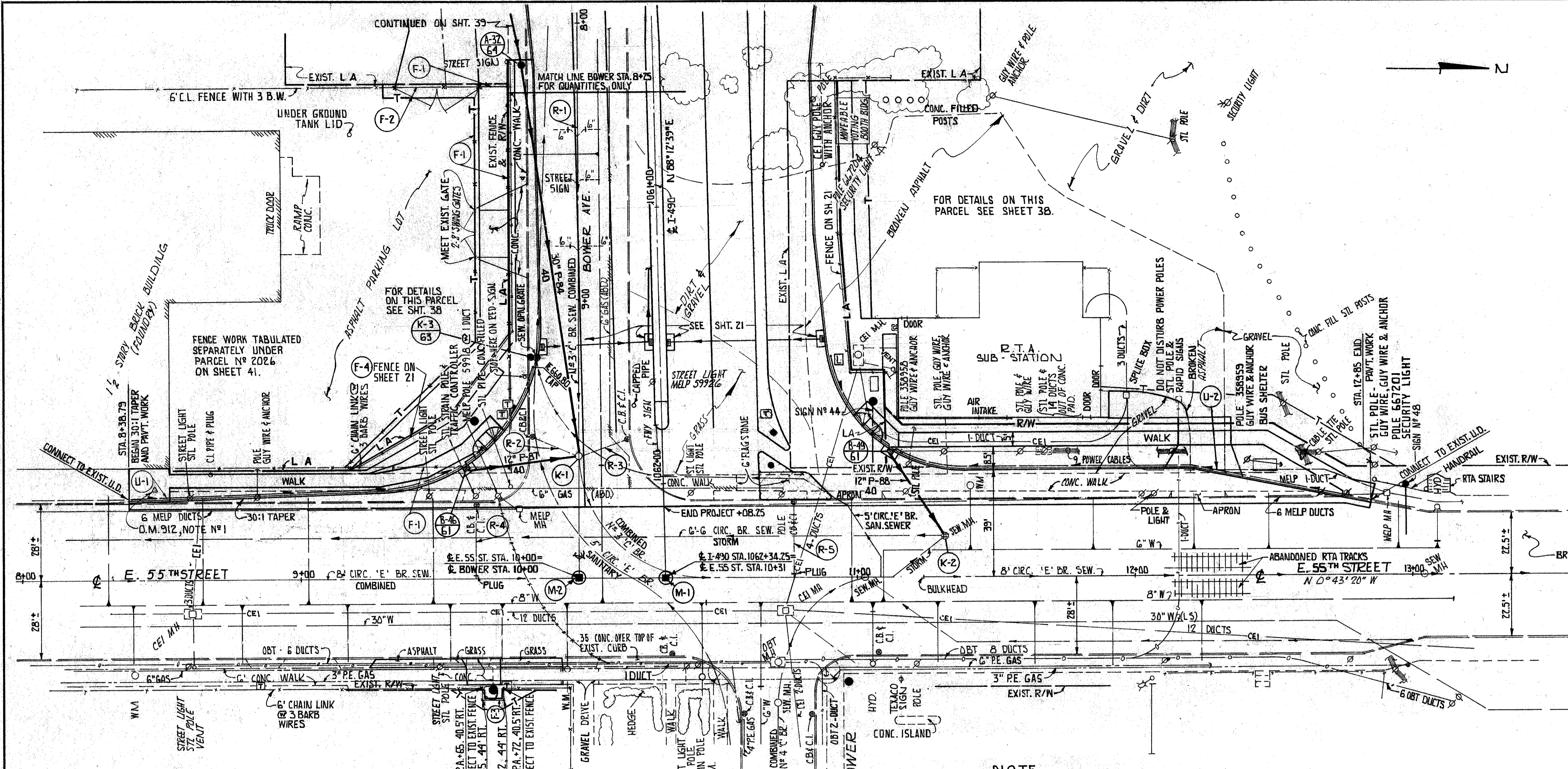
SCALE 1" = 20' DATE
 DESIGNED DRAWN TRACED CHECKED REVIEWED DATE REVISED
 T.L.L. G.O.C. T.L.L. G.D.R. T.L.L. 8/1/63

SHEET NO. 36

CUYAHOGA COUNTY
CUY-490-1.49

| REFERENCE DRAWINGS | SHEET |
|-------------------------------|---------------------|
| TYPICAL SECTIONS | 4&5 |
| GEOMETRIC LAYOUT | 14&15 |
| PAV'T. DETAILS & QUANTITIES | 38&39A |
| DRAINAGE & ROADWAY QUANTITIES | 41&11A |
| I-490 PLAN & PROFILE | 21 |
| BRAGG PLAN & PROFILE | 39&40 |
| CROSS SECTION KEY PLAN | 73 |
| WATER WORK | 127 & 128 |
| TRAFFIC CONTROL | 195, 197, 201 & 202 |
| LIGHTING PLANS | 153 |

| | |
|------------------------|-----------|
| RIGHT OF WAY | 254-261 |
| MAINTENANCE OF TRAFFIC | 102 & 105 |
| M.E.L.P. | 169 & 170 |



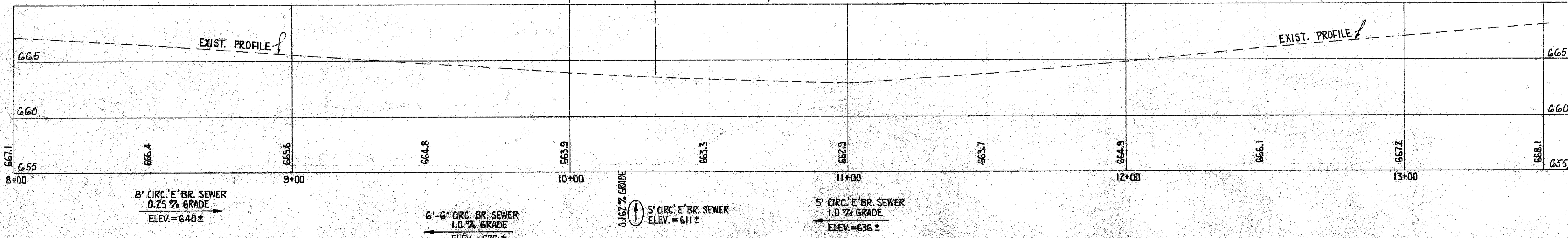
- LEGEND**
- [T] TRAFFIC PULL BOX
 - TRAFFIC CONTROL TYPE POLE WHEN UNACCOMPANIED BY A MARK NUMBER OR OTHER DESIGNATION
 - [L] LIGHTING PULL BOX

NOTE:
I. CONSTRUCTION NOT TO DISTURB O.M.

NOTE "A"
ITEM 607-TEMPORARY RELOCATED FENCE(6FT.) AS PER PLAN
THIS ITEM CONSISTS OF THE REMOVAL, RELOCATION AND RECONSTRUCTION OF THE EXISTING 6FT. CHAIN LINK FENCE WITH BARB WIRE AS CALLED FOR IN THE PLAN. FROM THE EXISTING LOCATION, THE FENCE IS TO BE MOVED TO A TEMPORARY LOCATION, AS INDICATED IN THE PLANS. RELOCATED FENCE SHALL BE OF THE SAME HEIGHT AND TYPE AS EXISTING FENCE. POSTS, CLIPS, CLAMPS, ETC., SHALL BE NEW. IN THE TEMPORARY FENCE LOCATION THE EXISTING FABRIC TOP ARMS TOP RAILS AND BARBWIRE ARE TO BE USED IF SERVICEABLE CONDITION AS DETERMINED BY THE ENGINEER. CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ITEM 607.

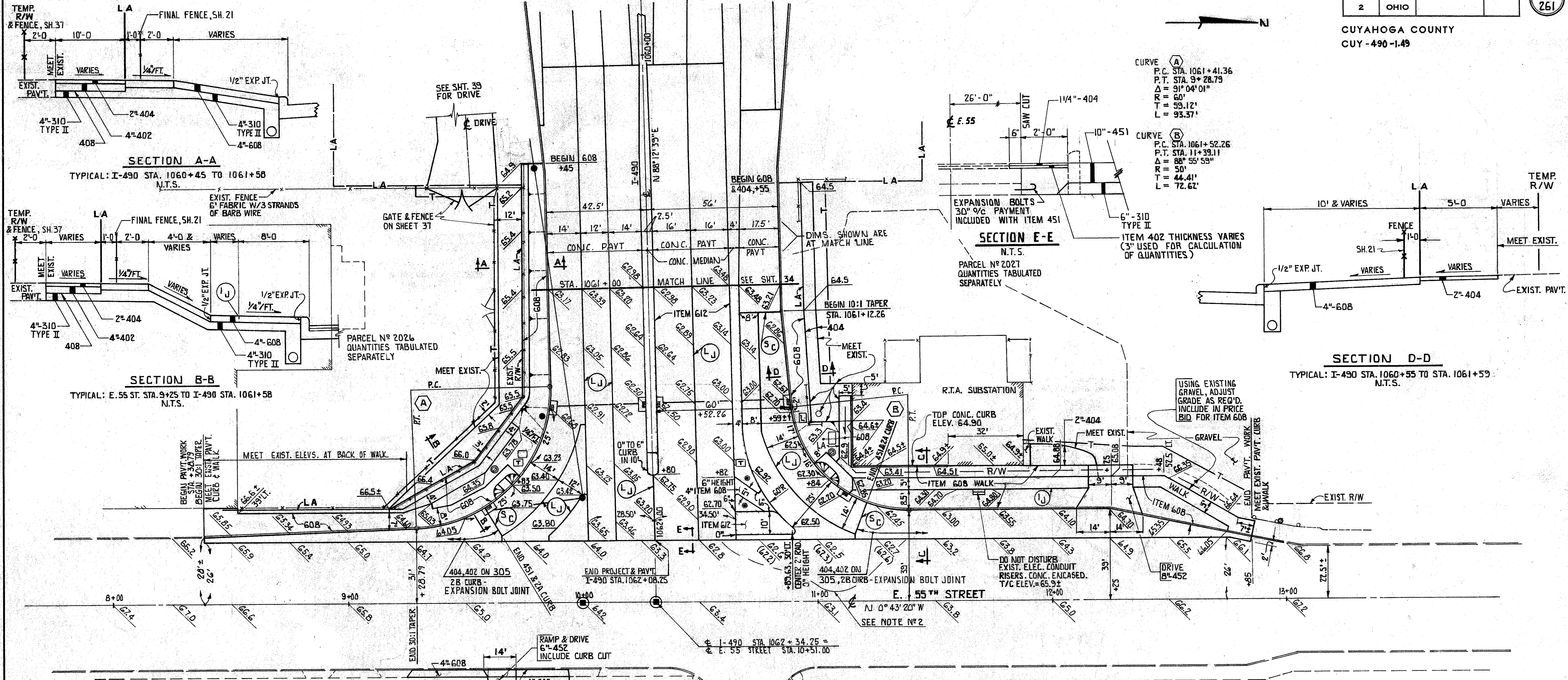
NOTE
FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 21, 128, 153, 169, 170 & 201.

O.M. 912 ELEV. 666.32
E. 55 ST. STA. 8+48, 33' LT.



| | | | |
|--|------|------|---|
| NO. | DATE | BY | REVISED |
| | | | TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 |
| EAST 55 STREET PLAN AND PROFILE INTERSECTION I-490 & E. 55th STREET | | | |
| SCALE: 1"=20' HORIZ. 1"=5' VERT. | | | |
| DESIGNED | | DATE | |
| DR | LY | JR | |

CONT. No. SHEET ACCT. No.



CURVE (A)
P.C. STA. 1061+41.36
P.T. STA. 9+28.79
Δ = 91° 04' 01"
R = 60'
T = 59.12'
L = 93.37'

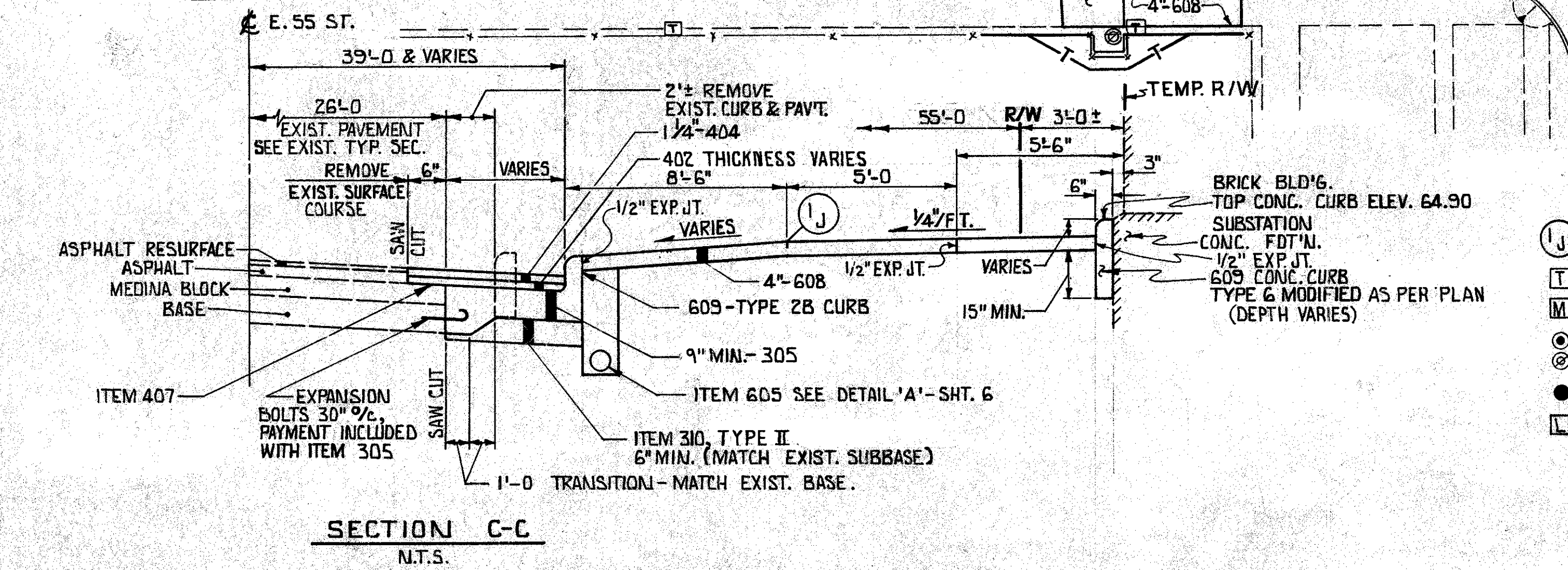
CURVE (B)
P.C. STA. 1061+52.26
P.T. STA. 11+39.11
Δ = 88° 55' 53"
R = 50'
T = 44.41'
L = 72.67'

SECTION A-A
TYPICAL: I-490 STA. 1060+45 TO 1061+58
N.T.S.

SECTION B-B
TYPICAL: E. 55 ST. STA. 9+25 TO I-490 STA. 1061+58
N.T.S.

SECTION E-E
N.T.S.
PARCEL NO 2027
QUANTITIES TABULATED
SEPARATELY

SECTION D-D
TYPICAL: I-490 STA. 1060+55 TO STA. 1061+59
N.T.S.



- LEGEND**
- (J) IMPRESSED JOINT
 - (T) TRAFFIC PULL BOX
 - (M) M.E.L.P. PULL BOX
 - (P) TRAFFIC CONTROL TYPE POLE
 - (S) SEWER MANHOLE
 - (L) LIGHTING PULL BOX

- NOTES**
- FOR LEGEND & ADDITIONAL NOTES SEE SHT. 34
 - ADJUST EXISTING LOW POINT TO ELEVATIONS SHOWN USING 404, 402 & 407
 - QUANTITIES ON SHT. 39A ALL QUANTITIES OUTSIDE R/W LIMITS ARE TABULATED BY PARCEL.

NO. DATE BY REVISION
TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

PAVEMENT DETAILS
I-490 STA. 1061+00 TO EAST 55TH STREET
EAST 55TH STREET STA. 8+00 TO 13+00

| | |
|---------------|---------|
| SCALE: 1"=20' | DATE |
| DESIGNED | DRAWN |
| TRACED | CHECKED |
| REVIEWED | DATE |
| CDR: R.L.H. | LV |
| | JRH |

SHEET ACCT. NO. CONT. NO.

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

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CUYAHOGA COUNTY
CUY-490-1.49

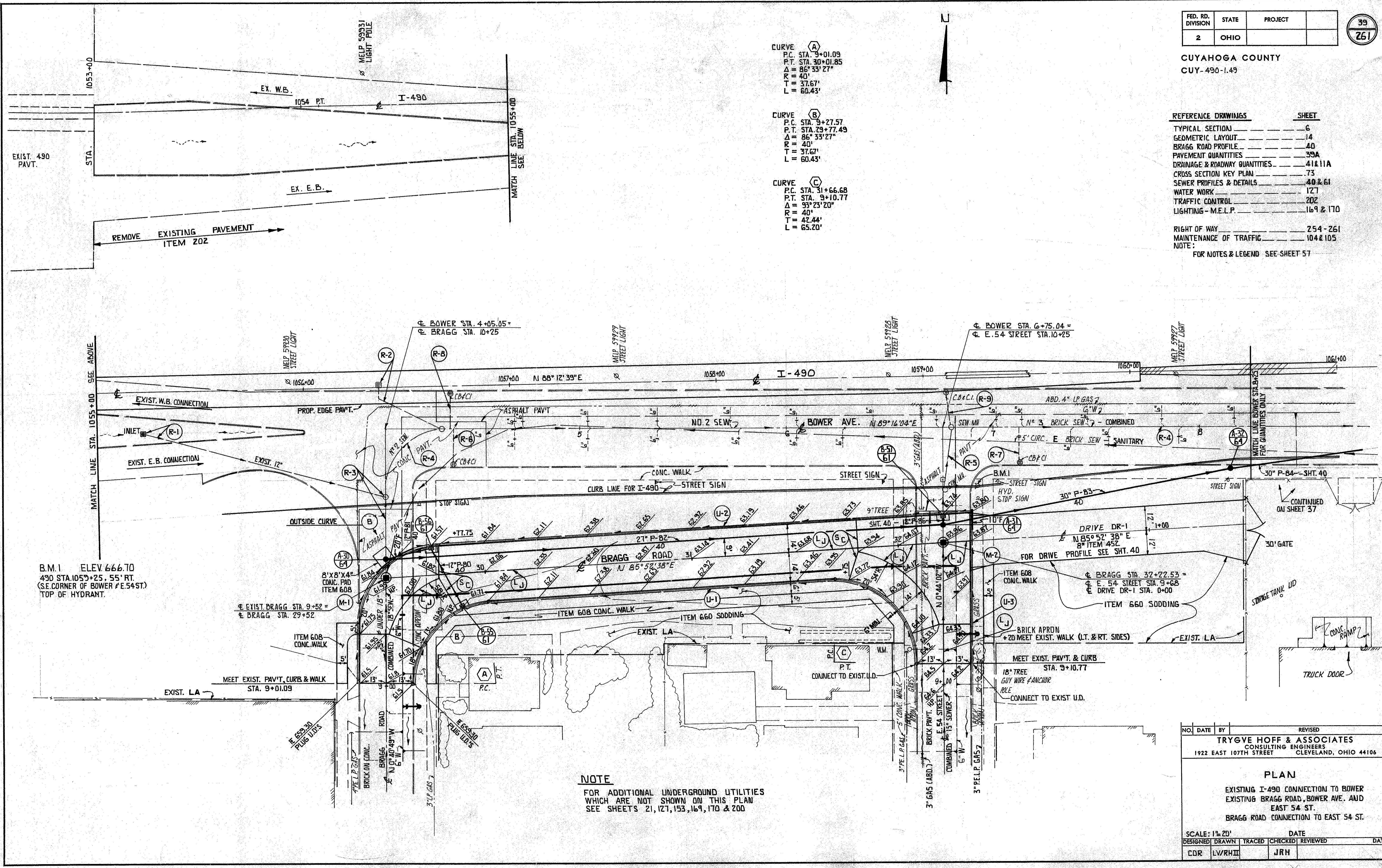
| REFERENCE DRAWINGS | SHEET |
|-------------------------------|-----------|
| TYPICAL SECTION | 6 |
| GEOMETRIC LAYOUT | 14 |
| BRAGG ROAD PROFILE | 40 |
| PAYMENT QUANTITIES | 39A |
| DRAINAGE & ROADWAY QUANTITIES | 41&11A |
| CROSS SECTION KEY PLAN | 73 |
| SEWER PROFILES & DETAILS | 40 & 61 |
| WATER WORK | 127 |
| TRAFFIC CONTROL | 202 |
| LIGHTING - M.E.L.P. | 169 & 170 |

RIGHT OF WAY 254-261
MAINTENANCE OF TRAFFIC 104 & 105
NOTE:
FOR NOTES & LEGEND SEE SHEET 57

CURVE (A)
P.C. STA. 9+01.09
P.T. STA. 30+01.85
 $\Delta = 86^\circ 33' 27''$
R = 40'
T = 37.67'
L = 60.43'

CURVE (B)
P.C. STA. 9+27.57
P.T. STA. 29+77.49
 $\Delta = 86^\circ 33' 27''$
R = 40'
T = 37.67'
L = 60.43'

CURVE (C)
P.C. STA. 31+66.68
P.T. STA. 9+10.77
 $\Delta = 93^\circ 23' 20''$
R = 40'
T = 42.44'
L = 65.20'



B.M. 1 ELEV. 666.70
490 STA. 1053+25.55 RT.
(S.E. CORNER OF BOWER & E. 54 ST.)
TOP OF HYDRANT.

NOTE
FOR ADDITIONAL UNDERGROUND UTILITIES
WHICH ARE NOT SHOWN ON THIS PLAN
SEE SHEETS 21, 127, 153, 169, 170 & 200

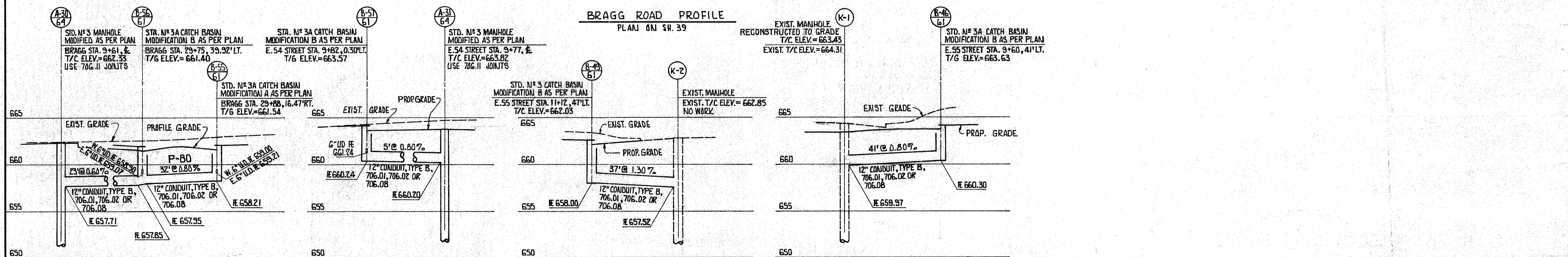
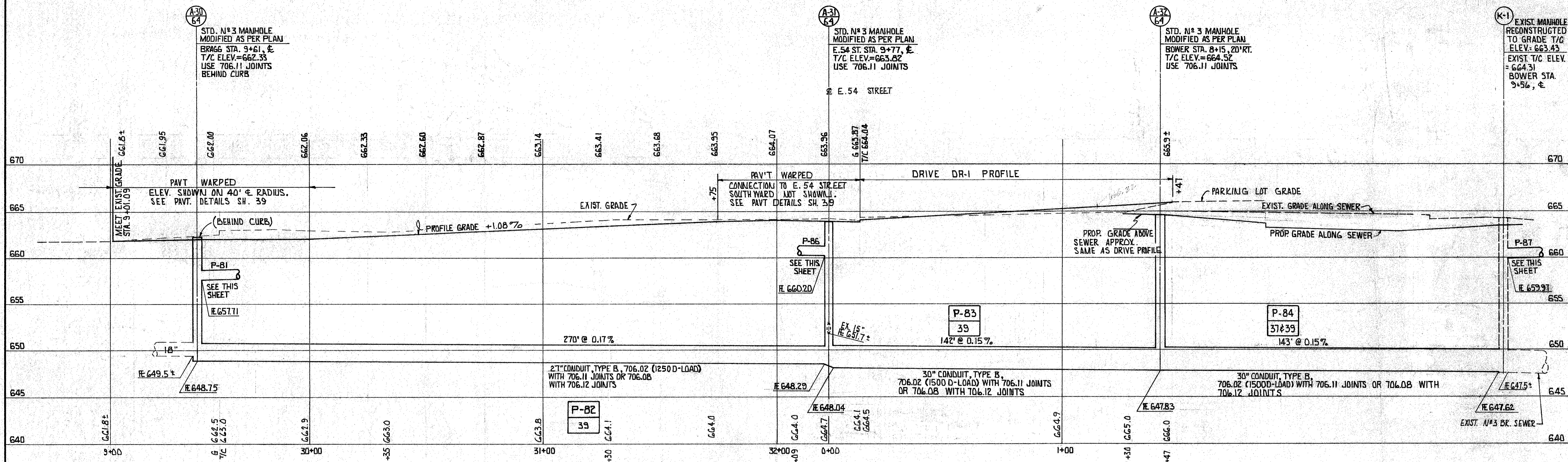
| NO. | DATE | BY | REVISED |
|--|---------|----------|---------|
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN | | | |
| EXISTING I-490 CONNECTION TO BOWER EXISTING BRAGG ROAD, BOWER AVE. AND EAST 54 ST. BRAGG ROAD CONNECTION TO EAST 54 ST. | | | |
| SCALE: 1" = 20' | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR | LVR/HII | JRH | |
| | | REVIEWED | DATE |

CONT. No. SHEET ACCT. No.

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

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CUYAHOGA COUNTY
CUY-490-1.49



| | | | | |
|--|--------|--------|---------|----------|
| NO. | DATE | BY | REVISED | |
| | | | | |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | | |
| BRAGG ROAD PROFILE SEWER PROFILES BRAGG ROAD, E. 54 STREET & E. 55 STREET | | | | |
| 1" = 5' VERT. SCALE: 1" = 20' HORIZ. | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED |
| CDR | RHI/LV | | JRH | |

SHEET ACCT. No. CONT. No.

SUB-SUMMARY OF QUANTITIES

| QUANTITIES | | FED. RD. DIVISION | STATE | PROJECT |
|---------------|---------------|-------------------|-------|---------|
| CALC. BY: CDR | DATE: JULY 78 | 2 | OHIO | |
| CK'D. BY: CAP | DATE: 4-82 | | | |

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QUANTITIES CARRIED TO GENERAL SUMMARY

CUYAHOGA COUNTY
CUY - 490-1.49

STORM

SANITARY

ROADWAY

STORM

ROADWAY

| SHEET NO. | MARK NO. | ITEM | 202 | | | | 604 | | | | 604 | | | | | |
|----------------|----------|---------------------------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|---|
| | | | L.F. | L.F. | EA. | EA. | EA. | EA. | EA. | EA. | EA. | EA. | EA. | EA. | | |
| 37 | B-46 | E. 55 STA. 9+60, 41' LT. | | | | | | | | | | | | | | |
| | B-49 | E. 55 STA. 11+12, 47' LT. | | | | | | | | | | | | | | |
| 37 | K-1 | BOWER STA. 9+56, ☐ | | | | | | | | | | | | | | |
| | K-3 | BOWER STA. 9+20, 15' RT. | | | | | | | | | | | | | | |
| 37 | M-1 | 490 STA. 1062+34.25, ☐ | | | | | | | | | | | | | | |
| | M-2 | E. 55 STA. 10+00, ☐ | | | | | | | | | | | | | | |
| 37 | R-1 | BOWER STA. 8+25 TO 9+55, ☐ | | 130 | | | | | | | | | | | | |
| | R-2 | BOWER STA. 9+50, RT. | 18 | | | | | | | | | | | | | |
| | R-3 | BOWER STA. 9+55, LT. | 18 | | | | | | | | | | | | | |
| | R-4 | E. 55 STA. 9+63, LT. | 26 | | | | | | | | | | | | | |
| | R-5 | E. 55 STA. 10+78, LT. | 26 | | | | | | | | | | | | | |
| 39 | A-30 | BRA66 STA. 9+61, ☐ | | | | | | | | | | | | | | |
| | A-31 | E. 54 STA. 9+77, ☐ | | | | | | | | | | | | | | |
| | A-32 | BOWER STA. 8+15, 20' RT. | | | | | | | | | | | | | | |
| 39 | B-55 | BRA66 STA. 29+88, 16.47' RT. | | | | | | | | | | | | | | |
| | B-56 | BRA66 STA. 29+75, 39.92' LT. | | | | | | | | | | | | | | |
| | B-57 | E. 54 STA. 9+82, 0.30' LT. | | | | | | | | | | | | | | |
| 39 | M-1 | BRA66 STA. 9+52, ☐ | | | | | | | | | | | | | | |
| | M-2 | E. 54 STA. 9+68, ☐ | | | | | | | | | | | | | | |
| 39 | R-1 | 490 STA. 1055+20 ± TO 1056+40 ±, RT. | 120 | | | | | | | | | | | | | |
| | R-2 | BOWER STA. 4+00 ± TO 4+32, LT. | 40 | | | | | | | | | | | | | |
| | R-3 | BRA66 STA. 9+61 TO 9+92, ☐ | 31 | | | | | | | | | | | | | |
| | R-4 | BRA66 STA. 9+92 TO BOWER STA. 8+25, ☐ | | 440 | 2 | | | | | | | | | | | |
| | R-5 | E. 54 STA. 9+77 TO 10+25, ☐ & RT. | 48 | | | | | | | | | | | | | |
| | R-6 | BOWER STA. 4+39, RT. | 18 | | | | | | | | | | | | | |
| | R-7 | BOWER STA. 7+13, RT. | 18 | | | | | | | | | | | | | |
| | R-8 | BOWER STA. 4+38, LT. | 18 | | | | | | | | | | | | | |
| | R-9 | BOWER STA. 6+78 ±, LT. | 18 | | | | | | | | | | | | | |
| I-FUNDS TOTALS | | | 399 | 570 | 4 | 10 | | | 1 | 3 | 1 | 3 | 1 | | | 4 |

| SHEET NO. | MARK NO. | ITEM | FROM | TO | 603 | | 605 | | 202 | | 607 | | | |
|----------------|----------|---|------|------|------|------|------|------|------|------|------|------------|-----|---|
| | | | | | L.F. | L.F. | L.F. | L.F. | L.F. | L.F. | L.F. | EA. | | |
| 37 | P-84 | BOWER STA. 8+75, RT. | 8+25 | K-1 | | 133 | | | | | | | | |
| | P-87 | E. 55 STA. 9+80, LT. | B-46 | K-1 | 41 | | | | | | | 1-45° BEND | | |
| | P-88 | E. 55 STA. 11+20, LT. | B-49 | K-2 | 37 | | | | | | | | | |
| 37 | U-1 | E. 55 STA. 8+39, LT. TO 490 STA. 1061+56, RT. | | | | | 20 | 148 | | | | | | |
| | U-2 | 490 STA. 1061+54, RT. TO E. 55 STA. 12+85, LT. | | | | | 20 | 197 | | | | | | |
| 39 | P-80 | BRA66 STA. 29+81, LT. & RT. | B-55 | B-56 | 32 | | | | | | | | | |
| | P-81 | BRA66 STA. 29+63, LT. | B-56 | A-30 | 23 | | | | | | | | | |
| | P-82 | BRA66 STA. 31+90, LT. | A-30 | A-31 | 270 | | | | | | | | | |
| | P-83 | BOWER STA. 7+45, RT. | A-31 | A-32 | 142 | | | | | | | | | |
| | P-84 | BOWER STA. 8+20, RT. | A-32 | 8+25 | 10 | | | | | | | | | |
| | P-86 | E. 54 STA. 9+80, ☐ | B-57 | A-31 | 5 | | | | | | | | | |
| 39 | U-1 | BRA66 STA. 29+65 TO 32+10, RT. | | | | | 20 | 271 | | | | | | |
| | U-2 | BRA66 STA. 9+01 TO 32+20, LT. | | | | | 40 | 290 | | | | | | |
| | U-3 | E. 54 STA. 9+10 TO 9+82, RT. | | | | | 20 | 68 | | | | 1-90° BEND | | |
| PARCEL NO 2026 | | | | | | | | | | | | | | |
| 37 | F-1 | BOWER STA. 8+23, RT. TO E. 55 STA. 9+16, LT. | | | | | | | | | | 205 | | |
| | F-2 | BOWER STA. 8+23, RT. | | | | | 30 | | | | | 1 | | |
| | F-3 | E. 55 STA. 9+65 TO 9+72 RT. | | | | | 7 | 15 | | | | | | |
| I-FUNDS TOTALS | | | 138 | 270 | 285 | | 120 | 974 | | | 37 | 15 | 205 | 1 |

CONT. No. SHEET ACCT. No.

DRAINAGE AND ROADWAY QUANTITIES
BRA66 ROAD, BOWER AVE, E. 54TH ST. AND E. 55TH ST. (SHEETS 37 & 39)

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

42
261

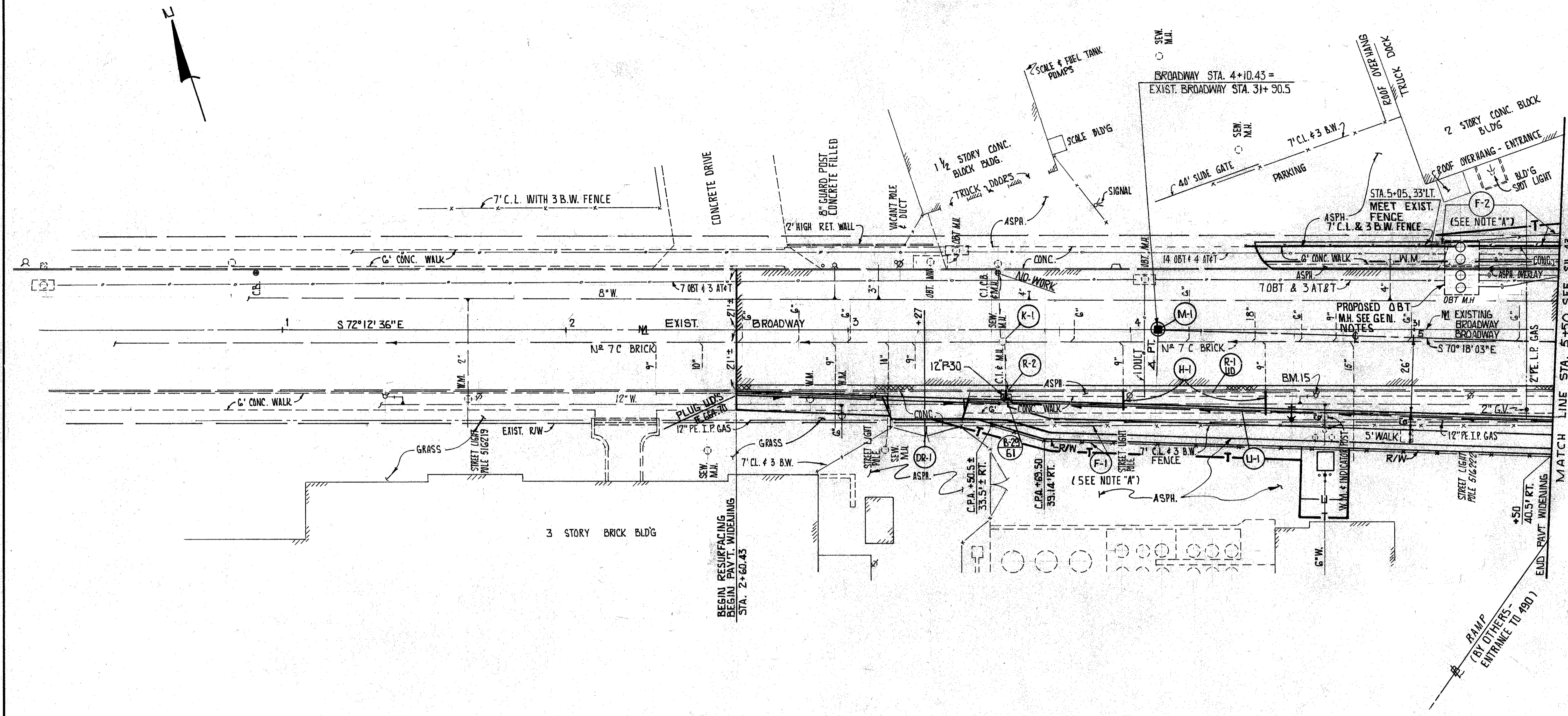
CUYAHOGA COUNTY
CUY - 490 - 1.49

| REFERENCE DRAWINGS | SHEET N ^o |
|-------------------------------|----------------------|
| GEOMETRIC LAYOUT | 16 |
| ROADWAY & DRAINAGE QUANTITIES | 46 & 11A |
| PAVEMENT DETAILS & QUANTITIES | 57 & 60A |
| SEWER PROFILES | 55 |
| CROSS SECTION KEY PLAN | 66 |
| WATER WORK | 121 |
| TRAFFIC CONTROL | 203 |
| LIGHTING | 101 |
| RIGHT OF WAY | 254-261 |
| MAINTENANCE OF TRAFFIC | 58 & 101 |

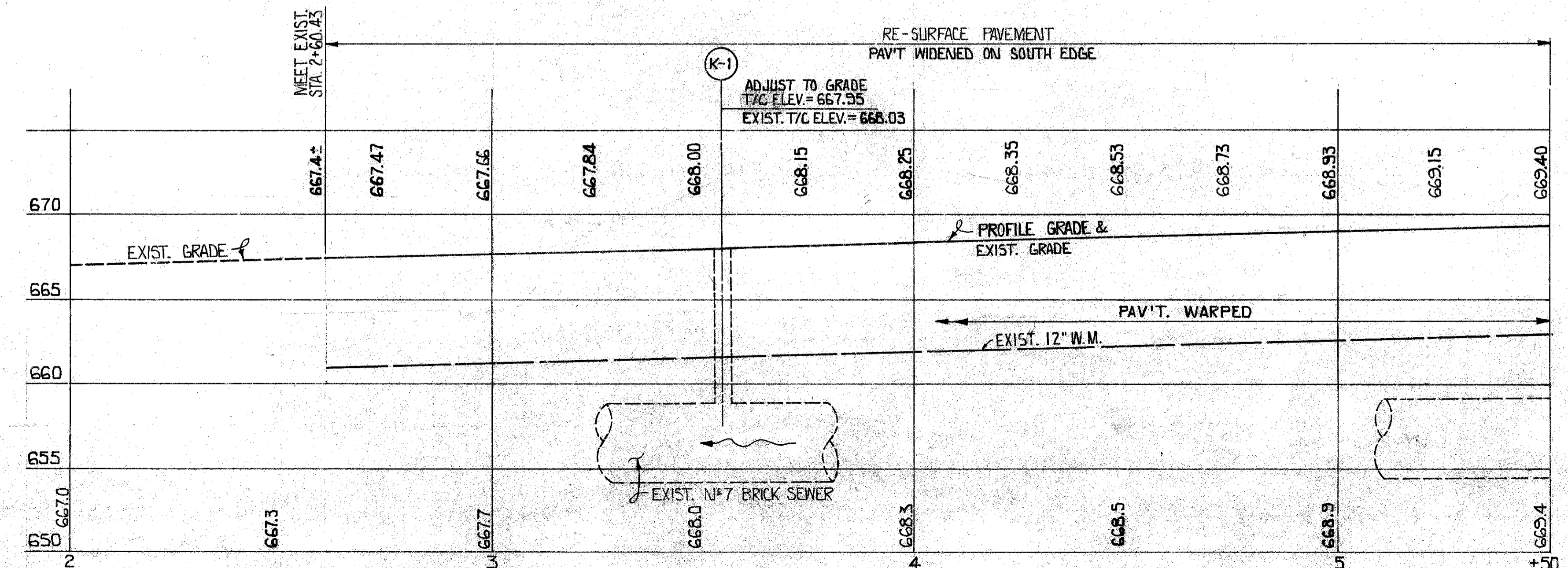
NOTE
FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN THIS PLAN SEE SHEETS 121 & 150.

LEGEND
C.P.A. CORNER POST ASSEMBLY.

NOTE "A"
ITEM 607 - RELOCATED FENCE (7FT.) AS PER PLAN
THIS ITEM OF WORK CONSISTS OF THE REMOVAL, RELOCATION AND RECONSTRUCTION OF THE EXISTING 7FT. CHAIN LINK FENCE WITH BARB WIRE AS CALLED FOR IN THE PLAN.
RELOCATED FENCE SHALL BE OF THE SAME HEIGHT AND TYPE AS EXISTING FENCE.
POSTS, CLIPS, CLAMPS, ETC., SHALL BE NEW. EXISTING FABRIC, TOP ARMS, TOP RAILS, AND BARB WIRE ARE TO BE REUSED IF IN GOOD CONDITION, AS DETERMINED BY THE ENGINEER. CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ITEM 607.
PAYMENT SHALL BE AT THE UNIT PRICE BID TIMES THE ACTUAL LINEAR FEET OF FENCE REMOVED, RELOCATED, AND RECONSTRUCTED.
ANY FENCE FABRIC NOT USED IN FINAL FENCE CONSTRUCTION SHALL BE NEATLY ROLLED AND STORED WITH OTHER SALVAGEABLE FENCE ITEMS WITHIN THE TEMPORARY R/W LIMITS FOR PICKUP BY THE OWNER.



B.M. 15 ELEV. 671.28
BROADWAY STA. 4+65, 22' RT.
TOP OF HYDRANT.



CONT. No. SHEET ACCT. No.

| NO. | DATE | BY | REVISED |
|--|--------|--------|---------|
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN AND PROFILE | | | |
| BROADWAY STA. 1+00 TO STA. 5+50 | | | |
| SCALE 1" = 20' HOR. DATE 1" = 5' VERT. | | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR. | LV/RHI | | JRH |



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

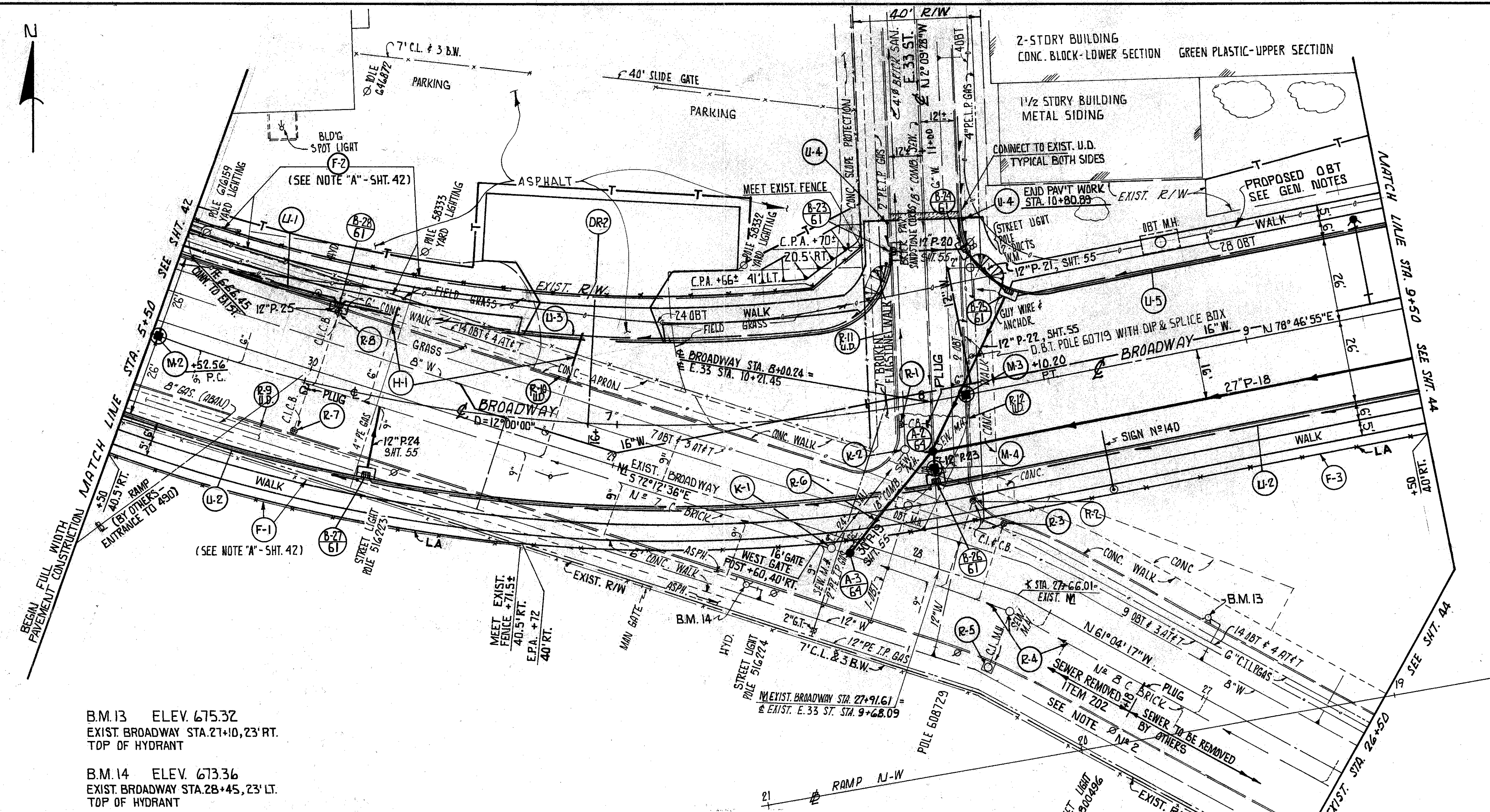
43
261

CUYAHOGA COUNTY
CUY-490-1.49

| REFERENCE DRAWINGS | SHEET NO. |
|---------------------------------|--------------|
| TYPICAL SECTION | 6 |
| GEOMETRIC LAYOUT | 16 |
| ROADWAY AND DRAINAGE QUANTITIES | 46 & 11A |
| PAVEMENT DETAILS AND QUANTITIES | 57, 58 & 60A |
| SEWER PROFILES | 55 |
| CROSS SECTION KEY PLAN | 66 |
| WATER WORK | 122 |
| TRAFFIC CONTROL | 203 |
| LIGHTING | 101 & 150 |
| RIGHT OF WAY | 254-261 |
| MAINTENANCE OF TRAFFIC | 98 & 101 |

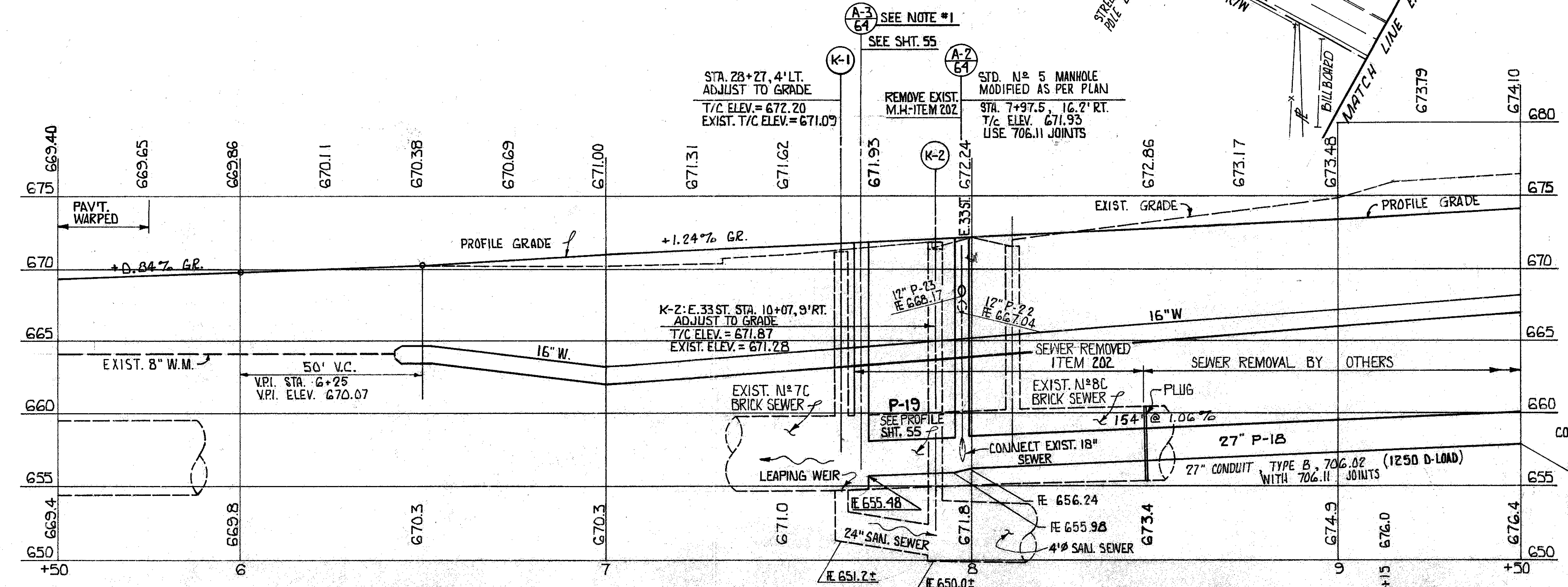
LEGEND
E.P.A. END POST ASSEMBLY
⊙ TRAFFIC CONTROL TYPE POLE

NOTES
1. MANHOLE MK A-3, INLET SIDE OF N° B SEWER, NOT TO BE SEALED UNTIL IT CAN BE ABANDONED BETWEEN E. 33 & E. 37 STREETS.
2. SEWER REMOVALS, BROADWAY SEWER CAN NOT BE ABANDONED UNTILL SEWER WORK EAST OF E. 37 ST. IN BROADWAY IS COMPLETED.
3. FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 122, 150, 178 & 198.



B.M.13 ELEV. 675.32
EXIST. BROADWAY STA. 27+10, 23' RT.
TOP OF HYDRANT

B.M.14 ELEV. 673.36
EXIST. BROADWAY STA. 28+45, 23' LT.
TOP OF HYDRANT



| NO. | DATE | BY | REVISED |
|---|---------------|----------|---------|
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN AND PROFILE | | | |
| BROADWAY STA. 5+50 TO STA. 9+50 | | | |
| SCALE | 1" = 5' VERT. | DATE | |
| DESIGNED | LV/RMH | TRACED | |
| CDR | | CHECKED | JRH |
| | | REVIEWED | |
| | | DATE | |

SHEET ACCT. No. CONT. No.

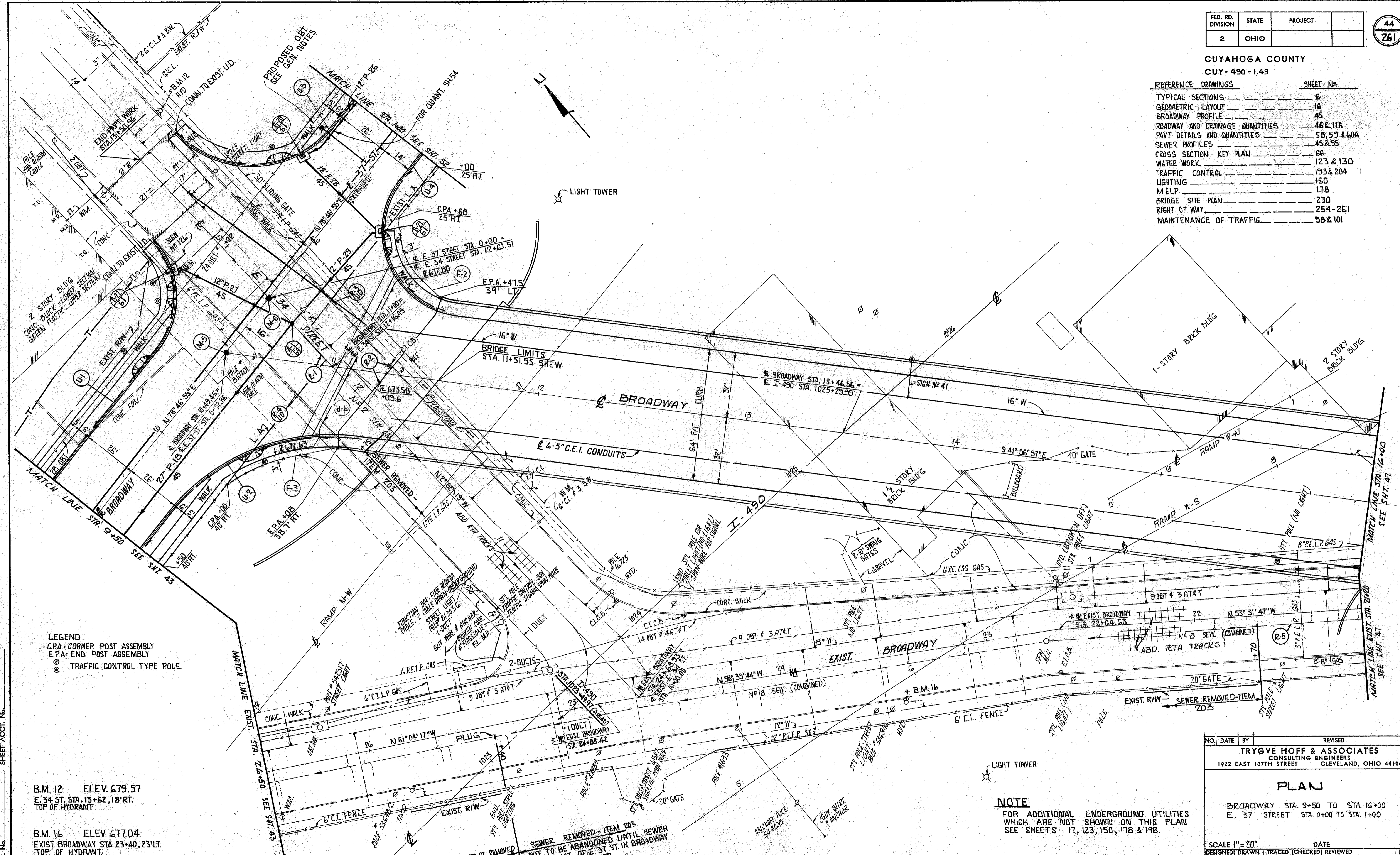
CONTINUED ON SHT. 45

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

44
261

CUYAHOGA COUNTY
CUY-490-149

| REFERENCE DRAWINGS | SHEET No. |
|---------------------------------|--------------|
| TYPICAL SECTIONS | 6 |
| GEOMETRIC LAYOUT | 16 |
| BROADWAY PROFILE | 45 |
| ROADWAY AND DRAINAGE QUANTITIES | 46 & 11A |
| PAVT DETAILS AND QUANTITIES | 58, 59 & 60A |
| SEWER PROFILES | 45 & 55 |
| CROSS SECTION - KEY PLAN | 66 |
| WATER WORK | 123 & 130 |
| TRAFFIC CONTROL | 193 & 204 |
| LIGHTING | 150 |
| M.E.L.P. | 178 |
| BRIDGE SITE PLAN | 230 |
| RIGHT OF WAY | 254-261 |
| MAINTENANCE OF TRAFFIC | 58 & 101 |



LEGEND:
 C.P.A. = CORNER POST ASSEMBLY
 E.P.A. = END POST ASSEMBLY
 (Symbol) = TRAFFIC CONTROL TYPE POLE

B.M. 12 ELEV. 679.57
 E. 34 ST. STA. 13+62, 18' RT.
 TOP OF HYDRANT

B.M. 16 ELEV. 677.04
 EXIST. BROADWAY STA. 23+40, 23' LT.
 TOP OF HYDRANT

SEWER TO BE REMOVED BY OTHERS
 SEWER REMOVED - ITEM 203
 NOT TO BE ABANDONED UNTIL SEWER WORK EAST OF E. 37 ST. IN BROADWAY IS COMPLETED

NOTE
 FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 17, 123, 150, 178 & 198.

NO. DATE BY REVISIONS
 TRYGVE HOFF & ASSOCIATES
 CONSULTING ENGINEERS
 1922 EAST 107TH STREET CLEVELAND, OHIO 44106

PLAN

BROADWAY STA. 9+50 TO STA. 16+00
 E. 37 STREET STA. 0+00 TO STA. 1+00

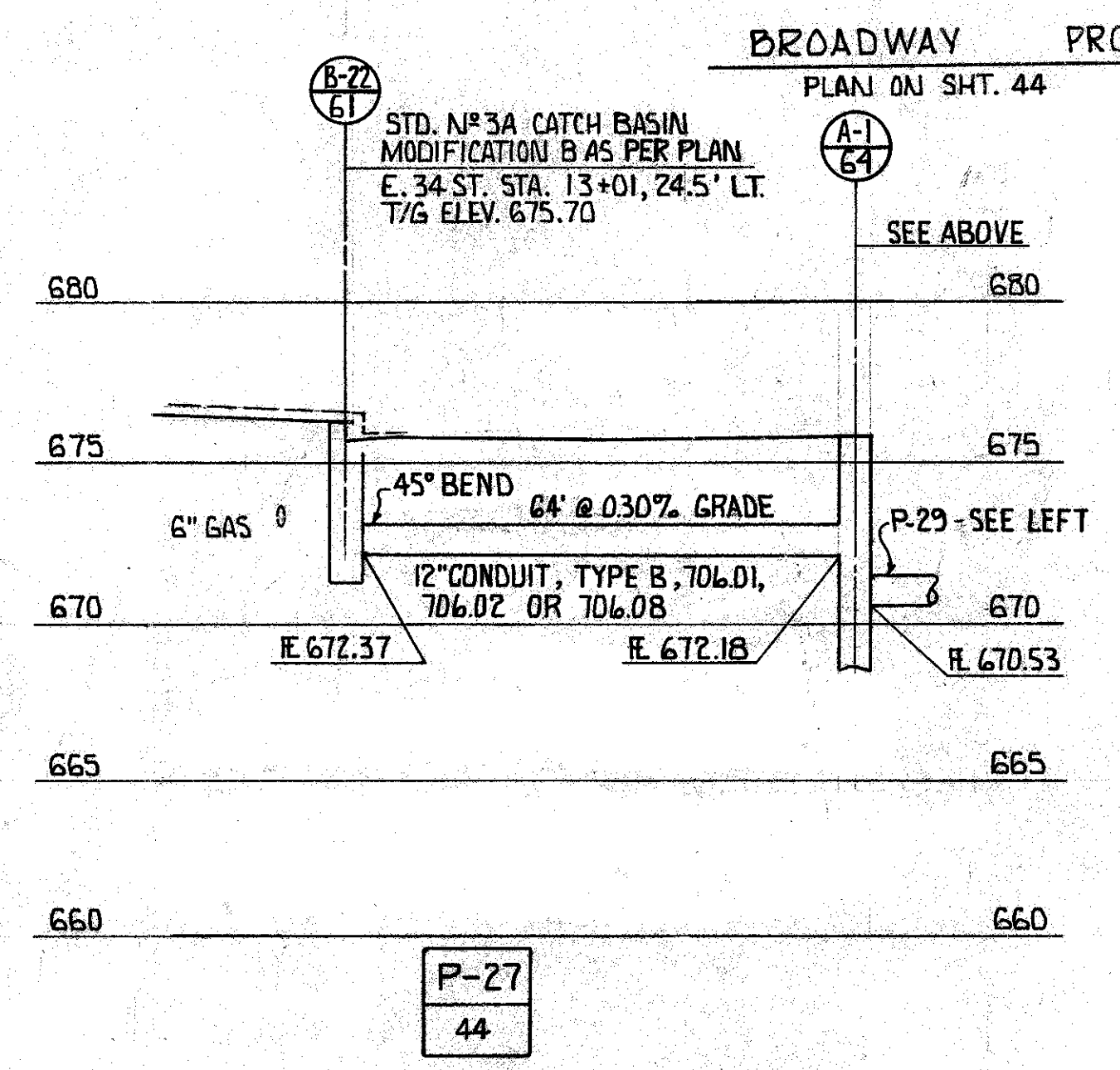
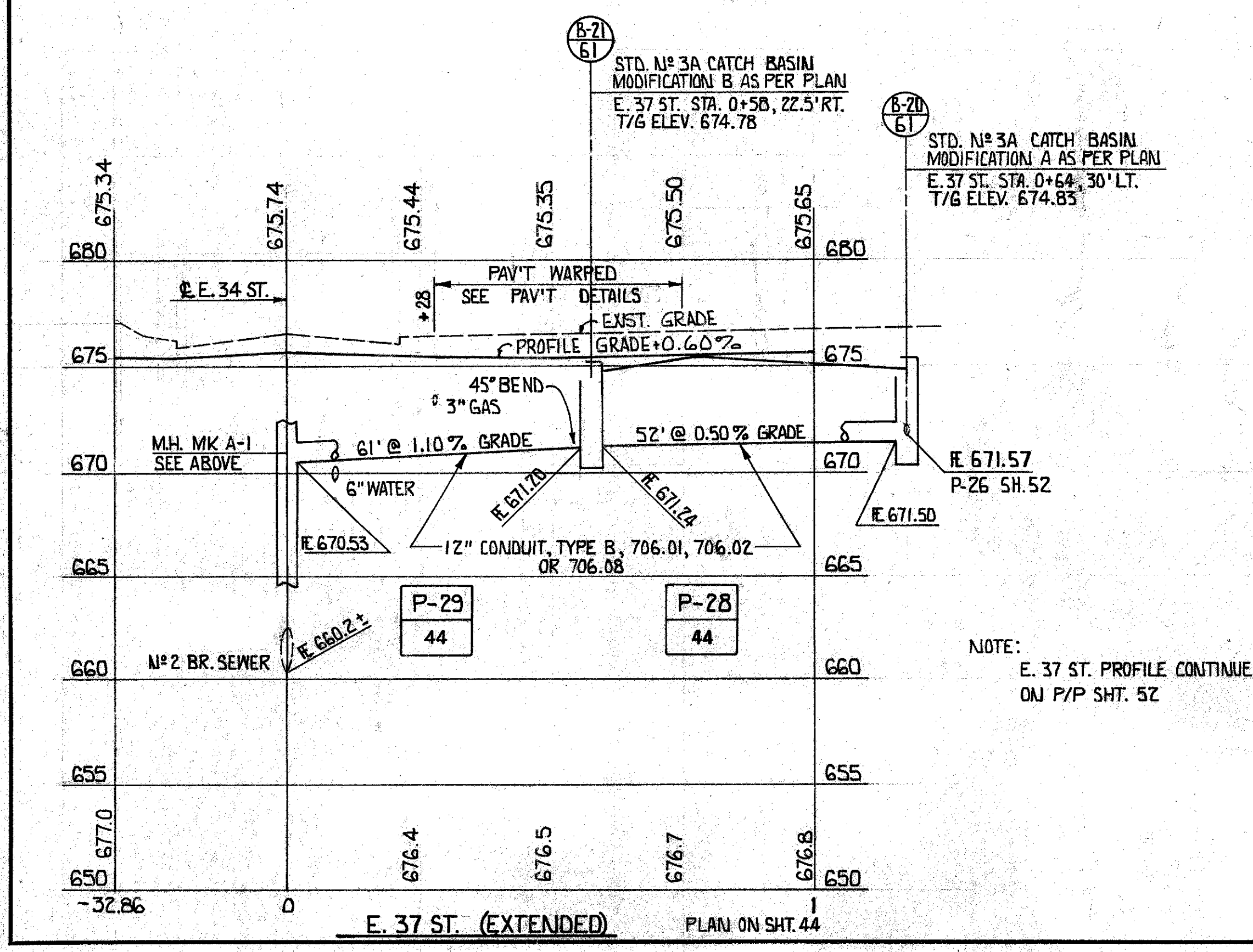
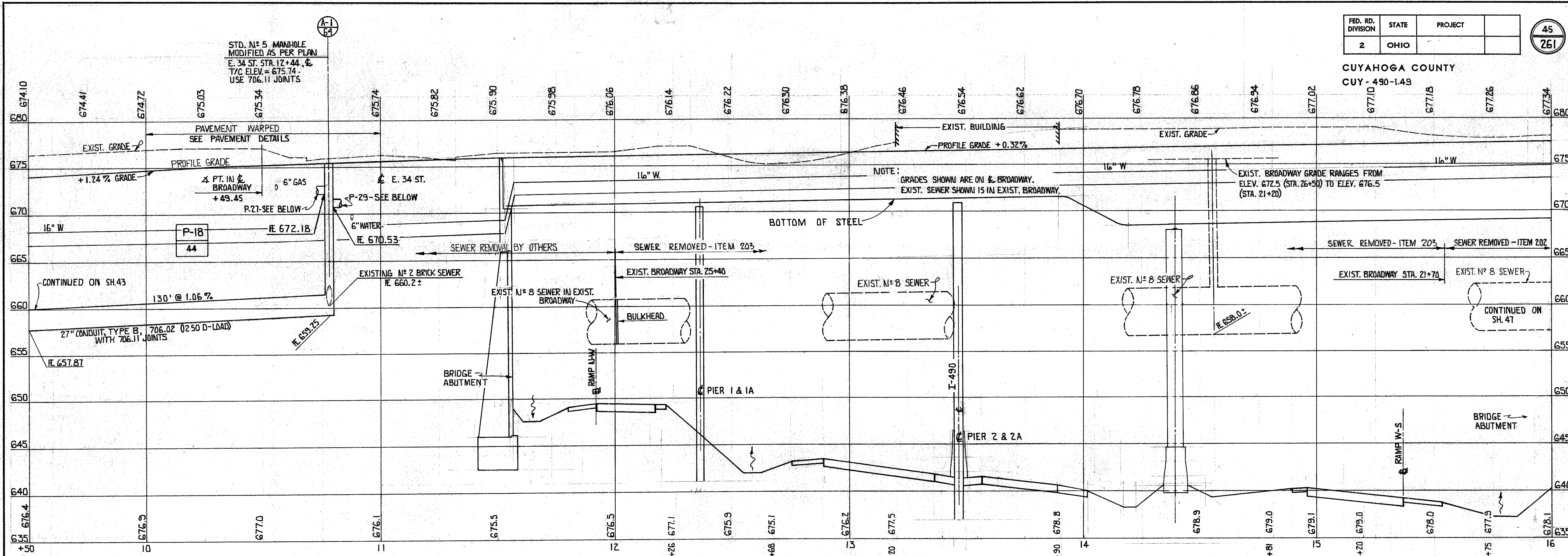
| | |
|----------------|----------|
| SCALE 1" = 20' | DATE |
| DESIGNED DRAWN | TRACED |
| CHECKED | REVIEWED |
| DATE | DATE |
| CDR | LV/RHJ |
| JRH | |

SHEET ACCT. No. CONT. No.

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

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261

CUYAHOGA COUNTY
CUY-490-1.49



FOR BROADWAY AND E. 37 STREET PLAN
SEE SHT. 44

| NO. | DATE | BY | REVISED |
|--|-------------|--------|---------|
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PROFILE | | | |
| BROADWAY STA. 9+50 TO STA. 16+00 E. 37 STREET (EXTENDED) STA. 0-32.86 TO STA. 1+00 | | | |
| SCALE 1" = 20' HORIZ. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| C.D.R. | R.H.J./L.V. | | J.R.H. |
| REVIEWED | | DATE | |

SHEET ACCT. No.

SUB-SUMMARY OF QUANTITIES

| QUANTITIES | | FED. RD. DIVISION | STATE | PROJECT |
|---------------|---------------|-------------------|-------|---------|
| CALC. BY: CDR | DATE: JULY 78 | 2 | OHIO | |
| CK'D. BY: | DATE: | | | |

QUANTITIES CARRIED TO
 GENERAL SUMMARY
CUYAHOGA COUNTY
 CUY - 490-149

| SHEET NO. | MARK NO. | ROADWAY | | | | | | | | | | ROADWAY | | | | | | | | | | | | | |
|-----------|----------|-----------------------------------|--------------------------------|----------------------------|------------------|--------------------------------|---|---|---|---------------------------|--|---------------------------|------|----------|---------|--|--|--|---|--|---------------------------------------|-------------------------------|---|-------------------------|----------------|
| | | ITEM | STORM | | | | | SANITARY | | | | | ITEM | STORM | | | | | SANITARY | | | | | | |
| | | LOCATION | PIPE REMOVED* 24" DIA. & UNDER | PIPE REMOVED OVER 24" DIA. | MANHOLES REMOVED | CATCH BASINS OR INLETS REMOVED | CATCH BASIN STD. NO. 3A W/ V-GRADE MODIF. A AS PER PLAN | CATCH BASIN STD. NO. 3A W/ V-GRADE MODIF. B AS PER PLAN | MANHOLE STD. NO. 5 MODIFIED AS PER PLAN | MANHOLE ADJUSTED TO GRADE | MONUMENT ASSEMBLY MODIFIED AS PER PLAN | MANHOLE ADJUSTED TO GRADE | | LOCATION | FROM TO | 6" CONDUIT, TYPE B 706.08 WITH 706.12 JOINTS | 8" CONDUIT, TYPE B 706.08 WITH 706.12 JOINTS | 12" CONDUIT, TYPE B 706.01, 706.02 OR 706.08 | 30" CONDUIT, TYPE B 706.02 (1250 D-LOAD) WITH 706.11 JOINTS | 6" SHALLOW PIPE UNDERDRAIN AS PER PLAN | 6" CONDUIT, TYPE F BENDS AND BRANCHES | RELOCATED FENCE T AS PER PLAN | FENCE 7" TYPE CL. WITH 3 STRAND BARB WIRE AS PER PLAN | GATE, TYPE CL, 1/4 FEET | FENCE, TYPE CL |
| | | UNIT | L.F. | L.F. | EA. | EA. | EA. | EA. | EA. | EA. | EA. | | | | L.F. | L.F. | L.F. | L.F. | L.F. | L.F. | EA. | L.F. | L.F. | EA. | L.F. |
| 42 | B-29 | BROADWAY STA. 3+56, 24' RT. | | | | | | | | | | | | | | | | | | | | | | | |
| | K-1 | BROADWAY STA. 3+54, 4' RT. | | | | | | | | | | | | | | | | | | | | | | | |
| | M-1 | BROADWAY STA. 4+10.43, E | | | | | | | | | | | | | | | | | | | | | | | |
| | R-1 | BROADWAY STA. 2+60 TO 5+50, RT. | 290 | | | | | | | | | | | | | | | | | | | | | | |
| | R-2 | BROADWAY STA. 3+56, RT. | | | | | | | | | | | | | | | | | | | | | | | |
| 43 | A-2 | BROADWAY STA. 7+97.5, 16.2' RT. | | | | | | | | | | | | | | | | | | | | | | | |
| | A-3 | BROADWAY STA. 28+20, 4' LT. | | | | | | | | | | | | | | | | | | | | | | | |
| | B-23 | E. 33 STA. 10+69, 12' LT. | | | | | | | | | | | | | | | | | | | | | | | |
| | B-24 | E. 33 STA. 10+69, 14.04' RT. | | | | | | | | | | | | | | | | | | | | | | | |
| | B-25 | BROADWAY STA. 8+31, 29.8' LT. | | | | | | | | | | | | | | | | | | | | | | | |
| | B-26 | BROADWAY STA. 7+96.5, 26' RT. | | | | | | | | | | | | | | | | | | | | | | | |
| | B-27 | BROADWAY STA. 6+25, 26' RT. | | | | | | | | | | | | | | | | | | | | | | | |
| | B-28 | BROADWAY STA. 6+06, 26' LT. | | | | | | | | | | | | | | | | | | | | | | | |
| | K-1 | BROADWAY STA. 28+27, 4' LT. | | | | | | | | | | | | | | | | | | | | | | | |
| | K-2 | E. 33 STA. 10+07, 9' LT. | | | | | | | | | | | | | | | | | | | | | | | |
| 44 | A-1 | E. 34 STA. 12+44, E | | | | | | | | | | | | | | | | | | | | | | | |
| | B-20 | E. 37 STA. 0+64, 30' LT. | | | | | | | | | | | | | | | | | | | | | | | |
| | B-21 | E. 37 STA. 0+58, 22.5' RT. | | | | | | | | | | | | | | | | | | | | | | | |
| | B-22 | E. 34 STA. 13+01, 24.5' LT. | | | | | | | | | | | | | | | | | | | | | | | |
| | M-5 | BROADWAY STA. 10+49.45, E | | | | | | | | | | | | | | | | | | | | | | | |
| | M-6 | E. 34 STA. 12+60.51, E | | | | | | | | | | | | | | | | | | | | | | | |
| | R-1 | E. 37 STA. 11+75 TO 12+46, E | 71 | | | | | | | | | | | | | | | | | | | | | | |
| | R-2 | E. 37 STA. 11+97, RT. | 20 | | | | | | | | | | | | | | | | | | | | | | |
| | R-3 | E. 37 STA. 11+75 TO 13+49, RT. | 174 | | | | | | | | | | | | | | | | | | | | | | |
| | R-4 | E. 37 STA. 11+75 TO 13+18, LT. | 143 | | | | | | | | | | | | | | | | | | | | | | |
| | R-5 | BROADWAY STA. 21+20 TO 21+70, LT. | 50 | | | | | | | | | | | | | | | | | | | | | | |
| | | | I-FUNDS TOTALS | 1,457 | 154 | 2 | 8 | 3 | 7 | 3 | 2 | | | | | | | | | | | | | | |

DRAINAGE AND ROADWAY QUANTITIES
 BROADWAY STA. 2+00 TO 16+00 (SHEETS 42, 43 & 44)

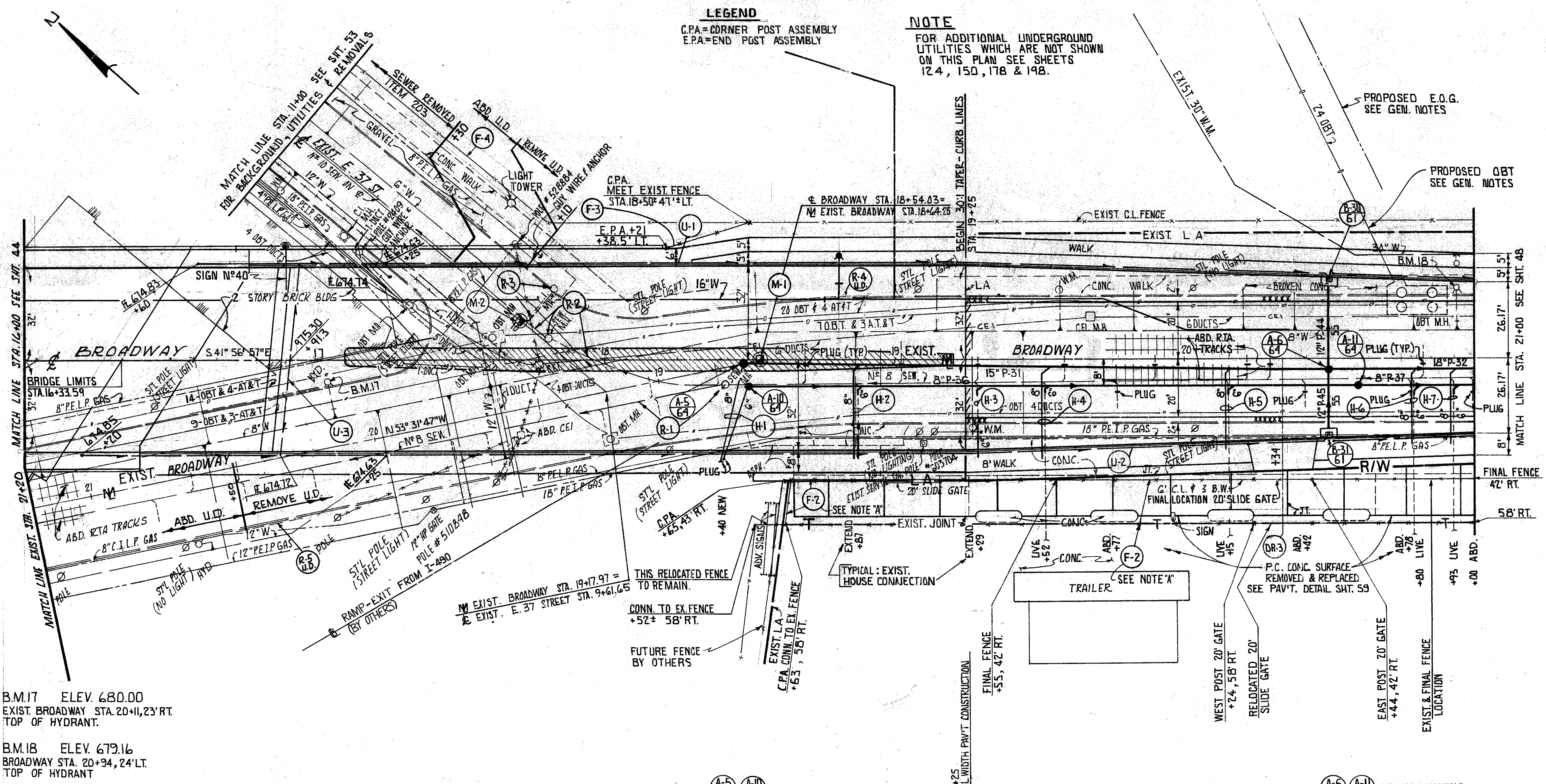
SHEET ACCT. No.

 CONT. No.

CUYAHOGA COUNTY
CUY - 490 - 1.49

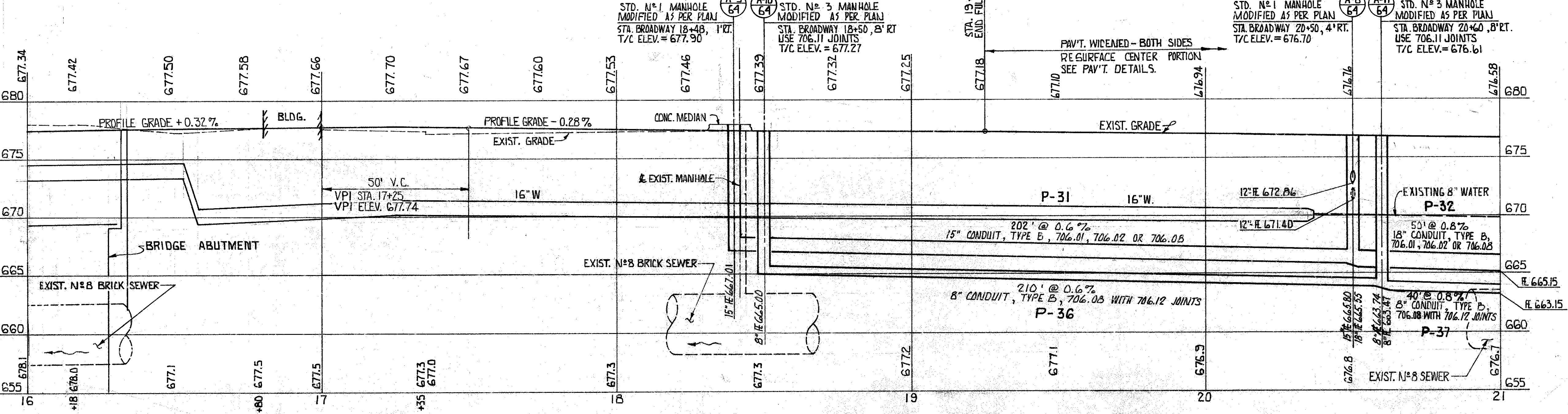
LEGEND
C.P.A. = CORNER POST ASSEMBLY
E.P.A. = END POST ASSEMBLY

NOTE
FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 124, 150, 178 & 198.



B.M.17 ELEV. 680.00
EXIST. BROADWAY STA. 20+41.23' RT.
TOP OF HYDRANT.

B.M.18 ELEV. 679.16
BROADWAY STA. 20+34.24' LT.
TOP OF HYDRANT



| REFERENCE DRAWINGS | SHEET NO. |
|-------------------------------|-----------|
| TYPICAL SECTIONS | 6 |
| GEOMETRIC LAYOUT | 16 |
| ROADWAY & DRAINAGE QUANTITIES | 50 & 11A |
| PAVEMENT DETAILS & QUANTITIES | 57 & 60A |
| SEWER PROFILES & DETAILS | 55 & 61 |
| CROSS SECTION KEY PLAN | 66 |
| WATER WORK | 124 |
| TRAFFIC CONTROL | 203 & 204 |
| LIGHTING | 150 |
| M.E.L.P. | 178 |
| BRIDGE SITE PLAN | 230 |
| RIGHT OF WAY | 254-261 |
| MAINTENANCE OF TRAFFIC | 38 & 101 |

- NOTES:**
- SEE GENERAL NOTE & DETAIL SHEET FOR HOUSE SEWER CONNECTION INFORMATION.
 - PLUG ALL SEWER CONNECTIONS ON THE NORTHERLY SIDE OF THE STREET AT TRENCH.
 - TYPICAL SECTION FOR SEWER CONSTRUCTION ON SHEET 48
 - PAVING OVER SEWER TRENCH DETAIL ON SHEET 62

NOTE "A"
ITEM 607 - RELOCATED FENCE (6 FT.) AS PER PLAN

THIS ITEM CONSISTS OF THE REMOVAL, RELOCATION AND RECONSTRUCTION OF THE EXISTING 6 FT. CHAIN LINK FENCE WITH BARB WIRE AS CALLED FOR IN THE PLAN. FROM THE EXISTING LOCATION, THE FENCE IS TO BE MOVED TO A TEMPORARY LOCATION, AND THEN FROM THE TEMPORARY LOCATION TO A FINAL LOCATION, ALL AS INDICATED IN THE PLANS. IN THE TEMPORARY FENCE LOCATION THE EXISTING HARDWARE AND POSTS MAY BE USED IF IN SERVICEABLE CONDITION. RELOCATED FENCE SHALL BE OF THE SAME HEIGHT AND TYPE AS EXISTING FENCE. POSTS, CLIPS, CLAMPS, ETC. SHALL BE NEW. EXISTING FABRIC, TOP ARMS, TOP RAILS, AND BARB WIRE ARE TO BE REUSED IF IN GOOD CONDITION AS DETERMINED BY THE ENGINEER. CONSTRUCTION METHODS SHALL BE IN ACCORDANCE WITH ITEM 607. PAYMENT SHALL BE AT THE UNIT PRICE BID TIMES THE ACTUAL LINEAR FEET OF FENCE REMOVED, RELOCATED AND RECONSTRUCTED, AT THE EXISTING, TEMPORARY, AND FINAL LOCATION. ALSO INCLUDED IN THE UNIT PRICE BID ARE RESTORATION OF POST HOLES TO MATCH EXISTING SURFACES. ANY FENCE FABRIC NOT USED IN FINAL FENCE CONSTRUCTION SHALL BE NEATLY ROLLED AND STORED WITH OTHER SALVAGEABLE FENCE ITEMS WITHIN THE TEMPORARY R/W LIMITS FOR PICKUP BY THE OWNER.

| | | | |
|---|-------|---------|----------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN AND PROFILE BROADWAY STA. 16+00 TO STA. 21+00 | | | |
| SCALE 1" = 5' VERT. | | DATE | |
| DESIGNED | | DRAWN | |
| CDR | LV/RH | CHECKED | REVIEWED |
| | | JRH | |

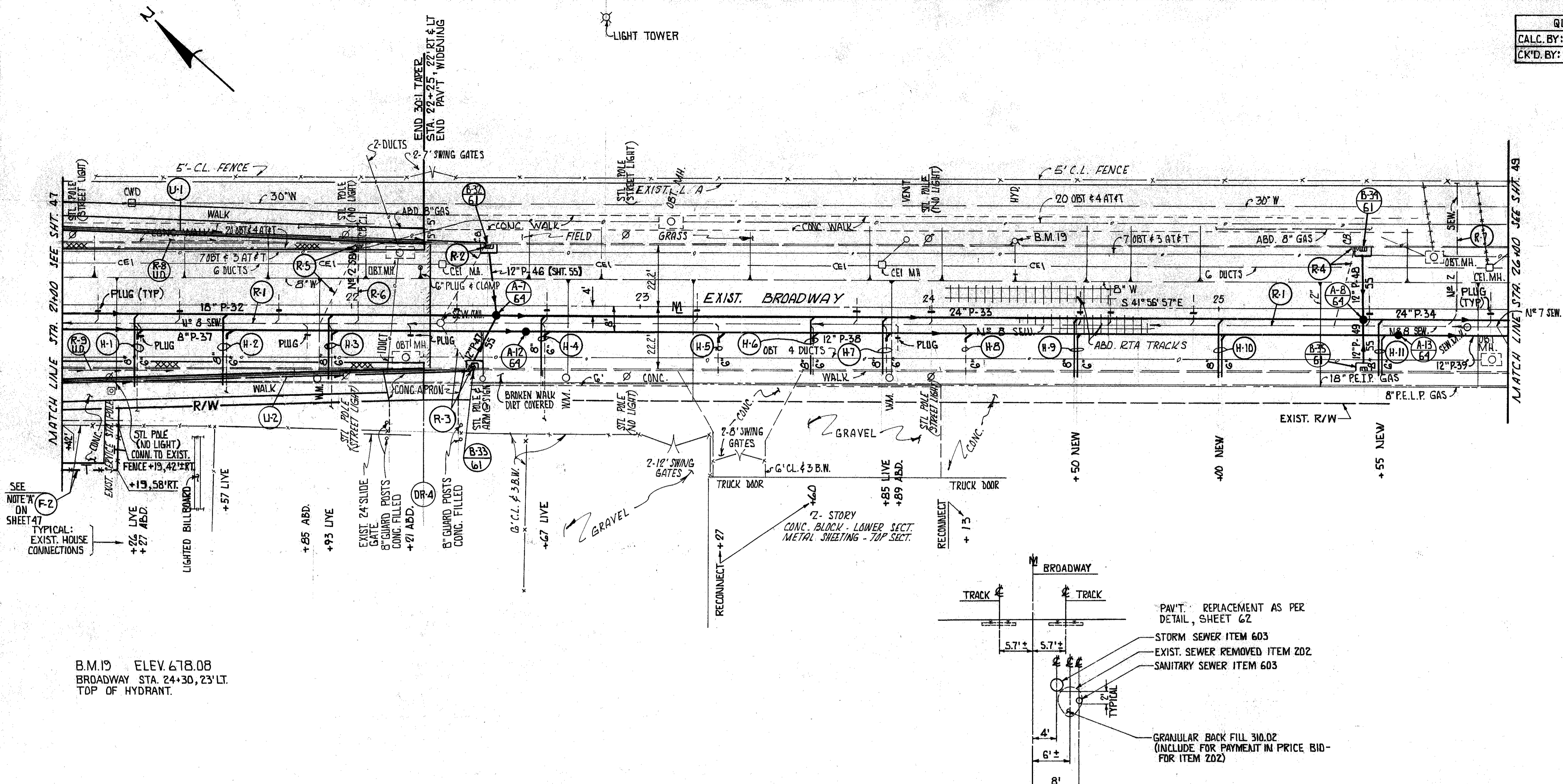
SHEET ACCT. No.

| QUANTITIES | | FED. RD. DIVISION | STATE | PROJECT |
|------------|-------|-------------------|-------|---------|
| CALC. BY: | DATE: | 2 | OHIO | |
| CK'D. BY: | DATE: | | | |

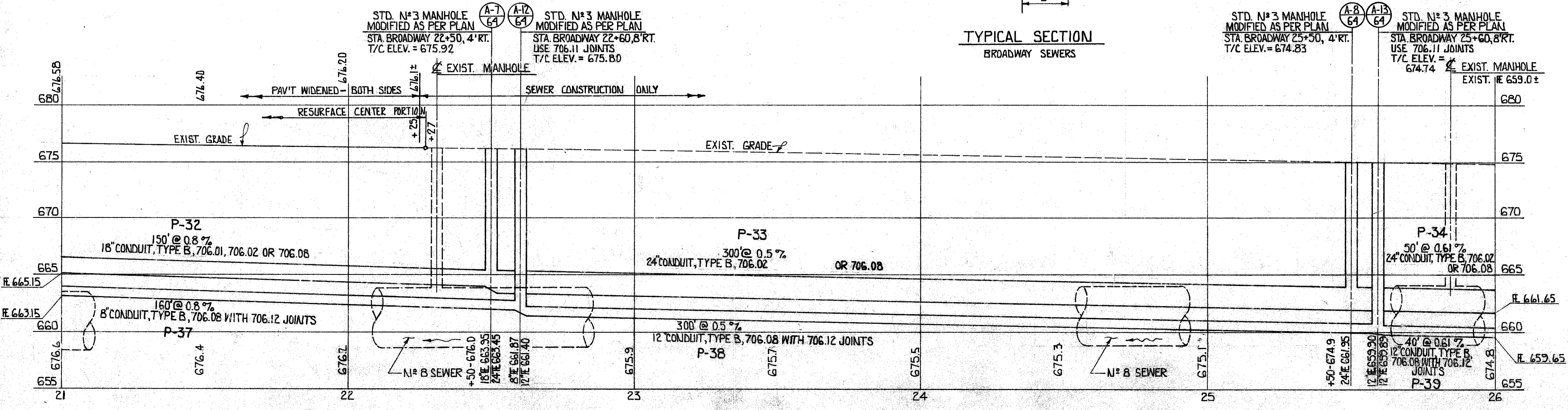
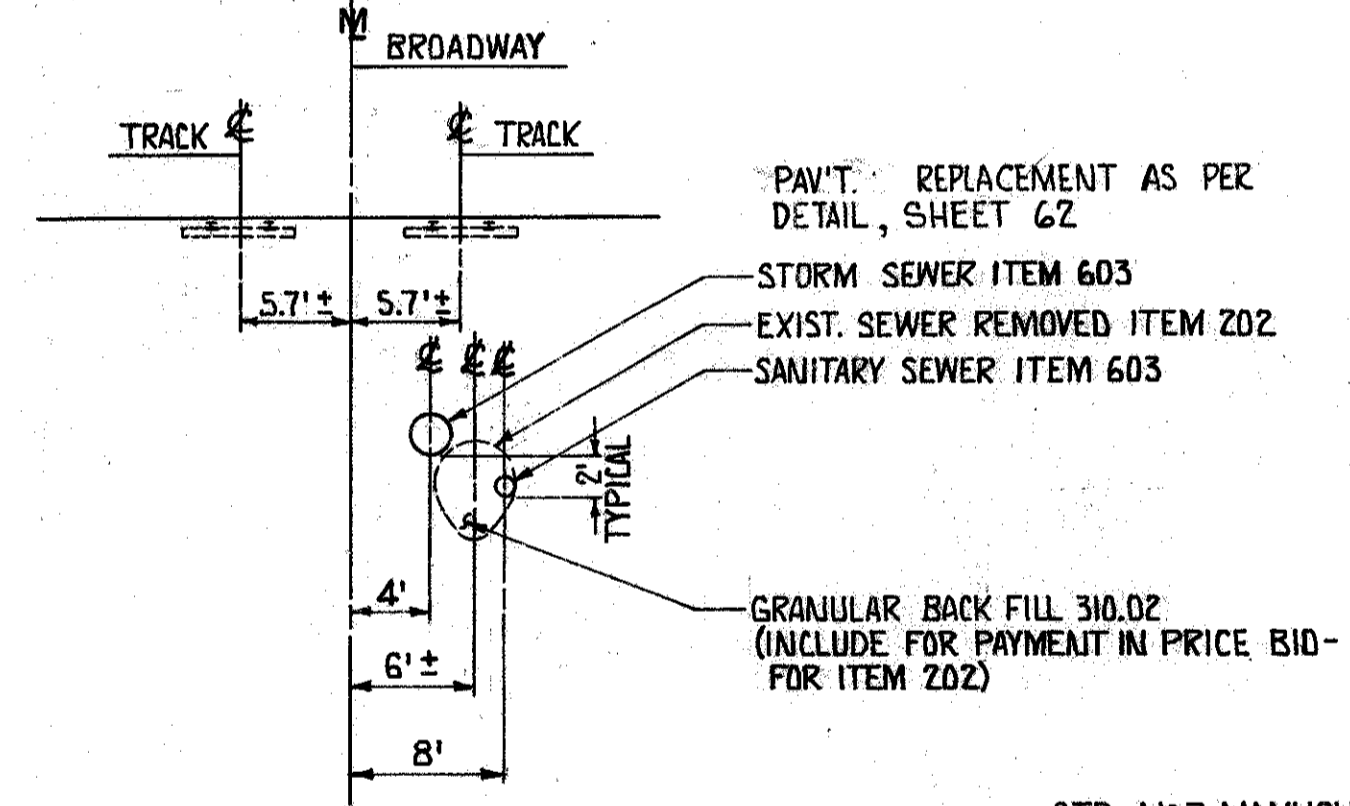
48
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CUYAHOGA COUNTY
CUY-490-149

| REFERENCE DRAWINGS | SHEET N ^o |
|---------------------------------|----------------------|
| GEOMETRIC LAYOUT | 16 |
| ROADWAY AND DRAINAGE QUANTITIES | 50&11A |
| PAVEMENT DETAILS AND QUANTITIES | 59&60A |
| SEWER PROFILE AND DETAILS | 55&61 |
| CROSS SECTION KEY PLAN | 66 |
| WATER WORK | 124 |
| TRAFFIC CONTROL | 204 |
| LIGHTING | 154 |
| M.E.L.P. | 183A |
| RIGHT OF WAY | 254-261 |
| MAINTENANCE OF TRAFFIC | 98&101 |



B.M.19 ELEV. 678.08
BROADWAY STA. 24+30, 23' LT.
TOP OF HYDRANT.



- NOTES:**
- SEE NOTE ON SHEET N^o 47.
 - FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 124 & 178.

| | | | |
|---|---------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN AND PROFILE BROADWAY STA. 21+00 TO STA. 26+00 | | | |
| SCALE 1" = 5' VERT. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR | LV/RHII | JRH | |

CONT. No. SHEET ACCT. No.

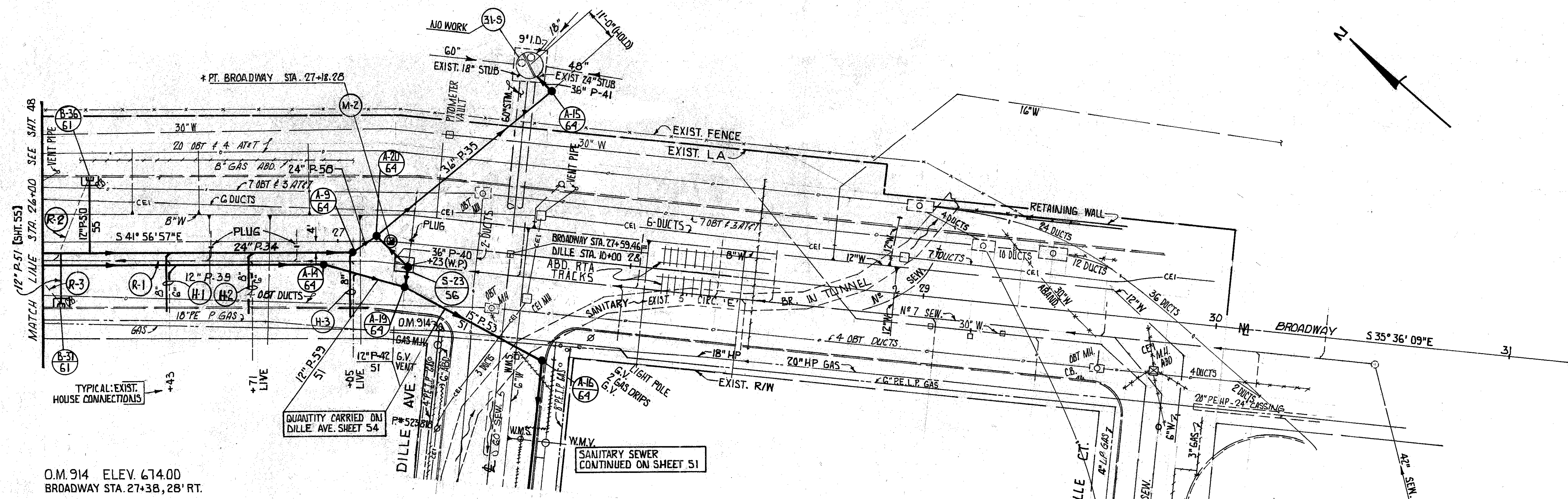
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|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 2 | OHIO | |

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261

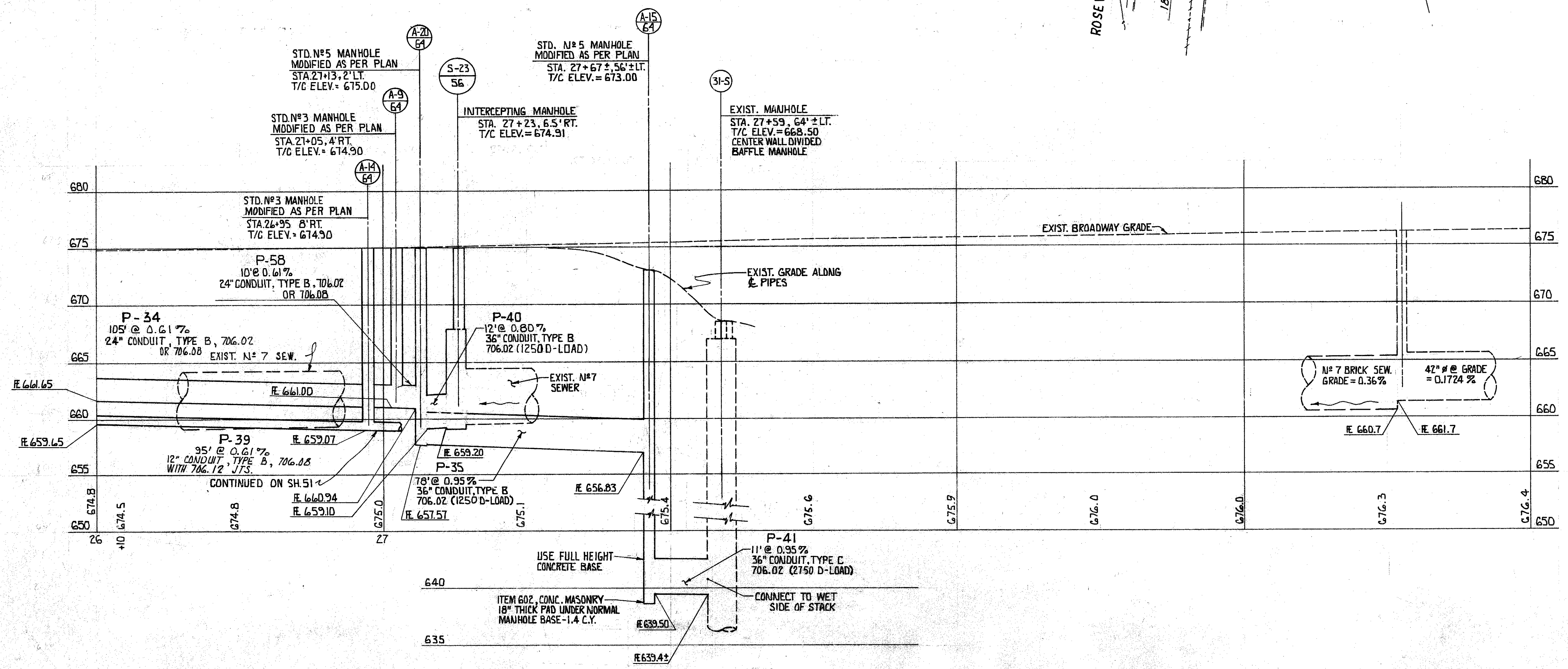
CUYAHOGA COUNTY
CUY-490-1.49

| REFERENCE DRAWINGS | SHEET N ^o |
|---------------------------------|----------------------|
| GEOMETRIC LAYOUT | 16 |
| ROADWAY AND DRAINAGE QUANTITIES | 50 |
| SEWER PROFILES & DETAILS | 55 & 61 |
| MAINTENANCE OF TRAFFIC | 98 & 101 |
| TRAFFIC CONTROL | 194 & 204 |

NOTES:
SEE NOTES ON SHEET N^o 47



O.M. 914 ELEV. 674.00
BROADWAY STA. 27+38, 28' RT.



| | | | |
|--|----------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN AND PROFILE BROADWAY STA. 26+00 TO STA. 31+00 | | | |
| SCALE 1" = 5' VERT. | | DATE | |
| SCALE 1" = 20' HOR. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR. | LY/RH II | | JRH |

SHEET ACCT. No. CONT. No.

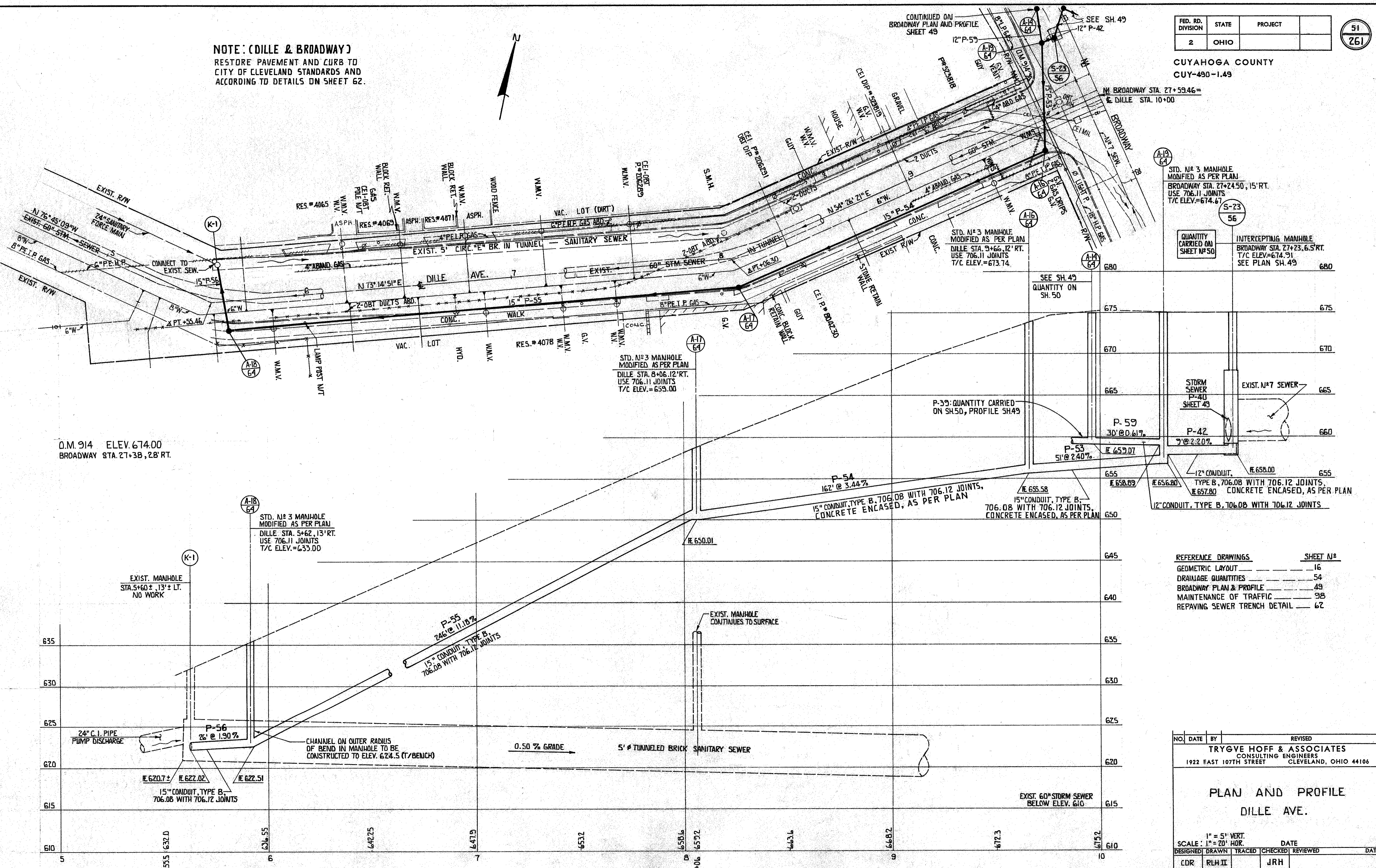
NOTE: (DILLE & BROADWAY)
RESTORE PAVEMENT AND CURB TO CITY OF CLEVELAND STANDARDS AND ACCORDING TO DETAILS ON SHEET 62.



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

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CUYAHOGA COUNTY
CUY-490-1.49



STD. N° 3 MANHOLE MODIFIED AS PER PLAN
BROADWAY STA. 27+24.50, 15' RT.
USE 706.11 JOINTS
T/C ELEV.=674.67

QUANTITY CARRIED ON SHEET NO 50
INTERCEPTING MANHOLE
BROADWAY STA. 27+23.65 RT.
T/C ELEV.=674.91
SEE PLAN SH. 49

STD. N° 3 MANHOLE MODIFIED AS PER PLAN
DILLE STA. 9+66.12 RT.
USE 706.11 JOINTS
T/C ELEV.=673.74

STD. N° 3 MANHOLE MODIFIED AS PER PLAN
DILLE STA. 8+06.12 RT.
USE 706.11 JOINTS
T/C ELEV.=659.00

STD. N° 3 MANHOLE MODIFIED AS PER PLAN
DILLE STA. 5+62.13 RT.
USE 706.11 JOINTS
T/C ELEV.=639.00

EXIST. MANHOLE
STA. 5+60 ± 13' LT.
NO WORK

| REFERENCE DRAWINGS | SHEET N° |
|------------------------------|----------|
| GEOMETRIC LAYOUT | 16 |
| DRAINAGE QUANTITIES | 54 |
| BROADWAY PLAN & PROFILE | 49 |
| MAINTENANCE OF TRAFFIC | 98 |
| REPAVING SEWER TRENCH DETAIL | 62 |

| | | | |
|-----|------|----|---------|
| NO. | DATE | BY | REVISED |
| | | | |

TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

**PLAN AND PROFILE
DILLE AVE.**

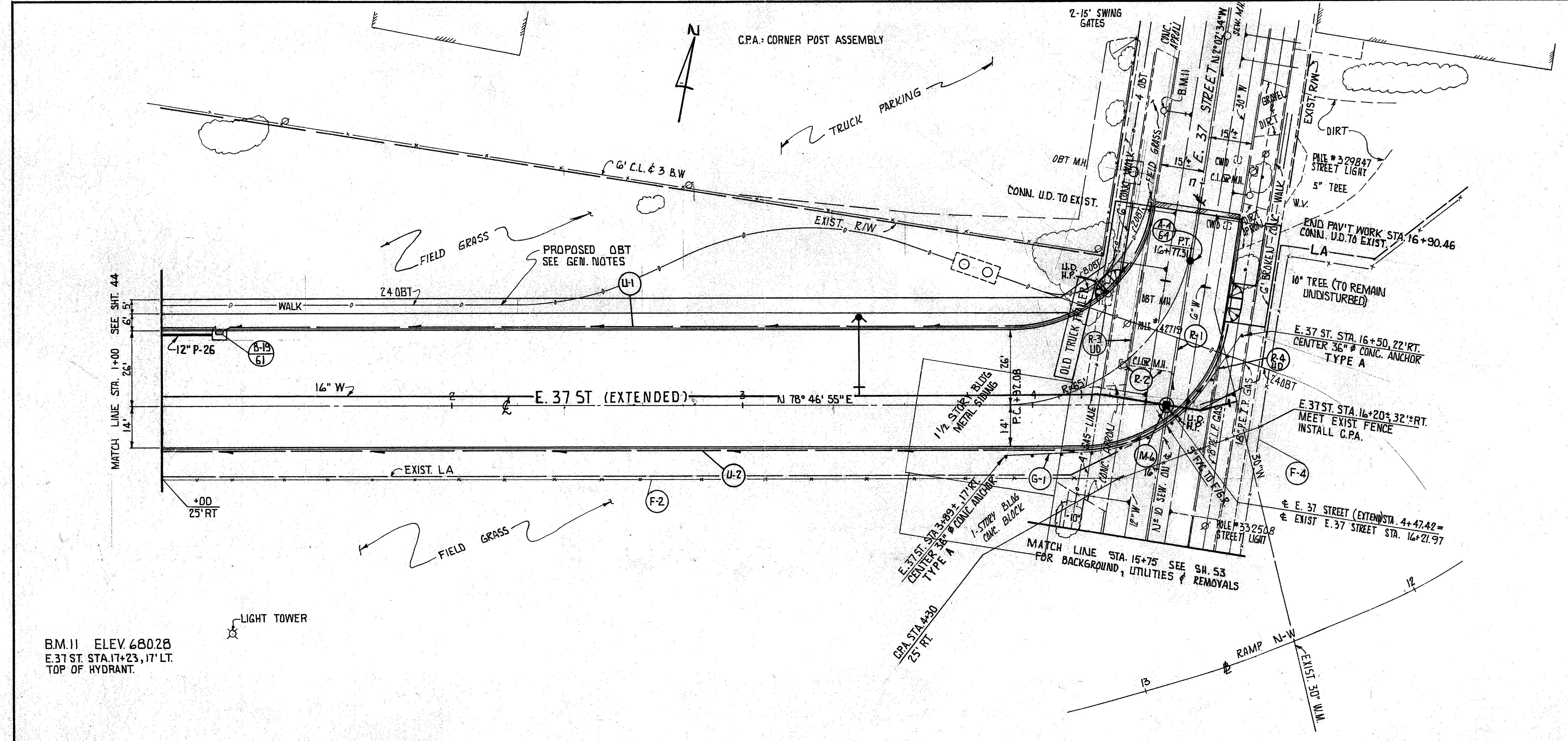
| | |
|---------------------------------------|--------|
| SCALE: 1" = 5' VERT. 1" = 20' HOR. | DATE |
| DESIGNED | DRAWN |
| CHECKED | TRACED |
| REVIEWED | DATE |
| CDR | RLH II |
| JRH | |

SHEET ACCT. No.

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

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261

CUYAHOGA COUNTY
CUY - 490 - 1.49

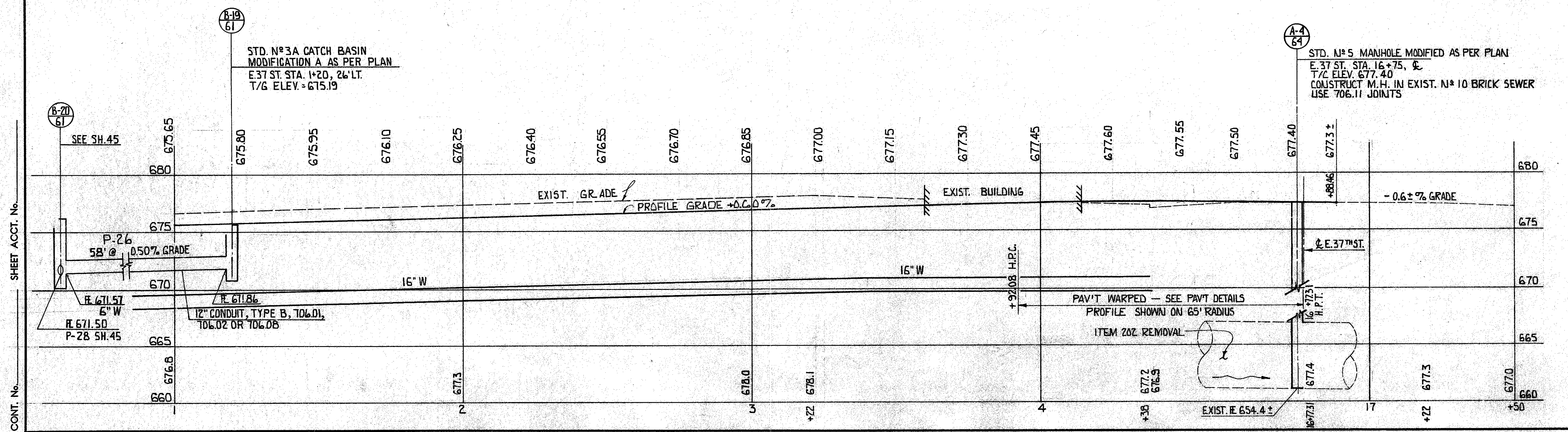


LIGHT TOWER

| REFERENCE DRAWINGS | SHEET NO. |
|---------------------------------|-----------|
| TYPICAL SECTIONS | 6 |
| GEOMETRIC LAYOUT | 16 |
| ROADWAY AND DRAINAGE QUANTITIES | 54 & 11A |
| PAVEMENT DETAILS AND QUANTITIES | 60 & 60A |
| CROSS SECTION KEY PLAN | 66 |
| WATER WORK | 126 |
| LIGHTING | 150 |
| TRAFFIC CONTROL | 203 |

| | |
|------------------------|---------------|
| RIGHT OF WAY | 254-261 |
| MAINTENANCE OF TRAFFIC | 98, 100 & 101 |

BM.11 ELEV. 680.28
E.37 ST. STA. 17+23, 17' LT.
TOP OF HYDRANT.



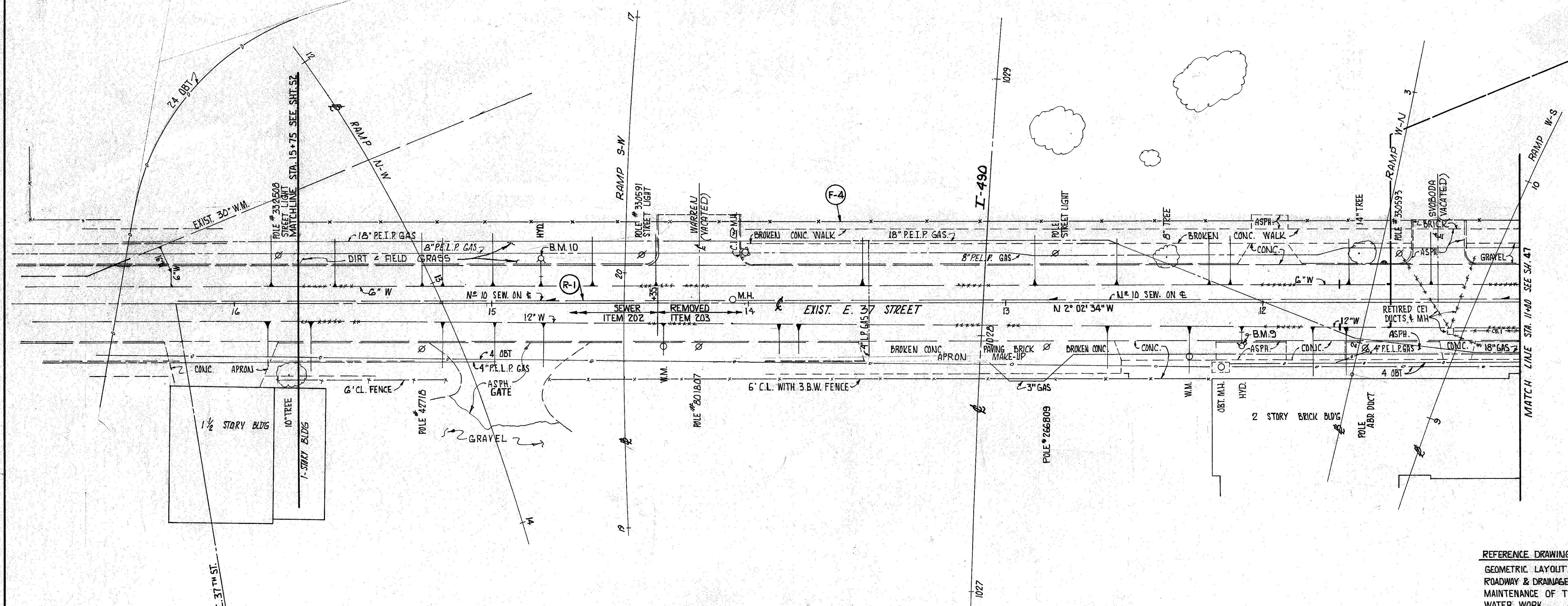
NOTE
FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 24, 126, 150 & 198

| | | | |
|---|---------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN AND PROFILE | | | |
| E. 37 STREET (EXTENDED) STA. 14+00 TO STA. 4+50 E. 37 STREET (EXISTING) STA. 15+75 TO 17+50 | | | |
| SCALE | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR. | LV/RHII | | JRH |

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

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CUYAHOGA COUNTY
CUY-490-1.49



| REFERENCE DRAWINGS | SHEET NO. |
|-------------------------------|-----------|
| GEOMETRIC LAYOUT | 16 |
| ROADWAY & DRAINAGE QUANTITIES | 54 & 11A |
| MAINTENANCE OF TRAFFIC | 98 & 100 |
| WATER WORK | 125 |

B.M. 9 ELEV. 681.41
E. 37 ST. STA. 12+08, 17' LT.
TOP OF HYDRANT.

B.M. 10 ELEV. 680.98
E. 37 ST. STA. 14+80, 17' RT.
TOP OF HYDRANT.

NOTE
FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN THIS PLAN SEE SHEETS 17, 23, 24, 125, 150 & 198

| NO. | DATE | BY | REVISED |
|---|------|----|---------|
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

PLAN

E. 37TH STREET STA. 11+00 TO STA. 15+75

| SCALE: 1" = 20' | DATE |
|-----------------|-----------------|
| DESIGNED: CDR | DRAWN: LV/RH II |
| TRACED: JRH | CHECKED: JRH |
| REVIEWED: JRH | DATE: |

CONT. No. SHEET ACCT. No.

SUB-SUMMARY OF QUANTITIES

| | | | |
|-------------------|-------------------|-------|---------|
| QUANTITIES | FED. RD. DIVISION | STATE | PROJECT |
| CALC. BY: CDR | DATE: JULY 78 | 2 | OHIO |
| CHK'D. BY: CAP | DATE: 4-82 | | |

QUANTITIES CARRIED TO GENERAL SUMMARY
CUYAHOGA COUNTY
 CUY - 490-149

54

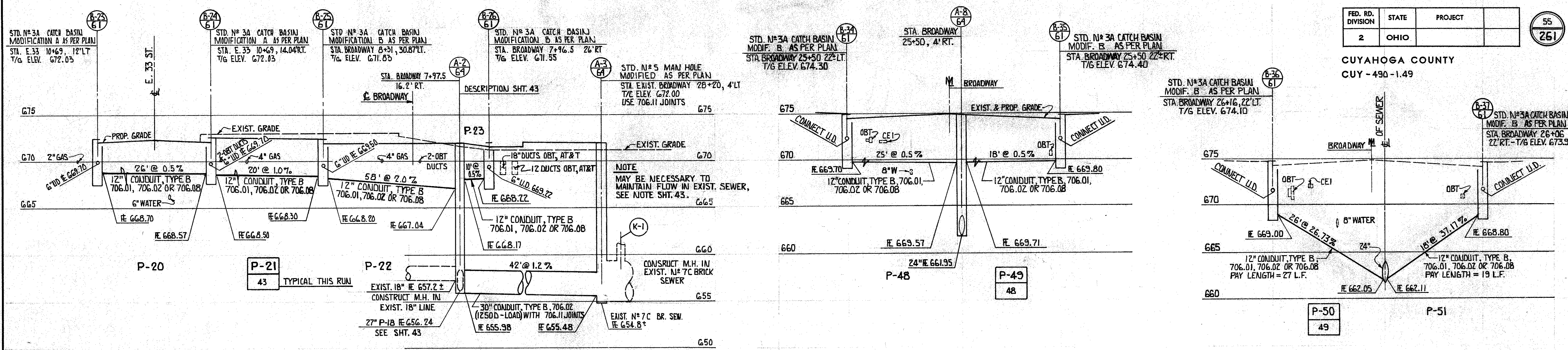
261

| SHEET No | MARK No | ITEM | STORM | | | ROADWAY | | | | STORM | | | SANITARY | | | | | | | | | | | | | | | |
|-----------------------|---------|--|-------------------------------|----------------------------|--------------------------------|--|---|--|---------------------------|--|-------------------|-------------------------|----------------|---|--------------------|--|---|---|---|---|--|-----|-----|--|--|--|--|--|
| | | | 202 | 604 | 604 | 202 | 604 | 606 | 607 | 603 | 605 | 603 | | | | | | | | | | | | | | | | |
| | | LOCATION | PIPE REMOVED 24" DIA. & UNDER | PIPE REMOVED OVER 24" DIA. | CATCH BASINS OR INLETS REMOVED | MANHOLE STD. No 5 MODIFIED AS PER PLAN | CATCH BASIN STD. No 3A w/ V-GREAT MODIF A AS PER PLAN | MANHOLE STD. No 3 MODIFIED AS PER PLAN | FENCE REMOVED FOR STORAGE | MONUMENT ASSEMBLY MODIFIED AS PER PLAN | GUARDRAIL, TYPE 5 | ANCHOR ASSEMBLY, TYPE A | FENCE, TYPE CL | 12" CONDUIT, TYPE B, 706.01, 706.02 OR 706.08 | 6" CONDUIT, TYPE F | 6" SHALLOW PIPE UNDERDRAIN AS PER PLAN | 12" CONDUIT, TYPE B, 706.08 WITH JOINTS ENCASED AS PER PLAN | 12" CONDUIT, TYPE B, 706.08 WITH JOINTS ENCASED AS PER PLAN | 15" CONDUIT, TYPE B, 706.08 WITH JOINTS ENCASED AS PER PLAN | 15" CONDUIT, TYPE B, 706.08 WITH JOINTS | | | | | | | | |
| | | UNIT | L.F. | L.F. | EA. | EA. | EA. | L.F. | EA. | L.F. | EA. | L.F. | EA. | L.F. | L.F. | L.F. | L.F. | L.F. | L.F. | L.F. | | | | | | | | |
| 51 | A-16 | DILLE STA. 9+66, 12' RT. | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| | A-17 | DILLE STA. 8+06, 12' RT. | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| | A-18 | DILLE STA. 5+62, 13' RT. | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| | A-19 | BROADWAY STA. 27+24.5, 15' RT. | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| 52 | A-4 | E. 37 STA. 16+75, & | | | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| | B-19 | E. 37 (EXT.) STA. 1+20, 26' LT. | | | | | 1 | | | | | | | | | | | | | | | | | | | | | |
| | F-4 | E. 37 STA. 15+75 TO 16+25 | | | | | | 50 | | | | | | | | | | | | | | | | | | | | |
| | F-2 | E. 37 (EXT.) STA. 1+00 TO E. 37 STA. 16+20±, RT. | | | | | | | | | | | 382 | | | | | | | | | | | | | | | |
| | G-1 | E. 37 STA. 3+89± TO 16+50, RT. | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | M-6 | E. 37 STA. 16+21.97, & | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | R-1 | E. 37 STA. 15+75 TO 16+77, & | | | 102 | | | | | | | | | | | | | | | | | | | | | | | |
| | R-2 | E. 37 STA. 16+35, LT. | | 15 | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| 53 | F-4 | E. 37 STA. 11+00 TO 15+75, RT. | | | | | | | 415 | | | | | | | | | | | | | | | | | | | |
| | R-1 | E. 37 STA. 14+35 TO 15+75, & | | 140 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I-FUNDS TOTALS | | | 241 | 242 | 1 | | 1 | 1 | 4 | 525 | 1 | 50 | 2 | 382 | 58 | 10 | 775 | | 30 | 9 | | 213 | 272 | | | | | |

(EXT.) - EXTENDED

DRAINAGE AND ROADWAY QUANTITIES
DILLE ROAD AND E. 37TH STREET (SHEETS 51, 52 & 53)

CONT. No. SHEET ACCT. No.



NOTE
MAY BE NECESSARY TO
MAINTAIN FLOW IN EXIST. SEWER,
SEE NOTE SHT. 43.

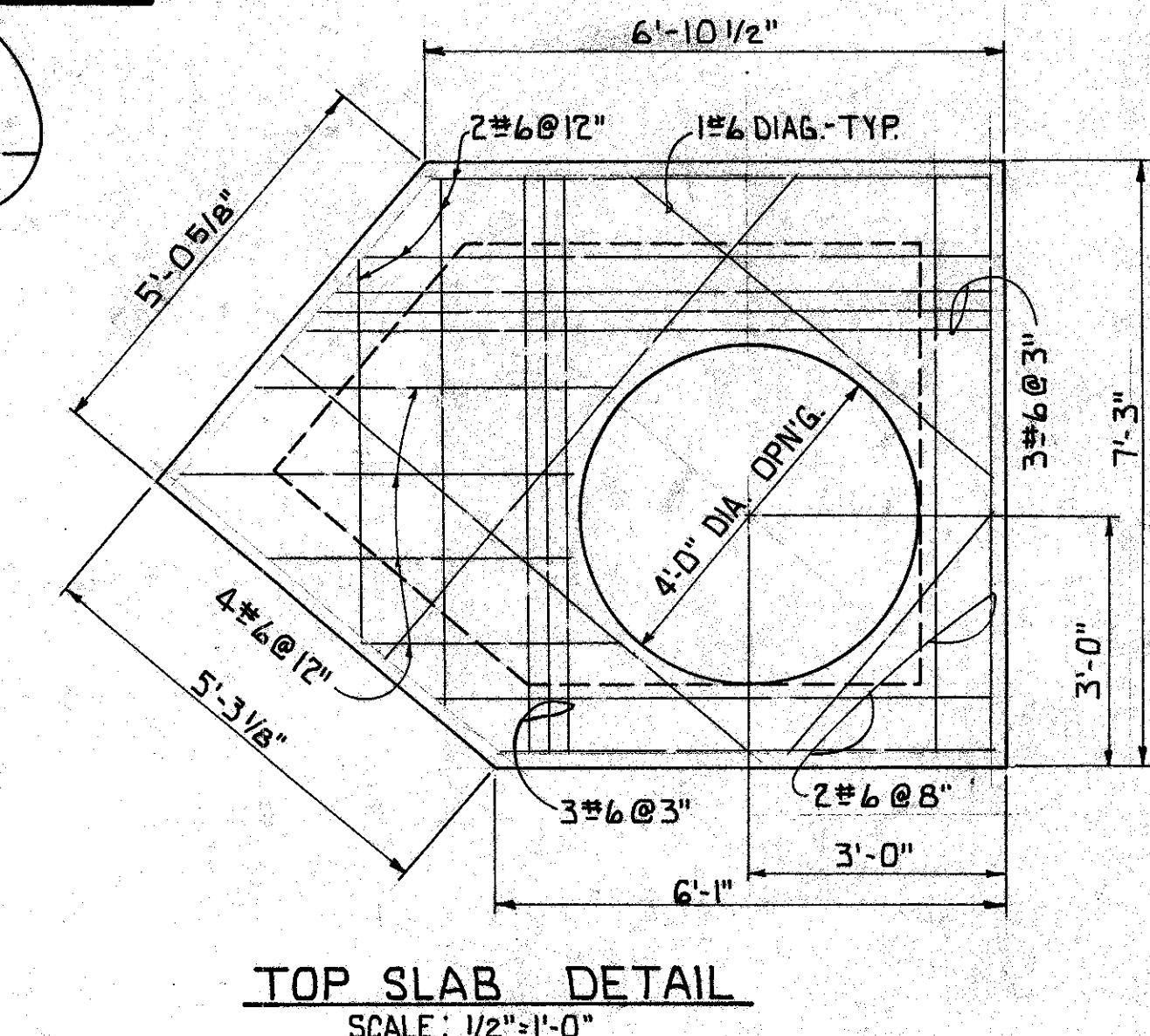
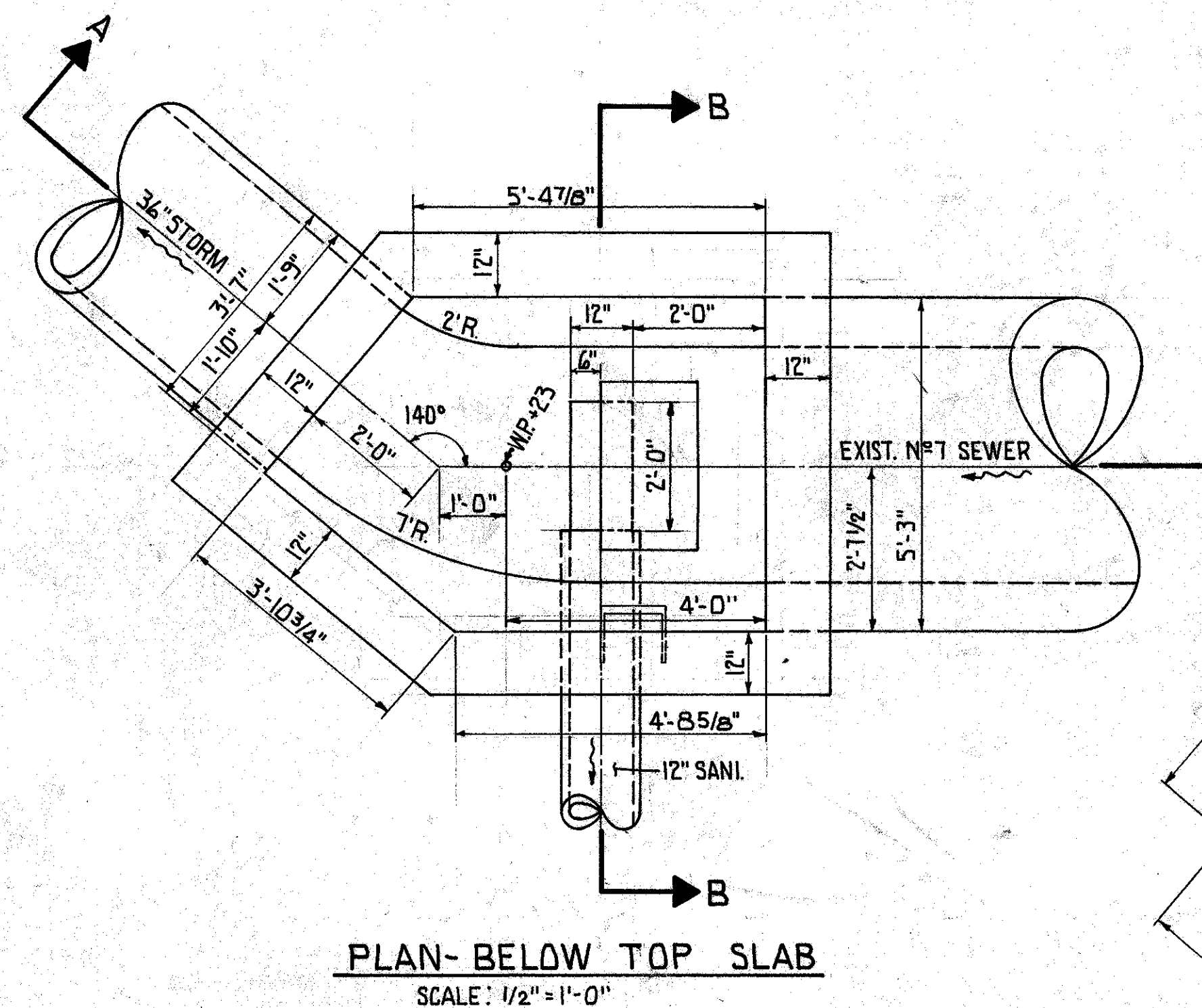
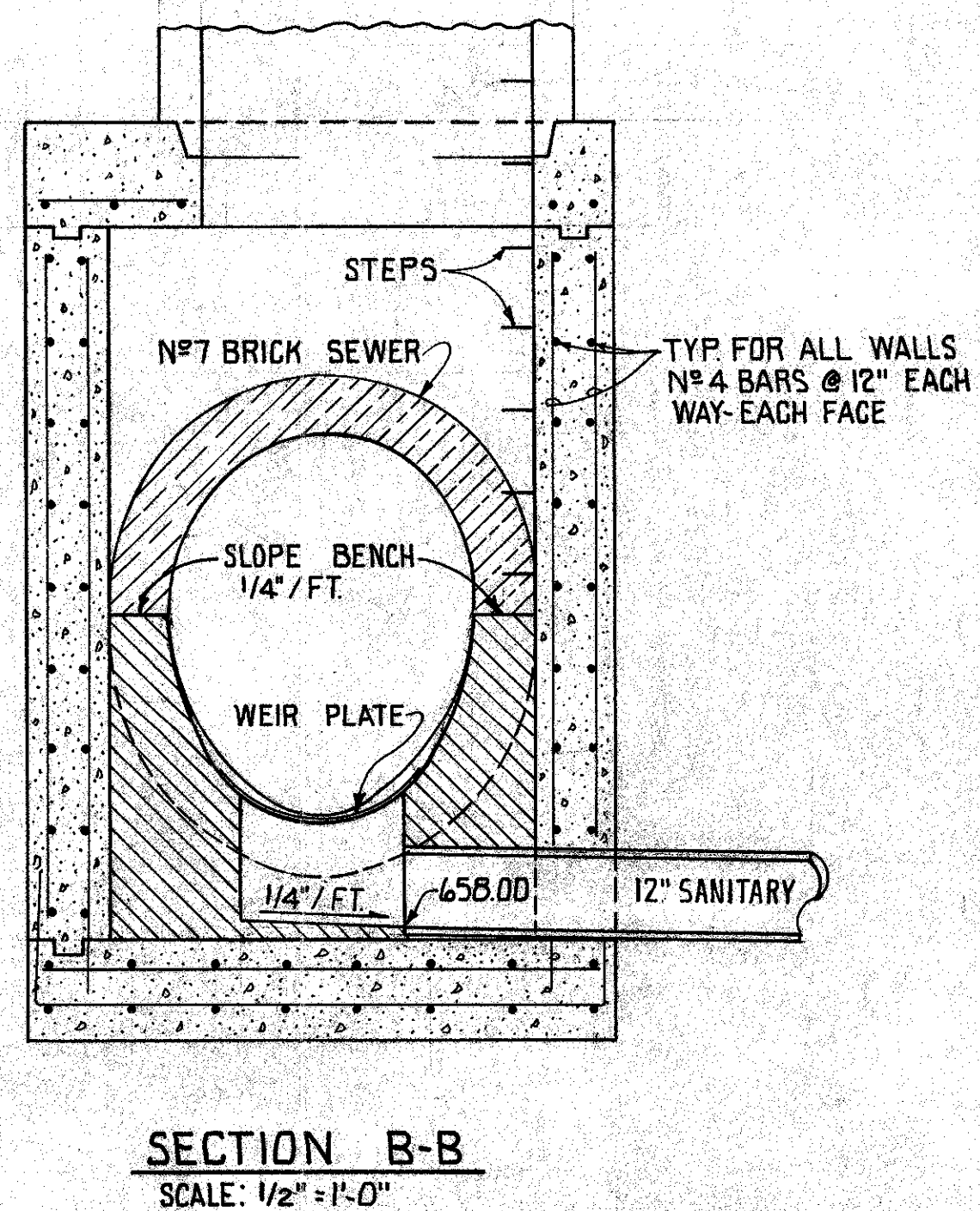
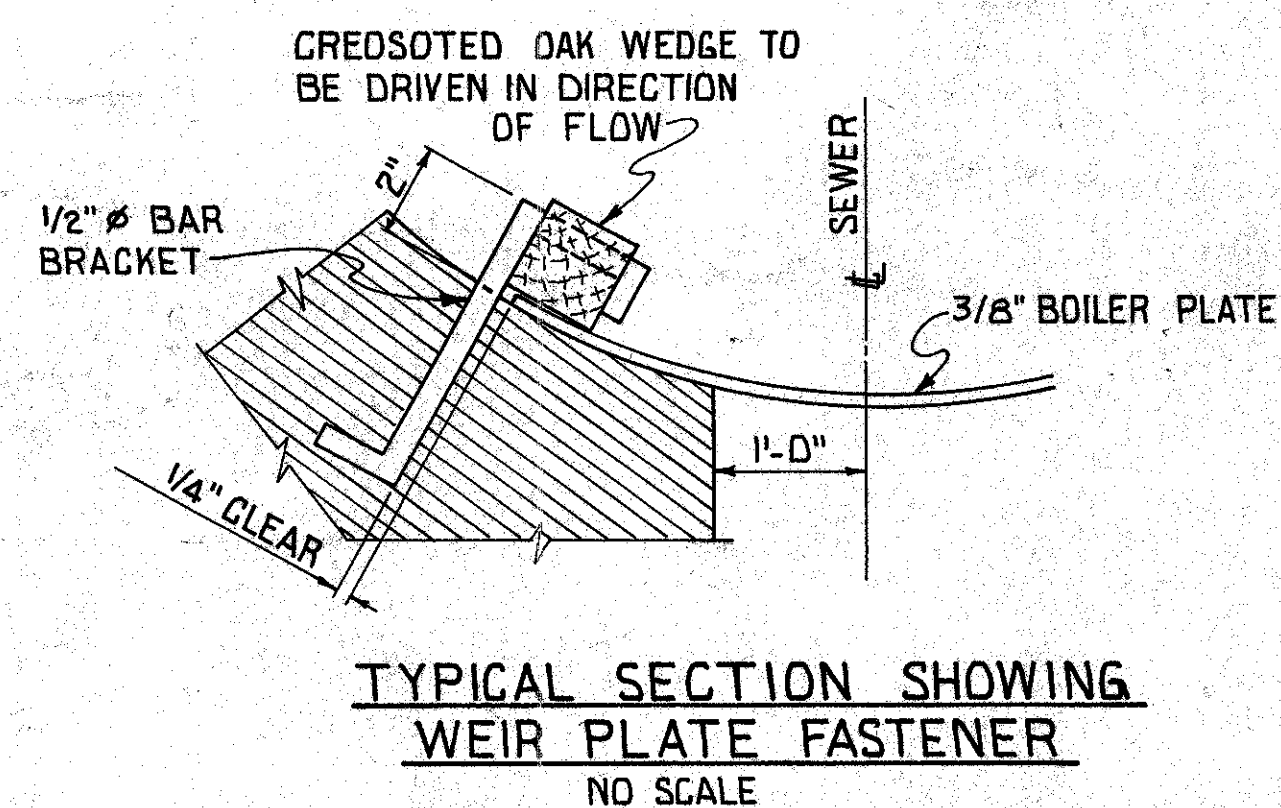
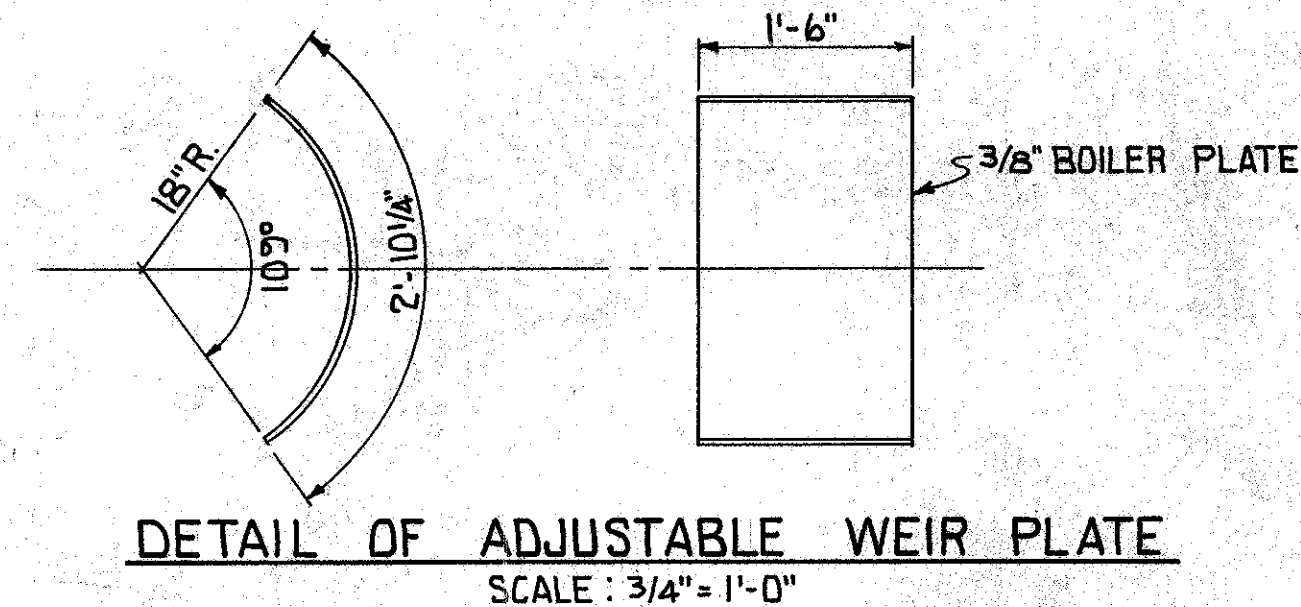
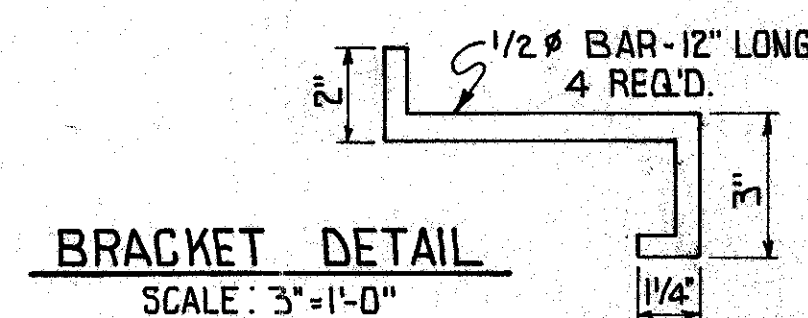
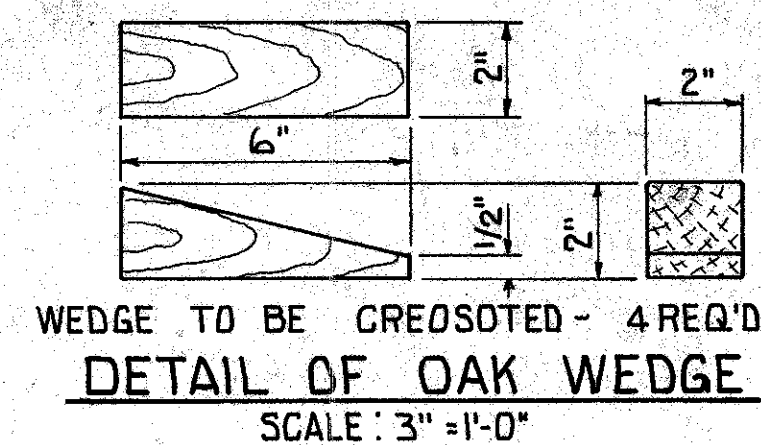
SHEET ACCT. No.

| | | | |
|--|----------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| SEWER PROFILES | | | |
| SCALE 1" = 5' VERT. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| C.D.R. | LV./RHII | JRH | |

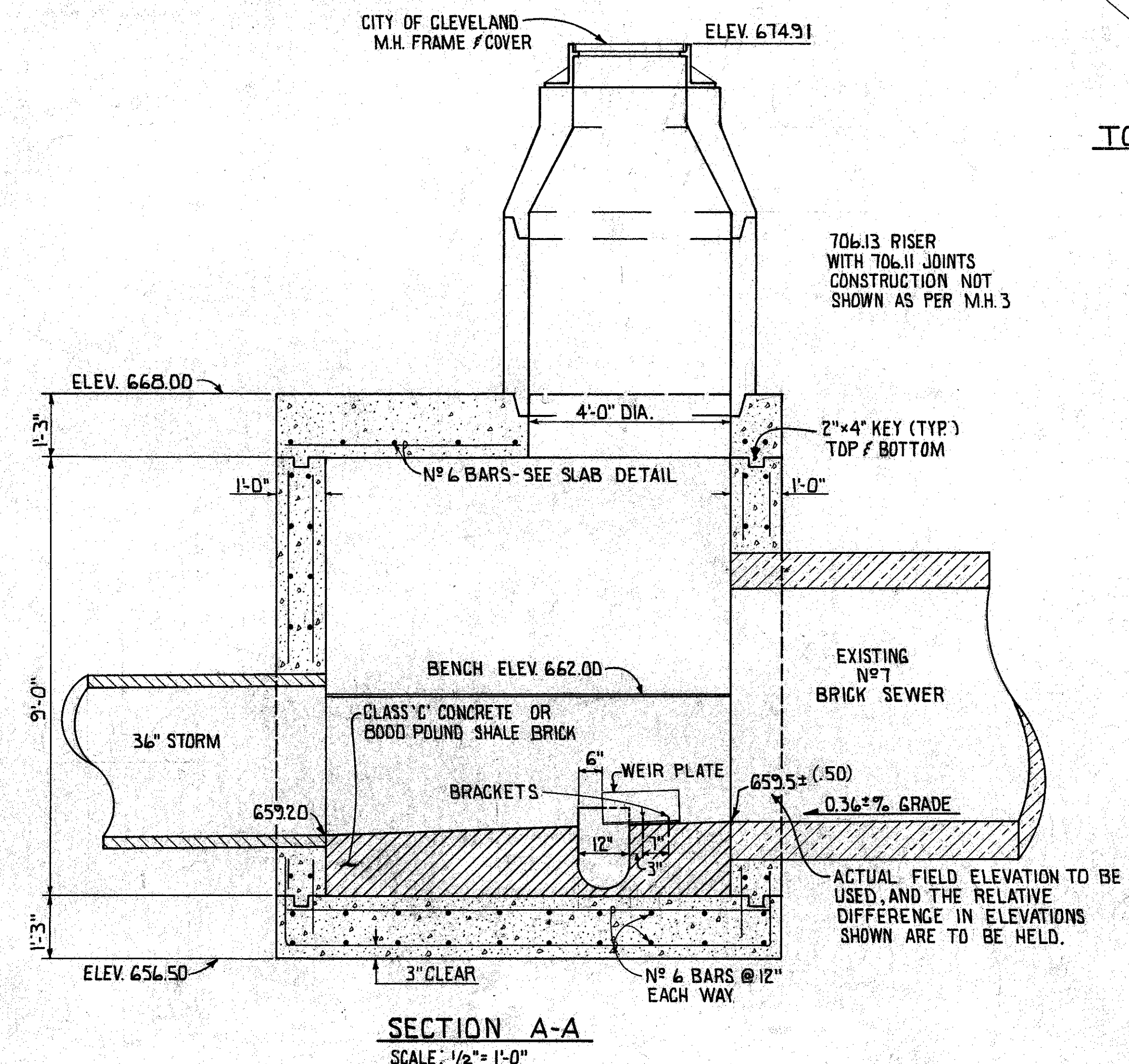
| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 2 | OHIO | |

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CUYAHOGA COUNTY
CUY-490-149



CITY OF CLEVELAND
M.H. FRAME & COVER
ELEV. 674.91



NOTES:
CONCRETE SHALL BE CLASS C, $f_c = 1333$ PSI.
REINFORCING STEEL, $f_s = 20,000$ PSI.
REINFORCING STEEL SHALL HAVE 2" CLEARANCE UNLESS OTHERWISE SHOWN

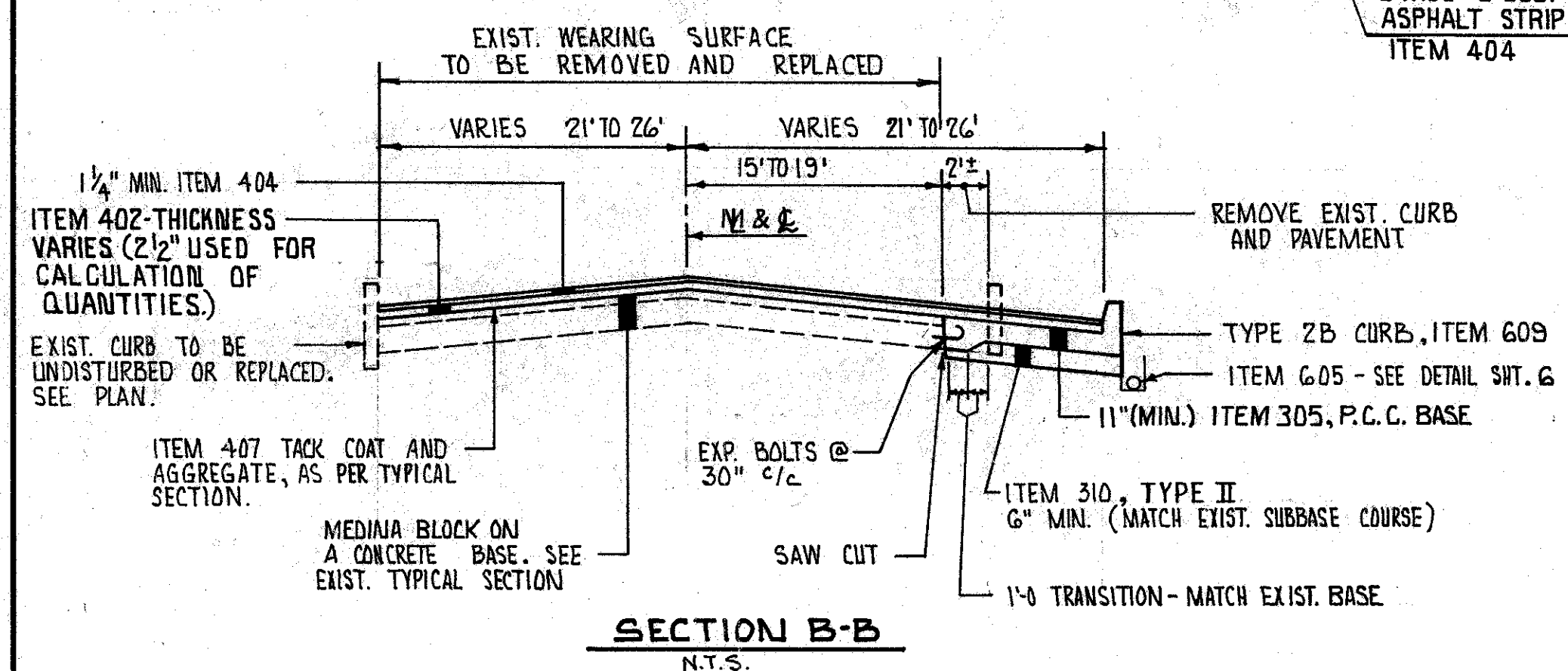
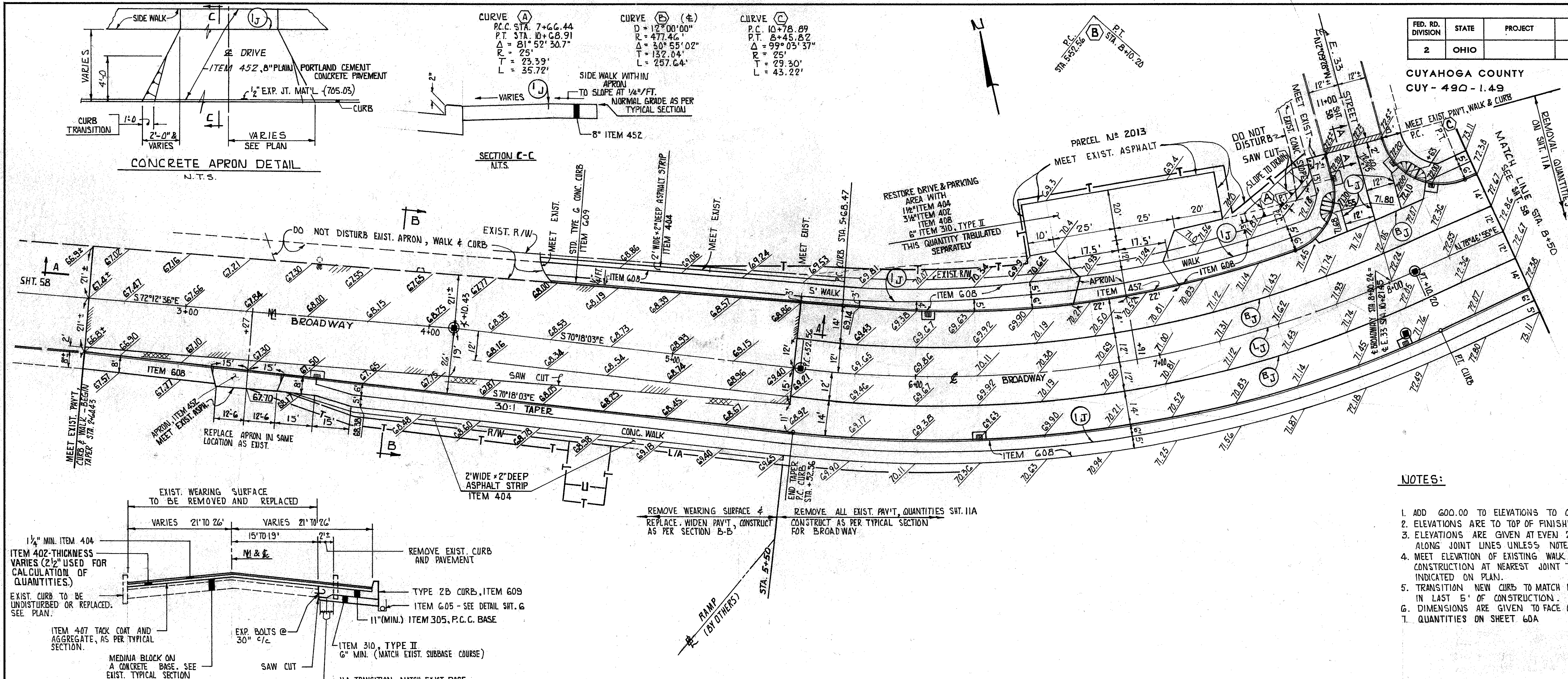
| | | | |
|--|-------|--------|---------|
| NO. | DATE | BY | REVISED |
| | | | |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| DRAINAGE DETAILS | | | |
| INTERCEPTING MANHOLE | | | |
| S-23 | | | |
| SCALE AS NOTED | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR | CAP | JRH | |

CONT. No. SHEET ACCT. No.

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

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CUYAHOGA COUNTY
CUY-490-1.49



CURVE (A)
P.C.C. STA. 7+66.44
P.T. STA. 10+68.91
 $\Delta = 81^\circ 52' 30.7''$
 $R = 25'$
 $T = 23.39'$
 $L = 35.72'$

CURVE (B) (±)
 $D = 12^\circ 00' 00''$
 $R = 477.46'$
 $\Delta = 30^\circ 55' 02''$
 $T = 132.04'$
 $L = 257.64'$

CURVE (C)
P.C. 10+78.89
P.T. 8+45.82
 $\Delta = 99^\circ 03' 37''$
 $R = 25'$
 $T = 29.30'$
 $L = 43.22'$

NOTES:

1. ADD 600.00 TO ELEVATIONS TO OBTAIN CRGS.
2. ELEVATIONS ARE TO TOP OF FINISHED GRADE.
3. ELEVATIONS ARE GIVEN AT EVEN 25' INTERVALS ALONG JOINT LINES UNLESS NOTED.
4. MEET ELEVATION OF EXISTING WALK WITH NEW CONSTRUCTION AT NEAREST JOINT TO LOCATION INDICATED ON PLAN.
5. TRANSITION NEW CURB TO MATCH EXISTING CURB IN LAST 5' OF CONSTRUCTION.
6. DIMENSIONS ARE GIVEN TO FACE OF CURB.
7. QUANTITIES ON SHEET 60A

LEGEND

- INDICATES RAISED CONCRETE MEDIUM
- WEARING SURFACE REMOVED AND REPLACED.
- PAVEMENT REMOVED
- STANDARD LONGITUDINAL JOINT
- STANDARD LONGITUDINAL BUTT JOINT
- IMPRESSED JOINT USING 1/4" RADIUS EDGING TOOL
- MONUMENTS TO BE SET
- STANDARD CONTRACTION JOINT

| | | | |
|---|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

PAVEMENT DETAILS
BROADWAY STA. 2+50 TO STA. 8+50

| | | | |
|----------------|---------|-----|--|
| SCALE 1" = 20' | DATE | | |
| DESIGNED | DRAWN | | |
| TRACED | CHECKED | | |
| REVIEWED | DATE | | |
| CDR. | LV/RHL | JRH | |

CONT. No. SHEET ACCT. No.

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

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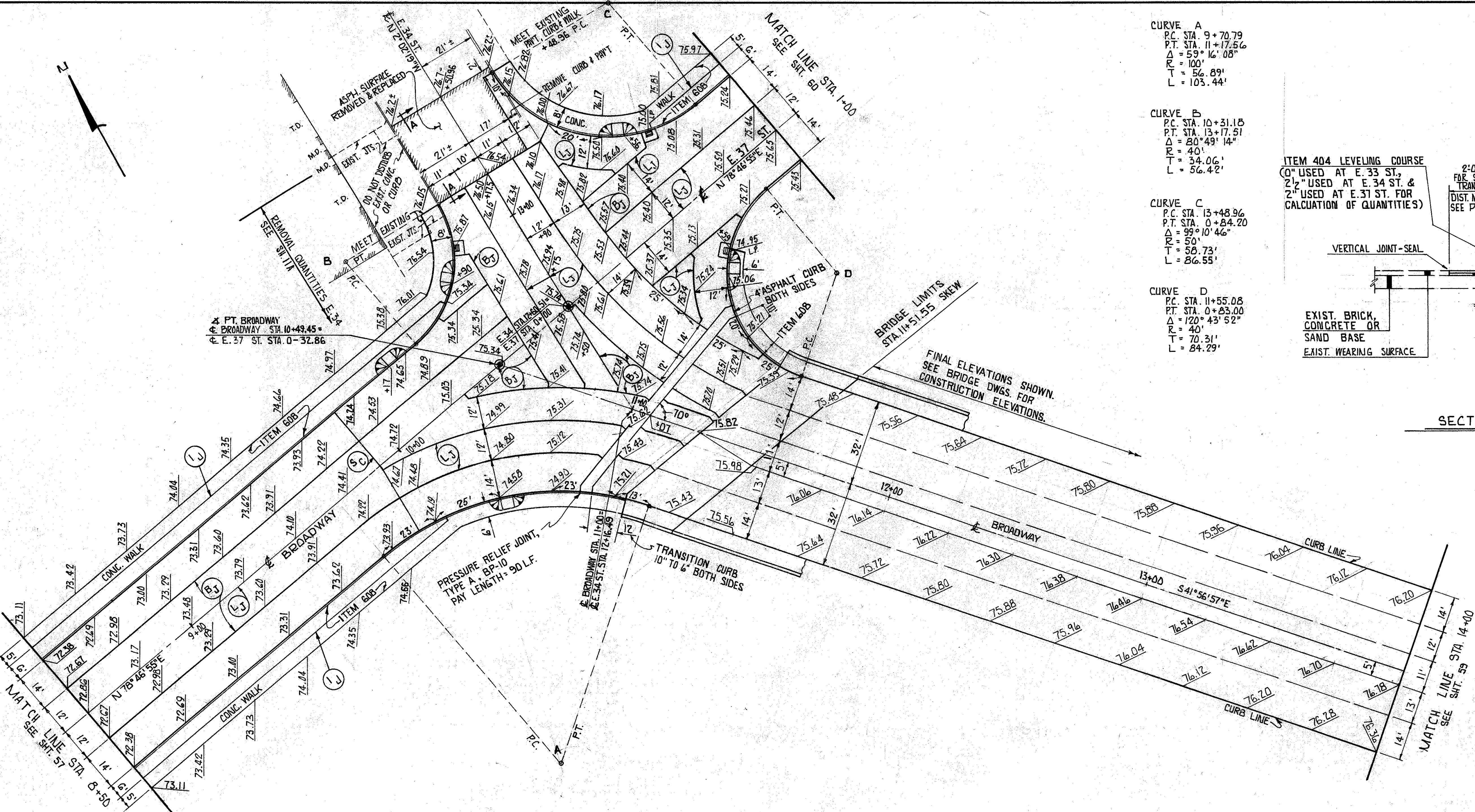
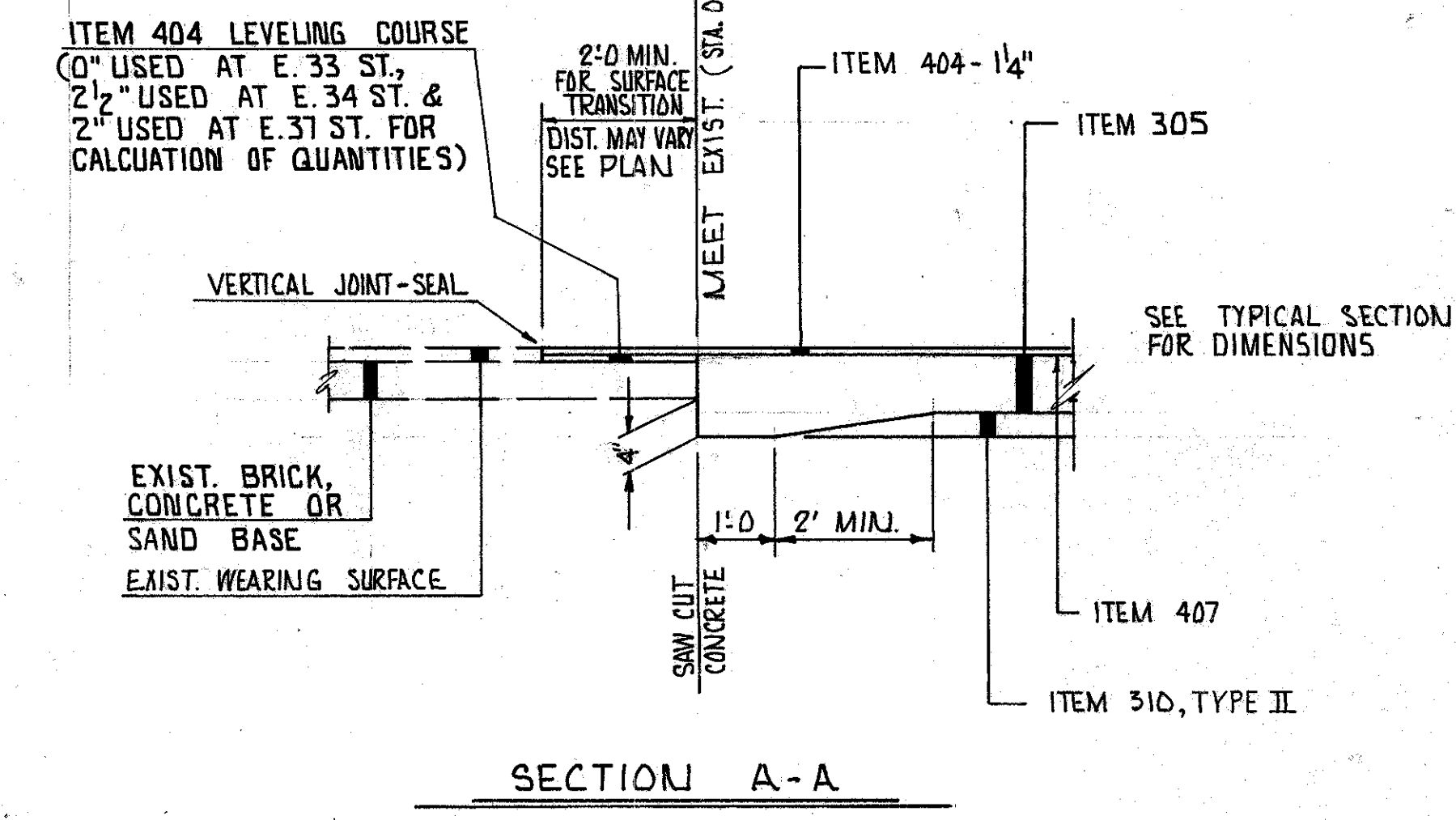
CUYAHOGA COUNTY
CUY-490-1.49

CURVE A
P.C. STA. 9+70.79
P.T. STA. 11+17.56
 $\Delta = 59^{\circ} 16' 08''$
 $R = 100'$
 $T = 56.89'$
 $L = 103.44'$

CURVE B
P.C. STA. 10+31.15
P.T. STA. 13+17.51
 $\Delta = 80^{\circ} 49' 14''$
 $R = 40'$
 $T = 34.06'$
 $L = 56.42'$

CURVE C
P.C. STA. 13+48.96
P.T. STA. 0+84.20
 $\Delta = 95^{\circ} 10' 46''$
 $R = 50'$
 $T = 58.73'$
 $L = 86.55'$

CURVE D
P.C. STA. 11+55.08
P.T. STA. 0+83.00
 $\Delta = 120^{\circ} 43' 52''$
 $R = 40'$
 $T = 70.31'$
 $L = 84.29'$



NOTES:
1. FOR LEGEND AND NOTES SEE SHEET 57.
2. QUANTITIES ON SHEET 60A.

CONT. No. SHEET ACCT. No.

| | | | |
|---|---------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PAVEMENT DETAILS | | | |
| BROADWAY STA. 8+50 TO STA. 14+00 E. 37 STREET (EXT.) STA. 0+00 TO STA. 1+00 | | | |
| SCALE 1"=20' | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR. | LV/RHII | | JRH |

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

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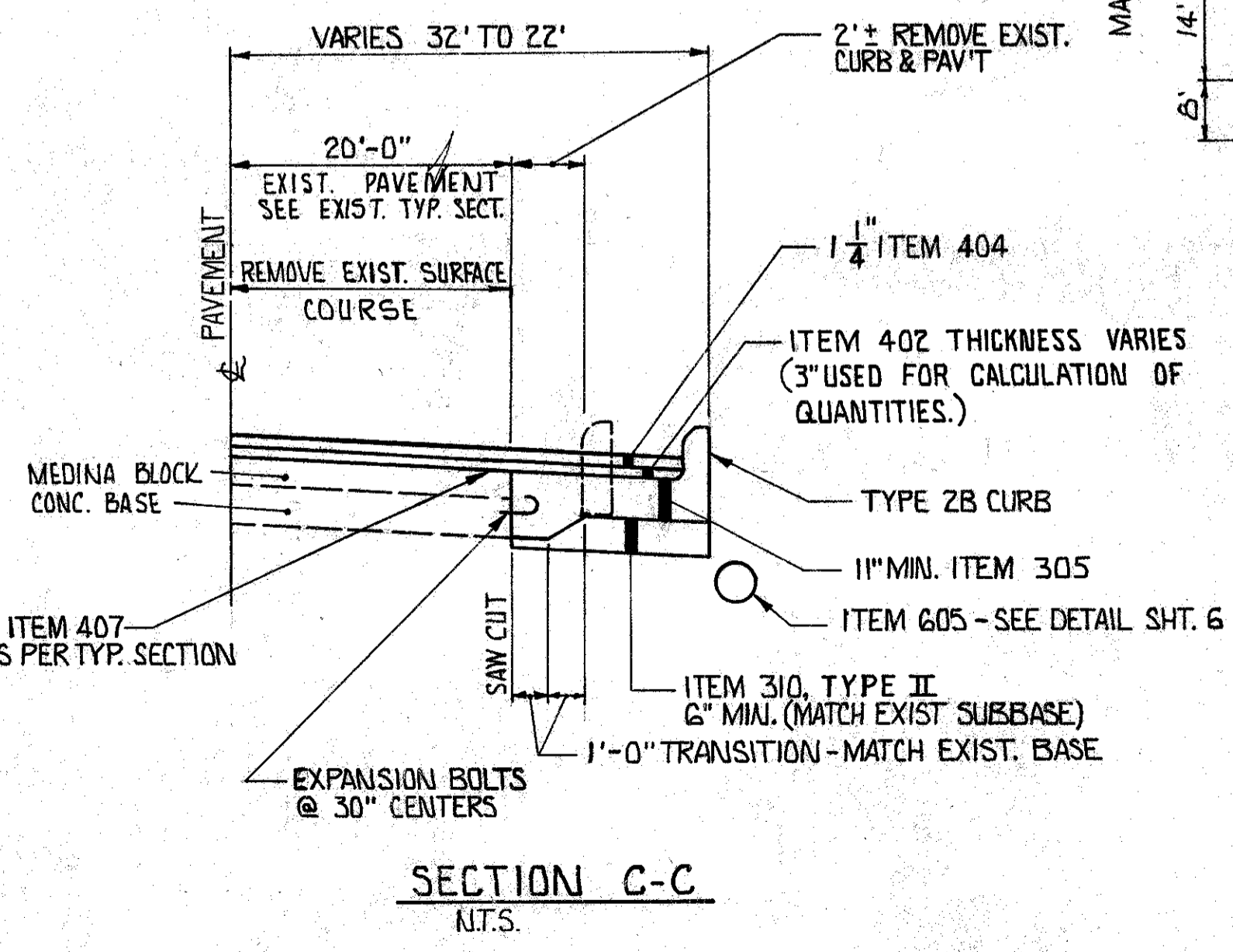
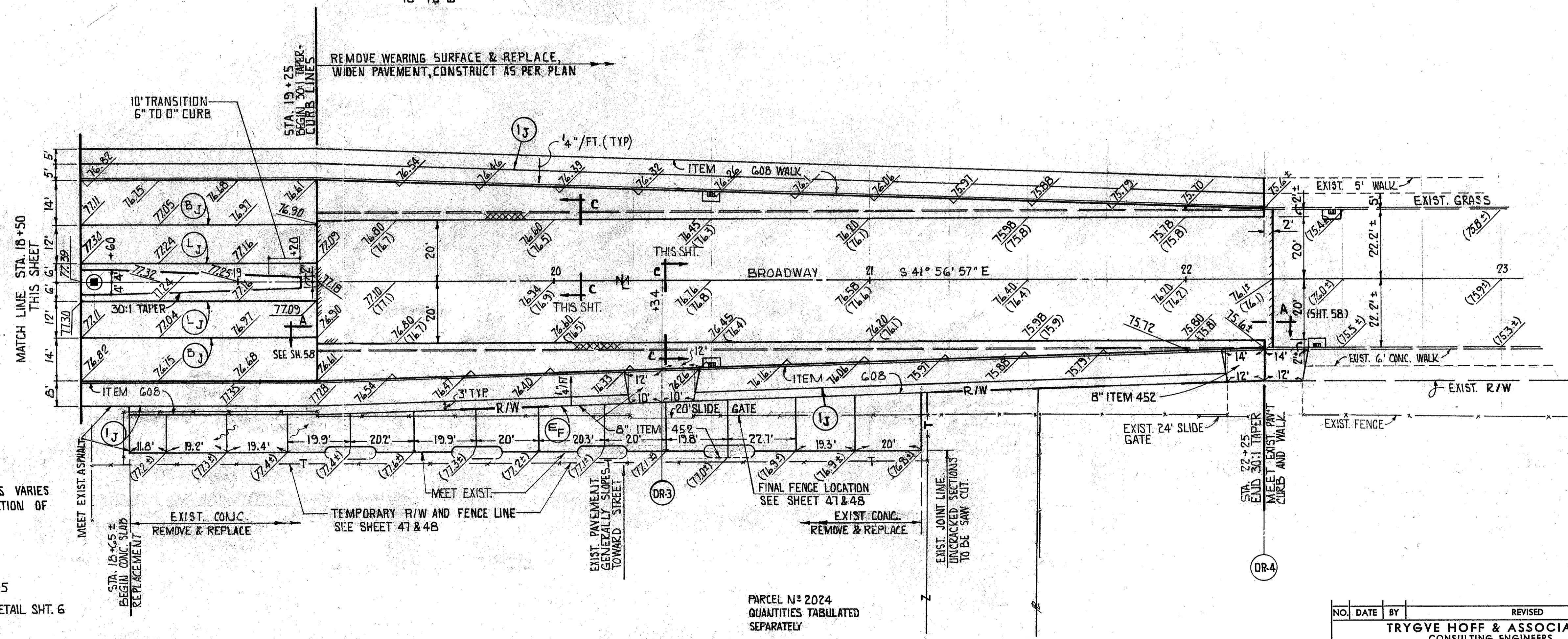
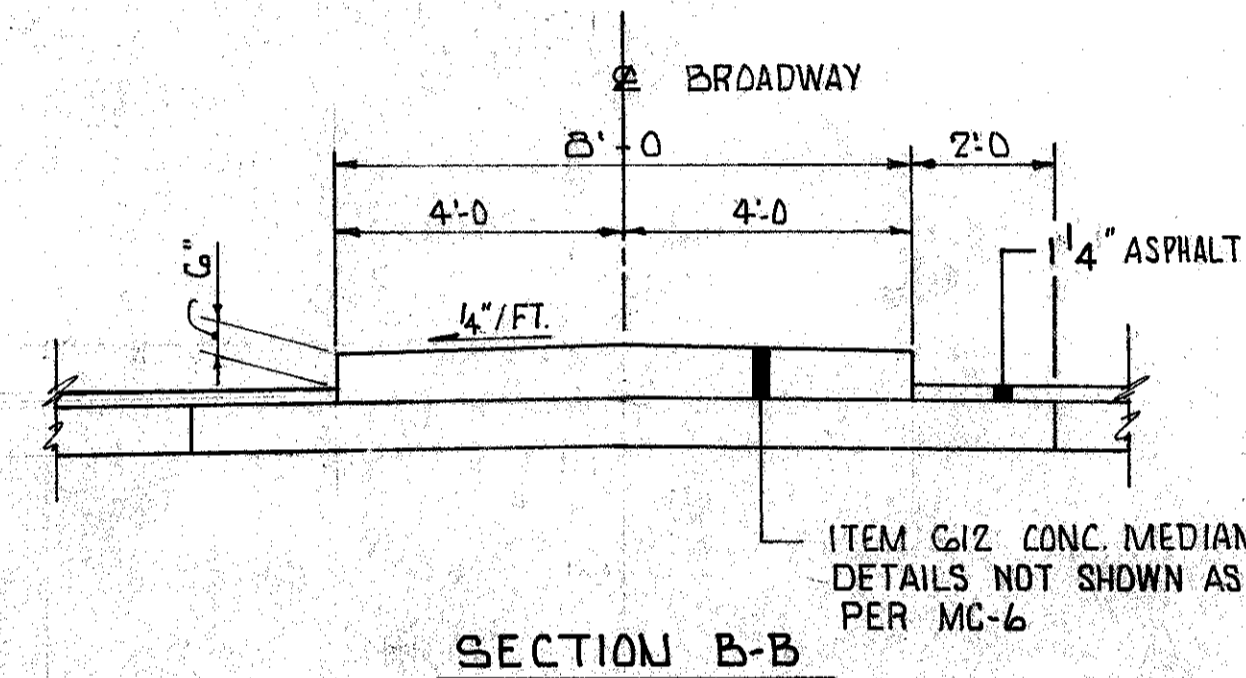
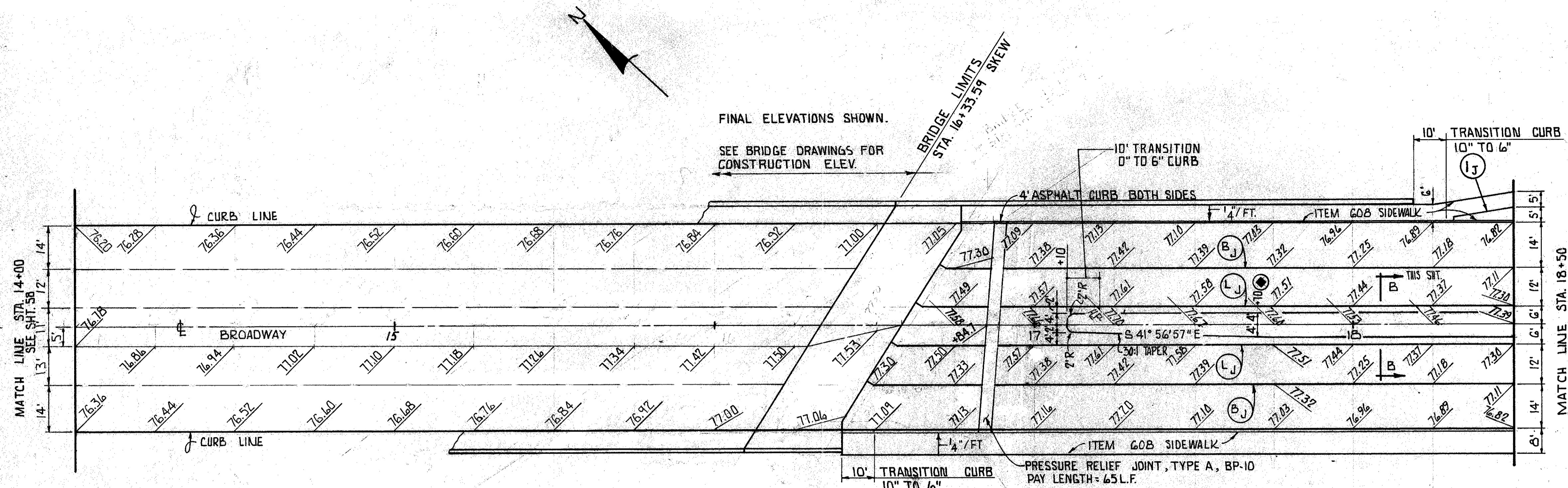
CUYAHOGA COUNTY
CUY-490-1.49

NOTE

- FOR LEGEND & NOTES SEE SHT. 57
- PAVEMENT QUANTITIES ON SHEET 6DA
- REMOVAL QUANTITIES ON SHEET 11A

(E) 1/2" EXPANSION JOINT FILLER AS PER ITEM 608

XX.XX — PROP. ELEVATION
(XX.XX) — EXIST. ELEVATION



SHEET ACCT. No.
CONT. No.

PARCEL N° 2024
QUANTITIES TABULATED
SEPARATELY

| | | | |
|-----|------|----|---|
| NO. | DATE | BY | REVISED |
| | | | TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 |

PAVEMENT DETAILS

BROADWAY STA. 14+00 TO STA. 23+00

| | | | |
|----------|----------|--------|---------|
| SCALE | 1" = 20' | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR. | LV/RHII | JRH | |

B17

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

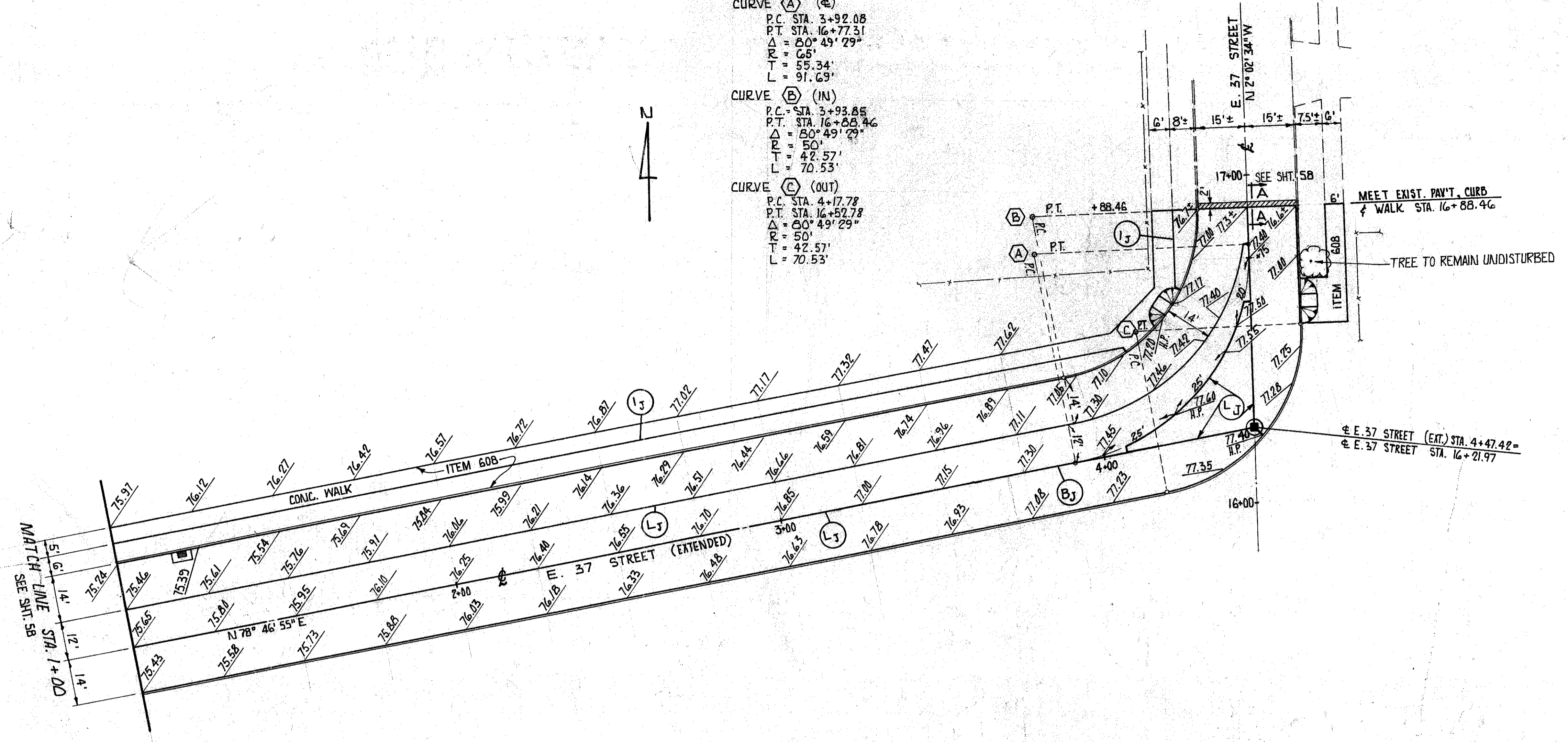
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CUYAHOGA COUNTY
CUY-490-1.49

CURVE (A) (C)
P.C. STA. 3+92.08
P.T. STA. 16+77.31
 $\Delta = 80^\circ 49' 29''$
R = 65'
T = 55.34'
L = 91.63'

CURVE (B) (IN)
P.C. STA. 3+93.85
P.T. STA. 16+88.46
 $\Delta = 80^\circ 49' 29''$
R = 50'
T = 42.57'
L = 70.53'

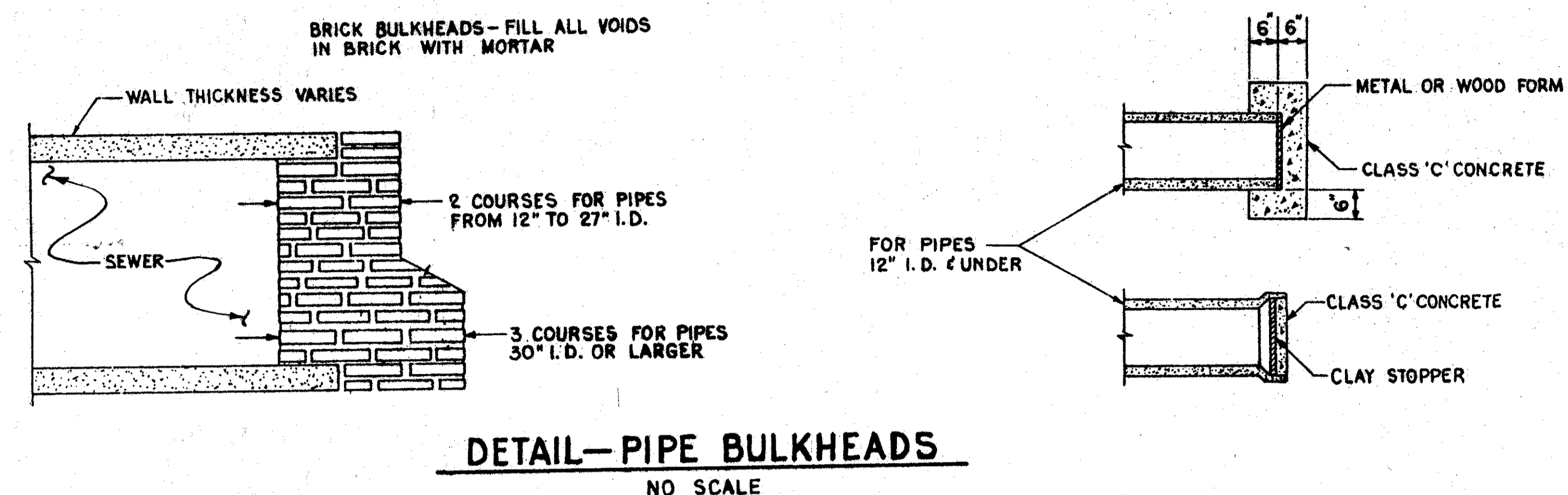
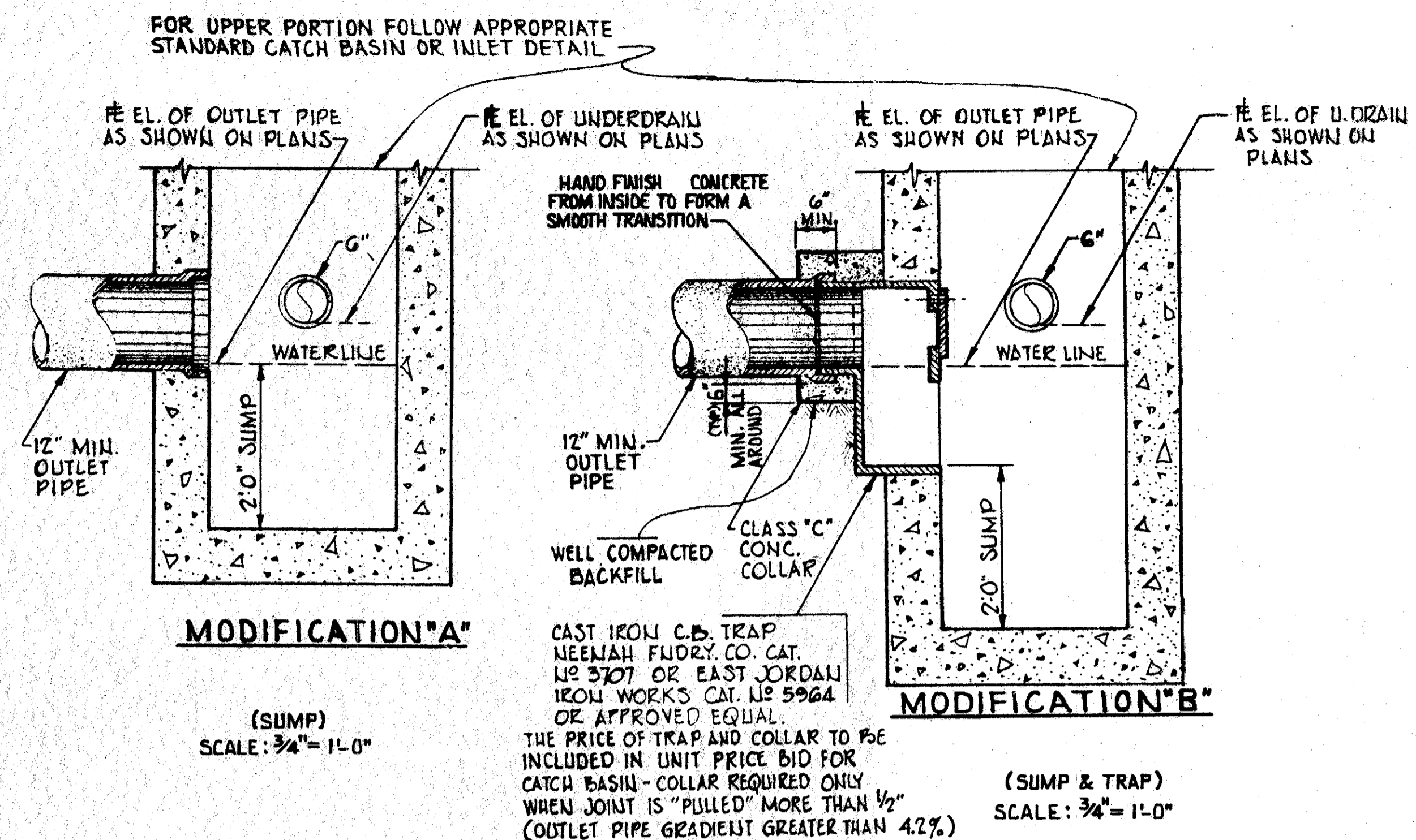
CURVE (C) (OUT)
P.C. STA. 4+17.78
P.T. STA. 16+52.78
 $\Delta = 80^\circ 49' 29''$
R = 50'
T = 42.57'
L = 70.53'



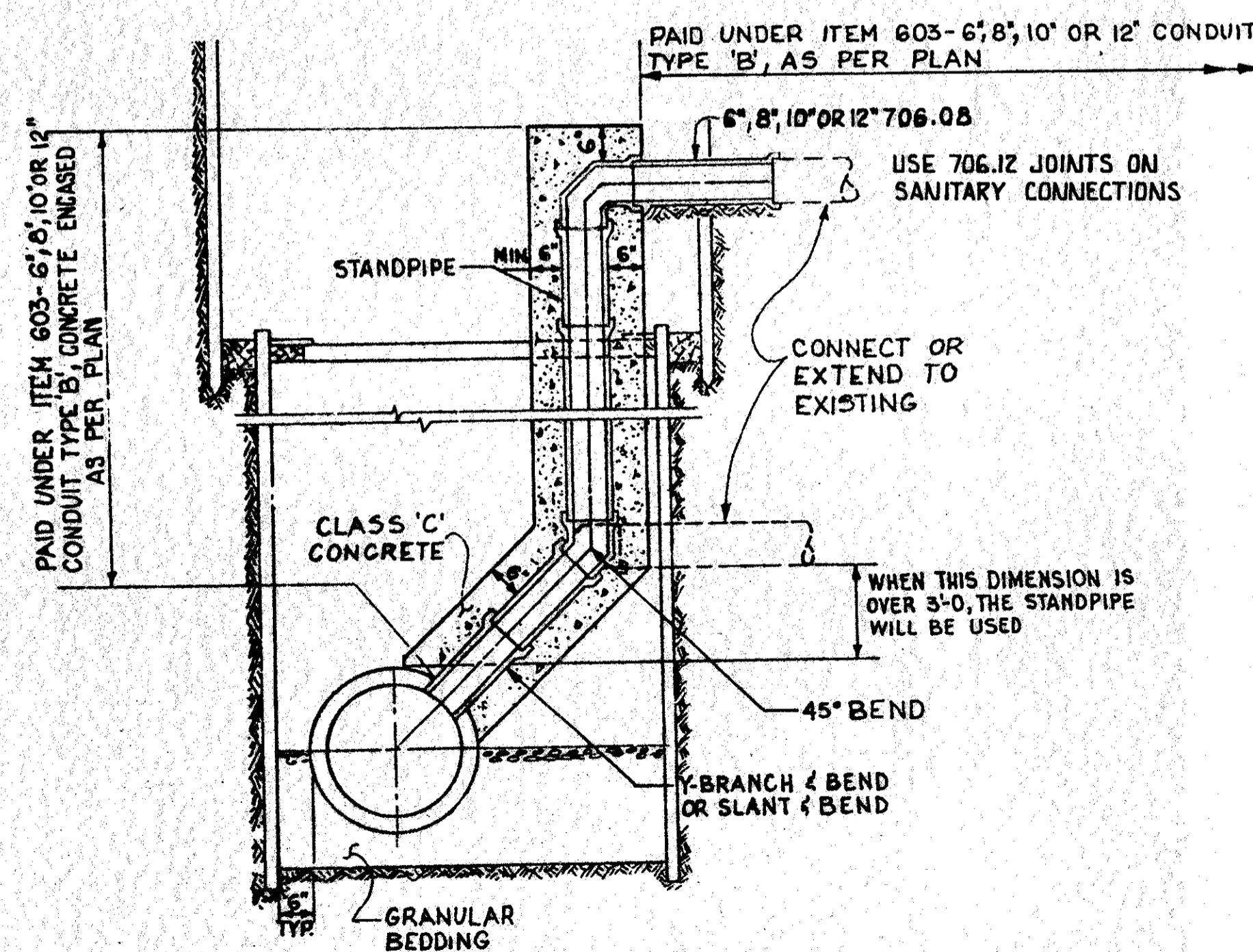
- NOTES:
1. LEGEND & NOTES ON SHEET 5T.
 2. QUANTITIES ON SHEET 6DA.

CONT. No. SHEET ACCT. No.

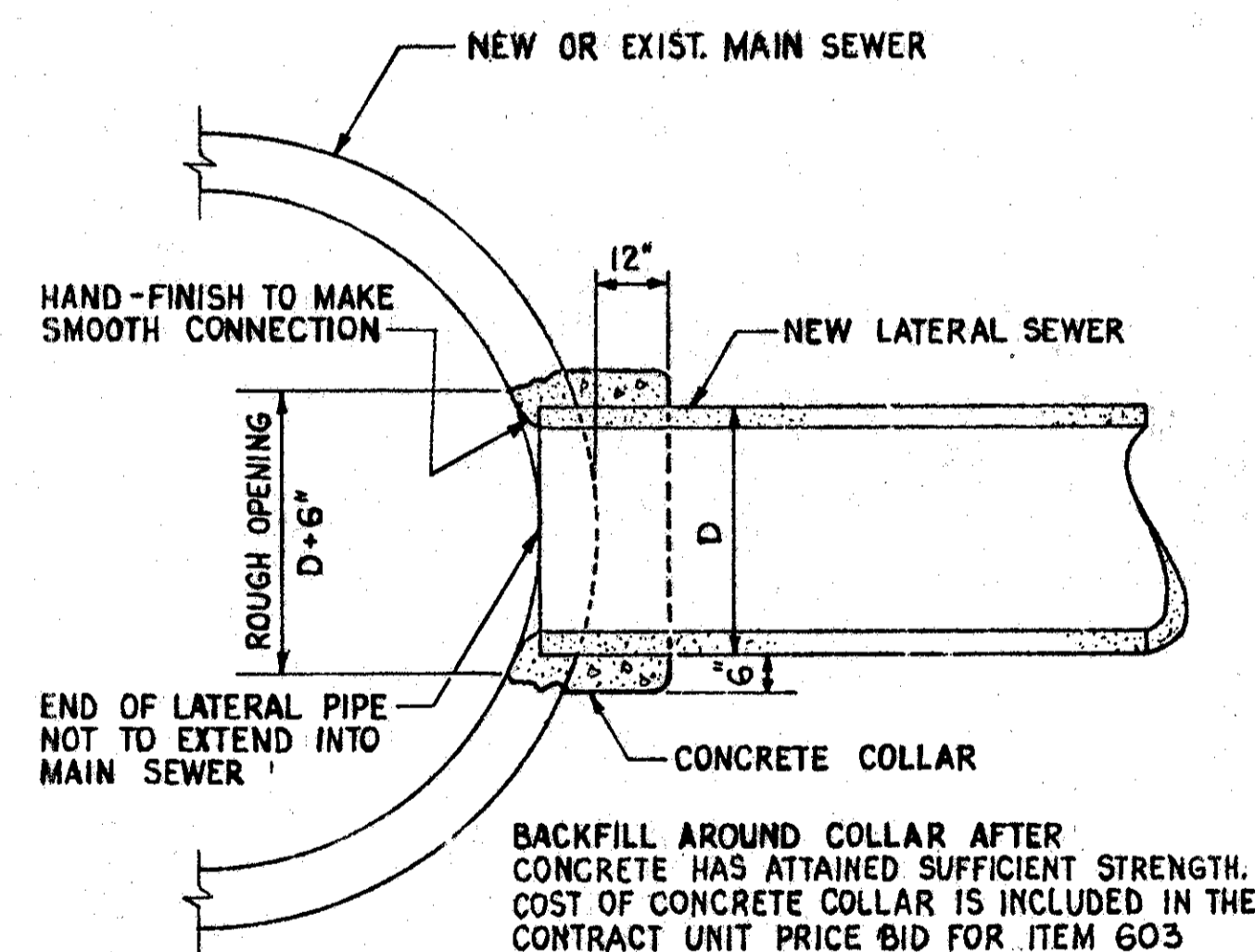
| | | | |
|---|--------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PAYEMENT DETAILS | | | |
| E. 37 STREET (EXTENDED) STA. 1+00 TO STA. 4+50 | | | |
| SCALE | 1"=20' | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| C.D.R. | L.V. | J.R.H. | |



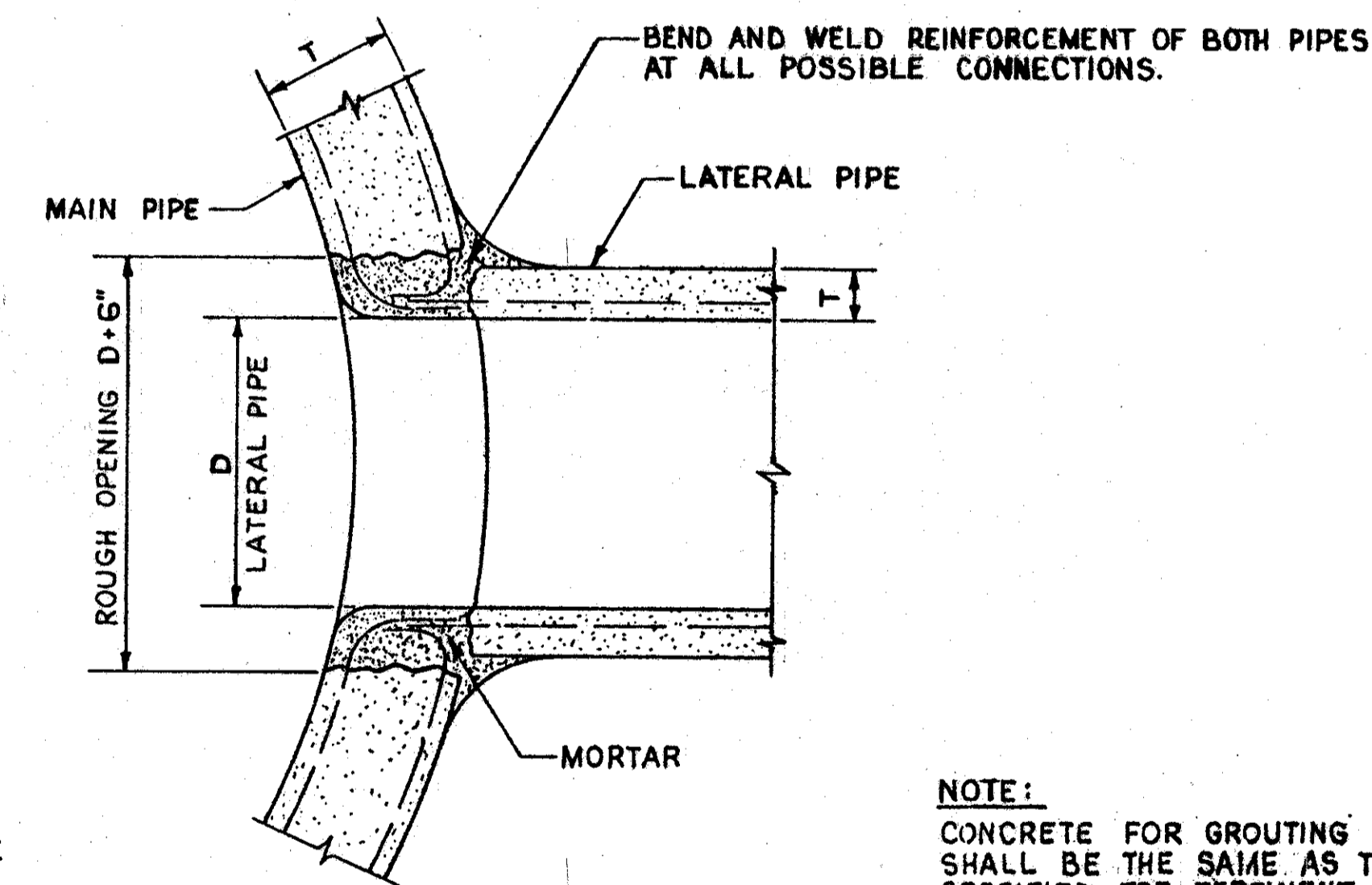
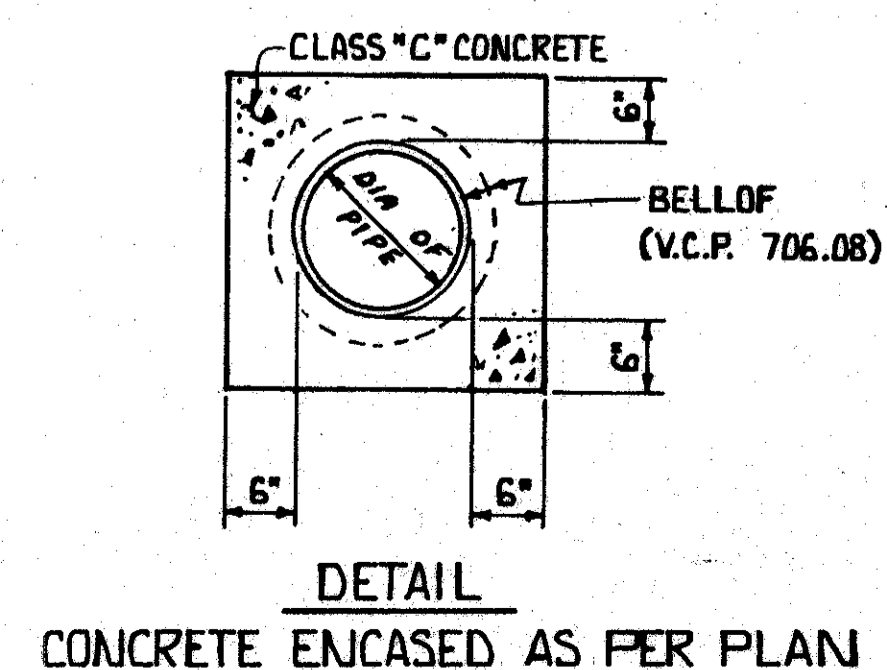
CATCH BASIN "MODIFICATION AS PER PLAN"



STANDARD DETAIL FOR STANDPIPE IN SHEETED TRENCH
NO SCALE



FIELD "T" CONNECTION
NO SCALE

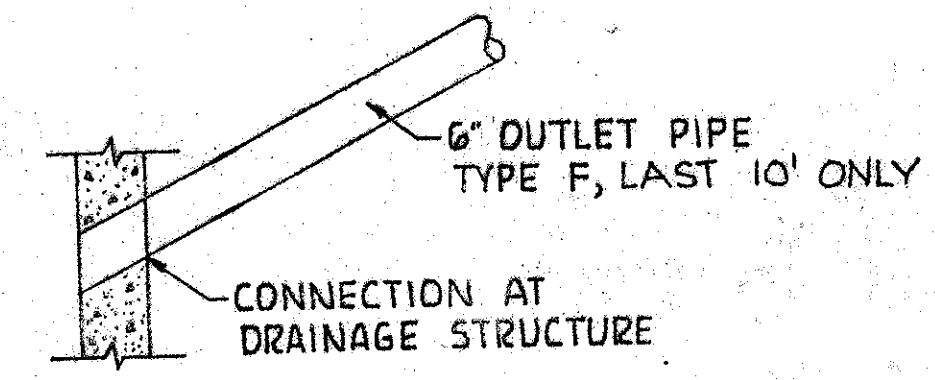
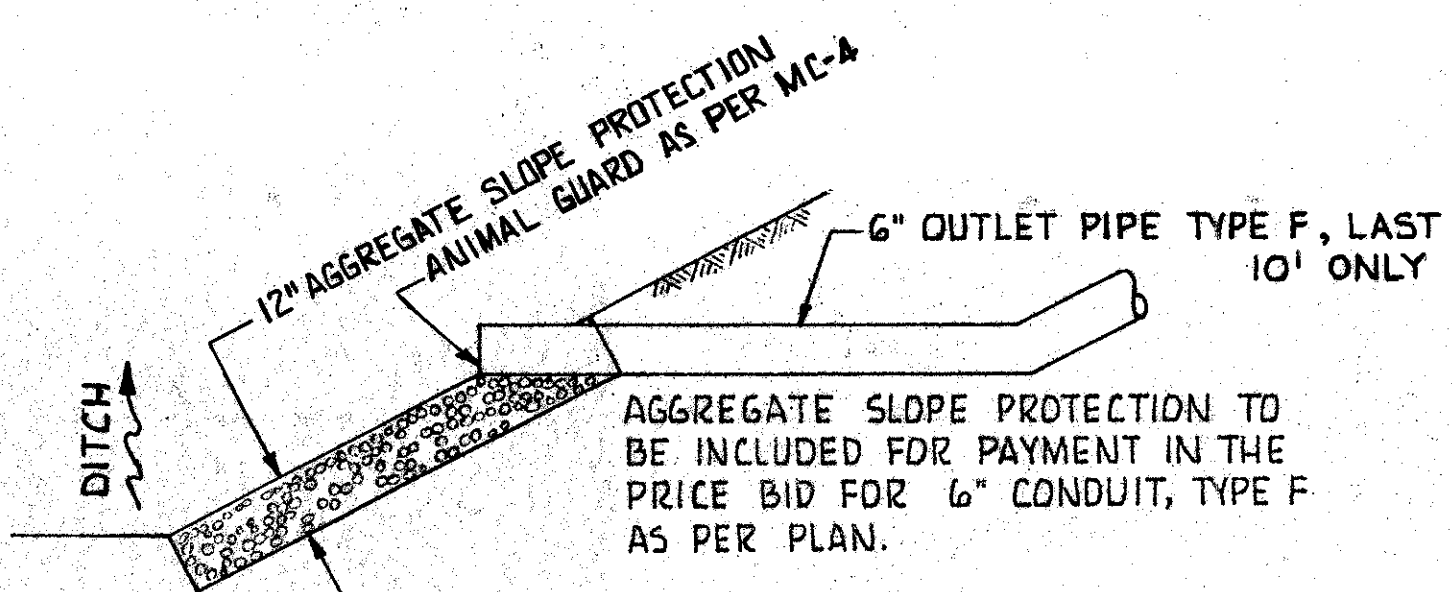
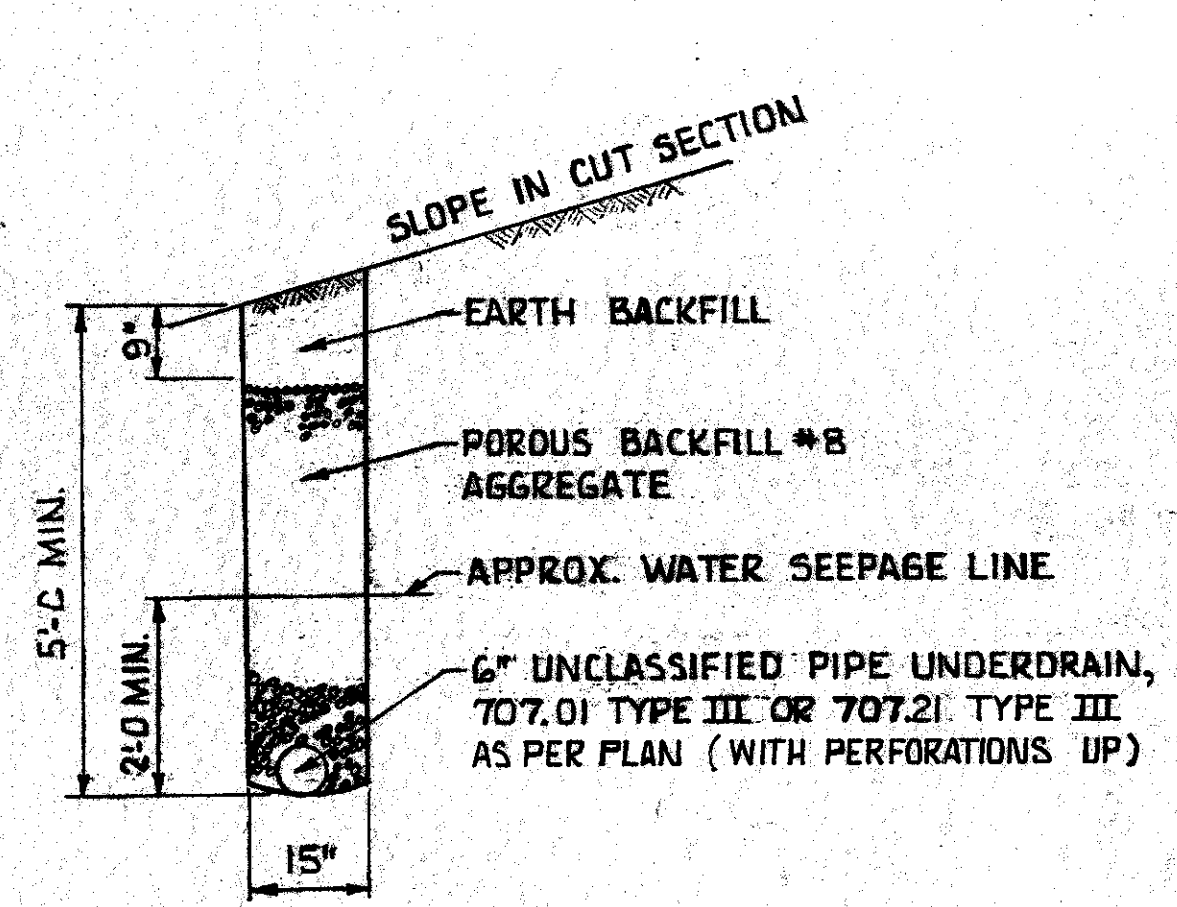


PREFABRICATED "T" CONNECTION
INCLUDE FOR PAYMENT WITH UNIT PRICE BID FOR PERTINENT PIPE
NO SCALE

NOTE:
CONCRETE FOR GROUTING SHALL BE THE SAME AS THAT SPECIFIED FOR PERTINENT PIPE.

| | | | | | |
|---|-------|--------|---------|----------|------|
| TRYGVE HOFF & ASSOCIATES ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | | | |
| DRAINAGE DETAILS | | | | | |
| CATCH BASIN MODIFICATION, STANDPIPE, BULKHEAD AND T-CONNECTION DETAILS | | | | | |
| SCALE | DATE | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| | | | JRH | | |

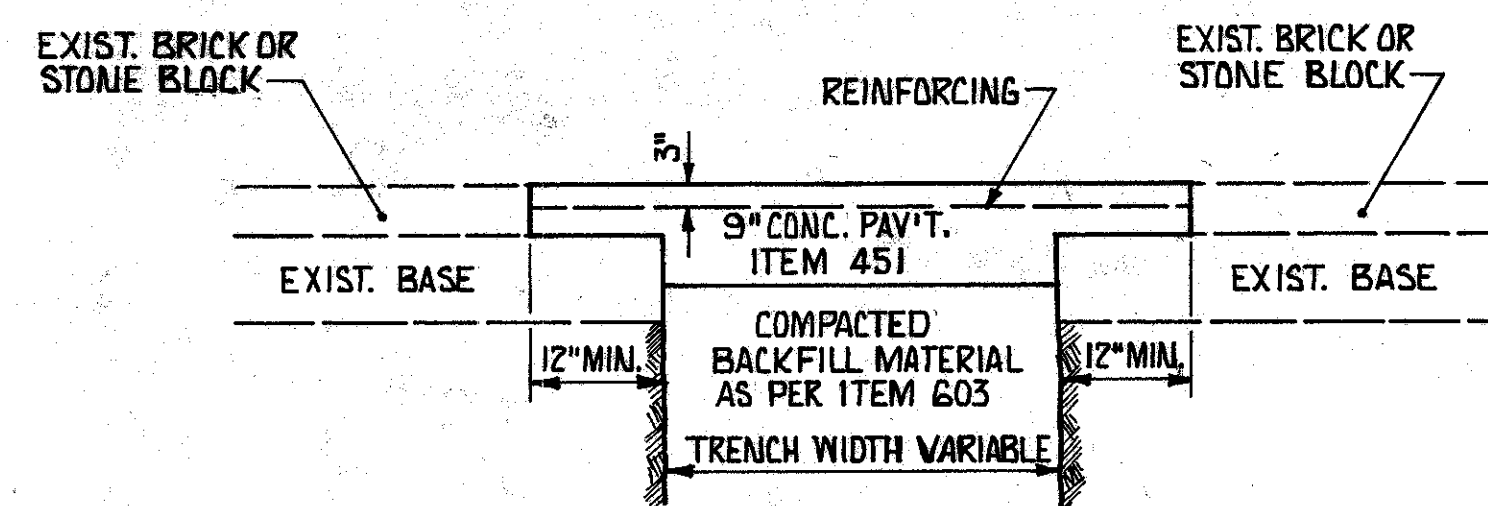
CUYAHOGA COUNTY
CUY-490-1.49



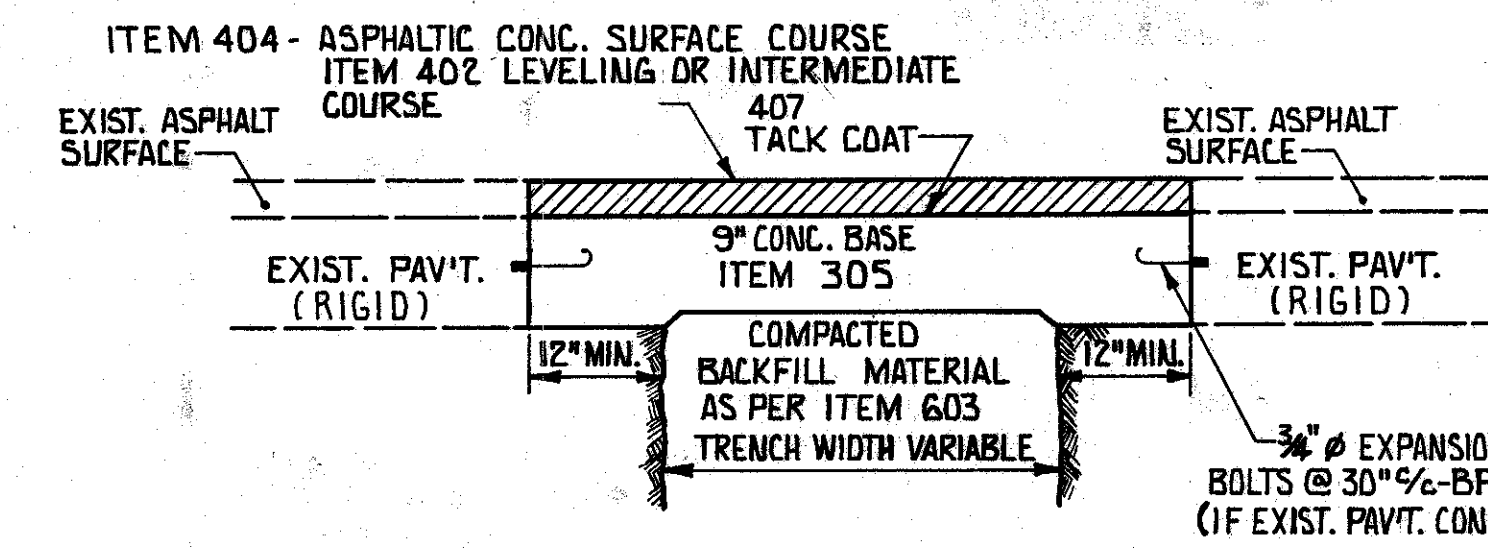
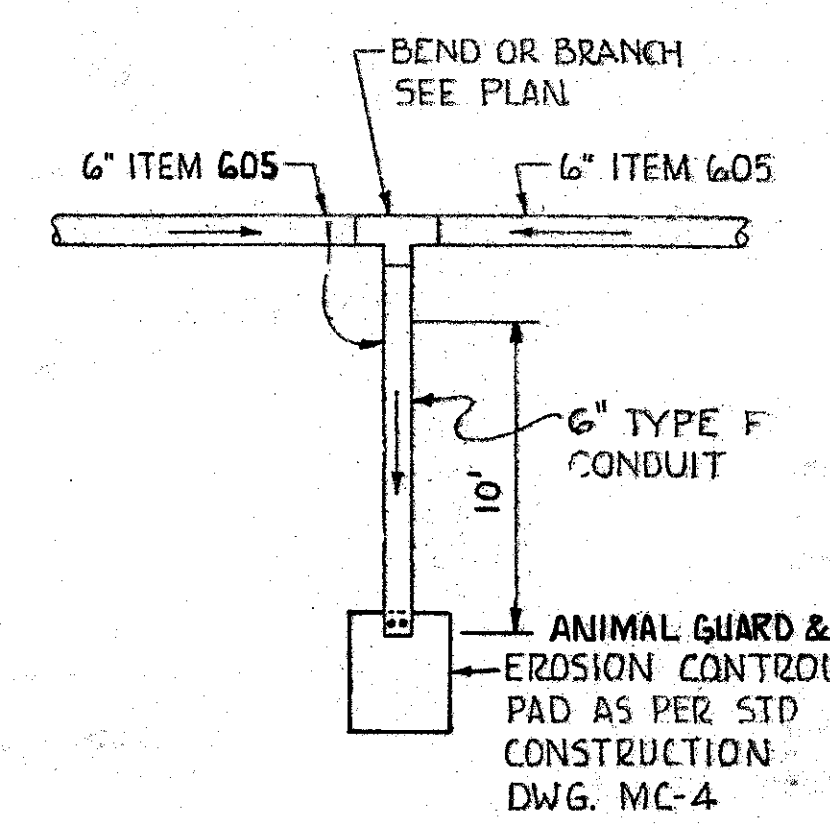
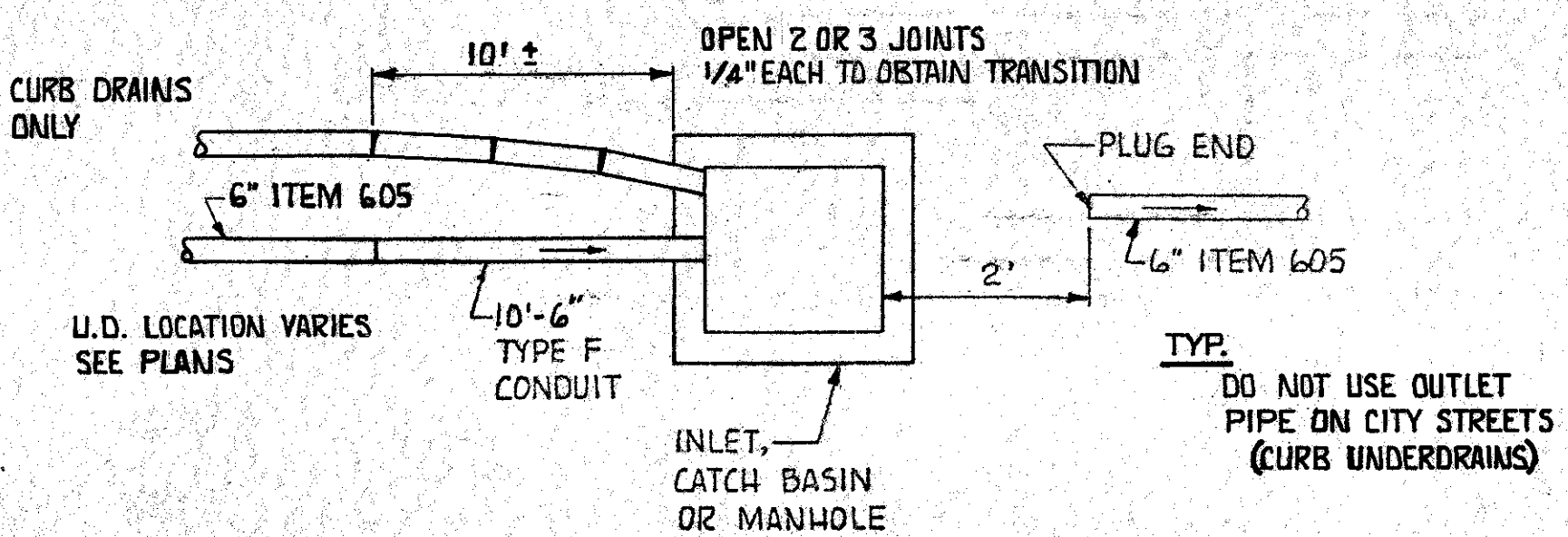
NOTE:
OUTLET INTERCEPTOR DRAINS EITHER INTO DITCH DRAINAGE STRUCTURE OR INTO AGGREGATE SLOPE PROTECTION AT ROADWAY DITCH LINE.

DETAIL - FOR INTERCEPTOR DRAIN

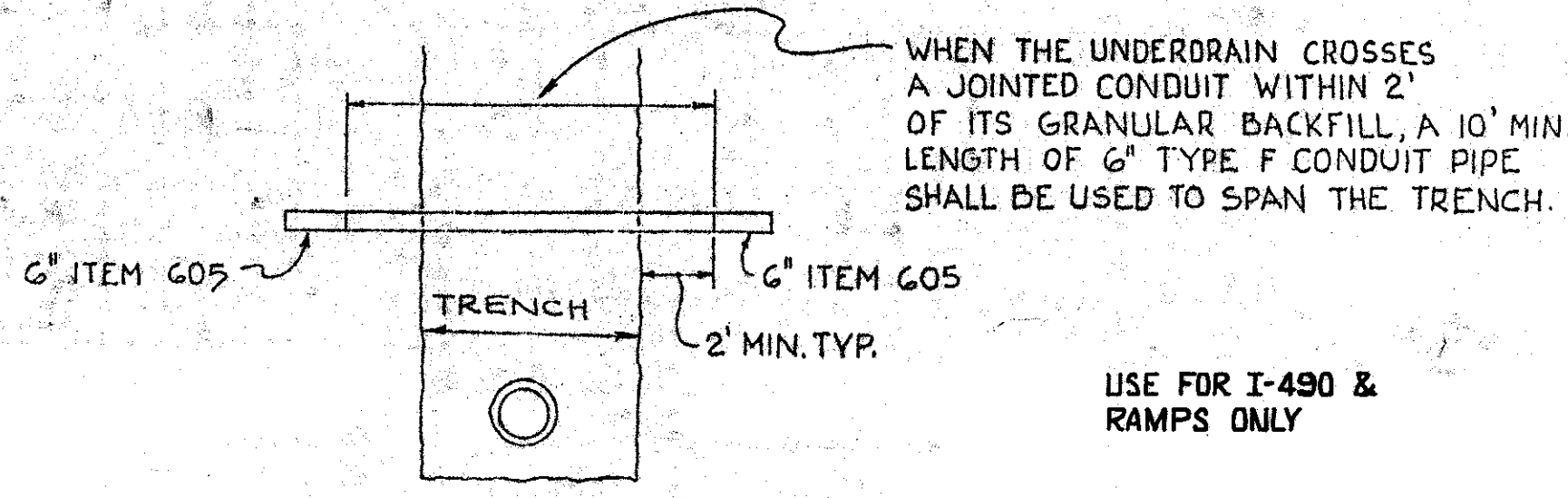
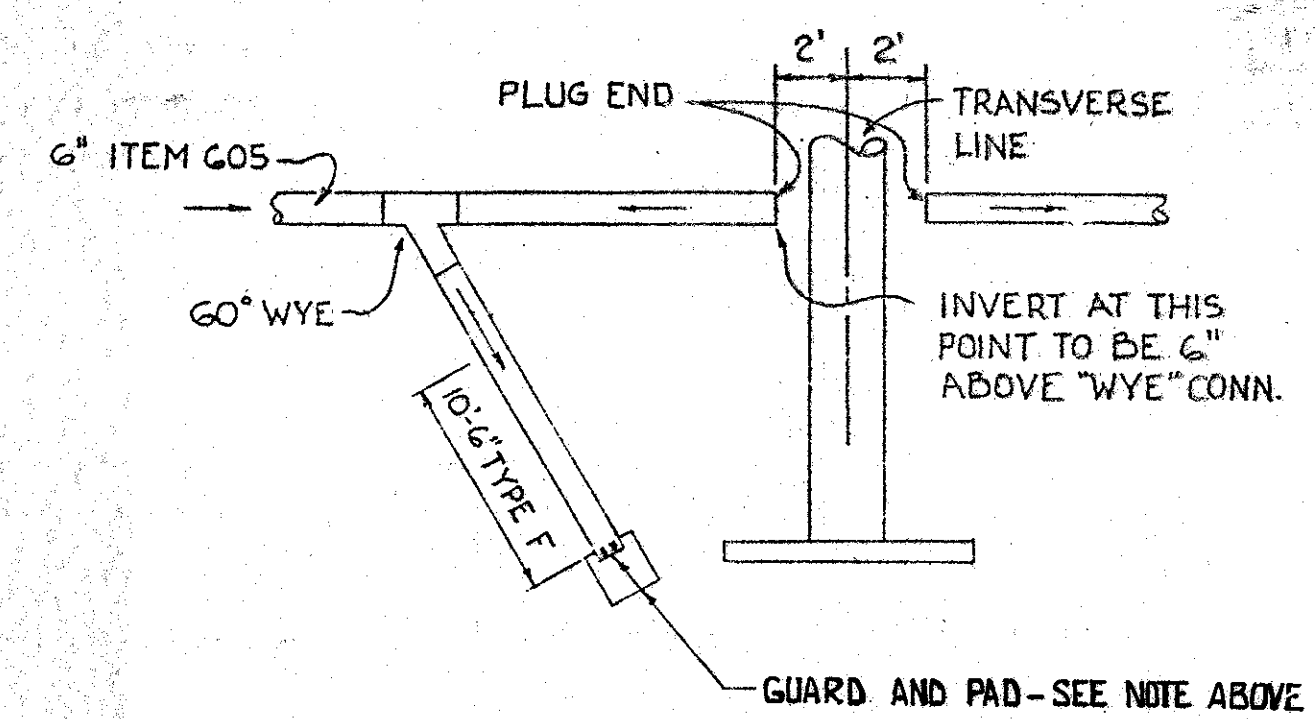
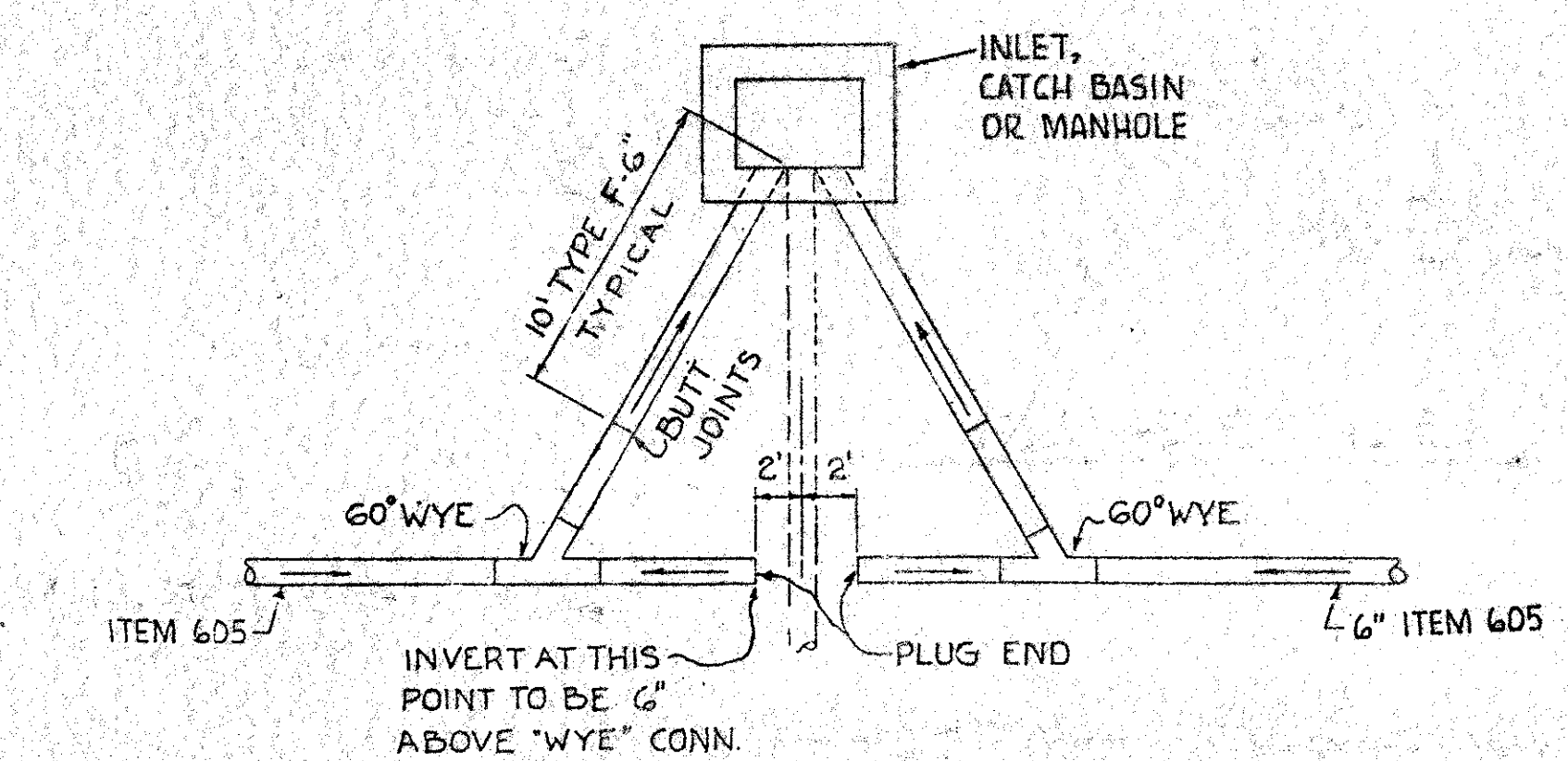
SCALE - 1/2" = 1'-0"
SEE GENERAL NOTE



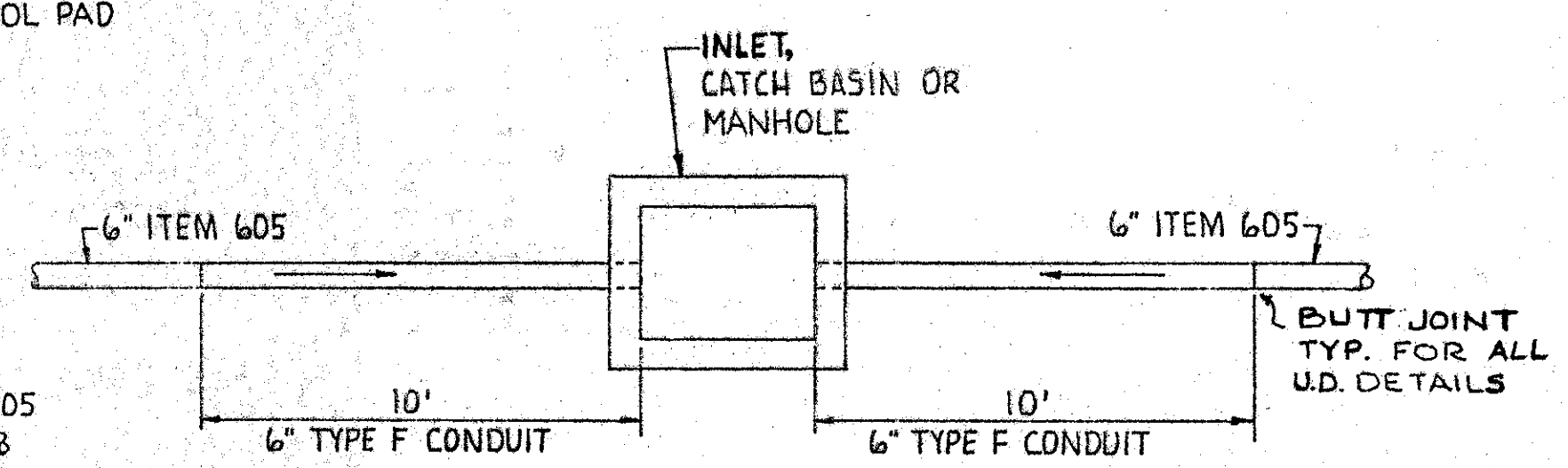
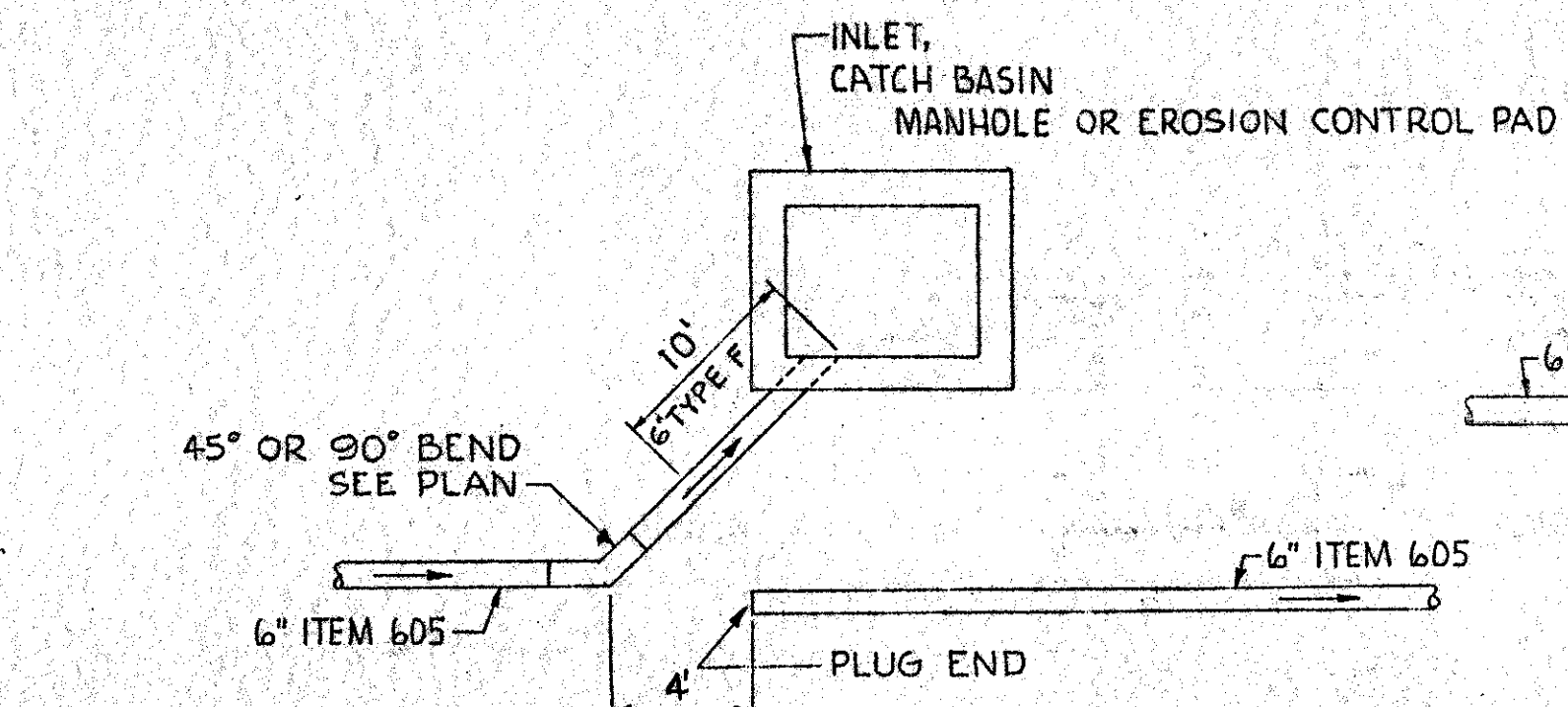
TYPICAL SECTION REPAVING OVER SEWER TRENCH IN BRICK OR STONE BLOCK PAVEMENTS WITH BASES
3/4" = 1'-0"



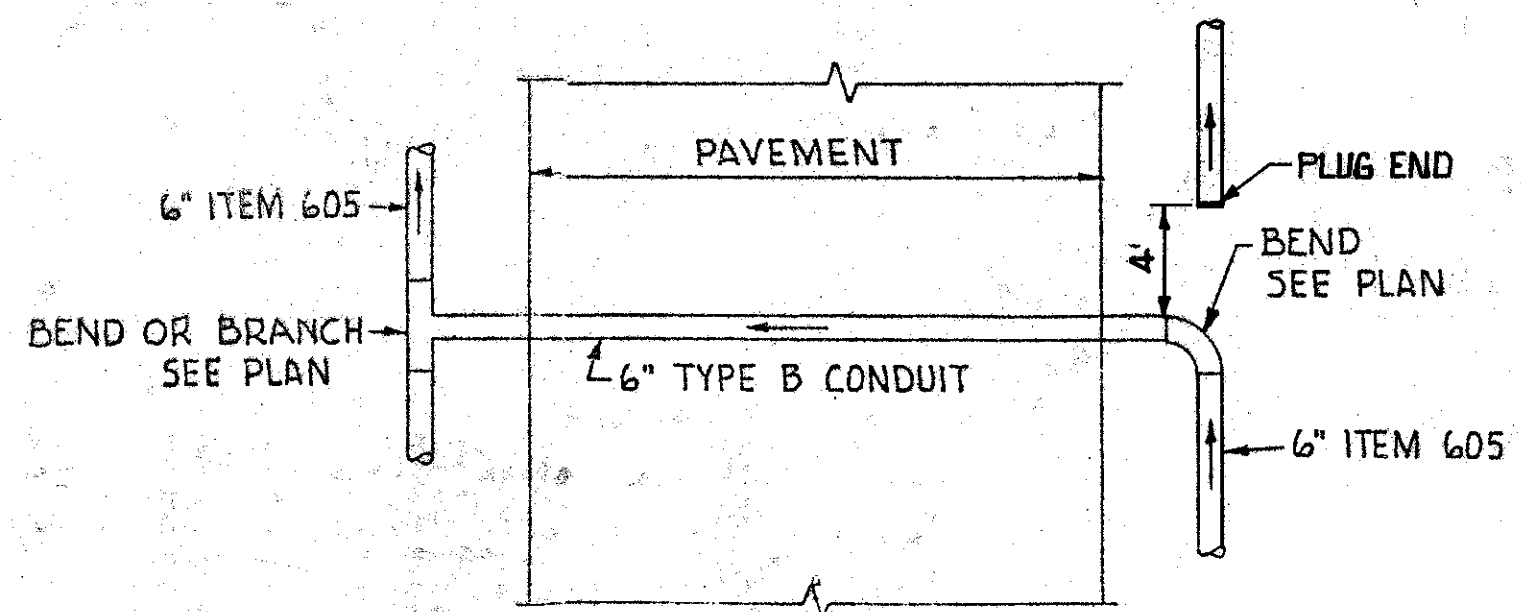
TYPICAL SECTION REPAVING OVER SEWER TRENCH IN ASPHALT PAVEMENTS
3/4" = 1'-0"



USE FOR I-490 & RAMPS ONLY



OUTLET DETAILS



CROSSING DETAILS

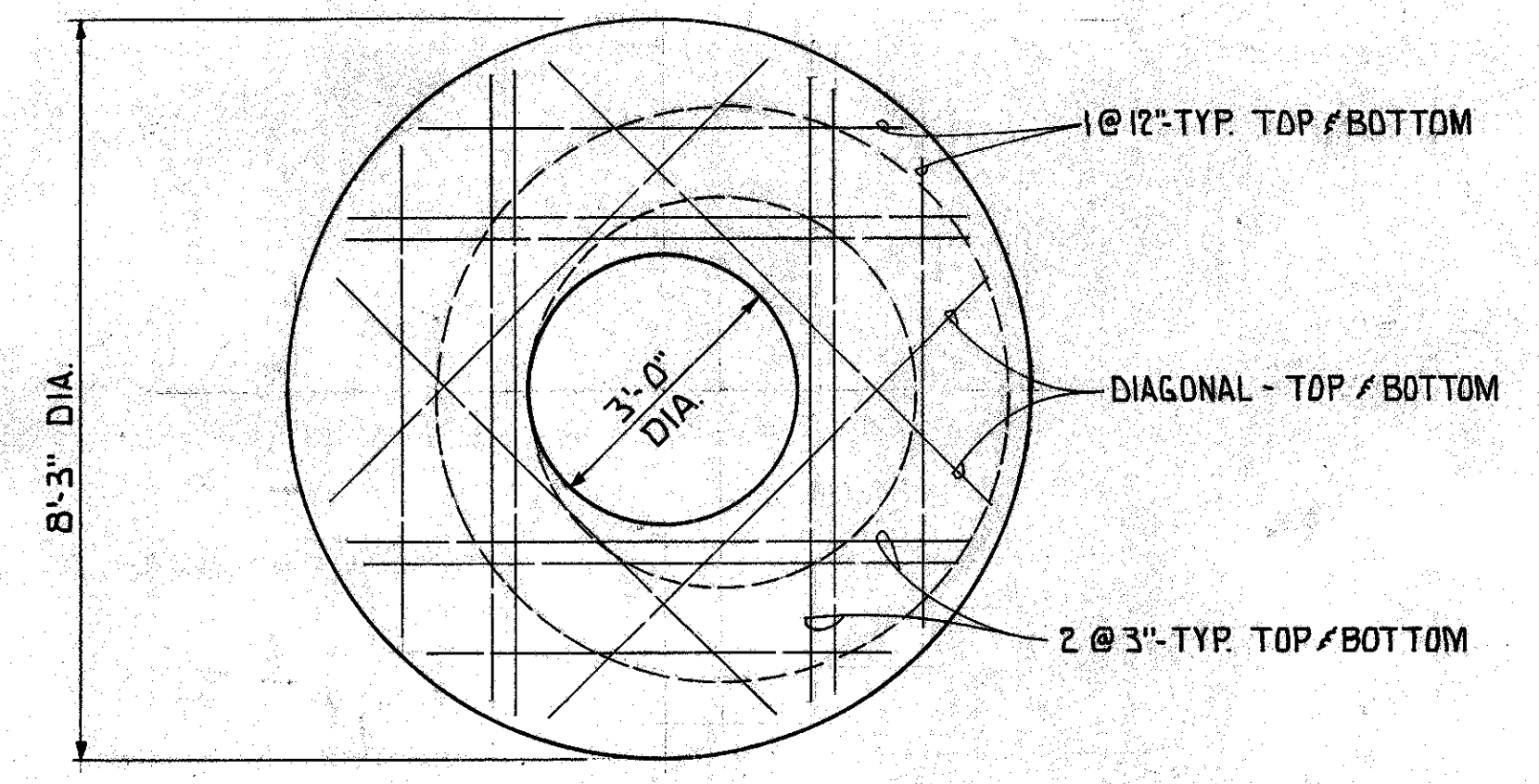
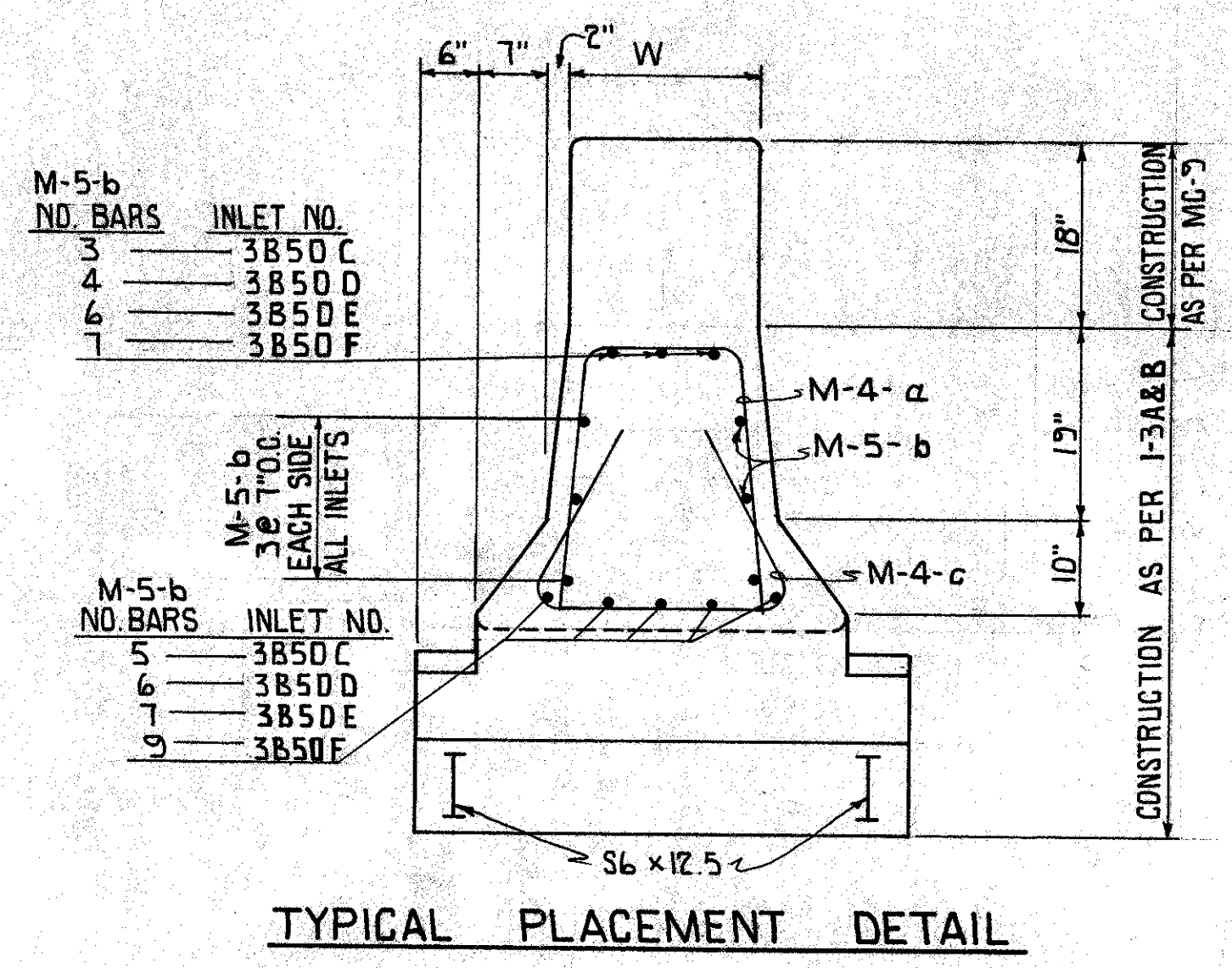
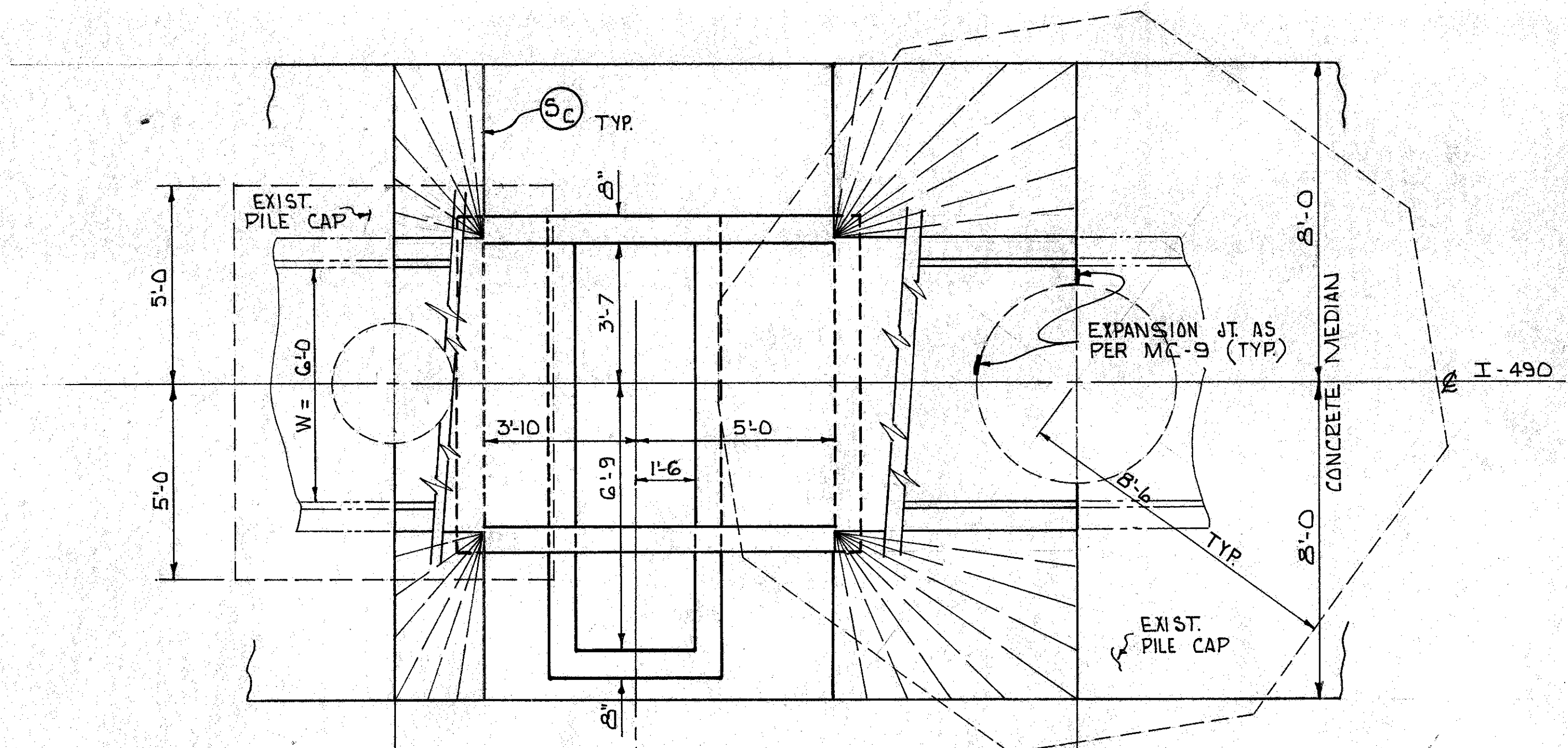
TYPICAL PIPE UNDERDRAIN DETAILS

NOTE: ELEVATIONS ARE SHOWN ON EITHER THE ROADWAY PLAN OR SEWER PROFILE SHEETS.

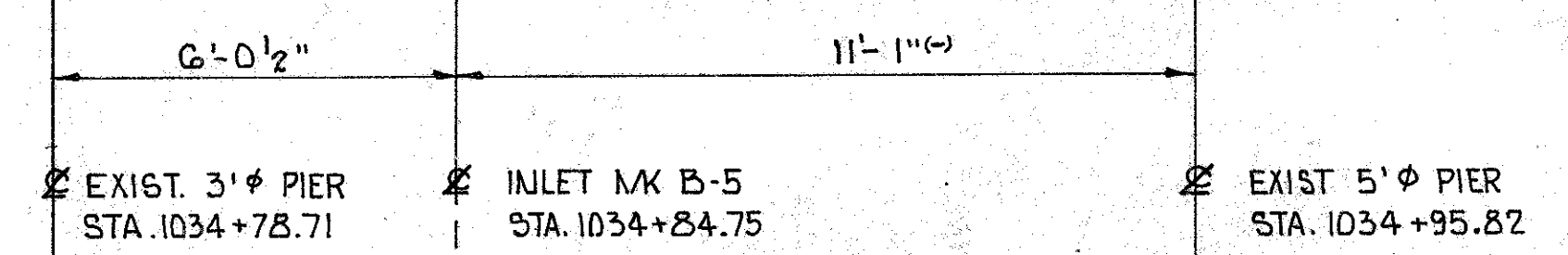
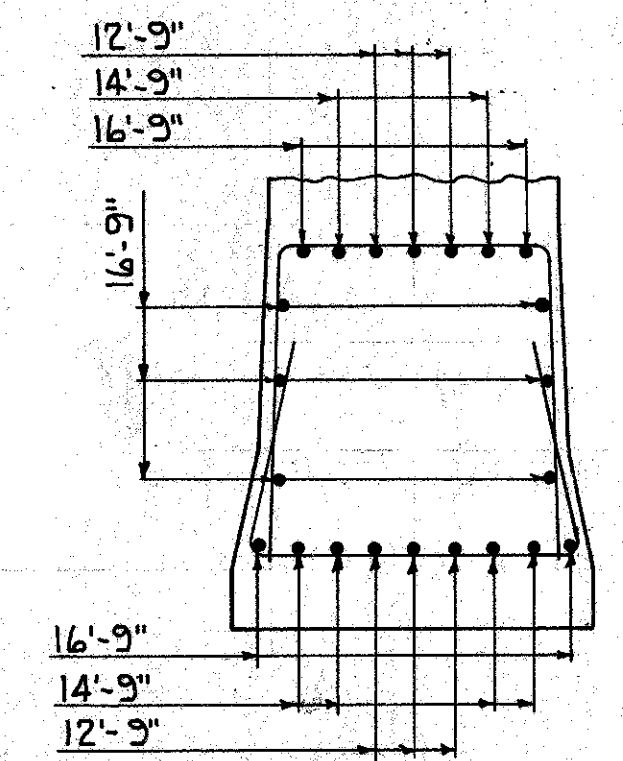
- NOTE:
1. USE FOR ALL UTILITY WORK INCLUDED IN THIS PROJECT
 2. FOR PAYMENT INCLUDE THE COST OF PAVEMENT, CURB OR SIDEWALK REMOVAL AND REPLACEMENT IN THE UNIT PRICE BID FOR THE SEWER OR OTHER UTILITY BEING CONSTRUCTED IN THE TRENCH, UNLESS OTHERWISE NOTED IN THE PLANS

| | | | |
|---|-------|----------|---------|
| TRYGVE HOFF & ASSOCIATES ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| DRAINAGE DETAILS | | | |
| INTERCEPTOR DRAIN UNDERDRAIN DETAILS TRENCH REPAVING | | | |
| SCALE | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| | | | |
| | JRH | REVIEWED | DATE |
| | | | |

CUYAHOGA COUNTY
CUY-490-1.49



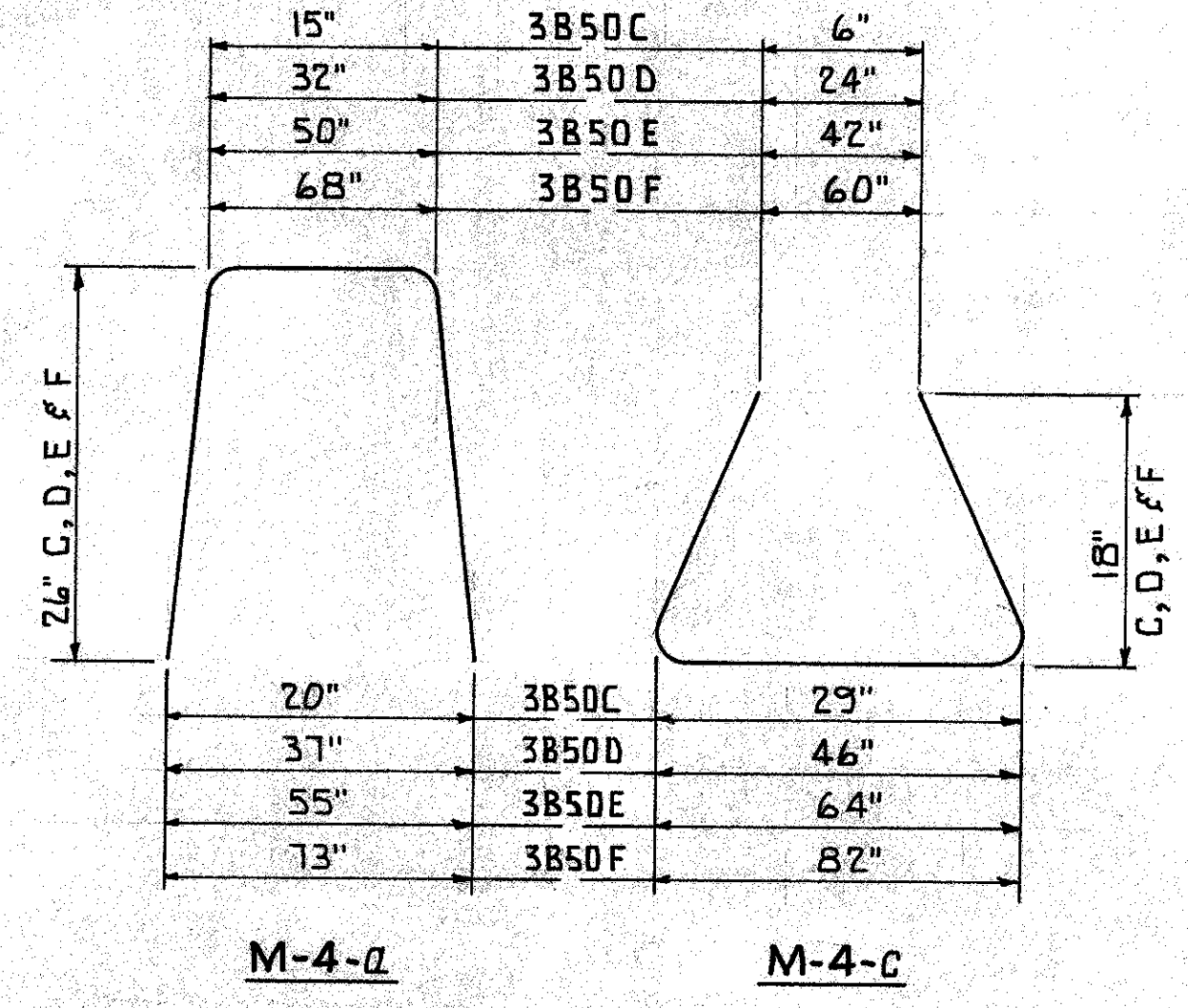
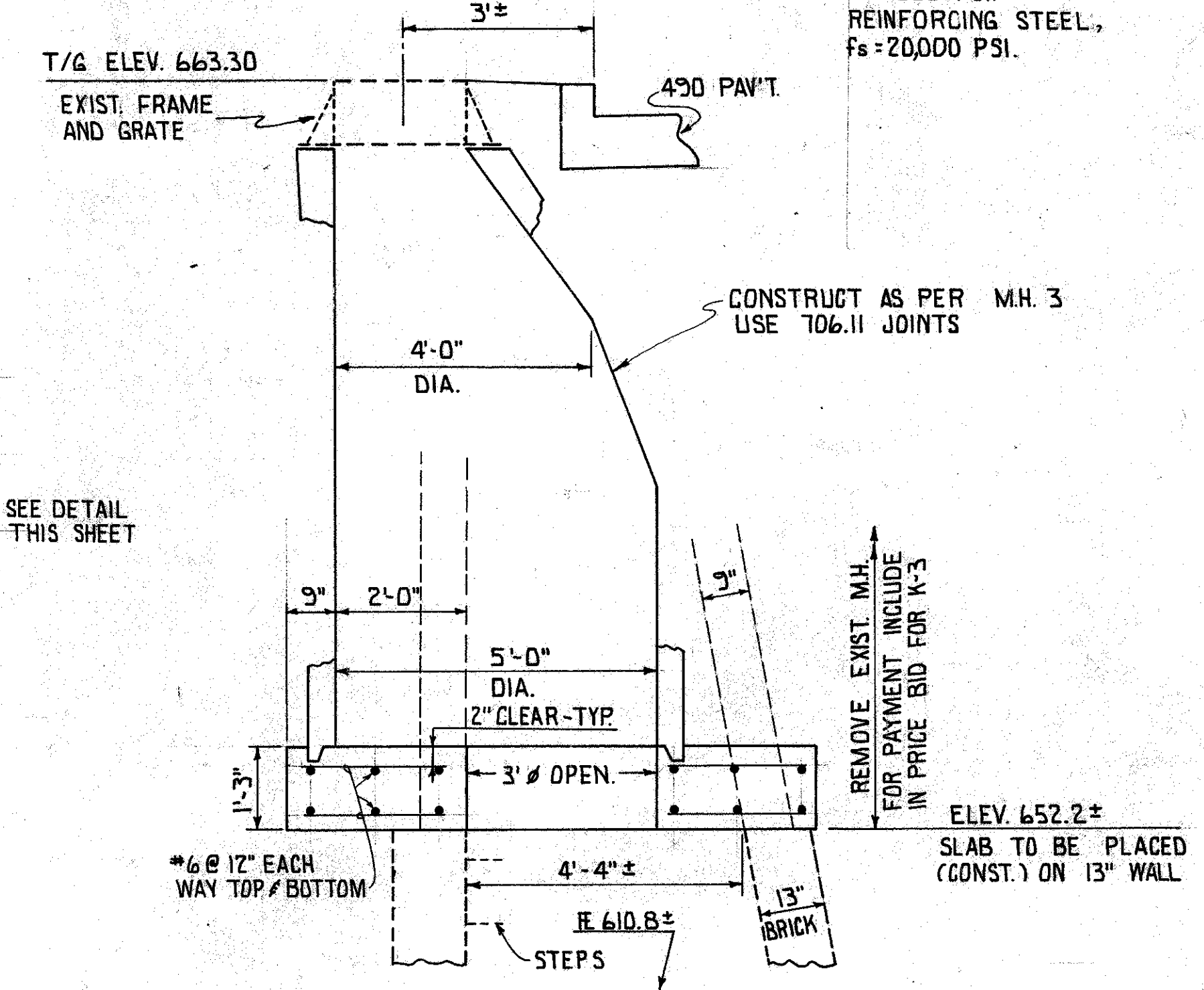
NOTE
CONCRETE SHALL BE CLASS C,
f_c = 1333 PSI.
REINFORCING STEEL,
f_s = 20,000 PSI.



NOTE:
1. CONG. BARRIER NOT SHOWN OVER INLET.
2. CONSTRUCT AS PER I-3850 UNLESS NOTED.

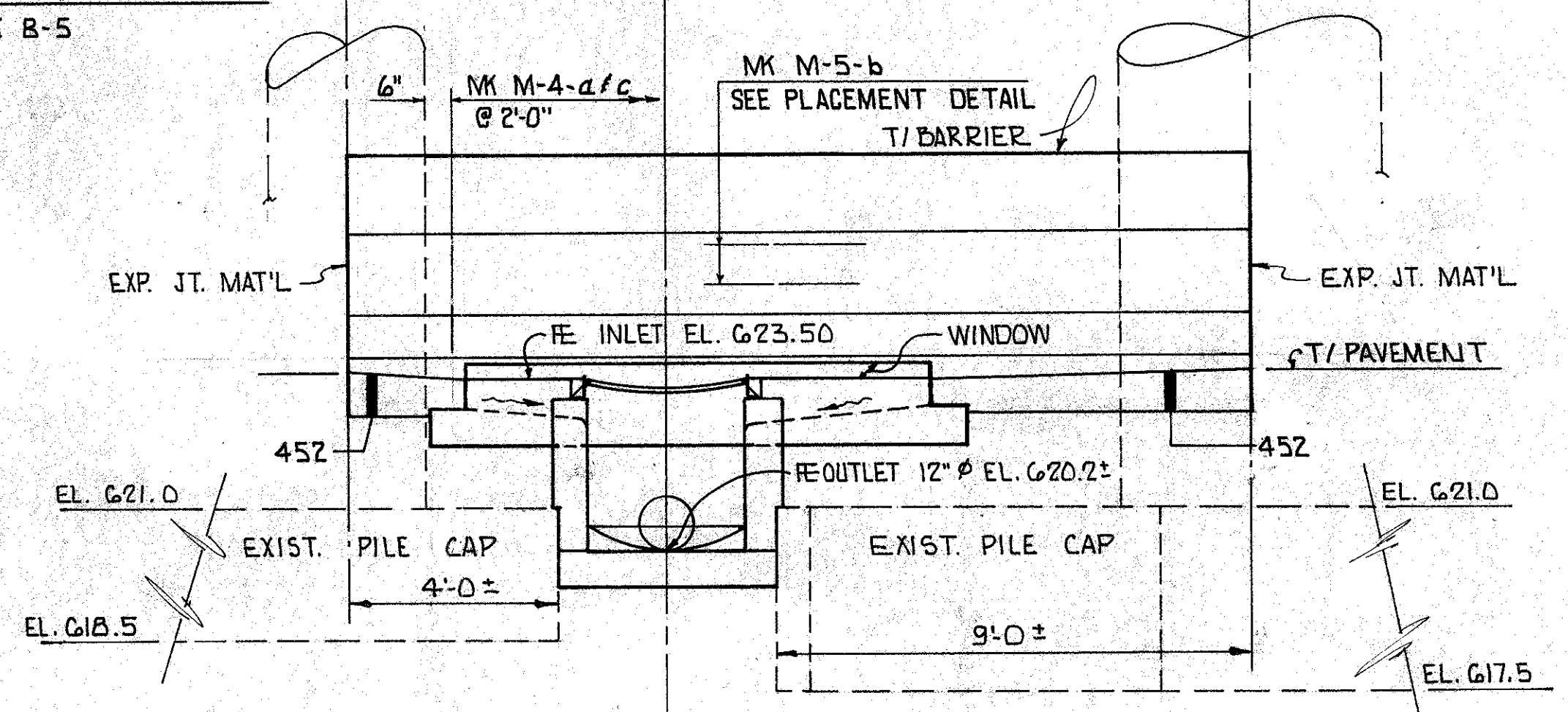
STEEL LIST

| INLET NO. | W | M-4-a | | M-5-b | | M-4-c | | S ₆ x 12.5 | | MARK NO. |
|-----------|---------|-------|----------|-------|----------|-------|----------|-----------------------|----------|----------|
| | | NO. | LIN. FT. | NO. | LIN. FT. | NO. | LIN. FT. | NO. | LIN. FT. | |
| 1-3850C | 18 1/2" | 10 | 5'-7" | 14 | 19'-8" | 10 | 5'-5" | 2 | 11'-0" | B-4 |
| 1-3850D | 36" | 10 | 7'-0" | 16 | 19'-8" | 10 | 6'-10" | 2 | 11'-0" | B-1 |
| 1-3850E | 54" | 10 | 8'-6" | 19 | 19'-8" | 10 | 8'-4" | 2 | 11'-0" | B-2 |
| 1-3850F | 72" | 10 | 10'-0" | 22 | 19'-8" | 10 | 9'-10" | 2 | 11'-0" | B-6 |
| 1-3850F | 72" | 7 | 10'-0" | 6 | 12'-9" | 7 | 9'-10" | 2 | 9'-10" | B-5 |
| | | | | 10 | 14'-9" | | | | | |
| | | | | 10 | 16'-9" | | | | | |



BARRIER
STD I-3850 MEDIAN INLET, MODIFIED
AS PER PLAN

NOTE: FOR DETAILS NOT SHOWN SEE
STD. CONSTRUCTION DWG. I-3-A & B



NOTE:
A" WALLS EXCEPT BETWEEN
EXIST. FDNS.

M.H. MK K-3 SHEET 37
RECONSTRUCTED TO GRADE AS PER PLAN
SCALE: 1/2" = 1'-0"

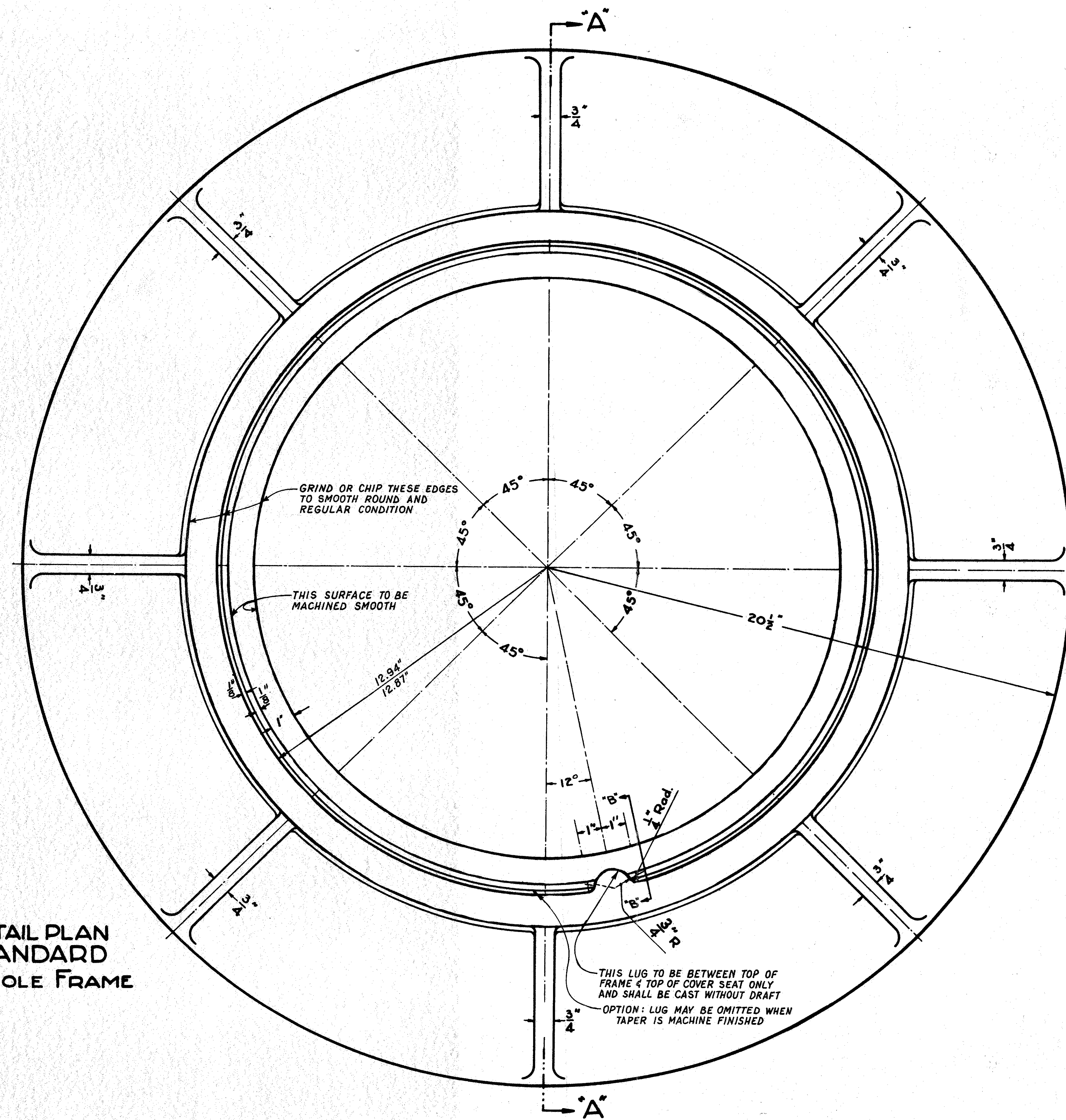
| | | | |
|---|--------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| DRAINAGE DETAILS | | | |
| 1-3850 MEDIAN INLET MODIFIED AS PER PLAN FOR MEDIAN INLETS: MK NO B-1,2,4,5 & 6 DETAIL FOR MEDIAN INLET MK NO B-5 DETAIL FOR M.H. MK K-3 | | | |
| SCALE | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| CDR | LV/CAP | JRH | |

SHEET ACCT. No.
CONT. No.

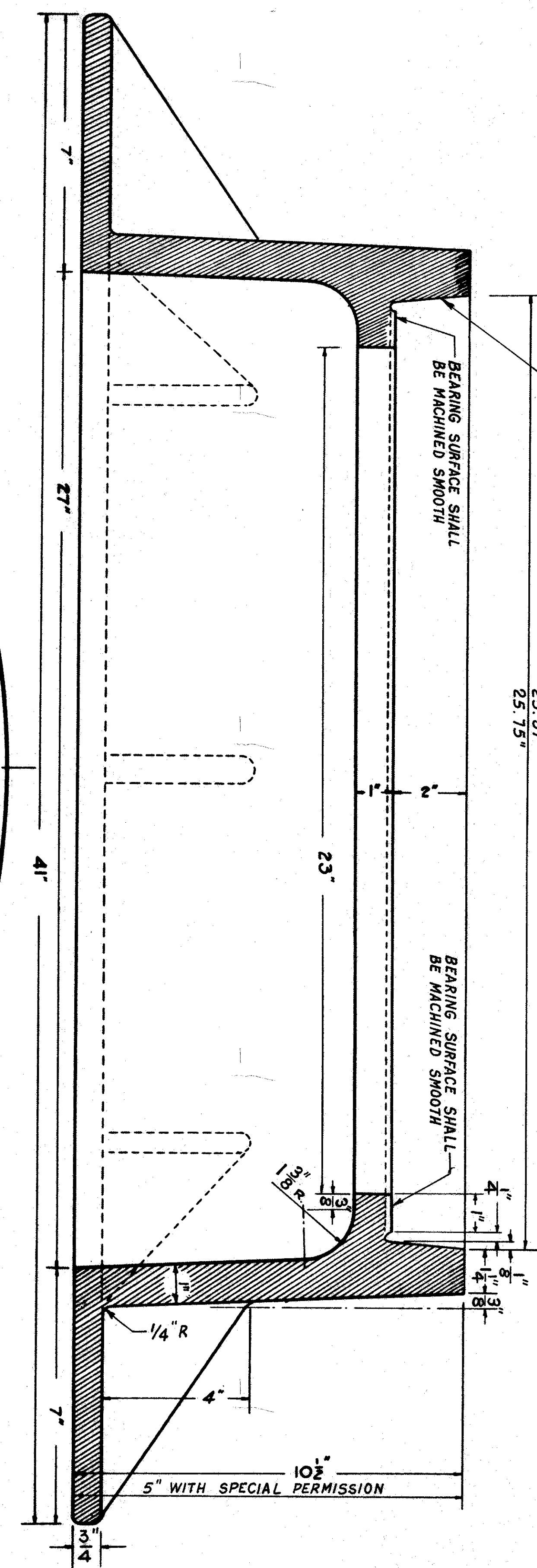
| | | |
|-------------|-------|---------|
| FHWA REGION | STATE | PROJECT |
| 2 | OHIO | |

64
261

CUYAHOGA COUNTY
CUY-490-1.49

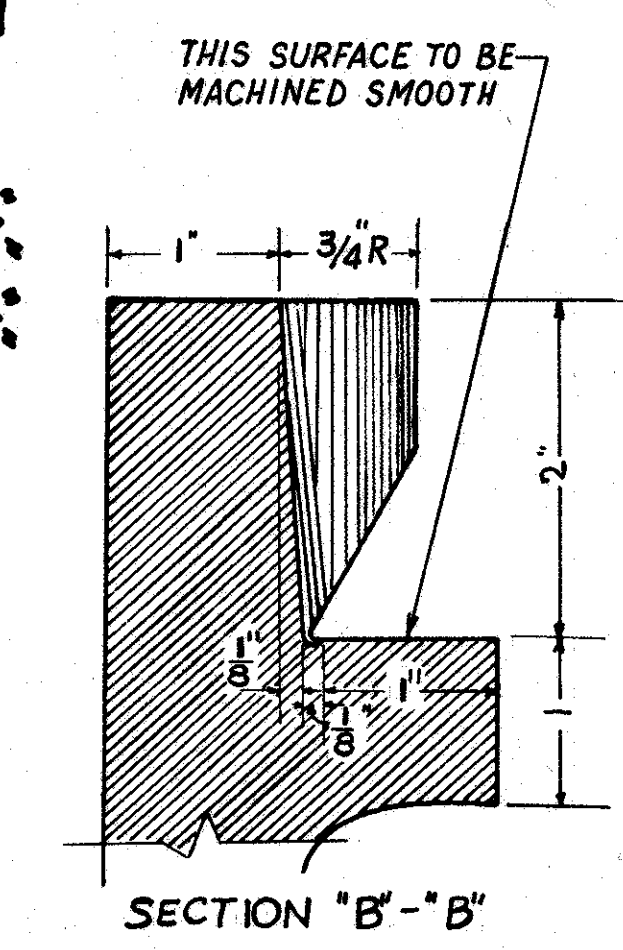


DETAIL PLAN
STANDARD
MANHOLE FRAME



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

SECTION THRU A-A



SECTION "B"-B

CONT. NO. SHEET ACCT. NO.

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

MINIMUM WEIGHT OF FRAME - 400 POUNDS

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

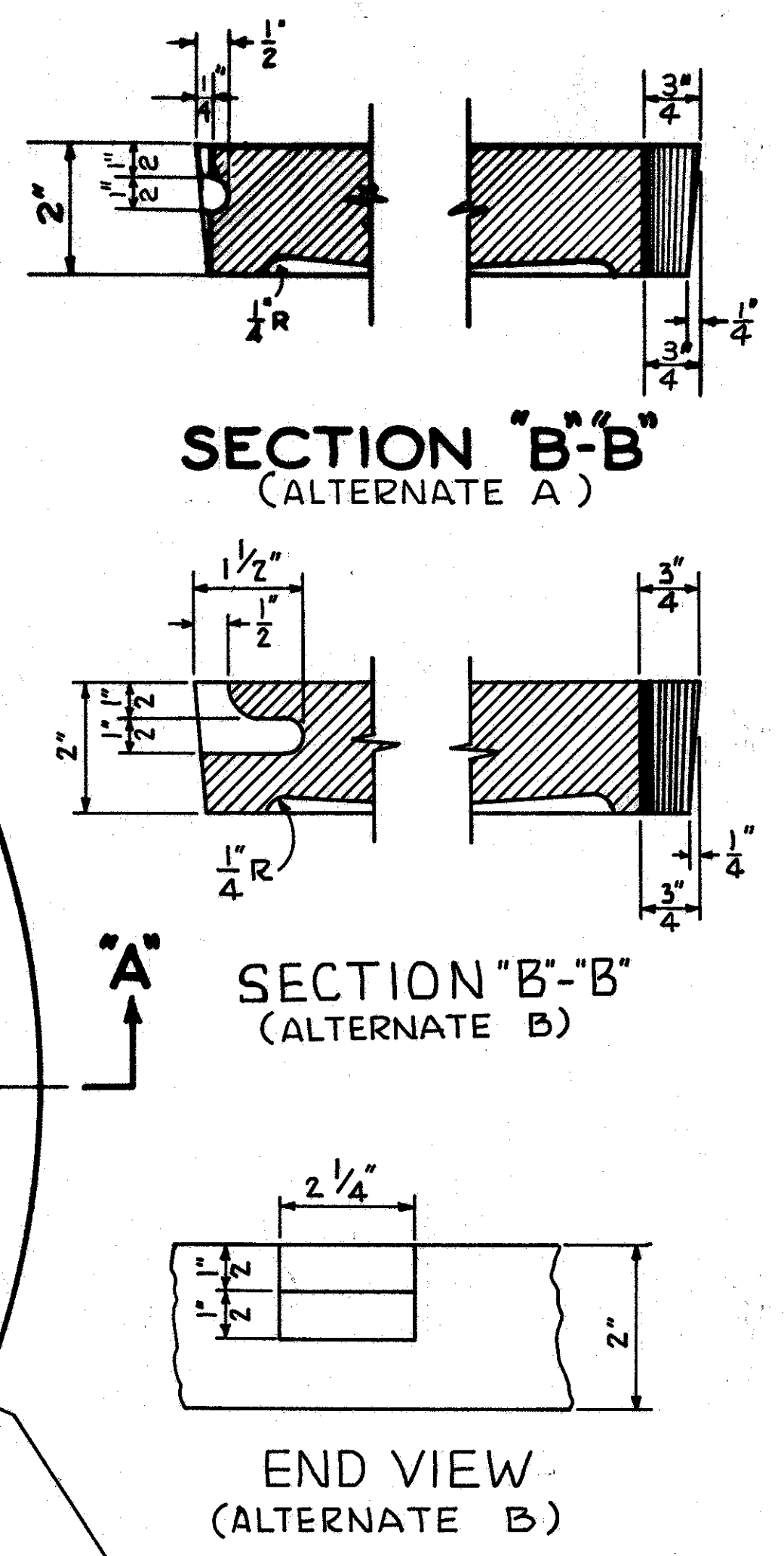
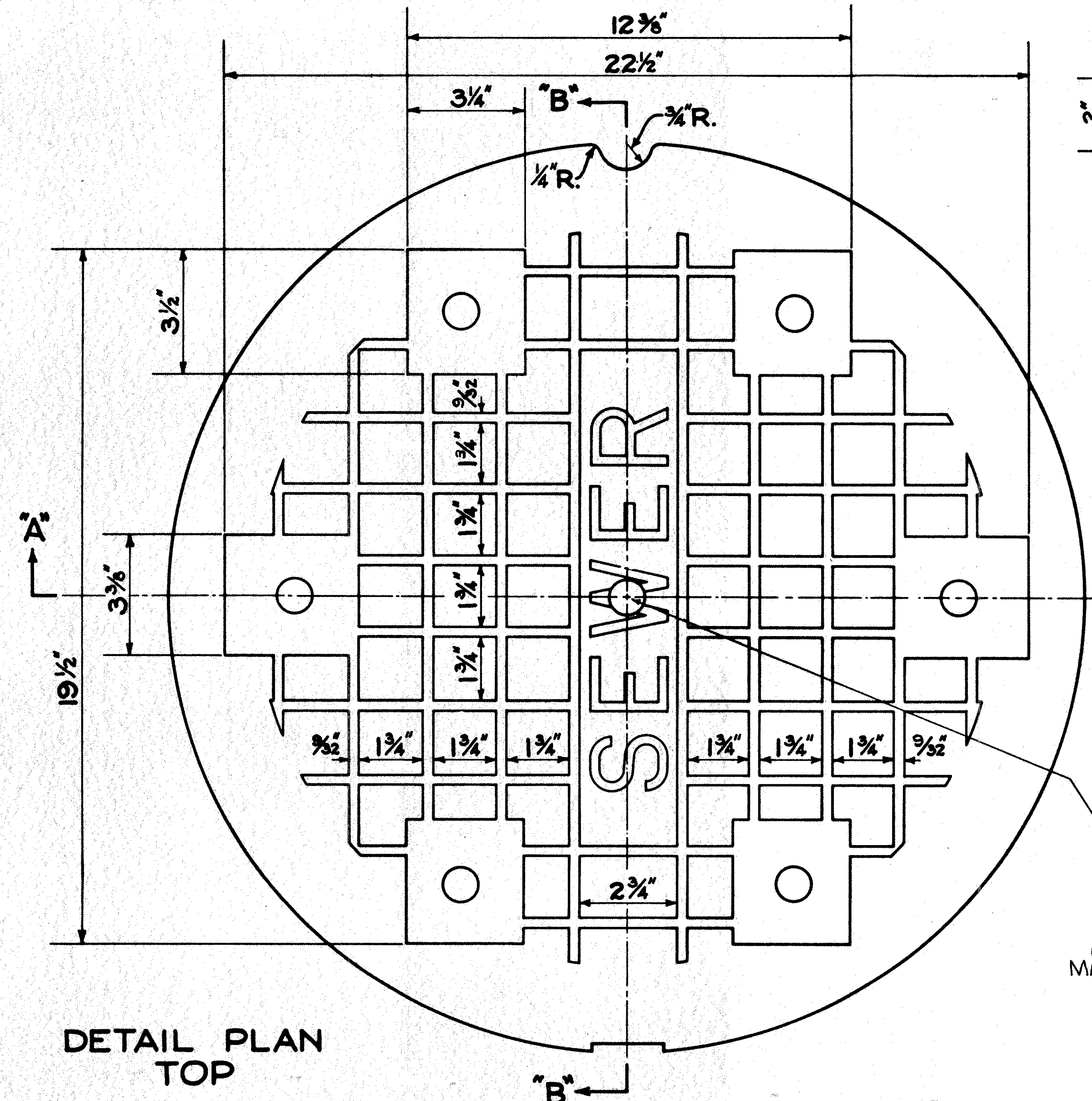
CITY OF CLEVELAND
MANHOLE FRAME

| | |
|--------------|---------|
| SCALE N.T.S. | DATE |
| DESIGNED | DRAWN |
| TRACED | CHECKED |
| REVIEWED | DATE |
| REVISOR | |

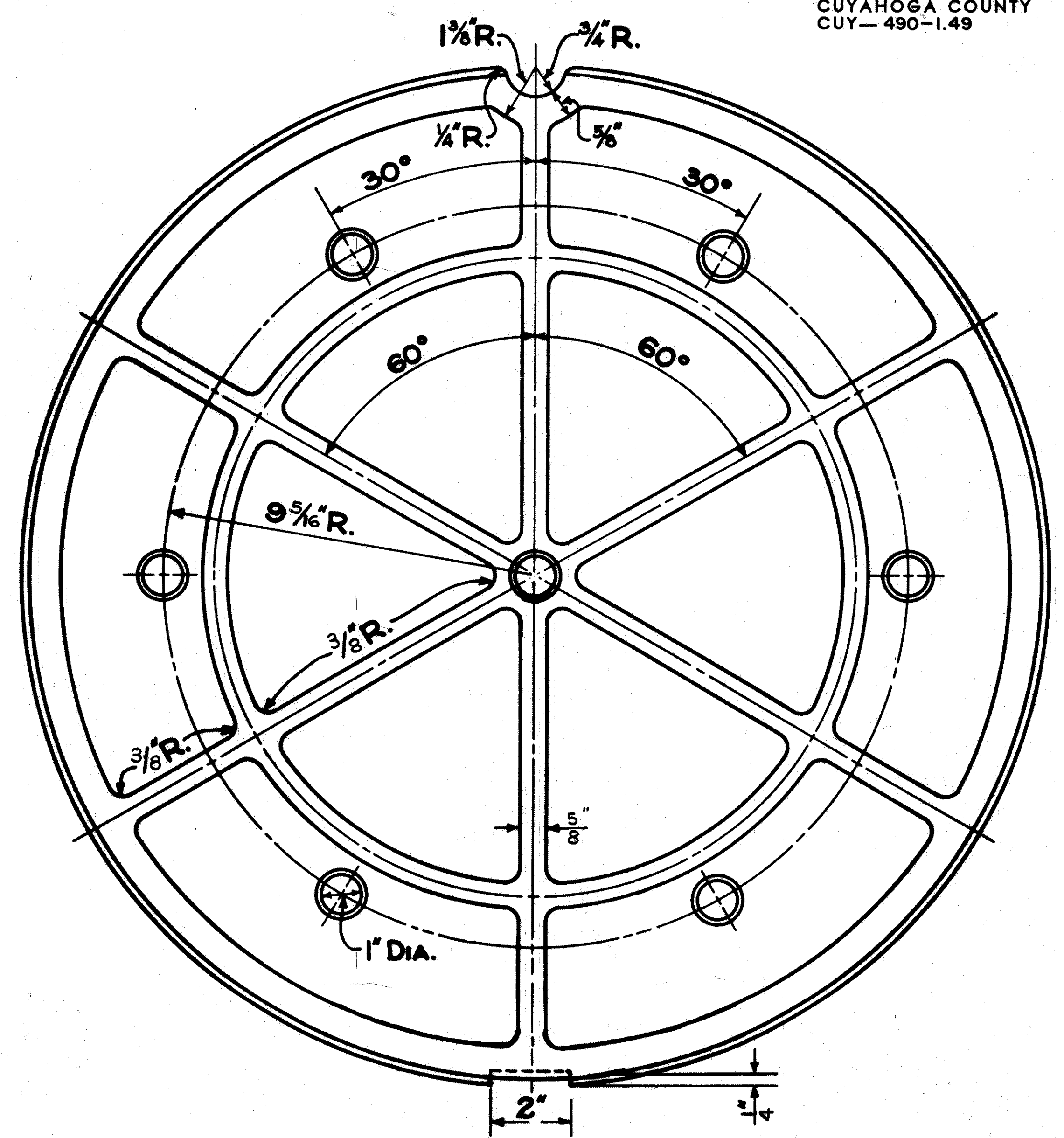
| | | | |
|-------------|-------|---------|--|
| FHWA REGION | STATE | PROJECT | |
| 2 | OHIO | | |

65
261

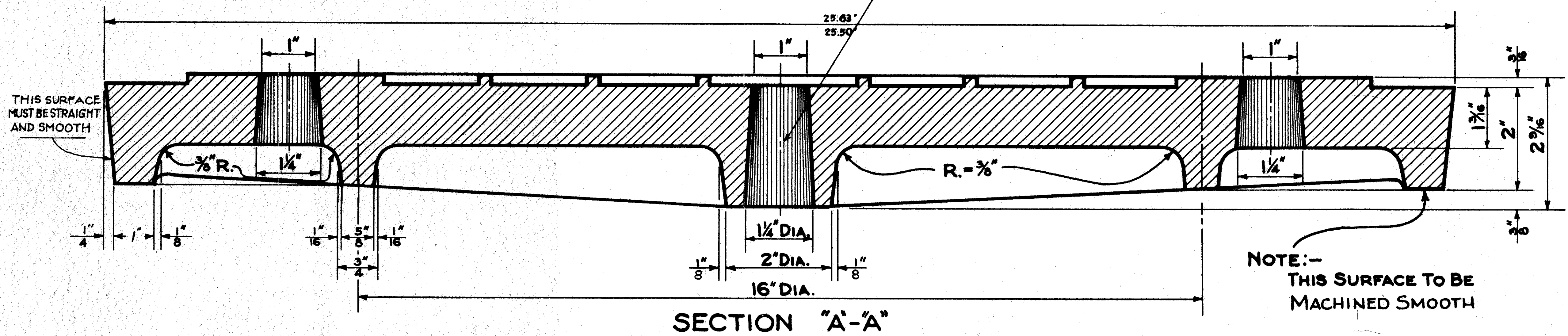
CUYAHOGA COUNTY
CUY-490-1.49



OPTION
CENTER HOLE
MAY BE OMITTED



DETAIL PLAN
BOTTOM



THIS SURFACE
MUST BE STRAIGHT
AND SMOOTH

NOTE:-
THIS SURFACE TO BE
MACHINED SMOOTH

MINIMUM WEIGHT OF COVER - 195 POUNDS

TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

CITY OF CLEVELAND
MANHOLE COVER

| | |
|--------------|----------|
| SCALE N.T.S. | DATE |
| DESIGNED | DRAWN |
| TRACED | CHECKED |
| REVIEWED | DATE |
| REVISOR | REVISION |

CONT. NO. SHEET ACCT. NO.

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

66
261

CUYAHOGA COUNTY
CUY-490-1.49



NOTES AND LEGEND

- MATCH LINE AND OR SKEW LINE MATCH LINE
- STATION AT WHICH CROSS SECTION IS TAKEN 15+00
- EXISTING CONTOURS 76 75
- PROPOSED CONTOURS 42 40
- PROPOSED ELEVATIONS 60.58
- FOR U.S.G.S. EL. DATUM ADD 600.00 TO ELEVATIONS SHOWN
- DIRECTION OF SURFACE WATER FLOW
- SLOPE LINE 2:1
- FOR CRUSHED AGGREGATE SLOPE PROTECTION AT BRIDGES
SEE BRIDGE PLANS.
WORK GRADING PLAN WITH BRIDGE PLANS
- WORK GRADING PLAN WITH CROSS SECTIONS.
FOR CROSS SECTIONS SEE SHEETS
I-490 67-77
W-S RAMP 78-82
N-W RAMP 83-86
BROADWAY 87-91

REVISOR: LHV/JRH

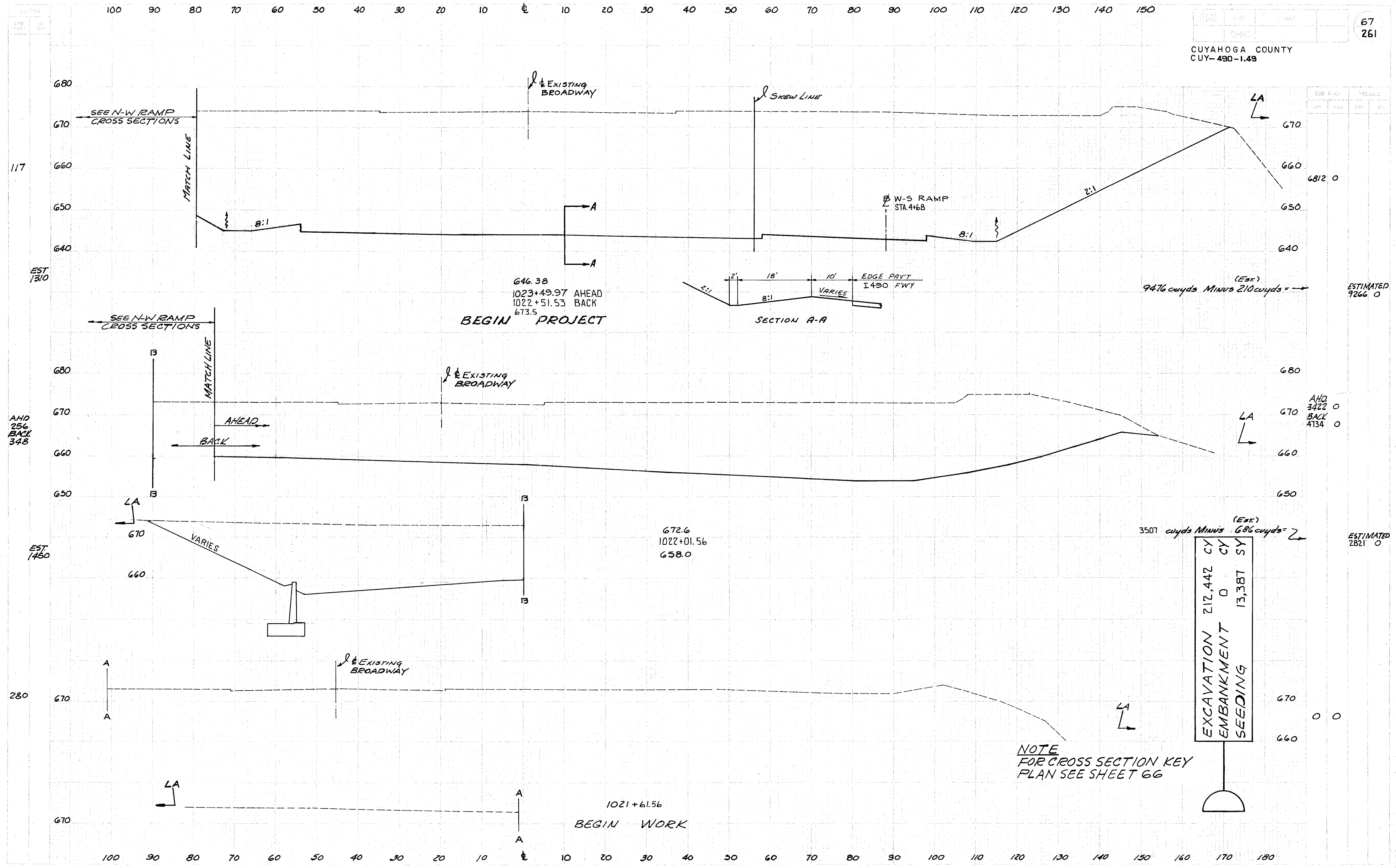
TRYGVE HOFF & ASSOCIATES
ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO

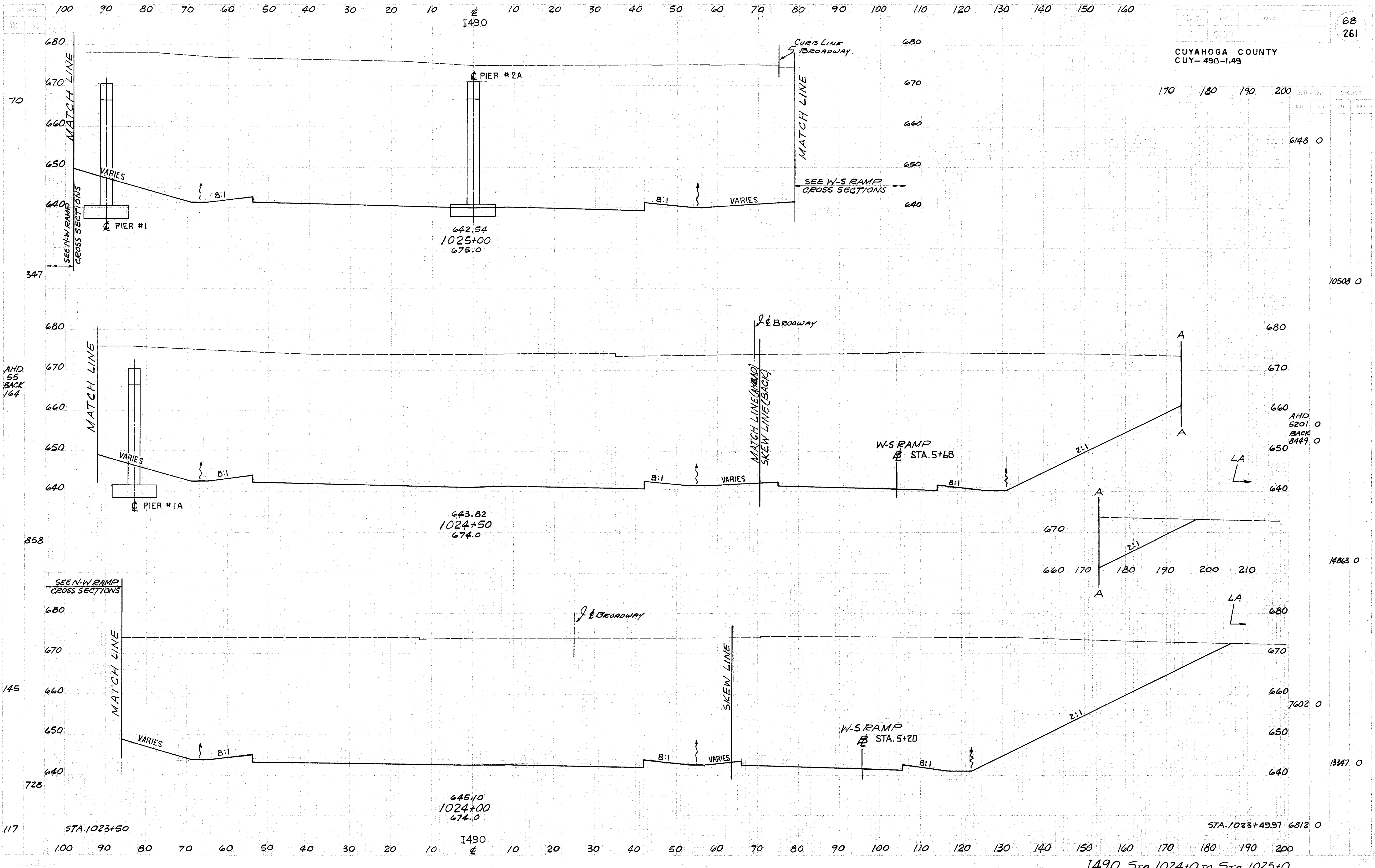
**GRADING PLAN &
CROSS SECTION KEY PLAN**
BROADWAY AREA

| | | | | | | |
|----------|--------|--------|---------|----------|--------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| D.W.S. | J.L.B. | | F.T. | T.L.L. | 8/1/63 | |

SCALE: 1" = 50' DATE

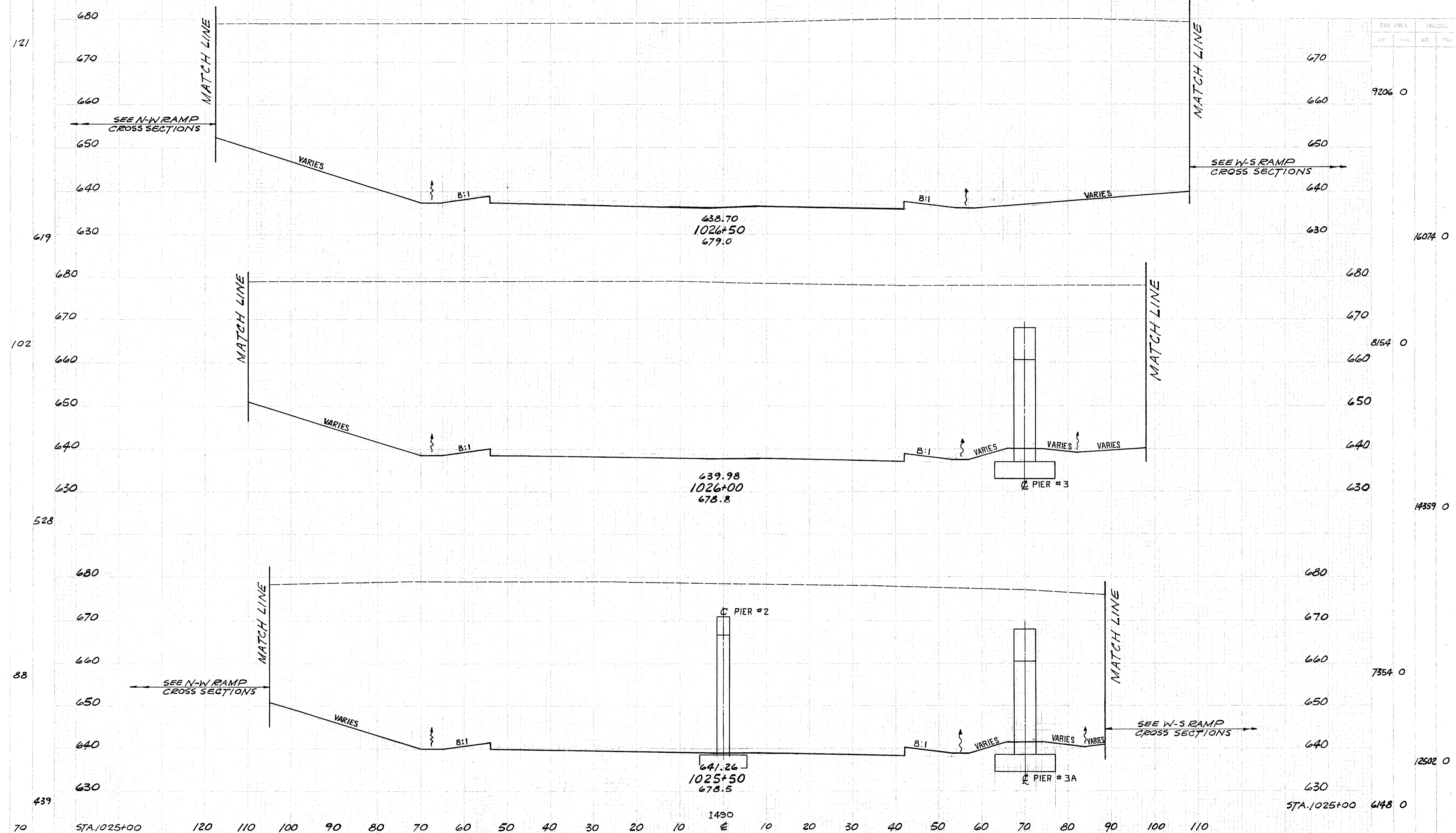
SHEET NO. 1





| STA. | EMP. AREA | | VOLUME | |
|------|-----------|-------|--------|-------|
| | EST. | PREL. | EST. | PREL. |
| 170 | | | | |
| 180 | | | | |
| 190 | | | | |
| 200 | | | | |
| | | | 6148 | 0 |
| | | | 10508 | 0 |
| | | | 14863 | 0 |
| | | | 7602 | 0 |
| | | | 13347 | 0 |
| | | | 6812 | 0 |

I490 STA. 1024+0 TO STA. 1025+0



638.70
1026+50
679.0

639.98
1026+00
678.8

641.26
1025+50
678.5

1490

1490 STA. 1025+50 TO STA. 1026+50

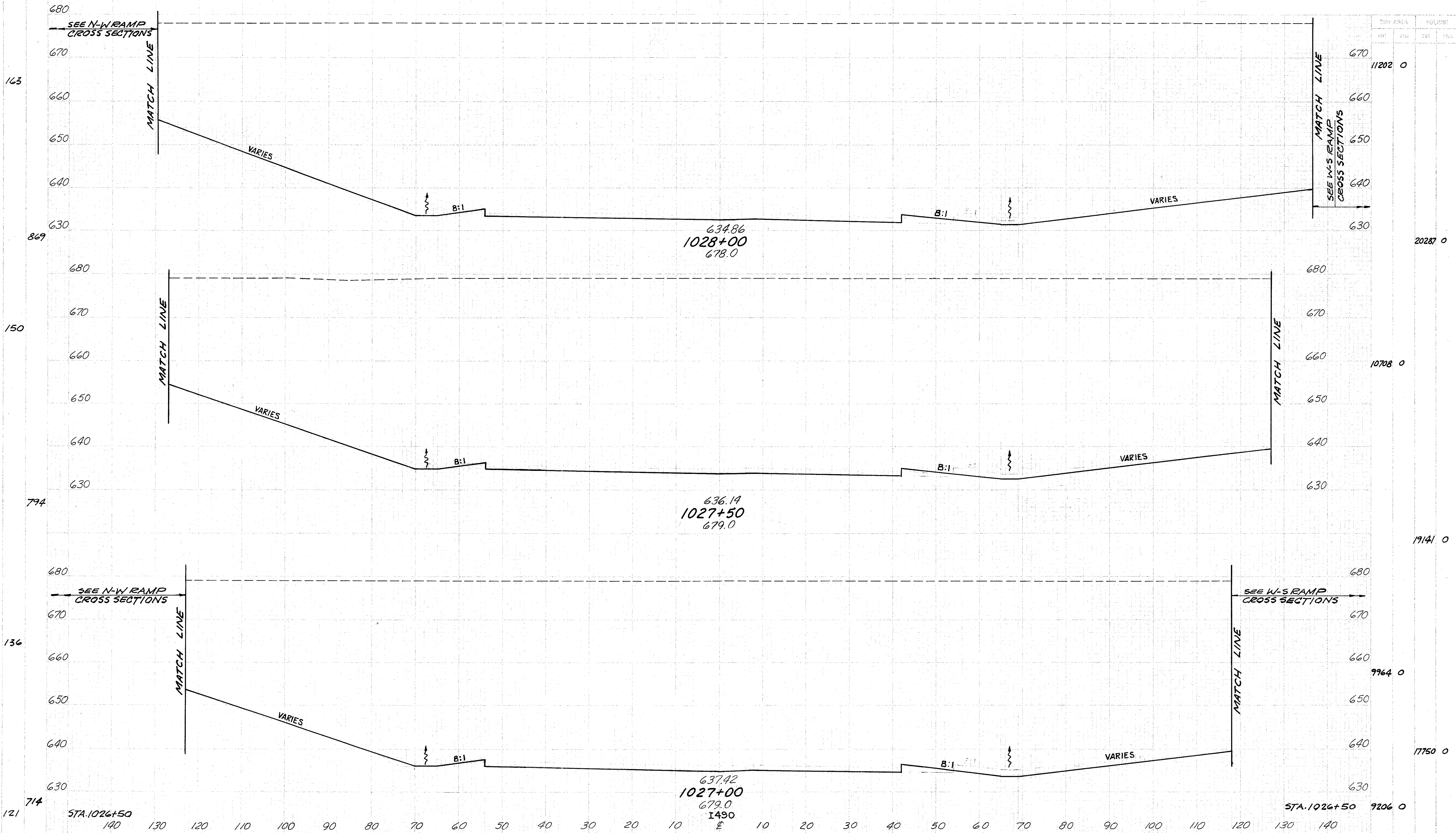
SHEET NO. 261

140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110

I490

CUYAHOGA COUNTY
CUY-490-1.49

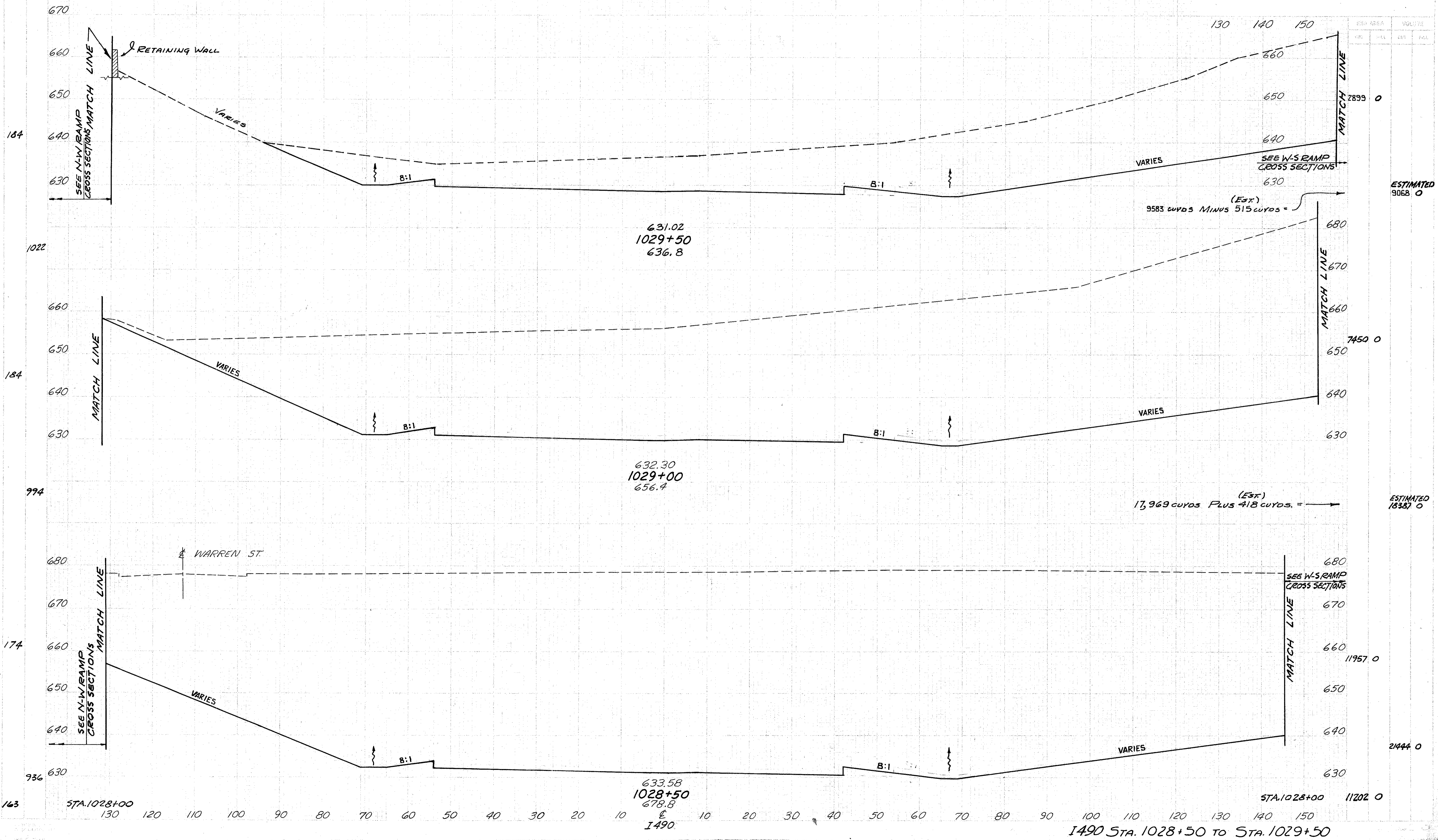
70
261



130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120

I490

CUYAHOGA COUNTY
CUY-490-1.49



631.02
1029+50
636.8

632.30
1029+00
656.4

633.58
1028+50
678.8
I490

I490 STA. 1028+50 TO STA. 1029+50

ESTIMATED
9068 0

ESTIMATED
18387 0

21444 0

| STA. | AREA | | VOLUME | |
|---------|------|---------|----------|-----------|
| | FT. | SQ. FT. | CUB. FT. | CUB. YDS. |
| 1029+50 | 130 | 660 | 2899 | 0 |
| 1029+00 | 130 | 650 | 7450 | 0 |
| 1028+50 | 130 | 640 | 11957 | 0 |
| 1028+00 | 130 | 630 | 21444 | 0 |

90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140

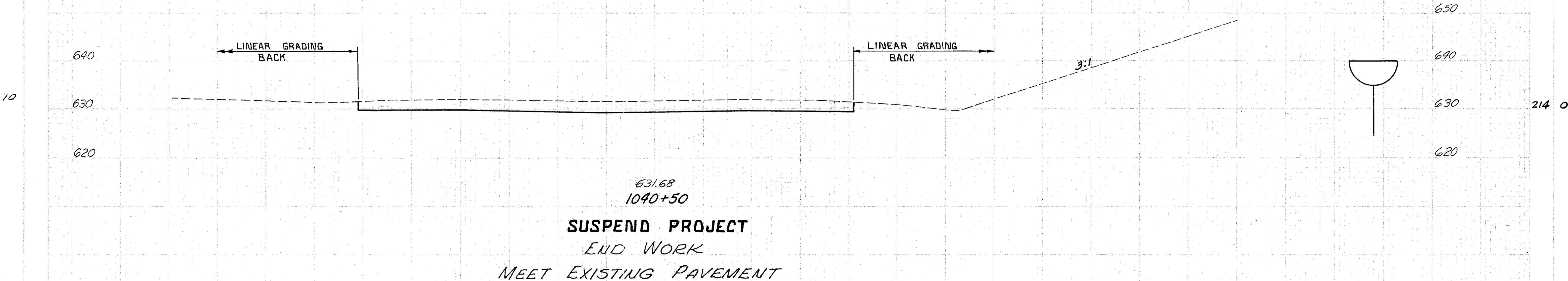
1490

| | | |
|----------|-----|---------|
| DATE | BY | PROJECT |
| 01/10/10 | OMG | |

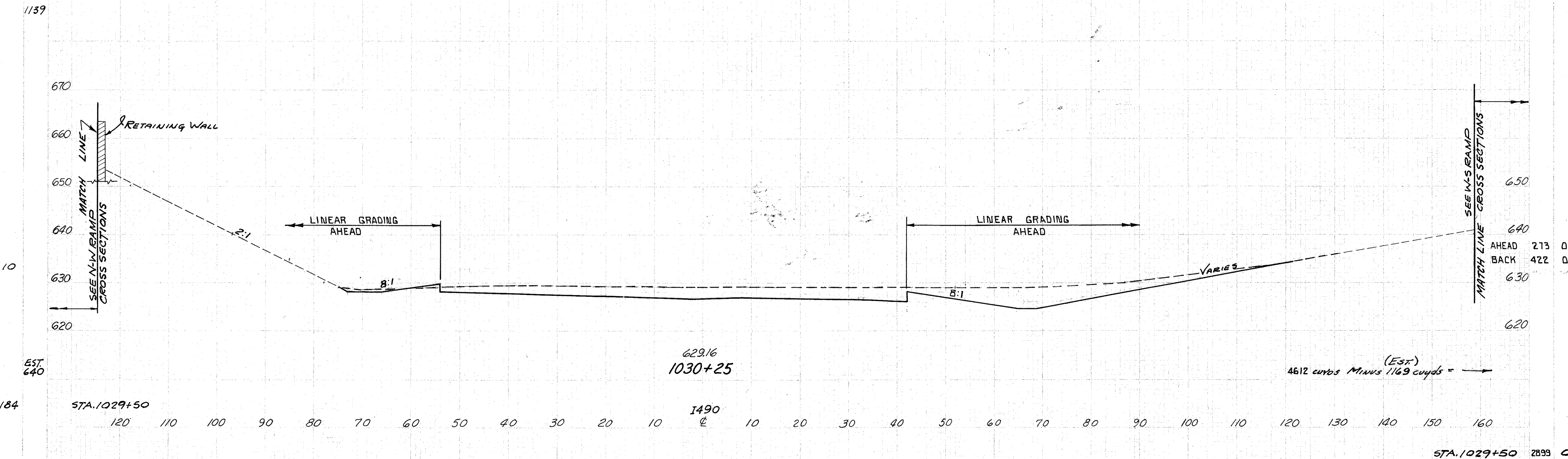
72
261

CUYAHOGA COUNTY
CUY-490-1.49

| SUB AREA | | VOLUME | |
|----------|------|--------|------|
| LINE | AREA | CUYD | CUYD |

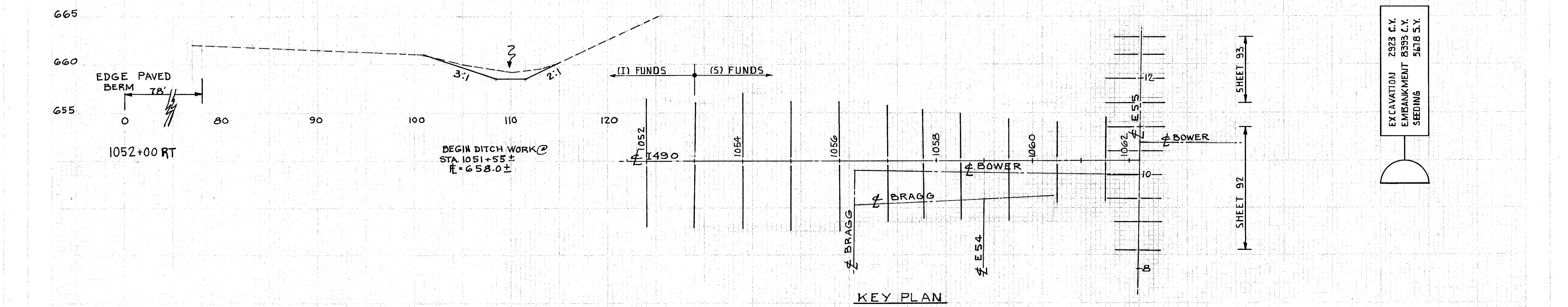
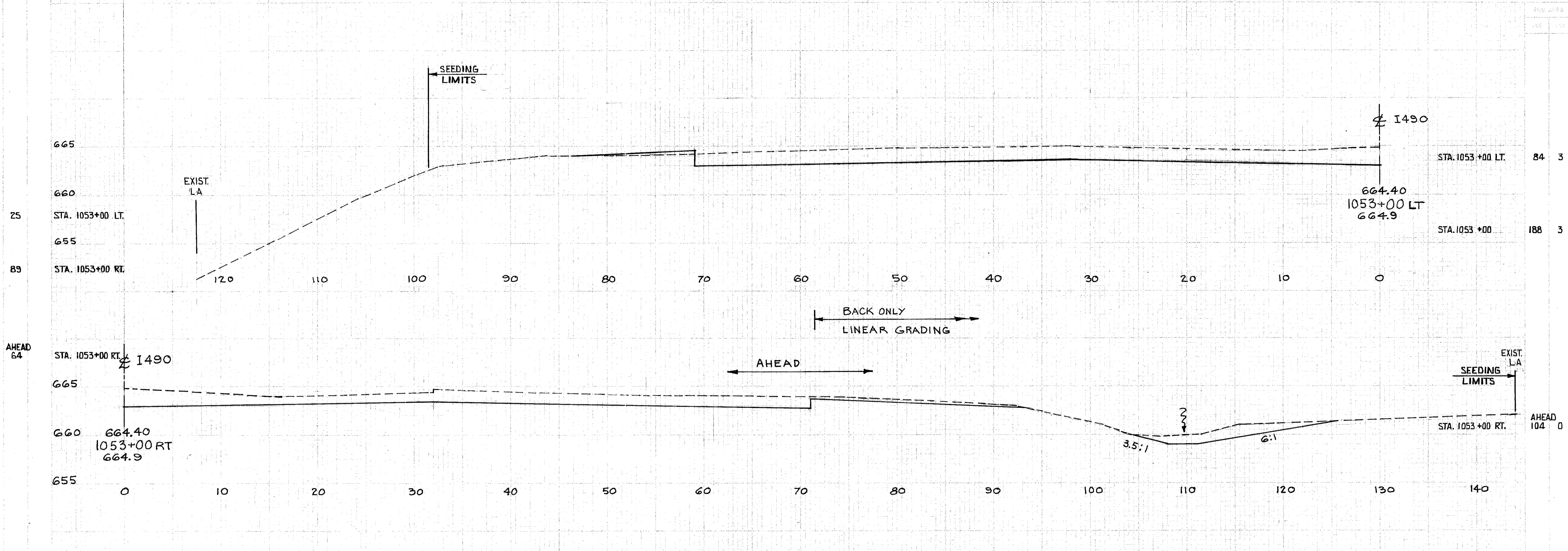


9245 0

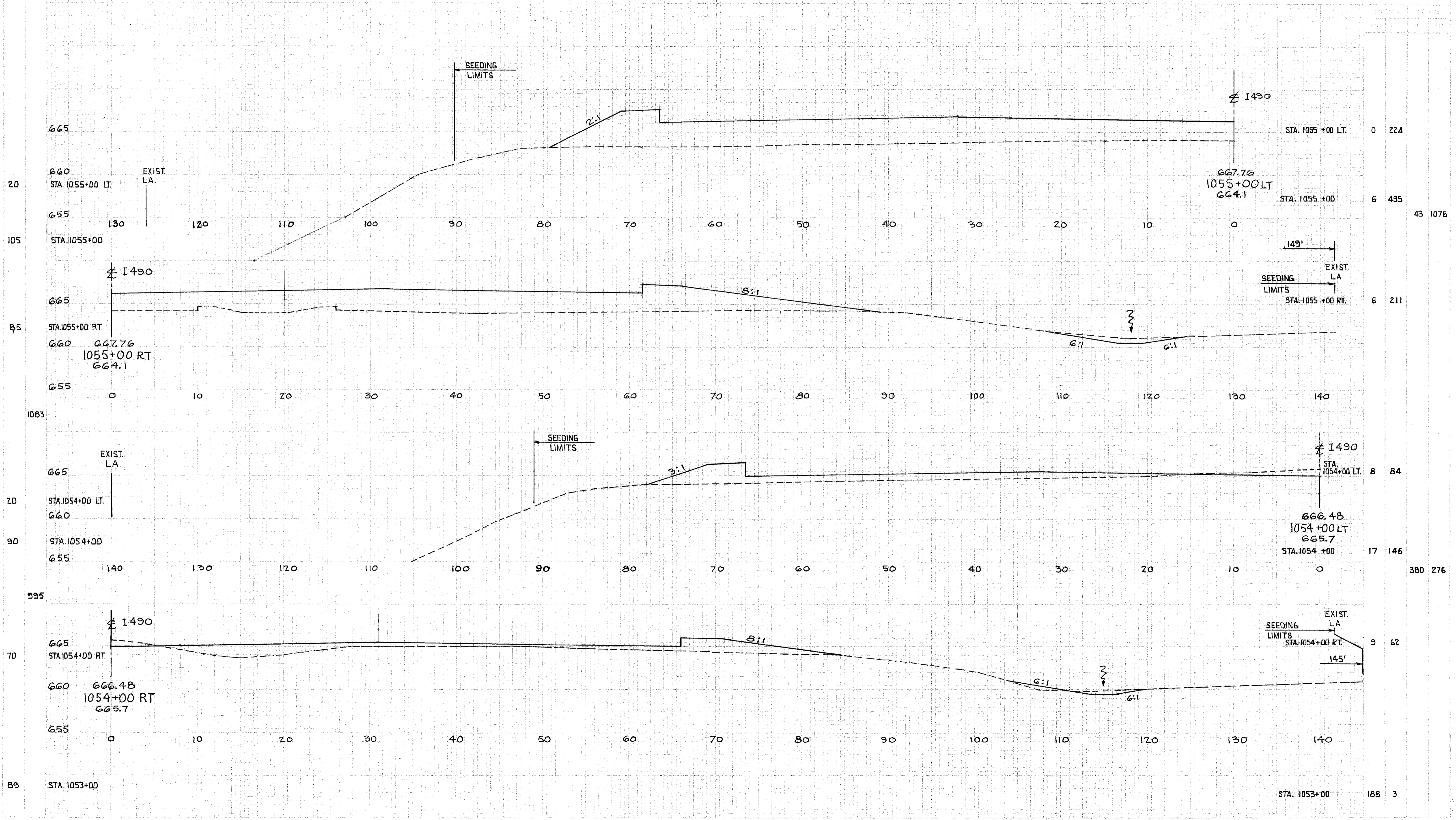


ESTIMATED
3443 0

1490 STA. 1030+25 TO STA. 1040+50



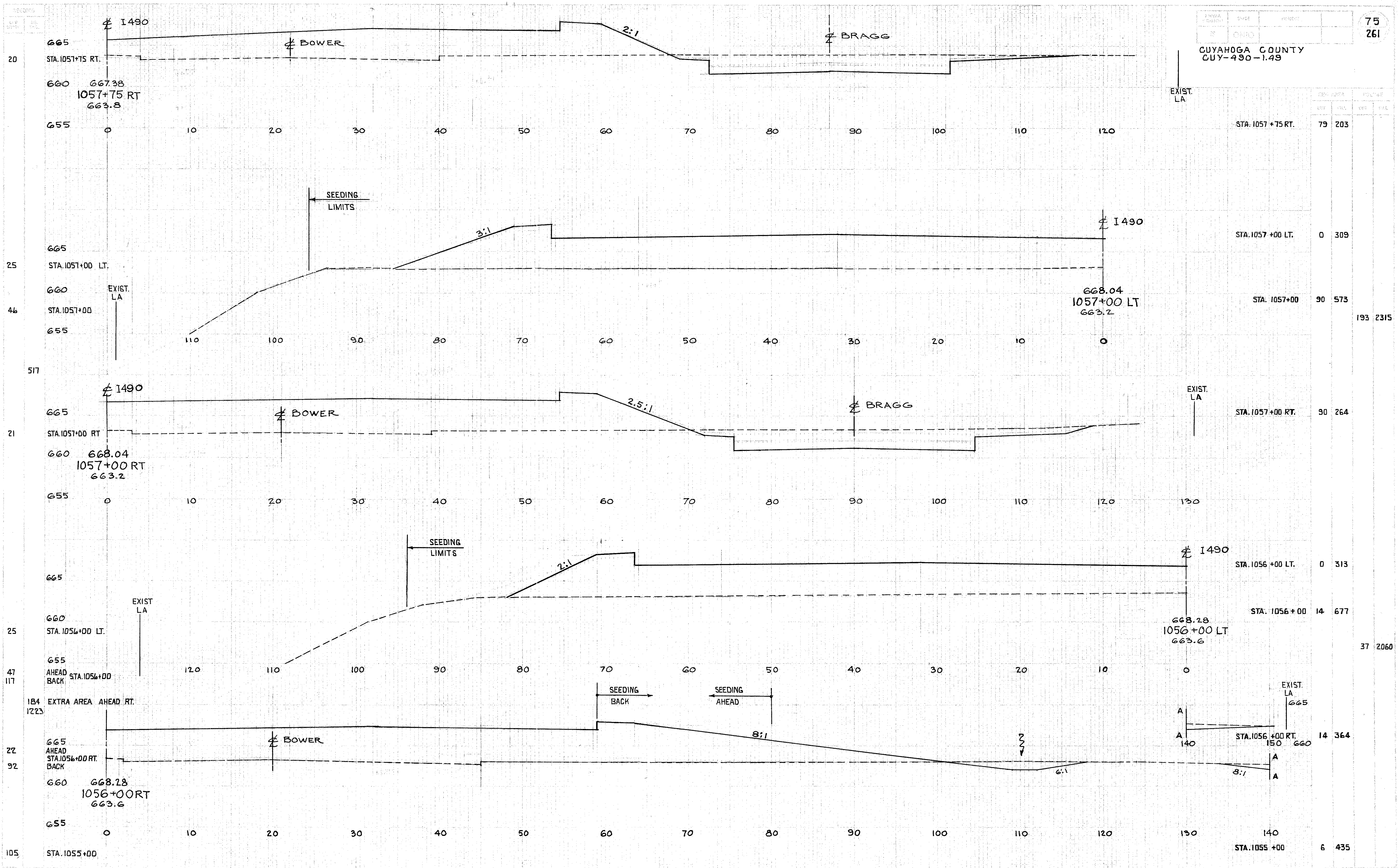
EXCAVATION 2923 C.Y.
EMBANKMENT 8393 C.Y.
SEEDING 5418 S.Y.



I490 STA 1054+0 TO 1055+0

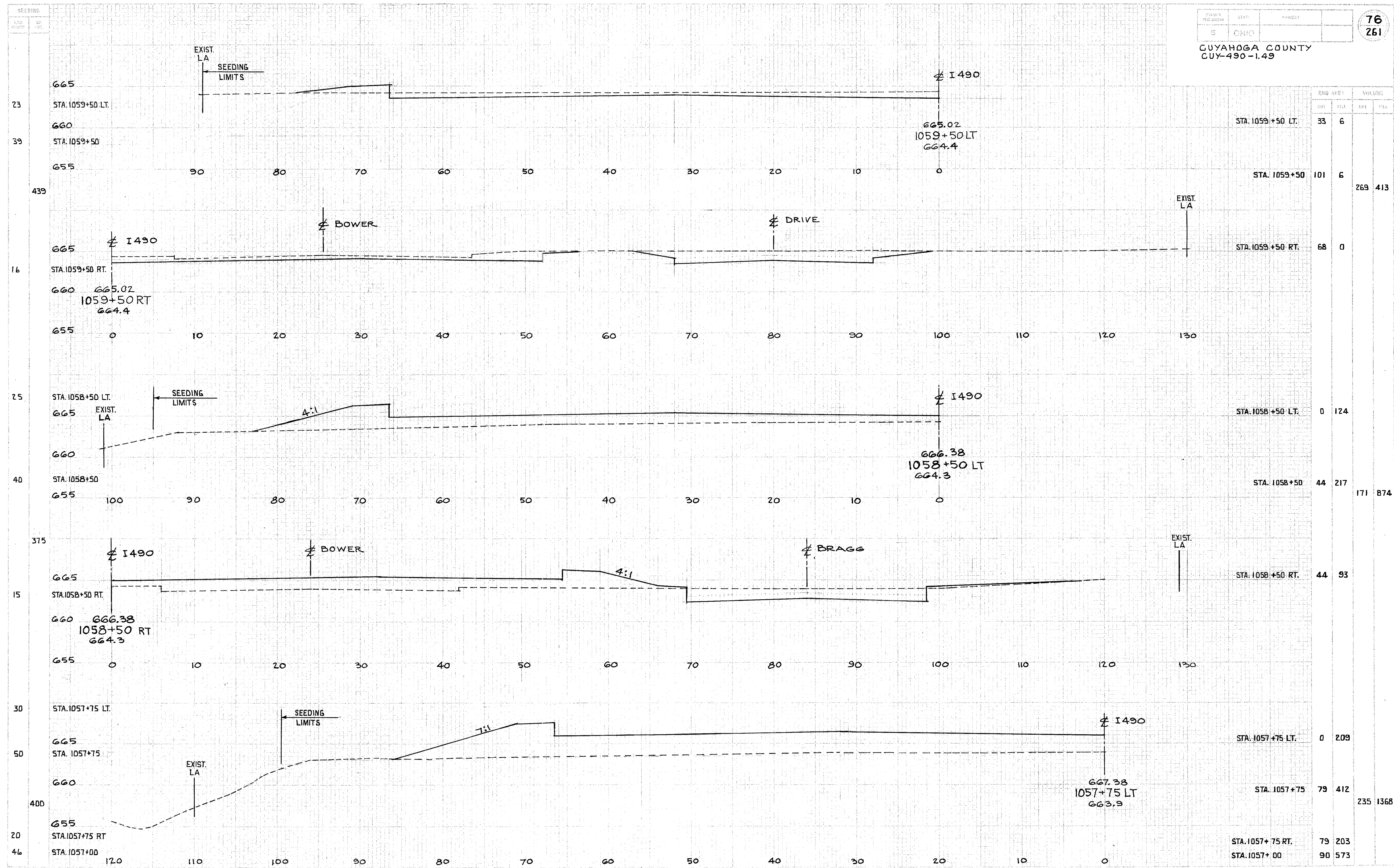
| | | |
|---------|------|----------|
| PROJECT | DATE | REVISION |
| NO. | DATE | |

CUYAHOGA COUNTY
CUY-490-1.49

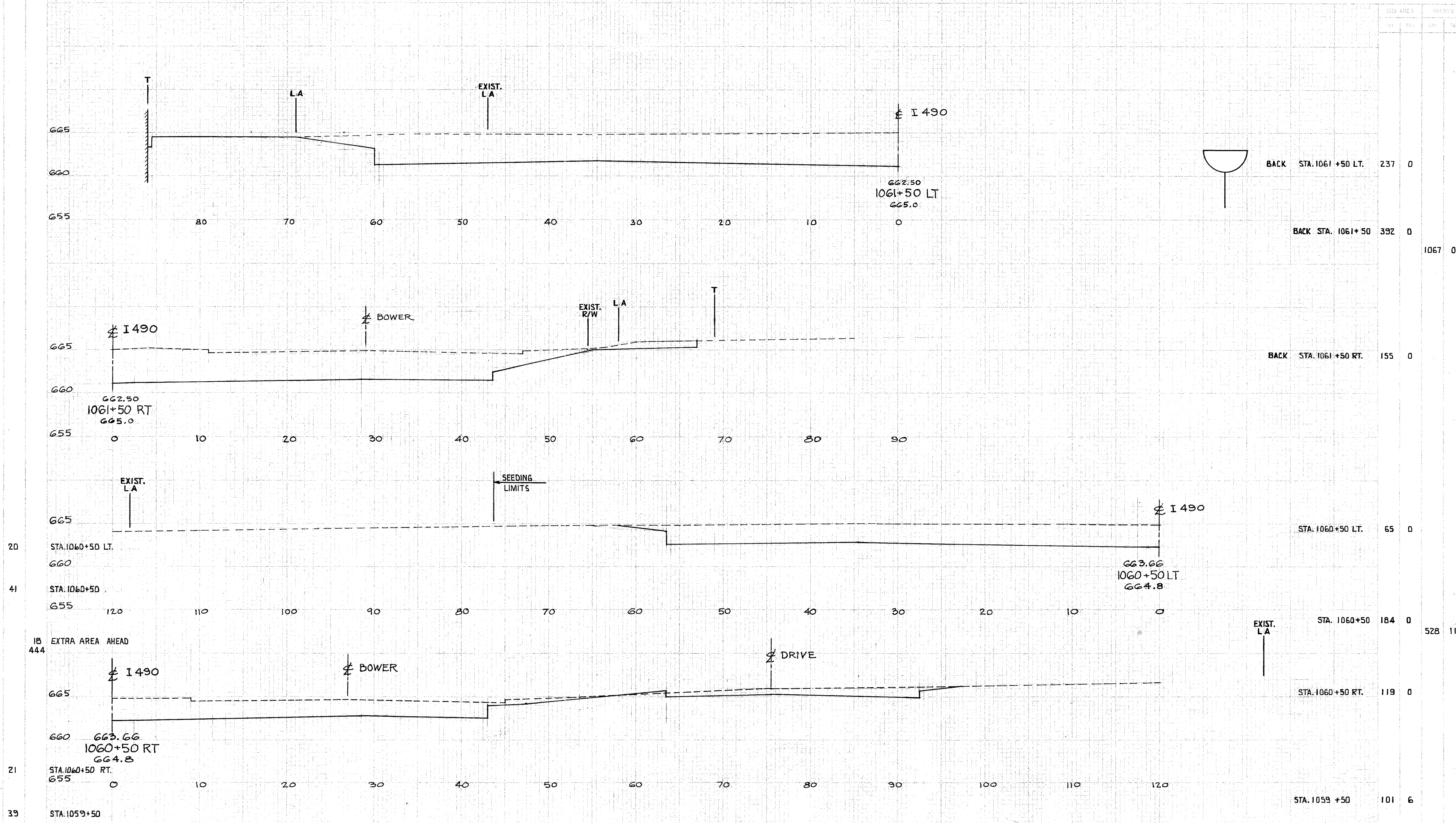


| STATION | AREA | FOOTING |
|---------|------|----------|
| 79 | 203 | |
| 0 | 309 | |
| 90 | 573 | 193 2315 |
| 90 | 264 | |
| 0 | 313 | |
| 14 | 677 | 37 2060 |
| 14 | 364 | |
| 6 | 435 | |

I490 STA 1056+0 TO 1057+75 RT

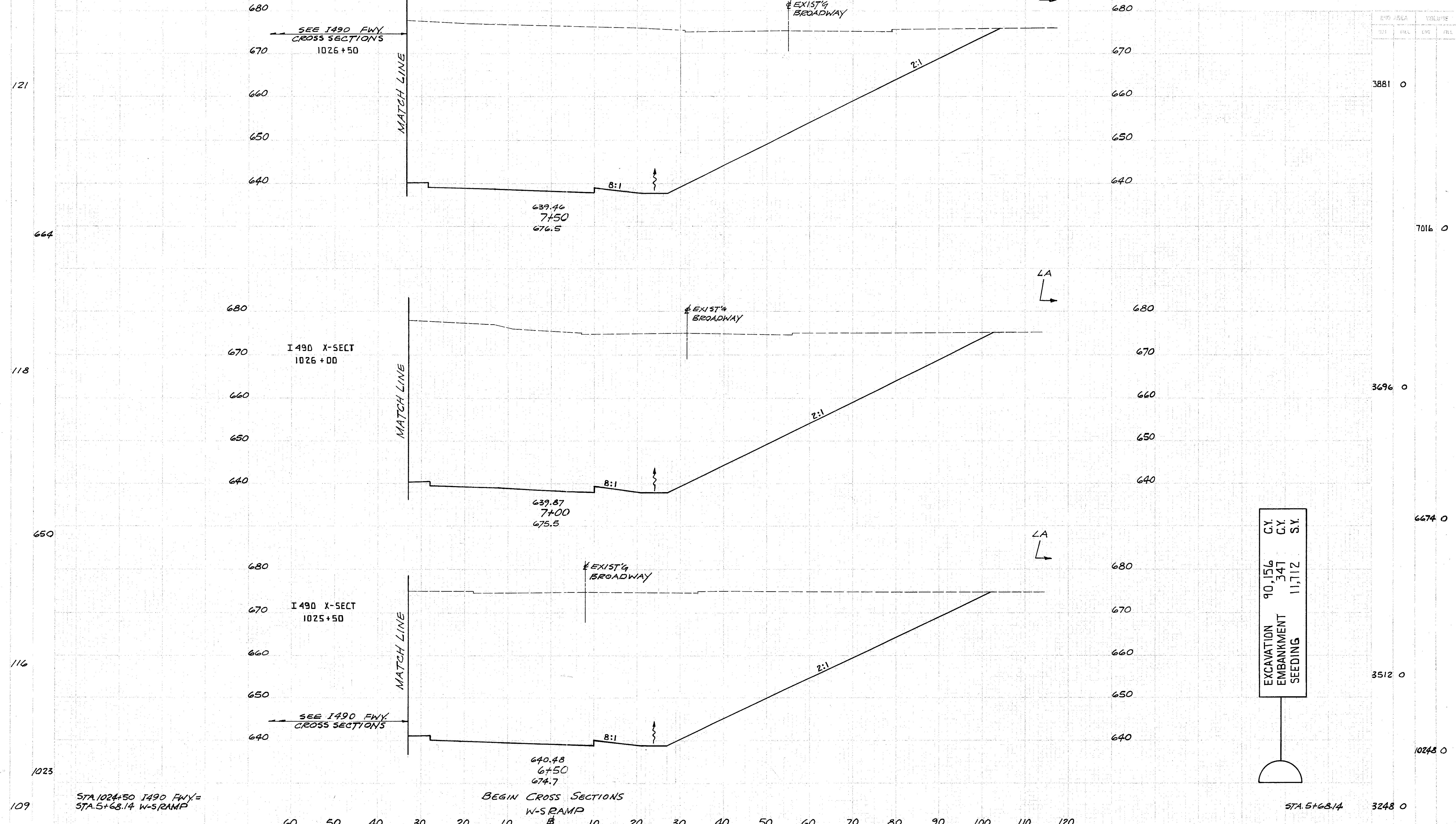


I490 STA 1057+75 LT to 1059+50



I 490 STA 1060+50 to 1061+50

60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120
 W-S RAMP

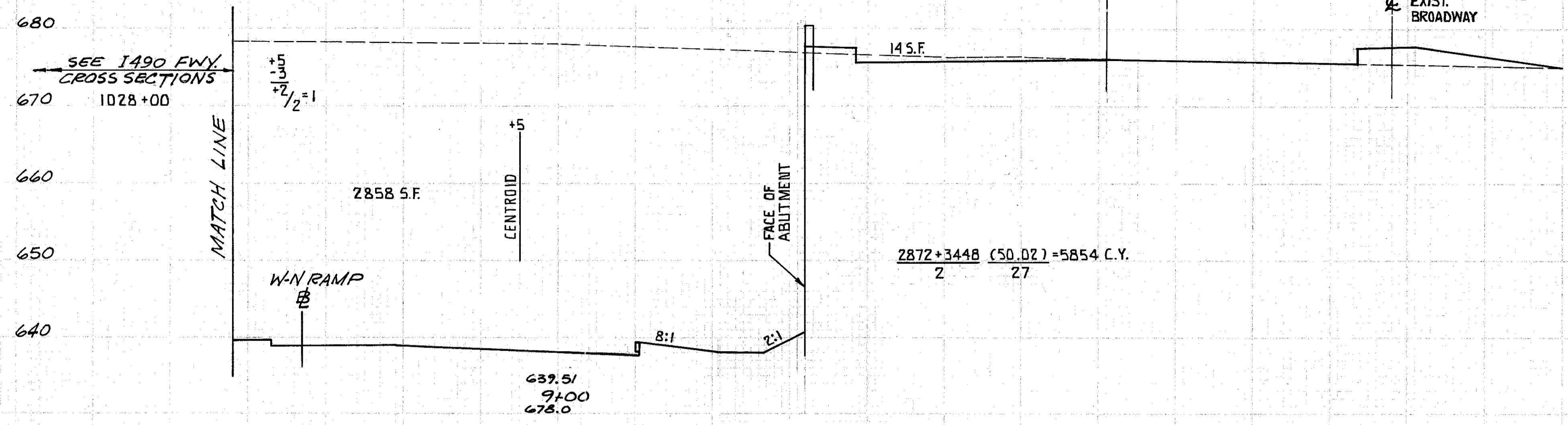


| | | |
|------------|--------|------|
| EXCAVATION | 90,156 | CY. |
| EMBANKMENT | 341 | CY. |
| SEEDING | 11,712 | S.Y. |

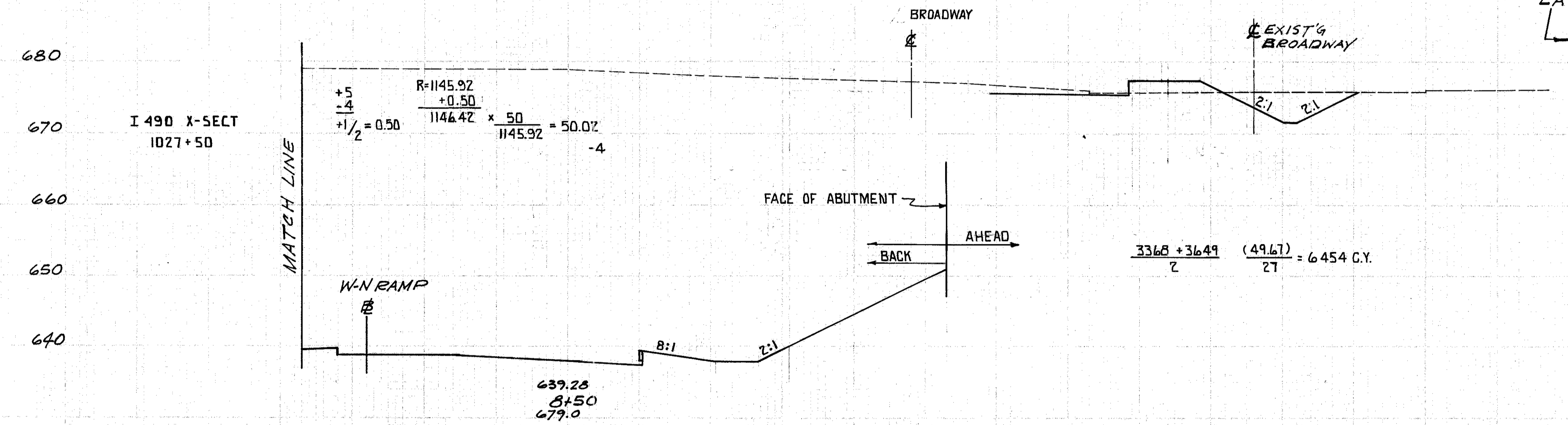
1023
 109
 STA. 1024+50 I490 FWY =
 STA. 5+68.14 W-S RAMP
 BEGIN CROSS SECTIONS
 W-S RAMP
 STA. 5+68.14
 3248 0
 W-S RAMP STA. 6+50 TO STA. 7+50

50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

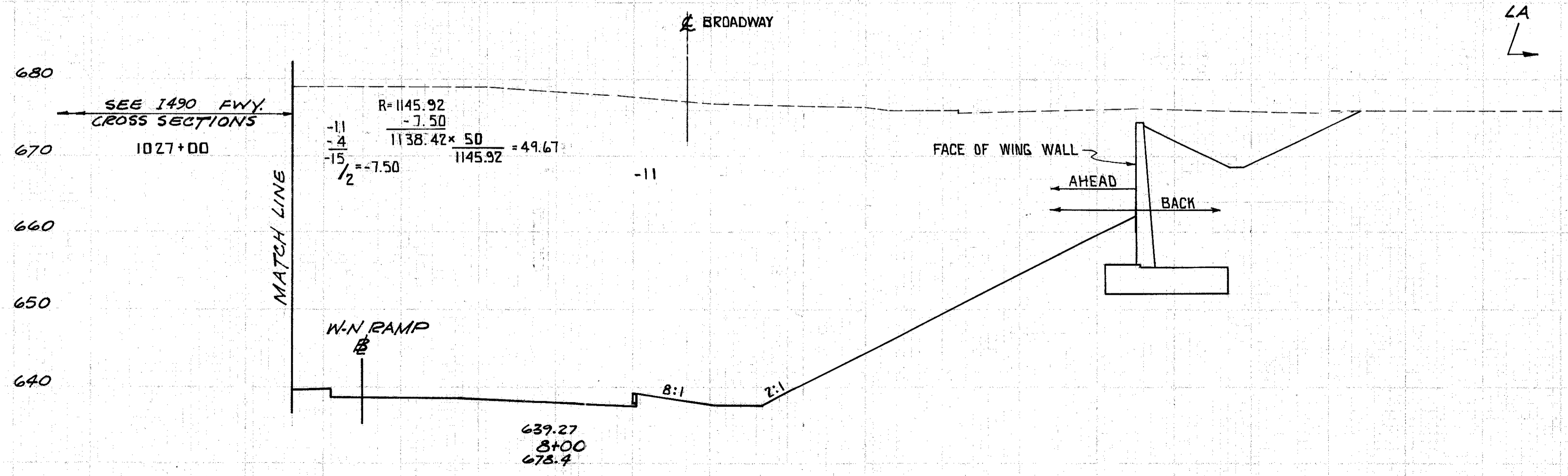
CUYAHOGA COUNTY
CUY-490-1.49



| EMD AREA | | VOLUME | |
|----------|------|--------|----|
| TYPE | FEET | CU | CY |
| AHEAD | 14 | | |
| AHEAD | 2858 | | |
| BACK | 2872 | 41 | |



| EXTRA AREA | | BACK = | |
|------------|------|--------|--|
| AHEAD | 3448 | 12 | |
| BACK | 3368 | 0 | |



| | | |
|-------|------|---|
| AHEAD | 3649 | 0 |
| BACK | 3802 | 0 |

28

222

AHD
52
BACK
89

563

115

656

121

STA. 7+50

50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

STA. 7+50

3881 0

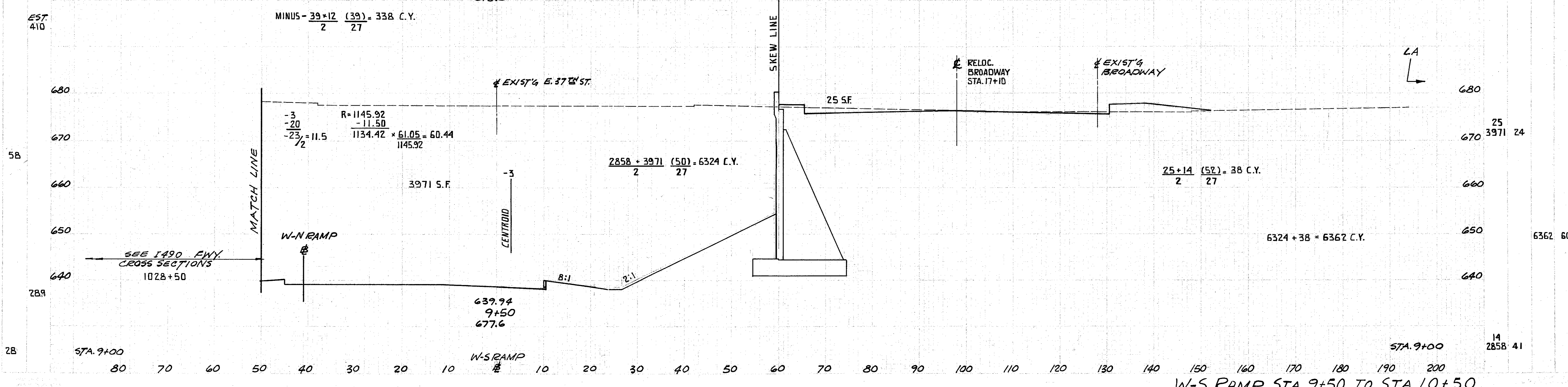
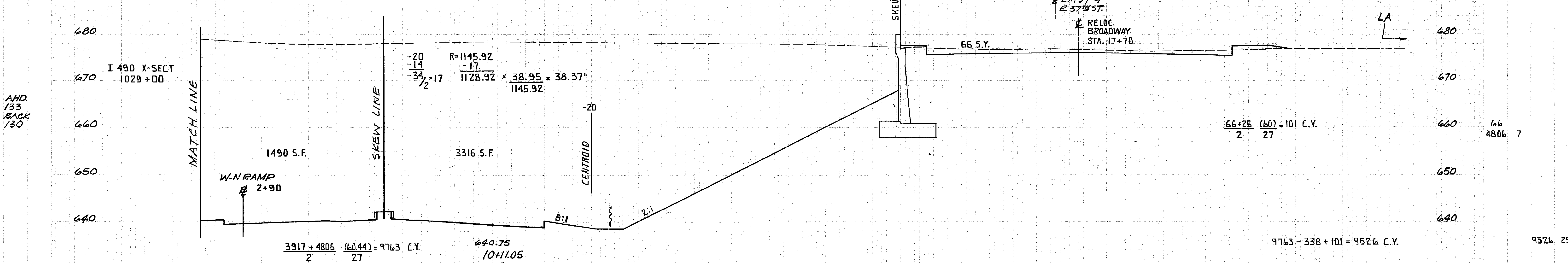
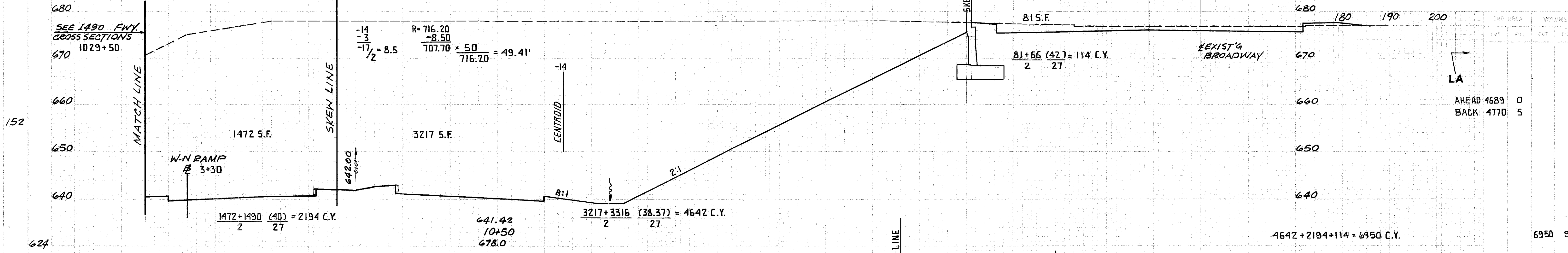
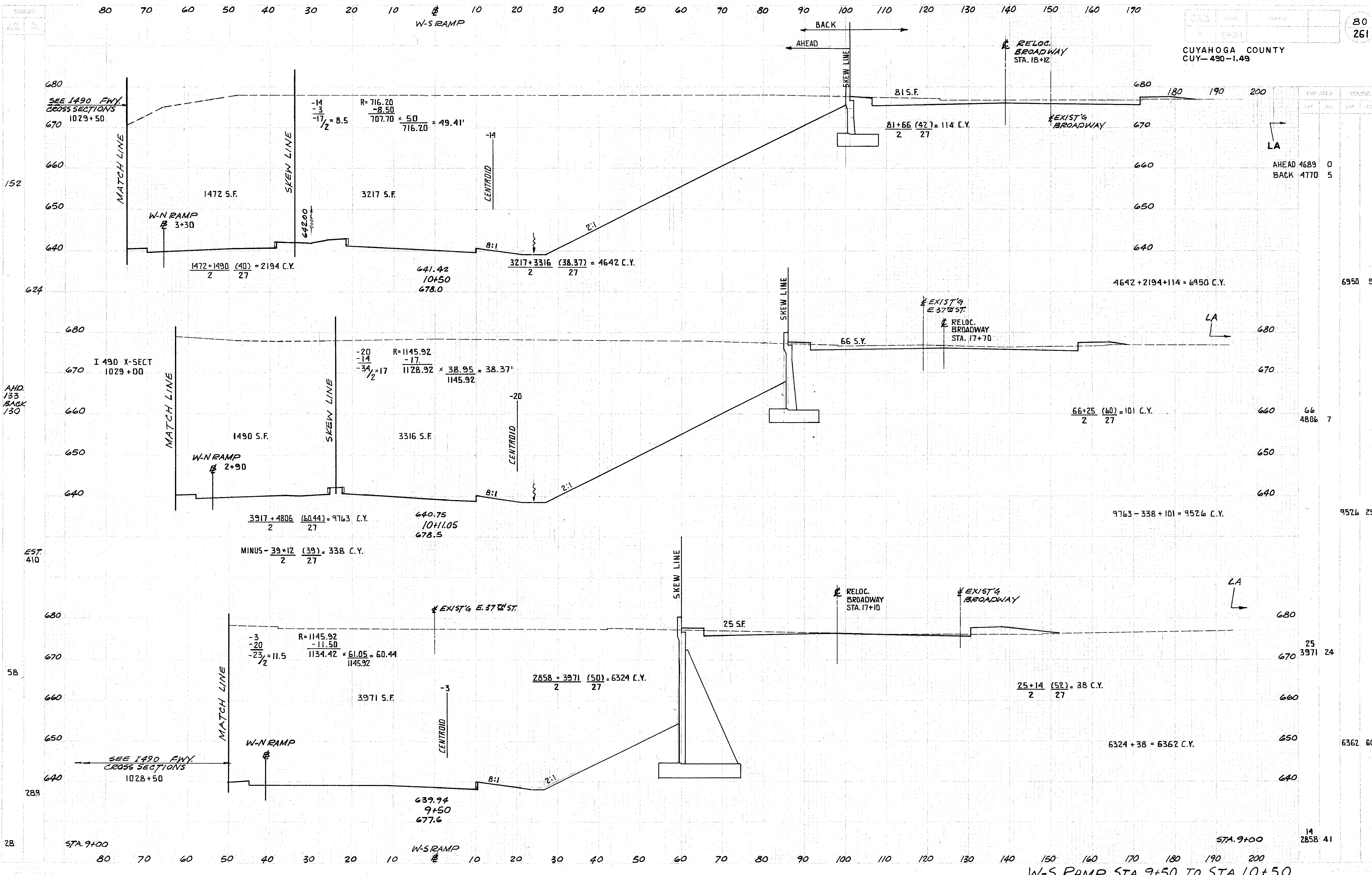
W-S RAMP STA. 8+00 TO STA. 9+00

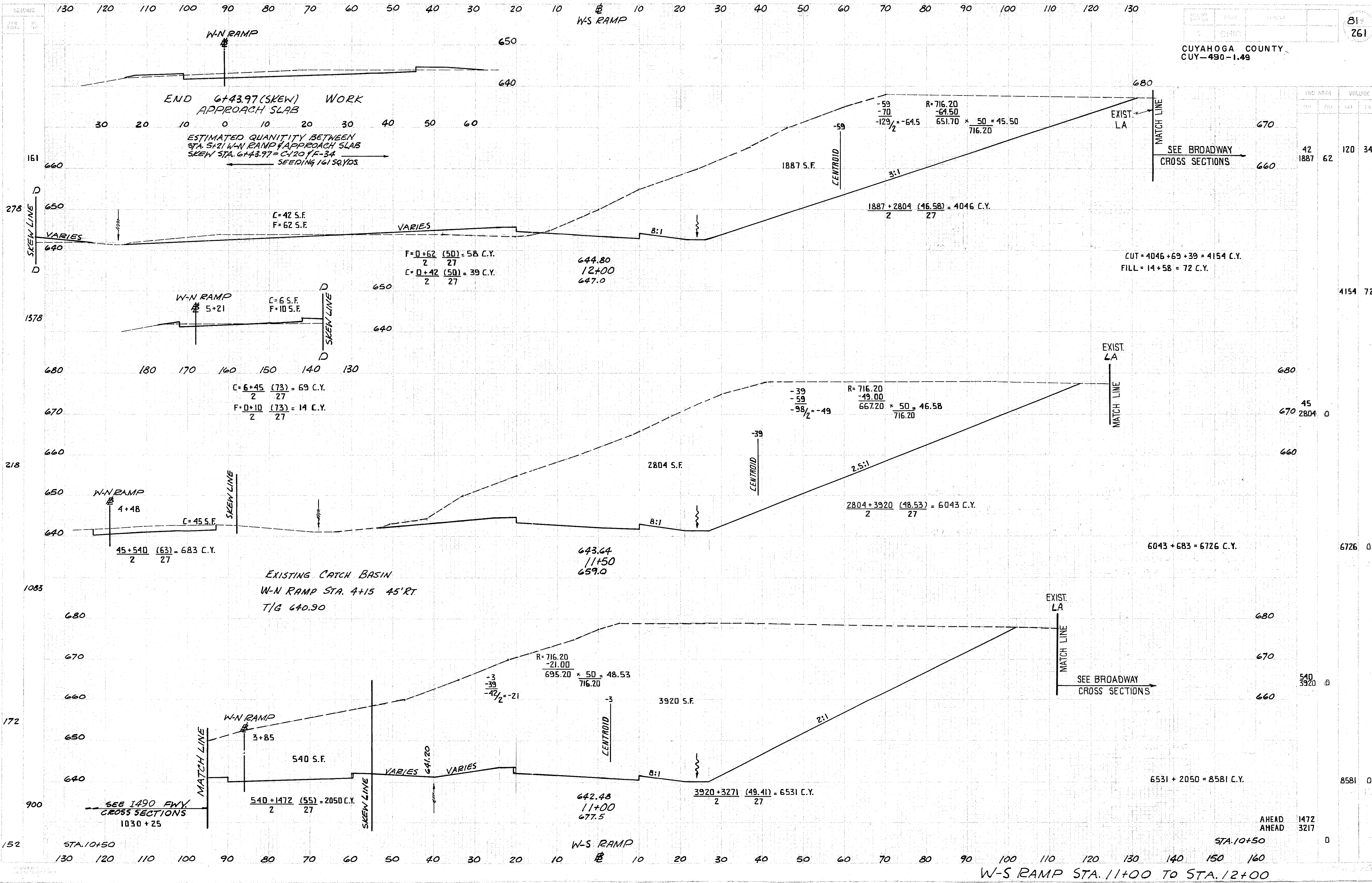
5854 49

93 22

6454 0

1114 0





| LINE | AREA | VOLUME |
|------|------|--------|
| 42 | 1887 | 62 |
| 120 | | 34 |

CUT = 4046 + 69 + 39 = 4154 C.Y.
 FILL = 14 + 58 = 72 C.Y.

4154 72

45
 2804

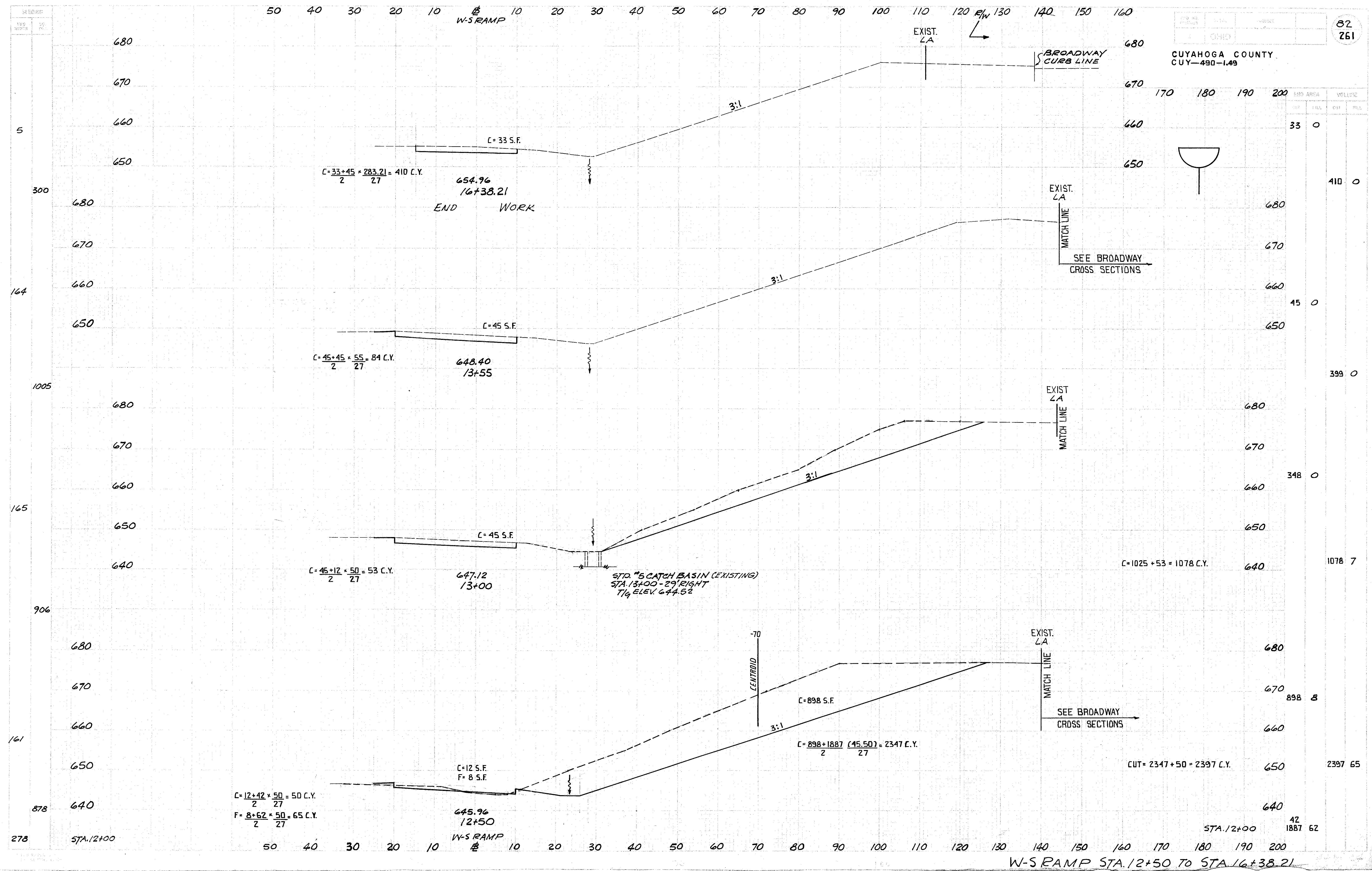
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540
 3920

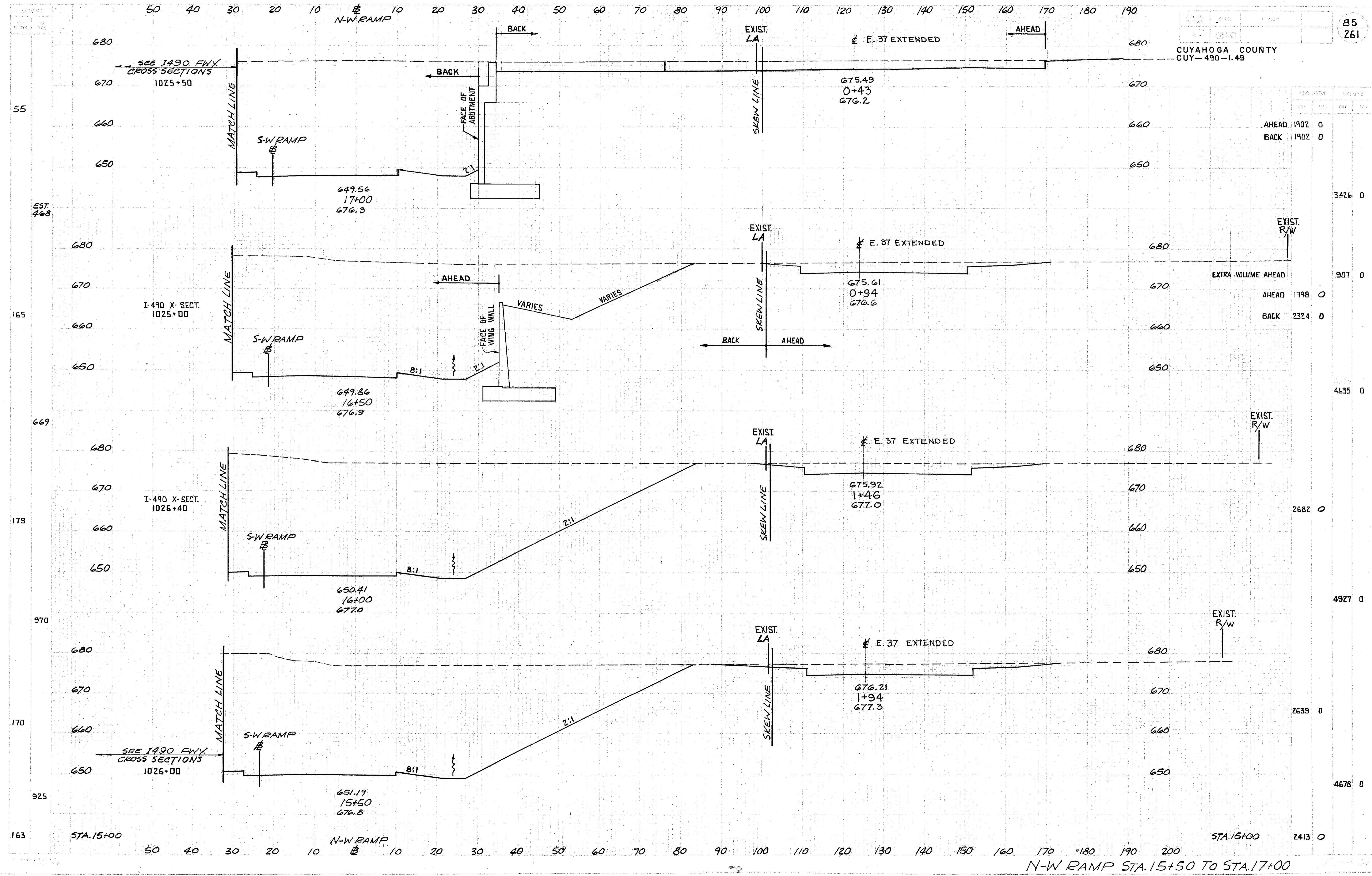
8581 0

AHEAD 1472
 AHEAD 3217

0



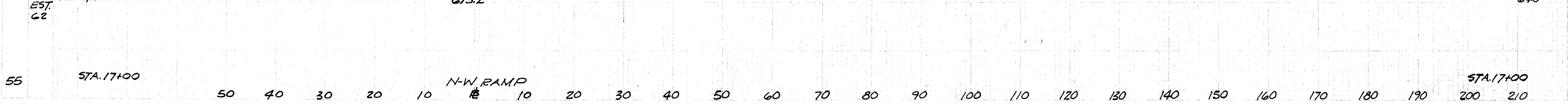
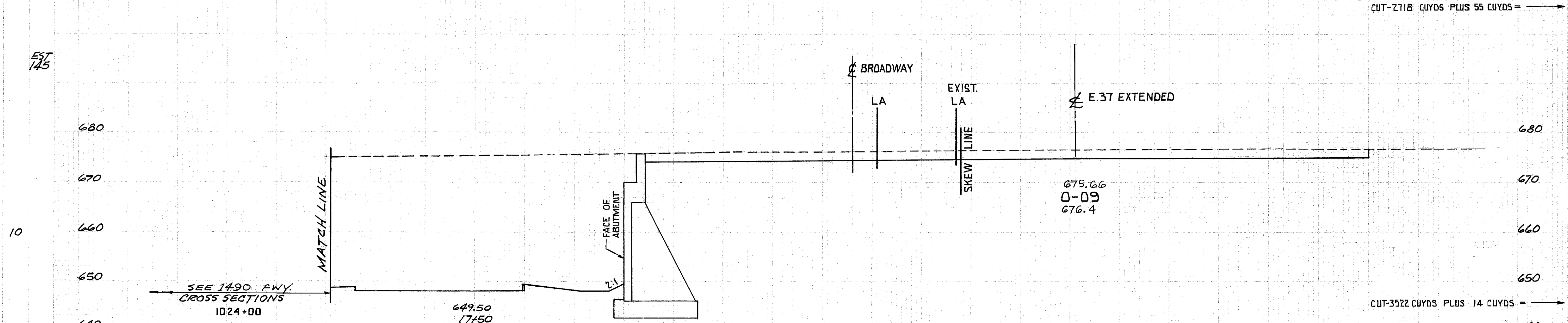
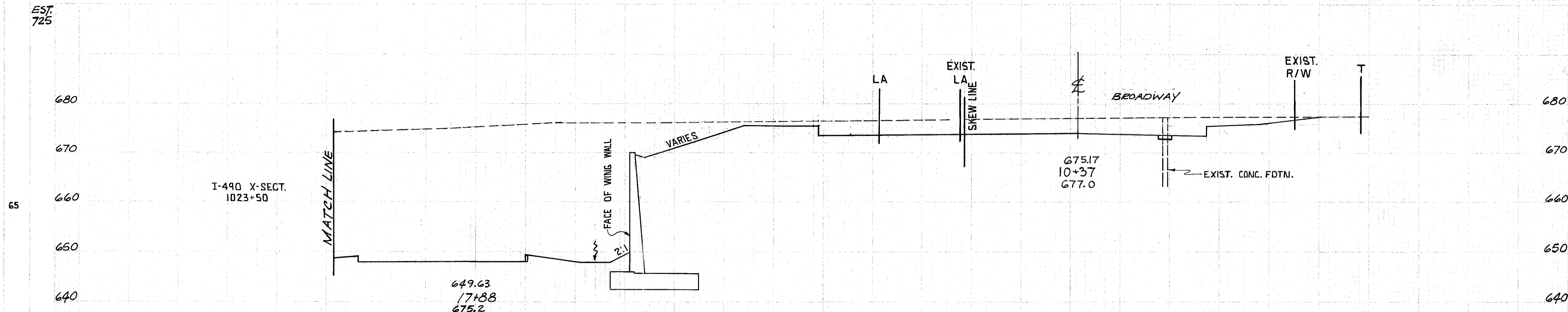
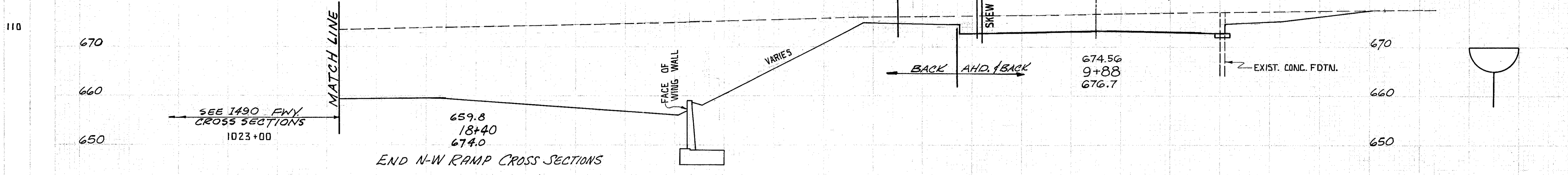
W-S RAMP STA. 12+50 TO STA. 16+38.21



N-W RAMP STA. 15+50 TO STA. 17+00

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CUYAHOGA COUNTY
CUY-490-1.49

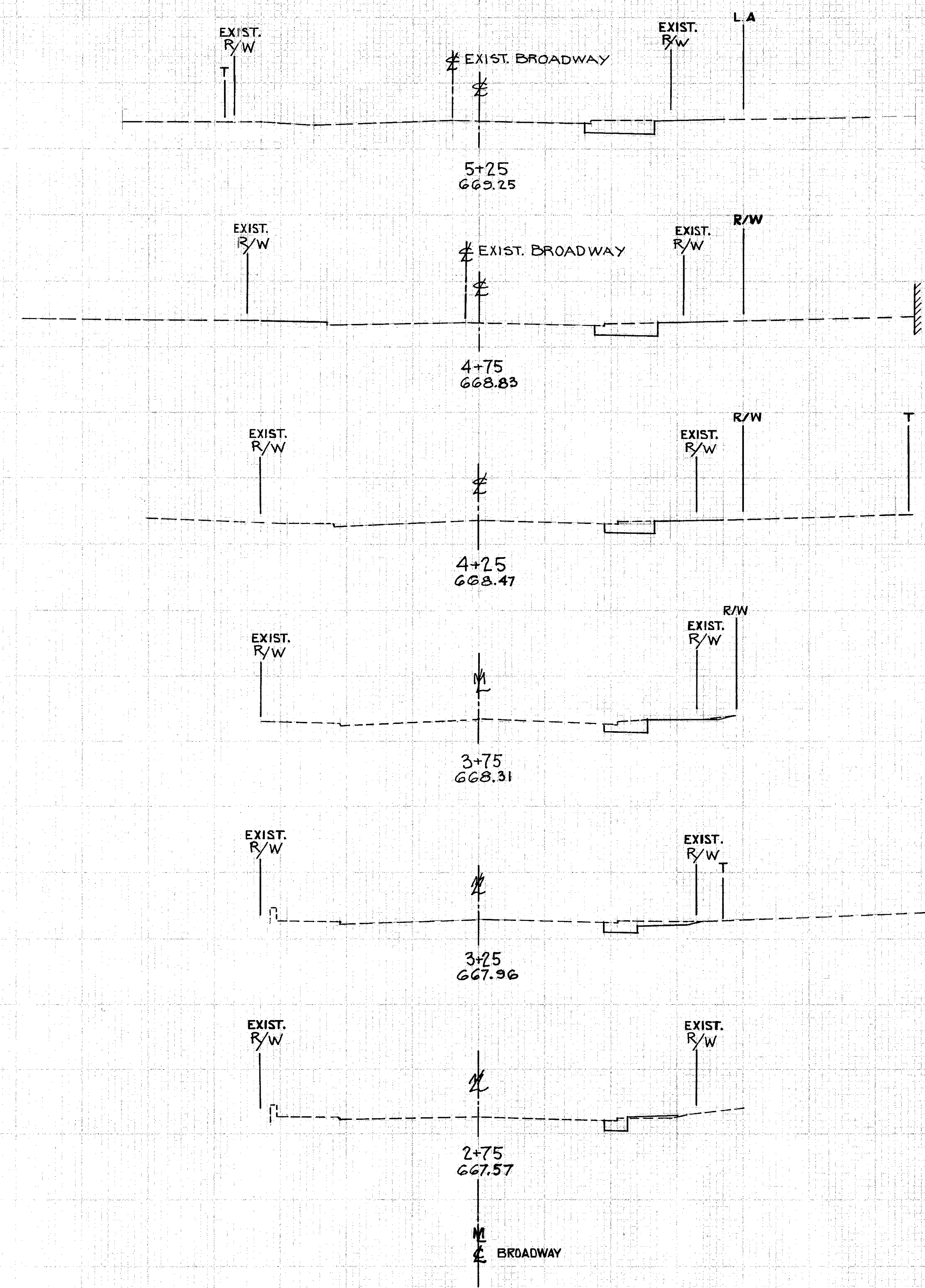


55 STA. 17+00 N-W RAMP STA. 17+50 TO STA. 18+40

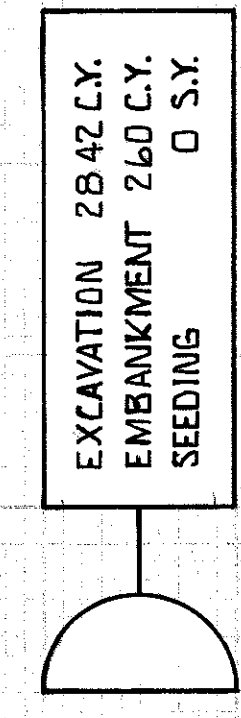
| EST. | CUT | FILL | TOTAL |
|------|------|------|-------|
| 110 | 0 | 0 | 0 |
| 65 | 1961 | 0 | 1961 |
| 10 | 1902 | 0 | 1902 |
| 55 | 3536 | 0 | 3536 |

CUYAHOGA COUNTY
CUY-490-1.49

675
665
675
665
675
665
675
665
675
665
675
665



| STATION | ELEVATION | TYPE |
|---------|-----------|------|
| 18 | 0 | |
| | 31 | |
| 15 | 0 | |
| | 24 | |
| 11 | 0 | |
| | 19 | |
| 9 | 0 | |
| | 22 | |
| 14 | 0 | |
| | 19 | 2 |
| 6 | 2 | |
| | 2 | |

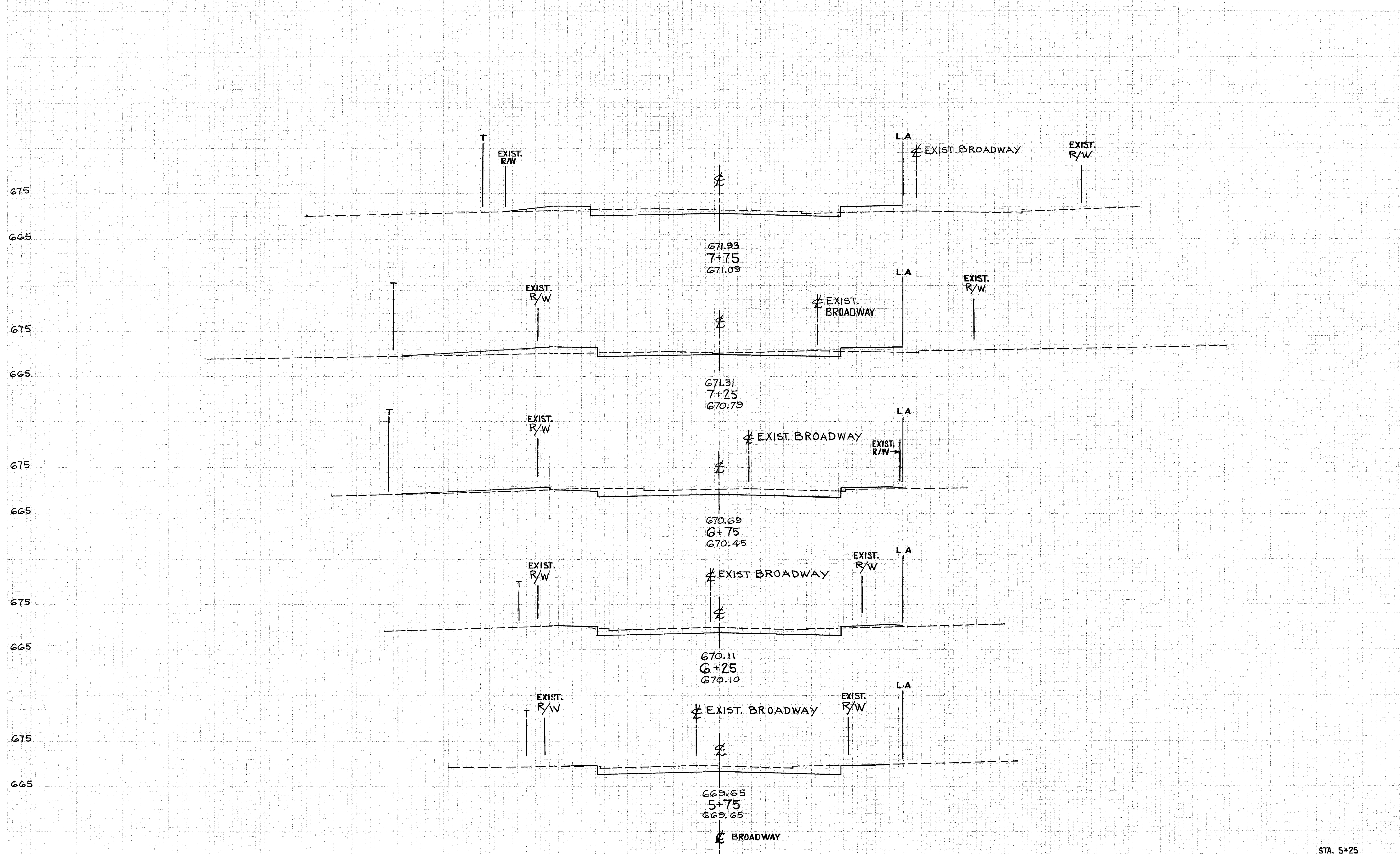


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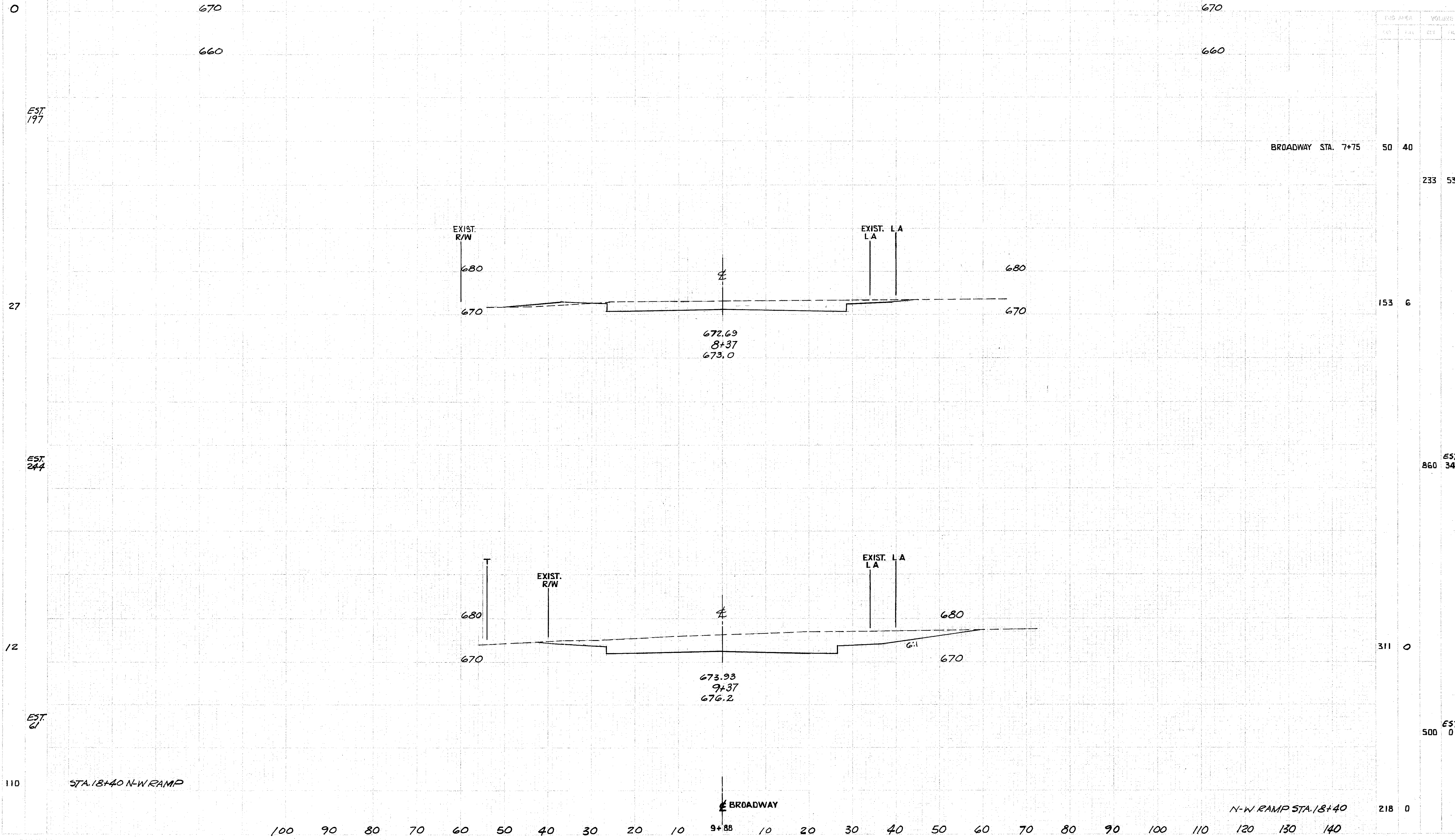
BROADWAY STA 2+75 TO 5+25

BACK

CUYAHOGA COUNTY
CUY-490-1.49



| CROSS AREA | | VOLUME | |
|------------|----|--------|-------|
| FT | IN | CU YD | CU FT |
| 50 | 40 | | |
| 77 | 87 | | |
| 33 | 53 | | |
| 87 | 61 | | |
| 61 | 12 | | |
| 109 | 14 | | |
| 56 | 3 | | |
| 112 | 4 | | |
| 64 | 1 | | |
| | 76 | | |
| 18 | 0 | | |



| CROSS AREA | | VOLUME | |
|------------|------|--------|------|
| SET | FILL | CUT | FILL |

BROADWAY STA. 7+75 50 40

233 53

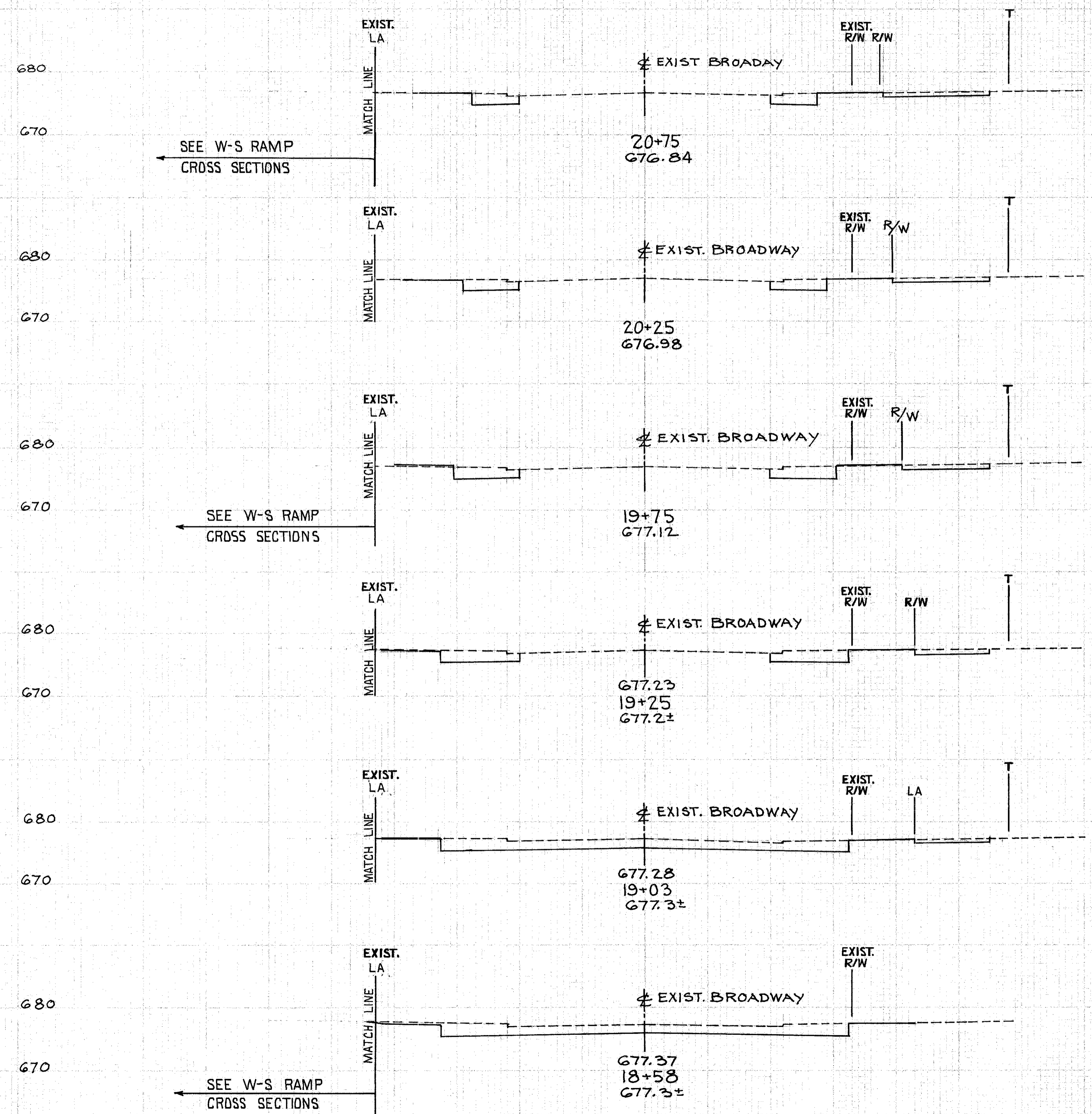
153 6

EST. 860 34

311 0

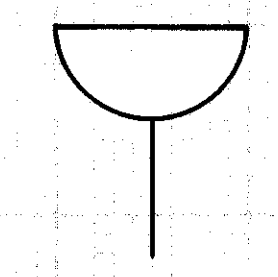
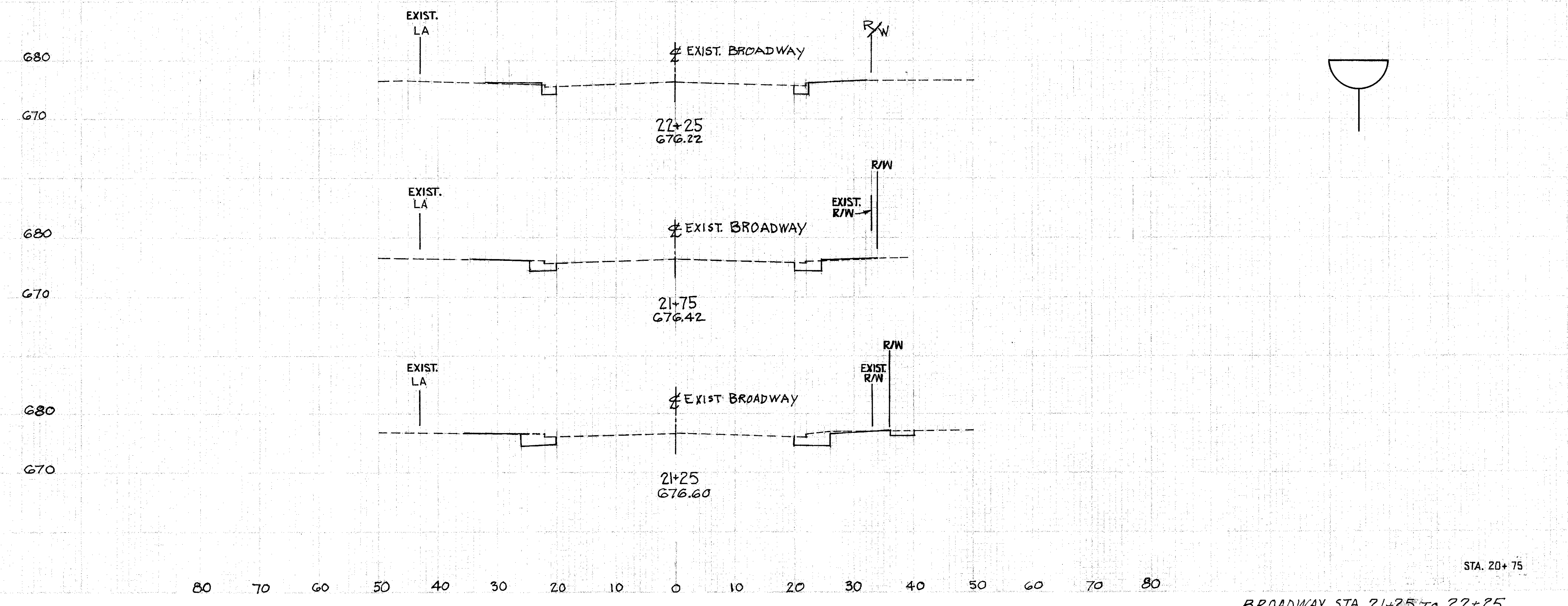
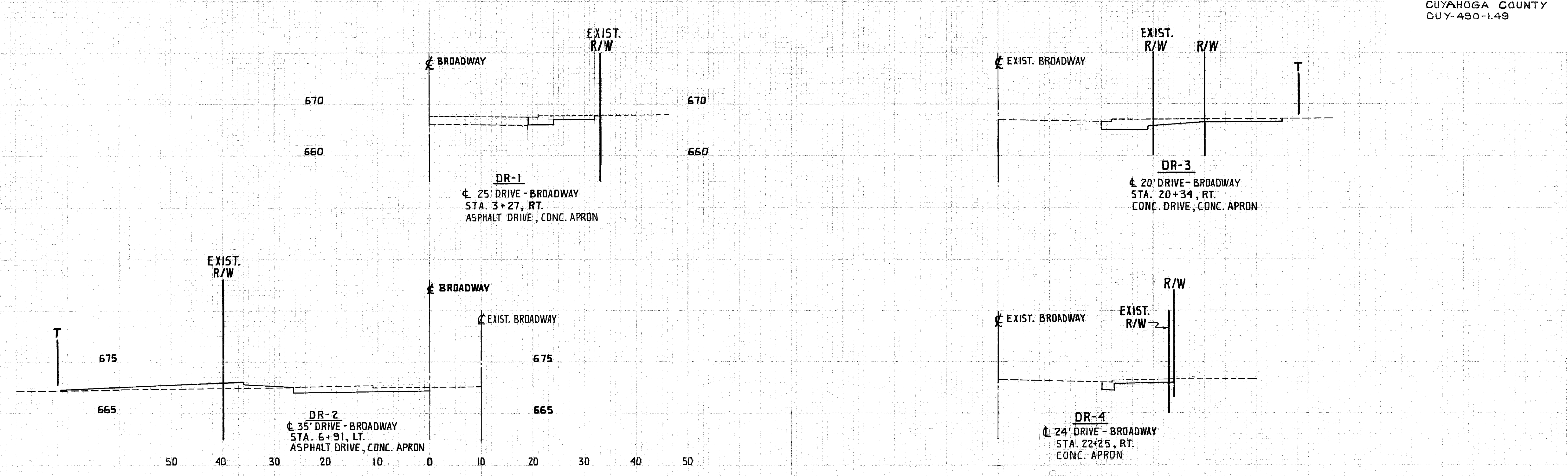
EST. 500 0

218 0



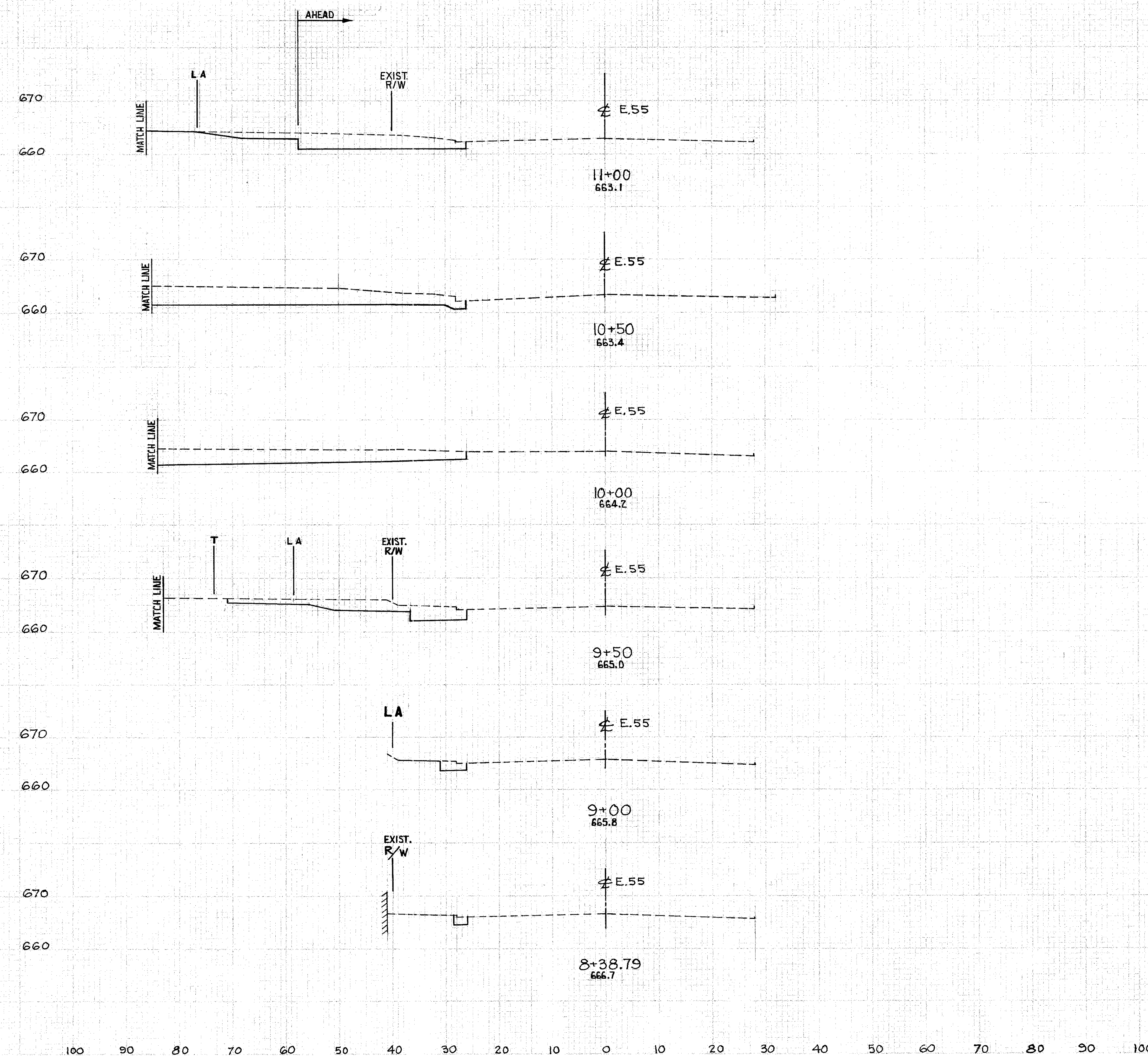
| LINE | POST | STATION | ELEVATION |
|------|------|---------|-----------|
| 33 | | | |
| 68 | | | |
| 40 | | | |
| 81 | | | |
| 47 | | | |
| 86 | | | |
| 46 | | | |
| 56 | | | |
| 90 | | | |
| 145 | | | |
| 84 | 0 | | |
| 127 | 4 | | |
| 48 | 5 | | |

| REV. | DATE | BY | CHKD. |
|------|------|----|-------|
| | | | |



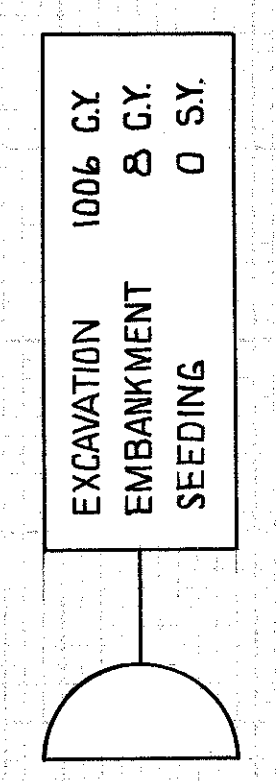
STA. 20+75

BROADWAY STA 21+25 TO 22+25

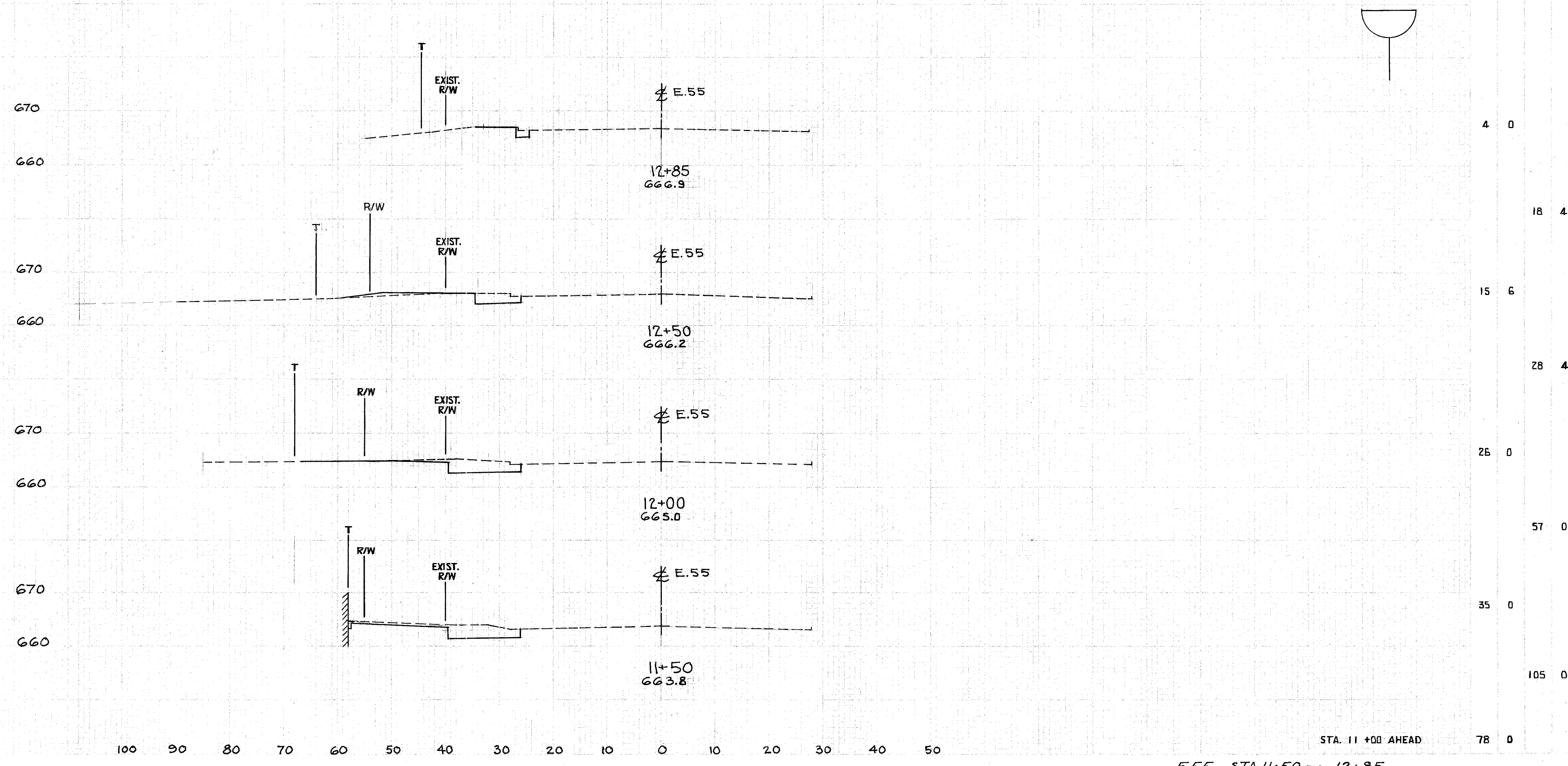


| EXTRA | AREA | AHEAD | BACK |
|-------|------|-------|------|
| | | 78 | 93 |

| STATION | 1006 CY | 8 CY | 0 SY |
|---------|---------|------|------|
| 11+00 | | | 9 |
| 10+50 | | | 244 |
| 10+00 | | | 279 |
| 9+50 | | | 183 |
| 9+00 | | | 69 |
| 8+38.79 | | | 8 |
| | | | 14 |
| | | | 4 |



E 55 STA 8+38.79 TO 11+00



E55 STA 11+50 TO 12+85

GENERAL SUMMARY MAINTAINANCE OF TRAFFIC

CALC.
BY JRH
DATE 4-26-82
CHKD.
BY CAP
DATE 4-82

CUY-490-1.49

OHIO
FHWA
REGION 5



| LINE NO | SHEET NUMBER | | | | | | | | | | FUNDS | TOTAL | TYPE CODE | ITEM | UNIT | DESCRIPTION | LINE NO | |
|---------|--------------|----|----|----|-----|-----|------|------|-----|---|-------|-------|-----------|------|------|-------------|---|----|
| | 95 | 96 | 97 | 99 | 100 | 102 | 103 | 104 | 105 | I | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | 1 | |
| 2 | | | | | | | | | | | | | | | | | 2 | |
| 3 | | | | | | | | | | | | | | | | | 3 | |
| 4 | | | | | | | 2480 | 2810 | 710 | | 550 | | 6550 | 6550 | 615 | S.Y. | TEMPORARY PAVEMENT CLASS A, AS PER PLAN | 4 |
| 5 | | | | | | | | | | | | | LUMP | LUMP | 615 | | TEMPORARY ROADS | 5 |
| 6 | | | | | | | | | | | | | | | | | | 6 |
| 7 | | | | | | | | | | | | | | | | | | 7 |
| 8 | | | | | | | | | | | | | | | | | | 8 |
| 9 | | | | | | | | | | | | | | | | | | 9 |
| 10 | | | | | | | | | | | | | 250 | 250 | 404 | C.Y. | BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC | 10 |
| 11 | | | | | | | | | | | | | 400 | 400 | 410 | C.Y. | TRAFFIC COMPACTED SURFACE, TYPE A or B | 11 |
| 12 | | | | | | | | | | | | | 400 | 400 | 410 | C.Y. | TRAFFIC COMPACTED SURFACE, TYPE C | 12 |
| 13 | | | | | | | | | | | | | | | | | | 13 |
| 14 | | | | | | | | | | | | | 50 | 50 | 616 | TON | CALCIUM CHLORIDE | 14 |
| 15 | | | | | | | | | | | | | 70 | 70 | 616 | M.GAL. | WATER | 15 |
| 16 | | | | | | | | | | | | | | | | | | 16 |
| 17 | | | | | | | | | | | | | | | | | | 17 |
| 18 | | | | | | | | | | | | | | | | | | 18 |
| 19 | | | | | | | | | | | | | 3000 | 3000 | 607 | L.F. | FENCE, TYPE SNOW, AS PER PLAN | 19 |
| 20 | | | | | | | | | | | | | | | | | | 20 |
| 21 | | | | | | | | | | | | | 5500 | 5500 | 608 | S.F. | 2" BITUMINOUS WALK, AS PER PLAN | 21 |
| 22 | | | | | | | | | | | | | | | | | | 22 |
| 23 | | | | | | | | | | | | | 2000 | 2000 | 622 | L.F. | TEMPORARY CONCRETE BARRIER | 23 |
| 24 | | | | | | | | | | | | | | | | | | 24 |
| 25 | | | | | | | | | | | | | | | | | | 25 |
| 26 | | | | | | | | | | | | | | | | | | 26 |
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| 63 | | | | | | | | | | | | | | | | | | 63 |
| 64 | | | | | | | | | | | | | | | | | | 64 |
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| 67 | | | | | | | | | | | | | | | | | | 67 |
| 68 | | | | | | | | | | | | | | | | | | 68 |
| 69 | | | | | | | | | | | | | | | | | | 69 |
| 70 | | | | | | | | | | | | | | | | | | 70 |
| 71 | | | | | | | | | | | | | | | | | | 71 |
| 72 | | | | | | | | | | | | | | | | | | 72 |

CONT. No. SHEET ACCT. No.

GENERAL NOTES

QUANTITIES CARRIED TO
GENERAL SUMMARY

PLANS

SHEETS 94 THRU 105 OUTLINE THE WORK AND METHODS REQUIRED TO MAINTAIN TRAFFIC.

TRAFFIC MAINTENANCE AND DUST CONTROL

TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH THE PLANS BY USE OF EXISTING PAVEMENT, TEMPORARY PAVEMENT OR PROPOSED PAVEMENT. THE (10) FEET SHALL BE CONSIDERED TO BE A MINIMAL LANE WIDTH; IN ADDITION, THERE SHALL BE AT LEAST TWO (2) FEET LATERAL CLEARANCE TO ANY OBJECT.

THE LIMITS AND DURATION OF TEMPORARY ROADWAYS SHALL BE HELD TO AN ABSOLUTE MINIMUM, AND IN ALL CASES SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

THE CONTRACTOR SHALL WORK IN CLOSE COOPERATION, THROUGH THE ENGINEER, WITH THE CITY OF CLEVELAND TRAFFIC ENGINEERING DIVISION, IN ORDER TO MAINTAIN THE TRAFFIC DURING ALL PHASES OF THE WORK.

THE FOLLOWING ESTIMATED QUANTITIES ARE PROVIDED IN THE GENERAL SUMMARY FOR USE WHERE AND AS DIRECTED BY THE ENGINEER TO MAINTAIN TRAFFIC.

| ITEM | DESCRIPTION | I-FUNDS |
|------|---|------------|
| 404 | BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC | 250 CY |
| 410 | TRAFFIC COMPACTED SURFACE , TYPE A or B | 400 CY |
| 410 | TRAFFIC COMPACTED SURFACE , TYPE C | 400 CY |
| 616 | CALCIUM CHLORIDE | 50 CY |
| 616 | WATER | 70 M. GAL. |
| 607 | FENCE, TYPE SNOW, AS PER PLAN | 3000 L.F. |
| 608 | 2" BITUMINOUS WALK, AS PER PLAN | 5500 S.F. |

ALL OTHER TRAFFIC CONTROL DEVICES REQUIRED IN THE LOCAL CONSTRUCTION AREAS NOT SHOWN ON THE PLANS SPECIFICALLY SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614 "MAINTAINING TRAFFIC."

TRAFFIC CONTROL SYSTEMS

A. WHEN REQUIRED

WHENEVER ANY PART OF THE TRAVELED SURFACE IS BEING WORKED UPON, OR IS OTHERWISE NOT SUITABLE FOR SAFE AND CONVENIENT USE BY VEHICLES, TRAFFIC CONTROL DEVICES SUFFICIENT TO PROTECT SUCH AREAS TO ASSURE THE SAFE AND CONVENIENT PASSAGE OF VEHICULAR TRAFFIC SHALL BE INSTALLED AND MAINTAINED. SUCH TRAFFIC CONTROL DEVICES AND THE MANNER IN WHICH THEY ARE USED SHALL BE CONSISTANT WITH THESE PLANS AND THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS HEREINAFTER REFERRED TO AS THE "MANUAL." THE TRAFFIC CONTROL DEVICE SYSTEM SHALL CONSTITUTE THE MINIMUM PROVISIONS FOR TRAFFIC CONTROL FOR EACH PARTICULAR SITUATION. WHENEVER THE ENGINEER DEEMS IT NECESSARY, ESPECIALLY WHERE A GRADE, CURVE, OR MERGE CONDITIONS EXISTS, HE MAY DIRECT THAT ADDITIONAL OR ALTERNATIVE DEVICES BE USED AND THE CONTRACTOR SHALL PROVIDE, INSTALL AND SUBSEQUENTLY REMOVE SUCH DEVICES AT NO ADDITIONAL COST TO THE STATE. ALSO, THE CONTRACTOR SHALL PROVIDE SUFFICIENT ADDITIONAL BARRICADES, ETC. TO PROTECT THE FRESH CONCRETE DURING THE CURING PERIOD FROM ANY VEHICLES WHICH DRIVE AROUND, OR THROUGH THE TRAFFIC CONTROL.

B. CONDITIONS

DURING ALL PARTS OF THIS PROJECT, SIGNING, BARRICADES, TEMPORARY PAVEMENT MARKINGS, ETC, SHALL BE LOCATED AS INDICATED ON SHEETS 98 THROUGH 105. THE NUMBER OF LANES AND THE MINIMUM LANE WIDTHS MAINTAINED SHALL BE AS INDICATED ON THE TRAFFIC CONTROL SHEETS AND AS HEREIN SPECIFIED.

C. ADVANCE WARNING SIGNS

ALL ADVANCE WARNING SIGNS FOR ANY CONDITIONS WHICH RESTRICTS TRAFFIC SHALL BE ERECTED BEFORE ANY SUCH RESTRICTION IS PUT INTO EFFECT. ALL SUCH SIGNS SHALL BE COVERED OR REMOVED FROM THE VIEW OF TRAFFIC WHENEVER THEY ARE NOT APPLICABLE.

D. FLASHING ARROW EQUIPMENT

WHENEVER ANY PART OF THE TRAVELED SURFACE IS CLOSED, THE MOTORIST SHALL BE WARNED AND DIRECTED BY THE CONTRACTOR THROUGH THE USE OF ONE (1) FLASHING ARROW ON THE APPROACH. FLASHING ARROWS SHALL CONFORM TO STANDARD DRAWING TC-35.10, IN ADDITION TO THOSE PROVISIONS SET FORTH IN THE "MANUAL."

E. TAPER RATES

ALL TAPER RATES ARE RELATIVE TO THE CENTERLINE IN CONSTRUCTION UNLESS SPECIFICALLY STATED AS BEING MEASURED TO A GIVEN EDGE OF PAVEMENT.

F. FAILURE TO COMPLY

IF THERE IS ANY FAILURE TO COMPLY WITH THE PROVISIONS FOR TRAFFIC CONTROL SET OUT IN THESE PLANS AND NOTES, OR WITH THE PROVISIONS FOR THE "MANUAL", THE HIGHWAY IN THE VICINITY OF THE WORK AREA SHALL NOT BE CONSIDERED IN CONDITION FOR THE SAFE AND CONVENIENT USE BY THE TRAVELING PUBLIC. ANY FAILURE TO KEEP THE HIGHWAY AND THE VICINITY OF THE WORK AREA IN A CONDITION FOR THE SAFE AND CONVENIENT USE BY THE TRAVELING PUBLIC SHALL BE CONSIDERED A BREACH OF THIS CONTRACT. WORK SHALL BE SUSPENDED UNTIL THE CONTRACTOR COMPLIES WITH THE PROVISIONS OF THE AFOREMENTIONED ITEMS.

SEQUENCE OF TRAFFIC CONTROL PHASES

THE TRAFFIC CONTROL PHASES SHALL BE IMPLEMENTED IN NUMERICAL ORDER.

TRAFFIC CONTROL MATERIAL

A. SIGNS

SIGN DIMENSIONS AND SPECIFICATIONS, INCLUDING LETTER SIZES, SHALL BE AS PROVIDED IN THE "MANUAL" OR IN SIGN DESIGN DRAWINGS PROVIDED BY THE DEPARTMENT OF TRANSPORTATION. THE SIGNS SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER PRIOR TO THE START OF THE PROJECT.

B. SIGN SUPPORTS

SIGN SUPPORTS SHALL BE OF SUFFICIENT SIZE AND HEIGHT AS TO SUPPORT THE SIGNS AT THE HEIGHT INDICATED IN THE "MANUAL" ON PLATE C-1. SUPPORTS SHALL ALSO BE ADEQUATE IN MASS AND STABILITY TO PREVENT THE SIGNS BEING BLOWN OVER BY WIND OR VEHICULAR GENERATED AIR TURBULENCE.

C. LIGHTING DEVICES

FLASHERS SHALL BE 12 VOLT BATTERY-OPERATED MODELS WITH EIGHT INCH (8") DIAMETER YELLOW LENSES ILLUMINATED BY RAPID INTERMITTENT FLASHES OF SHORT DURATION AND SHALL BE PLACED ON THE FIRST DRUM OF A SERIES.

CONTINUOUS BURN LIGHT SHALL BE 12 VOLT BATTERY-OPERATED MODELS WITH MINIMUM EIGHT INCH (8") DIAMETER YELLOW LENSES. THEY SHALL BE PLACED ABOVE THE GROUND ON THE TOPS OF DRUMS AND SPACED AT 50 FOOT INTERVALS WHENEVER DRUMS ARE REQUIRED, AND ON ALL SIGNS SHOWN ON THE MAINTENANCE OF TRAFFIC PLANS. CONTINUOUS BURN LIGHTS AS DESCRIBED ABOVE SHALL BE REQUIRED WHENEVER ANY PORTION OF THE TRAVELED SURFACE IS CLOSED DURING TWILIGHT OR NIGHTTIME HOURS. BATTERY OPERATED LIGHTS SHALL CONFORM TO OMUTCD SEC 7 G-6. FLASHING LIGHT SHALL BE TYPE "A". STEADY BURNING LIGHTS SHALL BE TYPE "C."

D. TEMPORARY DRUMS

THE STANDARD DEVICE FOR CLOSING ANY LANES TO TRAFFIC SHALL BE WEIGHTED DRUMS IN ACCORDANCE WITH ITEM 606.041. DRUMS SHALL BE LOCATED AS SHOWN ON THE MAINTENANCE OF TRAFFIC PLANS. ALL COSTS FOR INSTALLING, MAINTAINING AND SUBSEQUENT REMOVAL OF SAID DRUMS SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 614 "MAINTAINING TRAFFIC."

TEMPORARY TRAFFIC SIGNALS

TEMPORARY TRAFFIC SIGNALS SHALL BE FURNISHED IN ACCORDANCE WITH THE PLAN AND ITEM 614 "SPECIFICATION."

PAYMENT SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614 "MAINTAINING TRAFFIC."

SAFE PEDESTRIAN TRAFFIC

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE NEED FOR PROVIDING ADEQUATE PROTECTION TO SCHOOL CHILDREN AND OTHER PEDESTRIAN TRAFFIC IN THE VICINITY OF THIS PROJECT. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SUCH TEMPORARY PROTECTION FACILITIES AS THE ENGINEER DEEMS NECESSARY TO ACCOMMODATE IN A REASONABLE AND SAFE MANNER, ALL PEDESTRIAN TRAFFIC.

ITEM 608 - 2" BITUMINOUS WALK, AS PER PLAN

IN ADDITION TO PROVIDING AND INSTALLING THIS ITEM OF WORK, PAYMENT FOR MAINTENANCE AND SUBSEQUENT REMOVAL OF THE WALK SHALL ALSO BE INCLUDED IN THE UNIT PRICE BID PER SQUARE FOOT OF ITEM 608-2 "BITUMINOUS WALK AS PER PLAN." (SEE PREVIOUS NOTE FOR QUANTITIES.)

ITEM 607 - FENCE TYPE SNOW, AS PER PLAN

TEMPORARY FENCE IF REQUIRED FOR THE MAINTENANCE OF SAFE PEDESTRIAN TRAFFIC SHALL BE OF THE "SNOW TYPE" MEETING THE FOLLOWING SPECIFICATIONS IN ADDITION TO REQUIREMENTS OF ITEM 607.

1. WOOD PICKETS SHALL BE OF SPRUCE, POPLAR OR JACK PINE AND SHALL HAVE ONE COAT OF RED PAINT.
2. WOOD PICKETS SHALL HAVE A MINIMUM THICKNESS OF ONE-HALF INCH (1/2), A MINIMUM WIDTH, ONE AND ONE-HALF INCHES (1 1/2) AND MINIMUM LENGTH OF FOUR (4) FEET.
3. WOOD PICKETS SHALL BE WOVEN INTO PLACE WITH FIVE (5) DOUBLE STRANDS OF TWELVE AND ONE-HALF (12 1/2) GAUGE LOW CARBON GALVANIZED WIRE; SPACING SHALL BE A MAXIMUM OF TWO INCHES (2).
4. THE FENCE SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 607 USING STEEL LINE POSTS PER SECTION 710.11. PAYMENT FOR FURNISHING, INSTALLING, MAINTAINING, REMOVING AND ALL INCIDENTALS NECESSARY TO COMPLETE THIS ITEM SHALL BE PAID FOR IN THE UNIT PRICE BID FOR LINEAR FEET TO ITEM 607 "FENCE TYPE SNOW, AS PER PLAN." (SEE PREVIOUS NOTE FOR QUANTITIES.)

TEMPORARY CONCRETE BARRIER

THE CONTRACTOR SHALL OBTAIN, PLACE AND MAINTAIN THE TEMPORARY CONCRETE BARRIER AS SHOWN ON ON THE PLANS.

THE FOLLOWING QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY AND IS TO BE USED AS DIRECTED BY THE ENGINEER TO MAINTAIN TRAFFIC.

| ITEM 622 - TEMPORARY CONCRETE BARRIERS | I-FUNDS |
|--|-----------|
| | 2000 L.F. |

GENERAL NOTES

REPLACEMENT SIGNS

FLAT SHEET SIGNS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLANS, SPECIFICATIONS AND PROPOSAL WHICH BECOME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. PAYMENT FOR THE NEW SIGNS SHALL BE MADE AT THE BID PRICE PER SQUARE FOOT FOR ITEM SPECIAL "REPLACEMENT SIGNS AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF THE DAMAGED SIGNS, HARDWARE AND SUPPORTS; AND PROVIDING NECESSARY REPLACEMENT HARDWARE, SUPPORTS, ETC." REPLACEMENT SIGNS SHALL BE NEW BUT OTHER MATERIALS MAY BE USED, SUBJECT TO APPROVAL BY THE ENGINEER.

AN ESTIMATED QUANTITY OF ITEM SPECIAL - REPLACEMENT SIGNS HAS BEEN CARRIED TO THE GENERAL SUMMARY AND IS TO BE USED AS DIRECTED BY THE ENGINEER.

| ITEM SPECIAL | REPLACEMENT SIGNS | I-FUNDS |
|--------------|-------------------|----------|
| | | 300 S.F. |

REPLACEMENT DRUMS

DRUMS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF THE PLANS, SPECIFICATIONS AND PROPOSAL WHICH BECOME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER AND PAID FOR UNDER ITEM SPECIAL "REPLACEMENT DRUMS"; PAYMENT FOR EACH NEW DRUM SHALL INCLUDE: (1) THE COST OF REMOVING AND DISPOSING OF THE DAMAGED DRUM AND (2) PROVIDING, MAINTAINING AND REMOVING NEW DRUMS IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS FOR THE ORIGINAL DRUMS.

AN ESTIMATED QUANTITY OF ITEM SPECIAL - REPLACEMENT DRUMS HAS BEEN CARRIED TO THE GENERAL SUMMARY AND IS TO BE USED AS DIRECTED BY THE ENGINEER.

| ITEM SPECIAL | REPLACEMENT DRUMS | I-FUNDS |
|--------------|-------------------|---------|
| | | 200 EA |

TEMPORARY CURB

TEMPORARY ASPHALT CONCRETE CURB SHALL BE LOCATED AS SHOWN ON THE MAINTENANCE OF TRAFFIC PLANS AND IS TO BE INCLUDED IN THE LUMP SUM BID FOR ITEM 615 "TEMPORARY PAVEMENT, CLASS "A", AS PER PLAN."

GENERAL

BEFORE WORK BEGINS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THE NAMES AND TELEPHONE NUMBERS OF AT LEAST TWO PERSONS WHO CAN BE CONTACTED 24 HOURS PER DAY BY THE OHIO DEPARTMENT OF TRANSPORTATION AND ALL INTERESTED POLICE AGENCIES. THESE PERSONS SHALL BE RESPONSIBLE FOR PLACING OR REPLACING NECESSARY TRAFFIC CONTROL DEVICES TO MAINTAIN THE TRAVELED PAVEMENT SAFELY.

TRAFFIC SHALL BE MAINTAINED WITHOUT INTERRUPTION DURING CONSTRUCTION OF THE WORK EXCEPT AS OTHERWISE APPROVED BY THE ENGINEER OR SPECIFIED IN THESE NOTES OR PLANS. THE CONTRACTOR SHALL SET UP AND OPERATE HIS EQUIPMENT IN SUCH A MANNER AS TO NOT ENCR OACH UPON THE TRAVELED PAVEMENT.

THE CONTRACTOR SHALL PROVIDE AND PAY ALL COSTS FOR THE SERVICES OF LAW ENFORCEMENT OFFICER (S) WITH PATROL CAR (S) FOR THE EXCLUSIVE PURPOSE OF CONTROLLING TRAFFIC WHENEVER A CHANGE IN THE TRAFFIC PATTERN TAKES PLACE. THE NUMBER OF OFFICERS AND CARS REQUIRED FOR THIS PURPOSE SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. THE OFFICERS SHALL MOVE THEIR PATROL CARS AS NECESSARY TO INSURE THEIR CONSTANT PRESENCE AT THE POINT (S) OF SLOWDOWN, STOPPAGE OR BACK-UP. PAYMENT FOR THE ABOVE WILL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM SPECIAL "LAW ENFORCEMENT OFFICER WITH PATROL CAR."

THE FOLLOWING PAY ITEM AND QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY:

| ITEM SPECIAL | LAW ENFORCEMENT OFFICER WITH PATROL CAR | I-FUNDS |
|--------------|---|---------|
| | | 100 HR |

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ARRANGEMENTS REGARDING SCHEDULING AND PAYMENT OF LAW ENFORCEMENT OFFICER (S) WITH PATROL CAR (S). INFORMATION REGARDING ARRANGEMENTS FOR THESE SERVICES MAY BE OBTAINED BY CONTACTING:

CITY OF CLEVELAND - SAFETY DEPARTMENT - (216) 664-2200
OHIO HIGHWAY PATROL HEADQUARTERS - (216) 928-1185

TEMPORARY LIGHTING NOTES

THE CONTRACTOR SHALL SUPPLY, INSTALL, MAINTAIN AND LATER REMOVE ALL NECESSARY MATERIAL TO EFFECT A COMPLETE TEMPORARY LIGHTING SYSTEM AS SET FORTH IN THIS SET OF PLANS.

ALL MATERIALS SHALL CONFORM TO SECTIONS 625 AND 713 EXCEPT THAT REUSED MATERIAL IN GOOD CONDITION WILL BE PERMITTED. ALSO, SECTION 625.04 SHALL BE MODIFIED TO PERMIT MATERIALS TO BE FURNISHED AND INSTALLED PRIOR TO MATERIAL SUBMITTALS. THE CONTRACTOR SHALL WORK WITH THE LOCAL ELECTRIC UTILITY COMPANY AND THE CITY OF CLEVELAND TO OBTAIN A SOURCE OF ELECTRICAL POWER. THE COST OF ENERGY WILL BE THE RESPONSIBILITY OF THE CITY OF CLEVELAND.

THE CONTRACTOR SHALL AT SUCH TIME AS DIRECTED BY THE PROJECT ENGINEER, REMOVE THE TEMPORARY LIGHTING. ALL MATERIALS REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE TRANSFERRED OUTSIDE THE LIMITS OF THE PROPERTY.

THE MATERIALS LISTED BELOW ARE INTENDED TO BE A GUIDE TO THE CONTRACTOR AND IN NO WAY RELIEVES HIM FROM RESPONSIBILITY TO FURNISH, INSTALL AND MAINTAIN A COMPLETE TEMPORARY LIGHTING SYSTEM.

| I-FUNDS QUANTITY | UNIT | |
|------------------|------|---|
| 28 | EA. | WOOD POLE - 40 FT. - CLASS 3 |
| 35 | EA. | 10 FT. TO 14 FT. BRACKET ARM |
| 35 | EA. | LUMINAIRE 400 W TYPE III MERCURY OR COMPARABLE HIGH PRESSURE SODIUM WITH LAMP GROUND ROD UNIT |
| 30 | EA. | |
| 3430 | FT. | AERIAL CABLE 600V TRIPLEXED #4 OR #6 |
| 1700 | FT. | BRACKET CABLE 600V 1/6 #12 COPPER |
| 35 | EA. | 8" PATENT ANCHOR |
| 35 | EA. | PORCELAIN SPOOL INSULATOR |

PAYMENT FOR ALL TEMPORARY LIGHTING WORK SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM 614 "MAINTAINING TRAFFIC."

TEMPORARY LIGHTING LEGEND

- ▲ BRACKET ARM AND LUMINAIRE TO BE ADDED TO EXISTING POLE (EXISTING LUMINAIRE TO REMAIN)
- ⊕ EXISTING LIGHT POLE
- EXISTING POLE WITH LUMINAIRE TO BE RELOCATED
- EXISTING LIGHT POLE AND LUMINAIRE RELOCATED
- ⊗ NEW WOOD LIGHT POLE WITH BRACKET ARM AND LUMINAIRE

UTILITY CLEARANCE

THE CONTRACTOR SHALL CALL UTILITY PROTECTION SERVICE PHONE 1-800-362-2764, 48 HOURS BEFORE DIGGING OR DRIVING POSTS TO INSURE CLEARANCE OF UNDERGROUND UTILITIES.

614 TEMPORARY PAVEMENT MARKINGS

NOTE B

CUYAHOGA COUNTY
CUY-490-149

GENERAL

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN, AND WHEN NECESSARY, REMOVE TEMPORARY RETROREFLECTIVE PAVEMENT MARKINGS ON EXISTING, RECONSTRUCTED, RESURFACED OR TEMPORARY ROADS WITHIN THE WORK LIMITS, IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE MARKINGS SHALL BE MAINTAINED IN GOOD CONDITION DURING THE REQUIRED SERVICE PERIOD TO PROVIDE DAY AND NIGHT VISIBILITY. THE MARKINGS SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE ENGINEER TO MAINTAIN REQUIRED VISIBILITY AND/OR REFLECTIVITY AT NO ADDITIONAL COST TO THE STATE.

MATERIALS

UNLESS OTHERWISE INDICATED ON THE PLANS, TEMPORARY PAVEMENT MARKINGS MAY BE OF PAINT, PAVEMENT MARKING TAPE OR REMOVABLE PAVEMENT MARKING TAPE (TYPE R TAPE).

A. PAINT

PAINT SHALL COMPLY WITH 708.14 AND SHALL BE APPLIED IN ACCORDANCE WITH 621 EXCEPT AS MODIFIED HEREIN.

B. PAVEMENT MARKING TAPE

FLEXIBLE RETROREFLECTIVE PREFORMED PRESSURE SENSITIVE TAPE SHALL HAVE STRAIGHT EDGES AND BE FREE OF CRACKS. THE TAPE SHALL CONSIST OF PIGMENT AND FILLERS WITH SUFFICIENT BINDER AND PLASTICIZER TO RETAIN GLASS BEADS HAVING A REFRACTIVE INDEX MEETING THE MINIMUM REFLECTIVE INTENSITY STANDARD STATED IN THE MANUFACTURERS INFORMATION. THE TAPE SHALL BE FLEXOLITE "WET REFLECTIVE", 3M "SCOTCHLANE", OR AN APPROVED EQUAL.

THE GLASS BEADS SHALL BE DISTRIBUTED UNIFORMLY THROUGHOUT THE TAPE WITH SUFFICIENT SURFACE BEADS TO PROVIDE OPTIMUM REFLECTORIZATION AT ALL TIMES.

PAVEMENT MARKING TAPE SHALL COMPLY WITH THE COLOR REQUIREMENTS OF 708.14.

THE TAPE SHALL HAVE A PRECOATED ADHESIVE LAYER FOR PAVEMENT APPLICATION WITHOUT THE USE OF HEAT, SOLVENTS OR ADDITIONAL ADHESIVES. THE ADHESIVE SHALL BE SUFFICIENT TO RETAIN COMPLETE MARKINGS ON THE PAVEMENT SURFACE THROUGHOUT THE USEFUL LIFE OF THE MARKINGS.

IN ADDITION TO THE FOREGOING, ALL TEMPERATURE APPLICATION REQUIREMENTS AND OTHER APPLICABLE MANUFACTURER'S MATERIAL AND APPLICATION INSTRUCTIONS SHALL BE FOLLOWED.

WHEN APPROVED BY THE ENGINEER THE CONTRACTOR MAY USE REMOVABLE PAVEMENT MARKING TAPE (TYPE R TAPE), IN LIEU OF THAT DESCRIBED ABOVE, TO FACILITATE REMOVAL OF MARKINGS.

C. REMOVABLE PAVEMENT MARKING TAPE (TYPE R TAPE)

THE MARKING MATERIAL SHALL BE A MIXTURE OF POLYMERIC MATERIALS, PIGMENTS, REINFORCING MEDIUM TO FACILITATE REMOVAL, GLASS BEADS THROUGHOUT THE PIGMENTED PORTION, AND A RETROREFLECTIVE LAYER OF GLASS BEADS BONDED TO THE TOP SURFACE.

THE TAPE SHALL BE PRECOATED WITH A PRESSURE SENSITIVE ADHESIVE CAPABLE OF TEMPORARILY BONDING TO ASPHALT CONCRETE OR PORTLAND CEMENT CONCRETE PAVEMENT AT AN AMBIENT TEMPERATURE OF NOT LESS THAN 50° F AND RISING, AT A PAVEMENT TEMPERATURE OF NOT LESS THAN 50° F NOR MORE THAN 150° F, WITHOUT THE USE OF HEAT, SOLVENTS, AND ADDITIONAL ADHESIVES OR ACTIVATORS.

MATERIALS SHALL CONFORM TO THE COLOR REQUIREMENTS OF 708.14.

THE TAPE SHALL BE REMOVABLE FROM ASPHALT AND PORTLAND CEMENT CONCRETE INTACT OR IN LARGE PIECES AT TEMPERATURES ABOVE 40° F WITHOUT USE OF HEAT, SOLVENTS, GRINDING, OR SANDBLASTING. REMOVAL SHALL NOT RESULT IN DAMAGE TO, OR OBJECTIONABLE STAINING OF, THE PAVEMENT.

GLASS BEADS SHALL BE PROVIDED IN A PROPER SIZE, QUANTITY AND DISTRIBUTION TO ASSURE OPTIMUM RETROREFLECTIVITY AS THE FILM WEARS. THE FOLLOWING INITIAL AVERAGE REFLECTANCE VALUES AT 86.0° ENTRANCE ANGLE AS MEASURED IN ACCORDANCE WITH THE TESTING PROCEDURES OF FEDERAL TEST METHOD 370 SHALL BE CERTIFIED

| | WHITE | | YELLOW | |
|--------------------|-------|------|--------|-----|
| OBSERVATION ANGLE | 0.2 | 0.5 | 0.2 | 0.5 |
| SPECIFIC LUMINANCE | 1770 | 1270 | 1310 | 810 |

(MCD/FT²)/FC

THE TAPE SHALL BE 3-M COMPANY'S "STAMARK, DETOUR GRADE (SERIES 5710, 5711, 6270, 6211)" OR AN APPROVED EQUAL.

THE CONTRACTOR SHALL FURNISH TO THE ENGINEER CERTIFICATION THAT THE MATERIAL SUPPLIED MEETS THE PROPERTIES SPECIFIED HEREIN.

LAYOUT

THE TEMPORARY MARKINGS SHALL BE ACCURATELY LAID OUT IN CONFORMANCE WITH 621.051 AND SHALL BE LOCATED IN A TRUE LINE ON THE CENTER LINE, LANE LINE, EDGE LINE, OR CHANNELIZING LINE WHERE PERMANENT MARKINGS WOULD LIE UNLESS OTHERWISE SPECIFIED IN THE PLANS.

PLACEMENT

TEMPORARY MARKINGS SHALL BE PLACED IN ACCORDANCE WITH LAYOUTS ON SHEETS 99 thru 104 AND THE FOLLOWING REQUIREMENTS, UNLESS OTHERWISE SPECIFIED IN THE PLANS.

TEMPORARY MARKINGS SHALL BE COMPLETE AND IN PLACE ON ALL PAVEMENT PRIOR TO EXPOSING IT TO TRAFFIC. WHEN TEMPORARY MARKINGS ARE NO LONGER NEEDED, THEY SHALL BE REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH 621.134. AND NECESSARY PAVEMENT MARKINGS INSTALLED BEFORE THE FLOW OF TRAFFIC IS CHANGED TO THE NEXT PHASE OR RETURNED TO ITS NORMAL CHANNEL.

WHERE PERMANENT PAVEMENT MARKINGS ARE CALLED FOR IN THE PLANS, THE CONTRACTOR SHALL FURNISH AND PLACE THE PERMANENT MARKINGS WITHIN 30 CALENDAR DAYS FOLLOWING COMPLETION OF ALL SURFACE COURSES IN A SINGLE ROADWAY OR PRIOR TO THE END OF THE CONSTRUCTION SEASON, WHICHEVER COMES FIRST. PERMANENT MARKINGS SHALL NOT BE PLACED OVER ANY TAPE MARKINGS.

A. CLASS I MARKINGS

CLASS I MARKINGS SHALL BE AS DEFINED IN 621, EXCEPT AS FOLLOWS:

- 1) LANE LINES SHALL BE 4-INCHES IN WIDTH.
- 2) TRANSVERSE LINES SHALL BE 8-INCHES IN WIDTH.
- 3) STOP LINES SHALL BE 12-INCHES IN WIDTH.
- 4) CROSS WALK LINES SHALL BE 8-INCHES IN WIDTH.

GORE MARKINGS SHALL CONSIST OF TWO CHANNELIZING LINES PLACED AT THE THEORETICAL OR TEMPORARY GORE OF RAMPS AND DIVERGING OR CONVERGING ROADWAYS.

THE PAINT APPLICATION RATE SHALL BE NOT LESS THAN 16 GALLONS PER MILE FOR SOLID 4-INCH LINES, 24 GALLONS PER MILE FOR SOLID 6-INCH LINES, 48 GALLONS PER MILE FOR SOLID 12-INCH LINES, AND 4 GALLONS PER MILE FOR 4-INCH DASHED LINES.

B. CLASS II MARKINGS

CENTER LINES SHALL CONSIST OF SINGLE, YELLOW 12-INCH BY 4-INCH DASHES SPACED AT A MAXIMUM OF 40-FOOT INTERVALS.

LANE LINES SHALL CONSIST OF WHITE 12-INCH BY 4-INCH DASHES SPACED AT A MAXIMUM OF 40-FOOT INTERVALS.

CHANNELIZING LINES SHALL CONSIST OF WHITE 12-INCH BY 4-INCH DASHES SPACED AT A MAXIMUM OF 20-FOOT INTERVALS.

GORE MARKINGS SHALL BE TWO CONTINUOUS, WHITE 50-FOOT BY 4-INCH LINES PLACED AT THE THEORETICAL GORE OF AN EXIT RAMP OR DIVERGING ROADWAYS.

THE PAINT APPLICATION RATE SHALL BE NOT LESS THAN 16 GALLONS PER MILE FOR GORE MARKINGS, 0.8 GALLONS PER MILE FOR CHANNELIZING LINE, AND 0.4 GALLONS PER MILE FOR LANE LINE AND CENTER LINE.

CONFLICTING MARKINGS

THE CONTRACTOR SHALL, PRIOR TO PLACING TEMPORARY MARKINGS, REMOVE ALL EXISTING CONFLICTING MARKINGS VISIBLE TO THE TRAVELING PUBLIC DURING DAYLIGHT OR NIGHTTIME HOURS IN ACCORDANCE WITH 621.134. THE COST FOR REMOVAL OF CONFLICTING MARKINGS SHALL BE INCIDENTAL TO THE VARIOUS PAY ITEMS.

METHOD OF MEASUREMENT

TEMPORARY PAVEMENT MARKINGS WILL BE MEASURED COMPLETE IN PLACE, BY CLASS AND MATERIAL, IN THE UNITS DESIGNATED. DASHED LINE QUANTITIES WILL BE THE LENGTH OF THE COMPLETED STRIPE, INCLUDING GAPS, INTERSECTIONS, AND OTHER SECTIONS OF PAVEMENT NOT NORMALLY MARKED, IN ACCORDANCE WITH 621.15.

TEMPORARY PAVEMENT MARKINGS WILL INCLUDE THE LAYOUT, APPLICATION AND REMOVAL OF THE MARKINGS, WHEN REQUIRED.

BASIS OF PAYMENT

PAYMENT FOR ACCEPTED QUANTITIES COMPLETE IN PLACE WILL BE MADE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL BE FULL COMPENSATION FOR ALL MATERIALS, LABOR, INCIDENTALS AND EQUIPMENT FOR PLACEMENT, MAINTENANCE AND NECESSARY REMOVAL OF THE MARKINGS.

| ITEM | UNIT | DESCRIPTION |
|------|---------------|--|
| 614 | 4.0 MILES | TEMPORARY LANE LINES, CLASS I, (PAINT, TAPE OR TYPE R TAPE) |
| 614 | 2.0 MILES | TEMPORARY CENTER LINES, CLASS I, (PAINT, TAPE OR TYPE R TAPE) |
| 614 | 3500 LIN. FT. | TEMPORARY CHANNELIZING LINES, CLASS I, (PAINT, TAPE OR TYPE R TAPE) |
| 614 | 1.8 MILES | TEMPORARY EDGE LINES, CLASS I, (PAINT, TAPE OR TYPE R TAPE) |
| 614 | LIN. FT. | TEMPORARY GORE MARKING, CLASS II, (PAINT, TAPE OR TYPE R TAPE) |
| 614 | 500 LIN. FT. | TEMPORARY STOP LINES, CLASS I, (PAINT, TAPE OR TYPE R TAPE) |
| 614 | 1000 LIN. FT. | TEMPORARY CROSSWALK LINES, CLASS I, (PAINT, TAPE OR TYPE R TAPE) |
| 614 | 20 EACH | TEMPORARY LANE ARROWS, CLASS I, (PAINT, TAPE OR TYPE R TAPE) |
| 614 | EACH | TEMPORARY WORD "ONLY" ON PAVEMENT, 72-INCH, CLASS I, (PAINT OR TAPE) |
| 614 | LIN. FT. | TEMPORARY TRANSVERSE LINES, CLASS I, (PAINT, TAPE OR TYPE R TAPE) |
| 614 | 500 sq ft. | Temporary Island Marking, CLASS I, PAINT |

Quantities carried to General Summary.

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

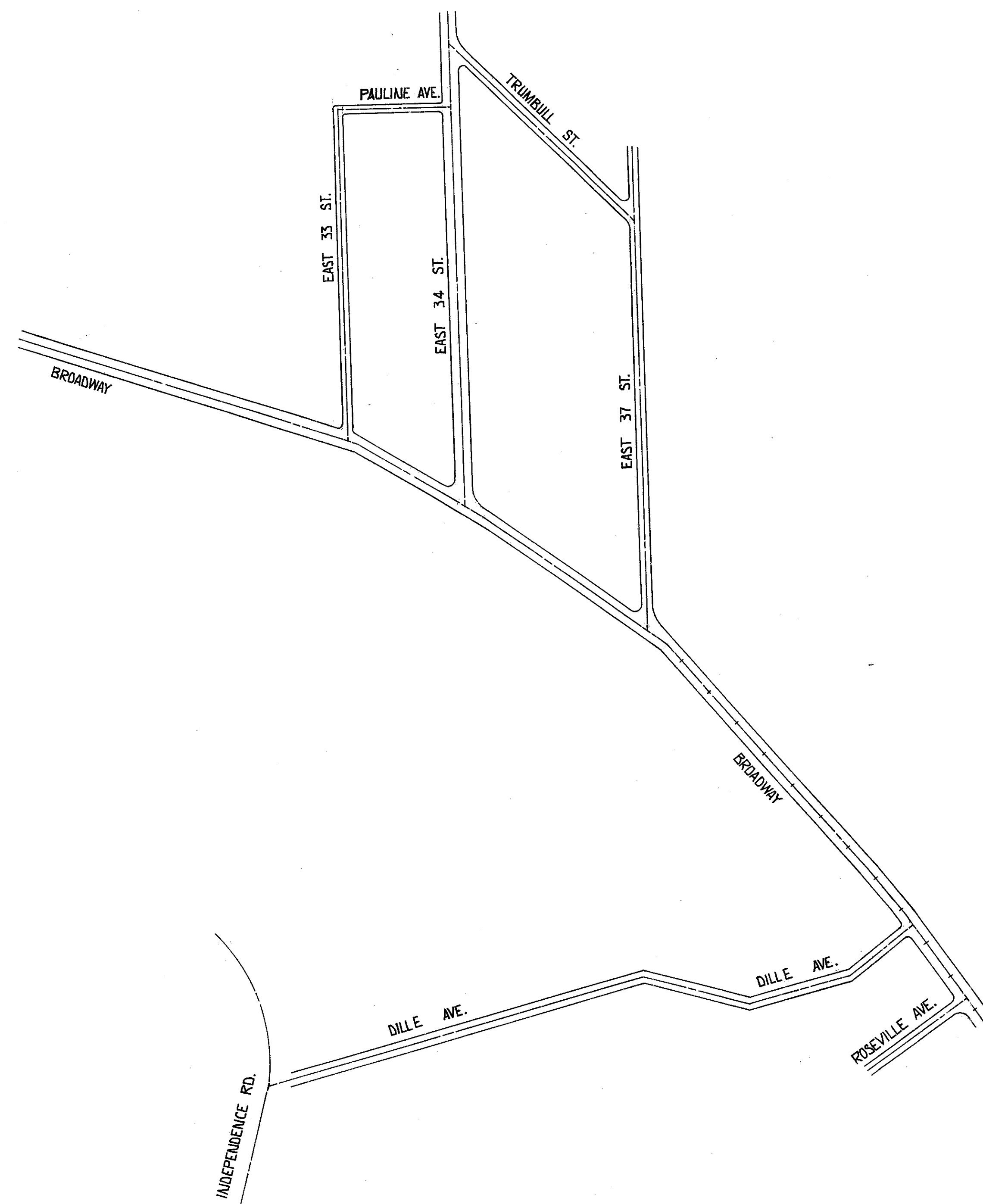
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CUYAHOGA COUNTY
CUY-490-1.49

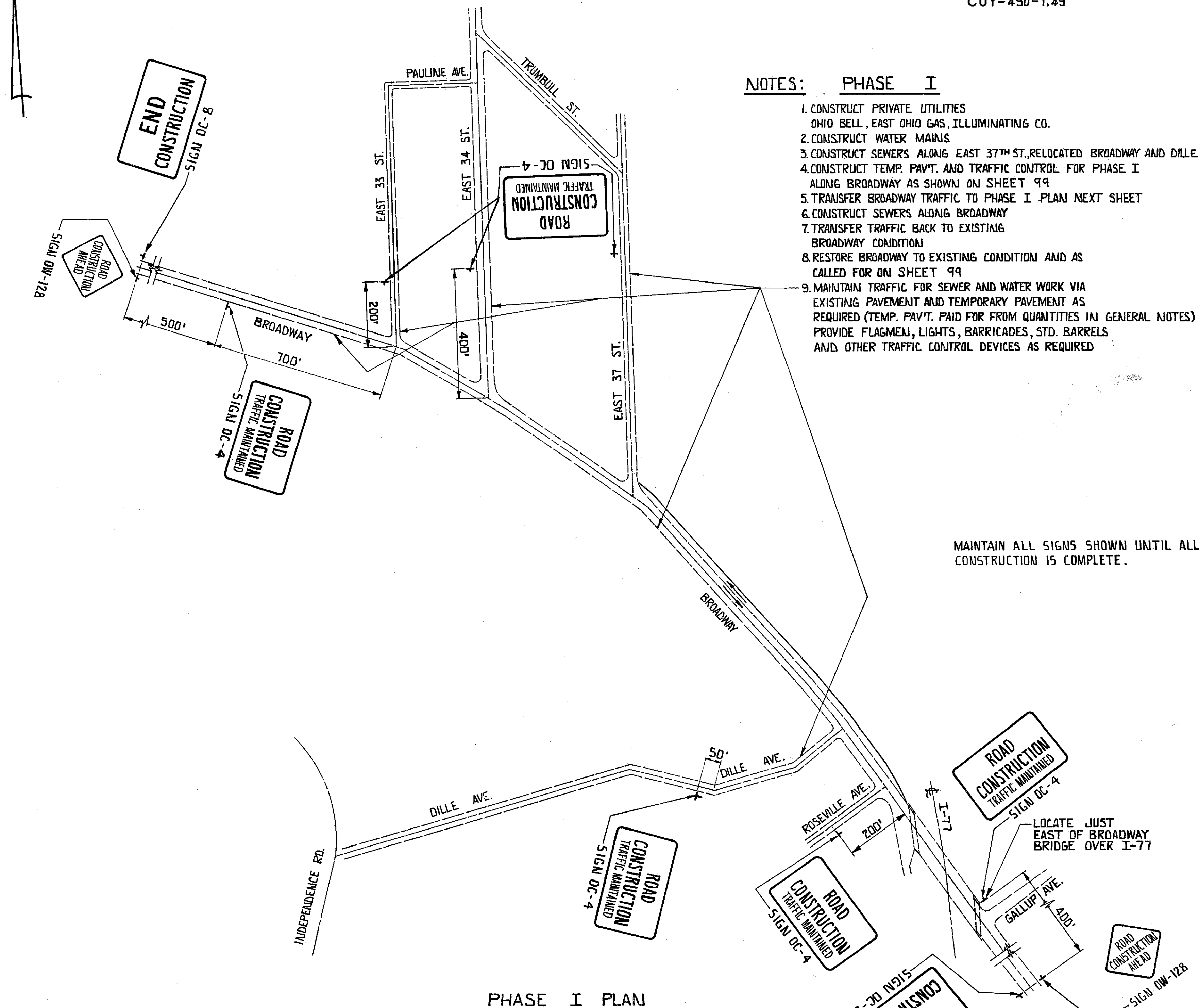
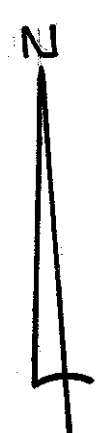
NOTES: PHASE I

1. CONSTRUCT PRIVATE UTILITIES
OHIO BELL, EAST OHIO GAS, ILLUMINATING CO.
2. CONSTRUCT WATER MAINS
3. CONSTRUCT SEWERS ALONG EAST 37TH ST., RELOCATED BROADWAY AND DILLE AVE.
4. CONSTRUCT TEMP. PAV'T. AND TRAFFIC CONTROL FOR PHASE I
ALONG BROADWAY AS SHOWN ON SHEET 99
5. TRANSFER BROADWAY TRAFFIC TO PHASE I PLAN NEXT SHEET
6. CONSTRUCT SEWERS ALONG BROADWAY
7. TRANSFER TRAFFIC BACK TO EXISTING
BROADWAY CONDITION
8. RESTORE BROADWAY TO EXISTING CONDITION AND AS
CALLED FOR ON SHEET 99
9. MAINTAIN TRAFFIC FOR SEWER AND WATER WORK VIA
EXISTING PAVEMENT AND TEMPORARY PAVEMENT AS
REQUIRED (TEMP. PAV'T. PAID FOR FROM QUANTITIES IN GENERAL NOTES)
PROVIDE FLAGMEN, LIGHTS, BARRICADES, STD. BARRELS
AND OTHER TRAFFIC CONTROL DEVICES AS REQUIRED

MAINTAIN ALL SIGNS SHOWN UNTIL ALL
CONSTRUCTION IS COMPLETE.



EXISTING PLAN



PHASE I PLAN



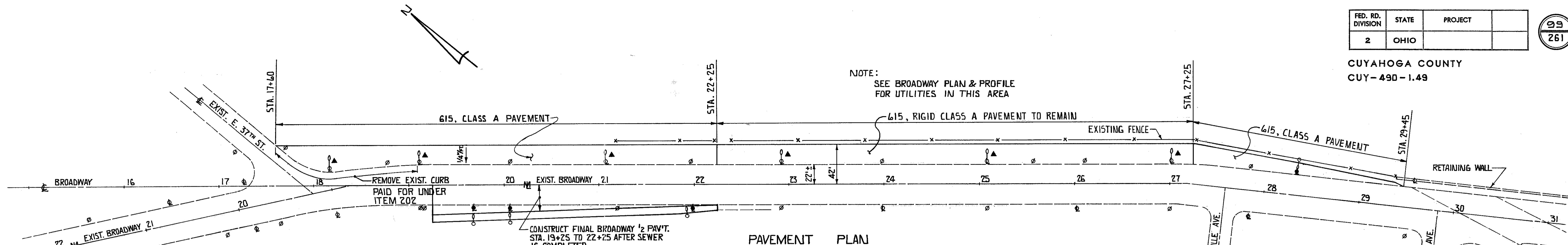
CONT. No. SHEET ACCT. No.

| | | | |
|---|--------|--------|----------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| MAINTENANCE OF TRAFFIC BROADWAY AREA EXISTING & PHASE I PLANS | | | |
| SCALE: 1"=200' | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| RLH | RLH II | | JRH |
| | | | REVIEWED |
| | | | DATE |

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| FED. RD. DIVISION | STATE | PROJECT |
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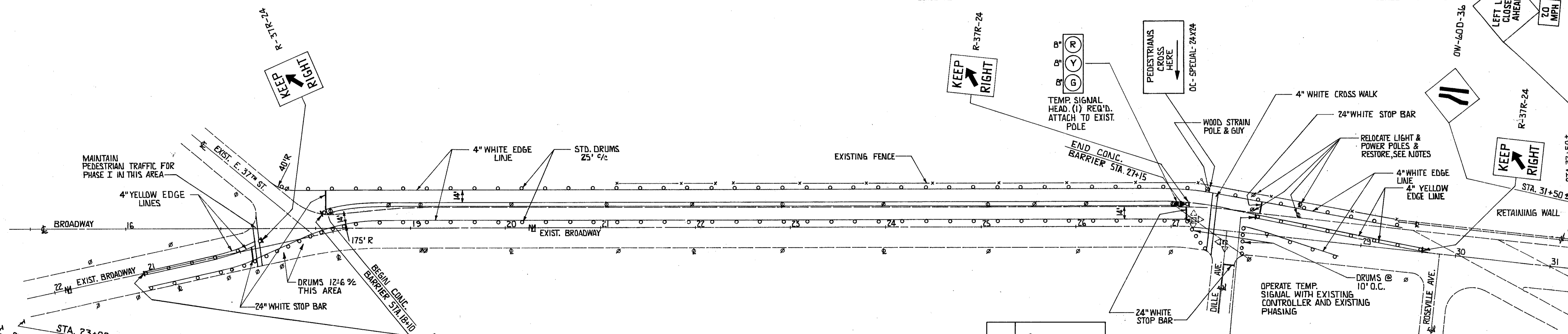
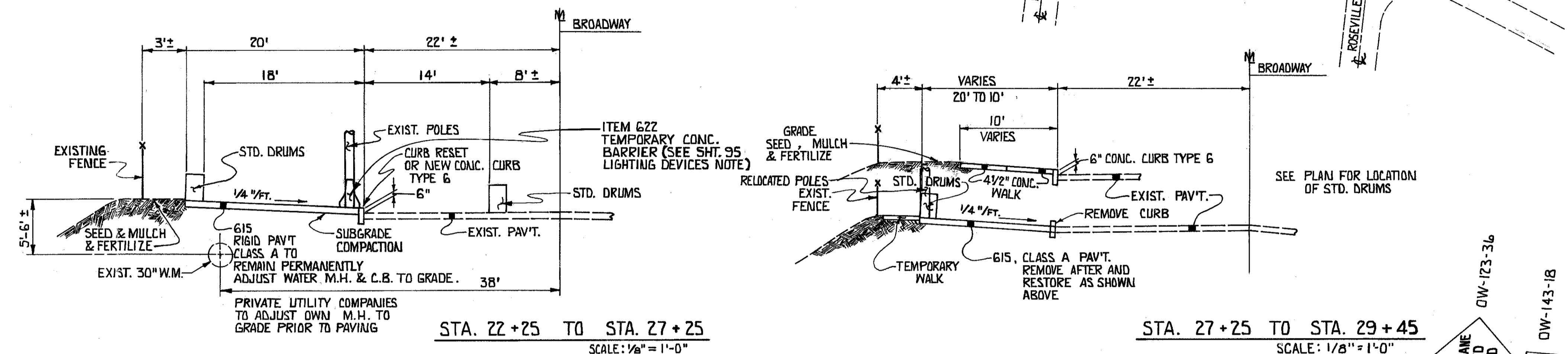
CUYAHOGA COUNTY
CUY-490-1.49



LIGHTING NOTES

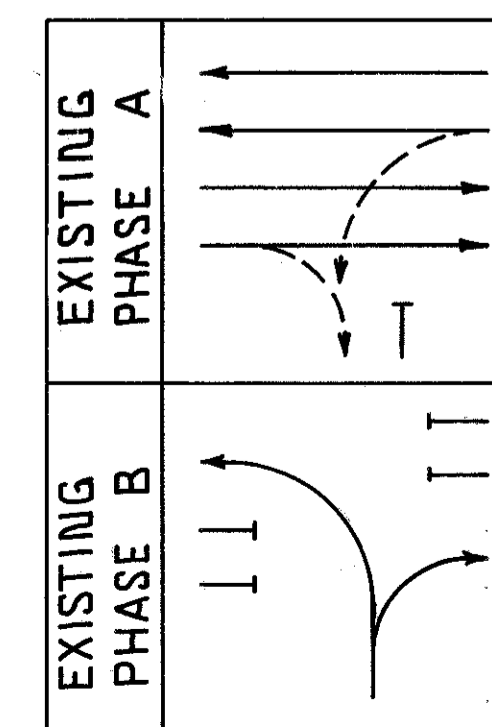
1. BRACKET ARM AND LUMINAIRE TO BE ADDED TO EXISTING POLE (EXISTING LUMINAIRE TO REMAIN)
2. EXISTING POLE WITH LUMINAIRE TO BE RELOCATED
3. WIRE TO EXISTING LIGHTING CIRCUITS

PAVEMENT PLAN



PHASE I TRAFFIC CONTROL PLAN

NOTE
FOR UNDERGROUND UTILITIES NOT SHOWN ON THIS PLAN SEE SHEETS 47, 48, 49, 51, 53, 124, 126 & 150.



| | | | |
|-----|------|----|---|
| NO. | DATE | BY | REVISED |
| | | | TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 |

MAINTENANCE OF TRAFFIC
BROADWAY AREA
PHASE I PLAN

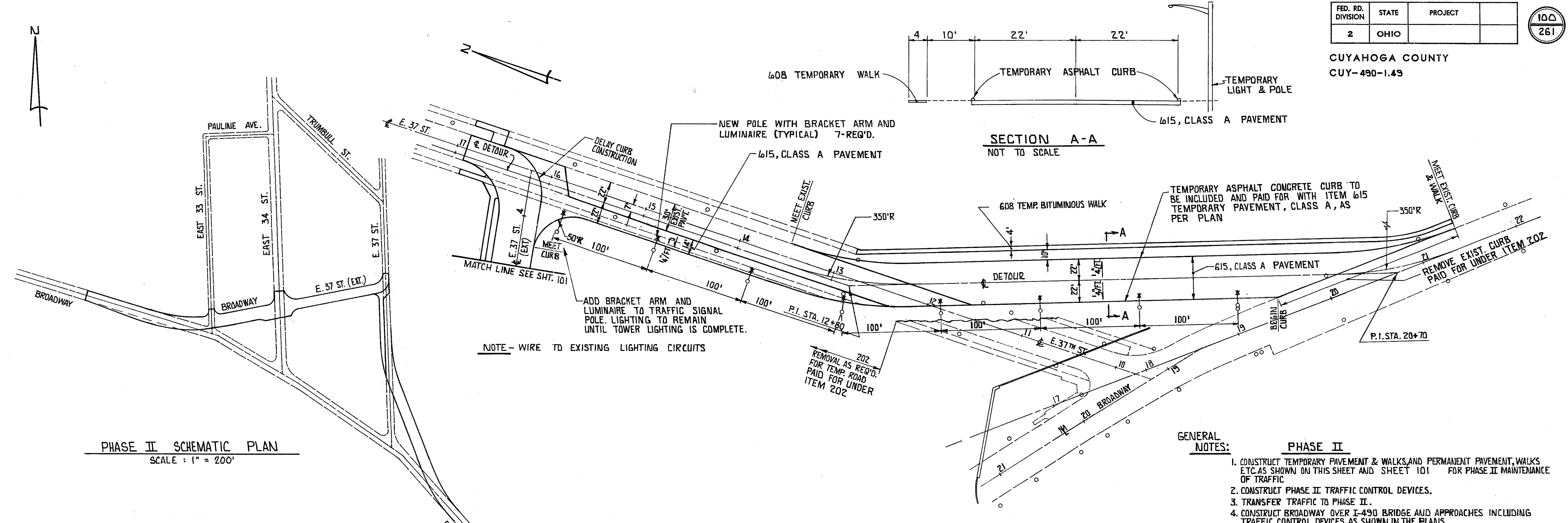
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|-----------------------------------|----------|--------|--------|---------|----------|------|
| SCALE: 1"= 50', UNLESS NOTED DATE | DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| | RLH | RLH.II | | JRH | | |

SHEET ACCT. No. CONT. No.

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| 2 | OHIO | |

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CUYAHOGA COUNTY
CUY-490-1.49



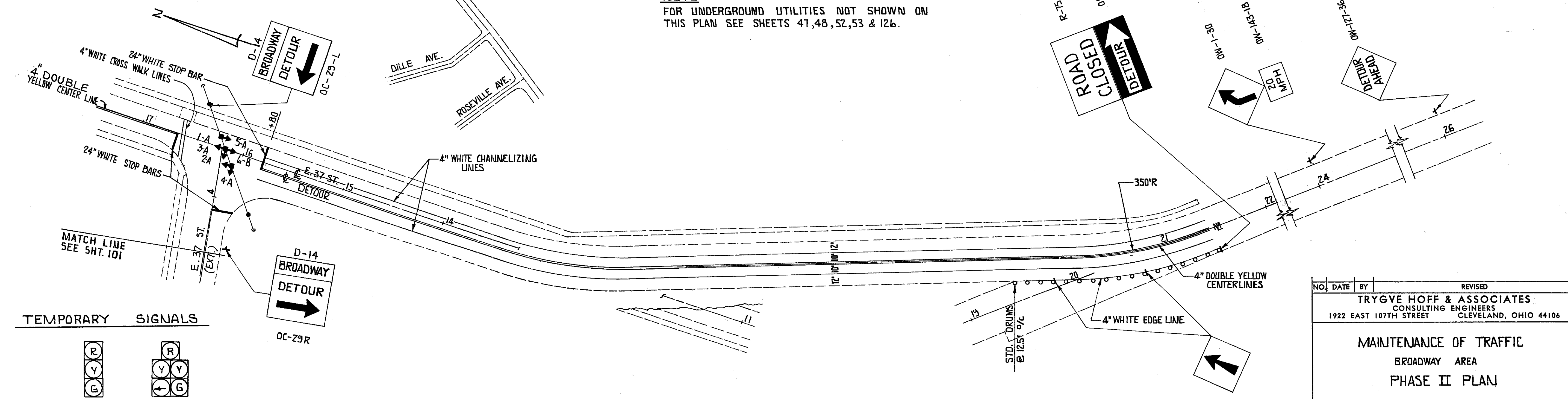
PHASE II SCHEMATIC PLAN
SCALE: 1" = 200'

SECTION A-A
NOT TO SCALE

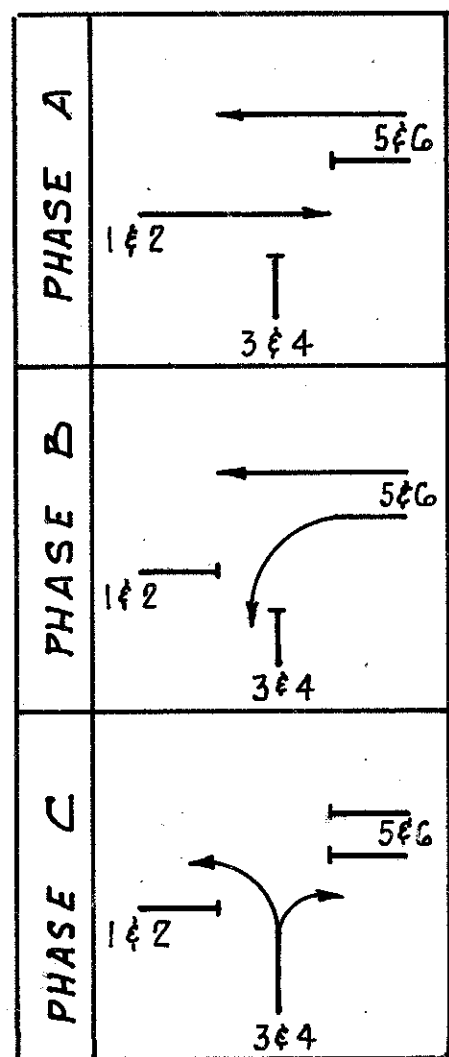
- GENERAL NOTES:
- PHASE II**
1. CONSTRUCT TEMPORARY PAVEMENT & WALKS AND PERMANENT PAVEMENT WALKS ETC. AS SHOWN ON THIS SHEET AND SHEET 101 FOR PHASE II MAINTENANCE OF TRAFFIC.
 2. CONSTRUCT PHASE II TRAFFIC CONTROL DEVICES.
 3. TRANSFER TRAFFIC TO PHASE II.
 4. CONSTRUCT BROADWAY OVER I-490 BRIDGE AND APPROACHES INCLUDING TRAFFIC CONTROL DEVICES AS SHOWN IN THE PLANS.
 5. TRANSFER TRAFFIC TO BROADWAY.
 6. COMPLETE PERMANENT CONSTRUCTION AT E. 37TH ST. INTERSECTION AND EAST BROADWAY APPROACH PAVEMENT. MAINTAIN TRAFFIC USING NEW, EXISTING AND TEMPORARY PAVEMENT AS REQUIRED. RED'D TEMP. PAVT. NOT SHOWN PAID FROM QUANTITIES IN GEN. NOTES. PROVIDE FLAGMEN, LIGHTS, BARRICADES, STD. BARRELS AND OTHER TRAFFIC CONTROL DEVICES AS REQUIRED.

PHASE II PAVEMENT PLAN
SCALE: 1" = 50'

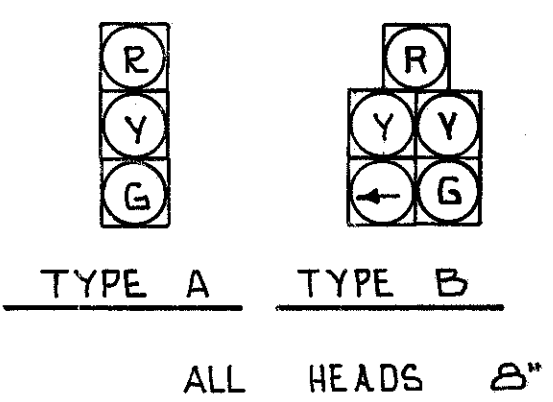
NOTE
FOR UNDERGROUND UTILITIES NOT SHOWN ON THIS PLAN SEE SHEETS 41, 48, 52, 53 & 126.



PHASE II TRAFFIC CONTROL PLAN
SCALE: 1" = 50'



TEMPORARY SIGNALS



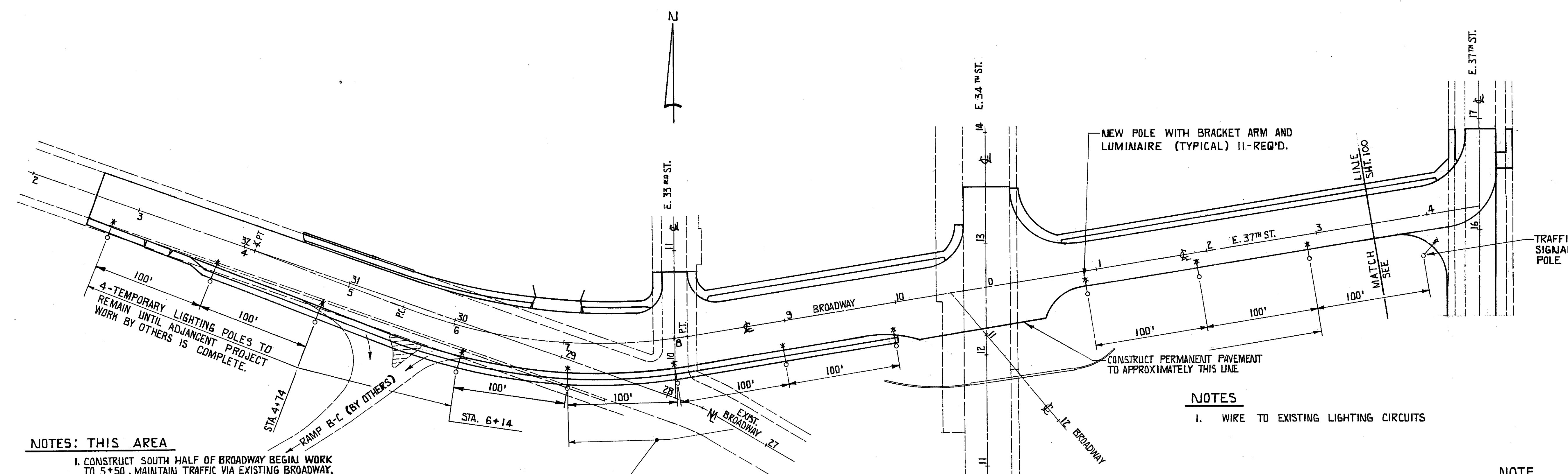
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|---|--------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| MAINTENANCE OF TRAFFIC BROADWAY AREA PHASE II PLAN | | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| RLH | RLH II | JRH | JRH |
| DATE | DATE | DATE | DATE |

CONT. No. SHEET ACCT. No.

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

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CUYAHOGA COUNTY
CUY-490-1.49



NOTES: THIS AREA

1. CONSTRUCT SOUTH HALF OF BROADWAY BEGIN WORK TO 5+50. MAINTAIN TRAFFIC VIA EXISTING BROADWAY. PROVIDING TEMP. PAVEMENT, FLAGMEN, LIGHTS, BARRICADES, STD. BARRELS AND OTHER TRAFFIC CONTROL DEVICES REQ'D.
2. CONSTRUCT BROADWAY & EAST 37th ST. FROM 33rd TO EAST 37th ST. MAINTAIN EAST 34th & 37th STREET TRAFFIC BY PROVIDING TEMP. PAVEMENT, FLAGMEN, LIGHTS, BARRICADES, STD. BARRELS AND OTHER TRAFFIC CONTROL DEVICES AS REQ'D.
3. CONSTRUCT THE NORTH HALF OF BROADWAY FROM BEGIN WORK TO EAST 33rd STREET.
4. TRANSFER BROADWAY TRAFFIC TO DETOUR (E. 37th, NEW BROADWAY). MAINTAIN TRAFFIC ON THE NORTH NEW PAV'T AND COMPLETE BROADWAY SOUTH HALF CONSTRUCTION STA. 5+50 TO EAST 33rd ST.

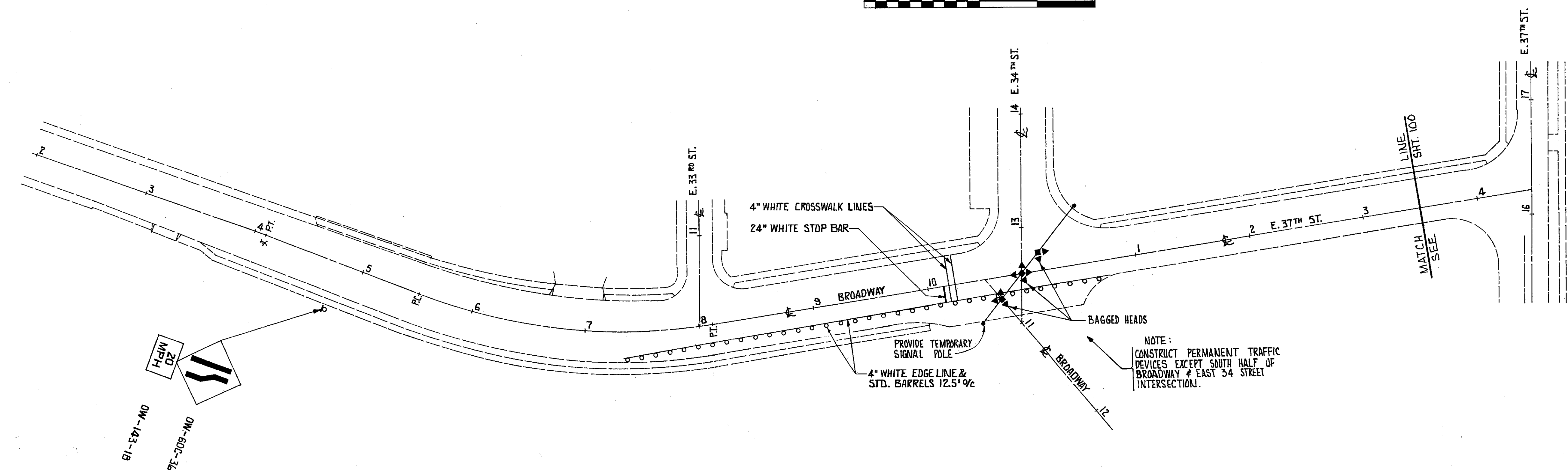
NOTES

1. WIRE TO EXISTING LIGHTING CIRCUITS

NOTE

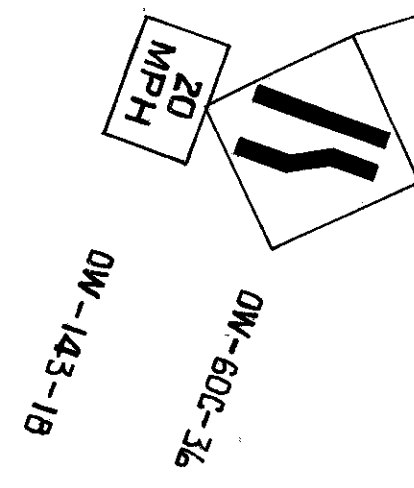
FOR UNDERGROUND UTILITIES NOT SHOWN ON THIS PLAN SEE SHEETS 42,43,44,52,53,121,122,123,125,126 & 150

PHASE II PAVEMENT PLAN



PHASE II TRAFFIC CONTROL PLAN

CONT. No. SHEET ACCT. No.

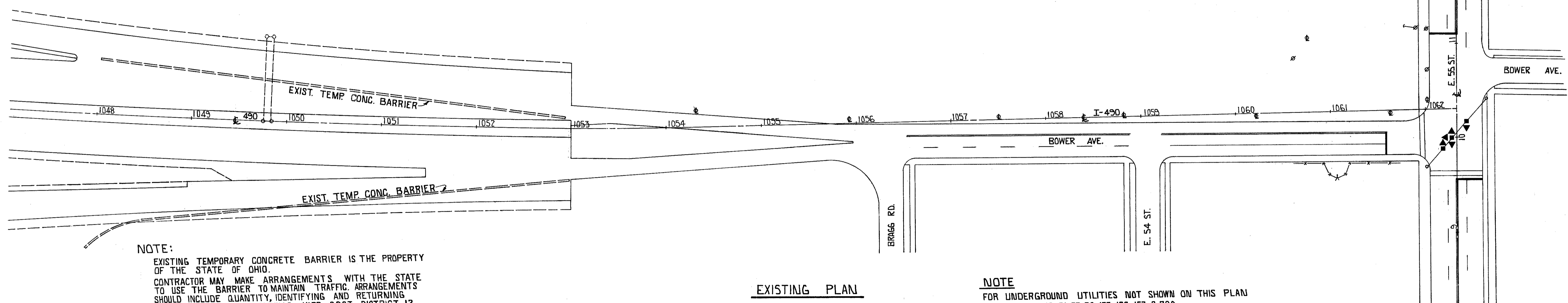


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|--|--------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| MAINTENANCE OF TRAFFIC BROADWAY AREA PHASE II PLAN | | | |
| SCALE: 1"=50' | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| RLH | RLH II | | JRH |

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

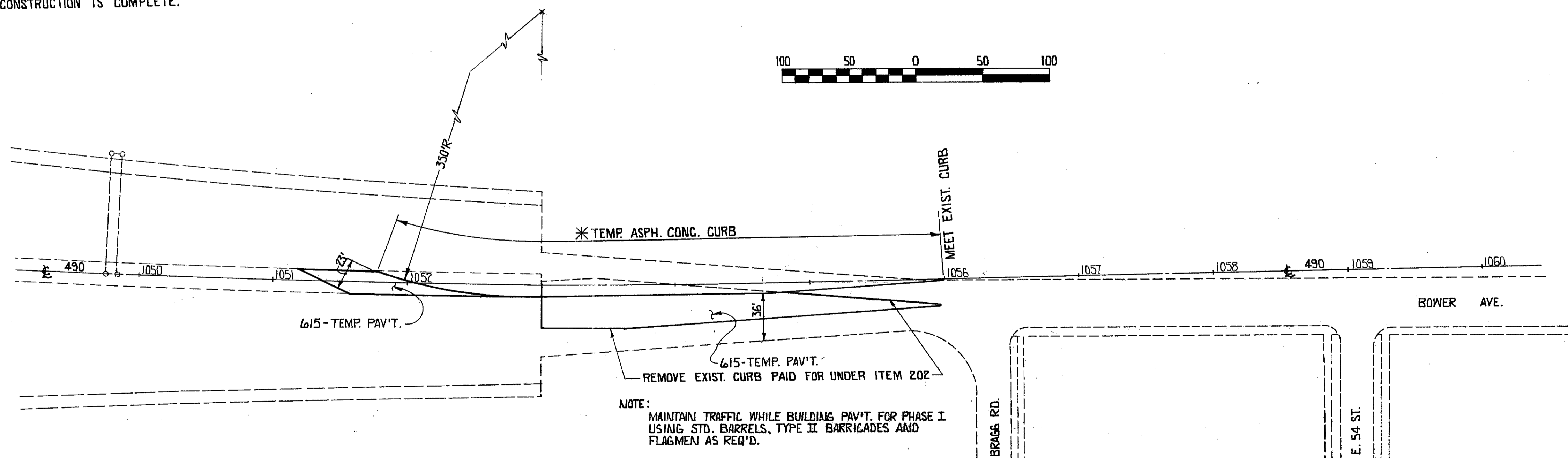
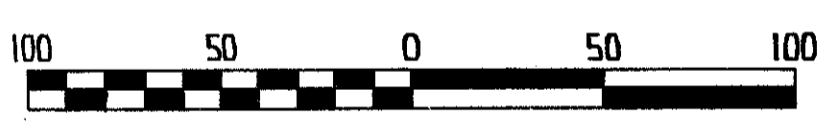
102
261

CUYAHOGA COUNTY
CUY.-490-1.49



NOTE:
EXISTING TEMPORARY CONCRETE BARRIER IS THE PROPERTY OF THE STATE OF OHIO. CONTRACTOR MAY MAKE ARRANGEMENTS WITH THE STATE TO USE THE BARRIER TO MAINTAIN TRAFFIC ARRANGEMENTS SHOULD INCLUDE QUANTITY, IDENTIFYING AND RETURNING BARRIERS TO THE WARRENSVILLE YARD, O.D.O.T. DISTRICT 12, AFTER CONSTRUCTION IS COMPLETE.

NOTE
FOR UNDERGROUND UTILITIES NOT SHOWN ON THIS PLAN SEE SHEETS 19, 21, 37, 39, 127, 128, 153 & 200.



NOTE:
MAINTAIN TRAFFIC WHILE BUILDING PAV'T. FOR PHASE I USING STD. BARRELS, TYPE II BARRICADES AND FLAGMEN AS REQ'D.

- NOTES: PHASE I**
1. CONSTRUCT TEMP. PAV'T ALL CLASS "A", THIS SHEET
 2. CONSTRUCT TRAFFIC CONTROL DEVICES, SHEET 103
 3. TRANSFER TRAFFIC, SHEET 103
 4. REMOVE PAV'T THIS SHEET
 5. CONSTRUCT NORTH HALF OF I-490 AS SHOWN ON SHEET 103

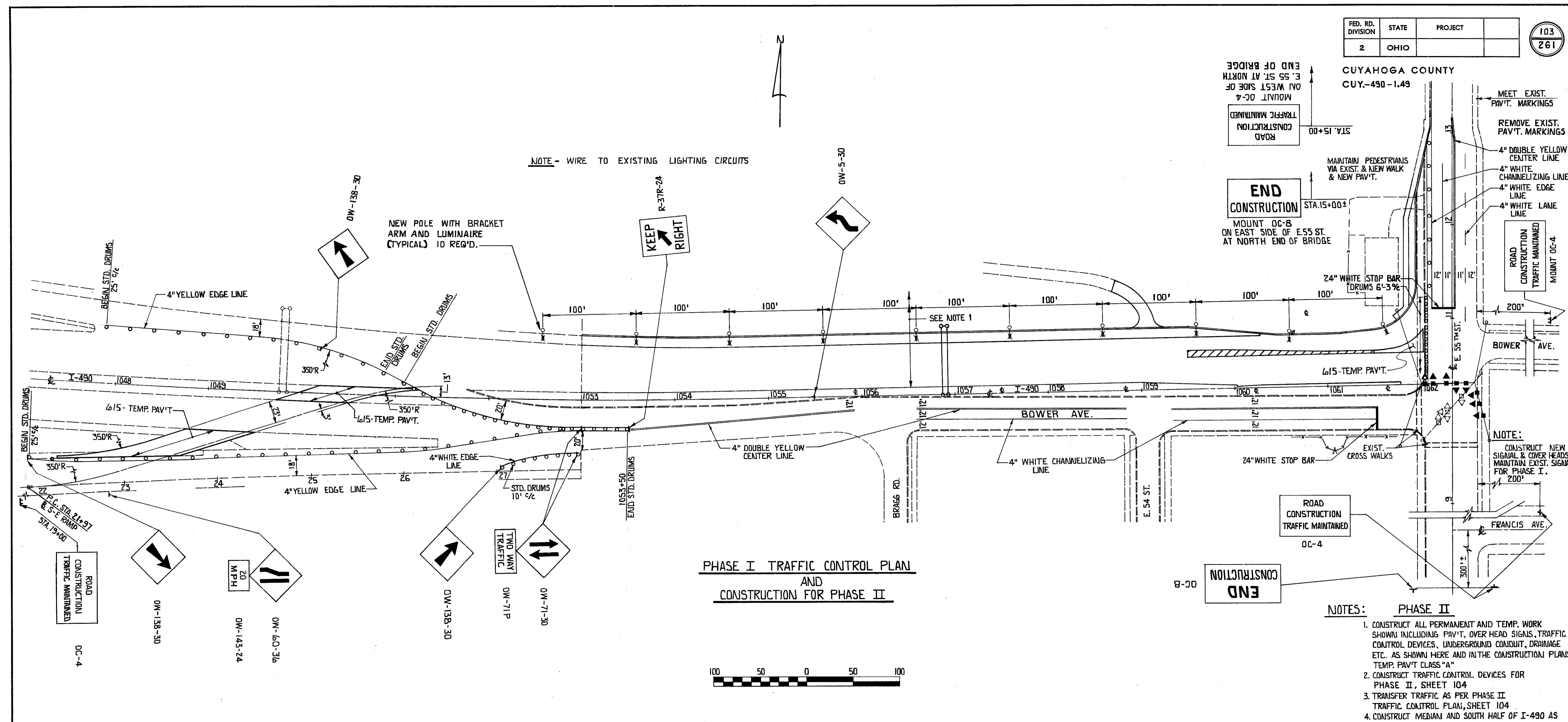
PHASE I PAVEMENT PLAN
WORK WITH TRAFFIC PLAN PHASE I NEXT SHEET

*TEMPORARY ASPHALT CONCRETE CURB TO BE INCLUDED AND PAID FOR WITH ITEM 615 TEMPORARY PAVEMENT, CLASS A, AS PER PLAN

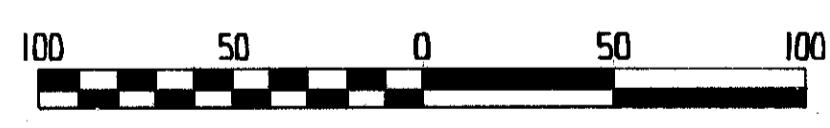
| | | | |
|---|--------|--------|----------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| MAINTENANCE OF TRAFFIC I-490 TO EAST 55 TH ST. EXIST. PLAN & PHASE I | | | |
| SCALE: 1" = 50' | | | DATE |
| DESIGNED | DRAWN | TRACED | CHECKED |
| RLH | RLH II | | JRH |
| | | | REVIEWED |
| | | | DATE |

CONT. No. SHEET ACCT. No.

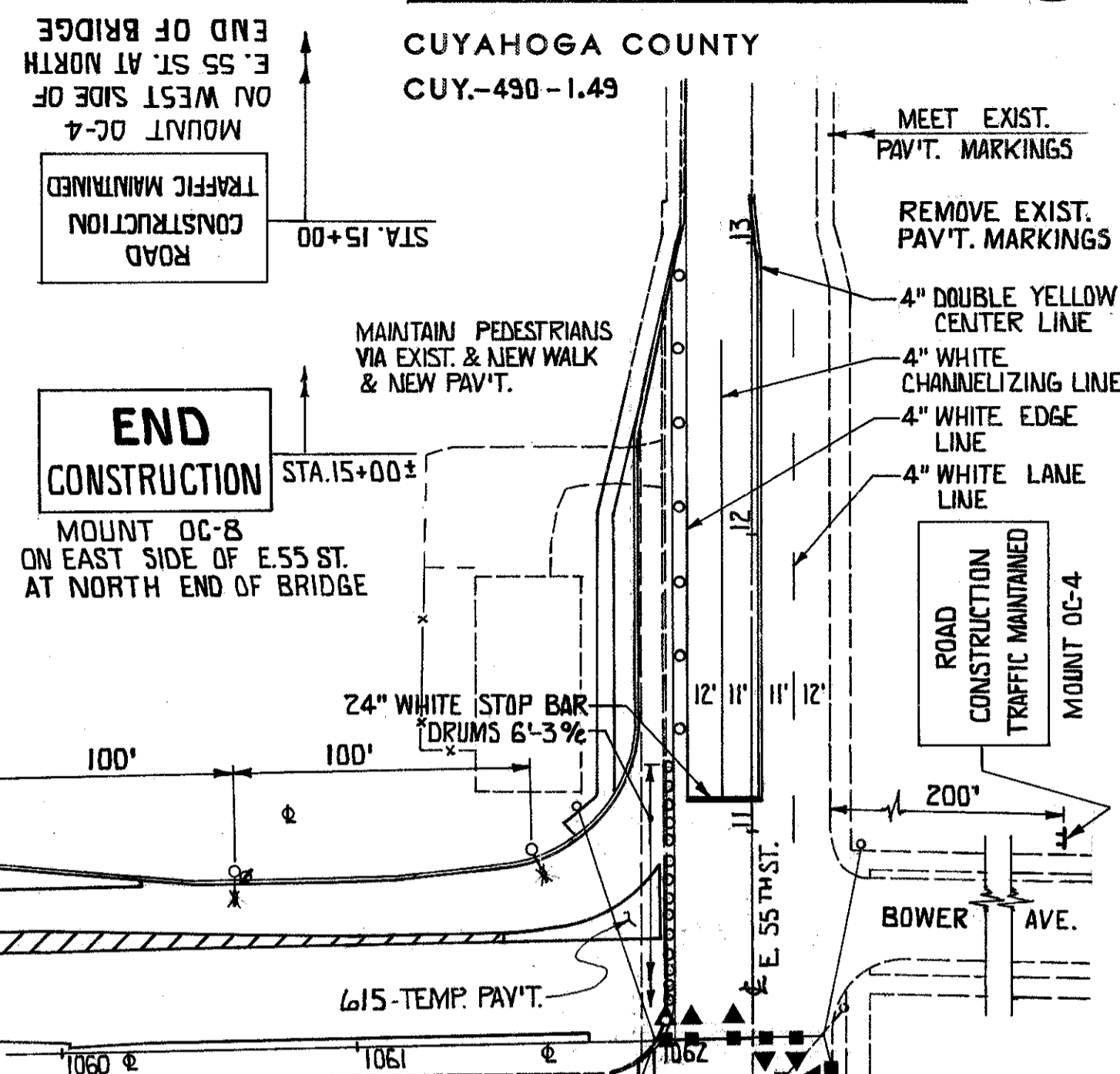
CUYAHOGA COUNTY
CUY-490-1.49



**PHASE I TRAFFIC CONTROL PLAN
AND
CONSTRUCTION FOR PHASE II**



NOTE
FOR UNDERGROUND UTILITIES NOT SHOWN ON THIS PLAN SEE SHEETS 19, 21, 31, 39, 127, 128, 153 & 200.



- NOTES: PHASE II**
1. CONSTRUCT ALL PERMANENT AND TEMP. WORK SHOWN INCLUDING PAV'T, OVER HEAD SIGNS, TRAFFIC CONTROL DEVICES, UNDERGROUND CONDUIT, DRAINAGE ETC. AS SHOWN HERE AND IN THE CONSTRUCTION PLANS. TEMP. PAV'T CLASS "A"
 2. CONSTRUCT TRAFFIC CONTROL DEVICES FOR PHASE II, SHEET 104
 3. TRANSFER TRAFFIC AS PER PHASE II TRAFFIC CONTROL PLAN, SHEET 104
 4. CONSTRUCT MEDIAN AND SOUTH HALF OF I-490 AS SHOWN ON SHEET 104
 5. MAINTAIN ALL OC-4 AND OC-8 SIGNS UNTIL CONSTRUCTION IS COMPLETE ON ALL PHASES.

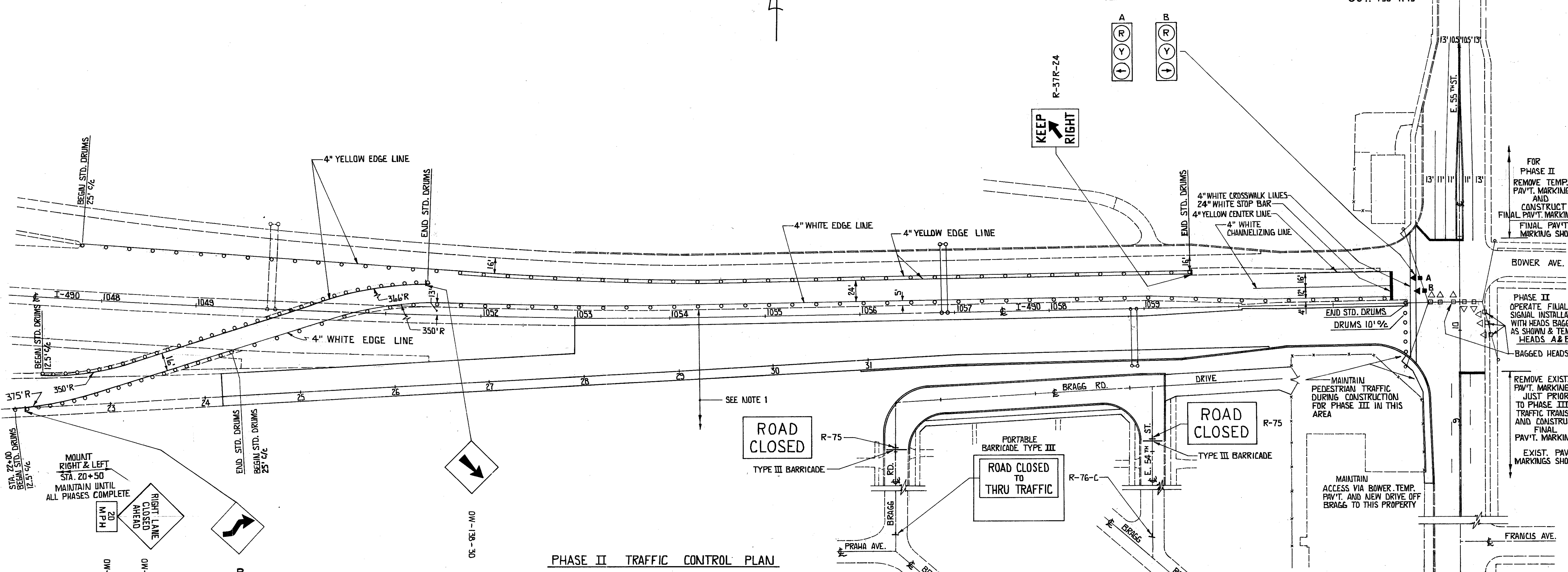
CONT. No. SHEET ACCT. No.

| | | | |
|---|--------|--------|----------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| MAINTENANCE OF TRAFFIC I-490 TO EAST 55 TH ST. PHASE I TRAFFIC CONTROL PHASE II CONSTRUCTION | | | |
| SCALE: 1"=50' | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| RLH | RLH II | | JRH |
| | | | REVIEWED |
| | | | DATE |

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

104
261

CUYAHOGA COUNTY
CUY. 490-1.49



PHASE II TRAFFIC CONTROL PLAN
AND
CONSTRUCTION FOR PHASE III



NOTE
FOR UNDERGROUND UTILITIES NOT SHOWN ON THIS PLAN SEE SHEETS 19, 21, 37, 39, 127, 128, 153 & 200.

- NOTES: PHASE III**
1. CONSTRUCT ALL PERMANENT WORK, MEDIAN & SOUTH OF I-490, BRAGG ROAD & E. 55TH ST. INCLUDING WATERWORK, DRAINAGE, UNDERGROUND CONDUIT, TRAFFIC CONTROL DEVICES, PAVEMENT ECT.
 2. CONSTRUCT TRAFFIC CONTROL DEVICES FOR PHASE III, SHEET 105
 3. TRANSFER TRAFFIC AS PER PHASE III TRAFFIC CONTROL PLAN, SHEET 105
 4. COMPLETE ISLAND CONSTRUCTION N-E QUADRANT I-490 - E. 55TH ST. INTERSECTION & FINAL PAVEMENT MARKINGS & SIGNS.

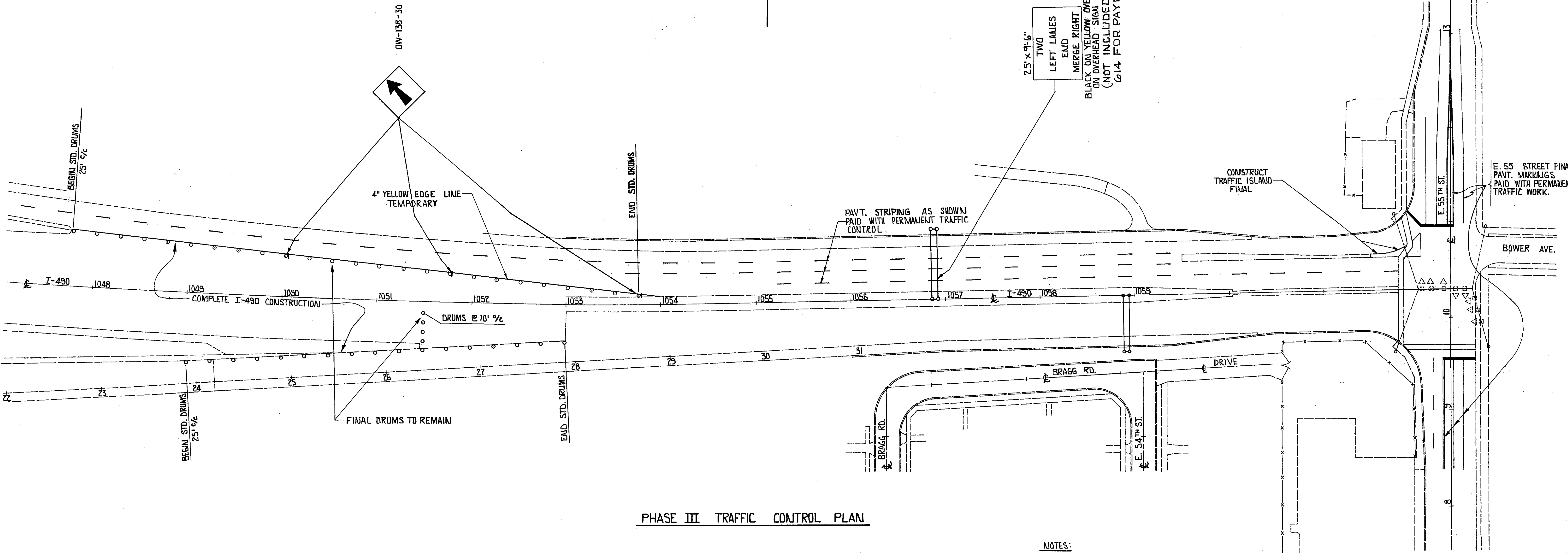
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|---|--------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| MAINTENANCE OF TRAFFIC I-490 TO EAST 55TH ST. PHASE II TRAFFIC CONTROL PHASE III CONSTRUCTION | | | |
| SCALE: 1"= 50' | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| RLH | RLH II | JRH | JRH |

CONT. No. SHEET ACCT. No.

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

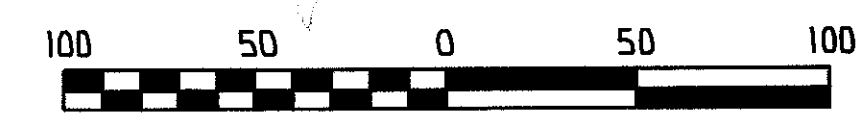
105
261

CUYAHOGA COUNTY
CUY-490-1.49



PHASE III TRAFFIC CONTROL PLAN

- NOTES:
1. COMPLETE PERMANENT TRAFFIC CONTROL DEVICES.
 2. TRANSFER TRAFFIC AS PER FINAL PLAN OPENING I-490, BY OTHERS.



NOTE
FOR UNDERGROUND UTILITIES NOT SHOWN ON THIS PLAN SEE SHEETS 19, 21, 31, 39, 127, 128, 153 & 200.

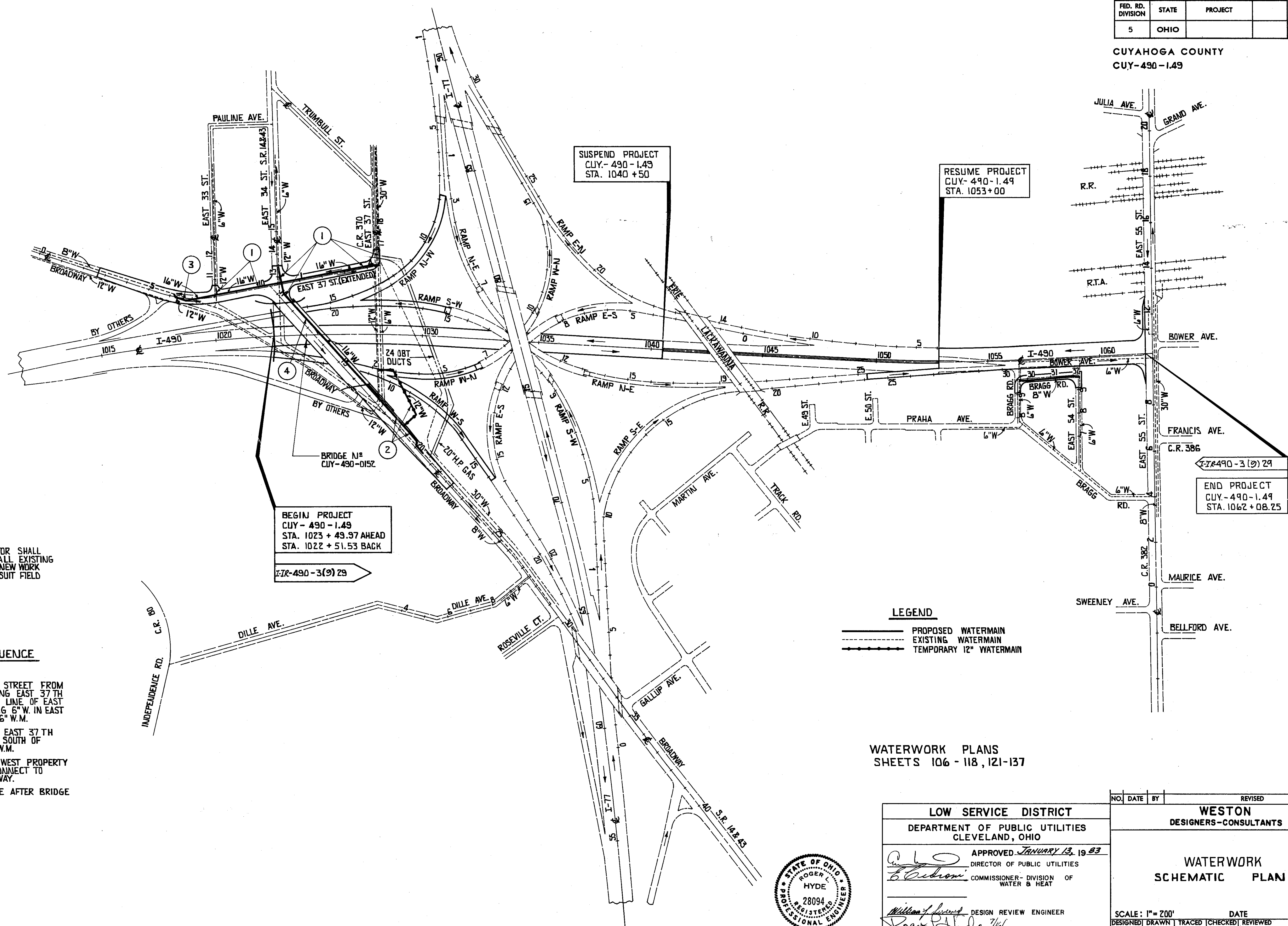
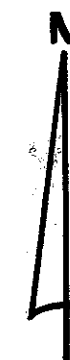
CONT. No. SHEET ACCT. No.

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|---|--------|--------|----------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| MAINTENANCE OF TRAFFIC I-490 TO EAST 55TH ST. PHASE III TRAFFIC CONTROL | | | |
| SCALE: 1" = 50' | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| RLH | RLH II | | JRH |
| | | | REVIEWED |
| | | | DATE |

| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 5 | OHIO | |

106
761

CUYAHOGA COUNTY
CUY-490-1.49



SUSPEND PROJECT
CUY-490-1.49
STA. 1040+50

RESUME PROJECT
CUY-490-1.49
STA. 1053+00

BEGIN PROJECT
CUY-490-1.49
STA. 1023+49.97 AHEAD
STA. 1022+51.53 BACK

END PROJECT
CUY-490-1.49
STA. 1062+08.25

NOTE:
BEFORE COMMENCING WORK CONTRACTOR SHALL VERIFY POSITION, SIZE AND TYPE OF ALL EXISTING WATER MAINS TO BE CONNECTED TO NEW WORK AND SHALL ADJUST CONSTRUCTION TO SUIT FIELD CONDITIONS.

GENERAL CONSTRUCTION SEQUENCE

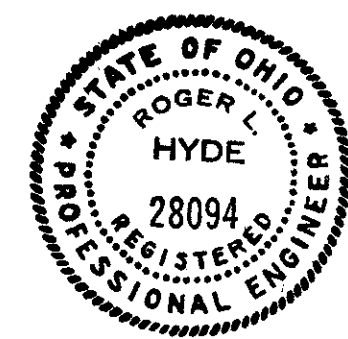
- 1 CONSTRUCT 16" W.M. ON EAST 37TH STREET FROM EXISTING 6" W. AND 12" W. IN EXISTING EAST 37TH STREET TO VALVE AT WEST PROPERTY LINE OF EAST 33RD STREET AND CONNECT EXISTING 6" W. IN EAST 33RD AND EAST 34TH STREET TO 16" W.M.
- 2 CONSTRUCT 12" TEMPORARY W.M. ON EAST 37TH STREET AND 16" W.M. ON BROADWAY SOUTH OF BRIDGE AND CONNECT TO EXISTING 8" W.M.
- 3 CONSTRUCT 16" W.M. FROM VALVE ON WEST PROPERTY LINE OF EAST 33RD STREET AND CONNECT TO EXISTING 8" W. AND 12" W. IN BROADWAY.
- 4 CONSTRUCT 16" W.M. ACROSS BRIDGE AFTER BRIDGE IS COMPLETED AND CONNECT.

LEGEND

| | |
|--|-------------------------|
| | PROPOSED WATERMAIN |
| | EXISTING WATERMAIN |
| | TEMPORARY 12" WATERMAIN |

WATERWORK PLANS
SHEETS 106 - 118, 121-137

CONT. No. SHEET ACCT. No.



LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO

APPROVED *January 13, 1993*
DIRECTOR OF PUBLIC UTILITIES

R. Hyde COMMISSIONER - DIVISION OF WATER & HEAT

William J. ... DESIGN REVIEW ENGINEER

Roger L. Hyde WESTON DESIGNERS - CONSULTANTS

| | | | | | | | |
|---------------------------------|-------|--------|---------|------------------------------|------|---------|--|
| NO. | | DATE | | BY | | REVISED | |
| WESTON | | | | DESIGNERS-CONSULTANTS | | | |
| WATERWORK SCHEMATIC PLAN | | | | | | | |
| SCALE: 1"=200' | | | | DATE | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | | |
| JRH | CAP | | JRH | | | | |

GENERAL SUMMARY

I FUNDS

| QUANTITIES | | | | FED. RD. DIVISION | STATE | PROJECT |
|--------------|-----------|--|--|-------------------|-------|---------|
| CALC. BY CAP | DATE 2-82 | | | 5 | OHIO | |
| CHKD. BY JRH | DATE 2-82 | | | | | |

107
267

CUYAHOGA COUNTY
CUY 490-1.49

| LINE NO. | SHEET NUMBER | | | | | | | | SUBTOTAL | TOTAL | UNIT | ITEM | DESCRIPTION |
|----------|--------------|------|------|-----|------|-----|-----|------|----------|-------|------|---------|---|
| | 109 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | | | | | |
| 1 | | | | | | | | | | | | | |
| 2 | | | | | 162 | 200 | | | 362 | 362 | L.F. | SPECIAL | 12" TEMPORARY BY PASS CONNECTION COMPLETE WITH PIPE AND FITTINGS- DUCTILE IRON PIPE, A.S.A. CLASS 56 CEMENT LINED WITH SLIP ON JOINTS AND BOLTLESS RESTRAINED FITTINGS AS NOTED |
| 3 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | 310 | 326 | 385 | | | 370 | 1391 | 1391 | L.F. | SPECIAL | 16" WATERMAIN- DUCTILE IRON PIPE, A.S.A. CLASS 56 CEMENT LINED WITH SLIP ON JOINTS AND BOLTLESS RESTRAINED FITTINGS AS NOTED |
| 6 | | | 66 | 60 | | | | | 126 | 126 | L.F. | SPECIAL | 12" WATERMAIN- DUCTILE IRON PIPE, A.S.A. CLASS 56 CEMENT LINED WITH SLIP ON JOINTS AND BOLTLESS RESTRAINED FITTINGS AS NOTED |
| 7 | | | | | | | | 270 | 270 | 270 | L.F. | SPECIAL | 8" WATERMAIN- DUCTILE IRON PIPE, A.S.A. CLASS 56 CEMENT LINED WITH SLIP ON JOINTS AND BOLTLESS RESTRAINED FITTINGS AS NOTED |
| 8 | | 26 | 30 | 26 | 18 | | | 26 | 144 | 144 | L.F. | SPECIAL | 6" WATERMAIN- DUCTILE IRON PIPE, A.S.A. CLASS 56 CEMENT LINED WITH LEAD OR BOLTLESS RESTRAINED JOINTS AND FITTINGS AS NOTED |
| 9 | | | | | | | | | | | | | |
| 10 | | | 3 | 3 | 1 | | | 1 | 8 | 8 | EA. | SPECIAL | 16" HUB VALVE |
| 11 | | | 2 | 1 | 1 | | | | 4 | 4 | EA. | SPECIAL | 12" HUB VALVE |
| 12 | | | | | | | | 2 | 2 | 2 | EA. | SPECIAL | 8" HUB VALVE |
| 13 | | | 1 | 1 | 1 | | | 1 | 4 | 4 | EA. | SPECIAL | 6" HUB VALVE |
| 14 | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | |
| 16 | | 1 | | | | | | | 1 | 1 | EA. | SPECIAL | 12"x6" TAPPING SLEEVE AND 6" VALVE COMPLETE |
| 17 | | | | | | | | 2 | 2 | 2 | EA. | SPECIAL | 6"x6" TAPPING SLEEVE AND 6" VALVE COMPLETE |
| 18 | | | | | | | | | | | | | |
| 19 | | | 1 | | | 1 | 1 | | 3 | 3 | EA. | SPECIAL | 12" CUTTING-IN VALVE COMPLETE |
| 20 | | | 1 | | 1 | | | | 2 | 2 | EA. | SPECIAL | 8" CUTTING-IN VALVE COMPLETE |
| 21 | | | 1 | 1 | | 1 | 1 | 2 | 6 | 6 | EA. | SPECIAL | 6" CUTTING-IN VALVE COMPLETE |
| 22 | | | | | | | | | | | | | |
| 23 | | | | 443 | 54 | | | | 497 | 497 | L.F. | SPECIAL | 16" O.D x 0.50" EXTRA STRONG GALVANIZED WELDED STEEL PIPE, ASTM A-120 GRADE B WATERMAIN ASSEMBLY COMPLETE |
| 24 | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| 26 | | | | | | | | | | | | | |
| 27 | | 1 | 1 | | 1 | | | | 3 | 3 | EA. | SPECIAL | HYDRANT REMOVED, EXTENDED & RESET |
| 28 | | | | | | | | | | | | | |
| 29 | | | 1 | 1 | 1 | | 1 | 2 | 6 | 6 | EA. | SPECIAL | FURNISHING AND SETTING 6" HYDRANT |
| 30 | | | | | | | | | | | | | |
| 31 | | 1 | | | | | | | 1 | 1 | EA. | SPECIAL | 6" FIRE SERVICE VAULT |
| 32 | | | | | | | | | | | | | |
| 33 | | 1 | | | | | | | 1 | 1 | EA. | SPECIAL | 6" FIRE LINE SETTING |
| 34 | | | | | | | | | | | | | |
| 35 | | 1 | 1 | | 1 | | 1 | | 4 | 4 | EA. | SPECIAL | ADJUST EXISTING VALVE BOX TO GRADE |
| 36 | | | | | | | | | | | | | |
| 37 | | 1 | | | | | | | 1 | 1 | EA. | SPECIAL | 6" LOCK TYPE INDICATOR WITH INDICATOR POST TYPE GATE VALVE |
| 38 | | | | | | | | | | | | | |
| 39 | | | | | 1 | | | 1 | 2 | 2 | EA. | SPECIAL | 3/4" WATER METER VAULT |
| 40 | | | | | | | | | | | | | |
| 41 | | | | | 1 | | | 1 | 2 | 2 | EA. | SPECIAL | 3/4" METER SETTING |
| 42 | | | | | | | | | | | | | |
| 43 | | | | | 5 | | | 7 | 12 | 12 | EA. | SPECIAL | 3/4" SERVICE CONNECTION EXTENDED |
| 44 | | | | | | | | | | | | | |
| 45 | | | | | 3 | | | | 3 | 3 | EA. | SPECIAL | RECONNECT EXISTING 3/4" SERVICE CONNECTION |
| 46 | | | | | | | | | | | | | |
| 47 | | | | | 6 | | 3 | 1 | 11 | 11 | EA. | SPECIAL | PLUGGING 3/4" SERVICE CONNECTION |
| 48 | | | | | | | | | | | | | |
| 49 | | 1 | | | | | 1 | 1 | 3 | 3 | EA. | SPECIAL | PLUGGING 6" WATERMAIN |
| 50 | | | | | | | | | | | | | |
| 51 | | | 1 | | 1 | | 1 | | 3 | 3 | EA. | SPECIAL | PLUGGING 12" WATERMAIN |
| 52 | | | | | | | | | | | | | |
| 53 | | | | | 1 | | | | 1 | 1 | EA. | SPECIAL | 2" AIR RELIEF ASSEMBLY COMPLETE |
| 54 | | | | | | | | | | | | | |
| 55 | | 3 | | | | | | | 3 | 3 | EA. | SPECIAL | 8" GUARD POST |
| 56 | | | | | | | | | | | | | |
| 57 | | 765 | 1644 | 912 | 1864 | 366 | 717 | 1044 | 958 | 8270 | LBS. | SPECIAL | MISCELLANEOUS METAL OR PLASTIC WORK |
| 58 | | | | | | | | | | | | | |
| 59 | | 2 | | | | | | | 2 | 2 | MBF | SPECIAL | SHEETING LEFT IN PLACE |
| 60 | | | | | | | | | | | | | |
| 61 | | L.S. | | | L.S. | | | L.S. | L.S. | L.S. | L.S. | SPECIAL | EXISTING STRUCTURES REMOVED |
| 62 | | | | | | | | | | | | | |
| 63 | | 1 | | | | | | | 1 | 1 | EA. | 202 | INDICATOR POST WITH GATE VALVE REMOVED |
| 64 | | | | | | | | | | | | | |
| 65 | | | 375 | 100 | 503 | | 70 | 635 | 144 | 1827 | L.F. | 202 | WATERMAIN REMOVED 24" AND UNDER |
| 66 | | | | | | | | | | | | | |
| 67 | | 2 | | | | | | | 2 | 2 | EA. | 202 | 8" STEEL CONCRETE FILLED GUARD POST REMOVED |
| 68 | | | | | | | | | | | | | |
| 69 | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | |
| 71 | | | | | | | | | | | | | |
| 72 | | | | | | | | | | | | | |
| 73 | | | | | | | | | | | | | |

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| | |
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| BRAGG | 127 |
| E. 55 ST. | 128 |
| TEMPORARY 12" W.M. PROFILE | 129 |
| DETAILS | 130-137 |

NOTE:

CAST IRON 250 PSI. MAY BE SUBSTITUTED IN LIEU OF DUCTILE IRON 350 PSI. FITTINGS.

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO

APPROVED JANUARY 13, 1982
William J. Anderson
DESIGN REVIEW ENGINEER

Roger P. Hyde 1/16/82 WESTON
DESIGNERS-CONSULTANTS

NO. DATE BY REVISOR
WESTON DESIGNERS-CONSULTANTS

WATERWORK GENERAL SUMMARY

| | |
|-----------------|----------------|
| SCALE | DATE |
| DESIGNED BY JRH | DRAWN BY CAP |
| TRACED BY JRH | CHECKED BY JRH |
| REVIEWED BY JRH | DATE |

CONT. No. SHEET ACCT. No.

GENERAL

SCOPE OF WORK

THE WORK CONTEMPLATED UNDER THIS CONTRACT COMPRISES THE FURNISHINGS AND INSTALLING COMPLETE WITH VALVES AND OTHER APPURTENANCES, THE FOLLOWING WATER MAIN RELOCATIONS AND PERFORMING OTHER INCIDENTAL WORK NECESSARY TO ABANDON EXISTING WATER FACILITIES AS SHOWN ON SHEET 121 THRU 136.

DEFINITIONS

WHEREVER IN THESE SPECIFICATIONS OR IN OTHER CONTRACT DOCUMENTS THE FOLLOWING TERMS OR PRONOUNS IN PLACE OF THEM ARE USED, THE INTENT AND MEANING SHALL BE INTERPRETED AS FOLLOWS:

THE STATE

THE STATE IS THE STATE OF OHIO ACTING THROUGH ITS AUTHORIZED REPRESENTATIVE.

ENGINEER

THE ENGINEER IS DISTRICT DEPUTY DIRECTOR OR DISTRICT ENGINEER, THE DISTRICT CONSTRUCTION ENGINEER OR THE DISTRICT MAINTENANCE ENGINEER OR THE PROJECT ENGINEER ASSIGNED TO ADMINISTER THE CONTRACT, OR THEIR DULY DESIGNATED DUPUTIES, AGENTS, OR REPRESENTATIVES.

THE CITY

THE CITY IS THE DIRECTOR, DEPARTMENT OF PUBLIC UTILITIES OF THE CITY OF CLEVELAND OR THEIR DULY DESIGNATED DEPUTIES, AGENTS OR REPRESENTATIVES.

STATUS OF CITY INSPECTOR

INSPECTORS AS DESIGNATED BY THE DIRECTOR OF PUBLIC UTILITIES ARE AUTHORIZED TO INSPECT ALL WORK DONE AND MATERIALS FURNISHED, SUCH INSPECTION MAY EXTEND TO ALL OR ANY PART OF THE WATERWORK, AND TO THE PREPARATION OR MANUFACTURE OF THE MATERIALS TO BE USED IN THE WATERWORK. THE CITY INSPECTOR AS DESIGNATED BY THE DIRECTOR OF PUBLIC UTILITIES WILL MAKE WORK INSTRUCTIONS THROUGH THE PROJECT ENGINEER. ARRANGEMENTS FOR CITY INSPECTORS ARE TO BE MADE BY NOTIFYING INSPECTION AND ENFORCEMENT DIVISION OF UTILITIES ENGINEERING, 564-3065, WITHIN THE TIME SPECIFIED. NO WORK WILL BE ACCEPTED UNLESS INSPECTED.

ACCESS TO WORK AND PLACE OF MANUFACTURE

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

DIMENSIONS, DETAILED DRAWINGS AND ELEVATIONS

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

FLOODS AND FREEZING WEATHER

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

ADDITIONAL WORK

(A) ATTENTION IS CALLED TO THE FACT THAT THE WORK OF THIS CONTRACT INCLUDED CERTAIN PERFORMANCES AS INCIDENTAL TO THE ITEMIZED REQUIREMENTS HEREOF, THOUGH NOT EXCLUSIVE AS FOLLOWS: TO PERFORM ALL EXCAVATION, BACKFILLING, SHEETING, SHORING, TEMPORARY AND FINAL REPAVING AND TO TEST THE INSTALLATION. SAND BACKFILL SHALL BE PLACED UNDER EXISTING AND PROPOSED PAVEMENT 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 THERE SHALL BE INCLUDED IN THE PRICES STIPULATED TO BE PAID FOR THE VARIOUS ITEMS OF WORK TO BE DONE UNDER THIS CONTRACT.

- (B) PRELIMINARY FLUSHING: BEFORE BEING PLACED IN SERVICE, ALL DIRT AND FOREIGN MATTER SHALL BE REMOVED FROM THE NEW WATER MAIN OR EXTENSIONS TO EXISTING MAINS BY A THOROUGH FLUSHING THROUGH THE HYDRANTS OR BY OTHER APPROVED MEANS. EACH VALVED SECTION OF NEWLY LAID PIPE SHALL BE FLUSHED INDEPENDENTLY. THIS SHALL BE DONE AFTER THE PRESSURE TEST AND MAY BE DONE BEFORE OR AFTER THE TRENCH SHALL HAVE BEEN BACKFILLED.
- (C) CHLORINATION: FOLLOWING THE PRELIMINARY FLUSHING, THE NEWLY LAID WATER MAIN SHALL BE CHLORINATED. THE PROCESS OF CHLORINATING, THE METHOD OF PROCEDURE, THE CHLORINATING AGENT AND THE RATE OF APPLICATION SHALL BE DETERMINED BY THE ENGINEER. THE CITY OF CLEVELAND WILL FURNISH THE NECESSARY LABOR AND MATERIAL REQUIRED FOR SUCH CHLORINATION AND INSTALL THE NECESSARY TAPS AT THE ENDS OF THE WATER MAIN SECTIONS TO BE CHLORINATED. NO CHARGE WILL BE ASSESSED THE CONTRACTOR FOR ANY LABOR, TOOLS, EQUIPMENT AND INCIDENTALS FURNISHED BY THE CITY OF CLEVELAND, DIVISION OF WATER. THE CONTRACTOR SHALL FURNISH THE NECESSARY LABOR AND MATERIAL FOR EXCAVATION AND BACKFILLING WHICH WILL BE REQUIRED FOR THE INSTALLATION OF TAPS FOR INJECTING THE CHLORINE SOLUTION, OPERATING PUMPS AND FLUSHING MAINS.
- (D) FINAL FLUSHING AND TEST: FOLLOWING CHLORINATION, ALL TREATED WATER SHALL BE THOROUGHLY FLUSHED FROM THE NEWLY LAID PIPE AT ITS EXTREMITIES UNTIL THE REPLACEMENT WATER THROUGHOUT ITS LENGTH SHALL, UPON TEST, BOTH CHEMICALLY AND BACTERIOLOGICALLY, BE PROVEN EQUAL TO THE WATER QUALITY SERVED THE PUBLIC FROM THE EXISTING WATER SUPPLY SYSTEM.
- (E) FOR THE PERFORMANCES DESCRIBED IN PARAGRAPHS (B), (C), AND (D), THE STATE WILL MAKE NO SPECIFIC OR SEPARATE PAYMENT OF ALLOWANCES, BUT THE COST THEREOF SHALL BE INCLUDED IN THE PRICES STIPULATED TO BE PAID FOR EACH LINEAR FOOT OF PIPE FURNISHED AND INSTALLED.

MAINTENANCE OF SERVICE AND CONNECTING RELOCATED MAINS

WHEN THE NEW MAINS HAVE BEEN TESTED AND CHLORINATED AND ARE READY TO BE CONNECTED TO THE OLD MAIN, THE CONTRACTOR SHALL MAKE SUCH CONNECTIONS AT A TIME DESIGNATED BY THE CITY. PRIOR TO SHUTTING DOWN THE EXISTING MAINS, THE CONTRACTOR SHALL TAKE SUITABLE PRECAUTIONS TO ASSURE A MINIMUM INTERRUPTION TO SERVICE, INCLUDING THE FOLLOWING:

- (A) PERFORM ALL NECESSARY EXCAVATION, INCLUDING BELL HOLES, EXPOSING THE EXISTING MAIN SUFFICIENTLY FOR THE OPERATION OF THE PIPE SAW BY THE CITY, OR PIPE CUTTING BY THE CONTRACTOR.
- (B) REMOVE THE CAP OR PLUG FROM THE END OF THE NEW MAIN.
- (C) SWAB THE INSIDE OF ALL PIPES, BENDS AND SLEEVES TO BE USED IN CONNECTION THOROUGHLY WITH A CHLORINE SOLUTION OF AT LEAST 100 P.P.M.
- (D) MAKE UP AS MUCH OF THE CONNECTION AS POSSIBLE OUTSIDE THE DITCH TO ELIMINATE THE NEED FOR MAKING MOST OF THE NECESSARY JOINTS DURING THE SHUTDOWN. BY CAREFUL MEASUREMENT ALL PIPE CUTS CAN BE MADE BY THE CONTRACTOR PRIOR TO SHUTTING DOWN.
- (E) HAVE SUFFICIENT MANPOWER AND EQUIPMENT ON THE SITE TO PERFORM THE OPERATION IN A MINIMUM OF TIME.
- (F) IN THE TIME PERIOD FROM MAY TO OCTOBER, SHUTDOWNS MAY NOT BE PERMITTED DUE TO SYSTEM WATER DEMANDS.

PAINTING

- (A) IT IS THE INTENTION OF THESE SPECIFICATIONS TO PROVIDE THAT ALL METAL WORK SUBJECT TO CORROSION SHALL BE SATISFACTORILY PROTECTED BY A DURABLE COATING OF PAINT OR OTHER APPROVED MATERIAL AND THAT ALL METAL SURFACES NOT BURIED IN EARTH, OR IN CONCRETE SHALL BE LEFT CLEAN AND WELL PAINTED AT THE COMPLETION OF THE CONTRACT. UNLESS OTHERWISE SPECIFIED, THE PROTECTION SHALL BE AT LEAST THAT GIVEN BY THREE (3) COATS OF APPROVED PAINT. THE FIRST COAT IS TO BE APPLIED AT THE SHOP BEFORE THE METAL HAS RUSTED AND AFTER ALL GREASE, DIRT AND SCALE HAS BEEN REMOVED. BOLTS AND NUTS SHALL NOT BE SHOP CDATED, BUT SHALL RECEIVE THREE (3) COATS OF APPROVED PAINT AFTER INSTALLATION.
- (B) ALL METAL WORK WHICH HAS NOT BEEN COATED BEFORE THE ARRIVAL ON THE JOB SHALL BE GIVEN A TEMPORARY PROTECTIVE COATING OF SUCH A NATURE AS TO PERMIT THE READY ADHERENCE OF FUTURE COATINGS. THE TEMPORARY COATING SHALL BE A GOOD GRADE ASPHALTIC PAINT OR OTHER APPROVED MATERIAL. THE TEMPORARY PROTECTION SHALL APPLY PARTICULARLY TO THE VALVE BOXES AND COVERS, MANHOLE RINGS AND COVERS, LADDERS AND LADDER RUNGS AND ELSEWHERE WHEN IN THE OPINION OF THE ENGINEER, SUCH PROTECTION IS NECESSARY.
- (C) ALL SURFACES OF METAL WHICH WILL BE IN CONTACT AFTER ASSEMBLING SHALL BE PAINTED, AT LEAST ONE COAT, BEFORE ASSEMBLING. THE FINAL COAT OF PAINT ON ALL EXPOSED WORK SHALL BE GIVEN SHORTLY BEFORE THE COMPLETION OF THE CONTRACT.
- (D) WHERE PAINTING CLAUSES APPEAR HEREINAFTER, THEY SHALL TAKE PRECEDENCE OVER THIS SECTION, EXCEPT THAT TEMPORARY PROTECTION HEREIN DESCRIBED MAY BE REQUIRED.
- (E) ALL OF THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE PARTICULAR ITEM REQUIRING THE PAINTING.

TESTS, INSPECTION AND REPORTS

NOTWITHSTANDING THE REQUIREMENTS OF ANY OTHER PROVISIONS OF THESE SPECIFICATIONS, THE CONTRACTOR SHALL ARRANGE FOR AND PAY ALL COSTS INVOLVED FOR SHOP INSPECTION OF ALL MATERIALS FURNISHED, MANUFACTURE OF ALL PIPE, VALVES, FITTINGS, ETC., FIELD AND SHOP WELDS AND WELDING, AND FURNISH TO THE STATE AND THE CITY OF CLEVELAND COPIES OF ALL SHOP, FABRICATION, MANUFACTURE AND OTHER RELATED INSPECTION REPORTS OF MATERIALS FURNISHED. THIS INSPECTION SHALL BE DONE BY A RECOGNIZED INSPECTION LABORATORY APPROVED BY THE CITY OF CLEVELAND, IN THE CASE OF ANY ITEM NOT SPECIFICALLY MENTIONED IN THE "WATERWORK NOTES," OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS - JANUARY 1, 1981, SHALL GOVERN.

HANDLING PIPE AND ACCESSORIES

- (A) UNLOADING CAST IRON OR DUCTILE 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. UNLOADING 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 OR DUCTILE IRON PIPE OR FITTING, THE COATING OF WHICH HAS BEEN DAMAGED IN SHIPPING OR HANDLING, SHALL HAVE THE DAMAGED PORTION WELL CLEANED AND COVERED WITH AN ASPHALT PAINT, APPROVED BY THE ENGINEER, BEFORE BEING PLACED IN THE WORK. THE CONTRACTOR SHALL THOROUGHLY COAT ALL EXPOSED PARTS OF BOLTS AND NUTS WITH AN APPROVED ASPHALT PAINT, AFTER ALL PIPE HAS BEEN LAID AND BEFORE BACKFILLING HAS BEEN PLACED. ALL FIELD COATING SHALL BE FURNISHED BY THE CONTRACTOR.
- (D) PIPE KEPT CLEAN: THE INTERIOR OF THE PIPE, FITTINGS, AND OTHER ACCESSORIES SHALL BE KEPT FREE FROM DIRT AND FOREIGN MATTER AT ALL TIMES.
- (E) FROST PROTECTION: VALVES AND HYDRANTS BEFORE INSTALLATION SHALL BE DRAINED AND STORED IN A MANNER THAT WILL PROTECT THEM FROM DAMAGE BY FREEZING.

CHANGES IN WATER MAINS

- (A) IN SUCH LOCATIONS AS MAY BE INDICATED ON THE CONTRACT DRAWINGS OR AS ORDERED BY THE ENGINEER TO CHANGE THE LOCATION OF HOUSE CONNECTIONS, SUCH CHANGES WILL MADE AS WORK TO BE DONE BY THE CITY. THE CONTRACTOR SHALL NOTIFY THE CITY IN AMPLE TIME TO PERMIT THE CITY TO MAKE SUCH CHANGES AND AVOID UNNECESSARY DELAY IN THE COMPLETION OF THE WORK. THE CONTRACTOR SHALL ALSO COOPERATE WITH THE CITY IN MAKING THESE CHANGES AND SHALL DO ALL EXCAVATING, BACKFILLING, SEEDING, SODDING, REPAVING, FURNISHING ALL MATERIAL REQUIRED. PAYMENT FOR THE WORK PERFORMED BY THE CONTRACTOR WILL BE AT THE UNIT PRICE BID FOR THE APPROPRIATE SERVICE CONNECTIONS. SEE WORK TO BE DONE BY THE CITY.
- (B) WHEREVER IT BECOMES NECESSARY, IN THE OPINION OF THE ENGINEER, TO CHANGE THE LOCATION OR ELEVATION OF WATER MAINS AND HYDRANTS AND WHERE CONNECTIONS ARE TO BE MADE BETWEEN EXISTING DISTRIBUTION MAINS AND WATER MAINS UNDER THIS CONTRACT, THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL EXISTING WATER LINE MATERIALS REQUIRED TO MAKE THE CONNECTION, AND SHALL FURNISH AND INSTALL COMPLETE ALL THE CAST IRON OR DUCTILE IRON PIPE, PRESTRESSED CONCRETE CYLINDER PIPE, FITTINGS, AND VALVES TO MAKE THE CONNECTIONS INDICATED, EXCEPT TAPPING 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. ALL PIPES, VALVES, AND APPURTENANCES REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR. (SEE WORK TO BE DONE BY THE CITY).

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| LOW SERVICE DISTRICT |
| DEPARTMENT OF PUBLIC UTILITIES CLEVELAND, OHIO |
| APPROVED <i>January 13, 1983</i> |
| <i>William J. Lumley</i> DESIGN REVIEW ENGINEER |
| <i>Roger F. Hyde</i> WESTON DESIGNERS-CONSULTANTS |

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| WESTON DESIGNERS-CONSULTANTS | | | | | |
| WATERWORK | | | | | |
| GENERAL NOTES | | | | | |
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| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| JRH | JMD | | CAP | | |

GENERAL
(CONT'D)

WORK TO BE DONE BY THE CITY

- (A) THE CONTRACTOR WILL FURNISH THE PIPING MATERIAL FOR AND THE CITY WATER DEPARTMENT SHALL MAKE ALL CHANGES REQUIRED, INCLUDING TAPPING, IN THE LOCATION OF EXISTING HOUSE SERVICE CONNECTIONS AND METERS. NO CHARGE WILL BE ASSESSED TO THE CONTRACTOR FOR LABOR, TOOLS, EQUIPMENT, AND INCIDENTALS FURNISHED BY THE CITY OF CLEVELAND DIVISION OF WATER.
- (B) THE CITY WATER DEPARTMENT WILL INSTALL ALL TAPPING SLEEVES AND VALVES ON CAST IRON AND DUCTILE IRON PIPE BUT THE CONTRACTOR SHALL SUPPLY THE TAPPING SLEEVES AND VALVES AND LEAD. THE CONTRACTOR SHALL FURNISH ALL AIR COMPRESSORS REQUIRED FOR THE WORK AND DO ALL OTHER WORK NECESSARY FOR THE INSTALLATION. NO CHARGE WILL BE ASSESSED TO THE CONTRACTOR FOR THE LABOR AND INSTALLATION COST INCIDENTAL TO THE WORK PERFORMED BY THE CITY OF CLEVELAND DIVISION OF WATER.
- (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. CONTRACTOR SHALL ARRANGE WITH AND PAY CHARGES AS DETERMINED BY THE DIVISION OF WATER AND HEAT PERMIT-SALES FOR CUTTING PIPE.

EXCAVATION

- (A) THE CONTRACTOR SHALL REMOVE ALL EXISTING STRUCTURES, ROADWAYS, DRIVEWAYS AND OTHER SIMILAR MATERIALS AND MAKE ALL EXCAVATION NECESSARY FOR THE PROPER CONSTRUCTION OF THE WATER MAIN, PIPE CONNECTIONS AND APPURTENANT STRUCTURES, INCLUDING TUNNEL AND SHAFT EXCAVATION. THE EXCAVATION SHALL INCLUDE THE REMOVAL, HANDLING, REHANDLING AND DISPOSAL OF MATERIALS ENCOUNTERED IN THE WORK AND SHALL INCLUDE ALL PUMPING, BAILING, DRAINAGE, SHEETING AND BRACING. MOREOVER, THE CONTRACTOR MUST ASSUME ALL RESPONSIBILITY FOR ANY ADDED EXPENSE OR OTHER LIABILITY WHICH MAY ARISE BY MEANS OF QUICKSAND, OBSTACLES OR CONDITIONS FORESEEN AND UNFORESEEN OR ENCOUNTERED IN THE WORK OF THIS CONTRACT.
- (B) TRENCHES SHALL IN EVERY CASE BE OF SUFFICIENT WIDTH TO PERMIT SOLID PACKING OF BACKFILL UNDER AND AROUND PIPES, AND SATISFACTORY CONSTRUCTION OF ALL APPURTENANCES AND FOR SUCH SHEETING AND SHORING, PUMPING AND DRAINING AS MAY BE NECESSARY.
- (C) THE TRENCH SHALL BE DUG TO THE ALIGNMENT AND DEPTH REQUIRED AND ONLY SO FAR IN ADVANCE OF PIPE LAYING AS THE ENGINEER SHALL PERMIT. THE TRENCH SHALL BE SO BRACED AND DRAINED THAT WORKMEN MAY WORK THEREIN SAFELY AND EFFICIENTLY. IT IS ESSENTIAL THAT THE DISCHARGE FROM PUMPS BE LED TO NATURAL DRAINAGE CHANNELS, TO DRAINS, OR TO SEWERS.
- (D) THE TRENCH WIDTH MAY VARY WITH AND DEPEND UPON THE DEPTH OF TRENCH AND THE NATURE OF THE EXCAVATED MATERIAL ENCOUNTERED. BUT IN ANY CASE SHALL BE OF AMPLE WIDTH TO PERMIT THE PIPE TO BE LAID AND JOINTED PROPERLY AND OF THE BACKFILL TO BE PLACED AND COMPACTED PROPERLY. THE MINIMUM WIDTH OF UNSHEETED TRENCH SHALL BE EIGHTEEN (18) INCHES AND FOR PIPE TEN (10) INCHES OR LARGER, AT LEAST TWELVE (12) INCHES LARGER THAN THE OUTSIDE DIAMETER OF THE PIPE FOR CONCRETE PIPE AND EIGHTEEN (18) INCHES LARGER THAN THE OUTSIDE DIAMETER OF THE PIPE FOR CAST IRON AND STEEL PIPE, EXCEPT BY CONSENT OF THE ENGINEER. THE MAXIMUM CLEAR WIDTH OF TRENCH SHALL BE NOT MORE THAN TWO (2) FEET GREATER THAN THE OUTSIDE PIPE DIAMETER. WHEN SHEETING AND BRACING IS USED, THE TRENCH WIDTH SHALL BE INCREASED ACCORDINGLY.
- (E) THE TRENCH, UNLESS OTHERWISE SPECIFIED, SHALL HAVE A FLAT BOTTOM CONFORMING TO THE GRADE TO WHICH THE PIPE IS TO BE LAID. THE PIPE SHALL BE LAID UPON SOUND SOIL CUT TRUE AND EVEN, SO THAT THE BARREL OF THE PIPE WILL HAVE A BEARING FOR ITS FULL LENGTH.
- (F) ANY PART OF THE TRENCH EXCAVATED BELOW GRADE SHALL BE CORRECTED WITH APPROVED MATERIAL, THOROUGHLY COMPACTED.
- (G) WHEN THE UNCOVERED TRENCH BOTTOM AT SUBGRADE IS SOFT AND IN THE OPINION OF THE ENGINEER CANNOT SUPPORT THE PIPE, A FURTHER DEPTH AND OR WIDTH SHALL BE EXCAVATED AND BACKFILLED TO PIPE FOUNDATION GRADE AS REQUIRED UNDER (F), OR OTHER APPROVED MEANS SHALL BE ADOPTED TO ASSURE A FIRM FOUNDATION FOR THE PIPE.
- (H) LEDGE ROCK, BOULDERS, LARGE STONES, AND SHALE SHALL BE REMOVED TO PROVIDE A CLEARANCE OF AT LEAST SIX (6) INCHES BELOW ALL PARTS OF THE PIPE, VALVES, OR FITTINGS AND A CLEAR WIDTH OF SIX (6) INCHES ON EACH SIDE OF ALL CONCRETE PIPE AND NINE (9) INCHES ON EACH SIDE OF ALL CAST IRON AND STEEL PIPE SHALL BE PROVIDED.
- (I) EXCAVATION BELOW SUBGRADE IN ROCK, SHALE OR IN BOULDERS SHALL BE BACKFILLED TO SUBGRADE WITH APPROVED MATERIAL, THOROUGHLY COMPACTED.
- (J) BELL HOLES OF AMPLE DIMENSIONS SHALL BE DUG IN EARTH TRENCHES AT EACH JOINT TO PERMIT THE JOINTING TO BE MADE PROPERLY. ADEQUATE CLEARANCE FOR PROPER JOINTING PIPE LAID IN ROCK SHALL BE PROVIDED AT BELL HOLES.
- (K) THE USE OF EXCAVATING MACHINERY WILL BE PERMITTED EXCEPT IN PLACES WHERE ITS OPERATION WILL CAUSE DAMAGE TO TREES, BUILDINGS, OR EXISTING STRUCTURES ABOVE OR BELOW GROUND, IN WHICH CASE HAND METHODS SHALL BE EMPLOYED.

- (L) TREES, FENCES, POLES AND ALL OTHER PROPERTY SHALL BE PROTECTED UNLESS THEIR REMOVAL IS AUTHORIZED. ANY PROPERTY DAMAGED SHALL BE SATISFACTORILY RESTORED BY THE CONTRACTOR.
- (M) HYDRANTS UNDER PRESSURE, VALVE PIT COVERS, VALVE BOXES, CURB STOP BOXES FIRE OR POLICE CALL BOXES, OR OTHER UTILITY CONTROLS SHALL BE LEFT UNOBSTRUCTED AND ACCESSIBLE DURING THE CONSTRUCTION PERIOD.
- (N) THE CONTRACTOR SHALL MAINTAIN ALL EXCAVATIONS IN GOOD ORDER DURING THE CONSTRUCTION, SO AS NOT TO HINDER OR INJURE THE PIPE LAYING, MASONRY OR OTHER WORK. HE SHALL TAKE ALL REASONABLE PRECAUTIONS TO PREVENT MOVEMENT OF THE SIDES OF SUCH EXCAVATION, AND SHALL REMOVE AT HIS OWN EXPENSE ANY MATERIAL SLIDING INTO THE EXCAVATION.

SHEETING AND BRACING

- (A) THE CONTRACTOR SHALL FURNISH AND PUT IN PLACE SUCH SHEETING AND BRACING AS MAY BE REQUIRED TO SUPPORT THE SIDES OF TRENCHES OR OTHER EXCAVATION AND SHALL REMOVE SUCH SHEETING AND BRACING, AS THE TRENCH OR EXCAVATION IS FILLED UP, UNLESS THE ENGINEER SHALL ORDER IT LEFT IN PLACE, IN WHICH CASE THE CONTRACTOR SHALL CUT THE PLANK OFF AT A HEIGHT AS ORDERED BY THE ENGINEER, OR AS CALLED FOR ON THE CONTRACT DRAWINGS. THAT PORTION OF THE TIMBER ORDERED TO BE LEFT IN PLACE WILL BE PAID FOR AT THE RATE OF FOUR HUNDRED AND FIFTY DOLLARS (\$450.00) PER THOUSAND FEET BOARD MEASURE. NO PAYMENT WILL BE MADE FOR WASTED ENDS. A QUANTITY OF 2 M.B.F. HAS BEEN PROVIDED IN THE GENERAL SUMMARY FOR ITEM SPECIAL - SHEETING LEFT IN PLACE.
- (B) FOR ALL EXCAVATIONS FOR THE WORK DESCRIBED HEREIN, THE CONTRACTOR SHALL FURNISH AND PLACE SHEETING AND BRACING SO AS TO REDUCE TO A MINIMUM THE POSSIBILITY OF INJURY OR DAMAGE TO 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.
- (D) WHEN SO DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL IMMEDIATELY REMOVE ALL EXCAVATED MATERIALS FROM THE SITE.

LAYING PIPE

- (A) PROPER IMPLEMENTS, TOOLS, AND FACILITIES, SATISFACTORY TO THE ENGINEER, SHALL BE PROVIDED AND USED BY THE CONTRACTOR FOR THE SAFE AND CONVENIENT PROSECUTION OF THE WORK. ALL PIPE, FITTINGS, AND VALVES SHALL BE CAREFULLY LOWERED INTO THE TRENCH, PIECE BY PIECE, BY MEANS OF DERRICK, PROPER SLINGS, AND OTHER SUITABLE TOOLS OR EQUIPMENT, IN SUCH MANNER AS TO PREVENT DAMAGE TO PIPE OR COATING. UNDER NO CIRCUMSTANCES SHALL PIPE OR ACCESSORIES BE DROPPED OR DUMPED INTO THE TRENCH. IF ANY DEFECTIVE PIECE IS DISCOVERED WHILE PIPE IS SUSPENDED OR AFTER BEING LAID, A NEW PIECE SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
- (B) ALL FOREIGN MATTER OR DIRT SHALL BE REMOVED FROM THE INSIDE OF THE PIPE BEFORE IT IS LOWERED INTO ITS POSITION IN THE TRENCH, AND IT SHALL BE KEPT CLEAN BY APPROVED MEANS DURING AND AFTER LAYING.
- (C) AT TIMES WHEN PIPE LAYING IS NOT IN PROGRESS, THE OPEN ENDS OF PIPE SHALL BE CLOSED BY APPROVED MEANS, AND NO TRENCH WATER SHALL BE PERMITTED TO ENTER THE PIPE. NO PIPE SHALL BE LAID IN WATER, OR WHEN THE TRENCH CONDITIONS OR THE WEATHER IS UNSUITABLE FOR SUCH WORK, EXCEPT BY PERMISSION OF THE ENGINEER.
- (D) WHEREVER NECESSARY TO DEFLECT PIPE FROM A STRAIGHT LINE, EITHER IN THE VERTICAL OR HORIZONTAL PLANE TO AVOID OBSTRUCTIONS, TO PLUMB STEMS, OR FOR OTHER REASONS, THE DEGREE OF DEFLECTION SHALL BE APPROVED BY THE ENGINEER.
- (E) BEFORE LAYING CAST IRON OR DUCTILE IRON PIPE, ALL LUMPS, BLISTERS AND EXCESS GOAL 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.
- (F) BEFORE LAYING CONCRETE PIPE, THE PIPE ENDS SHALL BE MADE SMOOTH WITH EMERY CLOTH, FILE OR OTHER APPROVED MEANS, WIRE BRUSHED AND WIPED UNTIL CLEAN AND DRY. PIPE ENDS SHALL BE KEPT CLEAN UNTIL JOINTS ARE MADE. AFTER CLEANING AND DRYING, ALL CONTACT SURFACES OF THE GASKETS AND STEEL JOINT RINGS SHALL BE

COATED WITH AN APPROVED FLAX SOAP BEFORE ENTERING THE SPIGOT END INTO THE SOCKET. IMMEDIATELY AFTER THE JOINT IS PULLED TOGETHER, THE PIPE SHALL BE BLOCKED WITH WOOD BLOCKING. A SURCINGLE SHALL BE INSTALLED AROUND THE JOINT AND THE PIPE SHALL BE SECURED WITH EARTH OR SAND AS REQUIRED, CAREFULLY TAMPED UNDER AND ON EACH SIDE UP TO THE SPRING - LINE OF THE PIPE, INCLUDING THE BELL HOLES. ALL BLOCKING SHALL BE REMOVED WHEN BACKFILL HAS REACHED THE SPRING LINE FOR THE PIPE.

FLOATING

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

TESTING MAINS

- (A) ALL PIPES, VALVES, FITTINGS, ETC., SHALL BE LAID IN SUCH A MANNER AS TO LEAVE ALL JOINTS WATERIGHT, AFTER THE PIPE IS LAID, AND BEFORE BACKFILL IS PLACED AROUND THE JOINTS, SUCH LENGTHS OF THE WATER MAIN AS THE ENGINEER MAY DETERMINE SHALL BE TESTED UNDER A HYDROSTATIC PRESSURE OF SEVENTY-FIVE (75) POUNDS PER SQUARE INCH ABOVE THE STATIC PRESSURE, BUT NOWHERE LESS THAN 100 POUNDS PER SQUARE INCH FOR LOW SERVICE DISTRICT AND 175 P.S.I. FOR 1st HIGH SERVICE DISTRICT.
- (B) THE TEST SHALL BE UNDER THE DIRECTION OF THE ENGINEER AND DIRECTOR OF PUBLIC UTILITIES OR HIS DESIGNATE, THE CITY WILL FURNISH A PRESSURE GAGE FOR MEASURING THE PRESSURE ON THE WATER MAIN, BUT THE CONTRACTOR SHALL FURNISH A SUITABLE PUMP, PIPES, TEST HEADS AND ALL APPLIANCES, LABOR, FUEL AND OTHER APPURTENANCES NECESSARY TO MAKE THESE TESTS.
- (C) THE TEST PRESSURE SHALL BE MAINTAINED FOR A SUFFICIENT LENGTH OR TIME TO ALLOW FOR A THOROUGH EXAMINATION OF JOINTS AND ELIMINATION OF LEAKAGE WHERE NECESSARY. THE PIPE LINES SHALL BE MADE ABSOLUTELY TIGHT UNDER THE TEST PRESSURE.
- (D) AFTER A SECTION OF THE WATER MAIN HAS BEEN TESTED THE CONTRACTOR SHALL DRAIN THE MAIN. IN CASE THE DRAINS ARE CONNECTED TO VALVE OR DRAIN VAULTS, THEN THE CONTRACTOR, WITHIN A REASONABLE TIME AFTER THE TEST HAS BEEN COMPLETED, SHALL PUMP ALL WATER OUT OF THE VAULTS.
- (E) IN COLD WEATHER IMMEDIATELY AFTER TESTING A SECTION OF THE WATER MAIN, THE CONTRACTOR SHALL OPEN ALL VALVES, AIR COCKS, BYPASSES AND DRAINS AND PROPERLY DRAIN BONNETS OF ALL VALVES IN THE SECTION OF THE WATER MAIN, AND TAKE ALL OTHER PRECAUTIONS NECESSARY TO PREVENT INJURY TO THE WATER MAIN AND APPURTENANCES DUE TO FREEZING.
- (F) AS AN ALTERNATE FOR TESTING CONCRETE AND STEEL MAINS OTHER THAN BY THE PRECEDING METHOD, THE CONTRACTOR MAY CHOOSE THE FOLLOWING PROCEDURE:
 - THE WATER MAIN SHALL BE TESTED UNDER THE SAME HYDROSTATIC PRESSURE AS PREVIOUSLY NOTED. THE TEST PRESSURE SHALL BE MAINTAINED FOR A PERIOD OF TWO (2) HOURS BY PUMPING ADDITIONAL WATER INTO THE MAIN, IF NECESSARY. THE QUANTITY OF WATER THUS PUMPED INTO THE MAIN MULTIPLIED BY TWELVE (12) SHALL BE TAKEN AS THE LEAKAGE PER TWENTY-FOUR HOURS.
- (G) THE PERMITTED LEAKAGE SHALL NOT EXCEED A RATE OF SEVENTY-FIVE (75) GALLONS PER TWENTY-FOUR (24) HOURS PER MILE 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 EXCEED THE PERMISSIBLE AMOUNT MENTIONED ABOVE, THE CONTRACTOR SHALL FIND THE LEAK AND MAKE THE JOINTS TIGHT. THE CONTRACTOR SHALL FURNISH SUITABLE MEANS FOR DETERMINING THE QUANTITY OF WATER LOST BY LEAKAGE DURING THE TEST.
- (J) IN ORDER TO BE ABLE TO MAKE PROPER ALLOWANCES FOR LEAKAGE AT VALVES, ETC. PREVIOUSLY NOTED, ONLY SUCH SECTIONS OF WATER MAIN MAY BE SELECTED FOR TEST AS WILL HAVE SUCH VALVES, REMOVABLE BULKHEADS, ETC. ACCESSIBLE.
- (K) THE EVALUATION OF ACTUAL LEAKAGE TO STANDARD PRESSURE (150 LBS.) LEAKAGE IS CALCULATED BY THE APPLICATION OF THE RATIO DETERMINED FROM THE SQUARE ROOT OF RESPECTIVE PRESSURES, OTHER FACTORS BEING EQUAL.

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| LOW SERVICE DISTRICT | |
| DEPARTMENT OF PUBLIC UTILITIES CLEVELAND, OHIO | |
| APPROVED <i>William J. Lawrence</i> January 13, 1983 DESIGN REVIEW ENGINEER | |
| <i>Roger P. Heyde 7/14/82</i> WESTON DESIGNERS-CONSULTANTS | |

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| WESTON DESIGNERS-CONSULTANTS | | | |
| WATERWORK | | | |
| GENERAL NOTES | | | |
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CUYAHOGA COUNTY
CUY- 490-1.49

**GENERAL
(CONT'D)**

CLOSING VALVES

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

PLUGGING DEAD ENDS

STANDARD PLUGS WITH CLAMPS SHALL BE INSERTED INTO THE BELLS OF ALL DEAD ENDS OF PIPES, TEES, OR CROSSES, AND SPIGOT ENDS CAPPED AND CLAMPED BY THE CONTRACTOR, ON ALL MAINS CONSTRUCTED BY HIM AND ON EXISTING WATER MAINS WHERE INDICATED IN THE CONTRACT DRAWINGS. CONCRETE PIERS SHALL BE PLACED WHEN CALLED FOR ON THE CONTRACT DRAWINGS, OR ORDERED BY THE ENGINEER. THE COST OF FURNISHING AND INSTALLING THE PLUGS IN NEW WATER MAINS SHALL BE INCLUDED IN THE PER LINEAR FOOT PRICE BID FOR THE VARIOUS SIZES OF NEW WATER MAINS. THE COST OF FURNISHING AND INSTALLING THE PLUG IN EXISTING WATER MAIN SHALL BE INCLUDED IN THE UNIT PRICE BID FOR EACH "ITEM SPECIAL - PLUGGING EXISTING WATER MAINS AND BRANCHES," CLASSIFIED AS TO SIZE AS SHOWN ELSEWHERE IN THESE PLANS.

BACKFILLING

- (A) THIS WORK INCLUDES ALL BACKFILLING, TOGETHER WITH RAMMING, PUDDLING, AND ROLLING, AS REQUIRED; THE REGRADING OF GROUNDS; THE REPLACING OF SURFACE AND SUBSURFACE STRUCTURES; THE PLACING AND MAINTAINING OF TEMPORARY SIDEWALKS, AND DRIVEWAYS; THE FURNISHING OF SUITABLE MATERIAL FOR BACKFILL, RESEEDING LAWNS AND REPLACING TREES AND SHRUBBERY DAMAGE BY THE CONTRACTOR; AND ALL APPURTENANT WORK INCIDENTAL THERETO. PAVEMENTS, CURBS, SIDEWALKS AND DRIVEWAYS WITHIN THE LIMITS OF THE WORK SHALL BE TEMPORARILY SURFACED, MAINTAINED AND FINALLY REPLACED OR REPAVED AS SET FORTH UNDER "ROAD SURFACES, SIDEWALKS, DRIVEWAYS AND CURBING."
- (B) BACKFILL, UNLESS OTHERWISE SPECIFIED, MAY BE MADE WITH MATERIAL EXCAVATED FROM TRENCHES, PROVIDING IT IS SATISFACTORY TO THE ENGINEER. IF, IN THE OPINION OF THE ENGINEER, THE MATERIAL EXCAVATED IS UNSATISFACTORY, THEN THE CONTRACTOR SHALL FURNISH AT HIS OWN EXPENSE OTHER MATERIAL SUITABLE FOR BACKFILL. ALL BACKFILL SHALL BE FREE FROM SLAG, CINDERS, RUBBISH AND OTHER OBJECTIONABLE MATERIAL.
- (C) BEFORE LAYING THE PIPE, THE BOTTOM OF THE TRENCH SHALL BE BROUGHT TO THE GRADE OF THE BOTTOM OF THE PIPE, EXCEPT AT FIELD JOINTS. WHEREVER THE BOTTOM OF THE TRENCH HAS BEEN EXCAVATED BELOW THE BOTTOM OF THE PIPE, THE CONTRACTOR SHALL PLACE SAND, OR OTHER MATERIAL SATISFACTORY TO THE ENGINEER TO BRING THE BOTTOM OF THE TRENCH TO THE GRADE OF THE BOTTOM OF THE PIPE. THIS BED SHALL BE THOROUGHLY TAMPED BEFORE THE PIPE IS LAID.
- (D) UNLESS OTHERWISE SPECIFIED, THE BACKFILL UNDER, AROUND AND TO A DEPTH OF ONE (1) FOOT ABOVE THE TOP OF ALL PIPE SHALL BE MADE WITH MATERIAL SATISFACTORY TO THE ENGINEER, WHICH MATERIAL SHALL BE FREE FROM STONE AND OTHER OBJECTIONABLE MATERIAL NOTED ABOVE. THE CONTRACTOR MUST USE SPECIAL CARE IN PLACING THIS PORTION OF THE BACKFILL, SO AS TO AVOID INJURING, DISTORTING OR MOVING THE PIPE DURING COMPACTION. ABOVE THIS LEVEL THE BACKFILL SHALL BE MADE WITH MATERIAL SATISFACTORY TO THE ENGINEER. HOWEVER, WHERE SPECIFIED, SAND SHALL BE USED FOR THE ENTIRE PORTION OF THE BACKFILL. SEE BELOW.
- (E) BACKFILLING AS NOTED IN PARAGRAPH (D) SHALL BE TAMPED IN THIN LAYERS, SIMULTANEOUSLY ON EACH SIDE OF THE PIPE, AND THOROUGHLY COMPACTED SO AS TO PROVIDE A SOLID BACKING AGAINST THE EXTERNAL SURFACE OF THE PIPE.
- (F) ONLY AFTER THE BACKFILL PREVIOUSLY MENTIONED HAS BEEN SATISFACTORILY COMPACTED, MAY WORK PROCEED IN PLACING THE REMAINING BACKFILL WHICH MUST BE CAREFULLY PLACED AND COMPACTED BY TAMPING, PUDDLING, OR ROLLING. ALL PRECAUTIONS MUST BE TAKEN TO ELIMINATE FUTURE SETTLEMENT. THE NUMBER OF MEN TAMPING SHALL BE NOT LESS THAN THE NUMBER BACKFILLING, AND ADDITIONAL MEN SHALL BE KEPT IN THE TRENCH TO SPREAD THE MATERIAL.
- (G) BACKFILLING SHALL NOT BE DONE IN FREEZING WEATHER, EXCEPT BY PERMISSION OF THE ENGINEER, AND IT SHALL NOT BE MADE WITH FROZEN MATERIAL, NOR SHALL ANY FILL BE MADE WHERE THE MATERIAL ALREADY IN THE DITCH IS FROZEN.
- (H) THE ENTIRE BACKFILL SHALL BE MADE WITH SAND WHERE PERMANENT PAVEMENTS, CURBS, DRIVEWAYS, OR SIDEWALKS HAVE BEEN OPENED FOR OR UNDERCUT BY THE EXCAVATION, WHERE ORDERED BY THE ENGINEER.
- (I) ALL SAND TO BE USED FOR BACKFILL SHALL BE 703.05 OHIO DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.
- (J) SPECIAL TREATMENT OF THE TRENCH WILL BE REQUIRED WHERE CINDER OR ACTIVE SULPHUR BEARING SHALE OR CLAYS 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 THE 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" ABOVE THE TOP OF PIPE SHALL BE MADE WITH SAND. THE CONTRACTOR MUST USE SPECIAL CARE IN PLACING THIS PORTION OF THE BACKFILL SO AS TO AVOID INJURING OR MOVING THE PIPE WHEN COMPACTING SAME. ON TOP OF THE SAND THE CONTRACTOR SHALL PLACE ANOTHER LAYER OF CRUSHED LIMESTONE FIVE (5) INCHES THICK ON THE ENTIRE WIDTH OF THE TRENCH. ON TOP OF THE COMPACTED LAYER OF LIMESTONE HYDRATED LIME SHALL THEN BE APPLIED IN THE AMOUNT OF 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, 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 AND MAINTAIN, WHEREVER THE PAVEMENT ROAD SURFACE HAS BEEN REMOVED OR DAMAGED BY HIM, A TEMPORARY PAVEMENT IN THE PAVED PORTION OF STREETS, OR A TEMPORARY ROAD SURFACE IN THE UNPAVED PORTION OF STREET SO AS TO PROVIDE A SAFE AND PASSABLE ROADWAY UNTIL SUCH TIME AS THE FINAL PAVEMENT OR ROAD SURFACE IS COMPLETED.
- (B) WHEN ONLY A PORTION OF THE STREET IS PAVED AND THE LINES OF EXCAVATION ARE IN THE UNPAVED PORTION, THE CONTRACTOR SHALL USE THE UTMOST CARE IN PREVENTING INJURY TO THE PAVEMENT. IF, IN MAKING THE EXCAVATION OR FOR ANY OTHER CAUSE THE PAVEMENT IS REMOVED OR INJURED BY THE CONTRACTOR, HE SHALL FURNISH, PLACE AND MAINTAIN A TEMPORARY PAVEMENT WHEREVER THE PAVEMENT HAS BEEN REMOVED OR DAMAGED, SO AS TO PROVIDE A SAFE AND PASSABLE ROADWAY UNTIL SUCH TIME AS THE FINAL PAVEMENT IS COMPLETED.
- (C) ALL FINAL PAVING OF ROAD SURFACES SHALL BE DONE BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER AND IN CONFORMITY WITH THE SUPPLEMENT TO STATE SPECIFICATIONS FOR THE CITY OF CLEVELAND, 1969. THE CONTRACTOR SHALL BEAR THE ENTIRE COST OF THE WORK. AT LOCATIONS NOT SPECIFICALLY MENTIONED, THE CONTRACTOR SHALL RESTORE THE SAME TYPE OF PAVEMENT AS ENCOUNTERED.
- (D) ALL DAMAGED OR DISPLACED CURB SHALL BE RENEWED OR RESET TO THE SATISFACTION OF THE ENGINEER. NO FAULTY CURB OR CURB LESS THAN 30" LONG WILL BE PERMITTED FOR REUSE.
- (E) IF PRIOR TO THE EXPIRATION OF THIS CONTRACT ANY OF THE PAVEMENT OR ROAD SURFACES WITHIN THE LINES OF EXCAVATION OR ADJACENT THERETO SHALL HAVE BEEN DAMAGED OR INJURED, DUE TO UNDERMINING, OR FOR OTHER CAUSE WHICH MAY BE ATTRIBUTED TO THE WORK WHICH IS BEING DONE BY THE CONTRACTOR, THEN THE CONTRACTOR SHALL REMOVE SUCH DAMAGED OR INJURED PAVEMENTS OR ROAD SURFACES, BACKFILL WITH SAND PROPERLY RAMMED AND REPLACE THE FINAL PAVEMENT OR ROAD SURFACE.
- (F) IF ANY SIDEWALKS, DRIVEWAYS OR CURBS ARE REMOVED OR INJURED BY THE CONTRACTOR IN THE COURSE OF MAKING EXCAVATION OR HANDLING MATERIALS, OR FOR ANY OTHER REASON WHICH MAY BE ATTRIBUTED TO WORK WHICH HAS BEEN DONE BY THE CONTRACTOR, THEN HE SHALL RELAY SAME AFTER ALL WORK, INCLUDING BACKFILLING, HAS BEEN COMPLETED. IF ANY STONE SIDEWALKS, DRIVEWAYS OR CURBS WHICH HAVE BEEN REMOVED OR INJURED ARE UNFIT TO BE RELAID, THEN THE CONTRACTOR SHALL FURNISH AND RELAY NEW MATERIAL. ALL CONCRETE OR CEMENT SIDEWALKS, DRIVEWAYS OR CURBS, WHICH ARE REMOVED OR INJURED BY THE CONTRACTOR, SHALL BE BROKEN UP BY HIM AND HE SHALL FURNISH ALL LABOR AND MATERIALS AND CONSTRUCT NEW SIDEWALKS, DRIVEWAYS OR CURBS TO REPLACE THOSE REMOVED OR INJURED. AT INTERSECTING WALKS, DRIVES, ETC., ADDITIONAL CONCRETE SLABS BEYOND THE EXCAVATION LIMITS SHALL BE REMOVED AND REPLACED WITH NEW MATERIAL, IN ORDER TO AVOID HAVING MORE JOINTS THAN IN THE ORIGINAL WORK. ALL SLABS REPLACED SHALL BE OF FULL WIDTH. THE CONTRACTOR SHALL FURNISH, PLACE AND MAINTAIN, WHEREVER THE SIDEWALK HAS BEEN REMOVED OR DAMAGED BY HIM, A TEMPORARY SIDEWALK SO AS TO PROVIDE A SAFE AND PASSABLE SIDEWALK UNTIL SUCH TIME AS THE FINAL SIDEWALK IS COMPLETED.
- (G) ALL PAVEMENTS, ROAD SURFACES, SIDEWALKS, DRIVEWAYS, OR CURBS, WHICH THE CONTRACTOR IS REQUIRED TO REPLACE OR TO HAVE REPLACED, SHALL, AT THE EXPIRATION OF THIS CONTRACT, BE IN AT LEAST AS GOOD CONDITION AS AT THE TIME OF AWARDSING 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 TO THESE SPECIFICATIONS. THE CONTRACTOR SHALL FURNISH EVIDENCE TO THE ENGINEER THAT THE WORK HAS BEEN COMPLETED TO THEIR SATISFACTION.
- (I) TUNNELING WILL NOT BE PERMITTED WITHOUT PERMISSION OF THE ENGINEER. IN BACKFILLING TUNNELS, SAND SHALL BE USED AS FAR AS POSSIBLE AND BALANCE OF BACKFILLING MADE WITH CLASS C CONCRETE, RAMMED IN PLACE.

- (J) THE CONTRACTOR SHALL MAKE ALL PAVEMENT CUTS BY CHANNELING MACHINE, HAND OPERATED PNEUMATIC TOOLS OR BY SUCH OTHER METHODS AS WILL FURNISH A CLEAN CUT IN THE PAVEMENT AND PAVEMENT BASE WITHOUT UNDUE SHATTERING. THE USE OF BALL OR WEIGHT TO BREAK THE PAVEMENT WILL NOT BE PERMITTED.
- (K) NO SPECIFIC OR SEPARATE PAYMENT WILL BE MADE FOR ALL OF THIS WORK, BUT THE COST THEREOF SHALL BE INCLUDED IN THE PRICES BID FOR THE VARIOUS ITEMS OF THE WORK TO BE DONE UNDER THIS CONTRACT. RESTORATION AS NOTED ABOVE WILL ONLY BE REQUIRED IN AREAS WHERE THE PLANS DO NOT OTHERWISE PROPOSE NEW CONSTRUCTION OF PAVEMENT, SIDEWALKS AND CURBS, EXCEPT THAT TEMPORARY RESTORATION IN SUCH AREAS MAY BE REQUIRED BY THE ENGINEER IN ORDER TO MAINTAIN TRAFFIC OR LOCAL ACCESS AS PER 104.04 AND 107.10, OHIO DEPARTMENT OF TRANSPORTATION SPECIFICATION.

LIST OF INVOICES

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

WORK PERMITS

THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND PAY ALL APPLICABLE FEES TO THE CITY OF CLEVELAND. THE COST OF SAID FEES SHALL BE INCLUDED IN THE APPLICABLE UNIT PRICES BID BY THE CONTRACTOR.

SEEDING AND SODDING

- (A) IN PREPARATION FOR SEEDING OR SODDING, THE SURFACES SHALL BE HARROWED TO A DEPTH OF THREE (3) INCHES. ALL GRASS, WEEDS, ROOTS, STICKS, STONES, ETC., ARE TO BE REMOVED AND THE SOIL CAREFULLY BROUGHT TO THE EXACT FINISHED GRADE OR SUBBASE BY RAKING. AN APPLICATION OF NOT LESS THAN ONE POUND PER ONE HUNDRED (100) SQUARE FEET OF A HIGH NITROGEN CONTENT COMMERCIAL FERTILIZER HAVING AN ANALYSIS OF 10:6:4 SHALL THEN BE UNIFORMLY DISTRIBUTED AND CAREFULLY RAKED IN.
- (B) IMMEDIATELY AFTER THE PREPARATION AND FERTILIZING OF THE SEED BED, THE PREPARED SURFACE SHALL BE SEEDED WITH NOT LESS THAN THREE HUNDRED (300) POUNDS OF GRASS SEED PER ACRE. THE SEED SHALL BE CAREFULLY AND UNIFORMLY SOWN BY EXPERIENCED AND SKILLED WORKMEN. FOLLOWING THE SEEDING, THE SURFACE SHALL BE LIGHTLY RAKED AND ROLLED WITH A LIGHT ROLLER. THE GRASS SEED TO BE USED SHALL BE APPROVED BY THE DIRECTOR.
- (C) IMMEDIATELY AFTER THE PREPARATION OF THE SURFACE FOR SOD, THE FRESHLY CUT SOD SHALL BE CAREFULLY PLACED IN FINAL POSITION, STAKED WITH SUFFICIENT WOODEN STAKES TO PREVENT MOVEMENT, CAREFULLY TAMPED TO FINAL POSITION AND ALL JOINTS CAREFULLY FILLED WITH SCREENED TOPSOIL TO BRING ALL TO A UNIFORM SURFACE.
- (D) ALL SEEDED AND SODDED SURFACES SHALL BE CAREFULLY LOOKED AFTER AND TENDED BY THE CONTRACTOR; SHALL BE WATERED AND THE GRASS CUT WHEN NECESSARY. SETTLED AREAS SHALL BE REILLED, LEVELED, AND TAMPED TO THE PROPER GRADE. ALL SEEDED AND SODDED SURFACES SHALL BE LEFT IN GOOD CONDITION ON THE COMPLETION OF THE WORK.
- (E) AS SEEDING AND SODDING CAN ONLY BE SUCCESSFULLY DONE AT CERTAIN SEASONS OF THE YEAR, THE PREPARATION OF THE SOD OR SEED BED, AND THE WORK OF SODDING AND SEEDING, SHALL ONLY BE DONE AT SUCH TIMES AS MAY BE APPROVED BY THE DIRECTOR.

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| LOW SERVICE DISTRICT | |
| DEPARTMENT OF PUBLIC UTILITIES CLEVELAND, OHIO | |
| APPROVED <u>January 13, 1983</u> | |
| <i>William J. Surmy</i> | DESIGN REVIEW ENGINEER |
| <i>Robert J. Hyde 7/16/82</i> | WESTON DESIGNERS-CONSULTANTS |

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| WESTON DESIGNERS-CONSULTANTS | |
| WATERWORK | |
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ITEM SPECIAL - WATER MAINS
(CONT'D)

PAINING

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

ALL DUCTILE IRON WATER MAIN PIPE AND FITTINGS USED IN CROSSING THE SUBJECT PROJECT UNDERGROUND AND WHERE NOTED ELSEWHERE IN PLANS SHALL BE GIVEN, IN ADDITION TO THAT COATING SPECIFIED, A COATING OF FOUR (4) MILS ADDITIONAL THICKNESS OR PROTECTION WITH POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH ANSI A21.5-1972 (AWWA C105-72) CLASS "C" INSTALLATION METHOD "B".

DRAWINGS

- (A) THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL DUPLICATE PRINTS OF ALL SHOP DRAWINGS FOR CAST IRON & DUCTILE IRON PIPE AND FITTINGS, AND MISCELLANEOUS DETAILS WHICH ARE NOT STANDARD CONSTRUCTION, EVEN THOUGH MENTIONED IN THE REGULAR CATALOGUE OF THE COMPANY FURNISHING THE PIPE. NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN APPROVED.
- (B) THE APPROVAL OF THE DRAWINGS BY THE ENGINEER SHALL NOT RELIEVE THE CONTRACTOR OF ANY OF HIS OBLIGATIONS IN CONNECTION WITH THIS CONTRACT.

MEASUREMENT

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

PAYMENT

THE FOOTAGE MEASURED AS PROVIDED ABOVE SHALL BE PAID FOR AT THE CONTRACT PRICE BID PER LINEAR FOOT FOR "ITEM SPECIAL-WATER MAINS" CLASSIFIED AS TO SIZE AND TYPE, WHICH PRICE AND PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR EXCAVATING AND FOR FURNISHING, HAULING, PLACING, CUTTING INTO AND CONNECTING THE PIPE, PIPE BENDS, FLUG AND CLAMPS AT DEAD ENDS, CONCRETE PIERS, SHEETING AND BRACING, SAND BACKFILL, WATER USED FOR COMPACTION, INCIDENTAL CONCRETE, THE REMOVAL OF ALL SURPLUS EXCAVATION AND DISCARDED MATERIAL, REPAVING, AND FOR ALL LABOR, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THIS ITEM, EXCEPT FOR THE ITEMS SPECIFICALLY LISTED AS SEPARATE PAY ITEMS.

THE CHLORINATION OF THE NEWLY LAID WATER MAINS BY THE CITY OF CLEVELAND, DIVISION OF WATER, WHICH IS DESCRIBED UNDER "GENERAL-ADDITIONAL WORK-(C) CHLORINATION" WILL BE AT NO EXPENSE TO THE CONTRACTOR.

ELECTROLYSIS BONDS AND TEST TAPS

GENERAL

UNLESS INDICATED OR SPECIFIED OTHERWISE, INSTALLATION, MATERIAL AND EQUIPMENT SHALL CONFORM TO THE SPECIFICATIONS SHOWN IN THE CONTRACT DRAWINGS AND SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE AND THE ELECTRICAL CODES OF THE STATE OF OHIO AND THE POLITICAL SUBDIVISIONS AS APPLICABLE TO THE LOCATION IN WHICH THE WORK IS TO BE PERFORMED AND WITH THE APPROVAL OF THE ENGINEER. SEE DETAIL SHEET NO. 132.

ELECTRICAL WORK

THE WORK COVERED BY THIS SUBSECTION CONSISTS OF FURNISHING ALL LABOR, EQUIPMENT, APPLIANCES, AND MATERIALS AND IN PERFORMING ALL OPERATIONS NECESSARY FOR THE INSTALLATION OF ALL ELECTRICAL WORK COMPLETE IN STRICT ACCORDANCE WITH THIS SECTION AND THE CONTRACT DRAWINGS AND APPROVAL OF THE ENGINEER.

TERMINALS

THE TERMINALS SHALL BE CLEARLY MARKED TO SHOW POLARITY AND SHALL BE READILY ACCESSIBLE FOR TESTING. THE NEGATIVE TERMINAL SHALL BE CLEARLY OR PERMANENTLY TAGGED "STRUCTURE". THE POSITIVE TERMINAL SHALL BE CLEARLY MARKED OR PERMANENTLY TAGGED "ANODE". THE ANODE LEADS SHALL TERMINATE IN THE TERMINAL BOX AS SHOWN ON THE DRAWINGS. SUFFICIENT SLACK SHALL BE LEFT IN THE WELL HEAD TO PERMIT MOVEMENT OF THE WIRES DUE TO SOIL SETTLEMENT.

MEASUREMENT AND PAYMENT

CORROSION CONTROL AS SHOWN ON THE CONTRACT DRAWINGS WILL NOT BE MEASURED FOR PAYMENT, BUT WILL BE INCLUDED IN PAYMENT FOR RESPECTIVE WATER MAIN PIPE.

ITEM SPECIAL - VALVES

WORK INCLUDED

THE CONTRACTOR SHALL FURNISH ALL MATERIALS FOR AND SHALL PROPERLY SET IN PLACE AND CONNECT AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER. ALL AIR RELIEF VALVES, 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 RELIEF VALVES

ALL AIR RELIEF VALVES OR AIR VENT VALVES SHALL BE 2-INCH BRONZE ANGLE METER VALVES WITH A BRONZE WATER METER 2-INCH IRON PIPE THREAD COMPANION FLANGE, AND A 2-INCH EXTRA HEAVY BRASS "CLOSE" (2-INCH LONG) NIPPLE. 2-INCH AIR RELIEF VALVES SHALL BE EQUAL IN ALL RESPECTS TO THE 2-INCH ANGLE METER VALVE MANUFACTURED BY J. JONES CO. NO. J-1527-F, FORD METER BOX CO. NO. FV-7, OR MUELLER CO., NO. H-14286.

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 THE HINGES BY MEANS OF HUBS, STUDS OR HINGE PINS. WHERE HINGE PINS ARE USED FOR ATTACHING GATES TO HINGES, THE MOVEMENT OF GATES SHALL BE CONFINED TO PREVENT EXCESSIVE TILTING ON HINGES.

(E) HINGES AND PINS

THE HINGES FOR SUSPENDING GATES OF CHECK VALVES SHALL BE OF CAST BRONZE. ALL PINS USED FOR FASTENING GATES TO HINGES AND FOR SUSPENDING HINGES IN BODIES OR CHECK VALVES SHALL BE OF GRADE FOUR BRONZE. WHERE PINS ATTACHING HINGES TO BODIES ARE ACCESSIBLE FROM THE OUTSIDE OF BODIES, THEY SHALL BE RETAINED IN PLACE BY MEANS OF REMOVABLE BRONZE SIDE PLUGS. ALL PINS SHALL BE SECURELY FASTENED IN PLACE.

(F) SEAT AND GATE RINGS

ALL CHECK VALVES HAVING CAST IRON BODIES SHALL HAVE BODY SEAT RINGS OF BRONZE SCREWED IN PLACE. WHERE GATES ARE MADE OF MATERIAL OTHER THAN BRONZE, THEY SHALL BE FITTED WITH BRONZE SEAT RINGS SECURELY FASTENED IN PLACE. THE FACES OF GATE AND SEAT RINGS COMING INTO CONTACT SHALL BE MACHINED FLAT TO PROVIDE TIGHT JOINTS. THE DIMENSIONS OF BRONZE SEAT AND GATE RINGS FOR THE VARIOUS SIZE CHECK VALVES SHALL NOT BE LESS THAN THOSE GIVEN IN GATE VALVES, PARAGRAPH (F), 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

MEET THE SAME REQUIREMENTS AS THOSE LISTED UNDER GATE VALVE MATERIAL SPECIFICATIONS SHEET 113 & 114.

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 SWWA C-500-80 OR LATEST REVISION THEREOF AND IN ADDITION SHALL COMPLY WITH THE FOLLOWING SUPPLEMENTARY REQUIREMENTS OR BE EQUAL TO VALVES PRESENTLY FURNISHED TO CITY UNDER REQUIREMENT CONTRACTS.

- 1) ALL GATE VALVES SHALL BE OF THE NONREVOLVING DOUBLE DISC PARALLEL SEAT BOTTOM WEDGE OR SIDE WEDGE TYPE.
 - 2) ALL GATE VALVES 20 INCHES AND OVER SHALL INCLUDE BYPASS VALVES ATTACHED THERETO.
 - 3) IN OPENING OR CLOSING THE VALVE, THE GATES SHALL BE FORCED ASCEND OR DESCEND BY REASON OF THE THRUST EXERTED UPON THEM BY THE VALVE STEM NUT; THIS THRUST BEING GENERATED BY THE ROTATION OF THE VALVE STEM.
 - 4) 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.
 - 5) ALL GATE VALVES, 16 INCH AND UNDER, SHALL BE CONSTRUCTED TO WORK VERTICALLY.
- (B) VALVES WITH STATIONARY STEMS: ALL GATE VALVES, UNLESS OTHERWISE ORDERED, SHALL BE MADE WITH SINGLE, NONRISING 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 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 INCHES IN DIAMETER SHALL CONFORM TO THOSE FOR CLASS "D" PRESSURE FITTINGS AS REQUIRED BY AWWA C110 ON VALVES 30 INCHES AND LARGER IN SIZE. THE BELL DIMENSIONS SHALL BE FOR THE CLASSES ORDERED.
- (F) VICTAULIC ENDS: VICTAULIC ENDS SHALL CONFORM TO THE DIMENSIONS GIVEN ON THE CONTRACT DRAWINGS.
- (G) 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."
- (H) FLANGE ENDS: THE END FLANGES OF FLANGED END GATE VALVES SHALL CONFORM IN DIMENSIONS AND DRILLING TO THE "AMERICAN 125 LB. CAST IRON FLANGE STANDARD, "UNLESS OTHERWISE ORDERED.
- (I) SCREW ENDS: ALL 2 INCH GATE VALVES AND UNDER SHALL BE MADE WITH SCREW ENDS, UNLESS OTHERWISE SPECIFIED. THE 3 INCH VALVES SHALL BE FURNISHED WITH SCREW ENDS WHENEVER REQUIRED BY THE ENGINEER. THREADS TO BE INSIDE STANDARD IRON PIPE THREADS.
- (J) 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 INCH VALVES SHALL BE NOT LESS THAN 1-3/16 INCH AND ON 2 INCH VALVES, NOT LESS THAN 1-3/8 INCH.

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| LOW SERVICE DISTRICT | |
| DEPARTMENT OF PUBLIC UTILITIES | |
| CLEVELAND, OHIO | |
| APPROVED <u>January 13, 1983</u> | |
| <i>William Shuenig</i> | DESIGN REVIEW ENGINEER |
| <i>Roger J. Hyde</i> | WESTON - DESIGNERS-CONSULTANTS |

| | | | | | |
|--|-------|--------|---------|----------|---------------|
| WESTON DESIGNERS-CONSULTANTS | | | | | |
| WATER WORK | | | | | |
| GENERAL NOTES | | | | | |
| SCALE | DATE | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE REVISION |
| JRH | JMD | | CAP | | |

CUYAHOGA COUNTY
CUY- 490 - 1.49

ITEM SPECIAL - VALVES
(CONT'D)

MATERIAL SPECIFICATIONS (CONT'D)

- (L) OTHER MATERIALS: ALL OTHER MATERIALS USED IN THE MANUFACTURE OF THESE VALVES AND NOT SPECIFIED IN THE SPECIFICATIONS SHALL BE OF THE BEST QUALITY OF THEIR KINDS, AND SUBJECT TO INSPECTION, TESTS, AND APPROVAL BY THE ENGINEER.
- (M) CHEMICAL ANALYSIS: CHEMICAL ANALYSIS OF THE MATERIAL USED SHALL BE FURNISHED BY THE CONTRACTOR WHENEVER REQUIRED BY THE ENGINEER.
- (N) CLEANING OF CASTINGS: ALL IRON CASTINGS SHALL BE THOROUGHLY CLEANED ON THE OUTSIDE AND INSIDE SURFACES, AND PROTECTED FROM RAIN OR MOISTURE UNTIL THEY ARE PAINTED.
- (O) HYDROSTATIC TESTS AT SHOP: ALL GATE VALVES SHALL BE TESTED IN THE SHOP BY HYDROSTATIC PRESSURE BY CLOSING THE VALVE AND APPLYING THE REQUIRED TEST PRESSURE IN THE BODY AND DOME OF THE VALVE AS SPECIFIED BELOW.

| | |
|-----------------|---|
| 3" AND UNDER | 300 PSI - NO TIME REQUIREMENT |
| 4" THROUGH 12" | 400 PSI - NO TIME REQUIREMENT |
| 14" THROUGH 20" | 300 PSI FOR 15 MINUTES, DROP PRESSURE TO 150 PSI, THEN ELEVATE AGAIN TO 300 PSI FOR 15 MINUTES - A TOTAL OF 1/2 HOUR. |

THIS IS A MODIFICATION OF SECTION 29 OF THE "STANDARD SPECIFICATIONS AWWA DESIGNATION G-500-61." ALL LEAKS, FLAWS OR OTHER DEFECTS DEVELOPED IN MAKING THESE TESTS SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER OR THE ENTIRE PIECE SHALL BE REJECTED. AFTER TESTING, ALL VALVES SHALL BE THOROUGHLY DRAINED. ALL EQUIPMENT FOR TESTING AND ALL TESTS SHALL BE MADE AT THE CONTRACTOR'S EXPENSE.

- (P) PERFORMANCE TESTS: EACH VALVE SHALL BE OPERATED IN THE POSITION THAT IT WILL ASSUME IN SERVICE, AND FOR THE FULL LENGTH OF GATE TRAVEL IN BOTH DIRECTIONS TO DEMONSTRATE THE FREE AND PERFECT FUNCTIONING OF ALL PARTS IN THE INTENDED MANNER. ANY DEFECTS OF WORKMANSHIP SHALL BE CORRECTED AND THE TEST REPEATED UNTIL SATISFACTORY PERFORMANCE IS DEMONSTRATED.

PLACING AND TESTING

- (A) ALL VALVES SHALL BE SET ACCURATELY AND CAREFULLY TO THE LINES AND GRADES GIVEN. ALL CONNECTIONS TO PIPE SHALL HAVE THE NECESSARY FLANGED, HUB, SOLDER JOINT, SCREWED OR VACUULIC ENDS AS REQUIRED UNDER THE VARIOUS SECTIONS OF THESE SPECIFICATIONS AND AS SHOWN ON THE VALVE SCHEDULE.
- (B) AFTER THE VALVES ARE SET IN PLACE AND READY TO OPERATE, THE CONTRACTOR SHALL TEST THEM UNDER WORKING PRESSURE AND CONDITIONS HEREIN SPECIFIED UNDER "GENERAL - TESTING MAINS;" ANY VALVE FOUND TO LEAK SHALL BE MADE WATERTIGHT AND IF FOUND TO BE OF FAULTY DESIGN, SHALL BE SATISFACTORILY REPAIRED OR REPLACED BY THE CONTRACTOR.

PAINTING

- (A) IRON BODY VALVES SHALL EITHER BE DIPPED IN ASPHALT PAINT AND ALL BRONZE PARTS CLEANED, OR ALL IRON CASTINGS SHALL BE PAINTED INSIDE BEFORE ASSEMBLING WITH TWO (2) COATS OF APPROVED PAINT, 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 USING INERTOL 66, OR KOPPERS BITUMASTIC 50 OR APPROVED EQUAL.

INSPECTION

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

DRAWINGS

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

- (B) TWO (2) PRINTS 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 FURNISH TO THE ENGINEER THREE (3) SETS OF MYLAR OR REPRODUCIBLE CLOTH, ONE OF WHICH SHALL BE FURNISHED TO THE DIRECTOR OF PUBLIC UTILITIES OF THE CITY OF CLEVELAND, AND ONE (1) SET RETURNED TO THE CONTRACTOR. NO WORK SHALL BE DONE IN THE SHOP UNTIL AFTER THE DRAWINGS HAVE BEEN FINALLY APPROVED.
- (C) IF THE VALVE FURNISHED IS ONE PREVIOUSLY APPROVED FOR WHICH DRAWINGS ARE PRESENTLY ON FILE WITH THE DEPARTMENT OF PUBLIC UTILITIES, THE DRAWING REQUIREMENT WILL BE WAIVED.

PAYMENT

THE UNIT PRICE STIPULATED FOR EACH "ITEM SPECIAL - VALVES" CLASSIFIED AS TO SIZE AND TYPE, SHALL INCLUDE THE FURNISHING, PLACING, TESTING AND PAINTING OF THE AIR RELIEF DRAIN VALVES, GATE VALVES, CHECK VALVES, INCLUDING BYPASS VALVES, OPERATING NUTS, AND OTHER ACCESSORIES AND APPURTENANCES AND THE FURNISHING OF ALL MATERIALS, LABOR, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.

NOTE: AIR RELIEF IS INCLUDED FOR PAYMENT IN "ITEM SPECIAL - 2" AIR RELIEF COMPLETE."

VALVE BOXES

VALVE BOXES AND COVERS

MATERIALS AND SPECIFICATIONS SHALL CONFORM TO "MISCELLANEOUS METAL OR PLASTIC WORK," "SPECIFICATIONS AND DETAILS AS SHOWN IN THE PLANS." CAST IRON SHALL BE ASTM DESIGNATION A-48 WITH NO SPECIFIC REQUIREMENT AS TO CLASS.

PAYMENT FOR VALVE BOXES AND COVERS SHALL BE THE UNIT PRICE STIPULATED PER POUND FOR ITEM SPECIAL - MISCELLANEOUS METAL OR PLASTIC WORK, AS DESCRIBED ELSEWHERE IN THESE NOTES.

BRICK AND CONCRETE MASONRY
ITEM SPECIAL - VAULTS, MANHOLES OR CHAMBERS

WORK INCLUDED

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

BRICK AND MASONRY MATERIAL

THE MATERIAL FURNISHED BY THE CONTRACTOR FOR THE VARIOUS KINDS OF MASONRY CONSTRUCTION TO BE CONSTRUCTED SHALL CONFORM TO THE FOLLOWING OHIO DEPARTMENT OF TRANSPORTATION (ODOT) SPECIFICATIONS:

- (A) ALL BRICK FURNISHED AND USED SHALL BE NO. 2 SHALE BRICK AND SHALL COMPLY WITH THE REQUIREMENTS FOR "GRADE SA" ASTM C32, OR ODOT 704.02 CONCRETE BRICK.
- (B) PORTLAND CEMENT SHALL CONFORM TO THE REQUIREMENTS OF 701.04 (ASTM C 150 TYPE 1) ODOT.
- (C) FINE AGGREGATE FOR MORTAR OR GROUT SHALL CONFORM TO THE REQUIREMENTS OF 703.03 ODOT.
- (D) AGGREGATE FOR PORTLAND CEMENT CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF 703.02 ODOT.
- (E) ALL WATER SHALL BE CLEAN AND ACCURATELY MEASURED FOR EACH BATCH OF CONCRETE.
- (F) ALL PLAIN CONCRETE SHALL BE THE ODOT 499 CLASS "C".
- (G) ALL REINFORCING STEEL SHALL BE ODOT ITEM 509.
- (H) ALL CEMENT MORTAR SHALL BE MIXED IN THE PROPORTION OF ONE (1) PART OF CEMENT TO THREE (3) PARTS OF SAND, EXCEPT THE MORTAR FOR BRICK CATCH BASINS AND SEWER MANHOLES WHICH SHALL BE 1 TO 2 MIX.
- (I) PRECAST MASONRY VAULT SECTIONS MAY BE FURNISHED IF THEY MEET THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS ON FILE WITH THE CLEVELAND DIVISION OF WATER OR APPROVED BY THE ENGINEER.

VAULT, MANHOLE AND CHAMBER CONSTRUCTION

- (A) ALL VAULTS, MANHOLES, CHAMBERS, BRICK NECKS & EXTENSIONS, AND TEMPORARY EXTENSIONS SHALL BE BUILT IN ACCORDANCE WITH THE CONTRACT DRAWINGS.
- (B) THE WALLS OF CIRCULAR STRUCTURES SHALL BE BUILT OF NO. 2 SHALE BRICK OR CONCRETE BRICK LAID IN 1:3 PORTLAND CEMENT MORTAR, WITH BRICK ARRANGED RADIIALLY AS HEADERS, FORMING A WALL NINE (9) INCHES THICK. IN DEEP MANHOLES, THE WALL SHALL BE THIRTEEN (13) INCHES THICK BELOW A POINT 12 FEET FROM THE SURFACE. ALL OF THE BRICK COMPOSING SAID STRUCTURES SHALL BE LAID IN FULL MORTAR BEDS AND JOINTS, WITH NO MORTAR JOINTS APPEARING ON THE INNER SURFACE OF THE MANHOLE EXCEEDING THREE-EIGHTHS (3/8) INCHES THICK.
- (C) THE TOP OF THE WALL OF STRUCTURES SHALL BE PROPERLY LEVELED OFF WITH MORTAR SO AS TO FORM A FLAT SURFACE UPON WHICH THE CAST IRON MANHOLE RING IS TO REST, AND THE STRUCTURE SHALL BE BUILT TO PROPER HEIGHT AS INDICATED BY THE CONTRACT DRAWINGS.
- (D) THE ENTIRE OUTER SURFACE OF ALL BRICK STRUCTURES SHALL BE PLASTERED WITH A SMOOTH COATING OF 1:3 PORTLAND CEMENT MORTAR, AT LEAST ONE-HALF (1/2) INCH THICK.
- (E) PRECAST OR CAST IN PLACE CONCRETE MASONRY CONSTRUCTION SHALL FOLLOW THE APPLICABLE SECTION OF ITEM 604 ODOT SPECIFICATION.

PAYMENT

PAYMENT SHALL BE MADE AT THE CONTRACT UNIT PRICE BID PER EACH "ITEM SPECIAL - VAULTS, MANHOLES OR CHAMBERS" CLASSIFIED AS TO SIZE AND TYPE, COMPLETE AND ACCEPTED IN PLACE. PAYMENT FOR BRICK OR CONCRETE MASONRY IS TO BE INCLUDED IN THE UNIT PRICE BID FOR THE ITEM IN WHICH IT IS USED AND SHALL CONSTITUTE FULL COMPENSATION FOR PERFORMING ALL THE REQUIREMENTS OF THIS ITEM INCLUDING ALL NECESSARY MATERIAL, LABOR, TOOLS, EQUIPMENT AND INCIDENTALS TO MAKE THIS A COMPLETE ITEM OF WORK.

PAYMENT FOR CONCRETE ANCHORS AND PIERS IS TO BE INCLUDED IN THE UNIT PRICE BID FOR "ITEM SPECIAL - WATER MAINS" (NEW LINES), "ITEM SPECIAL - PRESTRESSED CONCRETE CYLINDER PIPE" OR "ITEM SPECIAL - PLUGGING EXISTING WATER MAINS AND BRANCHES." PAYMENT FOR FRAMES, COVERS, AND STEPS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "ITEM SPECIAL - MISCELLANEOUS METAL OR PLASTIC WORK."

ITEM SPECIAL - FURNISHING & SETTING 6" HYDRANT

WORK INCLUDED

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

HYDRANTS

THE 6" HYDRANT DETAILS SHOWN IN THE PLANS IS A CITY OF CLEVELAND STANDARD AND SHALL CONFORM TO THE CITY'S SPECIFICATIONS ON FILE AT 1201 LAKESIDE AVENUE, CLEVELAND, OHIO 44114. IN ADDITION TO THE 6" HYDRANT DETAILS IN THE PLANS, THE CITY OF CLEVELAND HAS APPROVED THREE (3) ADDITIONAL 6" HYDRANT DETAILS ON FILE AT 1201 LAKESIDE AVENUE, CLEVELAND, OHIO 44114. THE DRAWING NOS. ARE D525, D526 AND D 530.

SETTING

- (A) GENERAL LOCATION: THE HYDRANT SHALL BE LOCATED IN A MANNER TO PROVIDE COMPLETE ACCESSIBILITY, AND IN SUCH MANNER THAT THE POSSIBILITY OF DAMAGE FROM VEHICLES OR INJURY TO PEDESTRIANS WILL BE MINIMIZED.
- (B) LOCATION REGARDING CURB LINES: WHEN PLACED BEHIND CURB THE HYDRANT BARREL SHALL BE SET SO THAT CENTER OF BARREL WILL BE NO LESS THAN 3 FEET FROM THE GUTTER FACE OF THE CURB EXCEPT BY CONSENT OF THE ENGINEER.
- (C) LOCATION REGARDING SIDEWALK: WHEN SET IN THE LAWN SPACE BETWEEN THE CURB AND THE SIDEWALK, OR BETWEEN THE SIDEWALK AND THE PROPERTY LINE, NO PORTION OF THE HYDRANT OR NOZZLE CAP SHALL BE WITHIN 6 INCHES OF THE SIDEWALK.
- (D) POSITION OF NOZZLES: THE HYDRANT SHALL STAND PLUMB WITH THE NOZZLES POINTING TOWARD THE ROAD END AT AN ANGLE OF FORTY-FIVE DEGREES THEREFROM. WHERE HYDRANT BRANCH PIPING IS PARALLEL WITH OR NOT AT RIGHT ANGLES TO THE CURB, THE CONTRACTOR SHALL RELEASE SWIVEL HEAD BOLTS AND ADJUST THE HYDRANT NOZZLES TO FACE THE ROAD AT THE PROPER ANGLE. A HYDRANT WITHOUT SWIVEL HEADS WILL BE ADJUSTED BY THE CITY WHERE NECESSARY TO CORRECT THE ANGLE ON NOZZLES. THE ELEVATION SHALL CONFORM TO THE ESTABLISHED GRADE WITH TOPS OF FROST CASING AT LEAST FOUR (4) INCHES ABOVE GRADE.

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO
APPROVED January 13, 1983
DESIGN REVIEW ENGINEER
William J. Querry
Robert Hyde 7/10/82 WESTON
DESIGNERS-CONSULTANTS

WESTON
DESIGNERS-CONSULTANTS

WATER WORK
GENERAL NOTES

| | | | | | | |
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| SCALE | DATE | | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| JRH | JMD | | CAP | | | |

ITEM SPECIAL - FURNISHING & SETTING 6" HYDRANT (CONT'D)

- (E) CONNECTION TO MAIN: THE HYDRANT SHALL BE CONNECTED TO THE MAIN PIPE WITH A BRANCH CONTROLLED BY THE INDEPENDENT GATE VALVES OF THE SAME SIZE AS THE HYDRANT, EXCEPT AS OTHERWISE DIRECTED.
- (F) DRAINAGE AT HYDRANT: DRAINAGE SHALL BE PROVIDED AT THE BASE OF THE HYDRANT BY FILLING AROUND THE ELBOW WITH COARSE GRAVEL OR CRUSHED STONE TO AT LEAST SIX (6) INCHES ABOVE THE WASTE OPENING. WHEREVER A HYDRANT IS SET IN ROCK, CLAY OR OTHER IMPERVIOUS SOIL, THE TRENCH SHALL BE WIDENED AND DEEPEDED ON EACH SIDE OF THE HYDRANT BASE AND THE SPACE SHALL BE FILLED COMPACTLY WITH COARSE GRAVEL OR BROKEN STONE MIXED WITH COARSE SAND OF SUFFICIENT QUANTITY TO ABSORB ALL WATER TO BE DRAINED FROM THE HYDRANT WHEN THE VALVE IS CLOSED.
- (G) ANCHORAGE FOR HYDRANT: THE HYDRANT SHALL BE SET ON A STONE SLAB OR A SIMILAR FOUNDATION AND THE BASE OF THE HYDRANT AND THE HYDRANT TEE SHALL BE WELL BRACED AGAINST UNEXCAVATED EARTH AT THE END OF THE TRENCH WITH CONCRETE BACKING, OR IT SHALL BE TIED TO THE PIPE WITH SUITABLE RODS OR CLAMPS AS DIRECTED BY THE ENGINEER.
- (H) CLEANING: THE HYDRANT SHALL BE THOROUGHLY CLEANED OR DIRTY OR FOREIGN MATTER BEFORE SETTING.

PAYMENT

- (A) THE UNIT PRICE STIPULATED TO BE PAID FOR EACH ITEM SPECIAL - "FURNISHING AND SETTING 6" HYDRANT SHALL INCLUDE FURNISHING HYDRANT, SETTING, TESTING, PAINTING, EXCAVATING, SHEETING AND SHORING, BACKFILLING, AND THE FURNISHING OF ALL LABOR, MATERIAL, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN.
- (B) THE CAST IRON PIPE AND DUCTILE IRON PIPE WILL BE PAID FOR UNDER ITEM SPECIAL - "WATER MAINS."
- (C) THE VALVES WILL BE PAID FOR UNDER ITEM SPECIAL - "VALVES."
- (D) THE VALVE BOXES WILL BE PAID FOR UNDER ITEM SPECIAL - "MISCELLANEOUS METAL OR PLASTIC WORK."

ITEM SPECIAL - HYDRANT REMOVED, EXTENDED AND RESET

THE CONTRACTOR SHALL PERFORM ALL THE WORK NECESSARY AT THE LOCATIONS SHOWN ON THE PLANS, INCLUDING REMOVING, INSPECTING, CLEANING, EXTENDING AND RESETTING THE HYDRANT; PLUG AND CAP EXISTING MAINS, TEES, AND CROSSES; EXCAVATE AND BACKFILL; REMOVE AND DELIVER ANY SALVAGEABLE MATERIAL TO THE HARVARD YARDS.

PAYMENT

THE WORK INCLUDED IN THIS ITEM SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR EACH ITEM SPECIAL - "HYDRANT REMOVED, EXTENDED, AND RESET" WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR FURNISHING OF CAST IRON PLUGS OR CAPS, LEAD, PIERS, LAYING, CAULKING, PAINTING, TESTING, CLEANING EXCAVATION, SHEETING AND SHORING, BACKFILLING, SANDBACKFILL. SURFACE RESTORATION TEMPORARY AND/OR PERMANENT REPAVING AND THE FURNISHING OF ALL LABOR, TOOLS, MATERIAL, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THIS ITEM OF WORK AS SPECIFIED.

ITEM SPECIAL - MISCELLANEOUS METAL OR PLASTIC WORK

WORK INCLUDED

- (A) THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MISCELLANEOUS METAL OR PLASTIC WORK WHICH IS REQUIRED FOR THE PROPER COMPLETION OF THE WORK INCLUDED UNDER THIS CONTRACT AND IS NOT SPECIFICALLY INCLUDED UNDER THE OTHER ITEMS OR THESE SPECIFICATIONS.
- (B) IN GENERAL, THE WORK SHALL INCLUDE THE FURNISHING AND INSTALLING OF MANHOLE FRAMES AND COVERS, MANHOLE STEPS, VALVE BOXES, EXTENSION STEMS AND BRACE, STRUCTURAL MEMBERS, BRONZE BOLTS, AND OTHER SIMILAR ITEMS REQUIRED FOR THE PROPER COMPLETION OF THE WORK.

MATERIALS

ALL CASTINGS SHALL CONFORM TO THE REQUIREMENTS OF ITEM 604 OF THE OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIALS SPECIFICATIONS, EXCEPT THAT THE CAST IRON SHALL CONFORM TO ASTM DESIGNATION A48, CLASS 30-B FOR MANHOLE FRAME AND COVER. ALL STRUCTURAL STEEL SHALL MEET THE REQUIREMENTS OF THE ASTM SPECIFICATIONS A 36. ALL BRONZE BOLTS AND NUTS SHALL CONFORM TO THE U.S. STANDARD SIZES, AND SHALL BE CLEAN CUT AND HAVE WELL FITTED THREADS. ALL BRONZE BOLTS AND NUTS SHALL BE TOBIR OR MANGANESE BRONZE, OR OF SIMILAR APPROVED MATERIALS.

CAST IRON VALVE BOXES AND COVERS SHALL BE GRAY IRON CASTINGS, IN WHICH APPEARANCE AND DIMENSION TOLERANCES ARE PRIMARY CONSIDERATIONS AND STRENGTH IS NOT A PRIMARY OR MAJOR CONSIDERATION. VALVE BOXES AND COVERS SHALL BE ASTE DESIGNATION A-48 WITH NO SPECIFIC REQUIREMENT AS TO CLASS. CHEMICAL COMPOSITION SHALL NOT BE CONSIDERED, BUT THE MATERIAL SHALL BE OF GOOD QUALITY AND OF SUCH CHARACTER AS SHALL MAKE THE METAL OF THE CASTINGS STRONG, TOUGH AND OF EVEN GRAIN. THE METAL SHALL BE MADE WITHOUT ANY ADMIXTURE OF CINDER IRON OR OTHER INFERIOR METAL.

PLASTIC VALVE BOX SHALL BE INJECTION MOLDED AND COMMERCIAL MANUFACTURED UTILIZING A COMPOUND PER ASTM D-2853-70, CLASS 1212. MATERIAL SHALL BE A RIGID COMBINATION OF POLYOLEFIN WITH FIBROUS INORGANIC COMPONENT REINFORCING, AND U.V. STABILIZER ADDITIVES TO ASSURE RESISTANCE TO MATERIAL DEGRADATION FROM ULTRA-VIOLET LIGHT. THE ENTIRE UPPER SECTION OF THE BOX SHALL BE MADE OF A MAGNETICALLY LOCATEABLE MATERIAL. THE USE OF MAGNETS WILL NOT BE PERMITTED. APPEARANCE AND DIMENSIONAL TOLERANCES ARE PRIMARY CONSIDERATION AND STRENGTH A MAJOR CONSIDERATION.

PLASTIC VALVE BOX SHALL HAVE A CAST IRON RING AND A CAST IRON 4-PRONGED TRAFFIC LID. CAST IRON SHALL HAVE A MINIMUM WEIGHT OF 18 LBS. AND MUST CONFORM TO ASTM A-148, CLASS 20 SPECIFICATIONS. BOX TO BE BUFFALO TYPE (SLIP) OR (SCREW) AND HAVE A SHAFT DIAMETER OF 5-1/4". THE BOTTOM PART OF THE BOX SHALL HAVE A BELL MEASURING 7-5/8" HIGH BY 10-1/16" WIDE AND HACE A KNOCK OUT AS STANDARD EQUIPMENT. A NO. 6 ROUND BASE AND A 20" EXTENSION SECTION MUST BE AVAILABLE.

PHYSICAL PROPERTIES OF MOLDED PLASTIC

| PROPERTIES | TEST METHOD ASTM | MINIMUM TEST VALUES |
|---------------------------------------|---------------------|------------------------|
| TENSILE STRENGTH (2.0"/MIN.) | D-638-72 | 3400 PSI |
| FLEXURAL MODULUS | D-790-71 | 191,000 PSI |
| COMPRESSIVE STRENGTH (.05"/MIN.) | D-695-69 | 3350 PSI |
| IMPACT STRENGTH, IZOD | D-256-72 | .6FT. LB/IN. |
| DUROMETER HARDNESS, TYPE D | D-2240-68 | 60 |
| DEFLECTION TEMPERATURE @66 PSI STRESS | D-648-72 | 230F |
| SPECIFIC GRAVITY | D-692-66 | 1.15 |

WORKMANSHIP AND FINISH SHALL CONFORM SUBSTANTIALLY TO THE DIMENSIONS ON THE CONTRACT DRAWINGS OR FURNISHED DRAWINGS. THE CASTINGS OR MOLDINGS SHALL BE FREE FROM INJURIOUS DEFECTS, CRACKS, GAS HOLES, FLAWS, AND EXCESSIVE SHRINKAGE. ADDITIONAL INSPECTION MAY BE MADE AT THE PROJECT OR WORK SITE. INSPECTION SHALL BE VISUAL INSPECTION FOR APPEARANCE AND SURFACE SMOOTHNESS IN COMPARISON WITH SAMPLES ACCEPTED AS STANDARD.

SAMPLE CASTINGS OR MOLDINGS FROM EACH PATTERN, WHEN REQUIRED BY THE ENGINEER, SHALL BE SUBMITTED BY THE MANUFACTURER FOR THE PURPOSE OF ESTABLISHING STANDARDS OF APPEARANCE AND DIMENSIONAL TOLERANCES. THE MANUFACTURER SHALL CERTIFY THAT HIS PRODUCT CONFORMS TO THESE SPECIFICATIONS. EACH CERTIFICATION SO FURNISHED SHALL BE SIGNED BY AN AUTHORIZED AGENT OF THE MANUFACTURER.

CLEANING AND TESTING

ALL CASTINGS SHALL BE THOROUGHLY CLEANED AND SUBJECTED TO A CAREFUL HAMMER TEST.

NO CASTINGS SHALL BE COATED UNLESS CLEAN AND FREE FROM RUST, AND APPROVED IN THESE RESPECTS BY THE ENGINEER OR HIS AUTHORIZED INSPECTOR IMMEDIATELY BEFORE BEING DIPPED.

COATING

EACH CASTING SHALL BE SPRAYED OR BRUSHED INSIDE AND OUT WITH ONE COAT OF ASPHALTIC COMPOUND VARNISH. THE VARNISH SHALL BE MADE OF HIGH GRADE ASPHALT FLUXED AND BLENDED WITH PROPERLY TREATED DRYING OILS AND THINNED TO A PROPER CONSISTENCY WITH A VOLATILE SOLVENT. THE VARNISH SHALL BE MADE TO COMPLY WITH FEDERAL SPECIFICATION 77-V-51a OR JOINT ARMY-NAVY SPECIFICATION JAN-P-450. OTHER METHODS OF COATING AND TYPES OF COATING MATERIAL SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. IN ADDITION TO THE SHOP COAT, THE CASTINGS SHALL RECEIVE TWO (2) COATS OF APPROVED PAINT.

INSPECTION

THE ENGINEER OR HIS AUTHORIZED REPRESENTATIVE SHALL HAVE THE RIGHT TO INSPECT THE MATERIAL AND WORK DONE, AS THE INTERESTS OF THE CITY OR STATE MAY REQUIRE. SUCH INSPECTION SHALL NOT RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM SAID WORK STRICTLY IN ACCORDANCE WITH THE SPECIFICATIONS, AND ANY MODIFICATION THEREOF, AS HEREIN PROVIDED, AND WORK NOT SO CONSTRUCTED SHALL BE REMOVED AND MADE GOOD BY THE CONTRACTOR AT HIS OWN EXPENSE. ALL MANHOLE RINGS AND COVERS MUST BE SOUND AND SHALL CONFORM TO THESE SPECIFICATIONS, AND ANY DEFECTIVE CASTINGS WHICH MAY HAVE PASSED THE INSPECTOR AT THE WORKS, OR ELSEWHERE, SHALL BE AT ALL TIMES LIABLE TO REJECTION WHEN DISCOVERED, UNTIL THE DATE OF FINAL PAYMENT UNDER THIS CONTRACT.

STEPS AND LADDERS

DUCTILE IRON STEPS AND LADDERS OF THE SIZE AND SHAPE SHOWN ON THE CONTRACT DRAWINGS SHALL BE BUILT INTO THE BRICK AND CONCRETE MASONRY OF THE MANHOLES AS INDICATED ON THE DRAWINGS.

RIMS AND COVERS

- (A) ALL CAST IRON MANHOLE RIMS AND COVERS OF THE FORMS, DIMENSIONS AND DETAILS SHOWN ON THE CONTRACT DRAWINGS SHALL BE FURNISHED AND INSTALLED AS DIRECTED.
- (B) THE RIMS SHALL BE PROPERLY SET IN PLACE IN A FULLBED OF MORTAR OF Poured MONOLITHIC IN THE MASONRY, AT SUCH ELEVATION AS TO MAKE THE TOP OF THE RIM CONFORM TO THE FINISHED SURFACES OF THE STRUCTURES OR THE FINISHED GRADE AS ESTABLISHED BY THE ENGINEER.

VALVE BOXES AND COVERS

THE CONTRACTOR SHALL FURNISH AND INSTALL, OVER EACH VERTICALLY SET VALVE AT THE LOCATIONS SHOWN ON THE DRAWINGS, OR AS REQUIRED, VALVE BOXES WITH COVERS OF THE ASSEMBLED TYPES AND SIZES HEREINAFTER SPECIFIED OR INDICATED ON THE CONTRACT PLANS.

- A. FOR WATER SERVICE CONNECTIONS AND VALVES TO EIGHT-INCH (8") SIZE:
ROUND COVER WITH BOTTOM/BASE NO. 2 AND 3, PLASTIC BOTTOM OR ALTERNATE NO. 1.
- B. FOR VALVES OF TEN-INCH (10") SIZE:
ROUND OR SQUARE COVER WITH BOTTOM/BASE NO. 4, ALTERNATE BOTTOM NO. 2 WITH NO. 6 BASE, OR PLASTIC BOTTOM WITH PLASTIC NO. 6 BASE.
- C. FOR VALVES OF TWELVE-INCH (12") SIZE:
ROUND OR SQUARE COVER WITH BOTTOM/BASE NO. 4, ALTERNATE BOTTOM NO. 2 WITH NO. 6 OR 8 BASE, OR PLASTIC BOTTOM WITH PLASTIC NO. 6 BASE.
- D. FOR VALVES OF SIXTEEN-INCH (16") SIZE:
ROUND OR SQUARE COVER WITH BOTTOM/BASE NO. 4, ALTERNATE BOTTOM NO. 2 WITH NO. 8 OR 160 BASE.
- E. FOR AIR RELIEF AND FLUSHING ASSEMBLIES:
OVAL COVER VALVE BOX OR ALTERNATE DOUBLE ROUND COVER, ASSEMBLED TYPE A.

NOTE:

VALVE BOXES FOR USE IN FLEXIBLE TYPE PAVEMENTS SHALL HAVE TOPS WITH FLANGE SUPPORT RING NO LESS THAN FIVE AND ONE-QUARTER INCHES (5-1/4") FROM COVER SURFACE. WHERE THE CONTRACTOR FURNISHES AN ALTERNATE SHORT TOP, 6-INCH SIZE SDR-21 PLASTIC PIPE CUT TO PROPER LENGTH SHALL BE USED AS EXTENSION PIECE WITH ANY ADJUSTABLE CAST IRON VALVE BOX BOTTOM.

ALL COVERS SHALL BE INTERCHANGEABLE IN TOPS OF THEIR RESPECTIVE BOXES: SLIP TYPE TOPS SHALL BE INTERCHANGEABLE WITH SLIP TYPE BOTTOMS OR EXTENSIONS. THESE ASSEMBLED TYPE VALVE BOXES SHALL EXTEND FROM VALVE BONNET TO FINISHED GRADE OR ELEVATION REQUIRED, BEING CAREFULLY LOCATED OVER THE VALVE OPERATING NUT (S) AND SHALL BE SET PLUMB AND TRUE AS REQUIRED.

VALVE BOXES AND COVER ASSEMBLIES SHALL BE COMPLETED AND THEIR PARTS SHALL COMPLY WITH THOSE PARTS SHOWN ON DRAWINGS WHICH ARE MADE A PART OF THESE SPECIFICATIONS AND ENCLOSED HEREIN AND ALSO ON FILE IN THE WATER ENGINEERING SECTION OF THE DIVISION OF WATER AND HEAT, ROOM 553 PUBLIC UTILITIES BUILDING, 1201 LAKESIDE AVENUE, CLEVELAND, OHIO 44114.

DETAILED DRAWINGS

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

PAINTING

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

LOW SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 CLEVELAND, OHIO

APPROVED January 13, 19 83
 [Signature] DESIGN REVIEW ENGINEER

[Signature] WESTON
 DESIGNERS-CONSULTANTS

**WESTON
 DESIGNERS-CONSULTANTS**

**WATERWORK
 GENERAL NOTES**

| | |
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| SCALE | DATE |
| DESIGNED DRAWN TRACED CHECKED REVIEWED | DATE REVISED |
| JRH JMD CAP | |

ITEM SPECIAL - RELOCATE AND RECONNECT EXISTING SERVICE CONNECTION

WORK INCLUDED
 THE CONTRACTOR WILL FURNISH ALL PIPE, FITTINGS, STRAP SADDLES, TAPPING SLEEVES AND TAPPING VALVES, CORPORATION COCKS, CURB STOPS AND BOXES, VALVES AND VALVE BOXES, AND THE CITY OF CLEVELAND, DIVISION OF WATER, WILL PERFORM THE WORK NECESSARY TO RELOCATE AND RECONNECT THE SERVICE PIPE INCLUDING TAPPING FROM WATER MAIN TO WATER METER OR CURB STOP. THE CONTRACTOR SHALL PERFORM THE NECESSARY EXCAVATION AND BACKFILL. MATERIALS REQUIRED FOR EACH SIZE INSTALLATION HAVE BEEN TABULATED IN THESE NOTES. SEE "MATERIALS REQUIRED FOR INSTALLATIONS."

THE SERVICE PIPE BEYOND THE METER OR CURB STOP SHALL BE INSTALLED BY THE CONTRACTOR INCLUDING ALL LABOR AND NEW MATERIALS NECESSARY TO COMPLETE THE SERVICE CONNECTION.

PIPE MATERIAL AS FOLLOWS:
 5/8" DIA. TO 2" DIA. - COPPER WATER TUBING, TYPE K, ASTM 888-74
 3" DIA. TO 4" DIA. - C.I. PIPE AND FITTINGS, A.S.A., CLASS 24, CEMENT LINED
 6" DIA. TO 8" DIA. - C.I. PIPE AND FITTINGS, A.S.A., CLASS 25, CEMENT LINED

PAYMENT
 WORK PERFORMED JOINTLY BY THE CITY AND THE CONTRACTOR WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR EACH ITEM SPECIAL - "RELOCATE AND RECONNECT EXISTING SERVICE CONNECTION, CLASSIFIED AS TO PIPE SIZE COMPLETE." THIS PRICE SHALL INCLUDE ALL NEW PIPE, VALVES AND MISCELLANEOUS METAL OR PLASTIC FOR THIS ITEM. THE LABOR, TOOLS, EQUIPMENT AND INCIDENTALS FURNISHED BY THE CITY OF CLEVELAND, DIVISION OF WATER WILL BE AT NO EXPENSE TO THE CONTRACTOR.

ITEM SPECIAL - SERVICE CONNECTION EXTENDED

WORK INCLUDED
 THE CONTRACTOR SHALL FURNISH ALL NEW MATERIAL AND ARRANGE FOR THE CITY OF CLEVELAND, DIVISION OF WATER TO DO THE ACTUAL RELOCATING OF CURB BOXES AND EXTENDING CONNECTION FROM EXISTING CURB BOX LOCATION TO NEW CURB BOX LOCATION. WORK PERFORMED BY THE CITY OF CLEVELAND WILL BE AT NO EXPENSE TO THE CONTRACTOR.

THE SERVICE PIPE EXTENDED BEYOND THE NEW CURB BOX LOCATION SHALL BE INSTALLED BY THE CONTRACTOR INCLUDING ALL LABOR AND NEW MATERIALS NECESSARY TO COMPLETE THE SERVICE CONNECTION.

THE CONTRACTOR SHALL FURNISH ALL THE MATERIAL INCLUDING NECESSARY NEW CURB COCKS AND PIPING AND SHALL DO ALL THE NECESSARY EXCAVATION, BACKFILLING, SEEDING, SODDING AND REPAVING REQUIRED IN MAKING THESE SERVICE CONNECTIONS AND ALTERATIONS AND COSTS THEREOF SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM SPECIAL - "SERVICE CONNECTION EXTENDED." THE CURB BOXES SHALL BE RELOCATED BY THE CITY AND SET TO FINAL GRADE BY THE CONTRACTOR. WATER METER VAULTS FOR CONNECTIONS 3/4" AND OVER SHALL BE CONSTRUCTED BY THE CONTRACTOR AND PAID FOR AT CONTRACT UNIT PRICE BID FOR EACH ITEM SPECIAL - "VAULTS, MANHOLES AND CHAMBERS." BRICK AND CONCRETE MASONRY, SEE SHEET 114.

MEASUREMENT
 THE SERVICE CONNECTION EXTENDED 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 ITEM SPECIAL - "SERVICE CONNECTION EXTENDED," CLASSIFIED BY SIZE, UNDER THIS ITEM SHALL INCLUDE THE EXCAVATION, BACKFILLING, SEEDING, SODDING AND REPAVING; AND FURNISHING OF ALL LABOR, NEW MATERIALS, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THE WORK AS SPECIFIED OR AS SHOWN. THE LABOR, TOOLS, EQUIPMENT AND INCIDENTALS FURNISHED BY THE CITY OF CLEVELAND, DIVISION OF WATER WILL BE AT NO EXPENSE TO THE CONTRACTOR.

IF NEW CURB BOXES ARE REQUIRED, THEY SHALL BE FURNISHED AND PAID FOR UNDER ITEM SPECIAL - "MISCELLANEOUS METAL OR PLASTIC WORK."

ITEM SPECIAL - TEMPORARY SERVICE CONNECTION

WORK INCLUDED
 THE CITY SHALL DISCONNECT THE EXISTING SERVICE CONNECTION FROM THE WATER MAIN THAT IS TO BE TAKEN TEMPORARILY OUT OF SERVICE. A TAP IS TO BE MADE ON A TEMPORARY BYPASS OR A WATER MAIN THAT WILL REMAIN IN SERVICE, AND THE SERVICE CONNECTION SHALL BE TEMPORARILY CONNECTED. AFTER SERVICE IS RESTORED TO THE WATER MAIN, THE SERVICE CONNECTION SHALL BE RECONNECTED. THE CITY WILL FURNISH THE LABOR AND MAKE ALL CHANGES NECESSARY TO RECONNECT WITH THE EXISTING HOUSE SERVICE CONNECTION AT THE CURB COCK. THE CONTRACTOR SHALL FURNISH THE PIPING MATERIALS AND DO ALL EXCAVATION, BACKFILLING, REPAVING AND ALL OTHER WORK.

PAYMENT
 THE ACTUAL NUMBER OF EACH ITEM SPECIAL - "TEMPORARY SERVICE CONNECTION," CLASSIFIED BY PIPE SIZE SHALL BE PAID AT THE CONTRACT UNIT PRICE. THIS PRICE AND PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR PERFORMING ALL OF THE REQUIREMENTS OF THIS ITEM, INCLUDING FURNISHING ALL NECESSARY MATERIALS, LABOR, TOOLS, EQUIPMENT, SUPPLIES AND INCIDENTALS. THE LABOR, TOOLS, EQUIPMENT AND INCIDENTALS FURNISHED BY THE CITY OF CLEVELAND, DIVISION OF WATER, WILL BE AT NO EXPENSE TO THE CONTRACTOR.

ITEM SPECIAL - 2" AIR RELIEF COMPLETE

WORK INCLUDED
 THE CONTRACTOR SHALL FURNISH PIPE WITH A 2" AIR RELIEF CONNECTION AND FURNISH AND INSTALL THE 2" AIR RELIEF COMPLETE AS SHOWN IN THE "WATER WORK DETAILS" AT THE LOCATIONS SHOWN IN THE PLANS.

PAYMENT
 THE WORK INCLUDED IN THIS ITEM SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR EACH "ITEM SPECIAL - 2" AIR RELIEF COMPLETE" WHICH PRICE AND PAYMENT SHALL CONSTITUTE FULL PAYMENT FOR FURNISHING AND INSTALLING ALL MATERIALS, LABOR, EQUIPMENT, TOOLS AND APPLIANCES NECESSARY TO COMPLETE THIS ITEM. THE VALVE BOX WILL BE PAID FOR SEPARATELY UNDER THE ITEM SPECIAL - "MISCELLANEOUS METAL OR PLASTIC."

ITEM SPECIAL - ADJUST EXISTING VALVE BOX TO GRADE

WORK INCLUDED
 THE CONTRACTOR SHALL ADJUST THE EXISTING VALVE BOX TO FIT THE REVISED GRADE BY EXCAVATION AROUND THE BOX AND RAISING OR LOWERING THE EXISTING EXTENSION SECTION OR NEW EXTENSION SECTION (PAID FOR AS MISCELLANEOUS METAL OR PLASTIC) BACKFILL SHALL BE TAMPED UNDER THE ADJUSTED VALVE BOX TO ENSURE THE BOX HAS A FIRM FOOTING.

PAYMENT
 THE WORK INCLUDED IN THIS ITEM SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR EACH ITEM SPECIAL - "ADJUST EXISTING VALVE BOX TO GRADE," WHICH PRICE AND PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR ADJUSTING THE VALVE BOX, EXCAVATION, TAMPING EARTH UNDER VALVE BOX, BACKFILL, SEEDING, AND FOR ALL LABOR, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THIS ITEM.

ITEM SPECIAL - METER SETTING
ITEM SPECIAL - FIRE LINE SETTING

WORK INCLUDED
 THE CONTRACTOR SHALL FURNISH ALL THE MATERIAL AND SHALL ARRANGE FOR THE INSTALLATION BY THE CITY OF METER AND FIRE LINE SETTINGS (ASSEMBLIES) IN THE NEW VAULTS AT THE LOCATIONS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER. MATERIALS REQUIRED FOR EACH SIZE AND TYPE OF INSTALLATION HAVE BEEN TABULATED IN THESE NOTES - SEE "MATERIALS REQUIRED FOR INSTALLATION." THE NECESSARY DIMENSION AND OTHER DETAILS ARE INCLUDED IN THE DETAILED PLAN SECTION. THE CONTRACTOR SHALL PROVIDE THE NECESSARY LABOR AND EQUIPMENT FOR HANDLING THE MATERIAL AND ASSISTING THE CITY IN THE INSTALLATION.

THE CITY OF CLEVELAND, DIVISION OF WATER, WILL INSTALL ALL NECESSARY PIPE, FITTINGS, VALVES AND METERS IN THE NEW VAULTS INCLUDING THE FURNISHING OF ALL NECESSARY LABOR, TOOLS AND EQUIPMENT REQUIRED TO COMPLETE THIS ITEM OF WORK.

MEASUREMENT
 THE METER SETTING OR FIRE LINE SETTING TO BE PAID FOR SHALL BE THE ACTUAL NUMBER OF EACH UNIT LISTED AND ESTIMATED SEPARATELY, COMPLETED AND ACCEPTED.

PAYMENT
 PAYMENT FOR THIS WORK, PERFORMED JOINTLY BY THE CITY AND THE CONTRACTOR, WILL BE AT THE CONTRACT UNIT PRICE BID FOR EACH ITEM SPECIAL - "METER SETTING" AND ITEM SPECIAL - "FIRE LINE SETTING," CLASSIFIED BY PIPE SIZE, COMPLETE. THIS PRICE AND PAYMENT SHALL CONSTITUTE FULL COMPENSATION FOR PERFORMING ALL THE REQUIREMENTS OF THIS ITEM INCLUDING FURNISHING ALL NECESSARY MATERIALS (INCLUDING PIPE, VALVES AND MISCELLANEOUS METAL), LABOR, TOOLS, EQUIPMENT SUPPLIES AND INCIDENTALS. THE LABOR, TOOLS, EQUIPMENT AND INCIDENTALS FURNISHED BY THE CITY OF CLEVELAND, DIVISION OF WATER WILL BE AT NO EXPENSE TO THE CONTRACTOR.

ITEM SPECIAL - TEMPORARY BYPASS CONNECTION COMPLETE WITH PIPE AND FITTINGS

WORK INCLUDED
 THE CONTRACTOR SHALL FURNISH AND INSTALL THE TEMPORARY BYPASS CONNECTION INCLUDING PIPE AND FITTINGS AT LOCATIONS SHOWN ON THE PLANS. THE APPLICABLE ITEMS OF WORK FOR NEW WATER MAINS SHALL APPLY. ONLY NEW PIPE SHALL BE USED. WHEN TEMPORARY CONNECTIONS ARE NO LONGER REQUIRED, THE PIPE SHALL BE REMOVED AND SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

MATERIAL
 DUCTILE IRON PIPE AND FITTINGS SHALL MEET THE SPECIFICATIONS AS LISTED UNDER "ITEM SPECIAL - WATER MAINS", SHEET 111.

- PAYMENT
- (A) THE WORK INCLUDED IN THE ITEM SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR "ITEM SPECIAL - TEMPORARY BYPASS CONNECTION COMPLETE WITH PIPE AND FITTINGS," CLASSIFIED AS TO SIZE AND TYPE, WHICH PRICE SHALL CONSTITUTE FULL PAYMENT FOR FURNISHING, INSTALLING, TESTING, CUTTING INTO AND CONNECTING EXISTING PIPE, CONCRETE PIERS, BACKFILLING, REPLACING PAVEMENT, SIDEWALK AND CURB, AND THE FURNISHING OF ALL MATERIAL, LABOR, EQUIPMENT AND APPURTENANCES NECESSARY TO COMPLETE THIS WORK.
 - (B) THE CHLORINATION OF THE TEMPORARY BYPASS CONNECTION BY THE CITY OF CLEVELAND, DIVISION OF WATER, AS DESCRIBED UNDER "GENERAL - ADDITIONAL WORK - (C) CHLORINATION," SHEET 108 WILL BE AT NO EXPENSE TO THE CONTRACTOR.
 - (C) UPON COMPLETION OF WATER WORK AND THE TEMPORARY CONNECTION IS NO LONGER NEEDED, THE CONTRACTOR SHALL REMOVE THE TEMPORARY CONNECTION AND REPLACE THE DAMAGED SEEDED, SODDED OR PAVED AREAS AT NO INCREASE IN UNIT PRICE BID FOR "ITEM SPECIAL - TEMPORARY BYPASS CONNECTION COMPLETE WITH PIPE AND FITTINGS."
 - (D) SEPARATE PAYMENT "ITEM SPECIAL - PLUGGING EXISTING WATER MAINS," CLASSIFIED AS TO SIZE, SHALL APPLY FOR PLUGGING TAP ON WATER MAIN USED FOR TEMPORARY BYPASS CONNECTION.

ITEM SPECIAL - LOCK TYPE INDICATOR POST WITH INDICATOR POST TYPE GATE VALVE

WORK INCLUDED
 THE CONTRACTOR SHALL FURNISH AND INSTALL TO THE NEW GRADE AT THE LOCATION SHOWN OR AS DIRECTED BY THE ENGINEER THE NEW INDICATOR POST WITH VALVE COMPLETE INCLUDING FURNISHING ALL NECESSARY MATERIALS, PIPING, LABOR, TOOLS, EQUIPMENT, SUPPLIES, INCIDENTALS, EXCAVATION, TAMPING AND BACKFILLING AS REQUIRED FOR THE PROPER COMPLETION OF THIS ITEM OF WORK.

QUALITY OF VALVES
 THE VALVES SHALL COMPLY WITH THE REQUIREMENTS OF THE ITEM SPECIAL - "VALVES" OF THESE SPECIFICATIONS INSOFAR AS THEY APPLY.

PAYMENT
 THE WORK INCLUDED IN THIS ITEM SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR EACH "ITEM SPECIAL - LOCK TYPE INDICATOR POST WITH INDICATOR POST TYPE GATE VALVE" WHICH PRICE SHALL CONSTITUTE FULL COMPENSATION FOR FURNISHING, INSTALLING, AND CONNECTING THE INDICATOR POST WITH VALVE, EXCAVATION, TAMPING, BACKFILLING, PAVING AND FOR ALL LABOR, EQUIPMENT, MATERIAL, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THIS ITEM OF WORK.

LOW SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 CLEVELAND, OHIO

APPROVED January 13, 19 83
William J. Lawrence DESIGN REVIEW ENGINEER

Roger J. Hyde 1/16/82 WESTON DESIGNERS-CONSULTANTS

WESTON DESIGNERS-CONSULTANTS

WATERWORK

GENERAL NOTES

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| SCALE | DATE | | | | |
| DESIGNED | DRAWN | TRACES | CHECKED | REVIEWED | DATE |
| JRH | JMD | | CAP | | |

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CUY-490-1.49

OHIO
FHWA
REGION 5

118
261

16.00" O.D. x 0.50 EXTRA STRONG GALVANIZED WELDED STEEL PIPE, A.S.T.M. A-120 GRADE-B WATERMAIN ASSEMBLY COMPLETE.

PAYMENT

THE WORK INCLUDED SHALL CONSIST OF THE FURNISHING AND INSTALLING OF STEEL PIPE INCLUDING STEEL PIPE FLANGES, COUPLINGS, EXPANSION JOINT ASSEMBLIES, STEEL PIPE SUPPORT ASSEMBLIES, FASTENINGS, PIPING INSULATION, APPURTENANCES, SLEEVE PACKING THRU ABUTMENT WALLS AND ELECTROLYSIS BONDS, TEST TAPS AND TEST STATIONS.

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" DRILLING 125 POUND TEMPLATE. 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 307-63T GRADE - A, EXCEPT WHERE ONE OR BOTH FLANGES ARE CAST IRON, IN WHICH CASE BOLTS SHALL BE GRADE - B.

(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 GALVANIZED BEFORE SHIPMENT AND NOT PRIMED. GASKETS FOR FLANGED PIPE SHALL BE FULL FACED RUBBER ONE-SIXTEENTH (1/16") INCH THICK 5 X MANILA ROPE PATTERN OR OTHER APPROVED TYPE.

(B) - VICTAULIC PIPE COUPLINGS:

(1) - WHERE SHOWN ON THE DRAWINGS OR WHERE REQUIRED, THE CONTRACTOR SHALL FURNISH AND INSTALL VICTAULIC PIPE COUPLINGS STYLE-77 FOR CONNECTION OF STEEL PIPES. STEEL PIPE ENDS SHALL BE FABRICATED AND GROOVED AS INDICATED ON THE DRAWINGS. SEE DETAIL SHEET NO. 131.

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 47-61. BOLTS SHALL BE MANUFACTURED BY THE COUPLING MANUFACTURER AND SHALL BE HEAT TREATED CADMIUM PLATED 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 "PAINTING."

(3) - ALL BOLTS AND NUTS SHALL BE OF THE SAME QUALITY AS PROVIDED FOR FLANGE JOINTS.

(C) - EXPANSION JOINT ASSEMBLY

(1) - THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO THE DIRECTOR OF PUBLIC UTILITIES FOR APPROVAL OF THE EXPANSION JOINT ASSEMBLY.

(2) - THE JOINT ASSEMBLY SHALL BE "DRESSER SYLTYE 63 TYPE 1" OR "ADSCO MODEL NO. S-151-15 SLIP TYPE WITH AN 8" TRAVERSE, OR APPROVED EQUAL. THE JOINT ASSEMBLY SHALL INCLUDE ALL MATERIALS, CADMIUM PLATED BOLTS, NUTS AND WASHERS, WELDED NECK FLANGES A.S.A. 150# AND GASKETS. NO FIELD WELDING OF GALVANIZED STEEL PIPE WILL BE PERMITTED.

PIPE SUPPORT ASSEMBLIES

(1) - THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS TO THE DIRECTOR OF PUBLIC UTILITIES FOR APPROVAL OF THE PIPE SUPPORT ASSEMBLIES. THEY SHALL BE FABRICATED AS DETAILED IN THE WATER WORK DETAILS ON SHEET NO. 131.

(2) - PIPE SUPPORT ASSEMBLIES SHALL BE COMPLETE INCLUDING ALL MATERIALS, CADMIUM PLATED SHOULDER AND CLAMP BOLTS, WASHERS AND NUTS. THE SUPPORT ASSEMBLY CLAMP, SEAT PLATE AND SHIMS SHALL ALL BE HOT DIPPED GALVANIZED AFTER FABRICATION PER A.S.T.M. A-123 LATEST REVISION. NO FIELD WELDING OF GALVANIZED STEEL PIPE WILL BE PERMITTED.

(3) - AFTER FABRICATION THE ENTIRE ASSEMBLY SHALL BE HOT DIPPED GALVANIZED EXCEPT BOLTS AND SLIP PIPE.

INSULATION, APPURTENANCES AND FASTENINGS

THE CONTRACTOR SHALL FURNISH AND INSTALL INSULATION SLEEVE PACKING, APPURTENANCES AND FASTENINGS AS CALLED FOR ON THE WATERWORK DETAIL PLANS.

THE STEEL PIPE THROUGH BRIDGE LIMITS SHALL BE INSULATED WITH THREE (3") INCHES OF HEAVY DENSITY FIBER GLASS (JOHNS-MANVILLE GUSTIN-BACON OWENS-CORNING OR APPROVED EQUAL) PREFORMED PIPE INSULATION, A.S.T.M. C-547-67, OR LATEST REVISION, WITH APPROVED FACTORY APPLIED REINFORCED FIRE RESISTANT PROTECTIVE VAPOR BARRIER JACKET OF LAMINATED KRAFT AND CORROSION RESISTANT METALLIC FOIL AND 0.010" MINIMUM STAINLESS STEEL WEATHER-PROOF JACKET. STAINLESS STEEL STRAPS ONE-HALF (1/2") INCH MINIMUM WIDTH WITH STAINLESS STEEL CLAMPS SHALL BE PLACED A MINIMUM OF TWO (2) PER SECTION OF PREFORMED INSULATION.

THE VOID BETWEEN THE PIPE SLEEVE AND THE WATERMAIN THROUGH THE BRIDGE ABUTMENTS SHALL BE FILLED WITH JUTE PACKING AND SEALED AT BOTH ENDS WITH THREE (3") INCHES OF HOT Poured LEAD.

**MATERIALS REQUIRED FOR INSTALLATION
(ALL MATERIALS SHALL BE NEW AND UNUSED)**

3/4" GENERAL SUPPLY WATER SERVICE CONNECTION

ON CAST IRON PIPE

| | | |
|----|------|-----------------------------------|
| 1 | 3/4" | CORPORATION COCK - COPPER TO IRON |
| 1 | 3/4" | CURB COCK - COPPER TO IRON |
| 1 | | CURB COCK BOX BOTTOM |
| 1 | | CURB COCK BOX TOP |
| 1 | | COPPER TUBING |
| OR | | |
| 1 | 3/4" | COMPRESSION CORPORATION STOP |
| 1 | 3/4" | ORISEAL COMPRESSION VALVE |
| 1 | | ORISEAL BOX |
| 1 | | ORISEAL BOX FOOTPIECE |
| 1 | | COPPER TUBING |

ON CONCRETE PIPE

THE SAME MATERIALS AS SPECIFIED ABOVE ARE USED FOR CONNECTION INSTALLATIONS (3/4") ON A CONCRETE PIPE.

THE ONLY ADDITIONAL MATERIAL REQUIRED IS ONE TAPPING SADDLE FOR CONCRETE PIPE.

ABOUT METERING 3/4" AND 1" WATER CONNECTIONS

IN MOST CASES 3/4" AND 1" WATER CONNECTIONS SERVE AS DOMESTIC SERVICE TO RESIDENTIAL PROPERTIES. STANDARDLY, METERS FOR THESE SIZE CONNECTIONS ARE INSTALLED INDOORS WITH A READOMATIC REGISTER ATTACHED TO THE OUTSIDE OF THE BUILDING. INSTALLATION DIAGRAM "A" SHOWS STANDARD APPROVED INSIDE SETTING. WHERE METER VAULTS ARE REQUIRED, 3/4" AND 1" METERS ARE INSTALLED ON RISERS.

6" FIRE LINE SETTING

| | | |
|----|---------------|--|
| 1 | 6" | O.S.V. VALVE - FLANGED |
| 1 | 6" | FLANGED DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY COMPLETE |
| 2 | 6" | RING GASKETS |
| 2 | 1/2" x 4" | BRASS NIPPLES |
| 2 | 1/2" | CURB COCKS, IRON TO IRON |
| 12 | 3/4" x 3" | MACHINE BOLTS |
| 4 | 3/4" x 3-1/2" | STUD BOLTS |
| 8 | 3/4" | HEX NUTS |

NOTE:

THE CONTRACTOR SHALL PREPARE A BILL OF MATERIAL OF ALL SERVICE CONNECTIONS BY SIZE AND TYPE AND SUBMIT SAME TO THE CITY OF CLEVELAND, DIVISION OF WATER AND HEAT, FOR THEIR APPROVAL.

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO

APPROVED *JANUARY 13, 1983*
DESIGN REVIEW ENGINEER
William Henry

Roger J. Hyde 7/1982 WESTON
DESIGNERS-CONSULTANTS

**WESTON
DESIGNERS-CONSULTANTS**

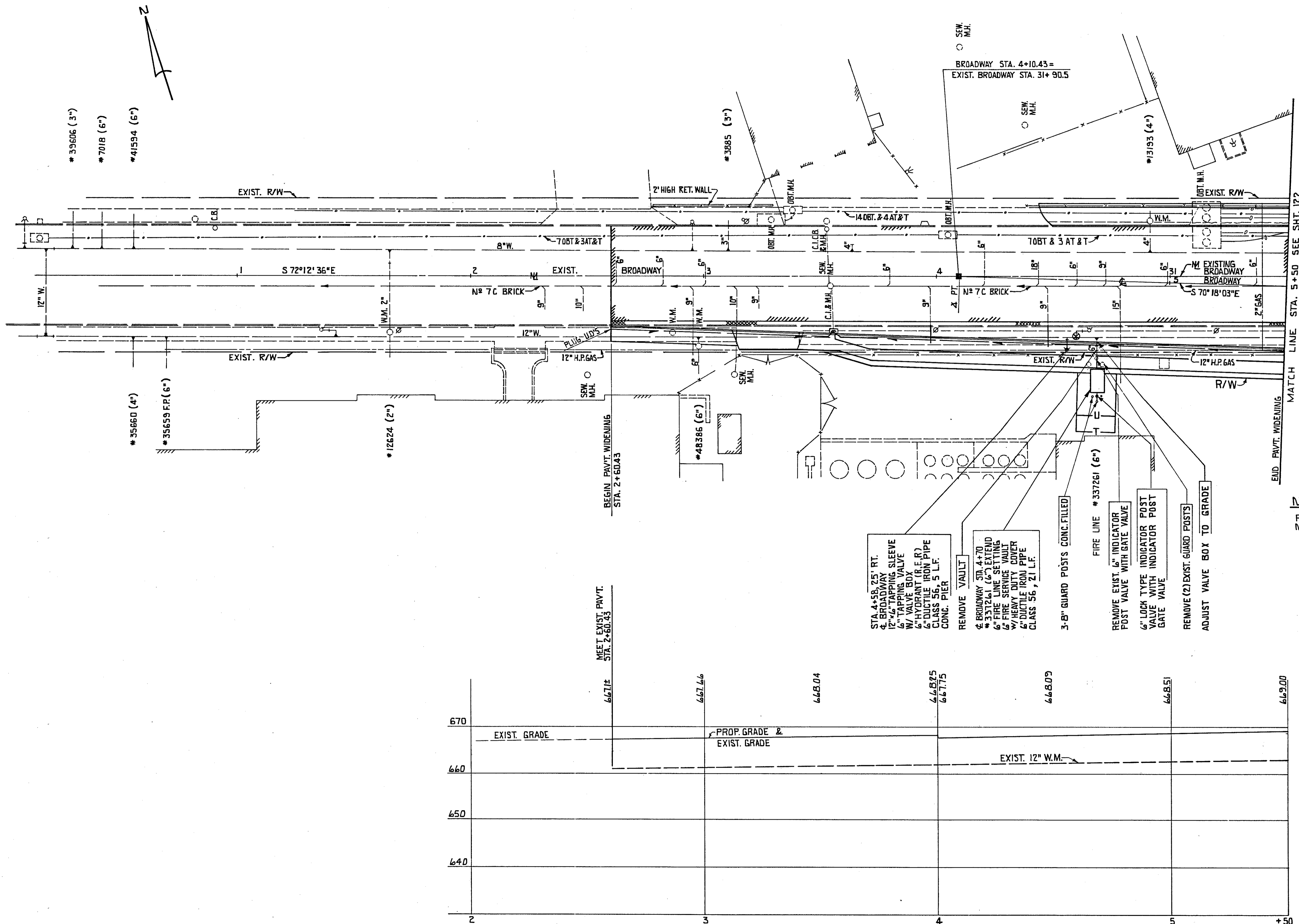
**WATERWORK
GENERAL NOTES**

| | |
|--|----------------|
| SCALE | DATE |
| DESIGNED DRAWN TRACED CHECKED REVIEWED | DATE REVISED |
| JRH JMD CAP | |

| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 5 | OHIO | |

121
261

CUYAHOGA COUNTY
CUY 490-1.49



LEGEND
 ⊗ PLUG AT MAIN
 (R.E.R.) = REMOVED, EXTENDED, AND RESET

NOTE
 FOR ADDITIONAL UNDERGROUND UTILITIES NOT SHOWN ON THIS PLAN SEE SHEETS 42 & 150.

- STA. 4+58.25' RT. 4\"/>

| | | | |
|-----|--------------|----------------------------|---------------|
| 670 | EXIST. GRADE | PROP. GRADE & EXIST. GRADE | EXIST. 12\"/> |
| 660 | | | |
| 650 | | | |
| 640 | | | |
| 2 | | | +50 |

LOW SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 CLEVELAND, OHIO

APPROVED JANUARY 13, 1983
William J. Lundy DESIGN REVIEW ENGINEER

Roger J. Hyde 7/10/82 WESTON DESIGNERS-CONSULTANTS

| | | | |
|-------------------------------------|-------|----------|----------|
| NO. | DATE | BY | REVISION |
| WESTON DESIGNERS-CONSULTANTS | | | |
| WATERWORK PLAN | | | |
| BROADWAY | | | |
| STA. 1+00 TO STA. 5+50 | | | |
| SCALE 1"=20' HORIZ. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| JRH | CAP | JRH | |
| | | REVIEWED | |
| | | DATE | |

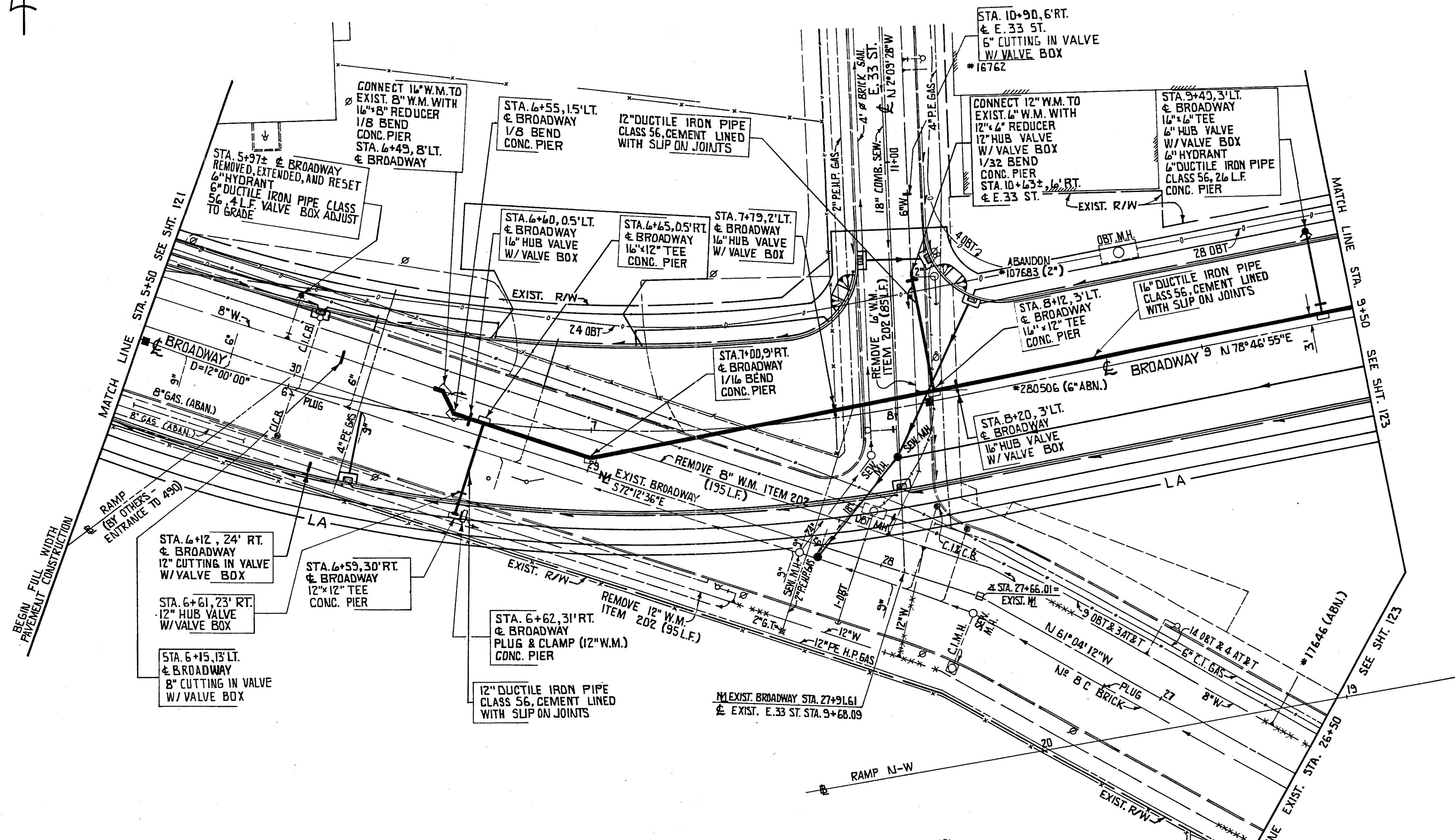
CONT. No. SHEET ACCT. No.



| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 5 | OHIO | |



CUYAHOGA COUNTY
CUY 490-1.49



NOTE
FOR ADDITIONAL UNDERGROUND UTILITIES NOT SHOWN SEE SHEETS 43, 150, 178 & 198.

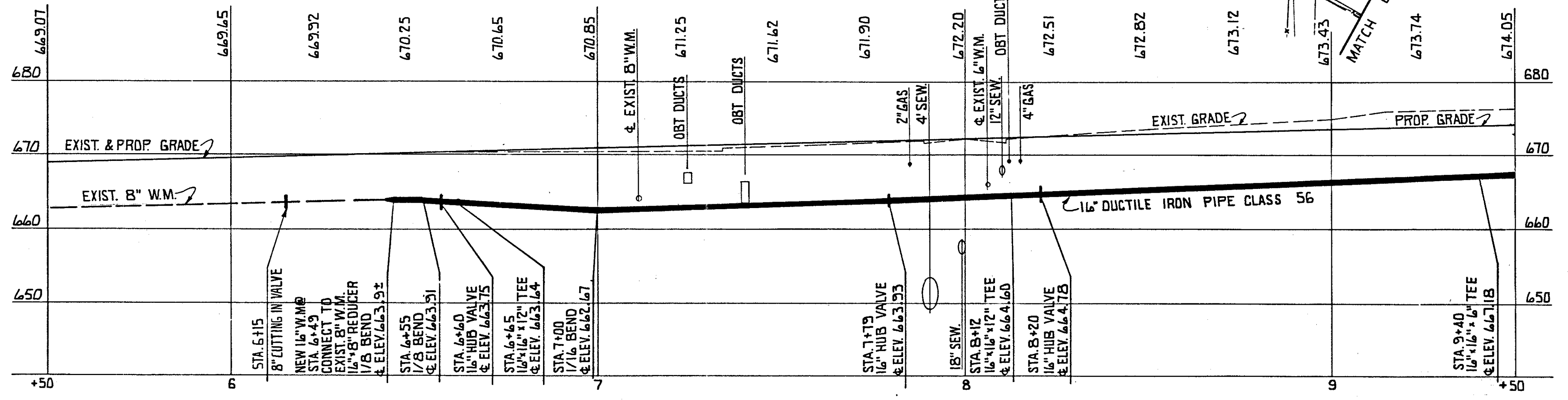
NOTE "A"
IN THE AREA OF VALVES & FITTINGS, PIPE JOINTS AND CONNECTIONS SHALL BE TIED FOR A MINIMUM DISTANCE OF 18" FEET ON EACH SIDE, USING BOLTLESS RESTRAINED JOINTS.

LEGEND
 - - - - - = ABANDON WATER MAIN
 ABN = ABANDON
 = EXISTING CURB COCK
 = SERVICE CONNECTION EXTENDED
 = NEW CURB COCK

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO

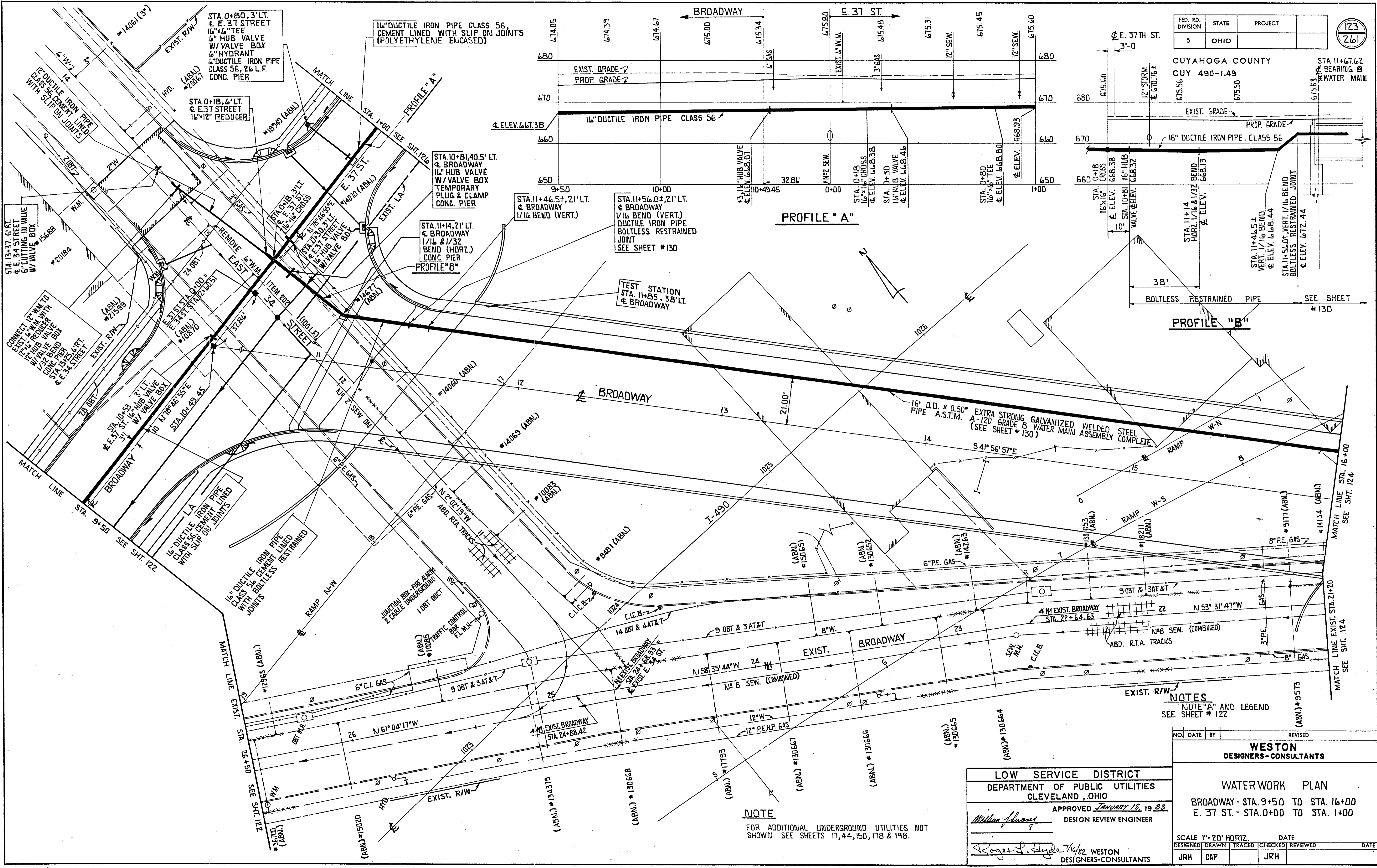
APPROVED JANUARY 13, 1983
William J. Swamy DESIGN REVIEW ENGINEER

Roger J. Hyde 7/10/82 WESTON
 DESIGNERS-CONSULTANTS



| | | | |
|--|-------|--------|----------|
| NO. | DATE | BY | REVISION |
| WESTON DESIGNERS-CONSULTANTS | | | |
| WATERWORK PLAN BROADWAY STA. 5+50 TO STA. 9+50 | | | |
| SCALE 1"=20' HORIZ. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| JRH | CAP | JRH | |
| DATE | | DATE | |

CONT. No. SHEET ACCT. No.



NOTES
NOTE "A" AND LEGEND
SEE SHEET # 122

| NO. | DATE | BY | REVISED |
|--|-------|--------|---------|
| WESTON DESIGNERS-CONSULTANTS | | | |
| WATERWORK PLAN | | | |
| BROADWAY - STA. 9+50 TO STA. 16+00 E. 37 ST. - STA. 0+00 TO STA. 1+00 | | | |
| SCALE 1" = 20' HORIZ. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| JRH | CAP | JRH | JRH |

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO

APPROVED JANUARY 13, 1983
DESIGN REVIEW ENGINEER

William Swaney
Roger J. Hyde 7/16/82 WESTON DESIGNERS-CONSULTANTS

NOTE
FOR ADDITIONAL UNDERGROUND UTILITIES NOT SHOWN SEE SHEETS 17, 44, 150, 178 & 198.

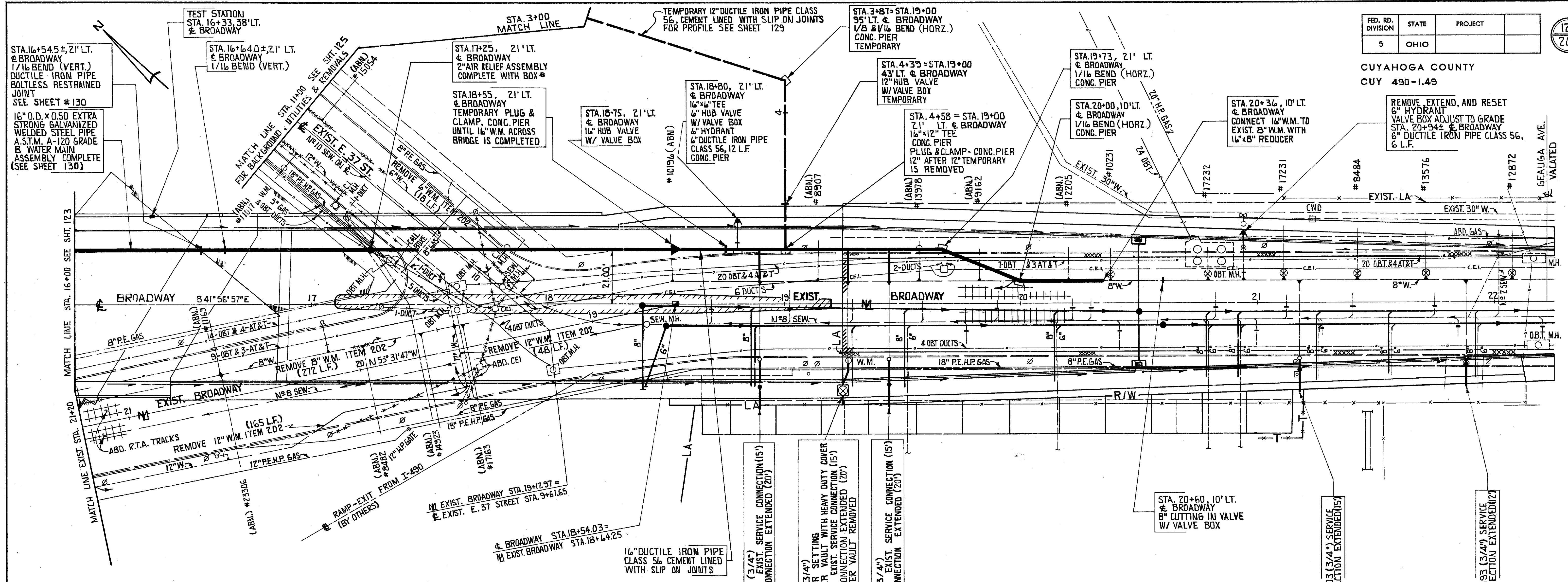
SHEET ACCT. NO. _____
CONT. NO. _____

| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 5 | OHIO | |

124
761

CUYAHOGA COUNTY
CUY 490-1.49

REMOVE, EXTEND, AND RESET
6" HYDRANT VALVE BOX ADJUST TO GRADE
STA. 20+94 ± & BROADWAY
6" DUCTILE IRON PIPE CLASS 56,
6 L.F.



- # 10900 (3/4") SERVICE CONNECTION (15') RECONNECT EXIST. SERVICE CONNECTION EXTENDED (20')
- # 15932 (3/4") 3/4" METER SETTING 3/4" METER VAULT WITH HEAVY DUTY COVER RECONNECT EXIST SERVICE CONNECTION (15') SERVICE CONNECTION EXTENDED (20') EXIST. METER VAULT REMOVED
- # 41207 (3/4") SERVICE CONNECTION (15') RECONNECT EXIST. SERVICE CONNECTION EXTENDED (20')
- # 9403 (3/4") SERVICE CONNECTION EXTENDED (15')
- # 16093 (3/4") SERVICE CONNECTION EXTENDED (20')

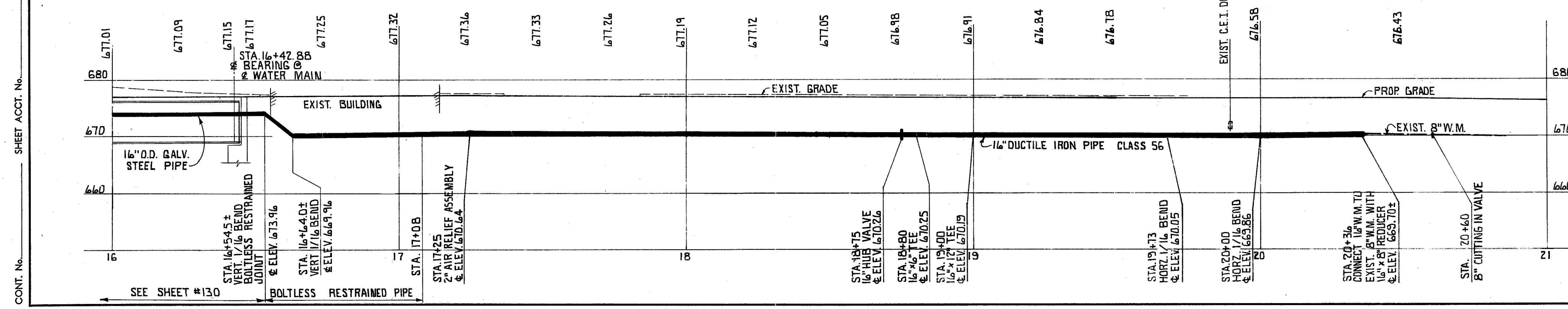
NOTES:

1. THE FOLLOWING CONNECTIONS WERE SHUT OFF AT CURB WITH PREVIOUS CONTRACT (CUY-254-18.56) 15054, 8907, 13978, 9162, 12205, 10231, 17232, 17231, 8484, 13576, 12872 & 10196
2. NOTE "A" AND LEGEND SEE SHEET 122.
3. ⊗ PLUG AT MAIN
4. FOR ADDITIONAL UNDERGROUND UTILITIES NOT SHOWN SEE SHEETS 47, 150, 178 & 198.

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO

APPROVED JANUARY 13, 1983
William J. Swartz DESIGN REVIEW ENGINEER

Roger J. Hyde, Jr. WESTON DESIGNERS-CONSULTANTS



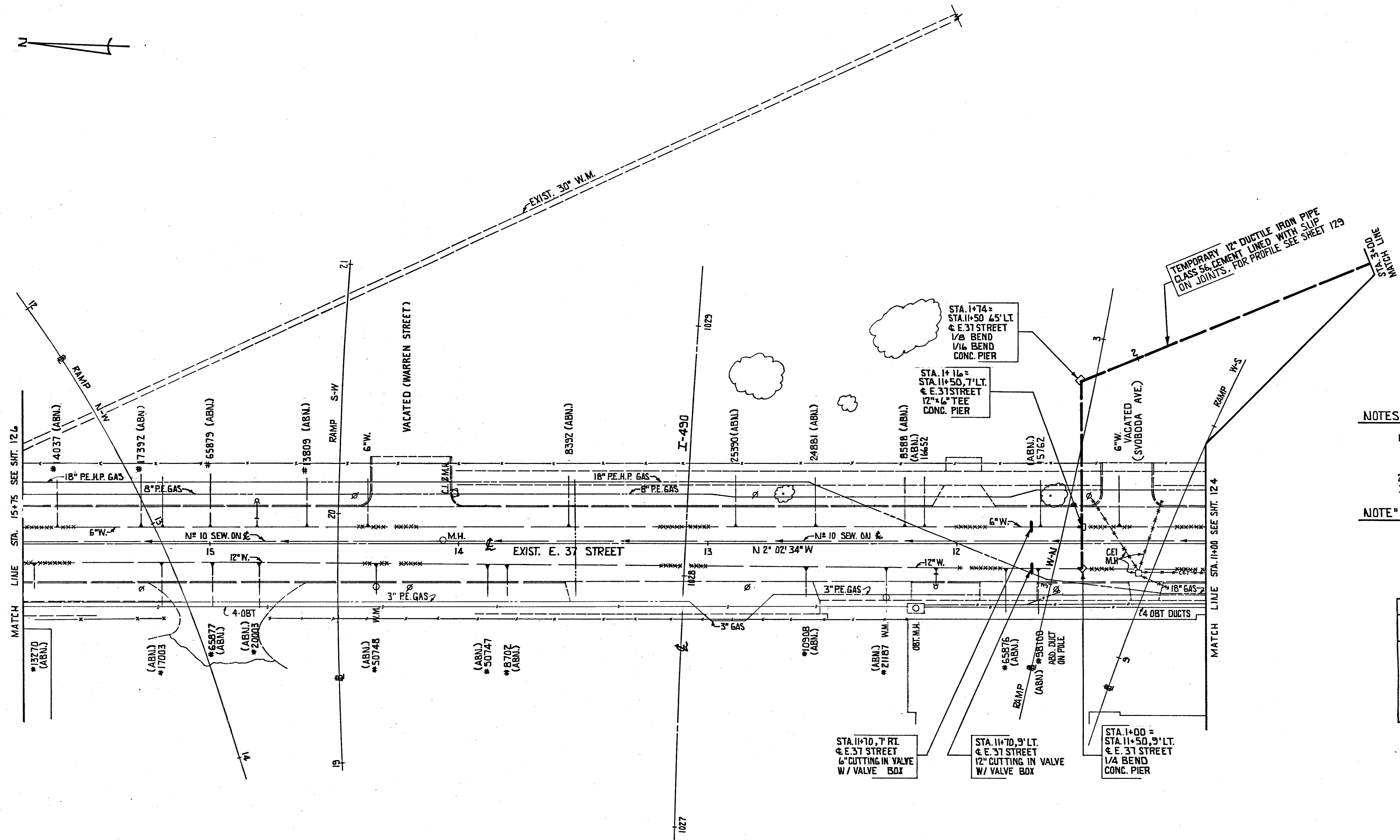
| | | | |
|-------------------------------------|-------|--------|---------|
| NO. | DATE | BY | REVISED |
| WESTON DESIGNERS-CONSULTANTS | | | |
| WATERWORK PLAN | | | |
| BROADWAY | | | |
| STA. 16+00 TO STA. 21+00 | | | |
| SCALE 1"=20' HORIZ. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| JRH | CAP | JRH | |

CONT. No. SHEET ACCT. No.

| | | | |
|-------------------|-------|---------|--|
| FED. RD. DIVISION | STATE | PROJECT | |
| 5 | OHIO | | |

125
261

CUYAHOGA COUNTY
CUY 490-1.49



NOTES:

1. THE FOLLOWING CONNECTIONS WERE SHUT OFF AT CURB WITH PREVIOUS CONTRACT (CUY-254-18.56) 14037, 17392, 65879, 13809, 8392, 25390, 24881, 8588, 16652 & 15762
2. NOTE "A" AND LEGEND SEE SHEET 122
3. FOR ADDITIONAL UNDERGROUND UTILITIES NOT SHOWN SEE SHEETS 17, 23, 24, 53, 150 & 198.

NOTE "B"

EXISTING 12" W.M. AND 6" W.M. TO 12" TEMPORARY W.M. TO STAY IN SERVICE UNTIL 16" W.M. ACROSS BRIDGE IS COMPLETED.

| | |
|---|--|
| LOW SERVICE DISTRICT | |
| DEPARTMENT OF PUBLIC UTILITIES CLEVELAND, OHIO | |
| <i>William J. Young</i> | APPROVED <u>January 13, 1983</u> DESIGN REVIEW ENGINEER |
| <i>Roger J. Doyle</i> | WESTON DESIGNERS-CONSULTANTS |

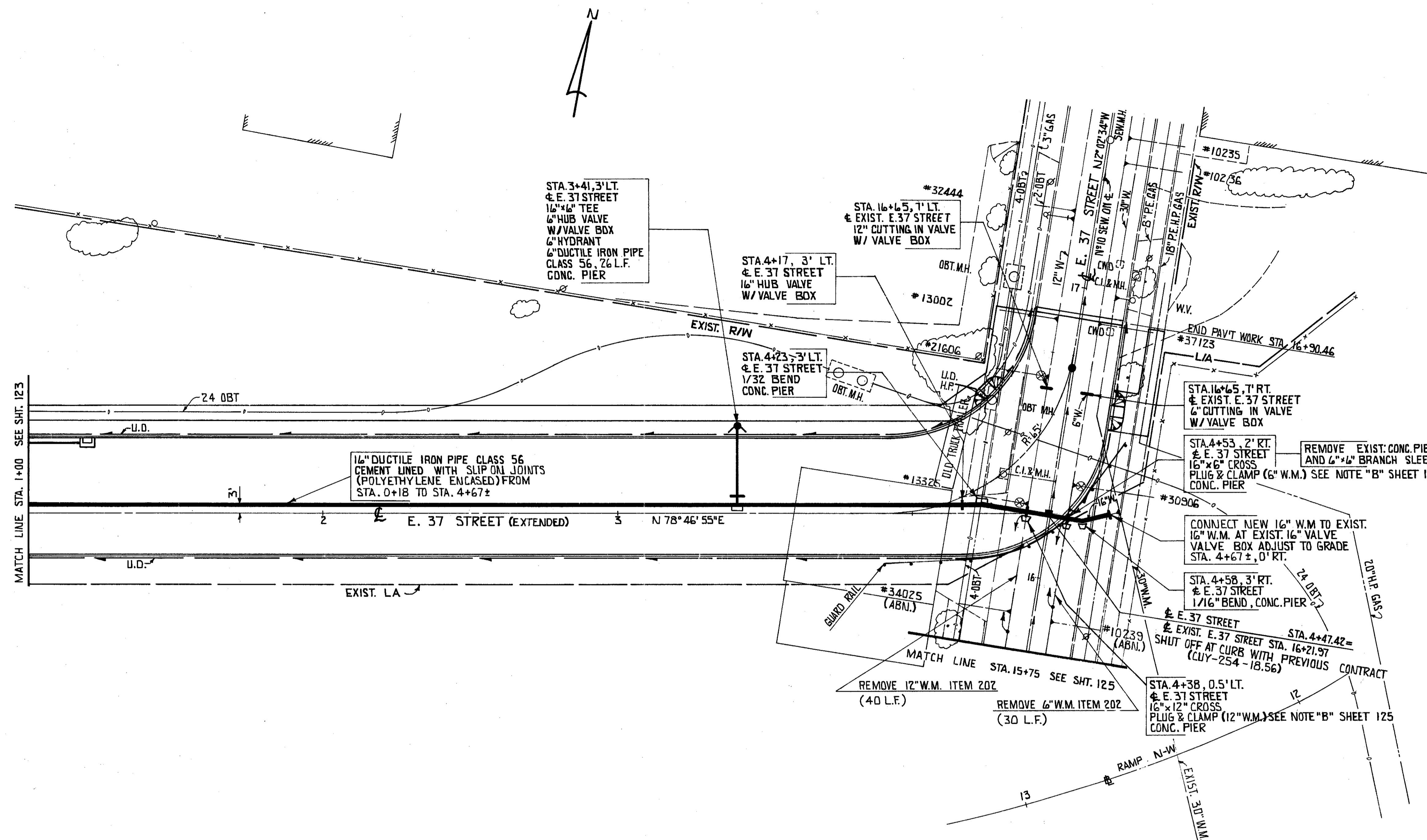
| | | | |
|--|-------|---------|----------|
| NO. | DATE | BY | REVISED |
| WESTON DESIGNERS-CONSULTANTS | | | |
| WATERWORK PLAN | | | |
| EXIST. E. 37 ST. | | | |
| STA. 11+00 TO STA. 15+75 | | | |
| SCALE 1" = 20' HORIZ. | | DATE | |
| DESIGNED | DRAWN | CHECKED | REVIEWED |
| JRH | CAP | JRH | |

CONT. No. SHEET ACCT. No.

| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 5 | OHIO | |

126
261

CUYAHOGA COUNTY
CUY 490-1.49

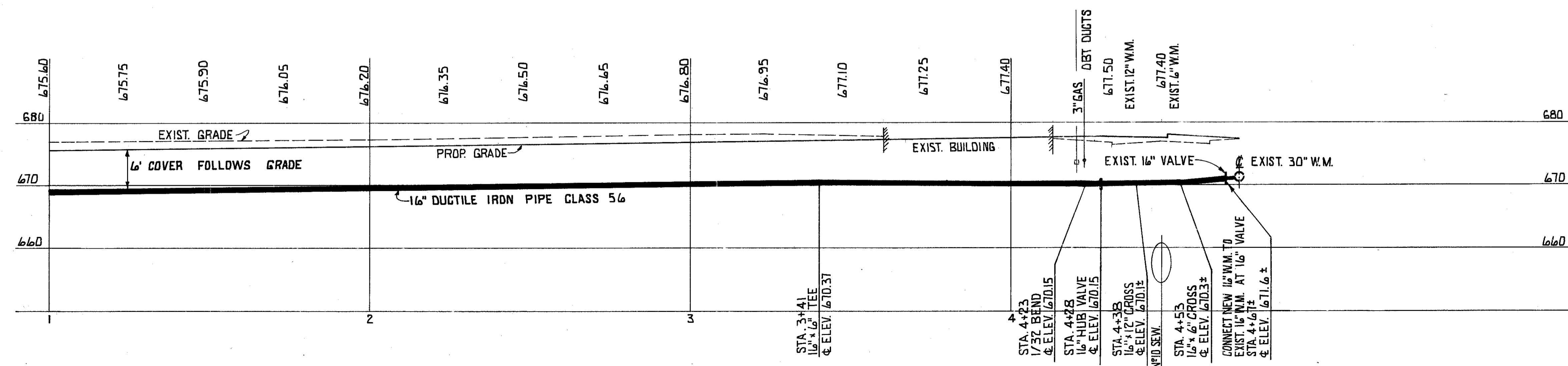


⊗ --- PLUG SERVICE CONN. AT MAIN

NOTE:

- NOTE "A" AND LEGEND SEE SHEET 122
- FOR ADDITIONAL UNDERGROUND UTILITIES NOT SHOWN SEE SHEETS 24, 52, 150 & 198.

| | |
|---|------------------------|
| LOW SERVICE DISTRICT | |
| DEPARTMENT OF PUBLIC UTILITIES CLEVELAND, OHIO | |
| APPROVED <i>January 13, 1983</i> | DESIGN REVIEW ENGINEER |
| <i>William J. Leveney</i> | |
| DESIGNERS-CONSULTANTS | |



| | | | |
|--|-------|--------|----------|
| NO. | DATE | BY | REVISION |
| WESTON DESIGNERS-CONSULTANTS | | | |
| WATERWORK PLAN E. 37 ST. STA. 1+00 TO STA. 4+50 EXIST. E. 37 ST. STA. 15+75 TO STA. 17+50 | | | |
| SCALE 1"=20' HORIZ. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| JRH | CAP | JRH | |

SHEET ACCT. No. CONT. No.

| | | | |
|-------------------|-------|---------|--|
| FED. RD. DIVISION | STATE | PROJECT | |
| 5 | OHIO | | |

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261

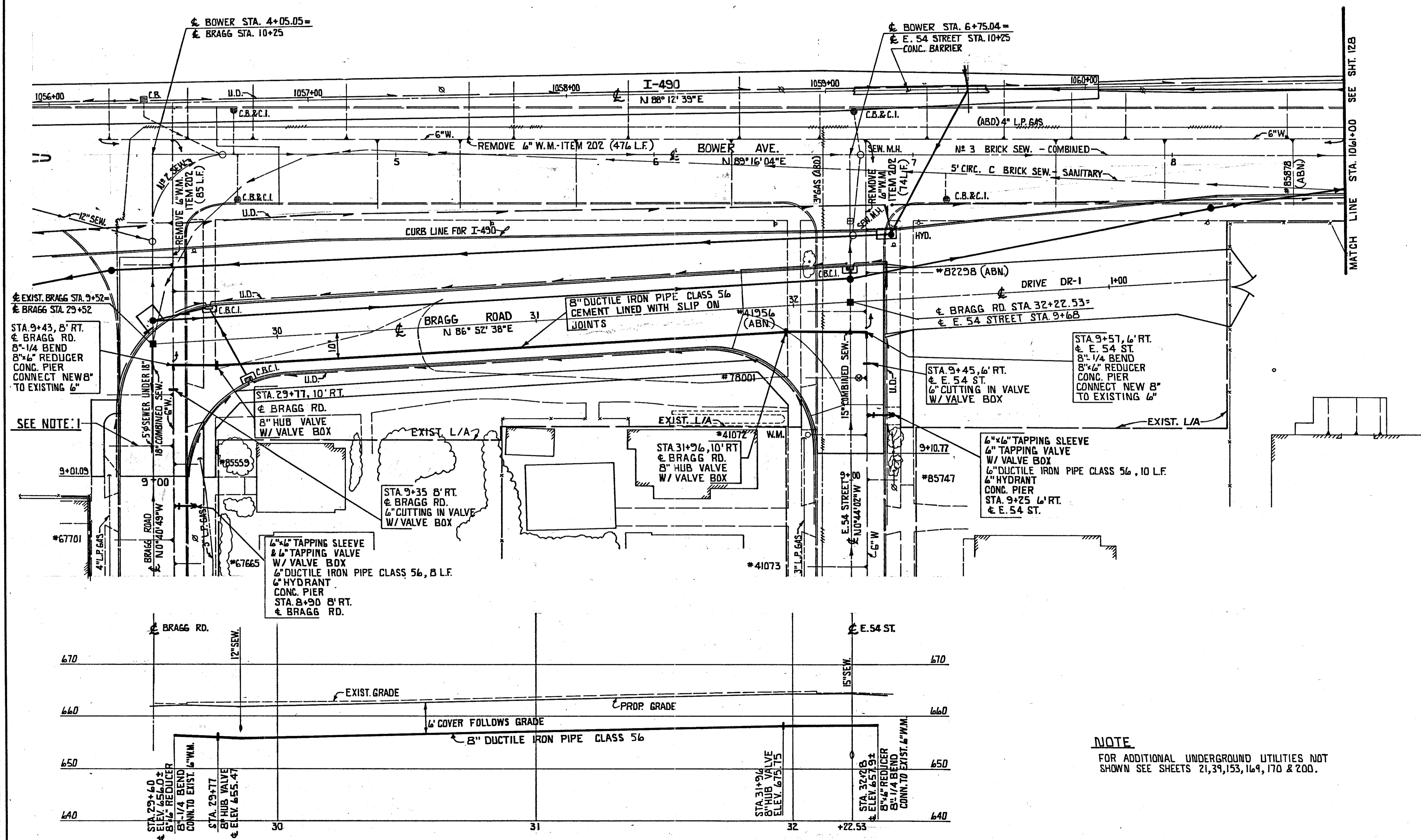
CUYAHOGA COUNTY
CUY 490-1.49



⊗ --- PLUG SERVICE CONN. AT MAIN

NOTE:
NOTE "A" AND LEGEND SEE SHEET 122

NOTE 1:
ALL SERVICE CONNECTIONS SHOWN WITHOUT AN IDENTIFYING NUMBER WERE PLUGGED AT MAIN UNDER PREVIOUS CONTRACT CUY-254-18.86



LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO

APPROVED January 13, 1983
William J. Hursey DESIGN REVIEW ENGINEER

Roger J. Hyde 7/10/82 WESTON
DESIGNERS-CONSULTANTS

| | | | |
|---|-------|----------|----------|
| NO. | DATE | BY | REVISION |
| WESTON DESIGNERS-CONSULTANTS | | | |
| WATERWORK PLAN BRAGG RD., E. 54 ST. & BOWER AVE. | | | |
| SCALE 1"=20' HORIZ. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| JRH | CAP | JRH | |
| | | REVIEWED | DATE |

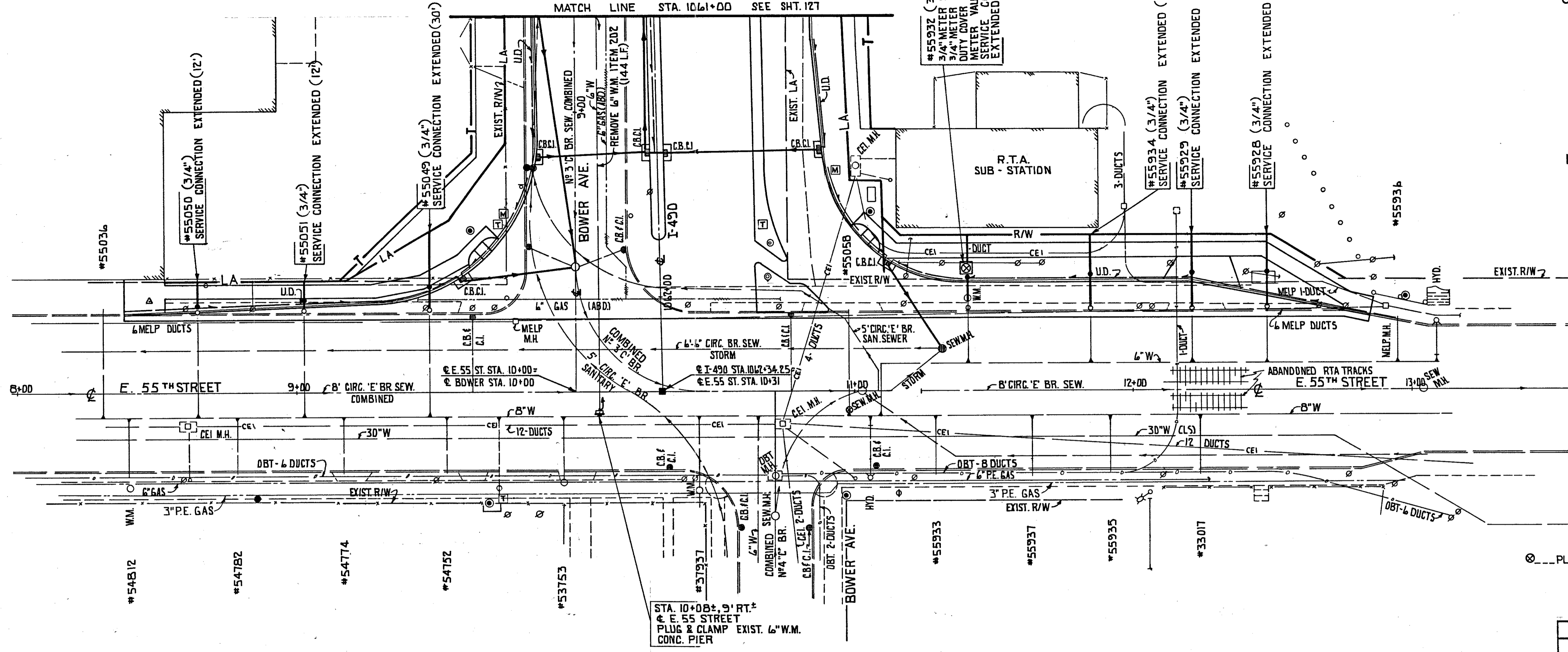
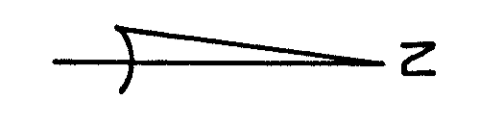
NOTE
FOR ADDITIONAL UNDERGROUND UTILITIES NOT SHOWN SEE SHEETS 21, 31, 153, 164, 170 & 200.

CONT. No. SHEET ACCT. No.

| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 5 | OHIO | |

128
261

CUYAHOGA COUNTY
CUY-490-1.49



- NOTES:
- NOTE "A" AND LEGEND SEE SHEET 122
 - FOR ADDITIONAL UNDERGROUND UTILITIES NOT SHOWN SEE SHEETS 21, 31, 153, 169, 170 & 201.

⊗...PLUG SERVICE CONN. AT MAIN

STA. 10+08±, 9' RT.±
E. 55 STREET
PLUG & CLAMP EXIST. 6" W.M.
CONC. PIER

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO

APPROVED January 13, 1983
William J. Luency DESIGN REVIEW ENGINEER

Roger L. Hyde 7/16/82 WESTON
DESIGNERS-CONSULTANTS

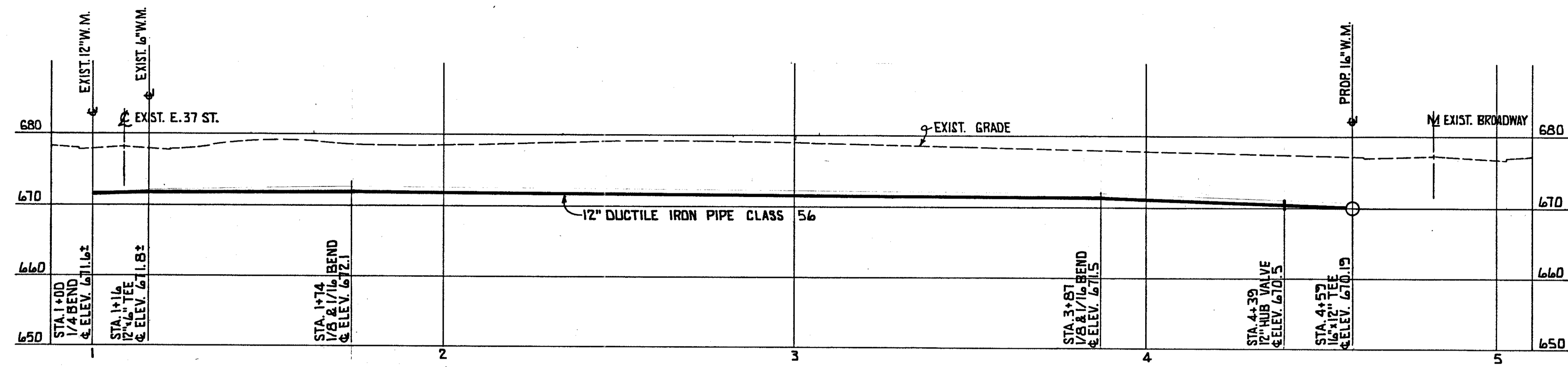
| | | | |
|--|-------|--------|---------|
| NO. | DATE | BY | REVISED |
| WESTON DESIGNERS-CONSULTANTS | | | |
| WATERWORK PLAN E. 55 ST. STA. 8+00 TO STA. 13+50 | | | |
| SCALE 1"=20' HORIZ. | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| REVIEWED | DATE | | |
| JRH | CAP | JRH | |

CONT. No. SHEET ACCT. No.

| | | | |
|-------------------|-------|---------|--|
| FED. RD. DIVISION | STATE | PROJECT | |
| 5 | OHIO | | |

129
261

CUYAHOGA COUNTY
CUY 490-1.49



PROFILE FOR TEMPORARY 12" WATER CONNECTING
EXIST. E. 37 ST. AND EXIST. BROADWAY. FOR PLAN
SEE SHEETS 124 & 125

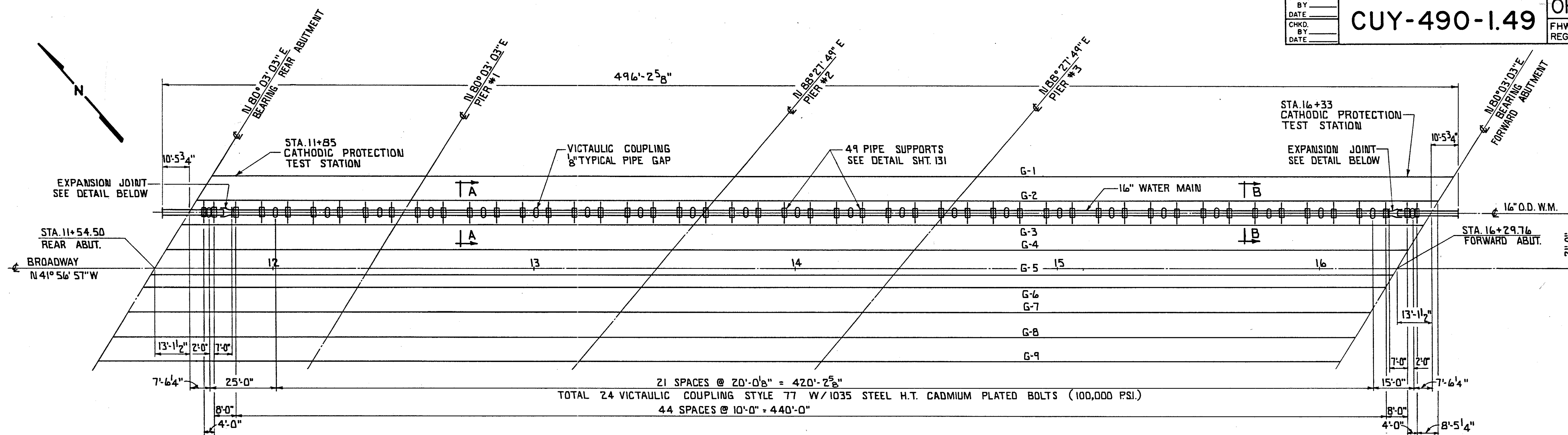
LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO

APPROVED January 13, 1983
William J. Lusney DESIGN REVIEW ENGINEER

Roger L. Hyde 7/16/82 WESTON
DESIGNERS-CONSULTANTS

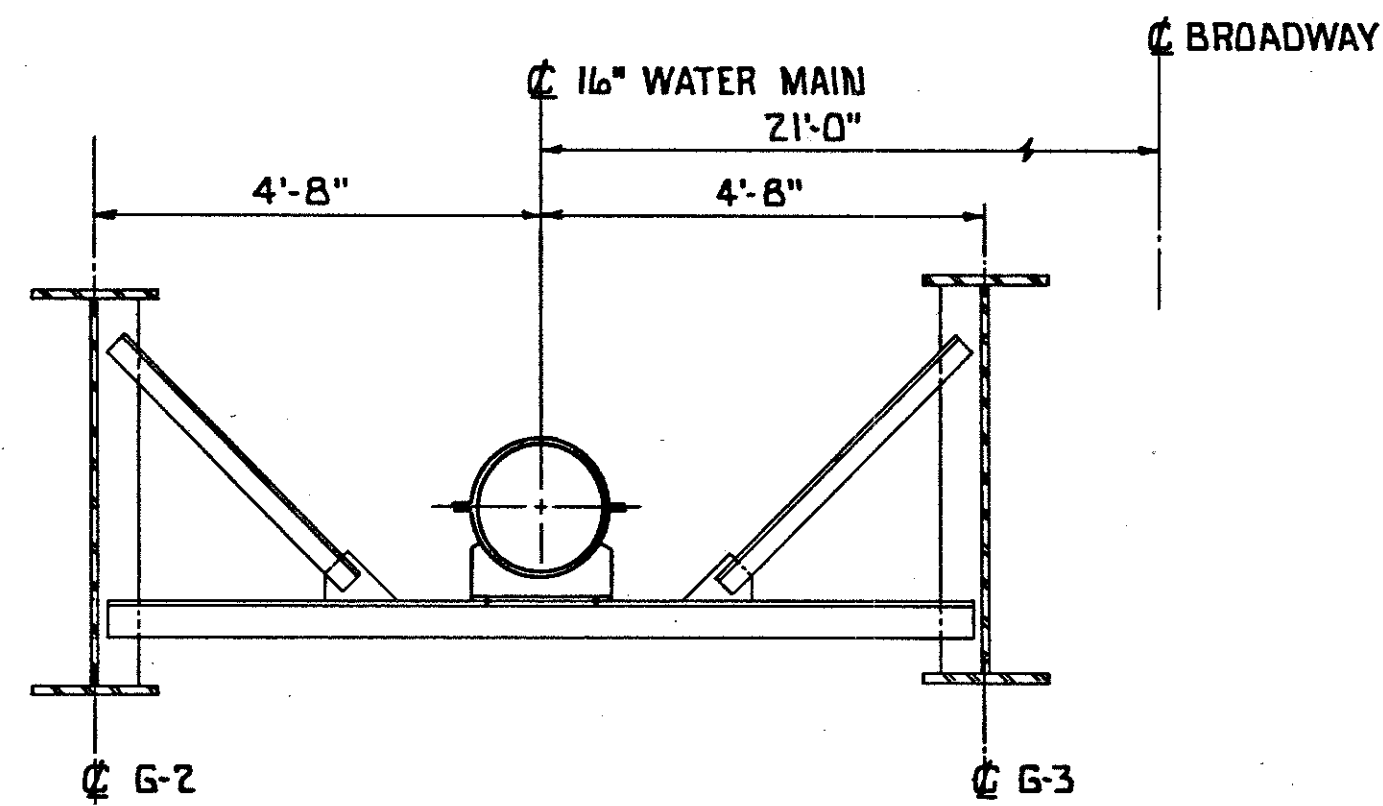
| | | | |
|--|-------|--------|---------|
| NO. | DATE | BY | REVISED |
| WESTON DESIGNERS-CONSULTANTS | | | |
| WATERWORK 12" TEMPORARY WATER MAIN PROFILE | | | |
| SCALE | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| JRH | CAP | | JRH |
| REVIEWED | | DATE | |

CONT. No. SHEET ACCT. No.

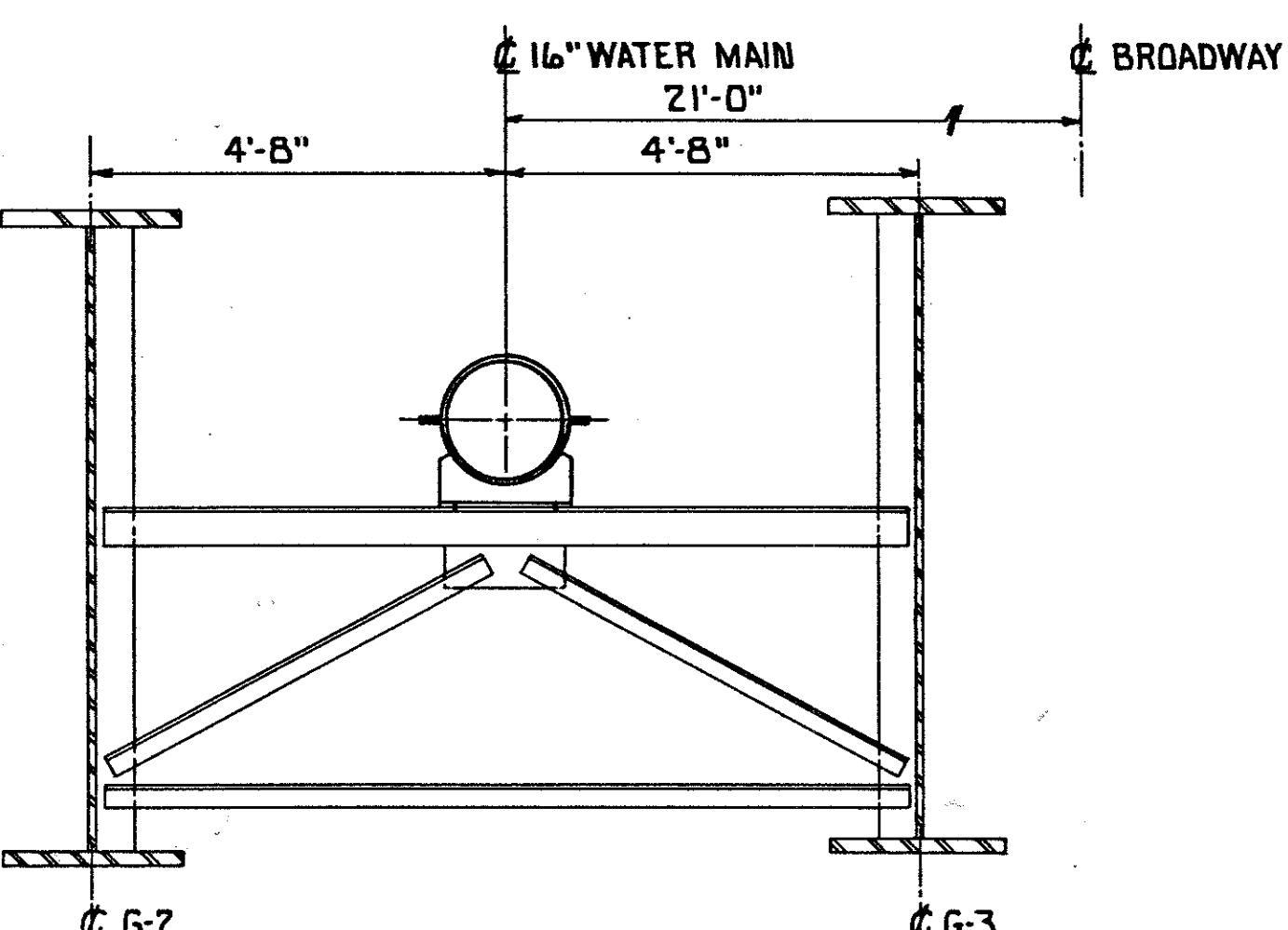


21 SPACES @ 20'-0" = 420'-2 5/8"
 TOTAL 24 VICTAULIC COUPLING STYLE 77 W/1035 STEEL H.T. CADMIUM PLATED BOLTS (100,000 PSI.)
 44 SPACES @ 10'-0" = 440'-0"

PLAN

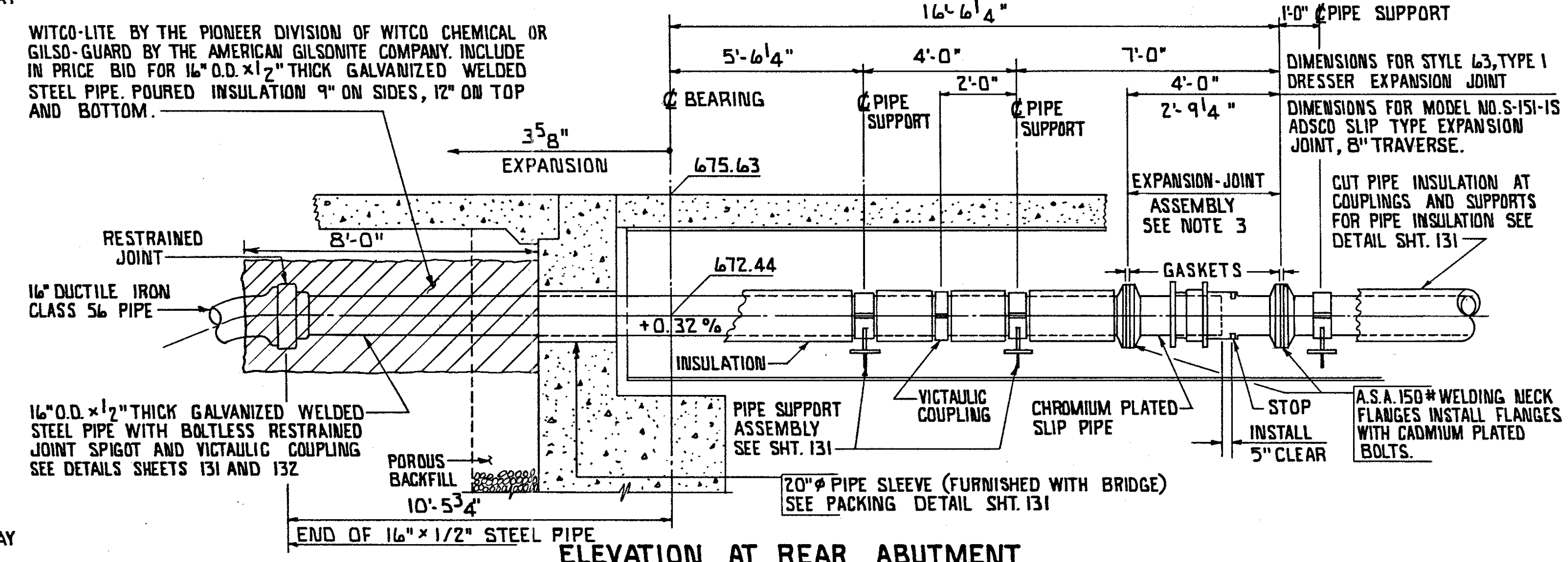


SECTION A-A
 TYPICAL FOR 48" GIRDER

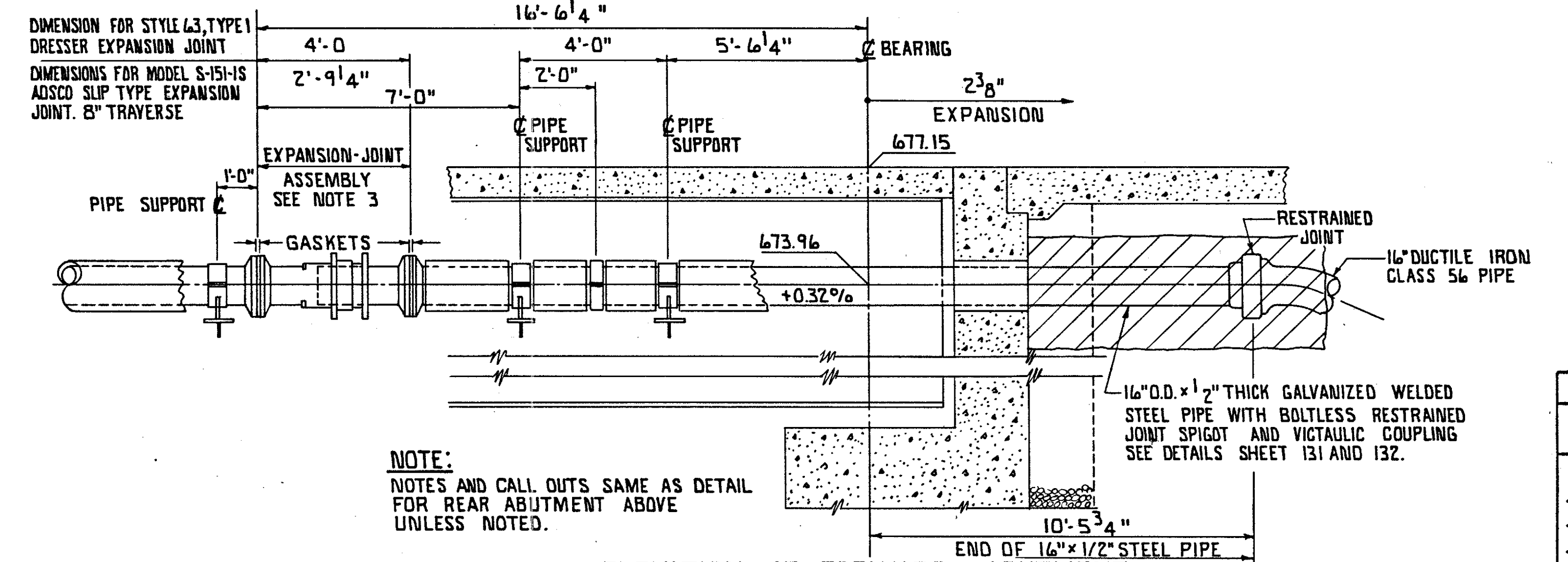


SECTION B-B
 TYPICAL FOR 84" GIRDER

WITCO-LITE BY THE PIONEER DIVISION OF WITCO CHEMICAL OR GILSO-GUARD BY THE AMERICAN GILSONITE COMPANY. INCLUDE IN PRICE BID FOR 16" O.D. x 1/2" THICK GALVANIZED WELDED STEEL PIPE. POURED INSULATION 9" ON SIDES, 12" ON TOP AND BOTTOM.



ELEVATION AT REAR ABUTMENT

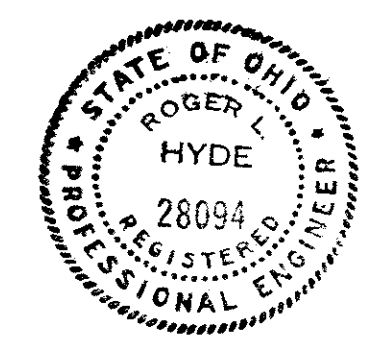


ELEVATION AT FORWARD ABUTMENT

NOTE:
 NOTES AND CALL OUTS SAME AS DETAIL FOR REAR ABUTMENT ABOVE UNLESS NOTED.

NOTES

1. THE CONTRACTOR SHALL FURNISH ALL SHOP DRAWINGS, WORKING DRAWINGS, INSTALLATION DRAWINGS AND INSTALLATION SCHEDULE TO THE DIRECTOR OF PUBLIC UTILITIES, CITY OF CLEVELAND FOR APPROVAL.
2. NO FIELD WELDING OR CUTTING OF GALVANIZED STEEL PIPE WILL BE PERMITTED. CARE SHALL BE EXERCISED IN HANDLING GALVANIZED PIPE, SMALL SCRATCHES IN GALVANIZED SURFACE SHALL BE COATED WITH ASPHALT VARNISH PRIOR TO INSTALLATION OF INSULATION, EXTENSIVE COATING DAMAGE SHALL BE CAUSE FOR REJECTING PIPE.
 EXPANSION JOINT ASSEMBLY, TWO REQUIRED, SHALL BE SLIP TYPE I DRESSER STYLE 63, OR ADSCO MODEL NO. S-15-15 (8" TRAVERSE) AS SHOWN ON THIS DRAWING OR APPROVED EQUAL. THE MATERIAL USED AND THE FINAL ASSEMBLY SHALL BE FOR WATER MAIN SERVICE (50 P.S.I. WORKING PRESSURE) AND EQUIVALENT TO 1/2" WALL X 16" O.D. PIPE MANUFACTURED IN ACCORDANCE WITH ASTM A-120 AND SHALL INCLUDE THE FOLLOWING:
 SLIP PIPE, CHROMIUM PLATED FLANGES, A.S.A. 150# WELDING NECK, UNLESS CAST INTEGRALLY WITH JOINT BODY. BOLTS, NUTS, WASHERS, ETC., ALL CADMIUM PLATED. PACKING AS RECOMMENDED BY MANUFACTURER.
 AFTER FABRICATION THE ENTIRE ASSEMBLY SHALL BE HOT DIPPED GALVANIZED EXCEPT BOLTS AND SLIP PIPE.
3. FABRICATION AND INSTALLATION PRINTS SHALL BE FURNISHED TO THE DIRECTOR OF PUBLIC UTILITIES, CITY OF CLEVELAND FOR APPROVAL. DRAWING REQUIREMENTS SHALL BE THE SAME AS REQUIRED FOR VALVES ON SHEET 112.
4. FILL SHALL BE THOROUGHLY COMPACTED IN VICINITY OF PIPE.
5. FOR ELECTRIC BONDING OF PIPE JOINTS AND CATHODIC PROTECTION TEST STATION, SEE SHEET 132.
6. FOR STRUCTURAL DETAILS, SEE SHEETS 229 TO 253.



LOW SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 CLEVELAND, OHIO

APPROVED JANUARY 13, 1953
William J. Lucey
 DESIGN REVIEW ENGINEER

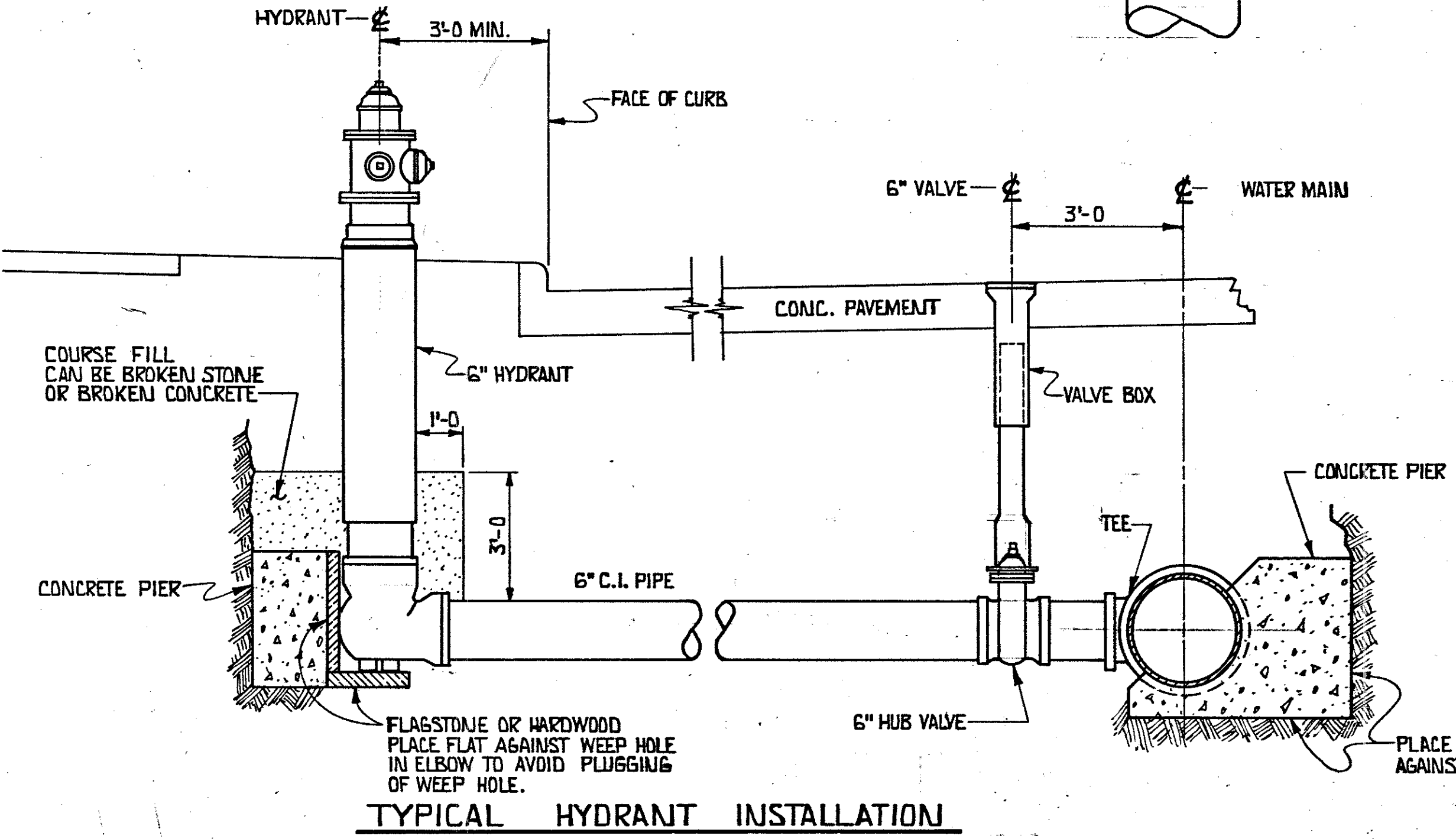
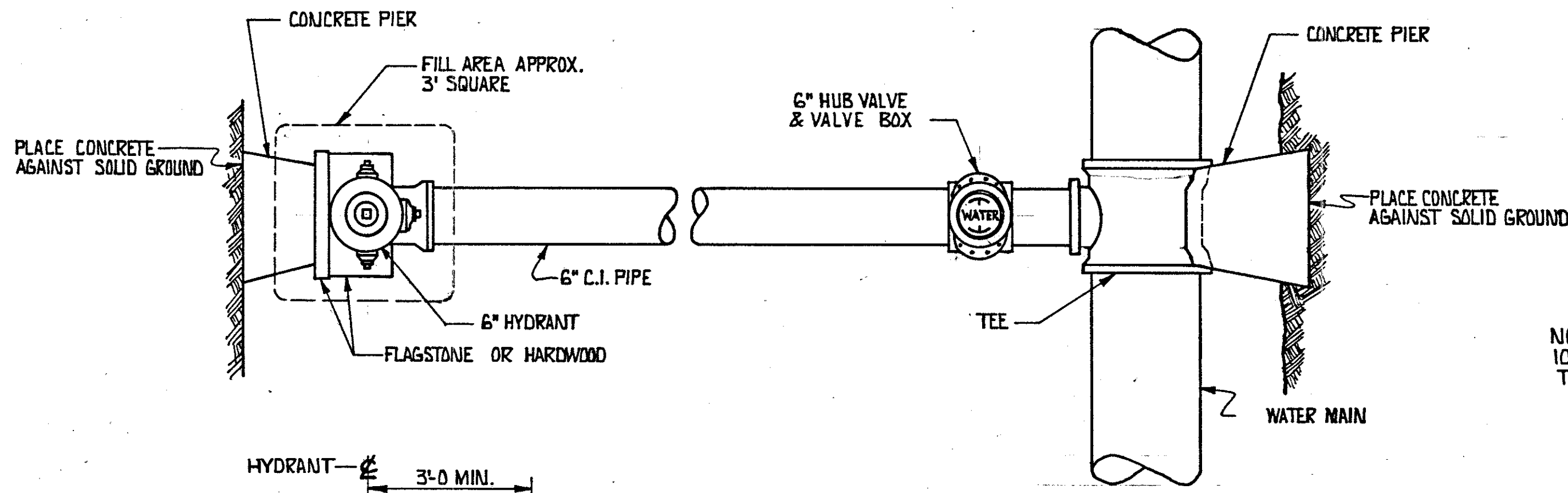
WESTON
 DESIGNERS-CONSULTANTS

WESTON A Business Trust
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

WATERWORK
 16" WATER MAIN THRU BROADWAY
 BRIDGE

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|--------|--------|---------|----------|------|---------|
| J.R.H. | C.A.P. | | J.R.H. | | | |

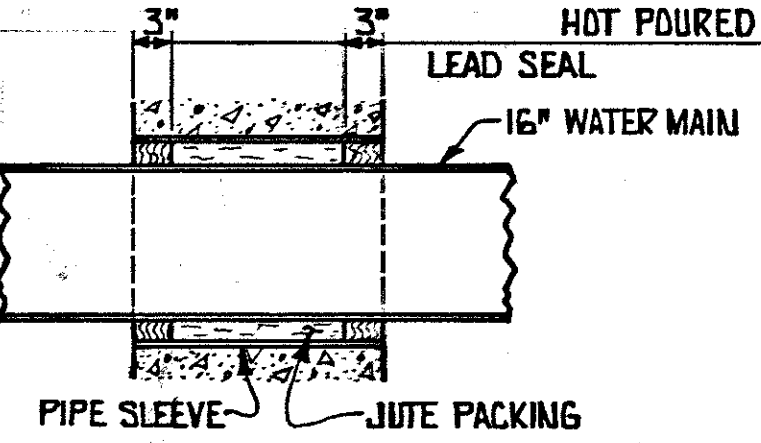
CUYAHOGA COUNTY
CUI-490-149



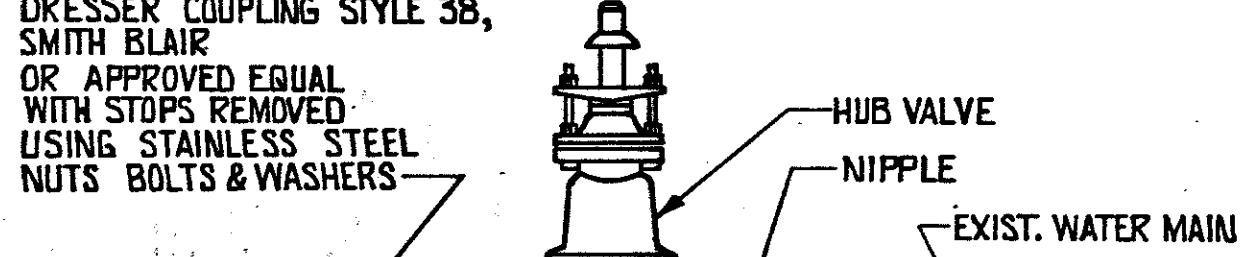
TYPICAL HYDRANT INSTALLATION

DETAIL AT END OF STEEL PIPE FOR VICTAULIC COUPLINGS STYLE NO 77

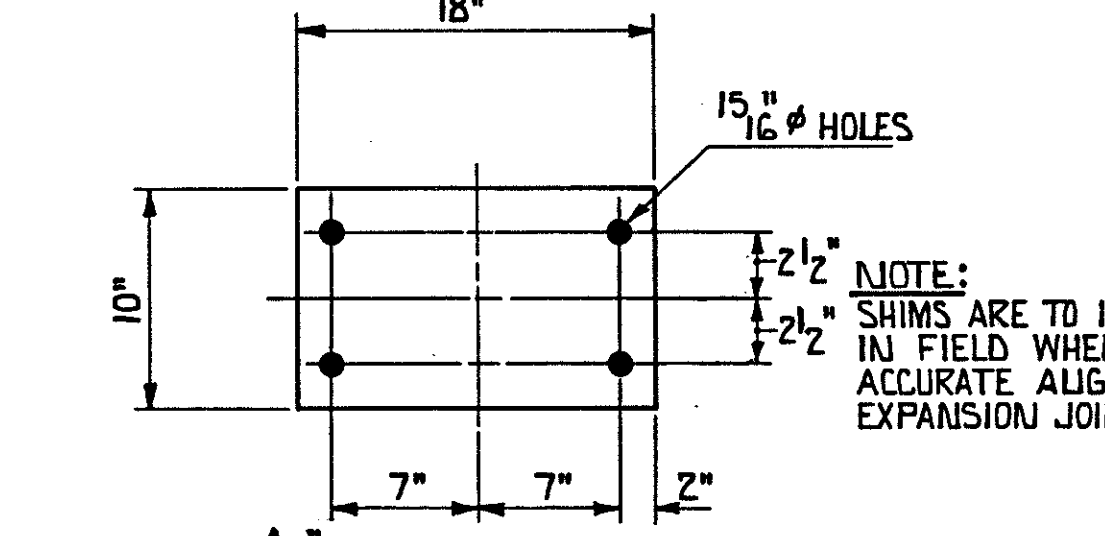
NOTE: 1035 STEEL H.T. CADMIUM PLATED BOLTS (100,000 P.S.I.) TO BE FURNISHED WITH VICTAULIC COUPLINGS.



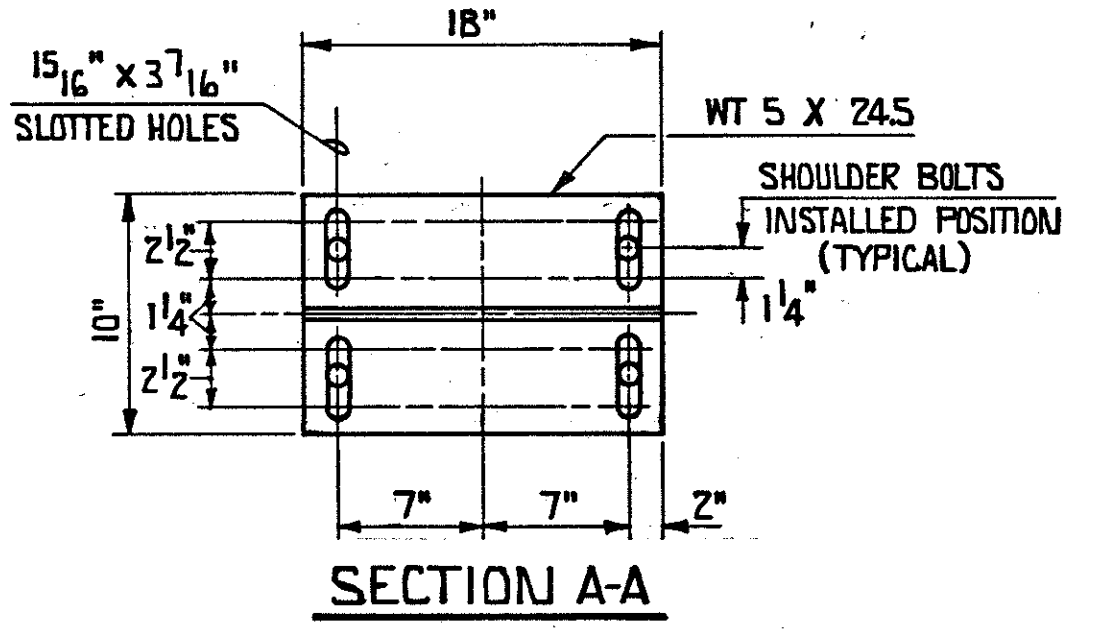
SLEEVE PACKING DETAIL



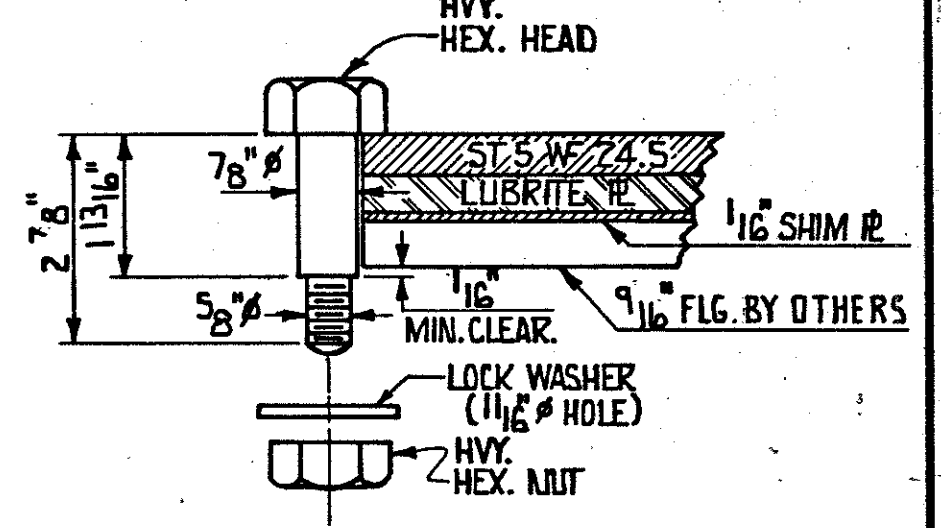
DETAIL OF "CUT-IN VALVE COMPLETE" FOR 6" THRU 16" PIPE



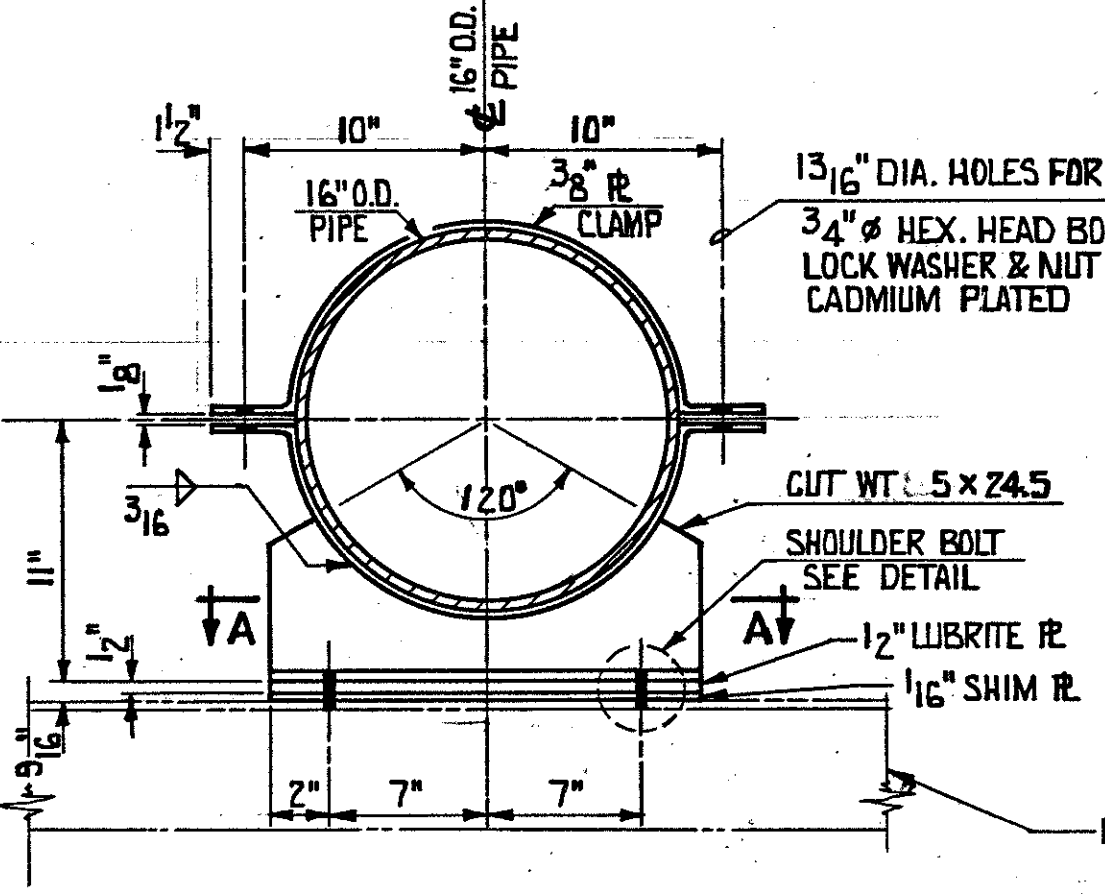
NOTE: SHIMS ARE TO BE INSTALLED (OR DELETED) IN FIELD WHERE REQUIRED TO ASSURE ACCURATE ALIGNMENT OF PIPE AT EXPANSION JOINT.



SECTION A-A

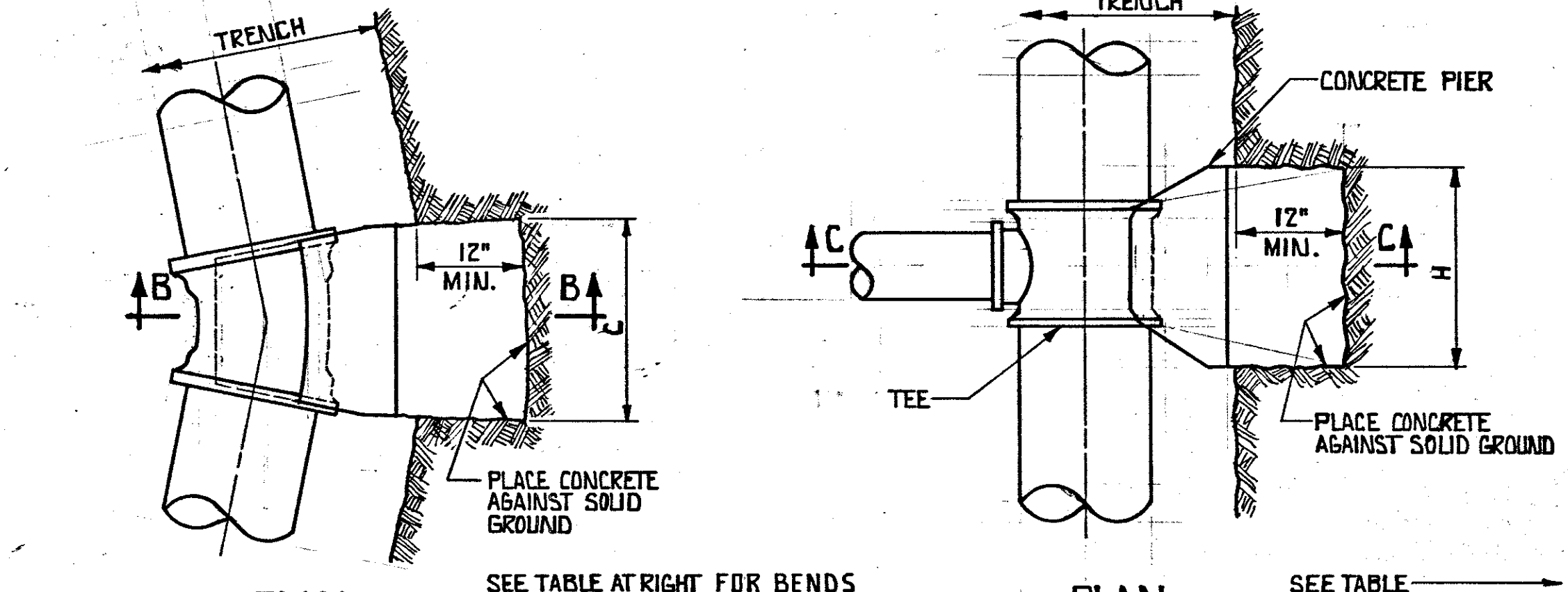


CADMIUM PLATED SHOULDER BOLT DETAIL



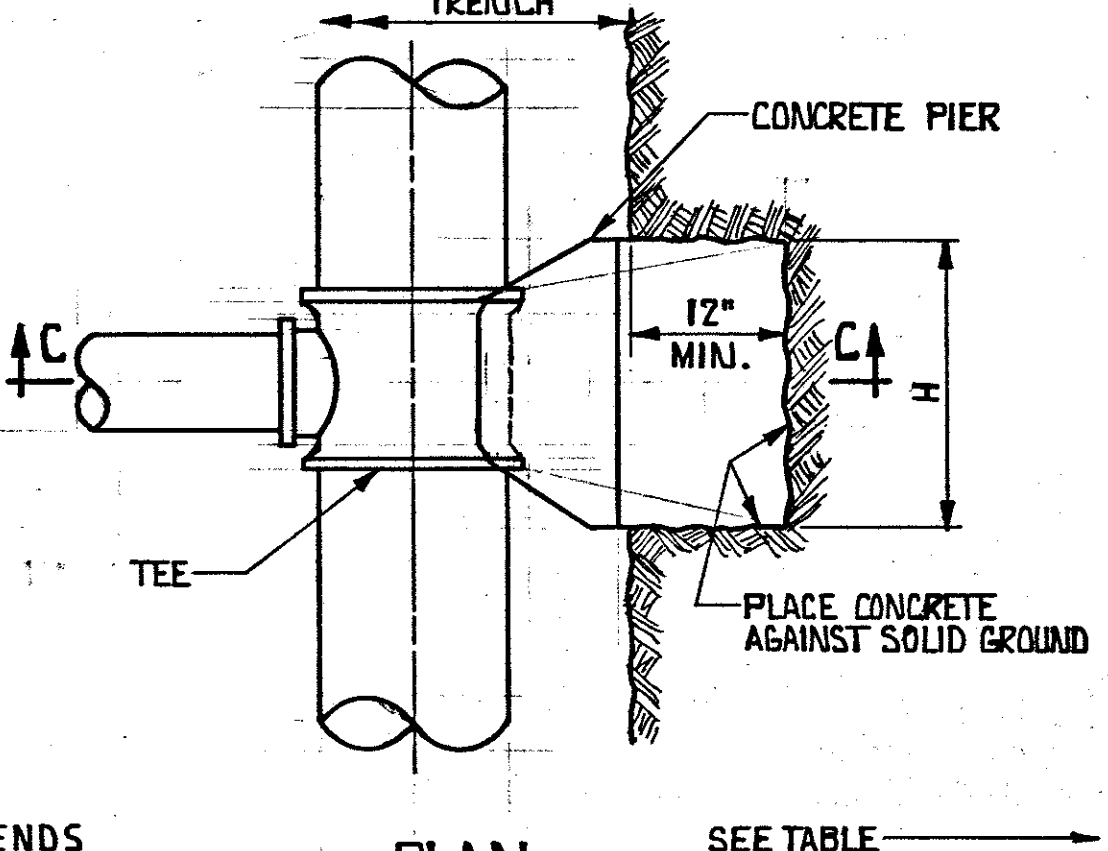
DETAIL OF 16" WATER MAIN SUPPORT ASSEMBLY

EXCEPT FOR BOLTS, LOCKWASHERS & NUTS WHICH ARE TO BE CADMIUM PLATED, ENTIRE ASSEMBLY, INCLUDING SHIMS, IS TO BE HOT DIPPED GALVANIZED, A.S.T.M. DESIGNATION A123, LATEST REVISION.



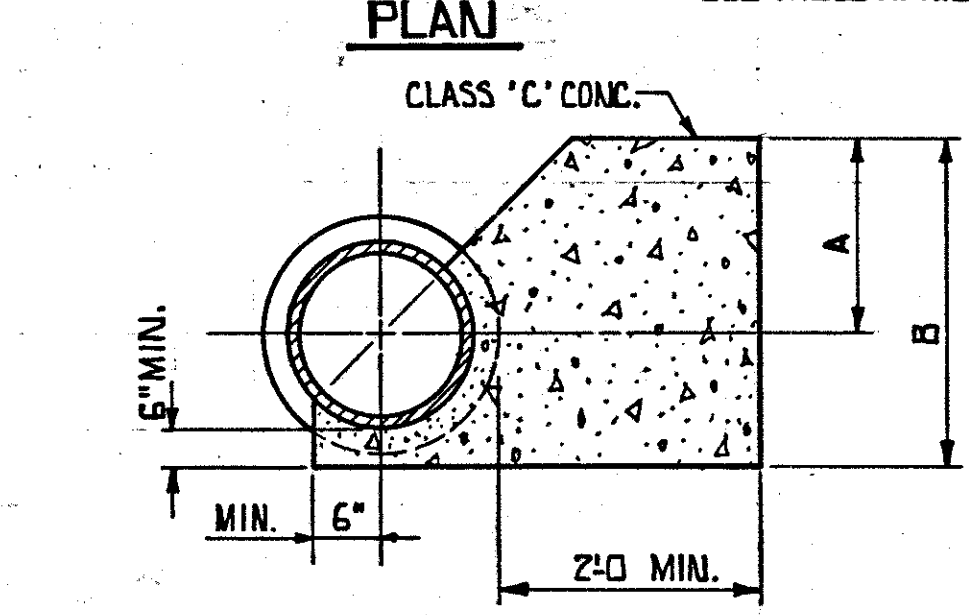
| SIZE | A | B | C |
|--------|--------|-------|-------|
| 6", 8" | 0'-8" | 1'-6" | 2'-0" |
| 12" | 1'-6" | 2'-6" | 3'-0" |
| 16" | 1'-10" | 3'-0" | 4'-0" |

CONCRETE PIER DETAIL FOR BENDS

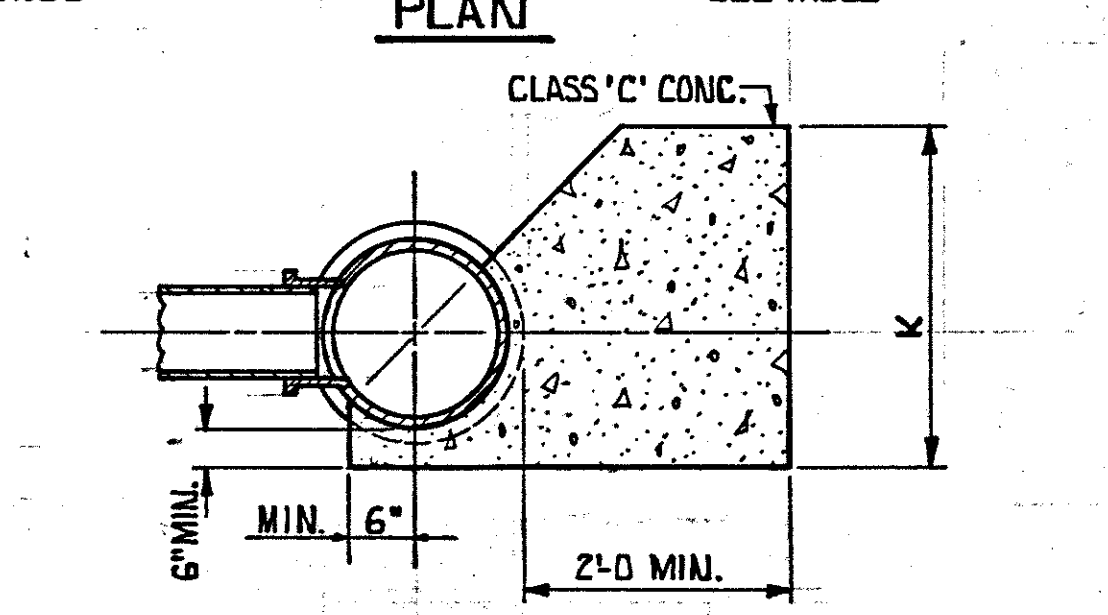


| SIZE | H | K |
|------|-------|-------|
| 6" | 2'-0" | 2'-0" |
| 8" | 2'-6" | 2'-6" |
| 12" | 2'-6" | 3'-0" |
| 16" | 3'-0" | 3'-0" |

CONCRETE PIER DETAIL FOR TEES



SECTION B-B
CONCRETE PIER DETAIL FOR BENDS



SECTION C-C
CONCRETE PIER DETAIL FOR TEES

MIN. OF TWO (2) STAINLESS STEEL STRAPS PER SECTION OF PERFORMED INSULATION. STRAPS TO BE 1/2" MIN. WIDTH WITH STAINLESS STEEL CLAMPS. COST TO BE INCLUDED IN PRICE BID FOR 16" WATER MAIN PIPE.

3" HEAVY DENSITY FIBER GLASS PREFORMED PIPE INSULATION A.S.T.M. C-547-67 OR LATEST REVISION, WITH APPROVED FACTORY APPLIED REINFORCED FIRE RESISTANT PROTECTIVE VAPOR BARRIER JACKET OF LAMINATED KRAFT AND CORROSION RESISTANT METALIC FOIL, AND 0.010" MIN. STAINLESS STEEL WEATHER-PROOFING JACKET. COST TO BE INCLUDED IN PRICE BID FOR 16" WATER MAIN PIPE.

JOHNS-MANVILLE, GUSTIN-BACON, OWENS-CORNING, OR APPROVED EQUAL.

DETAIL PIPE INSULATION THRU BRIDGE BETWEEN ABUTMENT WALLS

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO

APPROVED January 13, 1983
DESIGN REVIEW ENGINEER

William J. Lacey

WESTON DESIGNERS-CONSULTANTS

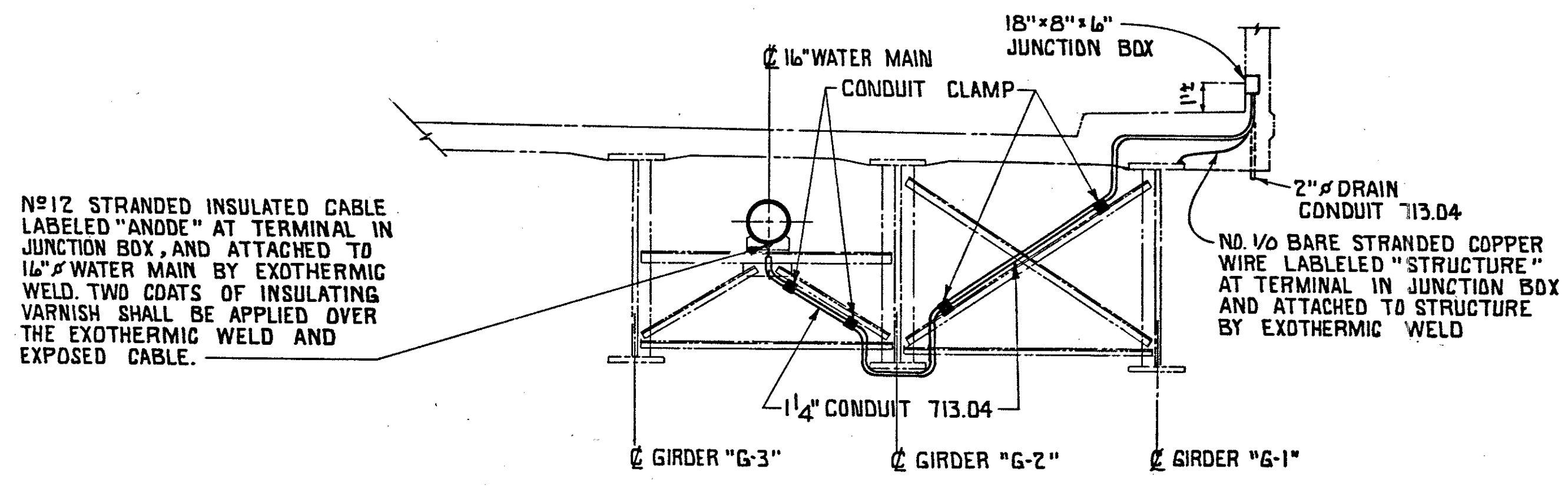
| | | | |
|--------------------------------|--------|--------|---------|
| NO. | DATE | BY | REVISED |
| WESTON DESIGNERS-CONSULTANTS | | | |
| WATERWORK DETAILS | | | |
| SCALE N.T.S. UNLESS NOTED DATE | | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| JRH | RLH II | JRH | |

SHEET ACCT. No. CONT. No.

| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 5 | OHIO | |

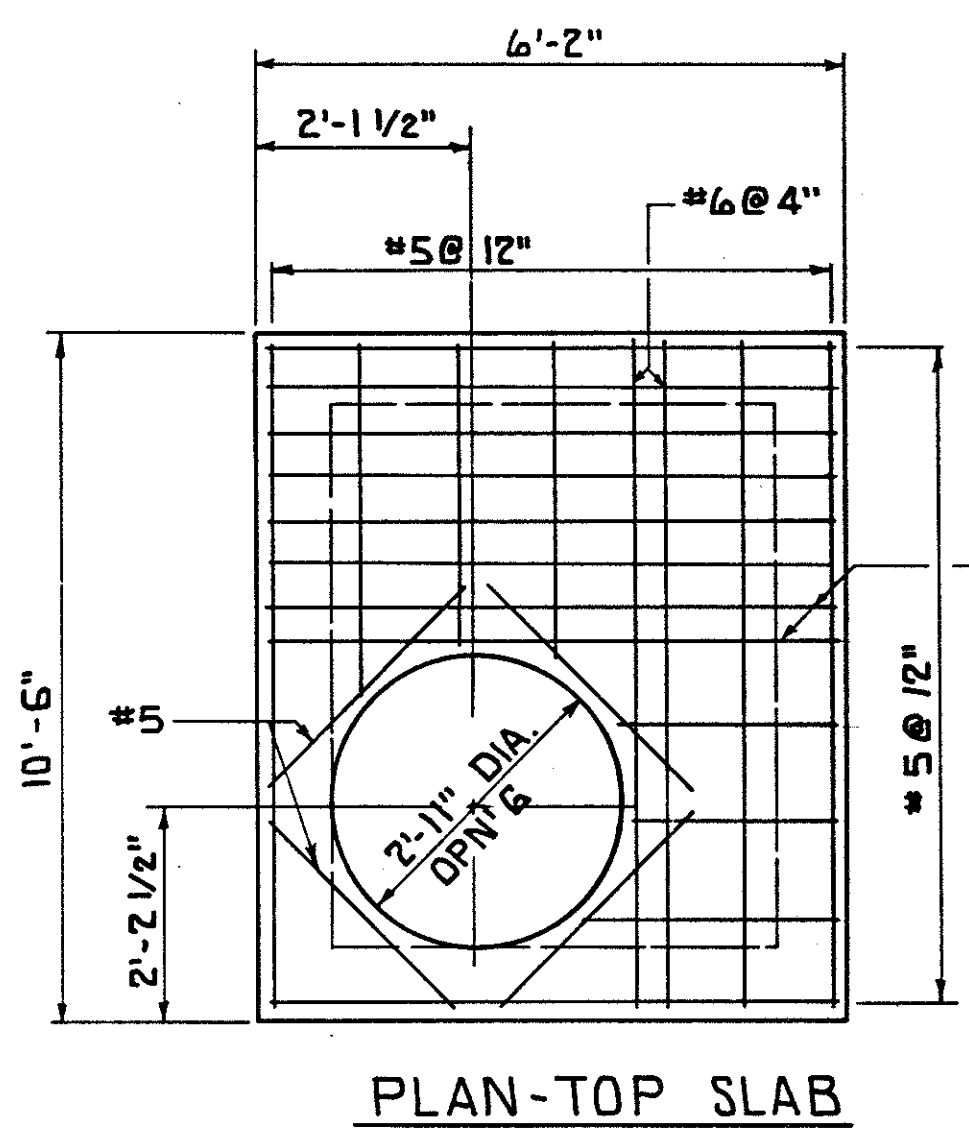
132
261

CUYAHOGA COUNTY
CUY-490-1.49

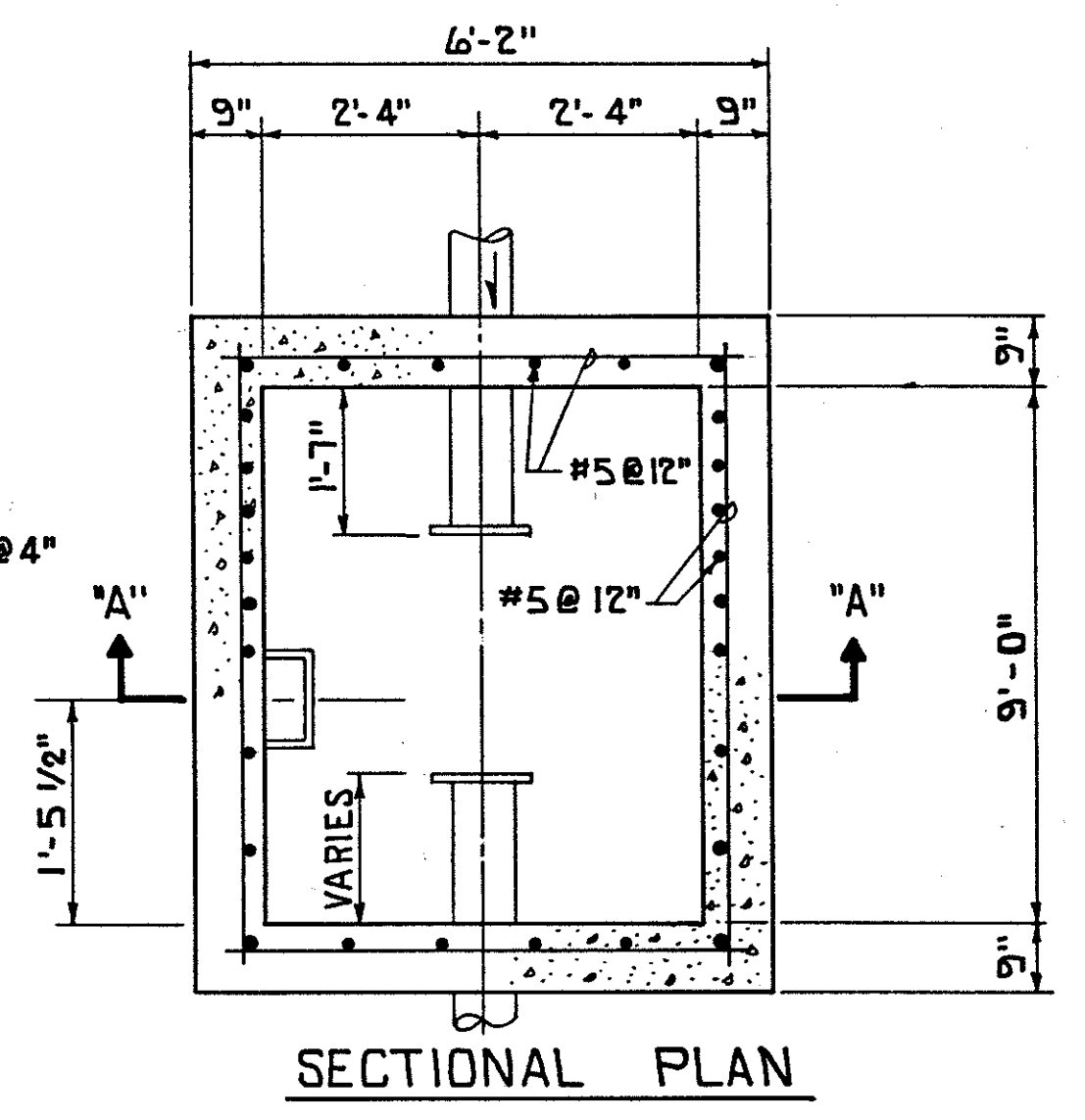


TYPICAL TEST STATION

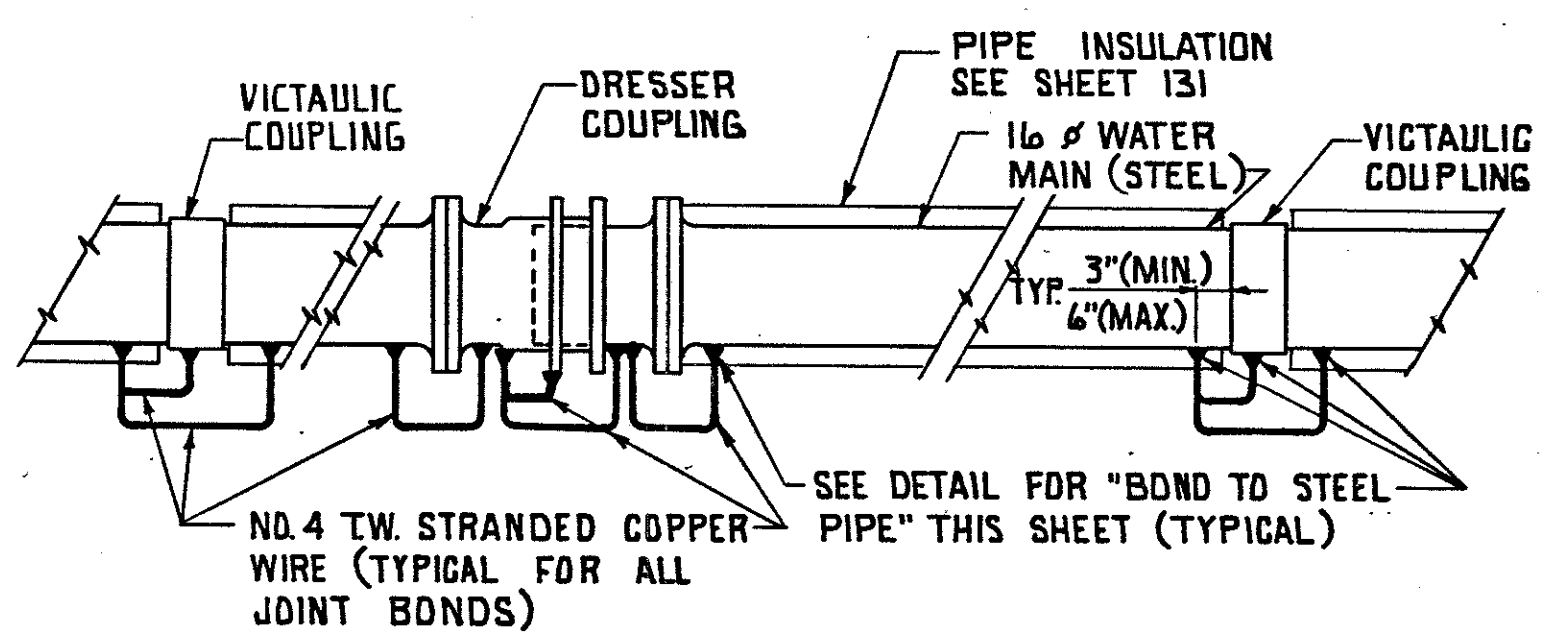
NOTE: FOR DETAILS NOT SHOWN, SEE STANDARD CONSTRUCTION DRAWING HL-4 & HL-7



PLAN-TOP SLAB

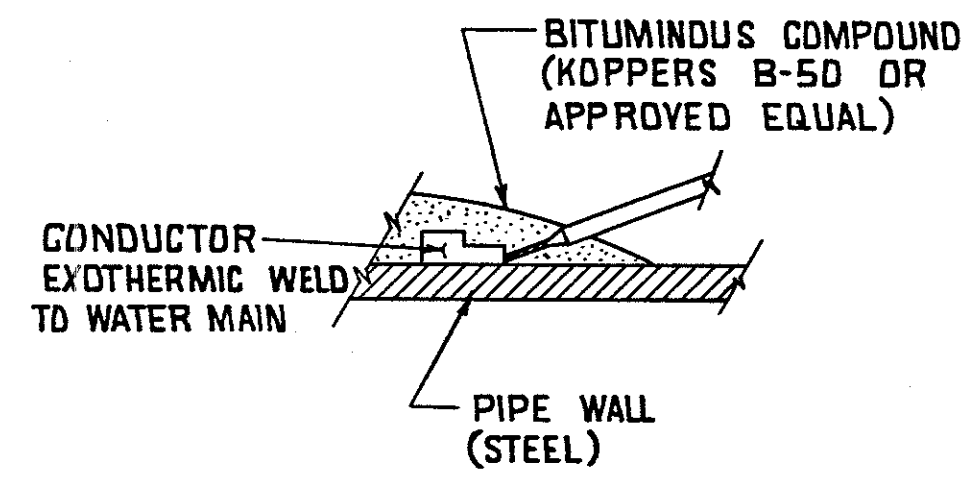


SECTIONAL PLAN



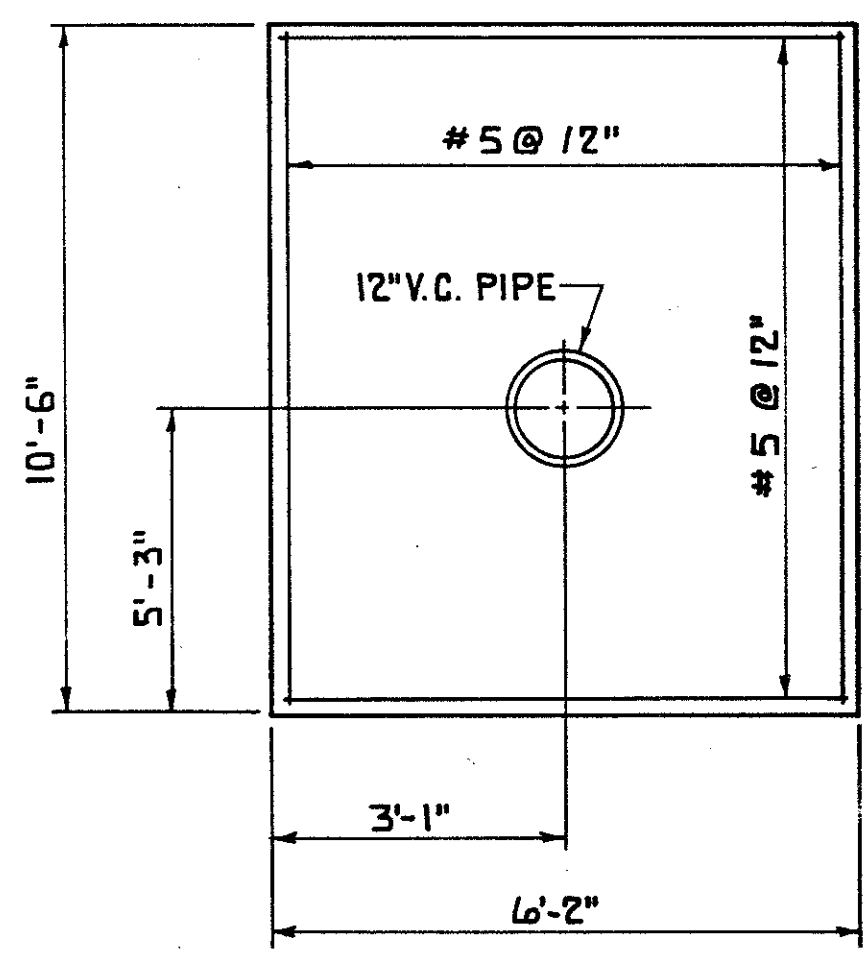
TYPICAL ELECTRICAL BONDING AT PIPE JOINTS

NOT TO SCALE

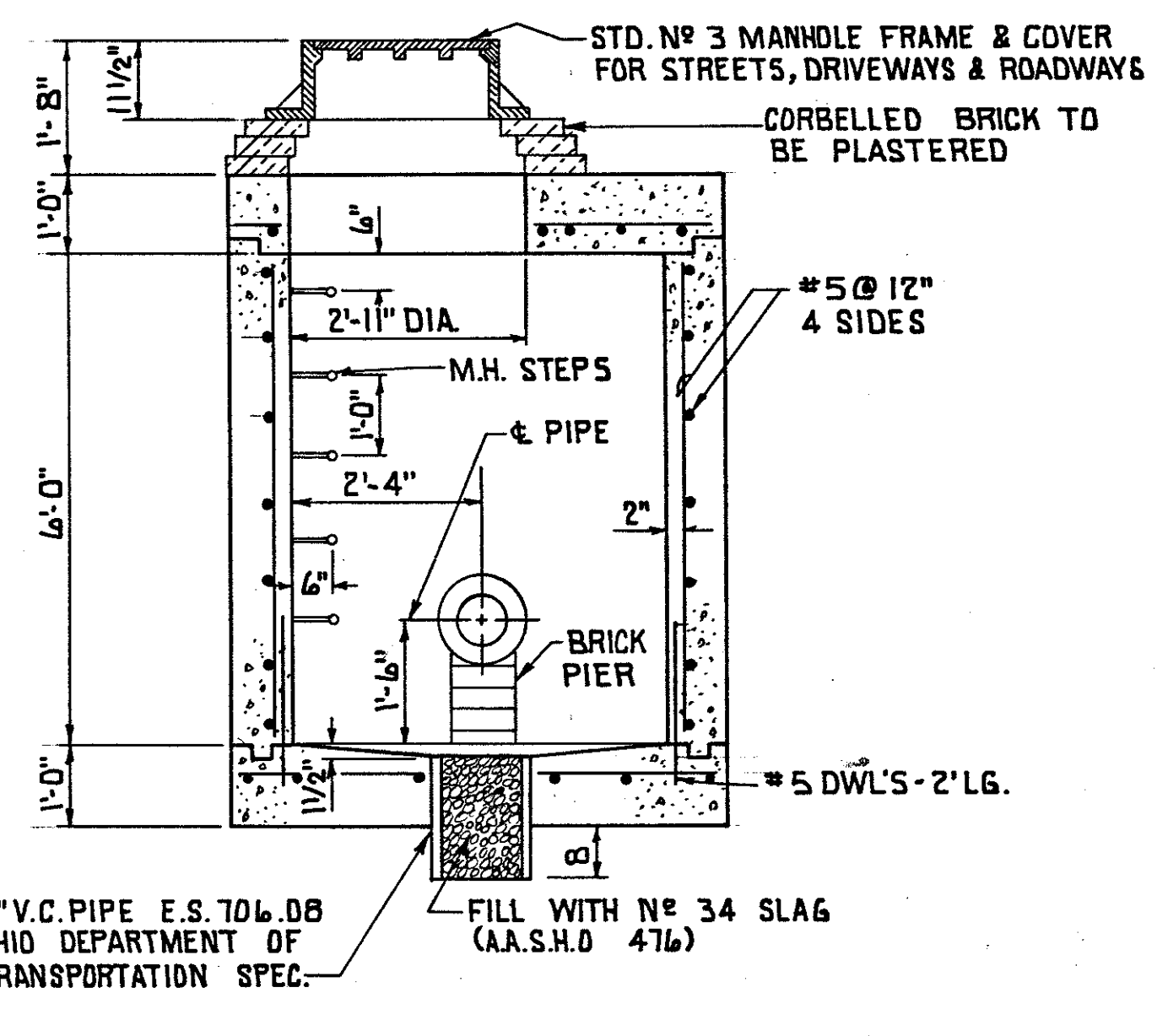


BOND TO STEEL PIPE

NOT TO SCALE



PLAN - BOTTOM SLAB

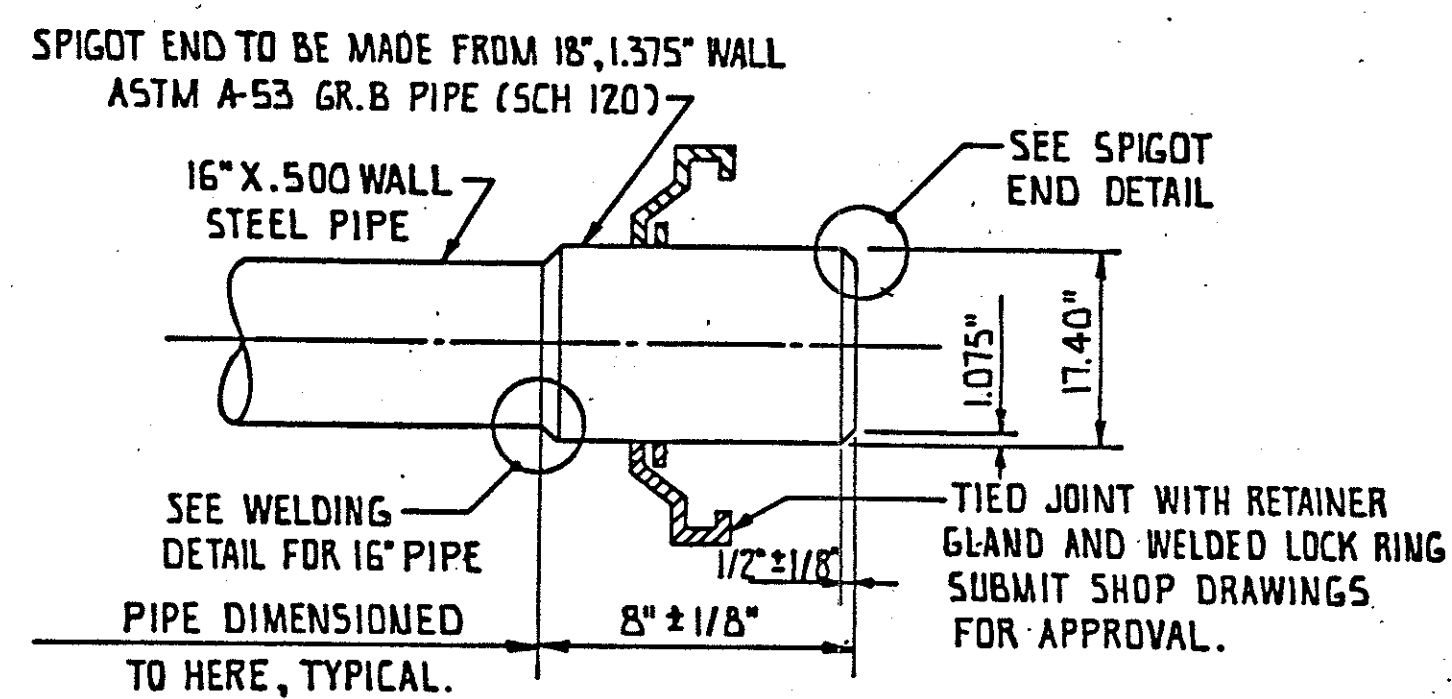


SECTION "A-A"

DETAIL OF 6" FIRE SERVICE VAULT

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

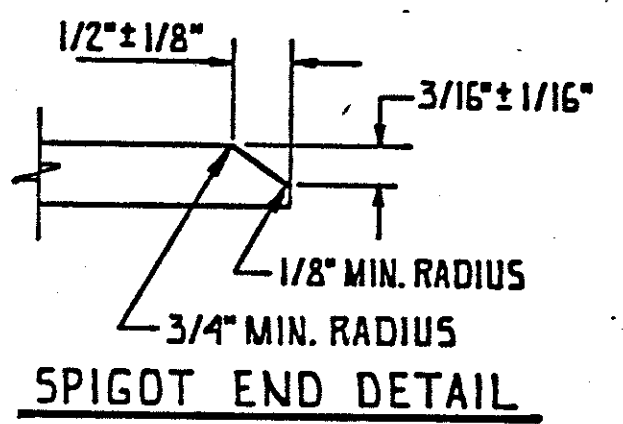
NOTE: SPIGOT END TO BE WELDED TO 16" PIPE BEFORE GALVANIZING.



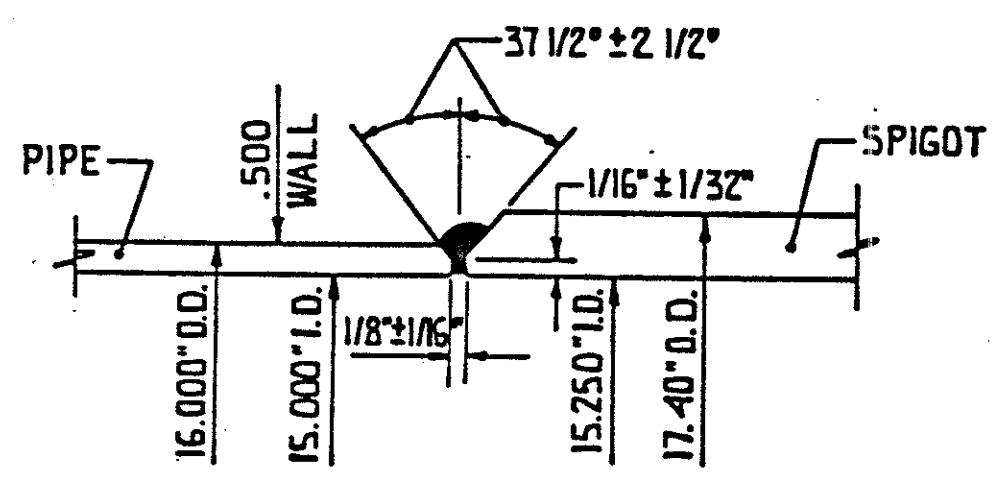
DETAIL "A"

CONNECTION DETAIL FOR 16" PIPE

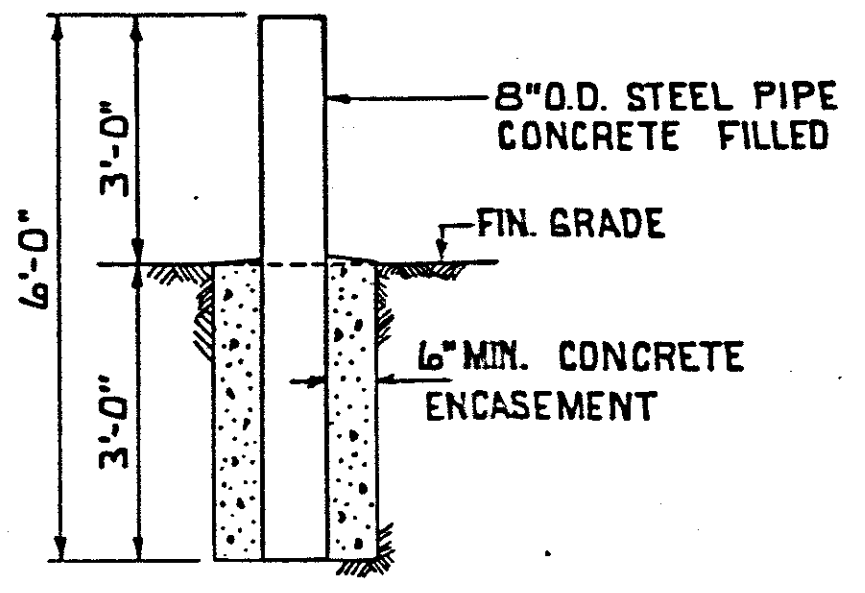
NOTE: CONNECTION DETAIL FOR 16" PIPE IS TO BE AS PROVIDED ON CLOW SUPER-LOCK JOINT PIPE DETAIL "A" ABOVE OR THAT AS PROVIDED ON U.S. PIPE TR FLEX PIPE.



SPIGOT END DETAIL

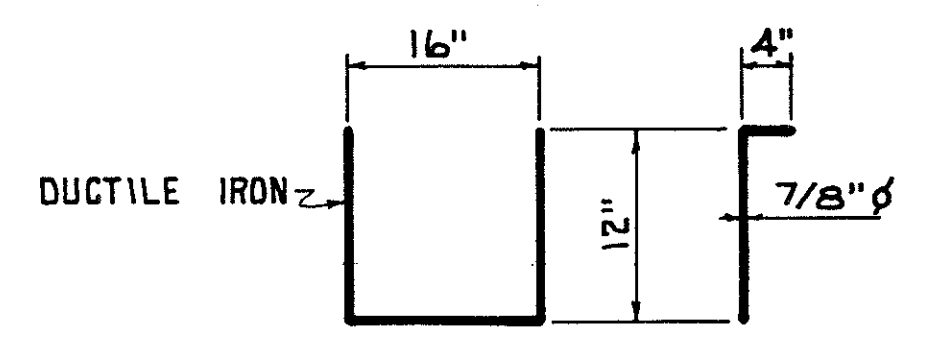


WELDING DETAIL FOR 16" PIPE



8" GUARD POST DETAIL

NOT TO SCALE



DETAIL OF MANHOLE RUNG

NOT TO SCALE

SHEET ACCT. No. CONT. No.

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO

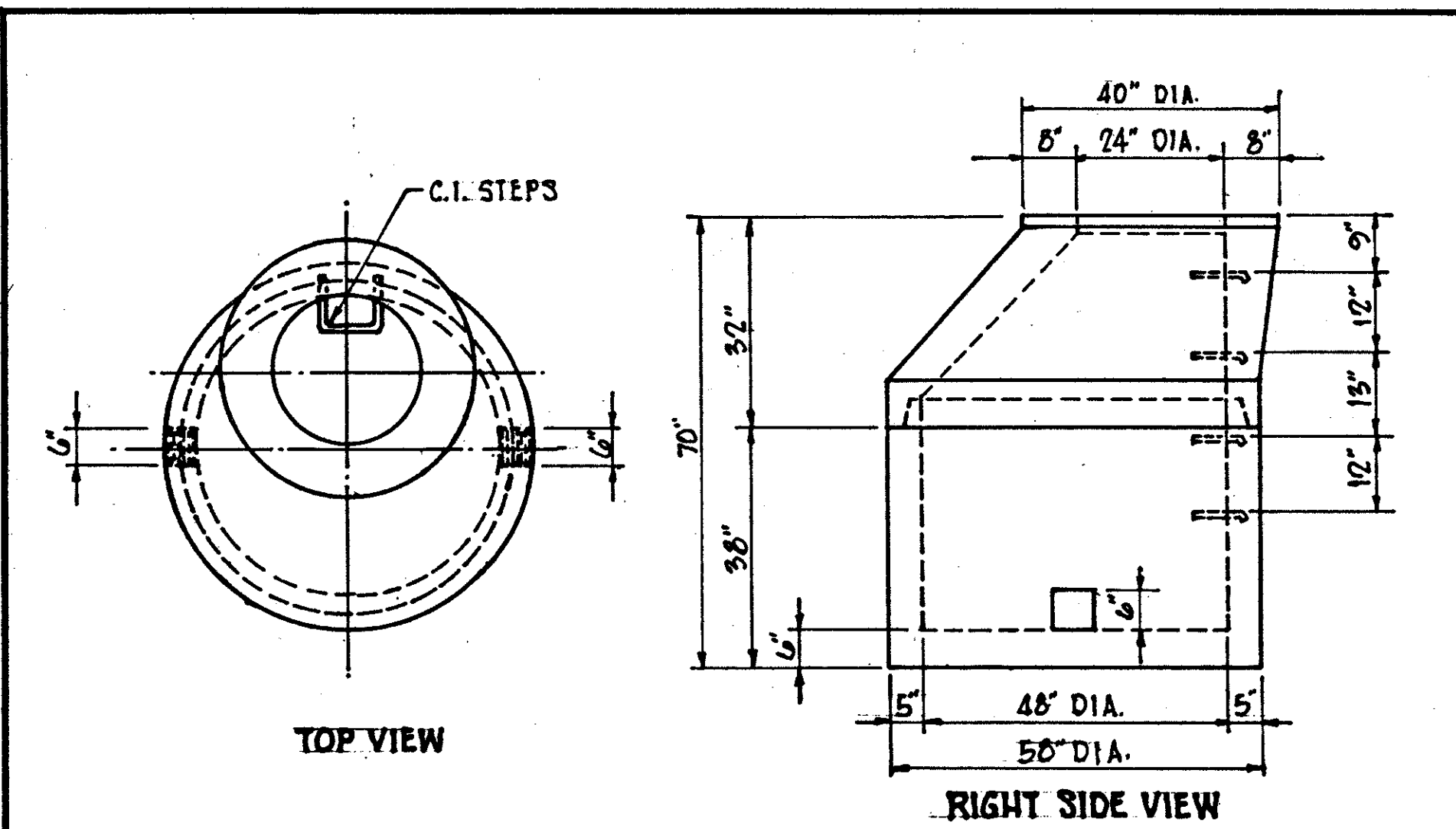
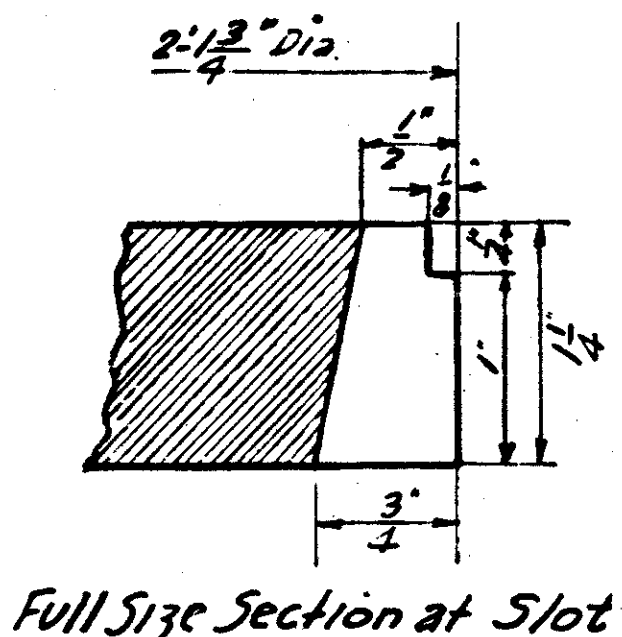
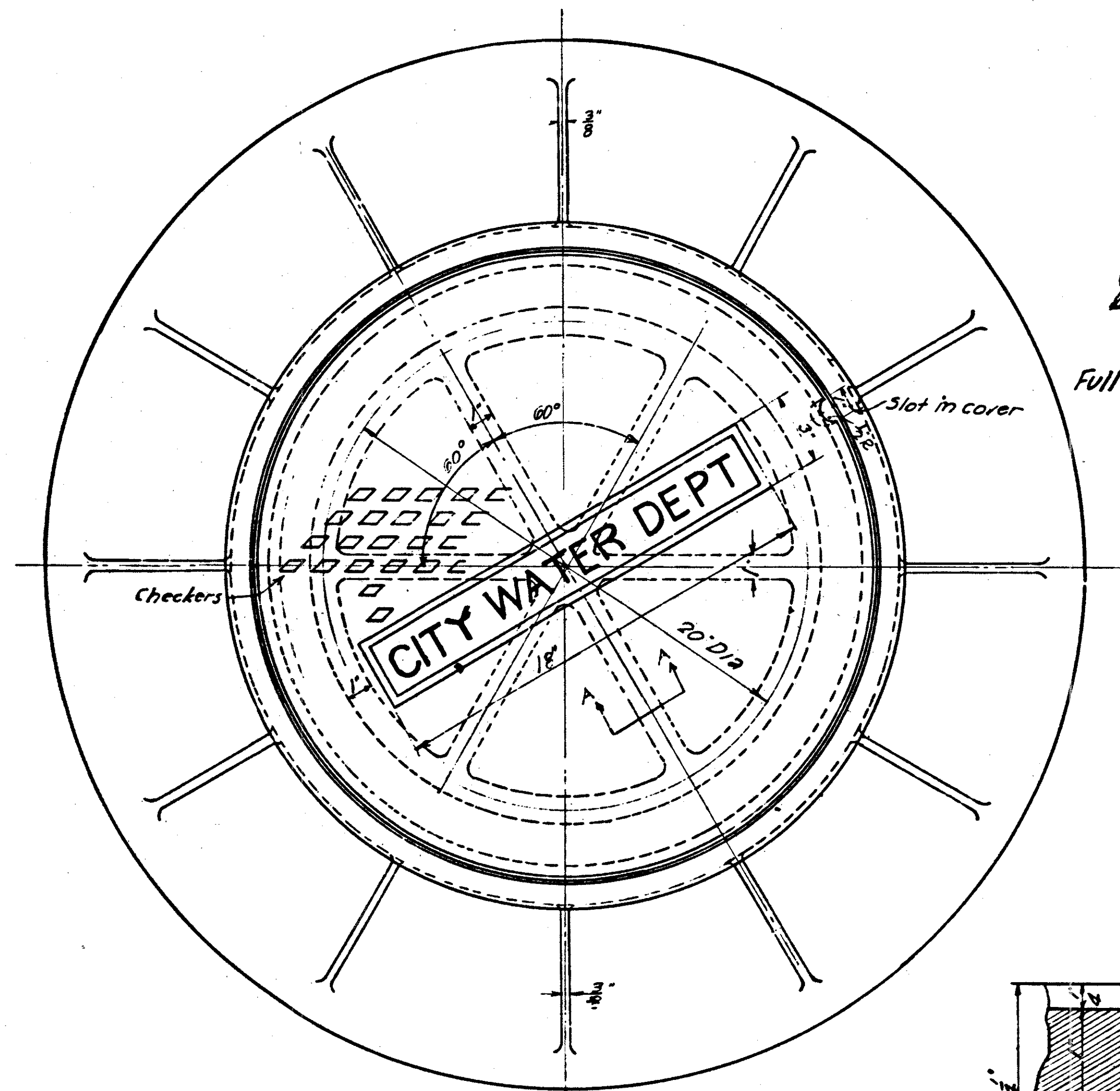
APPROVED *January 13, 1983*
William J. Sweeney DESIGN REVIEW ENGINEER

Roger P. Hyde WESTON DESIGNERS-CONSULTANTS

| | | | |
|------------------------------|-------|--------|---------|
| NO. | DATE | BY | REVISED |
| WESTON DESIGNERS-CONSULTANTS | | | |
| WATERWORK DETAILS | | | |
| SCALE AS NOTED | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| DATE | DATE | DATE | DATE |
| JRH | CAP | JRH | |

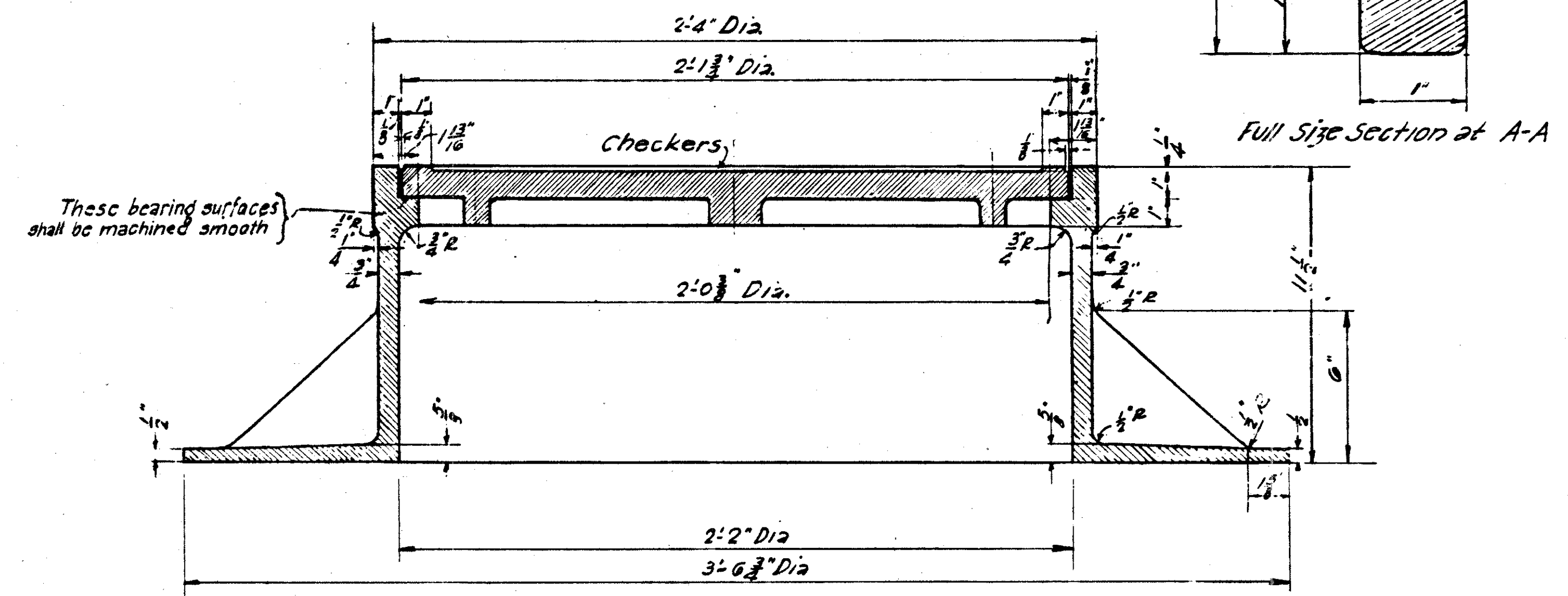
| | | | |
|-------------|-------|---------|-------------|
| FHWA REGION | STATE | PROJECT | 133 2.61 |
| 5 | OHIO | | |

CUYAHOGA COUNTY
CUY-490-1.49



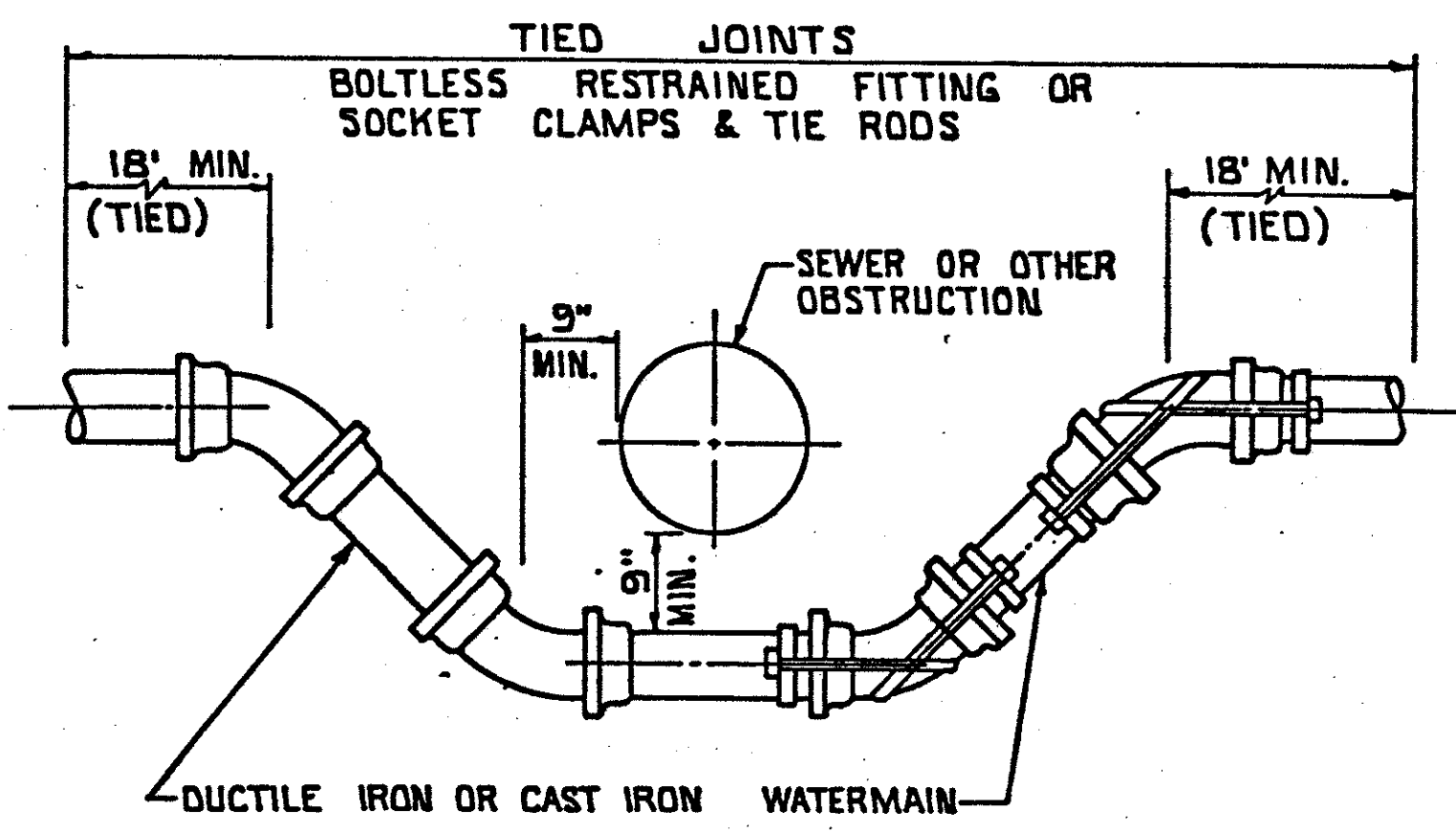
NOTES
UTILIZED FOR 3/4\"/>

| CLEVELAND DIVISION OF WATER METER VAULT | | | |
|--|--------------|------------------|----------------|
| SCALE: 1/2\"/> | APPROVED BY: | DRAWN BY: T.A.S. | |
| DATE: 10-21-74 | | REVISED 3-14-75 | |
| | | REVISED 3-20-75 | |
| | | | DRAWING NUMBER |

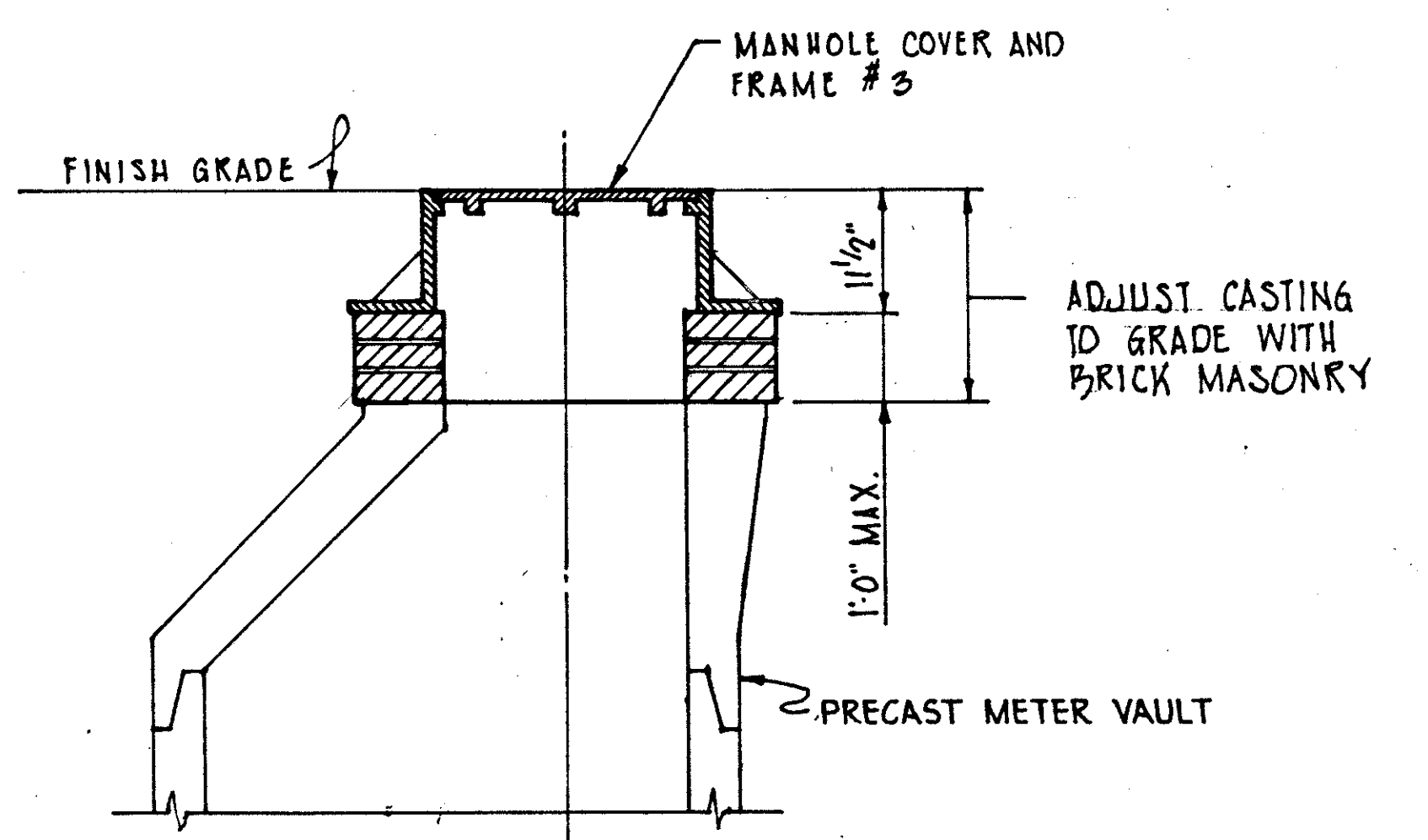


Manhole Frame & Cover #3
C.I. Manhole Frame Patt. S.M. 31.G1
C.I. Top Cover Patt. S.M. 31.B-2
EST. WEIGHT { FRAME = 426*
COVER = 125*

NOTE:
REPRODUCED FROM CITY OF CLEVELAND DEPT. OF PUBLIC UTILITIES, DIV. OF WATER AND HEAT STANDARD DETAILS.



WATERMAIN OFFSET DETAIL
NO SCALE



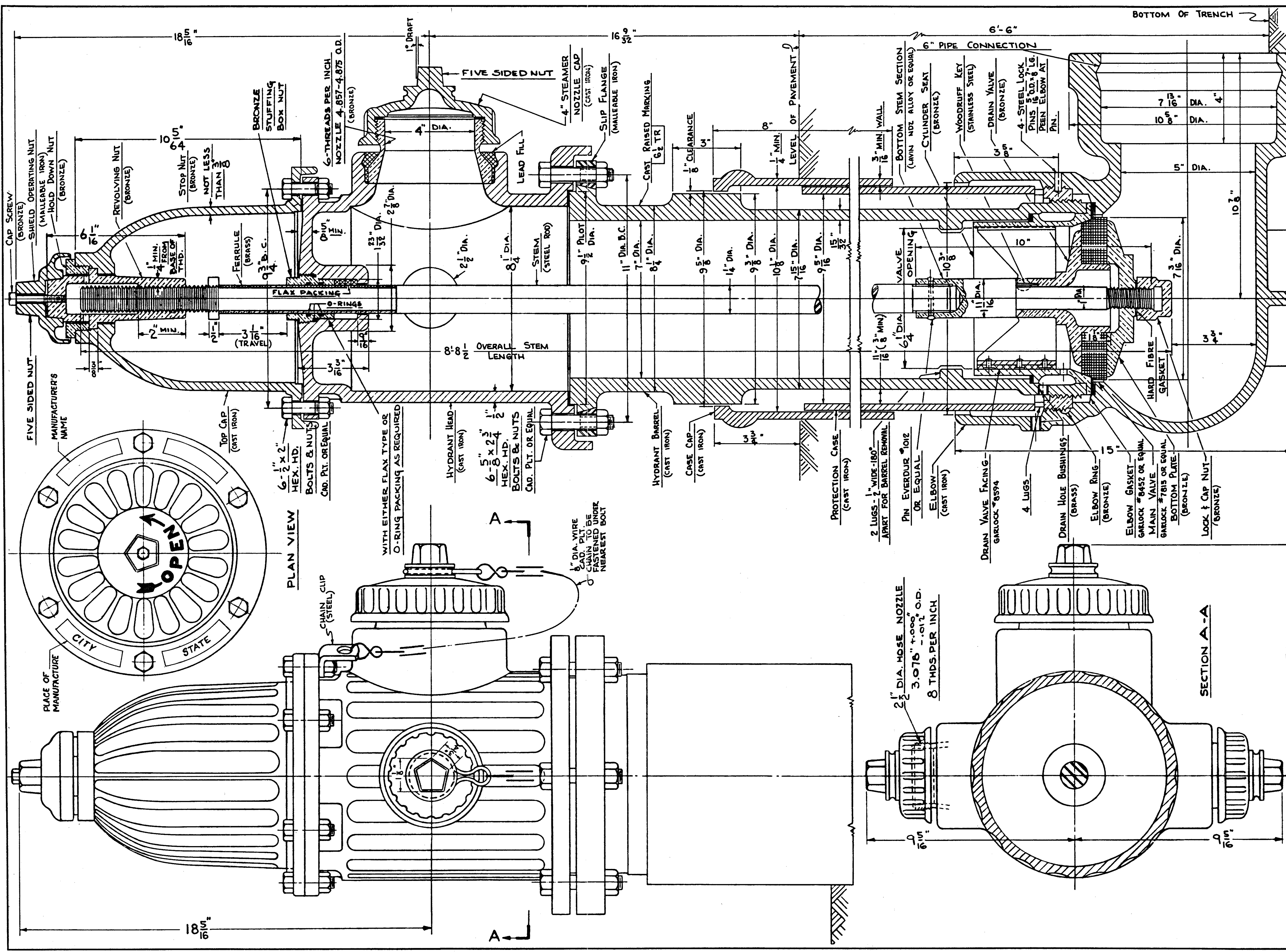
DETAIL "A" SCALE: 3/4\"/>

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO
APPROVED January 13, 1983
William J. Lavery DESIGN REVIEW ENGINEER
Roger L. Hyde 7/1982 WESTON DESIGNERS-CONSULTANTS

| WESTON DESIGNERS - CONSULTANTS | | | | | |
|--------------------------------|-------|--------|----------|------|---------|
| WATERWORK DETAILS | | | | | |
| SCALE | DATE | | | | |
| DESIGNED | DRAWN | TRACED | REVIEWED | DATE | REVISED |
| | CJM | JRH | | | |

SHEET ACCT. No. 1

CONT. No. SHEET ACCT. No.



| | | |
|-------------|-------|---------|
| FHWA REGION | STATE | PROJECT |
| 5 | OHIO | |

134
261

CUYAHOGA COUNTY
CUY-490-1.49

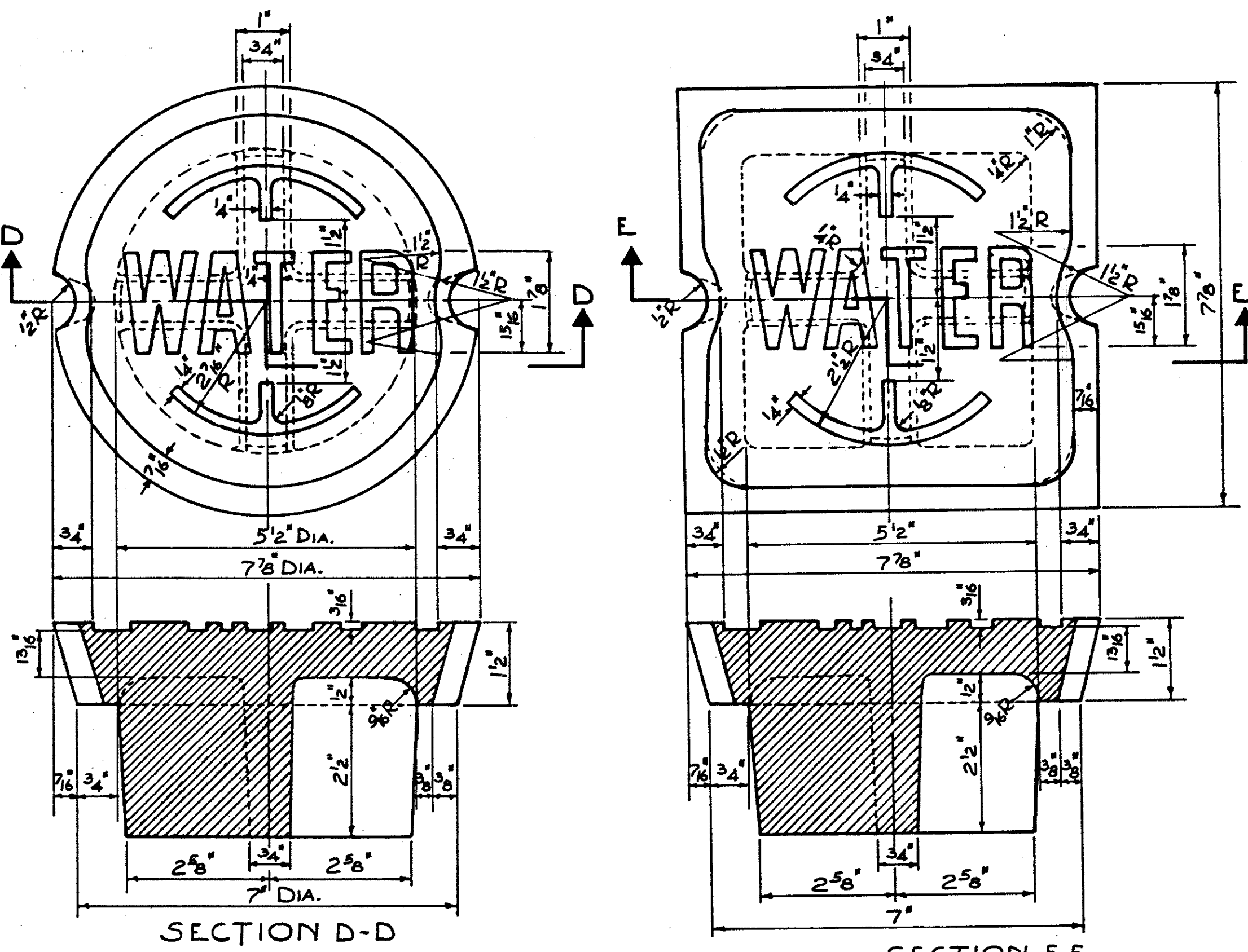
NOTE
THE CITY OF CLEVELAND HAS APPROVED THREE (3) ADDITIONAL 6" HYDRANT DETAILS ON FILE AT 1201 LAKESIDE AVENUE, CLEVELAND, OHIO, 44114. THE DRAWING NOS. ARE D525, D526 AND D530. WHICH MAY BE USED IN ADDITION TO THIS DETAIL.

| | |
|---|--|
| LOW SERVICE DISTRICT | |
| DEPARTMENT OF PUBLIC UTILITIES CLEVELAND, OHIO | |
| APPROVED <i>William J. Lenny</i> | JANUARY 12, 1983 DESIGN REVIEW ENGINEER |
| <i>Robert P. Hyde</i> 7/16/82 | WESTON DESIGNERS-CONSULTANTS |

REPRODUCED FROM CITY OF CLEVELAND
WATER DEPT. STD. DWG. No. D 498

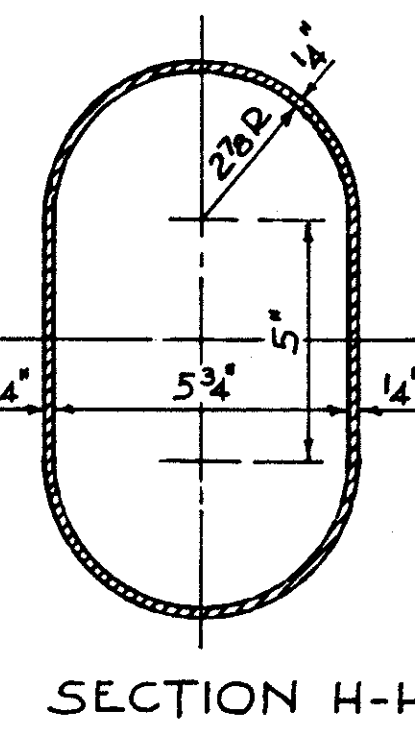
| | |
|---------------------------------|---------|
| WESTON DESIGNERS-CONSULTANTS | |
| WATERWORK DETAILS | |
| 6" FIRE HYDRANT | |
| SCALE 6" = 1'-0" | DATE |
| DESIGNED | DRAWN |
| TRACED | CHECKED |
| REVIEWED | DATE |
| REVISED | |

CUYAHOGA COUNTY
CUY-490-1.49

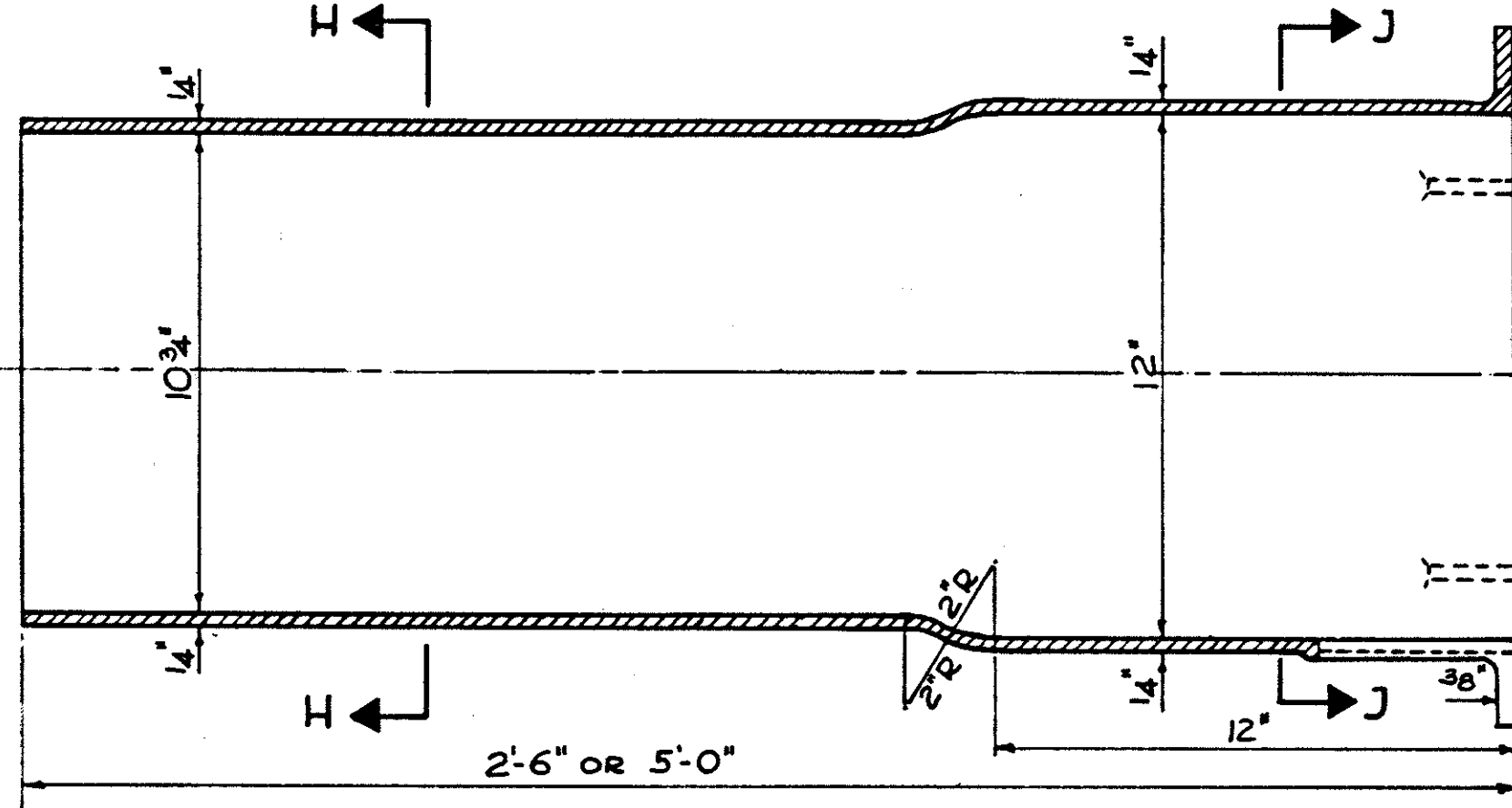


DETAIL OF ROUND COVER FOR No.1 AND 2 TOP
EST. WT. 20#

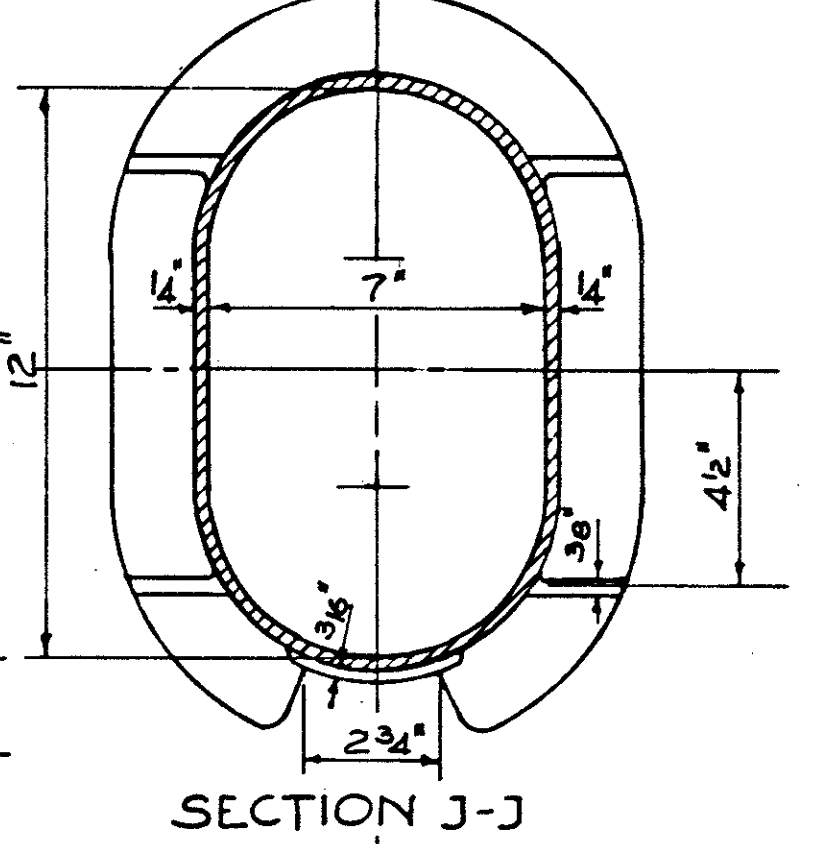
DETAIL OF SQUARE COVER FOR No.3 AND 4 TOP
EST. WT. 23#



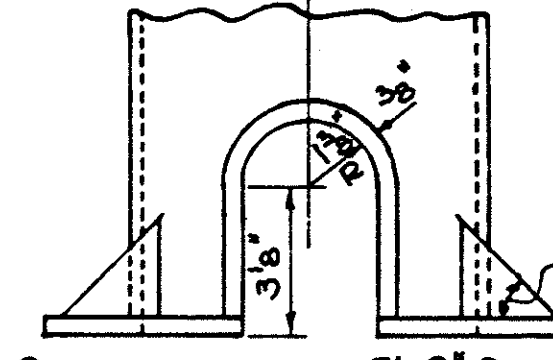
SECTION H-H



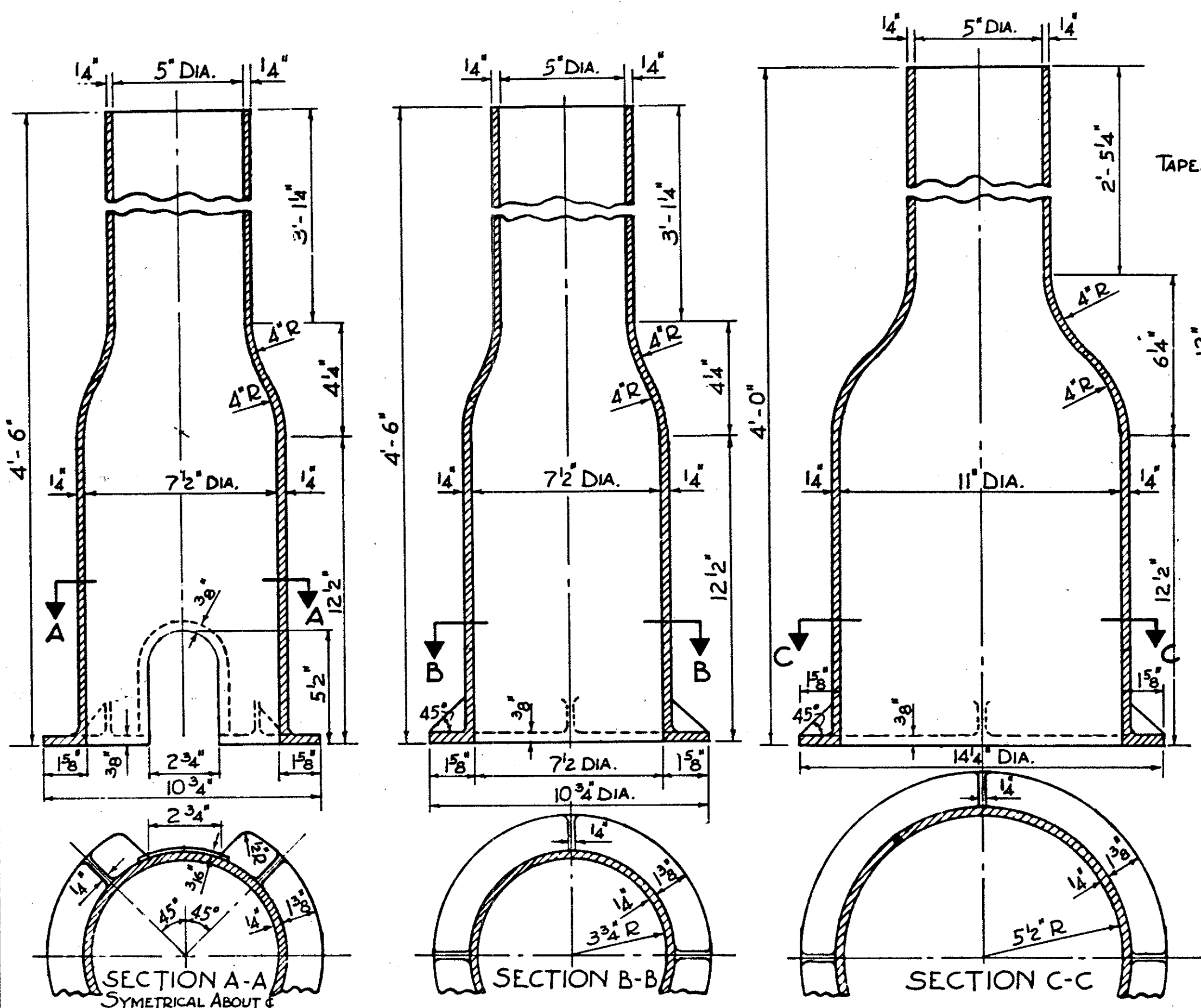
BASE
EST. WEIGHT 2'-6" LONG = 70#
EST. WEIGHT 5'-0" LONG = 126#



SECTION J-J



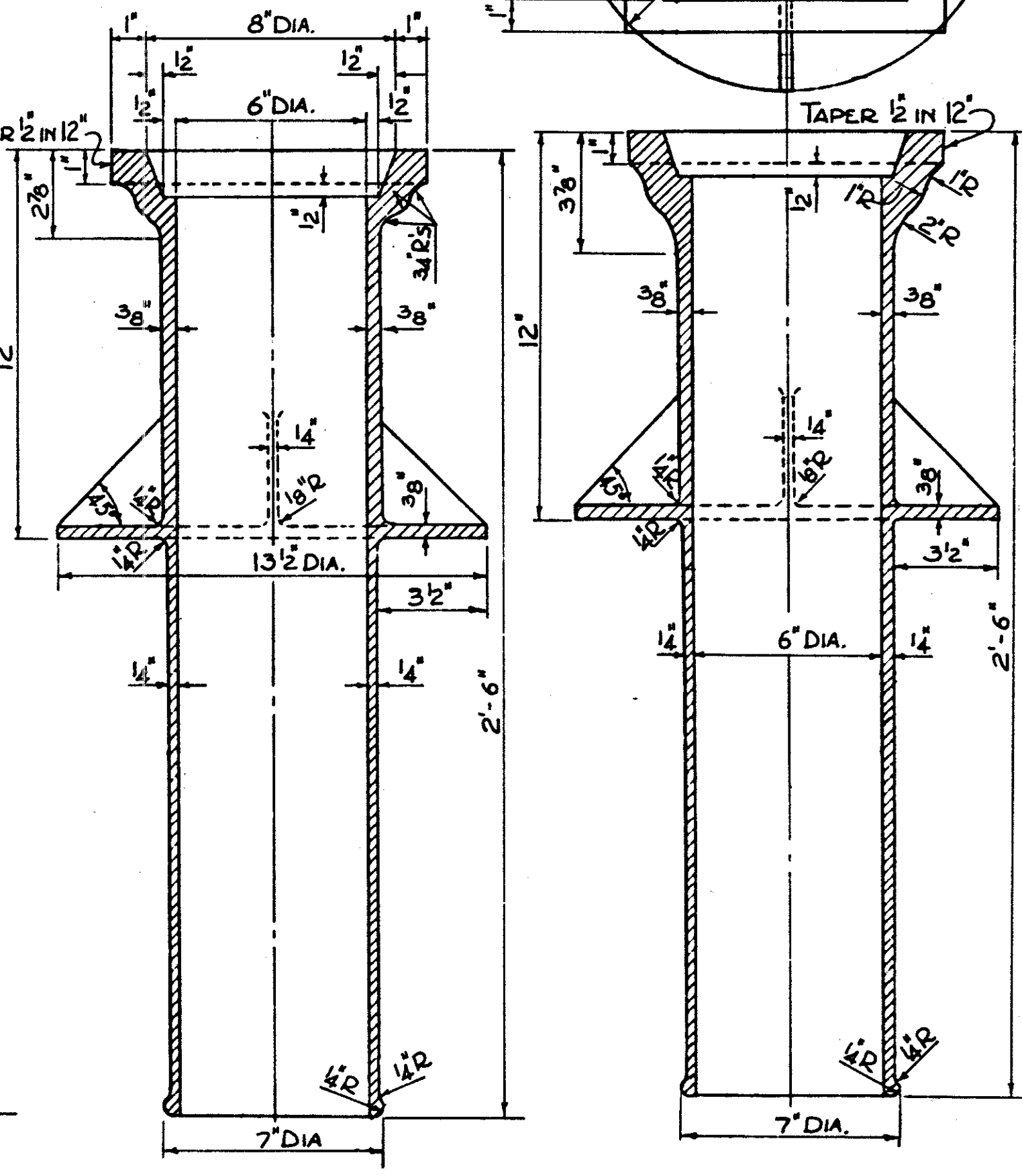
THIS OPENING TO BE IN 5'-0" BASE ONLY



SECTION A-A SYMMETRICAL ABOUT BASE No. 1 FOR 1 1/2" AND 2" VALVES EST. WEIGHT 69#

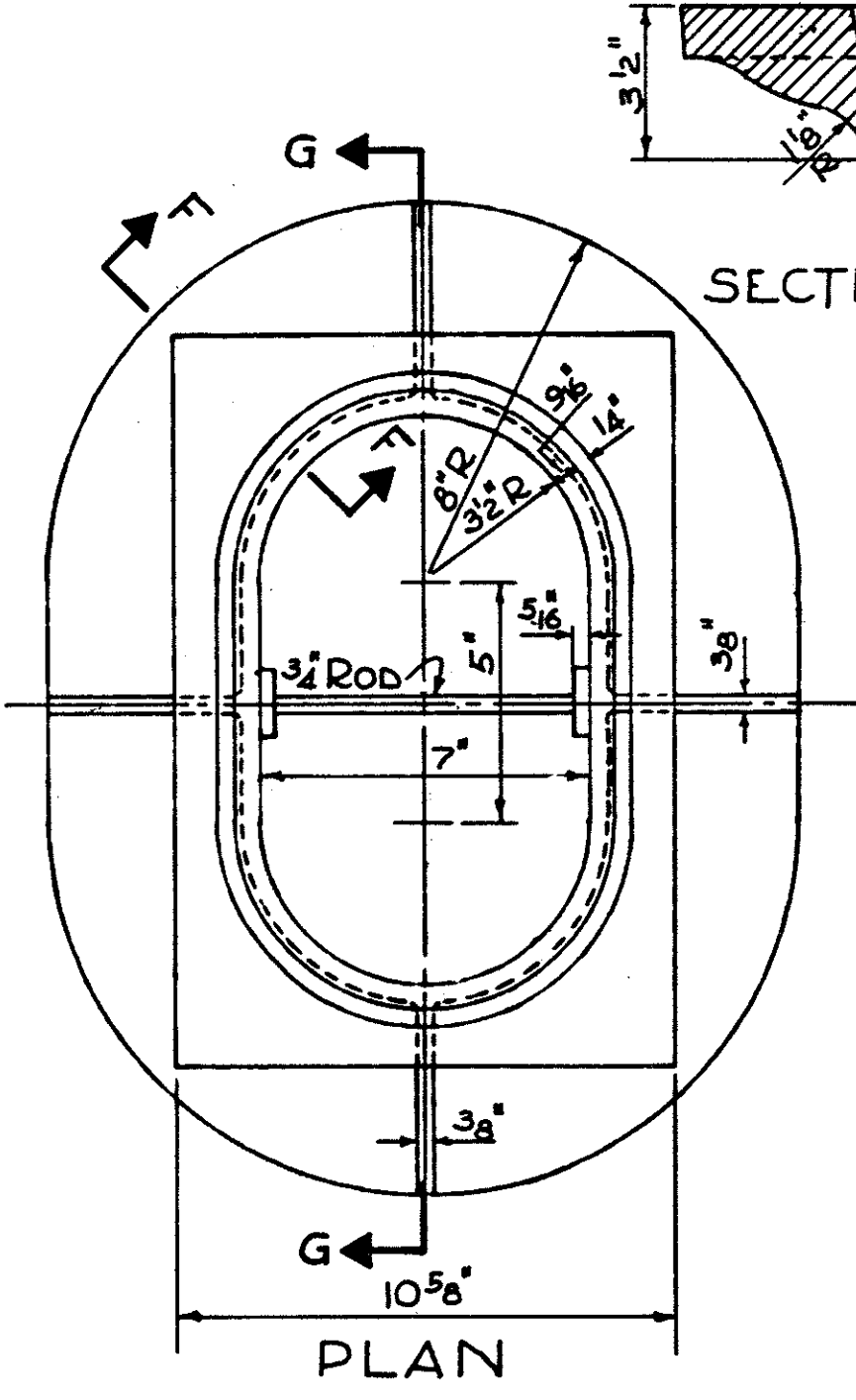
SECTION B-B BASE No. 2 AND 3 FOR 3", 4", 6" AND 8" VALVES EST. WEIGHT 71#

SECTION C-C BASE No. 4 FOR 10", 12" AND 16" VALVES EST. WEIGHT 79#



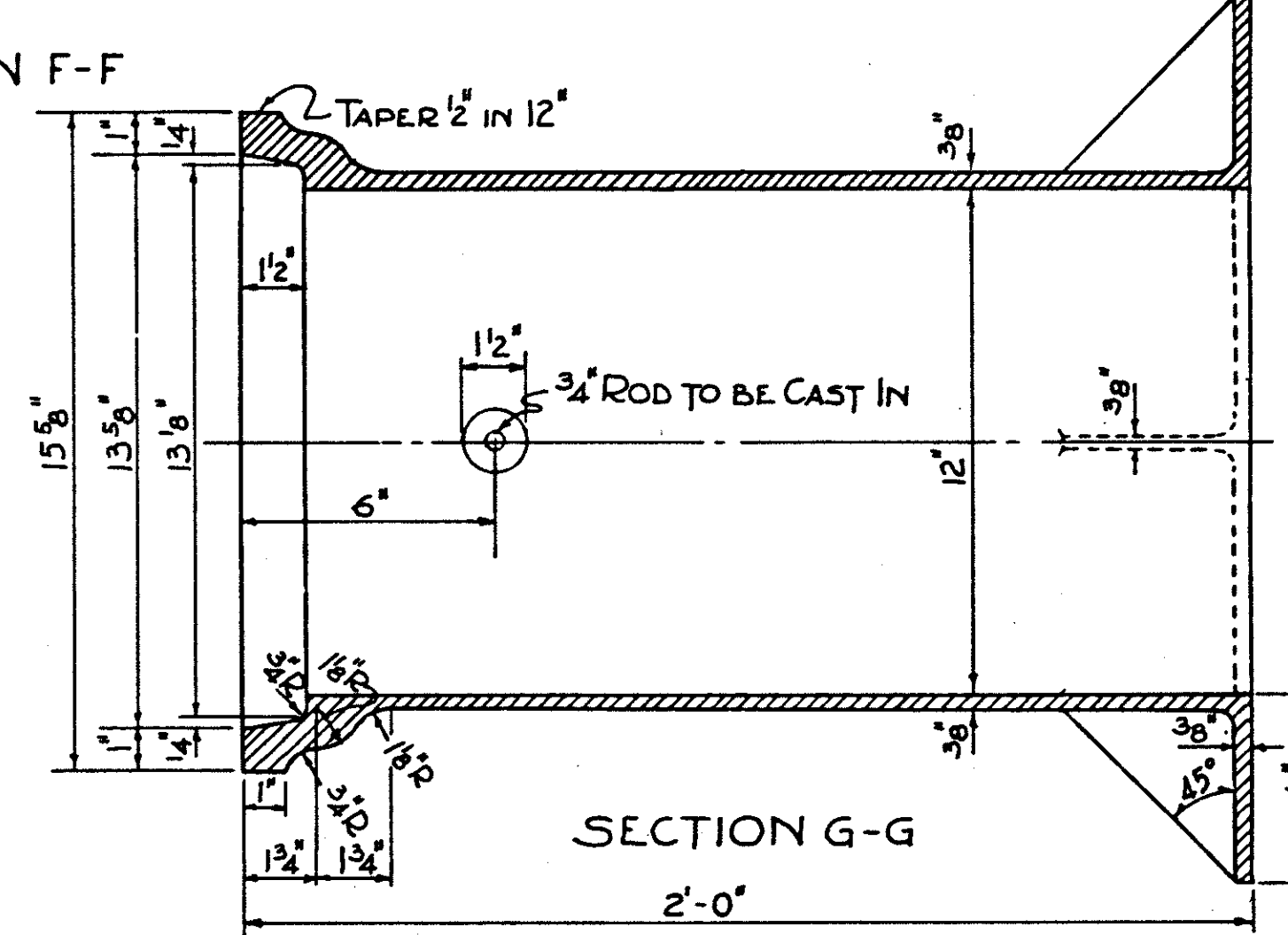
TOP WITH ROUND HEAD No.1 AND 2 EST. WEIGHT 73#

TOP WITH SQUARE HEAD No.3 AND 4 EST. WEIGHT 85#



SECTION F-F

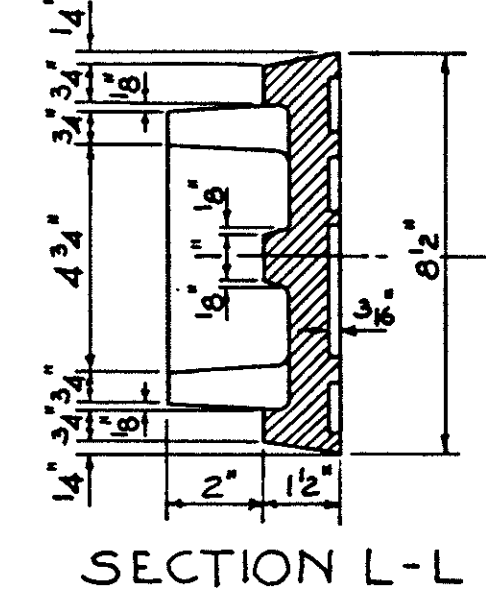
PLAN



SECTION G-G

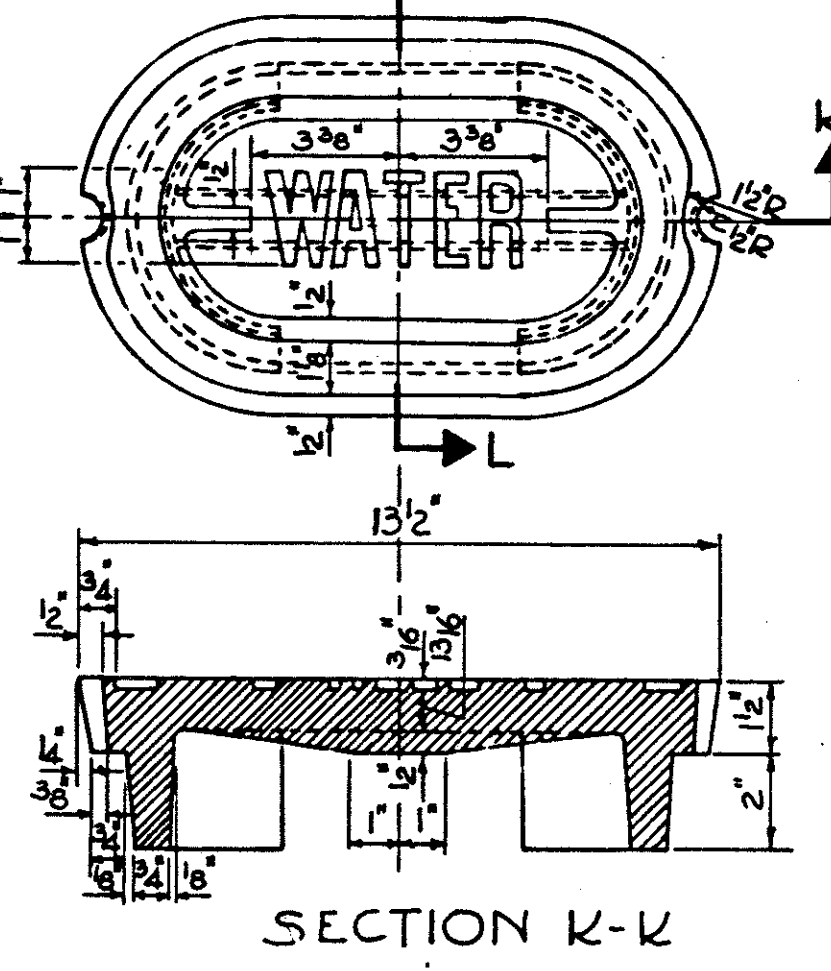
TOP EST. WEIGHT 128#

AIR RELIEF BOX No.5 IS TOP AND COVER
AIR RELIEF BOX No.6 IS TOP, BASE 2'-6" LONG AND COVER
FLUSHING BOX No.7 IS TOP, BASE 5'-0" LONG AND COVER



SECTION L-L

COVER EST. WEIGHT 37#



SECTION K-K

DETAIL OF AIR RELIEF BOX No.5 AND 6 AND FLUSHING BOX No.7

LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO

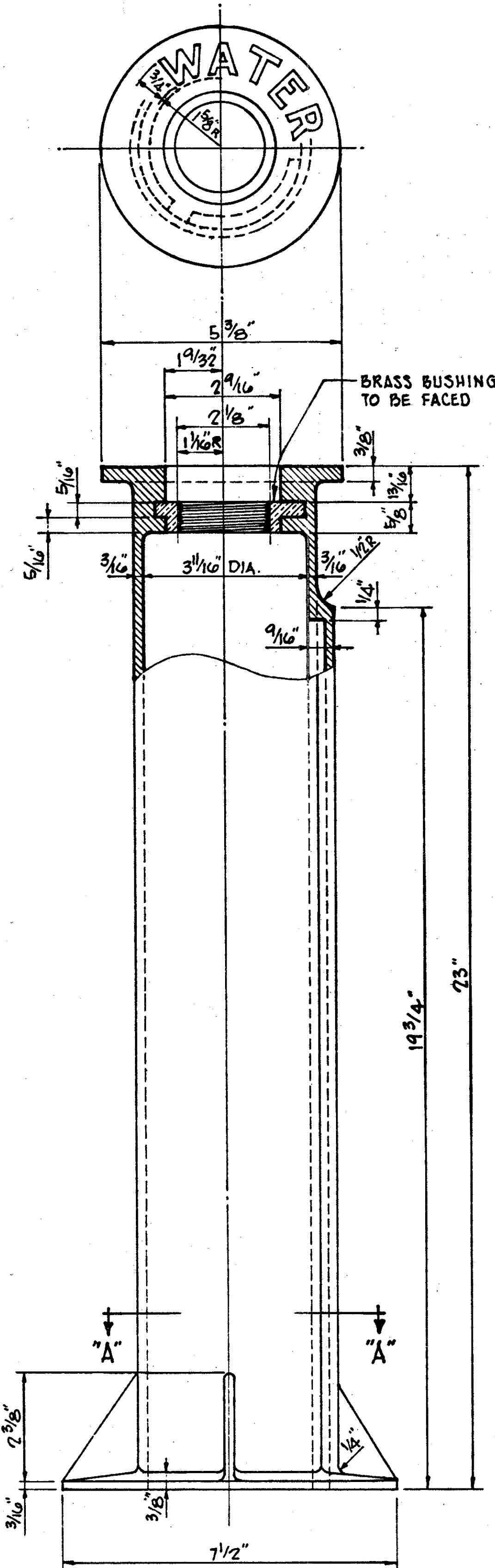
APPROVED *January 13, 1923*
Milton Fluey
DESIGN REVIEW ENGINEER

Roger P. Hyde 7/14/22
WESTON
DESIGNERS-CONSULTANTS

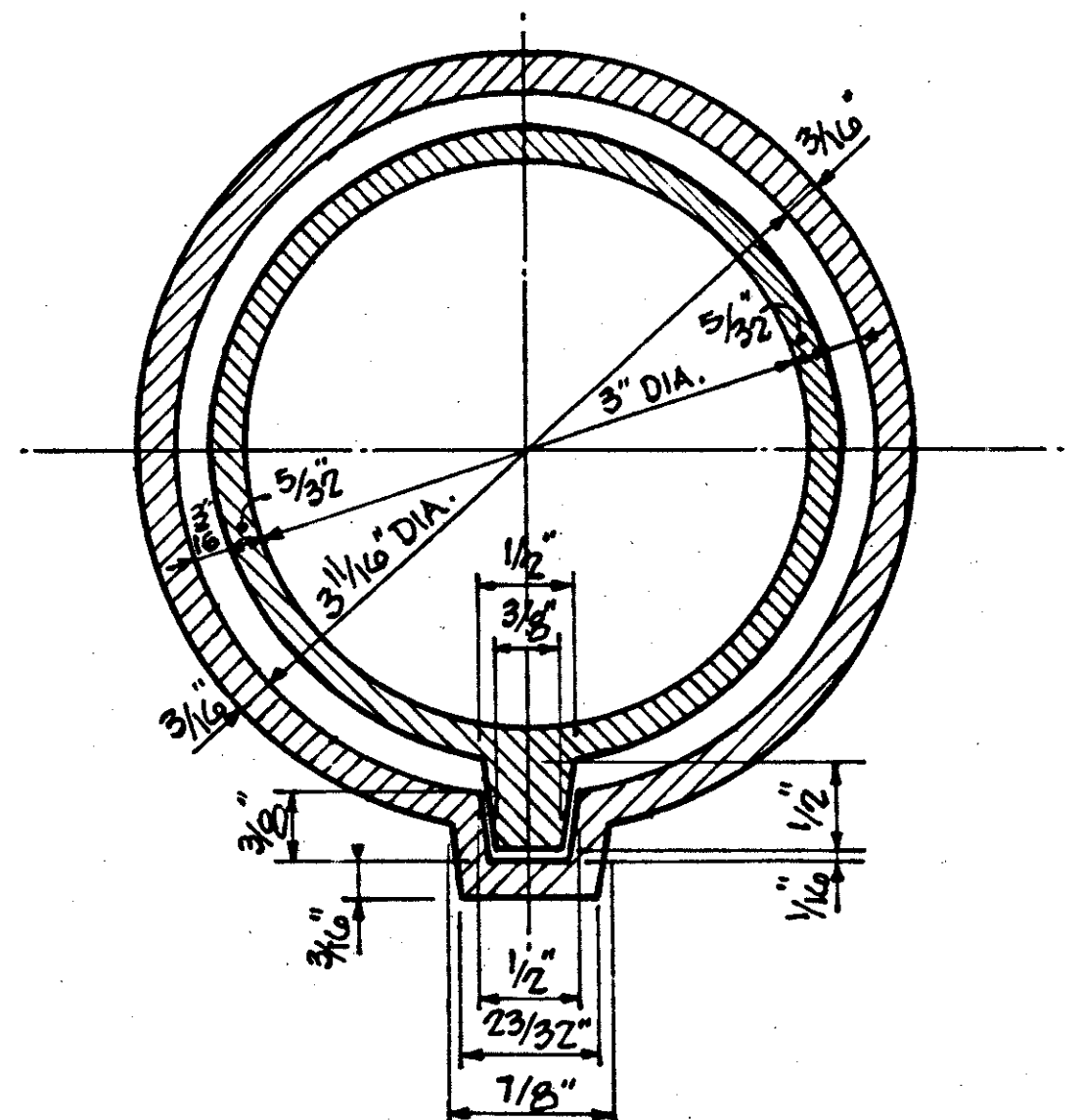
REPRODUCED FROM CITY OF CLEVELAND, DEPT. OF PUBLIC UTILITIES, DIVISION OF WATER AND HEAT DRAWING No. 5M 292

| | |
|------------------------------|----------|
| WESTON DESIGNERS-CONSULTANTS | |
| WATERWORK DETAILS | |
| VALVE AND AIR RELIEF BOXES | |
| SCALE | DATE |
| DESIGNED | DRAWN |
| TRACED | CHECKED |
| REVIEWED | DATE |
| REVISOR | REVISION |

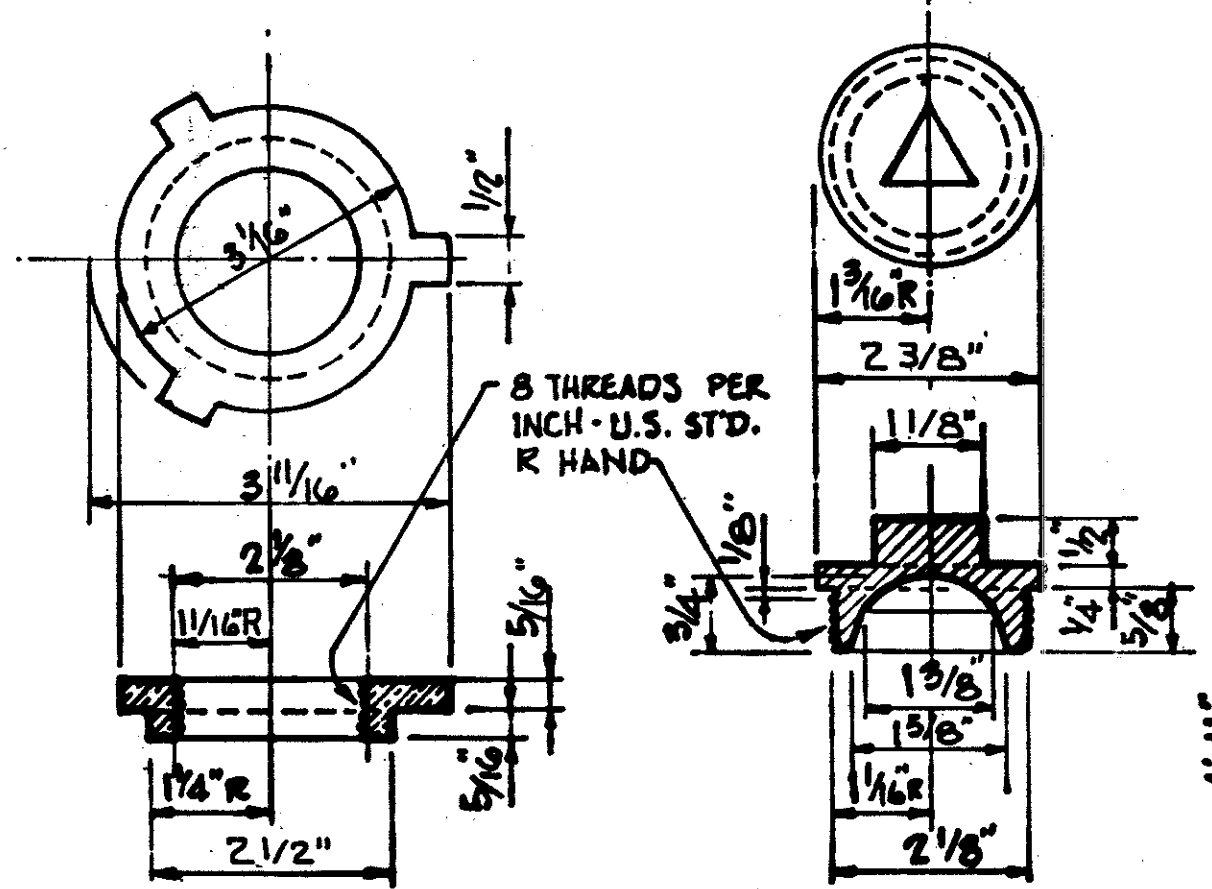
CONT. No. SHEET No. 11



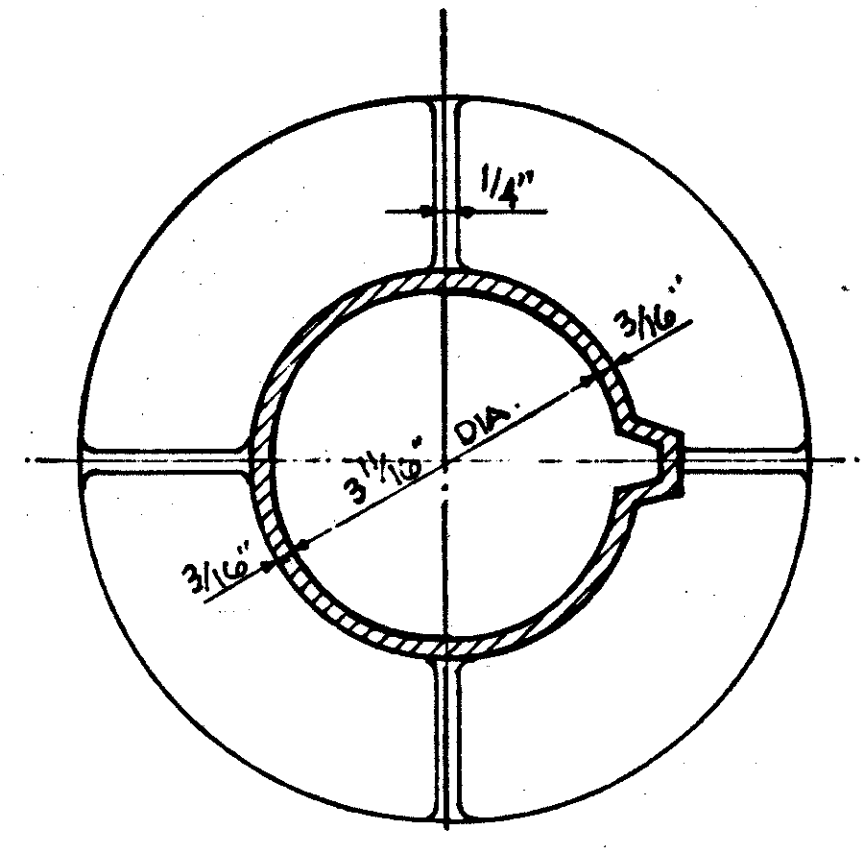
TOP PART OF STOP COCK BOX
SCALE: 6" = 1'-0" EST. WT. : 20.5 #



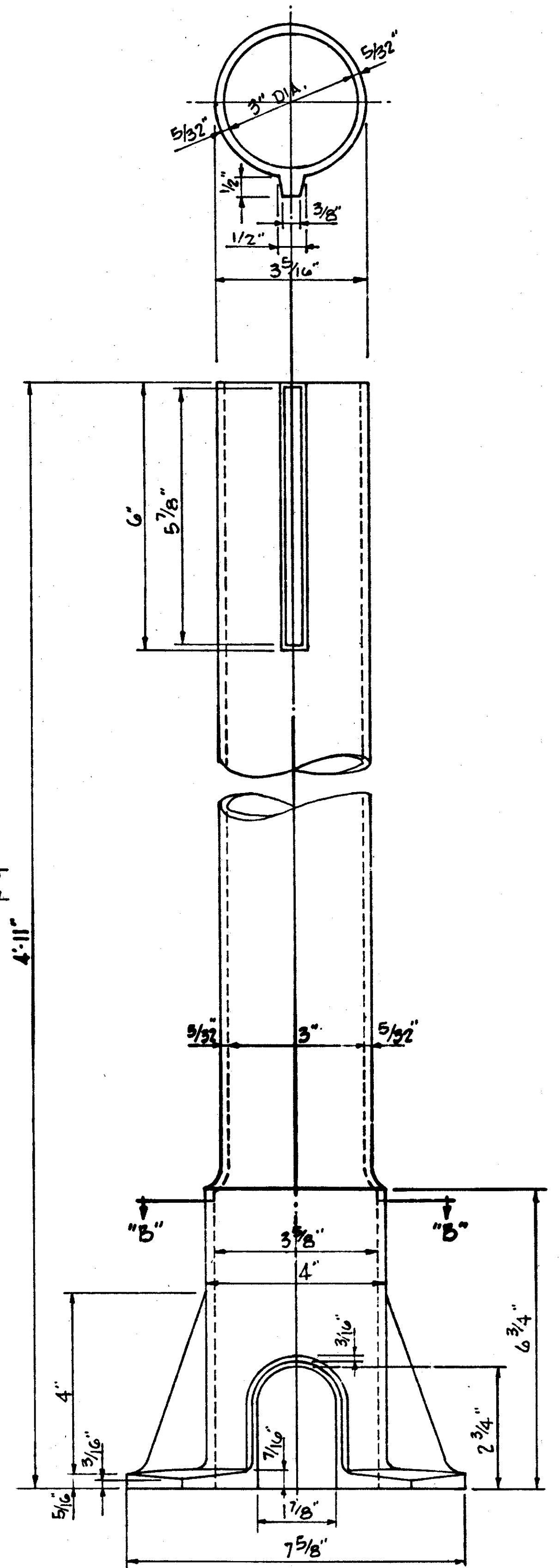
FULL SIZE SECTION



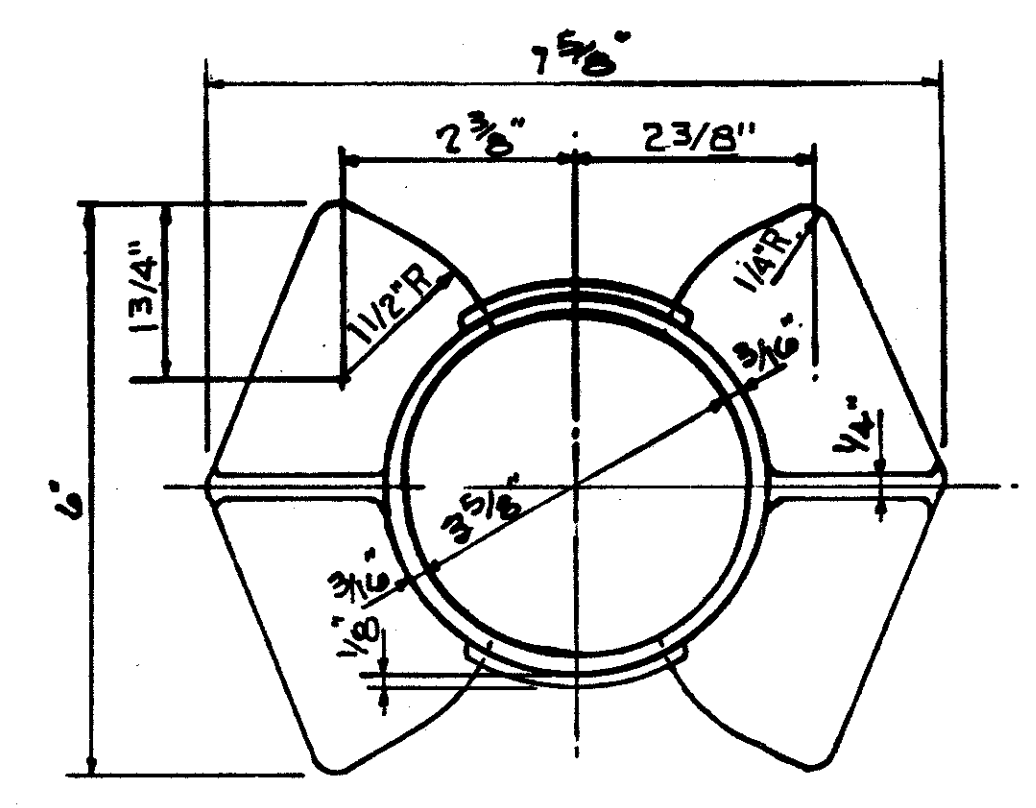
BRASS BUSHING SCALE: 6" = 1'-0" EST. WT. : 9.4 OZ.
CAST IRON PLUG SCALE: 6" = 1'-0" EST. WT. : 8 OZ.



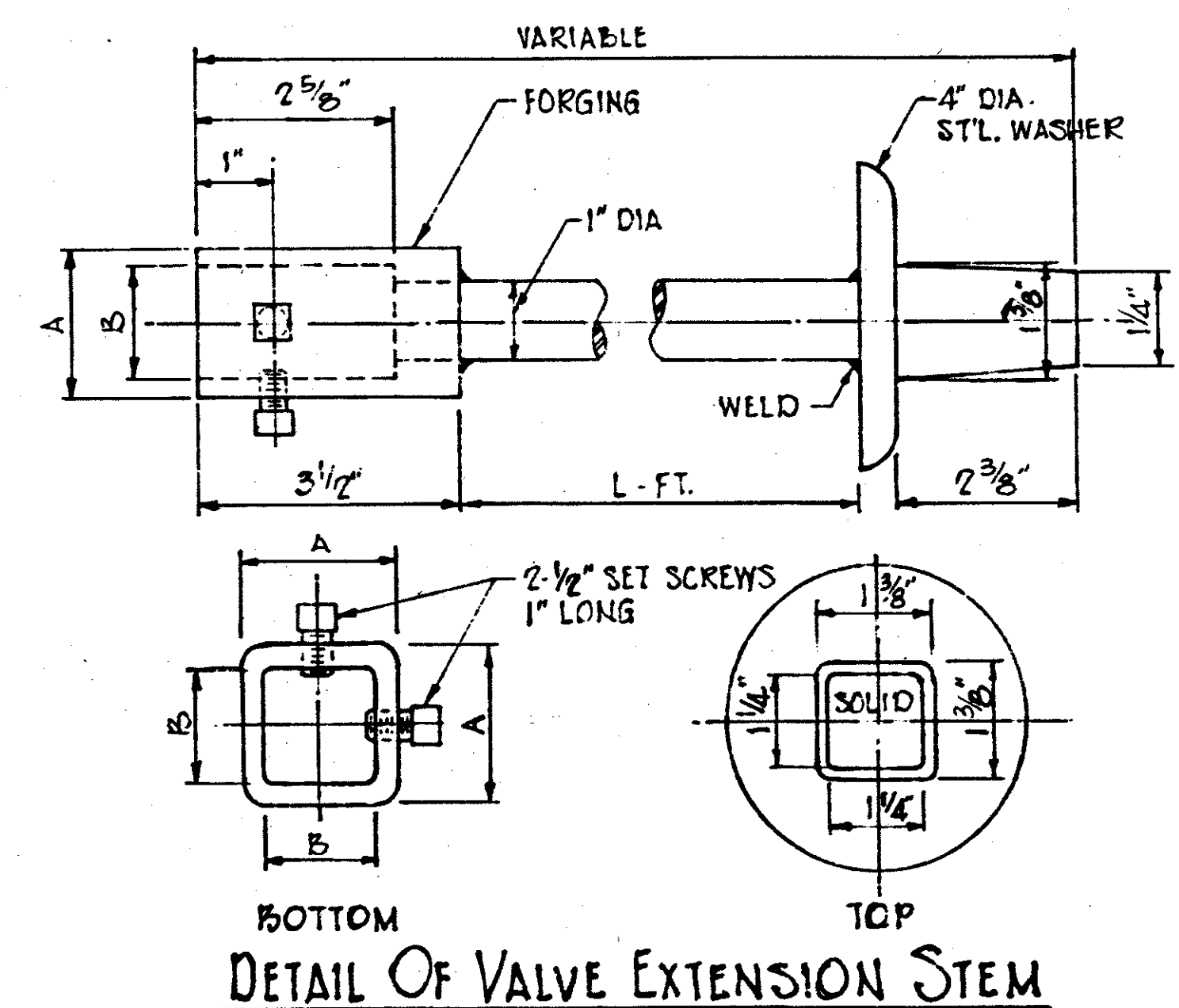
SECTION "A-A"
SCALE: 6" = 1'-0"



BOTTOM PART OF STOP COCK BOX
SCALE: 6" = 1'-0" EST. WT. : 29.5 #



SECTION "B-B"
SCALE: 6" = 1'-0"



DETAIL OF VALVE EXTENSION STEM
SCALE: 6" = 1'-0"

- NOTES:
- 1- VALVE NUTS TO BE COUNTERSUNK TO RECEIVE SET SCREWS
 - 2- EXTENSION STEM REQUIRED WHENEVER DEPTH TO TOP OF VALVE OPERATING NUT EXCEEDS 4'-0".

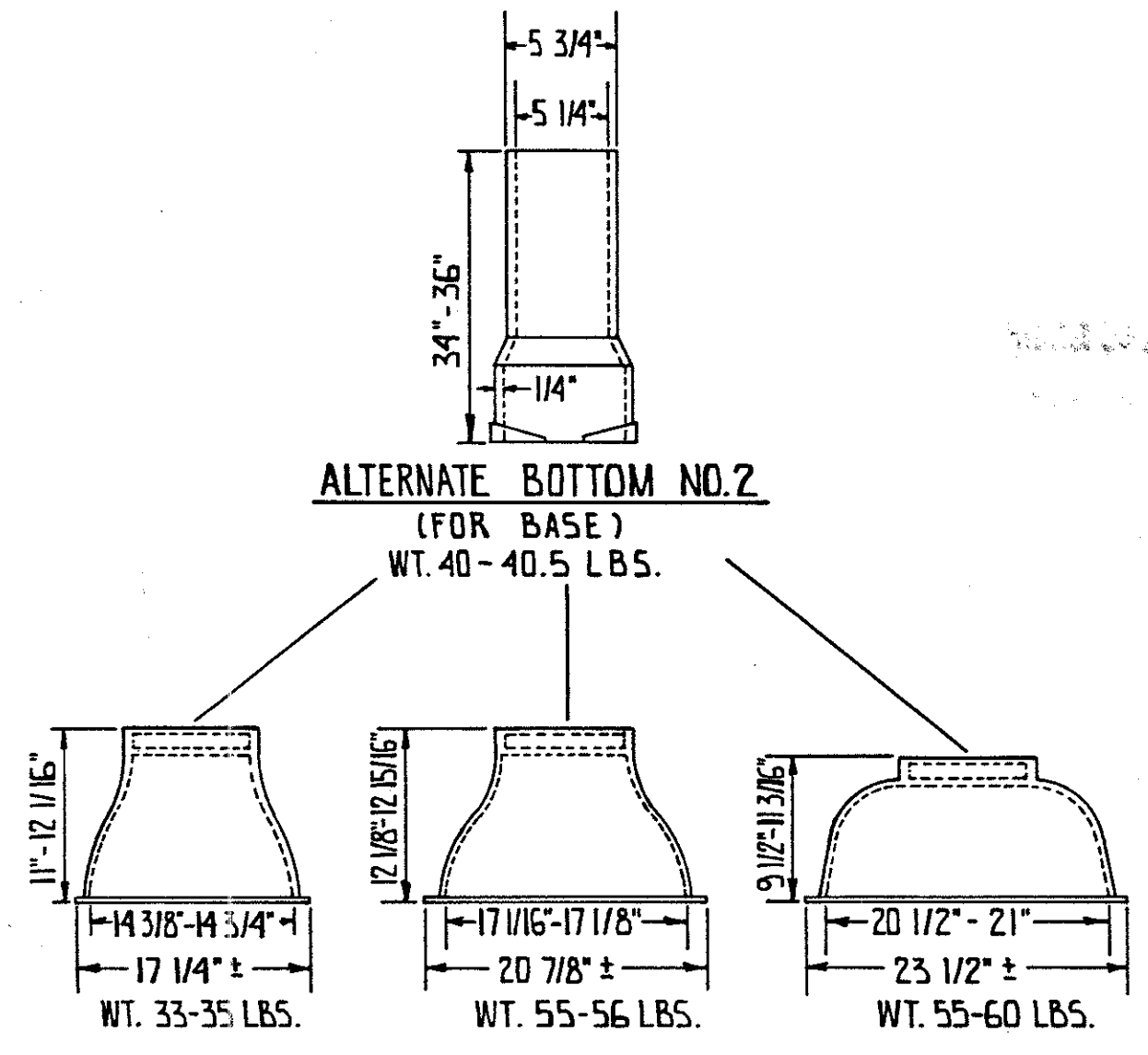
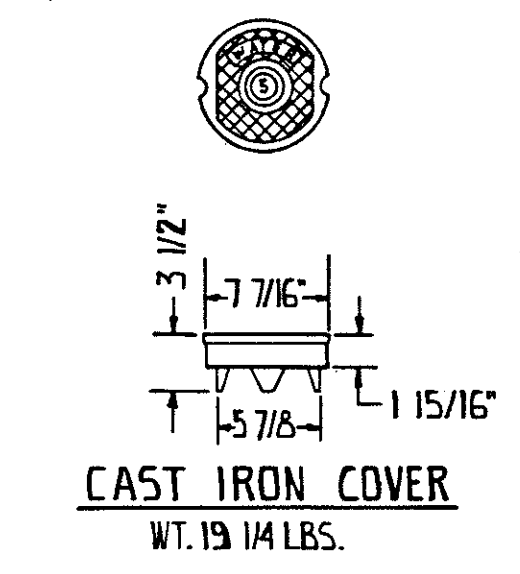
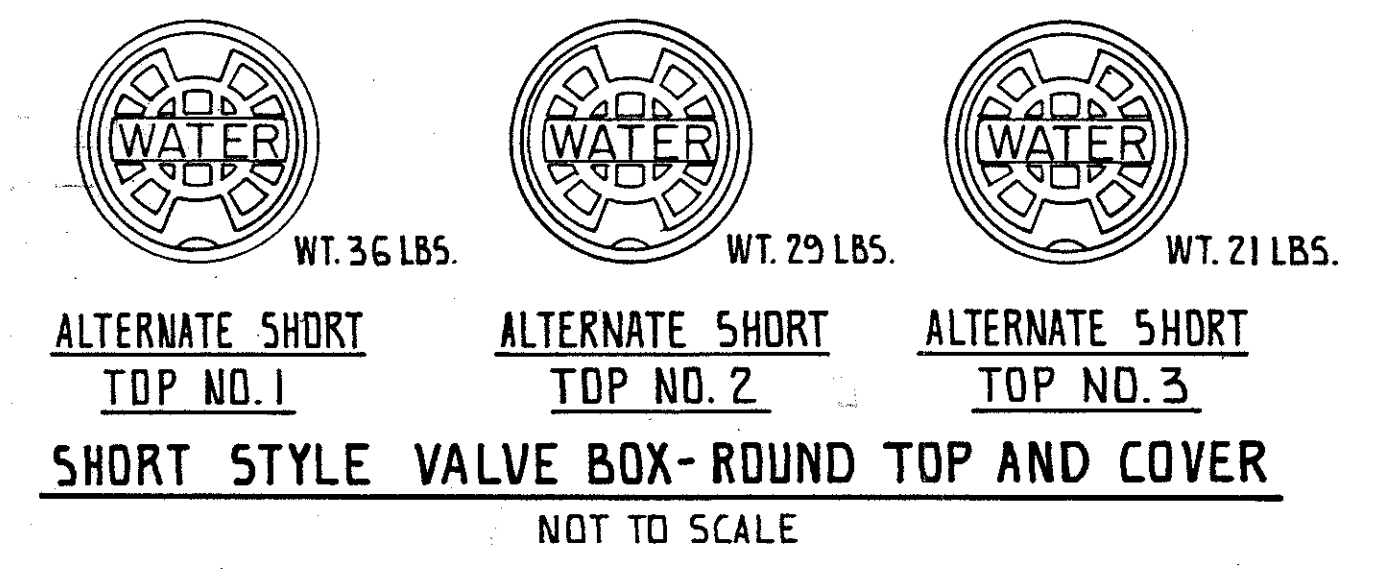
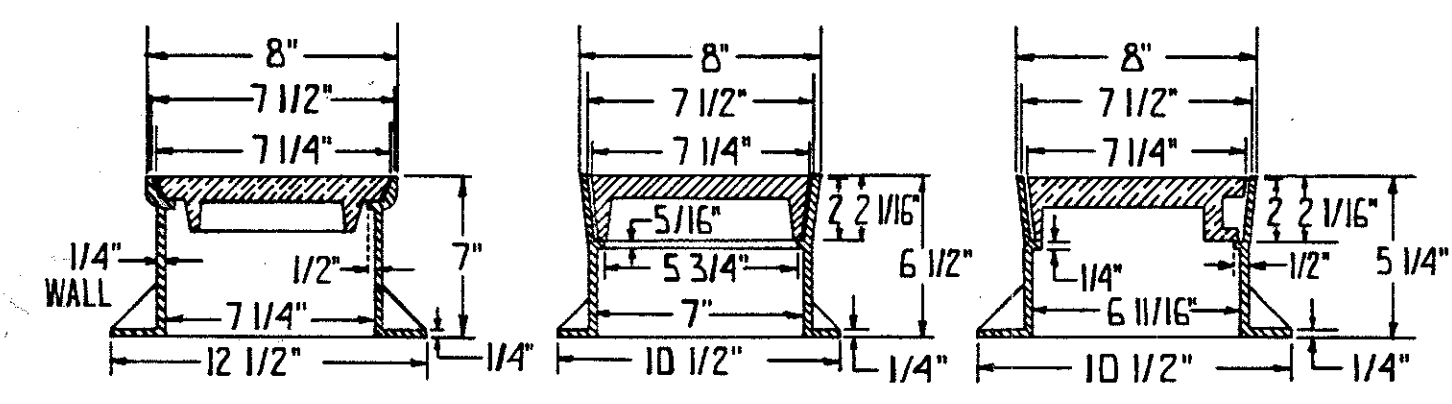
| VALVE SIZE | A | B | EST. WT. - LBS. |
|----------------|--------|--------|------------------|
| 2" AND SMALLER | 2" | 1 1/2" | 4.0# + 2.67" x L |
| 4" TO 20" | 2 1/2" | 2" | 5.8# + 2.67" x L |

CONT. No. SHEET ACCT. No.

• CURB STOP COCK BOX •
EST. WT. OF STOP COCK BOX COMPLETE: 51 #
COPIED FROM CLEVELAND WATER DEPARTMENT STD. DWG. C-447

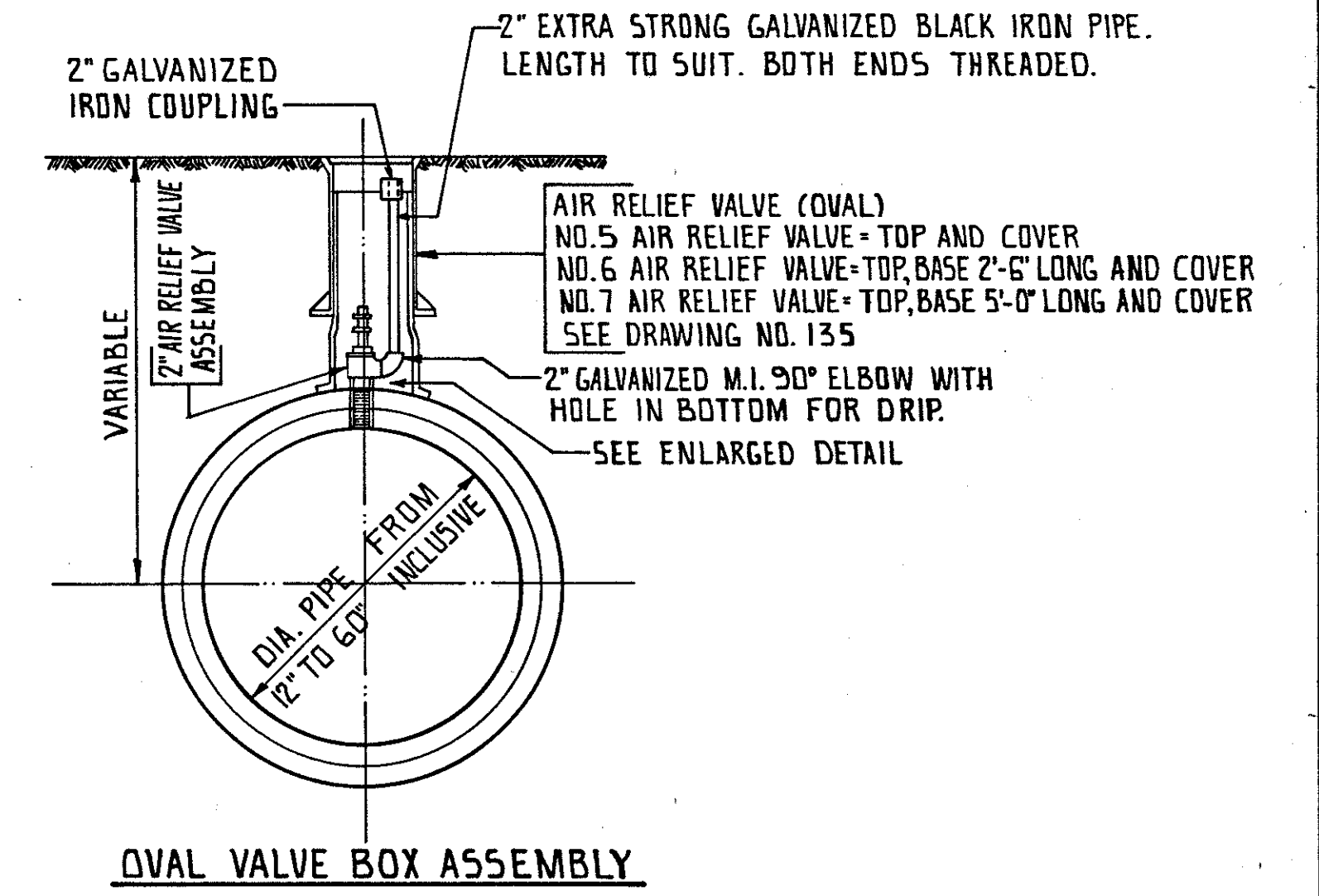
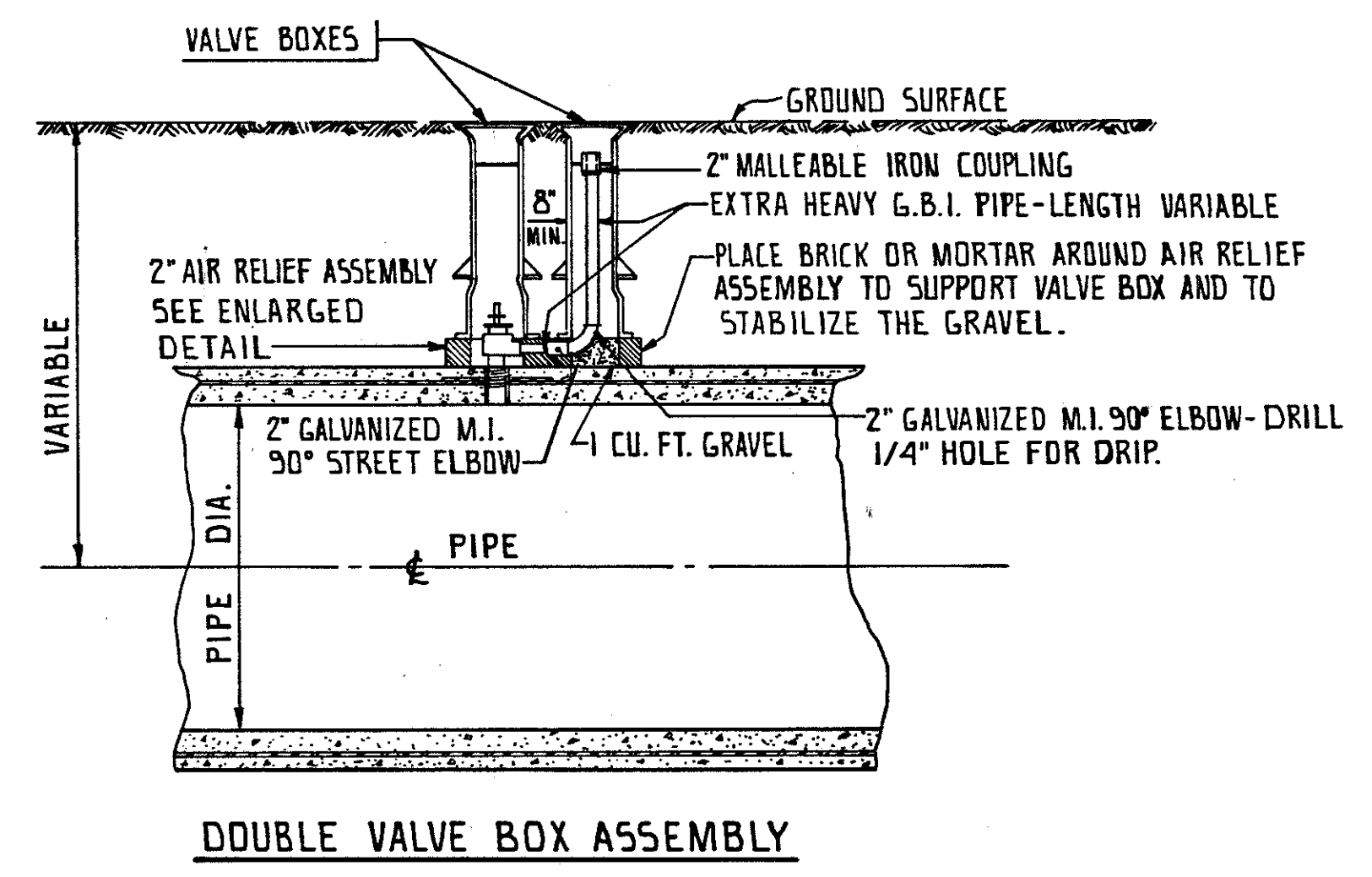
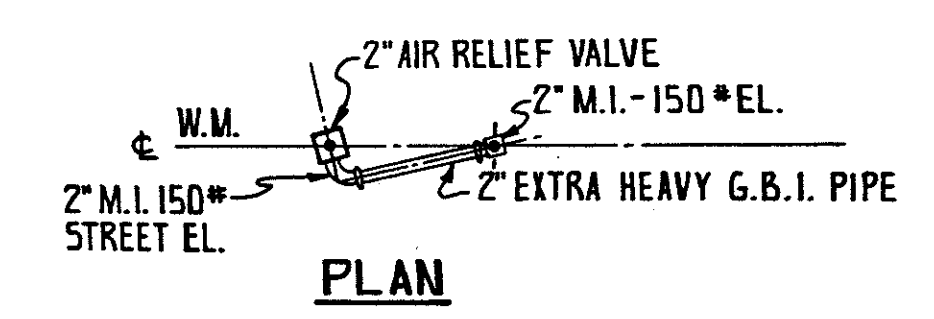
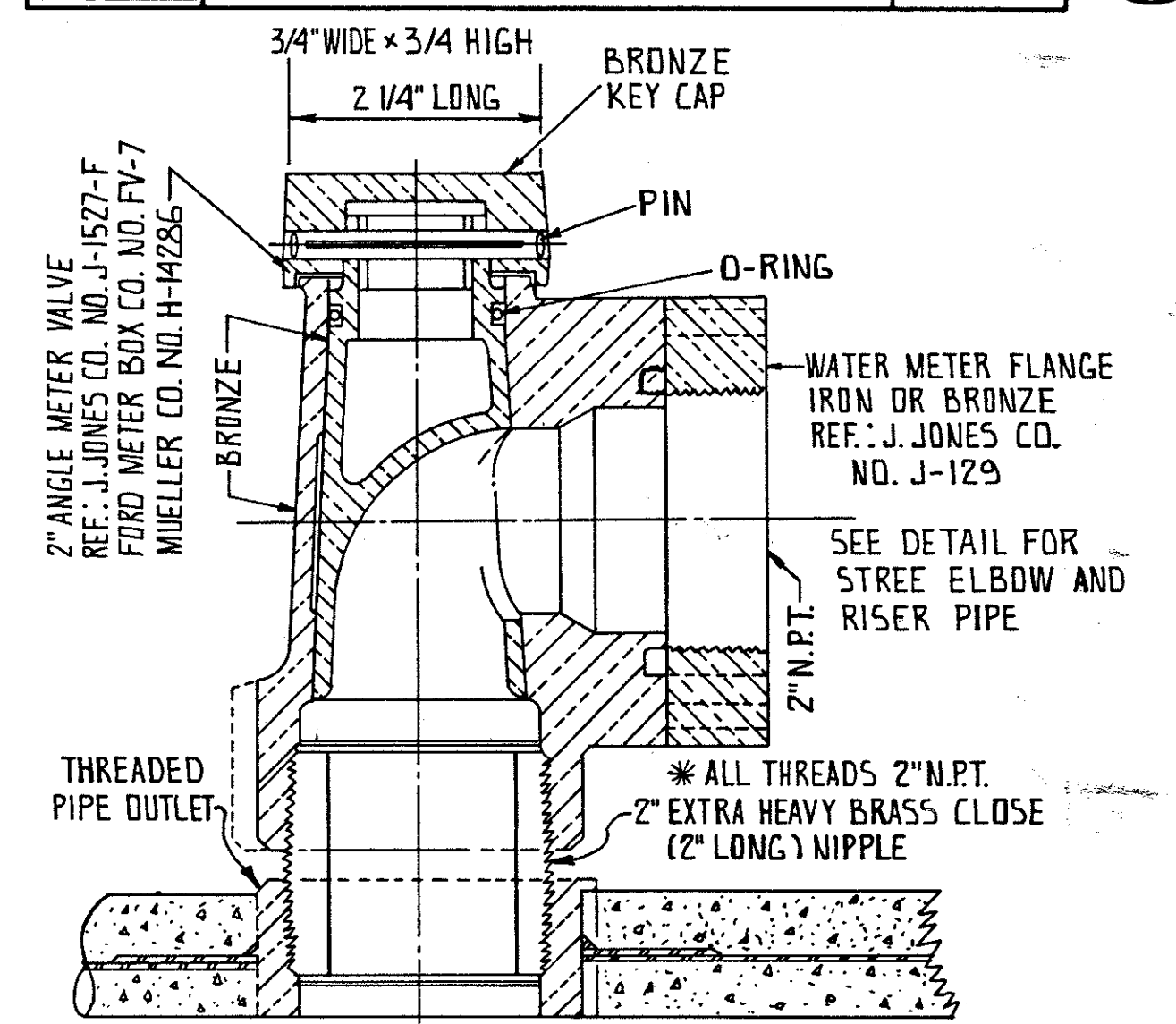
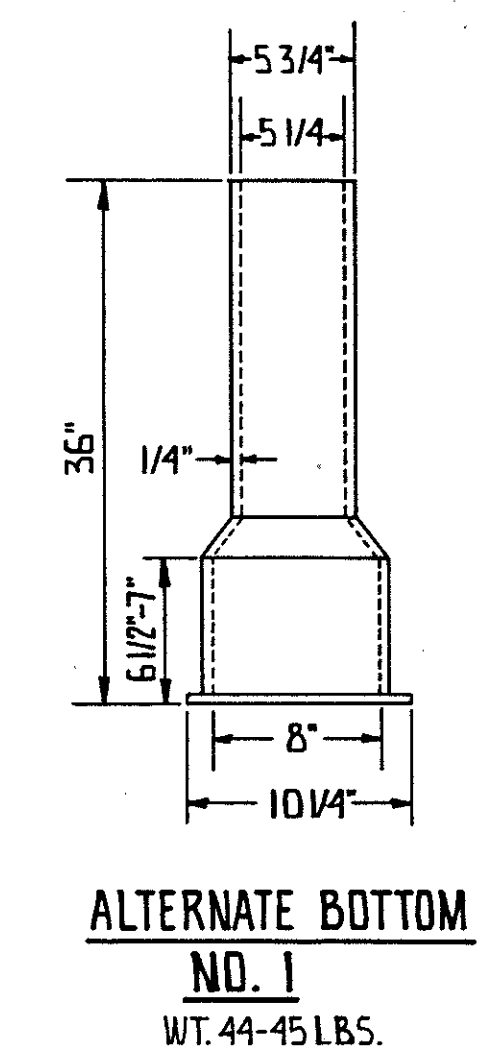
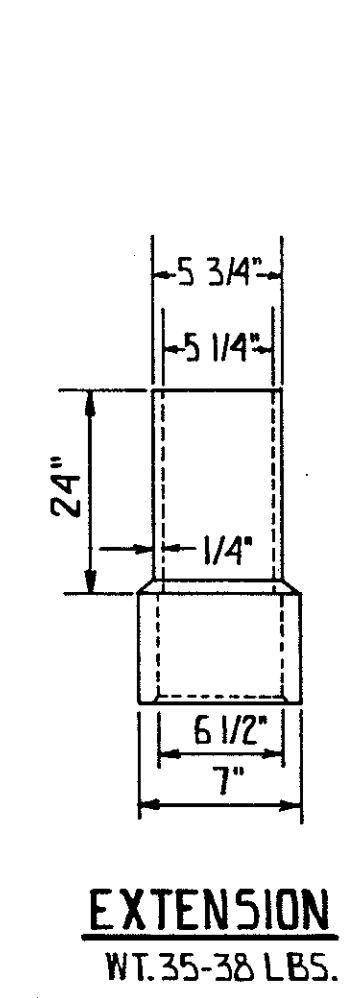
LOW SERVICE DISTRICT
DEPARTMENT OF PUBLIC UTILITIES
CLEVELAND, OHIO
APPROVED *January 13, 1983*
DESIGN REVIEW ENGINEER
Roger S. Lytle 7/16/82 WESTON DESIGNERS-CONSULTANTS

| | | | |
|---------------------------------|-------|--------|------------------|
| NO. | DATE | BY | REVISED |
| | | | |
| WESTON DESIGNERS-CONSULTANTS | | | |
| WATERWORK DETAILS | | | |
| SCALE: AS SHOWN | DATE | | |
| DESIGNED | DRAWN | TRACED | CHECKED REVIEWED |
| | JLD | | JRH |

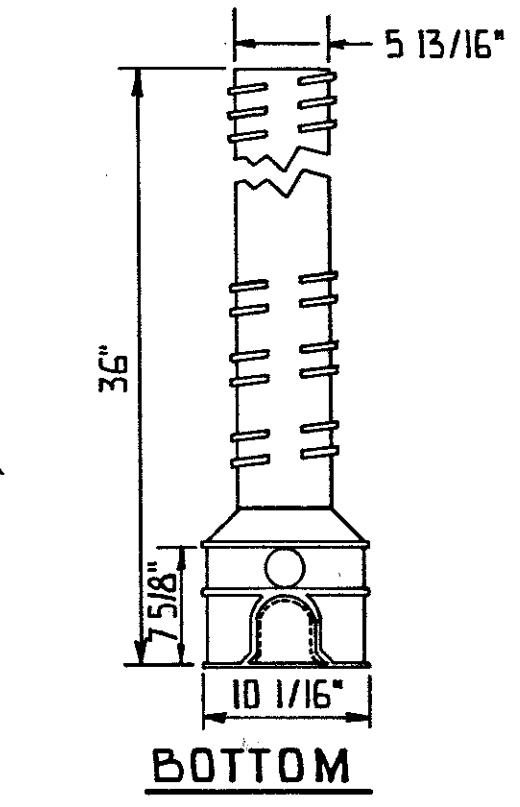
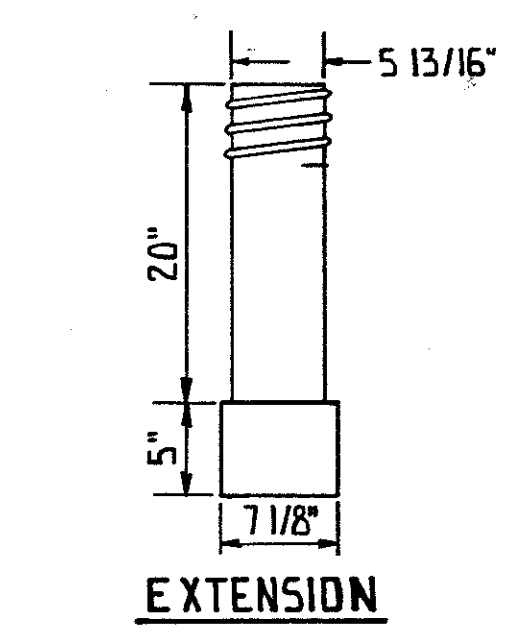
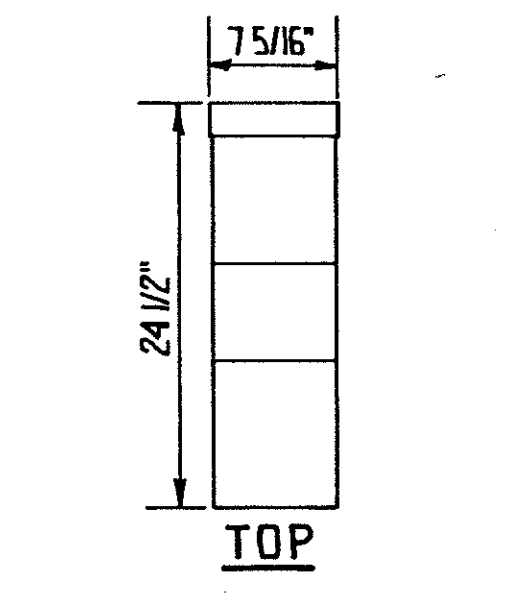
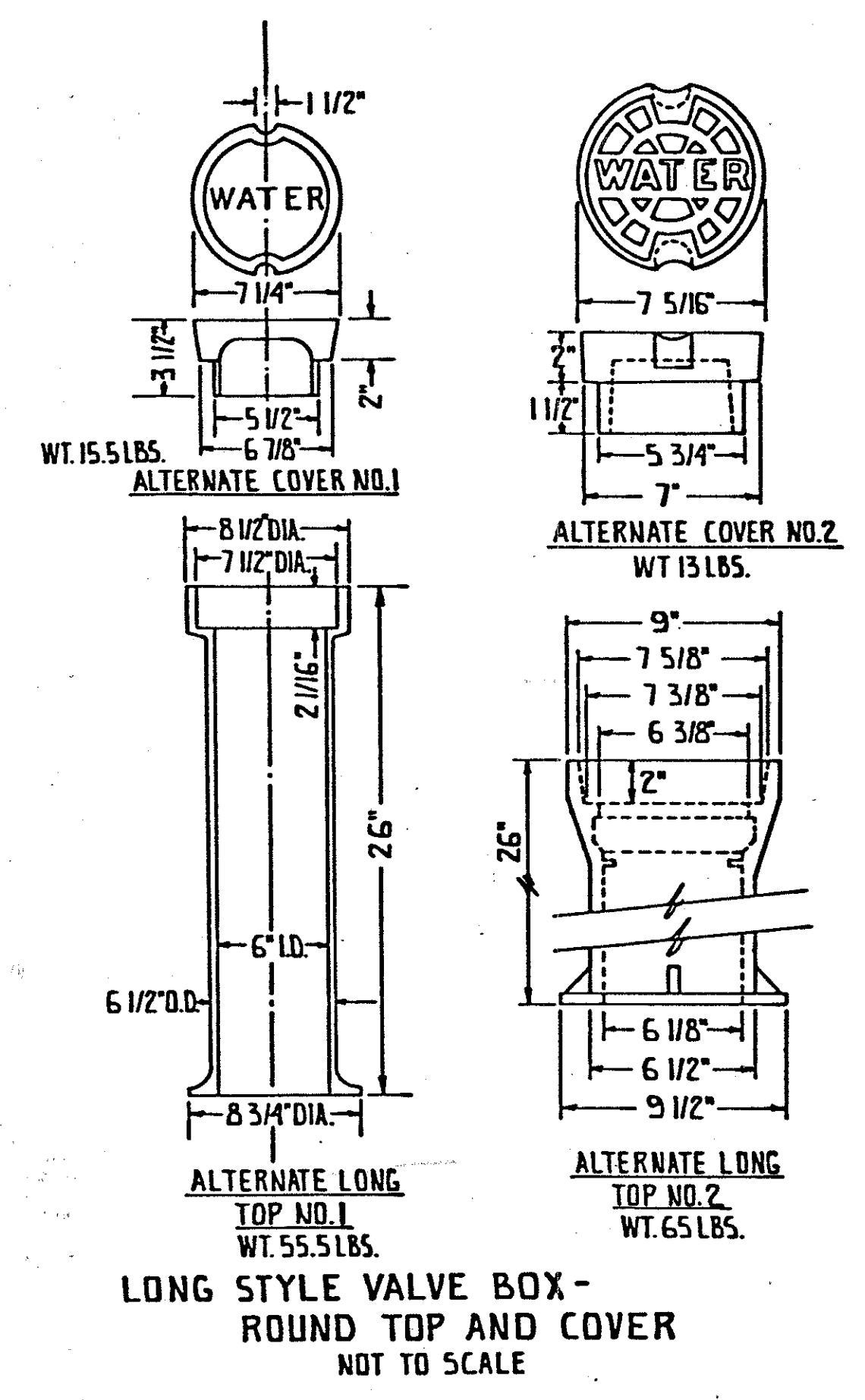


VALVE BOX BOTTOMS AND EXTENSIONS
 NOT TO SCALE

VALVE BOX DRAWINGS REPRODUCED FROM CITY OF CLEVELAND WATER DEPARTMENT STANDARD SKETCHES NO. SK-1236-A, SK-1236-B, SK-1236-C, AND SK-1236-D.



DETAIL OF 2" AIR RELIEF VALVE INSTALLATION
 NOT TO SCALE



PLASTIC VALVE BOX
 WITH POLYIRON TOP SECTION, CAST IRON FULL FLANGED RING, AND CAST IRON COVER.
 NOT TO SCALE

LOW SERVICE DISTRICT
 DEPARTMENT OF PUBLIC UTILITIES
 CLEVELAND, OHIO

APPROVED *January 13, 1982*
 DESIGN REVIEW ENGINEER

Robert Hyde 7/16/82
 WESTON DESIGNERS-CONSULTANTS

WESTON
 DESIGNERS - CONSULTANTS
 A BUSINESS TRUST
 3659 GREEN ROAD CLEVELAND, OHIO 44122

WATERWORK DETAILS

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| PRB | | | JRH | | | |

GENERAL NOTES
LIGHTING

CALC.
BY
DATE
CHKD.
BY
DATE

CUY-490-1.49

OHIO
FHWA
REGION 5

140
261

QUANTITIES CARRIED TO
GENERAL SUMMARY

SPECIFICATIONS

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

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

GENERAL

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

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

CLEVELAND ELECTRIC ILLUMINATING COMPANY (C.E.I.)
P.O. BOX 5000, 55 PUBLIC SQUARE, CLEVELAND, OHIO 44101
CIRCUIT "BOW", FROM:
CITY OF CLEVELAND
DIVISION OF LIGHT & POWER
1201 LAKESIDE AVENUE, CLEVELAND, OHIO 44114

THE CONTRACTOR WILL NOT BE REQUIRED TO FURNISH OR INSTALL THE PRIMARY DISTRIBUTION LINES, TRANSFORMERS, TRANSFORMER POLE, PHOTOCCELL, ARRESTERS OR LINE FUSES. THE CONTRACTOR SHALL PROVIDE CONNECTION TO BRANCH CIRCUITS AND GROUNDS AS HEREINAFTER SPECIFIED, AND SHALL ASSURE THAT ALL POWER SERVICE REQUIREMENTS WITH THE POWER SUPPLYING AGENCY ARE PROVIDED.

THIS PROJECT HAS BEEN DESIGNED ON THE BASIS OF A 5% MAXIMUM VOLTAGE DROP IN ALL BRANCH CIRCUITS.

REVIEW, INSPECTION AND MAINTENANCE OF EXISTING ROADWAY AND SIGN LIGHTING FACILITIES

BEFORE ANY WORK IS STARTED ON THIS PROJECT, REPRESENTATIVES OF THE STATE, CITY AND THE CONTRACTORS SHALL MAKE A VISUAL INSPECTION OF THE EXISTING ROADWAY AND SIGN LIGHTING SYSTEMS WITHIN THE PROJECT WORK LIMITS. RECORDS OF THIS INSPECTION AS TO POLE, SIGN AND CIRCUIT OUTAGES SHALL BE KEPT IN WRITING BY THE STATE.

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTINUOUSLY MAINTAIN THE EXISTING ROADWAY AND SIGN LIGHTING SYSTEMS WHICH HAVE BEEN INSPECTED AND DETERMINED OPERATIONAL BY THE ABOVE PARTIES, AND SHALL MAINTAIN SUCH SYSTEMS (EXCEPT THE REPLACEMENT OF KNOCKED-DOWN POLES) UNTIL THE NEW LIGHTING FACILITIES HAVE BEEN INSTALLED AND APPROVED, AND THE HIGH VOLTAGE TEST 839 IS ACCOMPLISHED. THEN, SUBJECT TO THE APPROVAL OF THE ENGINEER, ANY EXISTING CIRCUIT (S) MAY BE DISCONNECTED AND THE NEW ROADWAY AND SIGN LIGHTING CIRCUIT (S) ACTIVATED.

BASIS OF PAYMENT SHALL BE AT THE LUMP SUM BID PRICE FOR ITEM SPECIAL "MAINTAINING EXISTING LIGHTING" WHICH SHALL BE FULL COMPENSATION FOR FURNISHING ALL LABOR, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ITEM OF WORK.

ELECTRICAL SERVICE FOR ILLUMINATED SIGNS

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

STANDARD CONSTRUCTION DRAWING HL-3

POLE BASE DETAILS SHOWN ON THIS DRAWING ARE ESSENTIALLY FOR GALVANIZED STEEL POLES. FOR ALUMINUM DESIGN, OR OTHER PERMITTED STEEL MATERIAL DESIGNS, VARIATIONS FROM THESE DETAILS WILL BE ACCEPTABLE, AS APPROVED BY THE ENGINEER.

CONDUIT ON STRUCTURE

EXPANSION FITTINGS FOR CONDUIT ON STRUCTURES SHALL BE OZ TYPE AX, CROUSE-HINDS XJ-4, APPLETON TYPE XJ-4, OR EQUAL APPROVED BY THE ENGINEER. EACH EXPANSION FITTING SHALL HAVE A COPPER EXTERNAL BONDING JUMPER, FOR BRIDGE NO. CUY-490-0152.

LAMPS-HIGH PRESSURE SODIUM (HPS)

SUPPLEMENTING 713.14 OF THE SPECIFICATIONS, HIGH PRESSURE SODIUM (HPS) LAMPS SHALL BE OF THE WATTAGE INDICATED IN THE PLANS AND SHALL BE GENERAL ELECTRIC "LUCALOX", WESTINGHOUSE "CERAMALUX", SYLVANIA "LUMALUX", OR EQUAL AS APPROVED BY THE ENGINEER.

TOWER LUMINAIRES

LUMINAIRES FOR TOWER LIGHTING SHALL HAVE A SINGLE RATED 480 VOLT REGULATOR TYPE, 1000 WATT BALLAST DESIGNED FOR USE WITH A 1000 WATT HIGH PRESSURE SODIUM LAMP, AND SHALL CONFORM TO THE PHOTOMETRIC REQUIREMENTS FOR THE LIGHT, DISTRIBUTION, AS SPECIFIED.

625.07 - 717.13 UNDERPASS LUMINAIRES

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

SERVICE TO UNDERPASS LIGHTING

THIS ITEM SHALL CONSIST OF PROVIDING COMPLETE ELECTRICAL SERVICE, EXCEPT FOR LUMINAIRES, LAMPS AND STRUCTURE GROUNDING, FOR AN UNDERPASS LIGHTING SYSTEM ON BRIDGES WHERE SHOWN IN THE PLANS.

THE INSTALLATION WORK SHALL INCLUDE CONDUITS, CONDUIT GROUNDING, MOUNTINGS, FITTINGS, JUNCTION BOXES, CABLES, SECONDARY SERVICE EQUIPMENT (713.19 (10) AND ALL INCIDENTALS NECESSARY TO COMPLETE THIS ITEM OF WORK, READY FOR USE WITH THE SERVICE AS DETAILED IN THE PLANS. COMPONENT PARTS NOT SPECIFICALLY MENTIONED BUT REQUIRED FOR SATISFACTORY OPERATION OF THIS ITEM SHALL BE FURNISHED AND CONSIDERED PAID FOR AS PART OF THE ITEM.

THE LUMP SUM PRICE BID FOR ITEM SPECIAL "SERVICE TO UNDERPASS LIGHTING, AS PER PLAN," SHALL INCLUDE PAYMENT FOR ALL EQUIPMENT, LABOR AND MATERIALS NECESSARY TO COMPLETE THE WORK AS SPECIFIED, COMPLETE, TESTED AND ACCEPTED.

BYPASS SWITCH

A 20 AMPERE BYPASS SWITCH RATED AT 240 VOLTS, COMPLETE WITH WIRE AND CONDUIT, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. FOR CIRCUIT "BRO" THE CLEVELAND ELECTRIC ILLUMINATING COMPANY WILL MAKE FINAL CONNECTION TO THE SWITCH FOR MANUAL BYPASS CONTROL OF THEIR LIGHTING CONTROLLER.

FOR CIRCUIT "BOW," THE CITY OF CLEVELAND, DIVISION OF LIGHT AND POWER WILL MAKE FINAL CONNECTION TO THE SWITCH FOR MANUAL BYPASS CONTROL OF THEIR LIGHTING CONTROLLER.

BASIS OF PAYMENT SHALL BE INCLUDED IN ITEM 625 "CONTROL CENTER BY DESIGNATION."

PADLOCKS AND KEYS

EACH TOWER AND EACH ENCLOSURE SHALL BE FURNISHED WITH A PADLOCK. PADLOCKS SHALL BE EITHER BRASS OR BRONZE EQUAL TO MASTER NO. 4 BKA OR WILSON BOHANNAN 660A AND SHALL BE KEYED IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION 631.08, PARAGRAPH 3. PAYMENT WILL BE INCLUDED IN THE BID FOR ITEM (S) BEING LOCKED.

ITEM SPECIAL - PLASTIC CAUTION TAPE

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

THE TAPE SHALL BE PAID PER LINEAR FEET OF "ITEM SPECIAL - PLASTIC CAUTION TAPE," COMPLETE AND IN PLACE.

625.02 HAZARDOUS MATERIALS

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

EXISTING CIRCUIT CABLE AND ACCESSORIES, TO BE REMOVED

ALL EXISTING CIRCUIT CABLE AND ACCESSORIES ARE TO BE REMOVED FROM EXISTING CROSSOVERS AND DUCTS BETWEEN PULLBOXES TO ALLOW NEW CIRCUIT CABLE TO BE INSTALLED. ALL CONNECTOR KITS ARE THE PROPERTY OF THE STATE AND ARE TO BE REMOVED WITHOUT UNNECESSARY DAMAGE, STORED SAFELY ON THE PROJECT, AND RETURNED TO STATE FORCES AS DIRECTED BY THE ENGINEER. ALL REMOVED CIRCUIT CABLE SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

BASIS OF PAYMENT FOR THIS ITEM OF WORK SHALL BE INCLUDED IN THE UNIT BID PRICE FOR 625 "DISTRIBUTION CABLE, BY TYPE."

EXISTING LIGHT POLE AND FOUNDATION, TO BE REMOVED

SUPPLEMENTING ITEM 202 OF THE SPECIFICATIONS, THE CONTRACTOR SHALL REMOVE EXISTING ROADWAY LIGHTING UNITS, POLES, FOUNDATIONS AND ADJACENT PULLBOXES UNLESS OTHERWISE NOTED.

THE CONTRACTOR SHALL CAREFULLY REMOVE AND STORE ON THE PROJECT, AT THE LOCATION SPECIFIED BY THE ENGINEER, THE LAMP AND LUMINAIRE ASSEMBLY FROM EACH LIGHT POLE UNIT, ALL TRANSFORMER BASES AND CONNECTOR KITS, AND CERTAIN POLES, BRACKET ARMS AND OTHER ITEMS DEEMED SALVAGEABLE BY THE ENGINEER. ALL REMAINING ITEMS REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR. CIRCUIT CABLE IS TO BE ABANDONED IN PLACE OR REMOVED AS DIRECTED IN THE PLANS. FOUNDATIONS TO BE REMOVED MAY BE REMOVED EITHER COMPLETELY OR TO NOT LESS THAN ONE FOOT BELOW FINISHED GRADE. PULLBOXES ARE TO BE ABANDONED IN PLACE IN THE MANNER DESCRIBED IN 202.09 AND BACKFILL IN ACCORDANCE WITH 202.02.

UPON REMOVAL OF LIGHT POLES ON STRUCTURES, PROTRUDING STRUCTURE CONDUIT SHALL BE TRIMMED AT THE STRUCTURE AND A 1/4" GALVANIZED STEEL OR ALUMINUM COVER PLATE, FITTING THE EXISTING LIGHT POLE MOUNTING BOLT PATTERN, GASKETED OR CAULKED AND INSTALLED OVER THE OPENING. EXCESS BOLT MATERIAL SHALL BE TRIMMED AT THE NUT.

SALVAGEABLE LIGHTING MATERIAL REMOVED BY THE CONTRACTOR SHALL BE DELIVERED TO THE RESPECTIVE OWNERS, AS DESIGNATED IN THE PLANS, AT THE FOLLOWING ADDRESS:

OHIO DEPARTMENT OF TRANSPORTATION
MR. JOSEPH MORAN, DISTRICT LIGHTING ENGINEER
WARRENSVILLE HEIGHTS YARD
25609 EMERY ROAD
WARRENSVILLE HEIGHTS, OHIO 44128

CITY OF CLEVELAND, DIVISION OF LIGHT AND POWER
MR. GENE BABICH, CHIEF OF STREET LIGHTING
WEST 41ST STREET AND BUCKLEY AVENUE
CLEVELAND, OHIO 44113

THE CONTRACTOR SHALL NOTIFY EACH OWNER, ONE WEEK PRIOR TO DELIVERY.

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

ITEM 202 - EXISTING LIGHTING UNIT, TO BE REMOVED

ITEM 202 - EXISTING LIGHTING UNIT (STRUCTURE MOUNTED), TO BE REMOVED, AS PER PLAN INCLUDING ALL LABOR, MATERIAL, EQUIPMENT AND INCIDENTALS TO COMPLETE THE ITEM OF WORK AND ACCEPTED AS SPECIFIED.

ITEM 202 - EXISTING FOUNDATIONS, TO BE REMOVED

EXISTING UNDERPASS LIGHTING SYSTEM, TO BE REMOVED

SUPPLEMENTING ITEM 202 OF THE SPECIFICATIONS, THE CONTRACTOR SHALL REMOVE ALL EXISTING UNDERPASS LIGHTING UNITS, FIXTURES, BRACKETS, HANGERS, JUNCTION BOXES, CONDUIT, WIRE, AND OTHER MATERIALS OF THE INSTALLATION ON BRIDGES NO. CUY-77-1436C, NO. CUY-77-1438B, CUY 77-1439B, NO. CUY-77-1440A, CUY-77-1441A AND CUY-254-1893.

EXISTING CONTROL CABINETS SHALL REMAIN IN PLACE AND BE MODIFIED FOR USE WITH THE PROPOSED NEW UNDERPASS LIGHTING SYSTEM. BASIS OF PAYMENT SHALL BE AT THE LUMP SUM BID PRICE FOR ITEM 202, "EXISTING UNDERPASS LIGHTING SYSTEM, TO BE REMOVED, BRIDGE NO., AS PER PLAN," INCLUDING ALL LABOR, MATERIAL, EQUIPMENT, AND INCIDENTALS TO COMPLETE THE ITEM OF WORK.

GENERAL NOTES

LIGHTING

UNDERGROUND ELECTRICAL VAULTS TO BE ABANDONED

THE CONTRACTOR SHALL CAREFULLY REMOVE ALL DESIGNATED STATE-OWNED EQUIPMENT FROM EXISTING ELECTRICAL VAULTS DESIGNATED TO BE ABANDONED IN THE PLANS. THE ENGINEER WILL IDENTIFY ALL TRANSFORMERS, DISCONNECTS, BREAKERS AND MISCELLANEOUS HARDWARE TO BE REMOVED. SALVAGEABLE MATERIAL DESIGNATED FOR RETURN TO THE STATE IS TO BE DELIVERED TO THE FOLLOWING ADDRESS:

OHIO DEPARTMENT OF TRANSPORTATION
 MR. JOSEPH MORAN, DISTRICT LIGHTING ENGINEER
 WARRENSVILLE HEIGHTS YARD
 25609 EMERY ROAD
 WARRENSVILLE HEIGHTS, OHIO 44128

EXISTING STATE-OWNED LIGHTING CIRCUIT CABLE SHALL BE REMOVED FROM ALL EXISTING DUCTS INTO VAULT FROM THE NEAREST PULLBOX SERVING THE FORMER ROADWAY LIGHTING CIRCUITS.

THE CONTRACTOR SHALL NOTIFY THE CITY OF CLEVELAND, DIVISION OF LIGHT AND POWER, CHIEF OF STREET LIGHTING (TELEPHONE 664-3334) BEFORE ANY WORK IS TO BE DONE IN THE VAULTS, ALL CITY OF CLEVELAND OWNED EQUIPMENT AND CIRCUITS ARE TO REMAIN INTACT.

IF ALL EQUIPMENT, CITY AND STATE OWNED, HAS BEEN REMOVED FROM A VAULT, AND WHEN DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL ABANDON AND DISPOSE OF THE VAULT IN THE MANNER DESCRIBED IN 202.061 AND BACKFILL IN ACCORDANCE WITH 202.02.

BASIS OF PAYMENT SHALL BE AT THE LUMP SUM BID FOR ITEM 202 "EXISTING UNDERGROUND ELECTRICAL VAULT OR MANHOLE, BY DESIGNATION, TO BE ABANDONED, AS PER PLAN," INCLUDING ALL LABOR MATERIALS, EQUIPMENT AND INCIDENTALS TO COMPLETE THE ITEM OF WORK.

HIGH VOLTAGE DIRECT CURRENT TEST

A HIGH VOLTAGE DIRECT CURRENT TEST, AS DESCRIBED IN SUPPLEMENTAL SPECIFICATION 839, SHALL BE PERFORMED ON ALL DISTRIBUTION CABLE AND DUCT CABLE SYSTEMS TO BE INSTALLED ON THIS PROJECT. THE TEST SHALL NOT BE PERFORMED UNTIL AFTER ALL NEW CONSTRUCTION, SUCH AS GUARD RAIL, FENCE, DELINEATOR POSTS, SIGN SUPPORTS, ETC., IN THE IMMEDIATE VICINITY OF THE LOCATION OF THE CABLE RUN BEING TESTED, HAS BEEN COMPLETED.

| ITEM | UNIT | DESCRIPTION |
|------|----------|--------------------|
| 839 | LUMP SUM | HIGH VOLTAGE TEST. |

LIGHT TOWER FOUNDATION PAD

THE CONTRACTOR SHALL CONSTRUCT LIGHT TOWER FOUNDATION PADS OF THE TYPE, SIZE, AND MATERIAL INDICATED IN THE PLANS, AT THE LOCATIONS DESIGNATED, IN CONFORMITY WITH THE LINES GRADES AND DIMENSIONS SHOWN IN THE PLANS OR ESTABLISHED IN ACCORDANCE WITH THE SPECIFICATIONS FOR THE VARIOUS ITEMS.

BASIS OF PAYMENT SHALL BE AT THE UNIT BID PRICE PER EACH ITEM 625 - "LIGHT TOWER FOUNDATION PAD BY TYPE, AS PER PLAN," INCLUDING ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTALS TO COMPLETE THE ITEM OF WORK AS SPECIFIED AND ACCEPTED.

LIGHT TOWER HANDHOLE LOCATION

FOR LIGHT TOWERS WITH FOUNDATION PADS, THE POLE HANDHOLE SHALL BE LOCATED ON THE DOWN SLOPE OR OPEN SIDE OF THE PLATFORM. FOR LIGHT TOWERS WITHOUT FOUNDATION PADS, THE POLE HANDHOLE SHALL BE LOCATED ON THE SIDE OPPOSITE TRAFFIC FLOW ON THE ROADWAY FROM WHICH THE TOWER IS STATIONED.

LIGHT TOWER FOUNDATIONS

A. GENERAL

THE CONTRACTOR SHALL CONSTRUCT LIGHT TOWER FOUNDATIONS OF THE TYPE, SIZE, AND MATERIAL INDICATED IN THE PLANS, AT THE LOCATION DESIGNATED, IN CONFORMITY WITH THE LINES, GRADES AND DIMENSIONS SHOWN IN THE PLANS OR ESTABLISHED BY THE ENGINEER, AND IN ACCORDANCE WITH THE SPECIFICATIONS FOR THE VARIOUS ITEMS REQUIRED. THIS WORK CONSISTS OF CONSTRUCTING A CYLINDRICAL REINFORCED CONCRETE SHAFT, WITH CASING AS REQUIRED, CAST-IN-PLACE IN A BORED HOLE.

B. CONSTRUCTION REQUIREMENTS

LIGHT TOWER FOUNDATIONS SHALL BE LOCATED LONGITUDINALLY AND LATERALLY BY THE CONTRACTOR AND STAKED WITH THE PROPER SURFACE ELEVATION AS DETAILED IN THE PLANS. AFTER STAKEOUT, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST THREE DAYS OR MORE IN ADVANCE OF THE SCHEDULED WORK, SO THAT THE FOUNDATION LOCATIONS AND ELEVATIONS MAY BE VERIFIED AND FIELD CHECKED FOR OVERHEAD AND UNDERGROUND OBSTRUCTIONS, AT THE EXPENSE OF THE CONTRACTOR AND APPROVAL GIVEN BY THE ENGINEER TO COMMENCE CONSTRUCTION.

AFTER THE FOUNDATION EXCAVATION IS COMPLETE THE SHAFT SHALL BE INSPECTED TO CHECK THE DIMENSIONS AND ALIGNMENT. THE SHAFT SHALL BE SUNK VERTICALLY SUCH THAT ITS CENTER AT ANY HORIZONTAL PLANE WILL NOT BE OUT OF PLUMB FROM THE CENTER OF THE SHAFT AT THE TOP BY MORE THAN 2-INCHES IN 10-FEET. WHEN ANY FINAL EXCAVATIONS FOR SHAFTS EXCEEDS THE TOLERANCE SPECIFIED, ITS DEVIATION FROM SUCH TOLERANCES SHALL BE COMPENSATED FOR BY PLACING ADDITIONAL REINFORCING STEEL IN THE SHAFT OR BY OTHER APPROVED CONSTRUCTION AT THE EXPENSE OF THE CONTRACTOR. ANY EXCAVATION FOR THE SHAFT BEYOND THE LINES REQUIRED BY THE PLAN DIMENSIONS SHALL BE BACKFILLED WITH CONCRETE.

CASING WILL BE REQUIRED FOR SHAFT EXCAVATION WHEN IT IS NECESSARY TO PREVENT CAVING OF FOUNDATION MATERIALS, OR WHEN NECESSARY TO SEAL THE EXCAVATION OFF FROM GROUND WATER SEEPAGE. CASING, WHERE REQUIRED, SHALL BE OF METAL AND OF AMPLE STRENGTH TO WITHSTAND HANDLING STRESSES, THE INTERNAL PRESSURE OF FRESH CONCRETE AND THE EXTERNAL PRESSURE OF THE SURROUNDING EARTH AND WATER. IN ADDITION, THE CASING SHALL BE WATER-TIGHT. WHENEVER A CASING IS USED THAT IS TO BE REMOVED, THE CASING SHALL BE SMOOTH AND WELL OILED AND SHALL EXTEND SUFFICIENTLY ABOVE THE FINISHED SHAFT GRADE TO PROVIDE EXCESS CONCRETE TO BE PLACED FOR THE ANTICIPATED SLUMP DUE TO CASING REMOVAL. ALSO, WHERE CASINGS ARE TO BE REMOVED, THE CONCRETE SHALL BE OF SUCH WORKABILITY AS TO MINIMIZE VIBRATING AND RODDING OF THE CONCRETE. CASINGS TO BE REMOVED SHALL BE RETRACTED AS THE CONCRETE IS PLACED AND A MINIMUM CONCRETE HEAD OF TWO FEET SHALL BE MAINTAINED AT ALL TIMES ABOVE THE BOTTOM OF THE CASING. EXTREME CARE SHALL BE TAKEN TO PULL THE CASINGS IN A TRULY VERTICAL DIRECTION IN ORDER TO PREVENT DISTORTION OF THE SHAFT. IF ANY UPWARD MOVEMENT OF CONCRETE OCCURS INSIDE THE CASING AT THE BEGINNING OF THE RETRACTION OPERATION, OR AT ANY TIME DURING RETRACTION, PULLING SHALL BE STOPPED IMMEDIATELY AND THAT PORTION OF THE CASING REMAINING SHALL BE LEFT IN PLACE.

THE REINFORCING STEEL CAGE FOR THE FOUNDATION SHAFT SHALL BE COMPLETELY ASSEMBLED AND PLACED AS A UNIT FOR THE FULL LENGTH OF THE SHAFT PRIOR TO PLACING ANY CONCRETE. THE CAGE SHALL BE SUPPORTED BY A POSITIVE METHOD TO PREVENT ITS DISPLACEMENT. ADDITIONAL REINFORCEMENT MAY BE ADDED TO STIFFEN THE CAGE AT THE CONTRACTOR'S OPTION, AFTER APPROVAL BY THE ENGINEER.

CONCRETE FOR THE SHAFT SHALL BE PLACED IMMEDIATELY AFTER ALL EXCAVATION AND INSPECTION ARE COMPLETE, AND THE REINFORCING STEEL HAS BEEN PLACED. CONCRETE PLACEMENT SHALL BE AS CONTINUOUS AN OPERATION AS PRACTICABLE, WITH MINIMUM TIME INTERVALS ALLOWED BETWEEN SUCCESSIVE LOADS OF CONCRETE, FOR PULLING OF THE CASING, AND FOR OTHER OPERATIONS NECESSARILY CARRIED ON IN SEQUENCE WITH THE PLACING OPERATIONS. CONCRETE SHALL BE PLACED THROUGH A TREMIE TUBE WITH VIBRATORS OPERATED AS REQUIRED TO ASSURE PROPER CONSOLIDATION OF THE CONCRETE AND ELIMINATION OF ENTRAPPED AIR IN THE CONCRETE. THE CONCRETE SHALL PREFERABLY BE PLACED IN THE DRY. ACCORDINGLY, THE CONTRACTOR SHALL MAKE A DILIGENT EFFORT TO DEWATER THE SHAFTS. IF, AFTER MAKING SUCH AN EFFORT, IT IS DETERMINED THAT DEWATERING IS NOT POSSIBLE, A CONCRETE SEAL SHALL BE PLACED BY THE TREMIE METHOD. THE SEAL SHALL BE PLACED ON ONE CONTINUOUS POUR TO AN ELEVATION, AS NECESSARY, TO PERMIT DEWATERING. AT THE TIME THE SEAL IS PLACED, THE WATER LEVEL IN THE CASING SHALL HAVE STABILIZED TO PREVENT FLOW INTO THE CASING. ALL CONCRETE ABOVE THE SEAL SHALL BE PLACED IN THE DRY. THE STEEL CASING SHALL NOT BE RETRACTED FROM THE EXCAVATION WHEN SEAL CONCRETE IS USED AND THE CASING SHALL BECOME A PERMANENT PART OF THE FOUNDATION.

ITEM SPECIAL - TOWER LIGHTNING PROTECTION SYSTEM

THIS ITEM SHALL CONSIST OF PROVIDING AND INSTALLING AN APPROVED TOWER LIGHTNING PROTECTION SYSTEM AS DETAILED ON SHEET 163. THE COST OF ALL MATERIALS, LABOR, AND EQUIPMENT NECESSARY FOR THIS ITEM SHALL BE INCLUDED IN THE UNIT PRICE BID FOR EACH "ITEM SPECIAL - TOWER LIGHTNING PROTECTION SYSTEM."

LIGHT TOWER LUMINAIRE MOUNTING ARRANGEMENT

LUMINAIRE MOUNTING ARMS FOR TOWER LIGHTING UNITS SHALL BE INSTALLED BY THE POLE MANUFACTURER SO THAT THE REQUIRED NUMBER OF LUMINAIRES CAN BE INSTALLED ON THE LUMINAIRE MOUNTING RING IN A SYMMETRICAL ARRANGEMENT. WHEN ONLY TWO ARMS ARE REQUIRED THEY SHALL BE POSITIONED SO THE ARMS ARE PARALLEL TO THE CENTERLINE OR BASELINE OF THE PAVEMENT FROM WHICH THE TOWER IS STATIONED.

UNLESS OTHERWISE SPECIFIED IN THE PLANS, ALL LUMINAIRES WITH ASYMMETRIC DISTRIBUTIONS SHALL BE INSTALLED SO THE "ARROW" OR "STREET SIDE" DESIGNATION ON THE OPTICAL ASSEMBLY IS POSITIONED PERPENDICULAR TO THE CENTERLINE OR BASELINE OF THE PAVEMENT FROM WHICH THE TOWER IS STATIONED. ANY OPTICAL ROTATION CALLED FOR WILL BE EXPRESSED AS A CLOCKWISE (CW) OR COUNTERCLOCKWISE (CCW) ANGULAR MEASUREMENT FROM THE NORMAL "ARROW" ORIENTATION.

625.07 - 713.11 LUMINAIRES

STYLE C LUMINAIRES SHALL HAVE SINGLE RATED 480 VOLT, 400 WATT, INTEGRAL REGULATOR BALLASTS FOR USE WITH HIGH PRESSURE SODIUM LAMPS AND SHALL BE GENERAL ELECTRIC M-1000, WESTINGHOUSE OV-50, IIT AMERICAN 1000, OR EQUAL APPROVED BY THE ENGINEER.

LIGHT POLE IDENTIFICATION

WHERE SHOWN IN THE PLANS, POLE IDENTIFICATION ON EXISTING POLES SHALL BE OBLITERATED BY PAINTING OVER AND NEW POLE IDENTIFICATION ACCOMPLISHED PER HL-2. PAYMENT FOR THIS WORK SHALL BE INCIDENTAL TO THE VARIOUS ITEMS OF WORK.

ESTIMATED QUANTITIES

SPECIFIC LOCATIONS AND USAGE OF ESTIMATED QUANTITIES SET UP ON THIS PLAN TO BE USED AS DIRECTED BY THE ENGINEER SHALL BE MADE A MATTER OF RECORD BY INCORPORATION INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT. ESTIMATED QUANTITIES OF MATERIALS SHALL NOT BE ORDERED FOR DELIVERY TO THE PROJECT UNLESS AUTHORIZED BY THE ENGINEER.

UNDERDRAINS FOR PULL BOXES

REFERENCE IS MADE TO STANDARD DRAWING HL-10 FOR DETAILS OF DRAINING PULL BOXES. UNDERDRAINS FOR PULL BOXES SHALL BE USED AS DIRECTED BY THE ENGINEER AND SHALL BE PROVIDED WHERE THE LENGTH REQUIRED FOR A SATISFACTORY OUTLET DOES NOT EXCEED APPROXIMATELY 20 FEET. AN ESTIMATED QUANTITY OF "500 LINEAR FEET OF ITEM 605, 4" SHALLOW PIPE UNDERDRAINS" IS INCLUDED IN THE LIGHTING GENERAL SUMMARY FOR THIS PURPOSE.

ITEM 625.19 - CONTROL CENTER AS PER PLAN

IN ADDITION TO THE SPECIFICATIONS AS OUTLINED FOR CONTROL CENTER, ITEM 625.19, THE CONTRACTOR SHALL FURNISH AND INSTALL TWO PULLBOXES INCLUDING THE NECESSARY TRENCHING, CONDUIT, CABLE, CABLE SPLICING KITS AND INCIDENTALS COMPLETE FROM THE CONTROL CENTER TO THE POWER SERVICE POLE.

ITEM 625 - CABLE SPLICING KIT

THIS ITEM SHALL CONSIST OF PROVIDING AND INSTALLING AN APPROVED CABLE SPLICING KIT AS DIRECTED IN PARAGRAPH 5 OF SECTION 713.15 OF THE ODOT CONSTRUCTION AND MATERIAL SPECIFICATIONS. THE COST OF ALL MATERIALS, LABOR AND EQUIPMENT NECESSARY FOR THIS ITEM SHALL BE INCLUDED IN THE UNIT PRICE BID FOR EACH "ITEM 625 - CABLE SPLICING KIT."

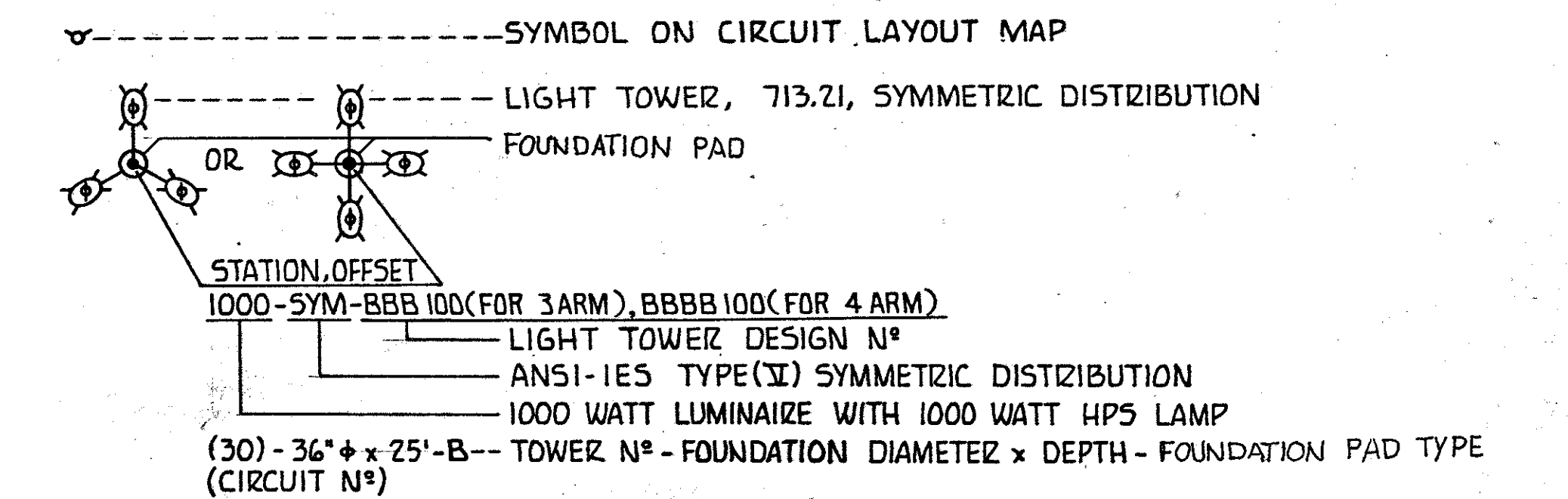
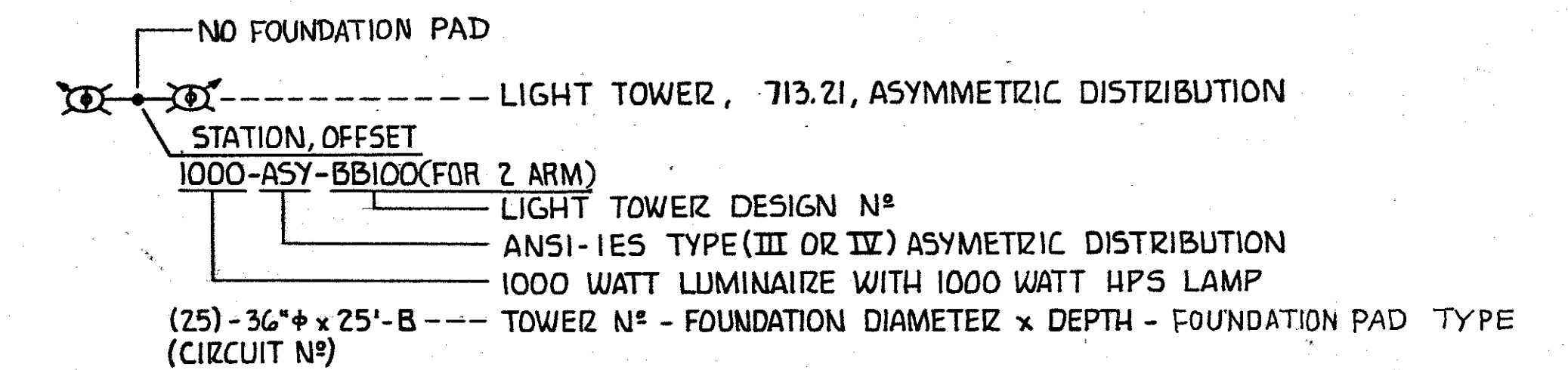
GENERAL NOTES

LIGHTING

LEGEND

- ----- PULLBOX, CONCRETE NEW 24" X 24"
- ◻ ----- PULLBOX, EXISTING TO REMAIN
- ⊠ ----- MEDIAN PULLBOX
- ----- NEW JUNCTION BOX, 6" X 6" X 4", UNDERDECK LIGHTING
- ▣ ----- PULLBOX EXISTING TO BE ABANDONED
- ▨ ----- CONTROL CENTER, PAD MOUNTED
- ⊕ ----- PLASTIC CAUTION TAPE WITH LIMITS
- ⊖ ----- EXISTING CONDUIT TO REMAIN
- 2-#4 ----- DUCT CABLE 1/2" φ, 713.03 IN 24" DEEP TRENCH, A.W.G. PER PLAN
- CONDUIT, 4" φ POLYVINYL CHLORIDE, WITH 713.02 CABLE
- ===== CONDUIT, 3" φ 713.04, CONCRETE ENCASED, WITH 713.02 CABLE
- ===== CONDUIT, 3" φ 713.04, JACKED UNDER PAVEMENT, PER STANDARD CONSTRUCTION DRAWING HL-11 WITH 713.02 CABLE
- 2-#4 ----- CONDUIT, 3" φ 713.04, WITH 713.02 CABLE
- E----- EXISTING CONDUIT TO BE ABANDONED

- ⊗ ----- EXISTING UNDERPASS LIGHTING UNIT TO BE REMOVED
- * ----- EXISTING FOUNDATION TO BE REMOVED AND PULLBOX TO BE ABANDONED UNLESS NOTED
- ⊗ ----- EXISTING POLE AND FOUNDATION TO BE REMOVED AND PULLBOX TO BE ABANDONED UNLESS NOTED
- ⊗ ----- TYPICAL MEDIAN MOUNTED LIGHTING UNIT, 400 WATT HIGH PRESSURE SODIUM, ANSI-IES TYPE III ON STANDARD (50' MOUNTING HEIGHT)
- ⊗ ----- TYPICAL GROUND MOUNTED LIGHTING UNIT, 400 WATT HIGH PRESSURE SODIUM, ANSI-IES TYPE III ON SIGNAL STRAIN POLE (50' MOUNTING HEIGHT)



- ⊕ ----- SYMBOL ON CIRCUIT LAYOUT MAP
- ⊖ ----- TYPICAL UNDERPASS LIGHTING UNIT, 100 WATT HIGH PRESSURE SODIUM, LAMP AND LUMINAIRE
- △ (N° OF KITS) ----- CABLE SPLICING KIT
- ⊕ (TYPE) (N° OF KITS) ----- CONNECTOR KIT, TYPE
 - A- TYPE II
 - B- TYPE III
 - C- TYPE VII A
 - D- TYPE VII B
 - E- TYPE VII C

QUANTITY CALCULATIONS
MADE BY CAP DATE 8/82
CHKD. BY JRH DATE 10/82

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

143
Z61

CUYAHOGA COUNTY
CUY-490-1.49

LIGHTING GENERAL SUMMARY

| LINE NO | FUNDS | PLAN SHEET NO. | SUB-SUMMARY SHEET NO. | PLAN SHEET NO. | | | | | | | | | | | | PARTICIPATION | | TOTAL | ITEM | UNIT | DESCRIPTION | LINE NO | |
|---------|-------|----------------|-----------------------|----------------|-----|-----|-----|-----|-----|-----|-----|-----|---------|----------|--|---------------|--|-------|------|------|-------------|---------|--|
| | | | | 150 | 150 | 151 | 152 | 153 | 154 | 155 | 156 | 157 | I Funds | IR Funds | | | | | | | | | |
| | | | | IR | I | IR | IR | I | IR | I | IR | I | IR | I | | | | | | | | | |
| | | | | 145 | 145 | 146 | 146 | 148 | 147 | 149 | 149 | 149 | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | | | | |
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TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

I-490 LIGHTING QUANTITIES GENERAL SUMMARY

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
|----------|-------|--------|---------|----------|------|
| | | | | | |

SHEET ACCT. No. _____

CONT. No. _____

LIGHTING QUANTITIES SUB-SUMMARY * I FUNDS

| | | | | |
|----------|------|-------------------|-------|---------|
| CAL. BY | CAP | FED. RD. DIVISION | STATE | PROJECT |
| DATE | 9/82 | 2 | OHIO | |
| CHKD. BY | JRH | | | |
| DATE | 9/82 | | | |

149
761

QUANTITIES CARRIED TO
GENERAL SUMMARY CUYAHOGA COUNTY
CUY-490-1.49

| SHEET No. | ITEM | | SPECIAL | | 625 | | REFERENCE N° | FUNDS | | | | | | | |
|-----------|------------------|------------------------------|--|-------------------------------|---------------------------------------|----------------------------|--------------|-------|--------------------------|---|---|---|-----|----|-----|
| | REFERENCE N° | STATION | EXIST. UNDERPASS LG. SYST. TO BE REMOVED | SERVICE TO UNDERPASS LIGHTING | LUMINAIRE UNDERPASS 100 W. HPS T13.13 | STRUCTURE GROUNDING SYSTEM | | | CONNECTOR KIT TYPE VII A | TYPE HL-5 JUNCTION BOX MODIFIED AS PER PLAN | NO. 4 AWG, 5000 VOLT DISTRIBUTION CABLE | NO. 2 AWG, 5000 VOLT DISTRIBUTION CABLE | | | |
| 157 | 221 | BRIDGE N° CUY-254-1893 | LUMP | LUMP | 24 | | | | | | | | 221 | IR | |
| | 222 | | | | | | | | | | | | 222 | | |
| | 223 | | | | | | | | | | | | 223 | | |
| | 224 | | | | | | | | | | | | 224 | | |
| | 225 | TOTALS SHEET 157 | | LUMP | LUMP | 24 | | | | | | | | | 225 |
| 156 | 226 | BRIDGE N° CUY-77-144DA&144IA | LUMP | LUMP | 13 | | 2 | | 360 | | | | 226 | IR | |
| | 227 | | | | | | | | | | | | 227 | | |
| | 228 | | | | | | | | | | | | 228 | | |
| | 229 | | | | | | | | | | | | 229 | | |
| | 230 | | | | | | | | | | | | 230 | | |
| | 231 | BRIDGE N° CUY-77-1438B&1439B | LUMP | LUMP | 4 | | 2 | | 520 | | | | 231 | | IR |
| | 232 | | | | | | | | | | | | 232 | | |
| | 233 | | | | | | | | | | | | 233 | | |
| | 234 | | | | | | | | | | | | 234 | | |
| | 235 | BRIDGE N° CUY-77-1436C | LUMP | LUMP | 8 | | 4 | | | | | | 235 | | |
| 236 | | | | | | | | | | | | 236 | | | |
| 237 | | | | | | | | | | | | 237 | | | |
| 238 | | | | | | | | | | | | 238 | | | |
| 239 | TOTALS SHEET 156 | | LUMP | LUMP | 25 | | 8 | | 360 | 520 | | | 239 | IR | |
| 155 | 240 | BRIDGE N° CUY-490-0152 | LUMP | 32* | 1* | 2* | 1* | | 60* | | | | 240 | I | |
| | 241 | | | | | | | | | | | | 241 | | |
| | 242 | | | | | | | | | | | | 242 | | |
| | 243 | | | | | | | | | | | | 243 | | |
| | 244 | TOTALS SHEET 155 | I FUNDS | LUMP | 32* | 1* | 2* | 1* | | 60* | | | | | 244 |
| 245 | | | | | | | | | | | | | 245 | | |
| 246 | | | | | | | | | | | | | 246 | | |
| 247 | | | | | | | | | | | | | 247 | | |
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| 249 | | | | | | | | | | | | | 249 | | |
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| 275 | | | | | | | | | | | | | 275 | | |

CONT. No. SHEET ACCT. No.

TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

I-490
LIGHTING QUANTITIES
SUB - SUMMARY

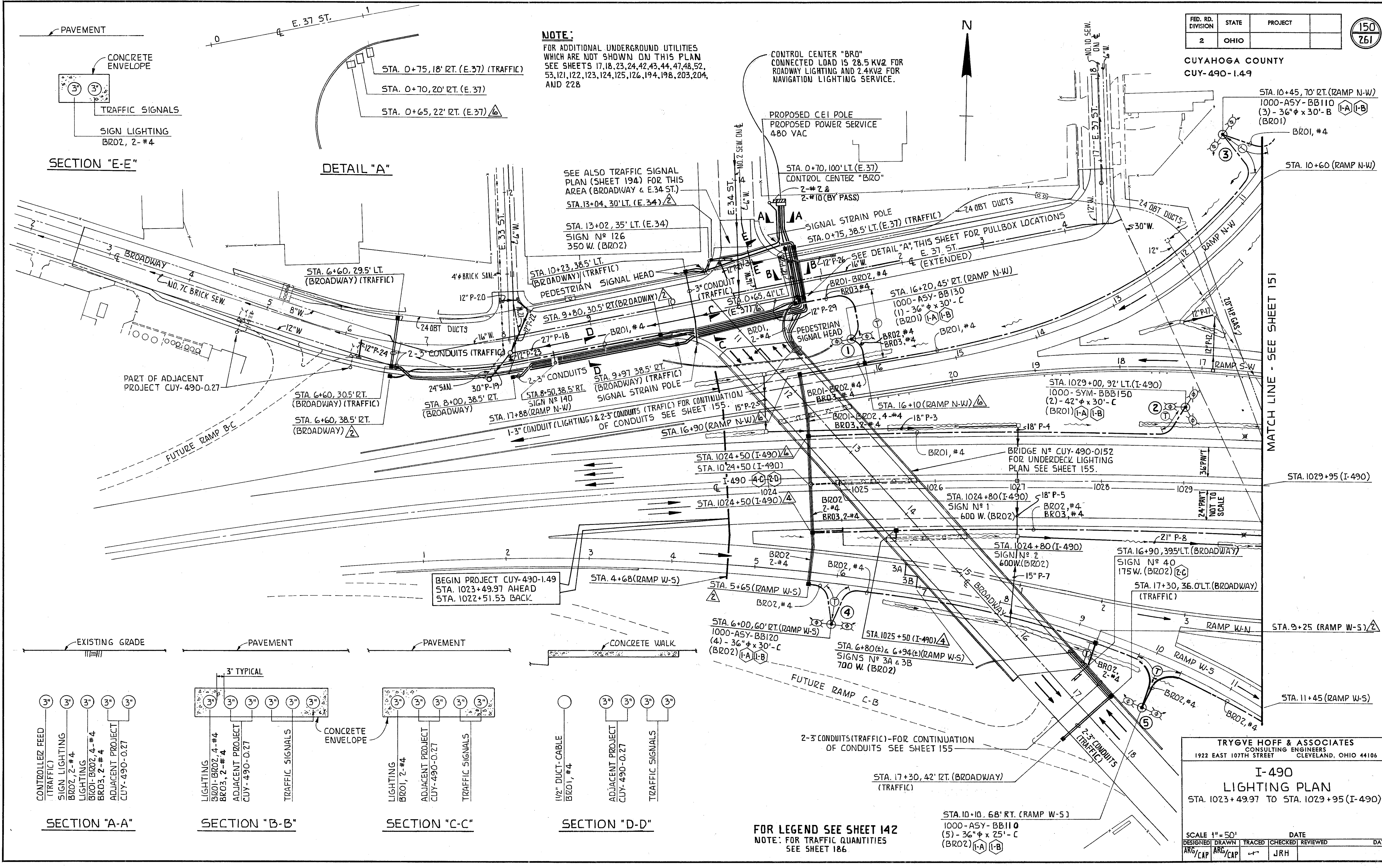
| | | | | | |
|----------|-------|--------|---------|----------|------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| ✓ | ARG | ✓ | ✓ | JRH | |
| | CAP | | | | |

| | | | |
|-------------------|-------|---------|------------|
| FED. RD. DIVISION | STATE | PROJECT | 150 761 |
| 2 | OHIO | | |

CUYAHOGA COUNTY
CUY-490-1.49

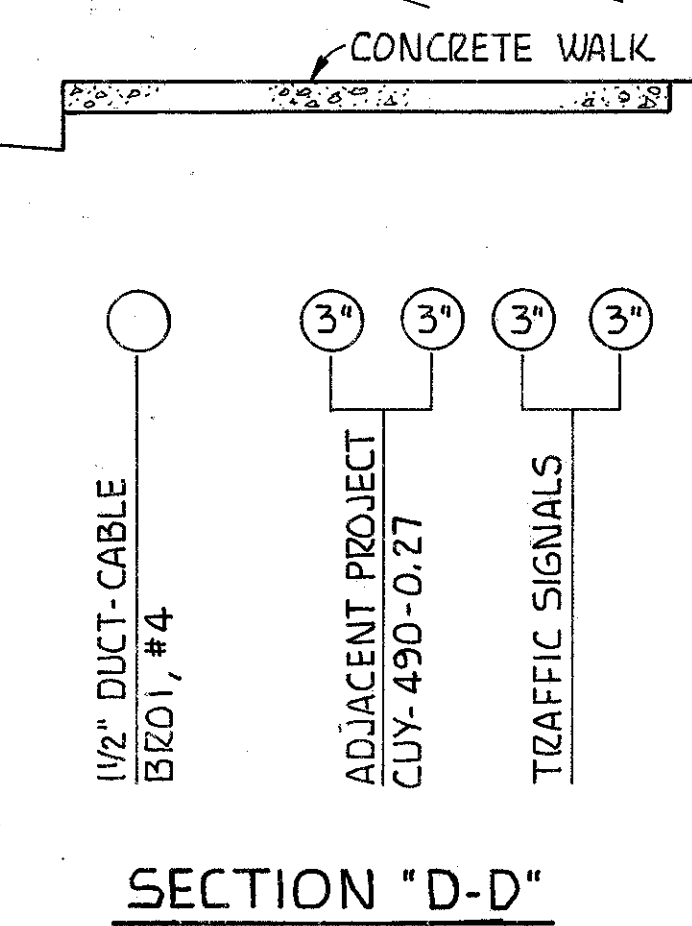
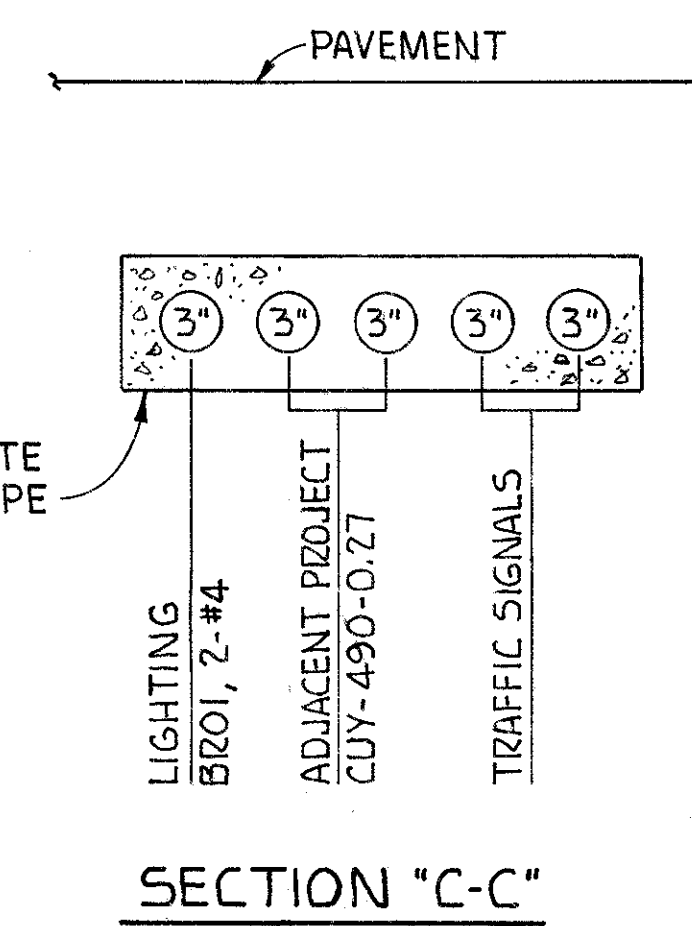
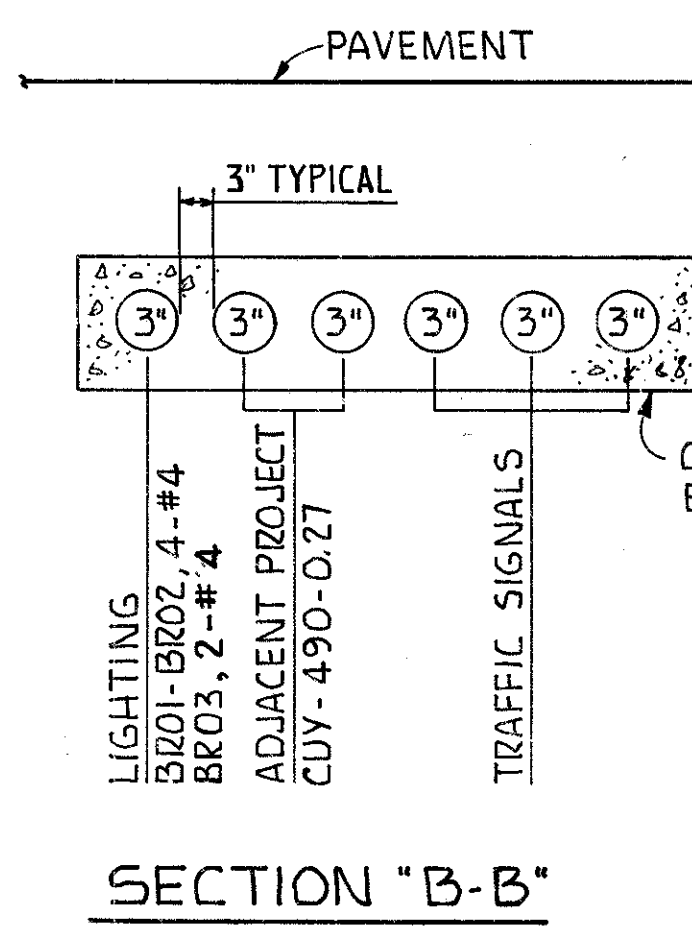
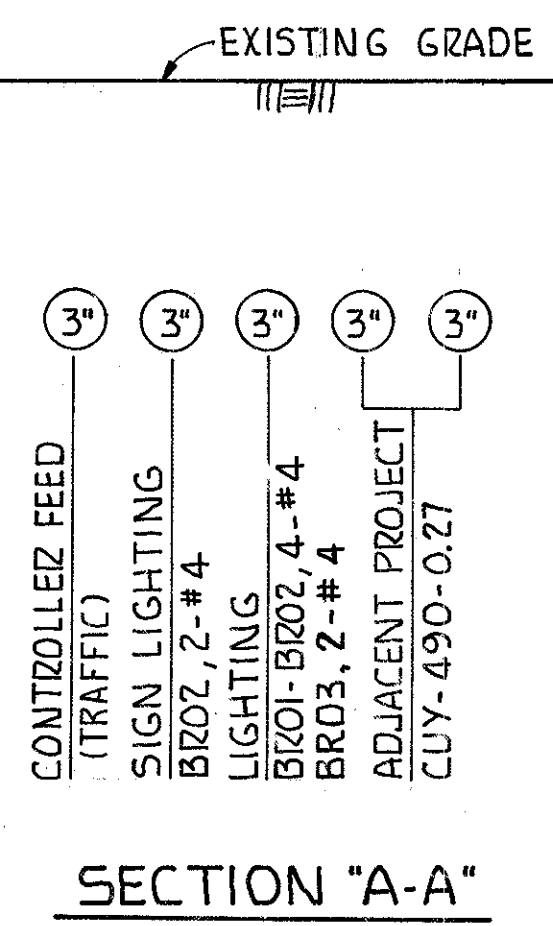
NOTE:
FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 17, 18, 23, 24, 42, 43, 44, 47, 48, 52, 53, 121, 122, 123, 124, 125, 126, 194, 198, 203, 204, AND 228

CONTROL CENTER "BRO"
CONNECTED LOAD IS 28.5 KV2 FOR ROADWAY LIGHTING AND 2.4KV2 FOR NAVIGATION LIGHTING SERVICE.



SECTION "E-E"

DETAIL "A"



FOR LEGEND SEE SHEET 142
NOTE: FOR TRAFFIC QUANTITIES SEE SHEET 186

TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

I-490 LIGHTING PLAN
STA. 1023+49.97 TO STA. 1029+95 (I-490)

| | |
|----------------|----------|
| SCALE 1" = 50' | DATE |
| DESIGNED | TRACED |
| ARG/CAP | ARG/CAP |
| CHECKED | REVIEWED |
| JRH | |

SHEET ACCT. No. CONT. No.

MATCH LINE - SEE SHEET 151

NOT TO SCALE

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

151
261

CUYAHOGA COUNTY
CUY-490-1.49



MATCH LINE
SEE SHEET 152

BOW5 2-#2 RUN IN EXISTING CONDUIT. FOR CONTINUATION
SEE UNDERDECK LIGHTING, SHEET 156.

FOR I-490 & I-77
INTERCHANGE
UNDERDECK
LIGHTING PLAN
SEE SHEET 156

STA. 7+02 (RAMP W-N)
EXIST'G. JUNCTION BOX IN BRIDGE
BRO2, 2-#4, RUN IN
EXISTING CONDUIT.
FOR CONTINUATION
SEE UNDERDECK
LIGHTING, SHEET 156.

MATCH LINE
SEE SHEET 154

FOR LEGEND SEE SHEET 142

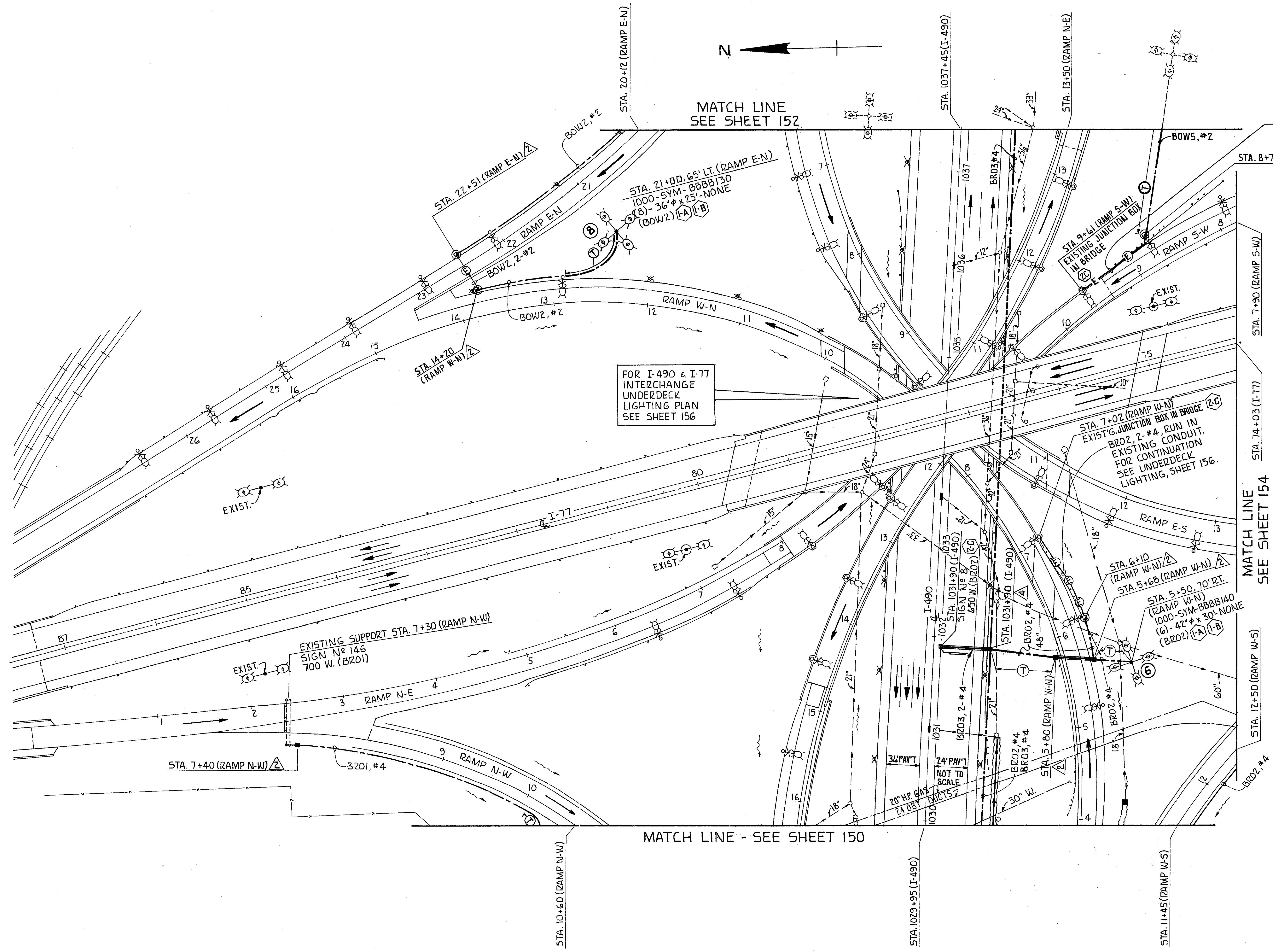
NOTE:
FOR ADDITIONAL UNDERGROUND UTILITIES
WHICH ARE NOT SHOWN ON THIS PLAN
SEE SHEETS 18, 23, 24, 24A, 53, 125, 198,
199, AND 228

| | | | |
|--|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

I-490
LIGHTING PLAN
STA. 1029+95 TO STA. 1037+45 (I-490)

| | | | | | |
|----------------|---------|--------|---------|----------|------|
| SCALE 1" = 50' | DATE | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| ARC/CAP | ARC/CAP | JRH | | | |

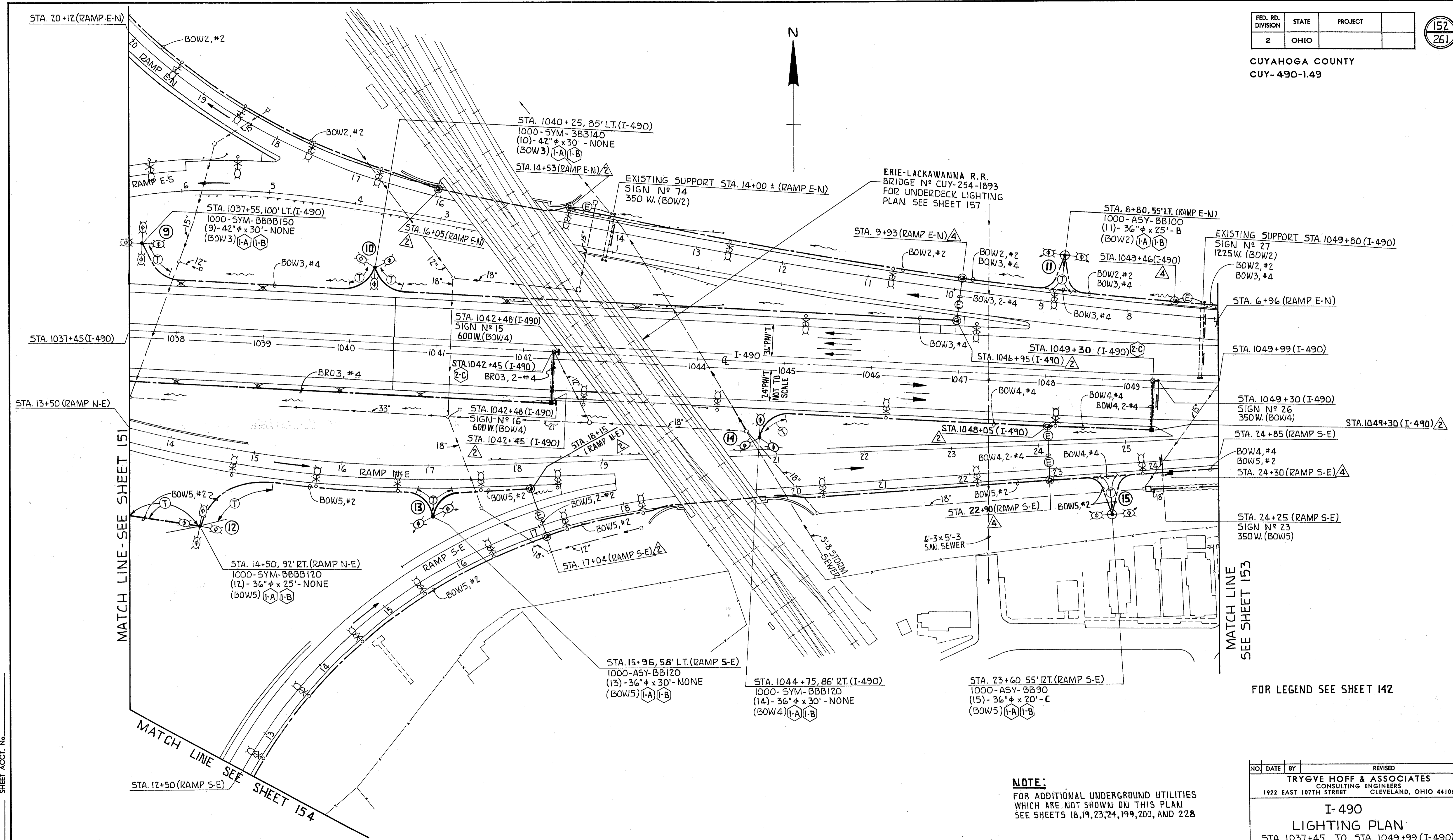
CONT. No. SHEET ACCT. No.



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

152
261

CUYAHOGA COUNTY
CUY-490-1.49



MATCH LINE - SEE SHEET 151

MATCH LINE SEE SHEET 154

MATCH LINE
SEE SHEET 153

NOTE:
FOR ADDITIONAL UNDERGROUND UTILITIES
WHICH ARE NOT SHOWN ON THIS PLAN
SEE SHEETS 18, 19, 23, 24, 199, 200, AND 228

FOR LEGEND SEE SHEET 142

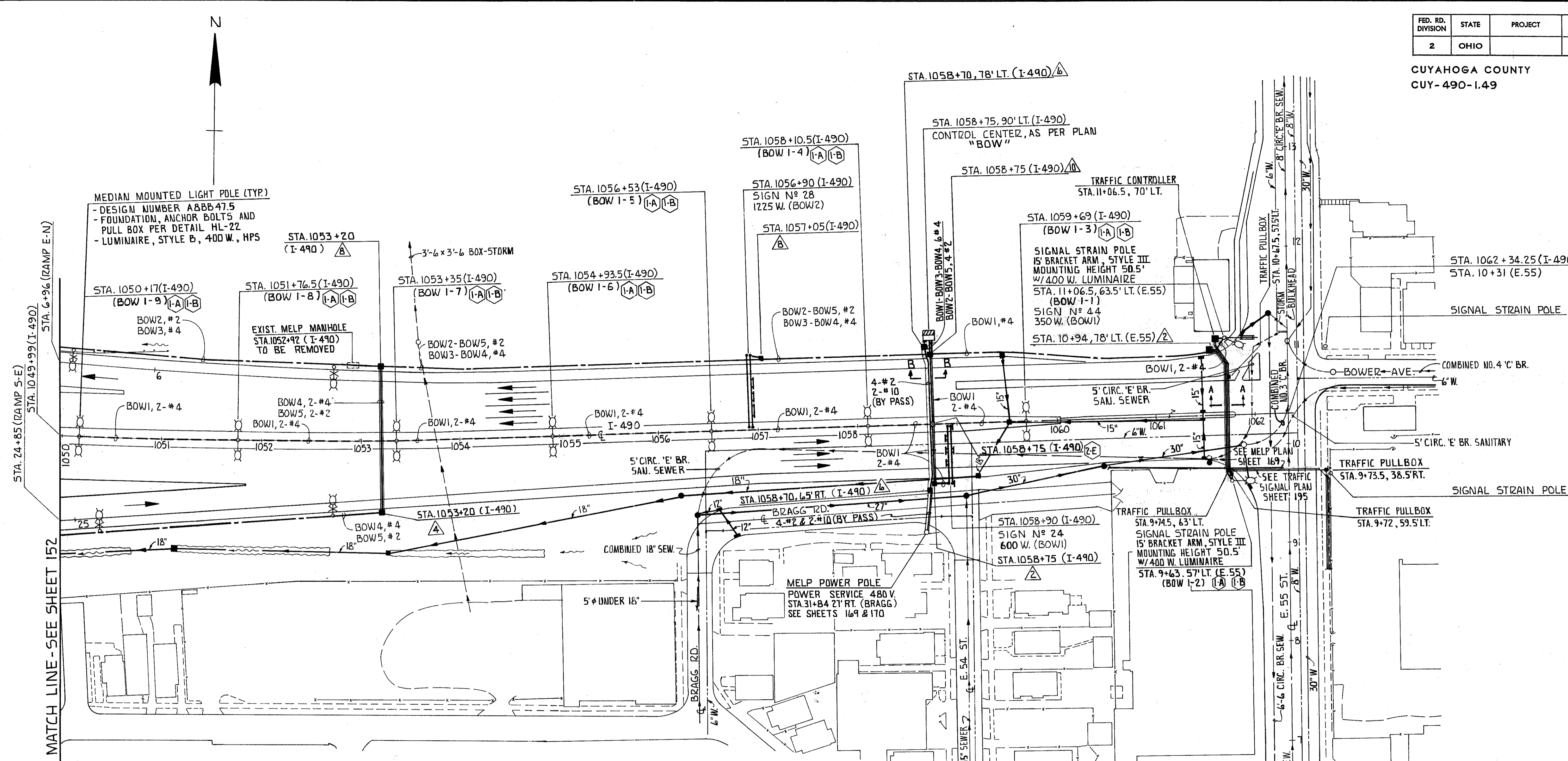
| | | | |
|---|---------|----------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| I-490 LIGHTING PLAN STA. 1037+45 TO STA. 1049+99 (I-490) | | | |
| SCALE 1" = 50' | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| ARG/CAP | ARG/CAP | JRH | |
| | | REVIEWED | DATE |

CONT. No. SHEET ACCT. No.

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

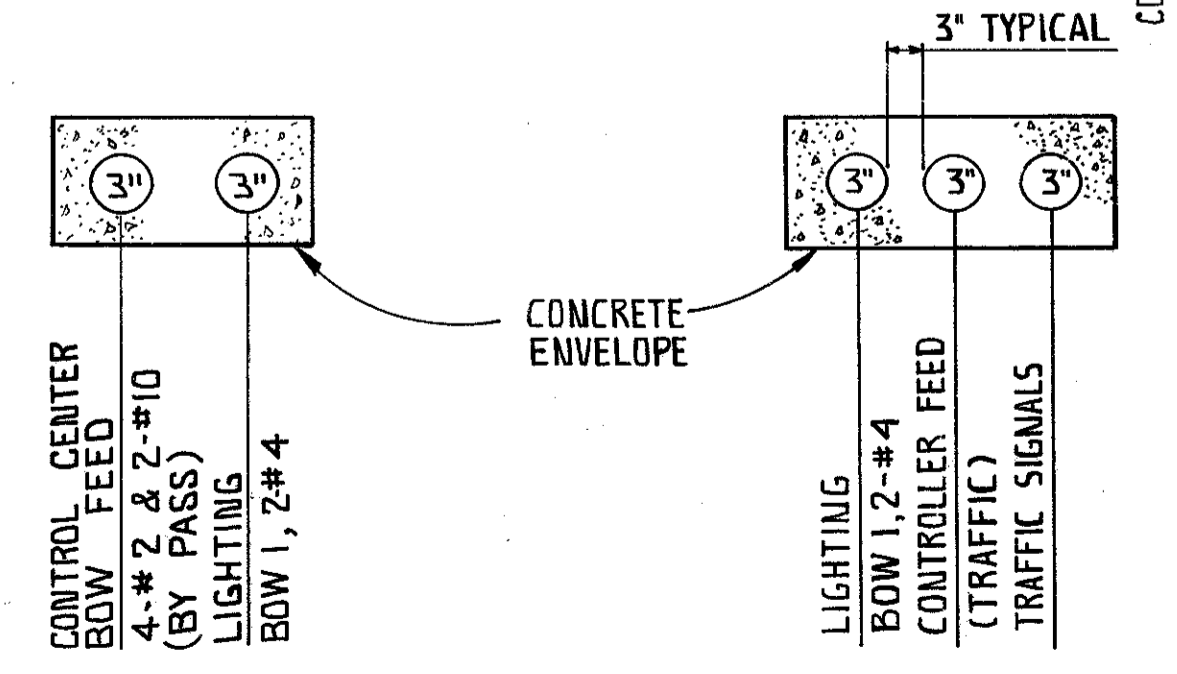
153
261

CUYAHOGA COUNTY
CUY-490-1.49



MATCH LINE-SEE SHEET 152

NOTE:
FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 19, 21, 37, 39, 127, 128, 169, 195, 197, 200, 201, AND 228



SECTION "B-B" SECTION "A-A"

FOR LEGEND SEE SHEET 142
FOR TRAFFIC QUANTITIES SEE SHEET 186

| | | | |
|---|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

**I-490
LIGHTING PLAN
STA. 1049+99 TO E.55 ST.**

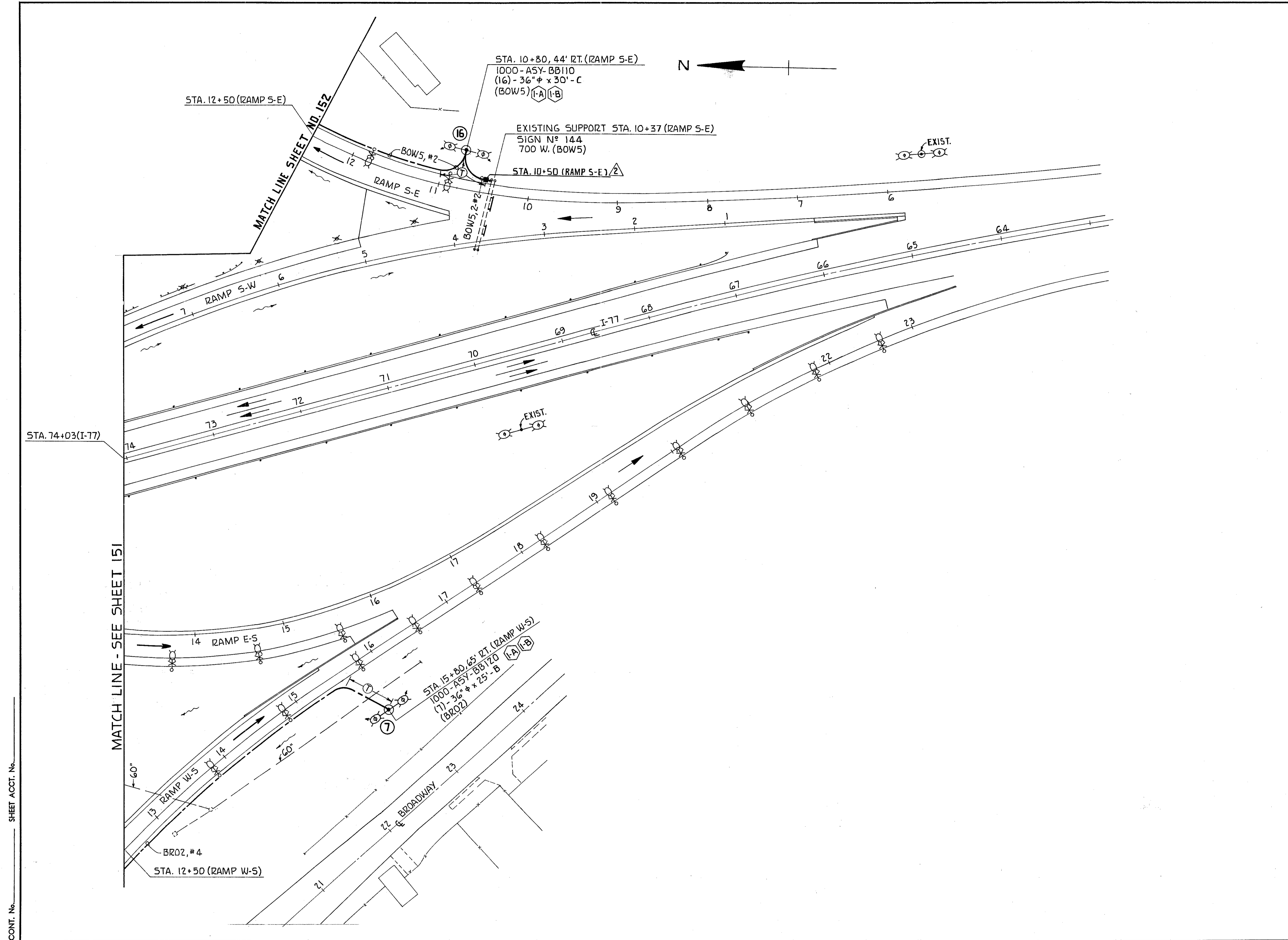
| | |
|----------------|----------|
| SCALE 1" = 50' | DATE |
| DESIGNED | TRACED |
| CHECKED | REVIEWED |
| DATE | DATE |

CONT. No. SHEET ACCT. No.

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

154
261

CUYAHOGA COUNTY
CUY-490-1.49



CONT. No. SHEET ACCT. No.

NOTE:
FOR ADDITIONAL UNDERGROUND UTILITIES WHICH ARE NOT SHOWN ON THIS PLAN SEE SHEETS 23, 47, 48, 126, AND 228

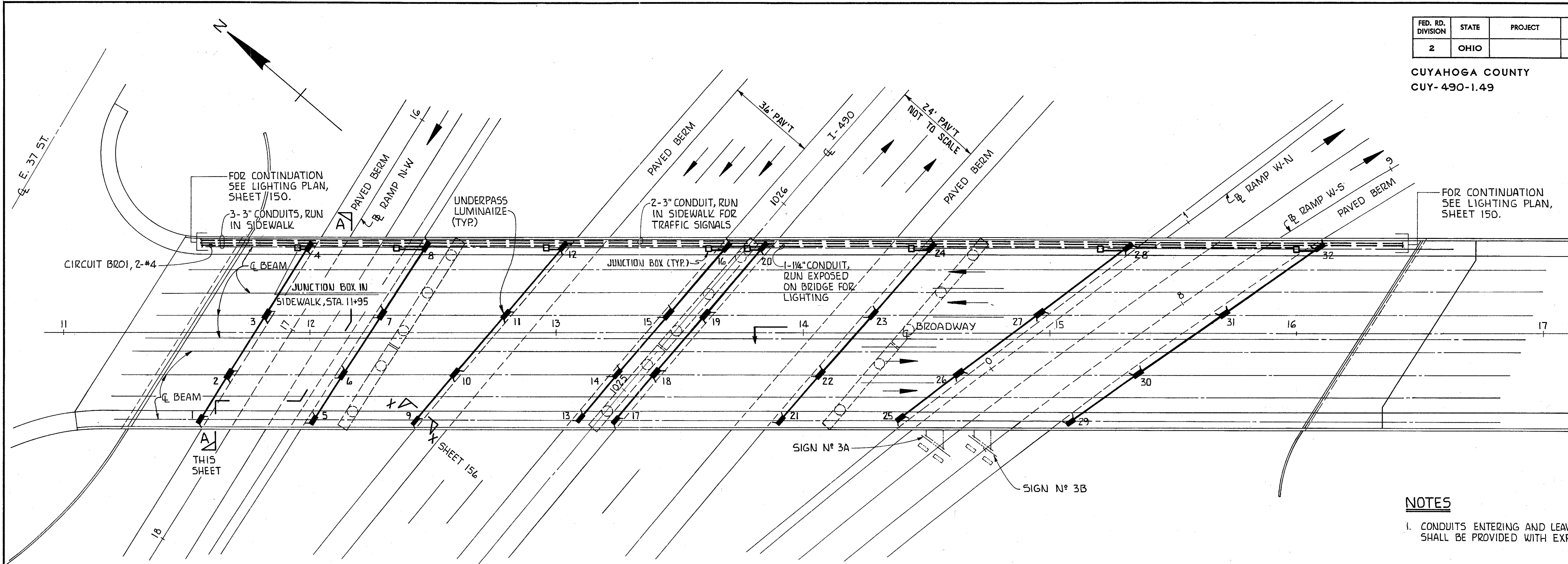
FOR LEGEND SEE SHEET 142

| | | | | | |
|---|---------|--------|---------|----------|------|
| NO. | DATE | BY | REVISED | | |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | | | |
| I-490 LIGHTING PLAN STA. 74+03 TO STA. 64+00 (I-17) | | | | | |
| SCALE 1" = 50' | | | DATE | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| ARG/CAP | ARG/CAP | JRH | | | |

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

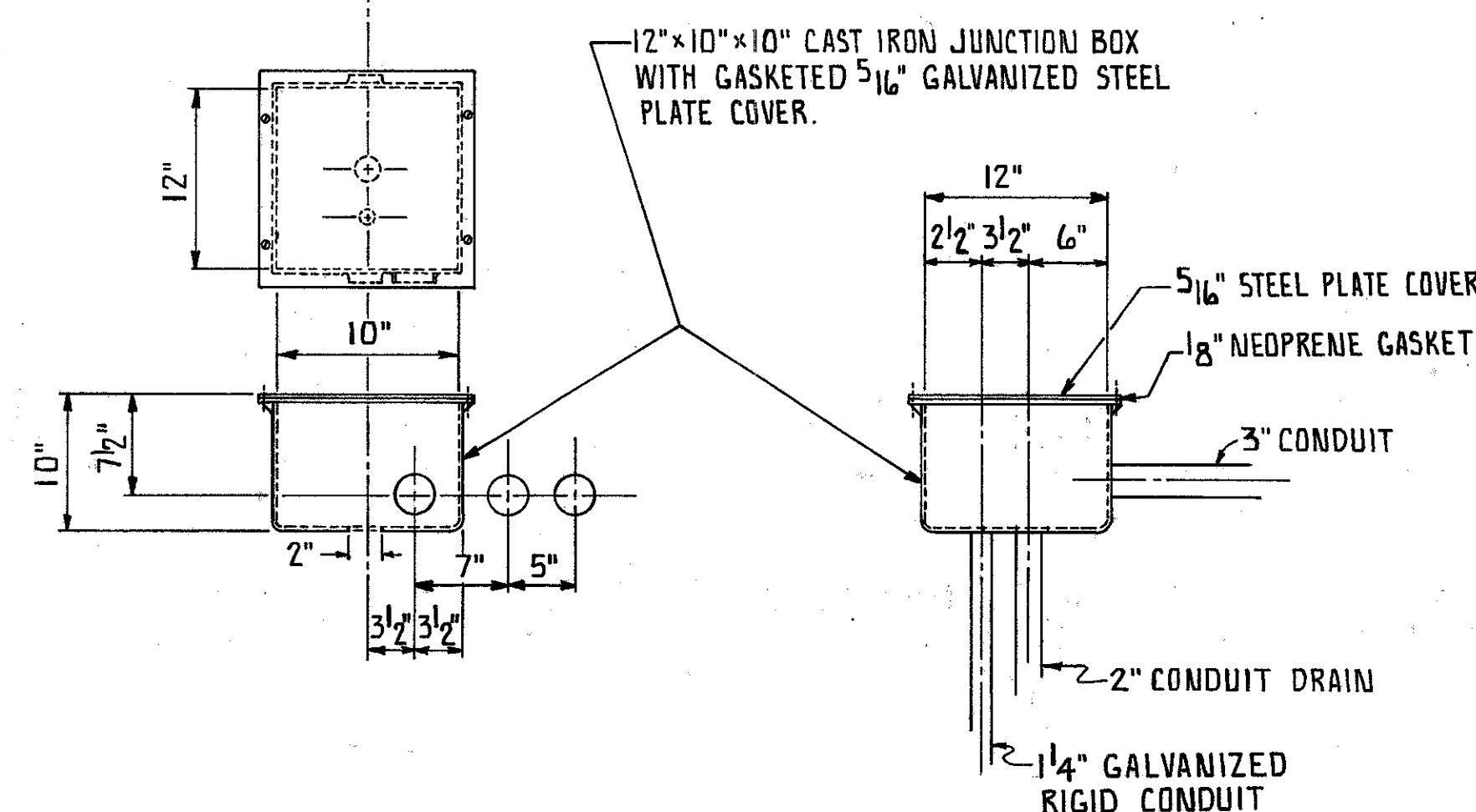
155
261

CUYAHOGA COUNTY
CUY-490-1.49

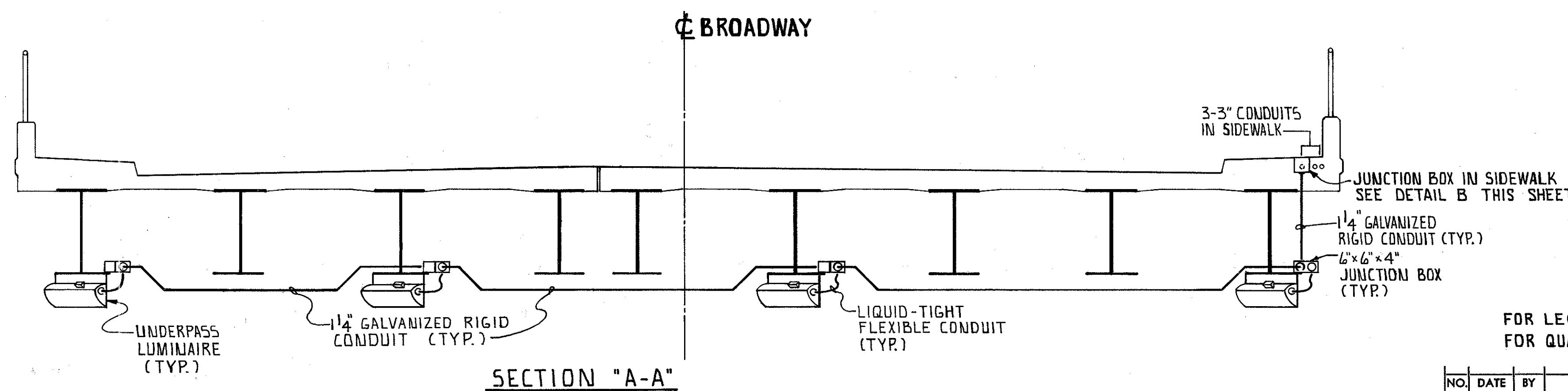


- NOTES**
- CONDUITS ENTERING AND LEAVING BRIDGE SHALL BE PROVIDED WITH EXPANSION FITTINGS

UNDERDECK LIGHTING PLAN
SCALE 1" = 20'



DETAIL B
JUNCTION BOX - TYPE HL-5
MODIFIED AS PER PLAN



SECTION "A-A"

FOR LEGEND SEE SHEET 142
FOR QUANTITIES SEE SHEET 149

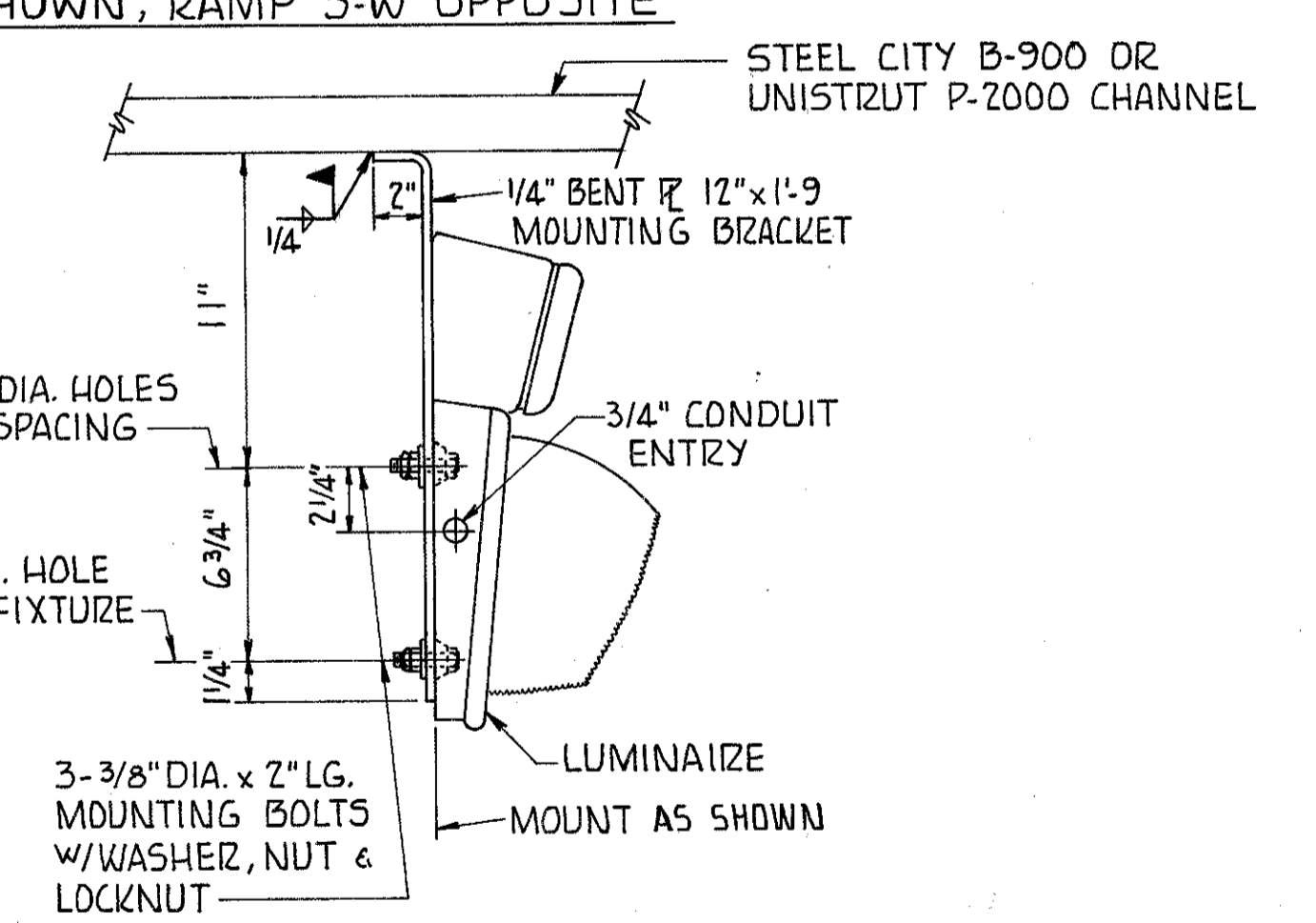
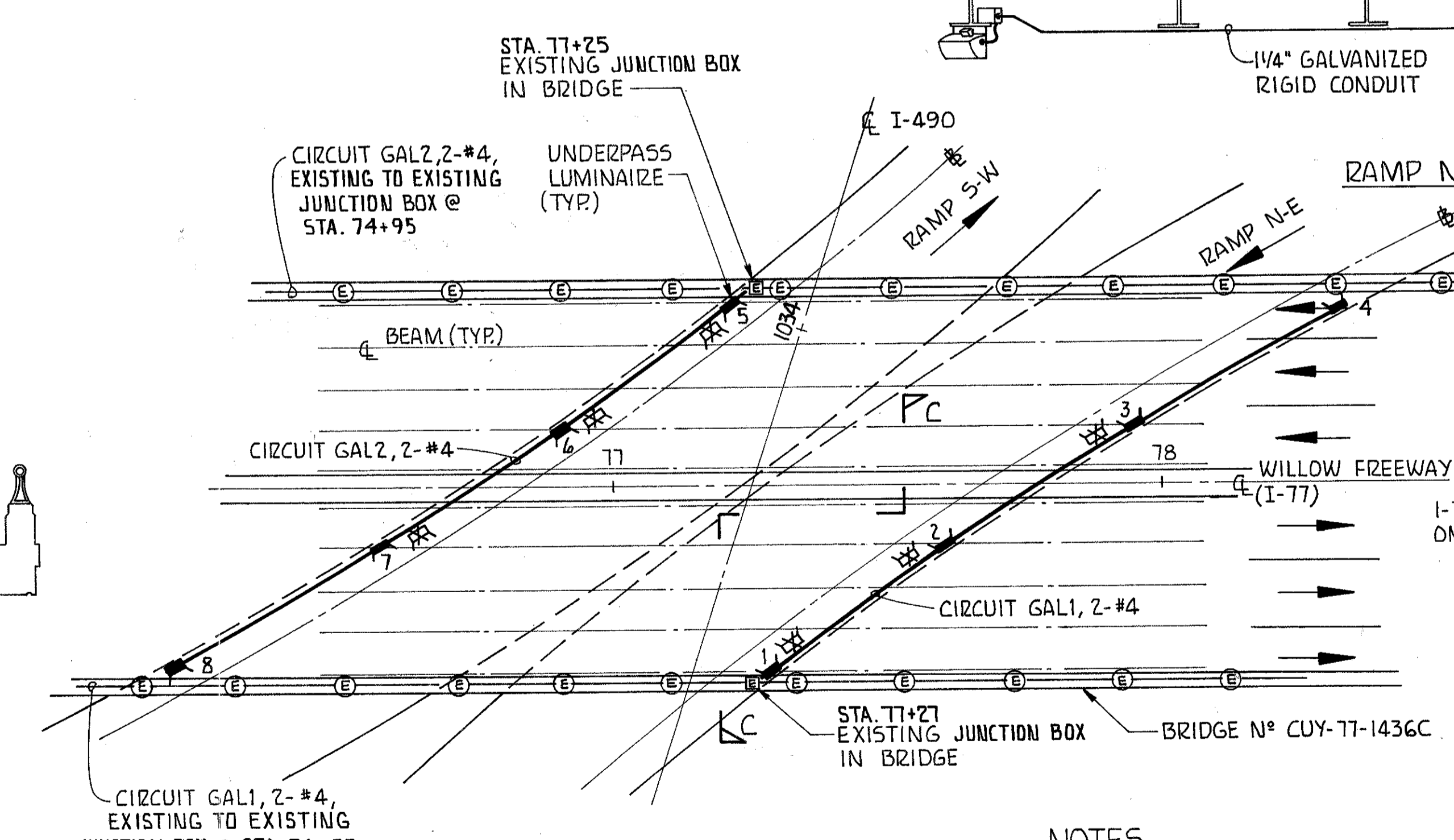
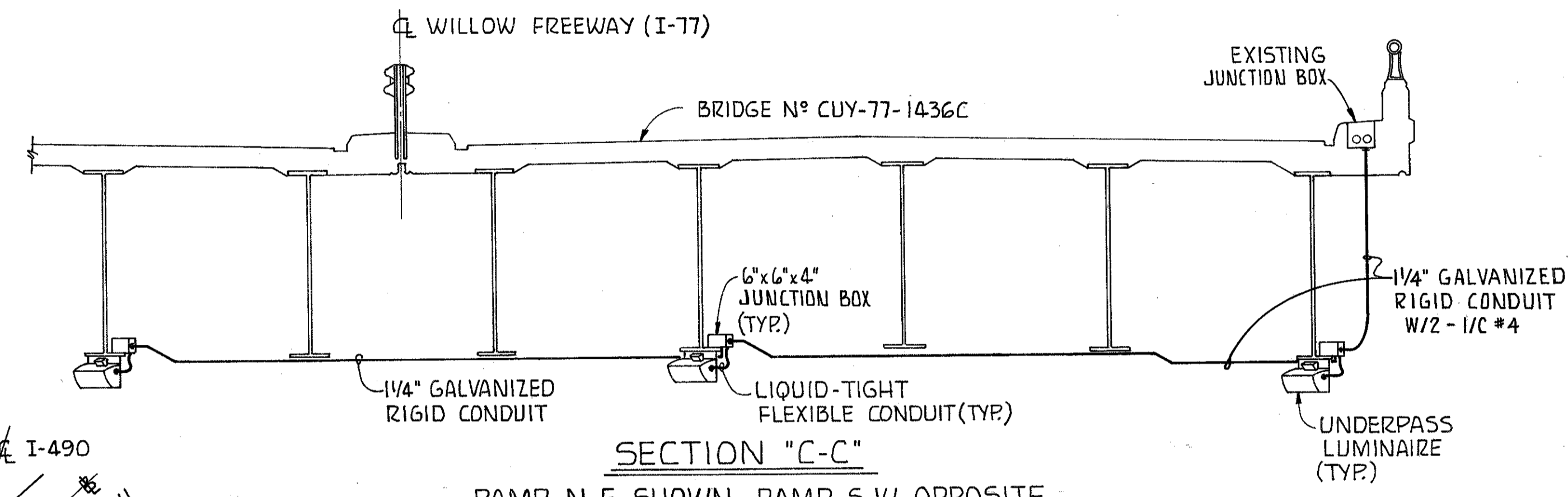
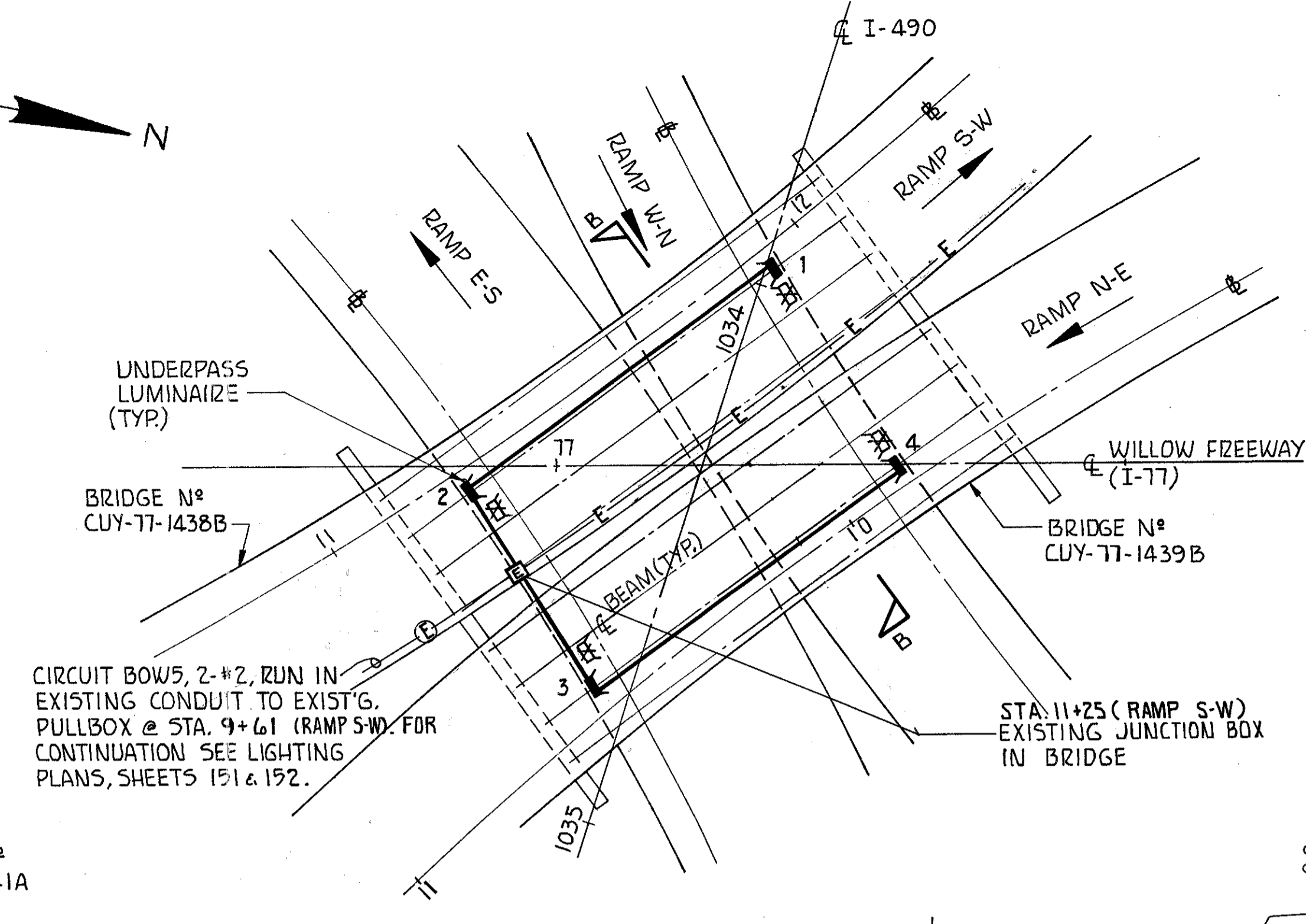
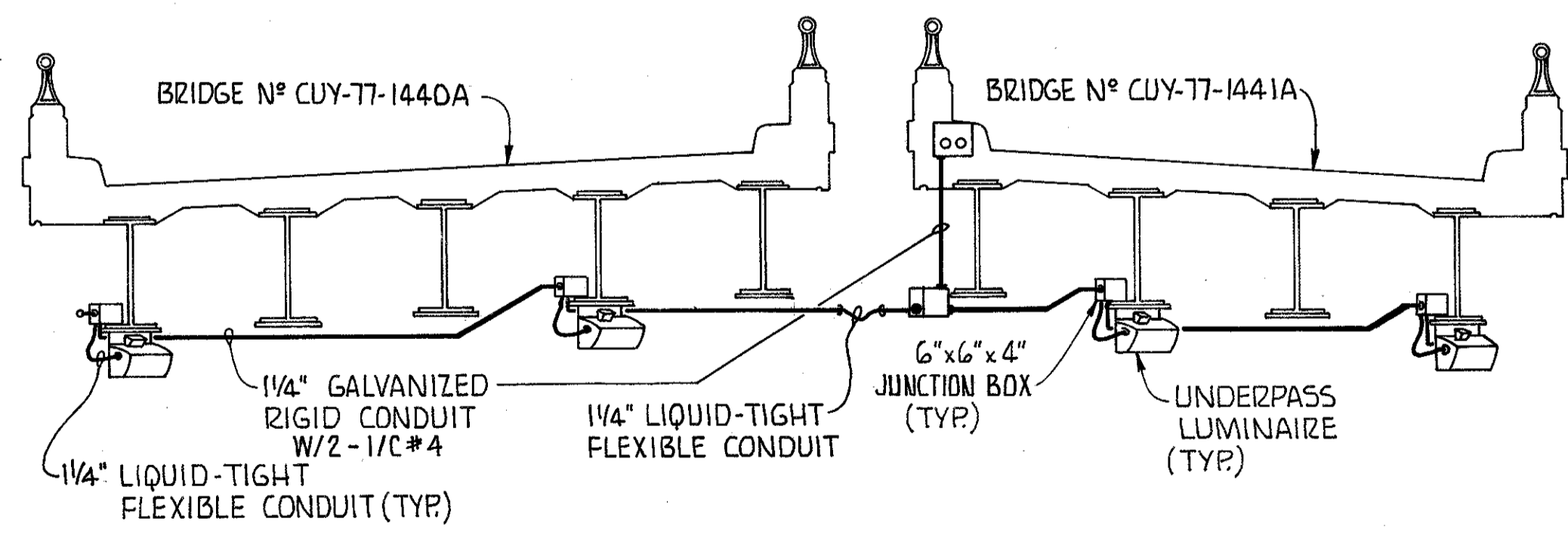
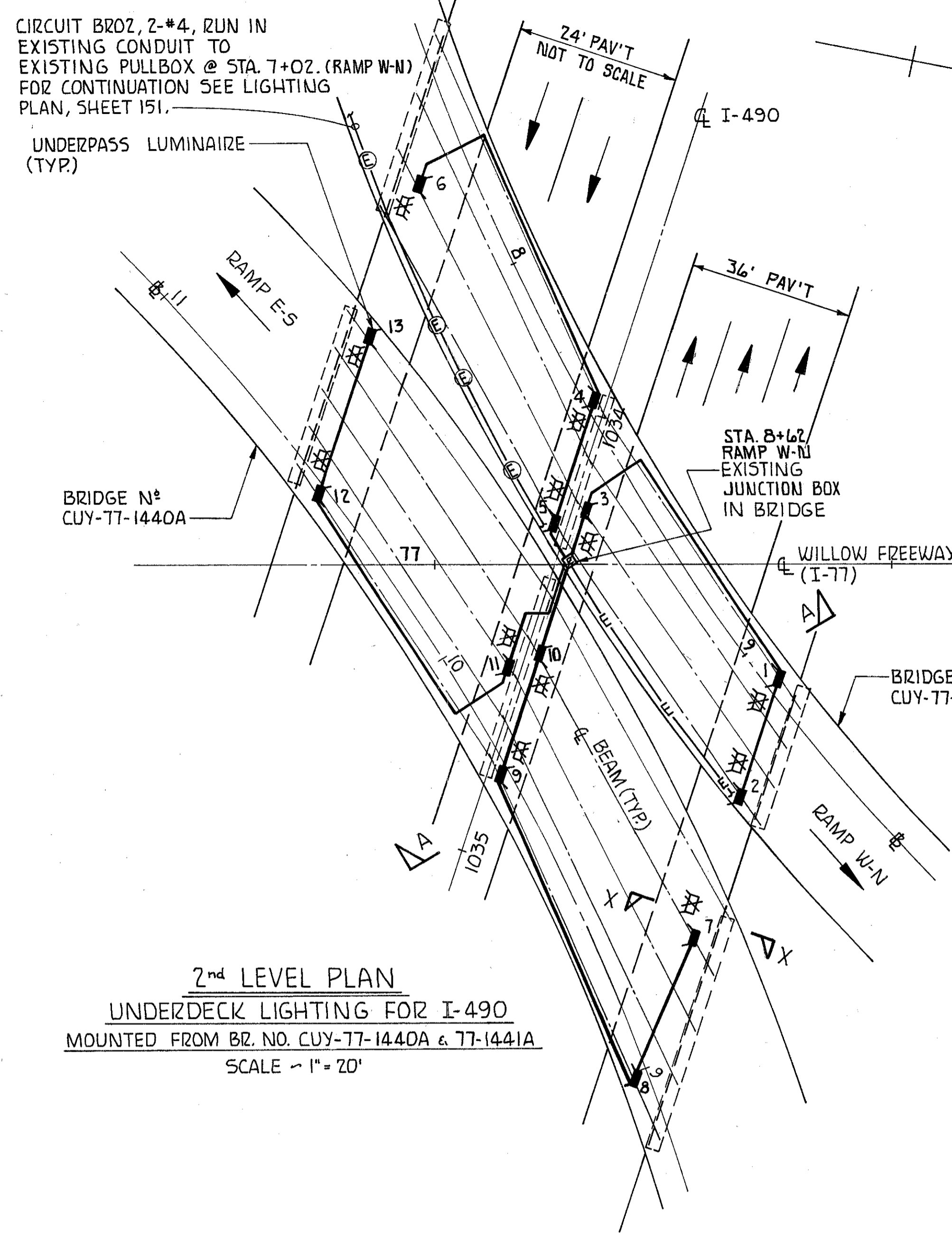
| NO. | DATE | BY | REVISED |
|-----|------|----|--|
| | | | TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 |

I-490
UNDERDECK LIGHTING
BRIDGE N° CUY-490-0152
I-490 UNDER BROADWAY

| | |
|--|------|
| SCALE AS NOTED | DATE |
| DESIGNED DRAWN TRACED CHECKED REVIEWED | DATE |
| ARG/CAP ARG/CAP | |

CONT. No. SHEET ACCT. No.

CUYAHOGA COUNTY
CUY-490-1.49



NOTES

1. UNDERPASS LUMINAIRES SHALL BE WELDED TO THE STRUCTURAL CHANNEL PARALLEL TO THE ROADWAY WHICH IS TO BE LIGHTED. THE STRUCTURAL CHANNEL SHALL BE STEEL CITY B-900, UNISTRUT P-2000 OR APPROVED EQUAL HELD AT RIGHT ANGLES TO OVERHEAD BEAM BY APPROVED BEAM CLAMPS.

FOR LEGEND SEE SHEET 142
FOR QUANTITIES SEE SHEET 149

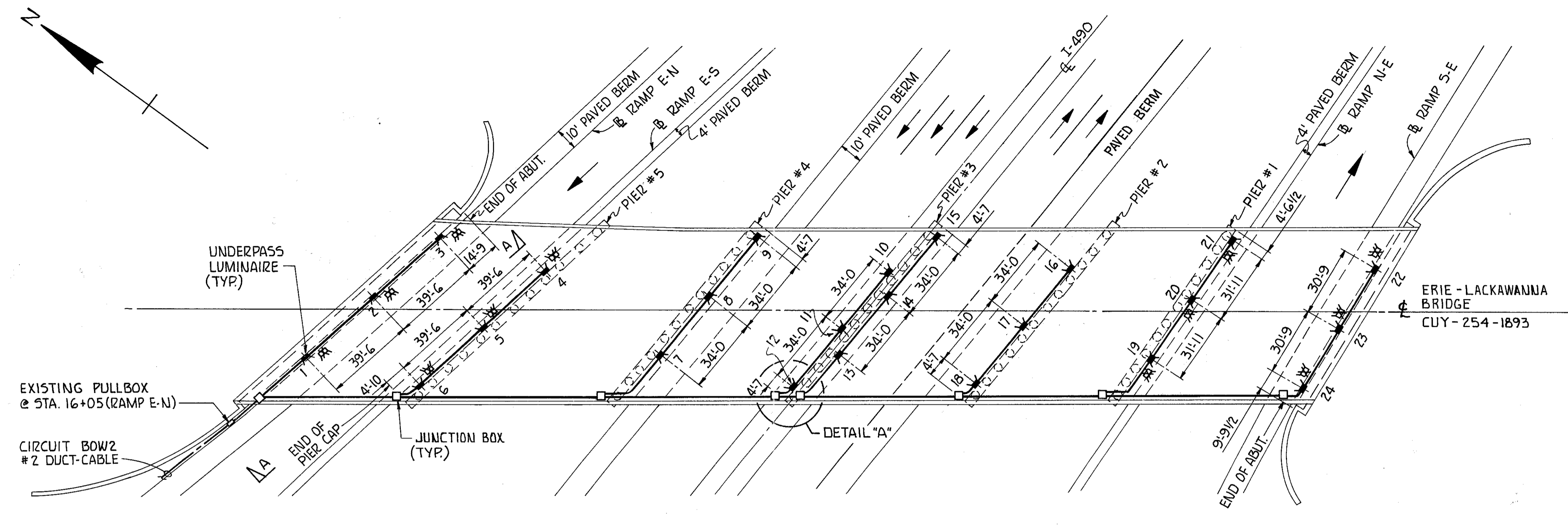
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|--|---------|----------|---------|
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| I-490 UNDERDECK LIGHTING BRIDGES N° CUY-77-1436C, CUY-77-1438B & CUY-77-1439B, CUY-77-1440A & CUY-77-1441A | | | |
| SCALE AS NOTED | DATE | DESIGNED | DRAWN |
| ARG/cap | ARG/cap | TRACED | CHECKED |
| | | REVIEWED | DATE |

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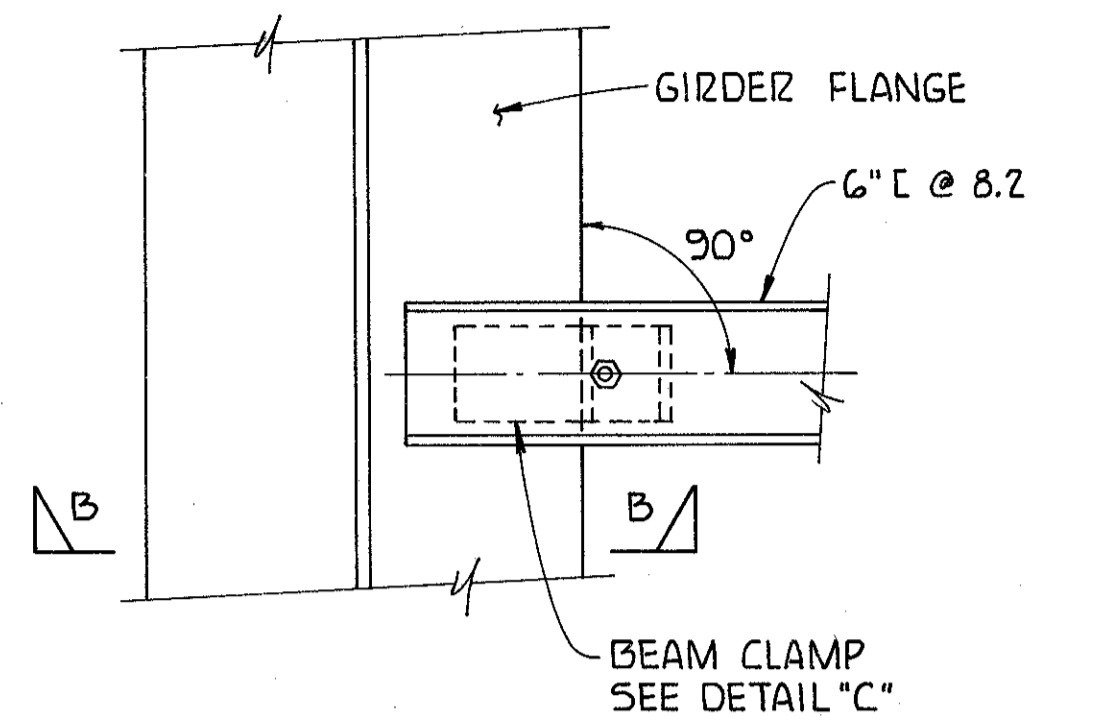
| FED. RD. DIVISION | STATE | PROJECT |
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| 2 | OHIO | |

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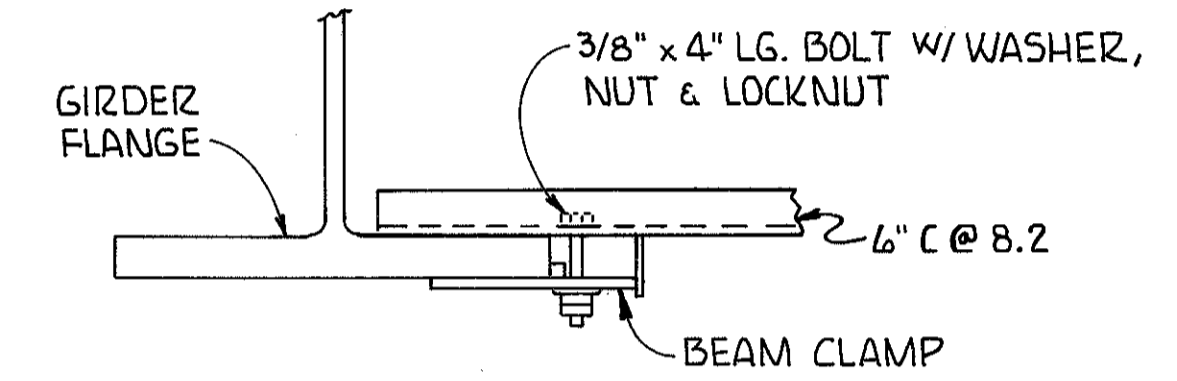
CUYAHOGA COUNTY
CUY-490-1.49



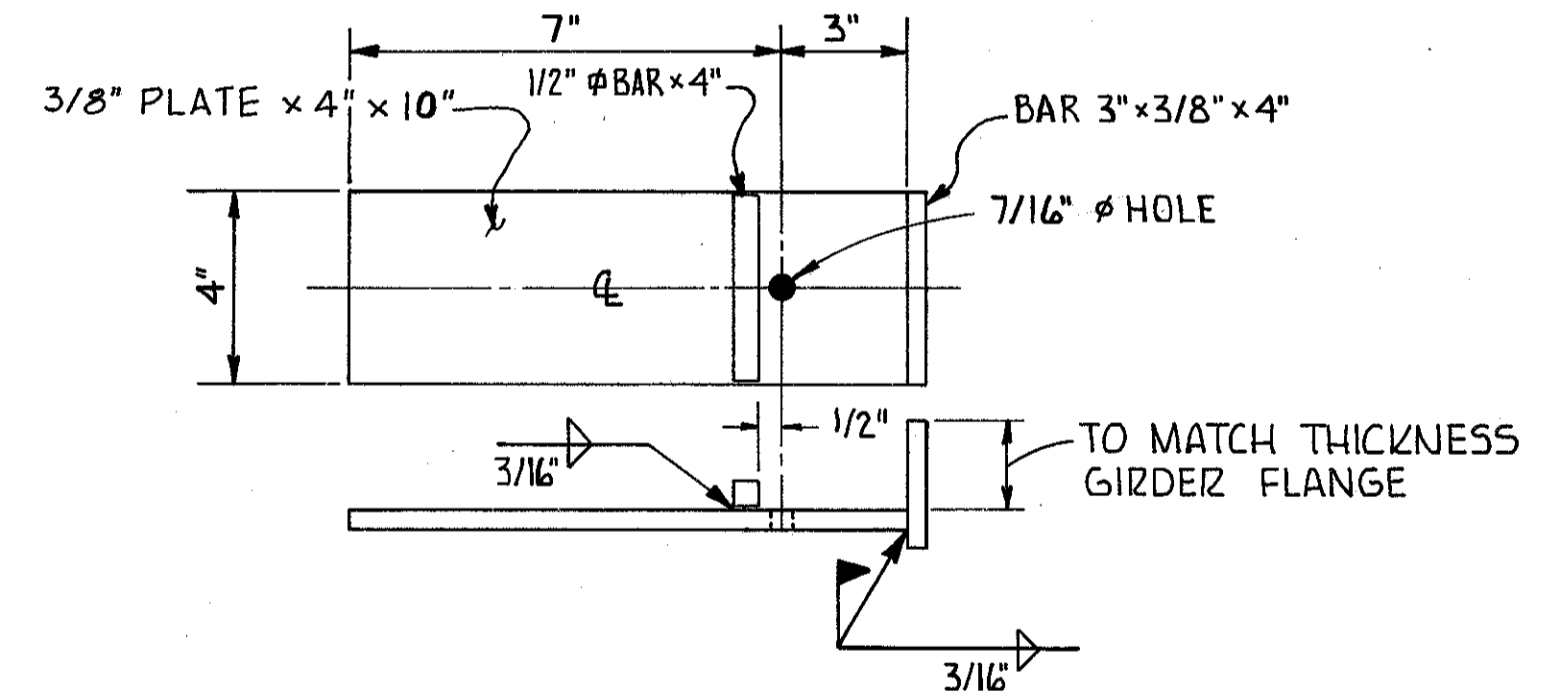
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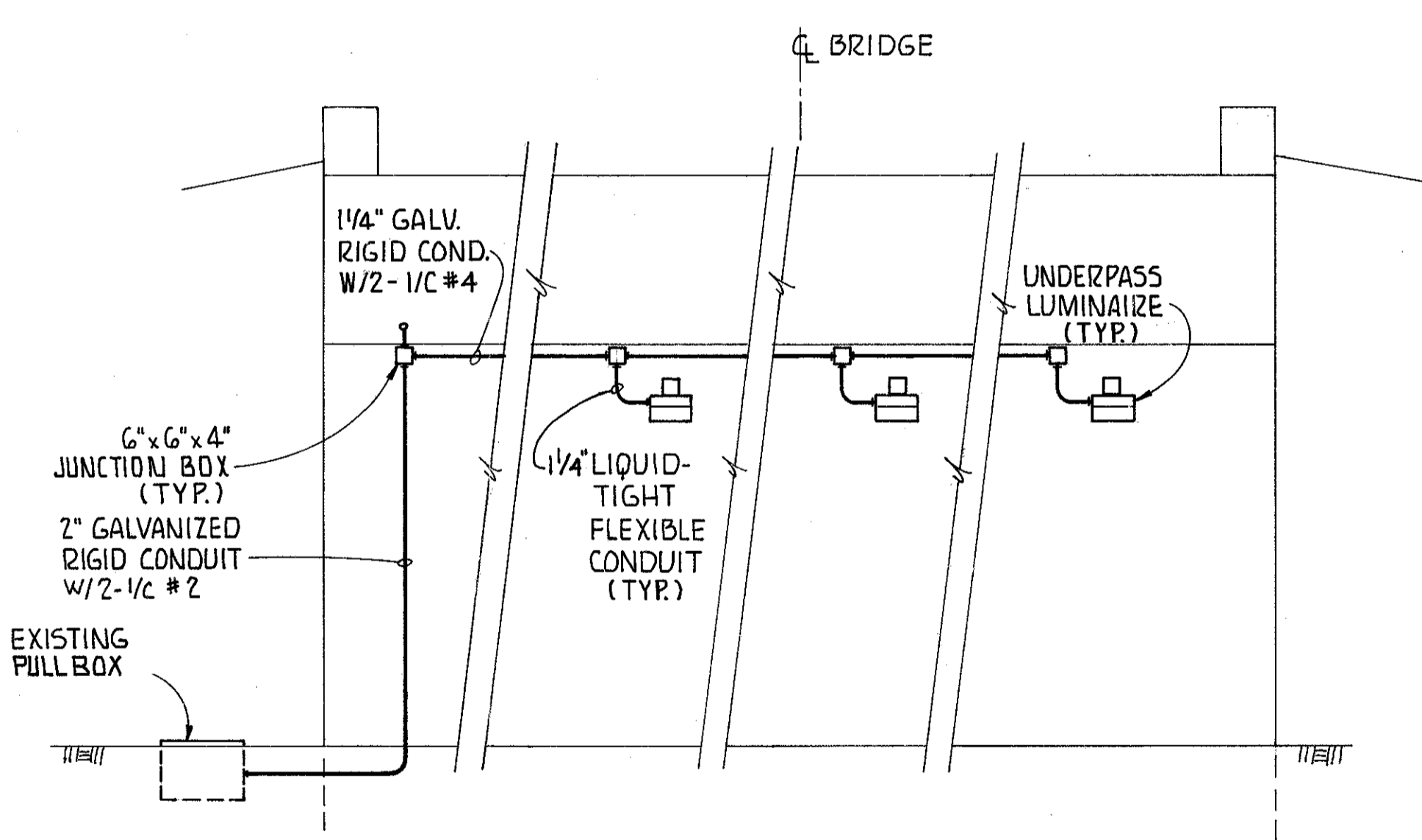
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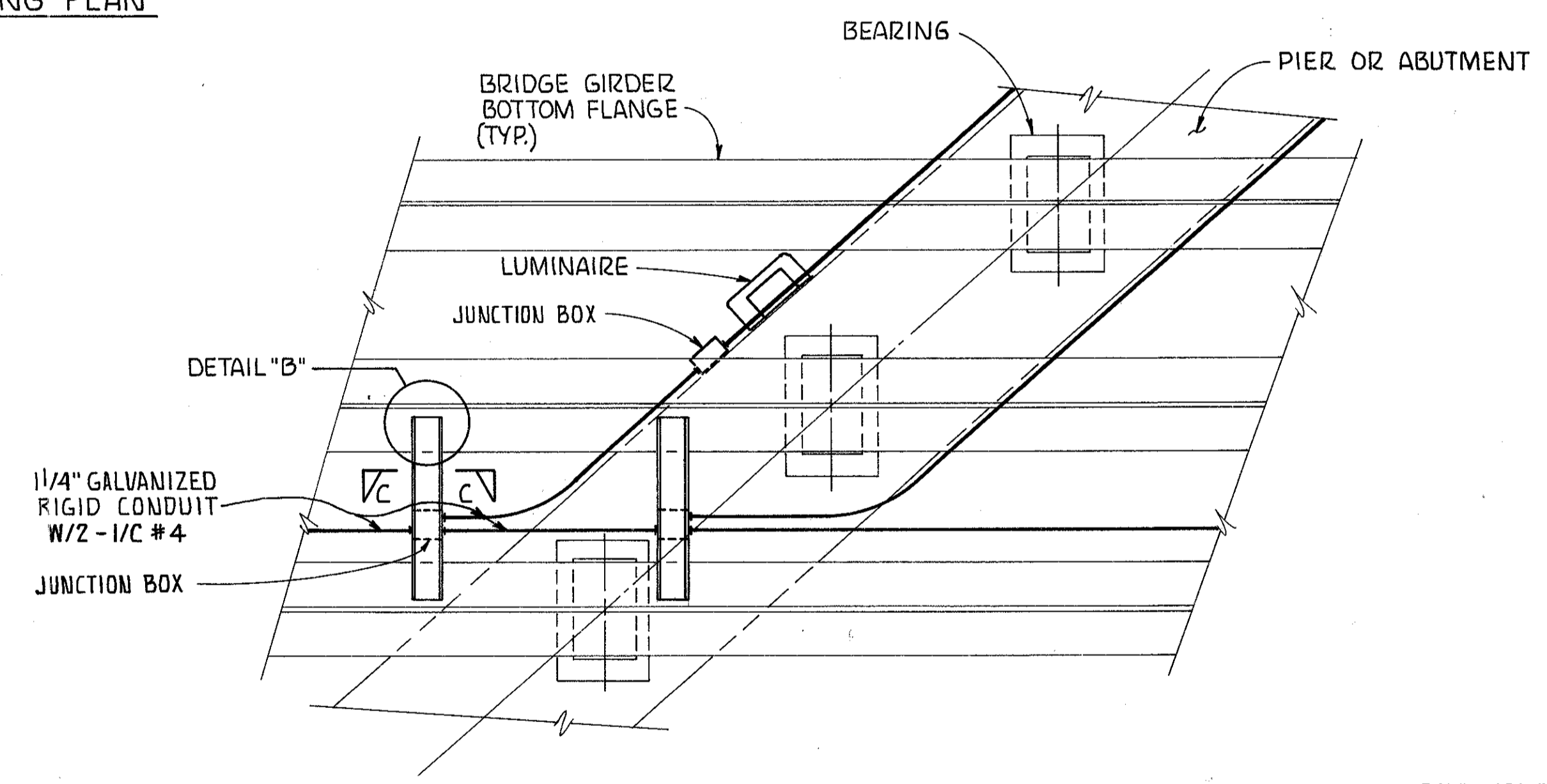
SECTION "B-B"
SCALE - 1/2" = 1'-0



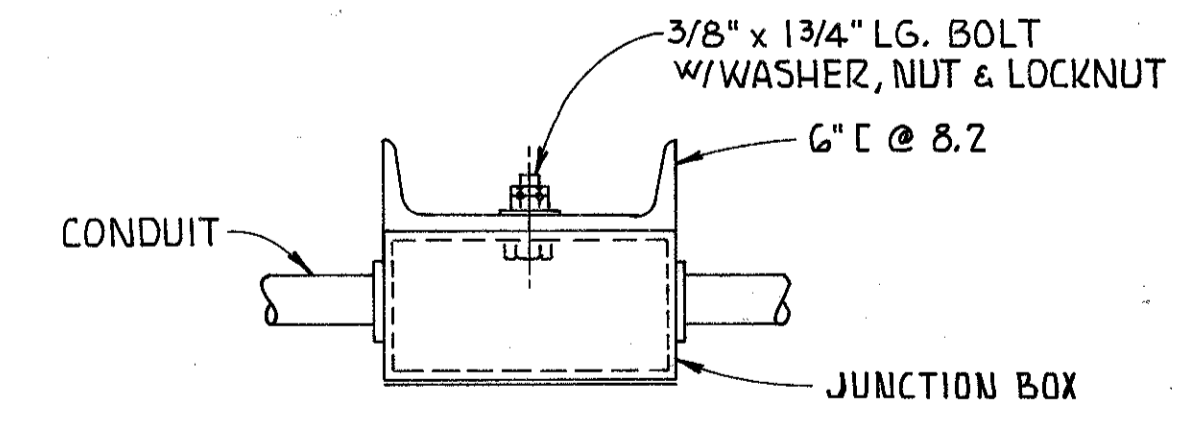
DETAIL "C" - BEAM CLAMP
SCALE - 3" = 1'-0



ELEVATION "A-A"
NO SCALE



DETAIL "A"
SCALE - 1/2" = 1'-0



SECTION "C-C"
SCALE - 3" = 1'-0

FOR LEGEND SEE SHEET 142

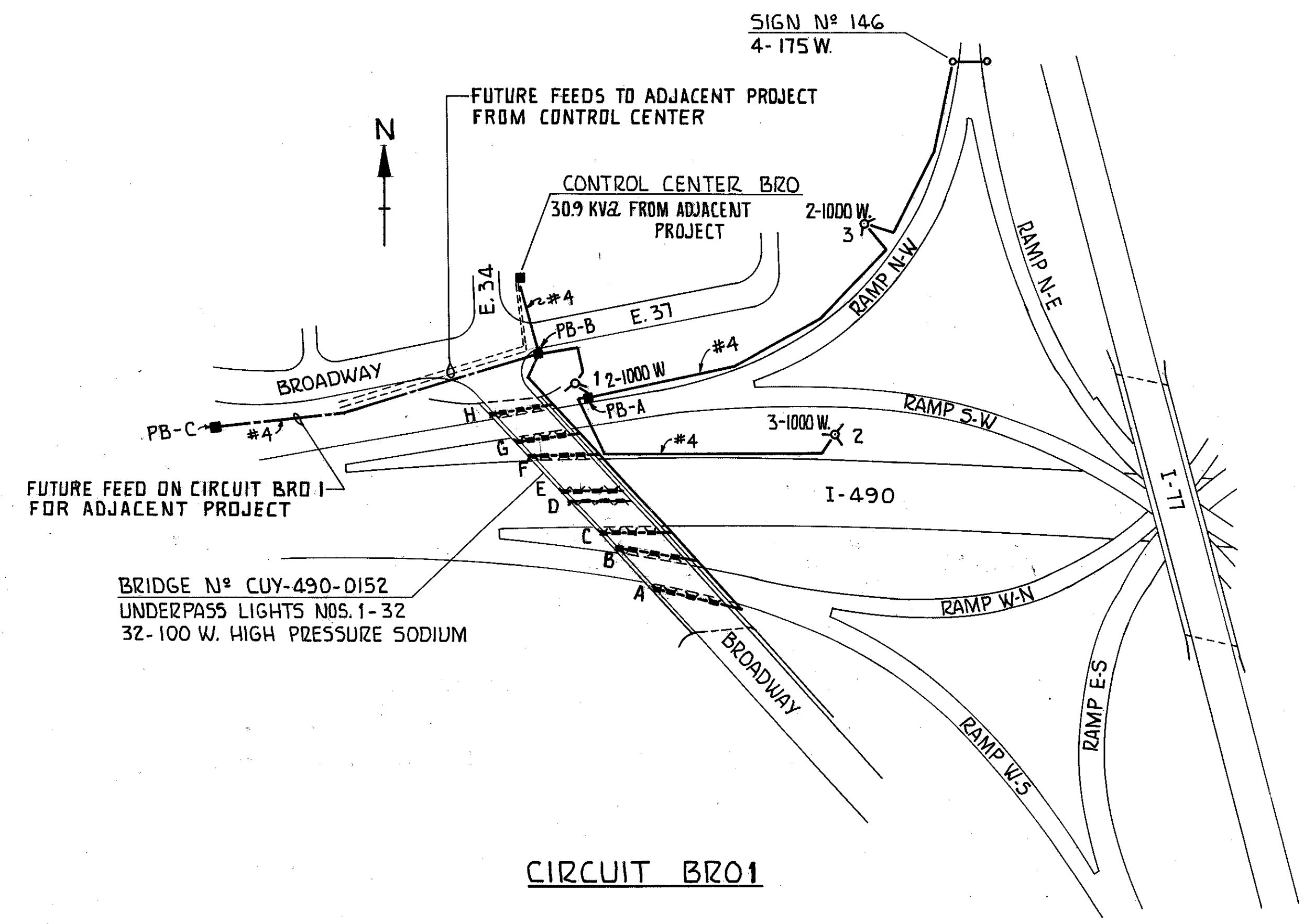
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| I-490 UNDERDECK LIGHTING BRIDGE N° CUY-254-1893 I-490 UNDER ERIE-LACKAWANNA RAILROAD | | | |
| SCALE AS NOTED | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| ARG/CAP | ARG/CAP | | |
| | | REVIEWED | DATE |

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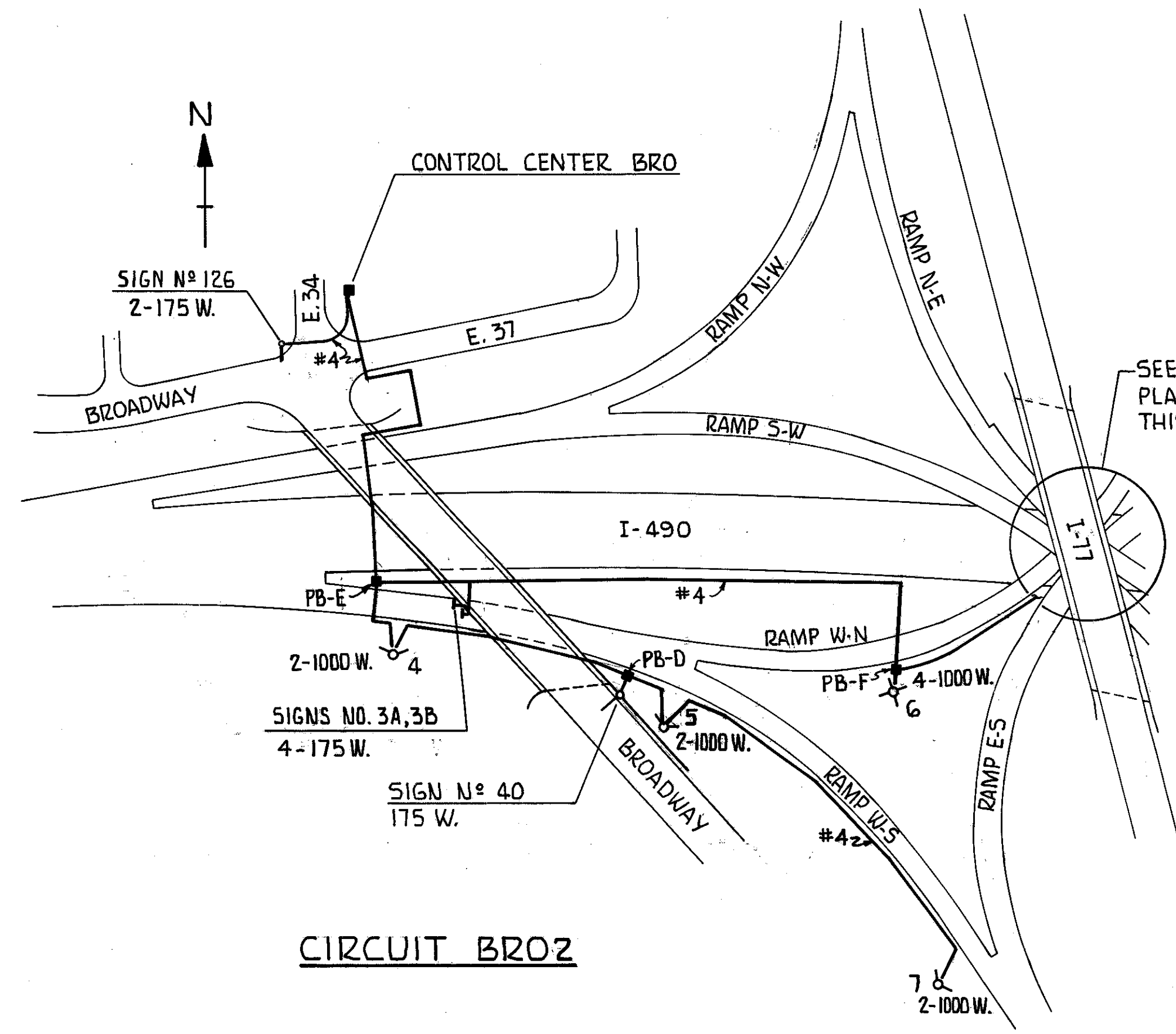
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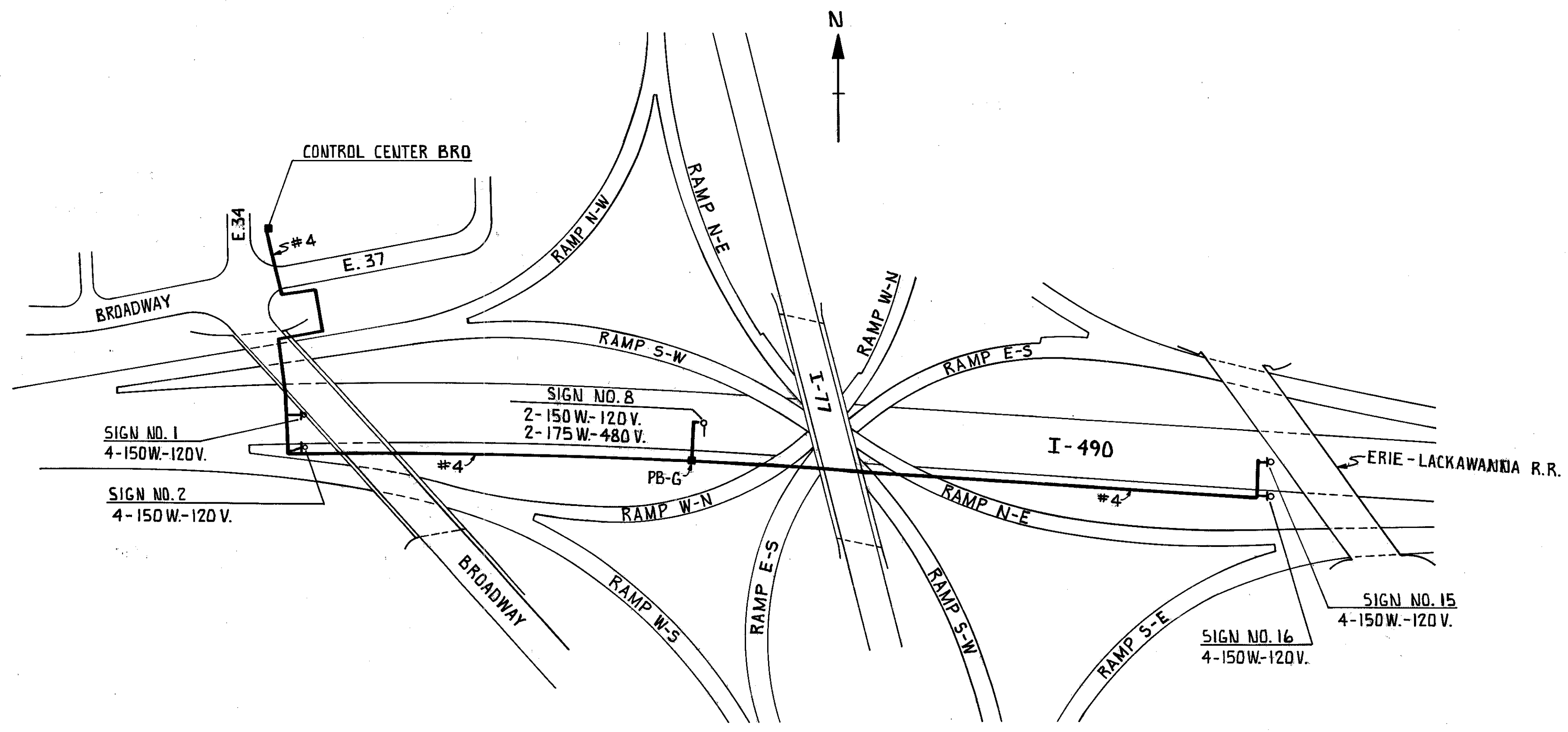
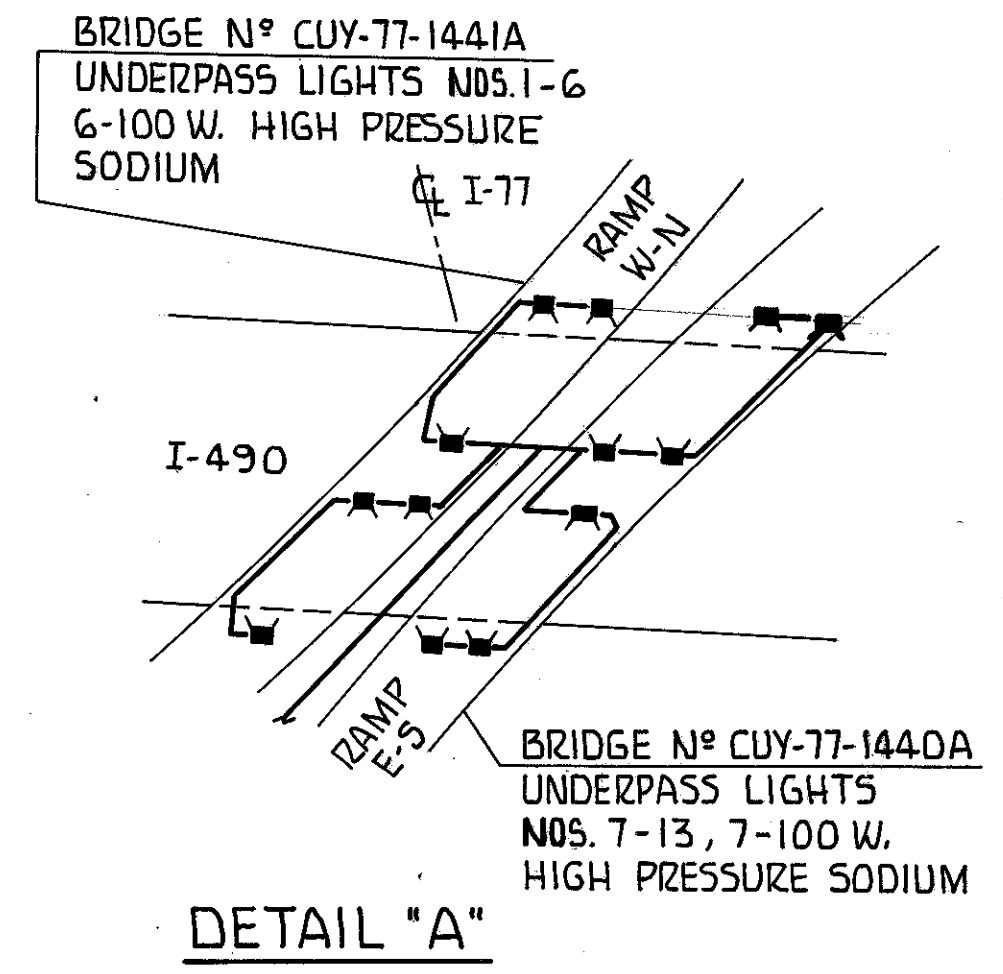
CUYAHOGA COUNTY
CUY-490-1.49



CIRCUIT BRO1



CIRCUIT BRO2



CIRCUIT BRO3

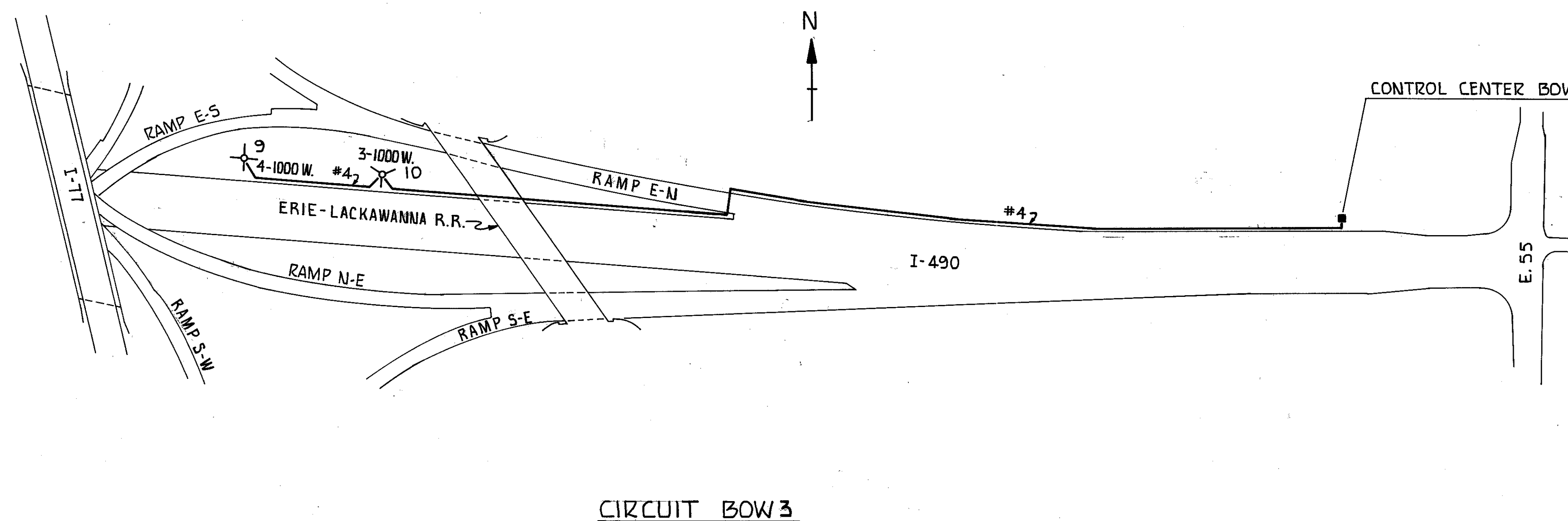
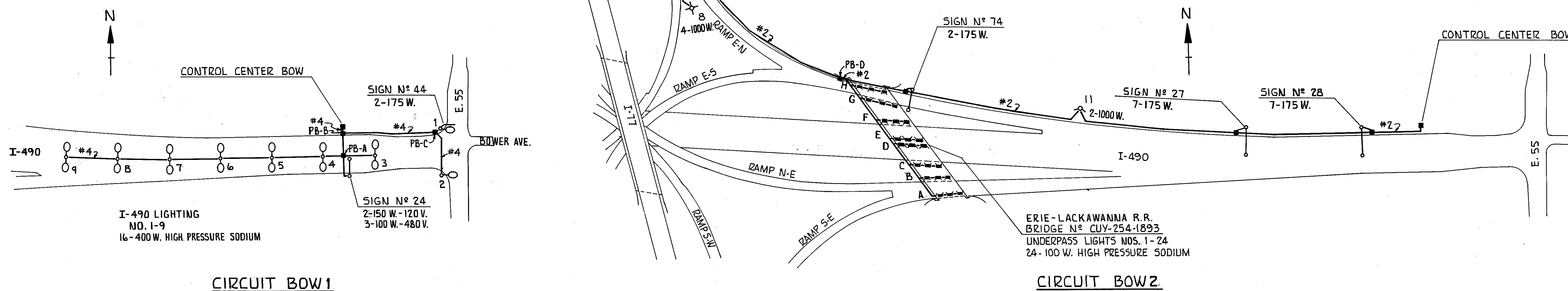
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| I-490 CIRCUIT MAPS CONTROL CENTER BRO | | | |
| SCALE | DATE | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| ARG/CAP | ARG/CAP | JRH | |

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

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CUYAHOGA COUNTY
CUY-490-1.49



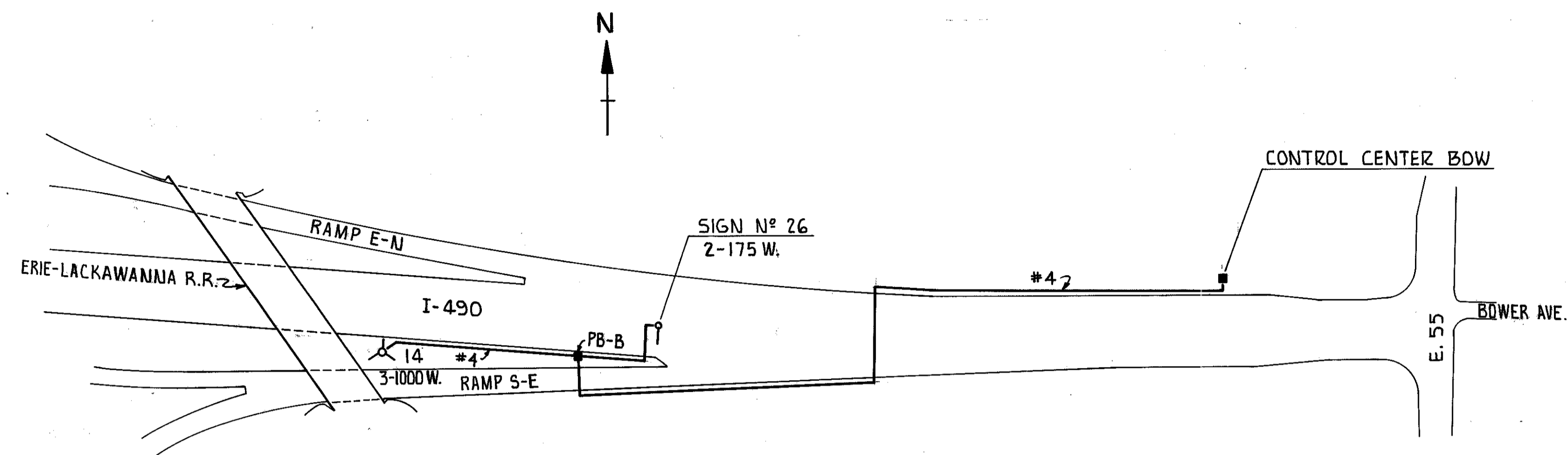
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| I-490 CIRCUIT MAPS CONTROL CENTER BOW | | | |
| SCALE | DATE | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| ARG/CAP | ARG/CAP | JRH | |

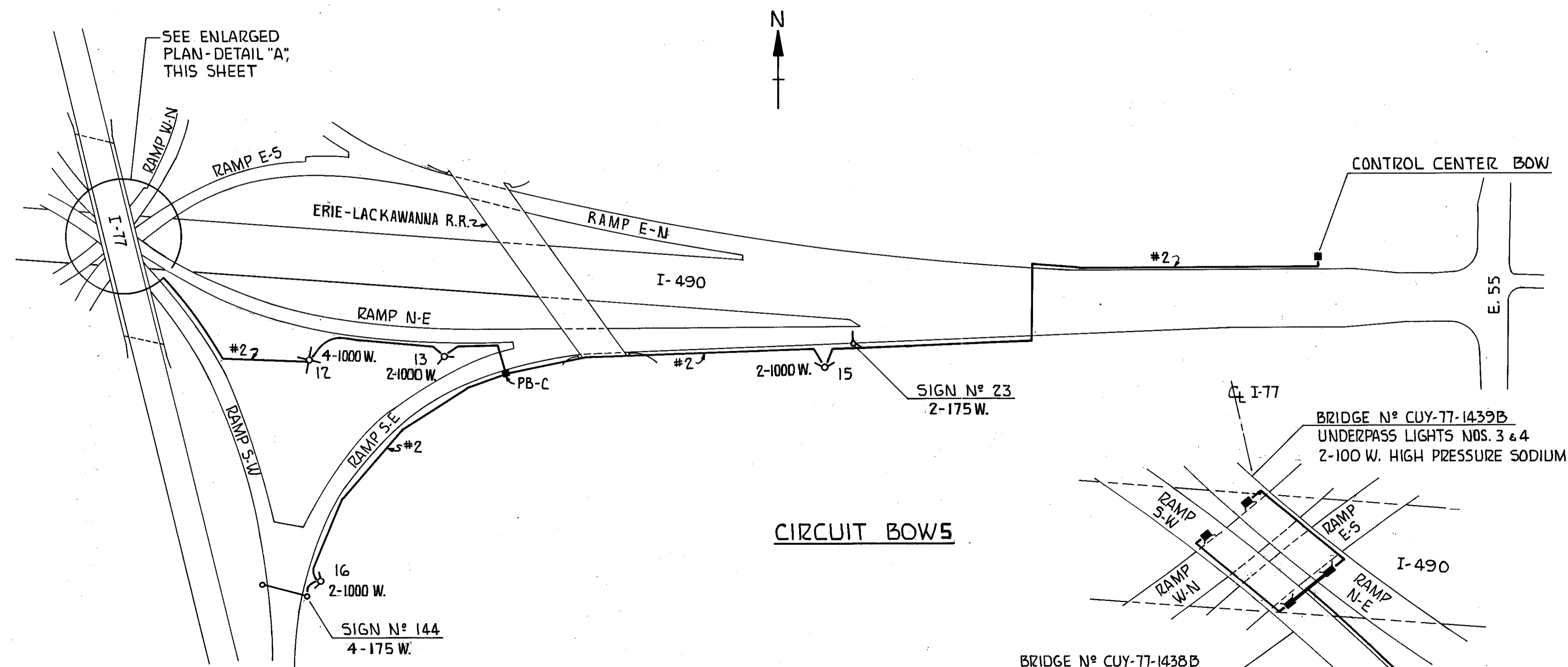
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| FED. RD. DIVISION | STATE | PROJECT | |
| 2 | OHIO | | |

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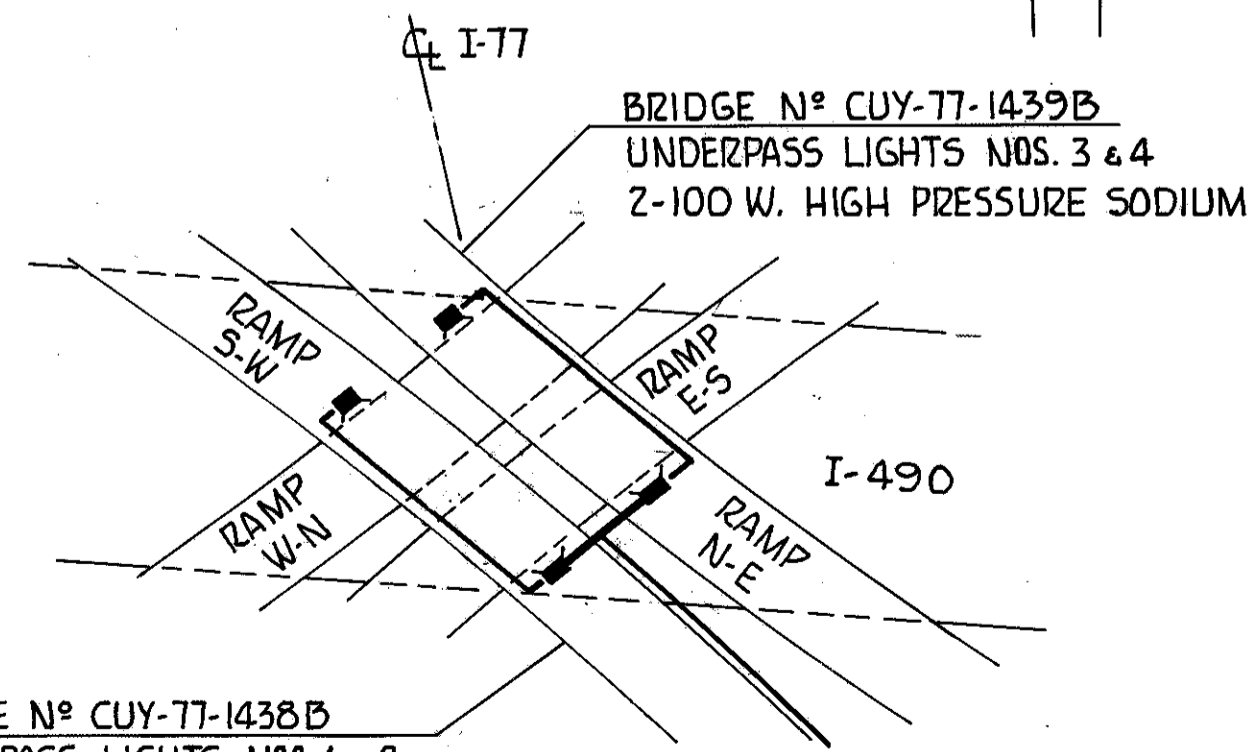
CUYAHOGA COUNTY
CUY-490-1.49



CIRCUIT BOW4



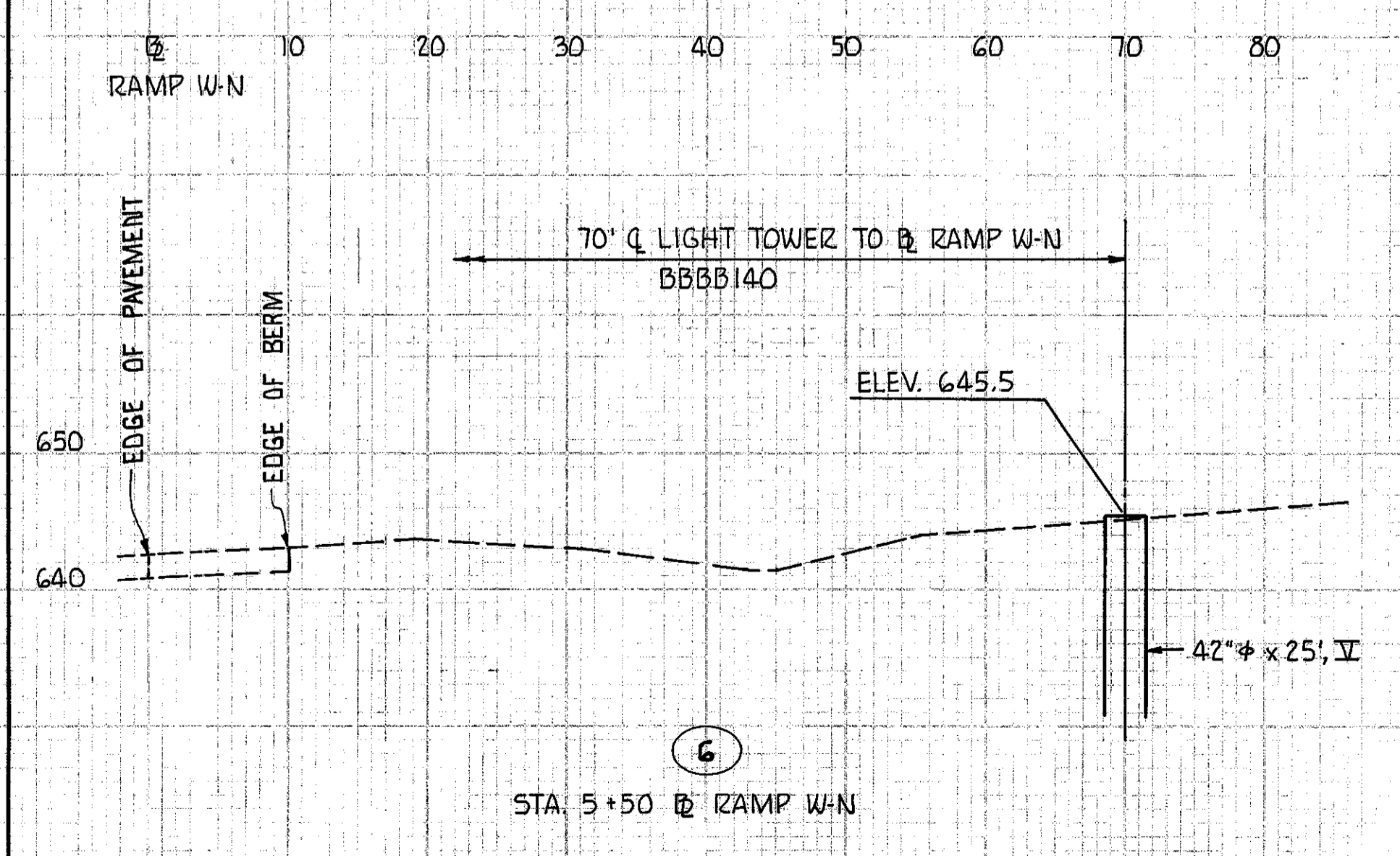
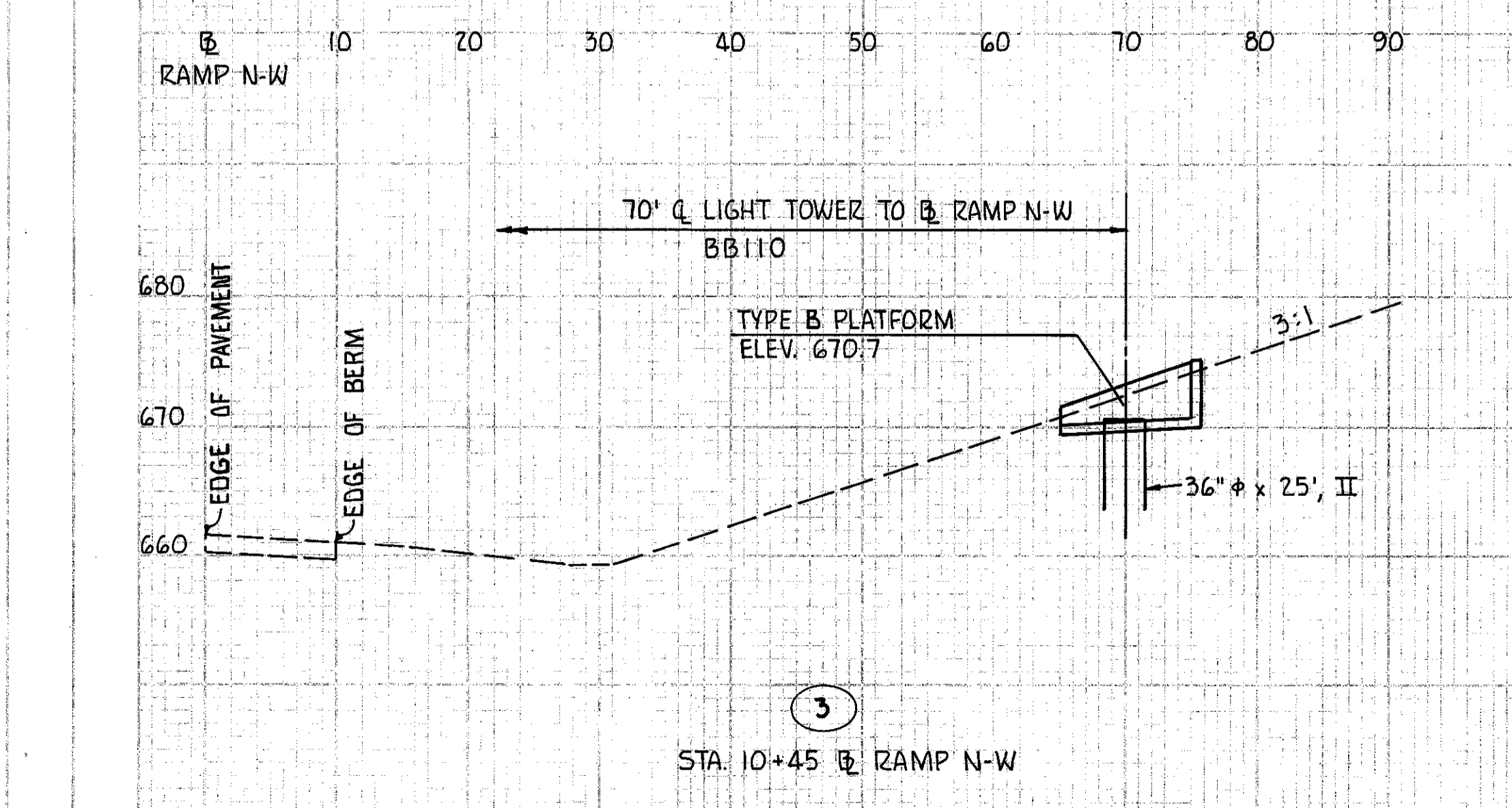
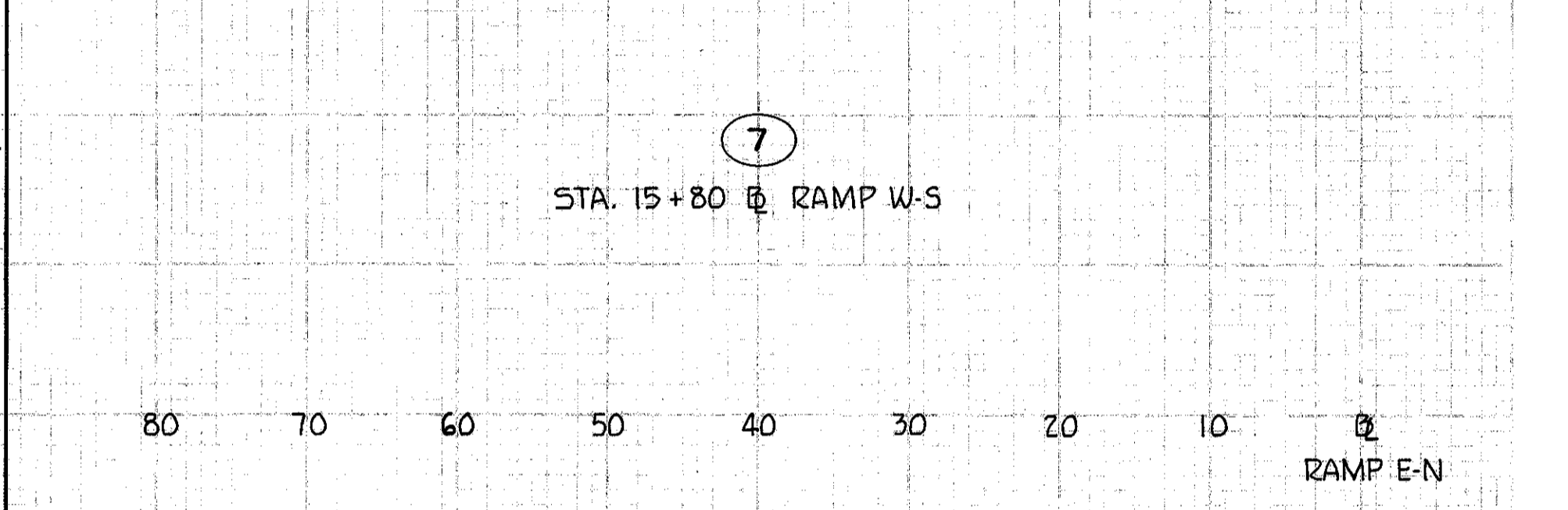
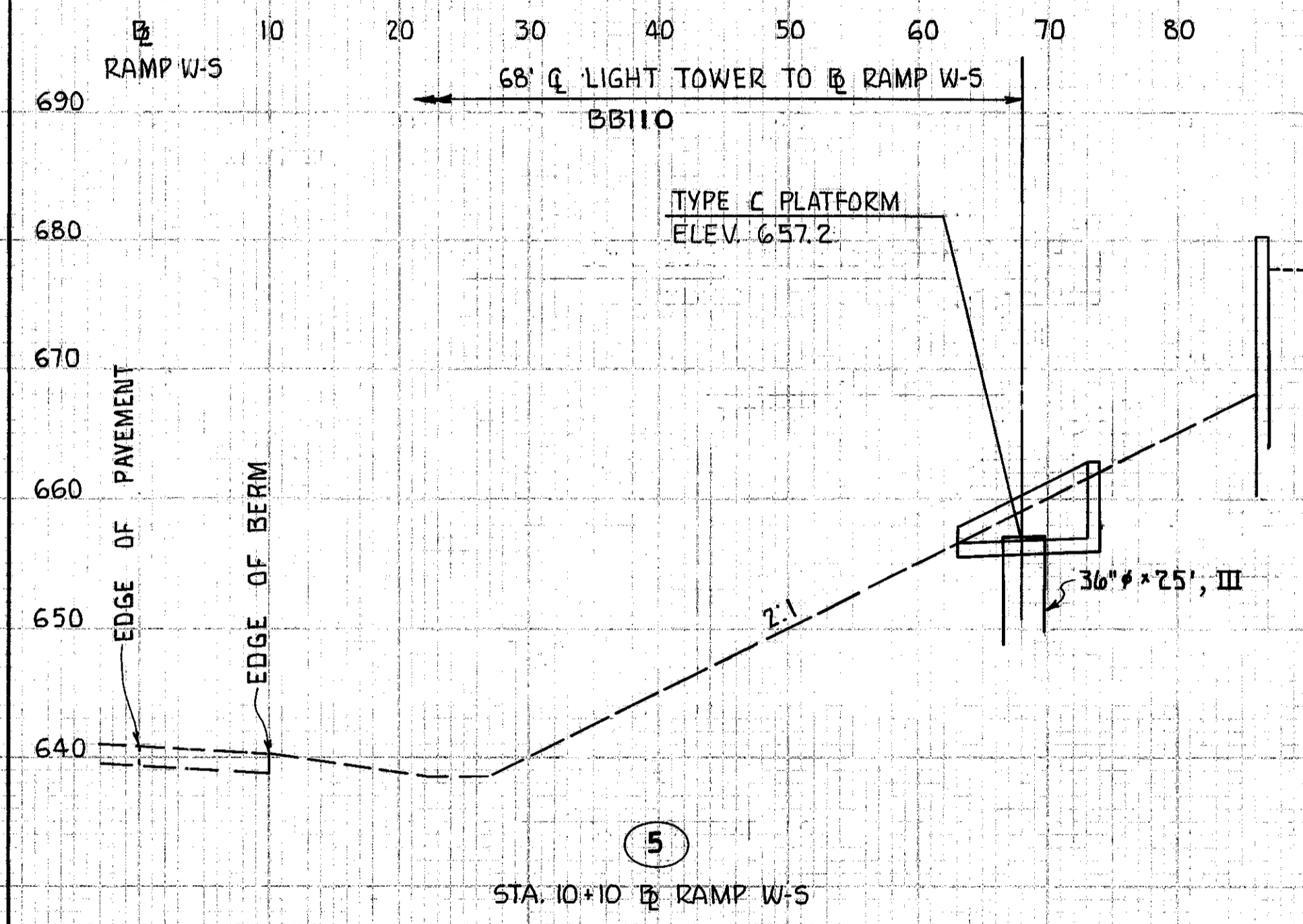
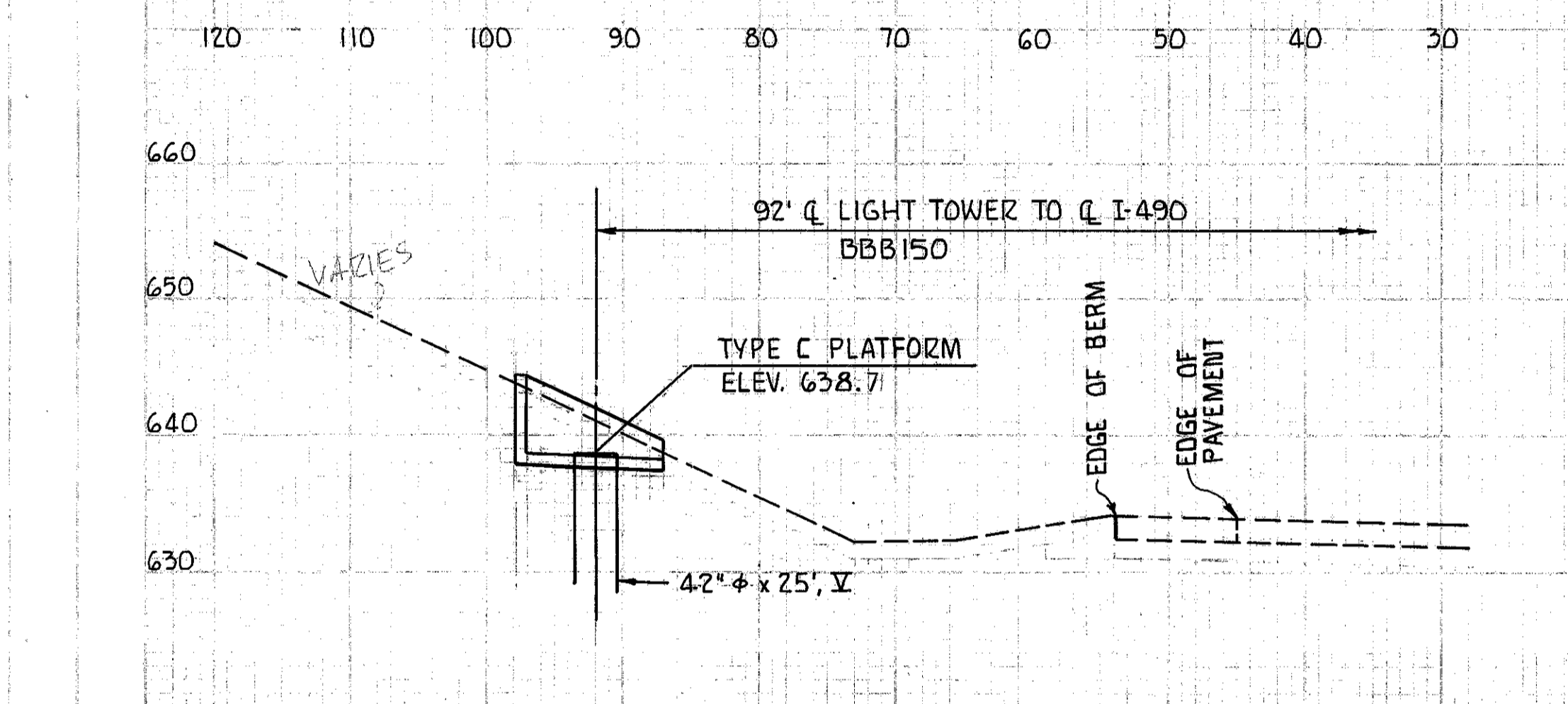
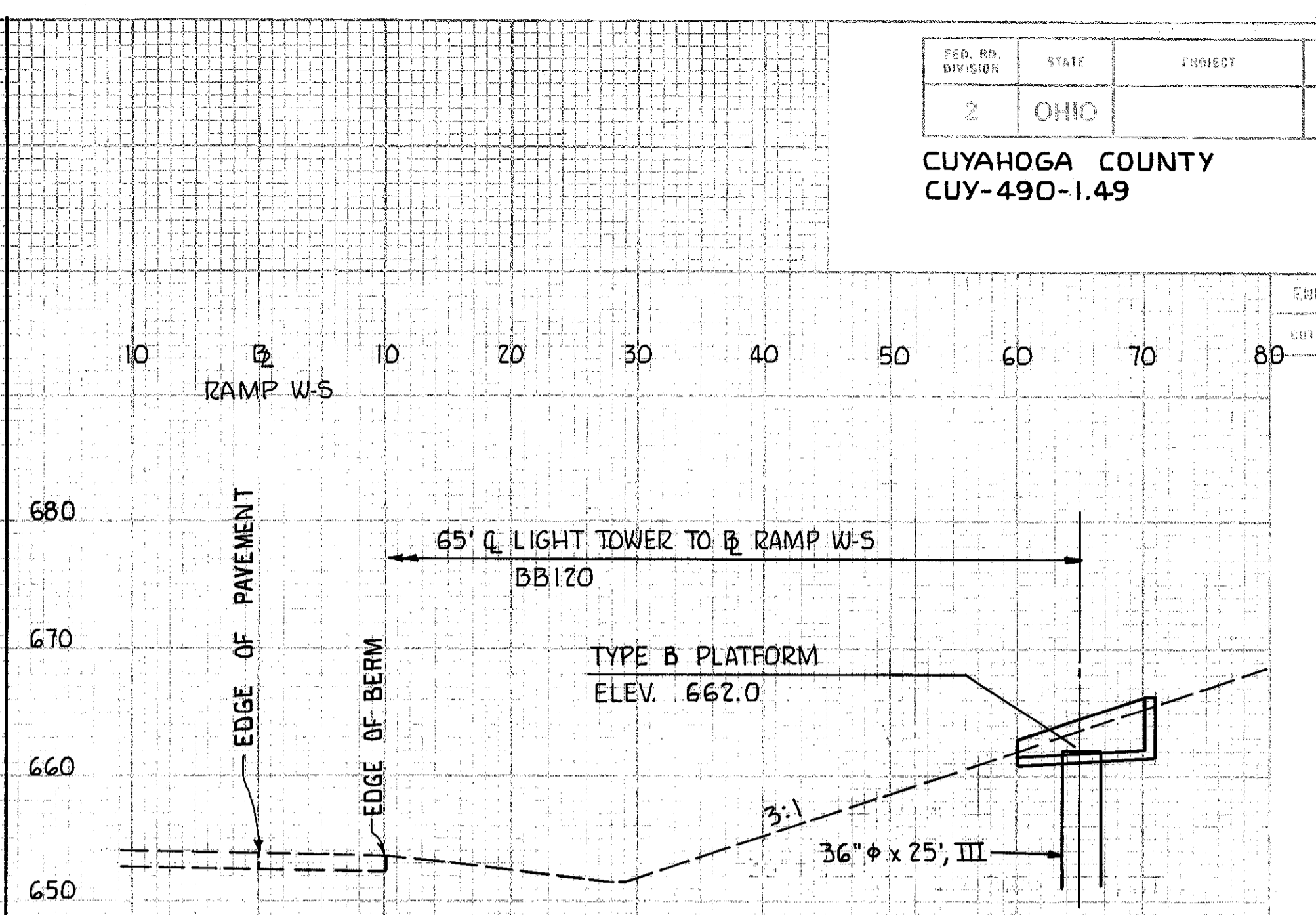
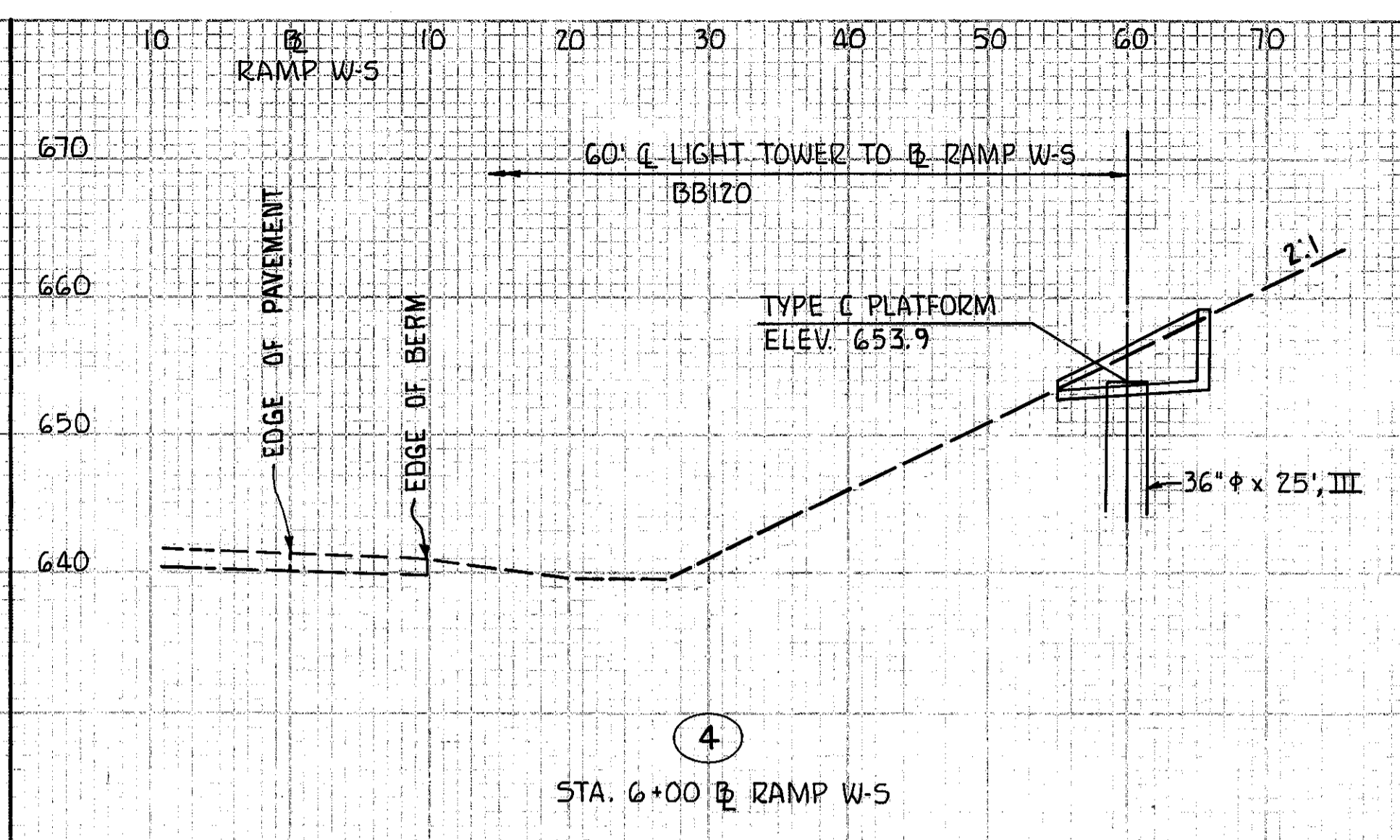
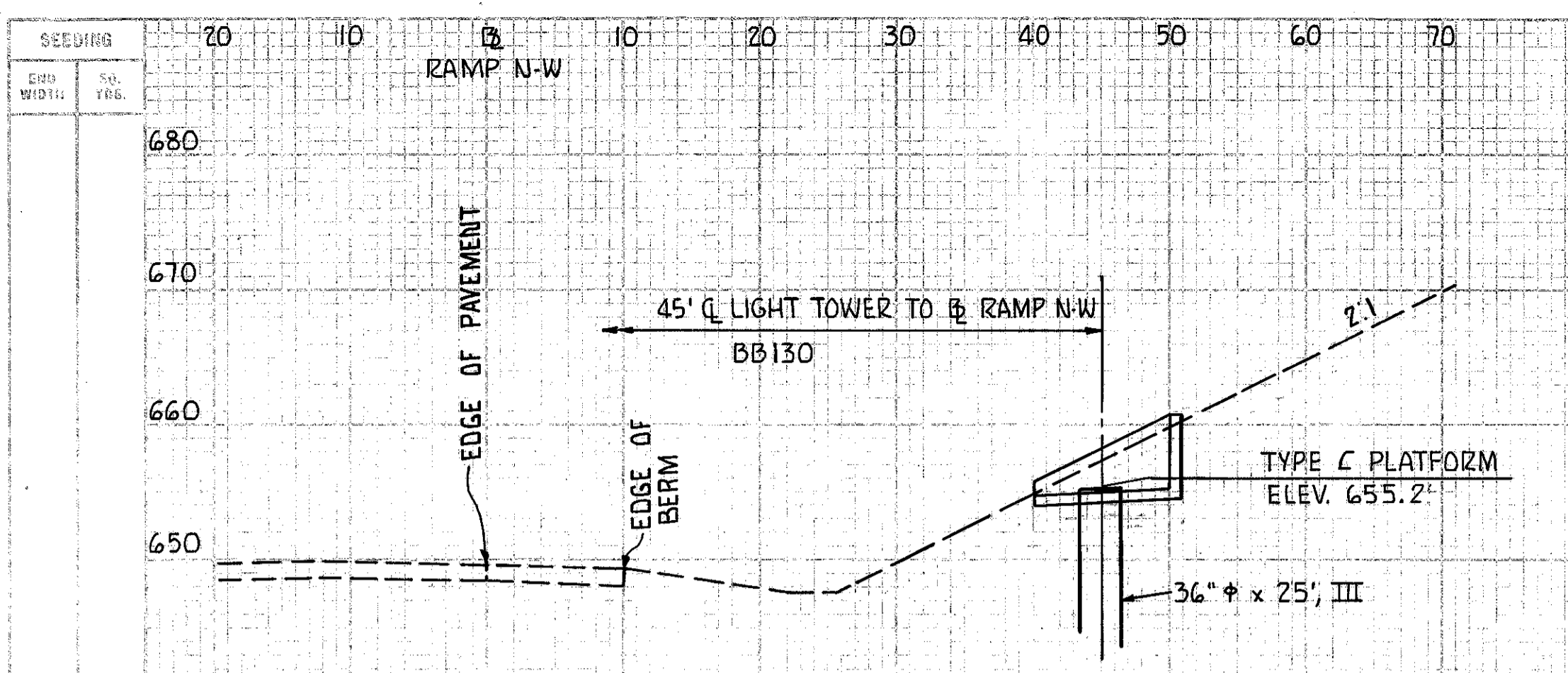
CIRCUIT BOW5



DETAIL "A"

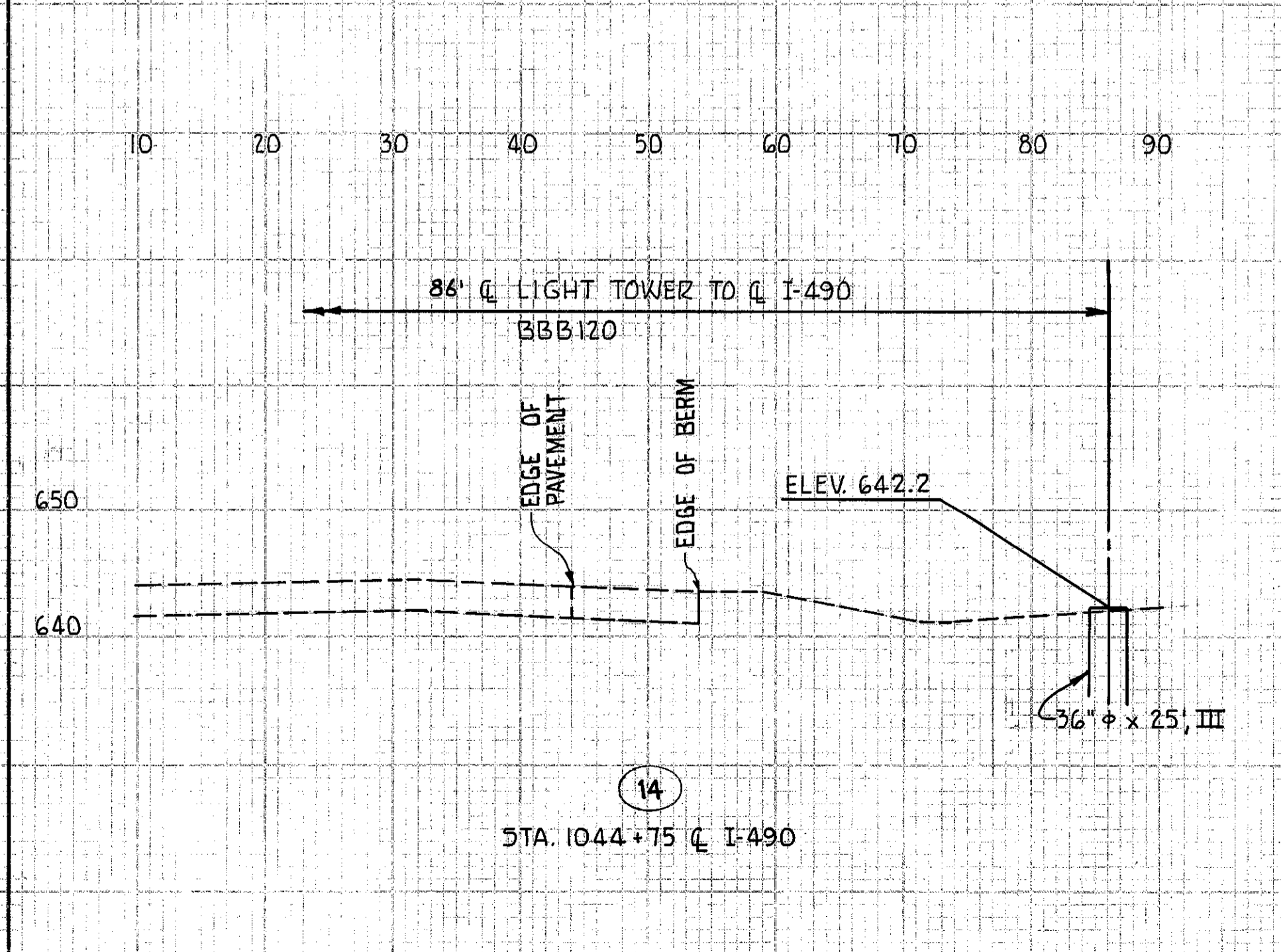
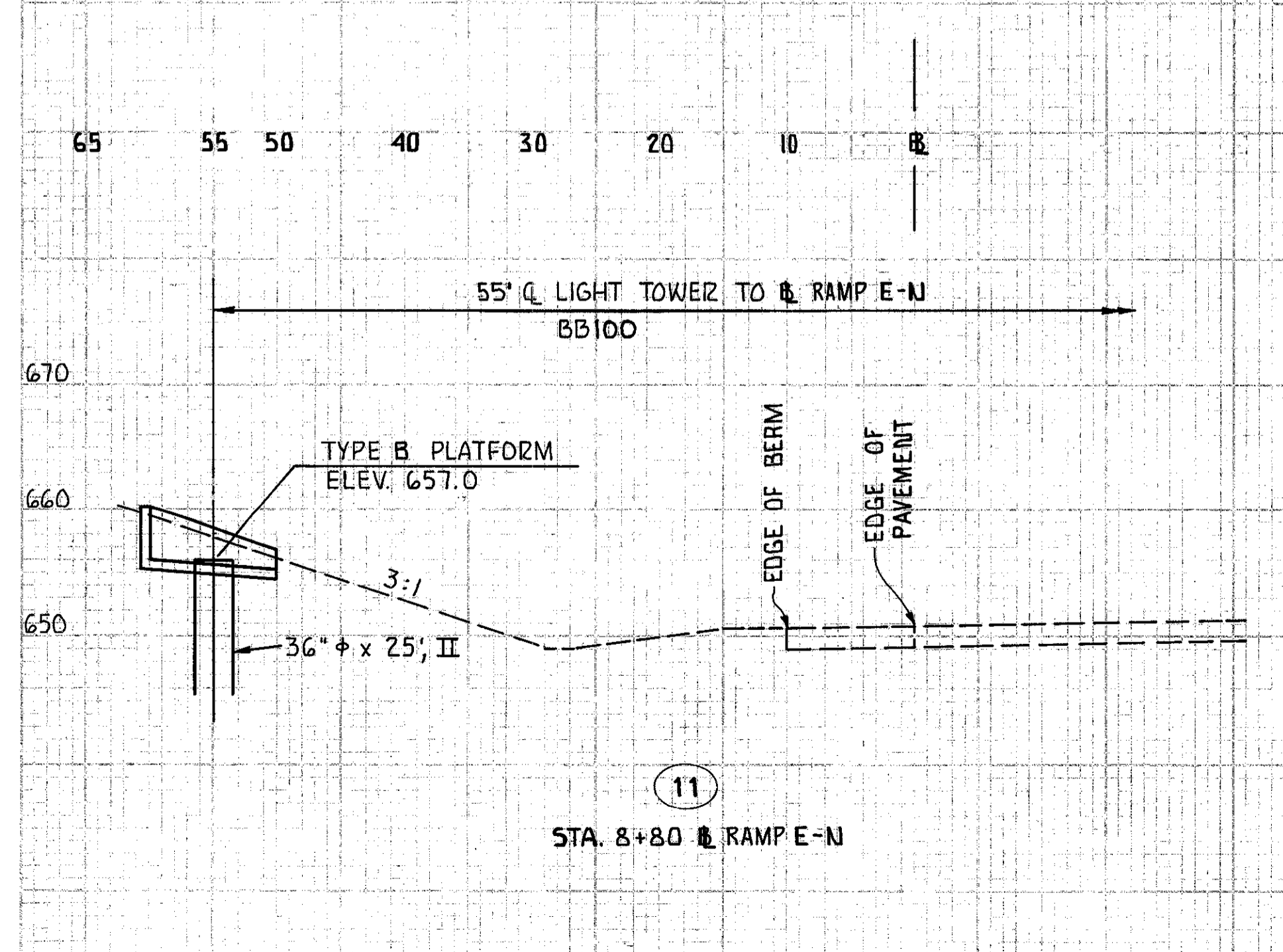
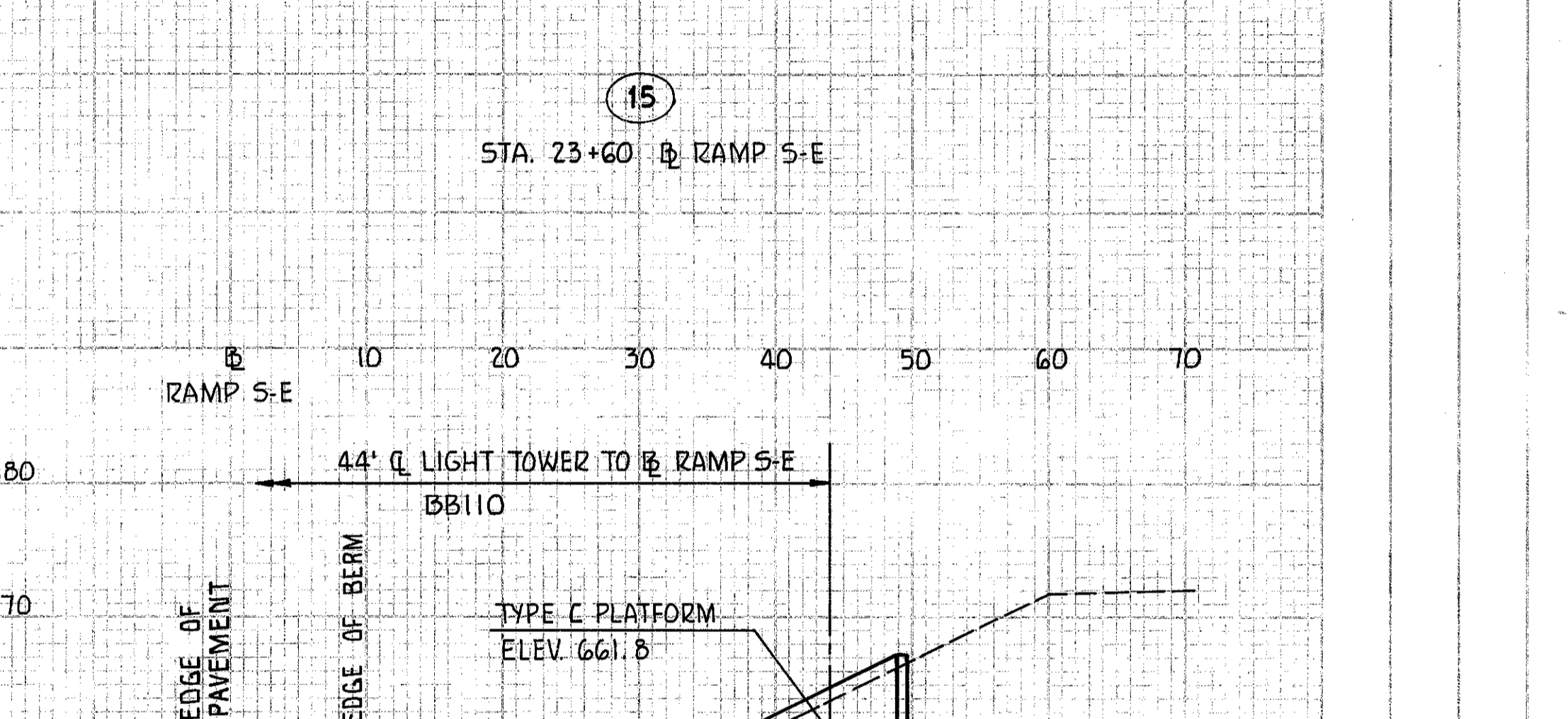
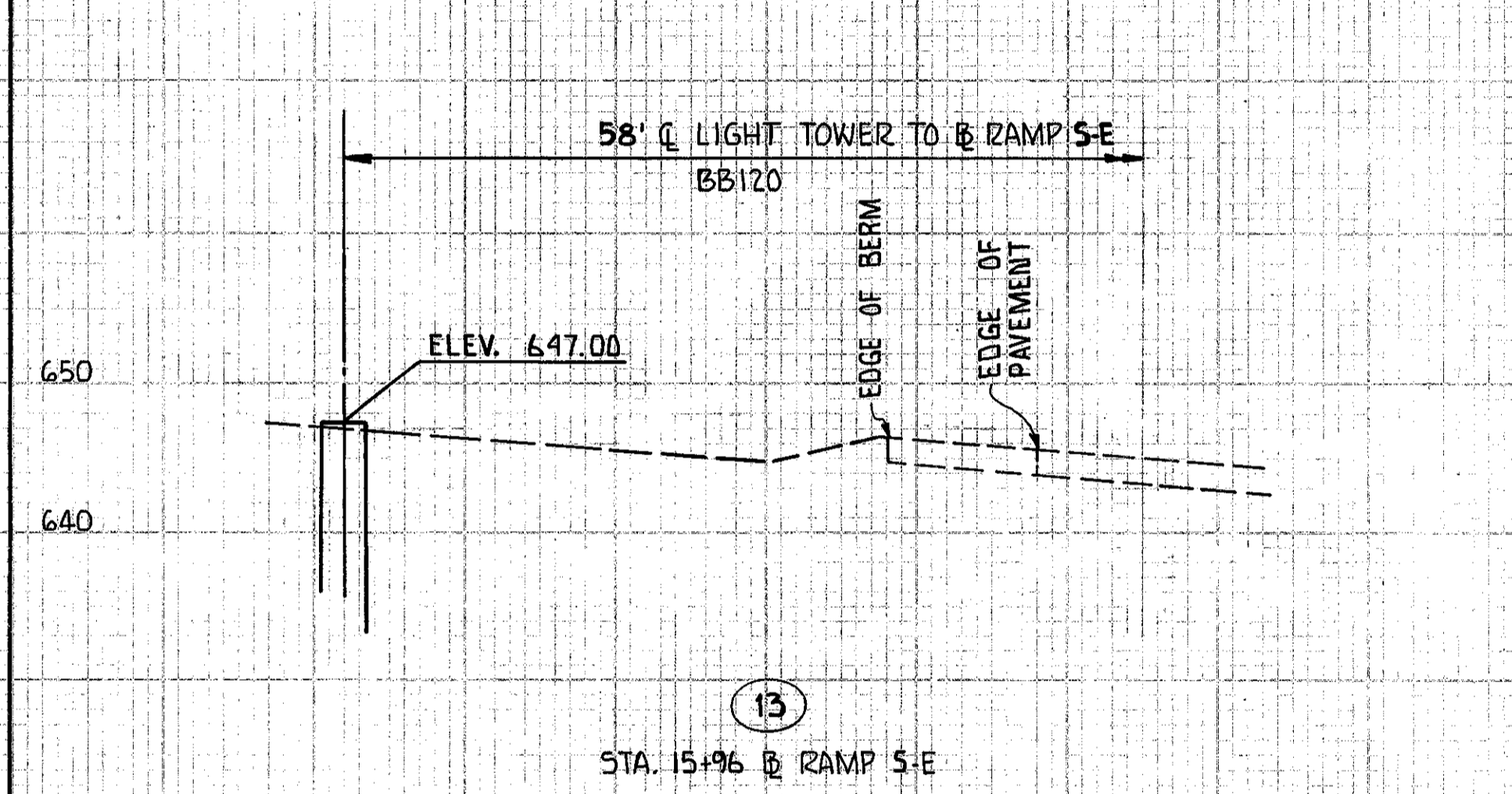
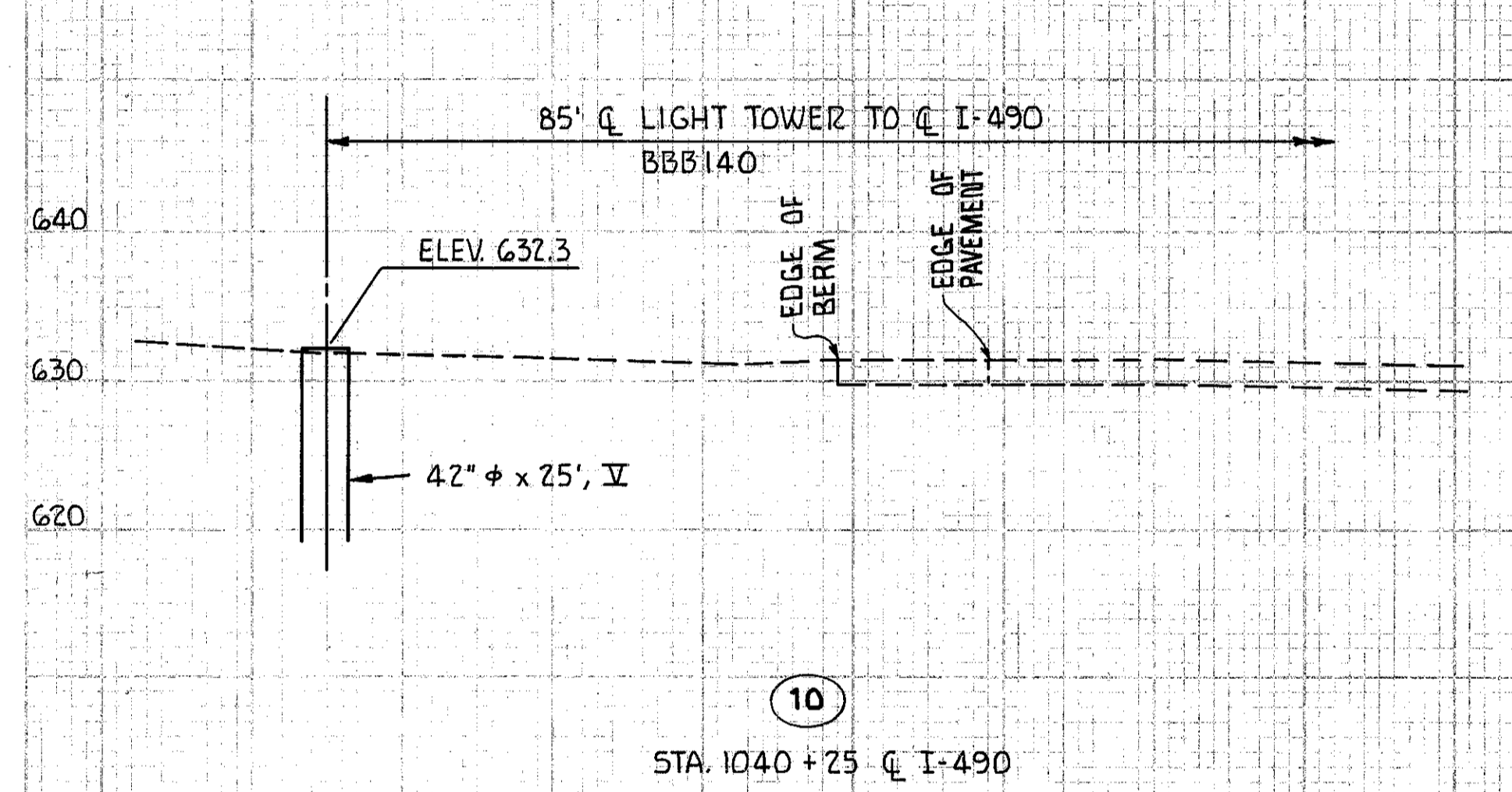
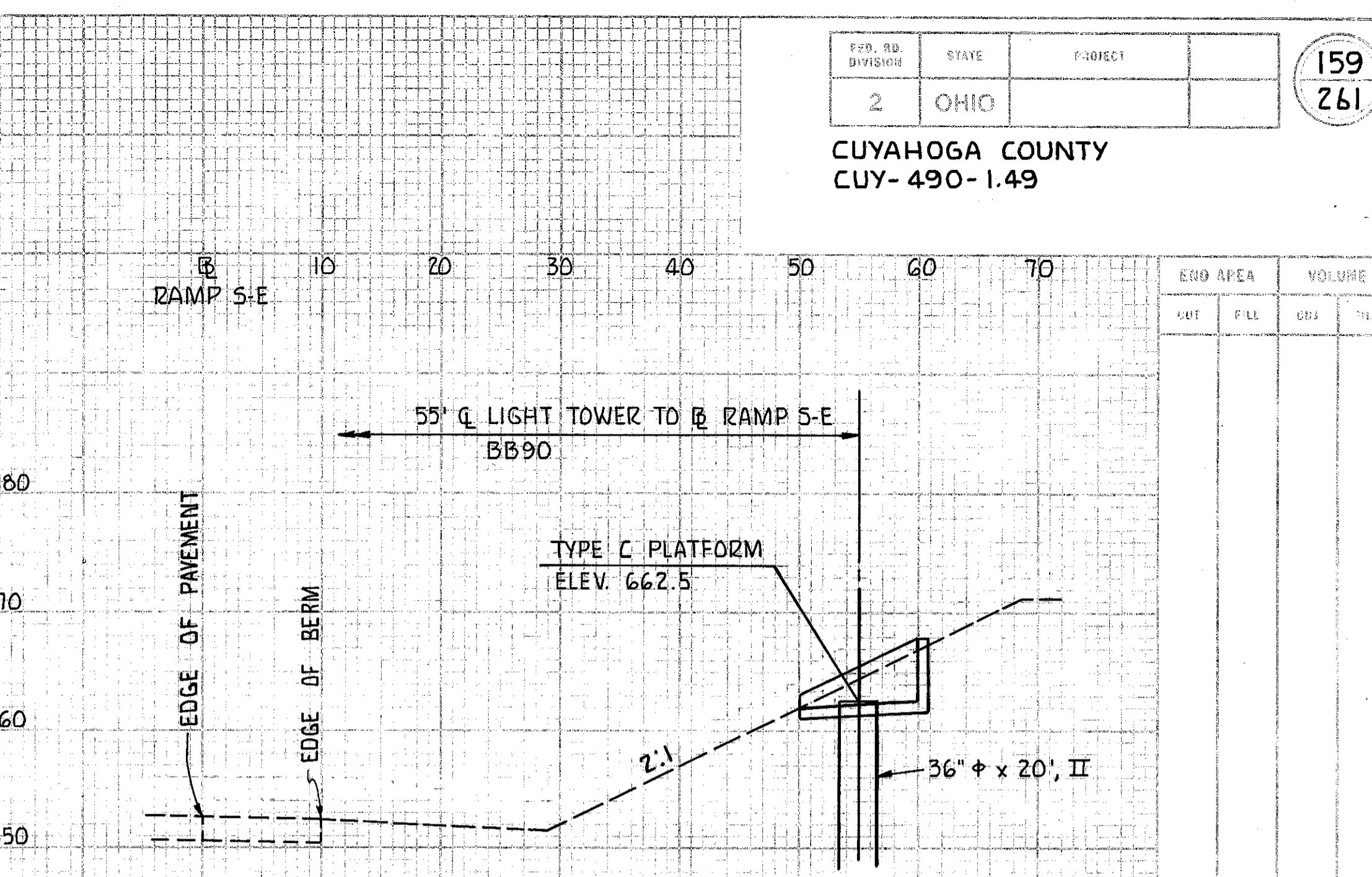
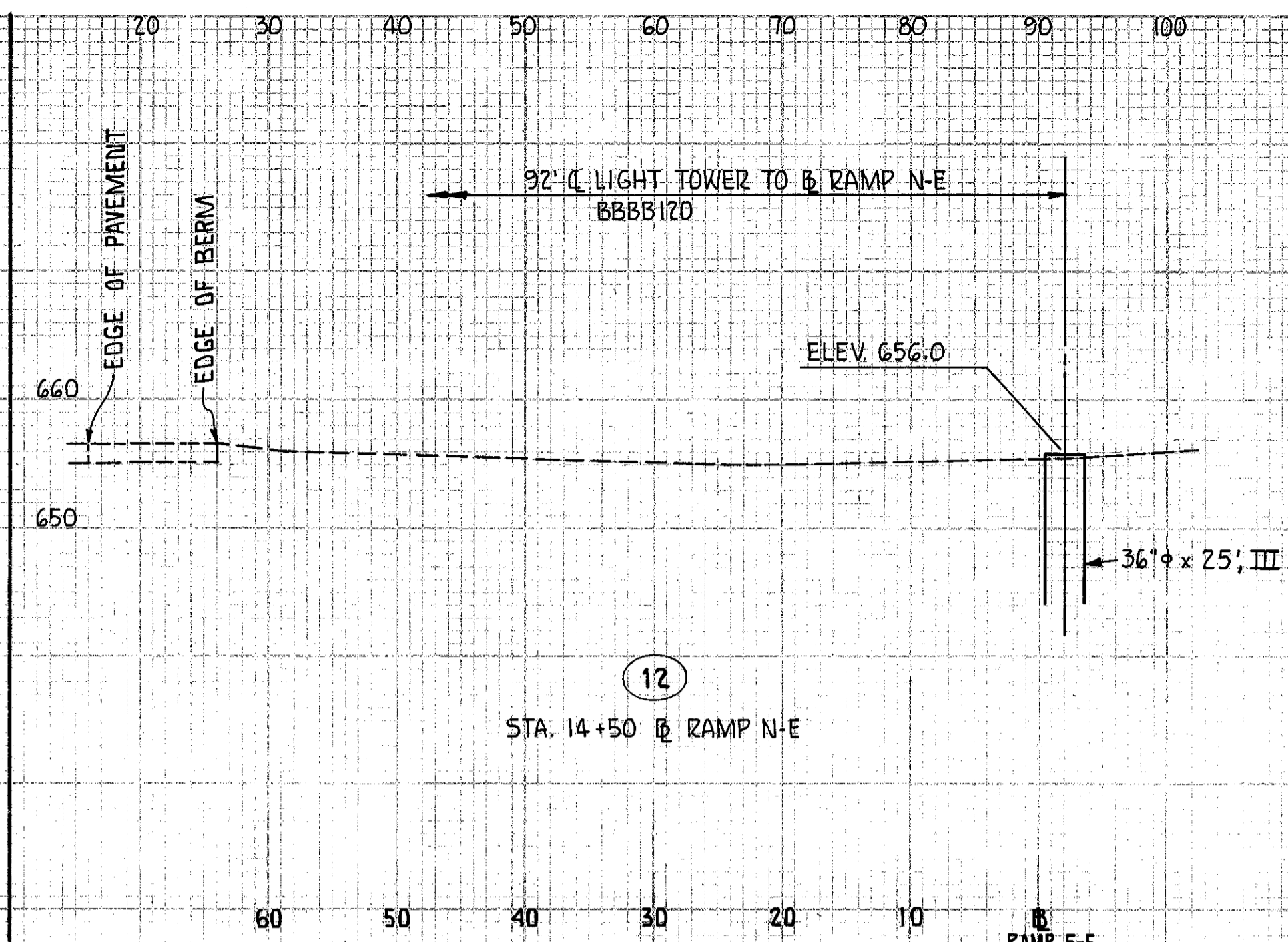
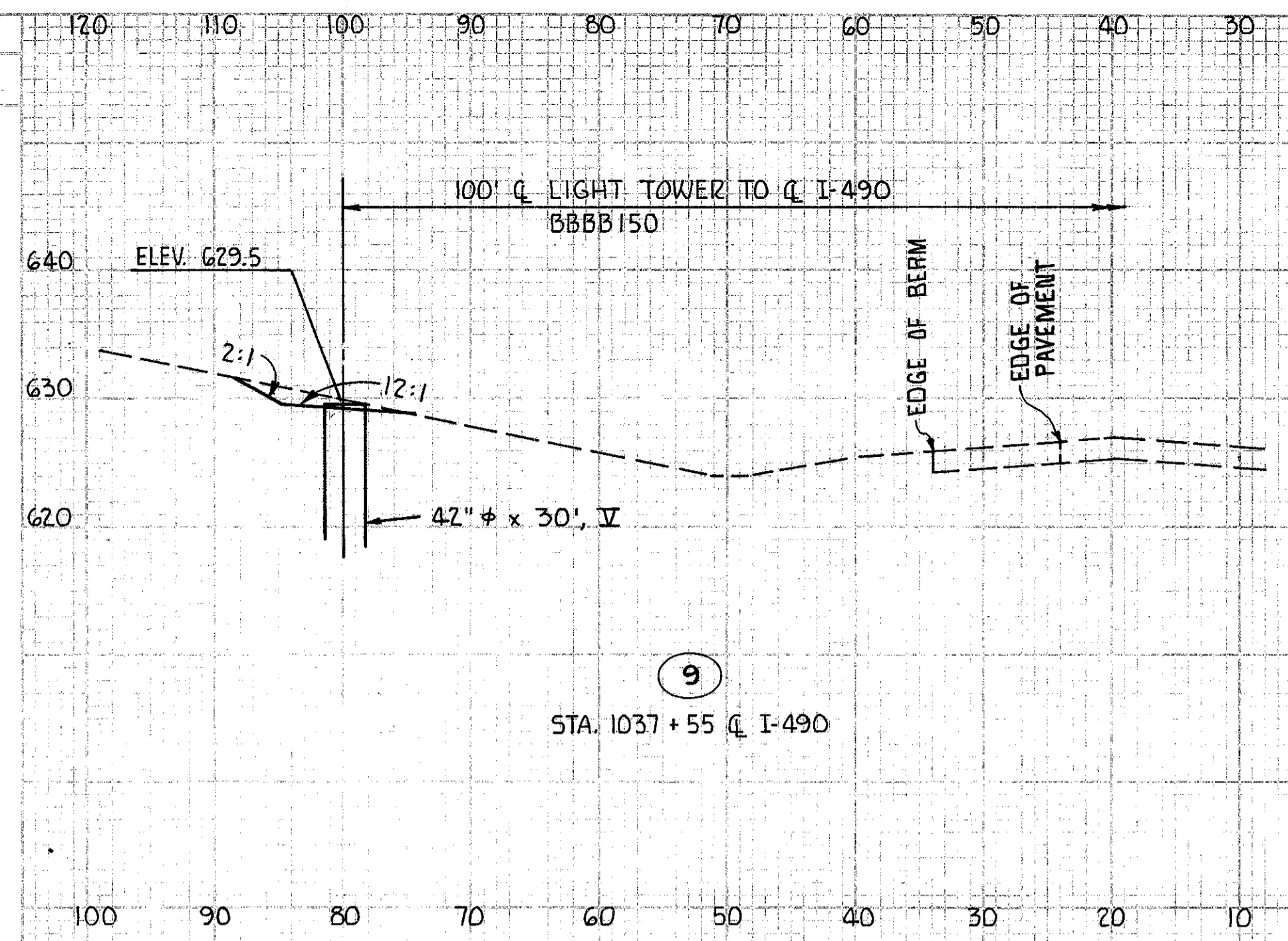
SHEET ACCT. No.
CONT. No.

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| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| I-490 CIRCUIT MAPS CONTROL CENTER BOW | | | |
| SCALE | DATE | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| ARG/CAP | ARG/CAP | JRH | |
| | | | REVIEWED |
| | | | DATE |



| CROSS AREA | | VOLUMES | |
|------------|------|---------|------|
| CUT | FILL | CUT | FILL |
| | | | |

CUYAHOGA COUNTY
CUY-490-1.49



| EDGE AREA | | VOLUME | |
|-----------|------|--------|------|
| DATE | FILL | CUB | FEET |
| | | | |

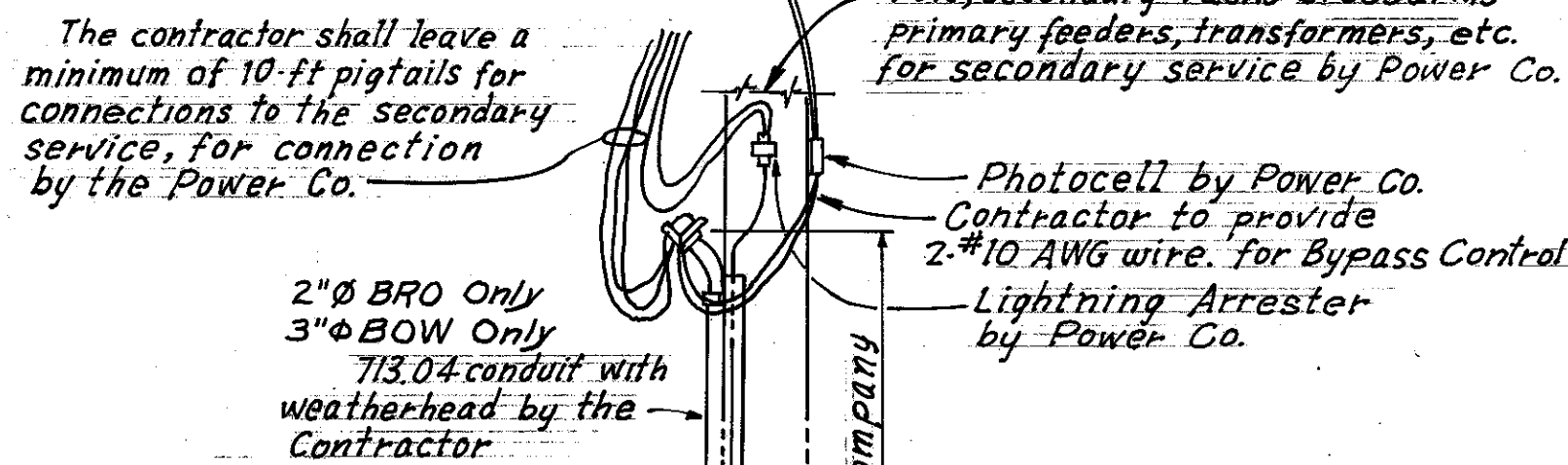
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| FED. RD. DIVISION | STATE | PROJECT |
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CUYAHOGA COUNTY
CUY-490-1.49

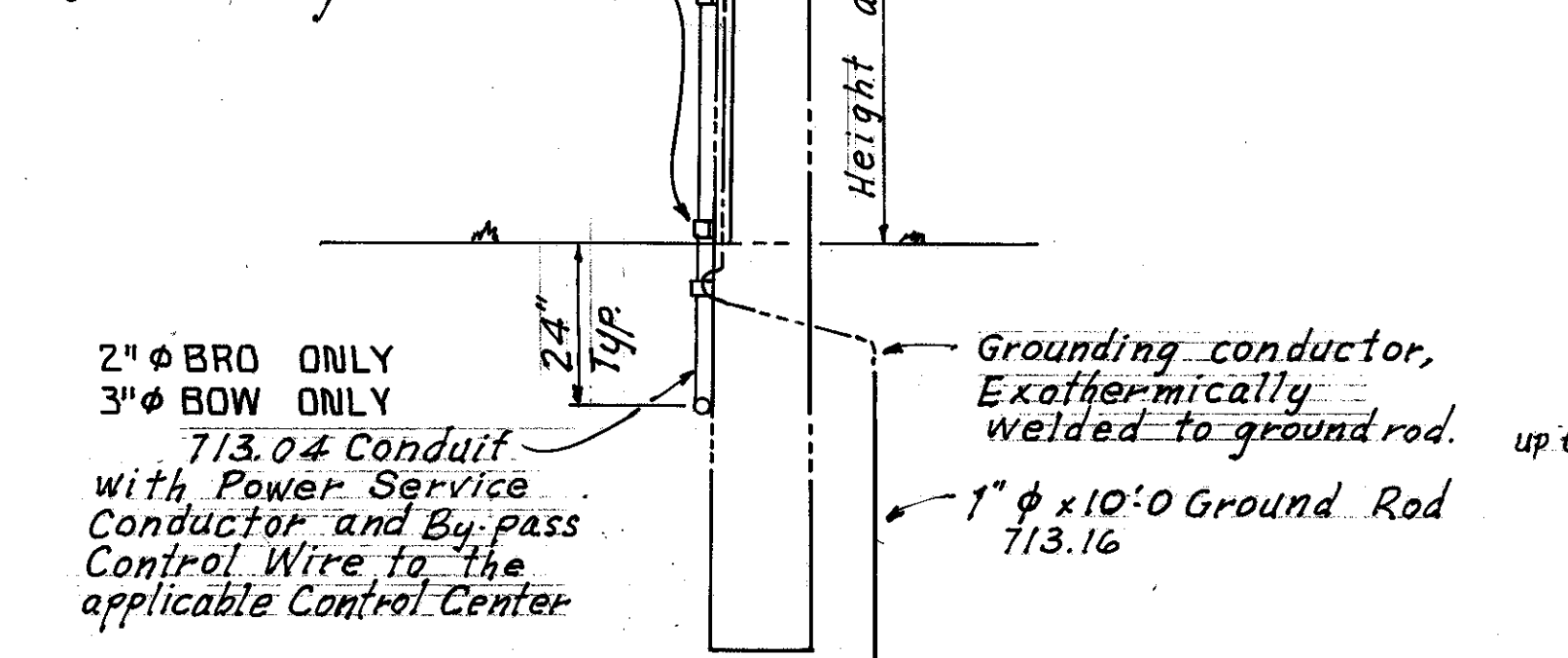
Note: All power service pole material shown, conduit weatherhead, wire ground rod and miscellaneous material and labor are to be included in the lump sum unit bid price for the Item 625, "Control Center, BRO and Item 625, Control Center, As Per Plan BOW.

The contractor shall leave a minimum of 10-ft pigtails for connections to the secondary service, for connection by the Power Co.



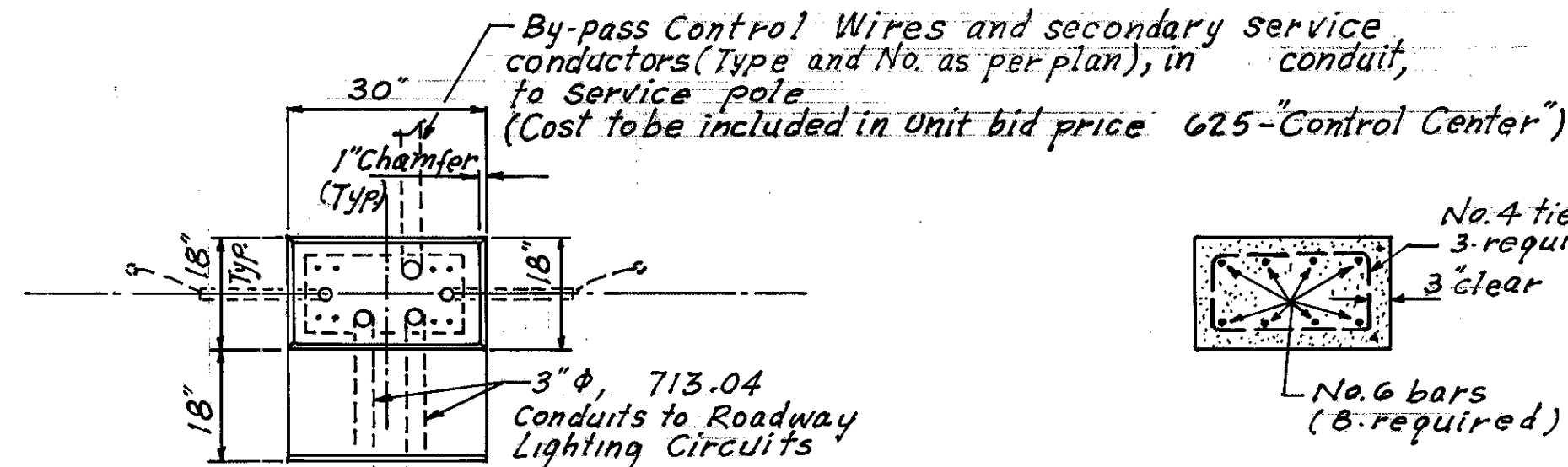
Securely fasten conduit to pole using two-hole galvanized straps at 6'-0" centers, or in manner approved by Power Co.

Contractor shall bond the weatherhead and conduit to the No. 4 AWG ground conductor.



CONNECTION TO POWER SERVICE POLE (TYPICAL)

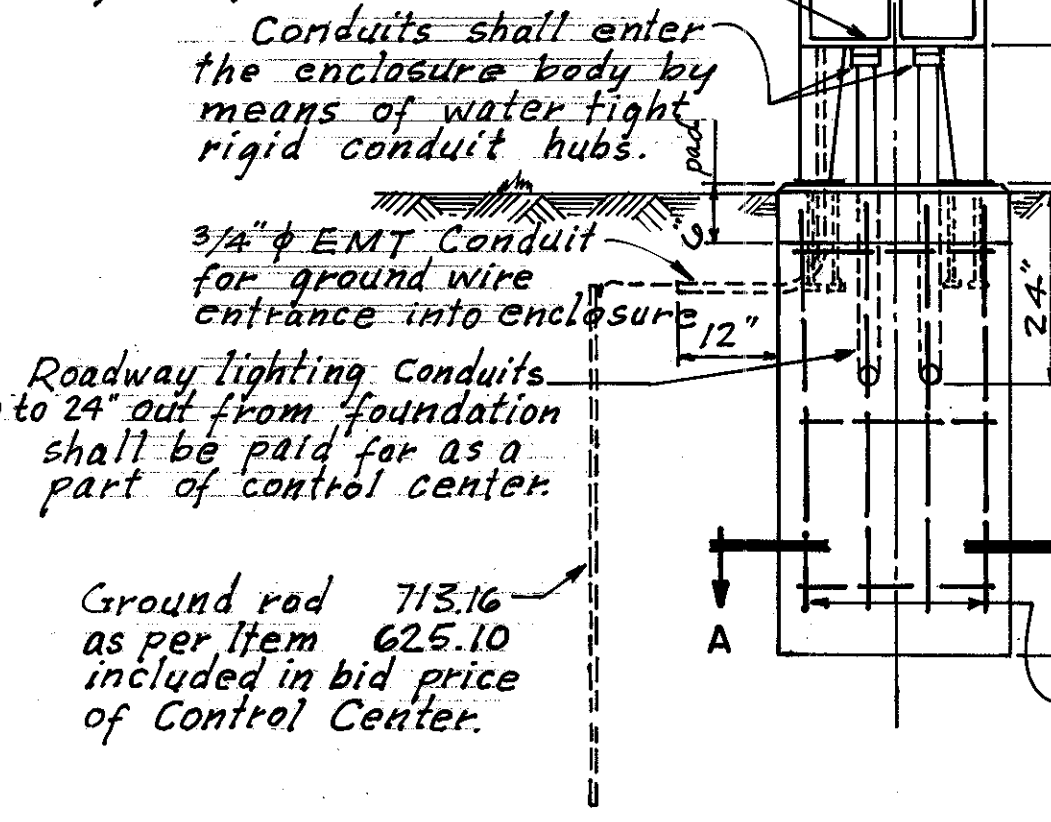
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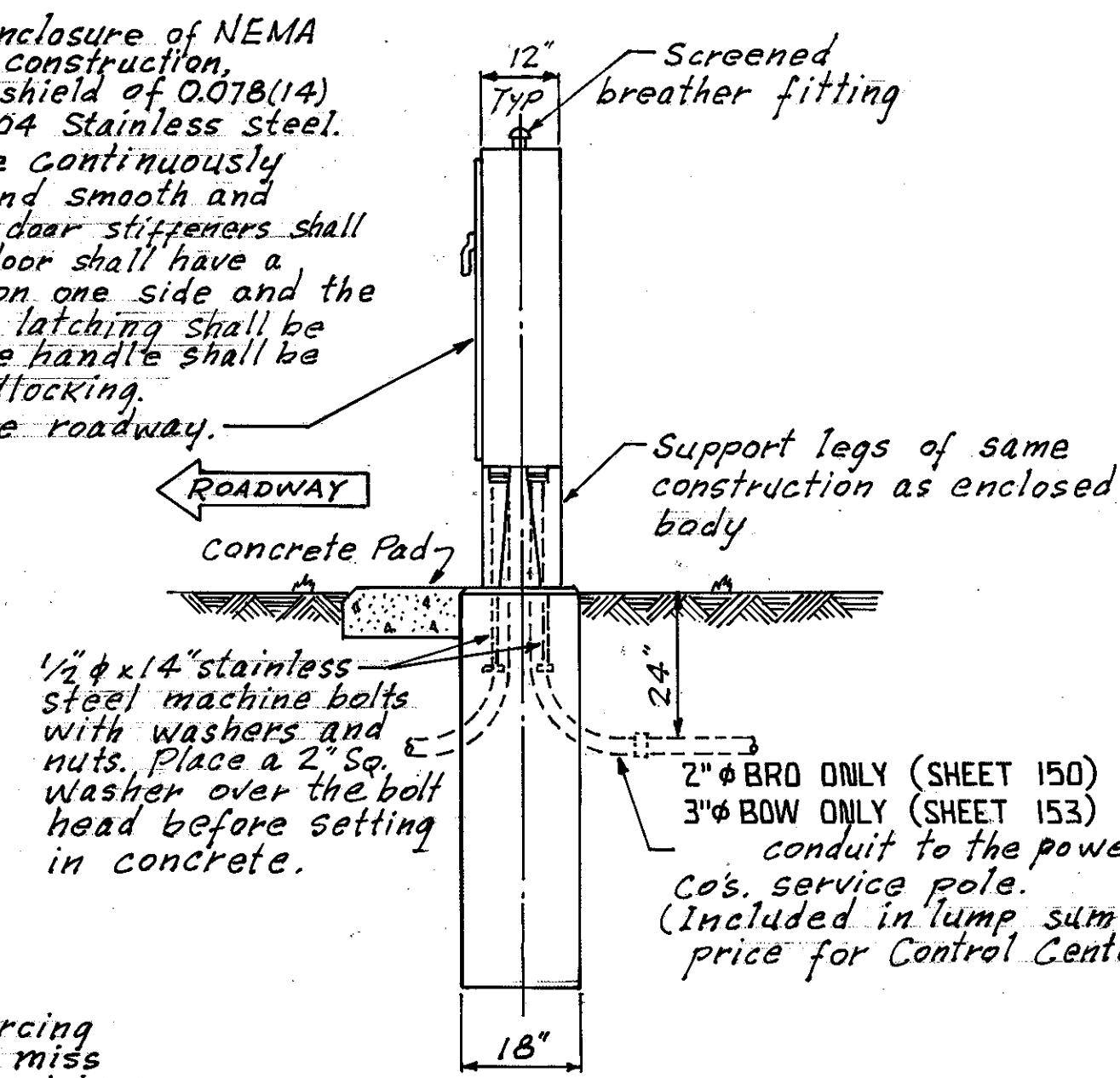
SECTION A-A THRU FOUNDATION

Notes: See Lighting Layout Sheets for direction and number of conduits out of foundation. Spacing and placement of anchor bolts in foundation is dependent upon the enclosure manufacturers dimensions. Enclosure dimensions are inside measurements. See Control Center data for type, and number of switches or contactors.

Each single door enclosure of NEMA Type 4 water tight construction, with NEMA 3 rainshield of 0.078(14) gage ASTM A 302-304 Stainless steel. All seams shall be continuously welded and ground smooth and polished, body and door stiffeners shall be provided. The door shall have a continuous hinge on one side and the gasketed 3-point latching shall be provided and the handle shall be arranged for padlocking. Cabinet shall face roadway.



FRONT VIEW



SIDE VIEW

(8) No. 6 hooked, reinforcing bars equally spaced to miss conduits. Bars to be minimum of 6" clear from top of foundation.

LIGHT TOWER FOUNDATION DATA

| TOWER NO | POLE DATA | | | DRILLED IN CAISSON DATA | | | | FOUNDATION PAD DATA | | FOUNDATION TYPE | |
|----------|-----------------------|-------------|--------------|-------------------------|---------------|---------------|-----------------|---------------------|------|-----------------|---------------|
| | Light Pole Design No. | Bolt Circle | Bolt Size | No. Of Bolts | DEPTH IN SOIL | DEPTH IN ROCK | EMBEDMENT DEPTH | ANCHOR BAR LENGTH | TYPE | | ELEVATION "A" |
| 1 | BB130 | 28.0" | 1 3/4" x 96" | 8 | 30' | | 30' | 29'-8" | C | 655.2 | IV |
| 2 | BBB150 | 30.75" | 2 1/4" x 96" | 8 | 30' | | 30' | 29'-8" | C | 638.7 | V |
| 3 | BB110 | 26.0" | 1 3/4" x 96" | 6 | 30' | | 30' | 29'-8" | B | 670.7 | II |
| 4 | BB120 | 26.0" | 1 3/4" x 96" | 6 | 30' | | 30' | 29'-8" | C | 653.9 | III |
| 5 | BB120 | 23.5" | 1 3/4" x 96" | 6 | 25' | | 25' | 24'-8" | C | 657.2 | III |
| 6 | BBB140 | 30.75" | 2 1/4" x 96" | 8 | 30' | | 30' | 29'-8" | | 645.5 | V |
| 7 | BB120 | 26.0" | 1 3/4" x 96" | 6 | 25' | | 25' | 24'-8" | B | 662.0 | III |
| 8 | BBB130 | 28.0" | 1 3/4" x 96" | 8 | 25' | | 25' | 24'-8" | | 650.0 | IV |
| 9 | BBB150 | 30.75" | 2 1/4" x 96" | 8 | 30' | | 30' | 29'-8" | | 629.5 | V |
| 10 | BBB140 | 30.75" | 2 1/4" x 96" | 8 | 30' | | 30' | 29'-8" | | 632.3 | V |
| 11 | BB100 | 23.5" | 1 3/4" x 96" | 6 | 25' | | 25' | 24'-8" | B | 657.0 | II |
| 12 | BBB120 | 26.0" | 1 3/4" x 96" | 6 | 25' | | 25' | 24'-8" | | 656.0 | III |
| 13 | BB120 | 26.0" | 1 3/4" x 96" | 6 | 30' | | 30' | 29'-8" | | 647.0 | III |
| 14 | BBB120 | 26.0" | 1 3/4" x 96" | 6 | 30' | | 30' | 29'-8" | | 642.2 | III |
| 15 | BB90 | 23.5" | 1 3/4" x 96" | 6 | 20' | | 20' | 19'-8" | C | 662.5 | II |
| 16 | BB110 | 26.0" | 1 3/4" x 96" | 6 | 30' | | 30' | 29'-8" | C | 661.8 | II |

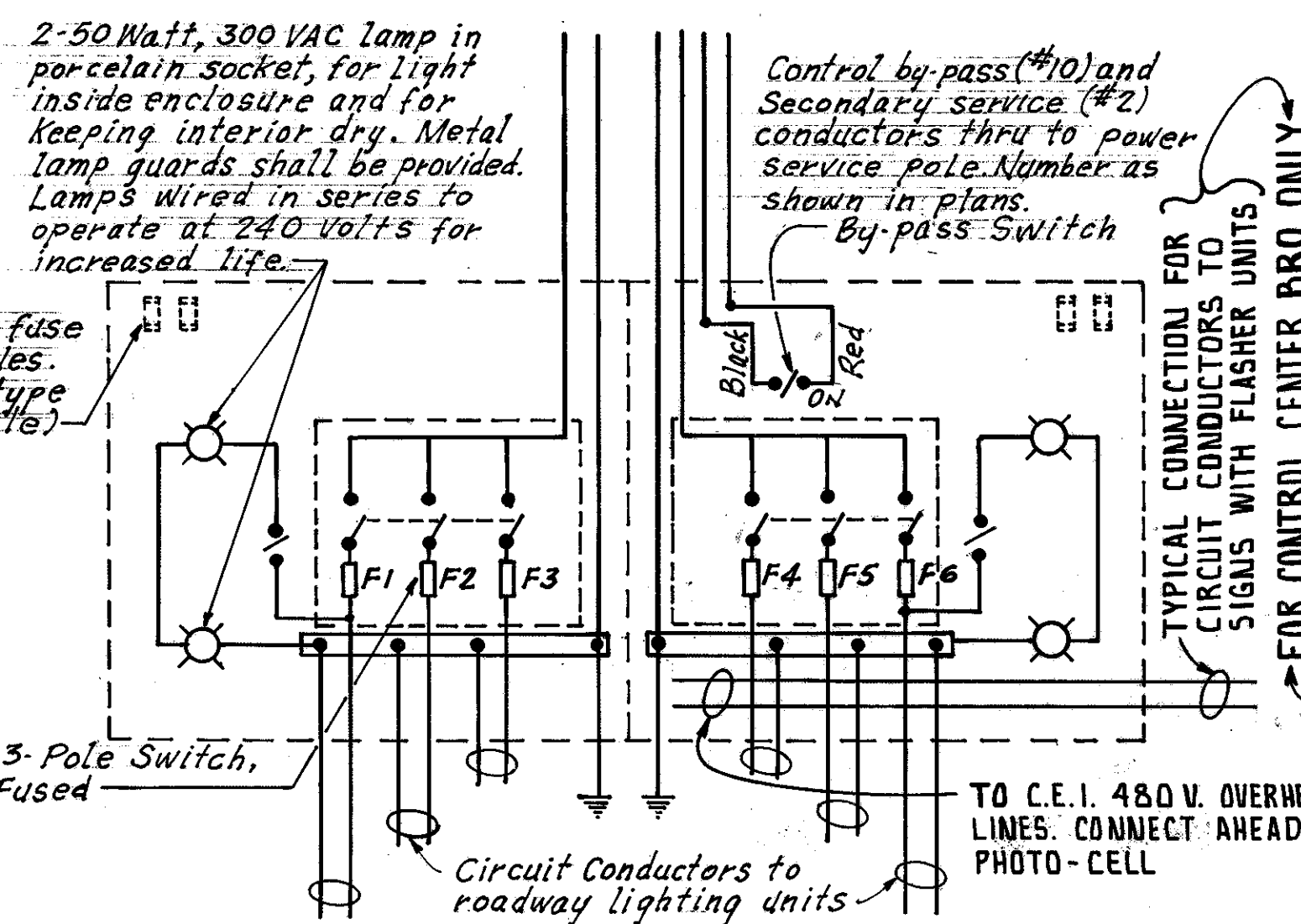
* No. 10 for Section Type IV and Type V

NOTE:

SERVICE CONDUIT LOCATIONS AND TERMINATION HEIGHTS ON THE SERVICE POLES SHALL BE AS DIRECTED BY THE UTILITY COMPANY. THE CONTRACTOR SHALL ARRANGE WITH THE UTILITY COMPANY FOR A FIELD INSPECTION OF EACH LOCATION PRIOR TO HIS INSTALLATION OF THE SERVICE EQUIPMENT.

SHEET ACCT. No.

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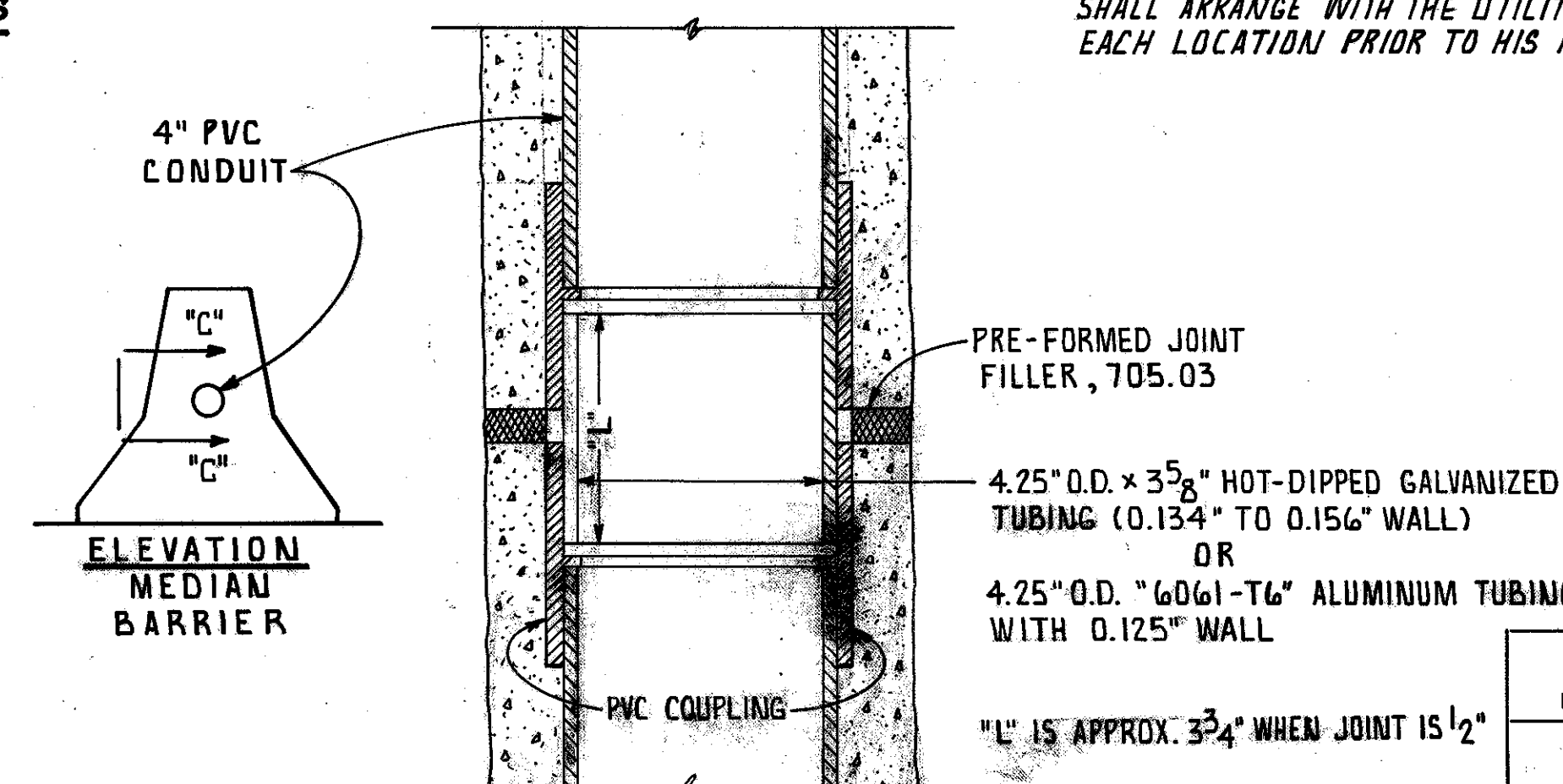


TYPICAL WIRING DIAGRAM

CONTROL CENTER DETAILS

| CONTROL CENTER | CONNECTED LOAD KVA | SERVICE ENTRANCE CONDUCTOR SIZE - AWG. | ENCLOSURE RATING AMPS. | CIRCUIT NUMBER | CIRCUIT LOAD AMPS. | CIRCUIT FUSE SIZE AMPS. | REMARKS |
|----------------|---|--|------------------------|----------------|--------------------|-------------------------|---------|
| BRO | 30.9 ADJACENT PROJECT 26.48-1-490 57.38 TOTAL | | | BRO 1 | 24.8 | 35 | |
| | | | | BRO 2 | 29.4 | 40 | |
| | | | | BRO 3 | 7.1 | 10 | |
| BOW | 40.35 | | | BOW 1 | 20.6 | 30 | |
| | | | | BOW 2 | 25.6 | 35 | |
| | | | | BOW 3 | 16.8 | 25 | |
| | | | | BOW 4 | 8.0 | 10 | |
| | | | | BOW 5 | 27.2 | 35 | |

TABLE B



SECTION "G-G"

NOTE: CONDUIT COUPLINGS AS DETAILED HEREIN SHALL BE PROVIDED AT ALL MEDIAN BARRIER JOINTS WHERE A JOINT FILLER IS USED, AS REQUIRED OR PERMITTED BY ITEM 622 OR STANDARD CONSTRUCTION DRAWING MC-5

TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

I-490
DETAILS
SERVICE POLE, CONTROL CENTER,
LIGHT TOWER FOUNDATION DATA

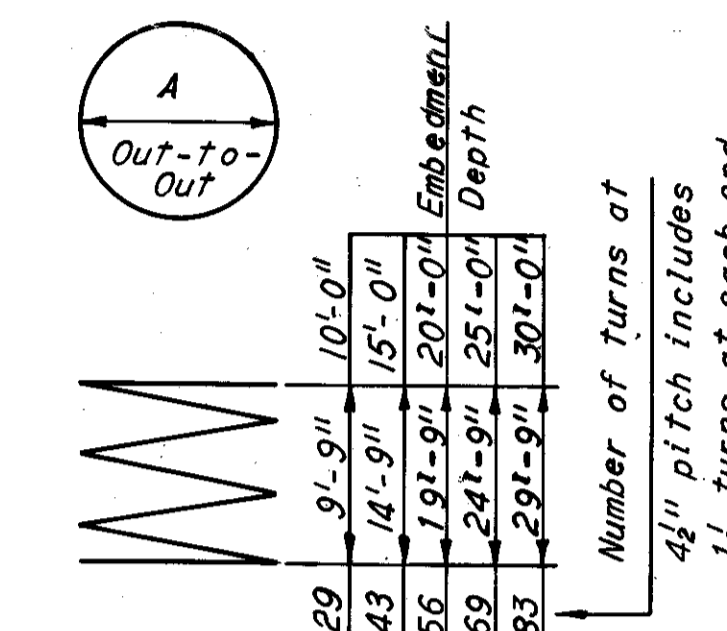
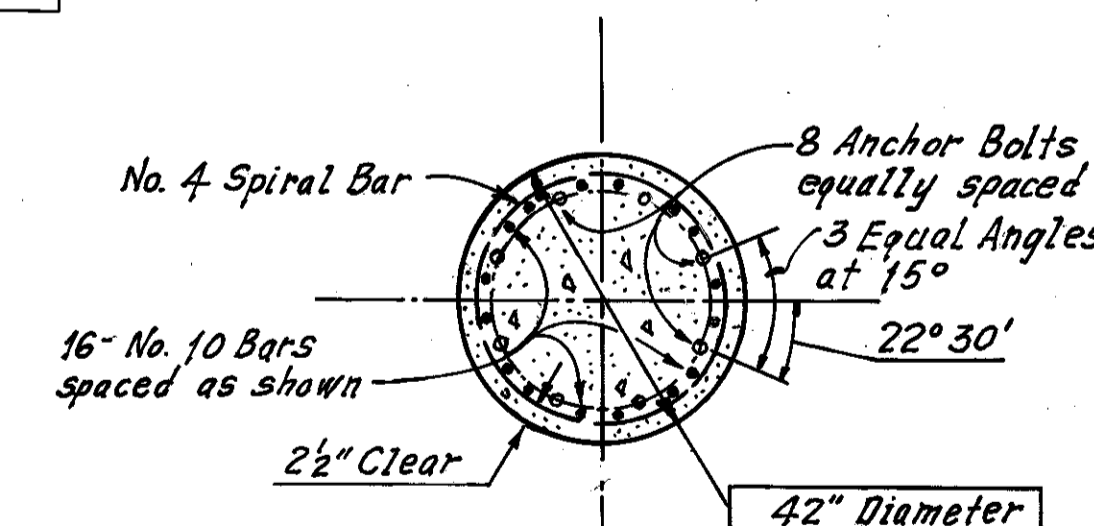
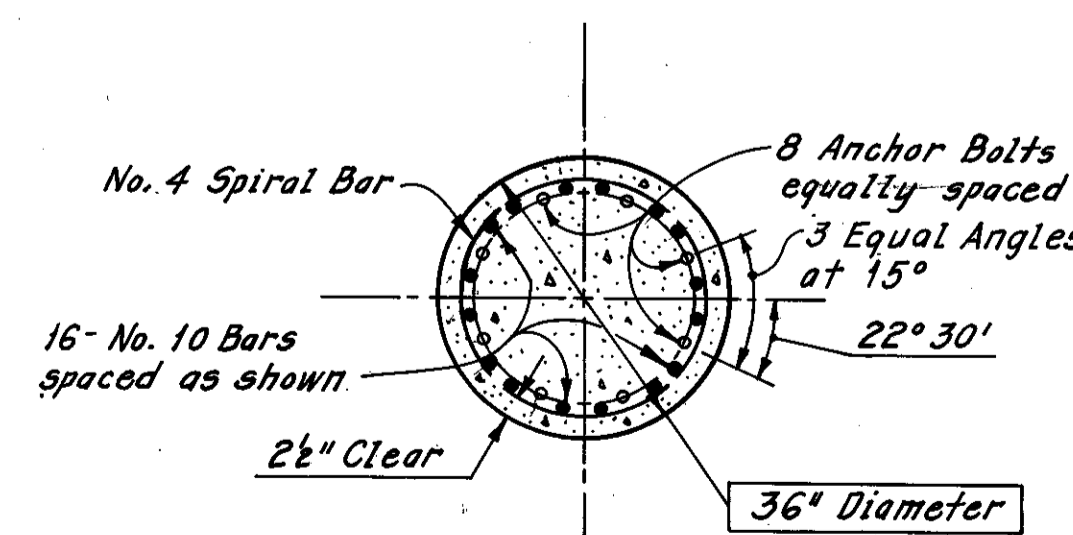
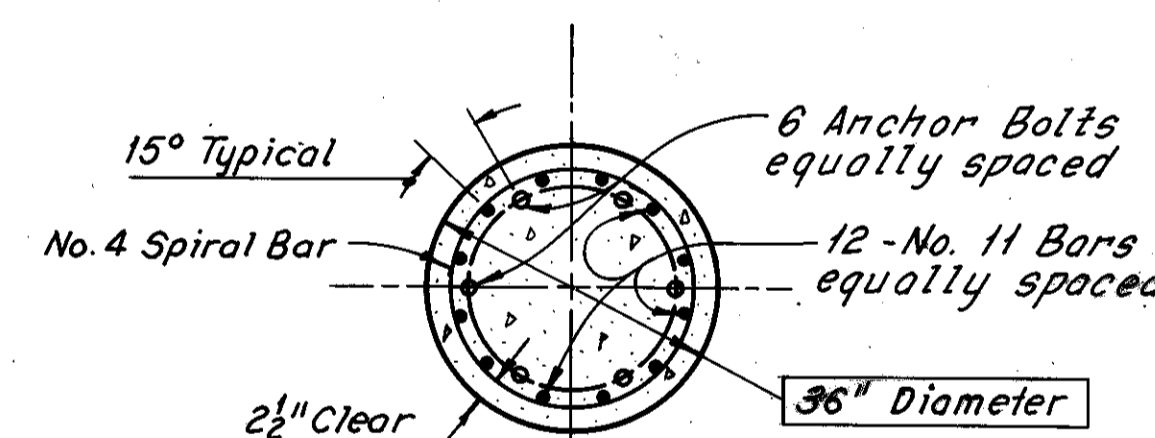
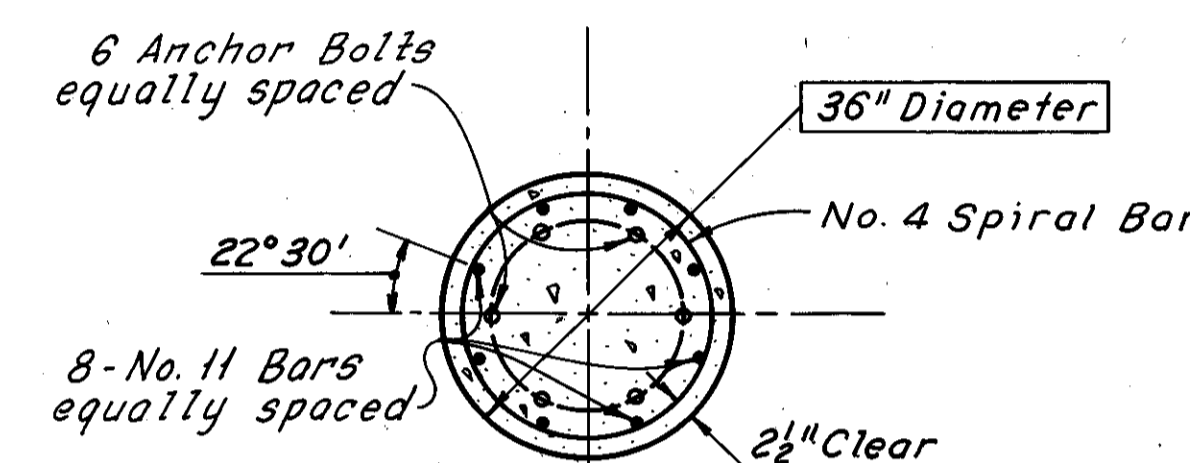
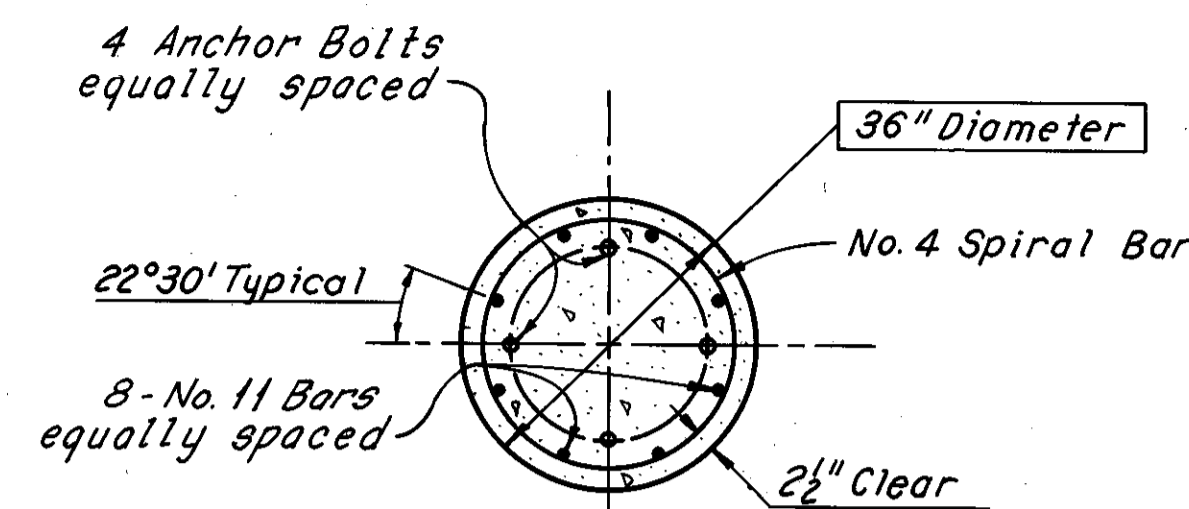
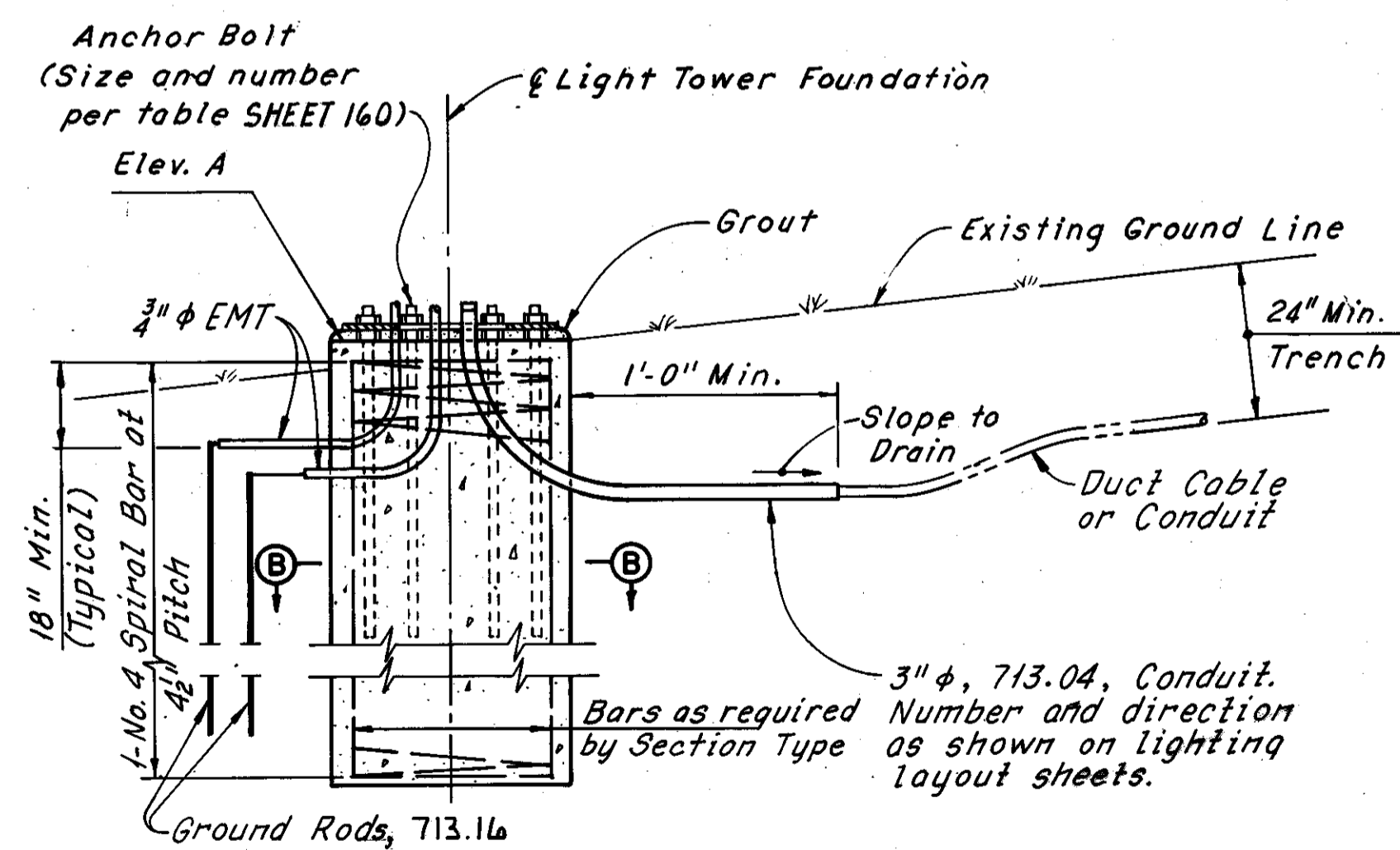
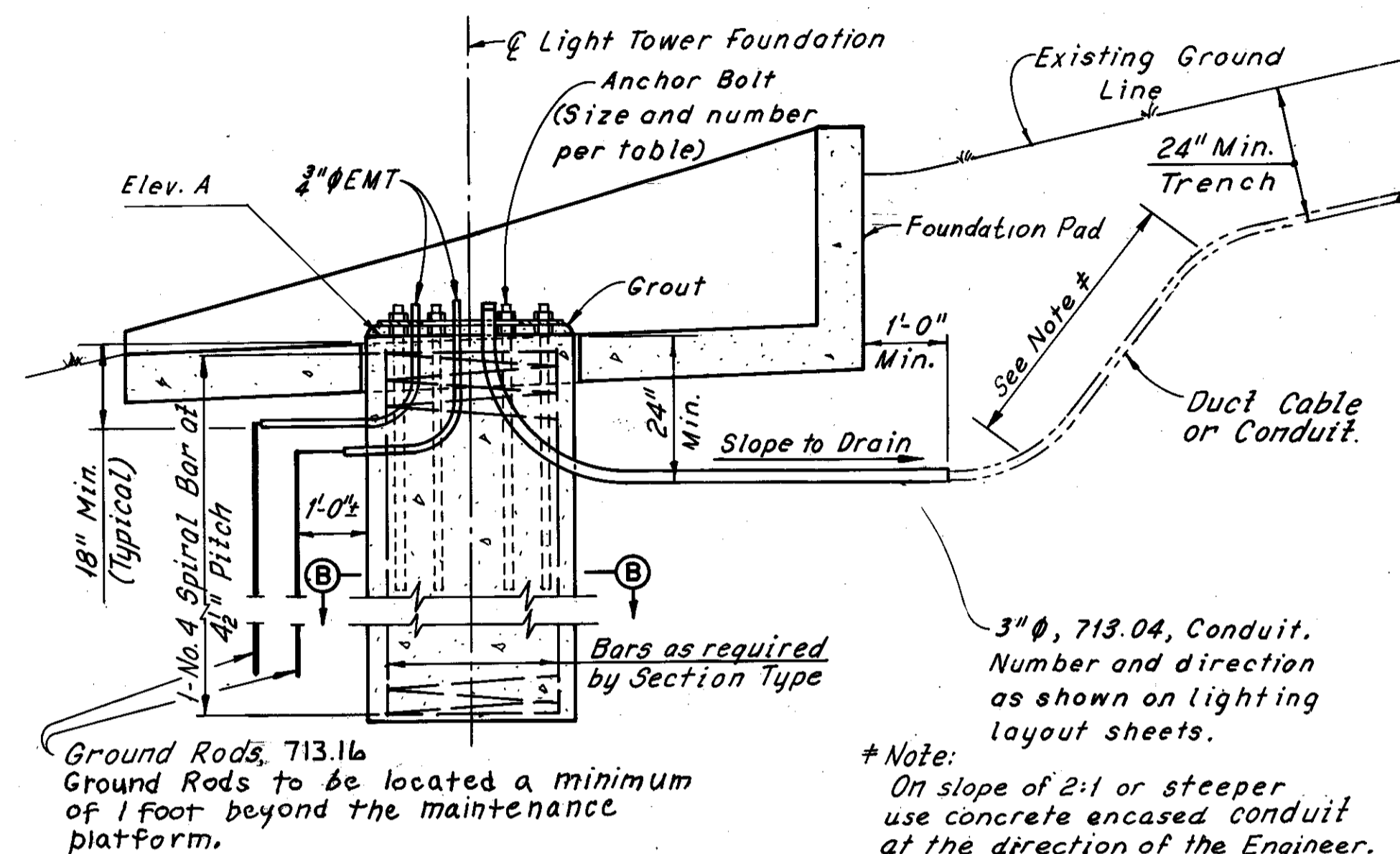
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|-------|----------|-------|--------|---------|----------|------|
| SCALE | DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| ~ | WPH | ~ | ~ | ~ | ~ | DATE |

LIGHT TOWER FOUNDATION DETAILS

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| FHWA REGION | STATE | PROJECT |
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SPIRAL REINFORCEMENT NOTE:

The Length shown on the No. 4 Spiral Bar Bending Diagram is the Foundation embedment depth with a 3" clearance.

Four steel channels, tee or angle spacers, weighing approximately 0.80 lbs. per foot of spacer shall be provided for each spiral unit. They shall be equally spaced along the periphery of the coil.

Notes:
Placement of reinforcement and anchor bolts is based on the anchor bolt data shown on Light Tower Foundation Data, Sheet 160. If a pole with a different anchorage pattern is proposed, the Contractor shall obtain approval from the Engineer prior to ordering reinforcing steel. The Contractor shall take special care in placing the anchor bolts to assure that the hand holes of the poles are placed in the proper location. The Contractor's plan for reinforcement and anchor bolt placement shall be approved by the Engineer.

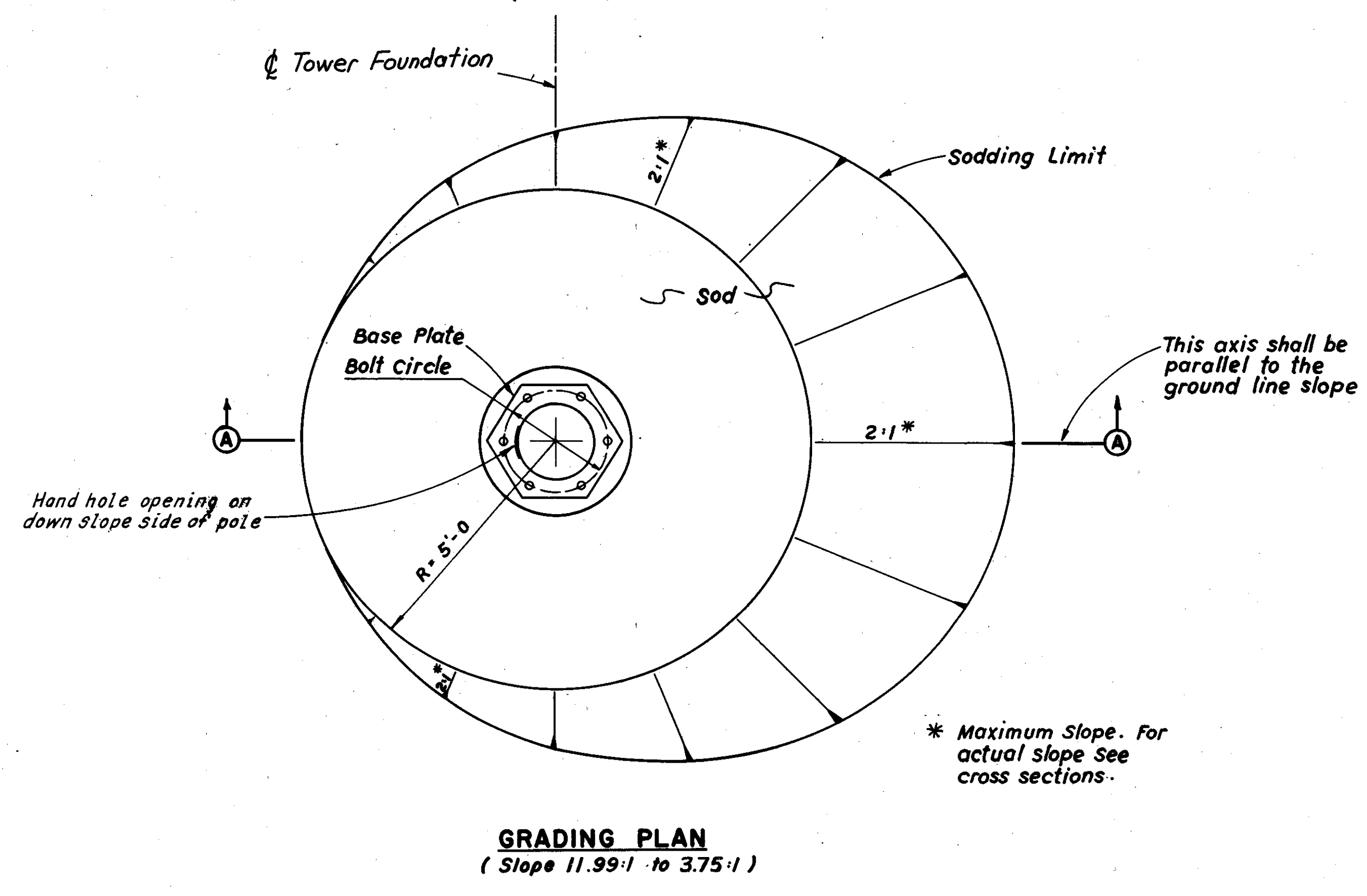
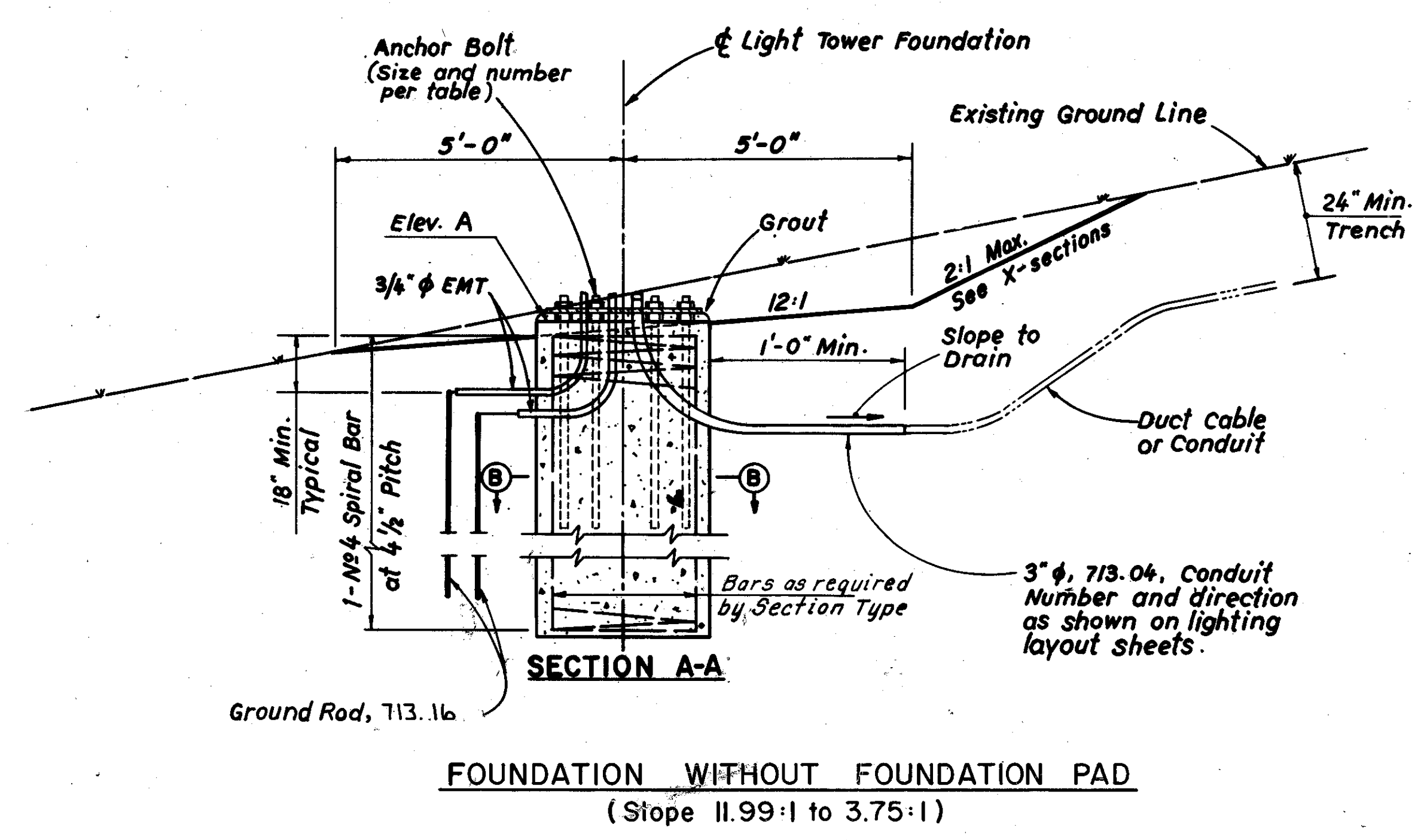
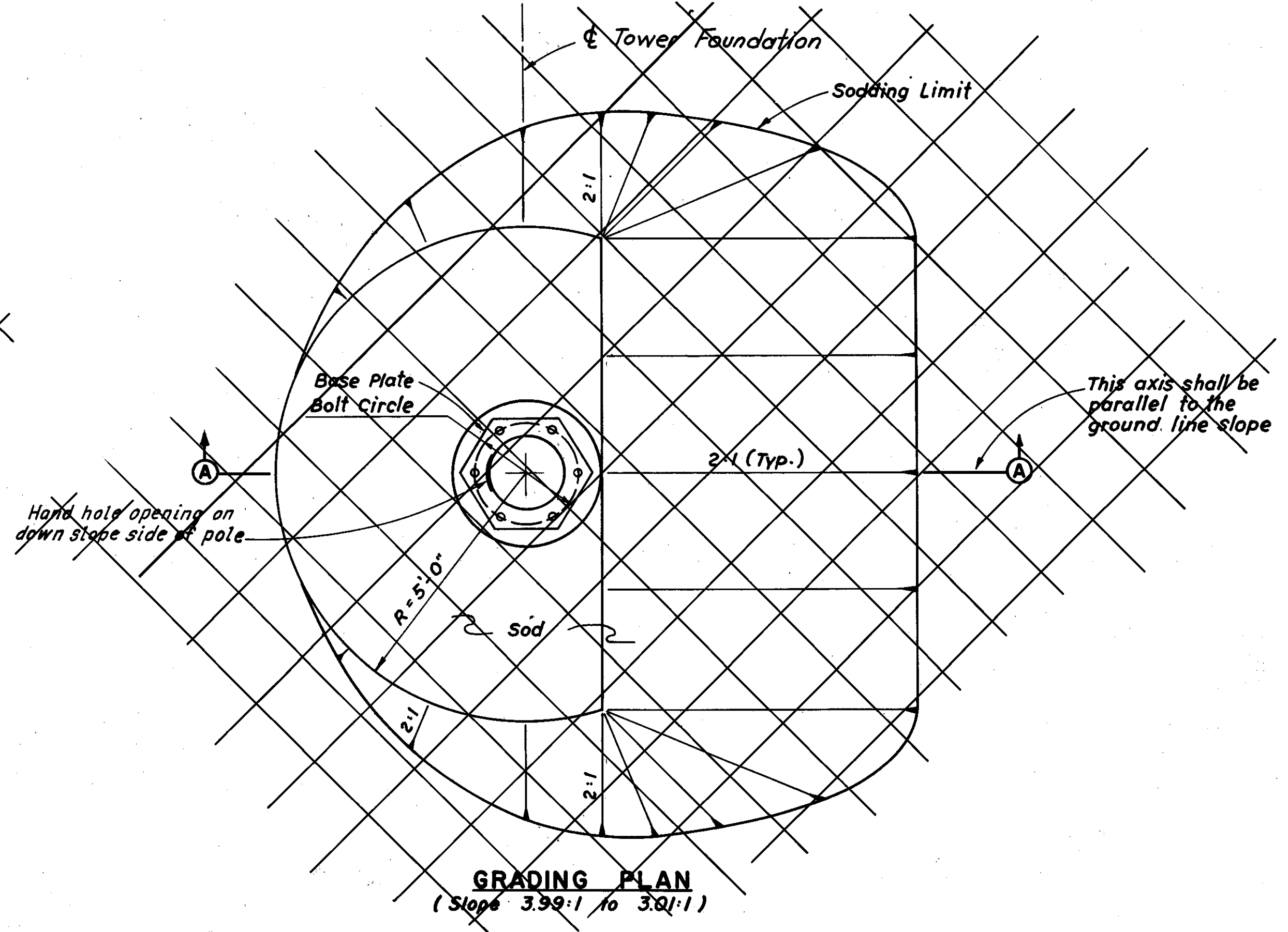
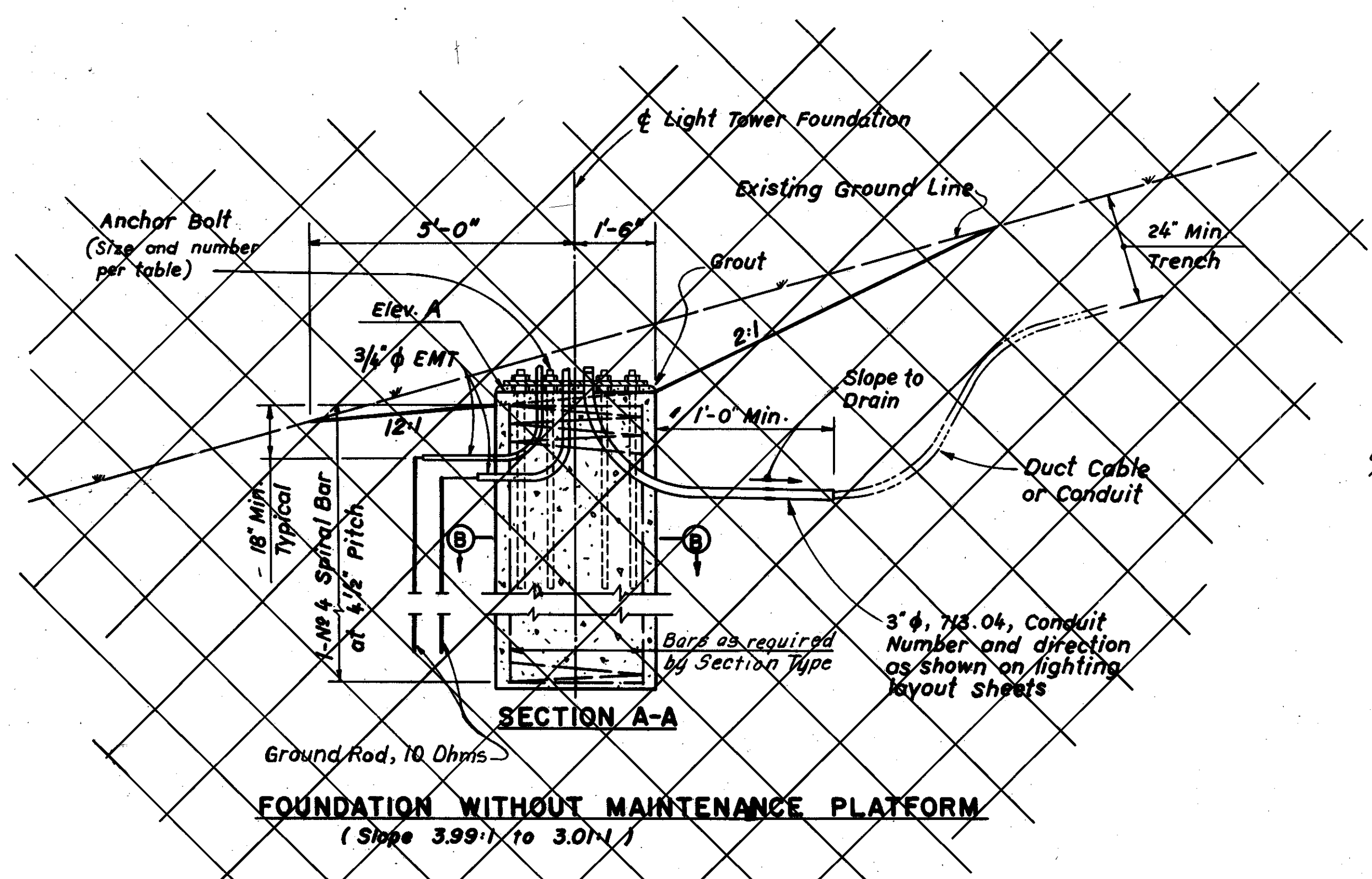
All concrete shall be Class C - basic unit stress 1,333 psi.
All reinforcing steel shall be ASTM A615, A616 or A617 - basic unit stress 20,000 psi. Spiral reinforcement may be plain bars, ASTM A82 or A615.

Comments shown are supplemental to O.D.O.T. Standard Construction Drawing HL-1.
For "Elevation A" and foundation embedment depth, see Light Tower Foundation Data Sheet 160
Foundation Pad and ground rods are itemized individually and are not included in the bid price of the tower foundation. All other items: anchor rods and bolts, conduit, etc., are included in the bid price of the tower foundation.

LIGHT TOWER FOUNDATION DETAILS

| | | | |
|-------------|-------|---------|-----|
| FHWA REGION | STATE | PROJECT | 162 |
| 5 | OHIO | | 261 |

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CUY-490-1.49



* Maximum Slope. For actual slope See cross sections.

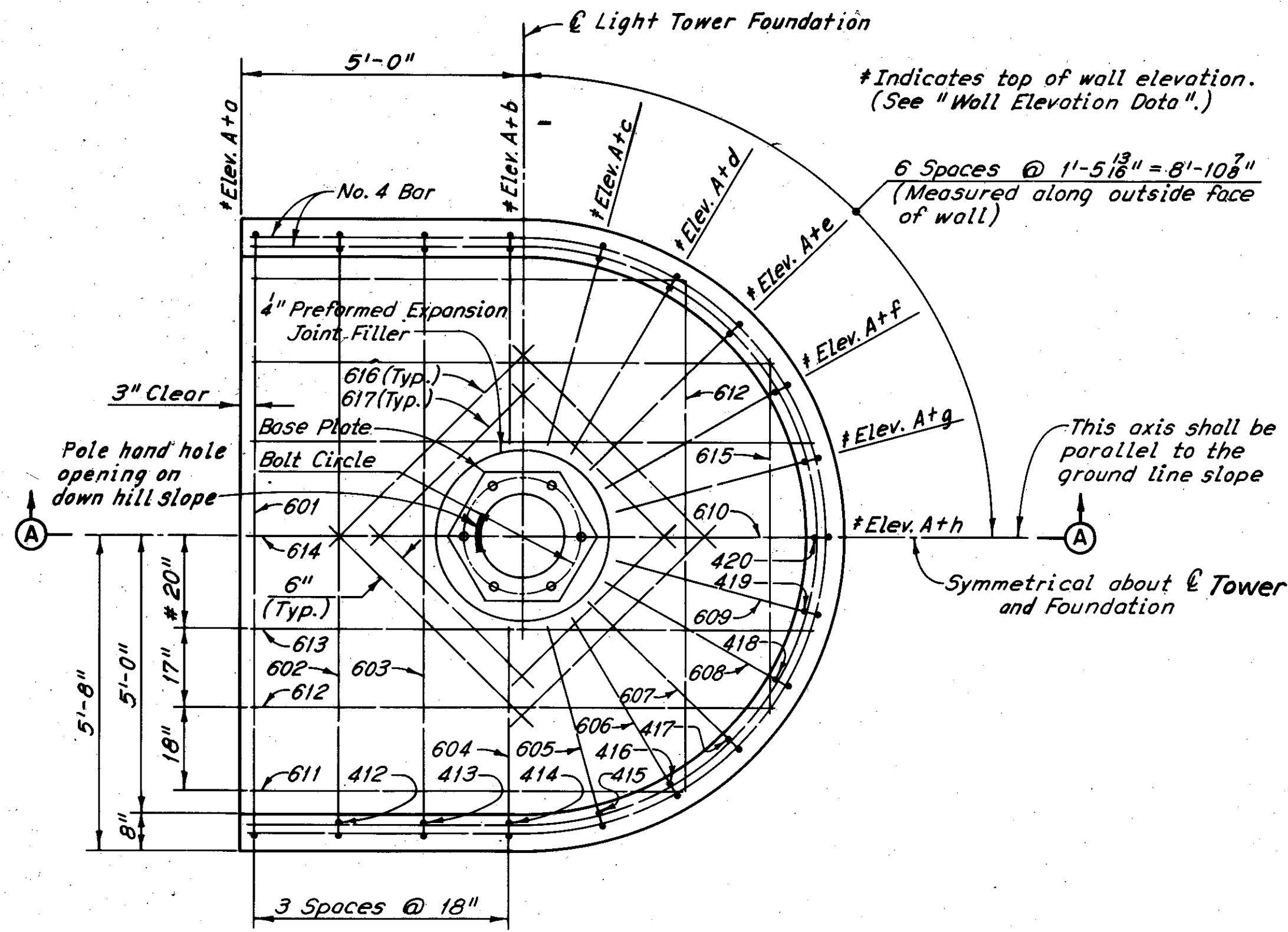
Note:
For Notes and Section B-B, see Sheet 161.

LIGHT TOWER FOUNDATION PAD

| FHWA REGION | STATE | PROJECT |
|-------------|-------|---------|
| 5 | OHIO | |

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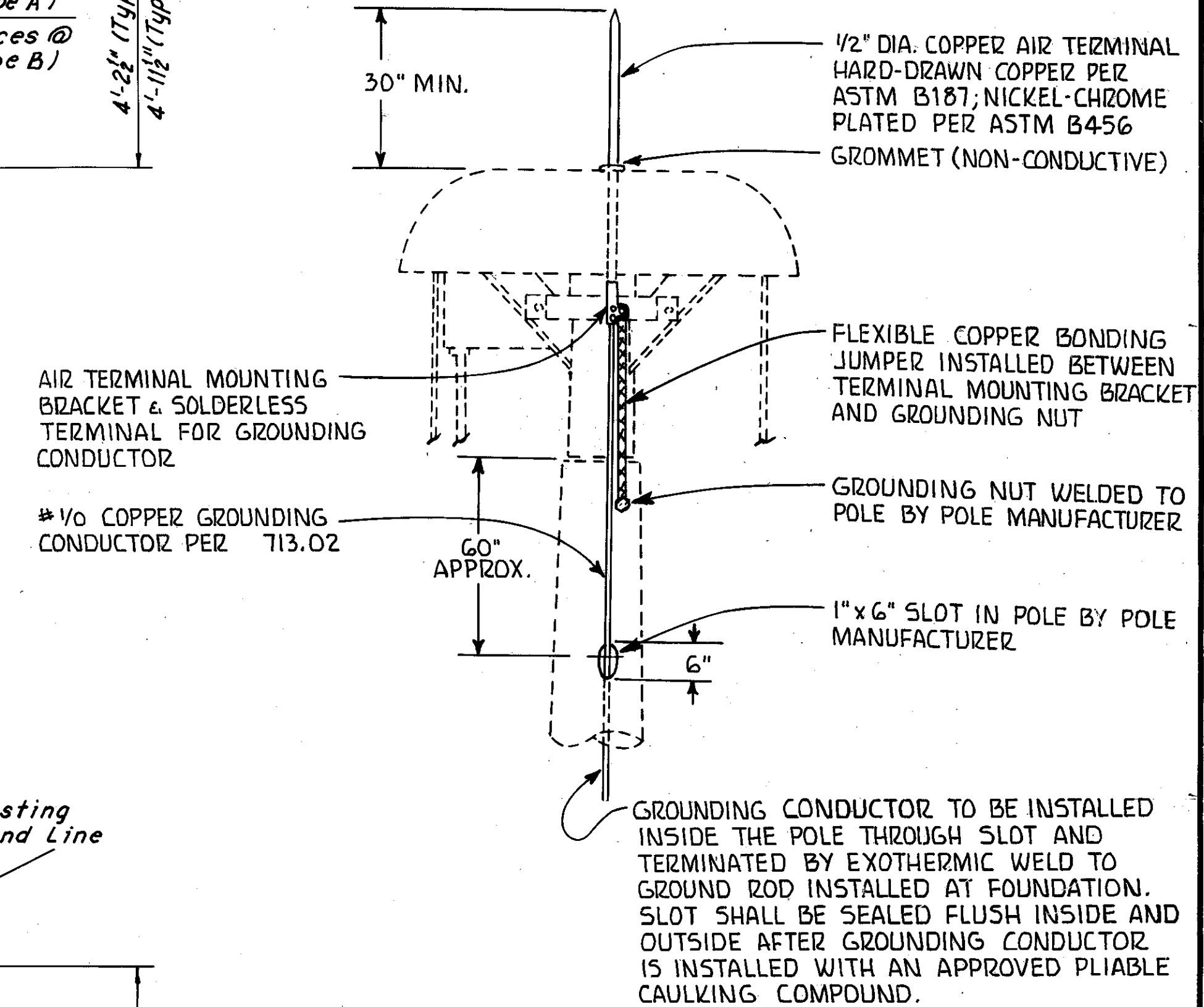
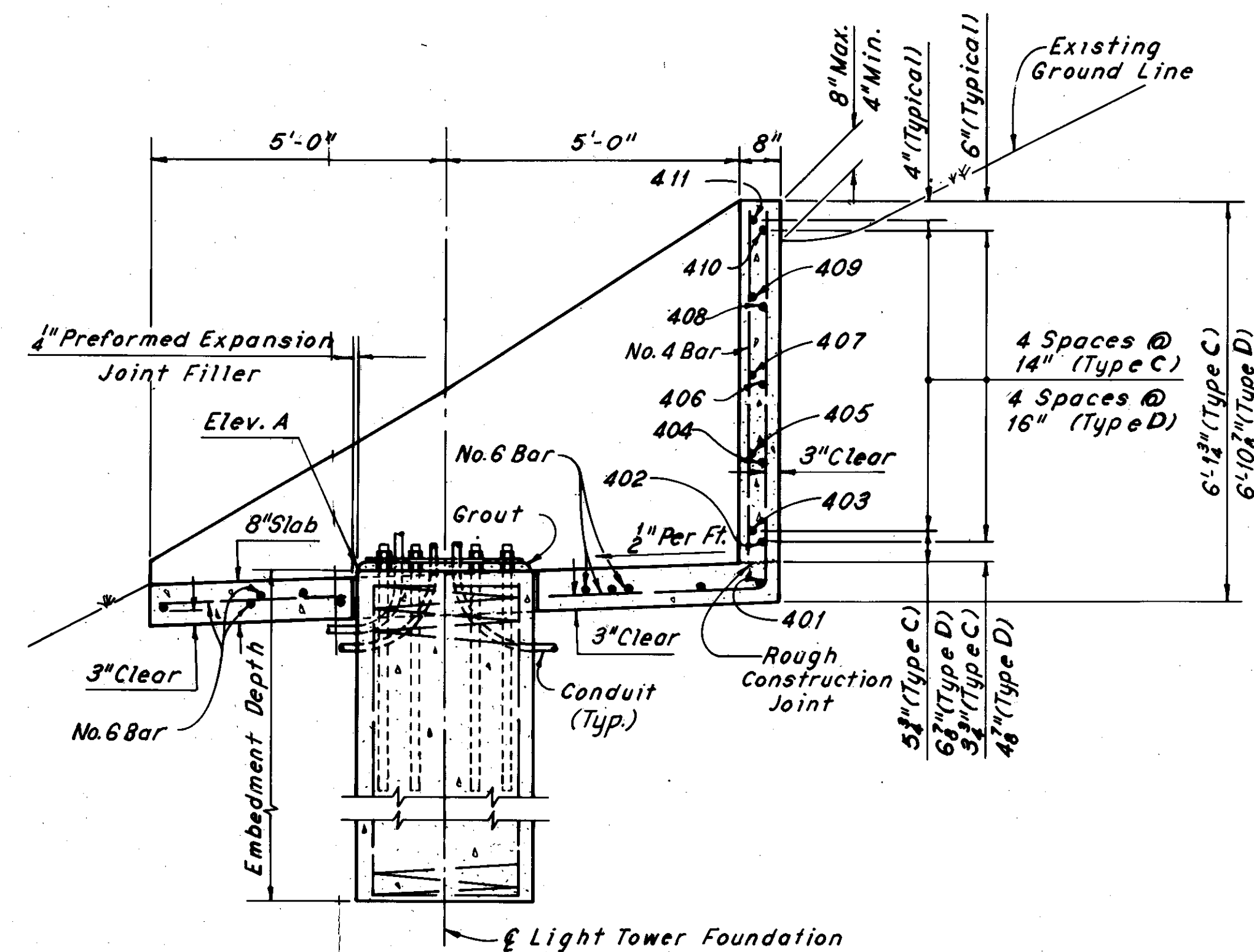
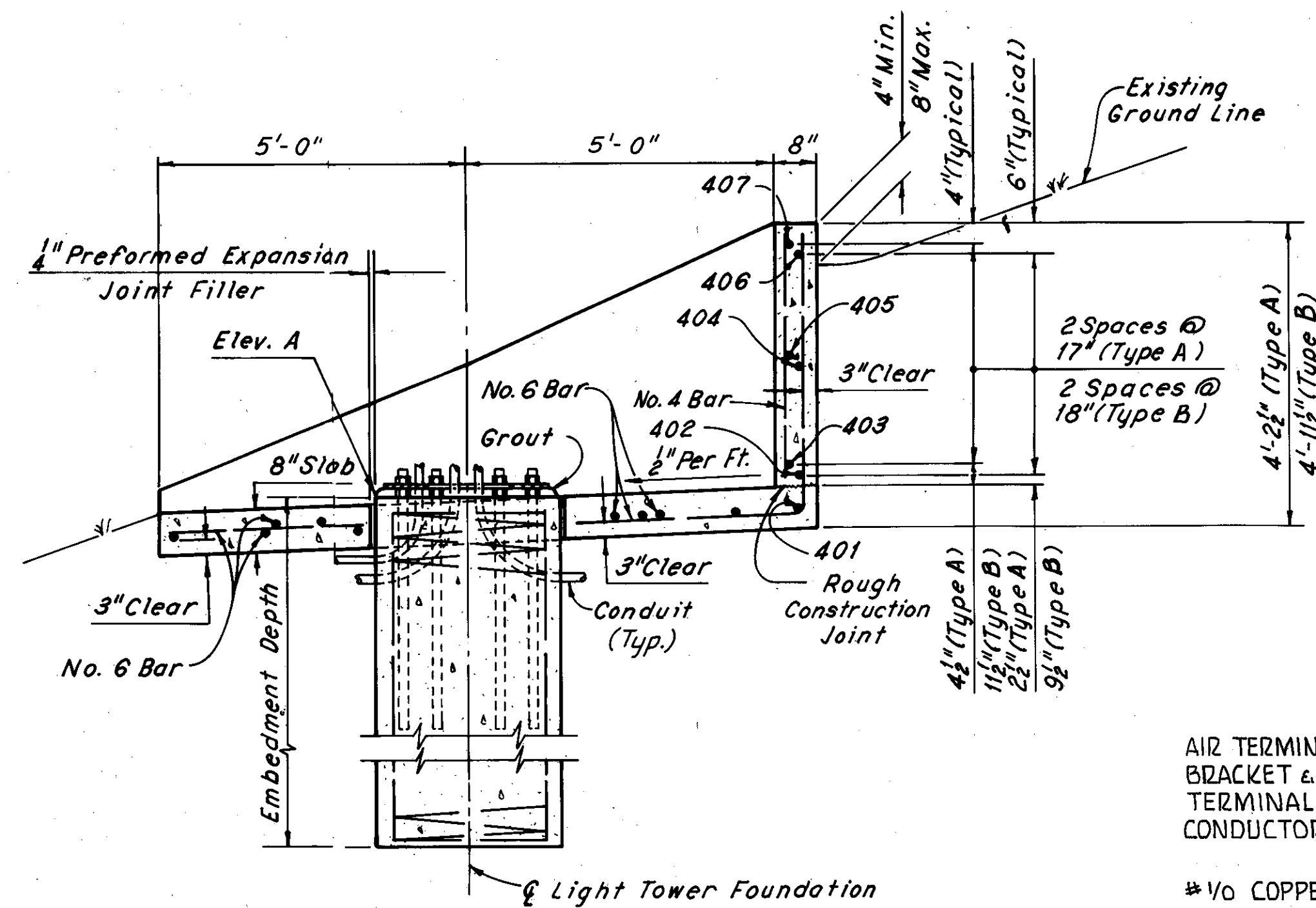


PLAN

| WALL ELEVATION DATA | | | | | | | | |
|---------------------|-----|------|------|------|------|------|------|------|
| TYPE | a | b | c | d | e | f | g | h |
| A | .08 | 1.78 | 2.28 | 2.74 | 3.14 | 3.45 | 3.64 | 3.71 |
| B | .09 | 2.14 | 2.74 | 3.30 | 3.78 | 4.15 | 4.39 | 4.46 |
| C | .10 | 2.70 | 3.46 | 4.17 | 4.79 | 5.25 | 5.55 | 5.65 |
| D | .11 | 3.06 | 3.92 | 4.73 | 5.43 | 5.96 | 6.29 | 6.41 |

Note: The values shown are in feet

| PLATFORM GROUPING | |
|-------------------|------------------|
| TYPE | SLOPE |
| A | 3.01:1 to 3.75:1 |
| B | 2.5:1 to 3.0:1 |
| C | 2.0:1 to 2.49:1 |
| D | 1.75:1 to 1.99:1 |



Notes:
Clearance for reinforcing bars is 2" typical, except as noted.
For Elevation A and embedment depth, see Light Tower Foundation Data Sheet 16D.
The following abbreviations are used:
No. = Number
Min. = Minimum
Max. = Maximum
Typ. = Typical
Elev. = Elevation

LIGHT TOWER FOUNDATION PAD REINFORCEMENT SCHEDULE

| | | |
|-------------|-------|---------|
| FHWA REGION | STATE | PROJECT |
| 5 | OHIO | |

CUYAHOGA COUNTY
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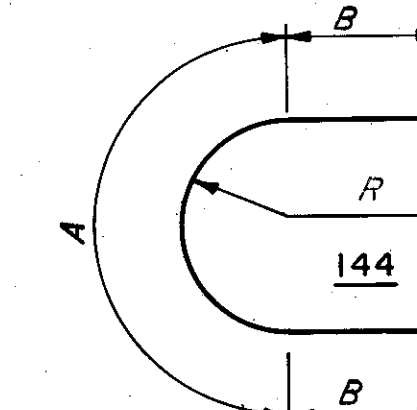
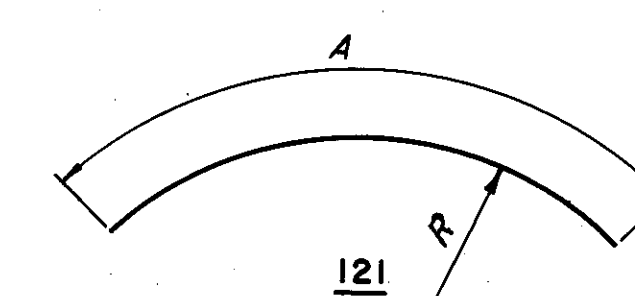
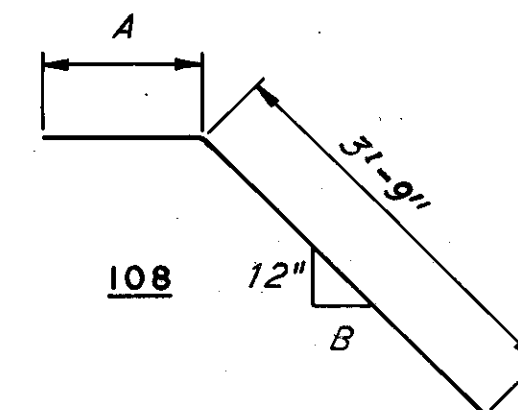
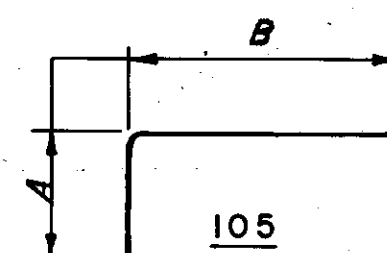
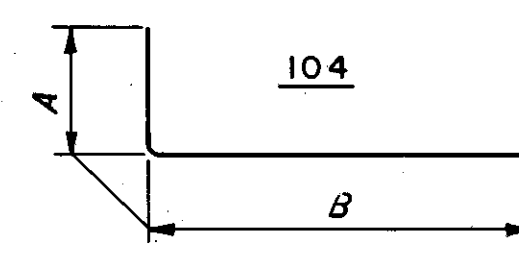
| WALL TYPE A | | | | | | |
|-------------|-----|---------|------|---------|---------|-----------|
| MARK | NO. | LENGTH | TYPE | A | B | R |
| 401 | 1 | 26'-3" | 144 | 16'-10" | 4'-9" | 5'-3 3/8" |
| 402 | 1 | 23'-11" | 144 | 16'-10" | 3'-7" | 5'-3 3/8" |
| 403 | 1 | 22'-7" | 144 | 16'-6" | 3'-1" | 5'-2 1/2" |
| 404 | 1 | 15'-9" | 121 | 15'-9" | ---- | 5'-3 3/8" |
| 405 | 1 | 14'-6" | 121 | 14'-6" | ---- | 5'-2 1/2" |
| 406 | 1 | 6'-2" | 121 | 6'-2" | ---- | 5'-3 3/8" |
| 407 | 1 | 4'-3" | 121 | 4'-3" | ---- | 5'-2 1/2" |
| 413 | 2 | 1'-0" | Str. | | | |
| 414 | 2 | 1'-6" | Str. | | | |
| 415 | 2 | 2'-0" | Str. | | | |
| 416 | 2 | 2'-6" | Str. | | | |
| 417 | 2 | 2'-9" | Str. | | | |
| 418 | 2 | 3'-0" | Str. | | | |
| 419 | 2 | 3'-3" | Str. | | | |
| 420 | 1 | 3'-3" | Str. | | | |
| 601 | 1 | 11'-10" | 105 | 8" | 10'-10" | ---- |
| 602 | 1 | 12'-10" | 105 | 1'-2" | 10'-10" | ---- |
| 603 | 1 | 13'-8" | 105 | 1'-7" | 10'-10" | ---- |
| 604 | 2 | 5'-7" | 104 | 2'-0" | 3'-9" | ---- |
| 605 | 2 | 6'-1" | 108 | 2'-6" | 1/2" | ---- |
| 606 | 2 | 6'-6" | 108 | 2'-11" | 1/4" | ---- |
| 607 | 2 | 6'-10" | 108 | 3'-3" | 3/8" | ---- |
| 608 | 2 | 7'-2" | 108 | 3'-7" | 3/8" | ---- |
| 609 | 2 | 7'-4" | 108 | 3'-9" | 1/2" | ---- |
| 610 | 1 | 7'-4" | 108 | 3'-9" | 1/2" | ---- |
| 611 | 2 | 7'-6" | Str. | | | |
| 612 | 3 | 9'-3" | Str. | | | |
| 613 | 2 | 10'-0" | Str. | | | |
| 614 | 1 | 3'-0" | Str. | | | |
| 615 | 1 | 6'-6" | Str. | | | |
| 616 | 4 | 5'-6" | Str. | | | |
| 617 | 4 | 4'-6" | Str. | | | |

| WALL TYPE B | | | | | | |
|-------------|-----|--------|------|---------|---------|-----------|
| MARK | NO. | LENGTH | TYPE | A | B | R |
| 401 | 1 | 26'-3" | 144 | 16'-10" | 4'-9" | 5'-3 3/8" |
| 402 | 1 | 21'-9" | 144 | 16'-10" | 2'-6" | 5'-3 3/8" |
| 403 | 1 | 20'-7" | 144 | 16'-6" | 2'-1" | 5'-2 1/2" |
| 404 | 1 | 14'-7" | 121 | 14'-7" | ---- | 5'-3 3/8" |
| 405 | 1 | 13'-6" | 121 | 13'-6" | ---- | 5'-2 1/2" |
| 406 | 1 | 5'-10" | 121 | 5'-10" | ---- | 5'-3 3/8" |
| 407 | 1 | 4'-0" | 121 | 4'-0" | ---- | 5'-2 1/2" |
| 412 | 2 | 9" | Str. | | | |
| 413 | 2 | 1'-3" | Str. | | | |
| 414 | 2 | 1'-9" | Str. | | | |
| 415 | 2 | 2'-6" | Str. | | | |
| 416 | 2 | 3'-0" | Str. | | | |
| 417 | 2 | 3'-6" | Str. | | | |
| 418 | 2 | 3'-9" | Str. | | | |
| 419 | 2 | 4'-0" | Str. | | | |
| 420 | 1 | 4'-0" | Str. | | | |
| 601 | 1 | 12'-0" | 105 | 9" | 10'-10" | ---- |
| 602 | 1 | 13'-0" | 105 | 1'-3" | 10'-10" | ---- |
| 603 | 1 | 14'-2" | 105 | 1'-10" | 10'-10" | ---- |
| 604 | 2 | 5'-11" | 104 | 2'-4" | 3'-9" | ---- |
| 605 | 2 | 6'-7" | 108 | 3'-0" | 1/2" | ---- |
| 606 | 2 | 7'-1" | 108 | 3'-6" | 1/4" | ---- |
| 607 | 2 | 7'-6" | 108 | 3'-11" | 3/8" | ---- |
| 608 | 2 | 7'-10" | 108 | 4'-3" | 3/8" | ---- |
| 609 | 2 | 8'-1" | 108 | 4'-6" | 1/2" | ---- |
| 610 | 1 | 8'-1" | 108 | 4'-6" | 1/2" | ---- |
| 611 | 2 | 7'-6" | Str. | | | |
| 612 | 3 | 9'-3" | Str. | | | |
| 613 | 2 | 10'-0" | Str. | | | |
| 614 | 1 | 3'-0" | Str. | | | |
| 615 | 1 | 6'-6" | Str. | | | |
| 616 | 4 | 5'-6" | Str. | | | |
| 617 | 4 | 4'-6" | Str. | | | |

| WALL TYPE C | | | | | | |
|-------------|-----|---------|------|---------|---------|-----------|
| MARK | NO. | LENGTH | TYPE | A | B | R |
| 401 | 1 | 26'-3" | 144 | 16'-10" | 4'-9" | 5'-3 3/8" |
| 402 | 1 | 24'-7" | 144 | 16'-10" | 3'-11" | 5'-3 3/8" |
| 403 | 1 | 23'-7" | 144 | 16'-6" | 3'-7" | 5'-2 1/2" |
| 404 | 1 | 20'-1" | 144 | 16'-10" | 1'-8" | 5'-3 3/8" |
| 405 | 1 | 19'-3" | 144 | 16'-6" | 1'-5" | 5'-2 1/2" |
| 406 | 1 | 15'-9" | 121 | 15'-10" | ---- | 5'-3 3/8" |
| 407 | 1 | 14'-11" | 121 | 14'-11" | ---- | 5'-2 1/2" |
| 408 | 1 | 11'-4" | 121 | 11'-4" | ---- | 5'-3 3/8" |
| 409 | 1 | 10'-4" | 121 | 10'-4" | ---- | 5'-2 1/2" |
| 410 | 1 | 5'-0" | 121 | 5'-0" | ---- | 5'-3 3/8" |
| 411 | 1 | 3'-4" | 121 | 3'-4" | ---- | 5'-2 1/2" |
| 412 | 2 | 1'-0" | Str. | | | |
| 413 | 2 | 1'-9" | Str. | | | |
| 414 | 2 | 2'-6" | Str. | | | |
| 415 | 2 | 3'-3" | Str. | | | |
| 416 | 2 | 3'-9" | Str. | | | |
| 417 | 2 | 4'-6" | Str. | | | |
| 418 | 2 | 4'-9" | Str. | | | |
| 419 | 2 | 5'-0" | Str. | | | |
| 420 | 1 | 5'-3" | Str. | | | |
| 601 | 1 | 12'-0" | 105 | 9" | 10'-10" | ---- |
| 602 | 1 | 13'-6" | 105 | 1'-6" | 10'-10" | ---- |
| 603 | 1 | 14'-10" | 105 | 2'-2" | 10'-10" | ---- |
| 604 | 2 | 6'-6" | 104 | 2'-11" | 3'-9" | ---- |
| 605 | 2 | 7'-3" | 108 | 3'-8" | 1/4" | ---- |
| 606 | 2 | 7'-11" | 108 | 4'-4" | 1/4" | ---- |
| 607 | 2 | 8'-6" | 108 | 4'-11" | 3/8" | ---- |
| 608 | 2 | 8'-11" | 108 | 5'-4" | 3/8" | ---- |
| 609 | 2 | 9'-2" | 108 | 5'-7" | 1/2" | ---- |
| 610 | 1 | 9'-4" | 108 | 5'-9" | 1/2" | ---- |
| 611 | 2 | 7'-6" | Str. | | | |
| 612 | 3 | 9'-3" | Str. | | | |
| 613 | 2 | 10'-0" | Str. | | | |
| 614 | 1 | 3'-0" | Str. | | | |
| 615 | 1 | 6'-6" | Str. | | | |
| 616 | 4 | 5'-6" | Str. | | | |
| 617 | 4 | 4'-6" | Str. | | | |

| WALL TYPE D | | | | | | |
|-------------|-----|--------|------|---------|---------|-----------|
| MARK | NO. | LENGTH | TYPE | A | B | R |
| 401 | 1 | 26'-3" | 144 | 16'-10" | 4'-9" | 5'-3 3/8" |
| 402 | 1 | 25'-3" | 144 | 16'-10" | 4'-3" | 5'-3 3/8" |
| 403 | 1 | 24'-5" | 144 | 16'-6" | 4'-0" | 5'-2 1/2" |
| 404 | 1 | 20'-7" | 144 | 16'-10" | 1'-11" | 5'-3 3/8" |
| 405 | 1 | 19'-9" | 144 | 16'-6" | 1'-8" | 5'-2 1/2" |
| 406 | 1 | 16'-1" | 121 | 16'-1" | ---- | 5'-3 3/8" |
| 407 | 1 | 15'-3" | 121 | 15'-3" | ---- | 5'-2 1/2" |
| 408 | 1 | 11'-1" | 121 | 11'-1" | ---- | 5'-3 3/8" |
| 409 | 1 | 10'-2" | 121 | 10'-2" | ---- | 5'-2 1/2" |
| 410 | 1 | 4'-8" | 121 | 4'-8" | ---- | 5'-3 3/8" |
| 411 | 1 | 3'-2" | 121 | 3'-2" | ---- | 5'-2 1/2" |
| 412 | 2 | 1'-0" | Str. | | | |
| 413 | 2 | 2'-0" | Str. | | | |
| 414 | 2 | 2'-9" | Str. | | | |
| 415 | 2 | 3'-9" | Str. | | | |
| 416 | 2 | 4'-6" | Str. | | | |
| 417 | 2 | 5'-0" | Str. | | | |
| 418 | 2 | 5'-6" | Str. | | | |
| 419 | 2 | 5'-9" | Str. | | | |
| 420 | 1 | 6'-0" | Str. | | | |
| 601 | 1 | 12'-0" | 105 | 9" | 10'-10" | ---- |
| 602 | 1 | 13'-8" | 105 | 1'-7" | 10'-10" | ---- |
| 603 | 1 | 15'-4" | 105 | 2'-5" | 10'-10" | ---- |
| 604 | 2 | 6'-10" | 104 | 3'-3" | 3'-9" | ---- |
| 605 | 2 | 7'-9" | 108 | 4'-2" | 1/2" | ---- |
| 606 | 2 | 8'-6" | 108 | 4'-11" | 1/4" | ---- |
| 607 | 2 | 9'-2" | 108 | 5'-7" | 3/8" | ---- |
| 608 | 2 | 9'-8" | 108 | 6'-1" | 3/8" | ---- |
| 609 | 2 | 9'-11" | 108 | 6'-4" | 1/2" | ---- |
| 610 | 1 | 10'-1" | 108 | 6'-6" | 1/2" | ---- |
| 611 | 2 | 7'-6" | Str. | | | |
| 612 | 3 | 9'-3" | Str. | | | |
| 613 | 2 | 10'-0" | Str. | | | |
| 614 | 1 | 3'-0" | Str. | | | |
| 615 | 1 | 6'-6" | Str. | | | |
| 616 | 4 | 5'-6" | Str. | | | |
| 617 | 4 | 4'-6" | Str. | | | |

BENDING DIAGRAMS



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

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CUYAHOGA COUNTY
CUY-490-1.49

FOLLOWING IS A LIST OF THE UTILITIES WITHIN THE LIMITS OF CONSTRUCTION:

CLEVELAND ELECTRIC ILLUMINATING CO.
55 PUBLIC SQUARE
CLEVELAND, OHIO 44113

CITY OF CLEVELAND

DEPARTMENT OF PUBLIC UTILITIES

OHIO BELL TELEPHONE CO.
100 ERIEVIEW PLAZA
CLEVELAND, OHIO 44114

DIVISION OF WATER & HEAT
1201 LAKESIDE AVENUE
CLEVELAND, OHIO 44114

EAST OHIO GAS CO.
1201 EAST 55TH STREET
CLEVELAND, OHIO 44114

DIVISION OF WATER POLLUTION CONTROL
1201 LAKESIDE AVENUE
CLEVELAND, OHIO 44114

CITY OF CLEVELAND

DIVISION OF LIGHT AND POWER
1201 LAKESIDE AVENUE
CLEVELAND, OHIO 44114

DEPARTMENT OF PUBLIC SAFETY

POLICE & FIRE COMMUNICATION SYSTEM
310 CARNEGIE AVENUE
CLEVELAND, OHIO 44114

DEPARTMENT OF PUBLIC SERVICE
CITY HALL, ROOM 227
601 LAKESIDE AVENUE
CLEVELAND, OHIO 44114

TRAFFIC ENGINEERING & PARKING
1801 ST. CLAIR AVENUE
CLEVELAND, OHIO 44114

UNDERGROUND UTILITIES NOTIFICATION

AT LEAST TWO WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION OPERATIONS IN AN AREA WHICH MAY INVOLVE UNDERGROUND UTILITY FACILITIES, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER, THE REGISTERED UTILITY PROTECTION SERVICE AND THE OWNERS OF EACH UNDERGROUND UTILITY FACILITY SHOWN IN THE PLANS.

THE OWNER OF THE UNDERGROUND UTILITY FACILITY SHALL, WITHIN FORTY-EIGHT HOURS, EXCLUDING SATURDAYS, SUNDAYS AND LEGAL HOLIDAYS, AFTER NOTICE IS RECEIVED, STAKE, MARK OR OTHERWISE DESIGNATE THE LOCATION OF THE UNDERGROUND UTILITY FACILITIES IN THE CONSTRUCTION AREA IN SUCH A MANNER AS TO INDICATE THEIR COURSE TOGETHER WITH THE APPROXIMATE DEPTH AT WHICH THEY WERE INSTALLED. THE MARKING OR LOCATING SHALL BE COORDINATED TO STAY APPROXIMATELY TWO DAYS AHEAD OF THE PLANNED CONSTRUCTION.

UTILITY ADJUSTMENTS

THE CONTRACTOR SHALL NOTIFY AT LEAST TWO (2) FULL WEEKS 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 PRIVATE UTILITIES WILL BE DONE BY AND AT THE EXPENSE OF THEIR RESPECTIVE OWNERS, UNLESS OTHERWISE NOTED ON THESE PLANS.

THE CONTRACTOR SHOULD CALL THE OHIO UTILITIES PROTECTION SERVICE, TOLL FREE, 800-362-2764. NONMEMBER UTILITY COMPANIES MUST BE CALLED DIRECTLY.

FEEDER SHUTDOWN

- A. A FEEDER SHUTDOWN SCHEDULE WITH DATES AND APPROXIMATE SHUTDOWN TIMES IS TO BE SUBMITTED TO THE CITY OF CLEVELAND, DIVISION OF LIGHT AND POWER, FOR APPROVAL TWO (2) WEEKS BEFORE A FEEDER SHUTDOWN IS REQUIRED. DUE TO THE NATURE OF THE LOADING OF THE 2.4 KV FEEDERS AND THE SEASON OF THE YEAR, IT WILL BE NECESSARY TO HAVE SOME OF THE FEEDER SHUTDOWNS ON OFF-PEAK DAYS, OR OFF-HOURS. THIS DETERMINATION WILL BE MADE BY MR. SESLER TITUS, SYSTEM OPERATING ENGINEER OF THE DIVISION OF LIGHT AND POWER.
- B. ALL FEEDER SHUTDOWNS SHALL BE CONFIRMED BY THE CONTRACTOR ONE DAY IN ADVANCE OF ALL SCHEDULED JOBS WITH THE SYSTEM OPERATING ENGINEER. ALL SWITCHING WILL BE DONE BY THE CITY OF CLEVELAND, DIVISION OF LIGHT AND POWER.

CABLE MARKING

EACH CABLE UPON ENTERING AND LEAVING MANHOLES SHALL BE MARKED WITH METAL TAGS, INDICATING THE FEEDER NUMBER AND CABLE SIZE. THE LETTERS SHALL BE 1/4" HIGH. SEE SPECIFICATION.

TRANSFORMERS

ALL NEW AND EXISTING TRANSFORMERS BEING REMOVED SHALL HAVE THE NAMEPLATE DATA RECORDED. THIS INFORMATION SHALL BE FORWARDED TO THE CITY OF CLEVELAND, DIVISION OF LIGHT AND POWER.

TEMPORARY SERVICE

ALL TEMPORARY SERVICES SHALL BE MAINTAINED DURING THE TIME OF CONSTRUCTION BY THE CONTRACTOR.

TIE INTO EXISTING MANHOLES

WHEN A NEW DUCTBANK IS CONNECTED INTO AN EXISTING MANHOLE, PART OF THE WALL SHALL BE CAREFULLY BROKEN TO RECEIVE NEW DUCTBANK, AFTER NEW DUCTBANK HAS BEEN INSTALLED, EXISTING MANHOLE SHALL BE REPAIRED, PATCHED AND SEALED. CABLES SHALL BE PROTECTED DURING THIS WORK WITH EXTREME CARE. ANY DAMAGE TO EXISTING CABLES SHALL BE REPAIRED. THIS WORK SHALL BE DONE UNDER THE SUPERVISION OF THE CITY OF CLEVELAND, DIVISION OF LIGHT AND POWER.

POLES

POLE LENGTHS AS SHOWN ON THE DRAWINGS, ARE FOR STANDARD LENGTH POLES. EXACT LINE HEIGHT IS TO BE DETERMINED IN THE FIELD TO MATCH THE EXISTING LINES.

DESCRIPTION OF WORK

THE CONTRACTOR SHALL SCHEDULE HIS WORK WITH OTHER TRADES AND SHALL COORDINATE AS INSTRUCTED BY THE PROJECT ENGINEER FOR THE LEAST INTERFERENCE WITH TRAFFIC, HIGHWAY CONSTRUCTION AND OTHER UTILITIES. CONNECT SECONDARY SERVICES AS REQUIRED TO INDIVIDUAL CUSTOMERS WITH MINIMUM SERVICE INTERRUPTIONS. PAYMENT SHALL BE ABSORBED IN OTHER RESPECTIVE PAY ITEMS.

NOTE

- A. SEQUENCE OF WORK NOTES ARE TO BE USED AS A GUIDE; FINAL DETAILS AND SEQUENCES ARE TO BE WORKED OUT WITH ALL OTHER TRADES IN THE FIELD AND APPROVED BY THE PROJECT ENGINEER.
- B. SOME WORK MAY BE DONE AT THE SAME TIME, BUT UNDER NO CIRCUMSTANCES SHALL POWER BE INTERRUPTED WITHOUT THE APPROVAL OF THE CITY OF CLEVELAND, DIVISION OF LIGHT AND POWER.
- C. ALL CONSTRUCTION WORK SHALL BE IN AGREEMENT WITH M.E.L.P. STANDARDS AND AS ENCLOSED IN "APPENDIX" SECTION OF SPECIFICATIONS.

SEQUENCE OF WORK

- (A) INSTALL NEW POLES AND FEEDERS AS SHOWN ON DRAWING 7078-3A.
- (B) INSTALL PERMANENT LIGHTING ON WOOD POLES.
- (C) CONNECT NEW FEEDERS TO EXISTING AND REMOVE OLD POLE LINES.
- (D) INSTALL UNDERGROUND AND MAKE FINAL CONNECTIONS.

LIST OF DRAWINGS

| | |
|-----------|---|
| 7078 - 1A | GENERAL NOTES (10 SHEETS) |
| 1B | GENERAL SUMMARY |
| 1C | SINGLE-LINE DIAGRAM |
| 7078 - 2A | UNDERGROUND PLAN & MEASUREMENT |
| 2B | UNDERGROUND MANHOLE DETAILS |
| 2C | UNDERGROUND MANHOLE COVER DETAILS |
| 7078 - 3A | OVERHEAD PLAN |
| 3B | OVERHEAD DETAILS |
| 3C | OVERHEAD DETAILS |
| 3D | OVERHEAD DETAILS |
| 3E | OVERHEAD DETAILS |
| 3F | OVERHEAD POLE ASSEMBLY |
| 3G | OVERHEAD POLE ASSEMBLY |
| 3H | TYPICAL POLE & CROSSARMS BILL OF MATERIAL |
| 3 I | POLE LIST & MATERIAL TABULATION |
| 7078 - 4A | BROADWAY POLE REMOVAL |

| SYMBOL LEGEND | |
|---------------------------------|---|
| —M— | NEW OVERHEAD WIRING |
| —E— | EXISTING OVERHEAD WIRING TO REMAIN |
| —R— | EXISTING OVERHEAD WIRING TO BE REMOVED |
| MELP | NEW UNDERGROUND DUCT LINE |
| —M— | EXISTING UNDERGROUND DUCT LINE |
| ● | NEW MELP POLE |
| ○ | EXISTING MELP POLE |
| ● | EXISTING MELP POLE TO BE REMOVED |
| ○ | EXISTING CEI POLE |
| ○ | EXISTING RTA POLE |
| ⊗ | EXISTING POLE-MOUNTED LIGHT FIXTURE |
| ⊗ | NEW POLE-MOUNTED LIGHT FIXTURE |
| ⊗ | EXISTING FOREIGN POLE |
| ⊗ | NEW POLE-MOUNTED TRANSFORMER (NUMBER INDICATES KVA) |
| ⊗ | EXISTING TRANSFORMER REMOVED (NUMBER INDICATES KVA) |
| ⊗ | NEW MELP MANHOLE |
| ⊗ | EXISTING MELP MANHOLE TO REMAIN |
| ⊗ | MANHOLE TO BE ABANDONED |
| 59918 | TYPICAL MELP POLE NUMBER |
| N-1 | TYPICAL NEW POLE NUMBER |
| SYMBOLS FOR SINGLE-LINE DIAGRAM | |
| ⊥ | GROUND |
| ⊗ | POLE-MOUNTED TRANSFORMER |
| ▽ | POTHEAD |
| ⊗ | LIGHTNING ARRESTER |
| ⊗ | POLE-MOUNTED LIGHT FIXTURE (N = NEW; E = EXISTING) |
| ⊗ | POLE-MOUNTED OIL SWITCH |
| ⊗ | POLE-MOUNTED FUSED CUTOFF w/ NEMA TYPE "K" FUSES |

APPROVED BY:

DIRECTOR OF PUBLIC UTILITIES

COMMISSIONER OF LIGHT & POWER

DEPUTY COMMISSIONER OF LIGHT & POWER

CONSULTING ENGINEER

ENGINEER OF DESIGN

| | | | |
|---|-------|--------|---------|
| A WESTERN BUSINESS TRUST | | | |
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| DIVISION OF LIGHT & POWER CITY OF CLEVELAND | | | |
| E. 55 th ST. - BRAGG RD. GENERAL NOTES & LEGEND | | | |
| SCALE | | | 7078-1A |
| DESIGNED | DRAWN | TRACED | CHECKED |
| ARG | JRH | | |

| INDEX | DESCRIPTION |
|--------|---|
| GS | GENERAL SPECIFICATION |
| GS. 01 | SCOPE OF WORK |
| GS. 02 | SUBMITTALS |
| GS. 03 | DEFINITIONS |
| GS. 04 | STATUS OF CITY INSPECTOR |
| GS. 05 | ADDITIONAL WORK |
| GS. 06 | STRUCTURES ENCOUNTERED |
| GS. 07 | TESTS, INSPECTION AND REPORTS |
| GS. 08 | TEMPORARY STREET LIGHTING |
| GS. 09 | TREE TRIMMING FOR INSTALLATION OF M. E. L. P. LINES |
| GS. 10 | REMOVAL |
| OC | OVERHEAD CONSTRUCTION SPECIFICATION |
| OC. 01 | SCOPE OF WORK |
| OC. 02 | POLE SETTING |
| OC. 03 | GRADING OF LINE |
| OC. 04 | LOCKNUTS |
| OC. 05 | SPLICES AND DEADENDS |
| OC. 06 | TAPS AND JUMPERS |
| OC. 07 | SAGGING OF CONDUCTORS |
| OC. 08 | SECONDARIES AND SERVICE DROPS |
| OC. 09 | GROUNDING |
| OC. 10 | WIRE |
| OC. 11 | GUY |
| OC. 12 | POLES |
| OC. 13 | CROSS ARMS |
| OC. 14 | DEADEND CLEVIS |
| OC. 15 | POTHEADS |
| OC. 16 | LIGHTNING ARRESTERS |
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ITEM GS
GENERAL SPECIFICATION

GS. 01 SCOPE OF WORK:

A. The Contractor shall relocate and/or remove all overhead and underground M. E. L. P. facilities of the City of Cleveland, as indicated on the plans or directed by the Engineer. This work shall be properly completed, including incidentals, as shown on the drawings and hereinafter specified.

B. All work in this Contract shall conform to the latest national electric safety code and OSHA, except where local regulations are more stringent, in which case local regulations shall govern.

C. The major items to be furnished and installed by this Contractor shall be as follows:

- Overhead pole line construction.
- Underground ductline and manhole construction including cables.
- Temporary feeder construction.
- Removal.

GS. 02 SUBMITTALS:

In addition to the requirements of 105 the Contractor shall submit shop drawings on the following items of equipment:

Poles
Cross Arms
Insulators
Transformers
Lightning Arresters
Fuse Cutouts
Load Break Switches
Oil Switches
Anchors
Wire
Guy Wire
Cable
Lighting Fixtures
Braces
Cable Splices

GS. 03 DEFINITIONS:

Whenever in these specifications or in any documents or instructions in construction where these specifications govern, the following terms are used, (or pronouns in place of them). The intent and meaning shall be interpreted as follows:

The City, or the City of Cleveland - The City, or the City of Cleveland, is the Director, Department of Public Utilities, of the City of Cleveland.

GS. 04 STATUS OF CITY INSPECTOR:

A. Inspectors as designated by the City of Cleveland shall be authorized to inspect all work done and materials furnished. Such inspecting may extend to all or any part of the work, and to the preparation or manufacture of the materials to be used in the work. The City Inspector as designated by the Director of Public Utilities shall make work instructions through the Project Engineer.

GS. 05 ADDITIONAL WORK:

Attention is called to the fact that the work of this Contract includes certain performances as incidental to the itemized requirements hereof, though not exclusive, as follows: To perform all excavation, backfilling, sheeting, shoring, temporary and final repaving. Sand backfill shall conform to the State of Ohio Department of Highway Construction and material Specifications and shall be placed under existing and proposed 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.

GS. 06 STRUCTURES ENCOUNTERED:

A. In addition to the conditions of 105 the Contractor shall notify in writing, companies, owners, or others in responsible charge of any structures that may be affected by his operations, and such notice shall be given in ample time to permit such companies, owners or others to take proper protection measures before such structures are in any way endangered by the work under this Contract. The Contractor shall not hinder or interfere with any such companies, owners or others in moving, supporting or otherwise protecting their property and structures,

but shall afford them every reasonable facility in taking such protective measures as may be necessary.

B. If a joint ownership pole is encountered under this Contract, it will be the Contractor's responsibility to coordinate his work with other companies in order to perform his work in the most efficient manner.

GS. 07 TESTS, INSPECTION AND REPORTS:

In addition to the requirements of 106.04 for tests and inspection to be made at the place of manufacture or fabrication, and reports required on tests and inspection of fabrication and workmanship, see items OC and UC.

GS. 08 TEMPORARY STREET LIGHTING:

The Contractor shall supply all temporary street lighting at his own expense for such periods of time as the Engineer may require for the proper protection of the public.

GS. 09 TREE TRIMMING FOR INSTALLATION OF M. E. L. P. LINES:

A. In addition to the requirements of 107, this Contractor shall guard against unnecessary damage to the trees resulting from his operation.

B. In the event that any work on the trees is found to be necessary such work shall be done either by the Division of Shade Trees of the City of Cleveland or by some other well-equipped organization approved by the Engineer.

C. The cost of trimming trees to the satisfaction of the City as herein stated shall be part of the cost of the job and shall be paid for by the Contractor.

GS. 10 REMOVAL:

This Contractor shall remove all overhead pole lines and abandon or remove all underground duct lines including temporary feeders as indicated on the drawings or as required.

A. Measurement for Removal

Shall be based on estimated units by this Contractor.

B. Payment for Removal

Shall be based on a contract lump sum price bid, which price shall be full compensation for removal of such items, as transformers, poles, cross arms, pole-line hardware, primary and secondary conductors, streetlight luminaires, oil switches, cables, etc., including excavation and backfill incidental to their removal.

ITEM OC
OVERHEAD CONSTRUCTION SPECIFICATION

OC. 01 SCOPE OF WORK:

A. All overhead construction work under this part of the contract shall be done in a thorough and workmanlike manner in accordance with the Specifications and the Construction Drawings.

B. The latest edition of the National Electrical Safety Code shall be followed except where local regulations are more stringent, in which case local regulations shall govern.

OC. 02 POLE SETTING:

A. The minimum depth for setting poles shall be as follows:

| Length of Pole (feet) | Setting in Soil (feet) | Setting in All Solid Rock (feet) |
|-----------------------|------------------------|----------------------------------|
| 20 | 4.0 | 3.0 |
| 25 | 5.0 | 3.5 |
| 30 | 5.5 | 3.5 |
| 35 | 6.0 | 4.0 |
| 40 | 6.0 | 4.0 |
| 45 | 6.5 | 4.5 |
| 50 | 7.0 | 4.5 |
| 55 | 7.5 | 5.0 |
| 60 | 8.0 | 5.0 |

B. "Setting in Soil" specifications shall apply:

- Where poles are to be set in soil.
- Where there is a layer of soil of more than two (2) feet in depth over solid rock.
- Where the hole in solid rock is not substantially vertical or the diameter of the hole at the surface of the rock exceeds approximately twice the diameter of the pole at the same level.

C. "Setting in all Solid Rock" specifications shall apply where poles are to be set in solid rock and where the hole is substantially vertical, approximately uniform in diameter and large enough to permit the use of tamping bars the full depth of the hole.

D. Where there is a layer of soil two (2) feet or less in depth over solid rock, the depth of the hole shall be the depth of the soil in addition to the depth specified under "Setting in all Solid Rock" provided, however, that such depth shall not exceed the depth specified under "Setting in Soil".

E. On sloping ground, the depth of the hole always shall be measured from the low side of the hole.

F. Poles shall be set so that alternate cross arm gains face in opposite directions, except at terminals and deadends where the gains of the last two poles shall be on the side facing the terminal or deadend. On unusually long spans, the poles shall be set so that the cross arm comes on the side of the pole away from the long span. Where pole top pins are used, they shall be on the opposite side of the pole from the gain, with the flat side against the pole.

G. Poles shall be set in alignment and plumb except at corners, terminals, angles, junctions, or other points of strain, where they shall be set and raked against the strain so that the conductors shall be in line.

H. Poles shall be raked against the conductor strain not less than one inch for each ten feet of pole length nor more than two inches for each ten feet of pole length after conductors are installed at the required tension.

I. "Blocking" of the pole per detail drawing shall be followed if so indicated on drawings or ordered by the City Inspector or Project Engineer.

J. Pole backfill must be thoroughly tamped the full depth. Excess dirt must be banded around the pole. Remove excess dirt and restore sidewalk or sod after setting.

K. For construction of poles see Section OC. 12 of this Specifications.

OC. 03 GRADING OF LINE:

When using high poles to clear obstacles such as buildings, foreign wire crossings, railroads, etc., there shall be no upstrain on pin-type insulators in grading the line each way to lower prices.

OC. 04 LOCKNUTS:

A locknut shall be installed with each nut, eyenut or other fastener on all bolts or threaded hardware such as insulator pins, upset bolts, double arming bolts, etc.

OC. 05 SPLICES AND DEADENDS:

Conductors shall be spliced and deadended as shown on the Construction Drawings. There shall be not more than one splice per conductor in any span and splicing sleeves shall be located at least ten feet from the conductor support.

OC. 06 TAPS AND JUMPERS:

- A. Jumpers and other leads connected to line conductors shall have sufficient slack to allow free movement of the conductors. Where slack is not shown on the Construction Drawings, it will be provided by at least two bends in a vertical plane, or one in a horizontal plane, or the equivalent.
- B. All leads on equipment such as transformers, reclosers, etc., shall be a minimum of #6 copper conductivity.

OC. 07 SAGGING OF CONDUCTORS:

- A. Conductors shall be sagged in accordance with the conductor manufacturer's recommendation. All conductors shall be sagged evenly. The air temperature at the time and place of sagging shall be determined by a certified etched glass thermometer.
- B. The sag of all conductors after stringing shall be in accordance with the conductor manufacturer's recommendations, except that a maximum increase of three inches of the specified sag in any span will be acceptable. However, under no circumstances will a decrease in the specified sag be allowed.

OC. 08 SECONDARIES AND SERVICE DROPS:

- A. Secondary conductors to be covered wires or multi-conductor service cable. The conductors shall be sagged in accordance with the manufacturer's recommendations.
- B. Secondaries and service drops shall be so installed as not to obstruct climbing space. There shall not be more than one splice per conductor in any span, and splicing sleeves shall be located at least ten feet from the conductor support. Where the same covered conductors or service cables are to be used for the secondary and service drop, they may be installed in one continuous run.
- C. Underground secondary service from poles shall be by means of aluminum riser conduit, strapped to pole properly and terminated in aluminum weatherhead. See OC. 24.

OC. 09 GROUNDING:

- A. Ground rods shall be driven full length in an undisturbed earth in accordance with the Construction Drawings. The top shall be buried below the surface of the earth. The maximum acceptable earth resistance value shall be 25 ohms. If the 25 ohm maximum resistance is exceeded by the use of a single ground rod a second 1/2" diameter by 8 foot rod shall be coupled or welded to the first rod and driven into the earth. If the maximum resistance is still exceeded a third 1/2" diameter by 8 ft. long rod shall be driven approximately 4' from initial rod and connected in parallel with the first set. Procedure shall continue till resistance of 25 ohms or less is obtained all year round. The ground wire shall be attached to the rod with a clamp and secured to the pole with staples top and bottom. The ground wire shall be covered by a ground moulding. The staples on the ground moulding shall be spaced two feet apart except for a distance of eight feet above the ground and eight feet down from the top of the pole where they shall be six inches apart.
- B. Electrical Grounding Standards -
 1. No three phase circuits are to be grounded.
NOTE: Exception to this rule - where 3 wire Edison lighting is combined with 220 volt, 3 phase power, the neutral of the Edison circuit must be grounded.
 2. All transformer cases where mounted on bipoles or installed in vaults, or on concrete slabs will be grounded.
 3. All transformer cases where mounted on poles or cross arms will not be grounded.
 4. All street lighting regulator cases will be grounded.
 5. All capacitor racks and housing will be grounded.
 6. All metal meter boxes or metering transformer enclosures will be grounded.
 7. All oil switch cases where mounted on poles or cross arms will not be grounded.
- C. The neutral wires and lighting-protective equipment shall be interconnected and attached to a common ground wire.

- D. Provide all ground rods and ground wires as indicated on the drawings. All connections at the rod shall be made with a copperweld cast bronze clamp having a hex head bronze set screw. Wire shall be #6 CU. W.P. for 2.4 KV and #2 CU. W.P. for all manholes and 11 KV and stranded. Ground moulding shall be 3/4" bulk rigid vinyl.

A. Measurement

1. The ground rods to be paid for will be the actual number of ground rods, completed, installed and accepted, including all clamps, ground wire and ground moulding.

B. Payment

1. This work described above and the contract unit price for each grounding rod bid under "Item OC. 09 - Grounding" in place, completed and accepted, shall form the basis of payment and shall constitute full compensation for furnishing material, and for all labor, equipment, tools and incidentals necessary to complete this item.

Terms of Sections "OC. 01" through and inclusive "OC. 10" shall govern this section. Terms and stipulations therein shall be understood as part of following "OC" section.

OC. 10 WIRE:

A. Overhead Wire

1. Wire shall be ACSR weatherproof.
2. ACSR Conductor shall be manufactured to conform to the latest revision of the following ASTM specifications:
 - a. ASTM-B230, Hard Drawn Aluminum Wire for electrical purposes.
 - b. ASTM-B232, Concentric-lay stranded aluminum conductors, steel reinforced.
 - c. ASTM-B261, Zinc coated (Class "A") Steel Core Wire for Aluminum Conductors, Steel Reinforced (ACSR).

3. ACSR Stranding shall be as follows:

| AWG Size | ACSR Strand |
|----------|---------------|
| # 4 | 7/1 (Hickory) |

4. Conductors must be handled with care. Conductors shall not be tramped on nor run over by vehicles. Each reel shall be examined and the wire shall be inspected for cuts, kinks, or other injuries. Injured portions shall be cut out and the conductor spliced. The conductors shall be pulled over suitable rollers or stringing blocks properly mounted on pole or cross arm, if necessary, to prevent binding while stringing.

With pin-type insulators the conductors shall be tied in the top groove of the insulator on tangent poles and on the side of the insulator away from the strain at angles. Pin-type insulators shall be tight on the pins and on tangent construction the top groove must be in line with the conductor after tying in.

All conductors shall be cleaned thoroughly by wirebrushing before splicing or the installation of a connector or clamp. A suitable inhibitor shall be used before splicing or applying connectors over aluminum conductor.

Weatherproof Covering

Wire shall have a polyethylene weather resistant type of covering which shall meet or exceed all requirements of ASA Specification No. C8 .35 1971, or latest revision thereof.

B. Aluminum Triplex and Quadruplex

1. Phase conductors shall be manufactured to conform to the latest revision of ASTM B231 concentrically-stranded conductors.
2. Neutral conductor shall be manufactured to conform to the latest revision of the following ASTM Specifications:

- a. ASTM-B230, Aluminum wire for electrical purposes.
- b. ASTM-B232, Concentric-Lay Stranded Aluminum Core Steel Reinforced Conductor.

C. Stranding shall be as follows:

| Phase | Conductors | Bare Neutral-Mess. | Code |
|-------|------------|--------------------|---|
| #4 | 7 Strand | #4-6 Strand | Periwinkle Conventional Poly Cenia - XLP Cross Linked Poly |
| #1/0 | 19 Strand | #1/0-6 Strand | |

D. Deadend Grips

Provide preformed deadends for use in deadending weatherproof covered copper conductors without removing the insulation on the wire. These deadends are to be made of aluminum alloy and generously coated with a durable PVC, polymerized chlorobutadiene or plastic coating over the entire metal surface. Each deadend grip must have a tag attached showing manufacturer's name, catalog number, and the size wire to which it can be attached. Deadend grip shall be A. B. Chance type PCAG, P. L. P. ND or approved equal.

E. Deadend Grips for Triplex

Provide preformed deadends for use in deadending triplex wire with aluminum alloy neutrals. These deadends are to be made of hard-drawn aluminum clad, steel wire (ASTM B-415-64T).

Each deadend grip shall have a tag attached showing manufacturer's name, catalog number, and the size wire to which it can be attached. Deadend grip shall be P. L. P. type SG, A. B. Chance Superlock or approved equal.

F. Measurement

The number of linear feet of wire forming the basis for payment shall be the actual number of linear feet furnished and placed in accordance with these specifications, as measured from center to center of poles and shall include miscellaneous fittings.

G. Payment

The footage measured as described above and the contract unit price per foot for "Item OC. 10 - Wire" classified as to size and type shall form the basis of payment and shall include hauling, pulling, installing, splicing, grips, and all labor, equipment, tools and incidentals to complete this item.

| Item | Unit | Description |
|--------|------|--------------------------------|
| OC. 10 | Ft. | No. 4 Wire- ACSR-Weatherproof |
| OC. 10 | Ft. | No. 4 Wire Triplex Secondary |
| OC. 10 | Ft. | No. 1/0 Wire Triplex Secondary |
| OC. 10 | Ft. | No. 4/0 Wire Quadruplex |

OC. 11 GUYS:

- A. Guys shall be placed before the conductors are strung, tightened by turnbuckle and shall be attached to the pole and constructed as shown on the plans.
- B. All anchors and rods shall be in accordance with Construction Drawings and in line with the strain and shall be so installed that approximately six inches of the rod remain out of the ground. In cultivated fields or other locations, as deemed necessary, the projection of the anchor rod above earth may be increased to a maximum of 12 inches to prevent burial of the rod eye. The backfill of all anchor holes must be thoroughly tamped the full depth.
- C. Alumoweld Guy Wire
 1. Alumoweld guy wire shall be made by a process in which atomized aluminum powder is applied to a high strength steel rod by means of controlled heat and pressure producing an atomic weld resulting in a guaranteed minimum aluminum thickness of 10% of wire radius.
 2. The 7#11 strand alumoweld guy wire shall have rated strength of 7,945 pounds.
 3. The 7#9 strand alumoweld guy wire shall have a rated strength of 12,630 pounds.
 4. Shipment shall be in 500' coils

5. Tension on guy wire shall never exceed 20% of the breaking strength on the guy cable used.

D. Anchor Rods

1. Anchor rods shall be twineye, threaded hot-dipped galvanized and manufactured to conform with applicable EEl Specification TD-2.
2. Rods for 8" x 22" anchors shall be Hubbard #8527, McGraw-Edison DA2D7 or equal.
3. Rods for 10" x 40" anchors shall be Hubbard #8529, McGraw-Edison DA2D9, or equal.

E. Anchors

1. Anchors shall be made of heavy gauge, pressed steel, and designed for heavy duty anchoring. The entire anchor shall be finished with black asphaltum paint.
2. Anchor shall be:

McGraw-Edison DA4P4,
Joslyn Cat. J7508 10" x 40", or Chance 1040S,
or approved equal.

F. Guy Grips

1. Guy grips used on "Alumoweld" guy wire shall be made of hard drawn aluminum clad steel wire of tentative ASTM Specification B-415-64T.
2. The holding power of the grip shall be in excess of the rated breaking strength of the guy wire on which it can be used.
3. Each guy grip shall have a tag attached showing manufacturer's name, catalog number, and the size guy wire to which it can be attached.
4. Attached guy wire shall be:

A. B. Chance Type AWSBG,
P. L. P. Type AWDE,
or approved equal.

G. Strain Insulators

1. Insulators shall be made from wet process porcelain, and conform to the latest ASA Standards.
2. Color shall be brown glazed.
3. 2.4 KV insulator shall be EEl NEMA Class 54-1 and 54-2 as detailed on drawings and shall be: (10,000#) (12,000#)

Hubbard #522 or Hubbard #521 & McGraw-Edison NG3A1
or NG2A1
For (12,000#) & (10,000#) respectively.

4. McGraw-Edison Cat. #NG3A1 and NG2A1 Alumoweld Guy Wire

Locke Cat. #504 and #502
(12,000#) (10,000#)
7#11 (7,945#)
7#9 (12,630#)
or approved equal.

H. Guy Wire Guards

1. Guards to be made of metal and shall completely encircle the guy strand. The retaining rod must not weaken the guard and must be made of galvanized steel strand. Guards to be 8'-0" long.
2. Guards shall be:

Joslyn J1618
Hubbard #27658 or approved equal.

I. Measurement

1. The guys to be paid for will be the actual number of guys completed, installed and accepted. Include alumoweld guy wire, anchors, anchor rods, strain insulators, guy grips, guy wire guard and miscellaneous hardware as shown on plans.

J. Payment

- The work described above and the contract unit price for each guy bid under "Item OC.11 - Guys" in place, completed and accepted shall form the basis of payment and shall constitute full compensation for all material, labor, equipment, tools, and incidentals necessary to complete these items, measured as provided above will be paid for under:

| Item | Unit | Description |
|-------|------|-------------------------------------|
| OC.11 | Ea. | Standard Anchor Guy with Insulators |
| OC.11 | Ea. | Head Guy or Arm Guy with Insulators |

OC.12 POLES:

- Poles 40'-0" or less shall be Western Red Cedar, and shall be manufactured and marked and shall conform in treatment and limitation of defects for wood poles to Edison Electric Institute Specification TD 100-52 and ASA 05.1 - latest edition except as noted below:

 - Spiral Grain (Twist Grain) No pole may have more than 1-twist in any 20 feet.
 - Knots - poles with 3 or more knots in a cluster or circle are not acceptable.
 - Sweep - sweep of poles shall be measured between butt and top of pole and shall be no more than 1 inch for every 10 feet of total length.
 - Short Crook - no more than 1 inch deviation in any five foot section will be allowed.
- 45'-0" and over shall be Western Red Cedar and shall be manufactured and marked and shall conform in treatment and limitation of defects and dimensions for Wood Poles to Edison Electric Institute Specification TD100-52 and ASA 05.1-1963.

All poles shall be incised over an area starting from two feet below ground line and extending to one foot above ground line. All poles shall be machine shaved full length above the incised area. All poles shall be roofed, gained and drilled as detailed on drawings.

C. Preservative Treatment

- The preservative shall be a 5 percent solution by weight of pure pentachlorophenol in a suitable light oil as a solvent and a carrier.
- The treatment shall be by a non-pressure process using a 210-to-235° F. hot immersion followed by a 125-to-150° F. cool immersion in horizontal tanks with covers to be closed during the entire period of treatment. Treatment shall be applied the full length of the pole.
- Treating cycles shall be adjusted to species of timber and its condition at the time of treatment.
- The process shall produce and guarantee an average minimum final retention of 1/2 pound of pure dry pentachlorophenol (10 pounds of 5 percent treating solution) per cubic foot of sapwood in the incised area and 1/4 pound of pure pentachlorophenol (5 pounds of 5 percent treating solution) average minimum over the rest of the pole. Alternate method of preservative treatment utilizing liquid petroleum gas is acceptable providing it meets the above average minimum requirements of final retention of pure dry pentachlorophenol.

D. Measurement

- The poles to be paid for will be the actual number of poles completed, installed, blocked if required by Engineer, and accepted.

E. Payment

- The work described above and the contract unit price for each pole bid under "Item OC.12 - Poles" in place, completed and accepted, shall form the basis of payment and shall constitute full compensation for all excavation, backfill, furnishing, hauling and placing all materials, and for all labor, equipment, tools and incidentals necessary to complete this item. These items, measured as provided above will be paid for under:

| Item | Unit | Description |
|-------|------|------------------------------|
| OC.12 | Ea. | Pole 30'-0" Length - Class 5 |
| OC.12 | Ea. | Pole 35'-0" Length - Class 5 |
| OC.12 | Ea. | Pole 40'-0" Length - Class 1 |
| OC.12 | Ea. | Pole 45'-0" Length - Class 1 |
| OC.12 | Ea. | Pole 45'-0" Length - Class 3 |
| OC.12 | Ea. | Pole 50'-0" Length - Class 1 |
| OC.12 | Ea. | Pole 55'-0" Length - Class 1 |
| OC.12 | Ea. | Pole 60'-0" Length - Class 1 |
| OC.12 | Ea. | Pole 70'-0" Length - Class 1 |
| OC.12 | Ea. | Block Pole |

OC.13 CROSS ARMS:

- All cross arms shall be manufactured from Douglas Fir timber in accordance with Edison Electric Institute Specification No. TD90-1949.
- Cross arms shall be incised to a depth of 1/8 inch on all four sides.
- Dimensions and drilling shall be as detailed on the drawings.
- Cross arms shall conform to EEI Specs. TD-90, latest revision thereof, including Section 7 on preservative treatment. The preservative shall be 5% solution of pentachlorophenol in a suitable petroleum carrier. The treatment method is optional with the supplier but the results must be equal to Paragraph 7.5 and 7.6 of these specifications.
- Penetration:** The preservative should penetrate all the sapwood. It shall penetrate longitudinally not less than one inch from pinholes, bolt holes and from the ends.
- Effects of Treatment and Cleanliness:** The treating method shall not injure the wood. After treatment, cross arms shall be reasonably clean to the touch and should remain so.

G. Steel Insulator Pins

These pins shall be hot-dipped, galvanized forged steel with cast lead threads for flat top cross arm mounting.

Important dimensions:
6" ht. over arm
1" thread dia.
5/8" x 5-3/4" shank

Joslyn: J-206
Hubbard: 984
or approved equal.

H. Suspension Type Insulator

This item shall be wet process suspension type insulator (Clevis and eye) in accordance with ASA Standards C 29.1-1973 and C 29.2-1973 (or latest revision) and shall be ASA class (52-1). This item shall meet the following design requirements:

| | | |
|------------------------------|---|--------------|
| A. Dimensions: | Leakage Distance | 7 inches |
| | Dry Arcing Distance | 4.125 inches |
| B. Mechanical Values: | Combined M & E Strength | 10,000 lbs. |
| | Impact Strength | 45 inch-lbs. |
| | Tension Proof. LB. | 4,000 lbs. |
| | Time Load | 6,000 lbs. |
| | Sustained Load | 5,000 lbs. |
| C. Electrical Values: | Low Frequency Dry Flashover | 60 KV |
| | Low Frequency Wet Flashover | 30 KV |
| | Negative and Positive Impulse Flashover | 100 KV |
| | Low Frequency Puncture | 80 KV |

D. Radio Influence Voltage Data:

RMS to ground 7.5 KV
Max. RIV-1000 KC 50 Microvolts

Suspension type insulators shall be:

A. B. Chance Cat. #C907-1001
Ohio Brass Co. - Cat. #32433
or approved equal.

I. Pin Type Insulator

- Insulator shall be pin type insulator made from wet process porcelain, and conform to the latest NEMA Publication, High Voltage Insulator Standards.

- Color shall be brown glazed.

- Insulator shall be as detailed on drawings and shall be:

Ohio Brass Cat. #38149
Pinco Cat. #L2064R
or approved equal.

J. Measurement

- The cross arms to be paid for will be the actual number of cross arms completed, installed and accepted, including insulators, clevises, and misc. mtg. hardware.

K. Payment

- The work described above and the contract unit price for each cross arm bid under "Item OC.13 - Cross Arms" in place, completed and accepted, shall form the basis of payment and constitute full compensation for furnishing, hauling, material, and for all labor, equipment, tools and incidentals necessary to complete this item. These items measured as provided above will be paid for under:

| Item | Units | Description |
|------------|-------|---|
| OC.13 | Ea. | Heavy Duty 8 Pin Cross Arm with 6 Pin Insulators (5KV) |
| OC.13 & 14 | Ea. | Heavy Duty 8 Pin Cross Arm with 6 Pin Insulators and 6 Deadend Clevises (5KV) |

| Item | Unit | Description |
|------------|------|--|
| OC.13 | Ea. | Heavy Duty 6 Pin Cross Arm with 3 Pin Insulators (5KV) |
| OC.13 | Ea. | Heavy Duty 6 Pin Cross Arm with 3 Pin Insulators (15KV) |
| OC.13 & 14 | Ea. | Heavy Duty 6 Pin Cross Arm with 3 Pin Insulators and 3 Deadend Clevises (5KV) |
| OC.13 | Ea. | Heavy Duty 6 Pin Cross Arm with 3 Pin Insulators and 3 Disc Strain Insulators (15KV) and Strain Clamps |
| OC.13 | Ea. | Standard 6 Pin Cross Arm |
| OC.13 | Ea. | Standard 6 Pin Cross Arm with 3 Pin Insulators (5KV) |
| OC.13 & 14 | Ea. | Standard 6 Pin Cross Arm with 3 Pin Insulators and 3 Deadend Clevises (5KV) |
| OC.13 & 14 | Ea. | Standard 6 Pin Cross Arm with 2 Pin Insulators and 2 Deadend Clevises (5KV) |
| OC.13 & 14 | Ea. | Corner Pole Deadend Clevises - Ass'y. (5KV) |
| OC.13 | Ea. | Corner Pole Disc Strain Insulator - Ass'y. (15KV) |
| OC.13 | Ea. | Standard 6 Pin Crossarm with 2 Pin Insulators (5KV) |

OC.14 DEADEND CLEVIS:

- Insulator shall be a primary spool insulator made by wet process porcelain and shall conform to the latest EEI-NEMA standards with rating and size meeting Class 53-5 requirements.

- Color shall be brown glazed. Insulator shall be:

Hubbard #1613
McGraw-Edison Cat. #DESS3, or approved equal.

- Clevis shall be made of hot-dipped galvanized 1/4" x 1-1/2" flat steel with 5/8" diameter galvanized steel bolt with non-ferrous self-locking cotter and an ultimate mechanical strength of 5000 pound minimum. Clevis with insulator above shall be:

Hubbard #1344
McGraw-Edison Cat. #DC1F1, or approved equal.

D. Measurements

Clevis to be paid for will be the actual number of clevises or clamps completed, installed and accepted including spool insulator, pin and miscellaneous mounting hardware, etc.

E. Payment

The work described above and the correct unit price for each deadend clevis or clamp bid under "Item OC.14 - Deadend Clevis" in place, completed and accepted shall form the basis of payment and constitute full compensation for furnishing, hauling, material and for all labor, equipment, tools and incidentals necessary to complete this item.

OC.15 POTHEADS:

- Potheads shall be 3 conductor, 250 MCM, 8.7 KV base size 4, outdoor, Shape "B", capnut style pothead complete with individually packaged sets of oil resistant entrance gaskets, aluminum washers, Style **WS Wiping Sleeve** 3 internal pressed - on 250 MCM connectors drilled for 4/0-19 Strand Concentric Round conductors complete with hood-nuts and style 3-D aerial lugs. Cable size is 2" O.D. Internal compression connector should be order to be used with type of compression tool used by Contractor.

- Potheads shall be G & W Cat. #T3524-B-WS

(PIM) Rusgreen C4253IU

C. Pothead Mounting Bracket

- Bracket shall be complete for pole mounting, 4-1/2" x 2" D. M. B. with locknuts for pothead mounting and ground clamp.

- All material shall be hot-dipped galvanized.

- Bracket shall be as detailed on drawings.

D. Measurements

- The potheads to be paid for will be actual number of potheads completed, installed and accepted. Including mounting bracket hardware, and cable guard.

E. Payment

- The work described above and the contract unit price for each pothead bid for "Item OC.15 - Potheads" in place, completed and accepted, shall form the basis of payment and shall constitute full compensation for all furnishing, material, and for all labor, equipment, tools and incidentals necessary to complete this item. These items as measured and provided above will be paid for under:

| Item | Unit | Description |
|-------|------|-------------|
| OC.15 | Ea. | Pothead 5KV |

OC.16 LIGHTNING ARRESTERS:

Lightning arresters shall be distribution valve type radio-noise free with top and bottom connection terminals (no pigtailed). Expulsion type will not be accepted. An E. E. I. -NEMA standard type A cross arm hanger shall be furnished with each arrester to accommodate 3-1/4" x 4-1/4" to 4" x 5" cross arm cross sections. Arrester bodies shall be made of wet process porcelain (#70 grey preferred or brown). Lightning arrester shall conform to all applicable NEMA standards LA-1962 (or latest revision) and ASA C62.1-1962 (or latest revision).

J. Payment
The work described above shall be paid for at the contract unit price for each transformer bid for "Item OC. 19 - Transformer" in place, completed and accepted, which price and payment shall constitute full compensation for furnishing, hauling, material, and for all labor, equipment, tools and incidentals necessary to complete this item. These items as measured and provided above will be paid for under:

| Item | Unit | Description |
|--------|------|---------------------|
| OC. 19 | Ea. | Transformer |
| OC. 19 | Ea. | Fused Cutouts |
| OC. 19 | Ea. | Primary Wire Holder |

OC. 20 OIL SWITCH SKV

Oil switches are to be used outdoors on three phase 2400 volt circuits and shall be:

1. Capable of carrying rated current continuously without overheating and,
2. Capable of interrupting rated current safely.

A. Rating

The oil switches shall be 400 ampere, not less than 4. 16 KV, three pole oil immersed, single throw, manually operated, non-automatic weatherproof.

B. Construction

1. The housing and cover of the switch shall be cast iron, or welded steel construction properly reinforced to withstand stresses imposed by handling during installation and switching operations when in service. The cover shall be formed and gasketed to positively insure against entrance of water.
2. The tank shall be attached to the frame in a manner which will assure easy removal for inspection and shall be provided with a drain plug, an insulating liner, insulating barriers between poles, and a mark showing the proper oil level to be maintained.
3. Circuit entrance to the switch contacts shall be made through removable wet process entrance bushings of ample design and thoroughly protected by overhanging switch case to give high wet flash-over. Switch shall be Westinghouse Type FO-11, Phoenix Electric Type PK-35 or equal.

C. Operation

1. The contact making and breaking mechanism shall be operated by an external handle. The open and closed positions shall be indicated by the position of the operating handle and marks on the switch housing.
2. The closed position of the switch shall be locked by a toggle link passing over center. Open position of the switch shall leave the contacts widely separated.

D. Mounting

The oil switches are to be mounted on cross arms and to give maximum flexibility of mounting, the body of the case shall be furnished with mounting ears of lugs to allow mounting the switch either parallel to, or at right angle to, the axis of the pole line.

E. Hangers

Each switch is to be furnished complete with two hangers as detailed on Drawing No. 5105-20.

F. Contacts

1. The oil switches shall be designed so that arcing contacts prevent arcing of the main current carrying contact surface. Arcing contacts shall be removable and easily replaceable.
2. Silver plating of the main contact surfaces is desirable and will receive consideration. The Bidder shall state additional price if main contact surfaces are silver plated.

G. Oil

Each oil switch shall be furnished complete with a normal filling of good, high grade insulating oil as described in ASTM D 877-67 latest applicable revision.

H. Finish

The entire housing and cover shall be thoroughly protected with one coat of chromate primer, and one coat of high grade weatherproof paint. In the event chromate primer is not available, two (2) coats of the weatherproof paint shall be used.

I. Description

Each bidder shall furnish full descriptive information and data on mounting dimensions and electrical rating on switches he proposes to supply.

J. Measurement

The oil switches to be paid for will be the actual number of oil switches completed, installed and accepted. Including mounting brackets, hardware, primary wire holder and 5KV wiring.

K. Payment

The work described above and the contract unit price for each oil switch bid for "Item OC.18 - Oil Switches" in place, completed and accepted, shall form the basis of payment and shall constitute full compensation for furnishing, hauling, material, labor, equipment, tools and incidentals necessary to complete this item.

OC. 24 ALUMINUM CONDUIT:

A. Conduit

Threaded both ends in 10 ft. lengths with American Standard tapered pipe thread. All rigid conduit, threaded coupling and straps shall be alloy 6063.

B. Weatherhead

Weatherhead, threaded for rigid aluminum conduit. Knockout cover for 3 wire service or as required.

C. Measurement

The number of linear feet of aluminum conduit to be paid for shall be the actual distance installed with all incidentals as required and/or indicated on drawings.

D. Payment

The footage measured as provided above shall be paid for at the contract bid price per linear foot for "Item OC.24 - Aluminum Conduit." Price and payment shall constitute full compensation for furnishing aluminum conduit, couplings, straps, bushings, installation, etc., with all labor, equipment, tools and incidentals necessary to complete this item and as shown on plan and/or as directed by Engineer, measured as provided above, will be paid for under:

| Item | Unit | Description |
|--------|------|---------------------|
| OC. 24 | Ft. | 4" Aluminum Conduit |

OC.25 CROSS ARM BRACES:

Material for braces shall be structural steel for 2.4 KV and wood for 11 KV conforming in all respects to ASTM Specification A 306 or latest revision thereof. Zinc coating (galvanizing) shall conform to ASTM Specification A153-67 or latest revision thereof. Zinc coating shall be capable of passing the "Preece Test" as set forth in ASTM Designation A239-41 or latest revision thereof. Steel braces shall be as manufactured by:

McGraw-Edison #DB114
Locke #6941, or approved equal. For 2.4KV

A. Measurement

The braces to be paid for will be the actual number of braces installed and accepted, including mounting hardware.

B. Payment

The work described above and the contract unit price for each brace bid under "Item OC.25 - Cross Arm Braces" in place, completed and accepted, shall form the basis of payment and shall constitute full compensation for all material, and for all labor, equipment, tools, and incidentals necessary to complete this item. These items measured as provided above will be paid for under:

| Item | Unit | Description |
|-------|------|----------------------------|
| OC.25 | Ea. | Cross Arm Brace Angle Iron |
| OC.25 | Pair | Cross Arm Brace, Wood |

OC.26 HARDWARE:

All hardware shall be hot-dipped galvanized, rolled threads, buffer point, square heads, and square nuts.

All hardware shall be uniform with standard threads, and shall be in accordance with ASTM Specification A-575 or A-576.

All hardware shall be new and designed to serve the particular function intended.

Hardware shall be manufactured by:

McGraw-Edison
Locke, or approved equal

A. Measurement

Shall be included with items where hardware is used.

B. Payment

Payment shall be included with unit prices where hardware is used.

OC.27 LATERAL POLE WOOD BRACES:

Wood braces shall be provided and installed on lateral poles as shown on the plans.

Braces may be cut from standard cross arms and shall conform to cross arm specification.

A. Measurement

The wood braces to be paid for will be the actual number installed and accepted. One wood brace shall consist of 4 wood spacers, 2 vertical, 4 horizontal pieces of wood and mounting hardware.

B. Payment

The work described above and the contract unit price, for each wood brace bid under "Item OC.27 - Wood Braces" shall form the basis of payment and shall constitute full compensation for all material, and for all labor, equipment, tools and incidentals necessary to complete this item.

OC.28 POLE MODIFICATION:

This Contractor shall modify all poles as indicated on the drawings, material used shall be as specified under section "Overhead Construction."

A. Measurement

The modified poles to be paid for will be the actual number of poles, completed, and accepted, including all incidentals.

B. Payment

This work included in this item and the contract unit price for each modified pole bid under "Item OC.28 - Modified Poles" completed and accepted, shall form the basis of payment and shall constitute full compensation for furnishing, hauling and placing all material, and for all labor, equipment, tools and incidentals necessary to complete this item.

**ITEM UC
UNDERGROUND CONSTRUCTION SPECIFICATION**

UC.01 SCOPE OF WORK:

A. The work to be done under this part of the contract comprises the furnishing and installing the following electrical conduit banks, manholes and cables.

1. Non-reinforced, concrete encased, conduit banks.
2. Reinforced concrete manholes.
3. Cable runs.

UC.02 EXCAVATION:

A. The Contractor shall remove all existing roadways, driveways and other similar materials and make to the lines and grades given, all excavation necessary for the proper construction of the contract work. The excavation shall include the removal, handling, rehandling, and disposal of materials encountered in the work and shall include all pumping, bailing, draining, sheeting and bracing. Moreover, the Contractor must assume all responsibility for any added expense of other liabilities which may arise by means of quicksand, obstacles or conditions foreseen or unforeseen and encountered in the work of this contract. Pavement removal shall be in accordance with the details for repaving over sewer and utility trenches shown in the construction roadway plans.

B. Trenches shall be of sufficient width to permit a solid packing of refill under and around the conduit, and satisfactory construction of all appurtenances and for such sheeting and shoring, pumping, and draining as may be necessary.

C. Any damage in working area caused by this Contractor as part of the work or as an incident shall be repaired and area shall be restored for neat appearance as required.

D. The trench shall be dug to the alignment and depth required and only so far in advance of laying of the conduit line as the Project Engineer shall permit. The trench shall be so braced and drained that workmen may work therein safely and efficiently. It is essential that the discharge from pumps be led to natural drainage channels, to drains, or to sewers.

E. The trench width may vary with and depend upon the depth of trench and the nature of the excavated material encountered; but in any case shall be of ample width to permit the conduit line to be laid and jointed properly and the backfill to be placed and compacted properly. The minimum width of trench shall be three (3'-0"). 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 required grade.

G. Any part of the trench excavated below grade shall be corrected with approved material, thoroughly compacted.

H. When the subgrade is soft and in the opinion of the Project Engineer cannot support the installation, a further depth and/or width shall be excavated and refilled to grade as required at Contractor's expense.

I. Ledge rock, boulders, large stones, and shale shall be removed to provide a clearance of at least six inches below conduit lines or other parts of the work and to clear width of six inches at Contractor's expense.

J. Excavations below subgrade in rock, shale or in boulders shall be refilled to subgrade with approved material, thoroughly compacted.

K. The use of excavating machinery will be permitted except in places where operation of same will cause damage to trees, building, or existing structures above or below ground, in which case hand methods shall be employed.

L. Hydrants under pressure, valve pit covers, valve boxes, curb stop boxes, fire or police call boxes, or other utility control shall be left unobstructed and accessible during the construction period.

M. Trees, fences, poles and all other property shall be protected unless their removal is authorized; and any property damaged shall be satisfactorily restored by the Contractor.

N. The Contractor shall maintain all excavations in good order during the construction, so as not to hinder or injure the conduit laying,

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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.

- O. Before laying the conduit line, the bottom of the trench shall be brought to the required grade. Wherever the bottom of the trench has been excavated below the grade, the Contractor shall place the sand or grit backfill to bring the bottom of the trench to the grade of the bottom of the conduits. This bed shall be thoroughly tamped before the conduit is laid, the balance of the selected backfill as detailed on drawings shall be thoroughly compacted by tamping and wetting as required for the material used.

If trench bottom is unacceptable as determined by the Engineer, additional material shall be added at the Contractor's expense.

UC.03 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 Project Engineer shall order it left in place, in which case, the Contractor shall cut the plank off at a height as ordered by the Project Engineer, or as called for on the Contract Drawings.
- 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 Project Engineer is of the opinion that at any point sufficient or proper supports, sheetings, or bracings have not been provided, he may order 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.

UC.04 REMOVAL OF EXCAVATED MATERIAL:

- A. All surplus material and such other material as the Project 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.
- 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 Project 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 municipality or township in which the work is being done.
- D. When so directed by the Project Engineer, the Contractor shall immediately remove all excavated materials from the site and dispose of the same.

UC.05 BACKFILLING:

Backfill shall be in accordance with Section 625.12 and payment shall be included in the cost of the respective item.

UC.06 SEEDING:

- A. In preparation for seeding or sodding, the surfaces shall be harrowed to a depth of three (3) inches. All grass, weeds, roots, sticks, stones, etc., are to be removed and the soil carefully brought to the exact finished grade or subbase by raking. An application of not less than two pounds per one hundred (100) square feet of high nitrogen content commercial fertilizer having an analysis of 10:5:4 shall then be uniformly distributed and carefully raked in.
- B. Immediately after the preparation and fertilizing of the seed bed, the prepared surface shall be seeded with not less than three (3) pounds of grass seed per 1,000 sq. ft. The seed shall be carefully and uniformly sown by experienced and skilled workmen. Following the seeding, the surface shall be lightly raked and rolled with a light roller. The grass seed to be used shall be as specified in the construction roadway plans.
- C. All seeded surfaces shall be carefully looked after and tended by the Contractor; shall be watered and the grass cut when necessary. Settled areas shall be refilled, leveled and tamped to the proper grade. All seeded surfaces shall be left in good condition on the completion of the work.
- D. As seeding can only be successfully done at certain seasons of the year, the preparation of the seed bed, and the work of seeding shall only be done at such times as may be approved by the Project Engineer.

UC.07 ROAD SURFACES, SIDEWALKS, DRIVEWAYS AND CURBING:

- A. The Contractor shall remove all pavement and road surfaces within the lines of excavation. After the conduit line has been laid, all appurtenant work constructed and backfill completed, he shall furnish, place and maintain, wherever the pavement or road surface has been removed or damaged by him, a temporary pavement in the paved portion of streets, or a temporary road surface in the unpaved portion of streets, so as to provide a safe and passable roadway until such time as the final pavement or road surface is completed.
- B. When only a portion of the street is paved and the lines of excavation are in the unpaved portion of same, the Contractor shall use the utmost care in preventing injury to the pavement. If, in making the excavation, or for any other cause, the pavement is removed or injured by the Contractor, he shall furnish, place and maintain a temporary pavement wherever the pavement has been removed or damaged, so as to provide a safe and passable roadway until such time as the final pavement is completed.
- C. All final paving or road surfaces, shall be done by the Contractor to the satisfaction of the City and the Engineer and shall conform to the details for repaving over sewer or utility trenches shown in the construction roadway plans. The Contractor shall bear the entire cost of this work.
- D. All damaged or displaced curb shall be renewed or reset to the satisfaction of the Engineer and/or City. No faulty curb or curb less than 30" long will be permitted for reuse.
- E. Location of Work: Existing Pavement as shown on City Records, and Restorations acceptable, are given on the Roadway Construction Plans.
- F. At locations not specifically mentioned, the Contractor shall restore the same type of pavement as encountered. If the thickness of the concrete base is greater than the record calls for, the Contractor shall restore the thickness given in the record.
- G. If prior to the expiration of the period of maintenance, 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 earth. He shall then backfill with sand properly rammed and replace the final pavement or road surface.
- H. 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 all labor and materials and construct new sidewalks, driveways or curbs, to replace those removed or injured. At intersecting walks, drives, etc., additional concrete slabs beyond the excavation limits shall be removed and replaced with new material, in order to avoid having more joints than in the original work. All slabs replaced shall be of full width. The Contractor shall furnish, place and maintain, wherever the sidewalk has been removed or damaged by him, a temporary sidewalk so as to provide a safe and passable sidewalk until such time as the final sidewalk is completed.
- I. All pavements, road surfaces, sidewalks, driveways, or curbs, which the Contractor is required to replace or to have replaced, shall, at the expiration of the period of maintenance, be in at least as good condition as at the time of awarding the contract.
- J. All work which the Contractor may do in connection with the opening up or replacing of pavement, road surfaces, sidewalks, driveways, or curbs, as well as the final repaving, shall be done at his expense, in accordance with the roadway construction plans and with the additional requirements of these specifications, and the Contractor shall furnish evidence to the Project Engineer that the work has been completed to their satisfaction.
- K. Tunneling will not be permitted.
- L. 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.
- M. 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.
- N. Temporary repaving shall consist of 3 inches of either cold mixed, cold laid asphaltic concrete meeting the State of Ohio Specifications 405 or hot mixed asphaltic concrete meeting the State of Ohio Specification 404.

UC.08 LAYING CONDUIT:

- A. Proper implements, tools, and facilities, satisfactory to the Project Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work. All conduits and fittings shall be carefully lowered into the trench piece by piece, in such manner as to prevent damage to conduit, and under no circumstances shall conduit or accessories be dropped or dumped into the trench. If any defective conduit or material be discovered while conduit is 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 conduit before it is lowered into its position in the trench, and it shall be kept clean by approved means during and after laying.
- C. Wherever necessary to deflect conduit from a straight line, either in the vertical or horizontal plane to avoid obstructions, or for other reasons, the degree of deflection shall be approved by the Project Engineer.
- D. No conduit shall be laid in water, or when the trench conditions or the weather is unsuitable for such work, except by permission of the Project Engineer.

UC.09 FLOATING:

The Contractor shall take every precaution against the floating of the concrete, encased conduit line due to water coming into the trench, or through casing in flushing or puddling. In case of such floating the Contractor shall replace the concrete encased conduit line at his own expense, and make wholly good any injury or damage which may have resulted.

UC.10 INSPECTION:

Inspections conducted under 105 and 106 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. All material must be sound and shall conform to these specifications, and any defective material which may have passed the inspector at the works, or elsewhere, shall be at all times liable to rejection when discovered, until the date of final payment under this contract.

UC.11 PLAIN AND REINFORCED CONCRETE MASONRY:

The material furnished by the Contractor for the various kinds of plain and reinforced masonry construction to be performed shall conform to 602.

UC.12 REINFORCED CONCRETE MANHOLES:

A. Work Included

The Contractor shall furnish all materials for and shall properly construct at the locations, to the line and grade, and to the dimensions and details as shown on the plans and accordance to these specifications all manholes complete with brick necks, frames, covers, and ventilated grating, cable pulling irons, grounding rods, racks and sumps. Terms of Sections UC.01 through and inclusive UC.11 shall govern this Section. Terms and stipulations therein shall be understood as part of this Section.

B. Concrete

Concrete shall conform to 511.

C. Reinforcing Steel

Reinforcing steel shall conform to 509 modified to 709.01.

D. Manhole Frames and Covers

- All cast iron manhole frames and covers as shown on the drawings shall be furnished and installed as directed. Frames shall be set in place in a full bed of mortar, at such elevations as to make the top of the frame conform to the finished surfaces or final established grade. Brick masonry may be used above the top of the manhole for setting the frame to grade. Manhole frames and cover shall be machined so that it will be impossible to rock the cover after it has been seated in the proper position in the frame.
- All castings shall conform to 711.12 ASTM-A48.
- All casting shall be thoroughly cleaned and subjected to a careful hammer test. No castings shall be coated unless clean and free from rust, and approved in these respects by the Director or his authorized inspector immediately before being dipped.
- Each casting shall be sprayed or brushed inside and out with one (1) coat of Asphaltic Compound Varnish. The varnish shall be made of high grade asphalt fluxed and blended with properly treated drying oils and thinned to a proper consistency with a volatile solvent. The varnish shall be approved and similar to Black Asphalt Varnish. Other methods of coating and types of coating materials shall be subject to the approval of the Engineer. In addition to the shop coat the coatings shall receive two (2) coats of approved paint.

E. Cable Pulling Irons

Cable pulling irons shall be made from 7/8 inch round steel rod shaped as shown on the drawings and tied into the reinforcing steel before concrete is poured. Pulling irons shall be hot-dipped galvanized after forming.

F. Ground Rod

The ground rod shall be 1/2" x 8'-0" copperweld ground rod and ground wire should be #2 bare stranded.

G. Cable Racks

Cable racks shall consist of:

| | |
|-----------|---|
| Rack | McGraw-Edison #DU1B7 Hubbard #2290 or approved equal. |
| Hook | McGraw-Edison #DU1S3 Hubbard #2262 or approved equal. |
| Insulator | McGraw-Edison #DE3U1 Hubbard #2123 or approved equal. |

Racks and supports shall be hot-dip galvanized.

H. Cleaning Manholes

Upon completion of the manholes and before acceptance and final payment shall be made, the Contractor shall remove all dirt, sand, mud, rubbish, debris, excess materials, falsework, temporary structures and equipment out of the manholes and all parts of the work shall be left in a neat and presentable condition satisfactory to the Project Engineer.

I. Measurement

The manholes to be paid for will be the actual number completed and accepted. Including ground rods, clamp, ground wire, cable supports, and cover.

J. Payment

The work included in this item and the contract unit price for each manhole bid under, "Item UC.12 - Reinforced Concrete Manholes" in place, completed and accepted, shall form the basis of payment and shall constitute full compensation for all excavation and backfill, for furnishing, hauling and placing all castings and tying existing or new ducts into manholes including raising or lowering ducts. Reinforcing steel, concrete brick and concrete masonry, pulling irons, ground rods and other material, etc., and for all labor, equipment, tools and incidentals necessary to complete these items. These items as measured and provided above will be paid for under:

| Item | Unit | Description |
|-------|------|------------------------------|
| UC.12 | Ea. | Reinforced Concrete Manholes |
| UC.12 | Ea. | Manhole (modified) |

UC.13 NON-REINFORCED, CONCRETE-ENCASED, CONDUIT BANKS AND DUCT CLEANING

A. Work Included

The Contractor shall furnish all materials for and shall properly construct and connect to manholes and to pull boxes as shown on drawings or as directed, all non-reinforced concrete-encased plastic conduit banks as required for the proper completion of the work included under this contract. Terms of Section UC.01 through and inclusive UC.11 shall govern this section. Terms and stipulations therein shall be understood as part of this Section.

B. Conduits and Fittings

- Shall be plastic PVC, Polyvinyl chloride power and communications duct. Concrete block spacers will not be accepted.
- Plastic PVC conduit shall be UL labeled and listed and conform to the latest revision of Underwriters Laboratories 651 Standard and shall be type EB, encased burial with concrete encasement, necessary couplings, adapters, expansions, end bells, and sweeps solvent welded together to form a watertight conduit run. End bells, couplings, and expansion fittings to be of the same material as the conduit. The conduit, fittings and the solvent weld cement shall produced by the same manufacturer.

UC.17 5KV Cable

A. Work Included

1. The Contractor shall furnish all necessary labor, materials, tools and equipment for installing and splicing all 5KV cable, complete, including racking, bonding and other appurtenant work, all as specified, required or shown on the contract drawings.

B. Cable

1. Cable for use underground and as laterals up to pole mounted potheads, shall be copper, impregnated paper insulated, lead covered. Riser cable for use from potheads to overhead lines and pole mounted equipment shall be copper, cross linked polyethylene insulated, both as indicated below:

| Conductor Size & Type | Voltage Class | Resistance per 1000 Ft. @ 25° C. | Stranding and Cross Section |
|-----------------------|---------------|----------------------------------|-----------------------------|
| #1/0, 3/C, PILC | 5KV Ungrd. | 0.102 | Belted 19 Strands Round |
| #1/0, 1/C, XLP | 5KV Non Shld. | 0.102 | 19 Strands Round |

2. Paper insulated cable shall conform to A.E.I.C. Specifications for "Solid-Type, Impregnated-Paper Insulated, Lead Covered Cable," latest Edition, and all applicable IPCEA Specifications, except as otherwise specifically noted.
3. Cross linked polyethylene insulated cable shall conform to Interior Standard #1 to IPCEA Pub. No. S-66-524, latest date. The wire before stranding of any conductor shall meet the requirements of the American Society for Testing Metals specifications for soft or annealed copper wire ASTM-B-3-54T.
4. Paper insulated cable shall be belted type for 5KV and for 15KV.
 - a. Thickness of insulation on conductors shall be 85 mils.
 - b. Thickness of belt shall be 45 mils for 5KV.
5. Lead sheath shall be a lead alloy designed for maximum resistance from bend creep, abrasion and corrosion; copper, if present, shall be in minimum traces.
6. Thickness of lead sheath on 5KV cable shall be for the appropriate core diameter, as specified in A.E.I.C. specifications, 10th edition Table IX.

The lead sheath on 15KV cable shall be covered with a reinforced polymerized chlorobutadiene jacket 110 mils thick with the polymerized chlorobutadiene bonded to the sheath. Thickness of lead shall be reduced as per A.E.I.C. specifications, 10th edition Table IX.
7. Lead sheath shall have the following physical requirements:
 - a. Arsenic content of 0.15% nominal
 - b. Elongation in 2" gauge min. % 25
 - c. IPCEA bonds minimum 300
 - d. Tensile strength minimum PSI 2400
8. Cable shall contain immediately under the sheath and along the core, a marker or identifying tape showing the manufacturer's name, the year of manufacture, and a consecutive serial number for identification purposes, all to appear at intervals of approximately one foot. The printed matter on the marker or identifying tape shall be legible when the tape is removed from the completed cable.
9. The Contractor shall furnish certified copies of the results of all tests on samples of the cable which he proposes to furnish made in accordance with the provisions of A.E.I.C. Specifications for "Solid-Type Impregnated-Paper Insulated Lead Covered Cable" 10th Edition, for paper insulated cable.
10. The Contractor shall furnish as part of his proposal the percentage of each element contained in the lead sheath alloy he proposes to supply. This data shall be on the cable manufacturer's forms.
11. Jacket for #1/0, 1/C, XLP cable
The overall jackets shall be polyvinylchloride compound, not less than 110 mils thick, with a permanent marker tape indicating the year of manufacture and sequential footage number repeated each foot, shall be inserted under the copper fire shields or outer jacket. The jacket surface shall be printed with the manufacturer's name, cable type, voltage rating and the conductor size.

C. 5KV Splices

1. Splices shall be made up from approved splice kits for 3C-1/0 5KV splicing. They shall be as manufactured by PLM Co., G.E., or equal.
2. The Contractor shall furnish as part of his proposal the splice kit drawings showing the splice including all details and splice plans to use.

D. Cable Lubricant

The lubricant shall be grease or soapstone or a combination of these (2) two ingredients.

E. Bonding Wire

Bonding wire shall be No. 2 AWG copper bonding wire.

F. Cable Guard

Cable guard shall be 3/16" x 8", 14 gauge sheet steel, hot-dip galvanized U cable guard for 1/0 and 1/0 5KV cable. Cable guard shall be Josly, Hubbard or approved equal.

G. Cable Pulling

1. Before starting cable installation, the duct to be occupied should be selected throughout the entire length of the run and the ducts selected must be checked to see that they are clean and free from all obstructions.
2. If reels eye left in the street, warning lights shall be placed around them.
3. Lubricant shall be applied to the cable just before it enters the feeding tube. A coating about 1/16 inches thick is ample.

No lubricant shall be applied to the first and last five feet of cable for convenience and cleanliness in splicing.
4. The reel of cable must be properly placed at the feeding end to prevent minimum flexing of the cable. It should always be located on the side of the manhole inward which the cable is pulled.
5. Where there is a bend in the duct line the pulling set up wherever possible should be planned for feeding-in at the manhole or pole nearest the bend.
6. The amount of slack in the cable at the feeding end shall be regulated by men stationed at the cable reel so that the cable passes freely to the feeding tube without being loose on it reel and without scraping the manhole frame.
7. The cable shall be drawn into the duct just fast enough to keep the cable and reel moving steadily and so that it can be properly inspected and lubricated.
8. Eyes or seals damaged during pulling shall be repaired unless splicing follows immediately.
9. When a cable is cut, unless splicing is to be done immediately, the ends shall be properly sealed by an approved method for preventing moisture entering cable. All sealed ends should be racked high.
10. The men in the pulling gang should place the cable in the manholes on the cable racks without trying to train it into its final position and shall tie the cable to the supports to prevent it from falling. The ends shall be trained as high as possible to keep them out of any water. Dynamometer reading shall be available throughout cable pulling process. Pulling tension shall not exceed manufacturer's recommendations.

H. Splicing

Splicing of cables shall be done in an approved manner, using PLM, G.E., or other approved splicing kits and according to the splicing kit manufacturer's instructions.

I. Fireproofing

Irvington Electric A. and Fireproofing Tape 7700 and cement shall be used as required in manholes. Fireproofing shall be made as shown on plan or directed by Engineer. Payment shall be the linear feet of cable fireproofed.

J. Cable Racking and Training

1. Insulated cable shall not be bent when temperature is below 14°F, unless cable is heated so that it is warm all the way through.
2. At least six (6) inches of straight cable out of the duct shall be allowed before starting the offset bend in manholes.
3. Bending radius of cable shall be minimum of eight (8) times overall cable diameter.
4. Cables shall be supported in such a way as to leave a splicing area for any future cable from other ducts.
5. At least six (6) inches of straight cable should extend beyond each end of the splicing to provide space for resting on the saddles of the supporting racks.
6. All cables and joints shall be so racked in the manhole that they are not directly under the manhole cover.
7. Cables shall be installed on lateral pole as shown on contract drawings.

K. Bonding

1. All soldering connections must be well-made.
2. Bond wires attached directly to the cable shield should form a 60-Deg. angle with the shield at the point of soldering.
3. Bond wires shall be properly connected to ground rod in manhole.

L. Testing

The Project Engineer or his authorized Inspector shall have the right to order Contractor to perform during and after cable run installation high voltage tests in accordance with AEIC Specifications for "Solid Type Impregnated-Paper Insulated Lead Covered Cable," for paper insulated cable at the following test voltages and time limitations, according to A.E.I.C. 10th Edition.

Paper Insulated Cable:

Existing cable 22 KV 5 minutes
Existing cable 15 KV 5 minutes

Low cable shall be defined as all cable installed by Contractor either temporary or permanent.

Existing cable shall be defined as MELP cable to which Contractor has made previous cable tests. Report of all test data results should be sent to:

Mr. Sasler Titus
System Operating Engineer
Division of Light and Power
2490 W. 41st Street
Cleveland, Ohio 44113

3. Polyvinyl chloride, PVC, conduit for electrical purposes shall conform to UL 651 Standards and shall be four (4) inches inside diameter type EB with concrete encasement as detailed on contract drawings. Coupling shall be socket type. End bells at manhole entrance, 90° angle couplings, standard couplings, various degree sweeps, 1 1/4" to 9 1/8", including field bends, and plugs or caps to close unused conduits shall be made of the same material as the conduit. Conduit spacers may be made of plastic, styrene, or polyvinyl chloride or polyethylene.

C. Concrete

Concrete used for encasement of conduits shall conform to State of Ohio, Department of Transportation, Construction and Material Specifications Item 499 Class C, using No. 8 size aggregate.

D. Installation

1. Conduit shall be installed by the built up methods as follows: Necessary spacers shall be placed at not greater than (5) foot intervals to hold ducts in the configuration desired, with the duct bank braced securely to keep from shifting and floating while concrete is poured. Each section of duct with its coupling shall be tapped securely into place in the previous coupling to set up the tapered joints tight and leakproof.
2. Concrete shall be worked into the spaces between ducts so that the conduit bank is effectively encased in concrete without voids or empty spaces.
3. Conduit which is cut to fit short sections shall be tapered with a wedge designed to produce the same jointing conditions as provided by factory made conduit sections.
4. The end bells shall be installed with the edge of the flared ends flush with the inside wall of the manholes.
5. All end bells shall be grouted in place.

E. Cleaning

After conduits have been installed the Contractor shall clean all the ducts by pulling through a mandrel to remove solid obstructions, followed by a circular wire brush to remove any dirt, sand or concrete which may have been introduced during construction, leaving a clean conduit free from obstructions or foreign matter. Active conduits shall be cleaned before cable is pulled, emergencies after highway construction completed.

F. Measurement

The number of lineal feet of conduit bank to be paid for shall be the actual number of lineal feet furnished and placed in accordance with the specifications as measured along the axis of the conduit line including fittings.

G. Payment

The footage measured as provided above shall be paid for at the contract price bid per lineal foot under Item UC, 13 - Non-Reinforced, Concrete-Encased, Conduit Bank classified as to size and type, which price and payment shall constitute full compensation for excavating and for furnishing, hauling and placing the conduit, fittings, spacers, concrete, sheeting and bracing, backfill, water used for compaction, incidental concrete. The removal of all surplus excavation and discarded material, repaving, seeding, and for all labor, equipment, tools and incidentals necessary to complete this item.

This item as measured and provided above will be paid for under:

| Item | Unit | Description |
|-------|------|---|
| UC,13 | Ft. | Non-Reinforced, Concrete-Encased, 3-4" Conduit Bank |
| UC,13 | Ft. | Duct Cleaning |

WESTON A Business Trust
DESIGNERS CONSULTANTS
3655 GREEN ROAD SUITE 215
CLEVELAND, OHIO 44122

GENERAL NOTES
MELP

M. Measurement
 The number of Linear feet of cable to be paid for shall be the distance from center of manhole to center of manhole, plus 10'-0" at ends in manholes, plus the distance to the lateral pole plus the height of lateral pole.

N. Payment
 The footage measured as provided above shall be paid for at the contract bid price per linear foot for "Item UC.17-5KV Cable Runs" classified as to size and type, which price and payment shall constitute full compensation for furnishing cable, splicing kits, fireproofing materials, bonding materials, cable sealing materials, cable guards, cable lubricant and for pulling, training, splicing, racking, bonding, fireproofing and installing on poles of cables and for all labor, equipment, tools and incidentals necessary to complete this item.

| Item | Unit | Description |
|--------|------|---------------------------------------|
| UC.17 | Ft. | 3/C 5 KV PILC #1/0 Cable |
| UC.17 | Ea. | Cable Guard for PILC Cable (8'-0" lg) |
| U.C.17 | Lump | Testing of Cable |
| U.C.17 | Ft. | Fireproofing of Cable |

OC-18 HIGH PRESSURE SODIUM LUMINAIRE

250 Watt High Pressure Sodium Luminaire With Integral Ballast - 240 V.

A. Luminaire
 Luminaire shall consist of a cast aluminum housing with slipfitters for 2" bracket and ballast compartment, specular "Alzak" finish aluminum reflector, hinged detachable cast aluminum reflector holding ring, mogul multiple porcelain enclosed socket, built-in regulated output ballast. The reflector shall be gasketed directly to the refractor rim and to the socket support bracket resulting in a completely sealed optical system. Clamping and leveling of the luminaire to the mounting bracket shall be accomplished by the tightening of 2 or 4 bolts.

B. Lamp Socket
 Lamp socket shall be mounted within the luminaire in such a manner as to obtain three (3) vertical settings of the socket and an infinite number of horizontal settings that will make the unit suitable for use with Mercury Metallic Vapor or High Pressure Sodium.

C. Gasket
 Gaskets between the reflector and refractor shall be made of ethylene propylene monomer diene rubber, or silicone rubber or approved equal. The optical assembly also contains a filter to be effective both mechanically, chemically and to assure proper mounting of the optical assembly.

D. Refractor
 Shall be of pressed, heat resistant crystal clear borosilicate glass, annealed, homogeneous and free from imperfections.

E. Ballast
 Shall be mounted internally and be a regulator type to operate on either a multiple 240v. or multiple 480v. circuit, a minimum starting temperature of -20 degrees F., power factor to be 99% or higher, suitable for use with HPS. Lamps; Luminaire to be General Electric, Westinghouse or McGraw Edison or approved equal.

| Ballast Type | Lamp Type | Lamp Watts | Line Volts | Line Amps | Line Watts | Power Factor % | Start Amp. |
|--------------|-----------|------------|------------|-----------|------------|----------------|------------|
| Reg. | HPS | 250w | 240v | 1.4a | 320w | 99% | 0.5a |
| Reg. | HPS | 250w | 480v | 0.7a | 320w | 99% | 0.3a |

F. Photo Electric Cell
 1000 watt photo cell shall be Fisher Pierce, Ripley Control, Tung Sol or approved equal and operate on 240v.

G. Weight
 Maximum weight of luminaire shall not exceed 53 pounds.

H. Finish
 Baked light gray enamel paint finish.

I. Bulb
 250 watt HPS (LU250/BD), or approved equal.

J. Accessories
 Twist lock receptacle and 1000 watt 240 volt photo electric cell. Twist lock receptacle to be adjustable for North orientation from outside of luminaire and shall be weatherproof with photo electric control correctly in place.

K. Measurement
 The HPS luminaires to be paid for will be the actual number of HPS luminaires completed, installed and accepted; including mounting bracket, bracket arm, mounting hardware, lamp and electrical connections.

L. Payment
 Payment shall be at the contract unit price each for "Item OC-18- HPS luminaire, type III, 250w, HPS ballast 240v and bracket arm" in place, completed and accepted; and shall constitute full compensation for furnishing materials and all labor, equipment, tools and incidentals necessary to complete this item.

7. Photo Electric Cell
 1000 watt photo cell shall be Fisher Pierce, Ripley Control, Tung Sol or approved equal and operate on 240v.

8. Payment
 Payment will be at the contract unit price for each "Item OC-21 Lighting Control Relay" complete, installed and accepted; and shall constitute full compensation for furnishing the device as a complete package containing all that is necessary to function as an independent control unit, including photo electric cell, all internal wiring connections and for furnishing all material, labor, equipment, tools and incidentals necessary to complete and install this item.

OC-21 LIGHTING CONTROL RELAY

Street Lighting Secondary Control Relay Pole Type for State Highway Lighting

1. Any device supplied under this specification shall be a complete package containing all that is necessary to function as an independent control unit, including all internal wiring connections.

2. The device shall be rated for 100 Amperes at 480 V.AC.

- 3. Circuit protection.**
- a. One (1) set of 600 volt, 100 Ampere, silver plated fuse clips.
 - b. One (1) 600 volt, 100 Ampere rated time delay fuse, bussman dual-element "fusetron" fuse or an approved equivalent.
 - c. One (1) 650 volt rated line side lightning arrester.

- 4. Control relay.**
- a. One (1) normally open, floating armature type mercury contact rated for 100 v., 480 V., for use on a 480 v. 2 wire system.
 - b. Control coil shall be 120 V.AC.

- 5. Control circuit.**
- a. Supplied by a 480/240 to 120 V. control transformer, mounted within the enclosure, sized to operate the control relay and the photo cell. The secondary shall be fused no higher than 115% of the secondary current rating.
 - b. Include terminals for a remotely mounted three (3) position selector switch (supplied by others) wired to hold the functions "hand-off-automatic".

- 6. The control enclosure.**
- a. Minimum NEMA class 3 (weather proof), corrosion resistant, have a continuous gasket, provisions for a padlock, and brackets for wood pole mounting, including all necessary mounting hardware.
 - b. A standard NEMA twist lock type photocell receptacle, protruding from the top of the control unit, receptacle to be mounted such that the case remains water tight.
 - c. Two (2) cable grips each for a #2 AWG type RHW conductor with jacket, for the load conductors, and one (1) cable grip for a 3 conductor #10 control cable.

WESTON A Business Trust
 3535 GREEN ROSS SUITE 215
 CLEVELAND, OHIO 44122

| GENERAL NOTES | | | | | |
|---------------|-------|--------|---------|----------|------|
| MELP | | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| | JD | | JRH | | |

| FED. RD. DIVISION | STATE | PROJECT |
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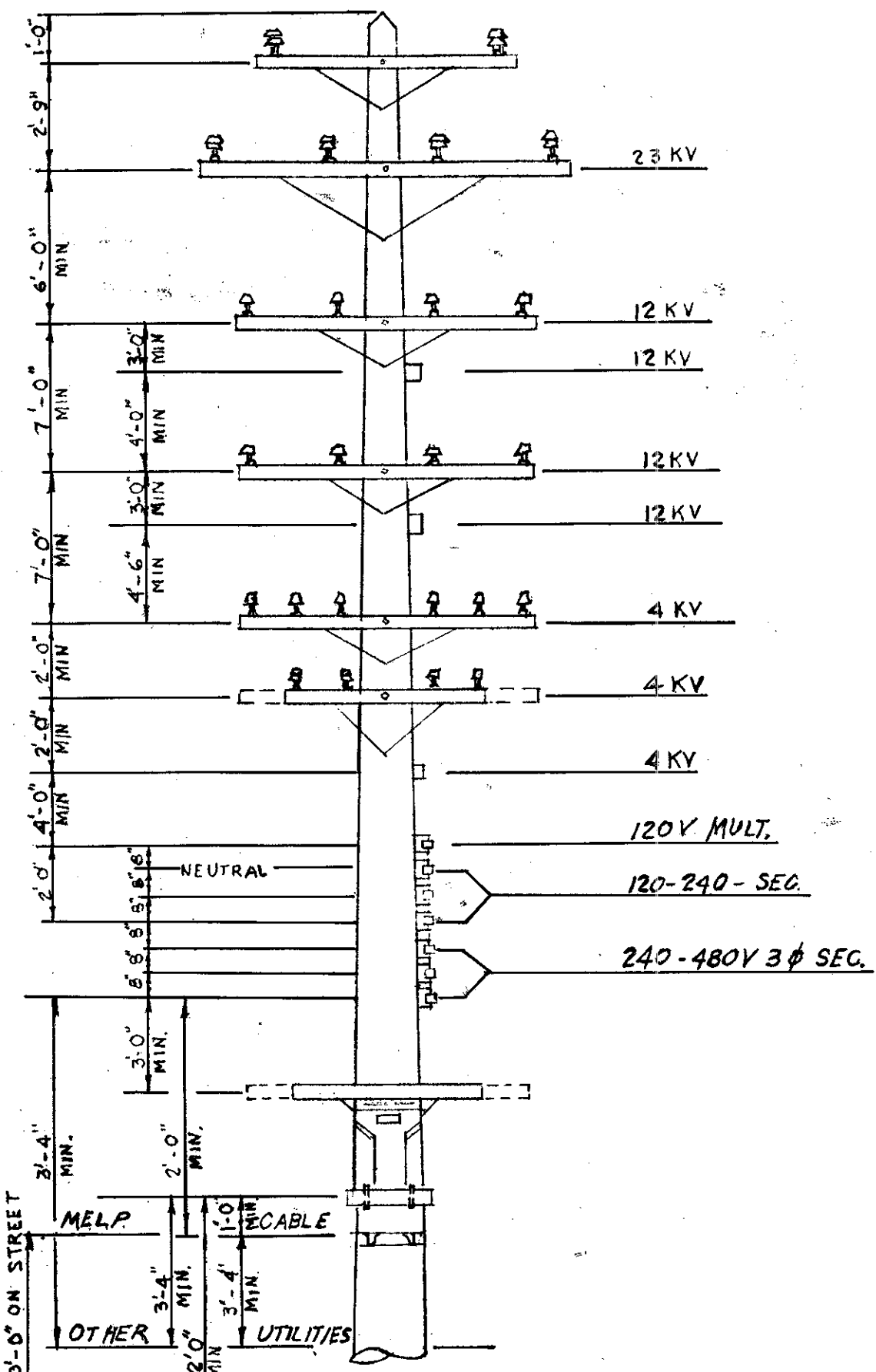
CUYAHOGA COUNTY
CUY-490-1.49

ITEM AP
APPENDIX

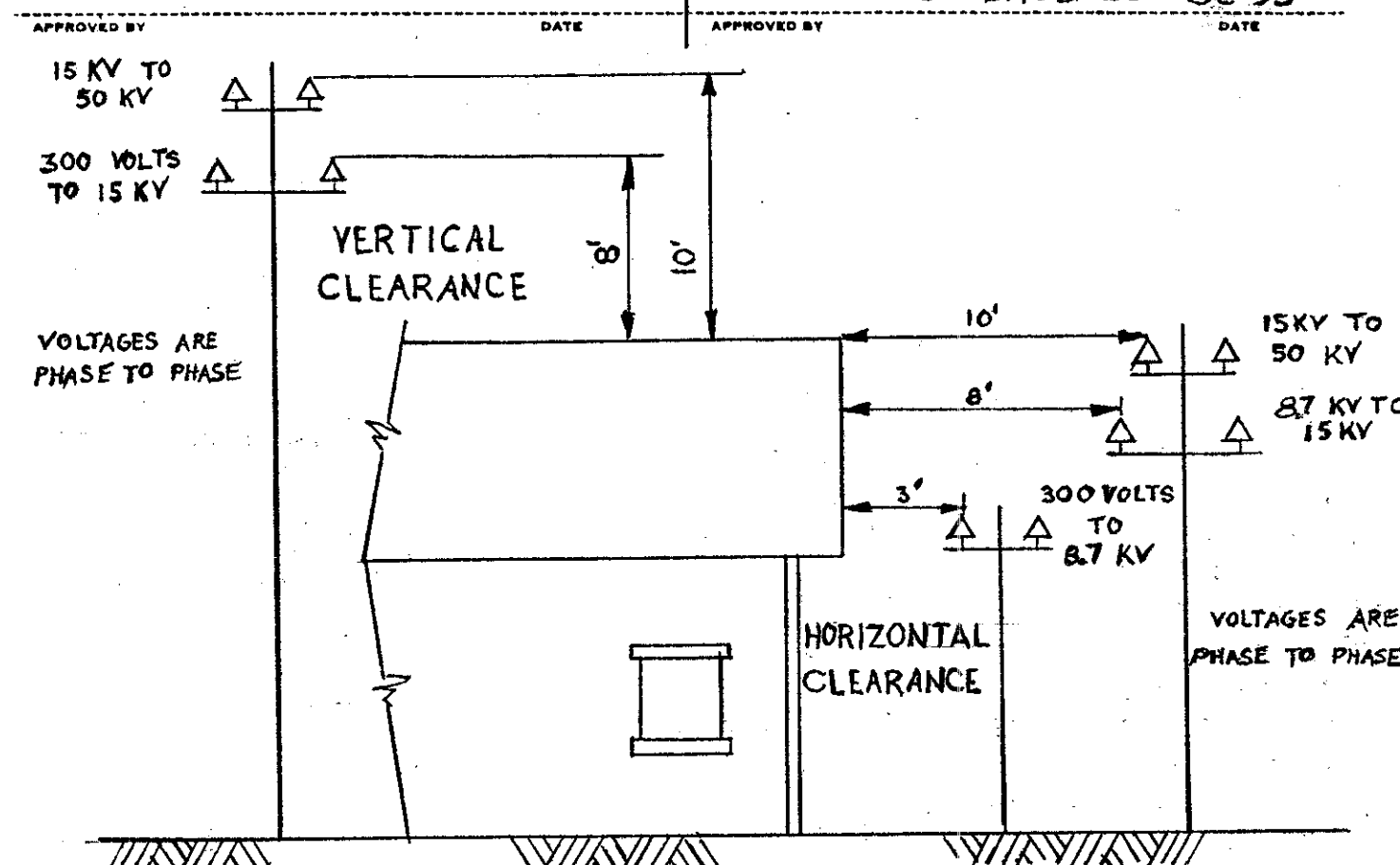
AP.01 ABBREVIATIONS:

- A.A.S.H.O. - American Association of State Highway Officials
- A.E.I.C. - Association of Edison Illuminating Companies
- A.I.S.I. - American Iron & Steel Institute
- ASA - American Standard Association
- ASTM - American Society of Testing Materials
- Ass'y - Assembly
- CEI - Cleveland Electric Illuminating Co.
- CP, CLP or XLP - Cross link Polyethylene
- C.I. - Cast Iron
- CKT - Circuit
- C.S. - City Sewer
- CU - Copper
- DBL - Double
- D.E. - Deadend
- DISC - Disconnect
- EA - Each
- EM - Emergency
- EX or EXIST - Existing
- E.E.I. - Edison Electric Institute of Specs.
- E - East
- F.H. - Fire Hydrant
- FT - Foot
- H.D. - Heavy Duty
- H.P. - High Pressure
- I.D. - Inside Diameter
- I.P.C.E.A. - Insulated Power Cable Engineers Ass'n.
- L.A. - Lightning Arrester
- L.P. - Low Pressure
- LT - Left
- LTG - Lighting
- MELP - Municipal Electric Light and Power
- M.H. - Manhole
- N - North
- N.O. - Normally Open
- P.I.L. - Paper Insulated Lead
- PRIM - Primary
- P.V.C. - Polyvinyl Chloride
- RT - Right
- S - South
- SEC - Secondary
- STA - Station
- STR - Street
- SPECS - Specifications

- TEMP - Temporary
- TRI - Triplexed
- XLP - Cross linked Polyethylene
- W.P. - Weatherproof
- W - West or With
- W/O - Without

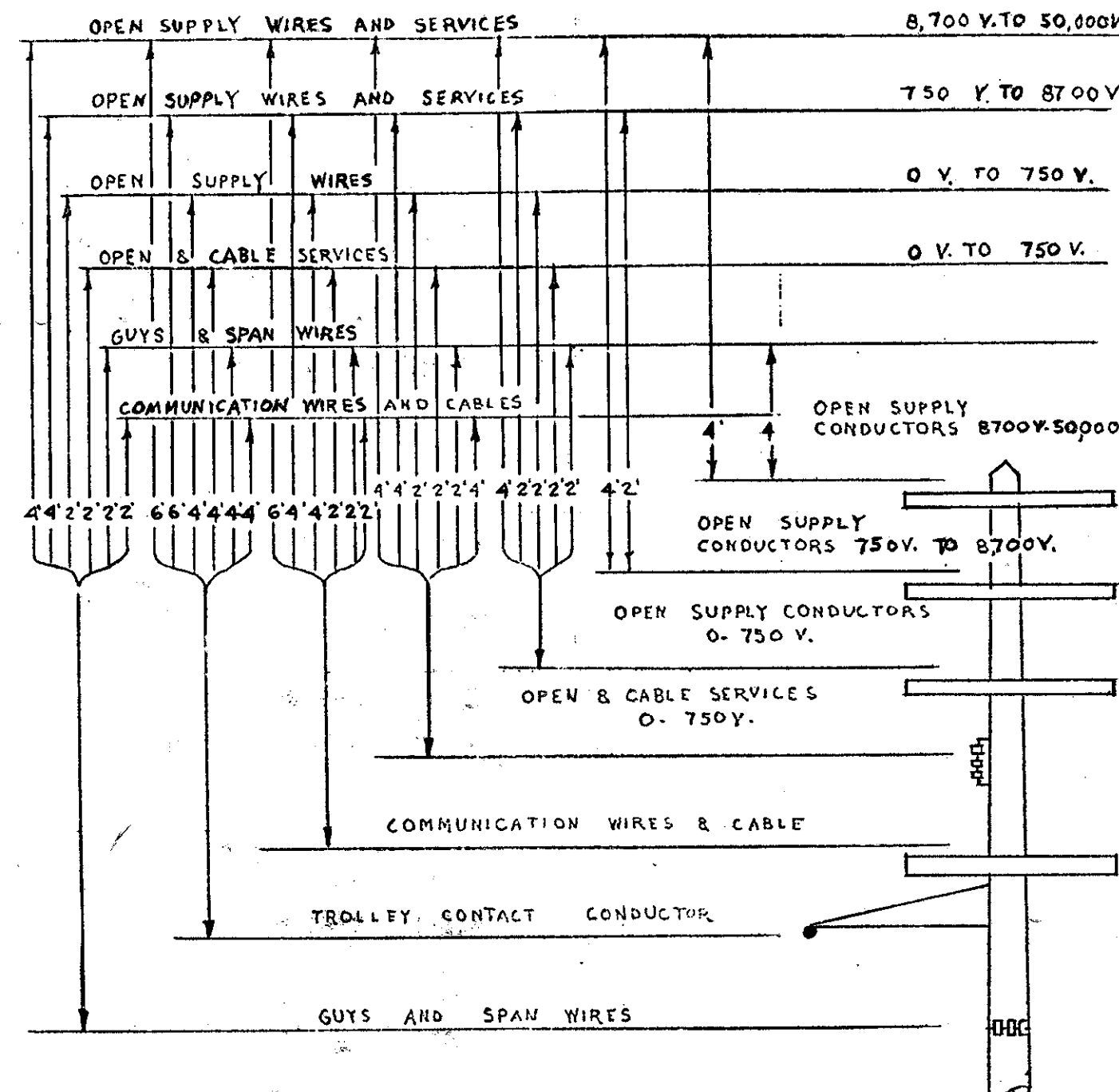


CONSTRUCTION STANDARDS - VERTICAL SEPARATION OF CROSS ARM SUPPORTS & ACCESSORIES FOR CIRCUITS OF DIFFERENT VOLTAGE
DIVISION OF LIGHT & POWER CLEVELAND, OHIO
DATE 7-31-64 2-2-1-3
REVISION DRAWN BY WDB CHECKED BY DATE 7-31-64
SUPERSEDES# SC-93



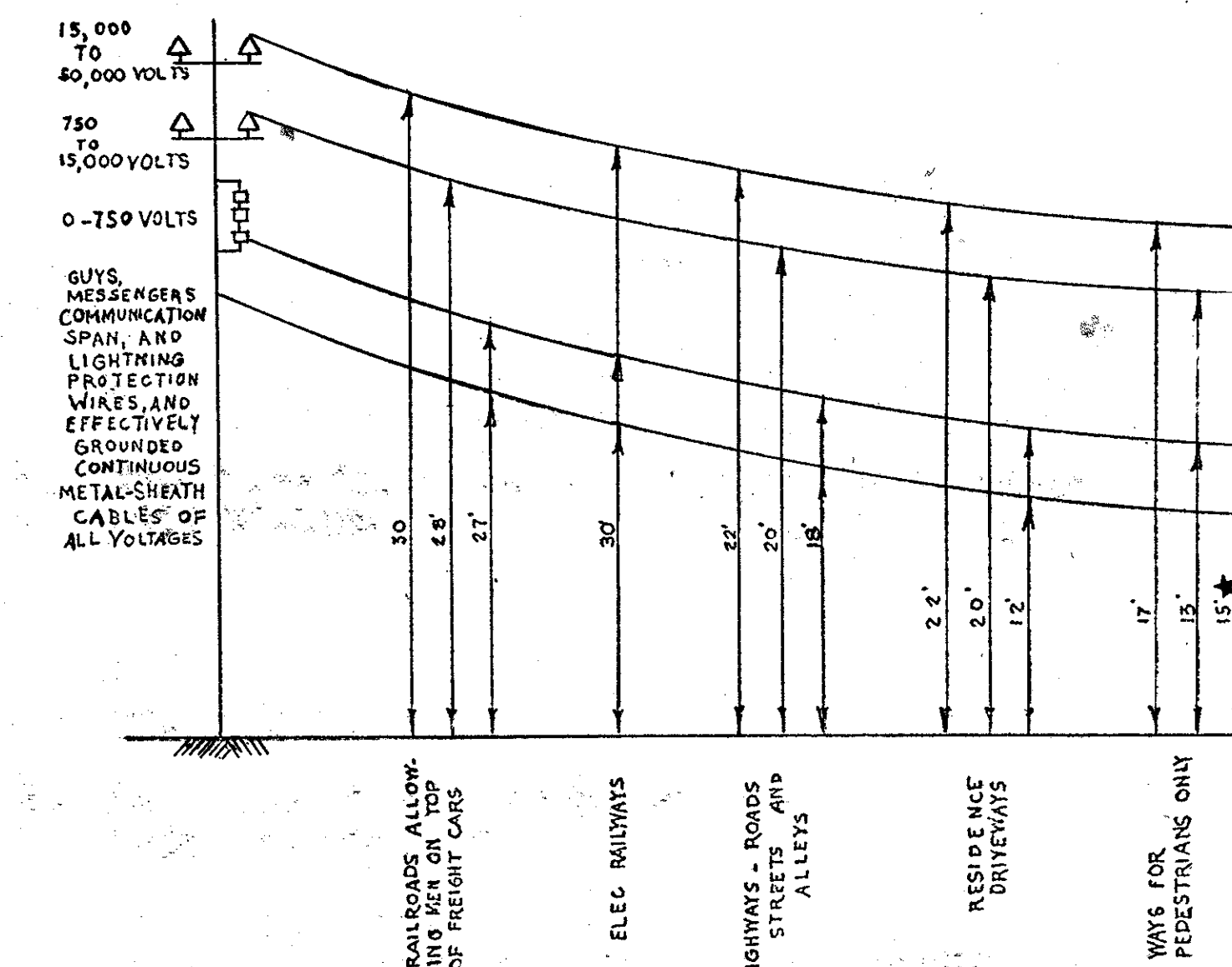
NOTE: THESE CLEARANCES ARE IN ACCORDANCE WITH THE NATIONAL SAFETY CODE - 5TH EDITION.

CONDUCTOR CLEARANCES FROM BUILDINGS
DIVISION OF LIGHT & POWER CLEVELAND, OHIO
DATE 11-2-64 2-2-1-3
REVISION DRAWN BY WDB CHECKED BY DATE 11-2-64
SUPERSEDES# SC-92



NOTE: SEE PAGES 51 & 52 OF THE NATIONAL ELECTRIC SAFETY CODE 5TH EDITION, FOR VARIATIONS AND CASES NOT SHOWN ABOVE.

CONSTRUCTION STANDARDS - CONDUCTOR CLEARANCES
POLE LEAD AND WIRE CROSSINGS - MIN. VERTICAL SEPARATIONS
MAX. SPAN (TOP CONDUCTORS) TO BE 350'
DIVISION OF LIGHT & POWER CLEVELAND, OHIO
DATE 7-31-64 2-2-1-2
REVISION DRAWN BY WDB CHECKED BY DATE 7-31-64
SUPERSEDES# SC-91



*MAY BE REDUCED TO 8' FOR SPAN GUYS

NOTE: THESE CLEARANCES ARE IN ACCORDANCE WITH THE NATIONAL SAFETY CODE - 5TH EDITION

CONSTRUCTION STANDARDS - VERTICAL CLEARANCES
MIN ABOVE GROUND OR RAILS - MAX. SPAN 750' CONDUCTORS ON FIXED SUPPORTS
DIVISION OF LIGHT & POWER CLEVELAND, OHIO
DATE 7-31-64 2-2-1-4
REVISION DRAWN BY WDB CHECKED BY DATE 7-31-64
SUPERSEDES# SC-90

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

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CUYAHOGA COUNTY
CUY-490-1.49

GENERAL SUMMARY

(M.E.L.P.) I FUNDS

* GENERAL NOTES

QUANTITIES CALCULATED By JRH DATE 1/83
QUANTITIES CHECKED By CAP DATE 1/83

| M.E.L.P. SPEC. | SHEET No. | | ITEM | QUANTITY TOTAL | Unit | DESCRIPTION |
|----------------|-----------|-------|---------|----------------|------|---|
| | 3I | G.N.* | | | | |
| OC-12 | 3 | | Special | 3 | EA | POLE - 35'-0 LENGTH, CLASS 5, SETTING 6'-0 |
| OC-12 | 1 | | Special | 1 | EA | POLE - 45'-0 LENGTH, CLASS 1, SETTING 6'-6 |
| OC-12 | 4 | | Special | 4 | EA | POLE - 45'-0 LENGTH, CLASS 3, SETTING 6'-6 |
| OG-2 | 2 | | Special | 2 | EA | BLOCK POLE |
| OC-13,14 | 2 | | Special | 2 | EA | HEAVY-DUTY 6-PIN CROSSARM W/ 3 PIN INSULATORS & 3 DEADEND CLEAVES (5KV) |
| OC-13 | 1 | | Special | 1 | EA | HEAVY-DUTY 6-PIN CROSSARM W/ 3 PIN INSULATORS (5KV) |
| OC-13 | 6 | | Special | 6 | EA | STANDARD 6-PIN CROSSARM W/ 3 PIN INSULATORS (5KV) |
| OC-13 | 3 | | Special | 3 | EA | STANDARD 6-PIN CROSSARM |
| OC-15 | 2 | | Special | 2 | EA | POTHEAD |
| OC-16 | 10 | | Special | 10 | EA | LIGHTNING ARRESTER - 2.5 KV |
| OC-17 | 13 | | Special | 13 | EA | 3- POINT SECONDARY RACK |
| OC-19 | 13 | | Special | 13 | EA | THROTTLE CUTOUT |
| OC-19 | 1 | | Special | 1 | EA | TRANSFORMER - 50 KVA, 2.4KV - 480V, 1Φ |
| OC-19 | 1 | | Special | 1 | EA | TRANSFORMER - 15 KVA, 2.4KV - 240/120V, 1Φ |
| OC-19 | 1 | | Special | 1 | EA | TRANSFORMER - 112.5 KVA, 2.4KV - 480V, 3Φ |
| OC-21 | 1 | | Special | 1 | EA | LIGHTING CONTROL RELAY |
| OC-18 | 3 | | Special | 3 | EA | LUMINAIRE, TYPE III, W/ 250 WATT H.P.S. BALLAST 240V & 10'-0 BRACKET ARM |
| OC-18 | 3 | | Special | 3 | EA | LUMINAIRE, TYPE III, W/ 400 WATT MERCURY BALLAST 480V & 10'-0 BRACKET ARM |
| OC-18 | 1 | | Special | 1 | EA | LUMINAIRE, TYPE III, W/ 250 WATT H.P.S. BALLAST 240V & 15'-0 BRACKET ARM |
| OC-18 | 1 | | Special | 1 | EA | LUMINAIRE, TYPE III, W/ 400 WATT MERCURY BALLAST 480V & 15'-0 BRACKET ARM |
| OC-09 | 3 | | Special | 3 | EA | GROUNDING |
| OC-11 | 2 | | Special | 2 | EA | STANDARD ANCHOR GUY W/ INSULATORS |
| OC-25 | 8 | | Special | 8 | EA | CROSSARM BRACE - FLAT |
| OC-25 | 8 | | Special | 8 | EA | CROSSARM BRACE - ANGLE IRON |
| GS-10 | | LUMP | Special | LUMP | | REMOVAL |
| OG-27 | 1 | | Special | 1 | EA | LATERAL POLE WOOD BRACE |
| OC-10 | 1350 | | Special | 1350 | FF | 1/2" - #4 ACSR WEATHERPROOF WIRE - 5KV |
| OC-10 | 1300 | | Special | 1300 | FF | #4 AWG TRIPLEX CABLE - 600 VOLT |

| M.E.L.P. SPEC. | SHEET No. | | ITEM | QUANTITY TOTAL | Unit | DESCRIPTION |
|----------------|-----------|--|---------|----------------|------|---|
| | 2A | | | | | |
| UC-13 | 240 | | Special | 240 | FF | NON-REINFORCED CONCRETE ENCASED, 3-4" PLASTIC DUCT BANK |
| UC-13 | 200 | | Special | 200 | FF | NON-REINFORCED CONCRETE ENCASED, 1-3" PLASTIC DUCT BANK |
| UC-13 | 240 | | Special | 240 | FF | DUCT CLEANING |
| UC-17 | 1660 | | Special | 1660 | FF | 3/4" - 5KV #1/0 AWG COPPER CABLE, PILC W/ NEOPRENE JACKET |
| UC-17 | LUMP | | Special | LUMP | LUMP | TESTING OF CABLES |
| UC-17 | 2 | | Special | 2 | EA | CABLE GUARD FOR PILC CABLE (8'-0" LG.) |
| UC-17 | 18 | | Special | 18 | FF | FIREPROOFING OF CABLE |
| UC-12 | 1 | | Special | 1 | EA | MANHOLE, REINFORCED CONCRETE (PRECAST) 4'x6'x6' |
| UC-12 | 1 | | Special | 1 | EA | MANHOLE MODIFIED |
| UC-02,05 | 250 | | Special | 250 | FF | EXCAVATION & BACKFILL |

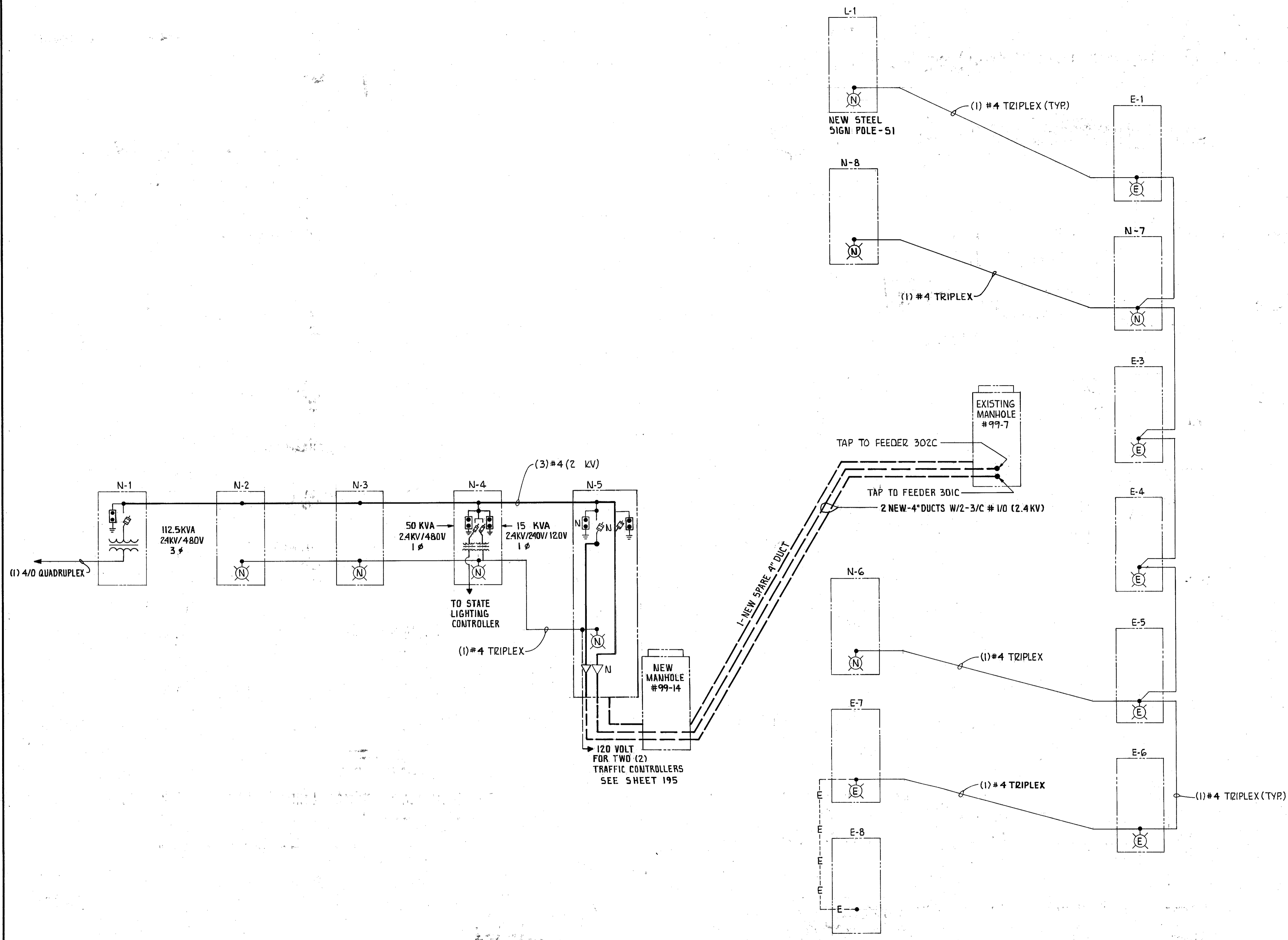
CONT. No. SHEET ACCT. No.

| | | | |
|---|-------|---------|----------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 DIVISION OF LIGHT & POWER CITY OF CLEVELAND EAST 55 TH STREET GENERAL SUMMARY | | | |
| SCALE | DATE | 7078-1B | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| 47 | PRB | 47 | JRH |
| | | | REVIEWED |
| | | | DATE |

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CUYAHOGA COUNTY
CUY-490-1.49



CONT. No. SHEET ACCT. No.

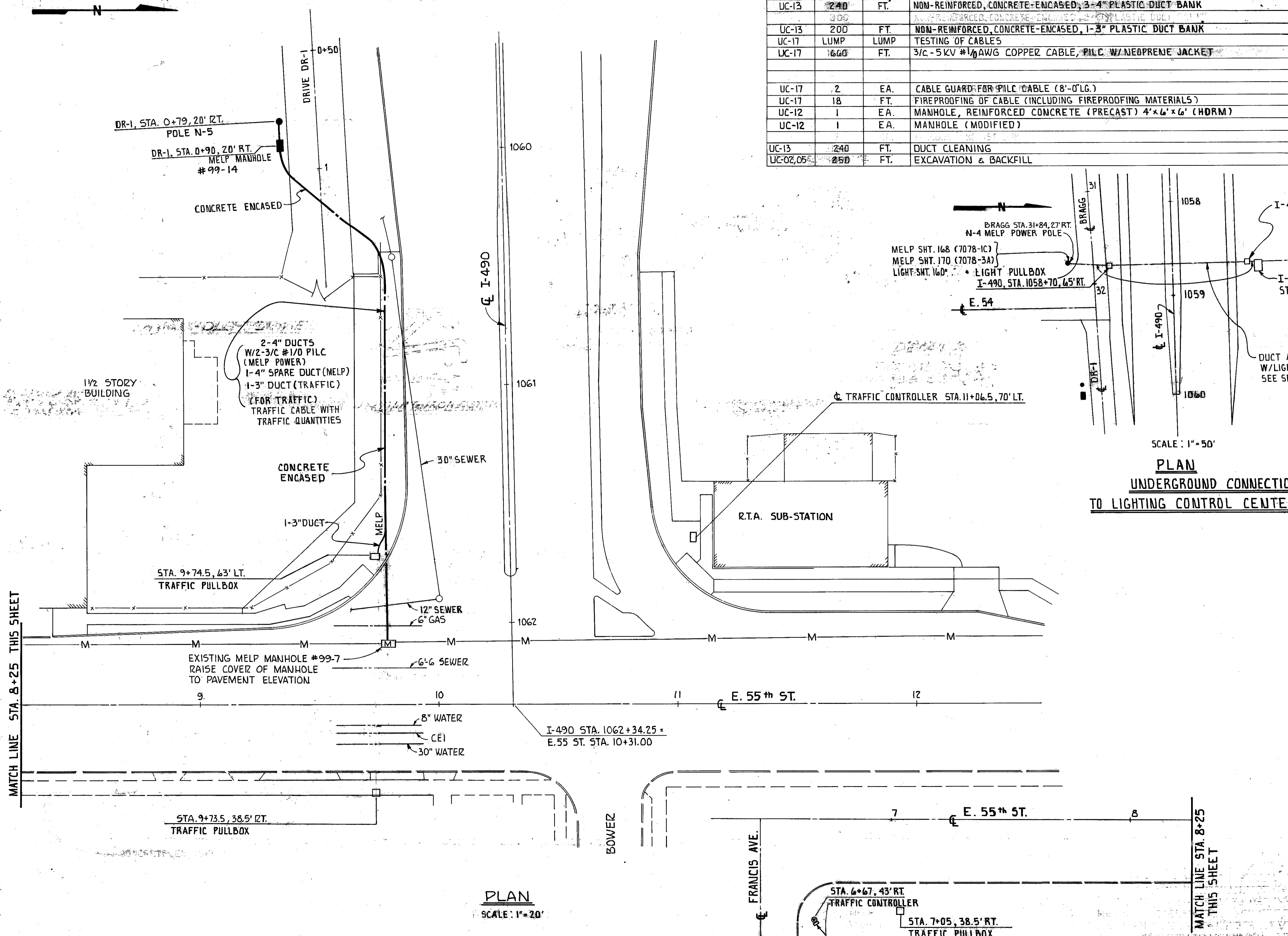
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| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| DIVISION OF LIGHT & POWER CITY OF CLEVELAND | | | |
| E.55th ST. - BRAGG RD. SINGLE-LINE DIAGRAM | | | |
| SCALE | | | 7078-1C |
| DESIGNED | DRAWN | TRACED | CHECKED |
| ARG | AZG | JRH | JRH |
| REVIEWED | | | DATE |

UNDERGROUND MEASUREMENT

| ITEM | QUANTITY | UNIT | DESCRIPTION |
|----------|----------|------|--|
| UC-13 | 240 | FT. | NON-REINFORCED, CONCRETE-ENCASED, 3-4" PLASTIC DUCT BANK |
| UC-13 | 300 | FT. | NON-REINFORCED, CONCRETE-ENCASED, 3-4" PLASTIC DUCT |
| UC-13 | 200 | FT. | NON-REINFORCED, CONCRETE-ENCASED, 1-3" PLASTIC DUCT BANK |
| UC-17 | LUMP | LUMP | TESTING OF CABLES |
| UC-17 | 1660 | FT. | 3/C-5KV #10 AWG COPPER CABLE, PILC W/NEOPRENE JACKET |
| UC-17 | 2 | EA. | CABLE GUARD FOR PILC CABLE (8'-0" LG.) |
| UC-17 | 18 | FT. | FIREPROOFING OF CABLE (INCLUDING FIREPROOFING MATERIALS) |
| UC-12 | 1 | EA. | MANHOLE, REINFORCED CONCRETE (PRECAST) 4'x6'x6' (HORM) |
| UC-12 | 1 | EA. | MANHOLE (MODIFIED) |
| UC-13 | 240 | FT. | DUCT CLEANING |
| UC-02,05 | 250 | FT. | EXCAVATION & BACKFILL |

| | | | |
|--------------|-------------------|-------|---------|
| CALC. BY JRH | FED. RD. DIVISION | STATE | PROJECT |
| DATE 1/83 | 2 | OHIO | |
| CHKD. CAP | | | |
| DATE 1/83 | | | |

CUYAHOGA COUNTY
CUY-490-1.49



SCALE: 1"=50'
PLAN
UNDERGROUND CONNECTION
TO LIGHTING CONTROL CENTER

LEGEND ON SHEET 166. (7078-1A)
FOR TRAFFIC CONTROLLERS AND TRAFFIC
PULLBOXES SEE SHEET 195 & 197.

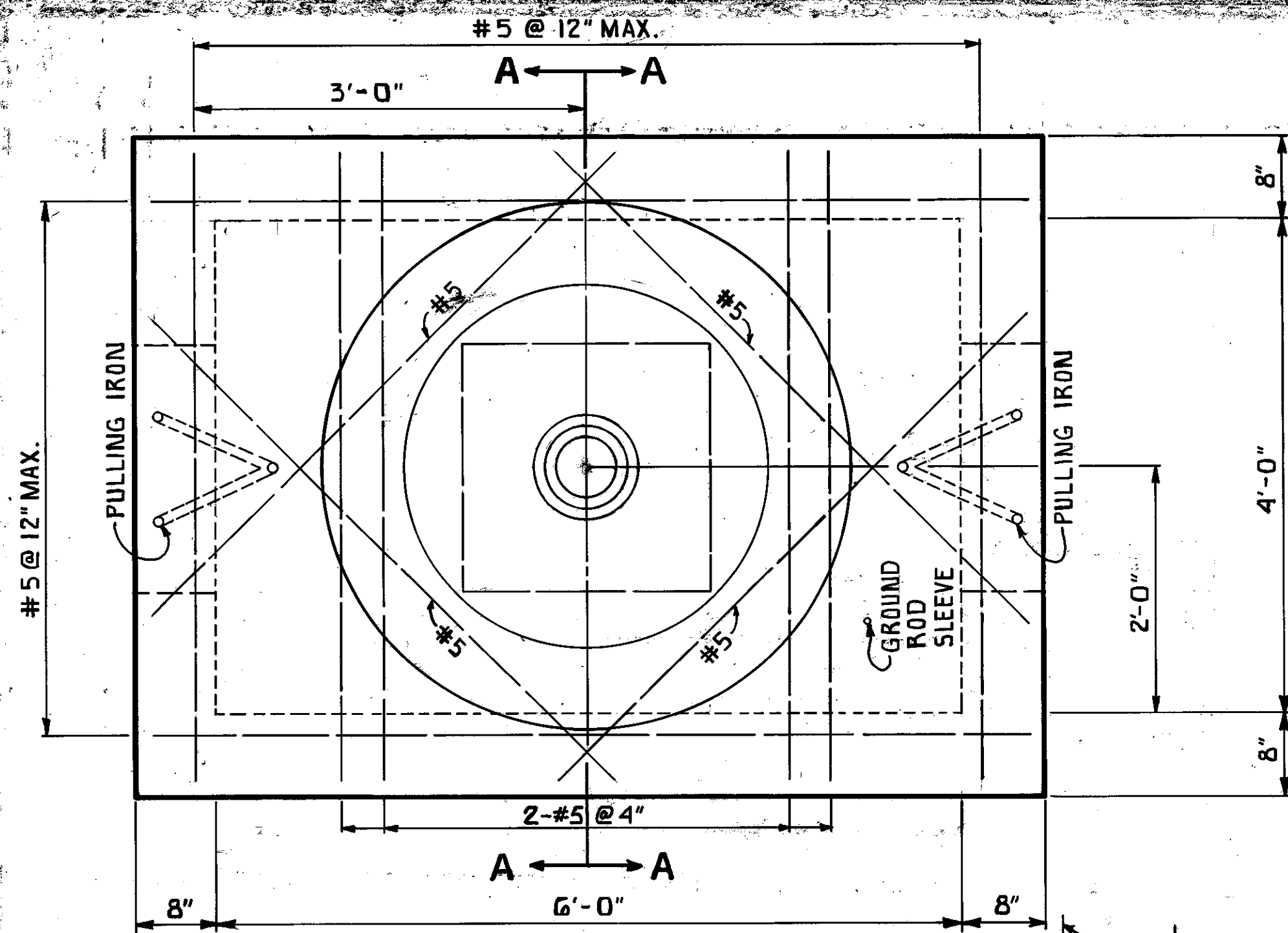
SHEET ACCT. No.

MATCH LINE STA. 8+25 THIS SHEET

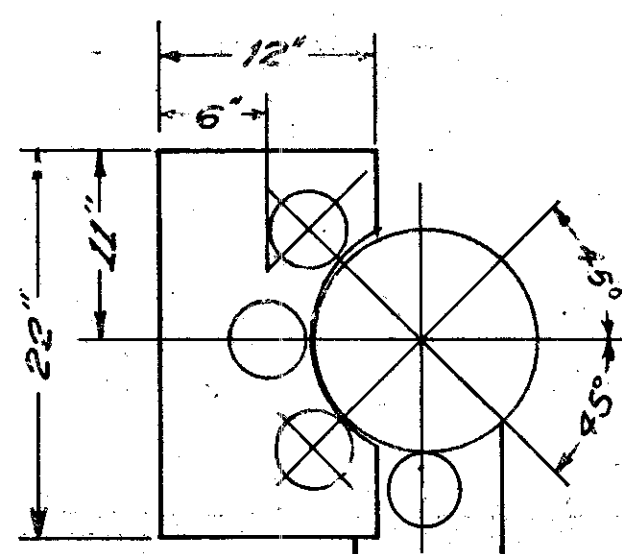
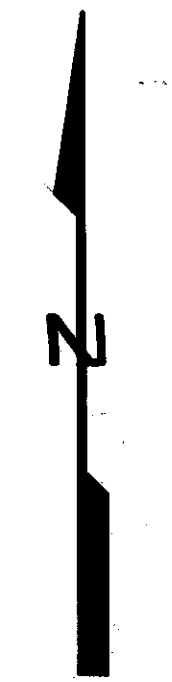
MATCH LINE STA. 8+25
THIS SHEET

PLAN
SCALE: 1"=20'

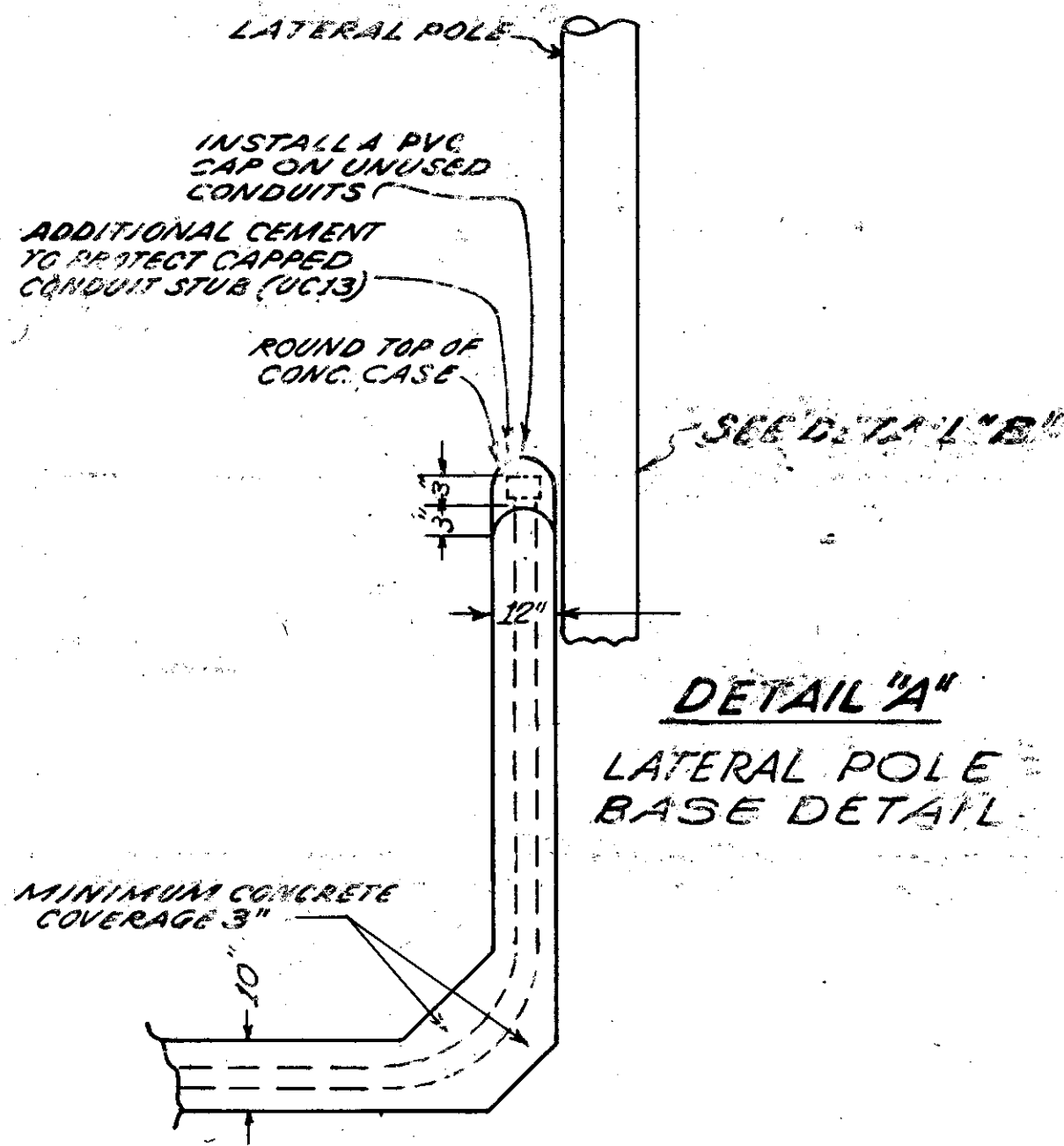
| | | | |
|--|-------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOEF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| DIVISION OF LIGHT & POWER CITY OF CLEVELAND | | | |
| E. 55th ST. - I-490 UNDERGROUND PLAN | | | |
| SCALE: 1"=20' 7078-2A | | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| ARG | ARG | JRH | |
| DATE | | | |



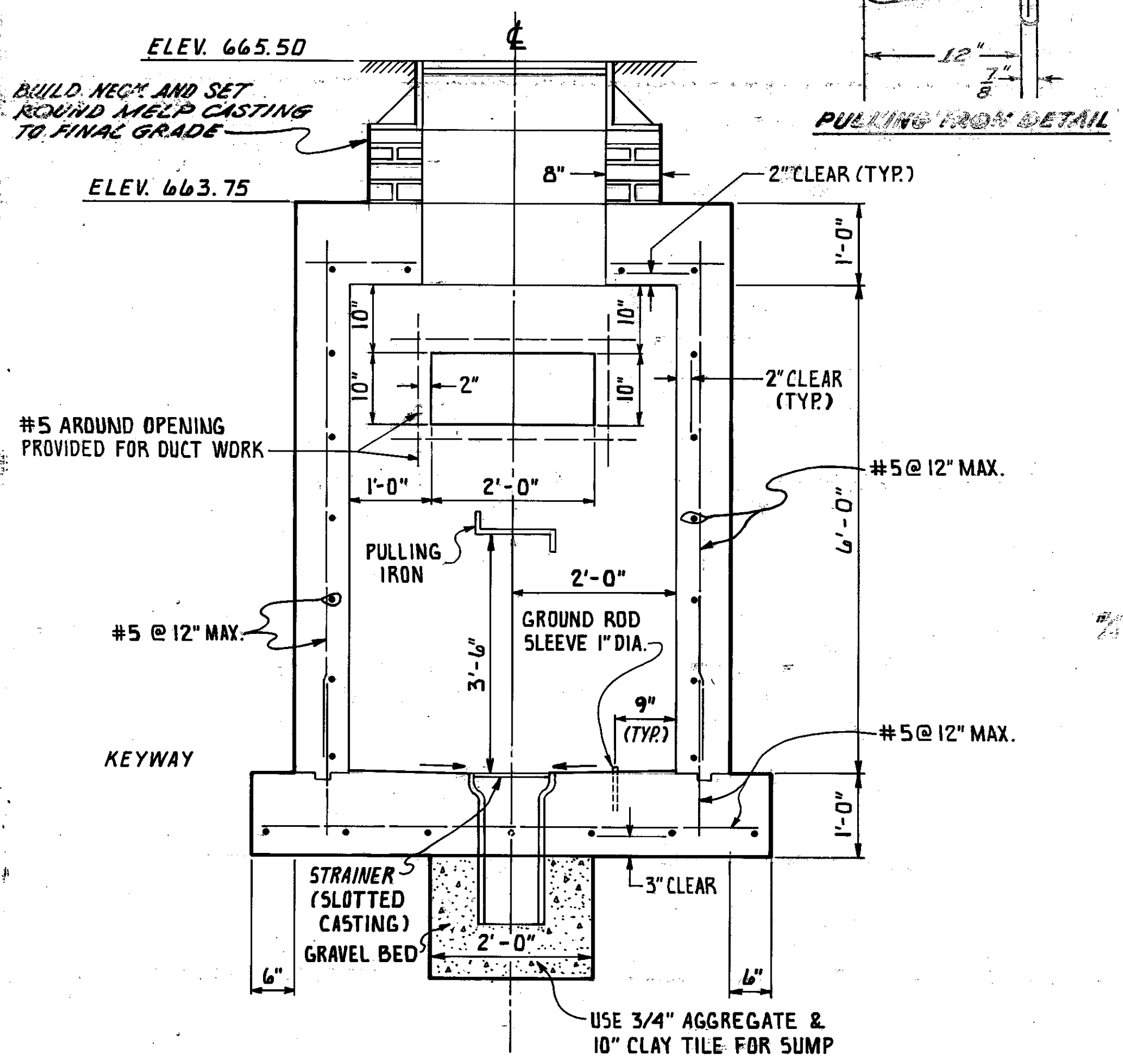
MANHOLE TOP VIEW



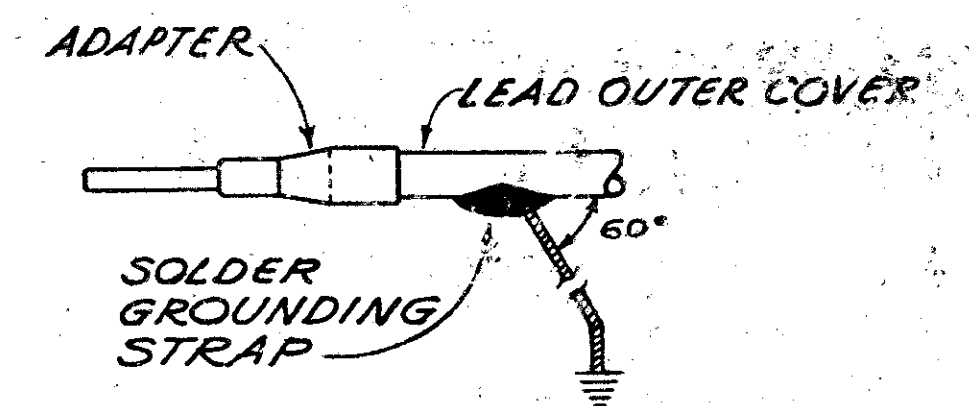
**DETAIL "B"
DUCT FORMATION
AT LATERAL POLE**



**DETAIL "A"
LATERAL POLE
BASE DETAIL**



**SECTION "A-A"
MELP ELECTRICAL MANHOLE**



**TYPICAL BONDING OF LEAD CABLE
SPECS UC 13**

NOTE:
THE DETAIL IS FOR A CAST IN PLACE MANHOLE AS PER ITEM DC-12.

A PRECAST MANHOLE BY MACK INDUSTRIES OR APPROVED EQUAL MAY BE PROVIDED WITH THE APPROVAL OF THE CITY OF CLEVELAND, DIVISION OF LIGHT AND POWER.

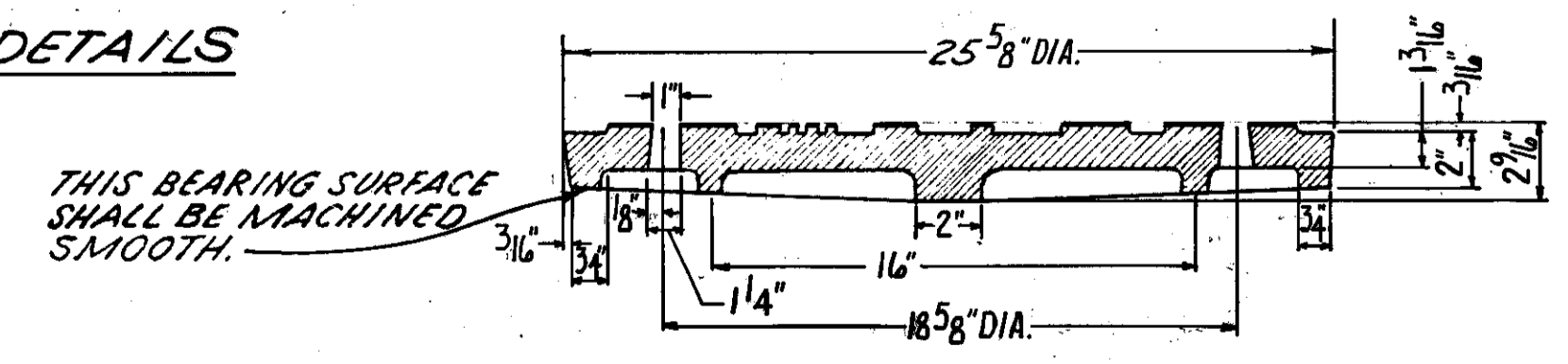
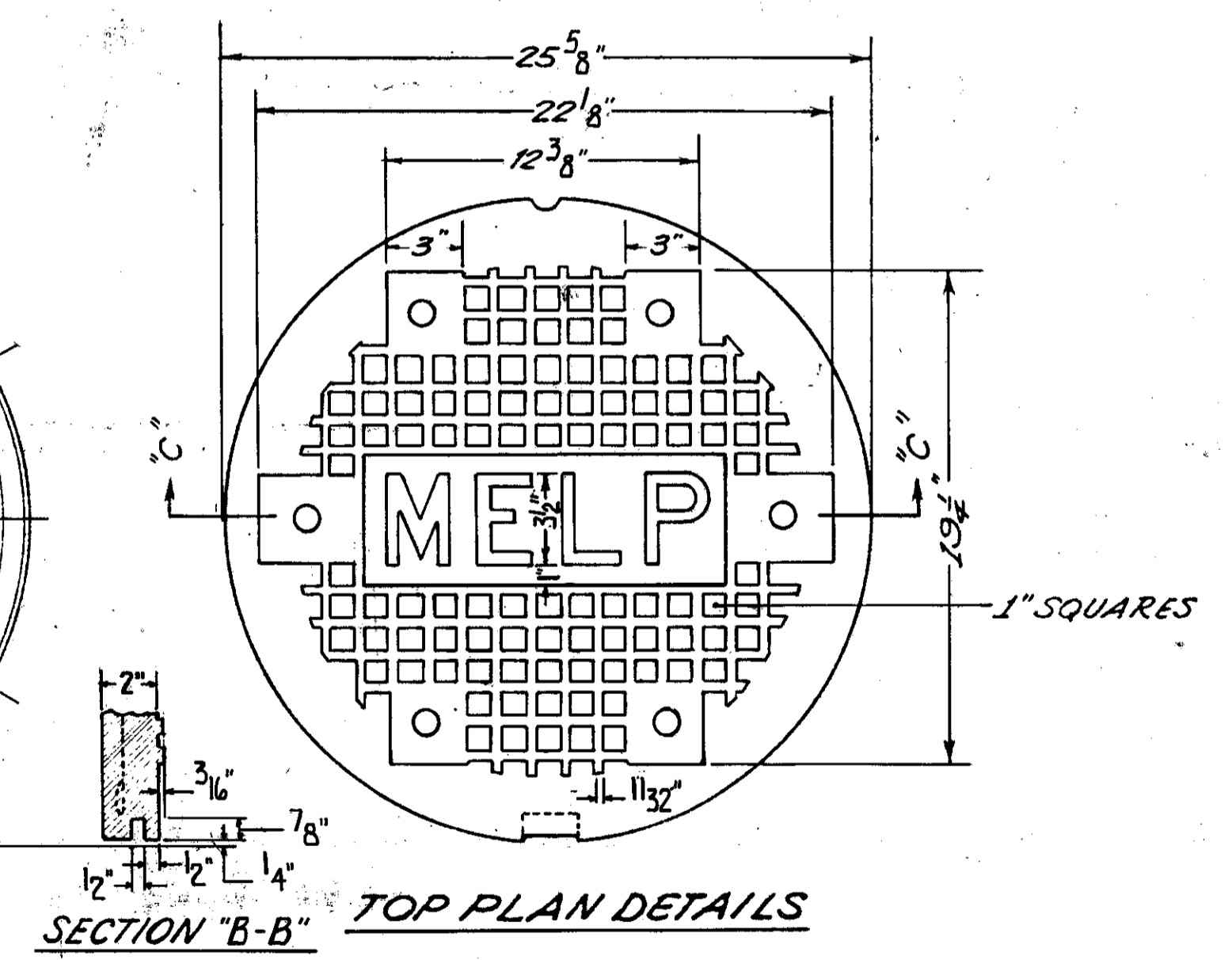
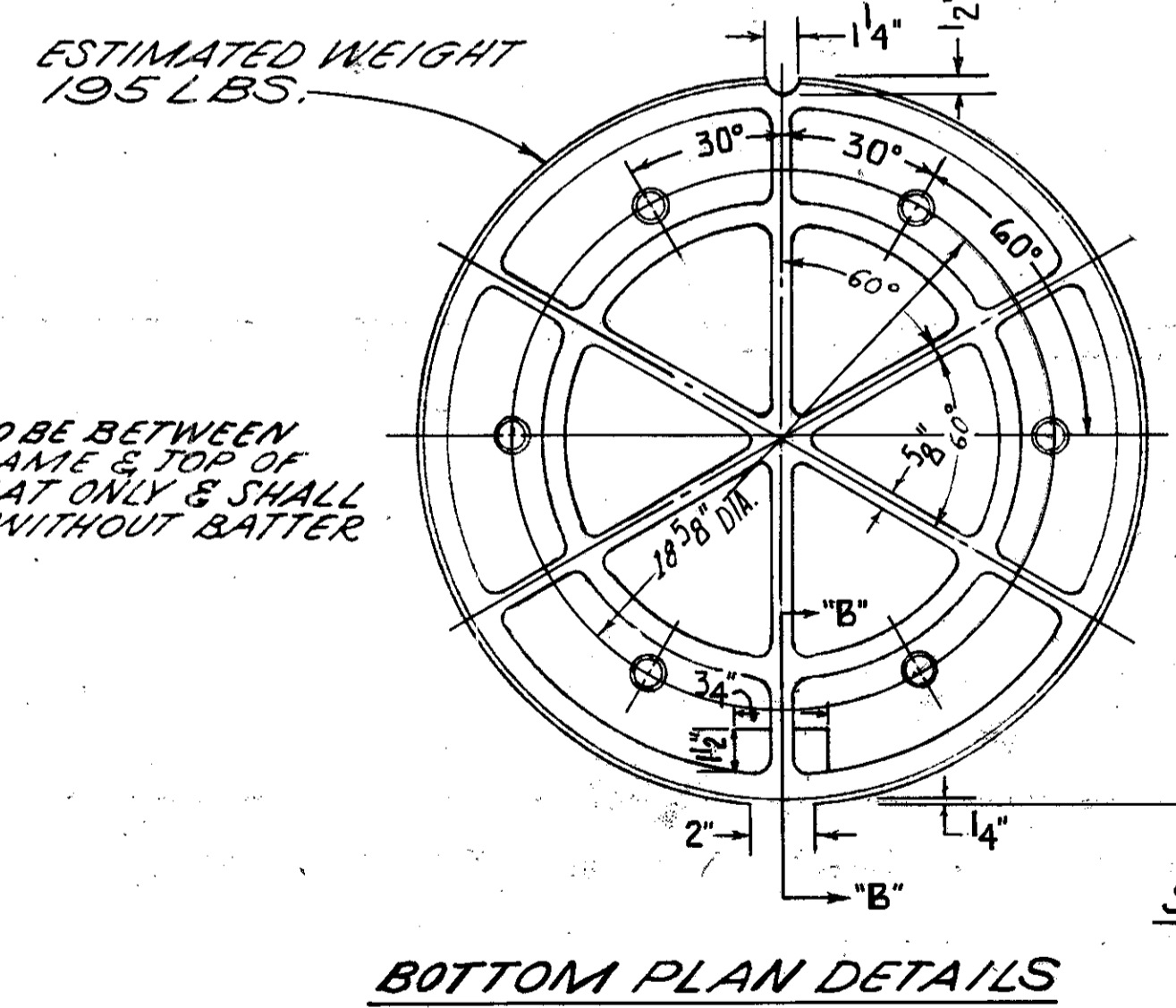
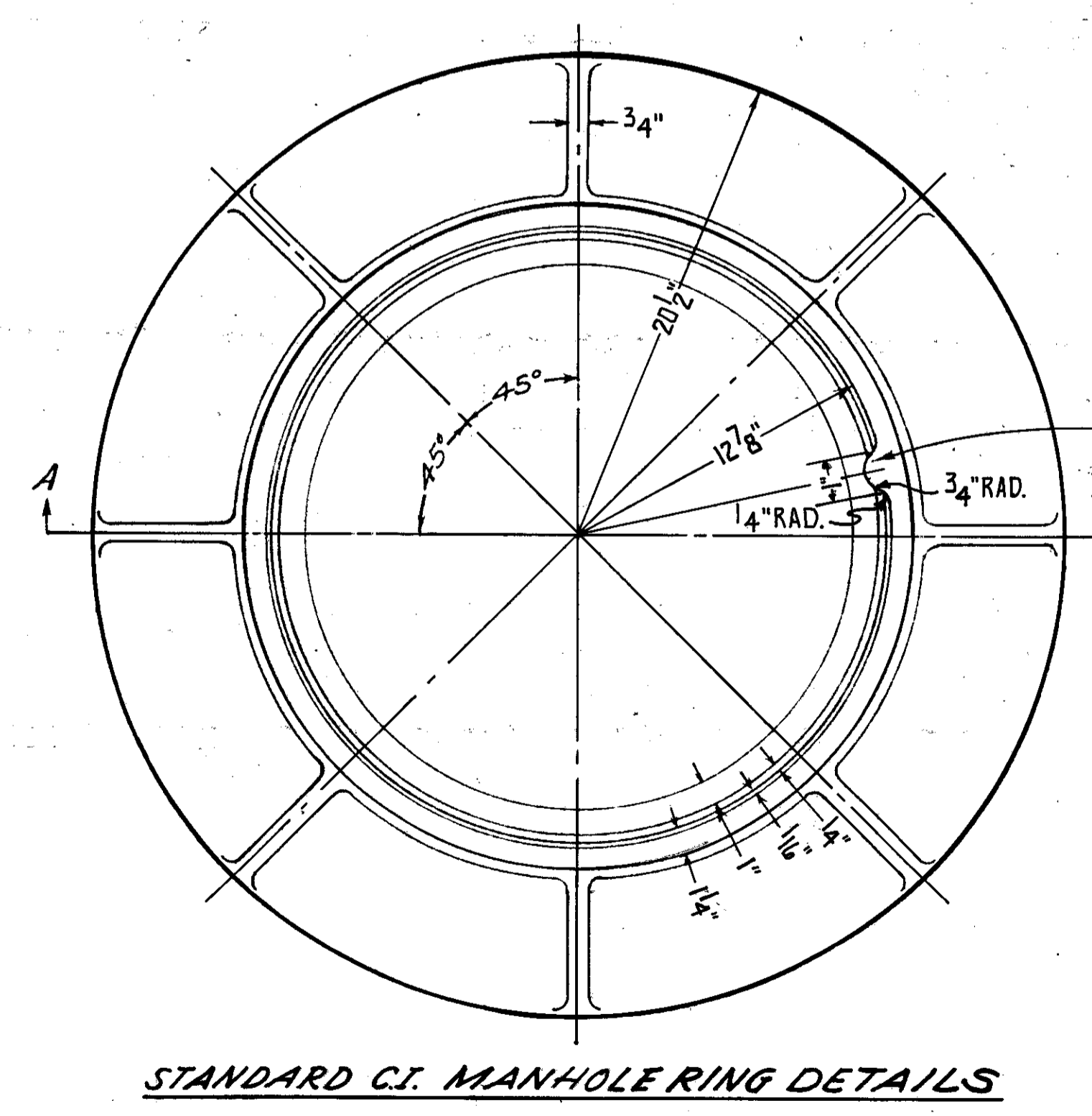
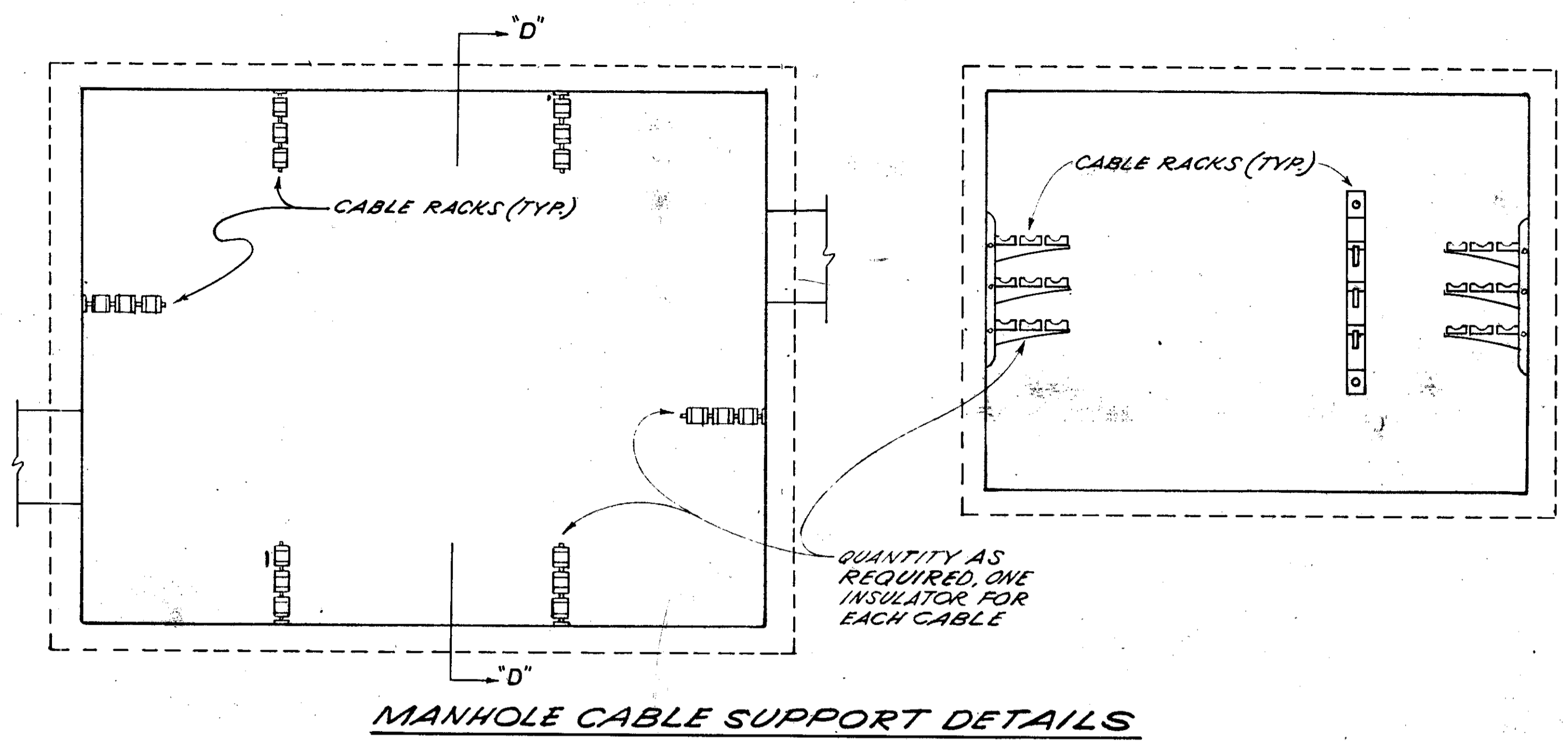
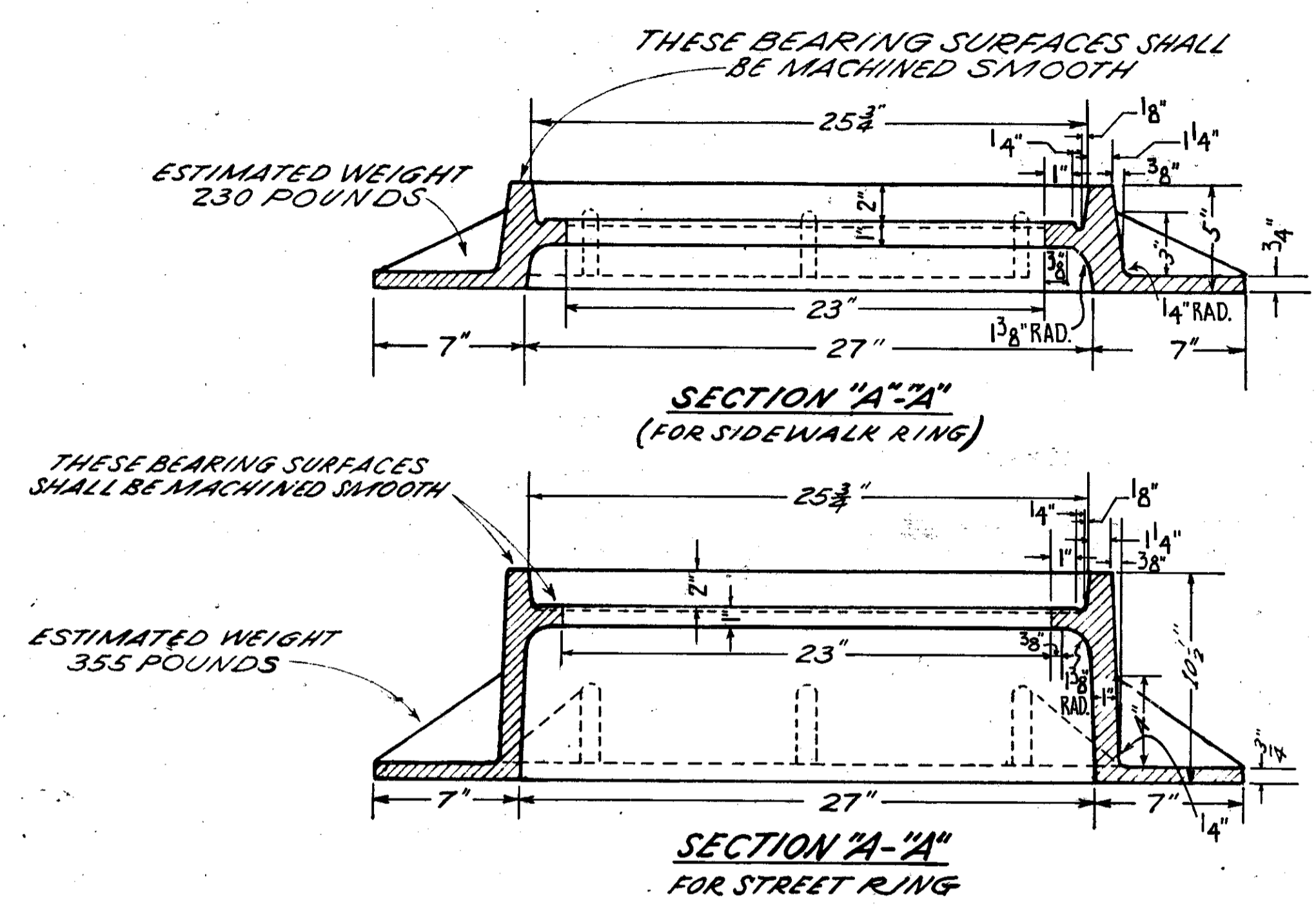
- NOTE:**
1. INSTALL PULLING IRONS OPPOSITE DUCTS ENTERING MANHOLE.
 2. DO NOT RUN RODS THRU DUCT OPENING.
 3. LOCATE 2'-0" x 2'-0" x 2'-0" SLAG SUMP (10" SEWER TILE) UNDER MANHOLE OPENING. SLOPE FLOOR TOWARD SUMP.
 4. CONCRETE SHALL BE CLASS "C" (4,000 PSI).
 5. FOR MANHOLE FRAME & COVER, SEE SHEET 169 B (7078-2D)

| NO. | DATE | BY | CHKD. | DATE |
|-----|------|----|-------|------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

DIVISION OF LIGHT & POWER
CITY OF CLEVELAND

**UNDERGROUND
MANHOLE DETAILS**

| | | | |
|-----------------|-------------------|------|---------|
| DRAWN BY PRB | SCALE AS SHOWN | DATE | 7078-2B |
| JRH | | | |



NOTE:
ALL COVERS AND FRAMES MUST BE INTERCHANGEABLE.
COVERS FOR STREET AND SIDEWALK FRAMES ARE IDENTICAL.

| NO. | DATE | DIST. |
|-----|------|-------|
| | | |
| | | |
| | | |

| REVISION | DATE | DESCRIPTION | BY | APPROVED |
|----------|------|-------------|----|----------|
| | | | | |
| | | | | |
| | | | | |

**DIVISION OF LIGHT & POWER
CITY OF CLEVELAND**

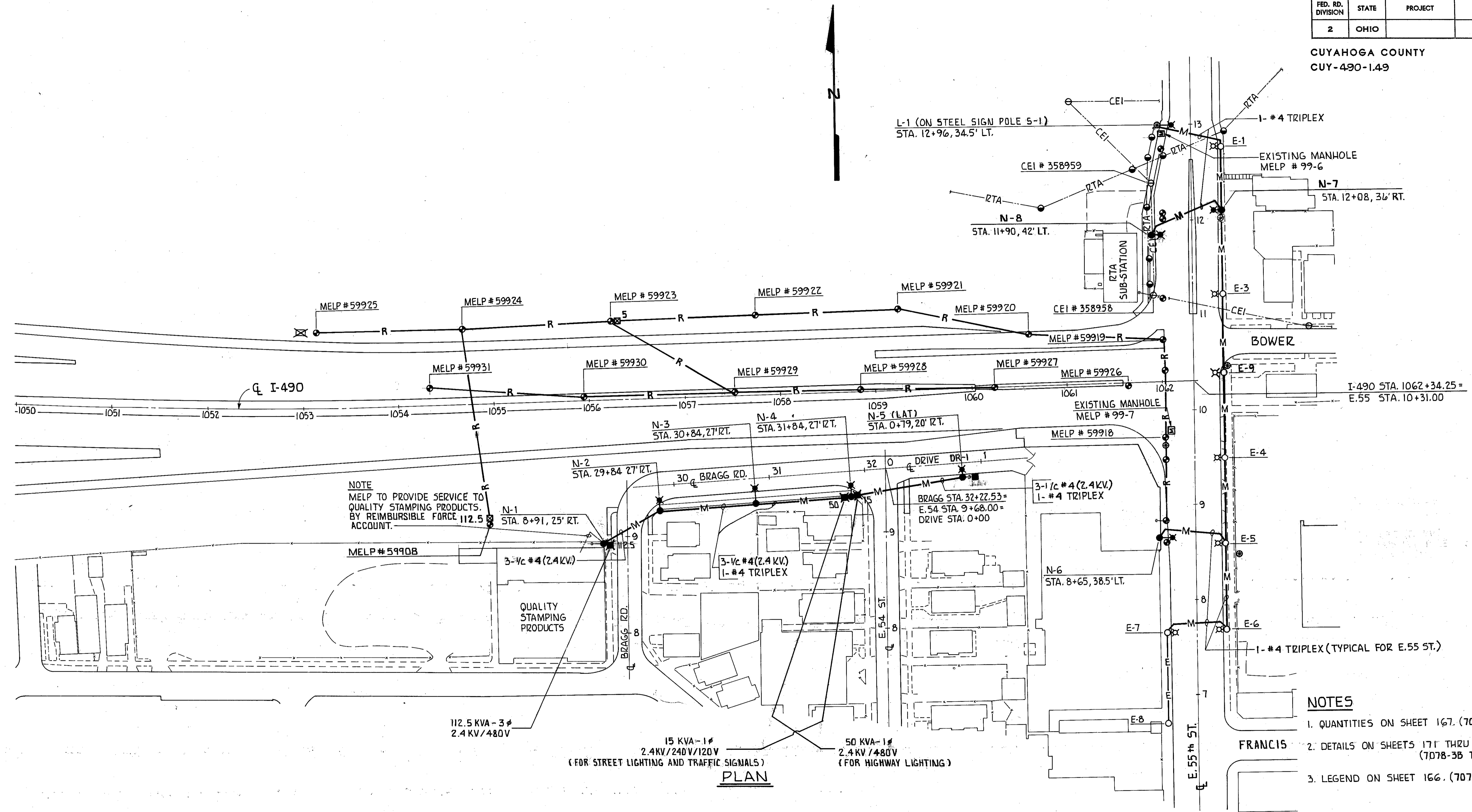
**UNDERGROUND
MANHOLE COVER
DETAILS**

DRAWN BY **PRB** SCALE **NONE** DRAWING NUMBER **7078-2C**
CHKD BY **JRH** DATE _____

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

170
261

CUYAHOGA COUNTY
CUY-490-149



NOTE
MELP TO PROVIDE SERVICE TO
QUALITY STAMPING PRODUCTS.
BY REIMBURSIBLE FORCE 112.5
ACCOUNT.

112.5 KVA - 3 #
2.4 KV / 480V

15 KVA - 1 #
2.4 KV / 240V / 120V
(FOR STREET LIGHTING AND TRAFFIC SIGNALS)

50 KVA - 1 #
2.4 KV / 480V
(FOR HIGHWAY LIGHTING)

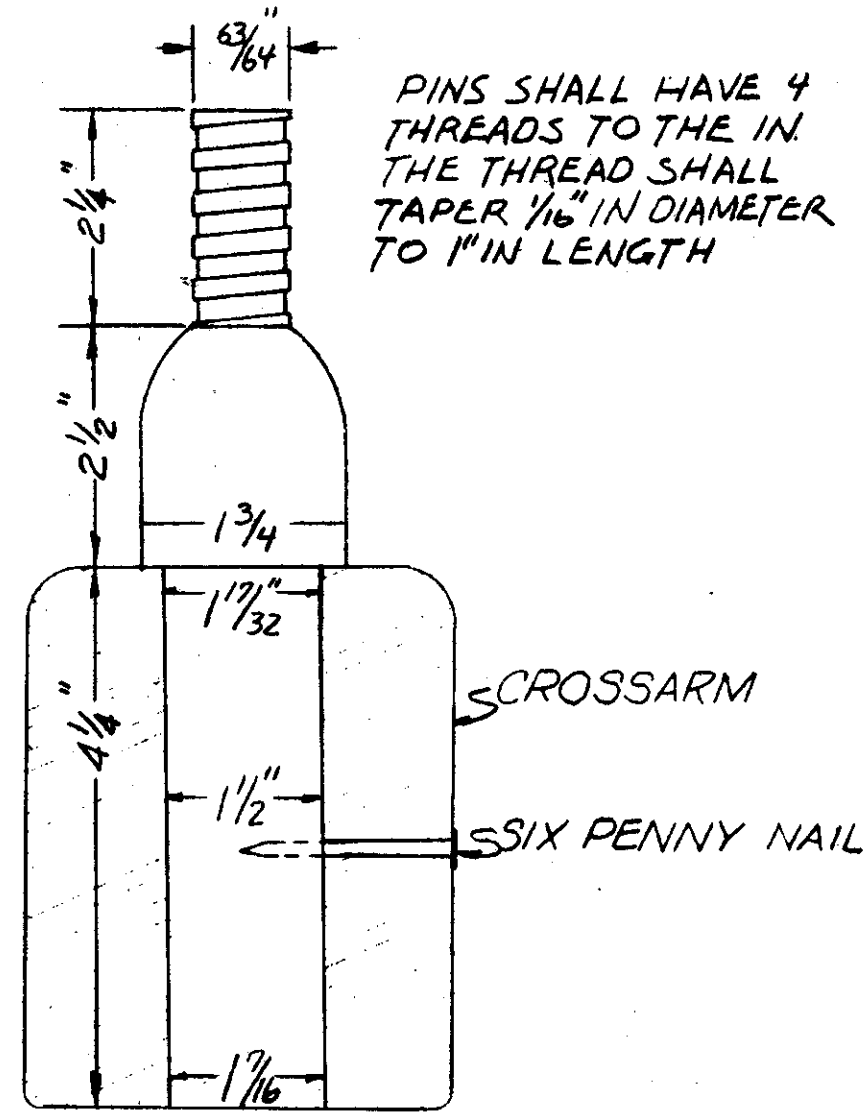
PLAN

NOTES

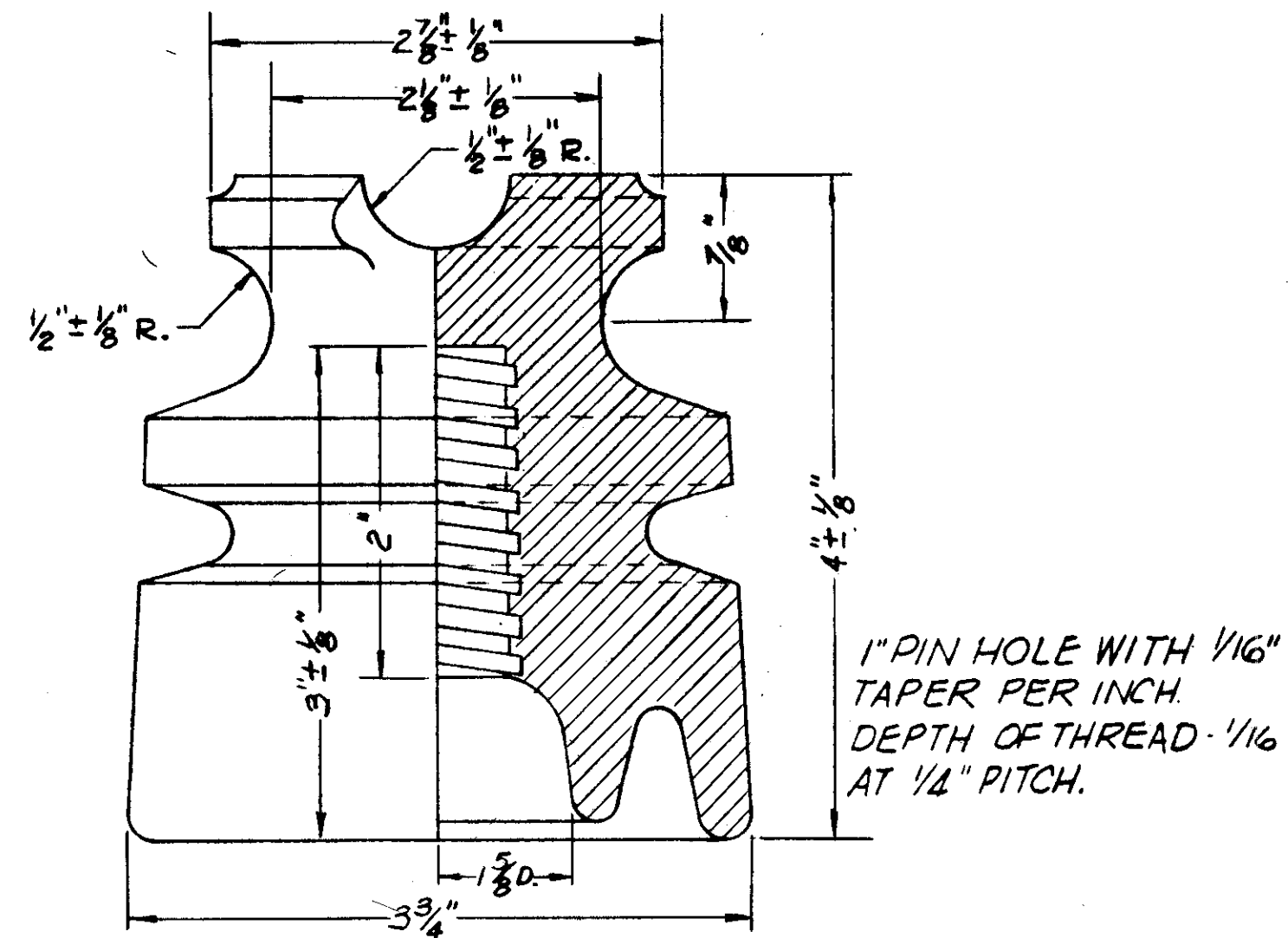
1. QUANTITIES ON SHEET 167. (7078-1B)
2. DETAILS ON SHEETS 171 THRU 175, 175A (7078-3B THRU 3G)
3. LEGEND ON SHEET 166. (7078-1A)

CONT. No. SHEET ACCT. No.

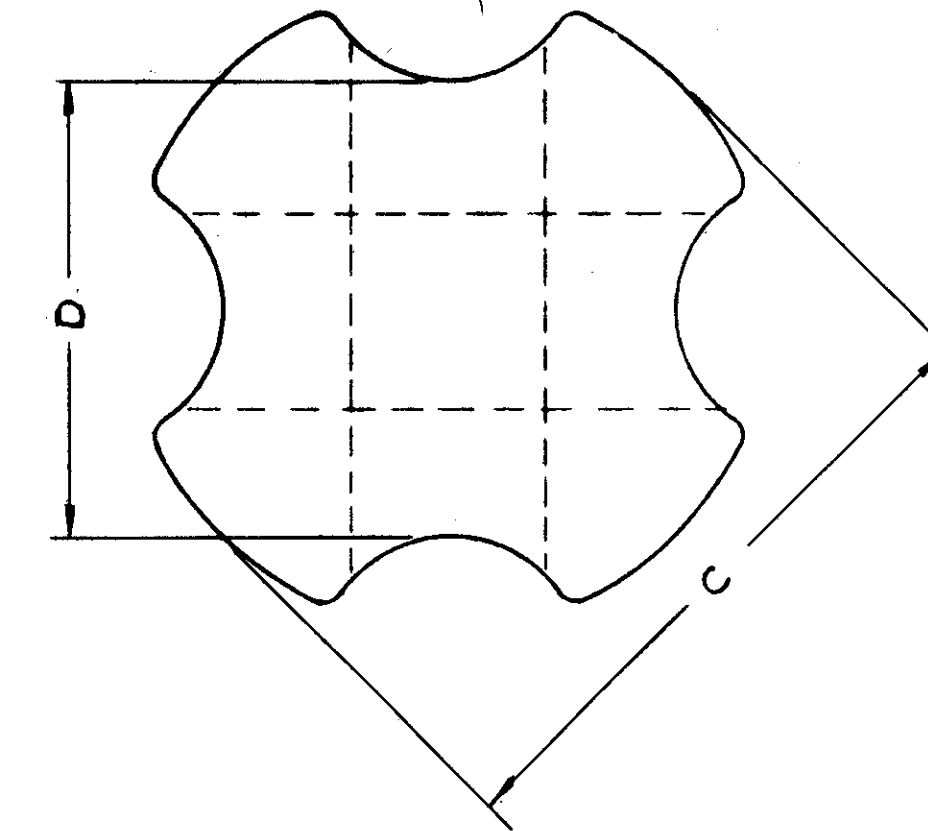
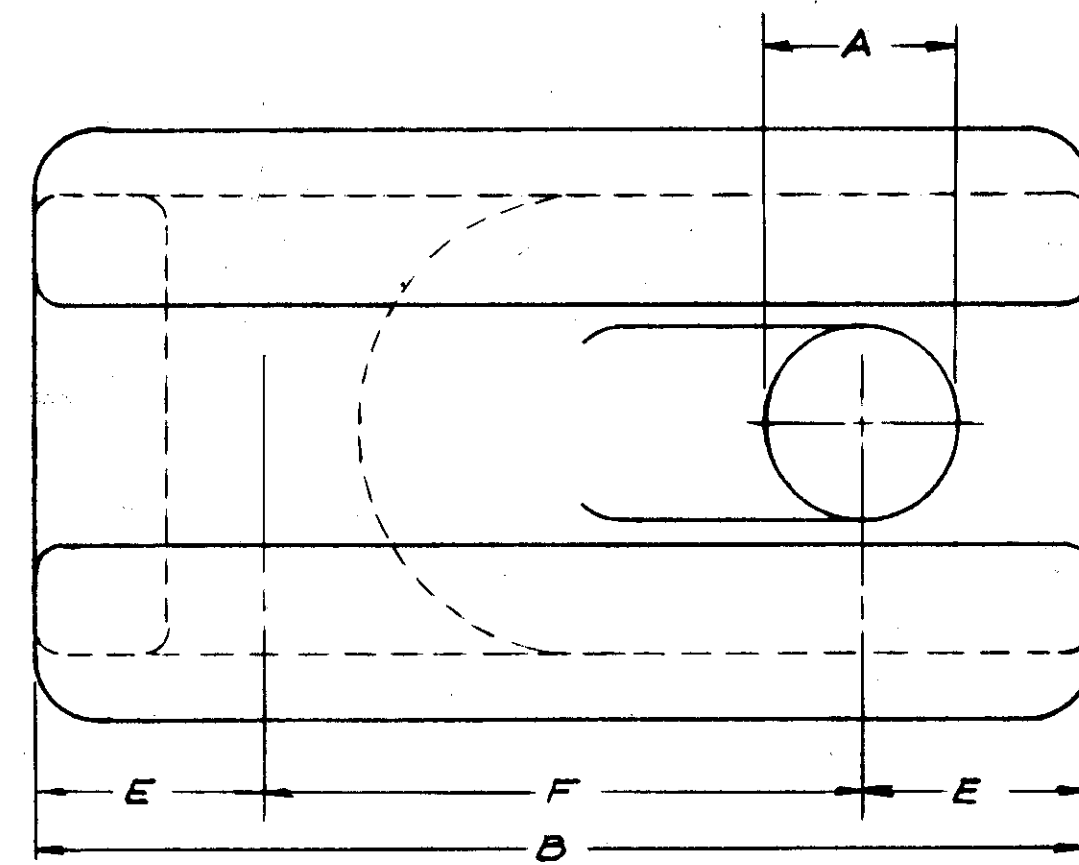
| | | | |
|---|----------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| DIVISION OF LIGHT & POWER CITY OF CLEVELAND | | | |
| E.55th ST. - BRAGG RD. OVERHEAD PLAN | | | |
| 7078-3A | | | |
| SCALE | 1" = 50' | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| ARZ | ARZ | JRH | JRH |
| REVIEWED | DATE | | |



WOOD LOCUST PIN DETAIL

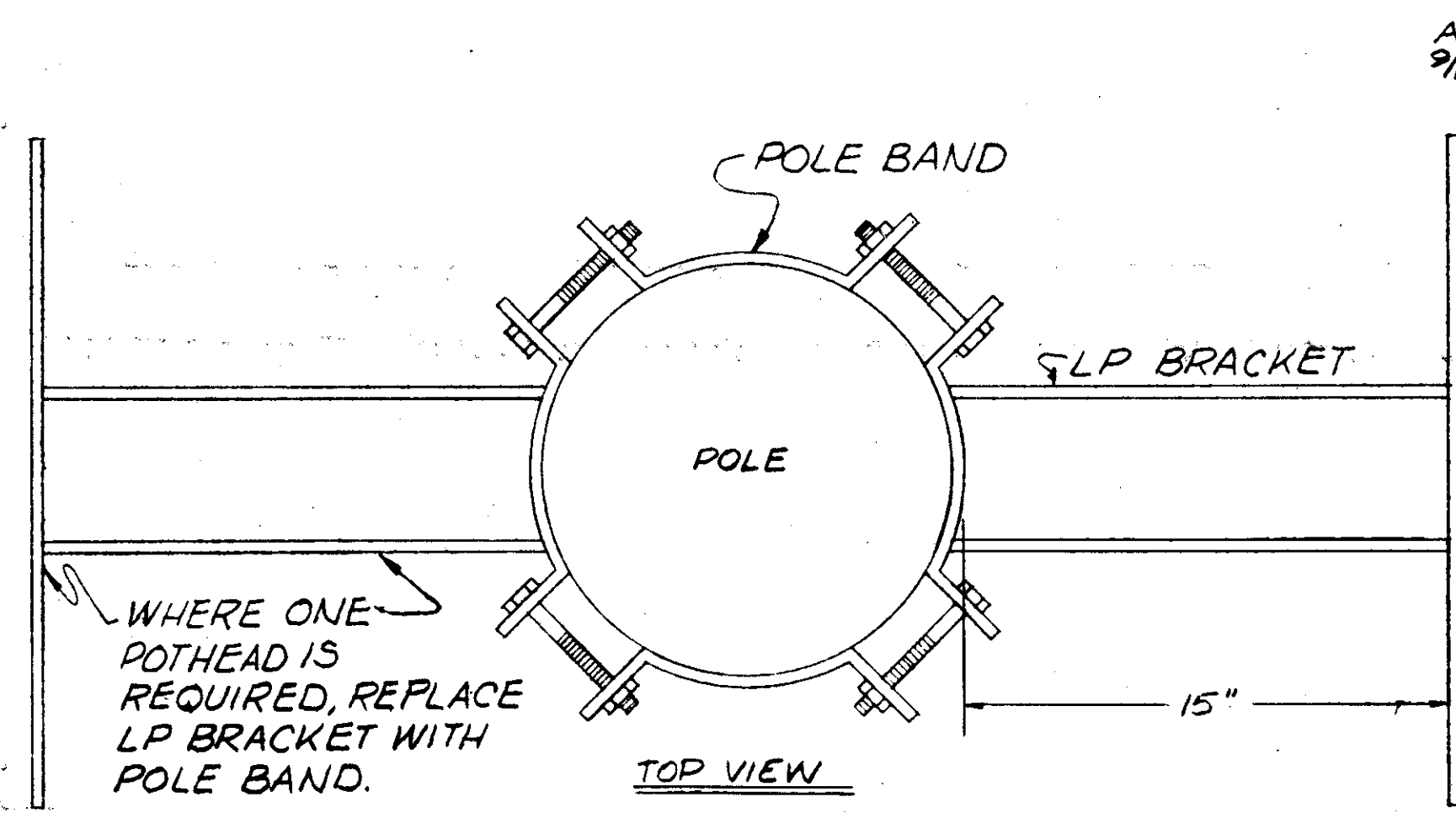


PIN TYPE INSULATOR

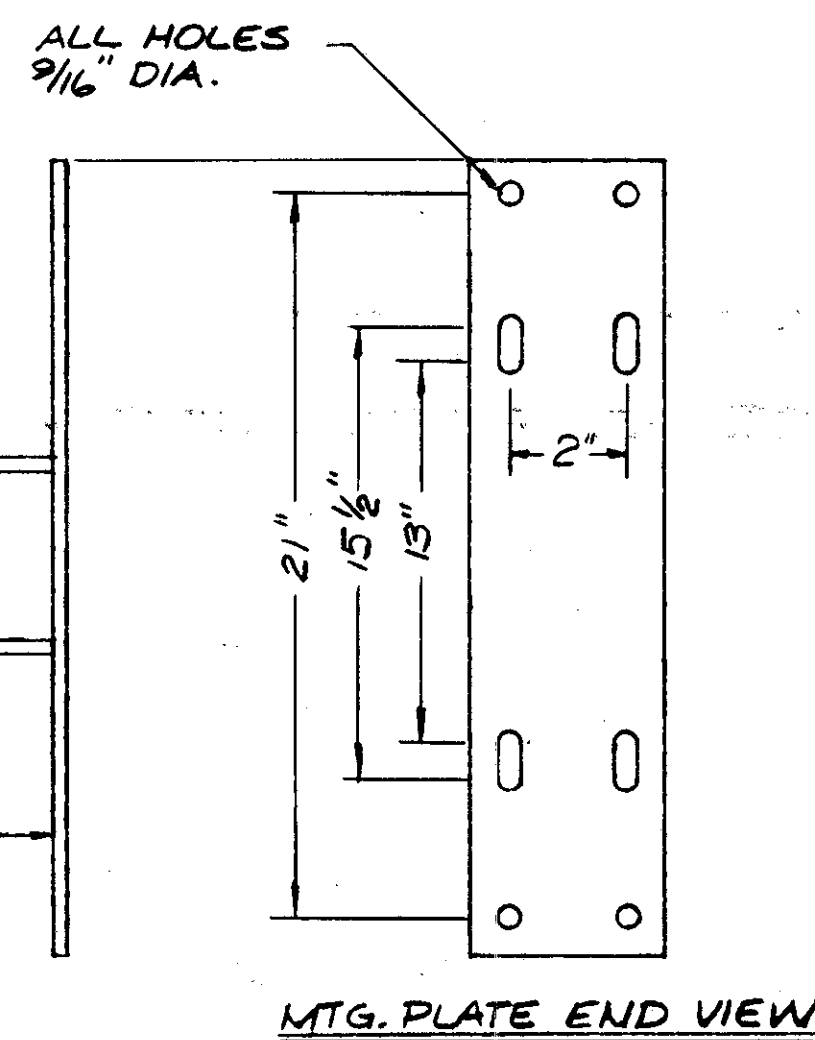


| ASA CLASS | DIMENSIONS IN INCHES | | | | | | MECH. STRENGTH | APPROX. WT. FLASHOVER | | LEAKAGE | | MAX. CABLE DIA. |
|-----------|----------------------|-------|-------|--------------|--------------|-------------|----------------|-----------------------|-----|---------|----------|-----------------|
| | A | B | C | D | E | F | | EACH LBS. | DRY | WET | DISTANCE | |
| 54-1 | 5/8 ± 1/16 | 3 1/2 | 2 1/2 | 1 3/4 ± 1/16 | 7/8 ± 1/16 | 1 3/4 ± 1/8 | 10,000 LBS. | 7/8 | 25 | 12 | 1 5/8" | 3/8" |
| 54-2 | 7/8 ± 1/16 | 4 1/8 | 2 7/8 | 2 3/8 ± 1/16 | 1 1/2 ± 1/16 | 2 1/4 ± 1/8 | 12,000 LBS. | 1 3/8 | 30 | 15 | 1 7/8" | 1/2" |

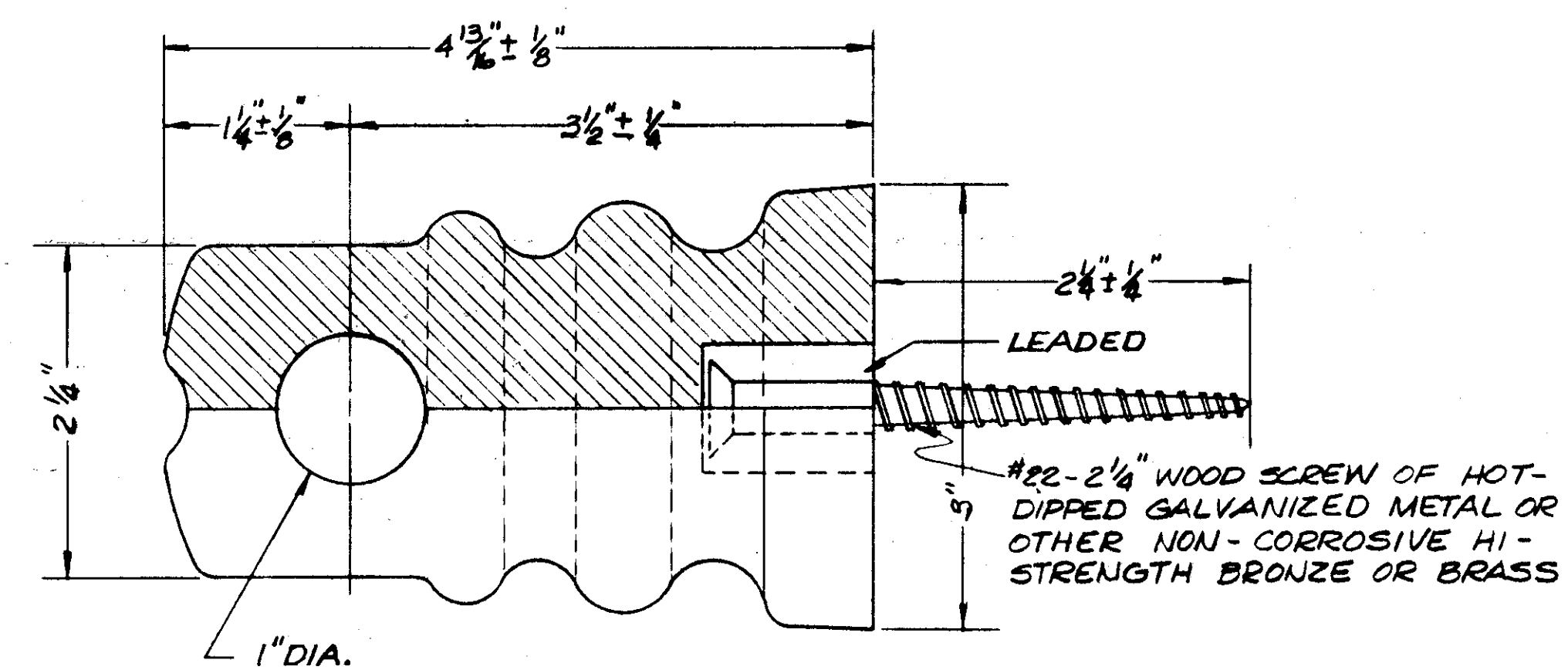
STRAIN TYPE INSULATOR



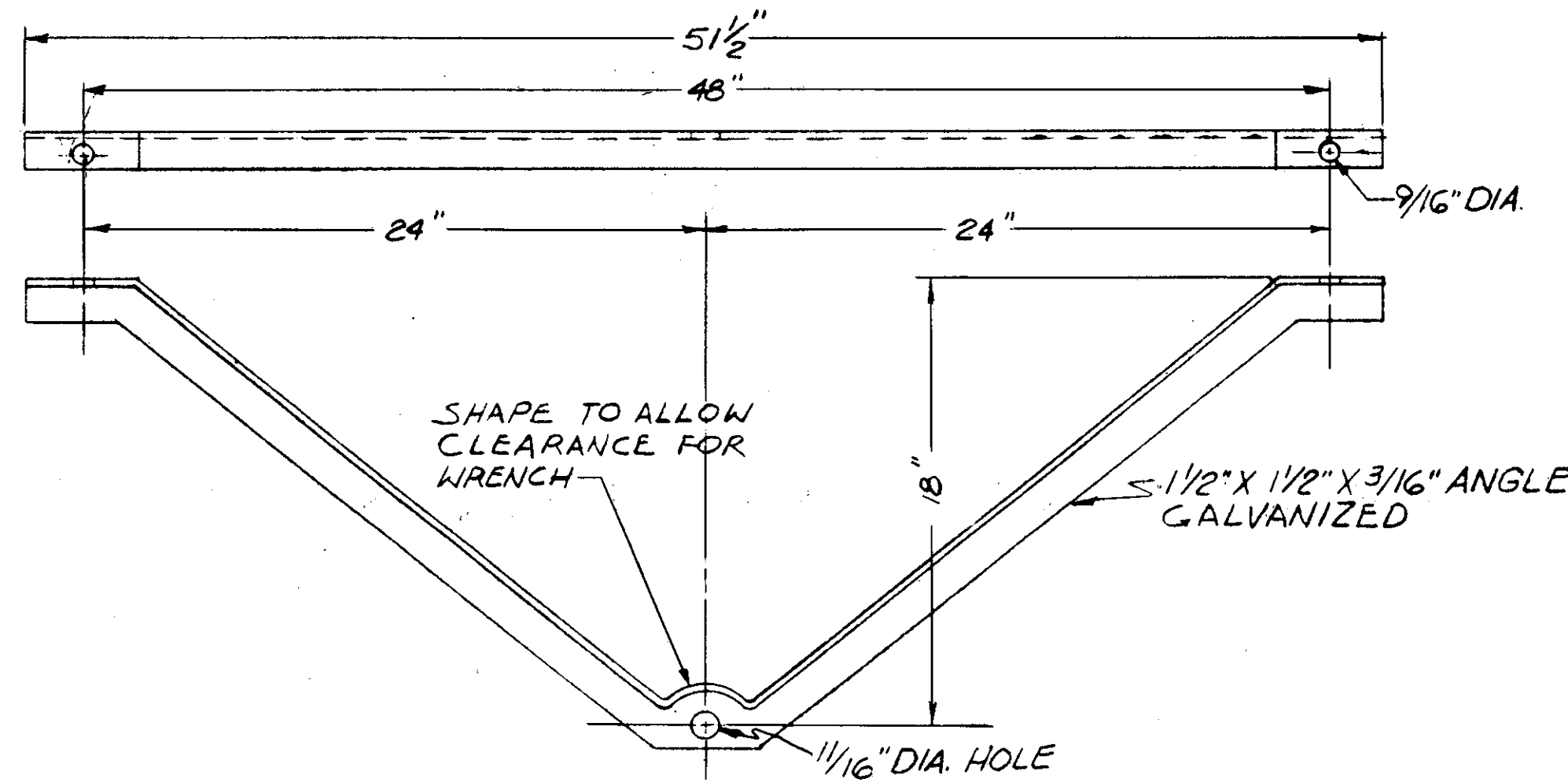
POTHEAD POLE BRACKET



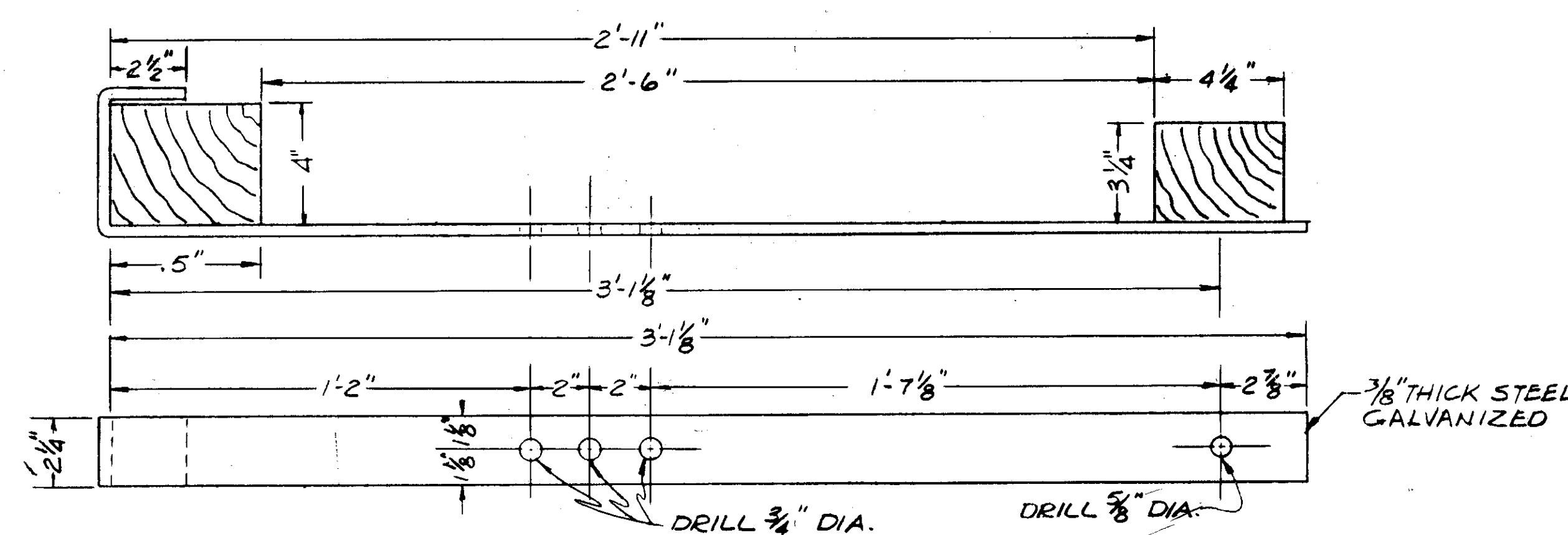
MTG. PLATE END VIEW



PRIMARY WIRE HOLDER

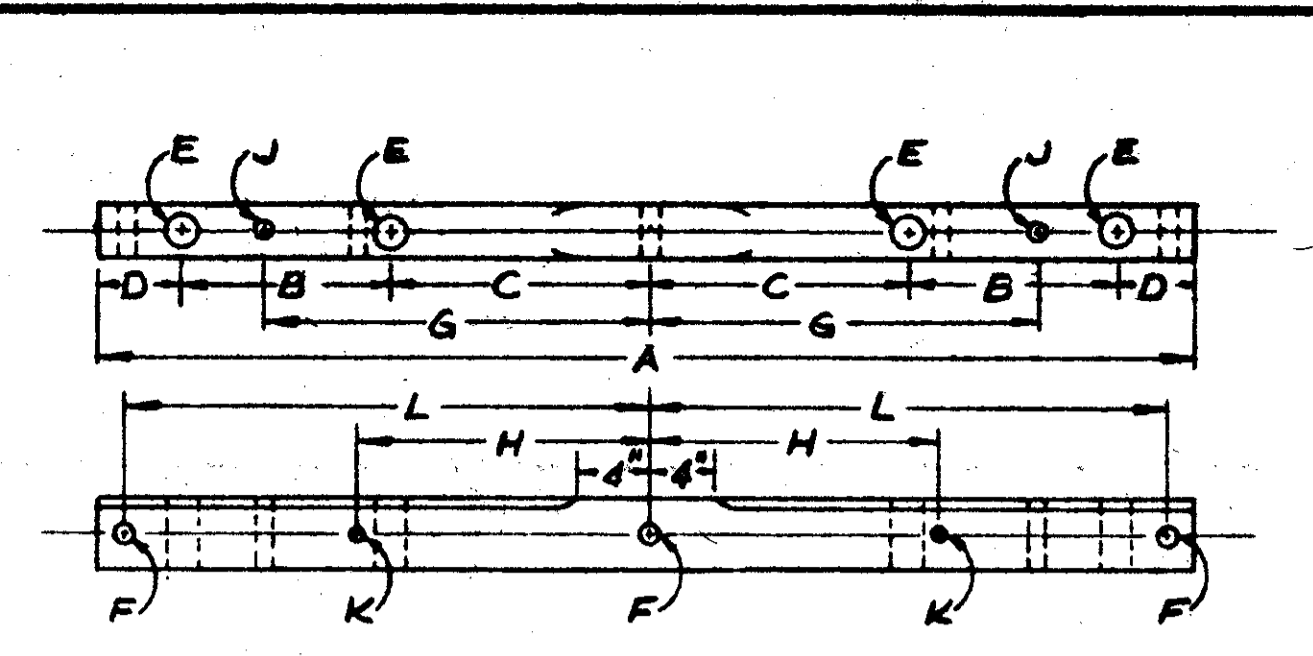


CROSSARM BRACE

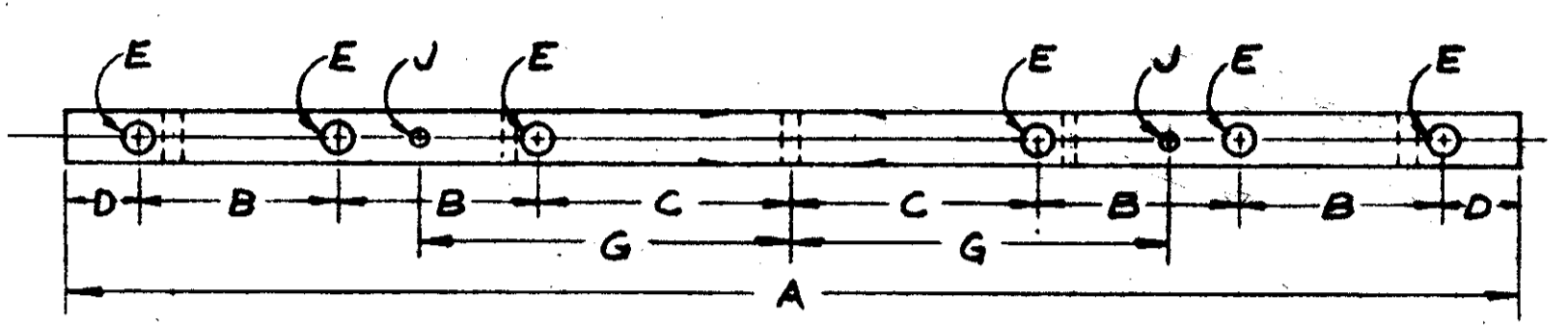


OIL SWITCH MOUNTING HANGER

CUYAHOGA COUNTY
CUY-490-1.49



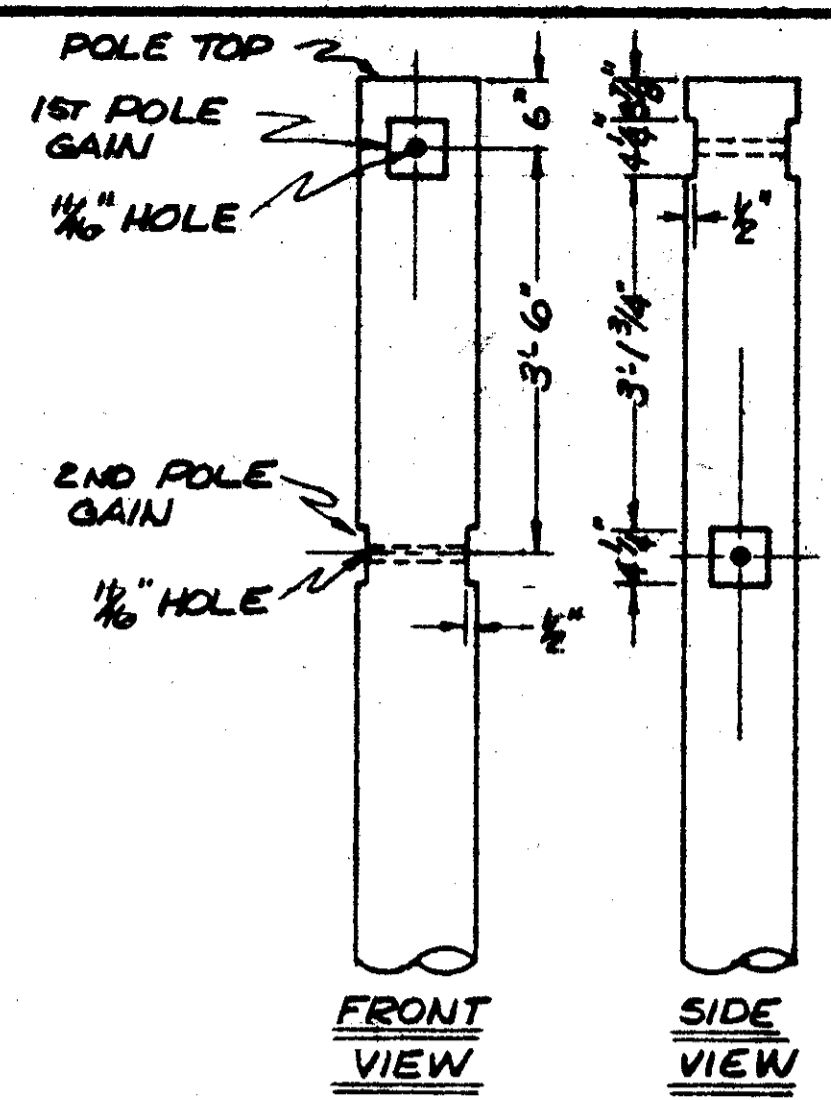
4 PIN CROSSARM



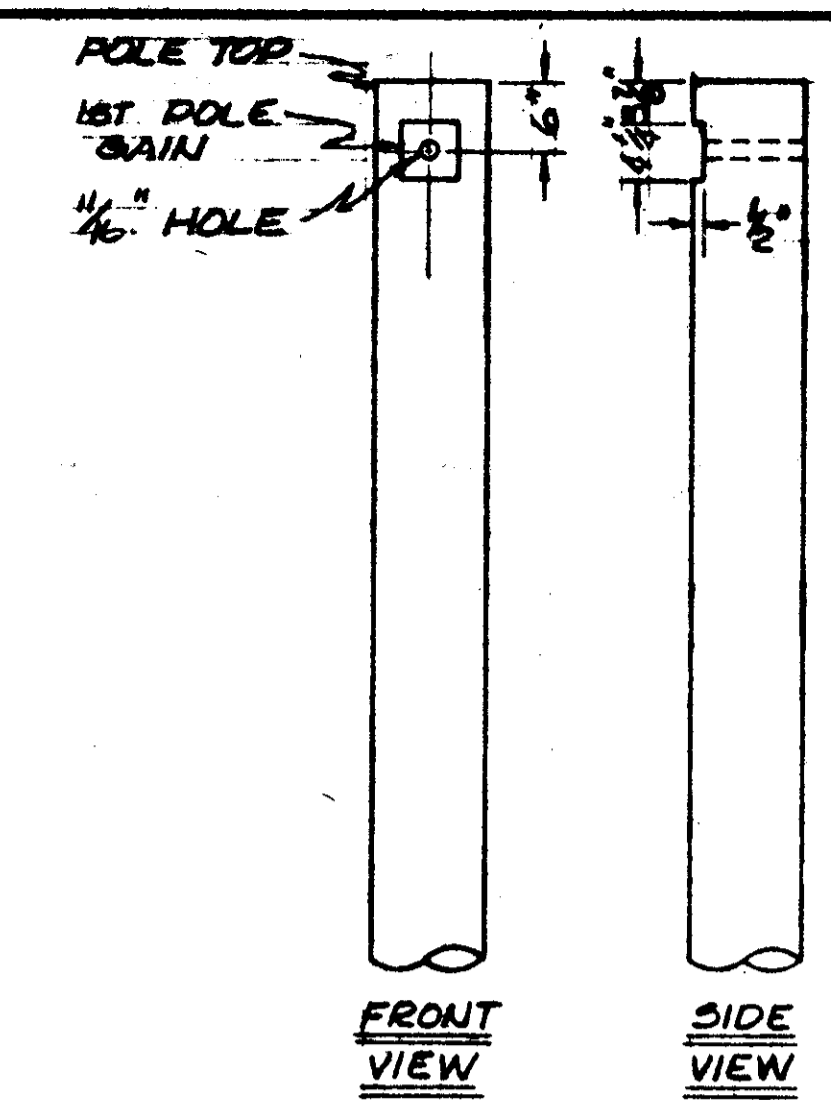
6 PIN CROSSARM



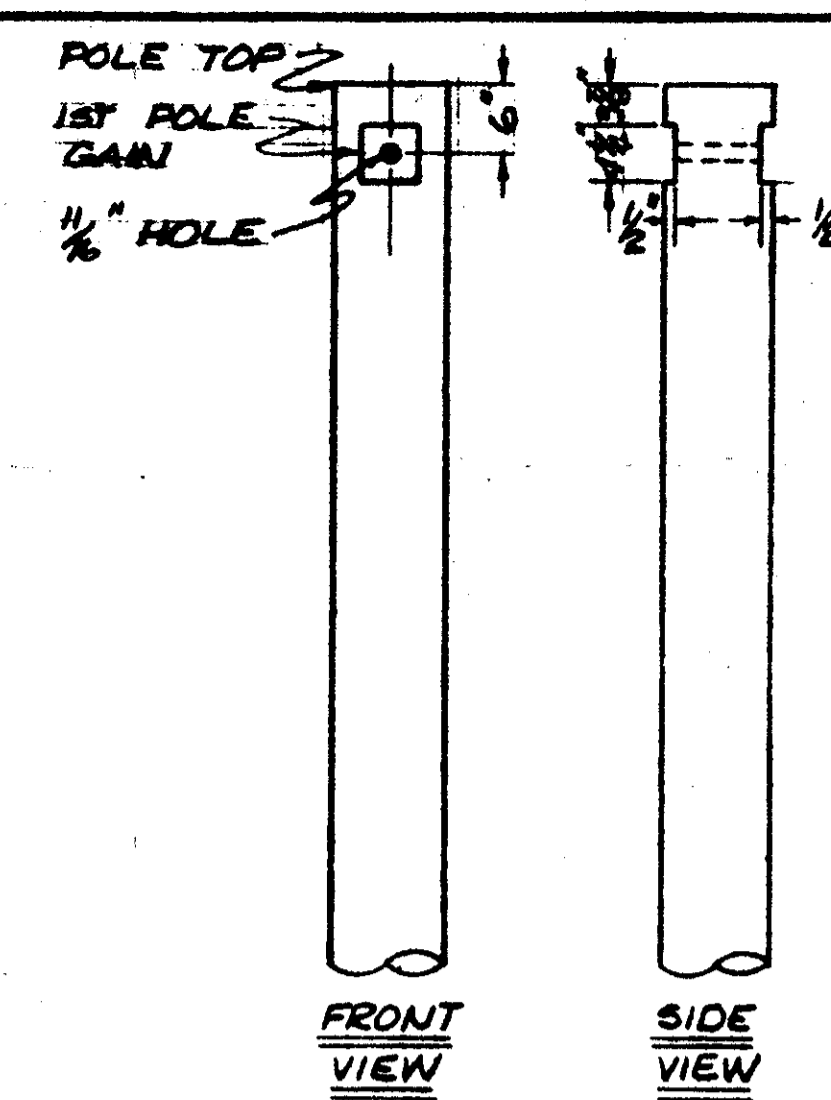
8 PIN CROSSARM



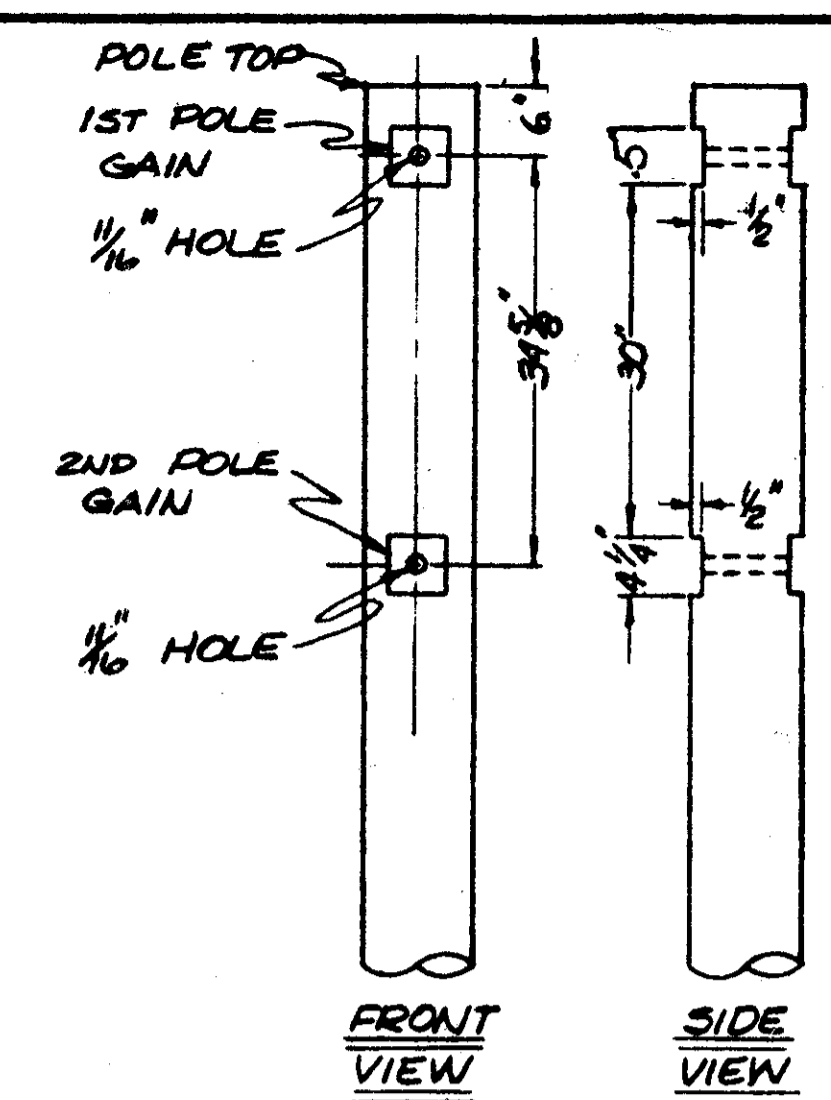
DETAIL "A"



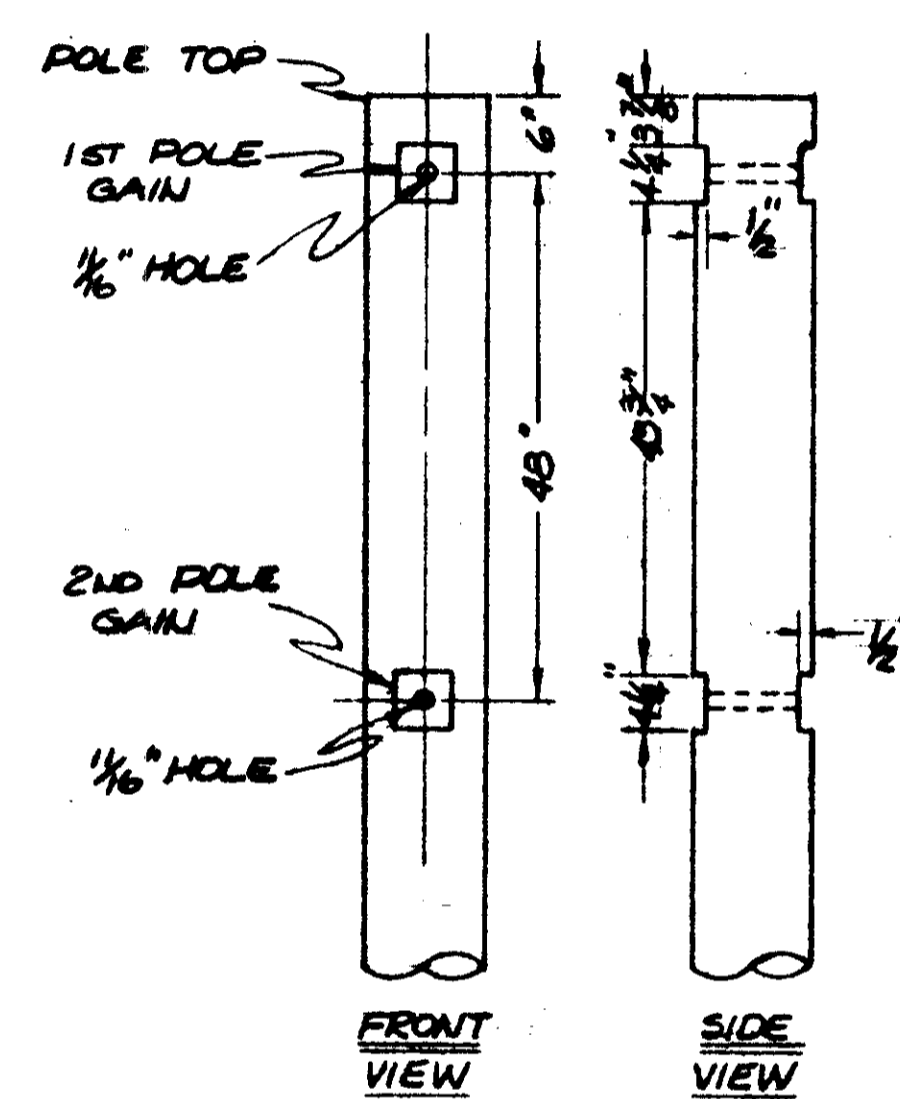
DETAIL "B"



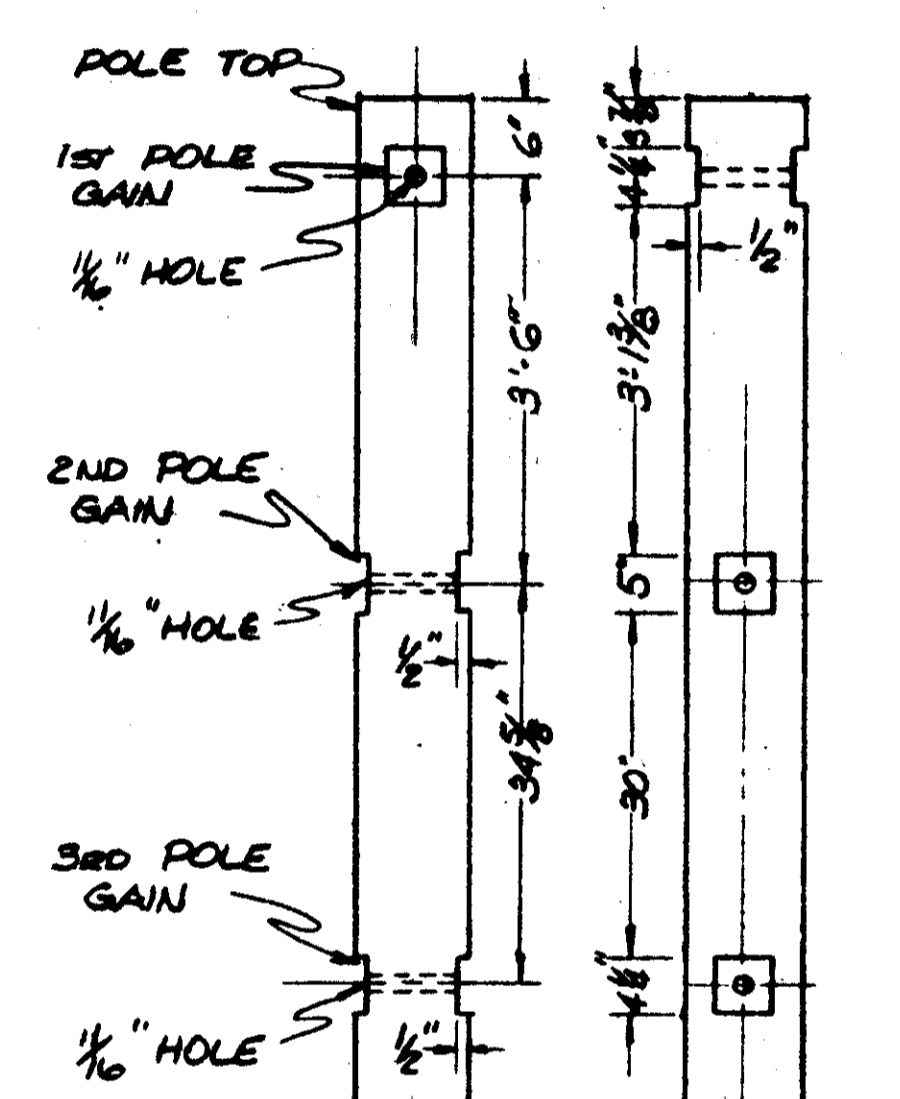
DETAIL "C"



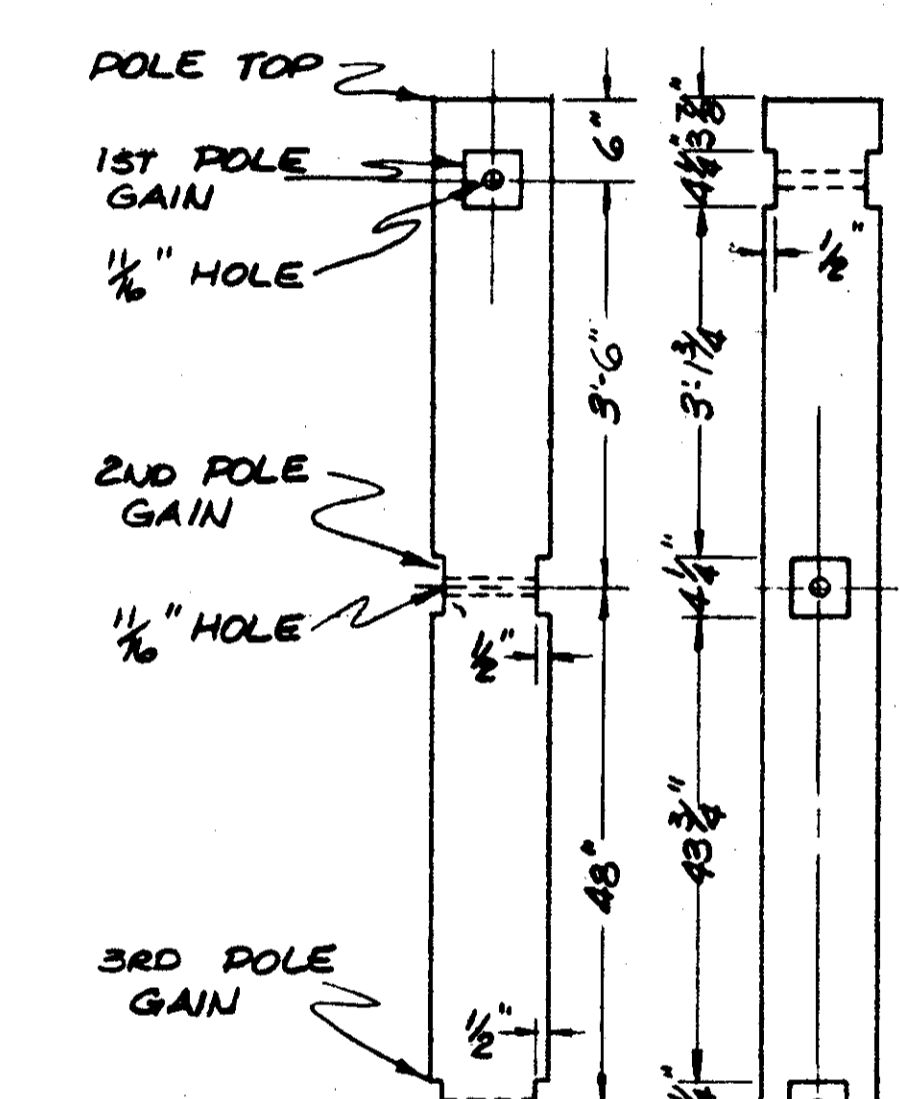
DETAIL "D"



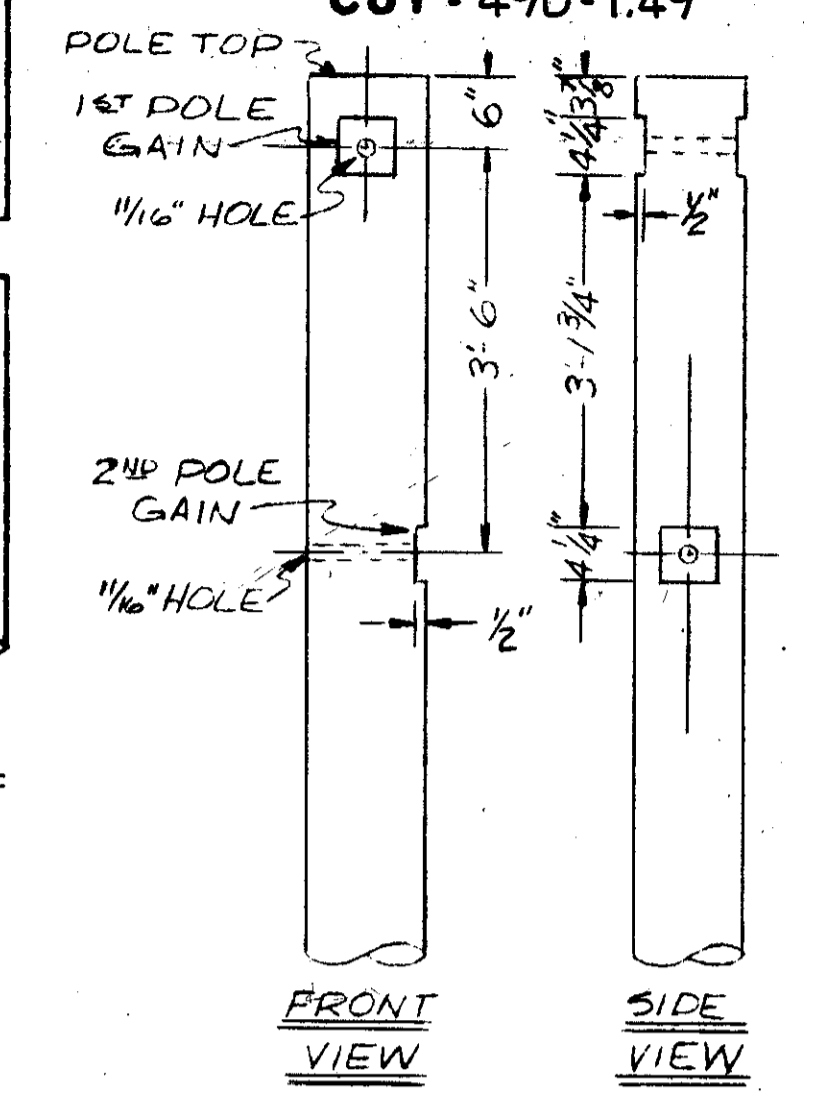
DETAIL "E"



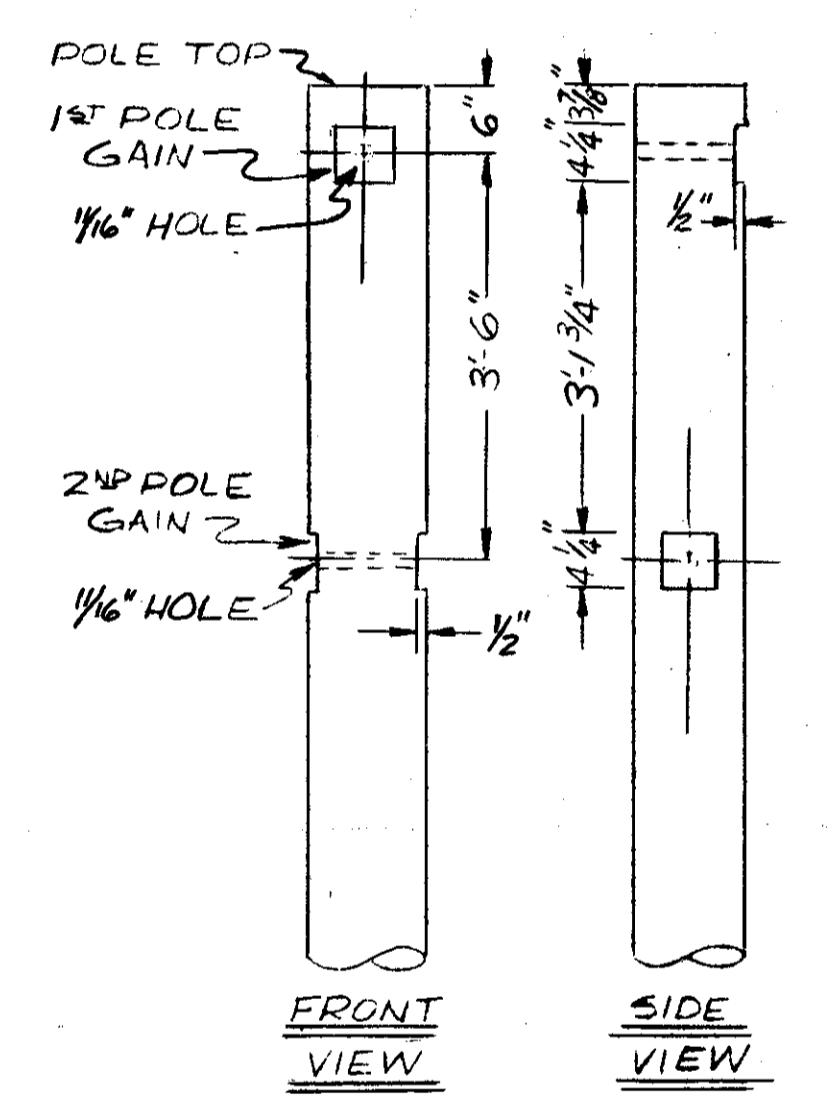
DETAIL "F"



DETAIL "G"



DETAIL "H"



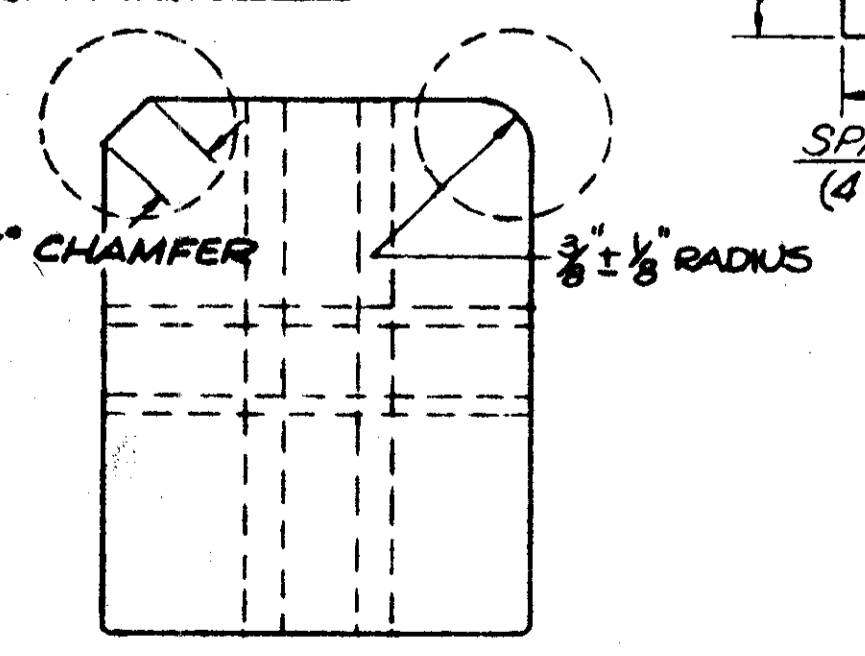
DETAIL "J"

POLE GAINING DETAILS

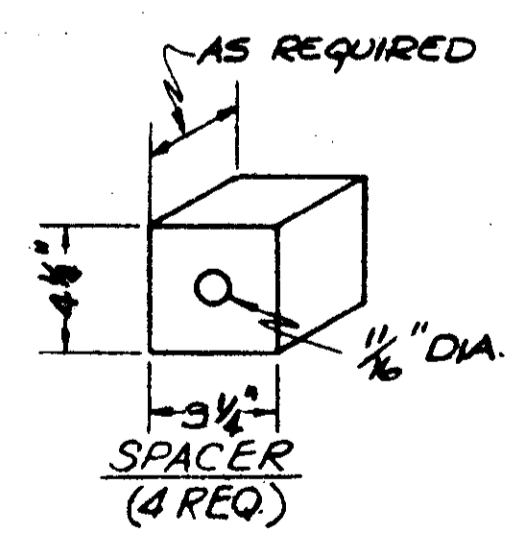
| TYPE | NO. PINS | LENGTH ARM | PIN HOLES | | | | CENTER AND END HOLE SIZE INCHES | BOLT BRACE HOLES | | | | END BOLT HOLE FOR SPACING BLOCK | | | |
|--------------------------|----------|---------------|----------------------|-----------------------|---------------------|---------------------|---------------------------------|------------------|----------------|----------------|----------------|---------------------------------|---|---|--|
| | | | SPACING INCHES SIDES | SPACING INCHES CENTER | SPACING INCHES ENDS | SPACING INCHES ENDS | | SPACING INCHES | SPACING INCHES | SPACING INCHES | SPACING INCHES | L | M | N | |
| 3 1/2" x 4 1/4" STANDARD | 4 | 5'-7 1/4" | 14 1/2" ± 1/8" | 15" ± 1/8" | 4" ± 1/8" | 1/16" | 1/16" | 2 1/2" ± 1/8" | 1 1/2" ± 1/8" | 3/16" | 7/16" | 3 1/2" ± 1/8" | | | |
| | 6 | 8'-0" ± 1/4" | " | " | " | " | " | " | " | " | " | 4 1/2" ± 1/8" | | | |
| 4" x 5" HEAVY DUTY | 6 | 10'-5" ± 1/2" | " | " | " | " | " | " | OMIT | " | OMIT | 4 1/2" ± 1/8" | | | |
| | 8 | 10'-5" ± 1/4" | " | " | " | " | " | " | OMIT | " | OMIT | 5 1/2" ± 1/8" | | | |

CROSSARM DETAILS

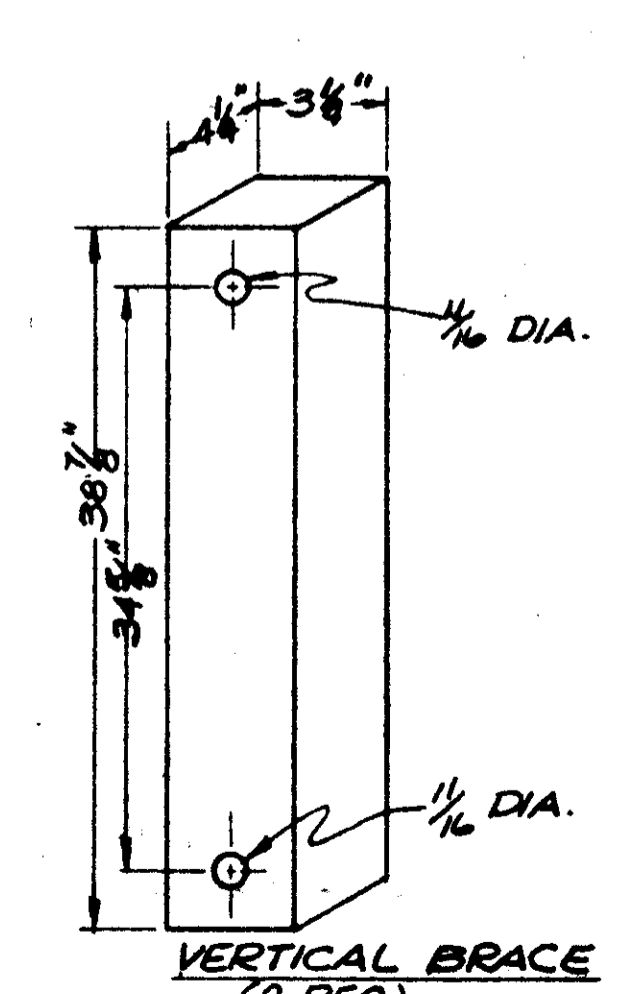
NOTES:
 THE TWO TOP EDGES (ONLY) SHALL BE EITHER CHAMFERED OR ROUNDED. (THE MANUFACTURER MAY CHOOSE THE SHAPE HE PREFERS.)
 THE TWO BOTTOM EDGES SHALL BE SLIGHTLY EASED FOR ENTIRE LENGTH 1/8" ± 1/16" RADIUS.



TYPICAL FOR ALL CROSSARMS



SPACER (4 REQ)

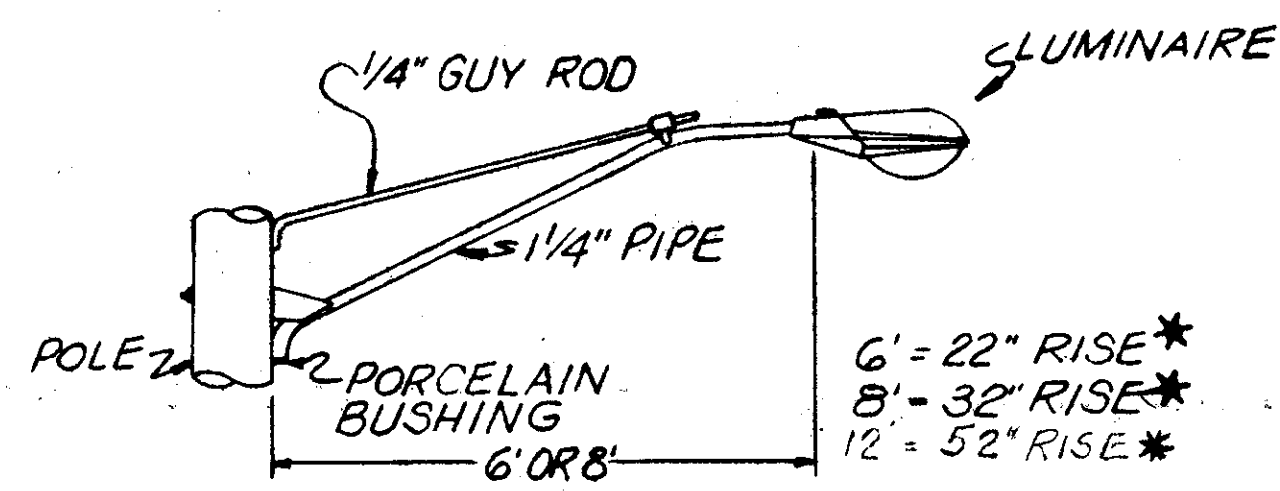


VERTICAL BRACE (2 REQ)

NOTE:
 MAY BE CUT FROM STANDARD CROSSARMS

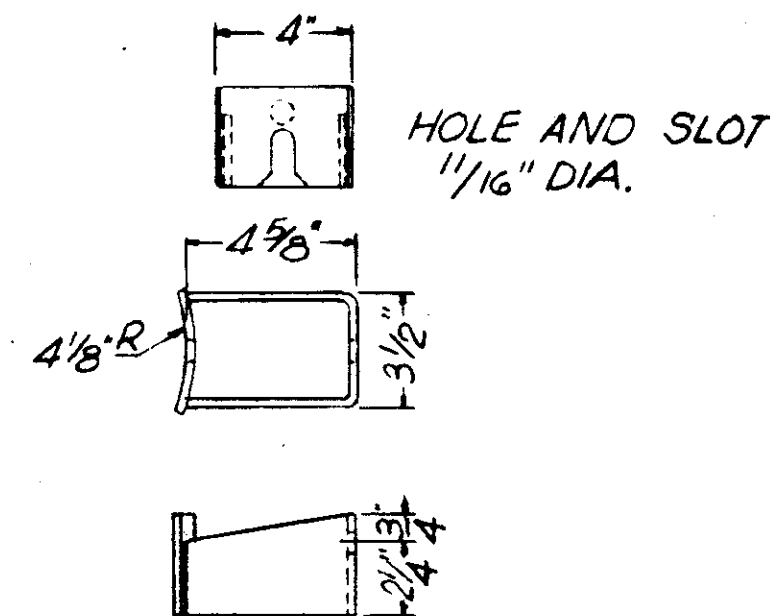
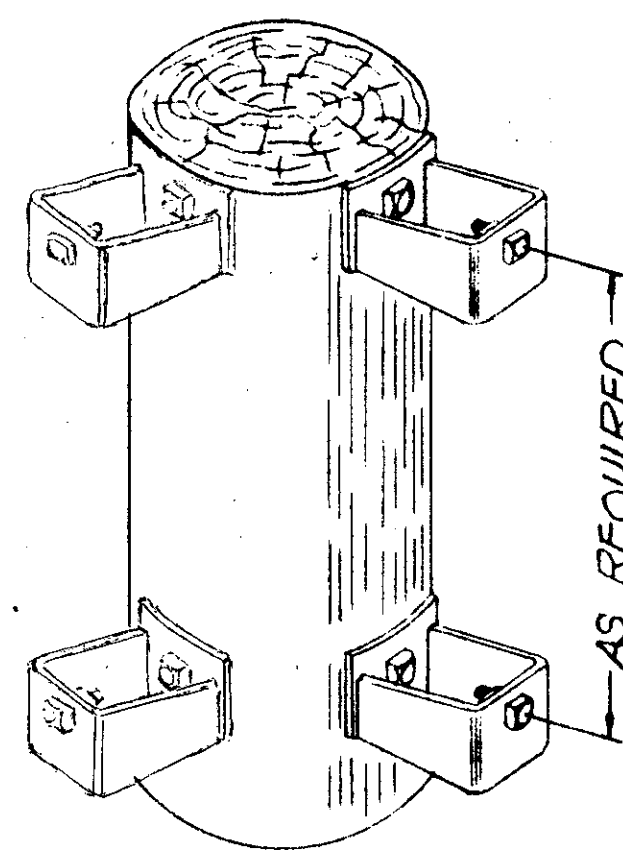
LATERAL POLE WOOD BRACING DETAILS

DIVISION OF LIGHT & POWER
CITY OF CLEVELAND
OVERHEAD DETAILS
 SCALE: No Scale
 DRAWN BY: ARG
 DATE:
 CHECKED BY:
 1078-3C

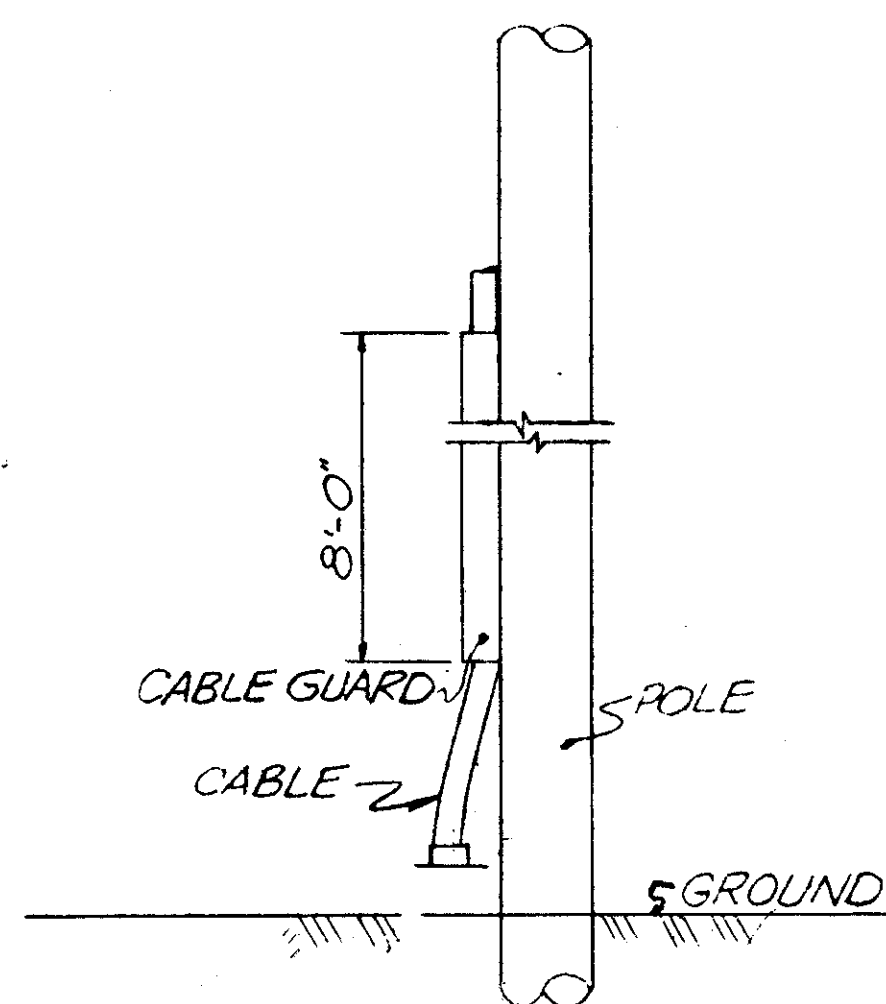


*RISE DIMENSION IS FROM TOP OF POLE PLATE TO CENTERLINE OF BRACKET.

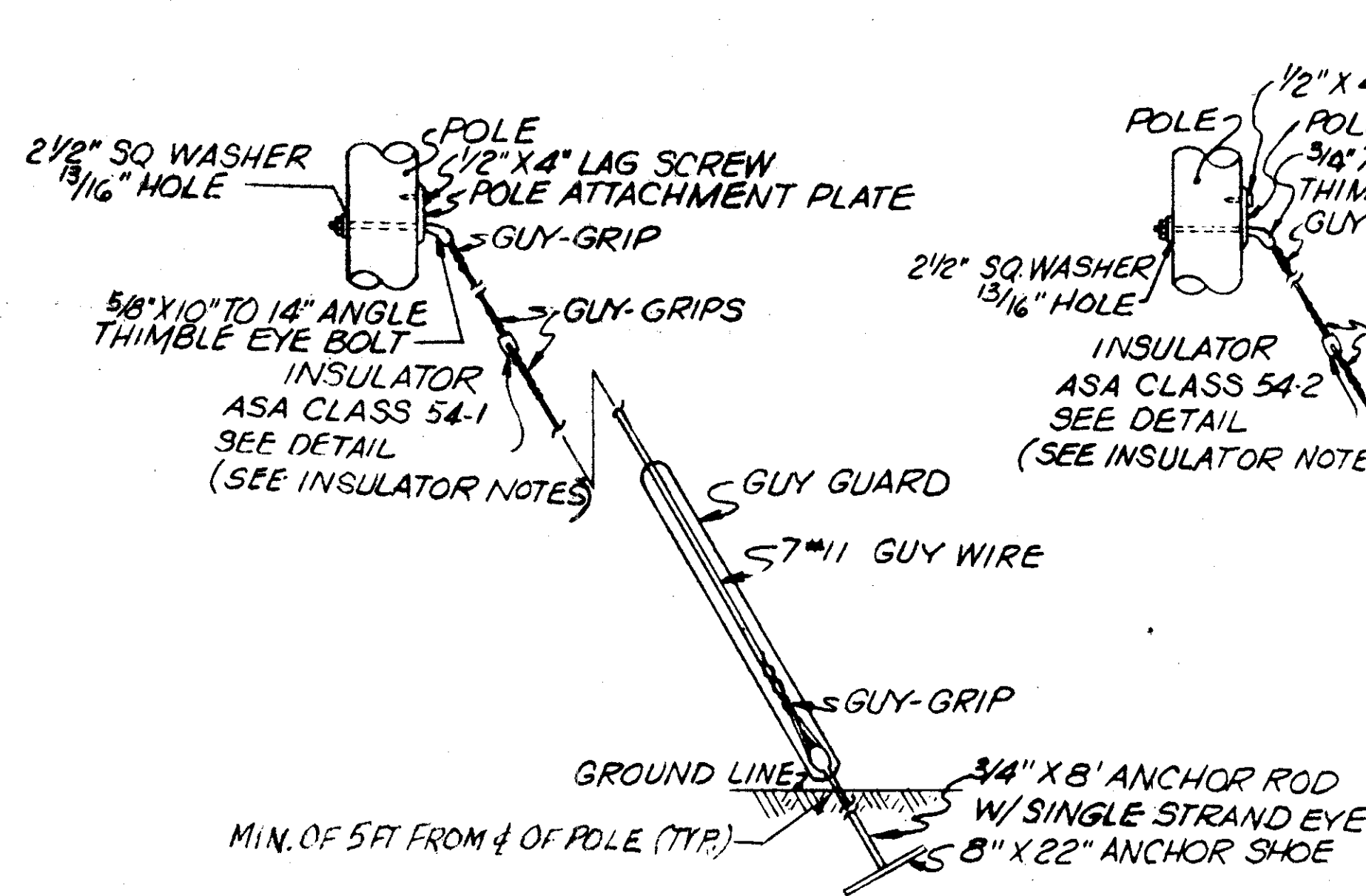
LIGHTING FIXTURE W/BRACKET ARM



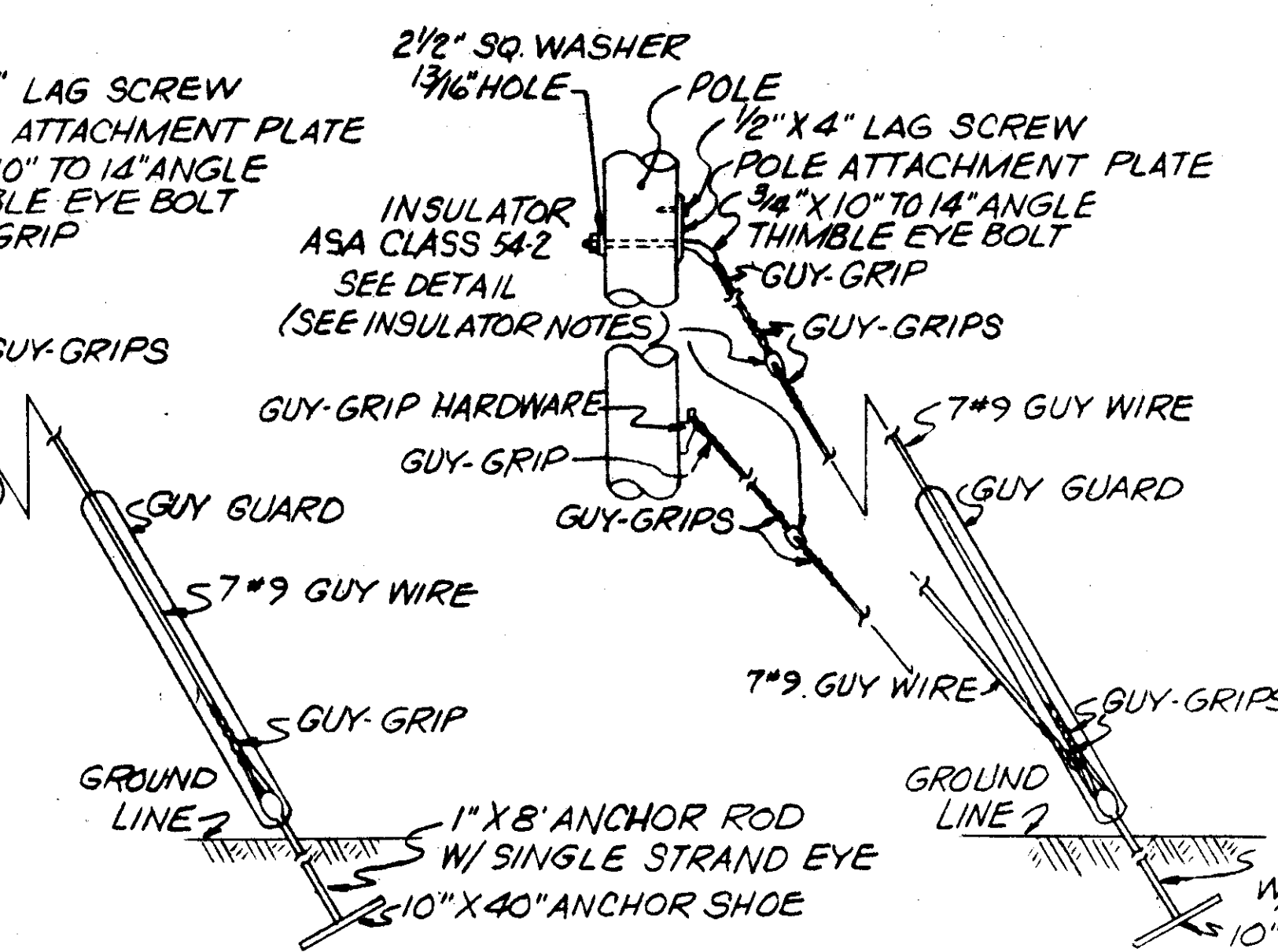
TRANSFORMER MOUNTING BRACKET
TO BE USED FOR 2 OR 3-1/2 TRANSFORMER BANKS ONLY



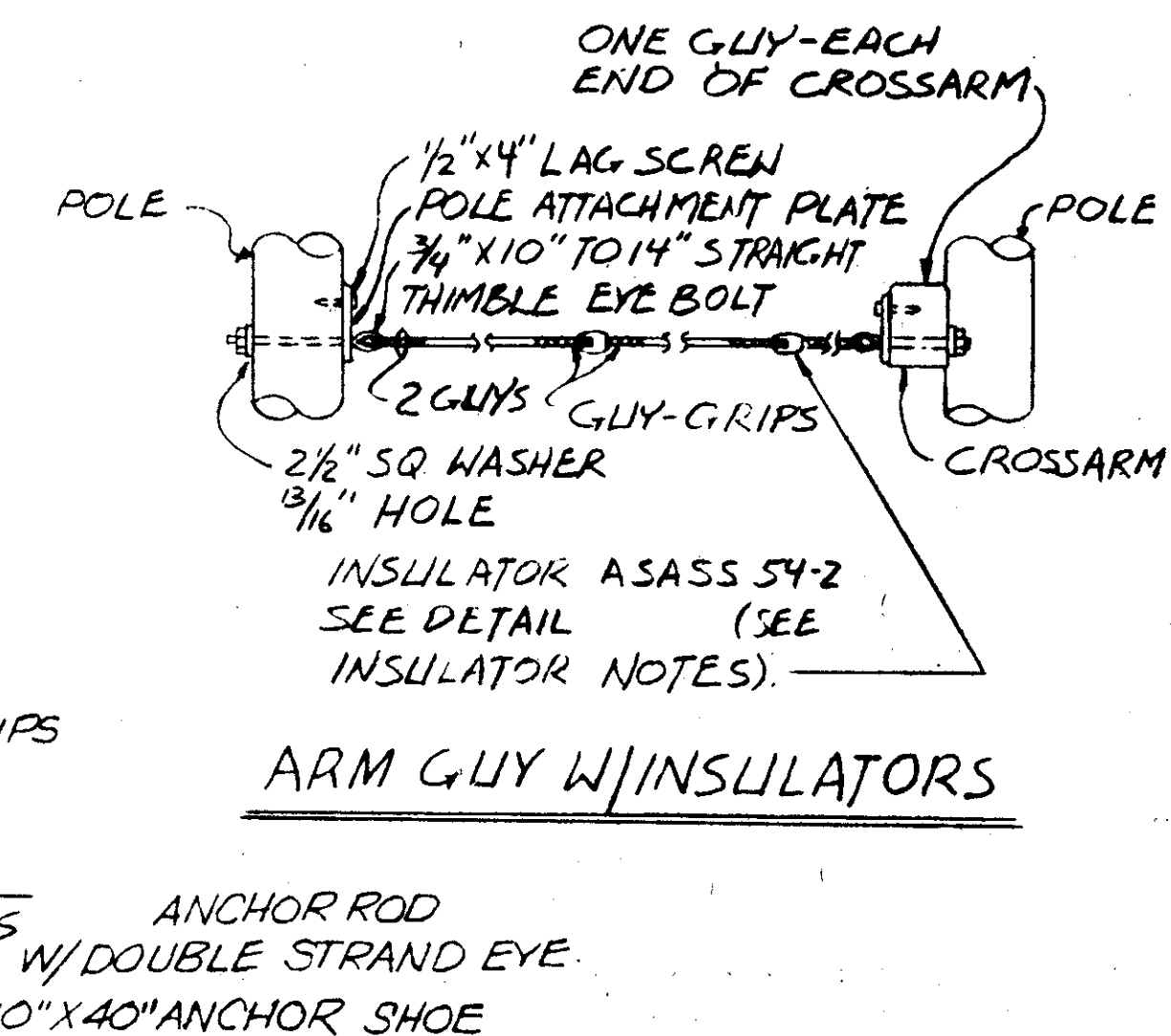
CABLE AND CABLE GUARD



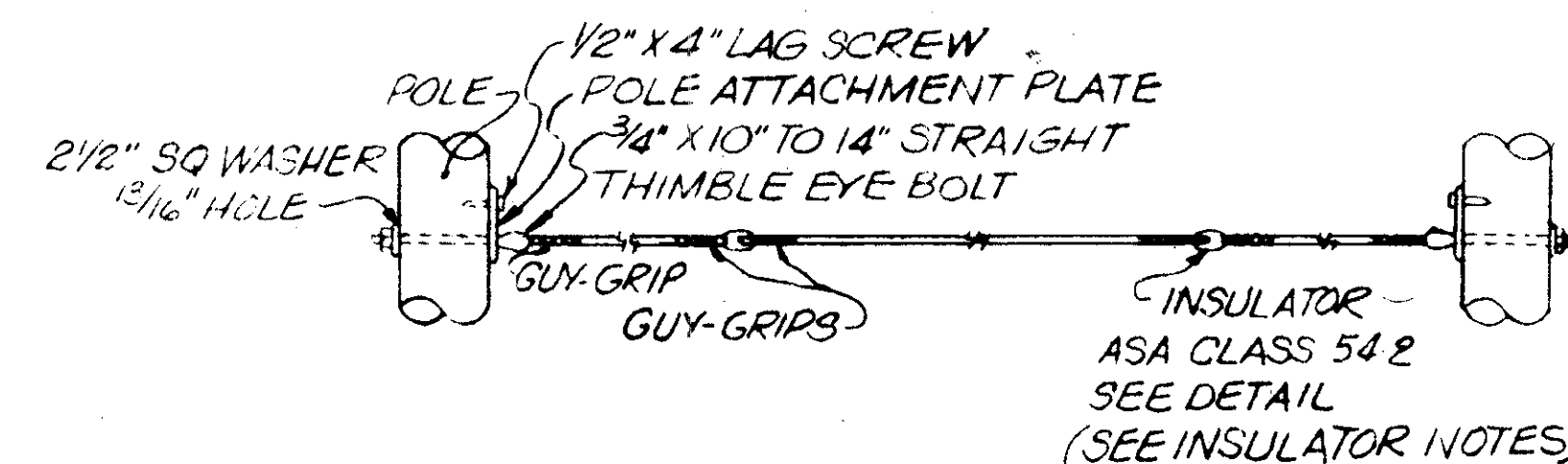
STANDARD ANCHOR GUY W/INSULATOR



HEAVY DUTY ANCHOR GUY W/INSULATOR

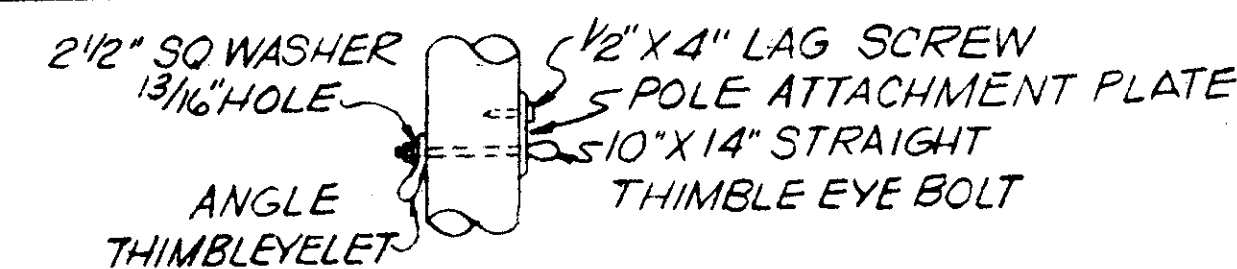


ARM GUY W/INSULATORS



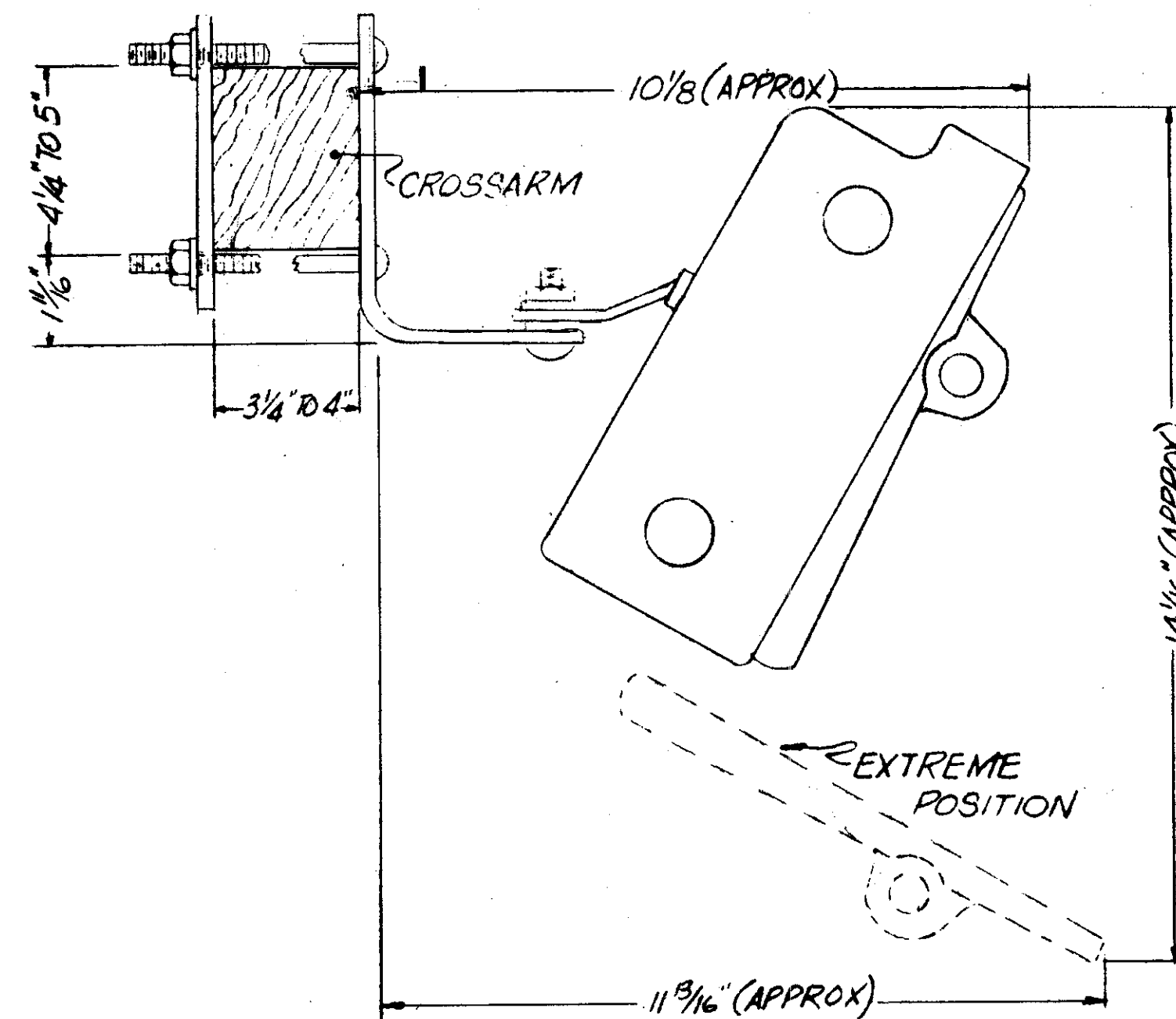
HEAD-GUY W/INSULATORS

NOTE
USE ANGLE OR STRAIGHT THIMBLEYELETS IN CONJUNCTION WITH ANGLE OR STRAIGHT THIMBLE EYE BOLT WHEN A SECOND GUY IS USED IN THE OPPOSITE DIRECTION.
EXAMPLE:

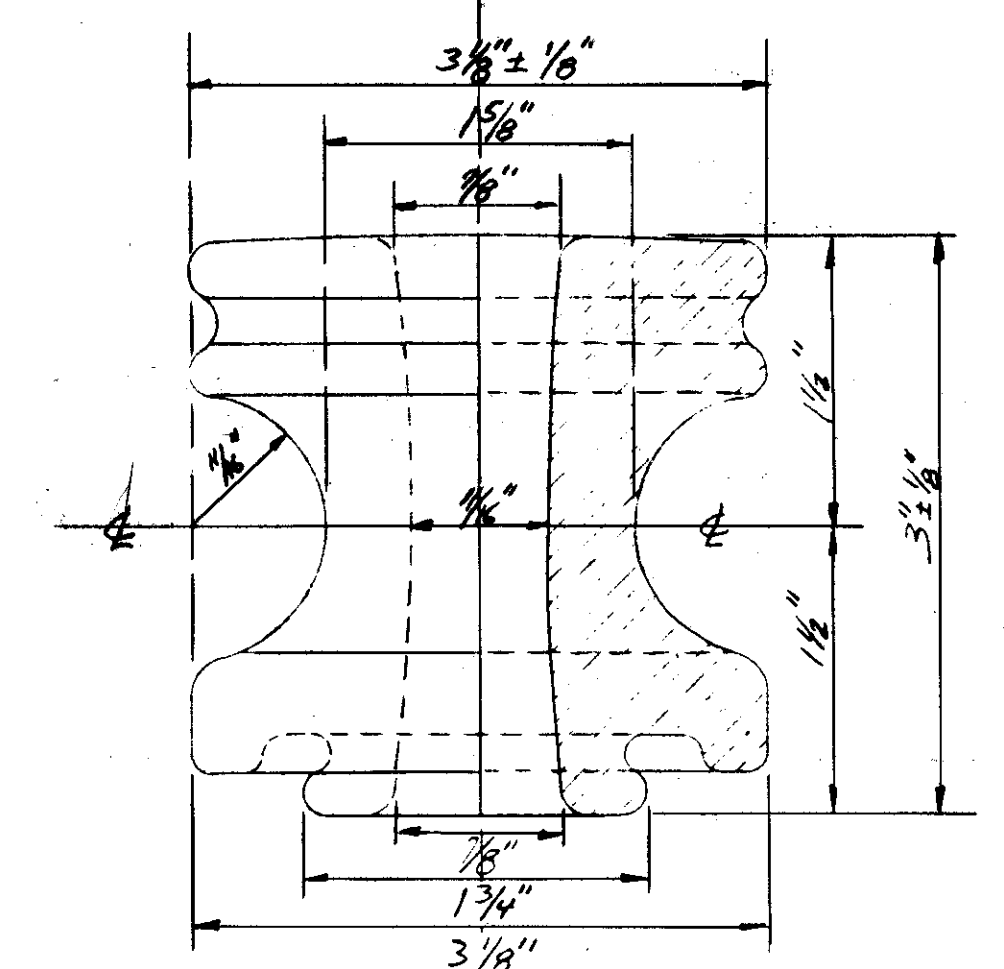
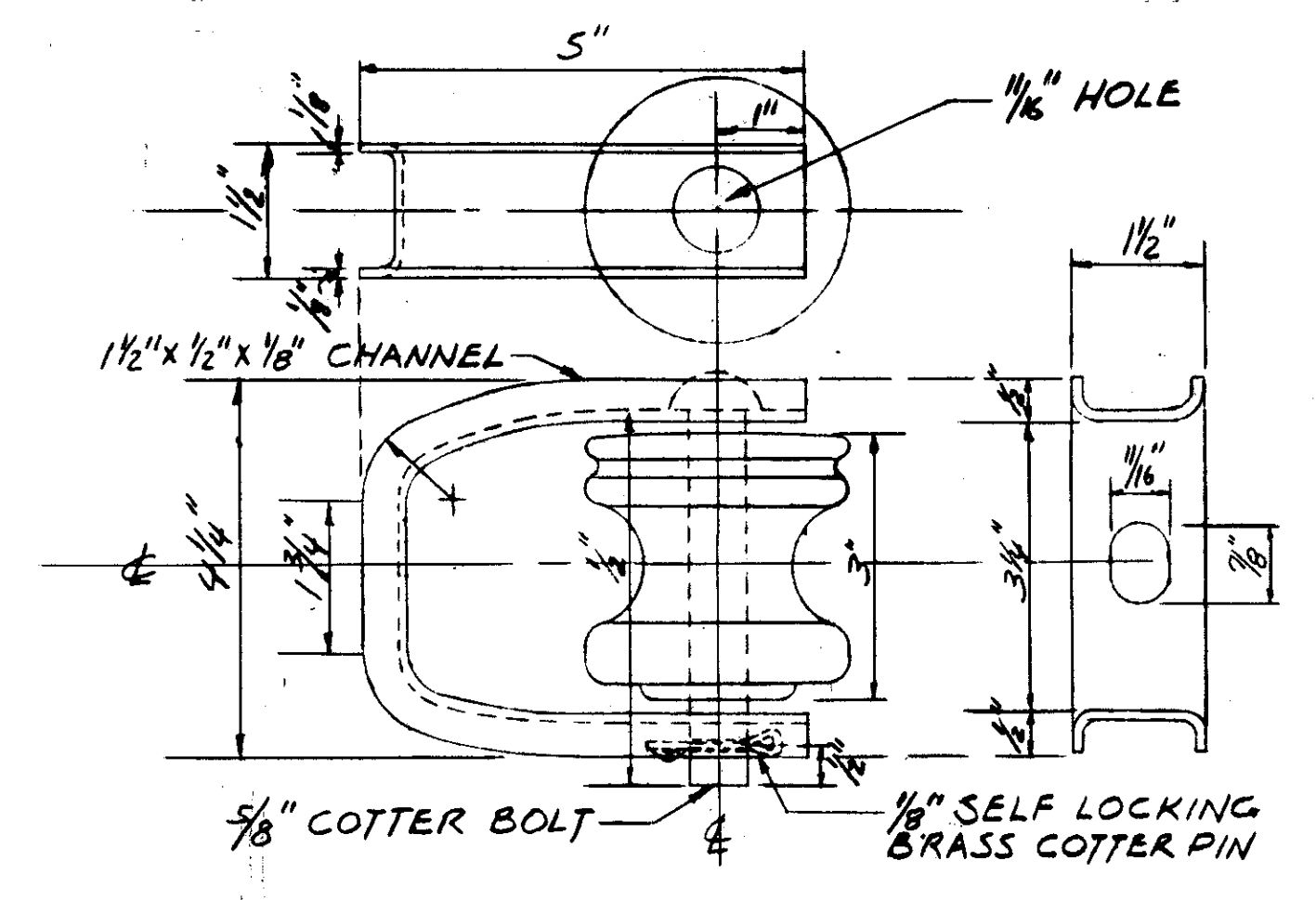
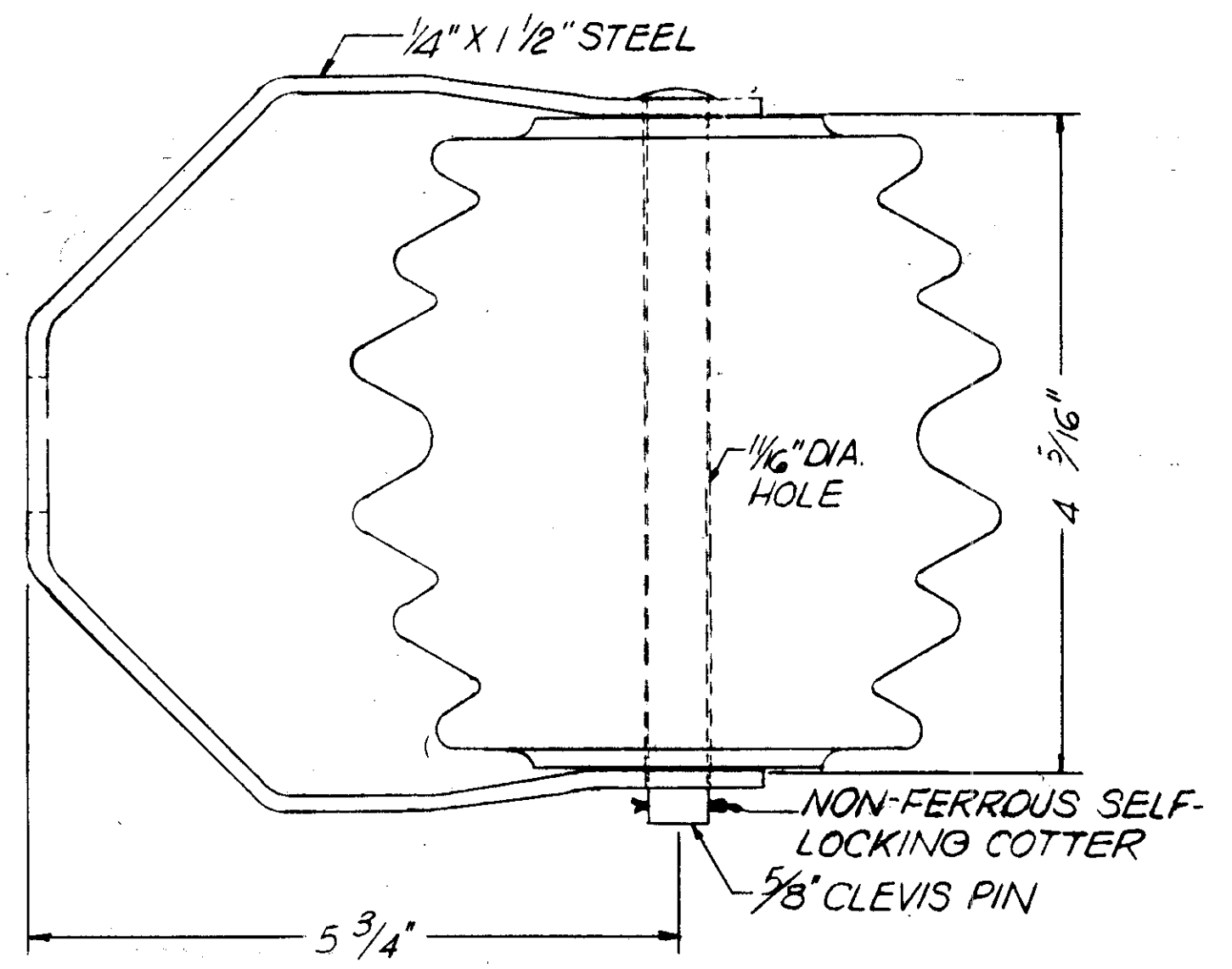
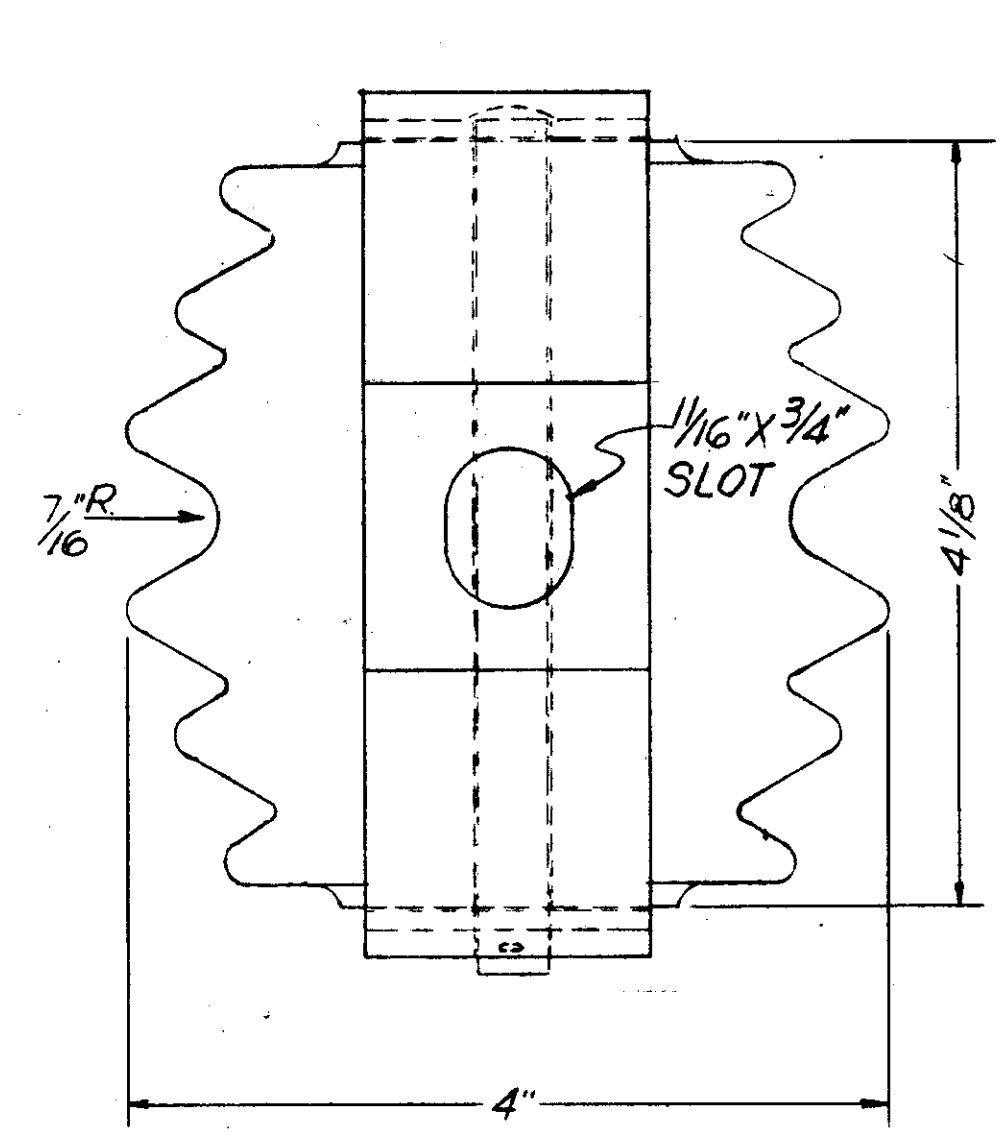


INSULATOR NOTES
(AS PER NATIONAL ELECT. SAFETY CODE)

- INSULATORS ARE NOT REQUIRED IN GUYS UNDER THE FOLLOWING CONDITIONS:
 - WHERE THE GUY IS ELECTRICALLY CONNECTED TO GROUNDED STEEL STRUCTURES OR TO A GROUND CONNECTION ON WOOD POLES.
 - WHERE THE GUYS ARE UNIFORMLY GROUNDED THROUGHOUT ANY SYSTEM OF OVERHEAD LINES.
 - WHERE A GUY IS ATTACHED TO A POLE ON PRIVATE RIGHT OF WAY CARRYING NO SUPPLY CIRCUITS WHERE VOLTAGE EXCEEDS 550V OR WHOSE TRANSMITTED POWER EXCEEDS 3200 WATTS.
- AN INSULATOR SHALL BE LOCATED IN EACH GUY WHICH IS ATTACHED TO A POLE OR A STRUCTURE CARRYING ANY SUPPLY CONDUCTORS OF MORE THAN 300V TO GROUND AND NOT MORE THAN 15000V BETWEEN CONDUCTORS, OR IN ANY GUY EXPOSED TO SUCH VOLTAGES. THIS GUY INSULATOR SHALL BE LOCATED AT LEAST 8'-0" ABOVE GROUND.
- WHERE A GUY ATTACHED TO ANY POLE CARRYING COMMUNICATION OR SUPPLY CONDUCTORS OR BOTH, IS CARRIED OVER OR UNDER ANY OVERHEAD SUPPLY CONDUCTORS OF MORE THAN 300V TO GROUND AND WHERE HAZARD OTHERWISE WOULD EXIST, TWO OR MORE GUY INSULATORS SHALL BE PLACED SO AS TO INCLUDE THE EXPOSED SECTION OF THE GUY BETWEEN THEM AS FAR AS POSSIBLE. NEITHER INSULATOR SHALL BE WITHIN 8'-0" OF THE GROUND.



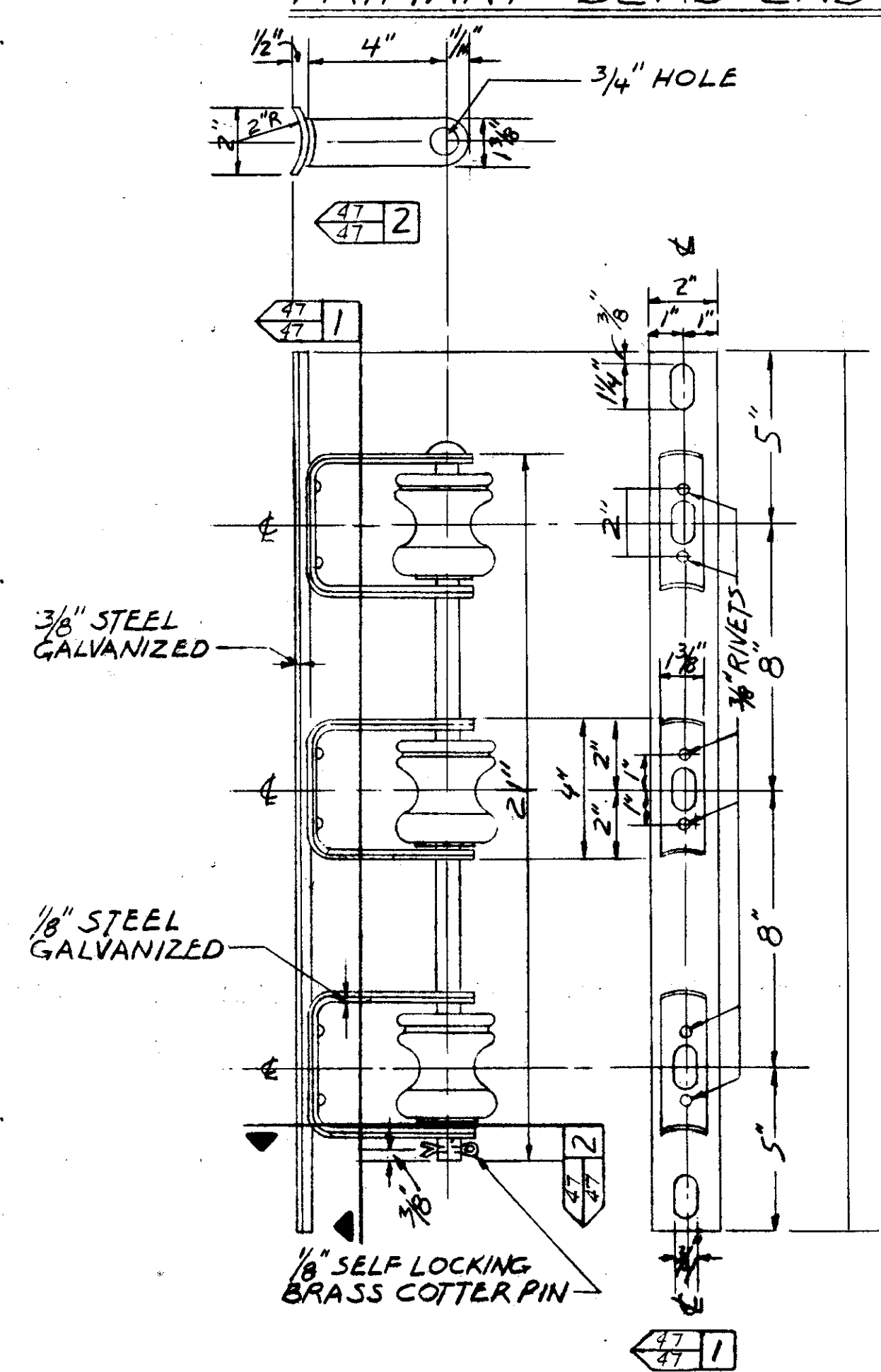
ENCLOSED THROTTLE CUTOUT



1PT SECONDARY PORCELAIN RACK

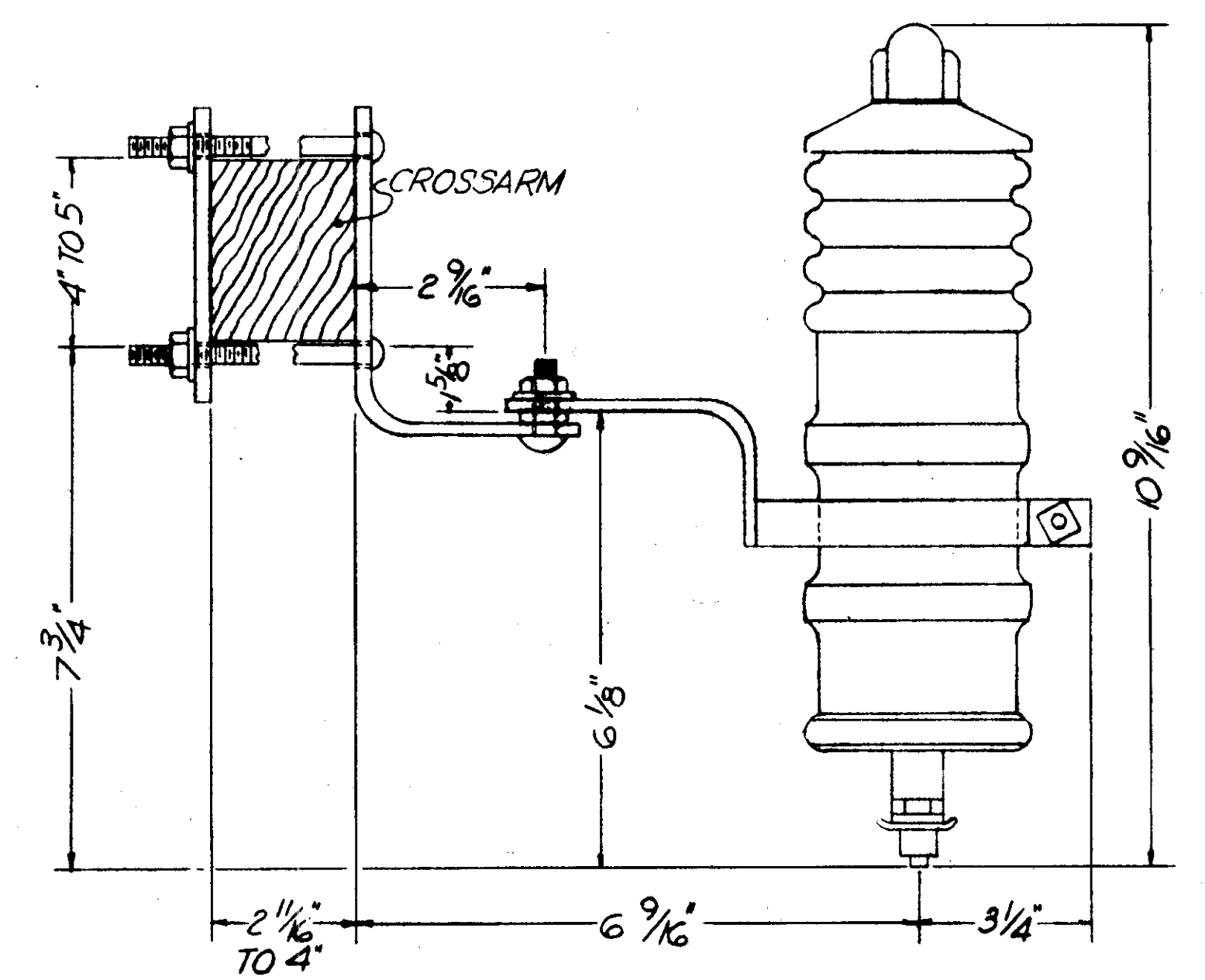
DETAIL - WET PROCESS
PORCELAIN SPOOL

PRIMARY DEAD-END INSULATOR

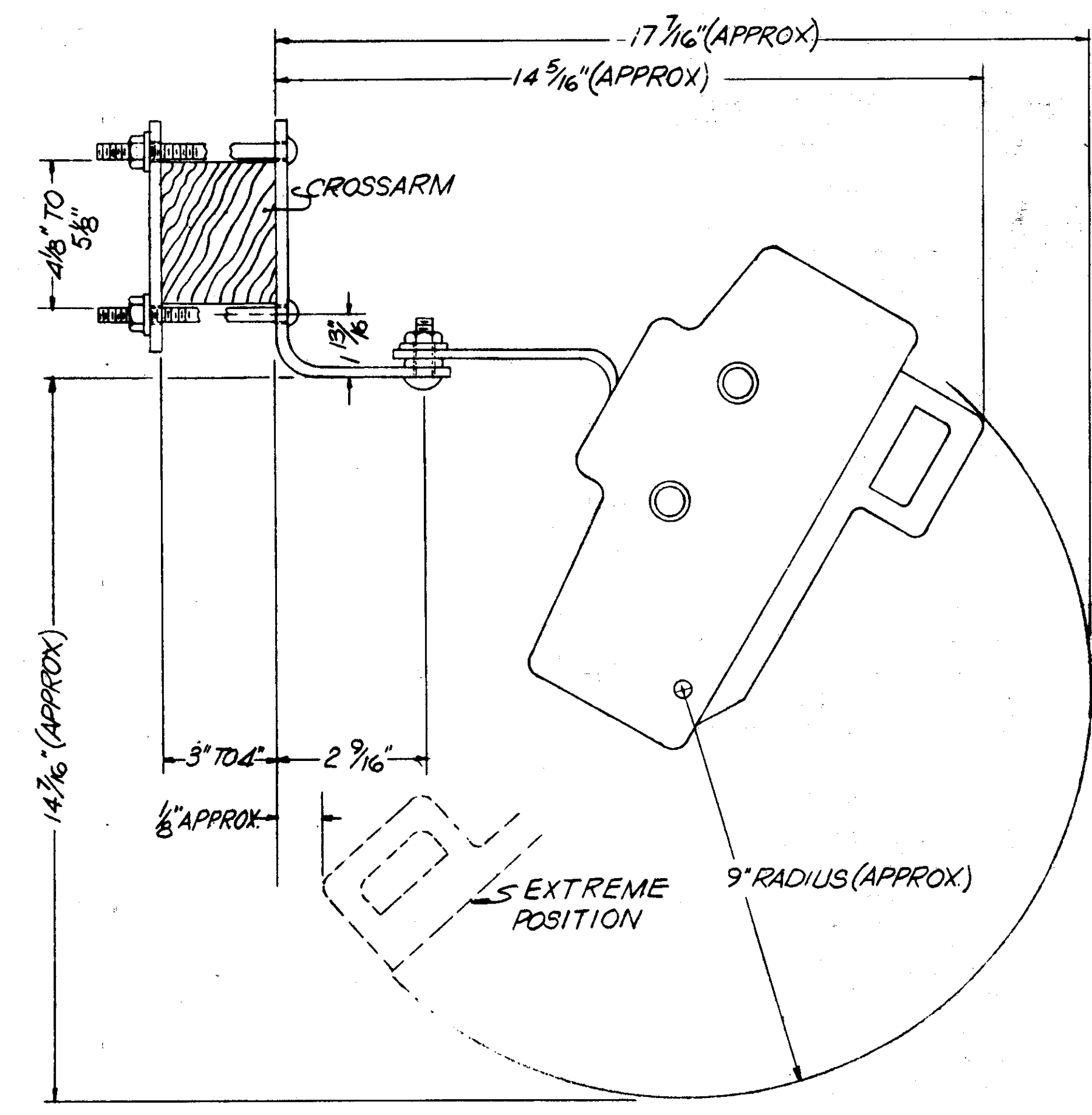


5/8" BUTTON HEAD
BOLT - HIGH CARBON
STEEL

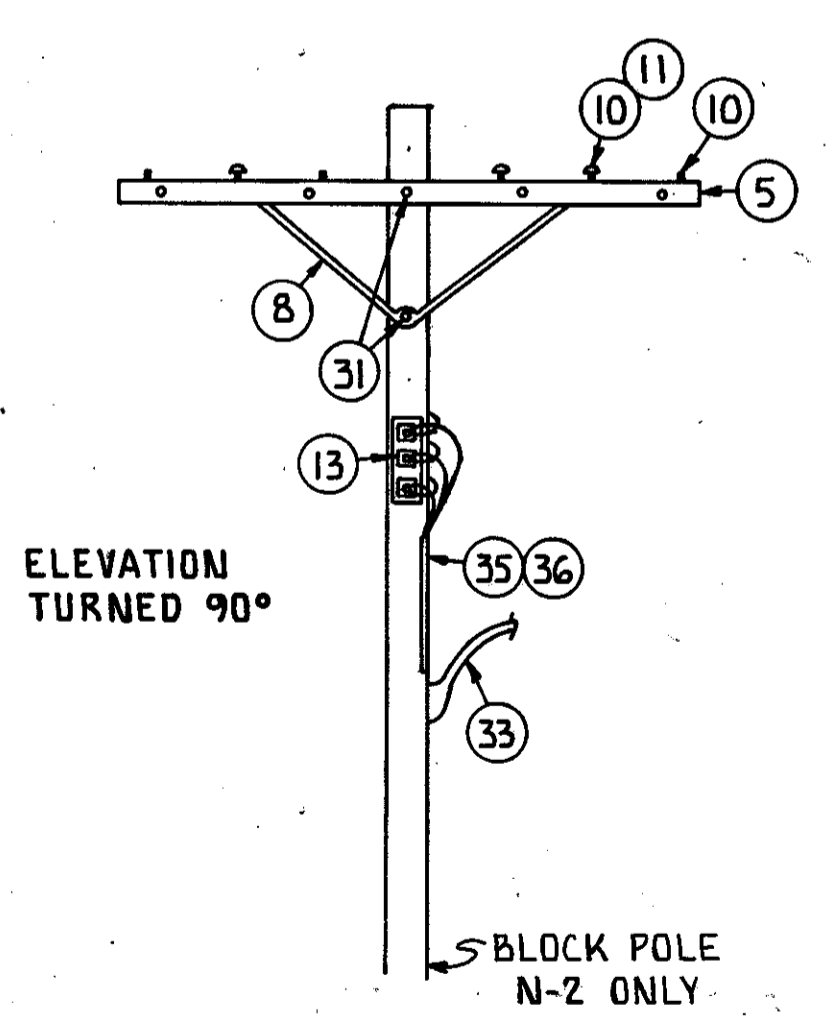
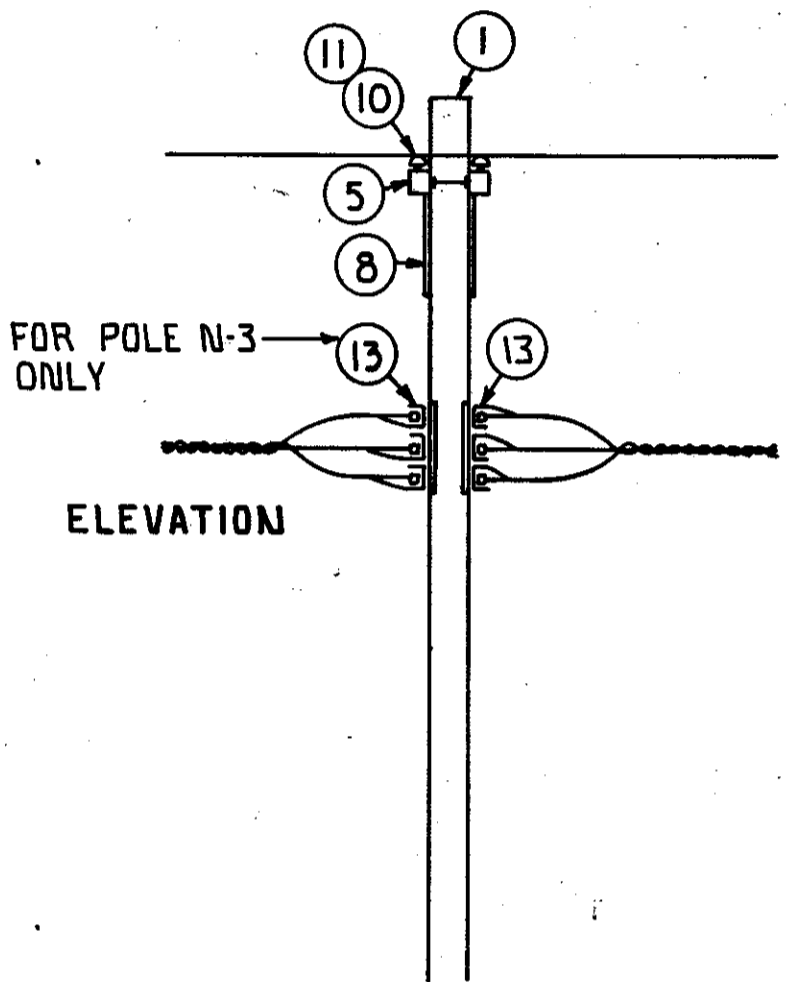
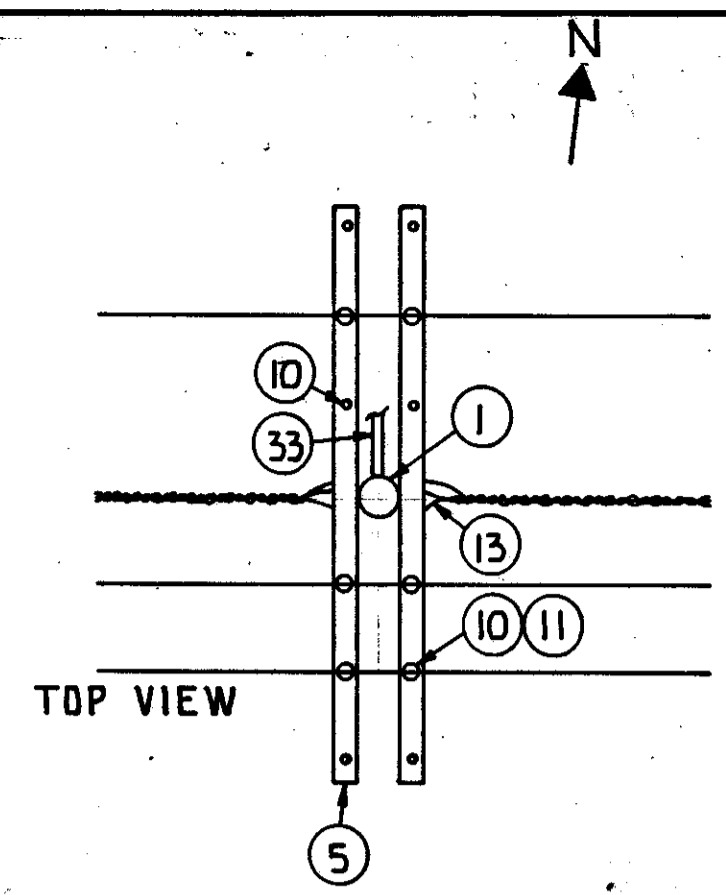
THREE POINT SECONDARY RACK



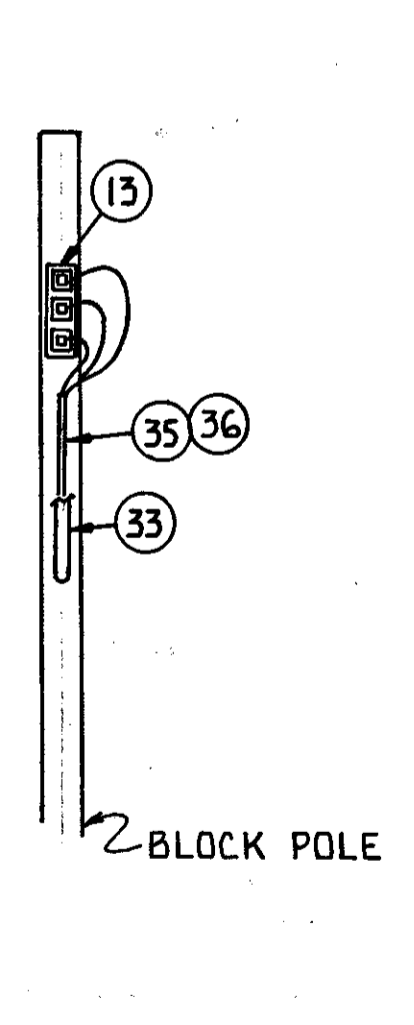
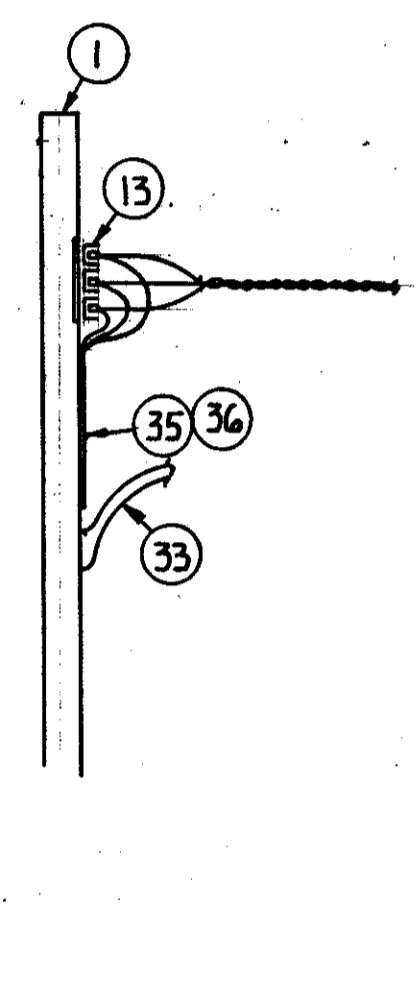
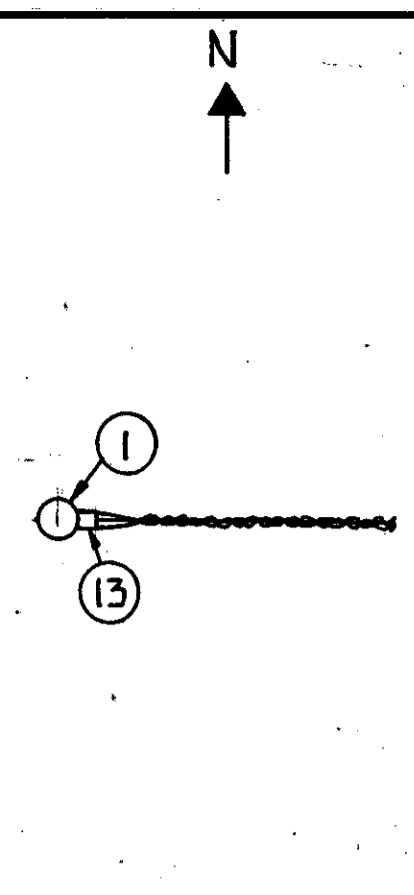
LIGHTNING ARRESTER



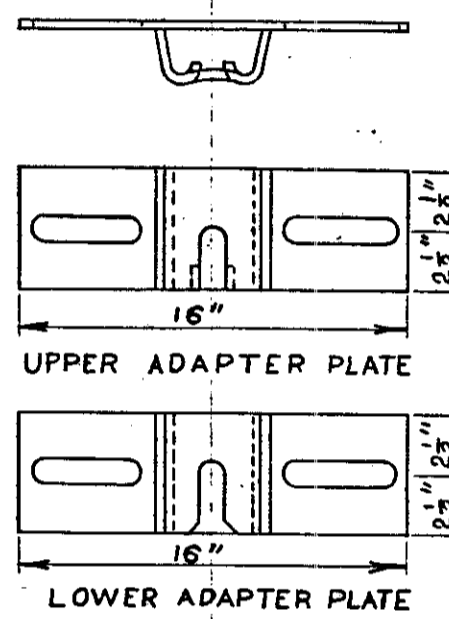
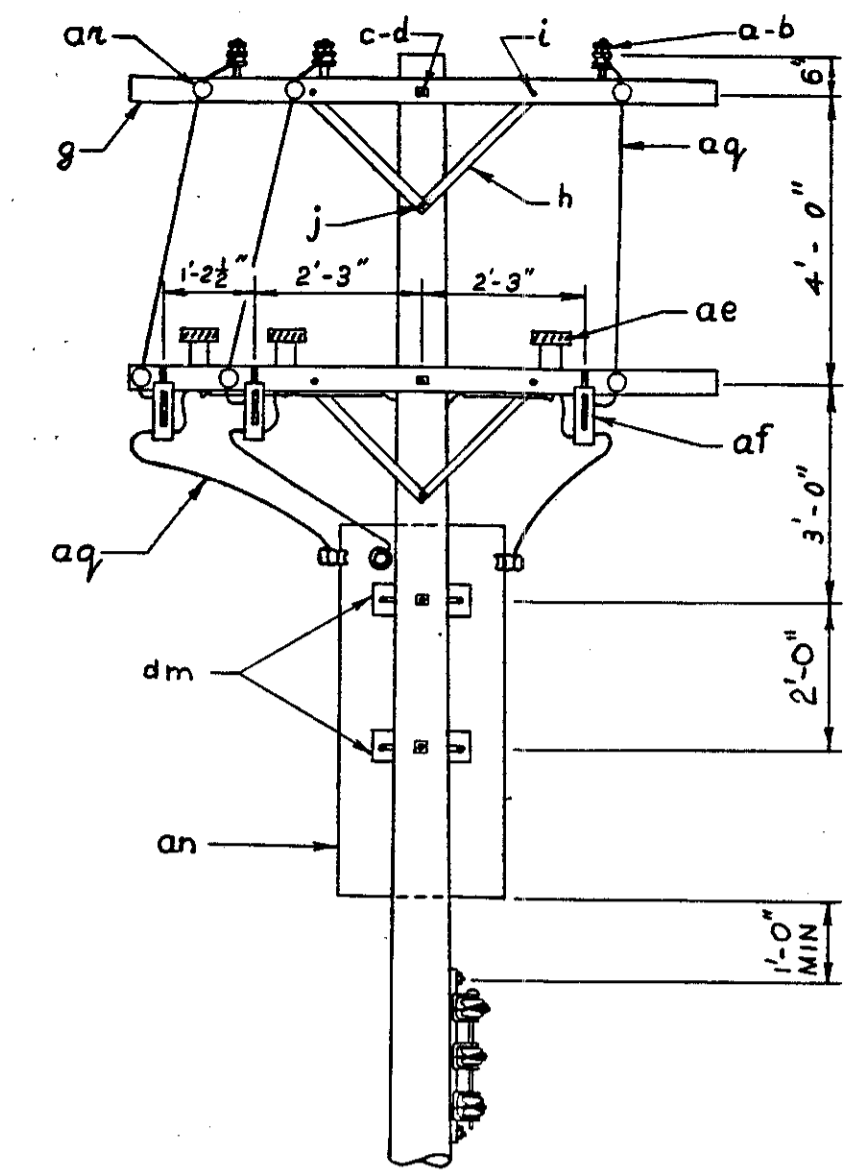
LOAD BREAK DISCONNECT



POLE N-2, N-3
FOR BILL OF MATERIAL
SEE SHEET 176 (7078-3H)



POLE N-6
FOR BILL OF MATERIAL
SEE SHEET 176 (7078-3H)

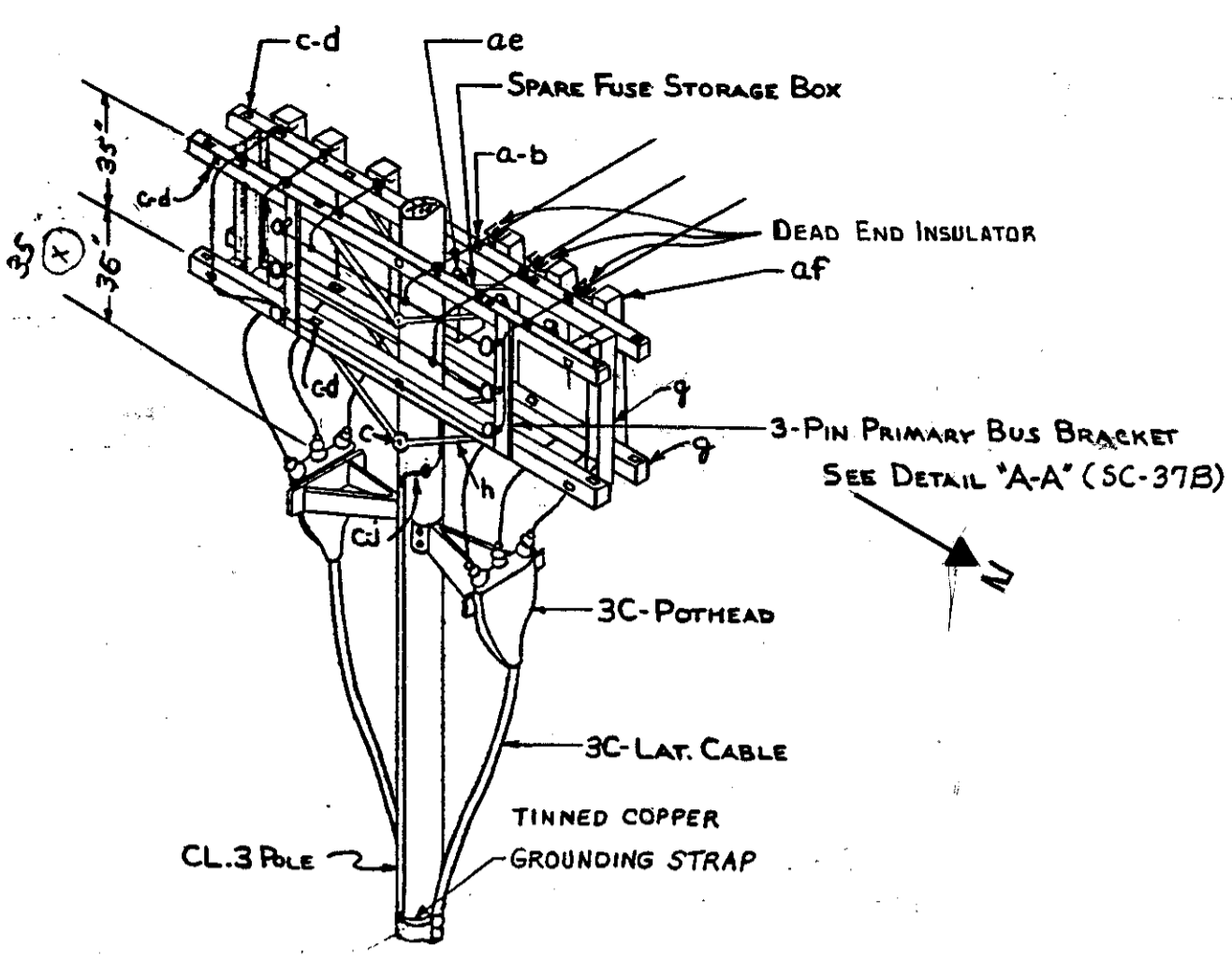
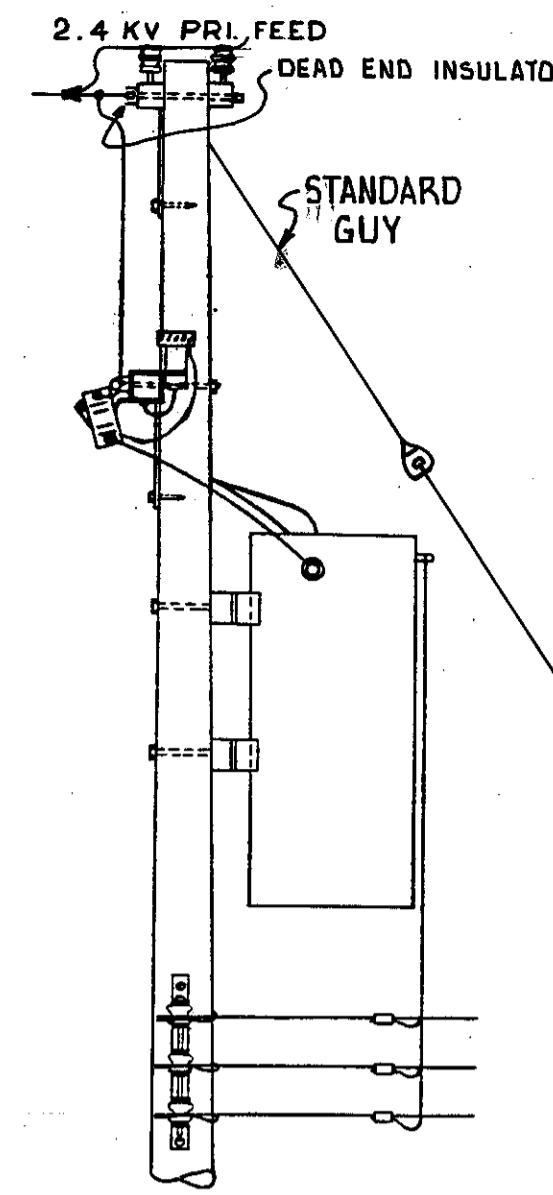


| | |
|---|------------|
| STD. TRANSFORMER POLE CONSTRUCTION, 1-75 TO 150 KVA - 3 Ø TRANSFORMER, DIRECT POLE MT. | |
| DATE | BY |
| 6-1-64 | HVG |
| DIVISION OF LIGHT & POWER CLEVELAND, OHIO | |
| REVISION | CHECKED BY |
| | G. HANN |
| | DATE |
| | 5-29-62 |
| SUPERSEDED # SC-167 | |

| SYM | QUAN | CODE NO. | DESCRIPTION |
|-----|------|----------|-------------------------------|
| dm | 2 | B-104 | HEAVY DUTY 6 PIN CROSS ARM |
| | 4 | B-573 | CROSS ARM BRACES - FLAT |
| | 1 | B-1157A | #6 CU. W.P. GROUND WIRE |
| | 1 | B-713 | GROUND MOULDING |
| | 1 | B-6279 | 3 PT. SEC. RACK |
| | 1 | B-5745 | 75 TO 150 KVA 3 Ø TRANSFORMER |
| | 4 | B-601 | STEEL PINS |
| | 1 | B-4326 | LINE INSULATORS |
| | 1 | B-7823 | PORCELAIN BRACKET, 1-PT. |
| | 1 | B-176A | 3/4" x 3 1/2" LAG SCREW |
| | 1 | B-1413 | 3/8" x 5" CARRIAGE BOLTS |
| | 1 | B-1398 | 3/8" x 12" MACHINE BOLTS |
| | 1 | B-1414 | 3/4" x 10" MACHINE BOLTS |
| | 1 | B-1500A | 3/8" x 14" MACHINE BOLTS |
| | 1 | B-9381 | 3/4" SQ. WASHERS 1/2" HOLE |
| | 1 | B-12136A | 3" x 5" CURVED WASHERS |
| | 1 | B-133 | 6-5 KV RUBBER INS. PRI. CABLE |
| | 1 | B-6707 | 3W LIGHTNING ARRESTERS |
| | 1 | B-5874 | THROTTLE CUTOUPS |
| | 1 | B-5874 | ADAPTER PLATES |
| | 1 | B-5874 | STANDARD 6 PIN CROSS ARM |

| | |
|---|------------|
| STD. TRANSFORMER POLE CONSTRUCTION, 1-75 TO 150 KVA - 3 Ø TRANSFORMER, DIRECT POLE MT. | |
| DATE | BY |
| 6-1-64 | HVG |
| DIVISION OF LIGHT & POWER CLEVELAND, OHIO | |
| REVISION | CHECKED BY |
| | R. J. A. |
| | DATE |
| | 6-1-64 |
| SUPERSEDED # SC-167 | |

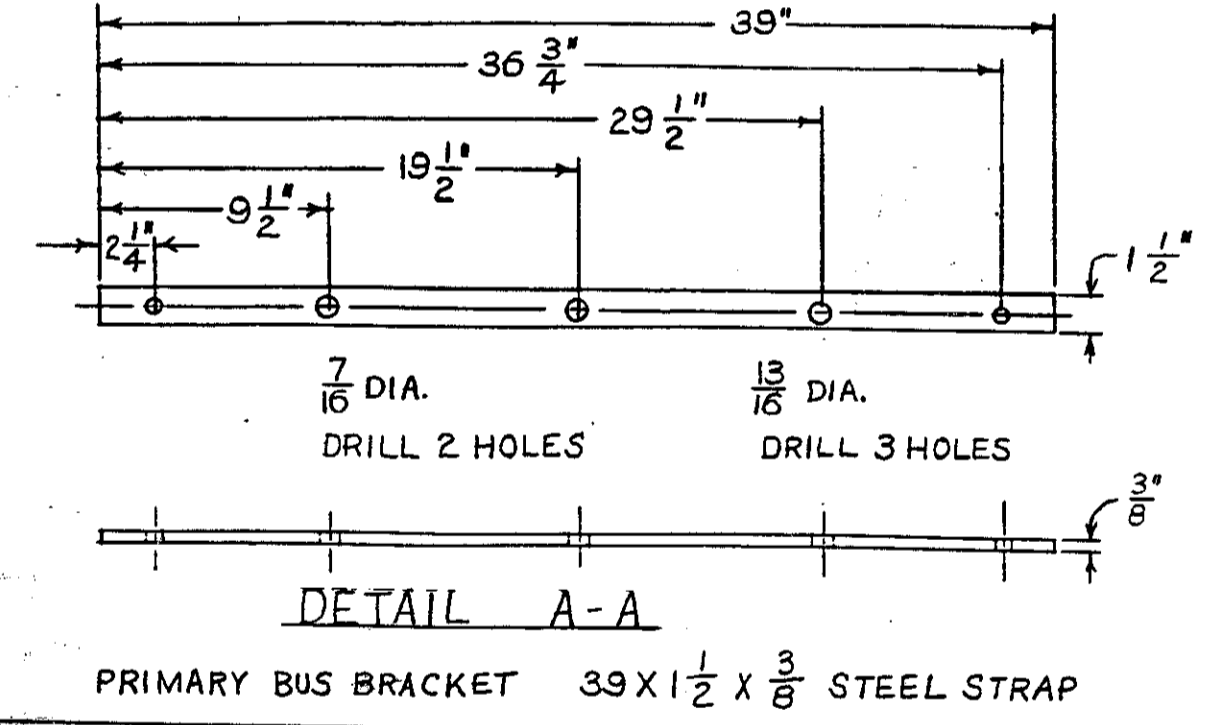
POLE N-1
MELP STD. DWG. 11-2-12-1 & 11-2-12-2



| SYM | QUAN | CODE NO. | DESCRIPTION |
|-----|------------|----------|------------------------------|
| B | 2 | B-105 | HEAVY DUTY 6 PIN CROSS ARMS |
| B | 2 | B-102 | STD. 6 PIN CROSS ARM |
| B | 2 | B-574 | LATERAL POLE WOOD BRACE |
| A | 2 | B-2745 | ANGLE IRON CROSS ARM BRACES |
| D | 4 | B-4326 | LINE INSULATORS |
| CJ | 60 (APPR.) | B-1157A | #6 CU. W.P. GROUND WIRE |
| | 40 (APPR.) | B-713 | GROUND MOULDING |
| C | 1 | B-1707 | 1/2" x 8" GROUND ROD |
| C | 6 | B-1415 | 3/8" x 10" MACHINE BOLTS |
| C | 2 | B-1417 | 3/8" x 10" MACHINE BOLTS |
| C | 2 | B-1418 | 3/8" x 14" MACHINE BOLTS |
| C | 2 | B-1419 | 3/8" x 16" MACHINE BOLTS |
| C | 2 | B-1501 | 3/8" x 14" MACHINE BOLTS |
| C | 2 | B-1500A | 3/8" x 16" WASHERS 1/2" HOLE |
| C | 2 | B-1417 | 1/8" SQ. WASHERS 3/16" HOLE |
| C | 4 | B-1415 | 3/8" x 10" MACHINE BOLTS |
| A-F | 6 | B-2799 | 100 AMP THROTTLE CUTOUPS |
| B | 2 | B-1170 | POTHEAD |
| B | 2 | B-587 | SPARE FUSE STORAGE BOX |

NOTE:
FOR CONNECTIONS SEE DRAWINGS SC-100 TO SC-106

| | |
|---|------------|
| STD LATERAL POLE CONSTRUCTION 6-100 AMP THROTTLE CUTOUPS | |
| DATE | BY |
| 70-2-1-9 | R. J. A. |
| DIVISION OF LIGHT & POWER CLEVELAND, OHIO | |
| REVISION | CHECKED BY |
| | R. J. A. |
| | DATE |
| | 6-19-68 |
| SUPERSEDED # SC-374 | |

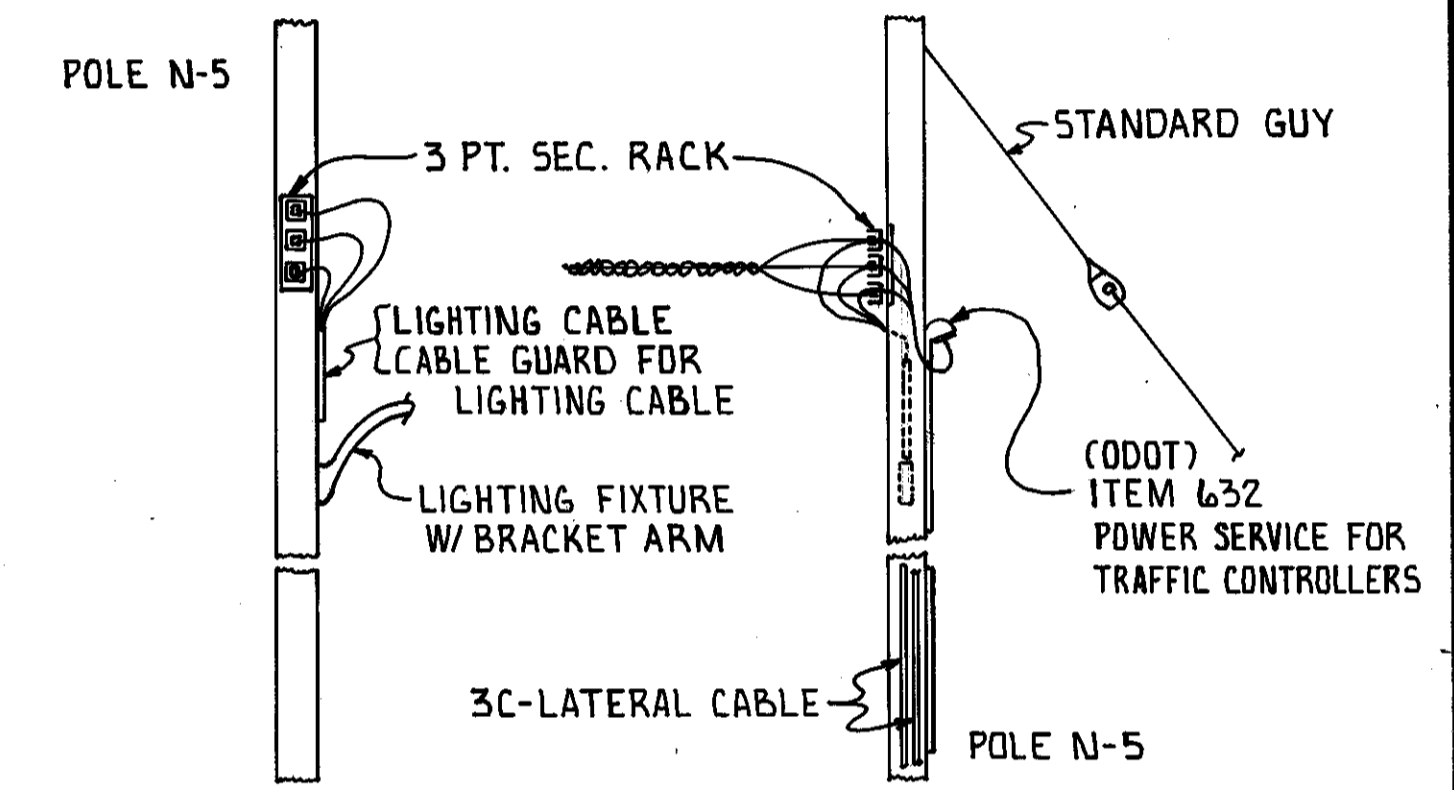


NOTE
FOR CONNECTIONS SEE DRAWINGS SC-100 TO SC-106

| SYM | QUAN. | CODE NO. | DESCRIPTION |
|-----|------------|----------|------------------------------|
| B | 2 | B-5694 | STEEL BUS STRAPS 'A-A' |
| B | 6 | B-5930 | STEEL INSULATOR PINS |
| B | 15 (APPR.) | B-2118 | 1/8" LAT. CABLE GUARDS |
| B | 2 | B-1955 | 1/8" LAT. CABLE GUARD CLAMPS |
| | | B-1955 | 1/8" LAT. CABLE GUARD CAPS |

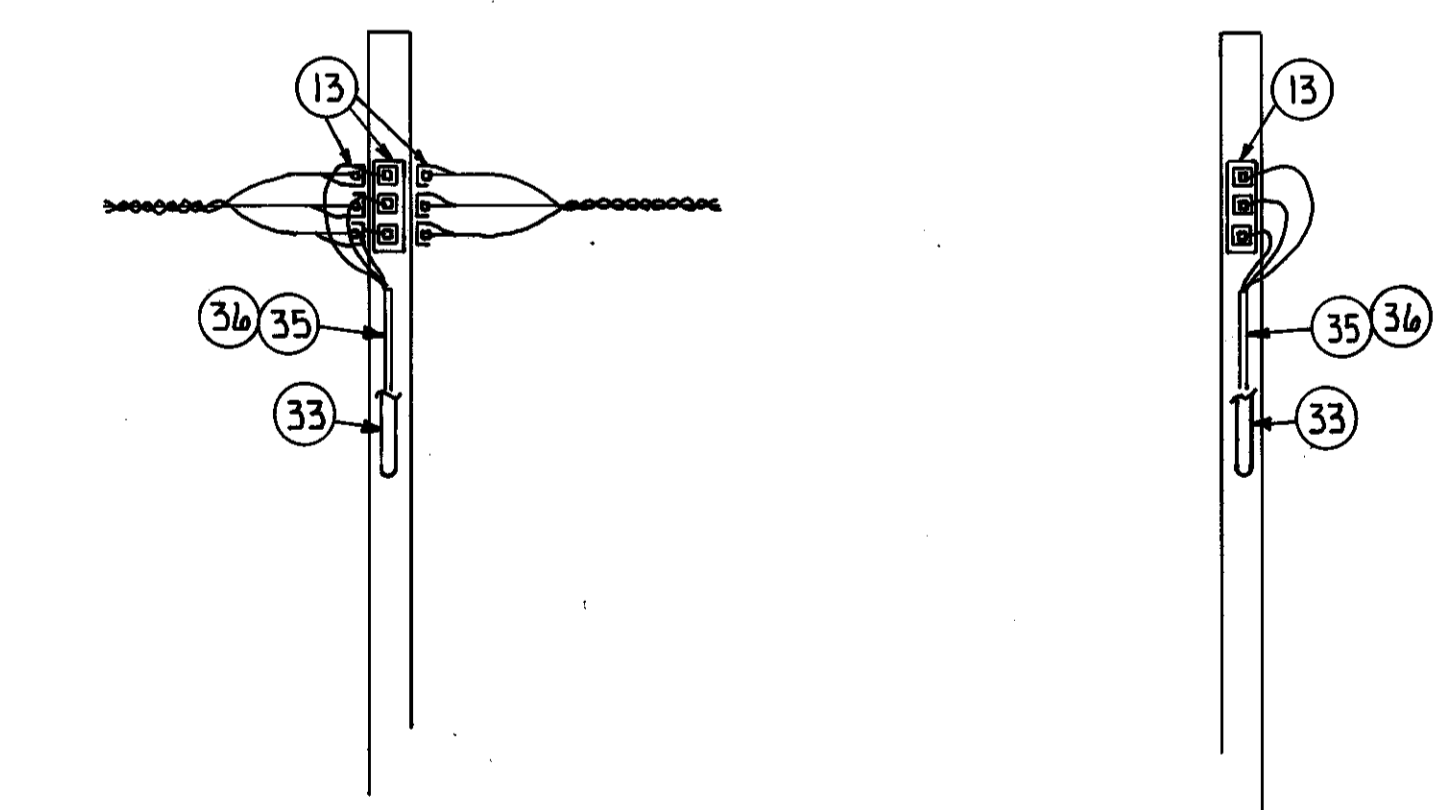
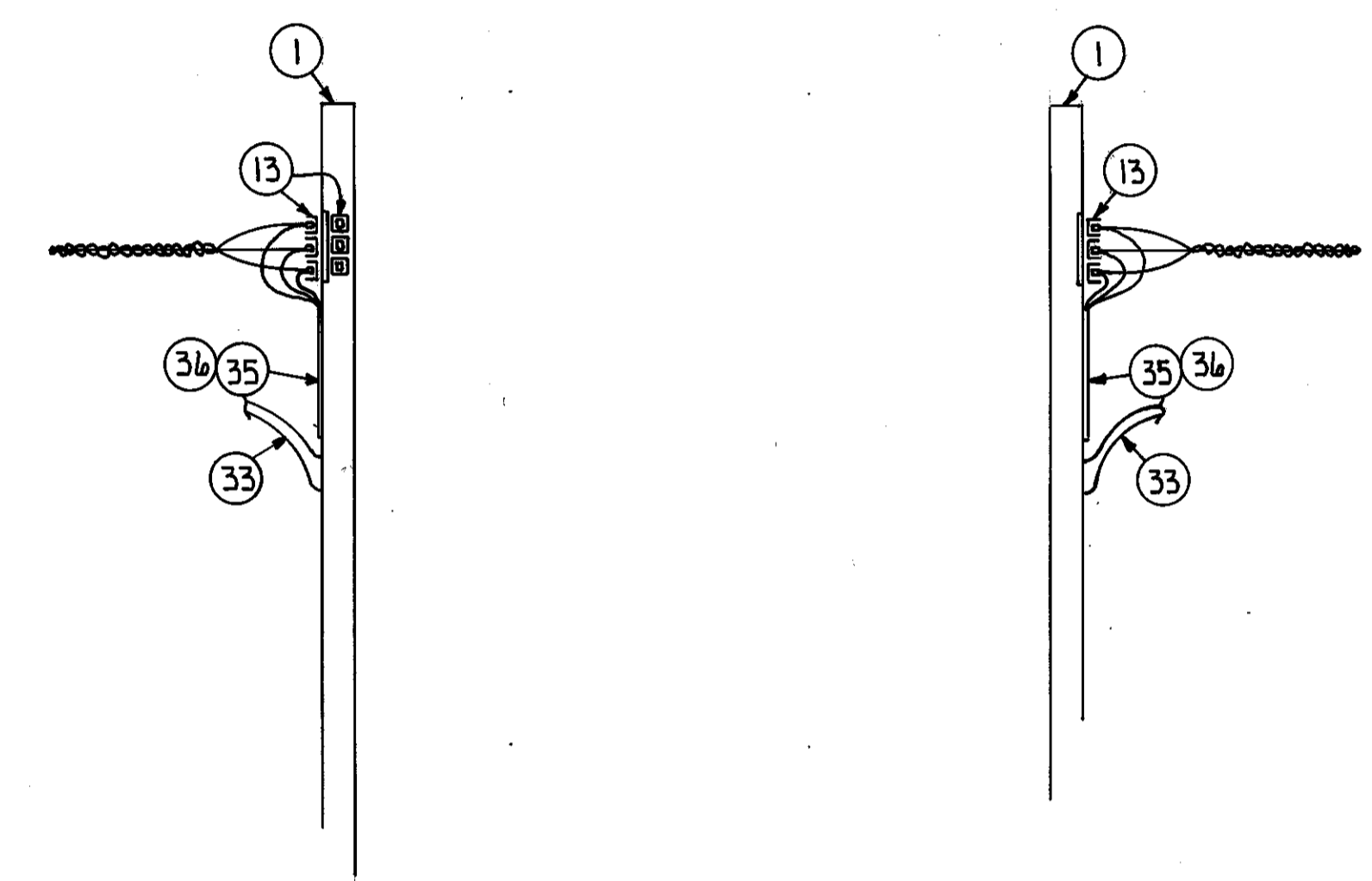
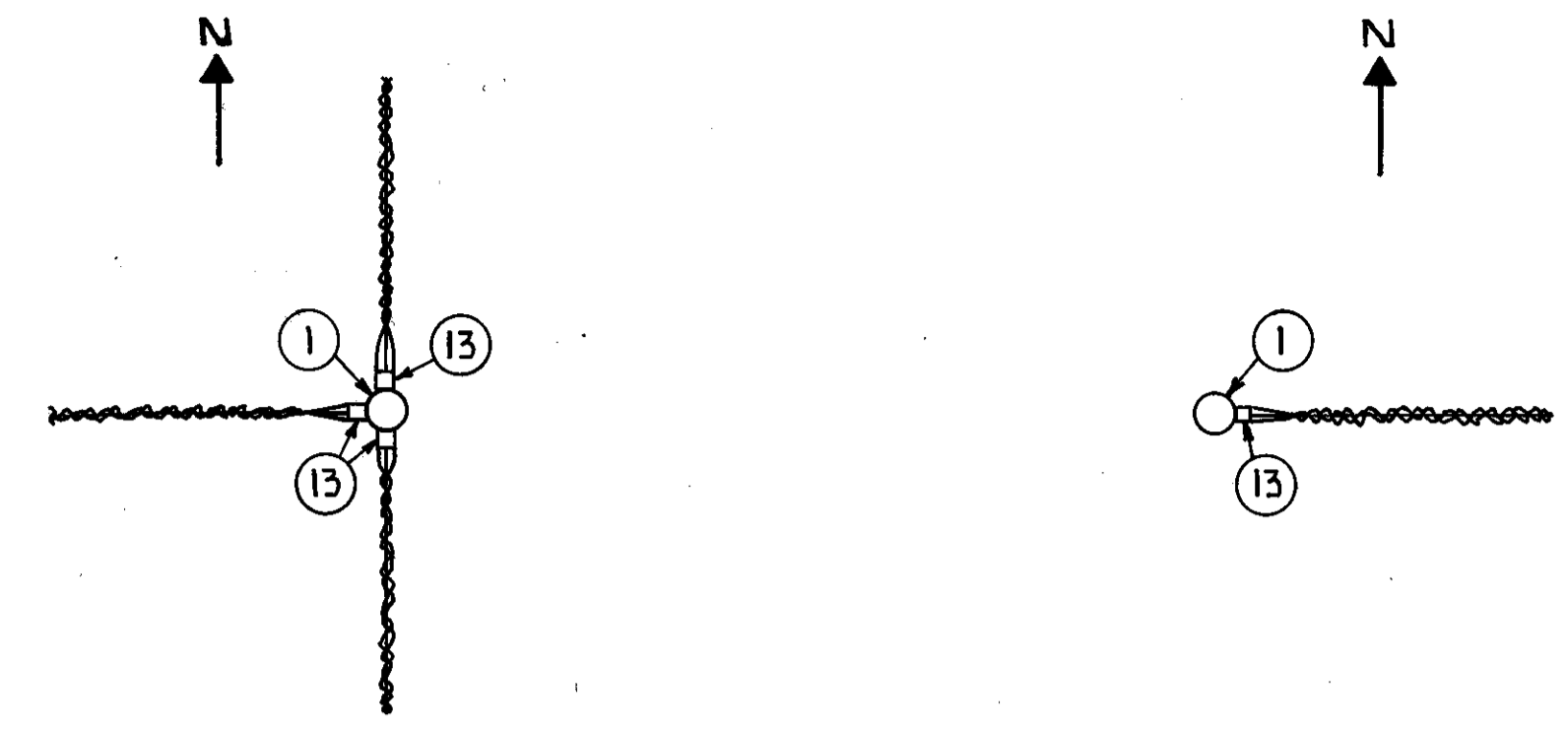
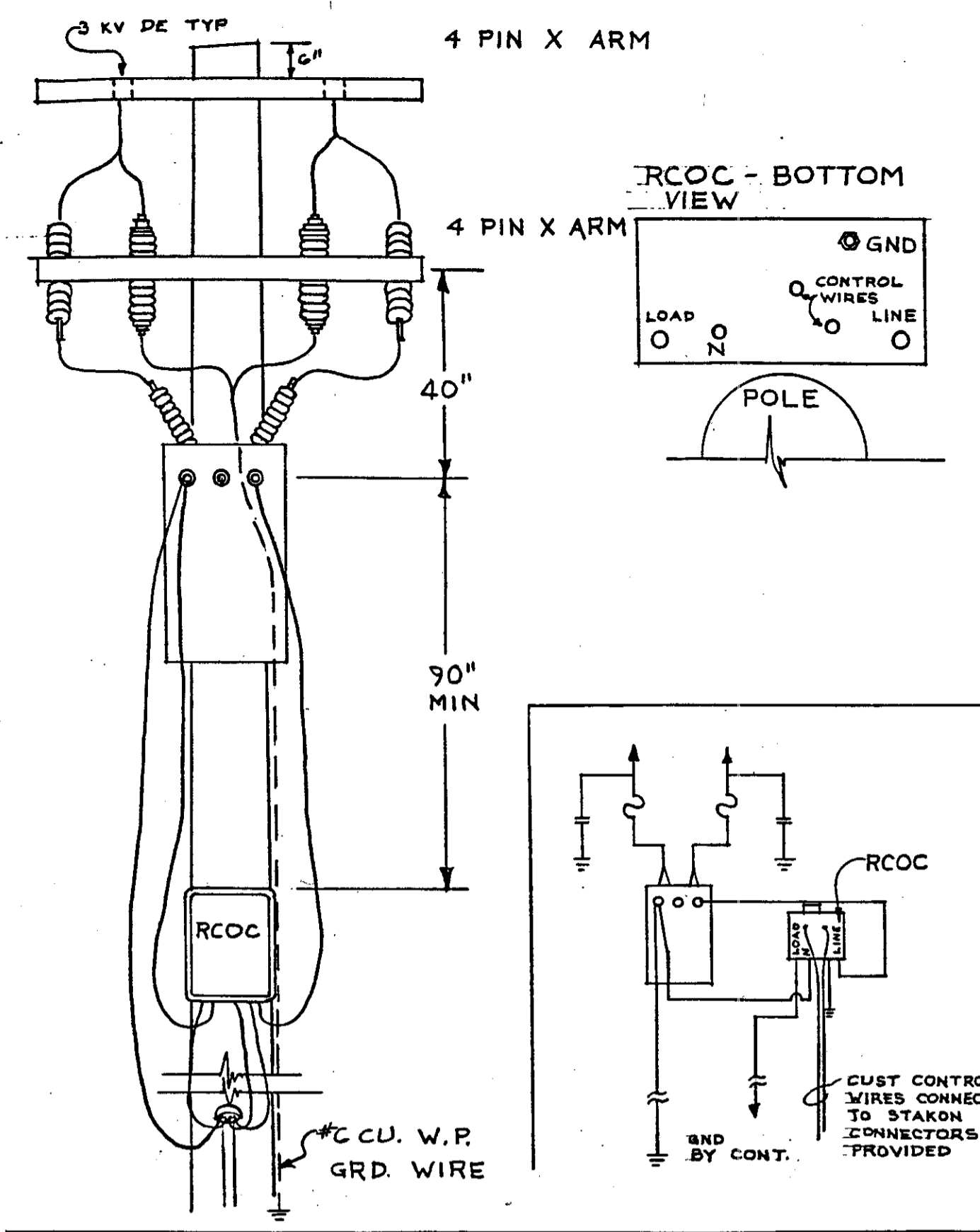
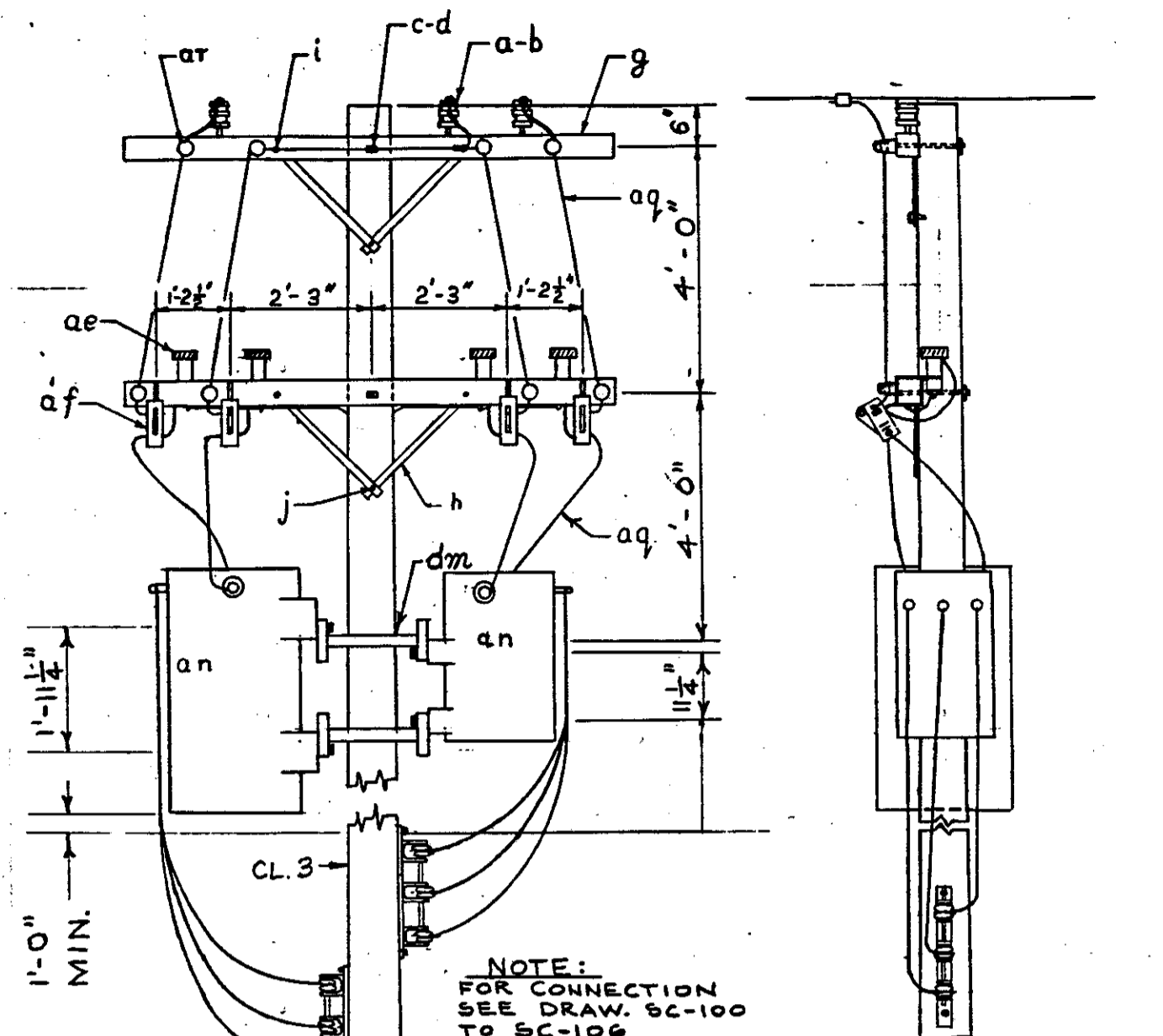
| | |
|--|------------|
| STD. LATERAL POLE CONSTRUCTION 6-100 AMP THROTTLE CUTOUPS | |
| DATE | BY |
| 14-2-1-2 | D.G.N. |
| DIVISION OF LIGHT & POWER CLEVELAND, OHIO | |
| REVISION | CHECKED BY |
| | R. J. A. |
| | DATE |
| | 6-19-68 |
| SUPERSEDED # SC-378 | |

POLE N-5
MELP STD. DWG. 10-2-1-9 & 14-2-1-2 & DETAIL "1"



DETAIL "1"

| | |
|---|--|
| WESTON DESIGNERS CONSULTANTS | A Business Trust 3650 GREEN ROAD SUITE 215 CLEVELAND, OHIO 44122 |
| | DIVISION OF LIGHT & POWER CITY OF CLEVELAND E. 55th ST. - BRAGG RD. OVERHEAD POLE ASSEMBLY |
| | 7078-3F |
| DESIGNED DRAWN TRACED CHECKED REVIEWED DATE REVISED | |
| PRB | JRH |



BILL OF MATERIAL

| SYM | QUAN | CODE NO | DESCRIPTION |
|---------|------|---------|---|
| h | 2 | B-104 | STANDARD 4 PIN CROSS ARM |
| h | 4 | B-515 | CROSS ARM BRACES, FLAT |
| dm | 2 | B-584 | CLUSTER MOUNTING BRACKET |
| a-f | 4 | B-133 | THROTTLE CUTOUTS |
| a-f | 4 | B-5745 | 3KV LIGHTNING ARRESTERS |
| b | 3 | B-4326 | STEEL WIRE |
| b | 3 | B-601 | LINE INSULATORS |
| b | 2 | B-6272 | PORCELAIN BRACKET, 1-PT |
| 60(APP) | 1 | B-1157A | 3PT. SEC. RACK |
| 40(APP) | 1 | B-7137 | 6 CU. W.P. GROUND WIRE |
| 4 | 1 | B-6107 | GROUND MOLDING |
| 14 | 1 | B-1413 | 1/2" x 8" GROUND ROD |
| 14 | 1 | B-7823 | 1/2" x 3/4" LAG SCREW |
| 14 | 1 | B-1176A | 3/8" x 5" CARriage BOLTS |
| 14 | 1 | B-1413 | 1/2" x 8" MACHINE BOLTS |
| 14 | 1 | B-1414 | 1/2" x 14" MACHINE BOLTS |
| 4 | 1 | B-8500A | 2 1/4" x 5" WASHERS 1 1/2" HOLE |
| 2 | 1 | B-1216A | 2-5 KV. RUBBER INS. PRT. CABLE |
| 2 | 1 | B-1216A | 1-5 TO 25 KVA - 18 & 1-37 1/2 TO 100 KVA - 17 |

ST. LIGHTING TRANSFORMER POLE WITH R.C. RCOC (1 POLE)
 RELAY FOR OPERATING 480V. MULTIPLE STREET LIGHTS

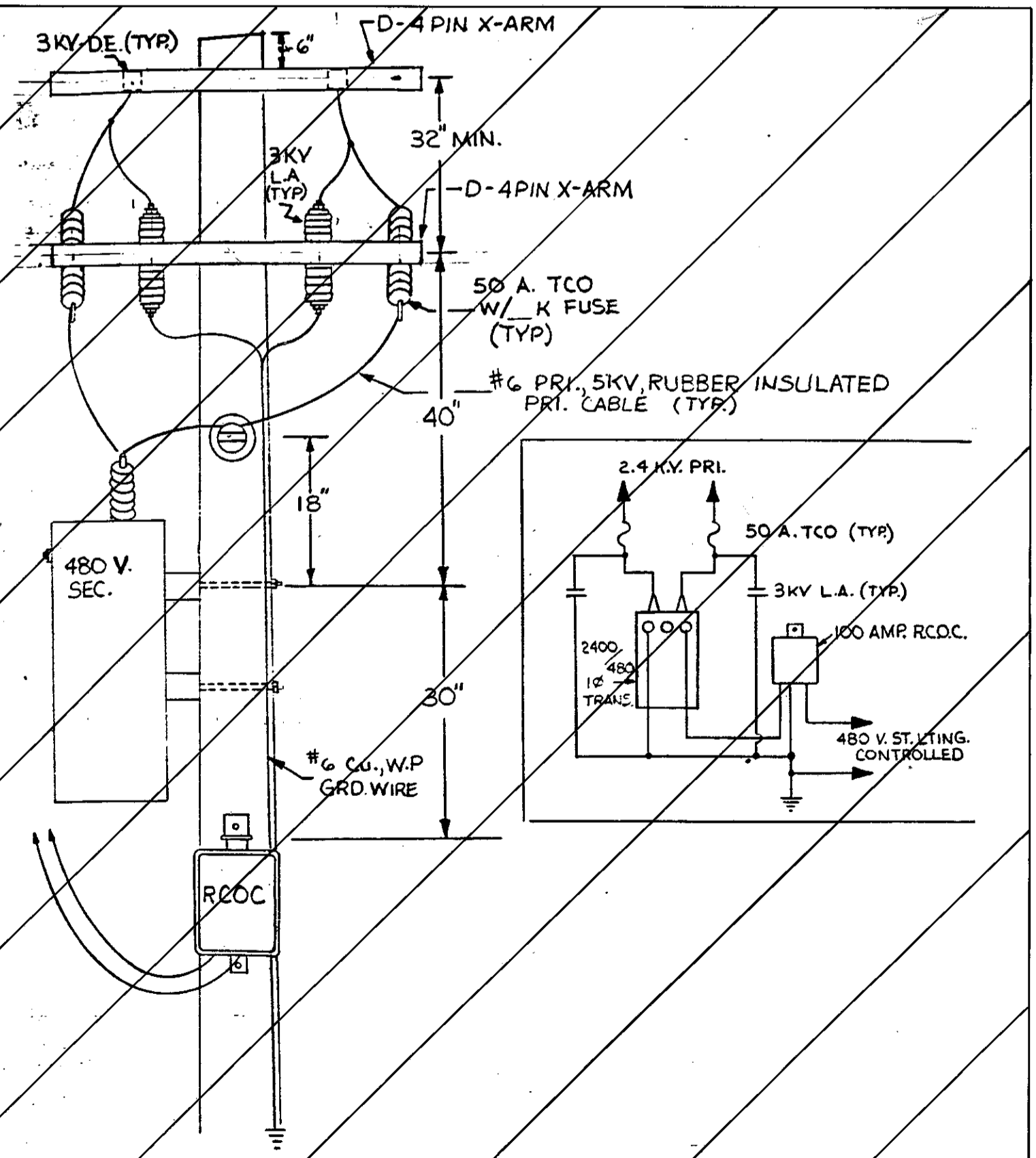
5-20-64 HVG
 10-17-63 S.F.G.

STD TRANSFORMER POLE CONSTRUCTION. CLUSTER M.T.
 1-5 TO 25 KVA & 1-37 1/2 TO 100 KVA. 2-1Ø SERVICES

DIVISION OF LIGHT & POWER CLEVELAND, OHIO
 DRAWN BY G. HAHN CHECKED BY [Signature] DATE 5-15-62
11-2-4-2

~~SC-6~~ SUPERSEDED BY SC-6 STD CONST. COMM. 5-27-64 4/17/63
 APPROVED BY [Signature] DATE 3/13/63

POLE N-4
 MELP STD. DWG. 11-2-4-2, 11-2-3-5



ST. LIGHTING TRANSFORMER POLE WITH PHOTO CONTROLLED
 RELAY FOR OPERATING 480V. MULTIPLE STREET LIGHTS

DIVISION OF LIGHT & POWER CLEVELAND, OHIO
 DRAWN BY J. M. N. CHECKED BY [Signature] DATE 12/6/78
11-2-3-4

POLE N-7
 FOR BILL OF MATERIAL
 SEE SHEET 176 (7078-3H)

POLE N-8
 FOR BILL OF MATERIAL
 SEE SHEET 176 (7078-3H)

WESTON A Business Trust
 DESIGNERS CONSULTANTS 3659 GREEN ROAD SUITE 215 CLEVELAND, OHIO 44122

DIVISION OF LIGHT & POWER
 CITY OF CLEVELAND
 E. 55th ST. - BRAGG RD.
 OVERHEAD POLE ASSEMBLY

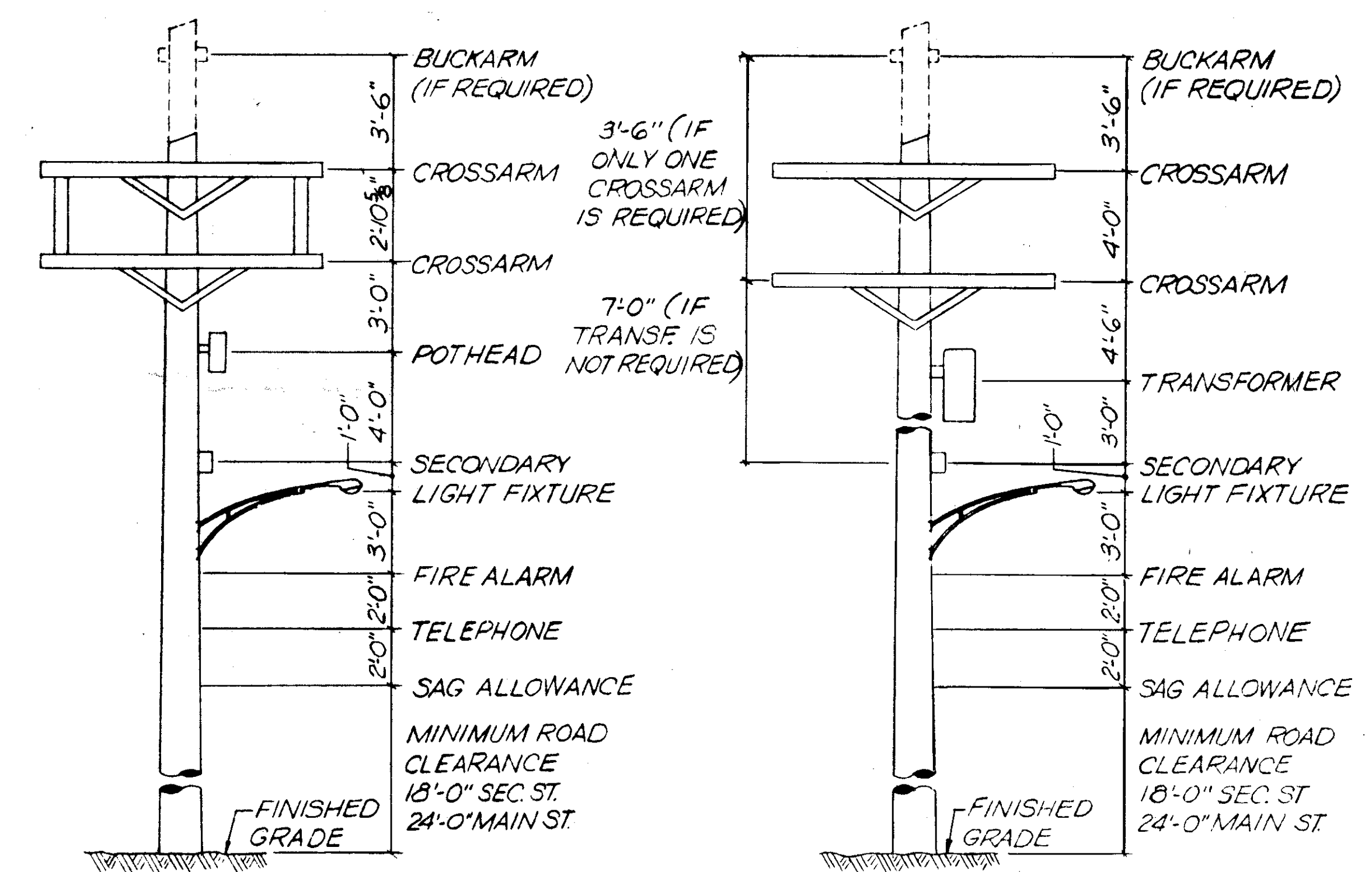
7078-3G

| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| PRB | JRH | | | | | |

| ITEM | DESCRIPTION |
|------|---|
| 50 | 5/8" X 18" MACHINE BOLT W/ 2 1/4" SQ WASHER & NUT |
| 51 | 5/8" X 16" MACHINE BOLT W/ 2 1/4" SQ WASHER & NUT |
| 52 | 5/8" X 12" MACHINE BOLT W/ 2 1/4" SQ WASHER & NUT |
| 53 | 5/8" X 18" DOUBLE ARM BOLT W/ 2 1/4" SQ WASH. & NUT |
| 54 | 5/8" X 16" DOUBLE ARM BOLT W/ 2 1/4" SQ WASH. & NUT |
| 55 | 5/8" X 10" MACHINE BOLT W/ 2 1/4" SQ WASHER & NUT |
| 56 | 1/2" X 6" MACHINE BOLT W/ 1 3/8" RD. WASHER & NUT |
| 57 | 1/2" X 5" MACHINE BOLT W/ 1 3/8" RD. WASHER & NUT |
| 58 | 5/8" X 18" DOUBLE ARM BOLT W/ 2 1/4" SQ WASH. & NUT |

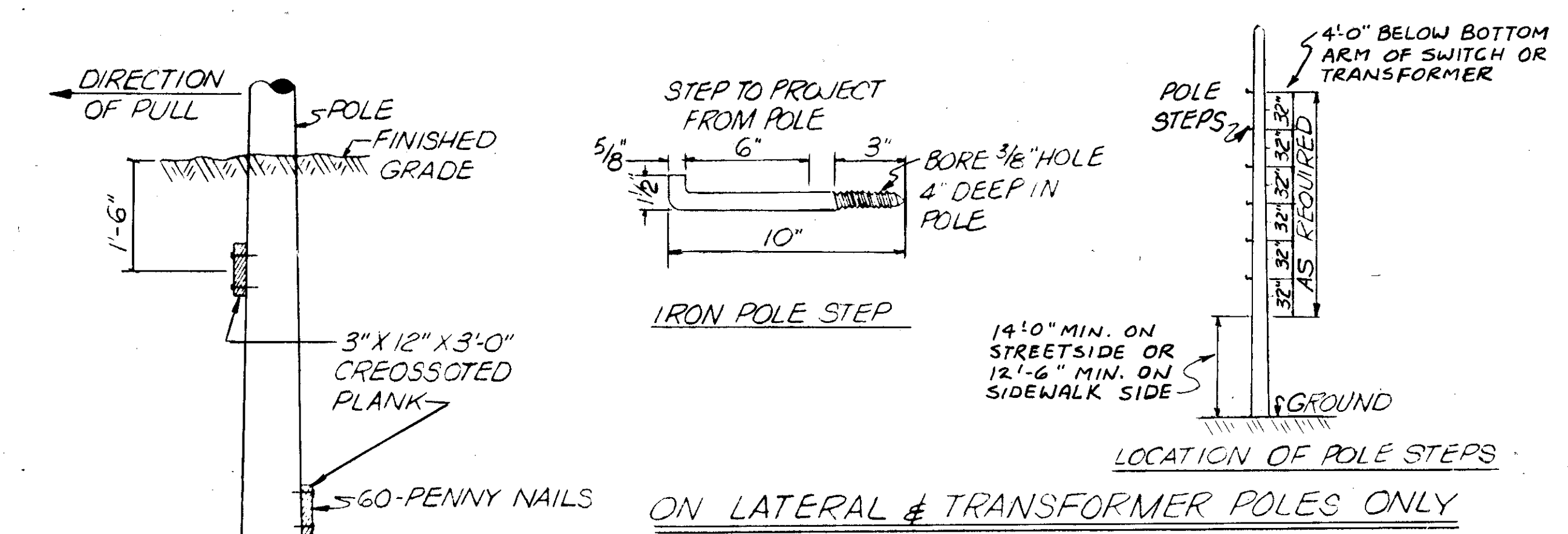
FOR POLES N-2, N-3, N-6, N-7, N-8 ONLY

| BILL OF MATERIAL FOR POLES | |
|----------------------------|-------------------------------------|
| ITEM No. | DESCRIPTION |
| 1 | POLE (SEE POLE SCHEDULE) |
| 2 | HEAVY DUTY 8 PIN CROSSARM |
| 3 | HEAVY DUTY 6 PIN CROSSARM |
| 4 | STANDARD 8 PIN CROSSARM |
| 5 | STANDARD 6 PIN CROSSARM |
| 6 | STANDARD 4 PIN CROSSARM |
| 7 | LATERAL POLE WOOD BRACING |
| 8 | CROSSARM BRACE, ANGLE IRON |
| 9 | DEAD END INSULATOR |
| 10 | STEEL PIN |
| 11 | PIN TYPE INSULATOR |
| 12 | 1 PT SECONDARY PORCELAIN BRACKET |
| 13 | 3 PT SECONDARY RACK ASSEMBLY |
| 14 | P.T.L. CABLE |
| 15 | PRIMARY WIRE HOLDER |
| 16 | OIL SWITCH WITH HANGERS |
| 17 | TRANSFORMER WITH MOUNTING HARDWARE |
| 18 | LOAD BREAK DISCONNECT |
| 19 | 5KV XLP INSULATED CABLE (1/2") |
| 20 | 3KV LIGHTNING ARRESTER |
| 21 | POTHEAD WITH MOUNTING BRACKET |
| 22 | CABLE GUARD FOR P.T.L. CABLE |
| 23 | |
| 24 | N# 6 CU WEATHERPROOF GROUND WIRE |
| 25 | WOOD MOULDING |
| 26 | 1/2" X 8'-0" GROUND ROD |
| 27 | STANDARD ANCHOR GUY |
| 28 | HEAVY DUTY ANCHOR GUY |
| 29 | DOUBLE ANCHOR GUY |
| 30 | HEAD GUY OR ARM GUY WITH INSULATORS |
| 31 | MACHINE BOLT W/WASHER |
| 32 | DOUBLE ARM BOLT W/WASHER |
| 33 | LIGHTING FIXTURE W/BRACKET ARM |
| 34 | TINNED COPPER GROUND STRAP |
| 35 | LIGHTING CABLE |
| 36 | CABLE GUARD FOR LIGHTING CABLE |
| 37 | ENCLOSED THROTTLE CUTOUT |
| 38 | WEATHERHEAD FOR 3" CONDUIT |
| 39 | STANDARD 8-PIN CROSSARM BRACE |
| 40 | 3/4" LATERAL CABLE |

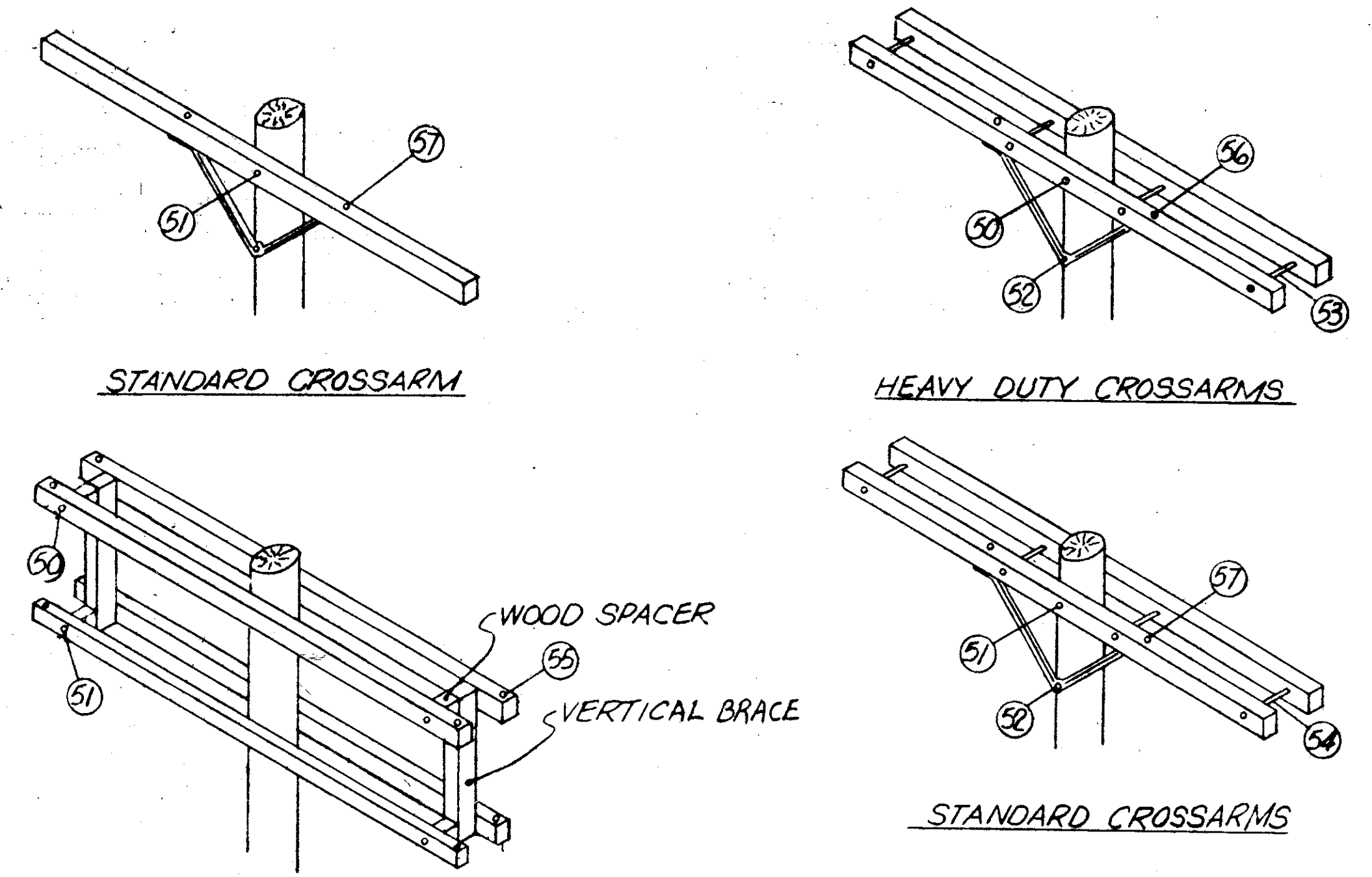


TYPICAL POLE SPACE ASSIGNMENT FOR LATERAL POLE

TYPICAL POLE SPACE ASSIGNMENT FOR LINE POLE



TYPICAL POLE BLOCKING



LATERAL POLE CROSSARMS AND WOOD BRACING

TYPICAL HARDWARE FOR CROSSARM MOUNTING

| | | |
|---|----------------|--|
| DIVISION OF LIGHT & POWER CITY OF CLEVELAND | | |
| TYPICAL POLE AND CROSSARMS BILL OF MATERIAL | | |
| SCALE | DRAWING NUMBER | |
| NO SCALE | 7078-3H | |
| DATE | | |
| DATE | | |

QUANTITIES CALCULATED By JRH DATE 1/83
QUANTITIES CHECKED By CAP DATE 1/83

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

CUYAHOGA COUNTY
CUY-490-1.49

SHEET No. 3A (170)

| DESCRIPTION | ITEM | UNIT | TOTAL | | | | | | | | | | | |
|--|----------|------|-------|---|---|---|---|---|---|---|---|--|--|---|
| POLE - 35'-0 LENGTH, CLASS 5, SETTING 6'-0 | OC-12 | EA | 3 | | | | | | 1 | 1 | 1 | | | |
| POLE - 45'-0 LENGTH, CLASS 1, SETTING 6'-6 | OC-12 | EA | 1 | 1 | | | | | | | | | | |
| POLE - 45'-0 LENGTH, CLASS 3, SETTING 6'-6 | OC-12 | EA | 4 | | 1 | 1 | 1 | 1 | | | | | | |
| BLOCK POLE | OC-2 | EA | 2 | 1 | | | | | 1 | | | | | |
| HEAVY DUTY 6 PIN CROSSARM W/ 3 PIN INSULATORS AND 3 DEAD END CLEAVES (5KV) | OC-13,14 | EA | 2 | 1 | | | | | 1 | | | | | |
| HEAVY DUTY 6-PIN CROSSARM W/3 PIN INSULATORS (5KV) | OC-13 | EA | 1 | | | | | | 1 | | | | | |
| STANDARD 6-PIN CROSSARM W/3 PIN INSULATORS (5KV) | OC-13 | EA | 6 | 1 | 2 | 2 | 1 | | | | | | | |
| STANDARD 6-PIN CROSSARM | OC-13 | EA | 3 | | | | | 1 | 2 | | | | | |
| POTHEAD | OC-15 | EA | 2 | | | | | | 2 | | | | | |
| LIGHTNING ARRESTER - 3KV | OC-16 | EA | 10 | 3 | | | | 4 | 3 | | | | | |
| 3-POINT SECONDARY RACK | OC-17 | EA | 13 | 1 | 1 | 2 | 2 | 1 | 1 | 3 | 1 | | | 1 |
| THROTTLE CUTOFF | OC-19 | EA | 13 | 3 | | | | 4 | 6 | | | | | |
| TRANSFORMER 50 KVA, 2400-480V, 1φ | OC-19 | EA | 1 | | | | | 1 | | | | | | |
| TRANSFORMER -15 KVA, 2400-240/120V, 1φ | OC-19 | EA | 1 | | | | | 1 | | | | | | |
| TRANSFORMER - 112.5 KVA, 2400 - 480V, 3φ | OC-19 | EA | 1 | 1 | | | | | | | | | | |
| LUMINAIRE, TYPE III, W/250W. H.P.S. BALLAST 240V & 10'-0 BRKT. ARM | OC-18 | ASSY | 3 | | 1 | | 1 | 1 | | | | | | |
| LUMINAIRE, TYPE III, W/250W. H.P.S. BALLAST 240V & 15'-0 BRKT. ARM | OC-18 | ASSY | 1 | | | 1 | | | | | | | | |
| LUMINAIRE, TYPE III, W/400 W. MERCURY BALLAST 400V. & 10'-0 BRKT. ARM | OC-18 | ASSY | 3 | | | | | 1 | 1 | 1 | | | | |
| LUMINAIRE, TYPE III, W/400 W. MERCURY BALLAST 400V. & 15'-0 BRKT. ARM | OC-18 | ASSY | 1 | | | | | | 1 | | | | | |
| LIGHTING CONTROL RELAY | OC-21 | EA | 1 | | | | | 1 | | | | | | |
| GROUNDING | OC-09 | ASSY | 3 | 1 | | | | 1 | 1 | | | | | |
| STANDARD ANCHOR GUY W/ INSULATORS | OC-11 | ASSY | 2 | 1 | | | | | 1 | | | | | |
| CROSSARM BRACE - FLAT | OC-25 | EA | 8 | 4 | | | 4 | | | | | | | |
| CROSSARM BRACE - ANGLE 120N | OC-25 | EA | 8 | | 2 | 2 | | 4 | | | | | | |
| LATERAL POLE WOOD BRACE | OC-27 | EA | 1 | | | | | | 1 | | | | | |

ASSEMBLY SHEET NUMBER
POLE TYPE - SEE LEGEND BELOW

| | | | | | | | | | |
|----------|------|------|------|------|------|------|------|------|------|
| POLE NO. | AL-1 | AL-2 | AL-3 | AL-4 | AL-5 | AL-6 | AL-7 | AL-8 | AL-9 |
| | ① | ① | ① | ② | ① | ① | ① | ① | ⑤ |

- ① LINE POLE
- ② LATERAL POLE
- ③ TRANSFORMER POLE
- ⑤ NEW STEEL SIGN POLE (SEE SHEET 210)

| ITEM | DESCRIPTION | UNIT | TOTAL | SHEET No. | | | | | | | | | | |
|-------|--------------------------------------|------|-------|-----------|--|--|--|--|--|--|--|--|--|--|
| OC-10 | 1/2" #4 ACSR WEATHERPROOF WIRE - 5KV | FT | 1350 | 1350 | | | | | | | | | | |
| OC-10 | #4 AWG TRIPLEX CABLE - 600 VOLT | FT | 1300 | 1300 | | | | | | | | | | |

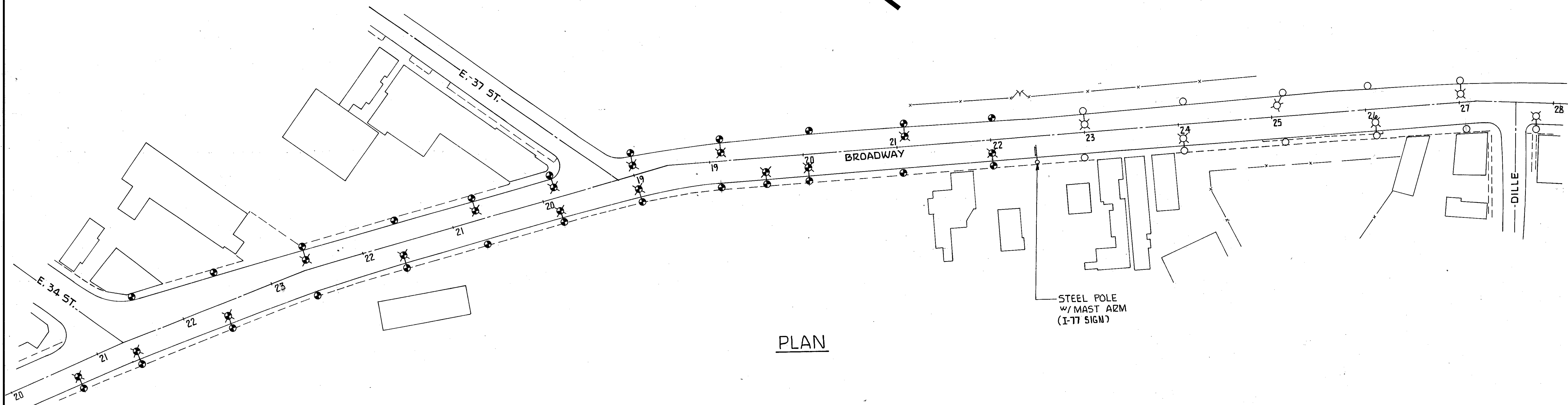
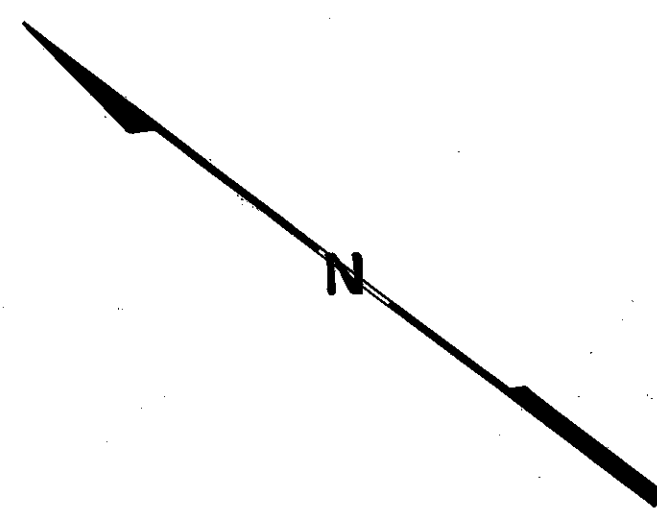
| | | | |
|--|-------|--------|-----------------------|
| NO. | DATE | BY | REVISED |
| | | | |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| DIVISION OF LIGHT & POWER CITY OF CLEVELAND | | | |
| EAST 55TH STREET POLE LIST & MATERIAL TABULATION | | | |
| SCALE 1/4" | | | 7078-31 |
| DESIGNED | DRAWN | TRACED | CHECKED REVIEWED DATE |
| PH | PRB | PH | JRH |

CONT. No. SHEET ACCT. No.

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

178
261

CUYAHOGA COUNTY
CUY-490-1.49



PLAN

LEGEND ON SHEET 166. (7078-1A)

CONT. No. SHEET ACCT. No.

| | | | |
|--|-------|--------|----------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| DIVISION OF LIGHT & POWER CITY OF CLEVELAND | | | |
| BROADWAY POLE REMOVAL | | | |
| SCALE 1" = 50' | | | 7078-4A |
| DESIGNED | DRAWN | TRACED | CHECKED |
| ARZ | ARZ | JRH | JRH |
| | | | REVIEWED |
| | | | DATE |

GENERAL SUMMARY

CALC. BY CAP DATE 8/82
CHKD. BY RLH DATE 5/83
OHIO FHWA REGION 5
CUY-490-149
185 261

| LINE NO | SHEET NUMBER | | | | | | | | | | | | TOTAL | ITEM UNIT | DESCRIPTION | LINE NO | | | | |
|---------|--------------|--|-----|--|-----|--|------|--|---|--|---|--|-------|-----------|-------------|---------|--|--|--|----|
| | 187 | | 190 | | 191 | | 191A | | I | | I | | | | | | | | | |
| 1 | | | | | | | | | | | | | | | | | | | | 1 |
| 2 | | | | | | | | | | | | | | | | | | | | 2 |
| 3 | | | | | | | | | | | | | | | | | | | | 3 |
| 4 | | | | | | | | | | | | | | | | | | | | 4 |
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SHEET ACCT. No.

GENERAL NOTES

630 REMOVAL OF GROUND MOUNTED SIGN SUPPORTS

GROUND MOUNTED SIGN SUPPORTS SHALL BE CAREFULLY REMOVED WHERE GROUND MOUNTED SIGNS HAVE BEEN REMOVED. THE SUPPORTS SHALL BE STORED ON THE PROJECT FOR SALVAGE BY STATE FORCES. SURFACE RESTORATION AND DISPOSAL OF SURPLUS MATERIAL SHALL BE IN ACCORDANCE WITH 603.09.

THESE SUPPORTS ARE NOT SHOWN ON THE PLAN AND AN ESTIMATED QUANTITY HAS BEEN PROVIDED IN THE GENERAL SUMMARY.

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

ITEM 630 REMOVAL OF GROUND MOUNTED SIGN SUPPORTS 1-FUNDS
50 EACH

630 REMOVAL OF OVERHEAD SIGN SUPPORT BRACKETS AND STORAGE

OVERHEAD SIGN SUPPORT BRACKETS SHALL BE CAREFULLY REMOVED AND STORED ON THE PROJECT FOR SALVAGE BY STATE FORCES AS SHOWN ON THE PLANS.

ITEM 630 REMOVAL OF OVERHEAD SIGN SUPPORT BRACKETS AND STORAGE

631 BALLAST WIRING ENCLOSURE

BALLAST ENCLOSURES SHALL BE FURNISHED AND INSTALLED ON OVERHEAD SIGN SUPPORTS AS SHOWN ON TC-32.10, OR AS DETAILED ON THE PLANS. THE ENCLOSURE SHALL BE MOUNTED ON BRACKETS WHICH ARE A PART OF NEW OVERHEAD SUPPORTS OR SEPARATELY FURNISHED FOR EXISTING SUPPORTS OR OVERPASS STRUCTURES.

ENCLOSURES SHALL BE WEATHERPROOF NEMA TYPE 4 IN ACCORDANCE WITH PLAN DETAILS, FABRICATED OF 0.06 INCH STEEL GALVANIZED IN ACCORDANCE WITH 711.02. THE FRONT COVER SHALL BE REMOVABLE AND BEAR A WARNING SIGN CONFORMING TO 713.20, PARAGRAPH 8D. CONDUIT FITTINGS AND ATTACHMENT HARDWARE SHALL BE FURNISHED WITH ENCLOSURE. ENCLOSURES SHALL CONTAIN A STEEL PANEL COMPLYING WITH 713.20, PARAGRAPH 8E FOR INSTALLING TERMINAL BLOCKS AND BUSBARS, RATED AT 600 VOLTS AND PROVIDED WITH MARKER STRIPS AND CAPABLE OF TERMINATING THE WIRE GAGE USED. BALLASTS SHALL BE ARRANGED IN THE ENCLOSURE IN THE SAME RELATIVE POSITION AS THEIR ASSOCIATED LUMINAIRE ON THE SIGN SUPPORT STRUCTURE.

ENCLOSURES SHALL BE OF TWO SIZES: TYPE A FOR SPAN TYPE SUPPORTS AS SHOWN ON TC-32.10 AND TYPE B FOR SINGLE POLE AND OVERPASS STRUCTURES AS DETAILED IN THE PLANS AND IN ACCORDANCE WITH THE FOLLOWING TABLE:

| SIZE (NOMINAL), INCHES | TYPE A | TYPE B |
|---|--------|--------|
| 42 x 12 x 10 | | |
| BARRIER TERMINAL BLOCK; NO. UNITS, NO TERMINALS (MIN) | 2, 10 | 2, 4 |
| SOLID INSULATED BUSBAR; NO. UNITS, NO TERMINALS (MIN) | 2, 11 | 2, 5 |
| SOLID UNINSULATED BUSBAR; NO. UNITS, NO TERMINALS (MIN) | 1, 11 | 1, 5 |

PAYMENT WILL BE AT THE CONTRACT UNIT PRICE FOR EACH ENCLOSURE, FURNISHED, IN PLACE, COMPLETE AND READY FOR SERVICE.

ITEM 631 EACH - BALLAST WIRING ENCLOSURE, BY TYPE.

631 BALLAST WIRING ENCLOSURE MOUNTING BRACKET ASSEMBLY

BALLAST ENCLOSURE MOUNTING BRACKET ASSEMBLIES SHALL BE FURNISHED FOR INSTALLATION ON EXISTING OVERHEAD SIGN SUPPORTS BY BOLTS IN TAPPED HOLES AND ON CONCRETE STRUCTURES BY EXPANSION BOLTS. BRACKETS SHALL BE IN ACCORDANCE WITH PLAN DETAILS AND GALVANIZED IN ACCORDANCE WITH 711.02. BRACKETS SHALL BE OF TWO SIZES: TYPE "A" FOR SPAN TYPE SUPPORTS AND SHOWN ON TC-32.10 AND TYPE "B" FOR SINGLE POLE AND OVERPASS STRUCTURES AS DETAILED IN THE PLANS AND ON TC-32.11.

PAYMENT WILL BE AT THE CONTRACT UNIT PRICE FOR EACH ASSEMBLY WHICH SHALL INCLUDE ALL NECESSARY BRACKETS, FIELD DRILLING AND HARDWARE, FURNISHED AND IN PLACE.

ITEM 631 EACH - BALLAST WIRING ENCLOSURE MOUNTING BRACKET ASSEMBLY, BY TYPE

631 ENCLOSURE PADLOCKS

DISCONNECT SWITCH ENCLOSURES FURNISHED IN ACCORDANCE WITH SPECIFICATION 631.08 SHALL INCLUDE A PADLOCK EQUAL TO MASTER NO. 48KA OR WILSON BOHANNON 660, WITH LOCK BODY OF BRONZE OR BRASS, AND KEYING IN ACCORDANCE WITH SPECIFICATION 631.08.

TRAFFIC CONTROL STANDARD CONSTRUCTION DRAWINGS

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

621 REMOVAL OF PAVEMENT MARKING

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

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

ITEM 621 REMOVAL OF PAVEMENT MARKING 1-FUNDS
8,000 L.F.

625 POWER SUPPLY FOR TRAFFIC SIGNALS

ELECTRIC POWER SHALL BE OBTAINED AS FOLLOWS:

EAST 34TH, 37TH AND BROADWAY SIGNAL

120 VOLTS - SEE SHEET 194

FROM: CLEVELAND ELECTRIC ILLUMINATING COMPANY
75 PUBLIC SQUARE
CLEVELAND, OHIO 44101

I-490 AND EAST 55TH; EAST 55TH AND FRANCIS SIGNALS

120 VOLTS - SEE SHEETS 195 AND 197
ALSO SEE MELP SHEETS 169 AND 170

POWER SUPPLY BY CONTRACTOR VIA
CITY OF CLEVELAND
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF LIGHT AND POWER
1201 LAKE SIDE AVENUE
CLEVELAND, OHIO 44114

630 SIGN BACKING ASSEMBLY, AS PER PLAN

IF DURING CONSTRUCTION A FIELD INVESTIGATION REVEALS THAT ADDITIONAL BACK BRACING IS REQUIRED TO MOUNT THE PROPOSED SIGNS ONTO THE EXISTING SIGN SUPPORTS, OTHER THAN THAT SHOWN IN THE PLANS, THE ADDITIONAL BACK BRACING TO PROVIDE THIS SUPPORT WILL BE NUMBER 2 POST WITH ALL APPLICABLE MOUNTING HARDWARE, NECESSARY PARTS, EQUIPMENT AND LABOR, FURNISHED AND ERECTED. TO PROVIDE FOR THIS CONTINGENCY, AN ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY FOR THIS PURPOSE.

ITEM 630 SIGN BACKING ASSEMBLY, AS PER PLAN - 100 L.F. (1 FUNDS)

THE CONTRACTOR SHALL NOT ORDER THE ABOVE MATERIAL UNTIL REQUESTED BY THE ENGINEER. IF NONE OR A PORTION IS NOT NEEDED THE ITEM SHALL BE NONPERFORMED.

630 REMOVAL OF GROUND MOUNTED SIGNS AND STORAGE

GROUND MOUNTED SIGNS SHALL BE CAREFULLY REMOVED WITHIN THE PROJECT WORK LIMITS AS DESIGNATED BY THE ENGINEER. THE CONTRACTOR SHALL NOTIFY THE ENGINEER SEVEN (7) DAYS BEFORE REMOVING ANY ITEM AND THAT THE ENGINEER IS TO NOTIFY CLYDE SCOTT OF THE CITY OF CLEVELAND TRAFFIC DIVISION AND THE DISTRICT TRAFFIC ENGINEER, SO THAT THE MAINTAINING AGENCIES MAY PICK UP THE ITEMS TO BE SALVAGED.

TO ASSURE MAINTENANCE OF ADEQUATE TRAFFIC CONTROL AT ALL TIMES, NO SIGNS SHALL BE REMOVED WITHOUT THE APPROVAL OF THE ENGINEER.

THESE SIGNS ARE NOT SHOWN ON THE PLAN AND AN ESTIMATED QUANTITY HAS BEEN PROVIDED IN THE GENERAL SUMMARY.

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

ITEM 630 REMOVAL OF GROUND MOUNTED SIGN AND STORAGE 1-FUNDS
50 EACH

631 SIGN FLOODLIGHT

A WEATHERPROOF SIGN FLOODLIGHT USING TWO (2) STANDARD 150 WATT, 120V TRAFFIC SIGNAL LAMPS SHALL BE FURNISHED AND INSTALLED ON SIGN 24E, SEE SHEETS 212 AND 216. THE FLOODLIGHT SHALL BE IN ACCORDANCE WITH SPECIFICATION 631.

PAYMENT WILL BE AT THE CONTRACT UNIT PRICE FOR EACH "ITEM 631 SIGN FLOODLIGHT (120 V)" COMPLETE, FURNISHED IN PLACE AND READY FOR SERVICE.

ITEM 631 SIGN SERVICE

IN LIEU OF THE REQUIREMENTS OF 631.06, CABLE FOR SIGN SERVICE SHALL BE RATED THE SAME AS THE HIGHWAY LIGHTING DISTRIBUTION AND CIRCUIT CABLE USED ON THIS PROJECT.

ITEM 632 SIGNAL CONTROLLER CABINET MOUNTING

IN LIEU OF THE DETAILS SHOWN ON TC-83.10, THE CONTROLLER CABINET (S) AT BROADWAY AND E. 34th ST. AND E. 55th ST. AND FRANCIS SHALL HAVE A MOUNTING HEIGHT, AS MEASURED FROM THE GROUND LINE TO THE BOTTOM OF THE CABINET, AS FOLLOWS:

| CABINET HEIGHT | MOUNTING HEIGHT |
|----------------|-----------------|
| LESS THAN 36" | 2.5' |
| 36" TO 48" | 2.0' |
| OVER 48" | 1.5' |

THE BLIND HALF COUPLING FOR THE 2-1/2" LB SHALL BE CENTERED 6" BELOW THE BOTTOM OF THE HANDHOLE FRAME AND AT 90° TO THE HANDHOLE.

632 REMOVAL OF TRAFFIC SIGNAL INSTALLATION

THE CONTRACTOR SHALL NOTIFY THE ENGINEER SEVEN (7) DAYS BEFORE REMOVING ANY ITEM AND THE ENGINEER IS TO NOTIFY CLYDE SCOTT OF THE CITY OF CLEVELAND TRAFFIC DIVISION AND THE DISTRICT TRAFFIC ENGINEER, SO THAT THE MAINTAINING AGENCIES MAY PICK UP THE ITEMS TO BE SALVAGED.

608-4" CONCRETE WALKS, AS PER PLAN

A QUANTITY OF 54 SQ. FT. OF 4" CONCRETE WALKS, AS PER PLAN, IS INCLUDED FOR USE WHEN DIRECTED BY THE ENGINEER. THIS IS TO PROVIDE 6 FT. X 3 FT. PLATFORMS NEAR POLE OR PEDESTAL MOUNTED SIGNAL CONTROL CABINETS IN UNPAVED AREAS, FROM WHICH SIGNAL MAINTENANCE PERSONNEL CAN CONVENIENTLY REACH THE SIGNAL EQUIPMENT FOR SERVICE.

625 TRENCH IN PAVED AREAS

IN LIEU OF THE DETAILS ON STANDARD CONSTRUCTION DRAWING HL-11, THE CONTRACTOR MAY PROVIDE THE NARROW SLIT TYPE TRENCH AS DETAILED ON SHEET 195.

620 Delineators, By Type, Flexible Post Mounted, As Per Plan

This item shall consist of furnishing and installing delineators as specified. The reflectors shall be either Type C or D and shall be approximately 3 inches by 6 inches with a minimum area of 18 square inches. The reflector shall be reflective sheeting bonded directly to the delineator post (not screwed or bolted).

The Seal Test as described in 620.03 shall not apply.

The flexible posts shall be white non-metallic, ultraviolet resistant, and designed to withstand repeated automobile impacts at 55 MPH and return to a vertical position with little or no damage to the vehicle. The posts shall be capable of being hand driven. Where adverse soil conditions cause the delineator post to exceed 1/4 inch per foot out of plumb in any direction, the Contractor may drive a pilot shaft before driving the post.

Flexible delineator posts shall be one of the following designs or approved equal:

- Design 1 flexible post shall be manufactured from 1 1/2" x 2 1/2" lexan with a 24 inch length of No. 1 steel drive post bolted to the bottom of the flexible portion. The total length of the composite post shall be 78 inches. The width of the post shall be 3.25 inches.
- Design 2 flexible post shall be manufactured from fiberglass reinforced plastic with a T cross-section. The post shall be 72 inches long and 3.60 inches wide.
- Design 3 flexible post shall be manufactured from fiberglass reinforced plastic with a curved cross-section. The post shall be 72 inches long and 3.60 inches wide.
- Design 4 flexible post shall be manufactured from fiberglass reinforced plastic with a curved cross-section. The post shall be 27 inches long and 3.25 inches in width. These posts may be installed by the Contractor in lieu of Designs 1, 2 or 3 when delineators would be placed behind guardrail. These posts shall be installed on the front of the wooden guardrail blockouts facing approaching traffic by installing either two 5/16 inch diameter by 1 1/2 inch long, zinc coated lag screws with zinc coated 5/16 inch flat washers or two 5/16 inch diameter by 1 1/2 inch long, zinc coated indented hex washer-head lag screws.

Payment will be at the contract unit price for each delineator which shall include furnishing and installing the post and all necessary hardware, labor and equipment.

620 EACH DELINEATORS, TYPE (C OR D), FLEXIBLE POST MOUNTED, AS PER PLAN

GENERAL NOTES

ITEM 861-SIGNAL CONTROLLERS

SIGNAL CONTROLLERS SHALL BE FURNISHED BY ONE OF THE FOLLOWING THREE MANUFACTURERS:

| | | |
|--|--|---|
| CROUSE - HINDS COMPANY WOLF & 7th NORTH STREET P.O. BOX 4999 SYRACUSE, NEW YORK 13201 | EAGLE SIGNAL CORPORATION 8004 CAMERON ROAD AUSTIN, TEXAS 78753 | KENTRON INCORPORATED 1023 12th STREET HUNTSVILLE, TEXAS 77340 |
|--|--|---|

A. CONTROLLER PRETIMED 3 DIAL ELECTRO-MECHANICAL MASTER/SECONDARY WITH CABINETS AS PER PLAN

MASTER/SECONDARY PRETIMED ELECTRO-MECHANICAL CONTROLLERS AS CALLED FOR IN THE PLAN AND SUPPLEMENTAL SPECIFICATION **861**.

THE CONTROLLER SHALL BE EQUIPPED WITH THREE DIALS, AND THREE OFFSETS PER DIAL, AND SHALL BE CAPABLE OF PROVIDING THE SIGNAL SEQUENCE CALLED FOR IN THE PLAN.

CONTROLLER CABINETS SHALL BE PREWIRED AT THE FACTORY. THE CABINET SHALL BE EQUIPPED WITH SCREENED VENTS AND LARGE SIX INCH MINIMUM DIAMETER FANS WITH THERMOSTATIC CONTROL. THE CABINETS SHALL CONTAIN A SEPARATE JACK MOUNTED FLASHING UNIT COMPLETE WITH SEPARATE JACK MOUNTED LOAD RELAYS AND FUSE CUT-OUT SWITCH.

THE LARGE CABINET DOORS SHALL BE FITTED WITH A SMALLER DOOR WHICH SHALL CONTAIN A MAIN ON-OFF SWITCH AND AN AUTOMATIC FLASH SWITCH. THE LOCK ON THE LARGE CABINET DOOR SHALL BE KEYPED TO THE CITY OF CLEVELAND MASTER. THE LOCK ON THE SMALL DOOR SHALL BE KEYPED TO THE CITY OF CLEVELAND POLICE MASTER. TWO KEYS SHALL BE FURNISHED WITH EACH LOCK. ALL EQUIPMENT REQUIRED FOR A SATISFACTORY OPERATION SHALL BE FURNISHED.

TWO COATS OF FEDERAL YELLOW PAINT SHALL BE APPLIED TO THE CONTROL CABINET. CABINETS SHALL BE PAINTED AFTER INSTALLATION. TWENTY-FOUR HOURS SHALL ELAPSE BETWEEN COATS OF PAINT. THE CONTRACTOR SHALL EXERCISE CARE TO PROTECT VEHICLES WHILE PAINTING AND SHALL ERECT AND REMOVE FRESH PAINT SIGNS ON EQUIPMENT.

PAYMENT FOR ITEM **861**-"CONTROLLER PRETIMED 3 DIAL ELECTRO-MECHANICAL MASTER/SECONDARY WITH CABINET" WILL BE AT THE CONTRACT UNIT PRICE FOR EACH COMPLETE AND IN PLACE, INCLUDING PREWIRED WIRING, WIRING CABINET, ALL CONNECTIONS AND TESTING AS SPECIFIED HEREIN AND IN **861**.

B. CONTROLLER, PRETIMED 3 DIAL ELECTRO-MECHANICAL SECONDARY WITH CABINET AS PER PLAN

CONTROLLER, PRETIMED 3 DIAL ELECTRO-MECHANICAL SECONDARY WITH CABINET AS CALLED FOR IN THE PLANS SHALL MEET ALL OF THE REQUIREMENTS OF SUPPLEMENTAL SPECIFICATION

THE CONTROLLER SHALL BE EQUIPPED WITH THREE DIALS AND THREE OFFSETS PER DIAL, SHALL BE CAPABLE OF PROVIDING THE SIGNAL SEQUENCE CALLED FOR IN THE PLANS, AND SHALL BE CAPABLE OF RECEIVING COORDINATION AND SEQUENCING FROM THE MASTER/SECONDARY CONTROLLER (IN "A" ABOVE) COMPATIBLE WITH ITS EQUIPMENT AND OPERATION.

CONTROLLER CABINET SHALL BE AS SPECIFIED IN "A" ABOVE.

PAYMENT FOR ITEM **861**-"CONTROLLER, PRETIMED 3 DIAL ELECTRO-MECHANICAL SECONDARY WITH CABINET" WILL BE AT THE CONTRACT UNIT PRICE FOR EACH COMPLETE AND IN PLACE, INCLUDING PREWIRED CABINET, ALL CONNECTIONS AND TESTING AS SPECIFIED HEREIN AND IN **861**.

ITEM 861 - RESET INTERRUPTER

AS SPECIFIED ON THE PLANS, A RESET INTERRUPTER SHALL BE PROVIDED AS PART OF, OR WILL BE ADDED TO, A MASTER PRETIMED CONTROLLER, MASTER-SECONDARY PRETIMED CONTROLLER, OR MASTER COORDINATOR. WHEN THE SECONDARY CONTROL EQUIPMENT IS BEING RESYNCHRONIZED AFTER A CYCLE LENGTH CHANGE, OFFSET CHANGE, PREEMPTION MODE, OR ANY LOSS OF SYNCHRONIZATION WITH THE MASTER EQUIPMENT, THE INTERRUPTER SHALL LIMIT THE PERIOD THAT THE SECONDARY CONTROL EQUIPMENT WILL DWELL THE SIGNALS. THE TOTAL RESYNCHRONIZATION PERIOD SHALL BE DIVIDED INTO INCREMENTS DISTRIBUTED OVER SEVERAL SIGNAL CYCLES.

PAYMENT FOR ITEM **861**-"RESET INTERRUPTER," WILL BE AT THE CONTRACT PRICE BID FOR EACH FURNISHED, COMPLETE AND IN PLACE AND WILL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, NECESSARY INCIDENTALS, ALL CONNECTIONS MADE AND WIRING COMPLETED, TESTED AND ACCEPTED AS SPECIFIED HEREIN AND **861**.

ITEM 843 WEEKLY PROGRAMMER

INSTEAD OF THE REQUIREMENTS OF 843.12, THE CONTRACTOR SHALL FURNISH, INSTALL AND PROGRAM A WEEKLY PROGRAMMER WHICH WILL SUPERVISE THE OPERATION OF VARIOUS ELEMENTS OF THE TRAFFIC CONTROL SYSTEM ON A TIME-OF-DAY BASIS. ALL COMPONENTS SHALL BE APPROPRIATELY RATED AND DESIGNED FOR OPERATION OVER A DESIGN LIFE OF AT LEAST TEN YEARS. EACH DEVICE SHALL HAVE ONE OR MORE ELECTRICAL CIRCUITS WHICH MAY BE UTILIZED TO CONTROL SPECIFIC SYSTEM FUNCTIONS. THE DEVICE SHALL HAVE A PRECISE TIME KEEPING METHOD POSSESSING A MINIMUM ACCURACY AS DEFINED IN TABLE 1. THE TIME KEEPING METHOD SHALL INCORPORATE A MEANS OF RETAINING THE PROPER TIME IN THE EVENT OF AN ELECTRICAL POWER FAILURE OF UP TO 10 HOURS DURATION, AND UPON RESUMPTION OF POWER, ALL CIRCUITS SHALL MAINTAIN PROPER TEMPORAL RELATIONSHIPS, AND RESUME PROPER FUNCTION IN ACCORDANCE WITH THE OPERATION SCHEDULE DESCRIBED IN THE PLANS. TIME KEEPING AND EVENT SETTINGS SHALL BE BASED UPON A 24-HOUR DAY BEGINNING AT MIDNIGHT.

EACH DEVICE, OR THE CABINET WIRING ASSOCIATED WITH THE DEVICE SHALL INCORPORATE A SWITCH (ES) OR OTHER CONTROL (S) WHICH WILL ALLOW MANUAL OVERRIDE OF EACH SEPARATE CIRCUIT WITHOUT DISTURBING THE PREPROGRAMMED TIME SETTINGS OR DISRUPTING THE TIME KEEPING OF THE DEVICE.

THE DEVICE (S) MAY EITHER BE SEPARATE UNITS, MOUNTED WITHIN THE CONTROLLER CABINET, OR MAY BE MODULES, CIRCUIT BOARDS OR OTHER COMPONENTS ADDED WITHIN A LOCAL OR MASTER CONTROLLER OR COORDINATOR. WHEN ADDED WITHIN A CONTROL UNIT IT SHALL NOT INTERFERE WITH THE NORMAL OPERATION OF THE CONTROL UNIT, NOR SHALL IT, IN THE CASE OF CONTROLLERS MEETING NEMA REQUIREMENTS, INTERFERE WITH THEIR STANDARD INTERFACE REQUIREMENTS.

THE DEVICE SHALL PROVIDE A NUMBER OF SEPARATE CIRCUITS, ALL RELATED TO A COMMON TIME KEEPING MECHANISM. EACH CIRCUIT SHALL BE SEPARATELY PROGRAMMABLE; HOWEVER, THE TIME RELATIONSHIP OF EACH CIRCUIT SHALL BE RELATED TO OTHER CIRCUITS IN A MANNER THAT, WITH PROPER PROGRAMMING, ANY TWO CIRCUITS MAY OPEN SIMULTANEOUSLY, CLOSE SIMULTANEOUSLY, ONE OPEN AND ONE CLOSE SIMULTANEOUSLY, OR THEY MAY OPEN OR CLOSE INDEPENDENTLY. IT SHALL BE POSSIBLE FOR EACH CIRCUIT TO BE AUTOMATICALLY OPENED OR CLOSED A NUMBER OF TIMES DURING THE DAY. THE PATTERN OF CIRCUIT OPENINGS AND CLOSINGS DURING ANY DAY OF THE WEEK MAY BE PROGRAMMED TO DIFFER FROM THE PATTERN PROGRAMMED FOR ANOTHER DAY OF THE WEEK; THIS, A DIFFERENT PATTERN MAY BE PROGRAMMED FOR EACH OF THE SEVEN DAYS OF THE WEEK. THE WEEKLY PATTERN SHALL BE AT LEAST AS FLEXIBLE AS THE FOLLOWING:

- A MINIMUM OF 60 TIMES IN EACH WEEK WHEN ANY OR ALL CIRCUITS MAY BE CHANGED (PROGRAM CHANGE).
- A MINIMUM OF 8 PROGRAM CHANGES POSSIBLE IN ANY DAY OF THE WEEK.
- THE WEEKLY PROGRAMMER MAY BE EITHER AN ELECTRO-MECHANICAL OR SOLID STATE DIGITAL DEVICE.
- THE DEVICE SHALL CONTROL TRANSFER BETWEEN: (DIALS 1, 2 AND 3; RESETS 1, 2 AND 3; SPLITS 1, 2 AND 3 AND SYSTEM FLASH.)

**TABLE
MINIMUM TEMPORAL ACCURACY
WEEKLY PROGRAMMER**

| | LONG TERM, TIME OF DAY CUMULATIVE ERROR (P.P.M.)* | BEGINNING OR END OF ANY INTERVAL COMPARED TO SET (SECONDS) |
|--|---|--|
| | | |
| 1. ELECTRO MECHANICAL | | |
| A) OPERATING ON STANDARD 60 HZ. AC POWER. * | 20 | ±300 |
| B) OPERATING WITH RESERVE POWER IN EVENT OF AC POWER FAILURE | 1000 | N.A. |
| 2. SOLID STATE DIGITAL | | |
| A) OPERATING ON STANDARD 60 HZ. AC POWER. * | 5 | ±10 |
| B) OPERATING WITH RESERVE POWER IN EVENT OF AC POWER FAILURE | 100 | N.A. |
| * ACCURACY MEASURED AS DEVIATION FROM ASSUMED ACCURACY OF THE 60 HZ. POWER SUPPLY. | | |
| ** P.P.M. - PARTS PER MILLION (100 P.P.M. = 8.64 SECONDS PER DAY) | | |

PAYMENT FOR ITEM 843 - "WEEKLY PROGRAMMER," WILL BE AT THE CONTRACT PRICE BID FOR EACH FURNISHED, COMPLETE AND IN PLACE AND WILL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, TOOLS, EQUIPMENT, NECESSARY INCIDENTALS, ALL CONNECTIONS MADE AND WIRING COMPLETED, TESTED AND ACCEPTED AS SPECIFIED HEREIN AND **843**.

MAINTENANCE OF TRAFFIC SIGNAL/FLASHER INSTALLATIONS

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRAFFIC SIGNAL/FLASHER INSTALLATIONS WITHIN THE PROJECT UNDER THE FOLLOWING CONDITIONS:

- EXISTING SIGNAL/FLASHER INSTALLATIONS WHICH THE PLANS REQUIRE THE CONTRACTOR TO ADJUST, MODIFY, ADD ON TO OR REMOVE, OR WHICH THE CONTRACTOR ACTUALLY ADJUSTS, MODIFIES OR OTHERWISE DISTURBS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ENTIRE INSTALLATION (AT AN INTERSECTION) FROM THE TIME HIS OPERATIONS FIRST DISTURB THE INSTALLATION UNTIL THE INSTALLATION HAS BEEN SUBSEQUENTLY REMOVED OR MODIFIED AND THE WORK IS ACCEPTED.
- NEW OR REUSED SIGNAL/FLASHER INSTALLATIONS OR DEVICES, INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF THESE FROM THE TIME OF INSTALLATION UNTIL THE WORK IS ACCEPTED.

THE CONTRACTOR SHALL CORRECT AS QUICKLY AS POSSIBLE ALL OUTAGES OR MALFUNCTIONS. HE SHALL PROVIDE THE CITY AND THE ENGINEER SUCH ADDRESSES AND PHONE NUMBERS WHERE HIS MAINTENANCE FORCES CAN BE CONTACTED. THE CONTRACTOR SHALL PROVIDE ONE OR MORE PERSONS TO RECEIVE ALL CALLS AND DISPATCH THE NECESSARY MAINTENANCE FORCES TO CORRECT OUTAGES. SUCH A PERSON OR PERSONS MAY BE USED TO PERFORM OTHER DUTIES AS LONG AS PROMPT ATTENTION IS GIVEN TO THESE CALLS AND A PERSON IS READILY AVAILABLE CONTINUOUSLY 24 HOURS A DAY, 7 DAYS A WEEK. ALL LAMP OUTAGES, CABLE OUTAGES, ELECTRICAL FAILURES, EQUIPMENT MALFUNCTIONS AND MISALIGNED SIGNAL HEADS SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER WITH THE SIGNAL BACK IN SERVICE WITHIN FOUR HOURS AFTER THE CONTRACTOR HAS BEEN NOTIFIED OF THE OUTAGE.

IN THE EVENT NEW SIGNALS ARE DAMAGED, PRIOR TO ACCEPTANCE, ALL DAMAGED EQUIPMENT EXCEPT POLES AND CONTROL EQUIPMENT SHALL BE REPLACED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER WITH THE SIGNAL BACK IN SERVICE WITHIN 8 HOURS AFTER THE CONTRACTOR'S NOTIFICATION OF THE OUTAGE.

IF POLES AND/OR CONTROL EQUIPMENT ARE DAMAGED AND MUST BE REPLACED, THE CONTRACTOR SHALL MAKE TEMPORARY REPAIRS AS NECESSARY TO BRING THE SIGNAL BACK INTO FULL OPERATION WITHIN THE ALLOWED 8-HOUR PERIOD, AND SHALL MAKE PERMANENT REPAIRS OR REPLACEMENT AS SOON THEREAFTER AS POSSIBLE.

NONE OF THE ABOVE SHALL BE CONSTRUED AS COLLECTIVE OR CONSECUTIVE OUTAGE TIME PERIODS AT ANY ONE LOCATION. THAT IS, WHERE MORE THAN ONE OUTAGE OCCURS AT ANY ONE LOCATION, THEN THE ALLOTTED TIME LIMIT SHALL BE FOR THE WORST SINGLE OUTAGE.

WHERE OUTAGES ARE THE DIRECT RESULT OF A VEHICLE ACCIDENT THE RESPONSE OF THE CONTRACTOR SHALL BE AS OUTLINED ABOVE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COLLECTION OF ANY COMPENSATION FOR THIS WORK FROM THOSE PARTIES RESPONSIBLE FOR THE DAMAGE.

WHERE THE CONTRACTOR HAS FAILED TO OR CANNOT RESPOND TO AN OUTAGE OR SIGNAL EQUIPMENT MALFUNCTION, AT THESE LOCATIONS WITHIN HIS RESPONSIBILITY, WITHIN PERIODS AS SPECIFIED ABOVE, THE ENGINEER MAY INVOKE THE PROVISIONS OF SECTION 105.15 AND ANY SUBSEQUENT BILLINGS TO THE STATE OR THE CITY OF CLEVELAND FOR POLICE SERVICES AND MAINTENANCE SERVICES BY CITY FORCES SHALL BE DEDUCTED FROM MONIES DUE OR TO BECOME DUE THE CONTRACTOR IN ACCORDANCE WITH PROVISIONS OF SECTION 105.15.

THE CONTRACTOR SHALL PROVIDE THE MAINTENANCE SERVICE ENTIRELY WITH HIS FORCES OR HE MAY CHOOSE TO ENTER INTO A COOPERATIVE UNDERSTANDING WITH THE LOCAL MAINTAINING AGENCY TO PROVIDE THE MAINTENANCE IN THE FOLLOWING METHODS (OR ANOTHER METHOD AS MAY BE AGREED BY THE CONTRACTOR LOCAL AGENCY AND THE ENGINEER):

- 9 AM TO 4 PM WEEKDAYS WITH THE CITY PROVIDING COVERAGE FROM 4 PM TO 9 AM WEEKDAYS, AND WEEKENDS AT THE CONTRACTOR'S EXPENSE AS PREVIOUSLY PROVIDED HEREIN.
- COMPLETE CITY MAINTENANCE AT THE CONTRACTOR'S EXPENSE, AS PREVIOUSLY PROVIDED HEREIN.

THE CONTRACTOR SHALL INFORM THE ENGINEER, IN WRITING, OF THE MAINTENANCE METHOD SELECTED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO ANY TRAFFIC SIGNAL COMPONENTS REQUIRED TO BE HANDLED DURING THE RELOCATION OF POLES AND REVISIONS TO THE SIGNAL SYSTEM.

WHEN A TRAFFIC SIGNAL MUST BE TAKEN OUT OF SERVICE BY THE CONTRACTOR, DUE TO CONSTRUCTION PROCEDURES, THIS OUTAGE SHALL NOT EXCEED 6 HOURS AND SHALL NOT INCLUDE THE HOURS OF 7-9 AM AND 3 TO 6 PM. ANY SIGNALIZED INTERSECTION, WHERE THE SIGNAL IS OUT OF SERVICE DUE TO CONSTRUCTION PROCEDURES, OR DUE TO AN OUTAGE OR MALFUNCTION OF EQUIPMENT AS DESCRIBED ABOVE, SHALL BE PROTECTED, BY THE CONTRACTOR, BY THE INSTALLATION OF TEMPORARY "STOP" SIGNS, EXCEPT FOR THE FOLLOWING INTERSECTIONS WHICH SHALL BE PROTECTED BY OFF-DUTY CITY OF CLEVELAND POLICE, HIRED BY THE CONTRACTOR:

EAST 55th STREET AND I-490
EAST 34TH STREET AND BROADWAY

ANY VEHICULAR TRAFFIC SIGNAL HEAD, EITHER NEW OR EXISTING WHICH WILL BE OUT OF OPERATION SHALL BE COVERED IN THE MANNER DESCRIBED IN 632.24.

ALL COSTS RESULTING FROM THE ABOVE REQUIREMENTS SHALL BE CONSIDERED TO BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614, MAINTAINING TRAFFIC.

SUB-SUMMARY GROUND MOUNTED SIGNS

| | | |
|---------------------------------------|-------------|---------------|
| CALC. BY CAP DATE 1-82 | CUY-490-149 | OHIO |
| CHKD BY JRH DATE 7-82 | | FHWA REGION 5 |
| QUANTITIES CARRIED TO GENERAL SUMMARY | | |

| FUND NO. | | | | REFERENCE DRAWINGS | LOCATION | SIGN CODE NO. | SIZE | ITEM 630 | | | | | | | | | | | | |
|----------------|---------------------|------------------|------------------------------|-------------------------------|----------|---------------|------|----------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------------|---|--------------------------|--|--|--|--|--|--|
| PLAN SHEET NO. | ELEVATION SHEET NO. | DETAIL SHEET NO. | SIGN MARK NO. | | | | | S.F. | SIGN SUPPORT ASSEMBLY, POLE MOUNTED | GROUND MOUNTED SUPPORTS, NO. 3 POST | GROUND MOUNTED SUPPORTS, NO. 4 POST | SIGN, DOUBLE FACE, STREET NAME | | STREET NAME SIGN SUPPORT | | | | | | |
| 203 | 224 | 223 | 120 | BROADWAY STA. 4+85, 26.5' LT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 121 | BROADWAY STA. 6+00, 28' LT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 122 | BROADWAY STA. 7+58, 28' LT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 123 | E. 33 ST. STA. 10+65, LT. | R-1-30 | 30"x30" | 6.3 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 124 | BROADWAY STA. 8+58, 28' LT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 125 | BROADWAY STA. 10+00, 28' LT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 130 | E. 37 ST. STA. 0+98, 28' LT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 131 | E. 37 ST. STA. 1+98, 28' LT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 132 | E. 37 ST. STA. 2+95, 28' LT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 116 | E. 37 ST. STA. 3+95, 28' LT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 117 | E. 37 ST. STA. 16+93, LT. | W-13-36 | 36"x36" | 9 | | | 14'-0" | | | | | | | | | | |
| 203 | 224 | 223 | 135 | BROADWAY STA. 2+60, 26' RT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 136 | BROADWAY STA. 3+13, 28' RT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 137 | BROADWAY STA. 4+90, 28' RT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 138 | BROADWAY STA. 6+90, 28' RT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 118 | BROADWAY STA. 7+95, 39.5' RT. | W-30-48 | 48"x24" | 8 | | | 11'-6" | 11'-6" | | | | | | | | | |
| 203 | 224 | 223 | 141 | BROADWAY STA. 8+69, 28' RT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 148 | BROADWAY STA. 9+68, 28.5' RT. | R-31B-36 | 36"x30" | 7.5 | | | 13'-0" | 13'-0" | | | | | | | | | |
| 203 | 224 | 223 | 151 | E. 37 ST. STA. 1+37, 16' RT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 152 | E. 37 ST. STA. 2+65, 16' RT. | R-55-12 | 12"x18" | 1.5 | | | | | | | | | | | | | |
| 203 | 224 | 223 | 145 | E. 37 ST. STA. 3+85, 16' RT. | W-14-36 | 36"x36" | 9 | | | 14'-0" | | | | | | | | | | |
| 203 | 224 | 224 | 154 | E. 33 ST. STA. 10+65, 20' LT. | | | | | | | | | 2 | 1 | | | | | | |
| 203 | 224 | 224 | 155 | E. 34 ST. STA. 13+08, 35' LT. | | | | | | | | | 2 | 1 | | | | | | |
| 204 | 214 | 40B | BROADWAY STA. 16+90, 39' LT. | W-68-36 | 36"x36" | 9 | | | | | | | | | | | | | | |
| 207 | 225 | 102 | RAMP E-S STA. 15+20, 43' RT. | W-49R-48 | 48"x48" | 16 | | | | 15'-6" | 15'-6" | | | | | | | | | |
| 207 | 225 | 103 | RAMP E-S STA. 21+00, 13' LT. | W-53-48 | 48"x48" | 16 | | | | 15'-6" | 15'-6" | | | | | | | | | |
| 207 | 225 | 104 | RAMP W-S STA. 21+25, 19' RT. | W-53-48 | 48"x48" | 16 | | | | 13'-0" | 13'-0" | | | | | | | | | |
| 207 | 225 | 105 | RAMP W-S STA. 22+75, 31' LT. | W-60C-48 | 48"x48" | 16 | | | | 15'-6" | 15'-6" | | | | | | | | | |
| 207 | 225 | 106 | RAMP W-S STA. 23+35, 15' RT. | W-60C-48 | 48"x48" | 16 | | | | 14'-0" | 14'-0" | | | | | | | | | |
| 207 | 225 | 107A | RAMP S-W STA. 7+00, 13' LT. | W-2-48 | 48"x48" | 16 | | | | 14'-6" | 14'-6" | | | | | | | | | |
| 207 | 225 | 107B | RAMP S-W STA. 7+00, 13' LT. | W-143-24 | 24"x24" | 4 | | | | | | | | | | | | | | |
| 207 | 226 | 108A | RAMP S-W STA. 7+00, 35' RT. | W-2-48 | 48"x48" | 16 | | | | 15'-0" | 15'-0" | | | | | | | | | |
| 207 | 226 | 108B | RAMP S-W STA. 7+00, 35' RT. | W-143-24 | 24"x24" | 4 | | | | | | | | | | | | | | |
| 207 | 226 | 109 | RAMP S-E STA. 13+00, 36' LT. | R-11A | 48"x60" | 20 | | | | 15'-0" | 15'-0" | | | | | | | | | |
| 207 | 226 | 110 | RAMP S-E STA. 13+00, 18' RT. | R-11A | 48"x60" | 20 | | | | 16'-0" | 16'-0" | | | | | | | | | |
| 208 | 226 | 95A | RAMP N-E STA. 6+35, 13' LT. | W-2-48 | 48"x48" | 16 | | | | 15'-0" | 15'-0" | | | | | | | | | |
| 208 | 226 | 95B | RAMP N-E STA. 6+35, 13' LT. | W-143-24 | 24"x24" | 4 | | | | | | | | | | | | | | |
| 208 | 226 | 96A | RAMP N-E STA. 6+35, 35' RT. | W-2-48 | 48"x48" | 16 | | | | 15'-6" | 15'-6" | | | | | | | | | |
| 208 | 226 | 96B | RAMP N-E STA. 6+35, 35' RT. | W-143-24 | 24"x24" | 4 | | | | | | | | | | | | | | |
| 208 | 226 | 97 | RAMP W-N STA. 17+90, 13' LT. | W-60C-48 | 48"x48" | 16 | | | | 15'-0" | 15'-0" | | | | | | | | | |
| 208 | 227 | 98 | RAMP E-N STA. 26+70, 19' RT. | W-60C-48 | 48"x48" | 16 | | | | 15'-0" | 15'-0" | | | | | | | | | |
| 208 | 227 | 99 | RAMP W-N STA. 15+80, 13' LT. | W-53-48 | 48"x48" | 16 | | | | 15'-0" | 15'-0" | | | | | | | | | |
| 208 | 227 | 100 | RAMP E-N STA. 24+60, 19' RT. | W-53-48 | 48"x48" | 16 | | | | 15'-0" | 15'-0" | | | | | | | | | |
| 208 | 227 | 101 | RAMP W-N STA. 13+50, 35' RT. | W-49R-48 | 48"x48" | 16 | | | | 15'-0" | 15'-0" | | | | | | | | | |
| TOTAL | | | | I - FUNDS | 352.8 | | | | 1 | 254'-0" | 507'-0" | | 4 | 2 | | | | | | |

| FUND NO. | | | | REFERENCE DRAWINGS | LOCATION | SIGN CODE NO. | SIZE | ITEM 620 DELINEATORS | | | | | | | | | | | | |
|----------------|---------------------|------------------|---------------|---|----------|---------------|-----------|----------------------|---|--------------------------|---|----|---|---|---|---|--|--|--|--|
| PLAN SHEET NO. | ELEVATION SHEET NO. | DETAIL SHEET NO. | SIGN MARK NO. | | | | | INTERVALS | TYPE "C" FLEXIBLE POST MOUNTED, AS PER PLAN | TYPE "C" BRACKET MOUNTED | TYPE "D" FLEXIBLE POST MOUNTED, AS PER PLAN | | | | | | | | | |
| 198 | I-490 | | | STA. 1024+00 TO STA. 1036+00, RT. & LT. | | | | 400 | | | | | 8 | | | | | | | |
| 198 | RAMP W-S | | | STA. 4+70 TO STA. 8+70, RT. | | | | 200 | | | | | 3 | | | | | | | |
| 198 | RAMP W-S | | | STA. 10+30 | | | | 160 | | | | | 1 | | | | | | | |
| 198 | RAMP W-S | | | STA. 10+35 | | | | - | | | | | | | | 1 | | | | |
| 198 | RAMP W-S | | | STA. 11+13 TO STA. 12+68, LT. | | | | 80 | | | | | | | | 3 | | | | |
| 198 | RAMP W-N | | | STA. 3+15, 4+35 | | | | - | | | | | 2 | | | | | | | |
| 198 | RAMP W-N | | | STA. 5+03, 5+74 | | | | - | | | | | 2 | | | | | | | |
| 198 | RAMP W-N | | | STA. 6+36 | | | | - | | | | | 1 | | | | | | | |
| 198 | RAMP W-N | | | STA. 7+02 TO STA. 9+82, RT. | | | | 70 | | | | | | | 5 | | | | | |
| 198 | RAMP W-N | | | STA. 10+52 | | | | - | | | | | 1 | | | | | | | |
| 198 | RAMP S-W | | | STA. 10+70 TO STA. 14+20, RT. | | | | 90 | | | | | | | 5 | | | | | |
| 198 | RAMP S-W | | | STA. 15+12 TO STA. 16+86, RT. | | | | 90 | | | | | 3 | | | | | | | |
| 198 | RAMP S-W | | | STA. 18+24 | | | | - | | | | | 1 | | | | | | | |
| 198 | RAMP N-W | | | STA. 11+35 TO STA. 13+35, LT. | | | | 70 | | | | | | | 4 | | | | | |
| 198 | RAMP N-W | | | STA. 13+32 | | | | - | | | | | 1 | | | | | | | |
| 198 | RAMP N-W | | | STA. 14+05 | | | | - | | | | | 1 | | | | | | | |
| 198 | RAMP N-W | | | STA. 15+48 TO STA. 17+45, RT. | | | | 200 | | | | | 2 | | | | | | | |
| 199 | I-490 | | | STA. 1048+00 | | | RT | 400 | | | | | | 1 | | | | | | |
| 199 | I-490 | | | STA. 1040+00, | | | RT. & LT. | 400 | | | | | 2 | | | | | | | |
| 199 | I-490 | | | STA. 1044+00 | | | RT. & LT. | 400 | | | | | 2 | | | | | | | |
| 199 | RAMP E-N | | | STA. 9+45 TO STA. 11+45, RT. | | | | 200 | | | | | 2 | | | | | | | |
| 199 | RAMP S-E | | | STA. 17+00 | | | | 140 | | | | | 1 | | | | | | | |
| 199 | RAMP S-E | | | STA. 18+44 TO STA. 22+44, RT. | | | | 200 | | | | | 3 | | | | | | | |
| 200 | I-490 | | | STA. 1053+50 TO STA. 1057+50, LT. | | | | 400 | | | | | | 2 | | | | | | |
| 200 | I-490 | | | STA. 1057+50 | | | | | | | | | 1 | | | | | | | |
| 200 | RAMP E-N | | | STA. 5+45 TO STA. 7+45, RT. | | | | 200 | | | | | 2 | | | | | | | |
| 200 | RAMP S-E | | | STA. 24+45 TO STA. 30+45, RT. | | | | 200 | | | | | 4 | | | | | | | |
| 201 | I-490 | | | STA. 1061+50, | | | RT. & LT. | - | | | | | | | 2 | | | | | |
| 207 | RAMP W-S | | | STA. 13+45 TO STA. 15+40, LT. | | | | 200 | | | | | | | 2 | | | | | |
| 207 | RAMP S-W | | | STA. 2+60 TO STA. 4+00, LT. | | | | 140 | | | | | | | 2 | | | | | |
| 207 | RAMP S-W | | | STA. 4+00 TO STA. 8+00, RT. | | | | - | | | | | | | 3 | | | | | |
| 207 | RAMP S-W | | | STA. 8+90, | | | | | | | | | 1 | | | | | | | |
| 207 | RAMP S-W | | | STA. 9+88, | | | | | | | | | | | 1 | | | | | |
| 208 | RAMP N-W | | | STA. 8+00, 7+10 | | | 5+70 | | | | | | 3 | | | | | | | |
| 208 | RAMP N-W | | | STA. 8+70, | | | | | | | | | 1 | | | | | | | |
| 208 | RAMP N-W | | | STA. 9+38 TO STA. 10+66, LT. | | | | 70 | | | | | | | 3 | | | | | |
| 208 | RAMP W-N | | | STA. 11+07 TO STA. 13+75, RT. | | | | 70 | | | | | 5 | | | | | | | |
| 208 | RAMP W-N | | | STA. 13+75 TO STA. 15+20 | | | | 70 | | | | | | | 3 | | | | | |
| 208 | RAMP W-N | | | STA. 16+60, | | | | | | | | | | | 1 | | | | | |
| TOTAL | | | | I - FUNDS | | | | | | 61 | 11 | 20 | | | | | | | | |

SUB - SUMMARY

| | | | | |
|---------------|------------|-------------------|-------|---------|
| QUANTITIES | | FED. RD. DIVISION | STATE | PROJECT |
| CALC. BY: CAP | DATE: 9/78 | 2 | OHIO | |
| CHK'D BY: RLH | DATE: 5/83 | | | |

191
261

QUANTITIES CARRIED TO
GENERAL SUMMARY CUYAHOGA COUNTY
CUY-490-1.49

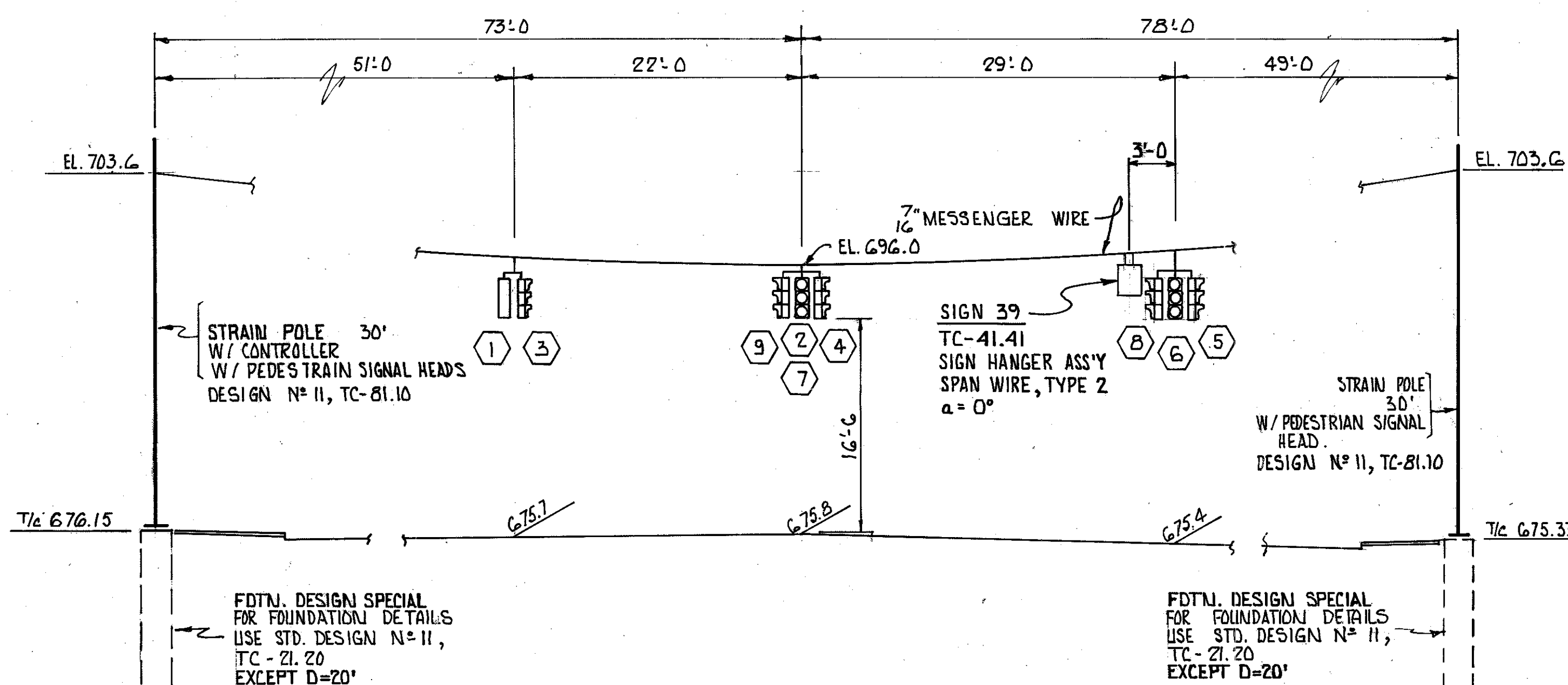
| FUNDS | SHEET N ^o | ITEM LOCATION | 621 | | | | | | | | | | | | | | |
|-------|----------------------|---|--------------------|---------------------|-------------------|--------------------|--------------------------|--------------------------|----------------------|----|----|----|--|--|--|--|-----|
| | | | EDGE LINES (WHITE) | EDGE LINES (YELLOW) | LANE LINES, 4 IN. | CHANNELIZING LINES | TRANSVERSE LINES (WHITE) | TRANSVERSE LINES (WHITE) | CURB MARKING (WHITE) | | | | | | | | |
| | | | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | | | | | |
| I | 198 | CUY-490 STA. 1023+50 TO 1036, LT. STA. 1023+50 TO 1036, RT. STA. 1023+50 TO 1023+90, RT. STA. 1023+90 TO 1036, RT. GORE @ W-S & MAINLINE | 1250 | 1250 | 2500 | | | | | | | | | | | | |
| | | RAMP W-S STA. 4+68 TO 4+98, LT. STA. 4+98 TO 7+45, LT. STA. 8+75 TO 10+25, LT. STA. 10+25 TO 13+00, LT. STA. 4+68 TO 8+75, LT. STA. 4+68 TO 13+00, RT. GORE @ W-S & W-N | | 247 | | 30 | | | 108 | | | | | | | | |
| | | RAMP W-N STA. 0+23 TO 11+00, LT. STA. 1+60 TO 3+10, RT. STA. 3+10 TO 11+00, RT. | 790 | 1076 | | 150 | | | | | | | | | | | |
| | | RAMP S-W STA. 10+00 TO 21+00, LT. STA. 10+00 TO 19+50, RT. | 950 | 1100 | | | | | | | | | | | | | |
| | | RAMP N-W STA. 11+00 TO 13+40, LT. STA. 13+40 TO 14+55, LT. STA. 16+08 TO 17+88, LT. | | 240 | | 115 | | | | | | | | | | | |
| | 198 | STA. 11+00 TO 17+88, RT. STA. 14+55 TO 14+95 LT. | 688 | 180 | | | | | | | | | | | | | |
| | | CUY-490 STA. 1036 TO 1048, LT. STA. 1036 TO 1046+80, LT. STA. 1046+80 TO 1048, LT. STA. 1036 TO 1048, RT. GORE @ E-N & MAINLINE | 1080 | 1200 | 2400 | | | 120 | | | | | | | | | |
| | | RAMP S-E STA. 16+95 TO 17+95, LT. STA. 16+95 TO 21+00, LT. STA. 16+95 TO 22+85, RT. | 590 | | | 405 | | | | | | | | | | | 100 |
| | | RAMP N-E STA. 17+93 TO 24+05, LT. STA. 22+77 TO 24+05, RT. STA. 17+93 TO 22+77, RT. | 484 | 612 | | | | | | | | | | | | | |
| | | RAMP E-N STA. 8+88 TO 10+00 LT. STA. 10+10 TO 12+94 LT. STA. 8+88 TO 12+94 LT. | | 284 | | 122 | | | | | | | | | | | |
| | 199 | STA. 8+88 TO 12+94 RT. | 406 | | 406 | | | | | | | | | | | | |
| | | SUB TOTAL I FUNDS THIS COLUMN | 9480 | 8914 | 8331 | 1132 | | | 543 | | | | | | | | 100 |

| FUNDS | SHEET N ^o | ITEM LOCATION | 621 | | | | | | | | | | | | | |
|-------|----------------------|---|-------------------------|--------------------|---------------------|-----------------------------|-------------------|--------------------|-----------------|------------|--------------------------|---------------------------------|-------------|-----------------------|----------------------|-----|
| | | | ISLAND MARKING (YELLOW) | EDGE LINES (WHITE) | EDGE LINES (YELLOW) | CENTER LINES (DOUBLE SOLID) | LANE LINES, 4 IN. | CHANNELIZING LINES | CROSSWALK LINES | STOP LINES | TRANSVERSE LINES (WHITE) | WORD "ONLY" ON PAVEMENT, 72 IN. | LANE ARROWS | CURB MARKING (YELLOW) | CURB MARKING (WHITE) | |
| | | | SF | LF | LF | LF | LF | LF | LF | LF | EA. | EA. | LF | LF | | |
| I | 200 | CUY-490 STA. 1048 TO 1050+50, LT. STA. 1048 TO 1053, LT. STA. 1048 TO 1053, RT. | | 500 | 500 | | 1000 | | | 250 | | | | | | |
| | | CUY-490 STA. 1060+25 TO 1061+00, LT. STA. 1053 TO 1059+50, LT. STA. 1053 TO 1060+05, LT. STA. 1053 TO 1060+25, LT. STA. 1059+50 TO 1061, LT. STA. 1059+85 TO 1061, LT. STA. 1053 TO 1053+85, RT. STA. 1053 TO 1059+75, RT. STA. 1053 TO 1060+05, RT. STA. 1057+01 TO 1059+75, RT. STA. 1057+01 TO 1060+30, RT. STA. 1060+05, RT. | | | 705 | | 1950 | | | | | | | | | 75 |
| | | RAMP S-E STA. 22+84 TO 23+80 LT. STA. 23+80 TO 27+89 LT. STA. 22+84 TO 27+89 LT. STA. 22+84 TO 27+89 RT. | | | 95 | | 409 | | | | | | | | | |
| | | RAMP S-E STA. 27+89 TO 28+77 LT. STA. 27+89 TO 31+93 E STA. 27+89 TO 31+93 RT. | | 404 | | | 404 | | | | | | | | | |
| | | RAMP E-N STA. 6+42 TO 8+88 LT. STA. 3+93 TO 8+88 E STA. 3+93 TO 8+88 RT. | | 495 | | | 495 | | | | | | | | | |
| | 200 | GORE E-N & MAINLINE | | | | | | | | | 230 | | | | | |
| | | CUY-490 STA. 1061 TO 1061+74 LT. STA. 1061 TO 1062+07 LT. STA. 1061+70 TO INTERSECTION STA. 1061 TO 1061+70 LT&RT STA. 1061+75 RT STA. 1061+81 LT&RT STA. 1061 TO 1061+75 RT. STA. 1061+45 RT. STA. 1061+00 TO PT CURVE (A) RT STA. 1061+00 TO PT CURVE (B) LT | | | | 180 | | | | | | | 51 | | | |
| | | FRANCIS AVE. INTERSECTION | | | 30 | | 70 | 15 | | | | | | | | |
| | | SUB TOTAL I FUNDS THIS COLUMN | 180 | 3043 | 2505 | 30 | 5803 | | 1582 | | 306 | 66 | 230 | 3 | 6 | 905 |
| | | SUB TOTAL I FUNDS LT COLUMN | | 9480 | 8914 | | 8331 | | 1132 | | | | 543 | | | 100 |
| | | CONVERTED UNITS | S.F. | MILE | MILE | MILE | MILE | | MILE | | LF | LF | LF | EA. | EA. | LF |
| | | TOTAL I FUNDS | 180 | 2.37 | 2.16 | .01 | 2.68 | | 0.51 | | 306 | 66 | 773 | 3 | 6 | 905 |

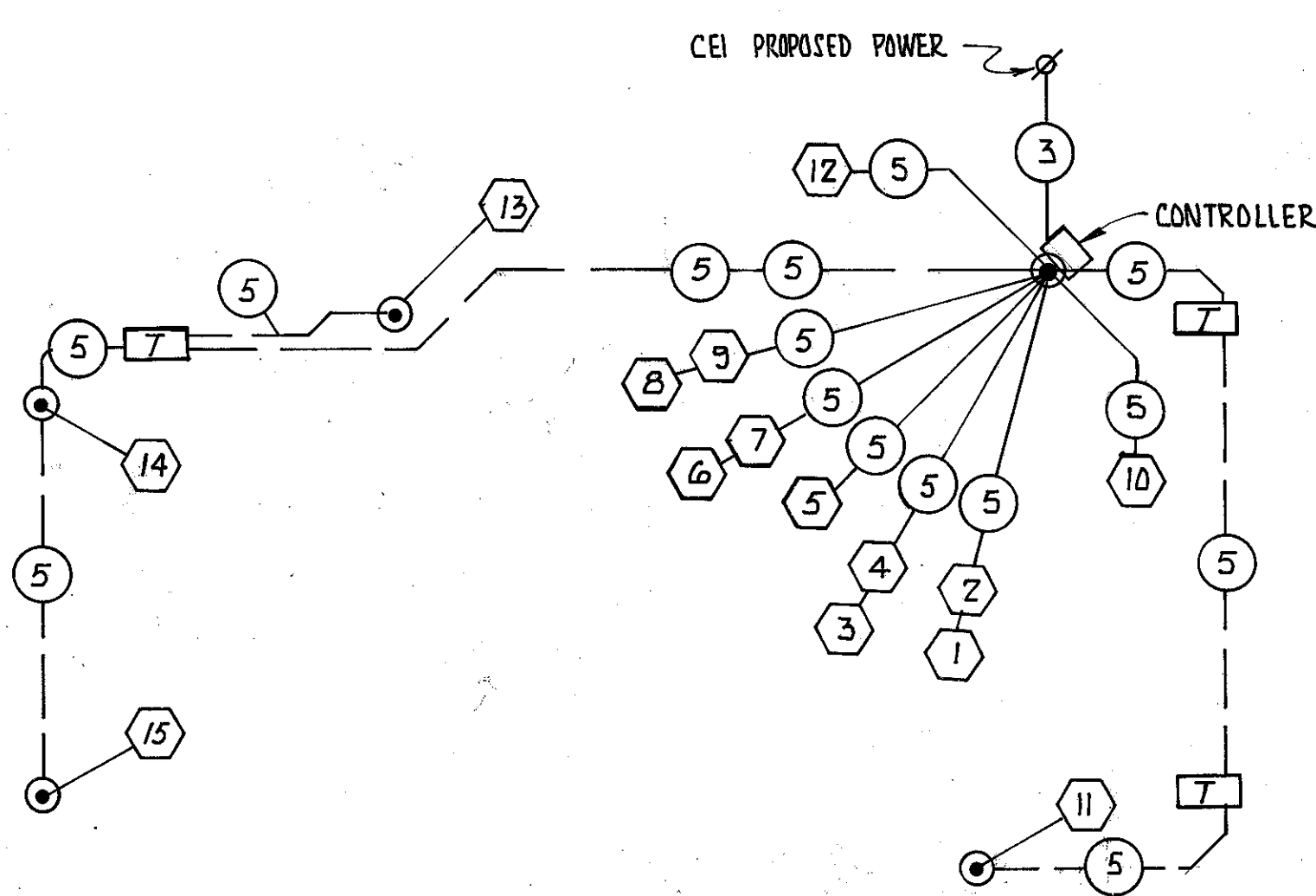
SHEET ACCT. No. CONT. No.

NO. DATE BY REVISED
TRYGVE HOFF & ASSOCIATES
 CONSULTING ENGINEERS
 1922 EAST 107TH STREET CLEVELAND, OHIO 44106
 SUB - SUMMARY
 QUANTITIES
 PAVEMENT MARKING
 SCALE DATE
 DESIGNED DRAWN TRACED CHECKED REVIEWED DATE
 LV. CAP RLH 5/83

CUYAHOGA COUNTY
CUY-490-1.49

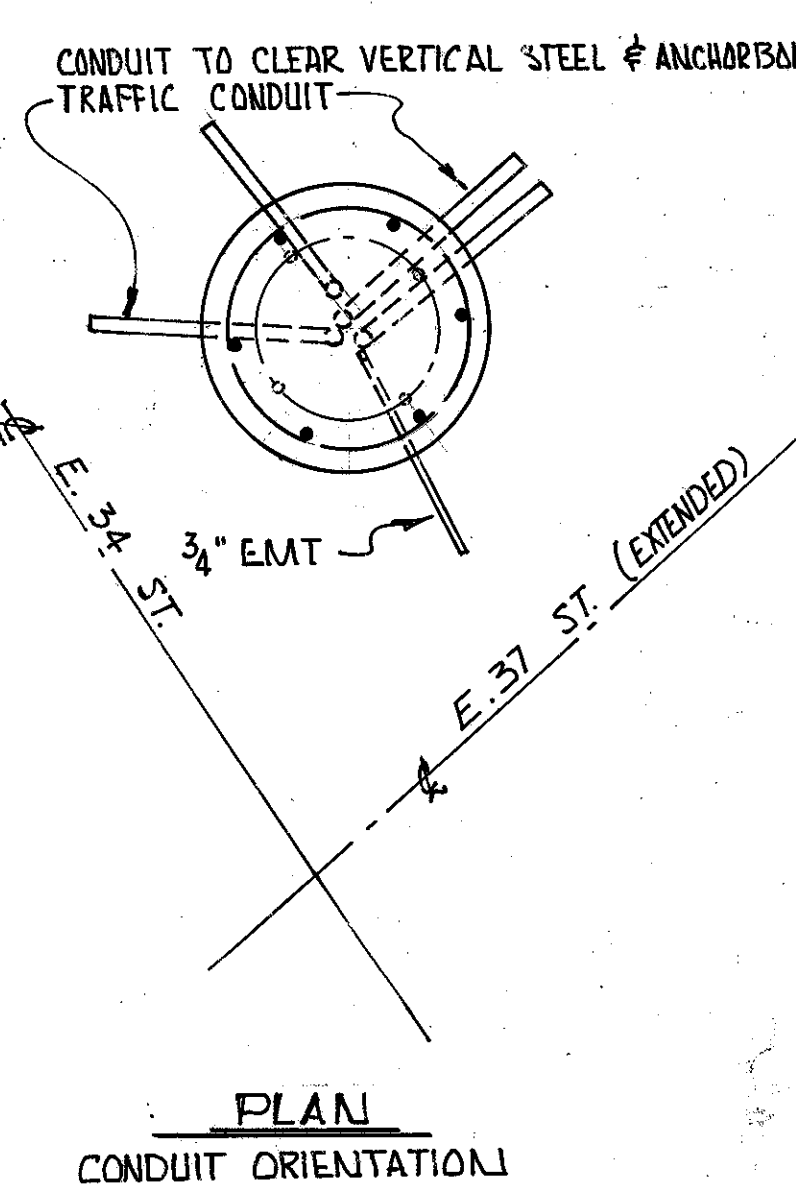
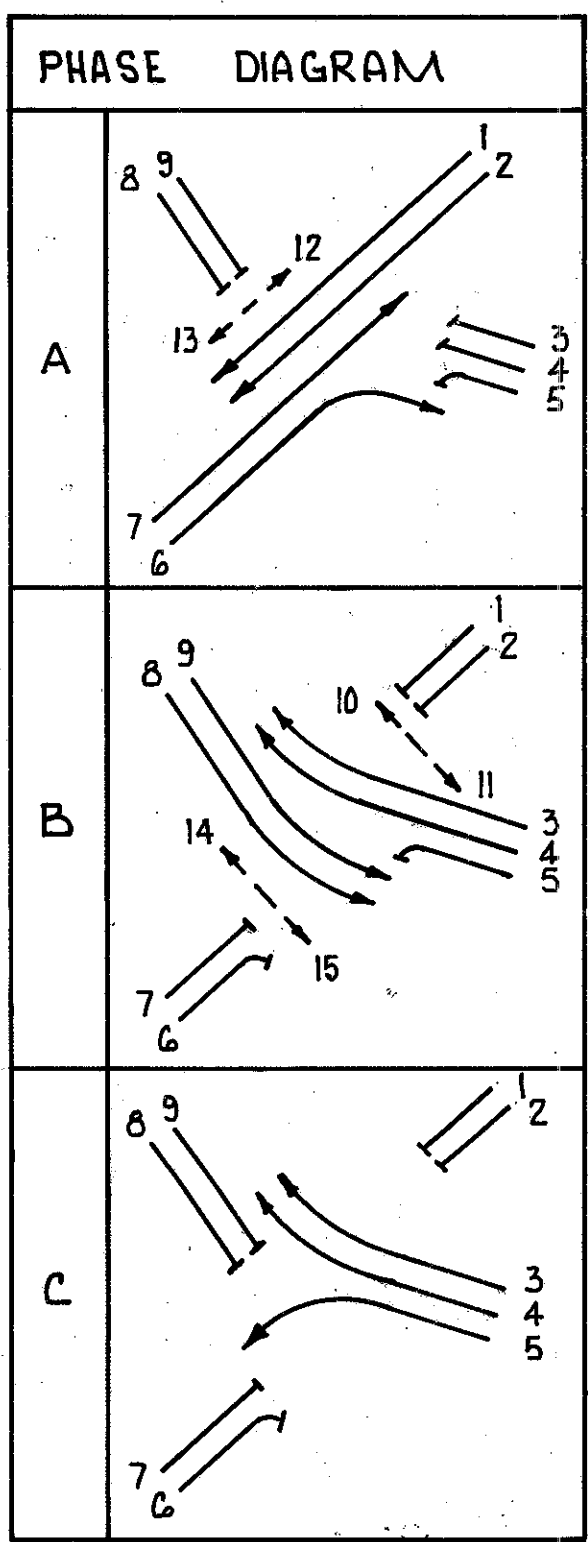


LOOKING EAST
SCALE: 1/8"=1'-0"

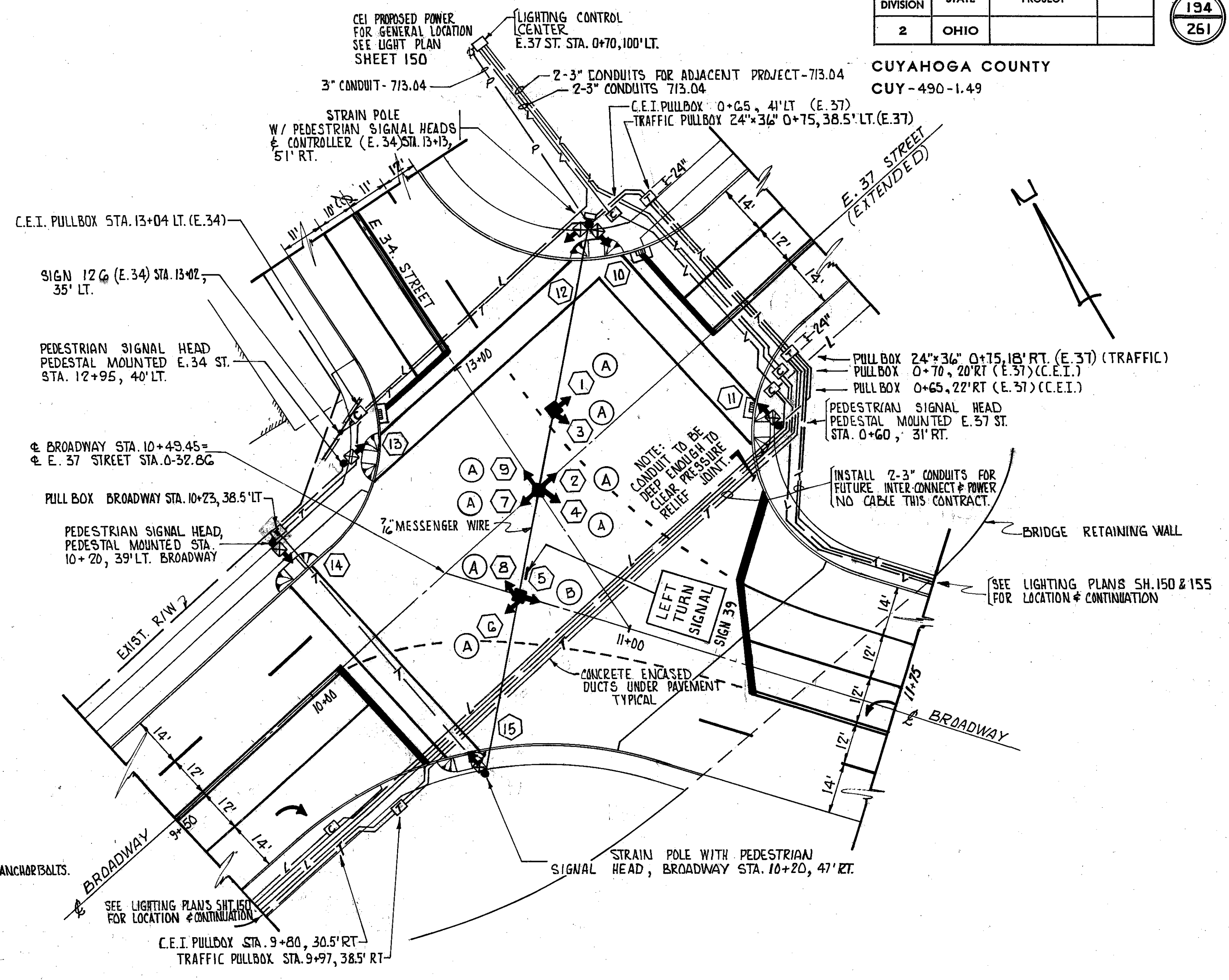


WIRING DIAGRAM
ONLY TRAFFIC CONDUIT W/ WIRE SHOWN

| SIGNAL HEAD | INTERVALS | | | | | | | | | | | | |
|-------------|-----------|-----|----|----|----|----|-----|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 1, 2 | G | G | G | Y | R | R | R | R | R | R | R | R | R |
| 3, 4 | R | R | R | R | R | G | G | G | G | G | G | Y | R |
| 5 | R | R | R | R | R | R | R | R | R | R | G | Y | R |
| 6, 7 | G | G | G | Y | R | R | R | R | R | R | R | R | R |
| 8, 9 | R | R | R | R | R | G | G | G | Y | R | R | R | R |
| 10, 11 | DW | DW | DW | DW | DW | W | FDW | DW | DW | DW | DW | DW | DW |
| 12, 13 | W | FDW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW |
| 14, 15 | DW | DW | DW | DW | DW | W | FDW | DW | DW | DW | DW | DW | DW |
| PHASE | A | | | | B | | | | | C | | | |



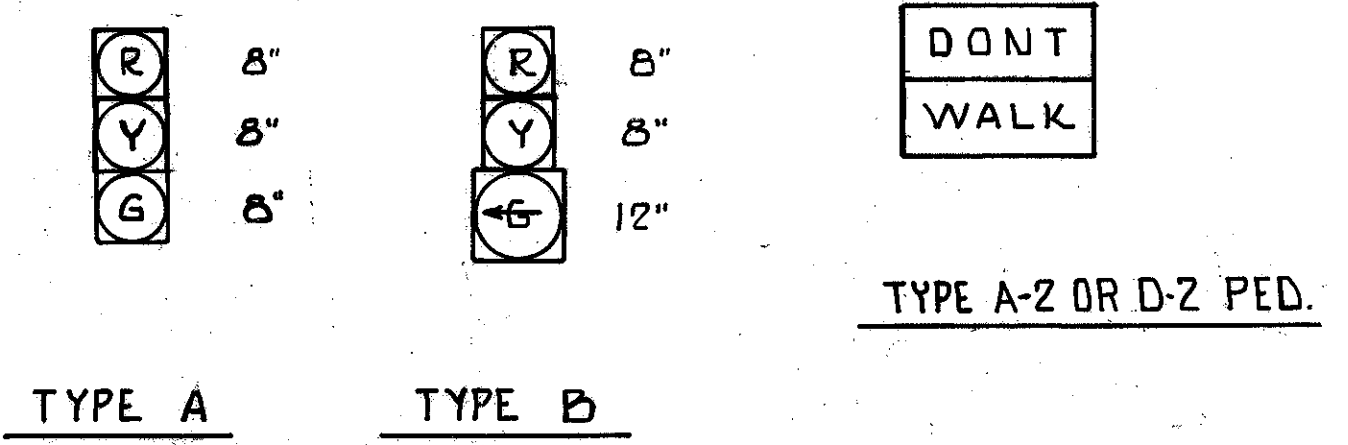
PLAN
CONDUIT ORIENTATION



PLAN
SCALE: 1"=20'

CONDUIT LEGEND
P = 120V CONTROLLER FEED 3" - 715.04
T = TRAFFIC 3" - 715.04
L = HIGHWAY LIGHTING / SIGNS 3" - 715.04
C = C.E.I.

NOTE
ALL TRAFFIC PULL BOXES ARE 24"x24" UNLESS NOTED.



TRAFFIC SIGNAL HEADS

| DIAL | TIME | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | TOTAL |
|------------|--|---|----|---|---|---|---|---|---|---|----|----|----|----|-------|
| 1. AVERAGE | 9:30 AM - 4:00 PM 6:30 PM - 7:30 PM | 8 | 11 | 4 | 3 | 2 | 8 | 8 | 4 | 3 | 2 | 12 | 3 | 2 | 70 |
| 2. MORNING | 7:30 AM - 9:30 AM | 8 | 11 | 2 | 3 | 2 | 8 | 8 | 2 | 3 | 2 | 16 | 3 | 2 | 70 |
| 3. EVENING | 4:00 PM - 6:30 PM | 8 | 11 | 2 | 3 | 2 | 8 | 8 | 2 | 3 | 2 | 16 | 3 | 2 | 70 |

| NO. | DATE | BY | REVISED |
|--|-------|---------|---------|
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| TRAFFIC SIGNAL PLAN & ELEVATION BROADWAY AND E.34 ST. | | | |
| SCALE: NOTED | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| REVIEWED | DATE | | |
| RH/LV | LV | JRH/RLH | RLH |
| | | | 5/83 |

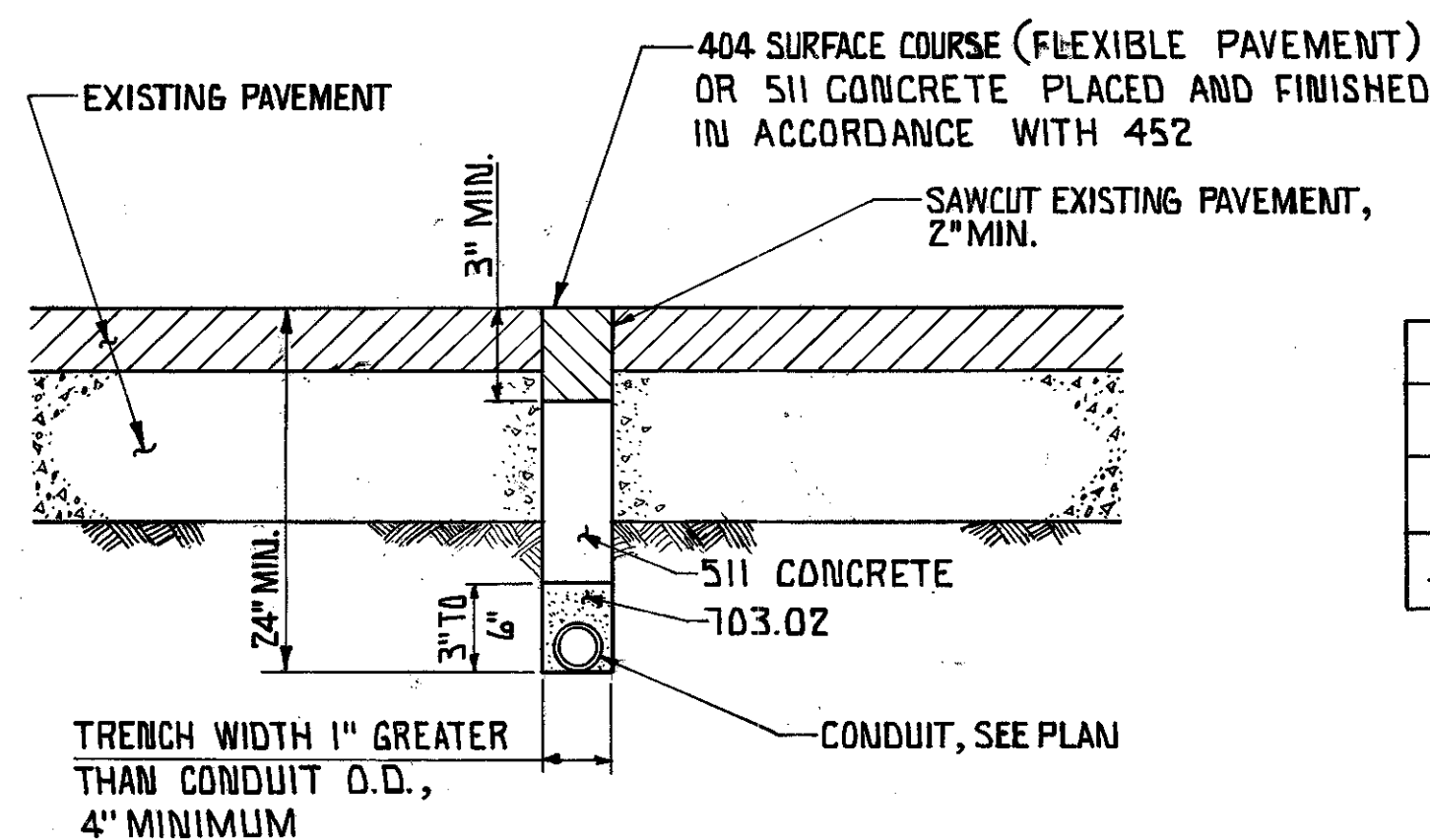
CONT. No. SHEET ACCT. No.

REFERENCE DRAWINGS. SHT.

SIGNAL ELEVATIONS & FDN'S. 196

MELP PLANS 169

LIGHTING PLANS 153



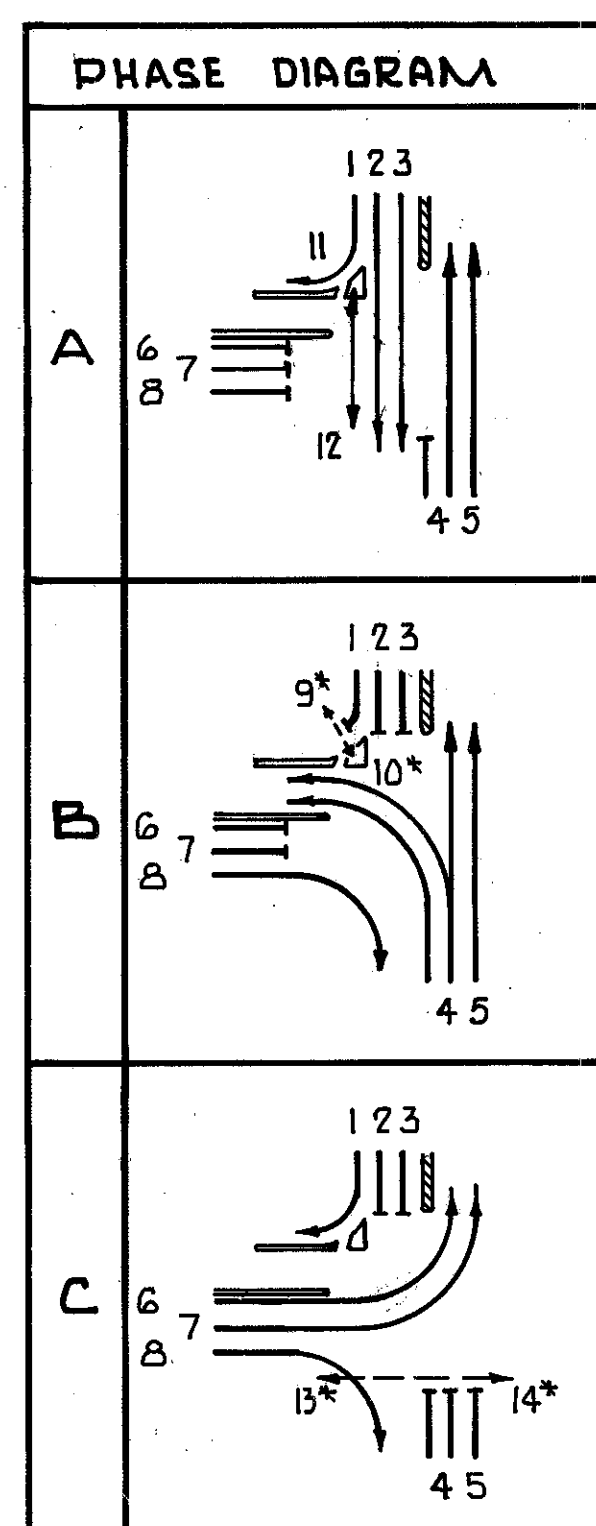
NARROW SLIT TYPE TRENCH DETAIL

| SIGNAL HEAD | INTERVALS | | | | | | | | | | | | | |
|-------------|-----------|-----|----|----|----|-----|----|----|----|----|-----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 1 | G | G | Y | R | R | R | R | R | R | G | G | G | G | G |
| 2, 3 | G | G | Y | R | R | R | R | R | R | R | R | R | R | R |
| 4 | G | G | G | G | G | G | G | Y | R | R | R | R | R | R |
| 5 | G | G | G | G | G | G | Y | R | R | R | R | R | R | R |
| 6, 7 | R | R | R | R | R | R | R | R | G | G | G | G | Y | R |
| 8 | R | R | R | R | G | G | G | G | Y | R | R | R | R | R |
| 9, 10 | DW | DW | DW | DW | PB | FDW | DW | DW | DW | DW | DW | DW | DW | DW |
| 11, 12 | W | FDW | DW | DY | DW | DW | DW | DW | DW | DW | DW | DW | DW | DW |
| 13, 14 | DW | DY | DW | DW | DW | DW | DW | DW | DW | PB | FDW | DW | DW | DW |
| PHASE | A | | | | B | | | | C | | | | | |

| DIAL | TIME | 1* | 2 | 3 | 4 | 5* | 6 | 7 | 8 | 9 | 10 | 11* | 12 | 13 | 14 | TOTAL |
|------------|--|----|----|---|---|----|---|---|---|---|----|-----|----|----|----|-------|
| 1. AVERAGE | 9:30 AM - 4:00 PM 6:30 PM - 7:00 AM | 10 | 20 | 3 | 2 | 9 | 6 | 3 | 2 | 3 | 3 | 9 | 15 | 3 | 2 | 90 |
| 2. MORNING | 7:00 AM - 9:30 AM | 10 | 20 | 3 | 2 | 9 | 6 | 3 | 2 | 3 | 3 | 9 | 15 | 3 | 2 | 90 |
| 3. EVENING | 4:00 PM - 6:30 PM | 10 | 20 | 3 | 2 | 9 | 6 | 3 | 2 | 3 | 3 | 9 | 15 | 3 | 2 | 90 |

* 7 SECONDS MIN. REQUIRED FOR PEDESTRIAN CROSSING

NOTE:
WHEN NOT CALLED BY PUSHBUTTON, PEDESTRIAN HEADS REMAIN DW. HEAD (1) THEN CONTINUES AS RIGHT TURN OVERLAP IN PHASE B. HEAD (2) CONTINUES AS RIGHT TURN OVERLAP THROUGHOUT PHASE C.



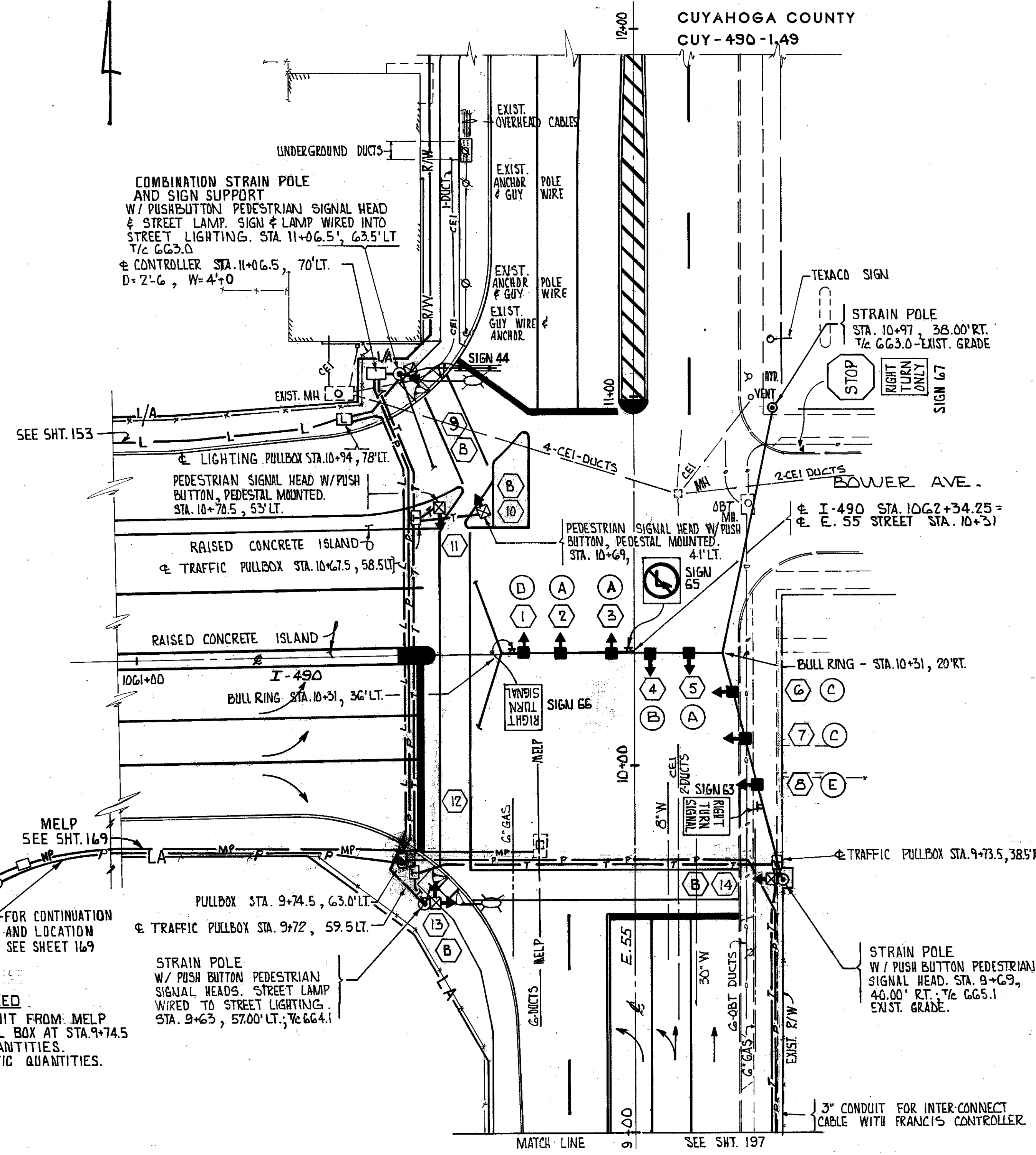
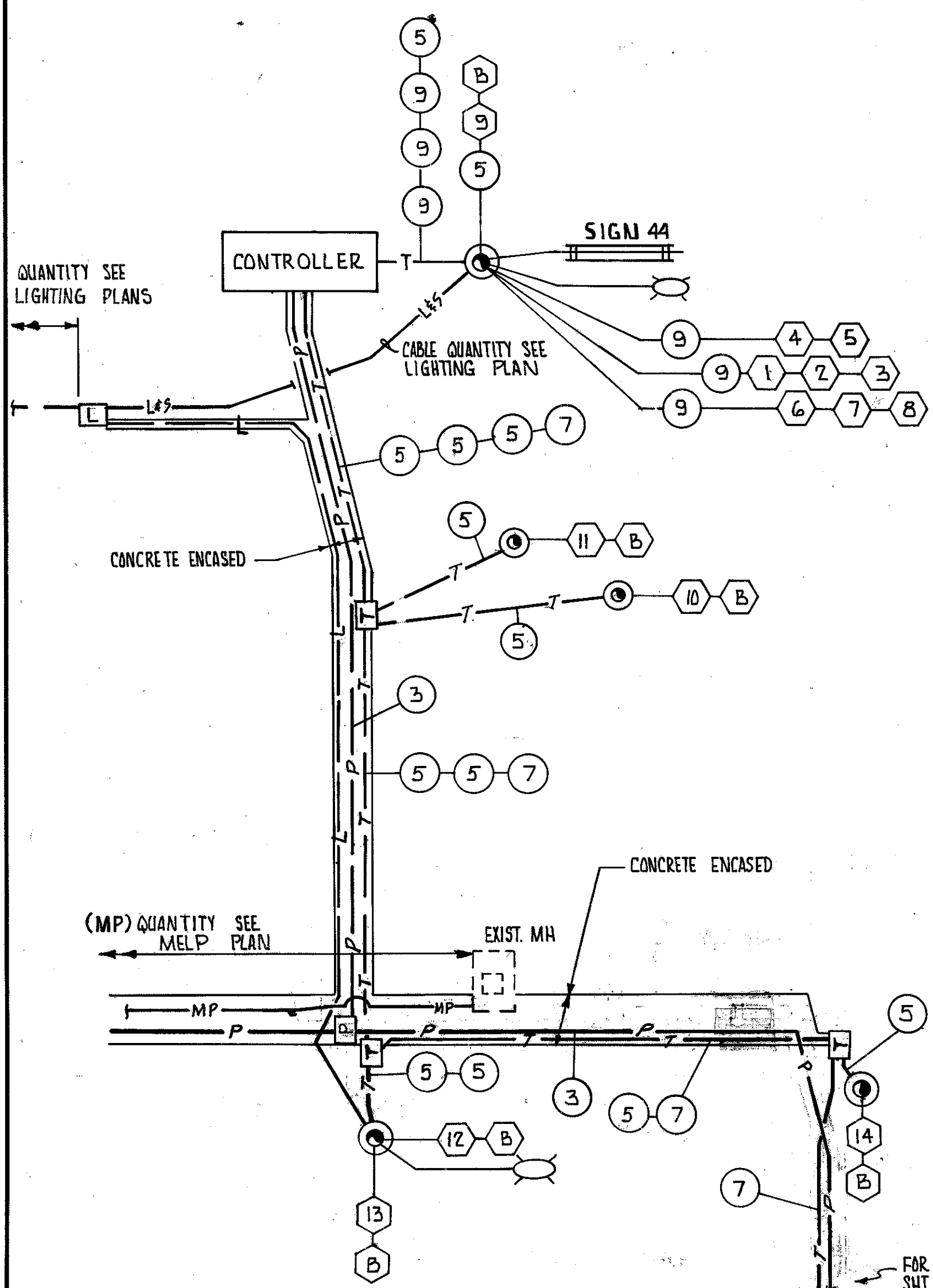
CONDUIT LEGEND THIS SHEET

| SYMBOL | CONDUIT |
|--------|---------------------------------|
| S | SIGN LIGHTING 3"-713.04 |
| P | 120 V CONTROLLER FEED 3"-713.04 |
| T | TRAFFIC 3"-713.04 |
| MP | MELP POWER SERVICE 3-4" DUCTS |
| L | HIGHWAY LIGHTING 3"-713.04 |

NOTE: 1. CONCRETE ENCASE ALL CONDUIT UNDER PAVEMENT
2. ALL TRAFFIC PULL BOXES ARE 24"x24" UNLESS NOTED.

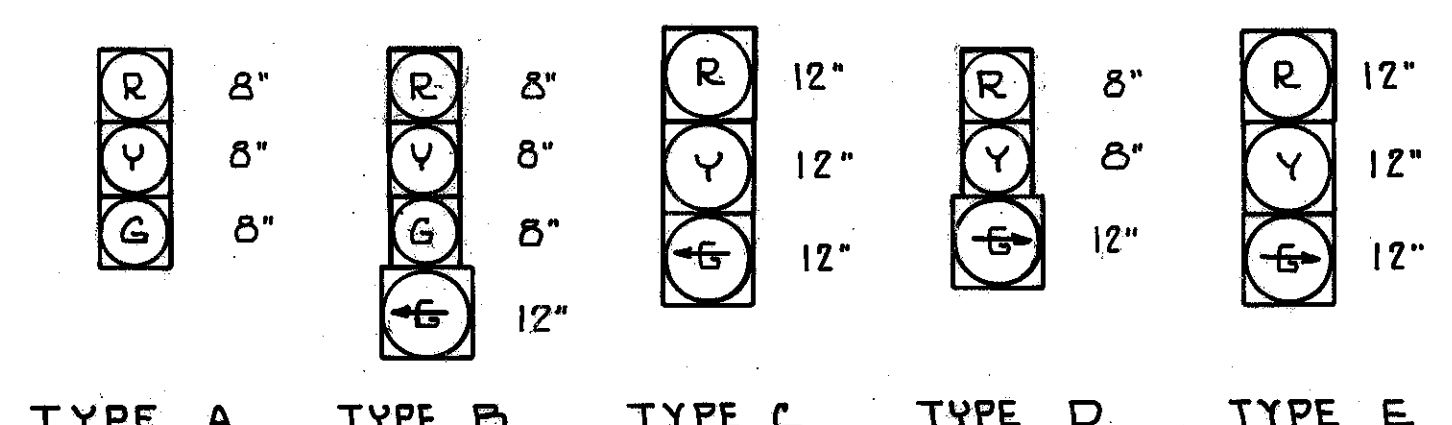
MELP POLE N-5 (SEE SHT. 169, 170 & 175) FOR CONTINUATION AND LOCATION SEE SHEET 169
ITEM 632 POWER SERVICE AS PER PLAN

CONTROLLER FEED TRENCH & 3" CONDUIT FROM MELP POLE N-5 TO PULL BOX AT STA. 9+74.5 WITH MELP QUANTITIES. CABLE WITH TRAFFIC QUANTITIES.



SIGNAL PLAN

NOTE:
COORDINATION: PHASE A YELLOW AT I-490 & E. 55 ST. BEGINS AT THE SAME TIME AS PHASE A YELLOW AT FRANCIS & E. 55 ST. MASTER CONTROLLER IS AT I-490 & E. 55 STREET.



TYPE A-2 OR D-2 PED.



NO. DATE BY

REVISED

TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

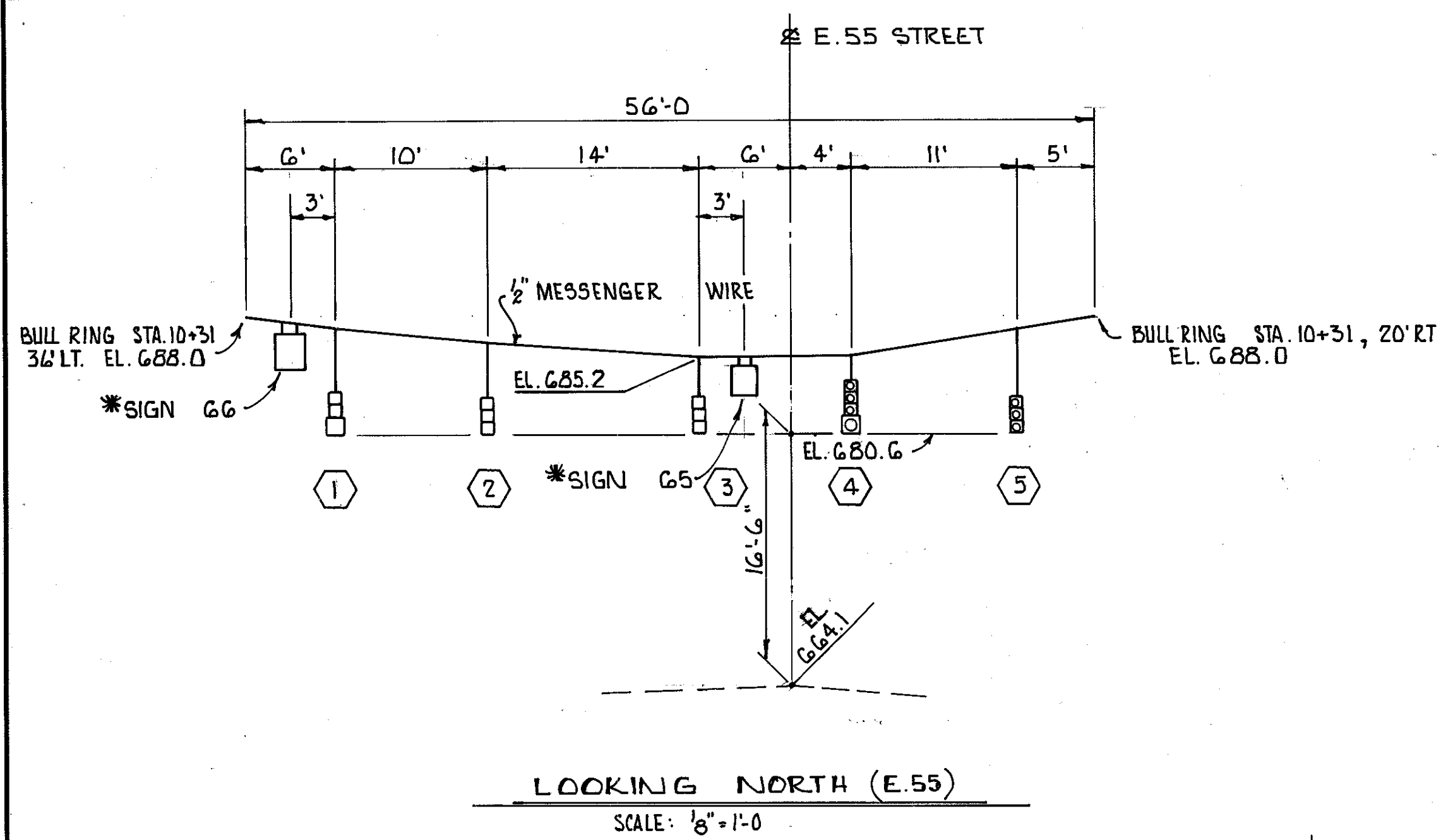
TRAFFIC SIGNAL PLAN
E. 55 ST. & I-490

| SCALE | DATE |
|-----------------|--------------|
| DESIGNED: RH/LV | DRAWN: LV |
| TRACED: JRH | CHECKED: RLH |
| REVIEWED: RLH | DATE: 5/83 |

SHEET ACCT. No.

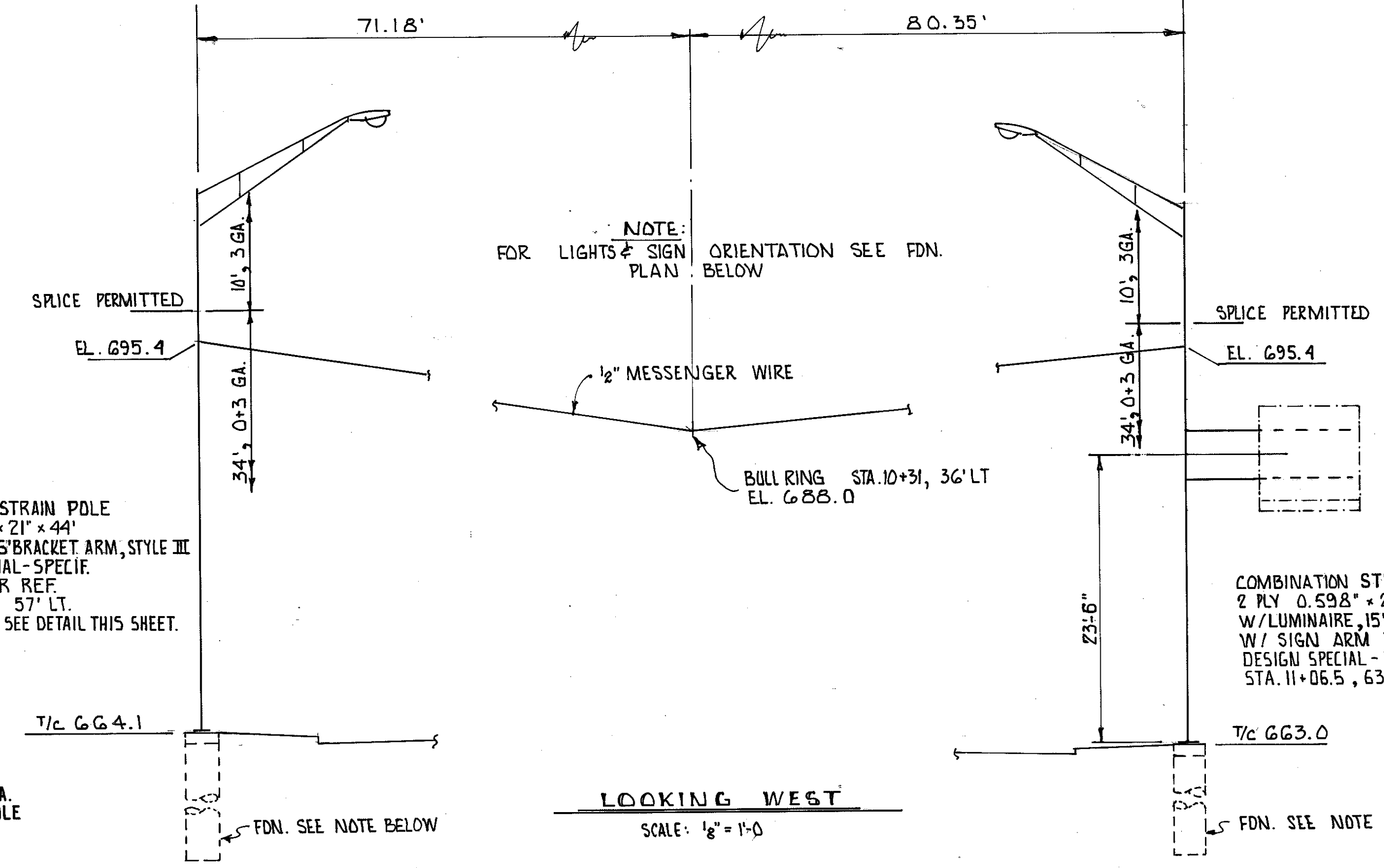
CONT. No.

CUYAHOGA COUNTY
CUY-490-1.49



LOOKING NORTH (E.55)
SCALE: 1/8" = 1'-0"

COMBINATION STRAIN POLE
2 PLY 0.598" x 21" x 44"
W/LUMINAIRE, 15' BRACKET ARM, STYLE III
DESIGN SPECIAL-SPECIF. TC-81.10 FOR REF.
STA. 9+63, 57' LT.
FOR BASE PLATE SEE DETAIL THIS SHEET.

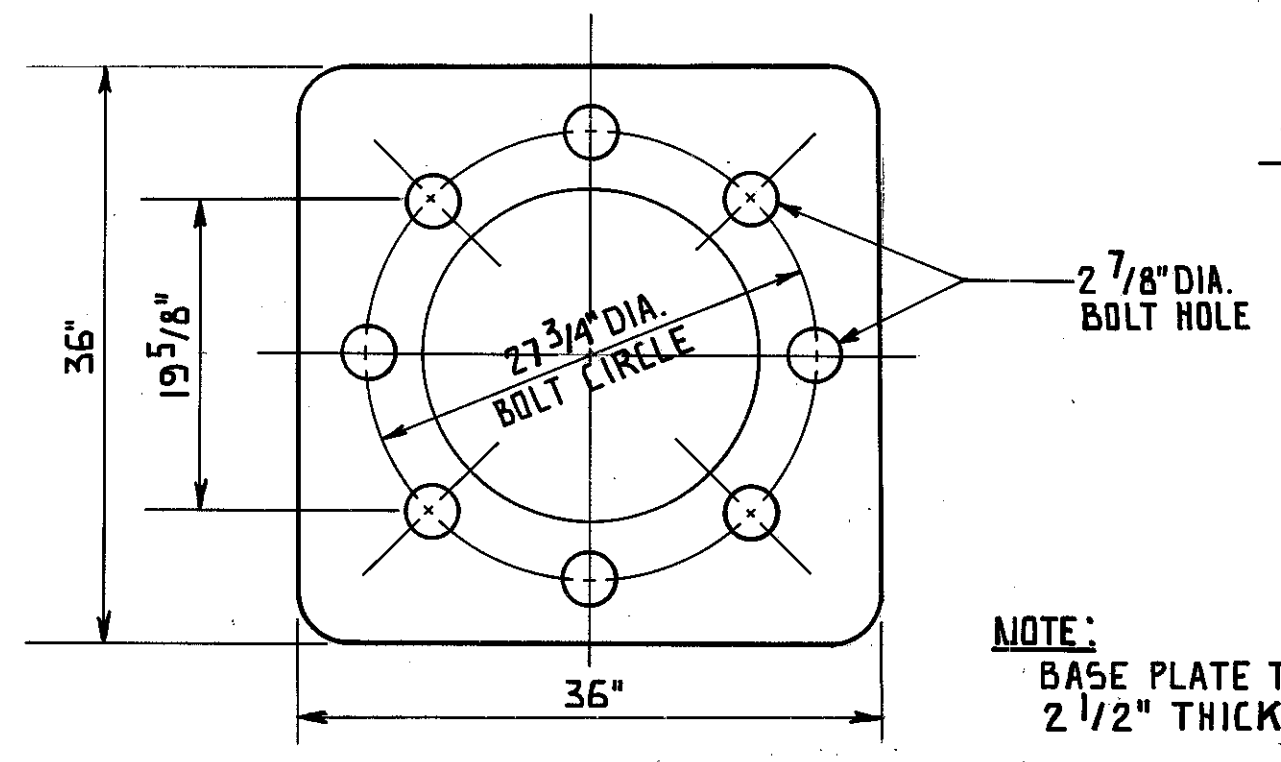


LOOKING WEST
SCALE: 1/8" = 1'-0"

COMBINATION STRAIN POLE
2 PLY 0.598" x 21" x 44"
W/LUMINAIRE, 15' BRACKET ARM, STYLE III
W/ SIGN ARM TRUSS 0.239", 6" x 4.60" x 20'-0" ARM
DESIGN SPECIAL-SPECIF. TC-81.10 FOR REF.
STA. 11+06.5, 63.5' LT. FOR BASE PLATE SEE DETAIL THIS SHEET.

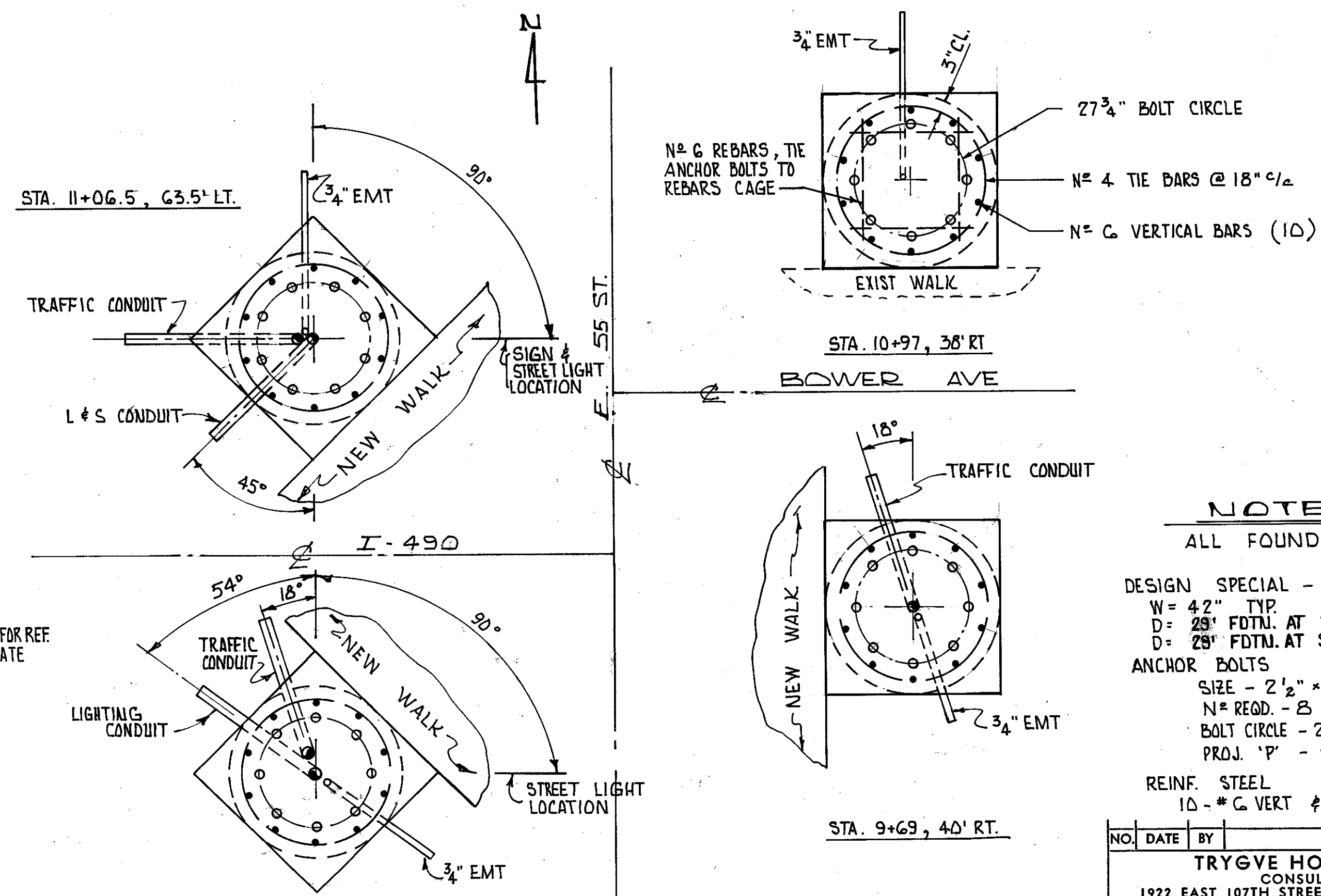
FOR SIGN 44 A & B ELEV.
SEE SHT. 215

*TC-41.41
SIGN HANGER ASS'Y.
SPAN WIRE, TYPE 2
SIGN G3 & G6: α = 0°
SIGN G5: α = 15°



BASE PLATE DETAIL
TYPICAL FOR ALL STRAIN POLES THIS SHEET
DESIGN SPECIAL-SPECIF. TC-81.10 FOR REF.

NOTE:
BASE PLATE TO BE
2 1/2" THICK



PLAN
STRAIN POLE FOUNDATIONS
SCALE: 1/2" = 1'-0"

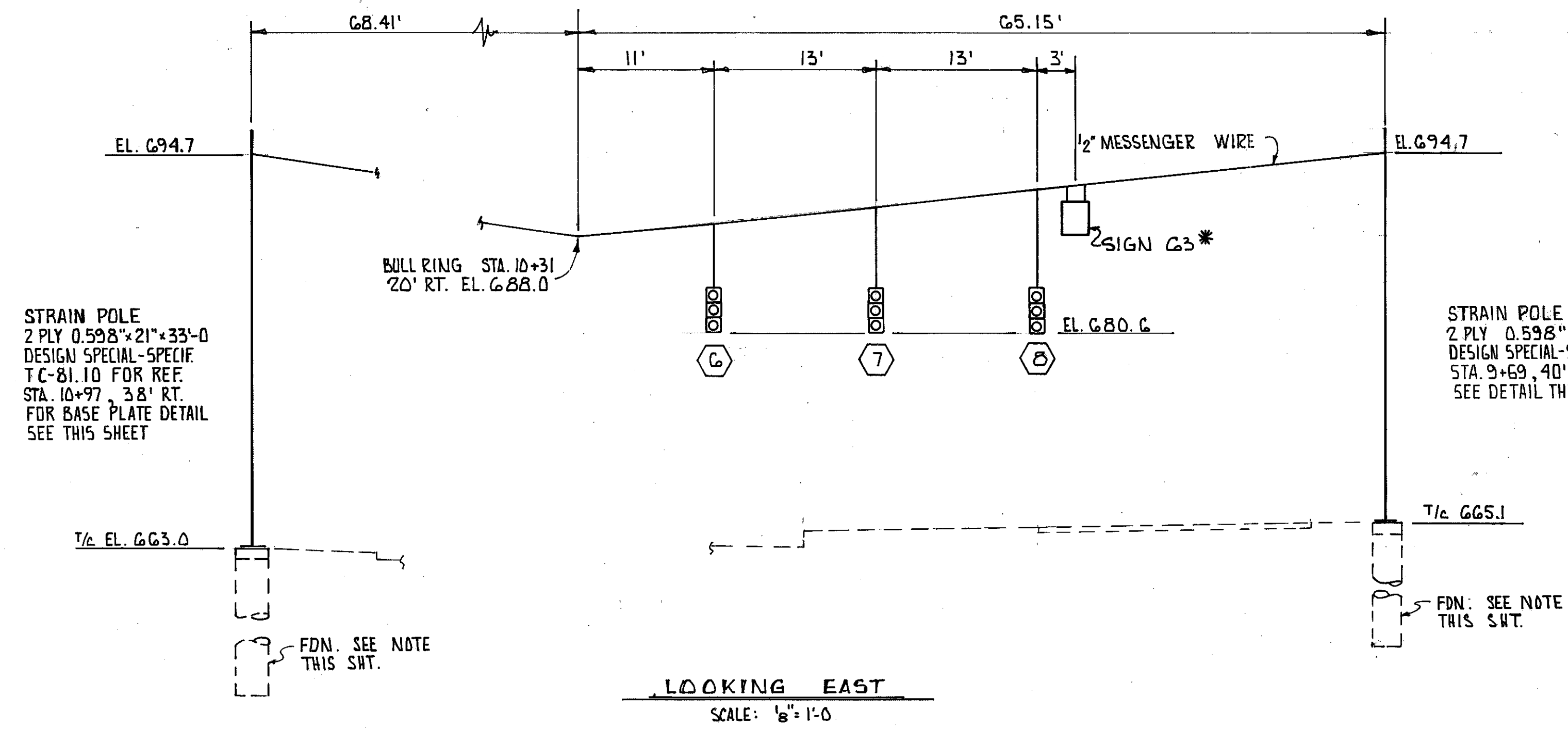
NOTE:
ALL FOUNDATIONS THIS SHEET.
DESIGN SPECIAL - SPECIF. TC-21.20 FOR REF.
W = 42" TYP.
D = 28" FDTN. AT STA. 11+06.5 LT.
D = 28" FDTN. AT STA. 9+63 LT., 10+97 RT. & 9+69 RT.
ANCHOR BOLTS
SIZE - 2 1/2" x 120"
N# REQD. - 8
BOLT CIRCLE - 27 3/4"
PROJ. 'P' - 9 3/4"
REINF. STEEL
10 - # 6 VERT. & # 4 TIE LOOPS @ 18" c/c

| NO. | DATE | BY | REVISED |
|-----|------|----|---|
| | | | TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 |

TRAFFIC SIGNAL ELEVATIONS
& POLE FOUNDATIONS
I-490 & E.55 STREET

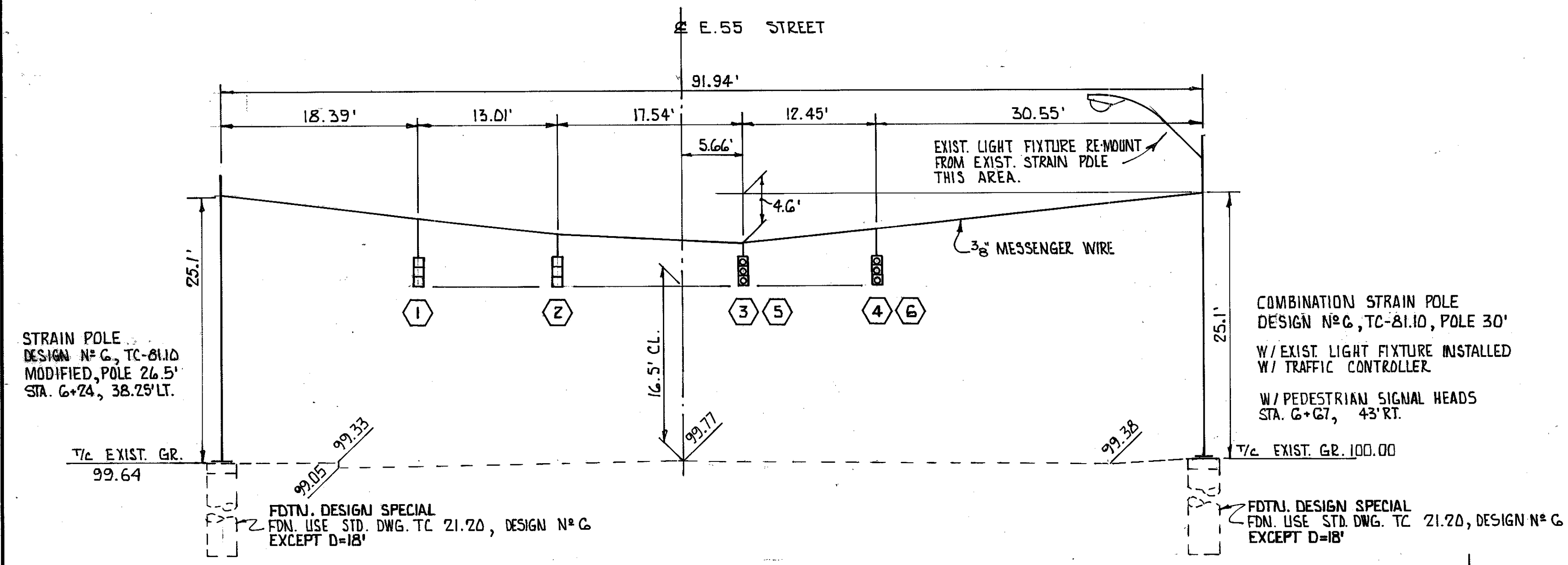
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
|----------|-------|--------|---------|----------|------|
| RH/LV | LV | | JRH/RLH | RLH | 5/83 |

SHEET ACCT. No. CONT. No.



LOOKING EAST
SCALE: 1/8" = 1'-0"

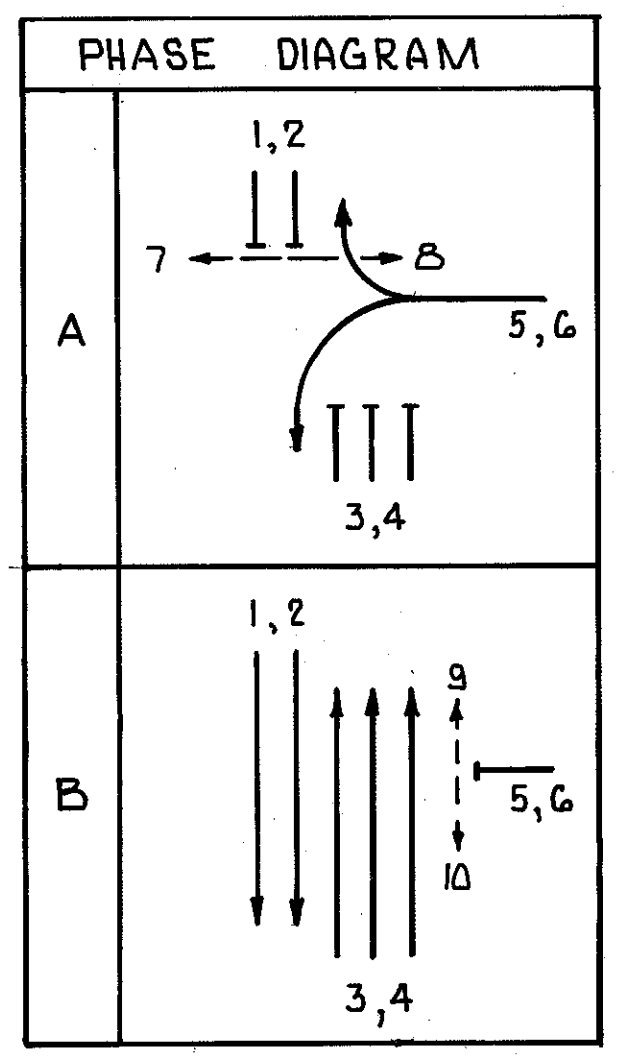
STRAIN POLE
2 PLY 0.598" x 21" x 31'-0"
DESIGN SPECIAL-SPECIF. TC-81.10 FOR REF.
STA. 9+69, 40' RT. FOR BASE PLATE
SEE DETAIL THIS SHEET



LOOKING NORTH
SCALE: 1/8" = 1'-0"

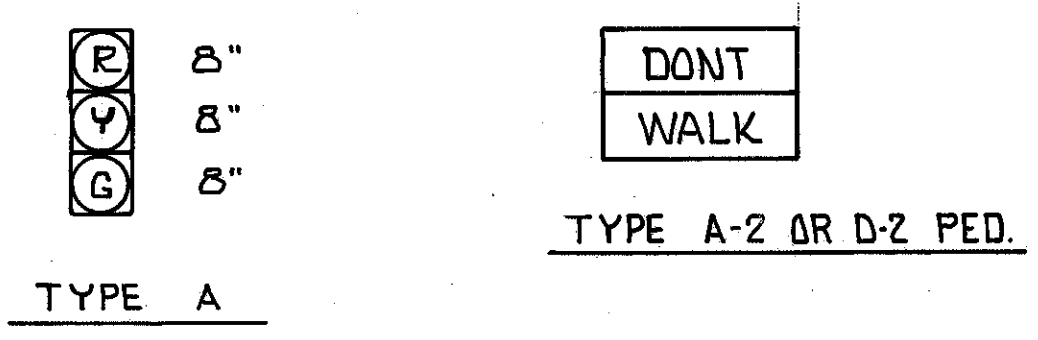
| SIGNAL HEAD | INTERVALS | | | | | | | | | |
|-------------|-----------|-----|----|----|----|-----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1, 2 | R | R | R | R | R | G | G | G | Y | R |
| 3, 4 | R | R | R | R | R | G | G | G | Y | R |
| 5, 6 | G | G | G | Y | R | R | R | R | R | R |
| 7, 8 | W | FDW | DW | DW | DW | DW | DW | DW | DW | DW |
| 9, 10 | DW | DW | DW | DW | W | FDW | DW | DW | DW | DW |
| PHASE | A | | | | | B | | | | |

| DIAL | TIME | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | TOTAL |
|------------|--|----|----|---|---|---|----|----|---|---|----|-------|
| 1. AVERAGE | 9:30 AM - 4:00 PM 6:30 PM - 7:00 AM | 14 | 12 | 4 | 3 | 2 | 30 | 12 | 8 | 3 | 2 | 90 |
| 2. MORNING | 7:00 AM - 9:30 AM | 20 | 12 | 4 | 3 | 2 | 24 | 12 | 8 | 3 | 2 | 90 |
| 3. EVENING | 4:00 PM - 6:30 AM | 8 | 12 | 4 | 3 | 2 | 36 | 12 | 8 | 3 | 2 | 90 |

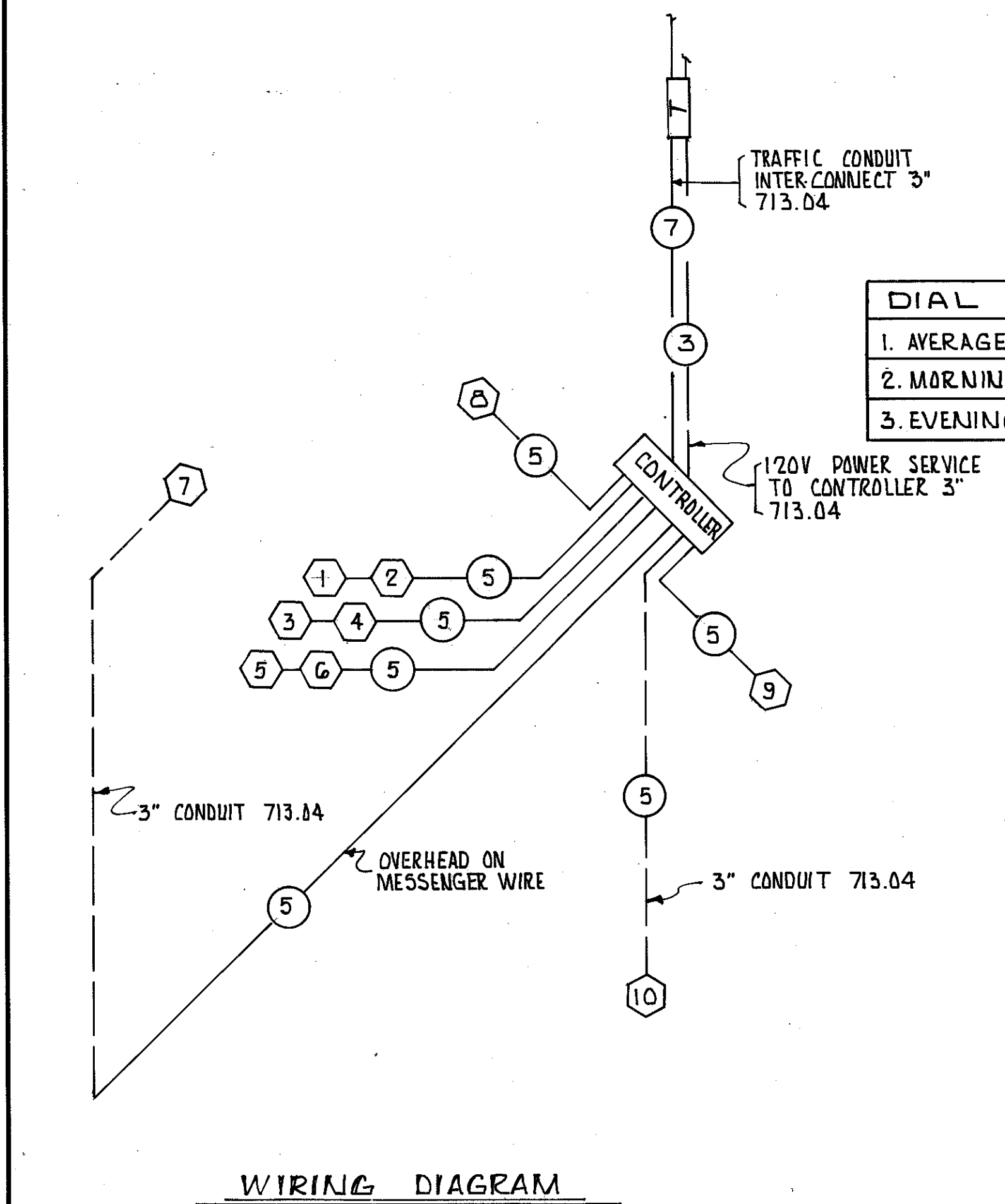


CONDUIT LEGEND
P = 120V CONTROLLER FEED 3"-713.04
T = TRAFFIC 3"-713.04

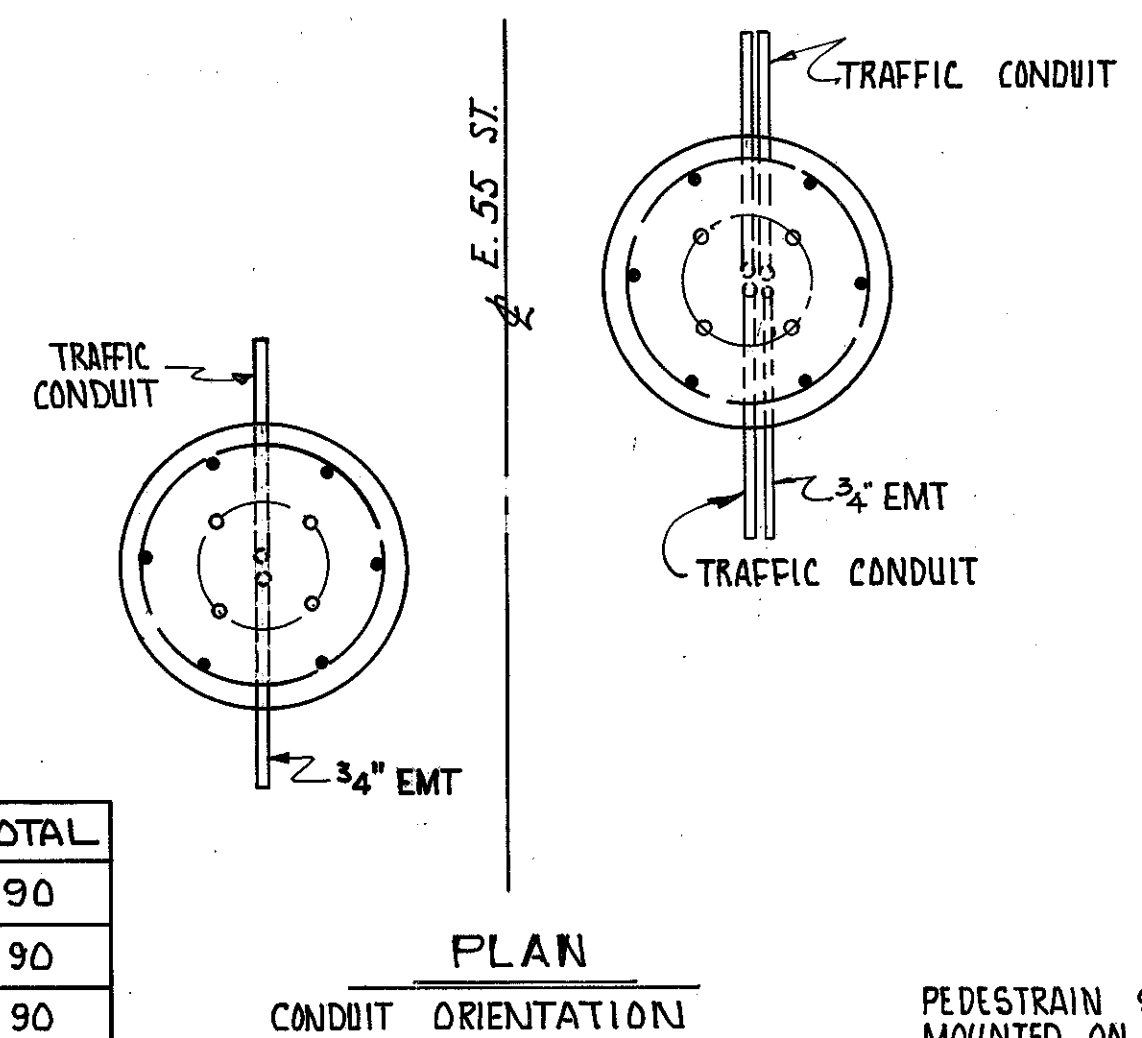
NOTE
ALL TRAFFIC PULL BOXES ARE 24"x24" UNLESS NOTED.



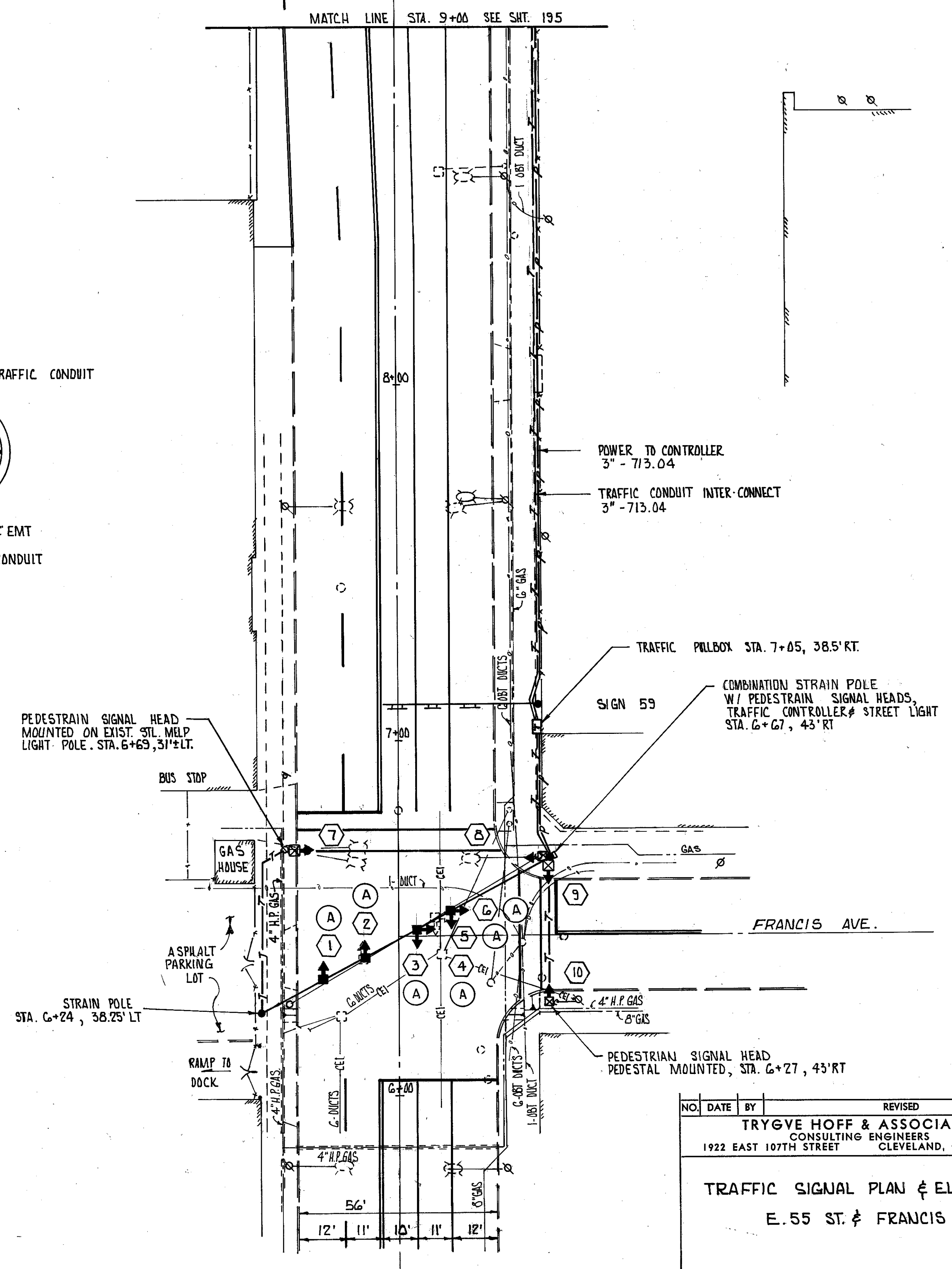
TRAFFIC SIGNAL HEAD



WIRING DIAGRAM



PLAN
CONDUIT ORIENTATION



SIGNAL PLAN
SCALE: 1" = 20'

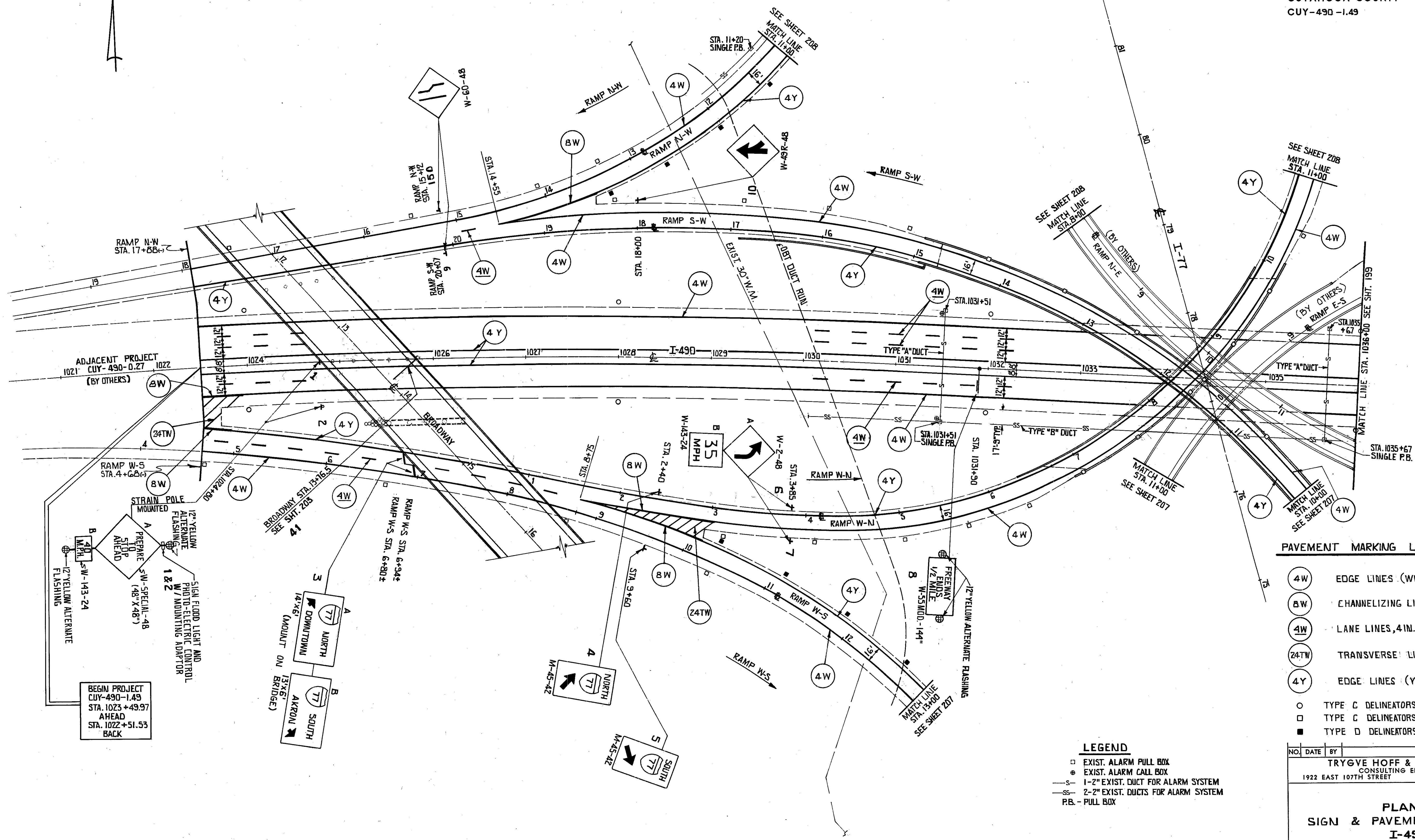
| | | | |
|--|-------|----------|---|
| NO. | DATE | BY | REVISED |
| | | | TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 |
| TRAFFIC SIGNAL PLAN & ELEVATION E. 55 ST. & FRANCIS | | | |
| SCALE | DATE | DESIGNED | DATE |
| DESIGNED | DRAWN | TRACED | CHECKED |
| R.H. | LV | JRH | RLH |
| | | | 5/83 |

SHEET ACCT. No.
CONT. No.

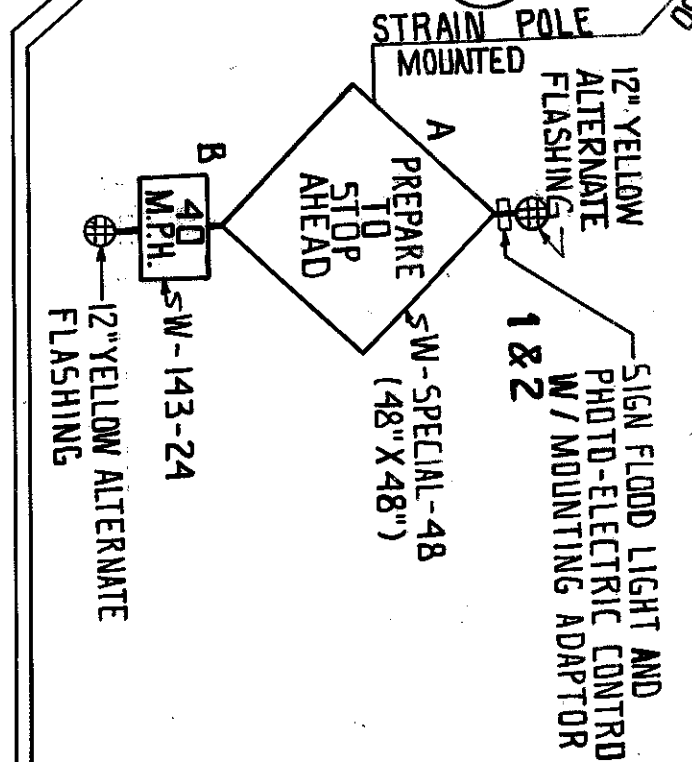
| | | | |
|-------------------|-------|---------|--|
| FED. RD. DIVISION | STATE | PROJECT | |
| 2 | OHIO | | |

192
261

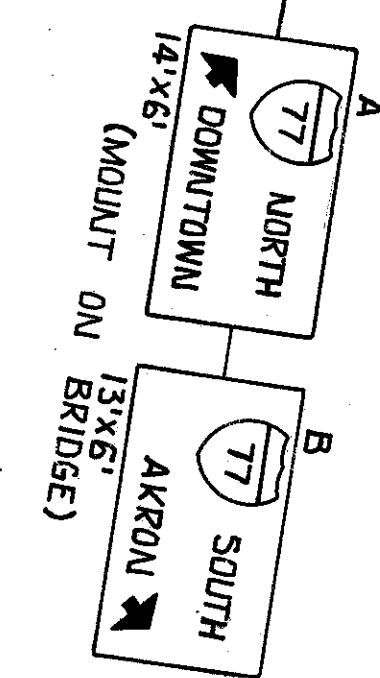
CUYAHOGA COUNTY
CUY-490-1.49



ADJACENT PROJECT
CUY-490-D.27
(BY OTHERS)



BEGIN PROJECT
CUY-490-1.49
STA. 1023+49.97
AHEAD
STA. 1022+51.53
BACK



PAVEMENT MARKING LEGEND

- 4W EDGE LINES (WHITE)
- 8W CHANNELIZING LINES
- 4W LANE LINES, 4 IN.
- 24TW TRANSVERSE LINES (WHITE)
- 4Y EDGE LINES (YELLOW)
- TYPE C DELINEATORS, COLORLESS
- TYPE C DELINEATORS, COLORLESS
- TYPE D DELINEATORS, YELLOW

LEGEND

- EXIST. ALARM PULL BOX
- ⊙ EXIST. ALARM CALL BOX
- - - 1-2" EXIST. DUCT FOR ALARM SYSTEM
- - - 2-2" EXIST. DUCTS FOR ALARM SYSTEM
- P.B. - PULL BOX

| | | | |
|-----|------|----|---------|
| NO. | DATE | BY | REVISED |
| | | | |

TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

PLAN
SIGN & PAVEMENT MARKING
I-490

| | |
|---------------|----------|
| SCALE: 1"=50' | DATE |
| DESIGNED | DRAWN |
| TRACED | CHECKED |
| REVIEWED | DATE |
| LHV/RLH | LHV/RLH |
| JRH | RLH 5/83 |

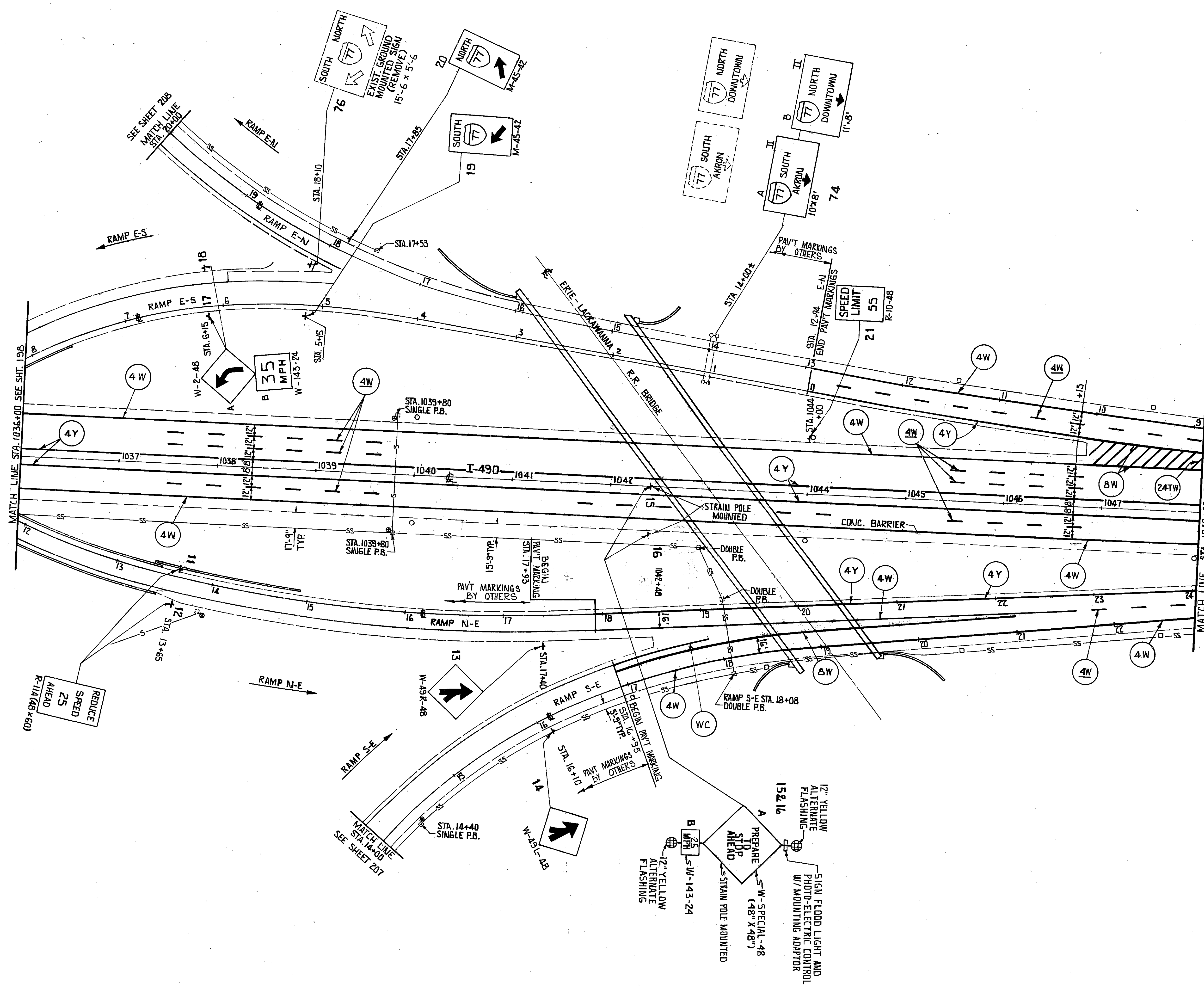
SHEET ACCT. No. _____
CONT. No. _____

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

199
261

CUYAHOGA COUNTY
CUY-490-1.49

- LEGEND**
- EXIST. ALARM PULL BOX
 - ⊙ EXIST. ALARM CALL BOX
 - - - 1-2" EXIST. DUCT FOR ALARM SYSTEM
 - - - 2-2" EXIST. DUCTS FOR ALARM SYSTEM
 - P.B. - PULL BOX



PAVEMENT MARKING LEGEND

- WC CURB MARKING (WHITE)
- 4W EDGE LINES (WHITE)
- 4W LANE LINES, 4 IN.
- BW CHANNELIZING LINES
- 4Y EDGE LINES (YELLOW)
- Z4TW TRANSVERSE LINES (WHITE)
- TYPE C DELINEATORS, COLORLESS
- TYPE C DELINEATORS, COLORLESS
- TYPE D DELINEATORS, YELLOW

| | | | |
|--|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

**PLAN
SIGN & PAVEMENT MARKING
I-490**

| | | | |
|---------------|---------|--------|---------|
| SCALE: 1"=50' | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| LHV/RLH | LHV/RHL | JRH | |

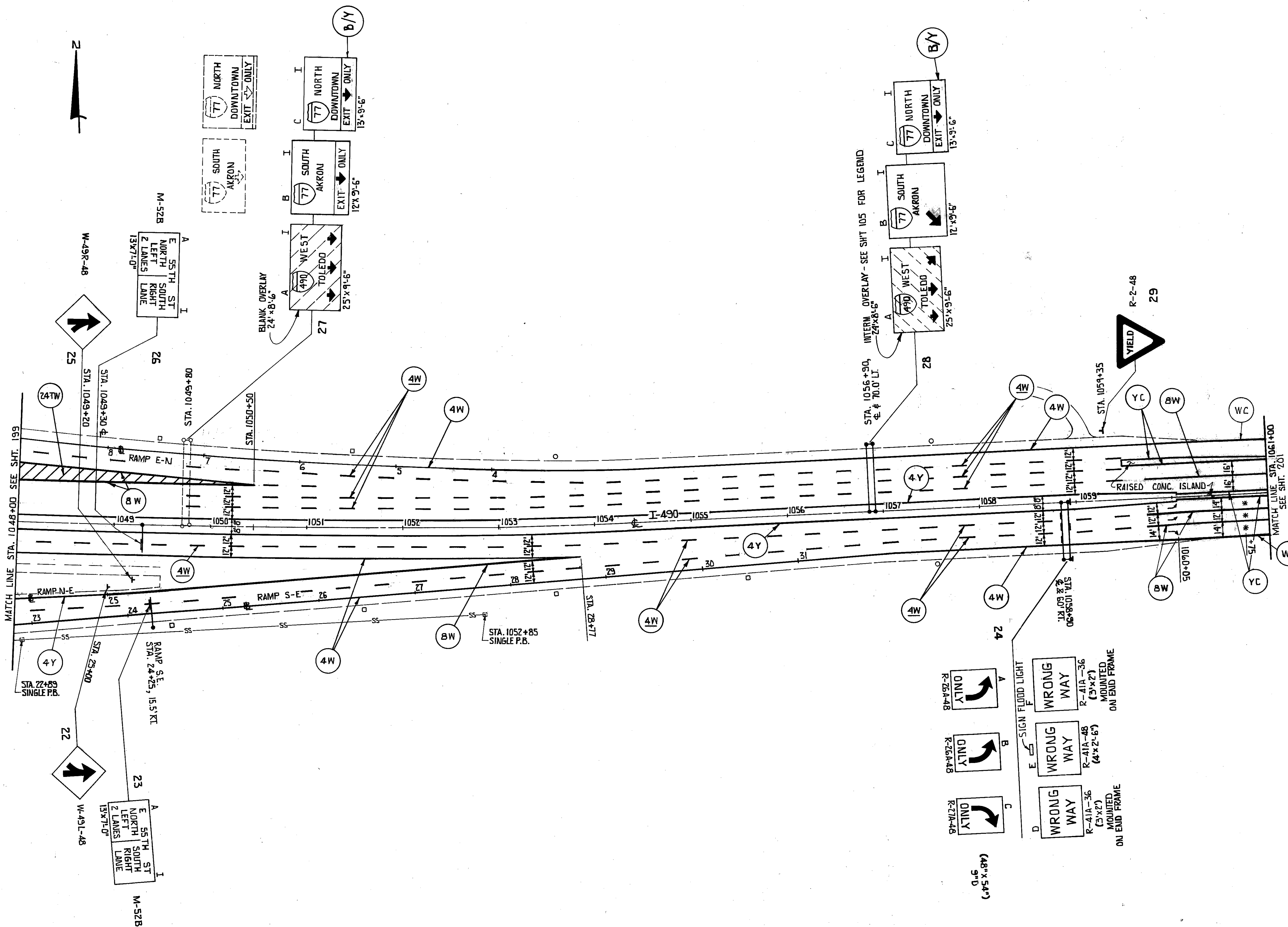
CONT. No. SHEET ACCT. No.

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

200
261

CUYAHOGA COUNTY
CUY-490-1.49

LEGEND
 □ EXIST. ALARM PULL BOX
 -SS- 2-2" EXIST. DUCTS FOR ALARM SYSTEM
 P.B.- PULL BOX



PAVEMENT MARKING LEGEND

- * WORD "ONLY" ON PAVEMENT, 72 IN.
- (4W) EDGE LINES (WHITE)
- (8W) CHANNELIZING LINES
- (4L) LANE LINES, 4IN.
- (24TW) TRANSVERSE LINES (WHITE)
- (4Y) EDGE LINES (YELLOW)
- (YC) CURB MARKING (YELLOW)
- (WC) CURB MARKING (WHITE)
- TYPE C DELINEATORS, COLORLESS
- TYPE C DELINEATORS, COLORLESS

NO. DATE BY REVISION
 TRYGVE HOFF & ASSOCIATES
 CONSULTING ENGINEERS
 1922 EAST 107TH STREET CLEVELAND, OHIO 44106

**PLAN
SIGN & PAVEMENT MARKING
I-490**

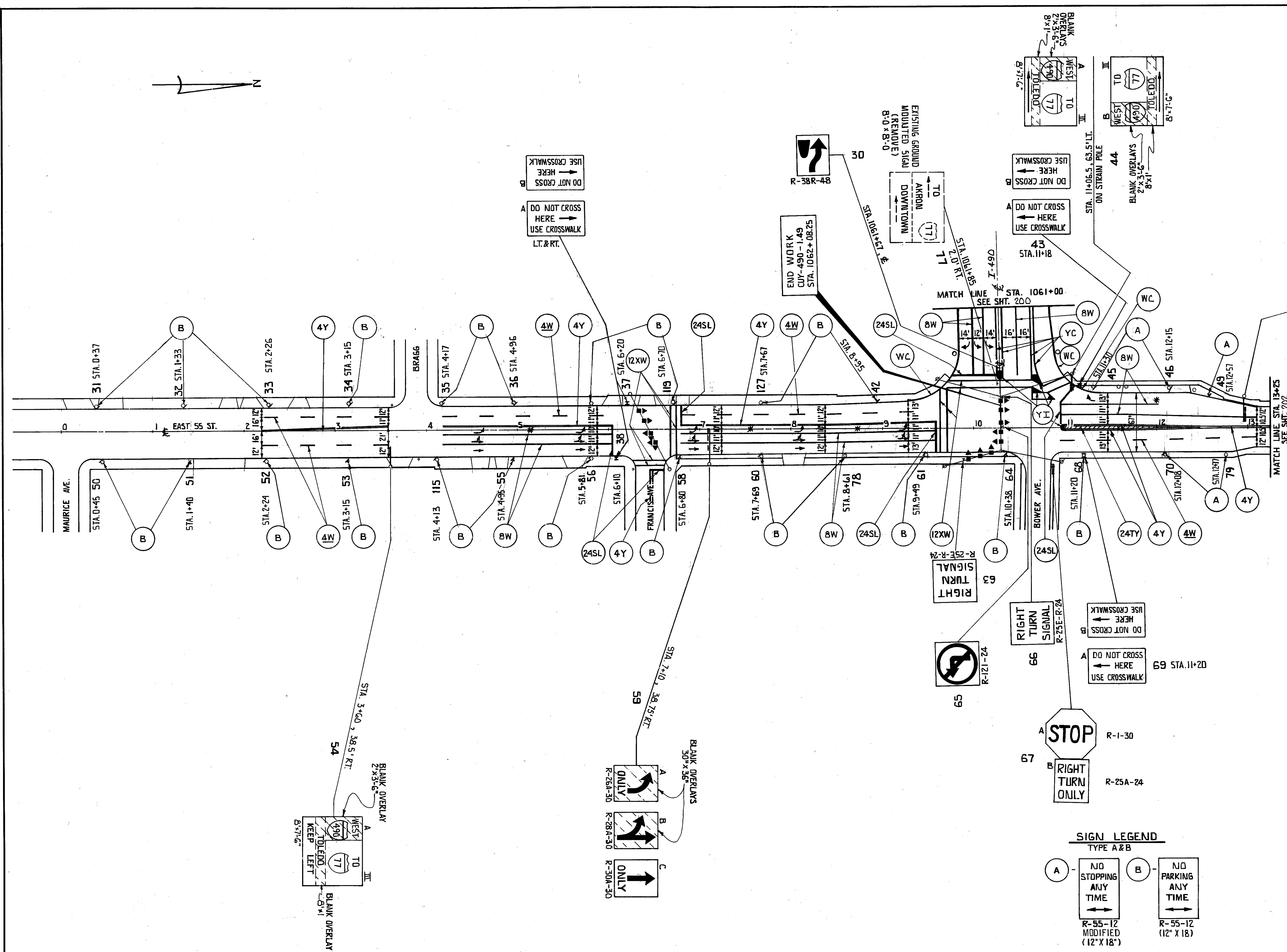
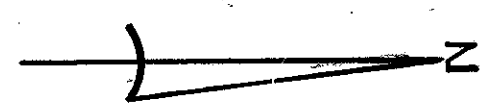
| | | | | | |
|----------|-------|--------|---------|----------|------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| LHV | LHV | RLH | JRH | RLH | 5/83 |

CONT. No. SHEET ACCT. No.

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

201
261

CUYAHOGA COUNTY
CUY-490-1.49



PAVEMENT MARKING LEGEND

- WC CURB MARKING (WHITE)
- YI ISLAND MARKING (YELLOW)
- 12XW CROSSWALK LINES
- 4W LANE LINES, 4 IN.
- 8W CHANNELIZING LINES
- 4Y CENTER LINES (DOUBLE SOLID)
- YC CURB MARKING (YELLOW)
- 24SL STOP LINES
- 24TY TRANSVERSE LINES (YELLOW)
- TYPE C DELINEATORS, COLORLESS
- * WORD "ONLY" ON PAVEMENT, 72 IN.

SIGN LEGEND
TYPE A & B

- A - NO STOPPING ANY TIME
R-55-12 MODIFIED (12" X 18")
- B - NO PARKING ANY TIME
R-55-12 (12" X 18)

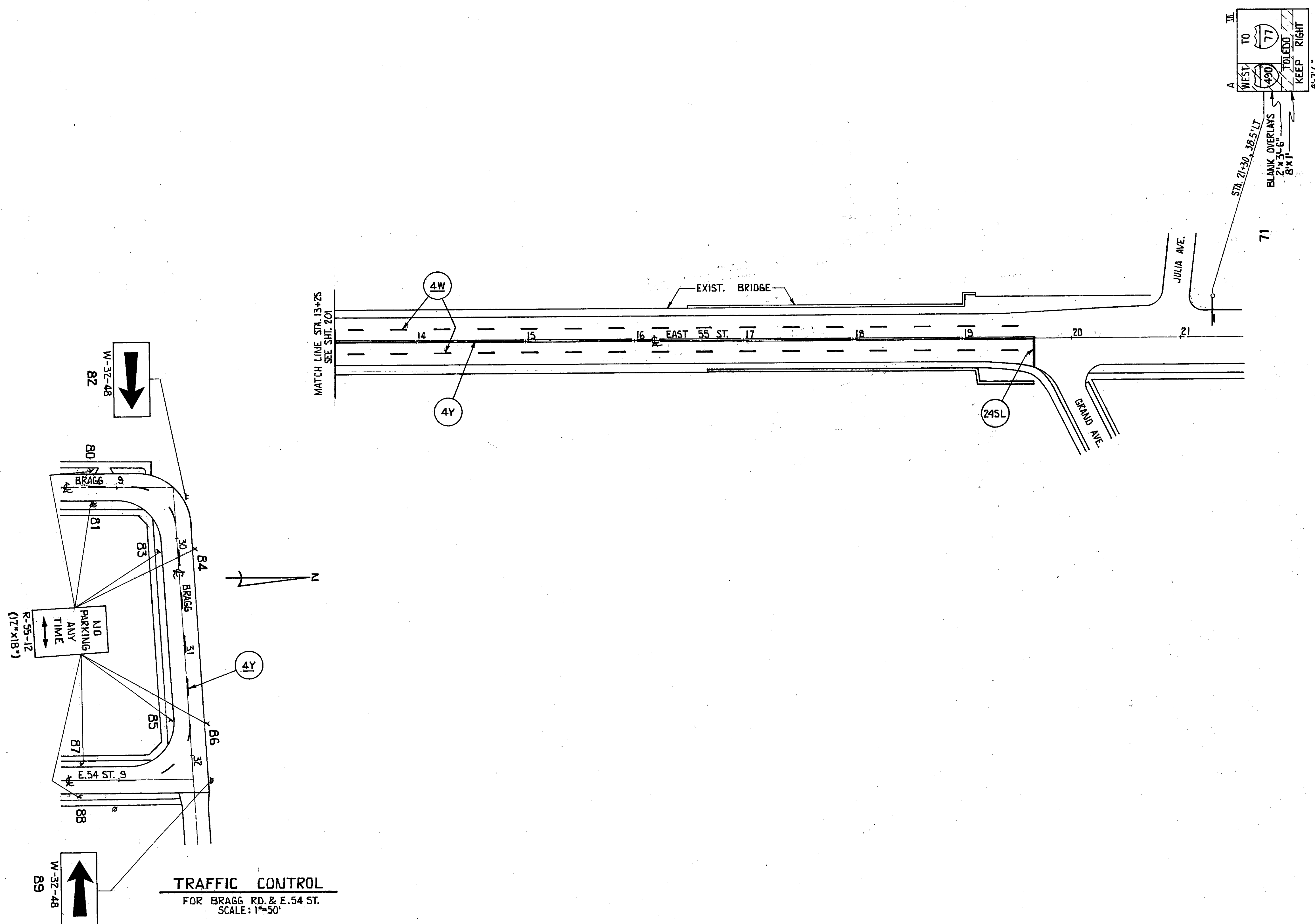
| | | | |
|--|---------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN SIGN & PAVEMENT MARKING I-490 & E. 55TH ST. | | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| LHV/RLH | LHV/RHJ | JRH | RLH |
| SCALE: 1" = 50' | | | DATE |
| | | | 5/83 |

CONT. No. SHEET ACCT. No.

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

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CUYAHOGA COUNTY
CUY-490-1.49



PAVEMENT MARKING LEGEND

- 4W** LANE LINES, 4-IN.
- 4Y** CENTER LINES (DOUBLE SOLID)
- 24SL** STOP LINES
- 4Y** CENTER LINES (BROKEN)

| | | | |
|---|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

**PLAN
SIGN & PAVEMENT MARKING
E. 55TH ST.
BRAGG**

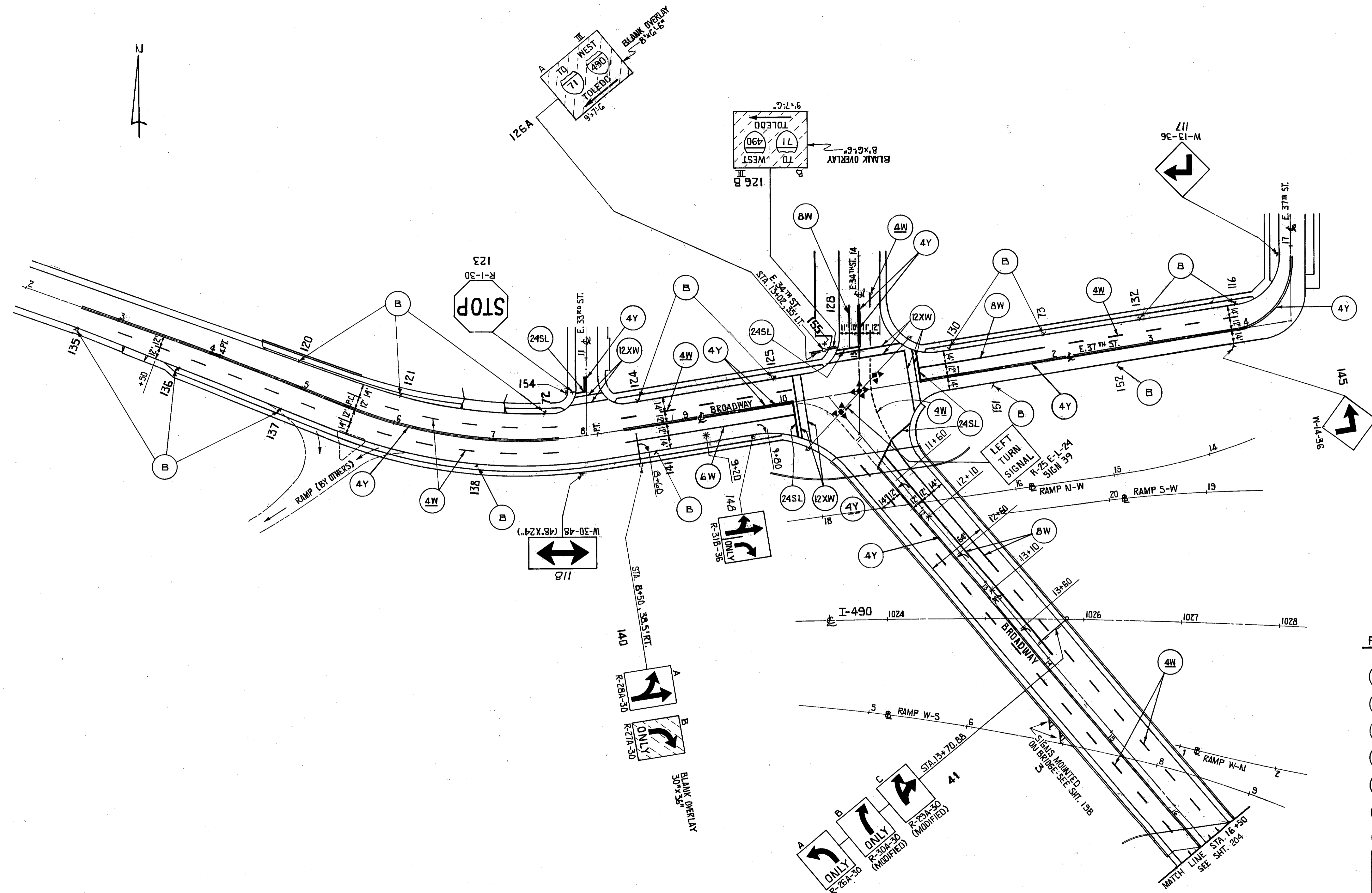
| | | | |
|---------------|-------|----------|---------|
| SCALE: 1"=50' | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| RLH | RLH | JRH | RLH |
| | | REVIEWED | DATE |
| | | 5/83 | |

CONT. No. SHEET ACCT. No.

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

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CUYAHOGA COUNTY
CUY-490-1.49



SIGN LEGEND

- (B) - NO PARKING ANY TIME
- R-55-12 (12"x18")

PAVEMENT MARKING LEGEND

- * WORD "ONLY" ON PAVEMENT, 72 IN.
- (4W) LANE LINES, 4 IN
- (8W) CHANNELIZING LINES
- (4Y) CENTER LINES (DOUBLE SOLID)
- (24SL) STOP LINE
- (12XW) CROSSWALK LINES
- (4W) DOTTED LINES, 4 IN (WHITE)
- (4Y) DOTTED LINES, 4 IN (YELLOW)

| | | | |
|--|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

**PLAN
SIGN & PAVEMENT MARKING
BROADWAY & E. 37TH ST.**

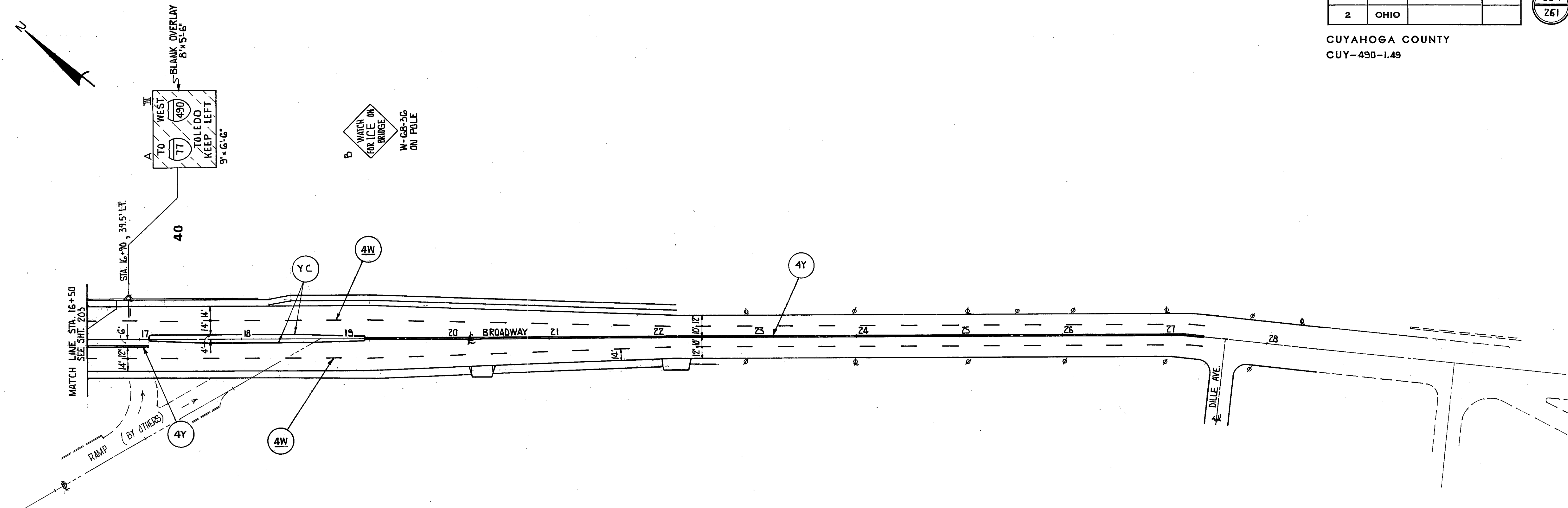
| | | | | | |
|----------|---------|--------|---------|----------|------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| LHV/RLH | LHV/RLH | | JRH | RLH | 5/83 |

CONT. No. SHEET ACCT. No.

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

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CUYAHOGA COUNTY
CUY-490-1.49



PAVEMENT MARKING LEGEND

- (4W) LANE LINES, 4 IN.
- (4Y) CENTER LINES (DOUBLE SOLID)
- (YC) CURB MARKING (YELLOW)

| | | | |
|---|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

**PLAN
SIGN & PAVEMENT MARKING
BROADWAY**

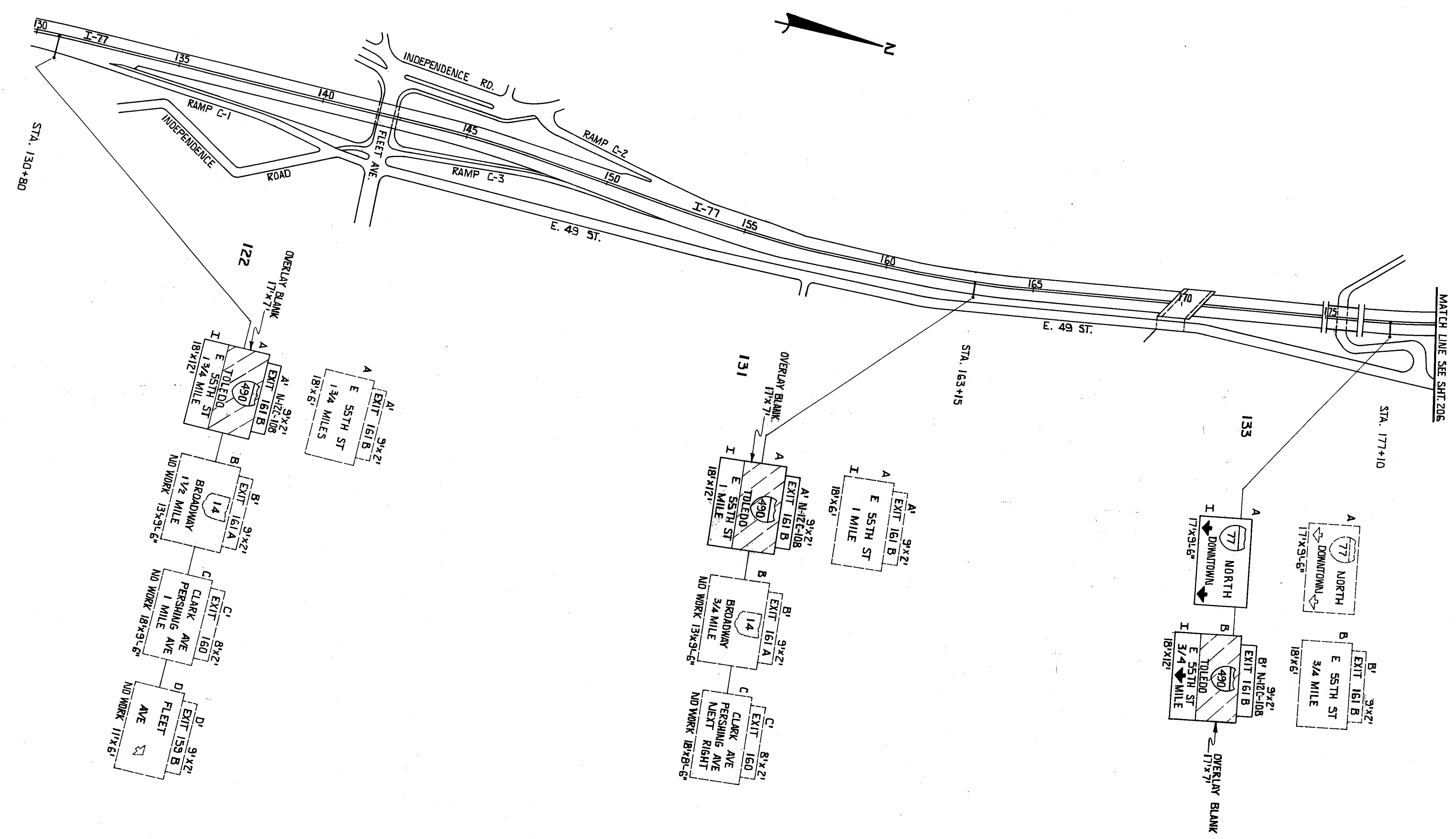
| | | | |
|---------------|-------|--------|---------|
| SCALE: 1"=50' | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| RLH | RLH | JRH | RLH |
| | | 5/83 | |

CONT. No. SHEET ACCT. No.

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

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CUYAHOGA COUNTY
CUY-490-1.48



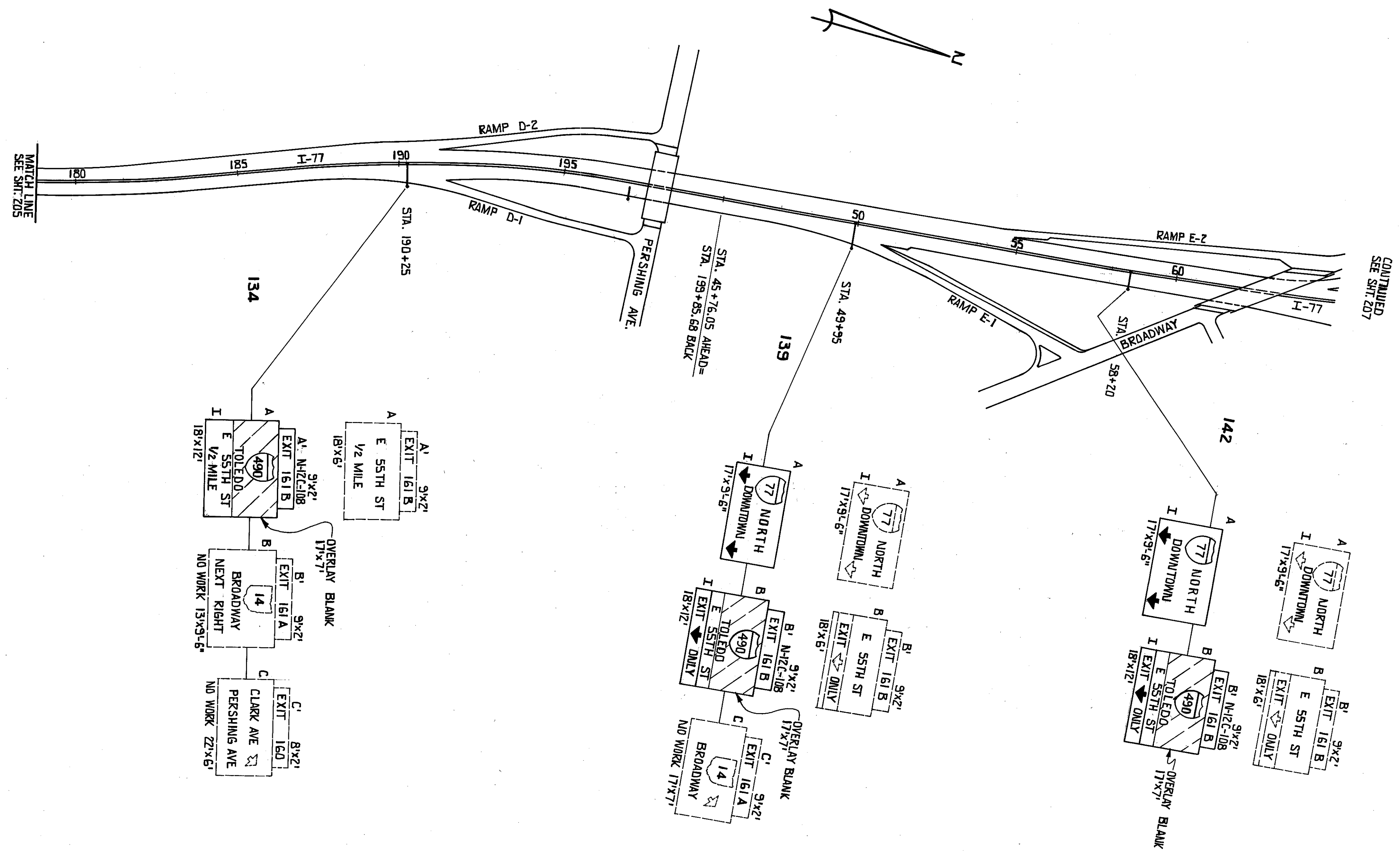
CONT. No. SHEET ACCT. No.

| | | | |
|---|-------|----------|----------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN SIGNS I-77 | | | |
| SCALE: 1"=200' | | | DATE |
| DESIGNED | DRAWN | TRACED | CHECKED |
| REVIEWED | DATE | REVIEWED | DATE |
| LHV/RLH | RHI | JRH | RLH 5/83 |

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

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CUYAHOGA COUNTY
CUY - 490 - 1.49



CONTINUED
SEE SHET 207

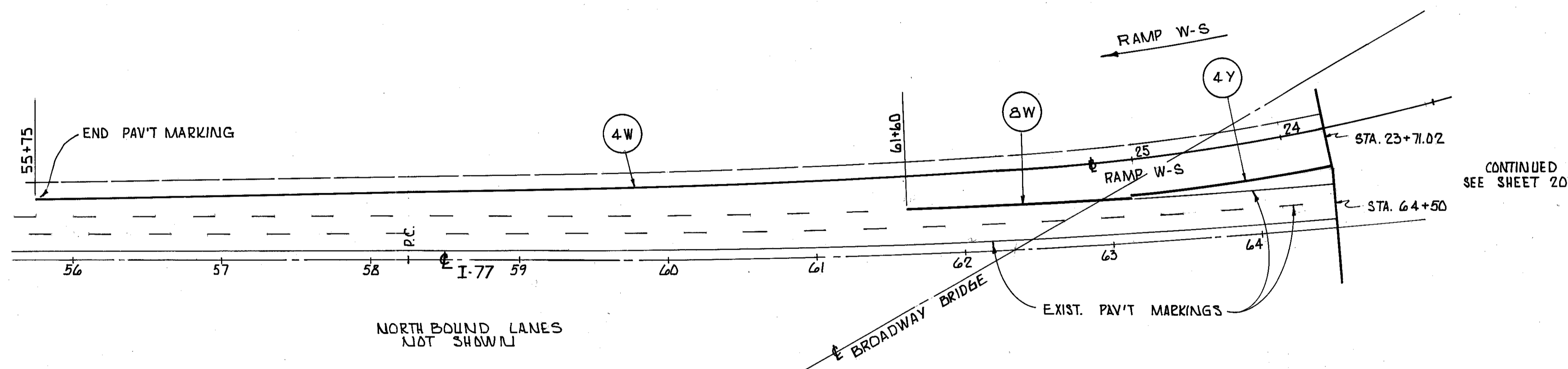
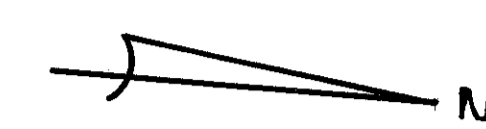
CONT. No. SHEET ACCT. No.

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|---|-------|--------|----------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN SIGNS I-77 | | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| DATE | DATE | DATE | DATE |
| LHV/RLH | RHII | JRH | RLH 5/83 |

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

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CUYAHOGA COUNTY
CUY - 490-1.49



CONTINUED
SEE SHEET 207

PAVEMENT MARKING LEGEND

- (4W) EDGE LINES (WHITE)
- (4Y) EDGE LINES (YELLOW)
- (BW) CHANNELIZING LINES

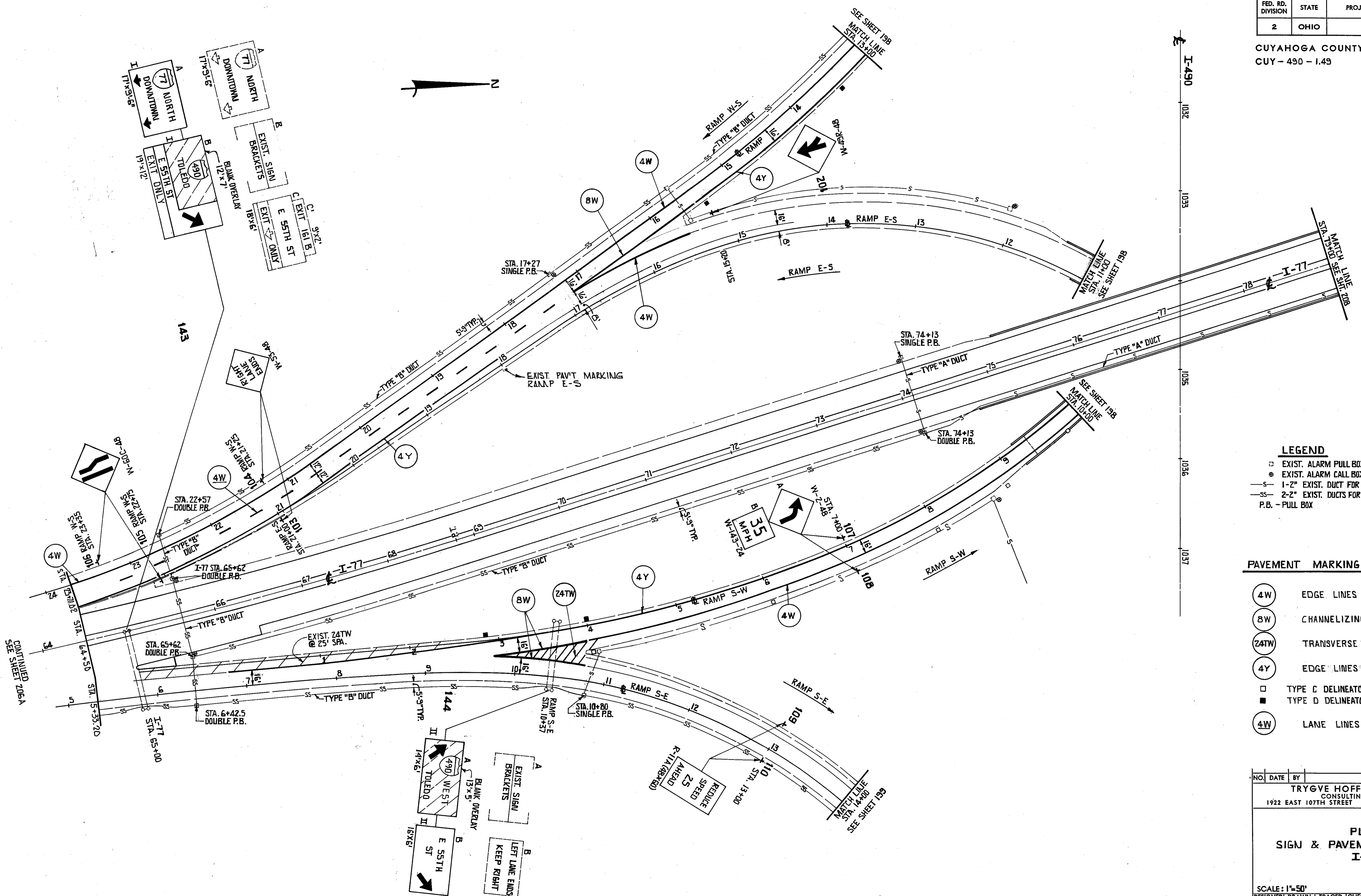
CONT. No. SHEET ACCT. No.

| | | | |
|---|-------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN PAVEMENT MARKING I-77 | | | |
| SCALE | DATE | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| LV | | | CAP |
| | | | RLH |
| | | | 5/83 |

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

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CUYAHOGA COUNTY
CUY - 490 - 1,49



I-490
1032
1033
1035
1036
1037

LEGEND

- EXIST. ALARM PULL BOX
- ⊙ EXIST. ALARM CALL BOX
- - 1-2" EXIST. DUCT FOR ALARM SYSTEM
- - - 2-2" EXIST. DUCTS FOR ALARM SYSTEM
- P.B. - PULL BOX

PAVEMENT MARKING LEGEND

- (4W) EDGE LINES (WHITE)
- (8W) CHANNELIZING LINES
- (24TW) TRANSVERSE LINES (WHITE)
- (4Y) EDGE LINES (YELLOW)
- TYPE C DELINEATORS, COLORLESS
- TYPE D DELINEATORS, YELLOW
- (4W) LANE LINES, 4 IN.

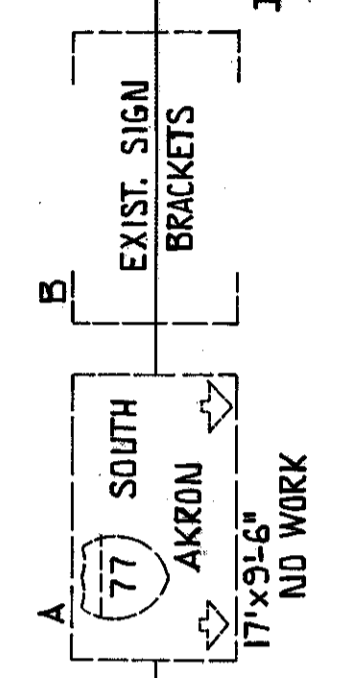
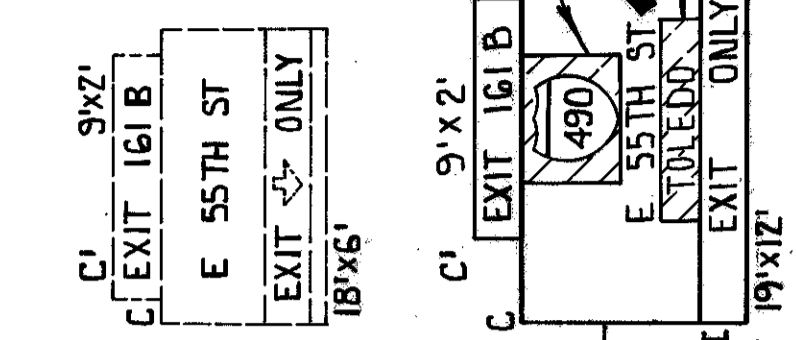
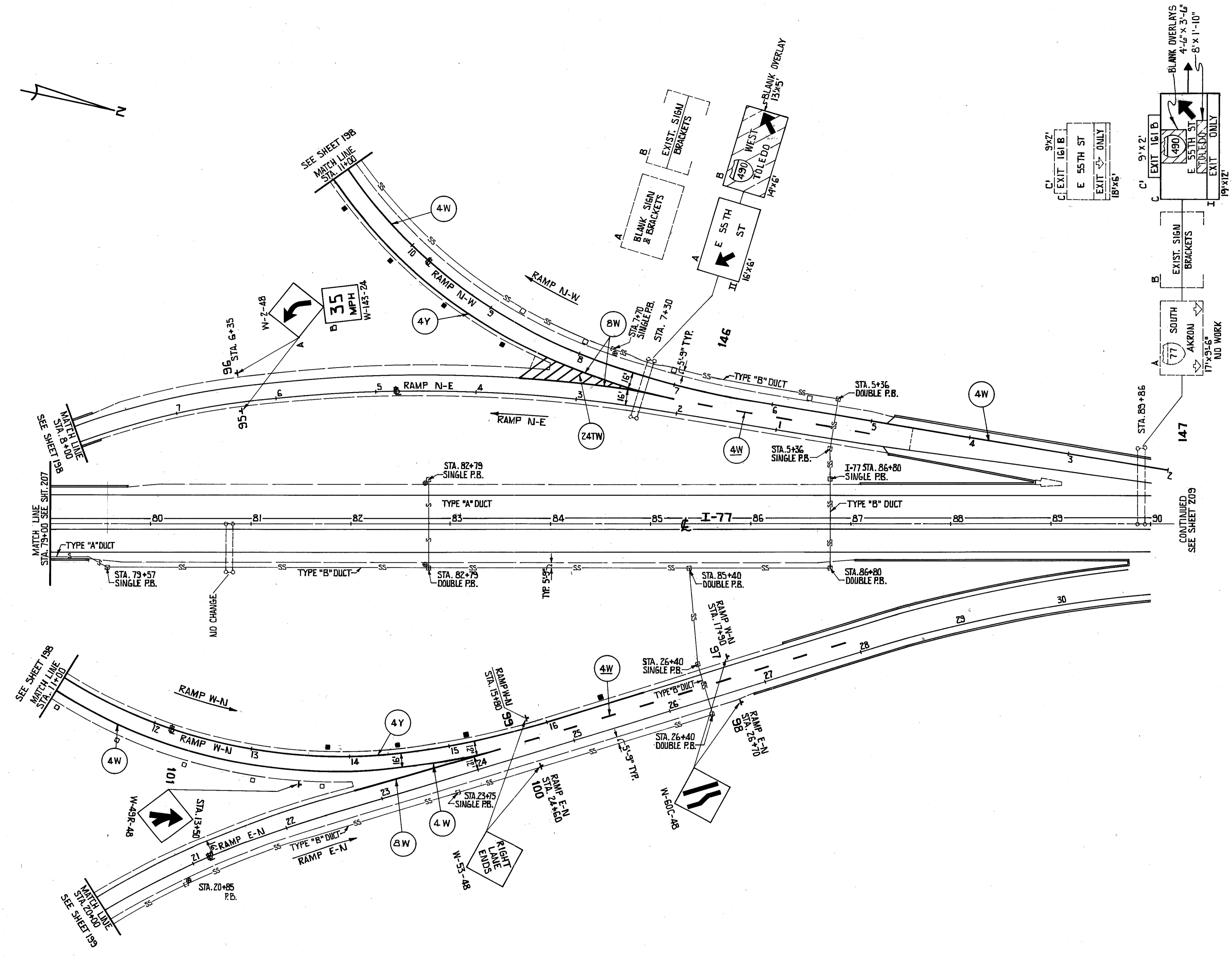
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|--|-------|--------|----------|
| NO. | DATE | BY | REVISION |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN SIGN & PAVEMENT MARKING I-77 | | | |
| SCALE: 1"=50' | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| REVIEWED | DATE | | |
| LHY/RLH | RLH | JRH | RLH |
| | | | 5/83 |

CONT. No. SHEET ACCT. No.

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

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CUYAHOGA COUNTY
CUY-490-1.49



- LEGEND**
- EXIST. ALARM PULL BOX
 - ⊙ EXIST. ALARM CALL BOX
 - I-2" EXIST. DUCT FOR ALARM SYSTEM
 - 2-2" EXIST. DUCTS FOR ALARM SYSTEM
 - P.B. - PULL BOX

PAVEMENT MARKING LEGEND

- (4W) LANE LINES, 4-IN.
- (4W) EDGE LINES (WHITE)
- (8W) CHANNELIZING LINES
- (4Y) EDGE LINES (YELLOW)
- (24TW) TRANSVERSE LINES (WHITE)
- TYPE C DELINEATORS, COLORLESS
- TYPE D DELINEATORS, YELLOW

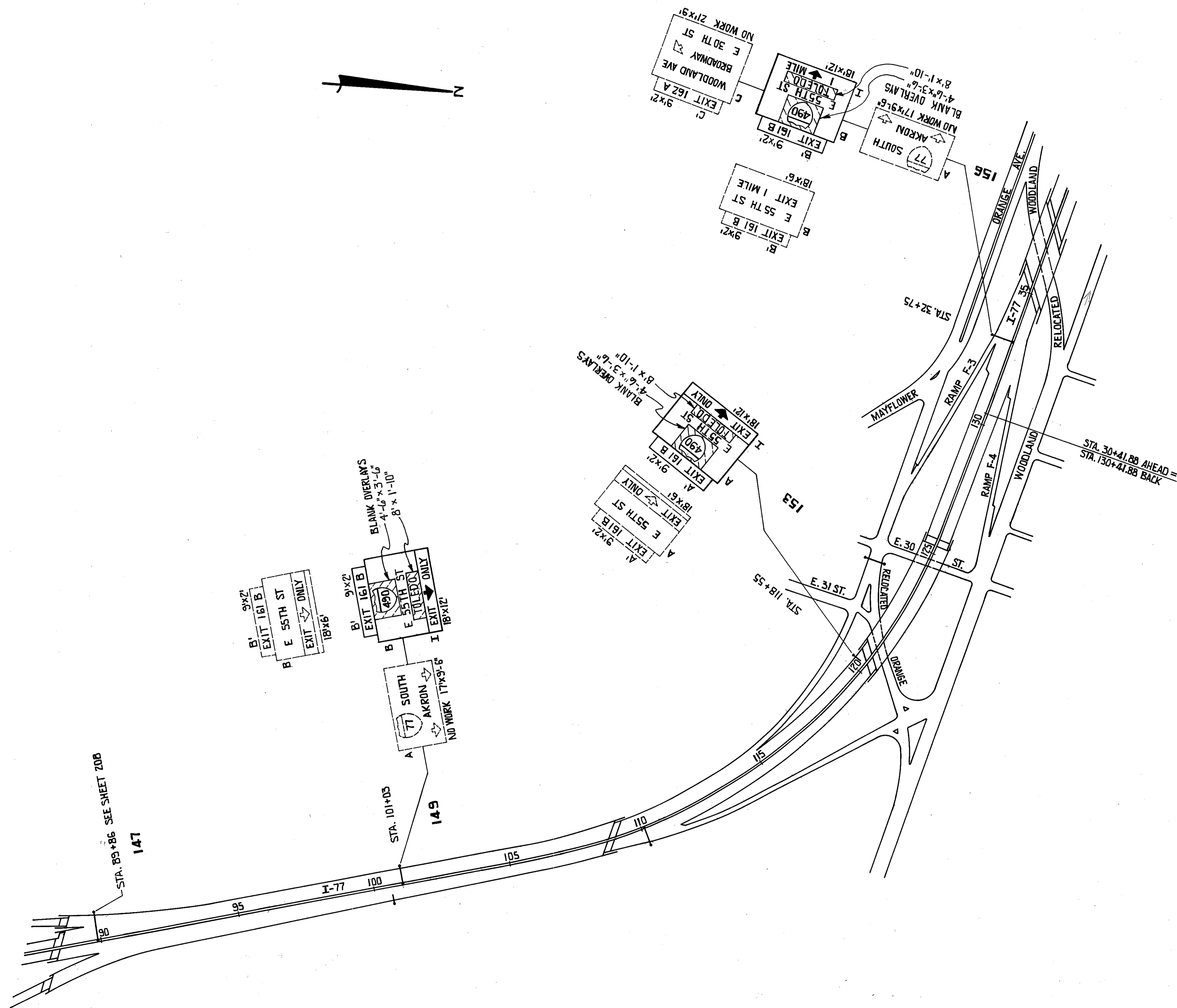
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|--|--------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| PLAN SIGN & PAVEMENT MARKING I-77 | | | |
| SCALE: 1"=50' | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| REVIEWED | | | |
| LHV/RLH | RLH II | JRH | RLH |
| | | | 5/83 |

CONT. No. SHEET ACCT. No.

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

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CUYAHOGA COUNTY
CUY-490-1.49



CONT. No. SHEET ACCT. No.

| | | | |
|---|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

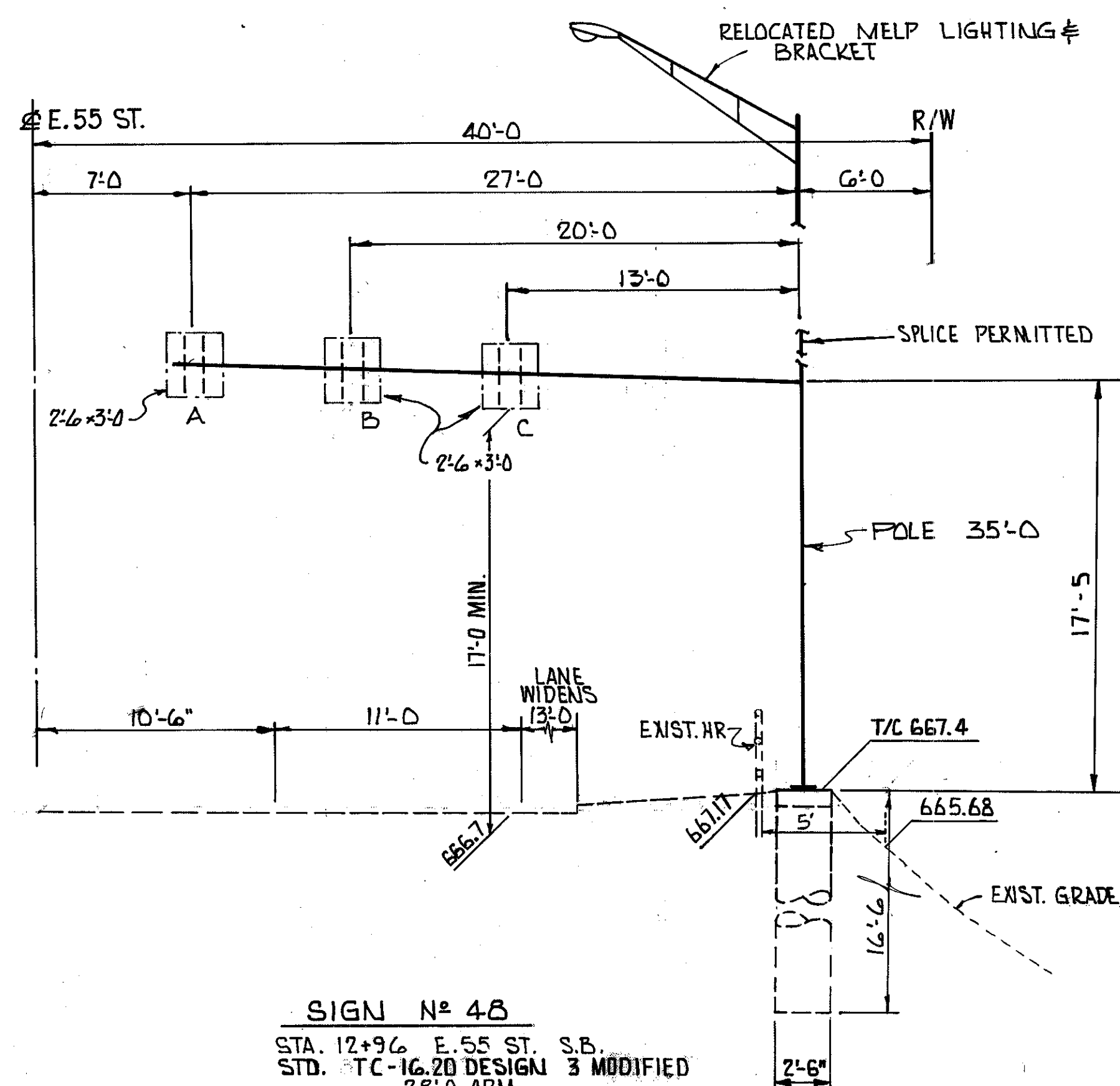
**PLAN
SIGNS
I-77**

| | |
|-------------------|--------------|
| SCALE: 1"=200' | DATE |
| DESIGNED: LHV/RLH | DRAWN: RH II |
| TRACED: JRH | CHECKED: RLH |
| REVIEWED: JRH | DATE: 5/83 |

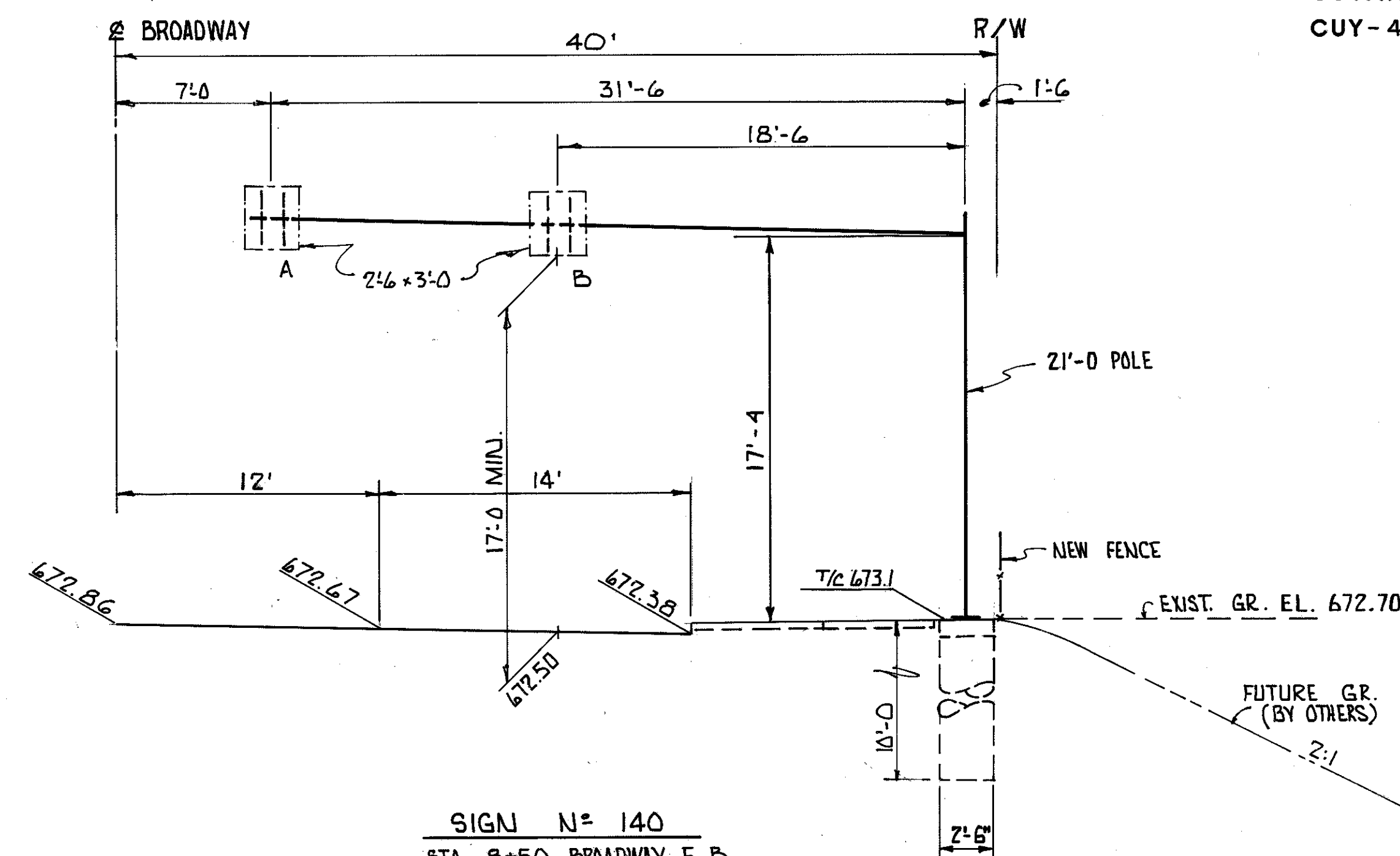
| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 2 | OHIO | |

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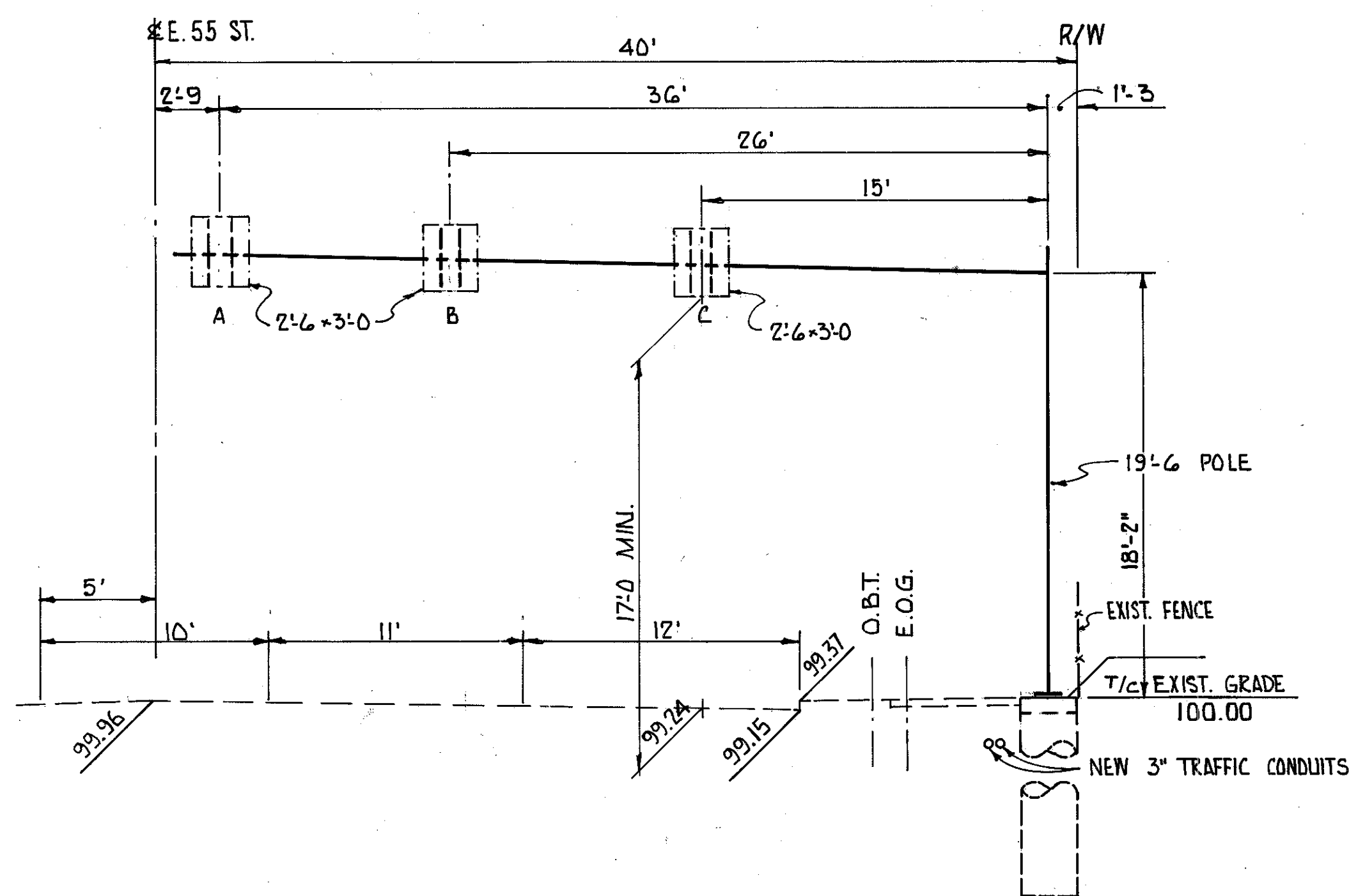
CUYAHOGA COUNTY
CUY-490-1.49



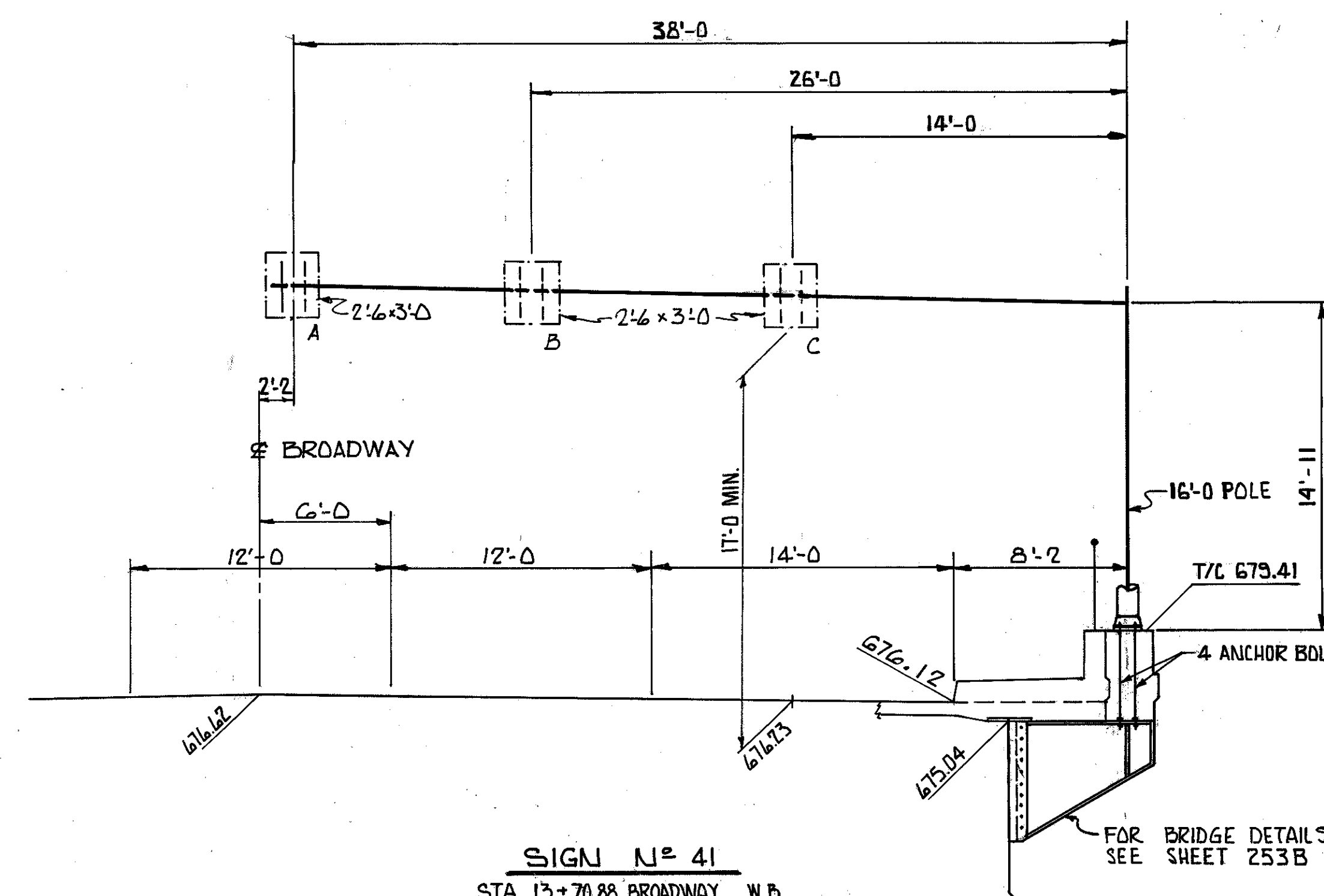
SIGN N° 48
STA. 12+96 E.55 ST. S.B.
STD. TC-16.20 DESIGN 3 MODIFIED
28'-0" ARM
FDN. STD. TC-21.20 DESIGN 4 MODIFIED
PLAN SHT. 201
W/LIGHT BRACKET ARM, STYLE III



SIGN N° 140
STA. 8+50 BROADWAY E.B.
STD. TC-16.20 DESIGN 3
32'-6" ARM
FDN. STD. TC-21.20 DESIGN 3 MODIFIED
PLAN SHT. 203



SIGN N° 59
STA. 7+10 E.55 ST. N.B.
STD. TC-16.20 DESIGN 4
39'-0" ARM
FDN. STD. TC-21.20 DESIGN 4
PLAN SHT. 201



SIGN N° 41
STA. 13+70.88 BROADWAY W.B.
STD. TC-16.20 DESIGN 4 MODIFIED
39'-0" ARM
PLAN SHT. 203

NOTES:
1. FOR OVERHEAD SIGN QUANTITIES SEE SHT. 192

1 3/4" Ø x 66" LONG, THREAD BOTH ENDS 9"
WITH 2 PLAIN WASHERS,
2 LOCK WASHERS & 4 HEAVY HEX NUTS

| NO. | DATE | BY | REVISED |
|-----|------|----|---------|
| | | | |

TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

SIGN ELEVATIONS
SIGNS - 41, 48, 59 & 140

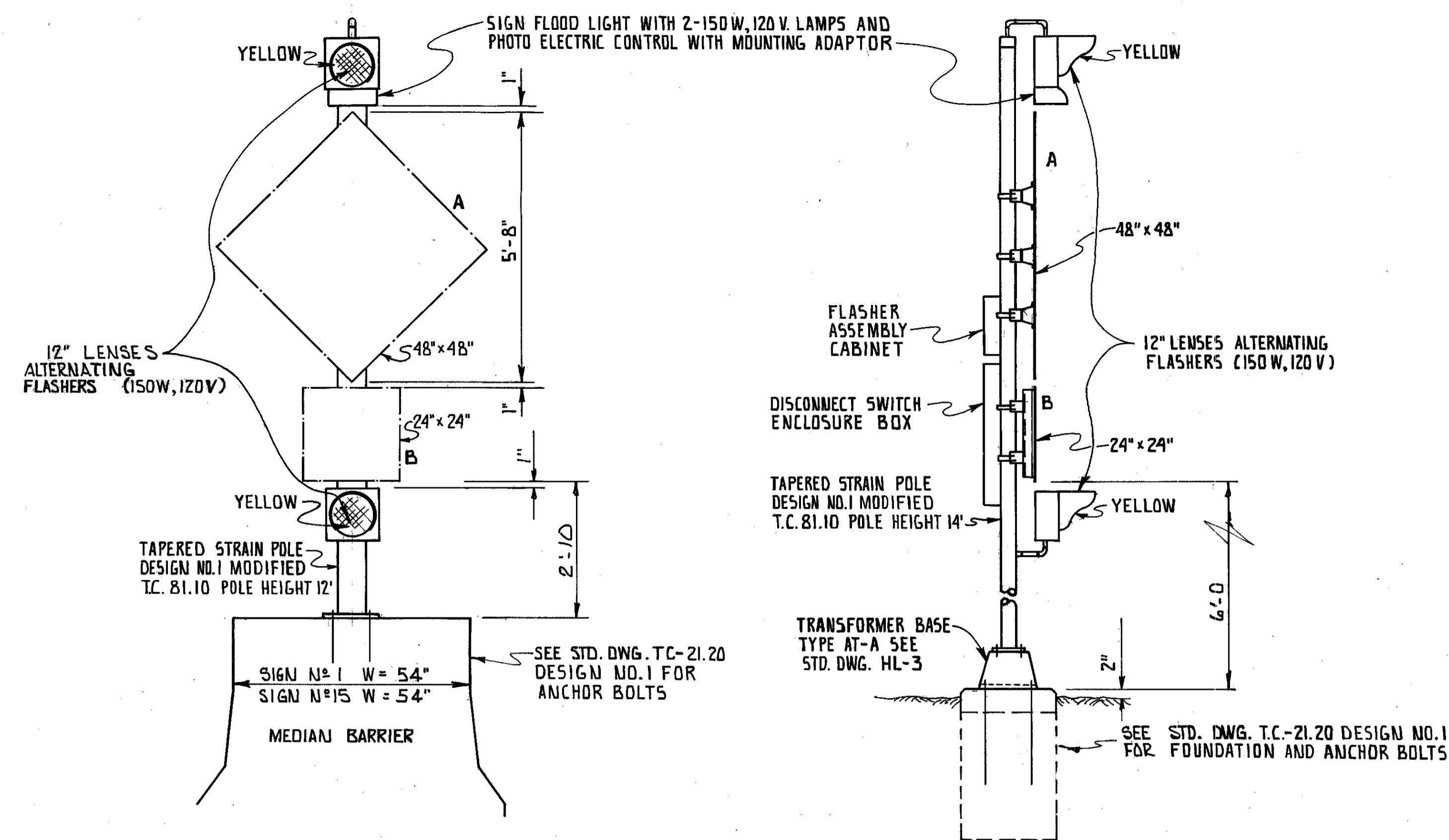
| SCALE | | DATE | |
|----------|-------|--------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED |
| LV | LV | RLH | RLH |
| | | CAP | 5/83 |

SHEET ACCT. No.
CONT. No.

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

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CUYAHOGA COUNTY
CUY-490-1.49

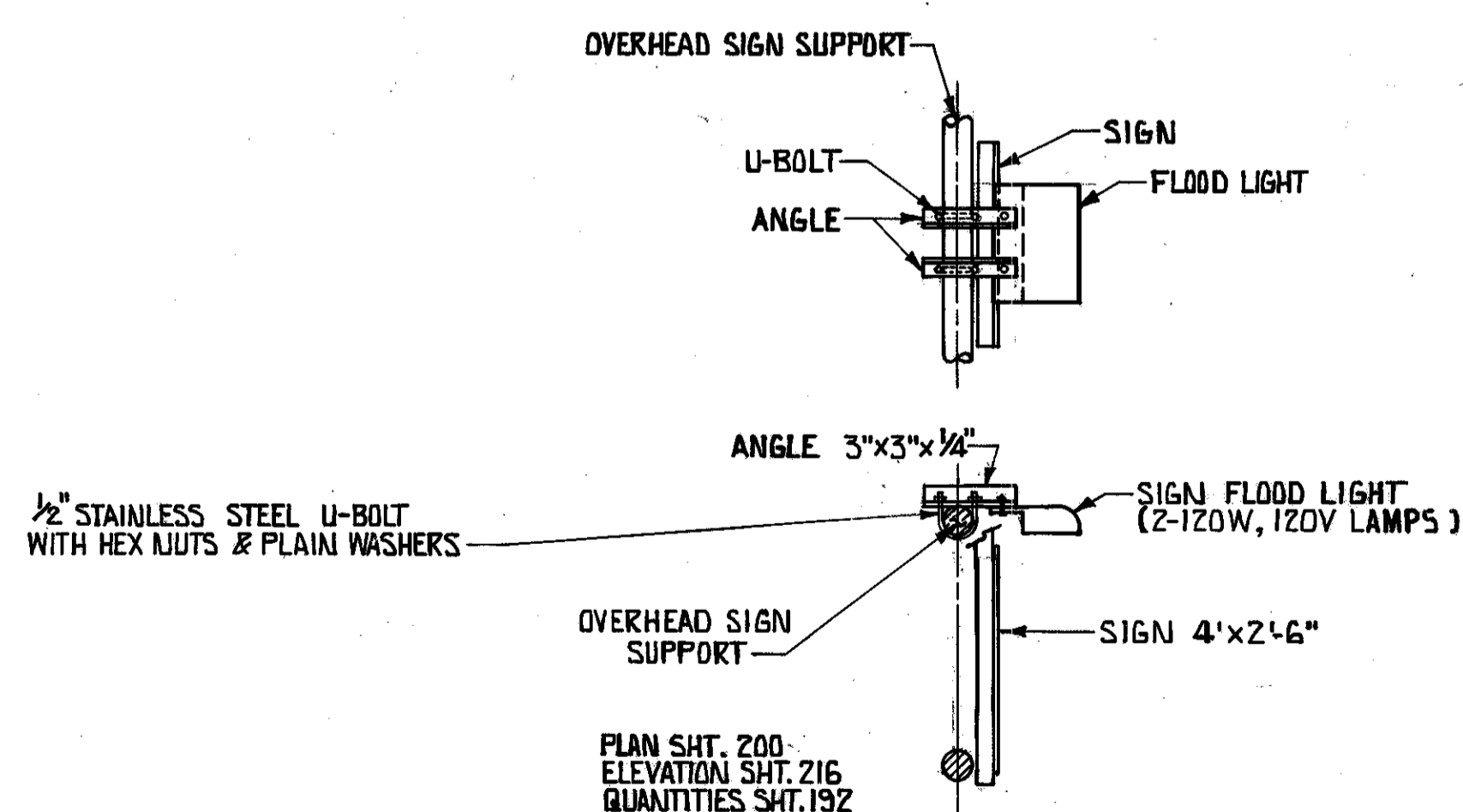


SIGN WITH FLASHER-ELEVATION

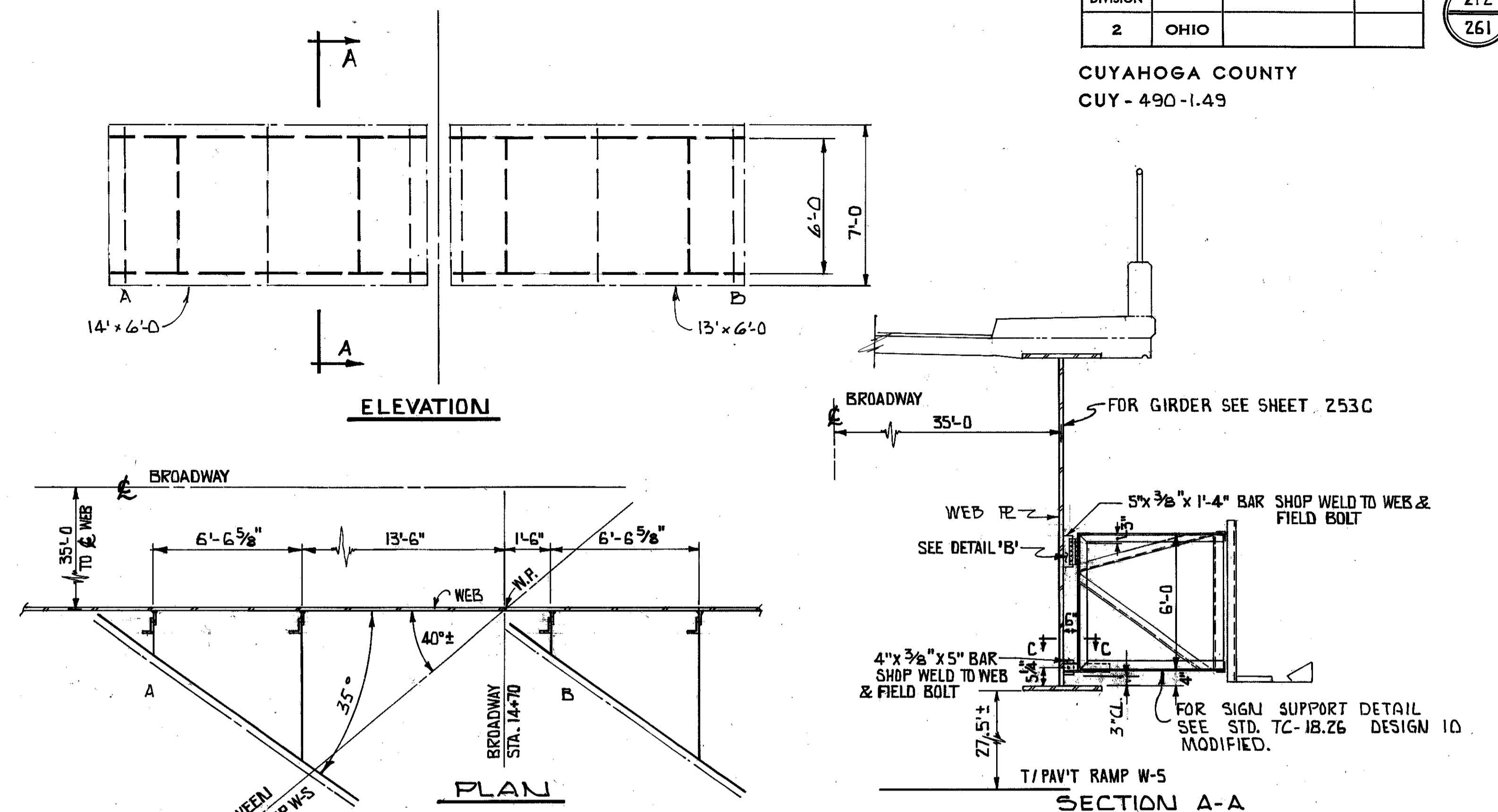
SIGN N° 1 I-490 STA. 1024+80, PLAN SHT. 198
SIGN N° 15 I-490 STA. 1042+48, PLAN SHT. 199
FOR SIGN QUANTITIES SEE SHT. 192
SIGNS: 1 & 15

SIGN WITH FLASHER-ELEVATION

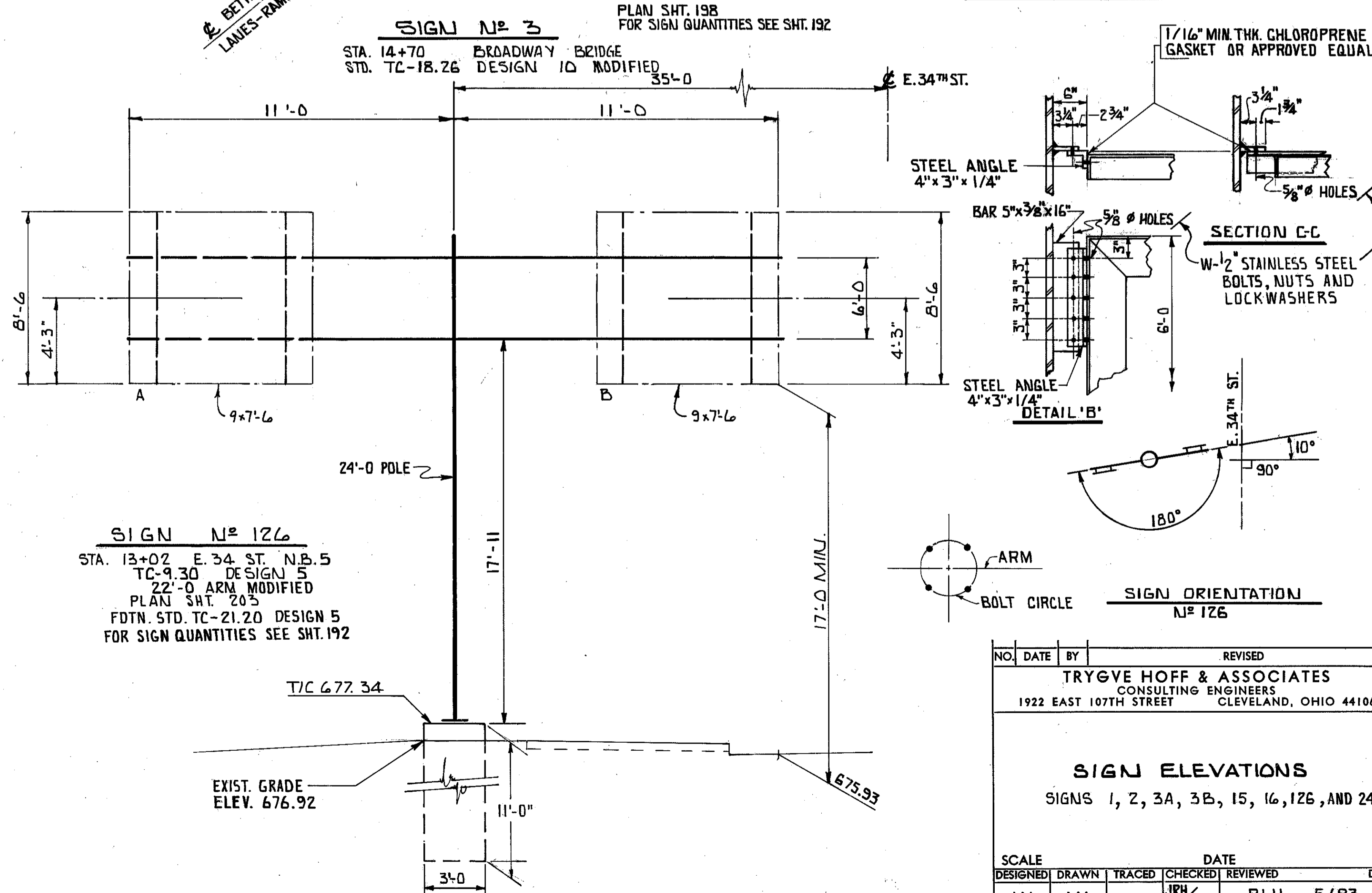
SIGN N° 2 I-490 STA. 1024+80, 51' RT. PLAN SHT. 198
SIGN N° 16 I-490 STA. 1042+48, 53' RT. PLAN SHT. 199
FOR SIGN QUANTITIES SEE SHT. 192
SIGNS: 2 & 16



SIGN N° 24E
I-490 STA. 1058+90



SIGN N° 3
PLAN SHT. 198
FOR SIGN QUANTITIES SEE SHT. 192
STA. 14+70 BROADWAY BRIDGE
STD. TC-18.26 DESIGN 10 MODIFIED



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|-----|------|----|---------|
| NO. | DATE | BY | REVISED |
| | | | |

TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

SIGN ELEVATIONS
SIGNS 1, 2, 3A, 3B, 15, 16, 126, AND 24E

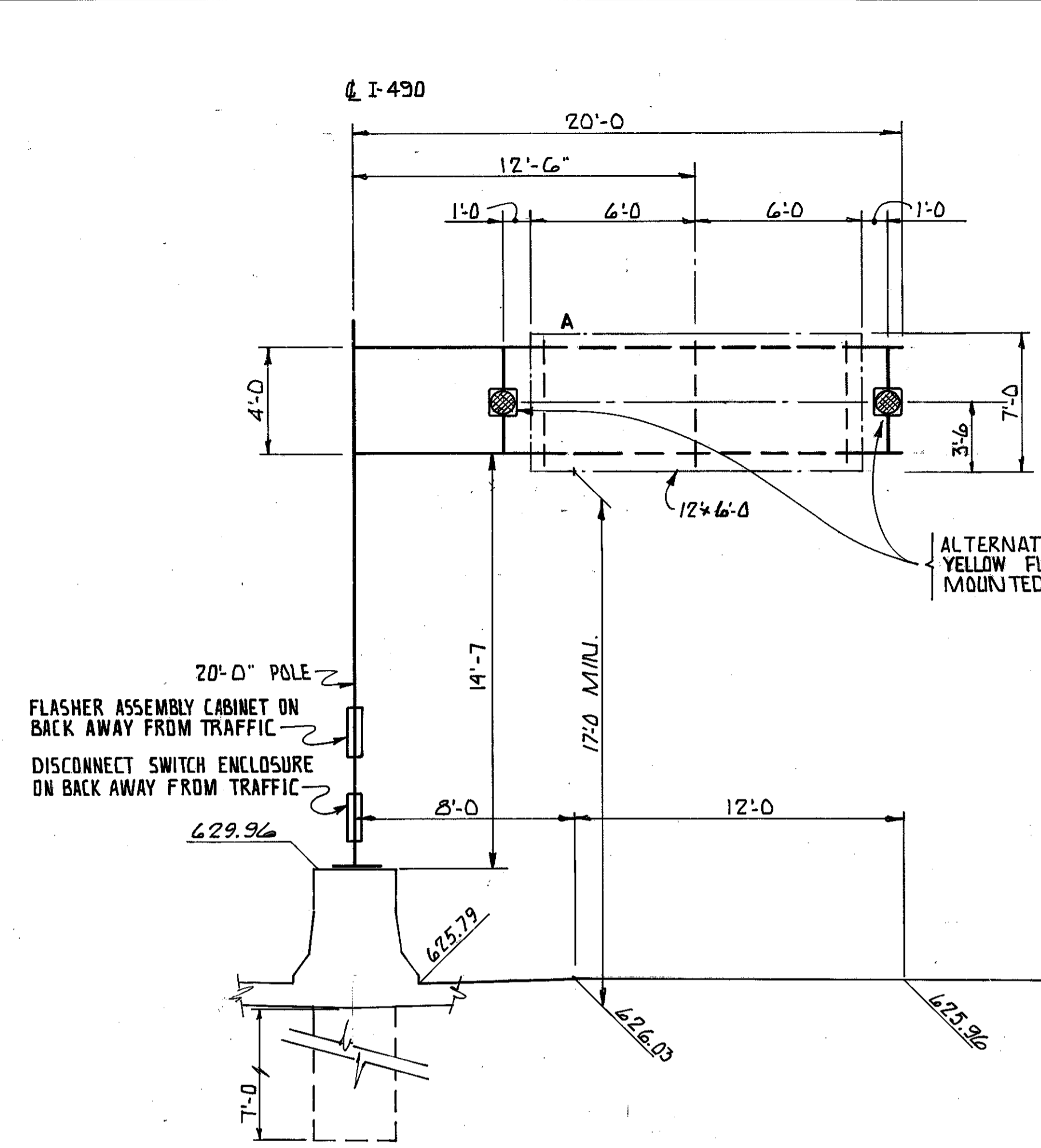
| | | | | | |
|----------|-------|--------|---------|----------|------|
| SCALE | DATE | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| LV | LV | | JRH | RLH | 5/83 |

CONT. No. SHEET ACCT. No.

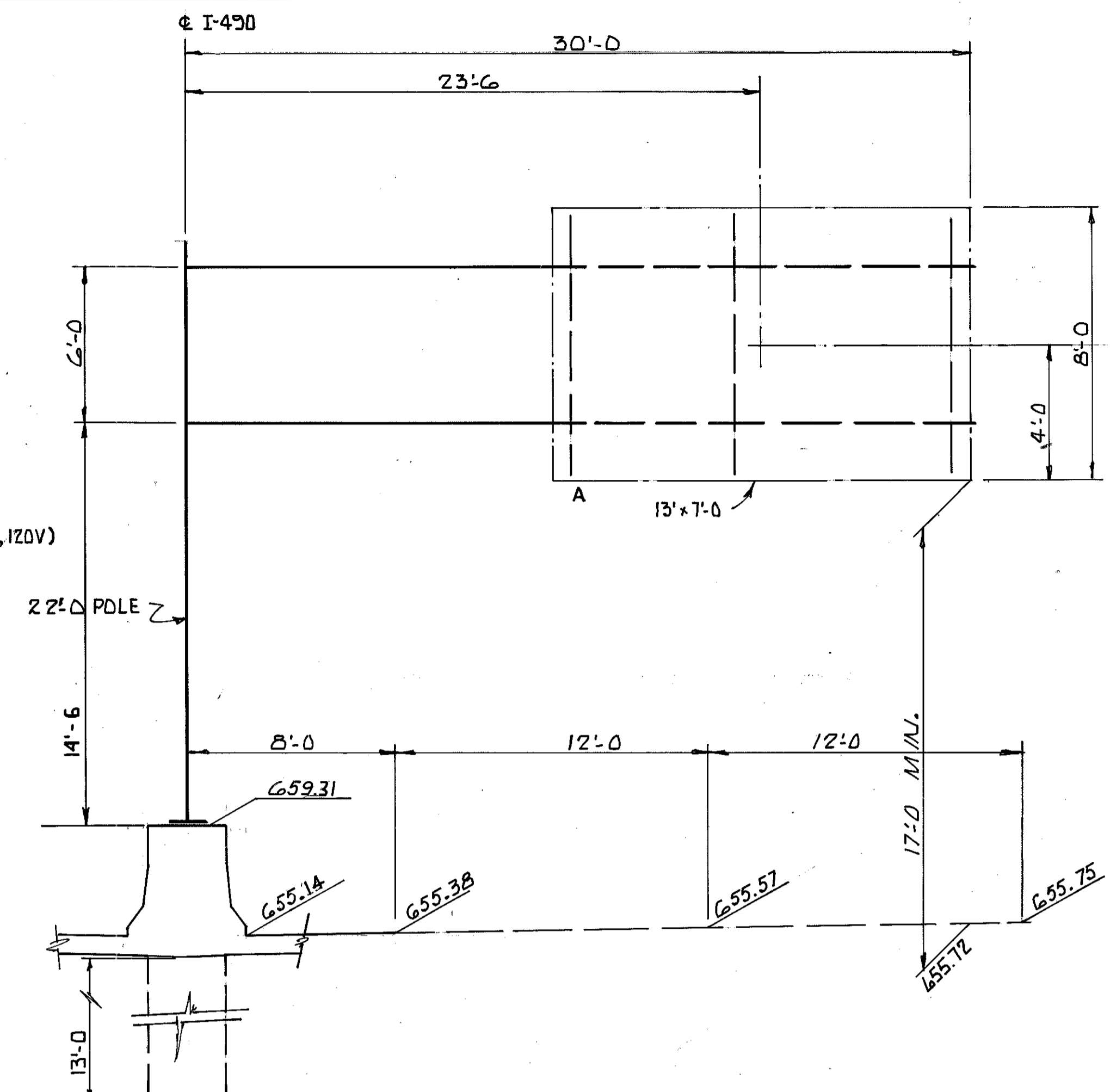
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|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 2 | OHIO | |

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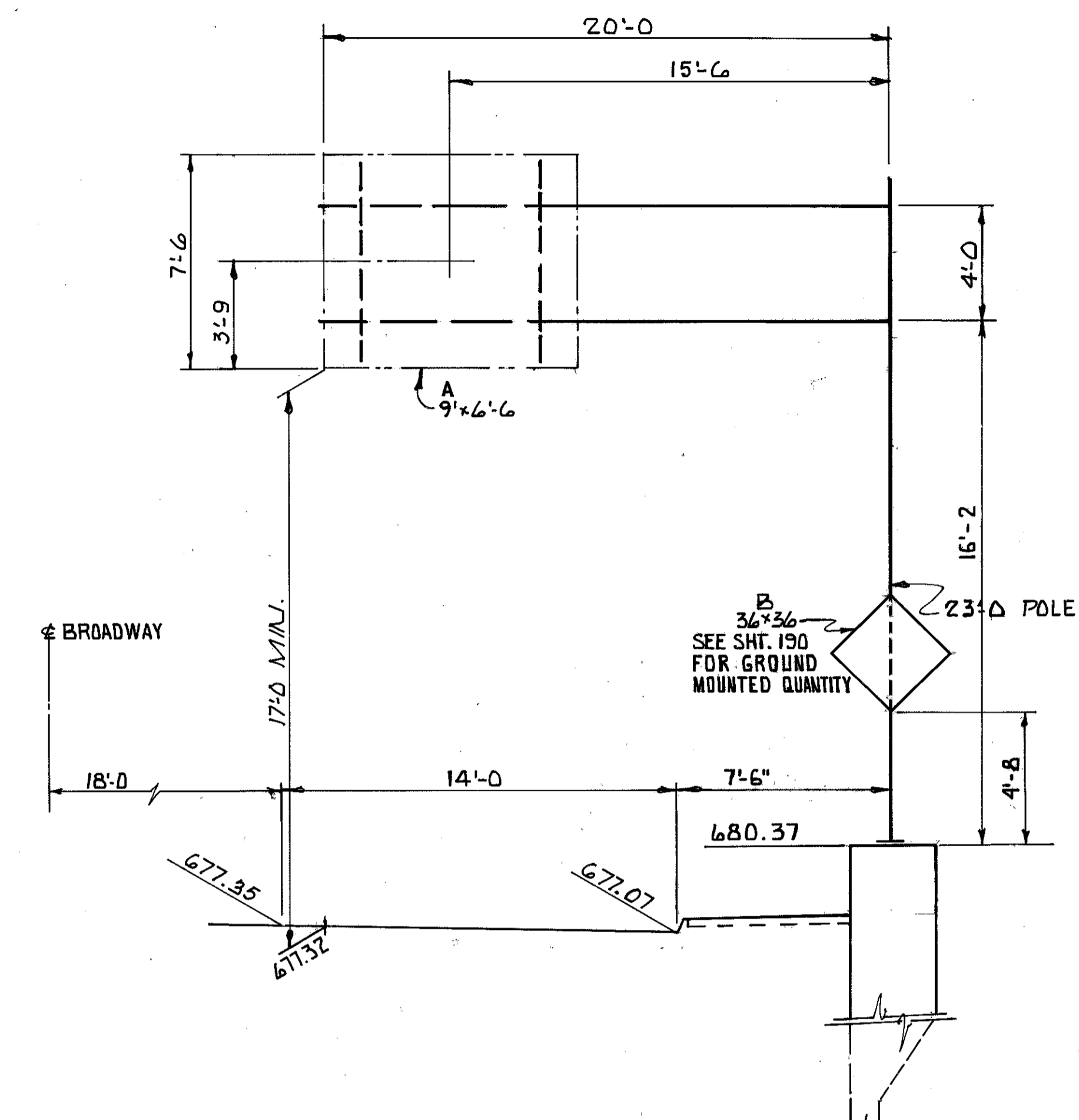
CUYAHOGA COUNTY
CUY-490-1.49



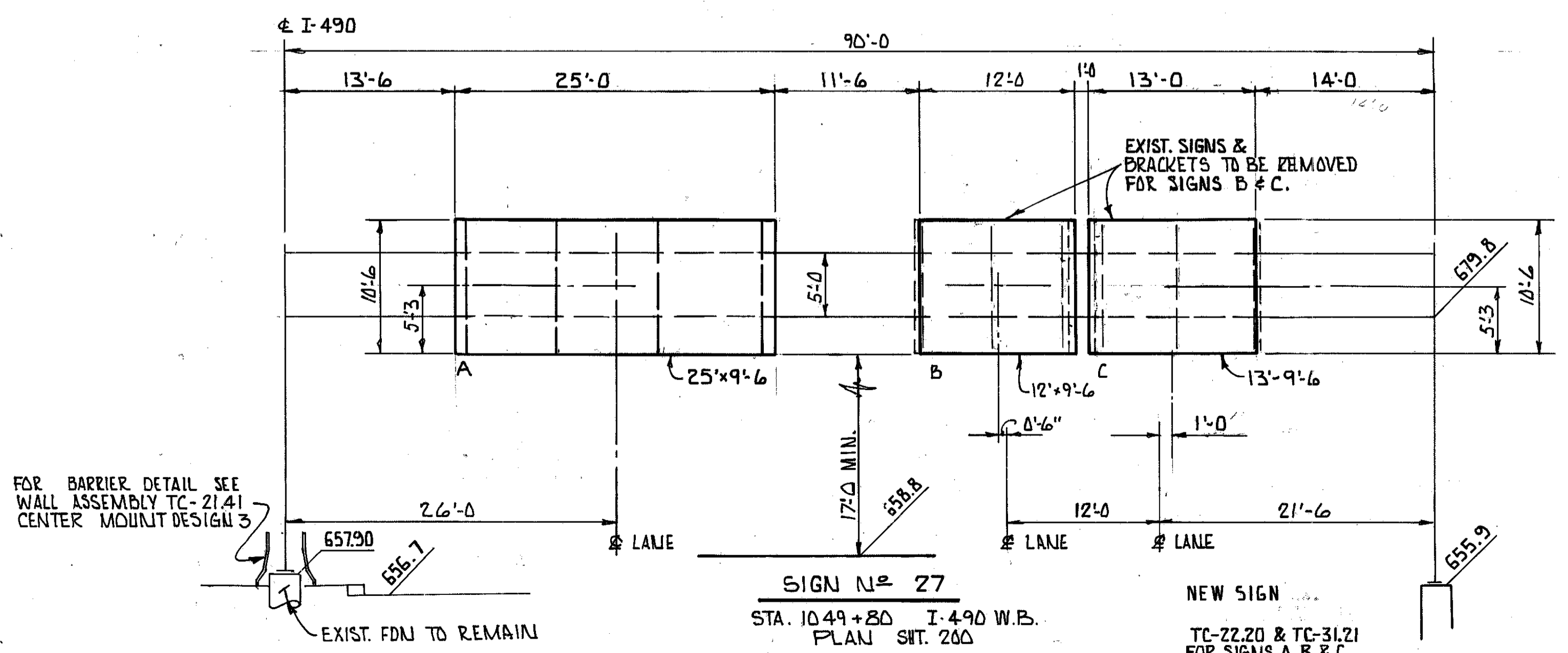
SIGN No. 8
STA. 1031+90 I-490 E.B.
STD. TC-12.30, DESIGN 4
20'-0" ARM
FDN. DESIGN 4
STD. TC-21.20 & TC-21.40
PLAN SHT. 19B



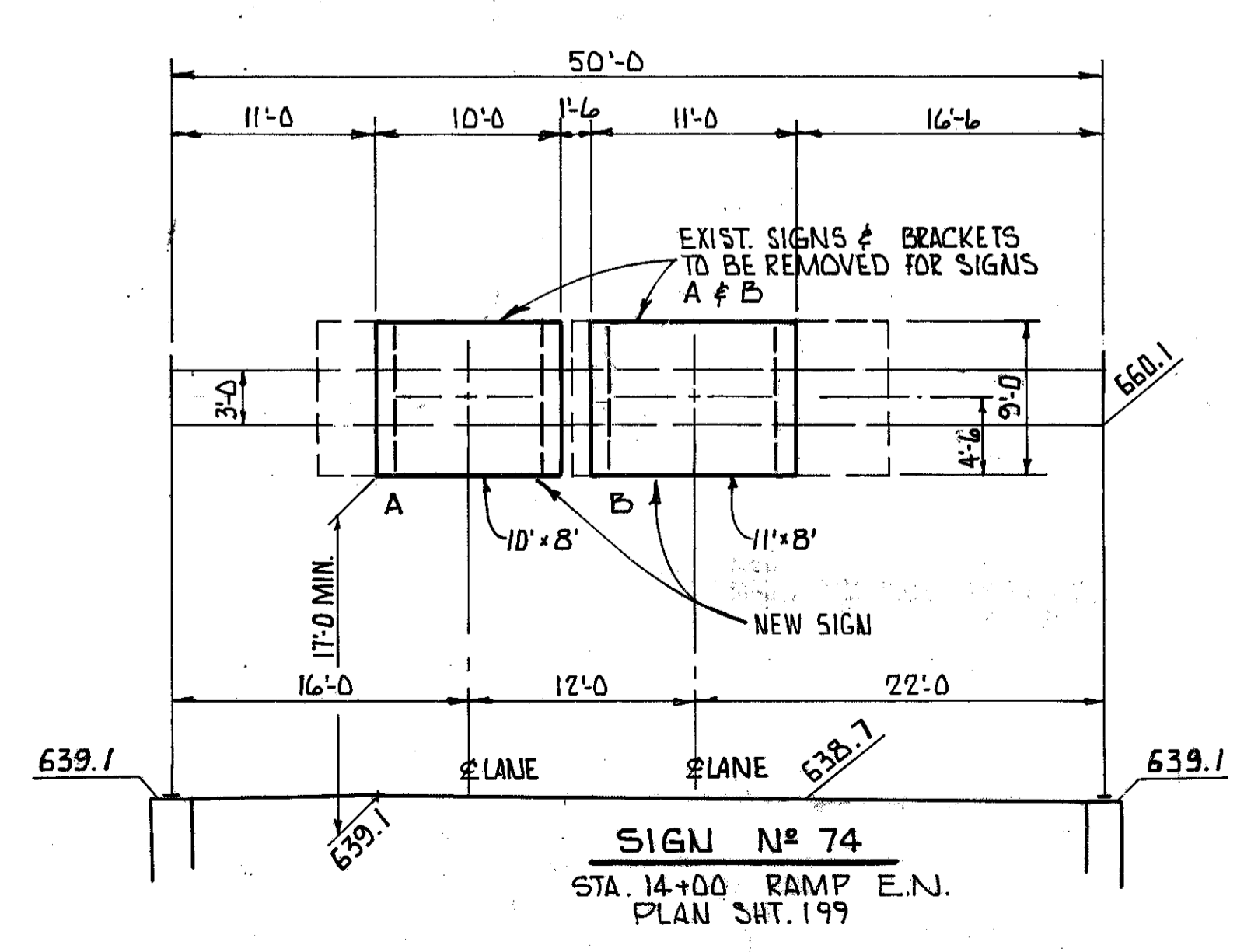
SIGN No. 26
STA. 1049+30 I-490 E.B.
STD. TC-12.30, DESIGN 10
30'-0" ARM
FDN. DESIGN 10
STD. TC-21.20 & TC-21.40
PLAN SHT. 200



SIGN No. 40
STA. 16+90 BROADWAY W.B.
STD. TC-12.30, DESIGN 2
20'-0" ARM
PLAN SHT. 204



SIGN No. 27
STA. 1049+80 I-490 W.B.
PLAN SHT. 200
NEW SIGN
TC-22.20 & TC-31.21
FOR SIGNS A, B & C



SIGN No. 74
STA. 14+00 RAMP E.N.
PLAN SHT. 199

NOTES:
1. FOR OVERHEAD QUANTITIES SEE SHT. 19Z

| | | | |
|---|-------|--------|----------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| SIGN ELEVATIONS | | | |
| SIGNS - 8, 26, 27, 40 & 74 | | | |
| SCALE | DATE | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| LV | LV | | RLH |
| | | | CAP |
| | | | REVIEWED |
| | | | RLH |
| | | | DATE |
| | | | 5/83 |

CONT. No. SHEET ACCT. No.

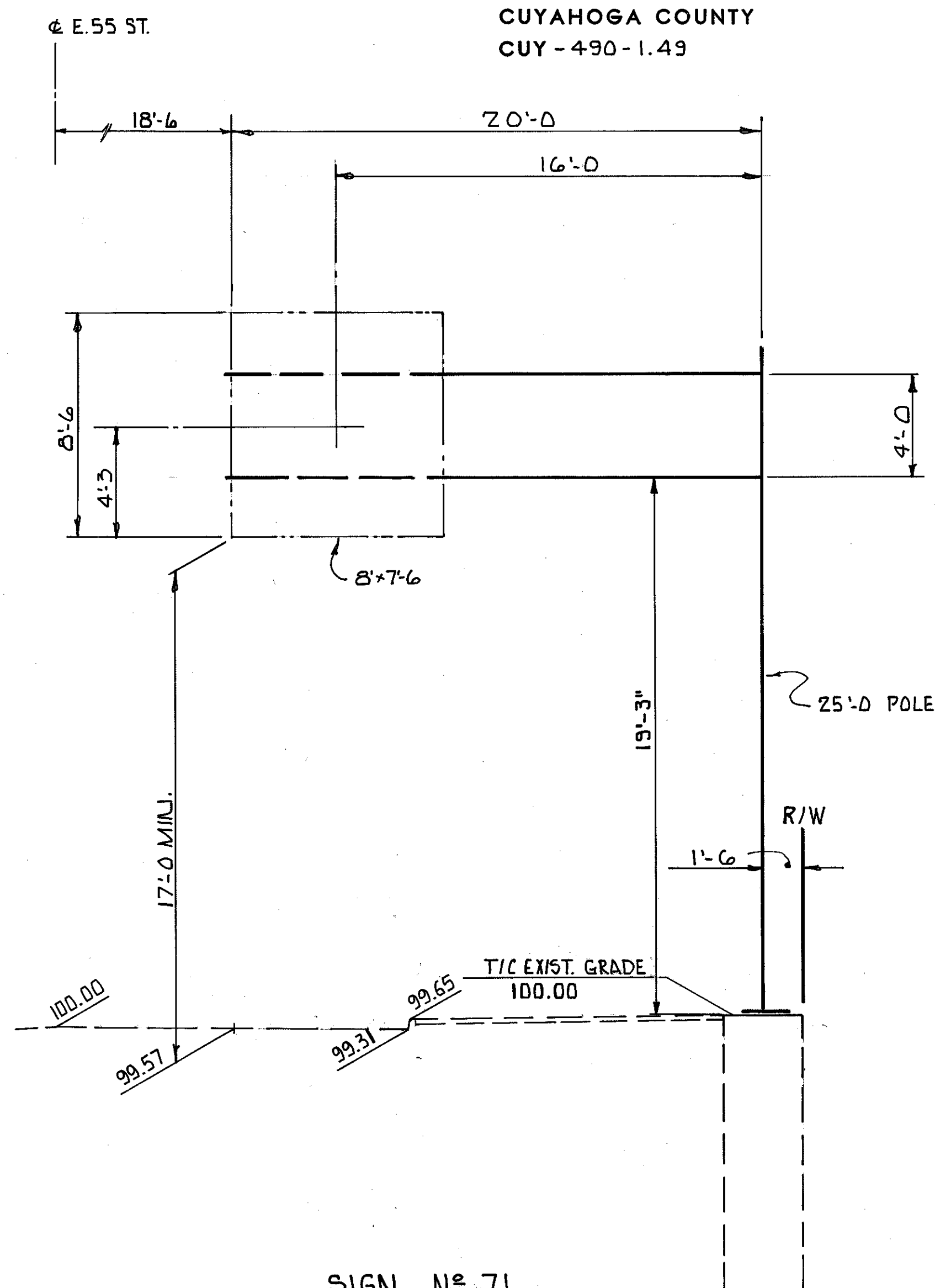
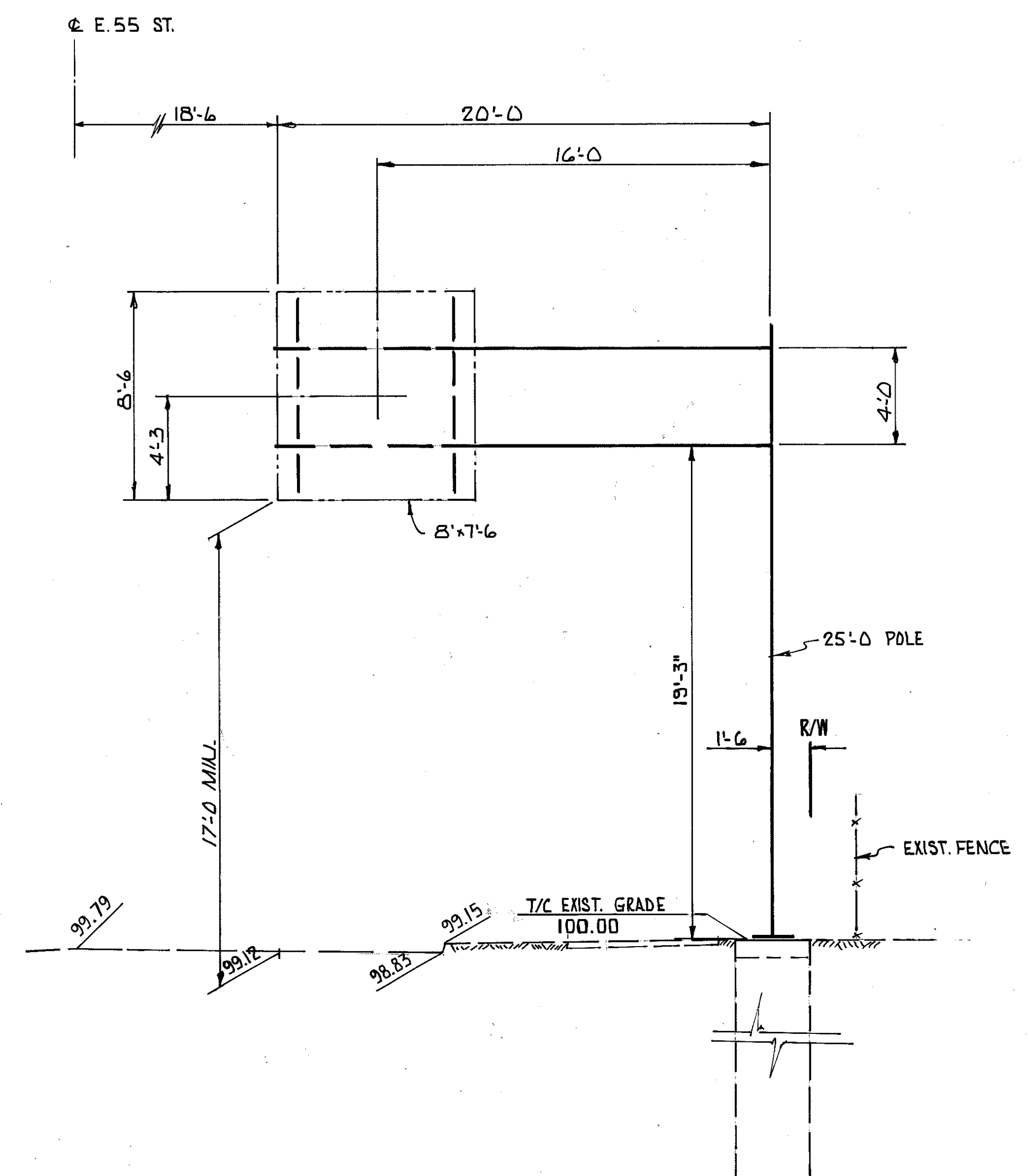
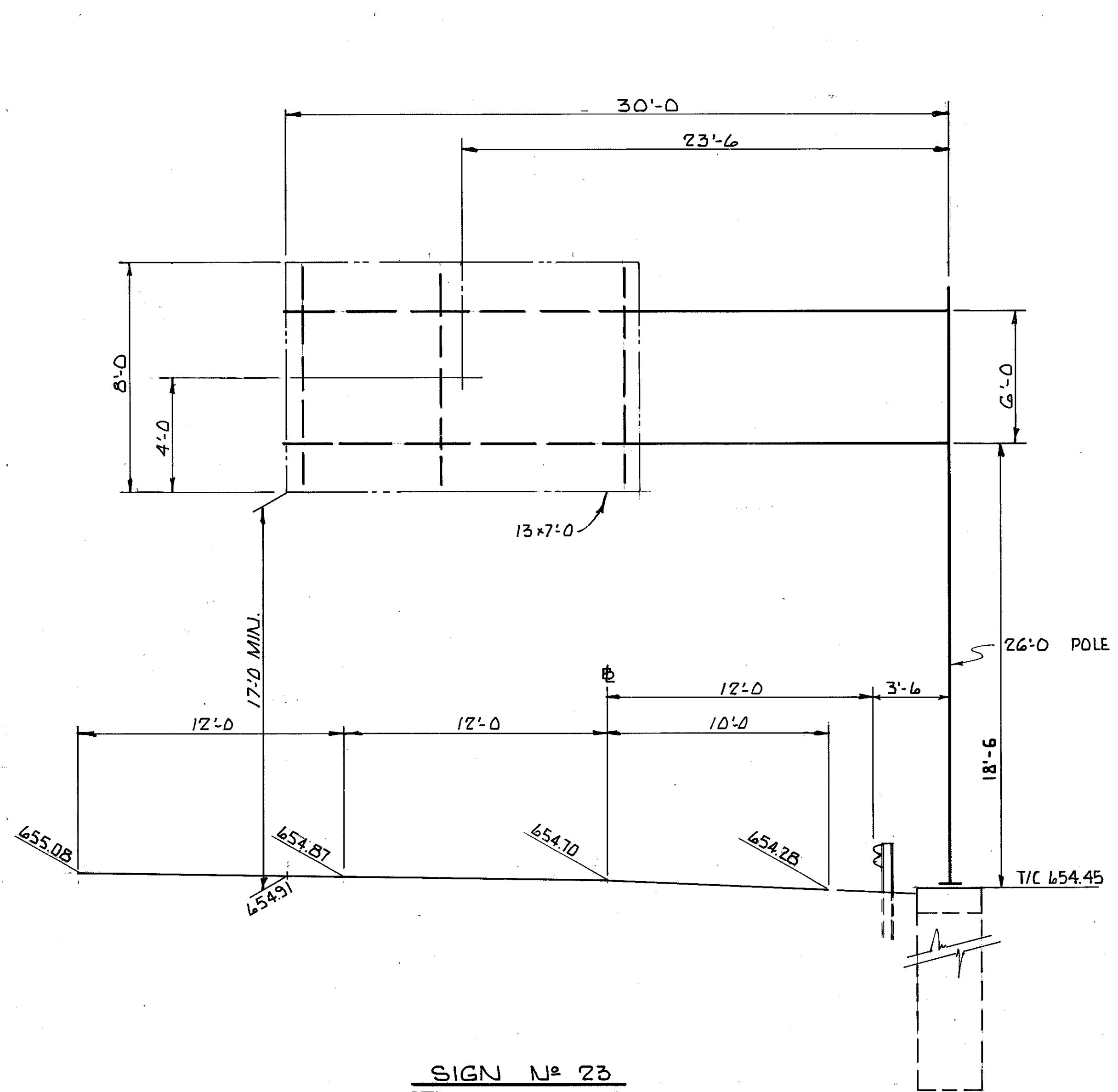
FOR BARRIER DETAIL SEE WALL ASSEMBLY TC-21.41 CENTER MOUNT DESIGN 3

EXIST. FDN TO REMAIN

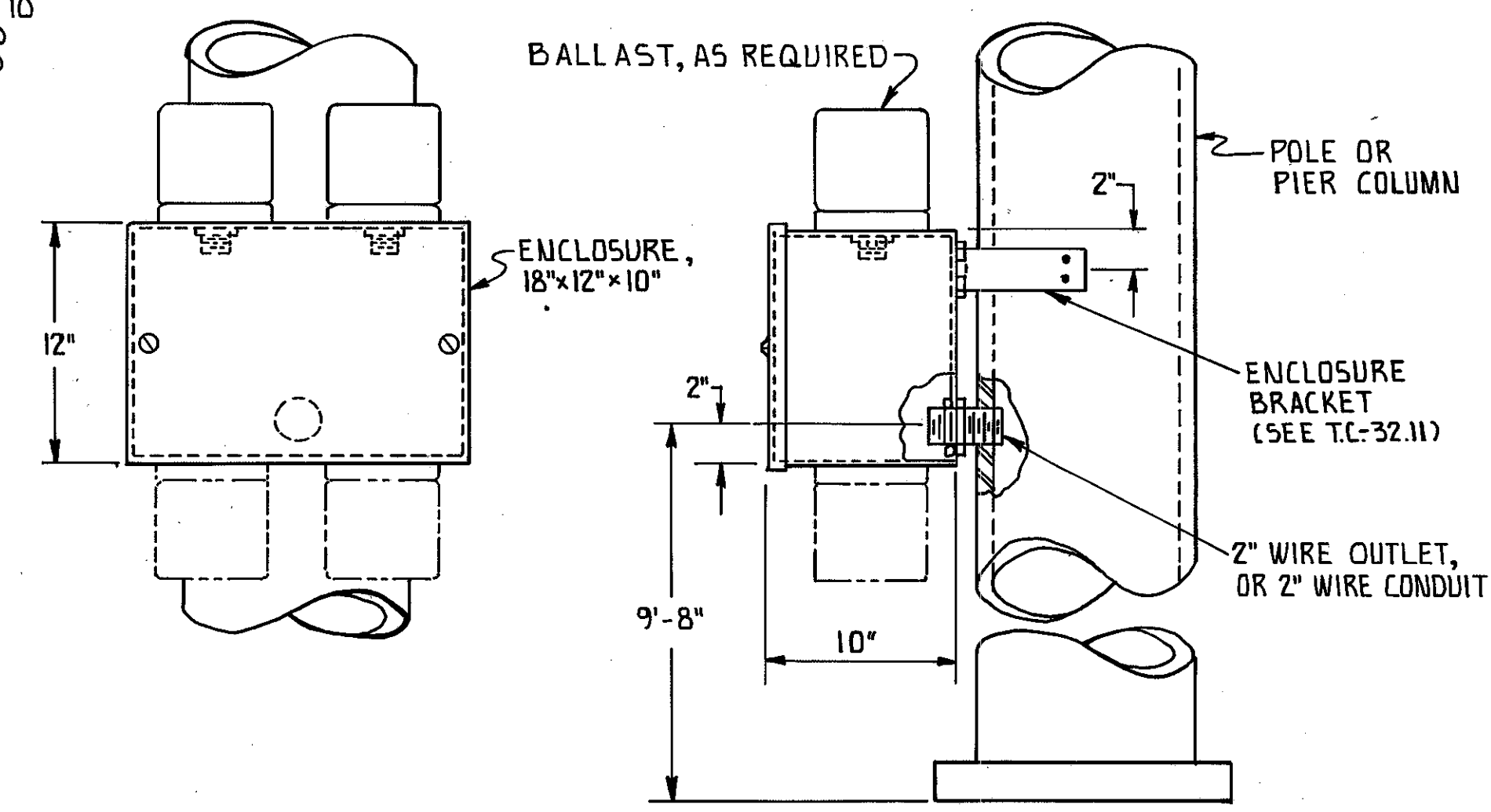
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|-------------------|-------|---------|--|
| FED. RD. DIVISION | STATE | PROJECT | |
| 2 | OHIO | | |

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CUYAHOGA COUNTY
CUY - 490 - 1.49

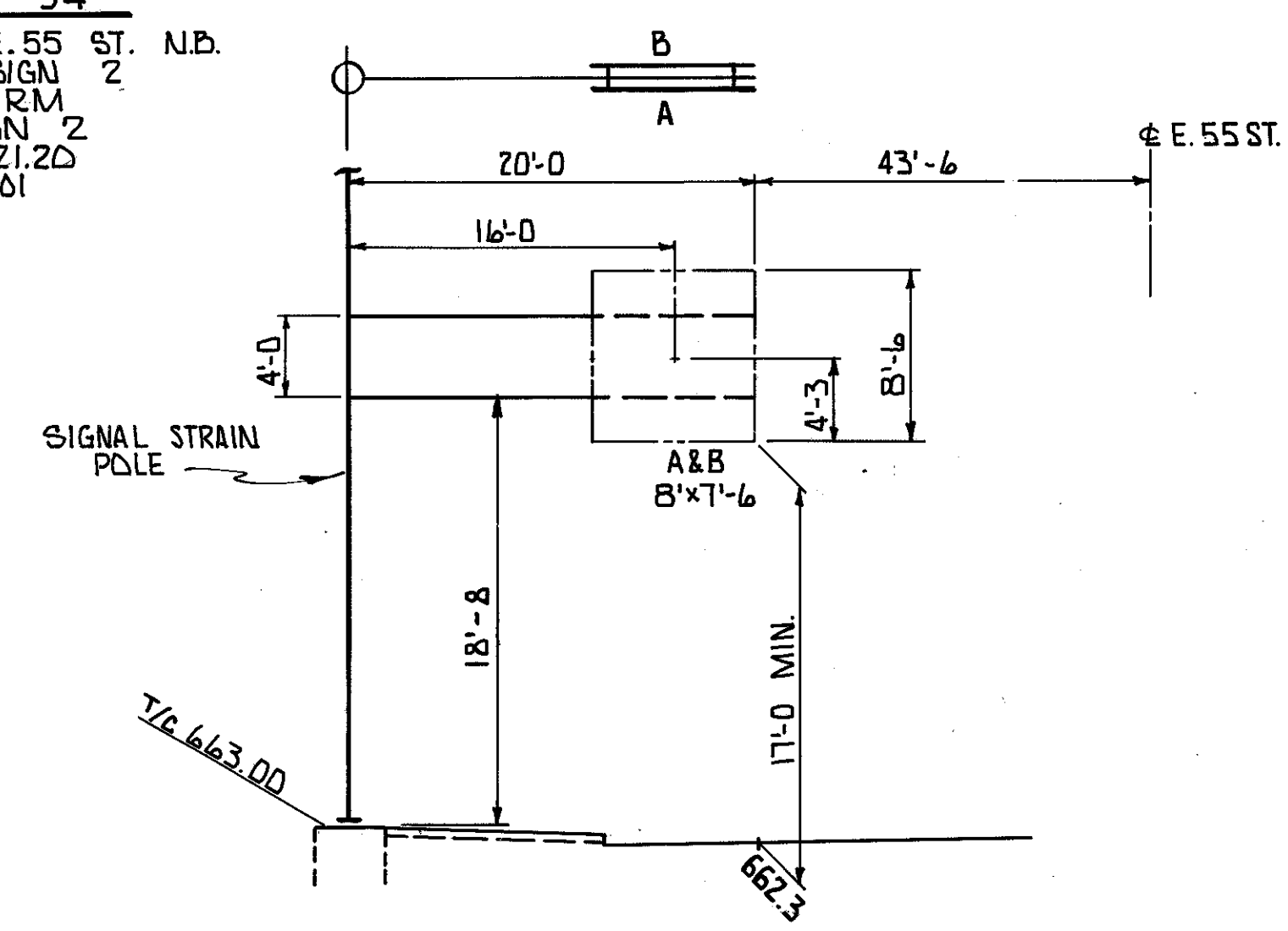


SIGN N^o 23
STA. 24+25 RAMP S.E.
STD. TC-12.30 DESIGN 10 MODIFIED
30'-0" ARM
FDN. DESIGN 10
STD. TC-21.20
PLAN SHT. 200



BALLAST ENCLOSURE, TYPE B

SIGN N^o 54
STA. 3+60 E. 55 ST. N.B.
STD. TC-12.30 DESIGN 2
20'-0" ARM
FDN. DESIGN 2
STD. TC-21.20
PLAN SHT. 201



SIGN N^o 44
STA. 11+06.5 E. 55 ST. N.B. # S.B.
SIGN ARM TRUSS TC-12.30 DESIGN 2 MODIFIED
20'-0" ARM
PLAN SHEET 201
FOR FOUNDATION AND POLE SEE SHT. 196

SIGN N^o 71
STA. 21+30 E. 55 ST. S.B.
STD. TC-12.30 DESIGN 2
20'-0" ARM
FDN. DESIGN 2
STD. TC-21.20
PLAN SHT. 202

NOTES:
1. FOR OVERHEAD SIGN QUANTITIES SEE SHT. 192

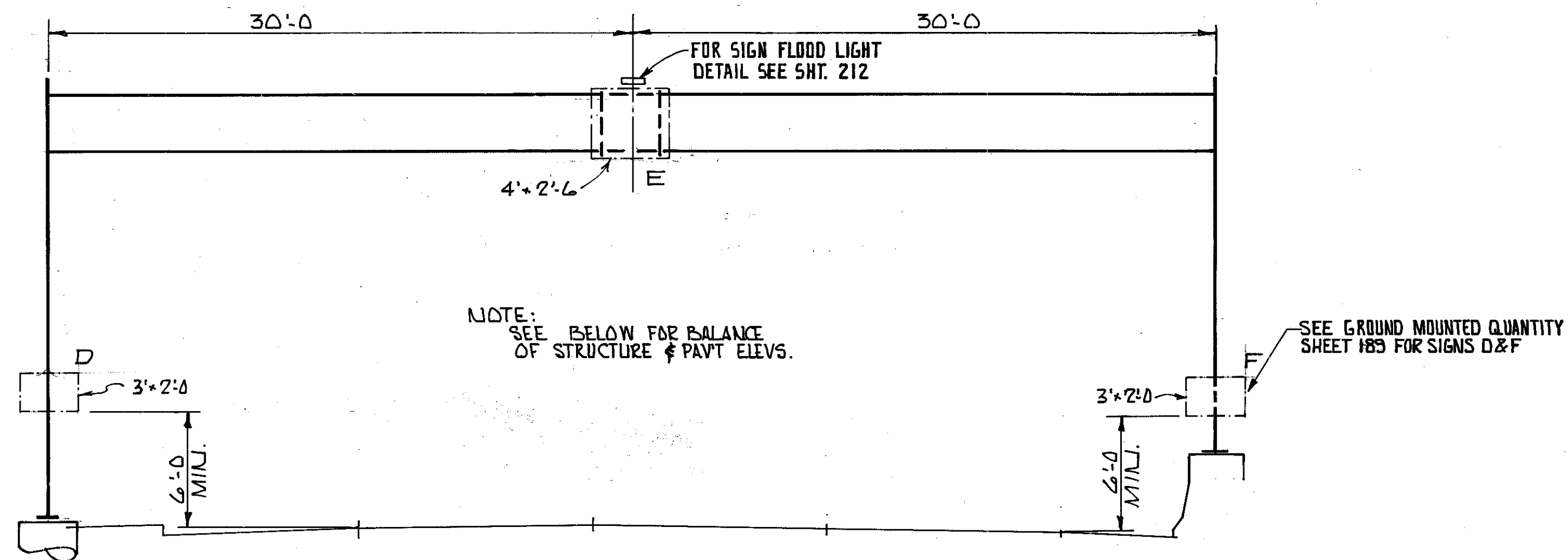
| | | | |
|--|-------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| SIGN ELEVATIONS SIGNS - 23, 44, 54 & 71 | | | |
| SCALE | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| LV | LV | RLH | RLH |
| | | CAP | 5/83 |

CONT. No. SHEET ACCT. No.

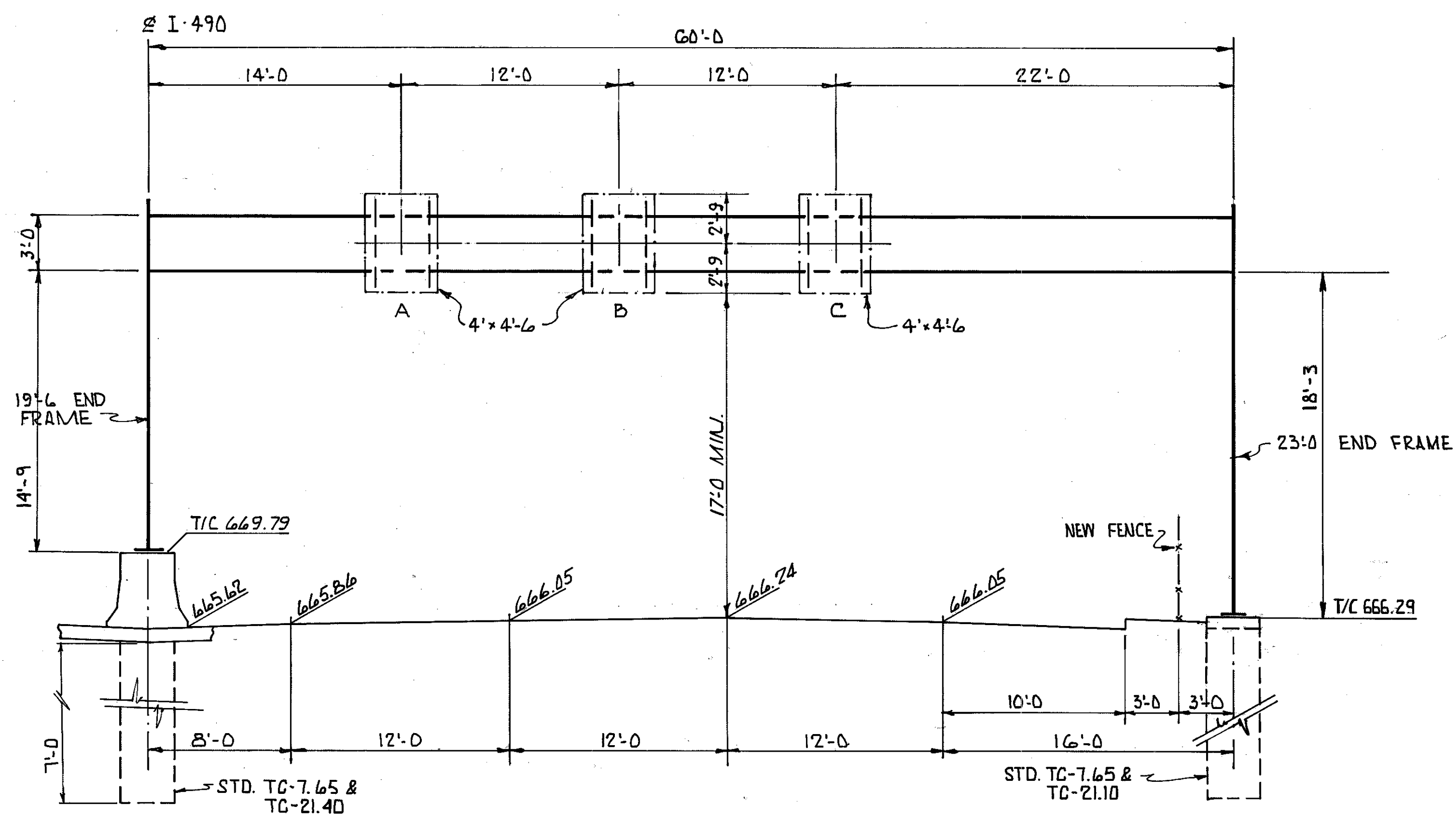
| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 2 | OHIO | |

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261

CUYAHOGA COUNTY
CUY-490-1.49

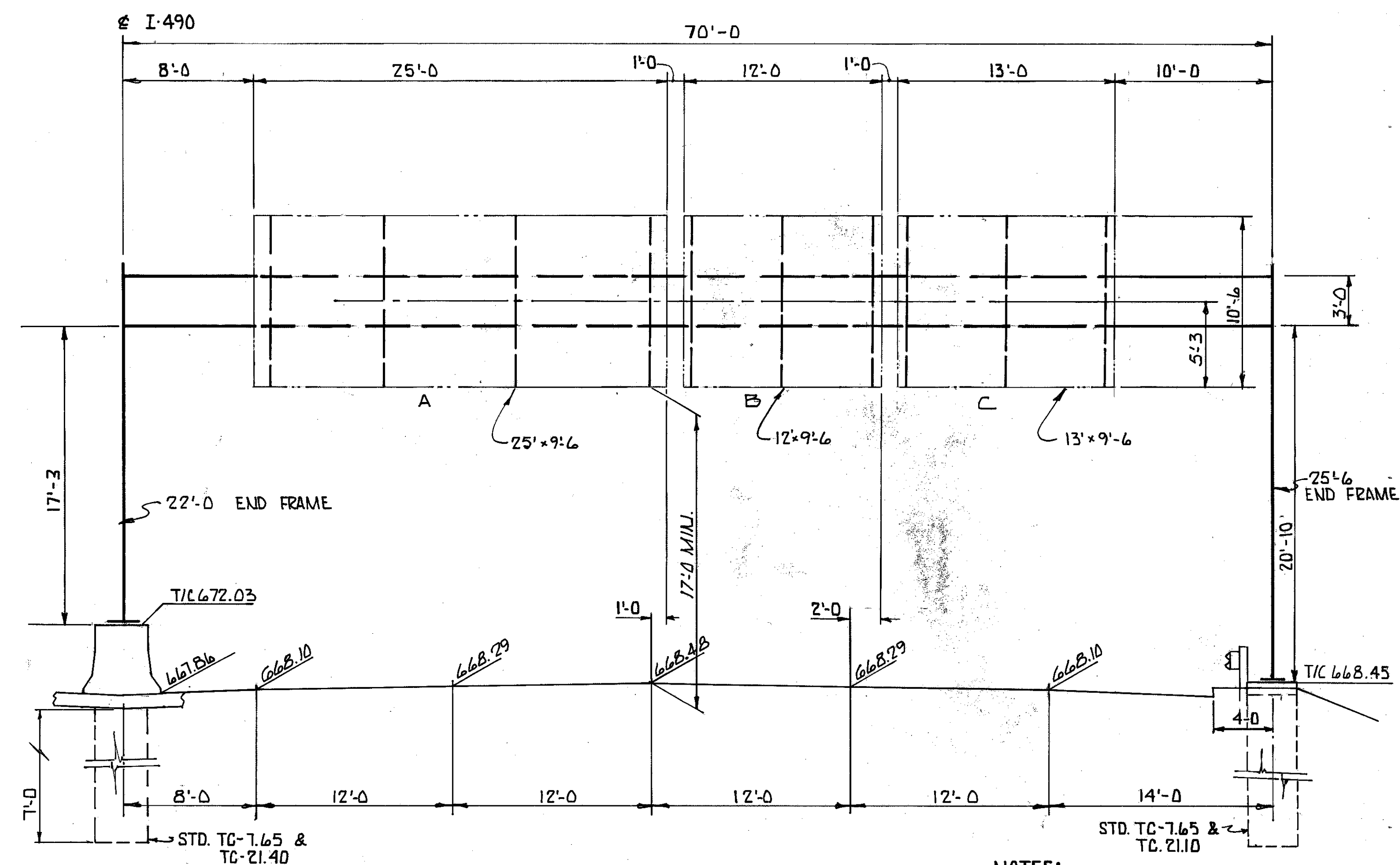


SIGN 24
LOOKING WEST BOUND



SIGN N^o 24

STA. 1058+90 I-490 E.B.
STD. TC-7.65 DESIGN 6
FDN. DESIGN 6
STD. TC-21.10 & TC-21.40
PLAN SHT. 200



SIGN N^o 28

STA. 1056+90 I-490 W.B.
STD. TC-7.65 DESIGN 6
FDN. DESIGN 6
STD. TC-21.10 & TC-21.40
PLAN SHT. 200

NOTES:
1. FOR OVERHEAD SIGN QUANTITIES SEE SHT. 192

| | | | |
|--|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

SIGN ELEVATIONS
SIGNS 24 & 28

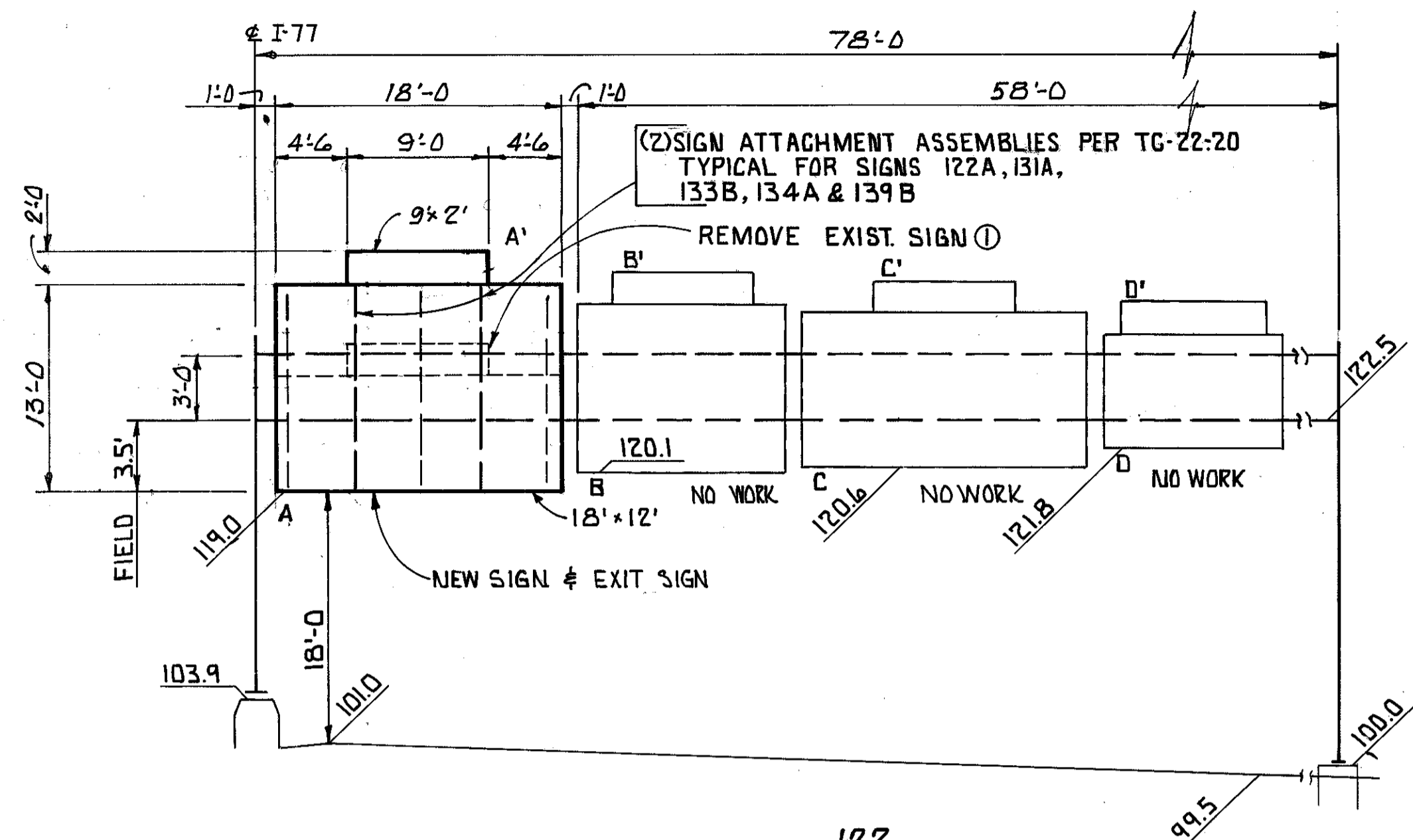
| | | | | | |
|----------|-------|--------|---------|----------|------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| LV | LV | | JRH/CAP | RLH | 5/83 |

CONT. No. SHEET ACCT. No.

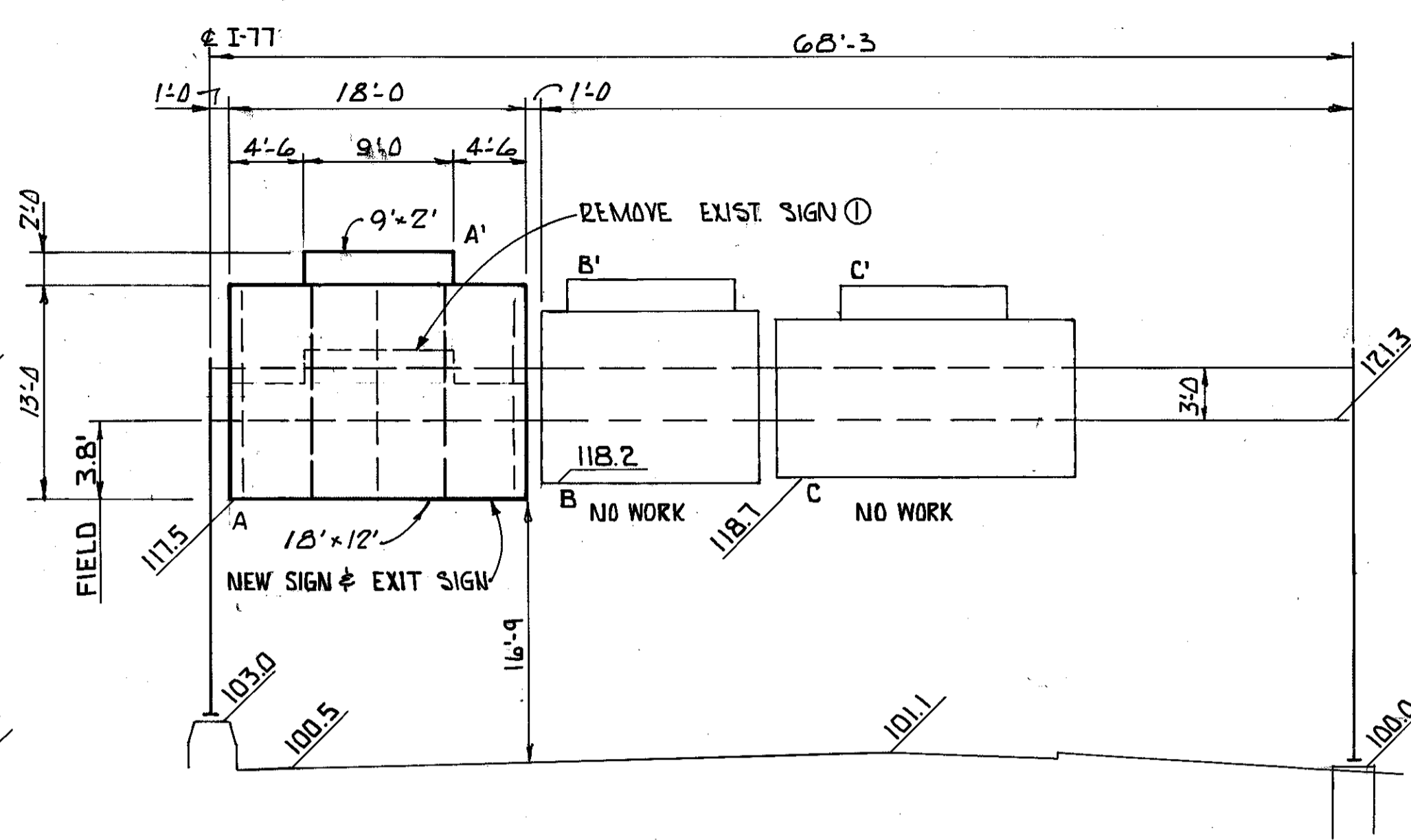
| | | | |
|-------------------|-------|---------|--|
| FED. RD. DIVISION | STATE | PROJECT | |
| 2 | OHIO | | |

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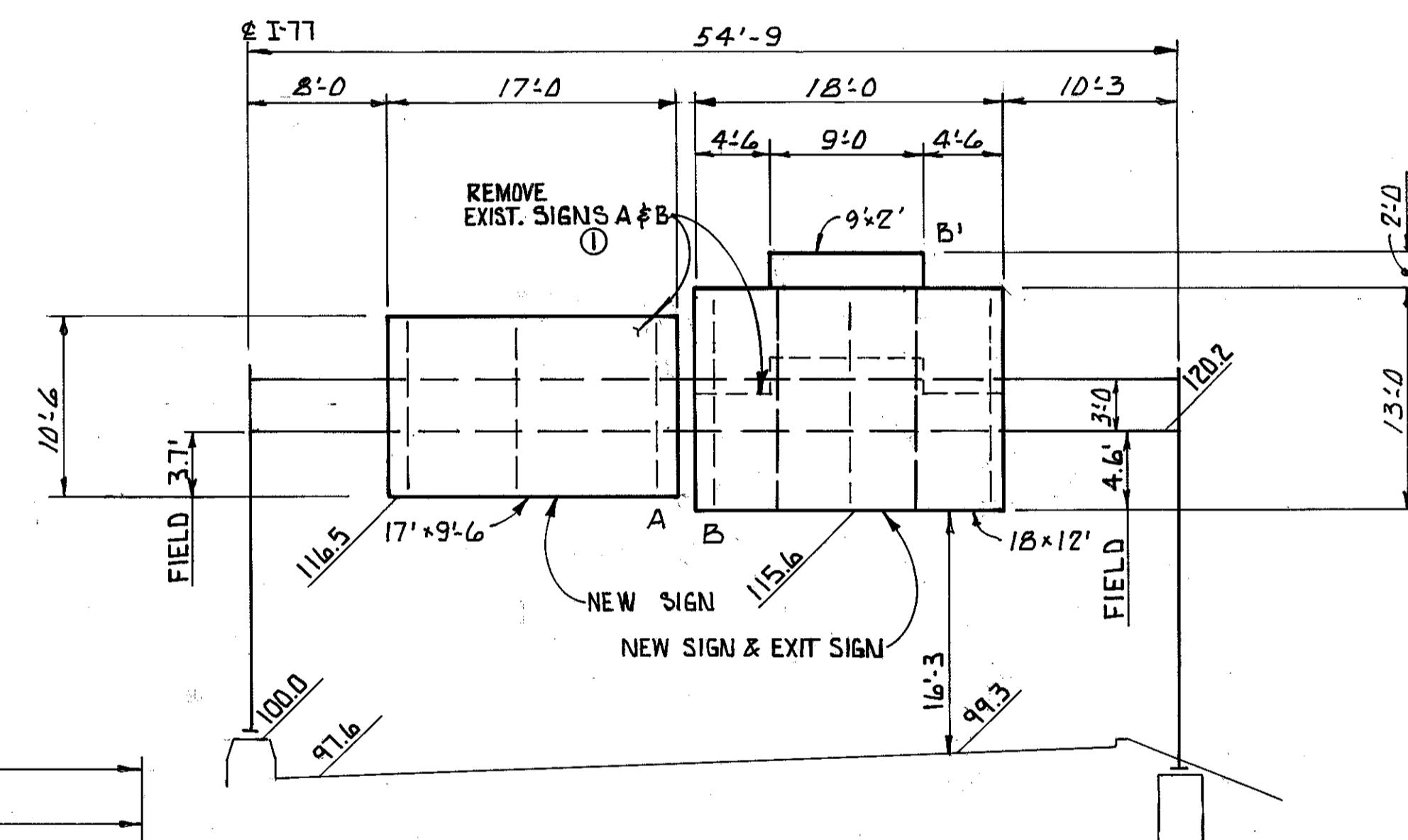
CUYAHOGA COUNTY
CUY-490-1.49



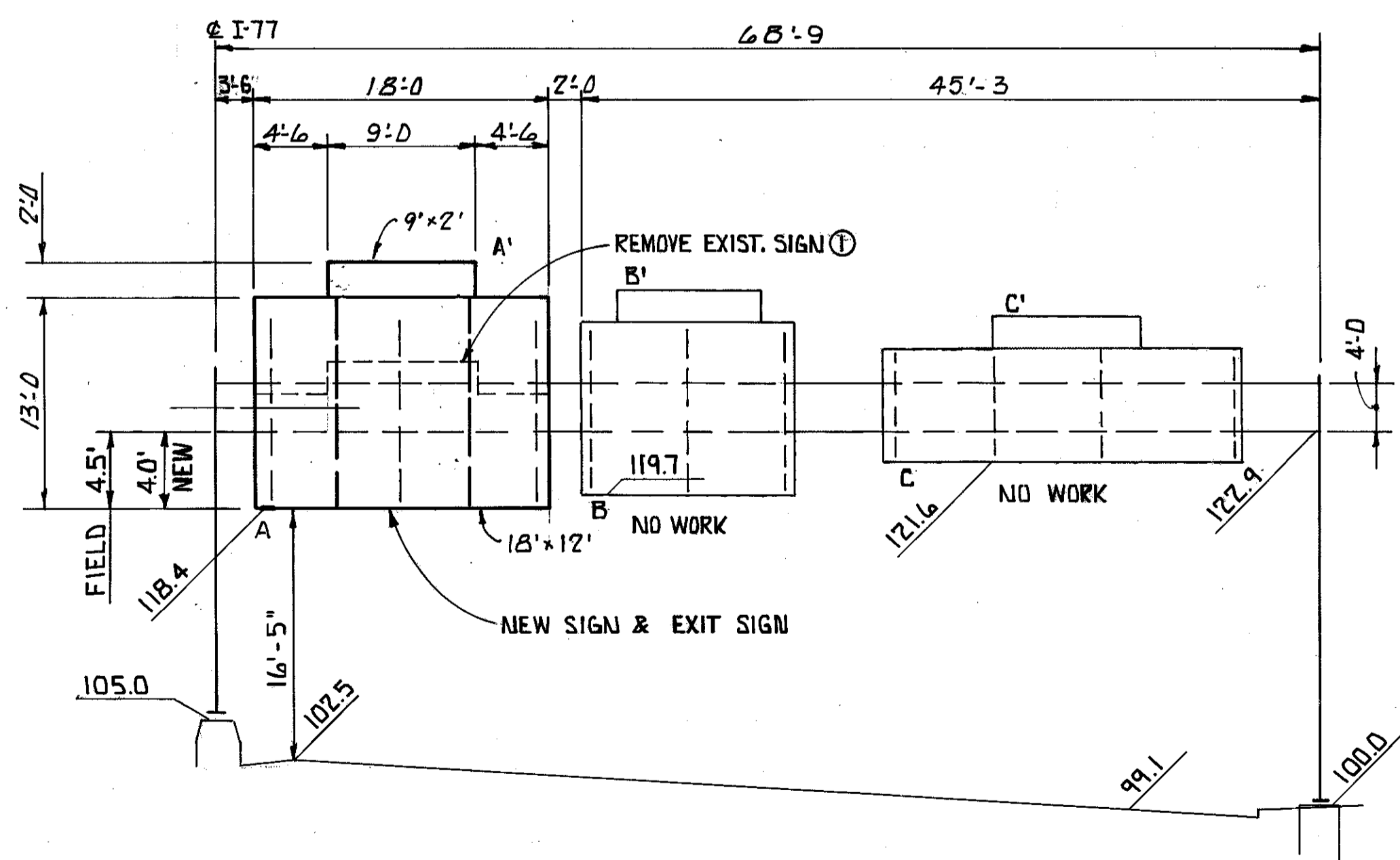
122
STA. 130+80 N.B. I-77
PLAN SHT. 205



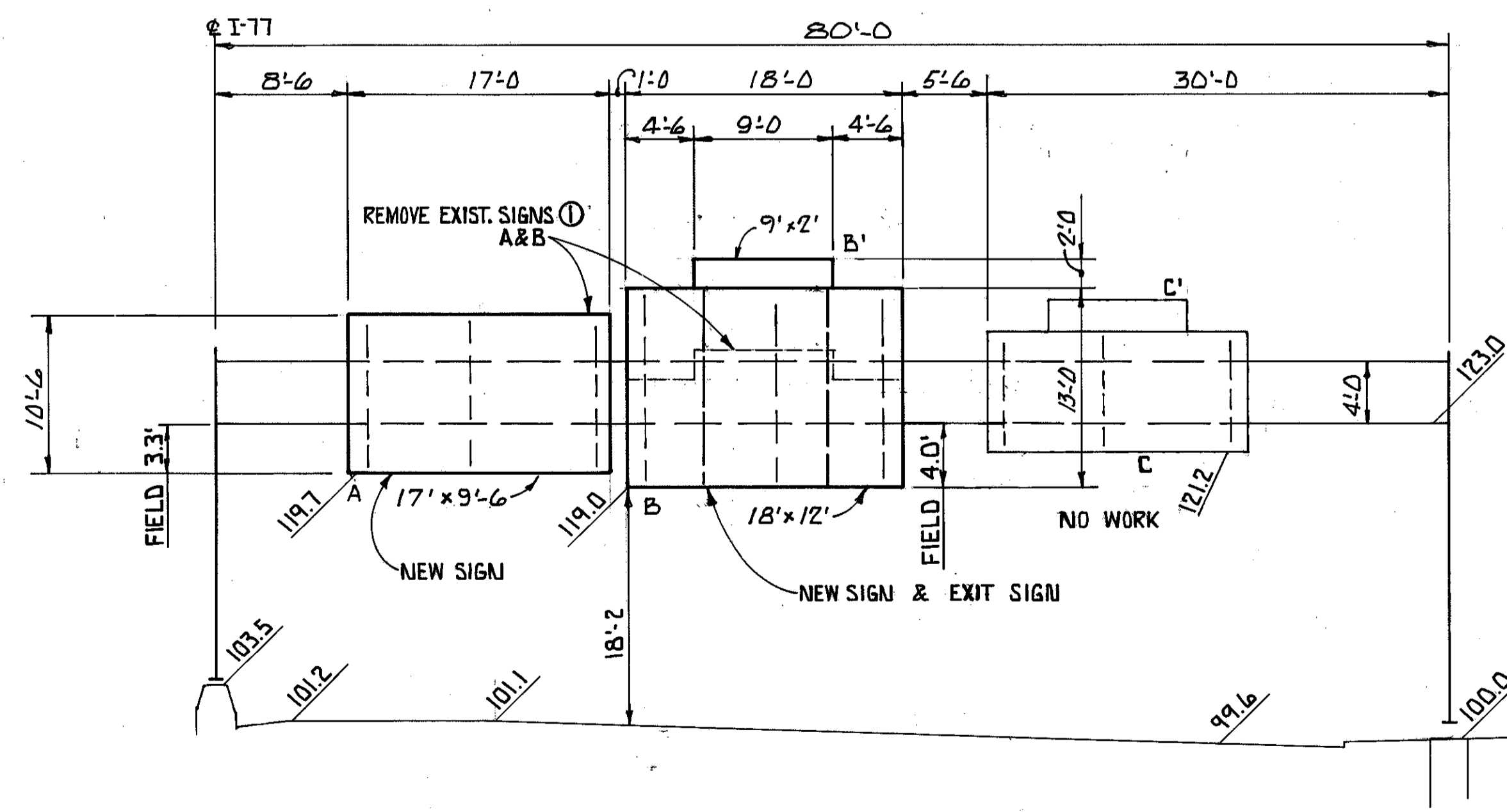
131
STA. 163+15 N.B. I-77
PLAN SHT. 205



133
STA. 177+10 N.B. I-77
PLAN SHT. 205



134
STA. 190+25 N.B. I-77
PLAN SHT. 206



139
STA. 49+95 N.B. I-77
PLAN SHT. 206

① EXIST. SIGN - MERCURY VAPOR W/12" GLARE SHIELD

NOTES:
2. FOR OVERHEAD SIGN QUANTITIES SEE SHT. 193

| NO. | DATE | BY | REVISED |
|-----|------|----|---------|
| | | | |

TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

SIGN ELEVATIONS

EXIST. STRUCTURES I-77
SIGNS - 122, 131, 133, 134 & 139

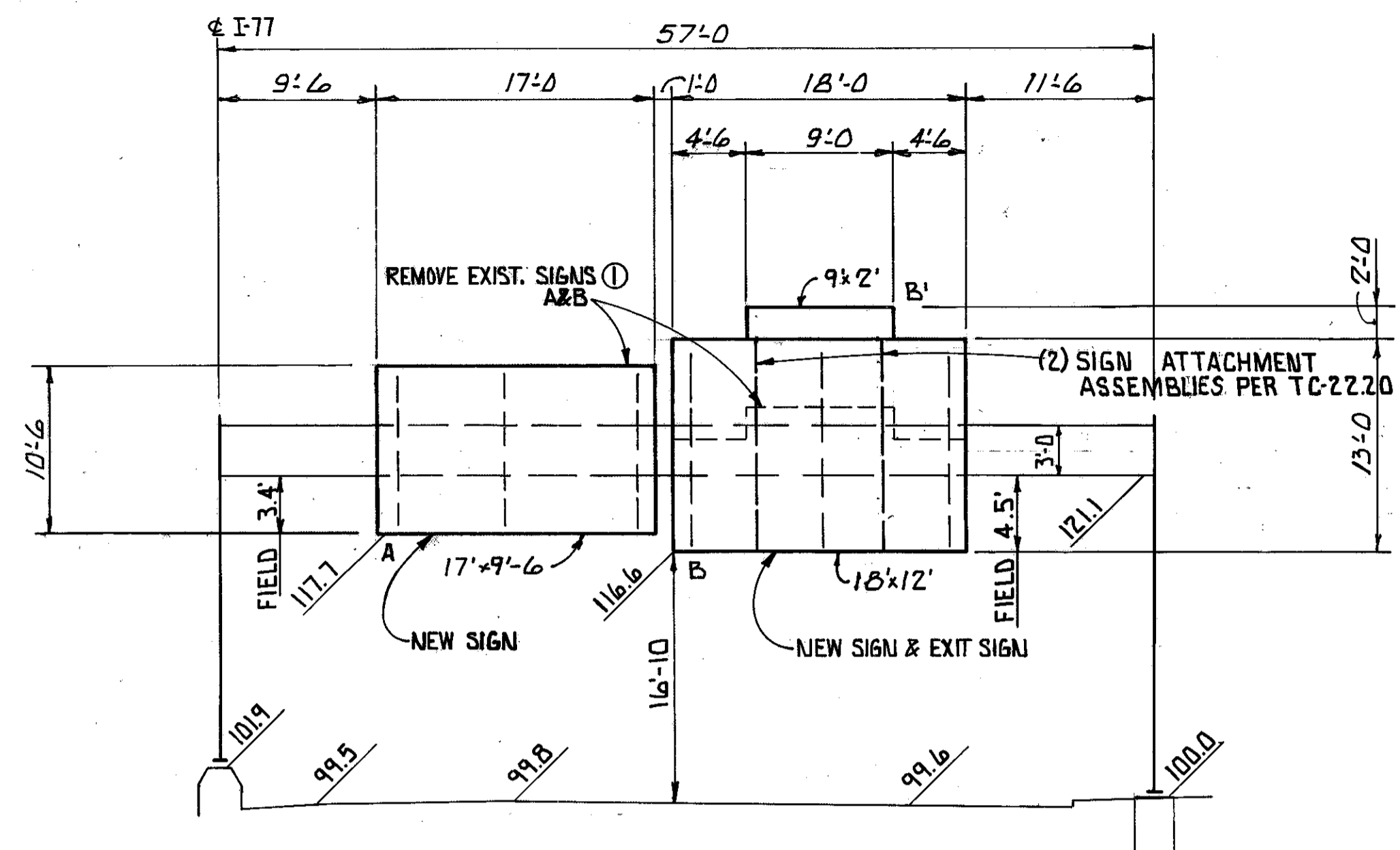
| SCALE | DATE | | | | |
|----------|-------|--------|---------|----------|------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| LV | LV | | JRH/CAP | RLH | 5/83 |

CONT. No. SHEET ACCT. No.

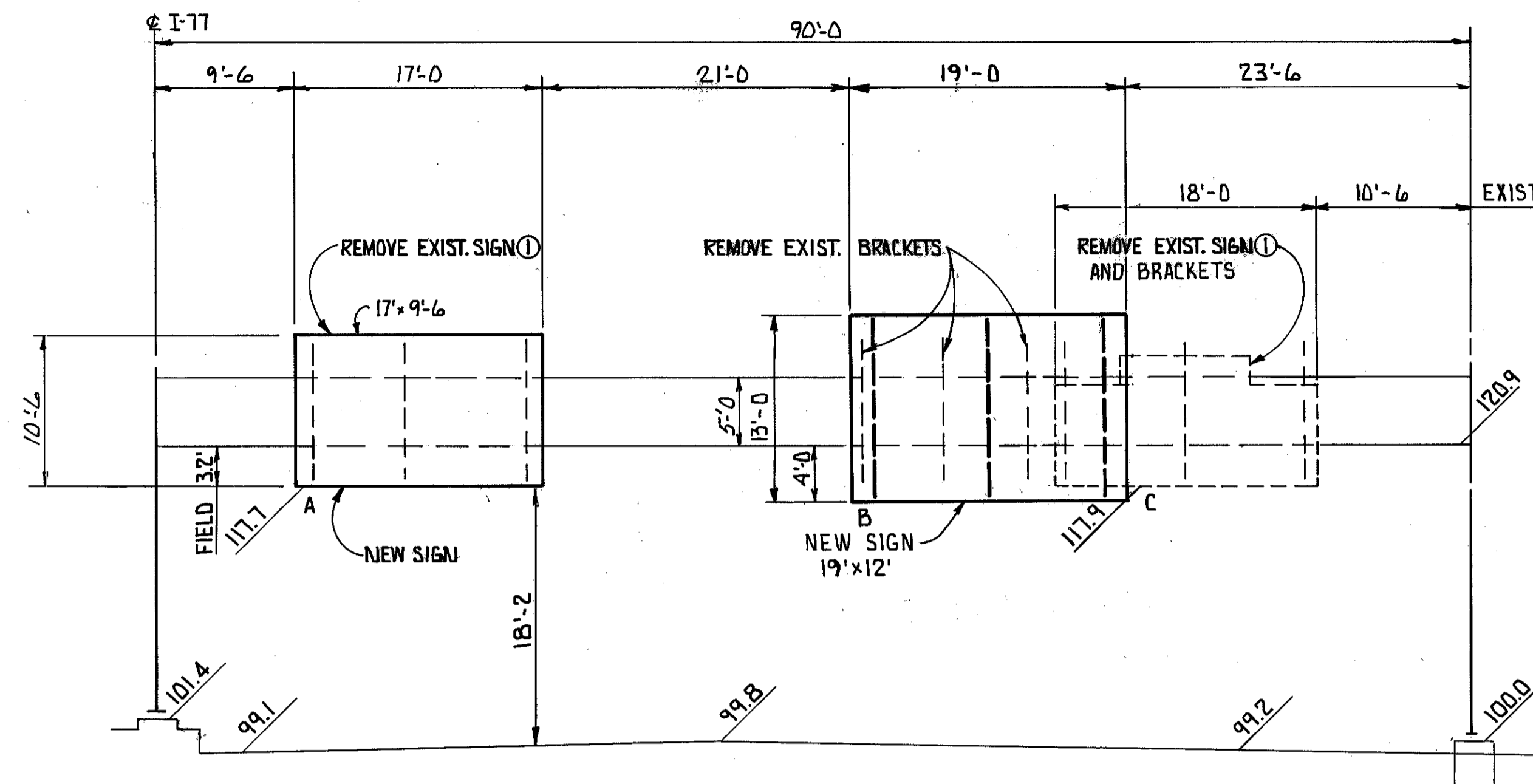
| | | | |
|-------------------|-------|---------|--|
| FED. RD. DIVISION | STATE | PROJECT | |
| 2 | OHIO | | |

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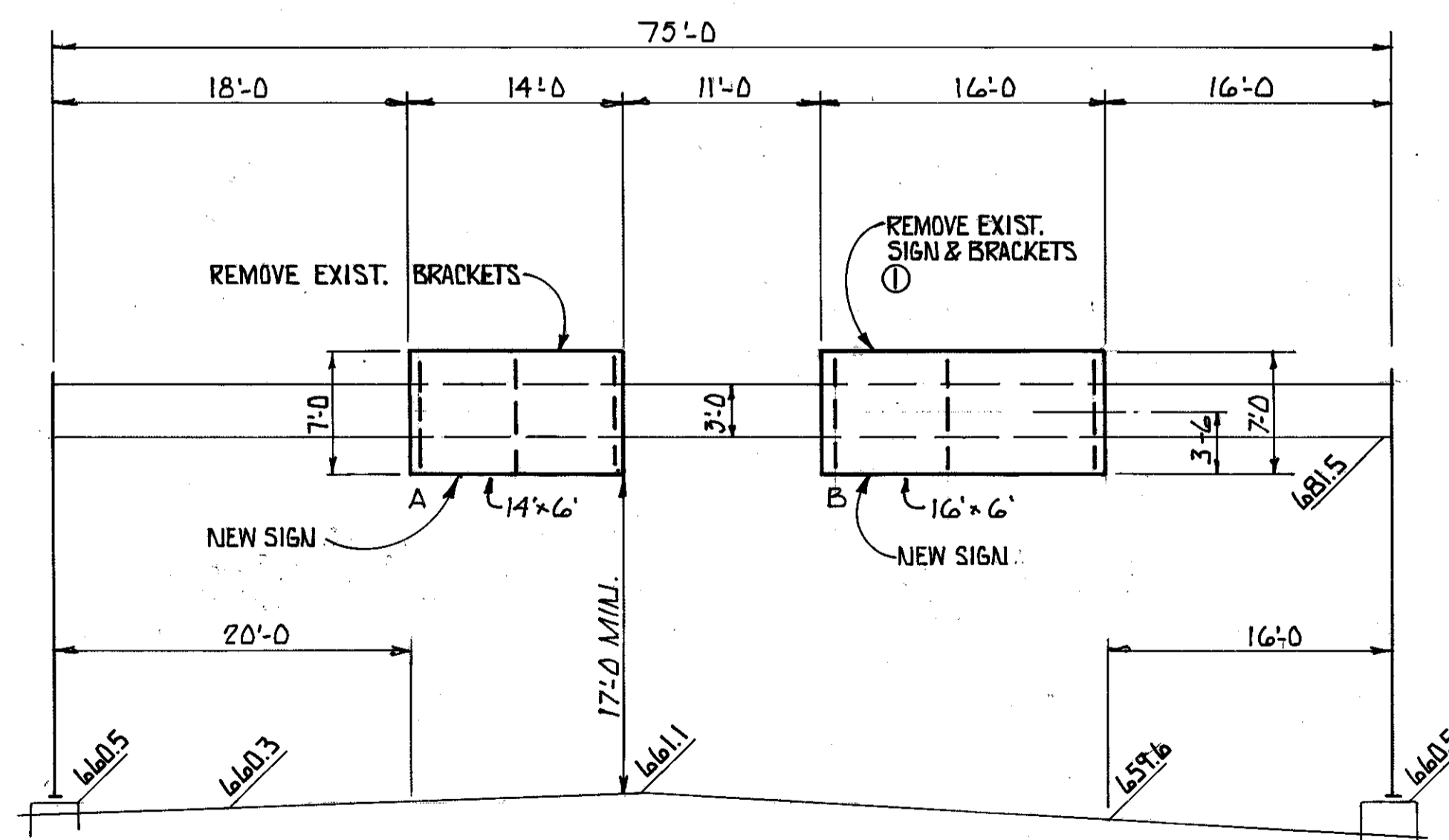
CUYAHOGA COUNTY
CUY-490-1.49



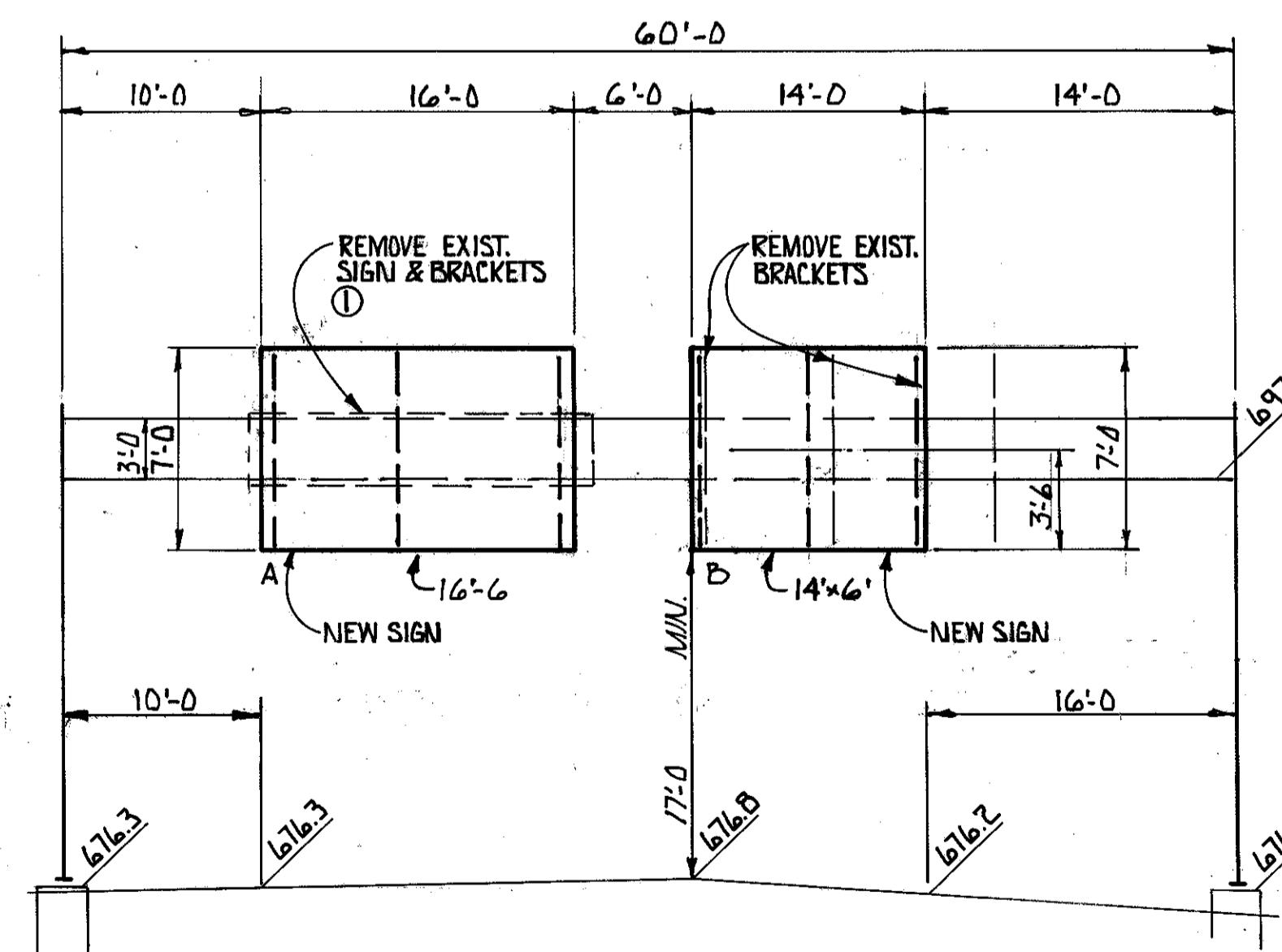
142
STA. 58+20 N.B. I-77
PLAN SHT. 206



143
STA. 65+00 N.B. I-77
PLAN SHT. 207



144
STA. 10+37 RAMP S-E
PLAN SHT. 207



146
STA. 7+50 RAMP N-W
PLAN SHT. 208

⊙ EXIST. SIGN - MERCURY VAPOR W/12" GLARE SHIELD

NOTES:
2. FOR OVERHEAD SIGN QUANTITIES SEE SHT. 193

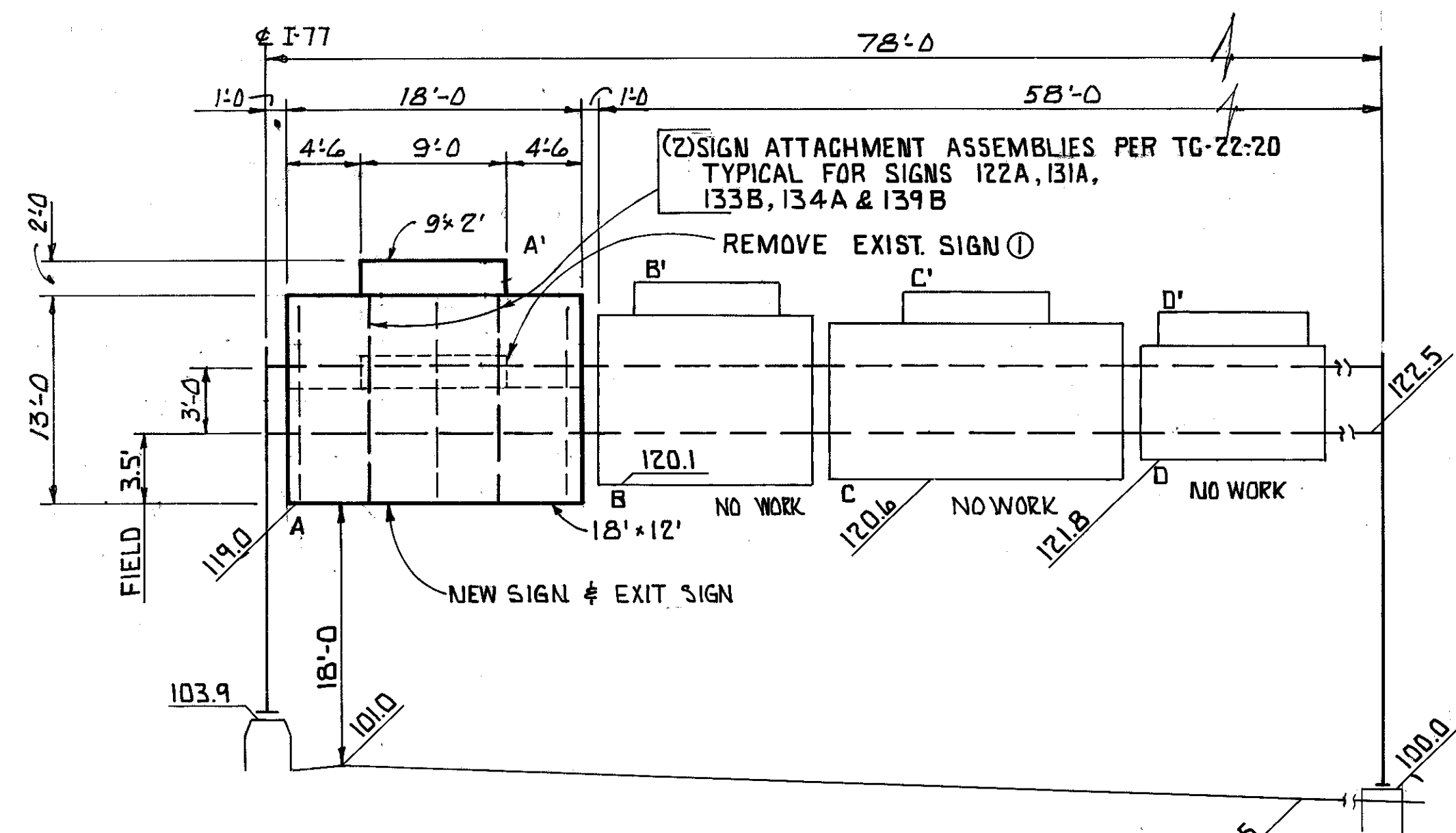
CONT. No. SHEET ACCT. No.

| | | | |
|---|-------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| SIGN ELEVATIONS | | | |
| EXIST. STRUCTURES I-77 SIGNS - 142, 143, 144, 146 | | | |
| SCALE | DATE | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| L.V. | L.V. | JRH | CAP |
| | | RLH | 5/83 |

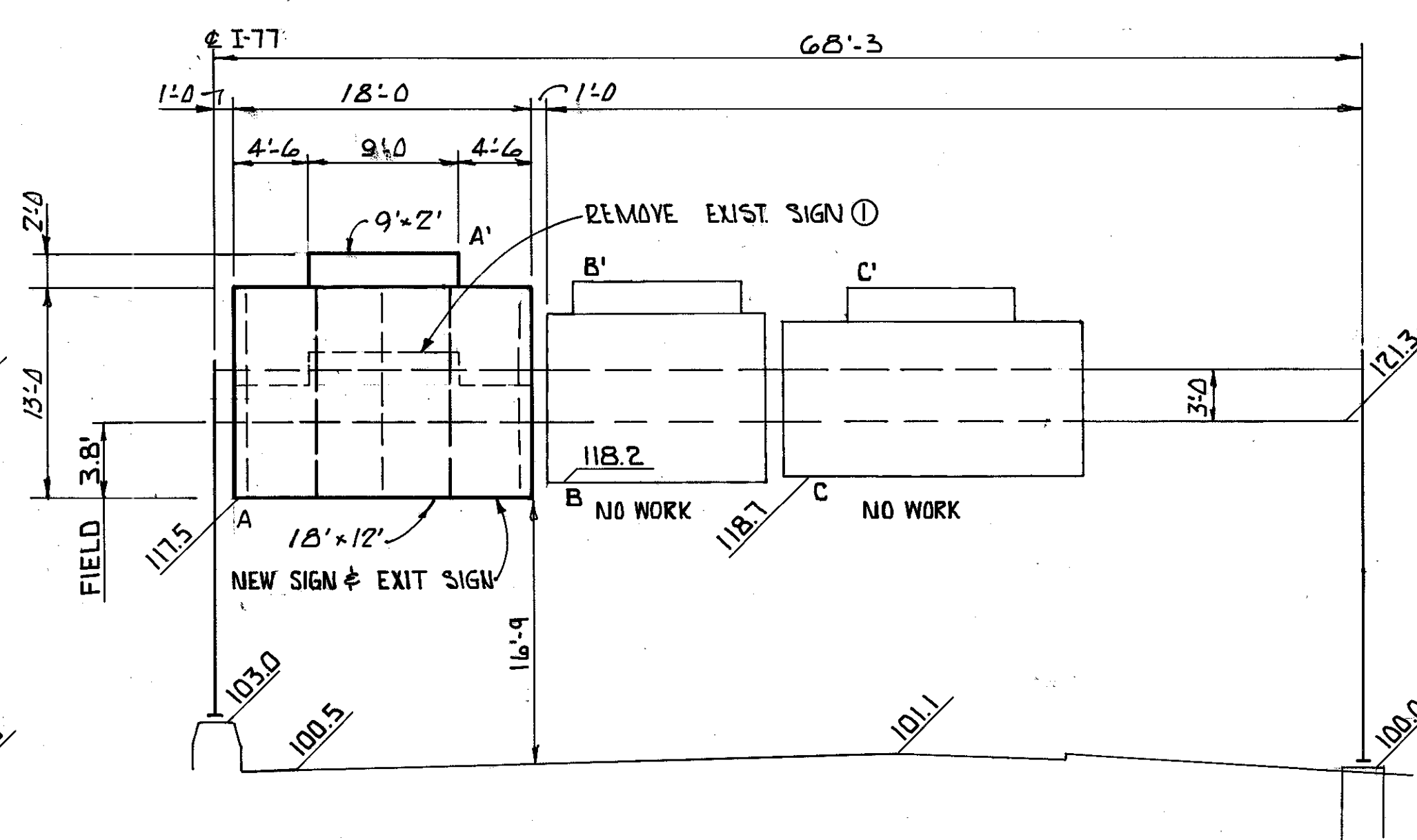
| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 2 | OHIO | |

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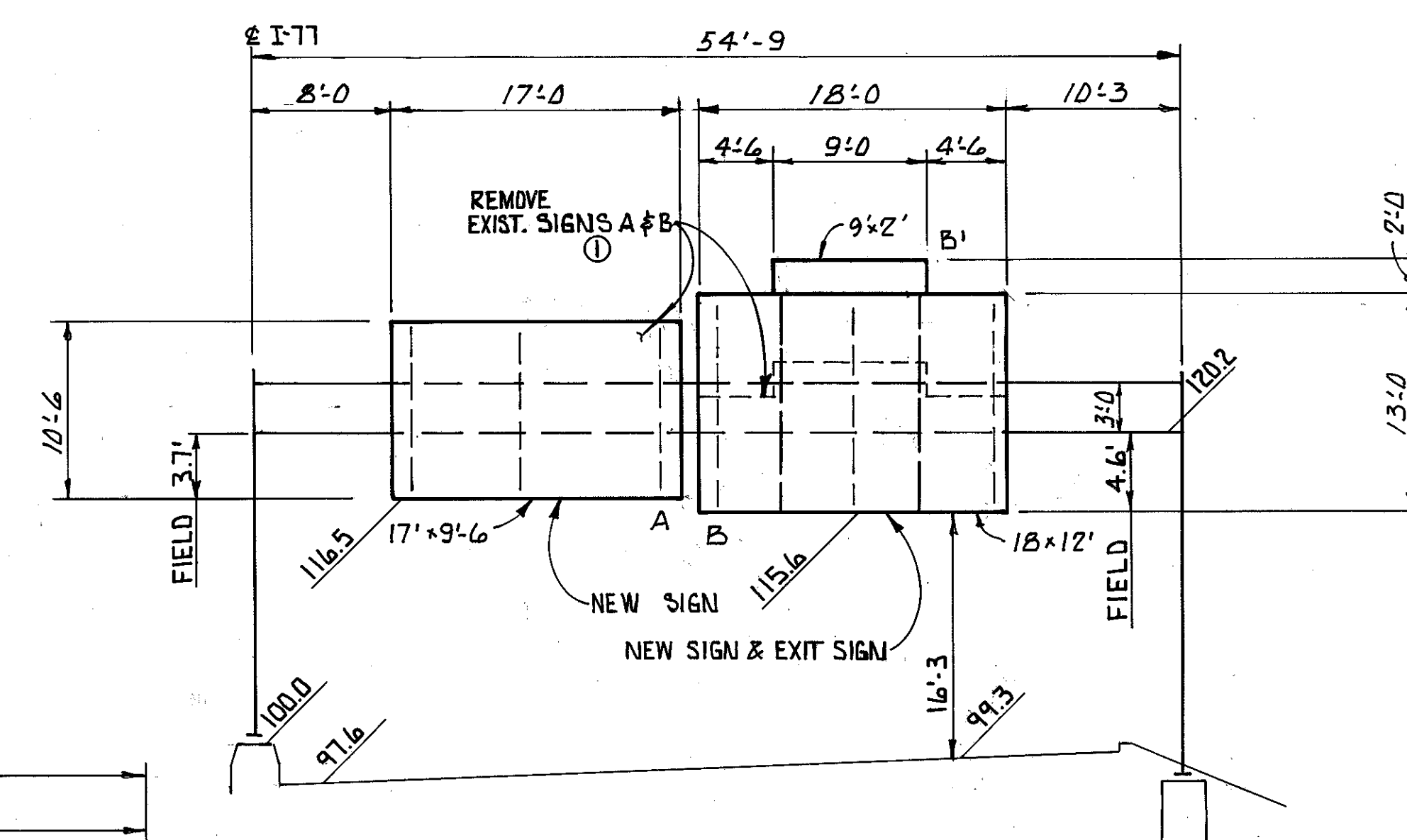
CUYAHOGA COUNTY
CUY-4-90-1.49



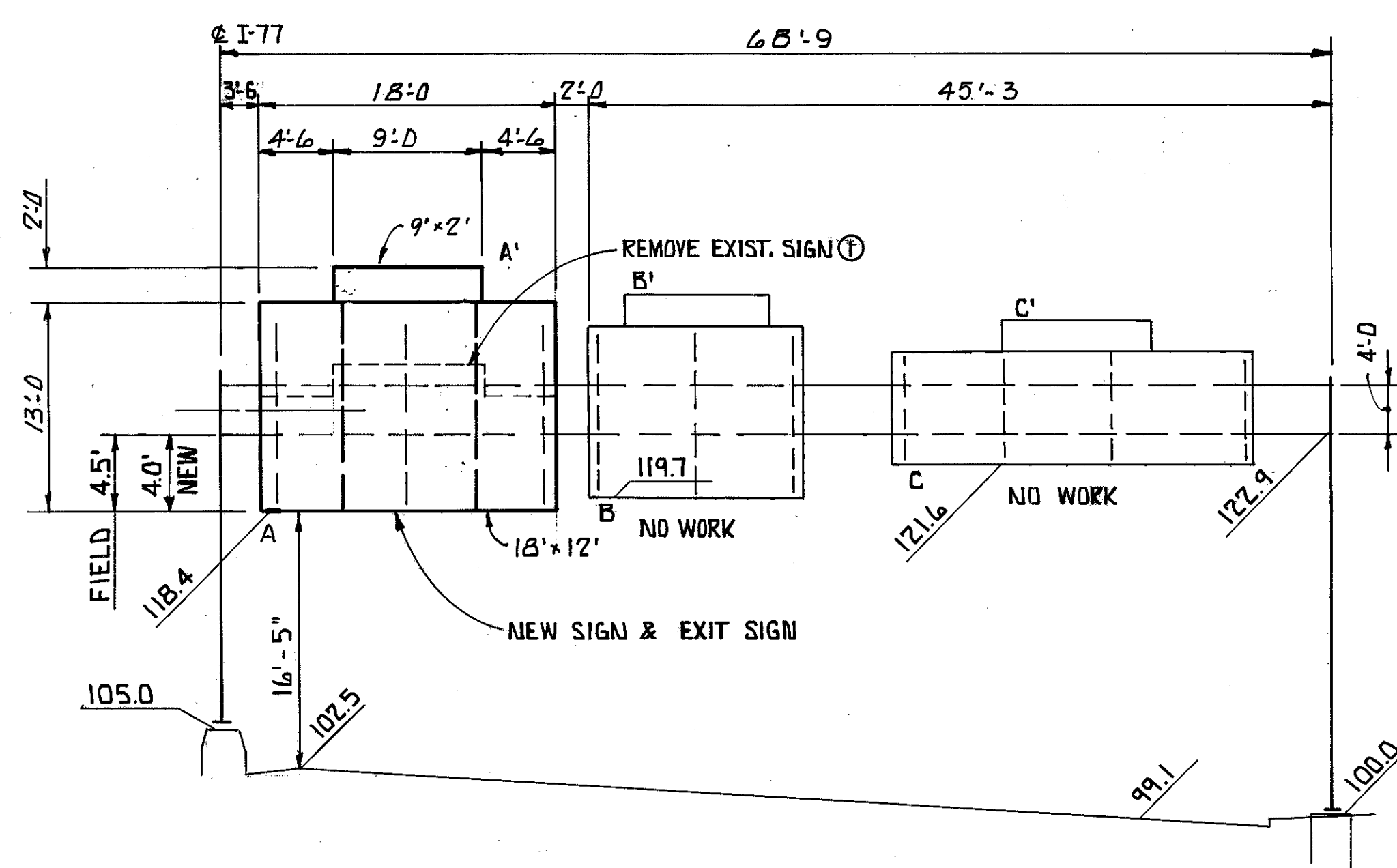
122
STA. 130+80 N.B. I-77
PLAN SHT. 205



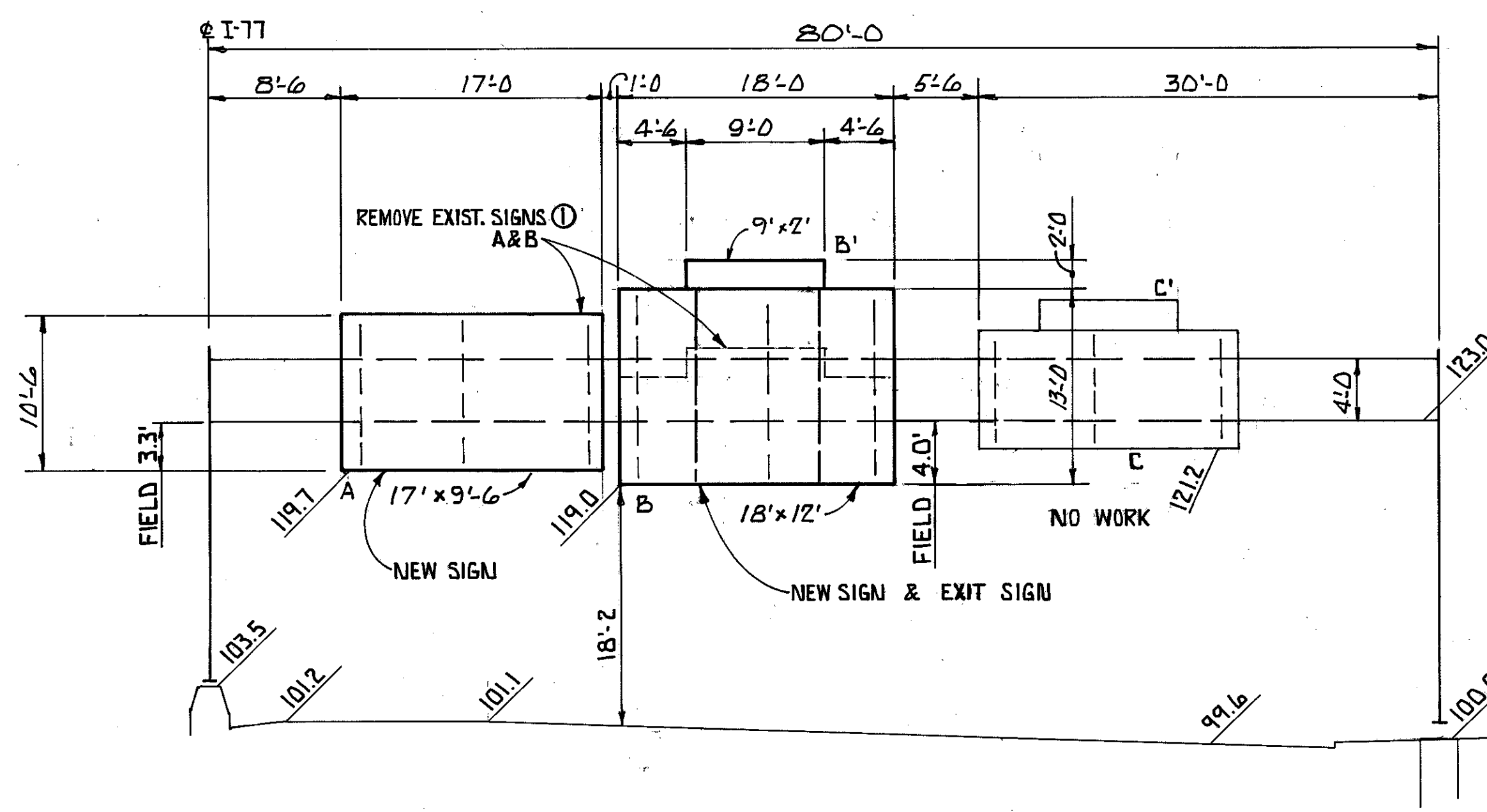
131
STA. 163+15 N.B. I-77
PLAN SHT. 205



133
STA. 177+10 N.B. I-77
PLAN SHT. 205



134
STA. 190+25 N.B. I-77
PLAN SHT. 206



139
STA. 49+95 N.B. I-77
PLAN SHT. 206

① EXIST. SIGN - MERCURY VAPOR W/12" GLARE SHIELD

NOTES:
2. FOR OVERHEAD SIGN QUANTITIES SEE SHT. 193

| | | | |
|---|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

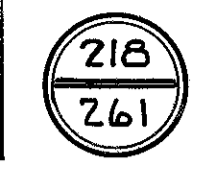
SIGN ELEVATIONS

EXIST. STRUCTURES I-77
SIGNS - 122, 131, 133, 134 & 139

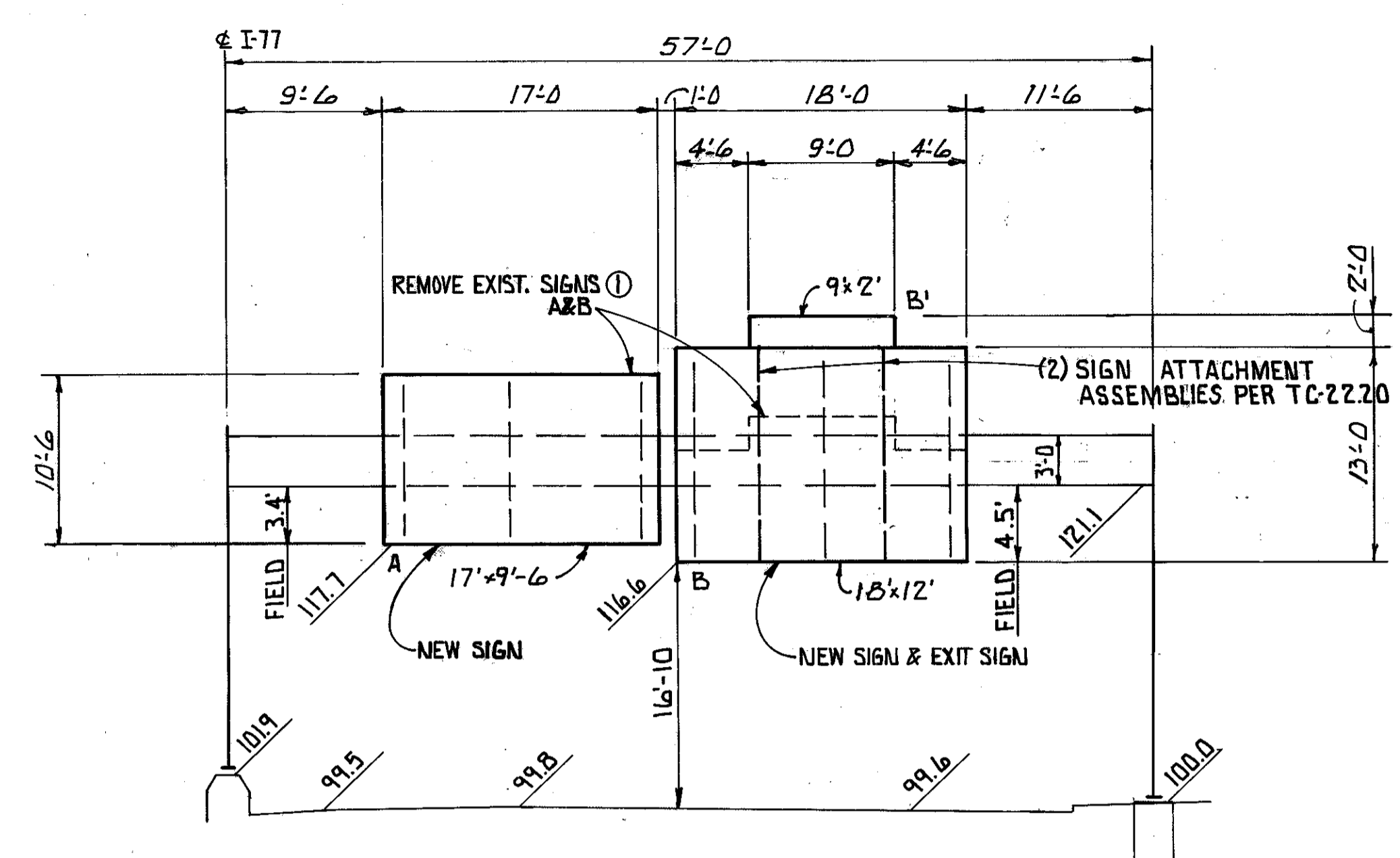
| | | | | | |
|----------|-------|--------|---------|----------|------|
| SCALE | DATE | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| LV | LV | JRH | CAP | RLH | 5/83 |

CONT. No. SHEET ACCT. No.

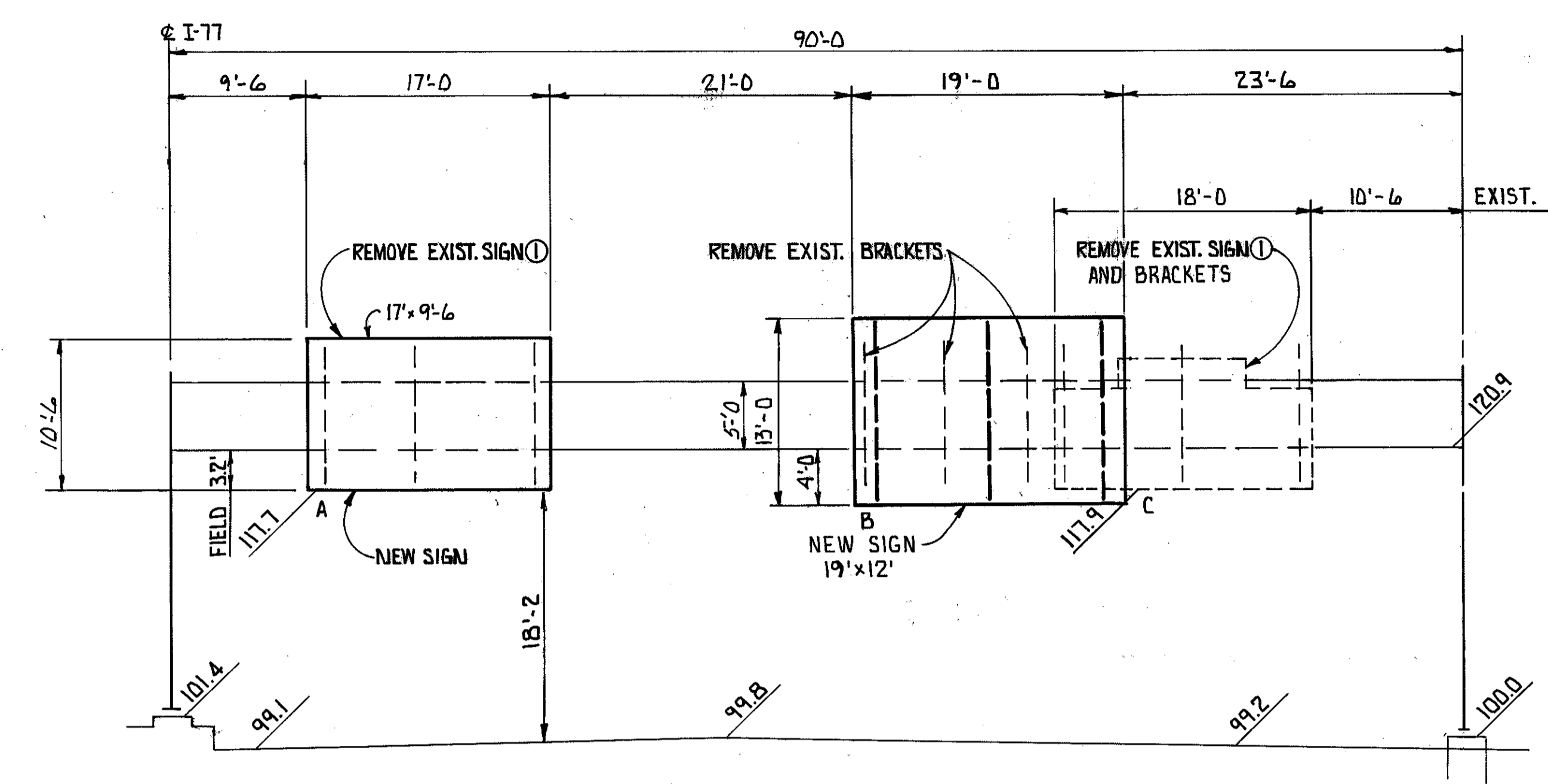
| | | | |
|-------------------|-------|---------|--|
| FED. RD. DIVISION | STATE | PROJECT | |
| 2 | OHIO | | |



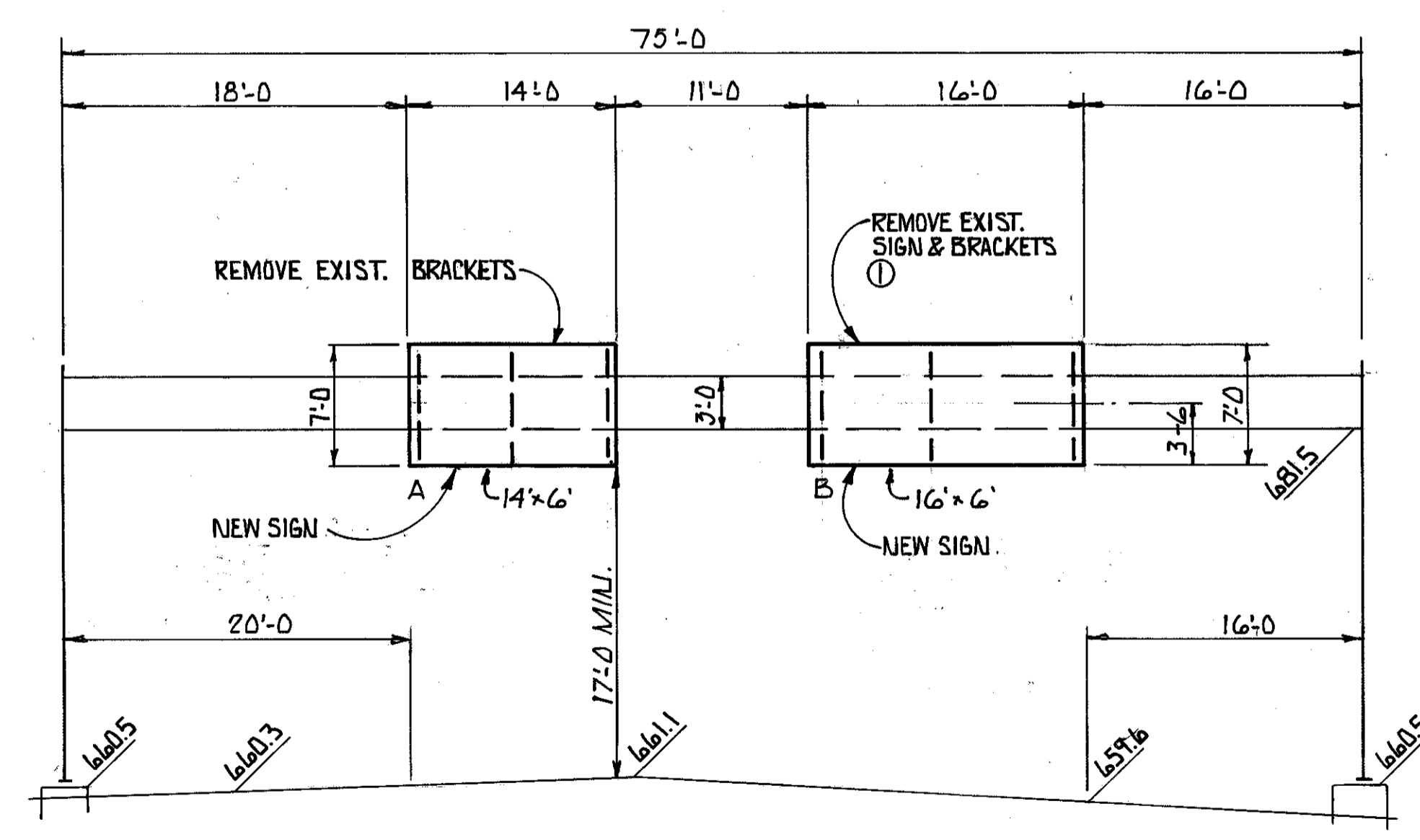
CUYAHOGA COUNTY
 CUY-490-1.49



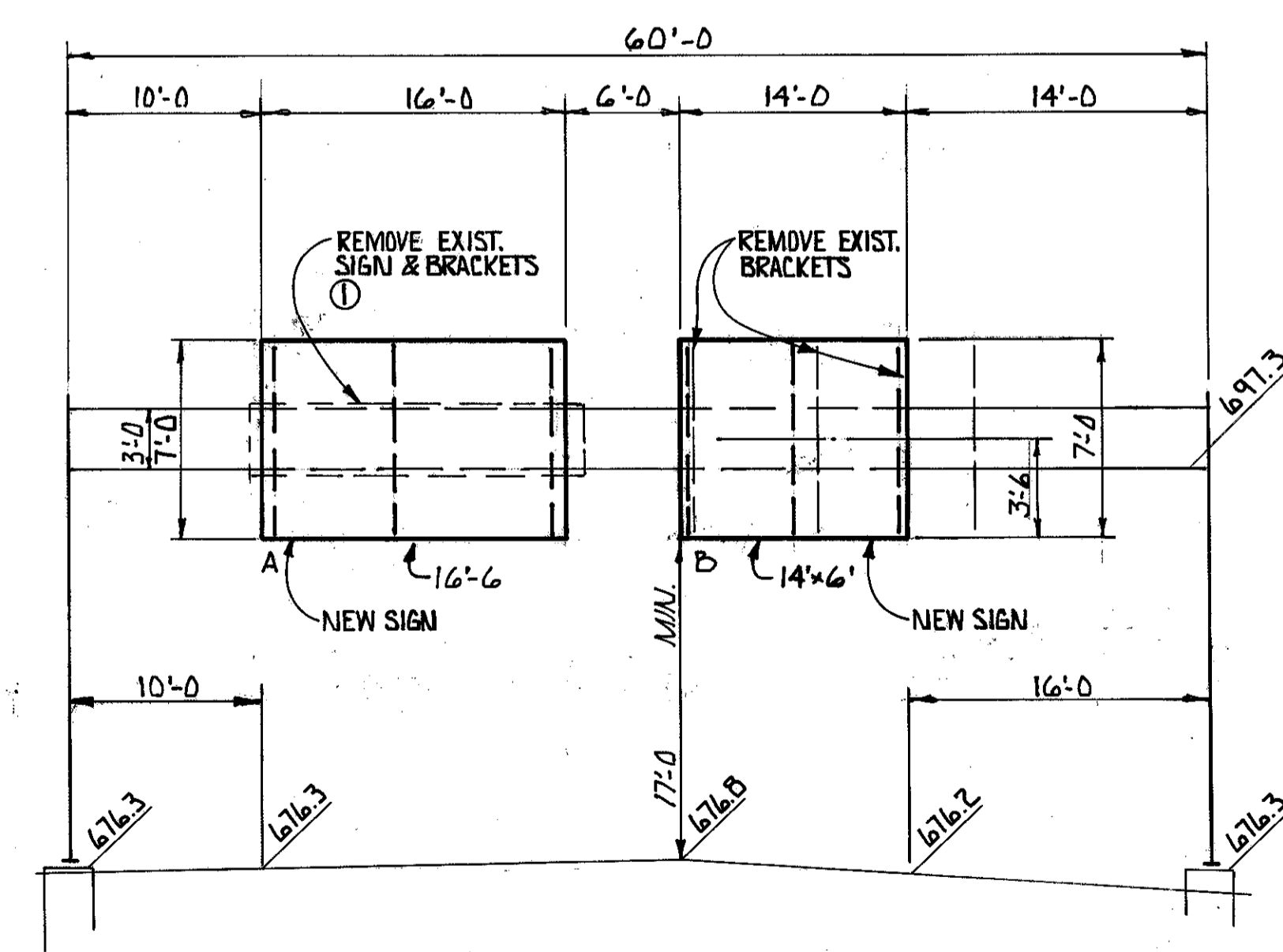
142
 STA. 58+20 N.B. I-77
 PLAN SHT. 206



143
 STA. 65+00 N.B. I-77
 PLAN SHT. 207



144
 STA. 10+37 RAMP S-E
 PLAN SHT. 207



146
 STA. 7+50 RAMP N-W
 PLAN SHT. 208

① EXIST. SIGN-MERCURY VAPOR W/12" GLARE SHIELD

NOTES:
 2. FOR OVERHEAD SIGN QUANTITIES SEE SHT. 193

| | | | |
|-----|------|----|--|
| NO. | DATE | BY | REVISED |
| | | | TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 |

SIGN ELEVATIONS

EXIST. STRUCTURES I-77
 SIGNS - 142, 143, 144, 146

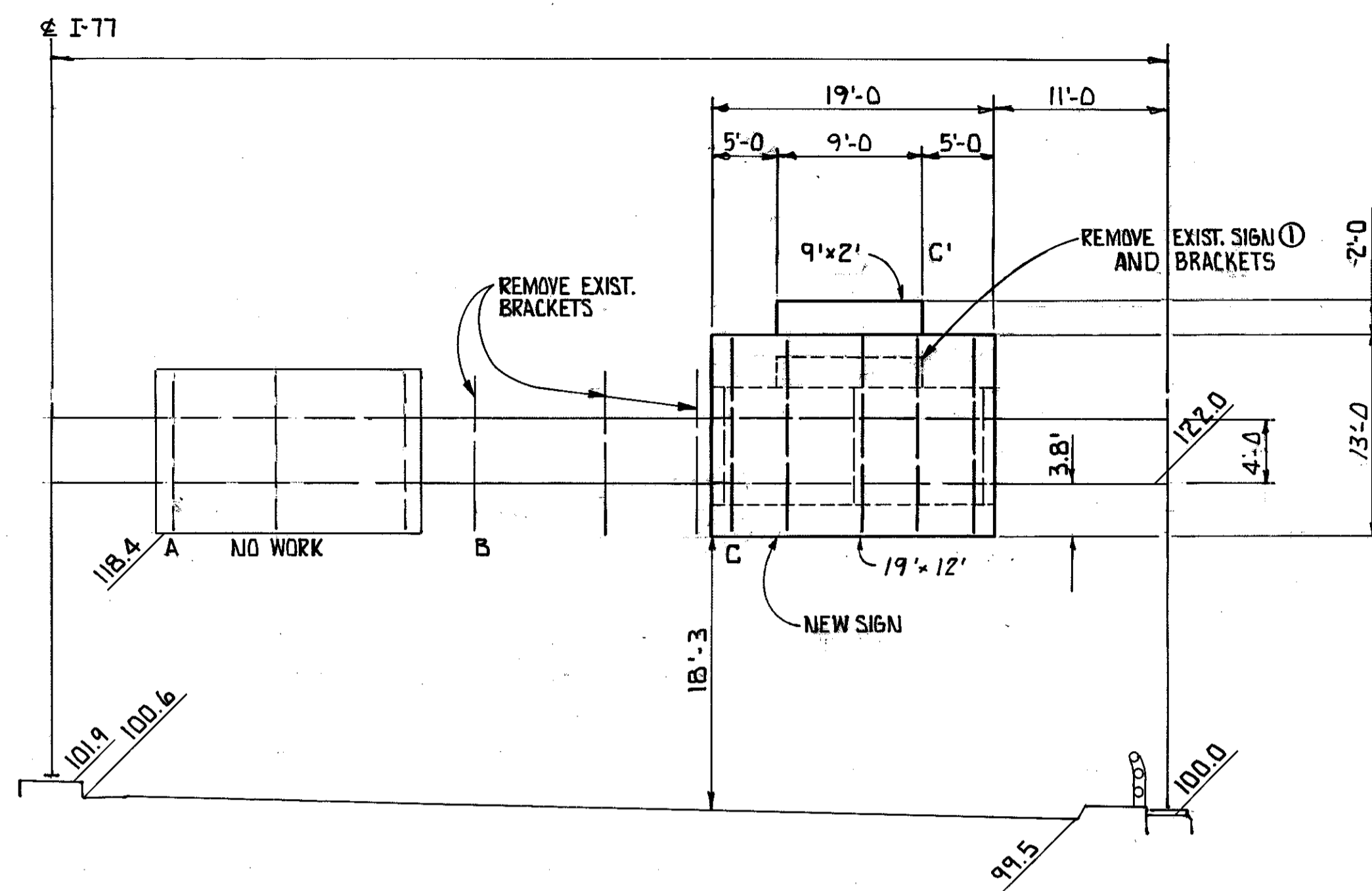
| | | | | | |
|----------|-------|--------|---------|----------|------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| L.V. | L.V. | JRH | CAP | RLH | 5/83 |

CONT. No. SHEET ACCT. No.

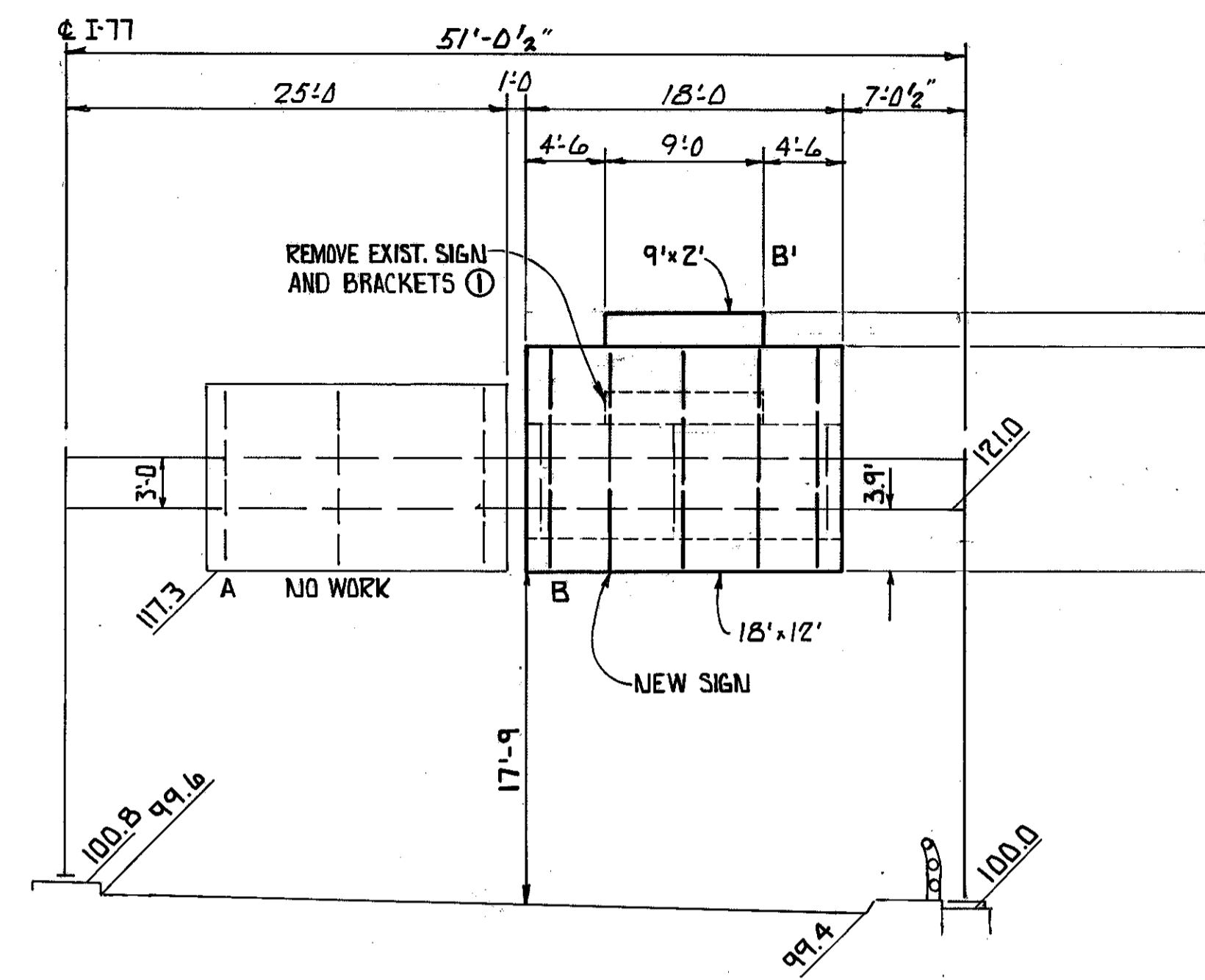
| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 2 | OHIO | |

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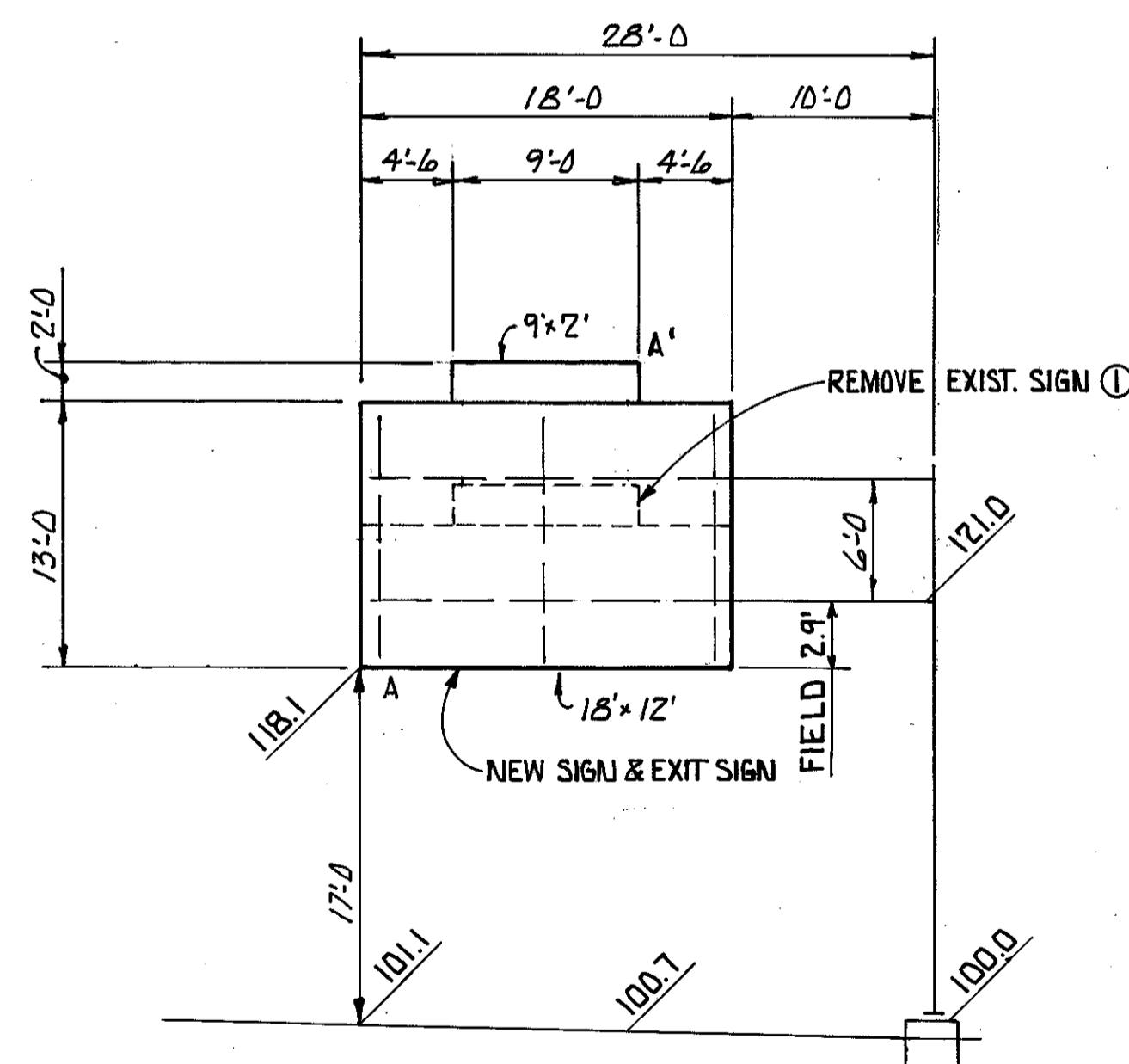
CUYAHOGA COUNTY
CUY-490-1.49



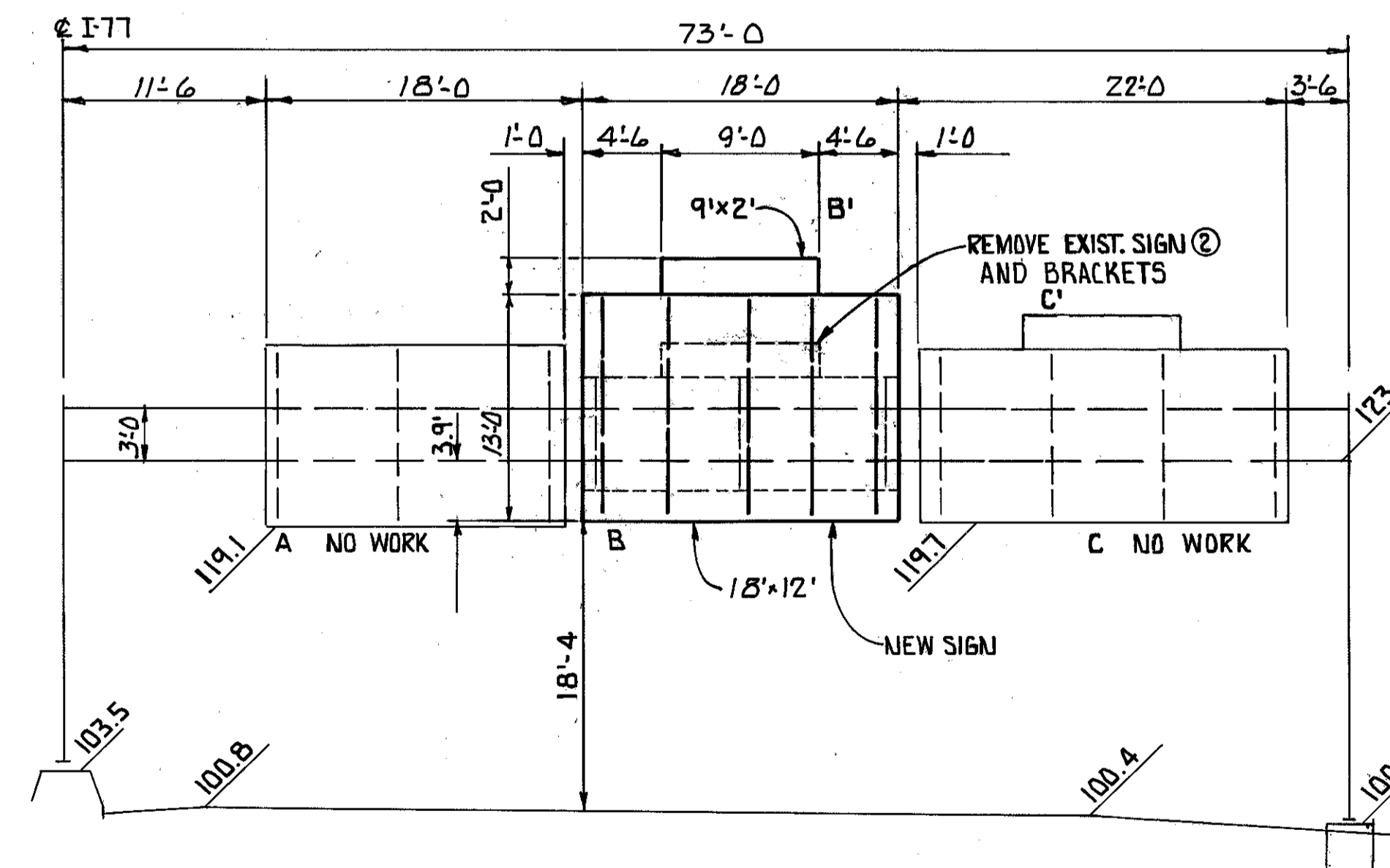
147
STA. 89+86.5 S.B. I-77
PLAN SHT. 208



149
STA. 101+03 S.B. I-77
PLAN SHT. 208



153
STA. 118+55 S.B. I-77
PLAN SHT. 209



156
STA. 32+75 S.B. I-77
PLAN SHT. 209

- ① EXIST. SIGN-MERCURY VAPOR W/12" GLARE SHIELD.
- ② EXIST. SIGN-MERCURY VAPOR W/6" GLARE SHIELD.

NOTES:
3. FOR OVERHEAD SIGN QUANTITIES SEE SHT. 193

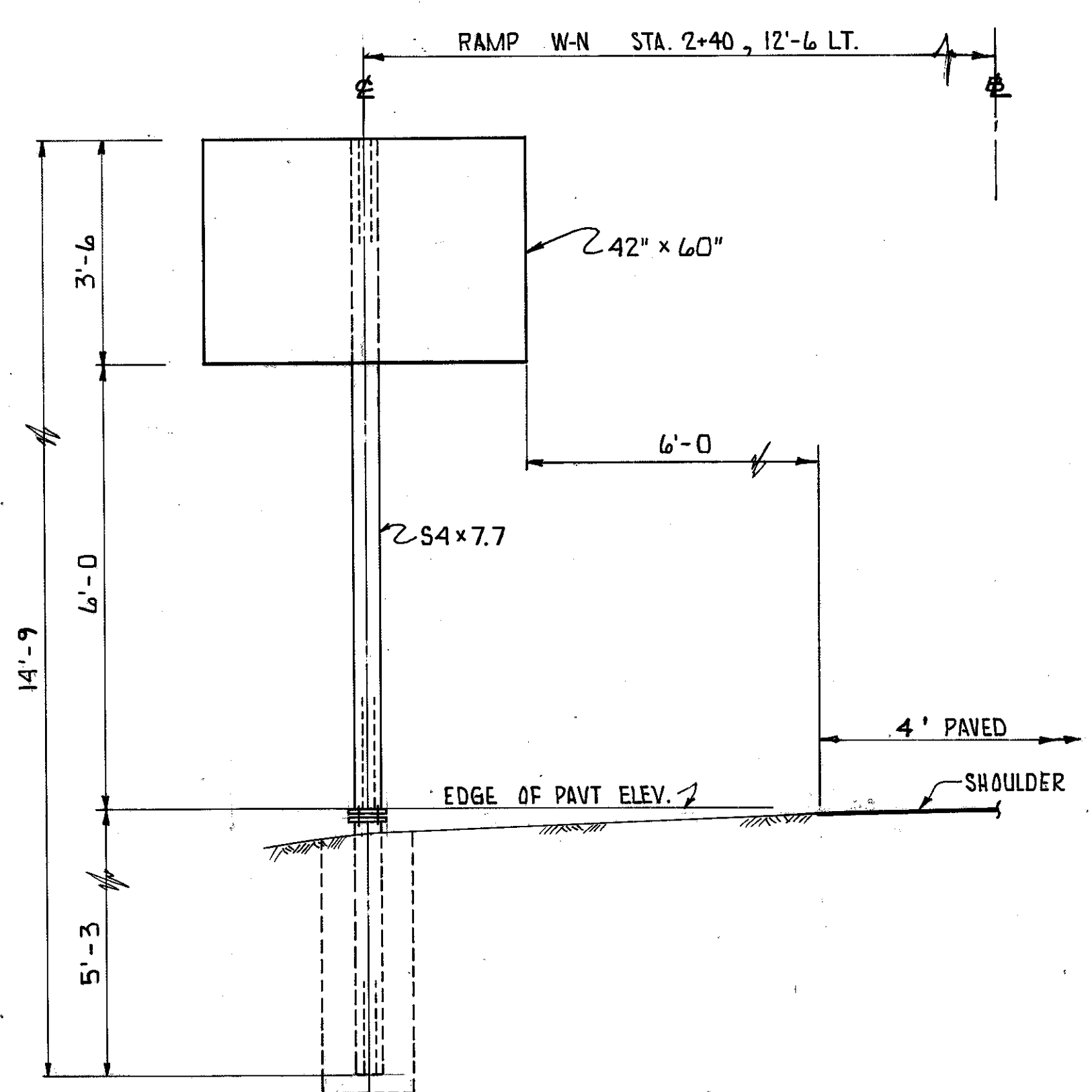
CONT. No. SHEET ACCT. No.

| | | | |
|--|-------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| SIGN ELEVATIONS | | | |
| EXIST. STRUCTURES I-77 SIGNS- 147, 149, 153 & 156 | | | |
| SCALE | DATE | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| L.V. | L.V. | JRH | CAP |
| | | RLH | 5/83 |

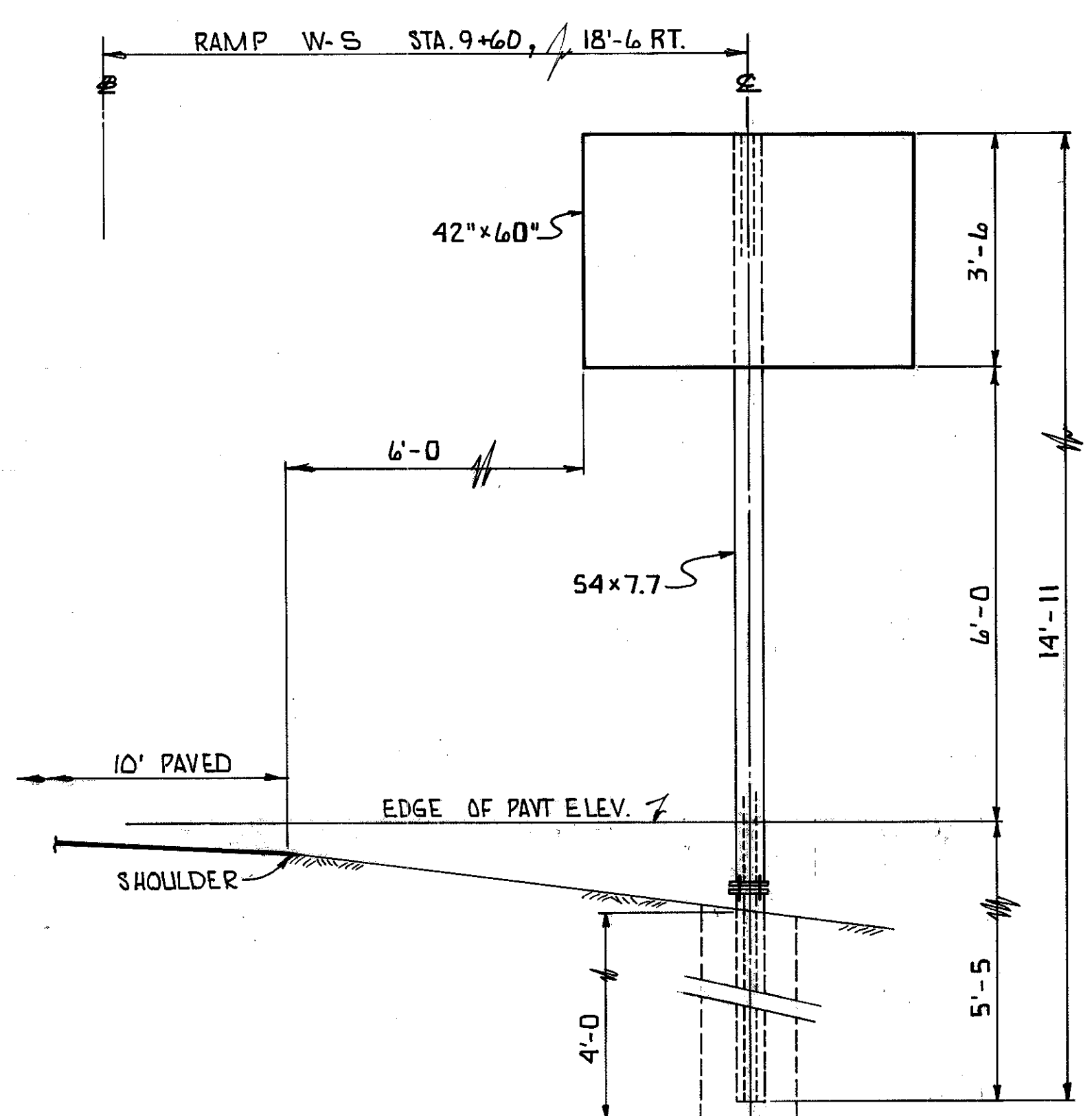
| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 2 | OHIO | |

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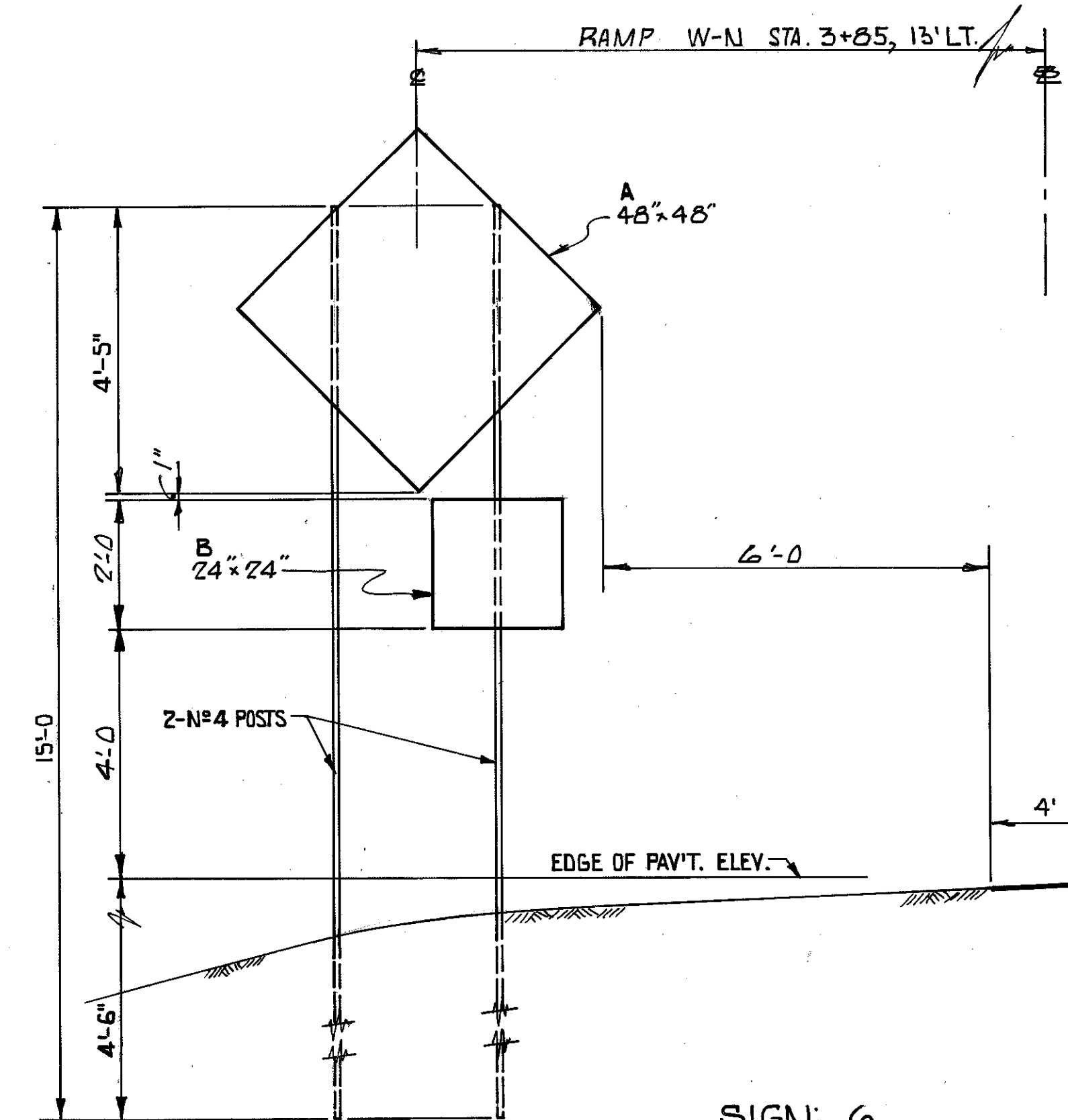
CUYAHOGA COUNTY
CUY-490-1.49



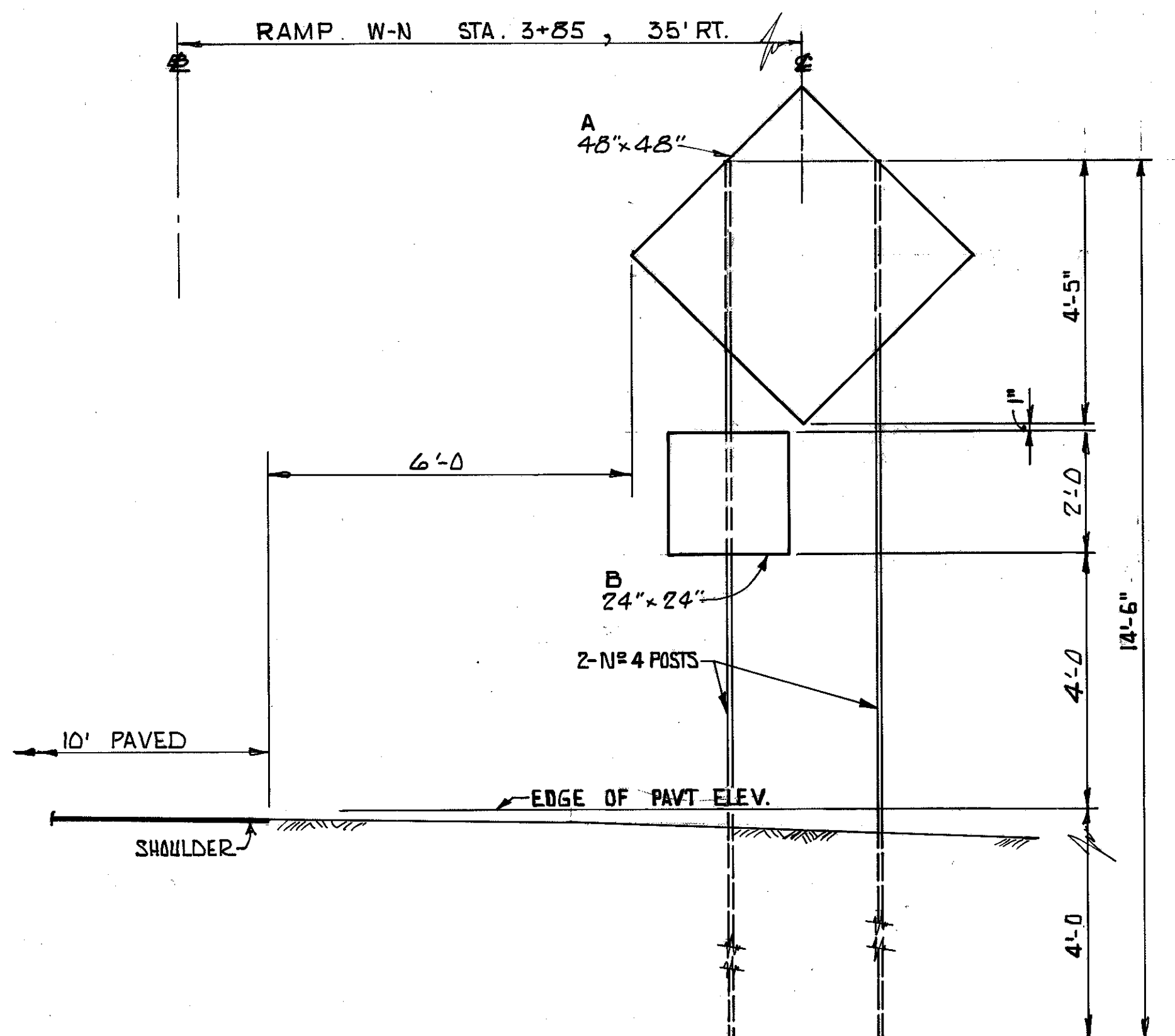
SIGN: 4
PLAN SHT. 198



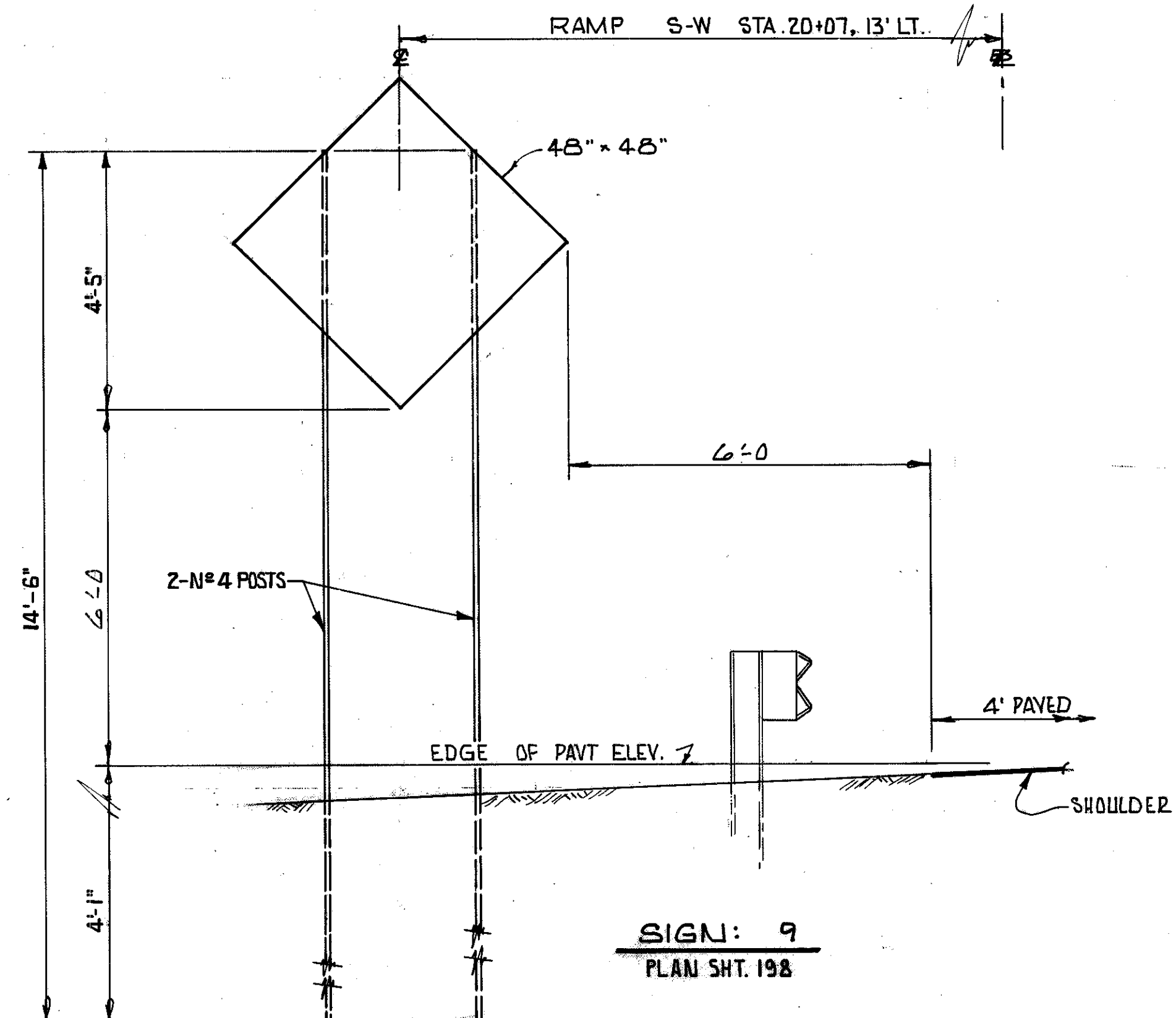
SIGN: 5
PLAN SHT. 198



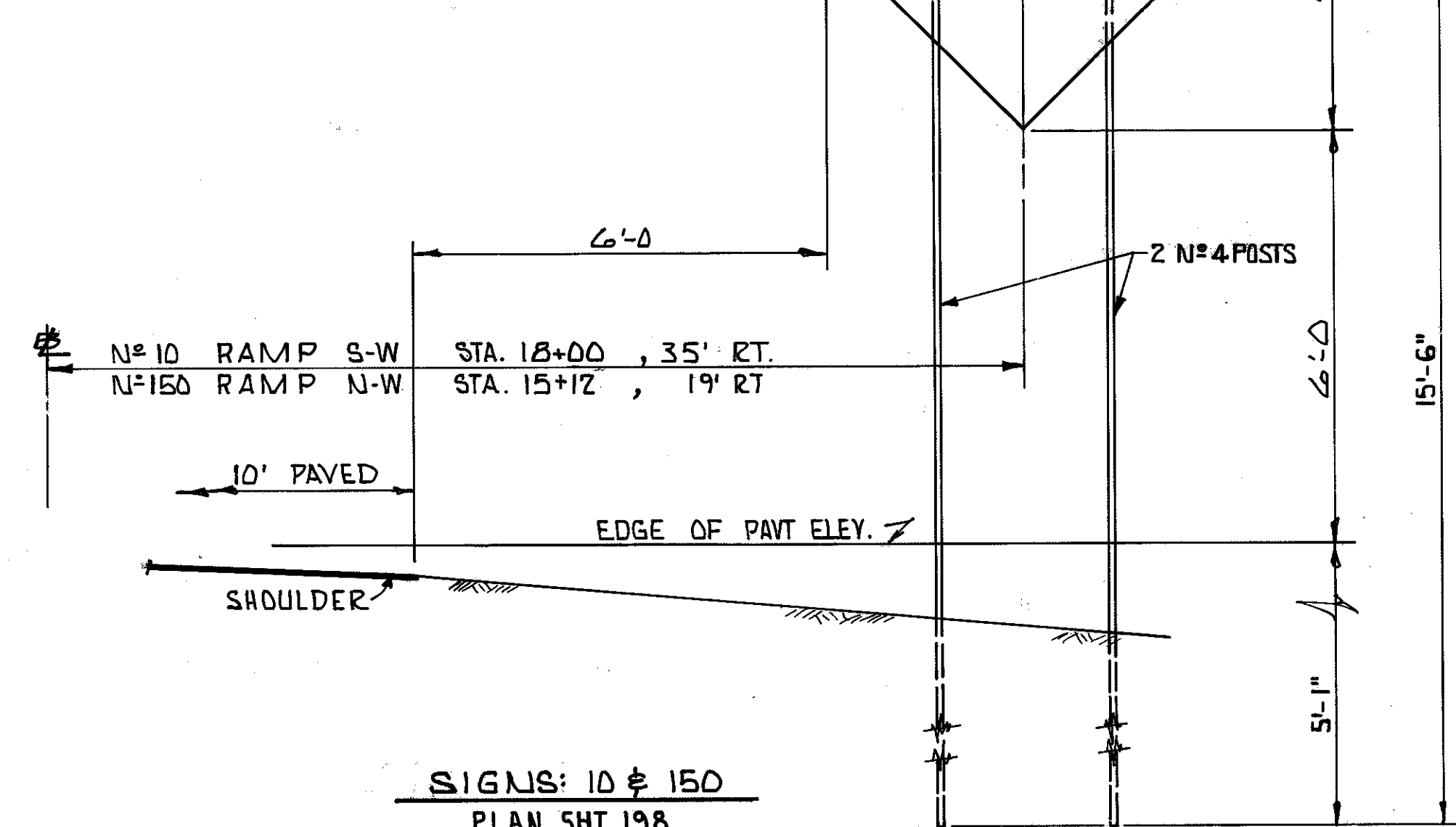
SIGN: 6
PLAN SHT. 198



SIGN: 7
PLAN SHT. 198



SIGN: 9
PLAN SHT. 198



SIGN: 10 & 150
PLAN SHT. 198

FOR QUANTITIES SEE SHT. 189

| | | | |
|-----|------|----|---------|
| NO. | DATE | BY | REVISED |
| | | | |

TRYGVE HOFF & ASSOCIATES
CONSULTING ENGINEERS
1922 EAST 107TH STREET CLEVELAND, OHIO 44106

SIGN ELEVATIONS
SIGN: 4, 5, 6, 7, 9, 10 & 150

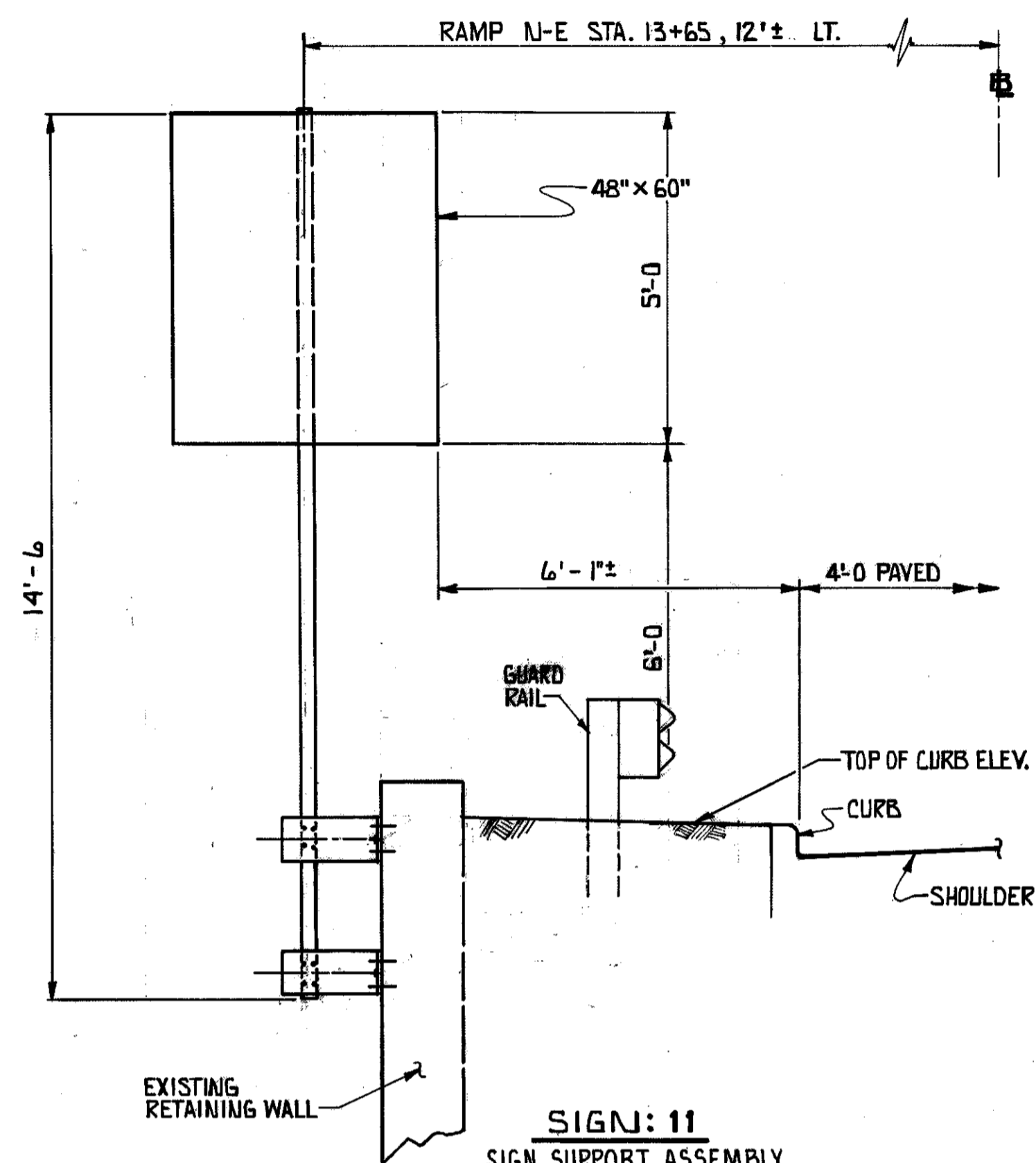
| | |
|----------|---------|
| SCALE | DATE |
| DESIGNED | DRAWN |
| TRACED | CHECKED |
| LV | CAP |
| REVIEWED | DATE |
| RLH | 5/83 |

SHEET ACCT. No. CONT. No.

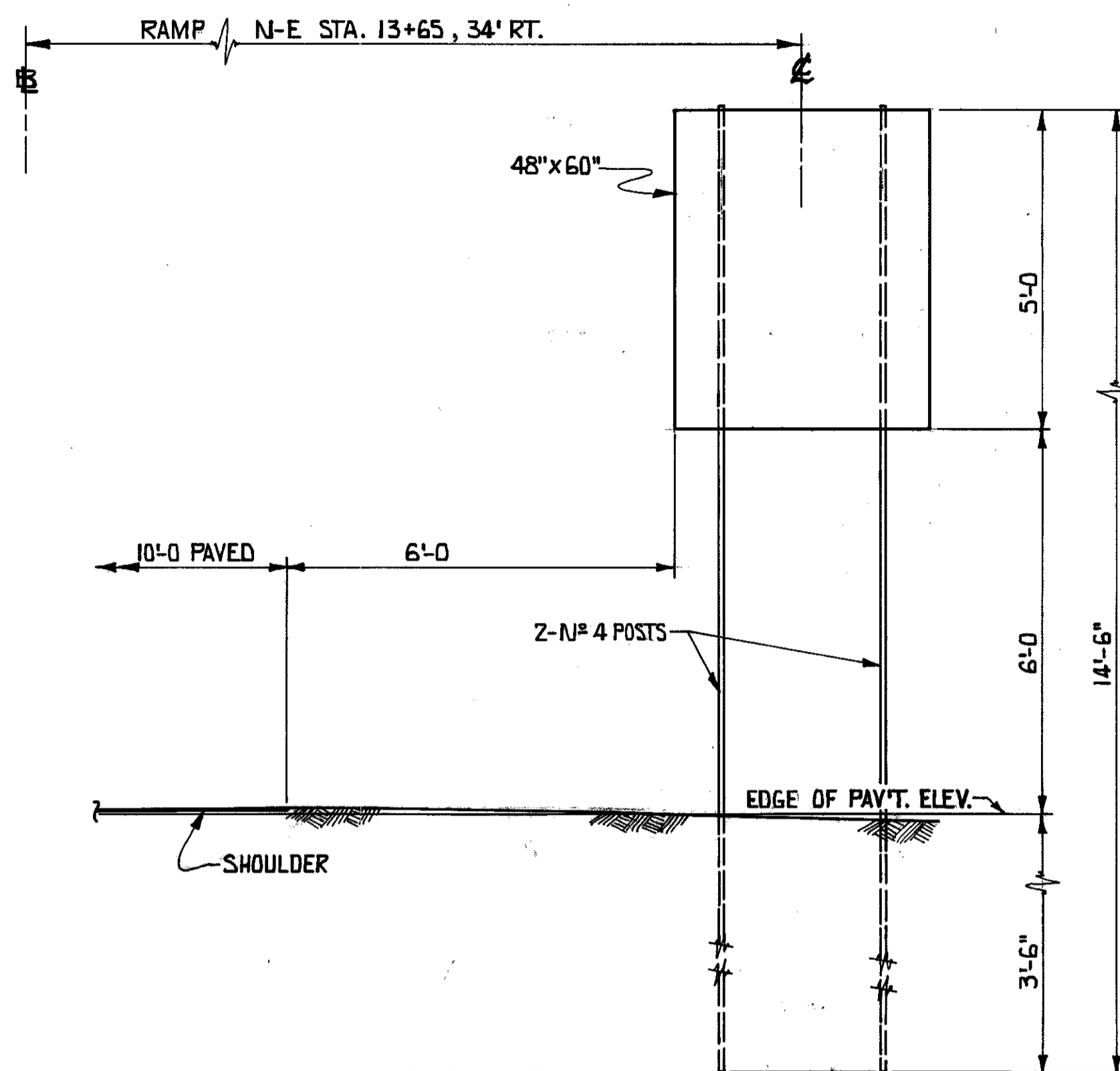
| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 2 | OHIO | |

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Z61

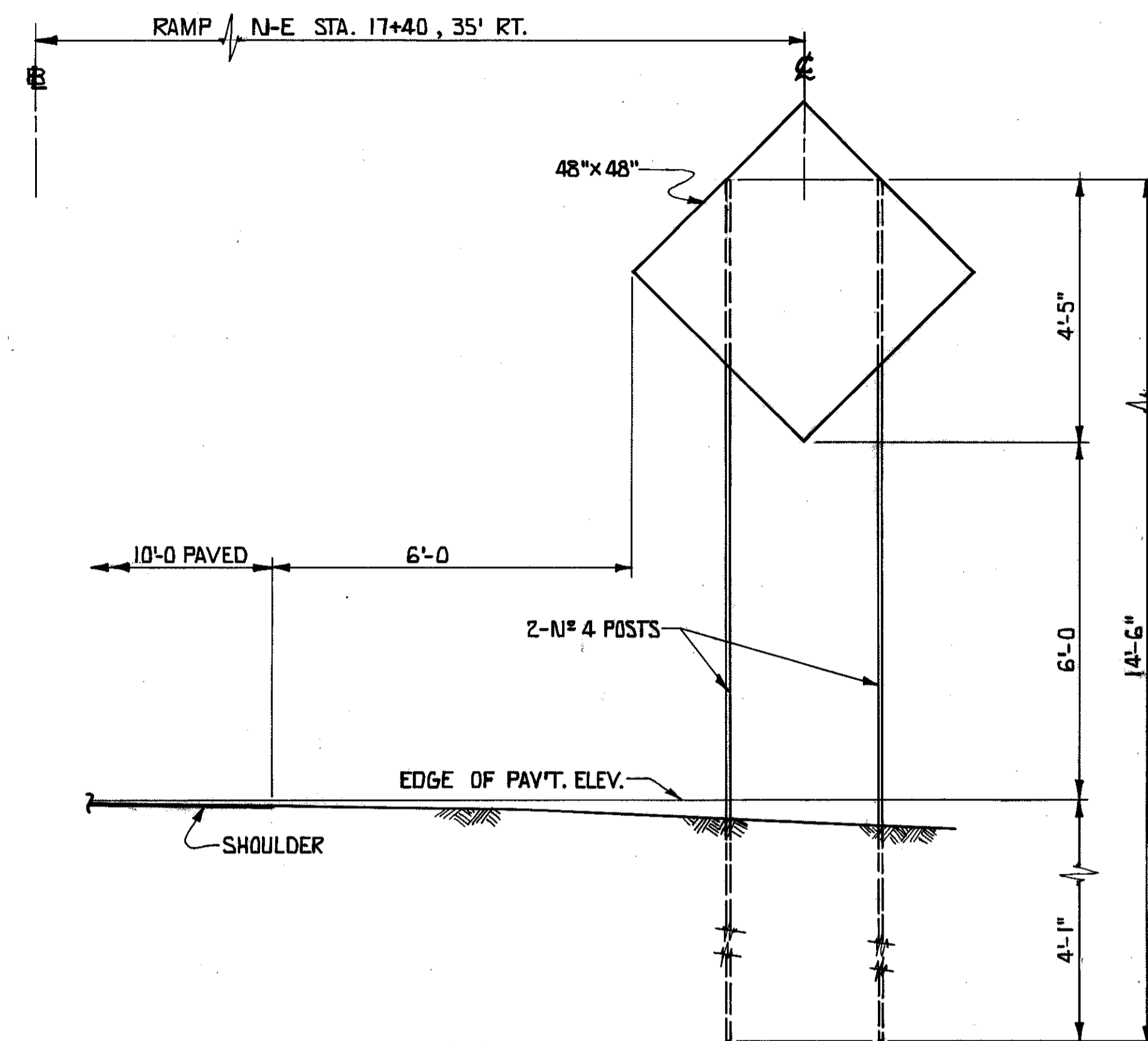
CUYAHOGA COUNTY
CUY-490-1.49



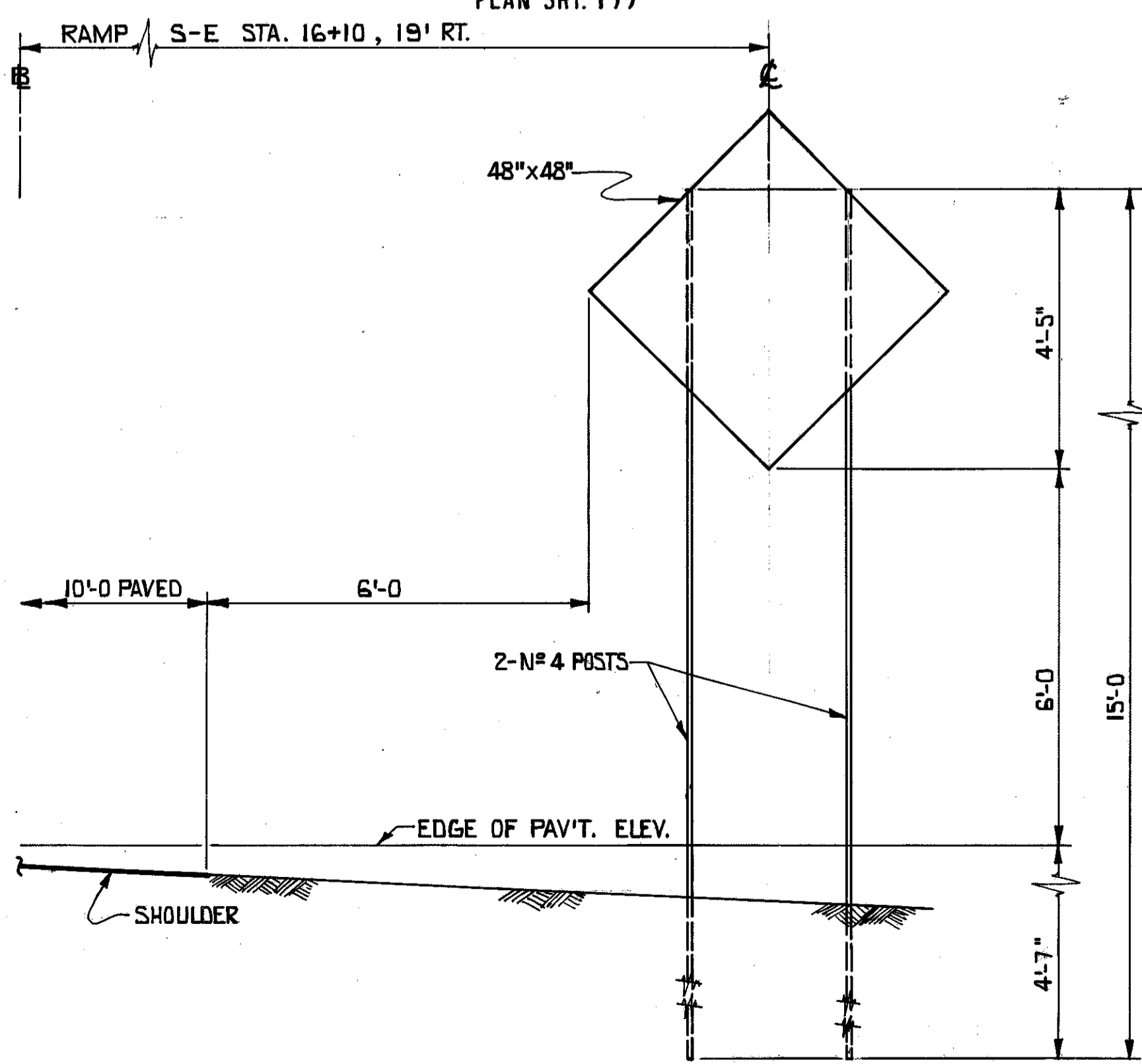
SIGN: 11
SIGN SUPPORT ASSEMBLY
BRIDGE MOUNTED, TYPE 2
TC-41.40
PLAN SHT. 199



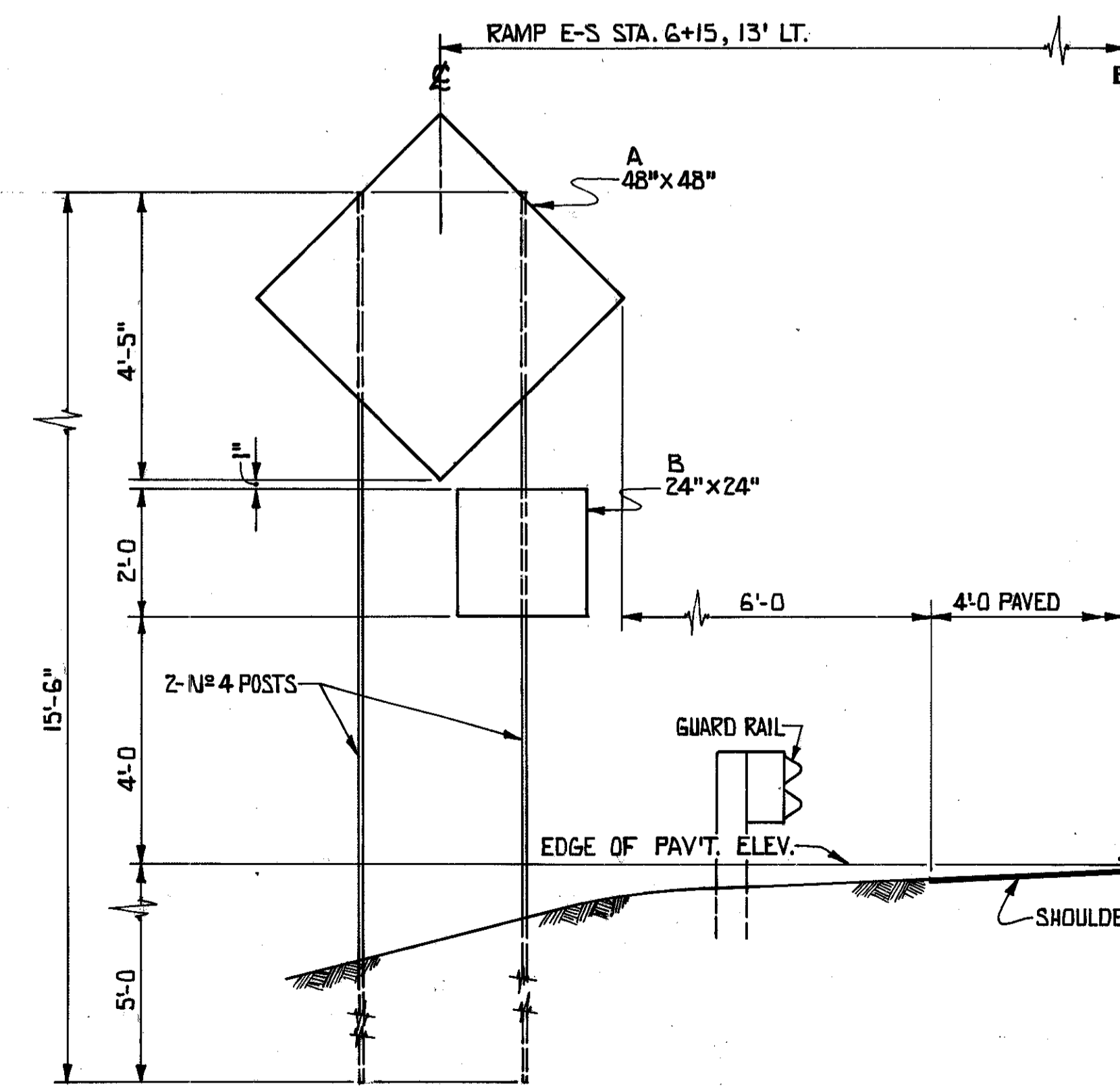
SIGN: 12
PLAN SHT. 199



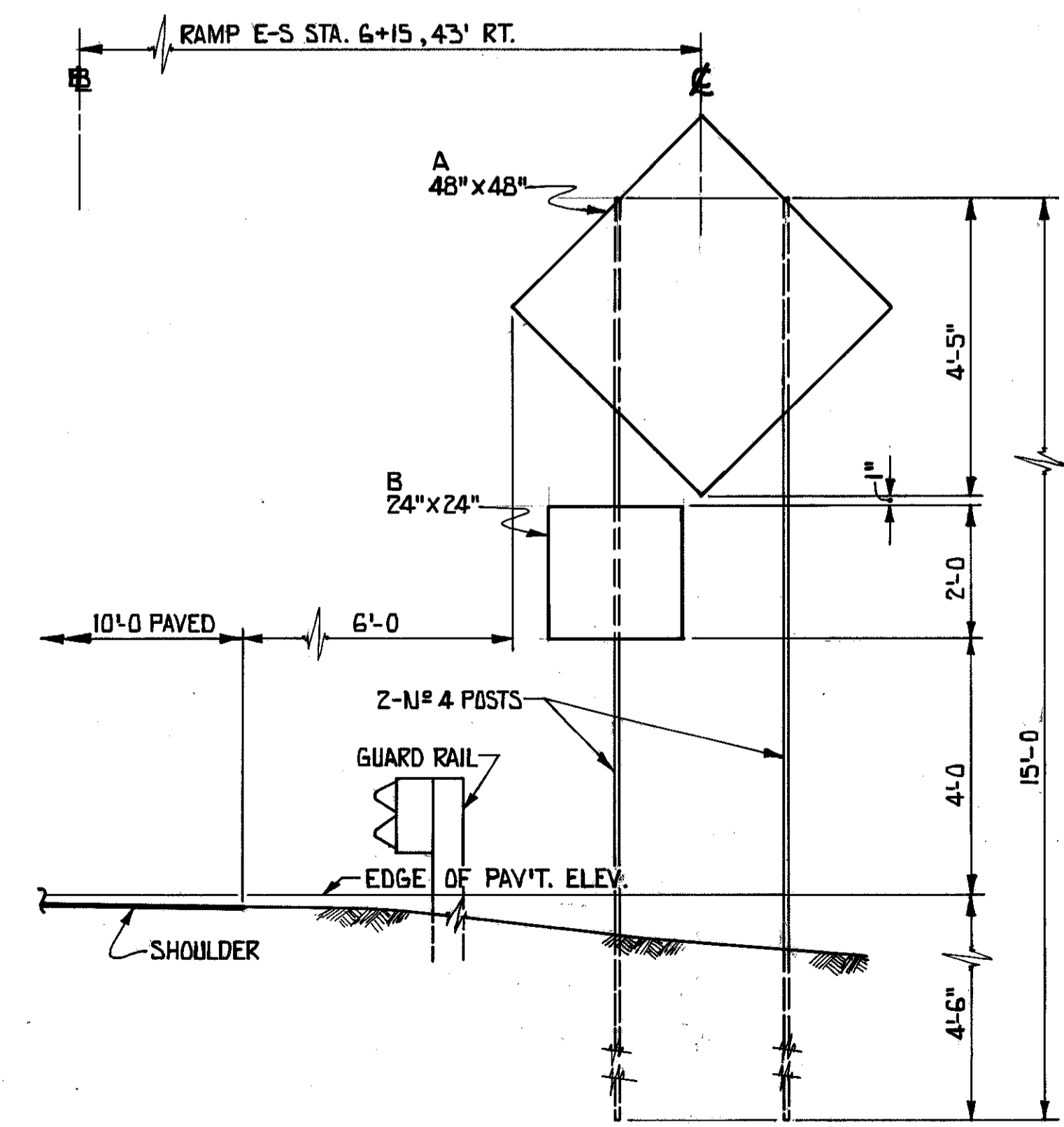
SIGN: 13
PLAN SHT. 199



SIGN: 14
PLAN SHT. 199



SIGN: 17
PLAN SHT. 199



SIGN: 18
PLAN SHT. 199

FOR QUANTITIES SEE SHT. 189

| | | | |
|-----|------|----|---|
| NO. | DATE | BY | REVISED |
| | | | TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 |

SIGN ELEVATIONS
SIGNS: 11, 12, 13, 14, 17 & 18

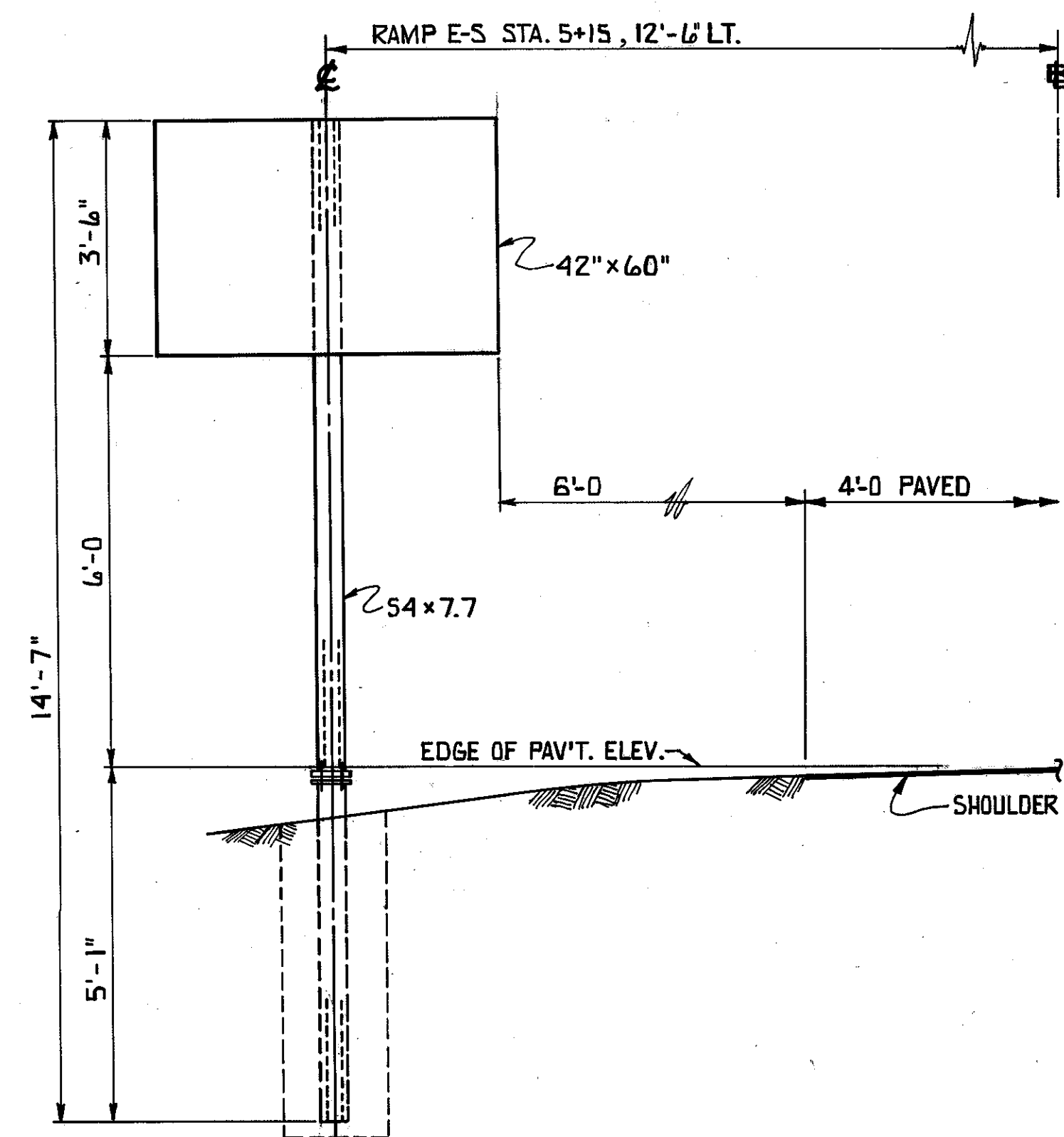
| | | | | | |
|----------|--------|--------|---------|----------|------|
| SCALE | DATE | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| | RLH II | | CAP | RLH | 5/83 |

CONT. No. SHEET ACCT. No.

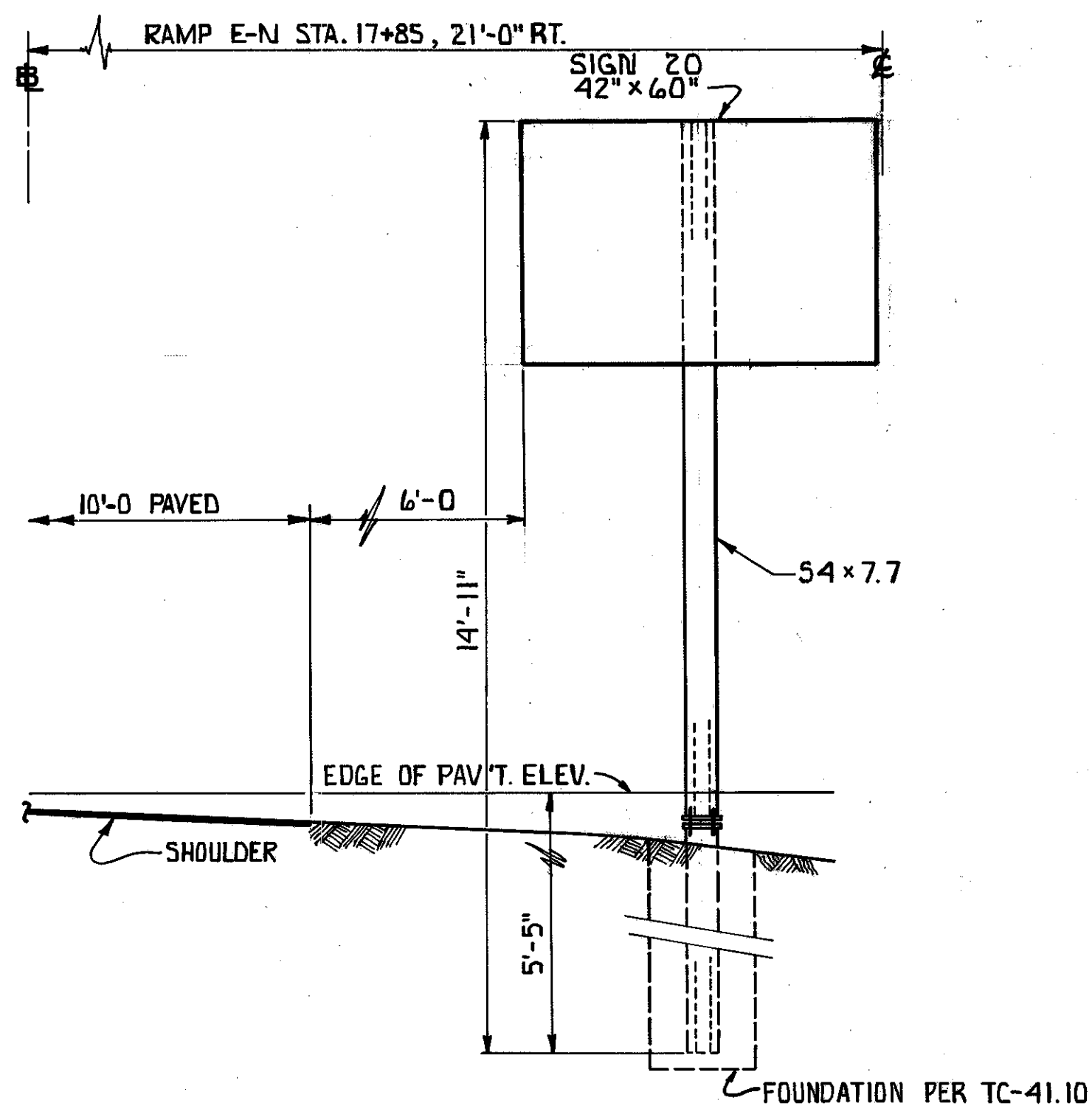
| | | |
|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 2 | OHIO | |

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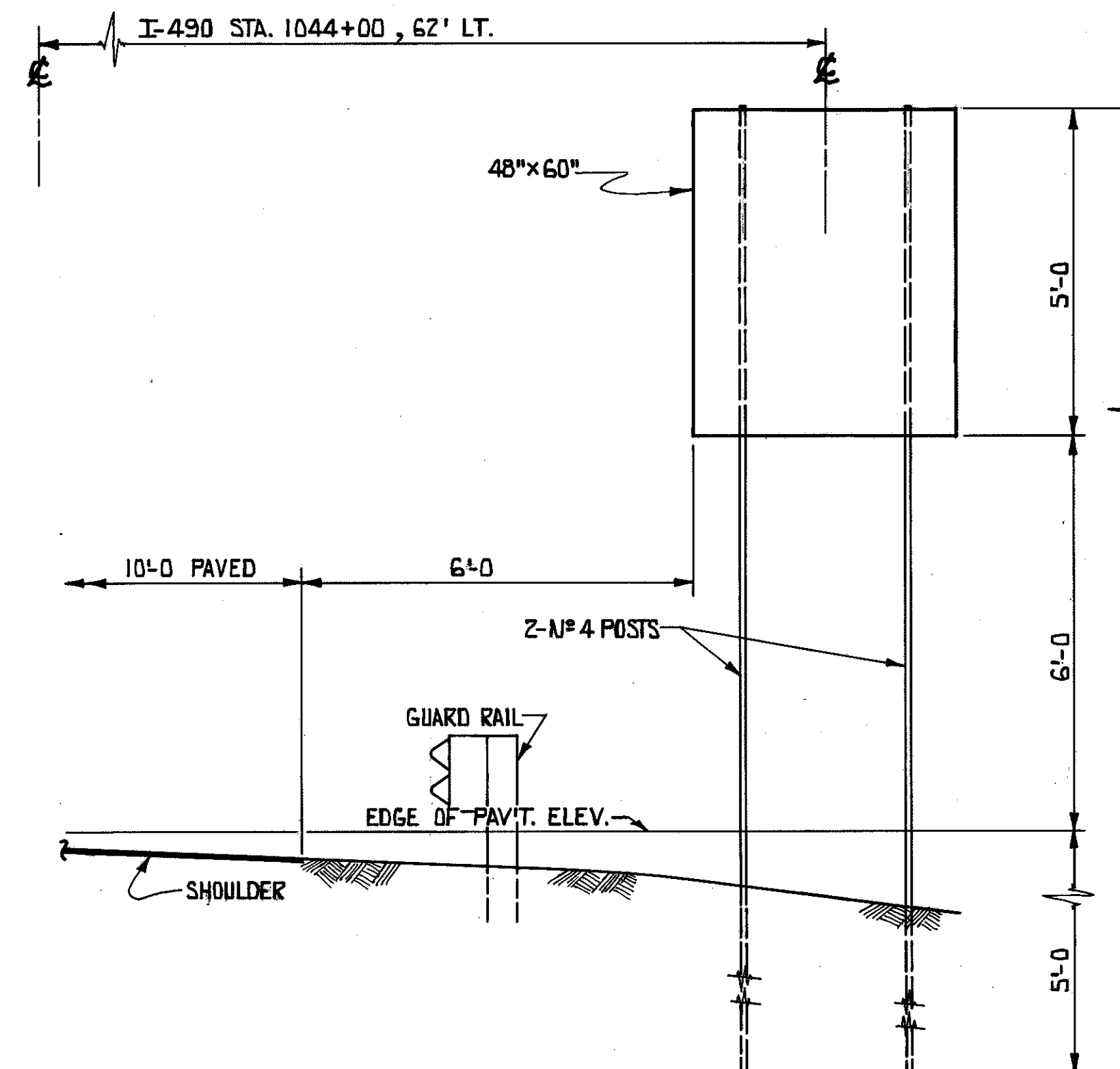
CUYAHOGA COUNTY
CUY-490 - 1.49



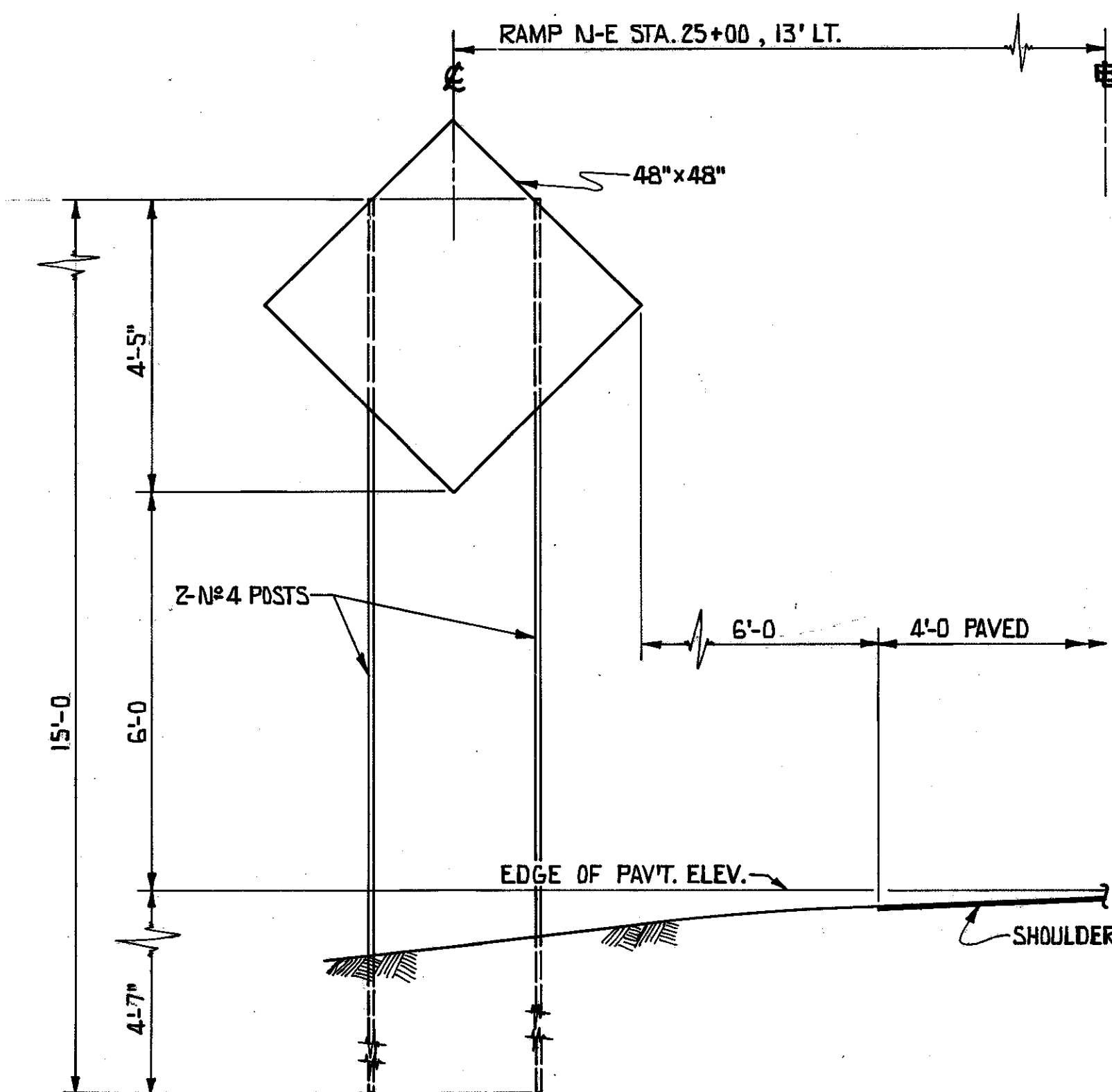
SIGN: 19
PLAN SHT. 199



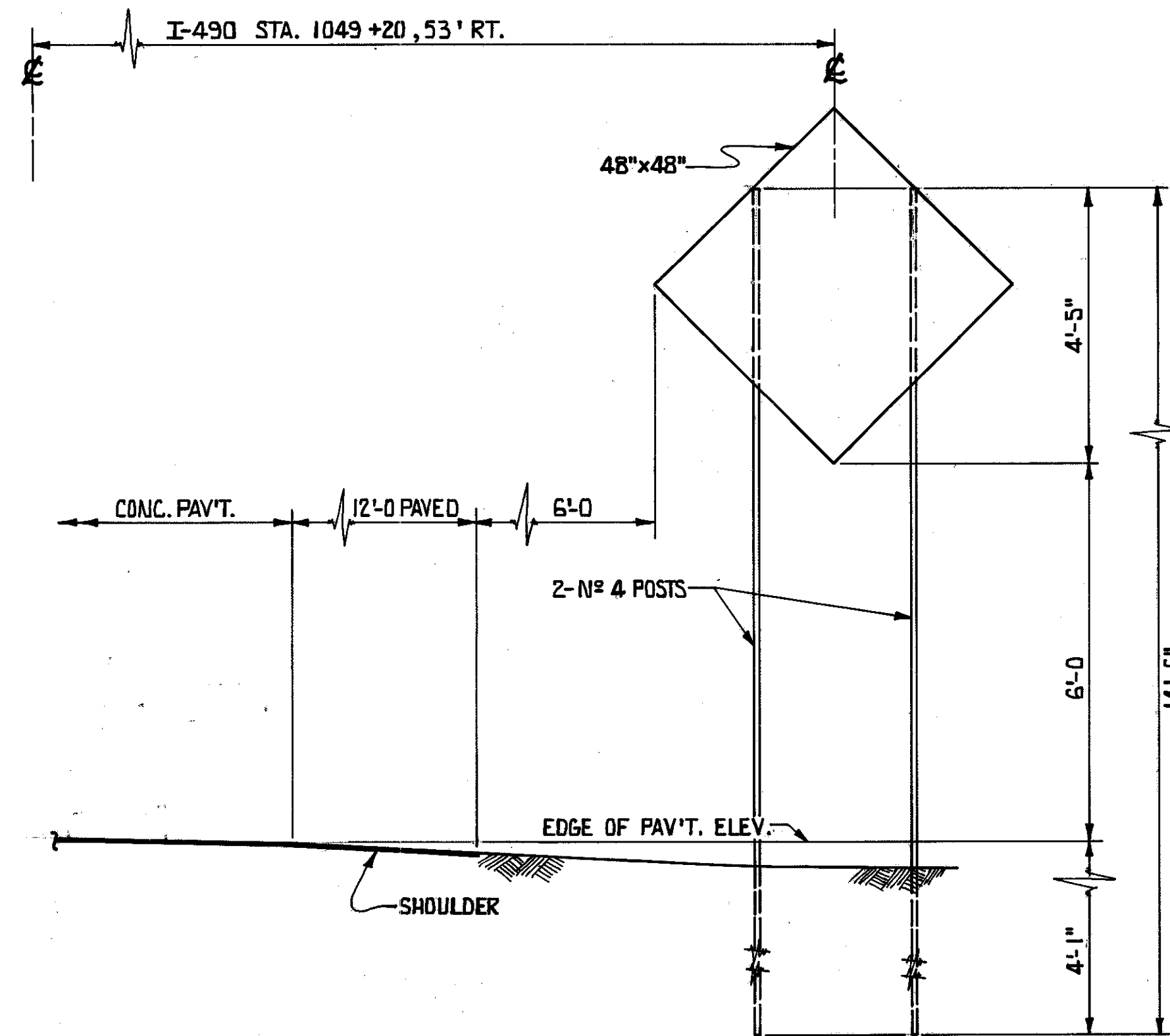
SIGN: 20
PLAN SHT. 199



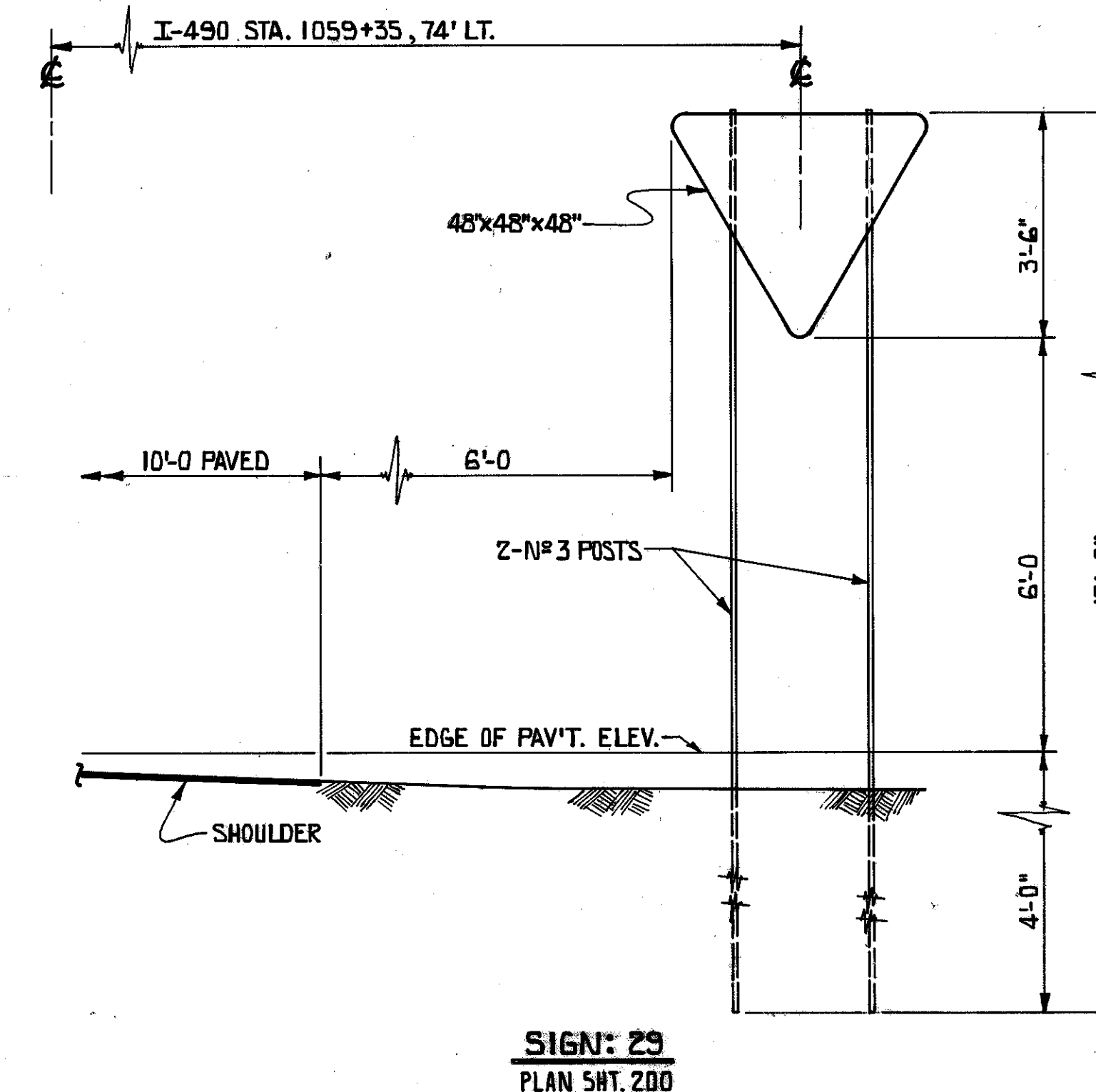
SIGN: 21
PLAN SHT. 199



SIGN: 22
PLAN SHT. 200



SIGN: 25
PLAN SHT. 200



SIGN: 29
PLAN SHT. 200

FOR QUANTITIES SEE SHT. 189

| | | | |
|-----|------|----|--|
| NO. | DATE | BY | REVISED |
| | | | TRYGVE HOFF & ASSOCIATES |
| | | | CONSULTING ENGINEERS |
| | | | 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 |

SIGN ELEVATIONS
SIGNS: 19, 20, 21, 22, 25, 29

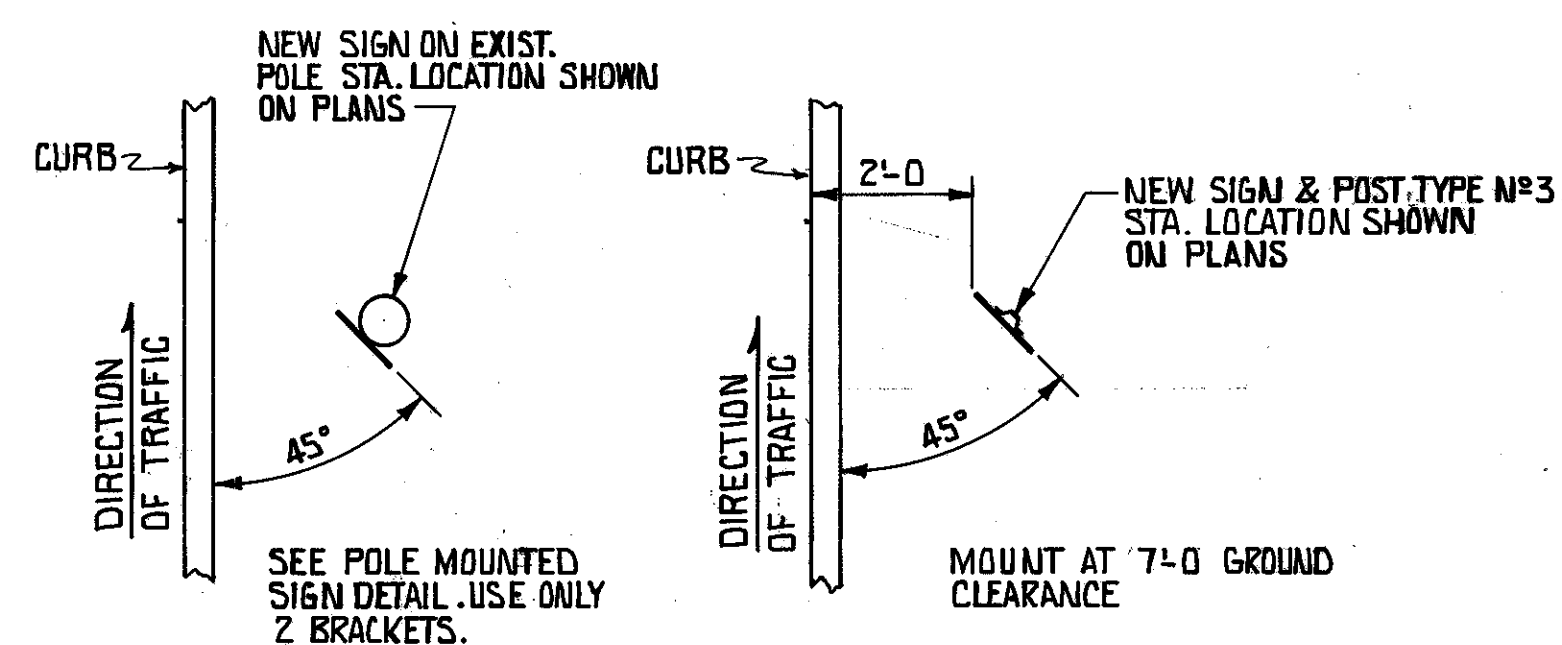
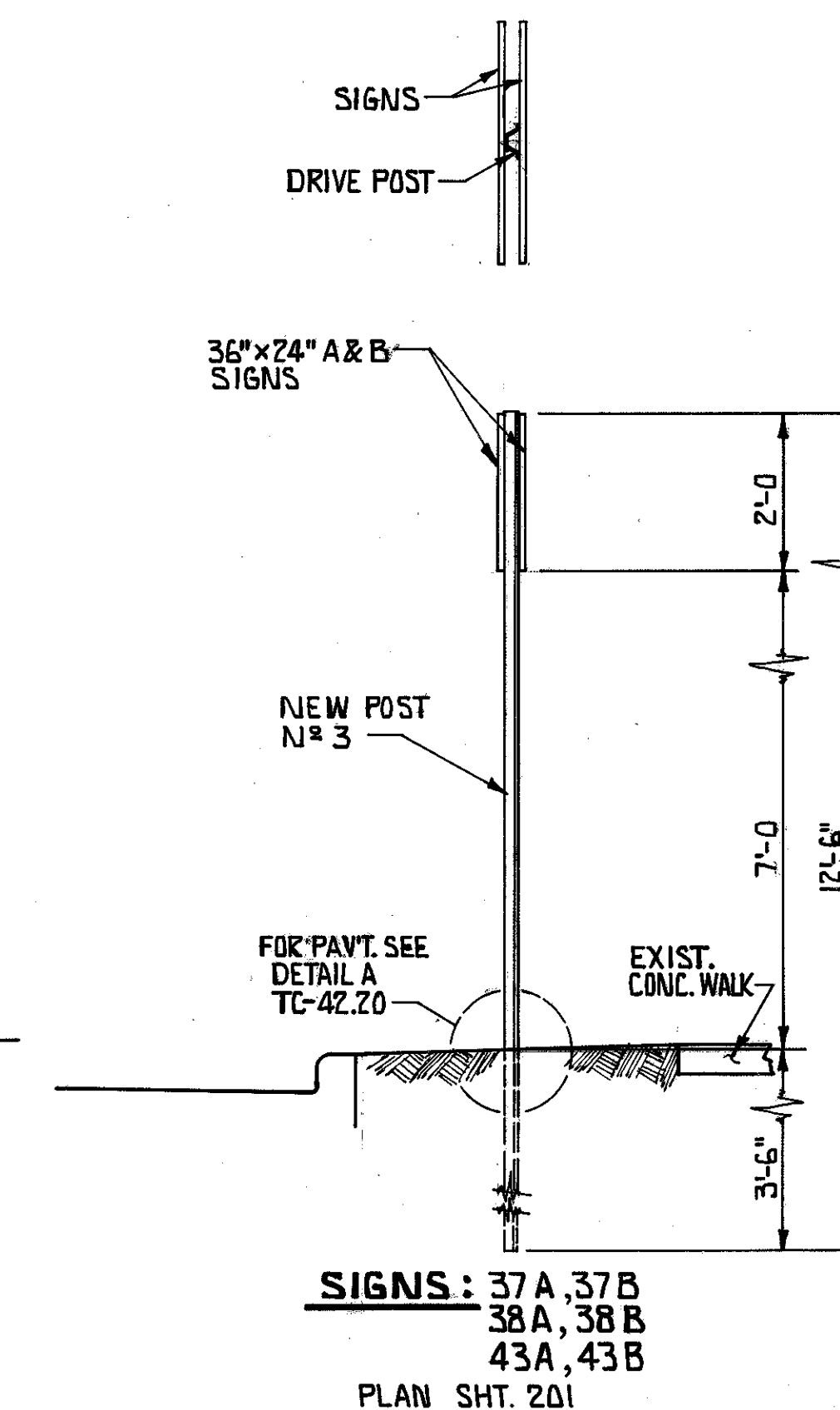
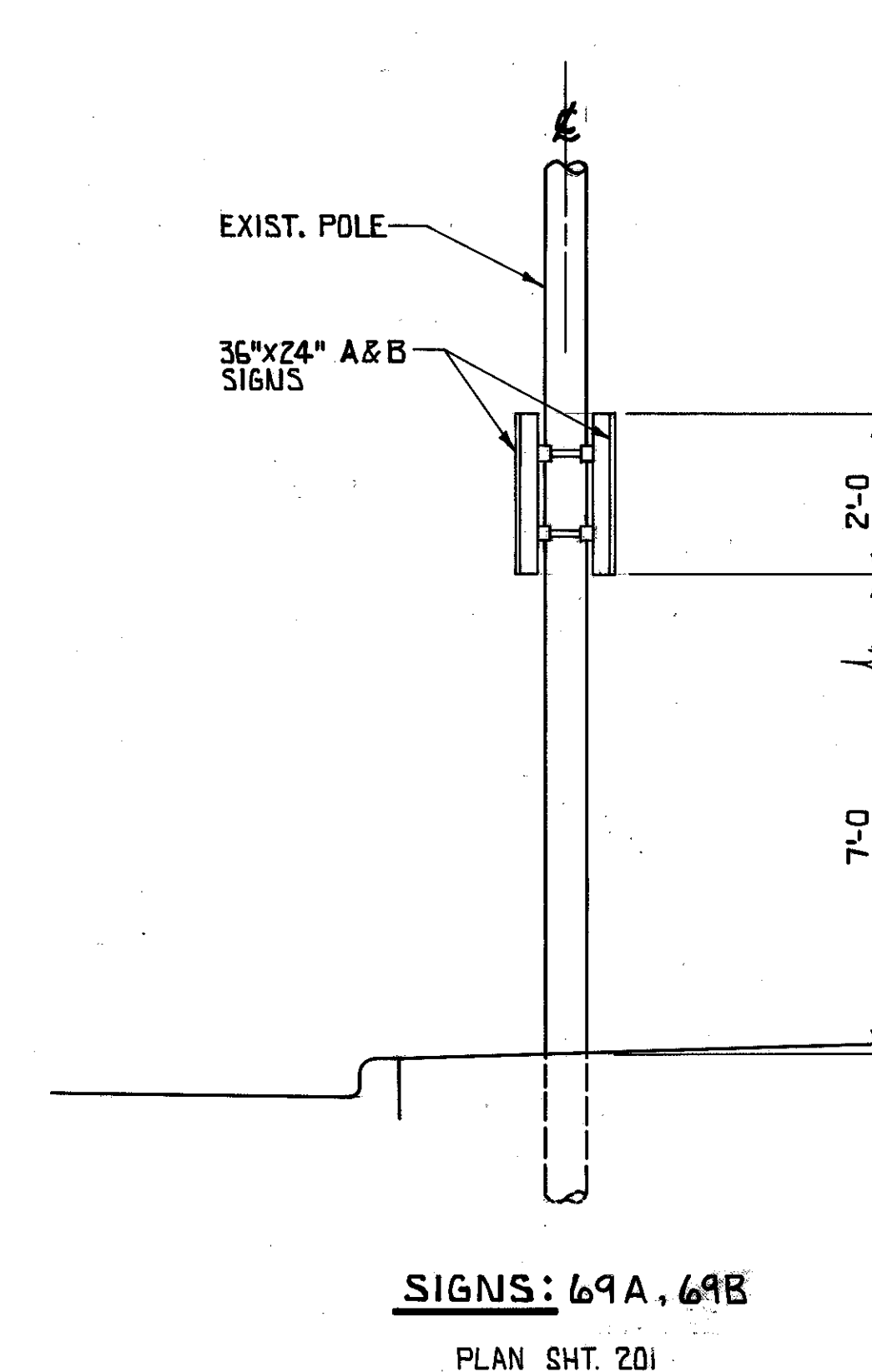
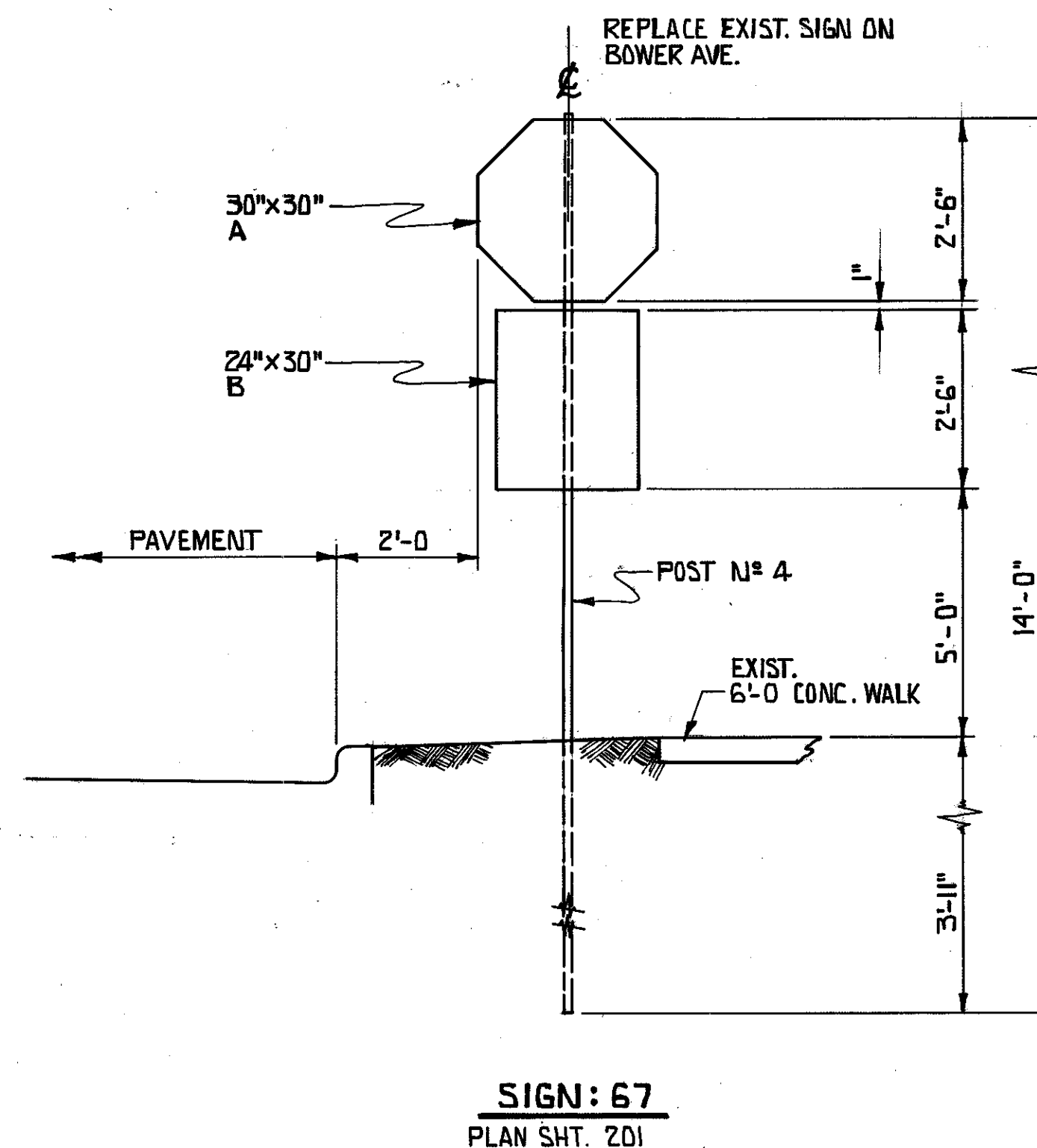
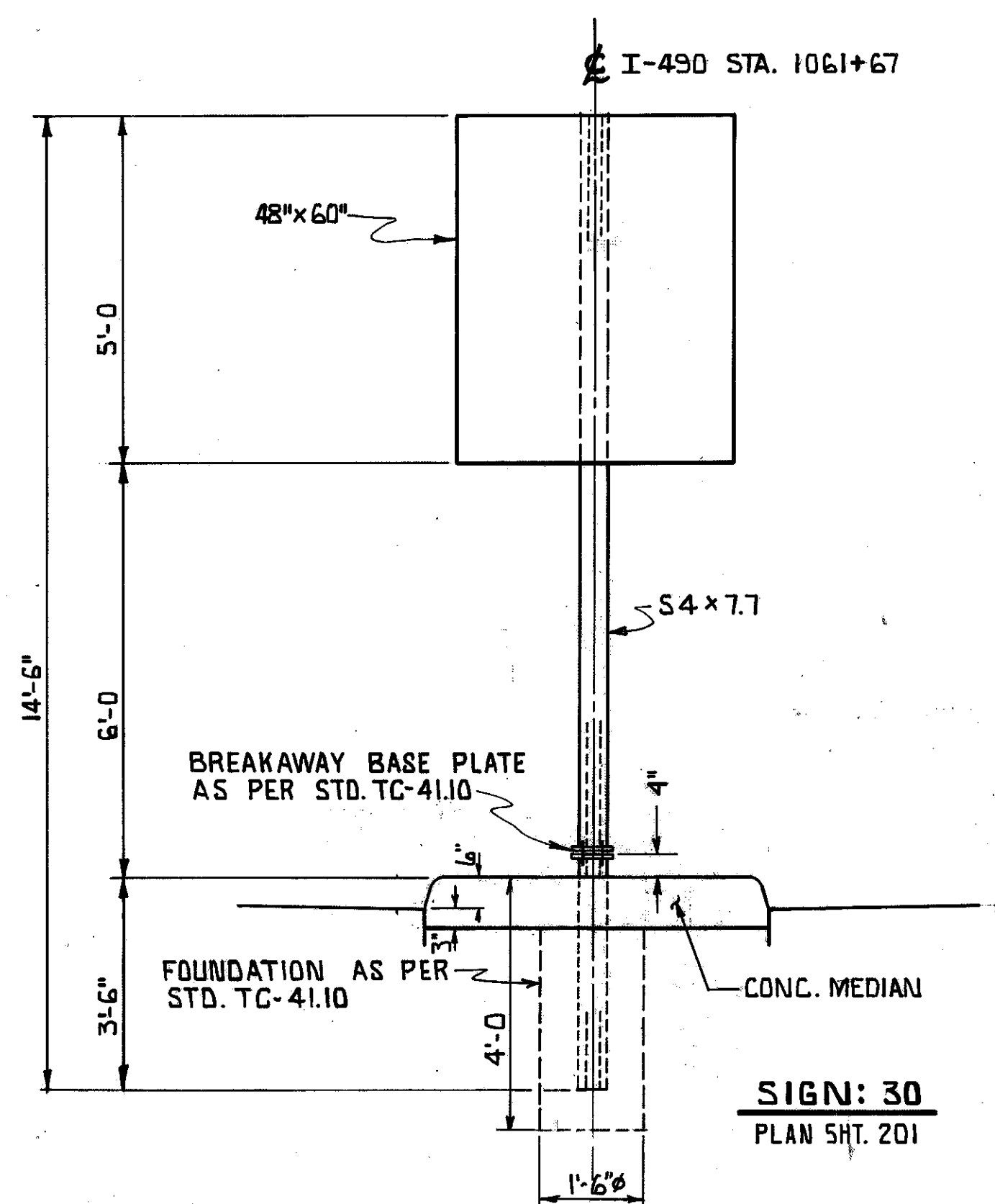
| | |
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| SCALE | DATE |
| DESIGNED | DRAWN |
| TRACED | CHECKED |
| REVIEWED | DATE |
| RLH II | CAP |
| RLH | 5/83 |

CONT. No. SHEET ACCT. No.

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

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CUYAHOGA COUNTY
CUY-490-1.49



TYPICAL DETAILS
FOR TYPE A & B SIGNS - 12" x 18"
FOR ELEVATIONS SEE SHT. 224

FOR QUANTITIES SEE SHT. 189

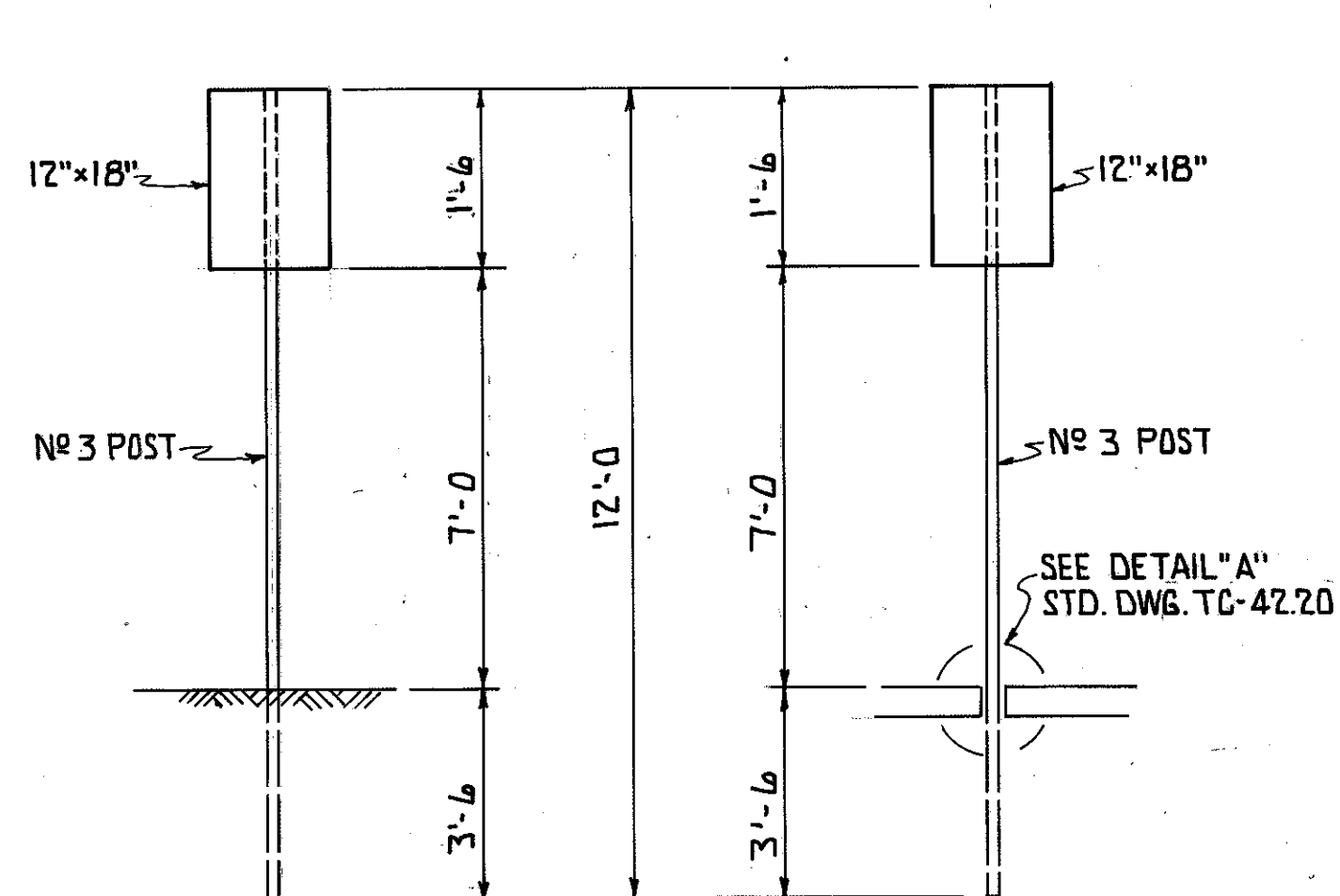
CONT. No. SHEET ACCT. No.

| | | | |
|---|-------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| E. 55 ST. & I-490 SIGN ELEVATIONS & DETAILS SIGNS: 30, 67, 43, 69, 37, & 38 | | | |
| SCALE | | DATE | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| RLH II | | GAP | RLH |
| | | | 5/83 |

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

224
761

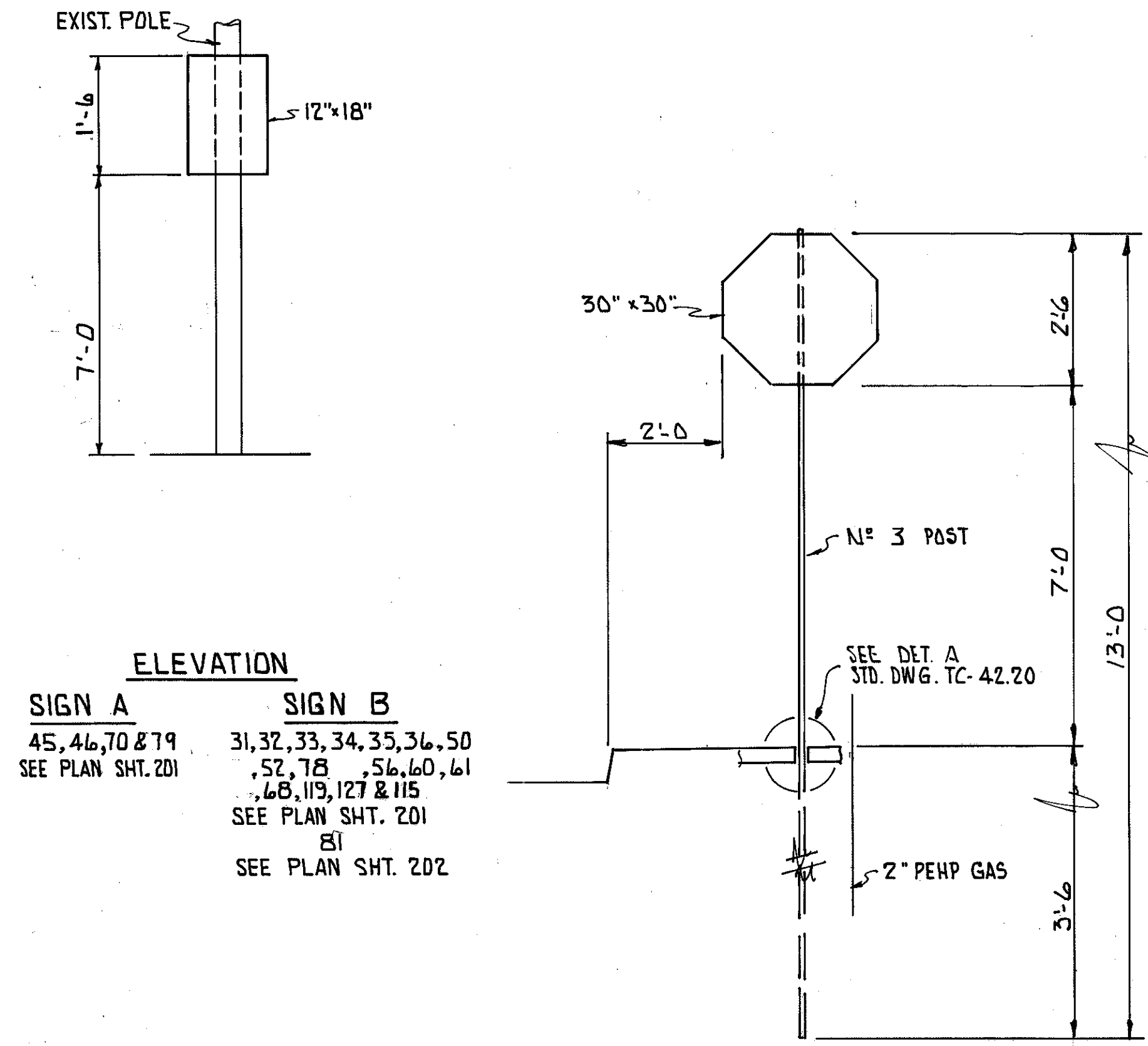
CUYAHOGA COUNTY
CUY-490-1.49



ELEVATION
SIGN B
80, 83, 84, 85, 86
87 & 88
SEE PLAN SHT. 202
151 & 152
SEE PLAN SHT. 203

ELEVATION
SIGN A
49 SEE PLAN SHT. 201

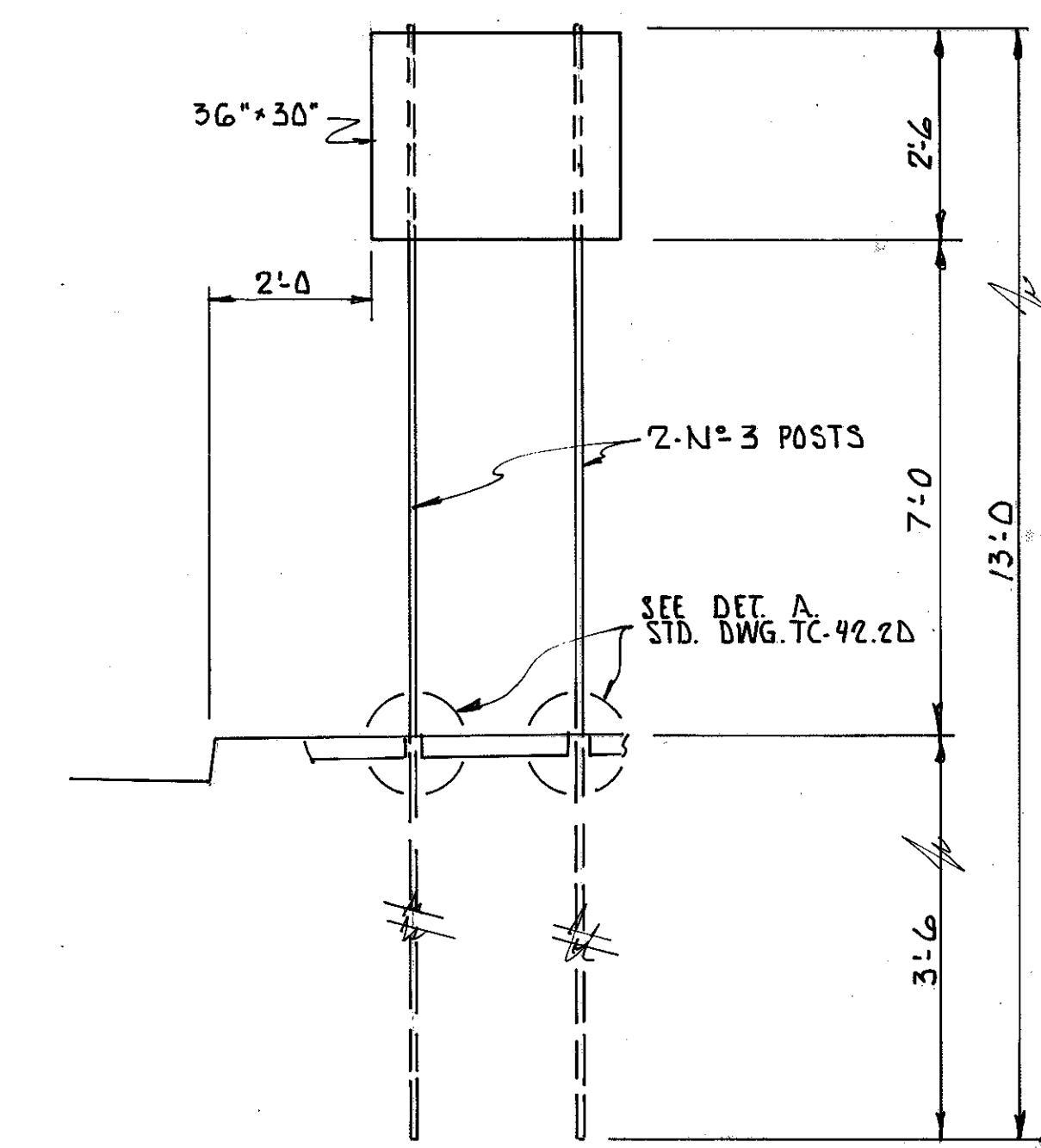
SIGN B
42, 51, 53, 55, 56 & 64
SEE PLAN SHT. 201
72, 73, 116, 120, 121, 124
125, 130, 132, 135, 136
137, 138 & 141
SEE PLAN SHT. 203



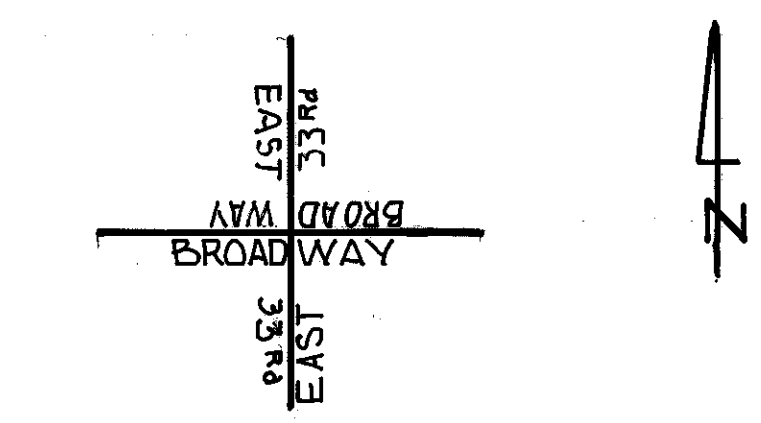
ELEVATION
SIGN A
45, 46, 70 & 79
SEE PLAN SHT. 201

SIGN B
31, 32, 33, 34, 35, 36, 50
52, 78, 56, 60, 61
68, 119, 127 & 115
SEE PLAN SHT. 201
81
SEE PLAN SHT. 202

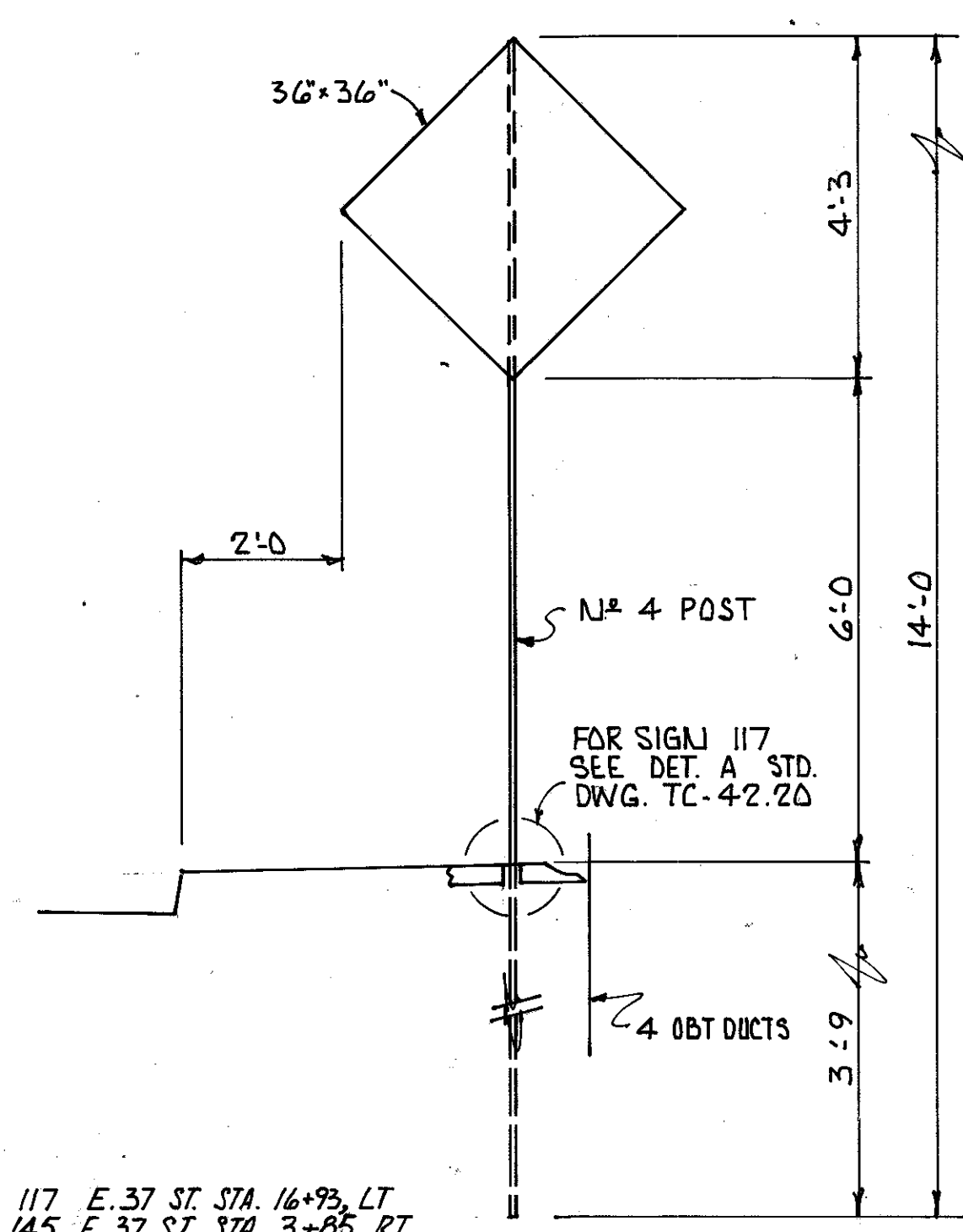
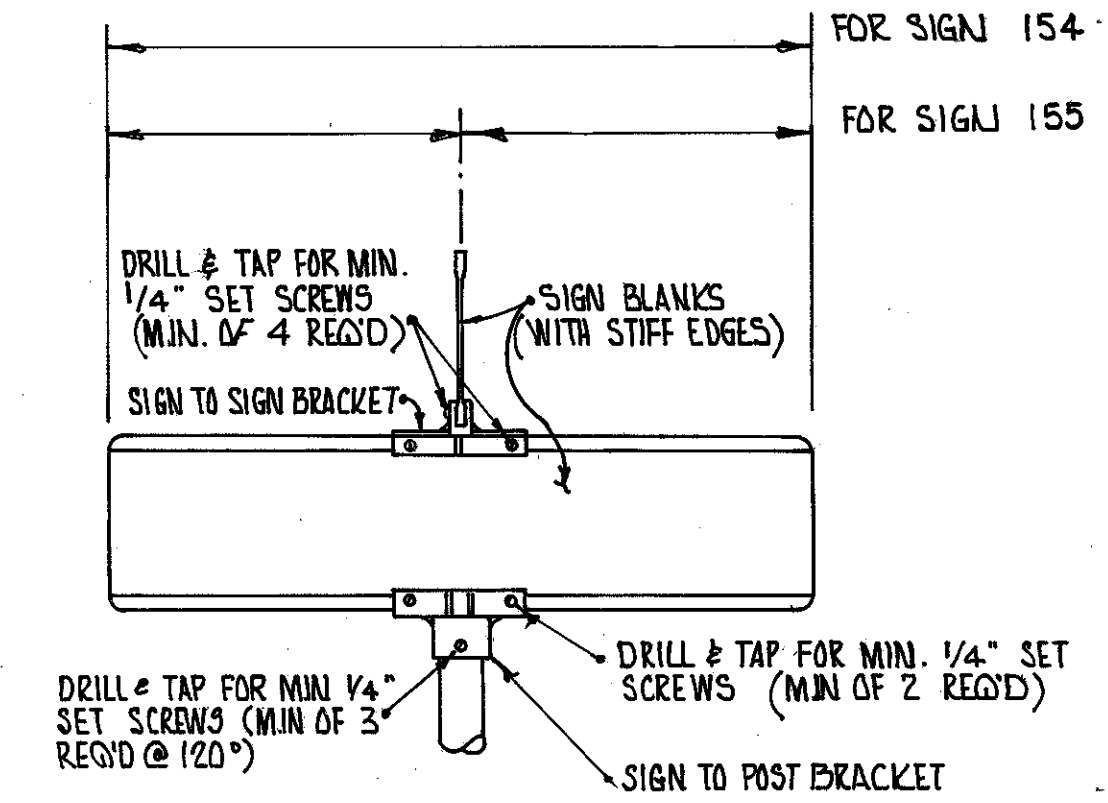
SIGN: 123
E. 33 STREET STA. 10+65, LT.
PLAN SHT. 203



SIGN: 145
BROADWAY STA. 9+68, RT.
PLAN SHT. 203

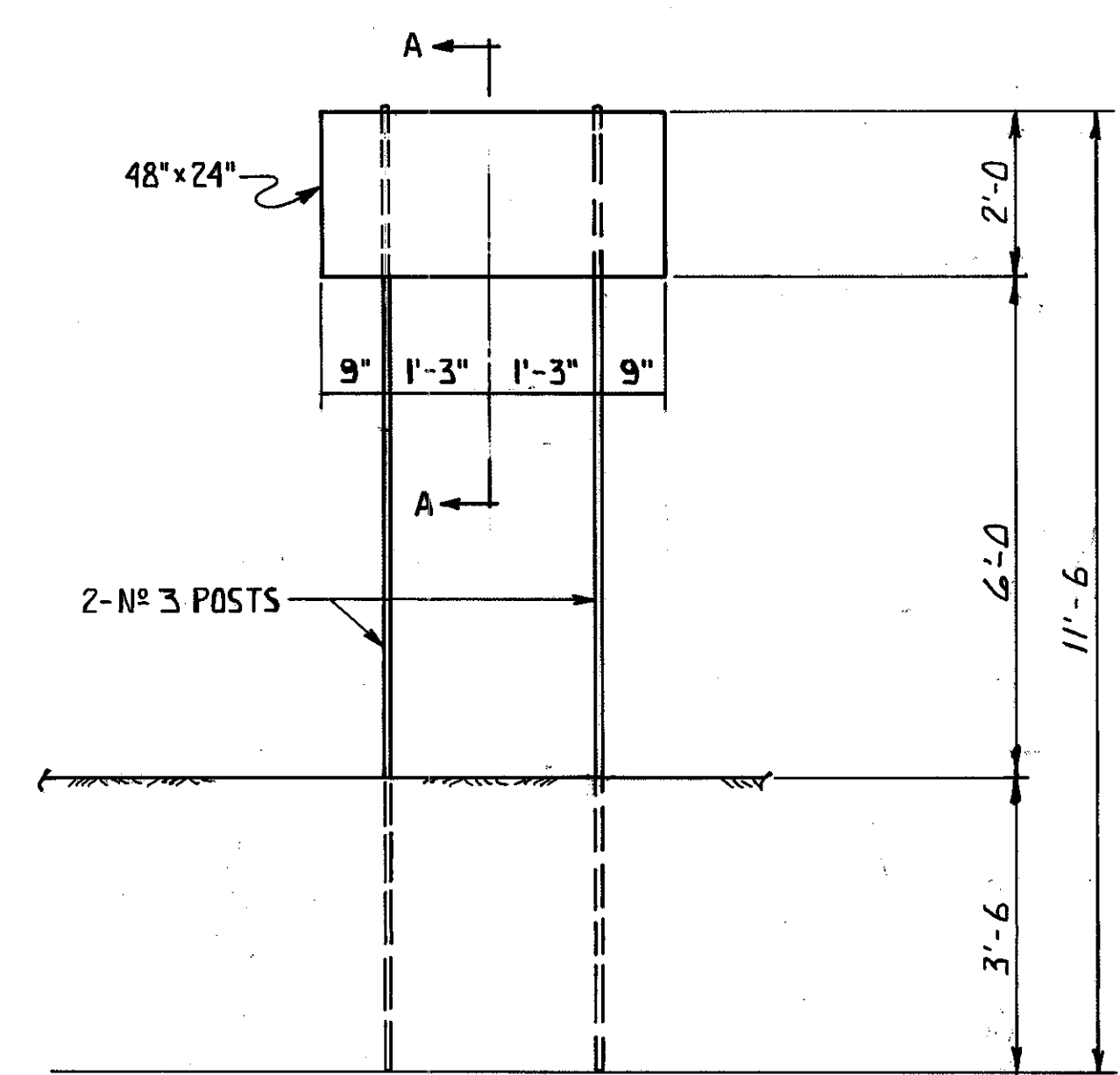


STREET NAMES
SIGN: 154
E. 33 STREET STA. 10+65, 20' LT.
PLAN SHT. 203

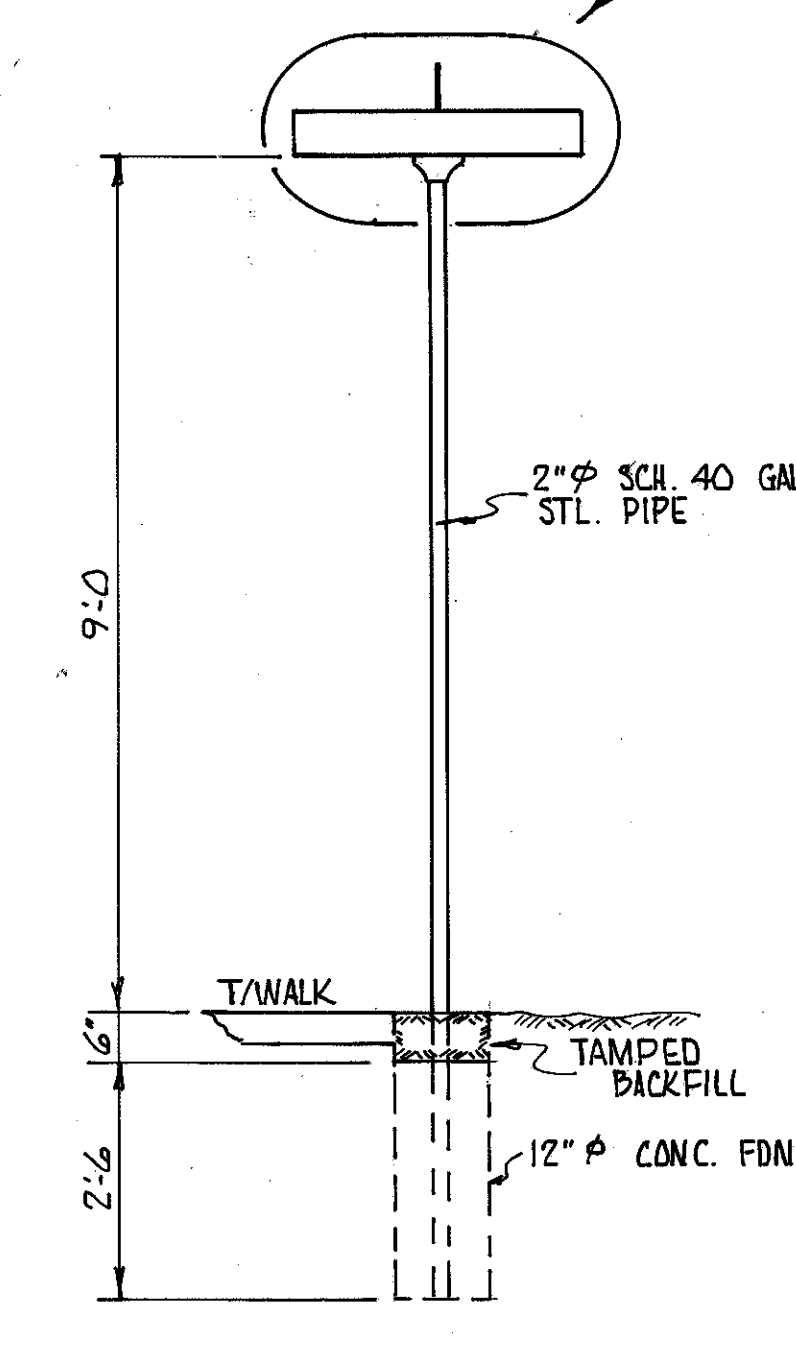
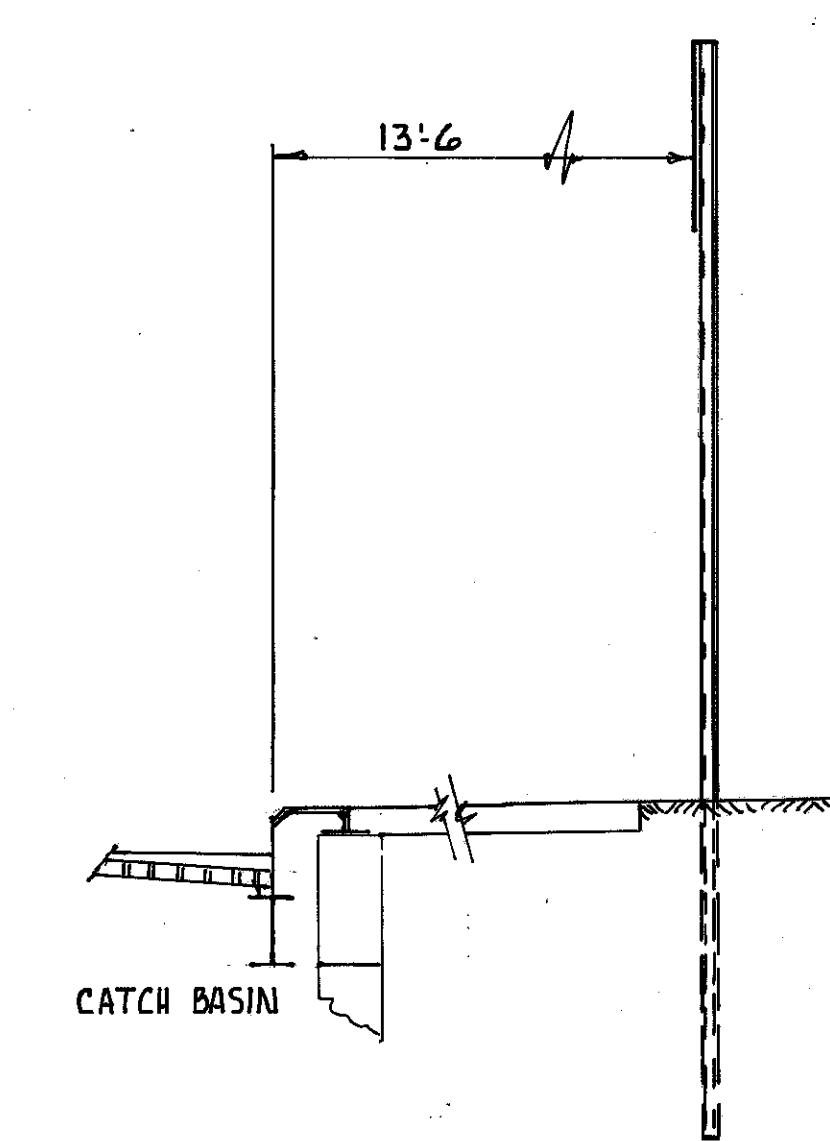


SIGN 117 E. 37 ST. STA. 16+93, LT.
SIGN 145 E. 37 ST. STA. 3+85, RT.
PLAN SHT. 203

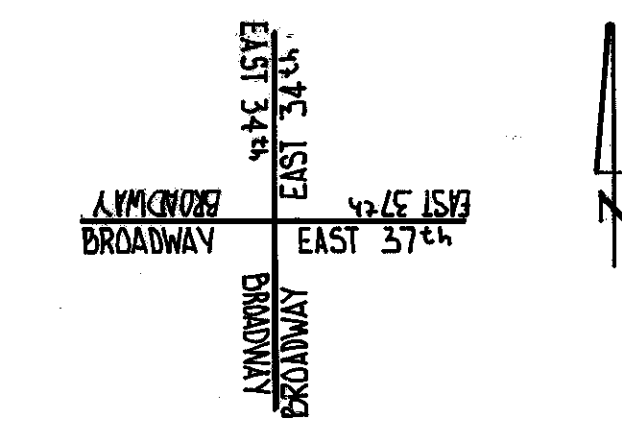
SIGNS: 117 & 145



SIGN: 118
BROADWAY STA. 7+95, RT-SHT. 203



TYPICAL STREET SIGN DETAIL



STREET NAMES
SIGN: 155
E. 34 STREET STA. 13+08, 35' LT.
PLAN SHT. 203

FOR QUANTITIES SEE SHT. 189 & 190

| | | | |
|--|------|----|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

| SIGN ELEVATIONS | | | |
|---|--|--|--|
| SIGNS: 31, 32, 33, 34, 35, 36, 42, 45, 49, 50, 51, 52, 53, 55, 56, 58, 60, 61, 68, 70, 72, 64, 73, 80, 81, 83, 84, 85, 86, 87, 88, 116, 117, 118, 119, 120, 121, 123, 124, 125, 127, 130, 132, 135, 136, 137, 138, 141, 145, 148, 151, 152, 154, 155 115' 46' 78 & 79 | | | |

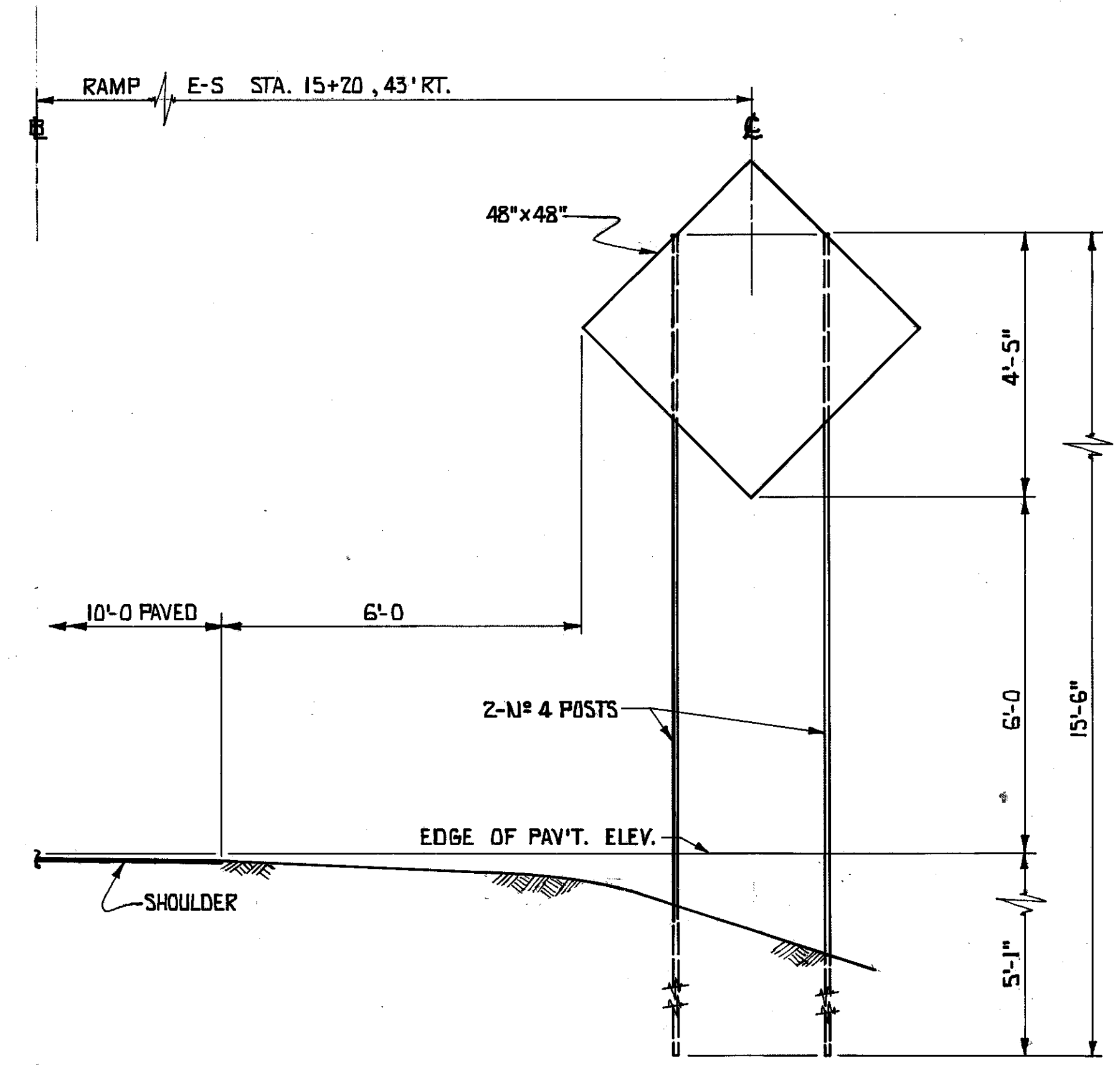
| SCALE | DATE | | | | |
|----------|-------|--------|---------|----------|------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| | LV | | CAP | RLH | 5/83 |

CONT. No. SHEET ACCT. No.

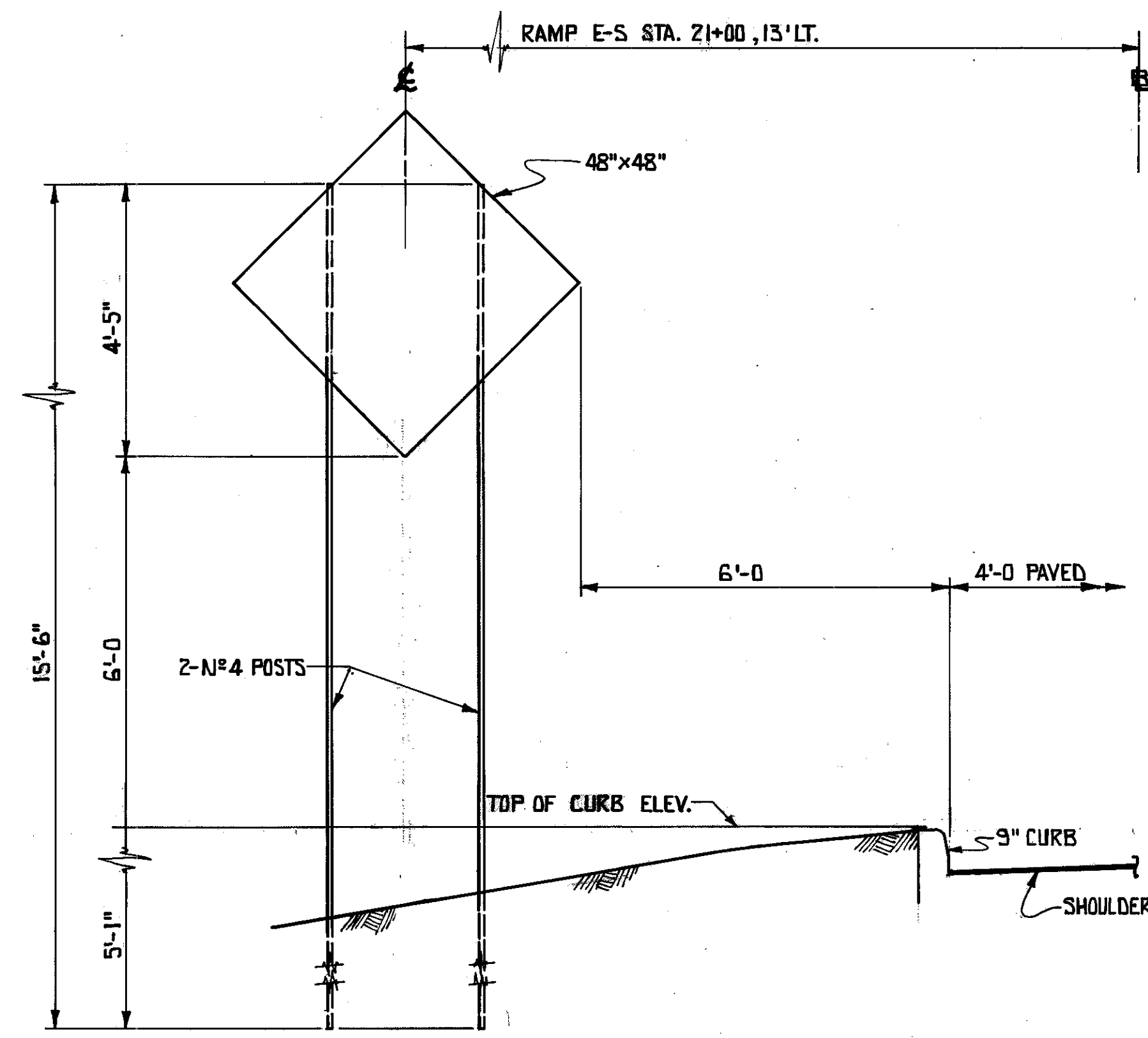
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|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 2 | OHIO | |

225
261

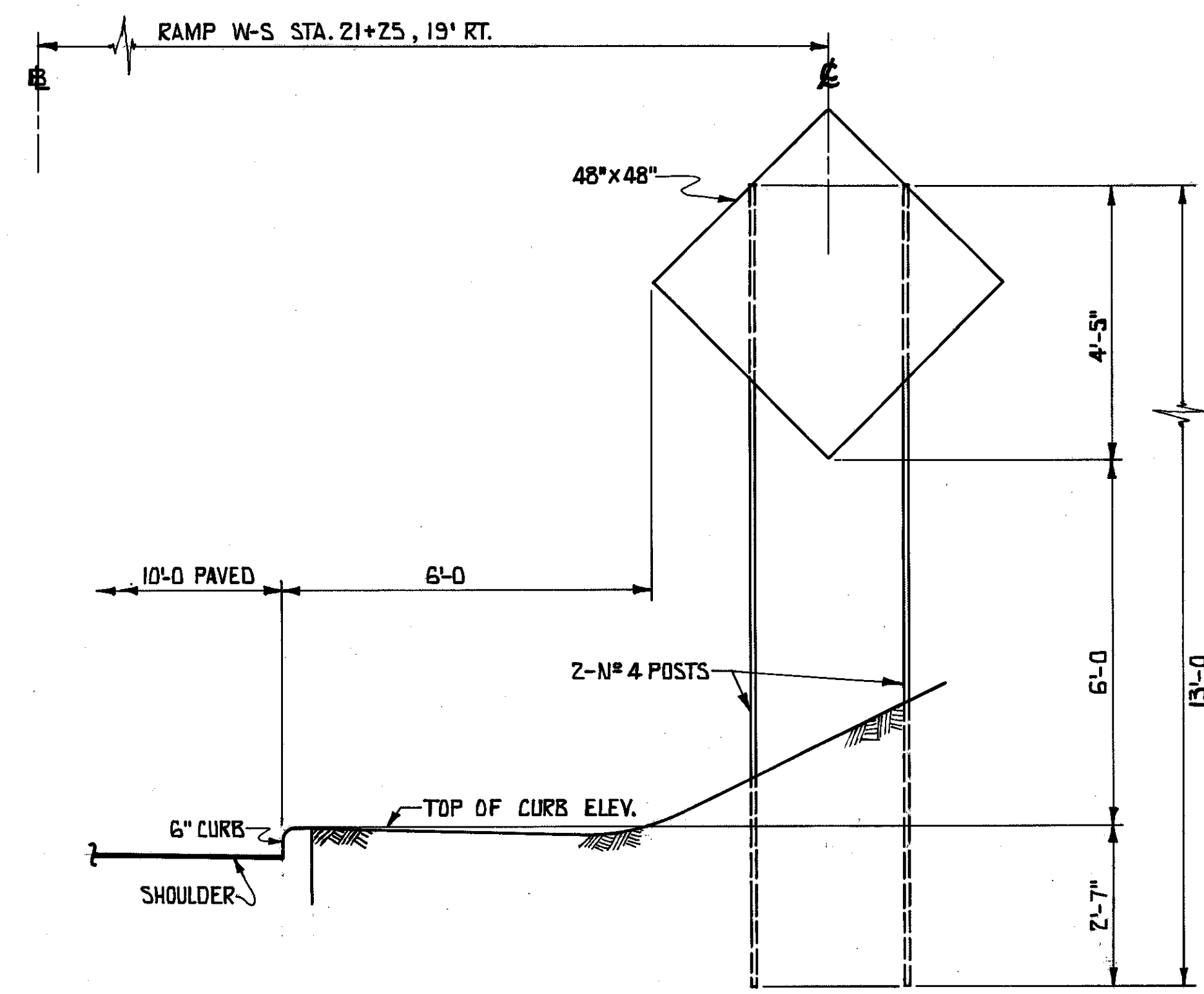
CUYAHOGA COUNTY
CUY-490-1.49



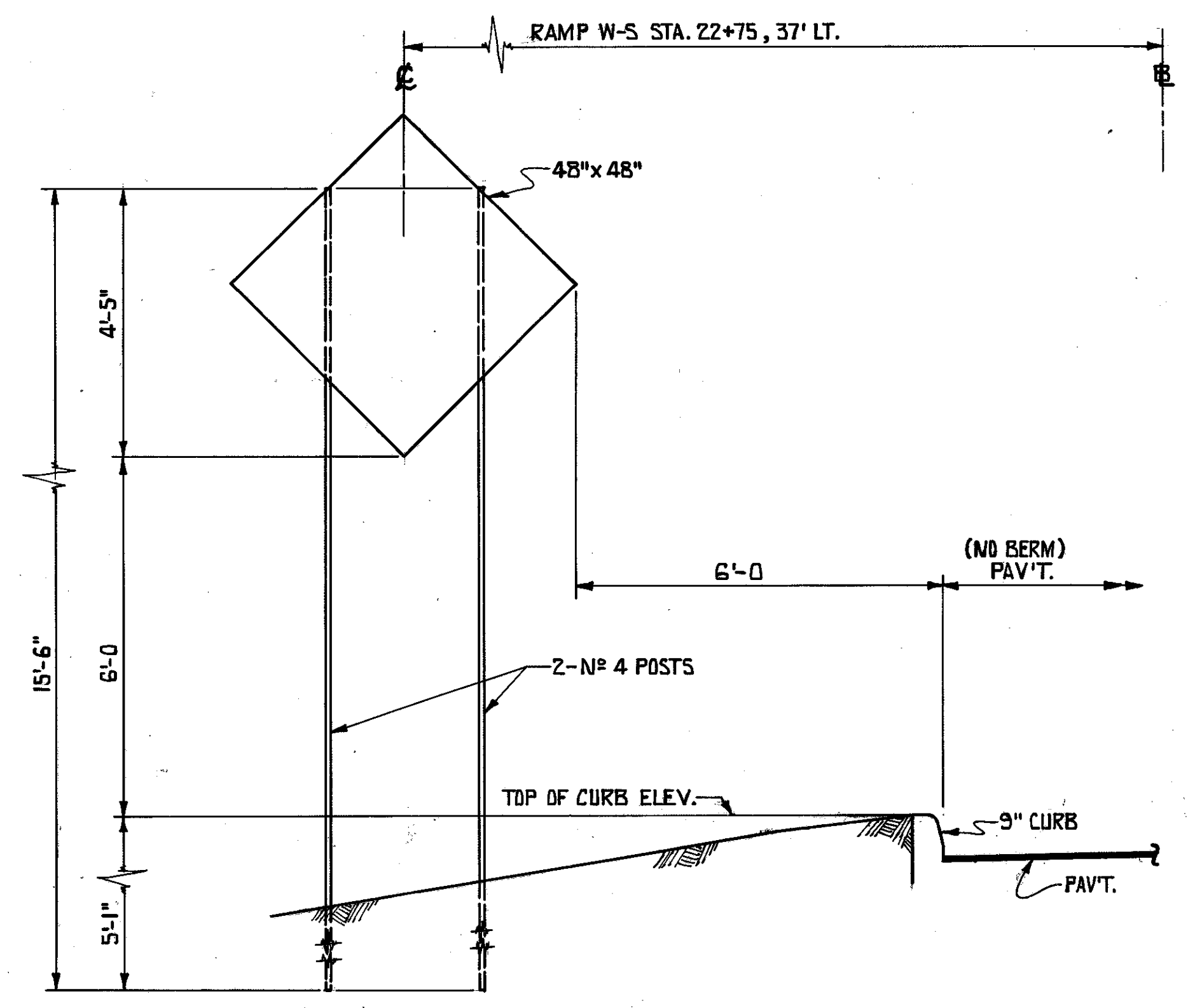
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PLAN SHT. 207



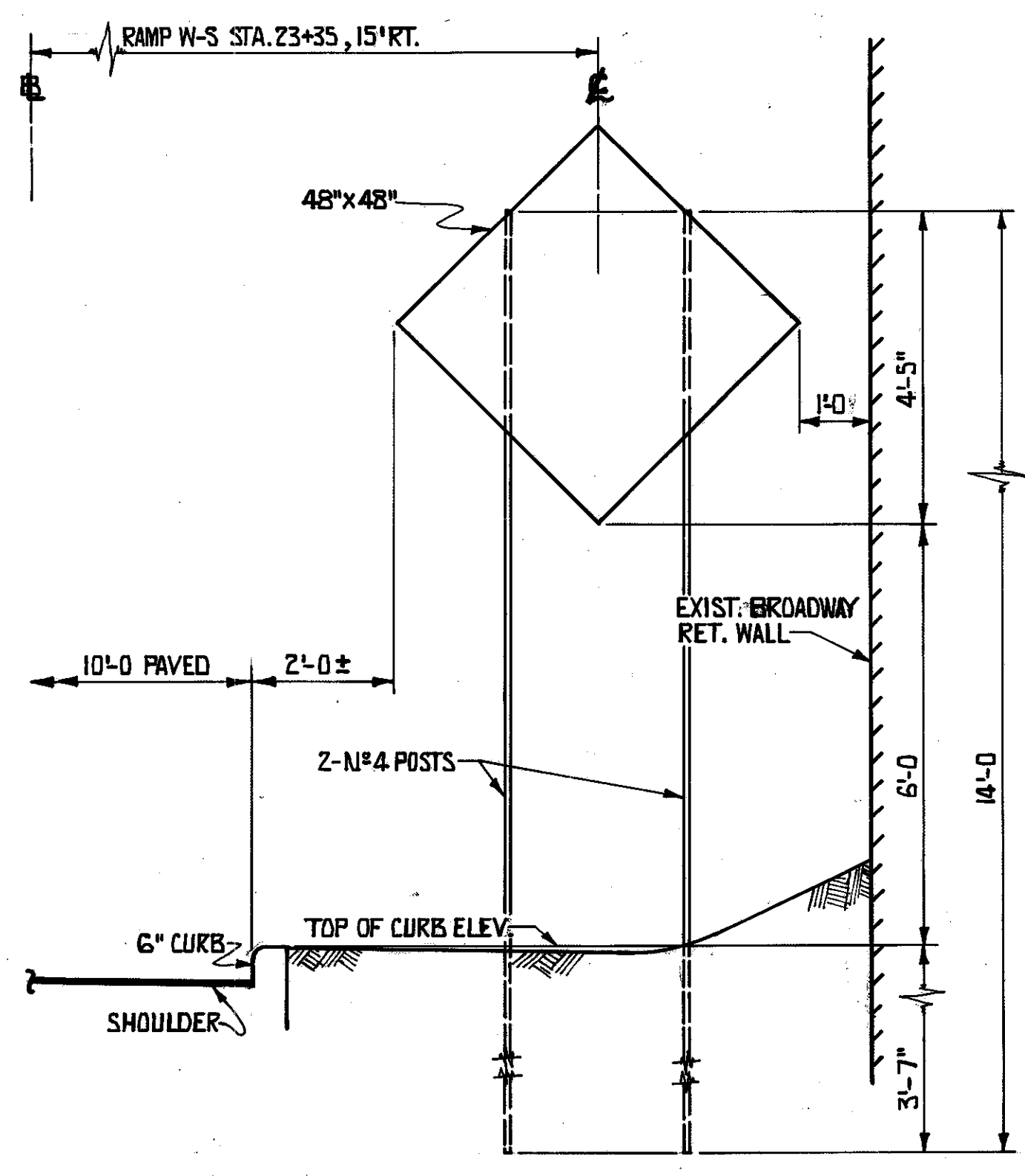
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PLAN SHT. 207



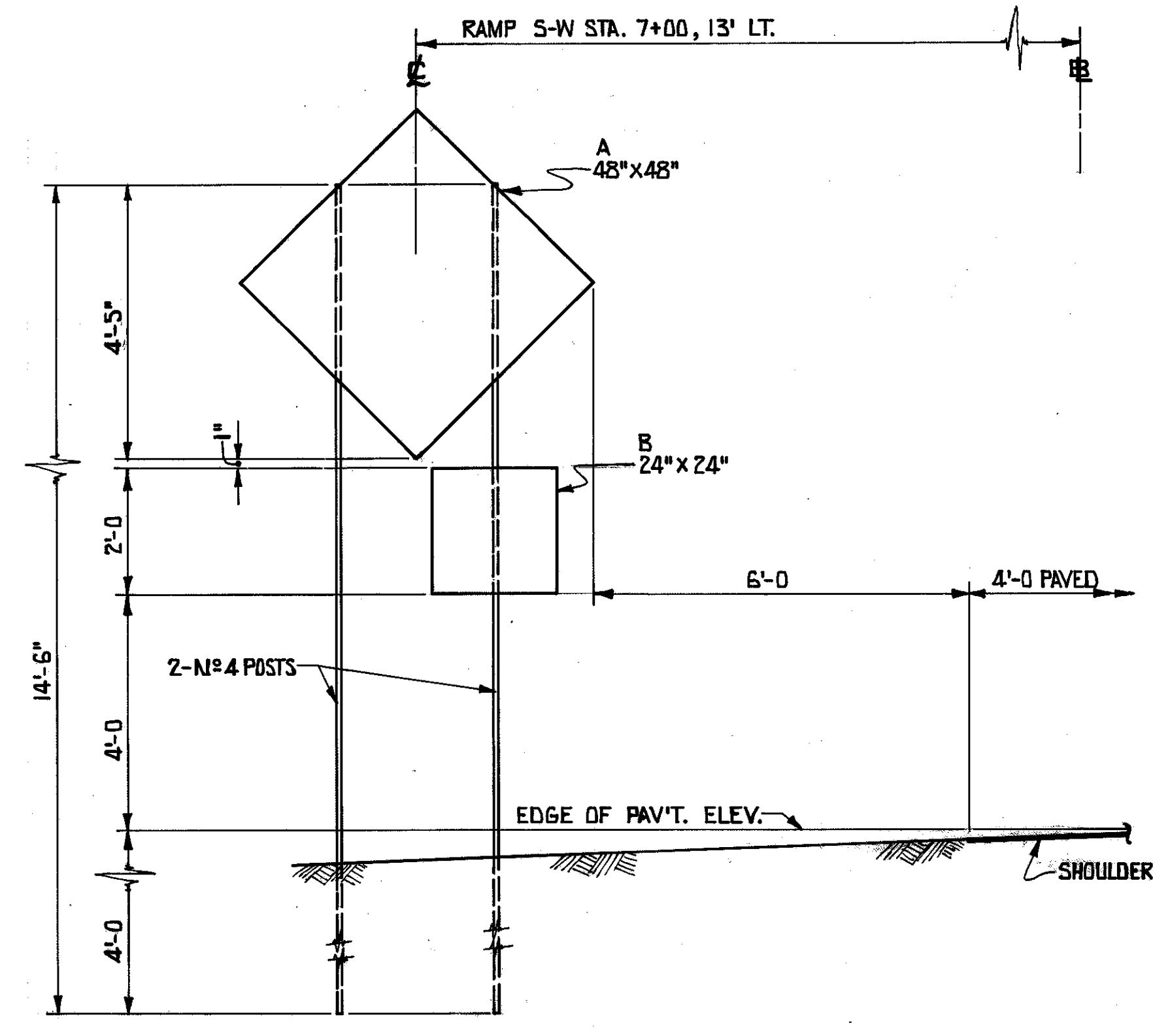
SIGN: 104
PLAN SHT. 207



SIGN: 105
PLAN SHT. 207



SIGN: 106
PLAN SHT. 207



SIGN: 107
PLAN SHT. 207

FOR QUANTITIES SEE SHT. 190

| | | | |
|-----|------|----|--|
| NO. | DATE | BY | REVISED |
| | | | TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 |

SIGN ELEVATIONS
SIGNS - 102, 103, 104, 105, 106 & 107

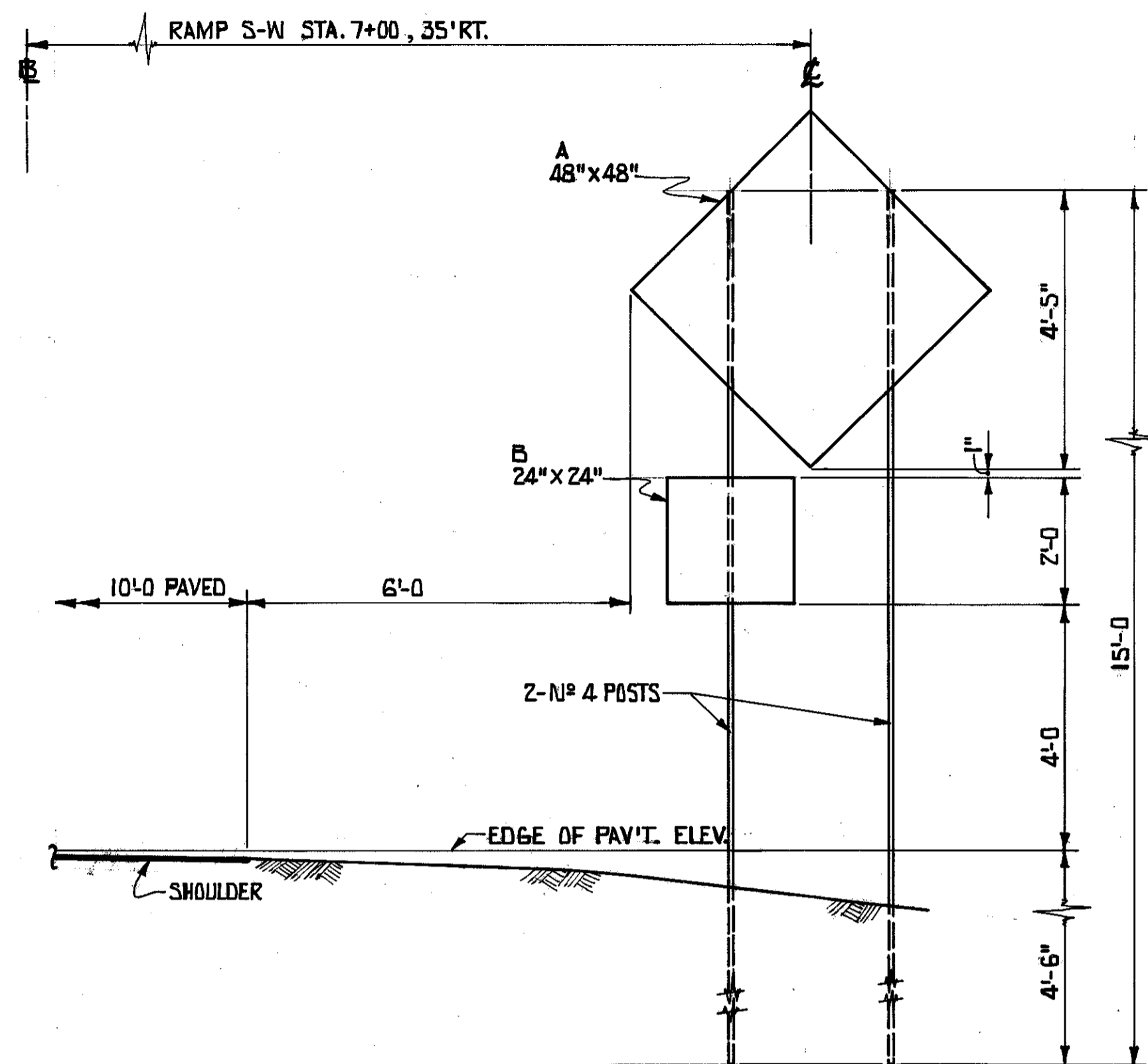
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|----------|--------|--------|---------|----------|------|
| SCALE | DATE | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| | RLH II | | CAP | RLH | 5/83 |

CONT. No. SHEET ACCT. No.

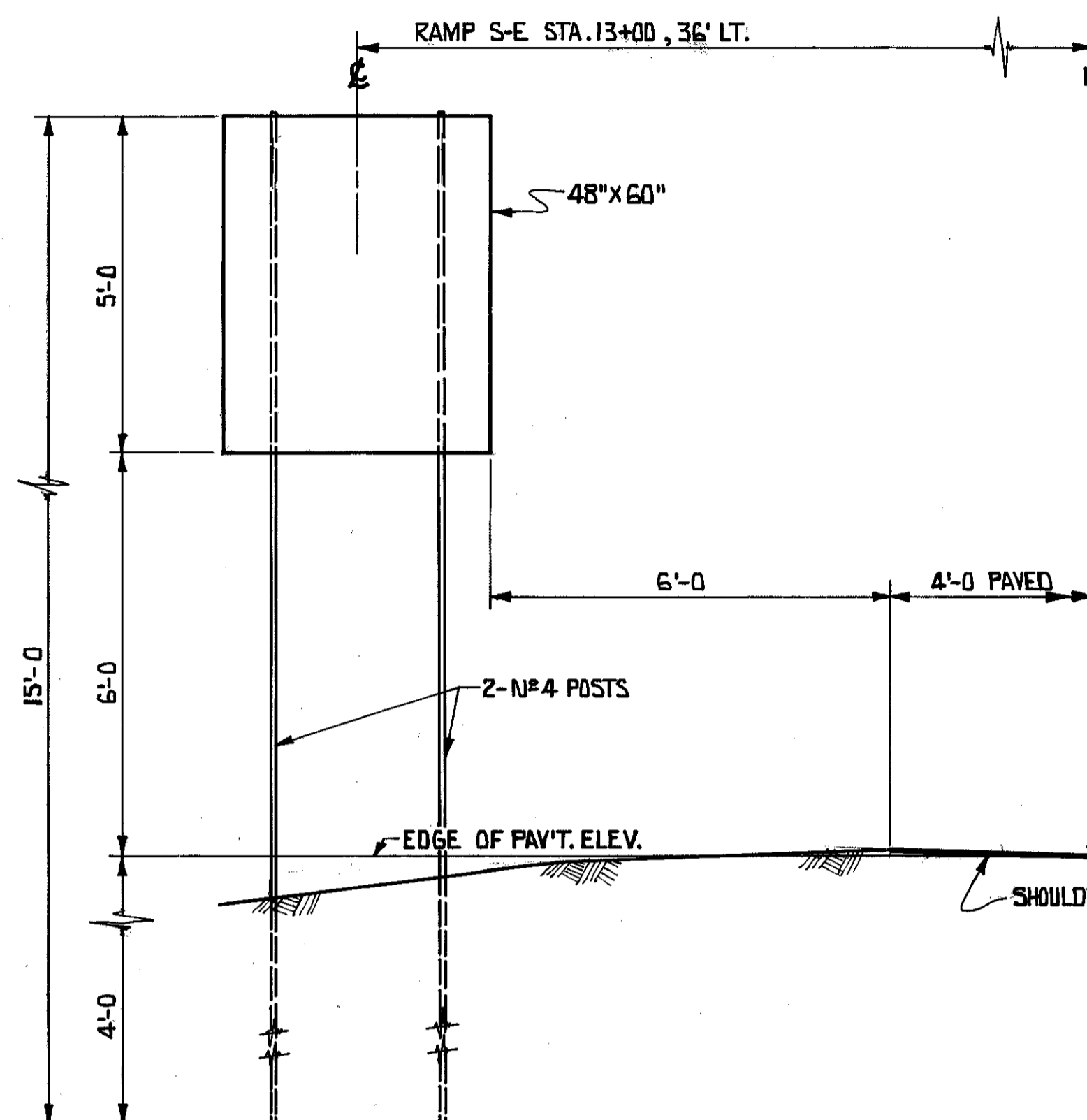
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|-------------------|-------|---------|--|
| FED. RD. DIVISION | STATE | PROJECT | |
| 2 | OHIO | | |

226
261

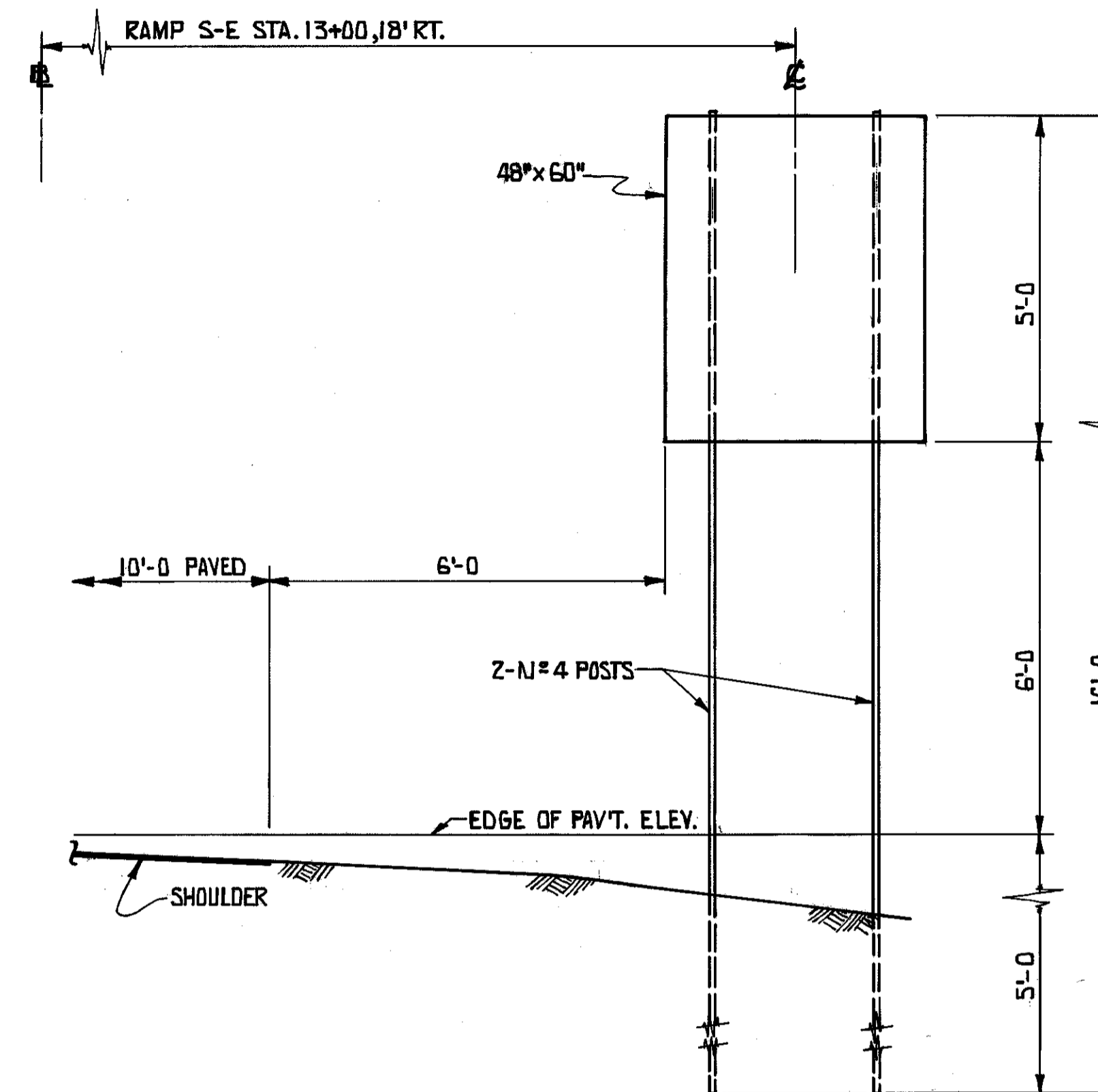
CUYAHOGA COUNTY
CUY-490-1.49



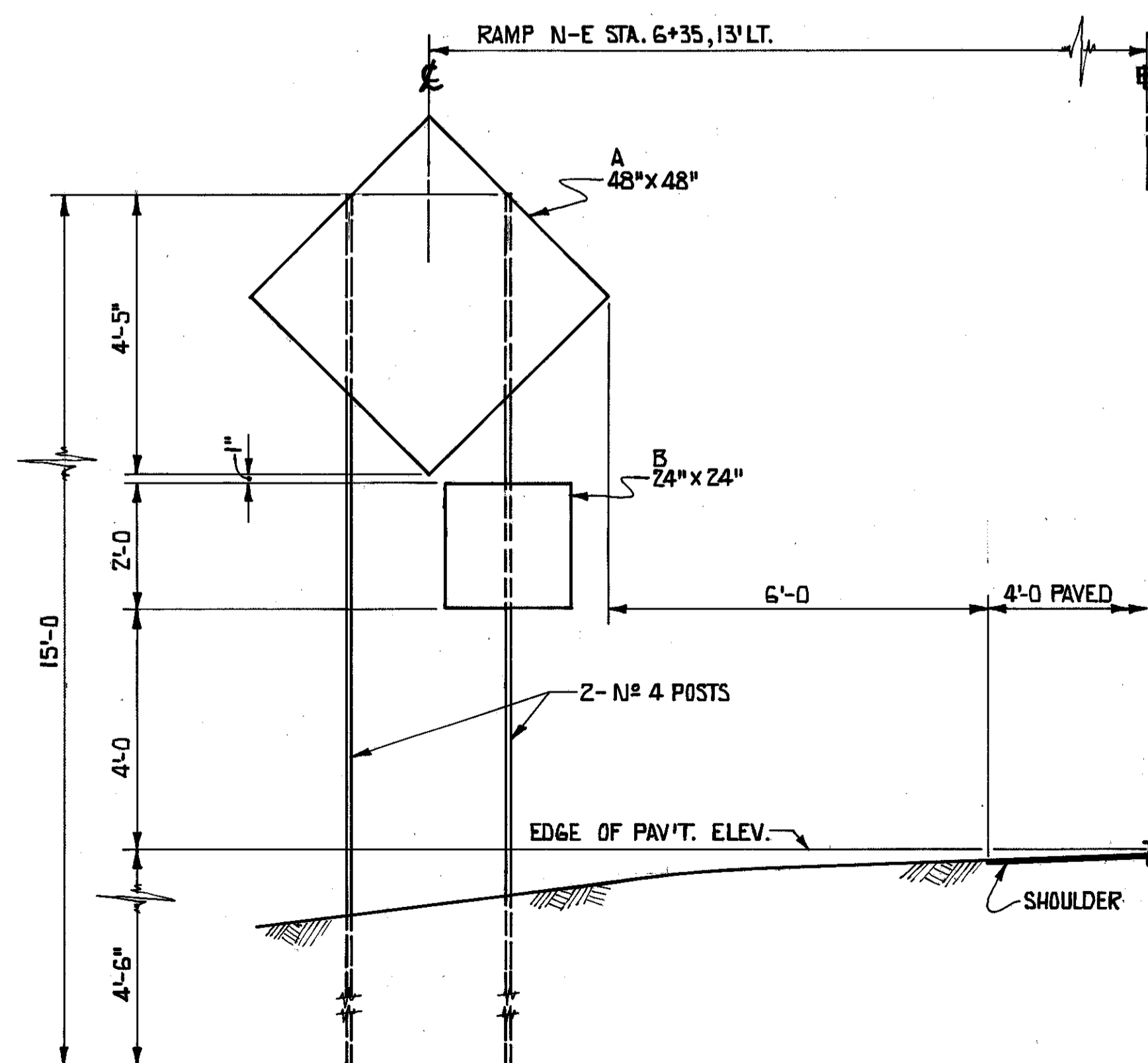
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PLAN SHT. 207



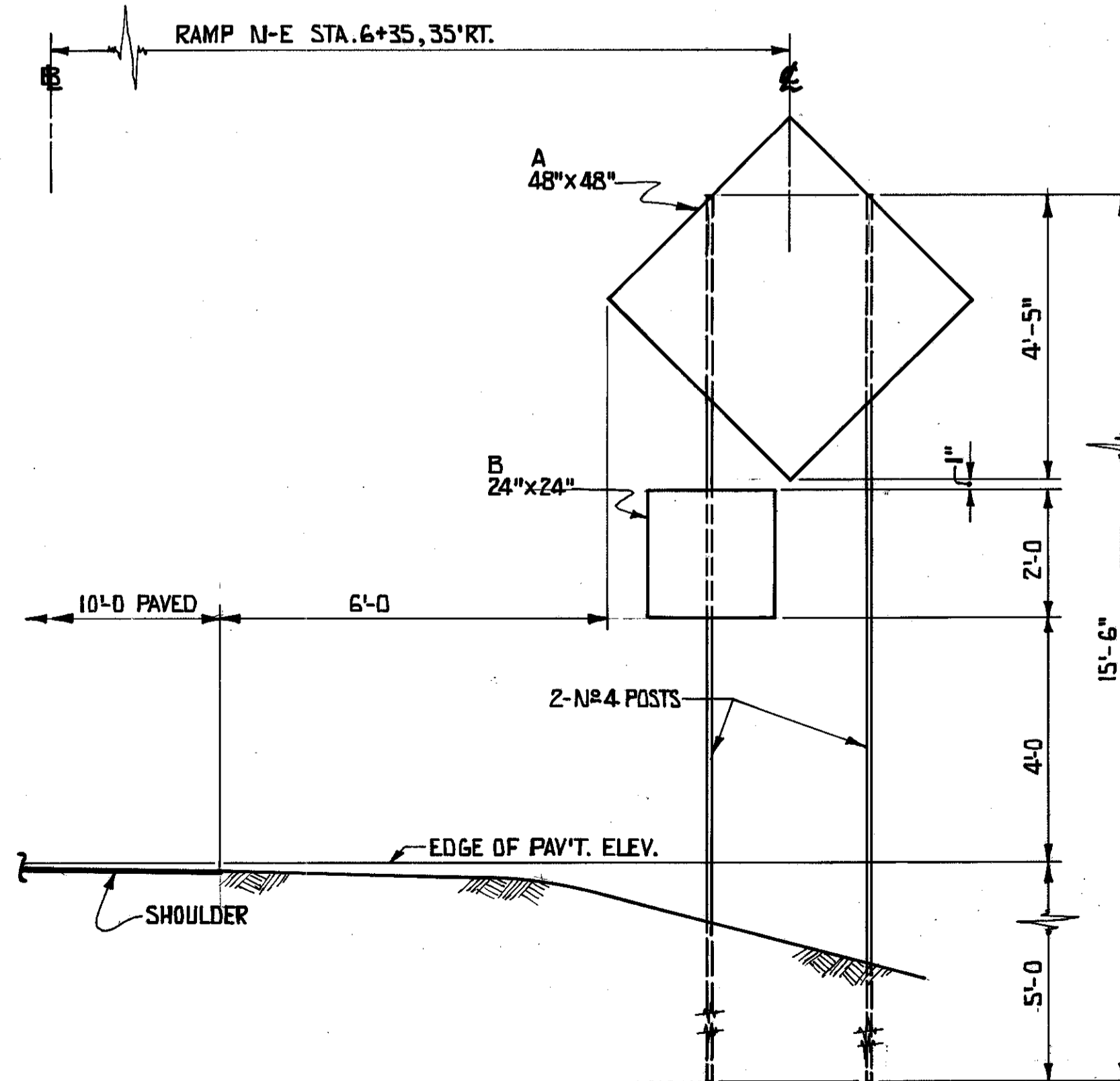
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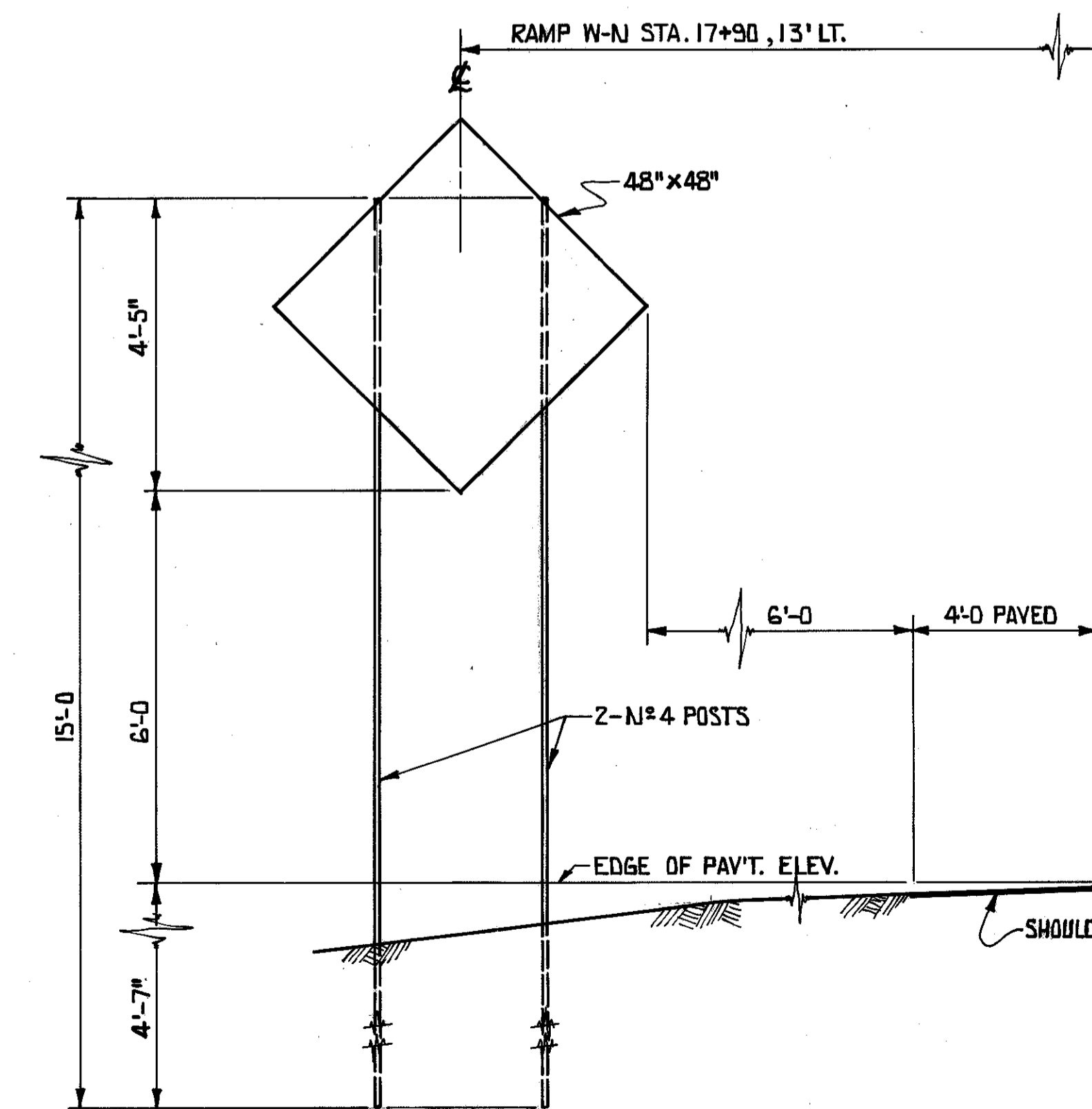
SIGN: 110
PLAN SHT. 207



SIGN: 95
PLAN SHT. 208



SIGN: 96
PLAN SHT. 208



SIGN: 97
PLAN SHT. 208

FOR QUANTITIES SEE SHT. 190

| | | | |
|-----|------|----|---|
| NO. | DATE | BY | REVISED |
| | | | TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 |

SIGN ELEVATIONS
SIGNS - 108, 109, 110, 95, 96 & 97

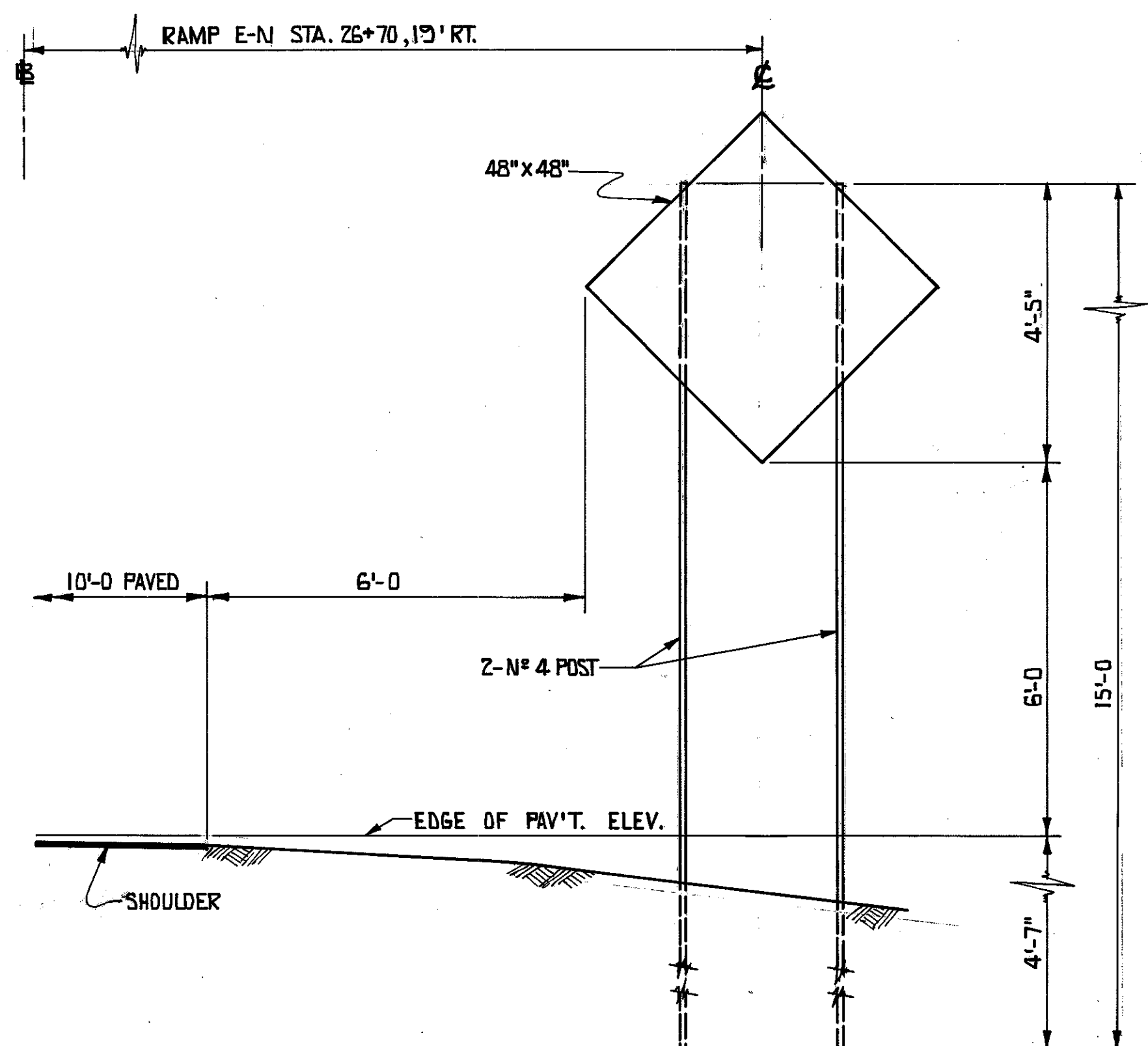
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|----------|--------|--------|---------|----------|------|
| SCALE | DATE | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| | RLH II | | CAP | RLH | 5/83 |

SHEET ACCT. No.
CONT. No.

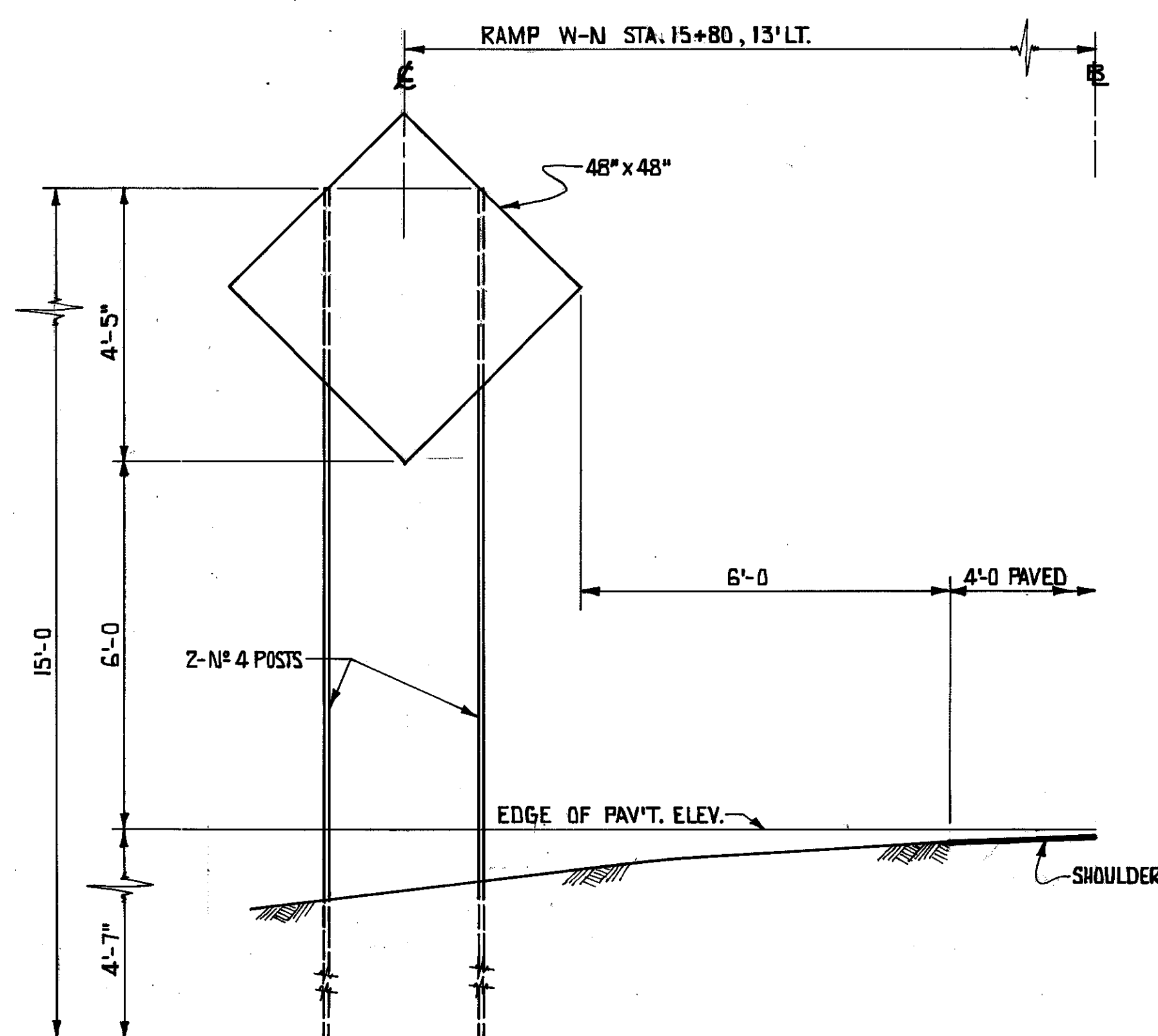
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|-------------------|-------|---------|
| FED. RD. DIVISION | STATE | PROJECT |
| 2 | OHIO | |

227
761

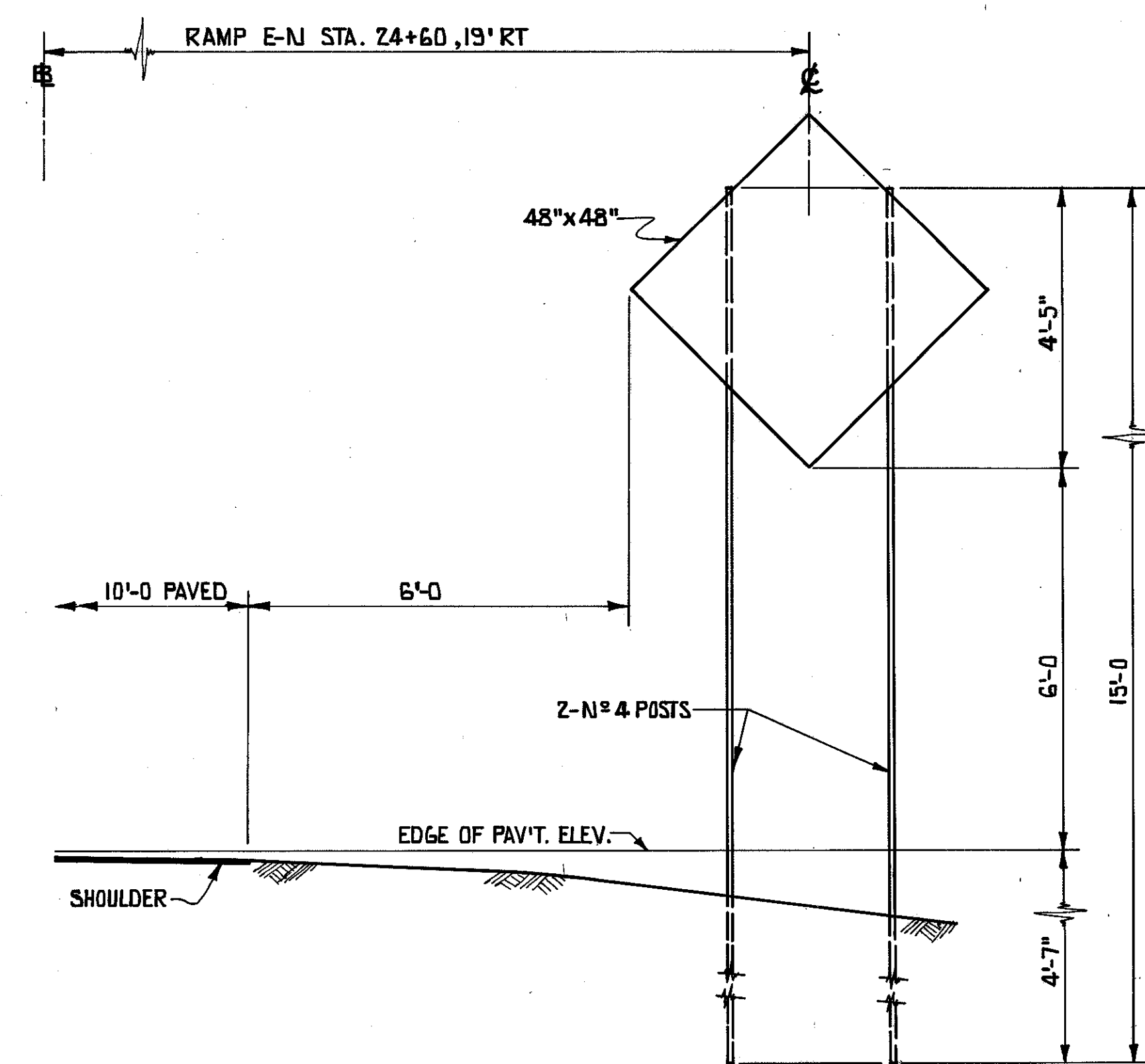
CUYAHOGA COUNTY
CUY-490 - 1.49



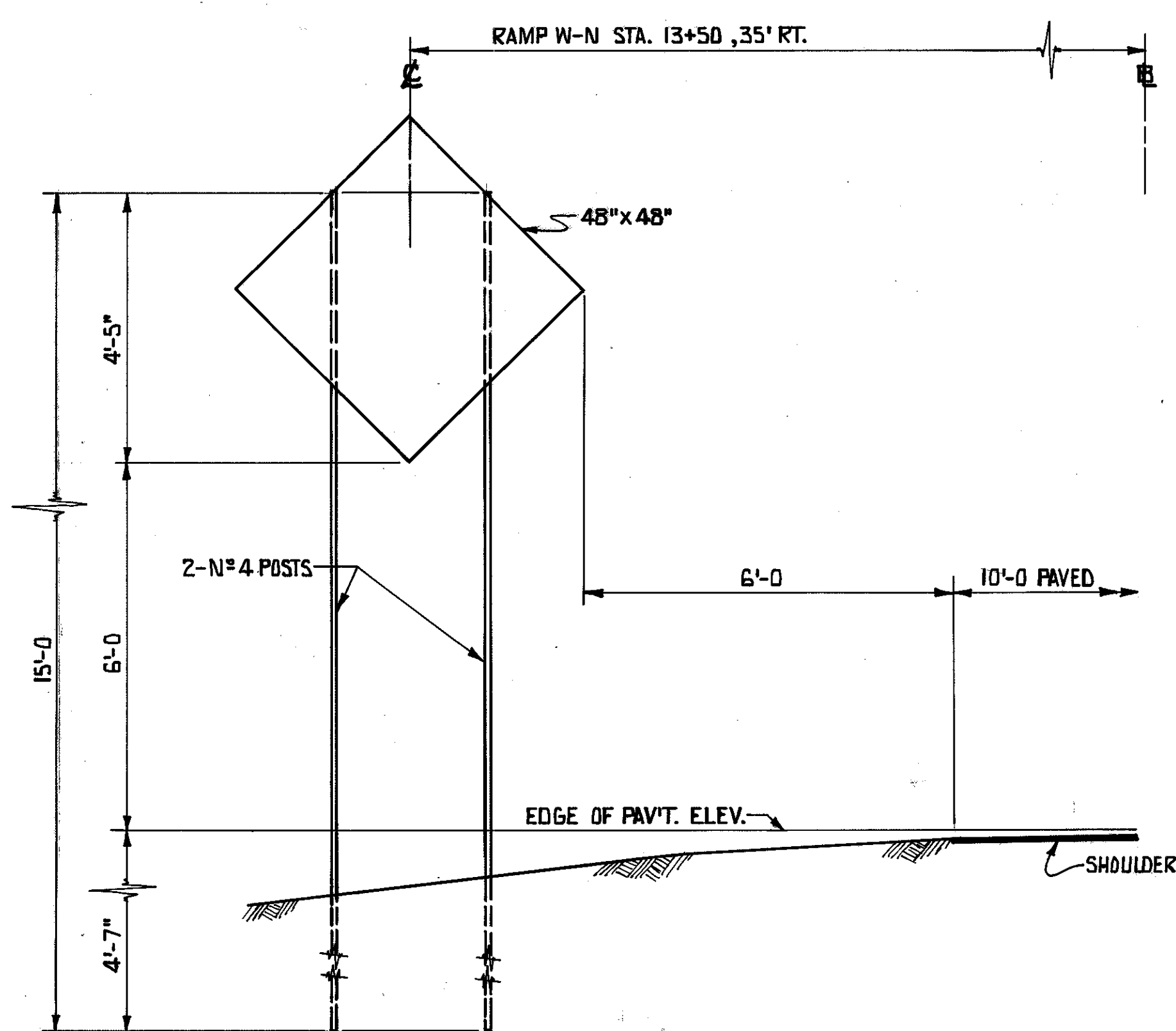
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PLAN SHT. 208



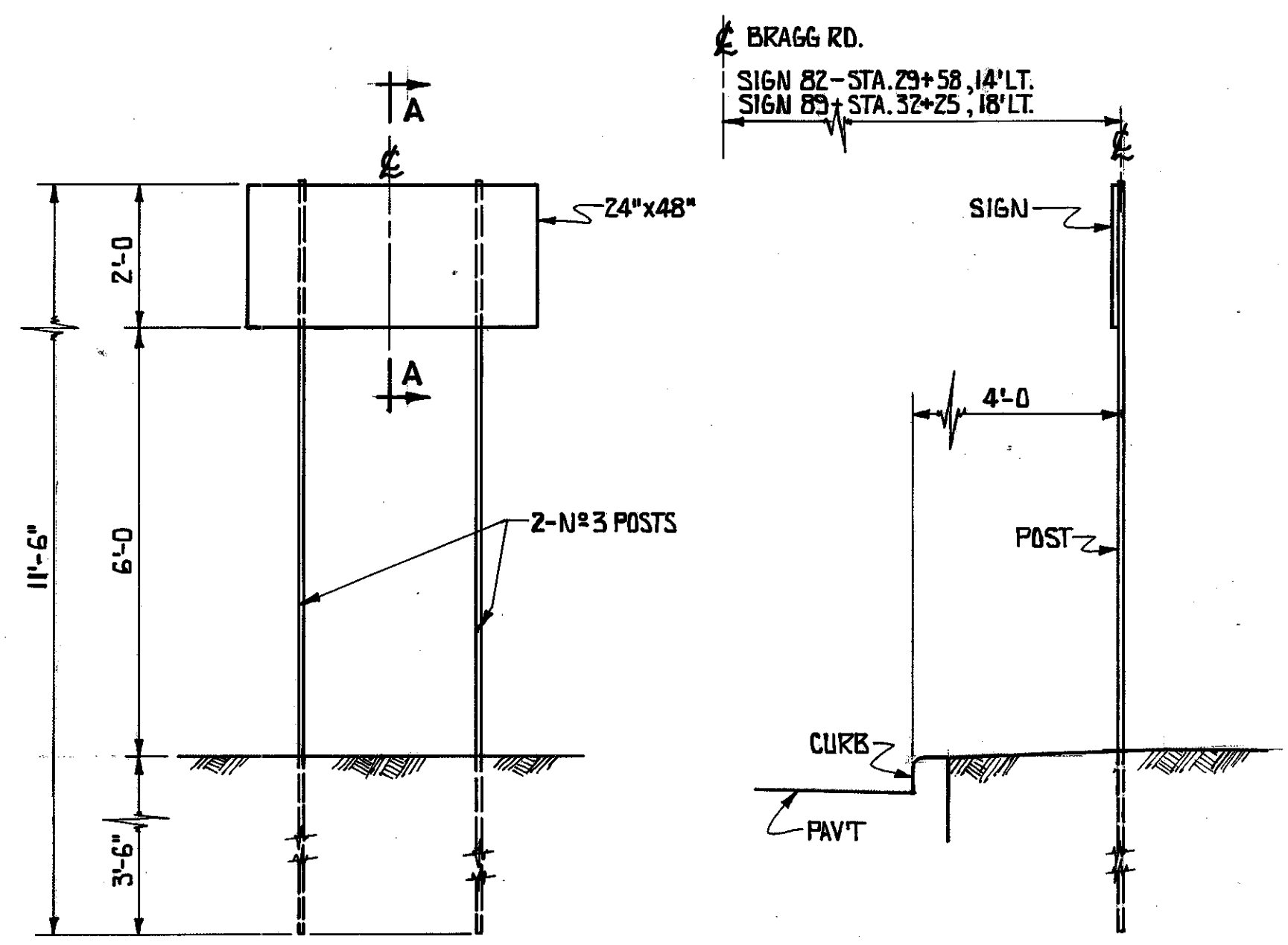
SIGN: 99
PLAN SHT. 208



SIGN: 100
PLAN SHT. 208



SIGN: 101
PLAN SHT. 208



SIGNS: 82 & 89
PLAN SHT. 202

SECTION A-A

FOR QUANTITIES SEE SHT. 189 & 190

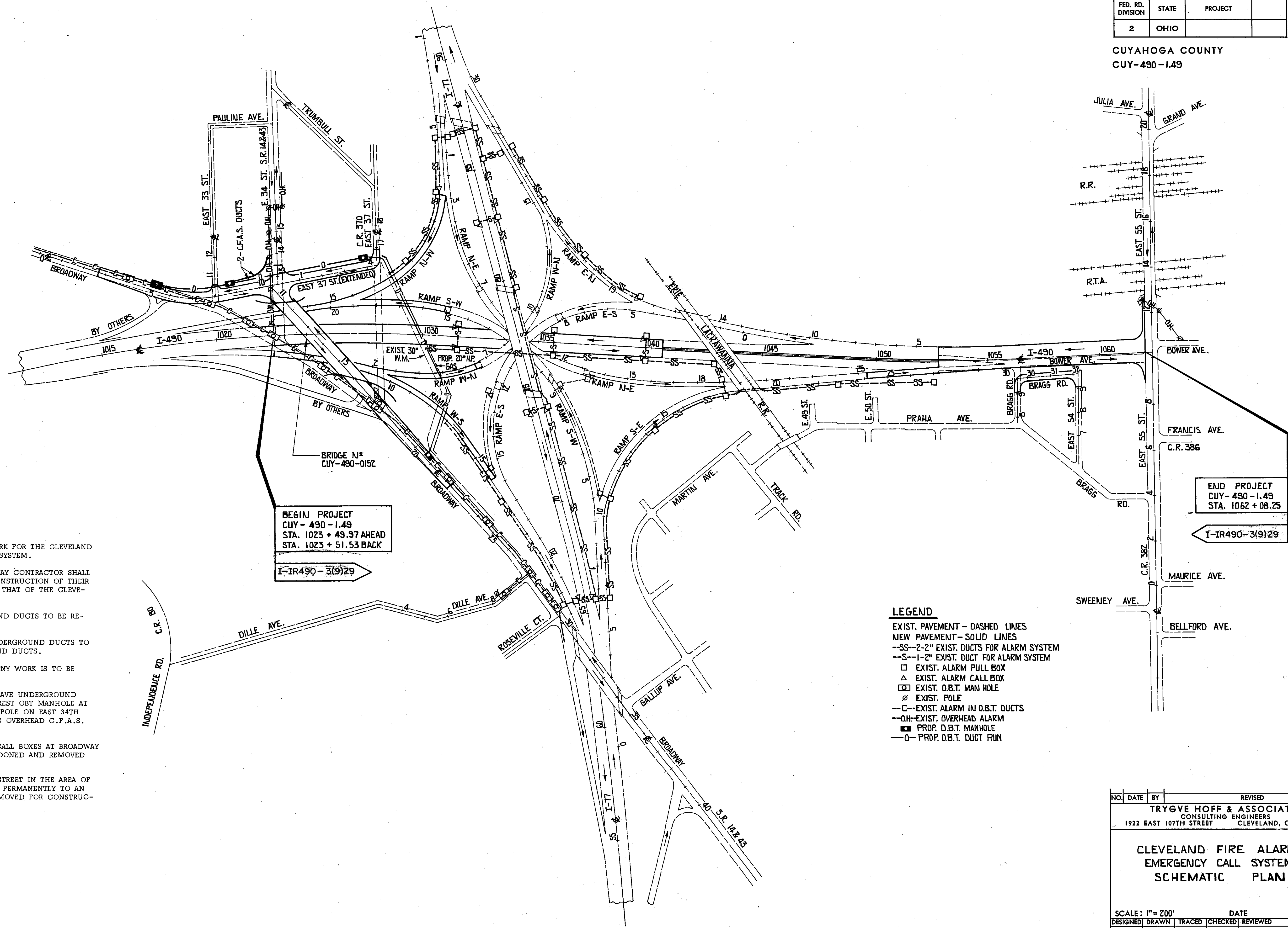
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|---|-------|--------|---------|
| NO. | DATE | BY | REVISED |
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |
| SIGN ELEVATIONS SIGNS: 98, 99, 100, 101, 82 & 89 | | | |
| SCALE | DATE | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| RLH II | | JRH | RLH |
| | | | 5/83 |

CONT. No. SHEET ACCT. No.

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

228
261

CUYAHOGA COUNTY
CUY-490-1.49



NOTES

- HIGHWAY CONTRACTOR HAS NO WORK FOR THE CLEVELAND FIRE ALARM AND EMERGENCY CALL SYSTEM.
- PROJECT ENGINEER AND THE HIGHWAY CONTRACTOR SHALL INSURE THAT THE SEQUENCE OF CONSTRUCTION OF THEIR WORK WILL BE COORDINATED WITH THAT OF THE CLEVELAND FIRE DEPARTMENT.
- OHIO BELL TELEPHONE UNDERGROUND DUCTS TO BE RELOCATED.
- CLEVELAND FIRE ALARM SYSTEM UNDERGROUND DUCTS TO BE RELOCATED IN OBT UNDERGROUND DUCTS.
- C.F.A.S. TO BE NOTIFIED BEFORE ANY WORK IS TO BE DONE TO THEIR DUCTS OR LINES.
- EAST 34TH STREET - C.F.A.S. TO HAVE UNDERGROUND DUCT LATERAL RUNNING FROM NEAREST OBT MANHOLE AT EAST 33RD STREET TO THE NEAREST POLE ON EAST 34TH STREET TO CONNECT WITH EXISTING OVERHEAD C.F.A.S. LINES.
- EXISTING POLICE AND FIRE ALARM CALL BOXES AT BROADWAY AND EAST 37TH STREET TO BE ABANDONED AND REMOVED BY C.F.A.S.
- EXISTING CALL BOX ON EAST 55TH STREET IN THE AREA OF R.T.A. BUILDING TO BE RELOCATED PERMANENTLY TO AN EXISTING POLE THAT WILL NOT BE MOVED FOR CONSTRUCTION.

BEGIN PROJECT
CUY - 490 - 1.49
STA. 1023 + 49.97 AHEAD
STA. 1023 + 51.53 BACK

I-IR490-3(9)29

END PROJECT
CUY - 490 - 1.49
STA. 1062 + 08.25

I-IR490-3(9)29

LEGEND

- EXIST. PAVEMENT - DASHED LINES
- NEW PAVEMENT - SOLID LINES
- SS--2-2" EXIST. DUCTS FOR ALARM SYSTEM
- S--1-2" EXIST. DUCT FOR ALARM SYSTEM
- EXIST. ALARM PULL BOX
- △ EXIST. ALARM CALL BOX
- ◻ EXIST. O.B.T. MAN HOLE
- ⊙ EXIST. POLE
- C-- EXIST. ALARM IN O.B.T. DUCTS
- OH-- EXIST. OVERHEAD ALARM
- PROP. D.B.T. MANHOLE
- O— PROP. O.B.T. DUCT RUN

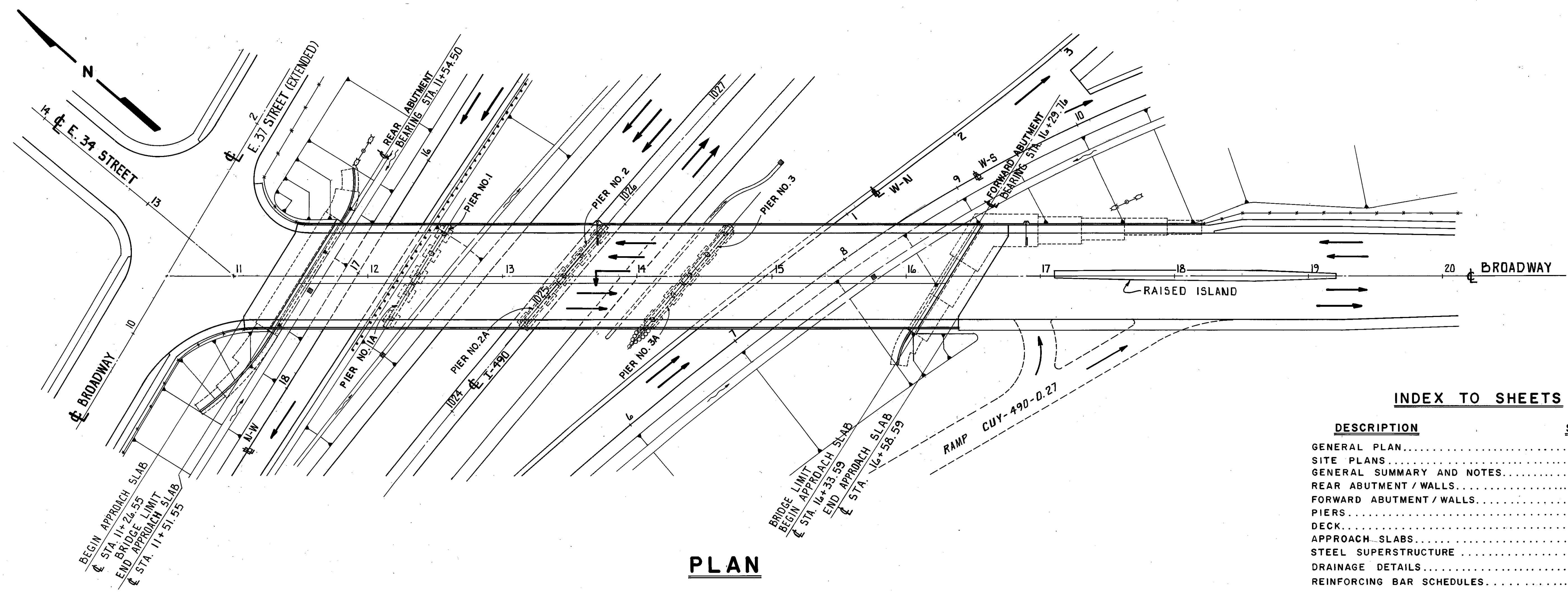
CONT. No. SHEET ACCT. No.

| NO. | DATE | BY | REVISED |
|--|------|----|---------|
| TRYGVE HOFF & ASSOCIATES CONSULTING ENGINEERS 1922 EAST 107TH STREET CLEVELAND, OHIO 44106 | | | |

CLEVELAND FIRE ALARM & EMERGENCY CALL SYSTEM SCHEMATIC PLAN

| | | | |
|------------------|---------------|--------------|---------------|
| SCALE: 1" = 200' | | DATE | |
| DESIGNED: JRH | DRAWN: RLH II | CHECKED: JRH | REVIEWED: RLH |
| | | 5/83 | |

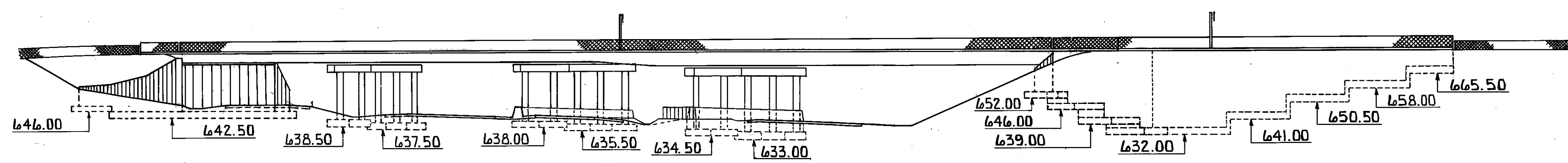
CUY-490-1.49



PLAN

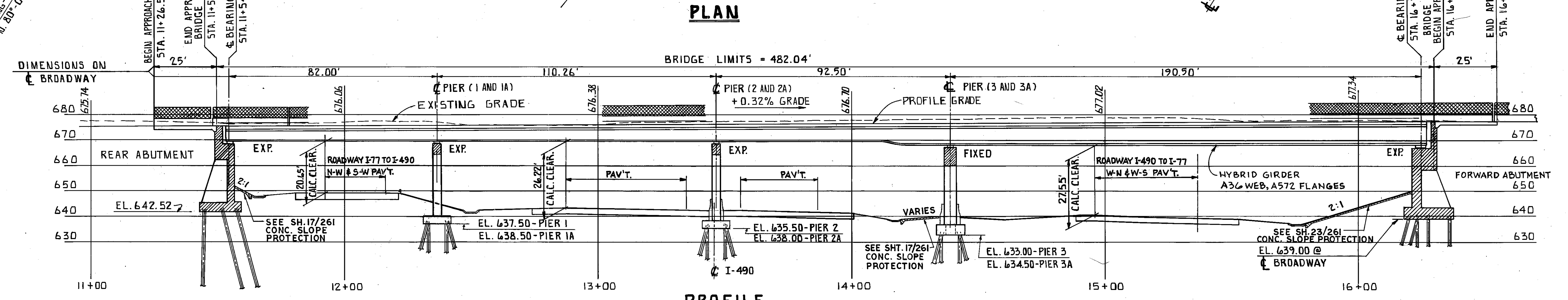
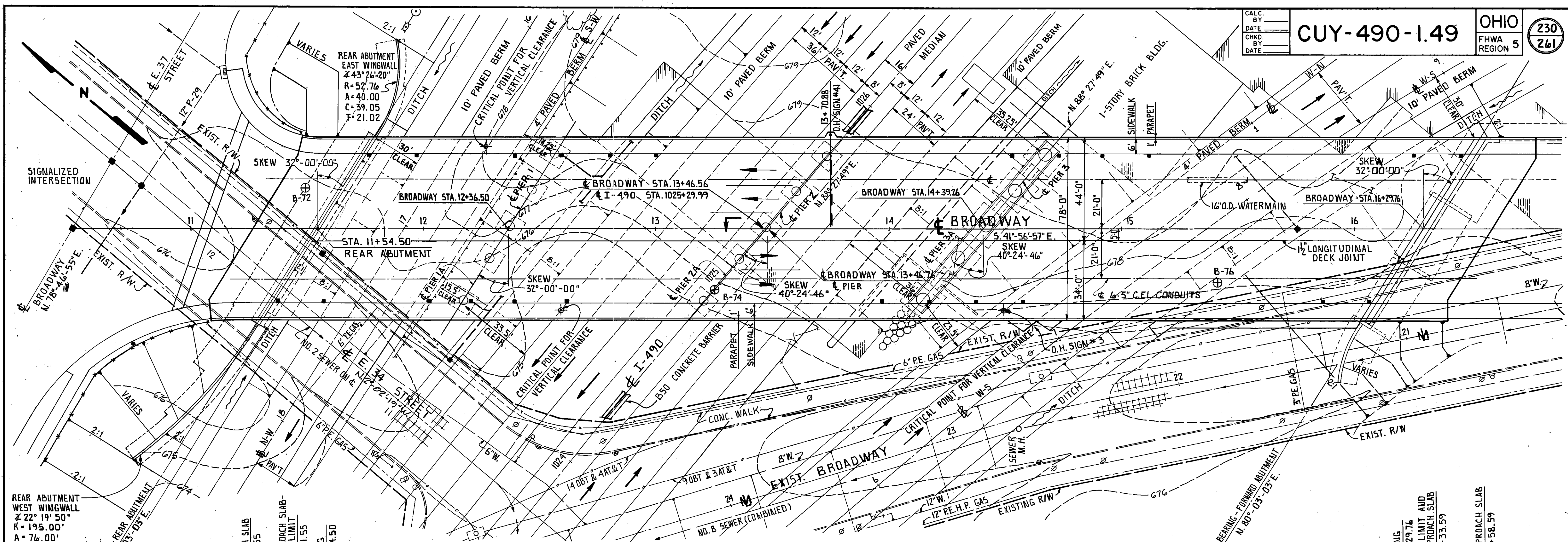
INDEX TO SHEETS

| DESCRIPTION | SHEET NUMBER |
|--------------------------------|--------------|
| GENERAL PLAN..... | 1 |
| SITE PLANS..... | 2-3 |
| GENERAL SUMMARY AND NOTES..... | 4 |
| REAR ABUTMENT / WALLS..... | 5-14 |
| FORWARD ABUTMENT / WALLS..... | 15-31 |
| PIERS..... | 32-35 |
| DECK..... | 36-42, 42A |
| APPROACH SLABS..... | 43 |
| STEEL SUPERSTRUCTURE..... | 44-50, 50A |
| DRAINAGE DETAILS..... | 51-54 |
| REINFORCING BAR SCHEDULES..... | 55-63 |



PROFILE
(PILES ARE NOT SHOWN)

| | | | | | | |
|---|-------|--|---------|----------|------|---------|
| WESTON DESIGNERS CONSULTANTS | | A Business Trust 3659 GREEN ROAD SUITE 215 CLEVELAND, OHIO 44122 | | 1 / 63 | | |
| GENERAL PLAN | | | | | | |
| BRIDGE NO. CUY-490-0152 | | | | | | |
| I-490 UNDER RELOC. BROADWAY | | | | | | |
| CUYAHOGA COUNTY STA. 11+51.55 TO STA. 16+33.59 | | | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| CAP | PRB | | JRH | JRH | 5/83 | |



NOTE:
 EARTHWORK LIMITS SHOWN ARE APPROXIMATE.
 ACTUAL SLOPES SHALL CONFORM TO PLAN
 CROSS-SECTIONS.

STEEL BEARING PILES
 ABUTMENTS, PIERS, WINGWALLS ARE FOUNDED ON 12HP53 STEEL PILES WITH
 AN ALLOWABLE BEARING CAPACITY OF 65 TONS/PILE, PILE LENGTH 50 FEET.

⊕ DENOTES BORING LOCATION

PROPOSED STRUCTURE

TYPE: TWIN BRIDGE STRUCTURES ON TWIN PIERS, 4-SPAN CONTINUOUS COMPOSITE
 (EXCLUDING THE 3RD SPAN WHICH IS NON-COMPOSITE),
 HYBRID WELDED PLATE GIRDERS WITH REINFORCED CONCRETE DECK AND
 REINFORCED CONCRETE SUBSTRUCTURE.

SPANS: (1) 82'-0", (2) 110'-3 1/8", (3) 92'-6", (4) 190'-6" ON & BROADWAY
 ROADWAY: 64'-0" F/F CURB W/6'-0" SIDEWALKS

LIVE LOAD: HS20-44 LOADING CASE 11 & ALTERNATE MILITARY LOADING

SKEW: (32°-00'-00") REAR, FORWARD ABUTMENT, PIERS NO. 1 & 1A
 (40°-24'-46") PIERS NO. 2 & 2A, 3 & 3A.

SURFACE COURSE: 1 1/4" LATEX MODIFIED CONCRETE

APPROACH SLABS: 25'-0", AS-1-81

ALIGNMENT: TANGENT

TRAFFIC VOLUME: 19,500 ADT (2000); 975 ADTT.

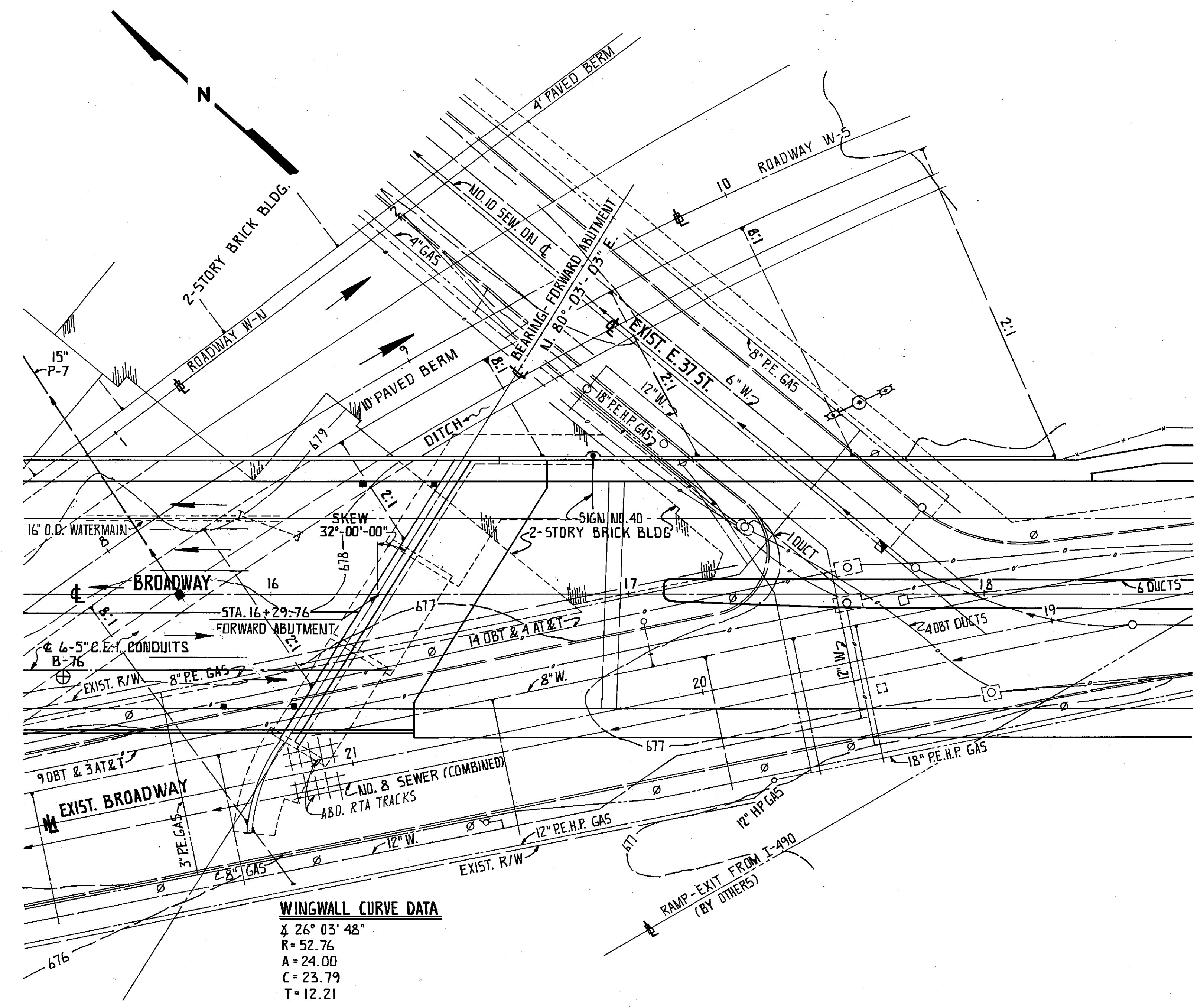
WESTON A Business Trust
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

2/63

SITE PLAN
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY
 CUYAHOGA COUNTY STA. 11+51.55
 TO STA. 16+33.59

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| PRB | JRH | RLH | 5/83 | 10/83 | | |

CUY-490-1.49



| | | | | | | |
|-------------------------------|-------|--------|---------|----------|------|-----------------------|
| WESTON | | | | | | 3/63 |
| A BUSINESS TRUST | | | | | | |
| 3659 GREEN ROAD | | | | | | CLEVELAND, OHIO 44122 |
| SITE PLAN | | | | | | |
| BRIDGE NO. CUY - 490 - 0152 | | | | | | |
| I-490 UNDER RELOC. BROADWAY | | | | | | |
| CUYAHOGA COUNTY STA. 11+51.55 | | | | | | |
| TO STA. 16+33.59 | | | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| PRB | | | JRH | RLH | 2/53 | |

ESTIMATED QUANTITIES

I FUNDS

CALC. BY JRH
DATE 4/83
CHKD. BY CAP
DATE 8/83

CUY-490-1.49

OHIO
FHWA REGION 5

232
261

| LINE NO. | ITEM | TOTAL | UNIT | DESCRIPTION | ABUTMENTS | PIERS | SUPER STRUCTURE | RETAINING WALLS | GENERAL | LINE NO. |
|----------|---------|------------|----------|--|-----------|---------|-----------------|-----------------|--------------|----------|
| 1 | 203 | 16,050 | CU. YD. | EMBANKMENT, AS PER PLAN | 9,664 | | | 6,386 | | 1 |
| 2 | 503 | 676 | CU. YD. | UNCLASSIFIED EXCAVATION | | 676 | | | | 2 |
| 3 | 503 | 19,740 | CU. YD. | UNCLASSIFIED EXCAVATION, AS PER PLAN | 11,482 | | | 8,258 | | 3 |
| 4 | 503 | | LUMP | COFFERDAMS, CRIBS, AND SHEETING | | | | | LUMP | 4 |
| 5 | | | | | | | | | | 5 |
| 6 | | | | | | | | | | 6 |
| 7 | 505 | | LUMP | PILE DRIVING EQUIPMENT MOBILIZATION | | | | | LUMP | 7 |
| 8 | 506 | | LUMP | STATIC LOAD TEST | | | | | LUMP | 8 |
| 9 | 506 | 2 | EACH | SUBSEQUENT STATIC LOAD TEST | | | | | 2 | 9 |
| 10 | 507 | 23,900 | LIN. FT. | STEEL PILES, HP12x53 | 8,550 | 6,400 | | 8,950 | | 10 |
| 11 | | | | | | | | | | 11 |
| 12 | 509 | 314,986 | LB. | REINFORCING STEEL, GRADE 60 | 125,523 | 70,444 | | 119,019 | | 12 |
| 13 | 511 | 420 | CU. YD. | CLASS C CONCRETE, PIERS ABOVE FOOTINGS | | 420 | | | | 13 |
| 14 | 511 | 654 | CU. YD. | CLASS C CONCRETE, ABUTMENTS ABOVE FOOTINGS | 654 | | | | | 14 |
| 15 | 511 | 518 | CU. YD. | CLASS C CONCRETE, WALLS | | | | 518 | | 15 |
| 16 | 511 | 1,425 | CU. YD. | CLASS C CONCRETE, FOOTINGS | 525 | 270 | | 630 | | 16 |
| 17 | 511 | 1,277 | CU. YD. | CLASS S CONCRETE, SUPERSTRUCTURE (SEE PROPOSAL NOTE) | | | 1,277 | | | 17 |
| 18 | | | | | | | | | | 18 |
| 19 | 512 | 1,492 | SQ. YD. | TYPE A WATERPROOFING | 683 | | | 809 | | 19 |
| 20 | | | | | | | | | | 20 |
| 21 | | | | | | | | | | 21 |
| 22 | | | | | | | | | | 22 |
| 23 | 513 | 1,379,141* | LB. | STRUCTURAL STEEL (AISC CATEGORY III), as per plan (See Proposal Note) | | | 1,379,141 | | | 23 |
| 24 | | | | | | | | | | 24 |
| 25 | 513 | 5,265 | EACH | WELDED STUD SHEAR CONNECTORS (SEE PROPOSAL NOTE) | | | 5,265 | | | 25 |
| 26 | | | | | | | | | | 26 |
| 27 | | | | | | | | | | 27 |
| 28 | 514 | 1,379,141* | LB. | FIELD PAINTING OF NEW STRUCTURAL STEEL, SYSTEM A | | | 1,379,141 | | | 28 |
| 29 | | | | | | | | | | 29 |
| 30 | 516 | 180 | LIN. FT. | STRUCTURAL STEEL EXPANSION JOINTS, INCLUDING ELASTOMERIC DRAINAGE TROUGH, AS PER PLAN | | | 180 | | | 30 |
| 31 | 516 | 476 | LIN. FT. | STRUCTURAL EXPANSION JOINTS INCLUDING ELASTOMERIC COMPRESSION SEALS, 2 1/2" WIDTH, AS PER PLAN | | | 476 | | | 31 |
| 32 | 516 | 9 | EACH | STEEL POT BEARINGS, 125 KIPS | 9 | | | | | 32 |
| 33 | 516 | 18 | EACH | STEEL POT BEARINGS, 300 KIPS | 9 | 9 | | | | 33 |
| 34 | 516 | 9 | EACH | STEEL POT BEARINGS, 350 KIPS | | 9 | | | | 34 |
| 35 | 516 | 9 | EACH | STEEL POT BEARINGS, 600 KIPS | | 9 | | | | 35 |
| 36 | | | | | | | | | | 36 |
| 37 | | | | | | | | | | 37 |
| 38 | 516 | 553 | LIN. FT. | PVC WATERSTOP, AS PER PLAN | 397 | | | 156 | | 38 |
| 39 | 516 | 180 | LIN. FT. | JOINT SEALER | | | | | 180 APP SLAB | 39 |
| 40 | 517 | 1,202 | LIN. FT. | RAILING (CONCRETE PARAPET AND CHAIN LINK FENCE) | 12 | | 957 | 233 | | 40 |
| 41 | | | | | | | | | | 41 |
| 42 | 518 | 868 | CU. YD. | POROUS BACKFILL | 459 | | | 409 | | 42 |
| 43 | 518 | 499 | LIN. FT. | 6" PERFORATED HELICAL CORRUGATED STEEL PIPE, 707.02, AS PER PLAN | 200 | | | 299 | | 43 |
| 44 | 518 | 383 | LIN. FT. | 6" NON-PERFORATED HELICAL CORRUGATED STEEL PIPE, INCLUDING SPECIALS, 707.02 | 189 | | | 194 | | 44 |
| 45 | | | | | | | | | | 45 |
| 46 | | | | | | | | | | 46 |
| 47 | 518 | 24 | EACH | SCOPPERS, INCLUDING SUPPORTS | | | 24 | | | 47 |
| 48 | 518 | 458 | LIN. FT. | 8" PIPE HORIZONTAL CONDUCTORS, INCLUDING SPECIALS | 184 | 294 | | | | 48 |
| 49 | 518 | 191 | LIN. FT. | 8" STANDARD PIPE DOWNSPOUT, GALVANIZED STEEL 707.08, INCLUDING SPECIALS | 105 | 86 | | | | 49 |
| 50 | 518 | 12 | LIN. FT. | 10" STANDARD PIPE DOWNSPOUT, GALVANIZED STEEL 707.08, INCLUDING SPECIALS | | 12 | | | | 50 |
| 51 | 523 | 12 | HR. | DYNAMIC LOAD TESTS | | | | | 12 | 51 |
| 52 | | | | | | | | | | 52 |
| 53 | 625 | | | SEE SHEETS 140-165 FOR LIGHTING SUMMARY | | | | | | 53 |
| 54 | | | | | | | | | | 54 |
| 55 | | | | | | | | | | 55 |
| 56 | | | | | | | | | | 56 |
| 57 | | | | | | | | | | 57 |
| 58 | | | | | | | | | | 58 |
| 59 | 824 | 443,241* | LB. | EPOXY COATED REINFORCING STEEL, GRADE 60 | 10,423 | 109,408 | 322,133 | 1,277 | | 59 |
| 60 | 845 | 3,367 | SQ. YD. | LATEX MODIFIED CONCRETE OVERLAY (SEE PROPOSAL NOTE) | | | 3,367 | | | 60 |
| 61 | 845 | 36 | CU. YD. | LATEX MODIFIED CONCRETE (BACKWALL & DECK), AS PER PLAN | 24 | | 12 | | | 61 |
| 62 | SPECIAL | 4,576 | SQ. YD. | SEALING OF CONCRETE SURFACES, (SEE PROPOSAL NOTE) | 666 | 983 | 2,229 | 698 | | 62 |

GENERAL NOTES

1. STANDARD DRAWINGS AND SUPPLEMENTAL SPECIFICATIONS REFERENCE SHALL BE MADE TO STANDARD DRAWINGS: AS-1-81 SHEET 1 OF 3 DATED 11-27-81
SD-1-69 SHEET 3 OF 4 DATED 6-12-69
- ADD TO SUPPLEMENTAL SPECIFICATIONS:
 - 836 DATED 3-12-75
 - 845 DATED 1-13-84
 - 824 DATED 10-8-82
 - 849 DATED 10-19-81
 - 853 DATED 6-26-78
 - 953 DATED 8-21-80
 - 956 DATED 6-26-78
2. DESIGN SPECIFICATIONS
THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1977, INCLUDING THE 1978, 1979, 1980, 1981, AND 1982 INTERIM SPECIFICATIONS AND THE OHIO "SUPPLEMENT" TO THESE SPECIFICATIONS.
3. DESIGN LOADING
DESIGN LOADING - HS20-44 CASE II AND THE ALTERNATE MILITARY LOADING.
4. DESIGN STRESSES
CONCRETE CLASS S - UNIT STRESS 1500 P.S.I. (SUPERSTRUCTURE).
CONCRETE CLASS C - UNIT STRESS 1333 P.S.I. (SUBSTRUCTURE).
REINFORCING STEEL ASTM A615, A616, OR A617.
GRADE 60 - UNIT STRESS 24,000 P.S.I.
SPIRAL REINFORCEMENT MAY BE PLAIN BARS, ASTM A82 OR A615.
STRUCTURAL STEEL ASTM A572 - UNIT STRESS 27,000 P.S.I.
A36 - UNIT STRESS 20,000 P.S.I.
5. DECK PROTECTION METHOD - EPOXY COATED REINFORCING STEEL, LATEX MODIFIED CONCRETE OVERLAY;
- 5A. MONOLITHIC WEARING SURFACES ARE ASSUMED, FOR DESIGN PURPOSES, TO BE 1" THICK.
6. PILES NOT DRIVEN TO BEDROCK
THE DESIGN LOAD FOR THE ABUTMENT AND PIER PILES IS 65 TONS PER PILE. ESTIMATED PILE LENGTH 50 FEET.
7. MAINTENANCE OF TRAFFIC
SEE MAINTENANCE OF TRAFFIC PLANS - SHEETS 98 THRU 101.
8. UTILITY LINES
ALL EXPENSE INVOLVED IN RELOCATING (INSTALLING) THE AFFECTED UTILITY LINES SHALL BE BORNE BY THE OWNER(S). THE CONTRACTOR AND OWNER(S) ARE REQUESTED TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WILL BE HELD TO A MINIMUM.
9. CROSS FRAMES AND LATERAL SUPPORTS SHALL NOT BE PERMANENTLY FASTENED IN ANY SPAN UNTIL THE DECK SLAB, WALK, PARAPET, AND WATERMAIN ARE COMPLETED; HOWEVER SUFFICIENT BRACING SHALL BE INSTALLED TO MEET THE REQUIREMENTS OF 501.06; ERECTION BOLTS SHALL BE USED. OTHER REQUIREMENTS ARE TO BE 513.22.
10. SEE TRAFFIC CONTROL PLANS - SHEETS 184-227.
11. SEE LIGHTING PLANS - SHEETS 140-165.

GENERAL NOTES

CONTINUED ON SHEET 5/63.

* INCLUDES 4,212 LB. STEEL FOR C.E.I. SUPPORTS at 100% CEI

* Cost Participation for this quantity shall be 80% Normal and 20% State, 90% Normal Participation, 10% State

4 / 63

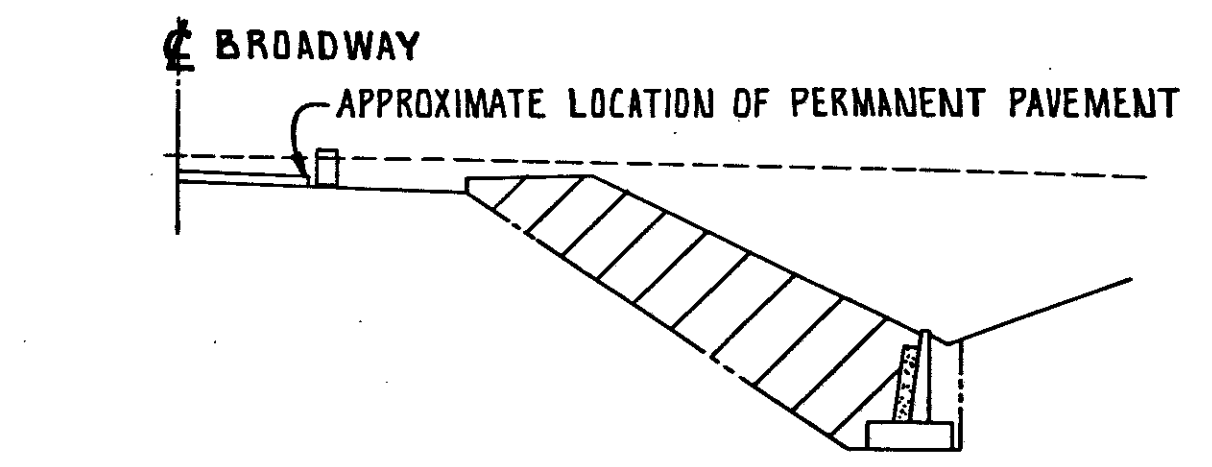
WESTON A Business Trust
DESIGNERS CONSULTANTS
3058 GREEN ROAD SUITE 215
CLEVELAND, OHIO 44122

ESTIMATED QUANTITIES

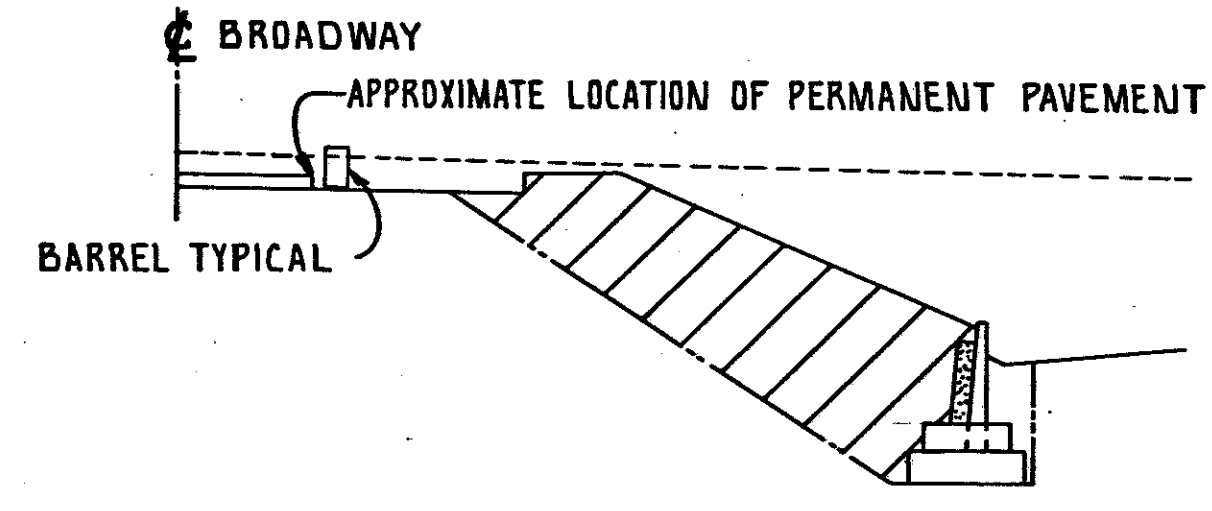
BRIDGE NO. CUY-490-0152
I-490 UNDER RELOC. BROADWAY

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| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| CAP | PRB | | JRH | RLH | 5/83 | 10/83 |

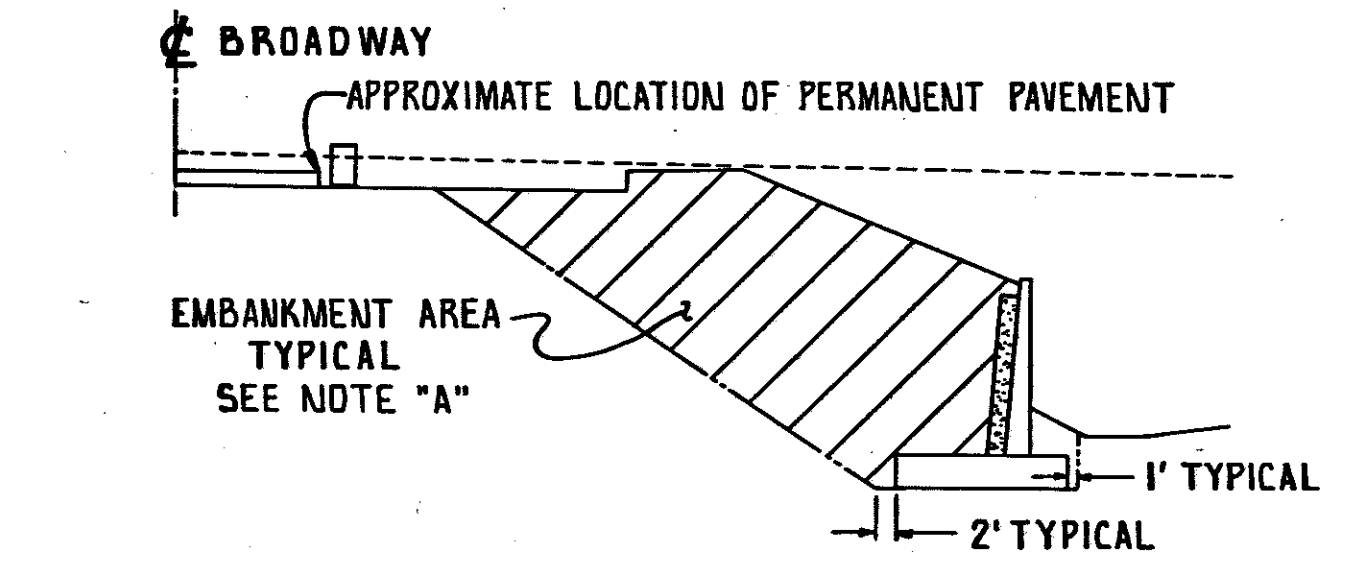
Revised 2-26-85 Revised 7-3-84



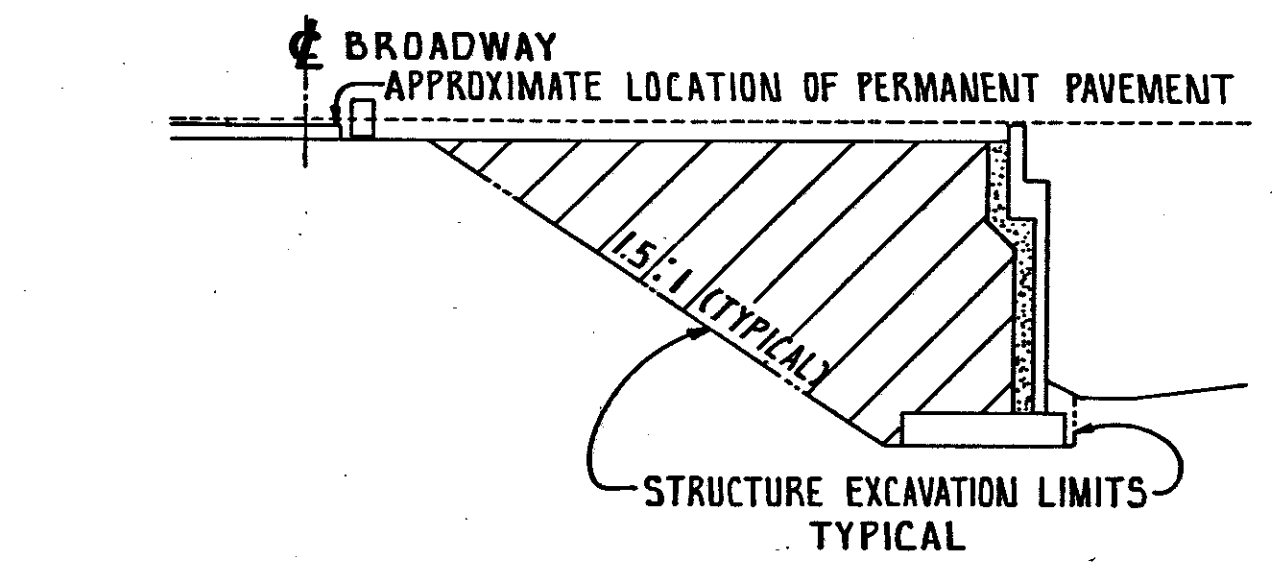
SECTION A-A



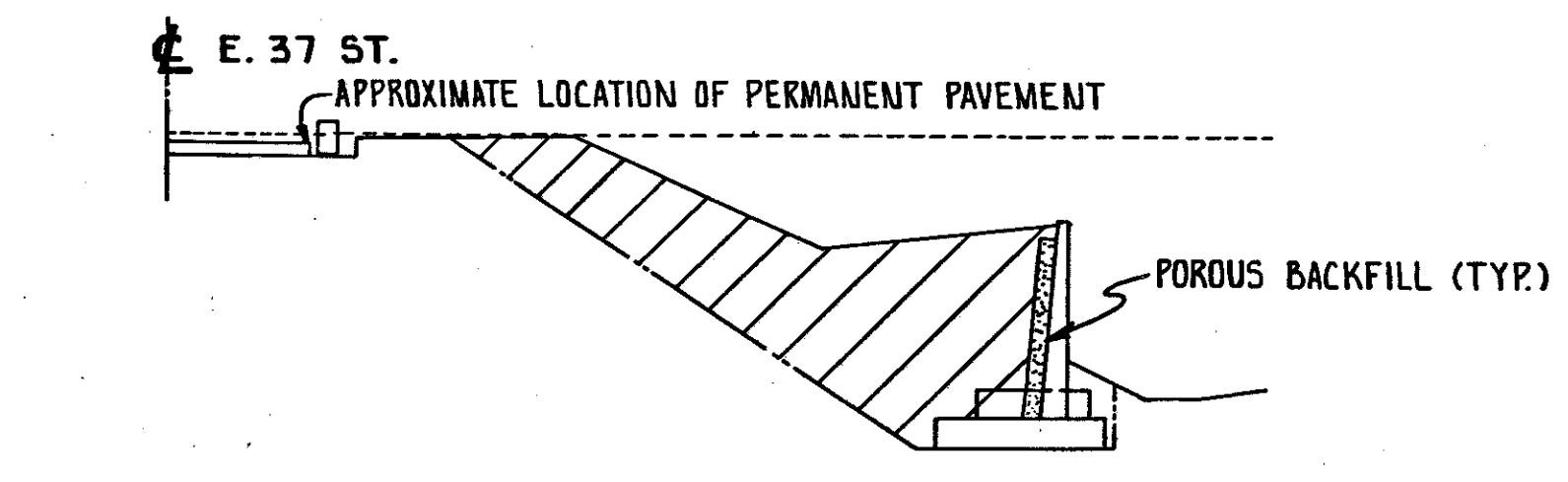
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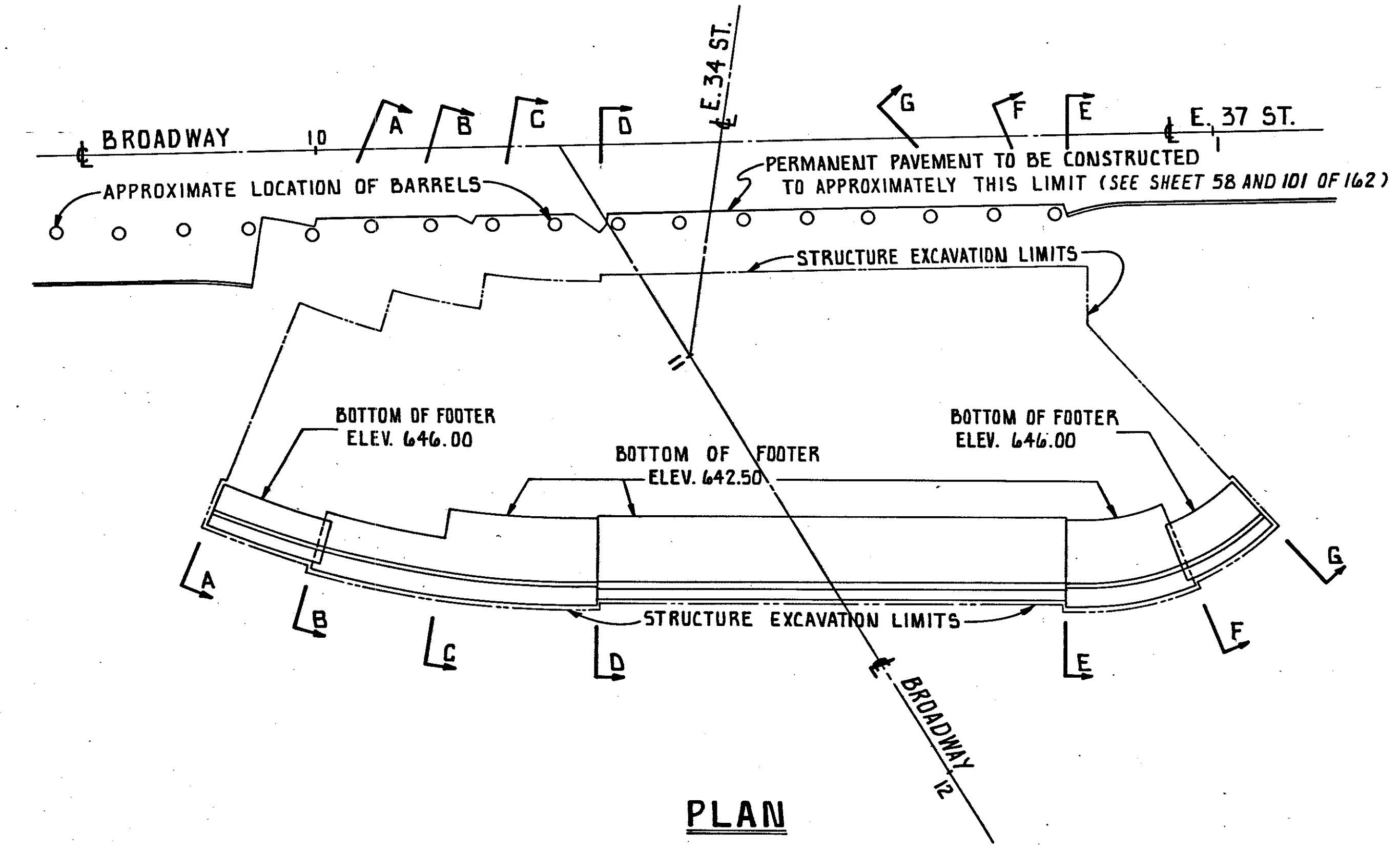
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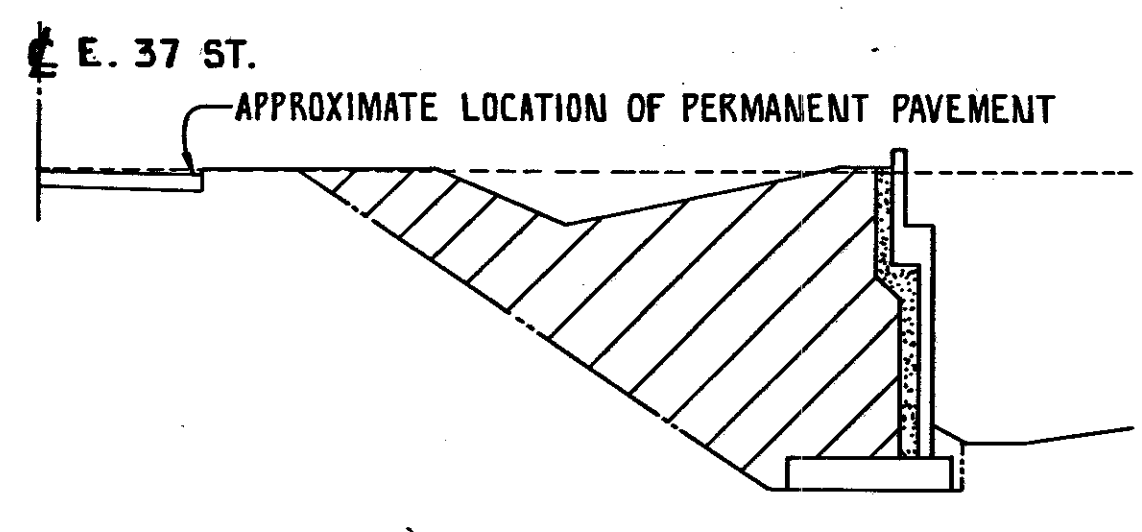
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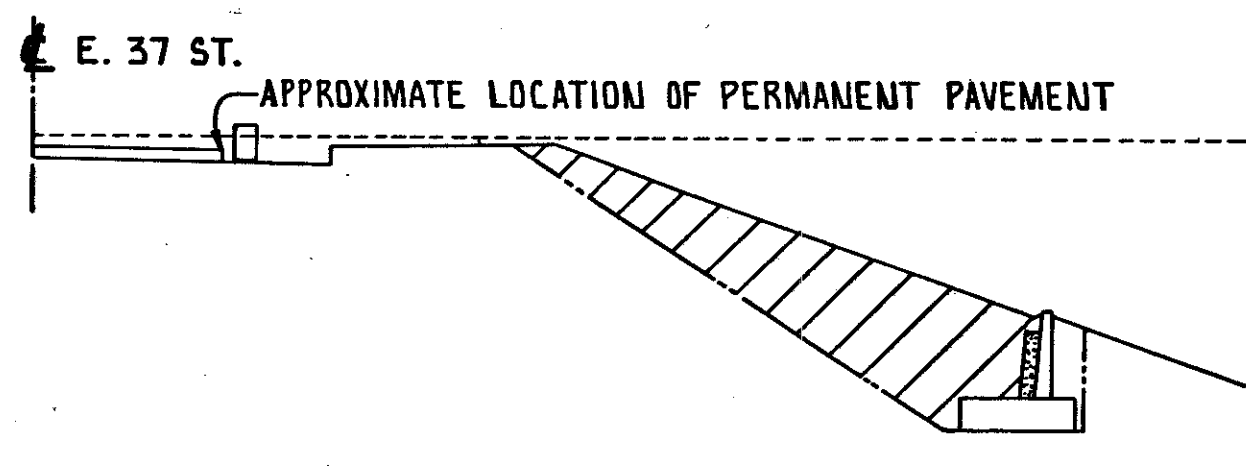
SECTION F-F



PLAN



SECTION E-E



SECTION G-G

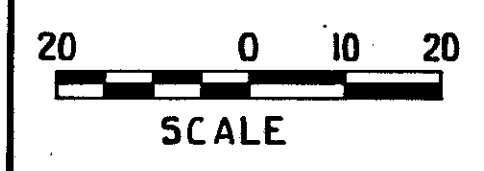
GENERAL NOTES
CONTINUED FROM SHEET 4/63.

12. 6" HELICAL PIPE SHALL MEET 707.02 AND PERFORATED PIPE BACKFILL SHALL BE SIZE 89 AND EXTEND A MINIMUM OF 18" AROUND THE PIPE OR TO CONCRETE.

13. ITEM SPECIAL - SEALING OF CONCRETE SURFACES
A CONCRETE SEALER, EITHER SILANE OR AN EPOXY SEALER, SHALL BE APPLIED TO THE FOLLOWING CONCRETE SURFACES: SIDEWALKS, MEDIANS, BACKWALLS, CURBS, PARAPETS (ALL SIDES), PIERS AND PIER CAPS LOCATED ADJACENT TO A ROADWAY, ABUTMENTS, EDGES OF DECK, THE UNDERSIDE OF DECK BENEATH THE JOINT AT THE ABUTMENTS, AND THE UNDERSIDE OF THE DECK EXTENDING BEYOND THE EXTERIOR BEAMS. SEE THE PROPOSAL FOR SURFACE PREPARATION REQUIREMENTS, APPLICATION RATES, MATERIALS REQUIREMENTS AND APPLICATION PROCEDURES.

14. THE TOP 24" OF BACKWALL AND END 24" AND 33" OF DECK AT EXPANSION JOINTS SHALL BE LATEX MODIFIED CONCRETE MEETING APPLICABLE SECTIONS OF SUPPLEMENTAL SPECIFICATION 845. PAYMENT SHALL BE AT THE UNIT PRICE BID CUBIC YARD FOR "ITEM 845, LATEX MODIFIED CONCRETE, (BACKWALL & DECK), AS PER PLAN" TIMES THE PLAN QUANTITY.

15. APPLY ITEM 512 TYPE A WATERPROOFING TO ABUTMENTS AND WINGWALLS FROM THE FOOTING TO THE APPROACH SLAB SEAT ON ABUTMENTS RETURNING TWO FEET ON COUNTERFORTS, TO WITHIN SIX INCHES OF THE TOP OF WINGWALLS EXCEPT FORWARD ABUTMENT EAST WINGWALL TO ELEVATION 672.5.



NOTE "A":

ITEM 203, EMBANKMENT, AS PER PLAN
THIS ITEM OF WORK SHALL CONSIST OF PLACING A SAND AND GRAVEL EMBANKMENT BEHIND ABUTMENTS AND WALLS IN ACCORDANCE WITH ITEM 203 TO THE LINES AND GRADES SHOWN ON THE BRIDGE PLANS, SHEETS 5/63 AND 15/63.
THE SAND AND GRAVEL GRADATIONS FOR GRANULAR BACKFILL SHALL CONFORM TO THE FOLLOWING:

| SIEVE SIZE | TOTAL PERCENT PASSING |
|------------|-----------------------|
| 2" | 100 |
| 1" | 70-90 |
| 3/4" | 50-85 |
| #4 | 25-50 |
| #40 | 5-20 |
| #200 | 0-10 |

MEASUREMENT AND PAYMENT SHALL BE IN ACCORDANCE WITH ITEM 203 EMBANKMENT.

NOTE "B":

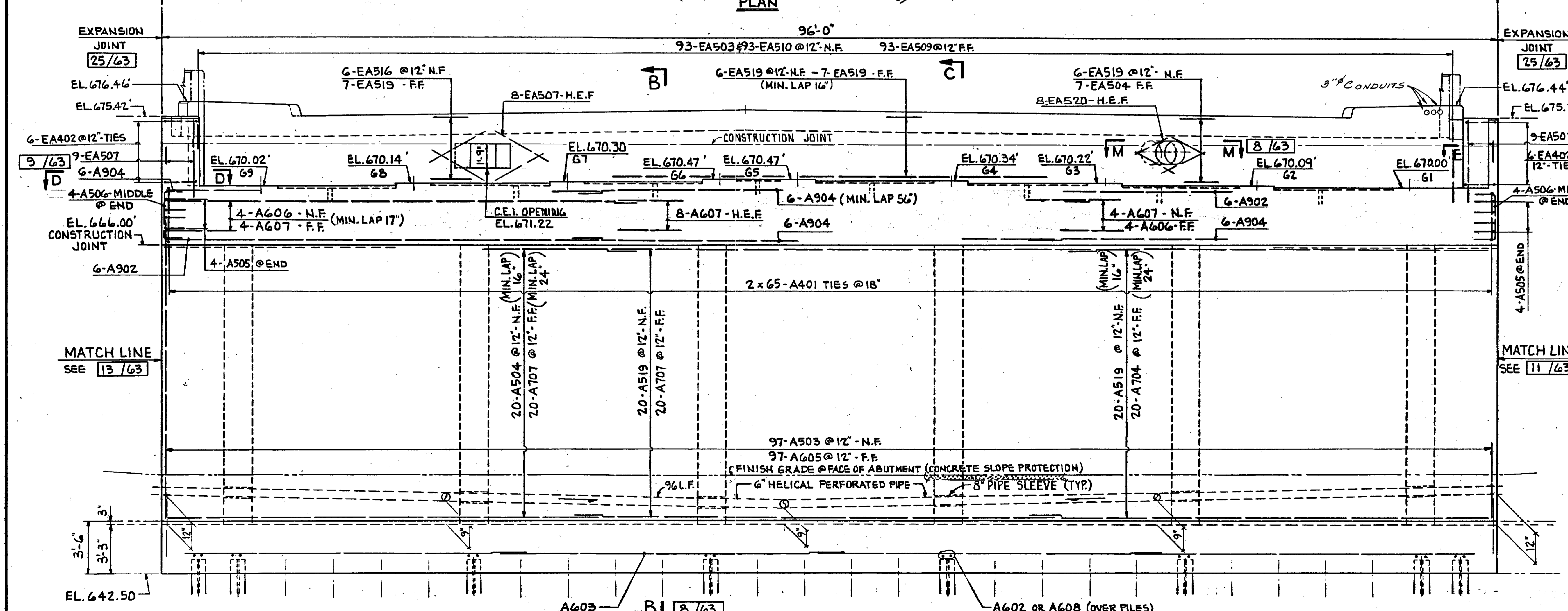
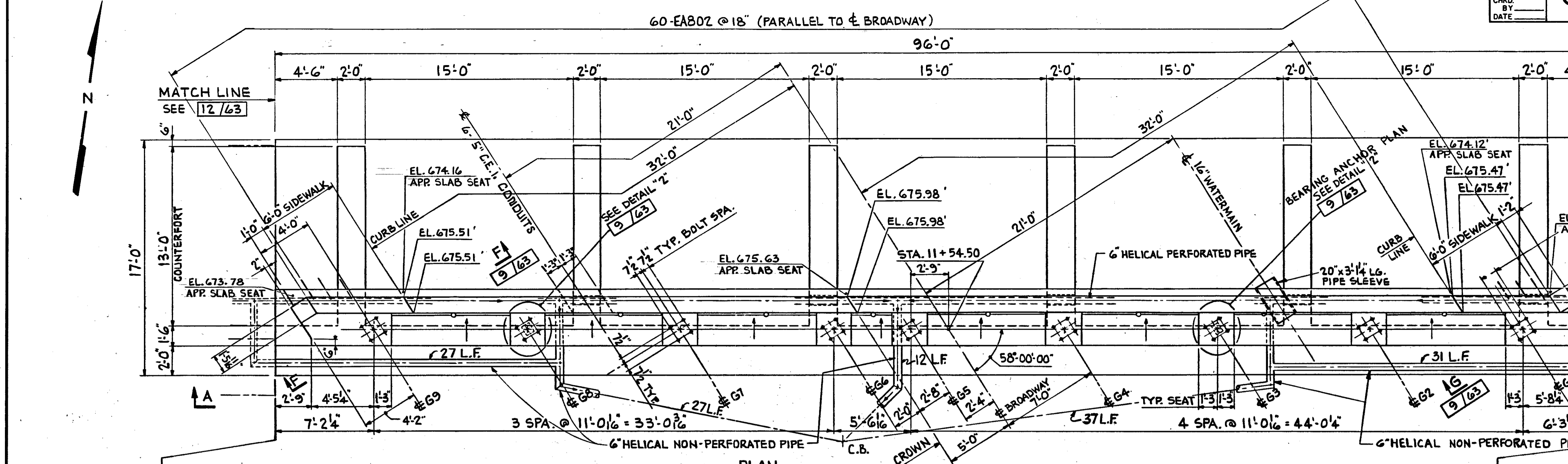
ITEM 503, UNCLASSIFIED EXCAVATION, AS PER PLAN
THIS ITEM OF WORK SHALL CONSIST OF EXCAVATION FOR ABUTMENTS AND WINGWALLS ON THIS PROJECT TO THE STRUCTURE EXCAVATION LIMITS SHOWN ON THE BRIDGE PLANS, SHEETS 5/63 AND 15/63.

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3659 GREEN ROAD SUITE 215
CLEVELAND, OHIO 44122

5/63

**SUBSTRUCTURE
REAR ABUTMENT AND WALLS
EXCAVATION AND EMBANKMENT
BRIDGE NO. CUY-490-0152
I-490 UNDER RELOC. BROADWAY**

| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| CAP | JRH | RLH | 2/83 | 10/83 | | |



- NOTES:**
- FOR NOTES SEE 4/63.
 - BEARING ANCHOR BOLTS SEE 50/63. ALL BEARING ANCHOR BOLTS SHALL BE CAST IN PLACE AND LOCATED AND SUPPORTED BY TEMPLATES. REINFORCING STEEL IN THE VICINITY OF THE BRIDGE SEAT SHALL BE ACCURATELY PLACED TO AVOID INTERFERENCE WITH THE CASTING OF BEARING ANCHOR BOLTS.
 - POROUS BACKFILL, 2 FEET THICK, SHALL EXTEND UP TO THE PLANE OF THE SUBGRADE AND Laterally TO THE ENDS OF THE WINGWALLS.
 - FOR PILE AND FOUNDATION PLAN SEE 7/63.
 - FOR REINFORCING SCHEDULE SEE 55/63.

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 6/63

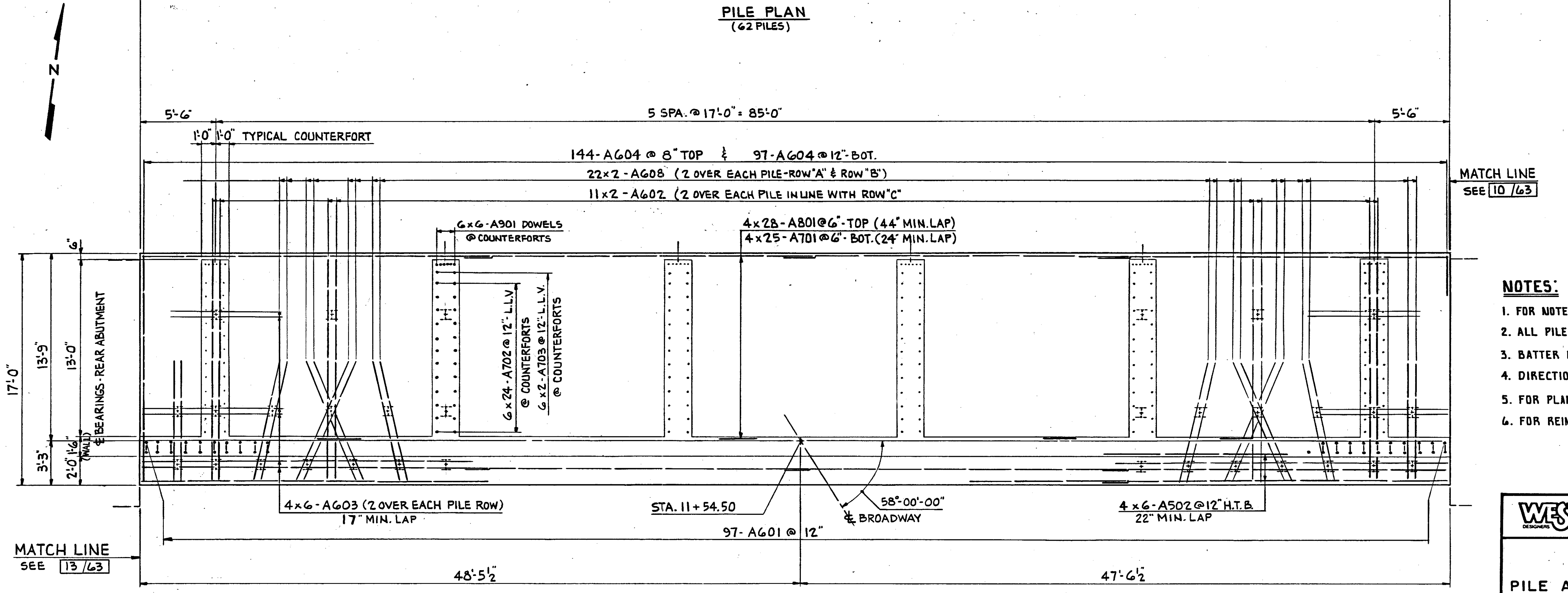
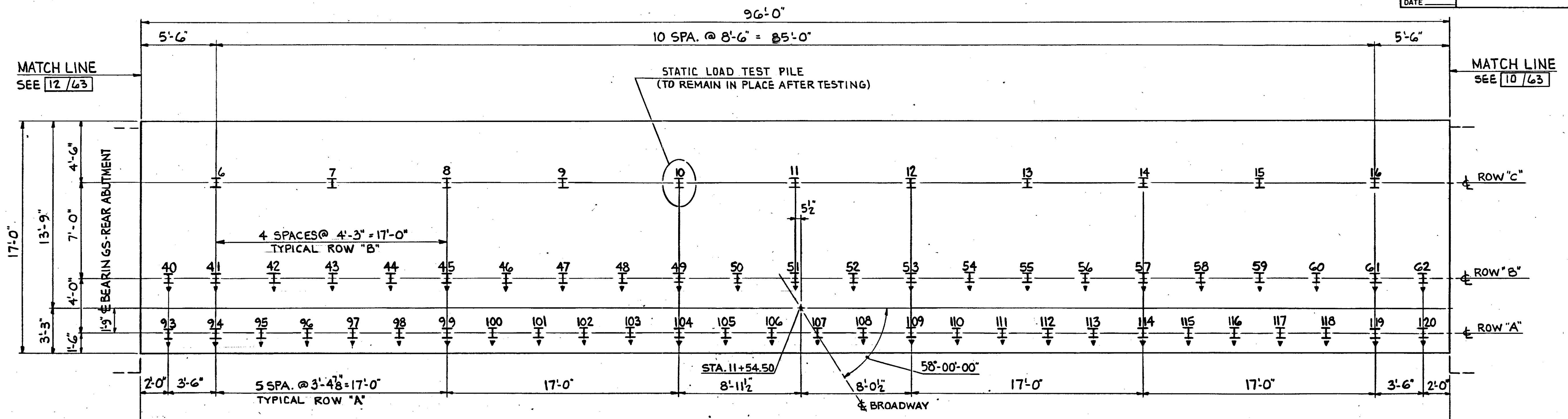
SUBSTRUCTURE REAR ABUTMENT PLAN AND ELEVATION
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| | | | | | | |
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| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |

CALC. BY
DATE
CHKD. BY
DATE

CUY-490-1.49

OHIO
FHWA REGION 5
235
261



NOTES:

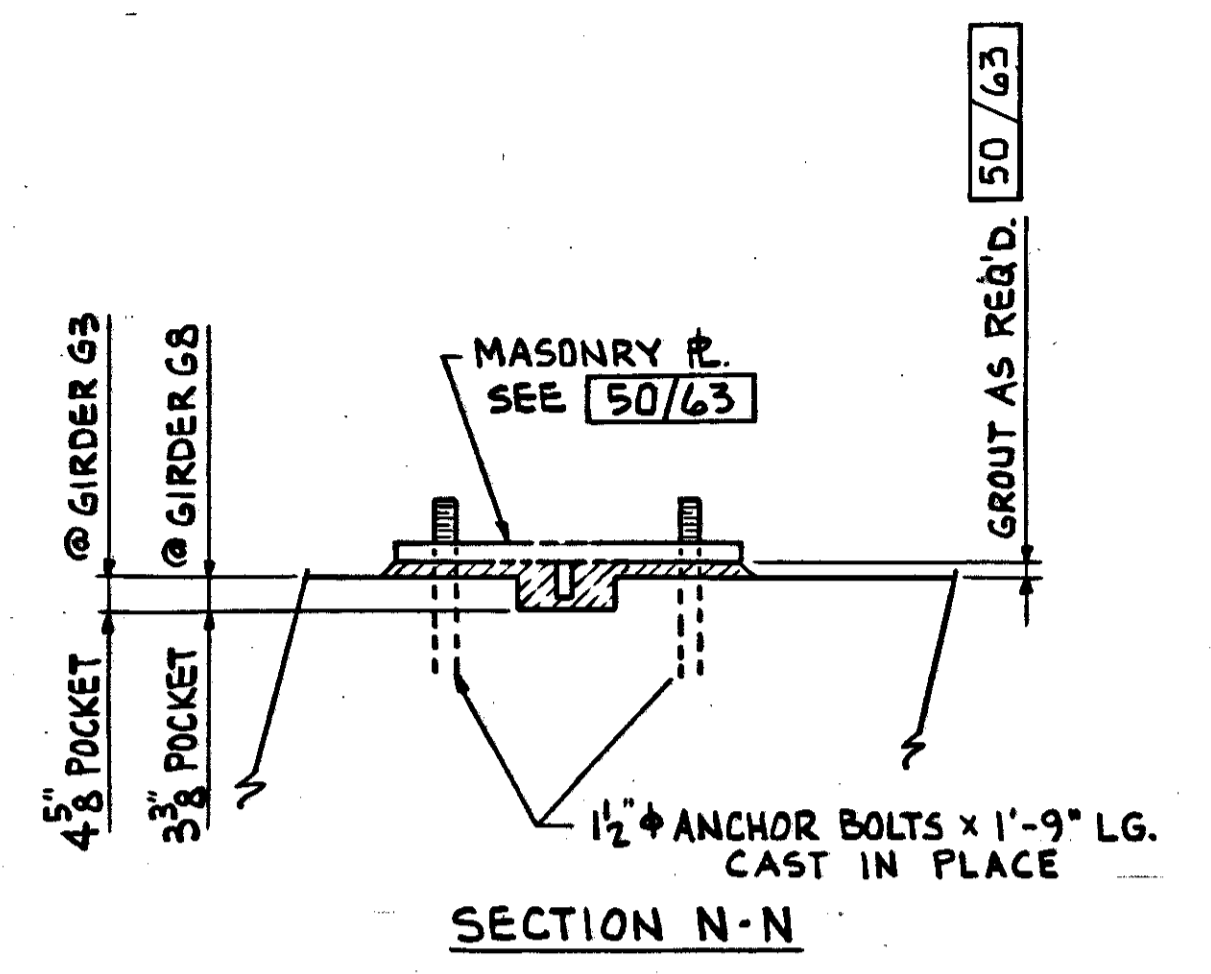
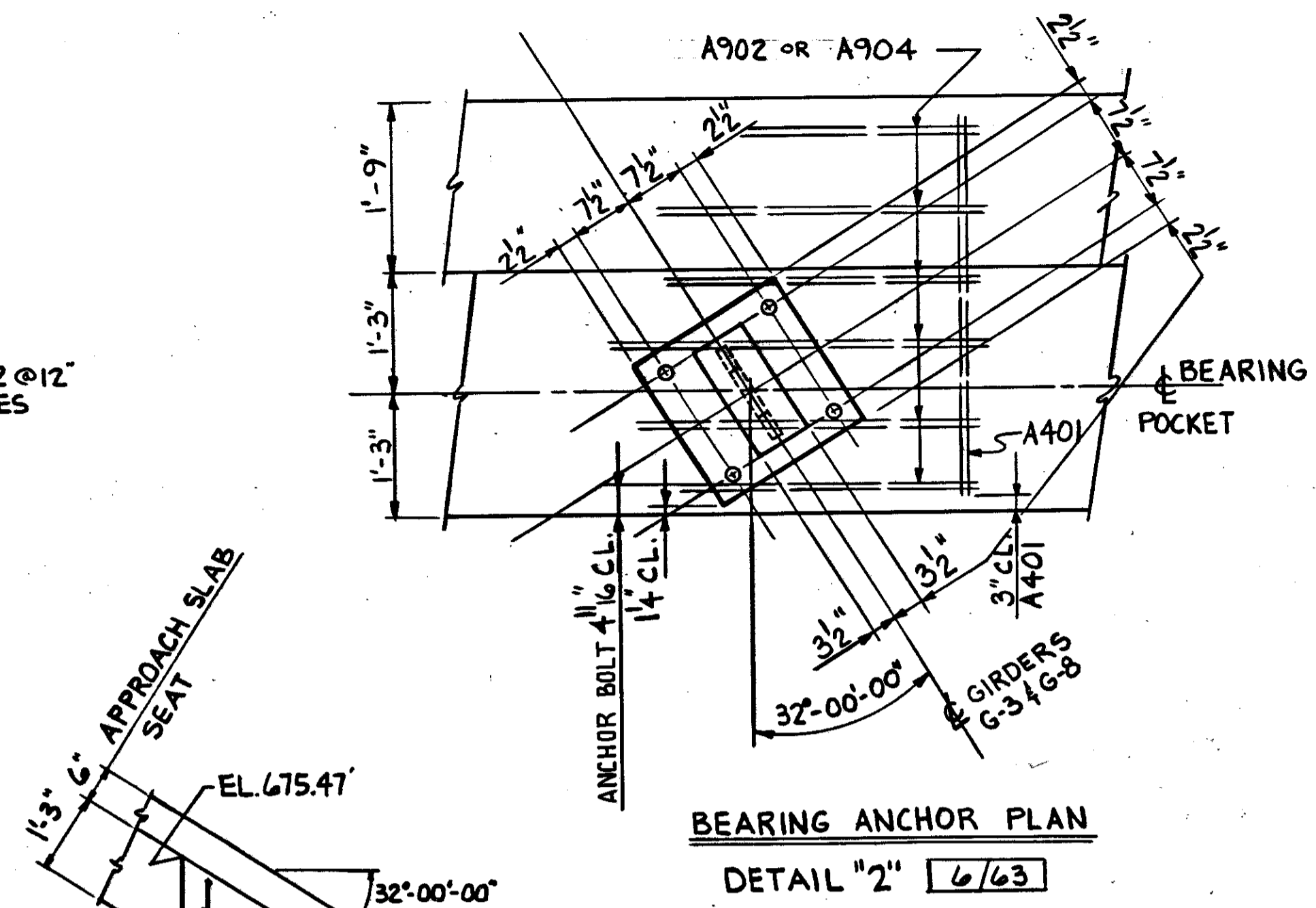
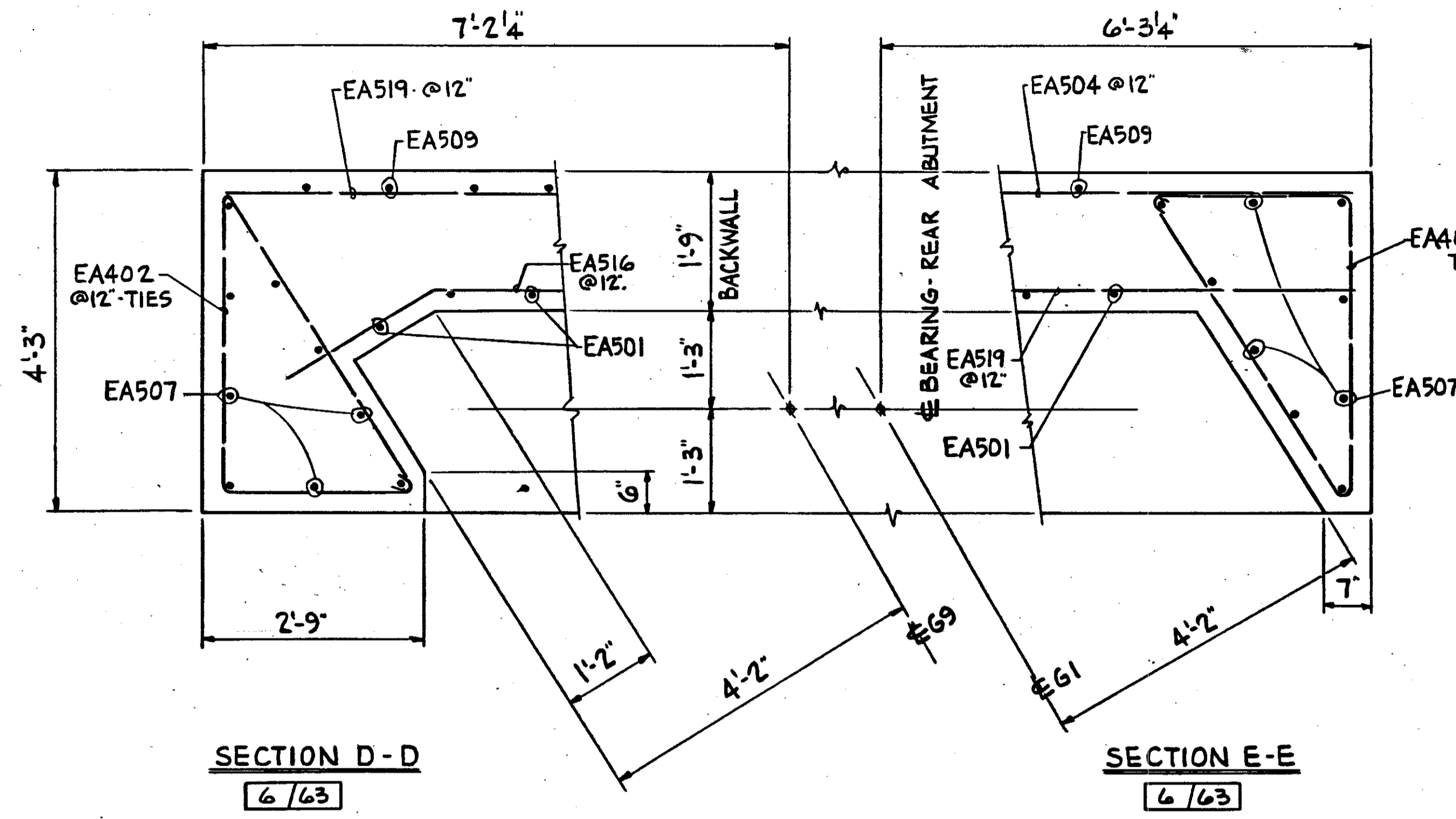
- FOR NOTES SEE 4/63
- ALL PILES ARE HP12 x 53.
- BATTER FOR PILES TO BE 1:4.
- DIRECTION OF BATTER →
- FOR PLAN AND ELEVATION SEE 6/63
- FOR REINFORCING SCHEDULE SEE 55/63

WESTON A Business Trust
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CLEVELAND, OHIO 44122
7/63

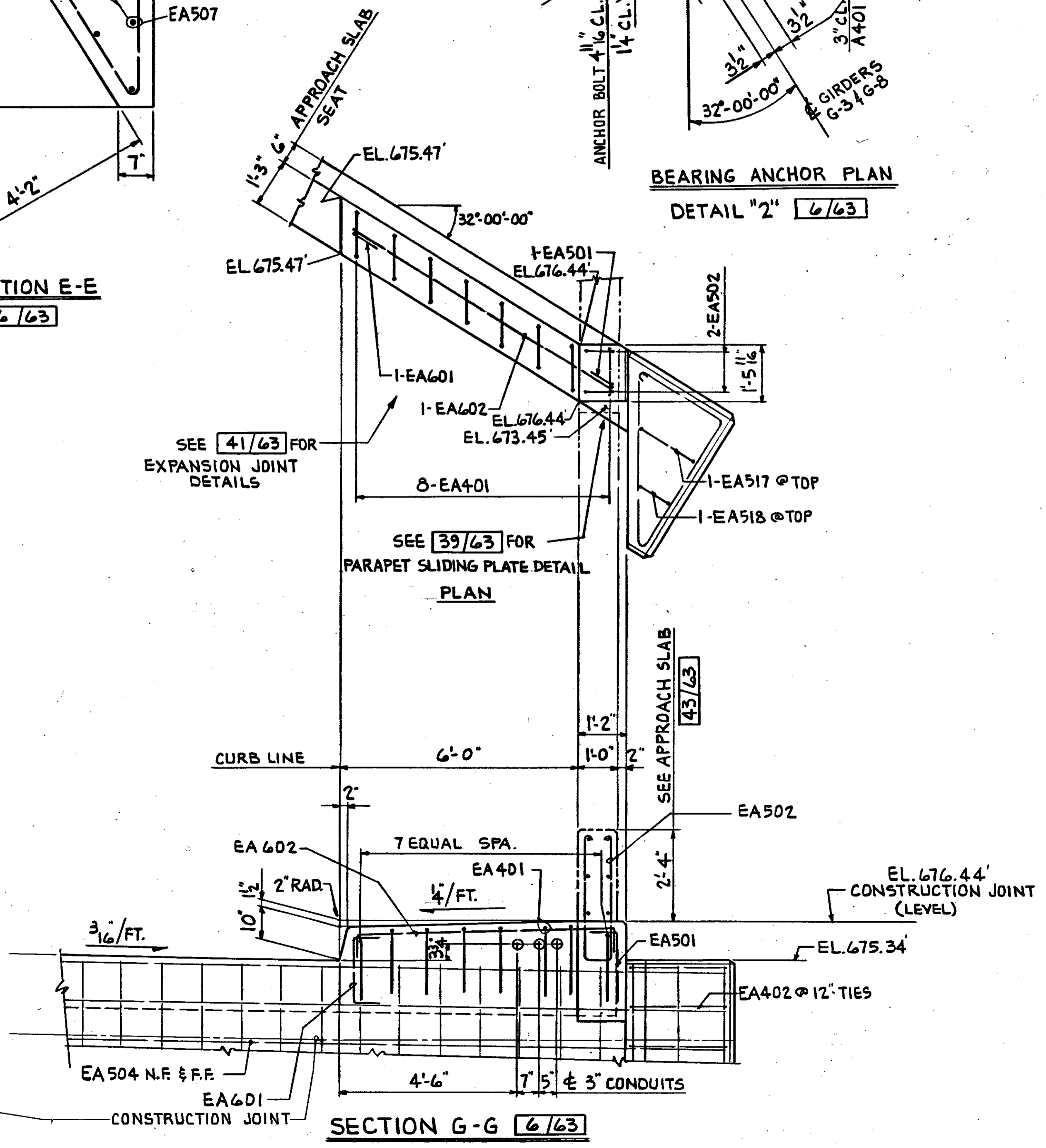
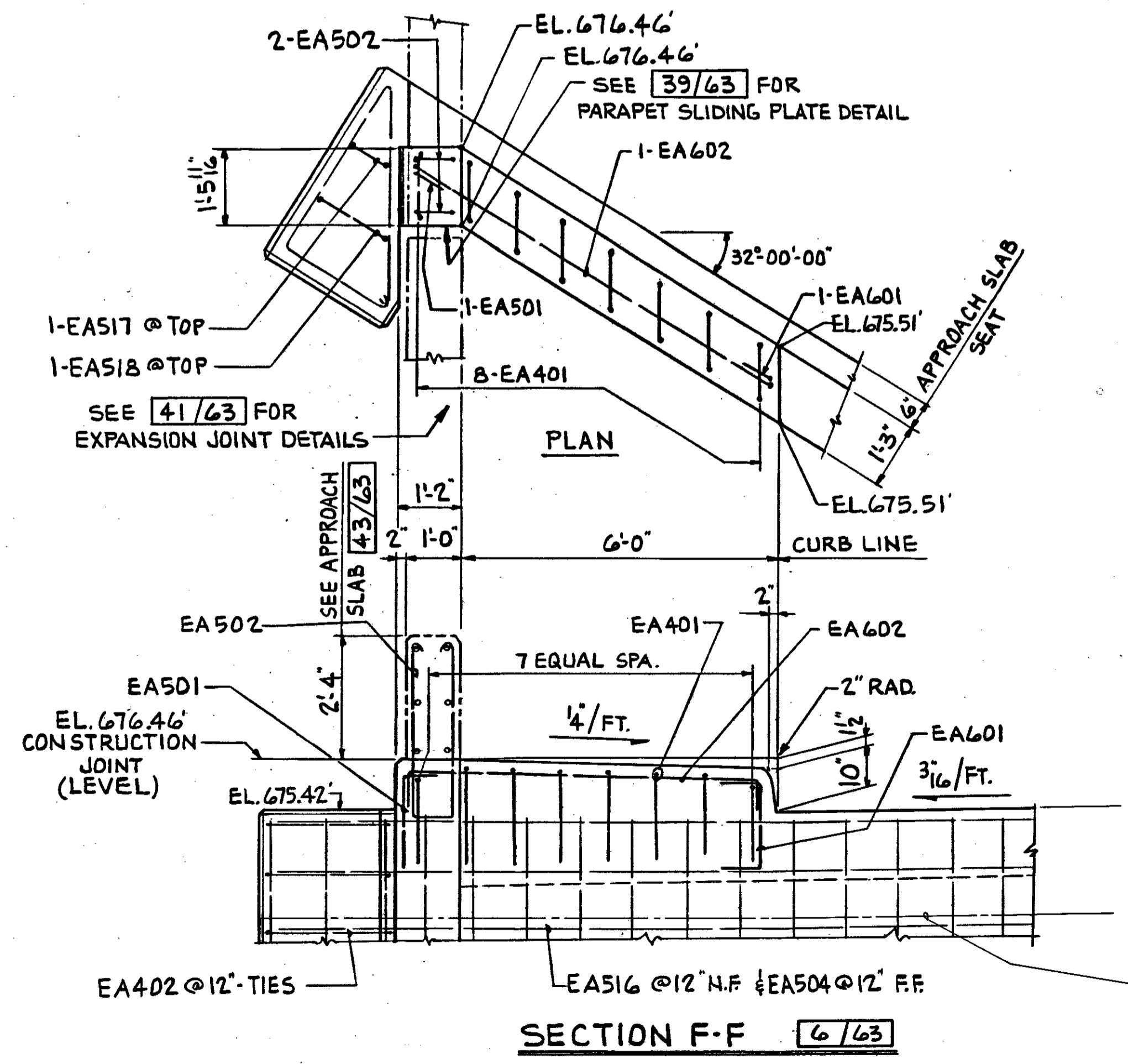
SUBSTRUCTURE
REAR ABUTMENT
PILE AND FOUNDATION PLANS
BRIDGE NO. CUY-490-0152
I-490 UNDER RELOC. BROADWAY

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| JWG | DF | | JRH | WHH | 7/83 | 10/83 |

CUY-490-1.49



NOTE: CONTRACTOR TO PLACE REINFORCING TO AVOID INTERFERENCE WITH ANCHOR BOLTS AND BAR. GIRDERS G-1, G-2, G-4, G-5, G-6, G-7 & G-9 HAVE NO SHEAR LUG OR POCKET IN SEAT.

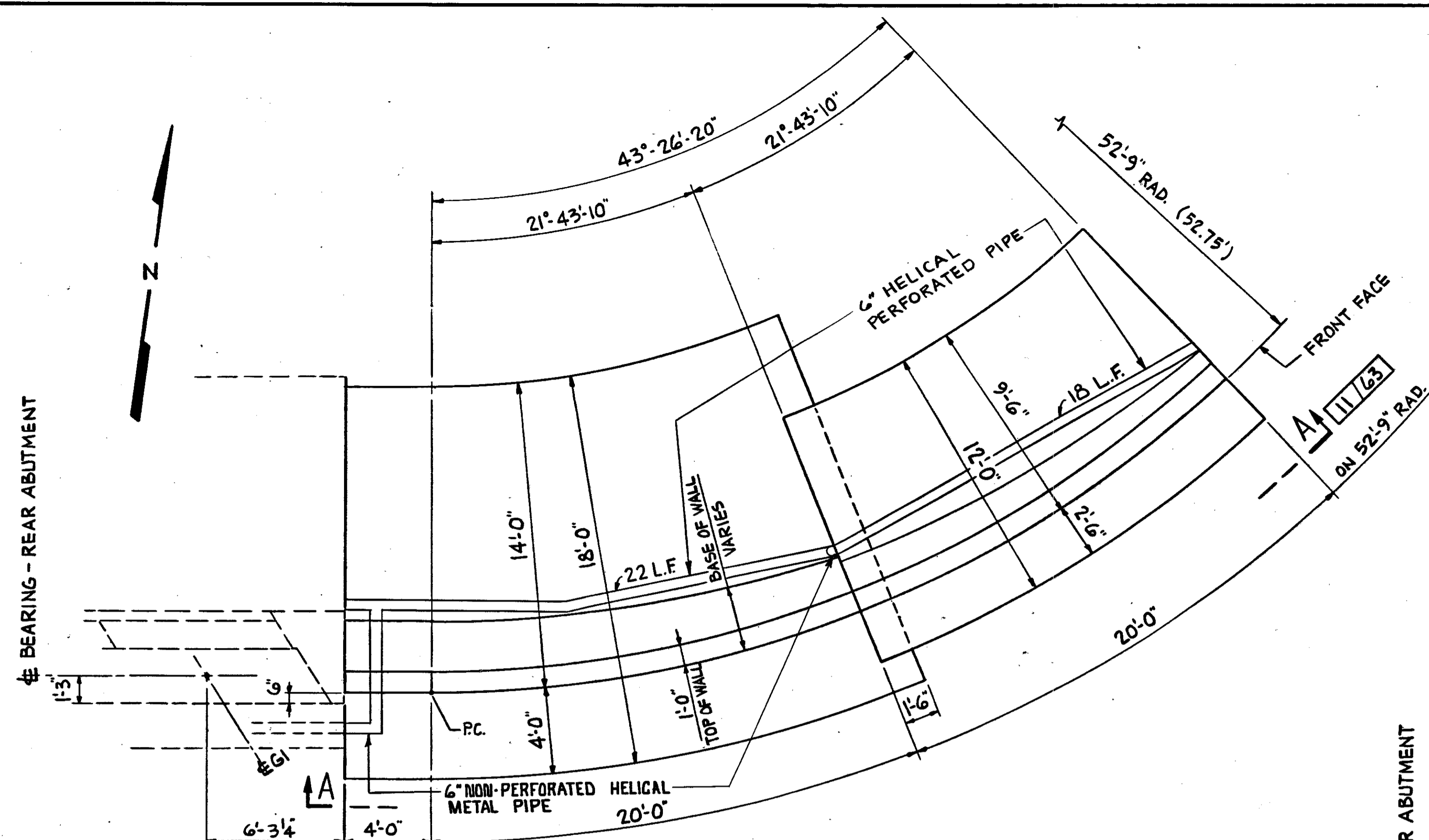


- NOTES:
- FOR NOTES SEE 4/63.
 - FOR ABUTMENT PLAN AND ELEVATION SEE 6/63.
 - FOR REINFORCING SCHEDULE SEE 55/63.

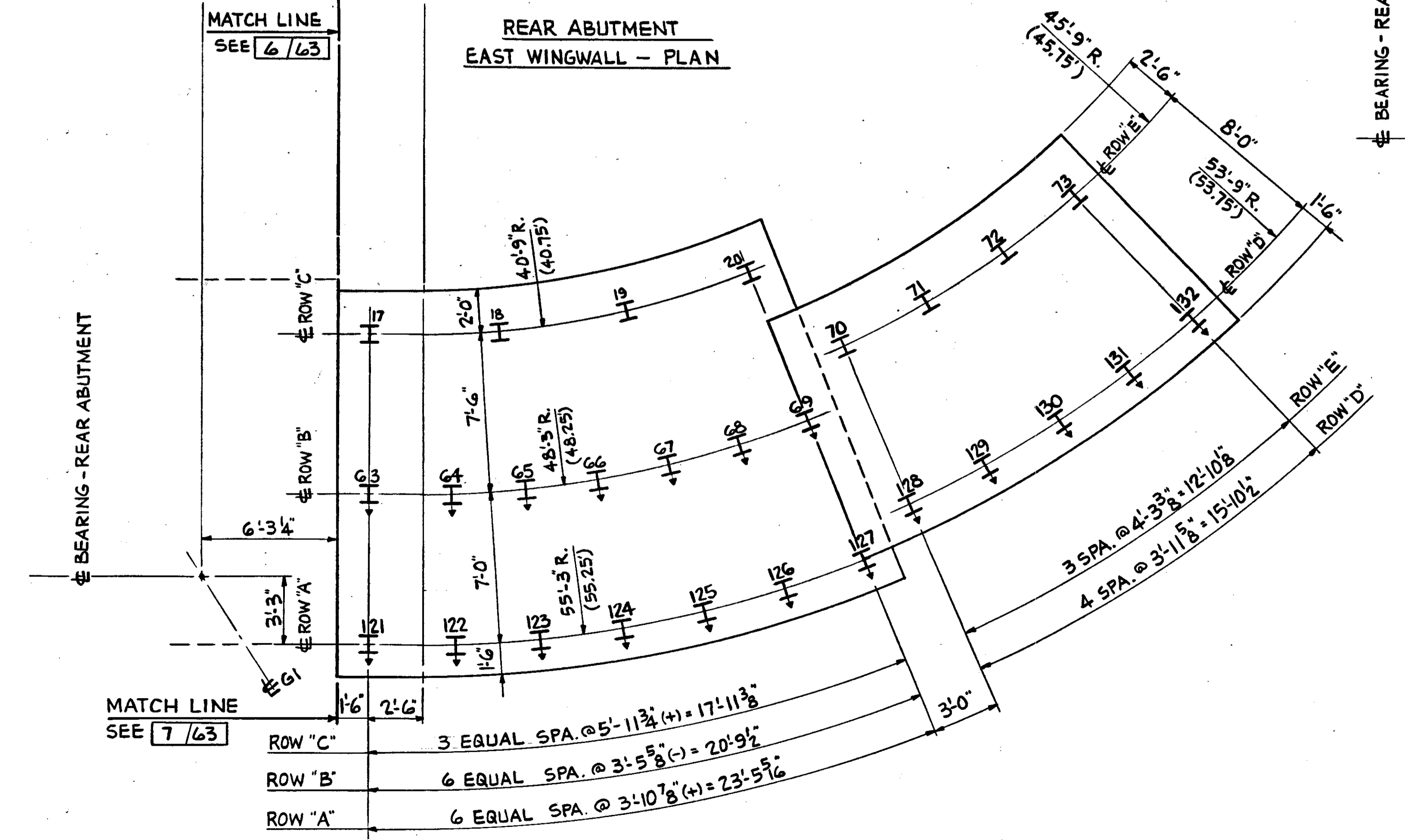
WESTON A Business Trust
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 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

SUBSTRUCTURE REAR ABUTMENT SECTIONS
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

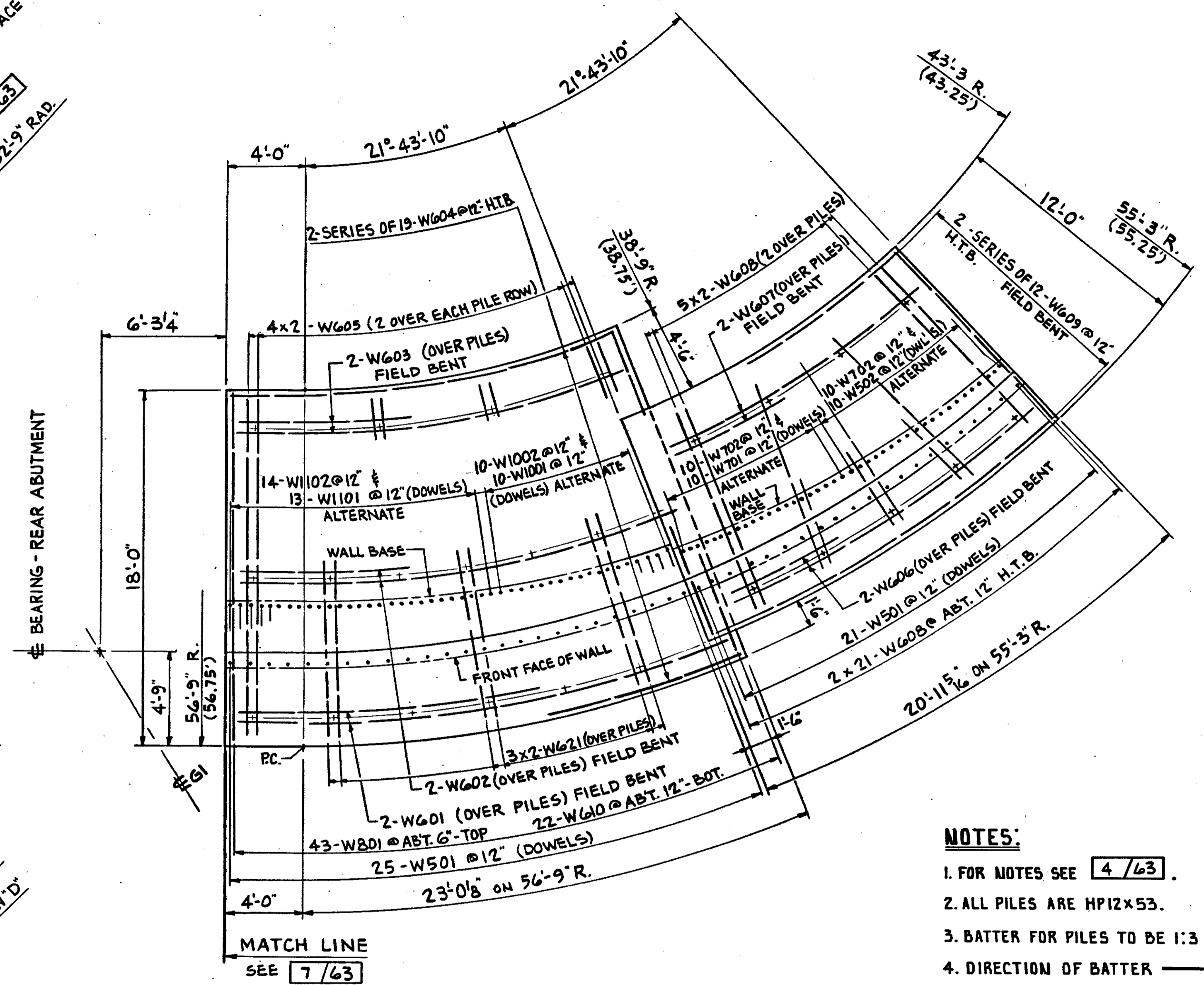
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| JWG | DF | | JRH | WHH | 2/83 | 10/83 |



REAR ABUTMENT
 EAST WINGWALL - PLAN



PILE PLAN
 (27 PILES)



FOUNDATION PLAN

- ABBREVIATIONS FOR REINFORCING PLACEMENT
- BOT. — BOTTOM
 - DWL. — DOWEL
 - DWL'S. — DOWELS
 - F.F. — FAR FACE
 - N.F. — NEAR FACE
 - E.F. — EACH FACE
 - H.E.F. — HALF EACH FACE
 - E.W. — EACH WAY
 - H.T.B. — HALF TOP & HALF BOTTOM
 - L.L.H. — LONG LEG HORIZONTAL
 - L.L.V. — LONG LEG VERTICAL
 - TYP. — TYPICAL
 - EL. — ELEVATION
 - SPA. — SPACES
 - MIN. — MINIMUM
 - REINF. — REINFORCING
 - REQ'D. — REQUIRED

- NOTES:
1. FOR NOTES SEE 4/63.
 2. ALL PILES ARE HPI2x53.
 3. BATTER FOR PILES TO BE 1:3.
 4. DIRECTION OF BATTER →
 5. FOR ELEVATION AND SECTIONS SEE 11/63.
 6. FOR REINFORCING SCHEDULE SEE 56/63.

WESTON A Business Trust
 3099 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

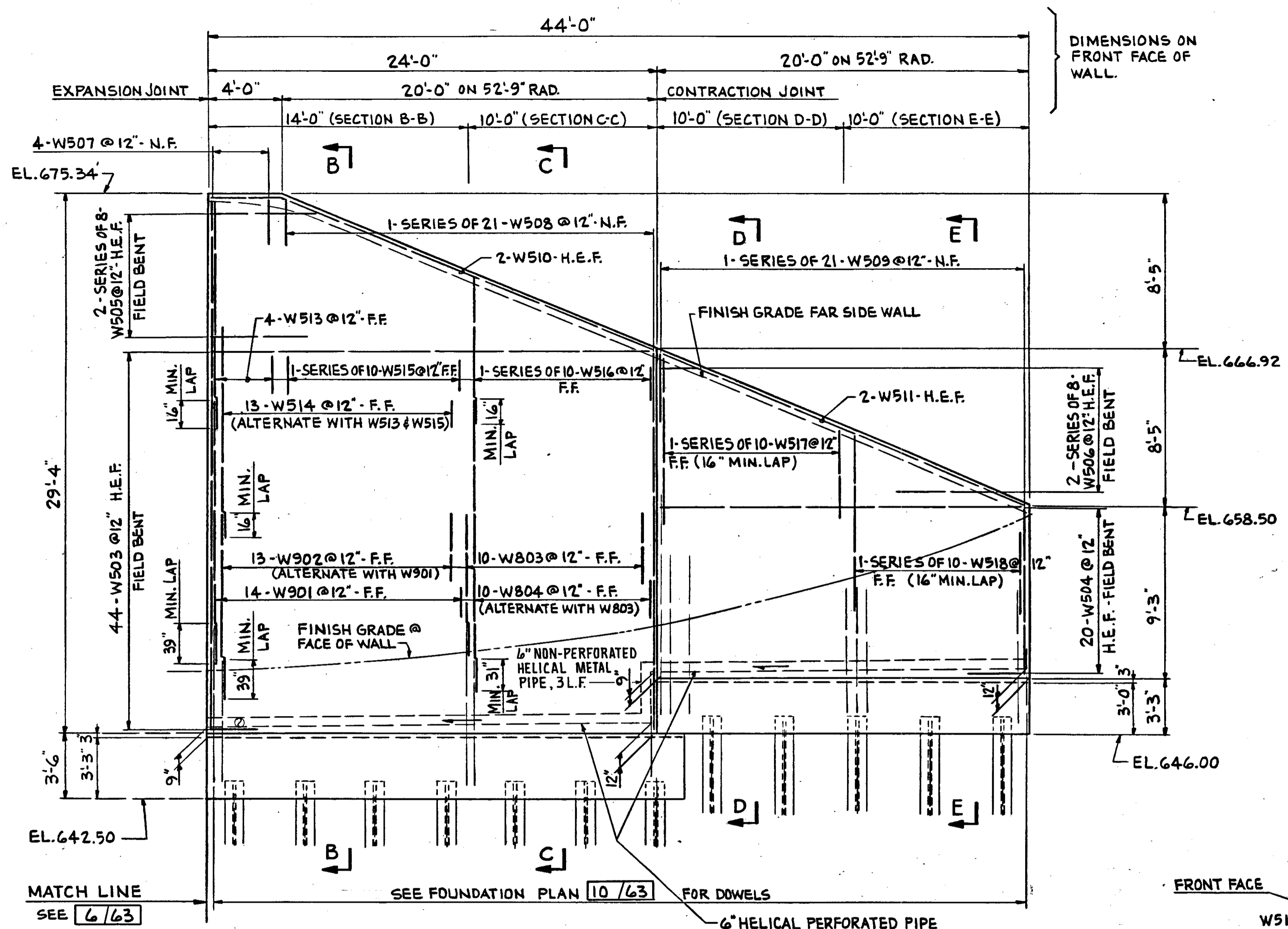
10/63

**SUBSTRUCTURE
 REAR ABUTMENT-EAST WINGWALL
 PLANS**

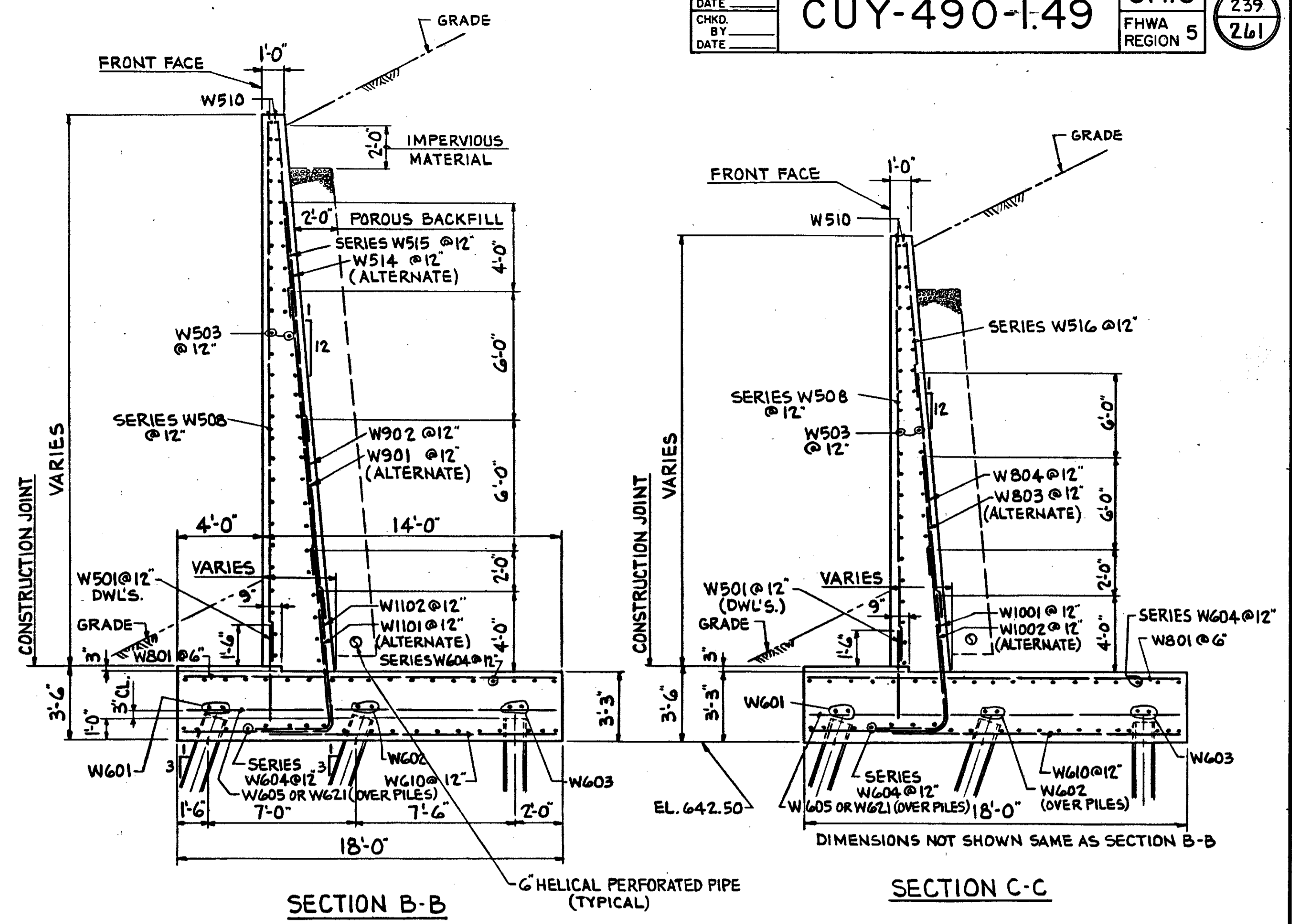
BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

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| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |

CUY-490-1.49

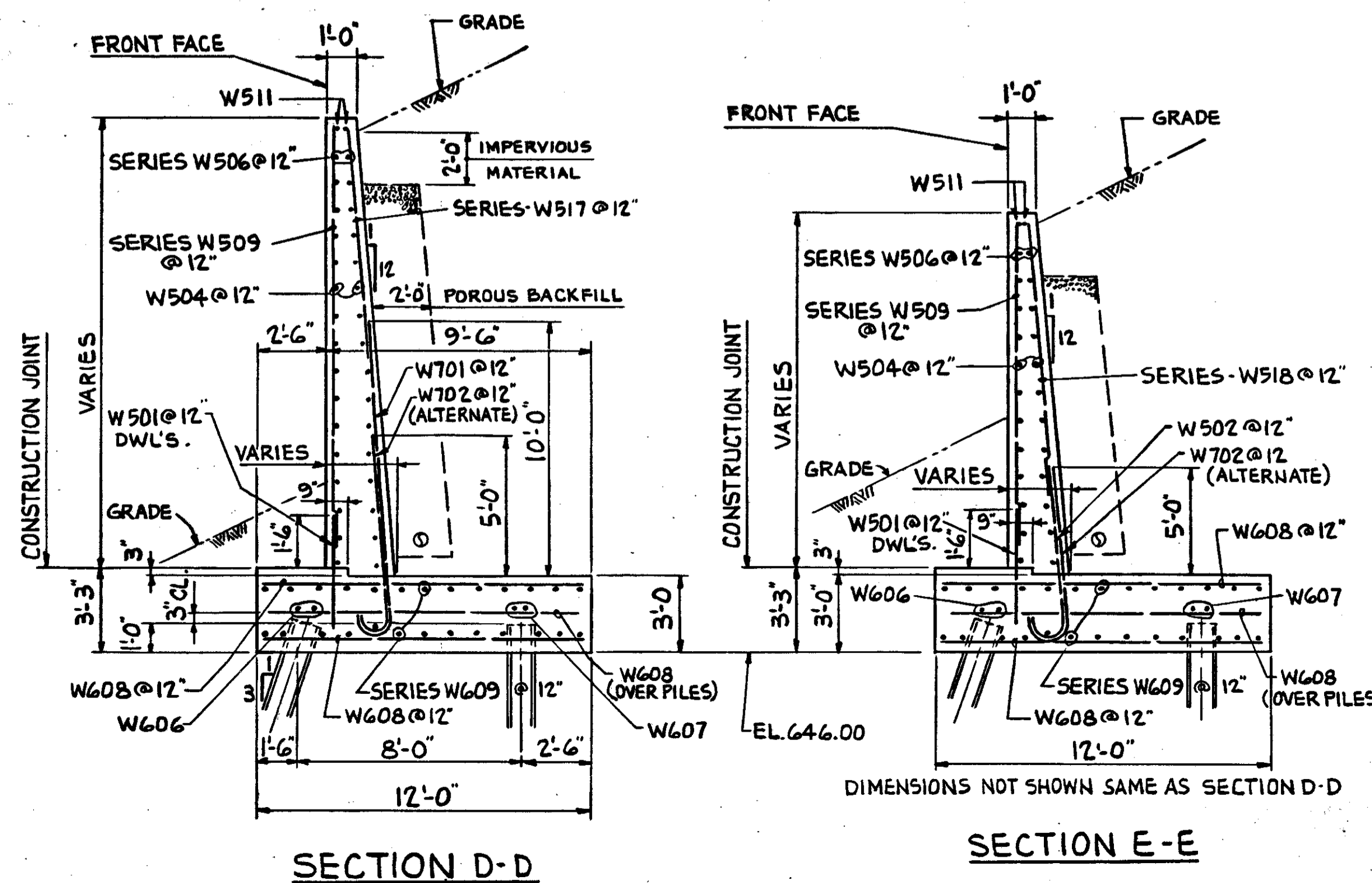


ELEVATION A-A (DEVELOPED)
10/63



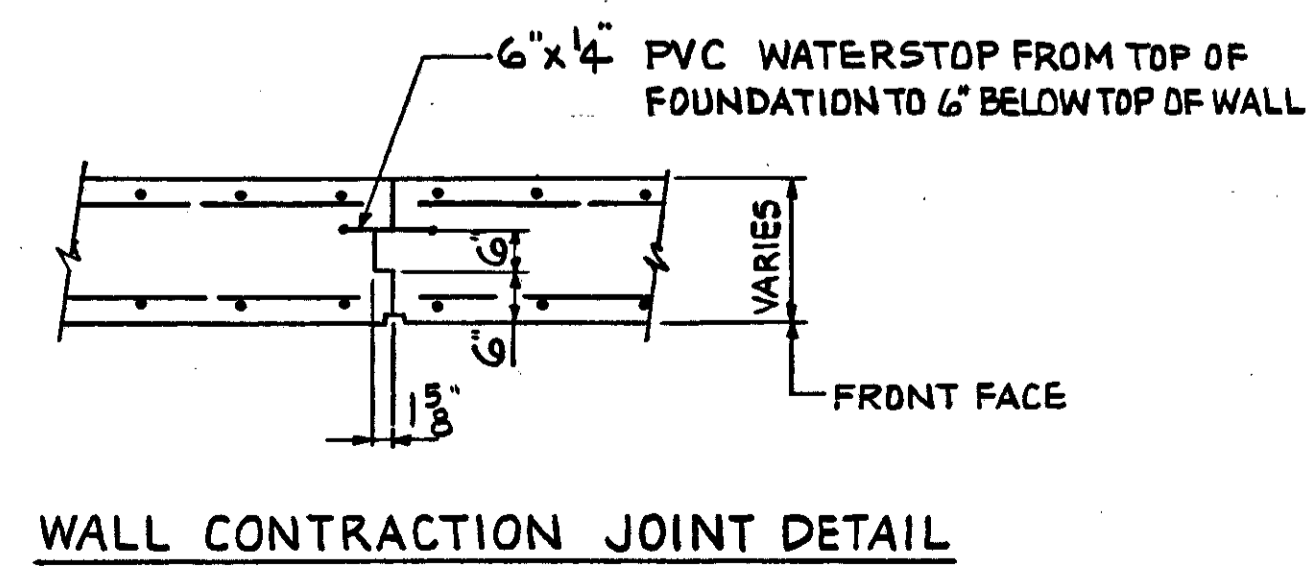
SECTION B-B

SECTION C-C

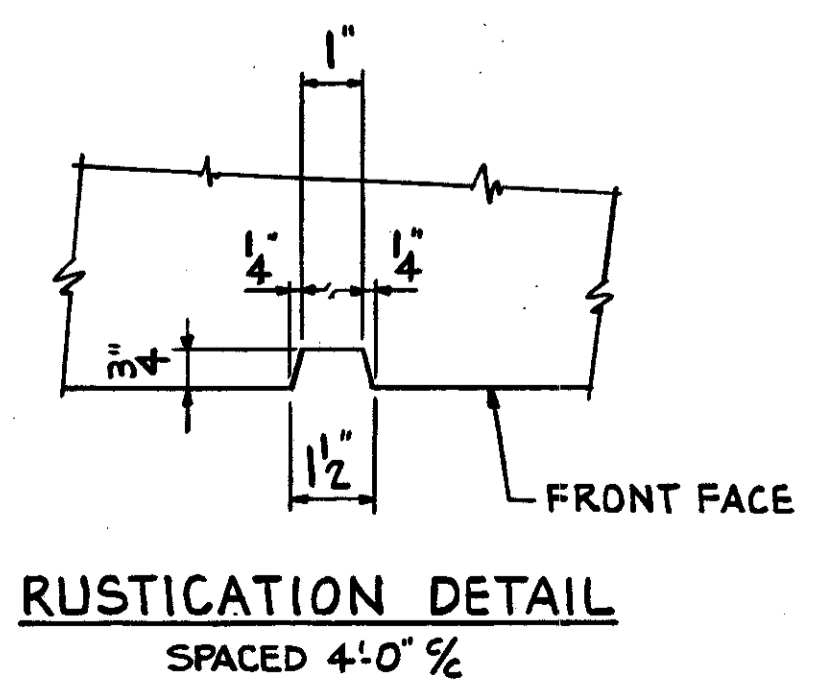


SECTION D-D

SECTION E-E



WALL CONTRACTION JOINT DETAIL



RUSTICATION DETAIL
SPACED 4'-0" @

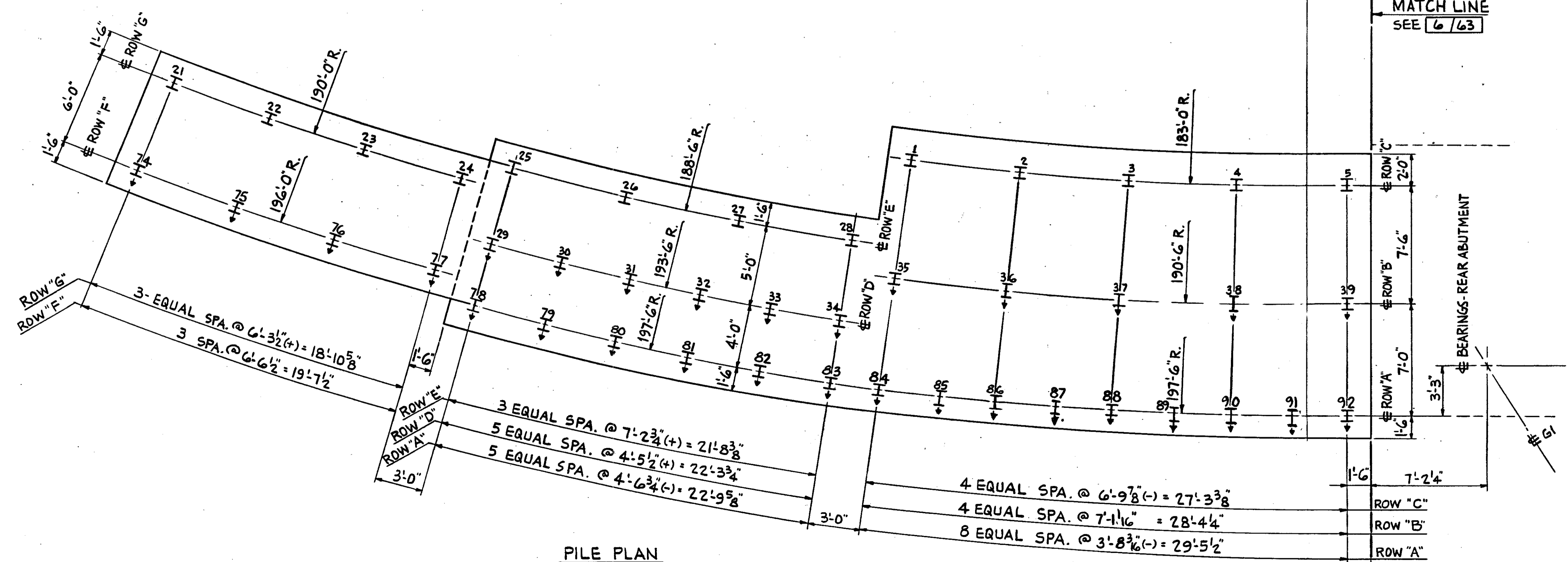
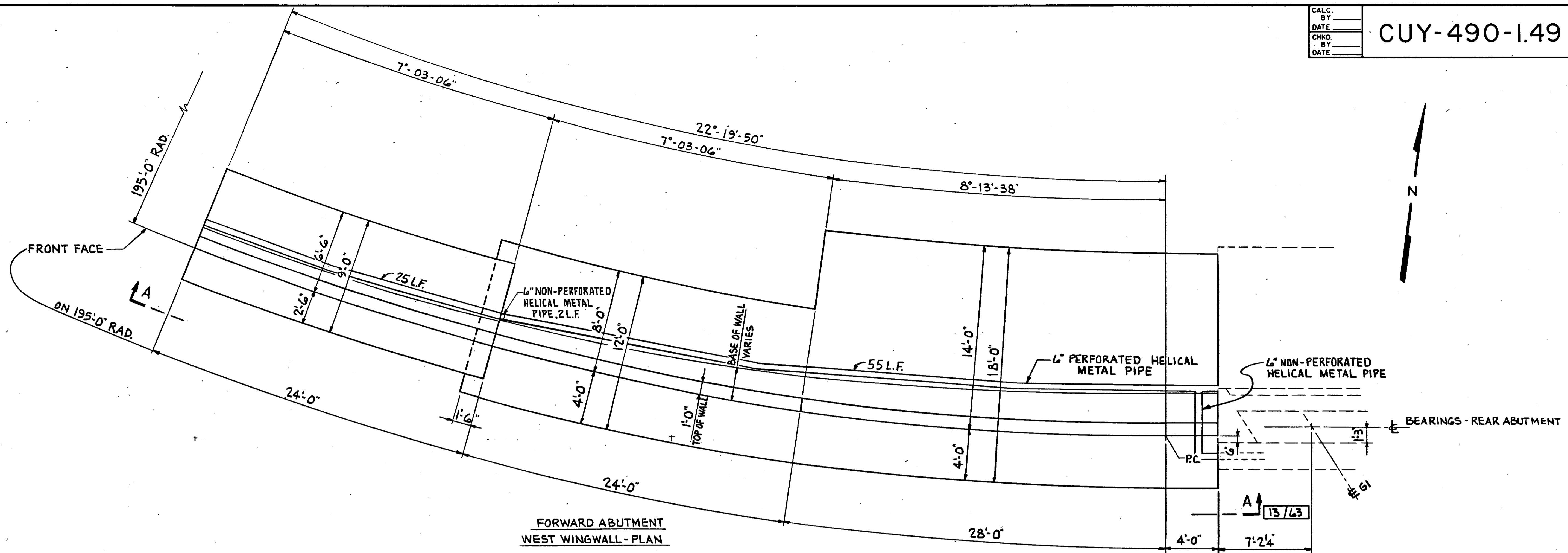
- NOTES:
1. FOR NOTES SEE 4/63.
 2. FOR PLANS SEE 10/63.
 3. FOR REINFORCING SCHEDULE SEE 5/6/63.

WESTON A Business Trust
3660 GREEN ROAD SUITE 215
CLEVELAND, OHIO 44122

11/63

**SUBSTRUCTURE
REAR ABUTMENT-EAST WINGWALL
ELEVATION, SECTIONS & DETAILS
BRIDGE NO. CUY-490-0152
I-490 UNDER RELOC. BROADWAY**

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| JWG | DF | | JRH | WHH | 3/83 | 10/83 |



- NOTES:**
1. FOR NOTES SEE **4/63**.
 2. ALL PILES ARE HP12x53.
 3. BATTER FOR PILES TO BE 1:3.
 4. DIRECTION OF BATTER →
 5. FOR FOUNDATION PLAN AND ELEVATION SEE **13/63**.
 6. FOR REINFORCING SCHEDULE SEE **56/63**.

WESTON A Business Trust
 DESIGNERS CONSULTANTS

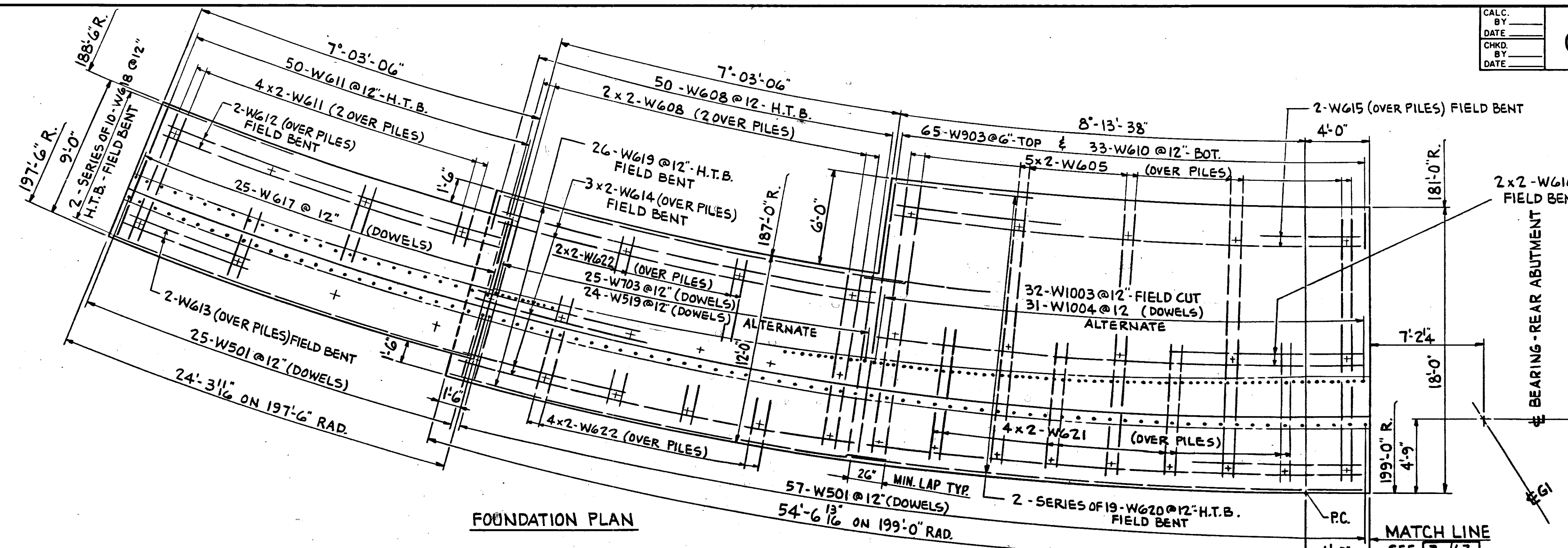
3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

12/63

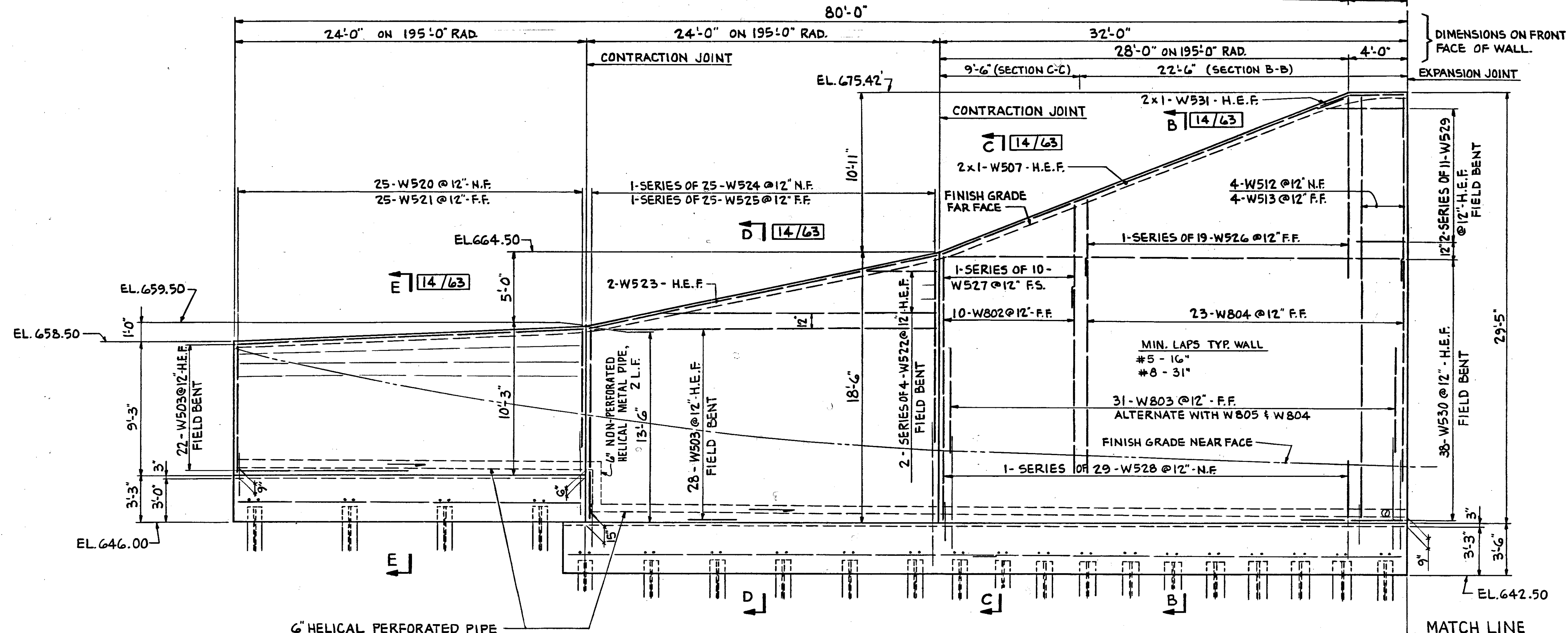
**SUBSTRUCTURE
 REAR ABUTMENT-WEST WINGWALL
 PLANS**

BRIDGE NO. CUY.-490-0152
 I-490 UNDER RELOC. BROADWAY

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |



FOUNDATION PLAN



ELEVATION A-A (DEVELOPED)

NOTES:

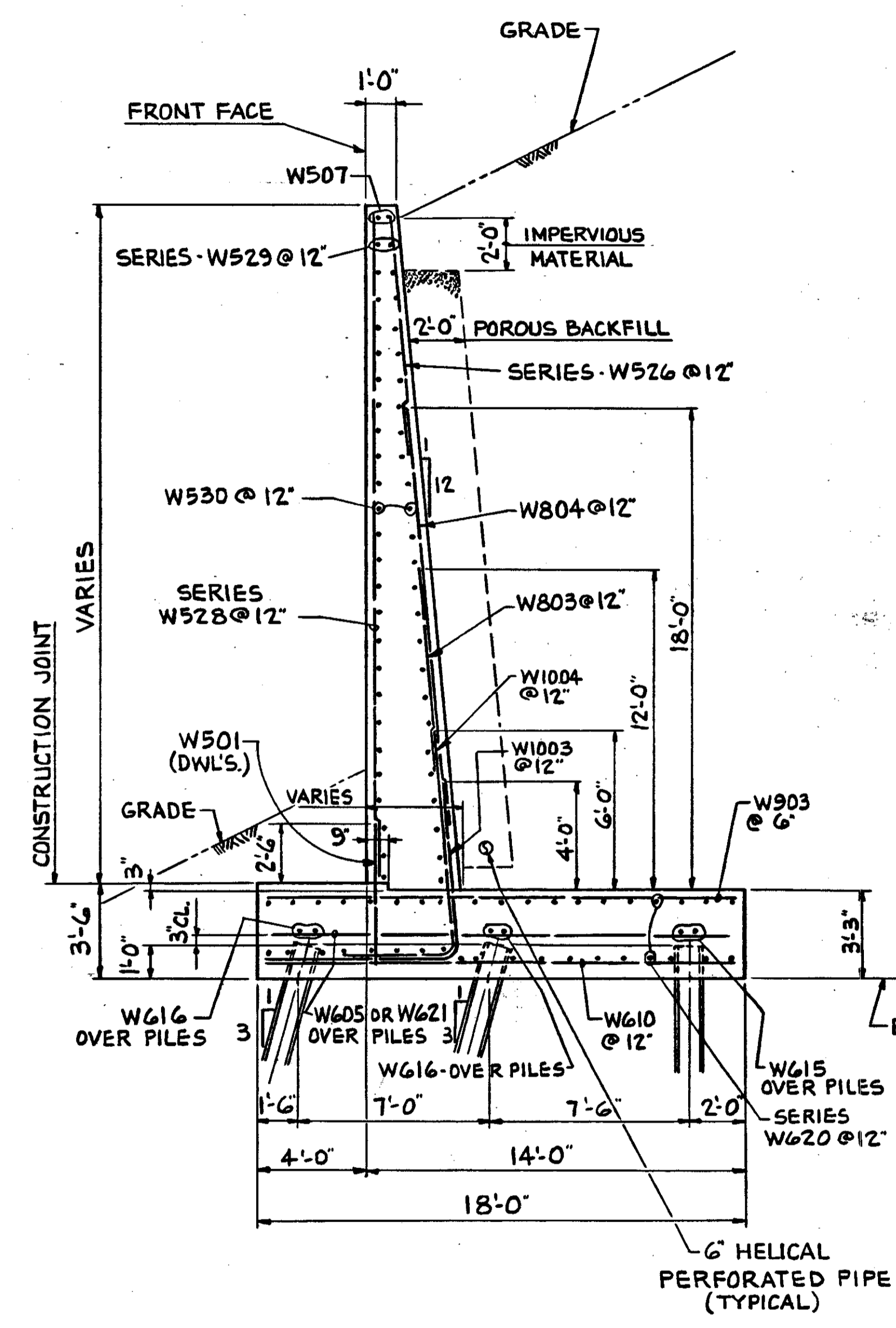
1. FOR NOTES SEE 4/63
2. FOR PLAN AND PILE PLAN SEE 12/63
3. FOR REINFORCING SCHEDULE SEE 56/63

WESTON A Business Trust
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 CLEVELAND, OHIO 44122

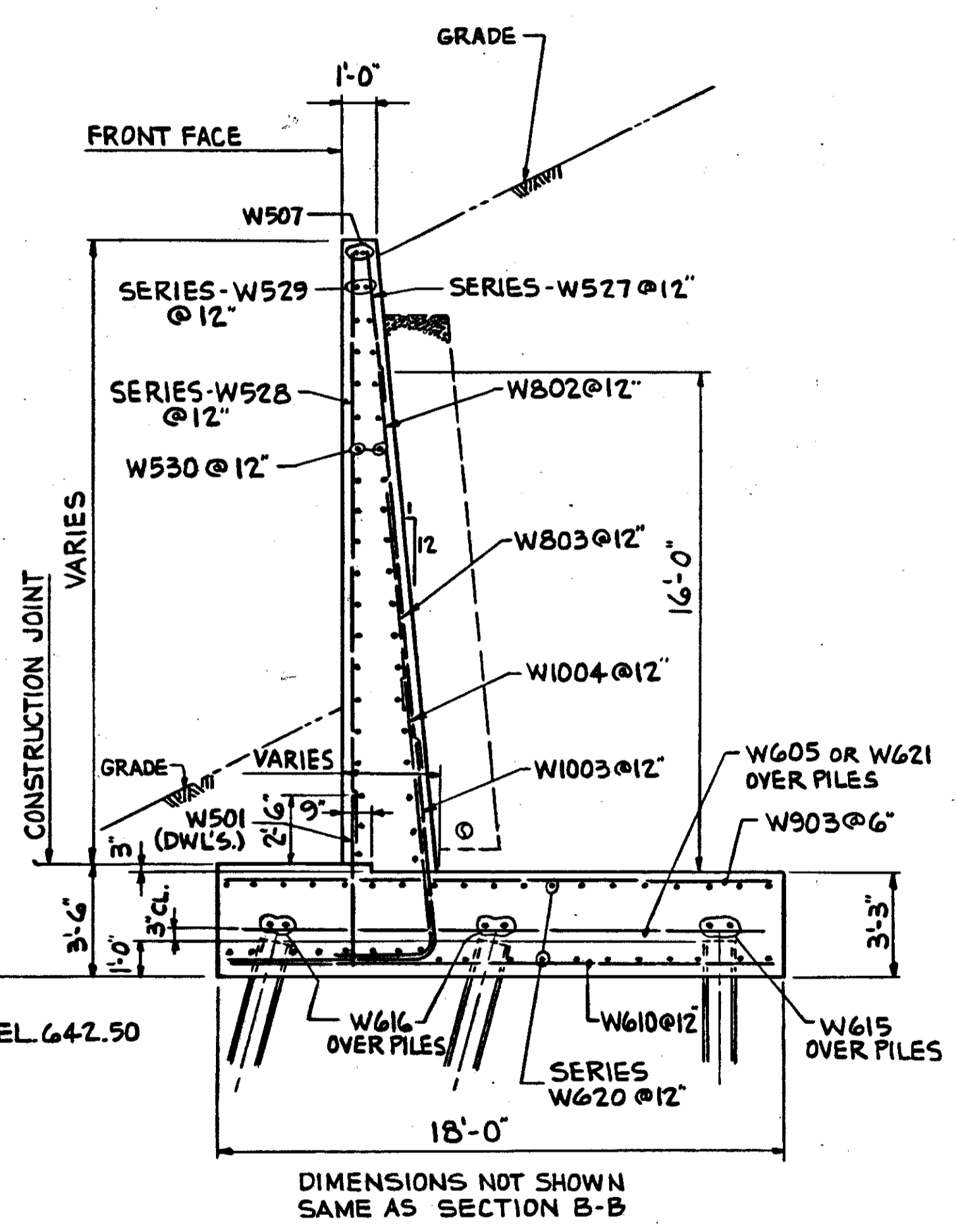
13/63

**SUBSTRUCTURE
 REAR ABUTMENT-WEST WINGWALL
 FOUNDATION PLAN AND ELEVATION
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY**

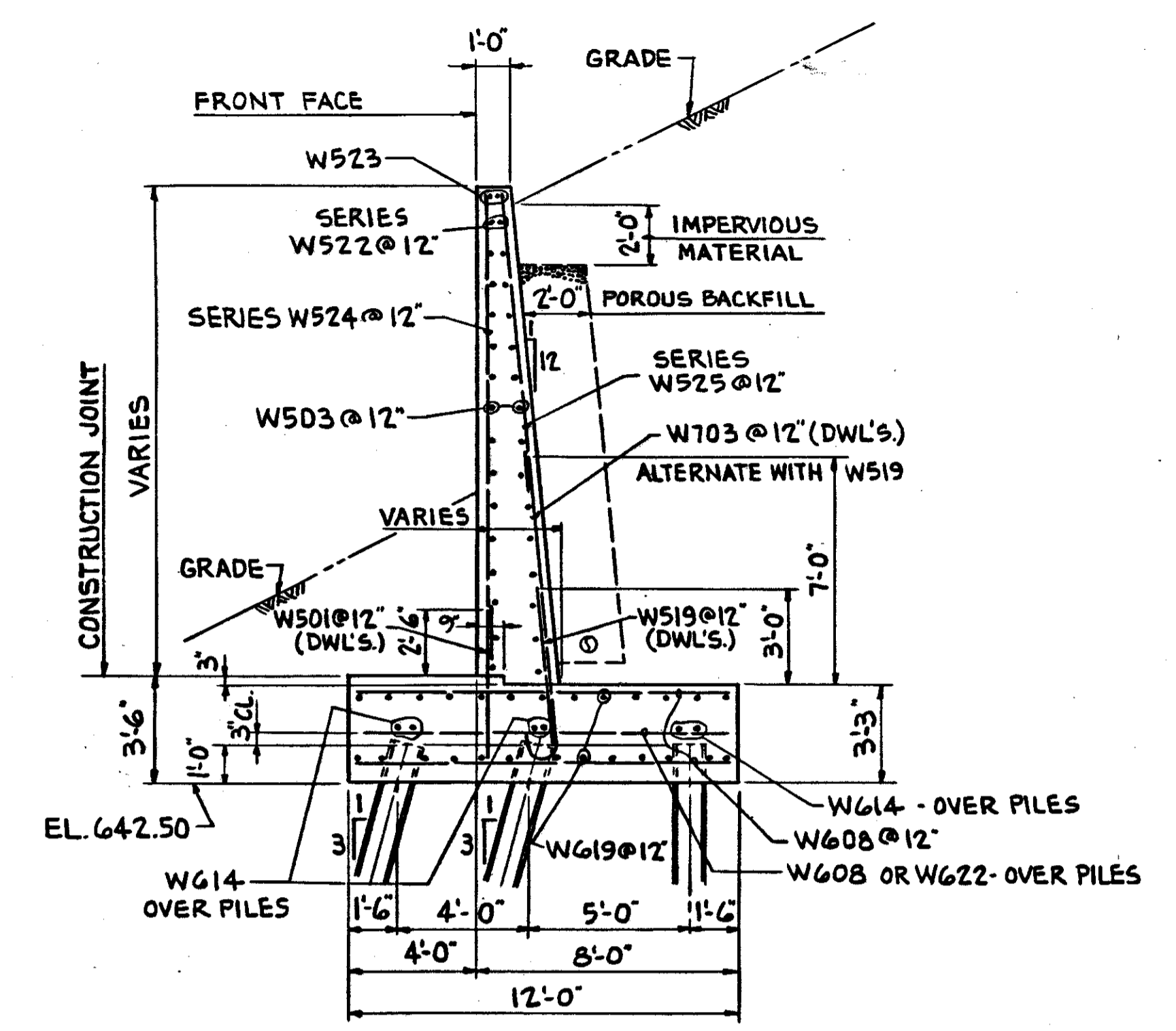
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|----------|-------|--------|---------|----------|------|---------|
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |



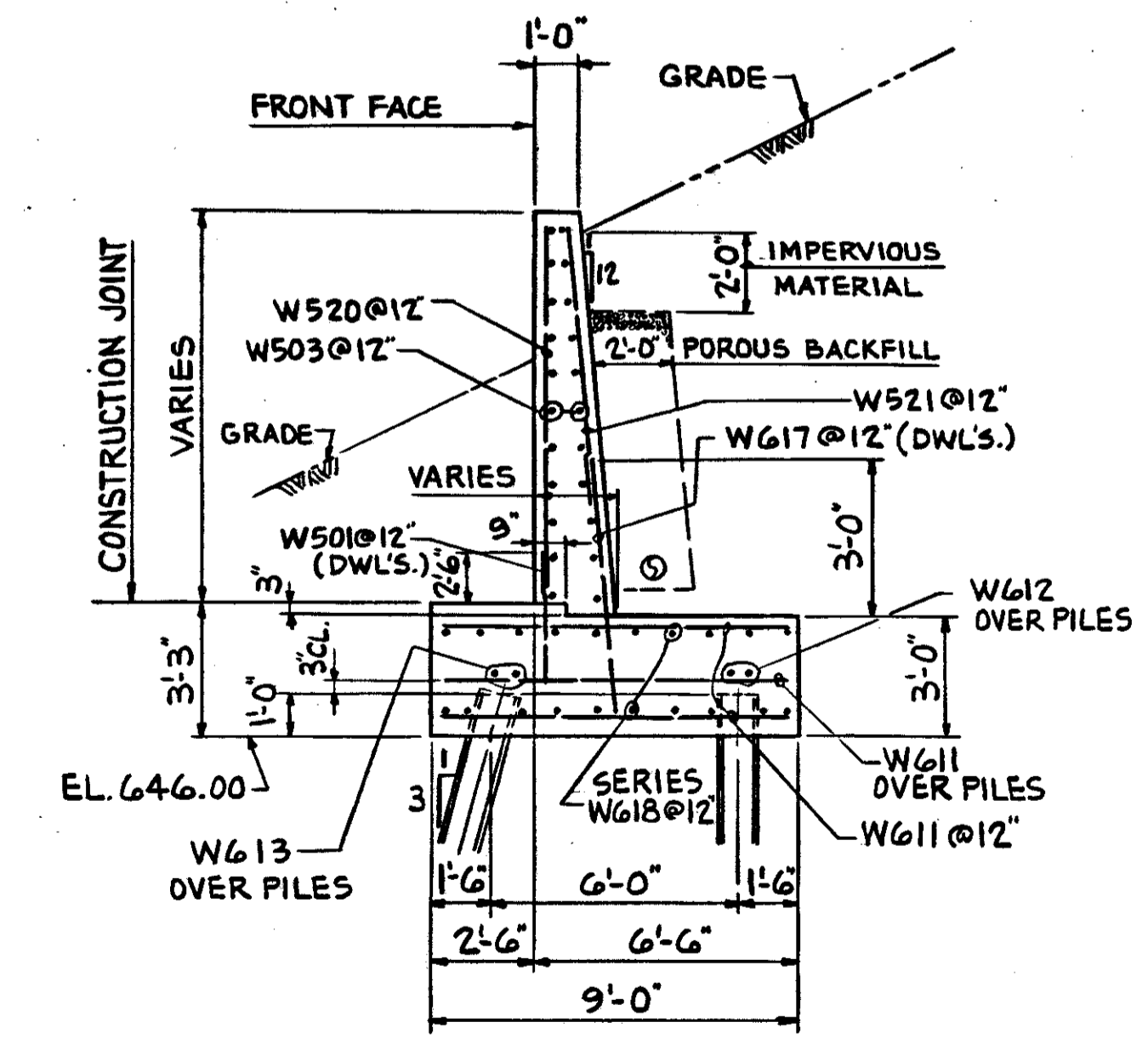
SECTION B-B
13/63



SECTION C-C
13/63



SECTION D-D
13/63



SECTION E-E
13/63

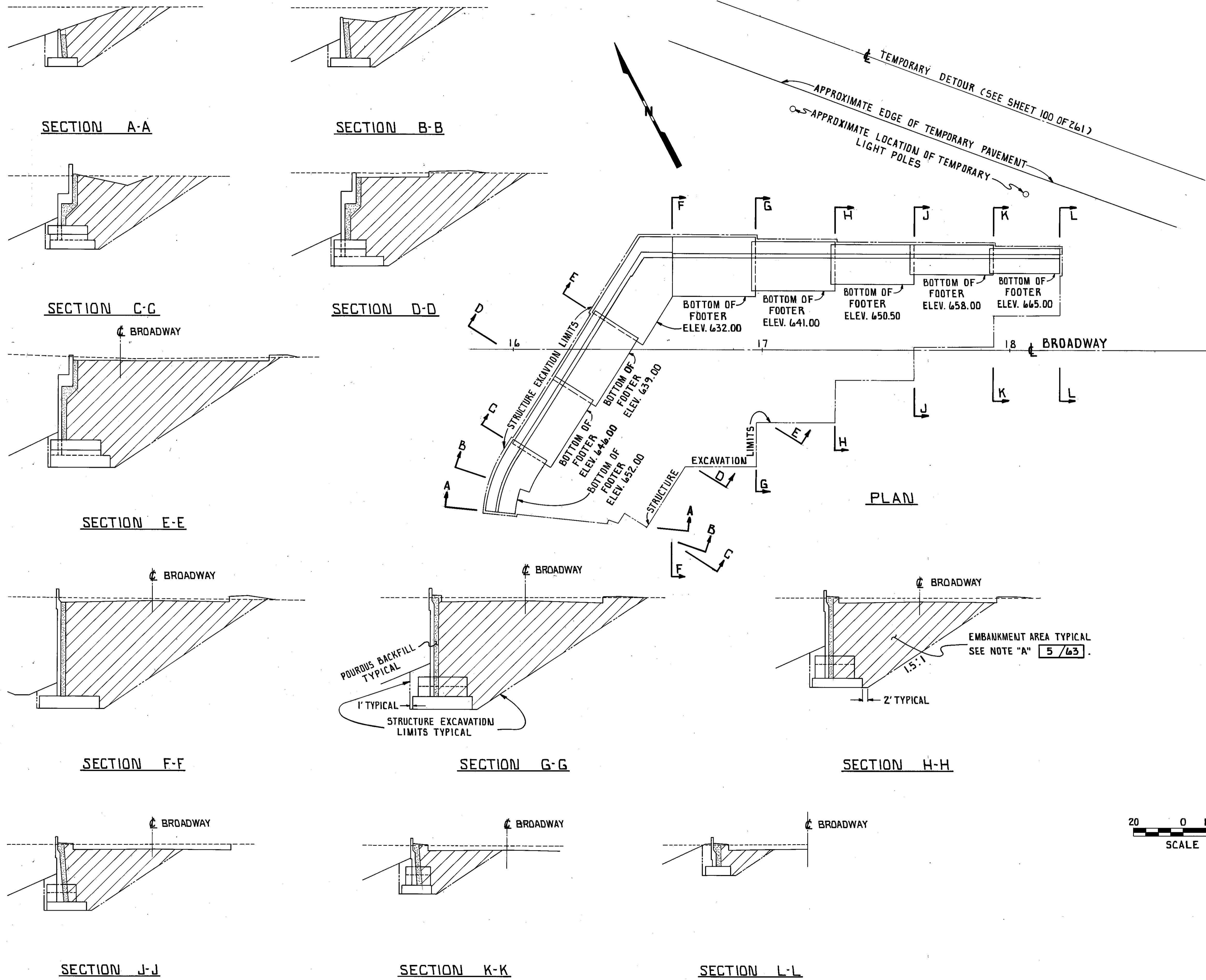
- NOTES:**
- FOR NOTES SEE 4/63
 - FOR PLAN AND PILE PLAN SEE 12/63
 - FOR REINFORCING SCHEDULE SEE 56/63

| | | | | | | |
|--|-------|--|---------|----------|------|---------|
| WESTON DESIGNERS CONSULTANTS | | A Business Trust | | 14/63 | | |
| | | 3658 GREEN ROAD SUITE 215 CLEVELAND, OHIO 44122 | | | | |
| SUBSTRUCTURE REAR ABUTMENT-WEST WINGWALL SECTIONS | | | | | | |
| BRIDGE NO. CUY-490-0152 I-490 UNDER RELOC. BROADWAY | | | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| JWG | DF | JRH | WHH | 2/83 | | |

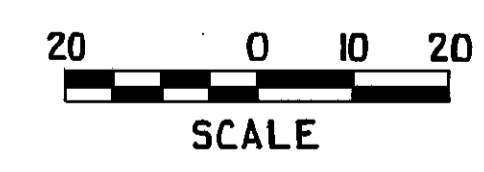
CALC. BY CAP
 DATE 11/82
 CHKD. BY JRH
 DATE 12/82

CUY-490-1.49

OHIO
 FHWA REGION 5
 243
 261



NOTES:
 1. SEE NOTE "A" AND NOTE "B" 5/63

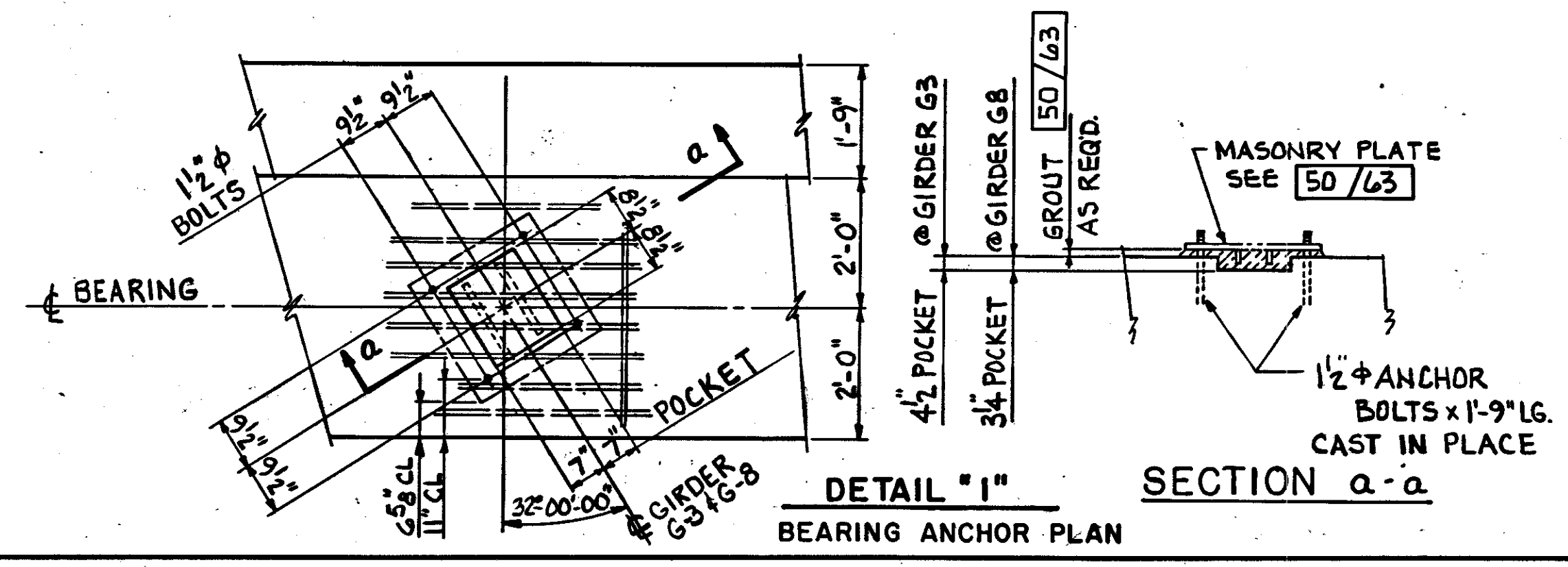
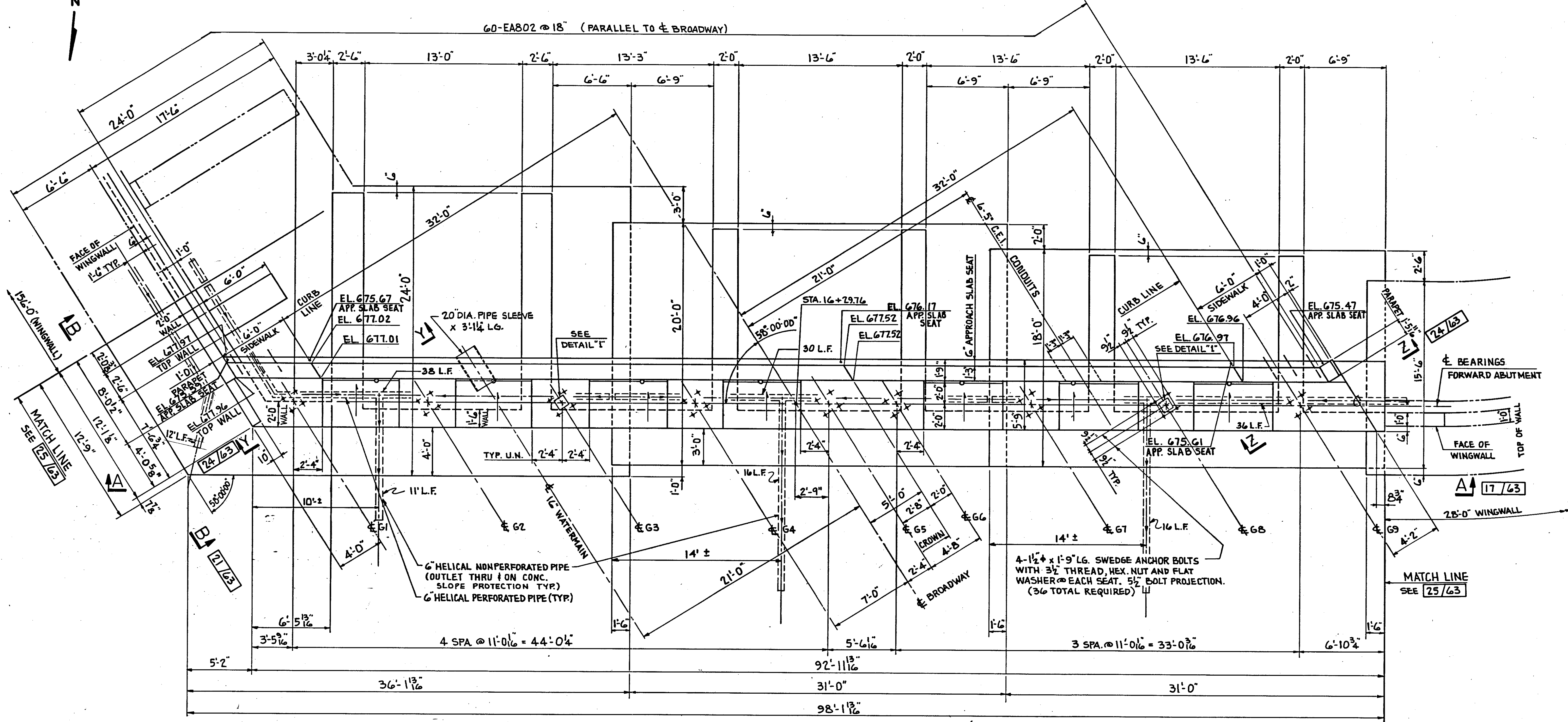


WESTON A Business Trust
 DESIGNERS CONSULTANTS 3659 GREEN ROAD SUITE 215 CLEVELAND, OHIO 44122

15/63

**SUBSTRUCTURE
 FORWARD ABUTMENT AND WALLS
 EXCAVATION AND EMBANKMENT
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY**

| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| CAP | JRH | RLH | 2/83 | | | |



PLAN

NOTE: CONTRACTOR TO PLACE REINFORCING TO AVOID INTERFERENCE WITH ANCHOR BOLTS AND BARS. G-1, G-2, G-4, G-5, G-6, G-7, G-9 HAVE NO SHEAR LUG OR POCKET IN SEAT.

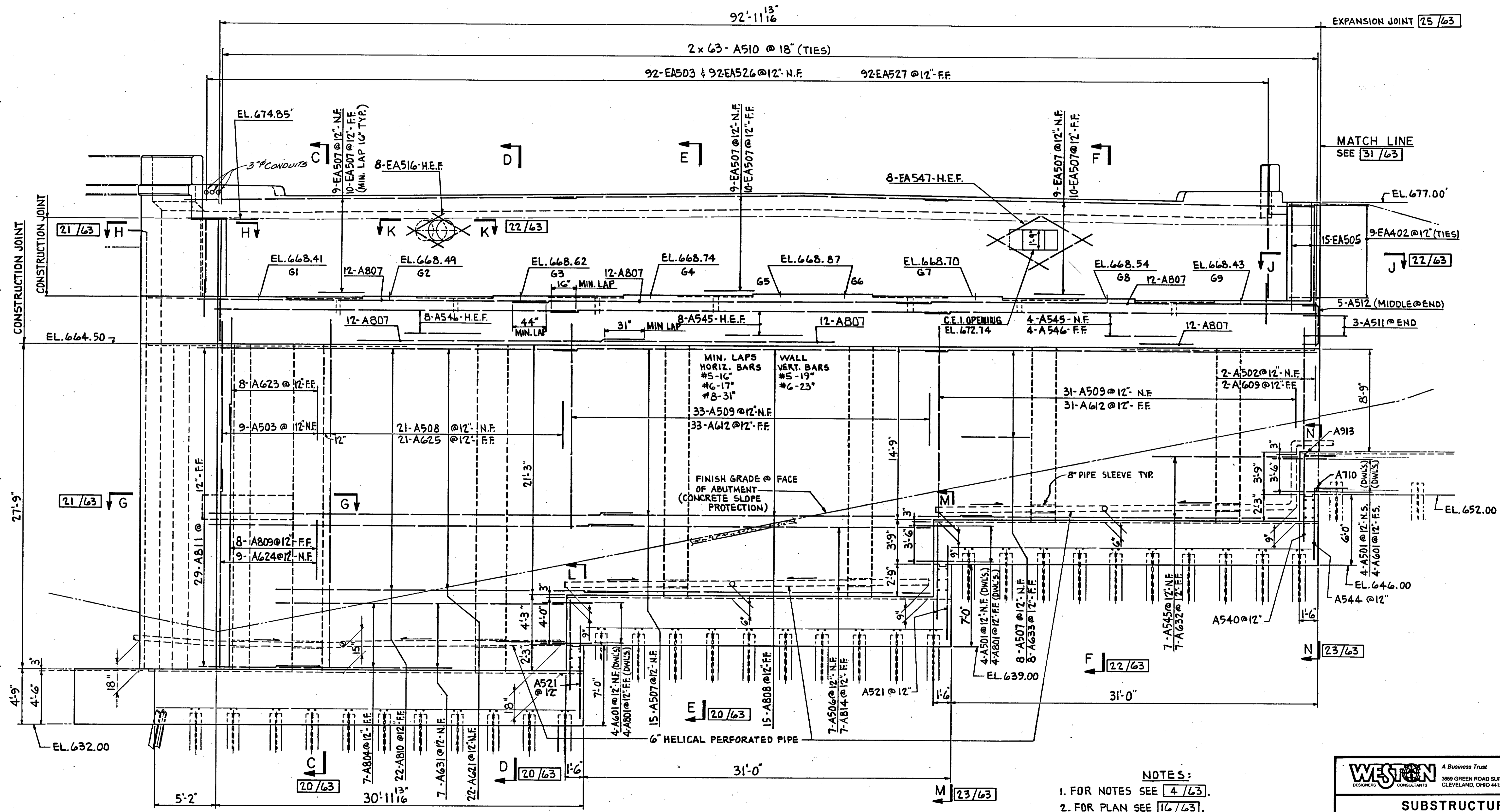
- NOTES:**
- FOR NOTES SEE [4/63].
 - BEARING ANCHOR BOLTS SEE [50/63]. ALL BEARING ANCHOR BOLTS SHALL BE CAST IN PLACE AND LOCATED AND SUPPORTED BY TEMPLATES. REINFORCING STEEL IN THE VICINITY OF THE BRIDGE SEAT SHALL BE ACCURATELY PLACED TO AVOID INTERFERENCE WITH THE CASTING OF BEARING ANCHOR BOLTS.
 - POROUS BACKFILL, 2 FEET THICK, SHALL EXTEND UP TO THE PLANE OF THE SUBGRADE AND LATERALLY TO THE ENDS OF THE WINGWALLS.
 - FOR PILE PLAN SEE [18/63].
 - FOR FOUNDATION PLAN SEE [19/63].
 - FOR ELEVATION SEE [17/63].
 - FOR REINFORCING SCHEDULE SEE [57/63] AND [58/63].
 - APPLY NOTE G SHEET [8/63] TO FORWARD ABUTMENT BACKWALL, TOP 2' LATEX MODIFIED CONCRETE.

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 CLEVELAND, OHIO 44122

SUBSTRUCTURE FORWARD ABUTMENT PLAN

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |



ELEVATION A-A 16/63

- NOTES:**
1. FOR NOTES SEE 4/63.
 2. FOR PLAN SEE 16/63.
 3. FOR SECTIONS SEE 20/63, 21/63, 22/63 & 23/63.
 4. FOR REINFORCING SCHEDULE SEE 57/63 & 58/63.

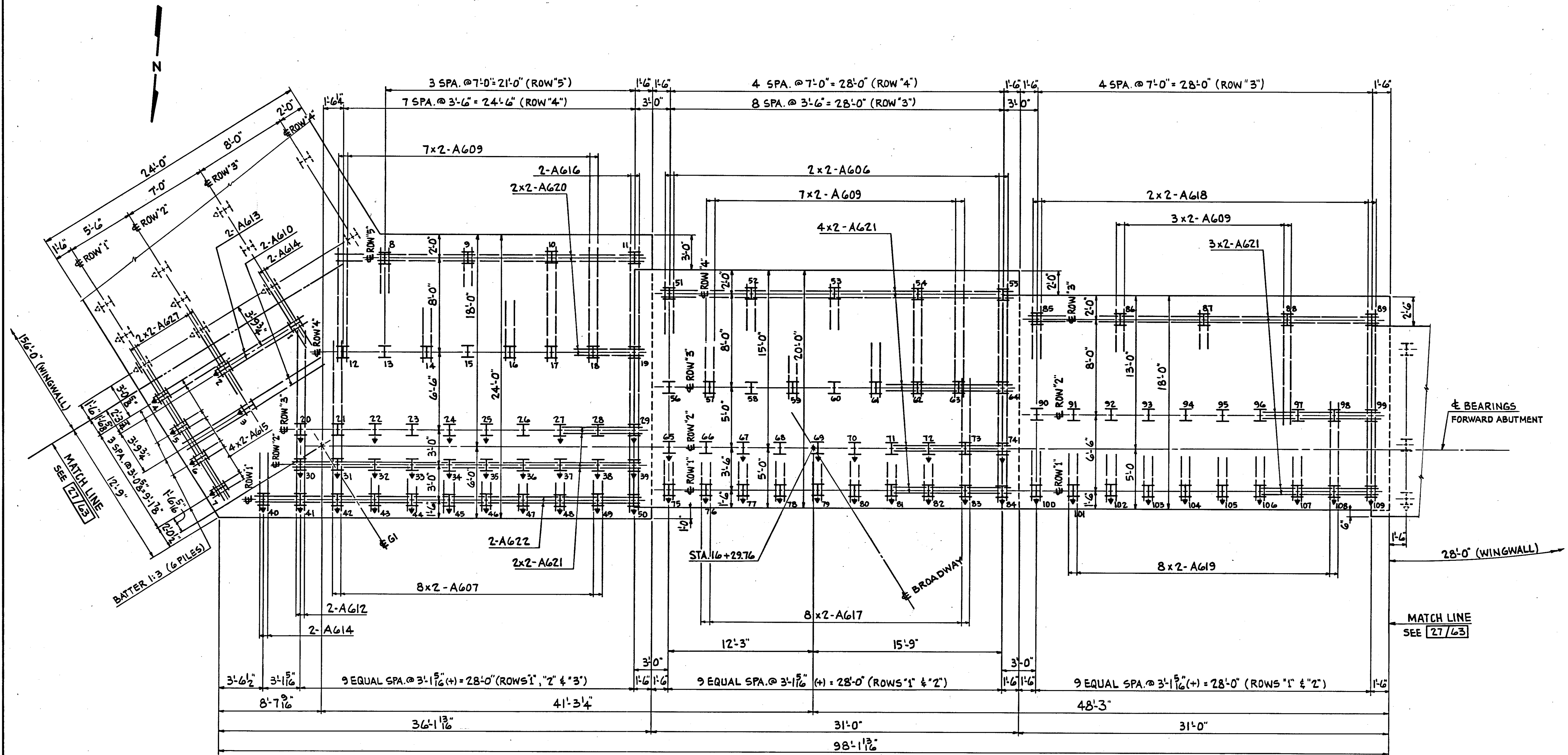
WESTON A Business Trust
 DESIGNERS CONSULTANTS
 3559 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

17/63

SUBSTRUCTURE FORWARD ABUTMENT ELEVATION

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |



NOTE: ALL REINFORCING SHOWN ON THIS PLAN TO BE PLACED OVER PILES.

PILE PLAN
 (109 PILES)

- NOTES:**
1. FOR NOTES SEE 4/63.
 2. ALL PILES ARE HP12 x 53.
 3. BATTER FOR PILES TO BE 1:4, UNLESS NOTED.
 4. DIRECTION OF BATTER →
 5. FOR PLAN AND ELEVATION SEE 16/63 & 17/63.
 6. FOR REINFORCING SCHEDULE SEE 57/63 & 58/63.

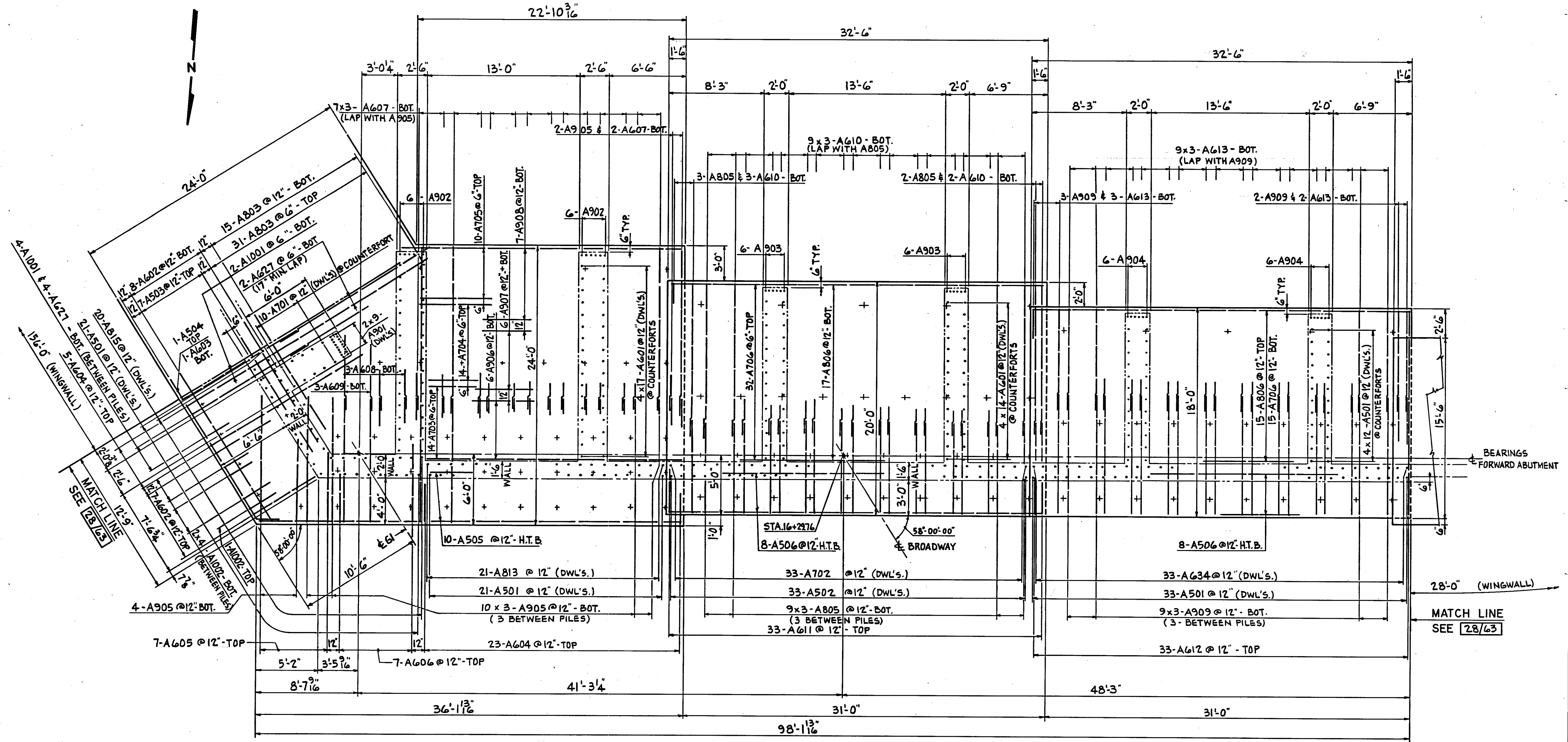
WESTON A Business Trust
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

18/63

**SUBSTRUCTURE
 FORWARD ABUTMENT
 PILE PLAN**

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |



FOUNDATION PLAN
 FOR ADDITIONAL REINFORCING OVER PILES
 SEE [18/63]

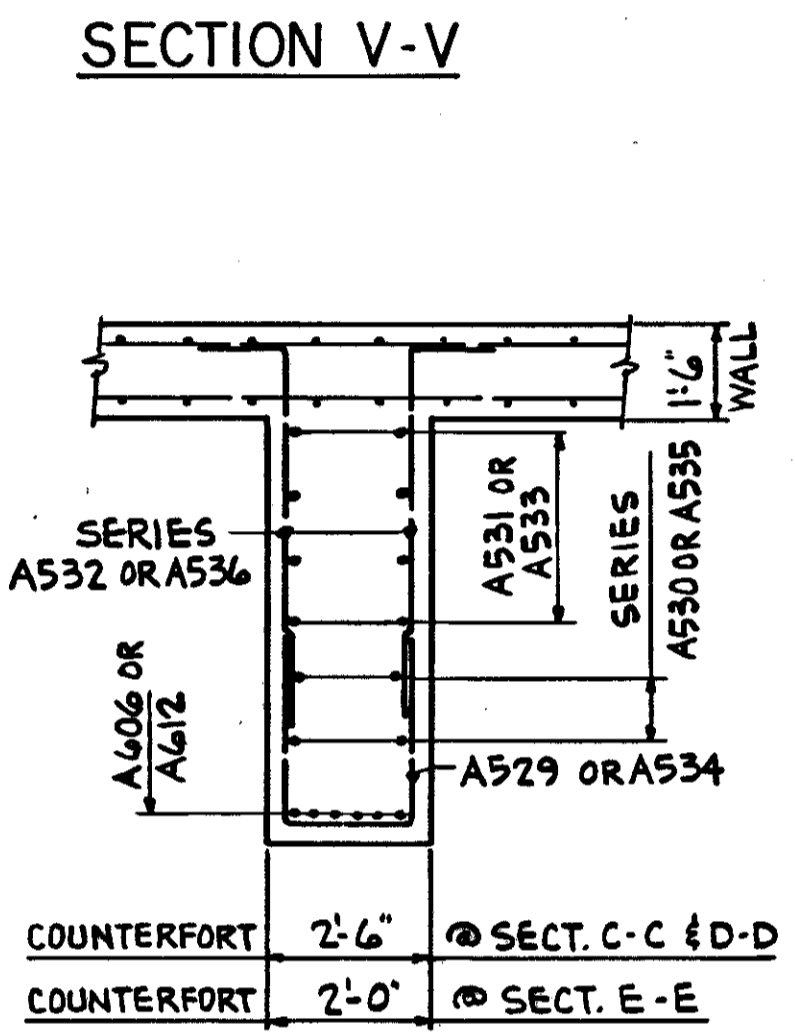
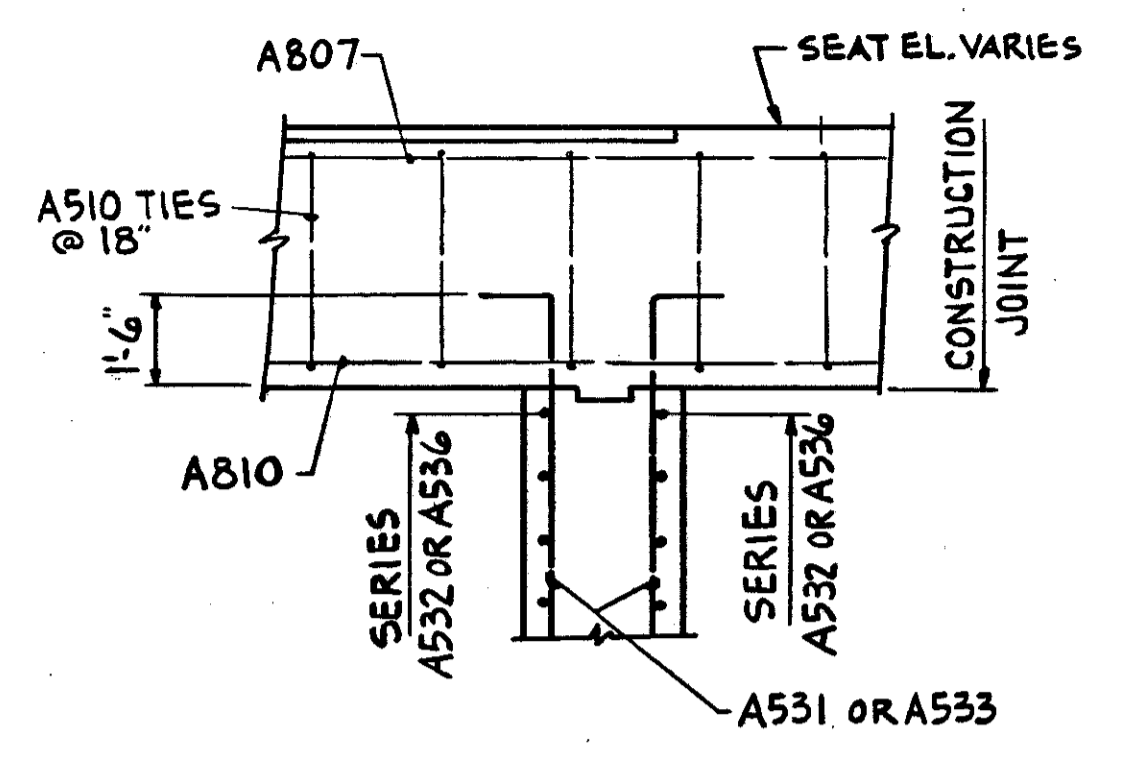
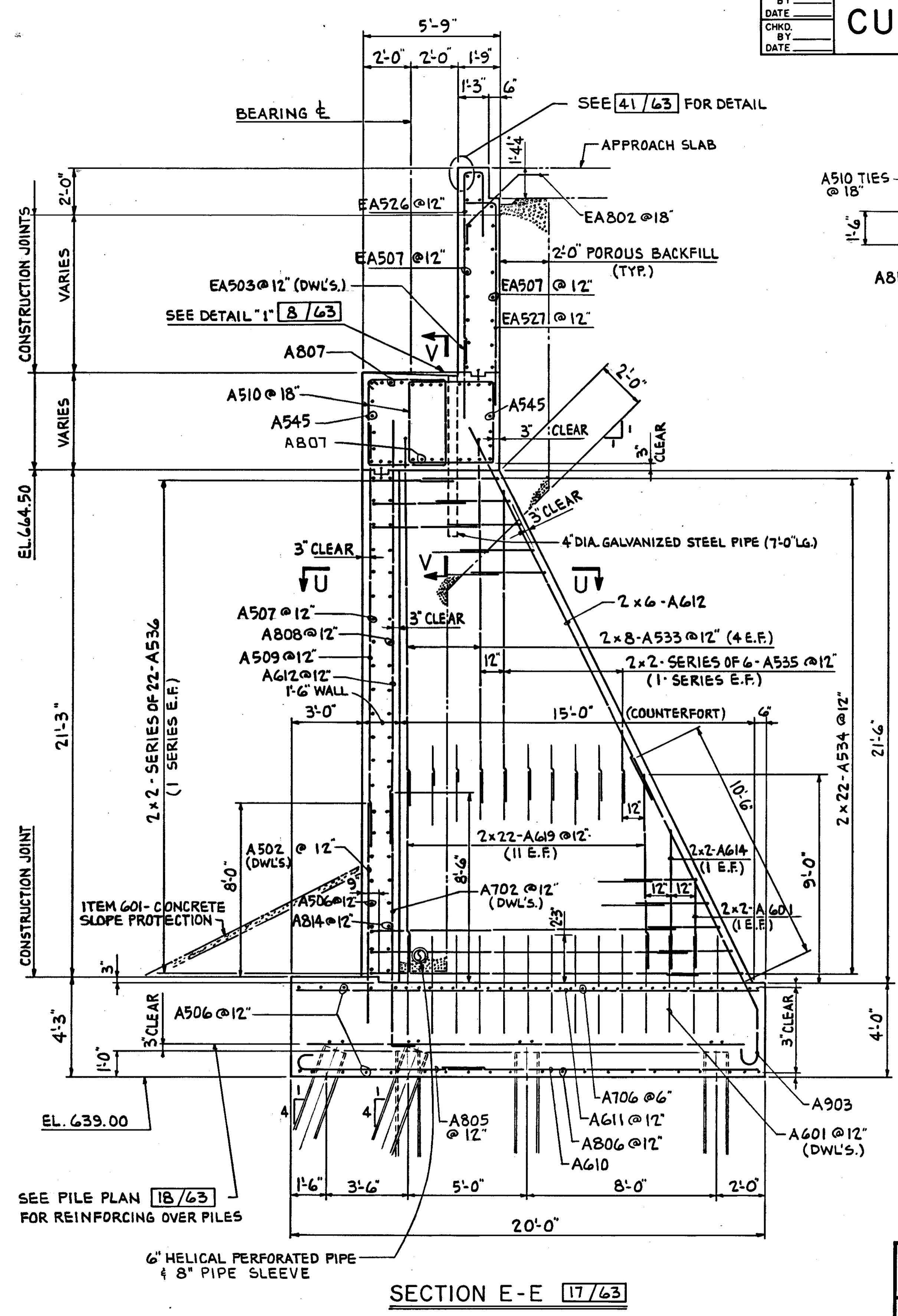
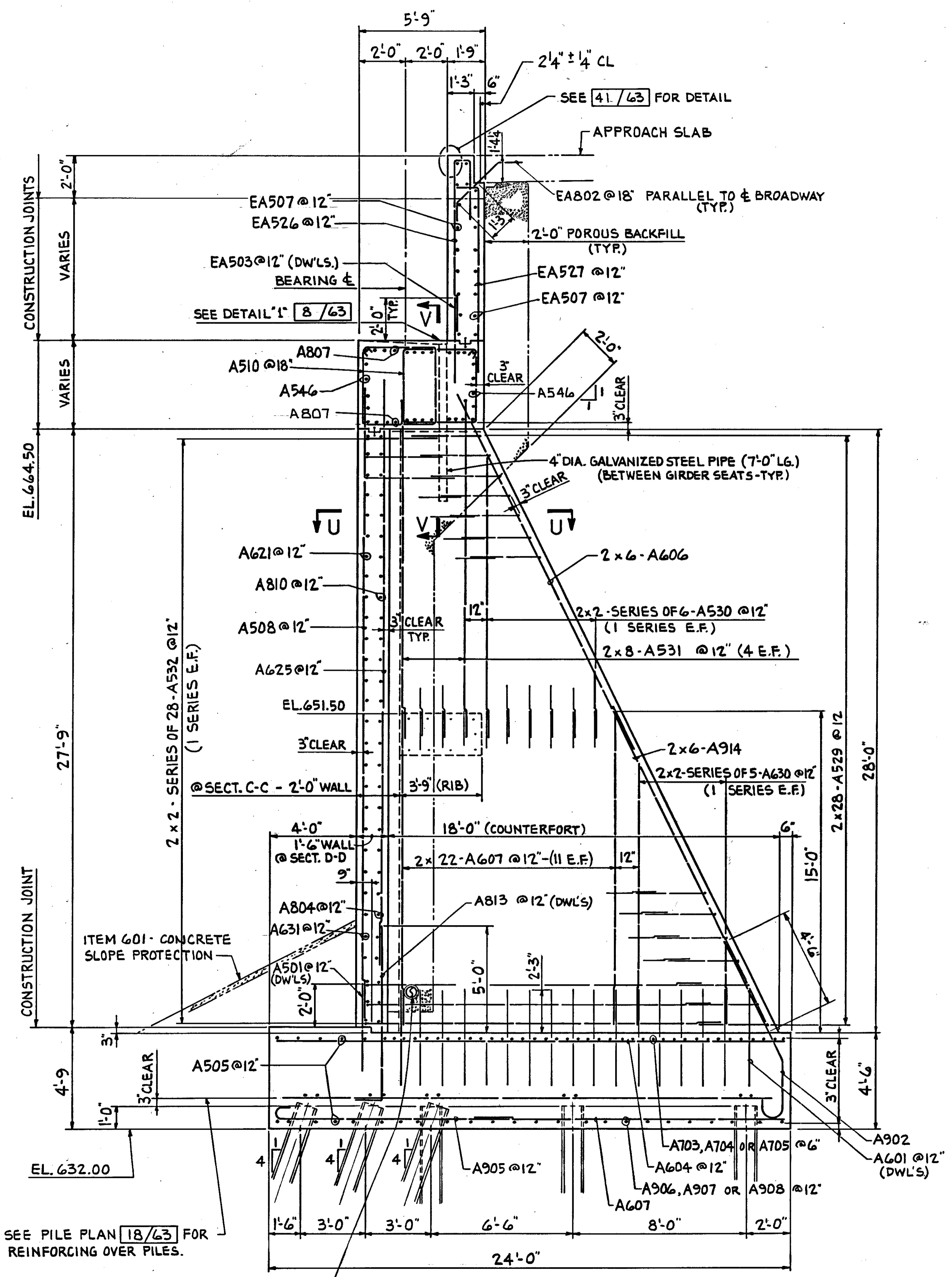
- NOTES:**
1. FOR NOTES SEE [4/63].
 2. FOR PLAN AND ELEVATION SEE [16/63] [17/63].
 3. FOR REINFORCING SCHEDULE SEE [57/63] [58/63].

WESTON A Business Trust
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 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

19/63

SUBSTRUCTURE FORWARD ABUTMENT FOUNDATION PLAN
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |



- NOTES:**
- FOR NOTES SEE 4/63.
 - FOR ELEVATION SEE 17/63.
 - FOR APPROACH SLAB SEE 43/63.
 - FOR REINFORCING SCHEDULE SEE 57/63 & 58/63.

SEE PILE PLAN 18/63 FOR REINFORCING OVER PILES.

6" HELICAL PERFORATED PIPE & 8" PIPE SLEEVE

SECTION C-C (NOTED)
SECTION D-D (NOTED) 17/63

SEE PILE PLAN 18/63 FOR REINFORCING OVER PILES

6" HELICAL PERFORATED PIPE & 8" PIPE SLEEVE

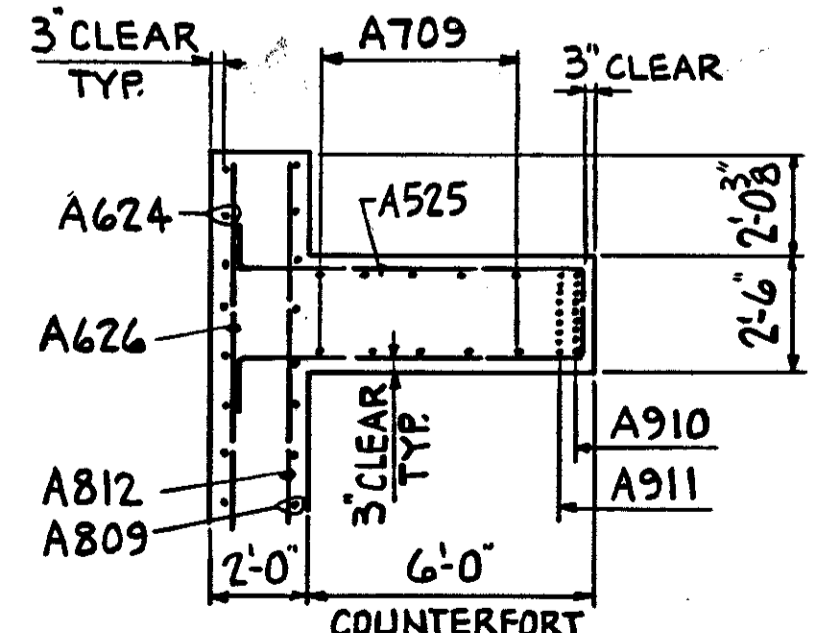
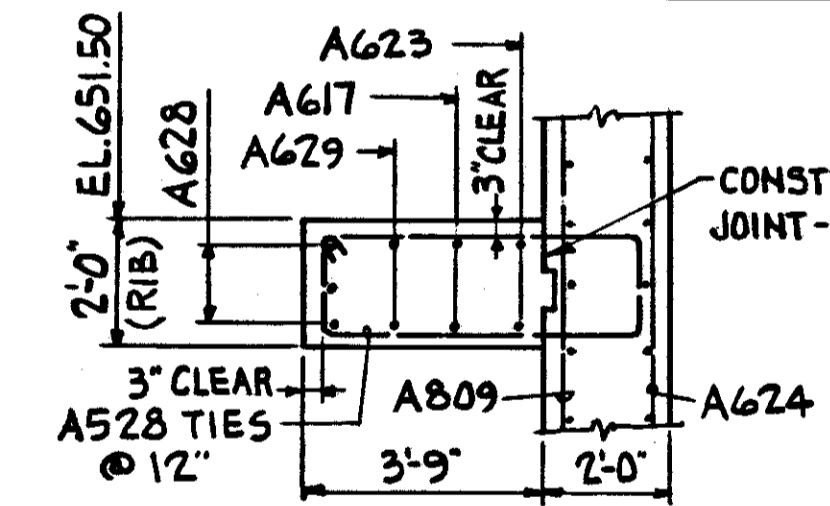
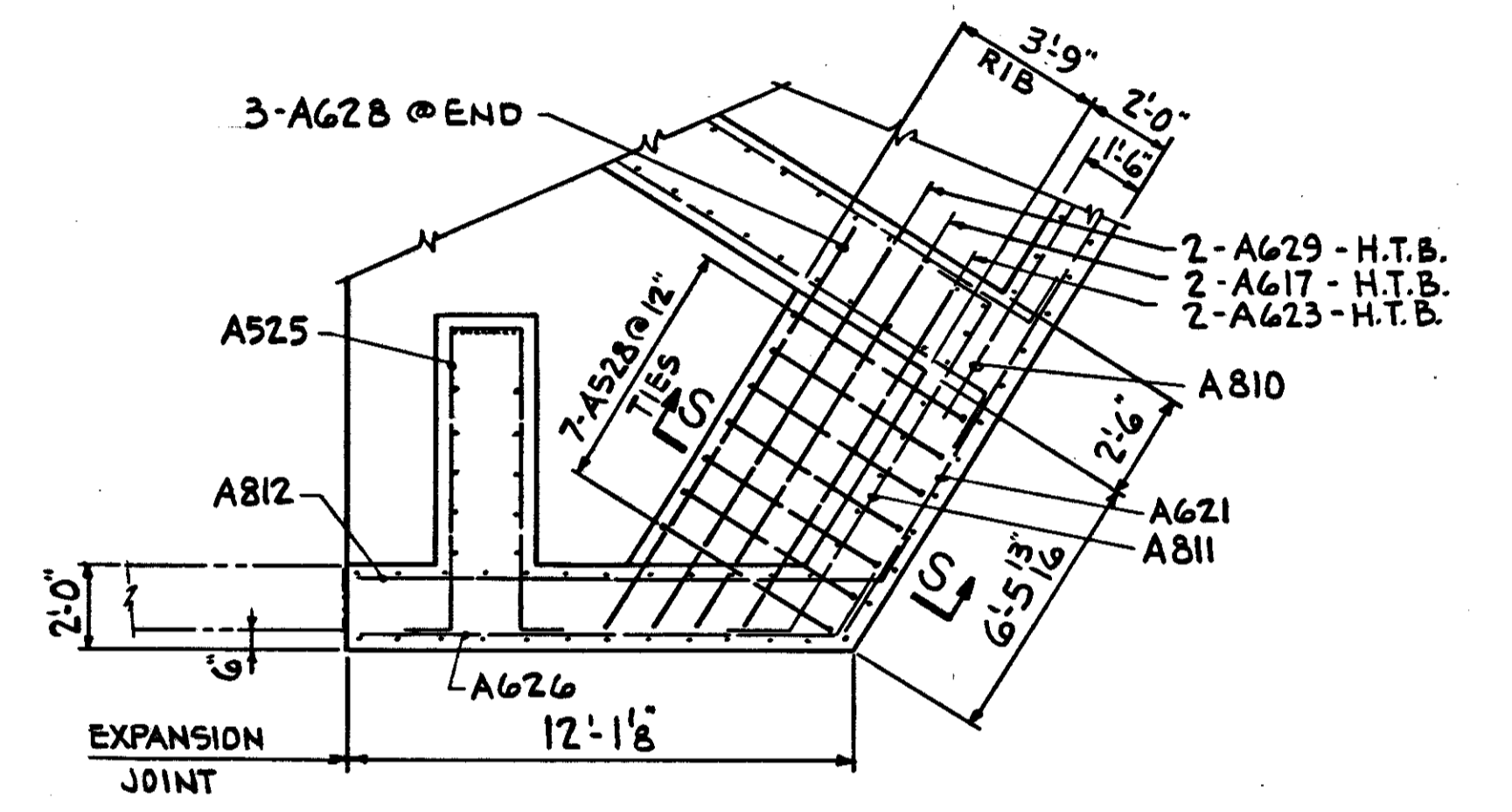
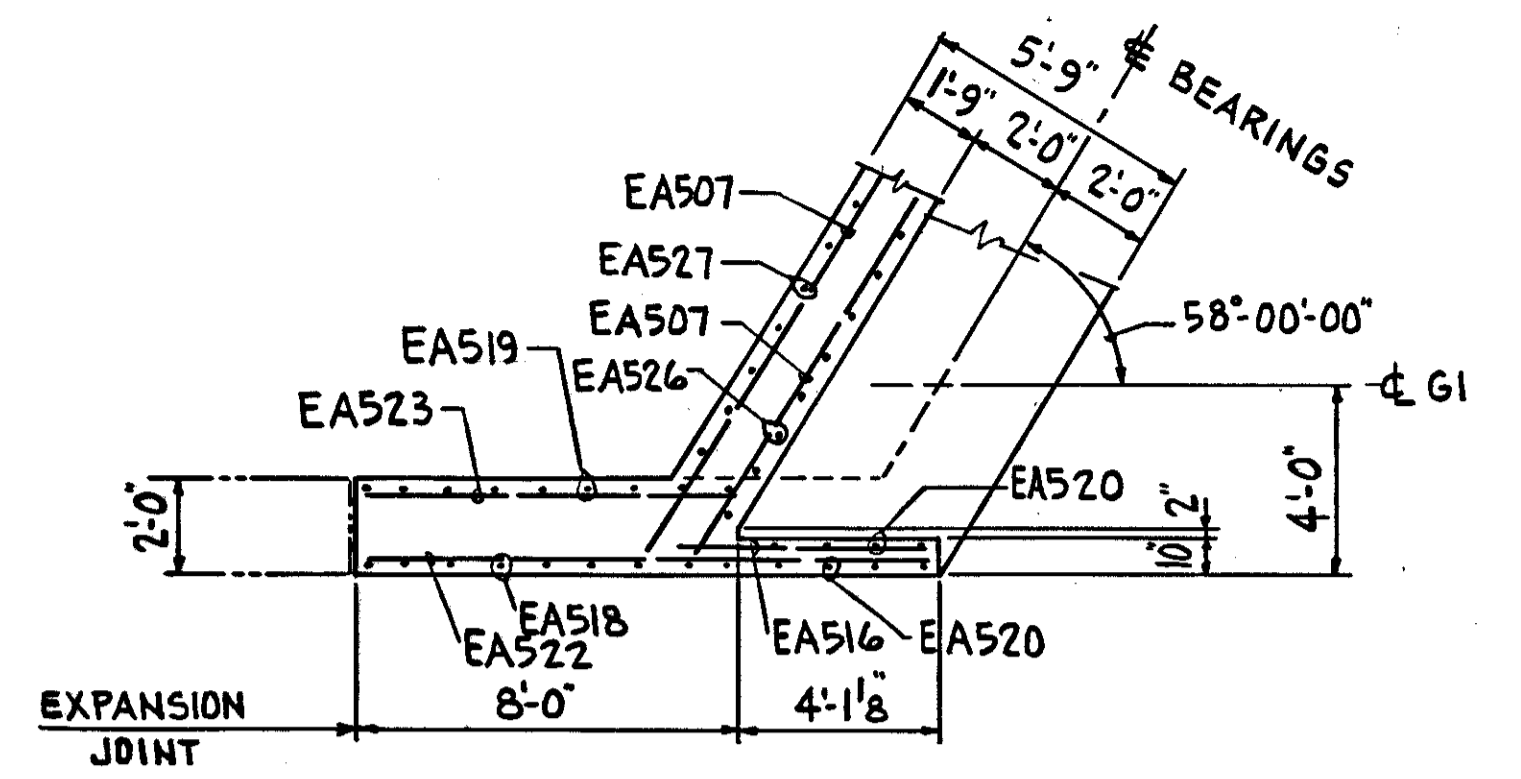
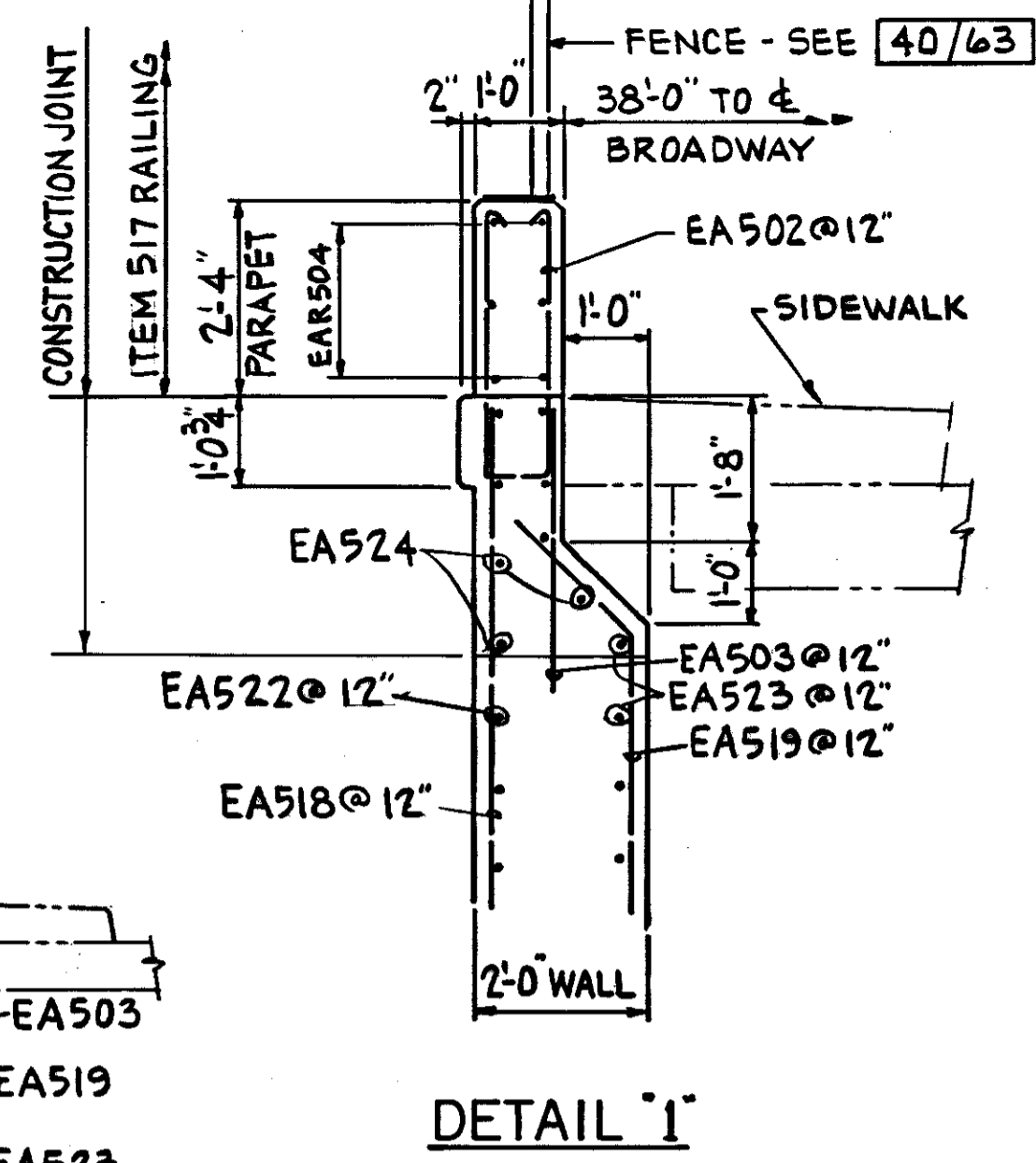
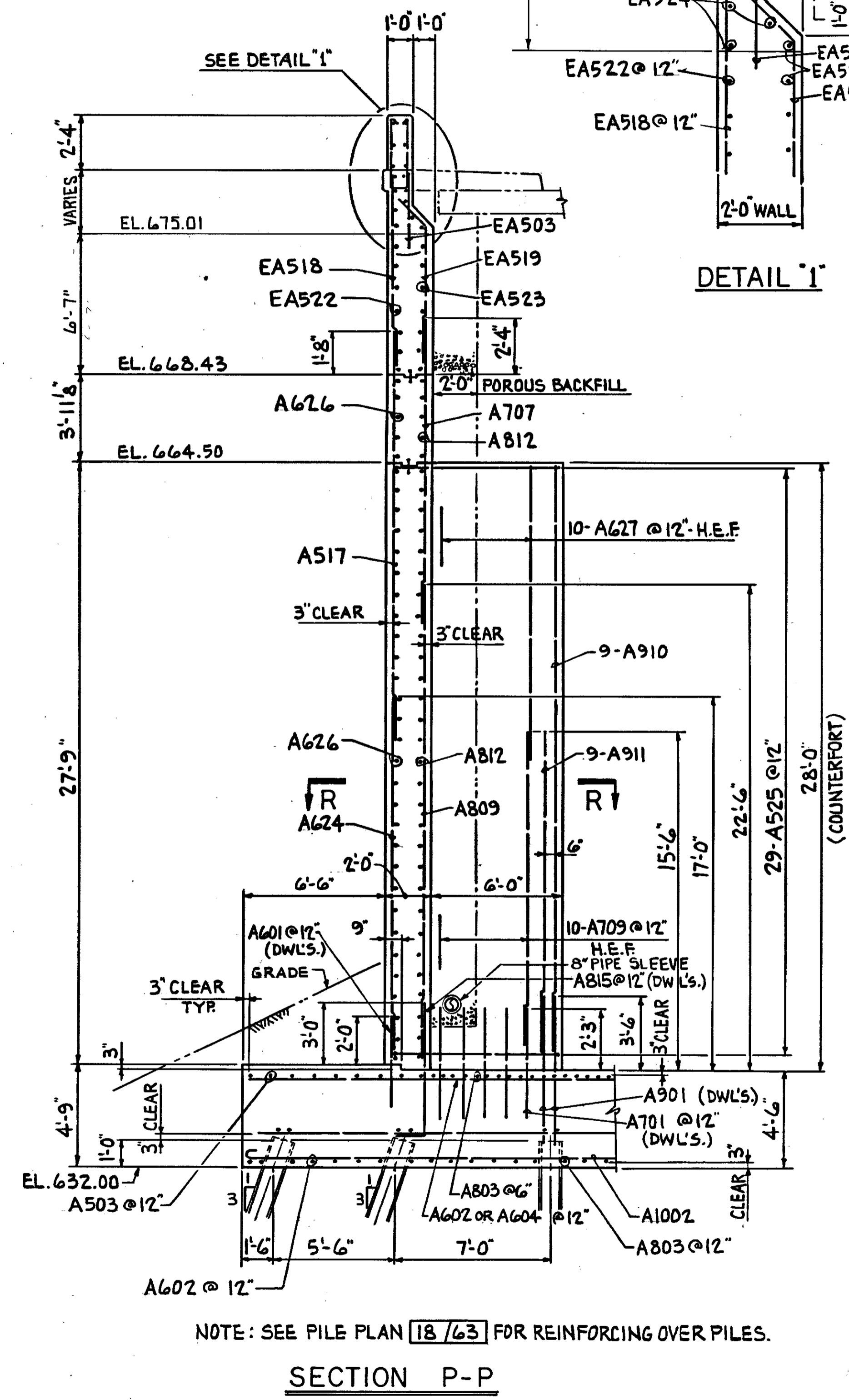
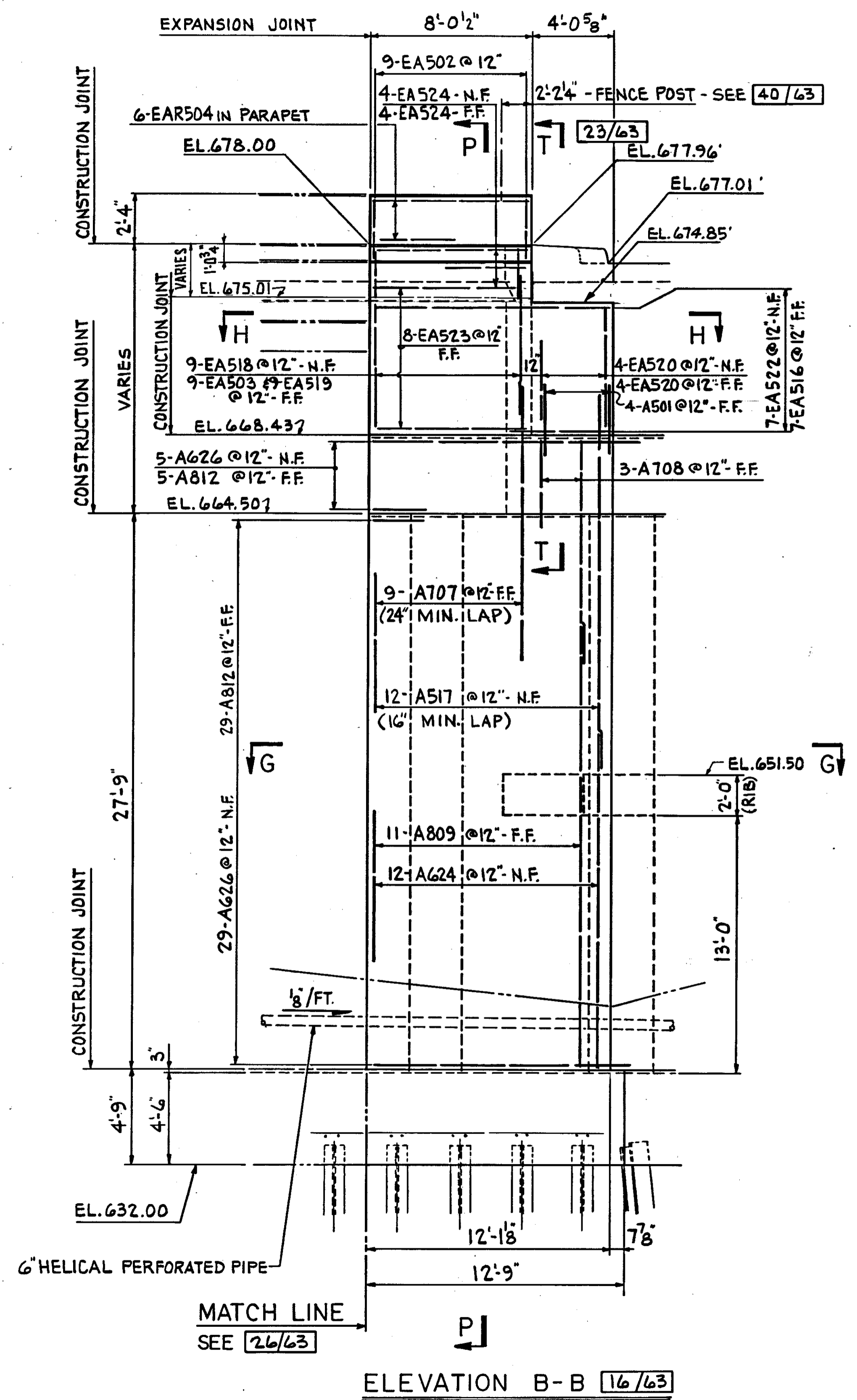
SECTION E-E 17/63

WESTON A Business Trust
 3699 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

SUBSTRUCTURE FORWARD ABUTMENT SECTIONS
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |

CUY-490-1.49



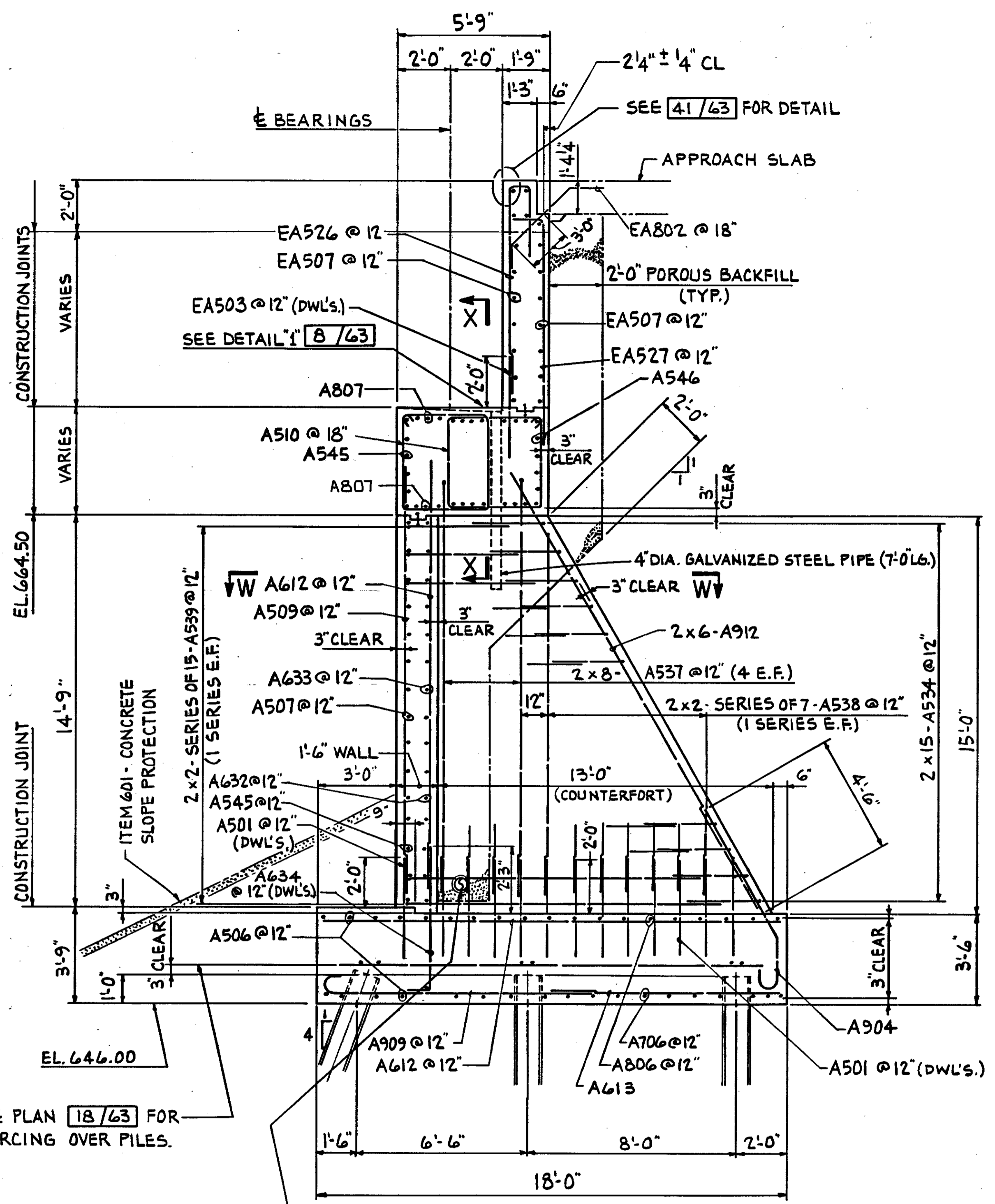
- NOTES:
- FOR NOTES SEE 4/63.
 - FOR ELEVATION SEE 17/63.
 - FOR APPROACH SLAB SEE 43/63.
 - FOR REINFORCING SCHEDULE SEE 57/63.

WESTON A Business Trust
 DESIGNERS CONSULTANTS
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 CLEVELAND, OHIO 44122
 21/63

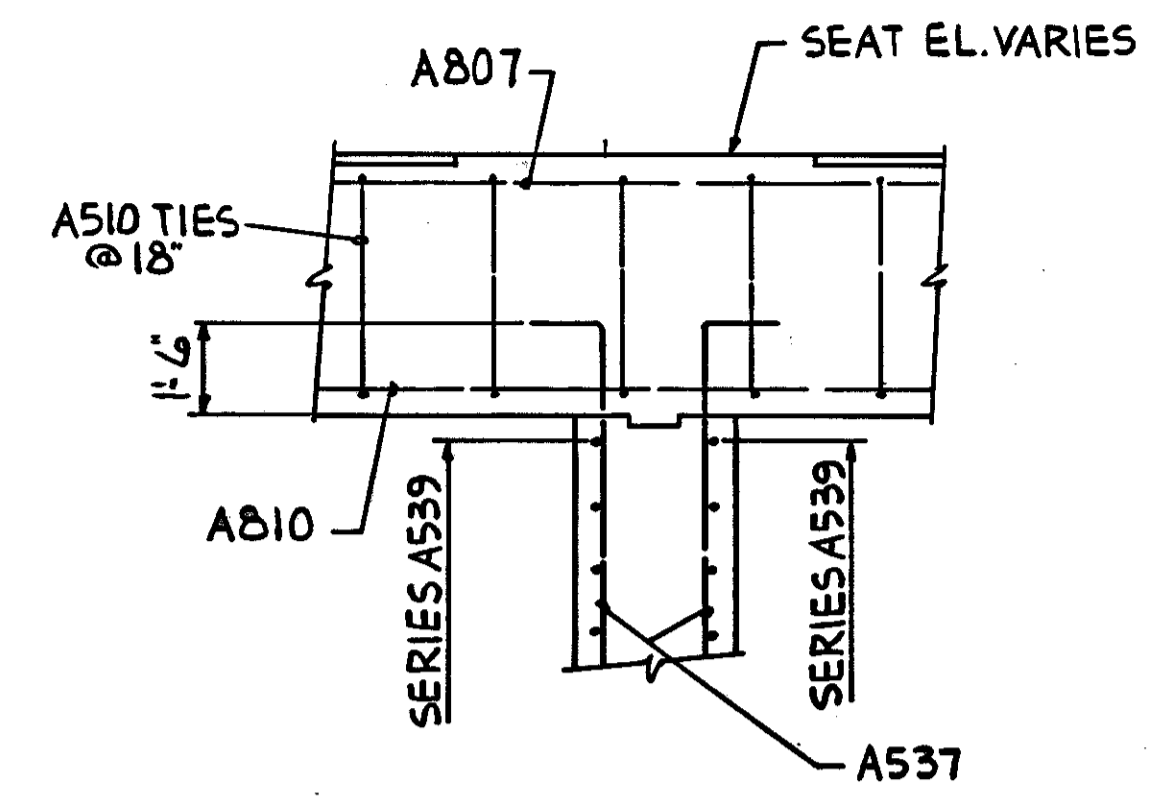
SUBSTRUCTURE FORWARD ABUTMENT ELEVATION AND SECTIONS
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |

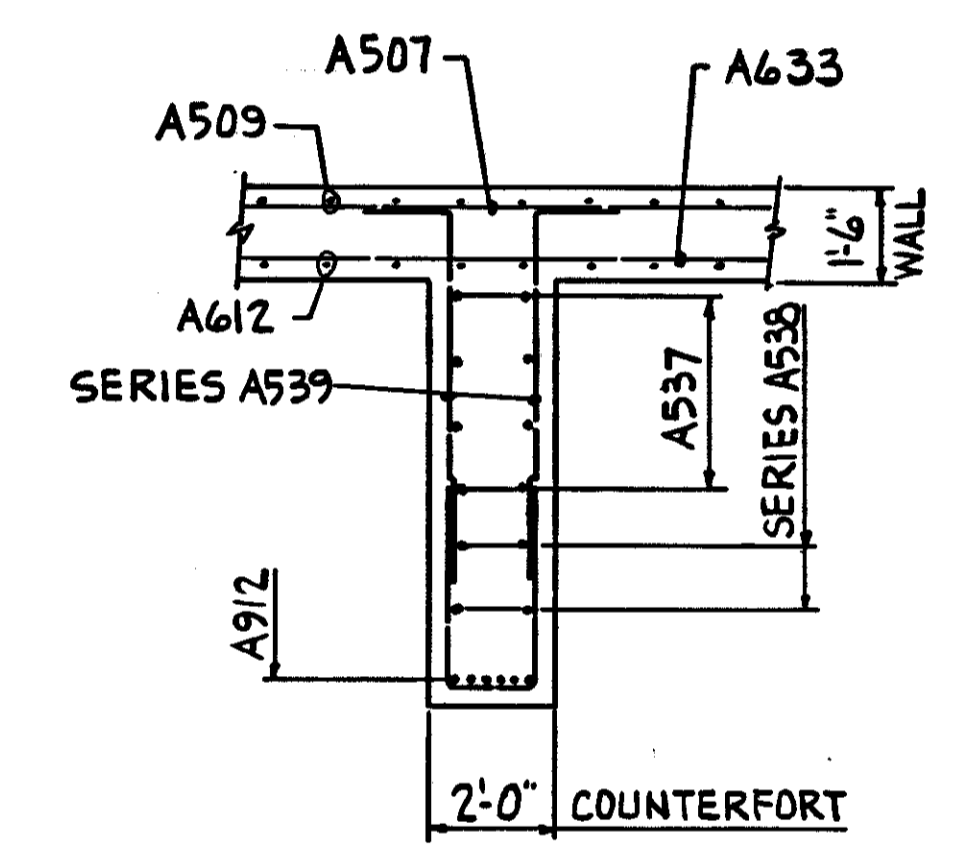
CUY-490-1.49



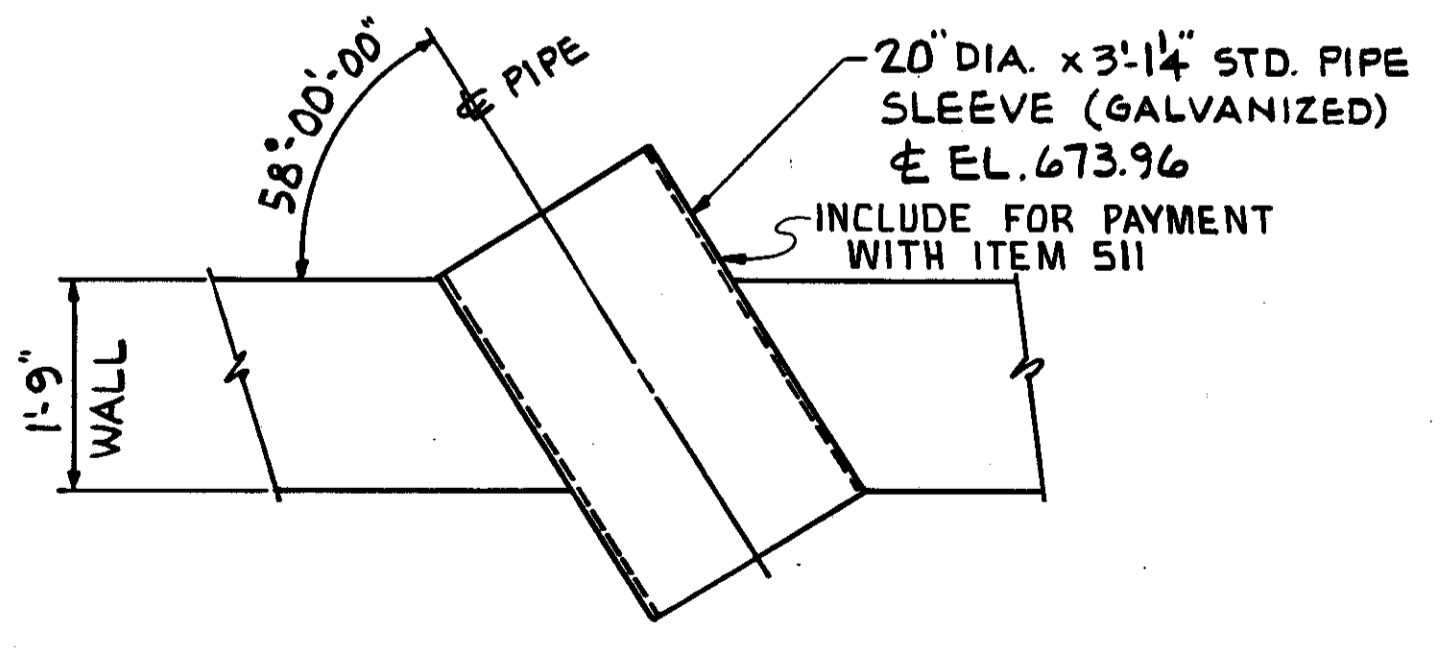
SECTION F-F 17/63



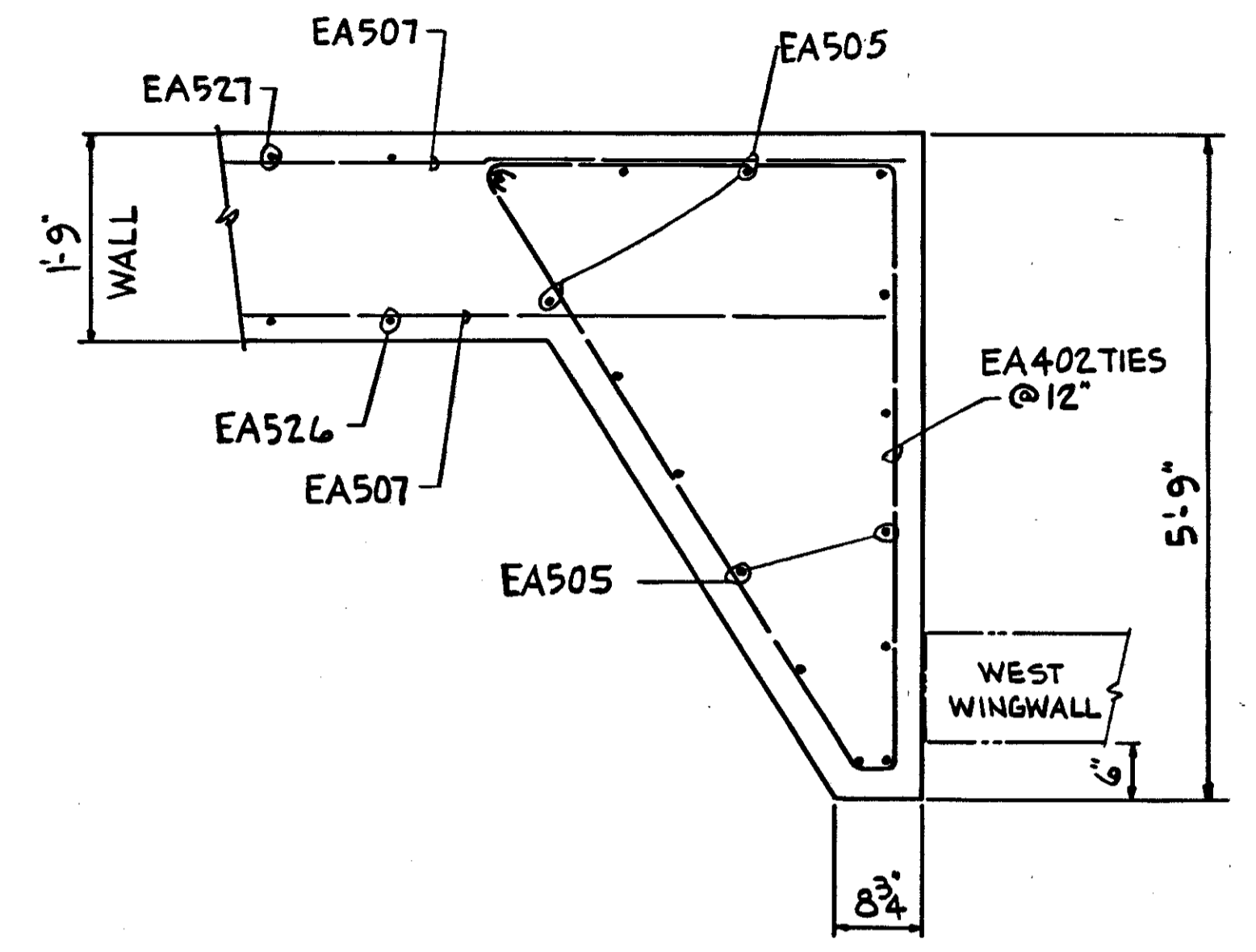
SECTION X-X



SECTION W-W



SECTION K-K 17/63



SECTION J-J 17/63

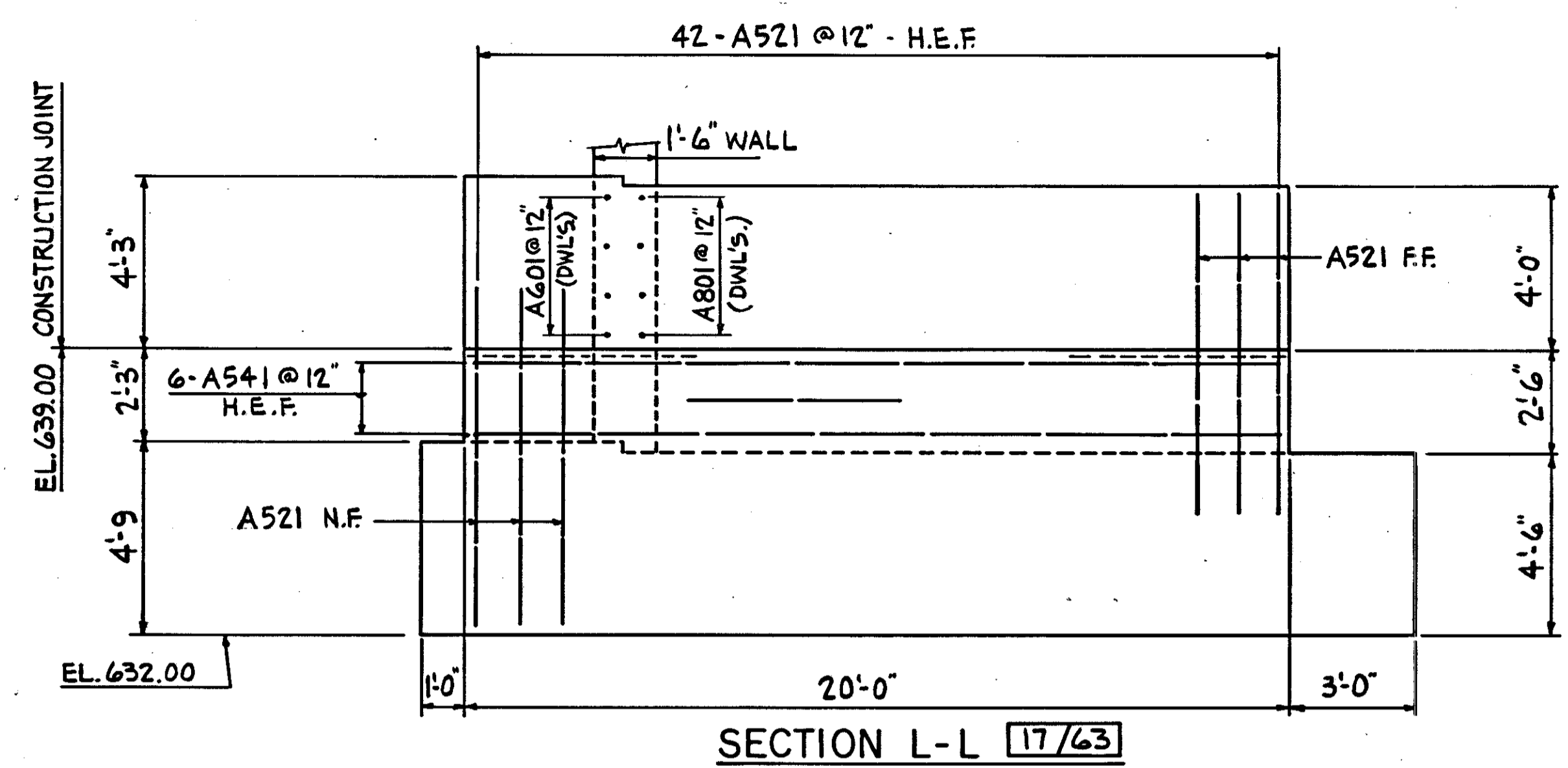
NOTES:

1. FOR NOTES SEE 4/63.
2. FOR ELEVATION SEE 17/63.
3. FOR APPROACH SLAB SEE 43/63.
4. FOR REINFORCING SCHEDULE SEE 57/63 & 58/63.

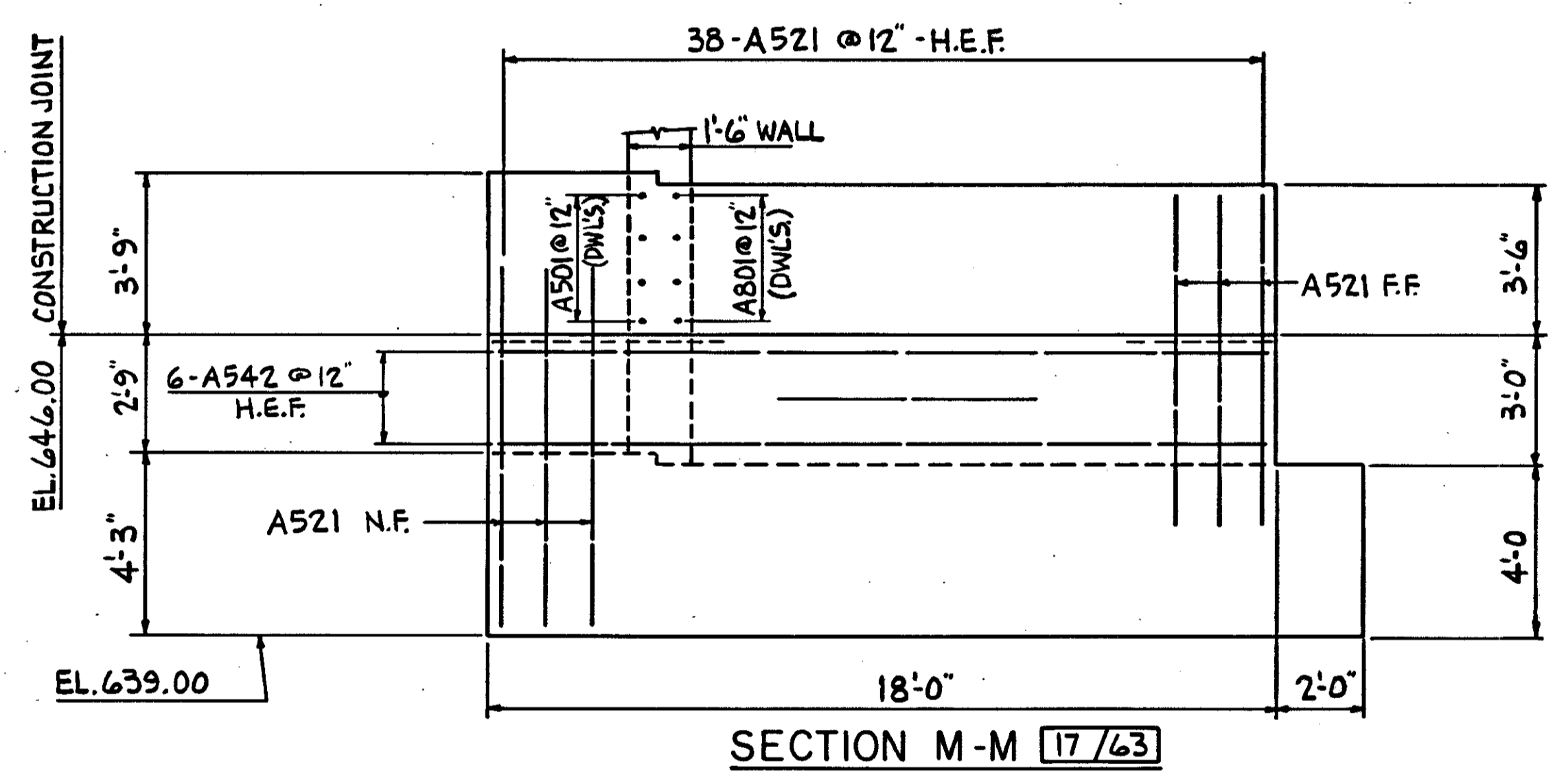
WESTON A Business Trust
 DESIGNERS CONSULTANTS
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122
 27/63

SUBSTRUCTURE FORWARD ABUTMENT SECTIONS
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

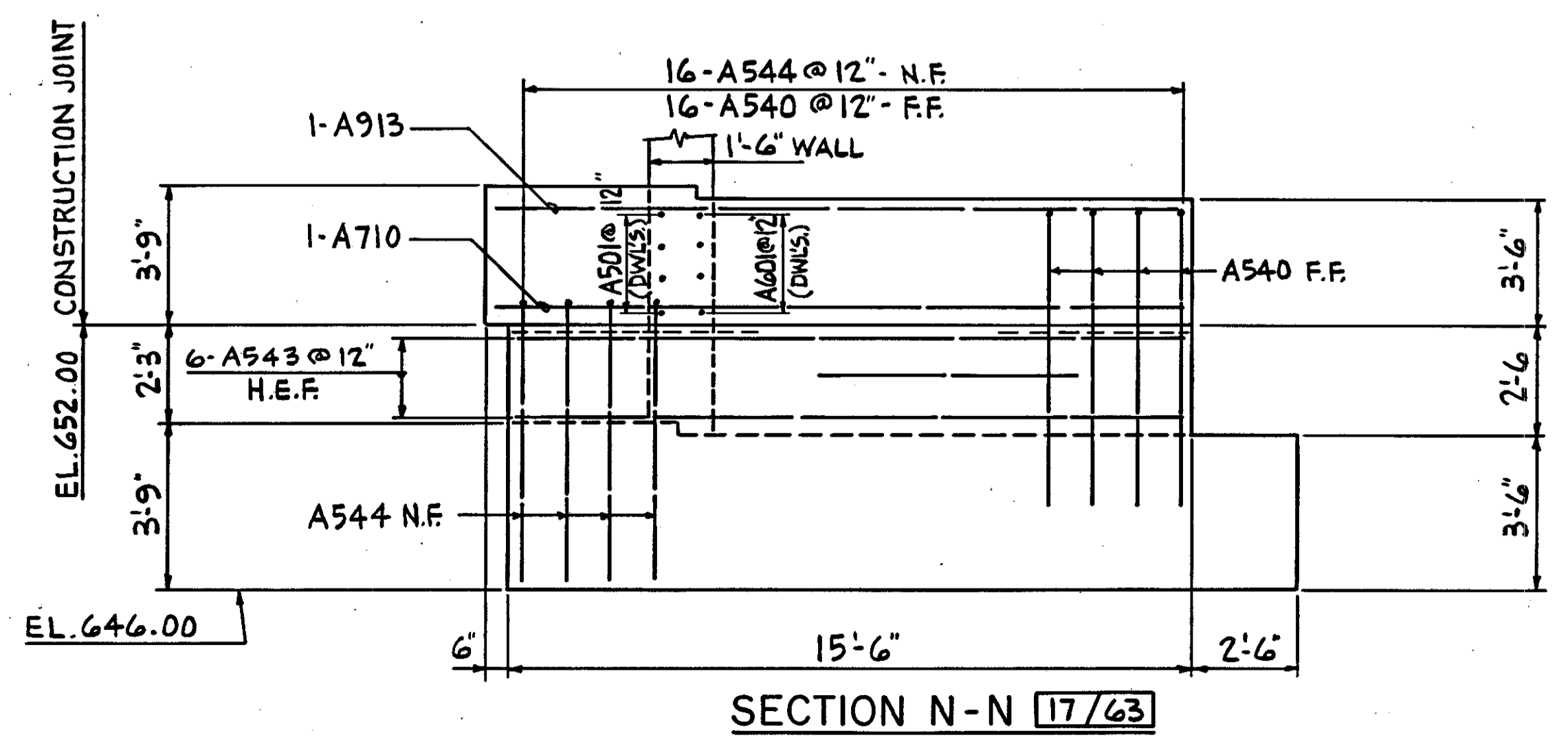
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|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |



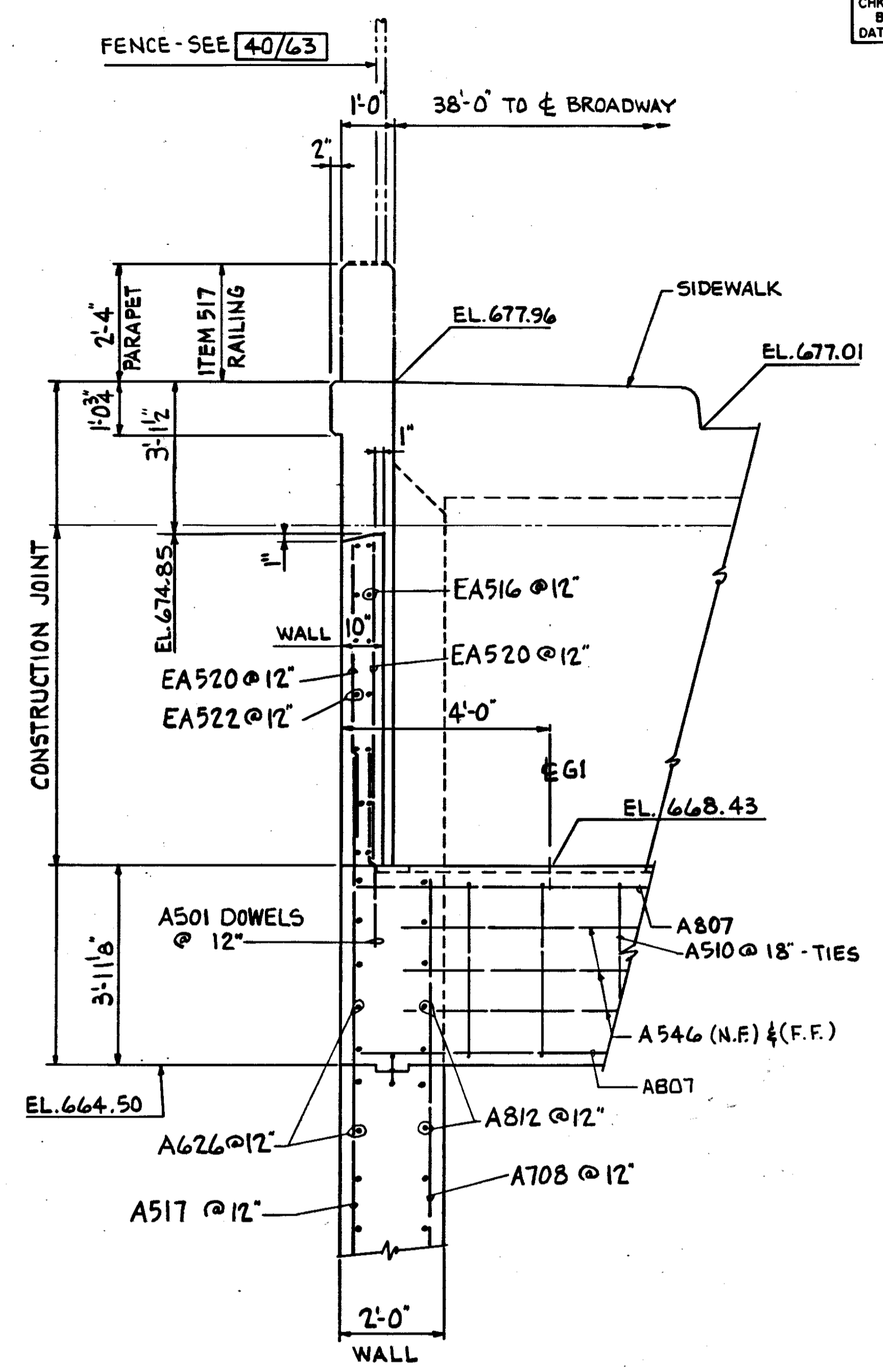
SECTION L-L [17/63]



SECTION M-M [17/63]

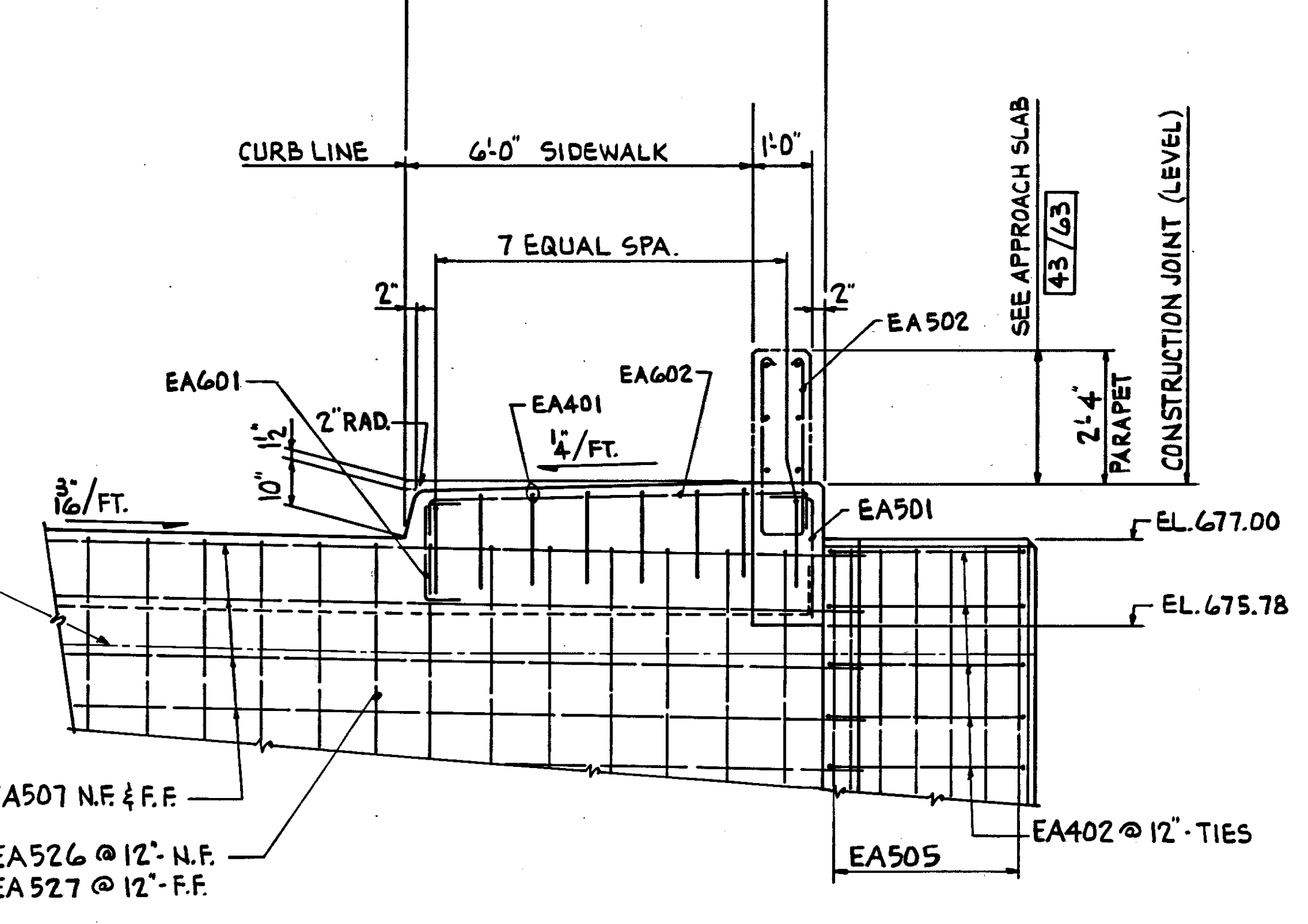
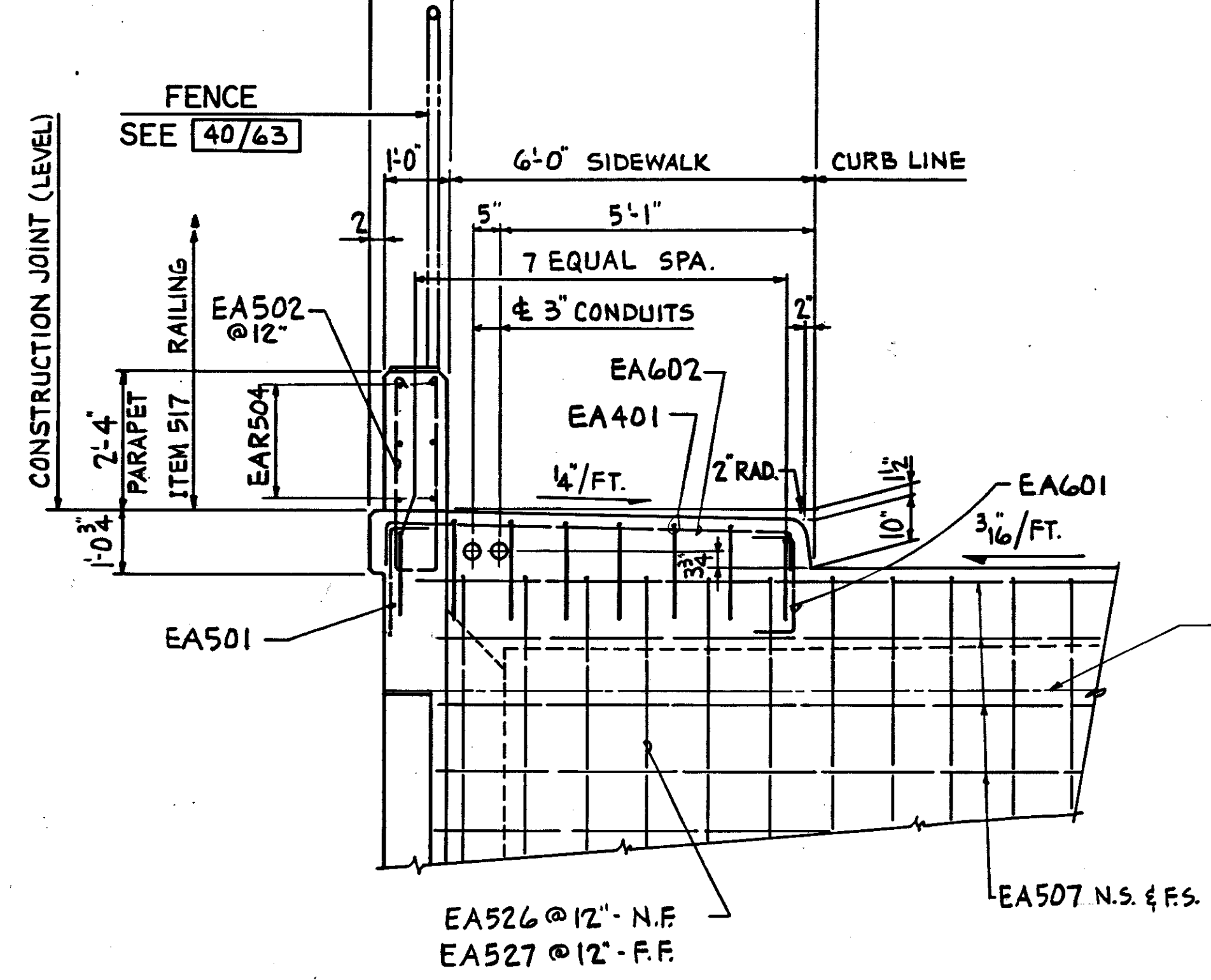
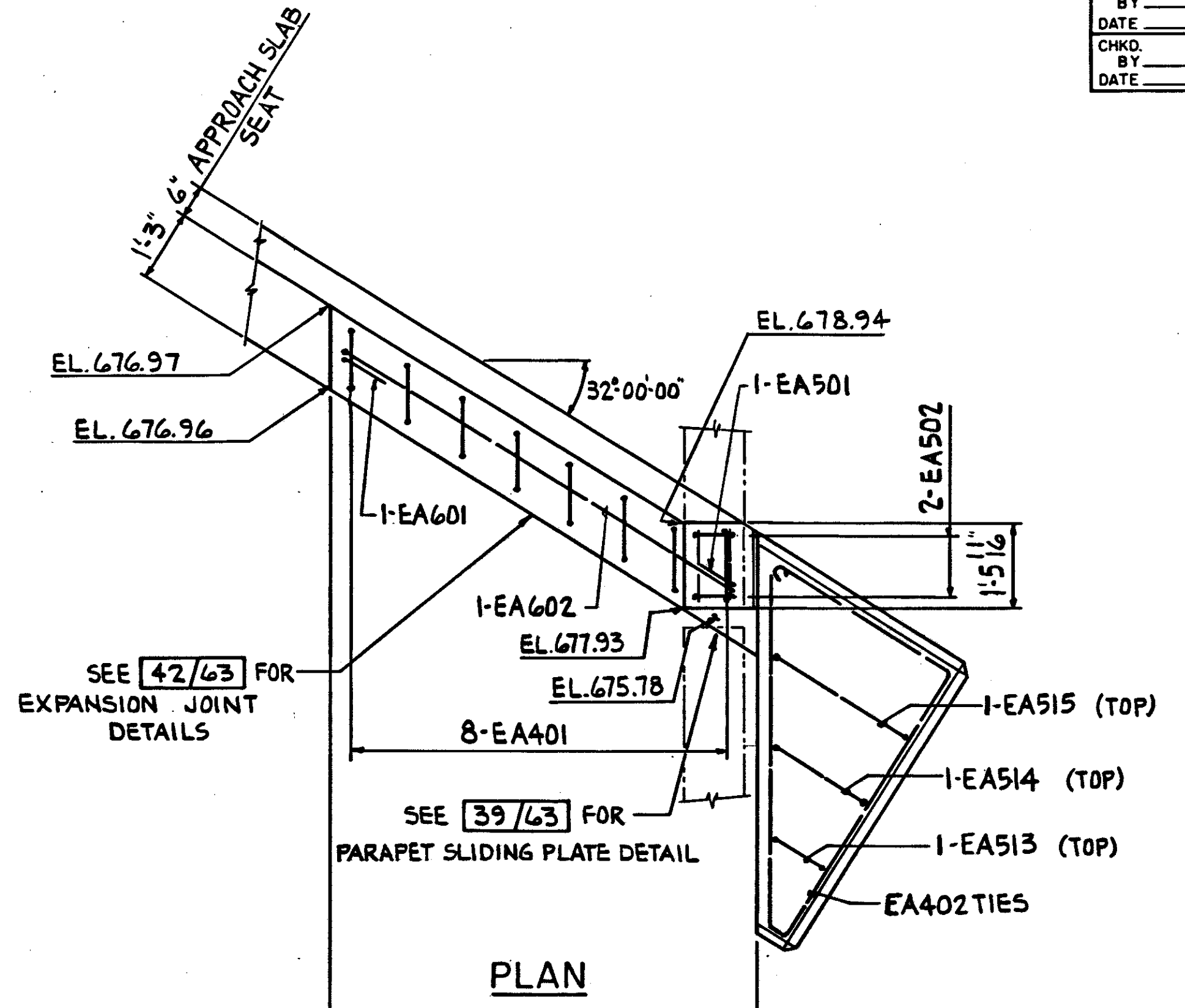
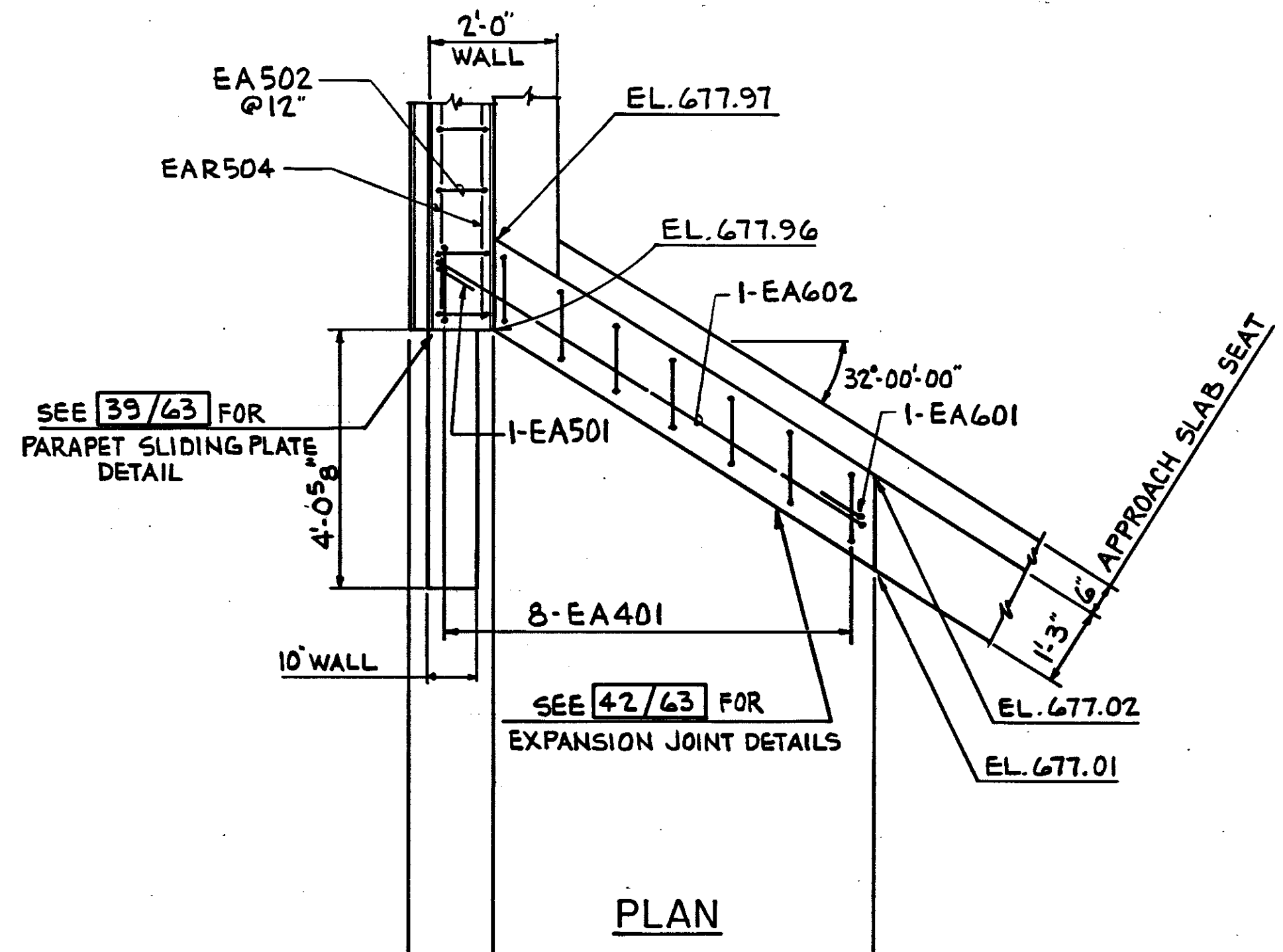


SECTION N-N [17/63]



SECTION T-T [21/63]

- NOTES:
- FOR NOTES SEE [4/63].
 - FOR ELEVATIONS SEE [17/63] & [21/63].
 - FOR REINFORCING SCHEDULE SEE [57/63] & [58/63].



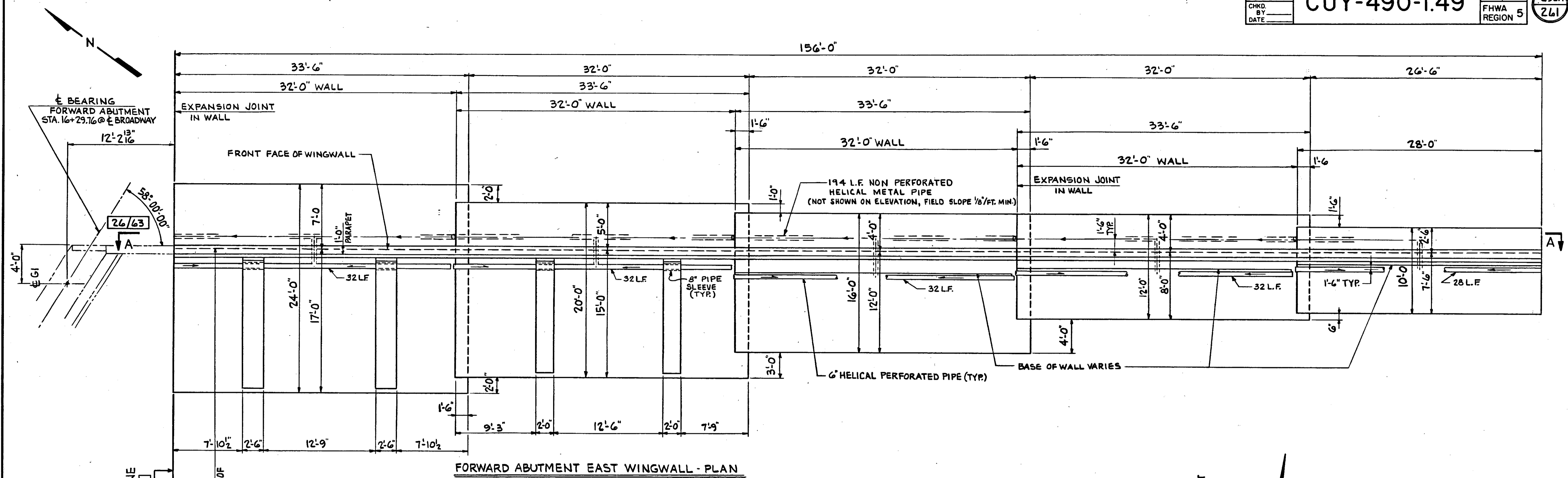
- NOTES:**
1. FOR NOTES SEE 4/63.
 2. FOR PLAN SEE 16/63.
 3. FOR APPROACH SLAB SEE 43/63.
 4. FOR REINFORCING SCHEDULE SEE 57/63 & 58/63.

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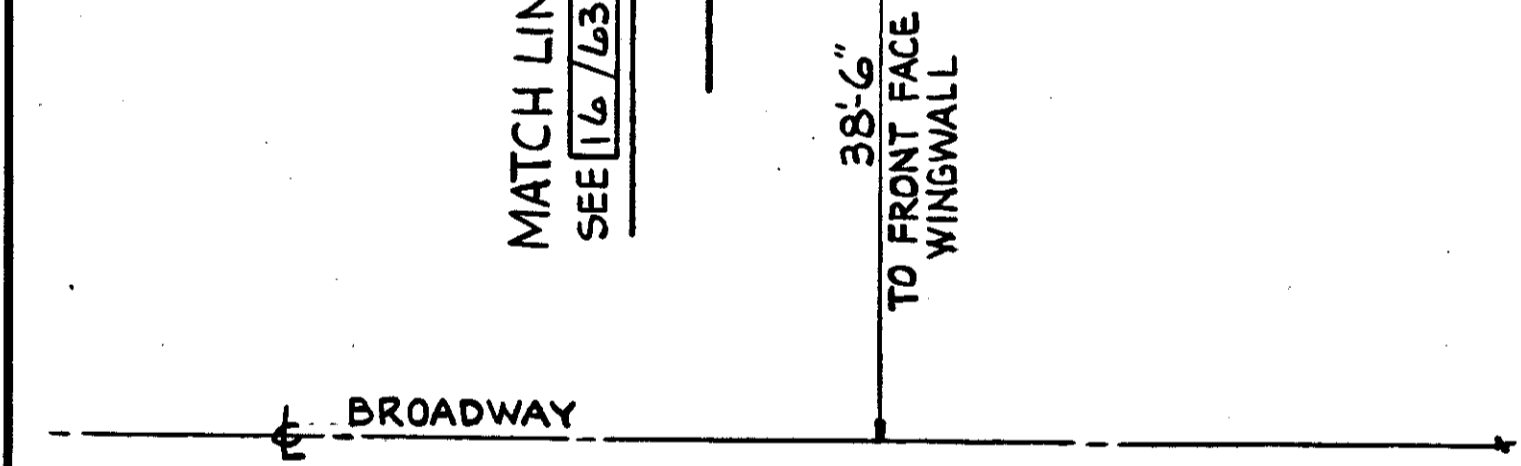
24/63

**SUBSTRUCTURE
 FORWARD ABUTMENT
 SIDEWALK-SECTIONS & PLANS
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY**

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |

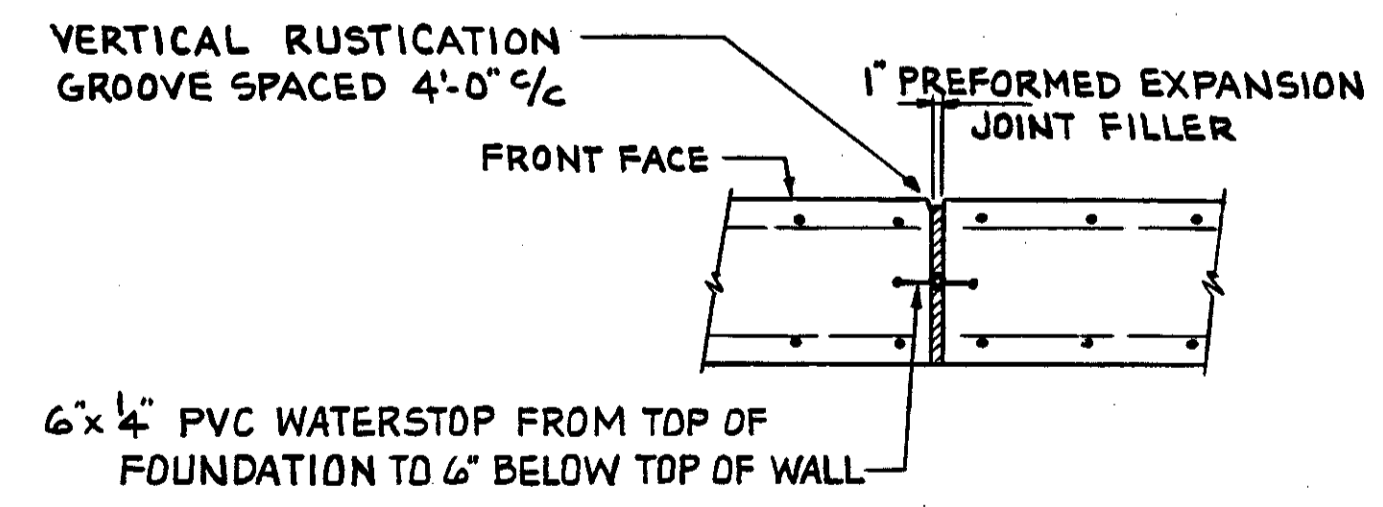


FORWARD ABUTMENT EAST WINGWALL - PLAN

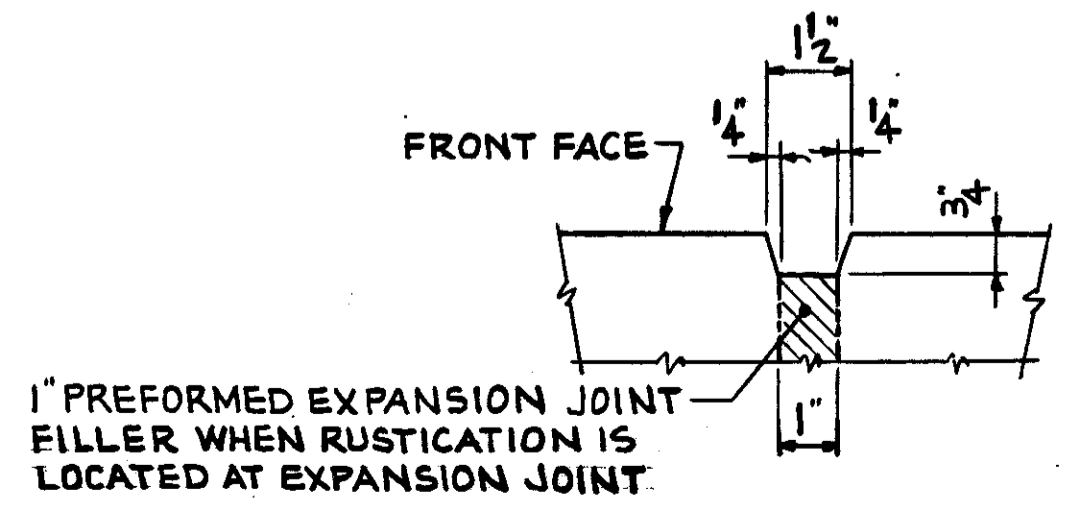


MATCH LINE
 SEE 16/63

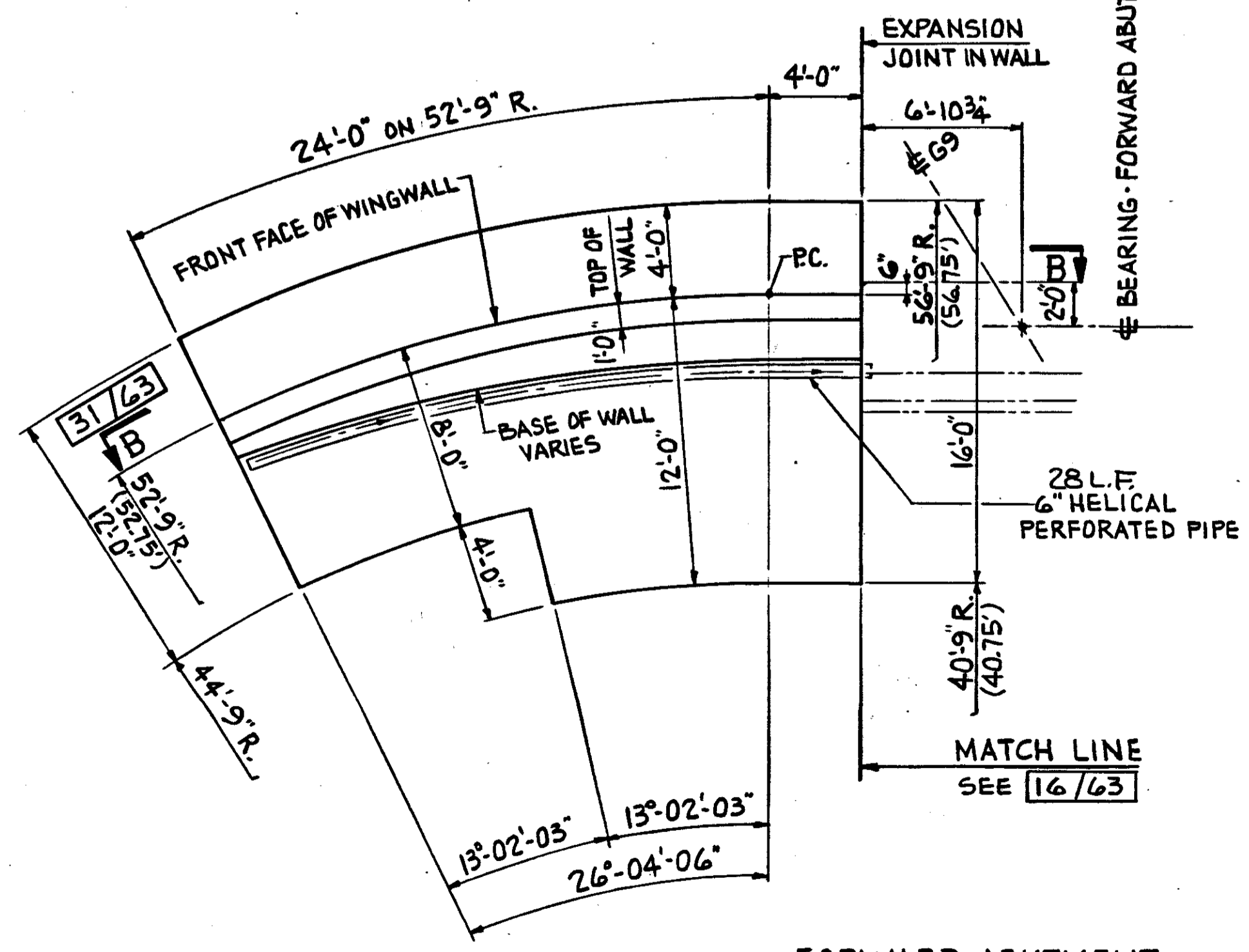
TO FRONT FACE OF
 WINGWALL



EXPANSION JOINT DETAIL



RUSTICATION DETAIL
 SPACED 4'-0" C/C



**FORWARD ABUTMENT
 WEST WINGWALL - PLAN**

NOTES:

1. FOR NOTES SEE 4/63.
2. FOR FORWARD ABUTMENT PLAN SEE 16/63.
3. FOR PILE PLANS, FOUNDATION PLANS, AND ELEVATIONS, SEE 27/63, 28/63, 25/63 AND 31/63.
4. FOR REINFORCING SCHEDULE SEE 59/63 AND 60/63.

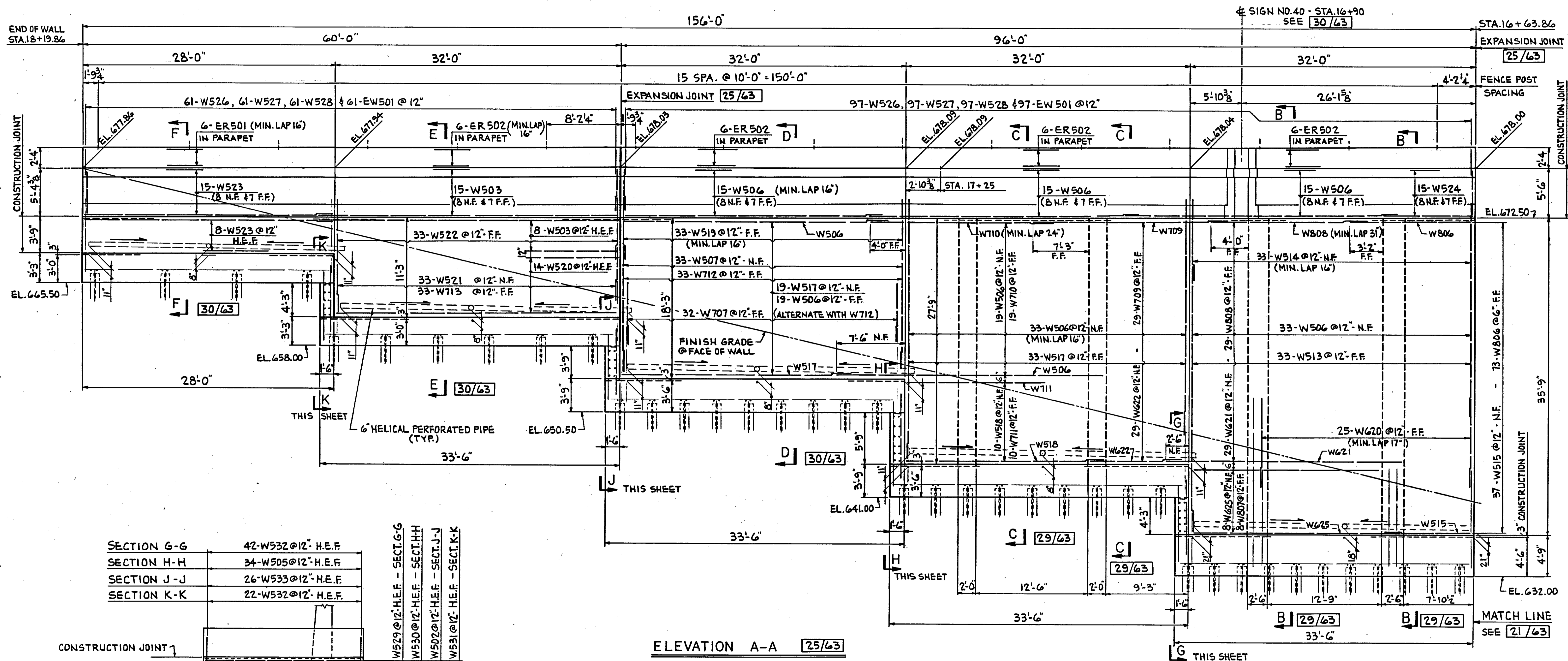
WESTON A Business Trust
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

DESIGNER CONSULTANT

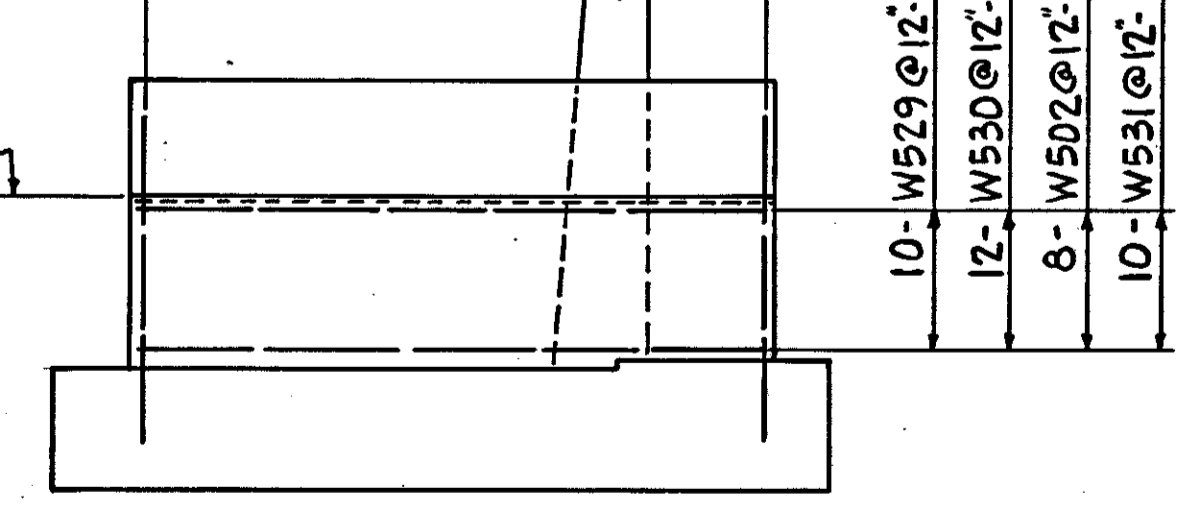
**SUBSTRUCTURE
 FORWARD ABUTMENT
 WINGWALL-PLANS**

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |



| | |
|-------------|----------------------|
| SECTION G-G | 42-W532 @ 12" H.E.F. |
| SECTION H-H | 34-W505 @ 12" H.E.F. |
| SECTION J-J | 26-W533 @ 12" H.E.F. |
| SECTION K-K | 22-W532 @ 12" H.E.F. |



SECTION G-G
 SECTION H-H
 SECTION J-J
 SECTION K-K

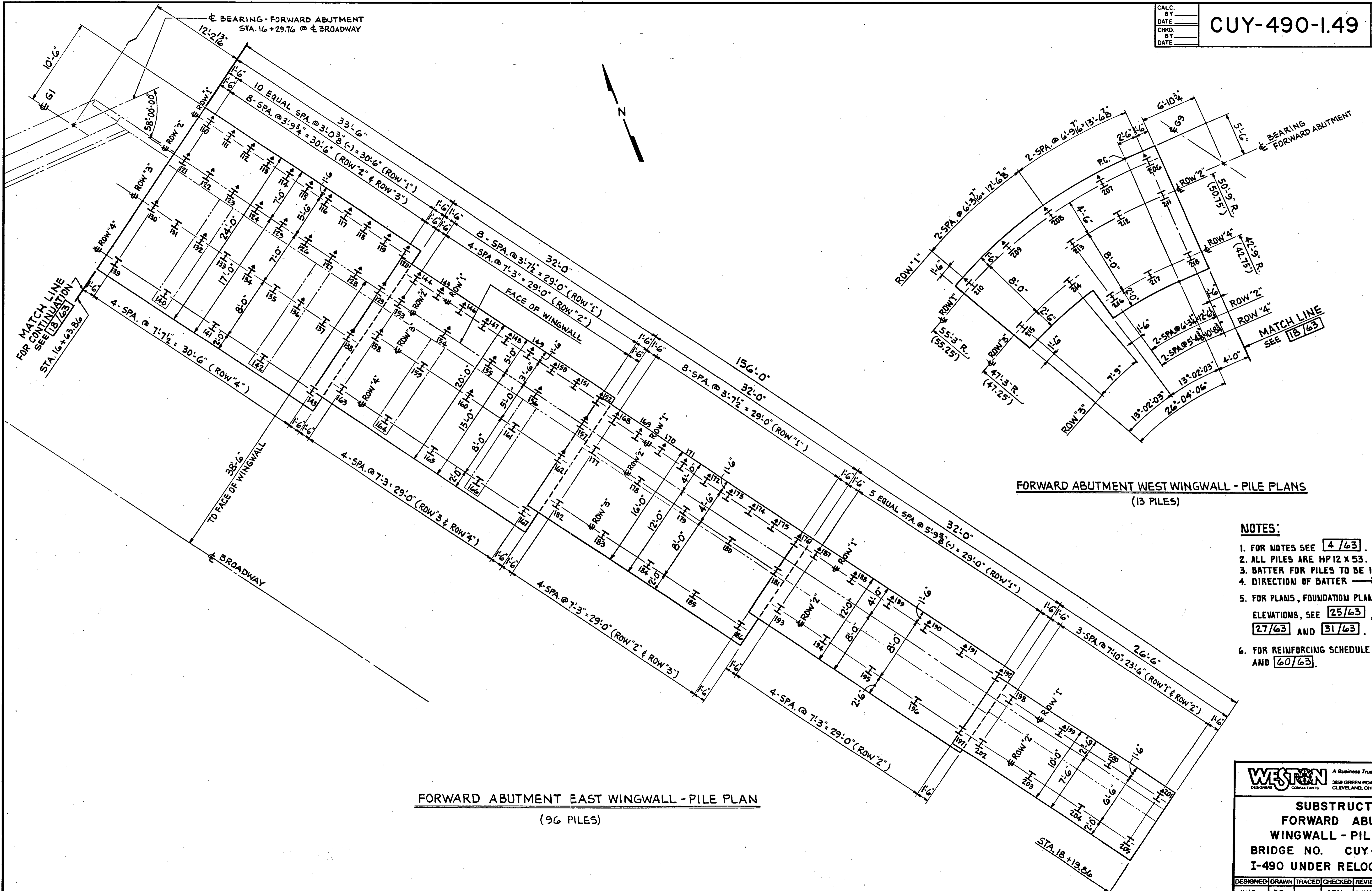
ELEVATION A-A 25/63

- NOTES:**
- FOR NOTES SEE 4/63.
 - FOR PLAN, PILE PLAN AND FOUNDATION PLANS, SEE 25/63, 27/63 AND 28/63.
 - FOR FENCE DETAILS SEE 40/63.
 - FOR REINFORCING SCHEDULE SEE 59/63 AND 60/63.
 - MIN. LAPS TYPICAL
 #5 - 16"
 #6 - 17"
 #7 - 24"

WESTON A Business Trust 26/63
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

**SUBSTRUCTURE
 FORWARD ABUTMENT-EAST WINGWALL
 ELEVATION AND SECTIONS
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY**

| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |



FORWARD ABUTMENT WEST WINGWALL - PILE PLANS
 (13 PILES)

FORWARD ABUTMENT EAST WINGWALL - PILE PLAN
 (96 PILES)

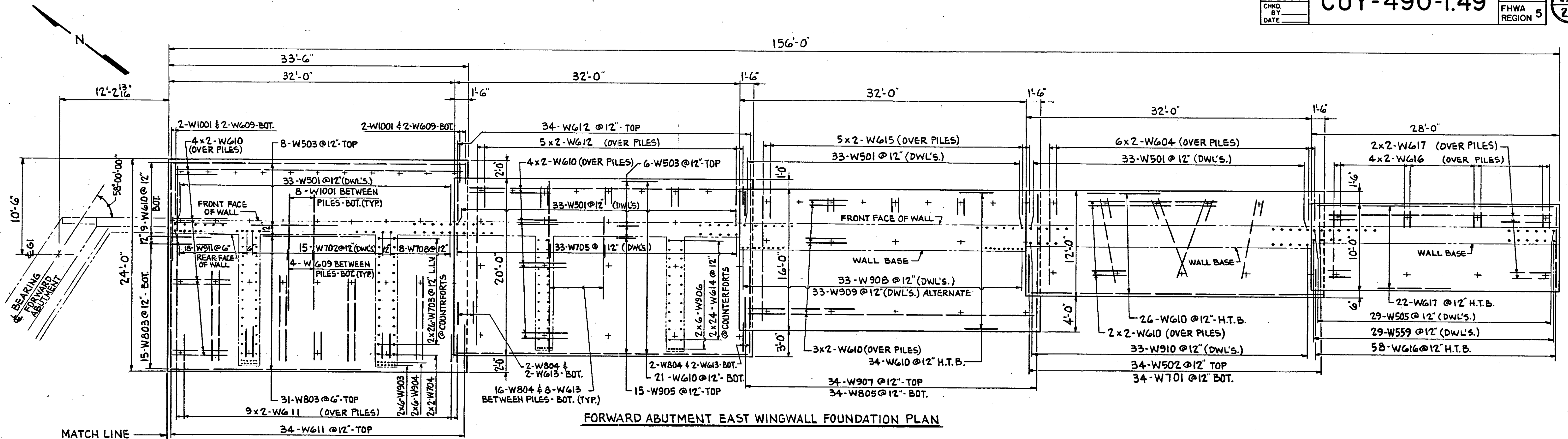
- NOTES:**
1. FOR NOTES SEE **4/63**.
 2. ALL PILES ARE HP 12 X 53.
 3. BATTER FOR PILES TO BE 1:3.
 4. DIRECTION OF BATTER →
 5. FOR PLANS, FOUNDATION PLANS, AND ELEVATIONS, SEE **25/63**, **28/63**, **27/63** AND **31/63**.
 6. FOR REINFORCING SCHEDULE SEE **59/63** AND **60/63**.

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 3639 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

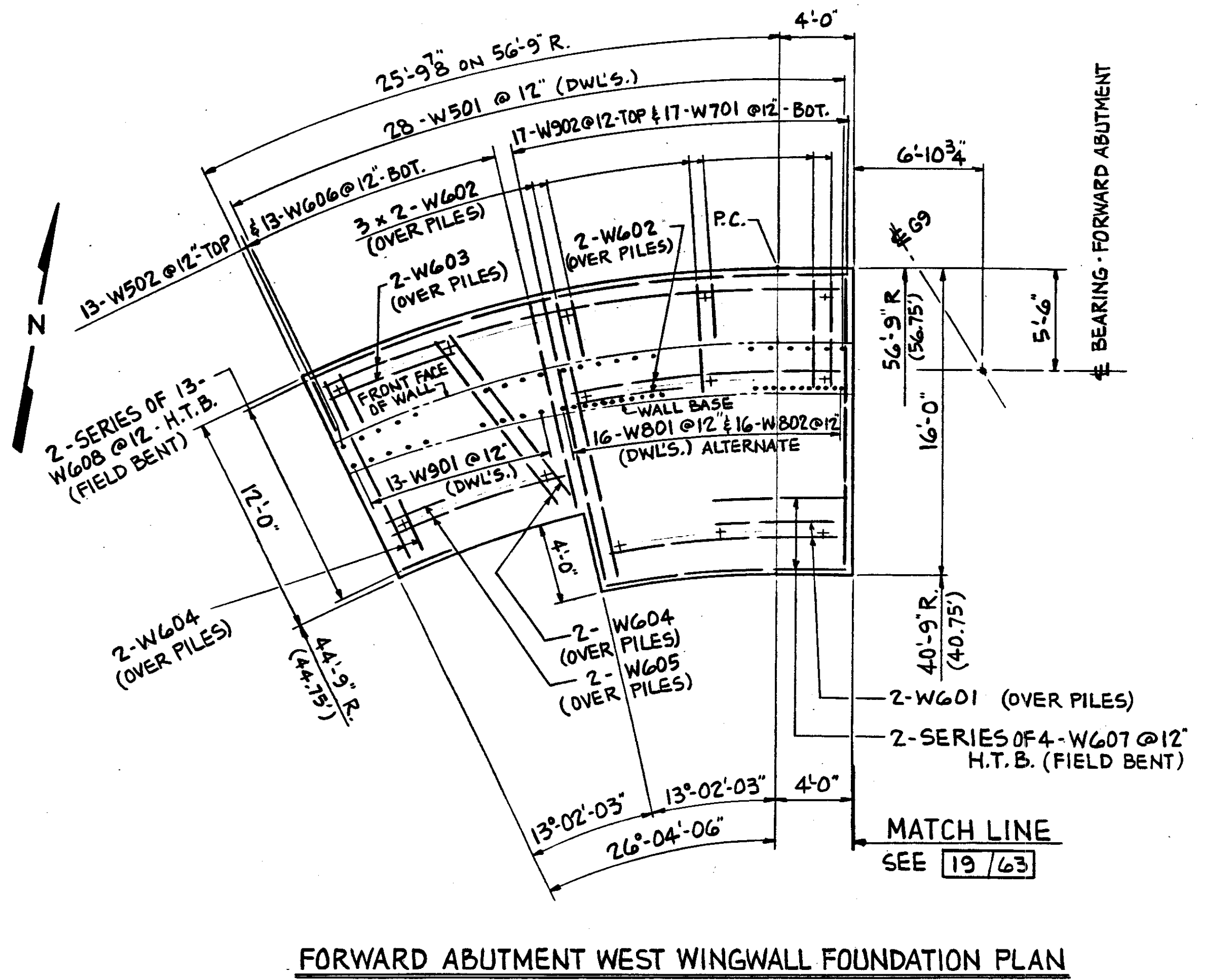
DESIGNED: JWG
 DRAWN: DF
 TRACED: _____
 CHECKED: JRH
 REVIEWED: WHH
 DATE: 2/83

27/63

**SUBSTRUCTURE
 FORWARD ABUTMENT
 WINGWALL - PILE PLANS**
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY



FORWARD ABUTMENT EAST WINGWALL FOUNDATION PLAN



FORWARD ABUTMENT WEST WINGWALL FOUNDATION PLAN

- NOTES:**
- FOR NOTES SEE 4/63.
 - FOR PLANS, PILE PLANS AND ELEVATIONS, SEE 25/63, 27/63, 26/63, AND 31/63.
 - FOR REINFORCING SCHEDULE SEE 59/63 AND 60/63.
 - MIN. LAPS - TYPICAL

| TOP BARS | BOTTOM BARS |
|----------|-------------|
| #5 - 22" | 16" |
| #6 - 26" | 17" |
| #7 - 33" | 24" |
| #8 - 44" | 31" |

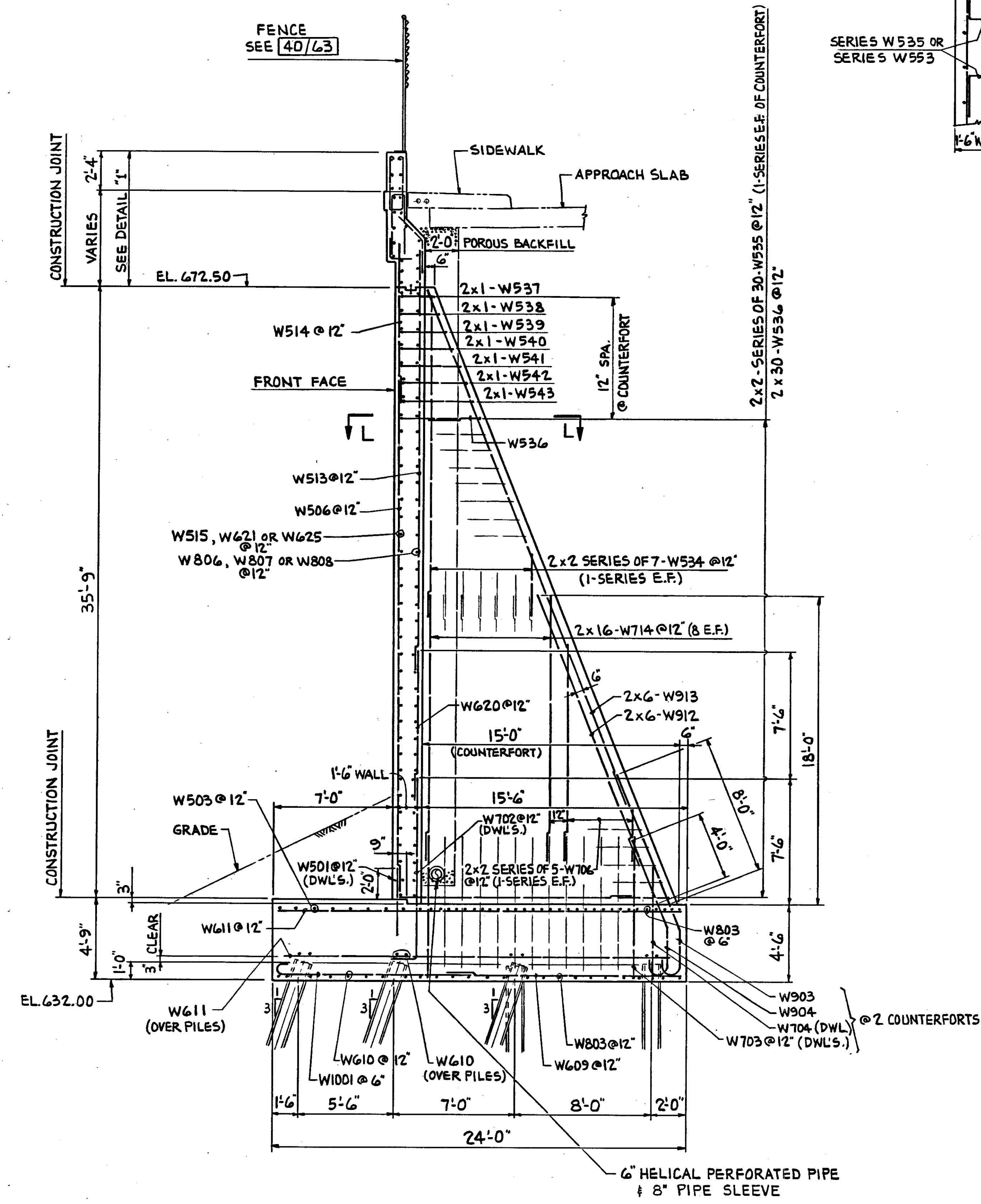
WESTON A Business Trust
 CONSULTANTS
 3559 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

28/63

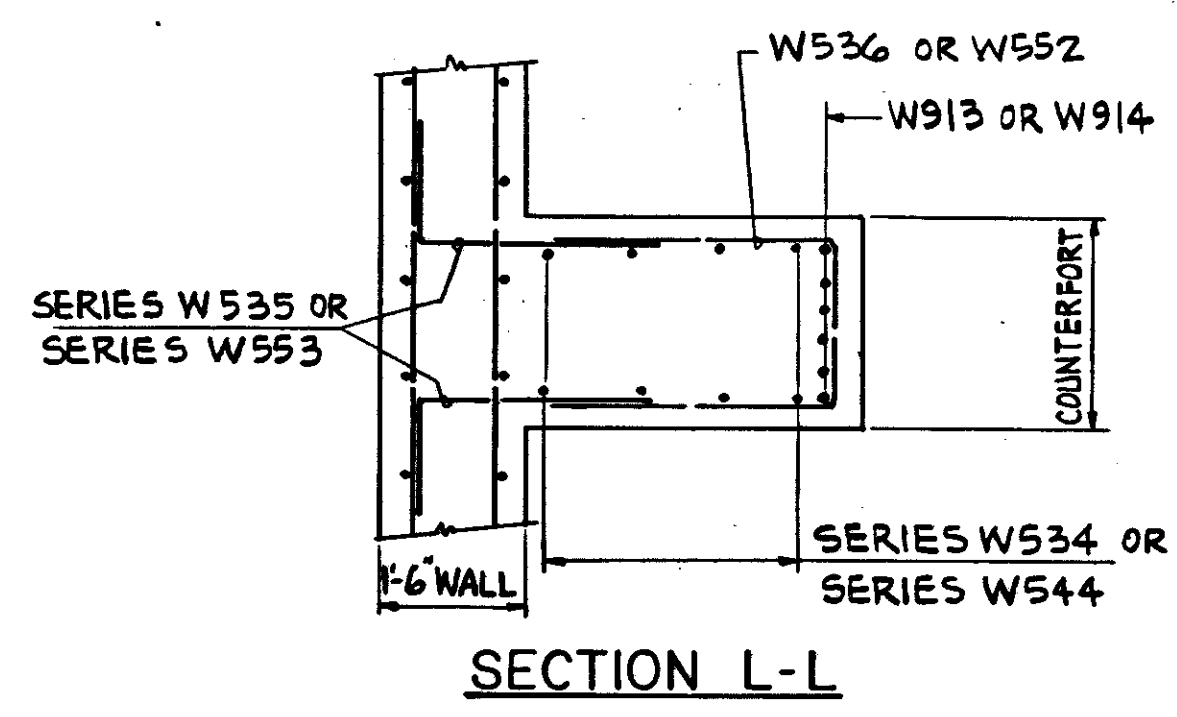
**SUBSTRUCTURE
 FORWARD ABUTMENT
 WINGWALL FOUNDATION PLANS**

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

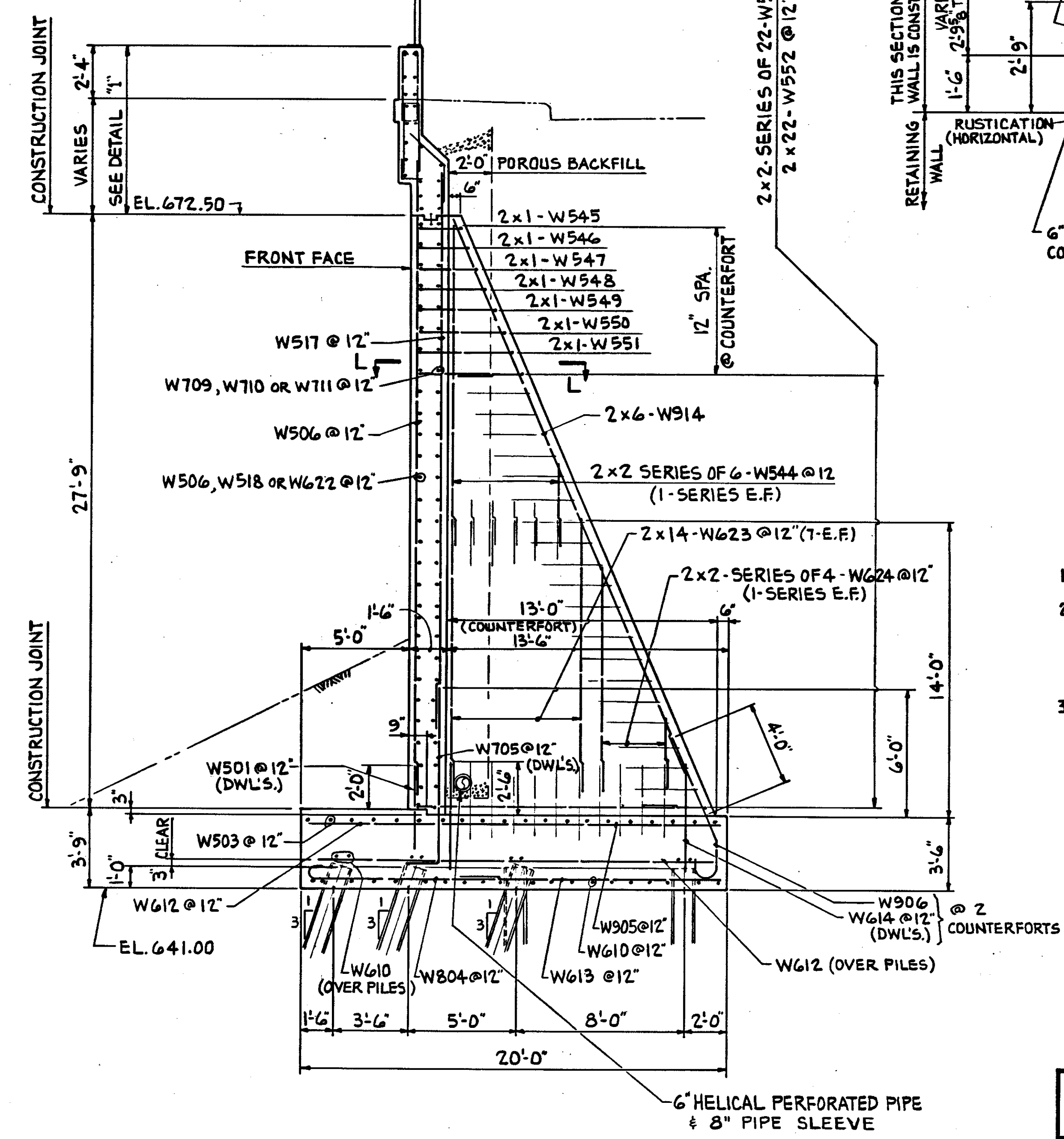
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |



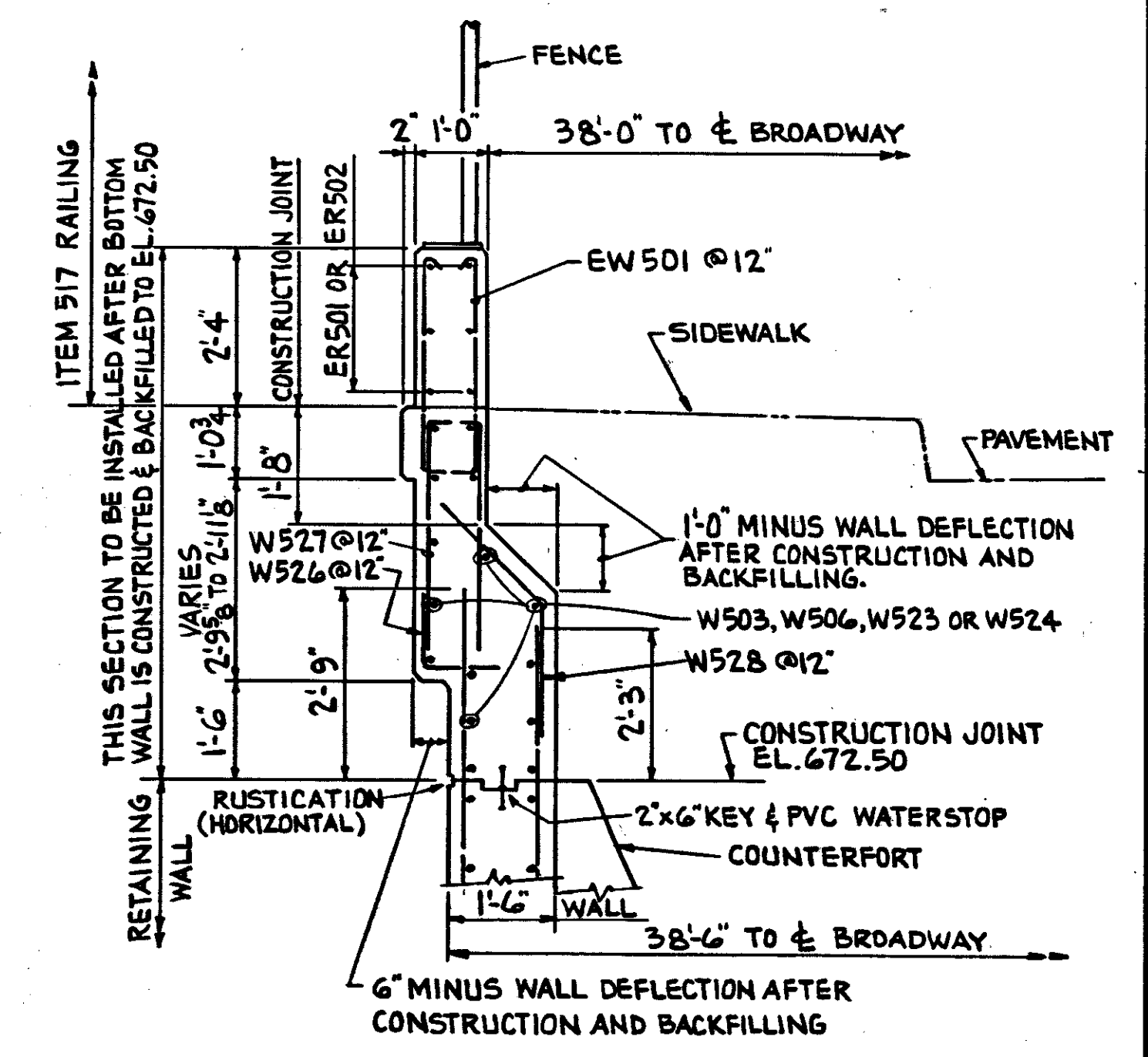
SECTION B-B 2/6/63



SECTION L-L



SECTION C-C 2/6/63



DETAIL 'I' TYPICAL

- NOTES:**
- FOR NOTES SEE 4/63.
 - FOR PLAN, PILE PLAN, FOUNDATION PLAN AND ELEVATION, SEE 25/63, 27/63, 28/63 AND 26/63.
 - FOR REINFORCING SCHEDULE SEE 59/63 AND 60/63.

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 DESIGNERS CONSULTANTS

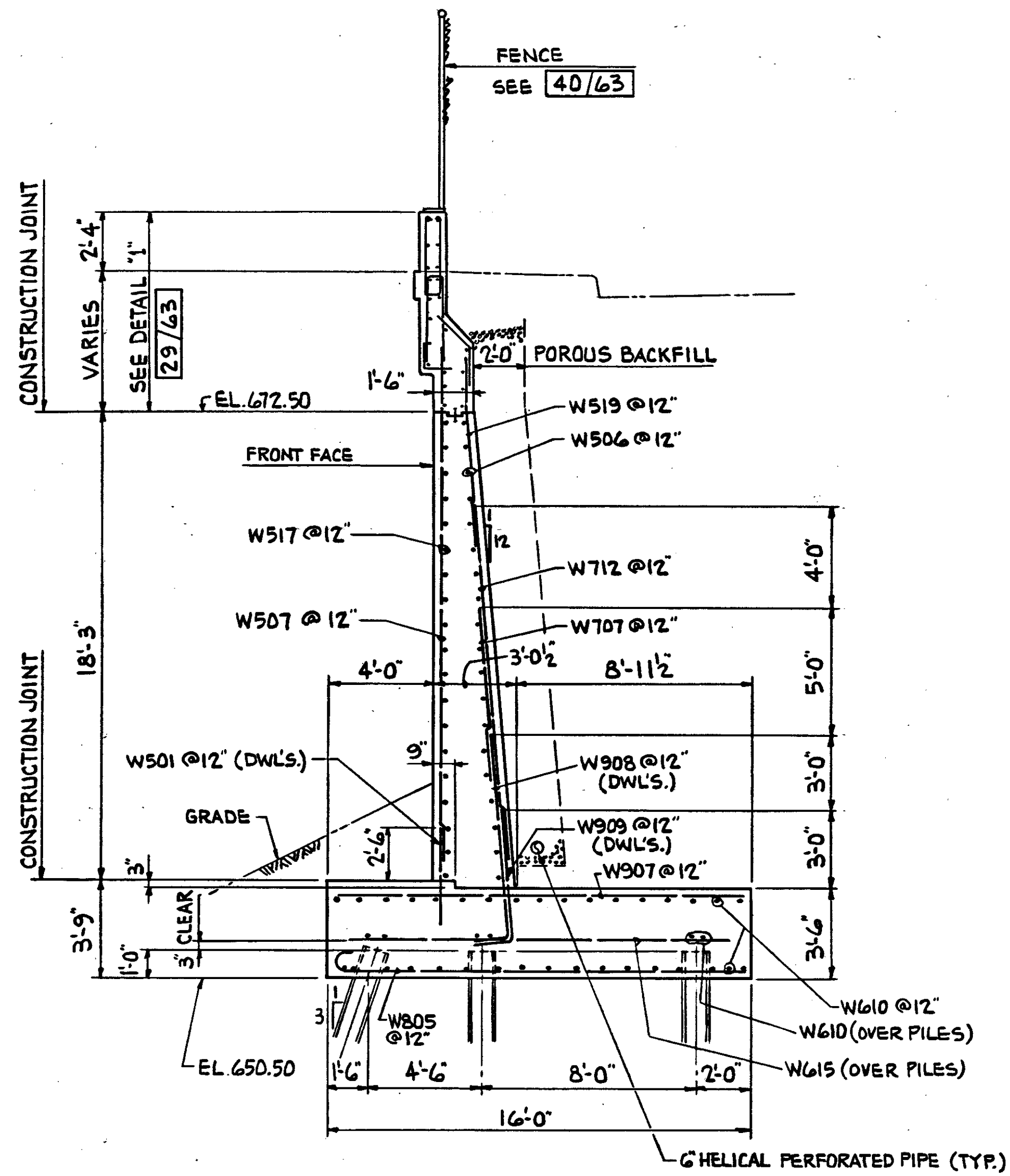
3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

29/63

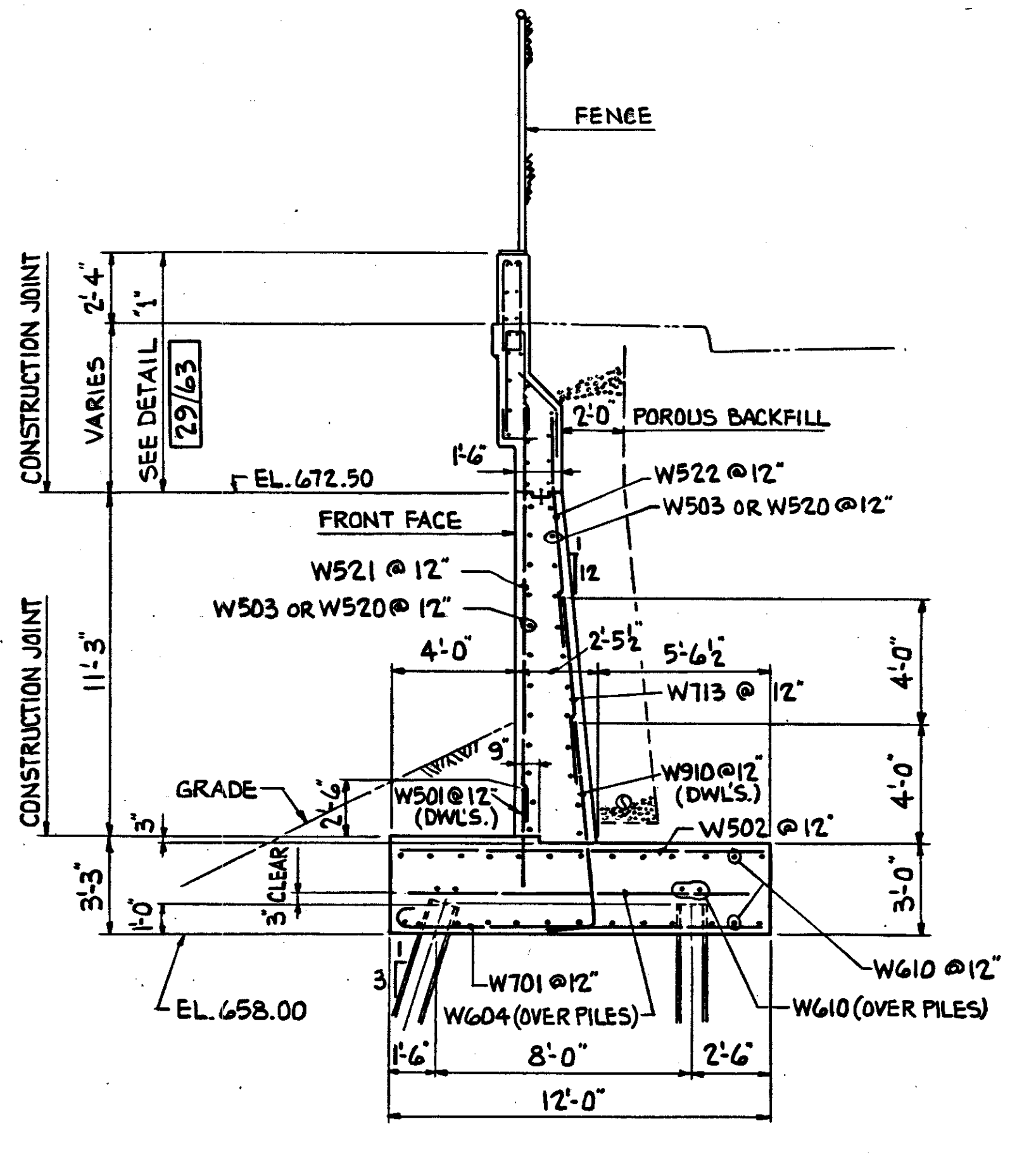
SUBSTRUCTURE FORWARD ABUTMENT-EAST WINGWALL SECTIONS AND DETAIL

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

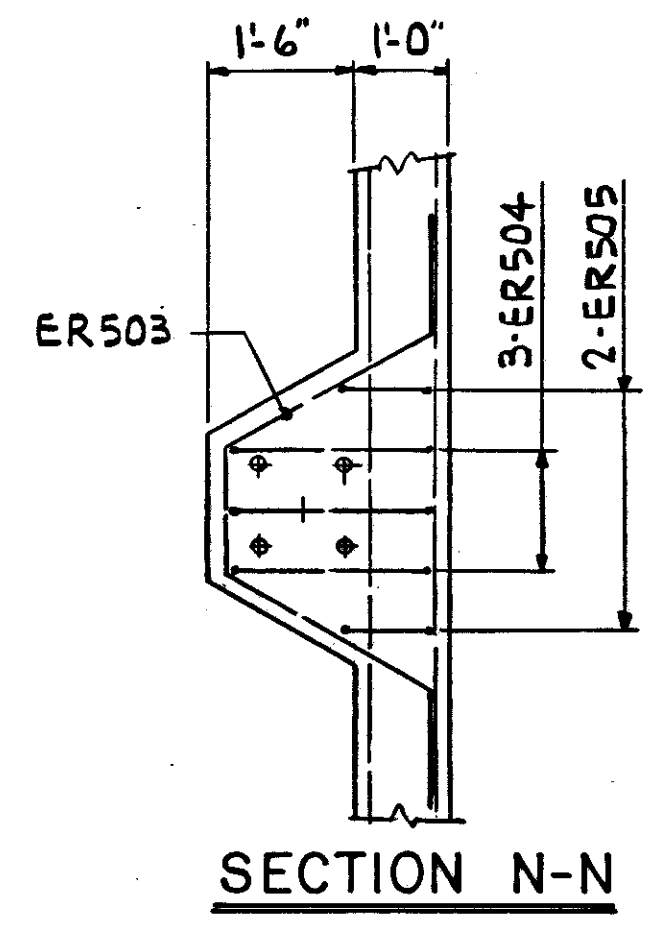
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |



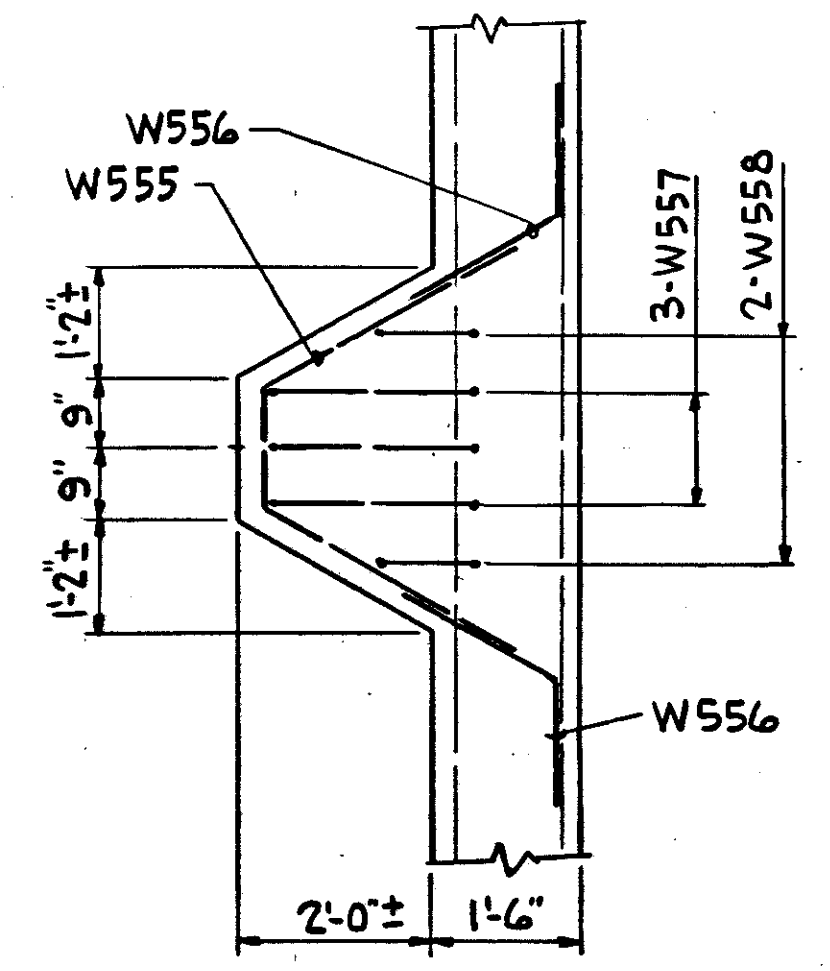
SECTION D-D [26/63]



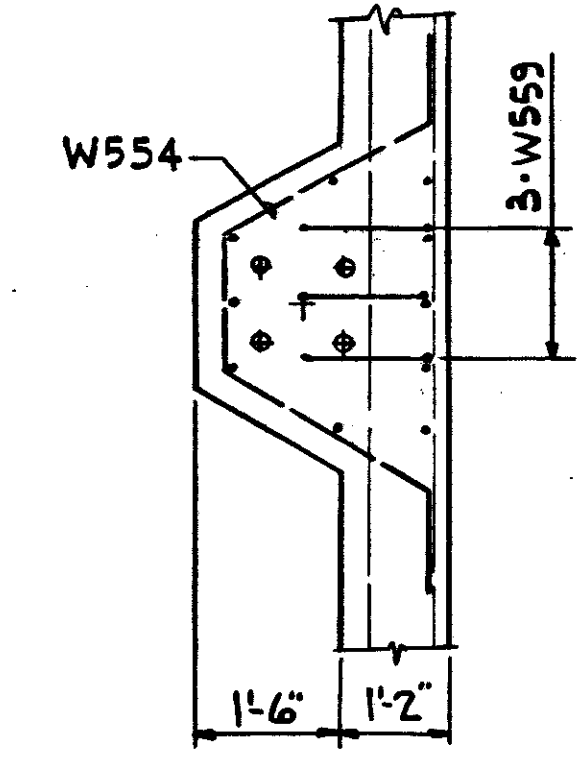
SECTION E-E [26/63]



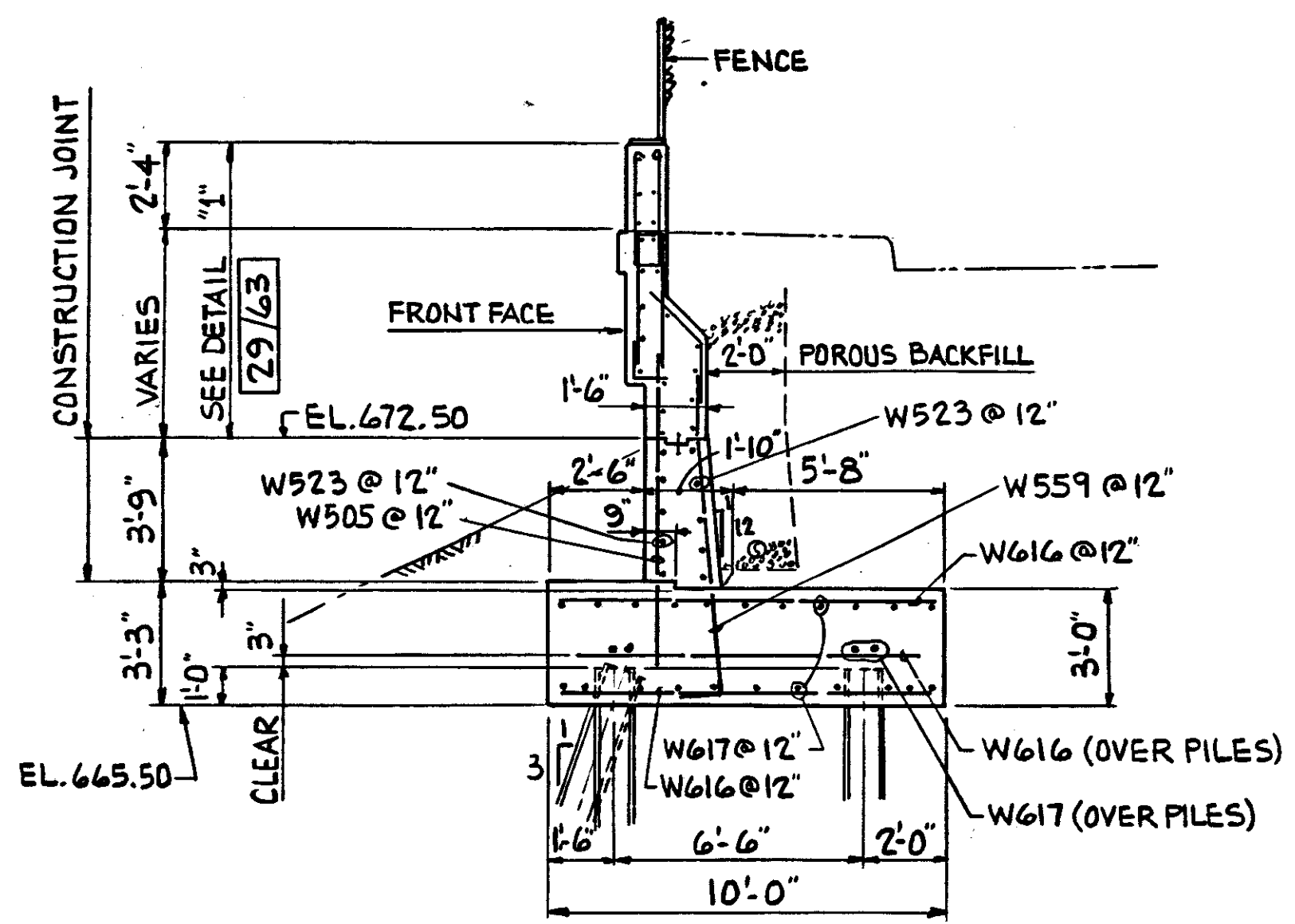
SECTION N-N



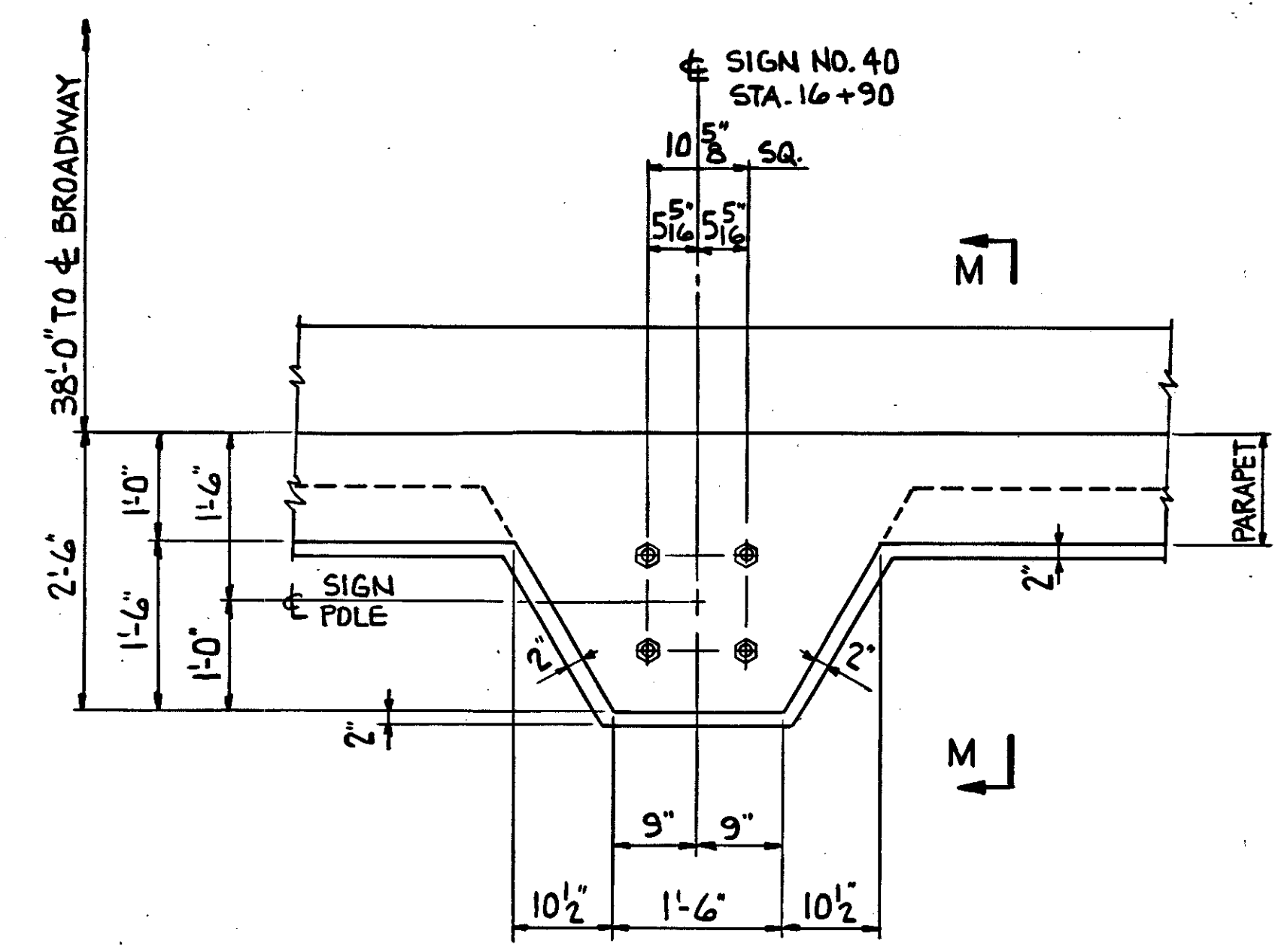
SECTION R-R



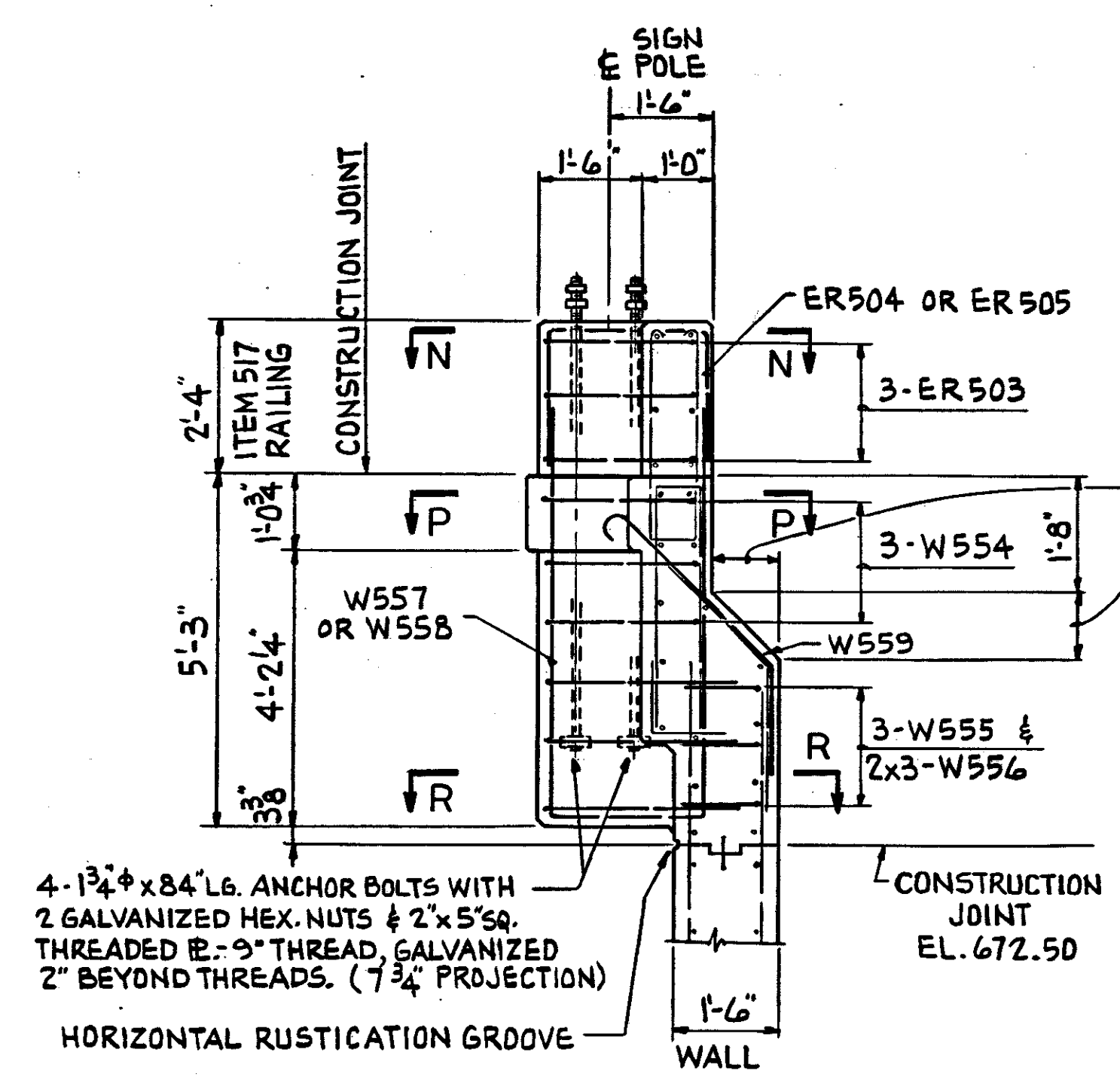
SECTION P-P



SECTION F-F [26/63]



PLAN - SIGN NO. 40 SUPPORT [26/63]



SECTION M-M

- NOTES:**
- FOR NOTES SEE [4/63].
 - FOR PLAN, PILE PLAN, FOUNDATION PLAN AND ELEVATION, SEE [25/63], [27/63], [28/63] AND [26/63].
 - FOR REINFORCING SCHEDULE SEE [59/63] AND [60/63].

4-1 3/4" x 84" L6 ANCHOR BOLTS WITH 2 GALVANIZED HEX. NUTS & 2' x 5' SQ. THREADED R-9° THREAD GALVANIZED 2" BEYOND THREADS. (7 3/4" PROJECTION)

HORIZONTAL RUSTICATION GROOVE

1'-0" MINUS WALL DEFLECTION AFTER CONSTRUCTION AND BACKFILLING.

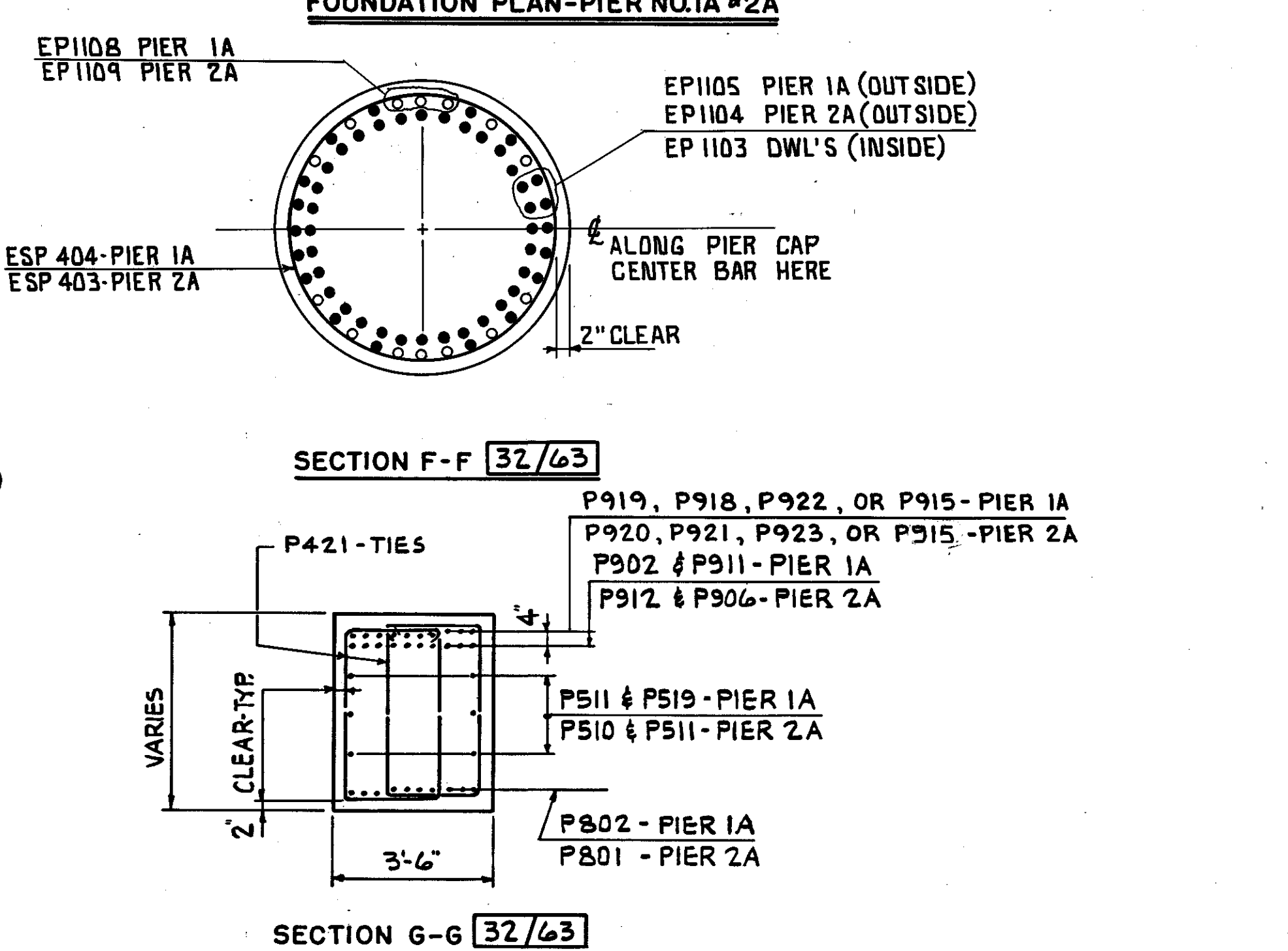
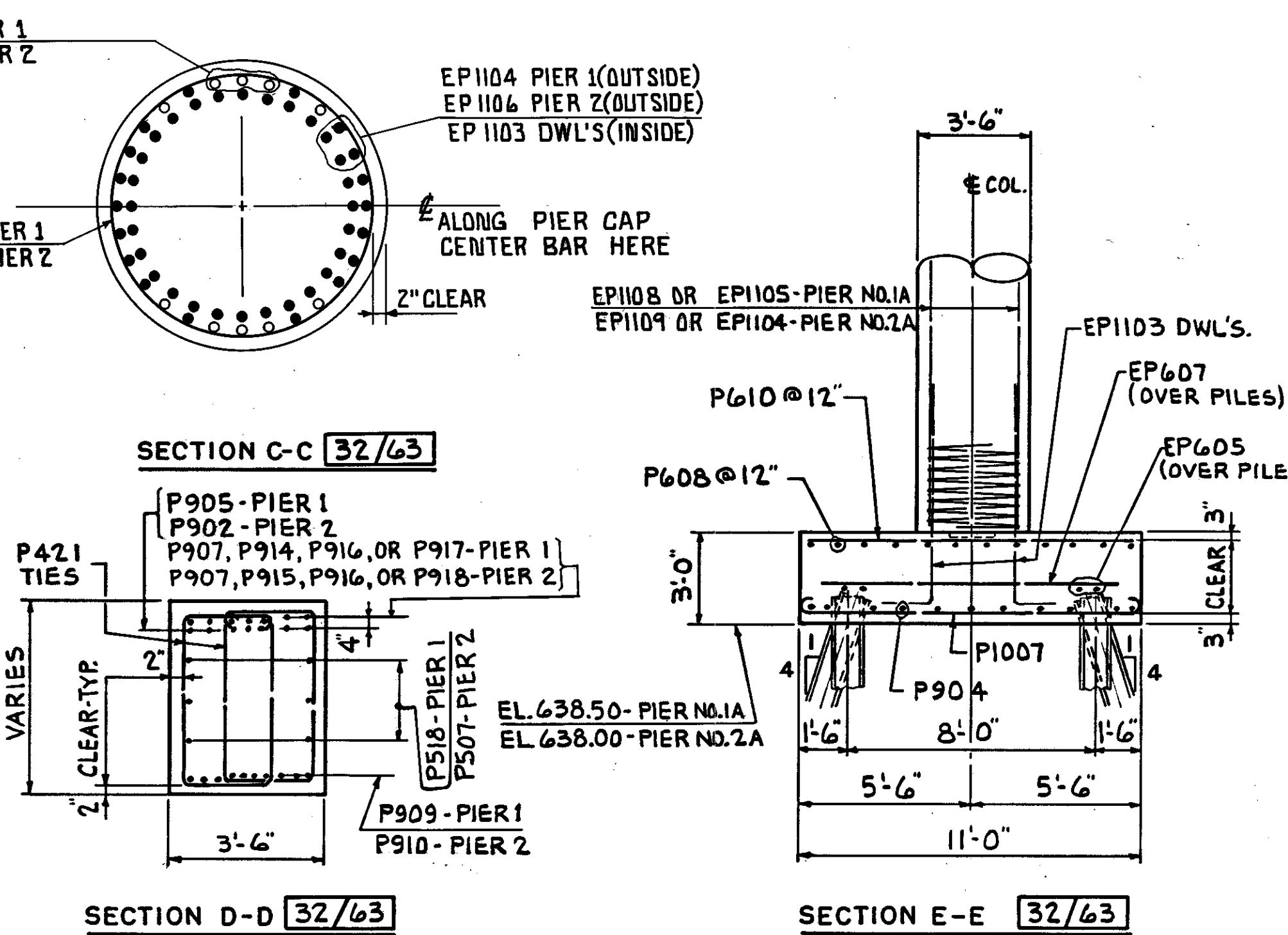
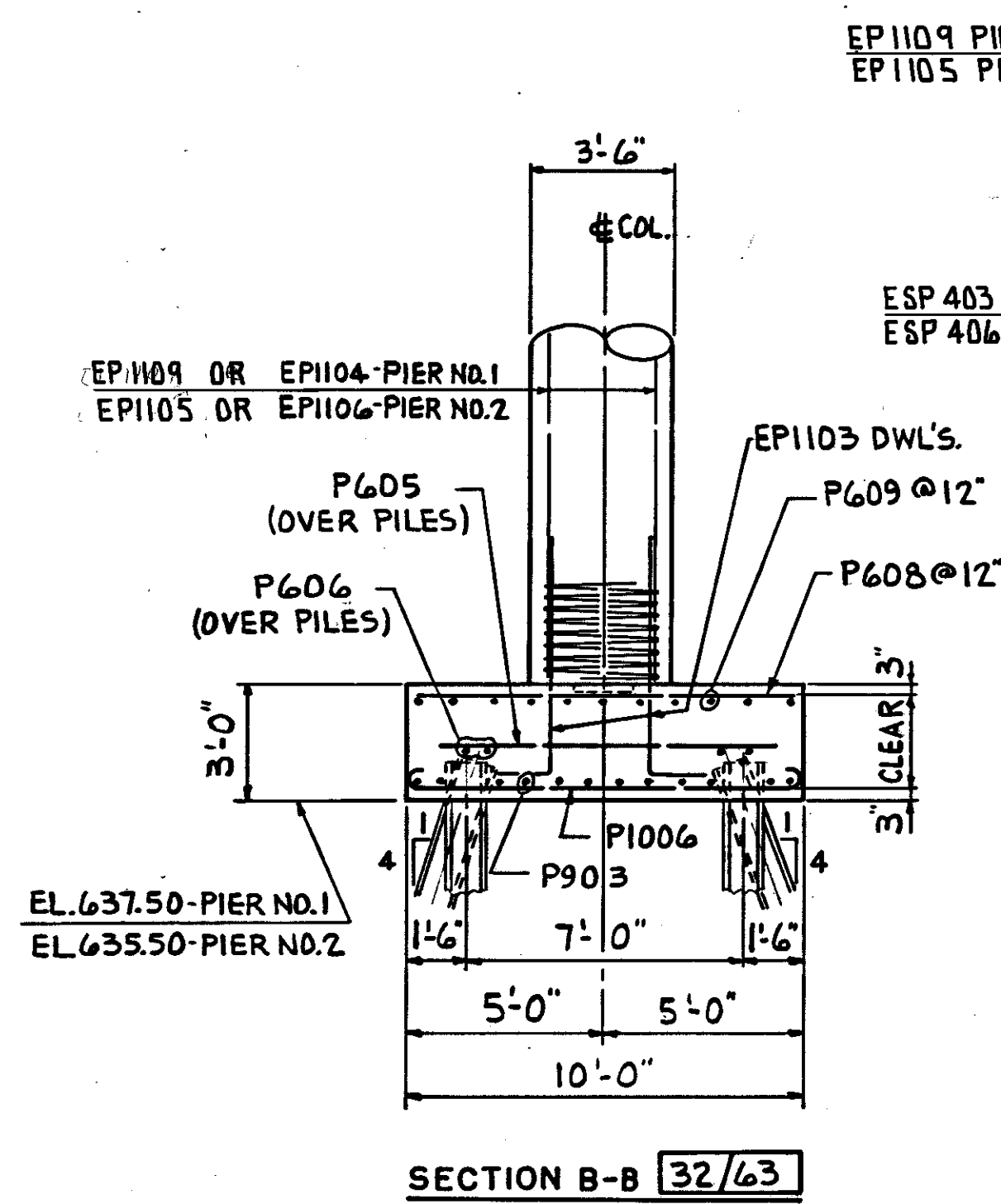
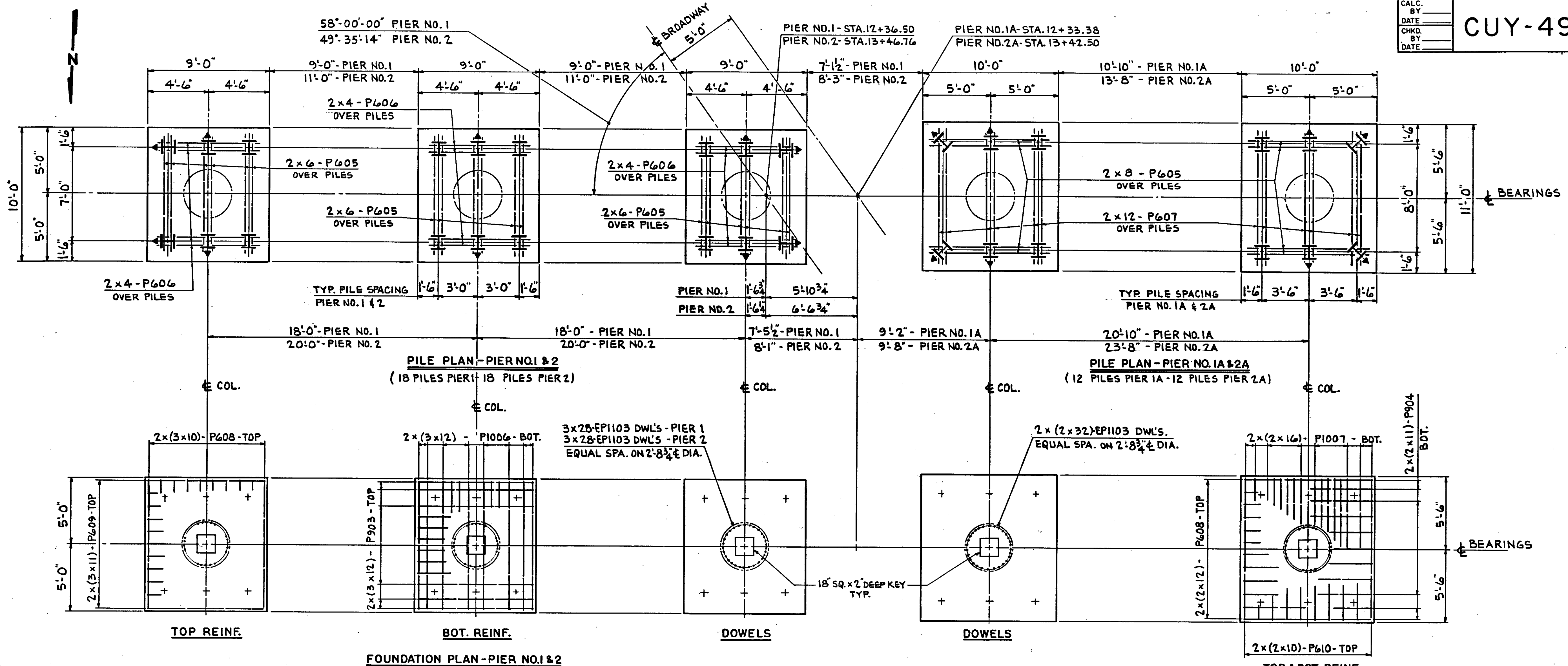
WESTON A Business Trust
 DESIGNERS CONSULTANTS
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

30/63

SUBSTRUCTURE FORWARD ABUTMENT-EAST WINGWALL SECTIONS AND DETAIL

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| JWG | DF | | JRH | WHH | 2/83 | 10/83 |



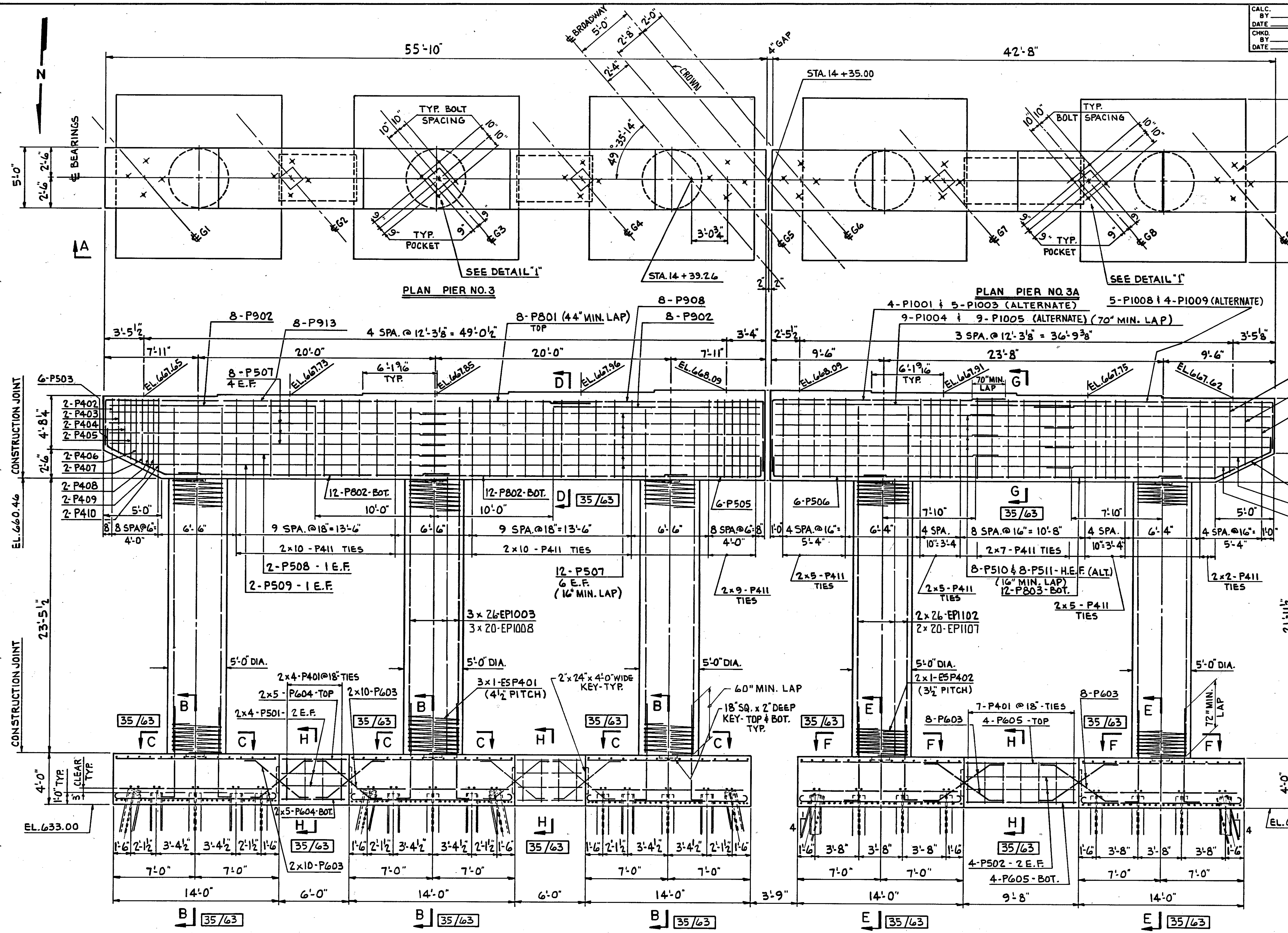
- NOTES:**
1. ALL PILES ARE HP 12 x 53.
 2. BATTER FOR PILES TO BE 1:4.
 3. DIRECTION OF BATTER →
 4. FOR FOUNDATION REINFORCEMENT SCHEDULE SEE 61/63.

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 CLEVELAND, OHIO 44122

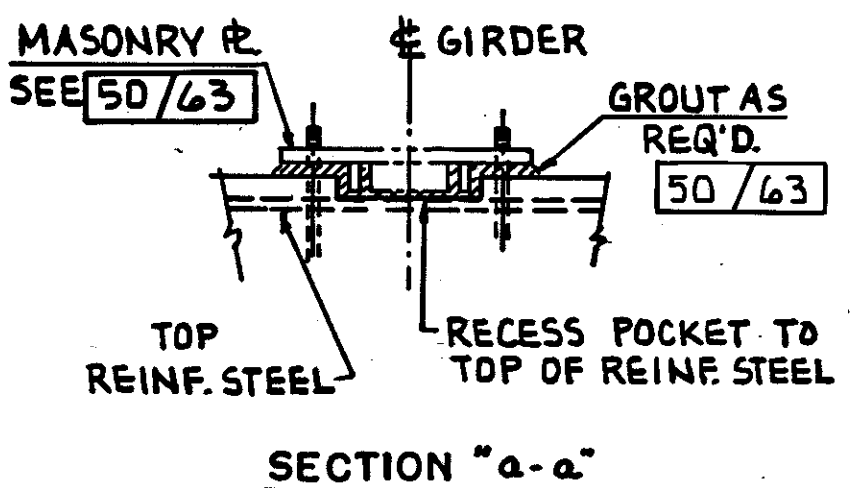
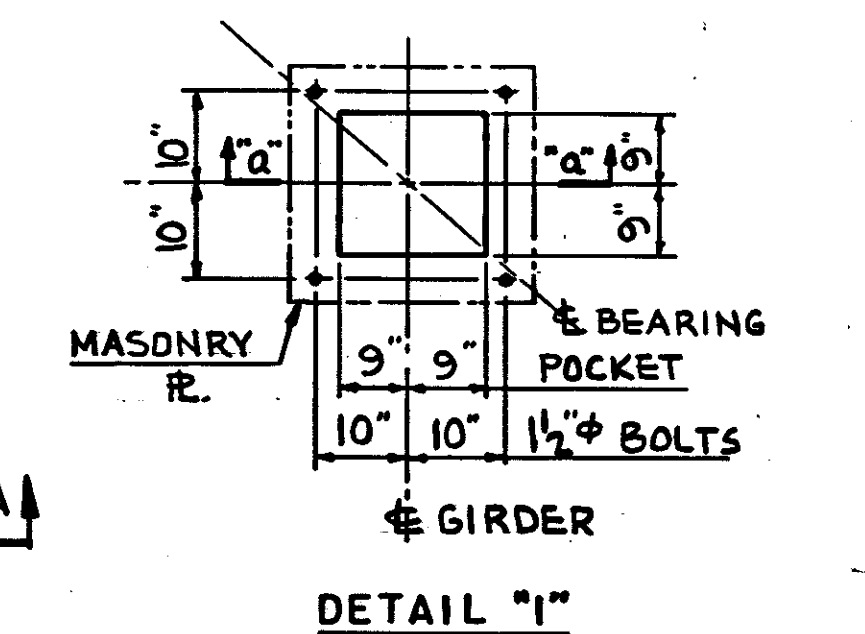
33/63

SUBSTRUCTURE
PIER NOS. 1, 1A, 2, & 2A
PILE & FOUNDATION PLAN
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| | | | | | |
|----------|-------|--------|---------|----------|-------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE |
| WHH | DF | JRH | RLH | 4/83 | 10/83 |



4-1/2" φ x 1'-9" LONG SWEDG ANCHOR BOLTS WITH 4" THREAD, HEX. NUT & FLAT WASHER @ EACH SEAT; 5" BOLT PROJECTION. (36 REQ'D.)

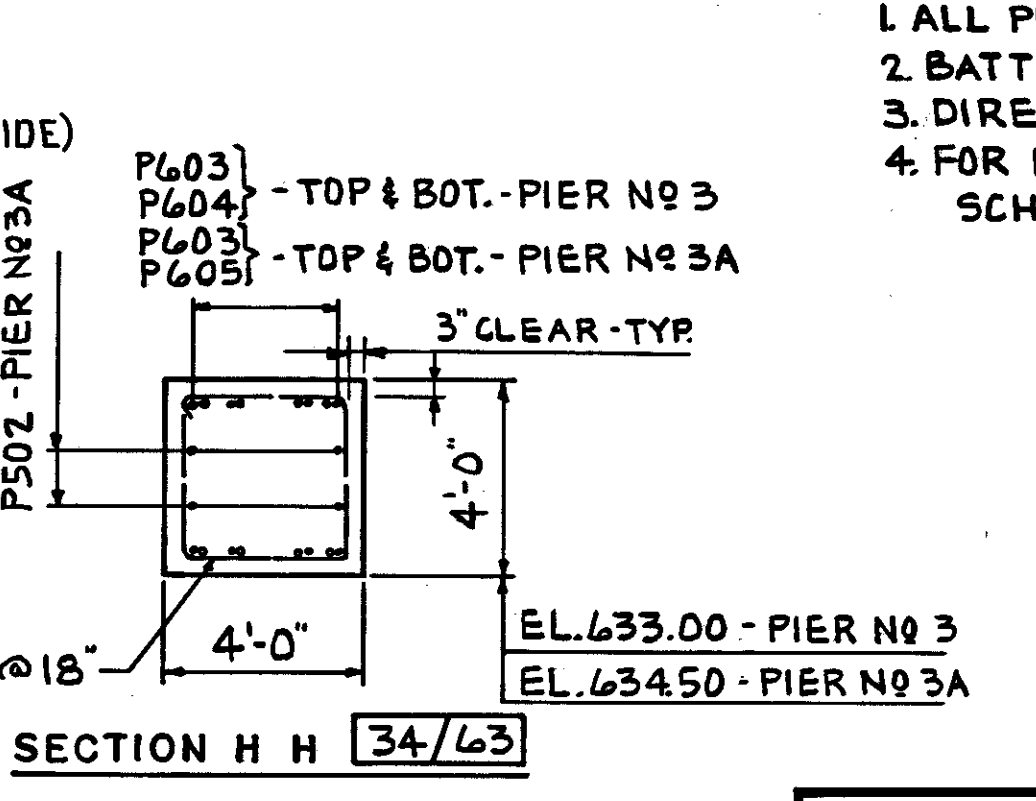
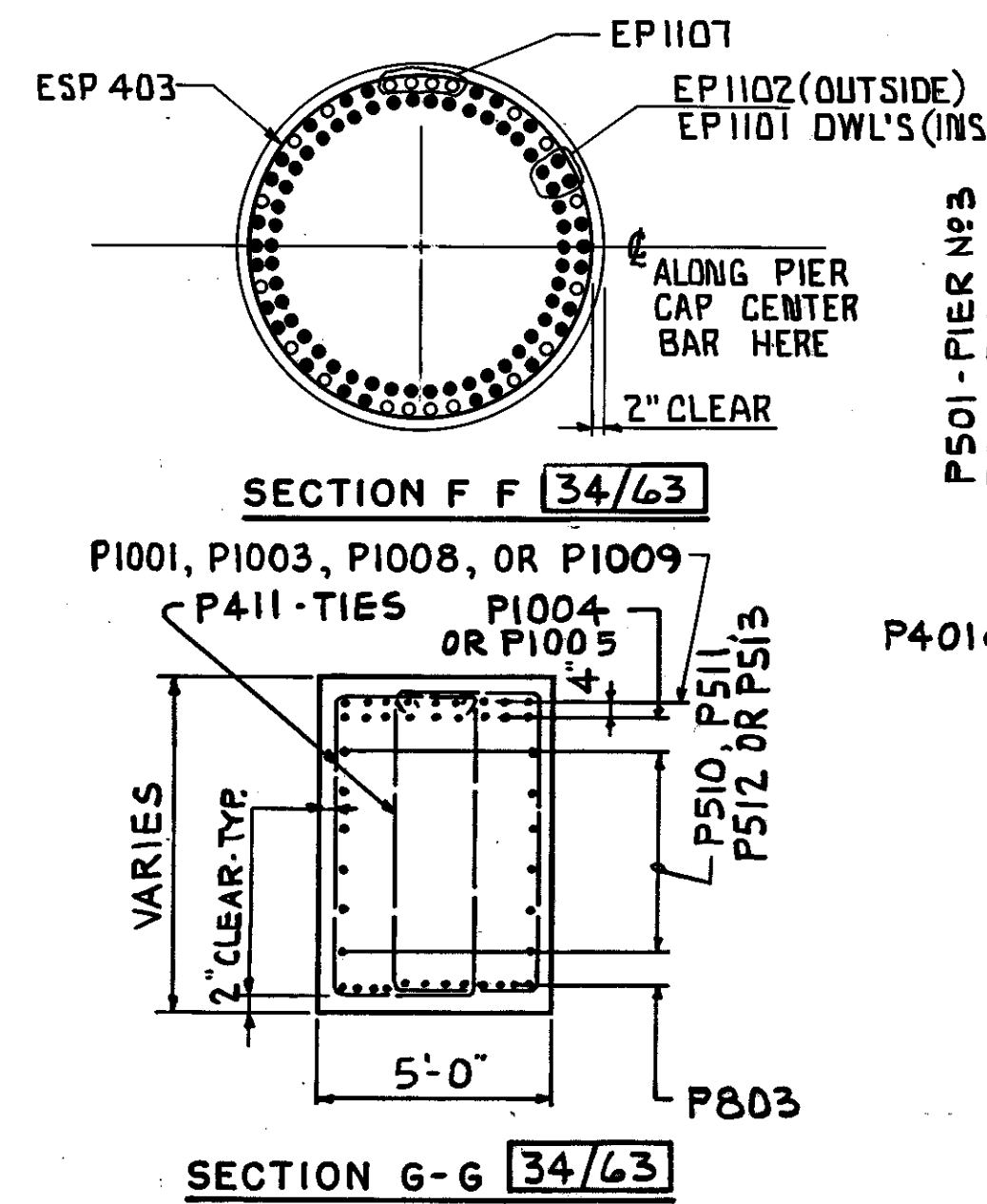
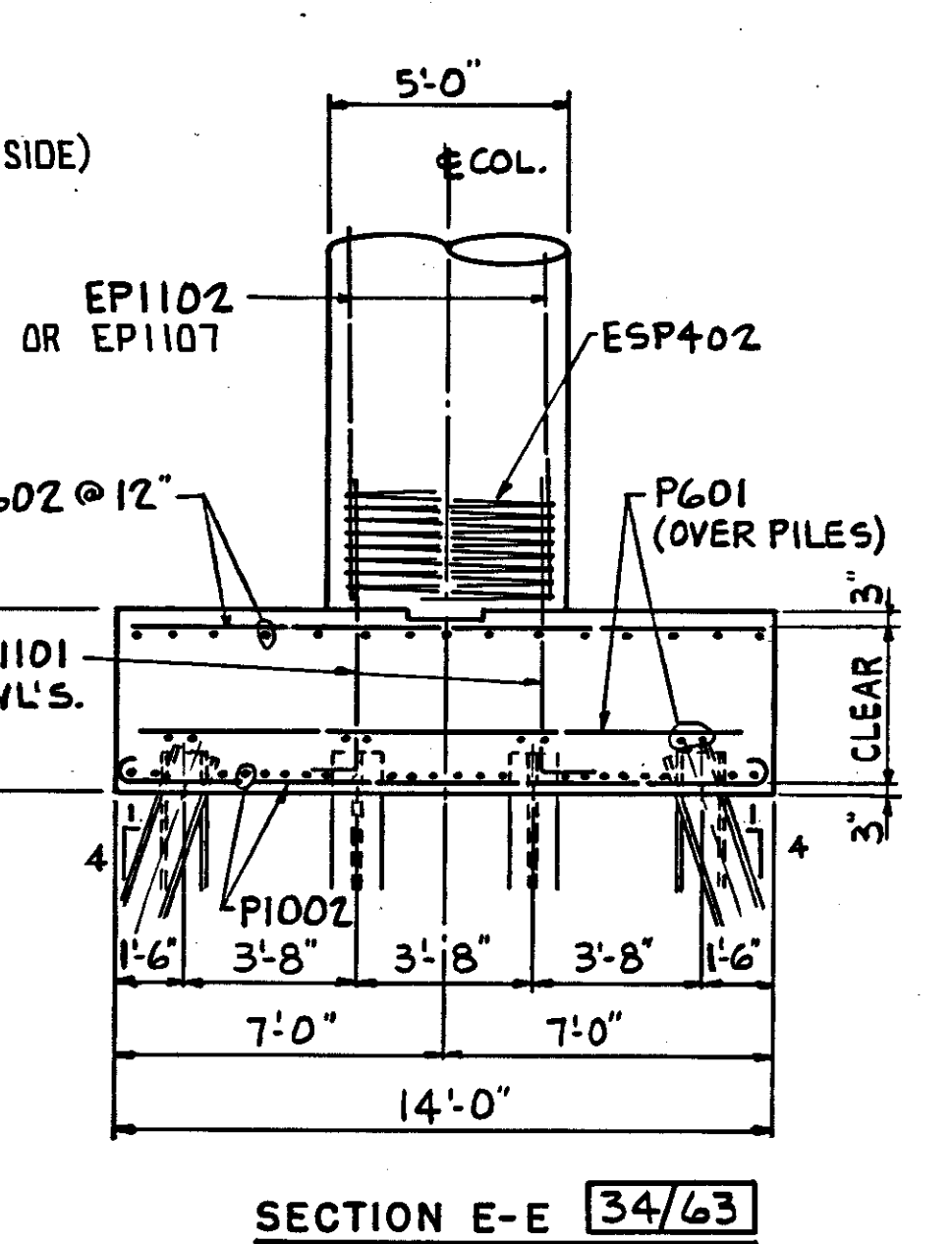
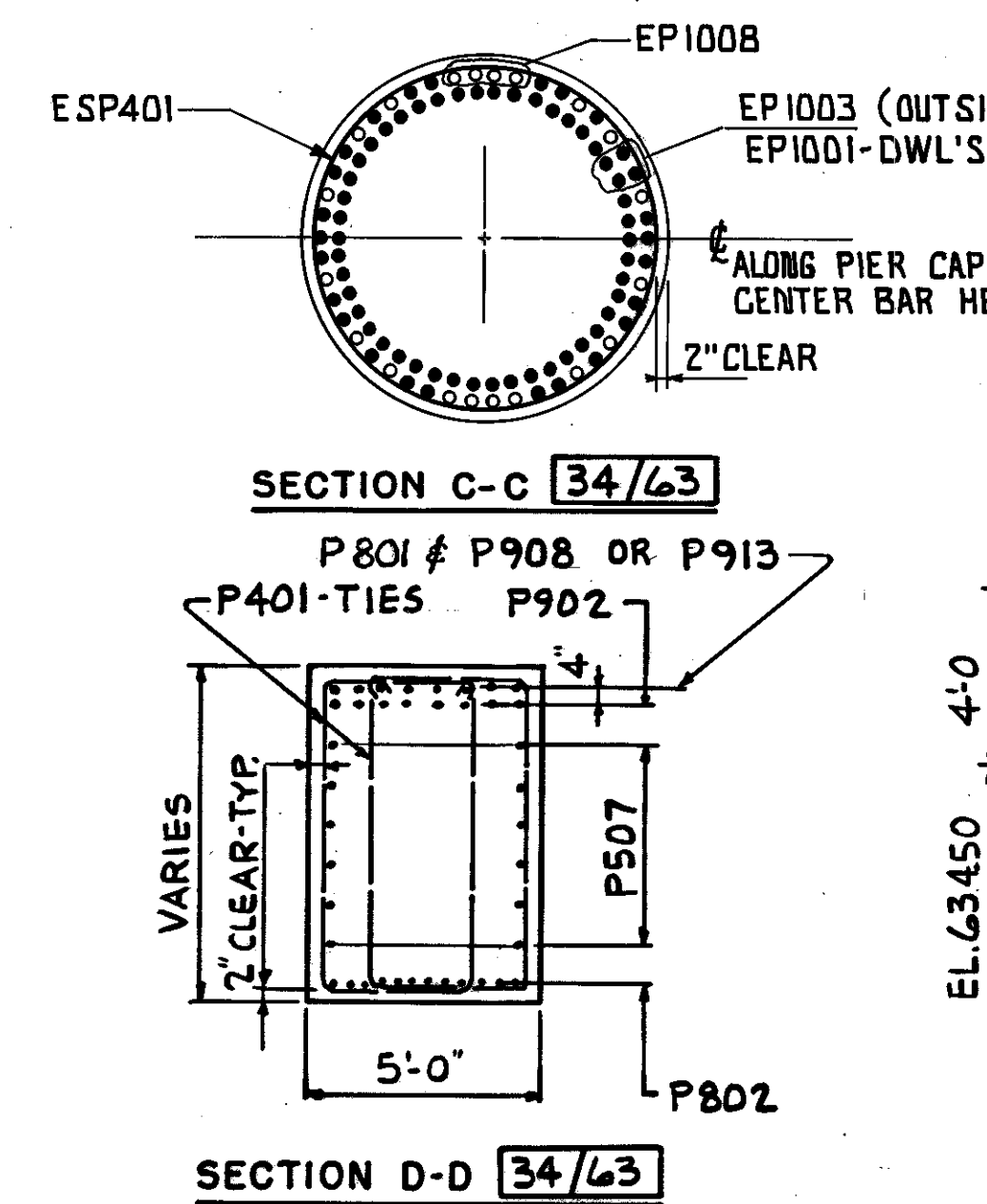
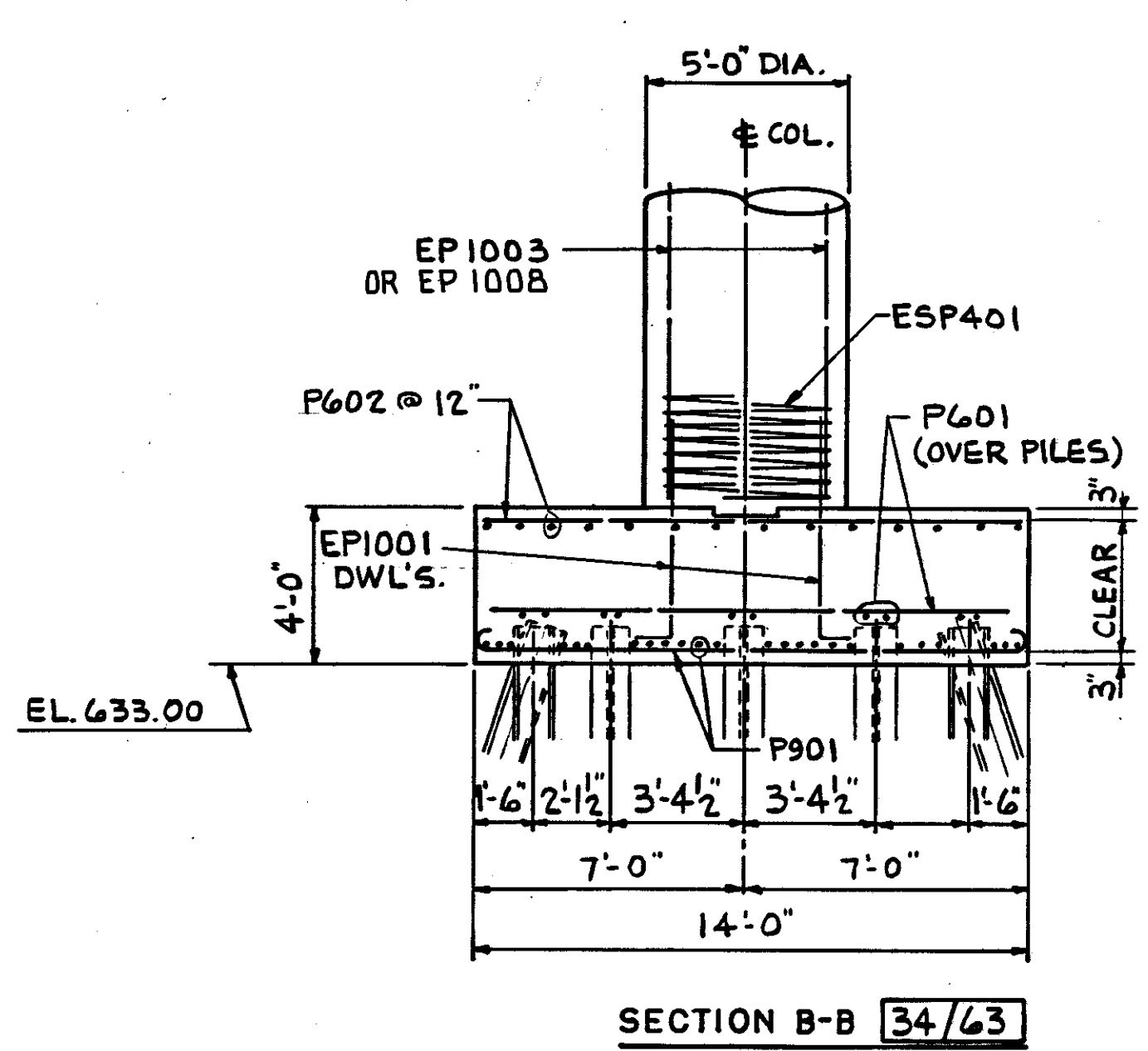
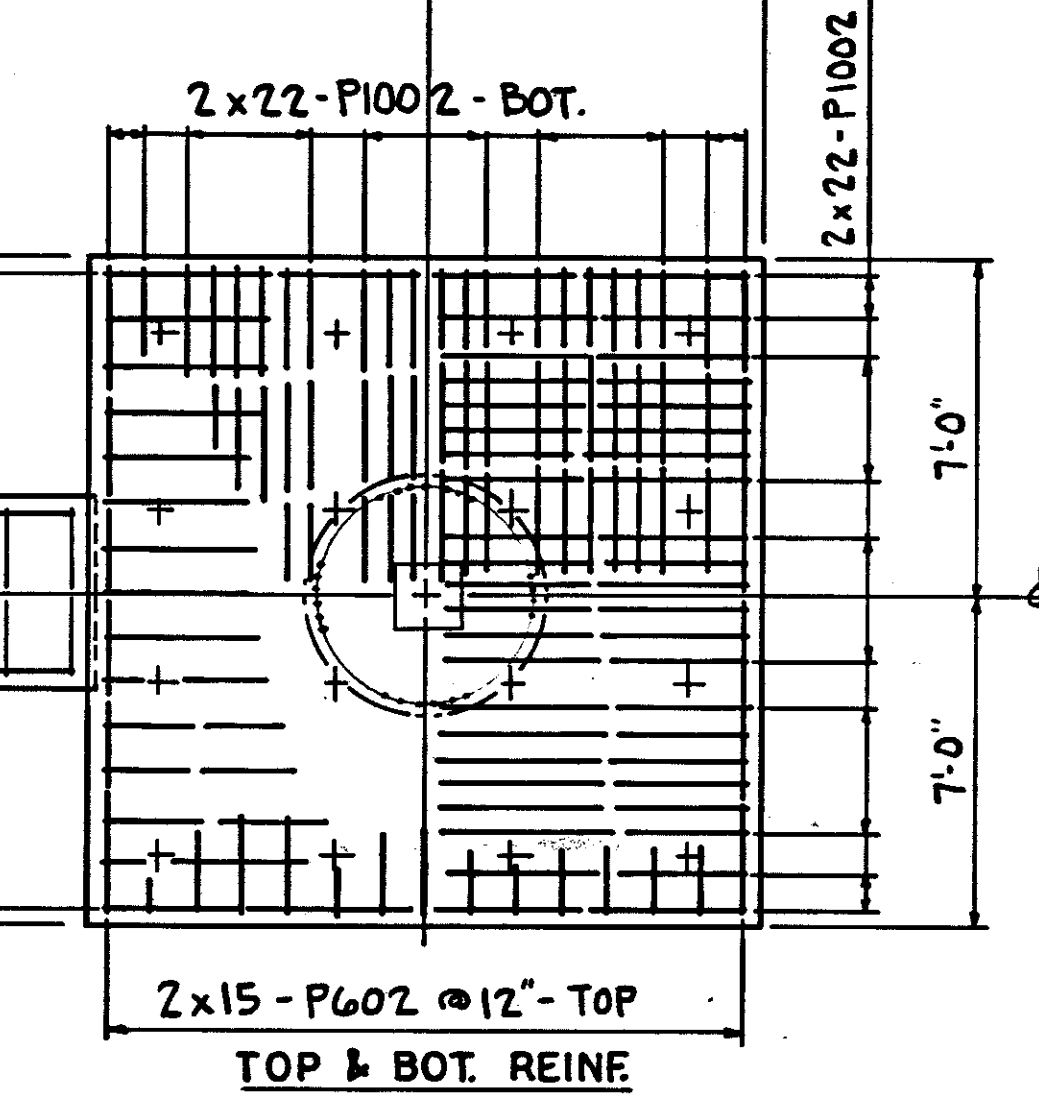
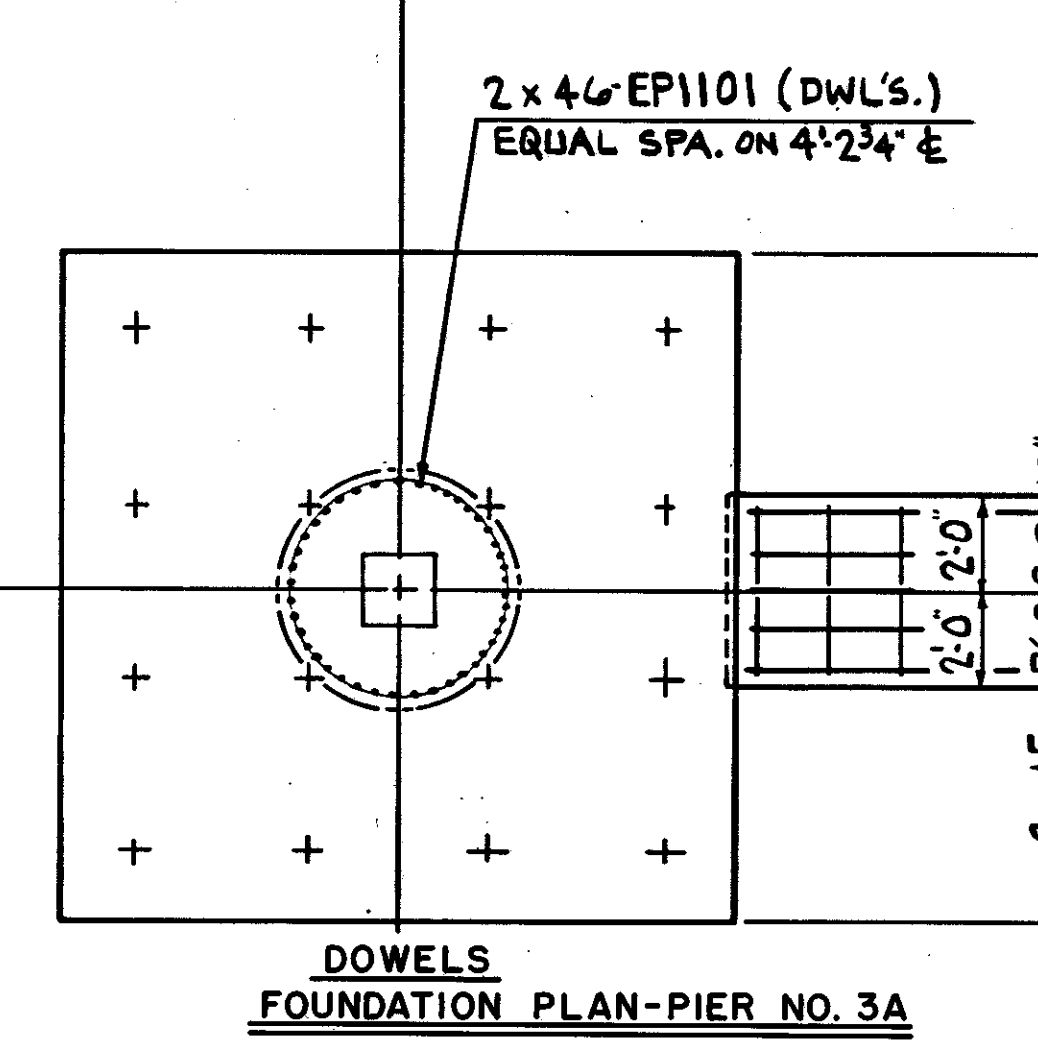
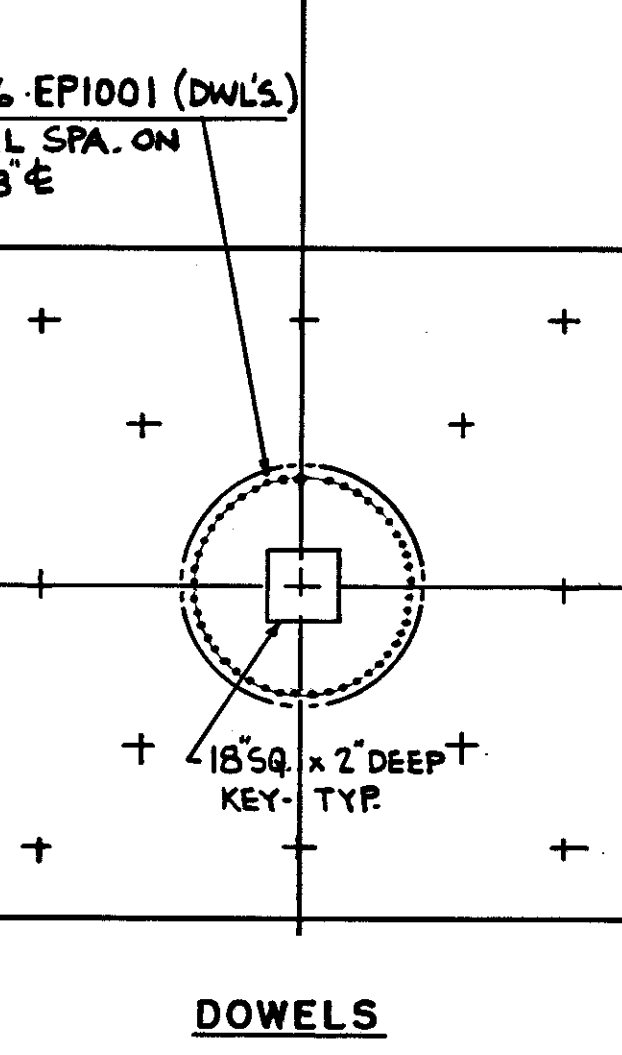
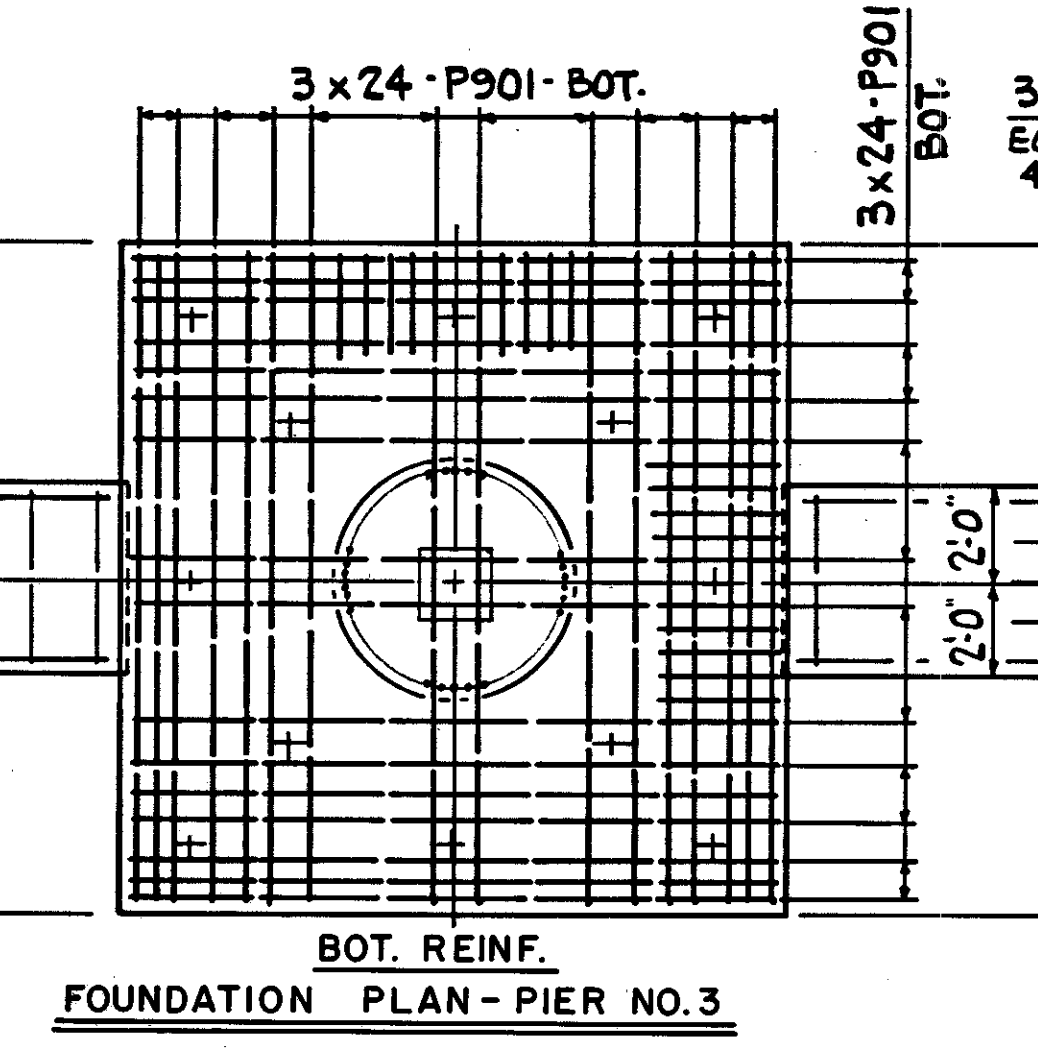
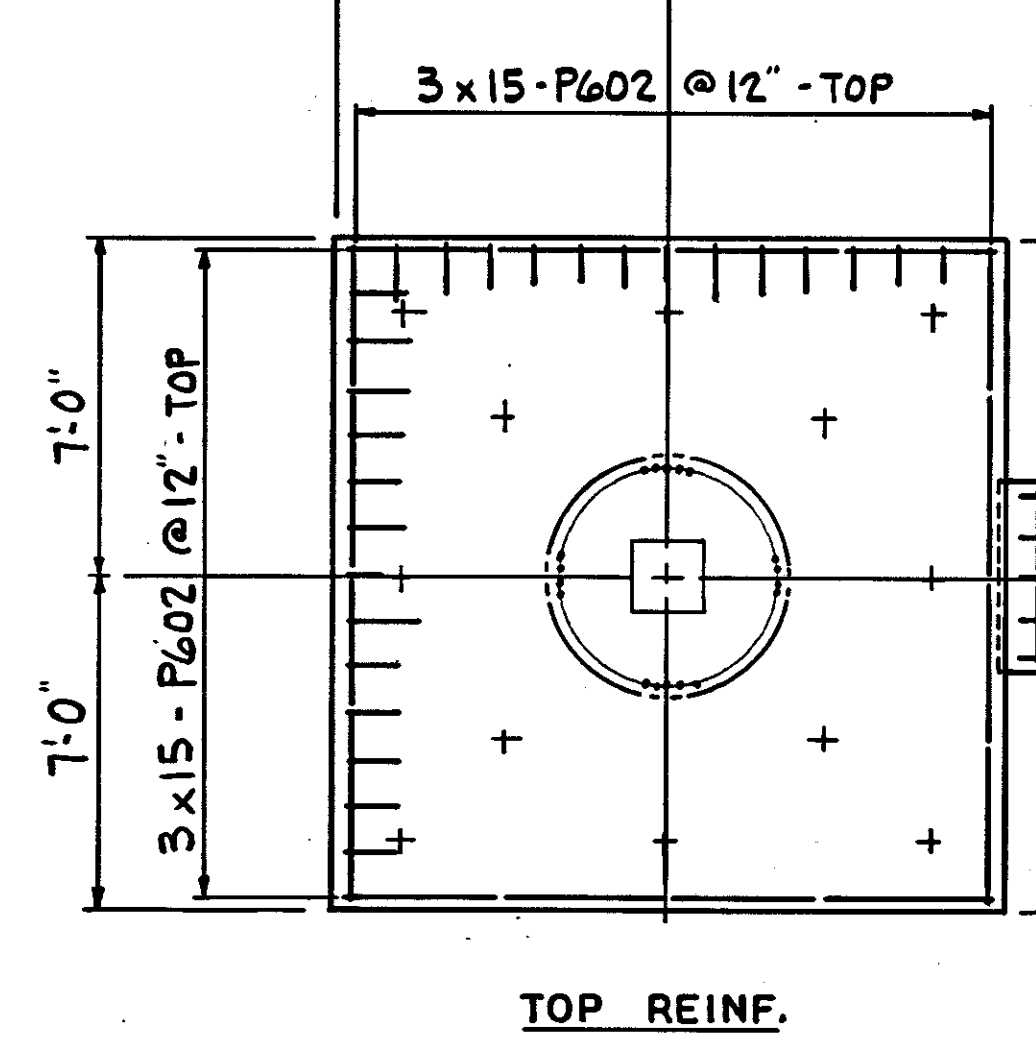
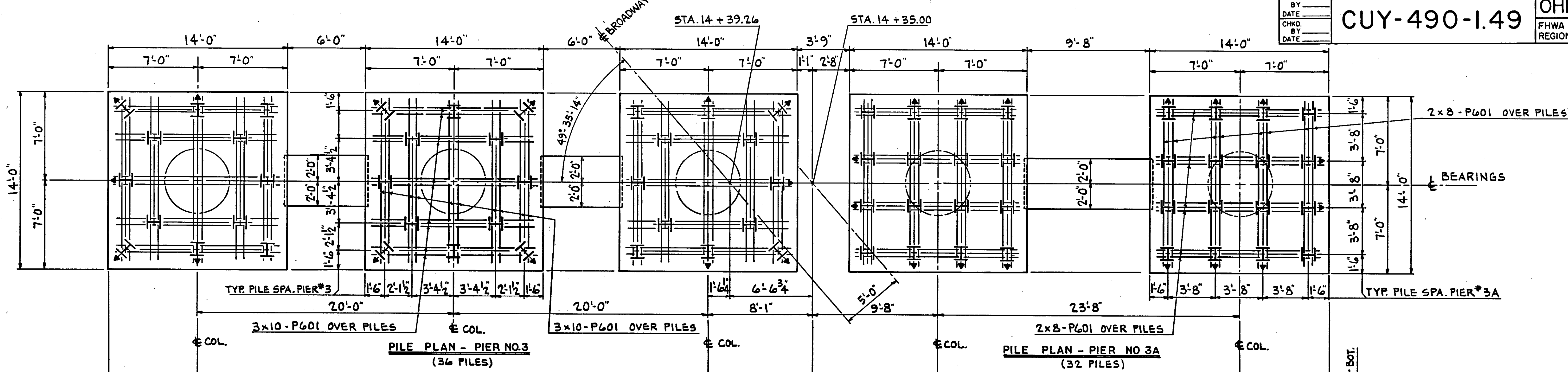


- NOTES:**
1. FOR FOUNDATION REINFORCING SEE [35/63].
 2. FOR REINFORCEMENT SCHEDULE SEE [61/63].
 3. BEARING ANCHOR BOLTS - SEE [50/63]. ALL BEARING ANCHOR BOLTS SHALL BE CAST IN PLACE, LOCATED AND SUPPORTED BY TEMPLATES. REINFORCING STEEL IN THE VICINITY OF THE GIRDER SEATS SHALL BE ACCURATELY PLACED TO AVOID INTERFERENCE WITH CASTING OF THE BEARING ANCHOR BOLTS.
 4. SEE NOTE 4 SHEET [32/63].

WESTON A Business Trust
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 3699 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

SUBSTRUCTURE PIER NO. 3 & 3A
PLAN & ELEVATION
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| WHH | DF | | JRH | RLH | 4/83 | 10/83 |

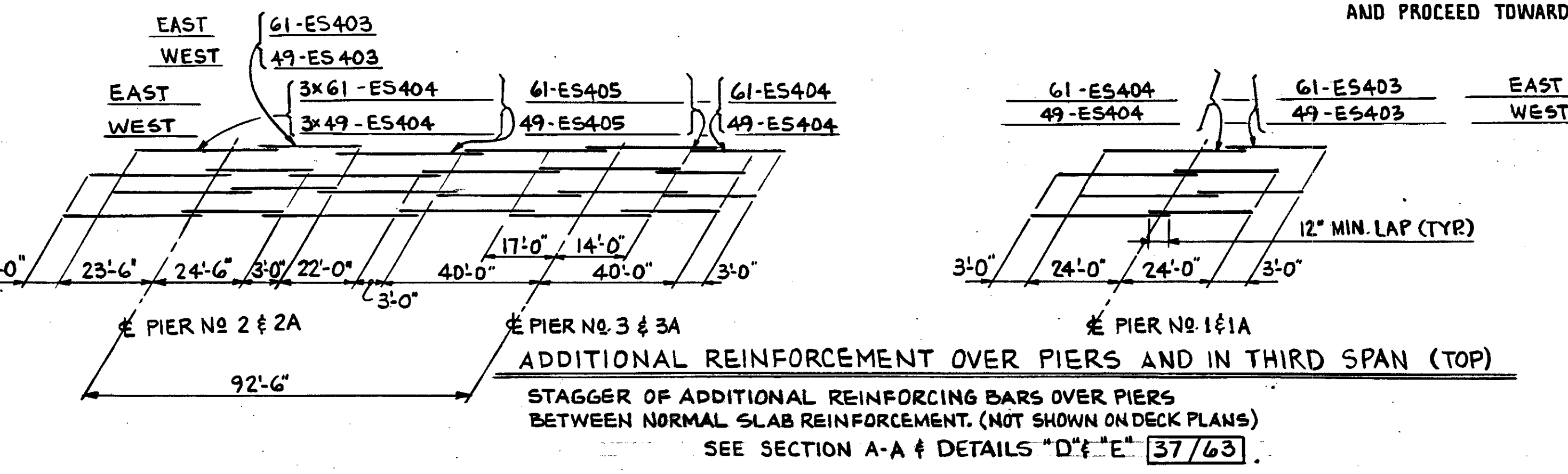
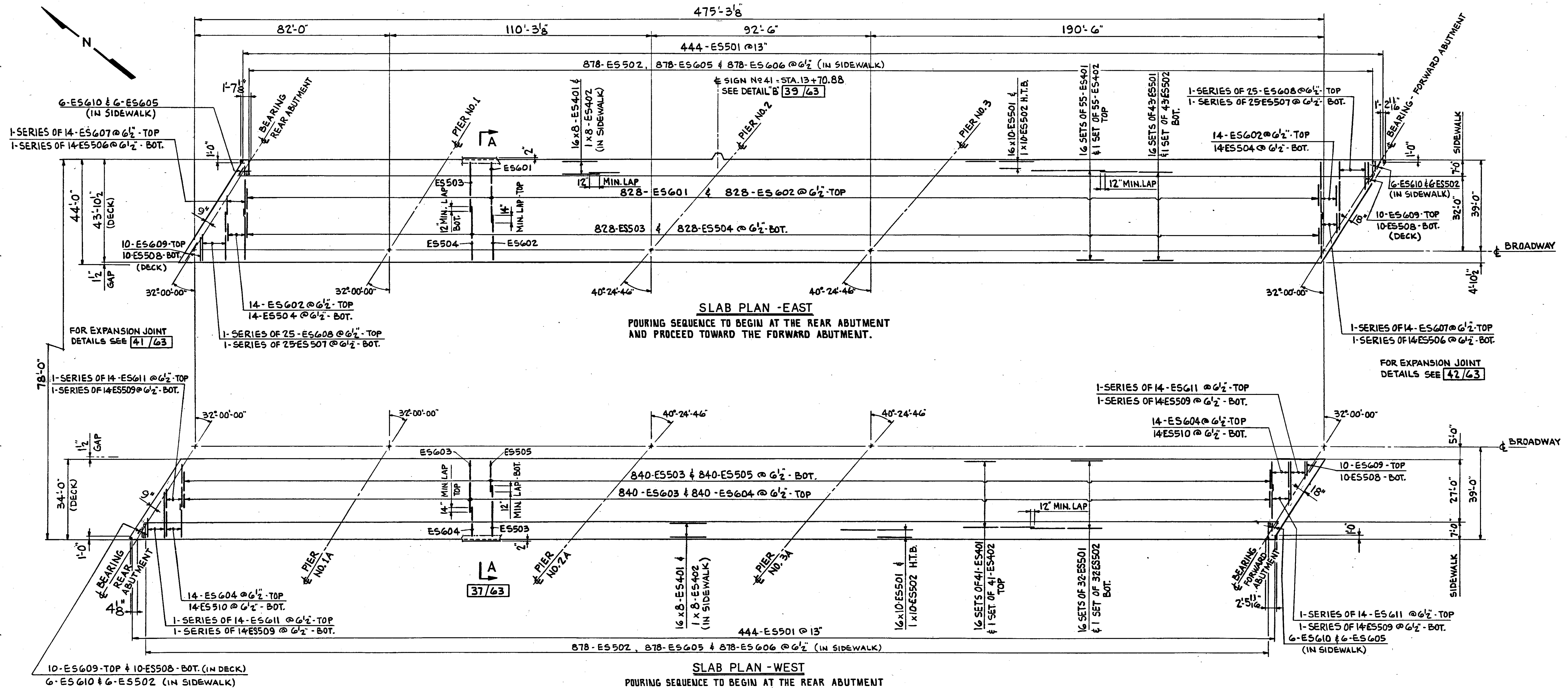


- NOTES:**
- ALL PILES ARE HP 12 x 53.
 - BATTER FOR PILES TO BE 1:4.
 - DIRECTION OF BATTER →
 - FOR FOUNDATION REINFORCEMENT SCHEDULE SEE 61/63.

WESTON A Business Trust 35/63
 DESIGNERS CONSULTANTS 3659 GREEN ROAD SUITE 215 CLEVELAND, OHIO 44122

SUBSTRUCTURE PIER NO. 3 & 3A PILE & FOUNDATION PLAN
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| | | | | | | |
|----------|-------|--------|---------|----------|-------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| WHH | DF | JRH | RLH | 4/83 | 10/83 | |



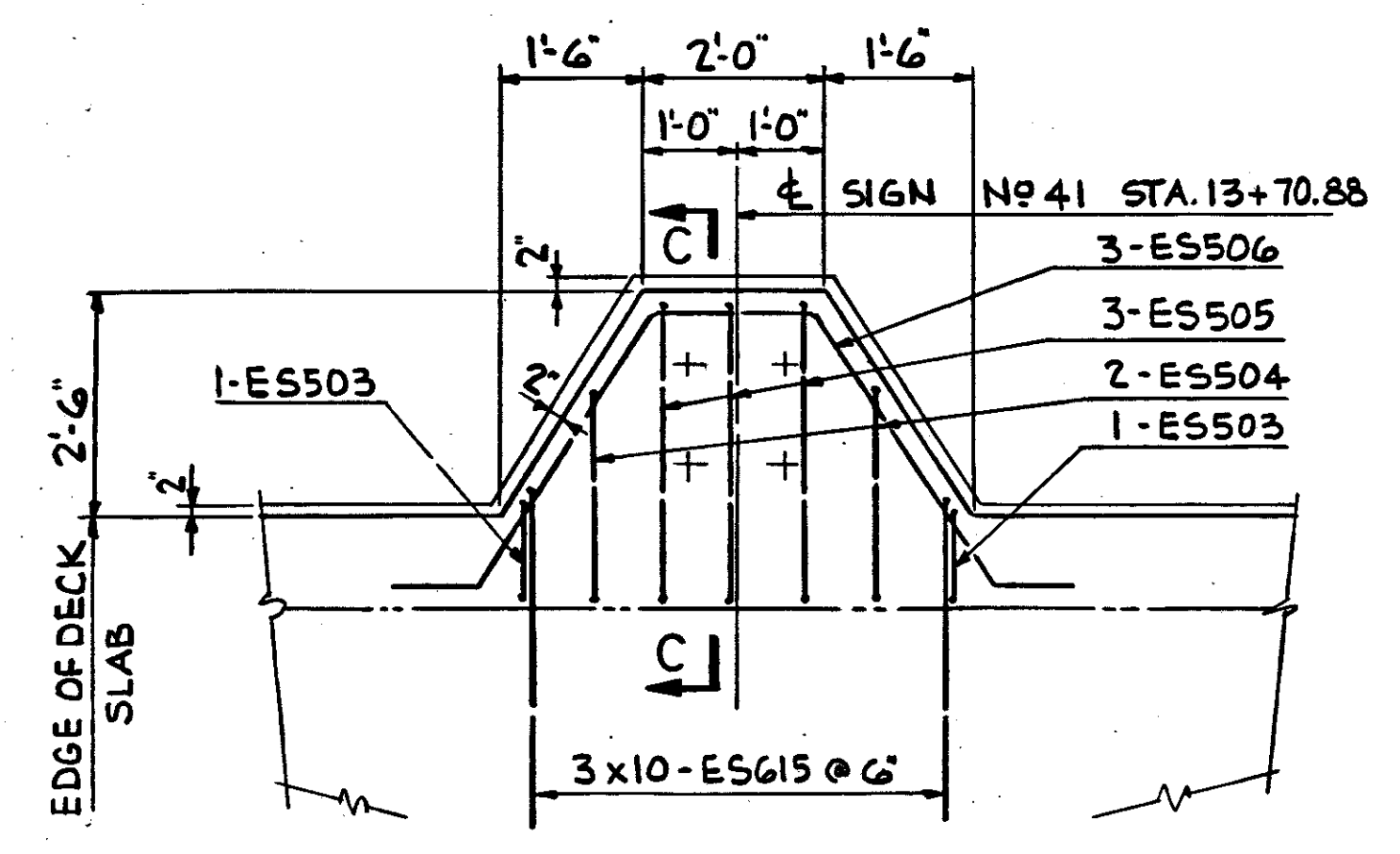
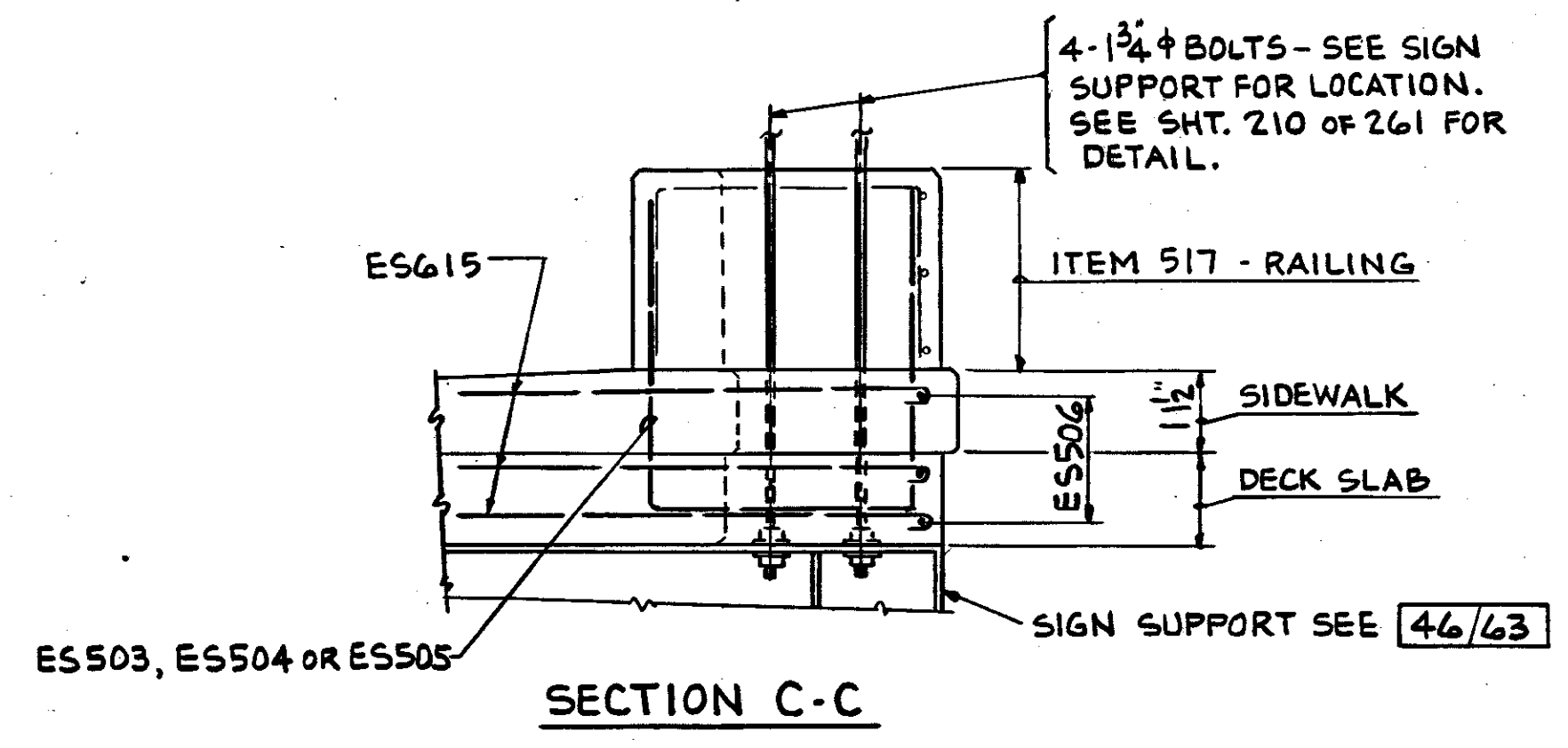
- NOTES:**
- FOR NOTES SEE 4/63
 - FOR REAR AND FORWARD ABUTMENT SEE 6/63 & 16/63
 - FOR REAR AND FORWARD APPROACH SLAB SEE 43/63
 - FOR PARAPETS SEE 39/63
 - FOR REINFORCING SCHEDULE SEE 63/63
 - FOR EXPANSION JOINTS SEE 41/63
 - THE LAST 24" AND 33" OF CONCRETE AT THE EXPANSION JOINTS SHALL BE LATEX MODIFIED, SEE NOTE 6 8/63, 41/63 AND 42A/63

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 CLEVELAND, OHIO 44122

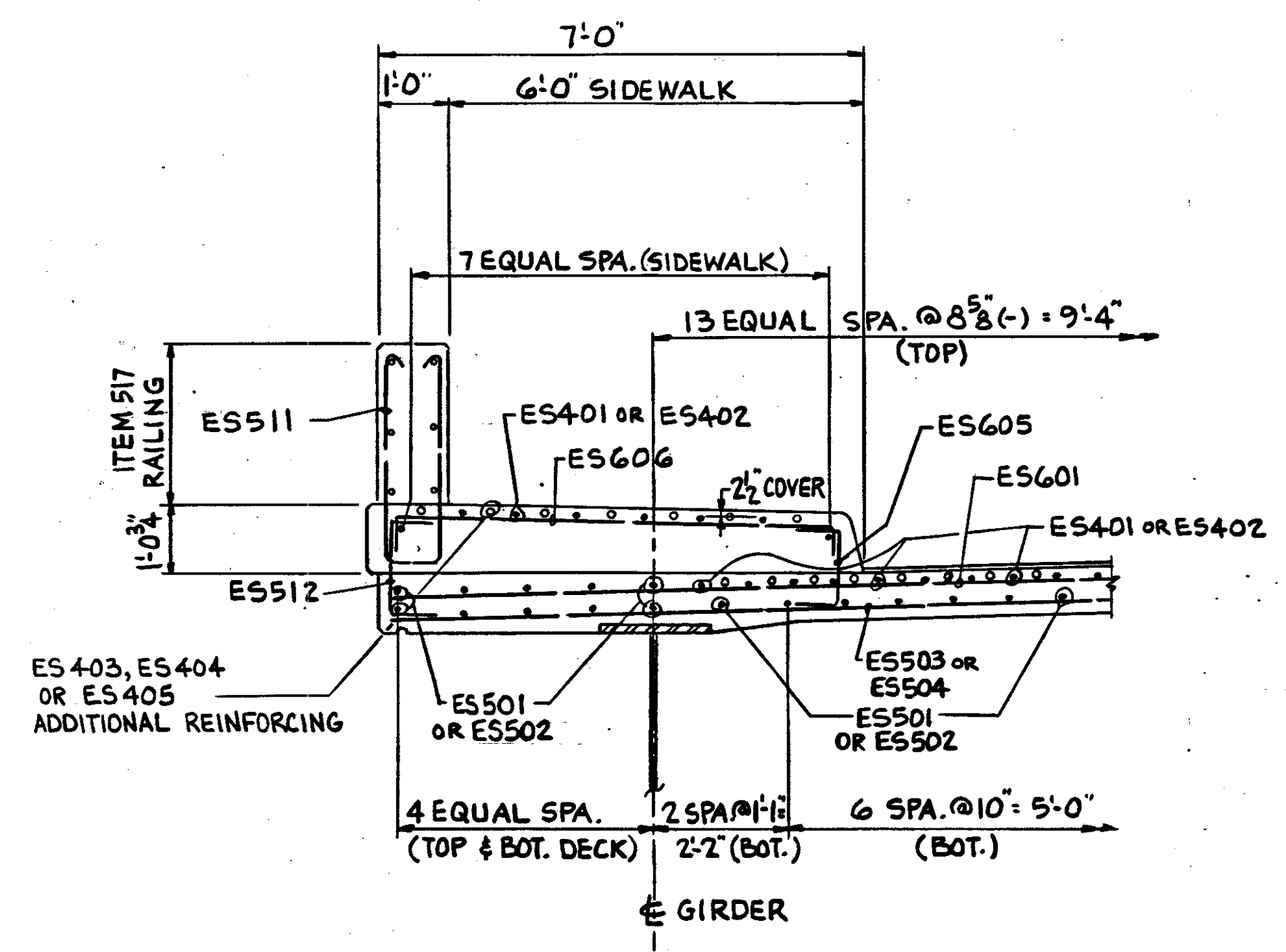
36/63

SUPERSTRUCTURE DECK SLAB EAST AND WEST PLANS
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

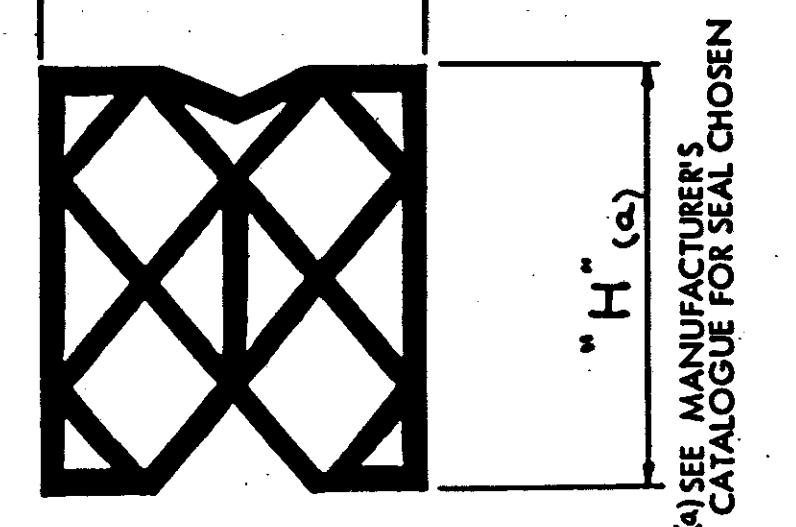
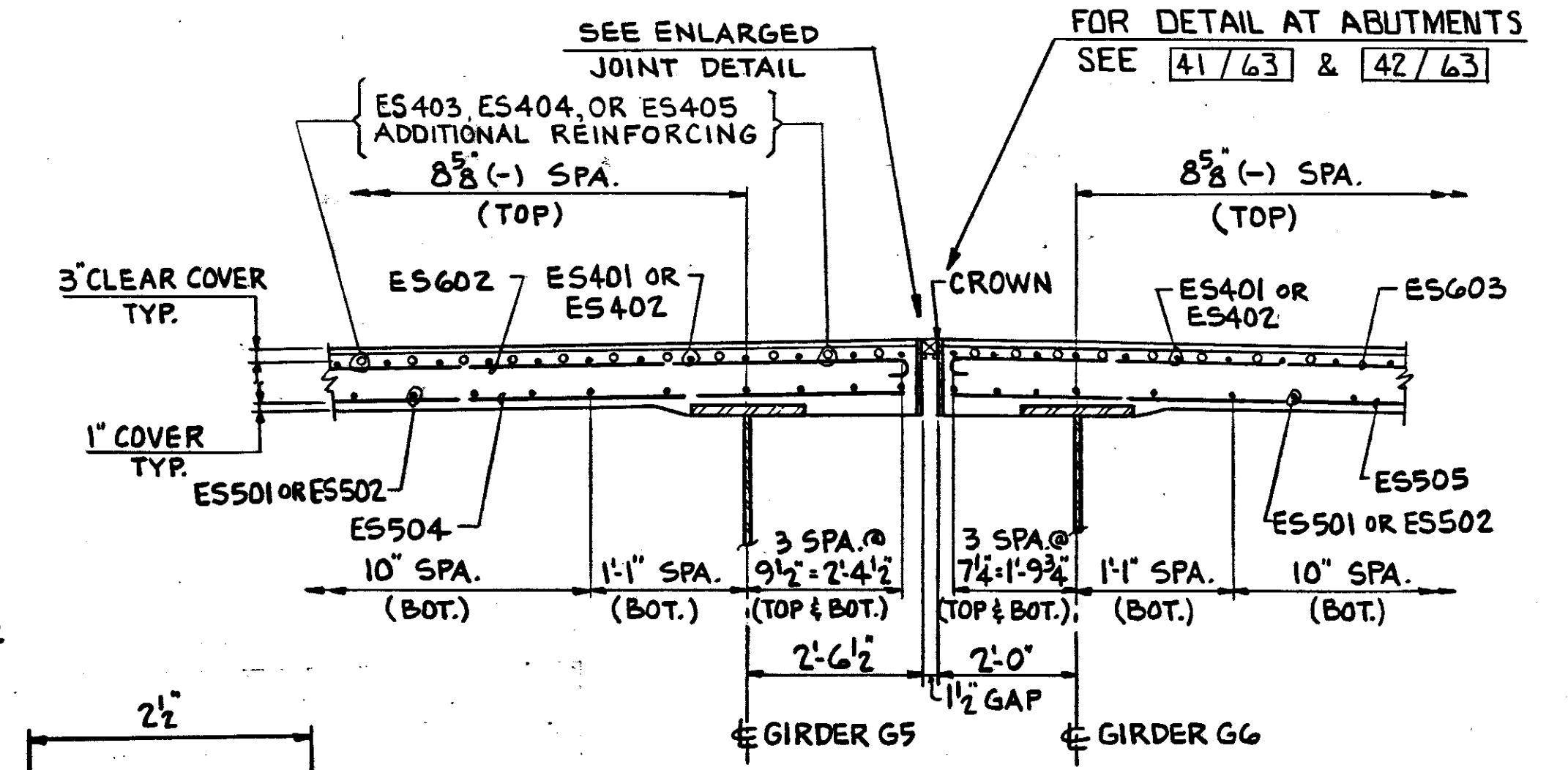
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| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| WHH | DF | | JRH | JWG | 2/83 | 10/83 |



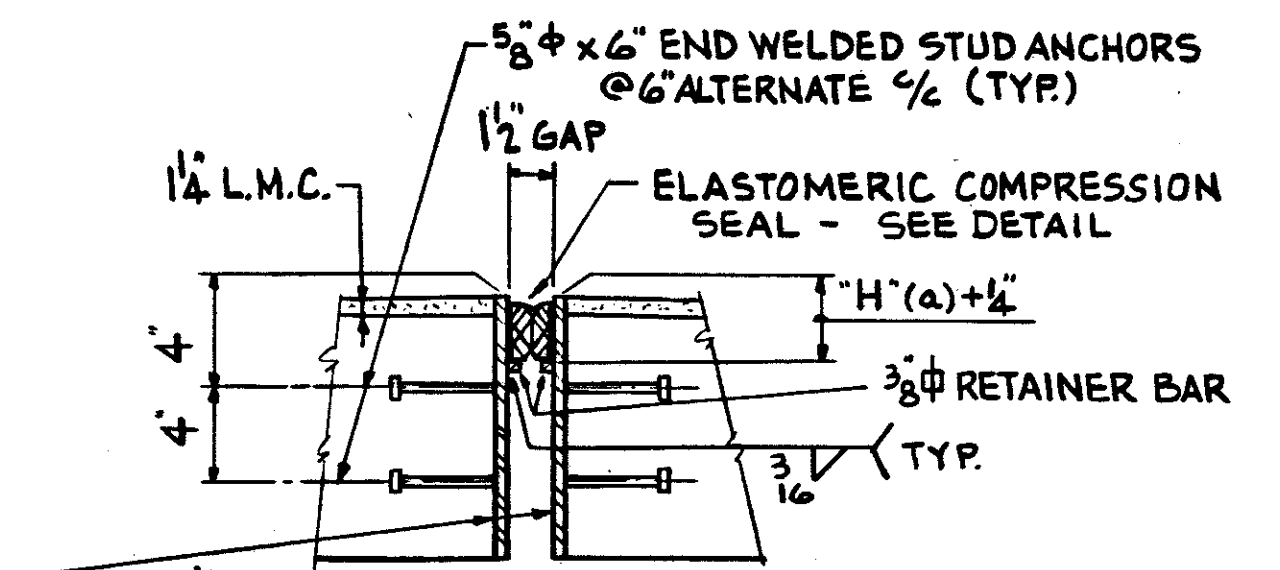
DETAIL "B" 36/63
 (NORMAL DECK & SIDEWALK REINF. NOT SHOWN)



DETAIL "D" TYPICAL SIDEWALK

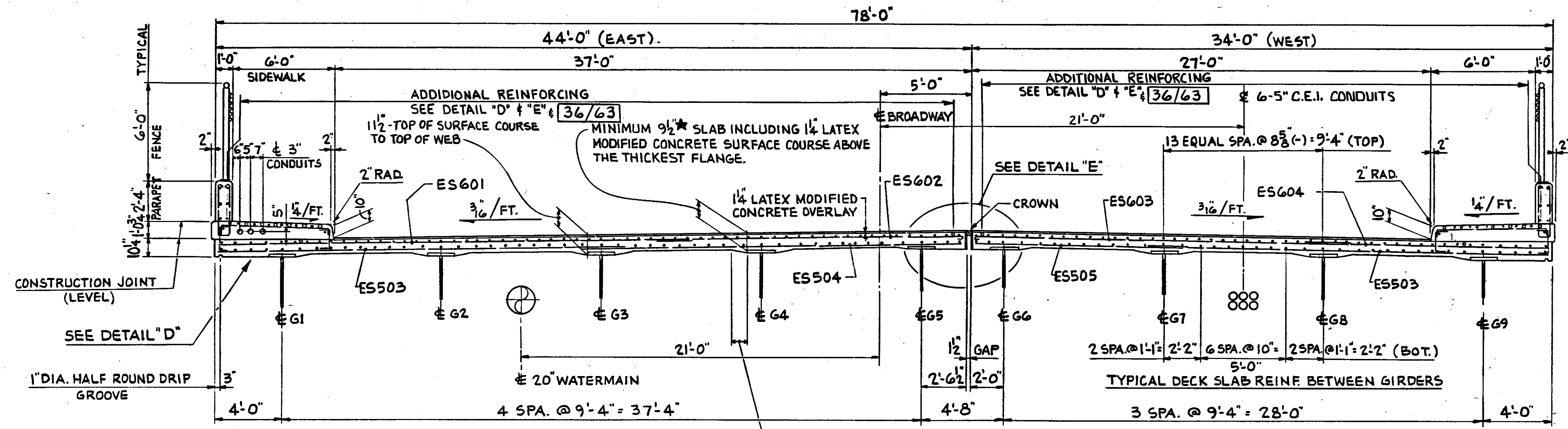


COMPRESSION SEAL DETAIL
 D.S. BROWN'S CV2500, ACME'S J250, WATSON-BOWMAN'S WD250, OR AN APPROVED ALTERNATE



3/8" x 12 1/8" (GALVANIZED) - PLATES SHALL BE FURNISHED AS LONG AS PRACTICABLE. AT ALL FIELD BUTT JOINTS THEY SHALL BE RIGIDLY BUTT WELDED TOGETHER, AS REQUIRED, PRIOR TO PLACING CONCRETE. AT AREAS OF FIELD WELDING, DAMAGED GALVANIZING SHALL BE BRUSHED CLEAN AND GALVANIZED PAINTED.

- NOTES
- DIMENSION MARKED WITH AN ASTERISK IS THE DESIGN DIMENSION. THE QUANTITY OF DECK CONCRETE TO BE PAID FOR SHALL BE BASED UPON THIS DIMENSION, EVEN THOUGH DEVIATION FROM IT MAY BE NECESSARY BECAUSE THE TOP OF THE FLANGE OF THE GIRDER MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE. DEDUCTION SHALL BE MADE FOR VOLUME OF ENCASED STEEL PLATES AS PER SEC. 511.18 OF THE CONSTRUCTION AND MATERIAL SPECIFICATION.
 - ALL REINFORCING TO HAVE 2" COVER, UNLESS OTHERWISE SPECIFIED.
 - FOR DECK SLAB REINFORCING SEE 36/63.
 - FOR PARAPET REINFORCING SEE 39/63.
 - FOR REINFORCING SCHEDULE SEE 63/63.



A TYPICAL HAUNCH WIDTH OF 9" SHALL BE USED FOR COMPUTING QUANTITY OF CONCRETE. HOWEVER, THE HAUNCH WIDTH MAY VARY BETWEEN 6" & 12" PROVIDED THAT THE SLOPE SHALL NOT BE MORE THAN 1:4 FOR A HAUNCH LESS THAN 9" IN WIDTH.

TYPICAL CROSS SECTION A-A 36/63

WESTON A Business Trust
 3635 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

37/63

SUPERSTRUCTURE DECK SLAB SECTIONS & DETAILS

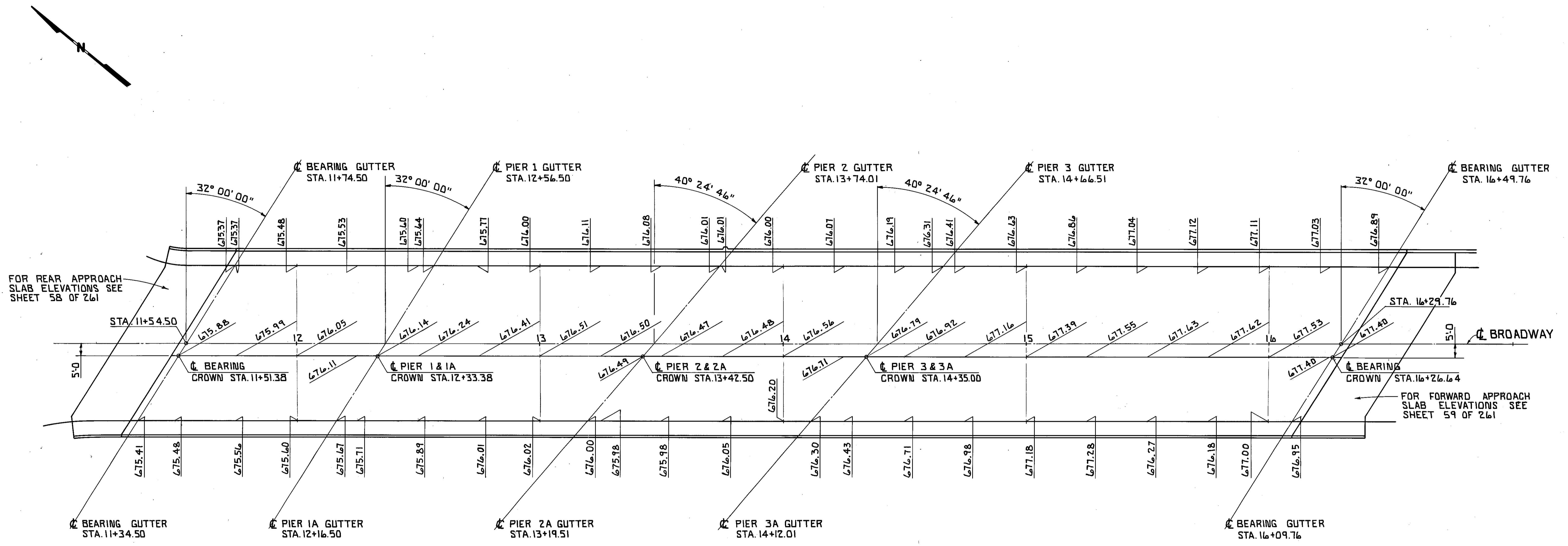
BRIDGE NO. CUY-490-0152

I-490 UNDER RELOC. BROADWAY

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| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| WHH | DF | | JRH | JWG | 2/83 | 10/83 |

CUY-490-1.49

OHIO
FHWA REGION 5
252 N
261

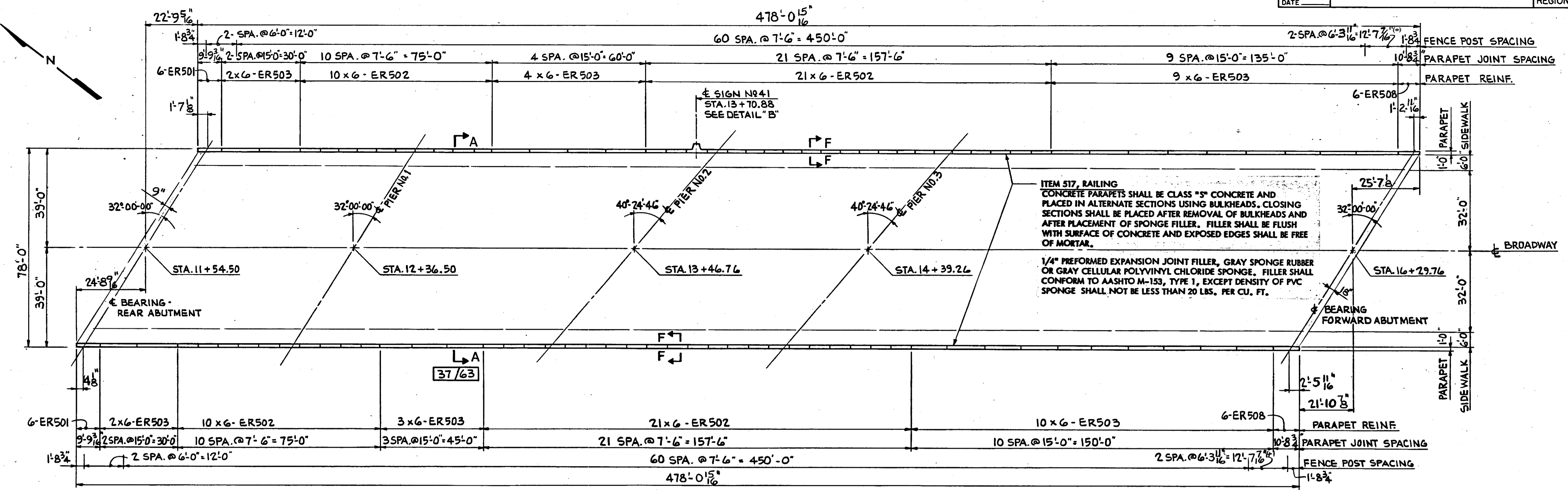


PLAN - DECK ELEVATIONS

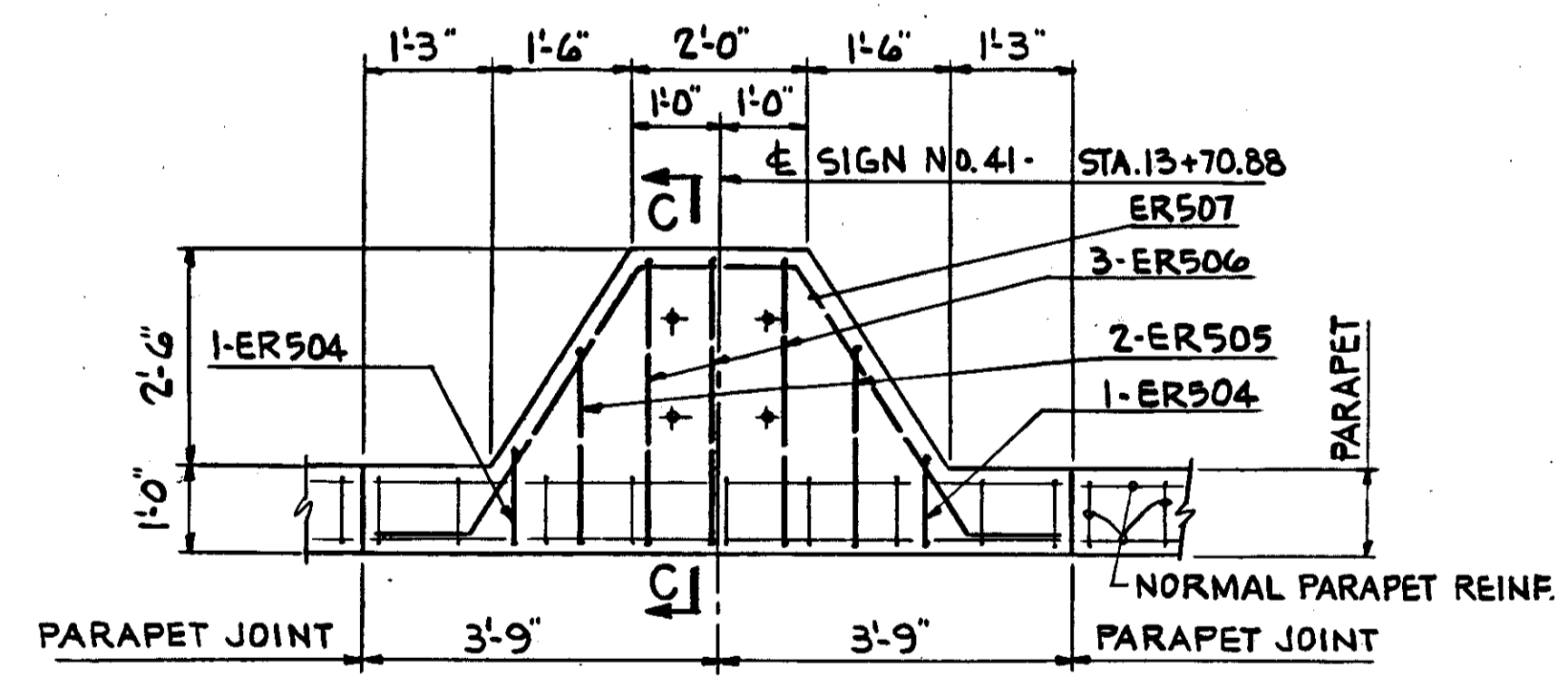
THE ELEVATIONS SHOWN ARE TOP OF CONCRETE SLAB (WITHOUT OVERLAY) BEFORE PLACING CONCRETE, AND ARE TO BE USED FOR SETTING FORMS. THEY INCLUDE THE PROPER AMOUNT OF DEAD LOAD DEFLECTION CAUSED BY SUPERIMPOSED DEAD LOADS.

NOTES:
1. SLAB ELEVATIONS ARE SHOWN ON BRIDGE CROWN LINE AND GUTTER LINES AT 25'-0" INTERVAL UNLESS OTHERWISE NOTED.

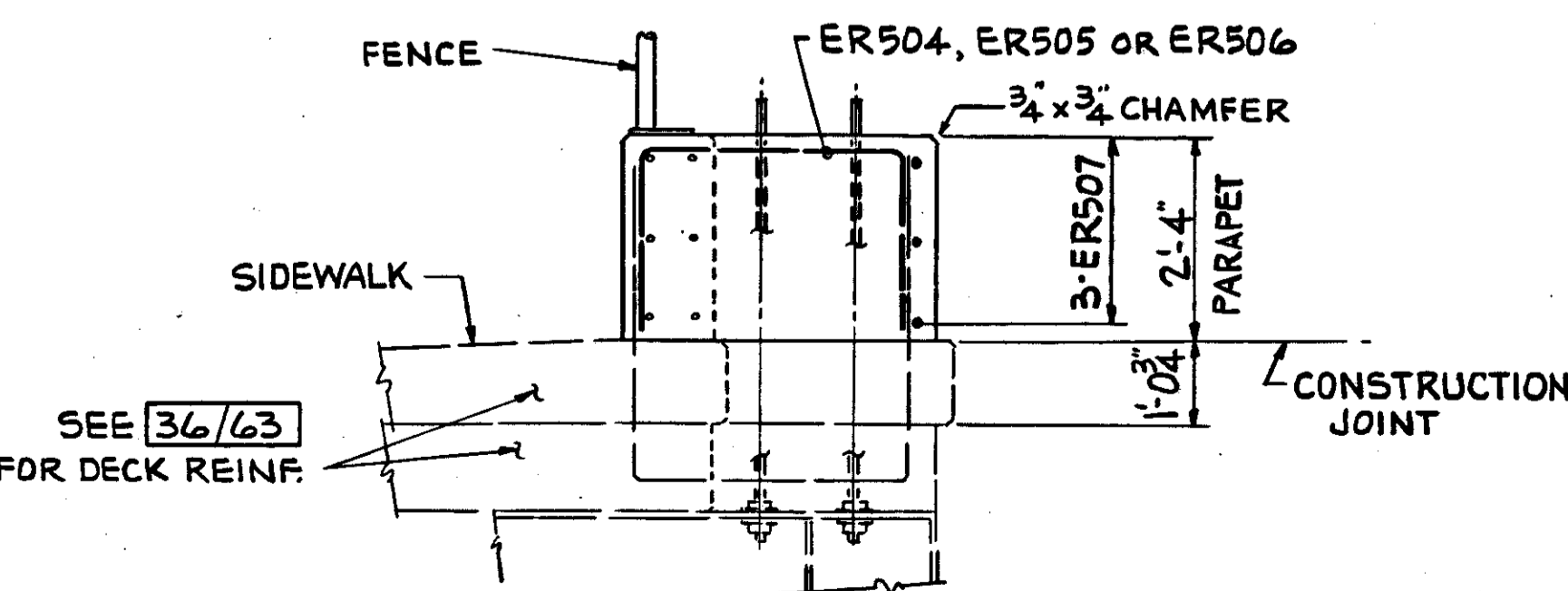
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|--|-------|--|---------|----------|
| WESTON DESIGNERS CONSULTANTS | | A Business Trust 3659 GREEN ROAD SUITE 215 CLEVELAND, OHIO 44122 | | 38/63 |
| SUPERSTRUCTURE DECK ELEVATIONS | | | | |
| BRIDGE NO. CUY-490-0152 I-490 UNDER RELOC. BROADWAY | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED |
| DATE | DATE | DATE | DATE | DATE |
| WHH | CAP | JRH | RLH | 4/83 |



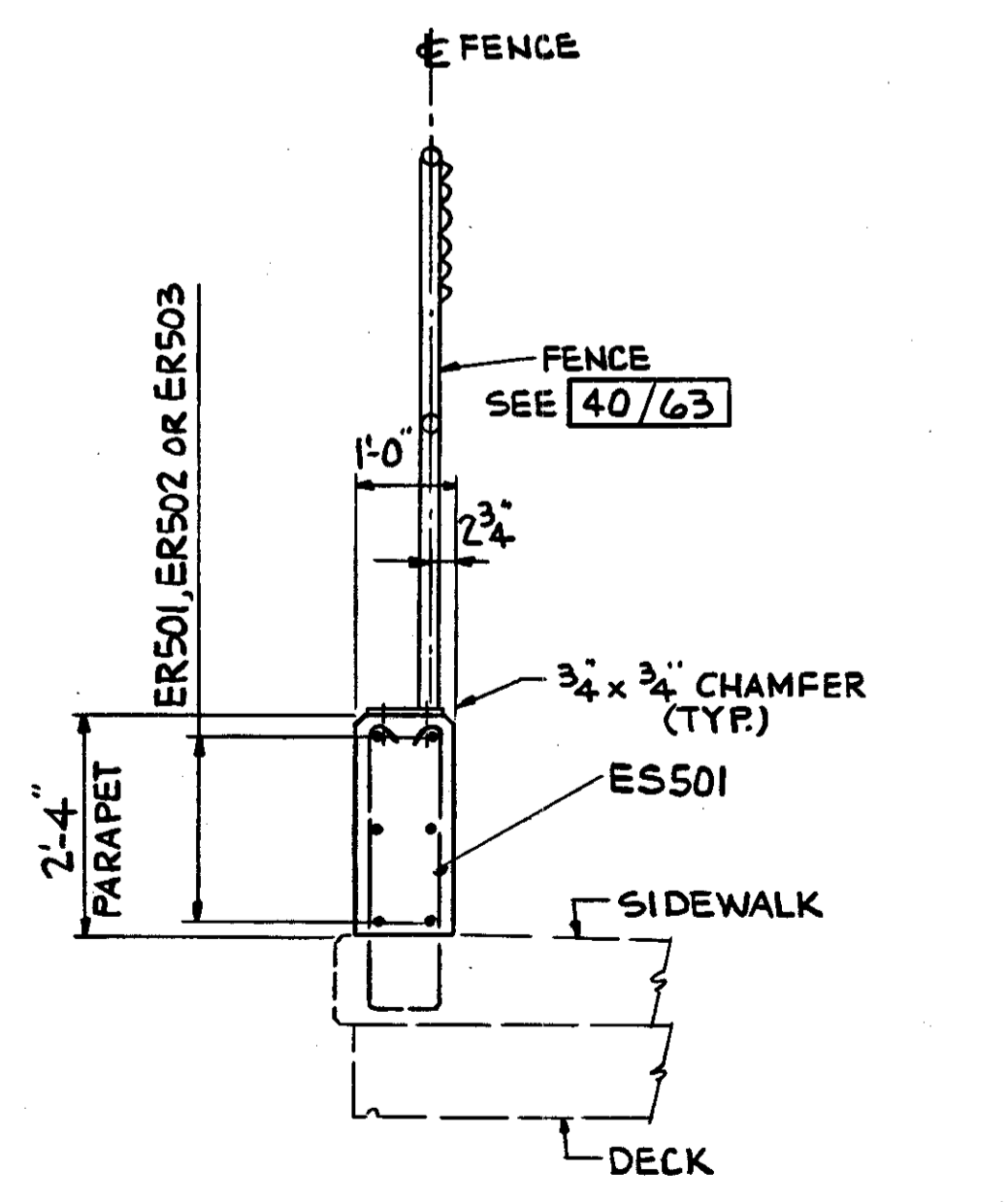
PARAPET PLAN



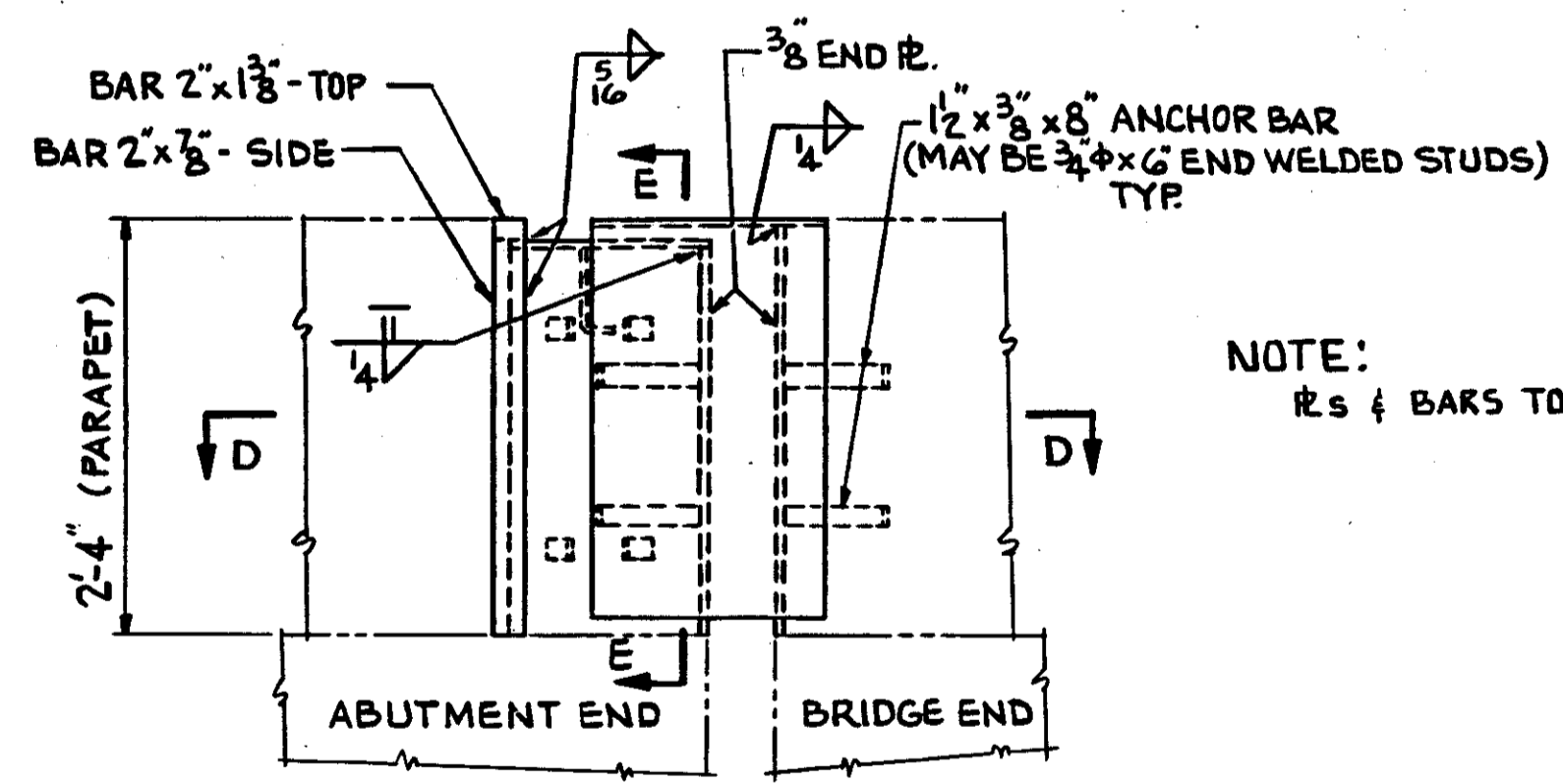
DETAIL "B" (SIGN NO. 41)



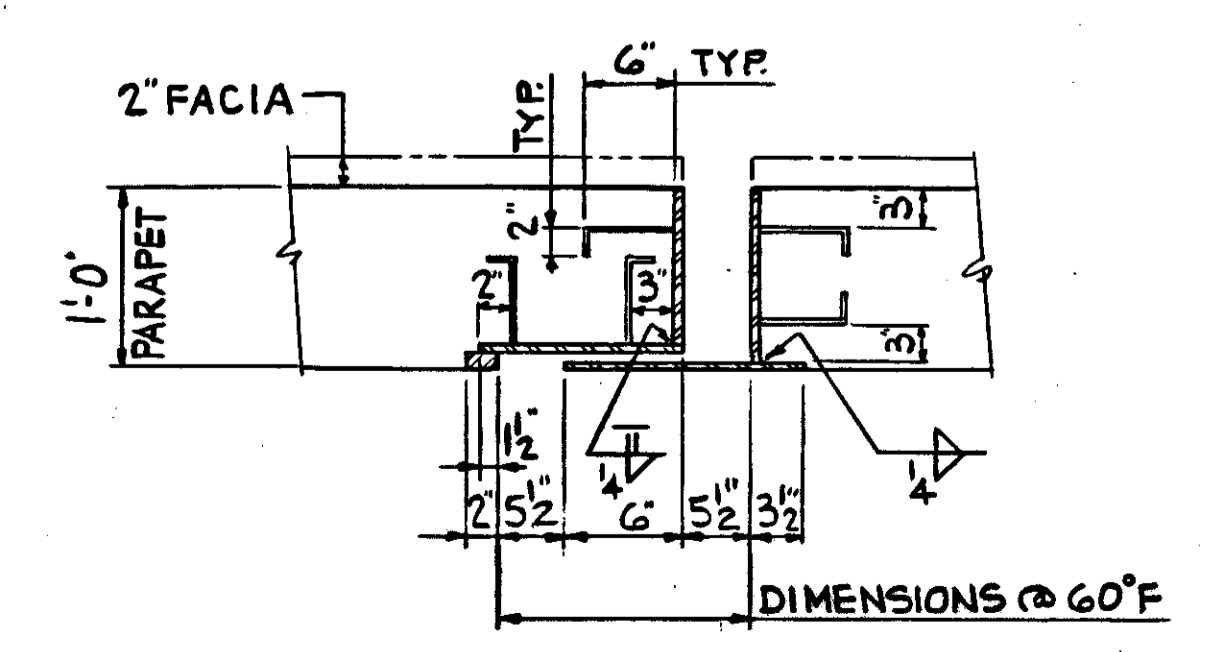
SECTION C-C



SECTION F-F (TYPICAL PARAPET)

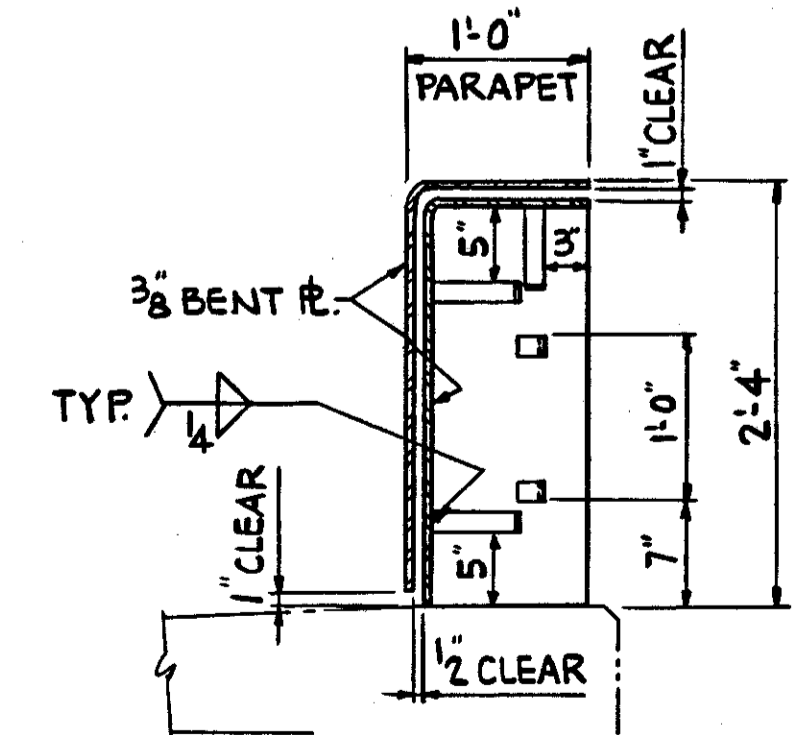


PARAPET SLIDING PLATE DETAIL (A36 STEEL)



SECTION D-D

NOTE:
 REINFORCING BARS & BARS TO BE GALVANIZED.



SECTION E-E

- NOTES:**
- FOR NOTES SEE 4/63.
 - FOR FENCE DETAILS SEE 40/63.
 - FOR DECK SLAB SEE 36/63 AND 37/63.
 - CONCRETE FOR SIGN POLE SUPPORT IS INCLUDED FOR PAYMENT WITH ITEM 517 RAILING.
 - FOR REINFORCING SCHEDULE SEE 63/63.

ITEM 517 - RAILING (CONCRETE PARAPET AND CHAINLINK FENCE), AS PER PLAN

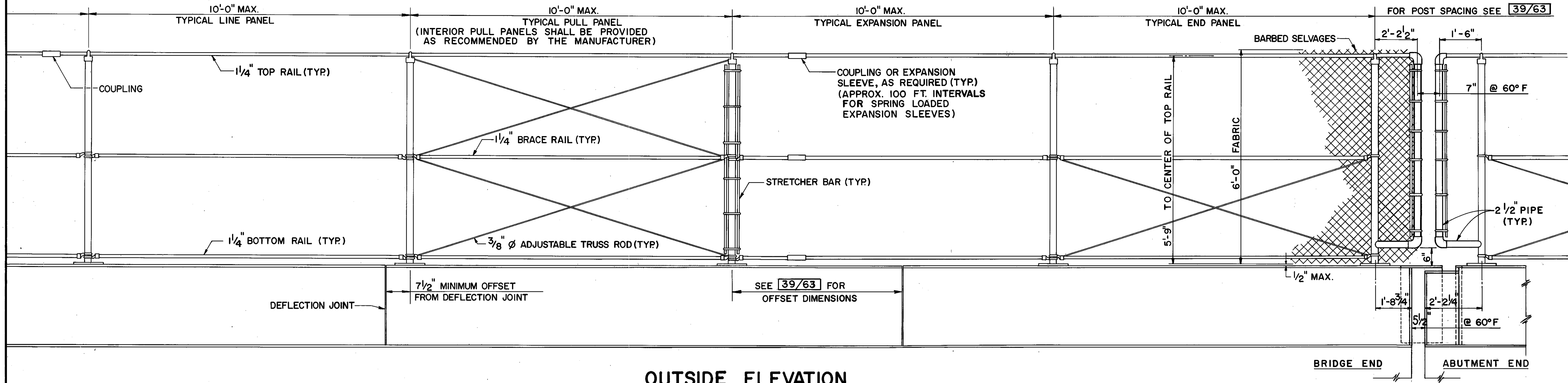
PAYMENT FOR PARAPET AND FENCE SHALL BE MADE AT THE CONTRACT UNIT PRICE FOR "ITEM 517 - RAILING (CONCRETE PARAPET AND CHAINLINK FENCE), AS PER PLAN." PAYMENT SHALL BE THE OVERALL LENGTH OF THE PARAPETS, PARAPET EXPANSION JOINT MATERIAL, LONGITUDINAL REINFORCING STEEL IN PARAPETS, PARAPET SLIDING PLATES, FENCE AND ALL MATERIALS, LABOR, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE FENCING AND PARAPETS.

WESTON A Business Trust
 DESIGNERS CONSULTANTS
 3559 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

39/63

**SUPERSTRUCTURE
 BRIDGE PARAPET
 PLANS, SECTIONS AND DETAILS
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY**

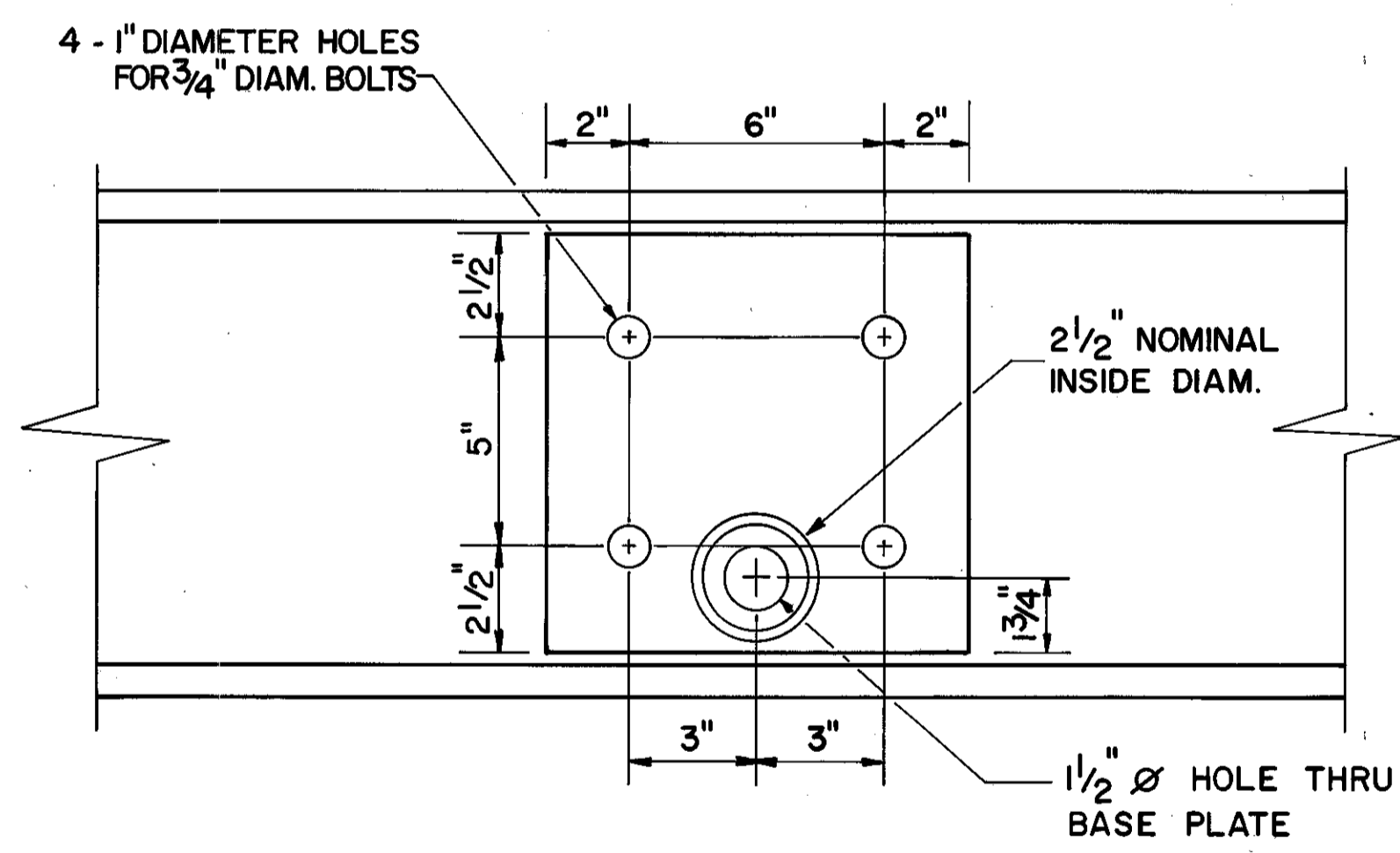
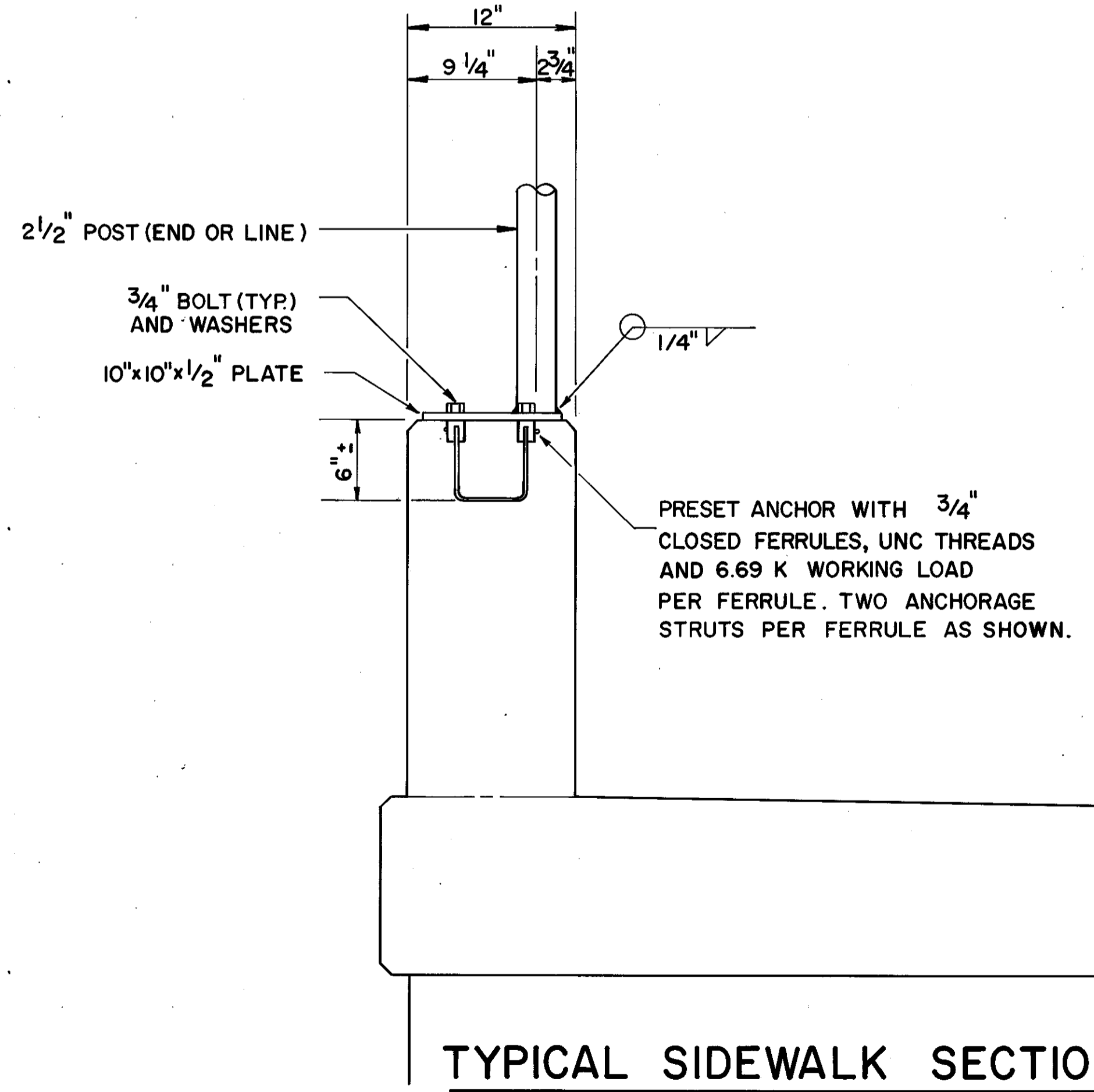
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| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| WHH | DF | JRH | JWG | 2/83 | 10/83 | |



OUTSIDE ELEVATION

FENCE, TYPE CL

THIS ITEM INCLUDES THE FURNISHING OF ALL MATERIALS, LABOR, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE FENCING. TENSION BANDS SHALL BE A MINIMUM OF 12 GAUGE STEEL BY 7/8 INCHES WIDE ASSEMBLED WITH 5/16 INCH DIAMETER BY 1/4 INCH GALVANIZED OR CADMIUM PLATED BOLTS. ONE TENSION BAND SHALL BE REQUIRED FOR EACH FOOT OF FABRIC HEIGHT. FENCE POSTS AND ANCHOR BOLTS SHALL BE PERPENDICULAR TO GRADE. RAILS SHALL BE PARALLEL TO GRADE. THE FABRIC AND RAILS SHALL BE FREE TO EXPAND OR CONTRACT ACROSS BRIDGE EXPANSION JOINTS. MATERIALS AND WORKMANSHIP SHALL MEET THE REQUIREMENTS OF ITEM 607 EXCEPT THAT ALUMINUM ALLOY POSTS AND BASE PLATES SHALL NOT BE USED. FABRIC TIES SHALL BE SPACED 14 INCH C/C MAXIMUM ON LINE OR END POSTS AND 24 INCH C/C MAXIMUM ON ALL RAILS. ALL POSTS AND PIPE SIZES ARE NOTED IN TERMS OF THE NOMINAL INSIDE DIAMETER OF STANDARD WEIGHT PIPE, SCHEDULE 40. STRETCHER BARS AND MISCELLANEOUS HARDWARE SHALL BE THAT OF THE CHAIN LINK FENCE INDUSTRY STANDARD. BASE PLATES AND MISCELLANEOUS BRACKETS FOR STEEL POSTS MAY BE OF ANY COMMERCIAL WELDABLE STEEL HAVING A YIELD STRENGTH OF NOT LESS THAN 33,000 P.S.I. ALUMINUM ALLOY FABRIC (AASHTO M-181, TYPE III) SHALL BE USED.

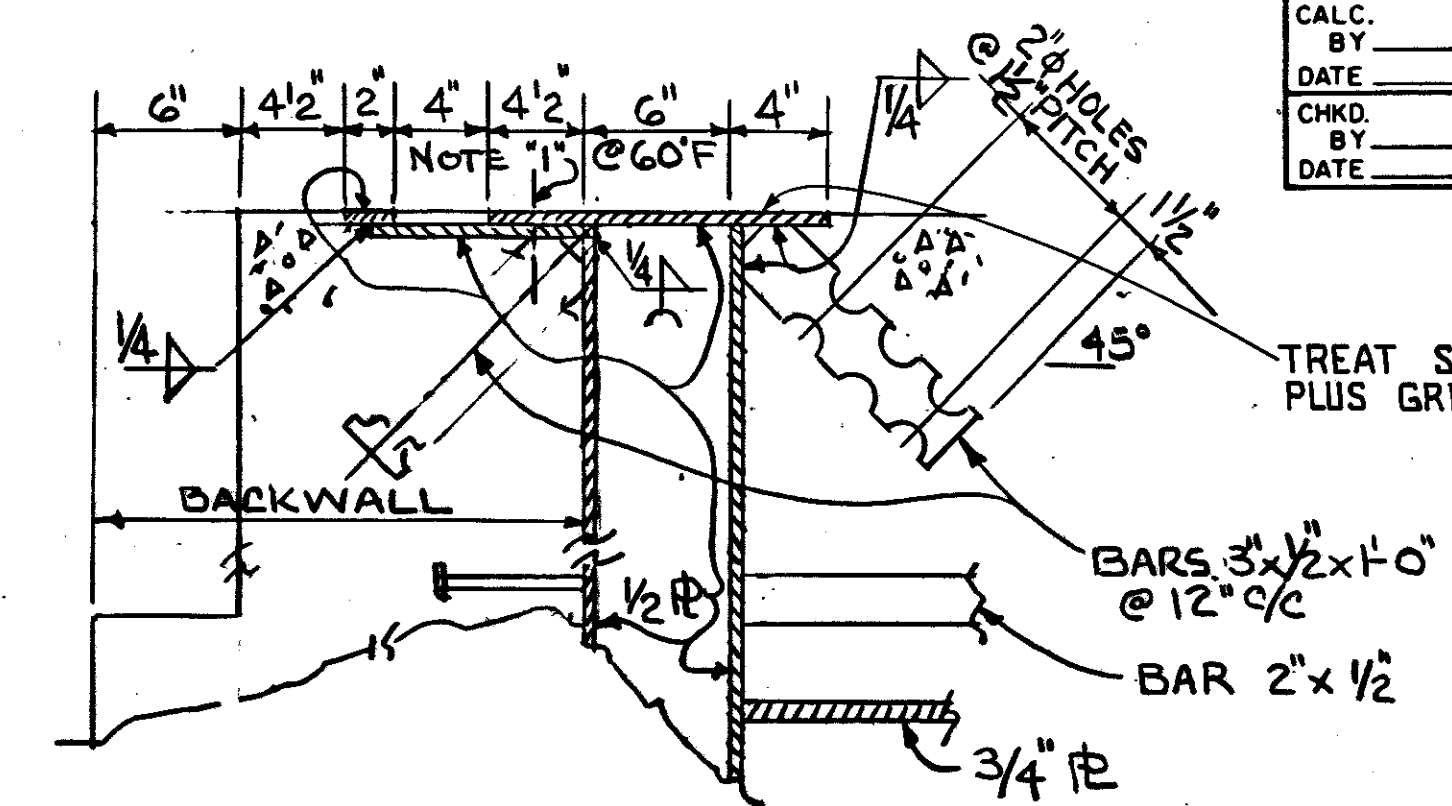


PLAN VIEW

WESTON A Business Trust
 DESIGNERS CONSULTANTS
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

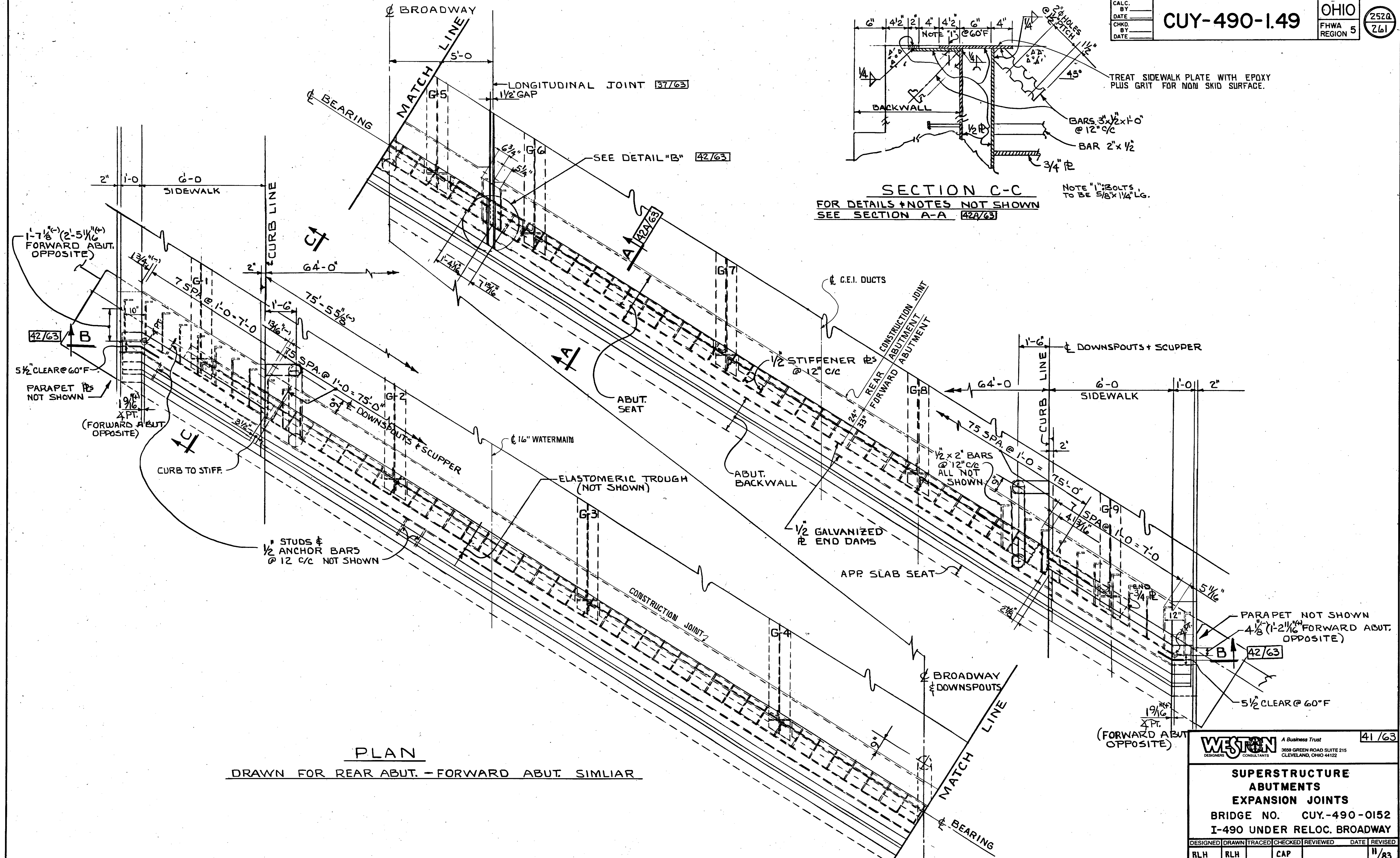
SUPERSTRUCTURE FENCE DETAILS
 BRIDGE NO. CUY.-490-0152
 I-490 UNDER RELOC. BROADWAY

| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| DF | PRB | | JRH | RLH | 2/83 | 10/83 |



SECTION C-C
 FOR DETAILS + NOTES NOT SHOWN
 SEE SECTION A-A 42A/63

NOTE: 1/2" BOLTS TO BE 5/8" x 1/4" LG.



PLAN
 DRAWN FOR REAR ABUT. - FORWARD ABUT. SIMILAR

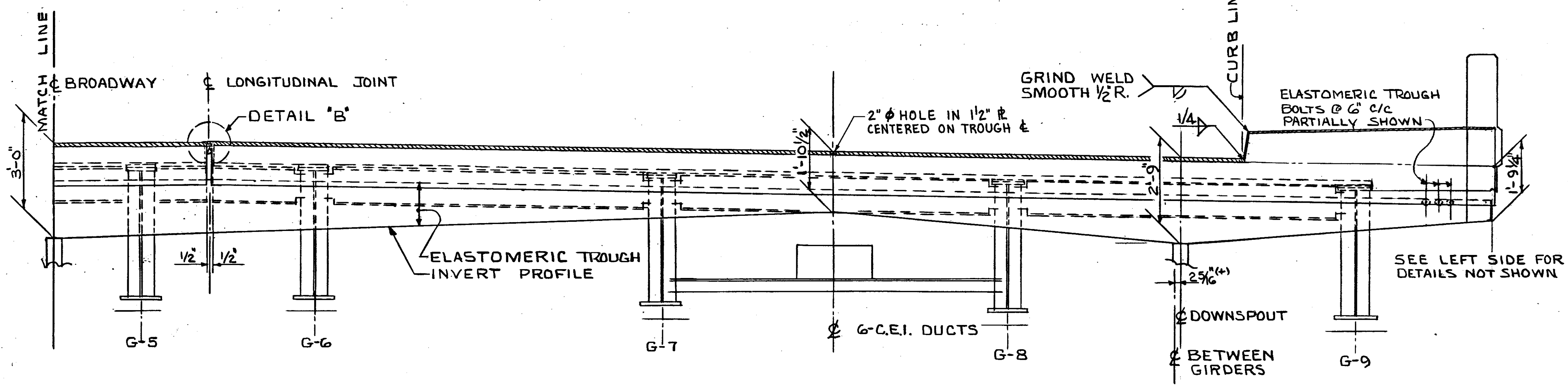
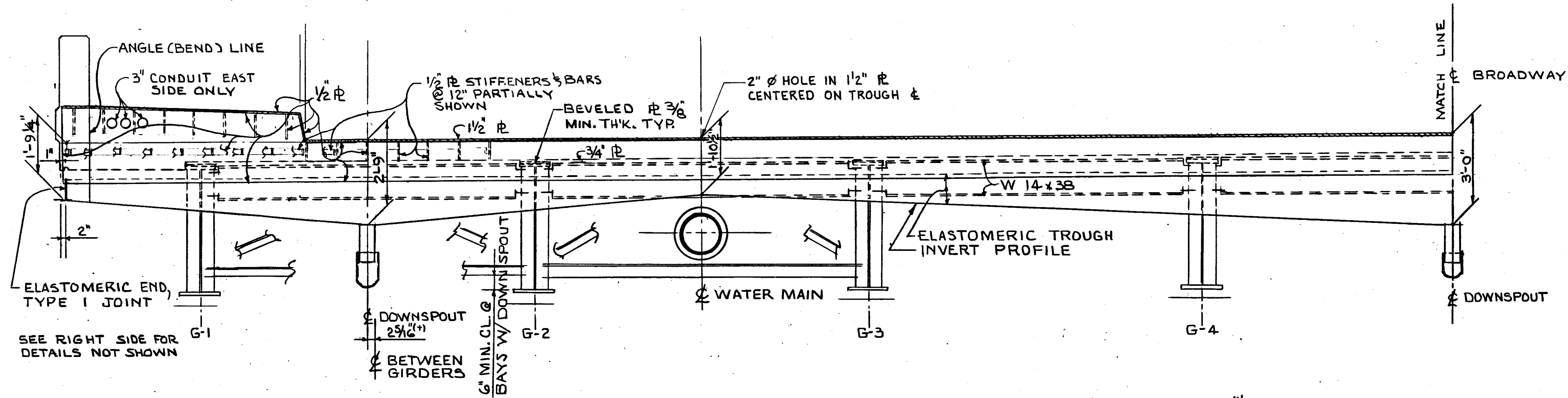
WESTON A Business Trust
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

41/63

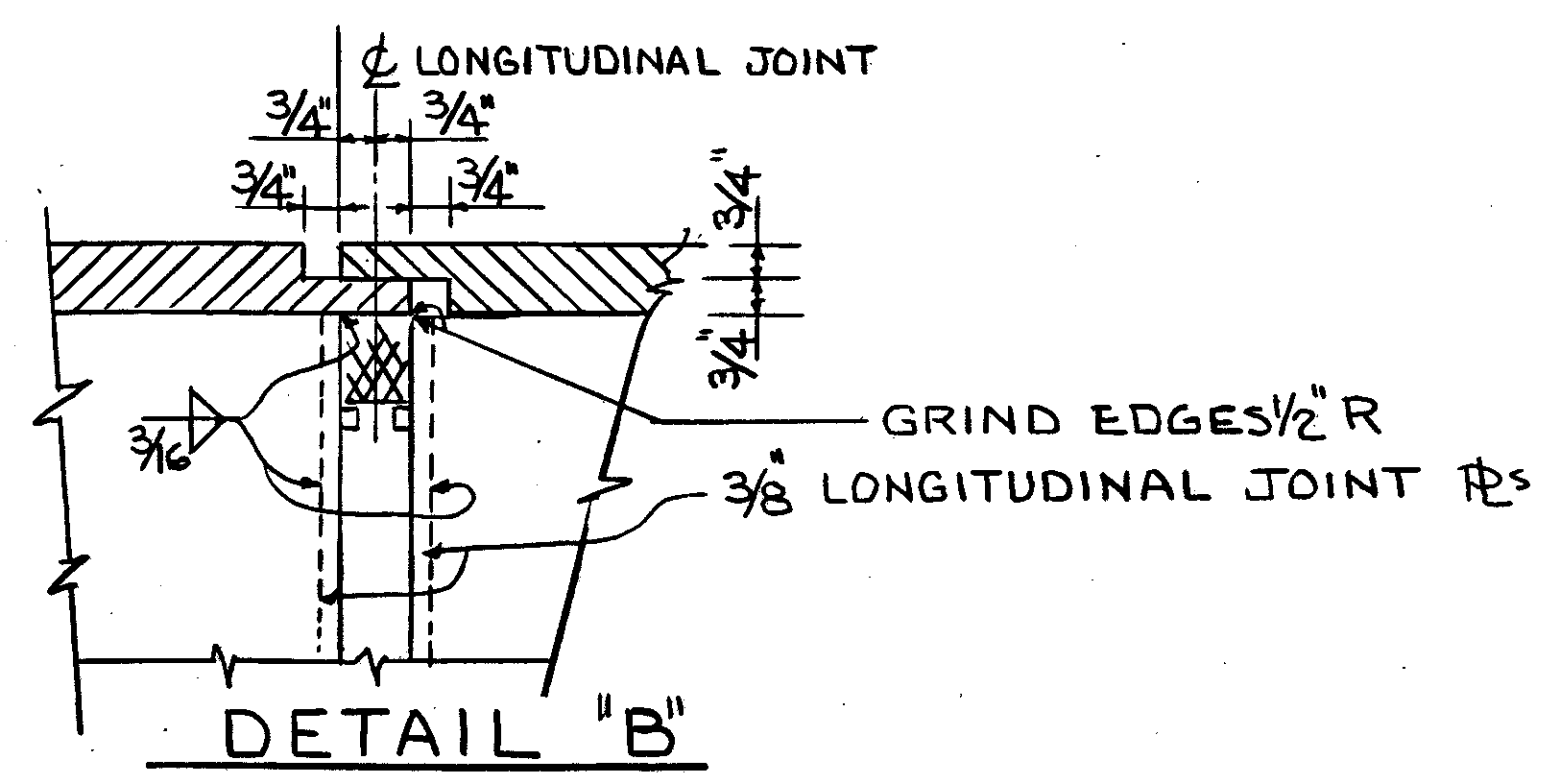
**SUPERSTRUCTURE
 ABUTMENTS
 EXPANSION JOINTS**

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| RLH | RLH | | CAP | | | 11/83 |



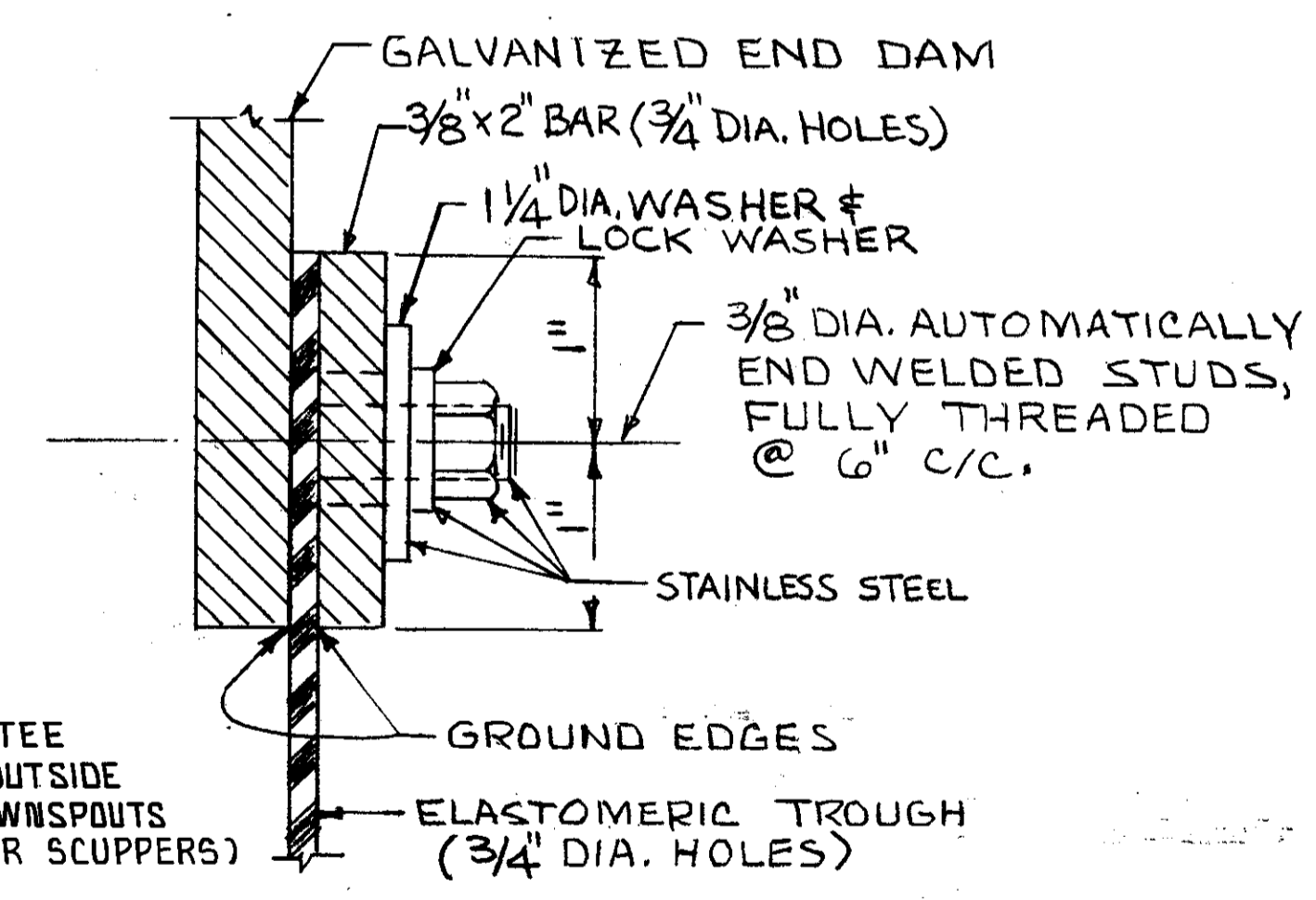
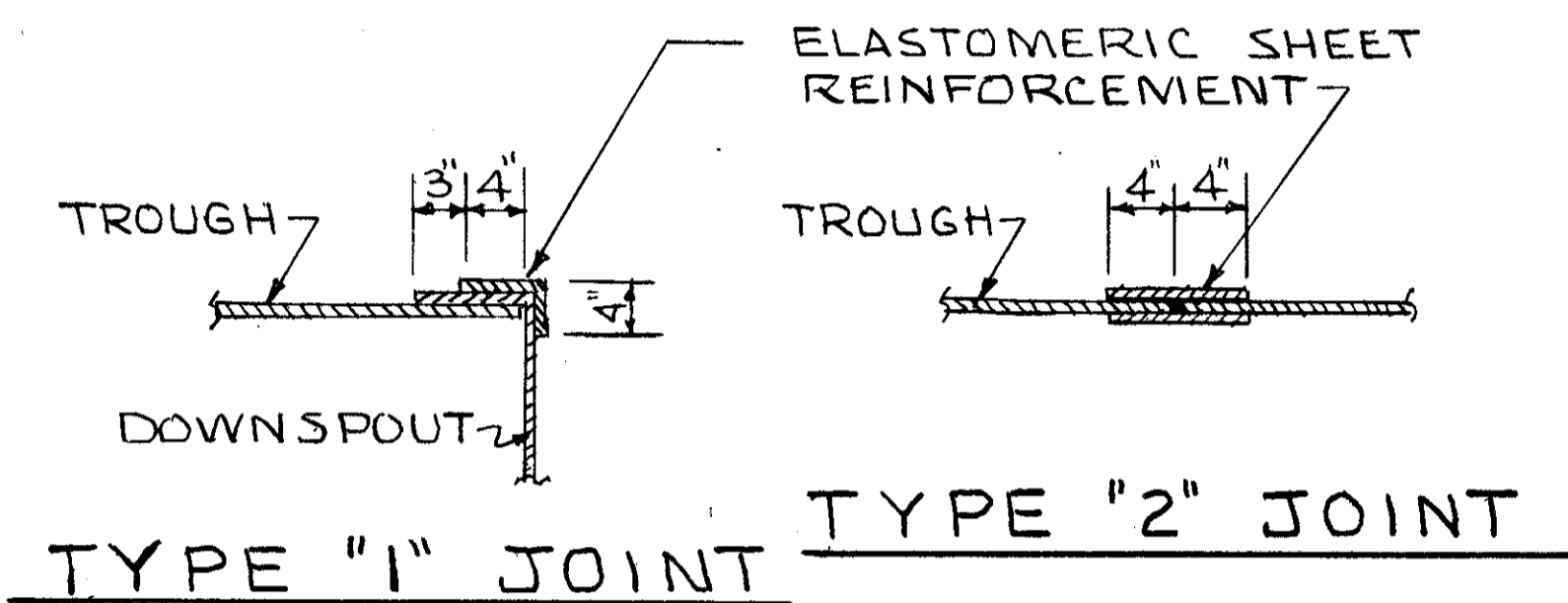
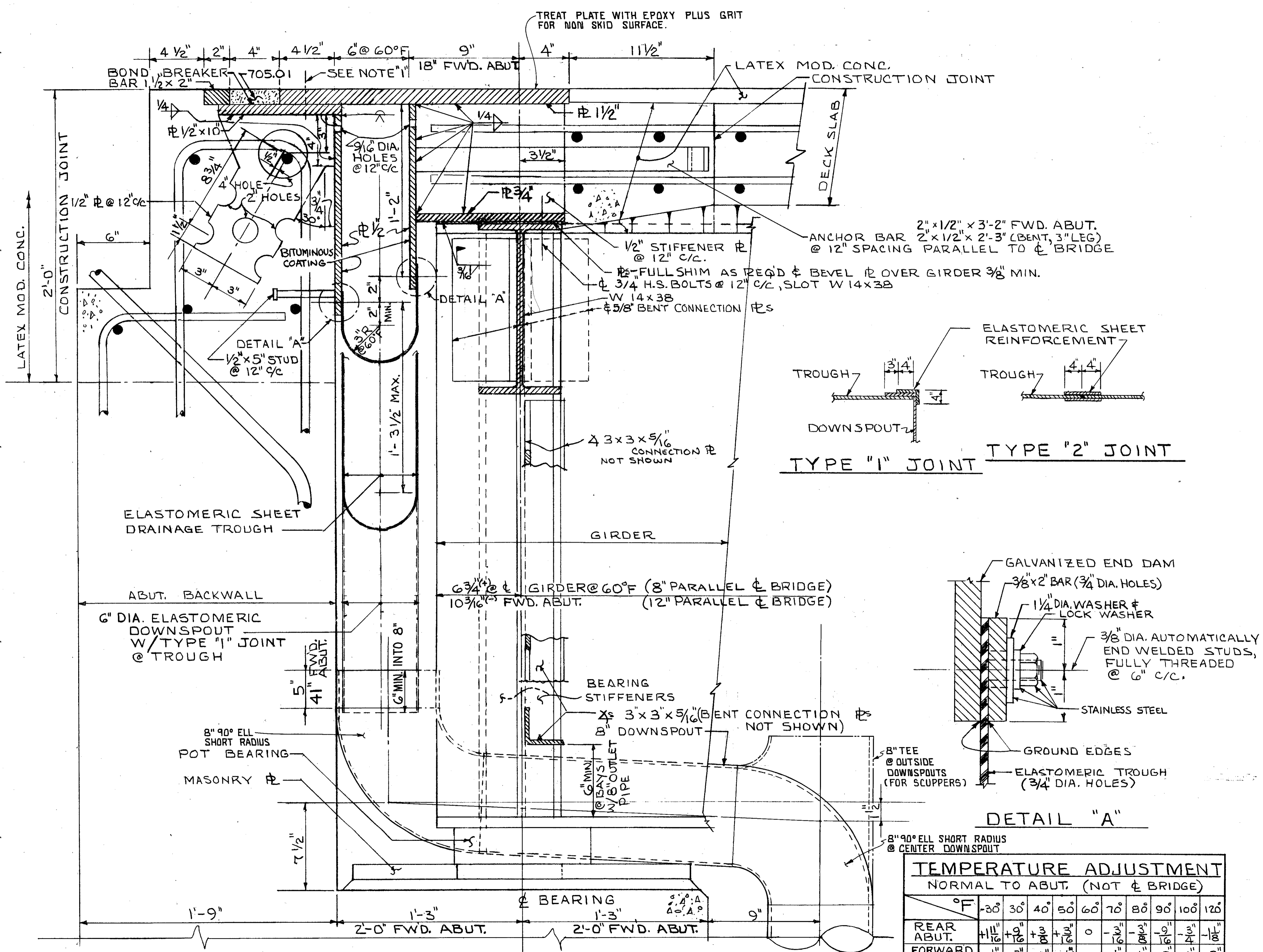
SECTION B-B 4/7/63
DRAWN FOR REAR ABUT. - FORWARD ABUT. SIMILAR



| | | | | |
|--|-------|--|---------|----------|
| WESTON DESIGNERS CONSULTANTS | | A Business Trust 3659 GREEN ROAD SUITE 215 CLEVELAND, OHIO 44122 | | 42/63 |
| SUPERSTRUCTURE ABUTMENTS EXPANSION JOINTS | | | | |
| BRIDGE NO. CUY-490-0152 I-490 UNDER RELOC. BROADWAY | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED |
| RLH | RLH | CAP | | 11/83 |

NOTES

- PROVIDE 2" X 5/8" BOLTS @ 2'-0" CENTERS WITH NUTS TACK-WELDED TO UNDER SIDE OF LOWER PLATE. CENTER 5/8" BOLTS IN 1/16" HOLES IN THE TOP PLATE. APPLY FLAKE GRAPHITE BETWEEN WASHERS AND PLATE. TURN BOLTS TIGHT AND RELEASE ON HALF TURN. REMOVE BOLTS AS SOON AS CONCRETE HAS SET, PREFERABLY WITHIN TWO HOURS AFTER PLACING. FILL HOLES WITH BITUMINOUS MATERIAL.
- ALL DIMENSIONS ARE MEASURED NORMAL TO THE ABUTMENT @ 60°F. FOR TEMPERATURES OTHER THAN 60°F SEE "TEMPERATURE ADJUSTMENT TABLE" ON THIS SHEET.
- THE CONTRACTOR SHALL COORDINATE PREPARATION OF SHOP DRAWINGS FOR, AND FABRICATION OF, THE ELASTOMERIC DRAINAGE TROUGH AND THE RELATED STRUCTURAL STEEL.
- SHOP DRAWINGS FOR THE ELASTOMERIC TROUGH SHALL BE PREPARED BY THE TROUGH FABRICATOR. THESE DRAWINGS, AFTER BEING COORDINATED WITH THE DRAWINGS OF THE STRUCTURAL STEEL FABRICATOR, SHALL BE SUBMITTED TO THE DIRECTOR FOR APPROVAL BEFORE THE START OF FABRICATION.
 ELASTOMERIC TROUGHS SHALL BE SHOP FABRICATED FROM ELASTOMERIC SHEETS USING VULCANIZED (WITH HEAT AND PRESSURES) JOINTS. HOLES SHALL BE BASED ON TEMPLATES FURNISHED BY THE STEEL FABRICATOR OR ON ACTUAL STUD LOCATIONS AS MEASURED IN THE FIELD. HOLES SHALL BE CLEANLY MADE PREFERABLY BY THE USE OF A CUTTING DIE.
 ELASTOMERIC SHEET SHALL BE DUPONT'S FAIRPRENE NN-0003, A 3/32 INCH THICK SHEET OF NYLON-REINFORCED NEOPRENE OR A SUITABLE ALTERNATE. THE ONE PLY MATERIAL SHALL CONFORM TO ASTM D751 AND THE FOLLOWING:
 THICKNESS0094 ± 0.01 IN.
 BREAKING STRENGTH, GRAB, W x F, MINIMUM700 x 700 LBS.
 ADHESION, 1" STRIP, 2" MIN., MINIMUM 9 LBS.
 BURSTING STRENGTH (MULLEN), MINIMUM 1400 P.S.I.
 HEAT AGING, 180° BEND WITHOUT CRACKING
 AFTER 70 HOURS AT 212°F
 LOW TEMPERATURE BRITTLENESS, ASTM D2136, PASS
 FLEX TEST AFTER 5 HOURS AT -40°F
- BITUMINOUS COATING SHALL CONFORM TO THE LATEST EDITION OF FEDERAL SPECIFICATION WW-P-405 B, COATING F, BRUSH OR TROWEL APPLIED. PRIOR TO ITS APPLICATION, SURFACES SHALL BE WIPED WITH A SUITABLE SOLVENT USING CLEAN DRY CLOTHS TO REMOVE CONTAMINANT TRACES. SURFACES SHALL BE DRY AND WARMER THAN 40°F DURING COATING APPLICATION. COATING THICKNESS SHALL BE NOT LESS THAN 1/16 OF AN INCH.
- STEEL PORTIONS OF END DAM INCLUDING TROUGH CLAMP BARS SHALL BE GALVANIZED. TROUGH FASTENING STUDS, NUTS AND WASHERS SHALL BE STAINLESS STEEL. PORTIONS, AS SHOWN, SHALL BE BITUMINOUS COATED.
- AFTER DECK CONCRETE HAS BEEN PLACED IN ADJACENT SPANS AND UP TO THE DECK CONSTRUCTION JOINT, ADJUST THE END DAM WITH RESPECT TO THE SUPPORTING STRINGERS AND ROADWAY SURFACE. THEN PLACE BACK WALL AND REMAINDER OF DECK CONCRETE AT THE EXPANSION JOINTS.
- CONCRETE SURFACE ADJACENT TO DECK PLATES SHALL BE FINISHED FLUSH WITH OR SLIGHTLY ABOVE THE STEEL JOINT SURFACE.
- PAYMENT IS AT THE LINEAL FOOT PRICE BID FOR "ITEM 516, STRUCTURAL STEEL EXPANSION JOINT, INCLUDING ELASTOMERIC DRAINAGE TROUGH, AS PER PLAN" TIMES THE PLAN LINEAL FEET OF JOINT.



TEMPERATURE ADJUSTMENT
 NORMAL TO ABUT. (NOT ¶ BRIDGE)

| °F | -30° | 30° | 40° | 50° | 60° | 70° | 80° | 90° | 100° | 120° |
|---------------|--------|-------|------|-------|-----|-------|------|-------|------|--------|
| REAR ABUT. | +11/16 | +9/16 | +3/8 | +3/16 | 0 | -3/16 | -3/8 | -9/16 | -3/4 | -18/16 |
| FORWARD ABUT. | +1/8 | +3/8 | +1/4 | +1/8 | 0 | -1/8 | -1/4 | -3/8 | -1/2 | -3/4 |

SECTION A-A
 DRAWN FOR REAR ABUT. - FORWARD ABUT. DIMENSIONS NOTED

WESTON A Business Trust
 3699 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

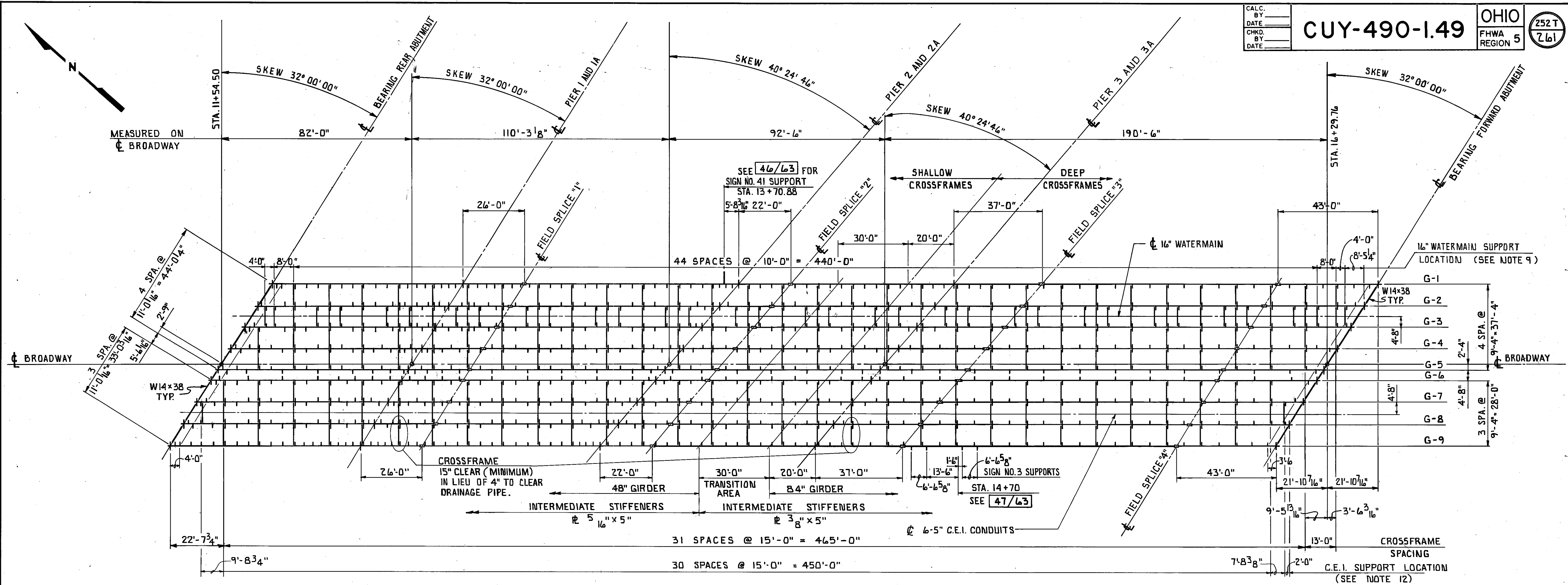
42 A / 63

SUPERSTRUCTURE ABUTMENTS EXPANSION JOINTS

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

DESIGNED DRAWN TRACED CHECKED REVIEWED DATE REVISED

RLH RLH CAP



FRAMING PLAN

NOTES:

1. CROSS FRAMES SHALL NOT BE PERMANENTLY FASTENED IN ANY SPAN UNTIL THE DECK SLAB, WALK, PARAPET AND WATERMAIN ARE COMPLETED; HOWEVER SUFFICIENT BRACING SHALL BE INSTALLED TO MEET THE REQUIREMENTS OF 501.06; ERECTION BOLTS SHALL BE USED. OTHER REQUIREMENTS ARE TO BE PER 513.22.
2. ALL STEEL SHALL BE PAINTED IN ACCORDANCE WITH ITEM 514, SYSTEM "A".
3. INTERMEDIATE STIFFENERS ON INTERIOR GIRDERS SHALL BE PLACED AS SHOWN ON THE PLAN EQUALLY SPACED BETWEEN CROSS FRAMES, WATERMAIN SUPPORTS AND BEARING STIFFENERS, UNLESS NOTED OTHERWISE.
4. INTERMEDIATE STIFFENERS ON OUTSIDE GIRDERS SHALL BE PLACED ON THE INSIDE FACE OF GIRDER WEB AND EQUALLY SPACED BETWEEN CROSS FRAMES AND BEARING STIFFENERS, UNLESS NOTED OTHERWISE.
- 4A. ADJUST LOCALLY LOCATION OF STIFFENERS AND CROSSFRAMES TO MISS FIELD SPLICES FROM LOCATIONS SHOWN ON THIS PLAN.
5. BEARING STIFFENERS AT ABUTMENTS AND PIERS SHALL BE PLACED IN PAIRS, ONE ON EACH SIDE OF ALL GIRDERS.
6. HIGH STRENGTH BOLTS SHALL BE ONE INCH DIAMETER UNLESS OTHERWISE NOTED.
7. WORK TOGETHER WITH **45/63**, **46/63** & **47/63**.
8. FOR FIELD SPLICE DETAILS SEE **49/63**.
9. WATERMAIN SUPPORTS AT CROSS FRAME LOCATIONS SHALL BE INTEGRAL WITH THE CROSS FRAME, ALL OTHER WATERMAIN SUPPORTS SHALL BE INDEPENDENT OF CROSS FRAMES.
10. FOR CROSSFRAME DETAILS SEE **45/63**.
11. FOR GIRDER DETAILS SEE **46/63** & **47/63**.
12. C.E.I. SUPPORTS AT CROSS FRAME LOCATION SHALL BE INTEGRAL WITH THE CROSS FRAME, ALL OTHER C.E.I. SUPPORTS SHALL BE INDEPENDENT OF CROSS FRAMES.

- LEGEND**
- |— INDICATES GIRDER SPLICE
 - |—|— INDICATES INTERMEDIATE OR BEARING STIFFENER

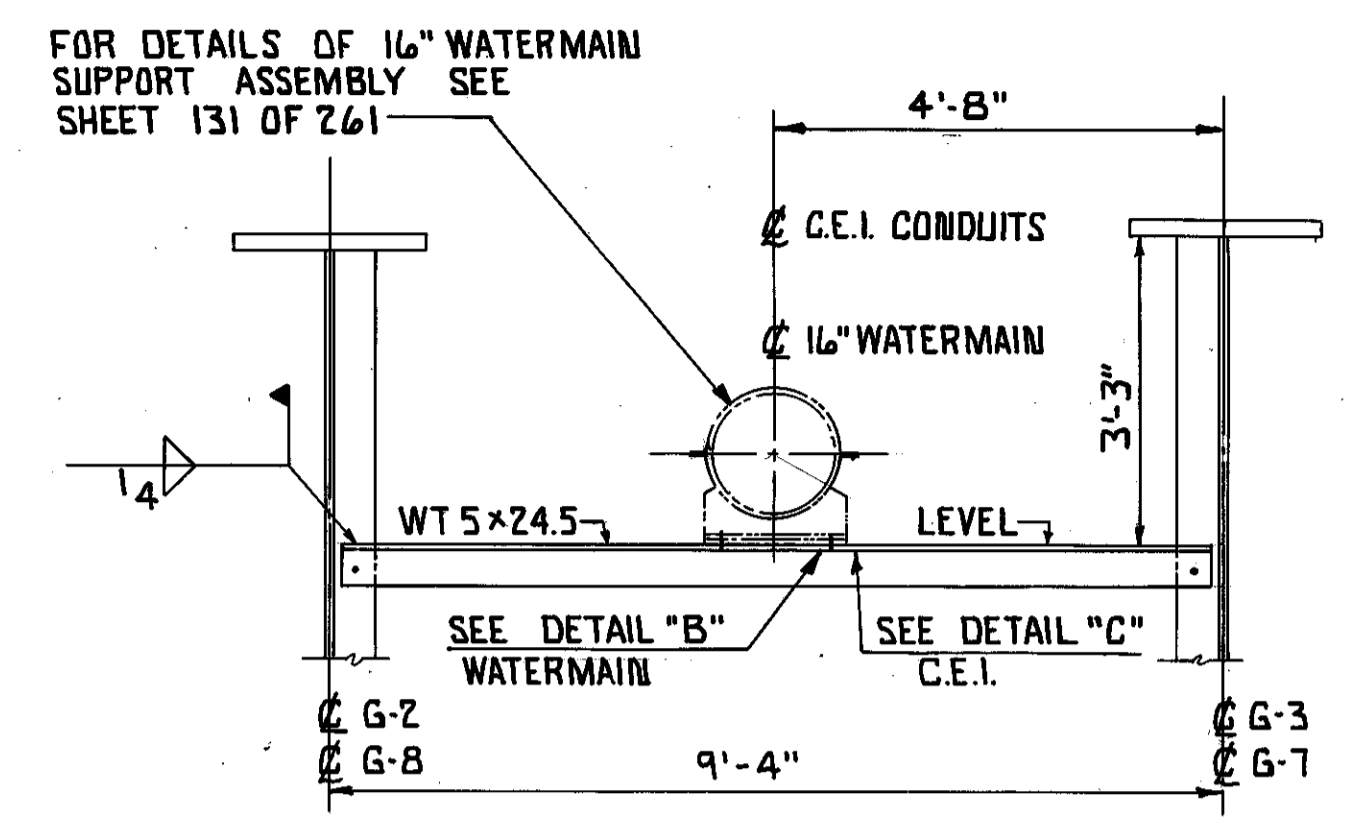
WESTON A Business Trust
 DESIGNERS CONSULTANTS
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

44/63

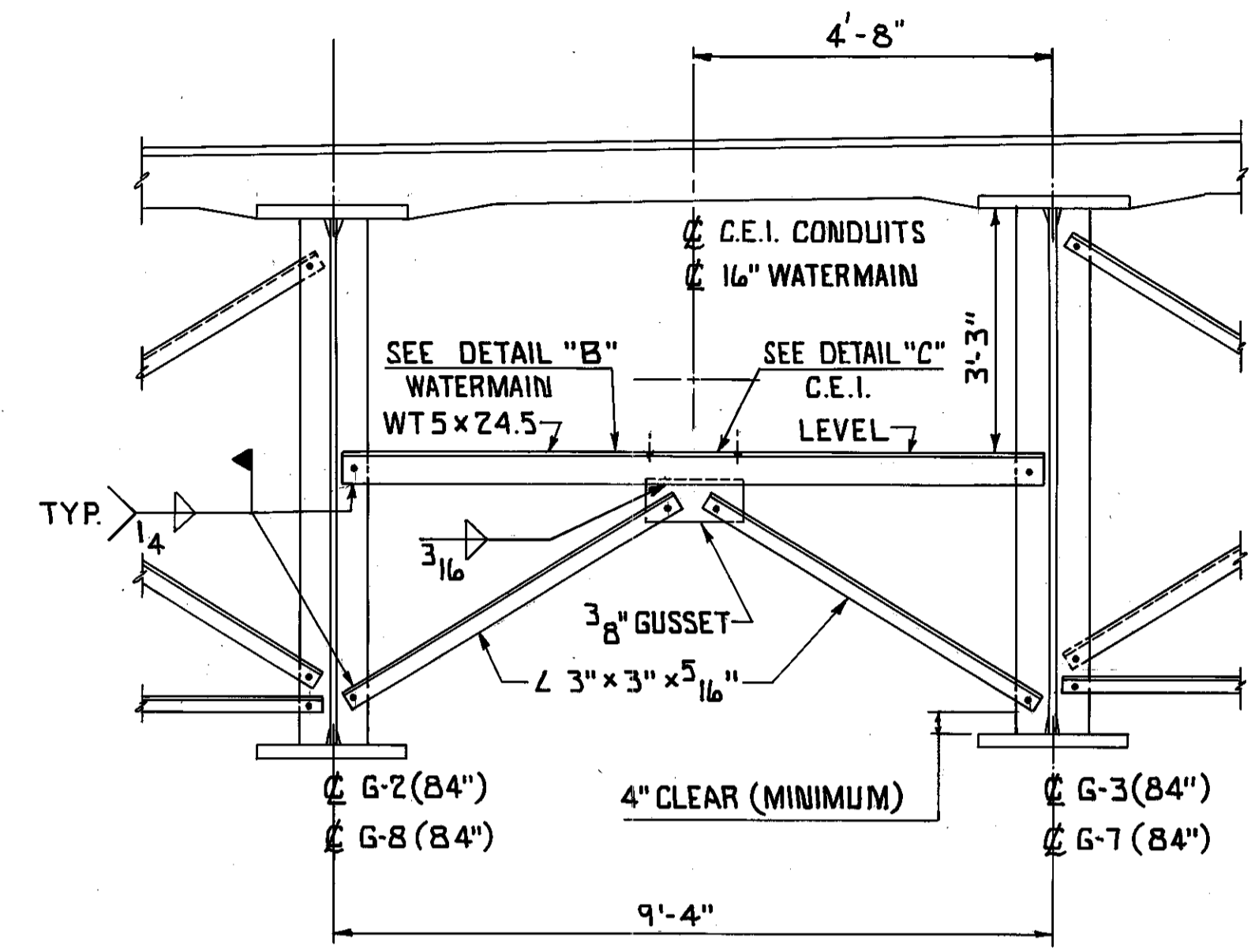
**SUPERSTRUCTURE
 STEEL FRAMING PLAN**

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| WHH | CAP | | DF | JRH | 2/83 | 10/83 |



TYPICAL WATERMAIN & C.E.I. SUPPORTS

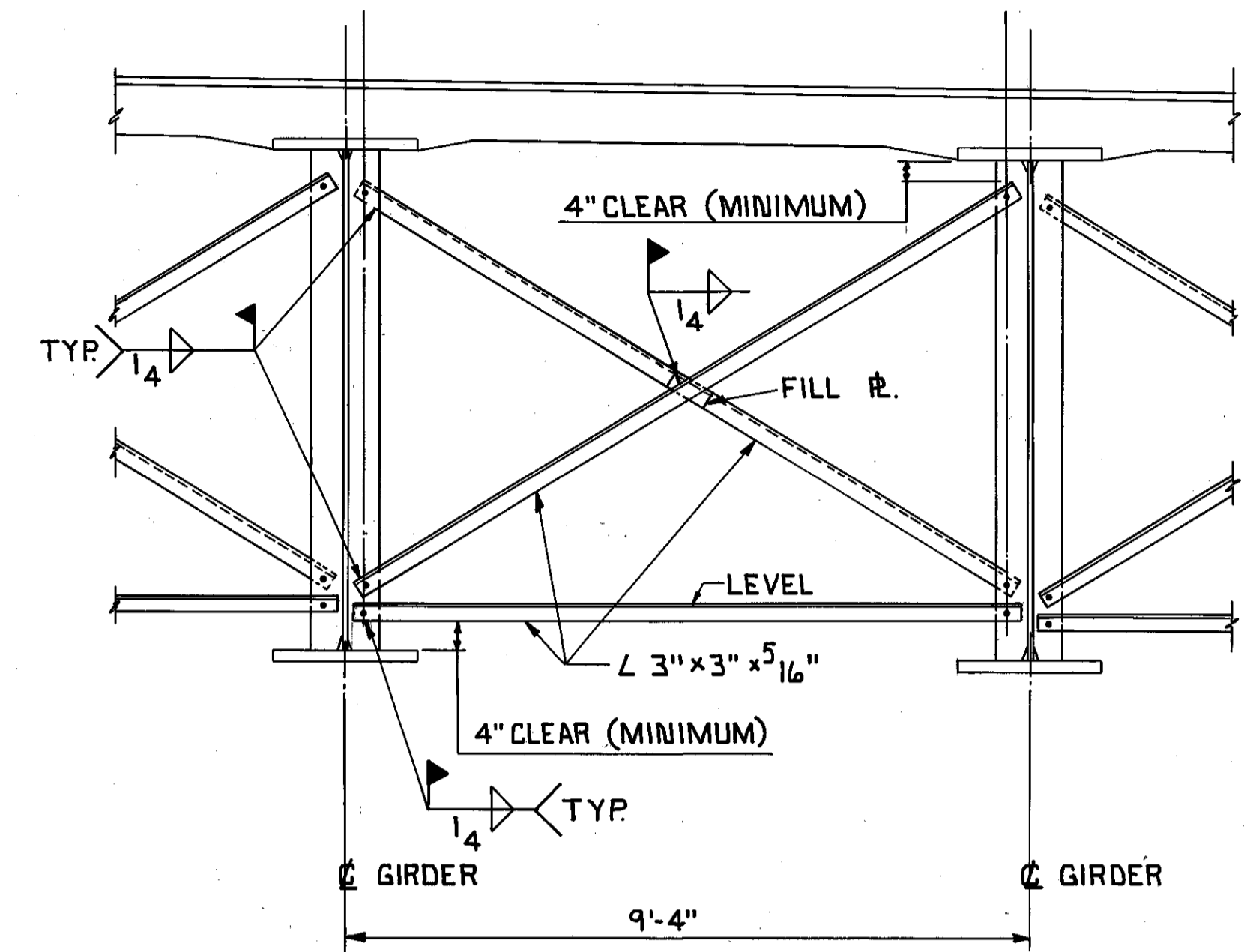


TYPICAL CROSSFRAMES @ WATERMAIN SUPPORTS

BETWEEN G-2 & G-3
(84" WEB R.)

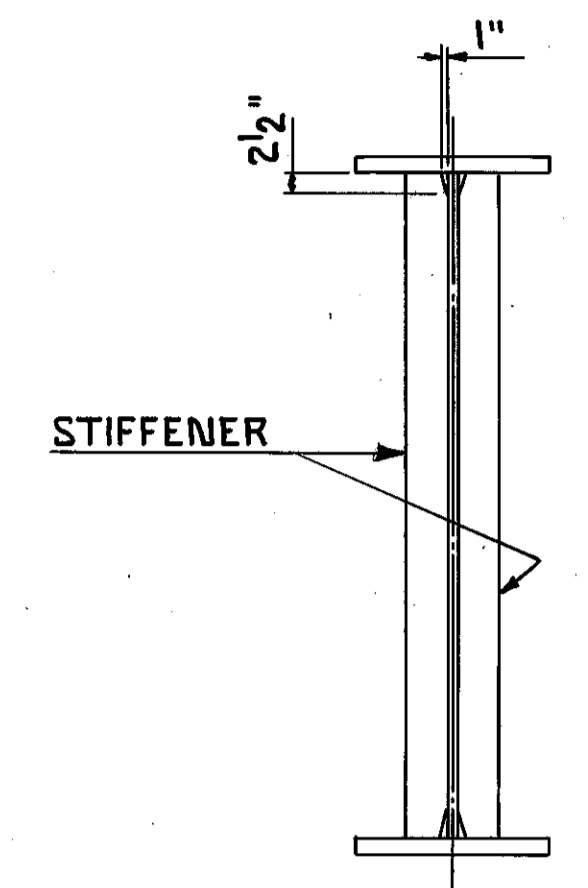
TYPICAL CROSSFRAMES @ C.E.I. SUPPORTS

BETWEEN G-7 & G-8
(84" WEB R.)



TYPICAL CROSSFRAMES

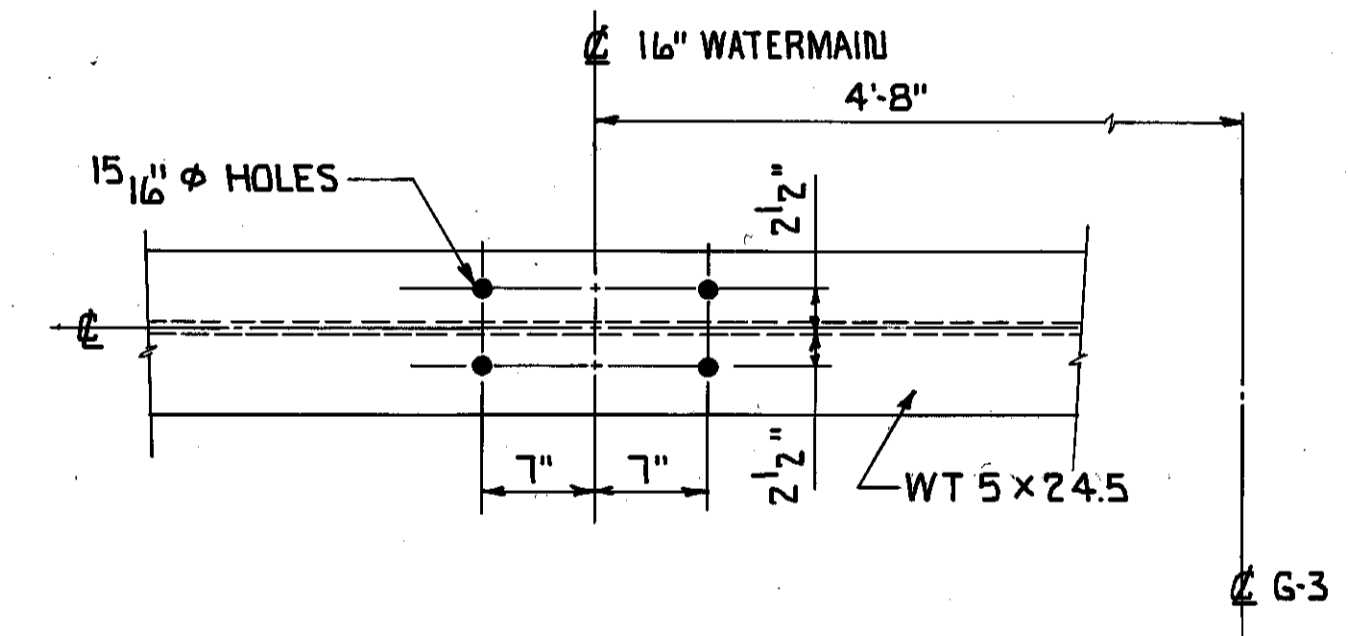
EXCEPT BETWEEN G-2 & G-3, G-7 & G-8



DETAIL "A"
TYPICAL NOTCH FOR ALL STIFFENERS

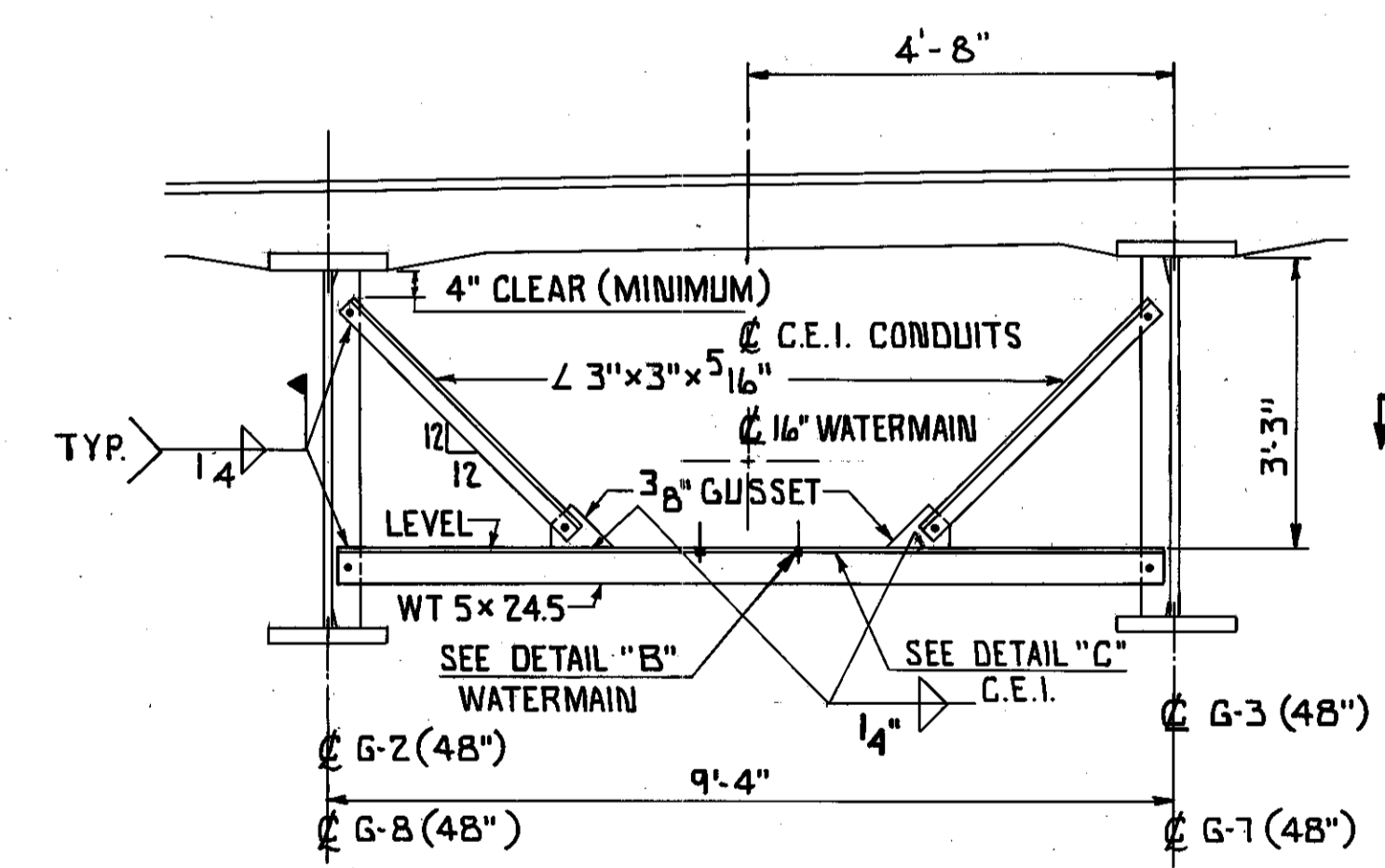
NOTES

1. ALL ERECTION BOLTS FOR CROSSFRAMES, END FRAMES AND WATERMAIN & C.E.I. SUPPORTS SHALL BE 5/8" HIGH STRENGTH BOLTS, UNLESS OTHERWISE NOTED.



DETAIL "B"

TYPICAL LOCATIONS FOR HOLES ON WATERMAIN SUPPORTS

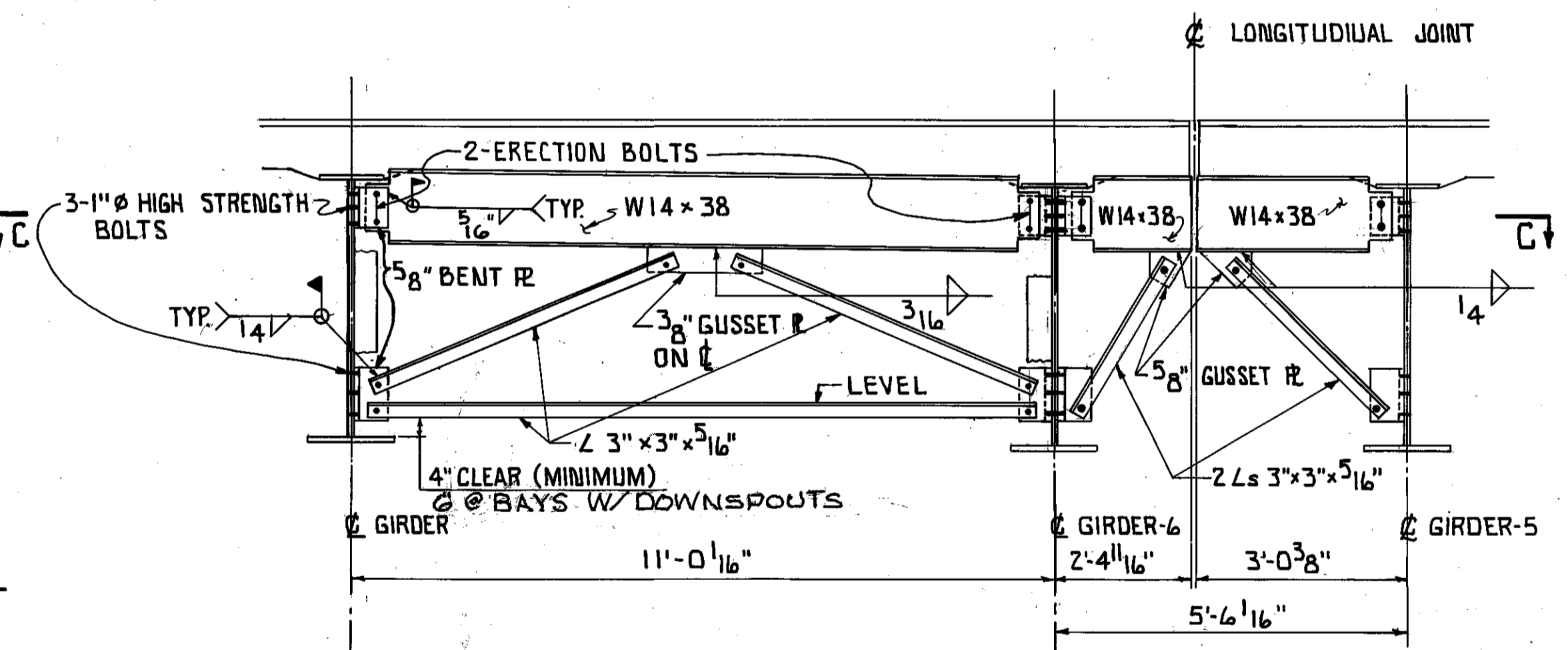


TYPICAL CROSSFRAMES @ WATERMAIN SUPPORTS

BETWEEN G-2 & G-3
(48" WEB R.)

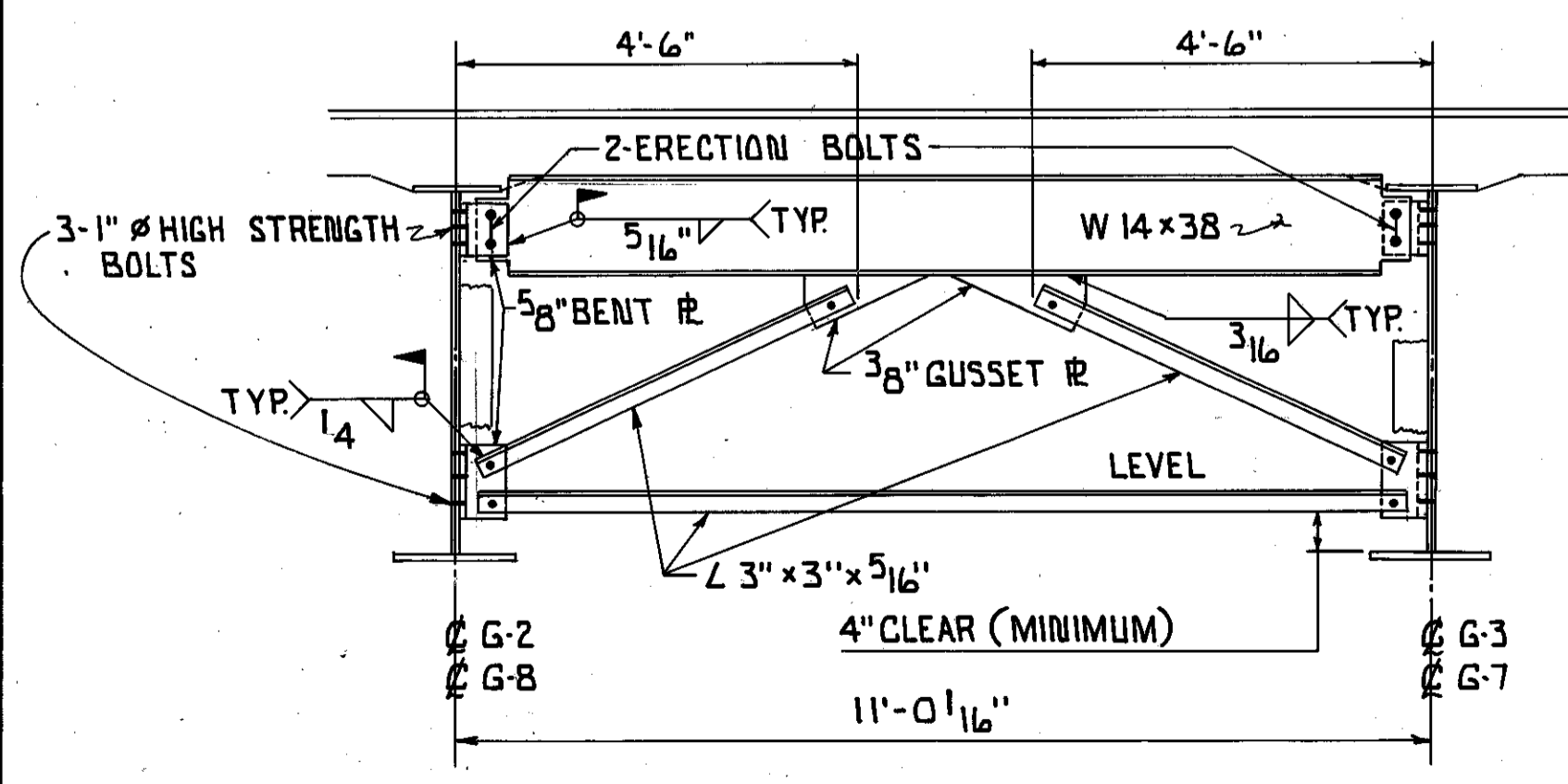
TYPICAL CROSSFRAMES @ C.E.I. SUPPORTS

BETWEEN G-7 & G-8
(48" WEB R.)



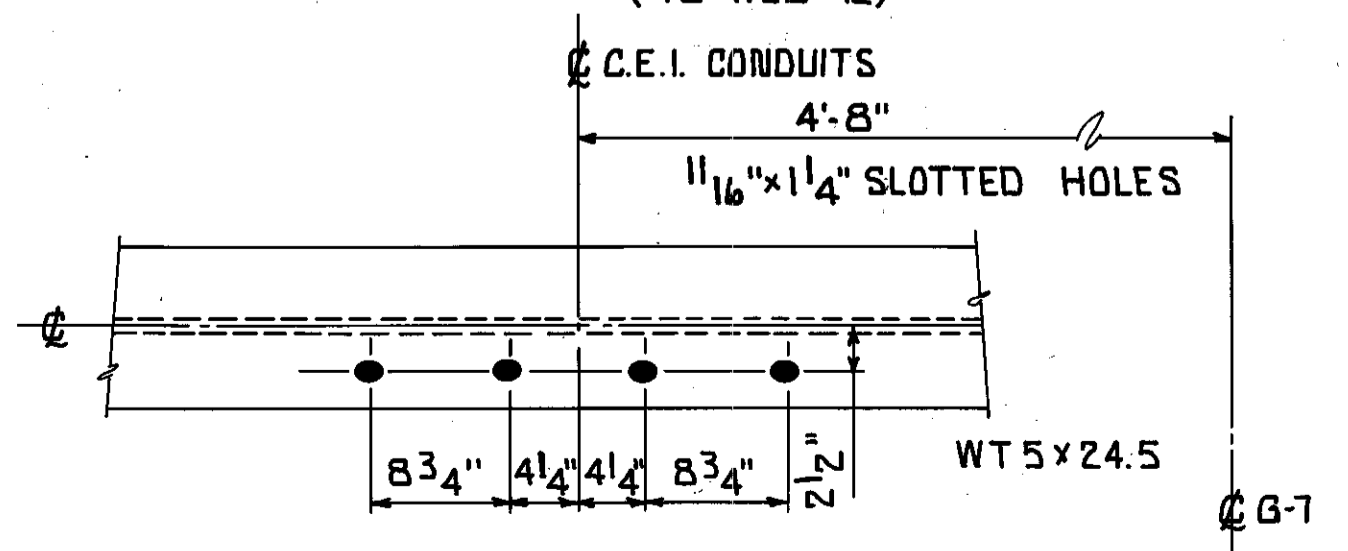
TYPICAL END FRAMES

EXCEPT BETWEEN
G-2 & G-3, G-7 & G-8



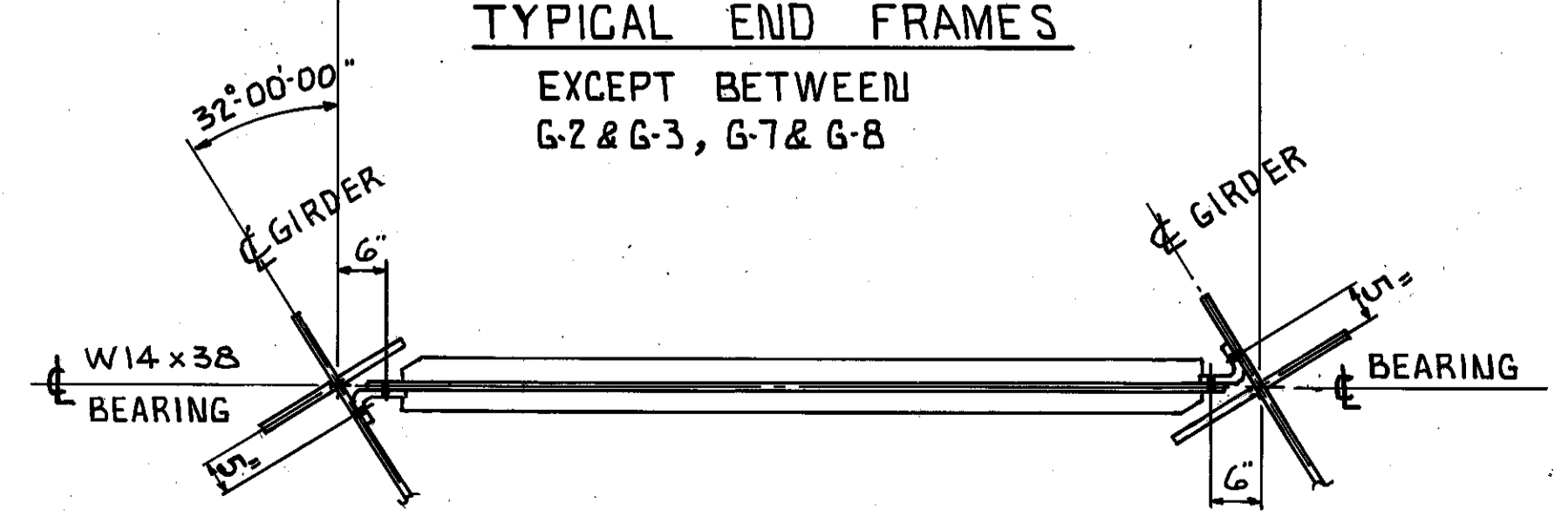
TYPICAL END FRAMES

BETWEEN G-2 & G-3, G-7 & G-8



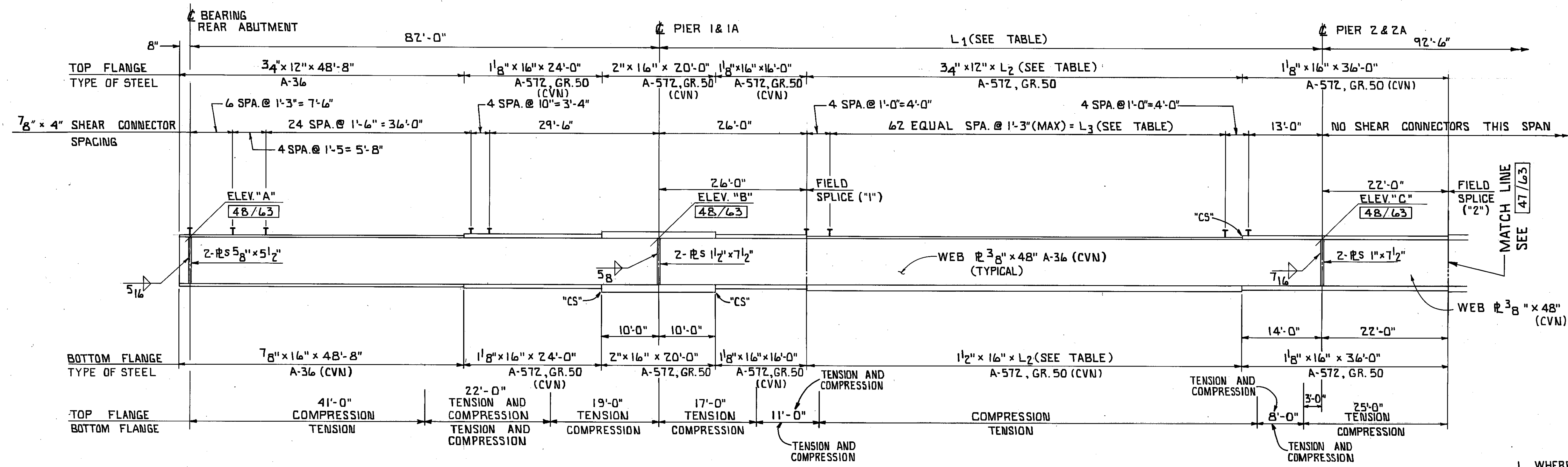
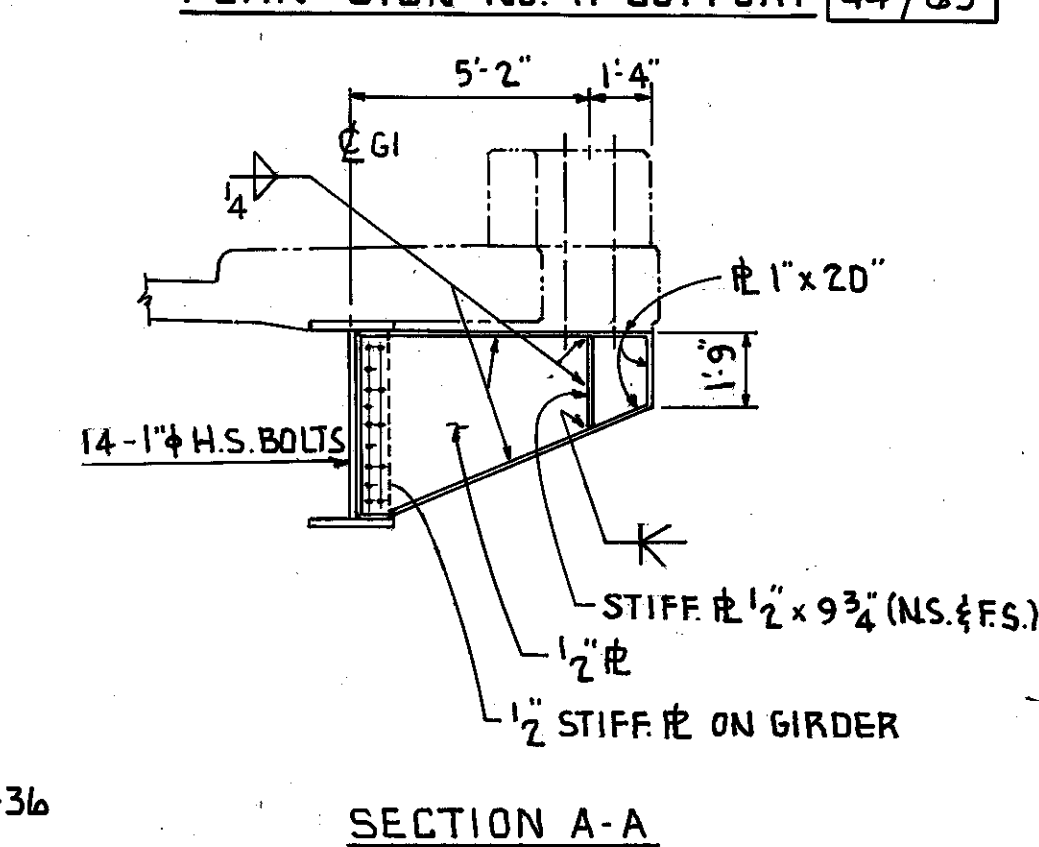
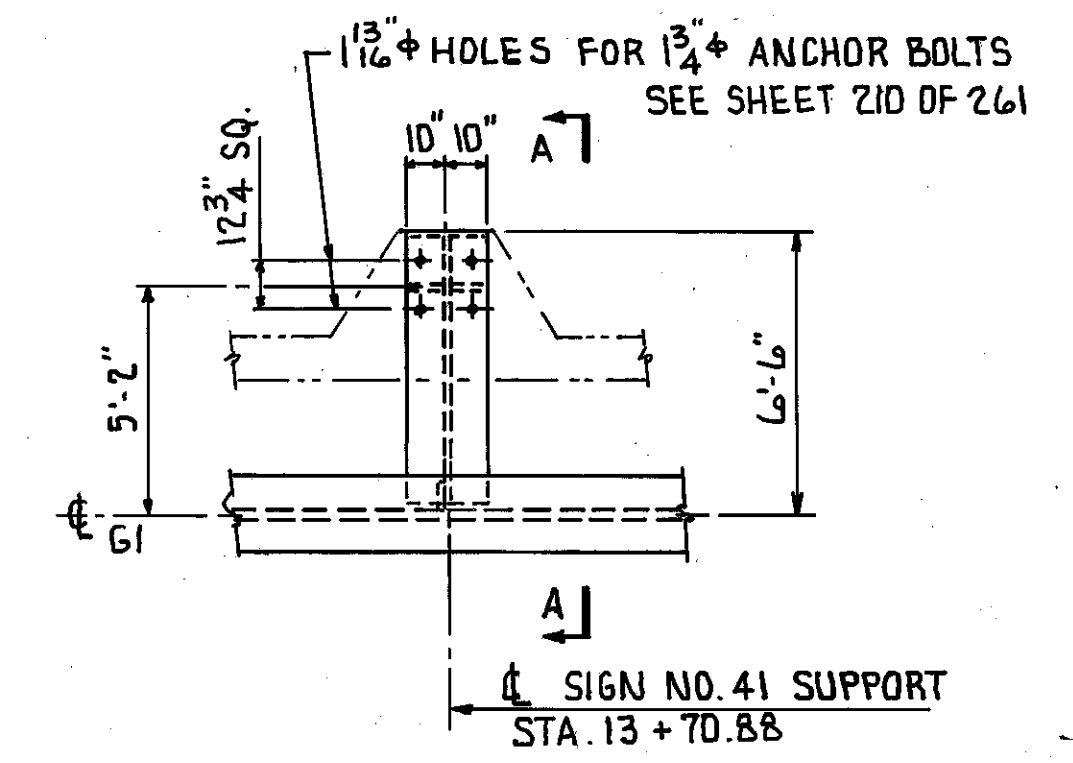
DETAIL "C"

TYPICAL LOCATIONS FOR HOLES ON C.E.I. SUPPORTS

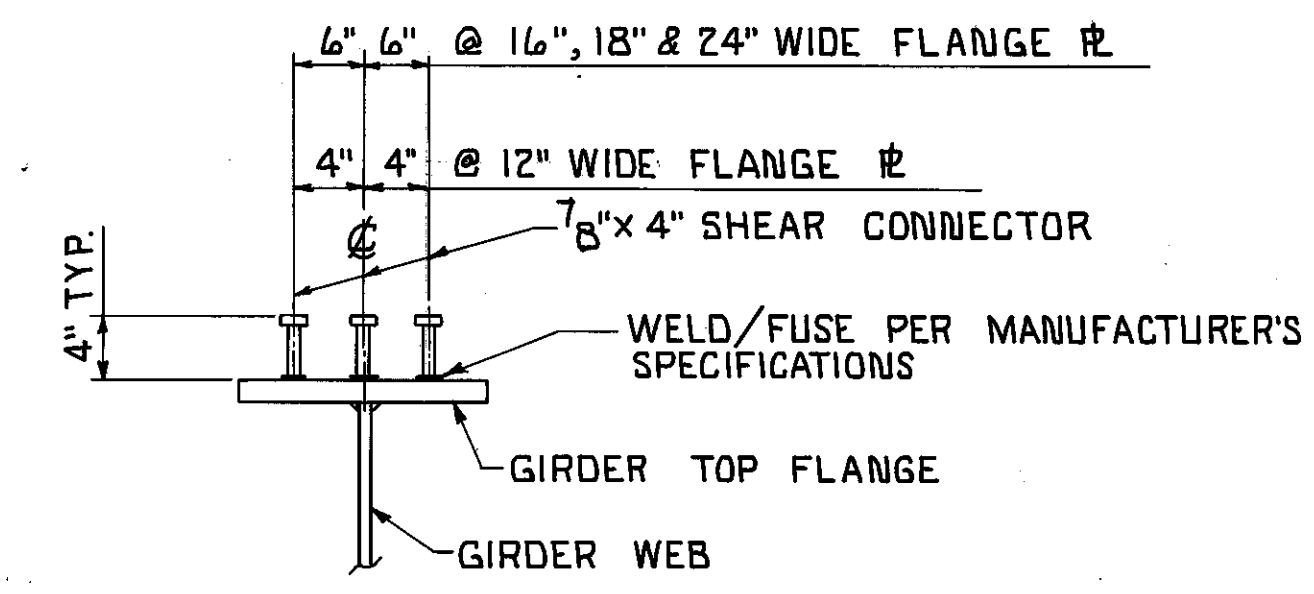


SECTION C-C

| | | | |
|--|-------|--|---------|
| WESTON A Business Trust DESIGNERS CONSULTANTS | | 3659 GREEN ROAD SUITE 215 CLEVELAND, OHIO 44122 | 45/63 |
| SUPERSTRUCTURE CROSSFRAME DETAILS AND PIPE SUPPORTS | | | |
| BRIDGE NO. CUY-490-0152 I-490 UNDER RELOC. BROADWAY | | | |
| DESIGNED | DRAWN | TRACED | CHECKED |
| DATE | DATE | DATE | DATE |
| WHH | CAP | DF | JRH |
| | | | 2/83 |
| | | | 10/83 |



- NOTES:**
- WHERE A SHAPE OR PLATE IS DESIGNATED "(CVN)", THE MATERIAL SHALL MEET SPECIFIED MINIMUM NOTCH TOUGHNESS REQUIREMENTS AS SPECIFIED IN T11.01.
 - SHOP SPLICES SHALL BE MADE WITH COMPLETE PENETRATION BUTT WELDS.
 - "CS"-INDICATES BUTT WELD SUBJECT TO COMPRESSIVE STRESSES ONLY.
 - FOR CAMBERS SEE 48/63.
 - FOR ADDITIONAL NOTES SEE 44/63.
 - FOR STEEL FRAMING PLAN SEE 44/63.
 - FOR CROSSFRAME DETAILS SEE 45/63.
 - FOR SPLICE DETAILS SEE 49/63.



TYPICAL SHEAR CONNECTOR TRANSVERSE SPACING

| GIRDER | G-1 | G-2 | G-3 | G-4 | G-5 | G-6 | G-7 | G-8 | G-9 |
|----------------|---------------------------------------|---------------------------------------|--|---------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|---------|
| L ₁ | 118'-2 ⁵ / ₁₆ " | 116'-0 ⁵ / ₁₆ " | 113'-11 ⁹ / ₁₆ " | 111'-10 ¹ / ₈ " | 109'-8 ³ / ₄ " | 108'-8 ¹ / ₈ " | 106'-6 ³ / ₄ " | 104'-5 ³ / ₈ " | 102'-4" |
| L ₂ | 78'-2 ⁵ / ₁₆ " | 76'-0 ⁵ / ₁₆ " | 73'-11 ⁹ / ₁₆ " | 71'-10 ¹ / ₈ " | 69'-8 ³ / ₄ " | 68'-8 ¹ / ₈ " | 66'-6 ³ / ₄ " | 64'-5 ³ / ₈ " | 62'-4" |
| L ₃ | 71'-2 ⁵ / ₁₆ " | 69'-0 ⁵ / ₁₆ " | 66'-11 ⁹ / ₁₆ " | 64'-10 ¹ / ₈ " | 62'-8 ³ / ₄ " | 61'-8 ¹ / ₈ " | 59'-6 ³ / ₄ " | 57'-5 ³ / ₈ " | 55'-4" |

| MATERIAL THICKNESS OF THICKER PART JOINED | MINIMUM SIZE OF FILLET WELD |
|---|-----------------------------|
| TO 1/2" INCLUSIVE | 3/16" |
| OVER 1/2" TO 3/4" | 1/4" |
| OVER 3/4" TO 1 1/2" | 5/16" |
| OVER 1 1/2" TO 2 1/4" | 3/8" |

THE MINIMUM SIZE SEAL WELD SHALL BE 3/16" FILLET WELD.

WESTON A Business Trust
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

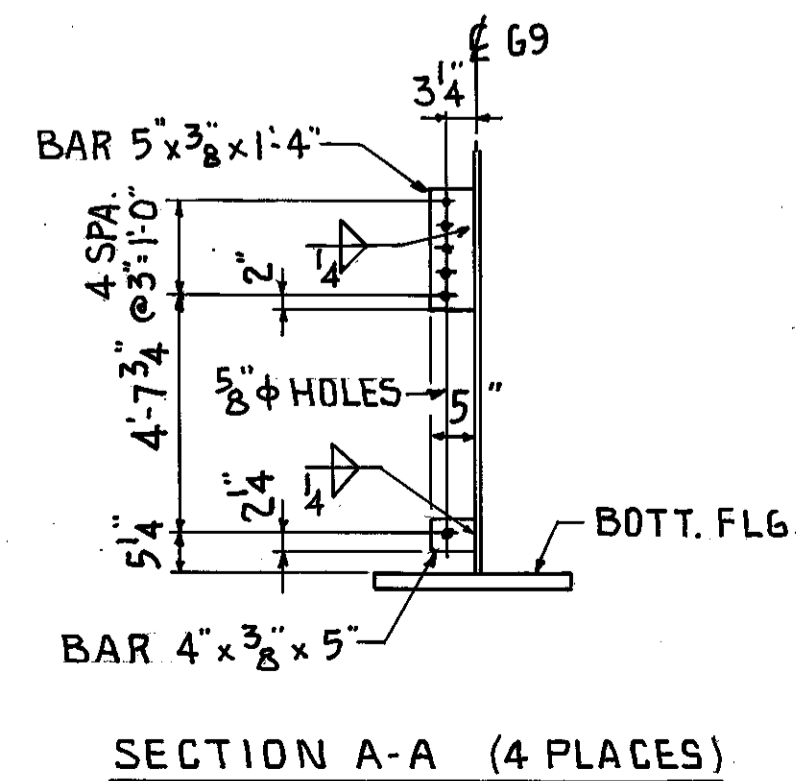
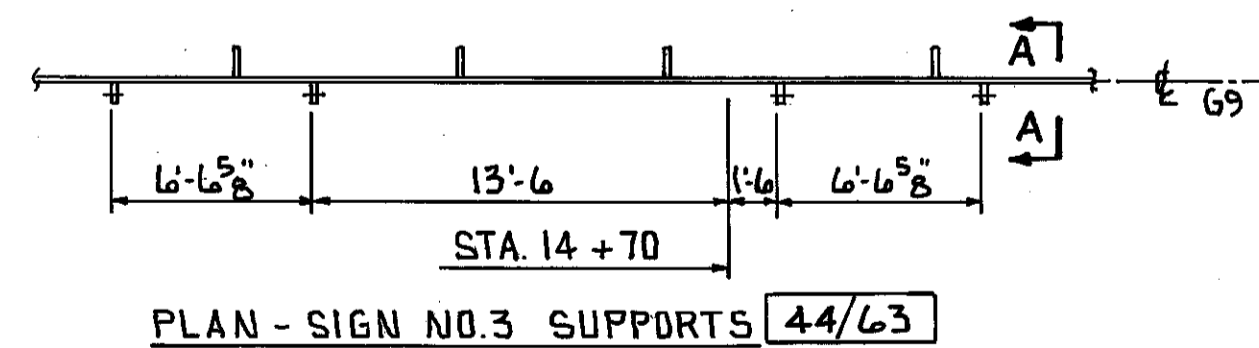
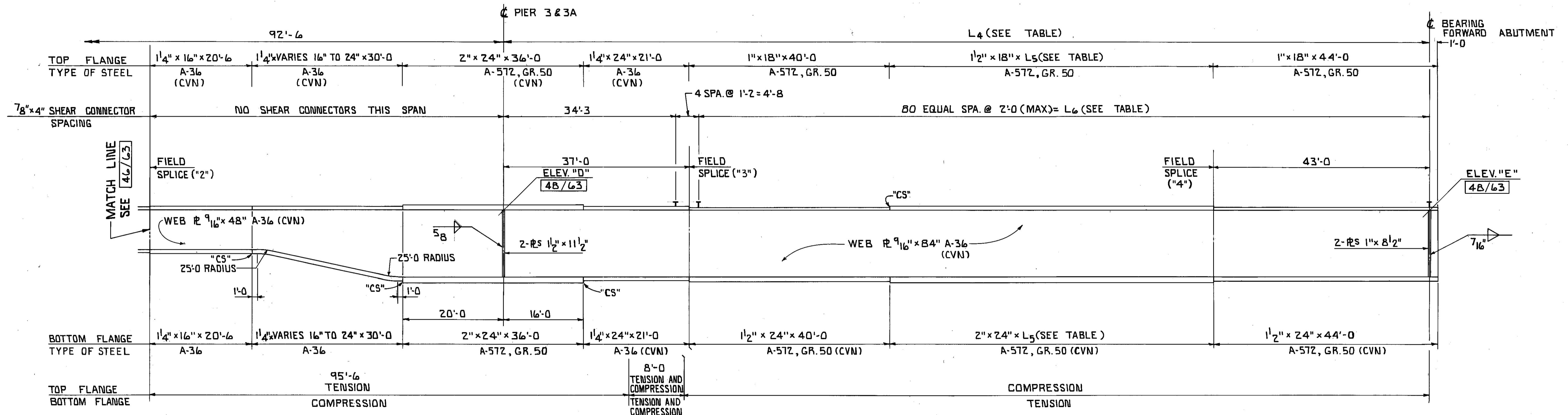
SUPERSTRUCTURE GIRDERS 1 THRU 9 ELEVATION
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED
 WHH | CAP | DF | JRH | 2/83 | 10/83

CALC. BY _____
 DATE _____
 CHKD. BY _____
 DATE _____

CUY-490-1.49

OHIO
 FHWA REGION 5
 252 W
 761



| GIRDER | G-1 | G-2 | G-3 | G-4 | G-5 | G-6 | G-7 | G-8 | G-9 |
|--------|---------------|--------------|---------------|----------|-------------|---------|-------------|-------------|-------------|
| L-4 | 182'-6 13/16" | 184'-8 3/16" | 186'-9 9/16" | 188'-11" | 191'-0 3/8" | 192'-1" | 194'-2 3/8" | 196'-3 3/4" | 198'-5 1/8" |
| L-5 | 62'-6 13/16" | 64'-8 3/16" | 66'-9 9/16" | 68'-11" | 71'-0 3/8" | 72'-1" | 74'-2 3/8" | 76'-3 3/4" | 78'-5 1/8" |
| L-6 | 143'-7 13/16" | 145'-9 3/16" | 147'-10 9/16" | 150'-0" | 152'-1 3/8" | 153'-2" | 155'-3 3/8" | 157'-4 3/4" | 159'-6 1/8" |

NOTES:
 FOR ADDITIONAL NOTES AND DETAILS
 SEE 44/63 AND 46/63.

WESTON A Business Trust
 DESIGNERS CONSULTANTS
 3569 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

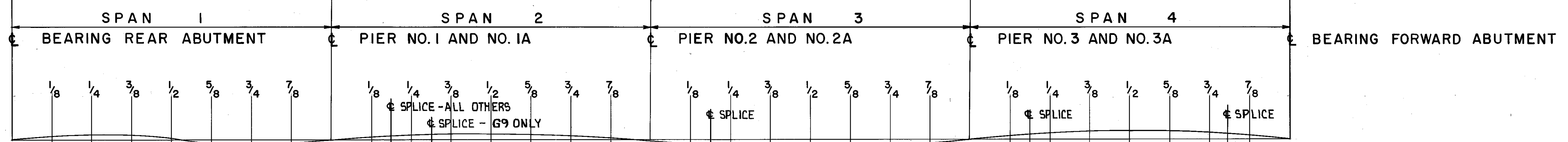
47/63

**SUPERSTRUCTURE
 GIRDERS 1 THRU 9
 ELEVATION**

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| WHH | CAP | | DF | JRH | 2/83 | 10/83 |

| GIRDER NO. | EL."A" | SPAN DIMENSION | EL."B" | SPAN DIMENSION | EL."C" | SPAN DIMENSION | EL."D" | SPAN DIMENSION | EL."E" |
|------------|--------|----------------|--------|--|--------|----------------|--------|--|--------|
| G 1 | 674.51 | 82' - 0" | 674.78 | 118' - 2 ⁵ / ₁₆ " | 675.15 | 92' - 6" | 675.45 | 182' - 6 ¹³ / ₁₆ " | 676.04 |
| G 2 | 674.60 | 82' - 0" | 674.86 | 116' - 0 ¹⁵ / ₁₆ " | 675.23 | 92' - 6" | 675.53 | 184' - 8 ³ / ₁₆ " | 676.12 |
| G 3 | 674.73 | 82' - 0" | 674.99 | 113' - 11 ⁹ / ₁₆ " | 675.35 | 92' - 6" | 675.65 | 186' - 9 ⁹ / ₁₆ " | 676.25 |
| G 4 | 674.85 | 82' - 0" | 675.11 | 111' - 10 ¹ / ₈ " | 675.47 | 92' - 6" | 675.76 | 188' - 11" | 676.37 |
| G 5 | 674.98 | 82' - 0" | 675.24 | 109' - 8 ³ / ₄ " | 675.59 | 92' - 6" | 675.89 | 191' - 0 ³ / ₈ " | 676.50 |
| G 6 | 674.98 | 82' - 0" | 675.24 | 108' - 8 ¹ / ₈ " | 675.58 | 92' - 6" | 675.89 | 192' - 1" | 676.50 |
| G 7 | 674.81 | 82' - 0" | 675.07 | 106' - 6 ³ / ₄ " | 675.41 | 92' - 6" | 675.71 | 194' - 2 ³ / ₈ " | 676.33 |
| G 8 | 674.65 | 82' - 0" | 674.92 | 104' - 5 ³ / ₈ " | 675.25 | 92' - 6" | 675.55 | 196' - 3 ³ / ₄ " | 676.17 |
| G 9 | 674.53 | 82' - 0" | 674.80 | 102' - 4" | 675.12 | 92' - 6" | 675.42 | 198' - 5 ¹ / ₈ " | 676.06 |



| GIRDER | TYPE | SPAN 1 | | | | | | | SPAN 2 | | | | | | | SPAN 3 | | | | | | | SPAN 4 | | | | | | | | | | |
|--------|------|--------|------|------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|------|--------|-------|-------|-------|-------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 0 | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 | | | |
| G 1 | 1* | 0 | 0 | 0 | -3/32 | -1/16 | -1/16 | -1/16 | 1/8 | 9/32 | 9/32 | 7/16 | 17/32 | 1/2 | 3/8 | 3/16 | -1/8 | -1/4 | -1/4 | -5/16 | -11/32 | -5/16 | -1/4 | -5/32 | 3/8 | 21/32 | 13/16 | 13/16 | 13/16 | 11/32 | 1/16 | 19/32 | |
| | 2* | 3/16 | 5/16 | 5/16 | 3/16 | 0 | 5/32 | 3/16 | 19/32 | 17/32 | 17/16 | 27/32 | 25/8 | 27/32 | 17/8 | 15/16 | 17/32 | 27/32 | 7/8 | -1/16 | -13/32 | -1 | 25/32 | 7/16 | 13/16 | 21/32 | 29/16 | 33/4 | 49/32 | 4/8 | 39/32 | 3/8 | 17/32 |
| | 3* | 3/16 | 5/16 | 5/16 | 1/8 | -1/16 | -1/4 | -1/4 | 11/16 | 11/16 | 11/16 | 21/16 | 33/16 | 3 | 21/4 | 11/8 | 11/16 | 11/16 | 11/16 | 11/16 | -13/16 | -17/16 | -15/16 | -1 | -9/16 | 19/16 | 21/16 | 33/8 | 45/16 | 51/16 | 57/16 | 43/8 | 4/8 |

CAMBER DIAGRAM

NOTES:
 1. FOR GIRDERS SEE 46/63 & 47/63.
 2. ELEVATION "A, B, C, D, AND E" ARE TO THE TOP OF GIRDER WEB.

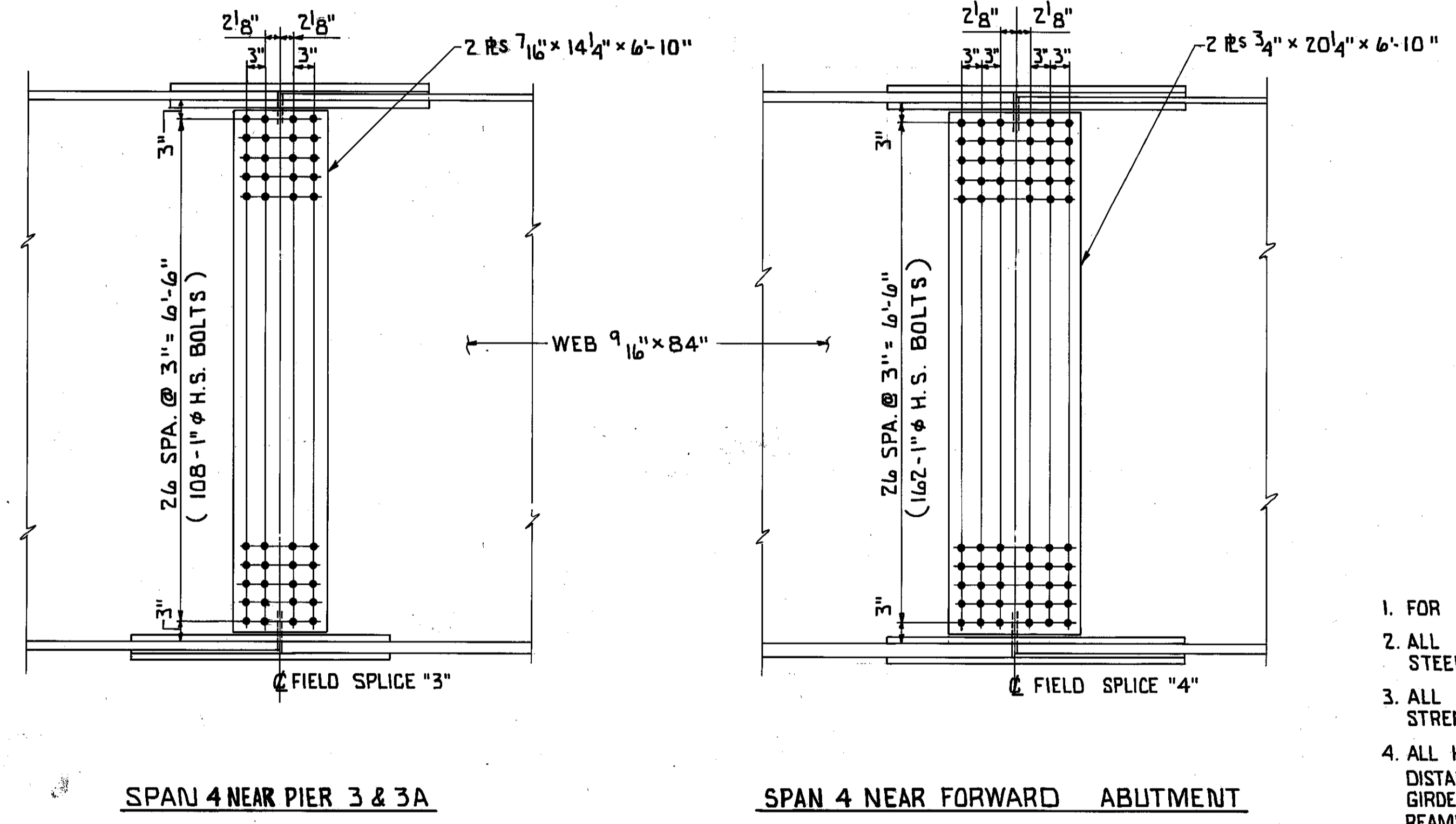
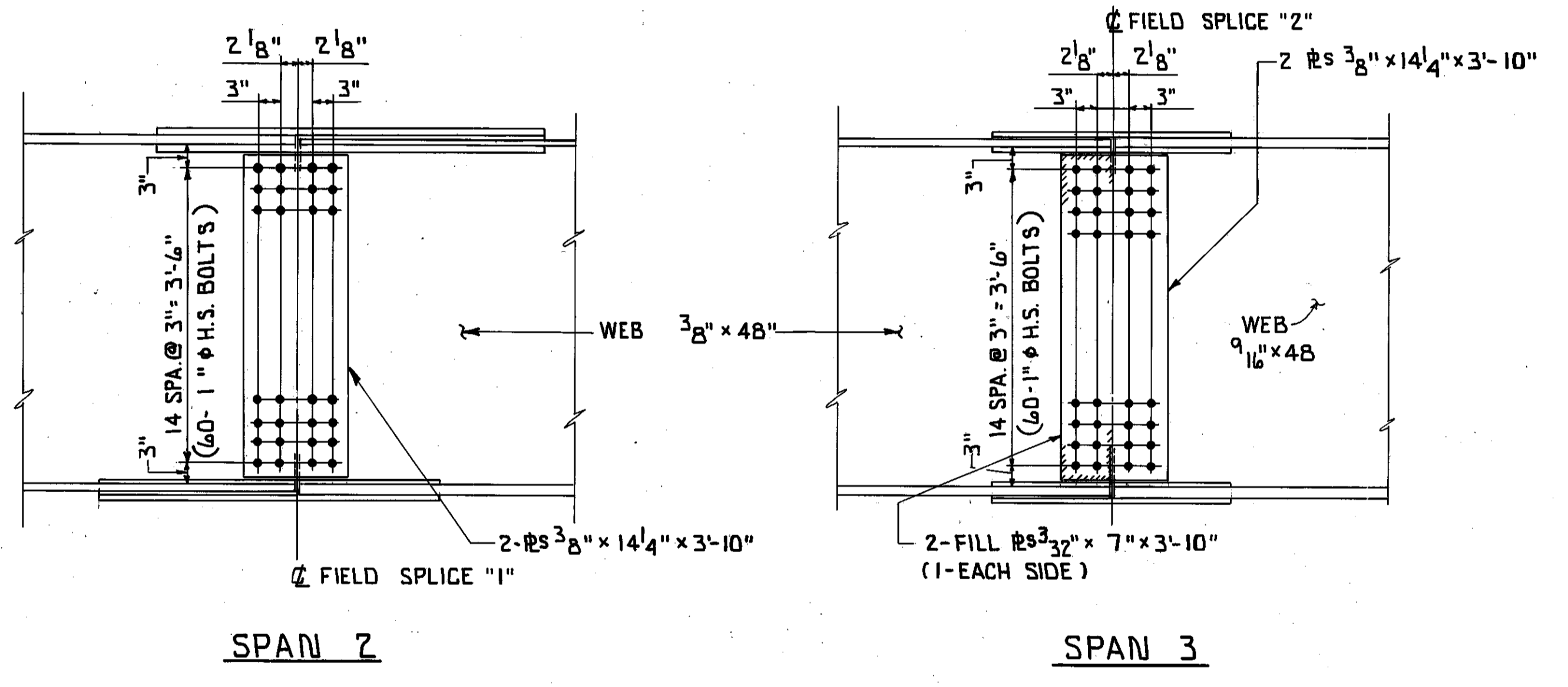
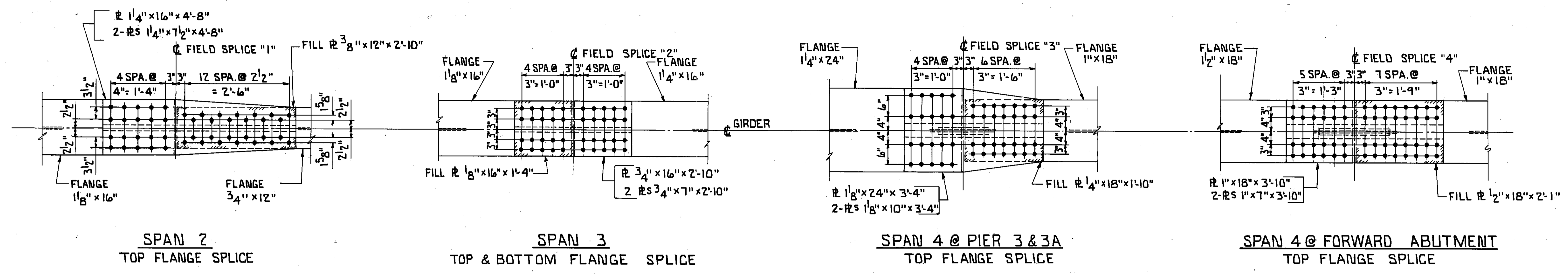
48/63

WESTON A Business Trust
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 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

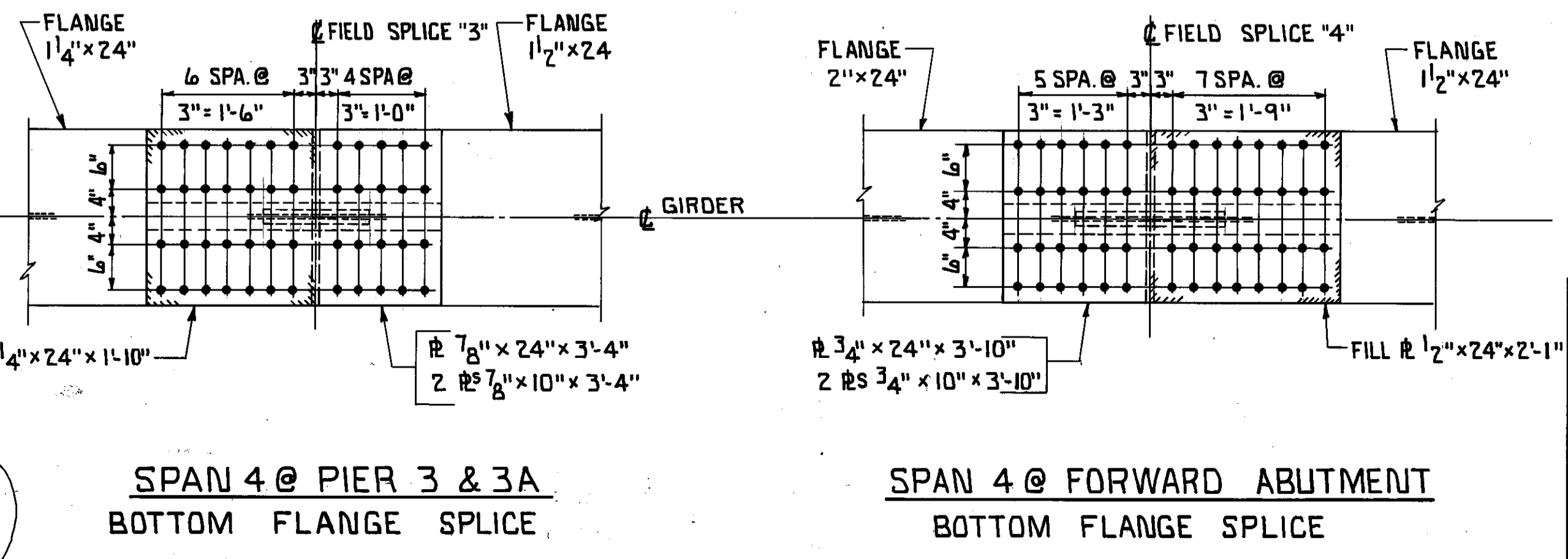
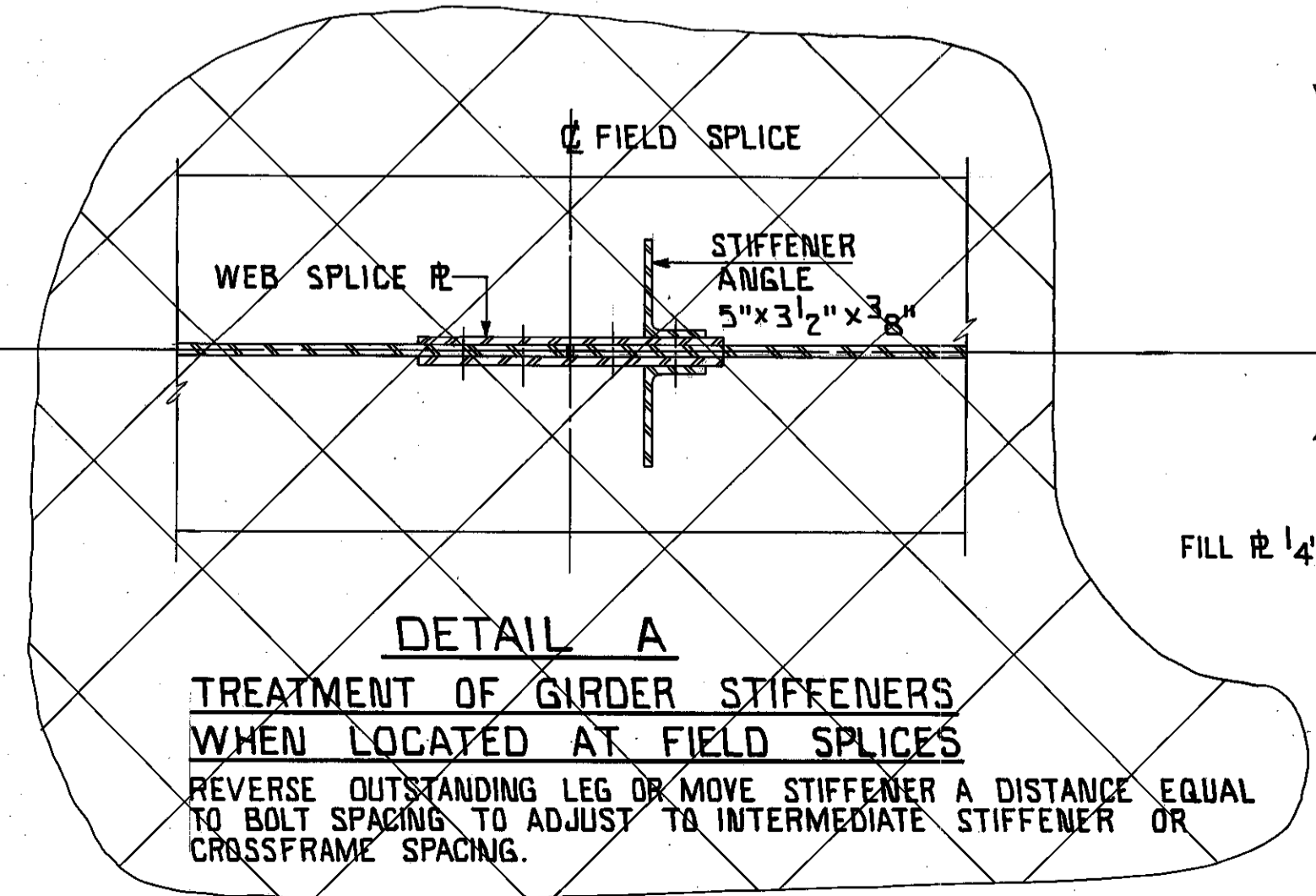
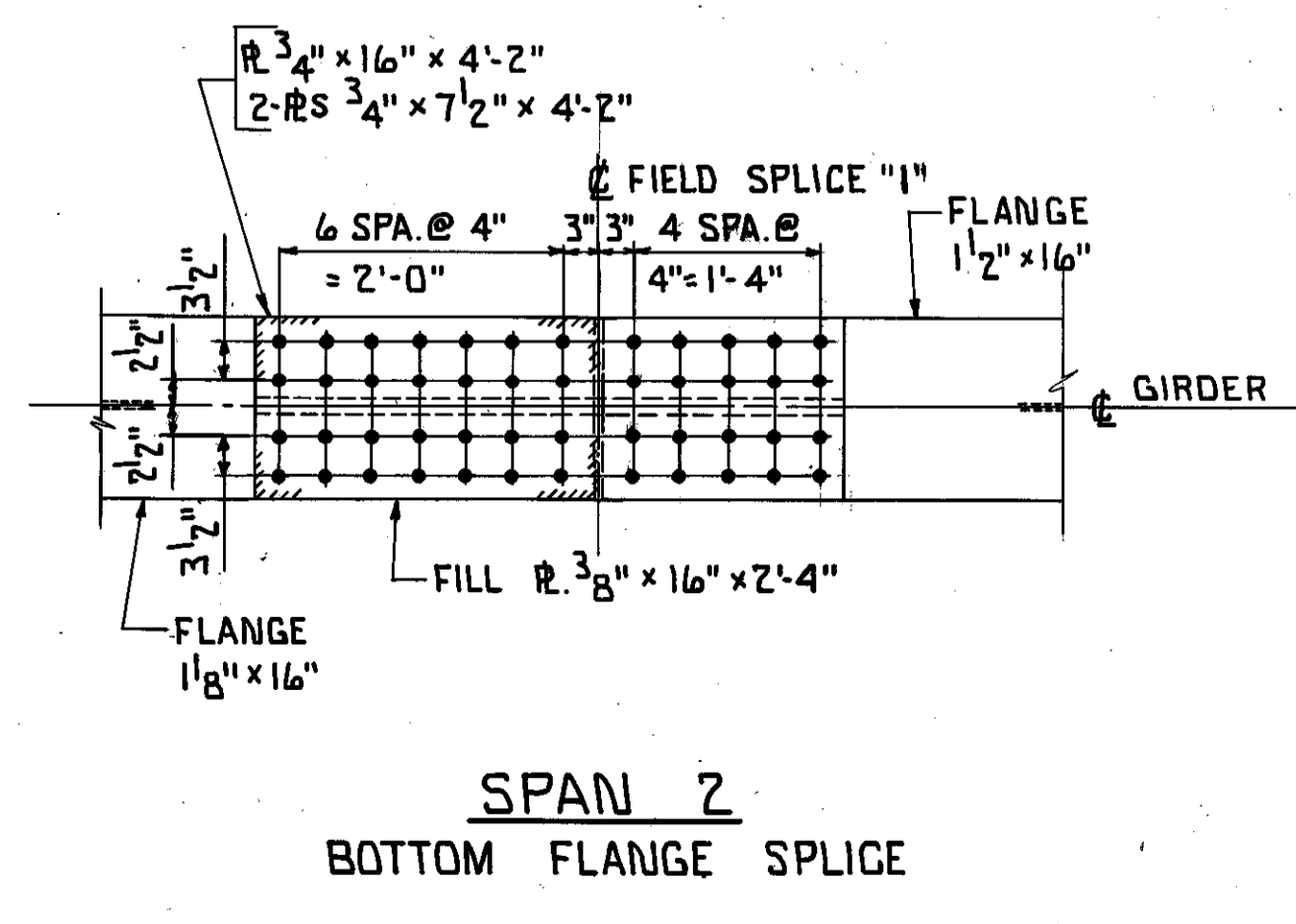
**SUPERSTRUCTURE
 GIRDERS G1 THRU G9
 CAMBER DIAGRAM**

**BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY**

| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| JWG | PRB | | DF | JRH | 2/83 | |



- NOTES**
- FOR GIRDER NOTES SEE 44/63.
 - ALL SPLICE MATERIAL TO BE ASTM A36 STEEL (CVN). FILLS NEED NOT BE CVN.
 - ALL BOLTS ARE 1" φ ASTM A325 HIGH STRENGTH STEEL BOLTS.
 - ALL HOLES ARE 1 1/16" φ WITH A MINIMUM EDGE DISTANCE OF 2", UNLESS NOTED. HOLES IN GIRDER FLANGE FIELD SPLICES SHALL BE REAMED OR DRILLED WITH ALL PLATES IN THEIR FINAL POSITION.



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 CLEVELAND, OHIO 44122

49/63

SUPERSTRUCTURE GIRDER FIELD SPLICES
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| | | | | | | |
|----------|--------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| W.H.H. | C.A.P. | | D.F. | J.R.H. | 2/83 | 10/83 |

(POT) BEARING DESIGN DATA

CALC. BY D.F.
DATE 2/83
CHKD. BY J.R.H.
DATE 2/83

CUY-490-1.49

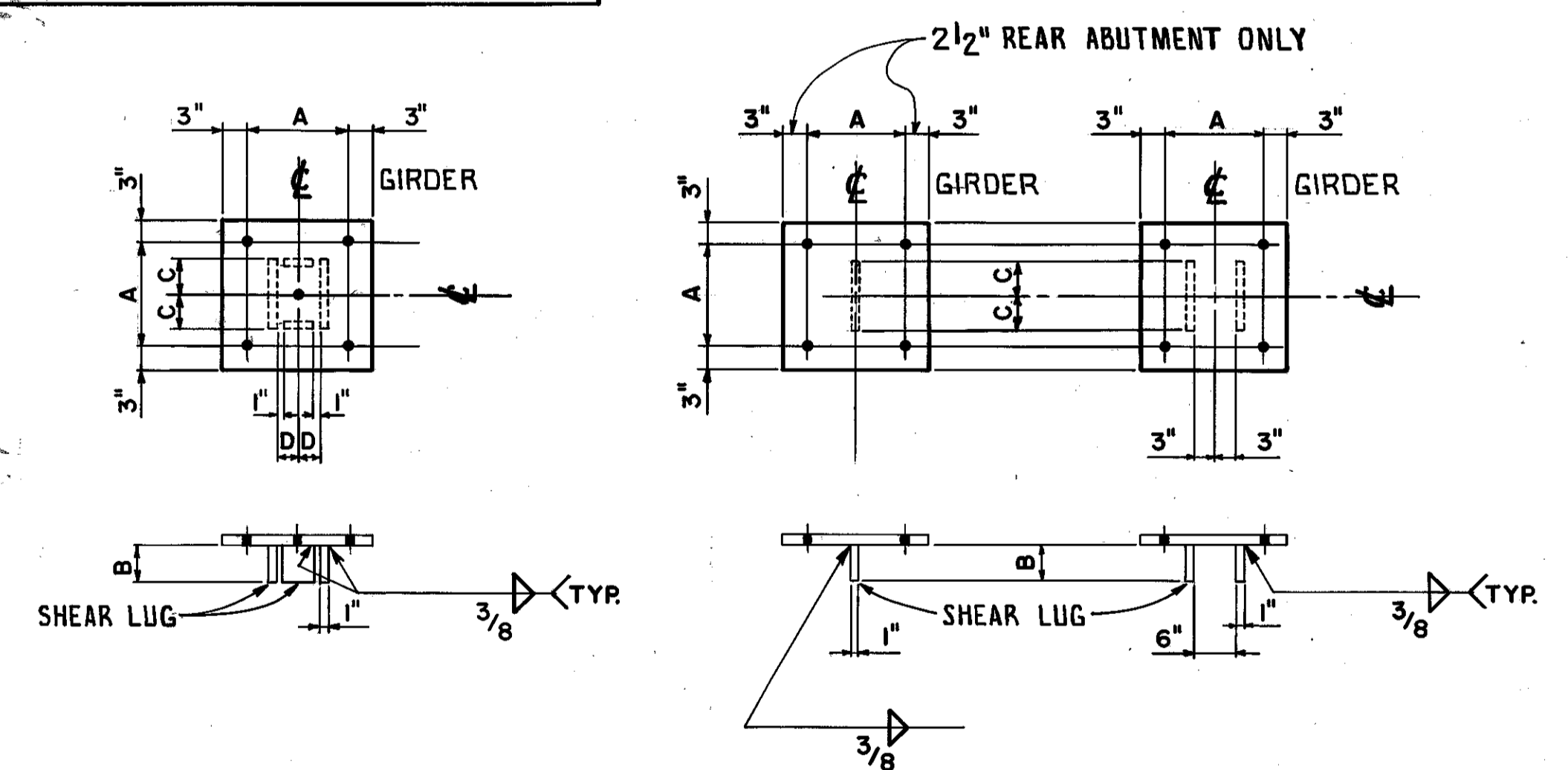
OHIO
FHWA REGION 5
252Z
261

| LOCATION | GIRDER NO. | QUANTITY | DESIGN CAPACITY IN KIPS | | | DESIGN MOVEMENT | | | | MASONRY PLATE | DESIGN THICKNESS (INCHES) | | | | MASONRY PLATE | | | | | | |
|----------------------------|----------------------|----------|-------------------------|----------------------|--|-----------------|--------|---------------------|---------------------|----------------|---------------------------|-------|---------------|---------|---------------|-----------|-----|--------|--------|----|--------------|
| | | | VERTICAL MINIMUM | LATERAL MINIMUM | MOVEMENT ⁽²⁾ FRICTION MAXIMUM | LONGITUDINAL | | LATERAL (MIN. U.N.) | | | ROTATION- ANY AXIS | GROUT | MASONRY PLATE | BEARING | TOTAL | SHEAR LUG | A | B | C | D | ANCHOR BOLTS |
| | | | | | | 1/2 | TOTAL | 1/2 | TOTAL | | | | | | | | | | | | |
| REAR ABUTMENT (FREE) | G1,G2,G4,G5,G6,G7,G9 | 7 | 125 | 12.5 | 5.0 | 2" | 4" | 1/2" | 1" | ONE (1) DEGREE | 1 1/4" x 21" x 1'-9" | 1" | 1 1/4" | 3" | 5 1/4" | 0 | 15" | — | — | — | 28 |
| REAR ABUTMENT (GUIDED) | G3,G8 | 2 | 125 | 30.0 | 5.0 | 2" | 4" | 1/16" | 1/8" ⁽³⁾ | | 1 1/4" x 21" x 1'-9" | 1" | 1 1/4" | 3" | 5 1/4" | G3 1 | 15" | 4 1/2" | 6 1/2" | — | 4 |
| PIER NO. 1 AND 1A (FREE) | G1,G2,G4,G5,G6,G7,G9 | 7 | 350 | 35.0 | 14.0 | 1 1/2" | 3" | 1/2" | 1" | | 1 1/4" x 21" x 1'-9" | 1" | 1 1/4" | 4" | 6 1/4" | 0 | 15" | — | — | — | 28 |
| PIER NO. 1 AND 1A (GUIDED) | G3,G8 | 2 | 350 | 65.0 | 14.0 | 1 1/2" | 3" | 1/16" | 1/8" ⁽³⁾ | | 1 1/4" x 21" x 1'-9" | 1" | 1 1/4" | 4" | 6 1/4" | G3 2 | 15" | 5" | 6 1/2" | — | 4 |
| PIER NO. 2 AND 2A (FREE) | G1,G2,G4,G5,G6,G7,G9 | 7 | 300 | 30.0 | 12.0 | 3/4" | 1 1/2" | 1/2" | 1" | | 1 1/4" x 21" x 1'-9" | 1" | 1 1/4" | 3 1/2" | 5 3/4" | 0 | 15" | — | — | — | 28 |
| PIER NO. 2 AND 2A (GUIDED) | G3,G8 | 2 | 300 | 70.0 | 12.0 | 3/4" | 1 1/2" | 1/16" | 1/8" ⁽³⁾ | | 1 1/4" x 21" x 1'-9" | 1" | 1 1/4" | 3 1/2" | 5 3/4" | G3 2 | 15" | 5" | 6 1/2" | — | 4 |
| PIER NO. 3 AND 3A (FREE) | G1,G5,G6,G9 | 4 | 600 | 60.0 | 12.0 | 1/4" | 1/2" | 1/2" | 1" | | 1 1/2" x 26" x 2'-2" | 1" | 1 1/2" | 5" | 7 1/2" | 0 | 20" | — | — | — | 16 |
| PIER NO. 3 AND 3A (FIXED) | G2,G3,G4,G7,G8 | 5 | 600 | 120.0 ⁽¹⁾ | | 0" | 0" | 0" | 0" | | 1 1/2" x 26" x 2'-2" | 1" | 1 1/2" | 5" | 7 1/2" | G2 4 | 20" | 3 1/2" | 8" | 7" | 4 |
| | | | | | | | | | | | | | | | | G3 4 | 20" | 5" | 8" | 7" | 4 |
| | | | | | | | | | | | | | | | | G4 4 | 20" | 6 1/4" | 8" | 7" | 4 |
| | | | | | | | | | | | | | | | | G7 4 | 20" | 6" | 8" | 7" | 4 |
| | | | | | | | | | | | | | | | | G8 4 | 20" | 4" | 8" | 7" | 4 |
| FORWARD ABUTMENT (FREE) | G1,G2,G4,G5,G6,G7,G9 | 7 | 300 | 30.0 | 12.0 | 1 1/2" | 3" | 1/2" | 1" | | 1 1/2" x 25" x 2'-1" | 1" | 1 1/2" | 3 1/2" | 6" | 0 | 19" | — | — | — | 28 |
| FORWARD ABUTMENT (GUIDED) | G3,G8 | 2 | 300 | 80.0 | 12.0 | 1 1/2" | 3" | 1/16" | 1/8" ⁽³⁾ | ONE (1) DEGREE | 1 1/2" x 25" x 2'-1" | 1" | 1 1/2" | 3 1/2" | 6" | G3 2 | 19" | 4 1/2" | 7 1/2" | — | 4 |
| | | | | | | | | | | | | | | | | G8 2 | 19" | 3 1/4" | 7 1/2" | — | 4 |

(1) ANY DIRECTION
(2) MAXIMUM CO-EFFICIENT OF FRICTION 0.04
GIRDER / BEARING TO BE CENTERED @ 60° F.
(3) MAXIMUM

MINIMUM GROUT THICKNESS 1/2"
MAXIMUM GROUT THICKNESS 1 1/2"

4-1 1/2" φ x 1'-9" LG. SWEDGE ANCHOR BOLTS WITH 4" THREAD, HEX. NUT AND FLAT WASHER @ EACH SEAT. 5" BOLT PROJECTION.



MASONRY PLATE DETAILS

ALL HOLES ARE 1 7/8" φ

FOR ITEM 516 STEEL POT BEARING NOTES SEE 50A/63

FOR FORWARD ABUTMENT SEE 16/63
FOR REAR ABUTMENT SEE 6/63
FOR PIERS SEE 32/63 & 34/63

WESTON A Business Trust
DESIGNERS CONSULTANTS
3659 GREEN ROAD SUITE 215
CLEVELAND, OHIO 44122

50/63
SUPERSTRUCTURE BEARING DETAILS
BRIDGE NO. CUY-490-0152
I-490 UNDER RELOC. BROADWAY

| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| RLH | PRB | | JRH | WHH | 2/83 | 10/83 |

Item 516 - STEEL POT BEARINGS

1. DESCRIPTION
 This item of work shall include the furnishing and installation of a complete bearing system, including fixed and guided confined elastomer pot bearings, connections of the bearings to the girders, masonry plates, grout and anchor bolts.
 The following manufacturer's bearings or approved equal may be furnished:
 Uni-Ton The Fluorocarbon Company
 P.O. Box 358
 337 Change Bridge Road
 Pine Brook, NH 07058
 Con-Slide Con-Serv, Inc.
 P.O. Box 404
 6 Deforest Ave.
 East Hanover, NJ 07936
 Spencer Dynamics
 8-235 Promenade St.
 Providence, RI 02980
 American Bearing Company, Inc.
 1275 Bloomfield Ave.
 Fairfield, NJ 07006
 Tobi Engineering, Inc.
 605-A County Club Drive
 Bensenville, IL 60106

2. GENERAL
 2.1 Bearings and masonry plates shall conform to the pot bearings design data listed on the plans, Sections 1.7, 1.14, 2.25 and 2.27 of the "Standard Specifications for Highway Bridges" adopted by The American Association of State Highway and Transportation Officials dated 1977 and interim specifications dated 1978, 1979, 1980, 1981, and 1982, and as specified in these Special Provisions.

2.2 Confined elastomer (pot) bearing shall consist of a rational element comprising an elastomeric disc totally confined within a steel cylinder. In addition, pot bearings may also have sliding surfaces of TFE and stainless steel to accommodate horizontal translation and have guide bars to limit movement in specified directions.

3. DESIGN
 3.1 The use of pot bearings is especially indicated where rotation is required in any direction in the horizontal plane; where minimum eccentricity of load is required and uniform load on bearing support areas is required, as well as general application in structures when governed by the following considerations:
 (1) The required rotation capacity in service is less than .04 radians for standard pot designs.
 (2) Minimum permanent or dead load in service is greater than 20% of the bearing capacity.
 (3) Bearings are not required to accept bending stresses.
 (4) Confined elastomer bearings are designed for forces equal to a minimum of 10% of the vertical capacity in any horizontal direction.

3.2 The upper plate element of the bearings shall be bevelled to match the roadway grade.
 3.3 Longitudinal and transverse centerlines of the bearings shall be clearly marked on the top and bottom plate elements. Bearings to be centered at 60 degrees (F).

3.4 Field welding and installation shall be controlled by the manufacturer and performed to his specifications.
 3.5 The coefficient to friction between TFE and stainless steel shall not exceed 0.04.
 3.6 The rotational capacity of the bearings shall not be less than 0.02 radians.
 3.7 Masonry plates and bearings shall be fabricated of A588 steel and be zinc metallized as per AWS C2.2-67, four mils on internal surfaces and six mils on external surfaces.

3.8 Masonry plates may vary in size depending on the vendors bearing.
 3.9 Fixed and guided masonry plates, shall be pressure grouted in place. All grout shall be nonshrink epoxy. Grout thickness shall be 1/2 inch minimum and 1 1/2 inch maximum.
 3.10 If the design thickness varies from the actual due to a particular manufacturer's bearing, the contractor shall adjust the top of concrete seat elevations accordingly, and show seat elevations on shop drawings.
 3.11 Anchor bolts shall be provided as called for on the plans.
 3.12 The contractor shall furnish complete shop drawings of the bearings and masonry plates, showing seat elevations.

3.13 Elastomeric Disc
 (1) Confined Elastomeric Discs shall have the following minimum thickness:
 Less than .011 radians rotations ID/25
 From .011 to .016 radians ID/25
 Over .017 radians rotation ID/25
 (2) Areas of elastomeric discs shall be designed for a working stress of 3500 psi ± 5% at the total dead and live loads of the structure.
 (3) At the permanent dead load of the structure the minimum compressive stress shall be 700 psi.
 (4) When using a flat brass sealing ring the upper edge of the elastomer shall be recessed to receive the brass rings.
 (5) Lubrication of the elastomeric disc shall be by means of .015" thick unfilled TFE discs the same ID as the pot located one above and one below the disc.
 (6) Elastomeric discs may be either chloroprene or natural polyisoprene of 50 ± 5 Shore A Durometer hardness.

3.14 Pot
 (1) All steel used in pot bearings shall conform to the minimum requirements of M-222.
 (2) Depth of the pot cavity shall be equal to or greater than:
 Design rotation + .02 radians + .1" + the thickness of the elastomeric disc.
 (3) Inside diameters shall be the same as the elastomeric disc.
 (4) When pots are connected to masonry or distribution plates it shall be by means of a full fillet weld around the entire perimeter.

3.15 Piston
 (1) Pistons shall be designed with outside diameters as follows:
 Flat brass sealing rings .03" to .05" less than pot inside nominal diameters.
 Round brass sealing rings .02" to .06" less than pot inside nominal diameters.
 (2) Piston thickness shall be:
 Pot ID X .08 minimum for square shape pots.
 Pot ID X .06 minimum for round shape pots.
 (3) Pistons for round cross section sealing rings shall have the lower outside edge bevelled to accept and retain the ring and permit full design rotation.
 (4) For laterally restrained pot bearings having a shear key in the piston the top surface shall have keyway slot and cold finished bar press fit and welded at the ends. Pistons of this design may also be machined from one piece of steel.

3.16 Elastomer Sealing Rings
 (1) Flat brass sealing rings shall meet the following requirements:
 (a) Width shall be 3/8" minimum for bearings up to 1000 kips capacity and 1/2" wide over 1000 kips capacity.
 (b) Thickness shall be .050" minimum.
 (c) Up to 1000 kips capacity 2 rings shall be used, from 1000 kips to 3000 kips 3 rings and over 3000 kips 4 rings shall be used.
 (d) Rings shall fit the ID of the pot snugly and the ends shall be cut at 45 degrees and when installed in the pot the maximum gap shall be .050".
 (e) Piston ring gaps shall be staggered 180 degrees apart.
 (2) Round cross section brass sealing rings shall meet the following design requirements:
 (a) Rings shall fit the pot ID snugly.
 (b) Rings shall be made from one piece rolled into a circle and brazed.

3.17 TFE Sliding Surface
 (1) The area of the TFE shall be designed for a working stress as per Section 14 at the full dead and live loads of the structure.
 (2) Unfilled TFE shall meet the following requirements:
 (a) When recessed into the surface of the piston for half its thickness, it shall be a minimum of 1/8" thick and not more than 3/16" thick.
 (b) When bonded to the surface of the piston it shall be a minimum of 3/32" thick and a maximum of 1/8" thick.
 (3) Filled TFE shall meet the following requirements:
 (a) When recessed into the surface of the piston for half its thickness, it shall be a minimum of 3/32" a maximum of 3/16" thick.
 (b) When bonded to the piston it shall be a minimum of 1/16" thick and a maximum of 3/32".
 (4) 100% virgin unfilled polytetrafluoroethylene fabric shall meet the following requirements:
 (a) When recessed into the surface of the piston for half its thickness, it shall be a minimum of 1/8" thick and a maximum of 3/16" thick after compression.
 (b) When mechanically attached and bonded to the surface of the piston, it shall be a minimum of 1/32" thick and a maximum of 1/8" thick after compression.

3.18 Stainless Steel Sliding Surface
 (1) The stainless steel surface shall cover the TFE surface in all operating positions plus one additional inch in every direction of movement.
 (2) Stainless steel shall be a minimum of 20 gage (U.S.S.G.) thickness and shall be connected to the sole plate by means of a seal weld around the entire perimeter.
 (3) Welding procedures shall be chosen such that the stainless steel in service is in contact with the sole plate and the surface is smooth and flat.
 (4) For pot bearing designs with center guided key a recess shall be machined in the sole plate a maximum of 1/8" wider than the shear key.
 (5) Stainless steel sliding surfaces shall be, preferably faced downward.

3.19 Guide Bars
 (1) May be connected to sole plates by means of either welding or high tensile screws. The use of high tensile screws other than those listed in table 1.7.41C shall be designed using .2 X Fu for allowable stress in single shear.

(2) Guide bars and their connections to the sole plate shall be designed for the horizontal forces on the bearing and not less than 10% of the vertical capacity of the bearing.
 (3) Unless the space between the guide bars is specified, it shall be a total of 1/8".
 (4) Guiding arrangements shall be designed so that the guiding member is always within the guides at all points of translation of the bearing.

4 MATERIALS
 4.1 Structural steel shall conform to the minimum requirements of M-222.
 4.2 Elastomers shall conform to sections 2.25.2 and 3 where applicable and Tables A and B.
 4.3 Elastomer seals may only be made of metal as follows:
 (a) Flat brass rings shall conform to the requirements of ASTM B-36, C26000.H02.
 (b) Round cross section brass rings shall conform to the requirements of Federal Specification QQB626, Composition 22 half hard.
 4.4 TFE sliding surfaces shall conform to the requirements of Sections 1.14 and 2.27.
 4.5 Stainless steel sliding surfaces shall conform to ASTM A240 type 304 with a surface finish 10 micro-inches rms or less.

5 MANUFACTURING REQUIREMENTS
 5.1 Pots may, preferably, be made from a solid plate by machining or fabricated by welding a flame cut shape to a plate. Fabricated pots shall be 100% ultra-sonically tested at the inside weld and magnetic particle tested at the exterior fillet weld.
 (a) The inside diameter shall be machined to a tolerance of +0.005" up to 20" diameter and +0.007" over 20" diameter.
 (b) Pot undersides shall be machined parallel to the inside to a class "A" tolerance as defined in this section.
 (c) Internal finish shall be 125 rms or better.
 5.2 Elastomeric disc tolerances shall be as follows:
 (a) Diameters greater than 20" +3/32".
 (b) Diameters less than 20" +1/16".
 (c) Thickness shall be -0" +1/8".
 (d) Discs may be manufactured from a maximum of 3 pieces.

5.3 Piston tolerances shall be as follows:
 (a) Diameters greater than 20" +0.007".
 (b) Diameters less than 20" +0.005".
 (c) Upper side class "A" tolerance.
 (d) Lower side class "B" tolerance.
 (e) Machined finishes shall be 125 rms or better.
 5.4 Masonry and distribution plate tolerances shall be as follows:
 (a) Plan dimensions over 30", -0" + 3/16".
 (b) Plan dimensions under 30", -0" + 1/8".
 (c) Flatness, class "B" tolerance.

5.5 TFE sliding surface tolerances shall be as follows:
 (a) Plan dimensions, total nominal design area -0" + 5%.
 (b) Flatness class "A" tolerance.
 5.6 Stainless steel sliding surfaces shall be seal-weld around the entire perimeter using techniques which will ensure it remains in contact with the backing plate.
 Finish shall be 10 rms or better.
 Flatness shall conform to Class "A" or better.
 5.7 Sole plates shall conform to the following requirements:
 (a) Plan dimensions over 30", -0" + 3/32".
 (b) Plan dimensions under 30", -0" + 1/8".
 (c) Thickness, - 1/32" + 1/8".
 (d) Flatness of upper surface, class "B" tolerance.
 (e) No bevelled edge shall be less than 5/8" thick.

5.8 Guide bar tolerances shall be as follows:
 (a) Length ± 1/8".
 (b) Section dimensions, ± 1/16".
 (c) Flatness where it bears on another plate, class "A" tolerance.
 (d) Bar to bar tolerance, "nominal dimension + 1/32".
 (e) Parallelism, bars shall be not more than 1/32" out of parallel.
 5.9 Overall height of bearing shall not exceed the nominal height by more than 3/16" or be less than 1/16" under.
 5.10 The edges of all parts shall be broken by grinding so that there are no sharp edges.

6. TOLERANCES FOR FLATNESS
 Flatness of bearing surfaces shall be determined by the following method:
 (a) A precision straight edge, longer than the nominal dimension to be measured shall be placed in contact with the surface to be measured as parallel to it as possible.
 (b) Select a feeler gage having an accuracy of ±.001" equal to the tolerance allowed and attempt to insert it under the straight edge.
 (c) Plates are "acceptable" if the feeler gage does not pass under the straight edge.

(d) Flatness tolerances shall be as follows:
 Class "A", 0.0005" X "nominal dimension"
 Class "B", 0.001" X "nominal dimension"
 Class "C", 0.002" X "nominal dimension"
 (e) "nominal dimension" shall be interpreted as the actual dimension of the plate, in inches, under the straight edge where the straight edge is not parallel to any plan dimension of the plate being measured.
 (f) In determining the flatness, the straight edge may be located in any position on the surface being measured.

7 TESTING AND ACCEPTANCE
 7.1 All test methods and procedures shall be submitted to the Director for approval.
 7.2 The contractor shall perform the following tests in his own facilities or at an independent test facility. The test facility shall be approved by the Director. The Director shall be allowed free access to the necessary parts of the manufacturer's plant and test facility.
 7.3 One bearing from each vertical capacity listed in the plans shall undergo the following Vertical Load Test:
 Vertical Load Test
 The sealing ring shall restrain the elastomer under each of the following load conditions:

- a. A vertical load of 150% of the bearing capacity while in a position rotated 0.02 radians. The rotation shall be reversed a minimum of five times; the load shall be applied for a period of 30 minutes each position.
- b. A vertical load of 20% of the bearing capacity and the same conditions as given above in "a".

During these test the bearings shall be examined for evidence of extrusion of elastomer around or past the sealing rings. Following the tests, the bearings shall be disassembled so that the bearing components can be examined. Bearings which exhibit damage or distress shall be redesigned and retested until suitable performance is obtained.

7.4 One bearing to be selected by the Director shall be tested for sliding friction.

Sliding Friction Test
 The test method and equipment shall be approved by the Director and include the following:

- A. The test must be arranged so that the coefficient of friction of the first movement of the manufactured bearing can be determined.
- B. The bearing surface shall be cleaned prior to testing, upon instructions of the bearing manufacturer.
- C. The test shall be conducted at maximum working stress for the TFE surface with the test load applied continuously for 12 hours prior to measuring friction.
- D. The first movement static and dynamic coefficient of the test bearing shall be determined at a sliding speed of less than 1 inch per minute and shall not exceed the coefficient of friction for design.
- E. The bearing specimen shall then be subjected to 100 movements of at least 1 inch of a relative movement at a speed less than 1 foot per minute. Following this test, the static and kinetic coefficient of friction shall be determined again and shall not exceed the values measured in "D" above. The bearing or specimen shall show no sign of bond failure or other defects.

7.5 Tests shall be made to show the bond of the TFE material to a material similar to the top surface of the piston. The test method and equipment shall be approved by the Director and include the following requirements:

- a. The test shall be made using the design loads for one bearing category.
- b. TFE material-substrate bond shall be capable of withstanding a shear force equal to 10 percent of the perpendicular or normal application loading without delamination in addition to the shear force developed as a result of the natural bearing shear force.

7.6 Bearings represented by the test specimens passing the above requirements will be approved for use in the structure subject to on-site inspection for visible defects.
 7.7 The Director may require additional testing to be performed, though previous tests have been acceptable. Such additional tests will be paid for under Item Special, "Additional bearing test, steel pot bearings".

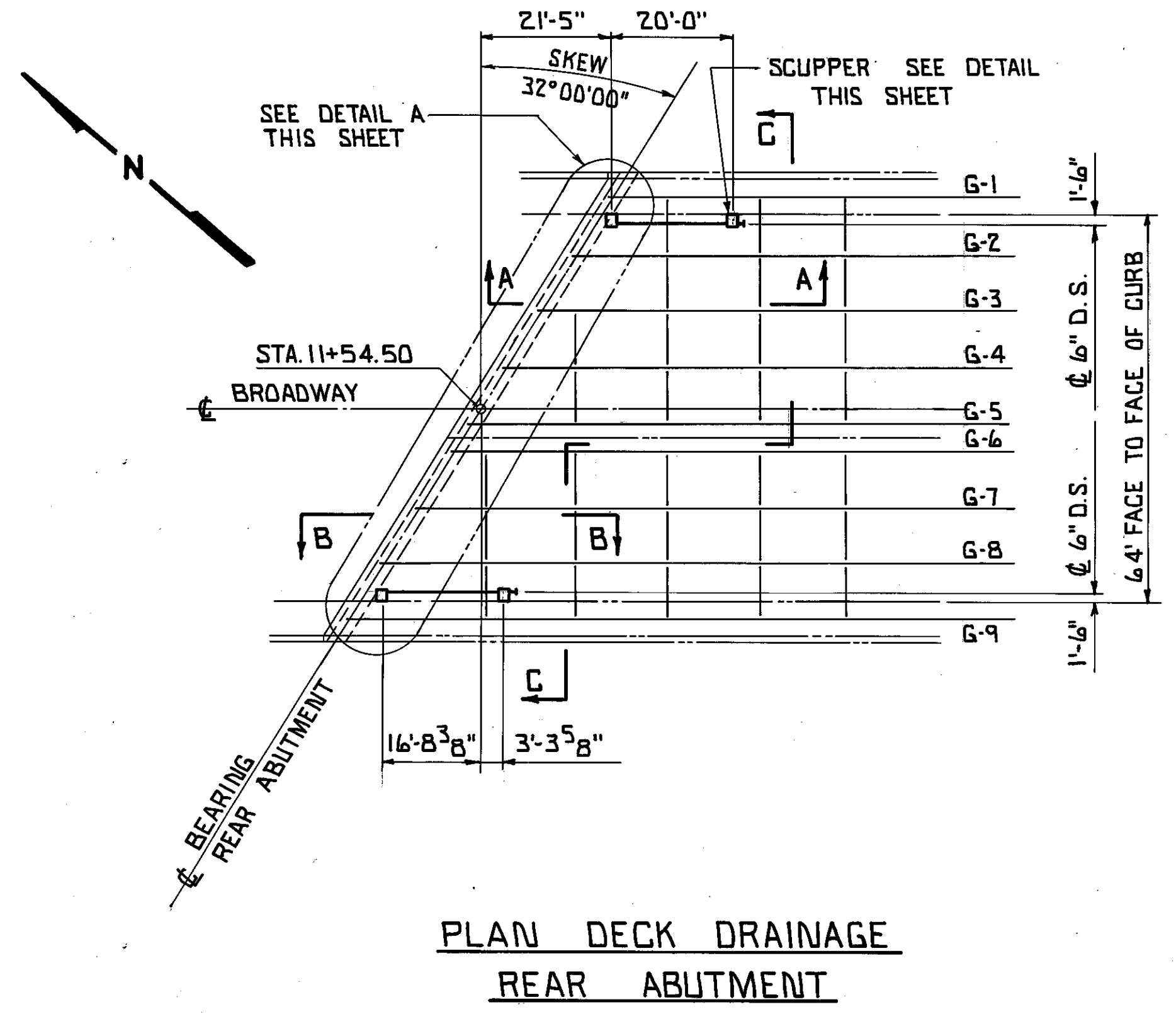
8 METHOD OF MEASUREMENT
 8.1 A complete bearing system will be measured on an each basis for various design capacities.

9 BASIS OF PAYMENT
 9.1 Payment will be made at the unit price bid per each for Item 516, "Steel Pot Bearings _____ Kips Capacity," for a complete bearing system furnished and installed in accordance with Item 516, the plans and manufacturer's specifications.
 9.2 Payment for all work listed under Testing and Acceptance of this specification will be made at the lump sum price for Item Special, "Bearing test, steel pot bearings".
 9.3 Additional bearing tests required by the Director as detailed in Section 7.7 of this specification will be paid for at the price per each listed under Item Special, "Additional bearing tests, steel pot bearings". The requirements listed under 7.3, 7.4 and 7.5 shall each be considered as one test for the purpose of measurement and payment.

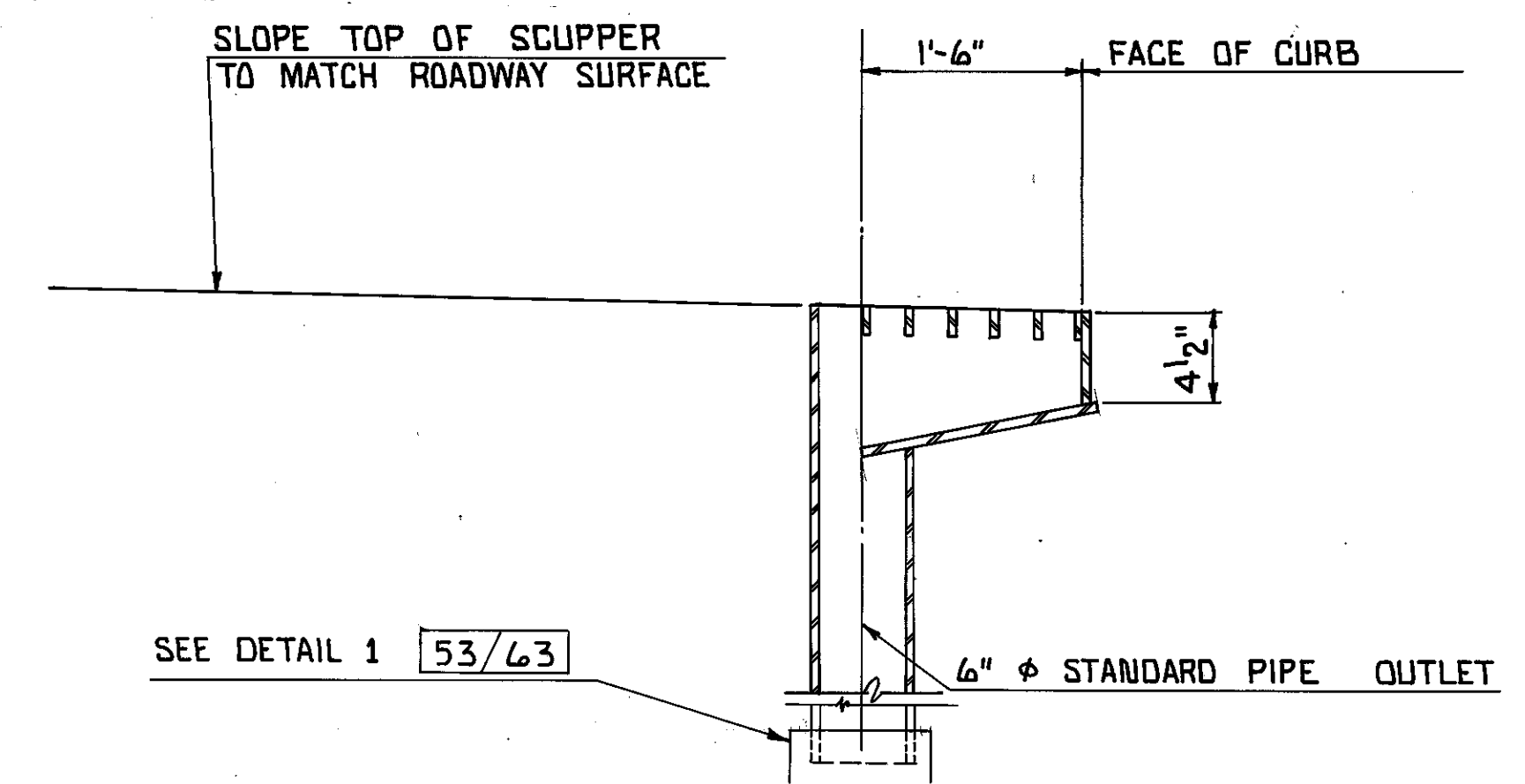
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| CHKD. BY _____ | | | |
| DATE _____ | | | |

| | | | | |
|--|---------|---|---------|---------------|
| WESTON DESIGNERS CONSULTANTS | | <small>A Business Trust</small> 3659 GREEN ROAD SUITE 215 CLEVELAND, OHIO 44122 | | 50A/L3 |
| SUPERSTRUCTURE BEARING NOTES | | | | |
| BRIDGE NO. CUY - 490 - 0152 | | | | |
| I-490 UNDER RELOC. BROADWAY | | | | |
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED |
| CAP | RLH | | | |
| DATE | REVISED | | | |

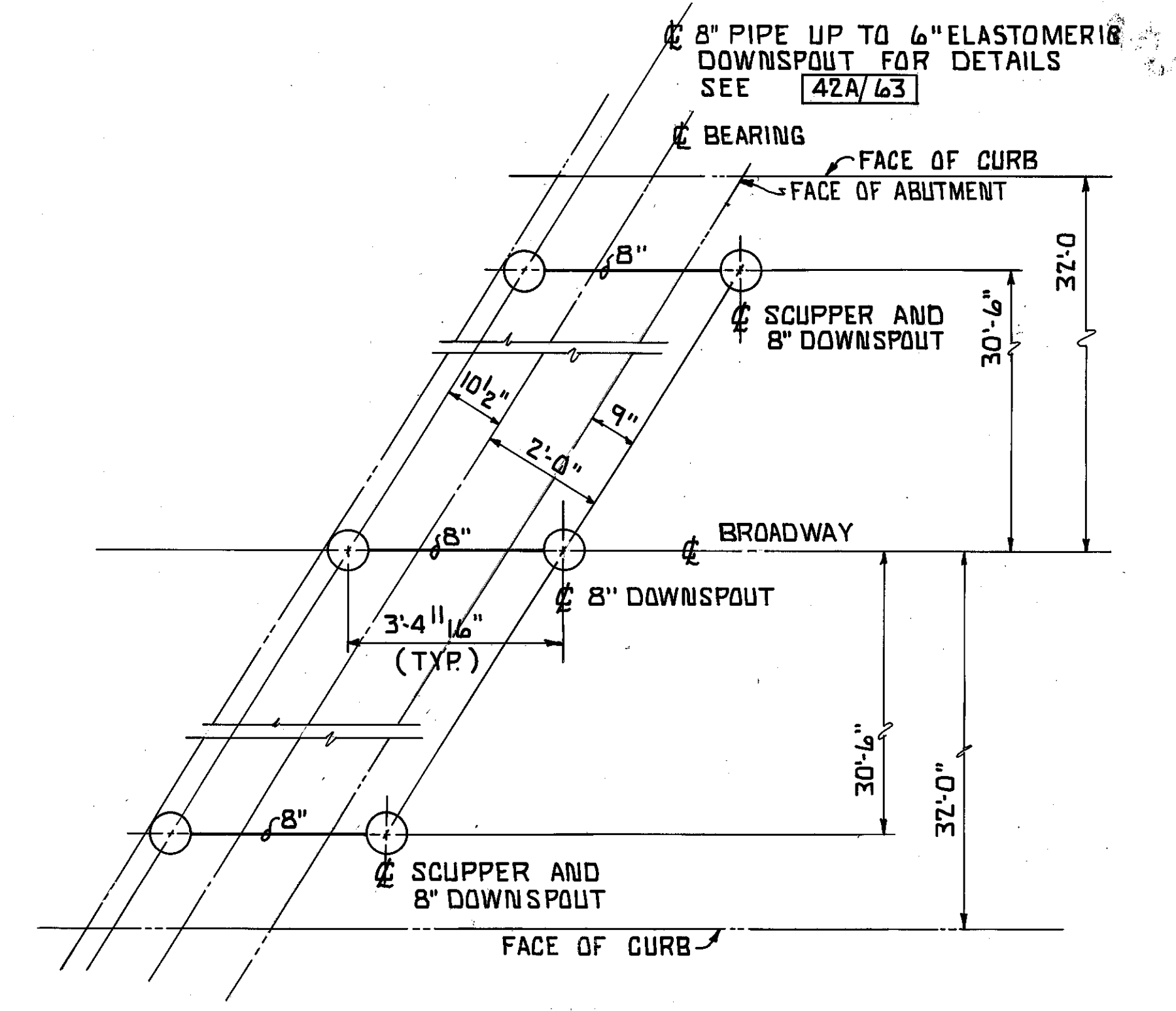
CUY-490-1.49



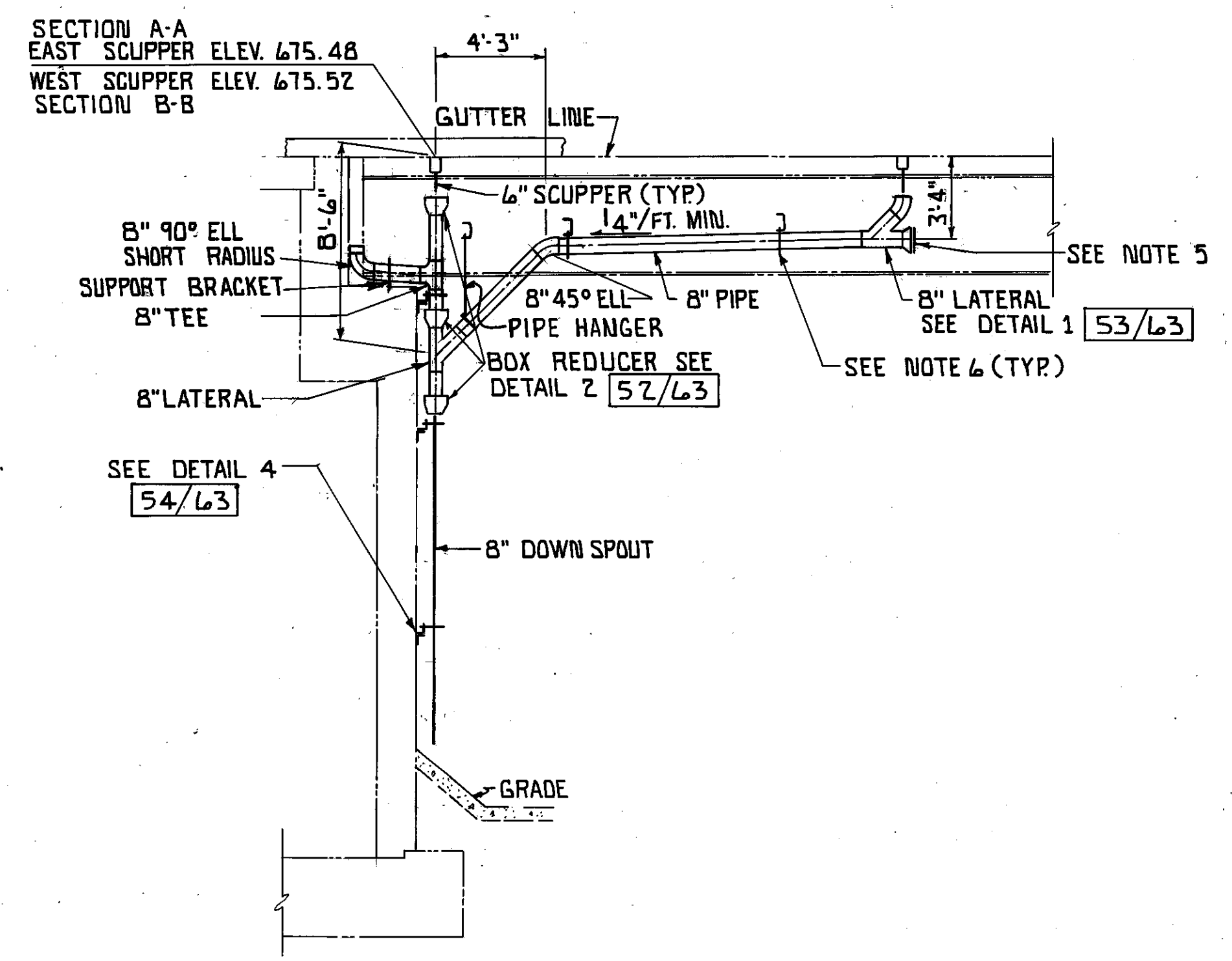
PLAN DECK DRAINAGE
REAR ABUTMENT



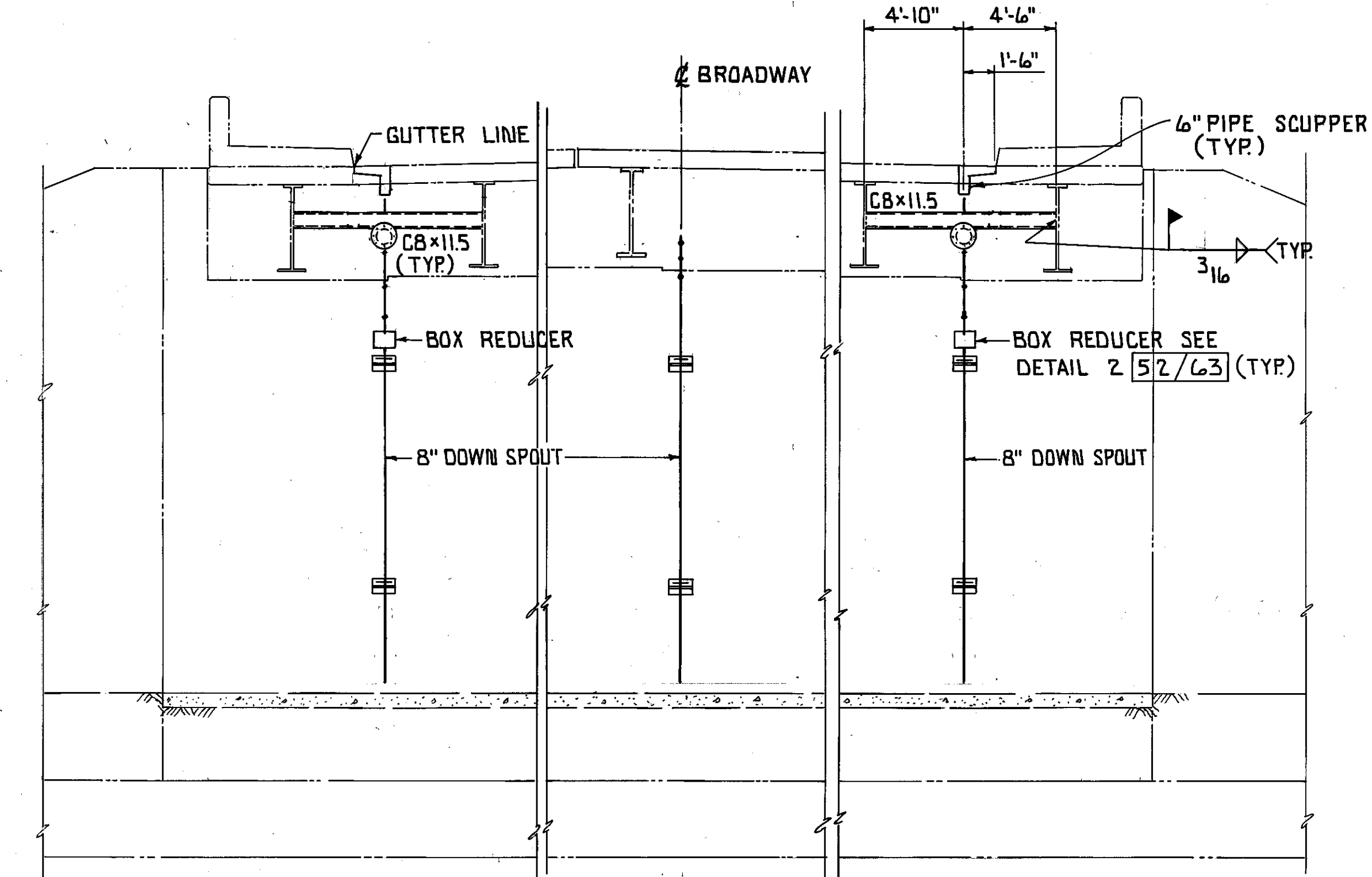
SCUPPER SECTIONAL ELEVATION
FOR DIMENSIONS AND DETAILS NOT SHOWN SEE STD. DWG. SD-1-69



DETAIL "A"



SECTION A-A SHOWN AND NOTED
SECTION B-B OPPOSITE AND NOTED



SECTION C-C

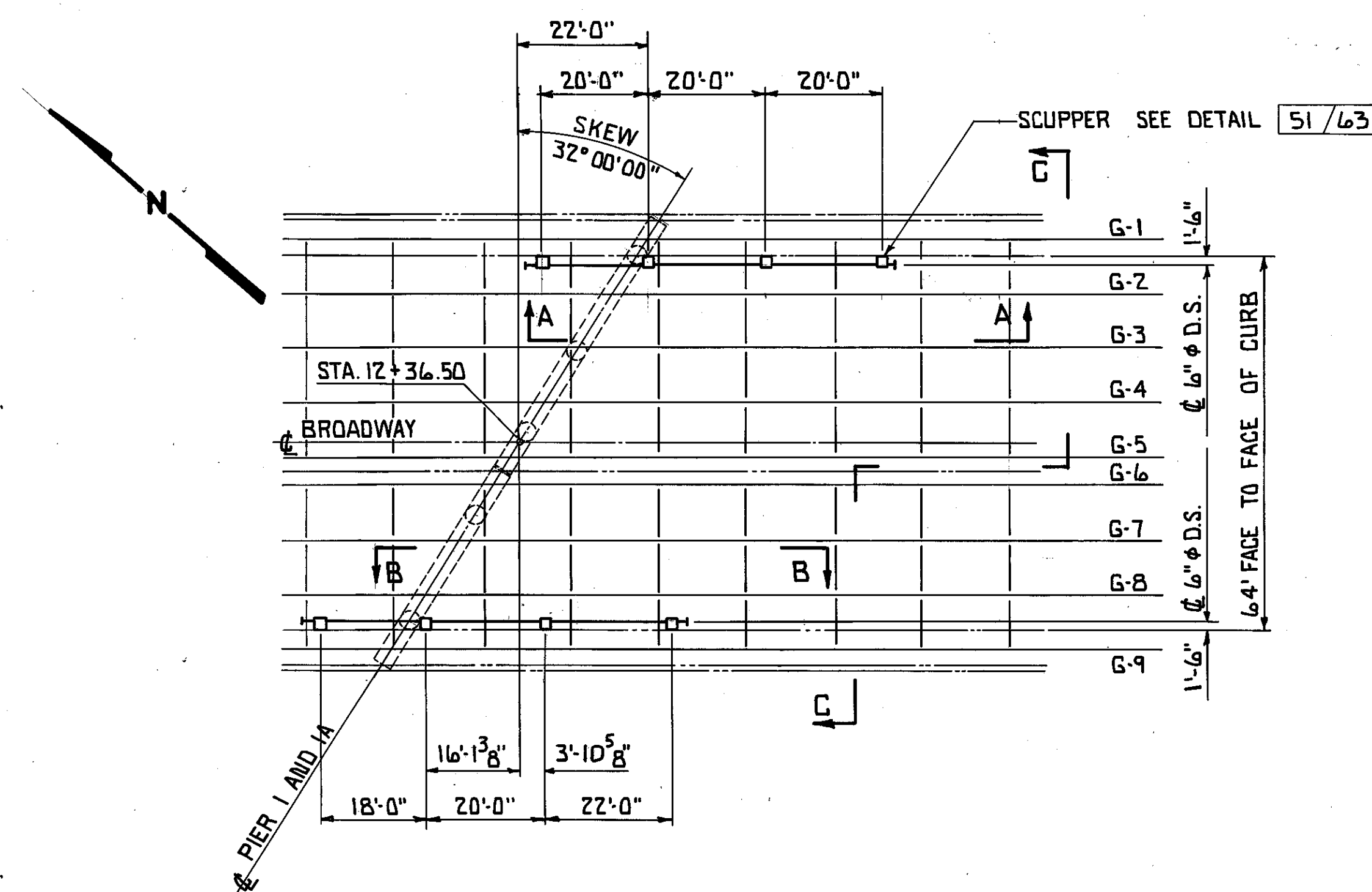
- NOTES**
- HANGERS & SUPPORTS ARE INCLUDED WITH THE PRICE PER LIN. FT. OF HORIZONTAL CONDUCTORS & DOWNSPOUTS FOR PAYMENT. ITEM 518
 - SCUPPERS & SCUPPER SUPPORTS SHALL BE HOT DIPPED GALVANIZED A36 STEEL. ITEM 518
 - THE 6" & 8" PHIPPS SHALL BE HOT DIPPED GALVANIZED STEEL PIPE, INCLUDING ALL FITTINGS. ITEM 518
 - JOINTS SHALL BE MADE BY WELDING OR BY THE USE OF CLAMP TYPE COUPLING WITH A RING GASKET. ALL WELDING SHOULD BE DONE BEFORE GALVANIZING. BOLTS SHALL BE GALVANIZED AS SPECIFIED IN ASTM A153.
 - CLEAN OUT - 8" WELD NECK FLG. WITH 8" BLIND FLG.
 - 5/8" GALVANIZED STD. U-BOLT WITH HEX. NUTS & LOCK WASHERS.
 - STD. BENDS SHALL BE TRIMED TO ADJUST FOR PIPE SLOPE BEFORE WELDING.
 - EXP. BOLTS TO MISS REINFORCING STEEL.

WESTON A Business Trust
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3659 GREEN ROAD SUITE 215
CLEVELAND, OHIO 44122

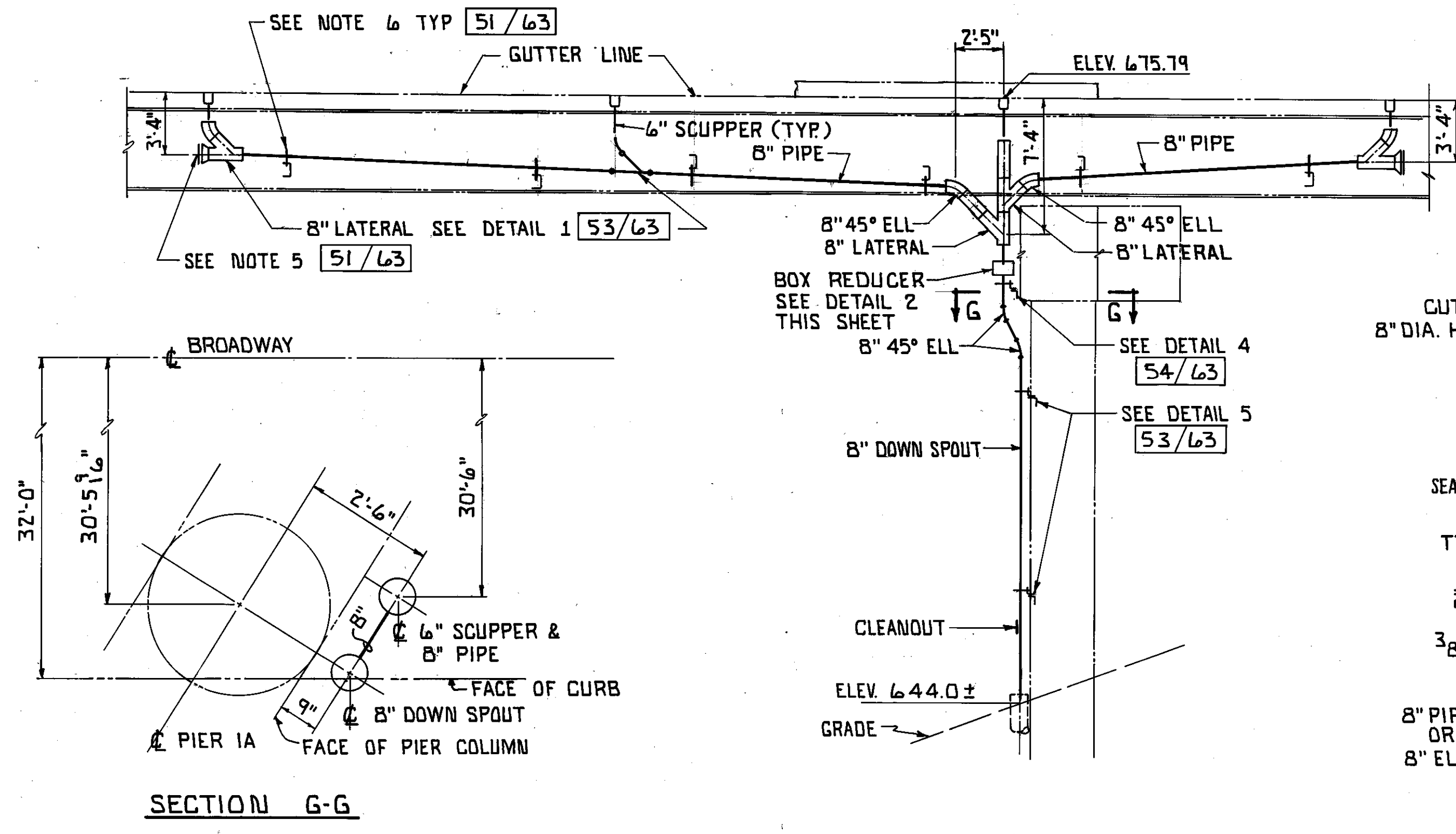
51/63

**SUPERSTRUCTURE
REAR ABUTMENT SCUPPER
LOCATION AND DRAINAGE DETAILS
BRIDGE NO. CUY-490-0152
I-490 UNDER RELOC. BROADWAY**

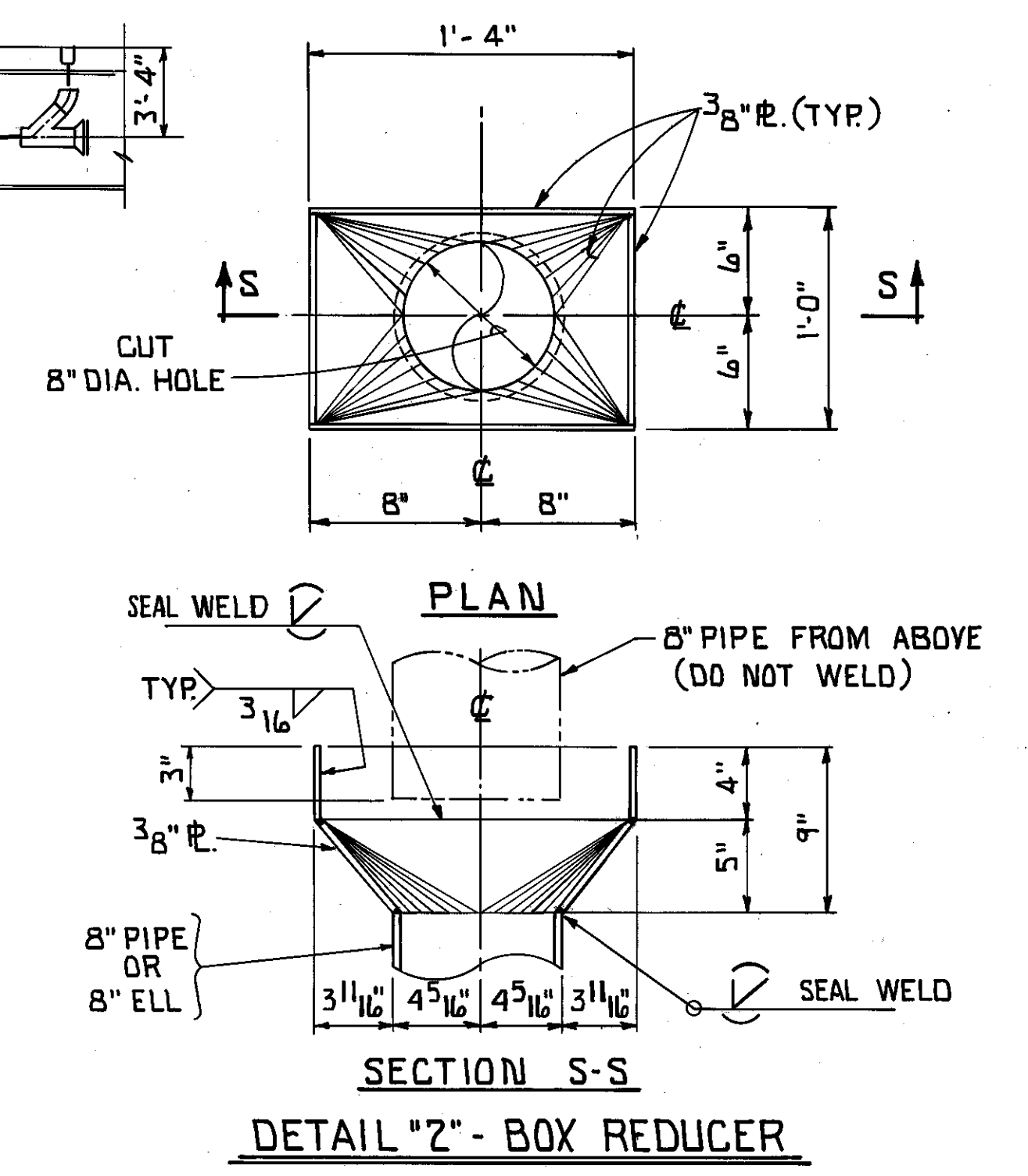
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| CAP | CAP | | DF | JRH | 2/83 | 10/83 |



**PLAN DECK DRAINAGE
 PIER 1 AND 1A**

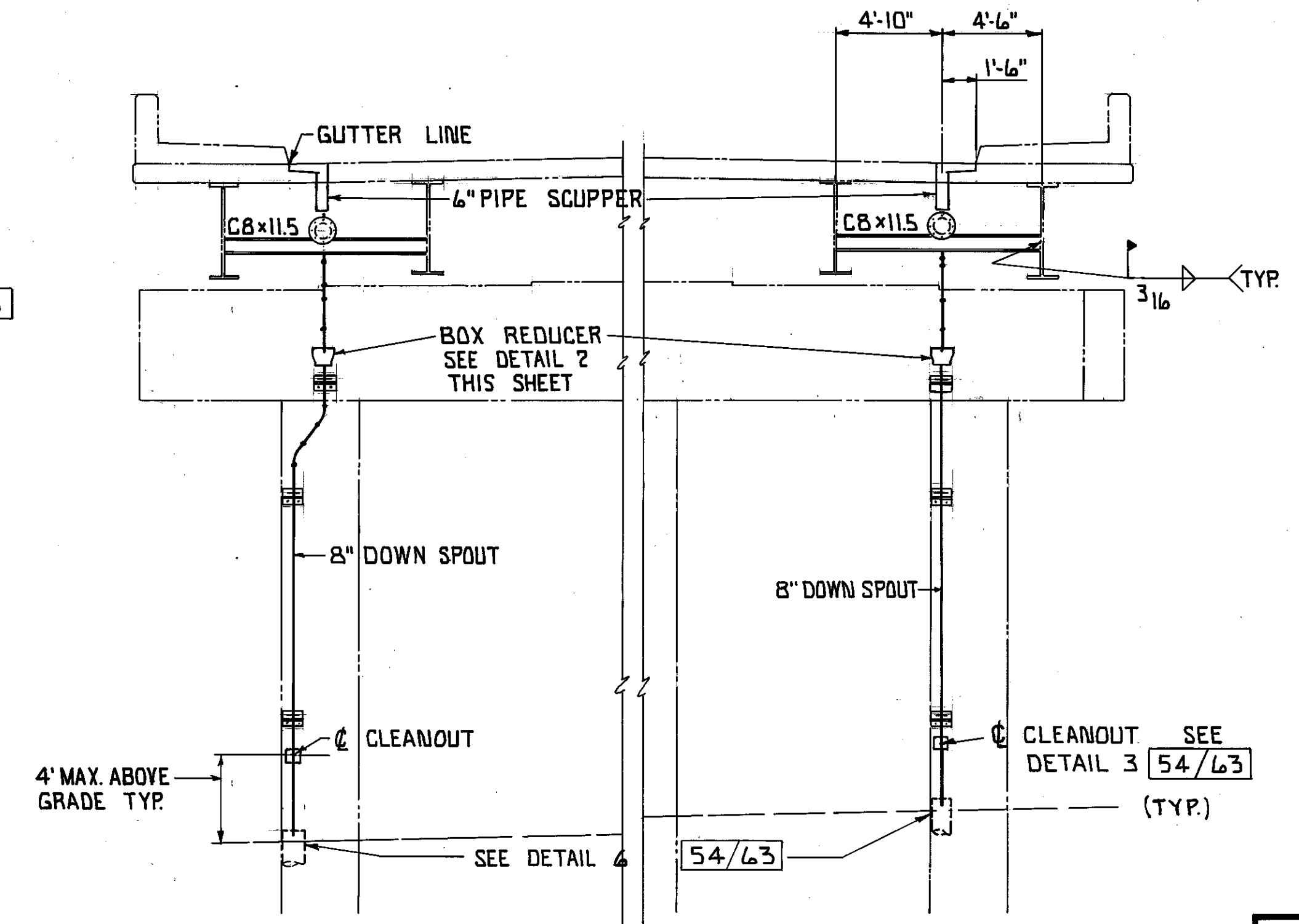


SECTION G-G

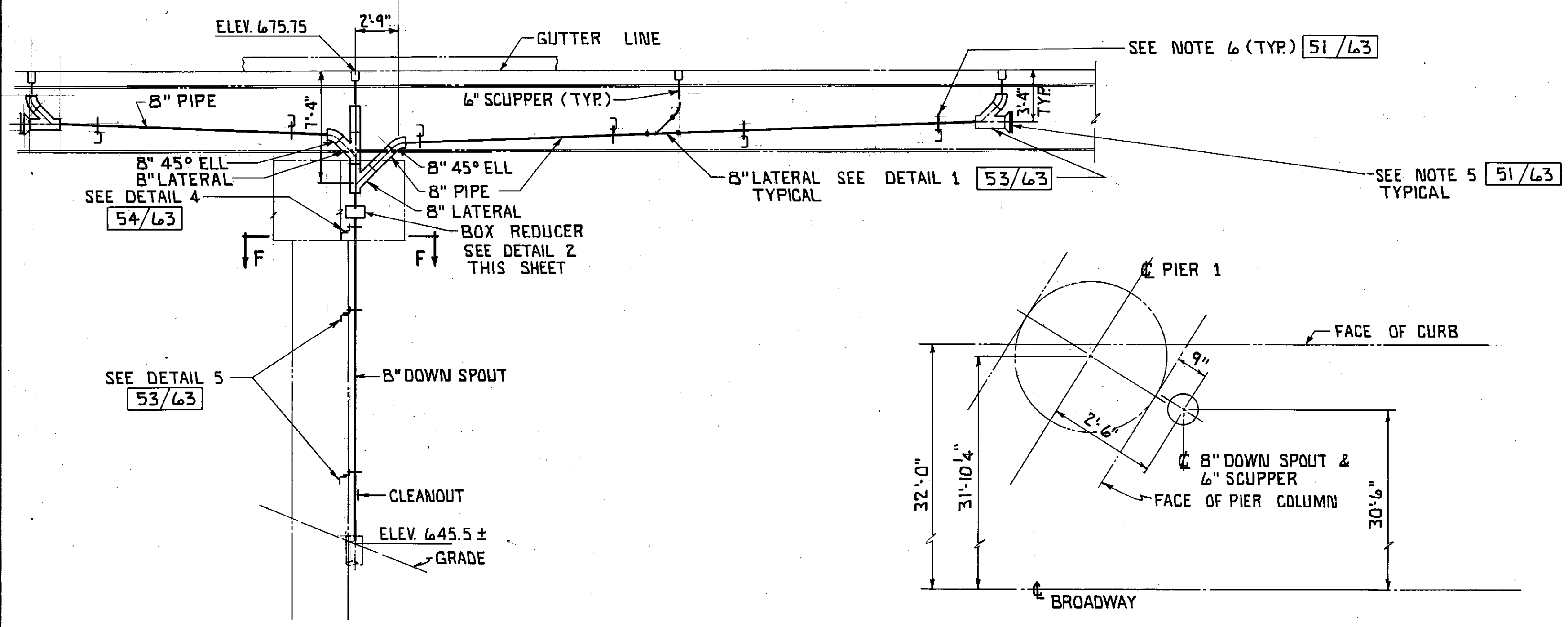


**SECTION S-S
 DETAIL "2" - BOX REDUCER**

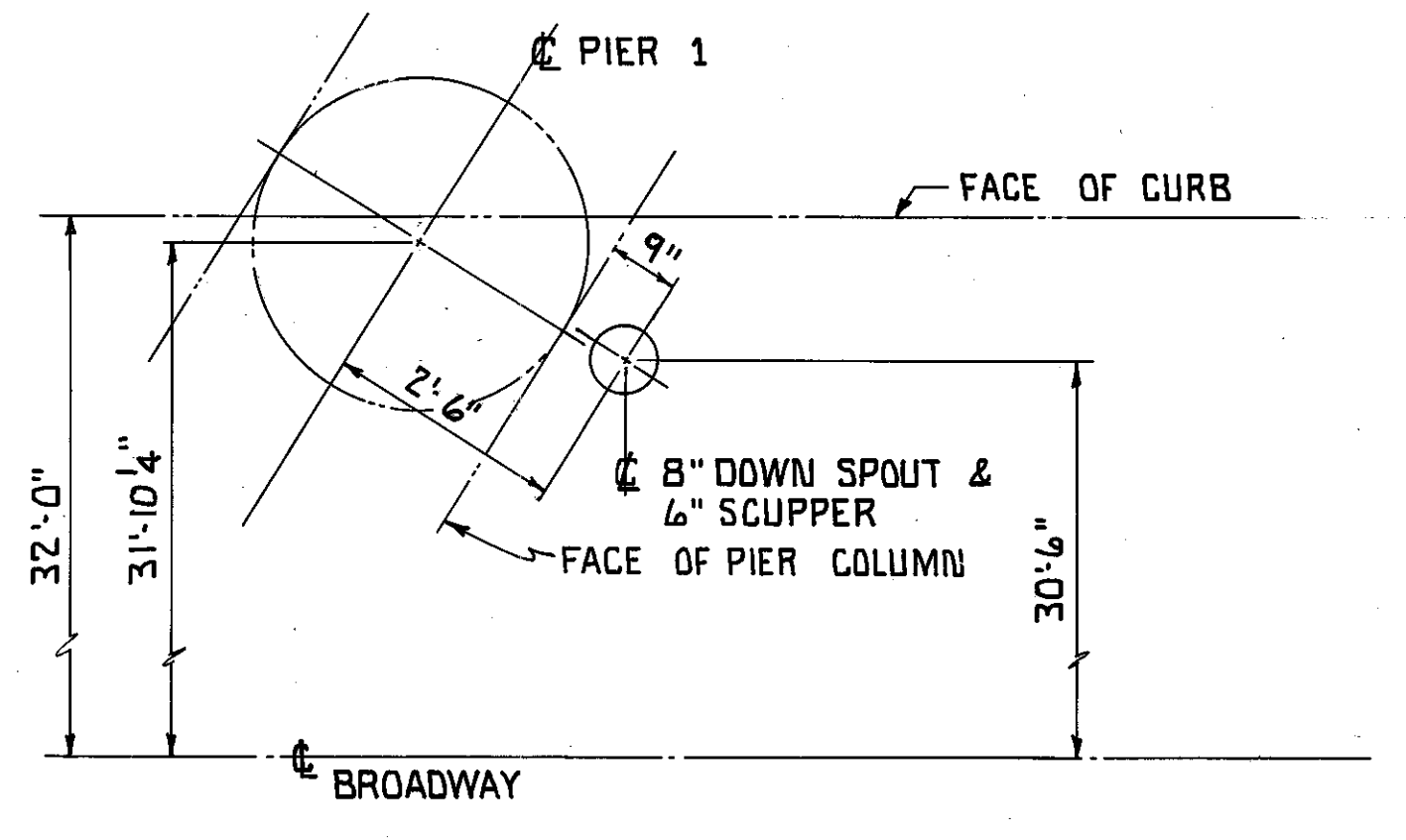
SECTION B-B



SECTION G-G



SECTION A-A



SECTION F-F

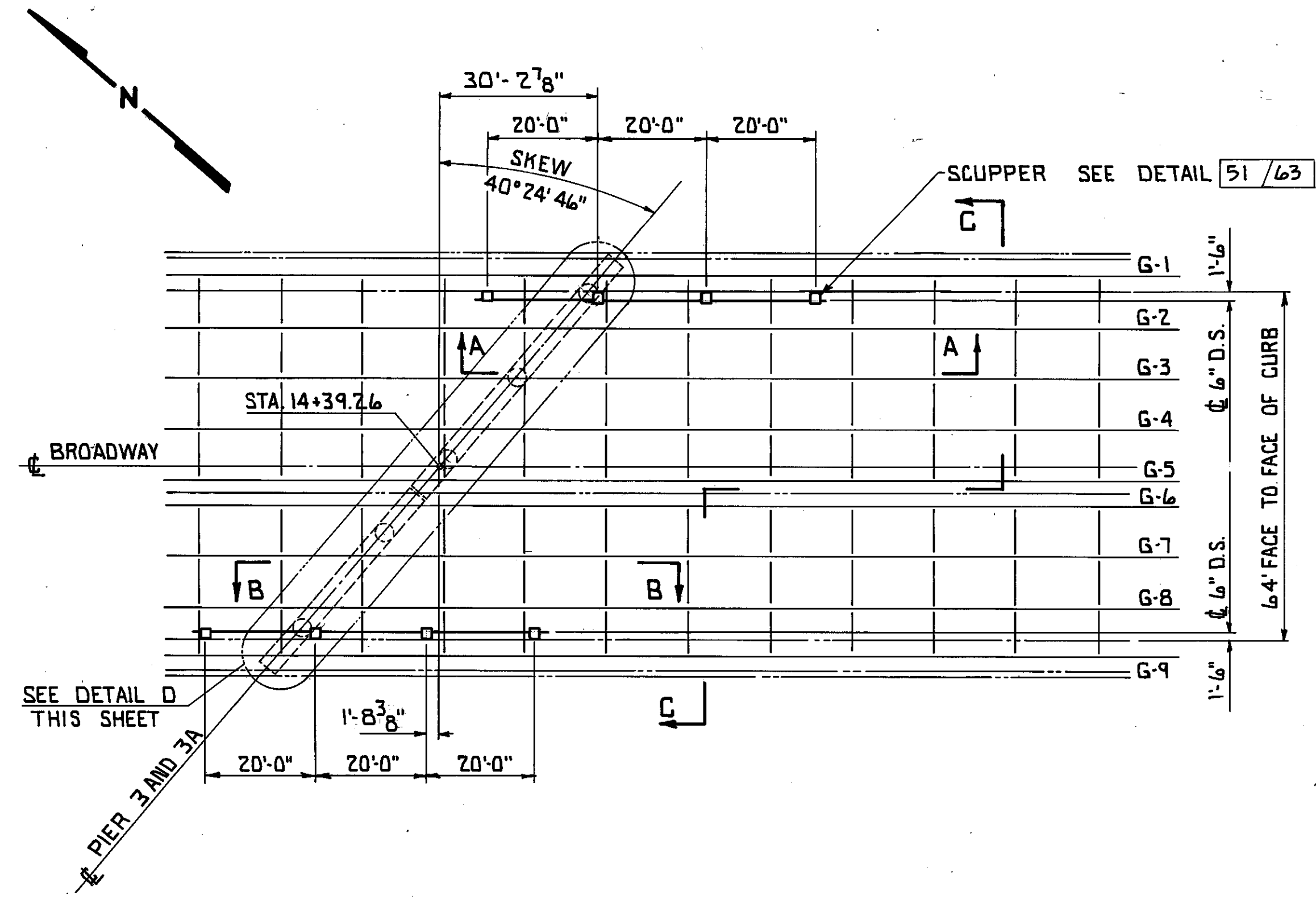
SEE 51/63 FOR NOTES.

WESTON A Business Trust
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

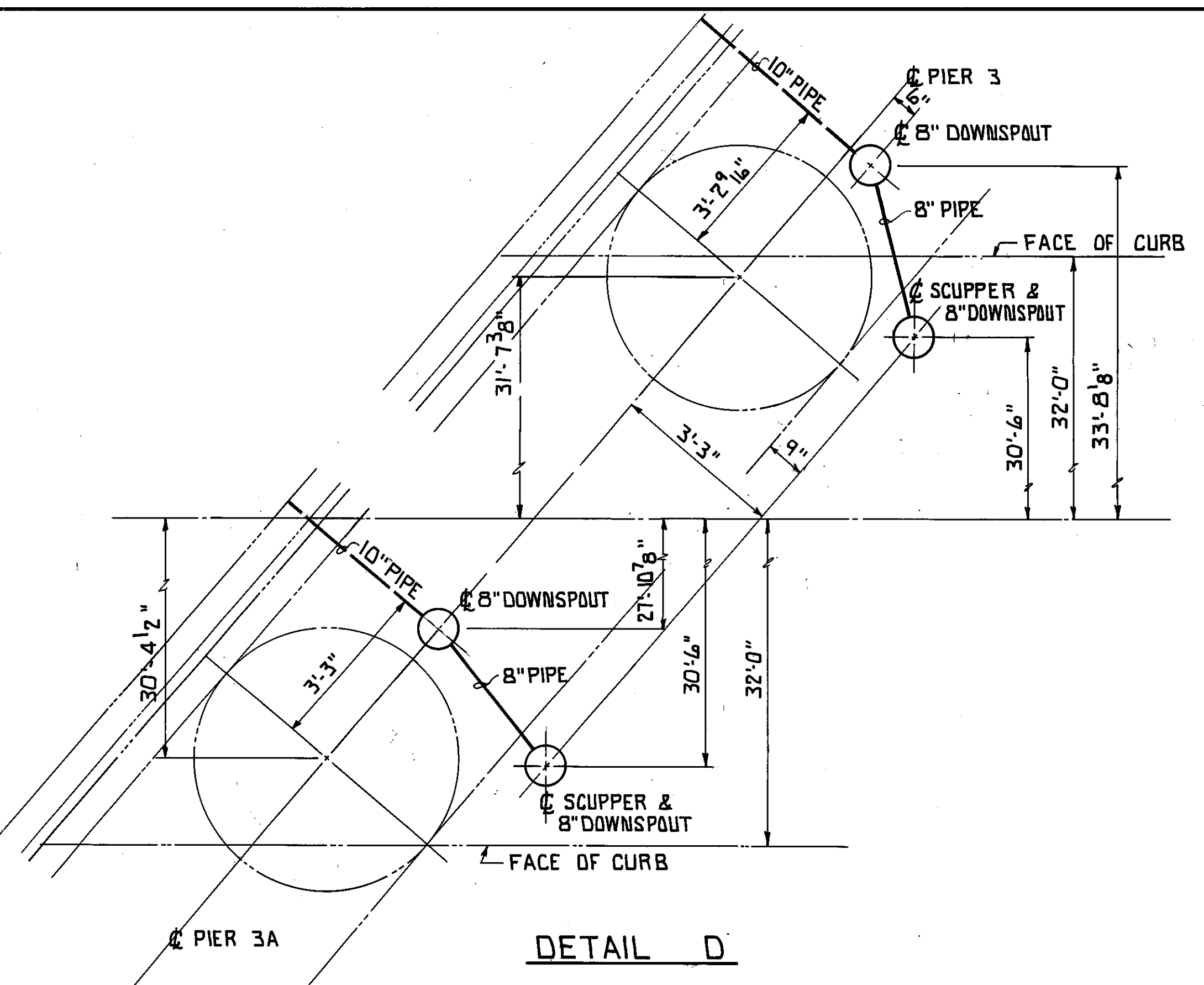
52/63

**SUPERSTRUCTURE
 PIER 1 AND 1A SCUPPER
 LOCATION AND DRAINAGE DETAILS
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY**

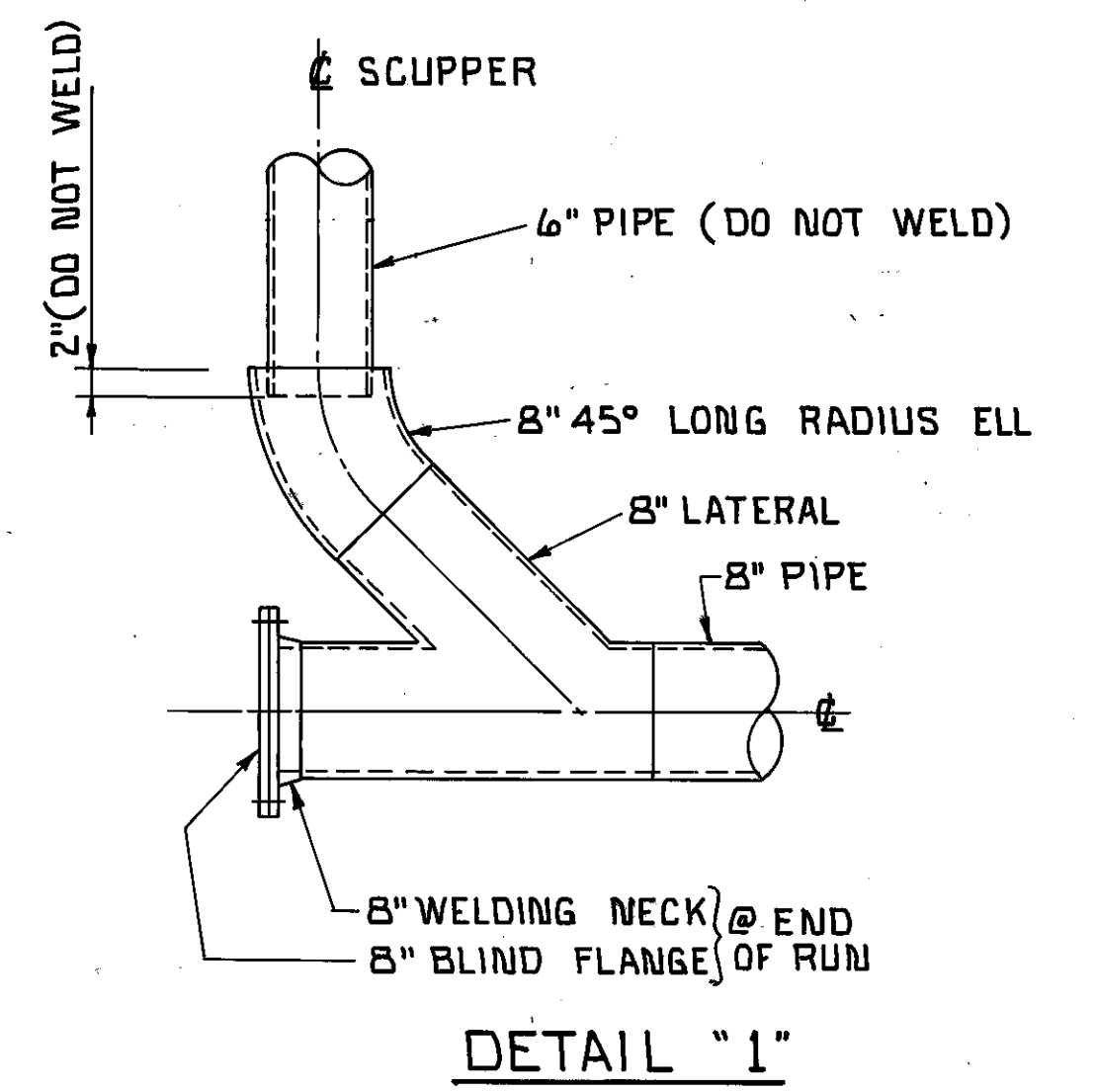
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|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| CAP | CAP | | DF | JRH | 2/83 | 10/83 |



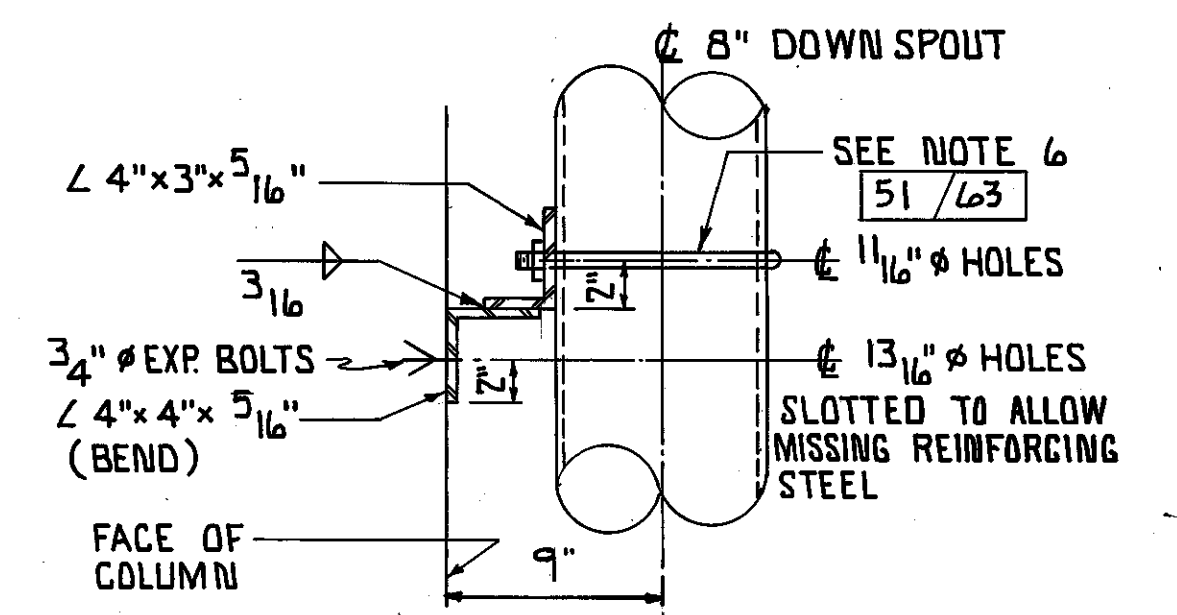
**PLAN DECK DRAINAGE
 PIER 3 AND 3A**



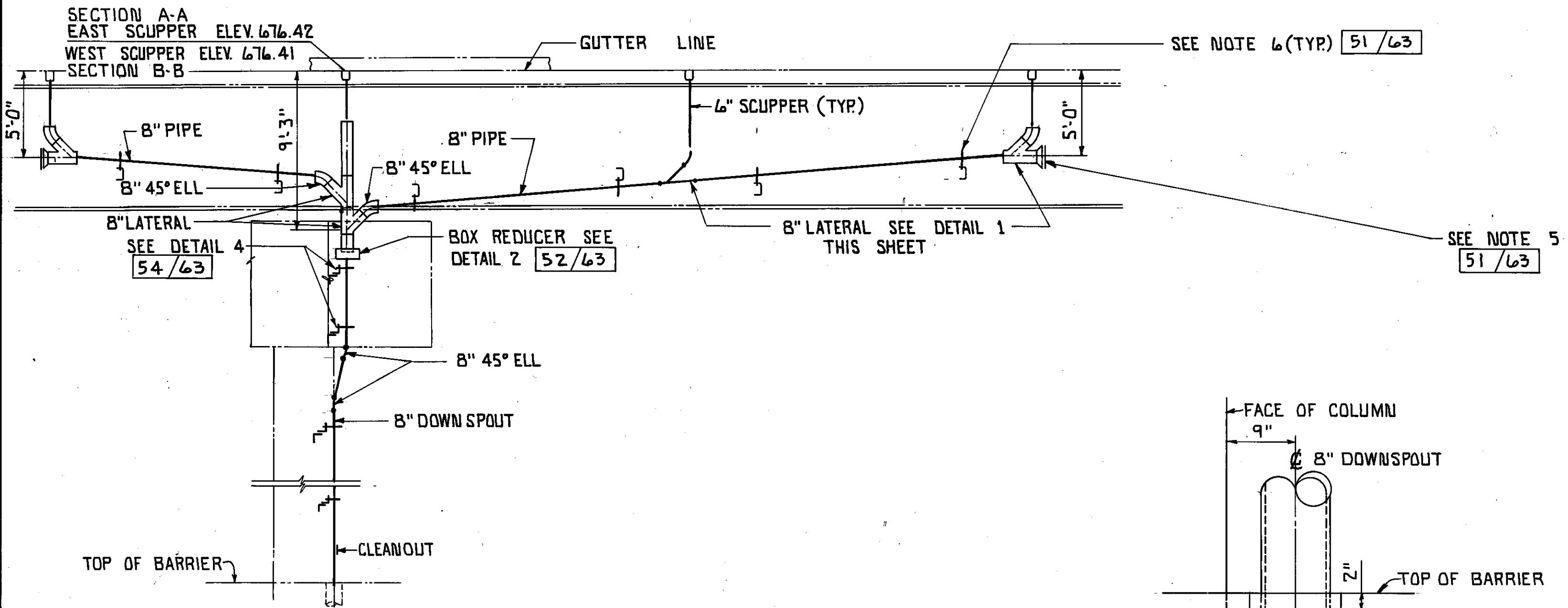
DETAIL D



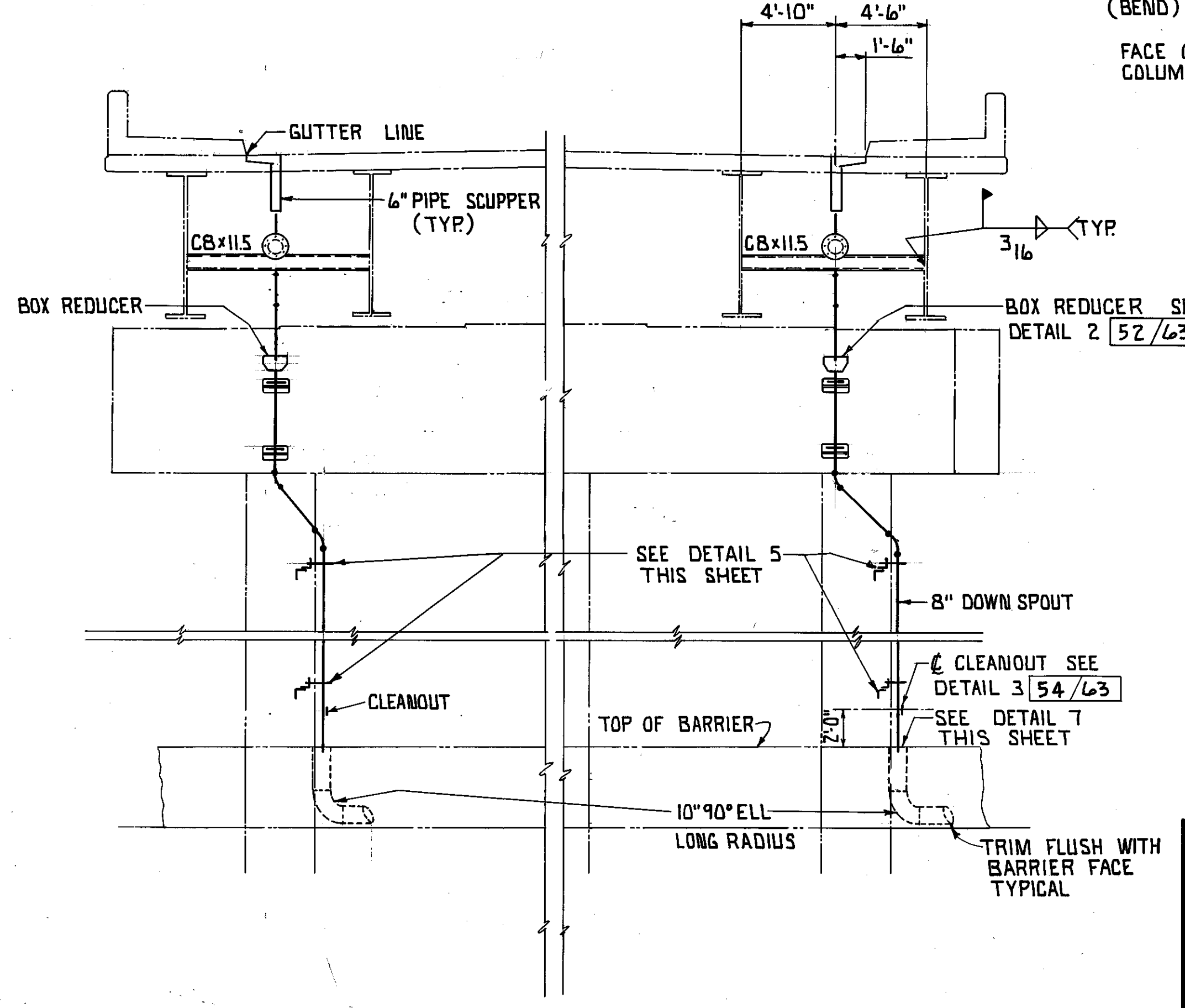
DETAIL 1



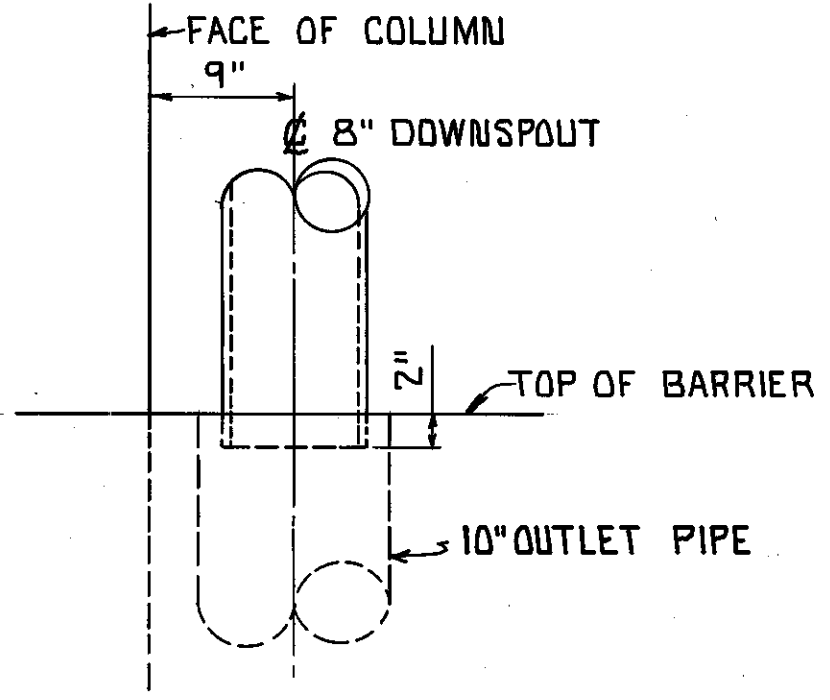
DETAIL 5



**SECTION A-A SHOWN AND NOTED
 SECTION B-B OPPOSITE AND NOTED**



SECTION C-C



DETAIL 7

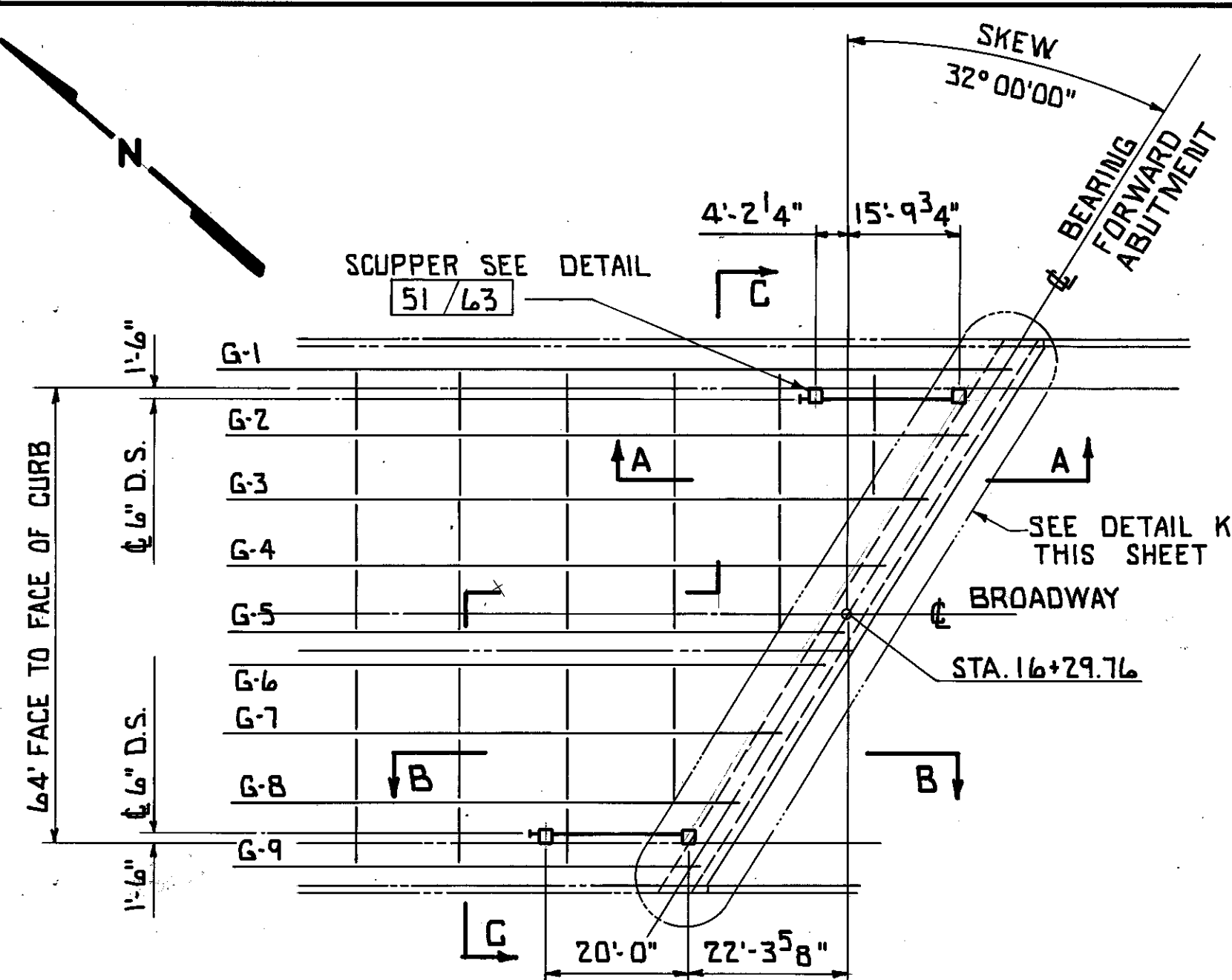
NOTE:
 SEE 51/63 FOR NOTES.

WESTON A Business Trust
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

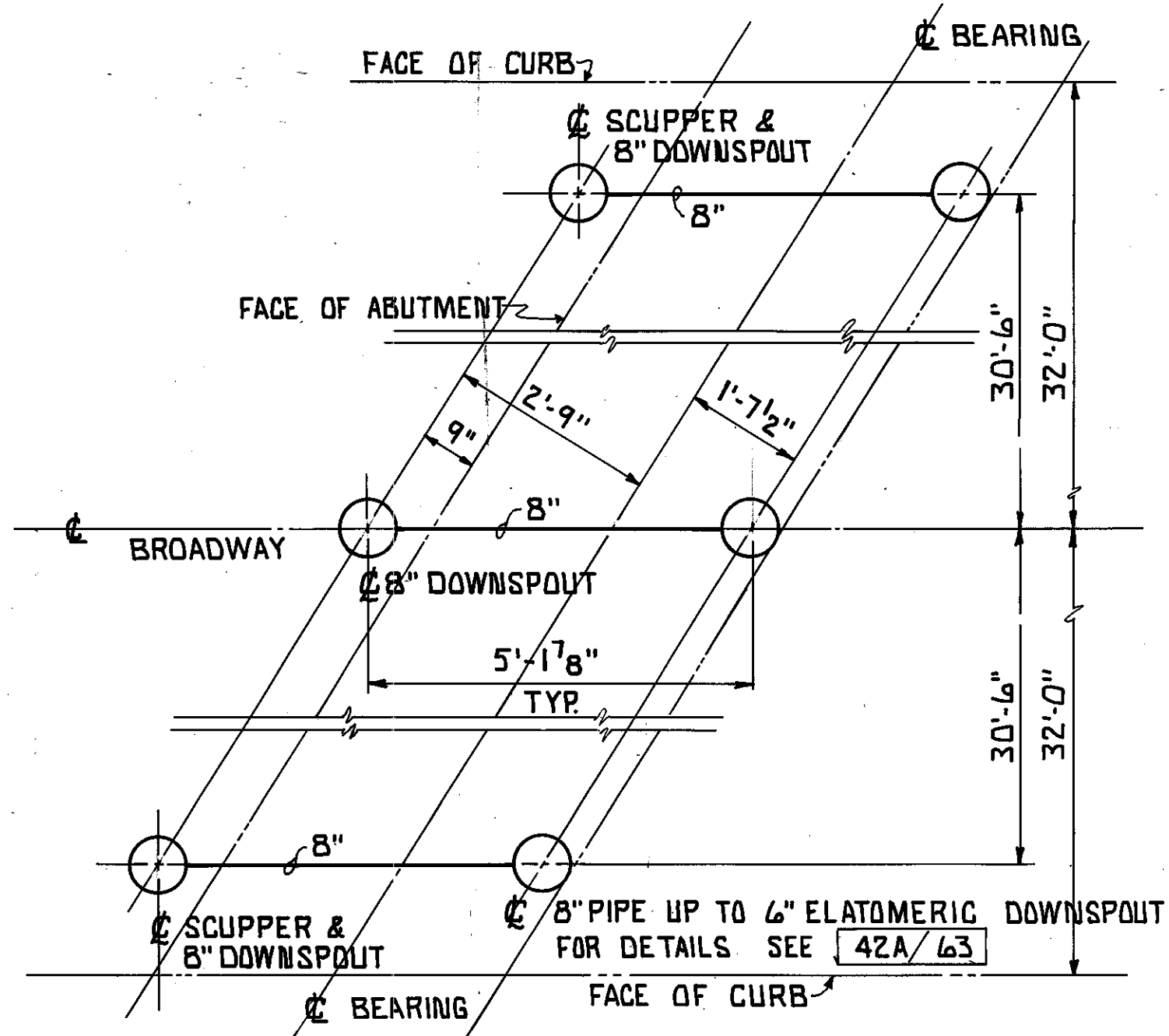
53/63

**SUPERSTRUCTURE
 PIER 3 AND 3A SCUPPER
 LOCATION AND DRAINAGE DETAILS
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY**

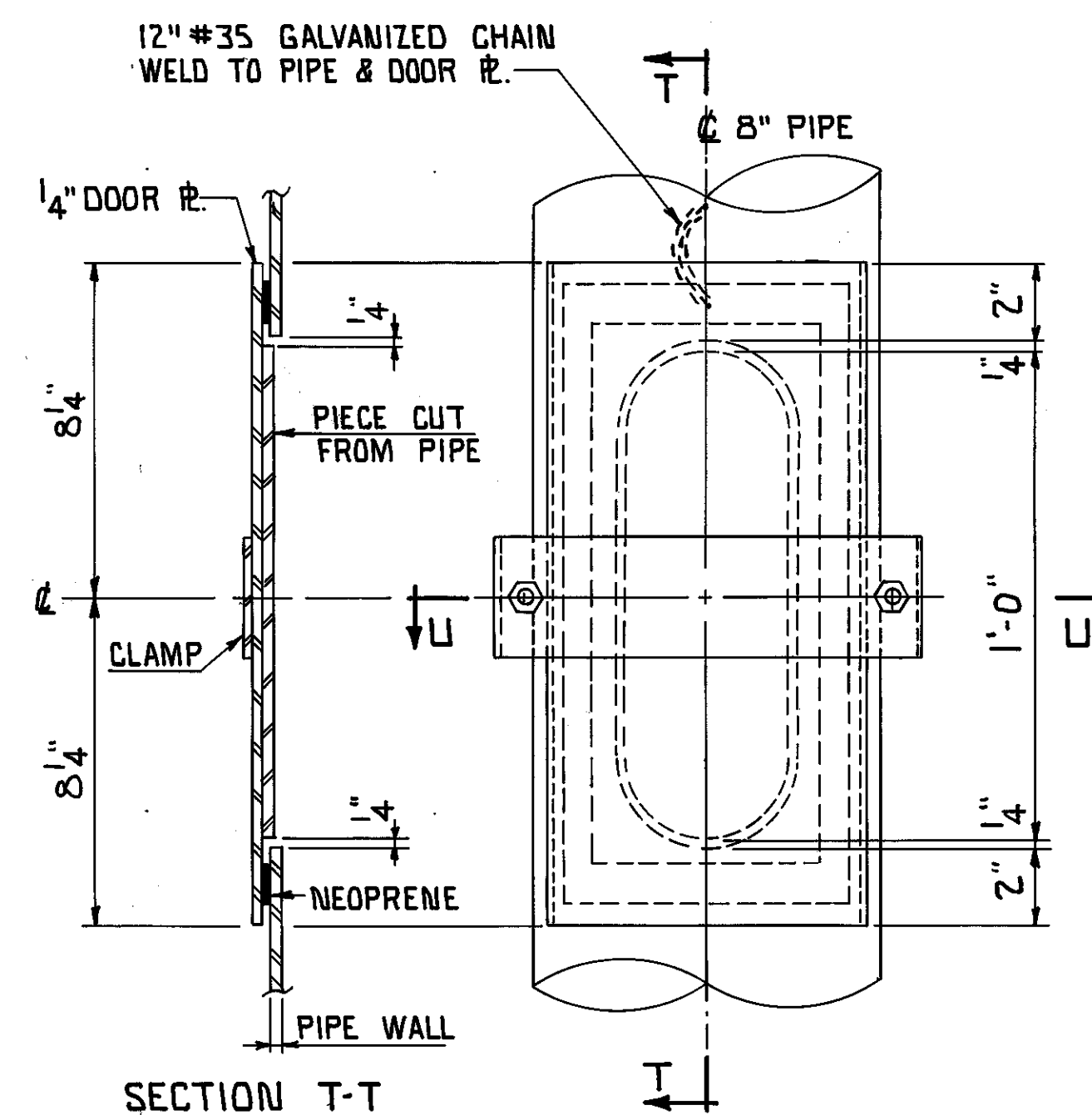
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|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| CAP | CAP | | DF | JRH | 2/83 | 10/83 |



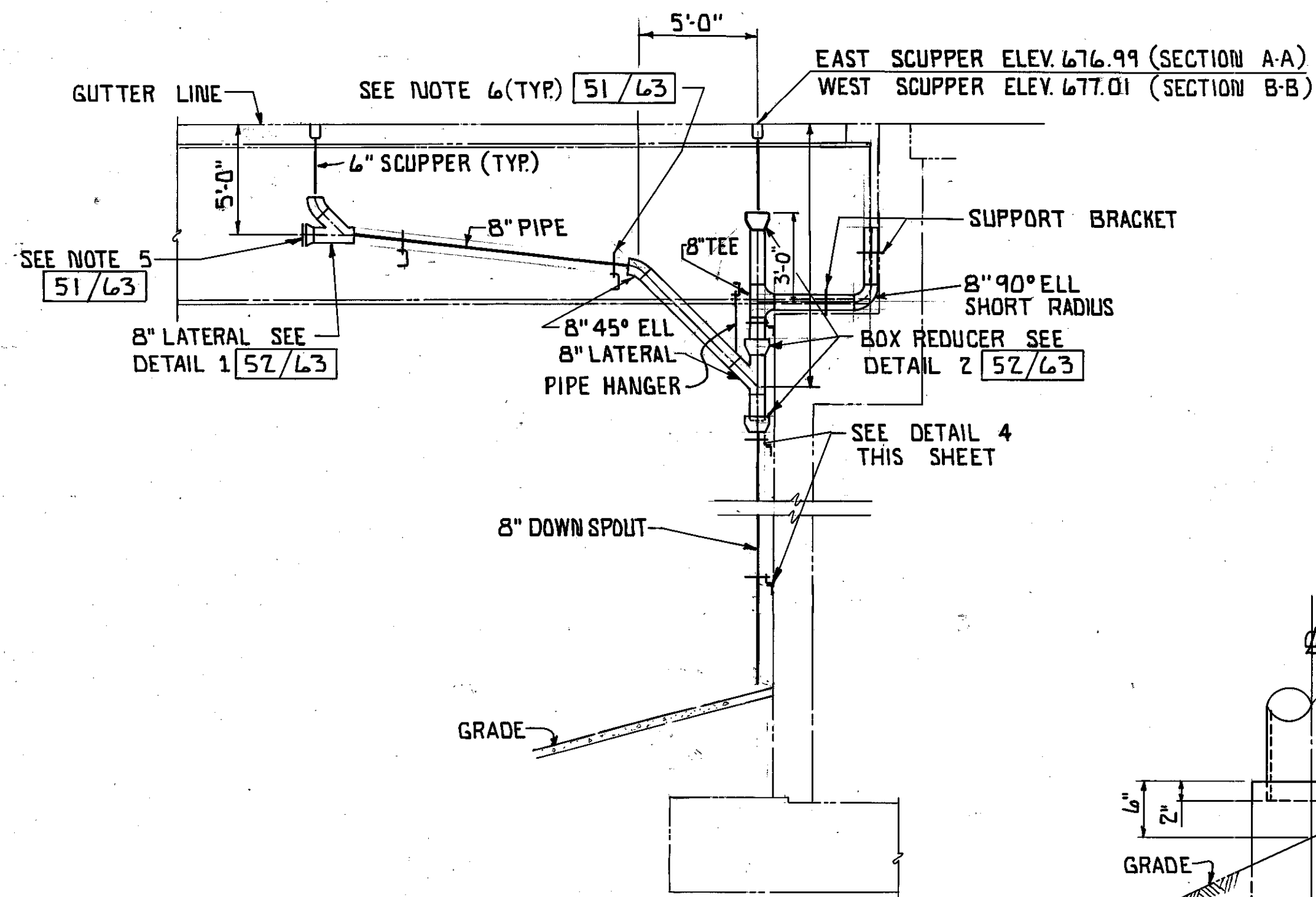
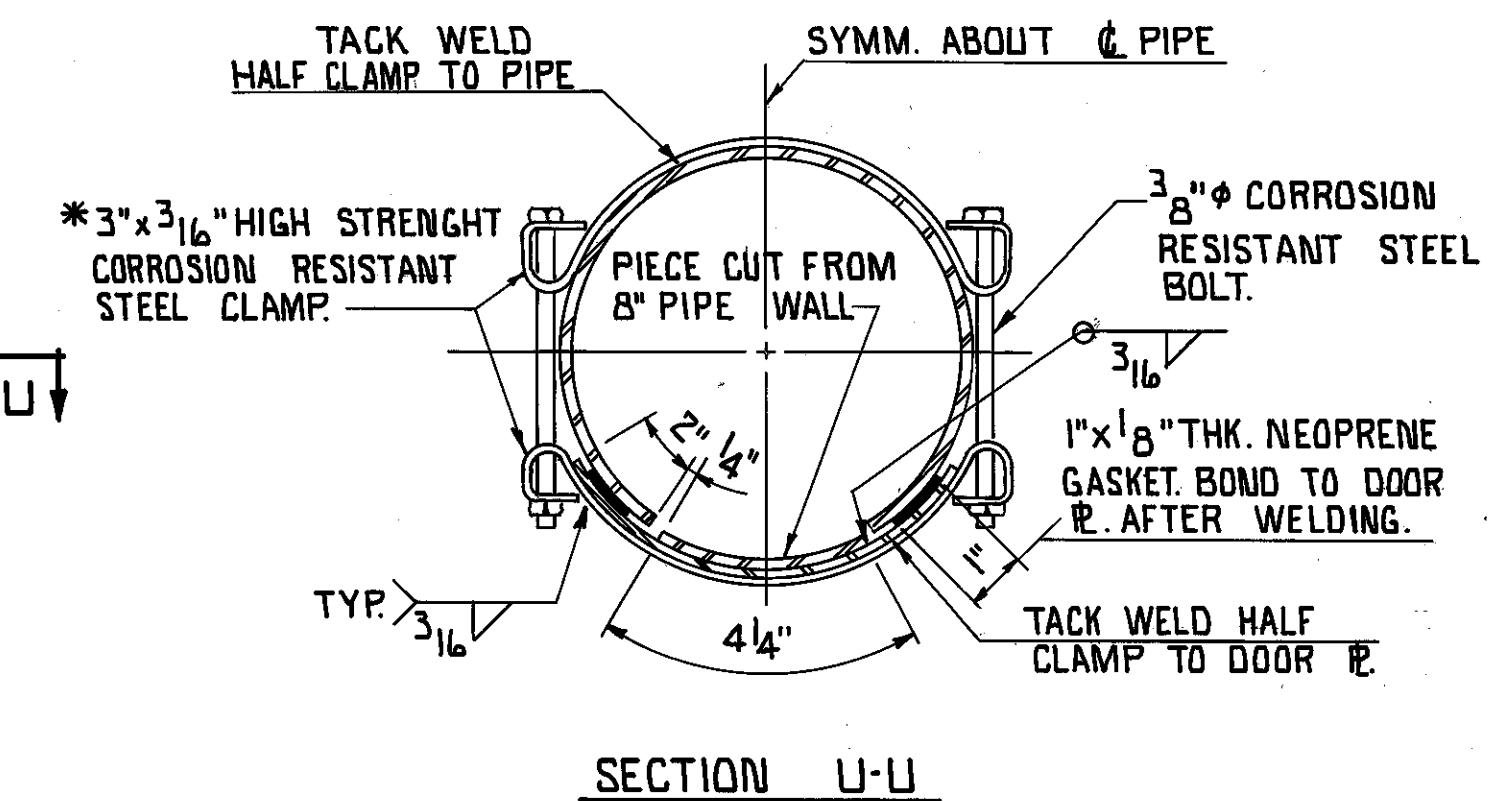
**PLAN DECK DRAINAGE
 FORWARD ABUTMENT**



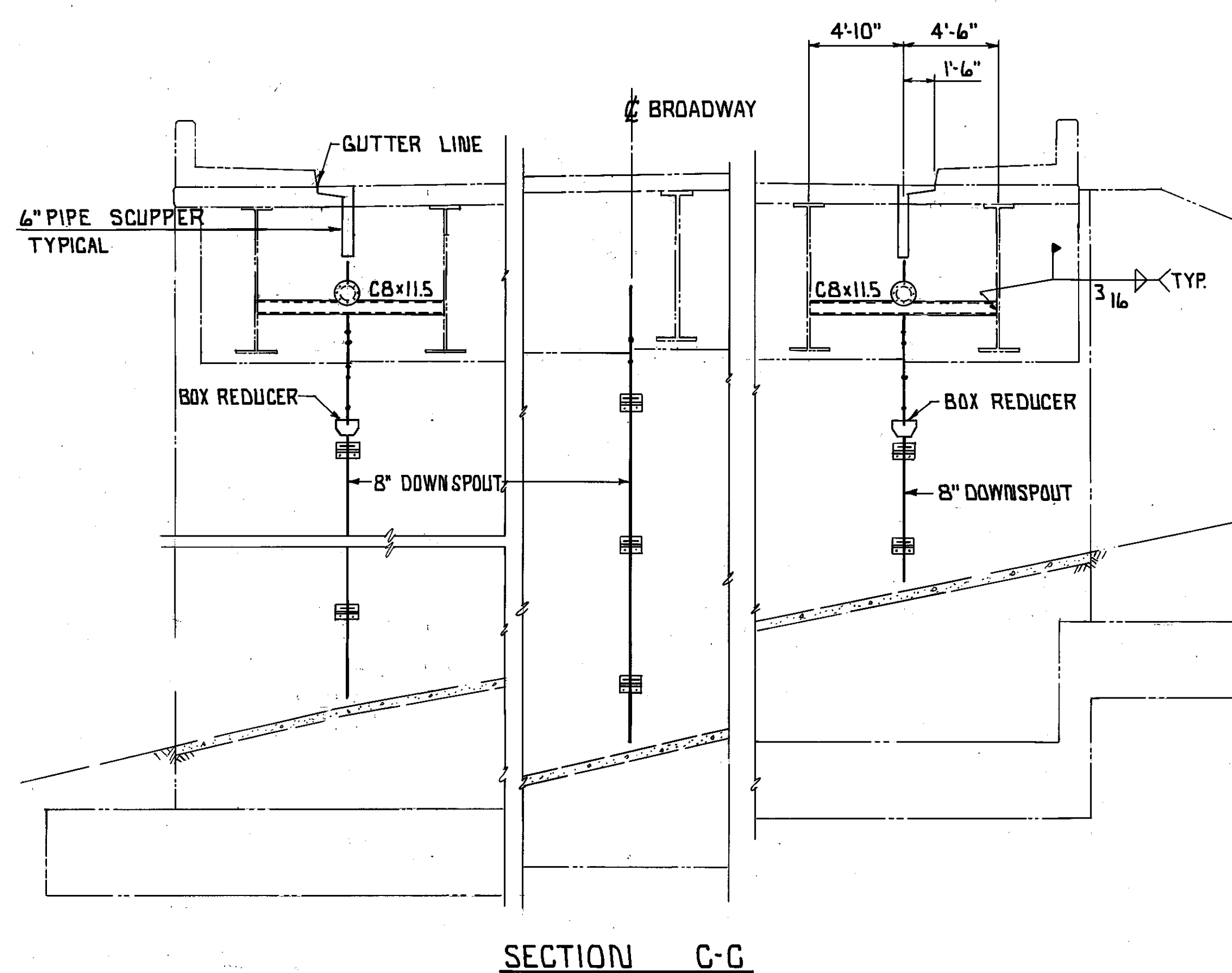
DETAIL "K"



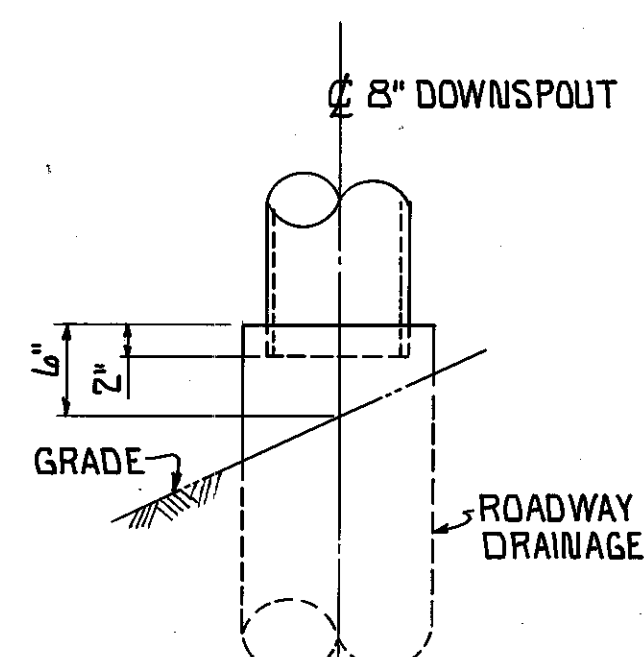
DETAIL "3" - CLEANOUT
 *CLAMP AVAILABLE FROM SUPPLIERS OF PARTS FOR OVERHEAD SIGN SUPPORTS.



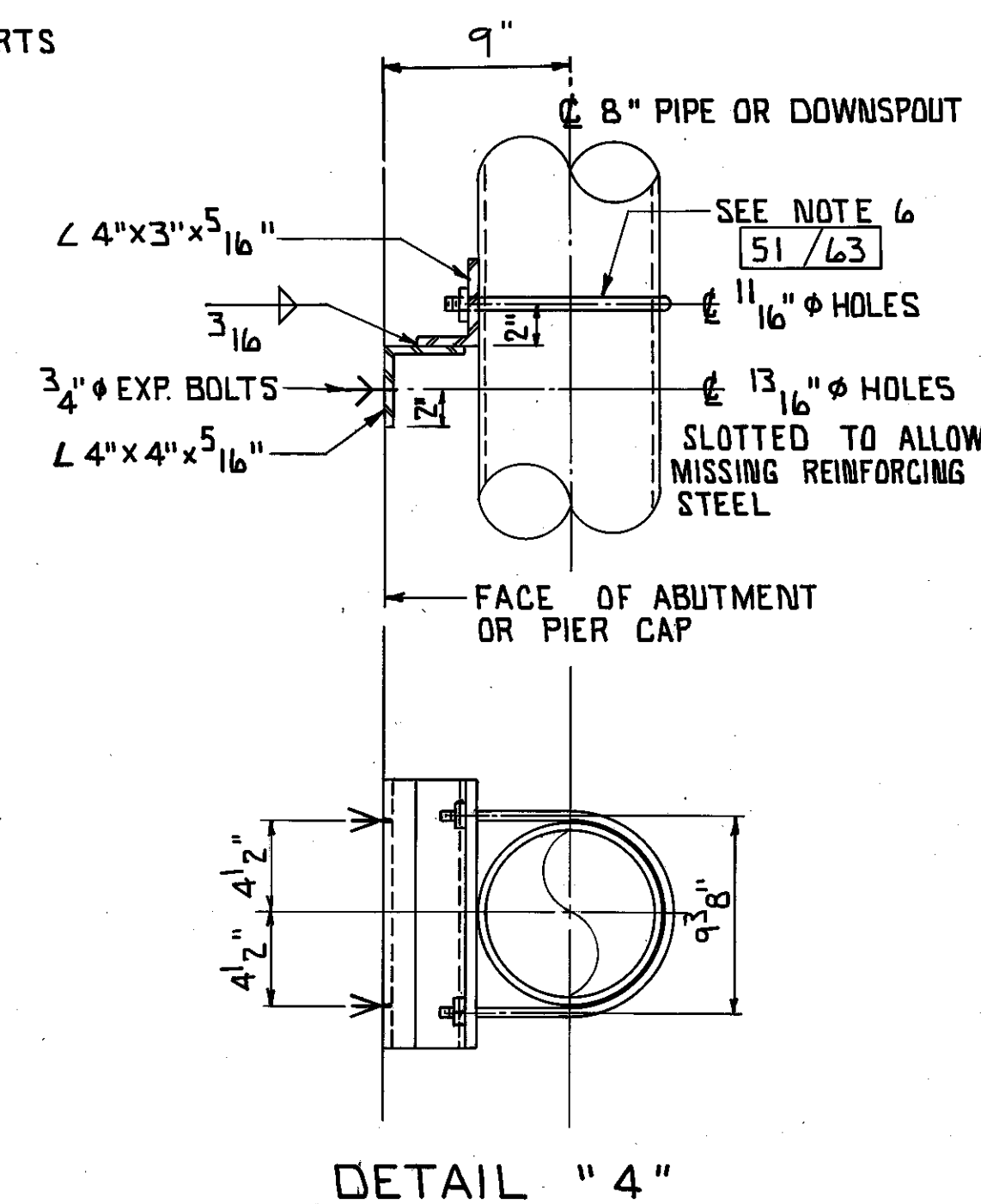
**SECTION A-A SHOWN AND NOTED
 SECTION B-B OPPOSITE AND NOTED**



SECTION C-C



DETAIL "6"



DETAIL "4"

SEE 51/63 FOR NOTES.

WESTON A Business Trust
 DESIGNERS CONSULTANTS 3659 GREEN ROAD SUITE 215 CLEVELAND, OHIO 44122

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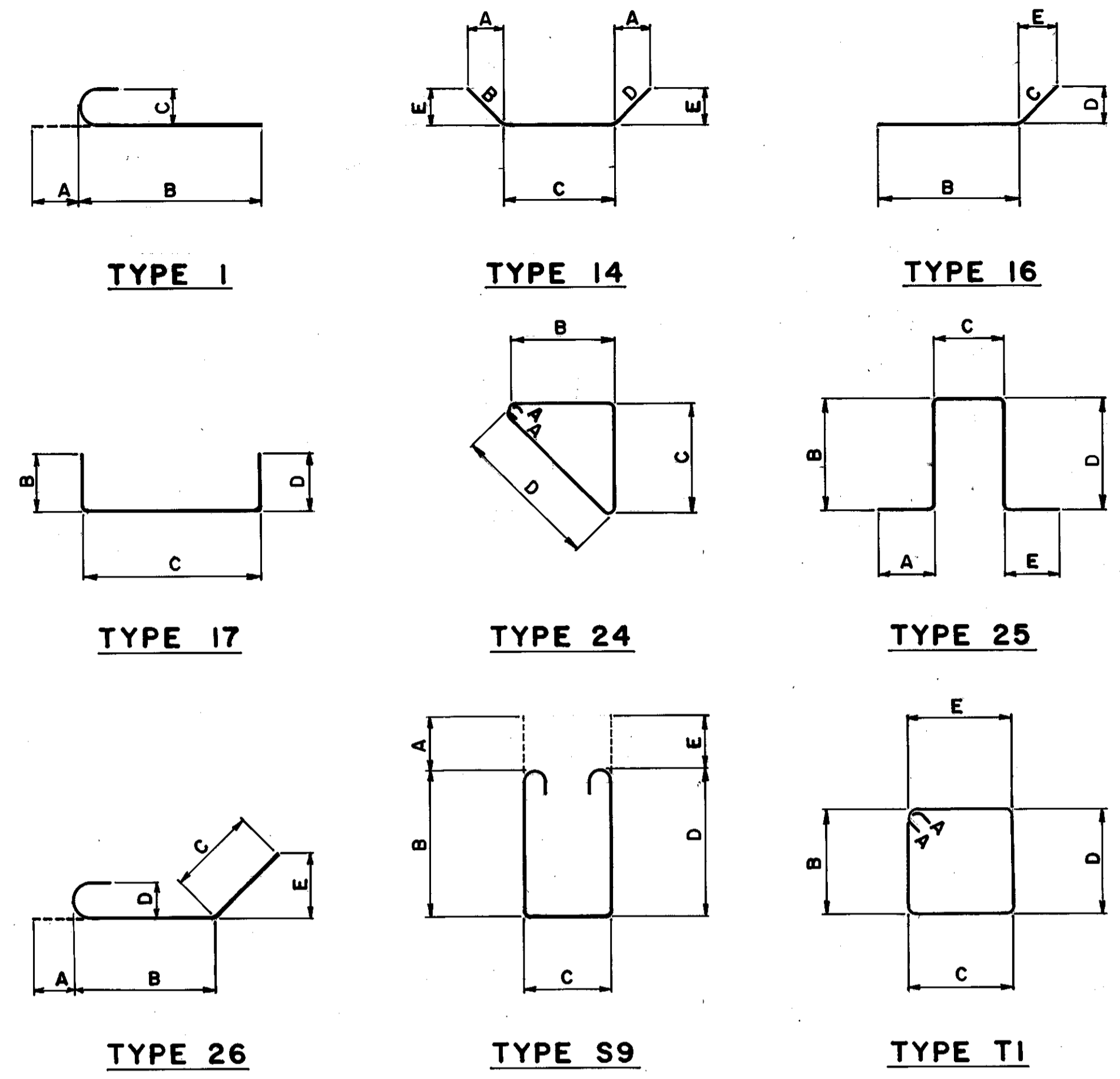
**SUPERSTRUCTURE
 FORWARD ABUTMENT SCUPPER
 LOCATION AND DRAINAGE DETAILS**

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
|----------|-------|--------|---------|----------|------|---------|
| CAP | CAP | | DF | JRH | 2/83 | 10/83 |

| ABUTMENT | | | | | | | | | | |
|----------|------------|----------|-----------------|--------|--|--|------------|-----------|------------------------------|--------|
| MARK | NO. REQ'D. | TYPE | LENGTH | A | B | C | D | E | | WEIGHT |
| A401 | 130 | T1 | 12'-0" | 4 1/2" | 3'-5" | 2'-4" | 3'-5" | 2'-4" | | 1,042 |
| | | | | | | | | | SUB TOTAL = | 1,042 |
| A502 | 24 | STRAIGHT | 25'-2" | | | | | | | 630 |
| A503 | 97 | STRAIGHT | 21'-9" | | | | | | | 2,200 |
| A504 | 20 | STRAIGHT | 32'-8" | | | | | | | 681 |
| A505 | 8 | 17 | 6'-2" | | 1'-4" | 3'-9" | 1'-4" | | | 51 |
| A506 | 8 | 17 | 6'-1" | | 1'-6" | 3'-4" | 1'-6" | | | 51 |
| A511 | 102 | 17 | 9'-3" | | 4'-0" | 1'-6" | 4'-0" | | | 984 |
| A512 | 6 | 25 | 12'-11" | 1'-0" | 4'-11 1/2" | 1'-6" | 4'-11 1/2" | 1'-0" | | 81 |
| A513 | 6 | 25 | 11'-11" | 1'-0" | 4'-5 1/2" | 1'-6" | 4'-5 1/2" | 1'-0" | | 75 |
| A514 | 6 | 25 | 10'-10" | 1'-0" | 3'-11" | 1'-6" | 3'-11" | 1'-0" | | 68 |
| A515 | 12-SERIES | 17 | 3'-8" TO 12'-0" | | 1'-0" | 12-SERIES OF 17/2'-9 1/2" TO 11'-1 1/2" / 6 1/4" INCR. | | | | 1,667 |
| A517 | 2 | 17 | 2'-6" | | 1'-0" | 9" | 1'-0" | | | 5 |
| A518 | 2 | 17 | 3'-3" | | 1'-0" | 1'-6" | 1'-0" | | | 7 |
| A519 | 40 | STRAIGHT | 33'-6" | | | | | | | 1,398 |
| | | | | | | | | | SUB TOTAL = | 7,898 |
| A601 | 97 | 17 | 10'-1" | | 4'-9" | 11 1/4" | 4'-9" | | | 1,469 |
| A602 | 22 | STRAIGHT | 16'-6" | | | | | | | 545 |
| A603 | 24 | STRAIGHT | 25'-4" | | | | | | | 913 |
| A604 | 241 | 1 | 17'-2" | 8" | 16'-6" | 6" | | | | 6,214 |
| A605 | 97 | STRAIGHT | 22'-0" | | | | | | | 3,205 |
| A606 | 8 | STRAIGHT | 31'-7" | | | | | | | 380 |
| A607 | 16 | STRAIGHT | 33'-10" | | | | | | | 813 |
| A608 | 44 | STRAIGHT | 8'-6" | | | | | | | 562 |
| | | | | | | | | | SUB TOTAL = | 14,101 |
| A701 | 100 | STRAIGHT | 25'-6" | | | | | | | 5,212 |
| A702 | 144 | 17 | 6'-10" | | 1'-6" | 5'-6" | | | | 2,011 |
| A703 | 12 | 17 | 5'-10" | | 1'-6" | 4'-6" | | | | 143 |
| A704 | 20 | STRAIGHT | 33'-9" | | | | | | | 1,380 |
| A705 | 36 | 17 | 22'-2" | | 1'-2" | 21'-2" | | | | 1,631 |
| A706 | 12-SERIES | STRAIGHT | | | 12-SERIES OF 9/2'-6" TO 18'-2" / 1'-11 1/2" INCREMENTS | | | | | 2,281 |
| A707 | 40 | STRAIGHT | 34'-3" | | | | | | | 2,800 |
| | | | | | | | | | SUB TOTAL = | 15,458 |
| A801 | 112 | STRAIGHT | 26'-9" | | | | | | | 8,000 |
| | | | | | | | | | SUB TOTAL = | 8,000 |
| A901 | 36 | 26 | 8'-4" | 1'-3" | 2'-0 1/2" | 5'-0 1/2" | 11 3/4" | 2'-3 1/2" | | 1,020 |
| A902 | 12 | STRAIGHT | 34'-6" | | | | | | | 1,408 |
| A903 | 36 | STRAIGHT | 25'-6" | | | | | | | 3,121 |
| A904 | 24 | STRAIGHT | 35'-6" | | | | | | | 2,897 |
| | | | | | | | | | SUB TOTAL = | 8,446 |
| | | | | | | | | | REAR ABUTMENT TOTAL WEIGHT = | 54,940 |

| ABUTMENT | | | | | | | | | | |
|----------|------------|----------|--------|--------|--------|-----------|-----------|-----------|---|--------|
| MARK | NO. REQ'D. | TYPE | LENGTH | A | B | C | D | E | | WEIGHT |
| EA401 | 16 | 17 | 4'-3" | | 1'-8" | 1'-1" | 1'-8" | | | 45 |
| EA402 | 12 | 24 | 11'-1" | 4 1/2" | 2'-4" | 3'-9" | 4'-5" | | | 89 |
| | | | | | | | | | SUB TOTAL = | 134 |
| EA501 | 2 | 17 | 2'-3" | | 6 1/2" | 1'-10" | | | | 5 |
| EA502 | 4 | S9 | 7'-9" | 7" | 3'-1" | 8" | 3'-1" | 7" | | 32 |
| EA503 | 93 | STRAIGHT | 4'-0" | | | | | | | 388 |
| EA504 | 7 | STRAIGHT | 32'-8" | | | | | | | 238 |
| EA507 | 26 | STRAIGHT | 6'-6" | | | | | | | 176 |
| EA509 | 93 | 17 | 7'-3" | | 1'-3" | 6'-1 1/2" | | | | 703 |
| EA510 | 93 | 17 | 7'-7" | | 4'-7" | 11" | 2'-4" | | | 736 |
| EA516 | 6 | 16 | 31'-0" | | 29'-0" | 2'-0" | 1'-0 3/4" | 1'-8 1/2" | | 194 |
| EA519 | 26 | STRAIGHT | 33'-6" | | | | | | | 908 |
| EA520 | 8 | STRAIGHT | 5'-0" | | | | | | | 42 |
| | | | | | | | | | SUB TOTAL = | 3,422 |
| EA601 | 2 | 17 | 2'-4" | | 6" | 1'-8" | 6" | | | 7 |
| EA602 | 2 | 17 | 8'-7" | | 6" | 7'-11" | 6" | | | 26 |
| | | | | | | | | | SUB TOTAL = | 33 |
| EA802 | 60 | 14 | 5'-3" | 1'-0" | 1'-5" | 2'-7" | 1'-5" | 1'-0" | | 841 |
| | | | | | | | | | SUB TOTAL = | 841 |
| | | | | | | | | | REAR ABUTMENT EPDXY COATED TOTAL WEIGHT = | 4,346 |



- NOTES:**
- REFER TO CMS SECTIONS 106.03, 700, 709.01 THROUGH 709.05, AND 709.08. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.
 - REINFORCING STEEL PREFIXED WITH AN "E" IN THE MARK NO. WILL BE EPOXY COATED. EXAMPLE: EA401

WESTON A Business Trust
 DESIGNERS CONSULTANTS
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

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**BAR SCHEDULE
 REAR ABUTMENT**

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED

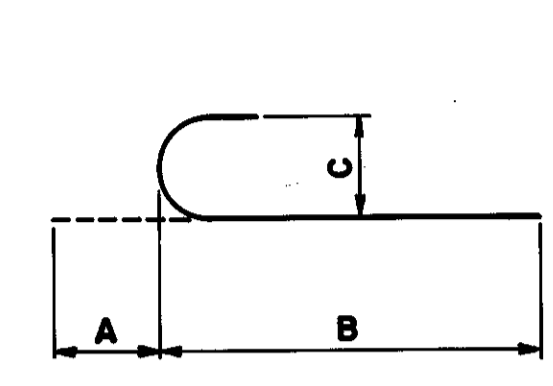
WHH | PRB | DF | JRH | 2/83 | 10/83

WINGWALL

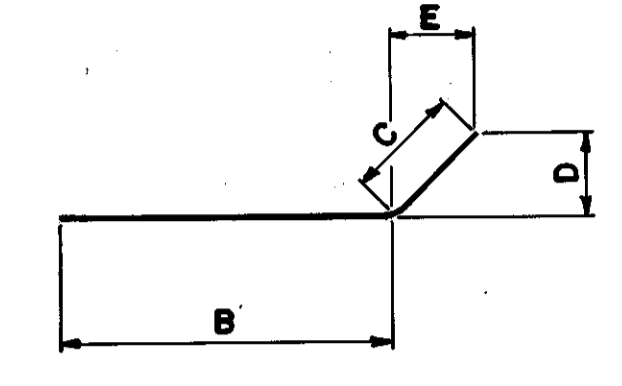
| MARK | NO. REQUIRED | | | TYPE | LENGTH | A | B | C | D | E | SERIES INCREMENT | WEIGHT |
|------|--------------|--------|----------|----------|---------|--------------------------------------|--------|-------|-------|-------|------------------|--------------------|
| | EAST | WEST | TOTAL | | | | | | | | | |
| W501 | 46 | 82 | 128 | STRAIGHT | 4'-6" | | | | | | | 601 |
| W502 | 10 | — | 10 | 1 | 8'-4" | 7" | 7'-9" | 5" | | | | 87 |
| W503 | 44 | 50 | 94 | STRAIGHT | 23'-8" | | | | | | | 2,320 |
| W504 | 20 | — | 20 | STRAIGHT | 19'-8" | | | | | | | 410 |
| W505 | 2-SER. | — | 2-SERIES | STRAIGHT | | 2-SERIES OF 8/4'-4" TO 20'-11 1/2" | | | | | 2'-4 1/2" | 211 |
| W506 | 2-SER. | — | 2-SERIES | STRAIGHT | | 2-SERIES OF 8/1'-7 1/2" TO 18'-2" | | | | | 2'-4 1/2" | 165 |
| W507 | 4 | 2 | 6 | STRAIGHT | 29'-0" | | | | | | | 181 |
| W508 | 1-SER. | — | 1-SERIES | STRAIGHT | | 1-SERIES OF 21/20'-6" TO 28'-11" | | | | | 5" | 541 |
| W509 | 1-SER. | — | 1-SERIES | STRAIGHT | | 1-SERIES OF 21/8'-11" TO 17'-3" | | | | | 5" | 287 |
| W510 | 2 | — | 2 | 16 | 25'-2" | | 21'-5" | 3'-9" | 1'-7" | 3'-5" | | 52 |
| W511 | 2 | — | 2 | STRAIGHT | 21'-5" | | | | | | | 45 |
| W512 | — | 4 | 4 | STRAIGHT | 28'-2" | | | | | | | 118 |
| W513 | 4 | 4 | 8 | STRAIGHT | 12'-8" | | | | | | | 106 |
| W514 | 13 | — | 13 | STRAIGHT | 11'-4" | | | | | | | 154 |
| W515 | 1-SER. | — | 1-SERIES | STRAIGHT | | 1-SERIES OF 10/8'-8" TO 12'-5" | | | | | 5" | 110 |
| W516 | 1-SER. | — | 1-SERIES | STRAIGHT | | 1-SERIES OF 10/4'-6" TO 8'-3" | | | | | 5" | 66 |
| W517 | 1-SER. | — | 1-SERIES | STRAIGHT | | 1-SERIES OF 10/5'-0" TO 8'-9" | | | | | 5" | 72 |
| W518 | 1-SER. | — | 1-SERIES | STRAIGHT | | 1-SERIES OF 10/5'-10" TO 9'-7" | | | | | 5" | 80 |
| W519 | — | 24 | 24 | STRAIGHT | 5'-9" | | | | | | | 144 |
| W520 | — | 25 | 25 | STRAIGHT | 8'-11" | | | | | | | 233 |
| W521 | — | 25 | 25 | STRAIGHT | 8'-4" | | | | | | | 217 |
| W522 | — | 2-SER. | 2-SERIES | STRAIGHT | | 2-SERIES OF 4/4'-7 1/2" TO 19'-0" | | | | | 4'-9 1/2" | 100 |
| W523 | — | 2 | 2 | STRAIGHT | 24'-2" | | | | | | | 50 |
| W524 | — | 1-SER. | 1-SERIES | STRAIGHT | | 1-SERIES OF 25/12'-3" TO 17'-3" | | | | | 2 1/2" | 385 |
| W525 | — | 1-SER. | 1-SERIES | STRAIGHT | | 1-SERIES OF 25/7'-8" TO 12'-8" | | | | | 2 1/2" | 265 |
| W526 | — | 1-SER. | 1-SERIES | STRAIGHT | | 1-SERIES OF 19/5'-5 1/2" TO 12'-7" | | | | | 4 3/4" | 179 |
| W527 | — | 1-SER. | 1-SERIES | STRAIGHT | | 1-SERIES OF 10/3'-9 1/4" TO 7'-4" | | | | | 4 3/4" | 58 |
| W528 | — | 1-SER. | 1-SERIES | STRAIGHT | | 1-SERIES OF 29/17'-3" TO 28'-5" | | | | | 4 3/4" | 691 |
| W529 | — | 2-SER. | 2-SERIES | STRAIGHT | | 2-SERIES OF 11/4'-1" TO 29'-6" | | | | | 2'-6 1/2" | 385 |
| W530 | — | 38 | 38 | STRAIGHT | 31'-8" | | | | | | | 1,255 |
| W531 | — | 2 | 2 | 16 | 6'-2" | | 3'-8" | 2'-6" | 11" | 2'-4" | | 13 |
| | | | | | | | | | | | | SUB TOTAL = 9,581 |
| W601 | 2 | — | 2 | STRAIGHT | 26'-0" | | | | | | | 78 |
| W602 | 2 | — | 2 | STRAIGHT | 23'-0" | | | | | | | 69 |
| W603 | 2 | — | 2 | STRAIGHT | 20'-6" | | | | | | | 62 |
| W604 | 2-SER. | — | 2-SERIES | STRAIGHT | | 2-SERIES OF 19/17'-10 1/2" TO 26'-6" | | | | | 5 3/4" | 1,266 |
| W605 | 8 | 10 | 18 | STRAIGHT | 17'-0" | | | | | | | 460 |
| W606 | 2 | — | 2 | STRAIGHT | 19'-10" | | | | | | | 60 |
| W607 | 2 | — | 2 | STRAIGHT | 16'-9" | | | | | | | 50 |
| W608 | 52 | 54 | 106 | STRAIGHT | 11'-6" | | | | | | | 1,831 |
| W609 | 2-SER. | — | 2-SERIES | STRAIGHT | | 2-SERIES OF 12/16'-0" TO 20'-4 1/4" | | | | | 4 3/4" | 655 |
| W610 | 22 | 33 | 55 | STRAIGHT | 17'-6" | | | | | | | 1,446 |
| W611 | — | 58 | 58 | STRAIGHT | 8'-6" | | | | | | | 740 |
| W612 | — | 2 | 2 | STRAIGHT | 22'-10" | | | | | | | 69 |
| W613 | — | 2 | 2 | STRAIGHT | 23'-6" | | | | | | | 71 |
| W614 | — | 6 | 6 | STRAIGHT | 25'-6" | | | | | | | 230 |
| W615 | — | 2 | 2 | STRAIGHT | 29'-9" | | | | | | | 89 |
| W616 | — | 4 | 4 | STRAIGHT | 32'-0" | | | | | | | 192 |
| W617 | — | 25 | 25 | STRAIGHT | 5'-9" | | | | | | | 216 |
| W618 | — | 2-SER. | 2-SERIES | STRAIGHT | | 2-SERIES OF 10/22'-8" TO 23'-9 1/2" | | | | | 1 1/2" | 698 |
| W619 | — | 26 | 26 | STRAIGHT | 28'-3" | | | | | | | 1,103 |
| W620 | — | 2-SER. | 2-SERIES | STRAIGHT | | 2-SERIES OF 19/29'-6" TO 32'-1 1/2" | | | | | 1 3/4" | 1,759 |
| W621 | 6 | 8 | 14 | STRAIGHT | 10'-0" | | | | | | | 210 |
| W622 | — | 12 | 12 | STRAIGHT | 7'-0" | | | | | | | 126 |
| | | | | | | | | | | | | SUB TOTAL = 11,480 |

WINGWALL

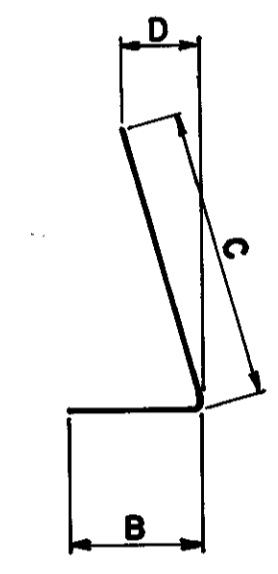
| MARK | NO. REQUIRED | | | TYPE | LENGTH | A | B | C | D | E | SERIES INCREMENT | WEIGHT |
|-------|--------------|------|-------|----------|---------|-----|--------|-------|----|---|------------------|--|
| | EAST | WEST | TOTAL | | | | | | | | | |
| W701 | 10 | — | 10 | 1 | 13'-7" | 10" | 12'-9" | 7" | | | | 278 |
| W702 | 20 | — | 20 | 1 | 8'-7" | 10" | 7'-9" | 7" | | | | 351 |
| W703 | — | 25 | 25 | 1 | 10'-7" | 10" | 9'-9" | 7" | | | | 541 |
| | | | | | | | | | | | | SUB TOTAL = 1,170 |
| W801 | 43 | — | 43 | STRAIGHT | 17'-6" | | | | | | | 2,009 |
| W802 | — | 10 | 10 | STRAIGHT | 14'-7" | | | | | | | 389 |
| W803 | 10 | 31 | 41 | STRAIGHT | 8'-7" | | | | | | | 940 |
| W804 | 10 | 23 | 33 | STRAIGHT | 16'-7" | | | | | | | 1,461 |
| | | | | | | | | | | | | SUB TOTAL = 4,799 |
| W901 | 14 | — | 14 | STRAIGHT | 15'-3" | | | | | | | 726 |
| W902 | 13 | — | 13 | STRAIGHT | 11'-3" | | | | | | | 497 |
| W903 | — | 65 | 65 | STRAIGHT | 17'-6" | | | | | | | 3,868 |
| | | | | | | | | | | | | SUB TOTAL = 5,091 |
| W1001 | 10 | — | 10 | 27 | 13'-6" | | 6'-10" | 7'-0" | 7" | | | 581 |
| W1002 | 10 | — | 10 | 27 | 11'-9" | | 3'-1" | 9'-0" | 9" | | | 506 |
| W1003 | — | 32 | 32 | 27 | 13'-3" | | 6'-7" | 7'-0" | 7" | | | 1,824 |
| W1004 | — | 31 | 31 | 27 | 11'-6" | | 2'-10" | 9'-0" | 9" | | | 1,534 |
| | | | | | | | | | | | | SUB TOTAL = 4,445 |
| W1101 | 13 | — | 13 | 27 | 12'-1" | | 3'-5" | 9'-0" | 9" | | | 835 |
| W1102 | 14 | — | 14 | 27 | 13'-10" | | 7'-2" | 7'-0" | 7" | | | 1,029 |
| | | | | | | | | | | | | SUB TOTAL = 1,864 |
| | | | | | | | | | | | | REAR ABUTMENT EAST AND WEST WINGWALL TOTAL WEIGHT = 38,430 |



TYPE 1



TYPE 16



TYPE 27

NOTES:

- REFER TO CMS SECTIONS 106.03, 700, 709.01 THROUGH 709.05, AND 709.08. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.

WESTON A Business Trust
 DESIGNERS CONSULTANTS 3659 GREEN ROAD SUITE 215 CLEVELAND, OHIO 44122
 56/63

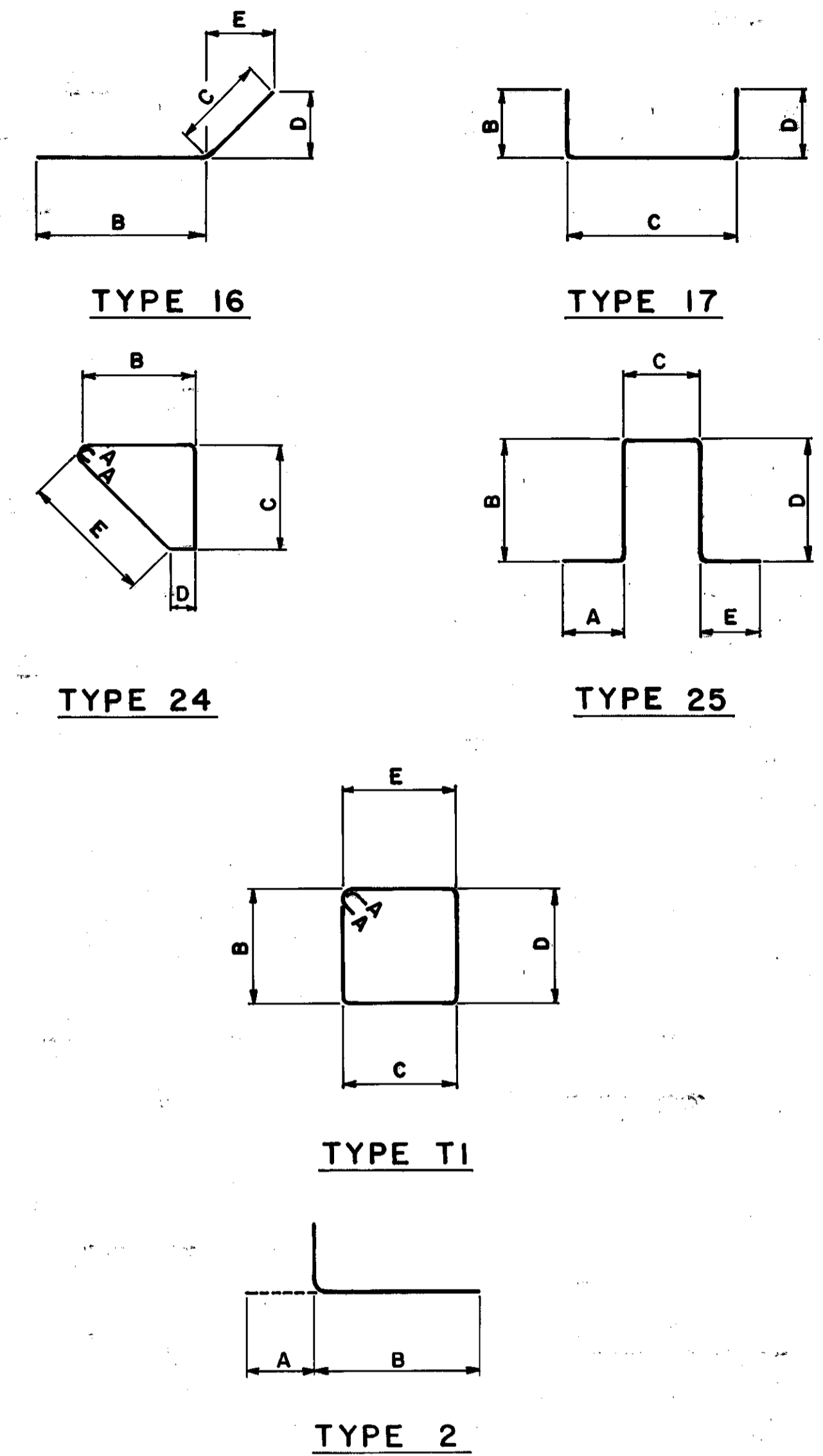
BAR SCHEDULE
 REAR ABUTMENT
 EAST AND WEST WINGWALL
 BRIDGE NO. CUY - 490 - 0152
 I-490 UNDER RELOC. BROADWAY

DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED
 WHH | PRB | | DF | JRH | 2/83 | 10/83

CUY-490-1.49

| ABUTMENT | | | | | | | | | | |
|-------------|------------|----------|------------------|--------|-------------------------------------|-----------------------------------|-----------|-----------|------------------|--------|
| MARK | NO. REQ'D. | TYPE | LENGTH | A | B | C | D | E | SERIES INCREMENT | WEIGHT |
| A501 | 135 | STRAIGHT | 4'-0" | | | | | | | 563 |
| A502 | 35 | STRAIGHT | 9'-8" | | | | | | | 353 |
| A503 | 16 | STRAIGHT | 14'-8" | | | | | | | 245 |
| A504 | 1 | 16 | 15'-9" | | 14'-3" | 1'-6" | 9 1/2" | 1'-3 1/4" | | 16 |
| A505 | 10 | STRAIGHT | 35'-8" | | | | | | | 372 |
| A506 | 23 | STRAIGHT | 32'-0" | | | | | | | 768 |
| A507 | 23 | STRAIGHT | 33'-0" | | | | | | | 792 |
| A508 | 21 | STRAIGHT | 29'-10" | | | | | | | 653 |
| A509 | 64 | STRAIGHT | 16'-10" | | | | | | | 1,124 |
| A510 | 126 | T1 | 14'-3 1/2" | 5 1/2" | 3'-5 1/4" | 3'-5 1/4" | 3'-5 1/4" | 3'-5 1/4" | | 1,878 |
| A511 | 3 | 17 | 5'-9 1/2" | | 1'-0" | 4'-0 1/2" | 1'-0" | | | 18 |
| A512 | 5 | 17 | 5'-1" | | 1'-0" | 3'-4" | 1'-0" | | | 27 |
| A517 | 12 | STRAIGHT | 18'-8" | | | | | | | 234 |
| A521 | 80 | STRAIGHT | 8'-6" | | | | | | | 709 |
| A525 | 29 | 25 | 18'-10" | 1'-0" | 7'-5" | 2'-0" | 7'-5" | 1'-0" | | 570 |
| A528 | 7 | T1 | 14'-1" | 5 1/2" | 1'-6" | 5'-1" | 1'-6" | 5'-1" | | 103 |
| A529 | 56 | 17 | 7'-9" | | 3'-0" | 2'-0" | 3'-0" | | | 453 |
| A530 | 4-SERIES | STRAIGHT | | | 4-SERIES OF 6 / 3'-5 1/2" TO 13'-8" | | | 2'-0 1/2" | | 214 |
| A531 | 16 | 17 | 16'-10" | | 1'-0" | 15'-11 1/2" | | | | 281 |
| A532 | 4-SERIES | 17 | 4'-8" TO 18'-2" | | 1'-0 1/2" | 4-SERIES OF 28 / 3'-9" TO 17'-3" | | 6" | | 1,334 |
| A533 | 16 | 17 | 16'-4" | | 1'-0" | 15'-5 1/2" | | | | 273 |
| A534 | 74 | 17 | 7'-3" | | 3'-0" | 1'-6" | 3'-0" | | | 560 |
| A535 | 4-SERIES | STRAIGHT | | | 4-SERIES OF 6 / 3'-5" TO 13'-5" | | | 2'-0" | | 211 |
| A536 | 4-SERIES | 17 | 4'-8" TO 15'-2" | | 1'-0 1/2" | 4-SERIES OF 22 / 3'-9" TO 14'-3" | | 6" | | 910 |
| A537 | 16 | 17 | 16'-9" | | 1'-0" | 15'-10 1/2" | | | | 280 |
| A538 | 4-SERIES | STRAIGHT | | | 4-SERIES OF 4 / 3'-8" TO 13'-11" | | | 1'-8 1/2" | | 103 |
| A539 | 4-SERIES | 17 | 4'-9" TO 12'-11" | | 1'-0 1/2" | 4-SERIES OF 15 / 3'-10" TO 12'-0" | | 7" | | 553 |
| A540 | 16 | 17 | 10'-9" | | 3'-6 1/2" | 7'-4" | | | | 179 |
| A541 | 6 | STRAIGHT | 19'-6" | | | | | | | 122 |
| A542 | 6 | STRAIGHT | 17'-6" | | | | | | | 110 |
| A543 | 6 | STRAIGHT | 15'-0" | | | | | | | 94 |
| A544 | 16 | 17 | 7'-8" | | 1'-9 1/2" | 6'-0" | | | | 128 |
| A545 | 19 | STRAIGHT | 31'-0" | | | | | | | 614 |
| A546 | 12 | STRAIGHT | 35'-0" | | | | | | | 438 |
| A547 | 8 | STRAIGHT | 6'-6" | | | | | | | 54 |
| SUB TOTAL = | | | | | | | | | | 15,336 |

| ABUTMENT | | | | | | | | | | |
|-------------|------------|----------|---------|-----|---------------------------------|-------|---------|-----------|------------------|--------|
| MARK | NO. REQ'D. | TYPE | LENGTH | A | B | C | D | E | SERIES INCREMENT | WEIGHT |
| A601 | 136 | STRAIGHT | 4'-6" | | | | | | | 919 |
| A602 | 15 | STRAIGHT | 15'-0" | | | | | | | 338 |
| A603 | 1 | 16 | 16'-2" | | 14'-6" | 1'-8" | 10 1/2" | 1'-5" | | 24 |
| A604 | 28 | STRAIGHT | 23'-6" | | | | | | | 988 |
| A605 | 7 | STRAIGHT | 11'-4" | | | | | | | 119 |
| A606 | 23 | STRAIGHT | 18'-6" | | | | | | | 639 |
| A607 | 83 | STRAIGHT | 14'-6" | | | | | | | 1,808 |
| A608 | 3 | STRAIGHT | 12'-0" | | | | | | | 54 |
| A609 | 39 | STRAIGHT | 10'-0" | | | | | | | 586 |
| A610 | 34 | STRAIGHT | 13'-4" | | | | | | | 681 |
| A611 | 33 | STRAIGHT | 19'-6" | | | | | | | 967 |
| A612 | 111 | STRAIGHT | 17'-6" | | | | | | | 2,918 |
| A613 | 34 | STRAIGHT | 8'-10" | | | | | | | 451 |
| A614 | 8 | STRAIGHT | 6'-0" | | | | | | | 72 |
| A615 | 8 | STRAIGHT | 7'-6" | | | | | | | 90 |
| A616 | 2 | STRAIGHT | 22'-6" | | | | | | | 68 |
| A617 | 18 | STRAIGHT | 10'-6" | | | | | | | 284 |
| A618 | 4 | STRAIGHT | 16'-6" | | | | | | | 99 |
| A619 | 60 | STRAIGHT | 8'-6" | | | | | | | 766 |
| A620 | 4 | STRAIGHT | 26'-6" | | | | | | | 159 |
| A621 | 40 | STRAIGHT | 30'-0" | | | | | | | 1,802 |
| A622 | 2 | STRAIGHT | 33'-0" | | | | | | | 99 |
| A623 | 10 | STRAIGHT | 9'-8" | | | | | | | 145 |
| A624 | 21 | STRAIGHT | 16'-7" | | | | | | | 523 |
| A625 | 21 | STRAIGHT | 27'-2" | | | | | | | 857 |
| A626 | 34 | 16 | 13'-3" | | 11'-8" | 1'-7" | 10" | 1'-3" | | 677 |
| A627 | 20 | STRAIGHT | 14'-0" | | | | | | | 421 |
| A628 | 3 | STRAIGHT | 11'-8" | | | | | | | 53 |
| A629 | 2 | STRAIGHT | 11'-0" | | | | | | | 33 |
| A630 | 4-SERIES | STRAIGHT | | | 4-SERIES OF 5 / 4'-3" TO 12'-5" | | | 2'-0 1/2" | | 250 |
| A631 | 7 | STRAIGHT | 29'-4" | | | | | | | 308 |
| A632 | 7 | STRAIGHT | 28'-10" | | | | | | | 303 |
| A633 | 8 | STRAIGHT | 30'-3" | | | | | | | 363 |
| A634 | 33 | 2 | 6'-5" | 10" | 5'-7" | | | | | 318 |
| SUB TOTAL = | | | | | | | | | | 18,182 |
| A701 | 10 | STRAIGHT | 5'-0" | | | | | | | 102 |
| A702 | 33 | 2 | 12'-5" | 12" | 11'-5" | | | | | 838 |
| A703 | 14 | STRAIGHT | 35'-0" | | | | | | | 1,002 |
| A704 | 14 | STRAIGHT | 30'-0" | | | | | | | 858 |
| A705 | 10 | STRAIGHT | 25'-0" | | | | | | | 511 |
| A706 | 47 | STRAIGHT | 32'-0" | | | | | | | 3,074 |
| A707 | 8 | STRAIGHT | 14'-9" | | | | | | | 241 |
| A708 | 3 | STRAIGHT | 12'-5" | | | | | | | 76 |
| A709 | 10 | STRAIGHT | 15'-4" | | | | | | | 313 |
| A710 | 1 | STRAIGHT | 15'-6" | | | | | | | 32 |
| SUB TOTAL = | | | | | | | | | | 7,047 |



NOTES:
 1. REFER TO CMS SECTIONS 106.03, 700, 709.01 THROUGH 709.05, AND 709.08. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.

WESTON A Business Trust
 DESIGNERS CONSULTANTS 3659 GREEN ROAD SUITE 215 CLEVELAND, OHIO 44122 5/7/83

BAR SCHEDULE FORWARD ABUTMENT
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

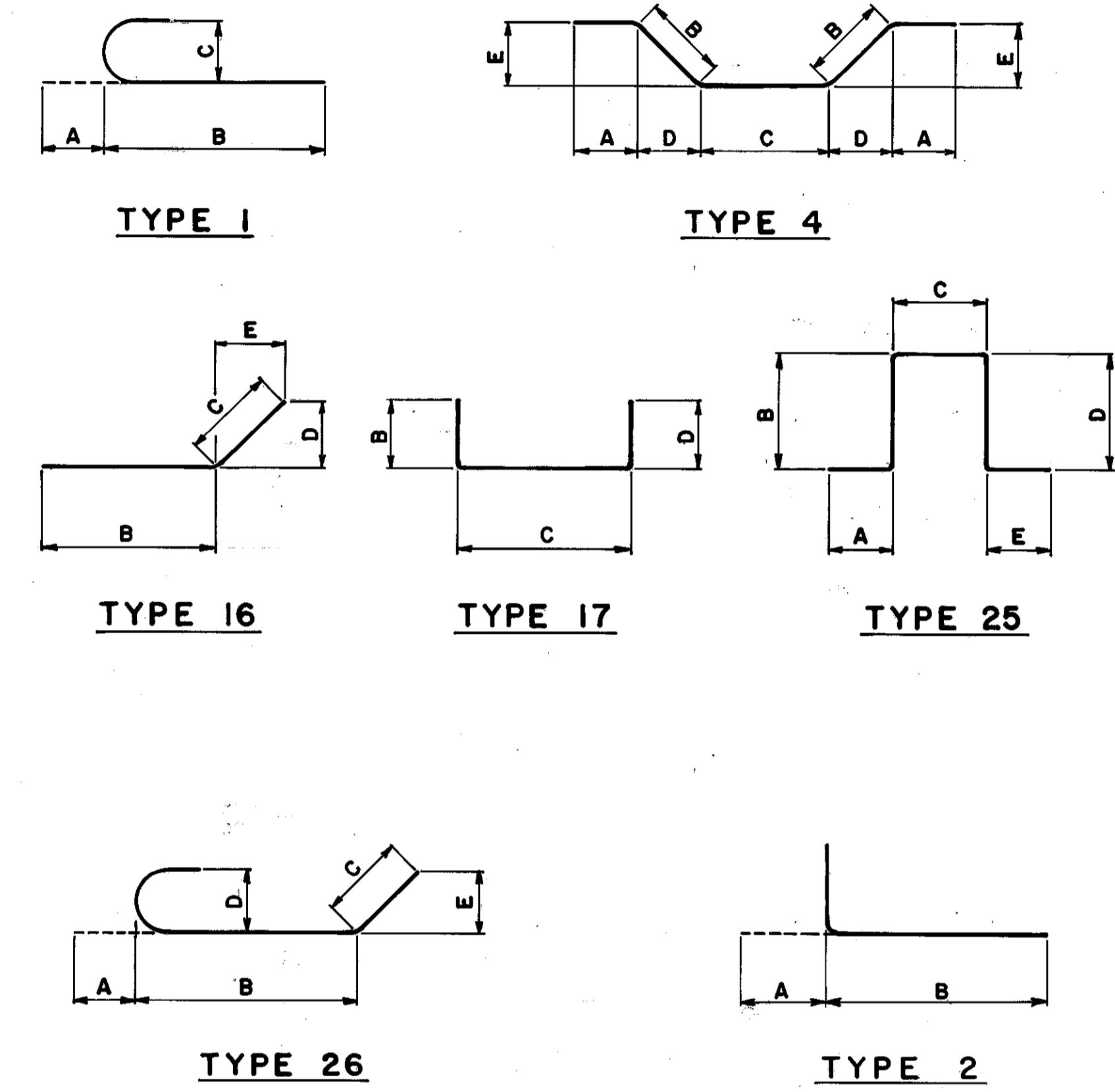
DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED
 WHH | PRB | | DF | JRH | 2/83 | 10/83

WINGWALL

| MARK | NO. REQUIRED | | | TYPE | LENGTH | A | B | C | D | E | SERIES INCREMENT | WEIGHT |
|------|--------------|--------|----------|----------|-------------------------|-------------------------------------|------------|--------------------------------------|------------|-----------|------------------|--------|
| | EAST | WEST | TOTAL | | | | | | | | | |
| W501 | 132 | 28 | 160 | STRAIGHT | 4'-0" | | | | | | | 668 |
| W502 | 42 | 13 | 55 | STRAIGHT | 11'-6" | | | | | | | 660 |
| W503 | 37 | — | 37 | STRAIGHT | 33'-0" | | | | | | | 1,273 |
| W504 | — | 4 | 4 | STRAIGHT | 9'-5" | | | | | | | 39 |
| W505 | 63 | — | 63 | STRAIGHT | 8'-6" | | | | | | | 559 |
| W506 | 149 | — | 149 | STRAIGHT | 30'-0" | | | | | | | 4,662 |
| W507 | 33 | 4 | 37 | STRAIGHT | 20'-5" | | | | | | | 788 |
| W508 | — | 2 | 2 | 16 | 29'-6" | | 25'-9" | 3'-9" | 1'-5" | 3'-5 1/2" | | 62 |
| W509 | — | 1-SER. | 1-SERIES | STRAIGHT | | 1-SERIES OF 12 / 4'-9" TO 9'-4" | | | | | 5" | 88 |
| W510 | — | 1-SER. | 1-SERIES | STRAIGHT | | 1-SERIES OF 25 / 10'-6" TO 20'-0" | | | | | 5" | 405 |
| W511 | — | 1-SER. | 1-SERIES | STRAIGHT | | 1-SERIES OF 13 / 4'-4" TO 9'-4" | | | | | 5" | 93 |
| W512 | — | 2-SER. | 2-SERIES | STRAIGHT | | 2-SERIES OF 9 / 6'-1" TO 25'-3" | | | | | 2'-4 3/4" | 294 |
| W513 | 33 | — | 33 | STRAIGHT | 24'-9" | | | | | | | 852 |
| W514 | 33 | — | 33 | STRAIGHT | 9'-2" | | | | | | | 316 |
| W515 | 37 | — | 37 | STRAIGHT | 9'-0" | | | | | | | 347 |
| W516 | — | 24 | 24 | STRAIGHT | 27'-6" | | | | | | | 688 |
| W517 | 52 | — | 52 | STRAIGHT | 25'-8" | | | | | | | 1,392 |
| W518 | 10 | — | 10 | STRAIGHT | 22'-1" | | | | | | | 230 |
| W519 | 33 | — | 33 | STRAIGHT | 8'-10" | | | | | | | 304 |
| W520 | 14 | — | 14 | STRAIGHT | 31'-6" | | | | | | | 460 |
| W521 | 33 | — | 33 | STRAIGHT | 13'-0" | | | | | | | 447 |
| W522 | 33 | — | 33 | STRAIGHT | 6'-10" | | | | | | | 235 |
| W523 | 23 | — | 23 | STRAIGHT | 28'-0" | | | | | | | 672 |
| W524 | 15 | — | 15 | STRAIGHT | 9'-9" | | | | | | | 153 |
| W525 | 3 | — | 3 | 26 | 5'-7" | 7" | 3'-0" | 2'-0" | 5" | 1'-5" | | 17 |
| W526 | 158 | — | 158 | 17 | 2'-10 1/2" | | 1'-6" | 1'-6" | | | | 474 |
| W527 | 158 | — | 158 | 17 | 6'-11" | | 3'-3" | 8" | 3'-3" | | | 1,140 |
| W528 | 158 | — | 158 | 16 | 4'-0" | | 2'-0" | 2'-0" | 1'-5" | 1'-5" | | 659 |
| W529 | 10 | — | 10 | STRAIGHT | 19'-6" | | | | | | | 203 |
| W530 | 12 | — | 12 | STRAIGHT | 15'-6" | | | | | | | 194 |
| W531 | 10 | — | 10 | STRAIGHT | 9'-6" | | | | | | | 99 |
| W532 | 64 | — | 64 | STRAIGHT | 6'-9" | | | | | | | 451 |
| W533 | 26 | — | 26 | STRAIGHT | 6'-3" | | | | | | | 169 |
| W534 | 4-SER. | — | 4-SERIES | STRAIGHT | | 4-SERIES OF 7 / 4'-0" TO 18'-3" | | | | | 2'-4 1/2" | 325 |
| W535 | 4-SER. | — | 4-SERIES | 17 | 4'-1/2" TO 6'-1/2" | | 1'-6" | 4-SERIES OF 30 / 2'-9" TO 14'-10" | 5" | | | 1,272 |
| W536 | 60 | — | 60 | 17 | 7'-9" | | 3'-0" | 2'-0" | 3'-0" | | | 485 |
| W537 | 2 | — | 2 | 25 | 7'-6" | 1'-6" | 1'-6" | 2'-0" | 1'-6" | 1'-6" | | 16 |
| W538 | 2 | — | 2 | 25 | 8'-4" | 1'-6" | 1'-11" | 2'-0" | 1'-11" | 1'-6" | | 17 |
| W539 | 2 | — | 2 | 25 | 9'-2" | 1'-6" | 2'-4" | 2'-0" | 2'-4" | 1'-6" | | 19 |
| W540 | 2 | — | 2 | 25 | 10'-0" | 1'-6" | 2'-9" | 2'-0" | 2'-9" | 1'-6" | | 21 |
| W541 | 2 | — | 2 | 25 | 10'-10" | 1'-6" | 3'-2" | 2'-0" | 3'-2" | 1'-6" | | 23 |
| W542 | 2 | — | 2 | 25 | 11'-8" | 1'-6" | 3'-7" | 2'-0" | 3'-7" | 1'-6" | | 24 |
| W543 | 2 | — | 2 | 25 | 12'-6" | 1'-6" | 4'-0" | 2'-0" | 4'-0" | 1'-6" | | 26 |
| W544 | 4-SER. | — | 4-SERIES | STRAIGHT | | 4-SERIES OF 6 / 3'-4 1/2" TO 15'-0" | | | | | 2'-1 1/2" | 217 |
| W545 | 2 | — | 2 | 25 | 7'-0" | 1'-6" | 1'-6" | 1'-6" | 1'-6" | 1'-6" | | 15 |
| W546 | 2 | — | 2 | 25 | 7'-11 1/2" | 1'-6" | 1'-11 3/4" | 1'-6" | 1'-11 3/4" | 1'-6" | | 17 |
| W547 | 2 | — | 2 | 25 | 8'-11" | 1'-6" | 2'-5 1/2" | 1'-6" | 2'-5 1/2" | 1'-6" | | 19 |
| W548 | 2 | — | 2 | 25 | 9'-10 1/2" | 1'-6" | 2'-11 1/4" | 1'-6" | 2'-11 1/4" | 1'-6" | | 21 |
| W549 | 2 | — | 2 | 25 | 10'-10" | 1'-6" | 3'-5" | 1'-6" | 3'-5" | 1'-6" | | 23 |
| W550 | 2 | — | 2 | 25 | 11'-9 1/2" | 1'-6" | 3'-10 3/4" | 1'-6" | 3'-10 3/4" | 1'-6" | | 25 |
| W551 | 2 | — | 2 | 25 | 12'-9" | 1'-6" | 4'-4 1/2" | 1'-6" | 4'-4 1/2" | 1'-6" | | 27 |
| W552 | 44 | — | 44 | 17 | 7'-3" | | 3'-0" | 1'-6" | 3'-0" | | | 333 |
| W553 | 4-SER. | — | 4-SERIES | 17 | 4'-6 3/4" TO 14'-7 1/2" | | 1'-6" | 4-SERIES OF 22 / 3'-2 1/4" TO 13'-3" | 5 3/4" | | | 881 |
| W554 | 3 | — | 3 | 4 | 8'-5" | 1'-4" | 2'-4 1/2" | 1'-3" | 1'-2 1/2" | 2'-0 1/2" | | 26 |
| W555 | 3 | — | 3 | 4 | 7'-1 1/2" | | 3'-0" | 1'-3" | 1'-6 1/2" | 2'-7" | | 22 |
| W556 | 6 | — | 6 | 16 | 3'-6" | | 1'-9" | 1'-9" | 1'-6 1/2" | 11" | | 22 |
| W557 | 3 | — | 3 | 17 | 14'-11" | | 6'-7" | 2'-0" | 6'-7" | | | 47 |
| W558 | 2 | — | 2 | 17 | 13'-9" | | 6'-7" | 10" | 6'-7" | | | 29 |
| W559 | 29 | — | 29 | 2 | 9'-6" | 9" | 8'-9" | | | | | 287 |
| | | | | | | | | | | | SUB TOTAL = | 23,331 |

WINGWALL

| MARK | NO. REQUIRED | | | TYPE | LENGTH | A | B | C | D | E | SERIES INCREMENT | WEIGHT |
|------|--------------|--------|----------|----------|---------|--------------------------------------|--------|----|---|---|------------------|--------|
| | EAST | WEST | TOTAL | | | | | | | | | |
| W601 | — | 2 | 2 | STRAIGHT | 13'-2" | | | | | | | 40 |
| W602 | — | 8 | 8 | STRAIGHT | 15'-6" | | | | | | | 186 |
| W603 | — | 2 | 2 | STRAIGHT | 28'-7" | | | | | | | 86 |
| W604 | 12 | 4 | 16 | STRAIGHT | 11'-6" | | | | | | | 276 |
| W605 | — | 2 | 2 | STRAIGHT | 10'-9" | | | | | | | 32 |
| W606 | — | 13 | 13 | 1 | 12'-2" | 8" | 11'-6" | 6" | | | | 237 |
| W607 | — | 2-SER. | 2-SERIES | STRAIGHT | | 2-SERIES OF 4 / 12'-9 3/4" TO 13'-6" | | | | | 2 3/4" | 158 |
| W608 | — | 2-SER. | 2-SERIES | STRAIGHT | | 2-SERIES OF 13 / 23'-11" TO 29'-2" | | | | | 5 1/4" | 1,037 |
| W609 | 36 | — | 36 | STRAIGHT | 13'-10" | | | | | | | 748 |
| W610 | 116 | — | 116 | STRAIGHT | 33'-0" | | | | | | | 5,750 |
| W611 | 52 | — | 52 | STRAIGHT | 23'-6" | | | | | | | 1,835 |
| W612 | 44 | — | 44 | STRAIGHT | 19'-6" | | | | | | | 1,289 |
| W613 | 36 | — | 36 | STRAIGHT | 12'-7" | | | | | | | 680 |
| W614 | 48 | — | 48 | STRAIGHT | 5'-0" | | | | | | | 360 |
| W615 | 10 | — | 10 | STRAIGHT | 15'-6" | | | | | | | 233 |
| W616 | 66 | — | 66 | STRAIGHT | 9'-6" | | | | | | | 942 |
| W617 | 26 | — | 26 | STRAIGHT | 27'-6" | | | | | | | 1,074 |
| W618 | — | 16 | 16 | STRAIGHT | 11'-7" | | | | | | | 278 |
| W619 | — | 16 | 16 | STRAIGHT | 8'-7" | | | | | | | 206 |
| W620 | 25 | — | 25 | STRAIGHT | 9'-1" | | | | | | | 341 |
| W621 | 29 | — | 29 | STRAIGHT | 26'-6" | | | | | | | 1,154 |
| W622 | 29 | — | 29 | STRAIGHT | 10'-4" | | | | | | | 450 |
| W623 | 28 | — | 28 | STRAIGHT | 13'-3" | | | | | | | 557 |
| W624 | 4-SER. | — | 4-SERIES | STRAIGHT | | 4-SERIES OF 4 / 4'-7 1/2" TO 11'-0" | | | | | 2'-1 1/2" | 188 |
| W625 | 8 | — | 8 | STRAIGHT | 24'-0" | | | | | | | 288 |
| | | | | | | | | | | | SUB TOTAL = | 18,425 |



NOTES:
 1. REFER TO CMS SECTIONS 106.03, 700, 709.01 THROUGH 709.05, AND 709.08. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.

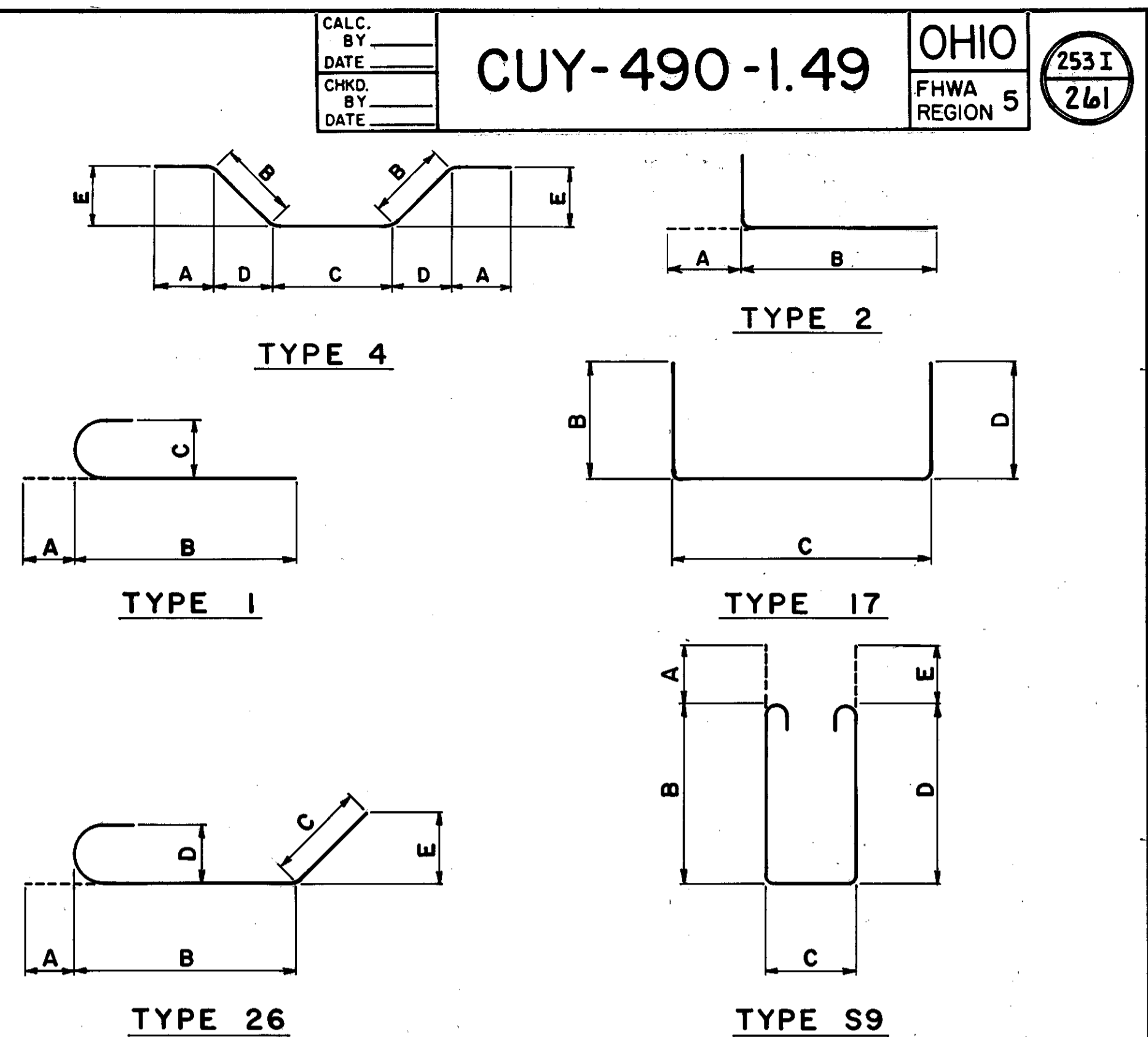
WESTON A Business Trust
 3609 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122
 59/63

BAR SCHEDULE
 FORWARD ABUTMENT
 EAST AND WEST WINGWALL
 BRIDGE NO. CUY - 490 - 0152
 I-490 UNDER RELOC. ROADWAY

DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED
 WHH | PRB | DF | JRH | 2/83 | 10/83

| WINGWALL | | | | | | | | | | | | |
|----------|--------------|------|----------|----------|---------|---------------------------------|--------|-----------|---------|------------|--|--------|
| MARK | NO. REQUIRED | | | TYPE | LENGTH | A | B | C | D | E | SERIES INCREMENT | WEIGHT |
| | EAST | WEST | TOTAL | | | | | | | | | |
| W701 | 34 | 17 | 51 | 1 | 12'-4" | 10" | 11'-6" | 7" | | | | 1,286 |
| W702 | 15 | — | 15 | 2 | 13'-1" | 12" | 12'-1" | | | | | 401 |
| W703 | 52 | — | 52 | 17 | 9'-8" | | 1'-6" | 8'-4" | | | | 1,027 |
| W704 | 4 | — | 4 | 17 | 8'-6" | | 1'-6" | 7'-2" | | | | 69 |
| W705 | 33 | — | 33 | 2 | 9'-7" | 12" | 8'-7" | | | | | 646 |
| W706 | 4-SER. | — | 4-SERIES | STRAIGHT | | 4-SERIES OF 5 / 4'-6" TO 14'-0" | | | | 2'-4 1/2" | | 378 |
| W707 | 32 | 13 | 45 | STRAIGHT | 7'-0" | | | | | | | 644 |
| W708 | 8 | — | 8 | 2 | 19'-7" | 12" | 18'-7" | | | | | 320 |
| W709 | 29 | — | 29 | STRAIGHT | 23'-0" | | | | | | | 1,363 |
| W710 | 19 | — | 19 | STRAIGHT | 19'-6" | | | | | | | 757 |
| W711 | 10 | — | 10 | STRAIGHT | 15'-4" | | | | | | | 313 |
| W712 | 33 | — | 33 | STRAIGHT | 14'-0" | | | | | | | 944 |
| W713 | 33 | — | 33 | STRAIGHT | 6'-0" | | | | | | | 405 |
| W714 | 32 | — | 32 | STRAIGHT | 16'-0" | | | | | | | 1,047 |
| | | | | | | | | | | | SUB TOTAL = | 9,600 |
| W801 | — | 16 | 16 | 2 | 9'-9" | 1'-2" | 8'-7" | | | | | 417 |
| W802 | — | 16 | 16 | 2 | 6'-9" | 1'-2" | 5'-7" | | | | | 288 |
| W803 | 46 | — | 46 | STRAIGHT | 33'-0" | | | | | | | 4,053 |
| W804 | 68 | — | 68 | 1 | 9'-8" | 11" | 8'-9" | 8" | | | | 1,755 |
| W805 | 34 | — | 34 | 1 | 16'-5" | 11" | 15'-6" | 8" | | | | 1,490 |
| W806 | 73 | — | 73 | STRAIGHT | 13'-5" | | | | | | | 2,615 |
| W807 | 8 | — | 8 | STRAIGHT | 21'-0" | | | | | | | 449 |
| W808 | 29 | — | 29 | STRAIGHT | 18'-8" | | | | | | | 1,445 |
| | | | | | | | | | | | SUB TOTAL = | 12,512 |
| W901 | — | 13 | 13 | 1 | 7'-6" | 1'-3" | 6'-3" | 11 3/4" | | | | 332 |
| W902 | — | 17 | 17 | STRAIGHT | 15'-6" | | | | | | | 896 |
| W903 | 12 | — | 12 | 26 | 13'-7" | 1'-3" | 3'-0" | 9'-4" | 11 3/4" | 3'-7 1/4" | | 554 |
| W904 | 12 | — | 12 | 26 | 9'-8" | 1'-3" | 2'-11" | 5'-6" | 11 3/4" | 2'-11 1/2" | | 394 |
| W905 | 15 | — | 15 | STRAIGHT | 33'-0" | | | | | | | 1,683 |
| W906 | 12 | — | 12 | 26 | 8'-7" | 1'-3" | 2'-8" | 4'-8" | 11 3/4" | 1'-11 3/4" | | 350 |
| W907 | 34 | — | 34 | STRAIGHT | 15'-6" | | | | | | | 1,792 |
| W908 | 33 | — | 33 | 2 | 10'-0" | 1'-4" | 8'-8" | | | | | 1,122 |
| W909 | 33 | — | 33 | 2 | 7'-0" | 1'-4" | 5'-8" | | | | | 785 |
| W910 | 33 | — | 33 | 2 | 8'-4" | 1'-4" | 7'-0" | | | | | 935 |
| W911 | 18 | — | 18 | 2 | 13'-4" | 1'-4" | 12'-0" | | | | | 816 |
| W912 | 12 | — | 12 | STRAIGHT | 18'-8" | | | | | | | 762 |
| W913 | 12 | — | 12 | STRAIGHT | 33'-10" | | | | | | | 1,380 |
| W914 | 12 | — | 12 | STRAIGHT | 29'-9" | | | | | | | 1,214 |
| | | | | | | | | | | | SUB TOTAL = | 13,015 |
| W1001 | 68 | — | 68 | 1 | 12'-8" | 1'-5" | 11'-3" | 1'-1 1/4" | | | | 3,706 |
| | | | | | | | | | | | SUB TOTAL = | 3,706 |
| | | | | | | | | | | | FORWARD ABUTMENT WINGWALLS TOTAL WEIGHT = | 80,589 |
| EW501 | 158 | — | 158 | S9 | 7'-9" | 7" | 3'-1" | 8" | 3'-1" | 7" | | 1,277 |
| | | | | | | | | | | | FORWARD ABUTMENT WINGWALLS EPOXY COATED TOTAL WEIGHT = | 1,277 |

| WINGWALL | | | | | | | | | | | | |
|---|--------------|------|-------|----------|--------|-------|-----------|-------|-----------|-----------|-------------------------------------|--------|
| MARK | NO. REQUIRED | | | TYPE | LENGTH | A | B | C | D | E | SERIES INCREMENT | WEIGHT |
| | EAST | WEST | TOTAL | | | | | | | | | |
| RAILING (INCLUDE WITH RAILING FOR PAYMENT) EPOXY COATED | | | | | | | | | | | | |
| ER501 | 6 | — | 6 | STRAIGHT | 28'-0" | | | | | | | 175 |
| ER502 | 24 | — | 24 | STRAIGHT | 33'-0" | | | | | | | 826 |
| ER503 | 3 | — | 3 | 4 | 8'-5" | 1'-4" | 2'-4 1/2" | 1'-3" | 1'-2 1/2" | 2'-0 1/2" | | 26 |
| ER504 | 3 | — | 3 | 17 | 5'-9" | | 2'-0" | 2'-0" | 2'-0" | | | 18 |
| ER505 | 2 | — | 2 | 17 | 4'-7" | | 2'-0" | 10" | 2'-0" | | | 10 |
| | | | | | | | | | | | RAILING EPOXY COATED TOTAL WEIGHT = | 1,055 |



- NOTES:**
- REFER TO CMS SECTIONS 106.03, 700, 709.01 THROUGH 709.05, AND 709.08. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.
 - REINFORCING STEEL PREFIXED WITH AN "E" IN THE MARK NO. WILL BE EPOXY COATED. EXAMPLE: EW501 OR ER501.

WESTON

A Business Trust
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

60/63

BAR SCHEDULE
FORWARD ABUTMENT
EAST AND WEST WINGWALL
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

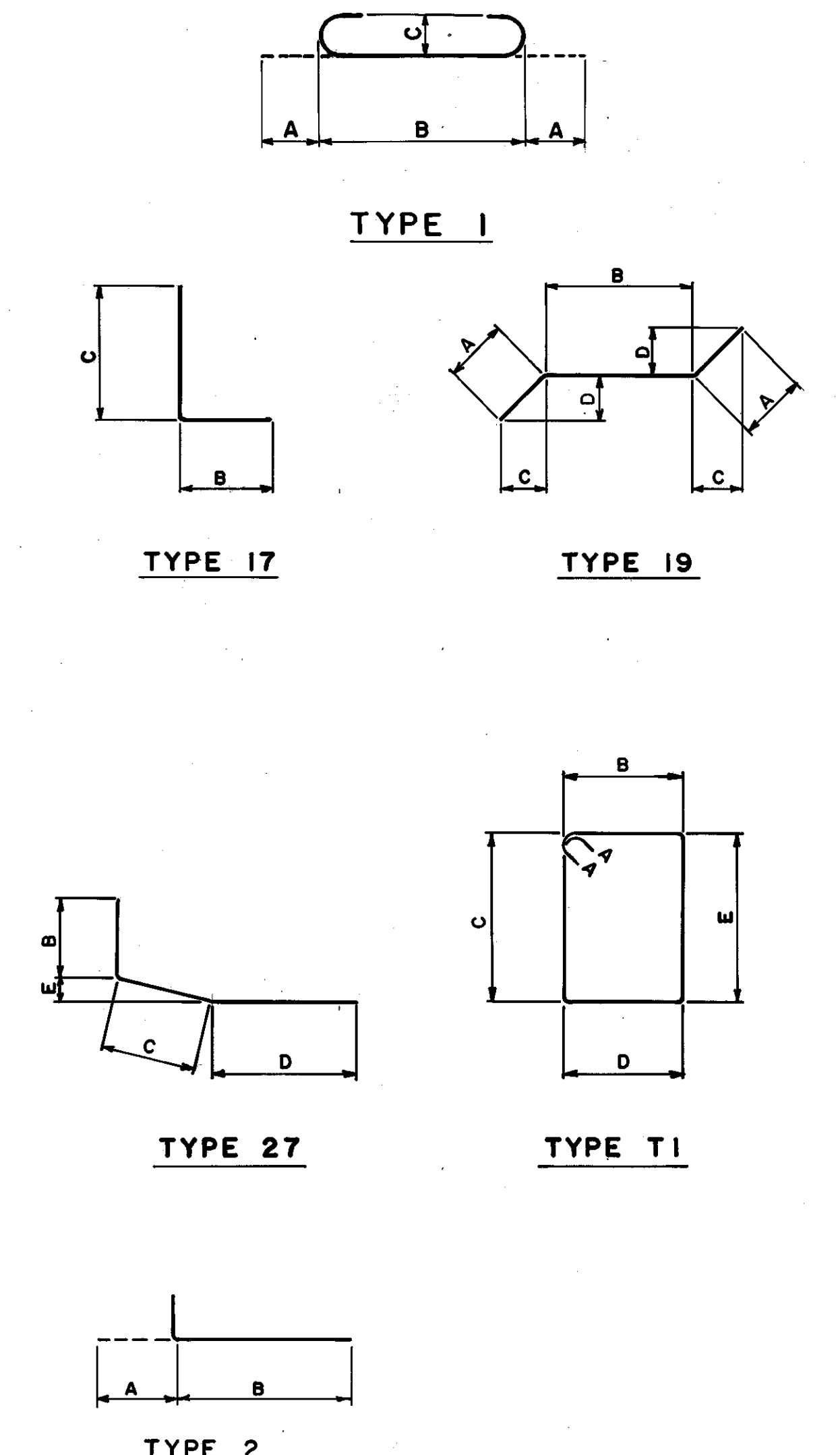
| | | | | | | |
|----------|-------|--------|---------|----------|------|---------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISED |
| WHH | PRB | | DF | JRH | 2/83 | 10/83 |

PIERS

| MARK | NO. REQ'D. | PIER NO. | | | | | | TYPE | LENGTH | A | B | C | D | E | WEIGHT |
|------|------------|----------|-----|----|-----|-----|----|------|---------|--------|------------|------------|-----------|------------|--------|
| | | 1 | 1A | 2 | 2A | 3 | 3A | | | | | | | | |
| P401 | 15 | | | | | 8 | 7 | T1 | 14'-6" | 4 1/2" | 3'-6" | 3'-6" | 3'-6" | 3'-6" | 145 |
| P402 | 2 | | | | | 2 | | T1 | 16'-1" | 4 1/2" | 3'-2" | 4'-7 1/2" | 3'-2" | 4'-7 1/2" | 21 |
| P403 | 2 | | | | | 2 | | T1 | 16'-7" | 4 1/2" | 3'-2" | 4'-10 1/2" | 3'-2" | 4'-10 1/2" | 22 |
| P404 | 2 | | | | | 2 | | T1 | 17'-1" | 4 1/2" | 3'-2" | 5'-1 1/2" | 3'-2" | 5'-1 1/2" | 23 |
| P405 | 2 | | | | | 2 | | T1 | 17'-7" | 4 1/2" | 3'-2" | 5'-4 1/2" | 3'-2" | 5'-4 1/2" | 23 |
| P406 | 2 | | | | | 2 | | T1 | 18'-1" | 4 1/2" | 3'-2" | 5'-7 1/2" | 3'-2" | 5'-7 1/2" | 24 |
| P407 | 2 | | | | | 2 | | T1 | 18'-7" | 4 1/2" | 3'-2" | 5'-10 1/2" | 3'-2" | 5'-10 1/2" | 25 |
| P408 | 4 | | | | | 2 | 2 | T1 | 19'-1" | 4 1/2" | 3'-2" | 6'-1 1/2" | 3'-2" | 6'-1 1/2" | 51 |
| P409 | 2 | | | | | 2 | | T1 | 19'-7" | 4 1/2" | 3'-2" | 6'-4 1/2" | 3'-2" | 6'-4 1/2" | 26 |
| P410 | 2 | | | | | 2 | | T1 | 20'-1" | 4 1/2" | 3'-2" | 6'-7 1/2" | 3'-2" | 6'-7 1/2" | 27 |
| P411 | 106 | | | | | 58 | 48 | T1 | 20'-6" | 4 1/2" | 3'-2" | 6'-10" | 3'-2" | 6'-10" | 1452 |
| P412 | 2 | | | | | 2 | | T1 | 16'-5" | 4 1/2" | 3'-2" | 4'-9 1/2" | 3'-2" | 4'-9 1/2" | 22 |
| P413 | 2 | | | | | 2 | | T1 | 17'-9" | 4 1/2" | 3'-2" | 5'-5 1/2" | 3'-2" | 5'-5 1/2" | 24 |
| P414 | 8 | 2 | 2 | | 2 | 2 | | T1 | 11'-4" | 4 1/2" | 2'-1 1/2" | 3'-3 1/2" | 2'-1 1/2" | 3'-3 1/2" | 61 |
| P415 | 8 | 2 | 2 | | 2 | 2 | | T1 | 11'-6" | 4 1/2" | 2'-1 1/2" | 3'-4 1/2" | 2'-1 1/2" | 3'-4 1/2" | 61 |
| P416 | 8 | 2 | 2 | | 2 | 2 | | T1 | 11'-8" | 4 1/2" | 2'-1 1/2" | 3'-5 1/2" | 2'-1 1/2" | 3'-5 1/2" | 62 |
| P417 | 8 | 2 | 2 | | 2 | 2 | | T1 | 11'-10" | 4 1/2" | 2'-1 1/2" | 3'-6 1/2" | 2'-1 1/2" | 3'-6 1/2" | 63 |
| P418 | 8 | 2 | 2 | | 2 | 2 | | T1 | 12'-0" | 4 1/2" | 2'-1 1/2" | 3'-7 1/2" | 2'-1 1/2" | 3'-7 1/2" | 64 |
| P419 | 8 | 2 | 2 | | 2 | 2 | | T1 | 12'-2" | 4 1/2" | 2'-1 1/2" | 3'-8 1/2" | 2'-1 1/2" | 3'-8 1/2" | 65 |
| P420 | 8 | 2 | 2 | | 2 | 2 | | T1 | 12'-4" | 4 1/2" | 2'-1 1/2" | 3'-9 1/2" | 2'-1 1/2" | 3'-9 1/2" | 66 |
| P421 | 438 | 110 | 100 | | 118 | 110 | | T1 | 12'-5" | 4 1/2" | 2'-1 1/2" | 3'-10" | 2'-1 1/2" | 3'-10" | 3,633 |
| | | | | | | | | | | | | | | SUB TOTAL= | 5,960 |
| | | | | | | | | | | | | | | | |
| P501 | 8 | | | | | 8 | | STR. | 5'-8" | | | | | | 47 |
| P502 | 4 | | | | | 4 | | STR. | 9'-4" | | | | | | 39 |
| P503 | 6 | | | | | 6 | | 27 | 9'-1" | 1'-6" | 5'-5" | 2'-3 1/2" | 2'-6" | | 57 |
| P504 | 6 | | | | | 6 | | 27 | 10'-8" | 1'-6" | 5'-5" | 3'-10 1/2" | | | 67 |
| P505 | 6 | | | | | 6 | | 17 | 8'-5" | 7'-1" | 1'-5 1/2" | | | | 53 |
| P506 | 6 | | | | | 6 | | 17 | 10'-0" | 8'-8" | 1'-5 1/2" | | | | 63 |
| P507 | 32 | | | 12 | | 20 | | STR. | 28'-6" | | | | | | 951 |
| P508 | 2 | | | | | 2 | | STR. | 27'-5" | | | | | | 57 |
| P509 | 2 | | | | | 2 | | STR. | 25'-6" | | | | | | 53 |
| P510 | 16 | | | | | 10 | | STR. | 25'-0" | | | | | | 417 |
| P511 | 22 | | 6 | | | 10 | | STR. | 18'-8" | | | | | | 428 |
| P512 | 2 | | | | | 2 | | STR. | 24'-1" | | | | | | 50 |
| P513 | 2 | | | | | 2 | | STR. | 15'-10" | | | | | | 33 |
| P514 | 14 | 7 | | | 7 | | | 27 | 8'-6" | 1'-6" | 3'-10 1/2" | 3'-3" | 8" | | 124 |
| P515 | 18 | | 9 | | 9 | | | 27 | 10'-4" | 1'-6" | 3'-10" | 5'-1" | 8" | | 194 |
| P516 | 14 | 7 | | | 7 | | | 17 | 8'-7" | 7'-3" | 1'-5 1/2" | | | | 125 |
| P517 | 18 | | 9 | | 9 | | | 17 | 10'-2" | 8'-10" | 1'-5 1/2" | | | | 191 |
| P518 | 12 | 12 | | | | | | STR. | 25'-10" | | | | | | 323 |
| P519 | 6 | | 6 | | | | | STR. | 21'-4" | | | | | | 134 |
| | | | | | | | | | | | | | | SUB TOTAL= | 3,406 |
| | | | | | | | | | | | | | | | |
| P601 | 92 | | | | | 60 | 32 | STR. | 13'-0" | | | | | | 1,796 |
| P602 | 150 | | | | | 90 | 60 | STR. | 13'-6" | | | | | | 3,042 |
| P603 | 56 | | | | | 40 | 16 | 19 | 6'-7" | 1'-0" | 4'-9" | 8 1/2" | 8 1/2" | | 554 |
| P604 | 20 | | | | | 20 | | STR. | 5'-8" | | | | | | 170 |
| P605 | 60 | 18 | 8 | | 18 | 8 | | STR. | 9'-4" | | | | | | 841 |
| P606 | 24 | 12 | | | 12 | | | STR. | 8'-0" | | | | | | 288 |
| P607 | 24 | | 12 | | 12 | | | STR. | 10'-0" | | | | | | 360 |
| P608 | 108 | 30 | 24 | | 30 | 24 | | STR. | 9'-6" | | | | | | 1,541 |
| P609 | 66 | 33 | | | 33 | | | STR. | 8'-6" | | | | | | 843 |
| P610 | 40 | | 20 | | 20 | | | STR. | 10'-6" | | | | | | 631 |
| | | | | | | | | | | | | | | SUB TOTAL= | 10,066 |

PIERS

| MARK | NO. REQ'D. | PIER NO. | | | | | | TYPE | LENGTH | A | B | C | D | E | WEIGHT |
|--------|------------|----------|----|----|----|----|----|--------|------------|-------------|---------|---------|-----|--|---------|
| | | 1 | 1A | 2 | 2A | 3 | 3A | | | | | | | | |
| P801 | 18 | | | | | 10 | | STR. | 27'-4" | | | | | | 1,314 |
| P802 | 34 | | | 10 | | | | STR. | 24'-0" | | | | | | 2,179 |
| P803 | 12 | | | | | | | STR. | 27'-8" | | | | | | 886 |
| | | | | | | | | | | | | | | SUB TOTAL= | 4,379 |
| P901 | 144 | | | | | | | 1 | 16'-0" | 15" | 13'-6" | 10 5/8" | | | 7,834 |
| P902 | 40 | | | | | 14 | | STR. | 17'-9" | | | | | | 2,414 |
| P903 | 72 | 36 | | | | 36 | | 1 | 11'-0" | 15" | 8'-6" | 10 5/8" | | | 2,693 |
| P904 | 44 | | | 22 | | | | 1 | 12'-0" | 15" | 9'-6" | 10 5/8" | | | 1,795 |
| P905 | 14 | 14 | | | | | | STR. | 16'-2" | | | | | | 770 |
| P906 | 10 | | | | | 10 | | STR. | 26'-6" | | | | | | 901 |
| P907 | 6 | 3 | | | | 3 | | 17 | 37'-5" | 34'-8" | 3'-0" | | | | 763 |
| P908 | 8 | | | | | | | 17 | 24'-2" | 17'-9" | 6'-8" | | | | 657 |
| P909 | 20 | 20 | | | | | | STR. | 21'-6" | | | | | | 1,462 |
| P910 | 20 | | | | | 20 | | STR. | 23'-6" | | | | | | 1,598 |
| P911 | 10 | | | 10 | | | | STR. | 25'-6" | | | | | | 867 |
| P912 | 10 | | | | | 10 | | STR. | 20'-6" | | | | | | 697 |
| P913 | 8 | | | | | | | 17 | 21'-7" | 17'-9" | 4'-2" | | | | 587 |
| P914 | 4 | 4 | | | | | | 17 | 24'-3" | 21'-6" | 3'-0" | | | | 330 |
| P915 | 14 | | 5 | | | 4 | 5 | 17 | 29'-3" | 26'-6" | 3'-0" | | | | 1,392 |
| P916 | 8 | 4 | | | | 4 | | 17 | 37'-2" | 33'-9" | 3'-8" | | | | 1,011 |
| P917 | 3 | 3 | | | | | | 17 | 23'-8" | 20'-3" | 3'-8" | | | | 241 |
| P918 | 8 | | 5 | | | 3 | | 17 | 28'-11" | 25'-6" | 3'-8" | | | | 787 |
| P919 | 5 | | 5 | | | | | 17 | 21'-2" | 17'-9" | 3'-8" | | | | 360 |
| P920 | 5 | | | | | 5 | | 17 | 23'-11" | 20'-6" | 3'-8" | | | | 407 |
| P921 | 5 | | | | | 5 | | 17 | 29'-11" | 26'-6" | 3'-8" | | | | 509 |
| P922 | 5 | | 5 | | | | | 17 | 20'-6" | 17'-9" | 3'-0" | | | | 349 |
| P923 | 5 | | | | | 5 | | 17 | 23'-3" | 20'-6" | 3'-0" | | | | 395 |
| | | | | | | | | | | | | | | SUB TOTAL= | 28,819 |
| P1001 | 4 | | | | | | | 4 | 17 | 24'-1" | 17'-9" | 6'-8" | | | 415 |
| P1002 | 88 | | | | | | | 88 | 1 | 16'-4" | 17" | 13'-6" | 12" | | 6,185 |
| P1003 | 5 | | | | | | | 5 | 17 | 36'-11" | 30'-7" | 6'-8" | | | 794 |
| P1004 | 9 | | | | | | | 9 | STR. | 30'-7" | | | | | 1,184 |
| P1005 | 9 | | | | | | | 9 | STR. | 17'-9" | | | | | 687 |
| P1006 | 72 | 36 | | | | 36 | | 1 | 12'-6" | 17" | 9'-6" | 12" | | | 3,821 |
| P1007 | 64 | | | 32 | | | | 1 | 13'-4" | 17" | 10'-6" | 12" | | | 3,672 |
| P1008 | 5 | | | | | | | 5 | 17 | 21'-7" | 17'-9" | 4'-2" | | | 464 |
| P1009 | 4 | | | | | | | 4 | 17 | 34'-5" | 30'-7" | 4'-2" | | | 592 |
| | | | | | | | | | | | | | | SUB TOTAL= | 17,814 |
| | | | | | | | | | | | | | | PIERS 1, 1A, 2, 2A, 3, AND 3A TOTAL WEIGHT = | 70,444 |
| EP1001 | 138 | | | | | | | 138 | 2 | 10'-2" | 1'-6" | 8'-8" | | | 6,037 |
| EP1003 | 78 | | | | | | | 78 | STR. | 29'-8" | | | | | 9,957 |
| EP1008 | 60 | | | | | | | 60 | STR. | 23'-5" | | | | | 6,046 |
| | | | | | | | | | | | | | | SUB TOTAL= | 20,040 |
| EP1101 | 92 | | | | | | | 92 | 2 | 11'-3" | 1'-8" | 9'-7" | | | 5,499 |
| EP1102 | 52 | | | | | | | 52 | STR. | 28'-2" | | | | | 7,781 |
| EP1103 | 296 | 84 | 64 | | | 84 | 64 | 2 | 10'-4" | 1'-8" | 8'-8" | | | | 16,251 |
| EP1104 | 90 | 54 | | | | | 36 | STR. | 28'-9" | | | | | | 13,747 |
| EP1105 | 66 | | 36 | | | 30 | | STR. | 27'-10" | | | | | | 9,760 |
| EP1106 | 54 | | | | | 54 | | STR. | 31'-3" | | | | | | 8,966 |
| EP1107 | 40 | | | | | | | 40 | STR. | 21'-10" | | | | | 4,640 |
| EP1108 | 28 | | 28 | | | | | STR. | 24'-4" | | | | | | 3,620 |
| EP1109 | 58 | 30 | | | | | 28 | STR. | 25'-4" | | | | | | 7,807 |
| | | | | | | | | | | | | | | SUB TOTAL= | 78,071 |
| | | | | | | | | | | | | | | | |
| ESP401 | 3 | | | | | | | 3 | SPIRAL | 23'-3" | 56" 0/0 | 4 1/2" | 62 | 4 | 2,116 |
| ESP402 | 2 | | | | | | | 2 | SPIRAL | 21'-10 1/2" | 56" 0/0 | 3 1/2" | 75 | 4 | 1,654 |
| ESP403 | 5 | 3 | | | | | | 2 | SPIRAL | 25'-1 1/2" | 38" 0/0 | 4 1/2" | 67 | 4 | 2,698 |
| ESP404 | 2 | | 2 | | | | | SPIRAL | 24'-4 1/2" | 38" 0/0 | 4 1/2" | 65 | 4 | 1,048 | |
| ESP405 | 3 | | | | | | | 3 | SPIRAL | 27'-9" | 38" 0/0 | 4 1/2" | 74 | 4 | 1,781 |
| | | | | | | | | | | | | | | 1 1/2 EXTRA TURNS @ TOP AND BOTTOM | |
| | | | | | | | | | | | | | | SUB TOTAL | 9,297 |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | EPOXY COATED BARS - PIERS 1, 1A, 2, 2A, 3, AND 3A TOTAL WEIGHT = | 109,408 |



NOTES:
 1. REFER TO CMS SECTIONS 106.03, 700, 709.01 THROUGH 709.05, AND 709.08. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.

WESTON A Business Trust
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

BAR SCHEDULE
 PIER NOS. 1, 1A, 2, 2A, 3, & 3A

BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

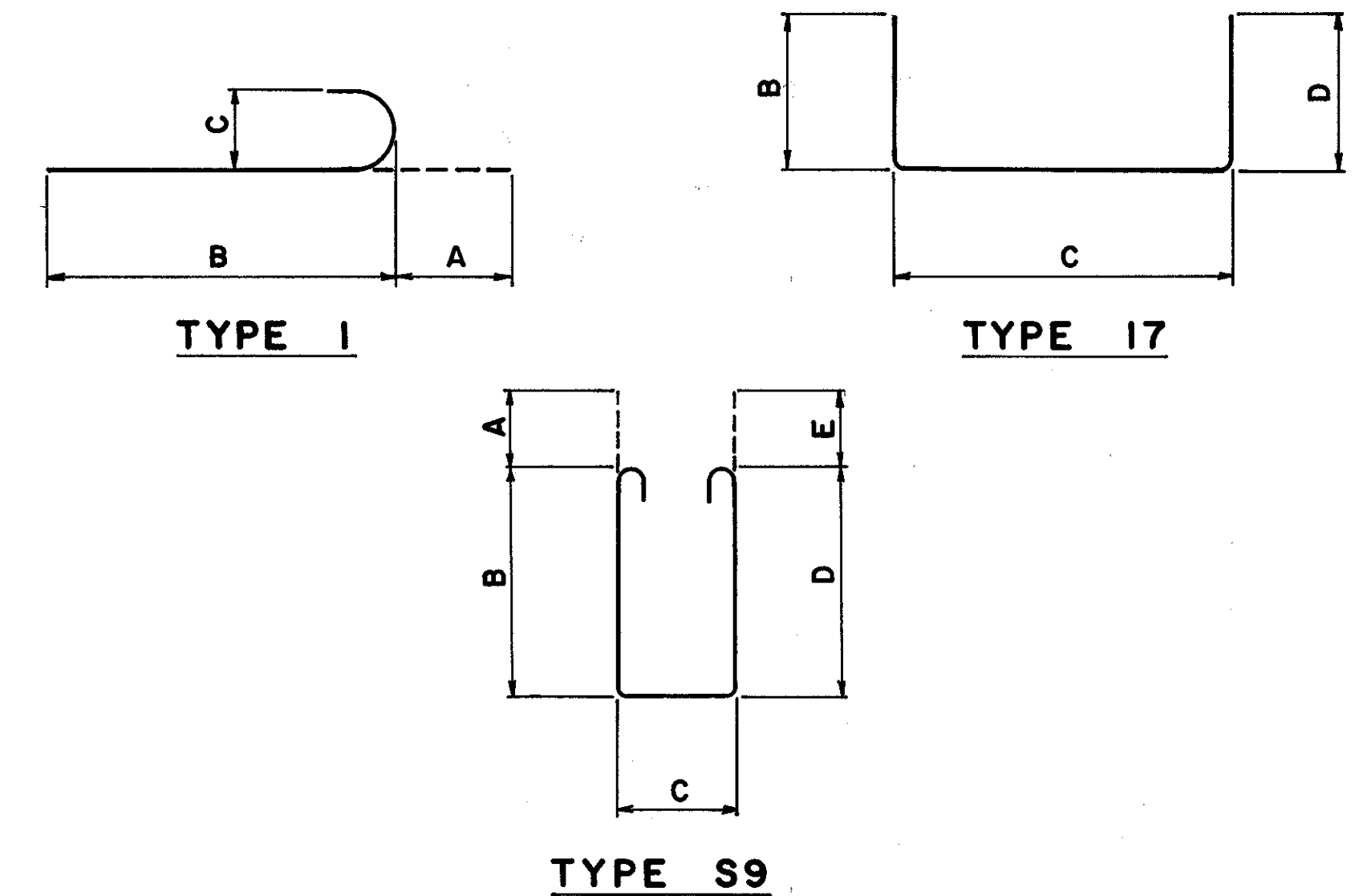
DESIGNED: WHH DRAWN: DF TRACED: JRH CHECKED: JRH REVIEWED: JRH DATE: 4/83 REVISED: 10/83

APPROACH SLAB

| MARK | NO. REQUIRED | | | TYPE | LENGTH | A | B | C | D | E | WEIGHT |
|-------------------------------|--------------|--------|----------|----------|---------|---|--------|-----------|---|---|--------|
| | REAR | FWD. | TOTAL | | | | | | | | |
| AS 501 | 184 | — | 184 | STRAIGHT | 24'-4" | | | | | | 4,670 |
| AS 502 | 1-SER. | — | 1-SERIES | STRAIGHT | | SERIES OF 4/14'-4" TO 23'-1 1/2"/2-11" INCREMENTS | | | | | 78 |
| AS 503 | 1-SER. | — | 1-SERIES | STRAIGHT | | SERIES OF 8/14'-4" TO 23'-8"/1'-4" INCREMENTS | | | | | 159 |
| AS 504 | 6 | — | 6 | STRAIGHT | 7'-0" | | | | | | 44 |
| AS 505 | 1 | — | 1 | STRAIGHT | 19'-1" | | | | | | 20 |
| AS 506 | 42 | 42 | 84 | STRAIGHT | 24'-7" | | | | | | 2,154 |
| AS 507 | 1-SER. | — | 1-SERIES | STRAIGHT | | SERIES OF 4/19'-3" TO 22'-6"/1'-11" INCREMENTS | | | | | 87 |
| AS 508 | 1 | — | 1 | STRAIGHT | 27'-3" | | | | | | 28 |
| AS 509 | 1-SER. | — | 1-SERIES | STRAIGHT | | SERIES OF 4/25'-3 1/2" TO 27'-2"/7 1/2" INCREMENTS | | | | | 109 |
| AS 510 | — | 189 | 189 | STRAIGHT | 24'-0" | | | | | | 4,731 |
| AS 511 | — | 1-SER. | 1-SERIES | STRAIGHT | | SERIES OF 3/17'-11" TO 22'-9"/2'-5" INCREMENTS | | | | | 64 |
| AS 512 | — | 1-SER. | 1-SERIES | STRAIGHT | | SERIES OF 7/17'-11" TO 24'-5"/1'-1" INCREMENTS | | | | | 155 |
| AS 513 | — | 1-SER. | 1-SERIES | STRAIGHT | | SERIES OF 4/20'-5" TO 23'-2"/11" INCREMENTS | | | | | 91 |
| AS 514 | — | 1-SER. | 1-SERIES | STRAIGHT | | SERIES OF 4/26'-3 1/2" TO 29'-2"/11 1/2" INCREMENTS | | | | | 116 |
| AS 515 | — | 1 | 1 | STRAIGHT | 29'-8" | | | | | | 31 |
| SUB TOTAL = | | | | | | | | | | | 12,537 |
| APPROACH SLABS TOTAL WEIGHT = | | | | | | | | | | | 42,216 |
| AS 1001 | 1-SER. | — | 1-SERIES | STRAIGHT | | SERIES OF 12/19'-1" TO 23'-9"/5" INCREMENTS | | | | | 1,106 |
| AS 1002 | 107 | 107 | 214 | I | 25'-11" | 1'-5" | 24'-6" | 1'-1 1/4" | | | 23,865 |
| AS 1003 | 1-SER. | — | 1-SERIES | STRAIGHT | | SERIES OF 12/24'-7" TO 27'-4"/3" INCREMENTS | | | | | 1,340 |
| AS 1004 | 1 | — | 1 | STRAIGHT | 27'-3" | | | | | | 117 |
| AS 1005 | 1 | — | 1 | STRAIGHT | 19'-1" | | | | | | 82 |
| AS 1006 | — | 1-SER. | 1-SERIES | STRAIGHT | | SERIES OF 9/20'-1" TO 22'-11"/4 1/4" INCREMENTS | | | | | 833 |
| AS 1007 | — | 1-SER. | 1-SERIES | STRAIGHT | | SERIES OF 12/24'-8 1/2" TO 29'-8"/4 1/2" INCREMENTS | | | | | 1,382 |
| AS 1008 | — | 1 | 1 | STRAIGHT | 29'-8" | | | | | | 128 |
| AS 1009 | 64 | 64 | 128 | STRAIGHT | 1'-6" | (1 1/4" DIA. SMOOTH BAR) | | | | | 826 |
| SUB TOTAL = | | | | | | | | | | | 26,679 |
| APPROACH SLABS TOTAL WEIGHT = | | | | | | | | | | | 42,216 |

APPROACH SLAB (EPOXY COATED)

| MARK | NO. REQUIRED | | | TYPE | LENGTH | A | B | C | D | E | WEIGHT |
|---|--------------|--------|----------|----------|--------|--|-------|-------|-------|----|--------|
| | REAR | FWD. | TOTAL | | | | | | | | |
| EAS 401 | — | 1-SER. | 1-SERIES | STRAIGHT | | SERIES OF 7/19'-6" TO 23'-0"/7" INCREMENTS | | | | | 99 |
| EAS 402 | — | 1 | 1 | STRAIGHT | 29'-8" | | | | | | 20 |
| EAS 403 | — | 1-SER. | 1-SERIES | STRAIGHT | | SERIES OF 7/26'-0" TO 29'-6"/7" INCREMENTS | | | | | 130 |
| EAS 404 | 1 | — | 1 | STRAIGHT | 19'-1" | | | | | | 13 |
| EAS 405 | 1-SER. | — | 1-SERIES | STRAIGHT | | SERIES OF 7/19'-4" TO 23'-4"/8" INCREMENTS | | | | | 100 |
| EAS 406 | 1-SER. | — | 1-SERIES | STRAIGHT | | SERIES OF 7/25'-1" TO 27'-4"/4 1/2" INCREMENTS | | | | | 123 |
| EAS 407 | 1 | — | 1 | STRAIGHT | 27'-3" | | | | | | 18 |
| SUB TOTAL = | | | | | | | | | | | 503 |
| EAS 501 | 48 | 31 | 79 | 17 | 3'-5" | 1'-0" | 1'-8" | 1'-0" | | | 282 |
| EAS 502 | — | 21 | 21 | 17 | 3'-4" | 1'-0" | 1'-7" | 1'-0" | | | 73 |
| EAS 503 | 48 | 31 | 79 | 59 | 7'-9" | 7" | 3'-1" | 8" | 3'-1" | 7" | 639 |
| SUB TOTAL = | | | | | | | | | | | 994 |
| EAS 601 | 48 | 52 | 100 | 17 | 3'-3" | 1'-0" | 1'-7" | 1'-0" | | | 488 |
| EAS 602 | 4 | 4 | 8 | 17 | 5'-11" | 7" | 5'-6" | | | | 71 |
| EAS 603 | — | 4 | 4 | 17 | 6'-4" | 7" | 5'-6" | 7" | | | 38 |
| EAS 604 | 44 | 27 | 71 | 17 | 7'-4" | 7" | 6'-6" | 7" | | | 782 |
| EAS 605 | 4 | 4 | 8 | 17 | 6'-11" | 7" | 6'-6" | | | | 83 |
| SUB TOTAL = | | | | | | | | | | | 1,462 |
| APPROACH SLABS EPOXY COATED TOTAL WEIGHT = | | | | | | | | | | | 2,959 |
| RAILING (INCLUDE WITH RAILING FOR PAYMENT) EPOXY COATED | | | | | | | | | | | |
| EAR 501 | 6 | — | 6 | STRAIGHT | 20'-7" | | | | | | 129 |
| EAR 502 | 6 | — | 6 | STRAIGHT | 29'-2" | | | | | | 182 |
| EAR 503 | — | 6 | 6 | STRAIGHT | 31'-1" | | | | | | 195 |
| RAILING EPOXY COATED TOTAL WEIGHT = | | | | | | | | | | | 506 |



- NOTES:**
- REFER TO CMS SECTIONS 106.03, 700, 709.01 THROUGH 709.05, AND 709.08. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING. RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08.
 - REINFORCING STEEL PREFIXED WITH AN "E" IN THE MARK NO. WILL BE EPOXY COATED. EXAMPLE: EAS 401 OR EAR 501.
 - APPROACH SLAB REINFORCING STEEL IS INCLUDED FOR PAYMENT WITH ITEM 611.

WESTON A Business Trust
 DESIGNERS CONSULTANTS
 3659 GREEN ROAD SUITE 215
 CLEVELAND, OHIO 44122

62/63

BAR SCHEDULE
APPROACH SLAB
 BRIDGE NO. CUY-490-0152
 I-490 UNDER RELOC. BROADWAY

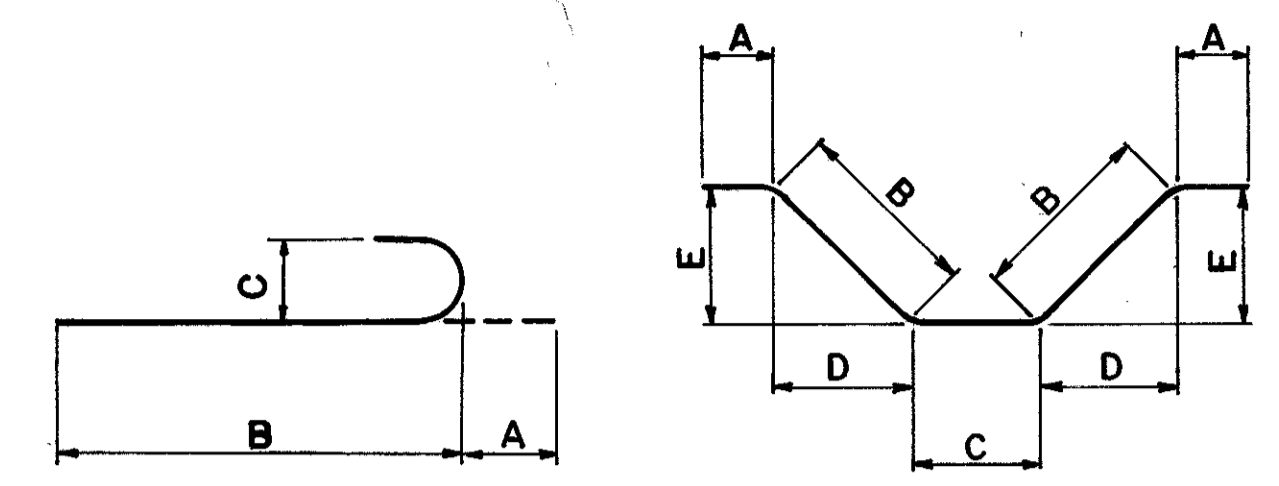
DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISE
 WHH | PRB | | DF | JRH | 2/83

DECK SLAB

| MARK | NO. REQUIRED | | | | | TYPE | LENGTH | A | B | C | D | E | WEIGHT |
|---------------------------------------|--------------|--------|---|---|----------|----------|---------|---|---------|-------|-------|---------|--------|
| | EAST | WEST | - | - | TOTAL | | | | | | | | |
| ES501 | 848 | 672 | | | 1520 | STRAIGHT | 30'-0" | | | | | | 47,561 |
| ES502 | 53 | 42 | | | 95 | STRAIGHT | 16'-0" | | | | | | 1,586 |
| ES503 | 828 | 840 | | | 1668 | STRAIGHT | 22'-10" | | | | | | 39,724 |
| ES504 | 856 | | | | 856 | STRAIGHT | 21'-9" | | | | | | 19,419 |
| ES505 | | 840 | | | 840 | STRAIGHT | 11'-10" | | | | | | 10,367 |
| ES506 | 2-SER. | | | | 2-SERIES | STRAIGHT | | 2-SERIES OF 14/11-3 1/2" TO 22'-8"/10 1/2" INCREMENTS | | | | | 495 |
| ES507 | 2-SER. | | | | 2-SERIES | STRAIGHT | | 2-SERIES OF 25/9'-6" TO 30'-6"/10 1/2" INCREMENTS | | | | | 1,043 |
| ES508 | 20 | 20 | | | 40 | STRAIGHT | 8'-0" | | | | | | 334 |
| ES509 | | 4-SER. | | | 4-SERIES | STRAIGHT | | 4-SERIES OF 14/9'-6" TO 20'-10 1/2"/10 1/2" INCREMENTS | | | | | 887 |
| ES510 | | 28 | | | 28 | STRAIGHT | 13'-6" | | | | | | 394 |
| ES511 | 443 | 443 | | | 886 | S9 | 7'-9" | 7" | 3'-1" | 8" | 3'-1" | 7" | 7,162 |
| ES512 | 884 | 884 | | | 1768 | 17 | 3'-3" | | 1'-0" | 1'-6" | 1'-0" | | 5,993 |
| SUB TOTAL = | | | | | | | | | | | | 134,965 | |
| ES401 | 1008 | 784 | | | 1792 | STRAIGHT | 30'-0" | | | | | | 35,912 |
| ES402 | 63 | 49 | | | 112 | STRAIGHT | 16'-0" | | | | | | 1,197 |
| ES403 | 122 | 98 | | | 220 | STRAIGHT | 25'-0" | | | | | | 3,674 |
| ES404 | 305 | 245 | | | 550 | STRAIGHT | 27'-0" | | | | | | 9,920 |
| ES405 | 61 | 49 | | | 110 | STRAIGHT | 31'-0" | | | | | | 2,277 |
| SUB TOTAL = | | | | | | | | | | | | 52,980 | |
| ES601 | 828 | | | | 828 | STRAIGHT | 26'-10" | | | | | | 33,372 |
| ES602 | 856 | | | | 856 | 1 | 18'-7" | 8" | 17'-11" | 6" | | | 23,893 |
| ES603 | | 840 | | | 840 | 1 | 21'-7" | 8" | 20'-11" | 6" | | | 27,231 |
| ES604 | | 868 | | | 868 | STRAIGHT | 14'-2" | | | | | | 18,470 |
| ES605 | 884 | 884 | | | 1768 | 17 | 2'-11" | | 1'-0" | 1'-3" | 1'-0" | | 7,745 |
| ES606 | 878 | 878 | | | 1756 | 17 | 7'-2" | | 6" | 6'-6" | 6" | | 18,902 |
| ES607 | 2-SER. | | | | 2-SERIES | STRAIGHT | | 2-SERIES OF 14/14'-10" TO 26'-2 1/2"/10 1/2" INCREMENTS | | | | | 863 |
| ES608 | 2-SER. | | | | 2-SERIES | STRAIGHT | | 2-SERIES OF 25/9'-6" TO 30'-6"/10 1/2" INCREMENTS | | | | | 1,502 |
| ES609 | 20 | 20 | | | 40 | STRAIGHT | 8'-0" | | | | | | 481 |
| ES610 | 12 | 12 | | | 24 | 17 | 4'-10" | | 6" | 4'-6" | | | 174 |
| ES611 | | 4-SER. | | | 4-SERIES | STRAIGHT | | 4-SERIES OF 14/9'-6" TO 20'-10 1/2"/10 1/2" INCREMENTS | | | | | 1,277 |
| ES612 | 30 | | | | 30 | 1 | 6'-2" | 8" | 5'-6" | 6" | | | 278 |
| SUB TOTAL = | | | | | | | | | | | | 134,188 | |
| DECK SLAB EPOXY COATED TOTAL WEIGHT = | | | | | | | | | | | | 322,133 | |

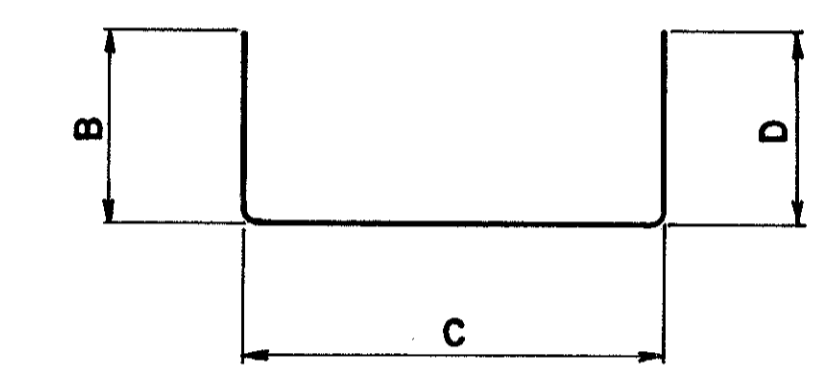
DECK SLAB

| MARK | NO. REQUIRED | | | | | TYPE | LENGTH | A | B | C | D | E | WEIGHT |
|--|--------------|------|---|---|-------|----------|--------|-----|-------|-------|------------|-------|--------|
| | EAST | WEST | - | - | TOTAL | | | | | | | | |
| RAILING (INCLUDE WITH RAILING FOR PAYMENT) EPOXY COATED | | | | | | | | | | | | | |
| ER501 | 6 | 6 | | | 12 | STRAIGHT | 9'-8" | | | | | | 121 |
| ER502 | 186 | 186 | | | 372 | STRAIGHT | 7'-2" | | | | | | 2,781 |
| ER503 | 90 | 90 | | | 180 | STRAIGHT | 14'-8" | | | | | | 2,754 |
| ER504 | 2 | | | | 2 | 17 | 4'-8" | | 2'-0" | 11" | 2'-0" | | 10 |
| ER505 | 2 | | | | 2 | 17 | 5'-9" | | 2'-0" | 2'-0" | 2'-0" | | 12 |
| ER506 | 3 | | | | 3 | 17 | 6'-10" | | 2'-0" | 3'-1" | 2'-0" | | 21 |
| ER507 | 3 | | | | 3 | 4 | 10'-6" | 10" | 3'-8" | 1'-9" | 1'-10 1/2" | 1'-4" | 33 |
| ER508 | 6 | 6 | | | 12 | STRAIGHT | 10'-6" | | | | | | 131 |
| RAILING EPOXY COATED TOTAL WEIGHT = | | | | | | | | | | | | 5,863 | |

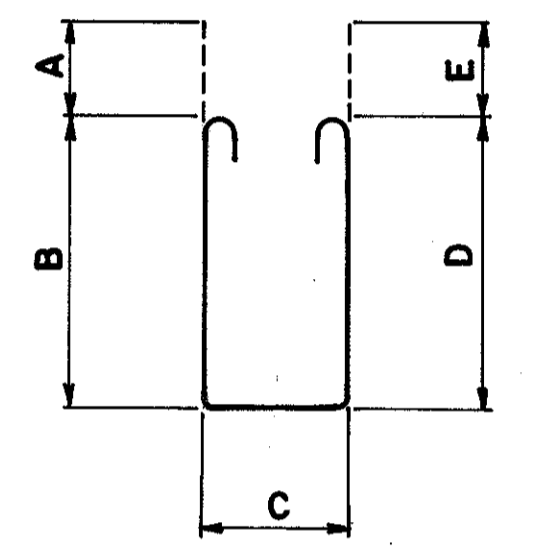


TYPE 1

TYPE 4



TYPE 17



TYPE S9

NOTES:

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- REINFORCING STEEL PREFIXED WITH AN "E" IN THE MARK NO. WILL BE EPOXY COATED. EXAMPLE: ES401 OR ER501.

BAR SCHEDULE
DECK SLAB

BRIDGE NO. CUY - 490 - 0152
 I-490 UNDER RELOC. BROADWAY

| | | | | | | |
|----------|-------|--------|---------|----------|------|--------|
| DESIGNED | DRAWN | TRACED | CHECKED | REVIEWED | DATE | REVISE |
| WHH | PRB | | DF | JRH | 2/83 | 10/8 |