



**CUY-90-14.90**

**PID 77332/85531**

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**APPENDIX EX-18**

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**CUY-077-1405 and CUY-090-1615 PID 0.427**  
**(Reference Document)**

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

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

0-12  
 21-0

FEDERAL PROJECT NUMBERS I-77-5(18)161 & I-90-1(101)29  
 APPEARING THROUGHOUT THIS PLAN SHALL BE CONSIDERED TO  
 READ I-77-5(17)161 & I-90-1(100)29.

WICOP-1111P  
 JUL 6 1977

FHWA REGION	STATE	PROJECT
5	OHIO	I-77-5(17)161 I-90-1(100)29

1  
84

I-77-5 (17) 161  
 I-90-1 (100) 29

CUYAHOGA COUNTY  
 CUY-77-14.05  
 CUY-90-16.15

PROJECT DESIGNATION CUY-77-14.12  
 CUY-90-16.21  
 APPEARING THROUGHOUT THIS PLAN SHALL BE  
 CONSIDERED TO READ CUY-77-14.05  
 CUY-90-16.15

STATE OF OHIO  
 DEPARTMENT OF TRANSPORTATION  
 CUY-77-14.05 AND CUY-90-16.15  
 CUYAHOGA COUNTY  
 CITY OF CLEVELAND

**CONVENTIONAL SIGNS**

COUNTY LINE	-----	LIMITED ACCESS (ONLY)	----- LA. -----
TOWNSHIP LINES	-----	RIGHT OF WAY (ONLY)	----- RW -----
SECTION LINE	-----	LIMITED ACCESS & RIGHT OF WAY	----- LA&RW -----
CORPORATION LINE	-----	EXISTING RIGHT OF WAY	-----
FENCE LINE (EXISTING)	-x-x-x-x-x-	PROPERTY LINE (IN EXISTING FENCE)	*-*-*
CENTER LINE	+-----+	RAILROAD	-----+-----
UTILITY POLES: TELEPHONE $\phi$ , POWER $\phi^P$ , LIGHT $\phi^L$		GUARDRAIL (EXISTING)	-----
		GUARDRAIL (PROPOSED)	-----

**INDEX OF SHEETS**

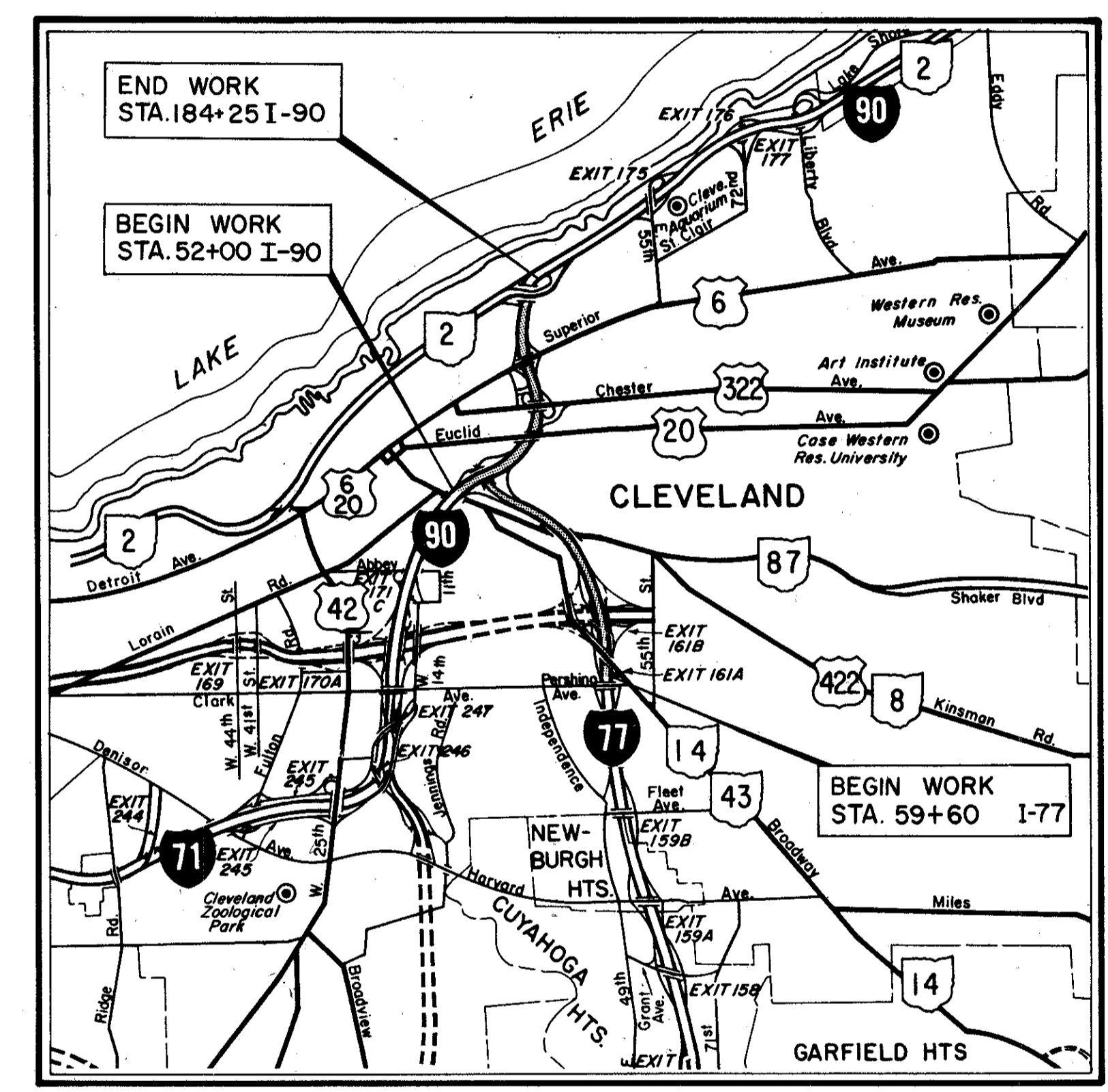
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**STANDARD DRAWINGS**

NUMBER	DATE	NUMBER	DATE
HL-1	9-6-73	HL-10	1-21-76
HL-2	7-27-73	HL-11	4-6-73
HL-3	7-27-73	HL-12	4-6-73
HL-6	3-22-77	HL-15	1-21-76
HL-8	1-21-76	HL-16	4-6-73
HL-9	3-22-77	MC-3	6-1-73

**SPECIFICATIONS SUPPLEMENTAL**

NUMBER	DATE	NUMBER	DATE
S625	1-11-74		
S713	1-11-74		
839	11-25-70		

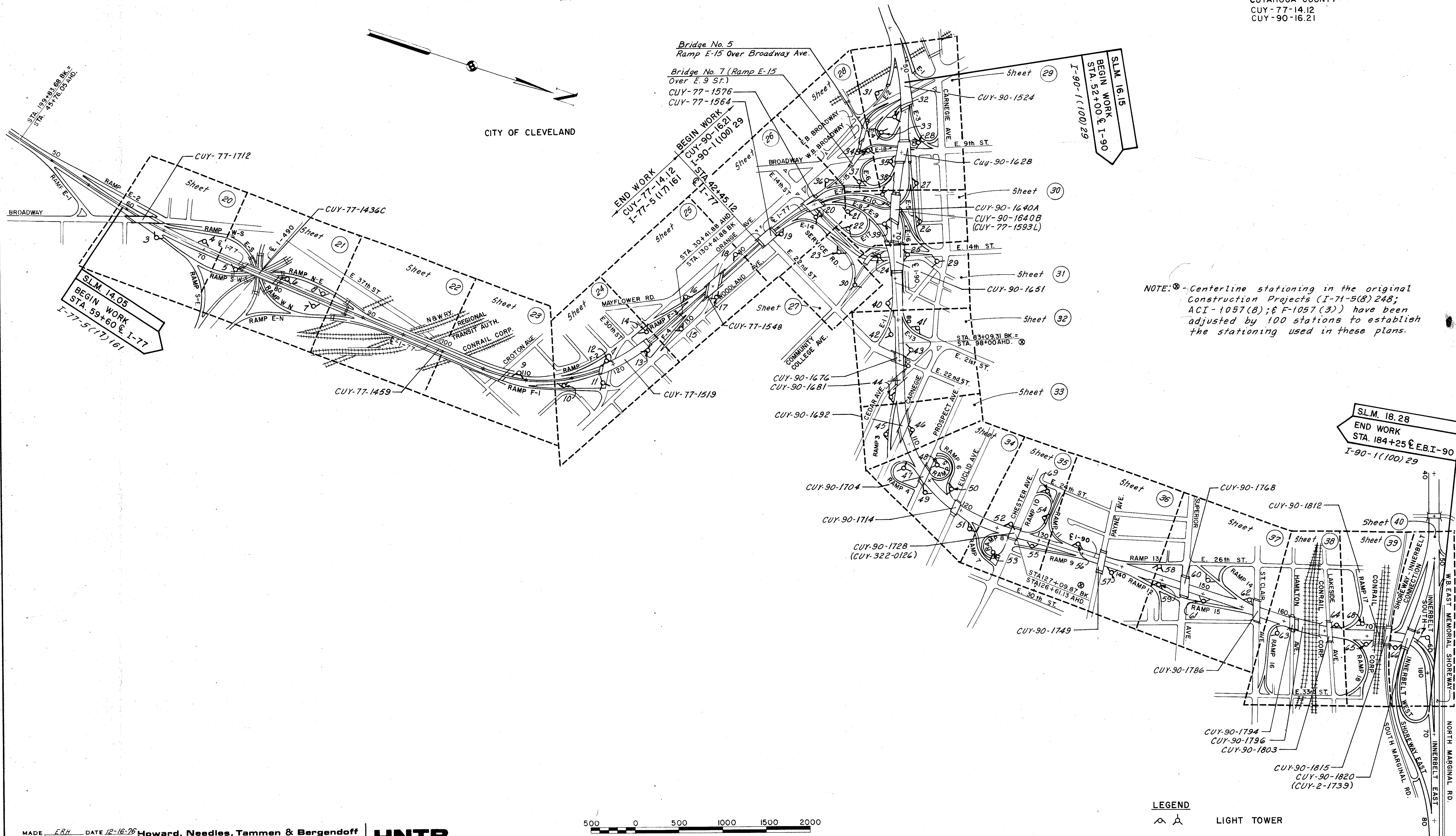


# SCHEMATIC LIGHTING PLANS

FHWA REGION	STATE	PROJECT
5	OHIO	

2  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



NOTE: Centerline stationing in the original Construction Projects (I-71-5(8) 248; ACI-1057(8); & F-1057(3)) have been adjusted by 100 stations to establish the stationing used in these plans.

MADE ERH DATE 12-16-76 Howard, Needles, Tammen & Bergendoff  
 TRACED EFJ DATE 12-24-76 CONSULTING ENGINEERS  
 CHECKED EFJ DATE 12-24-76 CLEVELAND, OHIO  
 SCALE 1"=500'

**HNTB**



LEGEND  
 LIGHT TOWER

FHWA REGION	STATE	PROJECT
5	OHIO	

3  
84

# LIGHTING NOTES

## QUANTITY CALCULATIONS

MADE BY ERH DATE 5-18-77  
CHECKED BY EFJ DATE 5-19-77

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

### 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.

### PLAN SPECIFICATION REFERENCES

References to Items 625 and 713 in these plans shall be considered to read as respective references to Items S625 and S713.

### 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, from:

Cleveland Electric Illuminating Company (C.E.I.),  
P.O. Box 5000, 55 Public Square, Cleveland, Ohio 44101

The Contractor will not be required to furnish or install the primary distribution lines, transformers, transformer pole, photocell, 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.

### COOPERATION

A contract for construction of an adjacent section may be let prior to this project contract or while this contract is in progress. The Contractor for this project shall coordinate his operation with the adjacent project contractor so as to complete both projects without undue delay or interference to the other Contractor.

The Contractor shall cooperate with the other Contractor to arrange a suitable work schedule, subject to the approval of the Engineer, to allow each Contractor to work and operate necessary equipment within work limits and to carry out the provisions of his contract. The Engineer shall notify each Contractor a minimum of thirty (30) days prior to any scheduled work by the other Contractor.

Each Contractor shall be held responsible for any damage by him, or his agents, to the work performed by the other Contractor.

Compensation for the above cooperation shall be incidental to the various pay items included within the construction project.

### ELEVATION DATUM

All elevations shown on these plans are in feet above the Cleveland Regional Geodetic Survey Datum Plane.

Pavement elevations shown in these plans were computed from previous plans and reflect the top of the concrete pavement then existing. Where roadway surfaces have been subsequently resurfaced add 0.21 feet to the edge of pavement elevation as shown in these plans, except at these locations; Sta. 161+57.75 I-90 to Sta. 161+75 I-90 overlay transitions from 0.21 feet to 0.10 feet and Sta. 161+75 I-90 to Sta. 173+75 overlay is a constant 0.10 feet.

### UNDERGROUND UTILITIES

The information shown in these plans concerning type and location of underground utilities, such as gas lines, electrical conduit or cable, waterlines, sewers, drains, etc., is not guaranteed to be accurate or all inclusive. The Contractor is responsible for making his own determinations as to the type and location of underground utilities as may be necessary to avoid damage thereto.

The Contractor shall comply with OSHA 1926.651 and call the Utilities Protection Service (1-800-362-2764) prior to any excavation.

The Contractor should exercise extreme caution and is fully responsible for all damage inflicted on underground utilities in excavation and trenching operations, replacement of guardrail and the like.

### UTILITIES

Following is a list of the utilities within the limits of construction:

East Ohio Gas Company, 1301 E. 55th Street, Cleveland, Ohio 44103.  
Cleveland Electric Illuminating Company, 55 Public Square, Cleveland, Ohio 44101  
Ohio Bell Telephone Company, Room 401, 820 Superior Avenue, W., Cleveland, Ohio 44113  
City of Cleveland Division of Light and Power, 1201 Lakeside Ave., Cleveland, Ohio 44114  
City of Cleveland, Division of Water, 1201 Lakeside Ave., Cleveland, Ohio 44114  
City of Cleveland, Division of Water Pollution Control, 1201 Lakeside Ave., Cleveland, Ohio 44114

### FIELD OFFICE

The Contractor shall provide a suitable field office having a minimum of 300 sq. ft. of floor space and, in addition to the requirements of Item 619, he shall provide and maintain sanitary provisions as per 107.05.

All the above shall be included in the lump sum price bid for Item 619, "Field Office".

### PUBLIC SAFETY

The period of time that a hazard is left unprotected by the removal of guardrail shall be held to an absolute minimum and in no case shall such a period be longer than one working day. If, after one day, the entire run of guardrail construction is not completed, the following shall apply:

- In areas where existing guardrail has been removed or the guardrail is in a partial stage of completion the Contractor shall provide and maintain Type II barricades with Type C (steady burning) warning lights (see Sheet 46 for detail) within the limits of the unprotected area. The barricades shall be placed at 50' intervals and offset at least two feet from the edge of traveled roadway and in close proximity to the construction. The approach end of a partially completed run of guardrail shall be fastened at ground level to a steel drum.
- If the existing guardrail is for the protection of an obstacle (i.e. sign support, bridge parapet, etc.) the Contractor shall erect Type 6 temporary beam rail in accordance with Item 606.04 for a length of 50 feet preceding the obstacle in the direction of traffic. The requirements of part (A) shall apply to the remaining guardrail within the run.
- The requirements stated in (A) and (B) shall apply for a period not to exceed one week. Where the rebuilding or construction of any run of guardrail cannot be accomplished within one week, the Contractor shall provide and maintain temporary beam rail, in accordance with Item 606.04, in the interim time it takes to complete the work. On the traffic approach end of the temporary beam rail, the end of the first section of rail shall be fastened to the steel drum so that the end of the rail is at the pavement or ground surface. In addition, a Type II barricade with Type B (High Intensity Flasher) Warning Light shall be placed in front of this initial section of temporary beam rail to provide forewarning to the approaching traffic.

The term "guardrail" as used herein shall be understood to cover all types of guardrail existing or proposed for the project including barrier design guardrail. The cost of complying with these safety procedures shall be in the lump sum bid for Item 614, Maintaining Traffic.

### EQUIPMENT AND MATERIAL STORAGE

In order to provide for the safety of the traveling public, the Contractor's attention is directed to the following:

- Construction equipment shall not be parked nor materials stored within the existing right of way limits of this project overnight.
- Construction equipment and vehicles in use during the working day shall not be parked any closer than thirty feet (30 ft) to the edge of roadway pavement, unless behind permanent guardrail, when the equipment and/or vehicles are not in operation.
- Private vehicles shall not be parked within the existing right of way limits of this project at any time.
- Materials removed for disposal, reuse, or storage may be stockpiled for pick-up and removal by the end of the same normal working day. Locations of the pick-up points shall be designated by the Engineer and shall be at least thirty feet (30 ft) away from the edge of the roadway pavement, unless behind permanent guardrail.
- Materials brought on-site for use in the project construction should be restricted to that quantity expected to be used during a working day and shall be stockpiled at a location greater than thirty feet (30 ft) from the edge of the roadway pavement, unless behind permanent guardrail. Materials not used during the same working day shall be removed from within the existing project right of way in accordance with (1) above.

6. Items 1 through 5 shall apply between the extreme work limits of this project. The above procedures supercede Item 614.03, Traffic Control, paragraph three. Exceptions to the above procedures shall not be made except as approved in writing by the Director.

The cost of complying with these safety procedures shall be included in the lump sum bid for Item 614, Maintaining Traffic.

### MAINTENANCE OF TRAFFIC

The Contractor shall conduct his operation with a minimum of hazard, delay and inconvenience to the motorists using the highway. Through traffic shall be maintained at all times and on all intersecting ramps.

Traffic control shall be maintained as indicated in the pertinent items of the specifications, and as outlined in the Ohio Manual of Uniform Traffic Control for Streets and Highways, current edition with latest revisions.

In addition, the following requirements shall apply:

- The Contractor shall submit in writing a schedule of operations to the Engineer and receive approval before work is started on the project.
- Traffic shall be maintained on the existing pavement without interruption during construction of the work except as otherwise approved by the Engineer.
- No lane closure shall be permitted without the written permission of the Engineer. Whenever any part of the travelled surface is closed, the motorists shall be warned and diverted by the Contractor through the use of a flashing arrow, equipped with an automatic dimming device, in addition to those provisions set forth in the Ohio Manual of Uniform Traffic Control Devices for Streets and Highways and in these Plans. The arrow shall consist of a minimum of eight sealed beam yellow lights at least 5 inches in diameter and 35 watts. These lights shall be mounted in the shape of an arrow on a panel and shall be elevated to a minimum height of seven (7) feet above the pavement. The lights shall flash either sequentially or simultaneously and shall be placed in a location, as directed by the Engineer, which will adequately warn the motoring public of the upcoming merger.
- The cost for the above shall be included in the lump sum price bid for Item 614, "Maintaining Traffic."

### 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 Contractor 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 625 "Maintaining Existing Lighting" which shall be full compensation for furnishing all labor, materials and incidentals necessary to complete the item of work.

### RESTORATION OF ELECTRICAL SERVICE FOR ILLUMINATED SIGNS

The Contractor shall provide and install new connector kits of the type specified in pull boxes adjacent to existing illuminated sign structures and reconnect electrical service to the illuminated sign. He shall demonstrate to the Engineer that power service has been restored to the sign.

Basis of payment for "Restoration of Electrical Service for Illuminated Signs" shall be included in the unit bid price of Item 625 - "Connector Kits, By Type", and is considered to be incidental to the scope of work.

### CONDUIT JACKED UNDER PAVEMENT, AS PER PLAN

This item shall consist of furnishing and installing conduit of the size or sizes indicated under existing pavement and contiguous shoulders by an approved method such as "drilling" or "jacking".

The Contractor shall place the conduit with the least amount of disturbance to existing pavement, subbase, berm pavement or shoulders of the roadway, and to prevent damage to the existing utilities.

All push pits or necessary excavations shall be backfilled and restored in accordance with 625.01.

Measurement of the conduit shall be the actual amount of linear feet installed under pavement and shoulders, measured in place, as accepted by the Engineer. The unit price bid for Item 625 "Conduit Jacked Under Pavement, As Per Plan" shall be full compensation for excavation, drilling or jacking, backfilling, compaction, restoration of pavement and all labor, material, equipment, and incidentals necessary to complete the work as specified.

MADE EFJ DATE 7-20-76  
TRACED JAG DATE 8-24-76  
CHECKED EFJ DATE 8-25-76  
SCALE None

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

**HNTB**

FHWA REGION	STATE	PROJECT	
5	OHIO		

4  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

# LIGHTING NOTES

## LIGHTING NOTES (CONTINUED)

### STANDARD CONSTRUCTION DRAWING HL-3

Pole Base details shown on this drawing are essentially for galvanized steel poles. For aluminum designs, or other permitted steel material designs, variations from these details will be acceptable, as approved by the Engineer.

### ELECTRICAL CABLES

In lieu of the requirements listed under S713.02, paragraphs 2(a) and 2(b), all cable to be used for 300 and 600 volt service shall be UL Type RHH, or RHW, or RHH/RHW and further meet the requirements of UL Type USE.

All single conductor cables to be used for 300 and 600 volt service shall not have a separate outer covering. ALTERNATE BIDS FOR 5KV CABLE SHALL BE FOR AN XLP TYPE UL MV-90, DRY.

### CONNECTOR KITS

At the option of the Contractor, Type IX cable connections may be substituted where Type II or III cable connections are specified in hand holes or transformer bases of light poles.

Type II through Type IX cable connections in pullboxes, junction boxes, and other enclosures below ground may be accomplished by the use of either of the following:

1. A sleeve or tee cable connector conforming to the general requirements of Style "S" or "H", or other connecting device approved by the Engineer. The connector shall be installed in accordance with the manufacturer's directions and the connection shall be sealed and waterproofed with a hi-dielectric compound such as "Aqua Seal" by Kearney, "Scotch Kit No. 2200" by 3M, or a similar compound by Blackburn or equal as approved by the Engineer. The sealing material shall be applied in accordance with the manufacturer's directions to make a watertight connection. Connections not accomplished in-line or in tee form shall be additionally protected by use of a hi-dielectric PVC, or other approved material, bent with an approved fastening device.

2. A preassembled kit, as manufactured by Joy or Bussman, or approved equal, with a waterproof or water-tight rating acceptable to the Engineer.

### LAMPS - HIGH PRESSURE SODIUM (HPS)

Supplementing 625.08, and 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 ASYMMETRIC, OR SYMMETRIC, DISTRIBUTION, AS SPECIFIED.

### UNDERPASS LUMINAIRES

UNDERPASS LUMINAIRES SHALL BE HOLOPHANE "UNDERPASS WALLPACK", OR EQUAL WESTINGHOUSE, MCGRAW-EDISON, OR GENERAL ELECTRIC UNDERPASS UNIT APPROVED BY THE ENGINEER, AND SHALL BE FURNISHED WITH AN INTEGRAL FUSE HOLDER AND 10-AMPERE FUSE. THE INTEGRAL BALLAST SHALL BE OF A REGULATOR TYPE, SINGLE RATED 480 VOLTS, AND DESIGNED FOR USE WITH A 100 WATT HIGH PRESSURE SODIUM LAMP, WITH LAMP OPERATING VOLTAGE OF 100 VOLTS.

### 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 [S713.19(10)] and all incidentals necessary to complete the 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 625 - "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.

### CONTROL CENTER AND SERVICE POLE

The Contractor shall furnish and install control center, located as per plans, to serve roadway lighting circuits. The control centers shall include the control equipment, mounted as shown on lighting detail sheets, and as specified.

The Contractor shall provide electrical service from the Power Company service pole to the Lighting Control Center, installed in the manner shown in the plans. This item of work shall include furnishing, and installing the conduit risers, weatherhead, arrester, and ground rod at the service pole, trench and conduit to the Control Center, all wiring of the size indicated in the plans and all other materials and incidentals as may be required to complete the item of work.

Basis of payment shall be at the lump sum bid price for Item 625 - "Control Center", complete, in place, with all materials, labor, and incidentals, installed, 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. THE CLEVELAND ELECTRIC ILLUMINATING COMPANY 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 WILSON BOHANNAN 660A, MASTER No. 4 BKA, OR APPROVED EQUAL, AND SHALL BE KEYPED ALIKE TO 81060. PAYMENT WILL BE INCLUDED IN THE BID FOR THE ITEMS BEING LOCKED.

### PLASTIC CAUTION TAPE

The location of underground duct cable and non-metallic conduit installed 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 approximate 6 inches wide polyethylene plastic, highly resistant to alkalis, acid or other chemical components likely to be encountered in soils. The tape shall be in bright yellow for contrast with the soil, with identifying printing ("Electric") in black letters, one side only. The identifying lettering shall be repeated continuously the full length of the tape. Tapes shall be supplied in continuous rolls. Identifying tapes shall be buried in the electric line trench. Trenches shall require one strip placed approximately down the center line. The tape shall be located approximately 8 inches to 12 inches below the final finished grade minimum. 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 not be placed in trenches adjacent to guard rail. The tape shall be Allen System, Terra Tape, Tecto Tape or approved equal.

Basis of payment shall be per lineal feet of Item 625 - "Plastic Caution Tape, As Per Plan", complete and in place.

### PULL BOX COVERS

Supplementing S713.09(3), covers for circular pullboxes shall be precast, steel reinforced concrete, of the size and dimensions detailed in the plans, with two (2) No. 4 Ga. galvanized steel lifting eyes recessed flush with the top of the cover. The cover shall be constructed with 4 x 4/6 reinforcing mesh and Class C concrete with No. 4 aggregate conforming to Item 499 of the Specifications.

Payment for Pullbox Covers, for circular pullboxes, shall be included in the unit price bid for Item 625 - "Pullbox, Circular, By Size, As Per Plan".

### EXISTING CIRCUIT CABLE AND ACCESSORIES, TO BE REMOVED

All existing circuit cable and accessories are to be removed from existing cross-overs 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 removal 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, pole and foundation, and the adjacent pullbox where described in the plans.

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 Hts. 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, as per Plan  
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.

### 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 where shown in the plans.

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.

### 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 THE 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 694-3334) 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 PRICE 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.

MADE EFJ DATE 2-20-76  
TRACED JAG DATE 2-24-76  
CHECKED EPI DATE 11-19-76  
SCALE NONE

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

**HNTB**

FHWA REGION	STATE	PROJECT
5	OHIO	

4A  
84

# LIGHTING NOTES

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

## LIGHTING NOTES (CONTINUED)

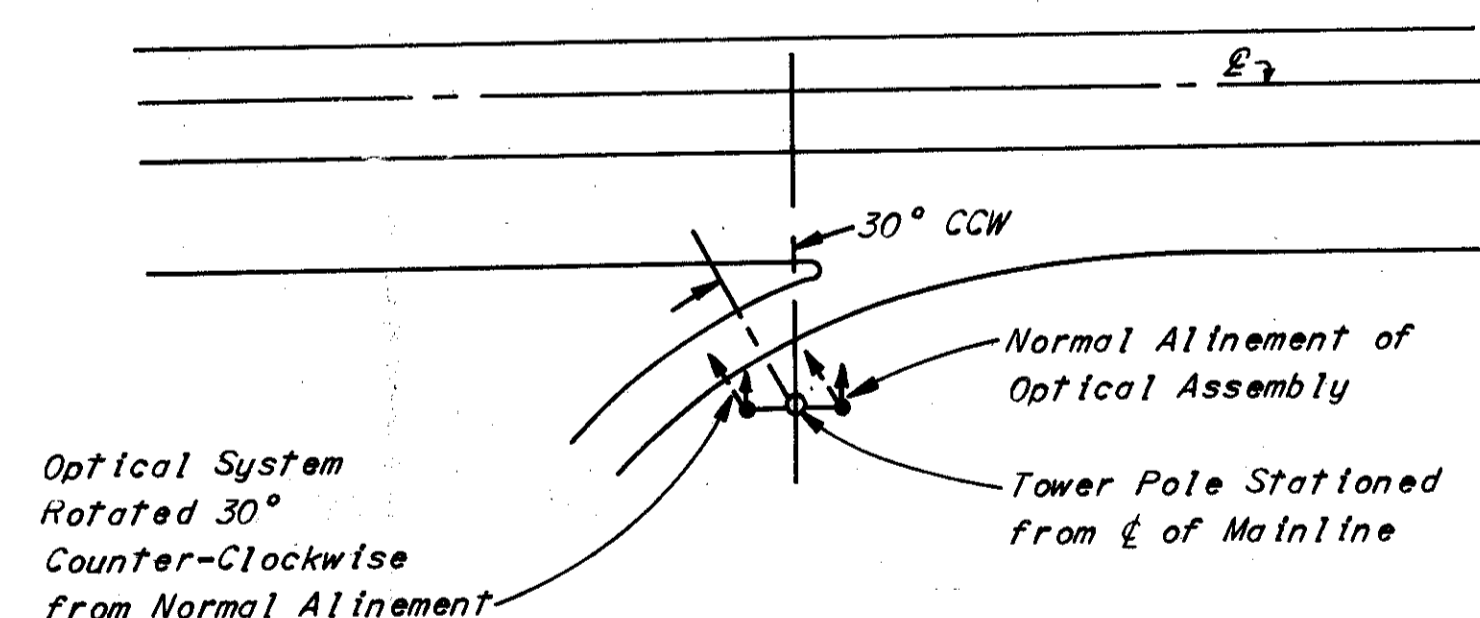
### LIGHT TOWER As Per Plan

ALL LIGHT TOWERS ON THIS PROJECT SHALL HAVE THE FOLLOWING ITEMS:

- A) A LOWERING DEVICE WITH A POSITIVE LATCHING MECHANISM TO REMOVE THE LOAD OF THE LUMINAIRE RING FROM THE LIFTING CABLES WHEN IN THE RAISED AND LATCHED POSITION. LATCHING AND UNLATCHING SHALL BE TRIGGERED BY THE OPERATION OF THE WINCH.
- B) THE HANDHOLE SHALL BE COVERED WITH A HINGED DOOR WITH A NONREMOVABLE STAINLESS STEEL PIN AND INCLUDE A HASP FOR PADLOCKING.
- C) A SECONDARY SURGE ARRESTER INSTALLED IN OR ON THE LUMINAIRE SUPPORT RING AND CONNECTED TO THE LOAD SIDE OF THE TERMINAL BLOCK.
- D) A 600V CIRCUIT BREAKER OR FUSE BLOCK INSTALLED IN THE TOWER BASE WITH LUGS TO ACCOMMODATE BOTH INCOMING AND OUTGOING CIRCUIT CABLES OF THE SIZE SPECIFIED IN THE PLANS.
- E) A WINCH WITH CABLE FOLLOWER OR OTHER APPROVED MEANS TO CONTAIN THE CABLE ON THE WINCH.
- F) FITTINGS FOR LIGHT TOWERS SHALL COMPLY WITH THE REQUIREMENTS OF S713.21 PARAGRAPH 6, EXCEPT GALVANIZED STEEL SHALL NOT BE PERMITTED.
- H) THE LUMINAIRE SUPPORT RING SHALL HAVE ROLLER CONTACT CENTERING ARMS OR SILICONE RUBBER BUMPER ROLLERS HAVING A DUROMETER HARDNESS SUCH THAT THE SHOCK TRANSFERRED TO EQUIPMENT MOUNTED ON THE LOWERING RING WILL NOT EXCEED 4G'S.
- I) THE CONTROL CABLE ON THE PORTABLE POWER UNIT SHALL BE A MINIMUM OF 20' FOOT LONG.

A HAND HOLE, WHICH SHALL BE LOCATED EITHER, 1) ON THE DOWN SLOPES, OPEN SIDE, FOR TOWERS WITH RETAINING WALLS; OR 2) ON THE SIDE OPPOSITE TRAFFIC FLOW TO WHICH TOWERS WITHOUT PLATFORMS ARE STATIONED.

### STANDARD ASYMMETRIC HIGH MAST LUMINAIRE MOUNTING ARRANGEMENT



Two luminaire mounting arms shall be installed on the luminaire mounting ring assembly at 180 degrees and positioned so that the arms are parallel to the centerline or baseline of the pavement from which the pole is stationed. Normally the luminaires shall be installed so that the "Arrow" or "Street Side" designation on the reflector is positioned perpendicular to the centerline or baseline from which the pole is stationed.

### LIGHT TOWER MAINTENANCE PLATFORM

The Contractor shall construct Light Tower Maintenance Platforms 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 Maintenance Platform, By Type, As per plan", including all labor, materials, equipment, and incidentals to complete the item of work as specified and accepted.

### 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 watertight. 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 in 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.

### RESTORATION OF DISTURBED AREAS AND DRAINAGE DITCH RELOCATION

Supplementing 625.01 of the Specifications, the Contractor shall restore all work areas, light tower construction sites, and access areas disturbed during construction to conform with the contiguous areas. This work shall include backfilling, compacting, grading, renovating, liming, fertilizing with 12-12-12 grade fertilizer, seeding and mulching, essentially in conformance with Items 203, 654, 655 and 659 of the Specifications, and as directed by the Engineer.

Payment for all restoration work, including equipment, labor, materials, all incidentals and the disposal of all debris shall be included in the unit price bid for the various items of work.

### LIGHT POLE UPGRADING

**General.** The Engineer shall check and ascertain that no light pole located behind rigid guard rail is upgraded in accordance with these details unless the face of rail in its planned location will be less than twenty-four (24) inches from the nearest face of the undisturbed pole in its existing location.

Even though light pole upgrading is directed, the Engineer shall further verify the actual need for each bid item at each pole location, and payment shall only be made for installations as directed and as determined by final measurement.

**Requirements.** This work shall consist of the following items:

1. Repairing, where directed, an existing concrete light pole foundation by furnishing and installing a steel bearing plate including four steel nuts with washers, as shown on the plans and in accordance with applicable sections of S19.06.
2. Furnishing and installing the following:
  - (a) A type AT-X light pole transformer base conforming to 713.01, the plans, and the plan data tabulated for ordering the AT-X base. This item shall include four steel nuts with washers to connect the AT-X base to the existing anchor bolts and four steel bolts, of the size shown on the plans, with steel nuts and galvanized clips or washers with nuts to connect the existing pole to the AT-X base.
  - (b) Light pole wiring extension Kits A, B, and C with all component items shown on the plans. In lieu of furnishing and placing cable extension Kits A and B, as detailed, the Contractor may, at his option, furnish and install all new No. 10 AWG pole and bracket cable in each light pole to be upgraded. Payment for one Kit A and one Kit B will be allowed for each pole so rewired.
  - (c) One each, 713.15 Type II and Type III cable connector kits, where same are not included in the existing pole wiring system.
  - (d) One each ground rod where directed by the Engineer as a maintenance replacement or required to secure an acceptable ground test as hereinafter specified.
3. Electrical testing as follows:
  - (a) A ground test as described in 625.22 except that the ground wire connecting each existing and/or newly installed ground rod to a light pole shall be included in the ground test.
  - (b) A performance test requiring the contractor to energize and manually operate, for a minimum period of one hour, each circuit of the roadway lighting system affected by this work. The Contractor shall make a visual check to determine that only those lights required to be energized by the circuit are operating. The Contractor shall record each fault and the method of correction performed. After correction of a fault, a restart of the interrupted test shall be required.

**Payment.** The unit price bid for each light pole foundation repaired and for each transformer base, wiring extension kit, connector kit, and ground rod furnished and installed shall include payment for all testing, equipment, labor, materials and component parts necessary to complete the work as specified.

### 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.

### GROUND RODS, As Per Plan

GROUND RODS FOR ALL LIGHT TOWERS SHALL HAVE A RESISTANCE TO EARTH NOT TO EXCEED 10 OHMS, IN LIEU OF 25 OHMS AS SPECIFIED IN S625.10.

MADE E.F.J. DATE 7-20-76  
TRACED J.A.G. DATE 8-24-76  
CHECKED E.F.J./J.S. DATE 11-16-76  
SCALE NONE

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

**HNTB**

# LIGHTING NOTES

QUANTITY CALCULATIONS  
 MADE BY ERH DATE 5-18-77  
 CHECKED BY EFJ DATE 5-19-77

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

## LIGHTING NOTES (CONTINUED)

### 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.

1. An estimated quantity of 500 linear foot of 605, 1/4 inch shallow pipe underdrains" is provided in the Lighting General Summary for use as directed by the Engineer in providing positive drainage for pull boxes in fill areas. It is intended that all pull boxes in these areas be provided with such drainage, provided the length of under-drain necessary to obtain a satisfactory outfall does not exceed 20 feet approximately. A perforated PVC pipe or conduit material approved by the Engineer may be used in the construction of this item.
2. An estimated quantity of 50 each, Item 202 "Pullbox, To Be Removed" is provided in the General Summary for use as directed by the Engineer. This work shall be for the purpose of removing existing pullboxes not associated with lightpoles or crossovers, as provided elsewhere.
3. An estimated quantity of 50 each, Item 625 "Pullbox Cover, Concrete, Replacement, As Per Plan", is provided in the General Summary for use as directed by the Engineer to replace missing or damaged covers to existing pullboxes which will be retained. These covers shall be salvageable covers, in good condition, removed from pullboxes which have been removed as provided elsewhere in these plans. When directed by the Engineer, the Contractor shall clean all debris from the pullbox to be recovered and assure that the cover seats flush with the top of the pullbox with not more than 0.5 inches total clearance each way.

### 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.

The testing requirements of 625.22(b) are hereby waived for those circuits on which the high voltage test is to be performed.

### POLICE AND FIRE EMERGENCY CALL BOXES

THIS ITEM OF WORK WILL CONSIST OF REMOVING, RELOCATING AND REMOUNTING EXISTING EMERGENCY CALL BOXES AT LOCATIONS SHOWN IN THE PLANS. THE WORK DOES NOT INCLUDE DISCONNECTION AND RECONNECTION OF THE SIGNAL COMMUNICATIONS CABLE.

AT LEAST 24 HOURS PRIOR TO WORK, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE CLEVELAND FIRE DEPARTMENT, FIRE SIGNAL DIVISION, ATTN.: JOSEPH UTLAK, CHIEF (621-1223). THE CFD WILL DISCONNECT THE EXISTING SIGNAL COMMUNICATIONS CABLE. THE CONTRACTOR WILL THEN REMOVE, RELOCATE AND REMOUNT THE BOXES IN A MANNER APPROVED BY THE CFD. CONCRETE ANCHOR FOR MOUNTING THE BOXES TO BRIDGE COLUMNS OR WINGWALLS SHALL BE TYPE APPROVED BY THE CFD. THE CFD WILL RECONNECT THE SIGNAL COMMUNICATIONS CABLE TO THE RELOCATED CALL BOX.

IT IS ESTIMATED THAT THERE ARE APPROXIMATELY 13 POLICE AND FIRE EMERGENCY CALL BOXES TO BE RELOCATED ON THE PROJECT.

BASIS OF PAYMENT FOR ALL LABOR, MATERIALS AND INCIDENTALS REQUIRED TO COMPLETE THE WORK AS SPECIFIED SHALL BE INCIDENTAL TO ALL OTHER ELECTRICAL WORK IN THE PROJECT.

### TOWER LIGHTNING PROTECTION

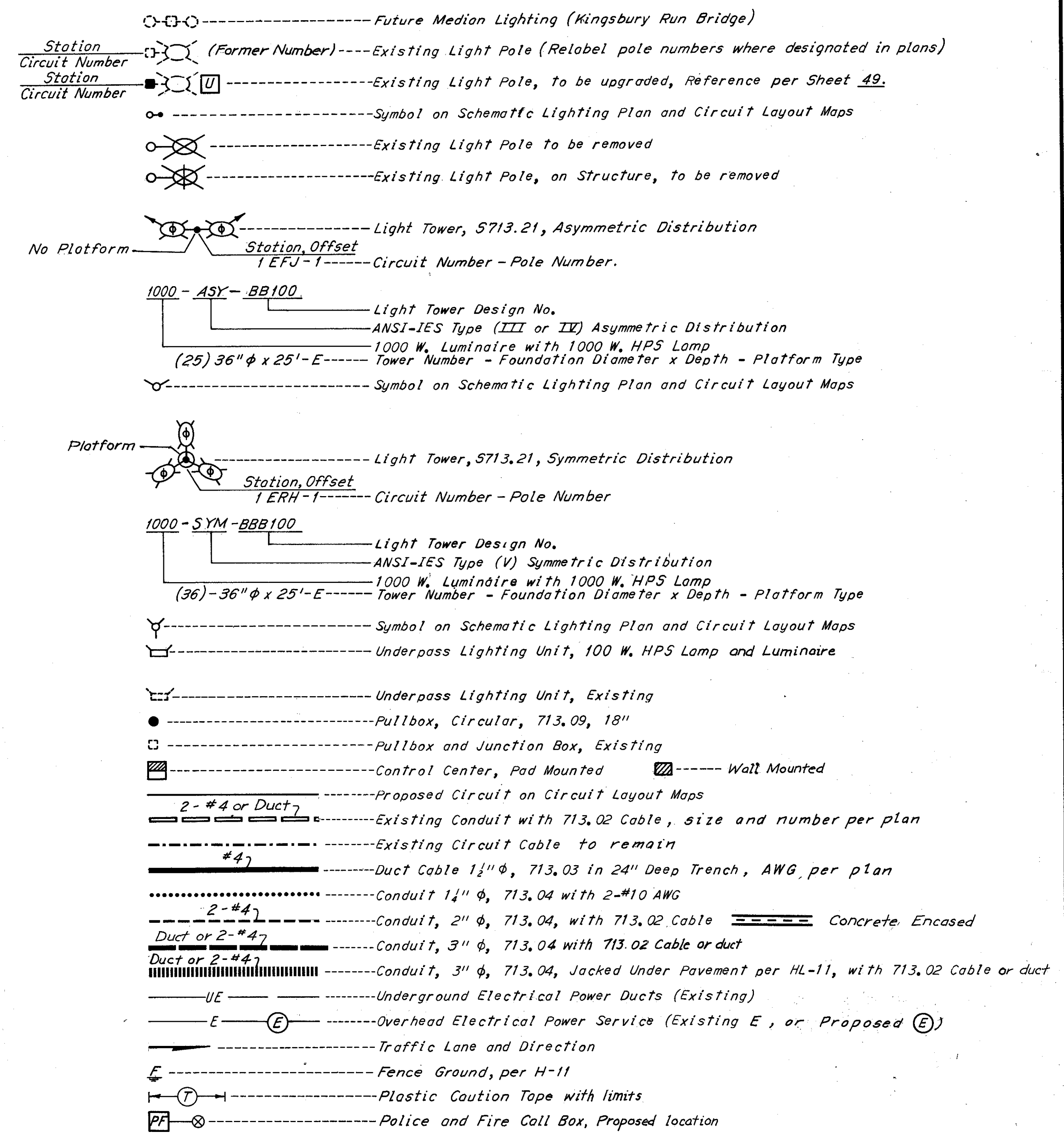
The unit price bid for each "Item S625, Tower Lightning Protection" shall be full compensation for furnishing and installing the air terminal and mounting bracket, grounding conductor, and bonding strap, and all labor, material, equipment, and incidentals necessary to complete the work as specified. See detail on Sh. No. 51.

### ESTIMATED QUANTITIES OF LUMINAIRES AND LAMPS.

AN ESTIMATED QUANTITY OF 142 200 WATT HIGH PRESSURE SODIUM LAMPS AND 142 STYLE B LUMINAIRES WITH 480 VOLT BALLASTS FOR 200 WATT HPS LAMPS SHALL BE SUPPLIED AND USED TO CONVERT THE LIGHTING UNITS SHOWN AS "EXISTING TO REMAIN" AND "EXISTING TO BE UPGRADED" TO HIGH PRESSURE SODIUM. THE STYLE B LUMINAIRE SHALL BE GENERAL ELECTRIC M-400, WESTINGHOUSE OV-25, MCGRAW EDISON "UNISTYLE-400," OR EQUAL APPROVED BY THE ENGINEER.

PAYMENT SHALL BE MADE AT THE UNIT PRICE BID FOR EACH ITEM S625 "LUMINAIRE, STYLE B, TYPE III, WITH 200 WATT HIGH PRESSURE SODIUM BALLAST" AND "LAMP, 200 WATT, HIGH PRESSURE SODIUM" AND SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIAL, EQUIPMENT, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK AS SPECIFIED.

## LEGEND







# LIGHTING GENERAL SUMMARY

QUANTITY CALCULATIONS  
 MADE BY E.R.H. DATE 5-18-77  
 CHECKED BY E.F.J. DATE 5-19-77

FHWA REGION	STATE	PROJECT	7 84
5	OHIO		

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

SHEET NUMBER	EST. QUANT.	COST PARTICIPATION			TOTAL QUANT.	UNIT	ITEM	DESCRIPTION
		FEDERAL-90%	STATE-5%	CITY-5%				
5	5							ROADWAY LIGHTING (CONTINUED) TYPE CODE - Y030
1								ROADWAY LIGHTING (CONTINUED) TYPE CODE - Y030
2								
3	94							LUMINAIRE, STYLE B, TYPE III, WITH 200 WATT HIGH PRESSURE SODIUM BALLAST
4	94	48						LAMP, 200 WATT, HIGH PRESSURE SODIUM
5								
6	6640 1750	1480 6840 650 1360 40						No. 4 AWG, 600 Volt Distribution Cable
7					8390	10370	10760	Lin. Ft.
8								
9								
10	6620 2230	2860 7850 7905 10545 6240						1 1/2" Ø Duct Cable w/2- No. 4 AWG, 600 Volt Cables
11					8850	35400	44250	Lin. Ft.
12								
13	320	615	10					Conduit 2" Ø, S713.04
14	70				320	625	945	Lin. Ft.
15	120	30 200 40			70		70	Lin. Ft.
16	135	205 660 325 255			120	270	390	Lin. Ft.
17					135	1445	1580	Lin. Ft.
18								
19								
20								
21					5	3	8	Each
22					3	10	13	Each
23					1	6	7	Each
24								
25					3	15	18	Each
26					13	25	38	Each
27								
28								
29								
30								
31	1							Light Tower Platform, Type D, As per plan
32					3	10	13	Light Tower Platform, Type E, As per plan
33					1	6	7	Light Tower Platform, Type F, As per plan
34								
35					3	15	18	Light Tower Foundation, 36" Ø x 20', As per plan
36					13	25	38	Light Tower Foundation, 36" Ø x 25', As per plan
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MADE E.R.H. DATE 12-27-76  
 TRACED A.P. DATE 12-28-76  
 CHECKED E.F.J. DATE 12-29-76  
 SCALE \_\_\_\_\_

**Howard, Needles, Tamman & Bergendoff**  
 CONSULTING ENGINEERS  
 CLEVELAND, OHIO



# LIGHTING GENERAL SUMMARY

QUANTITY CALCULATIONS  
 MADE BY E.R.H. DATE 5-18-77  
 CHECKED BY E.F.J. DATE 5-19-77

FHWA REGION	STATE	PROJECT
5	OHIO	

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21



SHEET NUMBER		STRUCTURE NUMBER CUY-																		EST. QUANT.		COST PARTICIPATION			TOTAL QUANT.	UNIT	ITEM	DESCRIPTION									
		-77-									-90-											FEDERAL-90%	STATE-5%	CITY-5%													
		1576	1524	1628	1640A	1640B	1651	1676	1681	1692	1704	1714	1728	1749	1768	1786	1794	1796	1803										1812	1820	3	5	TOTAL I-77	TOTAL I-90			
3	5																																				
I-77-5(17)161										I-90-1(10)29																											
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MADE E.R.H. DATE 12-27-76  
 TRACED V.A.G. DATE 12-28-76  
 CHECKED E.F.J. DATE 12-29-76  
 SCALE

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



# LIGHTING QUANTITIES SUB-SUMMARIES

QUANTITY CALCULATIONS  
 MADE BY ERH DATE 5-14-77  
 CHECKED BY EFJ DATE 5-14-77

FHWA REGION	STATE	PROJECT
5	OHIO	

8  
84

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

LINE NUMBER	STATION	STATION	SIDE	625										625			625		625				
				No. 4 AWG, 600 Volt Distribution Cable	Conduit 3" Ø 5713.04	1 1/2" Ø Duct Cable w/2-No. 4 AWG Cables	Conduit 2" Ø 5713.04	Conduit 2" Ø, 5713.04 Concrete Encased	Conduit 3" Ø, 5713.04 Jacketed Under Pavement As per plan	Pullbox, 18" Circular with cover, As per plan	Connector Kit Type II	Connector Kit Type III	Connector Kit Type VIII	Connector Kit Type IX	Connector Kit Type VIIIIC	GAL	CRD	ORG	Control Center Pad Mounted, As per plan	Plastic Caution Tape As per plan	Trench 24" deep		
				Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Each	Each	Each	Each	Lump	Lump	Lump	Lin. Ft.	Lin. Ft.				
1																							
2																							
3	Sheet 20																						
4	72+00	65+58	Lt.					720						2				100	700				
5	72+00	65+58	Rt.					660						2					645				
6	65+58		Lt.			200																	
7	65+58	6+46 Ramp S-E	Rt.			220																	
8	10+90 Ramp S-E	6+46 Ramp S-E	Rt.					470					1	1					450				
9	4+90 Ramp S-E		Rt.																				
10	6+46 Ramp S-E	CC "GAL"	Rt.			440													100				
11	64+80	CC "GAL"	Rt.			180			100										80				
12			Rt.					80															
13																							
14	Total	Sheet 20	I-77			1040		1850	180		90		1	1	6	2		Lump	100	1975			
15																							
16																							
17	Sheet 21																						
18	85+00	80+42	Lt.					520											40	500			
19	80+30	80+42	Lt.			70		25	35										25				
20	84+60	79+60	Rt.					580											60	560			
21	80+42	72+00	Lt.			1140			310					2	2				300				
22	79+60	74+55	Rt.											2	2								
23	74+80	74+55	Rt.			100		40	50										40				
24	74+55	72+00	Rt.						270										260				
25	87+00*	85+00	Lt.						225*										80*				
26	Total	Sheet 21	I-77			2360		65	1990			3		4	6				180	1685			
27																							
28																							
29	Sheet 23																						
30	108+16	113+00	Lt.					520											50	500			
31	107+40	113+00	Rt.					610												590			
32																							
33	Total	Sheet 23	I-77					1130						4	2				50	1090			
34																							
35																							
36	Sheet 24																						
37	126+00	124+60	Lt.			240		70	110										60	200			
38	124+60	118+40	Lt.			1260																	
39	118+40	119+50	Lt.					120											110	110			
40	118+40	116+15	Lt.					240												230			
41	116+15	7+55 Ramp E-2	Lt.					40															
42	113+00	CC "CPO"	Lt.					30											20	20			
43	7+55 Ramp E-2	CC "CRO"	Lt.					310											Lump	300	300		
44	126+00	124+20	Rt.			80		30	210											190			
45	124+50	118+28	Rt.			1260																	
46	118+28	118+30	Rt.			220														100			
47	118+30	113+95	Rt.						30	70										500			
48	113+95	CC "ORG"	Rt.			180		40	520										Lump	130	40		
49																							
50	113+00	CC "ORG"	Rt.						110											100			
51																							
52	Total	Sheet 24	I-77			3240		70	1650	140	70	30	2						Lump	Lump	620	1790	
53																							
54	I-77-5(18) 161																						
55	Total	Sheet 8	I-77			6640		135	6620	320	70	120	5						Lump	Lump	Lump	950	6540
56																							

All quantities shown are I-77-5(18) 161 participation

\* Quantities from 87+00 to 86+00 are shown on sheet 22

MADE ERH DATE 12-8-76  
 TRACED DLR DATE 12-16-76  
 CHECKED EFJ DATE 12-22-76  
 SCALE \_\_\_\_\_

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

**HNTB**

Rev. 2-17-78

# LIGHTING QUANTITIES SUB-SUMMARIES

## QUANTITY CALCULATIONS

MADE BY E.R.H. DATE 5-17-77  
 CHECKED BY E.F.J. DATE 5-17-77

FHWA REGION	STATE	PROJECT
5	OHIO	

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

LINE NUMBER	STATION	STATION	SIDE	625		625		625		625		625		625		625		625		625		
				Luminaire 100 W. Underpass, High Pressure Sodium As per plan	Lamp 100 W, High Pressure Sodium As per plan	No. 4 AWG, 600 Volt Distribution Cable	1 1/2" Ø Duct Cable w/2-No. 4 AWG Cables	Conduit 3" Ø 713.04	Conduit 3" Ø, 5713.04 Jacked Under Pavement As per plan	Pullbox, 18" Circular with cover As per plan	Connector Kit Type VIII	Connector Kit Type IX	Connector Kit Type VIII	Plastic Caution Tape As per plan	Trench 24" deep	Service To Underpass Lighting As per plan						
				Each	Each	Lin. Ft.	Lin. Ft.	Lin. Ft.	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Lump	
1																						
2																						
3	Sheet 25																					
4	40+00	34+01	Lt.			900		240														
5	34+01	30+92	Lt.					380														
6	30+92	126+00	Lt.					525														
7	37+10	36+07	Rt.					110														
8	34+60	36+07	Rt.					210														
9	36+07	3+20 Ramp E-4	Rt.			850		600														
10	3+20 Ramp E-4	126+00	Rt.					140														
11																						
12	Total	Sheet 25	I-77			1750		2205														
13																						
14																						
15																						
16	Sheet 26																					
17	40+00	40+19	Lt.					25														
18	44+80	7+00 Ramp E-14	Rt.					*645														
19	3+30 Ramp E-14	49+60	Rt.					*290														
20	49+05	49+60	Rt.																			
21	49+05	1+97 Ramp E-17	Rt.					*210														
22	BR. NO. CUY-77-1576			*6 <sup>s</sup>	*6 <sup>s</sup>			*600														*Lump <sup>s</sup>
23	1+97 Ramp E-17	2+68 Ramp E-17	Rt.					*75														
24	2+68 Ramp E-17	4+00 Ramp E-17	Rt.					*200														
25	13+13 Ramp E-15	13+75 Ramp E-15	Rt.					*95														
26	13+75 Ramp E-15	15+00 Ramp E-10	Rt.					*290														
27																						
28	Total	Sheet 26	I-77					25														
29	Total	Sheet 26	I-90	*6 <sup>s</sup>	*6 <sup>s</sup>	*810		*1595	*95													*Lump <sup>s</sup>
30																						
31																						
32																						
33	Sheet 27																					
34	10+10 Ramp E-14	7+00 Ramp E-14	Rt.					*365														
35	5+70 E.B. Scovill	5+00 W.B. Scovill	Lt.					*190														
36																						
37	Total	Sheet 27	I-90					*555														
38																						
39																						
40																						
41	Sheet 28																					
42	10+55 Ramp E-2	3+65 Ramp E-15	Rt.					*190														
43	13+60 E. 9 St.	12+70 E. 9 St.	Rt.					*230														
44	12+70 E. 9 St.	12+00 E. 9 St.	Rt.					*440														
45																						
46	6+50 Ramp E-6	5+60 Ramp E-6	Rt.					*95														
47	5+60 Ramp E-6	9+49 Ramp E-6	Rt.					*300														
48																						
49	Total	Sheet 28	I-90			*670		*710	*110													
50																						
51																						
52																						
53																						
54	Total	Sheet 9	I-77			1750		2230														
55	Total	Sheet 9	I-90	*6 <sup>s</sup>	*6 <sup>s</sup>	*1480		*2860	*205													*Lump <sup>s</sup>
56																						

Sta. Equation  
 130+41.98 B.C.  
 30+41.88 A.H.

MADE ERH DATE 12-9-76 **Howard, Needles, Tammen & Bergendoff**  
 TRACED DLR DATE 2-9-77 CONSULTING ENGINEERS  
 CHECKED EET DATE 2-17-77 CLEVELAND, OHIO



Quantities marked \* are I-90-1(101)29 participation  
 All others are I-77-5(18)161 participation

"s" denotes Structure Quantity.

# LIGHTING QUANTITIES SUB-SUMMARIES

## QUANTITY CALCULATIONS

MADE BY E.P.H. DATE 5-17-77  
 CHECKED BY E.F.J. DATE 5-17-77

FHWA REGION	STATE	PROJECT
5	OHIO	

10  
84

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

LINE NUMBER	STATION	STATION	SIDE	625		625		625		625		625		625		625		625		625		625		
				Each	Each	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each
1																								
2																								
3	Sheet 29																							
4	BR. NO. CUY-90-1524			13 <sup>s</sup>	13 <sup>s</sup>																		Lump <sup>s</sup>	
5	BR. NO. CUY-90-1628			12 <sup>s</sup>	12 <sup>s</sup>																		Lump <sup>s</sup>	
6	8+90 Ramp E-2	10+55 Ramp E-2	Rt.																					
7	3+65 Ramp E-15	42+40 W.B. Balwy	Lt.					185															50	
8	42+40 W.B. Balwy	8+00 Ramp E-4	Lt.					235																180
9	8+00 Ramp E-4	55+90 (Tower 32)	Rt.					150		50		25	1											200
10	55+90	58+60 (Tower 28)	Rt.					160																50
11	0+00 Ramp 3	2+10 Ramp 3	Rt.					570		50														150
12	0+83 Ramp 3 Conn	58+50	Lt.			250		270																380
13	58+50	9+00 Ramp E-5	Lt.			1460		250		115			1											430
14	5+80 Ramp E-4	8+00 Ramp E-4	Rt.					300																200
15	55+90	56+52	Rt.			140		200		60														200
16	1+40 Ramp E-6	61+22	Rt.			140				60														80
17	12+00 E-9 St.	9+00 Ramp E-8	Rt.					850		60														200
18	11+10 Ramp E-8	9+53 Ramp E-5	Lt.			440		60																300
19	Total	Sheet 29	I-90	25 <sup>s</sup>	25 <sup>s</sup>	2430		2870	360	335	25	6												950
20																								2280
21																								Lump <sup>s</sup>
22	Sheet 30																							
23	4+80 Ramp E-5	3+00 Ramp E-5	Rt.					210																200
24	2+50 Ramp E-16	4+00 Ramp E-10	Rt.			320				90														90
25	70+00	71+00	Lt.			220				50			1											50
26	10+53 Ramp E-17	2+60 Ramp E-8	Rt.			320																		320
27	65+25 (Tower 38)	15+00 Ramp E-10	Rt.					230		100		50	1											220
28	14+50 Ramp E-10	2+60 Ramp E-8	Rt.			240		500																480
29	4+00 Ramp E-17	68+35	Lt.			140				40		70												40
30	2+60 Ramp E-8	7+65 Ramp E-8	Rt.					570		60			2											620
31	68+65 (Tower 39)	7+65 Ramp E-8	Rt.					540					1											520
32	7+65 Ramp E-8	10+90 Ramp E-8	Rt.			210		210																200
33	64+40	10+90 Ramp E-8	Lt.			220		720																200
34	10+90 Ramp E-8	11+15 Ramp E-8	Lt.			140		50		25		100	1											360
35	9+00 Ramp E-5	8+60 Ramp E-5	Rt.			120				50														100
36	BR. NO. CUY-90-1640A			6 <sup>s</sup>	6 <sup>s</sup>																			25
37	BR. NO. CUY-90-1640B			3 <sup>s</sup>	3 <sup>s</sup>																			90
38																								Lump <sup>s</sup>
39	Total	Sheet 30	I-90	9 <sup>s</sup>	9 <sup>s</sup>	1930		3030	215	300	120	7												610
40																								3095
41	Sheet 31																							Lump <sup>s</sup>
42	22+70 N.B. E. 14 St.	3+00 Ramp E-5	Rt.					540																430
43	19+40 N.B. E. 14 St.	2+23 Ramp E-16	Lt.			450				25		55	1											170
44	2+93 Ramp E-5	2+50 Ramp E-16	Lt.			370				40														40
45	5+00 W.B. Scovill	16+70 N.B. E. 14 St.	Rt.					210																200
46	1+62 E.B. Scovill	16+70 N.B. E. 14 St.	Rt.					140																75
47	16+70 N.B. E. 14 St.	2+50 Ramp E-11	Rt.					650																160
48	71+00	1+85 Ramp E-10	Rt.			520																		620
49	4+00 Ramp E-10	78+00	Rt.			1140		170																160
50	79+00	78+00	Lt.					240																120
51																								Lump <sup>s</sup>
52	BR. NO. CUY-90-1651			13 <sup>s</sup>	13 <sup>s</sup>																			Lump <sup>s</sup>
53																								Lump <sup>s</sup>
54	Total	Sheet 31	I-90	13 <sup>s</sup>	13 <sup>s</sup>	2480		1950	40	25	55	3												160
55																								1815
56	Total	Sheet 10	I-90	47 <sup>s</sup>	47 <sup>s</sup>	6840		7850	615	660	200	16												1720

Quantities shown are I-90-1(101)29 participation.  
 s- denotes Structure Quantity.

MADE E.P.H. DATE 12-9-76  
 TRACED E.F.J. DATE 12-9-76  
 CHECKED E.F.J. DATE 12-23-76  
 SCALE

**HNTB**

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 CONSULTING ENGINEERS  
 CLEVELAND, OHIO



# LIGHTING QUANTITIES SUB-SUMMARIES

QUANTITY CALCULATIONS  
 MADE BY ERH DATE 5-16-77  
 CHECKED BY E.F.U. DATE 5-18-77

FHW REGION	STATE	PROJECT
8	OHIO	

12  
84

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

LINE NUMBER	STATION	STATION	SIDE	625	625	625	625	625	625	625	625	625	625	625	625	625	625	625	625	625	625	625	
				Luminaire 100W Underpass, High Pressure Sodium As per plan	Lamp 100W, High Pressure Sodium As per plan	No. 4 AWG, 600 volt Distribution Cable	Transformer Base Type AT-X, As per plan	1 1/2" Duct Cable w/2 - No. 4 AWG Cables	Conduit 3" # 713.04	Conduit 3" # 713.04 Jacked Under Pavement, As per plan	Pullbox, 18" with cover, As per plan	Extension Kit A	Extension Kit B	Extension Kit C	Connector Kit Type II	Connector Kit Type III	Connector Kit Type VIII	Connector Kit Type IX	Connector Kit Type VIFC	Ground Rod, S 713.16	Control Center Pad Mounted, As per plan	Plastic Courton Tape As per plan	Trench 24" Deep
				Each	Each	Lin. Ft.	Each	Lin. Ft.	Lin. Ft.	Lin. Ft.	Each	Each	Each	Each	Each	Each	CHE	STC	Lin. Ft.	Lin. Ft.	Lump		
1	Sheet	35																					
2	Tower #69	6+05 Ramp 11	Lt					480			2				4	1			350	410			
3	6+05 Ramp 10	4+00 Ramp 11	Lt					360												350			
4	126+20	1+30 Ramp 10	Lt					305			1				2	2				285			
5	Tower #54	1+30 Ramp 10	Lt					310	30		1									275			
6	1+30 Ramp 10	131+00	Lt					290												250			
7	123+00	1+60 Ramp 8	Rt					250												210			
8	9+70 Chester	1+60 Ramp 8	Rt					300							2				280	280			
9	1+60 Ramp 8	129+50	Lt					630							2	1	1		130	600			
10	129+50 (Tower #55)	131+00	Rt					180							2				30	170			
11	BR NO. CUY-90-1728			12 <sup>s</sup>	12 <sup>s</sup>																Lump <sup>s</sup>		
12	Total	Sheet 35	I-90	12 <sup>s</sup>	12 <sup>s</sup>			3105	30		7			8	6	3			790	2830	Lump <sup>s</sup>		
13	Sheet	36																					
14	4+00 Ramp 11	131+88	Lt					165							2					160			
15	131+00	2+48 Ramp 11	Rt			110		95							2	2				90			
16	144+00	1+57 Ramp 13	Lt					380												340			
17	1+57 Ramp 13	135+45	Lt					540												520			
18	141+20	139+20 (Tower #57)	Rt					260			1				2				45	240			
19	139+20	135+46	Rt					420											45	400			
20	131+00	2+40 Ramp 9	Rt					300							1					255			
21	2+40 Ramp 9	135+45	Lt			290		200												190			
22	135+45	134+40 (Tower #56)	Lt					220							2					150			
23	134+40	3+00 (CC CHE)	Lt			400		480		90					2				Lump	40	340		
24	BR NO. CUY-90-1749			8 <sup>s</sup>	8 <sup>s</sup>																Lump <sup>s</sup>		
25	Total	Sheet 36	I-90	8 <sup>s</sup>	8 <sup>s</sup>	800		3060	90		5			4	14				Lump	170	2685		
26	Sheet	37																					
27	144+00 (Tower #58)	0+40 SUPER	Lt					350							2					130	340		
28	148+00	151+30	Lt					340												330			
29	157+00	155+65 (Tower #62)	Lt				2	170			1				2	2				40	160		
30	155+65	6+60 E 26 St. Conn	Rt					670							2	2				40	650		
31	Tower #60	151+30	Lt					160						2	2	2				150	150		
32	7+85 E 30 St. Conn	Tower #59	Lt				2	370							2	2				300			
33	Tower #59	151+30	Lt					860	90		2				4	2				130	830		
34	4+20 Ramp 14	5+15 Ramp 15	Rt			560		150	45						4					100	140		
35	158+00	156+00 (CC STE)	Rt					260												Lump	60	240	
36	5+15 Ramp 15	156+00	Lt					1050								2				60	500		
37	BR NO. CUY-90-1768			8 <sup>s</sup>	8 <sup>s</sup>																Lump <sup>s</sup>		
38	BR NO. CUY-90-1786			8 <sup>s</sup>	8 <sup>s</sup>																Lump <sup>s</sup>		
39	Total	Sheet 37	I-90	16 <sup>s</sup>	16 <sup>s</sup>	560	4	4380	135	40	7	4	4	4	4	4	10	6	6	4	Lump	710	3640
40	Sheet	12																					
41	Total	Sheet 12	I-90	36 <sup>s</sup>	36 <sup>s</sup>	1360	4	10545	255	40	19	4	4	4	4	4	22	26	9	4	Lump	1670	9155

Quantities shown are I-90-1(101)29 participation  
 s - denotes structure quantities

MADE M.E.E. DATE 5-17-76  
 TRACED A.L.R. DATE 12-28-76  
 CHECKED E.F.J. DATE 12-27-76  
 SCALE \_\_\_\_\_

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



Rev. 1-26-78

# LIGHTING QUANTITIES SUB-SUMMARIES

QUANTITY CALCULATIONS  
 MADE BY E.R.H. DATE 5-18-77  
 CHECKED BY E.F.J. DATE 5-18-77

FHWA REGION	STATE	PROJECT
5	OHIO	

13  
84

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

LINE NUMBER	STATION	STATION	SIDE	625		625		625		625		625		625		625		625		625		625	
				Lin. Ft.	Each	Lin. Ft.	Lin. Ft.	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Lump	Lin. Ft.	Lin. Ft.	Lump	Lump	
1																							
2	Sheet 38																						
3	160+45	(CC "JAY")	Lt.																				
4	9+70 Ramp 16	7+80 Ramp 16	Lt.		3																		
5	9+70 E3351 Gm.	1+35 Ramp 16	Lt.		4		250																
6	1+95 Ramp 16	1+35 Ramp 16	Lt.				860																
7	1+35 Ramp 16	158+00	Lt.				75																
8	161+90	1+35 Ramp 16	Rt.				190																
9							145																
10	165+85	167+00	Lt.				150																
11	BR. NO. CUY-90-1794		Lt.																				
12	BR. NO. CUY-90-1796		Lt.																				
13	BR. NO. CUY-90-1803		Lt.																				
14	166+10	167+00	Rt.				100																
15	Total Sheet 38		I-90		7		1770																
16																							
17																							
18	Sheet 39																						
19	7+30 Ramp 18	CC KNG	Rt.		1		190																
20	1+15 Ramp 18	9+60 Ramp 18	Rt.		7		900																
21	167+00	1+15 Ramp 18	Rt.				120																
22	173+00	169+90	Rt.				340																
23	169+90 (Tower #63)	1+15 Ramp 18	Rt.				220																
24	173+00	167+48	Lt.				580																
25	167+00	169+30 Ramp 17	Lt.				330																
26	169+50 (Tower #68)	5+40 Ramp 17	Rt.				320																
27	5+40 Ramp 17	8+40 Ramp 17	Rt.				320																
28	8+40 Ramp 17	CC LAK	Rt.		4																		
29	BR. NO. CUY-90-1812		Lt.			40		10															
30																							
31	Total Sheet 39		I-90		12		3320	10															
32																							
33																							
34	Sheet 40																						
35	176+55 (Tower #71)	173+53	Lt.				390																
36	173+53	173+00	Lt.				110																
37	179+16	173+00	Rt.				650																
38																							
39	BR. NO. CUY-90-1820		Lt.																				
40																							
41	Total Sheet 40		I-90				1150																
42																							
43																							
44																							
45																							
46																							
47																							
48																							
49																							
50																							
51																							
52																							
53																							
54																							
55	Total Sheet 13		I-90		19		6240	10															
56																							

MADE BY E.R.H. DATE 12-3-76  
 TRACED BY E.F.J. DATE 2-18-77  
 CHECKED BY E.F.J. DATE 2-28-77  
 SCALE \_\_\_\_\_



Quantities shown are I-90-1(101)29 participation  
 s- denotes structure quantities.



# LIGHTING QUANTITIES SUB-SUMMARIES

QUANTITY CALCULATIONS  
 MADE BY E.R.H. DATE 5-12-77  
 CHECKED BY E.F.J. DATE 5-13-77

FHWA REGION	STATE	PROJECT
5	OHIO	

14  
84

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

LINE NO.	TOWER NO.	STATION	LOCATION	SIDE	COST PARTICIPATION	625	625	625		625	625	625	Special			625	625	625		625	625	625		625	625		
						Light Tower Design BB80	Light Tower Design BB90	Light Tower Design BB100		Light Tower Design BB 710	Light Tower Design BB120	Light Tower Design BB120	Tower Lightning Protection			Light Tower Platform Type D As Per Plan	Light Tower Platform Type E As Per Plan	Light Tower Platform Type F As Per Plan			Light Tower Foundation 36" ø x 20' Deep As Per Plan	Light Tower Foundation 36" ø x 25' Deep As Per Plan		Lamp 1000 W. High Pressure Sodium	Luminaire 1000 W Asymmetric	Luminaire 1000 W Type IX	
						EACH	EACH	EACH		EACH	EACH	EACH	EACH			EACH	EACH	EACH		EACH	EACH	EACH		EACH	EACH		
1																											
2		Sheet 20																									
3	3	64+80	☉ I-77	Rt.																							
4	4	69+76	☉ I-77	Lt.			1									1								2	2	2	1
5								1																			
6		Total Sheet 20			I-77		1	1					2			1								4	4	4	1
7																											
8																											
9		Sheet 21																									
10	5	74+80	☉ I-77	Rt.				1																			
11	6	80+30	☉ I-77	Lt.				1																			
12	7	84+60	☉ I-77	Rt.				1																			
13	8	85+00	☉ I-77	Lt.				1																			
14																											
15		Total Sheet 21			I-77			4					4											8	8	8	
16																											
17																											
18		Sheet 23																									
19	9	109+17	☉ I-77	Lt.			1																				
20																											
21		Total Sheet 23			I-77		1						1											2	2	2	
22																											
23																											
24		Sheet 24																									
25	10	113+95	☉ I-77	Rt.			1																				
26	11	118+30	☉ I-77	Rt.																							
27	12	119+50	☉ I-77	Lt.				1																			
28	13	124+20	☉ I-77	Rt.																							
29	14	125+50	☉ I-77	Lt.																							
30																											
31		Total Sheet 24			I-77		1	1		1	1	1	5			1		1						11	8	3	10
32																											
33																											
34		Sheet 25																									
35	15	129+10	☉ I-77	Rt.																							
36	16	32+00	☉ I-77	Lt.			1																				
37	17	34+60	☉ I-77	Rt.																							
38	18	39+45	☉ I-77	Lt.																							
39																											
40		Total Sheet 25			I-77		1	3					4			3								8	8		8
41																											
42																											
43		Sheet 26																									
44	19	44+80	☉ I-77	Rt.			*1																				
45	20	49+60	☉ I-77	Rt.																							
46	36	13+13	☉ Ramp E-13	Rt.			*1																				
47																											
48		Total Sheet 26			I-90		*2						*3			*1								*7	*4	*3	*6
49																											
50																											
51																											
52																											
53		Total Sheet 14																									
54		I-77-5 (18) 161			I-77		4	9		1	1	1	16			5	3	1						33	30	3	32
55		*I-90-1 (10) 29			I-90		*2						*3				*1							*7	*4	*3	*6
56																											

MADE E.R.H. DATE 12-9-76  
 TRACED D.L.R. DATE 12-13-76  
 CHECKED E.F.J. DATE 12-18-76  
 SCALE \_\_\_\_\_



Items indicated "\*" are I-90-1 (10) 29 quantities  
 All others are to be I-77-5 (18) 29 quantities.

Rev. 2-17-78

# LIGHTING QUANTITIES SUB-SUMMARIES

QUANTITY CALCULATIONS

MADE BY E.R.H. DATE 5-12-77  
 CHECKED BY E.F.J. DATE 5-13-77

FHWA REGION	STATE	PROJECT
5	OHIO	

15  
84

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

LINE NO.	TOWER NO.	STATION	LOCATION	SIDE	COST PARTICIPATION	625	625	625	625	625	625	625	625	Special	625	625	625	625	625	625	625	625	625	
						Light Tower Design BB80	Light Tower Design BB90	Light Tower Design BB120	Light Tower Design BB80	Light Tower Design BB100	Light Tower Design BB110	Light Tower Design BB120	Light Tower Design BB130	Tower Lightning Protection	Light Tower Platform Type E As Per Plan	Light Tower Platform Type F As Per Plan	Light Tower Foundation 36"Ø x 20' Deep As Per Plan	Light Tower Foundation 36"Ø x 25' Deep As Per Plan	Light Tower Foundation 36"Ø x 30' Deep As Per Plan	Lamp 1000 W High Pressure Sodium	Luminaire 1000 W Asymmetric	Luminaire 1000 W Type I	Ground Rod, 45 Per Plat	
						EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
1																								
2		Sheet 27																						
3																								
4	23	10+10	E Ramp E-14	Rt.		1																		
5	30	5+70	E.B. Scovill	Lt.										1										
6																								
7		Total Sheet 27			I-90	1								2										
8																								
9		Sheet 28																						
10																								
11																								
12	34	13+60	E 9th St.	Rt.			1							1										
13	37	6+55	E Ramp E-6	Lt.										1										
14																								
15		Total Sheet 28			I-90		1							2										
16																								
17		Sheet 29																						
18																								
19																								
20	27	9+75	E Ramp E-5	Rt.		1																		
21	28	58+60	E I-90	Lt.										1										
22	31	8+90	E Ramp E-2	Rt.																				
23	32	55+90	E I-90	Rt.																				
24	33	5+80	E Ramp E-4	Rt.																				
25	35	61+22	E I-90	Rt.			1																	
26																								
27		Total Sheet 29			I-90	2	1							6										
28																								
29		Sheet 30																						
30																								
31																								
32	21	4+78	E Ramp E-17	Rt.			1																	
33	22	10+53	E Ramp E-17	Rt.		1																		
34	26	4+80	E Ramp E-5	Rt.																				
35	38	65+25	E I-90	Rt.																				
36	39	68+65	E I-90	Rt.																				
37																								
38		Total Sheet 30			I-90	2	1							5										
39																								
40		Sheet 31																						
41																								
42																								
43	24	1+62	E.B. Scovill	Lt.																				
44	25	19+40	N.B.E.14 St.	Lt.																				
45	29	22+70	N.B.E.14 St.	Rt.																				
46	40	77+75	E I-90	Rt.		1																		
47																								
48		Total Sheet 31			I-90	1		1						4										
49																								
50																								
51																								
52																								
53																								
54																								
55		Total Sheet 15			I-90	6	3	1	1	2	3	2	1	19	1	1								
56																								

MADE E.R.H. DATE 12-9-76  
 TRACED E.F.J. DATE 12-15-76  
 CHECKED E.F.J. DATE 12-18-76  
 SCALE

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



Participation is I-90-1(101)29 for all quantities shown.

# LIGHTING QUANTITIES SUB-SUMMARIES

QUANTITY CALCULATIONS

MADE BY E.R.H. DATE 5-12-77  
 CHECKED BY E.F.J. DATE 5-13-77

FHWA REGION	STATE	PROJECT
5	OHIO	

16  
84

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

LINE NO.	TOWER NO.	STATION	LOCATION	SIDE	COST PARTICIPATION	625	625	625	625	625	Special			625	625	625			625	625	625			
						Light Tower Design BB60	Light Tower Design BB70	Light Tower Design BB80	Light Tower Design BB8100	Light Tower Design BB8110	Tower Lightning Protection	Light Tower Platform Type D As Per Plan	Light Tower Platform Type E As Per Plan	Light Tower Platform Type F As Per Plan	Light Tower Foundation 36"Ø x 20' Deep As Per Plan	Light Tower Foundation 36"Ø x 25' Deep As Per Plan	Light Tower Foundation 36"Ø x 30' Deep As Per Plan	Lamp 1000 W High Pressure Sodium	Luminaire 1000 W Asymmetric	Luminaire 1000 W Type II	Ground Rod, As Per Plan			
						EACH	EACH	EACH	EACH	EACH	EACH			EACH	EACH	EACH			EACH	EACH	EACH			
1																								
2		Sheet	32																					
3																								
4	41	2+60	Ramp E-13	Rt.				1			1								2	2			2	
5	42	5+02	Ramp E-11	Lt.				1			1								2	2			2	
6	43	99+15	I-90	Lt.		1					1								2	2			2	
7	44	2+40	Ramp 3	Rt.			1				1								2	2			2	
8																								
9		Total	Sheet 32		I-90	1	1	2			4			1	3				8	8			8	
10																								
11		Sheet	33																					
12																								
13																								
14	45	7+30	Ramp 3	Rt.			1				1								2	2			2	
15	46	108+70	I-90	Lt.		1					1								2	2			2	
16																								
17		Total	Sheet 33		I-90		2				2			1	1				4	4			4	
18																								
19		Sheet	34																					
20																								
21																								
22	47	112+25	I-90	Rt.				1			1								3		3		2	
23	48	9+30	Prospect	Lt.					1		1								3		3		2	
24	49	115+62	I-90	Rt.			1				1								2	2			2	
25	50	117+78	I-90	Lt.		1					1								2	2			2	
26	51	2+18	Ramp 7	Rt.			1				1								2	2			2	
27																								
28		Total	Sheet 34		I-90		2	1	1	1	5			2	1				12	6	6		10	
29																								
30		Sheet	35																					
31																								
32																								
33	52	126+20	I-90	Lt.			1				1								2	2	3		2	
34	53	9+88	Chester	Rt.				1			1								3				2	
35	54	3+65	Ramp 10	Lt.			1				1								2	2			2	
36	55	129+50	I-90	Rt.		1					1								2	2			2	
37	69	7+20	Chester Conn.	Rt.			1				1								2	2			2	
38																								
39		Total	Sheet 35		I-90		1	3	1		5			2	3				11	8	3		10	
40																								
41		Sheet	36																					
42																								
43																								
44	56	134+40	I-90	Lt.			1				1								2	2			2	
45	57	139+20	I-90	Rt.		1					1								2	2			2	
46																								
47		Total	Sheet 36		I-90		2				2			1	1				4	4			4	
48																								
49																								
50																								
51																								
52																								
53																								
54																								
55		Total	Sheet 16		I-90	1	8	6	2	1	18			3	3	3			39	30	9		36	
56																								

Participation is I-90-1(101)29 for all quantities shown.

MADE E.R.H. DATE 12-8-76  
 TRACED D.L.R. DATE 12-14-76  
 CHECKED E.F.J. DATE 12-18-76  
 SCALE

**HNTB**  
 CONSULTING ENGINEERS  
 CLEVELAND, OHIO

# LIGHTING QUANTITIES SUB-SUMMARIES

QUANTITY CALCULATIONS

MADE BY E.R.H. DATE 5-12-77  
 CHECKED BY E.F.J. DATE 5-13-77

FHWA REGION	STATE	PROJECT
5	OHIO	

17  
84

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

LINE NO.	TOWER NO.	STATION	LOCATION	SIDE	COST PARTICIPATION		625	625	Special	625	625	625	625	625	625	625	625	625	625	625
					Light Tower Design BB70	Light Tower Design BB80														
					EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
1																				
2		Sheet 37																		
3																				
4	58	144+20	℄ I-90 Lt.				1										2	2		2
5	59	4+95	℄ Ramp 12 Lt.														2	2		2
6	60	5+87	℄ Ramp 14 Lt.														2	2		2
7	61	150+30	℄ I-90 Rt.				1										2	2		2
8	62	155+65	℄ I-90 Lt.				1										2	2		2
9																				
10		Total Sheet 37		I-90			3				2	1	5				10	10		10
11																				
12		Sheet 38																		
13																				
14																				
15	63	1+95	℄ Ramp 16 Lt.				1										2	2		2
16	64	166+20	℄ I-90 Lt.				1										2	2		2
17																				
18		Total Sheet 38		I-90			2				1	1	2				4	4		4
19																				
20		Sheet 39																		
21																				
22																				
23	65	169+90	℄ I-90 Rt.				1										2	2		2
24	68	169+50	℄ I-90 Lt.				1										2	2		2
25																				
26		Total Sheet 39		I-90			2				1		2				4	4		4
27																				
28		Sheet 40																		
29																				
30																				
31	66	173+50	℄ I-90 Rt.				1										2	2		2
32	67	176+55	℄ S.B. I-90 Lt.														2	2		2
33																				
34		Total Sheet 40		I-90			1				1		2				4	4		4
35																				
36																				
37																				
38																				
39																				
40																				
41																				
42																				
43																				
44																				
45																				
46																				
47																				
48																				
49																				
50																				
51																				
52																				
53																				
54																				
55		Total Sheet 17		I-90			8				5	2	11				22	22		22
56																				

Participation I-90-1(101)29 for all quantities shown.

MADE E.R.H. DATE 12-10-76  
 TRACED D.L.R. DATE 12-15-76  
 CHECKED E.F.J. DATE 12-18-76  
 SCALE

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



# LIGHTING QUANTITIES SUB-SUMMARIES

QUANTITY CALCULATIONS  
 MADE BY E.R.H. DATE 5-14-77  
 CHECKED BY E.F.J. DATE 5-14-77

FHWA REGION	STATE	PROJECT
5	OHIO	

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

LINE NUMBER	STATION	STATION	SIDE	202		202		202		(Ref.)		202	
				Existing Lighting unit, to be removed, as per plan		Existing Underpass Lighting, to be removed, as per plan		Existing Lighting unit, structure mounted, to be removed, as per plan		Unit to be re-turned		Existing Underground Electrical Vault To be abandoned, As per plan	
				Each	Lump	Each	Lump	Each	Lump	State	City of Cleveland	Each	Lump
1		Project		I-77	I-77	I-77	I-77	I-77					I-77
2													
3	62+46 I-77	64+06 I-77	Rt.	3				3					
4	63+66 I-77	64+46 I-77	Lt.	2				2					
5													
6	Total	Sheet 62		5				5					
7													
8													
9													
10													
11	64+86 I-77	73+96 I-77	Lt./Rt.	15				15					
12	6+40 Ramp S-E	9+29 Ramp S-E	Rt.	5				5					
13													
14	Total	Sheet 63		20				20					
15													
16													
17													
18													
19	74+30 I-77	86+72 I-77	Lt./Rt.	13		8		21					
20	5+47 Ramp N-E	3+65 Ramp N-E	Rt.	3				3					
21	10+35 Ramp N-W	5+79 Ramp N-W	Rt.	6				6					
22													
23	Total	Sheet 64		22		8		30					
24													
25													
26													
27													
28													
29	87+00 I-77	99+00 I-77	Lt./Rt.			5		5					
30													
31	Total	Sheet 65				5		5					
32													
33													
34													
35													
36													
37													
38													
39													
40													
41													
42	108+90 I-77	Vault 82-13	Rt.										Lump
43	107+40 I-77	117+32 I-77	Lt./Rt.	21				21					
44	3+32 Ramp F-1	12+90 Ramp F-1	Rt.	12				12					
45	7+49 Ramp F-2	11+09 Ramp F-2	Lt.	5				5					
46	9+32 Rel. Orange	9+90 Rel. Orange	Lt./Rt.	6				6					
47													
48	Total	Sheet 67		44				44					Lump
49													
50													
51													
52													
53													
54													
55													
56													

LINE NUMBER	STATION	STATION	SIDE	202		202		202		(Ref.)		202	
				Existing Lighting unit, to be removed, as per plan		Existing Underpass Lighting, to be removed, as per plan		Existing Lighting unit, structure mounted, to be removed, as per plan		Unit to be re-turned		Existing Underground Electrical Vault To be abandoned, As per plan	
				Each	Lump	Each	Lump	Each	Lump	State	City of Cleveland	Each	Lump
1		Project		I-77	I-90	I-77	I-90	I-77	I-90	I-77	I-90		I-77
2													
3	118+24 I-77	129+87 I-77	Lt./Rt.	14				10		24			
4	124+50 I-77	Vault 82-12											Lump
5	Total	Sheet 68		14				10		24			Lump
6													
7													
8													
9													
10	30+41 I-77	39+50 I-77	Lt./Rt.	14				4		18			
11	0+49 Ramp F-4	6+88 Ramp F-4	Lt./Rt.	8				8		8			
12	4+07 Ramp F-3	8+97 Ramp F-3	Lt./Rt.	6				6		6			
13													
14	Total	Sheet 69		28				4		32			
15													
16													
17													
18													
19	44+10 I-77	Vault 81-29											Lump
20	39+50 I-77	48+00 I-77	Lt./Rt.	6	5			4	6	9			
21	2+49 Ramp E-14	3+29 Ramp E-14	Rt.	2				2		2			
22													
23	Total	Sheet 70		6	7			4	6	11			Lump
24													
25													
26													
27													
28													
29	48+74 I-77	50+81 I-77	Lt./Rt.	2				4		6			
30	2+42 Ramp E-7	6+17 Ramp E-7	Lt./Rt.	6				6		6			
31	0+28 Ramp E-8	4+13 Ramp E-8	Lt.	5				5		5			
32	1+44 Ramp E-9		Lt.	1				1		1			
33	13+56 Ramp E-10	17+29 Ramp E-10	Rt.	6				6		6			
34	4+15 Ramp E-14	9+38 Ramp E-14	Lt.	7				7		7			
35	13+31 Ramp E-15	16+60 Ramp E-15	Rt.	3				2		5			
36	1+97 Ramp E-17	15+13 Ramp E-17	Lt./Rt.	11				11		11			
37	Bridge No. CUY-77-1576		Lt./Rt.					Lump					
38													
39	Total	Sheet 71		41		Lump		6		47			
40													
41													
42													
43													
44													
45													
46													
47	39+80 I-77	41+50 I-77	Lt./Rt.	3						3			
48	0+69 Ramp E-15	12+49 Ramp E-15	Rt.	10				5		15			
49	7+66 Ramp E-18	9+44 Ramp E-18	Lt./Rt.	1				2		3			
50													
51	Total	Sheet 72		14				7		18		3	
52													
53													
54													
55													
56													

LINE NUMBER	STATION	STATION	SIDE	202		202		202		(Ref.)		202	
				Existing Lighting unit, to be removed, as per plan		Existing Underpass Lighting, to be removed, as per plan		Existing Lighting unit, structure mounted, to be removed, as per plan		Unit to be re-turned		Existing Underground Electrical Vault To be abandoned, As per plan	
				Each	Lump	Each	Lump	Each	Lump	State	City of Cleveland	Each	Lump
1		Project		I-90	I-90	I-90	I-90	I-90					I-90
2	41+50 I-90	45+00 I-90	Lt./Rt.	7						7			
3	54+54 I-90	57+60 I-90	Lt./Rt.	6				1		7			
4	7+35 Ramp E-2	10+40 Ramp E-2	Lt./Rt.	5						5			
5	1+00 Ramp E-3	5+84 Ramp E-3	Lt./Rt.	11						9		2	
6	2+63 Ramp E-4	9+38 Ramp E-4	Lt./Rt.	10						10			
7	Bridge No. CUY-90-1524		Lt./Rt.					Lump					
8													
9	Total	Sheet 73		39		Lump		1		31		9	
10</													

# LIGHTING QUANTITIES SUB-SUMMARIES

QUANTITY CALCULATIONS  
 MADE BY E.R.H. DATE 5-14-77  
 CHECKED BY E.F.J. DATE 5-14-77

FHWA REGION	STATE	PROJECT
5	OHIO	

19  
84

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

LINE NUMBER	STATION	STATION	SIDE	202		202		(Ref.)		202	
				Existing Lighting unit, to be removed, as per plan	Existing Underpass Lighting, to be removed, as per plan	Existing Lighting unit structure mounted, to be removed, as per plan	Unit to be re-turned	State	City of Cleveland	Existing Underground Electrical Vault To be abandoned, As per plan	
				Each	Lump	Each	-----	-----	Lump		
1		Project		I-90	I-90	I-90	I-90		I-90		I-90
2											
3	14+35 E I-90	18+85 E I-90	Lt.	11				11			
4	2+00 E Ramp 5	6+00 E Ramp 5	Rt.	2				2			
5	2+50 E Ramp 6	6+85 E Ramp 6	Lt.	5				5			
6	Bridge No. CUY-90-1714		Lt.		Lump						
7											
8	Total	Sheet 77		18	Lump			18			
9											
10											
11	2+10 E Ramp 7	Manhole B-123									Lump
12	3+00 E Ramp 8	Vault 95-94									Lump
13	20+10 E I-90	27+00 E I-90	Lt.	15				15			
14	3+10 E Ramp 7	7+59 E Ramp 7	Lt.	5				5			
15	2+35 E Ramp 8	6+61 E Ramp 8	Rt.	3				3			
16											
17	Total	Sheet 78		23				23			2-Lump
18											
19											
20											
21	135+45 E I-90	Vault 95-93									Lump
22	27+40 E I-90	36+90 E I-90		22				22			
23	3+29 E Ramp 9	8+58 E Ramp 9	Rt.	6				6			
24	2+05 E Ramp 10	6+00 E Ramp 10	Rt.	5				5			
25	3+47 E Ramp 11	7+53 E Ramp 11	Lt.	6				6			
26											
27	Total	Sheet 79		39				39			Lump
28											
29											
30											
31											
32											
33	38+09 E I-90	50+52 E I-90	Lt.	27				27			
34	3+39 E Ramp 12	7+43 E Ramp 12	Lt.	5				5			
35	2+95 E Ramp 13	7+40 E Ramp 13	Rt.	5				5			
36	5+24 E.30 St. Conn.	6+09 E.30 St. Conn.	Lt.	2				2			
37											
38	Total	Sheet 80		39				39			
39											
40											
41											
42											
43											
44											
45											
46											
47											
48											
49											
50											
51											
52											
53											
54											
55											
56											

LINE NUMBER	STATION	STATION	SIDE	202		202		(Ref.)		202	
				Existing Lighting unit, to be removed, as per plan	Existing Underpass Lighting, to be removed, as per plan	Existing Lighting unit structure mounted, to be removed, as per plan	Unit to be re-turned	State	City of Cleveland	Existing Underground Electrical Vault To be abandoned, As per plan	
				Each	Lump	Each	-----	-----	Lump		
1		Project		I-90	I-90	I-90	I-90		I-90		I-90
2											
3	51+15 E I-90	56+10 E I-90	Lt.	12				12			
4	1+80 E Ramp 14	8+85 E Ramp 14	Lt.	7				7			
5	3+15 E Ramp 15	7+15 E Ramp 15	Lt.	5				5			
6	4+61 E.26 St. Conn.		Rt.	1				1			
7											
8	Total	Sheet 81		25				25			
9											
10											
11											
12	60+40 E I-90	Vault M-41									Lump
13	57+25 E I-90	66+20 E I-90	Lt.	16				16			
14	1+50 E Ramp 16	4+70 E Ramp 16	Lt.	4				4			
15	Bridge No. CUY-90-1786		Lt.		Lump						
16	Bridge No. CUY-90-1796		Lt.		Lump						
17											
18	Total	Sheet 82		20	Lump			20			Lump
19											
20											
21											
22	70+50 E I-90	Manhole M-44									Lump
23	66+80 E I-90	72+85 E I-90	Lt.	13				13			
24	1+70 E Ramp 17	3+55 E Ramp 17	Rt.	4				4			
25	2+18 E Ramp 18		Rt.	1				1			
26	Bridge No. CUY-90-1812		Lt.		Lump						
27											
28	Total	Sheet 83		18	Lump			18			Lump
29											
30											
31											
32											
33	73+00 E I-90	78+53 E I-90	Lt.	8				8			
34											
35	Total	Sheet 84		8				8			
36											
37											
38											
39											
40	Sub Total	Sheet 19									
41	Project I-90-1(101)	29		190	Lump			190			Lump
42											
43											
44											
45											
46											
47											
48											
49											
50											
51											
52											
53											
54											
55											
56											

MADE MEE DATE 9-10-76  
 TRACED DLR DATE 9-16-76  
 CHECKED E.F.J. DATE 12-21-76  
 SCALE

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

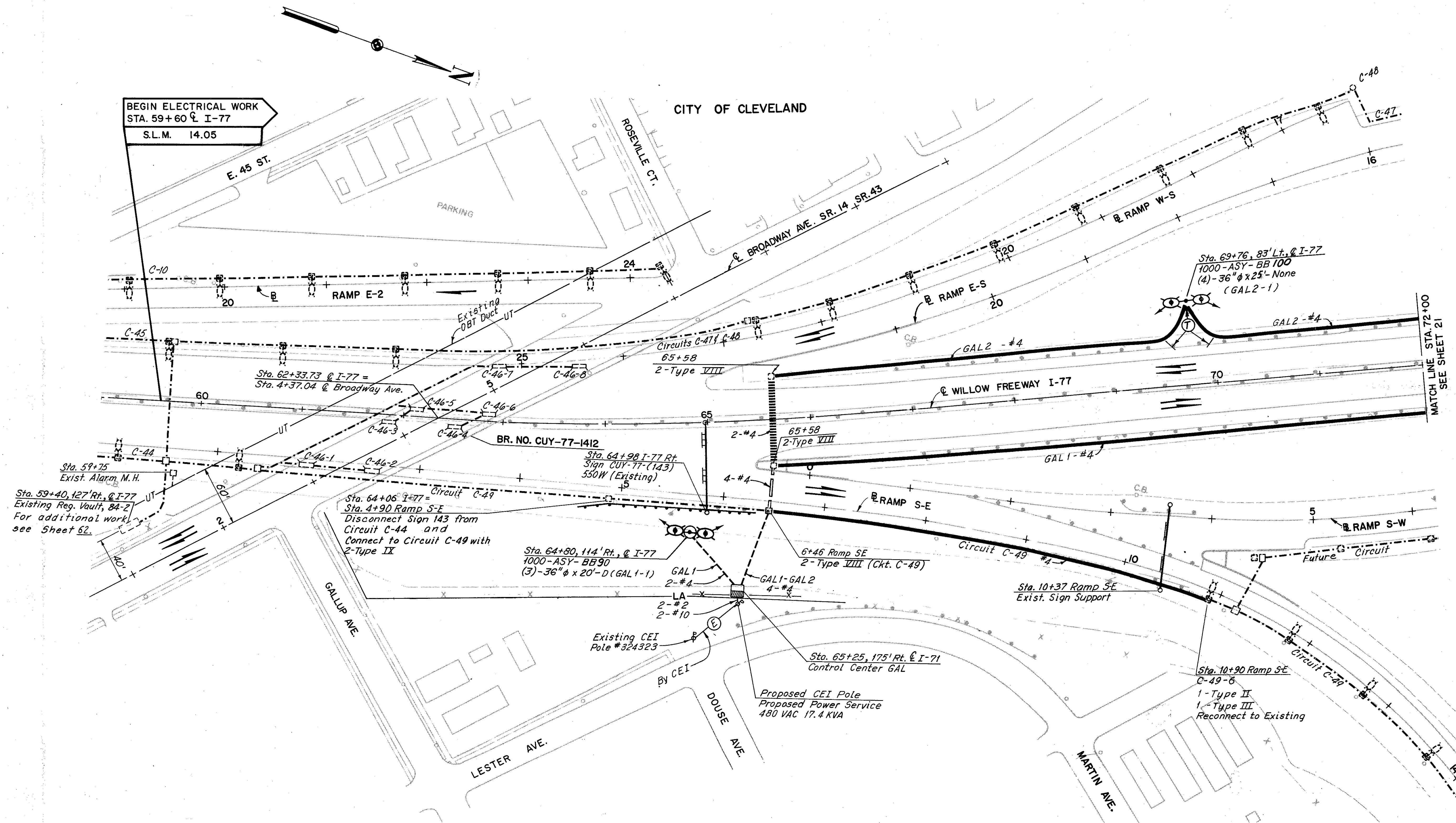
**HNTB**

# LIGHTING INSTALLATION PLANS

FHWA REGION	STATE	PROJECT
5	OHIO	

20  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



BEGIN ELECTRICAL WORK  
STA. 59+60 @ I-77  
S.L.M. 14.05

CITY OF CLEVELAND

MATCH LINE STA. 72+00  
SEE SHEET 21

Sta. 59+75  
Exist. Alarm M.H.

Sta. 59+40, 127' Rt. @ I-77  
Existing Reg. Vault, 84-2  
For additional work  
see Sheet 62.

Sta. 64+06 I-77 =  
Sta. 4+90 Ramp S-E  
Disconnect Sign 143 from  
Circuit C-44 and  
Connect to Circuit C-49 with  
2-Type IX

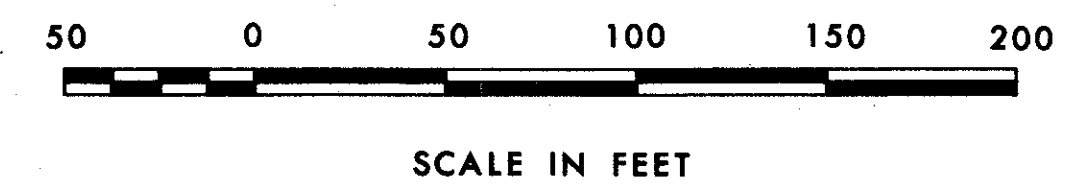
Sta. 64+80, 114' Rt. @ I-77  
1000-ASY-BB90  
(3)-36" φ x 20'-D (GAL1-1)

Existing CEI Pole #324323  
By CEI

Sta. 65+25, 175' Rt. @ I-77  
Control Center GAL

Proposed CEI Pole  
Proposed Power Service  
480 VAC 17.4 KVA

Sta. 10+90 Ramp S-E  
C-49-6  
1-Type II  
1-Type III  
Reconnect to Existing



FOR LEGEND SEE SHEET 5

MADE EPJ DATE 10-18-76  
TRACED AJT DATE 11-28-76  
CHECKED EPJ DATE 12-22-76  
SCALE 1" = 50'

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

**HNTB**

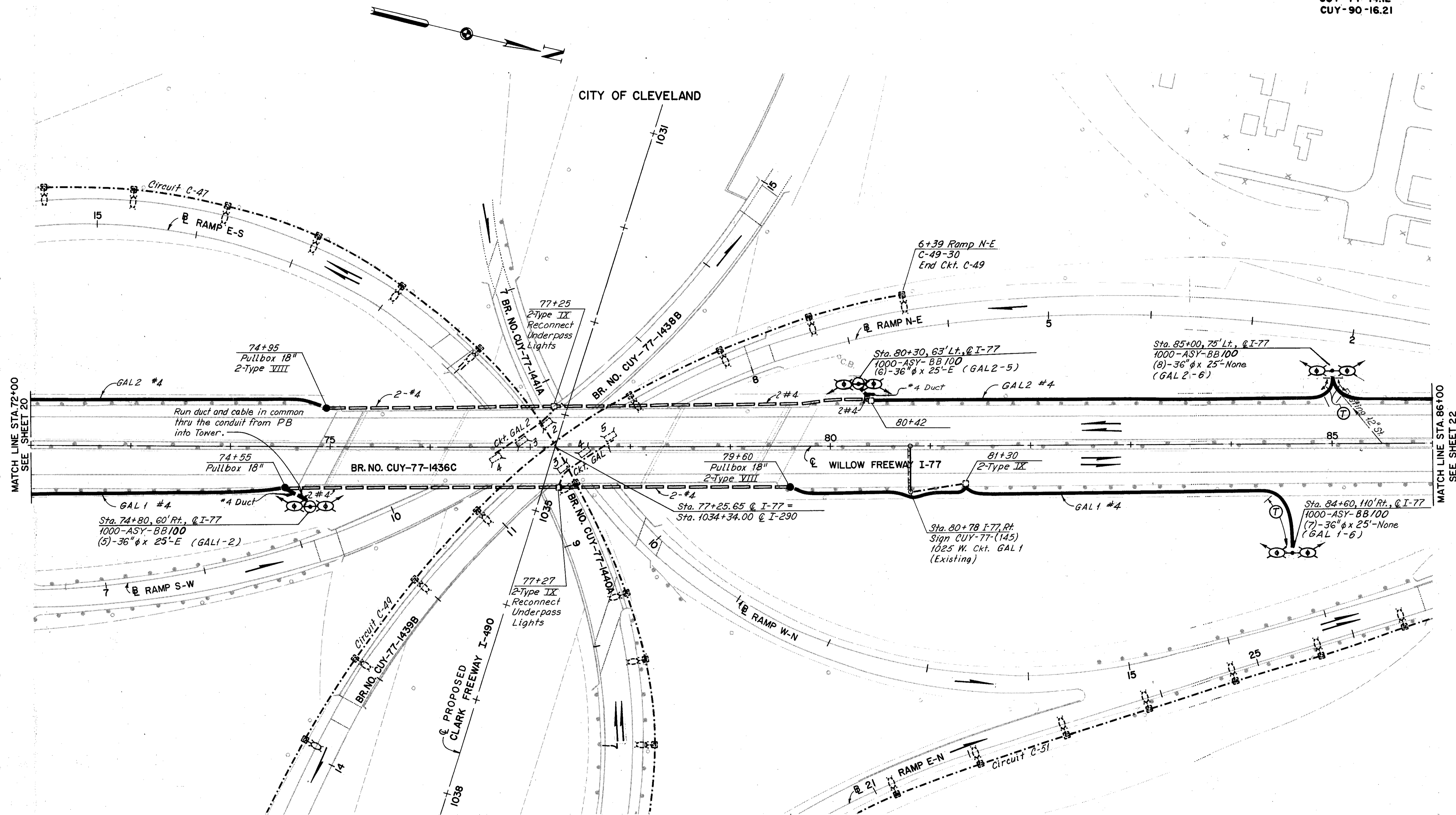
Rev. 2-17-78

LIGHTING PLAN STA. 59+00 TO STA. 72+00 I-77

FHWA REGION	STATE	PROJECT
5	OHIO	

21  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



MATCH LINE STA 72+00  
SEE SHEET 20

MATCH LINE STA 86+00  
SEE SHEET 22

FOR LEGEND SEE SHEET 5

MADE ERH DATE 10-18-76  
TRACED AJT DATE 11-28-76  
CHECKED BY DATE 12-22-76  
SCALE 1/8" = 1'-0"

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

**HNTB**



Rev. 2-17-78

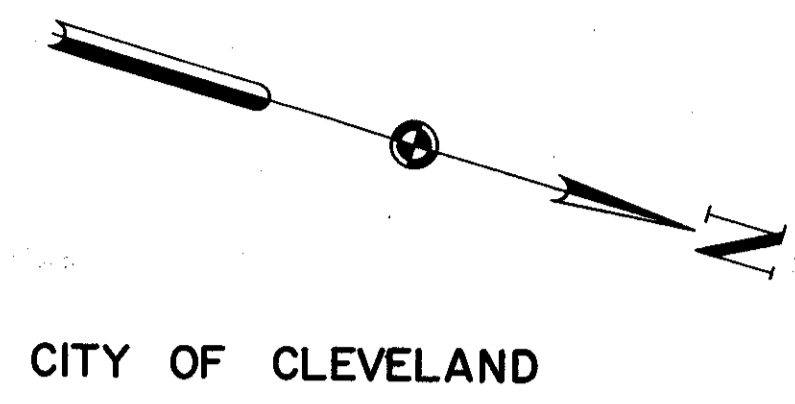




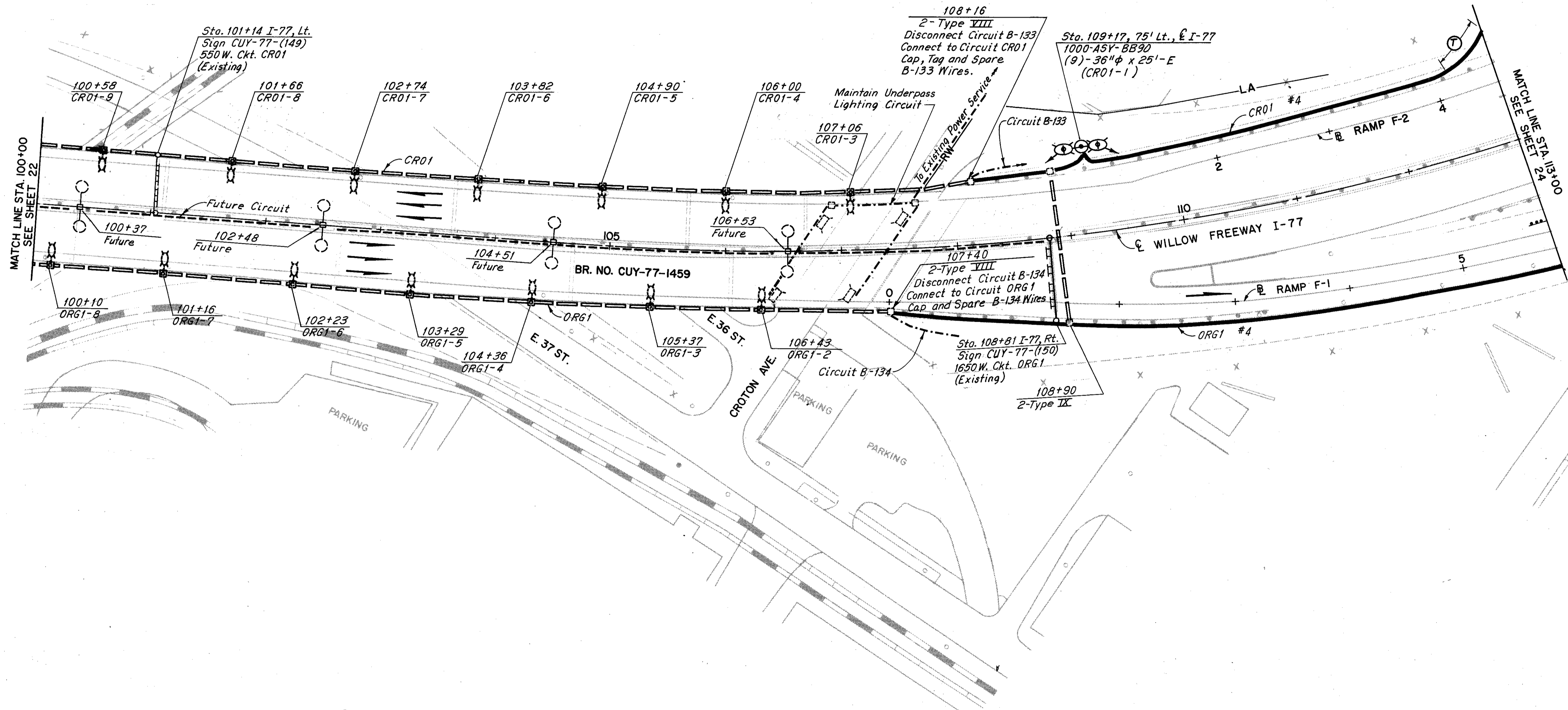
FHWA REGION	STATE	PROJECT
5	OHIO	

23  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



CITY OF CLEVELAND



MADE ERH DATE 10-18-76  
 TRACED DLG DATE 11-23-76  
 CHECKED P.E.T. DATE 12-22-76  
 SCALE 1"=50'

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

**HNTB**



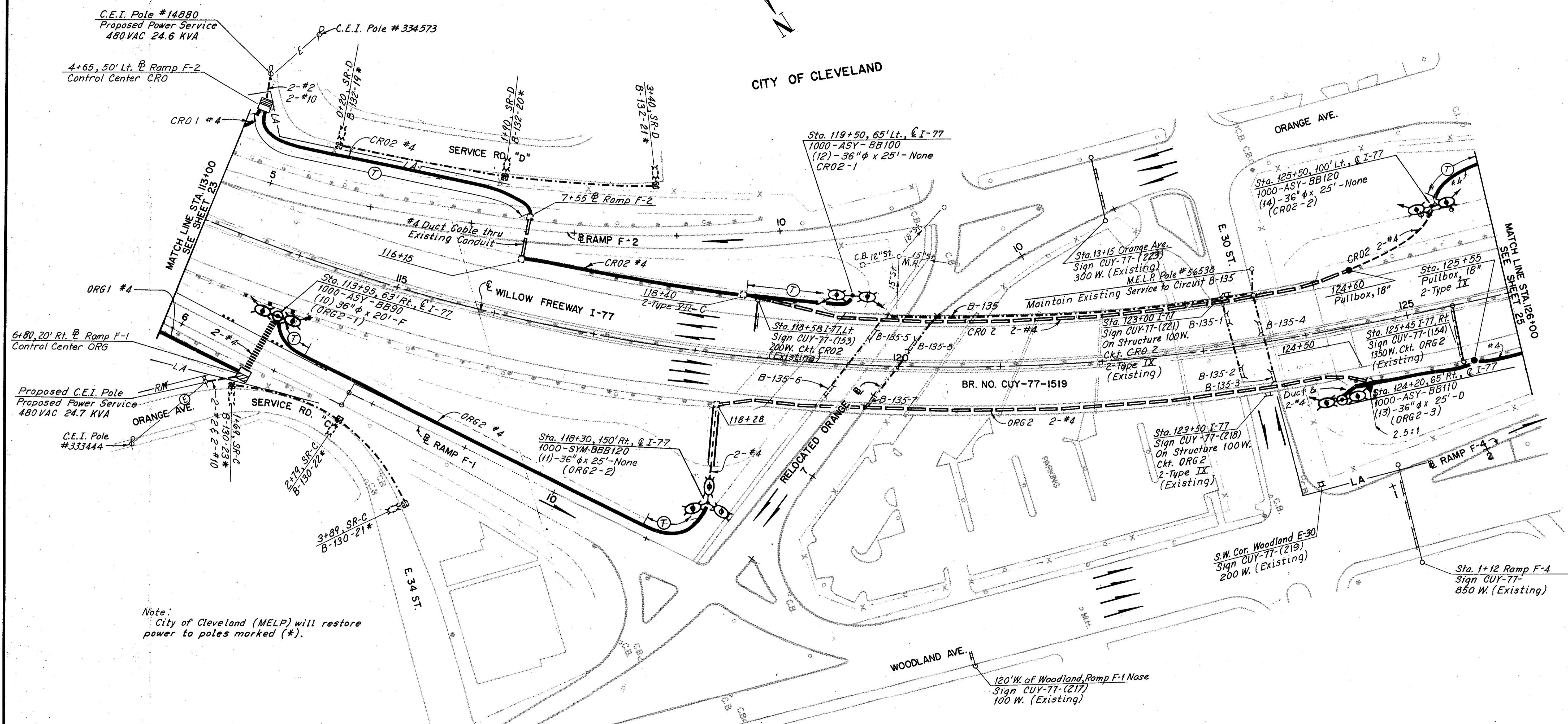
FOR LEGEND SEE SHEET 5

FHWA REGION	STATE	PROJECT
5	OHIO	

24  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

CITY OF CLEVELAND



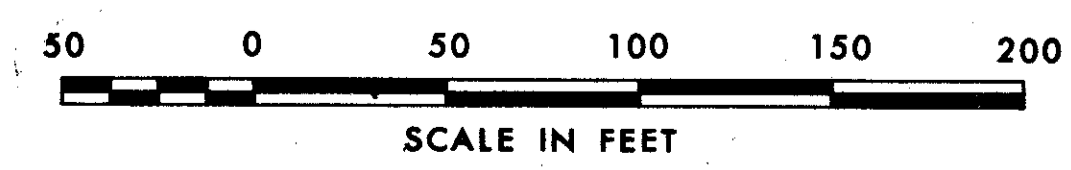
Note:  
City of Cleveland (MELP) will restore  
power to poles marked (\*).

FOR LEGEND SEE SHEET 5

MADE E.R.H. DATE 11-18-76  
TRACED D.L.B. DATE 11-22-76  
CHECKED E.E. DATE 12-22-76  
SCALE 1" = 50'

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

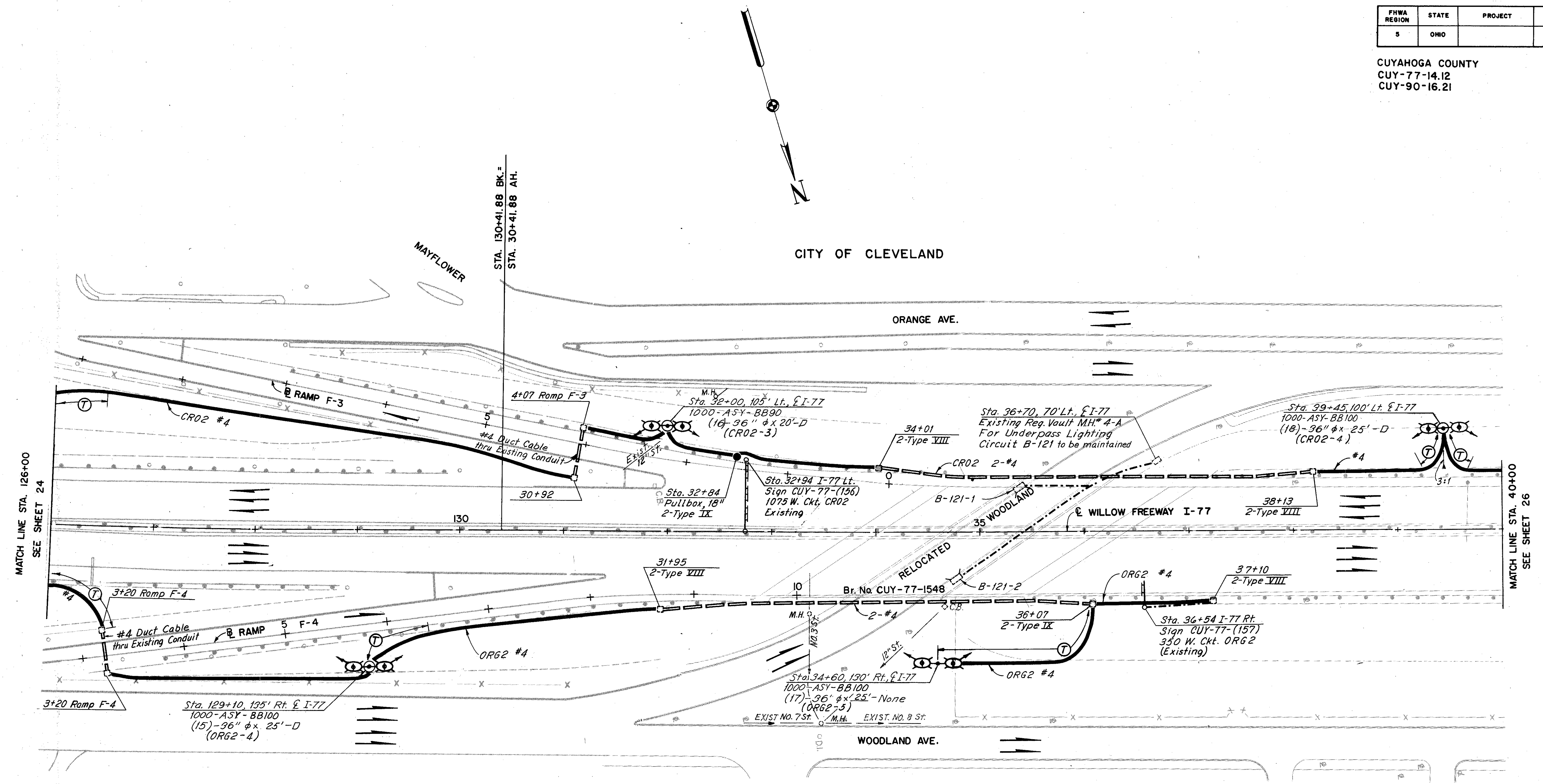
**HNTB**



FHWA REGION	STATE	PROJECT	
5	OHIO		

25  
84

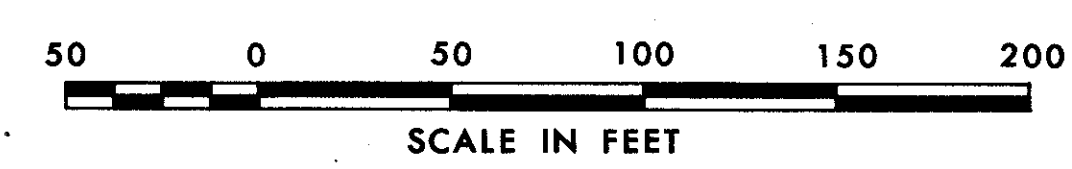
CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



CITY OF CLEVELAND

MATCH LINE STA. 126+00  
SEE SHEET 24

MATCH LINE STA. 40+00  
SEE SHEET 26



FOR LEGEND SEE SHEET 5

MADE F.P.H. DATE 10-18-76  
TRACED J.W.R. DATE 11-22-76  
CHECKED E.F.V. DATE 12-22-76  
SCALE 1"=50'

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

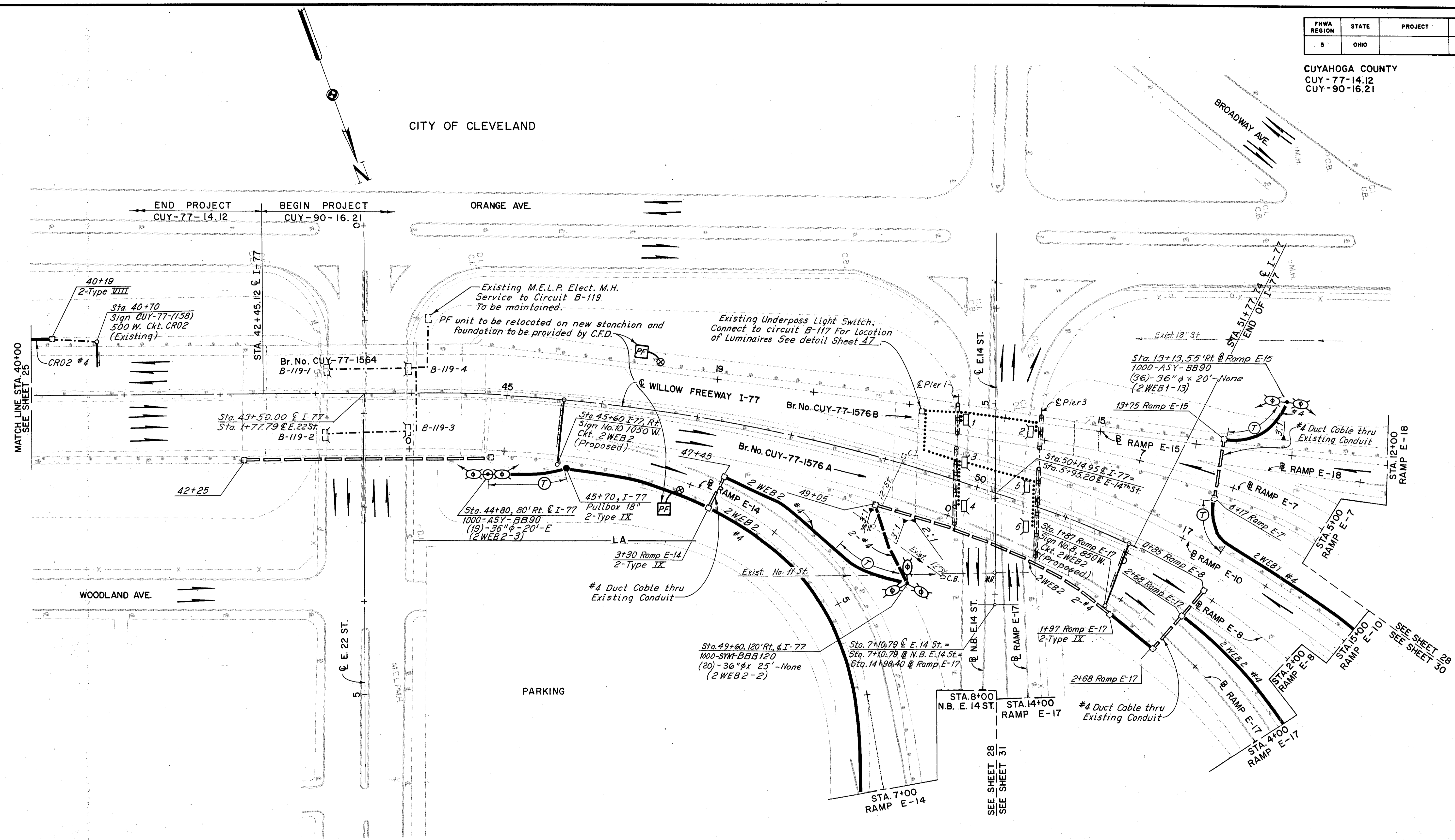
**HNTB**

FHWA REGION	STATE	PROJECT
5	OHIO	

26  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

CITY OF CLEVELAND



FOR LEGEND SEE SHEET 5



MADE ERH DATE 12-2-26 **Howard, Needles, Tammen & Bergendoff**  
 TRACED DLB DATE 12-6-76 CONSULTING ENGINEERS  
 CHECKED E.E. DATE 12-21-76 CLEVELAND, OHIO  
 SCALE 1" = 20'

**HNTB**

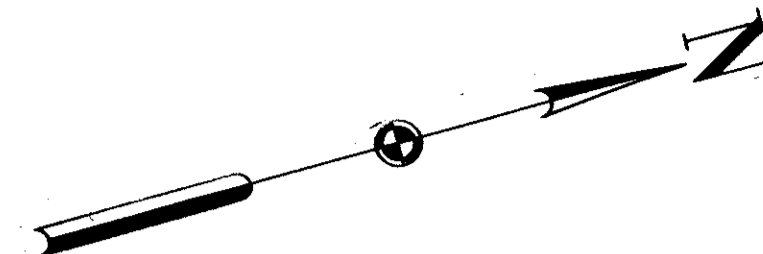
FHWA REGION	STATE	PROJECT
5	OHIO	

27  
84

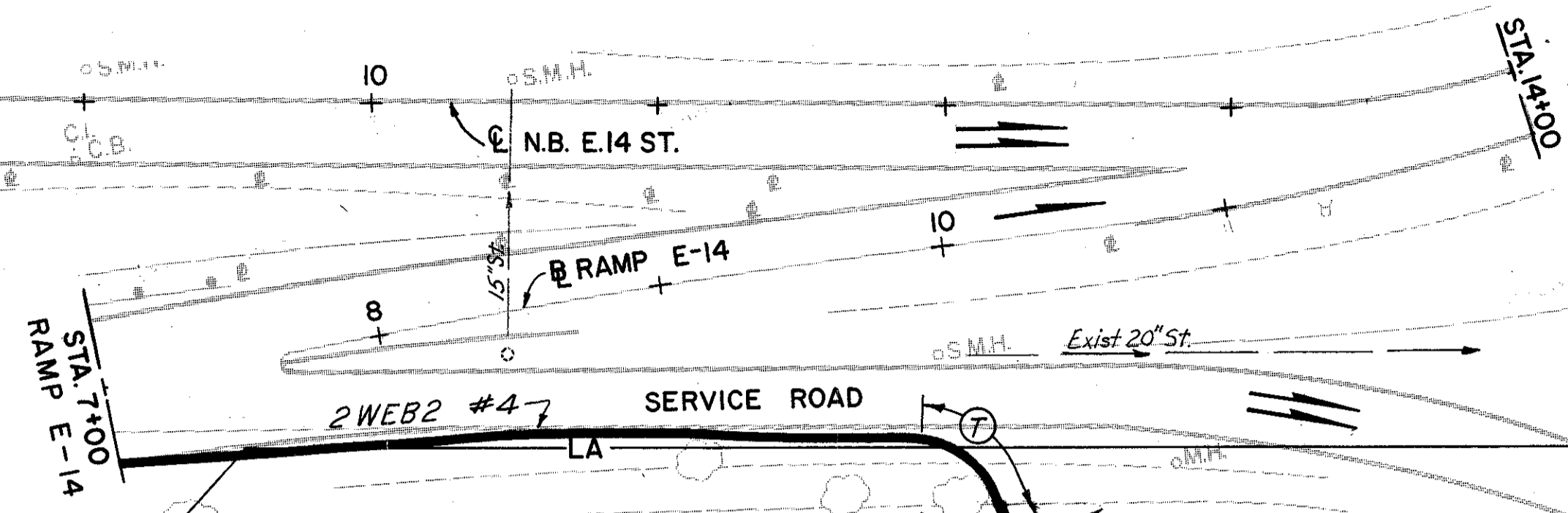
CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

CITY OF CLEVELAND

SEE SHEET 31



N. B. E. 14 ST.  
STA. 8+00



Sta. 10+10, 103' RT., RAMP E-14  
1000-ASY-BB80  
(23)-36" φ x 20'-None  
(2 WEB2-4)

Sta. 5+70, 18' LT., E.B. SCOVILL  
1000-SYM-BBB100  
(30)-36" φ x 25'-None  
(CEN2-4)

E. B. SCOVILL  
STA. 4+00

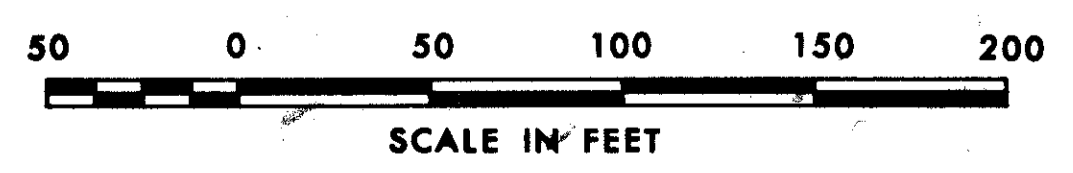
W. B. SCOVILL  
STA. 5+00

PARKING

PARKING

E. 22 ST.

SEE SHEET 32



FOR LEGEND SEE SHEET 5

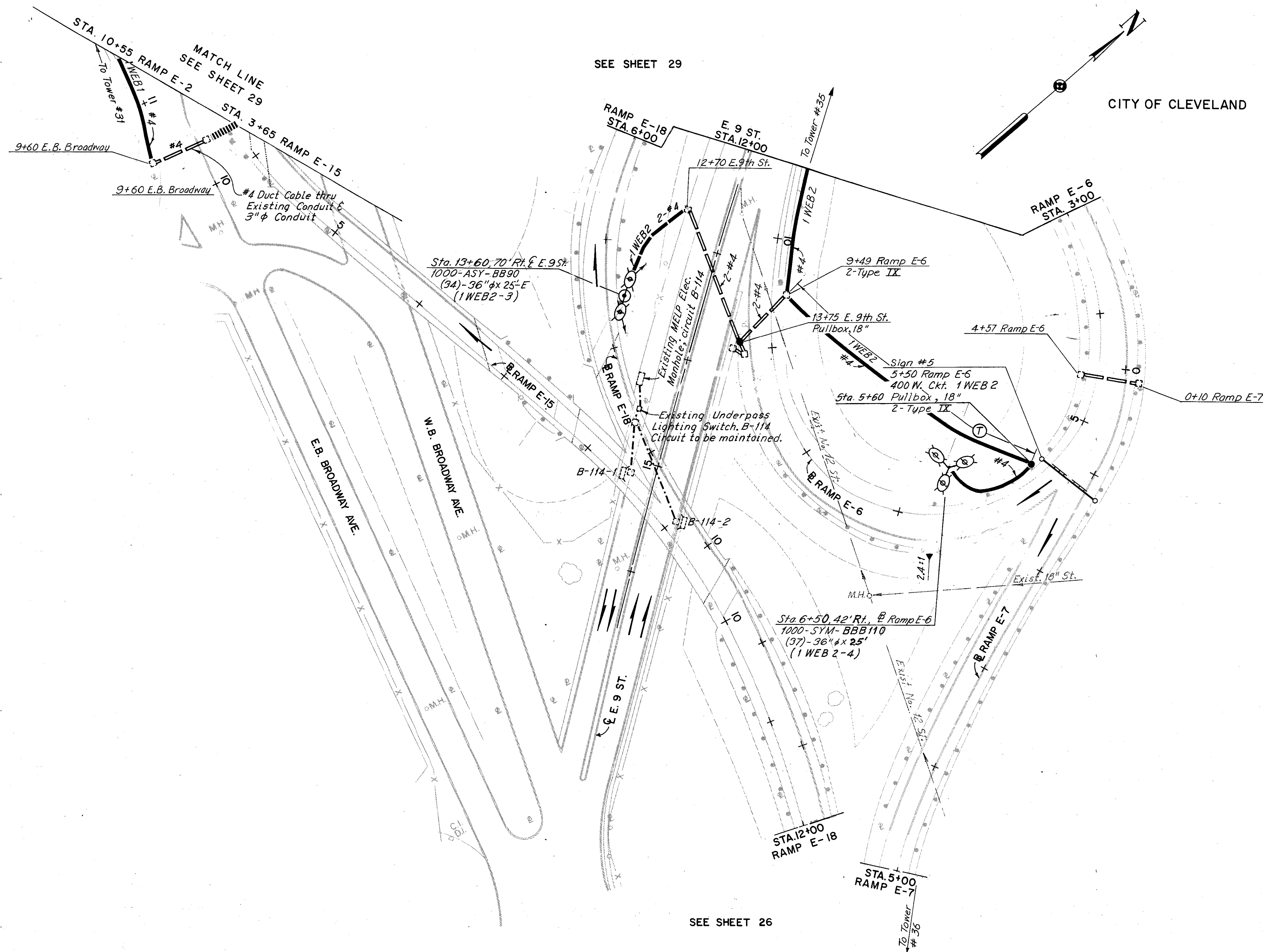
MADE ERH DATE 12-2-76  
TRACED DLR DATE 12-6-76  
CHECKED EEV DATE 12-22-76  
SCALE 1/4" = 50'  
Howard, Needles, Tammen & Bergendoff  
CONSULTING ENGINEERS  
CLEVELAND, OHIO



FHWA REGION	STATE	PROJECT
5	OHIO	

28  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



SEE SHEET 29

CITY OF CLEVELAND

SEE SHEET 26



MADE ERH DATE 12-17-76 **Howard, Needles, Tammen & Bergendoff**  
 TRACED ERH DATE 12-29-76 **CONSULTING ENGINEERS**  
 CHECKED ERH DATE 12-29-76 **CLEVELAND, OHIO**  
 SCALE 1" = 20'

**HNTB**

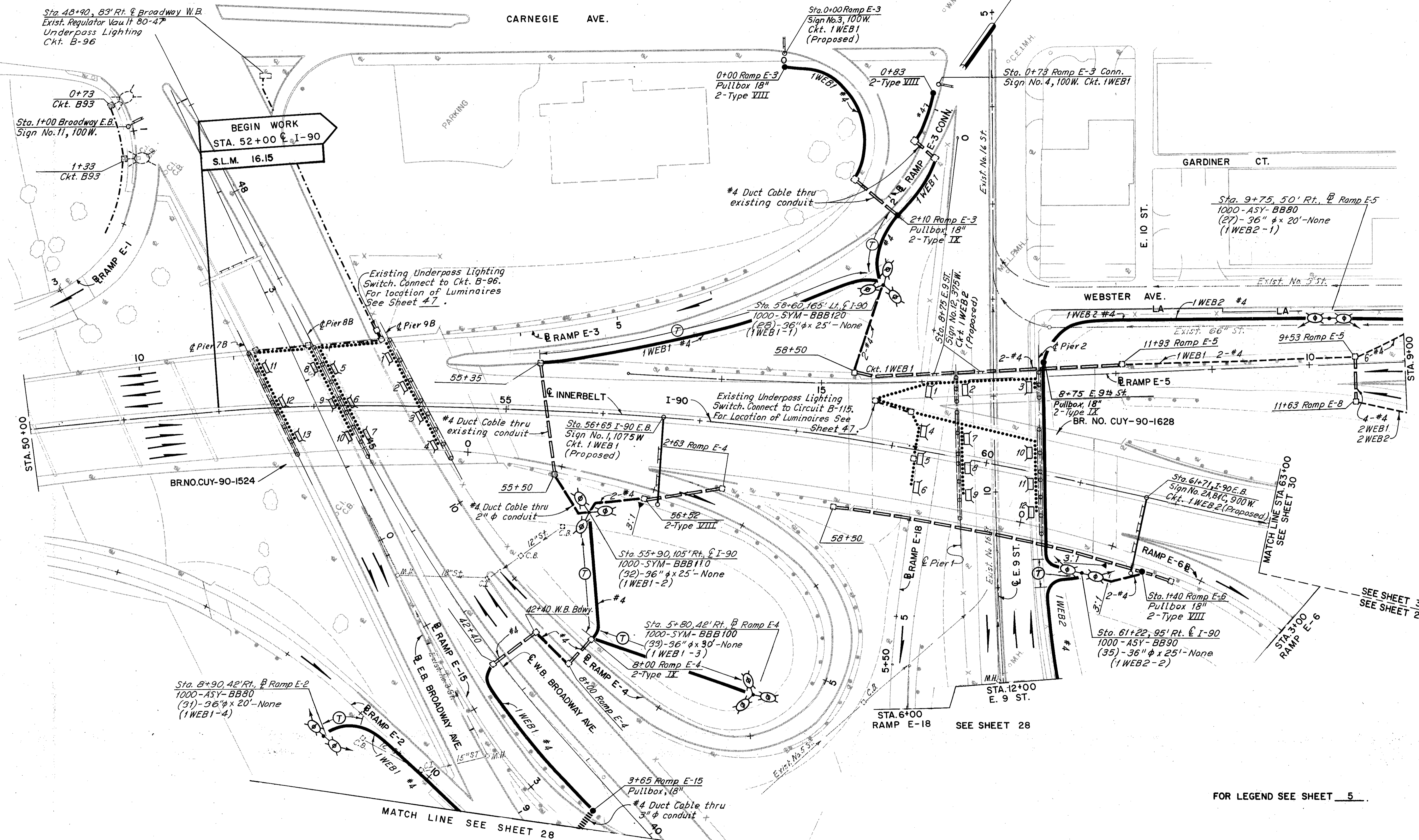
FOR LEGEND SEE SHEET 5

FHWA REGION	STATE	PROJECT
5	OHIO	

29  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

CITY OF CLEVELAND



MADE E.H. DATE 12-2-76  
TRACED D.L.R. DATE 12-20-76  
CHECKED E.F. DATE 12-25-76  
SCALE 1" = 50'

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

**HNTB**



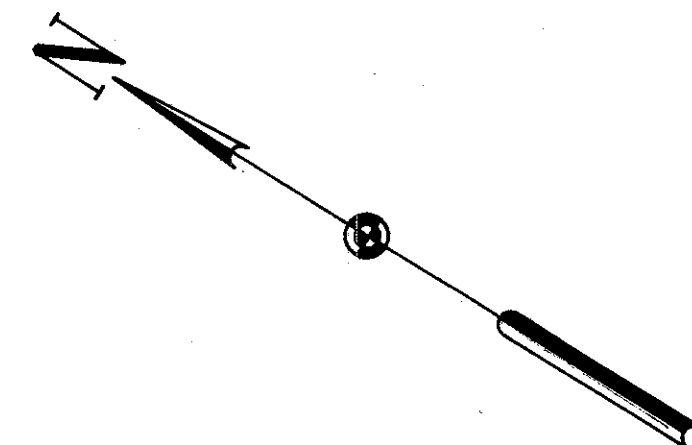
FOR LEGEND SEE SHEET 5



FHWA REGION	STATE	PROJECT
5	OHIO	

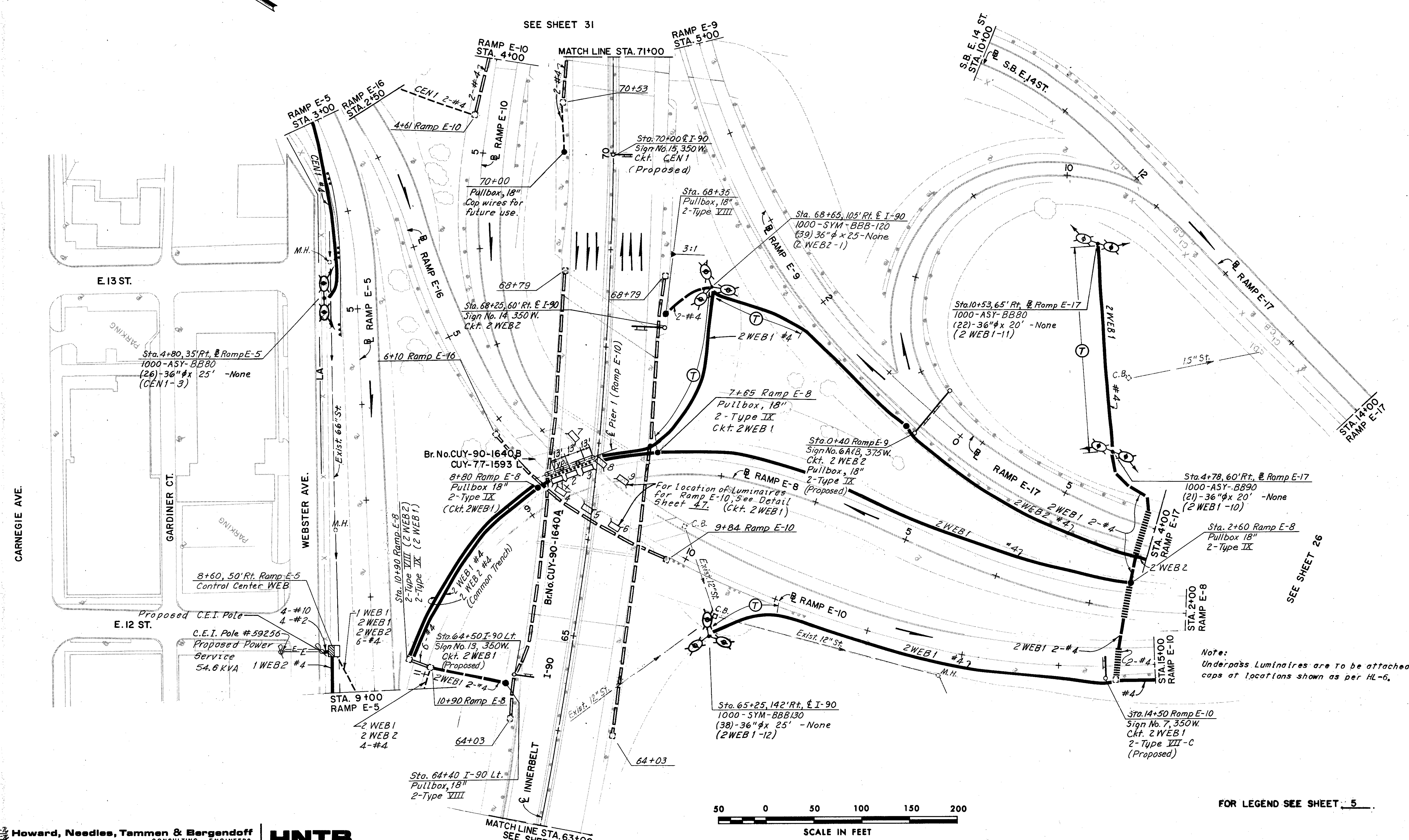
30  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



CITY OF CLEVELAND

SEE SHEET 31



Note:  
Underpass Luminaires are to be attached to pier caps at locations shown as per HL-6.

FOR LEGEND SEE SHEET 5

MADE ERH DATE 12-17-76  
TRACED DLG DATE 12-20-76  
CHECKED EFW DATE 12-23-76  
SCALE 1" = 80'

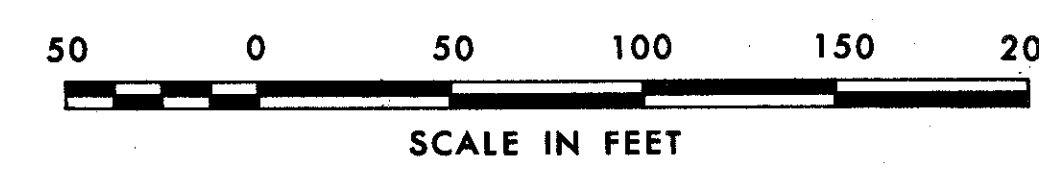
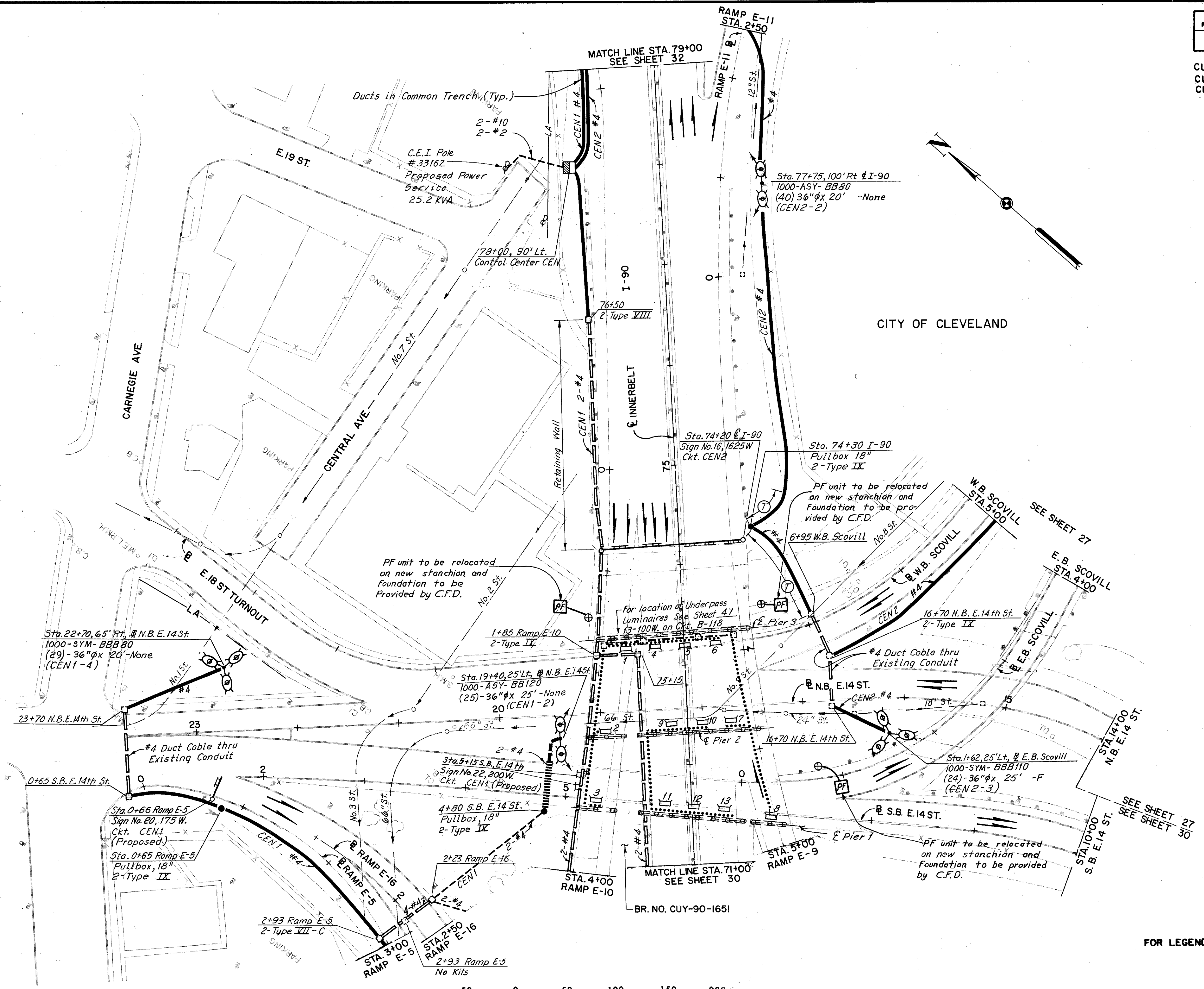
Howard, Needles, Tammen & Bergendoff  
CONSULTING ENGINEERS  
CLEVELAND, OHIO

**HNTB**

FHWA REGION	STATE	PROJECT
5	OHIO	

31  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



FOR LEGEND SEE SHEET 5

MADE ERH DATE 12-2-76  
 TRACED DLB DATE 12-6-76  
 CHECKED E.J. DATE 12-23-76  
 SCALE 1"=20'

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

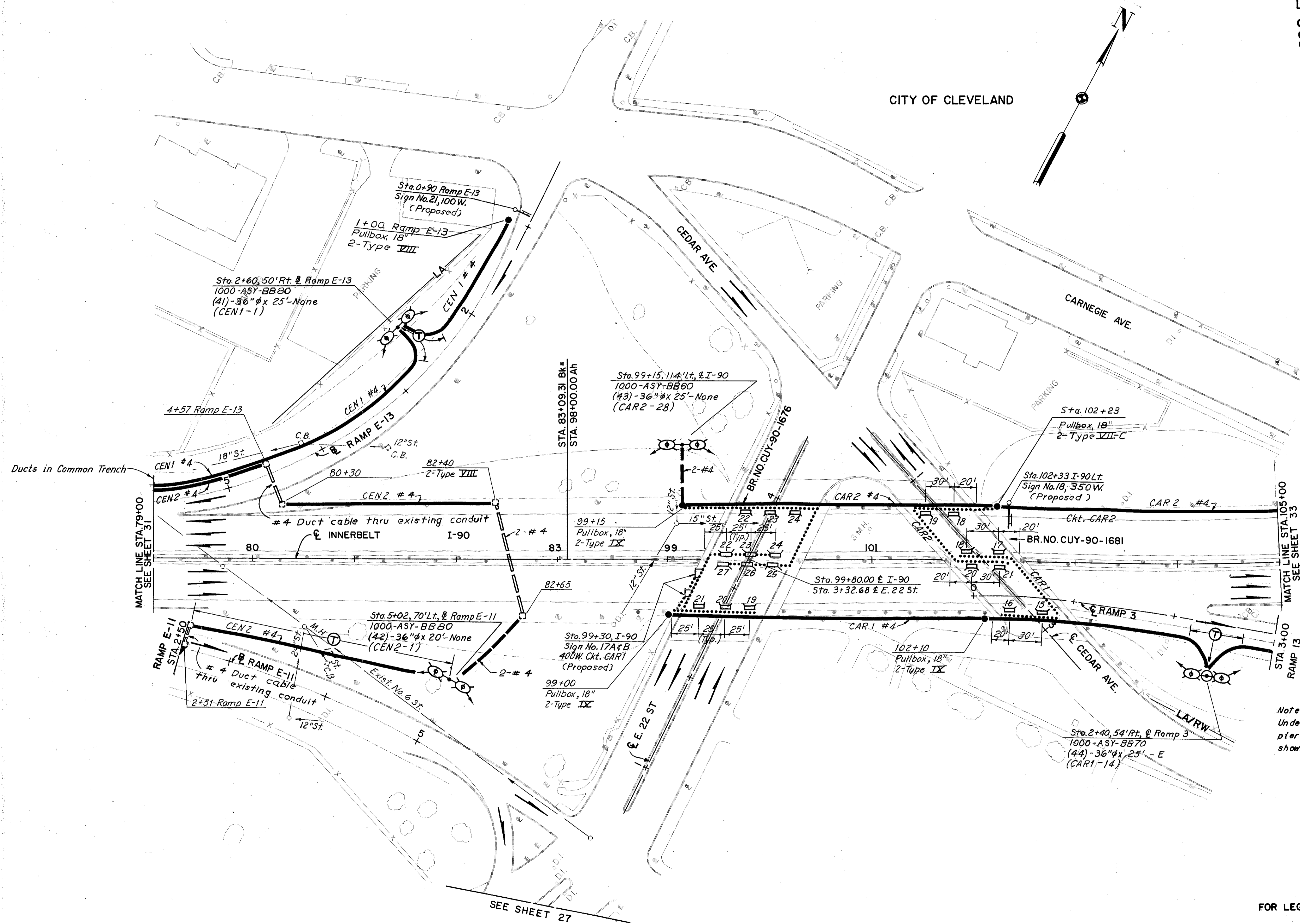
**HNTB**

FHWA REGION	STATE	PROJECT
5	OHIO	

32  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

CITY OF CLEVELAND

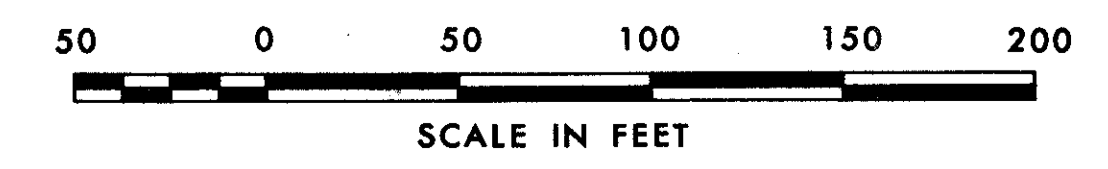


Note:  
Underpass Luminaires are to be attached to pier cap and abutment faces at locations shown as per HL-6.

FOR LEGEND SEE SHEET 5

MADE ERH DATE 12-2-76  
TRACED DLB DATE 12-8-76  
CHECKED PLY DATE 12-22-76  
SCALE 1"=20'  
Howard, Needles, Tammen & Bergendoff  
CONSULTING ENGINEERS  
CLEVELAND, OHIO

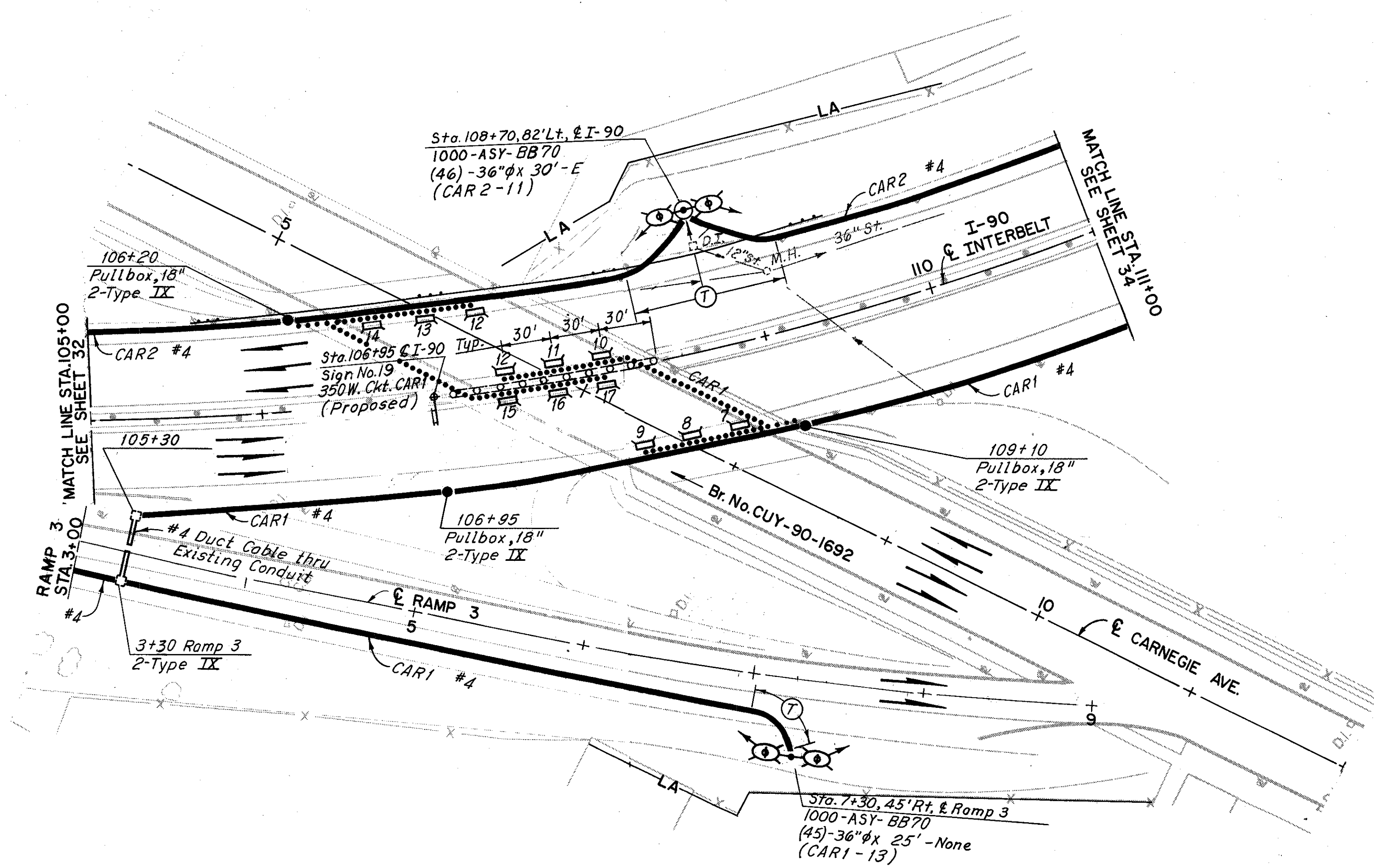
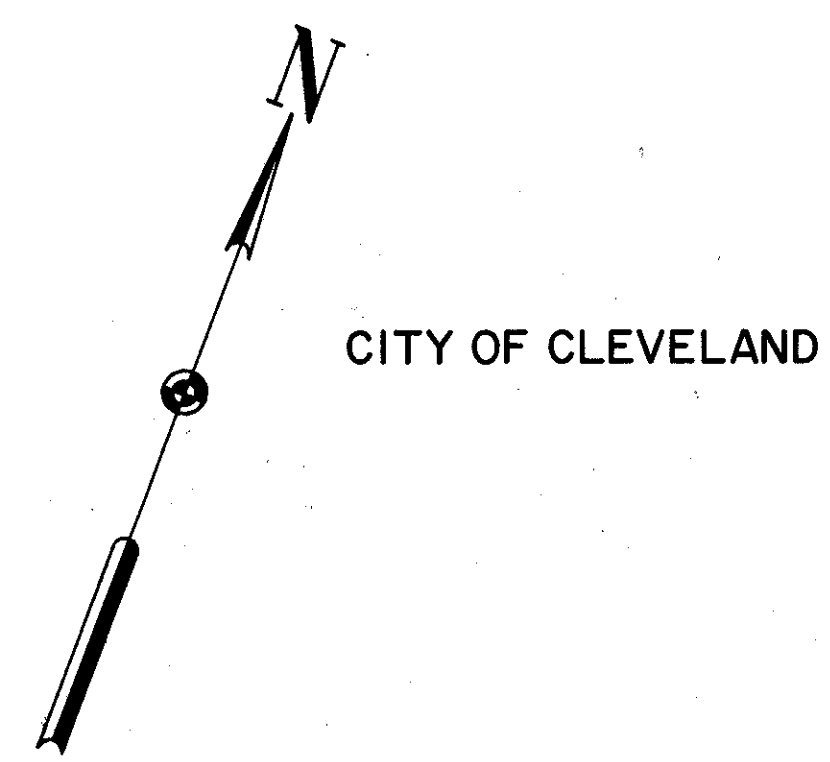
**HNTB**



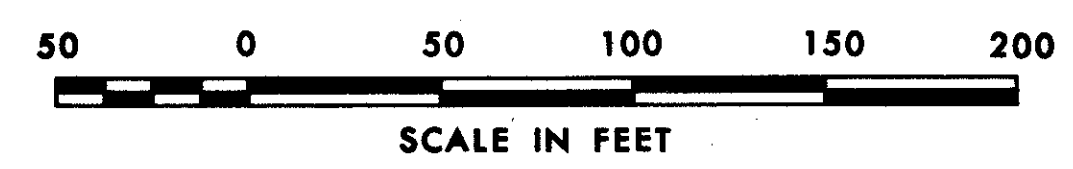
FHWA REGION	STATE	PROJECT	
5	OHIO		

33  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



Note:  
Underpass Luminares are to be attached to  
pier cap and abutment faces at locations  
shown as per HL-6.



FOR LEGEND SEE SHEET 5

MADE ERH DATE 12-2-76 HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 TRACED DLR DATE 12-8-76 CONSULTING ENGINEERS  
 CHECKED REV DATE 12-24-76 CLEVELAND, OHIO  
 SCALE 1" = 30'

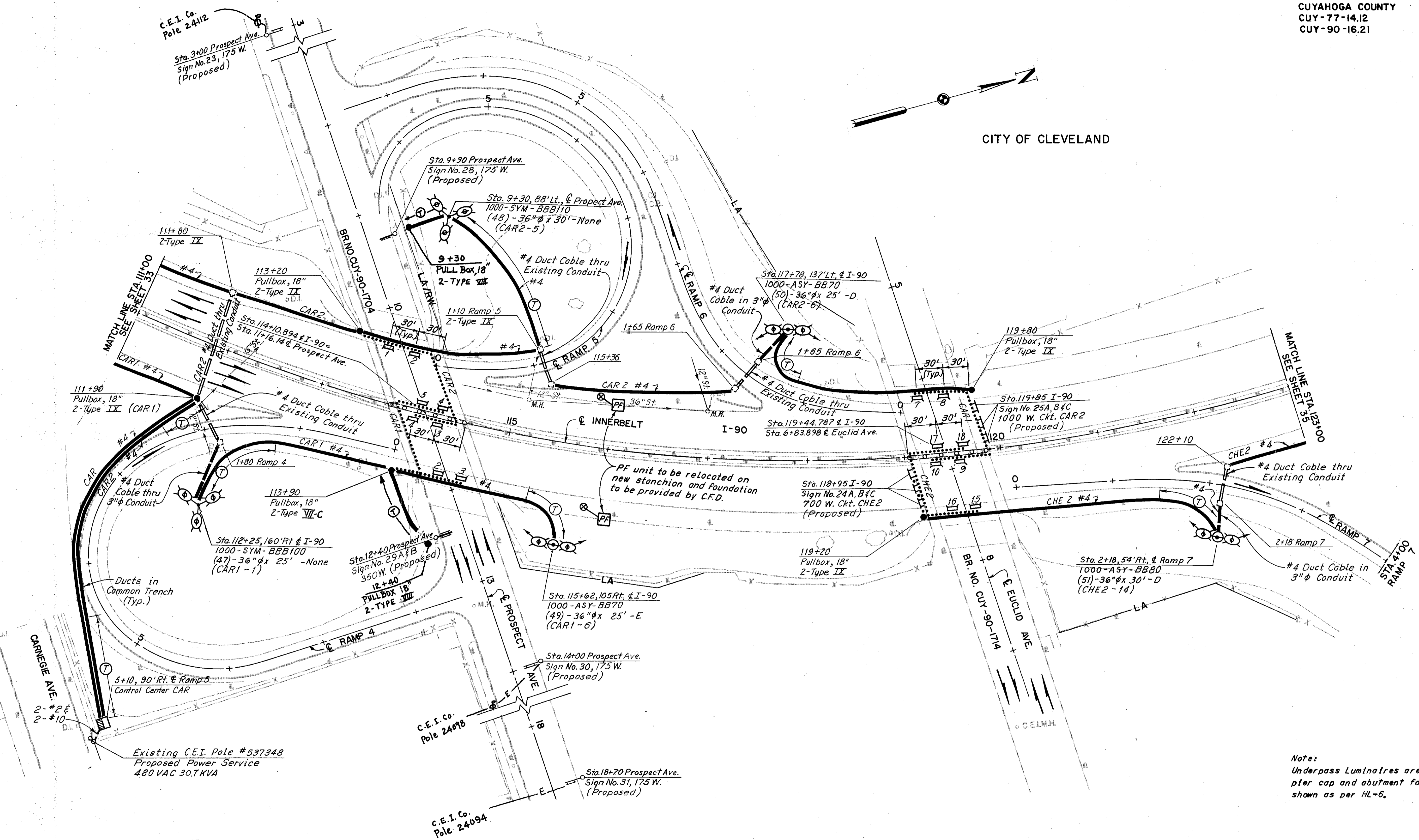


FHWA REGION	STATE	PROJECT
5	OHIO	

34  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

CITY OF CLEVELAND



Note:  
Underpass Luminaires are to be attached to pier cap and abutment faces at locations shown as per HL-6.

FOR LEGEND SEE SHEET 5



MADE ERH DATE 12-2-76  
TRACED DLB DATE 12-5-76  
CHECKED EJV DATE 12-28-76  
SCALE 1"=50'

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

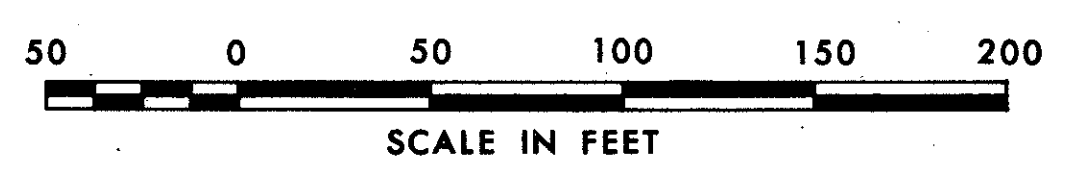
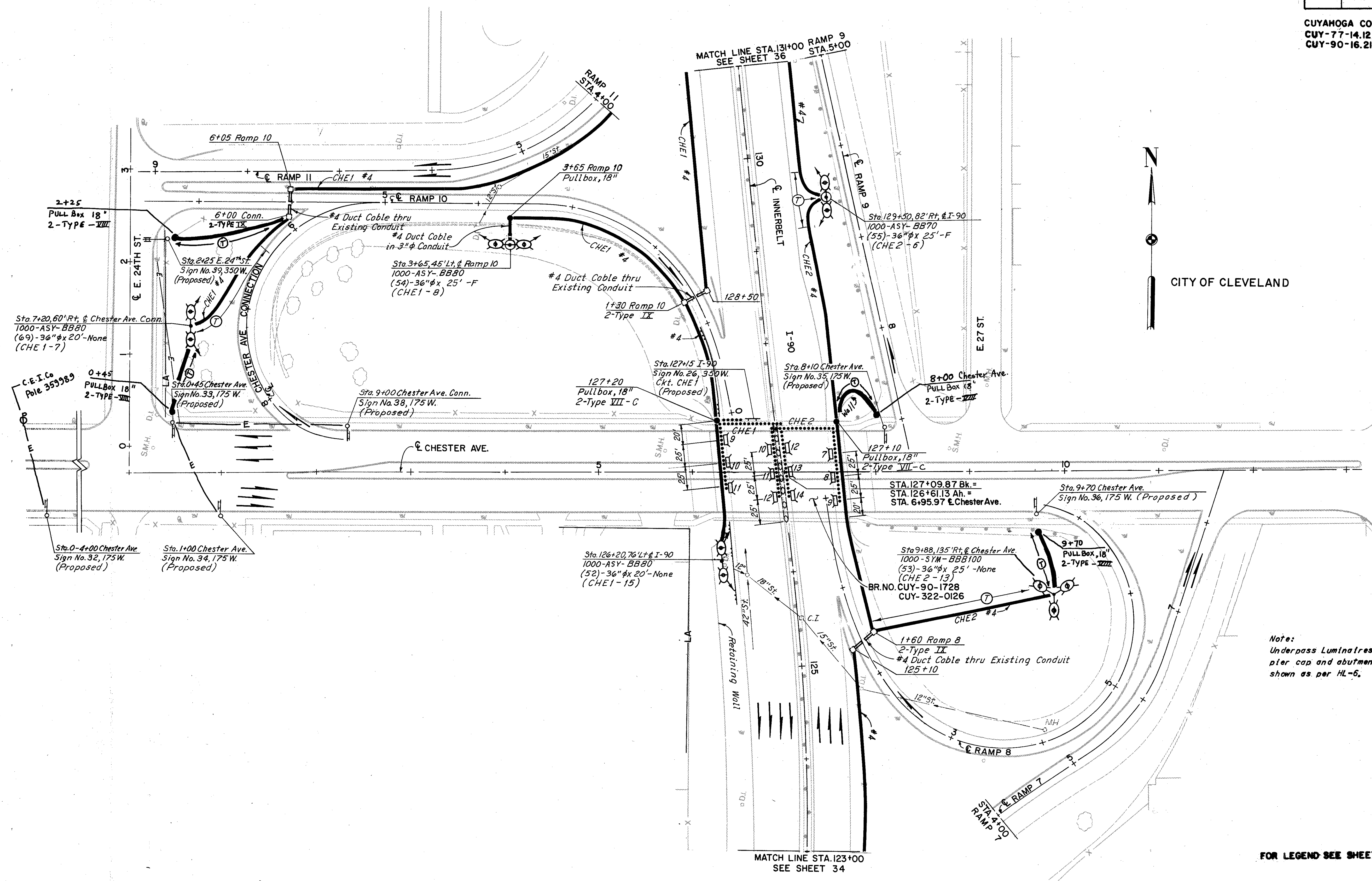
**HNTB**

Rev. 1-26-78

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



CITY OF CLEVELAND



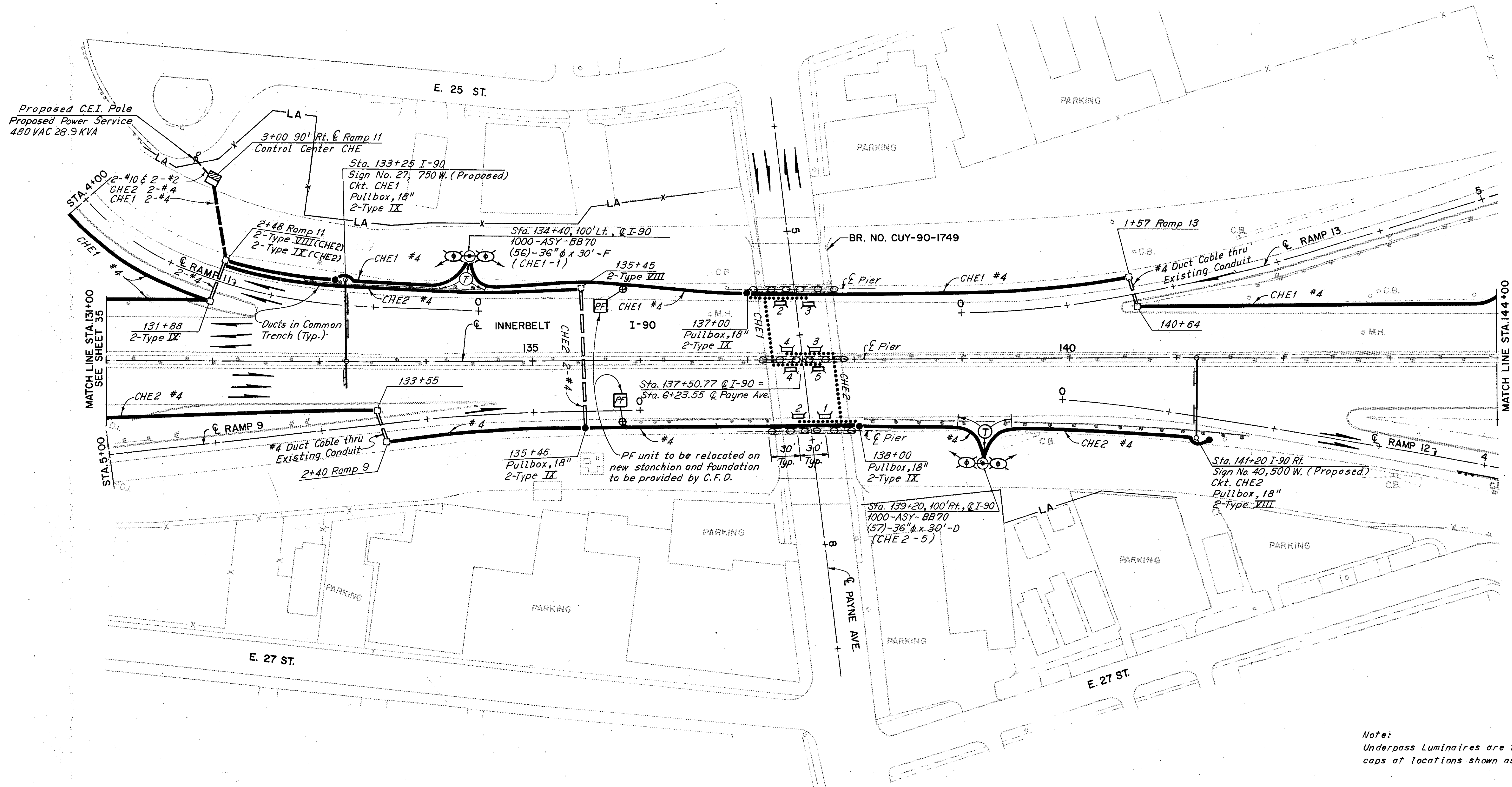
MADE ERH DATE 12-2-76 **Howard, Needles, Tammen & Bergendoff**  
 TRACED DLR DATE 12-2-76 CONSULTING ENGINEERS  
 CHECKED ERJ DATE 12-2-76 CLEVELAND, OHIO  
 SCALE 1" = 50'



FOR LEGEND SEE SHEET 5

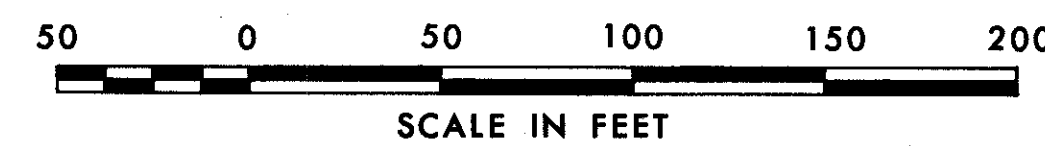
Rev. 1-26-78

CITY OF CLEVELAND



Note:  
Underpass Luminaires are to be attached to pier caps at locations shown as per HL-6.

FOR LEGEND SEE SHEET 5



MADE ERH DATE 12-2-76 **Howard, Needles, Tammen & Bergendoff**  
 TRACED DLR DATE 12-6-76 CONSULTING ENGINEERS  
 CHECKED E.J. DATE 12-27-76 CLEVELAND, OHIO  
 SCALE 1" = 20'

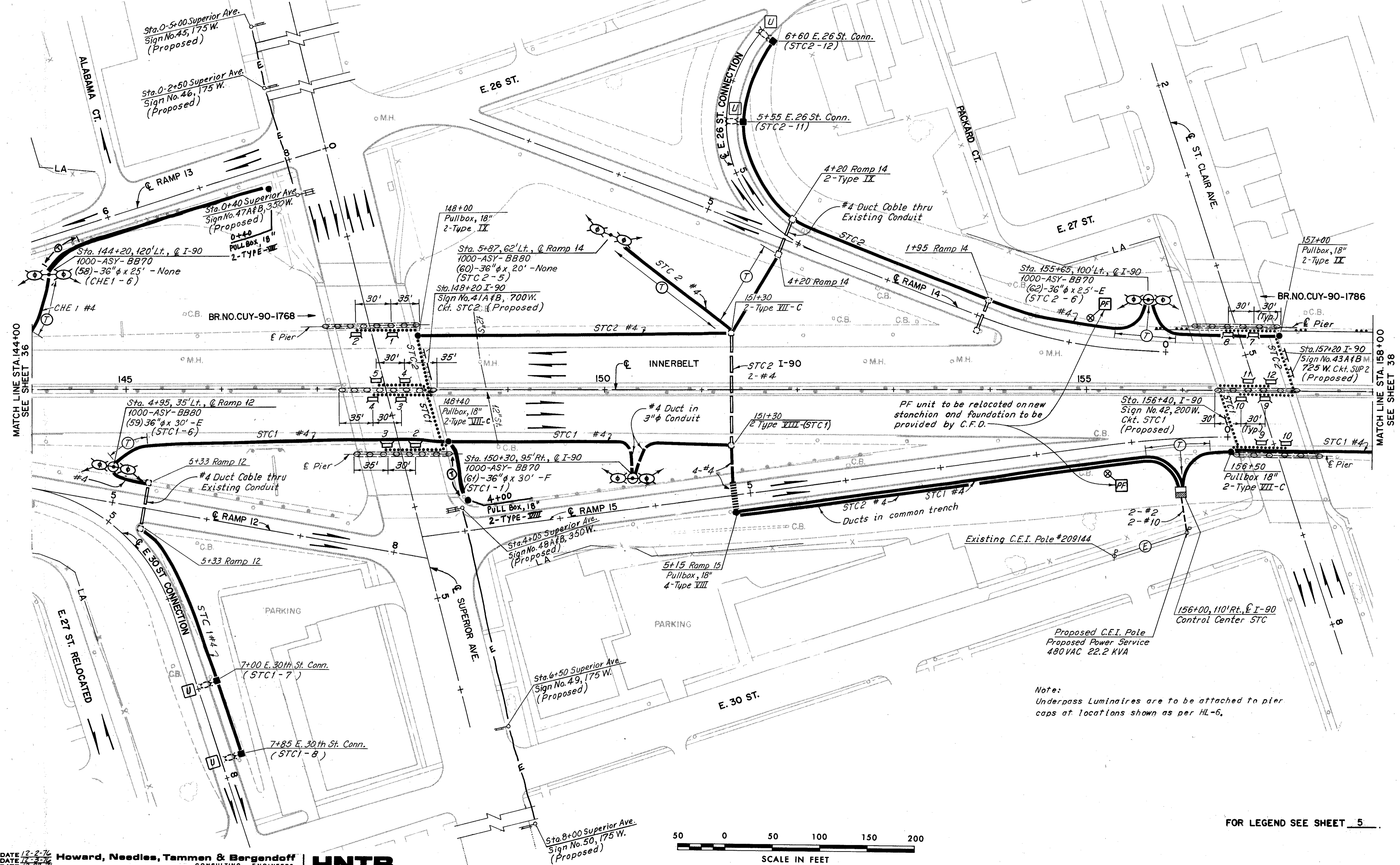
**HNTB**

FHWA REGION	STATE	PROJECT
5	OHIO	

37  
84

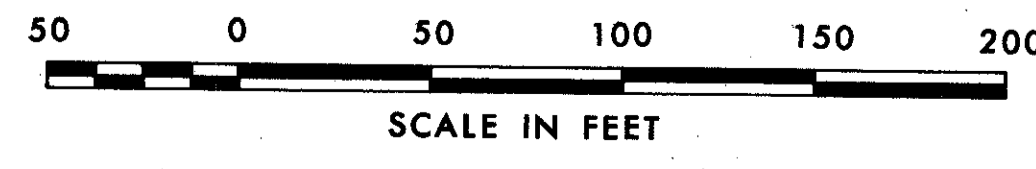
CUYAHOGA COUNTY  
CUY - 77-14.12  
CUY - 90-16.21

CITY OF CLEVELAND



MATCH LINE STA 144+00  
SEE SHEET 36

MATCH LINE STA 158+00  
SEE SHEET 38



FOR LEGEND SEE SHEET 5

MADE ERH DATE 12-2-76  
TRACED DLB DATE 12-3-76  
CHECKED EEN DATE 12-21-76  
SCALE 1"=50'

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

**HNTB**

Note:  
Underpass Luminaires are to be attached to pier caps at locations shown as per HL-6.

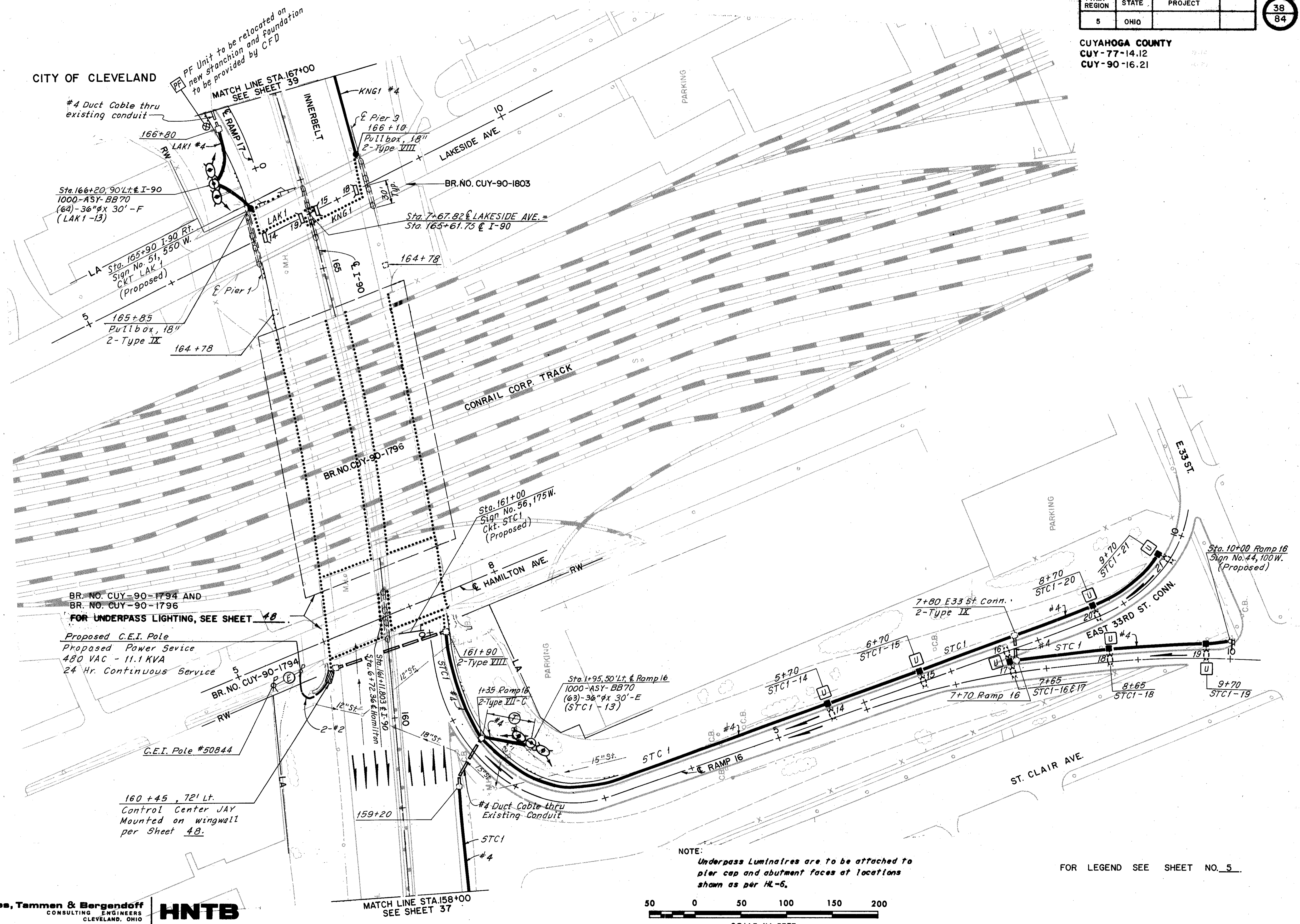
Rev. 1-26-78



FHWA REGION	STATE	PROJECT
5	OHIO	

38  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



CITY OF CLEVELAND

#4 Duct Cable thru existing conduit

Sta. 166+20, 90' Lt. & I-90  
1000-ASY-BB70  
(64)-36" x 30' - F  
(LAK1-13)

LA Sta. 165+90 I-90 Rt.  
Sign No. 51, 550 W.  
Ckt. LAK1  
(Proposed)

165+85  
Pull box, 18"  
2-Type IX

PF Unit to be relocated on new station and Foundation to be provided by CFD

MATCH LINE STA. 167+00 SEE SHEET 39

INNERBELT

KNG1 #4

£ Pier 3  
166+10  
Pull box, 18"  
2-Type VIII

LAKESIDE AVE.

BR. NO. CUY-90-1803

Sta. 7+67.82 £ LAKESIDE AVE. =  
Sta. 165+61.75 £ I-90

164+78

CONRAIL CORP. TRACK

BR. NO. CUY-90-1796

Sta. 161+00  
Sign No. 56, 175 W.  
Ckt. STC1  
(Proposed)

HAMILTON AVE.

BR. NO. CUY-90-1794 AND  
BR. NO. CUY-90-1796

FOR UNDERPASS LIGHTING, SEE SHEET 48

Proposed C.E.I. Pole  
Proposed Power Service  
480 VAC - 11.1 KVA  
24 Hr. Continuous Service

BR. NO. CUY-90-1794

C.E.I. Pole #50844

160+45, 72' Lt.  
Control Center JAY  
Mounted on wingwall  
per Sheet 48.

MATCH LINE STA. 158+00  
SEE SHEET 37

NOTE:  
Underpass Luminaires are to be attached to pier cap and abutment faces at locations shown as per HL-6.

FOR LEGEND SEE SHEET NO. 5

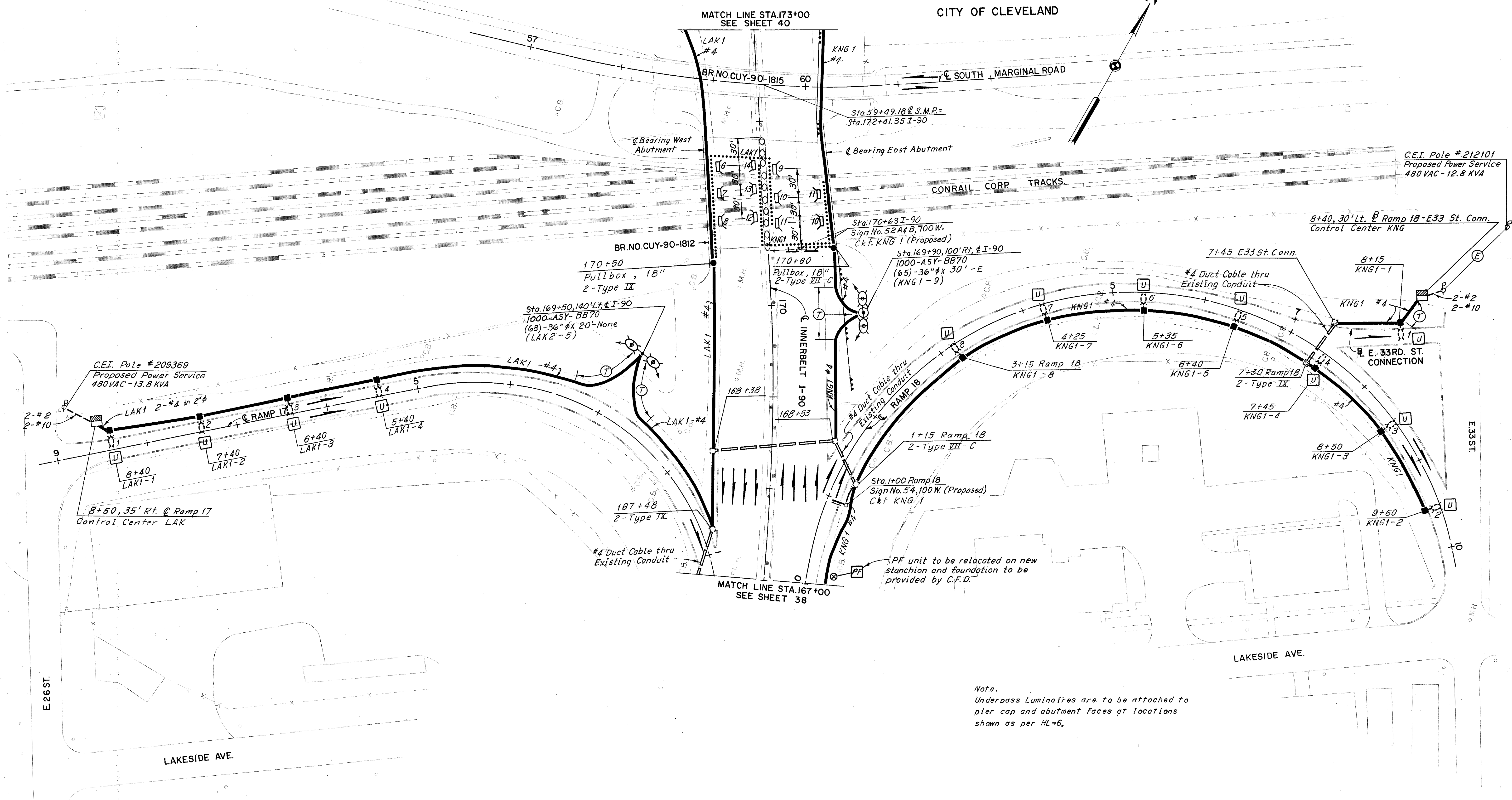


MADE WGP DATE 12-19-75  
TRACED JAB DATE 12-19-76  
CHECKED F.J. DATE 12-23-76  
SCALE 1" = 30'

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



CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



Note:  
Underpass Luminaires are to be attached to pier cap and abutment faces at locations shown as per HL-6.



FOR LEGEND SEE SHEET 5

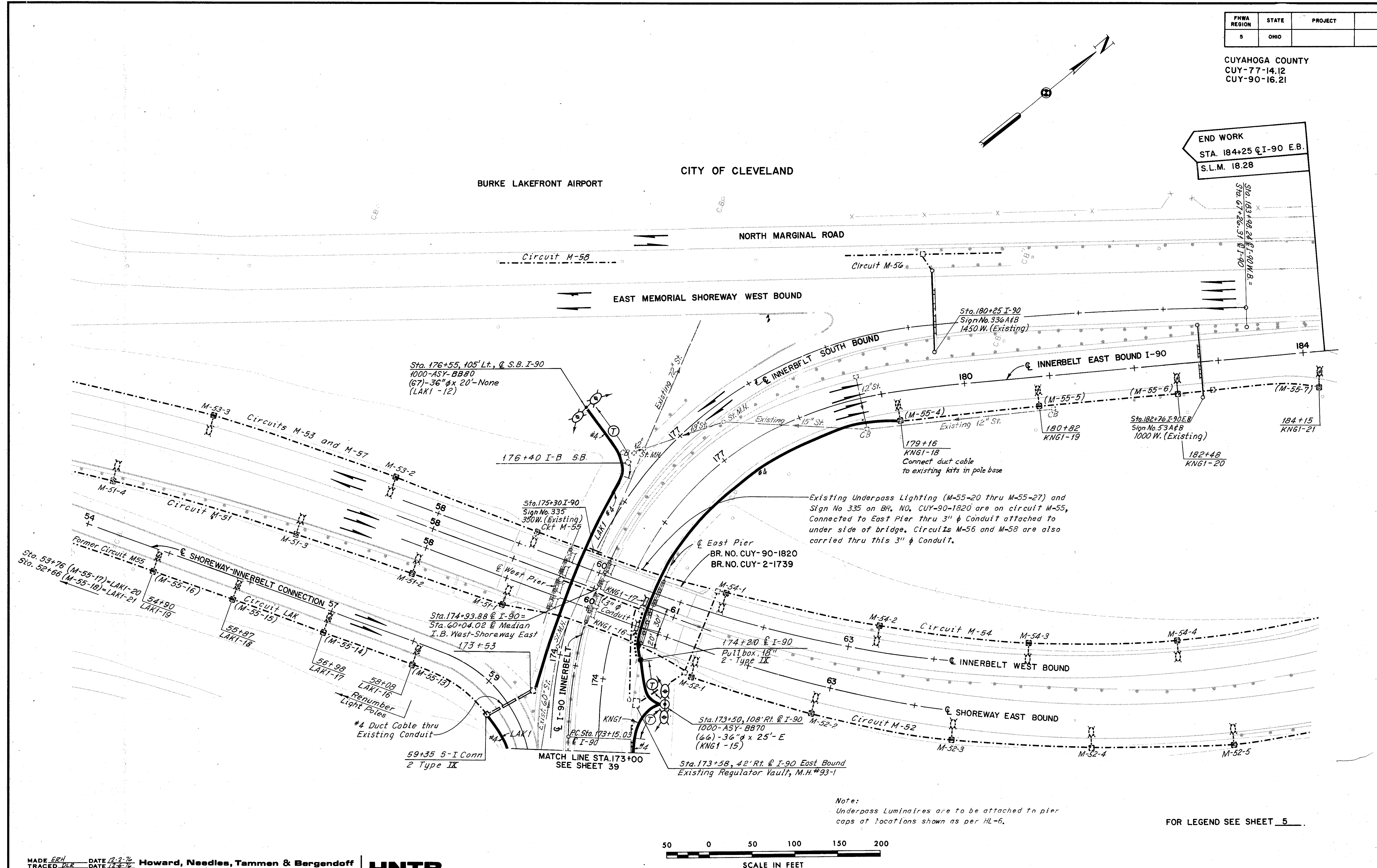
FHWA REGION	STATE	PROJECT
5	OHIO	

40  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

END WORK  
STA. 184+25 @ I-90 E.B.  
S.L.M. 18.28

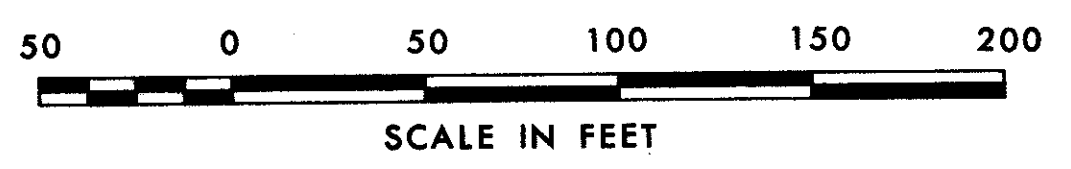
BURKE LAKEFRONT AIRPORT CITY OF CLEVELAND



Existing Underpass Lighting (M-55-20 thru M-55-27) and Sign No 335 on BR. NO. CUY-90-1820 are on circuit M-55, Connected to East Pier thru 3"  $\phi$  Conduit attached to under side of bridge. Circuits M-56 and M-58 are also carried thru this 3"  $\phi$  Conduit.

Note:  
Underpass Luminaires are to be attached to pier caps at locations shown as per HL-6.

FOR LEGEND SEE SHEET 5



MADE ERH DATE 12-2-76  
TRACED DLB DATE 12-2-76  
CHECKED EFL DATE 12-28-76  
SCALE 1" = 50'

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

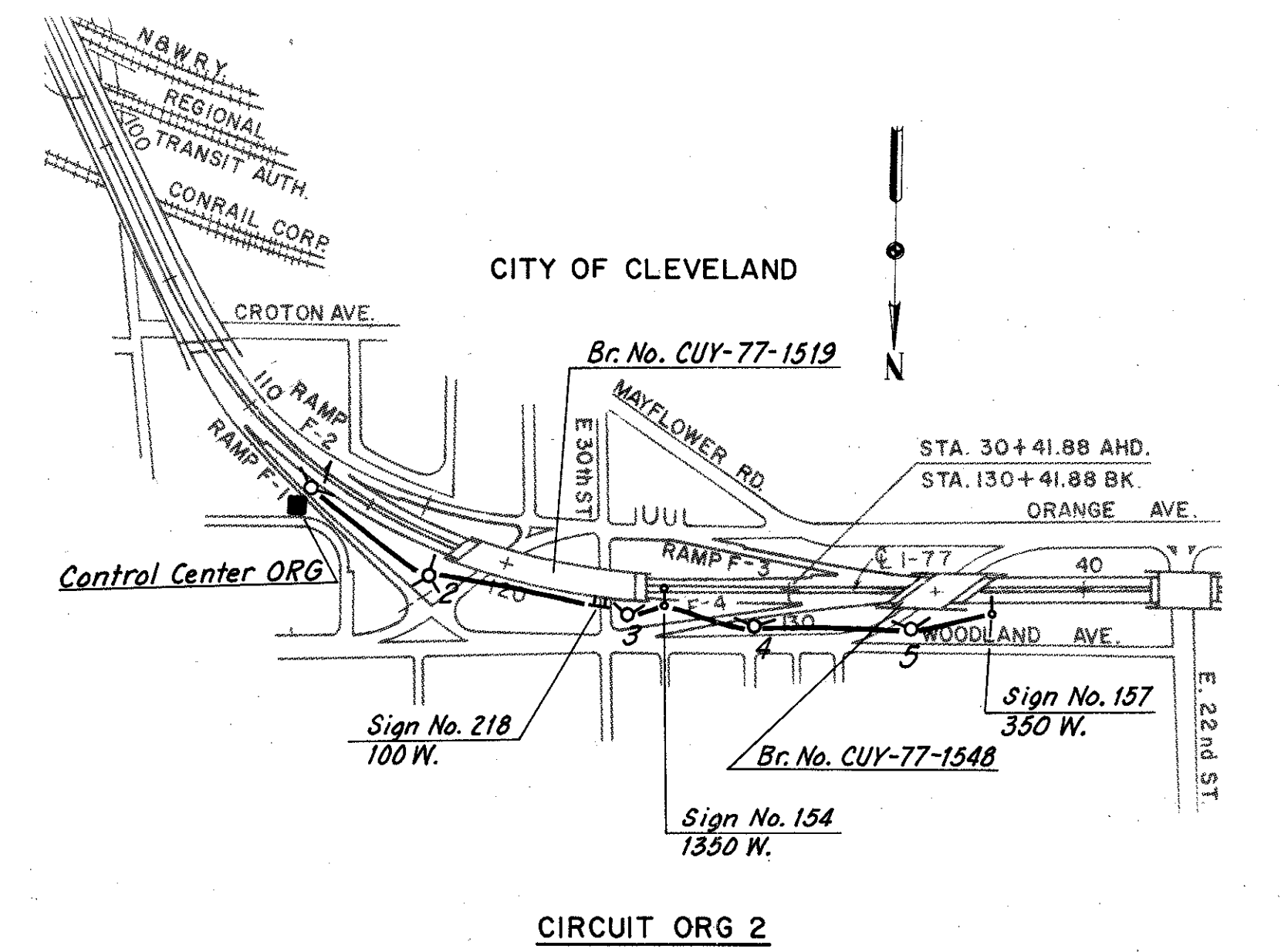
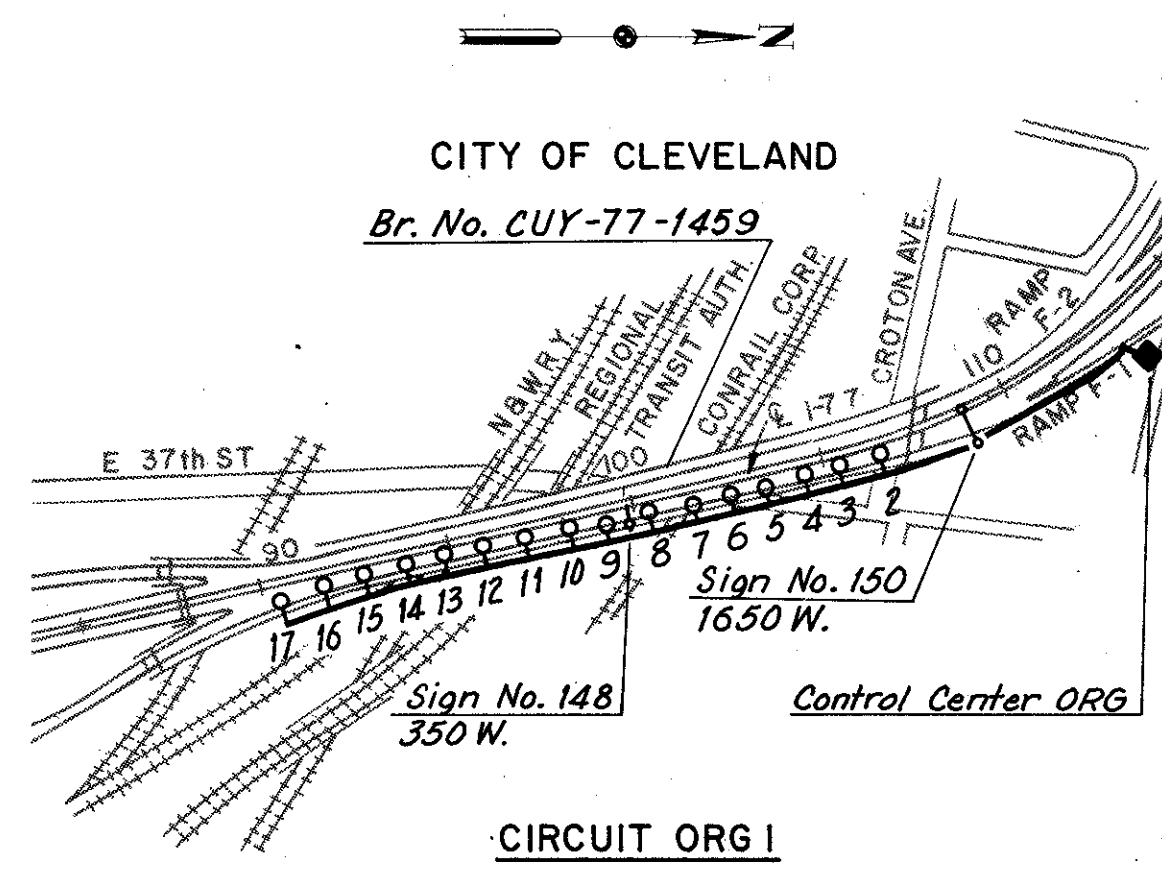
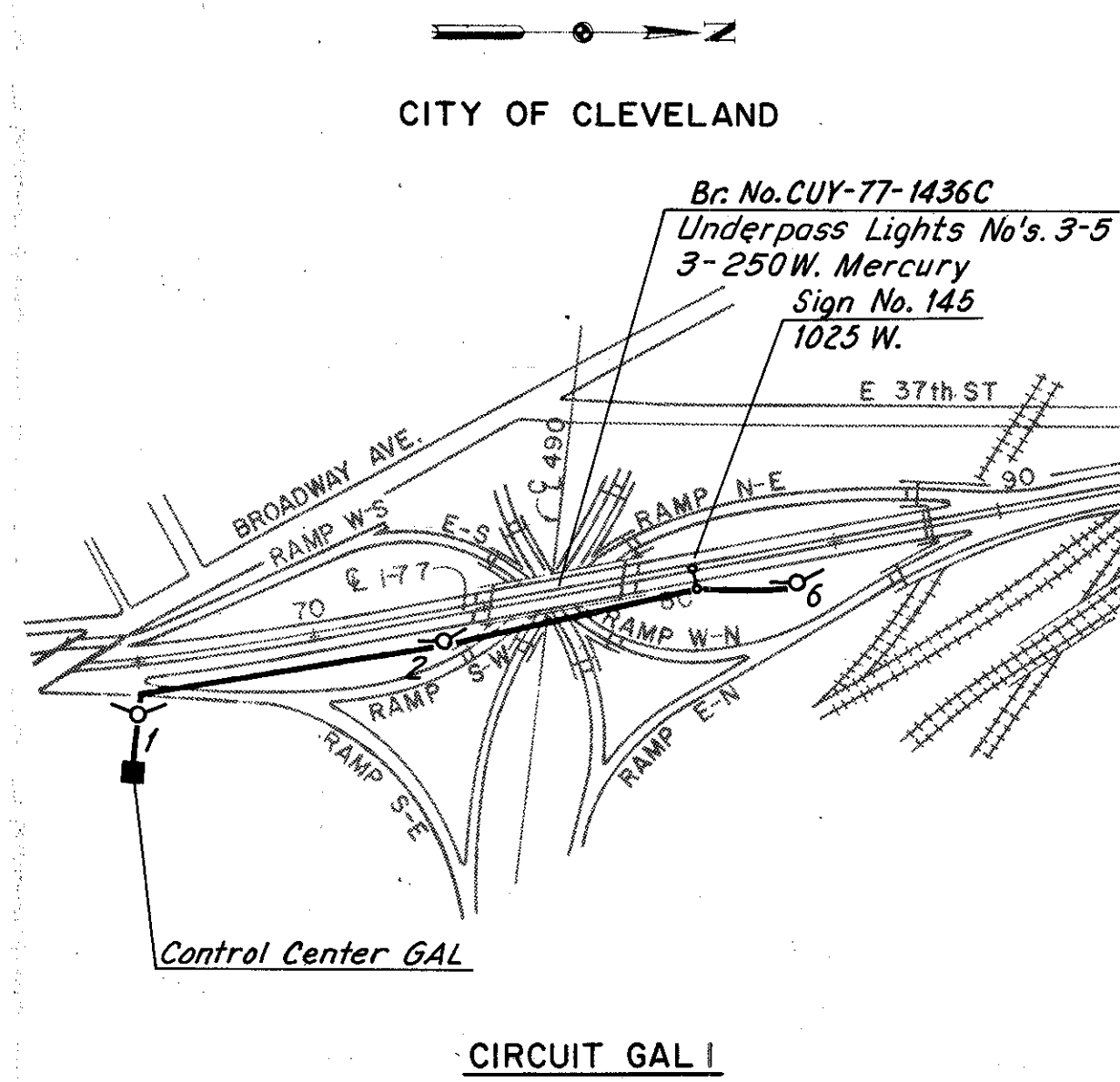
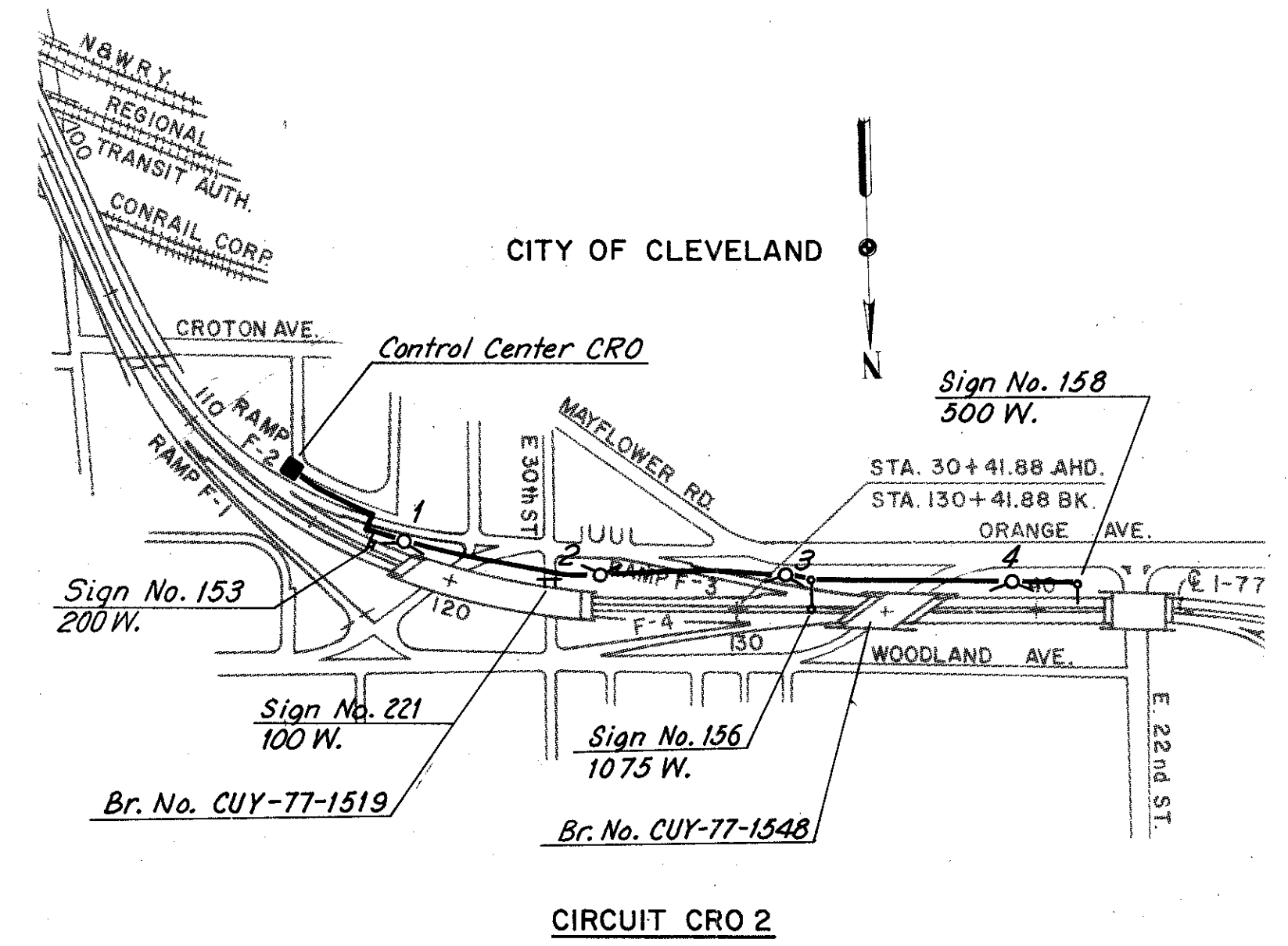
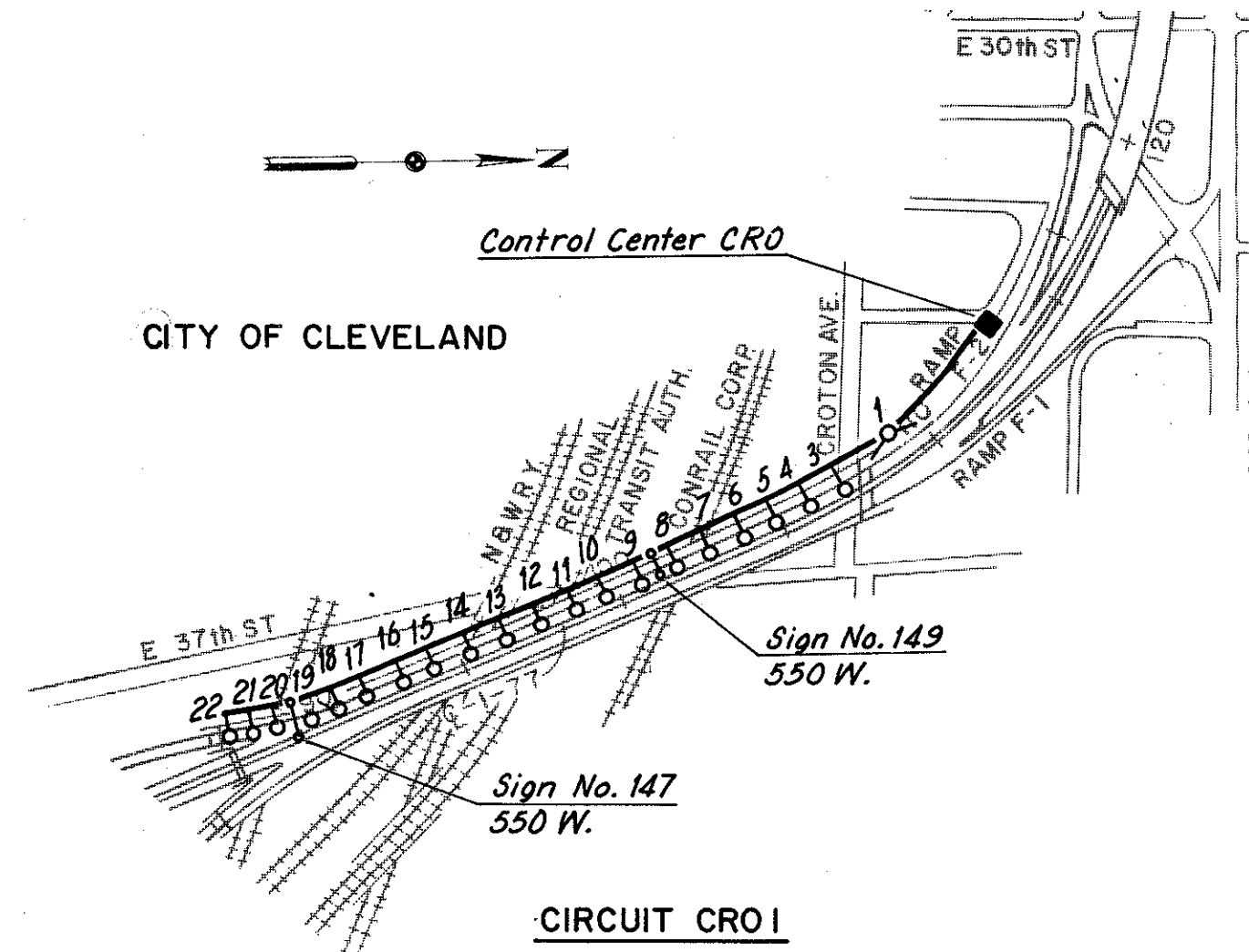
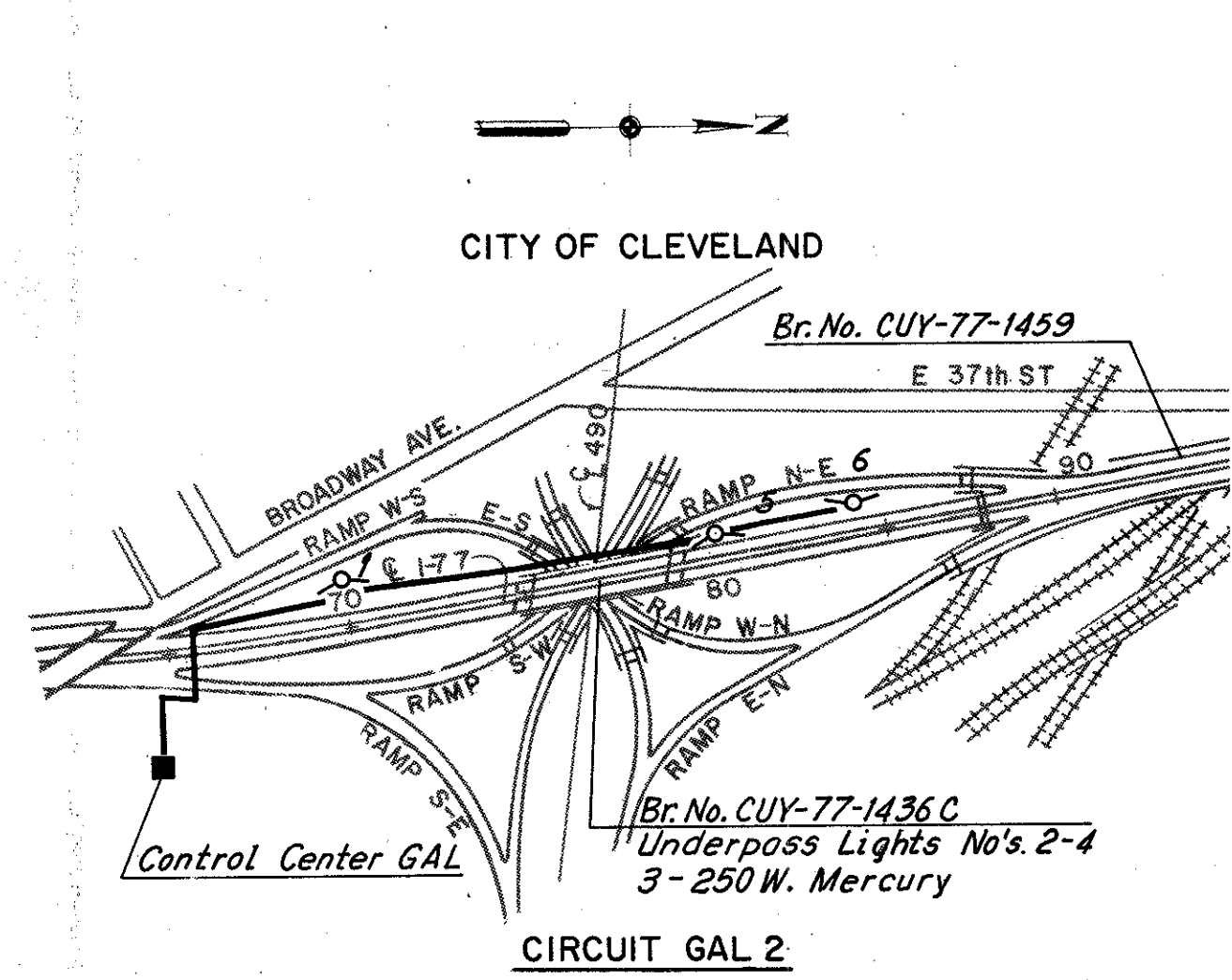
HNTB

# CIRCUIT LAYOUT MAPS

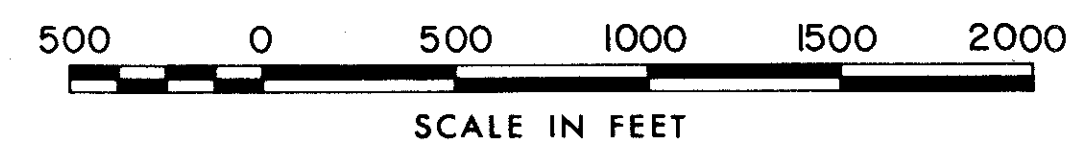
FHWA REGION	STATE	PROJECT
5	OHIO	

41  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



Note: For circuit load data. See sheet 45.

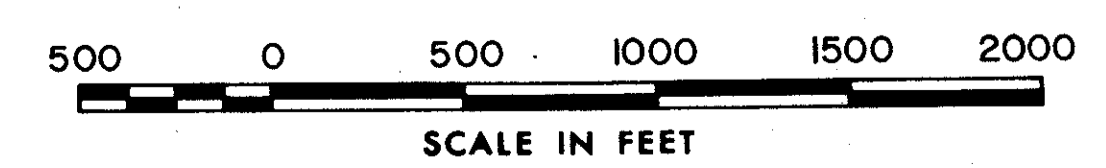
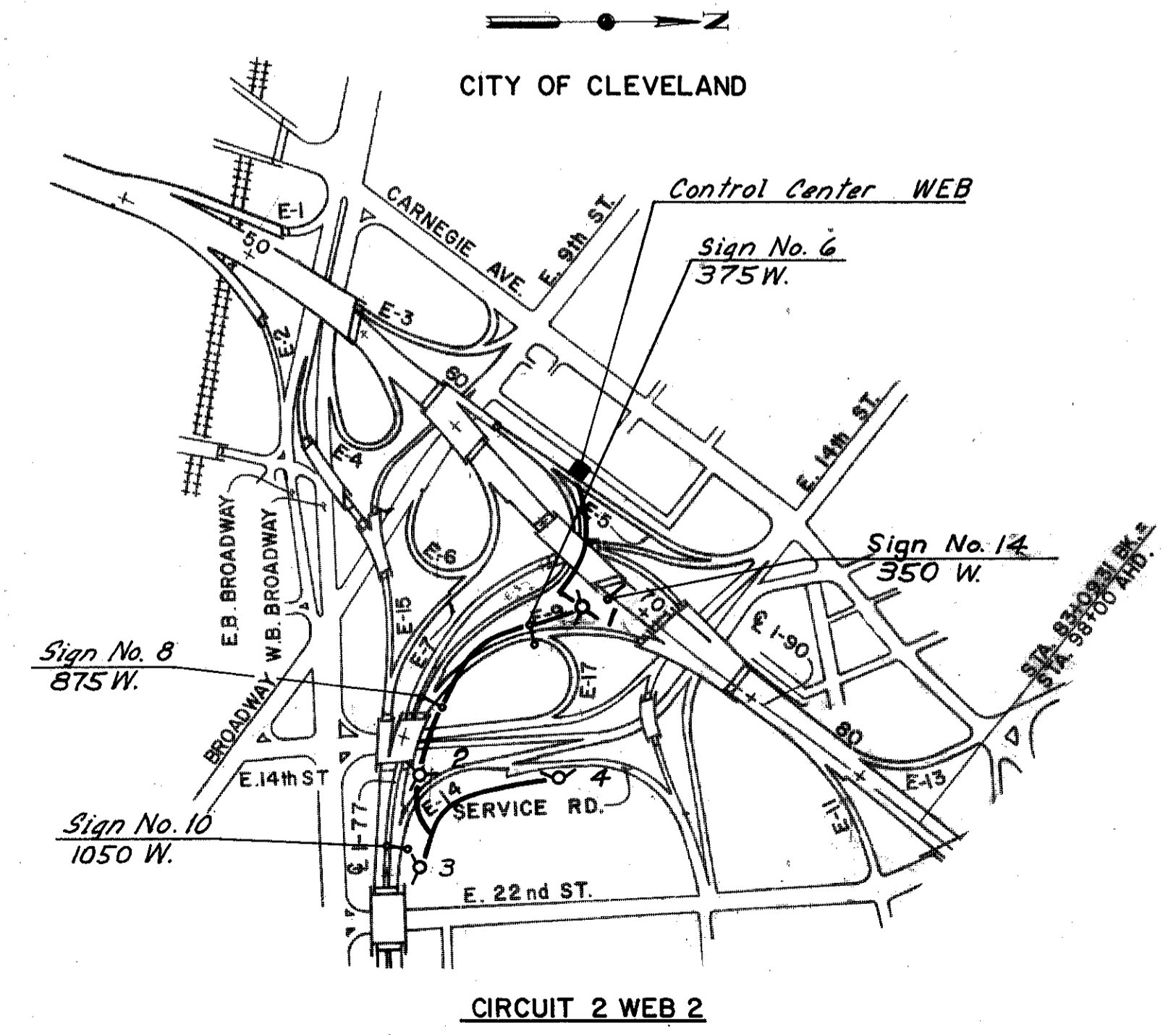
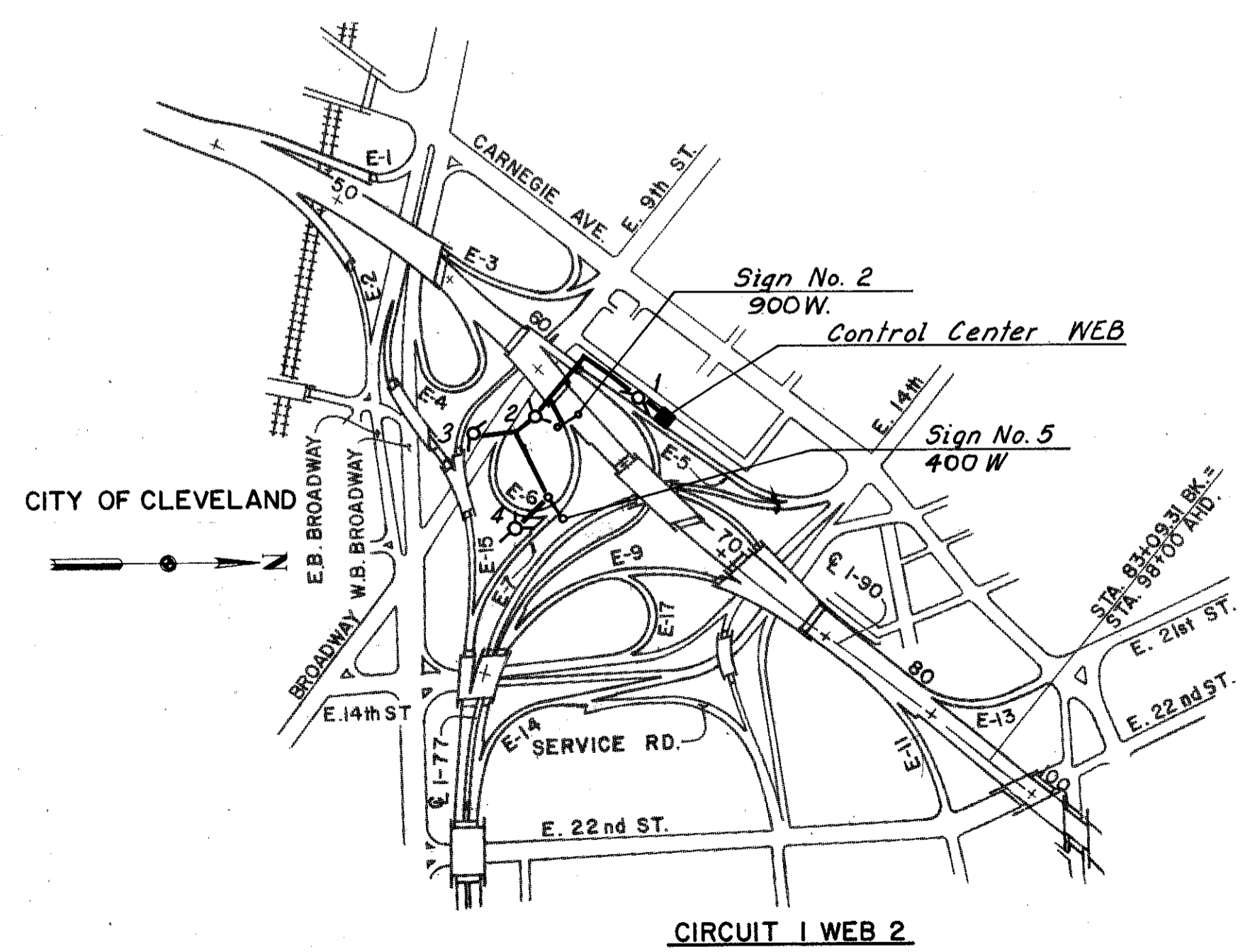
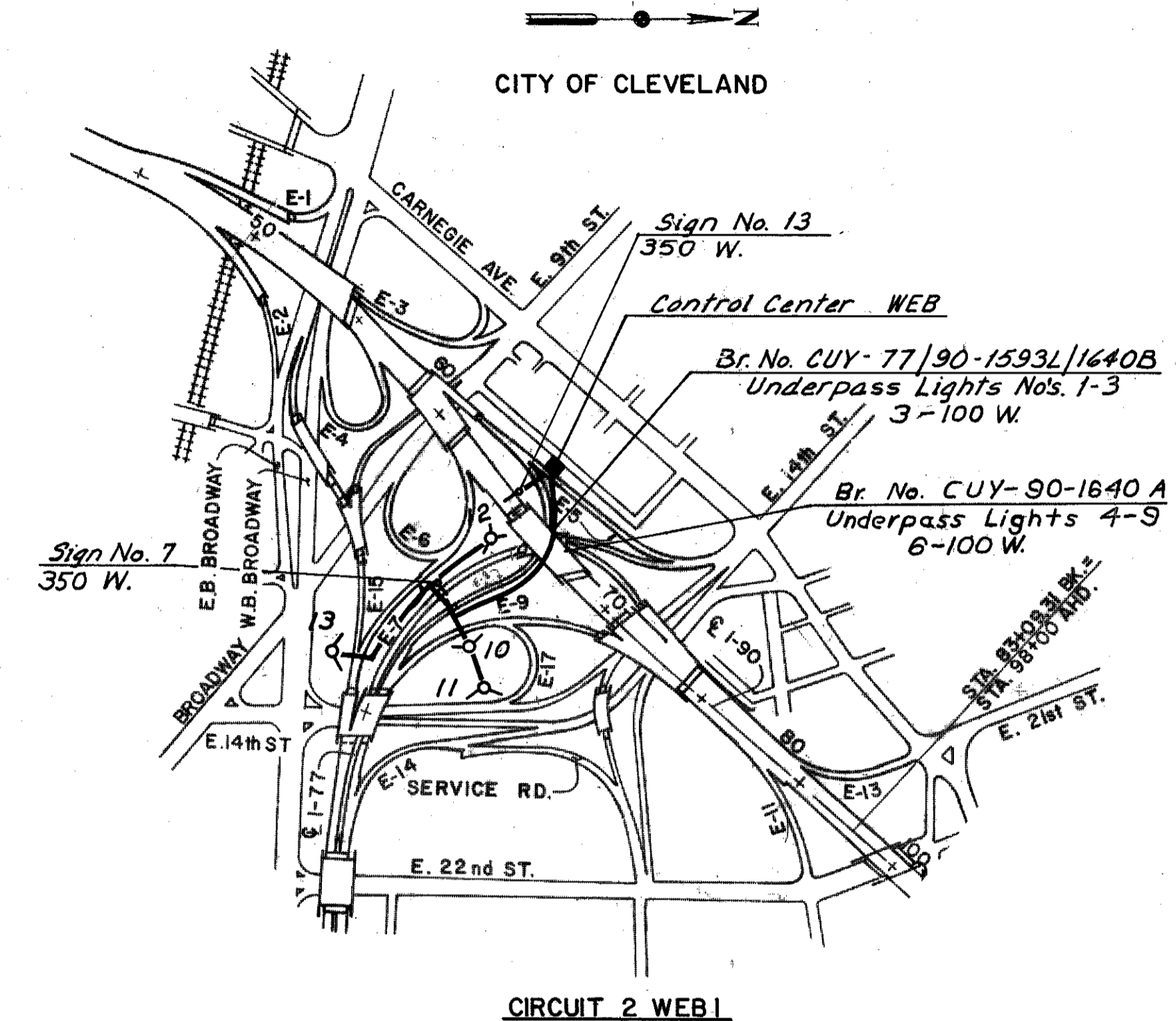
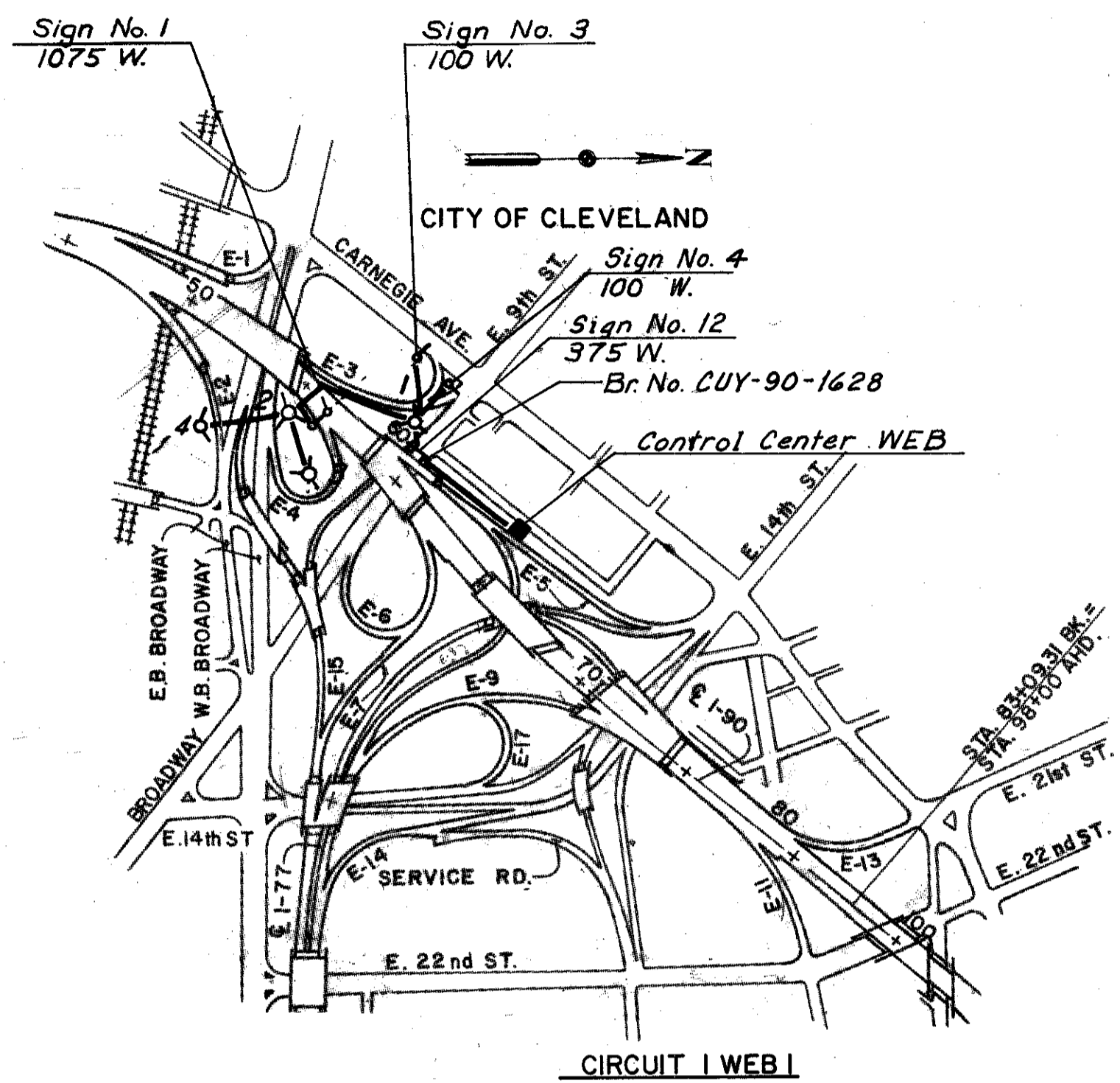


# CIRCUIT LAYOUT MAPS

FHWA REGION	STATE	PROJECT
5	OHIO	

42  
84

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21



MADE F.R.V. DATE 10-8-76  
 TRACED D.L.B. DATE 10-14-76  
 CHECKED G.F. DATE 10-21-76  
 SCALE 1" = 500'

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

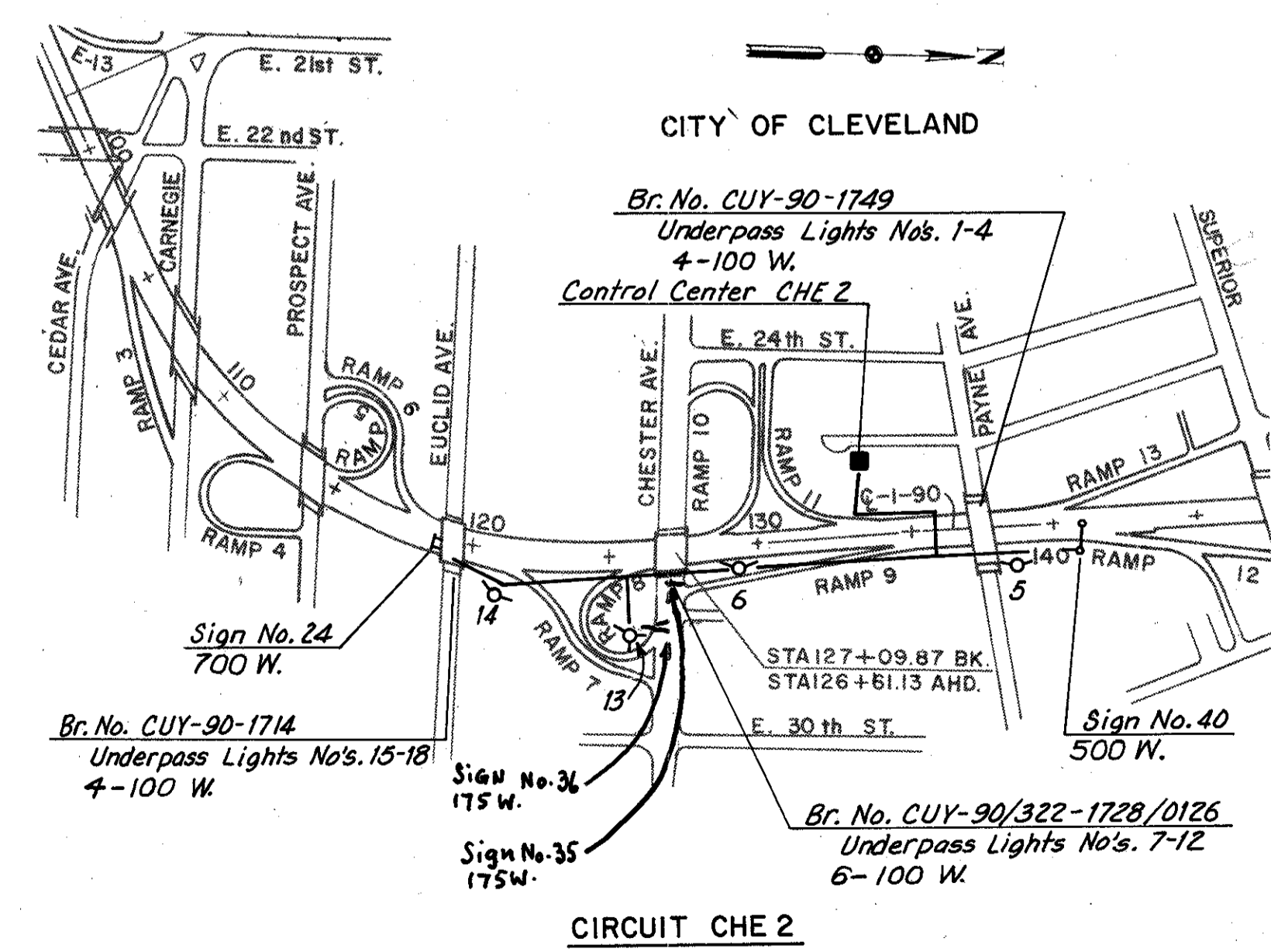
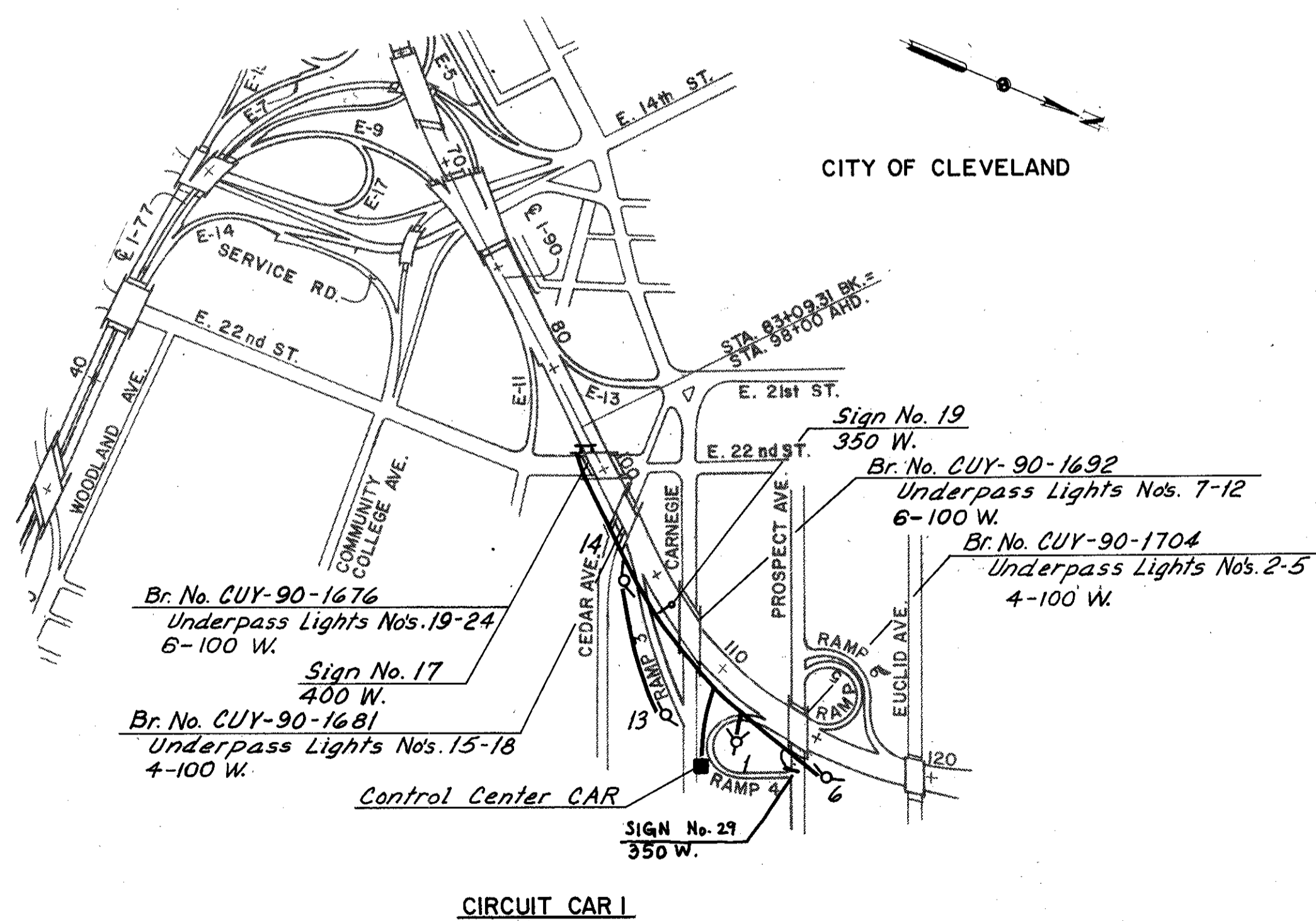
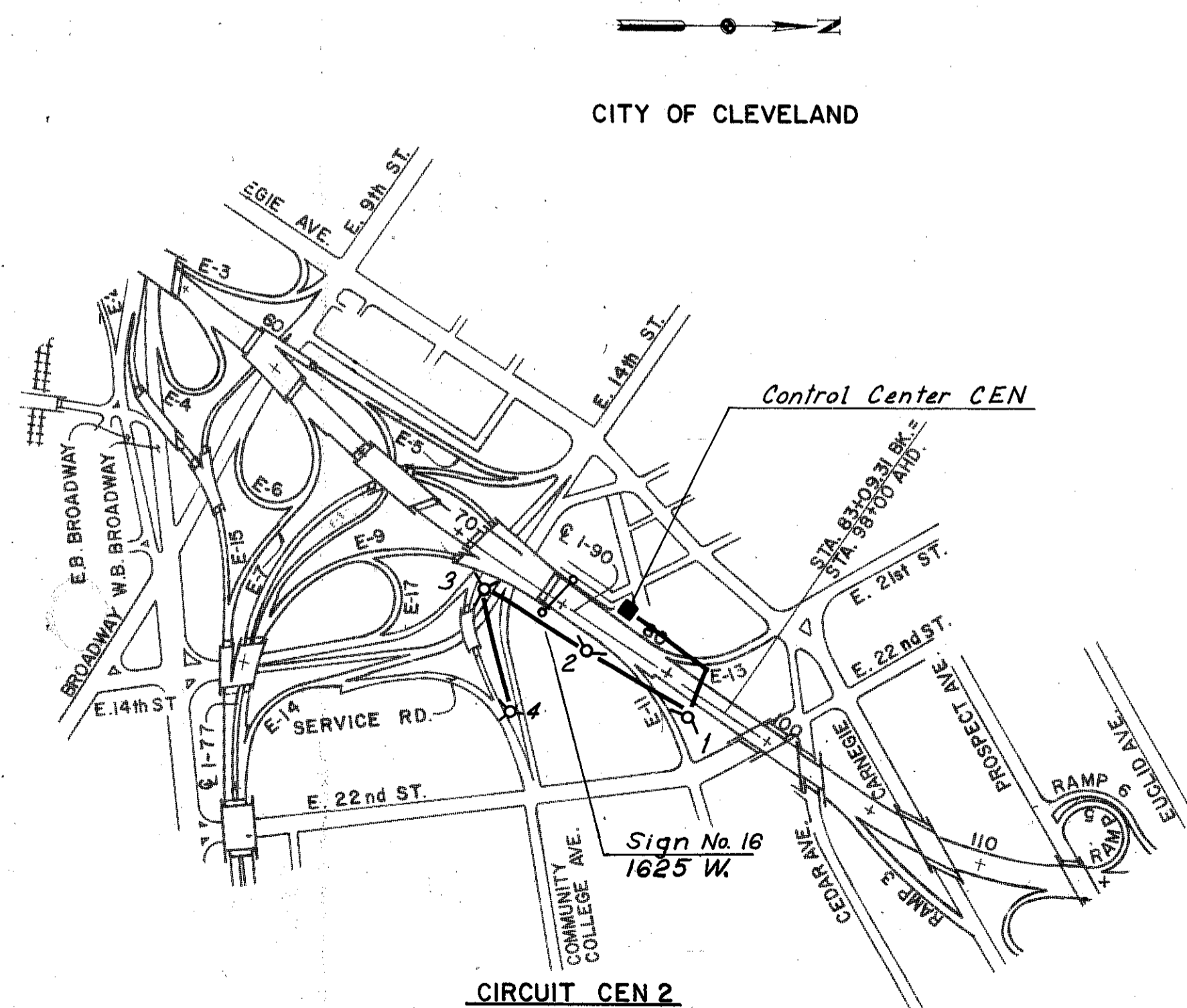
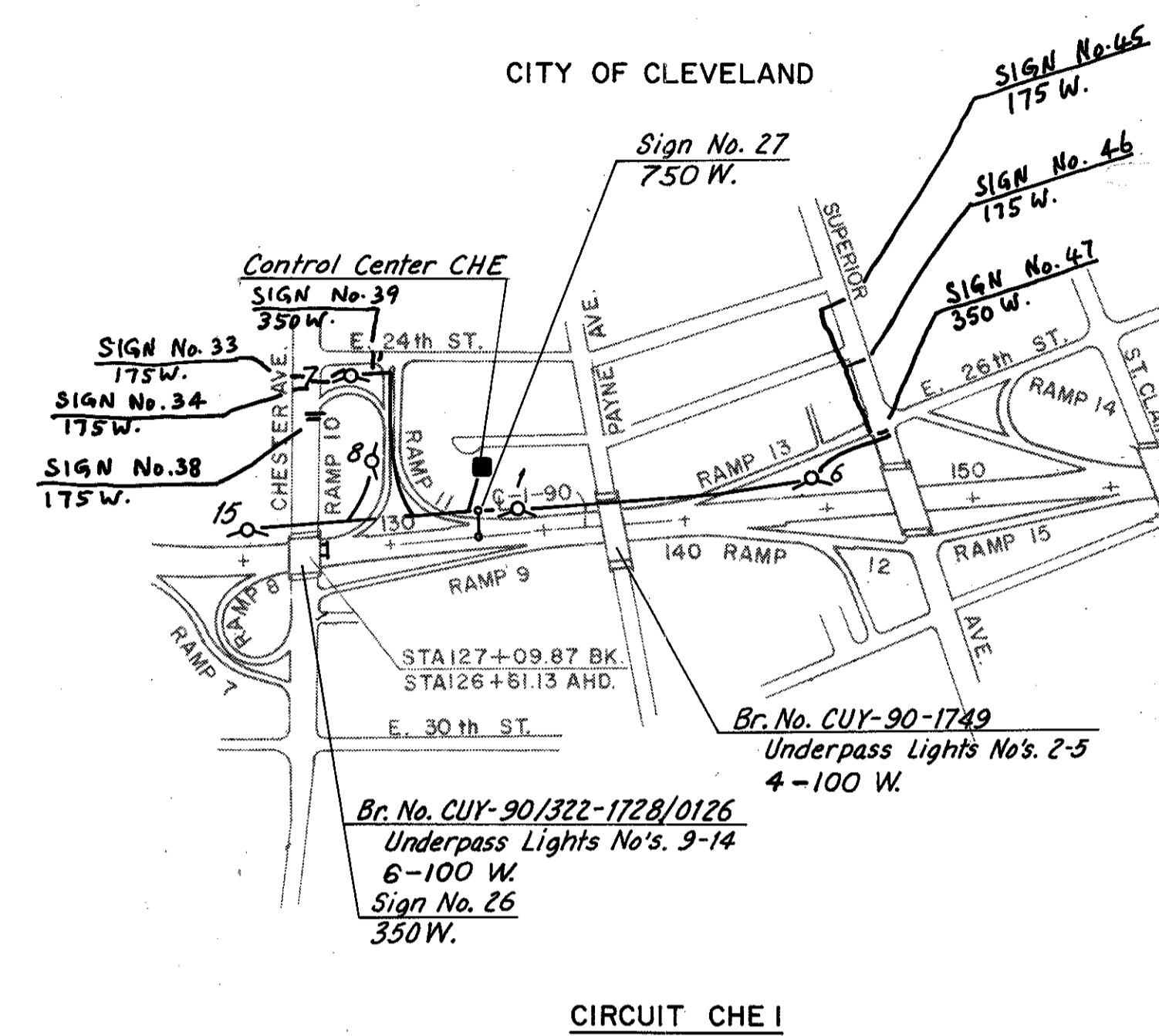
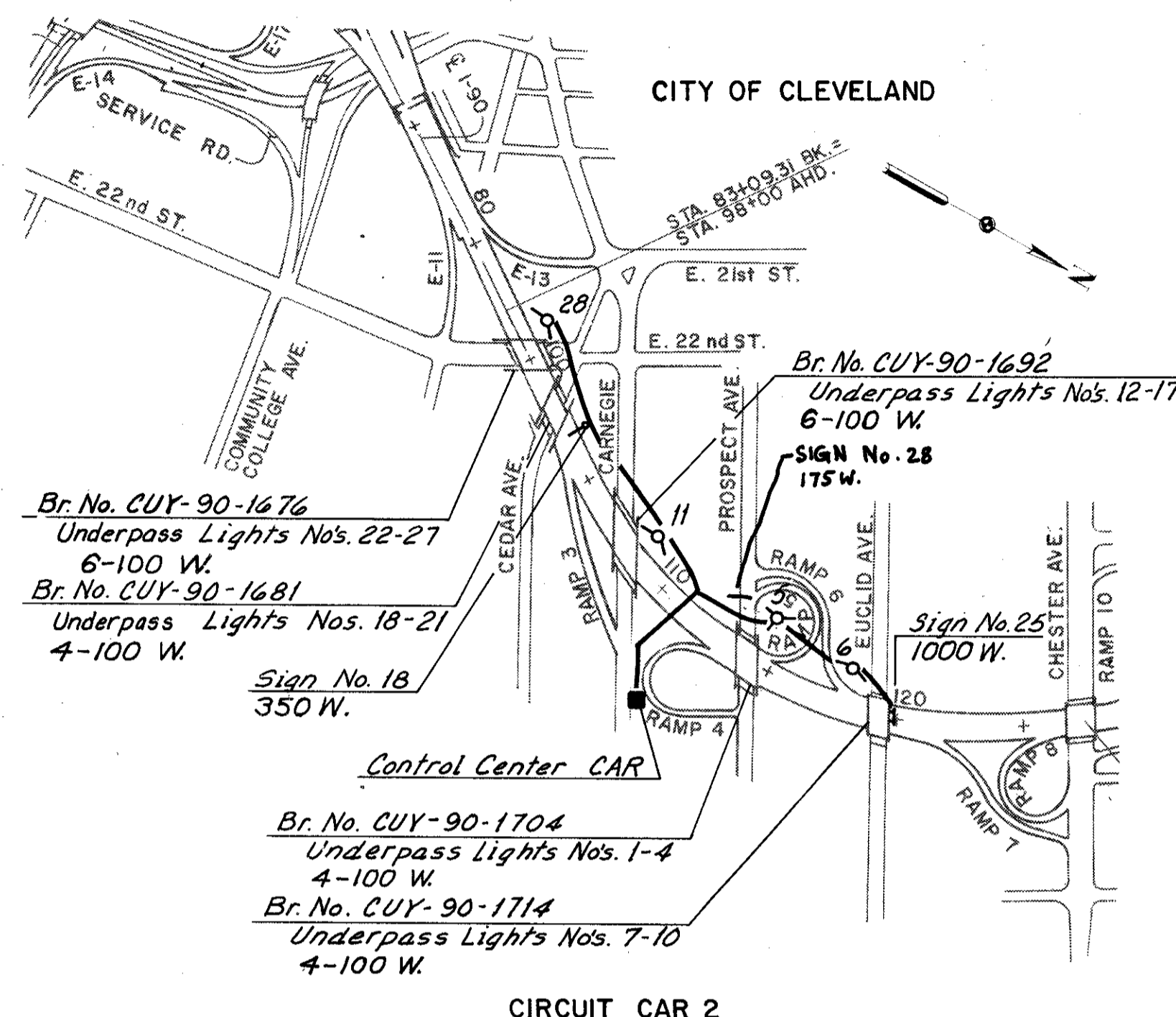
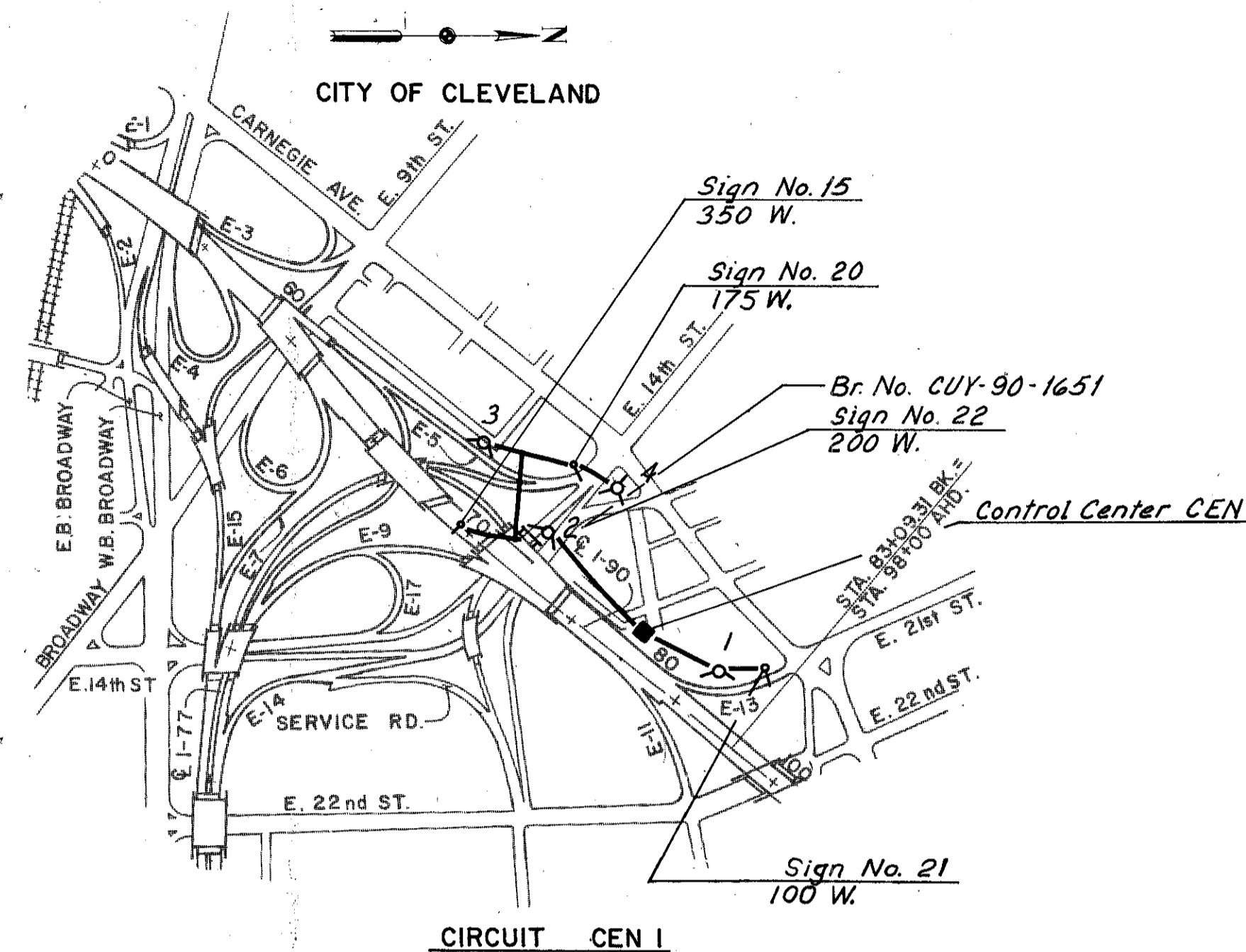


FHWA REGION	STATE	PROJECT
5	OHIO	

43  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

# CIRCUIT LAYOUT MAPS



MADE F.P.H. DATE 10-2-78  
TRACED T.T.H. DATE 10-14-78  
CHECKED E.T. DATE 10-21-78  
SCALE 1"=500'

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



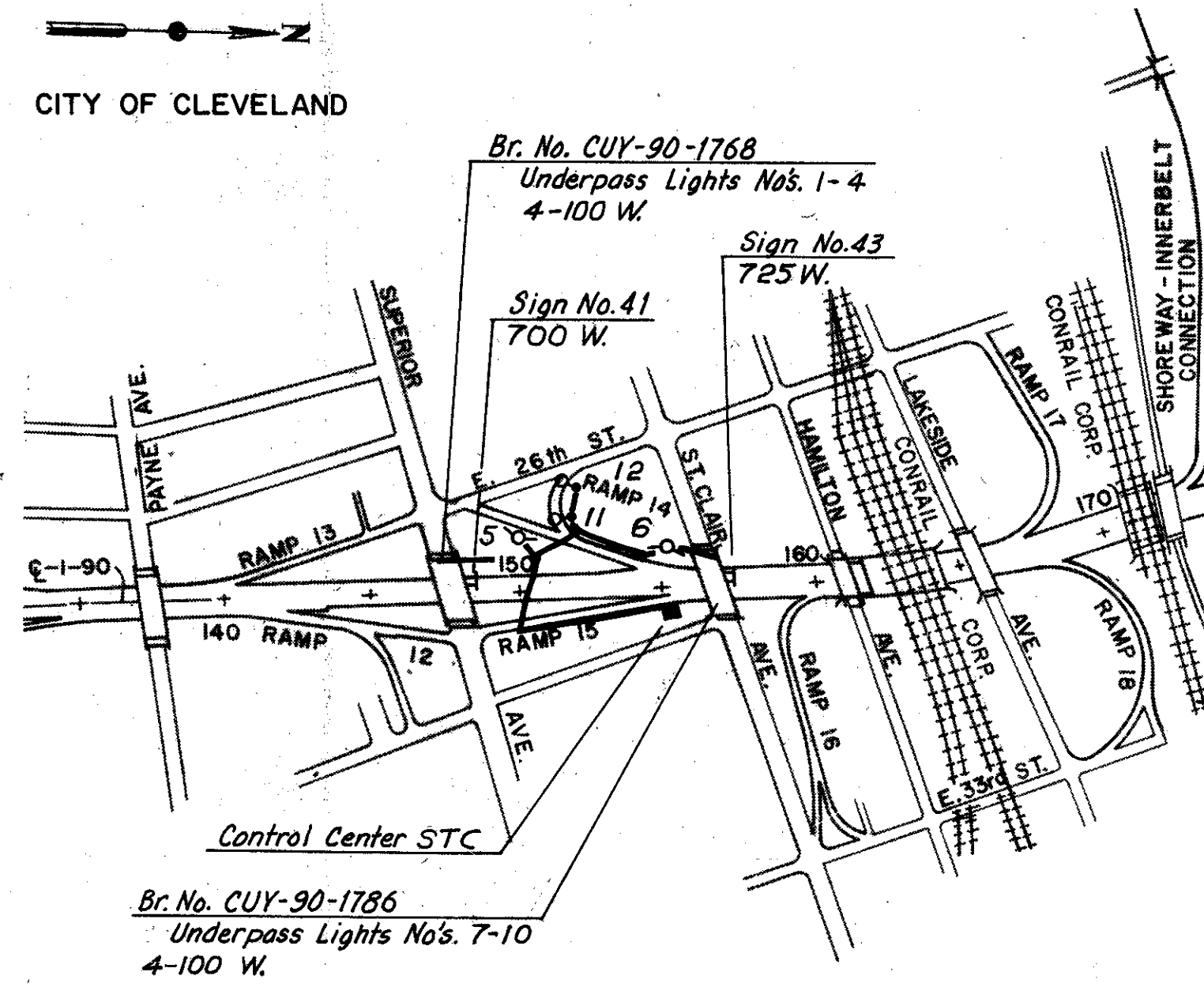
Rev. 1-26-78

# CIRCUIT LAYOUT MAPS

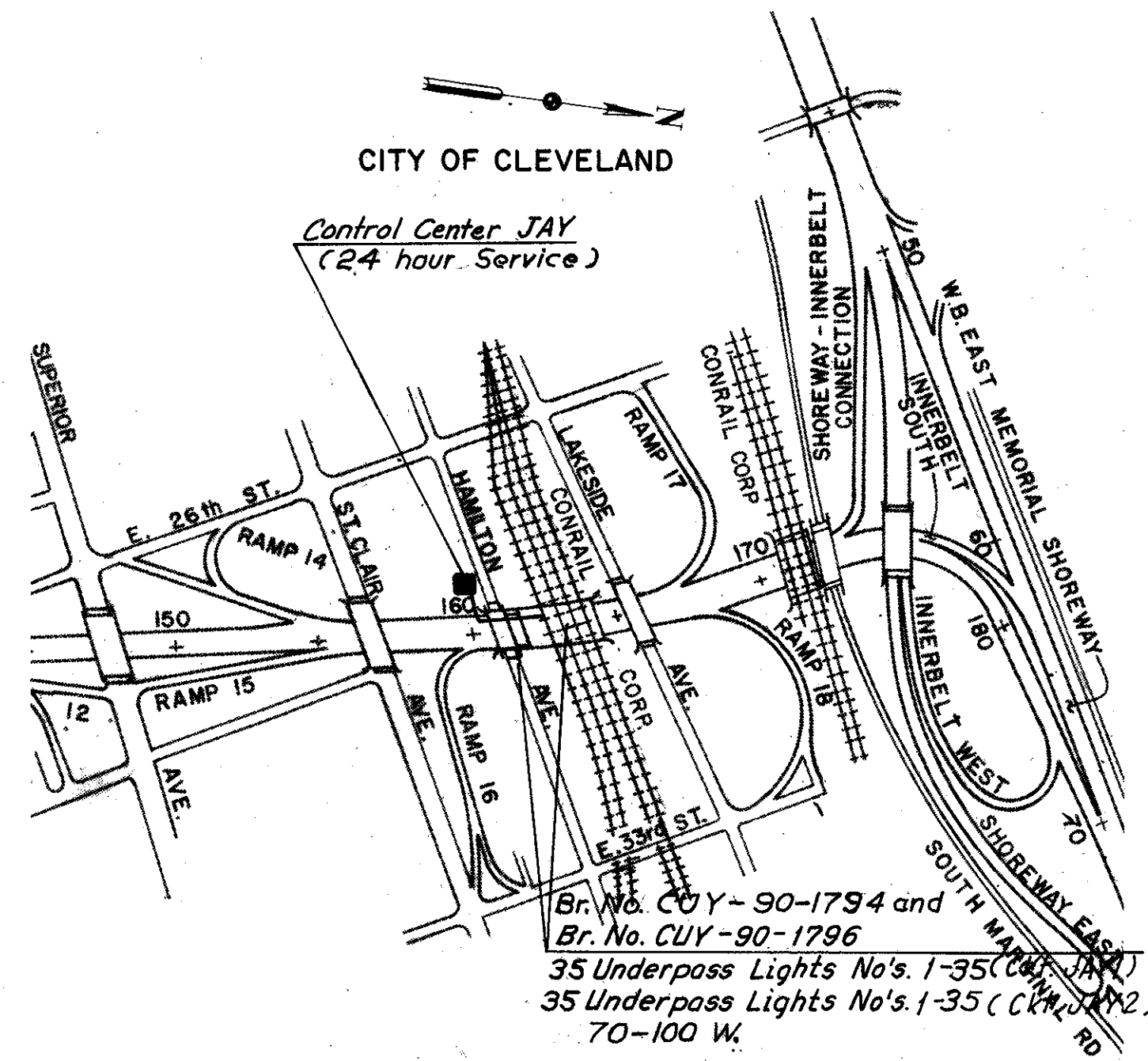
FHWA REGION	STATE	PROJECT	
5	OHIO		

44  
84

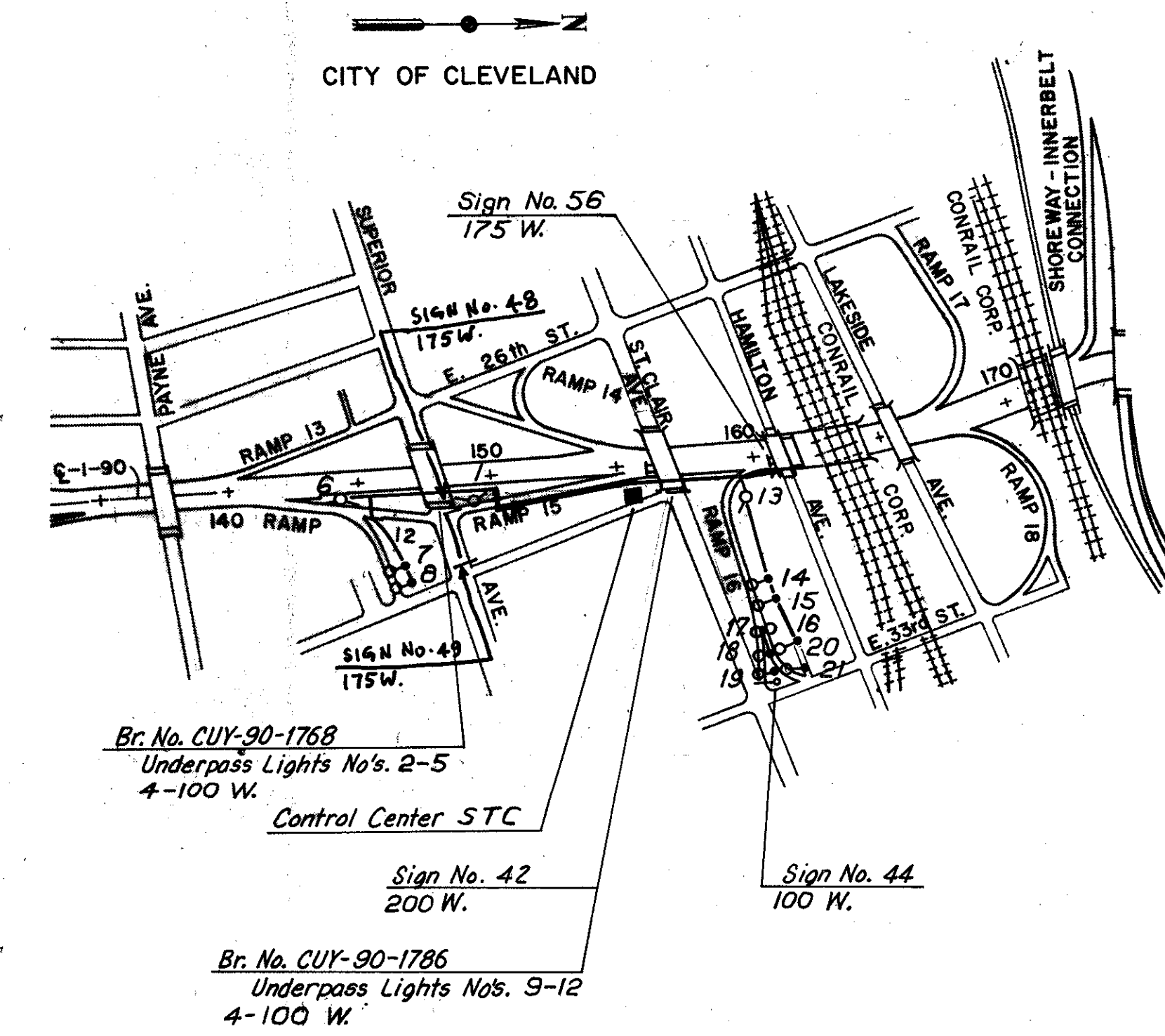
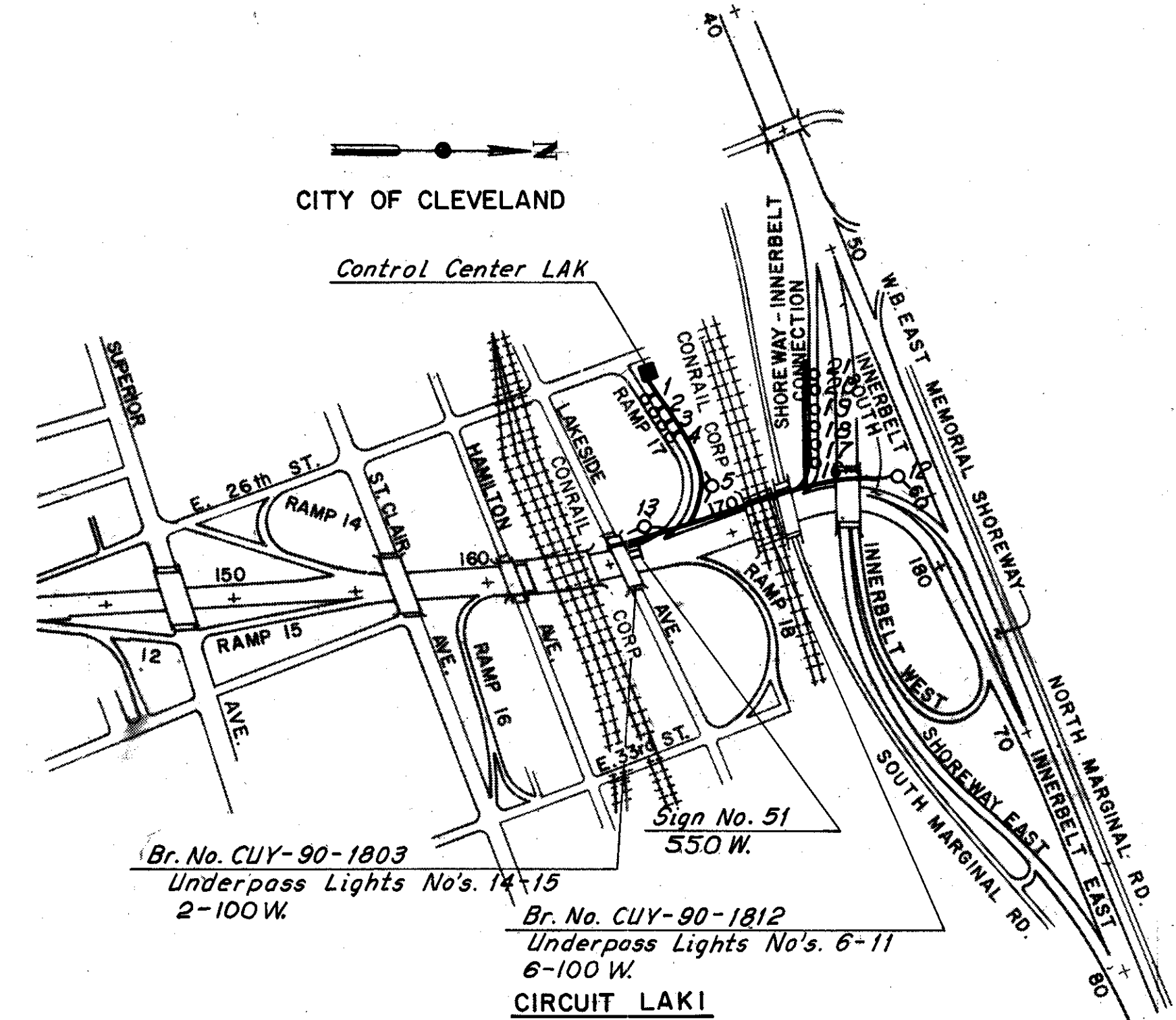
CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21



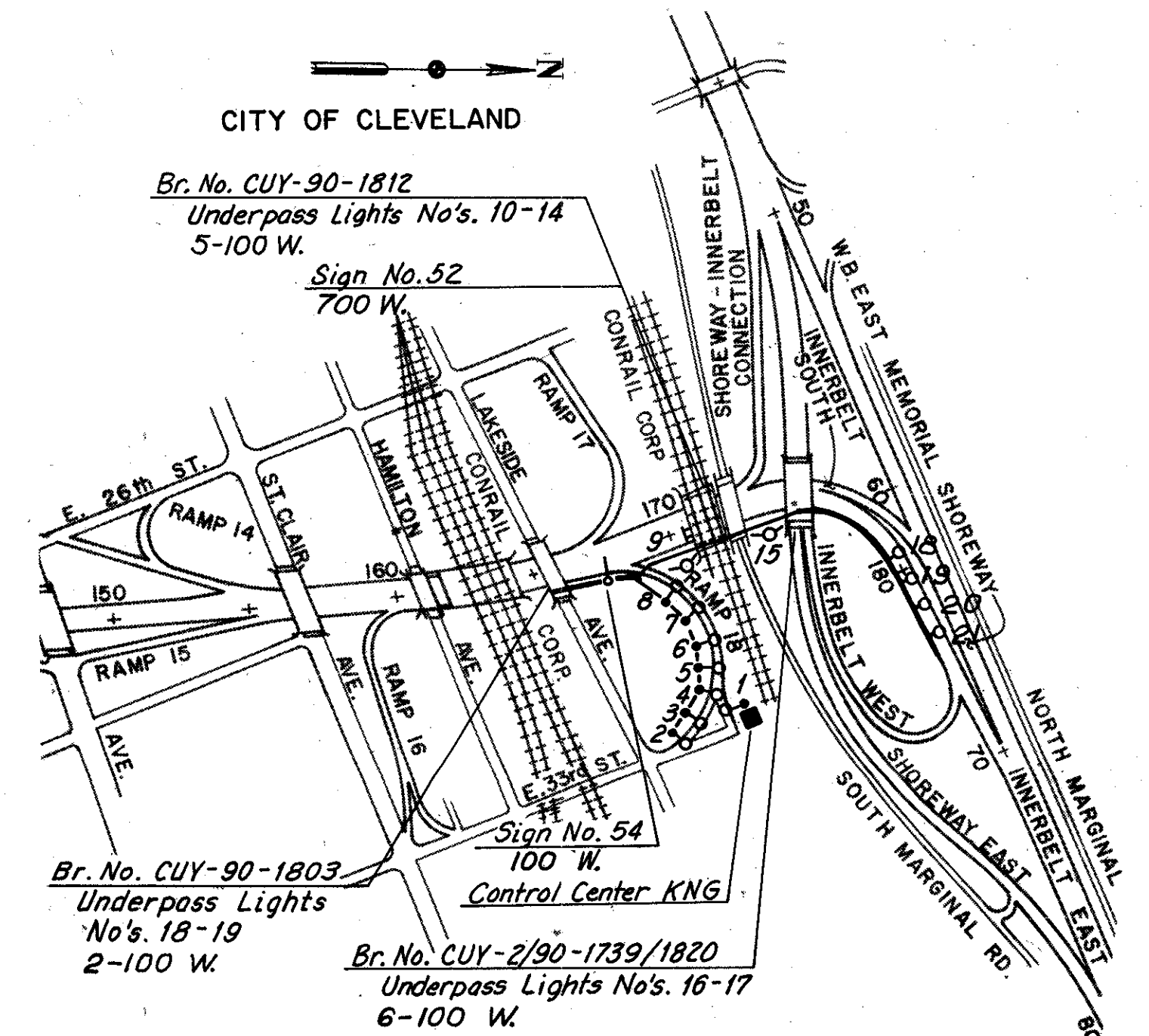
CIRCUIT STC2



CIRCUITS JAY1 & JAY2



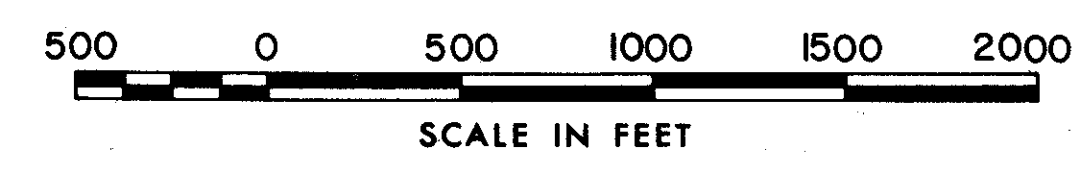
CIRCUIT STC1



MADE BY F.R.H. DATE 12-8-76  
 TRACED BY J.L.B. DATE 11-14-76  
 CHECKED BY J.L.B. DATE 12-21-76  
 SCALE 1"=500'

Howard, Needles, Tamman & Bergendoff  
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**HNTB**



Rev. 1-26-78

71-0

FHWA REGION	STATE	PROJECT
5	OHIO	

45  
84

CUYAHOGA COUNTY  
CUY - 77-14.12  
CUY - 90-16.21

# CONTROL CENTER DATA

SHEET NO.	CONTROL CENTER DATA														
	CENTER CIRCUIT	LOCATION	SECONDARY				SERVICE	LAMP TYPE				SIGN	CIRCUIT	CIRCUIT	CIRCUIT
		VOLTAGE (VOLTS)	LOAD (KVA)	XFMR. (KVA)	CABLE (AWG)	SWITCH (TYPE)	100W HPS 0.33A Eq.	250W MERC. 0.7A Eq. (EXIST.)	400W MERC. 1.0A Eq. (EXIST.)	1000W HPS 2.5A Eq.	LOAD (WATTS)	LOAD (AMPS)	FUSES (AMPS)	DROP (%)	
20	GAL	65+25 @ I-77, 170' Rt.	480	17.4		2	SC-100	6		12	1025	36.3			
	GAL1			9.2				3		6	1025	19.2	25	2.73	
	GAL2			8.2				3		6	-	17.1	25	2.99	
	GAL3			-							-	-	25		Spare Circuit
21	CR0	4+65 @ Ramp F-2, 50' Lt.	480	24.6		2	SC-100		20	10	2975	51.2			
	CR01			13.1					20	2	1100	27.3	35	4.29	
	CR02			11.5					-	8	1875	23.9	30	4.65	
	CR03			-							-	-	35		Spare Circuit
21	ORG	6+80 @ Ramp F-1, 20' Rt.	480	24.7		2	SC-100		16	11	3800	51.5			
	ORG1			9.7					16		2000	20.2	25	3.11	
	ORG2			15.0					-	11	1800	31.1	40	3.23	
	ORG3			-							-	-	40		Spare Circuit
30	WEB	8+60 @ Ramp E-5, 50' Rt.	480	54.6		2	SC-100	9			39	6300	113.6		
	1WEB1			14.5							11	1275	30.2	40	4.47
	1WEB2			12.5							9	1675	26.0	35	2.55
	1WEB3			-							-	-	40		Spare Circuit
	2WEB1			13.0				9			9	700	27.0	35	3.67
	2WEB2			14.6							10	2650	30.5	40	4.93
	2WEB3			-							-	-	40		Spare Circuit
31	CEN	78+00 @ I-90, 90' Lt.	480	25.2		2	SC-100				19	2450	52.6		
	CEN1			11.6							9	825	24.2	35	2.51
	CEN2			13.6							10	1625	28.4	35	4.88
	CEN3			-							-	-	35		Spare Circuit
34	CAR	5+10 @ Ramp 4, 90' Rt.	480	31.2		2	SC-100	44			18	2625	65		
	CAR1			15.1				20			9	1100	31.4	40	2.90
	CAR2			16.1				24			9	1525	33.6	40	3.50
	CAR3			-							-	-	40		Spare Circuit

SHEET NO.	CONTROL CENTER DATA														
	CENTER CIRCUIT	LOCATION	SECONDARY				SERVICE	LAMP TYPE				SIGN	CIRCUIT	CIRCUIT	CIRCUIT
		VOLTAGE (VOLTS)	LOAD (KVA)	XFMR. (KVA)	CABLE (AWG)	SWITCH (TYPE)	100W HPS 0.33A Eq.	250W MERC. 0.7A Eq. (EXIST.)	400W MERC. 1.0A Eq. (EXIST.)	1000W HPS 2.5A Eq.	LOAD (WATTS)	LOAD (AMPS)	FUSES (AMPS)	DROP (%)	
36	CHE	3+00 @ Ramp 11, 90' Rt.	480	30.8		2	SC-100	24			19	4225	64.4		
	CHE1			16.2							10	1675	33.9	40	1.85
	CHE2			14.6							14	1550	30.5	40	4.62
	CHE3			-							-	-	40		Spare Circuit
37	STC	156+00 @ I-90, 110' Rt.	480	22.6		2	SC-100	16		12	10	2250	47.0		
	STC1			14.1							8	825	29.4	35	1.64
	STC2			8.5							8	1425	17.6	25	2.01
	STC3			-							-	-	35		Spare Circuit
39	LAK	8+50 @ Ramp 17, 35' Rt.	480	13.8		2	SC-60	8		10	6	550	28.8		
	LAK1			13.8							8	550	28.8	35	3.39
	LAK2			-							-	-	35		Spare Circuit
39	KNG	8+40 @ E33 St. Conn. 30' Lt.	480	12.8		2	SC-60	9		12	4	800	26.6		
	KNG1			12.8							9	800	26.6	35	2.84
	KNG2			-							-	-	35		Spare Circuit
38	JAY	160+45 @ I-90, 72' Lt.	480	11.1		4	S-60	70					23.2		24 Hr. Service
	JAY1			5.5							35		11.6	20	1.59
	JAY2			5.5							35		11.6	20	2.39
	JAY3			-							-	-	20		Spare Circuit

MADE BY E.R.H. DATE 12-14-76  
 TRACED BY B. DATE 12-21-76  
 CHECKED BY J.F.J. DATE 12-27-76  
 SCALE

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

**HNTB**

Rev. 1-26-78



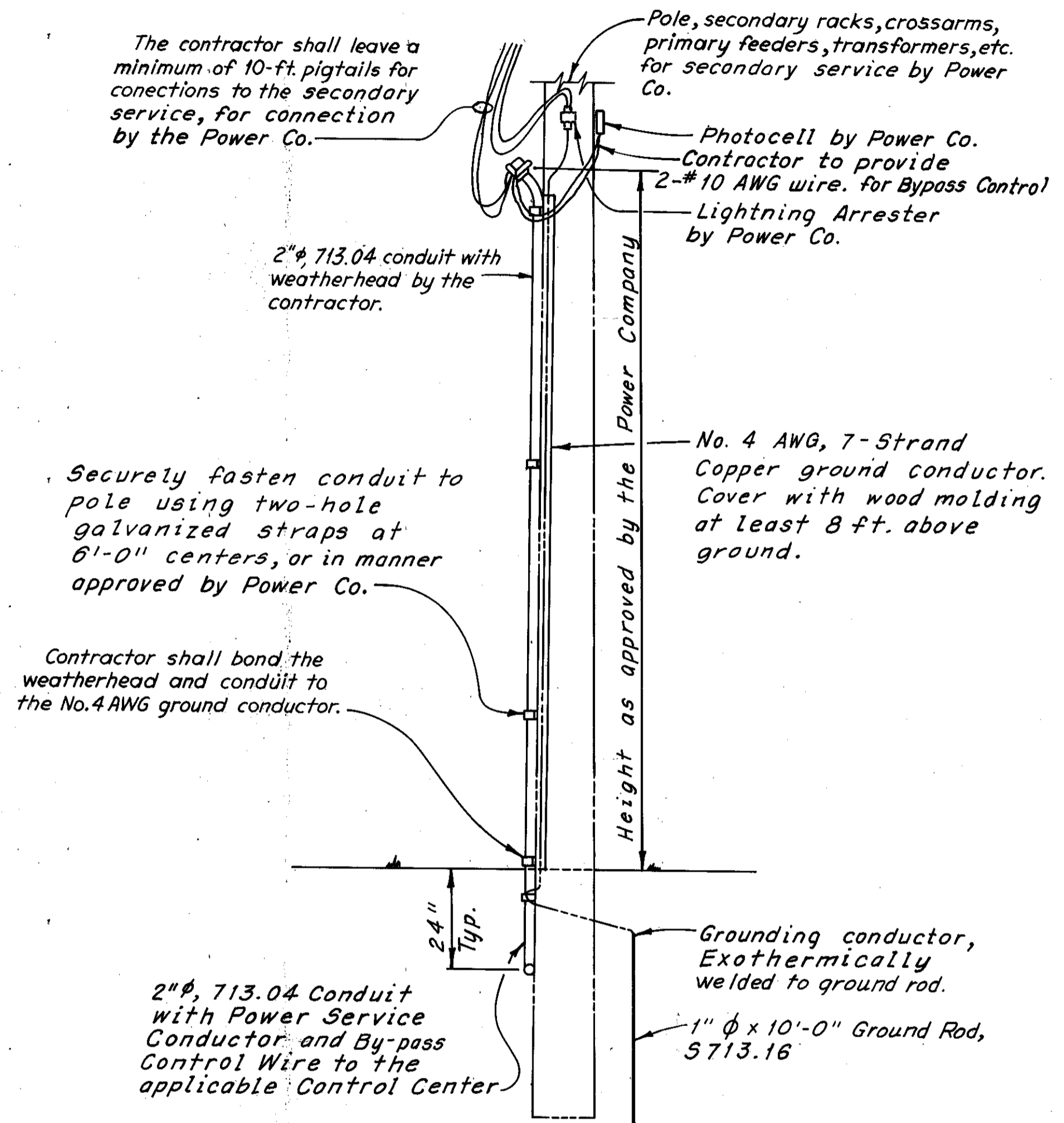
# LIGHTING DETAILS

FHWA REGION	STATE	PROJECT
5	OHIO	

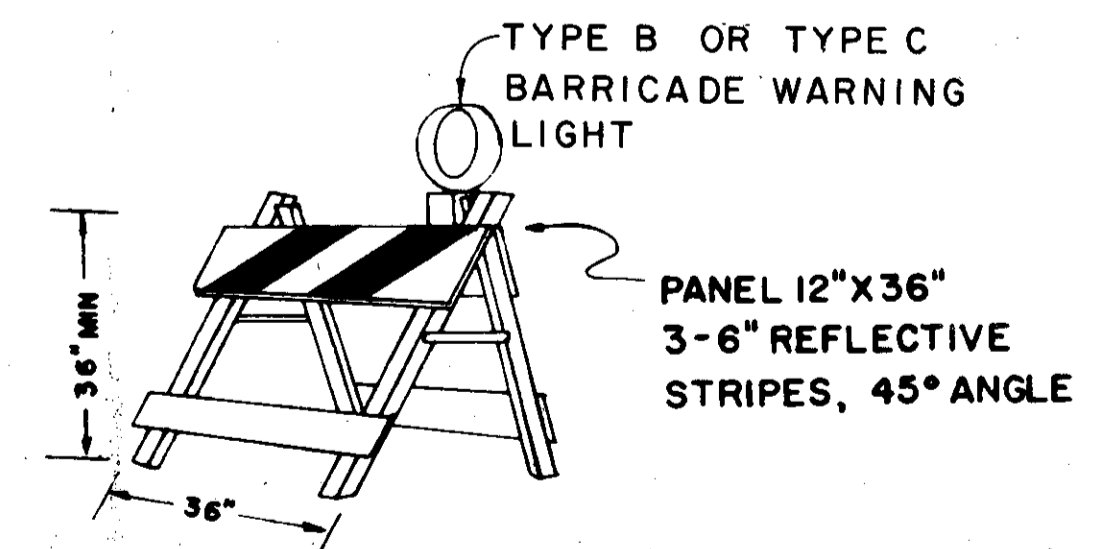
46  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

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 S625, "Control Center, By Designation".

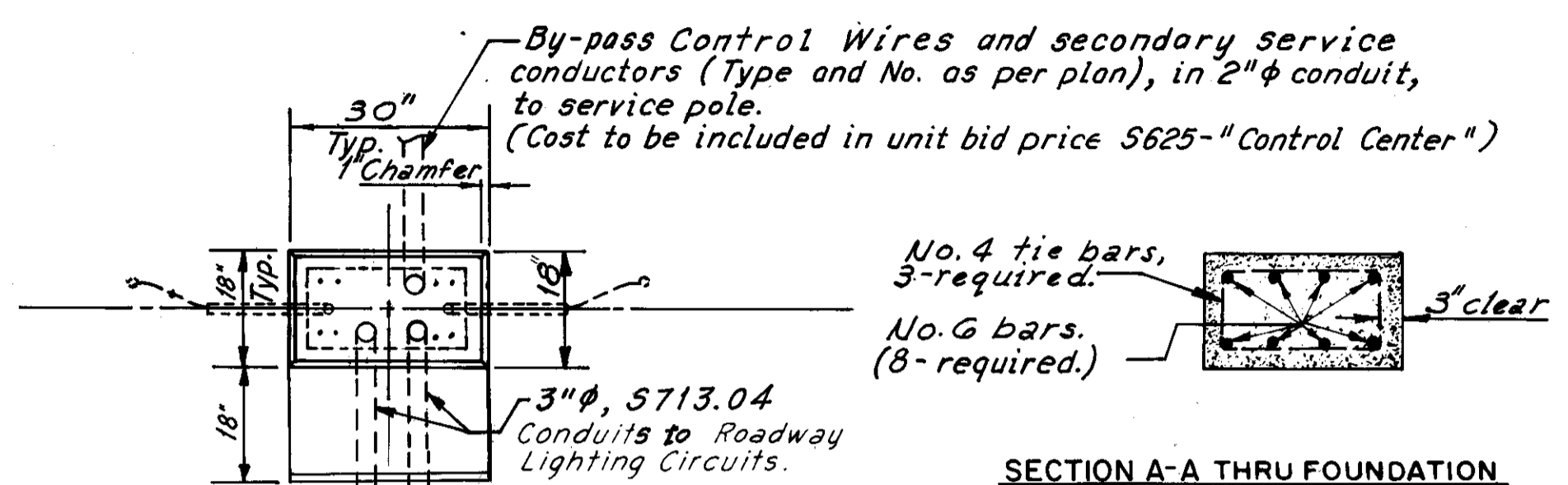


CONNECTION TO POWER SERVICE POLE (TYPICAL)  
No Scale

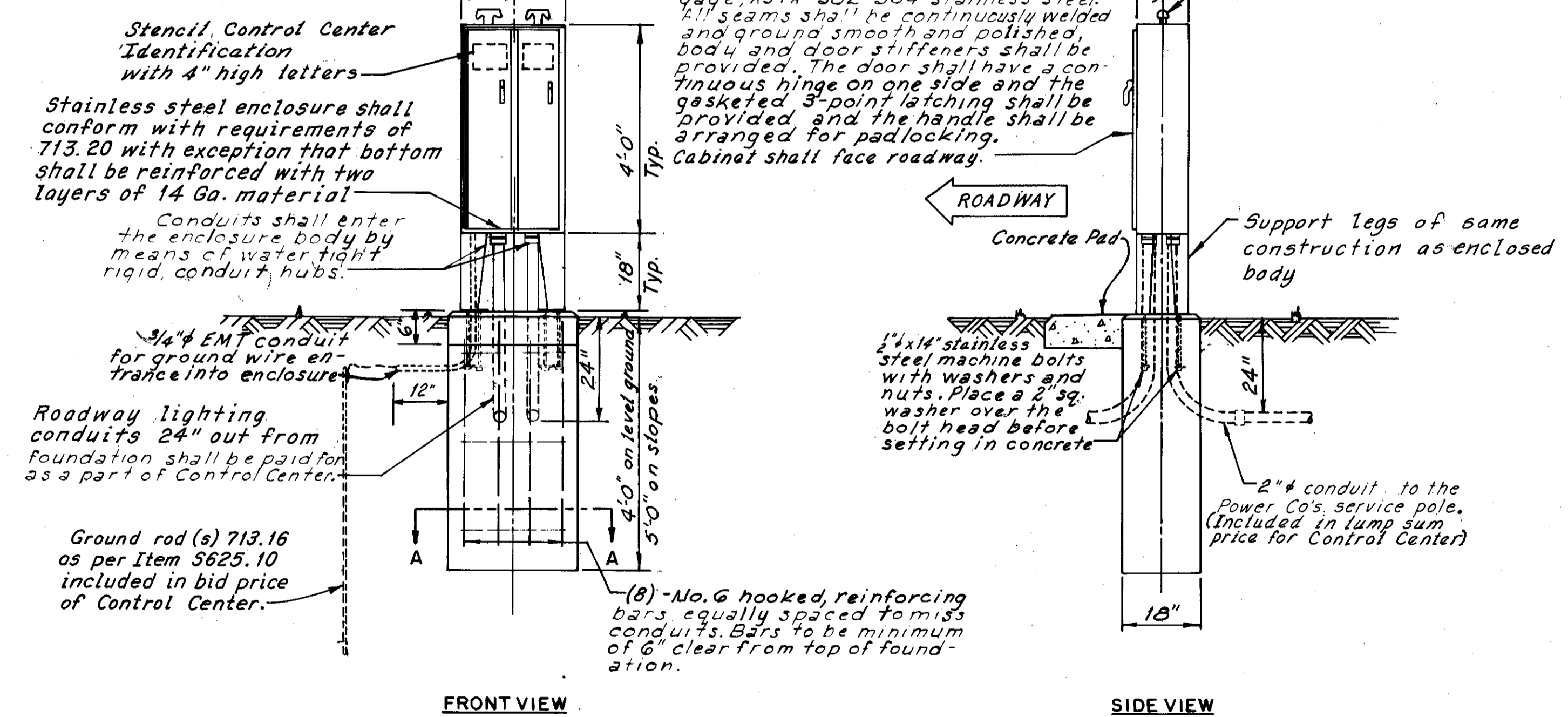


REFLECTORIZED TYPE II BARRICADE DETAIL

IF WEIGHTS ARE ADDED TO IMPROVE STABILITY, THE WEIGHTS SHALL BE ADDED TO THE LOWER HORIZONTAL BRACING.



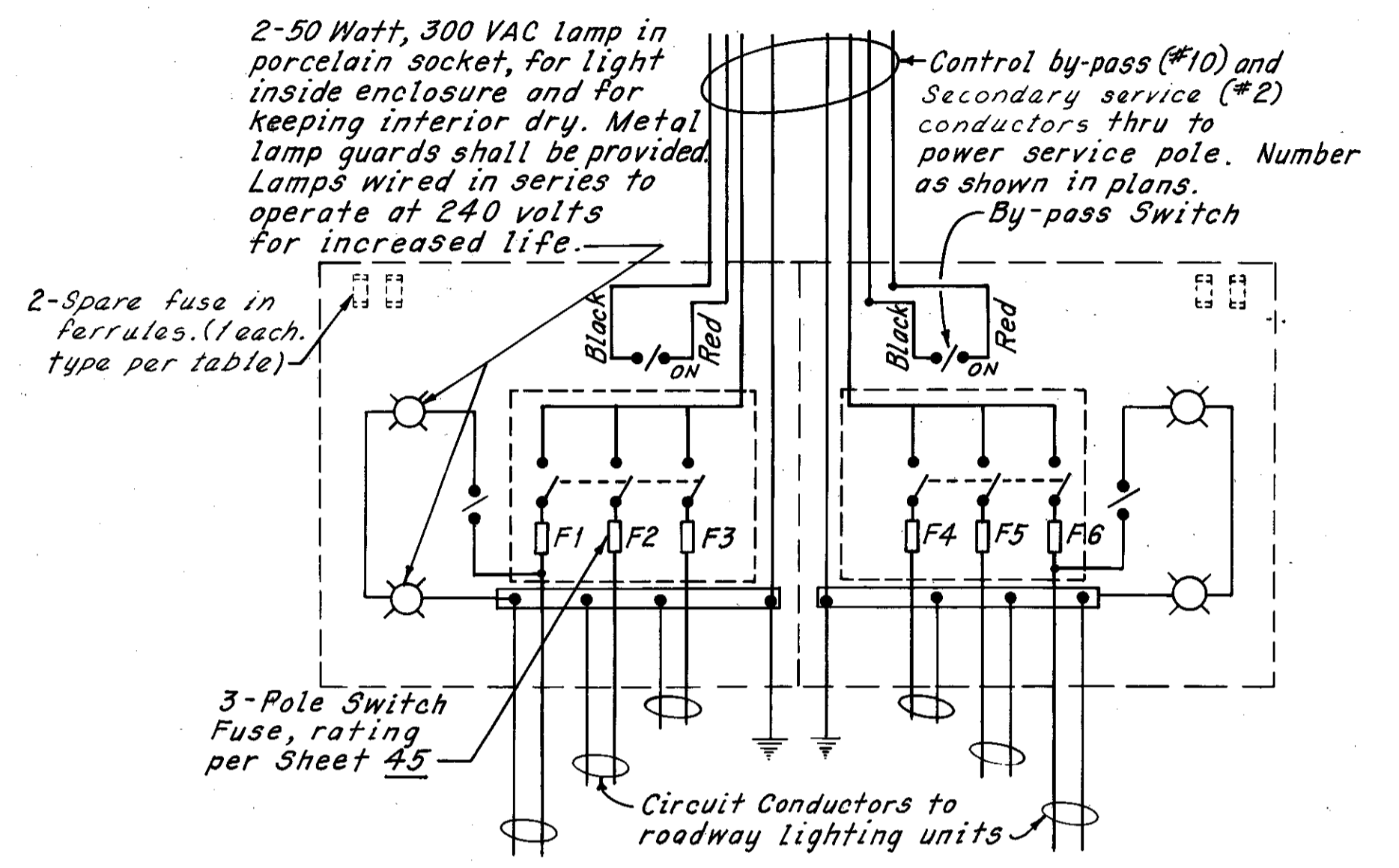
Notes:  
See "Lighting Layout" sheets for direction and number of conduits out of foundation. Spacing and placement of anchor bolts in foundation is dependent upon the enclosure manufacturers dimensions. Enclosure dimensions are inside measurements. See Control Center Data for type, size and number of switches or contactors.



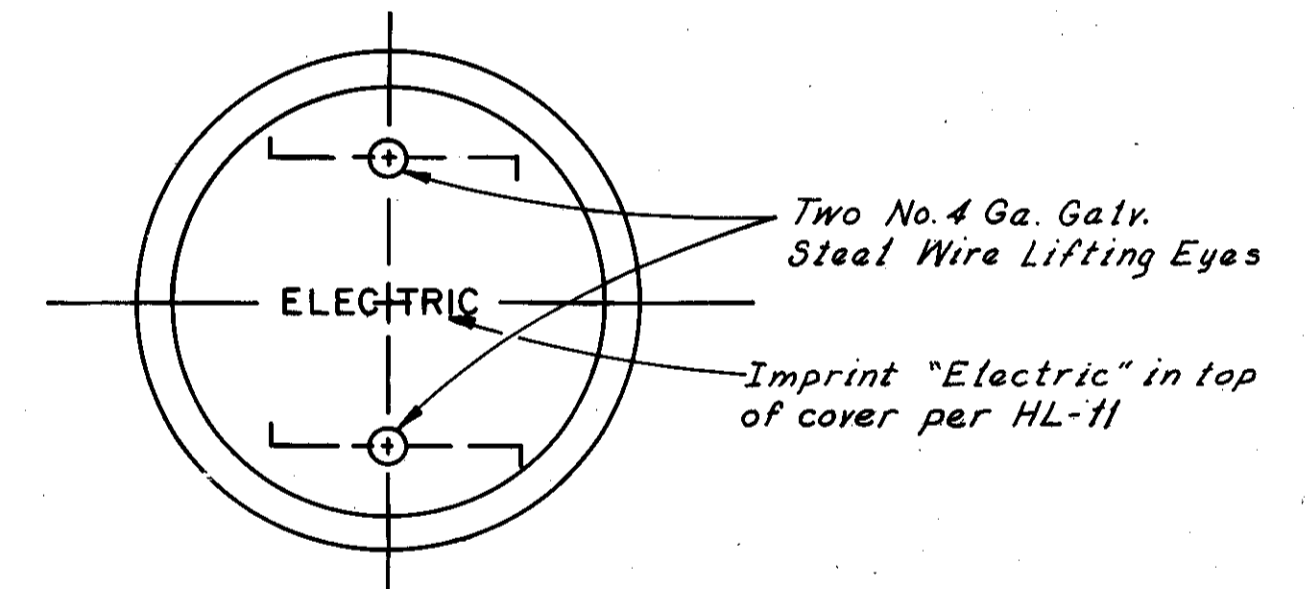
CONTROL CENTER DETAILS

**SMALL BARRICADES:**  
TYPE II BARRICADES SHALL BE USED WHERE REQUIRED, FOR ALL REPAIRS. THESE SHALL BE OF EITHER WOOD OR METAL. THESE SHALL BE AT LEAST 36" HIGH AND 36" WIDE. NEAR THE TOP OF THE BARRICADE THERE SHALL BE A PANEL WITH ALTERNATE ORANGE AND REFLECTORIZED WHITE, 6" WIDE STRIPES. THIS PANEL SHALL BE AT LEAST 36" WIDE AND 12" HIGH. A SINGLE FACED FLASHER SHALL BE LOCATED AT THE TOP OF THE BARRICADE AT THE END NEAREST TO TRAFFIC. THE FLASHER SHALL FACE ONCOMING TRAFFIC. THE BARRICADES SHALL BE OF SUFFICIENT STABILITY SO THAT WIND OR TRAFFIC AIR TURBULANCE WILL NOT UPSET THEM. BARRICADES SHALL BE IN ACCORDANCE WITH PERTINENT SECTIONS OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION, LATEST REVISIONS.

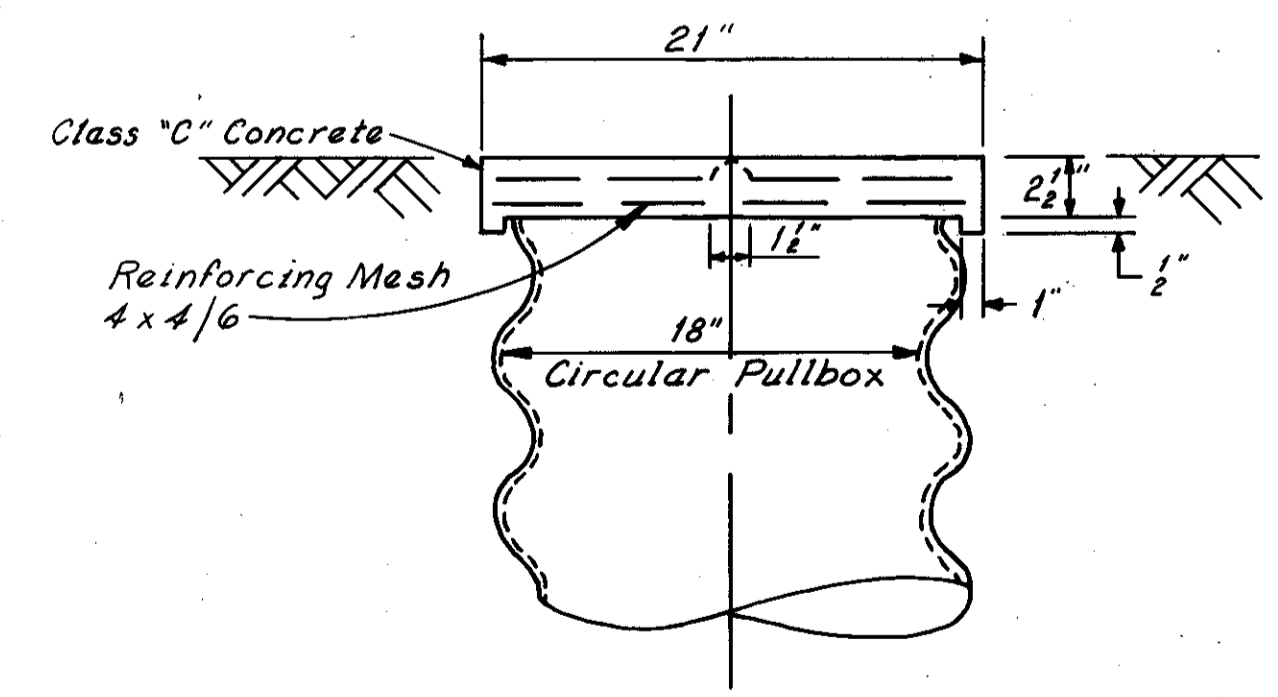
**FLASHERS:**  
FLASHERS SHALL BE IN ACCORDANCE WITH PERTINENT SECTIONS OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION, LATEST REVISIONS, SUPPLEMENTAL SPECIFICATION 844 AND SHEET 3.



TYPICAL WIRING DIAGRAM



PULL BOX COVER DETAIL



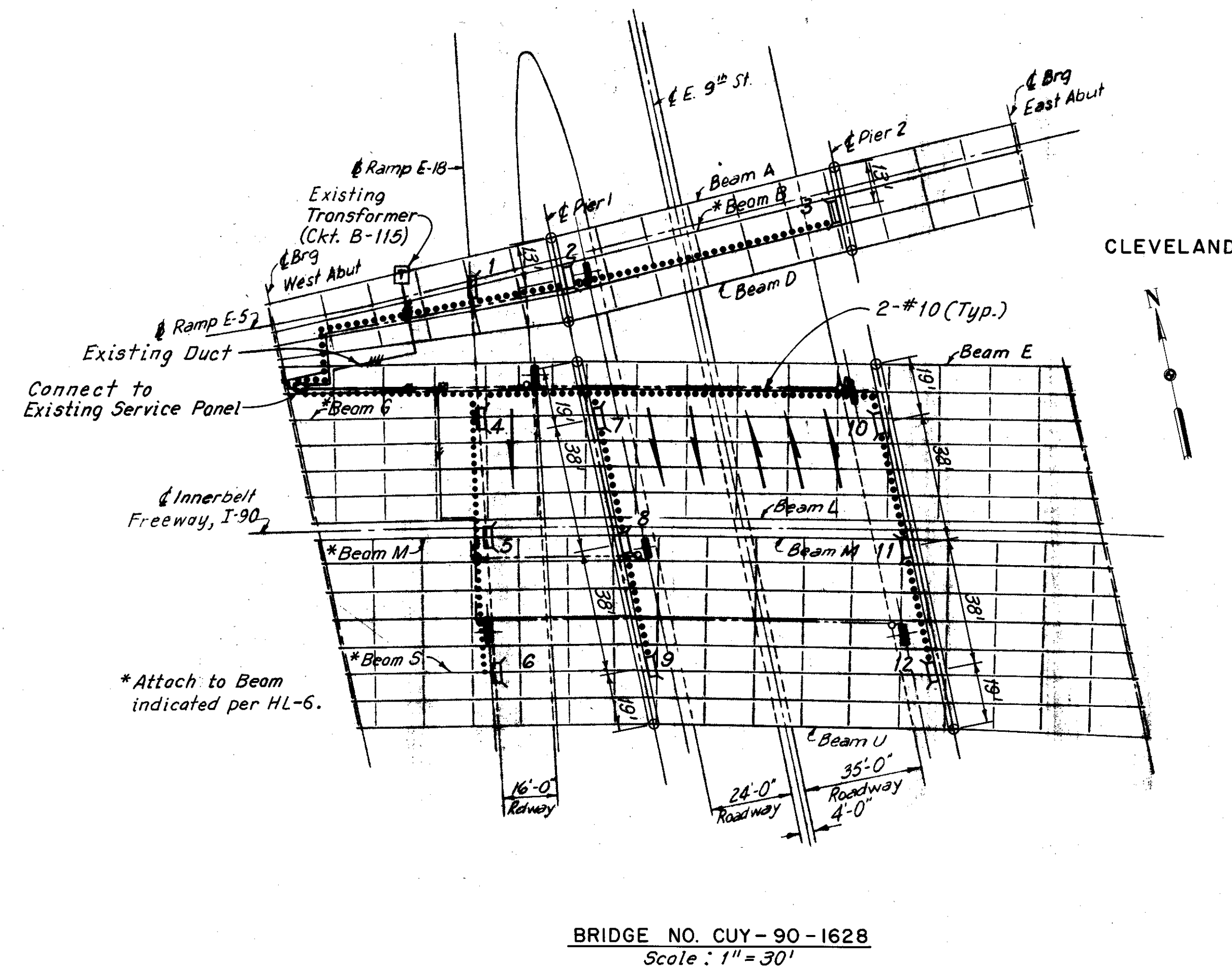
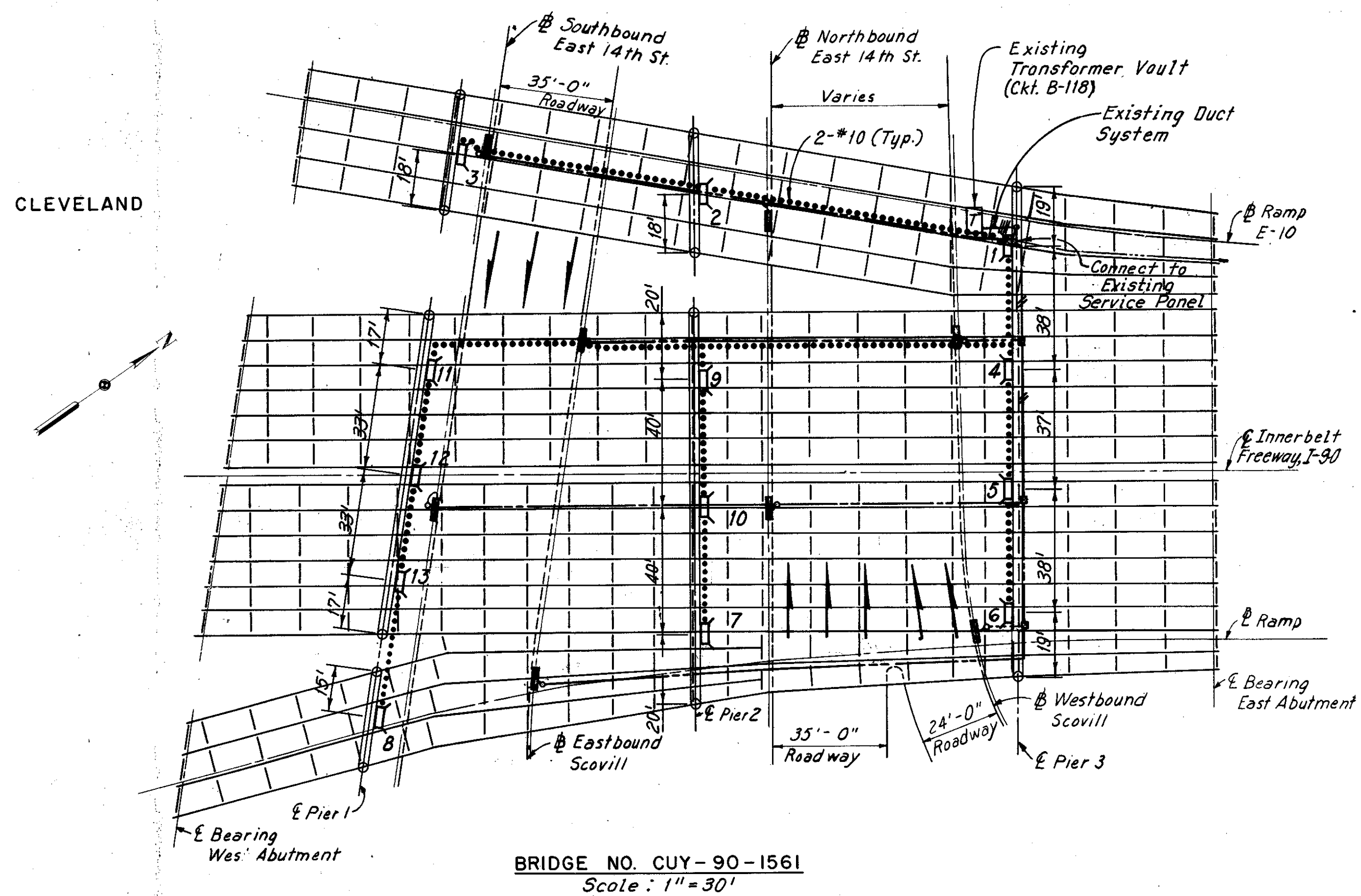
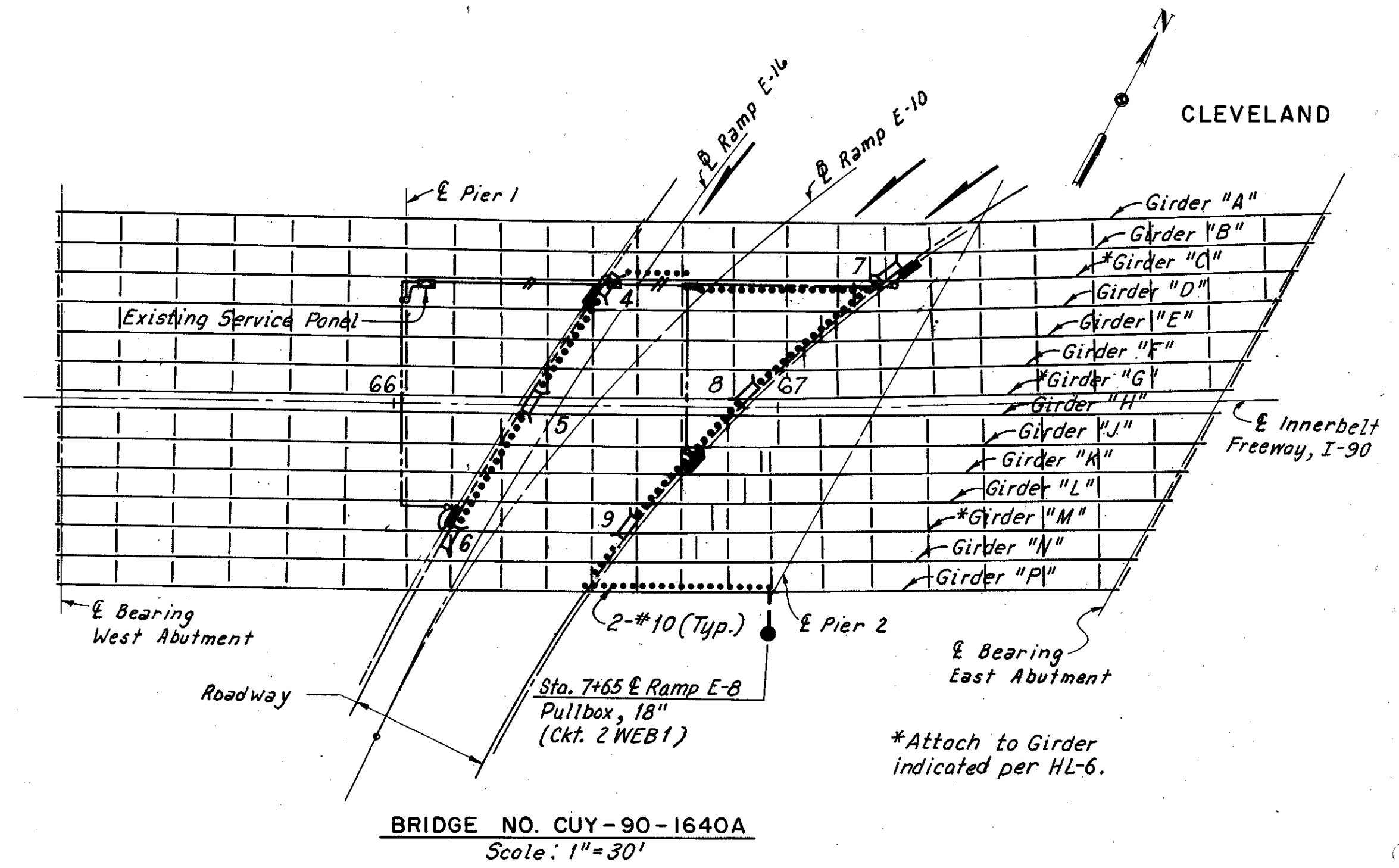
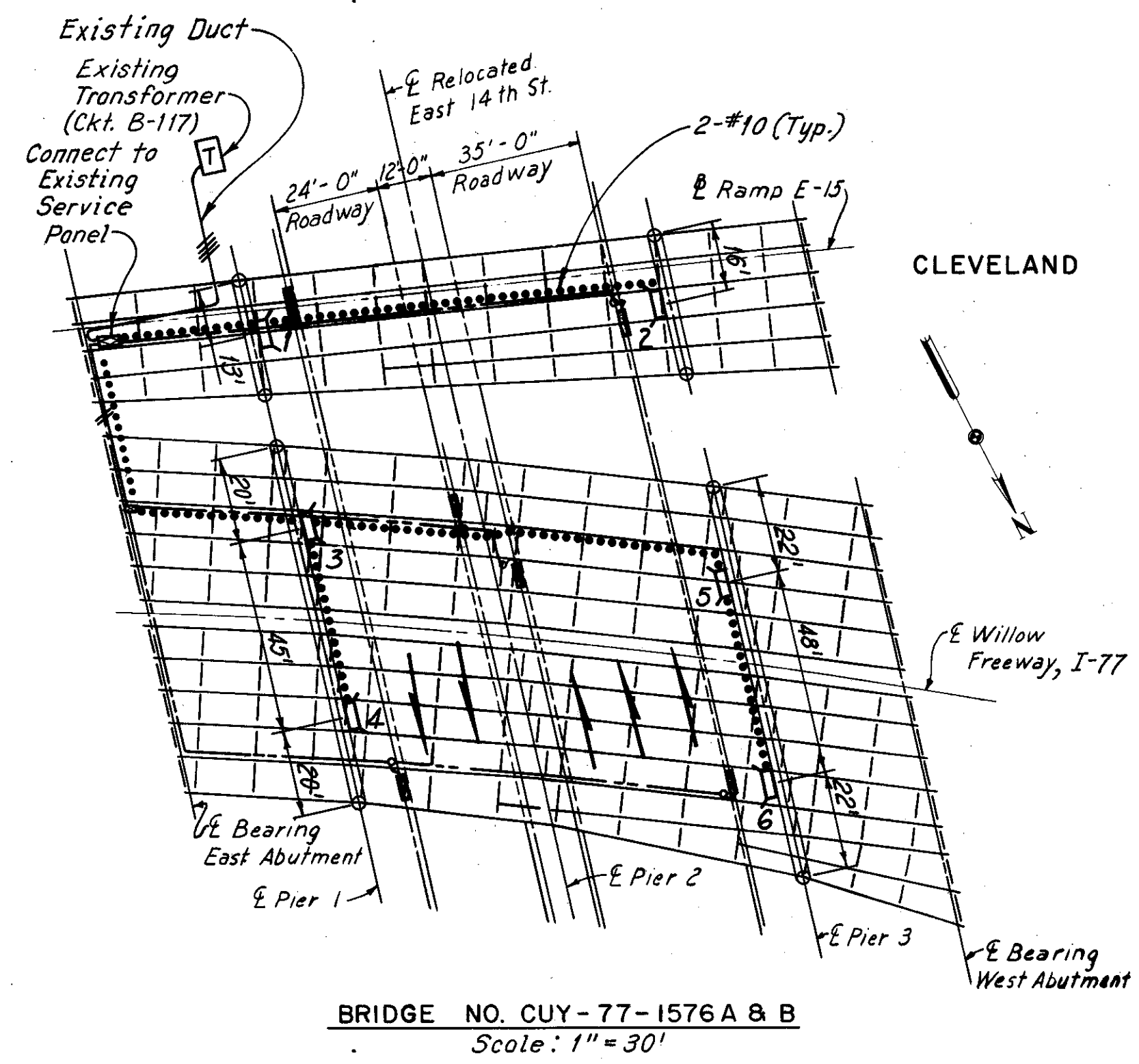
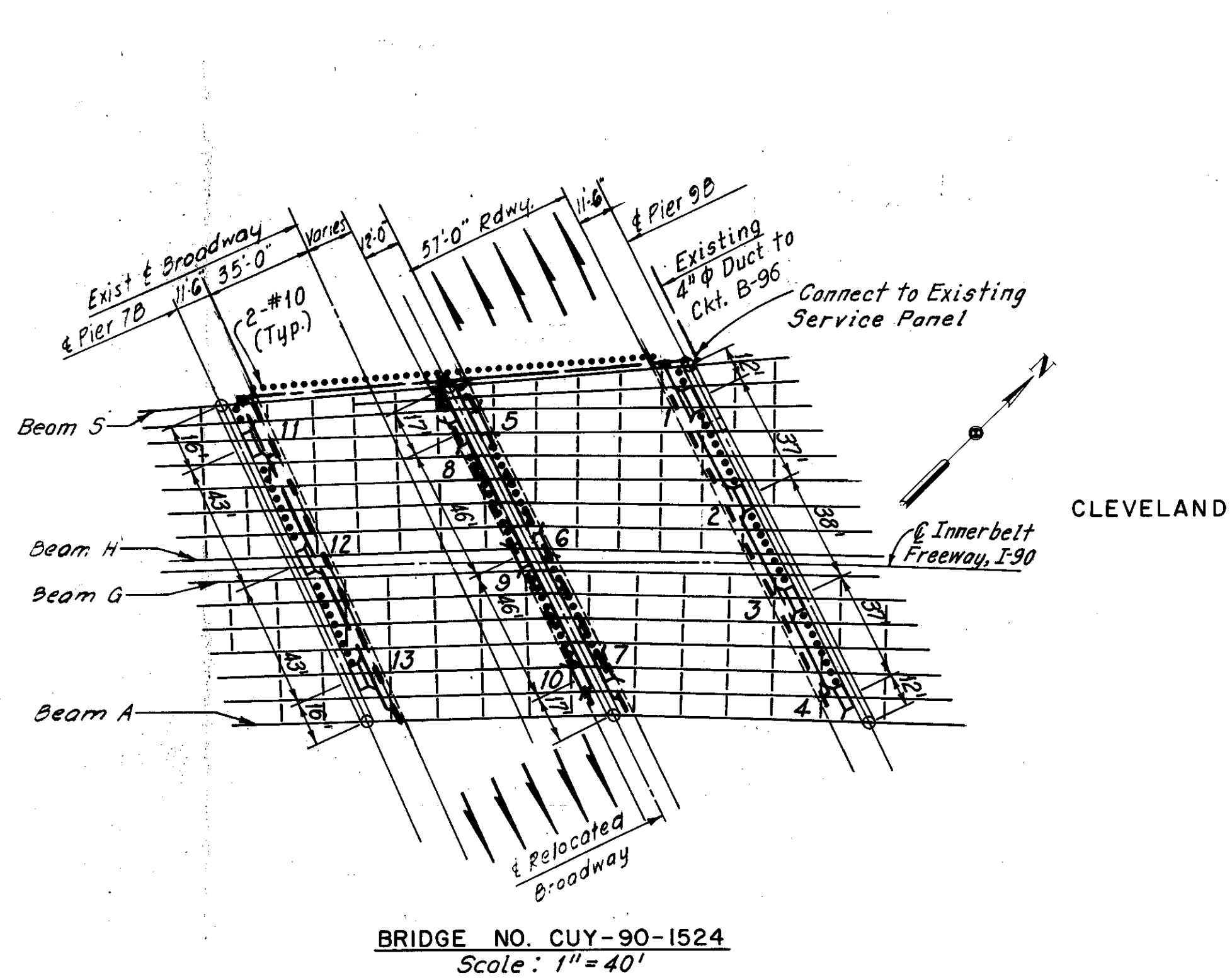
PULL BOX COVER DETAIL  
Scale: 1/2"=1'-0"

# UNDERPASS LIGHTING DETAILS

FHWA REGION	STATE	PROJECT
5	OHIO	

47  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



MADE ERH DATE 12-2-76  
TRACED DLB DATE 12-10-77  
CHECKED EJU DATE 12-27-77  
SCALE As Shown

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

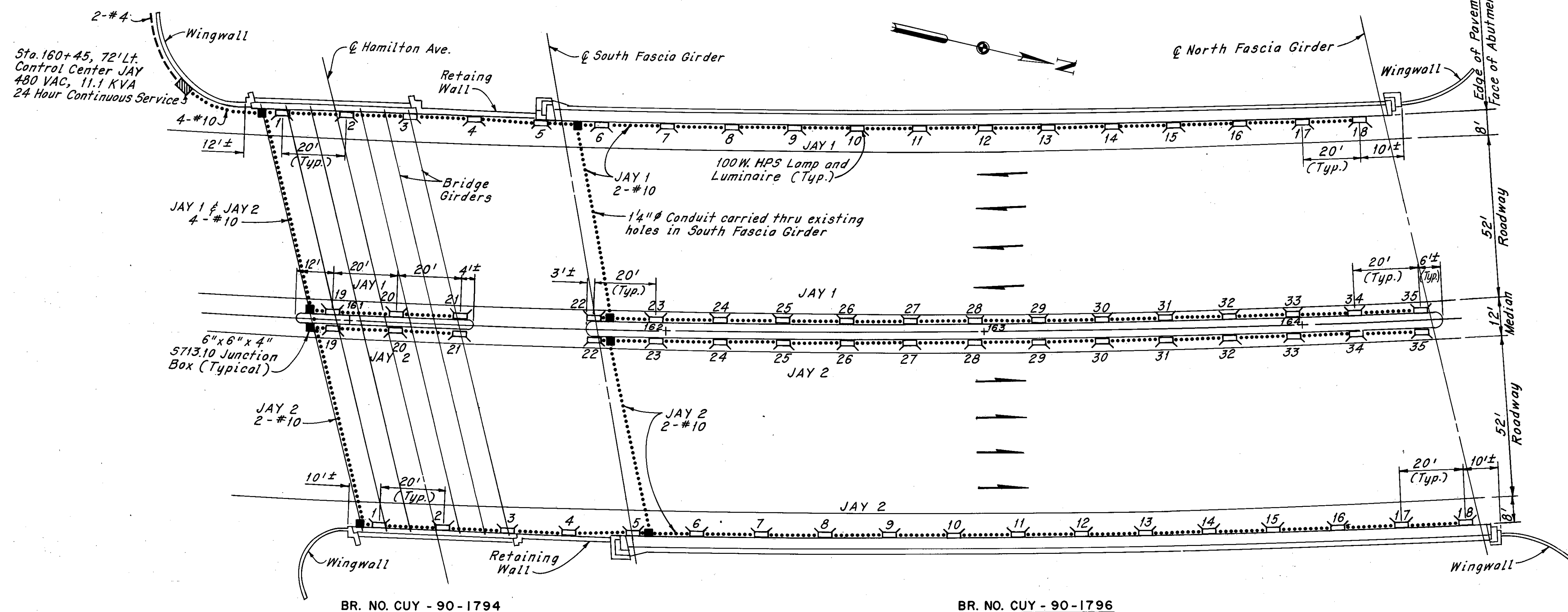
**HNTB**

# UNDERPASS LIGHTING DETAILS

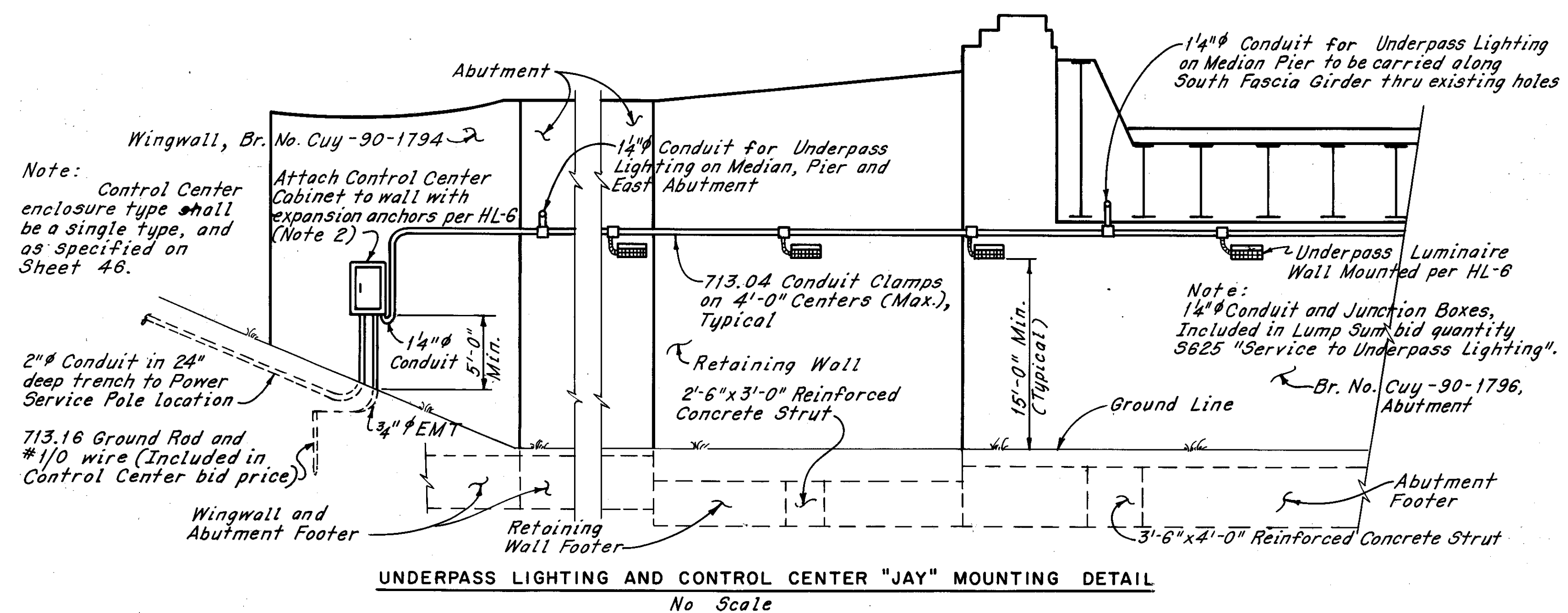
FHWA REGION	STATE	PROJECT
5	OHIO	

48  
84

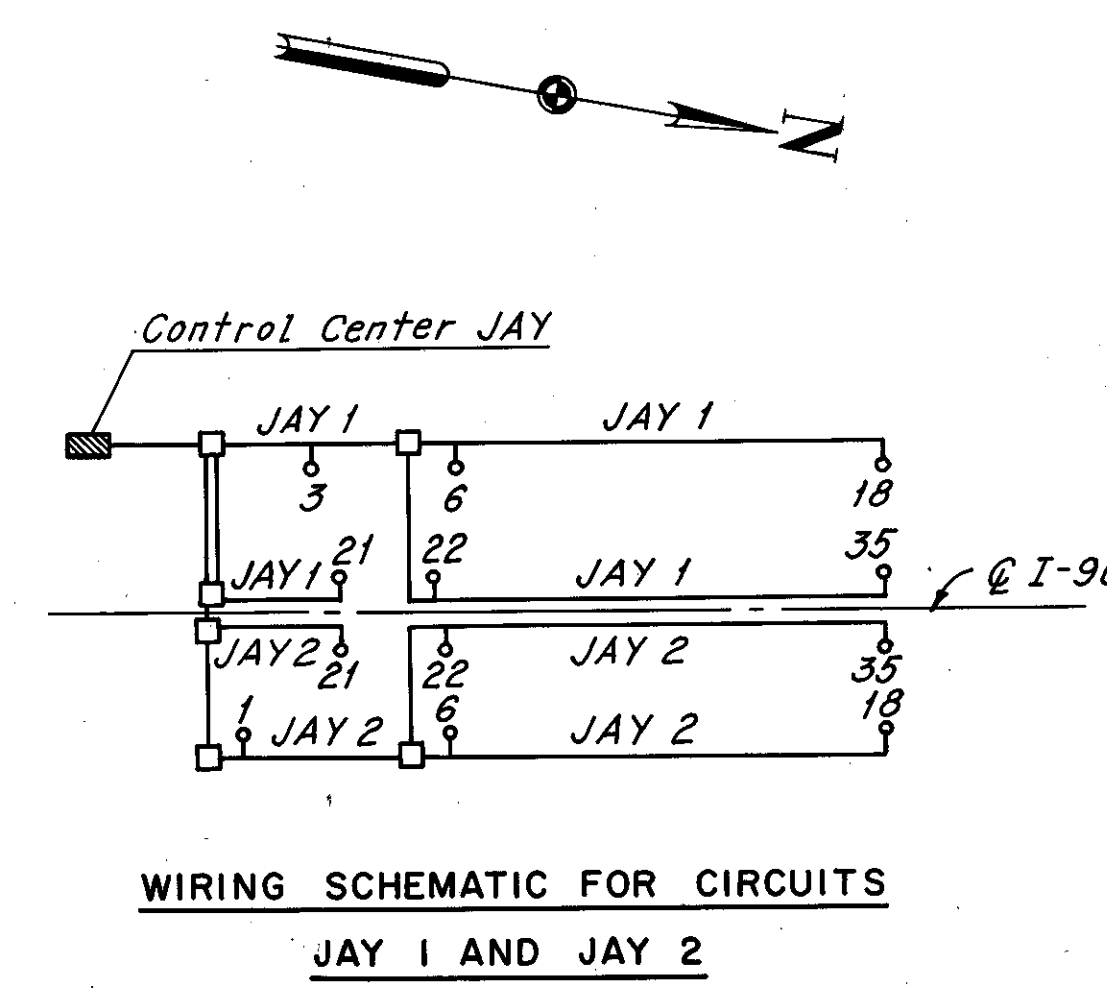
CUYAHOGA COUNTY  
CUY - 77-14.12  
CUY - 90-16.21



UNDERPASS LIGHTING  
No Scale



UNDERPASS LIGHTING AND CONTROL CENTER "JAY" MOUNTING DETAIL  
No Scale



WIRING SCHEMATIC FOR CIRCUITS  
JAY 1 AND JAY 2

MADE E.R.H. DATE 5-4-77  
TRACED C.P. DATE 3-16-77  
CHECKED E.F.L. DATE 3-17-77  
SCALE None

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

**HNTB**

# LIGHT POLE UPGRADING

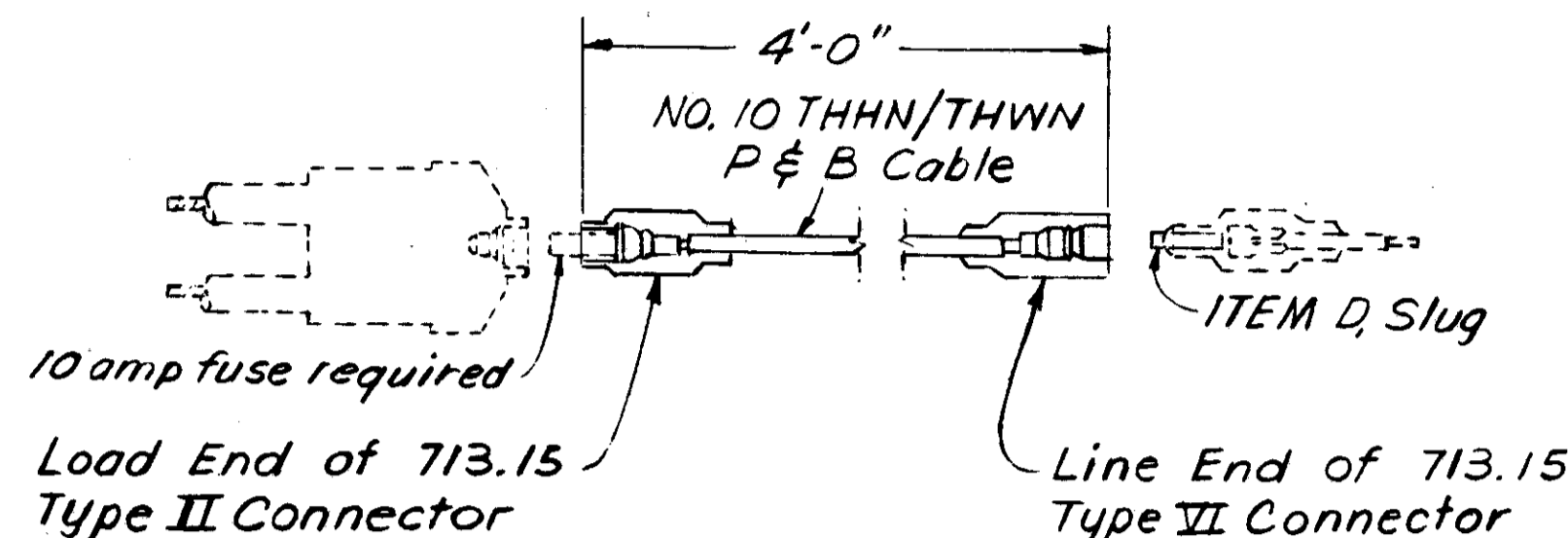
CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

F.W.H.A.	STATE	PROJECT
5	OHIO	

WHERE AT-X BASE IS BEING ADDED THE EXISTING WIRING SHALL BE MODIFIED WITH THE CABLE EXTENSION KITS AND ITEMS DETAILED BELOW:

## EXTENSION KIT "A" FOR ENERGIZED CABLE

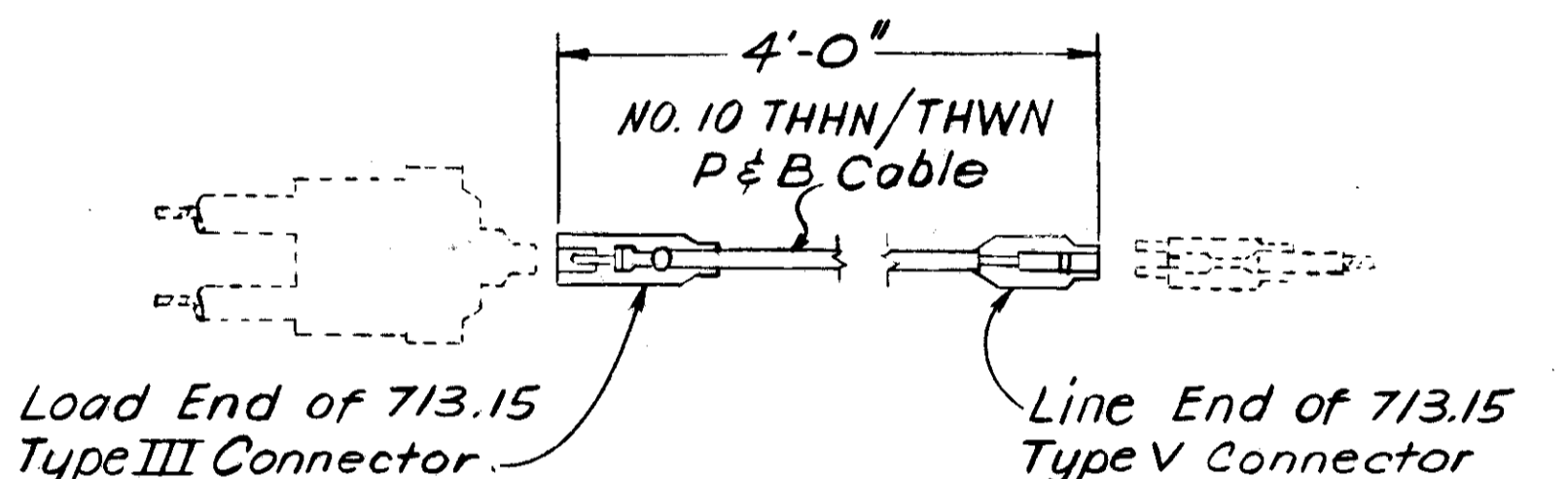
Fits between line end and load end of 713.15 Type II Kit



Two of these Kits will be required where system is 3-wire, 120/240 volts or 2-wire, 480 volts ungrounded.

## EXTENSION KIT "B" FOR NEUTRAL CABLE

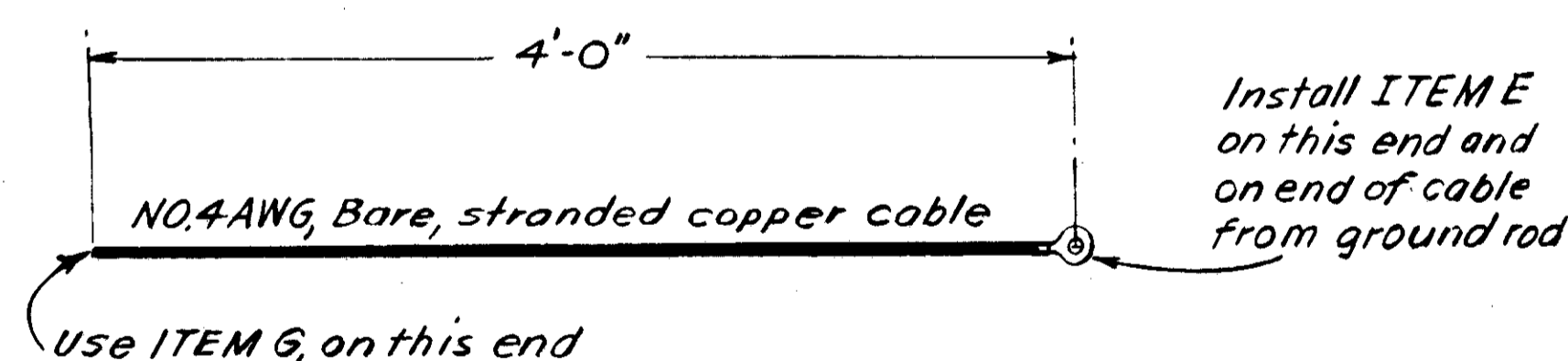
Fits between line end and load end of 713.15 Type III Kit



NOTE: A and B will provide enough slack to enable bringing connectors outside of base without unplugging to change fuses.

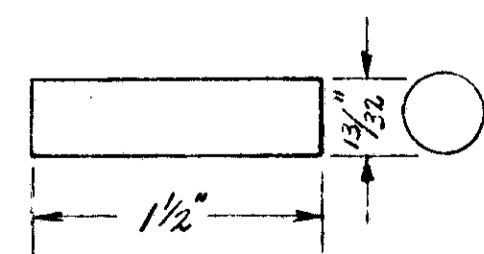
This Kit not required where electrical system is 3-wire, 120/240 volts or 2-wire, 480 volts ungrounded.

## EXTENSION KIT "C" FOR GROUND CABLE



Includes ITEM G This Kit not required where electrical system is 3-wire, 120/240 volts or 2-wire 480 volts ungrounded.

ITEM D Tin plated silicon bronze slug for use in Extension Kit A

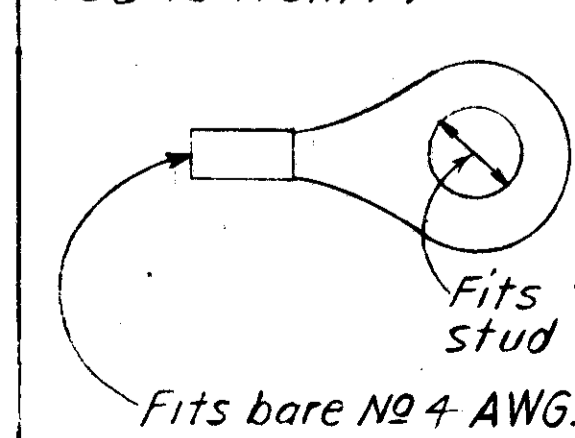


Included in Kit A for payment

ITEM E Straight ring tongue terminal.

One required for each Kit C used.

One required to connect ground cable from ground rod to item F.

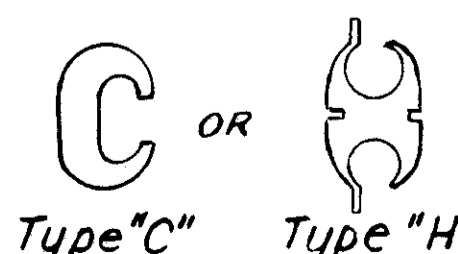


Included in AT-X base for payment

ITEM F Stainless Steel Hex Head Cap Screw 1/2"-13

Included in AT-X base for payment

ITEM G Compression Connector (select one)



To connect Extension Kit "C" to Extension Kit "B"

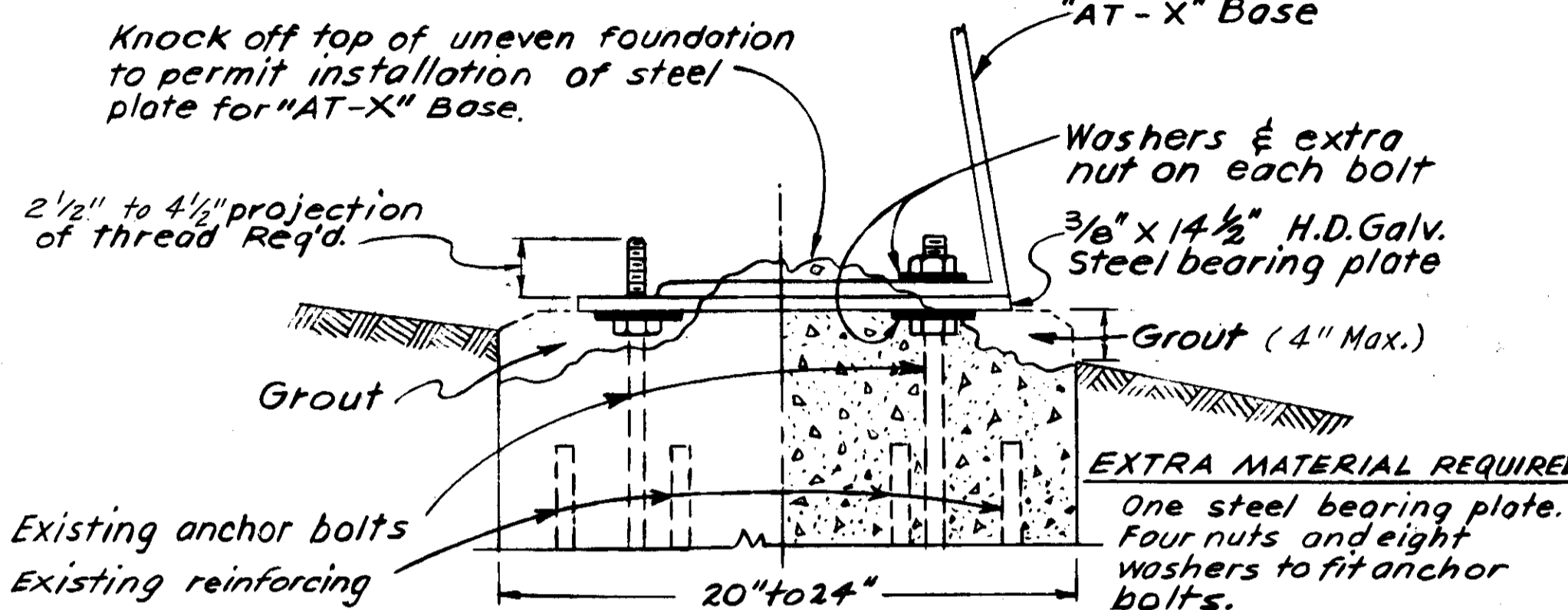
Included in Kit C for payment

## PROCEDURE FOR INSTALLING BREAKAWAY "AT-X" TRANSFORMER BASES ON EXISTING PROJECTS

### REPAIR OF DAMAGED FOUNDATION

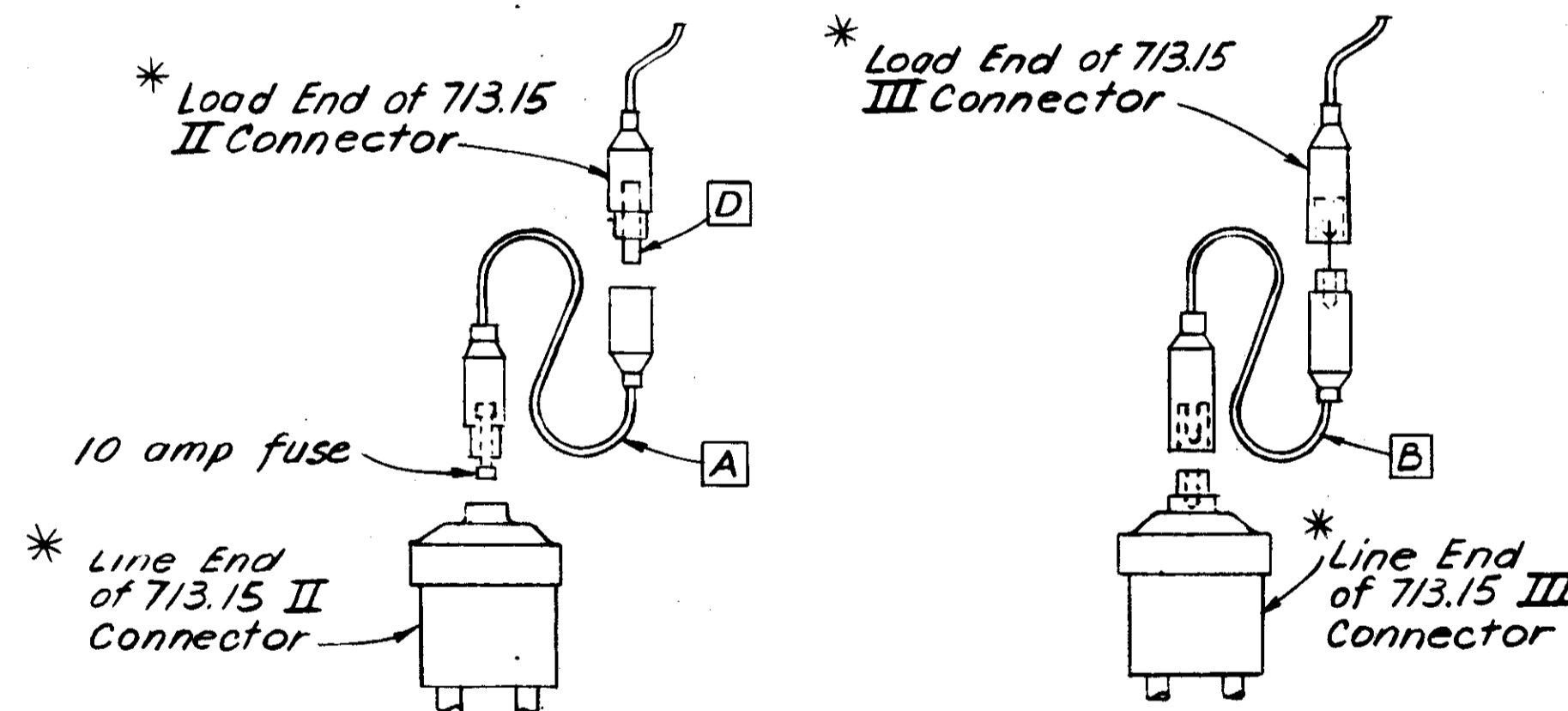
#### FOUNDATION

Where field inspection reveals that top of the existing light pole foundation has disintegrated proceed as follows:

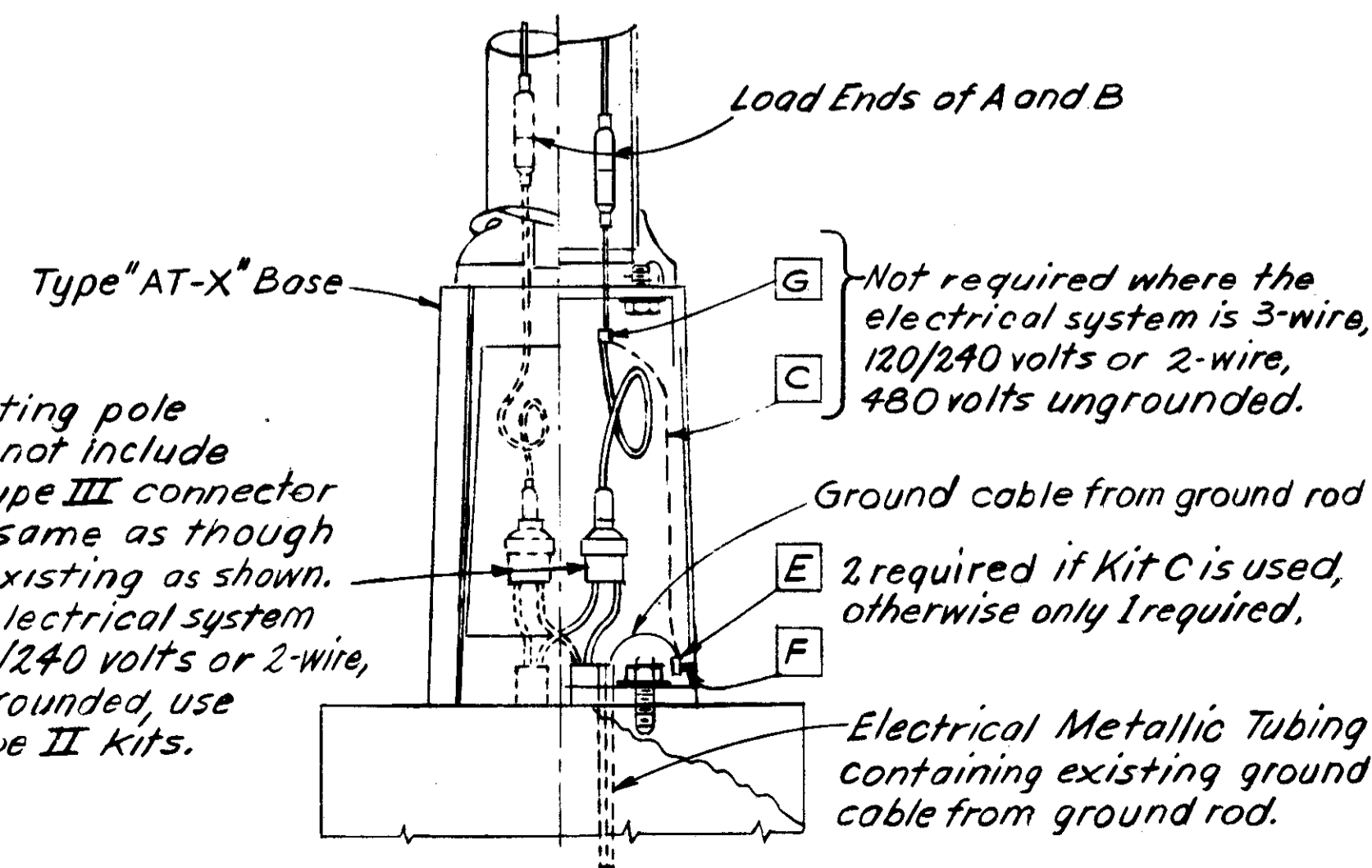


### METHOD OF INSTALLING EXTENSION KITS

1. Prior to detaching pole from anchor bolts, pull load end connectors from line end connectors as shown:



2. After installing "AT-X" Base and light pole, plug in Extension Kits as shown:



\* Where existing pole wiring does not include Type II and Type III connector kits install same as though they were existing as shown. Where the electrical system is 3-wire, 120/240 volts or 2-wire, 480 volts ungrounded, use only two, Type II kits.

Not required where the electrical system is 3-wire, 120/240 volts or 2-wire, 480 volts ungrounded.

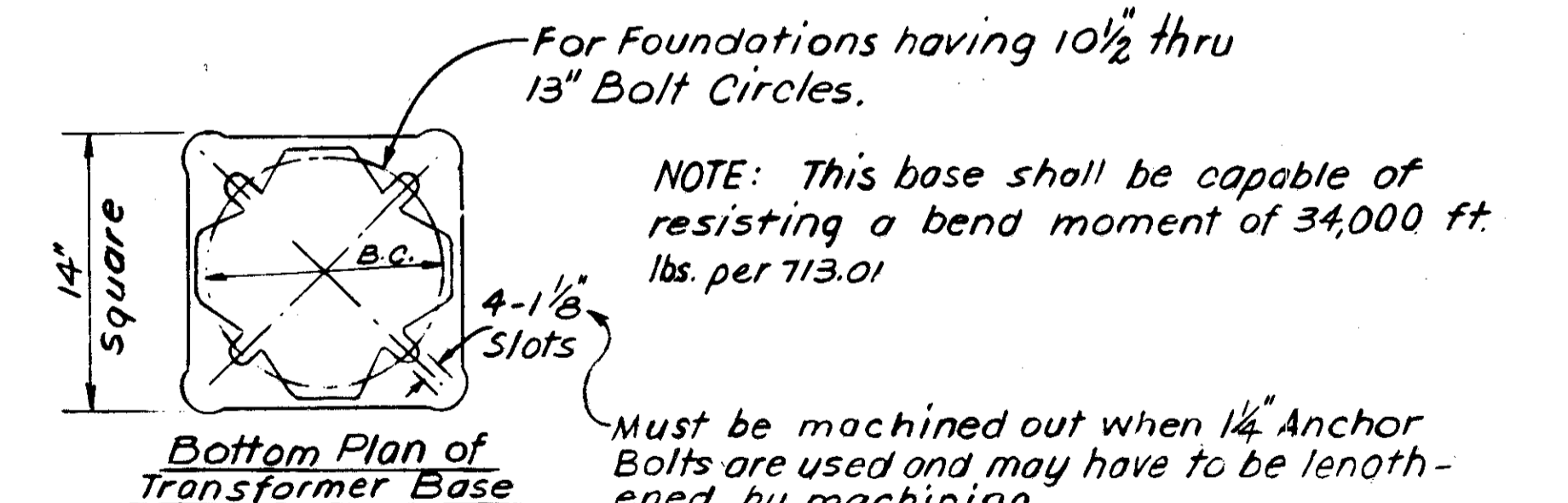
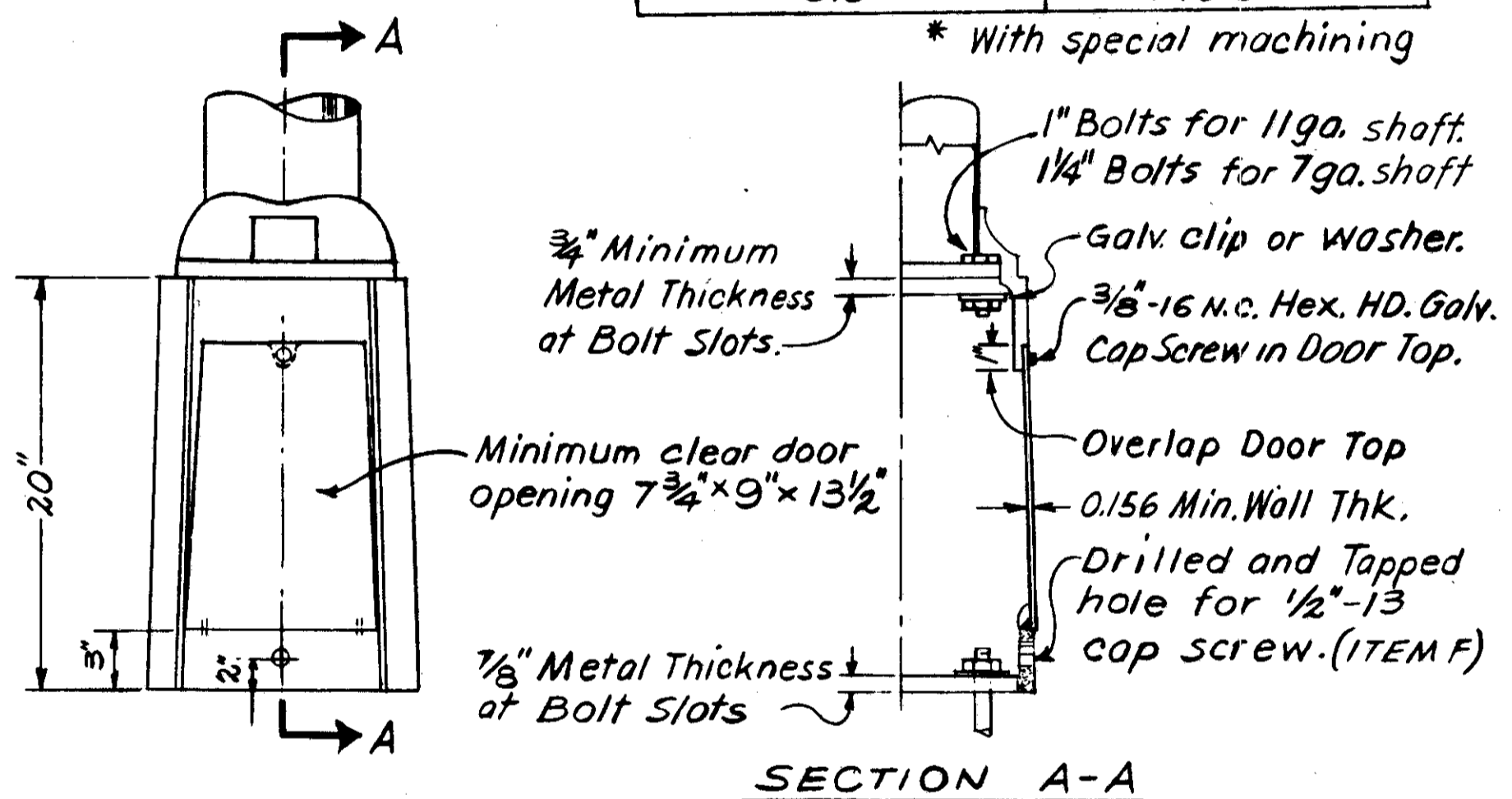
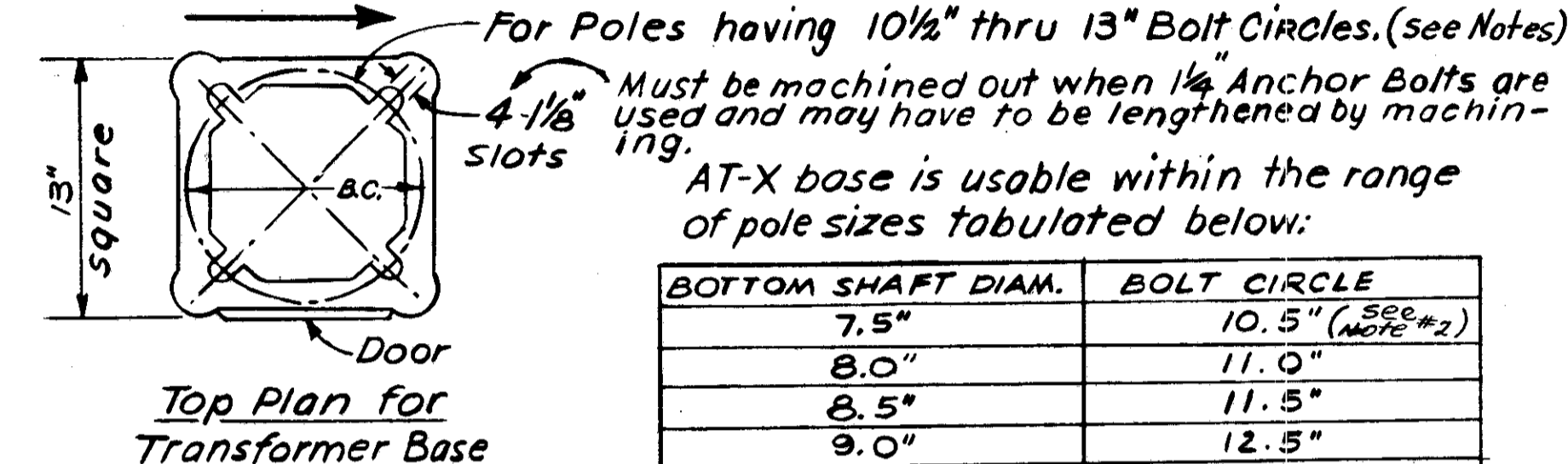
2 required if Kit C is used, otherwise only 1 required.

## FRANGIBLE ALUMINUM TRANSFORMER BASE TYPE "AT-X"

DATA NECESSARY FOR ORDERING FRANGIBLE BASES

REF. LETTER	EXISTING FOUNDATION ANCHOR BOLT CIRCLE	EXISTING ANCHOR BOLT DIAMETER	EXISTING SHAFT DIAMETER		EXISTING SHAFT LENGTH	EXISTING ARM LENGTH	MANUFACTURER'S POLE DESIGN NUMBER
			TOP	BOTTOM			
U	12 1/2"	1 1/4"	5.36"	9"	26'-0"	10'	-

#### FLOW OF TRAFFIC



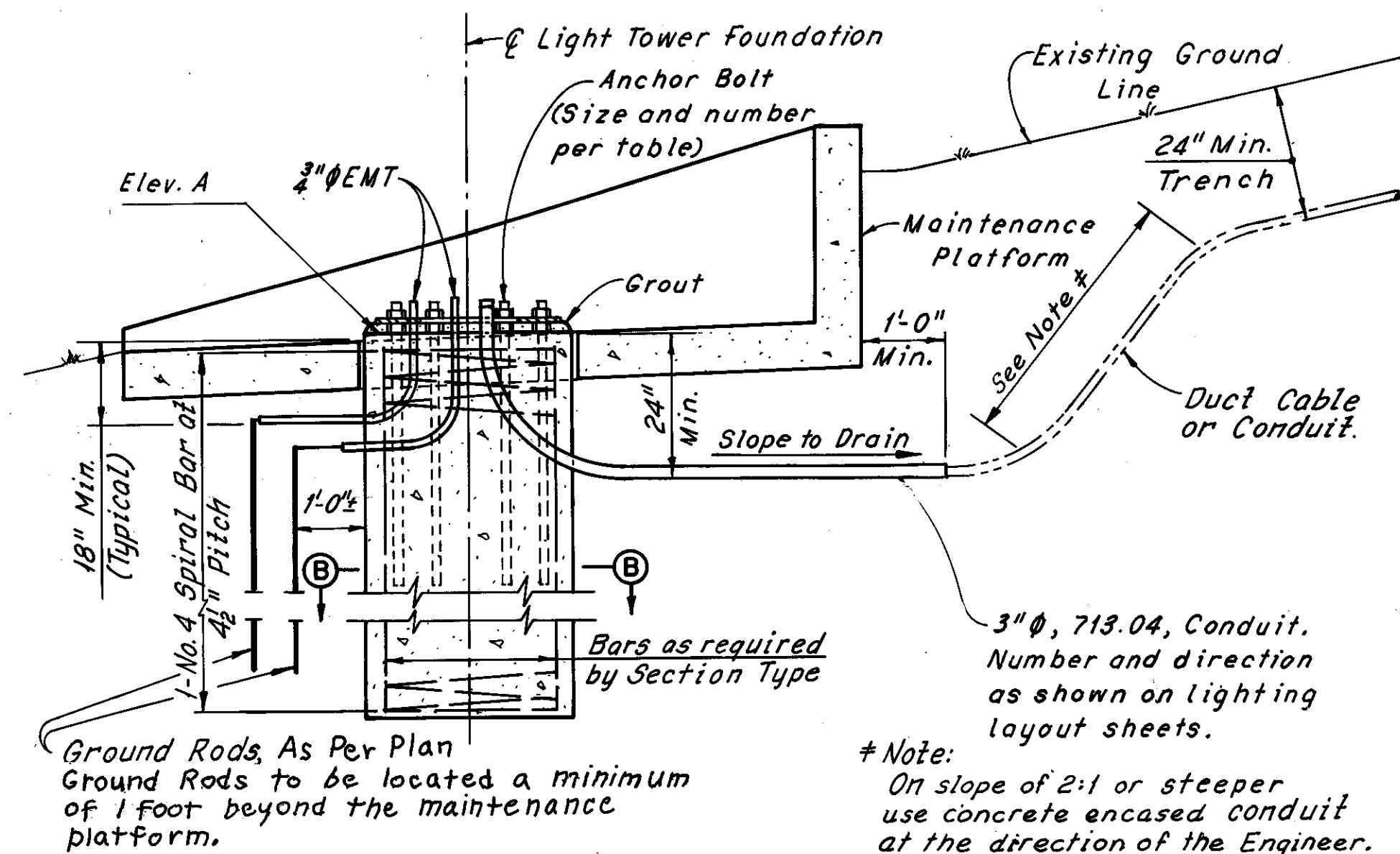
NOTES: 1. Poles having bolt circles larger than 13" will require Type "AT-C" Transformer Base with adapter plates.  
 2. Poles having bolt circle smaller than 10.5" will require top and bottom adapter plates obtainable from the manufacturer of the AT-X Transformer Base. Payment for such adapter plates shall be included in payment for AT-X base

# LIGHT TOWER FOUNDATION DETAILS

FHWA REGION	STATE	PROJECT
5	OHIO	

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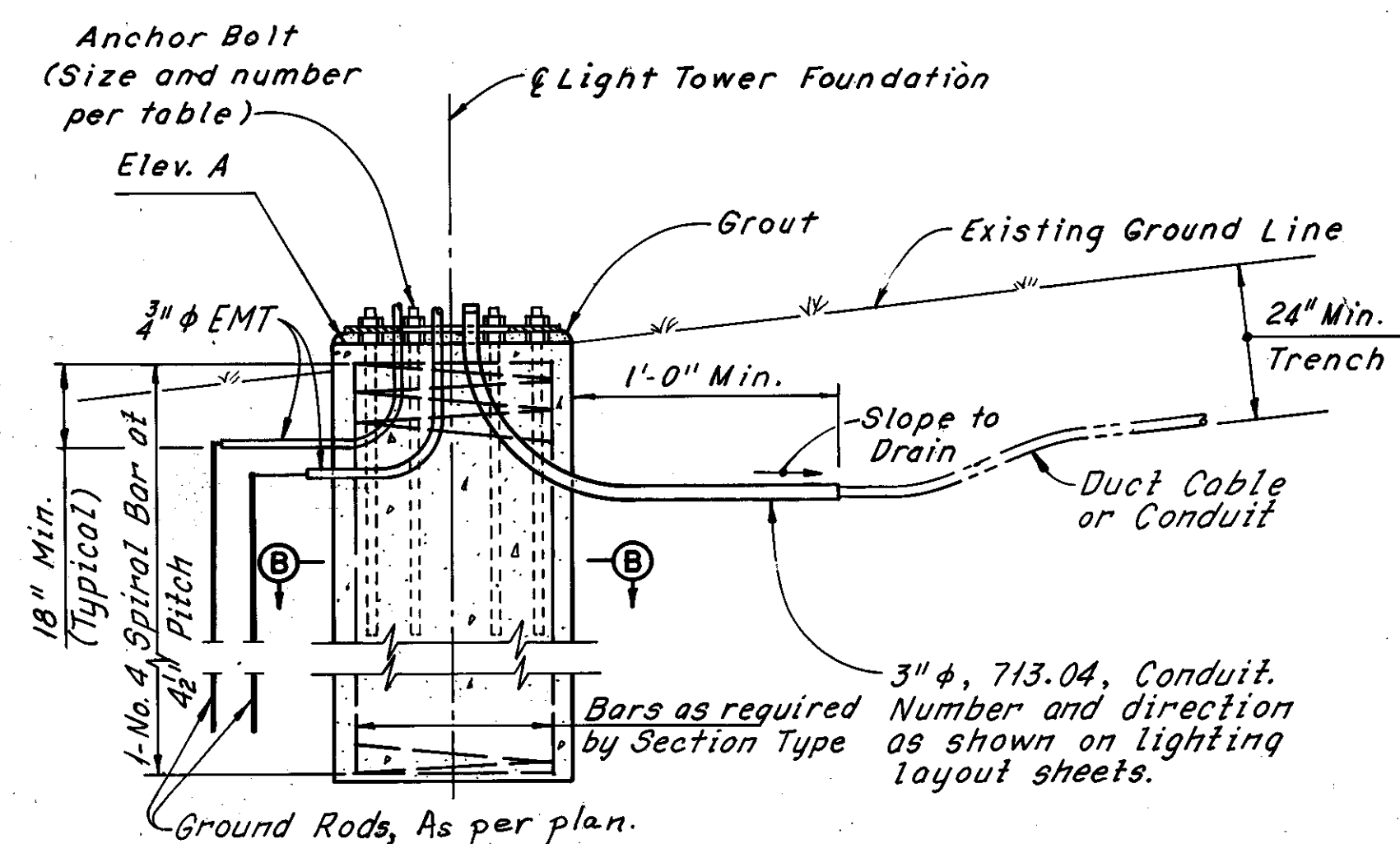
CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



## FOUNDATION WITH MAINTENANCE PLATFORM

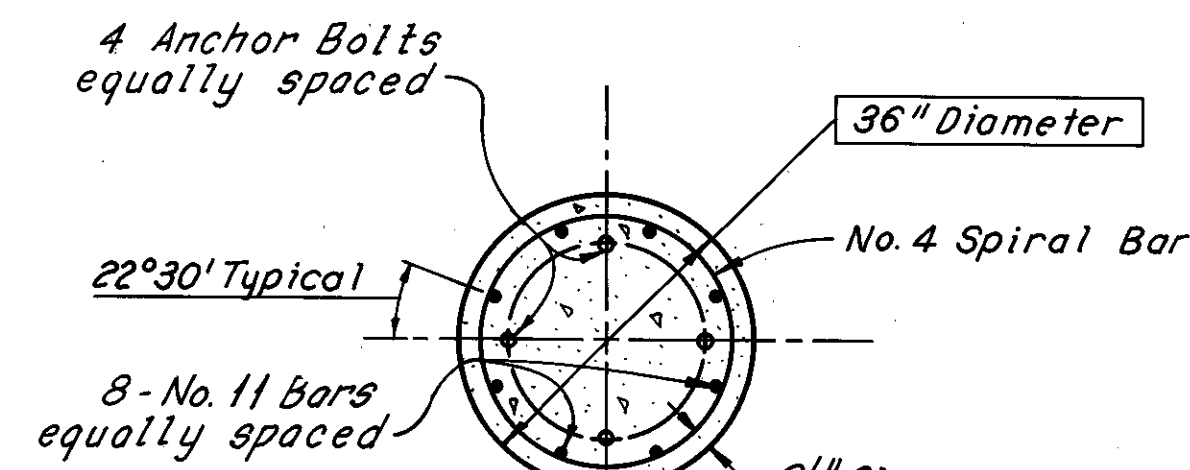
(Slope 3.0:1 or steeper)

(Maintenance Platform reinforcement, See Sheet 51)  
(Maintenance platform will be used on slopes 3.0:1 to 3.99:1 under special conditions)



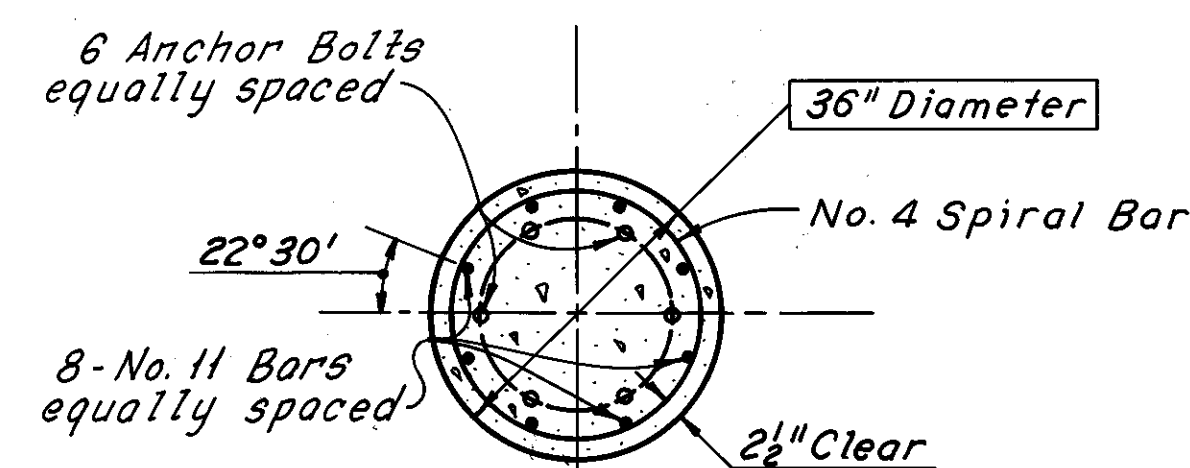
## FOUNDATION WITHOUT MAINTENANCE PLATFORM

(Slope 4.0:1 or flatter)



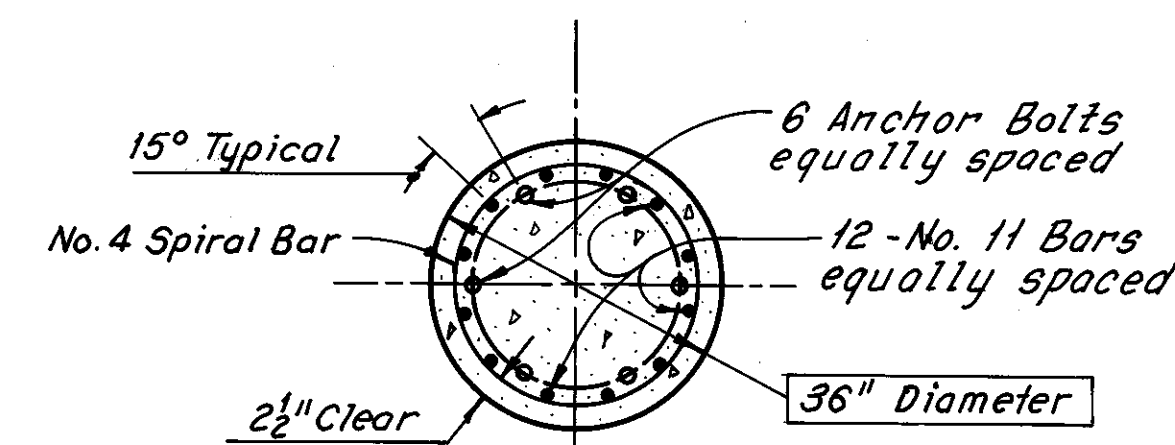
### SECTION B-B

#### TYPE I



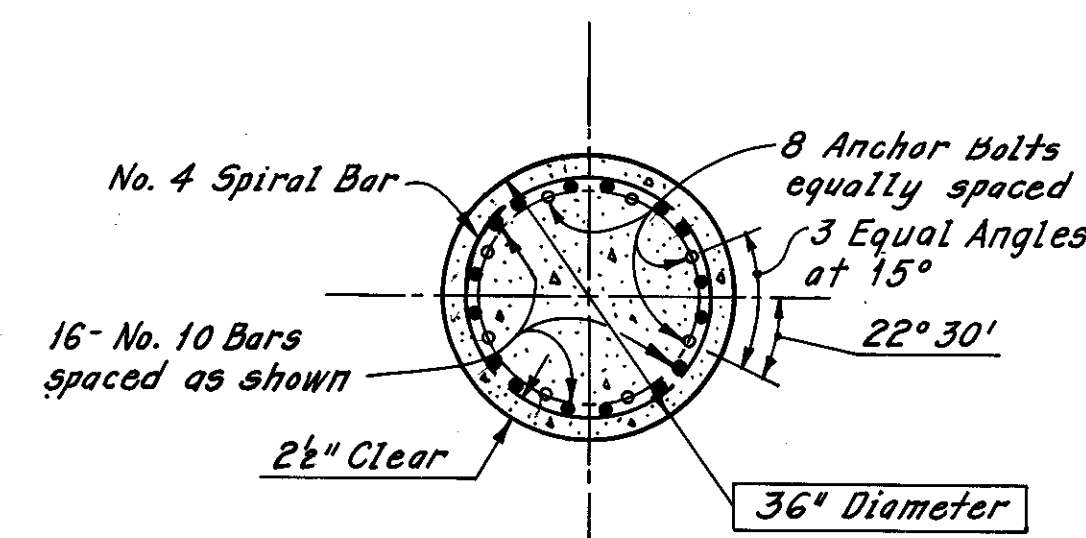
### SECTION B-B

#### TYPE II



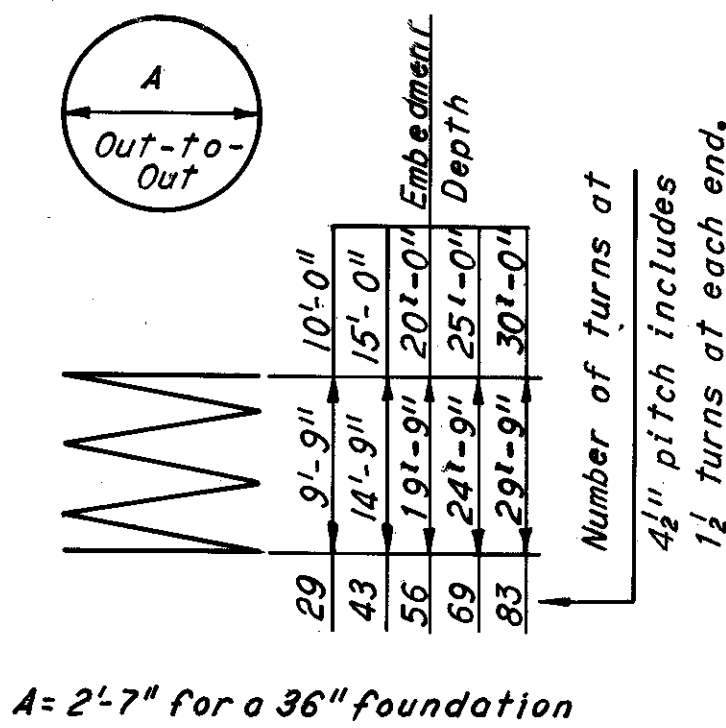
### SECTION B-B

#### TYPE III



### SECTION B-B

#### TYPE IV



### 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.

### NO. 4 SPIRAL BAR

#### Notes:

Placement of reinforcement and anchor bolts is based on the anchor bolt data shown on Light Tower Foundation Data, Sheet 53. 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 A62 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 53.

Maintenance platforms 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.

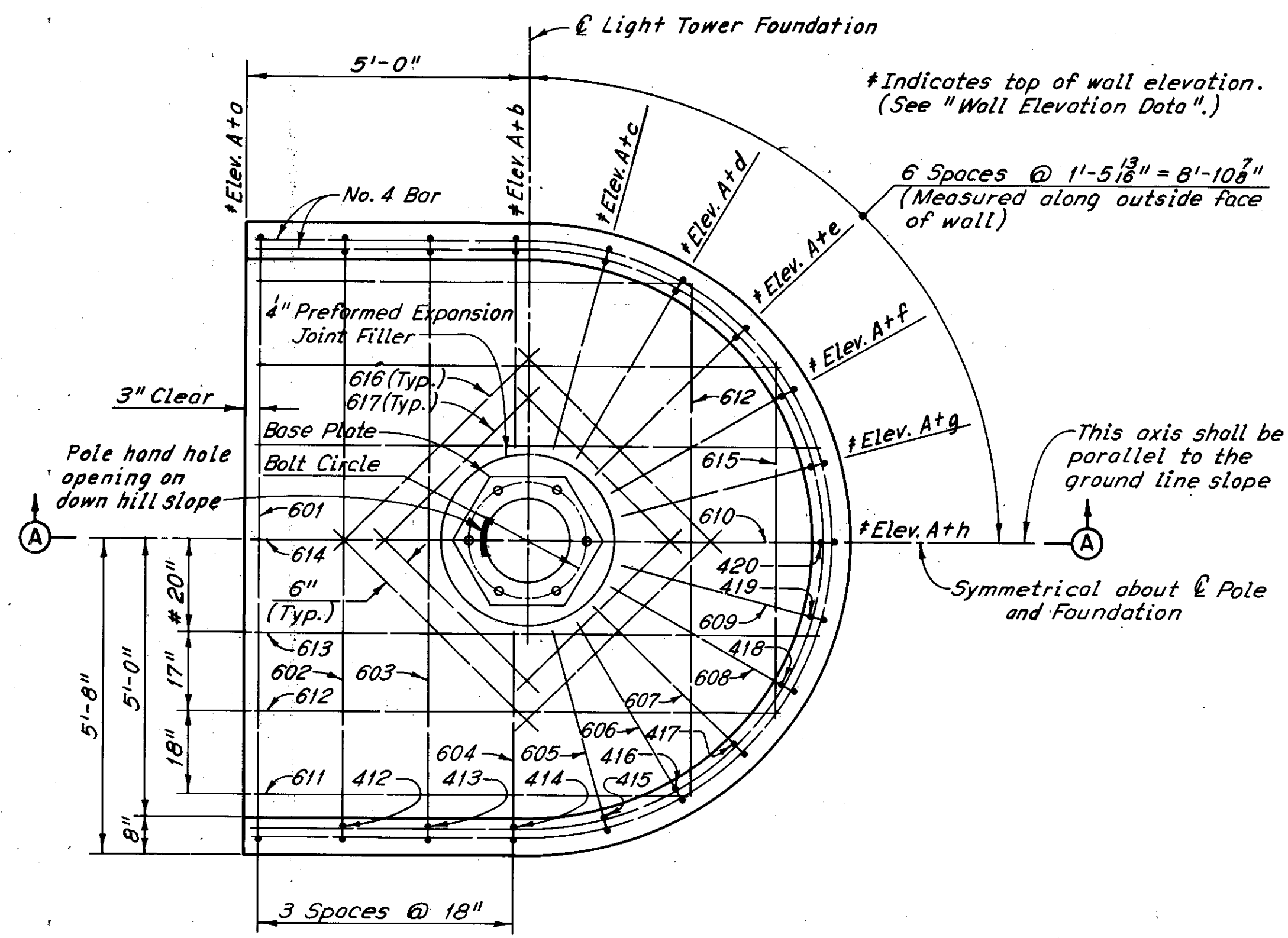


# LIGHT TOWER MAINTENANCE PLATFORM

FHWA REGION	STATE	PROJECT
5	OHIO	

51  
84

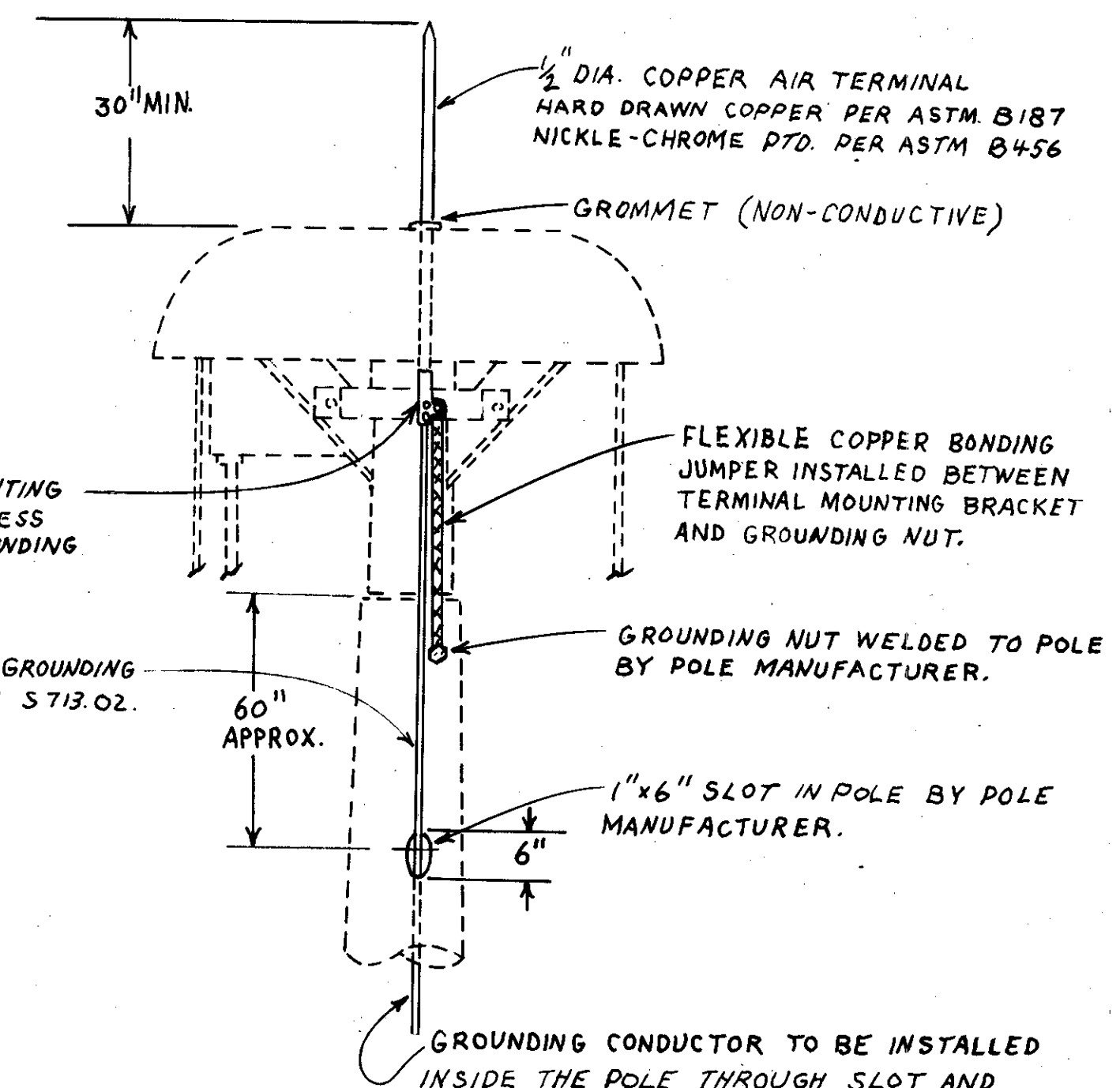
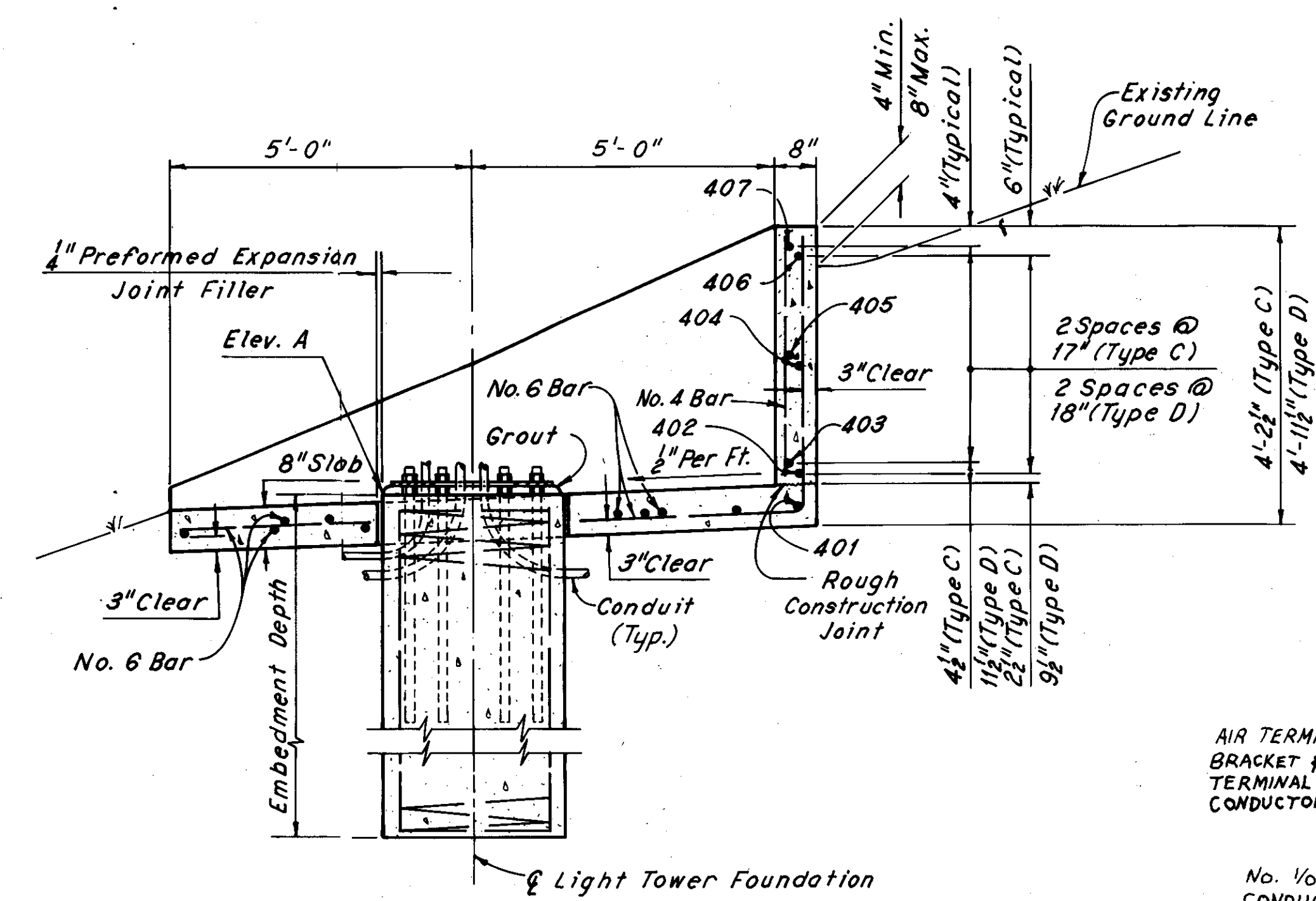
CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



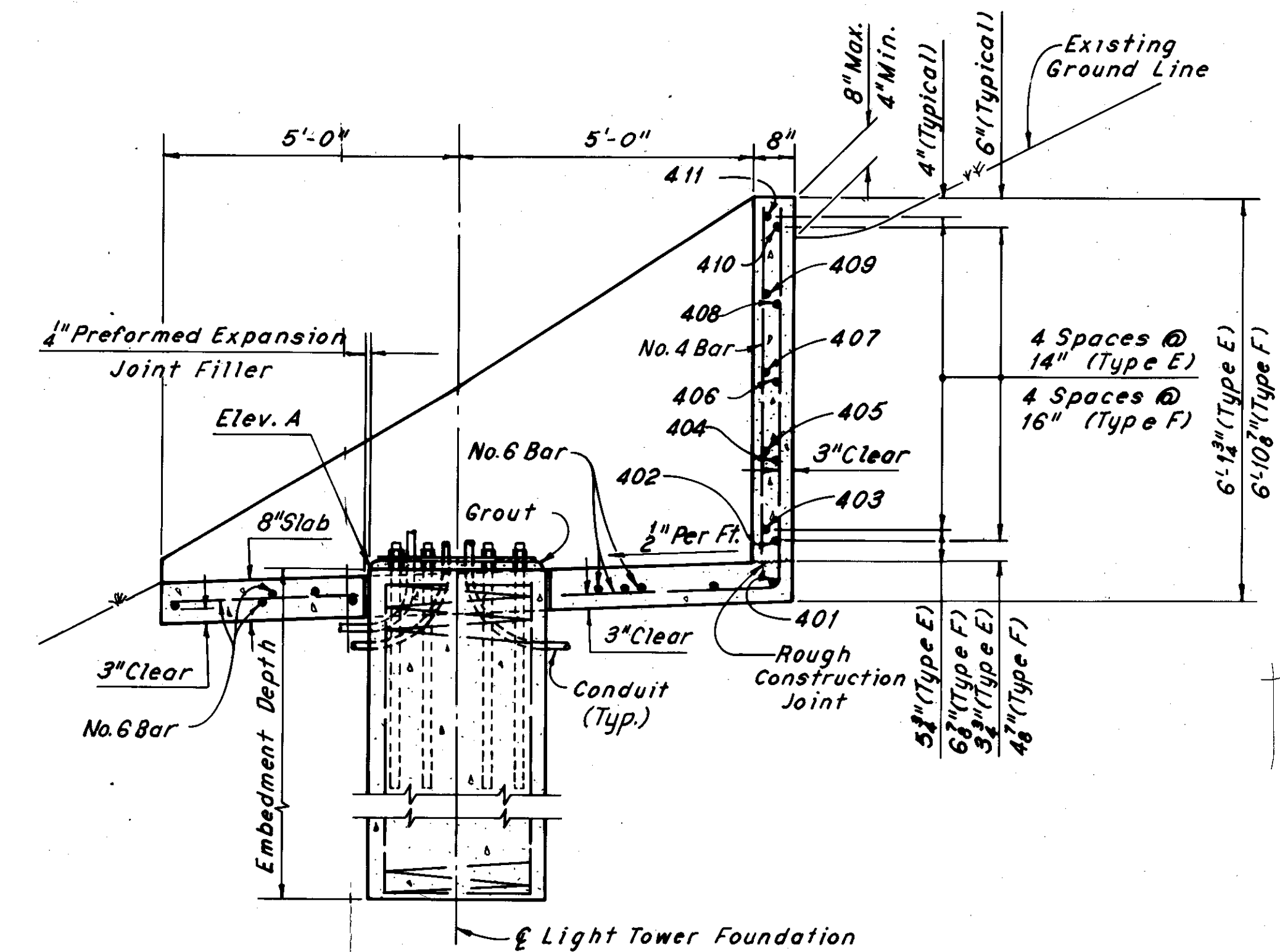
WALL ELEVATION DATA								
TYPE	a	b	c	d	e	f	g	h
C	.08	1.78	2.28	2.74	3.14	3.45	3.64	3.71
D	.09	2.14	2.74	3.30	3.78	4.15	4.39	4.46
E	.10	2.70	3.46	4.17	4.79	5.25	5.55	5.65
F	.11	3.06	3.92	4.73	5.43	5.96	6.29	6.41

Note: The values shown are in feet

PLATFORM GROUPING	
TYPE	SLOPE
C	3.01:1 to 3.99:1
D	2.5:1 to 2.99:1
E	2.0:1 to 2.49:1
F	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 53.  
The following abbreviations are used:  
No. = Number  
Min. = Minimum  
Max. = Maximum  
Typ. = Typical  
Elev. = Elevation



# LIGHT TOWER MAINTENANCE PLATFORM REINFORCEMENT SCHEDULE

FHWA REGION	STATE	PROJECT
5	OHIO	

52  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

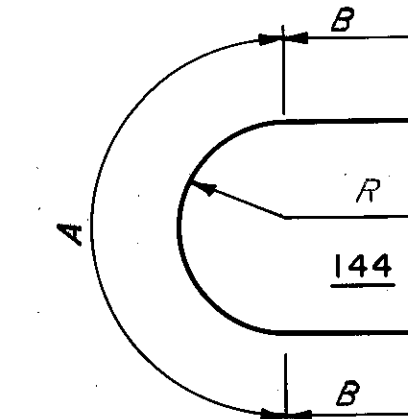
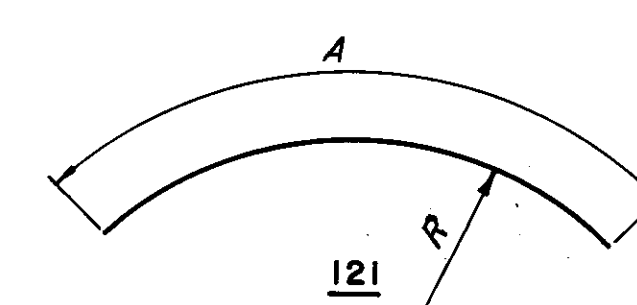
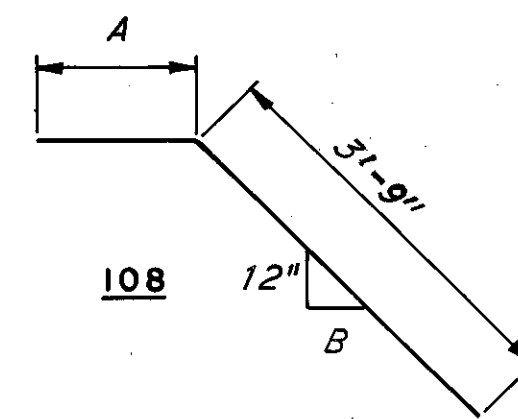
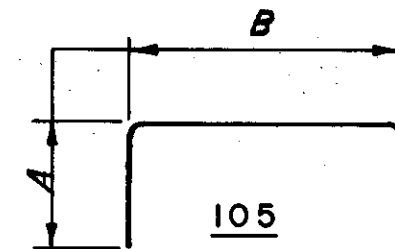
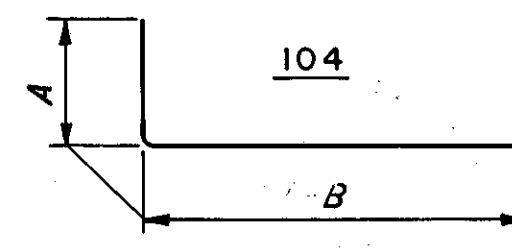
WALL TYPE C						
MARK	NO.	LENGTH	TYPE	A	B	R
401	1	26'-3"	144	16'-10"	4'-9"	5'-3 3/4"
402	1	23'-11"	144	16'-10"	3'-7"	5'-3 3/4"
403	1	22'-7"	144	16'-6"	3'-1"	5'-2 1/2"
404	1	15'-9"	121	15'-9"	----	5'-3 3/4"
405	1	14'-6"	121	14'-6"	----	5'-2 1/2"
406	1	6'-2"	121	6'-2"	----	5'-3 3/4"
407	1	4'-3"	121	4'-3"	----	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"	1/2"	----
609	2	7'-4"	108	3'-9"	1/2"	----
610	1	7'-4"	108	3'-9"	1/2"	----
611	2	7'-5"	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 3/4"
402	1	21'-9"	144	16'-10"	2'-6"	5'-3 3/4"
403	1	20'-7"	144	16'-6"	2'-1"	5'-2 1/2"
404	1	14'-7"	121	14'-7"	----	5'-3 3/4"
405	1	13'-6"	121	13'-6"	----	5'-2 1/2"
406	1	5'-10"	121	5'-10"	----	5'-3 3/4"
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"	1/2"	----
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 E						
MARK	NO.	LENGTH	TYPE	A	B	R
401	1	26'-3"	144	16'-10"	4'-9"	5'-3 3/4"
402	1	24'-7"	144	16'-10"	3'-11"	5'-3 3/4"
403	1	23'-7"	144	16'-6"	3'-7"	5'-2 1/2"
404	1	20'-1"	144	16'-10"	1'-8"	5'-3 3/4"
405	1	19'-3"	144	16'-6"	1'-5"	5'-2 1/2"
406	1	15'-9"	121	15'-10"	----	5'-3 3/4"
407	1	14'-11"	121	14'-11"	----	5'-2 1/2"
408	1	11'-4"	121	11'-4"	----	5'-3 3/4"
409	1	10'-4"	121	10'-4"	----	5'-2 1/2"
410	1	5'-0"	121	5'-0"	----	5'-3 3/4"
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"	1/2"	----
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"	1/2"	----
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 F						
MARK	NO.	LENGTH	TYPE	A	B	R
401	1	26'-3"	144	16'-10"	4'-9"	5'-3 3/4"
402	1	25'-3"	144	16'-10"	4'-3"	5'-3 3/4"
403	1	24'-5"	144	16'-6"	4'-0"	5'-2 1/2"
404	1	20'-7"	144	16'-10"	1'-11"	5'-3 3/4"
405	1	19'-9"	144	16'-6"	1'-8"	5'-2 1/2"
406	1	16'-1"	121	16'-1"	----	5'-3 3/4"
407	1	15'-3"	121	15'-3"	----	5'-2 1/2"
408	1	11'-1"	121	11'-1"	----	5'-3 3/4"
409	1	10'-2"	121	10'-2"	----	5'-2 1/2"
410	1	4'-8"	121	4'-8"	----	5'-3 3/4"
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"	1/2"	----
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





CUYAHOGA COUNTY  
CUY - 77-14.12  
CUY - 90-16.21

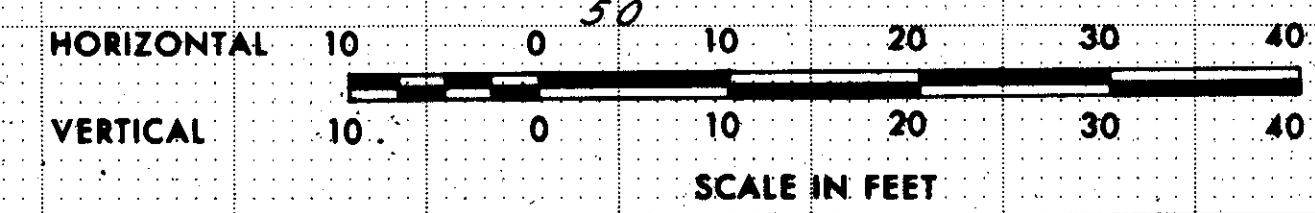
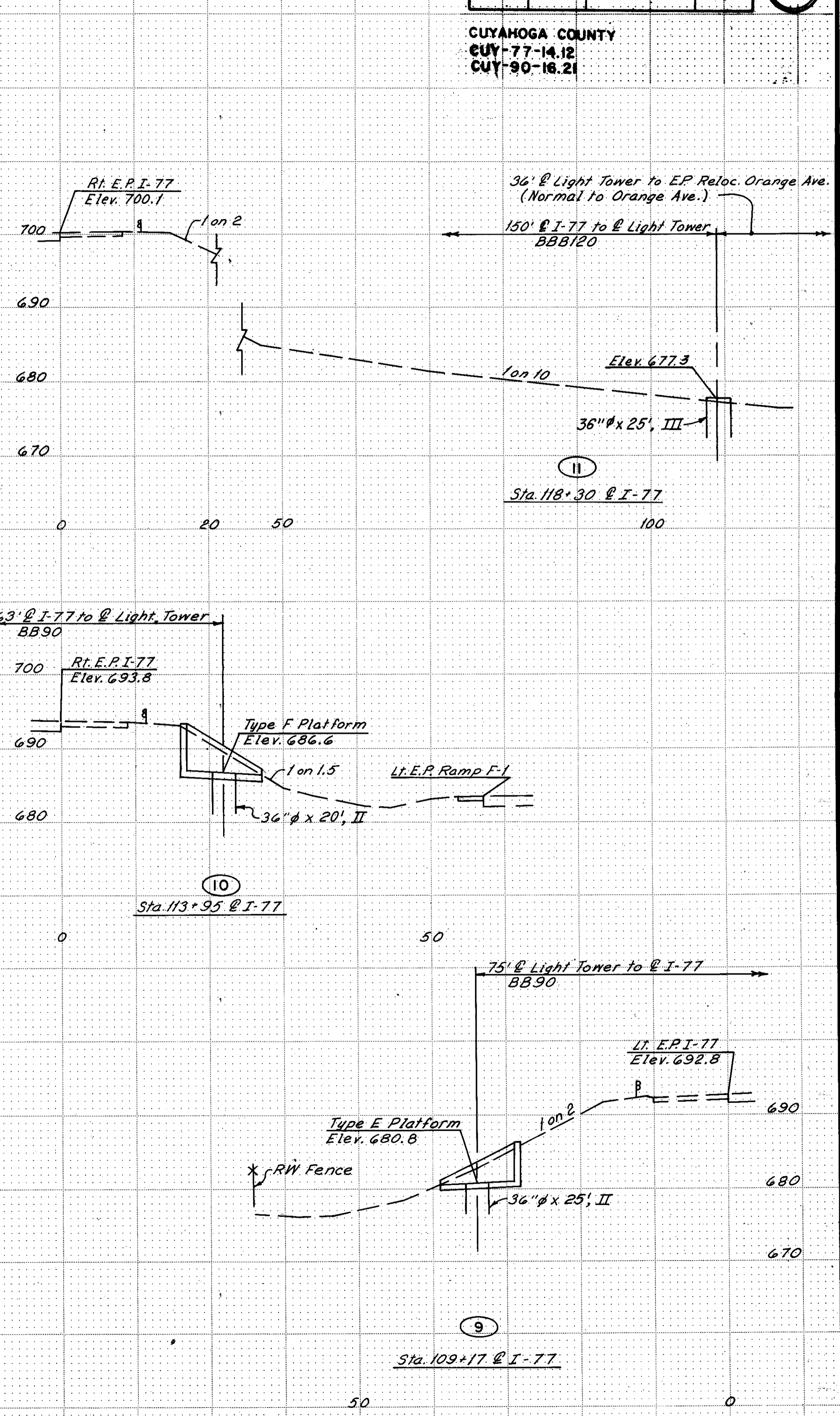
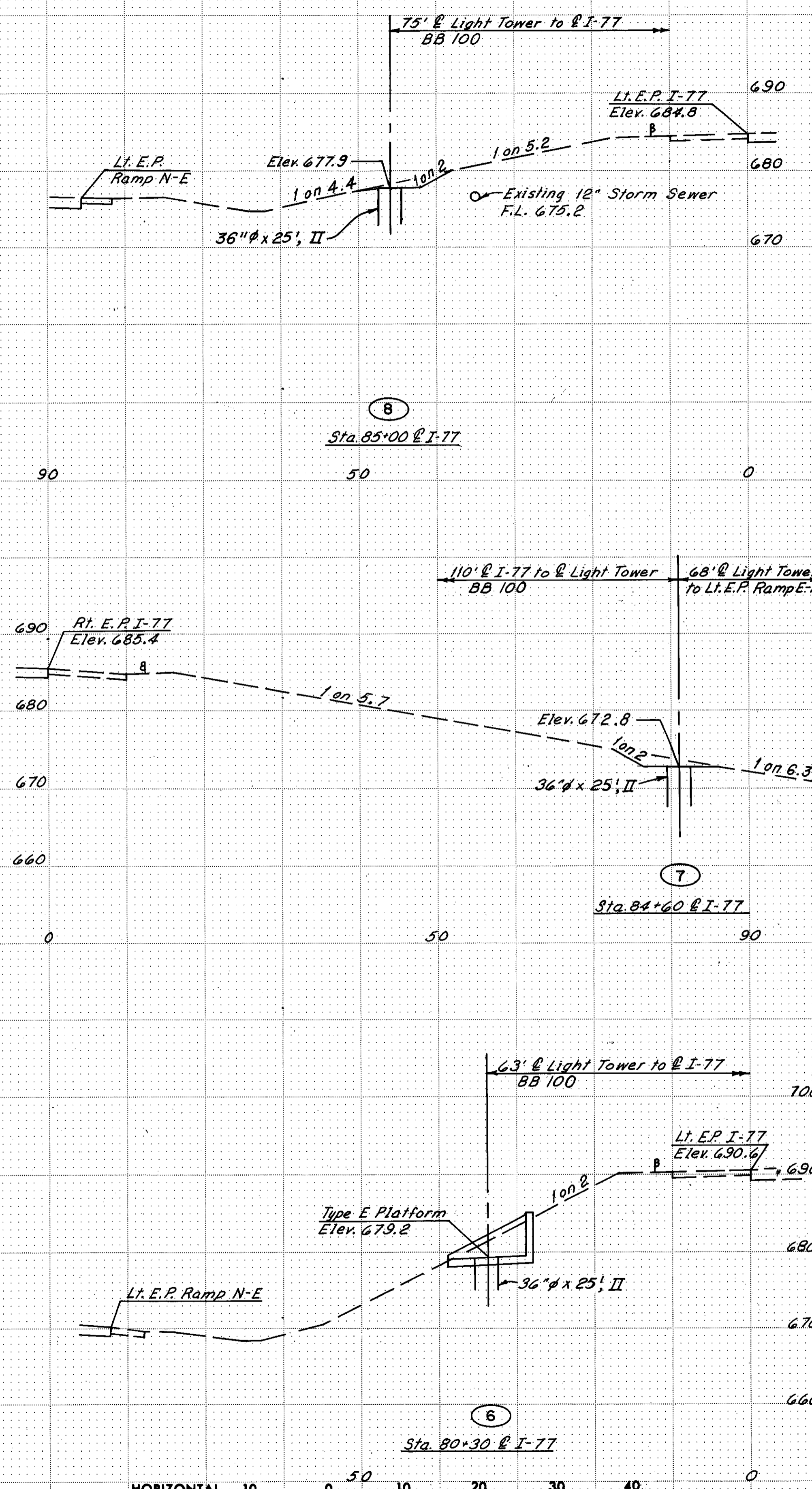
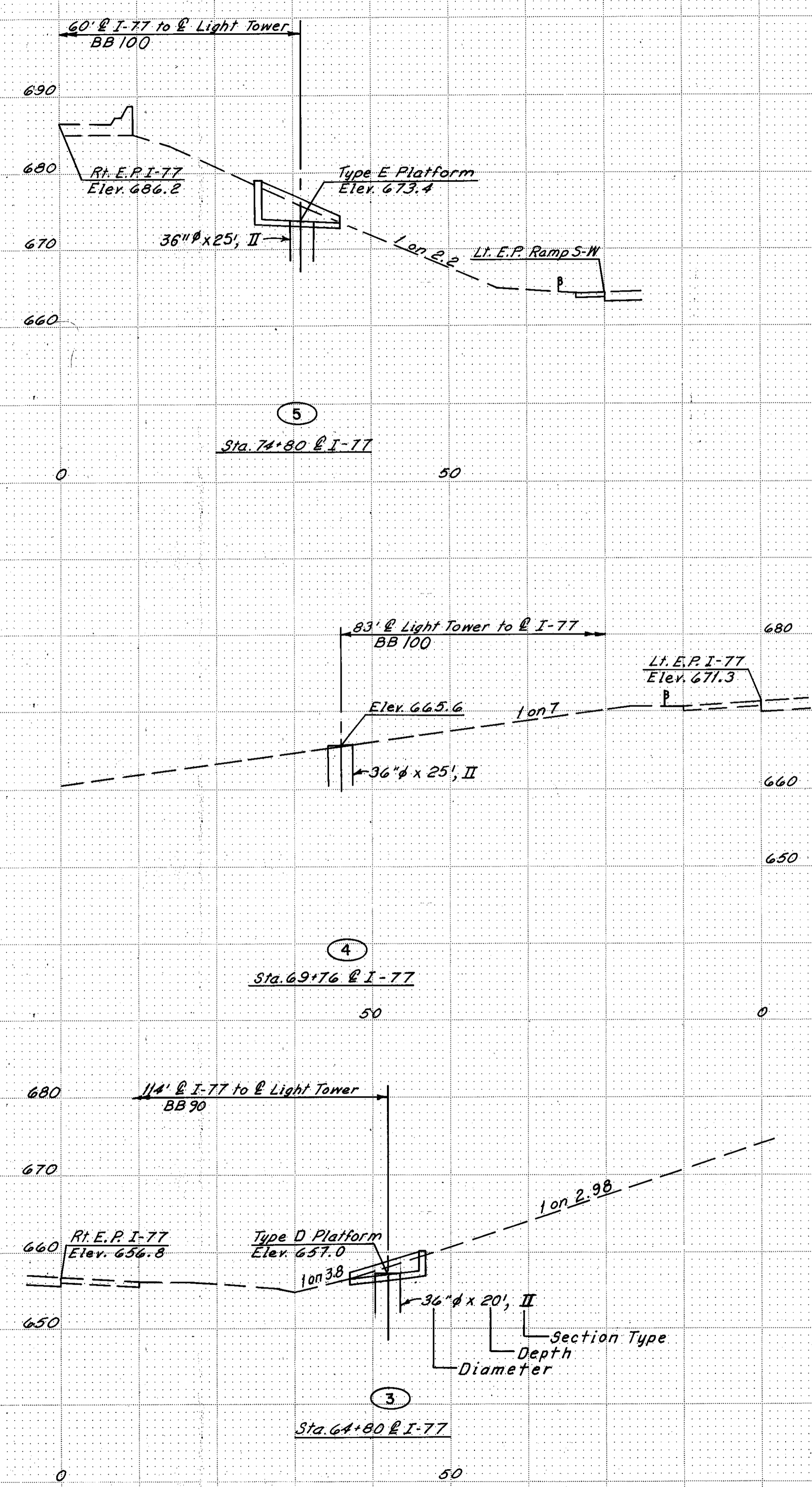
# LIGHT TOWER FOUNDATION DATA

TOWER NO.	POLE DATA				DRILLED - IN CAISSON DATA					MAINTENANCE PLATFORM DATA	
	LIGHT POLE DESIGN NO.	BOLT CIRCLE	BOLT SIZE	NO. OF BOLTS	DEPTH TO SHALE	DEPTH IN SHALE	EMBEDMENT DEPTH	SECTION TYPE	NO. 11 BAR LENGTH	TYPE	ELEV. A
1											
2											
3	BB 90	23.5"	1 1/2" x 96"	6			20'-0"	II	19'-9"	D	657.0
4	BB 100	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"		665.6
5	BB 100	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"	E	673.4
6	BB 100	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"	E	679.2
7	BB 100	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"		672.8
8	BB 100	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"		677.9
9	BB 90	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"	E	680.8
10	BB 90	23.5"	1 1/2" x 96"	6			20'-0"	II	19'-9"	F	686.6
11	BBB 120	26.0"	1 1/2" x 96"	6			25'-0"	III	24'-9"		677.3
12	BB 100	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"		679.8
13	BB 110	26.0"	1 1/2" x 96"	6			25'-0"	II	24'-9"	D	691.8
14	BB 120	26.0"	1 1/2" x 96"	6			25'-0"	III	24'-9"		682.1
15	BB 100	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"	D	680.4
16	BB 90	23.5"	1 1/2" x 96"	6			20'-0"	II	19'-9"	D	683.9
17	BB 100	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"		676.8
18	BB 100	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"	D	680.1
19	BB 90	23.5"	1 1/2" x 96"	6			20'-0"	II	19'-9"	E	686.1
20	BBB 120	26.0"	1 1/2" x 96"	6			25'-0"	III	24'-9"		678.2
21	BB 90	23.5"	1 1/2" x 96"	6			20'-0"	II	19'-9"		676.3
22	BB 80	23.5"	1 1/2" x 96"	4			20'-0"	I	19'-9"		679.9
23	BB 80	23.5"	1 1/2" x 96"	4			20'-0"	I	19'-9"		674.4
24	BBB 110	26.0"	1 1/2" x 96"	6			25'-0"	II	24'-9"	F	666.7
25	BB 120	26.0"	1 1/2" x 96"	6			25'-0"	III	24'-9"		668.4
26	BB 80	23.5"	1 1/2" x 96"	4			25'-0"	I	24'-9"		670.9
27	BB 80	23.5"	1 1/2" x 96"	4			20'-0"	I	19'-9"		672.8
28	BBB 120	26.0"	1 1/2" x 96"	6			25'-0"	III	24'-9"		672.9
29	BBB 80	23.5"	1 1/2" x 96"	4			20'-0"	I	19'-9"		671.0
30	BBB 100	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"		674.4
31	BB 80	23.5"	1 1/2" x 96"	4			20'-0"	I	19'-9"		673.9
32	BBB 110	26.0"	1 1/2" x 96"	6			30'-0"	III	29'-9"		679.1
33	BBB 100	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"		674.6
34	BB 90	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"	E	679.9
35	BB 90	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"		682.0

TOWER NO.	POLE DATA				DRILLED - IN CAISSON DATA					MAINTENANCE PLATFORM DATA	
	LIGHT POLE DESIGN NO.	BOLT CIRCLE	BOLT SIZE	NO. OF BOLTS	DEPTH TO SHALE	DEPTH IN SHALE	EMBEDMENT DEPTH	SECTION TYPE	NO. 11 BAR LENGTH	TYPE	ELEV. A
36	BB 90	23.5"	1 1/2" x 96"	6			20'-0"	II	19'-9"		677.1
37	BBB 110	26.0"	1 1/2" x 96"	6			25'-0"	II	24'-9"		678.2
38	BBB 130	28.0"	1 1/2" x 96"	8			25'-0"	IV	24'-9"		675.1
39	BBB 120	26.0"	1 1/2" x 96"	6			25'-0"	III	24'-9"		688.8
40	BB 80	23.5"	1 1/2" x 96"	4			20'-0"	I	19'-9"		670.8
41	BB 80	23.5"	1 1/2" x 96"	4			25'-0"	I	24'-9"		672.2
42	BB 80	23.5"	1 1/2" x 96"	4			20'-0"	I	19'-9"		669.3
43	BB 60	23.5"	1 1/2" x 96"	4			25'-0"	I	24'-9"		670.9
44	BB 70	23.5"	1 1/2" x 96"	4			25'-0"	I	24'-9"	E	654.2
45	BB 70	23.5"	1 1/2" x 96"	4			25'-0"	I	24'-9"		670.2
46	BB 70	23.5"	1 1/2" x 96"	4			30'-0"	I	29'-9"	E	653.0
47	BBB 100	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"		652.3
48	BBB 110	26.0"	1 1/2" x 96"	6			30'-0"	II	29'-9"		657.8
49	BB 70	23.5"	1 1/2" x 96"	4			25'-0"	I	24'-9"	E	658.6
50	BB 70	23.5"	1 1/2" x 96"	4			25'-0"	I	24'-9"	D	652.0
51	BB 80	23.5"	1 1/2" x 96"	4			30'-0"	I	29'-9"	D	646.7
52	BB 80	23.5"	1 1/2" x 96"	4			20'-0"	I	19'-9"		633.5
53	BBB 100	23.5"	1 1/2" x 96"	6			25'-0"	II	24'-9"		649.5
54	BB 80	23.5"	1 1/2" x 96"	4			25'-0"	I	24'-9"	F	643.7
55	BB 70	23.5"	1 1/2" x 96"	4			25'-0"	I	24'-9"	F	637.0
56	BB 70	23.5"	1 1/2" x 96"	4			30'-0"	I	29'-9"	F	634.0
57	BB 70	23.5"	1 1/2" x 96"	4			30'-0"	I	29'-9"	D	630.2
58	BB 70	23.5"	1 1/2" x 96"	4			25'-0"	I	24'-9"		628.3
59	BB 80	23.5"	1 1/2" x 96"	4			30'-0"	I	29'-9"	E	619.7
60	BB 80	23.5"	1 1/2" x 96"	4			20'-0"	I	19'-9"		626.5
61	BB 70	23.5"	1 1/2" x 96"	4			30'-0"	I	29'-9"	F	622.9
62	BB 70	23.5"	1 1/2" x 96"	4			25'-0"	I	24'-9"	E	621.6
63	BB 70	23.5"	1 1/2" x 96"	4			30'-0"	I	29'-9"	E	619.4
64	BB 70	23.5"	1 1/2" x 96"	4			30'-0"	I	29'-9"	F	617.7
65	BB 70	23.5"	1 1/2" x 96"	4			30'-0"	I	29'-9"	E	599.0
66	BB 70	23.5"	1 1/2" x 96"	4			25'-0"	I	24'-9"	E	594.5
67	BB 80	23.5"	1 1/2" x 96"	4			20'-0"	I	19'-9"		591.8
68	BB 70	23.5"	1 1/2" x 96"	4			20'-0"	I	19'-9"		607.6
69	BB 80	23.5"	1 1/2" x 96"	4			20'-0"	I	19'-9"		653.0

\* No. 10 for Section Type IV

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21



MADE BY ERH DATE 6-11-76  
 TRACED BY DATE 9-13-76  
 CHECKED BY DATE 12-18-76  
 SCALE 1/4" = 1'-0"

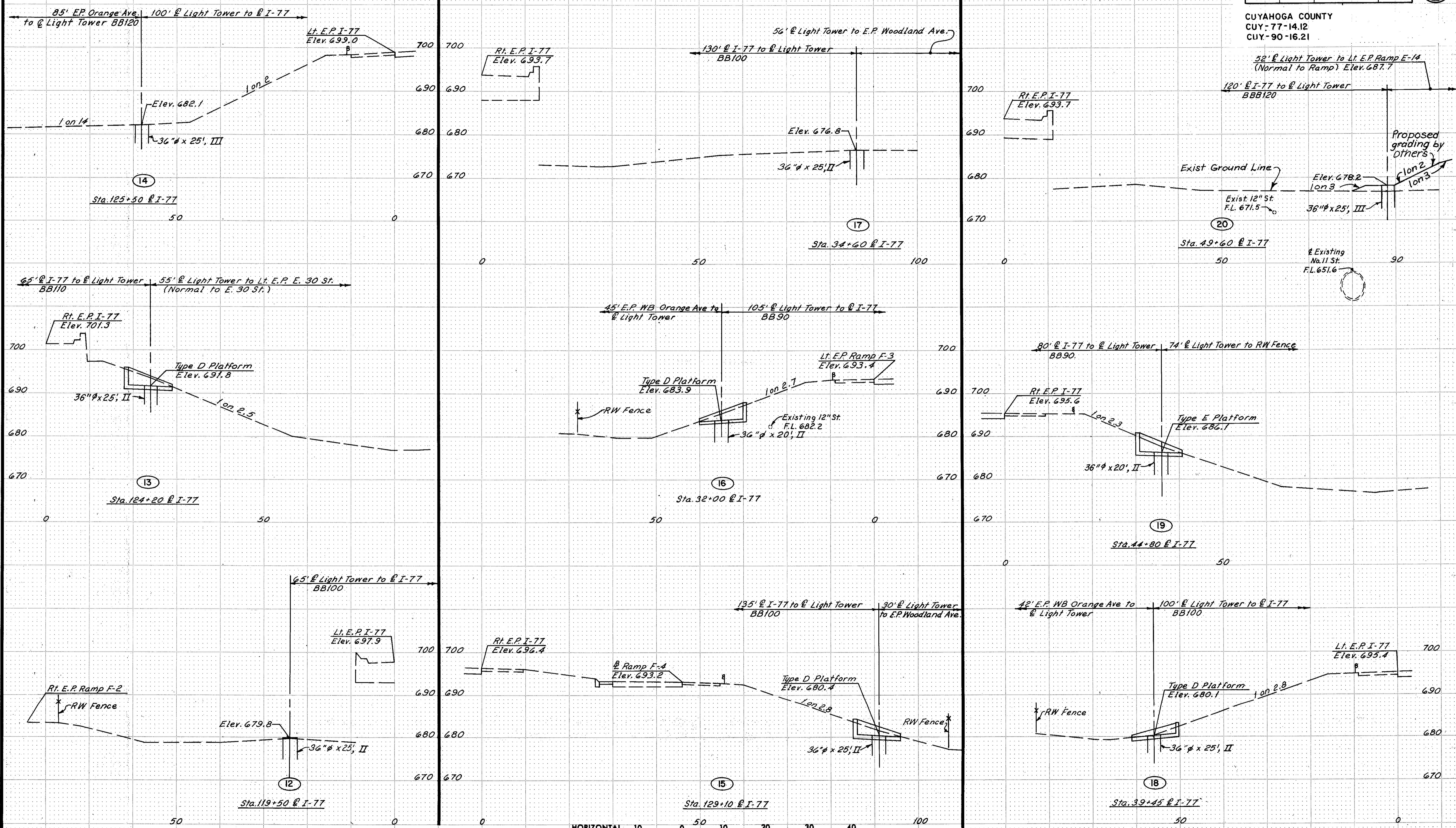
**Howard, Needles, Tamman & Bergendoff**  
 CONSULTING ENGINEERS  
 CLEVELAND, OHIO

**HNTB**

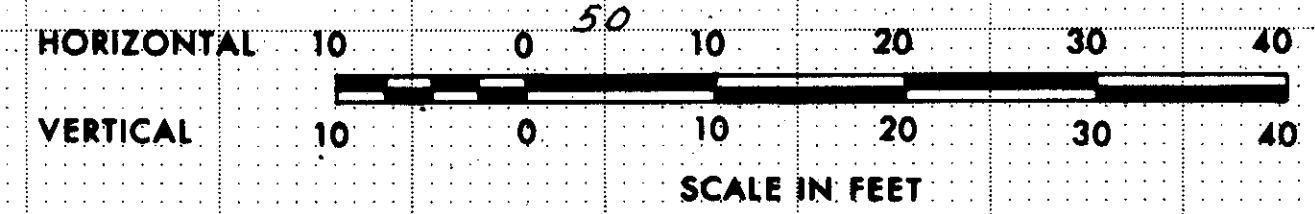
Rev. 2-17-78

Pavement elevations are to be corrected as per elevation Datum note on sheet 3.

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21



MADE ERH DATE 6-11-76  
 TRACED JAK DATE 7-12-78  
 CHECKED JAK DATE 12-12-78  
 SCALE 1" = 10'  
**Howard, Needles, Tammen & Bergendoff**  
 CONSULTING ENGINEERS  
 CLEVELAND, OHIO

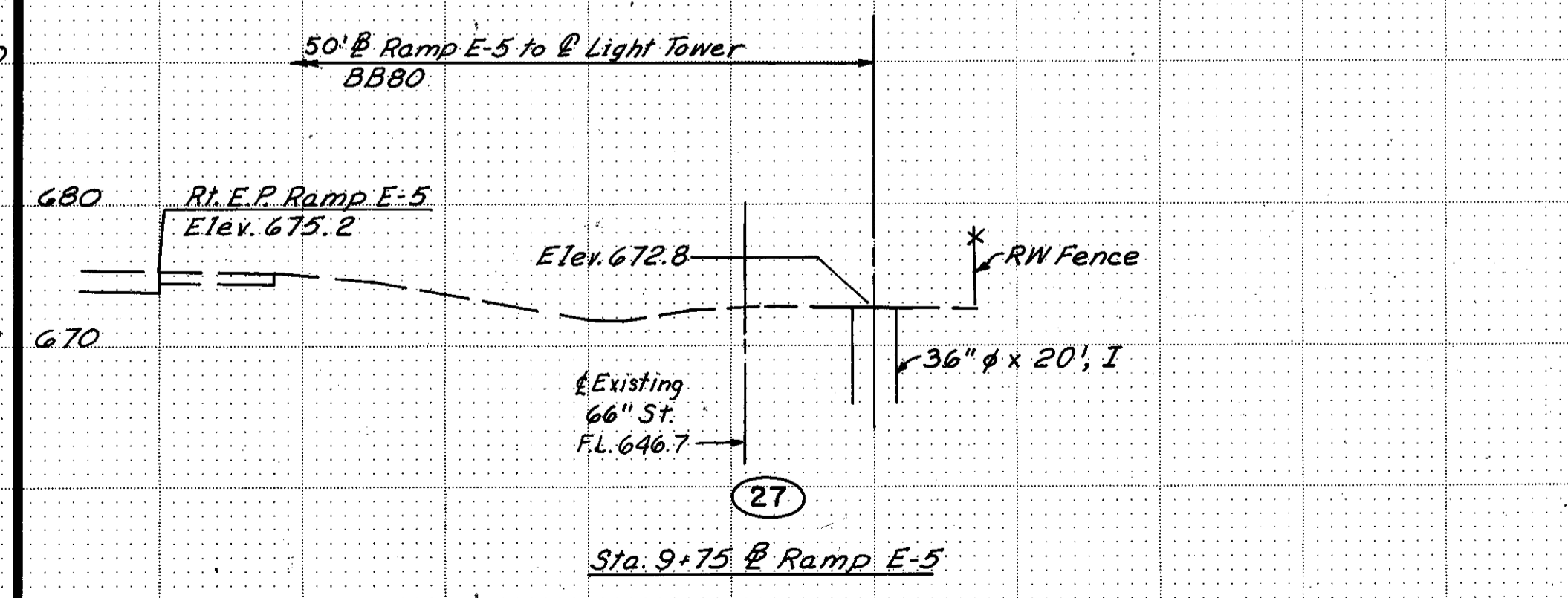
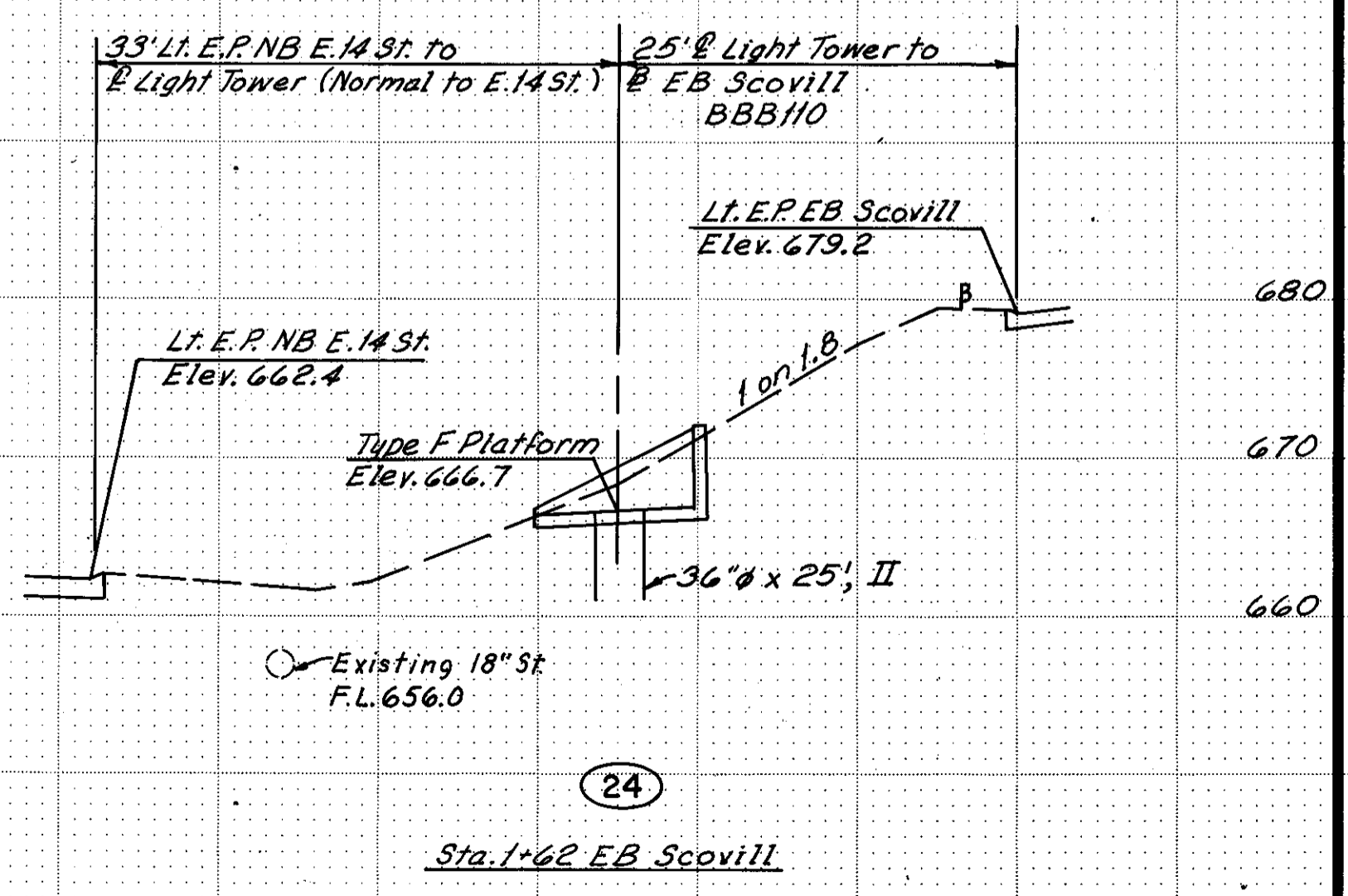
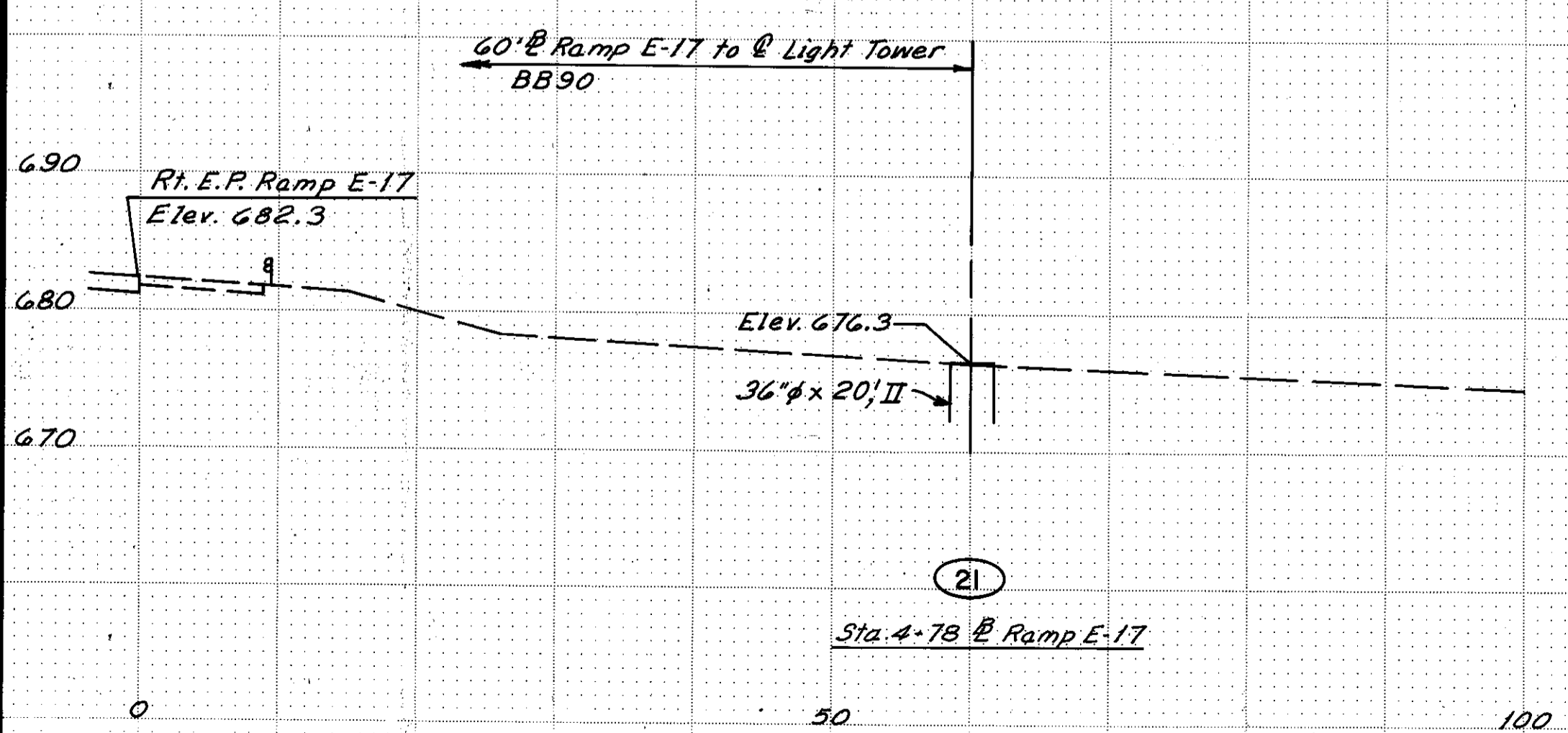
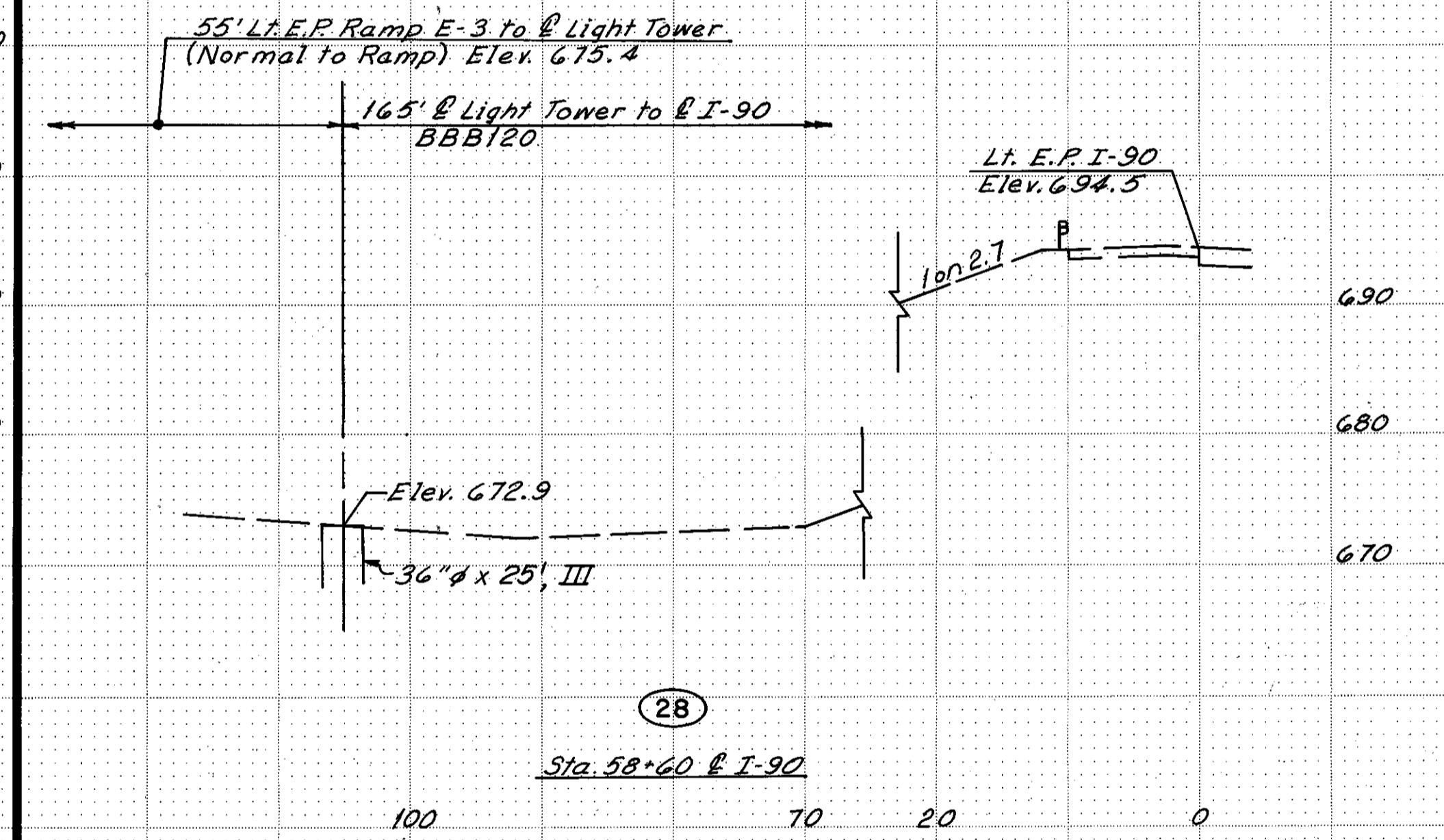
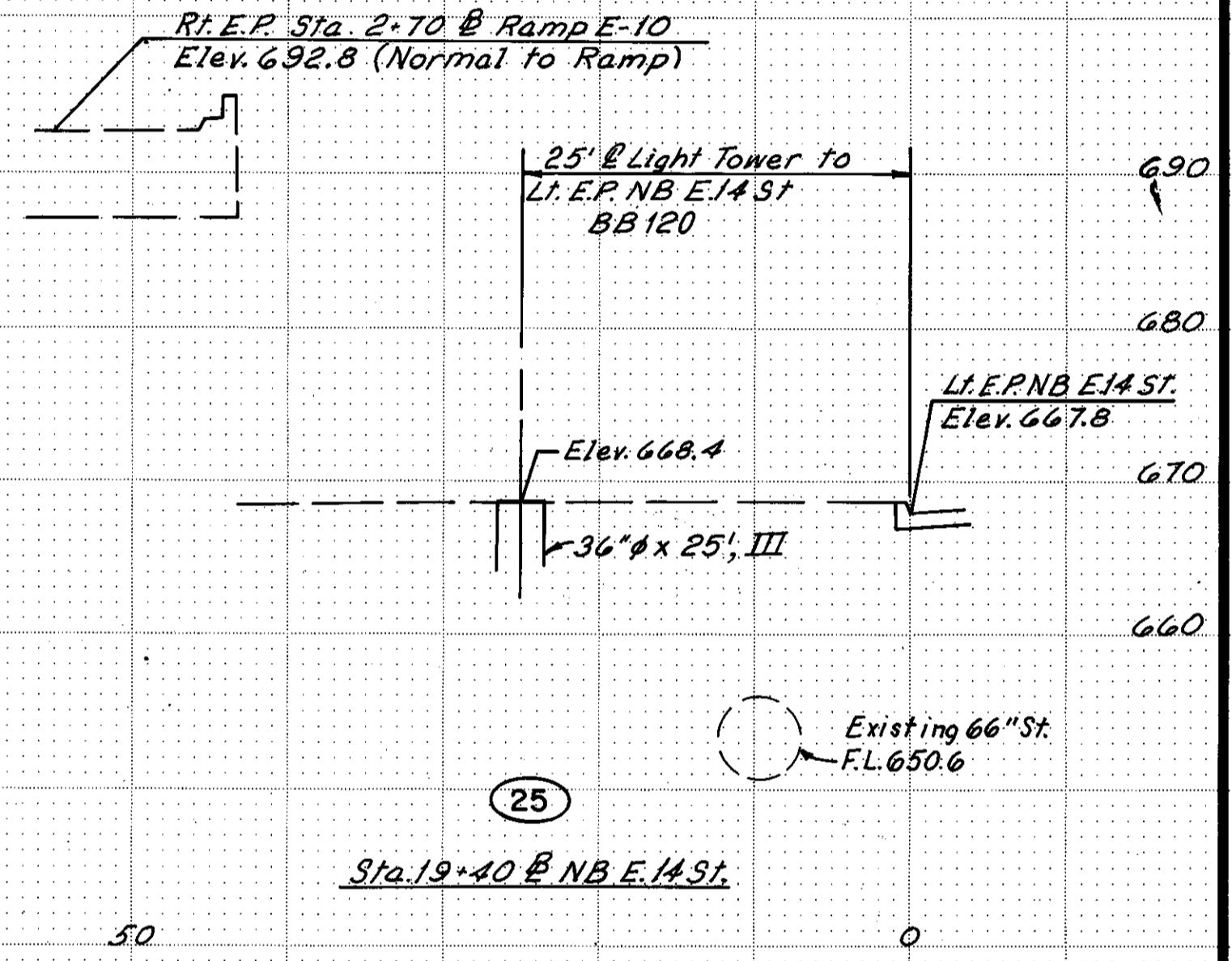
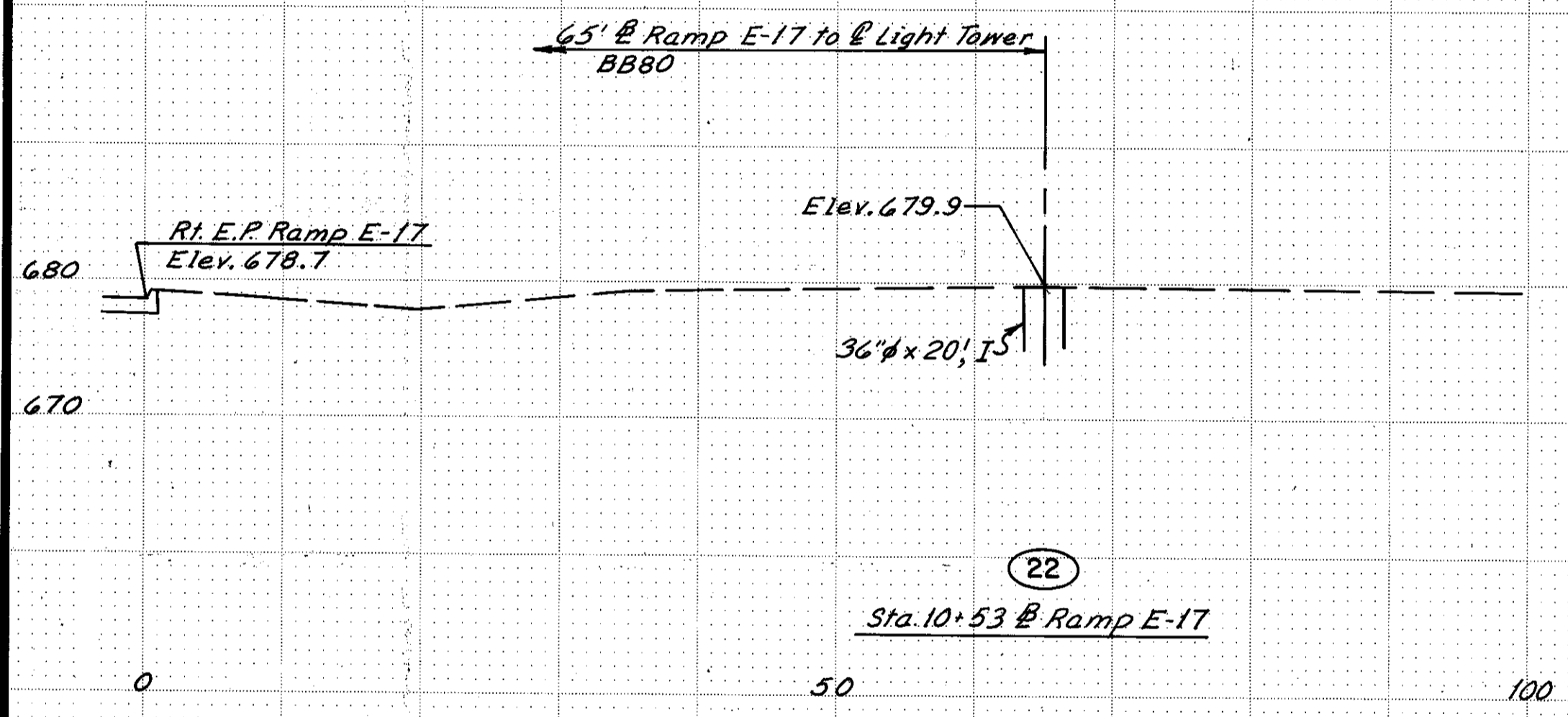
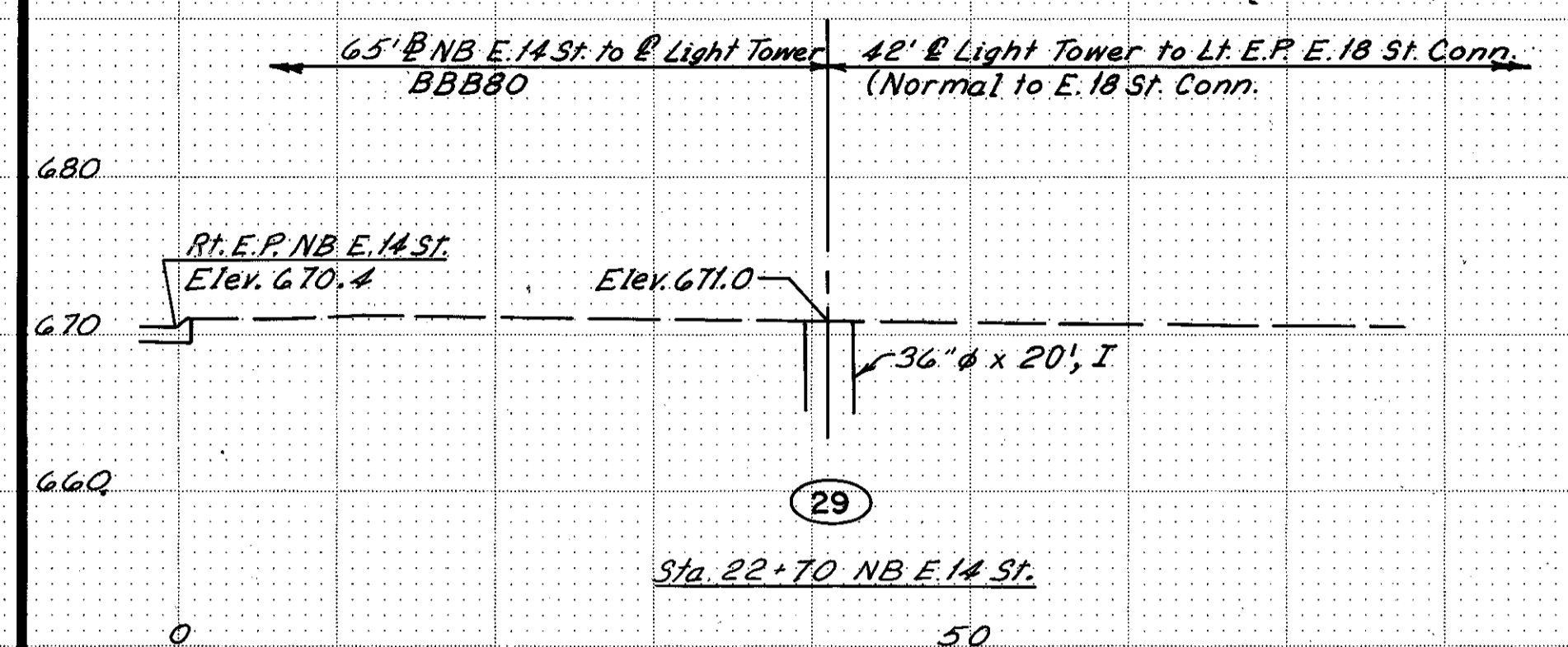
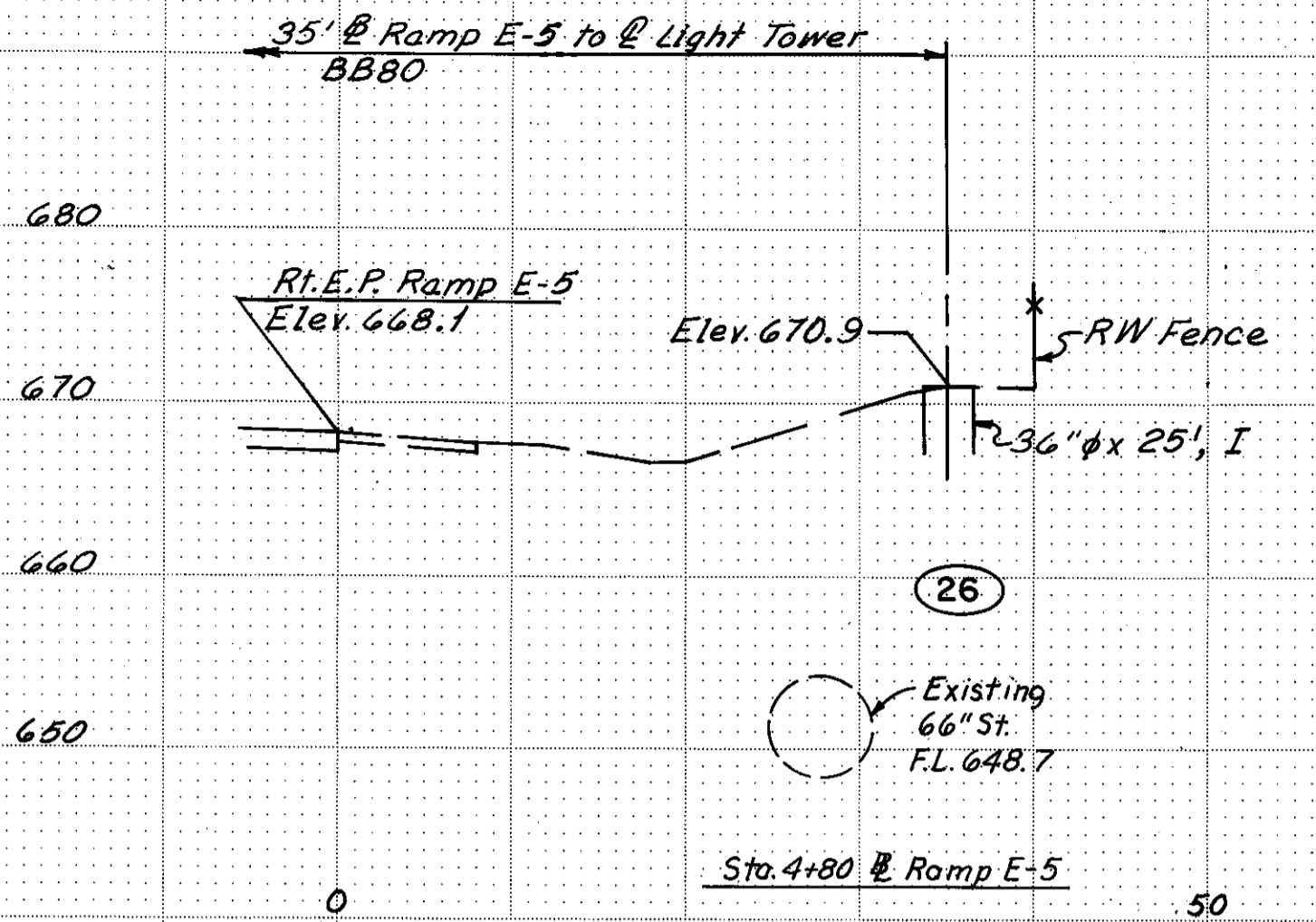
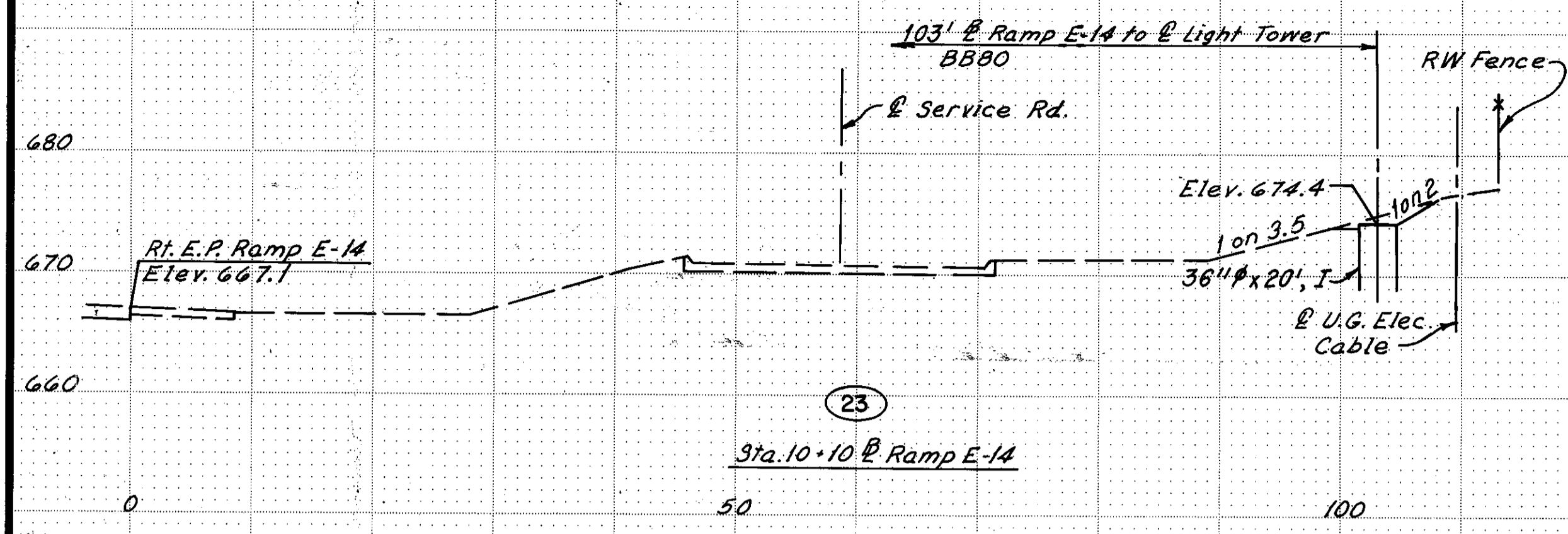


Pavement elevations are to be corrected as per Elevation Datum note on Sheet 3.

FHWA REGION	STATE	PROJECT
5	OHIO	

56  
84

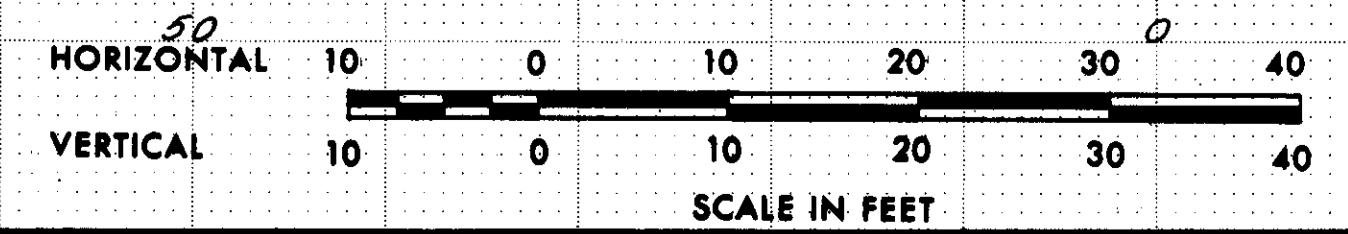
CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.2



MADE ERH DATE 6-14-76  
TRACED TJK DATE 9-12-76  
CHECKED EAT DATE 12-18-76  
SCALE 1" = 40'

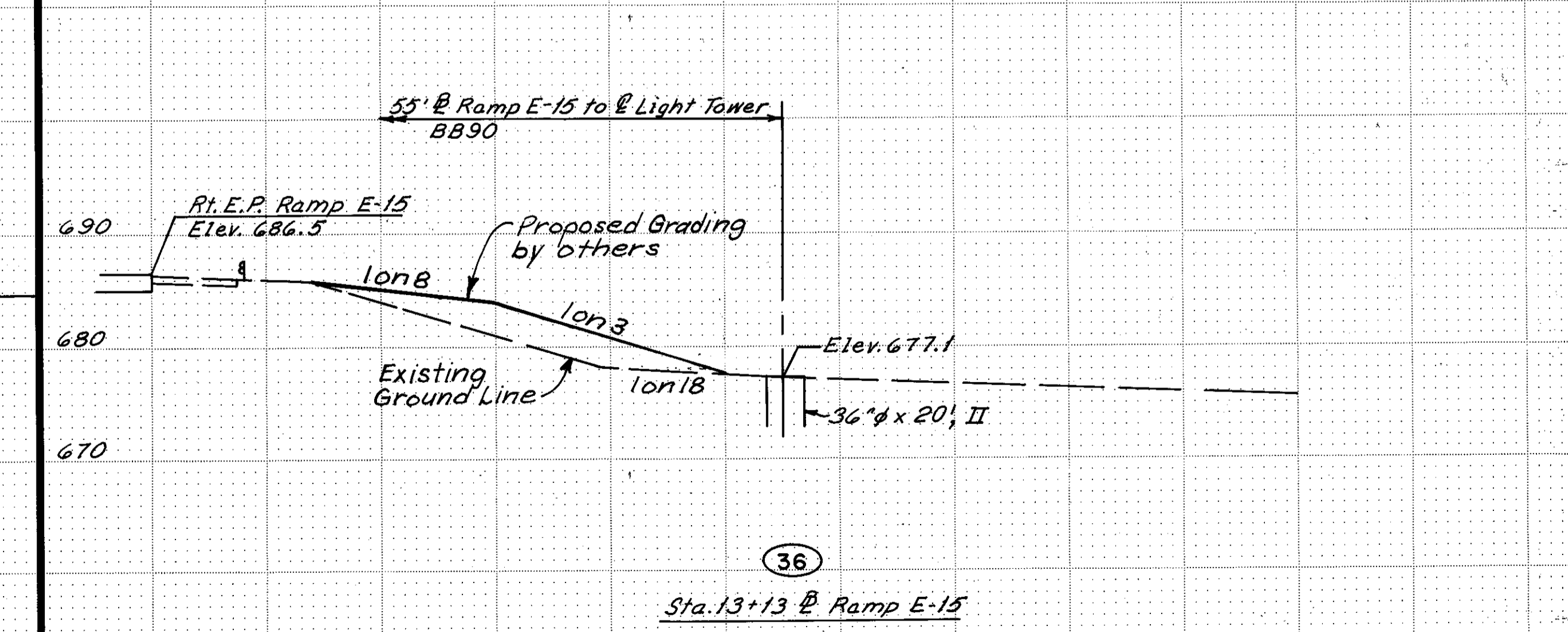
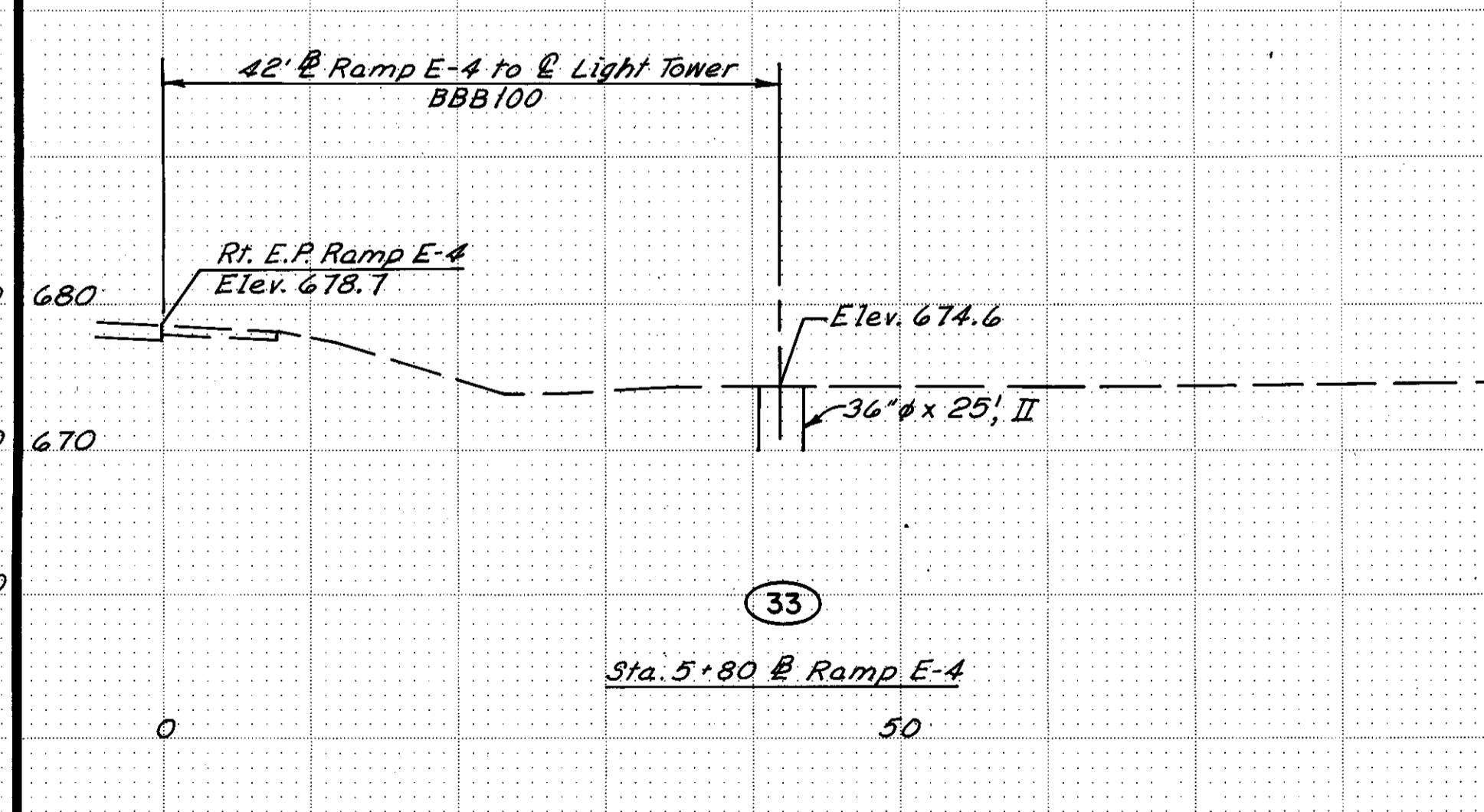
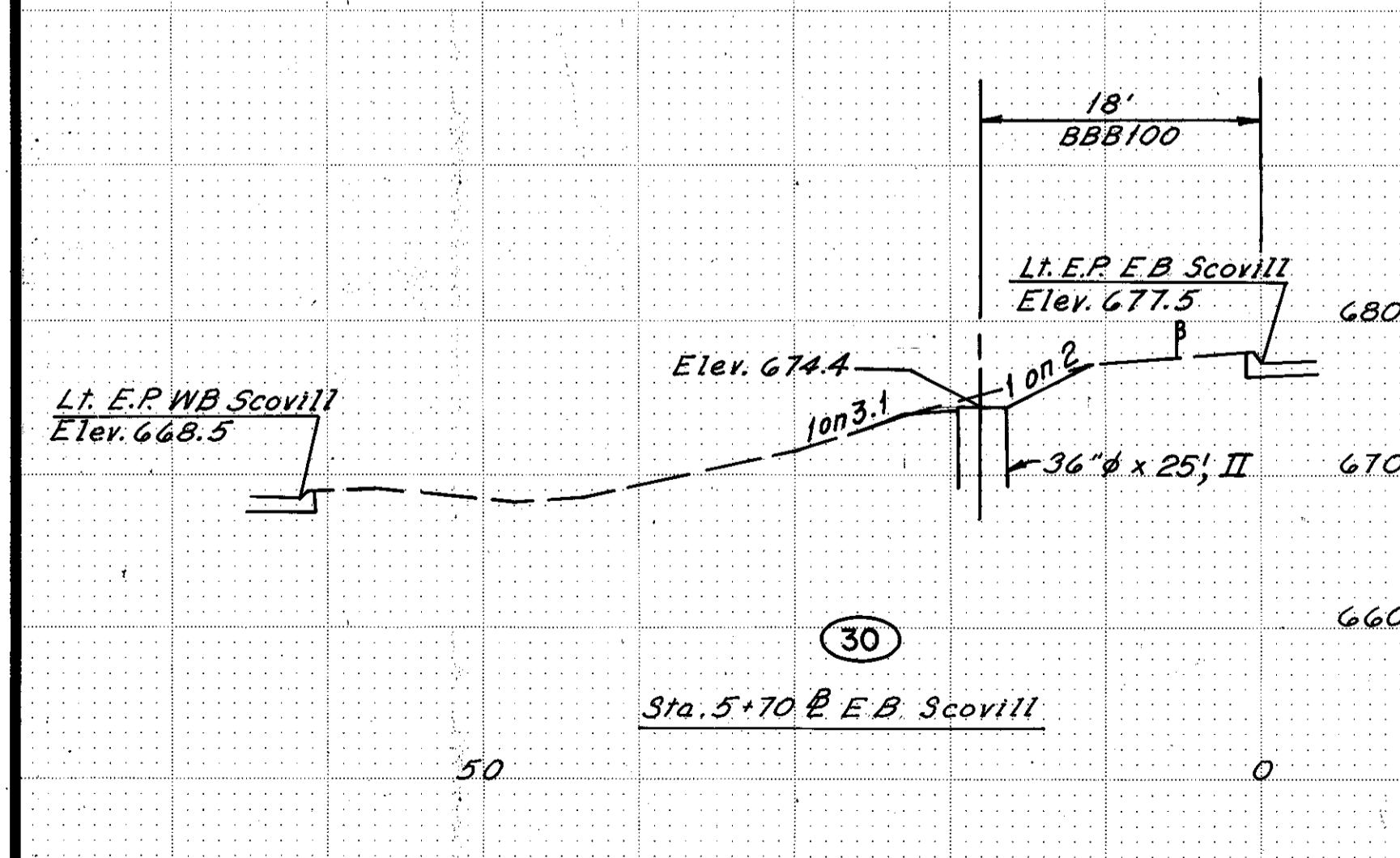
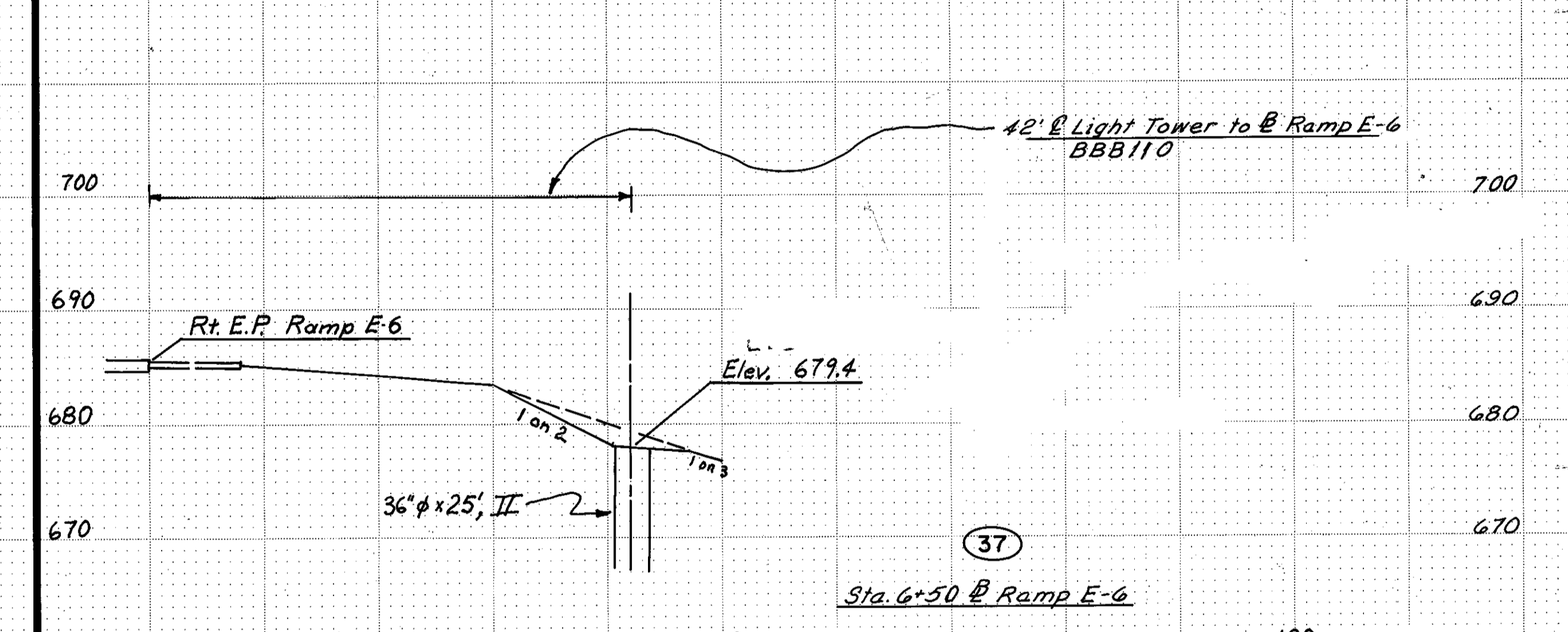
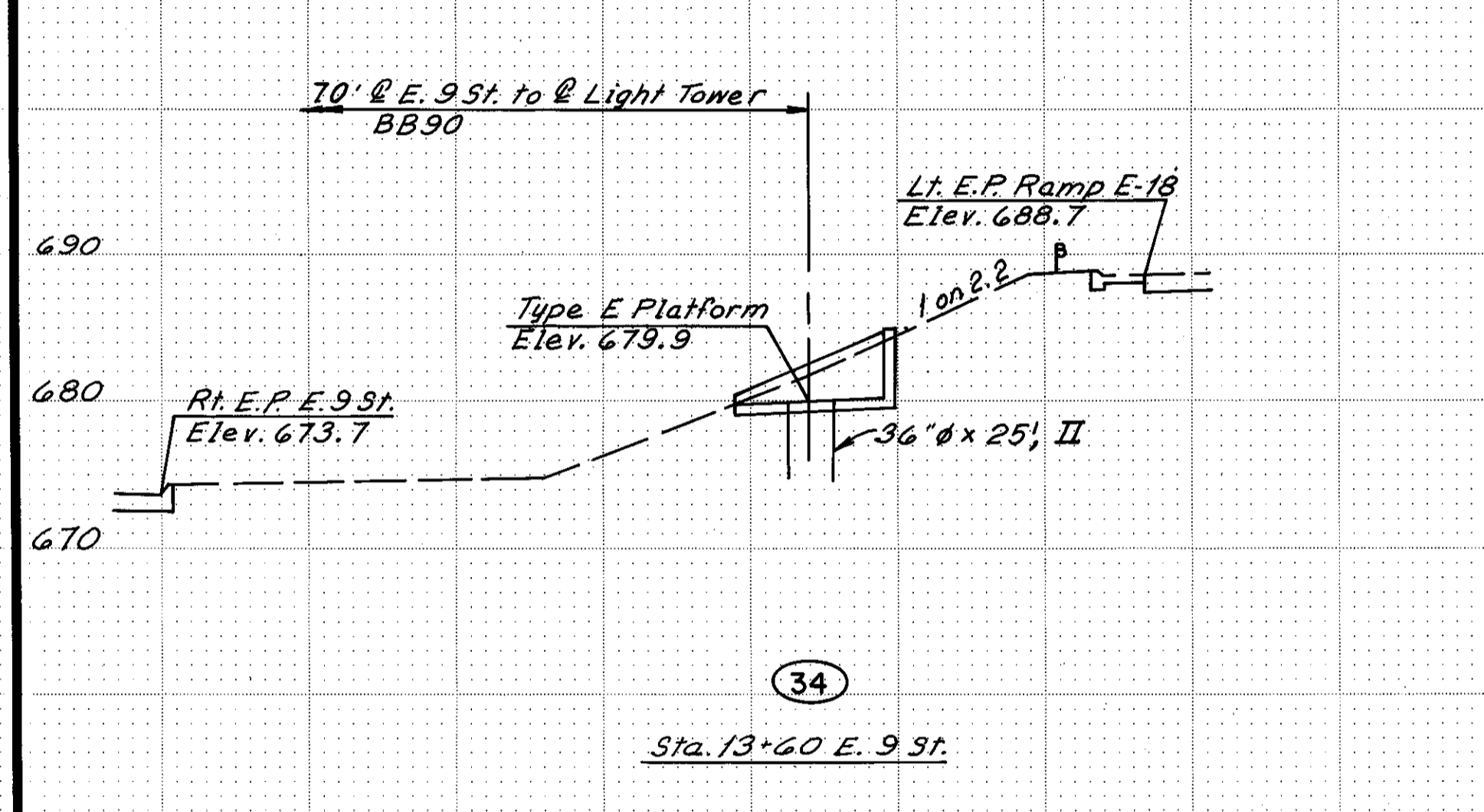
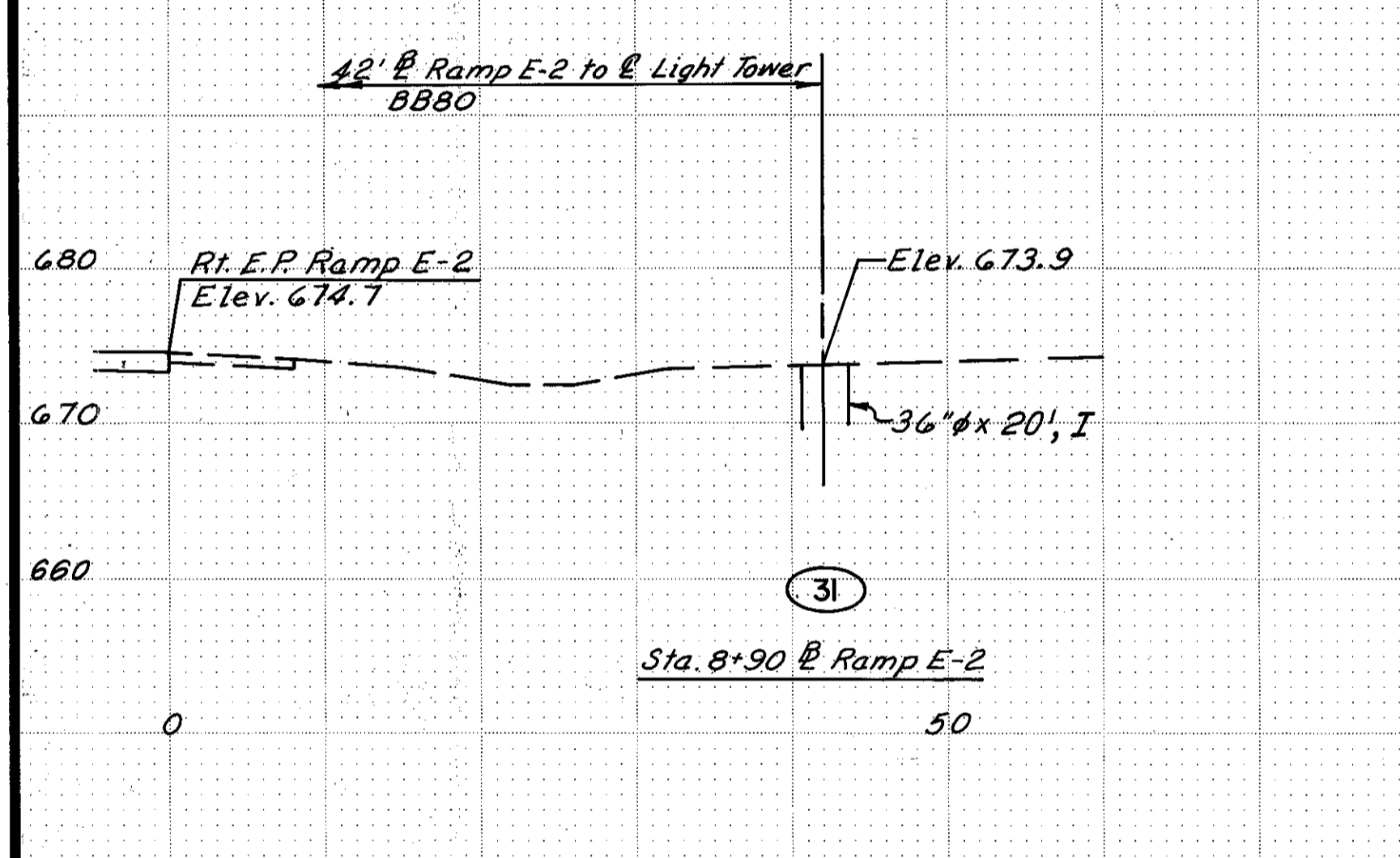
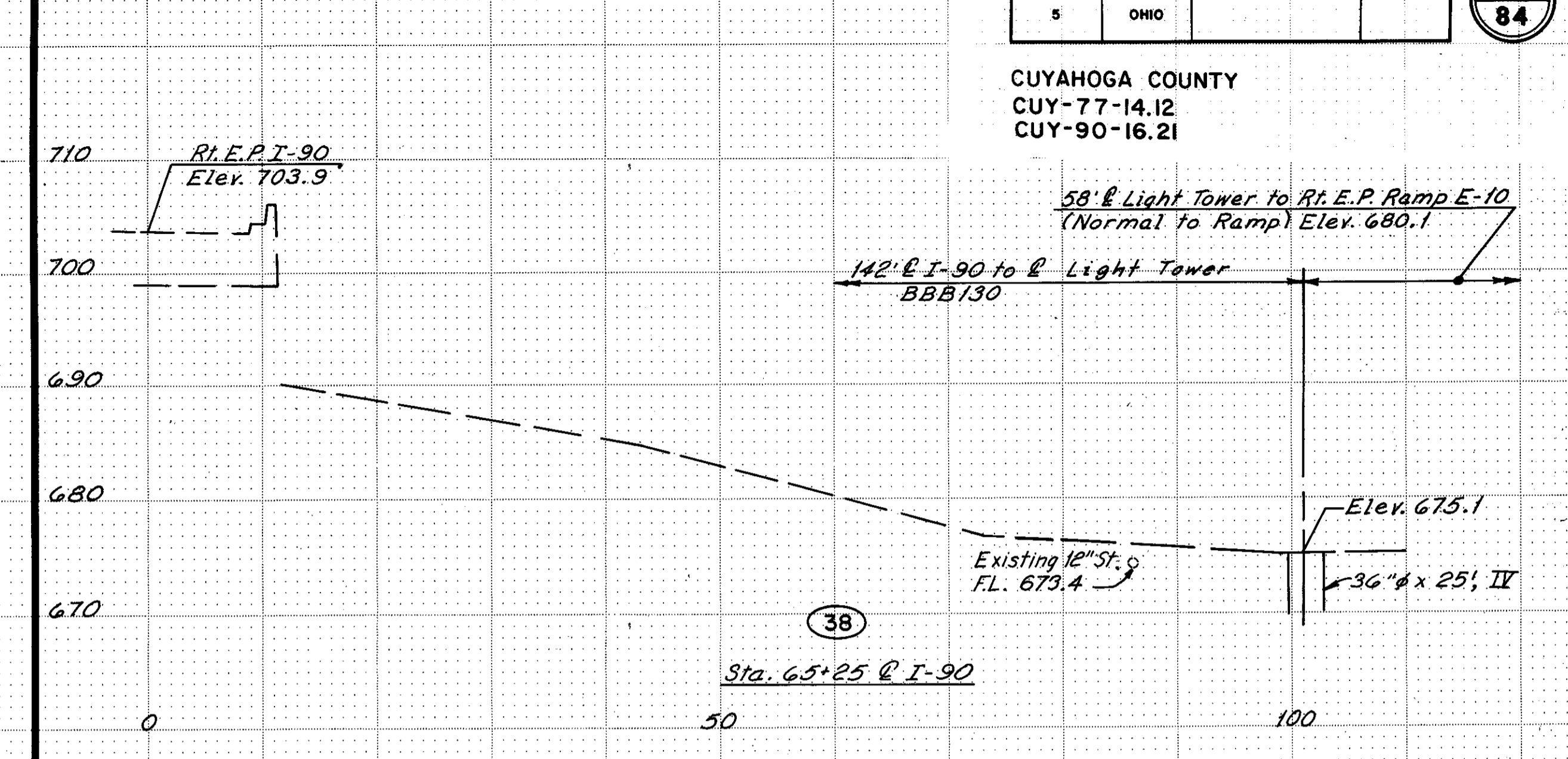
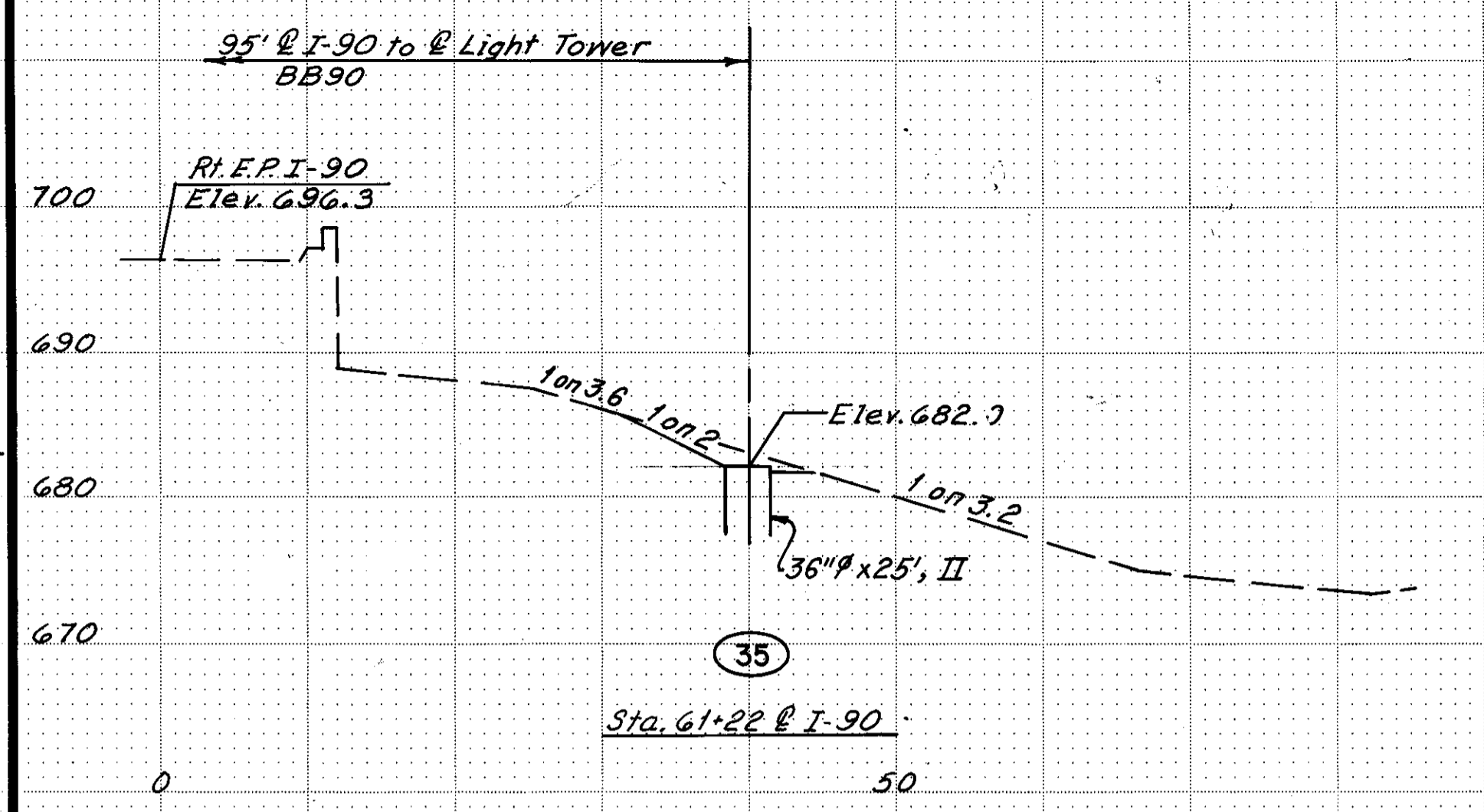
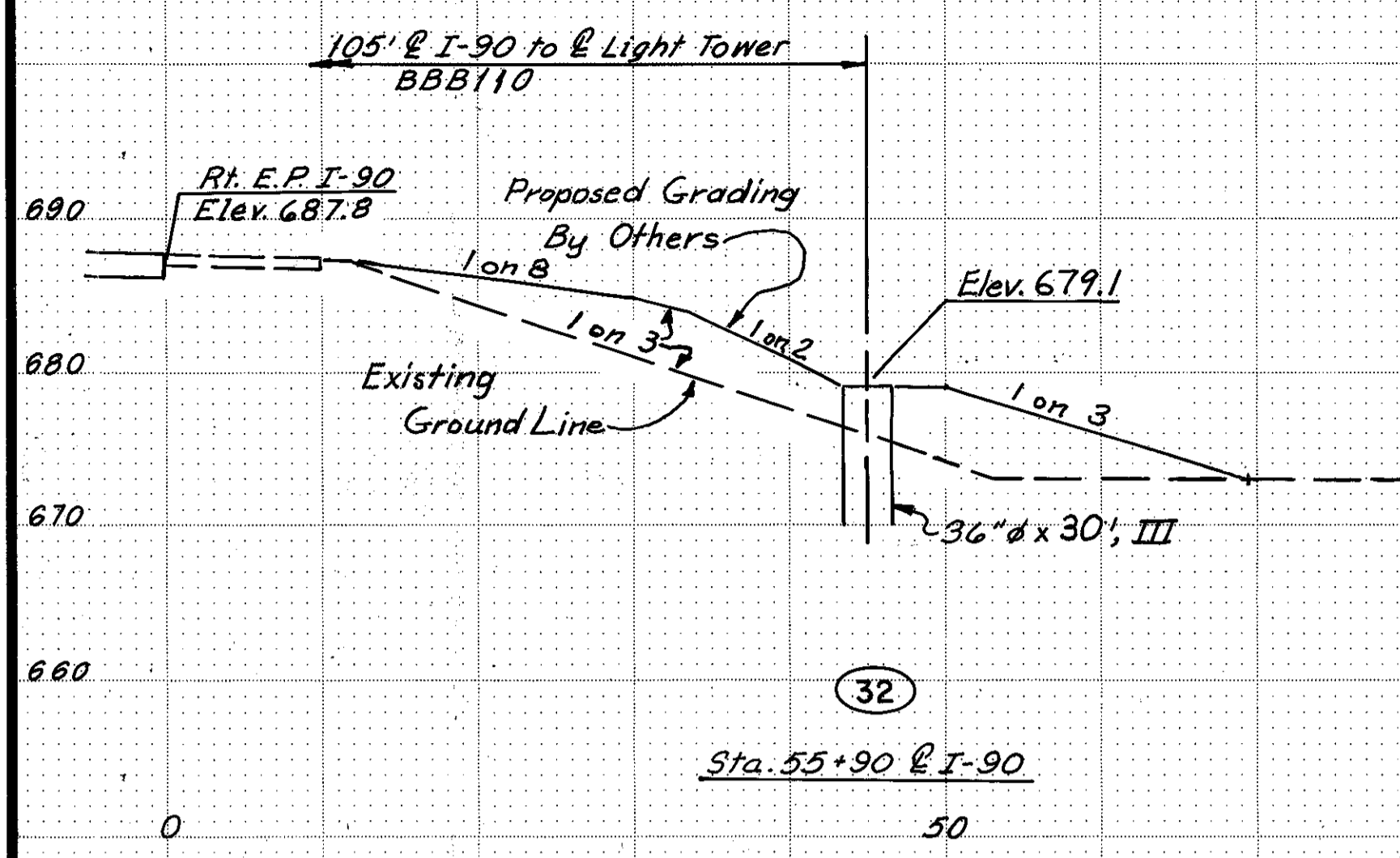
Howard, Needles, Tammen & Bergendoff  
CONSULTING ENGINEERS  
CLEVELAND, OHIO

**HNTB**



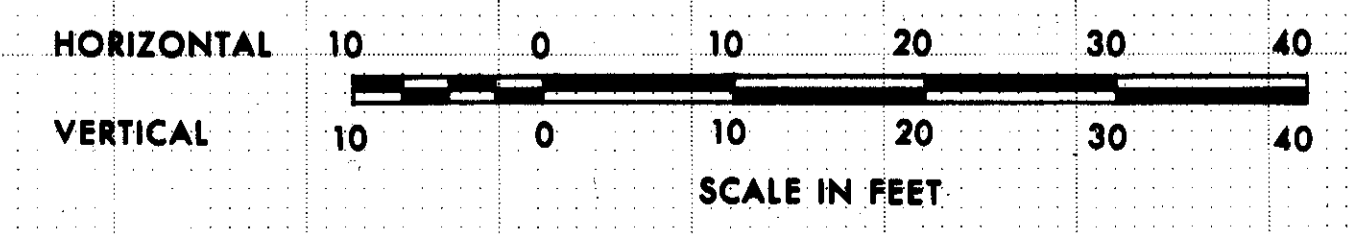
Pavement elevations are to be corrected as per Elevation Datum note on Sheet 3.

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



MADE ERH DATE 6-15-76  
TRACED TAB DATE 3-15-78  
CHECKED E.P. DATE 12-18-78  
SCALE 1/4" = 1'

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



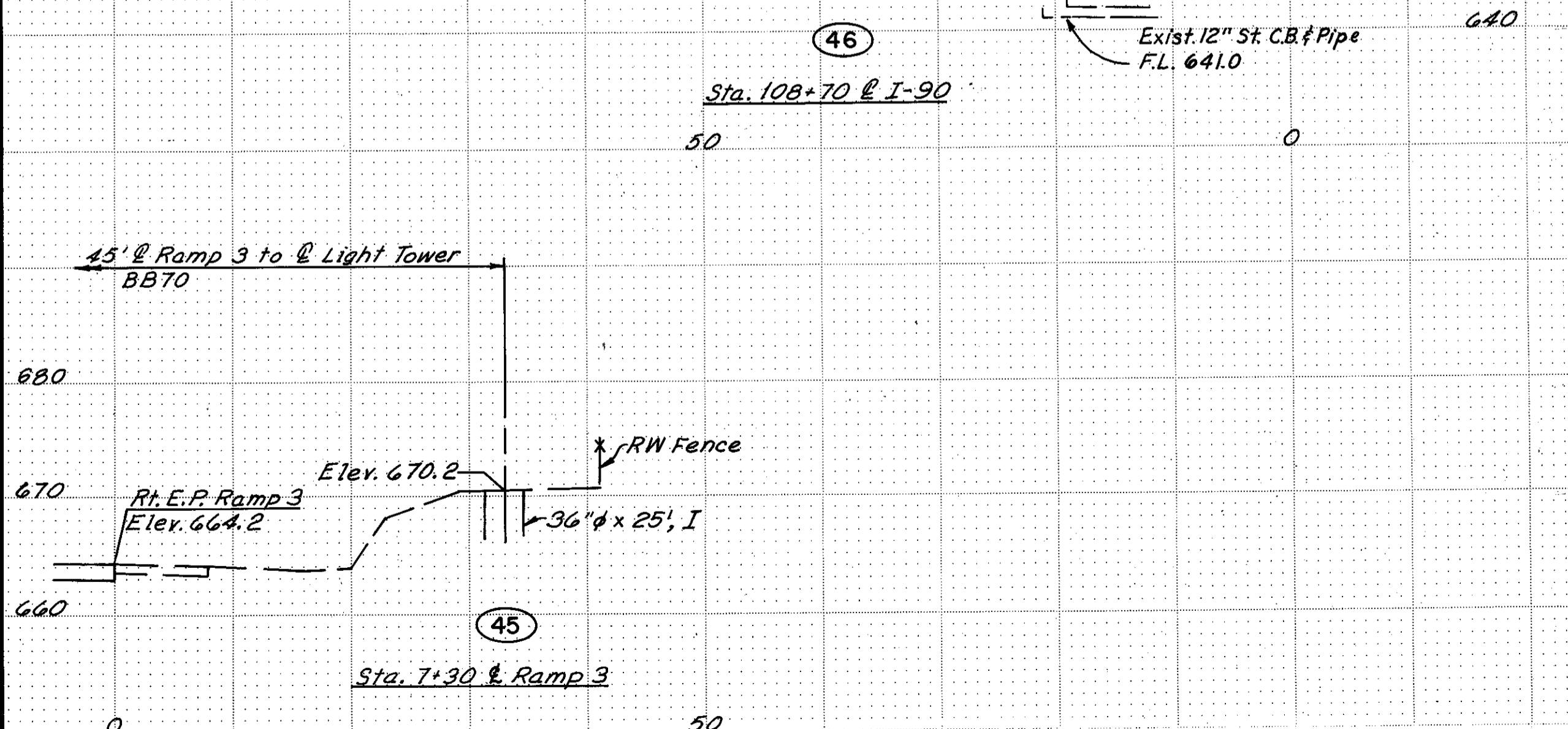
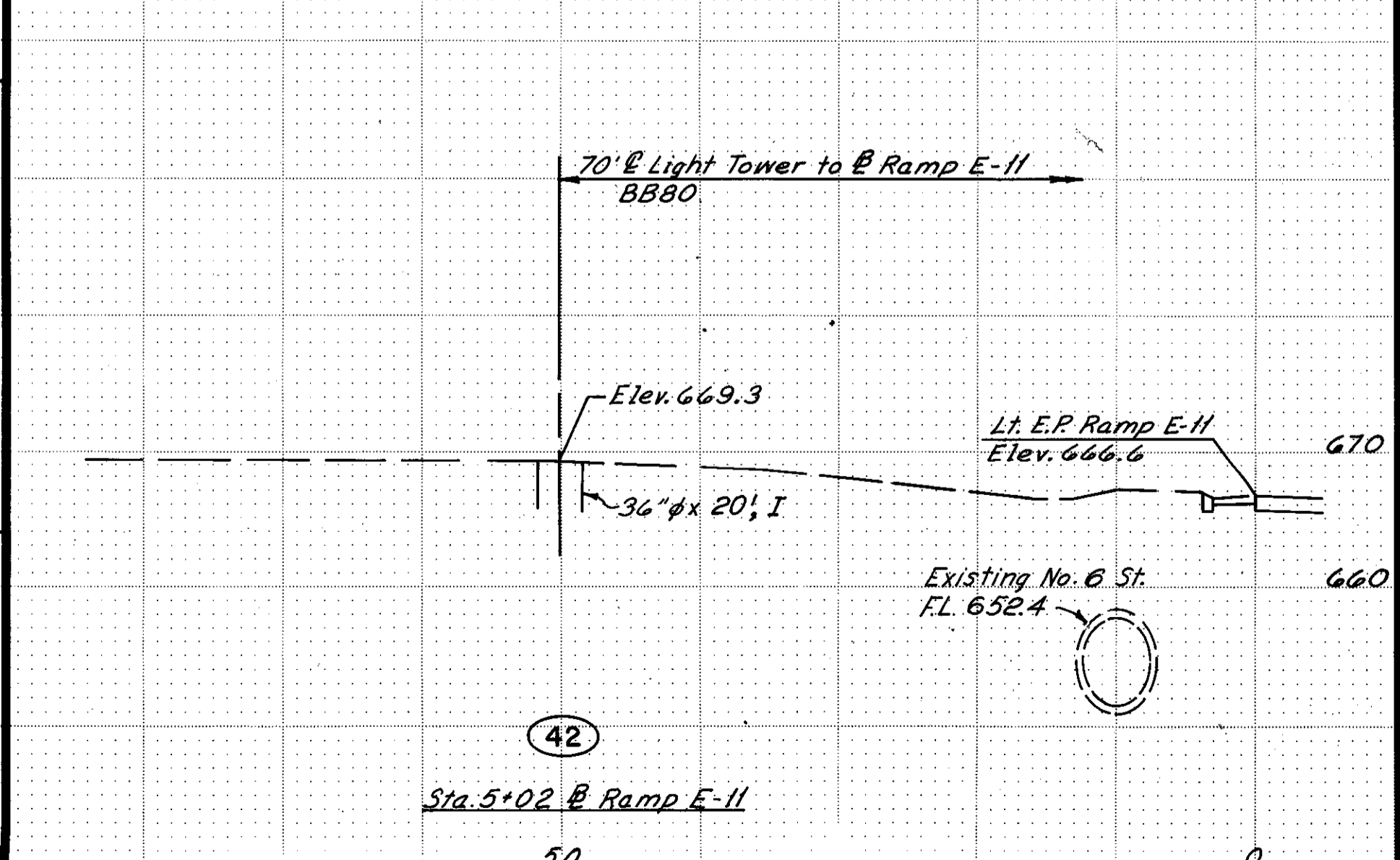
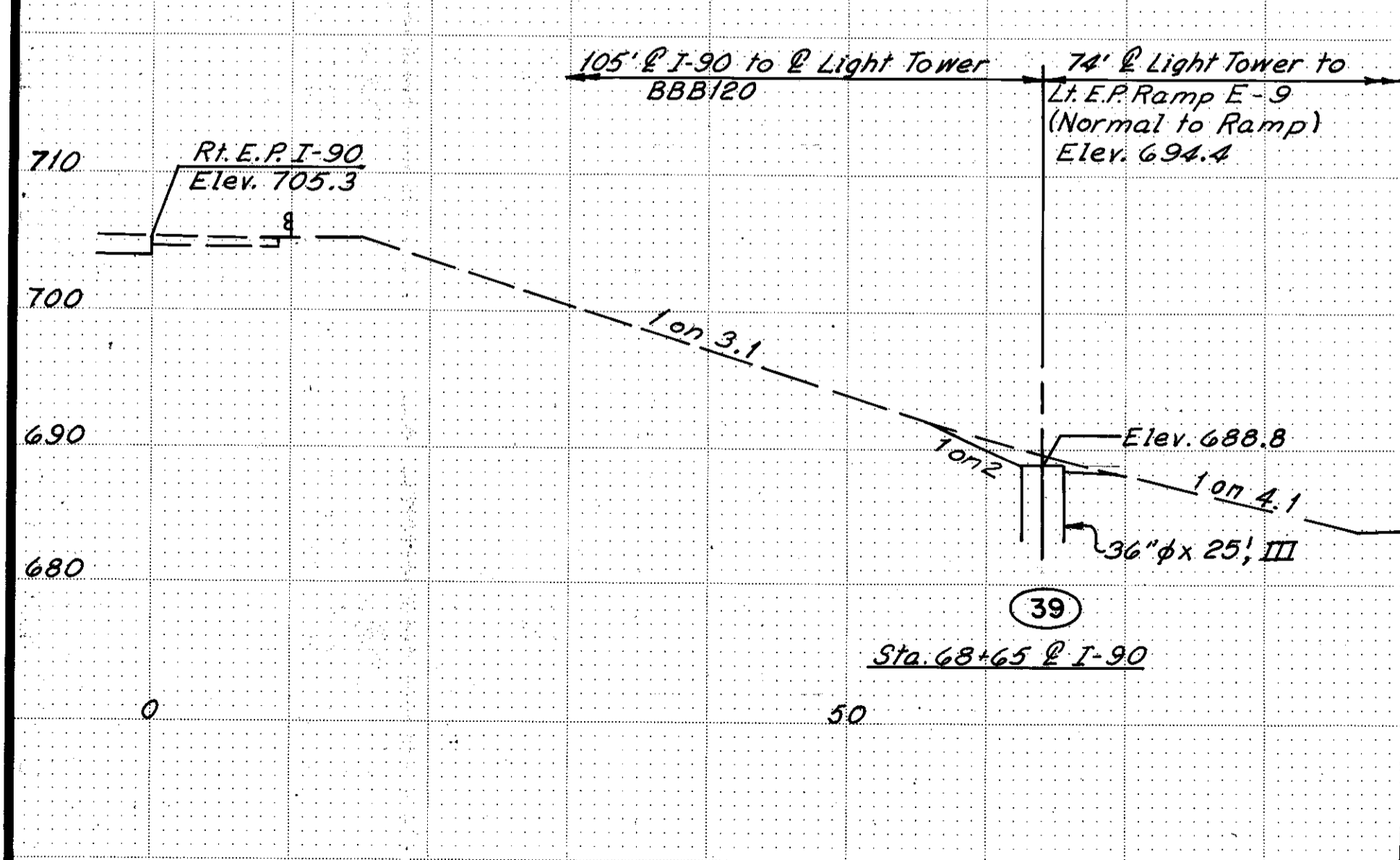
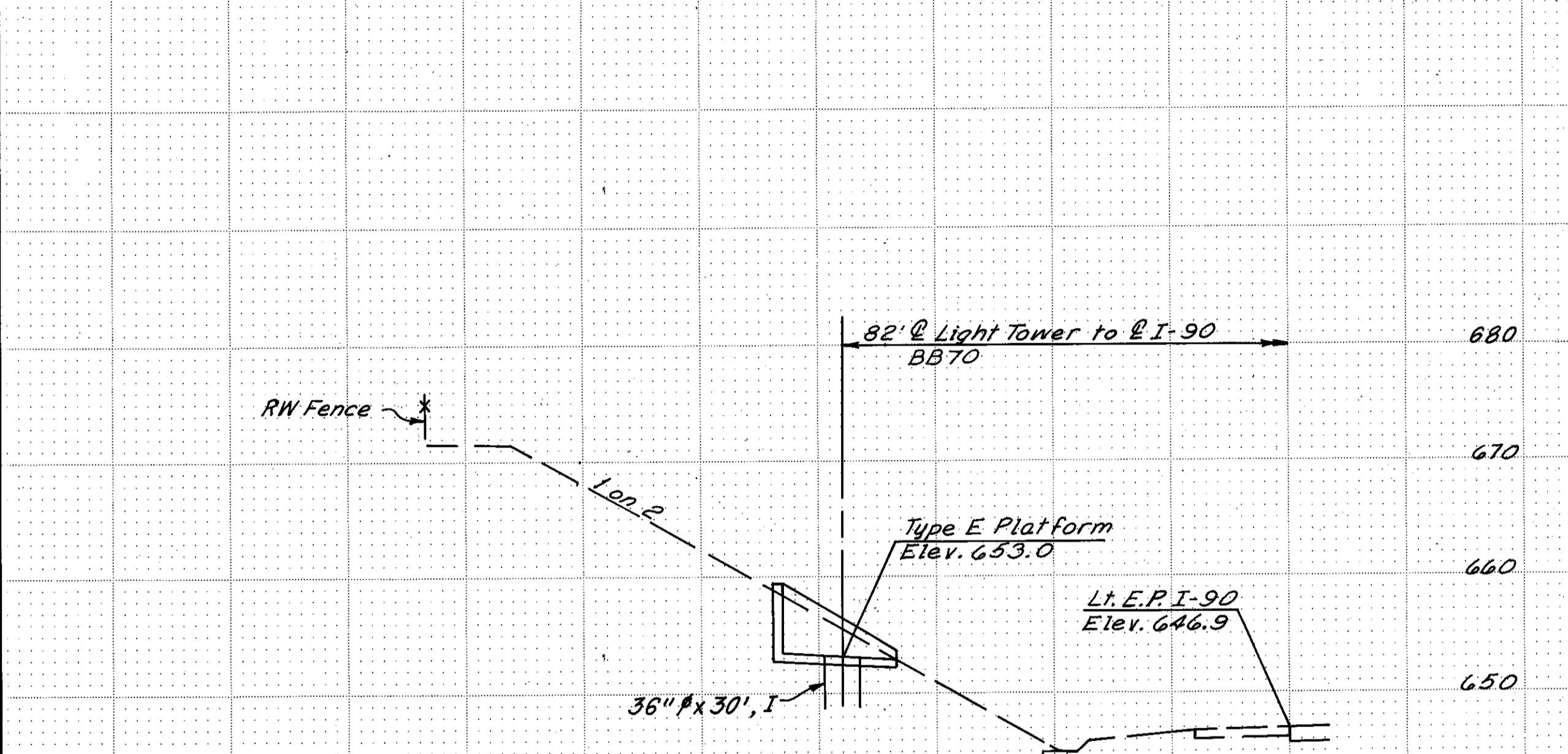
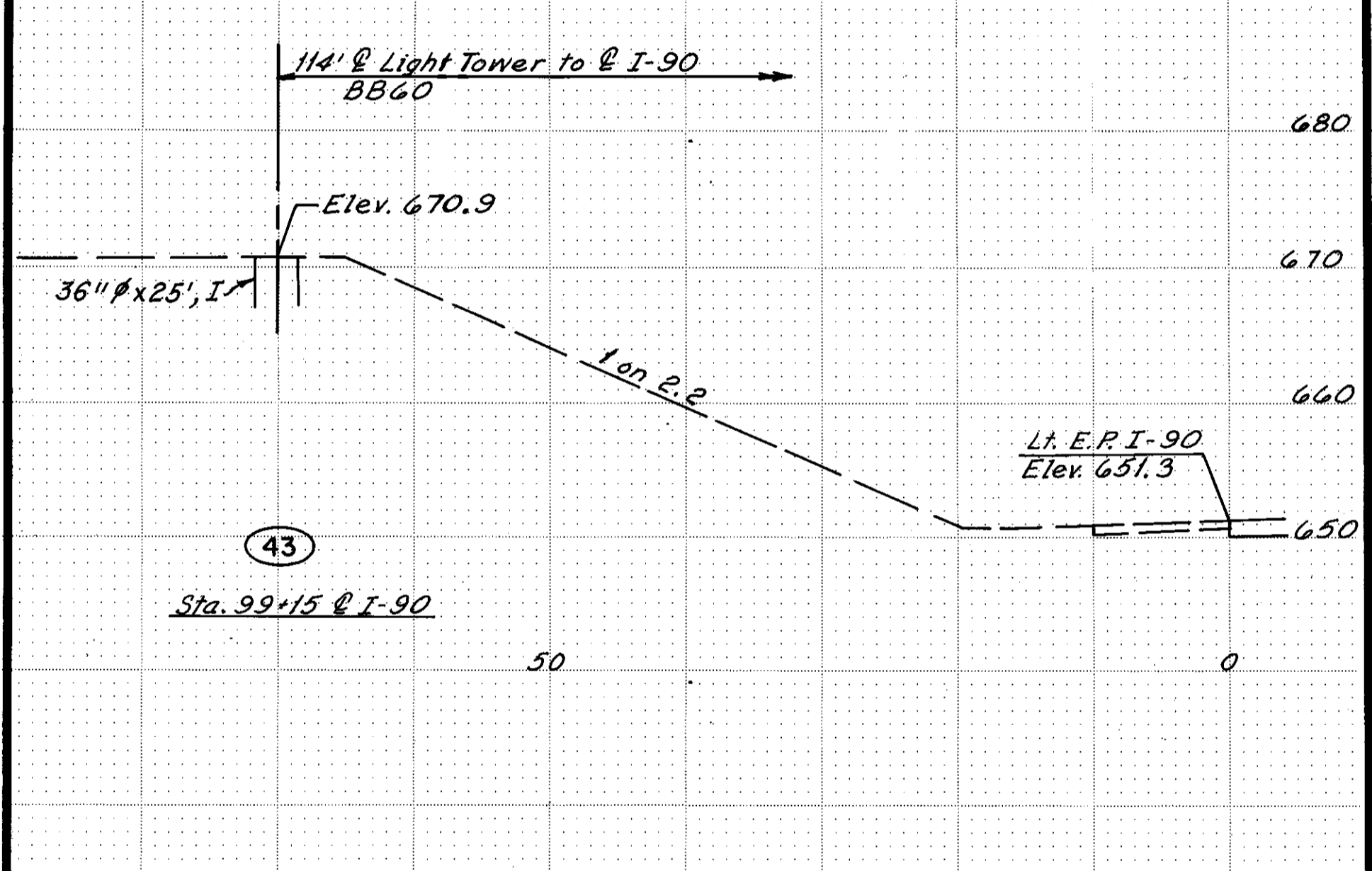
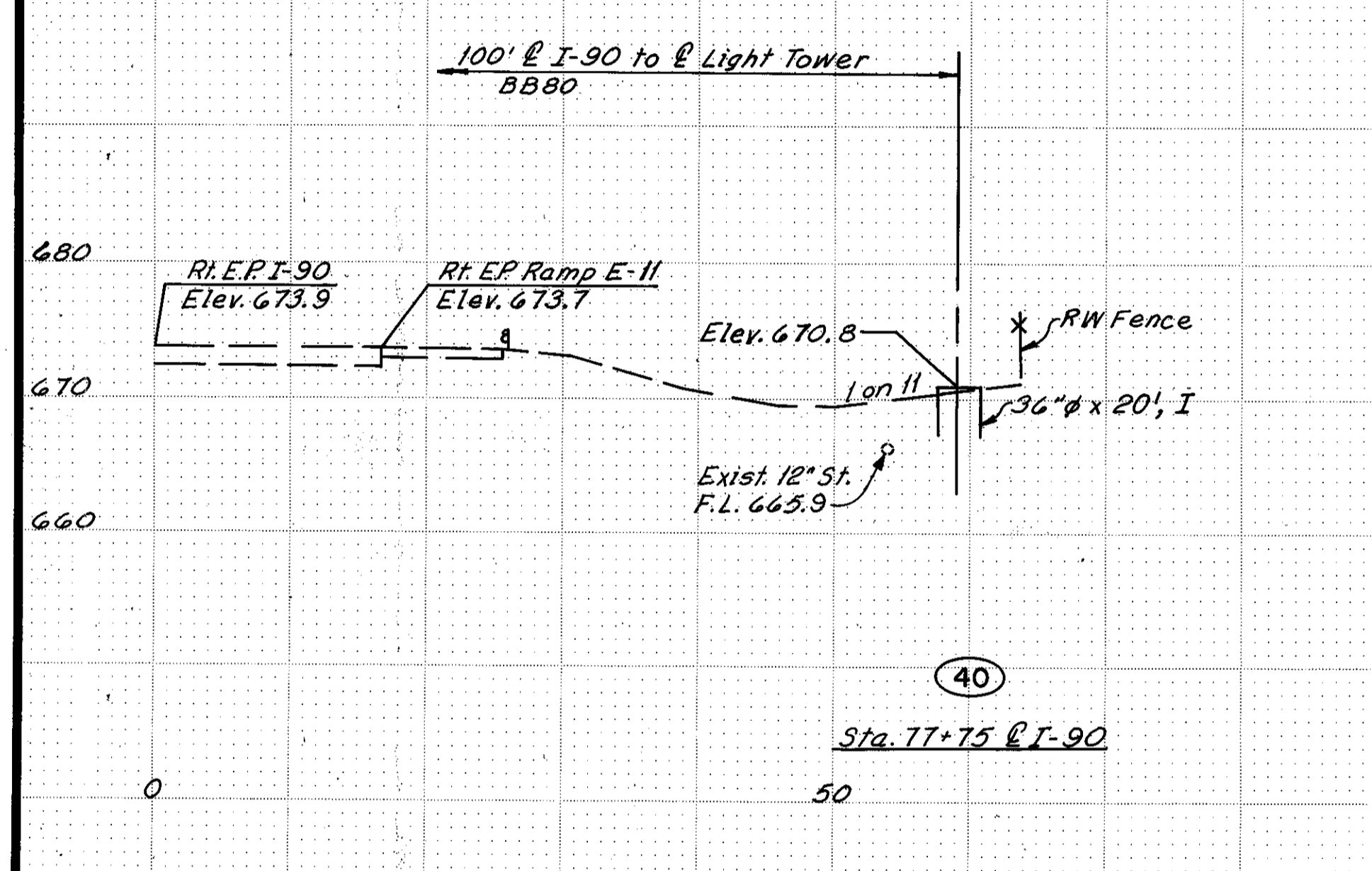
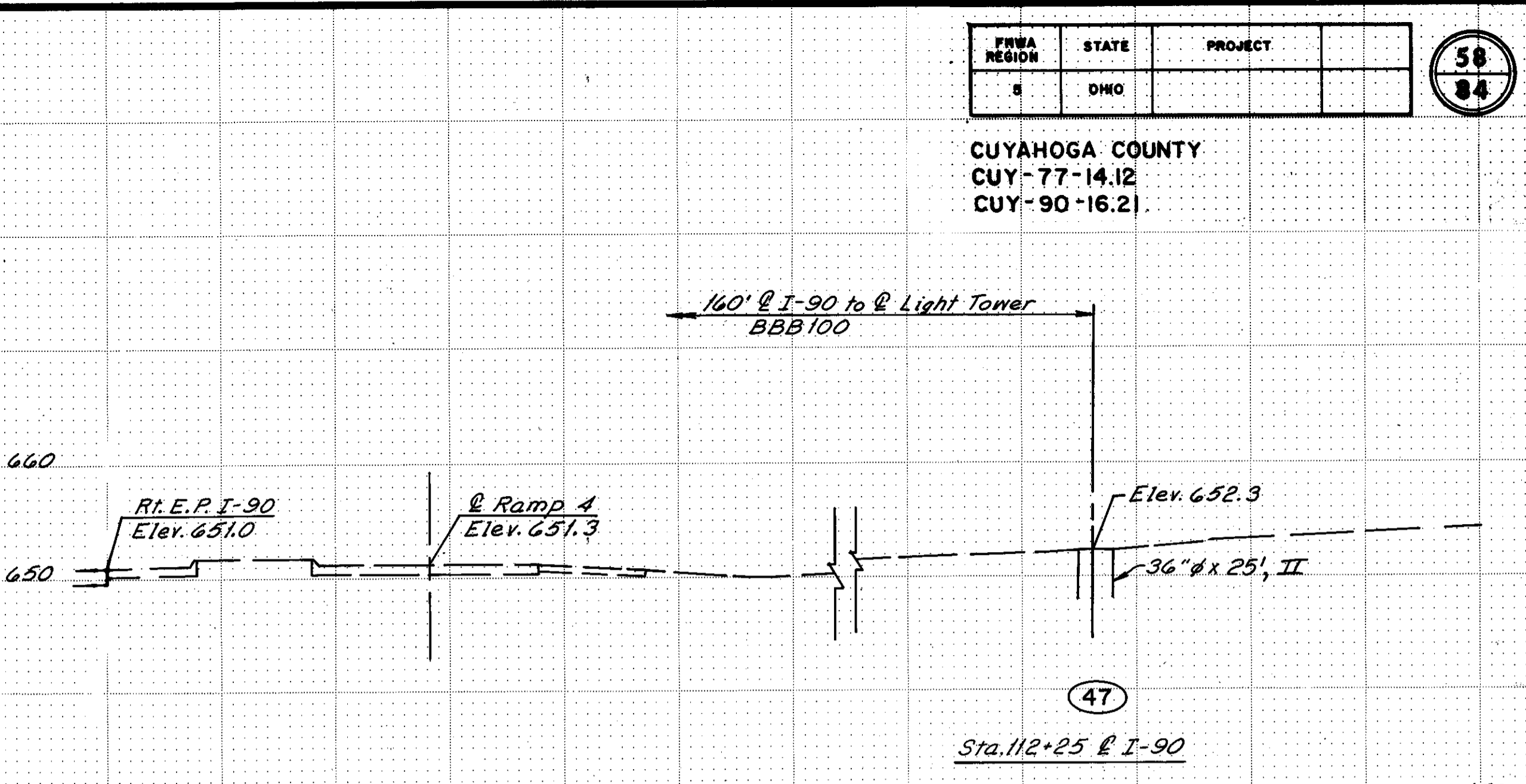
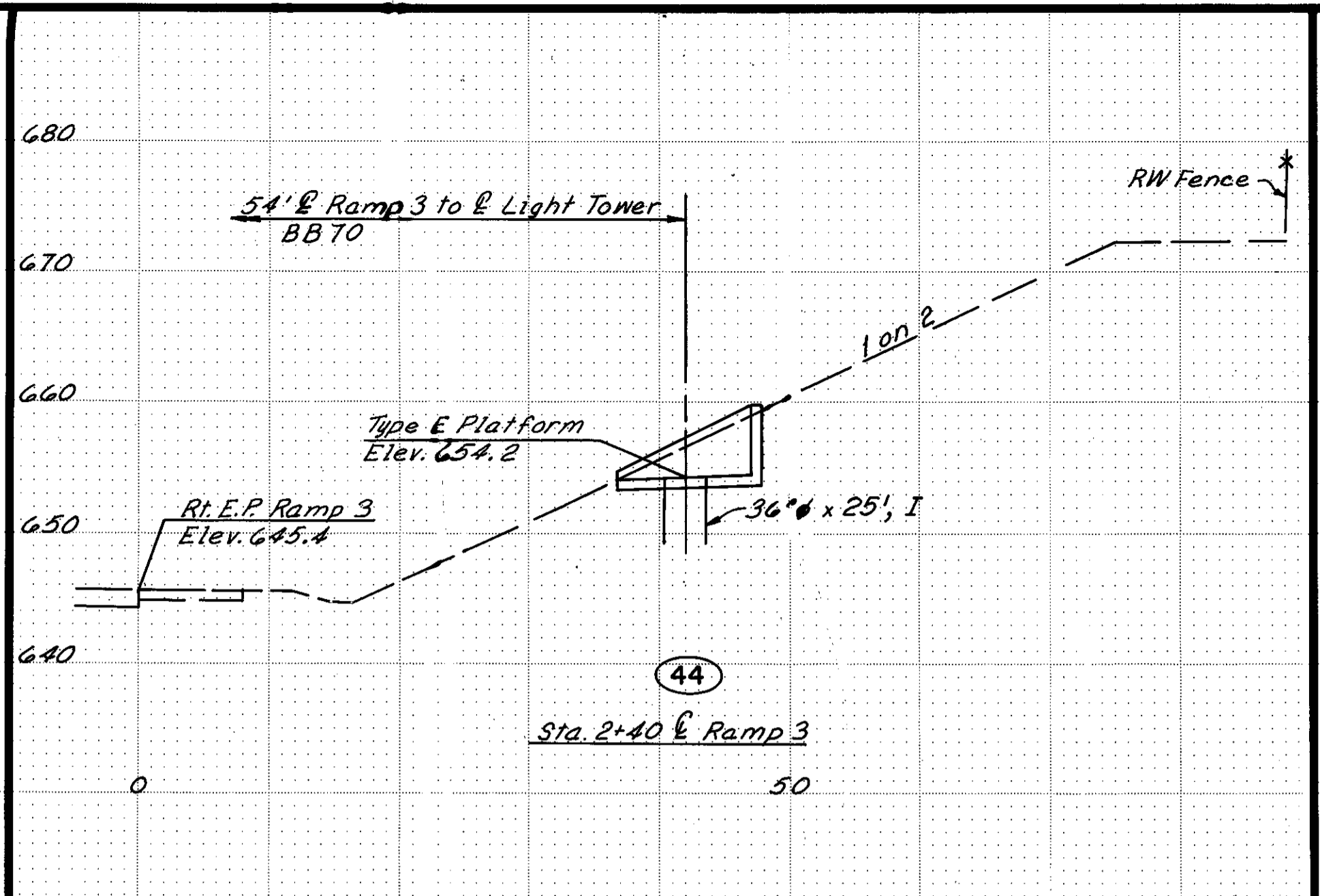
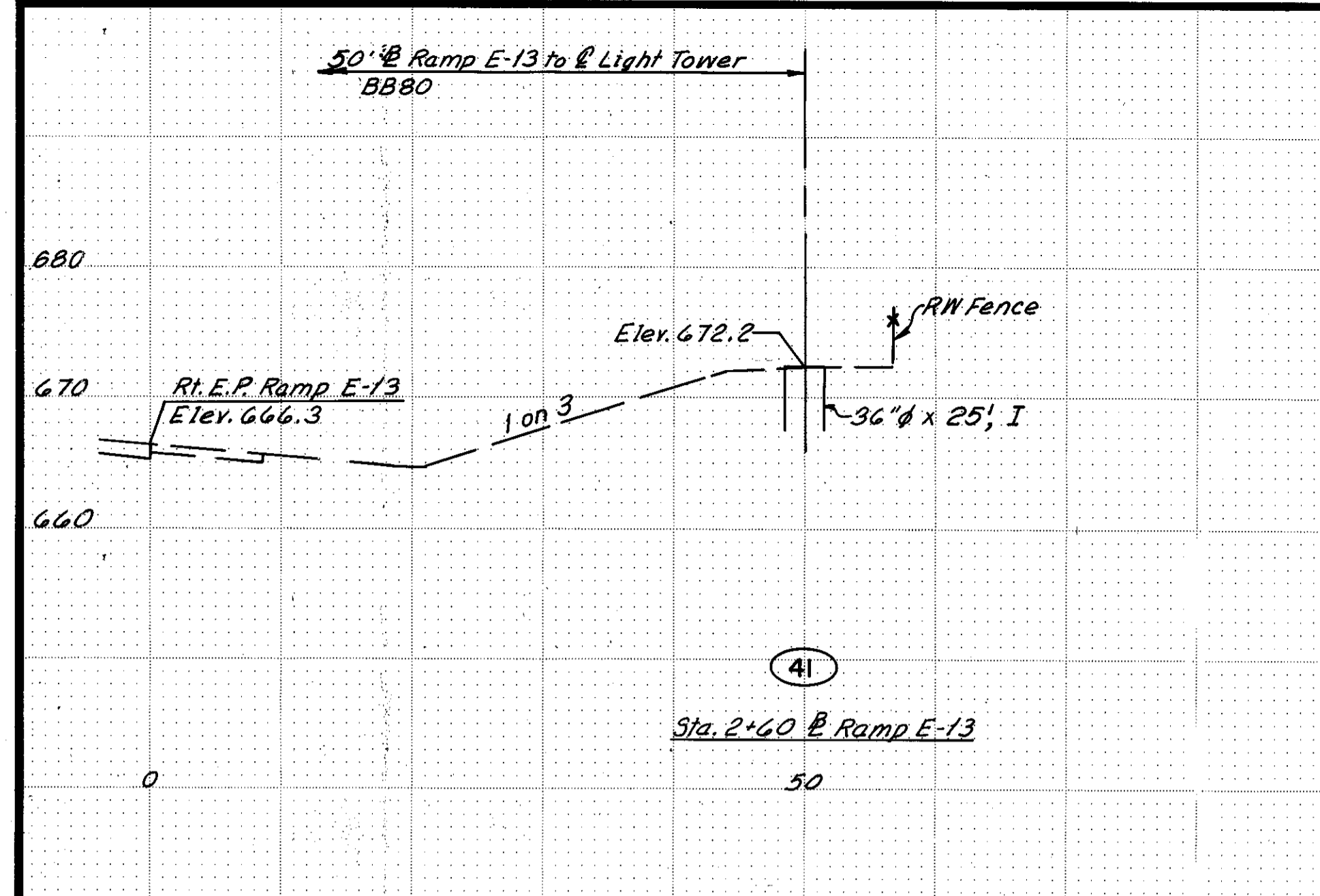
Rev. 3-21-78

Pavement elevations are to be corrected  
as per Elevation Datum note on Sheet 3.

FWWA REGION	STATE	PROJECT
5	OHIO	

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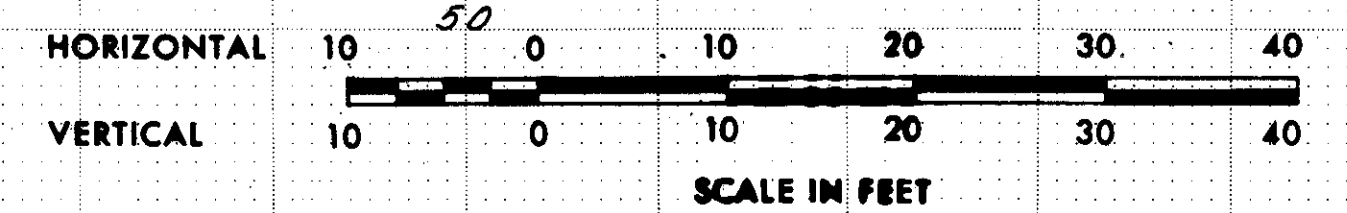
CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21



MADE ERH DATE 6-15-76  
 TRACED LBY DATE 7-12-76  
 CHECKED EBY DATE 12-16-76  
 SCALE 1"=10'

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

**HNTB**

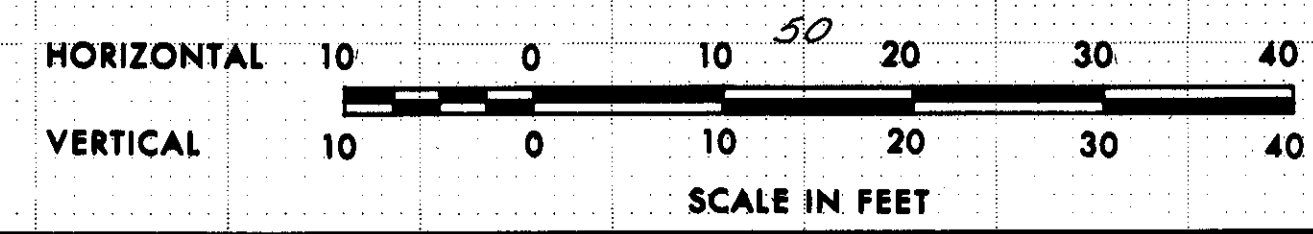
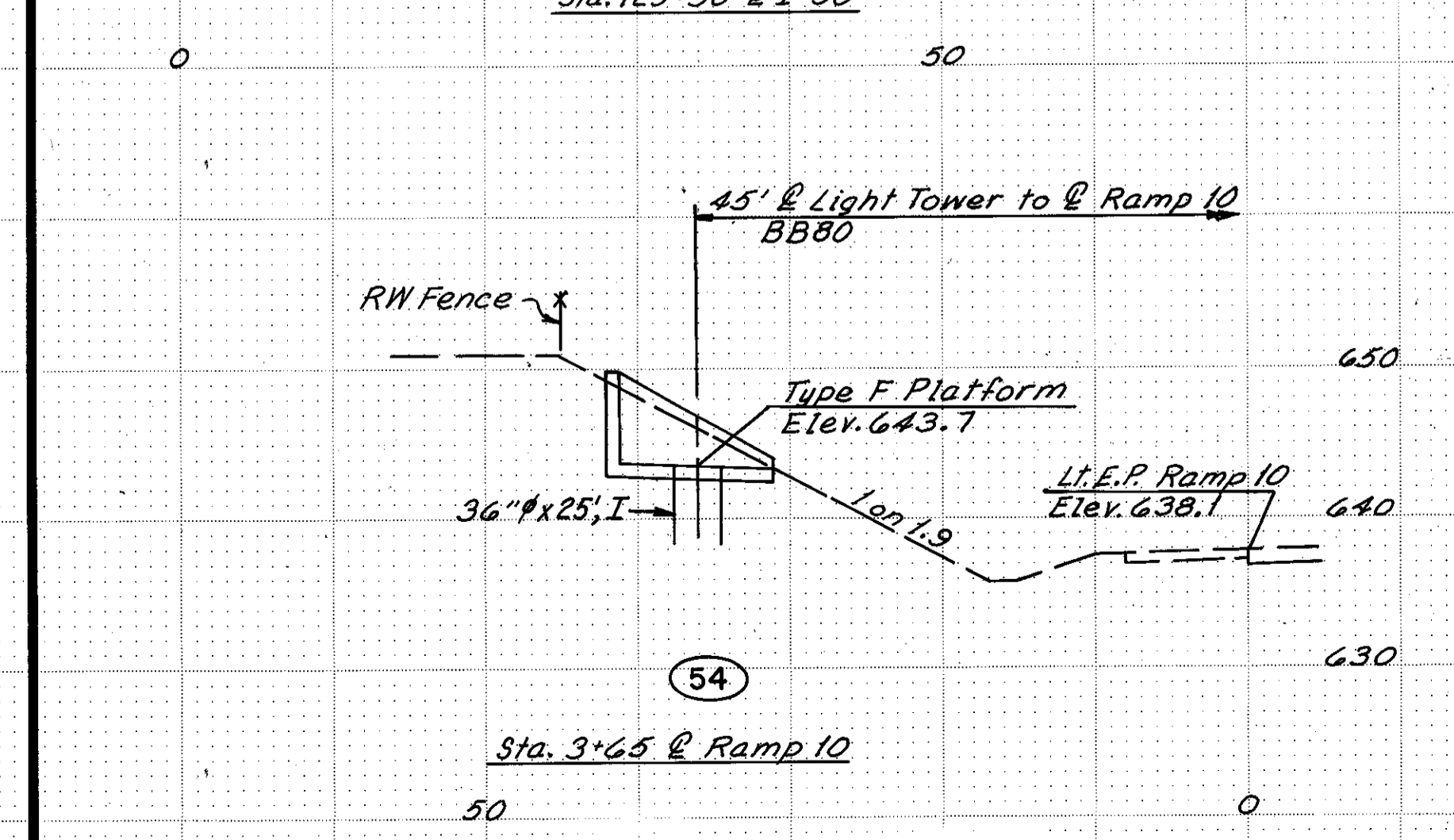
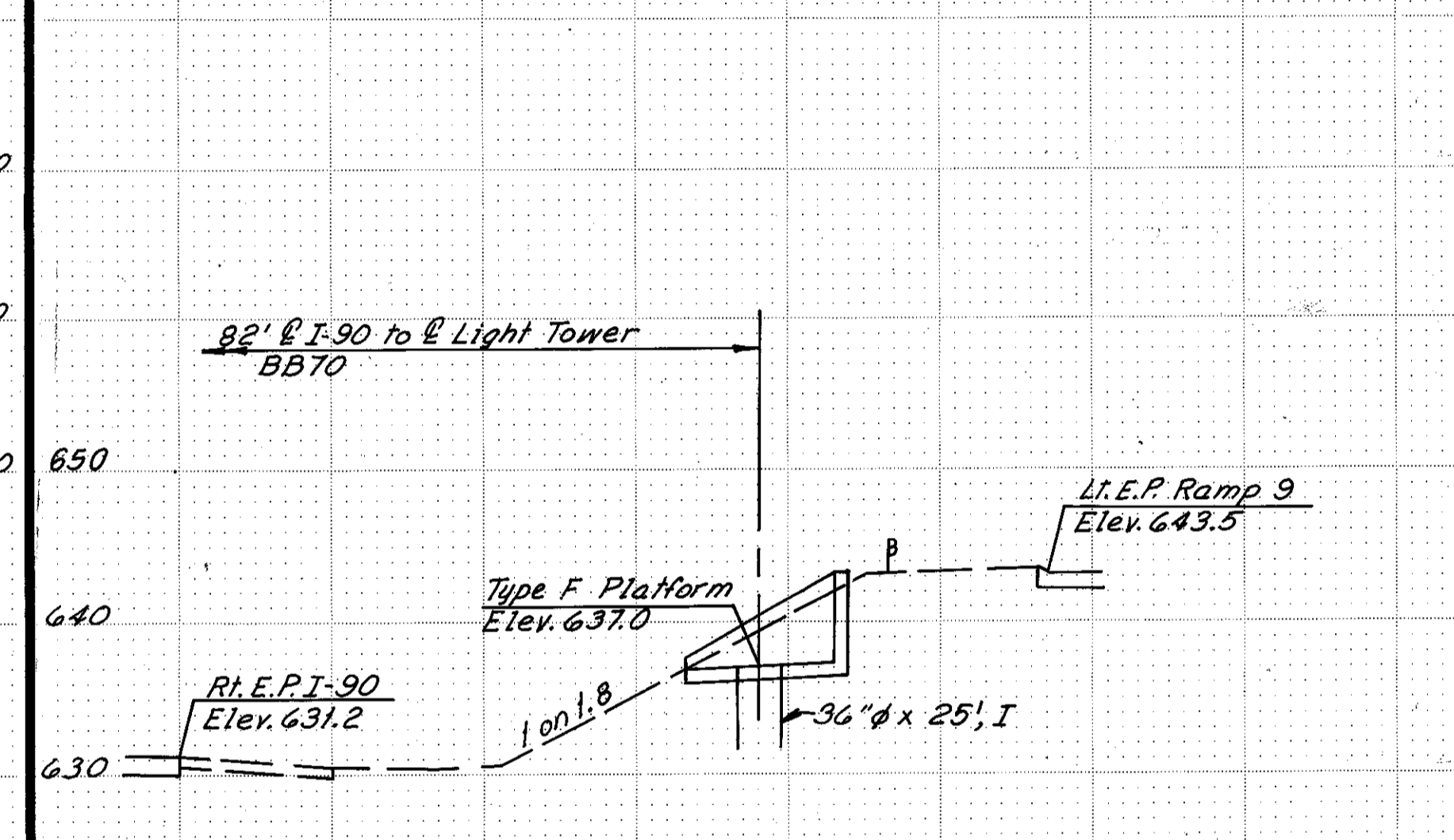
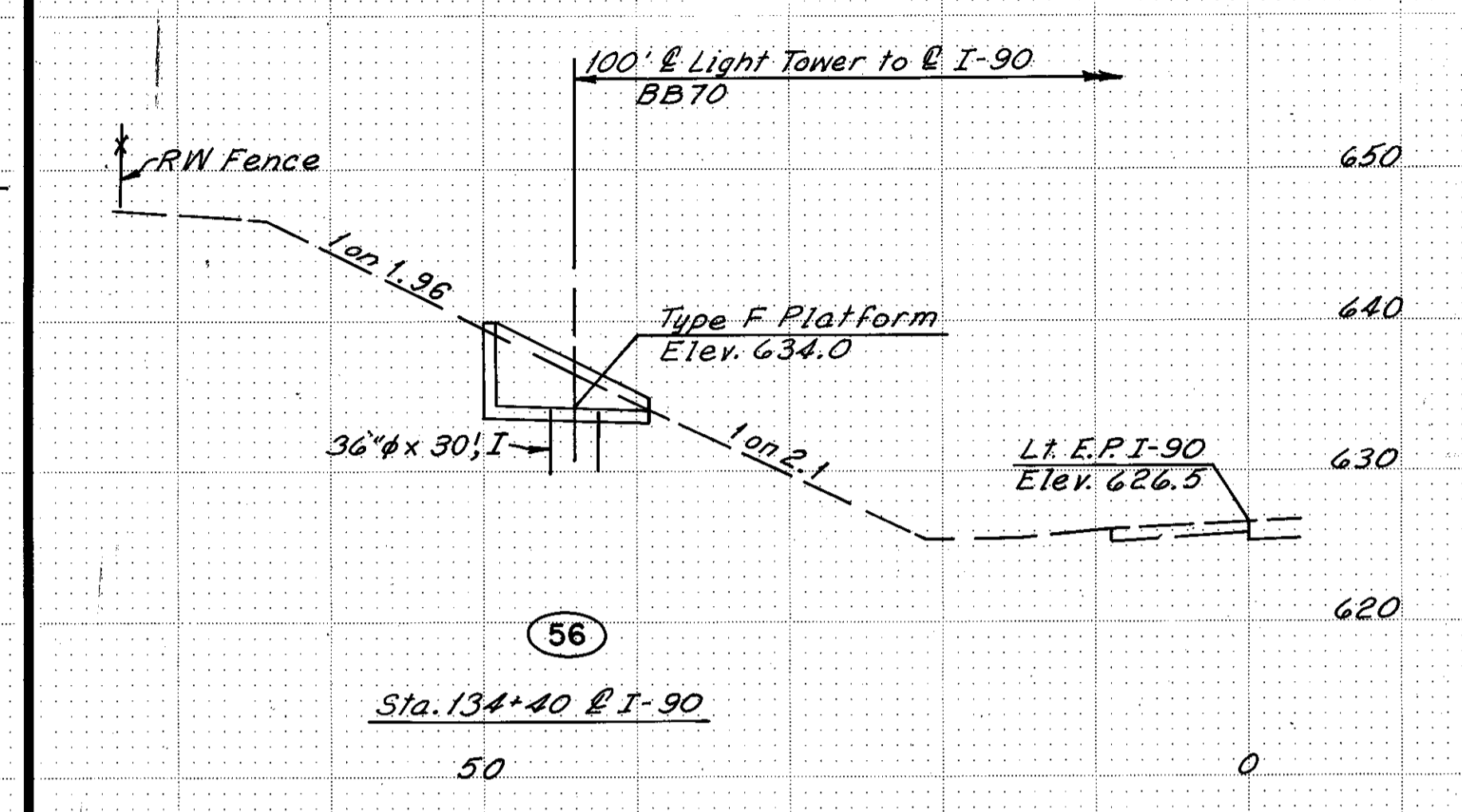
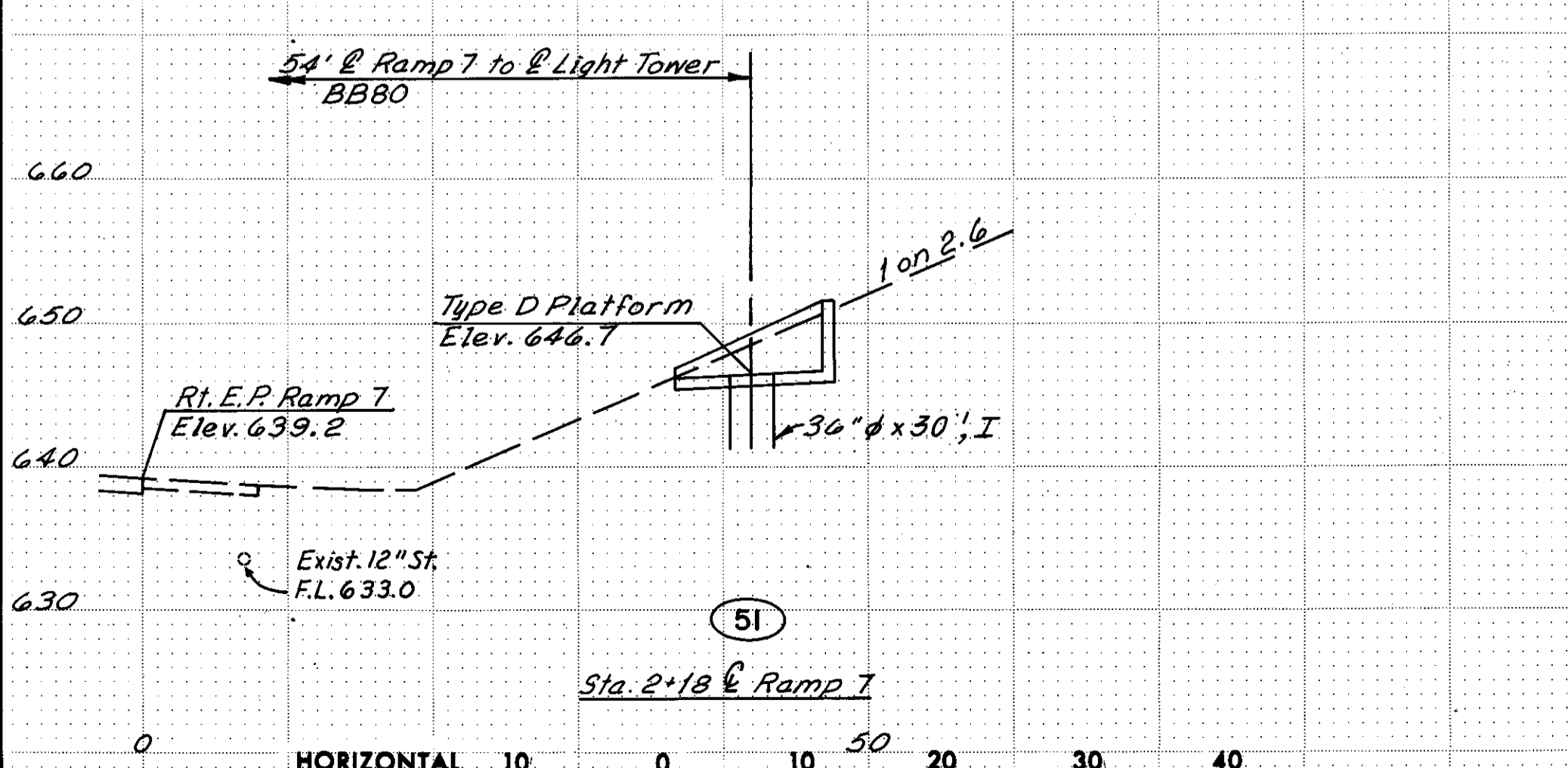
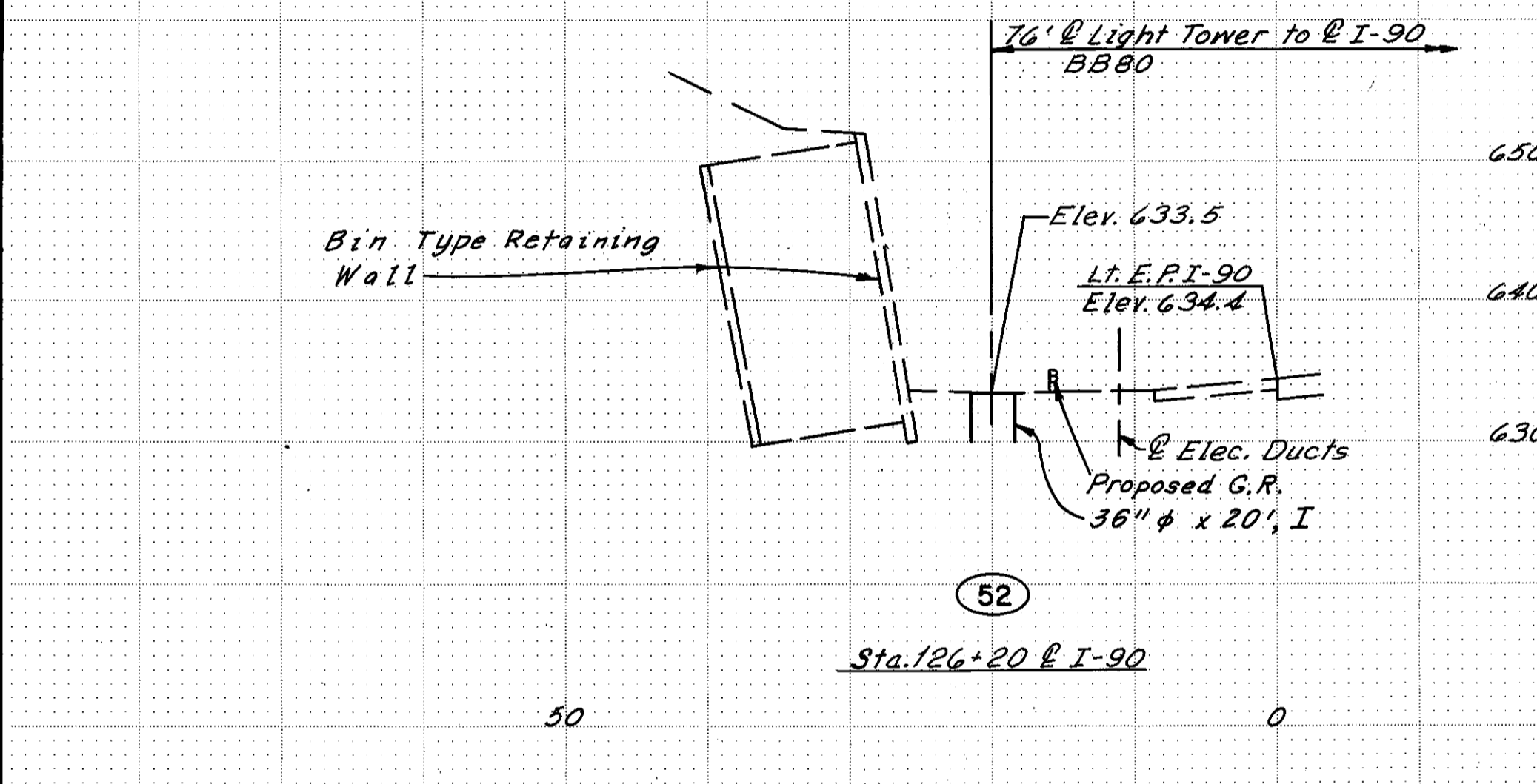
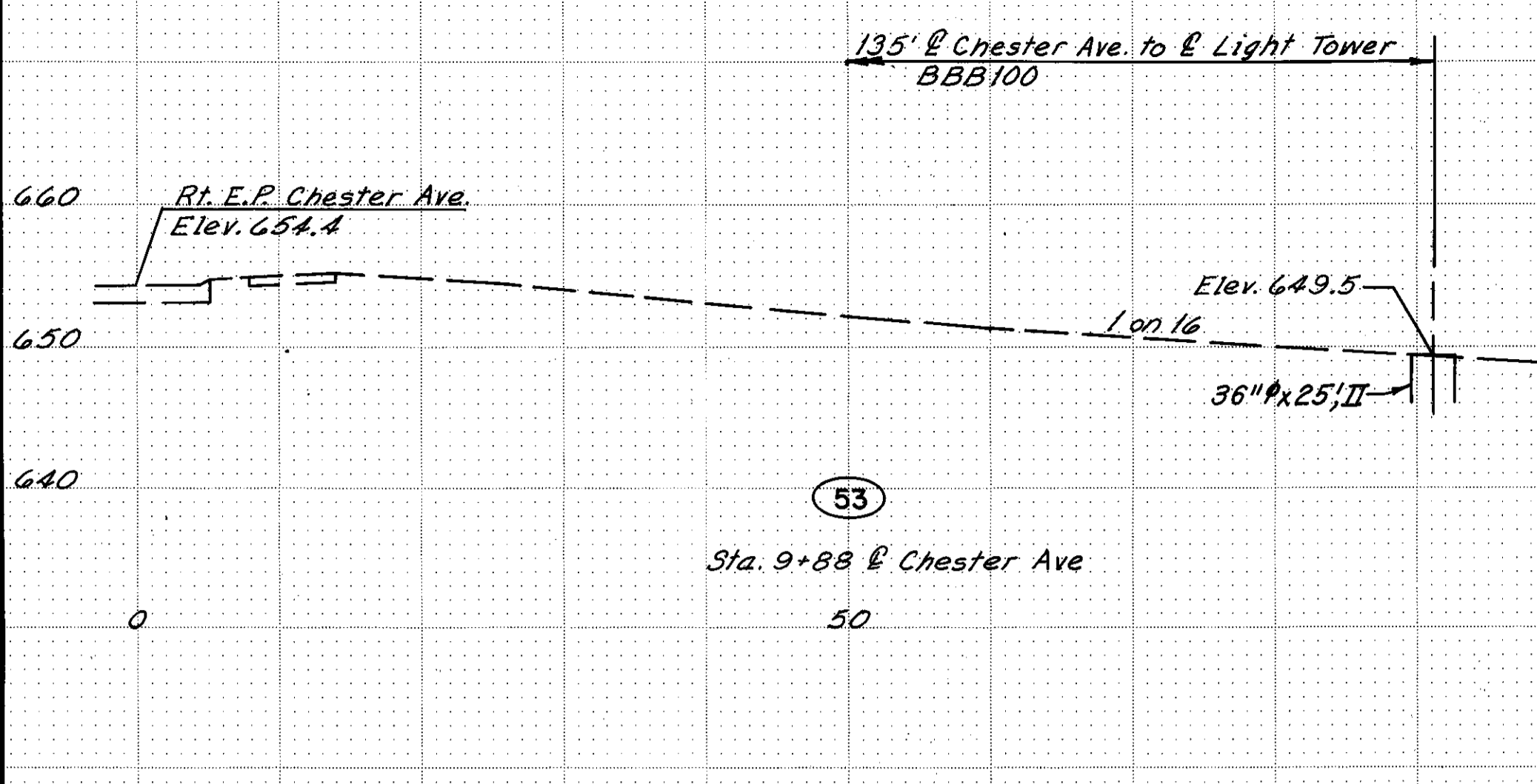
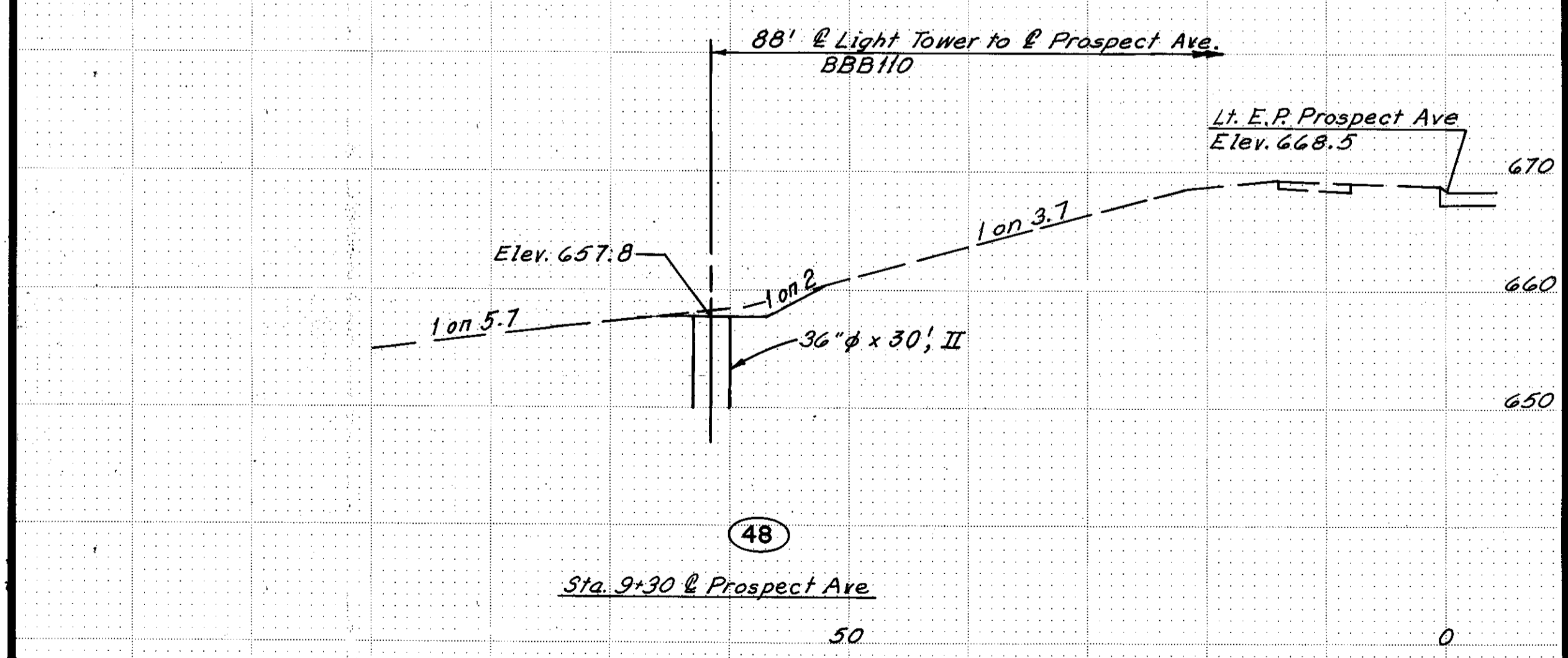
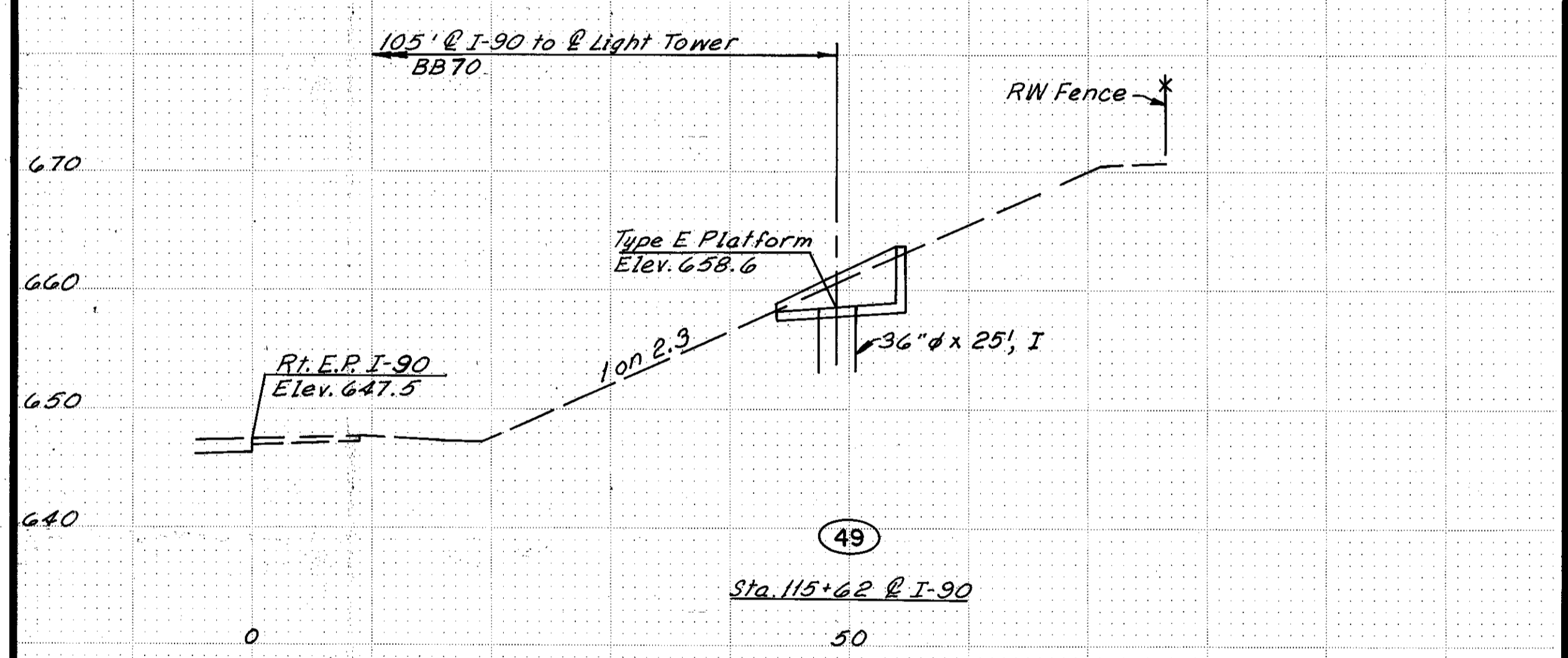
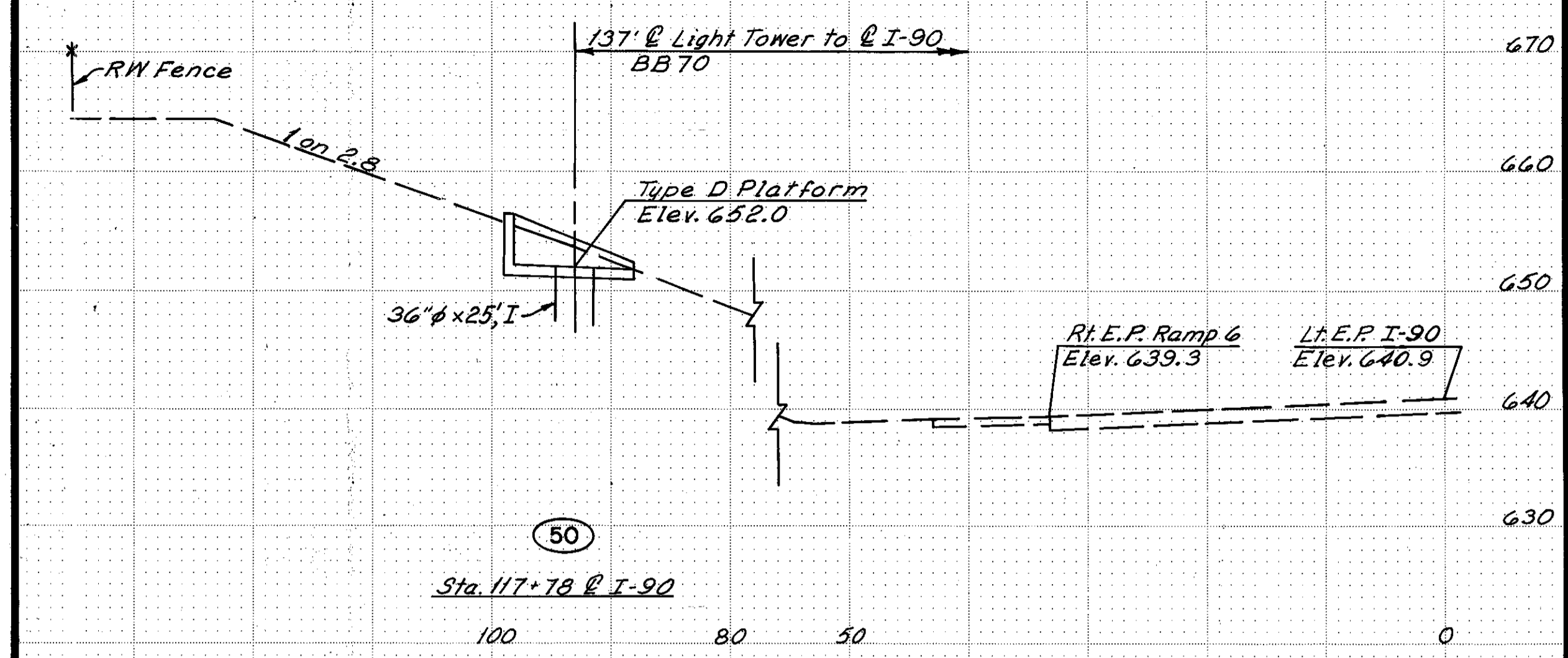


Pavement elevations are to be corrected as per Elevation Datum note on Sheet 3.

FHWA REGION	STATE	PROJECT
5	OHIO	

59  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



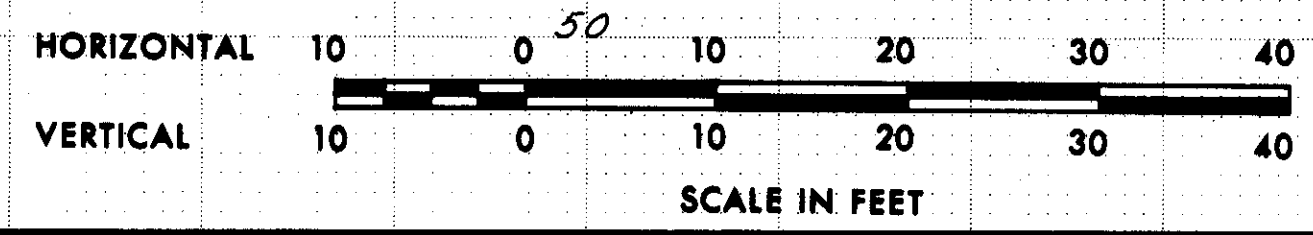
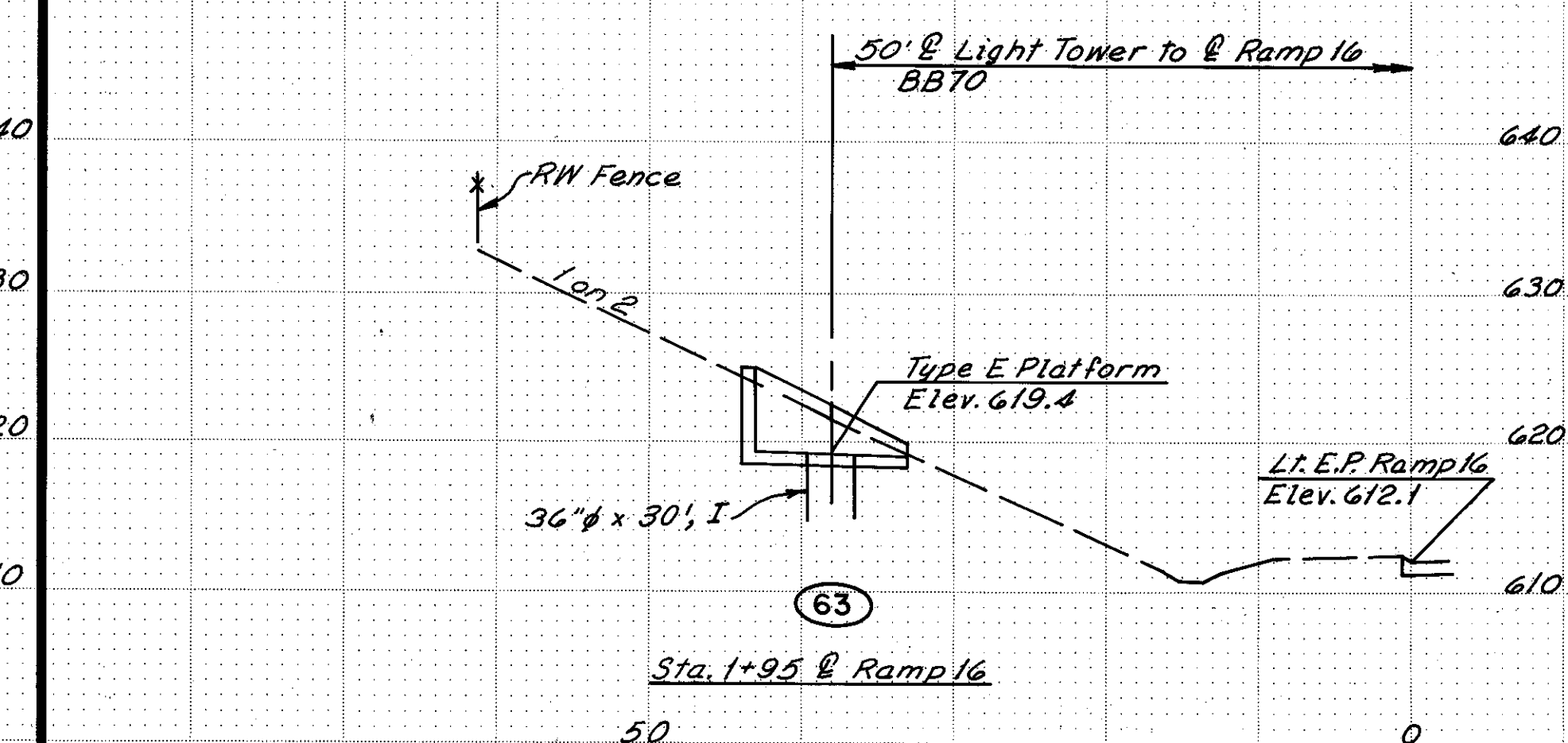
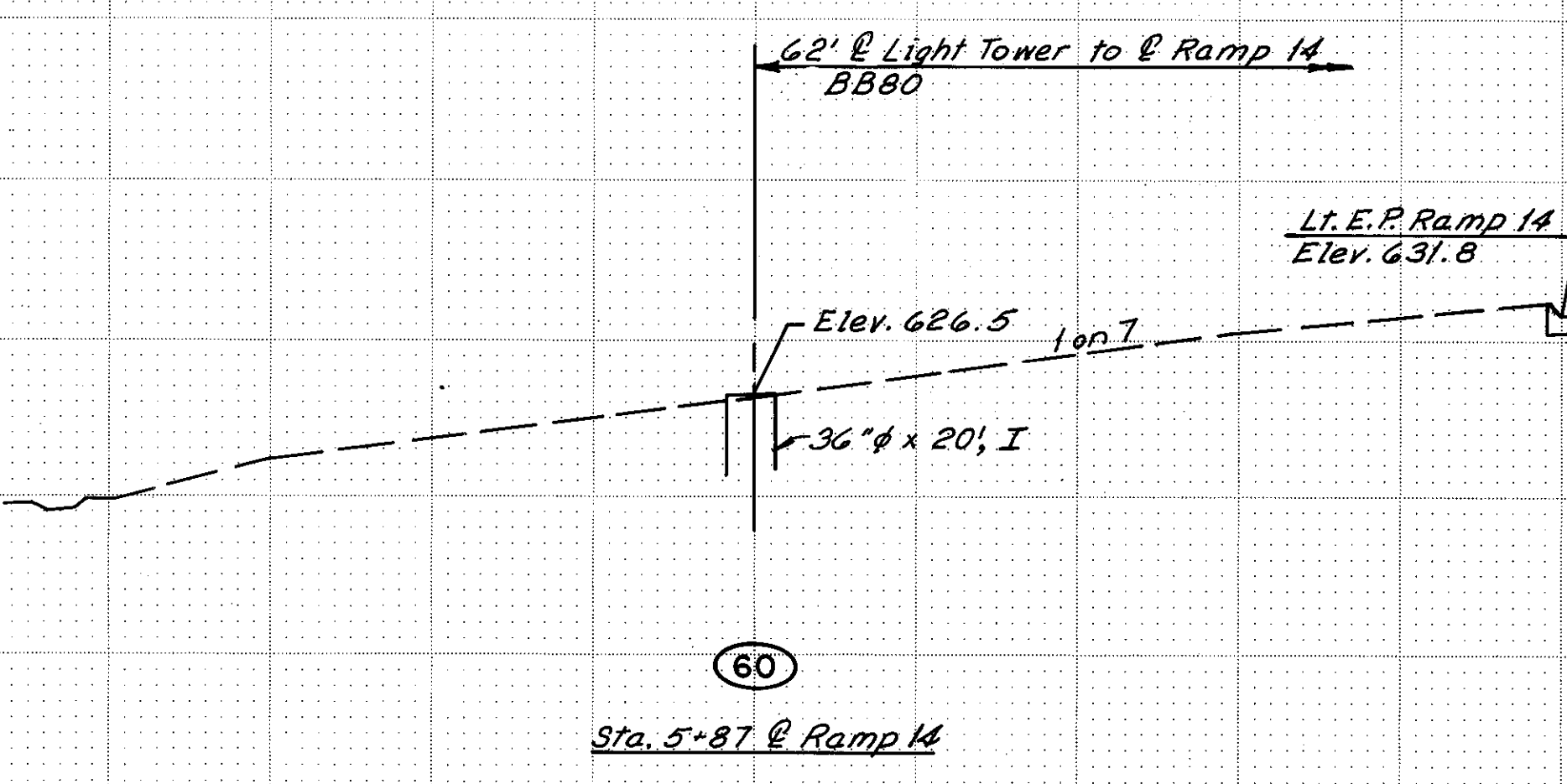
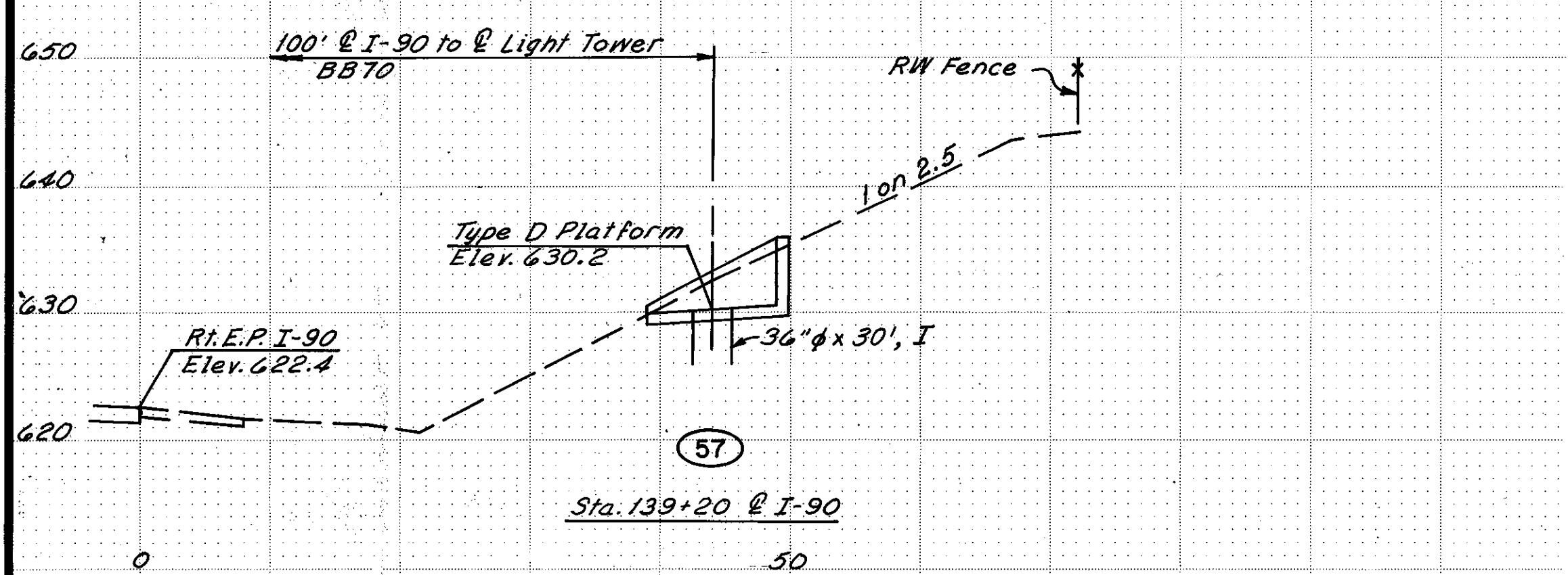
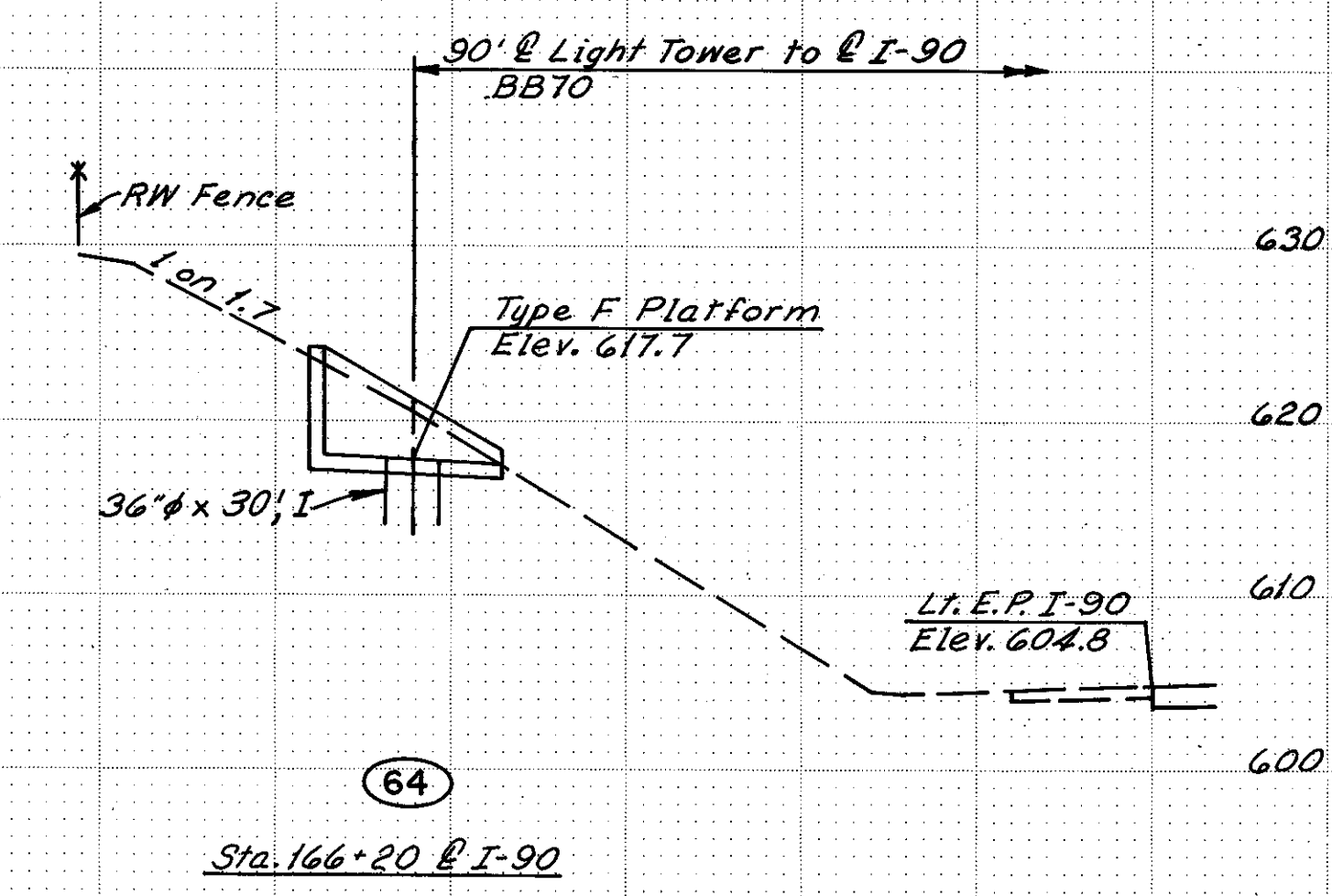
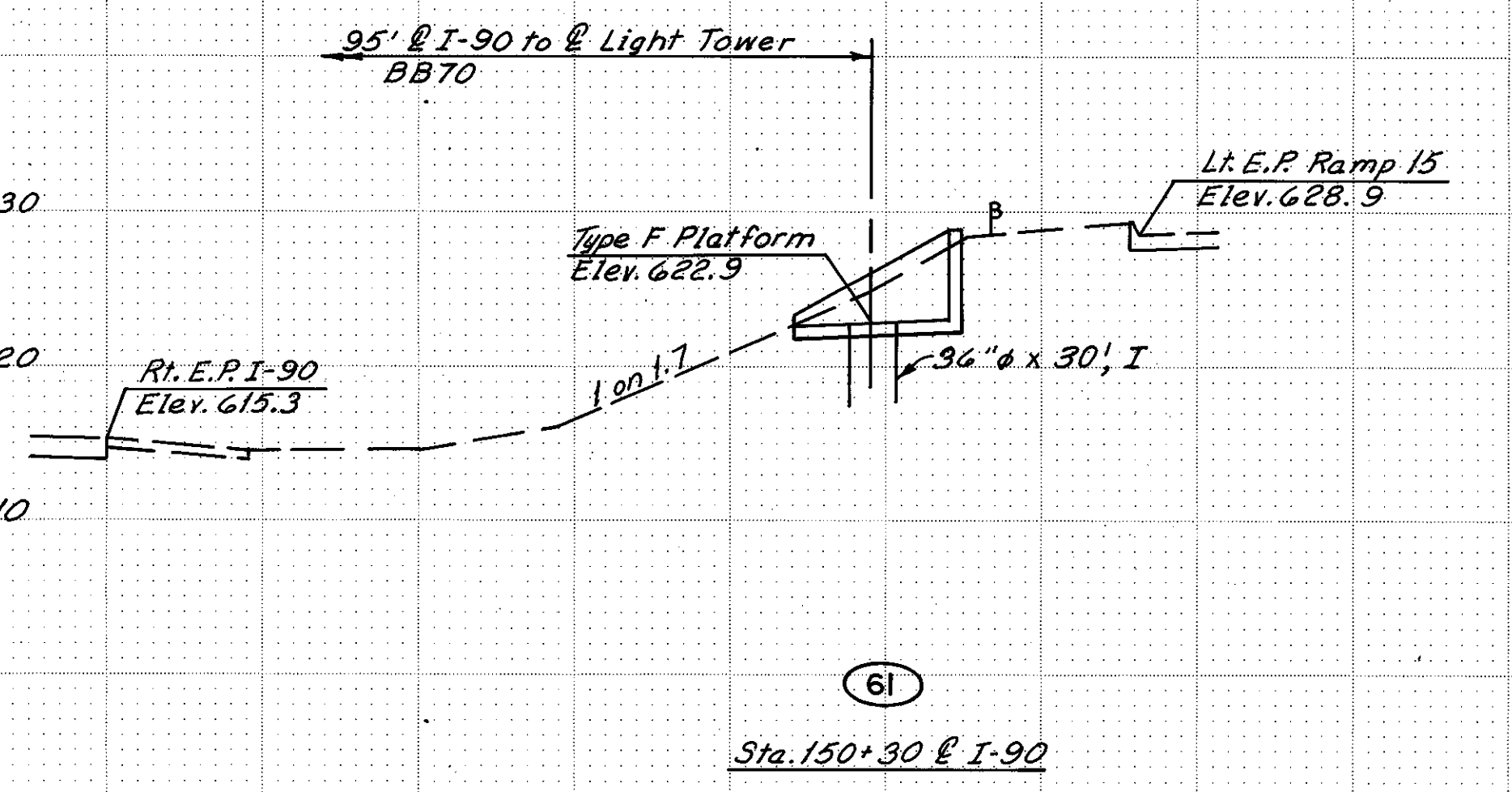
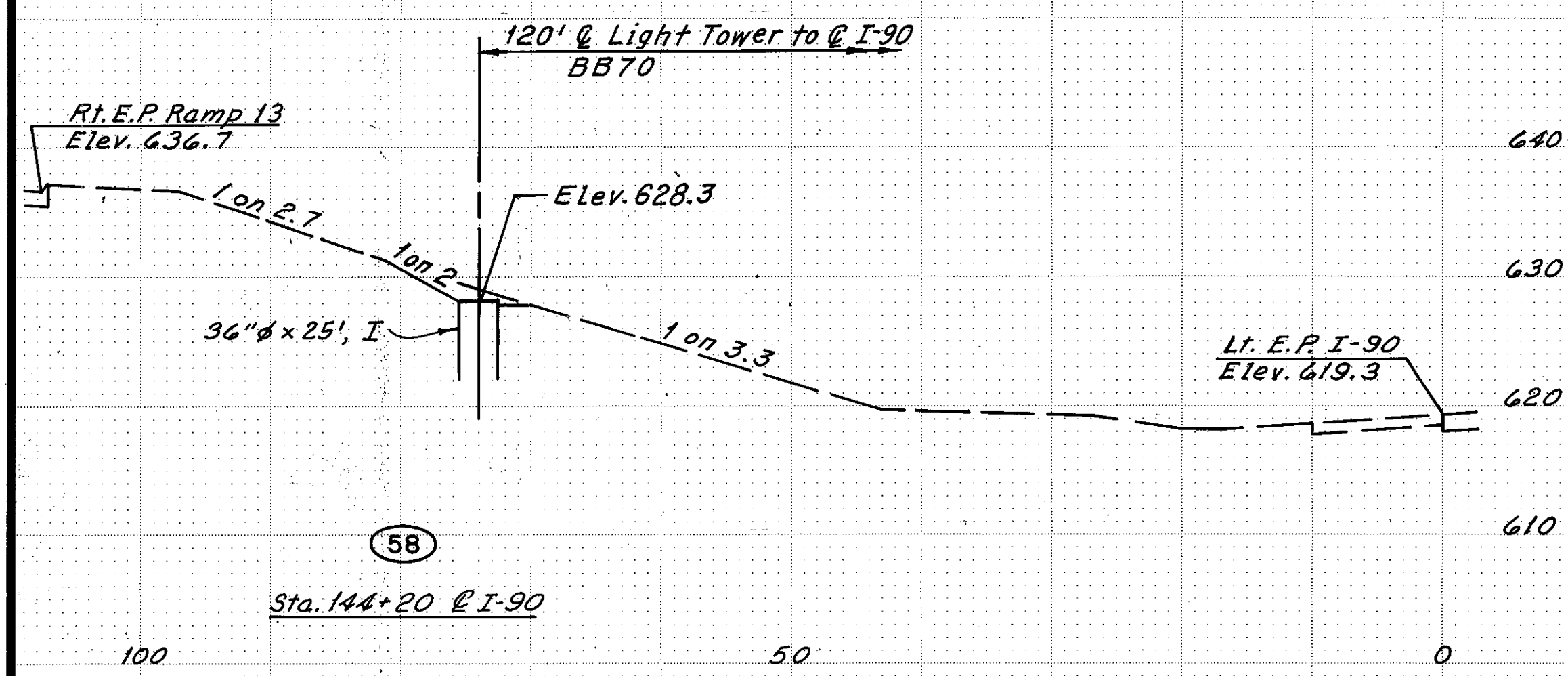
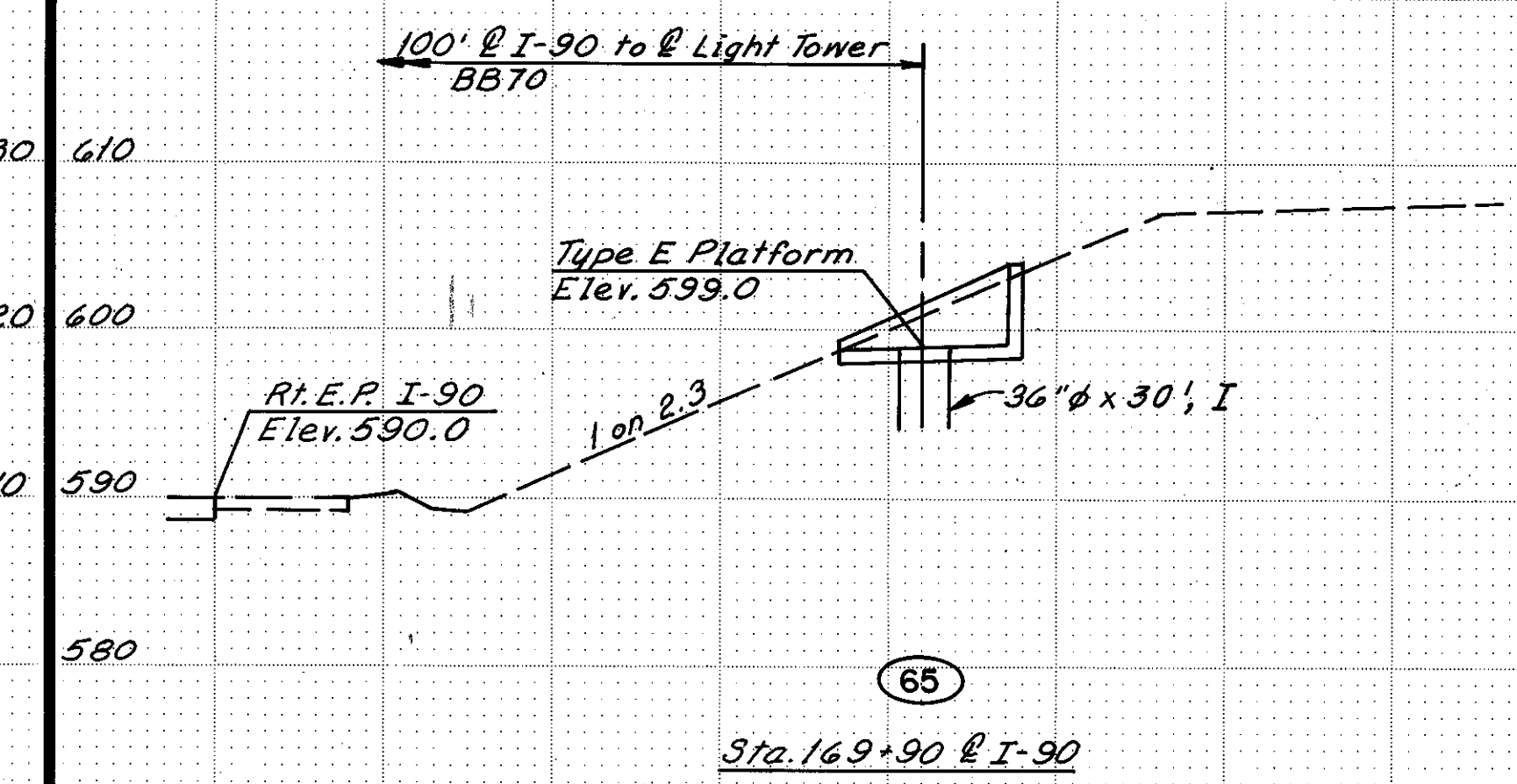
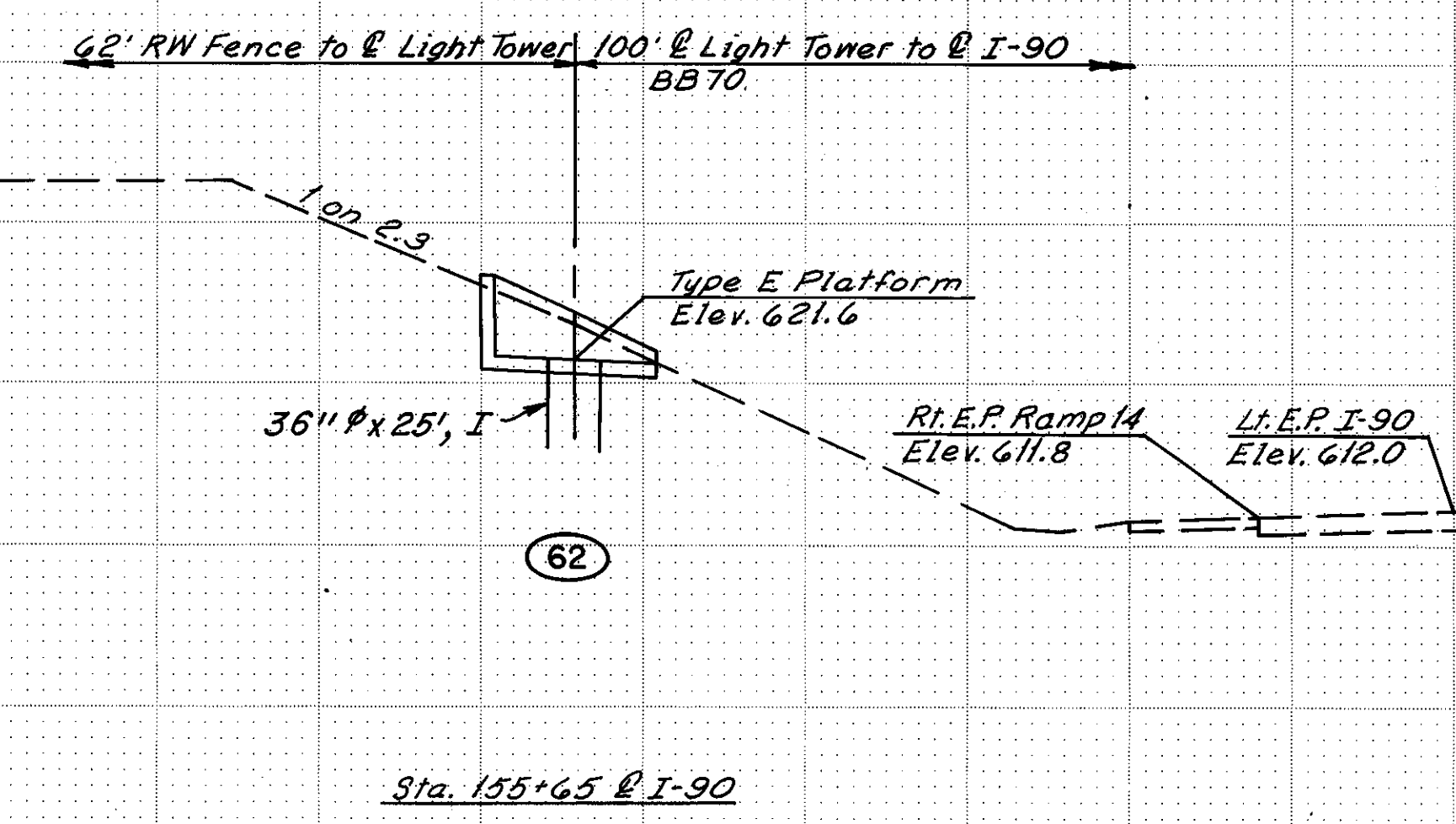
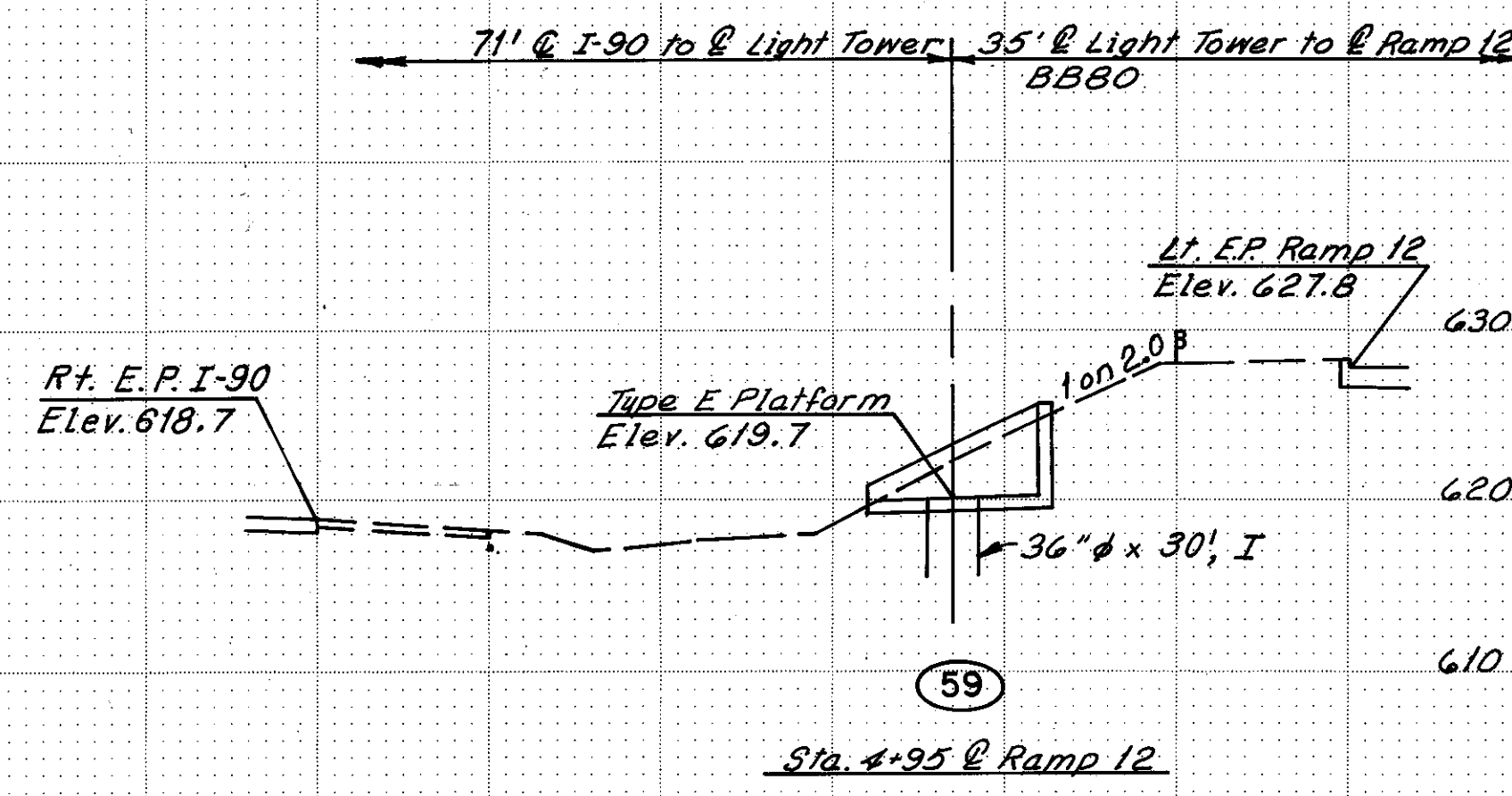
MADE ERH DATE 6-16-76  
TRACED TAK DATE 9-16-76  
CHECKED EEL DATE 12-18-76  
SCALE 1"=10'

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

**HNTB**

Pavement elevations are to be corrected  
as per Elevation Datum note on Sheet 3.

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



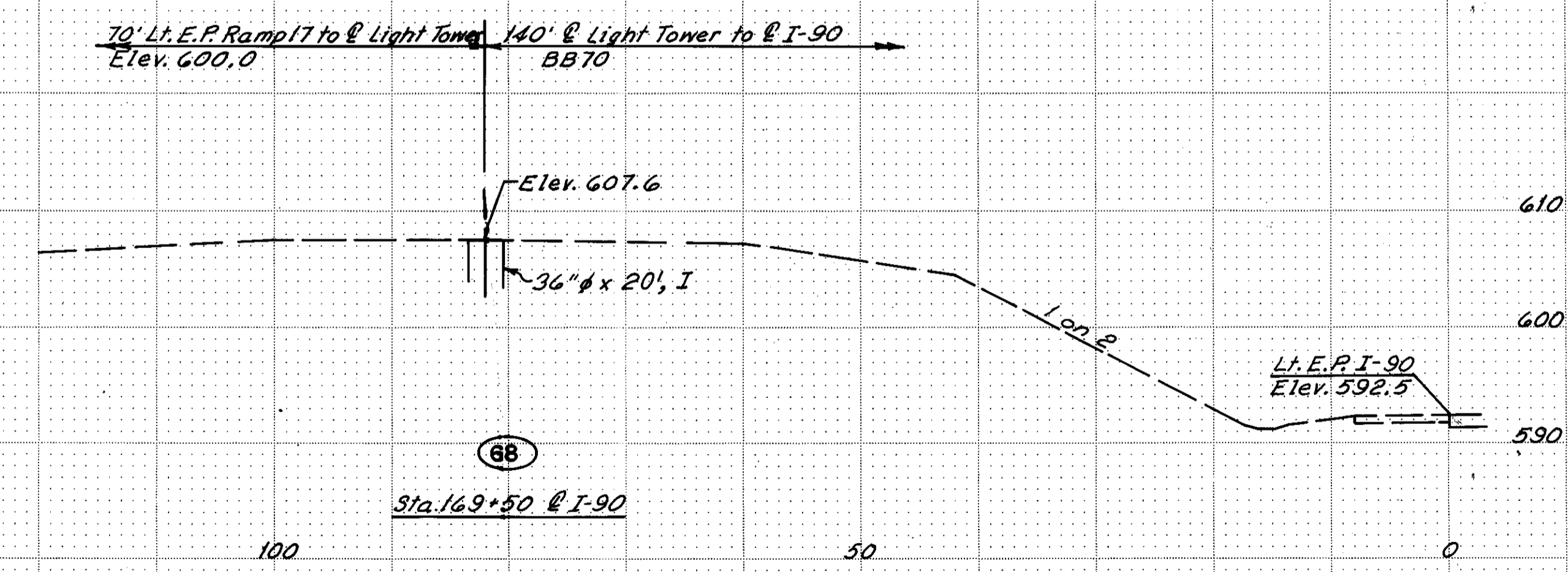
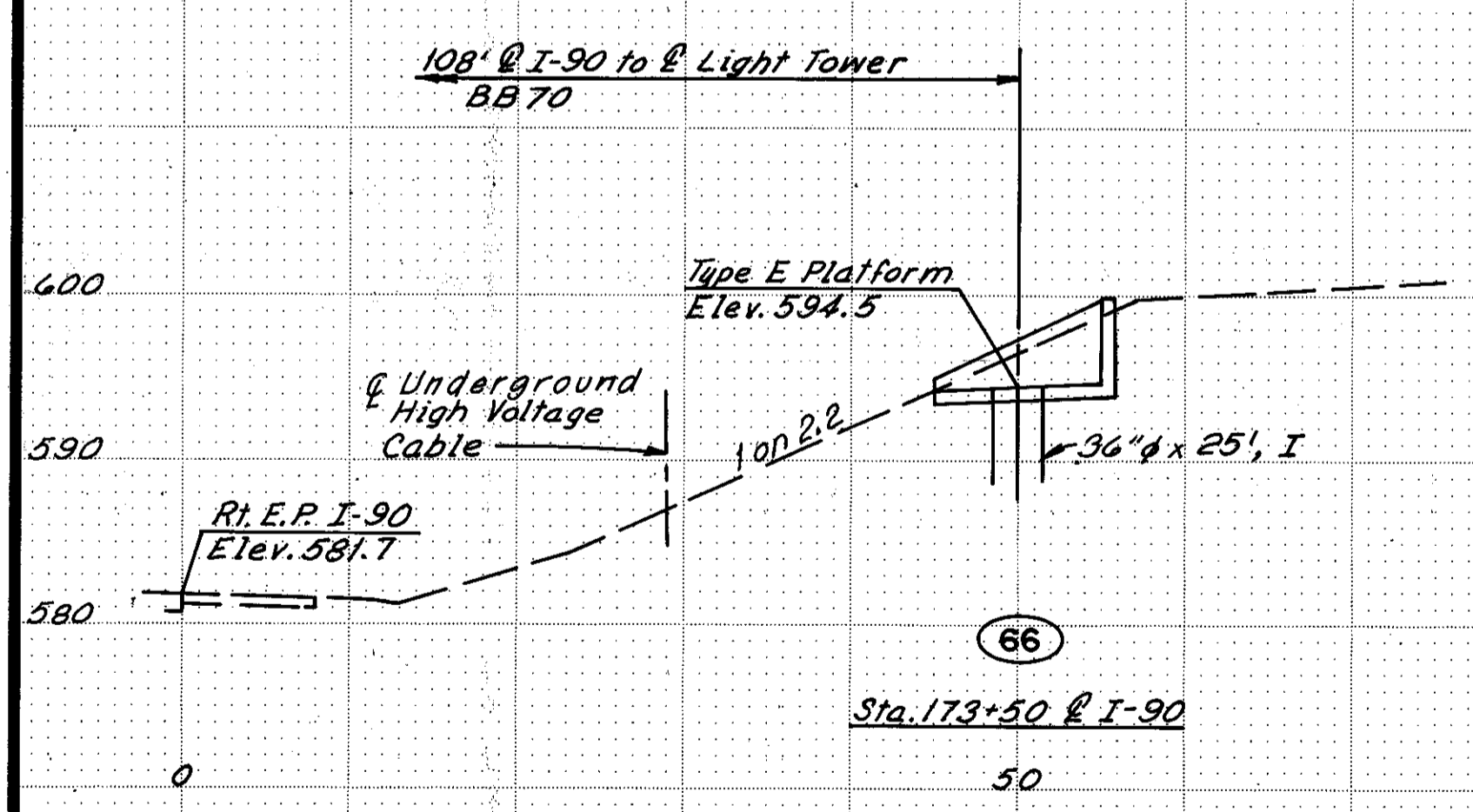
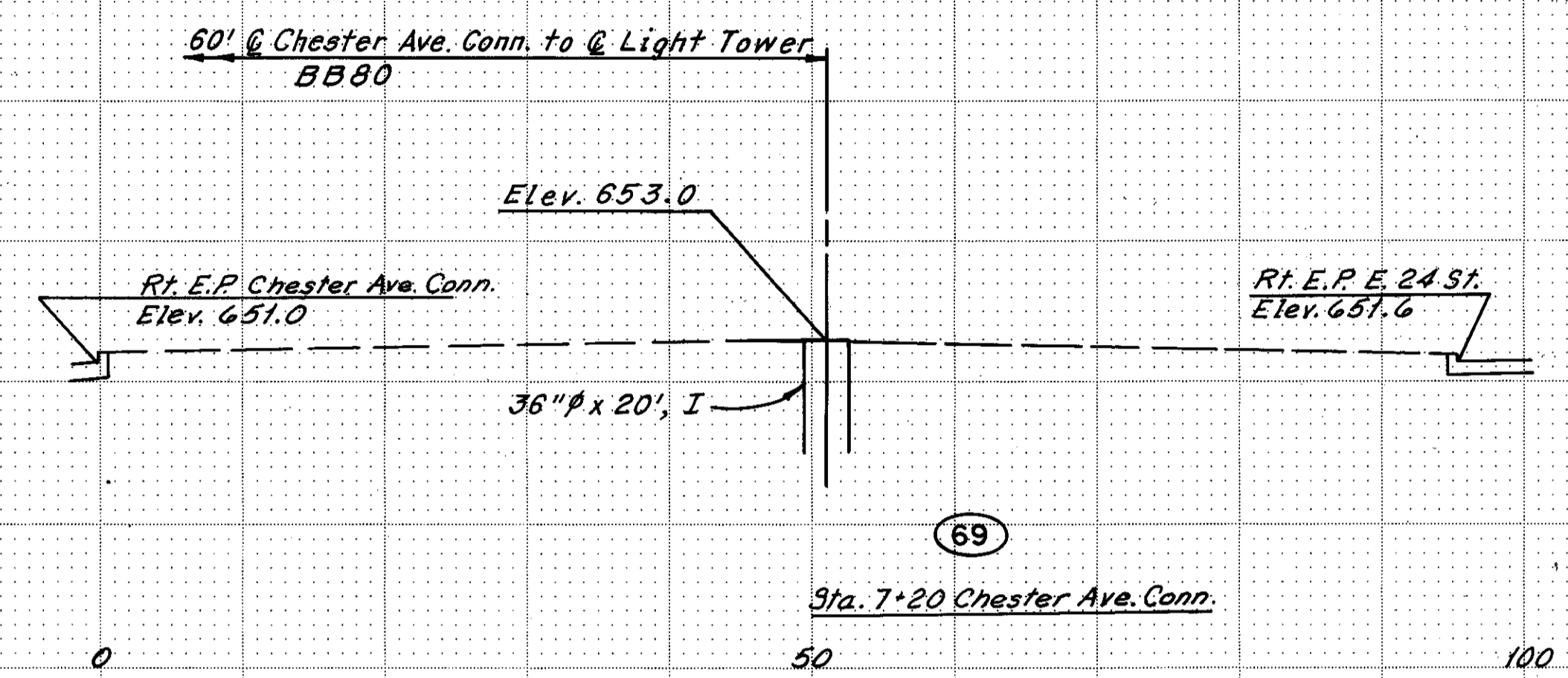
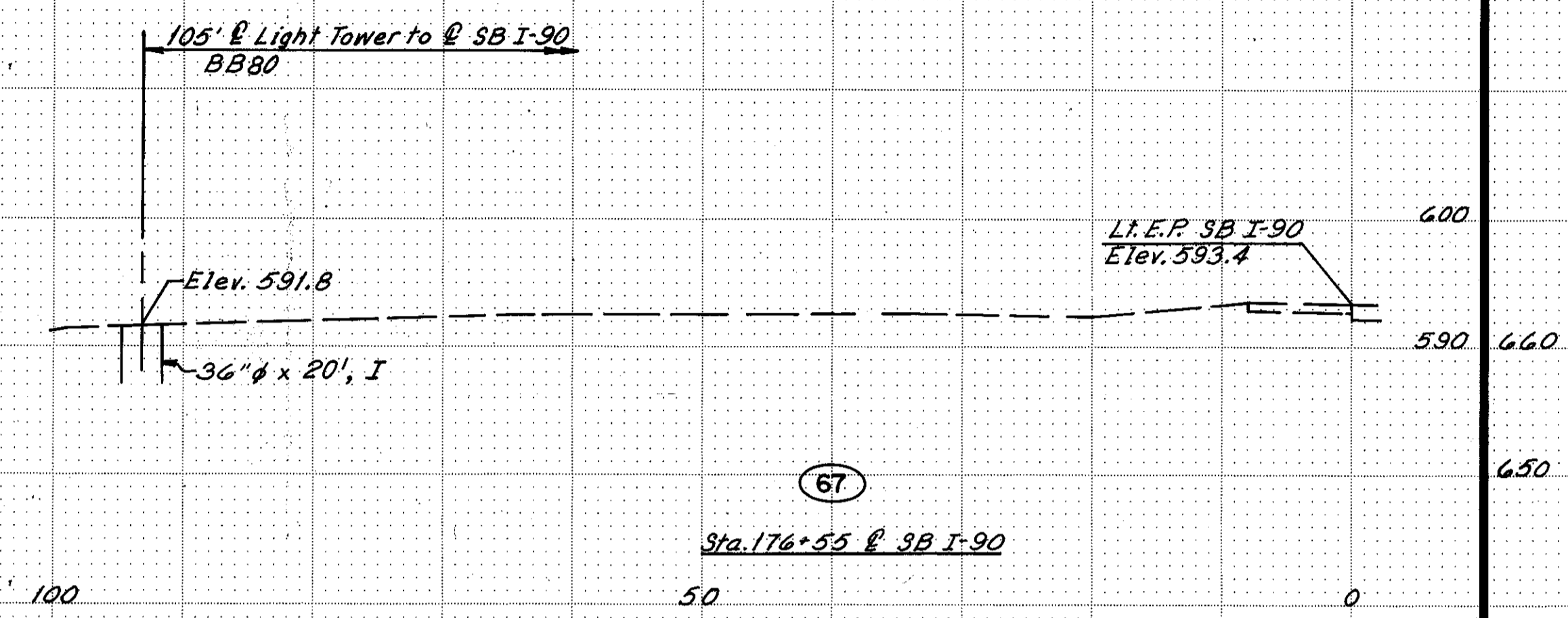
MADE ERH DATE 6-18-76  
TRACED TAE DATE 9-18-76  
CHECKED EEV DATE 12-18-76  
SCALE 1"=10'

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



Pavement elevations are to be corrected as per Elevation Datum note on Sheet 3.

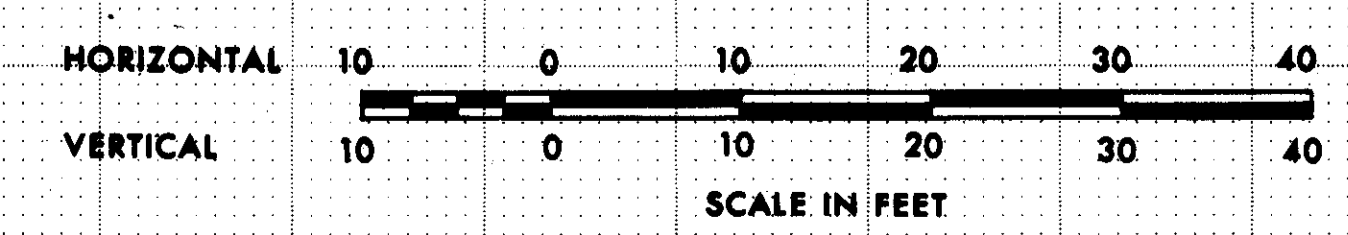




MADE E.H. DATE 6-14-76  
 TRACED T.A.K. DATE 7-17-76  
 CHECKED E.F.U. DATE 7-18-76  
 SCALE 1"=10'

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

**HNTB**



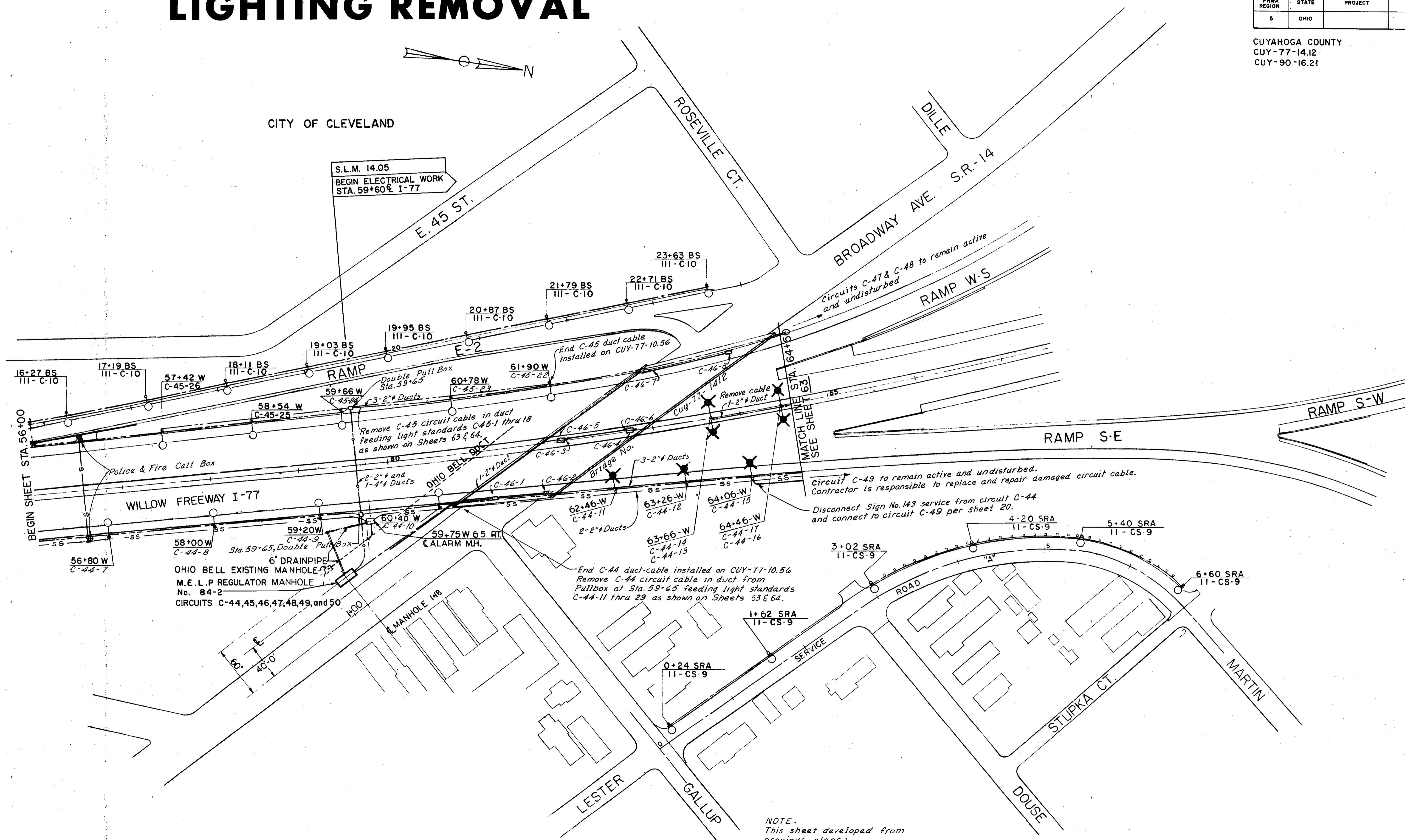
Pavement elevations are to be corrected as per Elevation Datum note on Sheet 3.

# LIGHTING REMOVAL

FHWA REGION	STATE	PROJECT
5	OHIO	

62  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



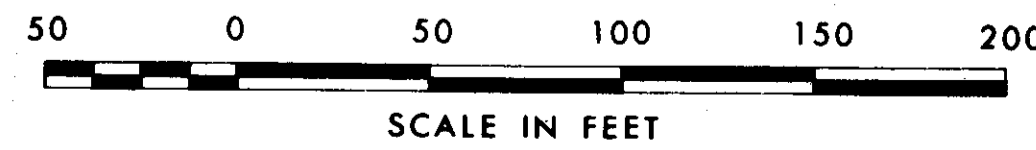
OHIO BELL EXISTING MANHOLE  
M.E.L.P. REGULATOR MANHOLE  
No. 84-2  
CIRCUITS C-44,45,46,47,48,49, and 50

NOTE.  
This sheet developed from  
previous plans:  
Cuy- 21-(13.77-14.94)  
Cuy- 77-(10.56-13.81)

MADE BY DATE 10-18-84  
TRACED BY DATE 11-21-84  
CHECKED BY DATE 12-22-84  
SCALE 1" = 30'-0"

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

**HNTB**

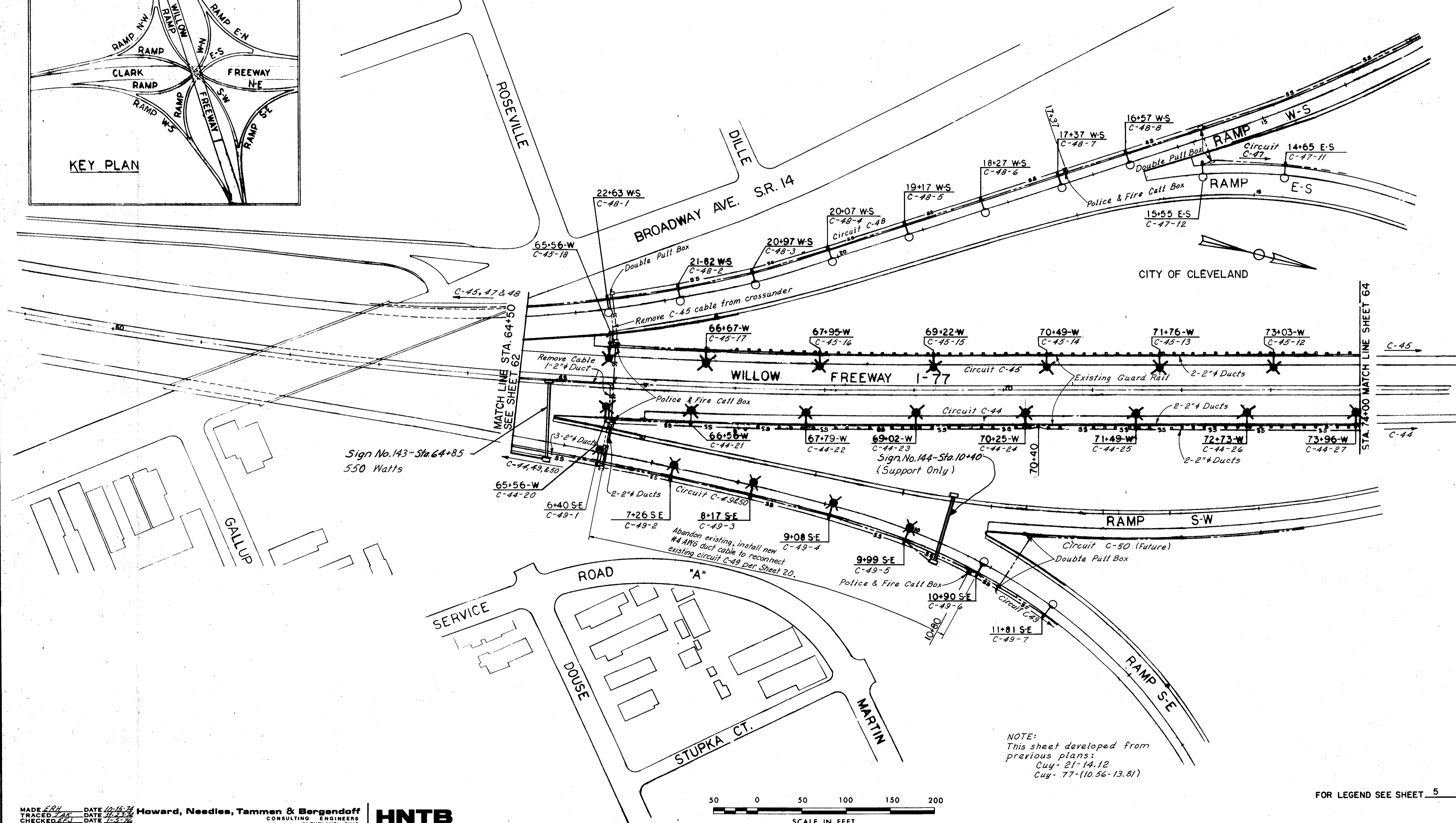
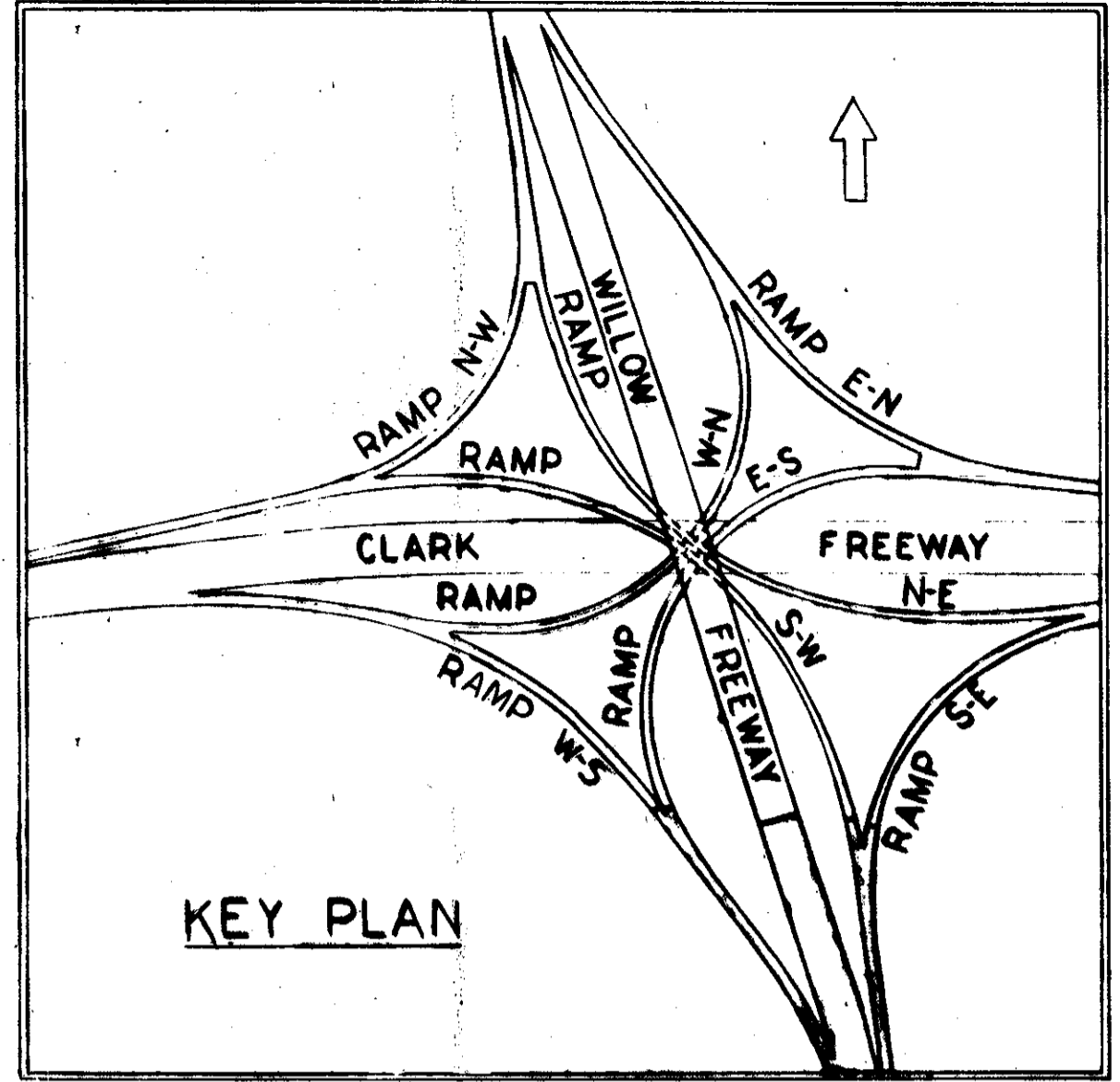


FOR LEGEND SEE SHEET 5

FHWA REGION	STATE	PROJECT
5	OHIO	

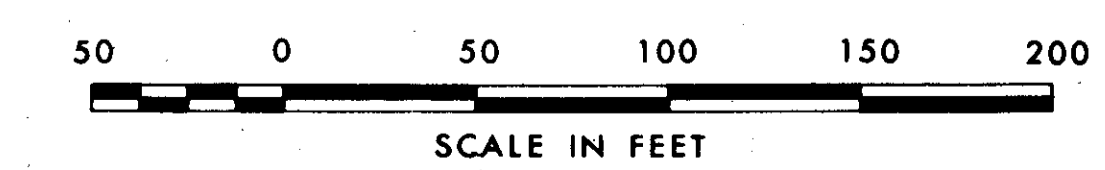
63  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



CITY OF CLEVELAND

NOTE:  
This sheet developed from  
previous plans:  
Cuy-21-14.12  
Cuy-77-(10.56-13.81)



FOR LEGEND SEE SHEET 5

MADE BY: [Signature] DATE: 10-15-74  
TRACED BY: [Signature] DATE: 11-23-74  
CHECKED BY: [Signature] DATE: 1-3-76  
SCALE: 1" = 50'-0"

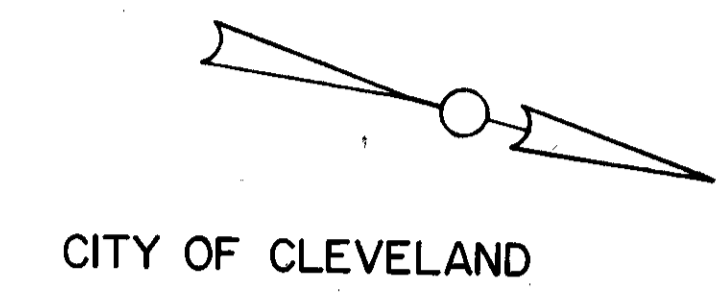
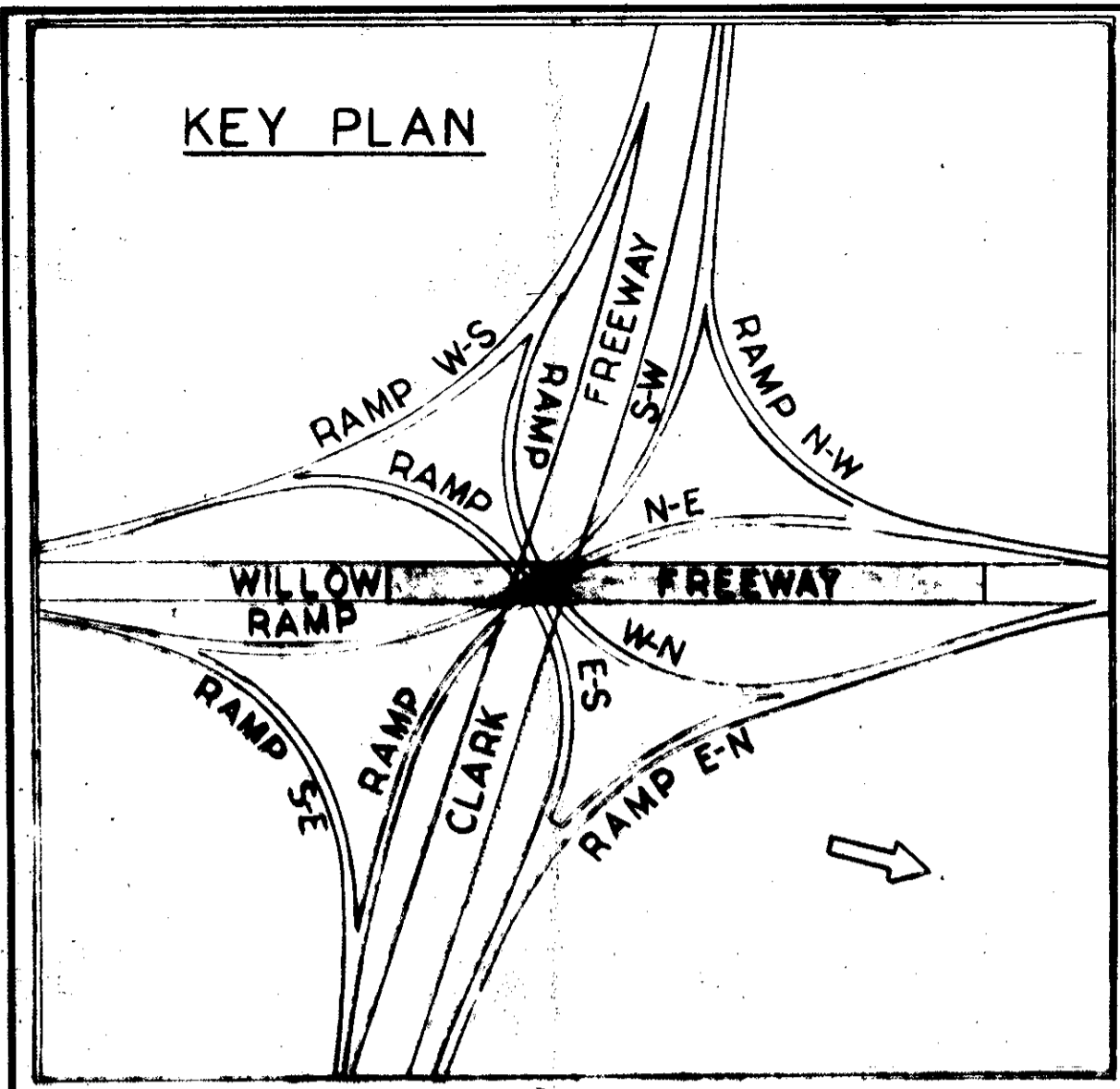
Howard, Needles, Tammen & Bergendoff  
CONSULTING ENGINEERS  
CLEVELAND, OHIO

**HNTB**

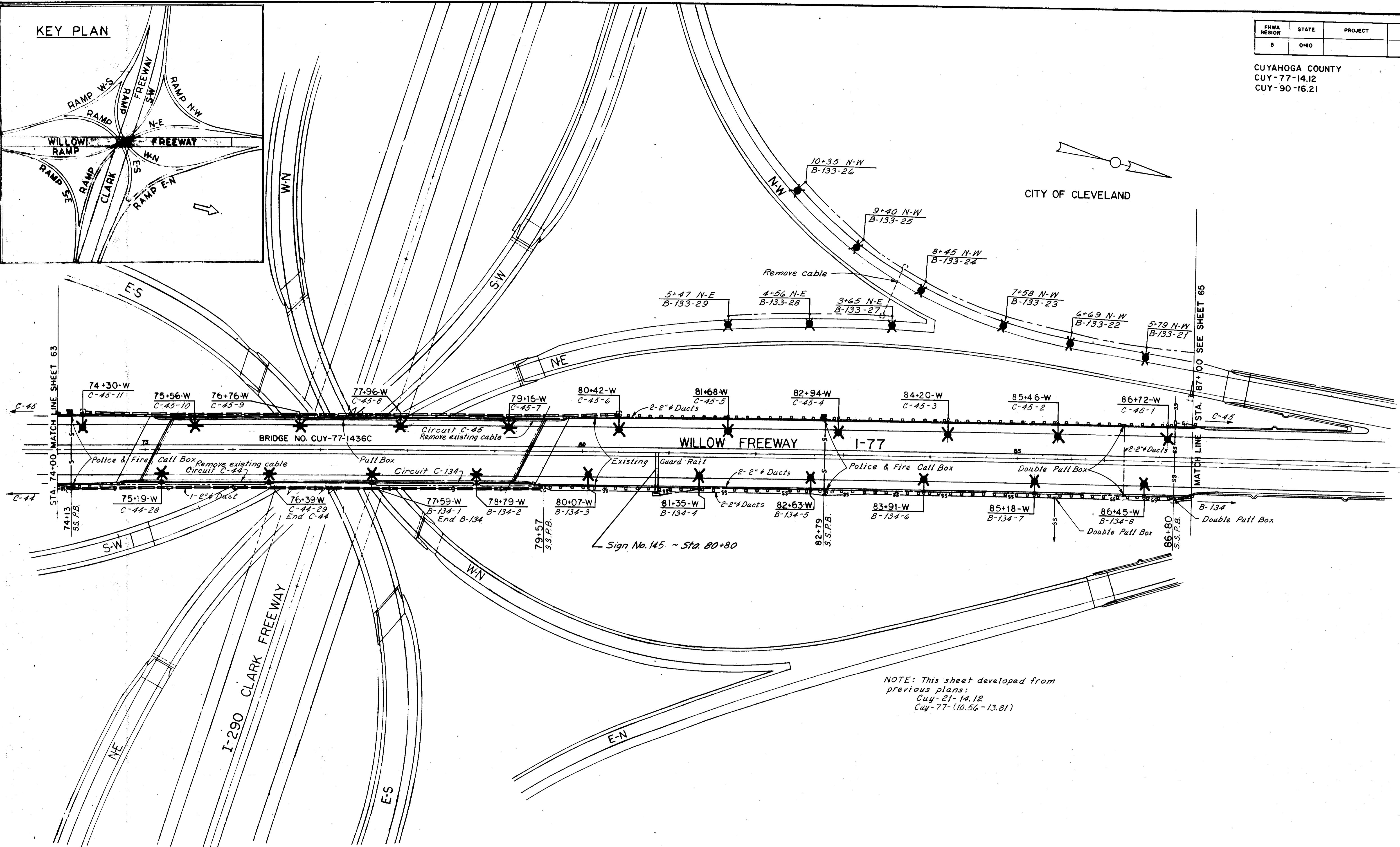
FHWA REGION	STATE	PROJECT
5	OHIO	

64  
84

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21



CITY OF CLEVELAND

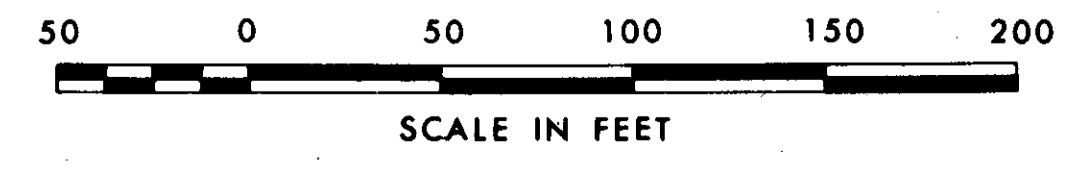


NOTE: This sheet developed from previous plans:  
 Cuy-21-14.12  
 Cuy-77-(10.56-13.81)

MADE E.P.H. DATE 11-15-74  
 TRACED J.A.K. DATE 12-26-74  
 CHECKED E.L.J. DATE 1-6-76  
 SCALE 1"=50'-0"

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

**HNTB**

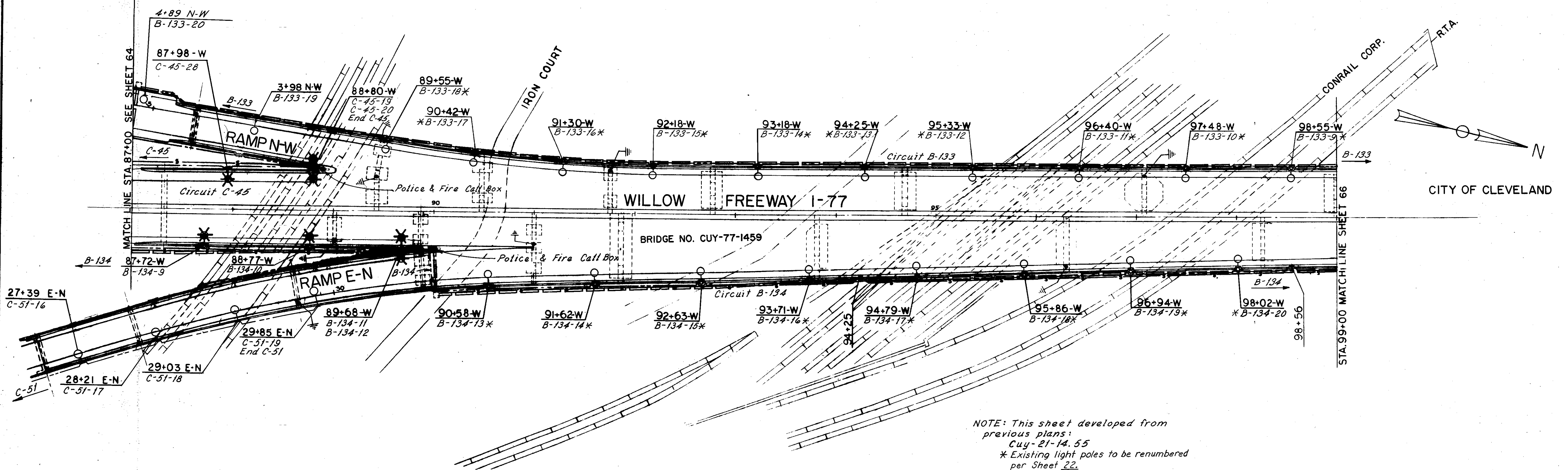


FOR LEGEND SEE SHEET 5

FHWA REGION	STATE	PROJECT
5	OHIO	

65  
84

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21



NOTE: This sheet developed from previous plans: Cuy-21-14.55  
 \* Existing light poles to be renumbered per Sheet 22.

MADE BY: ERH DATE: 11-15-74  
 TRACED BY: JAX DATE: 11-26-74  
 CHECKED BY: JAX DATE: 12-7-76  
 SCALE: 1" = 30'

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

**HNTB**

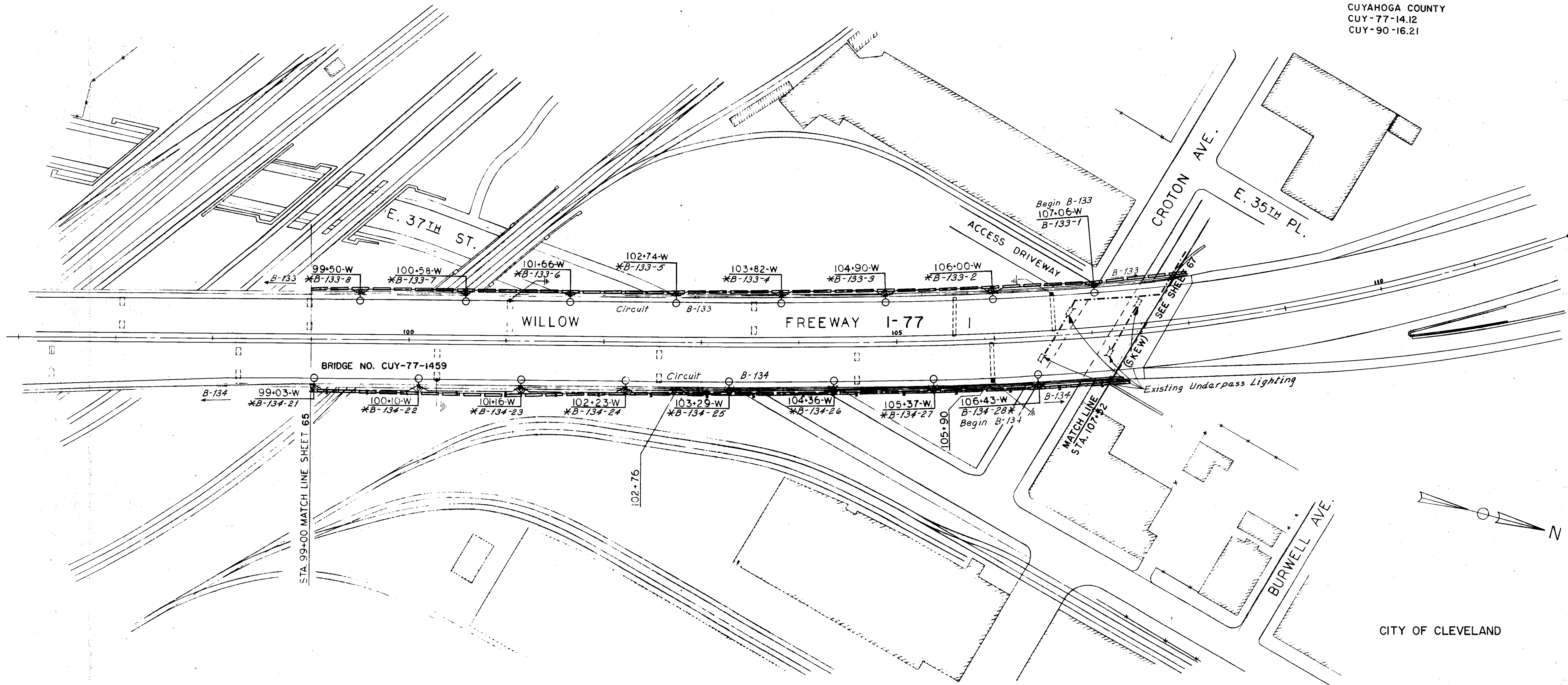
50 0 50 100 150 200  
 SCALE IN FEET

FOR LEGEND SEE SHEET 5

FHWA REGION	STATE	PROJECT
5	OHIO	

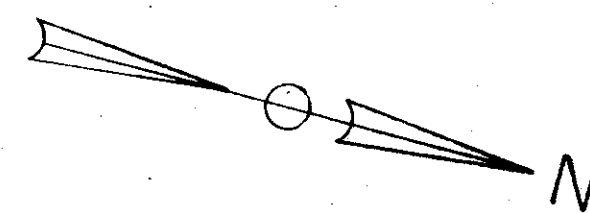
66  
84

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21



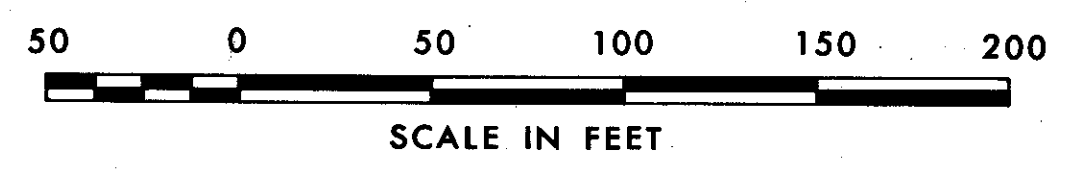
NOTE: This sheet developed from previous plans: Cuy-21-14.55  
 \* Existing light poles to be renumbered per Sheets 22 and 23.

CITY OF CLEVELAND



MADE BY: [Signature] DATE: 11/15/74  
 TRACED BY: [Signature] DATE: 11/15/74  
 CHECKED BY: [Signature] DATE: 1-9-75  
 SCALE: 1"=50'-0"

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



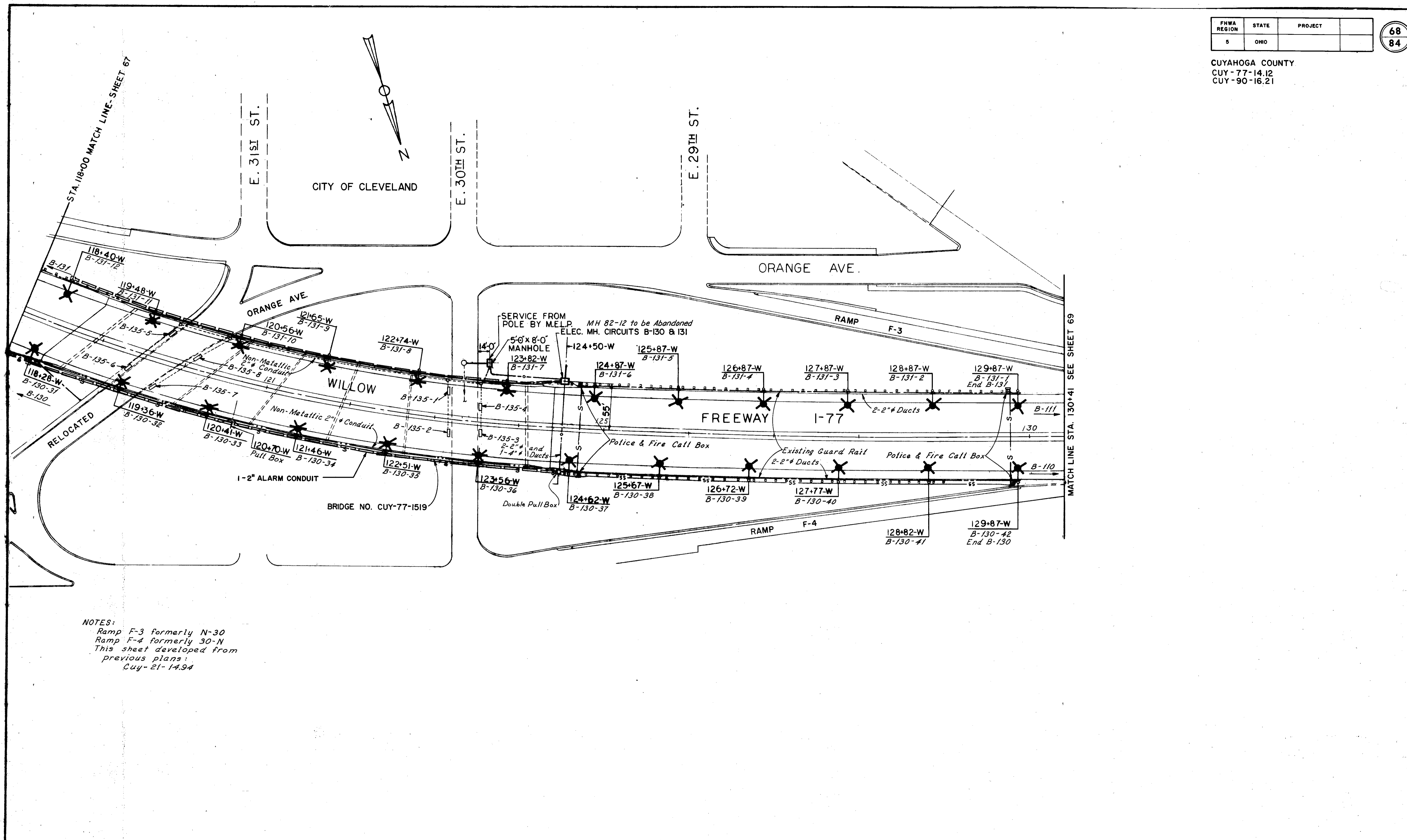
FOR LEGEND SEE SHEET 5



FHWA REGION	STATE	PROJECT
5	OHIO	

68  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

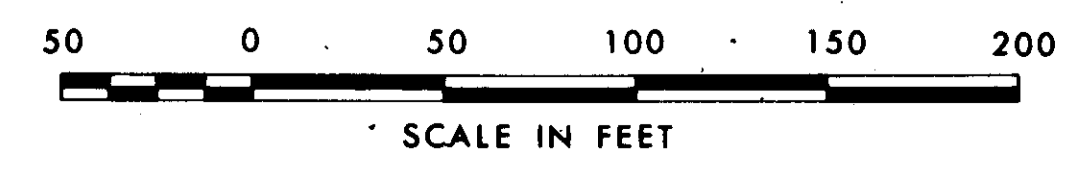


NOTES:  
Ramp F-3 formerly N-30  
Ramp F-4 formerly 30-N  
This sheet developed from  
previous plans:  
Cuy-21-14.94

MADE BY: ERH DATE: 11-15-74  
TRACED BY: JAK DATE: 11-27-74  
CHECKED BY: JAK DATE: 1-7-76  
SCALE: 1"=30'-0"

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

**HNTB**



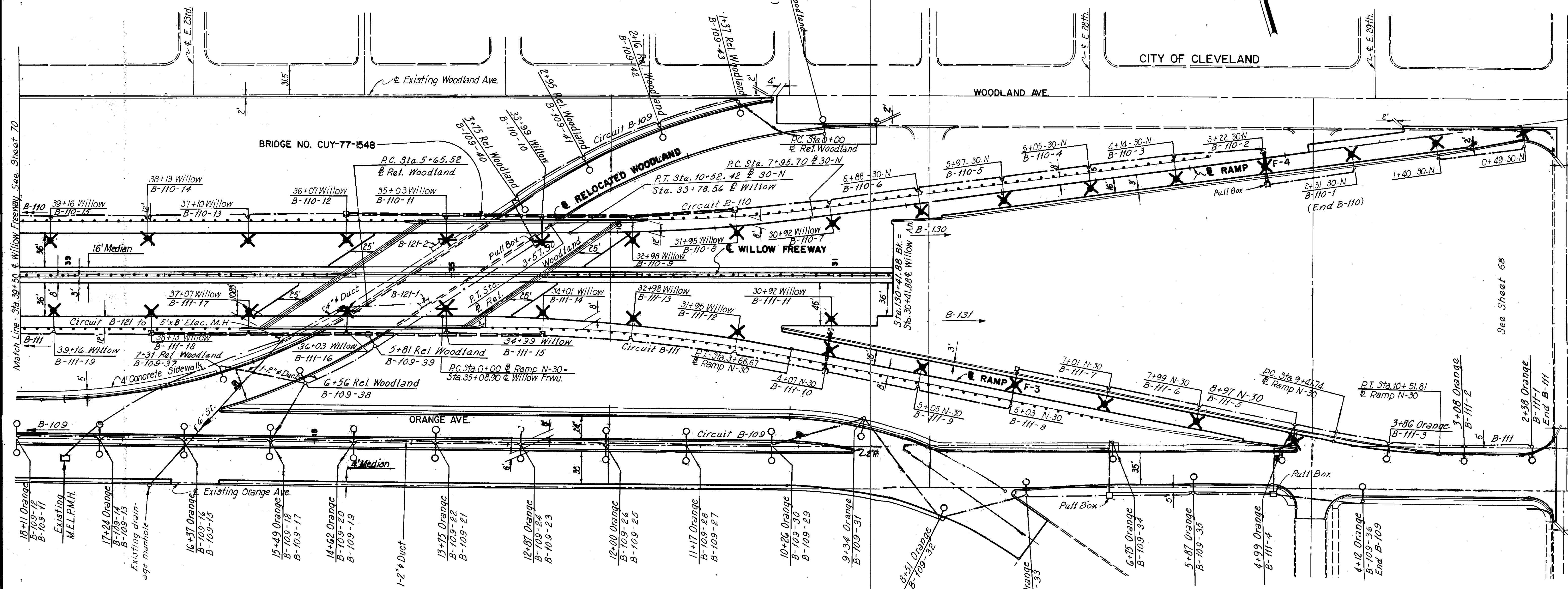
FOR LEGEND SEE SHEET 5



FHWA REGION	STATE	PROJECT
5	OHIO	

69  
84

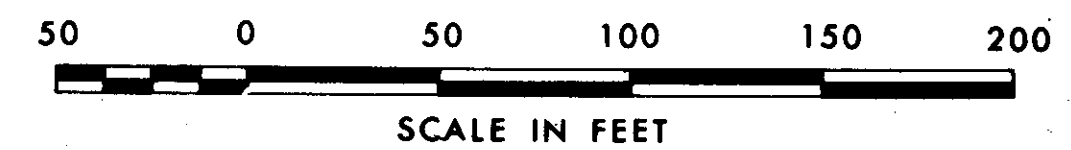
CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



NOTE:  
This sheet developed from  
previous plans:  
Cuy-42-18.29  
Cuy-42-18.42  
Cuy-21-15.32

MADE E.R.H. DATE 11-16-74  
TRACED J.A.K. DATE 11-27-74  
CHECKED F.E.J. DATE 1-2-76  
SCALE 1"=30'-0"

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

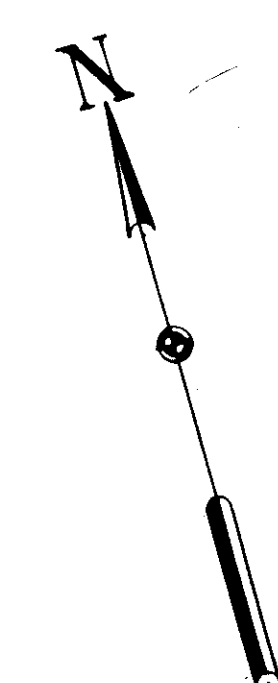


FOR LEGEND SEE SHEET 5

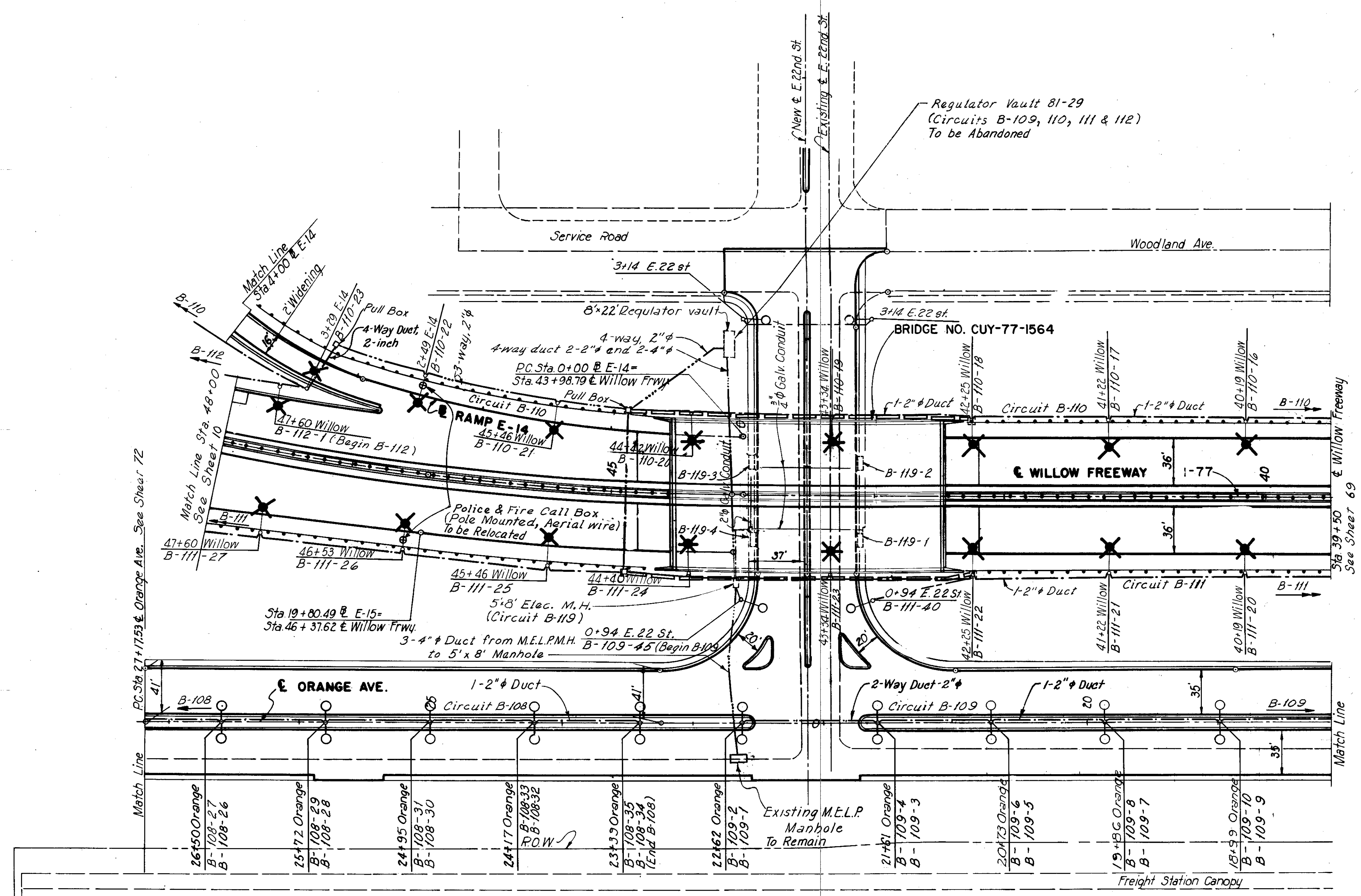
FHWA REGION	STATE	PROJECT
5	OHIO	

70  
84

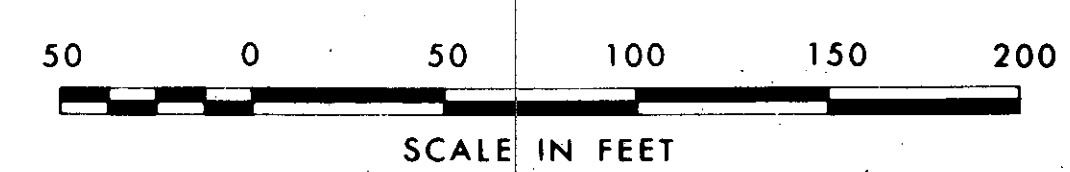
CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



CITY OF CLEVELAND



NOTE:  
This sheet developed from  
previous plans:  
Cuy-42-18.29  
Cuy-42-18.42  
Cuy-21-15.32



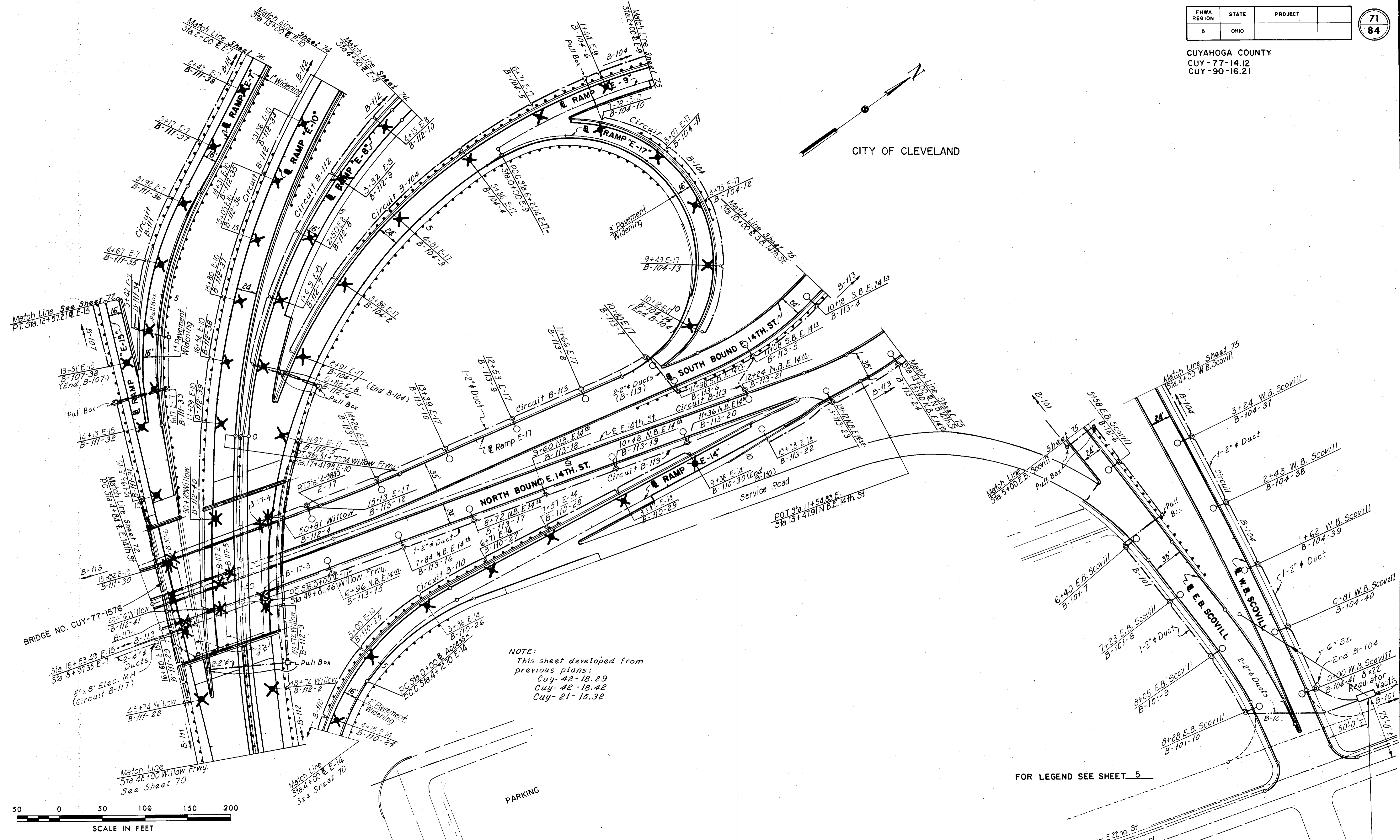
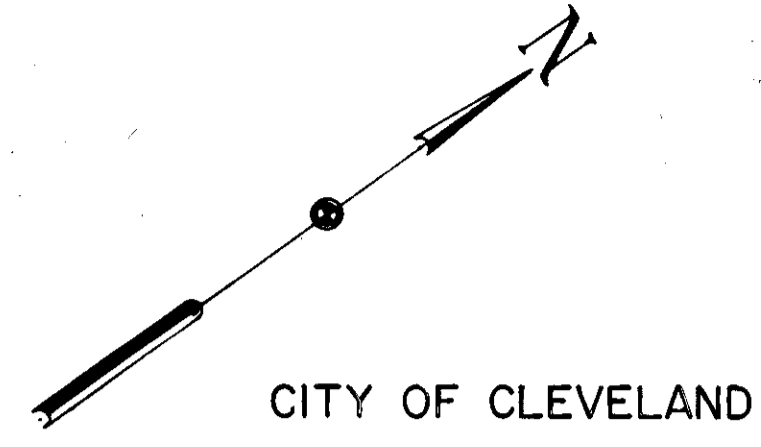
FOR LEGEND SEE SHEET 5

MADE BY DATE 11-16-74  
TRACED BY DATE 11-19-74  
CHECKED BY DATE 1-7-76  
SCALE 1"=50'-0"

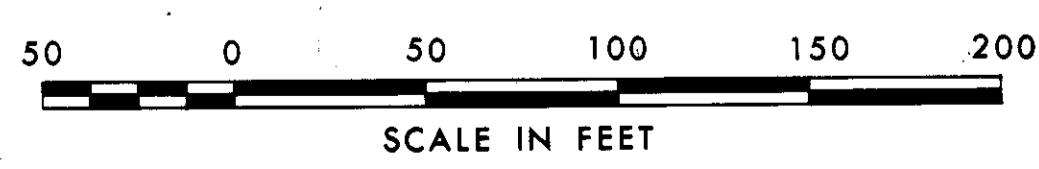
Howard, Needles, Tammen & Bergendoff  
CONSULTING ENGINEERS  
CLEVELAND, OHIO

**HNTB**

CUYAHOGA COUNTY  
 CUY - 77-14.12  
 CUY - 90-16.21



NOTE:  
 This sheet developed from  
 previous plans:  
 Cuy-42-18.29  
 Cuy-42-18.42  
 Cuy-21-15.32



FOR LEGEND SEE SHEET 5

MADE BY: *ERH* DATE: *11/14/74*  
 TRACED BY: *ERH* DATE: *11/14/74*  
 CHECKED BY: *ERH* DATE: *11/14/74*  
 SCALE: *1" = 30'-0"*

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

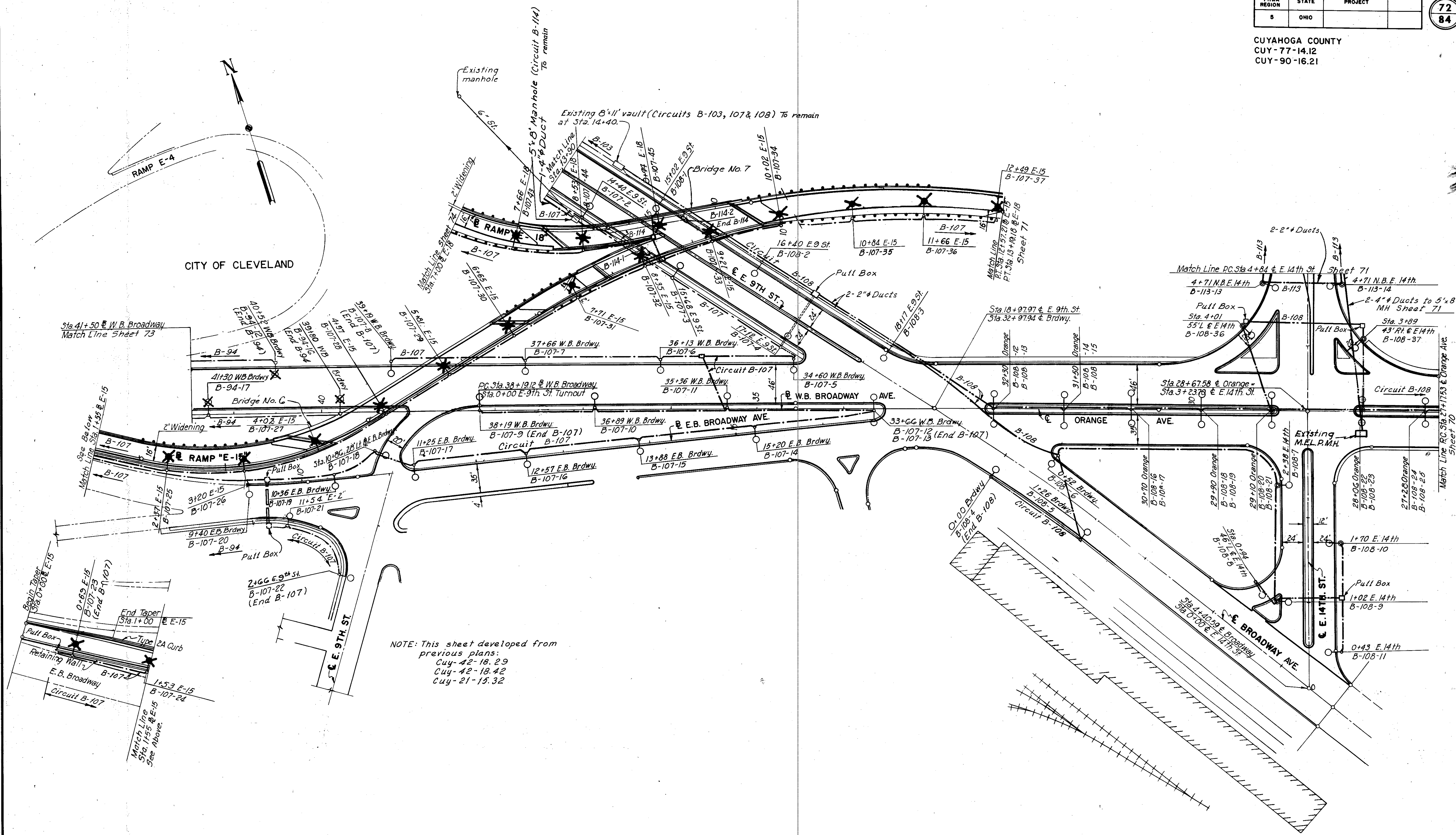


Regulator Vault 81-32  
 Circuits B-101 & 104  
 To Remain

FHWA REGION	STATE	PROJECT
5	OHIO	

72  
84

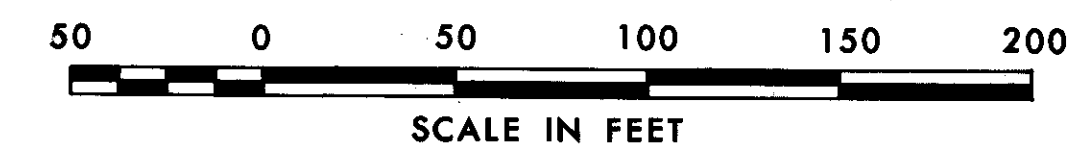
CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



NOTE: This sheet developed from previous plans:  
Cuy-42-18.29  
Cuy-42-18.42  
Cuy-21-15.32

MADE BY *ERH* DATE *11-16-74* HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
 TRACED BY *TRC* DATE *7-23-75* CONSULTING ENGINEERS  
 CHECKED BY *TRC* DATE *7-9-76* CLEVELAND, OHIO  
 SCALE *1" = 50'-0"*

**HNTB**

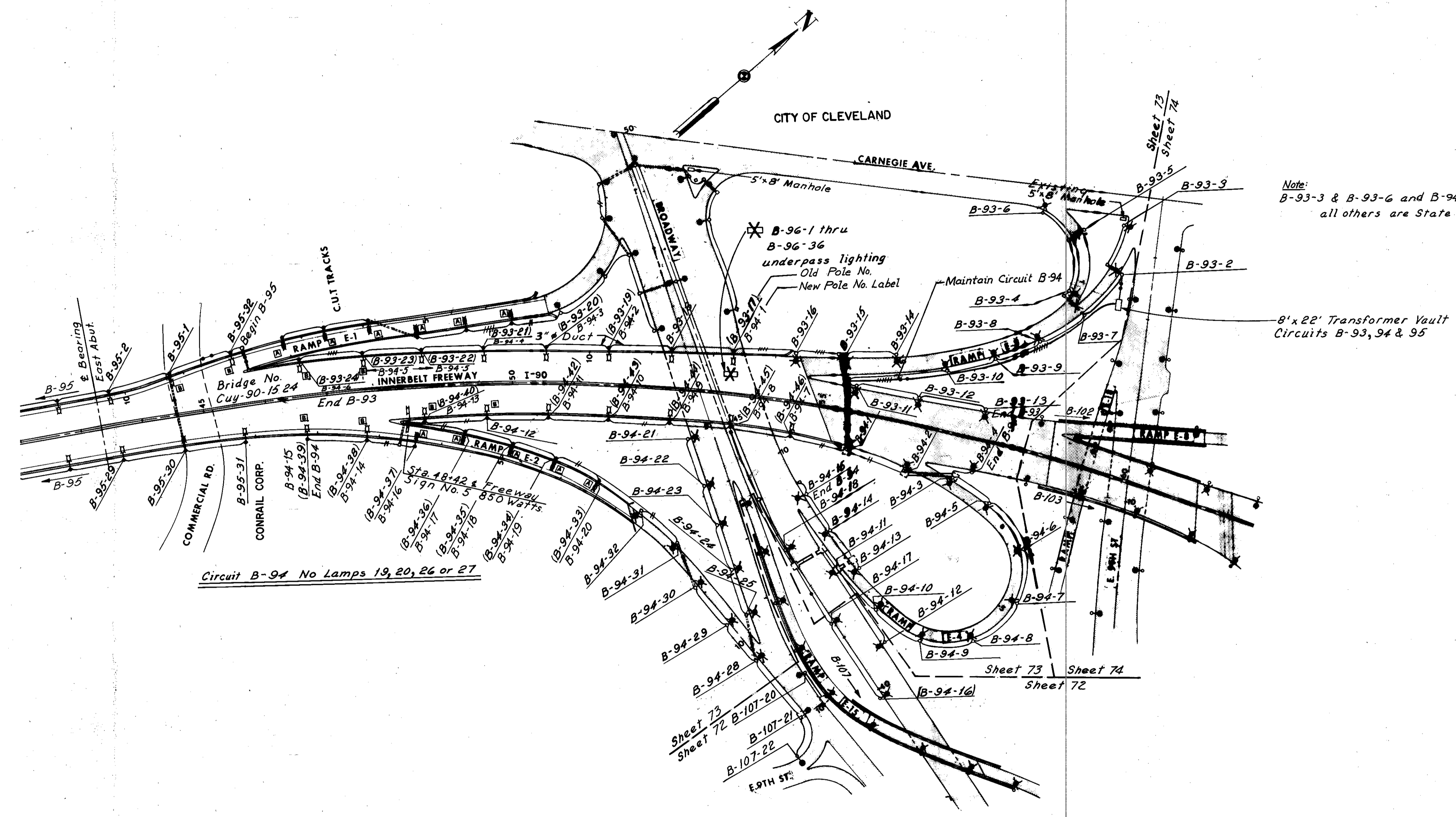


FOR LEGEND SEE SHEET 5

FHWA REGION	STATE	PROJECT
5	OHIO	

73  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



Note:  
B-93-3 & B-93-6 and B-94 (11, 12, 16, 17, 18, 21, 22, 23, 24-25) are city owned light poles;  
all others are State owned.

Circuit B-94 No Lamps 19, 20, 26 or 27

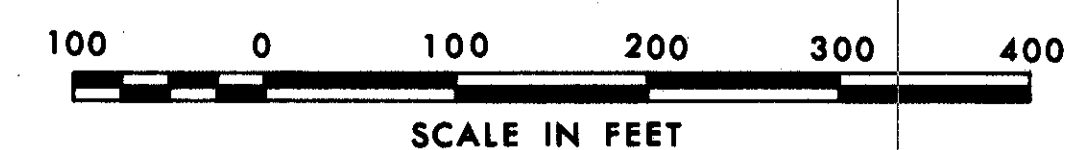
NOTE:  
This sheet developed from  
previous plans:  
Cuy-90-15.24  
Cuy-42-17.43/18.02

Circuit B-107 is shown on Sheets 72 & 74.

MADE BY: ERH DATE: 11-16-74  
TRACED BY: JAK DATE: 4-7-75  
CHECKED BY: JAK DATE: 1-9-78  
SCALE: 1" = 100'-0"

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

**HNTB**

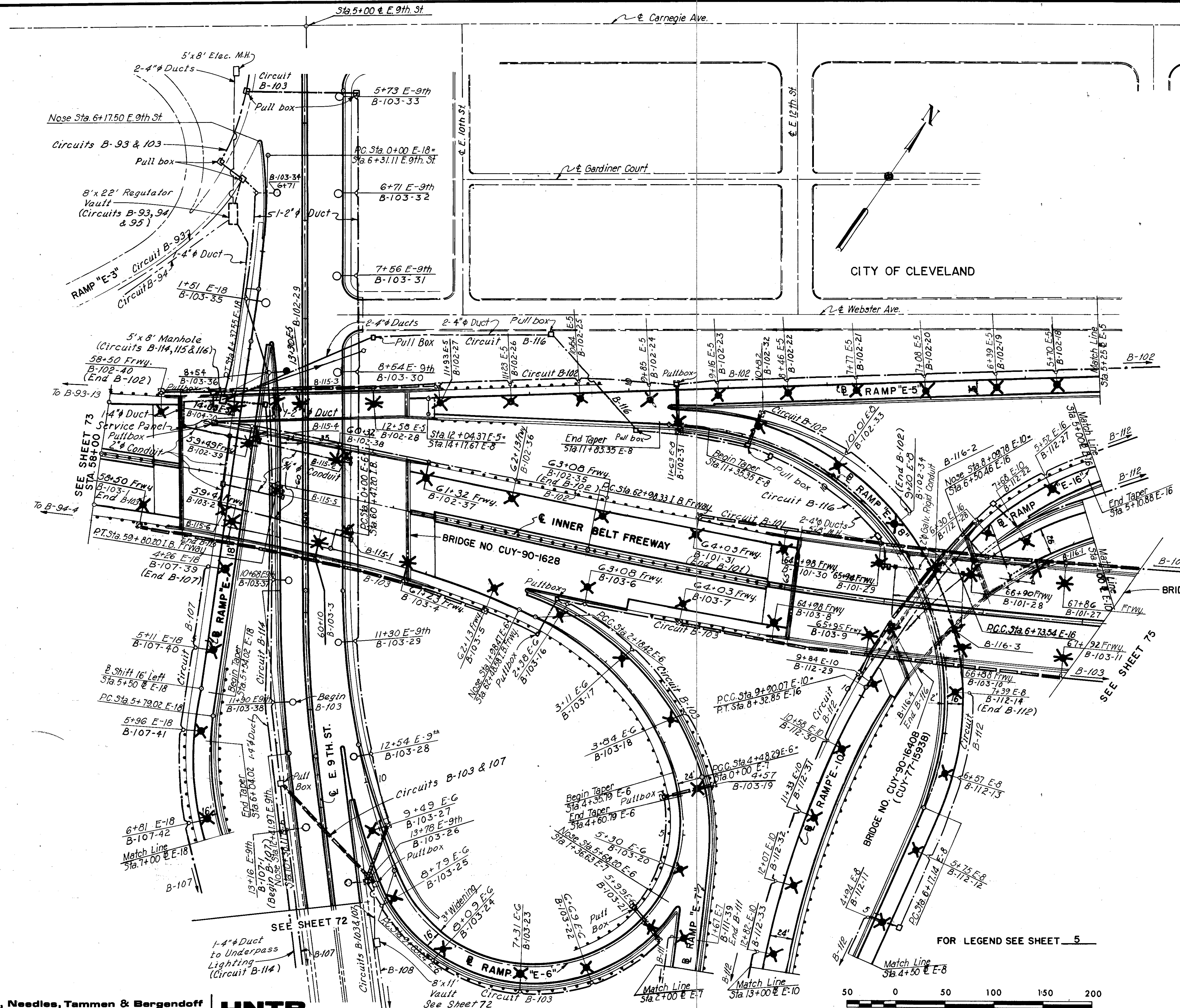


FOR LEGEND SEE SHEET 5

FHWA REGION	STATE	PROJECT
5	OHIO	

74  
84

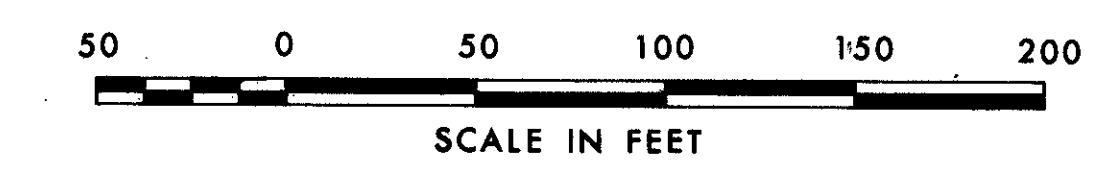
CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



NOTE:  
This sheet developed from  
previous plans:  
Cuy-42-18.29  
Cuy-42-18.42  
Cuy-21-15.32

BRIDGE NO. CUY-90-1640A  
(CUY-77-1593A)  
Underpass Lighting To Be Removed  
Circuit B-115; 6 lamps @ E. 9 St.  
Circuit B-116; 4 lamps @ Ramp E-10

FOR LEGEND SEE SHEET 5



MADE BY DATE 11/14/44 Howard, Needles, Tammen & Bergendoff  
TRACED BY DATE 11/14/44 CONSULTING ENGINEERS  
CLEVELAND, OHIO  
CHECKED BY DATE 1-9-46  
SCALE 1"=50'-0"

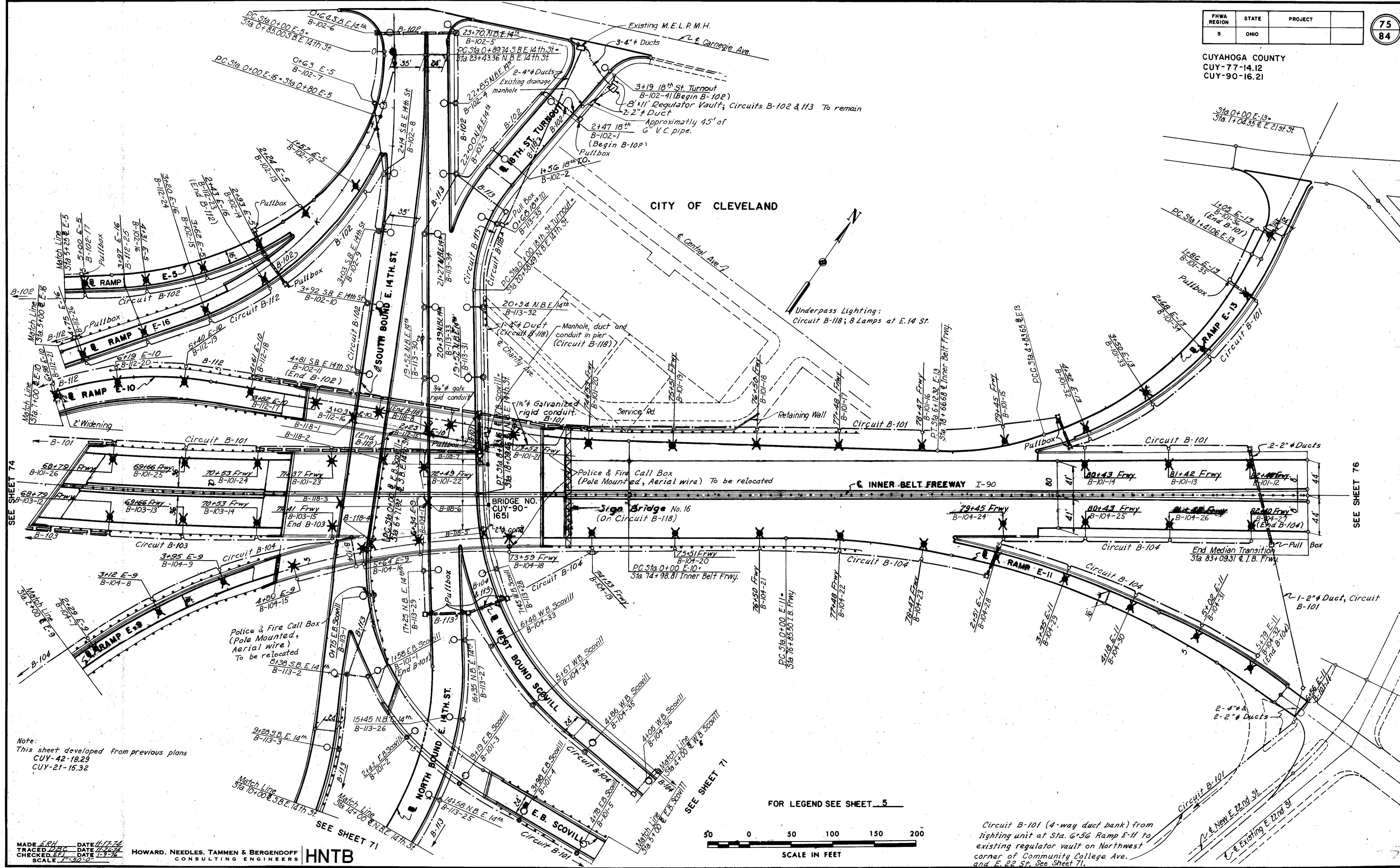
**HNTB**

SEE SHEET 71

FHWA REGION	STATE	PROJECT
5	OHIO	

75  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

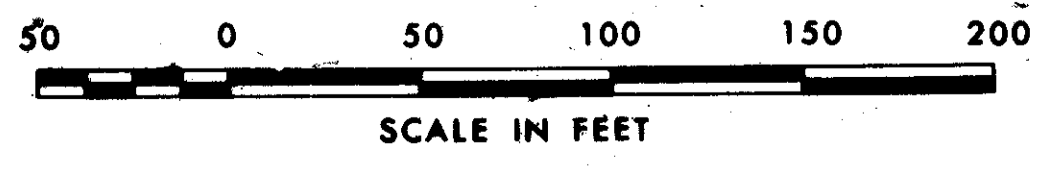


Note:  
This sheet developed from previous plans  
CUY-42-18.29  
CUY-21-15.32

MADE BY DATE 4/17/74  
TRACED BY DATE 2/16/74  
CHECKED BY DATE 1/9/76  
SCALE 1"=30'-0"

HOWARD, NEEDLES, TAMMEN & BERGENDOFF  
CONSULTING ENGINEERS  
**HNTB**

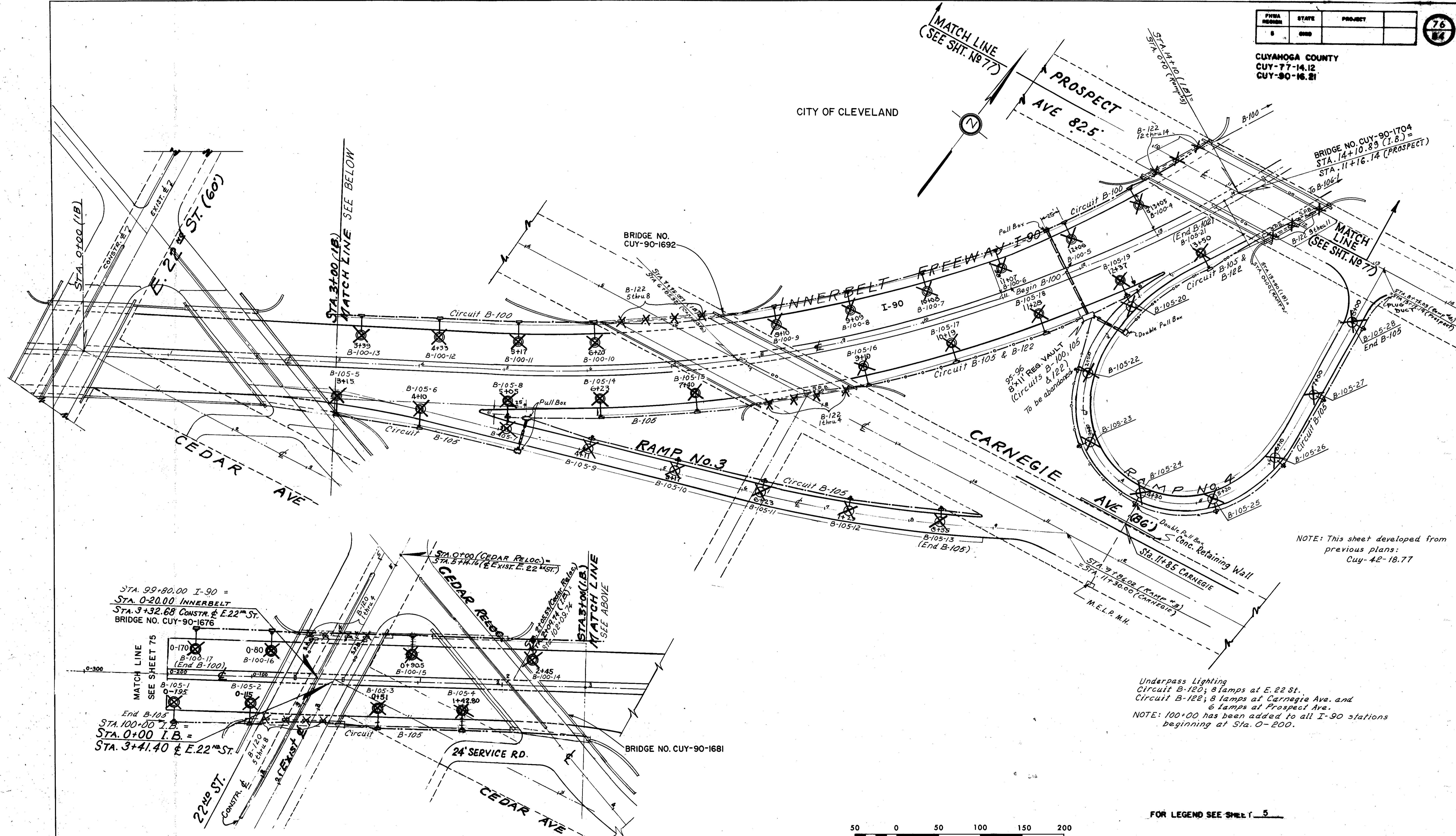
FOR LEGEND SEE SHEET 5



Circuit B-101 (4-way duct bank) from lighting unit at Sta. 6+56 Ramp E-11 to existing regulator vault on Northwest corner of Community College Ave. and E. 22 St. See Sheet 71.

CUYAHOGA COUNTY  
 CUY-77-14.12  
 CUY-90-16.21

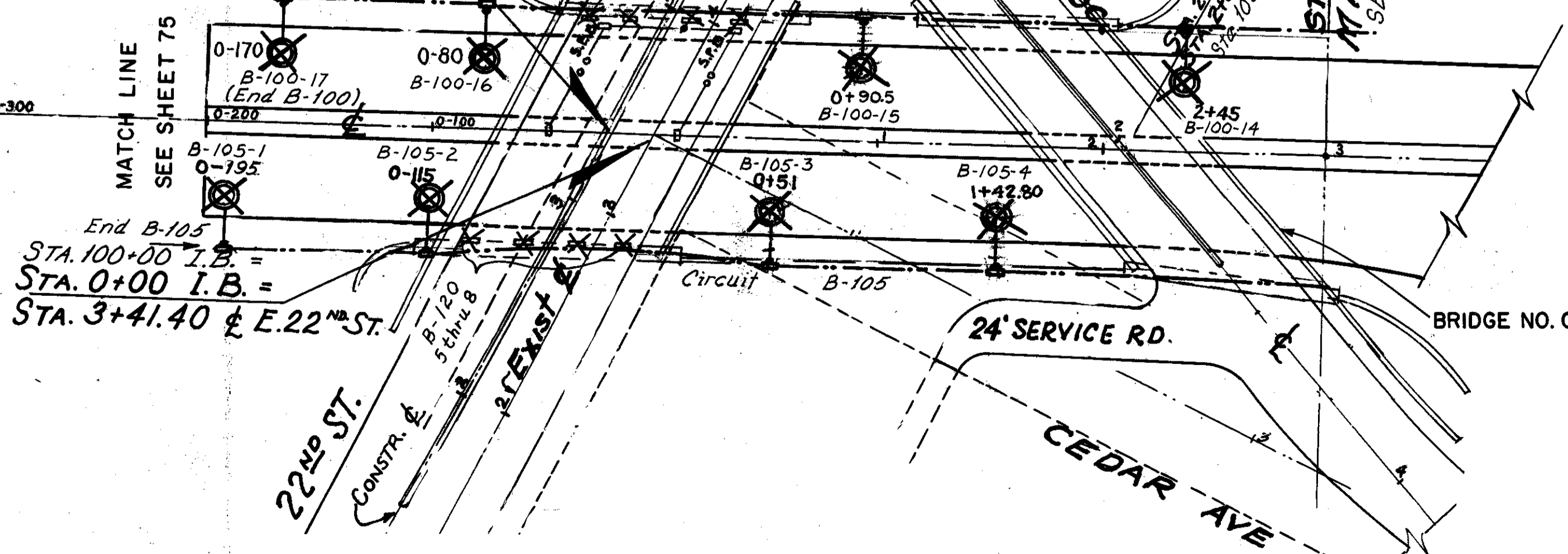
CITY OF CLEVELAND



NOTE: This sheet developed from previous plans:  
 Cuy-42-18.77

Underpass Lighting  
 Circuit B-120; 8 lamps at E. 22 St.  
 Circuit B-122; 8 lamps at Carnegie Ave. and  
 6 lamps at Prospect Ave.  
 NOTE: 100+00 has been added to all I-90 stations  
 beginning at Sta. 0+200.

STA. 99+80.00 I-90 =  
 STA. 0+20.00 INNERBELT  
 STA. 3+32.68 CONSTR. & E. 22<sup>ND</sup> ST.  
 BRIDGE NO. CUY-90-1676



FOR LEGEND SEE SHEET 5



MADE BY: [Signature] DATE: 4-11-74  
 TRACED BY: [Signature] DATE: 1-26-76  
 CHECKED BY: [Signature] DATE: 1-9-76  
 SCALE: 1" = 20'

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

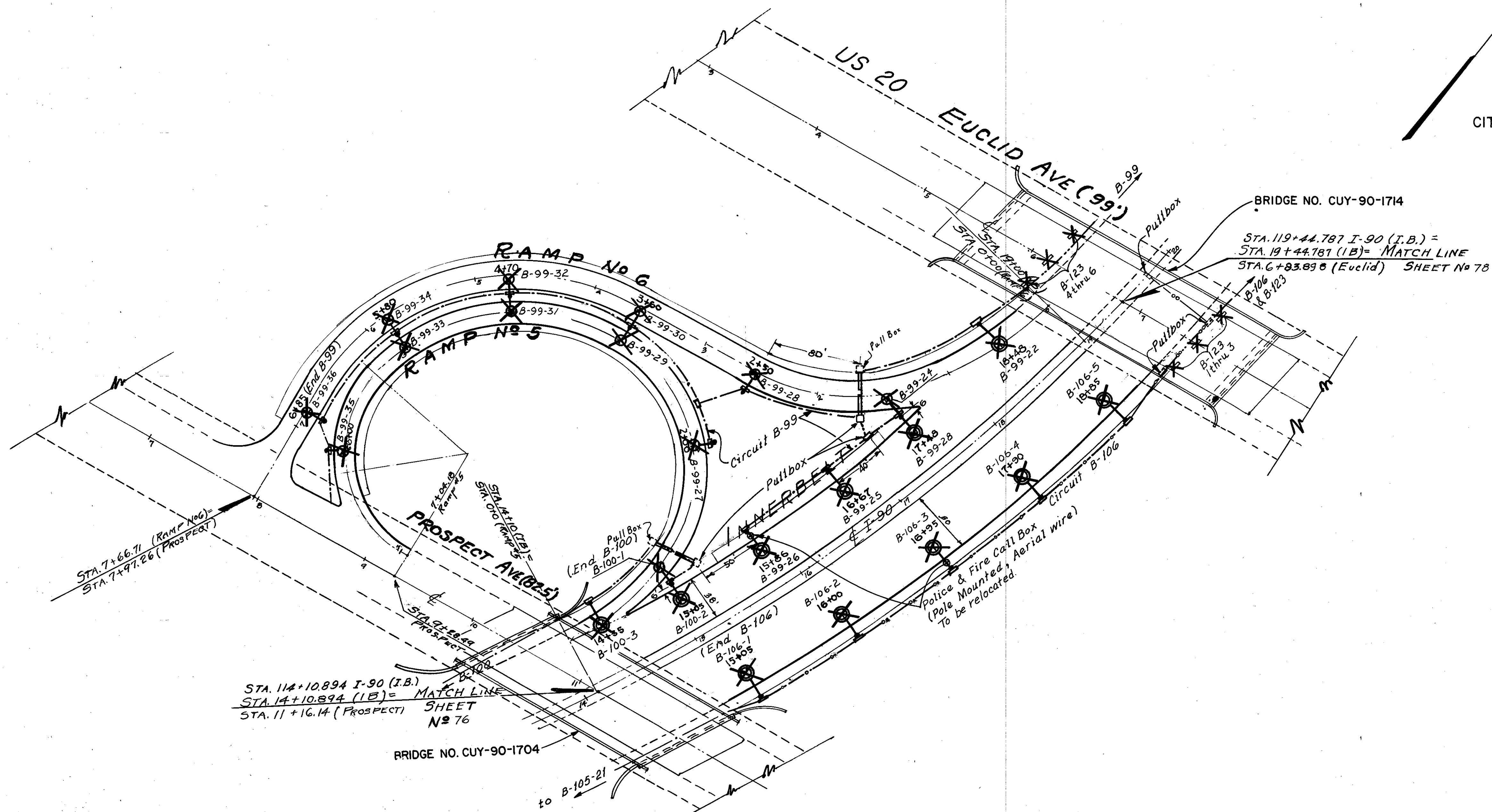
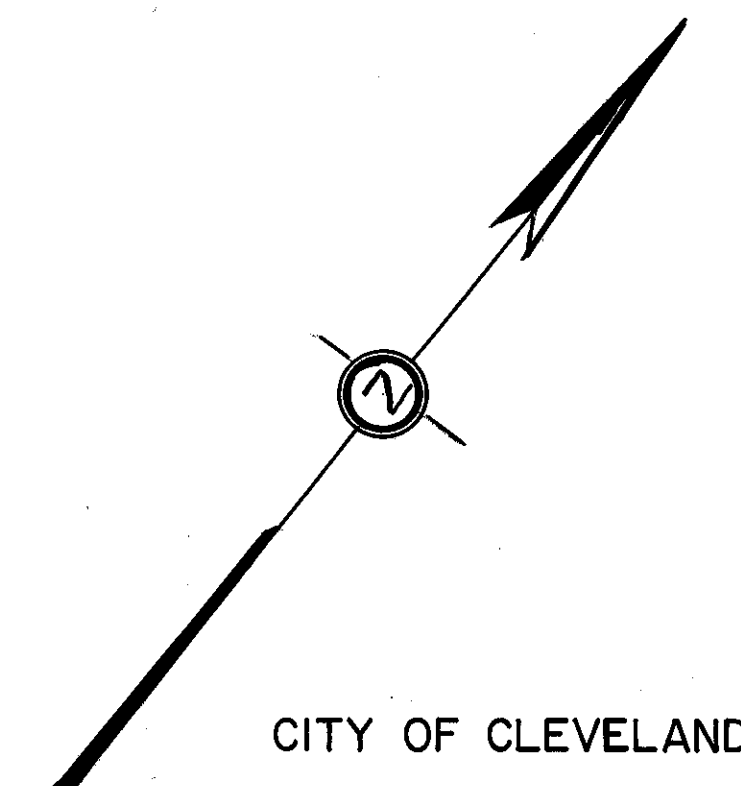
**HNTB**



FHWA REGION	STATE	PROJECT
5	OHIO	

77  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



STA. 11+16.14 (PROSPECT) = MATCH LINE  
SHEET NO 76

BRIDGE NO. CUY-90-1714  
STA. 19+44.787 I-90 (I.B.) = MATCH LINE  
STA. 6+83.890 (Euclid) SHEET NO 78

FOR LEGEND SEE SHEET 5

NOTE: 100+00 has been added to all I-90 Stations beginning at Sta. 0-200

This sheet developed from previous plans: Cuy-42-18.77

MADE ERH DATE 11-17-74  
TRACED JAK DATE 11-21-76  
CHECKED EFL DATE 1-18-78  
SCALE 1"=30'-0"

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

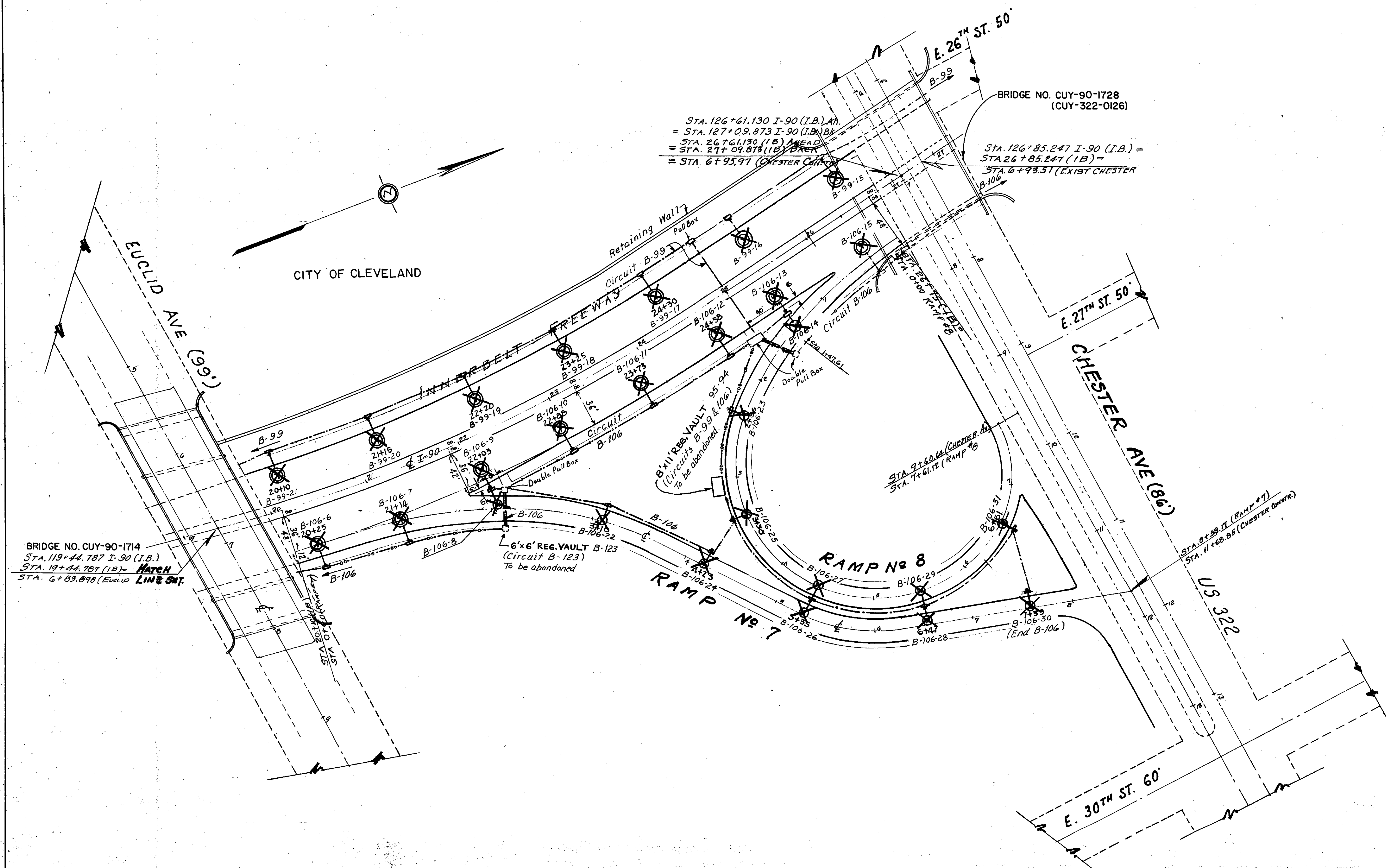
**HNTB**



FHWA REGION	STATE	PROJECT
5	OHIO	

78  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



BRIDGE NO. CUY-90-1714  
STA. 119+44.787 I-90 (I.B.)  
STA. 19+44.787 (I.B.) - MATCH  
STA. 6+83.898 (Euclid) LINE SH.

STA. 126+61.130 I-90 (I.B.) AHEAD  
= STA. 127+09.873 I-90 (I.B.) BK  
= STA. 26+61.130 (I.B.) AHEAD  
= STA. 27+09.873 (I.B.) BK  
= STA. 6+95.97 (CHESTER CENTER)

BRIDGE NO. CUY-90-1728  
(CUY-322-0126)

STA. 126+85.247 I-90 (I.B.) =  
STA. 26+85.247 (I.B.) =  
STA. 6+93.31 (EXIST CHESTER)

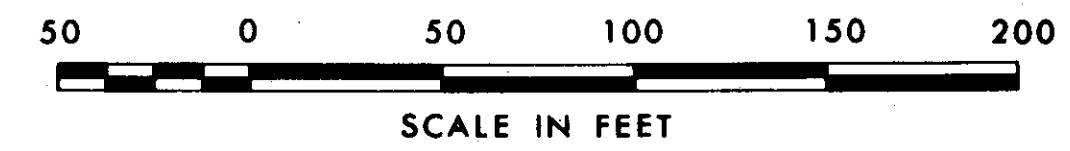
FOR LEGEND SEE SHEET 5

This sheet developed from previous plans:  
Cuy-42-18.77  
Cuy-42-19.28

MADE BY: ERH DATE: 11/17/74  
TRACED BY: JAK DATE: 11/28/74  
CHECKED BY: JAK DATE: 1/18/76  
SCALE: 1"=50'-0"

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

**HNTB**



NOTE: 100+00 has been added to all I-90 Stations beginning at Sta. 0-200

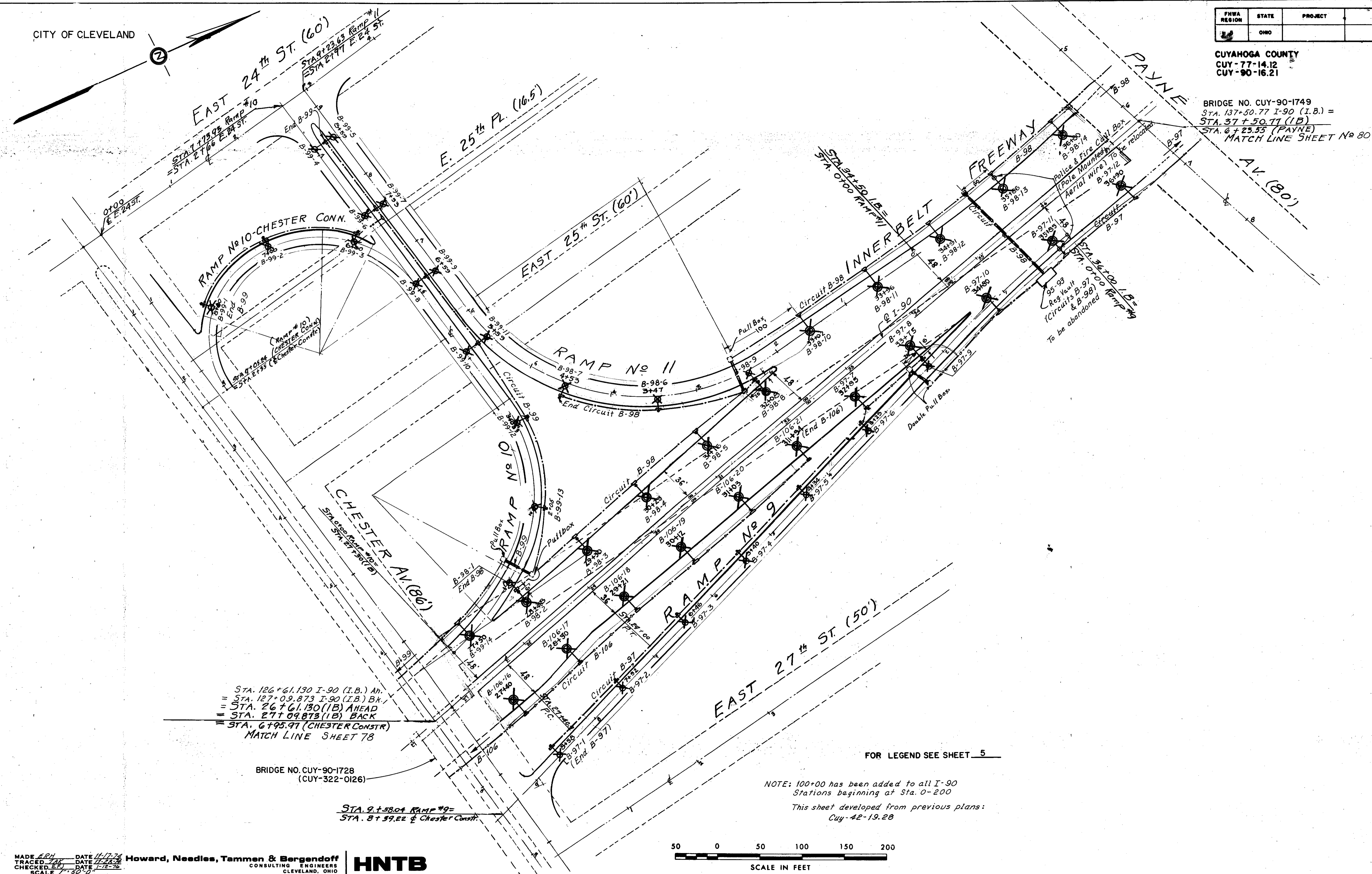
CITY OF CLEVELAND

FHWA REGION	STATE	PROJECT
84	OHIO	

79  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

BRIDGE NO. CUY-90-1749  
STA. 137+50.77 I-90 (I.B.) =  
STA. 37+50.77 (I.B.)  
STA. 6+25.55 (PAYNE)  
MATCH LINE SHEET No 80



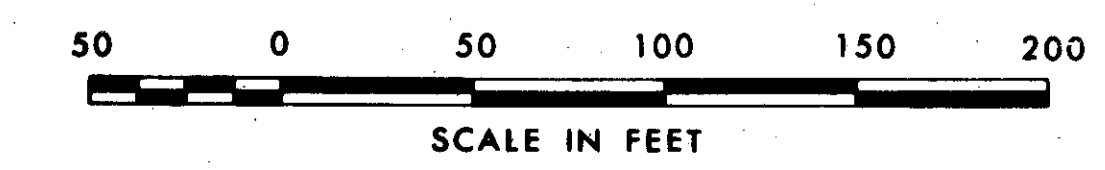
STA. 126+61.130 I-90 (I.B.) Ah.  
 = STA. 127+09.873 I-90 (I.B.) Bk.  
 = STA. 26+61.130 (I.B.) AHEAD  
 = STA. 27+09.873 (I.B.) BACK  
 = STA. 6+95.97 (CHESTER CONSTR)  
 MATCH LINE SHEET 78

BRIDGE NO. CUY-90-1728  
 (CUY-322-0126)

STA. 2+58.04 RAMP #9=  
 STA. 8+59.22 of Chester Constr.

FOR LEGEND SEE SHEET 5

NOTE: 100+00 has been added to all I-90  
 Stations beginning at Sta. 0-200  
 This sheet developed from previous plans:  
 Cuy-42-19.28



MADE BY ERH DATE 11-17-74  
 TRACED BY DATE 11-28-74  
 CHECKED BY DATE 1-18-76  
 SCALE 1" = 50'-0"

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

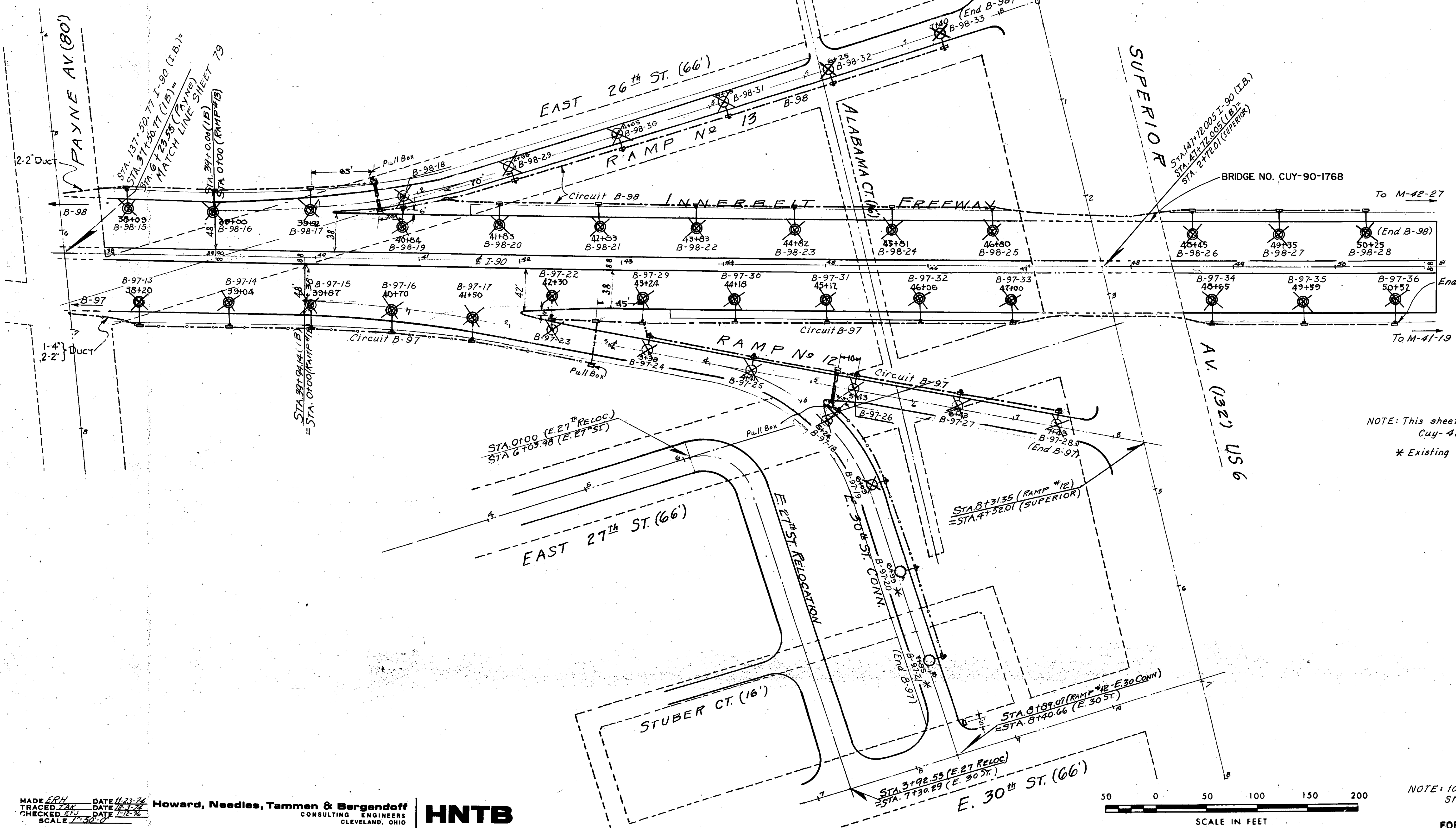
**HNTB**

FHWA REGION	STATE	PROJECT
5	OHIO	

80  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

CITY OF CLEVELAND

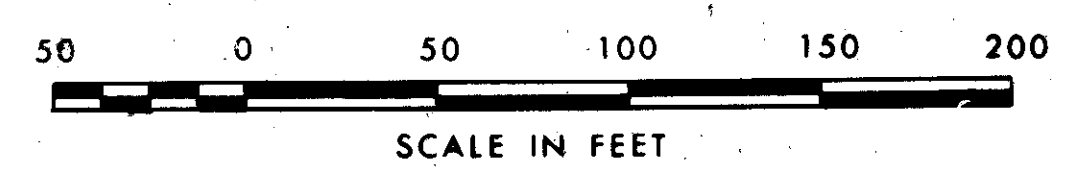


NOTE: This sheet developed from previous plans:  
Cuy-42-19.28  
\* Existing light poles to be renumbered as per Sheet 37.

MADE BY: DATE: 11-21-74  
TRACED BY: DATE: 1-18-75  
CHECKED BY: DATE: 1-18-75  
SCALE: 1"=50'-0"

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

**HNTB**



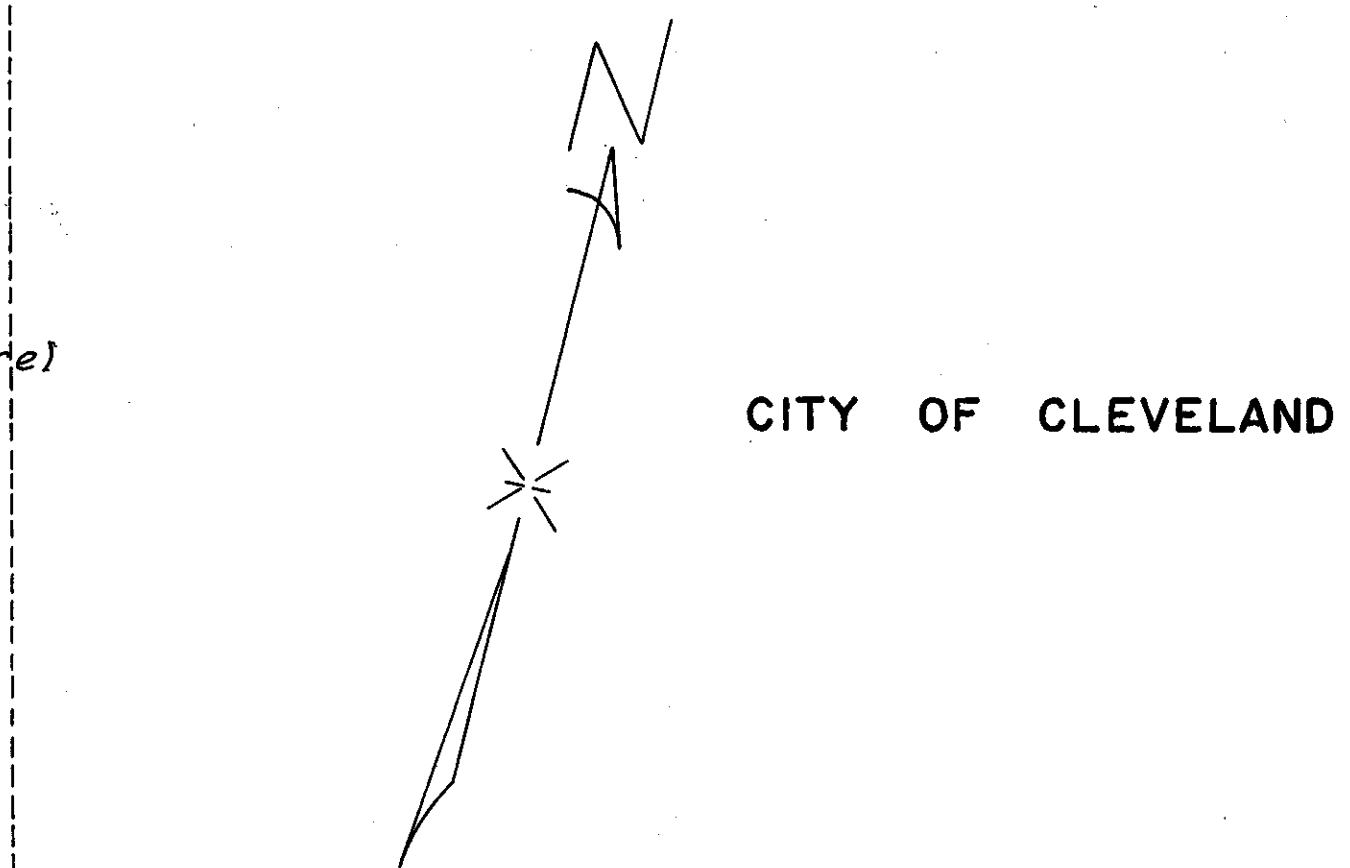
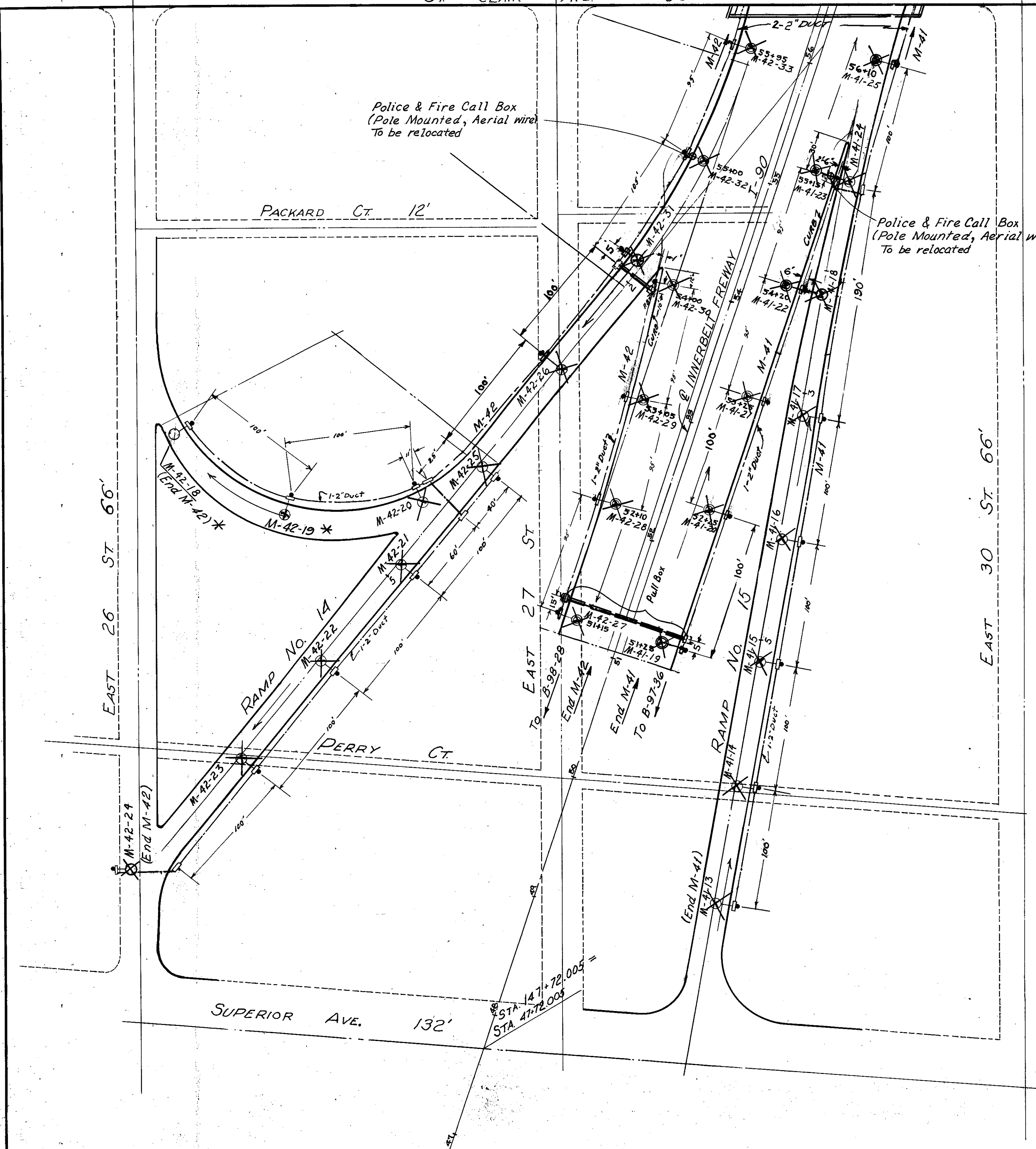
NOTE: 100+00 has been added to all I-90  
Stations beginning at Sta. 0-200

FOR LEGEND SEE SHEET 5  
LIGHTING REMOVAL I-90 STA. 37+50 TO STA. 51+00

FYMA REGION	STATE	PROJECT
5	OHIO	

81  
84

CUYANOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



SONORA AVE. 60'

BUCK CT

FOR LEGEND SEE SHEET 5

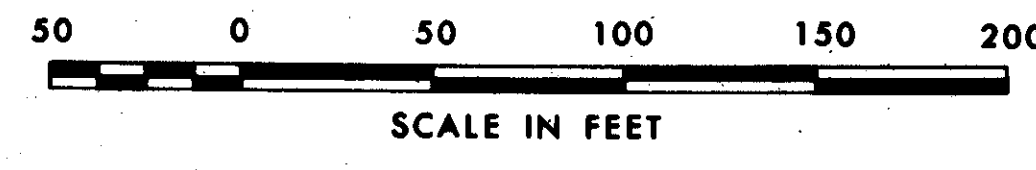
NOTE: 100+00 has been added to all I-90 Stations beginning at Sta. 0+200.  
This sheet developed from previous plans CUY-42R-19.78

\* Existing light poles to be renumbered per sheet 37

MADE BY: [Signature] DATE: 11-23-74  
TRACED BY: [Signature] DATE: 12-1-74  
CHECKED BY: [Signature] DATE: 1-18-76  
SCALE: 1" = 30'-0"

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

**HNTB**

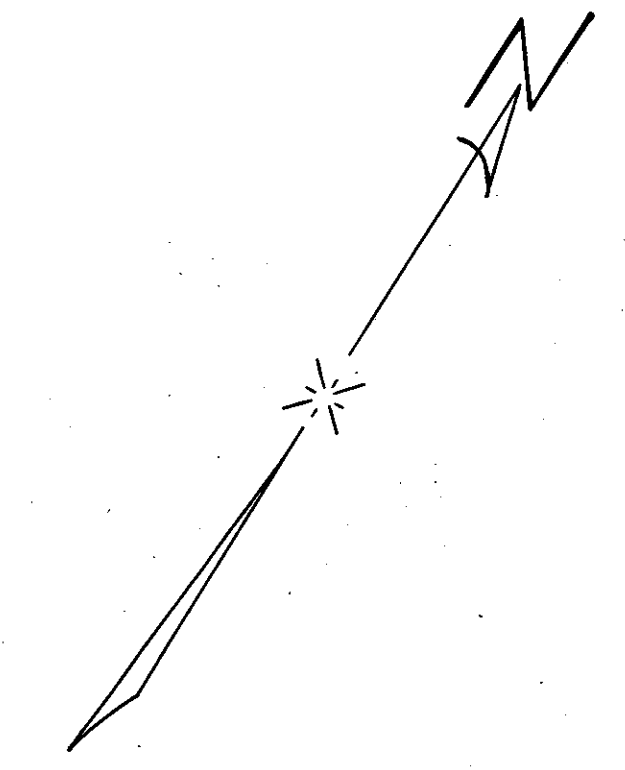
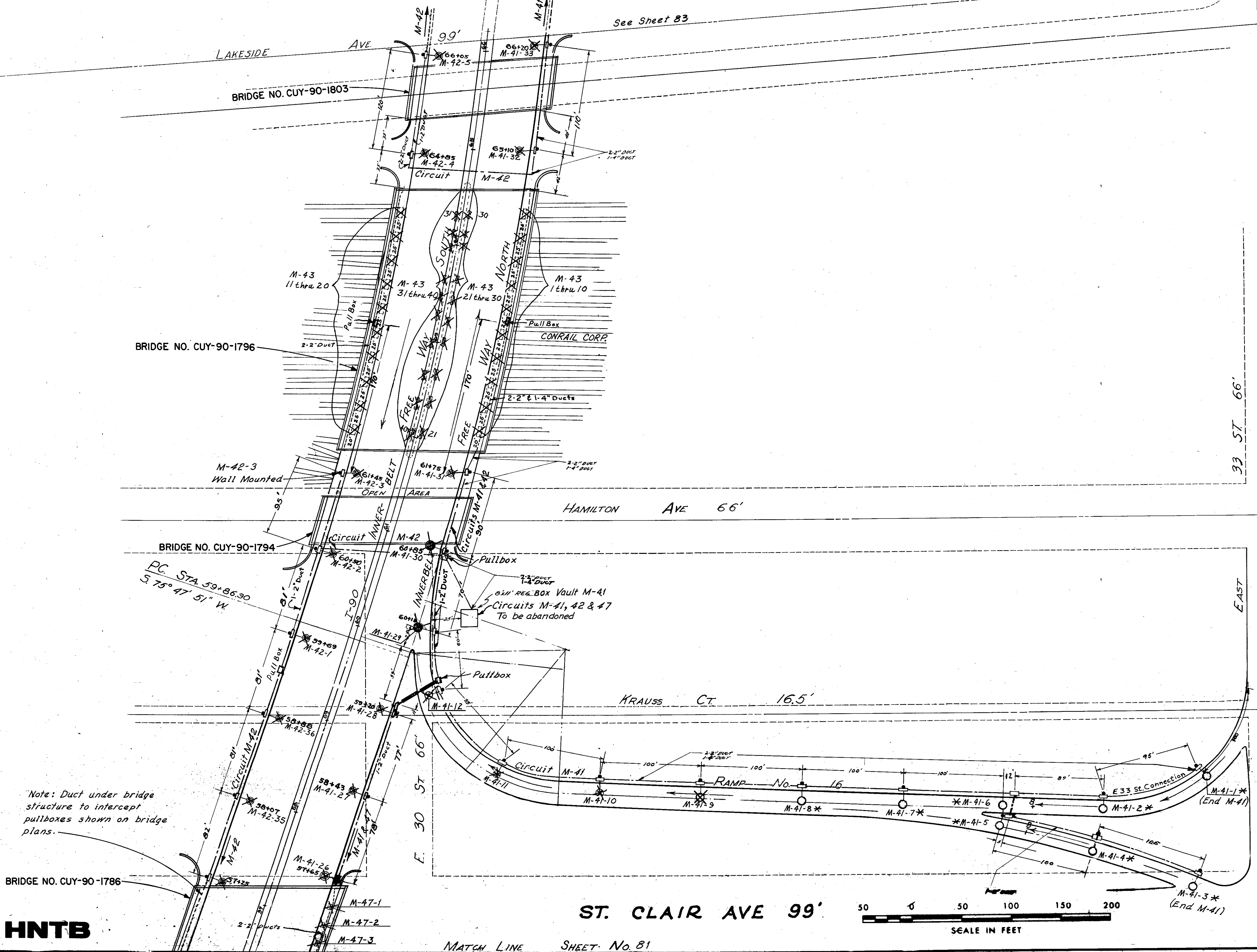


FHWA REGION	STATE	PROJECT
5	OHIO	

82  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21

See Sheet 83



CITY OF CLEVELAND

\* Existing light poles to be renumbered per sheet 38

Underpass Lighting - To be removed  
Circuit M-47; 3 lamps at St. Clair Ave.  
Circuit M-43; 40 lamps at P.C. R.R.

NOTE: 100+00 has been added to all I-90 Stations beginning at Sta. 0-200  
This sheet developed from previous plans: Cuy-42R-19.78

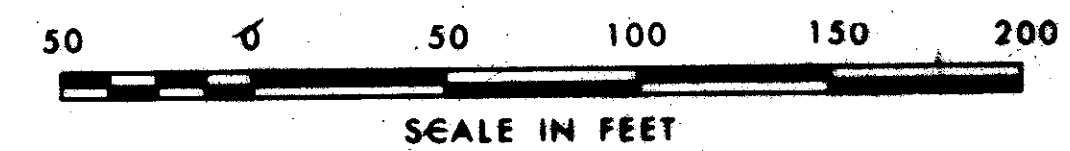
FOR LEGEND SEE SHEET 5

Note: Duct under bridge structure to intercept pullboxes shown on bridge plans.

MADE BY DATE  
TRACED BY DATE  
CHECKED BY DATE  
SCALE 1" = 30'-0"

**HNTB**

ST. CLAIR AVE 99'



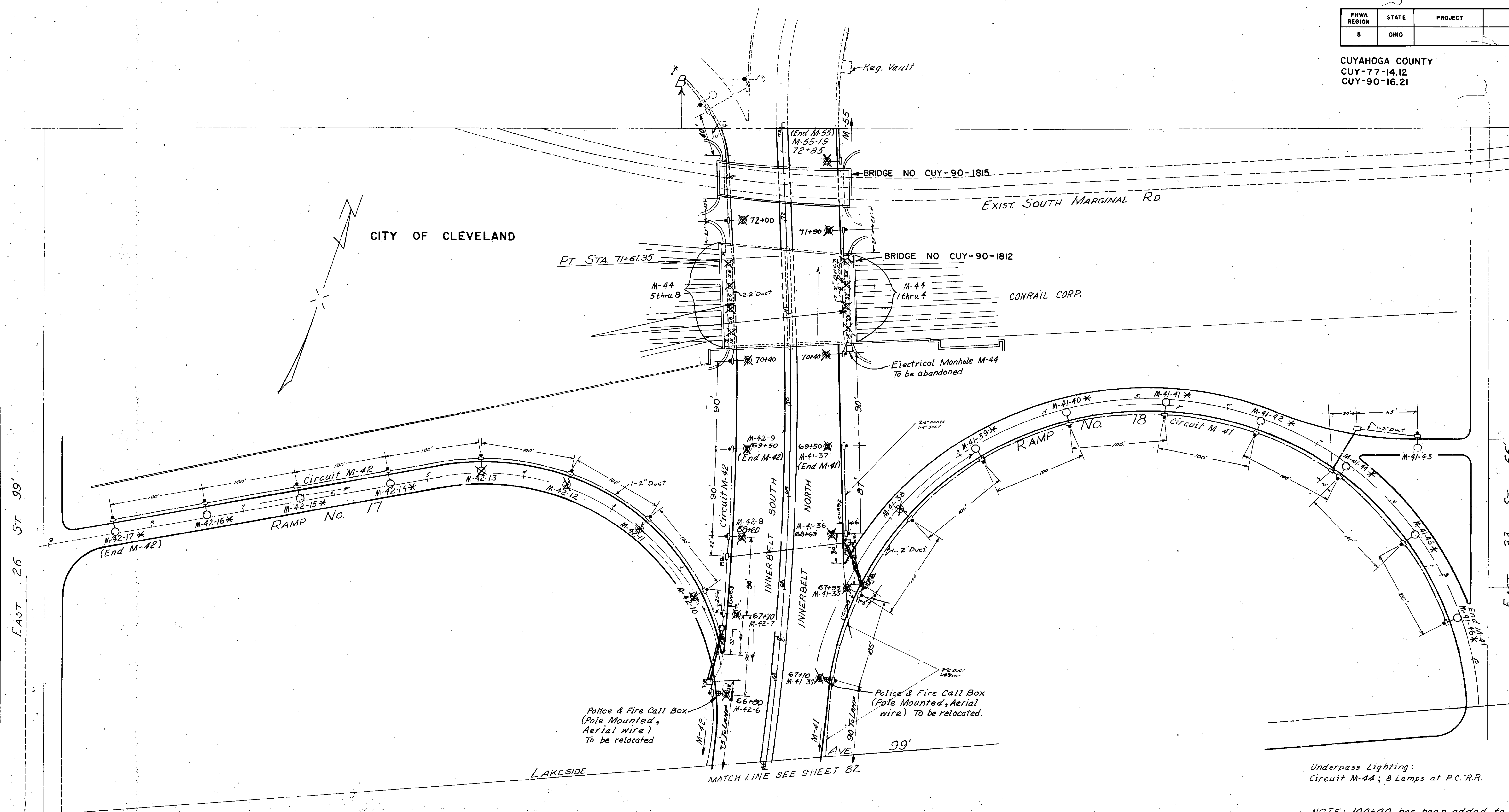
MATCH LINE SHEET No. 81

LIGHTING REMOVAL I-90 STA. 56+50 TO STA. 66+10

FHWA REGION	STATE	PROJECT
5	OHIO	

83  
84

CUYAHOGA COUNTY  
CUY-77-14.12  
CUY-90-16.21



Underpass Lighting:  
Circuit M-44; 8 Lamps at P.C. R.R.

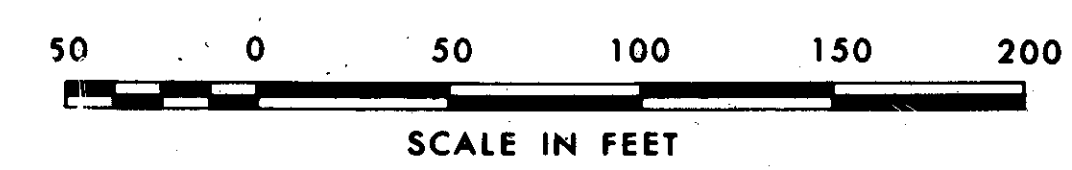
NOTE: 100+00 has been added to all I-90 Stations beginning at Sta. 0-200.

\* Existing light poles to be renumbered per sheet 39.

FOR LEGEND SEE SHEET 5

MADE BY: ERH DATE: 4/23/74  
TRACED BY: DATE: 4/23/74  
CHECKED BY: DATE: 1/22/76  
SCALE: 1" = 30'

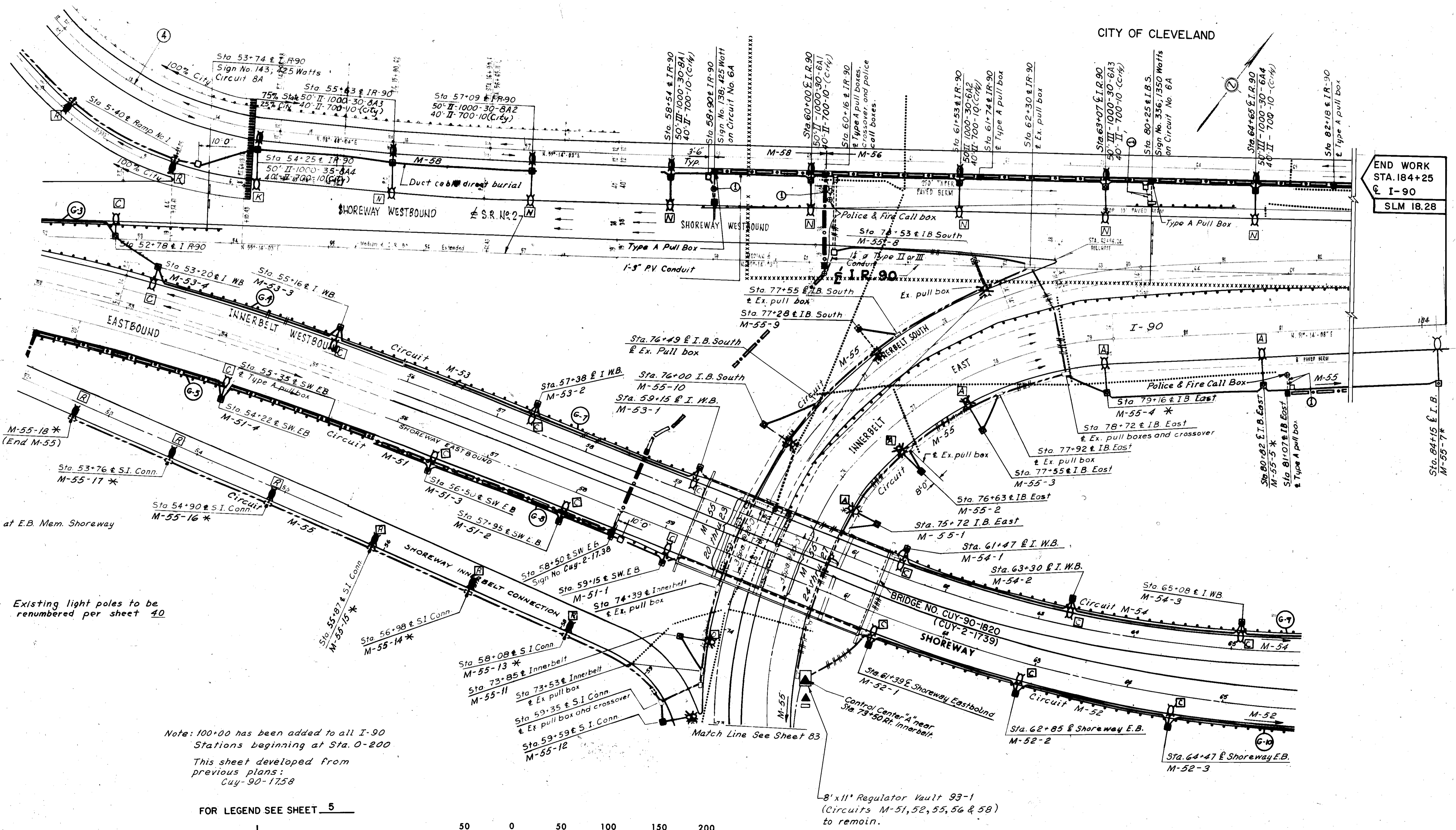
Howard, Needles, Tammen & Bergendoff  
CONSULTING ENGINEERS  
CLEVELAND, OHIO



FHWA REGION	STATE	PROJECT
5	OHIO	

84

CUYAHOGA COUNTY  
 CUY-77-14.05  
 CUY-90-16.15

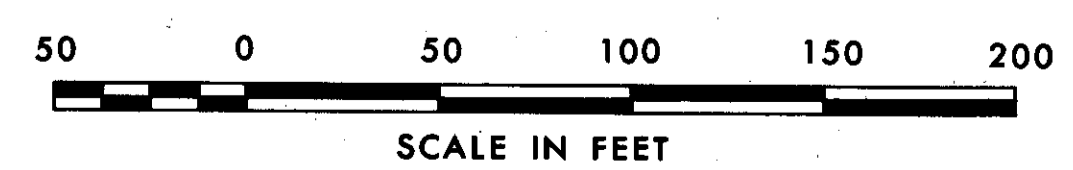


Underpass Lighting:  
 Circuit M-55; 8 Lamps at E.B. Mem. Shoreway

\* Existing light poles to be renumbered per sheet 40

Note: 100+00 has been added to all I-90 Stations beginning at Sta. 0-200  
 This sheet developed from previous plans: Cuy-90-1758

FOR LEGEND SEE SHEET 5



MADE E.R.H. DATE 12-1-74  
 TRACED J.A.R. DATE 4-8-77  
 CHECKED E.F.J. DATE 1-13-76  
 SCALE 1"=50'-0"

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

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