STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUM - 271 - 6.01
SUMMIT COUNTY
RICHFIELD & BOSTON TOWNSHIPS

OHIO	
FHWA REGION 5	1 / 22
IR-271-6(67)235	FEDERAL PROJECT

SUMMIT COUNTY
SUM-271-6.01

IR-271-6(67)235

MICROFILM

CONVENTIONAL SIGNS

County Line
Township Line
Section Line
Corporation Line or
Fence Line (existing) (proposed)
Center Line 352 353
Trees, Stumps, (to be removed)
Utility Poles: Telephone, Power, Light.

Limited Access (only) LA
Right of Way (only) RW
Limited Access & Right of Way LA & RW
Existing Right of Way
Property Line (in existing fence)
Railroad or
Guardrail (existing) (proposed)

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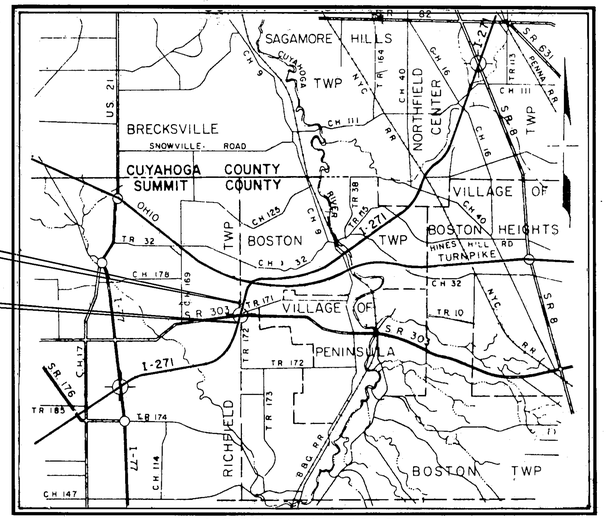
CROSS SECTIONS	19-20-21-22

END WORK-I-271
STA. 330+40

BEGIN WORK-I-271
STA. 282+82



LOCATION MAP

SCALE IN MILES
0 1 2 3 4

1985 SPECIFICATIONS

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

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

Approved Francis V. Fischer
Date 3-18-86 District Deputy Director of Transportation

Approved
Date Engineer, Bureau of Bridges and Structural Design

Approved Wayne H. Kauble
Date 8-19-86 Chief Engineer, Planning and Design

Approved Warren G. Smith
Date 8-19-86 Director, Department of Transportation

LINE DATA

Net Length of Project Work Limits		0.00 Lin. Ft. or 0.000 Miles
Begin Work I-271:	Sta. 282+82	
End Work I-271:	Sta. 330+40	4758 Lin. Ft.
Begin Work S.R. 303:	Sta. 129+35	
Station Equation:	Sta. 142+42.35 Back = Sta. 92+41.28 Ahead	
End Work S.R. 303:	Sta. 58+80	2946.07 Lin. Ft.
Net Length of Work:		7709.07 Lin. Ft. or 1.459 Miles

Portion to be improved
State & Federal
Other Roads

SCALES

Plan 0 50 100
0 100

Cross Section: Horizontal 0 10 20, Vertical 0 10 20

SUPPLEMENTAL SPECIFICATIONS	
NUMBER	DATE

Plan Prepared By:

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

RALPH E. ROBISON 29717 REGISTERED PROFESSIONAL ENGINEER

Ralph E. Robison
RALPH E. ROBISON

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS						
NUMBER	DATE	NUMBER	DATE			
HL- 1	12-28-84	HL-25	12-21-84			
HL- 2	07-27-73	HL-26	12-21-84			
HL- 3	12-28-84					
HL- 8	01-21-76	TC-35.10	8-29-84			
HL- 9	03-22-77					
HL-10	12-28-84					
HL-11	06-01-79					
HL-12	12-28-84					
HL-15	12-28-84					
HL-16	12-28-84					
HL-23	12-21-84					
HL-24	12-21-84					

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

Project: SUM-271-6.01
Date of Letting _____ 19___, Contract No. _____

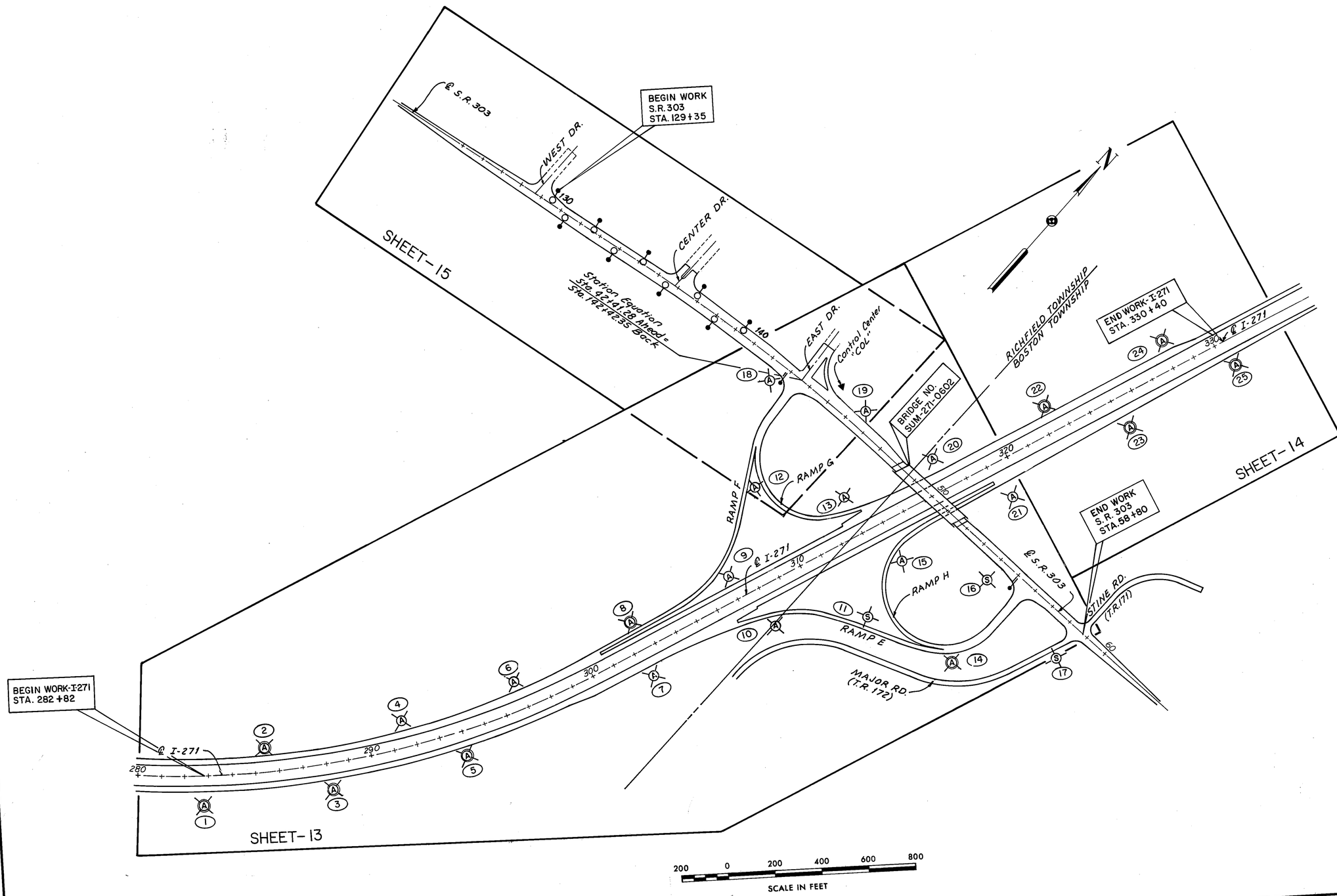
LD0300 Rev. 11-21-73

FHWA REGION	STATE	PROJECT	
5	OHIO		

2
22

SUMMIT COUNTY
SUM-271-6.01

SCHEMATIC PLAN



Howard, Needles, Tammen & Bergendoff | HNTB

SCHEMATIC PLA

LIGHTING NOTES

QUANTITY CALCULATIONS
MADE BY RDJ DATE 3-14-86
CHECKED BY FEG DATE 3-14-86

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TEMPORARY OVERHEAD WIRING MAY BE USED. ALL MATERIALS NECESSARY TO MAINTAIN THE EXISTING LIGHTING SHALL BE FURNISHED BY THE CONTRACTOR AND THE TEMPORARY INSTALLATIONS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR WHEN NO LONGER NEEDED.

RECONDITIONED OR APPROVED USED MATERIALS MAY BE FURNISHED. TEMPORARY OVERHEAD CONSTRUCTION SHALL NOT BE LESS THAN GRADE A FOR STRENGTH REQUIREMENT AS DEFINED BY THE NATIONAL ELECTRIC SAFETY CODE.

CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CIRCUITRY ONLY. ROUTINE MAINTENANCE ITEMS SUCH AS LAMP REPLACEMENT, KNOCKDOWNS, OR OUTAGES DUE TO A SOURCE OTHER THAN CONSTRUCTION SHALL REMAIN ODOT'S RESPONSIBILITY.

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THE LOCATION OF UNDERGROUND DUCT CABLE OR NON-METALLIC CONDUIT, WHEN INSTALLED IN LOCATIONS OTHER THAN THE NORMAL OR ALTERNATE TRENCH ALIGNMENT SHOWN ON STANDARD CONSTRUCTION DRAWING HL-1, SHALL BE MARKED BY THE USE OF A CONTINUOUS IDENTIFYING TAPE BURIED IN THE TRENCH ABOVE THE LINE. THE IDENTIFYING TAPE SHALL BE AN INERT MATERIAL, APPROXIMATELY 6" WIDE, COMPOSED OF POLYETHYLENE PLASTIC, HIGHLY RESISTANT TO ALKALIS, ACID OR OTHER CHEMICAL COMPONENTS LIKELY TO BE ENCOUNTERED IN SOILS. THE TAPE SHALL BE BRIGHT YELLOW WITH IDENTIFYING PRINTING "ELECTRIC" IN BLACK LETTERS, ONE SIDE ONLY. TAPES SHALL BE SUPPLIED IN CONTINUOUS ROLLS WITH THE IDENTIFYING LETTERING REPEATED CONTINUOUSLY THE FULL LENGTH OF THE TAPE. IDENTIFYING TAPES SHALL BE BURIED IN THE ELECTRIC LINE TRENCH WITH ONE STRIP PLACED APPROXIMATELY DOWN THE CENTERLINE AND LOCATED APPROXIMATLEY 8" TO 12" BELOW THE FINAL FINISHED GRADE. THE TAPE SHALL BE PLACED IN THE TRENCH WITH PRINTED SIDE UP AND SHALL BE ESSENTIALLY PARALLEL WITH THE FINISHED SURFACE. THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO INSURE THAT THE TAPE IS NOT PULLED, DISTORTED, OR OTHERWISE MISPLACED IN COMPLETING THE TRENCH BACKFILL. TAPE SHALL BE ALLEN SYSTEM'S, TERRA TAPE, OR EQUAL AS APPROVED BY THE ENGINEER.

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THE FOUNDATION SHALL BE REMOVED TO ONE (1) FOOT BELOW THE TOP OF THE PROPOSED SUBBASE AND BACKFILLED IN ACCORDANCE WITH ITEM 203.

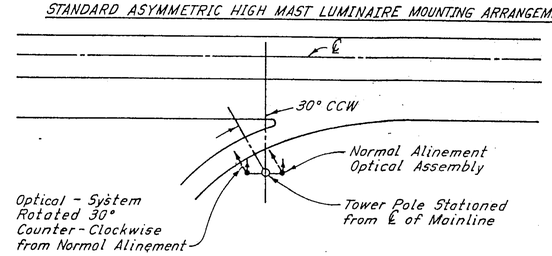
THE POLE, MAST ARM, LUMINAIRE AND LAMP SHALL BE STORED WITHIN THE PROJECT LIMITS FOR REMOVAL BY STATE FORCES. THE ENGINEER SHALL CONTACT THE DISTRICT TRAFFIC ENGINEER TO ARRANGE FOR THE REMOVAL OF THE POLE, MAST ARM, LUMINAIRE AND LAMP. THE CONTRACTOR SHALL DISPOSE OF ALL OTHER NON-SALVAGEABLE ITEMS AS PART OF THIS ITEM OF WORK.

PAYMENT FOR THIS ITEM OF WORK WILL BE AT THE CONTRACT UNIT PRICE BID PER EACH FOR ITEM 202 REMOVE EXISTING LIGHT POLE FOR STORAGE, AS PER PLAN WHICH WILL BE FULL COMPENSATION FOR ALL LABOR, EQUIPMENT, MATERIAL AND INCIDENTALS NECESSARY TO COMPLETE THIS ITEM OF WORK.

LIGHT TOWER LUMINAIRE MOUNTING ARRANGEMENT
LUMINAIRE MOUNTING ARMS FOR TOWER LIGHTING UNITS SHALL BE INSTALLED BY THE POLE MANUFACTURER SO THAT THE REQUIRED NUMBER OF LUMINAIRES CAN BE INSTALLED ON THE LUMINAIRE MOUNTING RING IN A SYMMETRICAL ARRANGEMENT.

UNLESS OTHERWISE SPECIFIED IN THE PLANS, ALL LUMINAIRES WITH ASYMMETRIC DISTRIBUTIONS SHALL BE INSTALLED SO THE "ARROW" OR "STREET SIDE" DESIGNATION ON THE OPTICAL ASSEMBLY IS POSITIONED PERPENDICULAR TO THE CENTERLINE OR BASELINE OF THE PAVEMENT FROM WHICH THE TOWER IS STATIONED. ANY OPTICAL ROTATION CALLED FOR WILL BE EXPRESSED AS A CLOCKWISE (CW) OR COUNTERCLOCKWISE (CCW) ANGULAR MEASUREMENT FROM THE NORMAL "ARROW" ORIENTATION.

STANDARD ASYMMETRIC HIGH MAST LUMINAIRE MOUNTING ARRANGEMENT



LIGHT TOWER FOUNDATIONS
LIGHT TOWER FOUNDATIONS SHALL COMPLY WITH 625.06 AND THE LIGHT TOWER FOUNDATION DETAILS AS PER PLAN.

NOTE NUMBER THREE (3) ON DWG. HL-24 SHALL BE AMENDED AS FOLLOWS: IF SOLID ROCK IS ENCOUNTERED BEFORE REACHING THE REQUIRED EMBEDMENT, THE REMAINING EMBEDMENT MAY BE DECREASED BY FIFTY PERCENT, BUT THE EMBEDMENT INTO SOLID ROCK NEED NOT EXCEED SEVEN FEET EXCEPT AS REQUIRED TO PROVIDE A MINIMUM TEN (10) FOOT TOTAL EMBEDMENT.

IT IS EXPECTED THAT SHALE AND POSSIBLY SANDSTONE WILL BE ENCOUNTERED AT NUMEROUS LOCATIONS AND MAY BE VERY CLOSE TO GROUND SURFACE (NOTABLY LIGHT TOWERS 1,3,7, 23,24, AND 25).

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," INCLUDING ALL LABOR, MATERIALS, EQUIPMENT, AND INCIDENTALS TO COMPLETE THE ITEM OF WORK AS SPECIFIED AND ACCEPTED.

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MADE R.D.J. DATE 3-14-86
TRACED DATE
CHECKED F.E.G. DATE 3-14-86
SCALE —

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

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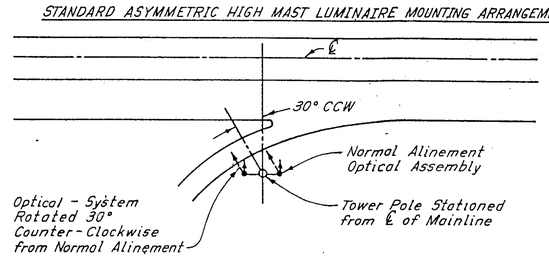

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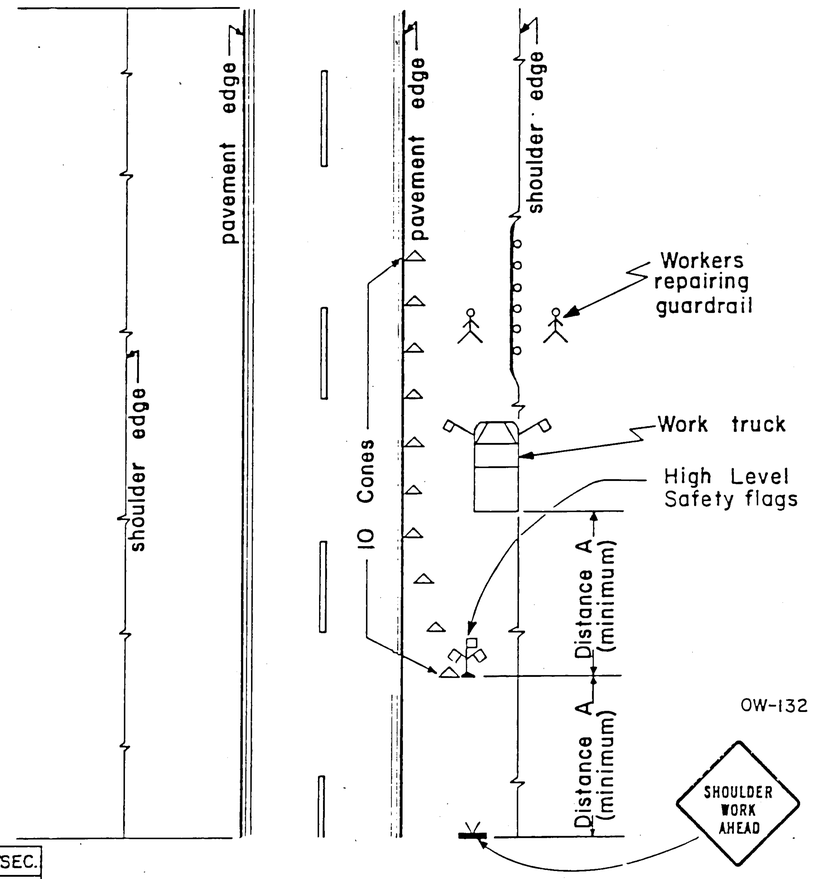
CLEVELAND, OHIO
HNTB

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

PLAN NO.

SUMMIT COUNTY
SUM.-271-6.01

TYPICAL APPLICATIONS OF TRAFFIC CONTROL DEVICES FOR STATIONARY OPERATIONS ON THE SHOULDER



REF.SEC.
7D-16

NOTES:
1. Space the cones at 50' maximum.
2. For work within the median, install the same cones and signs for both directions of travel.

TYPE OF ROADWAY	DISTANCE A - ft.
Urban	200
Standard	500
Expressway	750

FHWA REGION	STATE	PROJECT	
5	OHIO		

SUMMIT COUNTY
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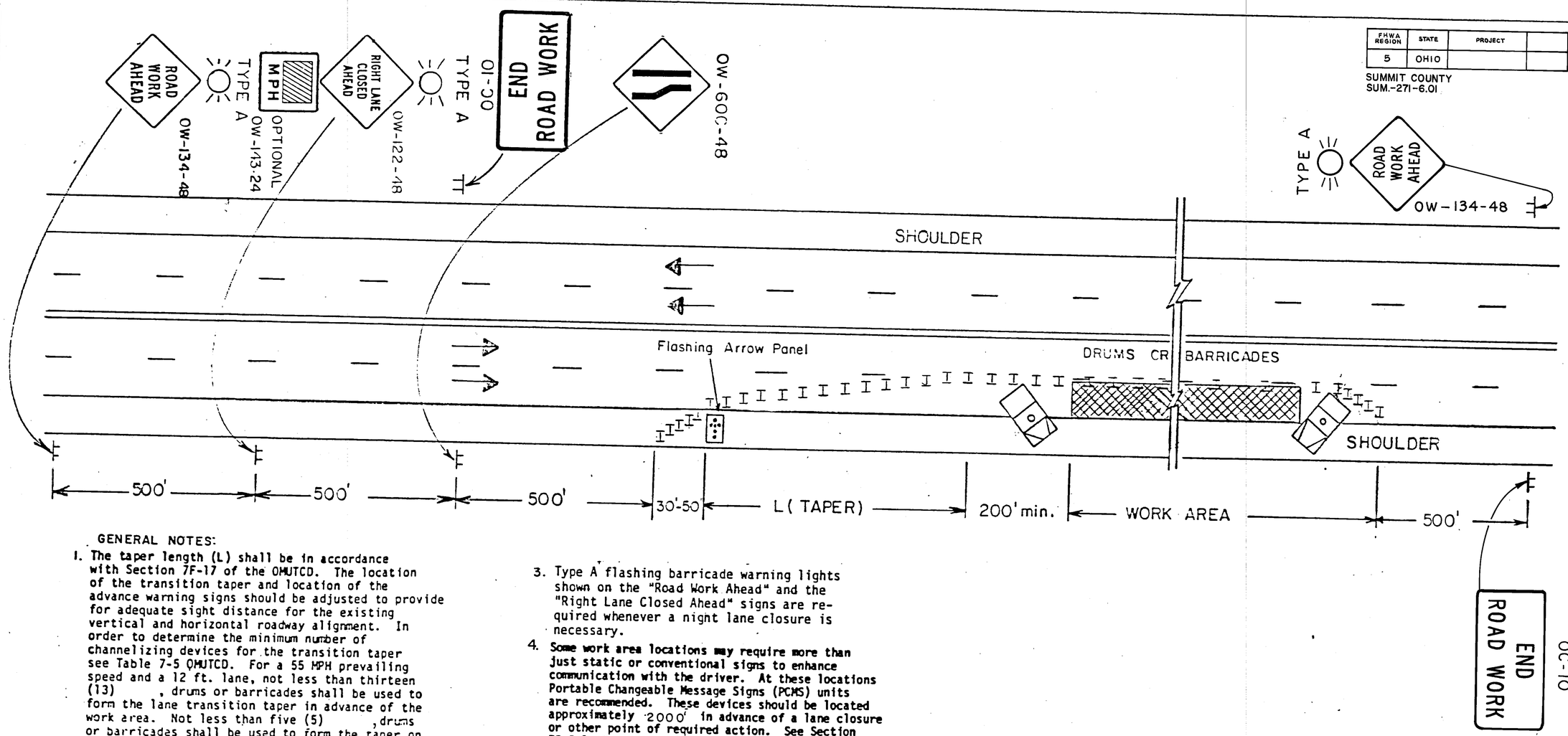


GENERAL NOTES:

1. The taper length (L) shall be in accordance with Section 7F-17 of the OMUTCD. The location of the transition taper and location of the advance warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment. In order to determine the minimum number of channelizing devices for the transition taper see Table 7-5 OMUTCD. For a 55 MPH prevailing speed and a 12 ft. lane, not less than thirteen (13) , drums or barricades shall be used to form the lane transition taper in advance of the work area. Not less than five (5) , drums or barricades shall be used to form the taper on the shoulder. Drums or barricades shall be spaced approximately 50' to 60' center to center for the first 1000 feet of the work area and at a maximum of 100 to 120 feet for the balance of the work area. Drums or barricades on the return taper shall be spaced at 10' center to center. Cones may be substituted for barricades or drums for short term lane closures. Cones shall not be used for night lane closures.

2. Type C steady burning barricade warning lights shall be erected on drums or barricades for night lane closures. The maximum spacing shall be identical to the channelizing device spacing requirements described in Note 1.

3. Type A flashing barricade warning lights shown on the "Road Work Ahead" and the "Right Lane Closed Ahead" signs are required whenever a night lane closure is necessary.

4. Some work area locations may require more than just static or conventional signs to enhance communication with the driver. At these locations Portable Changeable Message Signs (PCMS) units are recommended. These devices should be located approximately 2000' in advance of a lane closure or other point of required action. See Section 7G-8.1, OMUTCD for further guidance on use of PCMS units.

5. The work vehicles shown at the beginning and end of the work area shall be in place and unoccupied whenever workers are in the work area. These work vehicles shall be removed from the pavement whenever workers are not in the work area. Other protective devices may be used in lieu of the work vehicles shown when approved by the Engineer. The vehicles shall be equipped with a 360° rotating or flashing amber beacon clearly visible a minimum of a ½ mile.

6. The flashing arrow panel shall meet requirements of TC-35.10.

OHIO DEPARTMENT OF TRANSPORTATION

CLOSING RIGHT LANE OF A MULTILANE UNDIVIDED HIGHWAY

DATE 12/82 8/83

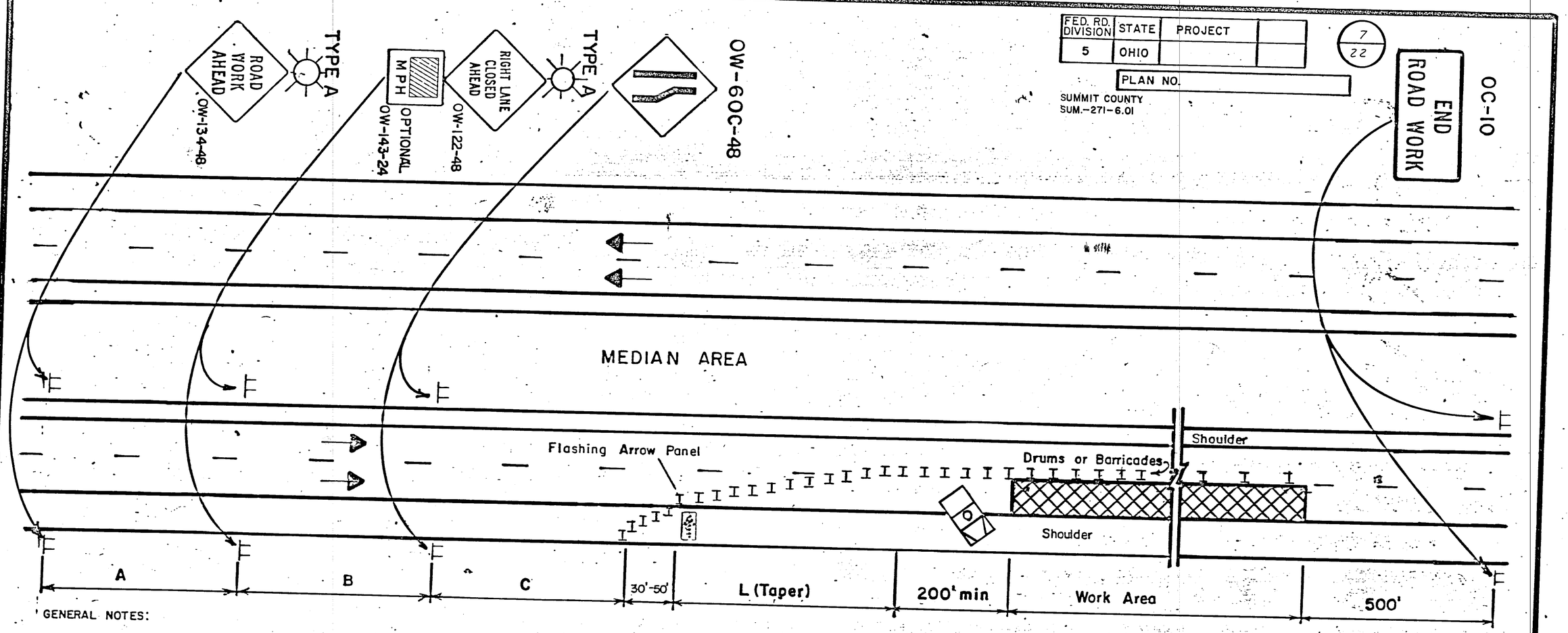
DR | CK

FED. RD. DIVISION	STATE	PROJECT	
5	OHIO		

PLAN NO.

SUMMIT COUNTY
SUM.-271-6.01

7/22



GENERAL NOTES:

1. The taper length (L) shall be in accordance with Section 7F-17 of the OMUTCD. The location of the transition taper and location of the advance warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment. In order to determine the minimum number of channelizing devices for the transition taper see Table 7-5 OMUTCD. For a 55 MPH prevailing speed and a 12 ft. lane, not less than thirteen (13) drums or barricades shall be used to form the lane transition taper in advance of the work area. Not less than five (5) drums or barricades shall be used to form the taper on the shoulder. Drums or barricades shall be spaced approximately 50' to 60' center to center for the first 1000 feet of the work area and at a maximum of 100 to 120 feet for the balance of the work area. Cones may be substituted for barricades or drums for short term lane closures. Cones Shall Not Be Used For Night Lane Closures.

2. The major standard level warning sign sizes may be used on divided streets or highways that are not classified as freeways or expressways.

3. When work is being performed in the lane adjacent to the median on a divided highway an OW-123-48 sign(s) shall be substituted for the OW-122-48 sign(s) and an OW-60D-48 sign(s) shall be substituted for the OW-60C sign(s).

4. The work vehicle shown at the beginning of the work area shall be in place and unoccupied whenever workers are in the work area. This work vehicle shall be removed from the pavement whenever workers are not in the work area. Other protective devices may be used in lieu of the work vehicle shown when approved by the Engineer. The vehicle shall be equipped with a 360° rotating or flashing amber beacon clearly visible a minimum of a ½ mile.

5. The flashing arrow panel shall meet requirements contained in TC 35.10.

6. Type C steady burning barricade warning lights shall be erected on drums or barricades for night lane closures. The maximum spacing shall be identical to the channelizing device spacing requirements described in Note 1.

MINIMUM DISTANCE	A	B	C
MAJOR STANDARD	500'	500'	500'
URBAN FREEWAY & EXPRESSWAY	500' TO 1000'	500' TO 1000'	500' TO 1000'
RURAL FREEWAY & EXPRESSWAY	2600'	1600'	1000'

7. Type A flashing barricade warning lights shown on the "Road Work Ahead" and the "Right Lane Closed Ahead" signs are required whenever a night lane closure is necessary.

8. Some work area locations may require more than just static or conventional signs to enhance communication with the driver. At these locations Portable Changeable Message Signs (PCMS) units are recommended. These devices should be located approximately 2000-4000 ft. in advance of a lane closure or other point of required action. See Section 7G-8.1, OMUTCD for further guidance on use of PCMS units.

OHIO DEPARTMENT OF TRANSPORTATION

CLOSING ONE LANE OF A FOUR LANE DIVIDED HIGHWAY

DATE 2/82

7I-1a

Rev. EEF 9/84

QUANTITY CALCULATIONS
MADE BY RDJ DATE 3-14-86
CHECKED BY FEG DATE 3-14-86

LIGHTING QUANTITIES GENERAL SUMMARY

FHWA REGION	STATE	PROJECT
5	OHIO	

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SUMMIT COUNTY
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LINE NO.	LIGHTING SHEET NO. 13 PARTICIPATION I	14 I	15 II	11 I	3 I	3 II	4 I	4 II	COST PARTICIPATION I	II	GRAND TOTAL	ITEM	UNIT	DESCRIPTION	REFERENCE LETTER	LINE NO.
1																1
2																2
3				18					18		18	202	EACH	REMOVE EXISTING LIGHT POLE FOR STORAGE, AS PER PLAN		3
4																4
5				Lump					Lump		Lump	202		CONTROL CENTER AND SERVICE POLE, TO BE REMOVED AND STORED		5
6																6
7							375	125	375	125	500	603	LIN. FT.	4" CONDUIT TYPE E, 707.15		7
8					Lump	Lump			Lump	Lump	LUMP	SPEC	LUMP	MAINTAINING EXISTING LIGHTING		8
9	72	16							88		88	625	EACH	LUMINAIRE, LIGHT TOWER, ASYMMETRIC, 400W, HPS, 713.21		9
10	12								12		12	625	EACH	LUMINAIRE, LIGHT TOWER, SYMMETRIC, 400W, HPS, 713.21		10
11	2	2							4		4	625	EACH	LIGHT TOWER, DESIGN BBBB90, 713.21		11
12	16	2							18		18	625	EACH	LIGHT TOWER, DESIGN BBBB100, 713.21		12
13	1								1		1	625	EACH	LIGHT TOWER, DESIGN BBBB110, 713.21		13
14	2								2		2	625	EACH	LIGHT TOWER, DESIGN BBBB 120, 713.21		14
15	1	2							3		3	625	EACH	LIGHT TOWER MAINTENANCE PLATFORM TYPE A		15
16	1								1		1	625	EACH	LIGHT TOWER MAINTENANCE PLATFORM TYPE B		16
17	2	2							4		4	625	EACH	LIGHT TOWER MAINTENANCE PLATFORM TYPE C		17
18	2								2		2	625	EACH	LIGHT TOWER MAINTENANCE PLATFORM TYPE D		18
19	18	4							22		22	625	EACH	LIGHT TOWER FOUNDATION, 36"ø x 25' DEEP		19
20	3								3		3	625	EACH	LIGHT TOWER FOUNDATION, 36"ø x 30' DEEP		20
21	43	8							51		51	625	EACH	GROUND ROD, 713.16		21
22	21	4							25		25	SPEC	EACH	TOWER LIGHTNING PROTECTION SYSTEM		22
23			9							9	9	625	EACH	CONNECTOR KIT, TYPE II		23
24			9							9	9	625	EACH	CONNECTOR KIT, TYPE III		24
25	860								860		860	625	LIN. FT.	NO. 2 AWG, 5000 VOLT, DISTRIBUTION CABLE		25
26	26		4						26	4	30	625	EACH	CABLE SPLICING KIT		26
27			2							2	2	625	EACH	LIGHT POLE DESIGN A10B32.5		27
28			7							7	7	625	EACH	LIGHT POLE DESIGN A15B32.5		28
29			9							9	9	625	EACH	LUMINAIRE, STYLE B, TYPE III, 200W, HPS, 713.11		29
30			855							855	855	625	LIN. FT.	NO. 10 AWG, POLE AND BRACKET CABLE		30
31	7		3						7	3	10	625	EACH	PULLBOX, CONCRETE 18", 713.08		31
32	2								2		2	625	EACH	PULLBOX, CONCRETE 24", 713.08		32
33	100		195						100	195	295	625	LIN. FT.	CONDUIT JACKED OR DRILLED UNDER PAVEMENT 3"ø, 713.04		33
34	1								1		1	625	EACH	POWER SERVICE		34
35	10630	1,890	2,195						12520	2195	14,715	625	LIN. FT.	TRENCH, 24" DEEP		35
36	7785								7785		7785	625	LIN. FT.	1½"ø DUCT CABLE w/2-NO. 2 AWG, 5000 VOLT CABLES		36
37	3715	1,930	2,475						5645	2475	8120	625	LIN. FT.	1½ ø DUCT CABLE w/2-NO. 4 AWG, 5000 VOLT CABLES		37
38	360								360		360	625	LIN. FT.	1½ ø DUCT CABLE w/2-1/0 AWG, 5000 VOLT CABLE		38
39	340								340		340	625	LIN FT.	NO. 1/0 AWG, 5000 VOLT DISTRIBUTION CABLE		39
40	900								900		900	625	LIN. FT.	NO. 4 AWG, 5000 VOLT DISTRIBUTION CABLE		40
41	5440	550	140						5990	140	6130	SPEC.	LIN. FT.	PLASTIC CAUTION TAPE		41
42	30								30		30	625	LIN. FT.	CONDUIT 3"ø, 713.04		42
43									Lump	Lump	LUMP	625	LUMP	HIGH VOLTAGE TEST		43
44			9							9	9	625	EACH	LIGHT POLE FOUNDATION 24" X 6' DEEP		44
45																45
46																46
47																47
48																48
49																49
50																50
51																51
52																52
53																53
54																54
55																55
56									Lump	Lump	LUMP	614	LUMP	MAINTAINING TRAFFIC		56
57									Lump	Lump	LUMP	619	LUMP	FIELD OFFICE		57
58									Lump	Lump	LUMP	623	LUMP	CONSTRUCTION LAYOUT STAKES		58
59									Lump	Lump	LUMP	624	LUMP	MOBILIZATION		59
60																60

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY
HNTB

MADE R.D.J. DATE 3-14-86
CHECKED F.E.G. DATE 3-14-86

Note: All quantities from sheets 13 and 14 are cost participation I.
All quantities from sheet 15 are cost participation II, 100% State

LIGHTING QUANTITIES SUB-SUMMARY

QUANTITY CALCULATIONS
MADE BY R.D.J. DATE 3-14-86
CHECKED BY F.E.G. DATE 3-14-86

FHWA REGION	STATE	PROJECT
5	OHIO	

SUMMIT COUNTY
SUM-271-6.01

REFERENCE LINE	STATION	STATION	SIDE	625 LUMINAIRE, LIGHT TOWER, ASYMMETRIC, 400W, HPS, 713.21 (EACH)	625 LUMINAIRE, LIGHT TOWER, SYMMETRIC, 400W, HPS, 713.21 (EACH)	625 LIGHT TOWER, DESIGN BBBB 90, 713.21 (EACH)	625 LIGHT TOWER, DESIGN BBBB 100, 713.21 (EACH)	625 LIGHT TOWER, DESIGN BBBB 110, 713.21 (EACH)	625 LIGHT TOWER, DESIGN BBBB 120, 713.21 (EACH)		625 LIGHT TOWER FOUNDATION 36"ϕ x 25' DEEP (EACH)	625 LIGHT TOWER FOUNDATION 36"ϕ x 30' DEEP (EACH)	625 LIGHT POLE FOUDATION 24"×6' DEEP	625 GROUND ROD, 713.16 (EACH)	SPEC 608 TOWER LIGHTNING PROTECTION		625 LIGHT POLE DESIGN A10B32.5 (EACH)	625 CONNECTOR KIT TYPE II (EACH)	625 CONNECTOR KIT TYPE III (EACH)	625 CONDUIT 3"ϕ, 713.04 (LIN. FT.)	625 CABLE SPLICING KIT (EACH)	625 LIGHT POLE DESIGN A15B32.5 (EACH)	625 LUMINAIRE, STYLE B, TYPE III 200W, HPS, 713.11 (EACH)	625 NO. 10, POLE AND BRACKET CABLE (LIN. FT.)	625 PULLBOX, CONCRETE 18", 713.08 (EACH)	625 PULLBOX, CONCRETE 24", 713.08 (EACH)	625 CONDUIT JACKED OR DRILLED UNDER PAVEMENT 3"ϕ, 713.04 (LIN. FT.)	625 POWER SERVICE (EACH)	625 TRENCH, 24" DEEP	625 1½"ϕ DUCT CABLE w/2-NO. 2 AWG, 5000VOLT CABLES (LIN. FT)	625 1½"ϕ DUCT CABLE w/2-NO. 4 AWG, 5000VOLT CABLES (LIN. FT)	625 1½"ϕ DUCT CABLE w/2-NO. 1/0 AWG, 5000VOLT CABLES (LIN. FT)	625 NO. 1/0 AWG, 5000VOLT DISTRIBUTION CABLE	625 NO. 4 AWG, 5000VOLT DISTRIBUTION CABLE	625 LIGHT TOWER MAINTENANCE PLATFORM TYPE A (EACH)	625 LIGHT TOWER MAINTENANCE PLATFORM TYPE B (EACH)	625 LIGHT TOWER MAINTENANCE PLATFORM TYPE C (EACH)	625 LIGHT TOWER MAINTENANCE PLATFORM TYPE D (EACH)	625 NO. 2 AWG, 5000VOLT DISTRIBUTION CABLE	SPEC. PLASTIC CAUTION TAPE (LIN. FT.)
1	SHEET 13																																				
2	285+52 I-271	(TOWER 2)	Lt.	4			1					1		2	1																			1		
3	285+52 I-271	291+68 I-271	Lt.																											620	630					140	
4	291+68 I-271	(TOWER 4)	Lt.	4			1				1			2	1																						
5	291+68 I-271	296+90 I-271	Lt.																											525	535					170	
6	296+90 I-271	(TOWER 6)	Lt.	4			1				1			2	1																						
7	296+90 I-271	302+52 I-271	Lt.																											565	575					150	
8	302+52 I-271	(TOWER 8)	Lt.	4			1				1			2	1																						
9	302+52 I-271	305+60 Ramp F	Lt.																											310	310				1	90	
10	305+60 Ramp F	305+60 I-271	Lt./Lt.																												50						
11	305+60 I-271	307+10 I-271	Lt./Lt.																											160	170					150	
12	307+10 I-271	(TOWER 9)	Lt.	4			1				1			2	1																						
13	307+10 I-271	309+65 I-271	Lt.																											355	365					170	
14	309+65 I-271	(TOWER 12)	Lt.	4			1				1			2	1																						
15	309+65 I-271	312+50 I-271	Lt.																											370	380					70	
16	312+50 I-271	312+50 Ramp G	Lt./Lt.																							1				50							
17	312+50 I-271	312+56 I-271	Lt.																											50	60					50	
18	312+56 I-271	(TOWER 13)	Lt.	4			1				1			2	1																						
19	312+56 Ramp G	44+50 S.R.303	Lt./Rt.																											360	370					360	
20	44+50 S.R.303	44+50 S.R.303	Rt./Lt.																								1	100		15	220	220		220			
21	44+50 S.R.303	(CC-"COL")	Rt.											1	-						30	2					1		1	10				120	120			120	15
22	282+82 I-271	(TOWER 1)	Rt.	4		1					1			2	1																					1	
23	282+82 I-271	288+18 I-271	Rt.																											550	560					260	
24	288+18 I-271	(TOWER 3)	Rt.	4			1					1		2	1																				1		
25	288+18 I-271	293+95 I-271	Rt.																											600	610					200	
26	293+95 I-271	(TOWER 5)	Rt.	4			1					1		2	1																				1		
27	293+95 I-271	302+30 I-271	Rt.																											850	860					185	
28	302+30 I-271	(TOWER 7)	Rt.	4			1				1			2	1																						
29	302+30 I-271	307+40 Ramp E	Rt./Rt.																											520	530					90	
30	307+40 Ramp E	307+90 I-271	Rt./Rt.													2														50		60				60	
31	307+90 I-271	(TOWER 10)	Rt.	4			1				1			2	1																						
32	307+40 Ramp E	307+50 I-271	Rt./Rt.																												30						
33	307+50 I-271	311+42 I-271	Rt.																							1				470	480					70	
34	311+60 I-271	(TOWER 11)	Rt.		4		1				1			2	1																						
35	311+60 I-271	314+50 I-271	Rt.													2														380	390					160	
36	314+50 I-271	314+50 Ramp H	Rt./Rt.													2															60						
37	314+50 Ramp H	51+60 S.R.303	Rt./Rt.																											200	210					180	
38	51+60 S.R.303	47+90 S.R.303	Rt.													2																				740	
39	47+90 S.R.303	44+50 S.R.303	Rt.													2														350			360				
40	314+00 I-271	(TOWER 15)	Rt.	4			1				1			2	1																						
41	314+00 I-271	54+15 S.R.303	Rt./Rt.																											380		390				360	
42	54+15 S.R.303	(TOWER 16)	Rt.		4				1		1			2	1																						
43	54+15 S.R.303	54+90 S.R.303	Rt.																											90		100				75	
44	54+90 S.R.303	54+80 (STGR) S.R.303	Rt.													2																					
45	54+90 S.R.303	56+05 S.R.303	Rt.																													120					
46	56+05 S.R.303	57+85 S.R.303	Rt.																											180		190				170	
47	57+85 S.R.303	313+82 I-271	Rt./Rt.													2										1				480		490				470	
48	313+82 I-271	(TOWER 14)	Rt.	4					1		1			2	1																				1		
49	57+85 S.R.303	58+80 S.R.303	Rt.																													100					
50	58+80 S.R.303	58+50 S.R.303	Rt.																							1				90		100				80	
51	58+50 S.R.303	(TOWER 17)	Rt.		4		1				1			2	1																						
52	314+00 I-271	52+30 S.R.303	Rt./Rt.																											270		280				260	
53	52+30 S.R.303	52+30 S.R.303	Rt./Lt.																													80					
54	52+30 S.R.303	52+00 S.R.303	Lt.																											30		40					
55	52+00 S.R.303	319+40 I-271	Lt./Rt.													2														200		210				190	

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY
HNTB

MADE R.D.J. DATE 3-14-86
CHECKED F.E.G. DATE 3-14-86

LIGHTING QUANTITIES SUB-SUMMARY

QUANTITY CALCULATIONS
MADE BY R.D.J. DATE 3-14-86
CHECKED BY F.E.G. DATE 3-14-86

FHWA REGION	STATE	PROJECT
5	OHIO	

10/22

SUMMIT COUNTY
SUM-271-6.01

	REFERENCE LINE	STATION	STATION	SIDE	625 LUMINAIRE, LIGHT TOWER, ASYMMETRIC, 400W, HPS, 713.21	625 LUMINAIRE, LIGHT TOWER, SYMMETRIC, 400W, HPS, 713.21	625 LIGHT TOWER, DESIGN BBBB 90, 713.21	625 LIGHT TOWER, DESIGN BBBB 100, 713.21	625 LIGHT TOWER, DESIGN BBBB 110, 713.21	625 LIGHT TOWER, DESIGN BBBB 120, 713.21		625 LIGHT TOWER FOUNDATION 36"ø x 25' DEEP	625 LIGHT TOWER FOUNDATION 36"ø x 30' DEEP	625 LIGHT POLE FOUNDATION 24" x 6' DEEP	625 GROUND ROD, 713.16	SPEC 608 TOWER LIGHTNING PROTECTION		625 LIGHT POLE DESIGN A10B32.5	625 CONNECTOR KIT TYPE II	625 CONNECTOR KIT TYPE III	625 CONDUIT 3"ø, 713.04	625 CABLE SPLICING KIT	625 LIGHT POLE DESIGN A15B32.5	625 LUMINAIRE, STYLE B, TYPE III 200W, HPS, 713.11	625 NO. 10, POLE AND BRACKET CABLE	625 PULLBOX, CONCRETE 18", 713.08	625 PULLBOX, CONCRETE 24", 713.08	625 CONDUIT JACKED OR DRILLED UNDER PAVEMENT 3"ø, 713.04	625 POWER SERVICE	625 TRENCH, 24" DEEP	625 1½"ø DUCT CABLE w/2-NO. 2 AWG, 5000VOLT CABLES	625 1½"ø DUCT CABLE w/2-NO. 4 AWG, 5000VOLT CABLES	625 1½"ø DUCT CABLE w/2-NO. 1/0 AWG, 5000VOLT CABLES	625 NO. 1/0 AWG, 5000VOLT DISTRIBUTION CABLE	625 NO. 4 AWG, 5000VOLT DISTRIBUTION CABLE	625 LIGHT TOWER MAINTENANCE PLATFORM TYPE A	625 LIGHT TOWER MAINTENANCE PLATFORM TYPE B	625 LIGHT TOWER MAINTENANCE PLATFORM TYPE C	625 LIGHT TOWER MAINTENANCE PLATFORM TYPE D	625 NO. 2 AWG, 5000VOLT DISTRIBUTION CABLE	SPEC. 632 PLASTIC CAUTION TAPE	
					EACH							EACH			EACH			EACH			LIN.FT.	EACH			LIN.FT.	EACH			LIN.FT.	EACH						EACH			LIN.FT.	LIN.FT.	
1		SHEET 13	(Con't.)																																				
2		319+40 I-271	(TOWER 21)	Rt.	4		1					1			2	1																								
3		319+40 I-271	320+00 I-271	Rt.																																			
4		44+50 S.R.303	42+95 S.R.303	Rt.																										110		120							70	
5		42+95 S.R.303	141+85 S.R.303	Rt.																						1				160		170							155	
6		141+85 S.R.303	141+40 S.R.303	Rt.																		2				1						100								
7		141+40 S.R.303	141+65 S.R.303	Rt.																										50		60							50	
8		141+65 S.R.303	(TOWER 18)	Rt.	4			1				1			2	1						2				1				80		90							80	
9																																							
10		44+50 S.R.303	48+10 S.R.303	Lt.																																			
11		48+10 S.R.303	52+00 S.R.303	Lt.																		2								660	390								660	
12		44+50 S.R.303	45+50 S.R.303	Lt.																		2												780						
13		45+50 S.R.303	(TOWER 19)	Lt.	4				1			1			2	1														20		110							20	
14		45+50 S.R.303	317+15 I-271	Lt.																																			
15		317+15 I-271	(TOWER 20)	Lt.	4			1				1			2	1														150		360							150	
16		317+15 I-271	320+00 I-271	Lt.																																			
17			TOTAL		72	12	2	16	1	2		18	3		43	21					30	26				7	2	100	1	320		325							80	
18																														10630	7785	371.5	360	340	900	1	1	2	2	860	5440
19		SHEET 14																																					
20		320+00 I-271	322+46 I-271	Lt.																																			
21		322+46 I-271	(TOWER 22)	Lt.	4			1				1			2	1														250		260							80	
22		322+46 I-271	328+08 I-71	Lt.																																1				
23		328+08 I-271	(TOWER 24)	Lt.	4		1					1			2	1														565		575							210	
24		320+00 I-271	325+20 I-271	Rt.																																	1			
25		325+20 I-271	(TOWER 23)	Rt.	4		1					1			2	1														525		535							90	
26		325+20 I-271	330+40 I-271	Rt.																																1				
27		330+40 I-271	(TOWER 25)	Rt.	4			1				1			2	1														550		560							170	
28			TOTAL		16		2	2				4			8	4																					1			
29																														1890		1930				2	2		550	
30		SHEET 15																																					
31		141+40 S.R.303	138+05 S.R.303	Rt.										1					1	1		2	1	1	95					335		345								
32		138+05 S.R.303	135+50 S.R.303	Rt.										1					1	1			1	1	95					255		265								
33		135+50 S.R.303	132+85 S.R.303	Rt.										1				1	1	1				1	95					265		275								
34		132+85 S.R.303	130+35 S.R.303	Rt.										1				1	1	1				1	95					250		260								
35		141+40 S.R.303	141+40 S.R.303	Rt./Lt.																		2				1		80				180								
36		141+40 S.R.303	139+25 S.R.303	Lt.										1					1	1			1	1	95					215		225								
37		139+25 S.R.303	136+75 S.R.303	Lt.										1					1	1			1	1	95					250		260								
38		136+75 S.R.303	136+25 S.R.303	Lt.																						1				50		60							45	
39		136+25 S.R.303	135+10 S.R.303	Lt.																						1		115												
40		135+10 S.R.303	134+10 S.R.303	Lt.										1					1	1			1	1	95					100		110							95	
41		134+10 S.R.303	131+60 S.R.303	Lt.										1					1	1			1	1	95					250		260								
42		131+60 S.R.303	129+35 S.R.303	Lt.										1					1	1			1	1	95					225		235								
43			TOTAL											9				2	9	9		4	7	9	855	3		195		2195		2475							140	
44																																							
45		GRAND	TOTAL		88	12	4	18	1	2		22	3	9	51	25	7.5	2	9	9	30	30	7	9	855	10	2	295	1	14715	7785	8120	360	340	900	3	1	4	2	860	6130

HOWARD NEEDLES, TAMMEN & BERGENDOFF
CONSULTING ENGINEERS
KANSAS CITY
HNTB

MADE R.D.J. DATE 3-14-86
CHECKED F.E.G. DATE 3-14-86

Note: All quantities from sheets 13 and 14 are cost participation I.
All quantities from sheet 15 are cost participation II

LIGHTING REMOVAL
SUB-SUMMARY

QUANTITY CALCULATIONS
MADE BY RDJ DATE 3-14-86
CHECKED BY FEG DATE 3-14-86

5	OHIO		

11
22

SUMMIT COUNTY
SUM-271-6.01

REFERENCE LINE	STATION	STATION	SIDE	202 REMOVE EXISTING LIGHT POLE FOR STORAGE, AS PER PLAN			202 EXISTING CONTROL CENTER AND SERVICE POLE, TO BE REMOVED AND STORED	
				EACH			LUMP	
1	293+00 I-271		LT.	1				
2	296+45 I-271		LT.	1				
3	299+72 I-271		LT.	1				
4	312+55 I-271		LT.	1				
5	311+90 Ramp G		LT.	1				
6	313+85 I-271		LT.	1				
7	320+40 I-271		LT.	1				
8								
9	299+60 I-271		RT.	1				
10	306+15 I-271		RT.	1				
11	307+55 I-271		RT.	1				
12	308+15 Ramp E		RT.	1				
13	320+00 I-271		RT.	1				
14	323+30 I-271		RT.	1				
15	326+80 I-271		RT.	1				
16								
17	41+50 S.R. 303		LT.	1				
18	43+50 S.R. 303		RT.	1				
19	54+80 S.R. 303		LT.	1				
20	56+40 S.R. 303		RT.	1				
21								
22								
23								
24								
25								
26								
27	52+70 S.R. 303		Lt.				LUMP	
28								
29		TOTAL		18			LUMP	
30								

MADE R.D.J. DATE 3-14-86
TRACED DATE
CHECKED F.E.G. DATE 3-14-86
SCALE —

Howard, Needles, Tammen & Bergendoff
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CLEVELAND, OHIO

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LIGHTING PLAN

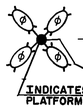
LEGEND

FHWA REGION	STATE	PROJECT		
5	OHIO			

12/22

SUMMIT COUNTY
SUM-271-6.01

(13) — LIGHT TOWER NUMBER

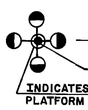


— LIGHT TOWER, 713.21, ASYMMETRIC DISTRIBUTION
— CIRCUIT NUMBER - POLE NUMBER

400-ASY- BBBB100
- LIGHT TOWER DESIGN
- ANSI-IES TYPE (II or III) ASYMMETRIC DISTRIBUTION
- 400W LUMINAIRE WITH 400W HPS LAMP
- (13) NONE-36"ø x 30' — TOWER NO. - PLATFORM TYPE - FOUNDATION DIAMETER x DEPTH

(13) (A) — LIGHT TOWER SYMBOL ON SCHEMATIC LIGHTING PLAN

(17) — LIGHT TOWER NUMBER



— LIGHT TOWER, 713.21, SYMMETRIC DISTRIBUTION
— CIRCUIT NUMBER - POLE NUMBER

400-SYM- BBBB100
- LIGHT TOWER DESIGN
- ANSI-IES TYPE (V) SYMMETRIC DISTRIBUTION
- 400W LUMINAIRE WITH 400W HPS LAMP
- (17) TYPE A-36"ø x 30' — TOWER NO. - PLATFORM TYPE - FOUNDATION DIAMETER x DEPTH

(17) (S) — LIGHT TOWER SYMBOL ON SCHEMATIC LIGHTING PLAN

- LIGHT POLE DESIGN A10B32.5 WITH STEEL ANCHOR BASE 10' BRACKET ARM STYLE B LUMINAIRE WITH 200W, HPS, LAMP, TYPE III DISTRIBUTION
- LIGHT POLE DESIGN A15B32.5 WITH STEEL ANCHOR BASE, 15' BRACKET ARM STYLE B LUMINAIRE WITH 200W, HPS, LAMP, TYPE III DISTRIBUTION
- LIGHT POLE SYMBOL ON SCHEMATIC PLAN AND CIRCUIT LAYOUT MAPS
- EXISTING LIGHT POLE DESIGN 11A15B32.5 AND FOUNDATION TO BE REMOVED FOR STORAGE
- EXISTING LIGHT POLE DESIGN 11A10B32.5 AND FOUNDATION TO BE REMOVED FOR STORAGE
- CONCRETE PULLBOX PER HL-10, 18", UNLESS NOTED OTHERWISE
- EXISTING 18" DIAMETER FIBER PULLBOX
- EXISTING CONTROL CENTER TO BE REMOVED
- CONTROL CENTER MOUNTED ON POLE PER HL-15
- # X — 1½" DUCT CABLE WITH 2 NO.X AWG 5000 VOLT CABLES, IN 24" DEEP TRENCH
- EXISTING 2"ø CONDUIT - 713.04
- EXISTING 3"ø CONDUIT - 713.04
- CONDUIT 3"ø, 713.04 WITH 713.02 CABLE (or 713.03 DUCT) JACKED OR DRILLED UNDER PAVEMENT
- EXISTING CANTILEVER SIGN
- (T) — PLASTIC CAUTION TAPE WITH LIMITS

MADE R.O.J. DATE 3-14-86
TRACED DATE
CHECKED E.E.G. DATE 3-14-86
SCALE —

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

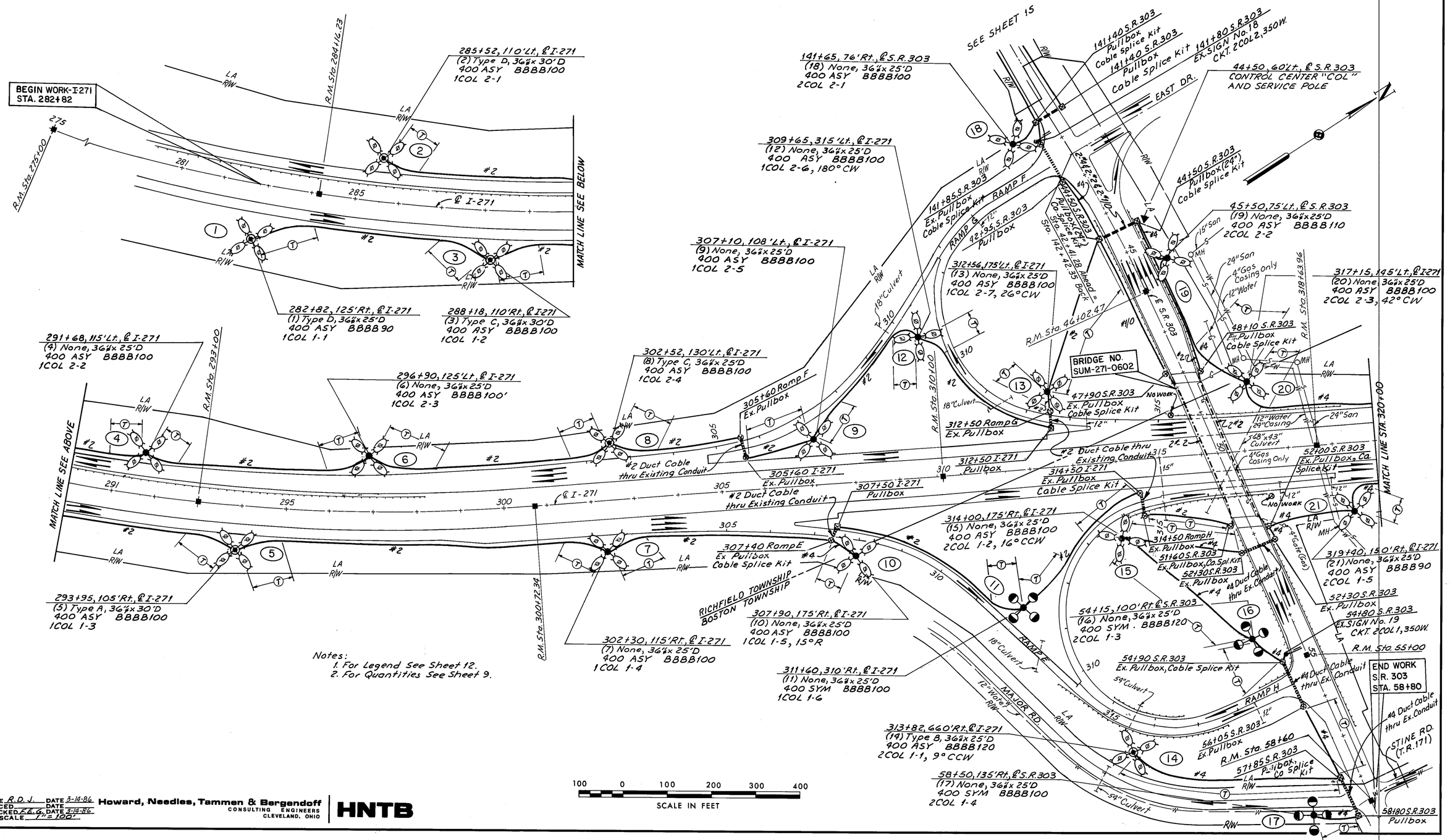
HNTB

LIGHTING PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

13/22

SUMMIT COUNTY
SUM-271-6.01



MADE R.D.J. DATE 3-14-86
TRACED DATE
CHECKED E.E.G. DATE 3-14-86
SCALE 1"=100'

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

HNTB

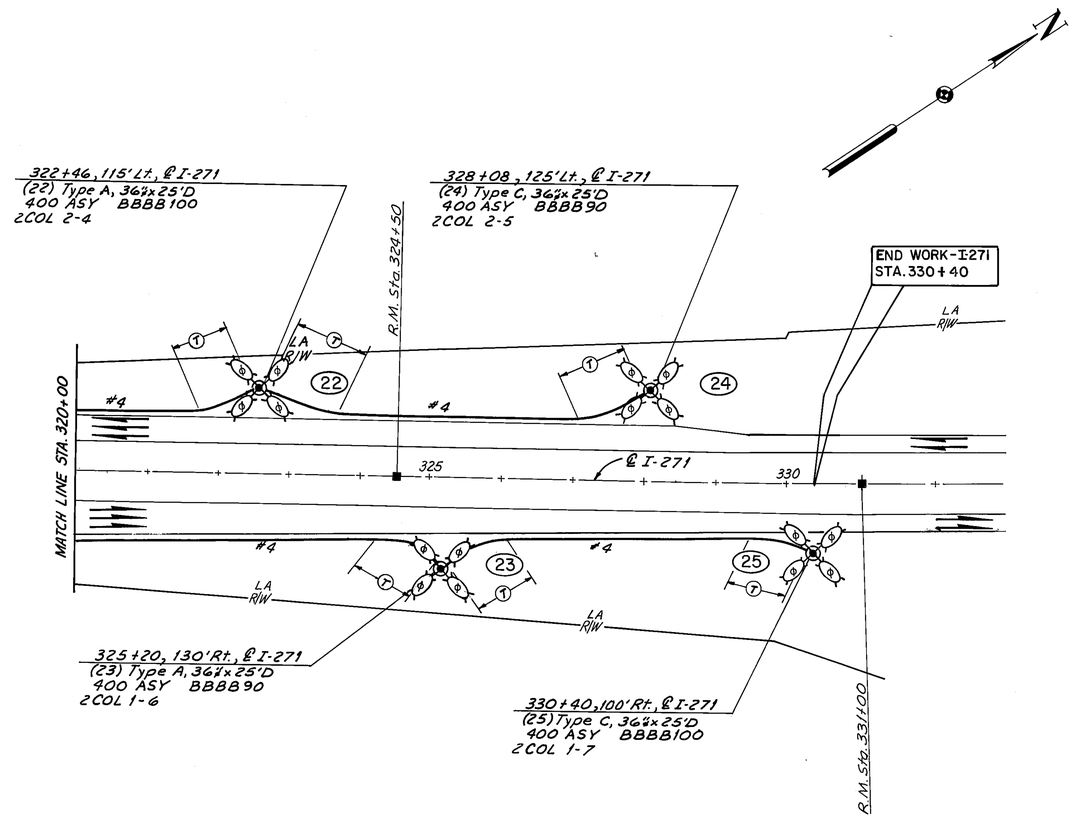
LIGHTING PLAN STA. 282+82 TO STA. 320+00

LIGHTING PLAN

FHWA REGION	STATE	PROJECT		
5	OHIO			

14
22

SUMMIT COUNTY
SUM-271-6.01



Notes:
1. For Legend See Sheet 12.
2. For Quantities See Sheet 9 & 10.

100 0 100 200 300 400
SCALE IN FEET

MADE R.O.J. DATE 3-14-86
TRACED DATE
CHECKED C.E.G. DATE 3-14-86
SCALE 1" = 100'

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

HNTB

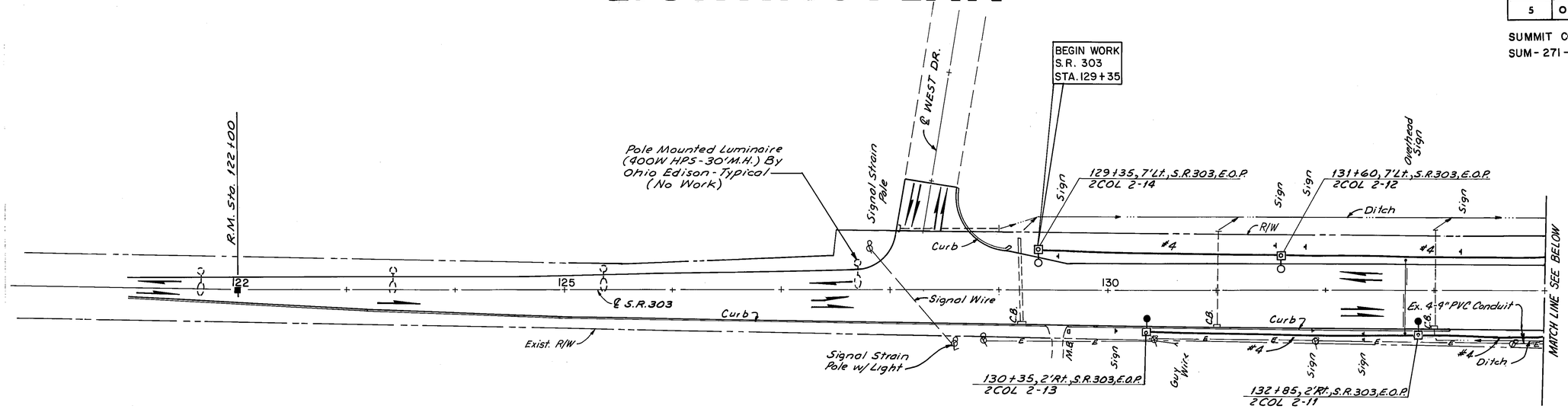
LIGHTING PLAN STA. 320+00 TO STA. 330+40

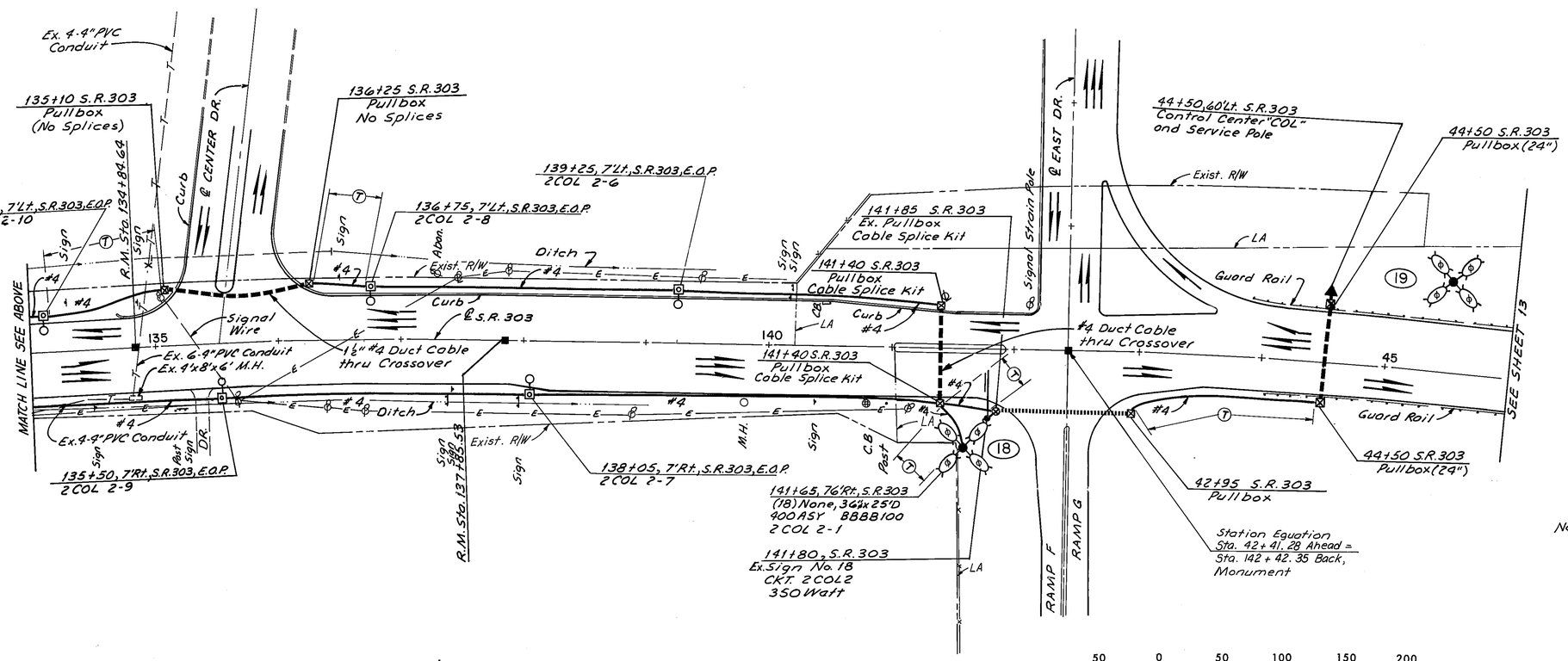
LIGHTING PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

15/22

SUMMIT COUNTY
SUM-271-6.01





Notes:
1. For Legend See Sheet 12.
2. For Quantities See Sheet 10

MADE R.O.J. DATE 3-14-86
TRACED DATE
CHECKED E.E.G. DATE 3-14-86
SCALE 1" = 50'

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

HNTB

50 0 50 100 150 200
SCALE IN FEET

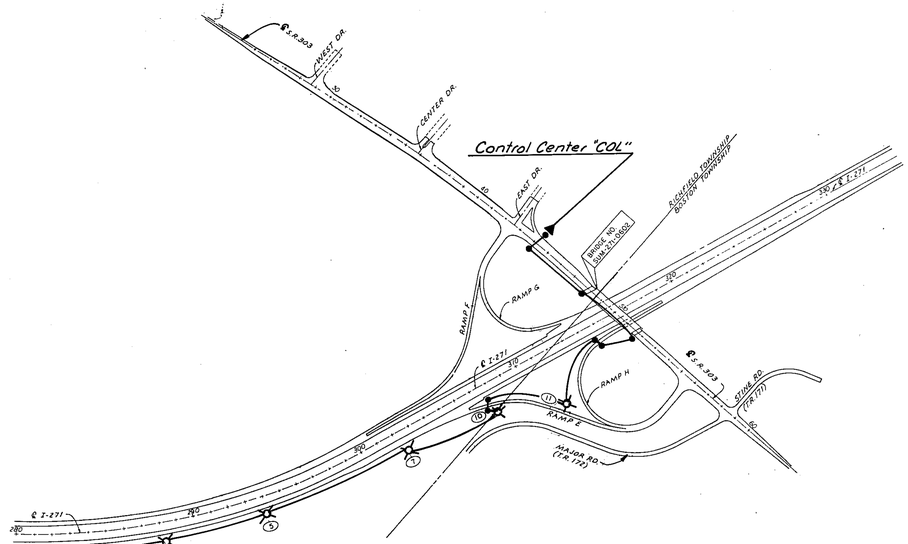
LIGHTING PLAN STA. 129+35 TO STA. 44+50

CIRCUIT LAYOUT MAPS

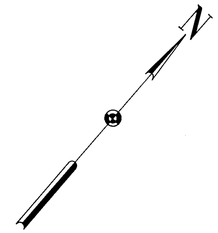
FHWA REGION	STATE	PROJECT	
5	OHIO		

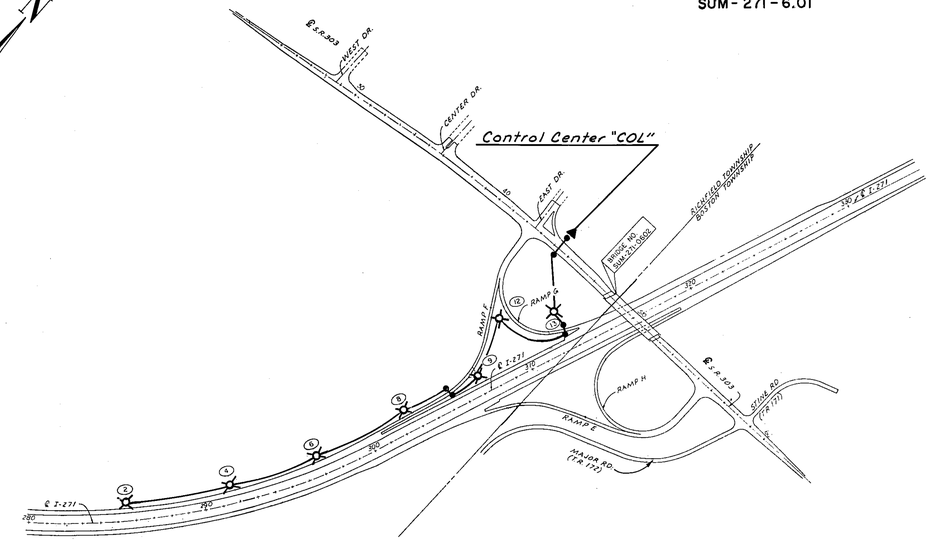
16/22

SUMMIT COUNTY
SUM-271-6.01

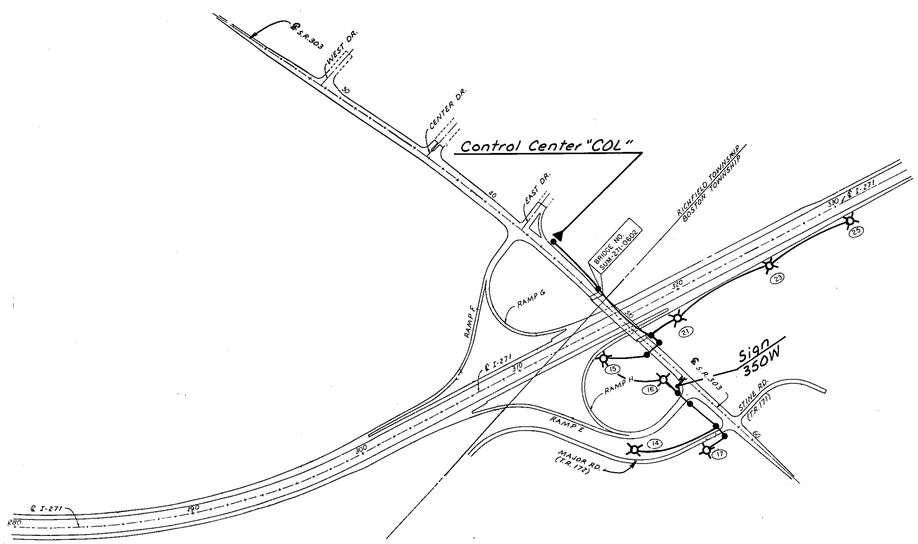


CIRCUIT 1COL 1
24 400W HPS 26.4A
12.67 KVA

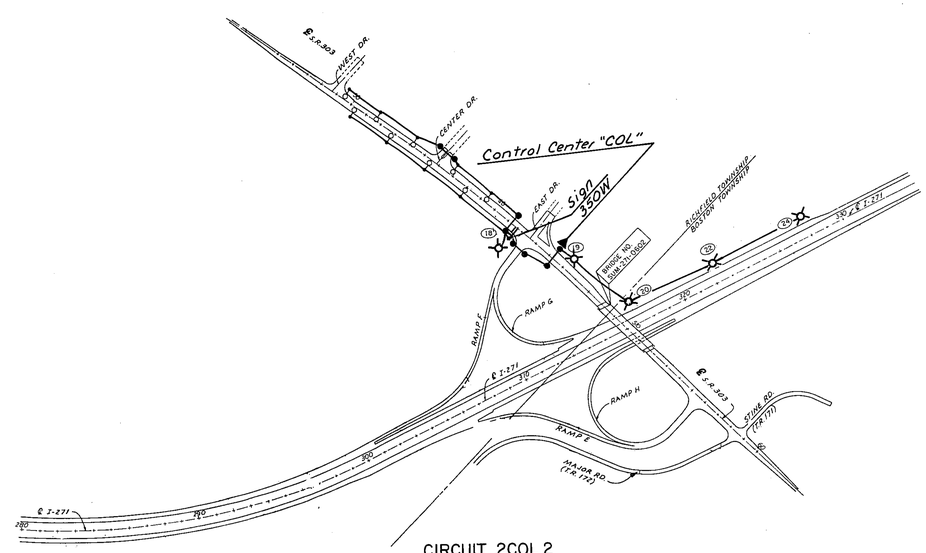




CIRCUIT 1COL 2
28 400W HPS 30.8A
14.78KVA



CIRCUIT 2COL 1
28 400W HPS 30.8A
1 350W SIGN 1.0A
31.8A
15.26KVA



CIRCUIT 2COL 2
20 400W HPS 22.0A
9 200W HPS 6.6A
1 350W SIGN 1.0A
29.6A
14.21KVA

MADE R.D.J. DATE 3-14-86
TRACED DATE
CHECKED E.E.G. DATE 3-14-86
SCALE 1" = 400'

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

HNTB

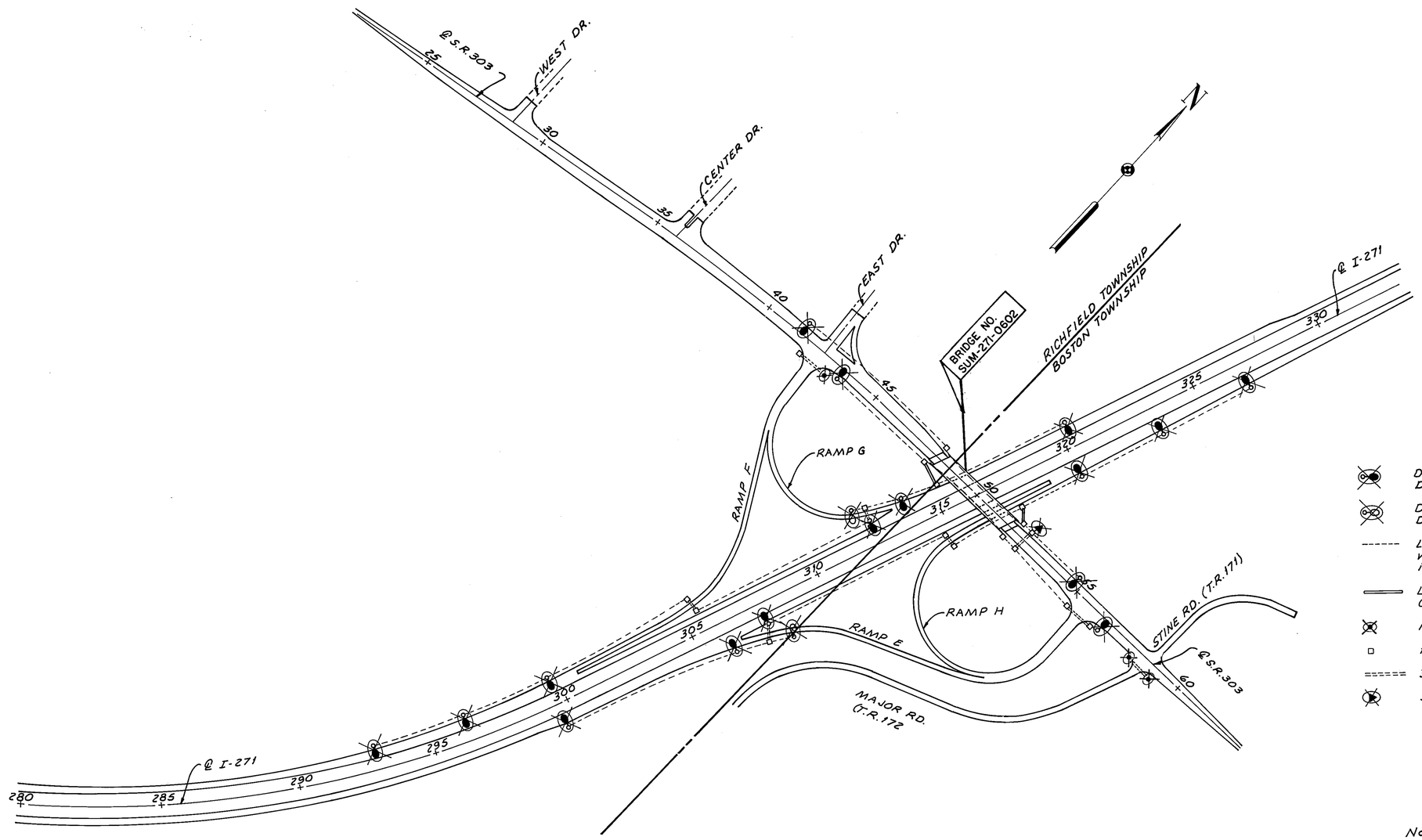
400 0 400 800 1200 1600
SCALE IN FEET

LIGHTING REMOVAL PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

17/22

SUMMIT COUNTY
SUM-271-6.01



LEGEND

- Design #11A15B32.5 Light Pole w/15' Arm III Distr. (Roadway)
- Design #11A10B32.5 Light Pole w/10' Arm II Distr. (Ramp)
- ------ Lighting Ckt. Cable, 2/c Duct-Cable along Roadway & Ramp. 2 1/c Cables (Pair) Across Ramp in 3" Conduit, or thru Bridge in 2" Conduit.
- Lighting Ckt. Cable, 2 1/c (Pair) in 2" Galv. Stl. Conduit for Protection up Slope at Bridge.
- Marker, to be Abandoned.
- 18" Fiber Pullbox
- ====== 3" Galvanized Steel Conduit.
- Service Pole - Existing Control Center "C."

Note:
For Quantities See Sheet 11.

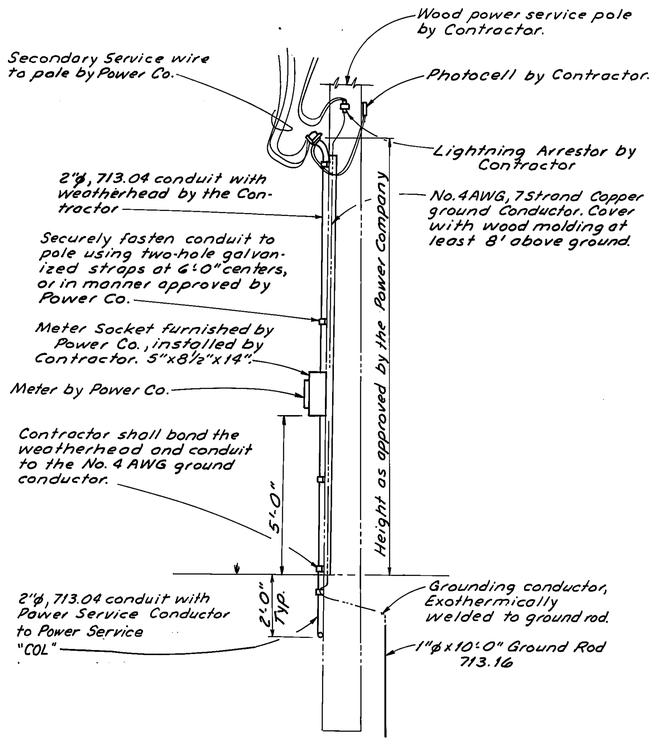
200 0 200 400 600 800
SCALE IN FEET

MADE R.D.J. DATE 3-14-86
TRACED ____ DATE ____
CHECKED F.E.G. DATE 3-14-86
SCALE 1" = 200'

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

HNTB

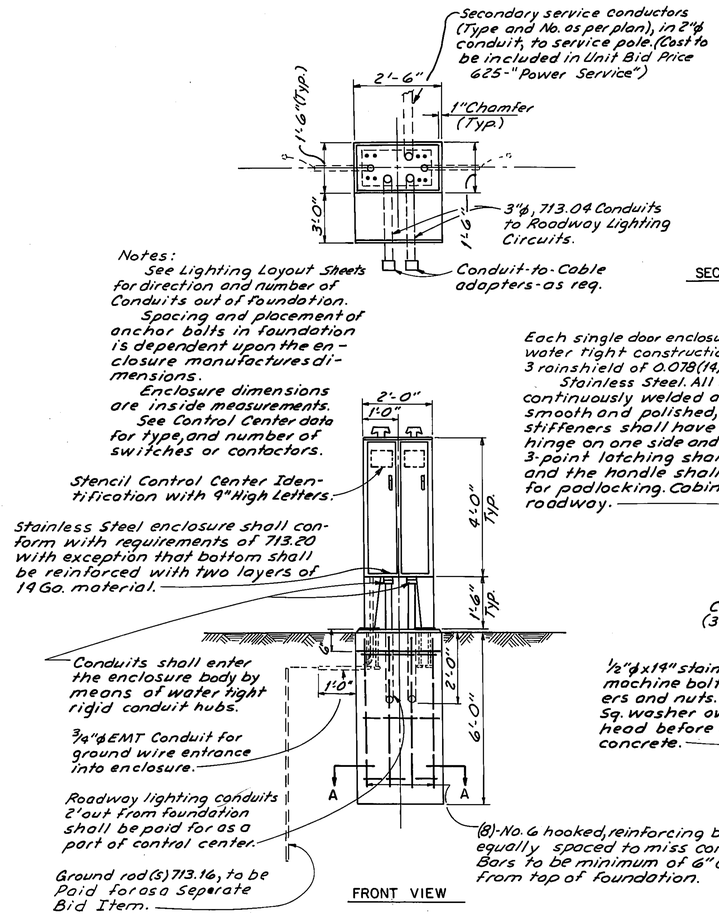
Note:
All power service pole material shown, conduit weatherhead, wire ground rod and miscellaneous material and labor are to be included in the unit bid price for the Item 625, "Power Service COL."



CONNECTION TO POWER SERVICE POLE
No Scale

POWER SERVICE DATA						
POWER SERVICE LOCATION	CONNECTED LOAD KVA	SERVICE ENTRANCE CONDUCTOR SIZE AWG	SERVICE SWITCH (TYPE)	CIRCUIT NUMBER	CIRCUIT LOAD AMPS	CIRCUIT FUSE SIZE AMPS
COL	56-92	#1/0	SC-100	1COL 1	26.4	60
				1COL 2	30.8	
				1COL 3	–	
				2COL 1	31.8	
				2COL 2	29.6	
COL	56-92	#1/0	SC-100	2COL 3	–	60

Note: Control Transformer shall be rated at 300VA.



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 manufactures dimensions.
Enclosure dimensions are inside measurements.
See Control Center data for type, and number of switches or contactors.

Each single door enclosure NEMA Type 4 water tight construction, with NEMA 3 rainshield of 0.078(14) gage ASTM-A-302-304 Stainless Steel. All seams shall be continuously welded and ground smooth and polished, body and door stiffeners shall have a continuous hinge on one side and the gasketed 3-point latching shall be provided and the handle shall be arranged for padlocking. Cabinet shall face roadway.

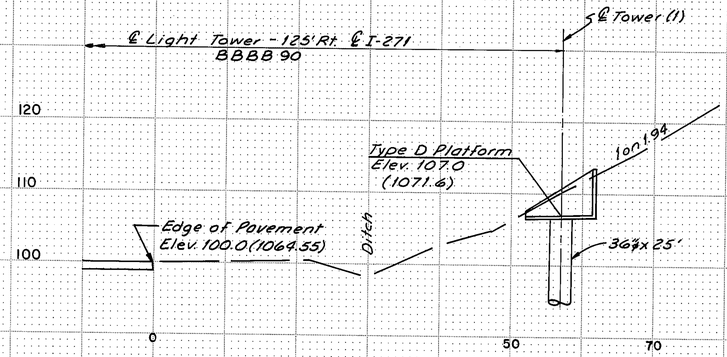
The concrete walk and the foundation are included in the Unit Bid Price "625-POWER SERVICE."

POWER SERVICE "COL" DETAILS
No Scale

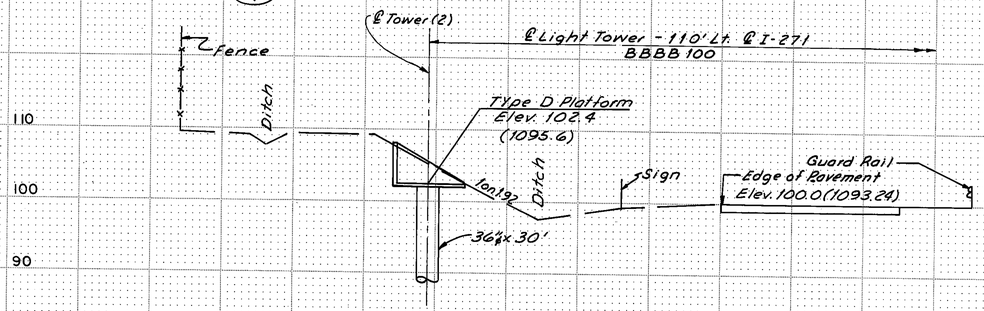
FHWA REGION	STATE	PROJECT	
5	OHIO		

19
22

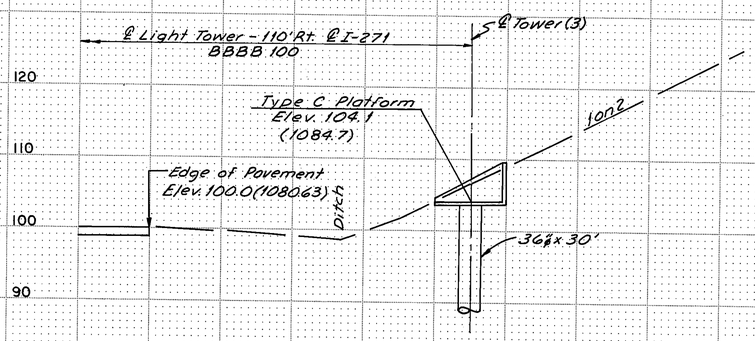
SUMMIT COUNTY
SUM-271-6.01



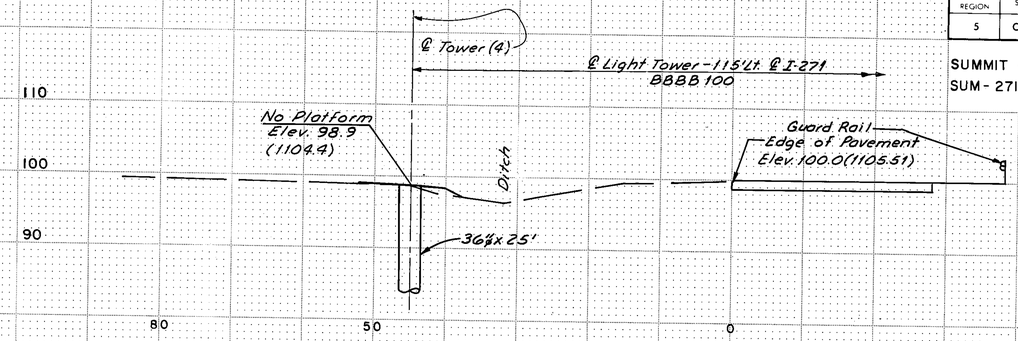
STA. 282 + 82 ℄ I-271
(1)



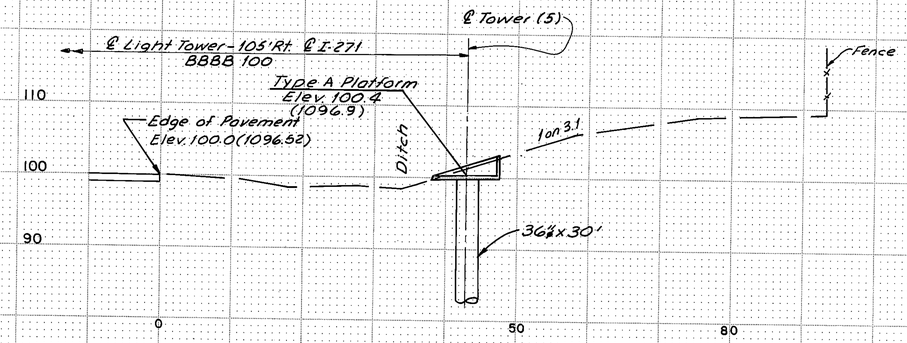
STA. 285 + 52 ℄ I-271
(2)



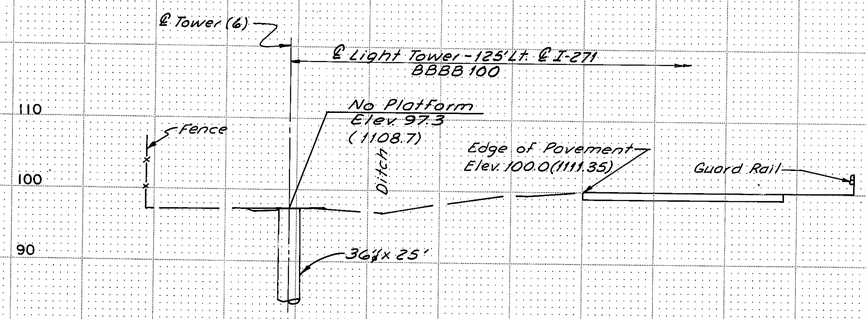
STA. 288 + 18 ℄ I-271
(3)



STA. 291 + 68 ℄ I-271
(4)



STA. 293 + 95 ℄ I-271
(5)



STA. 296 + 90 ℄ I-271
(6)

MADE R.D.J. DATE 3-14-86
TRACED DATE
CHECKED E.E.G. DATE 3-14-86
SCALE

Howard, Needles, Tammen & Bergendoff
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CLEVELAND, OHIO

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HORIZONTAL 10 0 10 20 30 40
VERTICAL 10 0 10 20 30 40
SCALE IN FEET

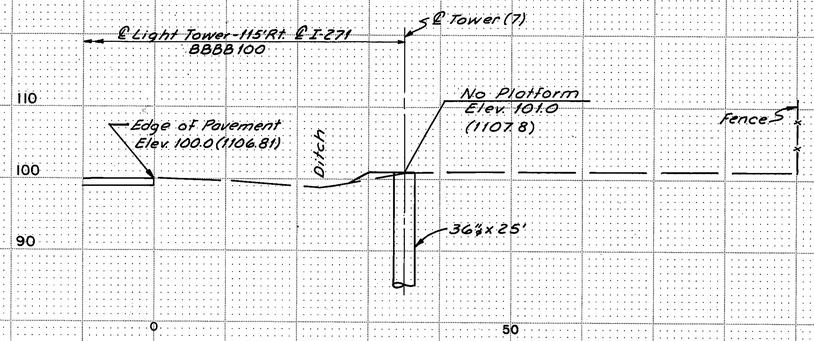
LIGHT TOWER (1) THRU (6)

VA 35281

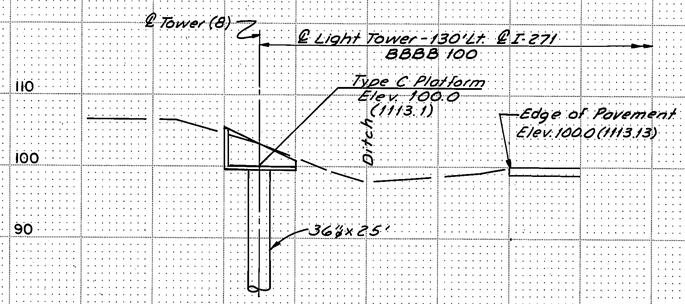
FHWA REGION	STATE	PROJEC	
5	OHIO		

20/22

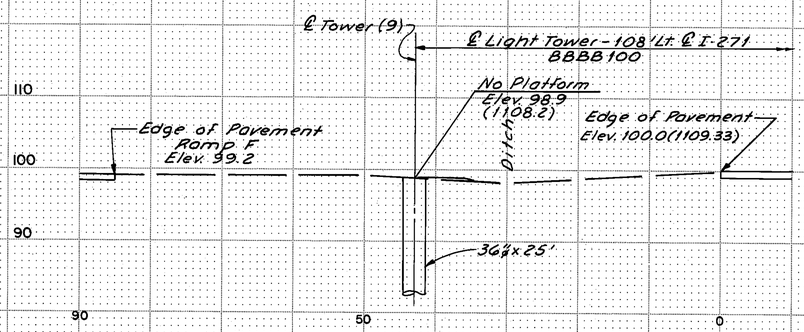
SUMMIT COUNTY
SUM-271-6.01



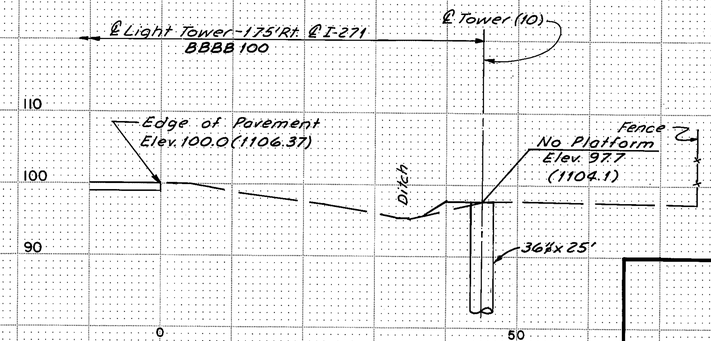
STA. 302+30 ℄ I-271
(7)



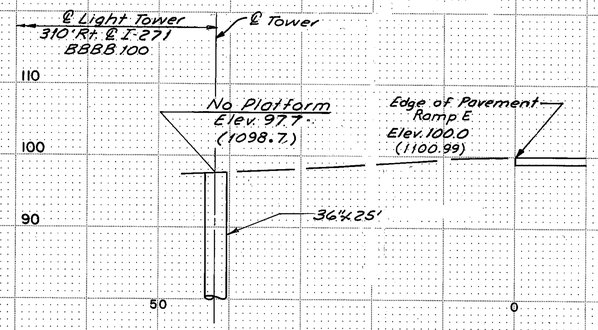
STA. 302+52 ℄ I-271
(8)



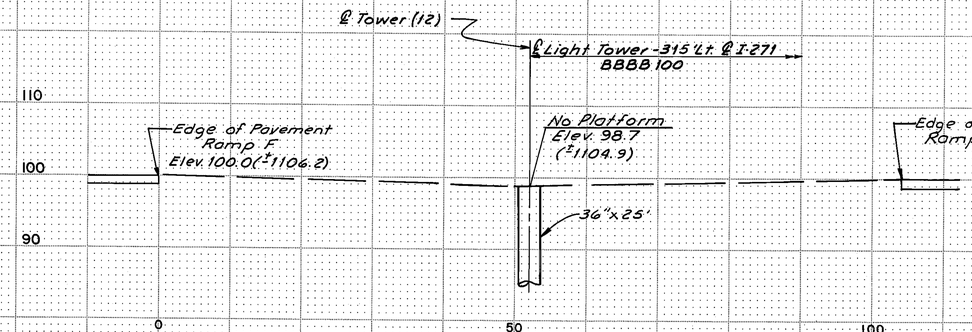
STA. 307+10 ℄ I-271
(9)



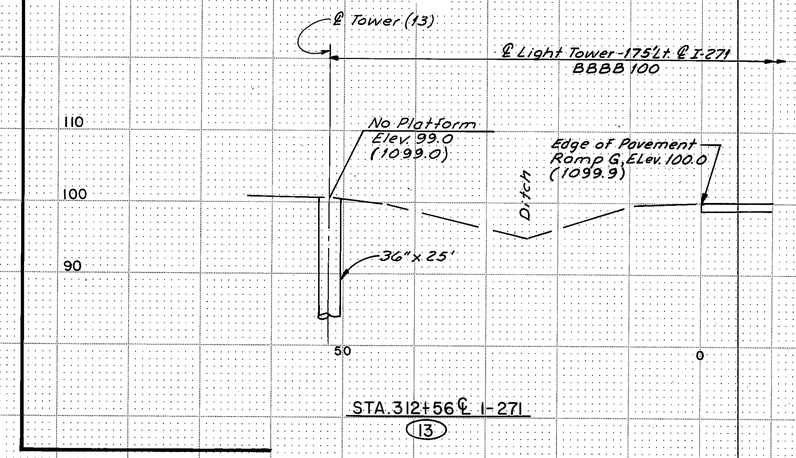
STA. 307+90 ℄ I-271
(10)



STA. 311+60 ℄ I-271
(11)



STA. 309+65 ℄ I-271
(12)



STA. 312+56 ℄ I-271
(13)

MADE R.D.J. DATE 3-14-86
TRACED DATE
CHECKED F.P.G. DATE 3-14-86
SCALE

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

HNTB

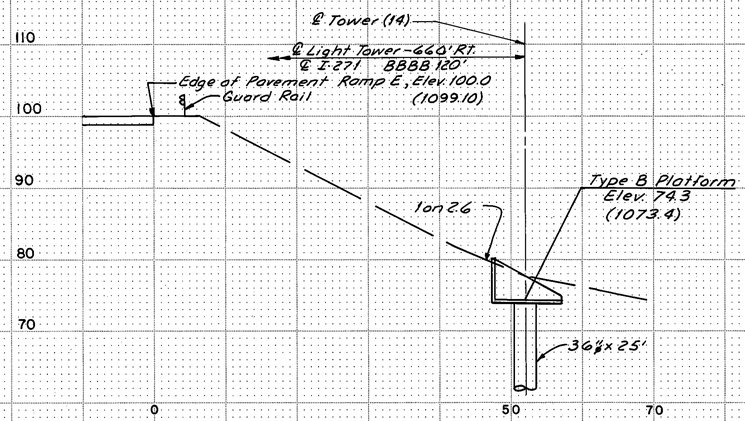
HORIZONTAL 10 0 10 20 30 40
VERTICAL 10 0 10 20 30 40
SCALE IN FEET

LIGHT TOWER (7) THRU (13)

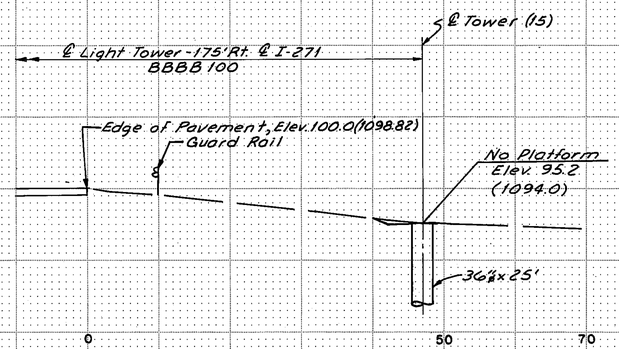
FHWA REGION	STATE	PROJECT	
5	OHIO		

21/22

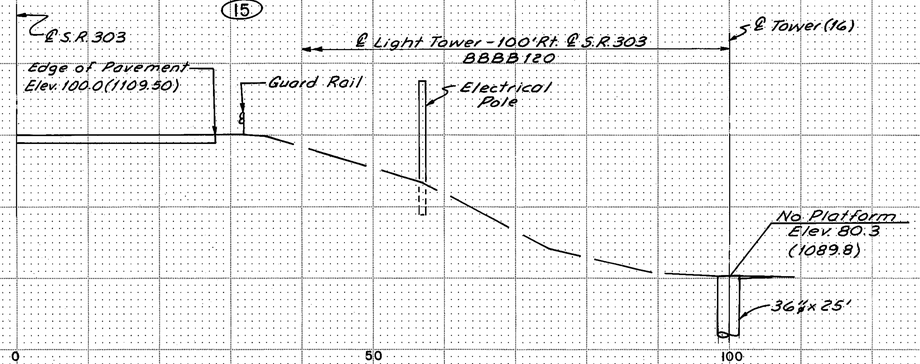
SUMMIT COUNTY
SUM-271-6.01



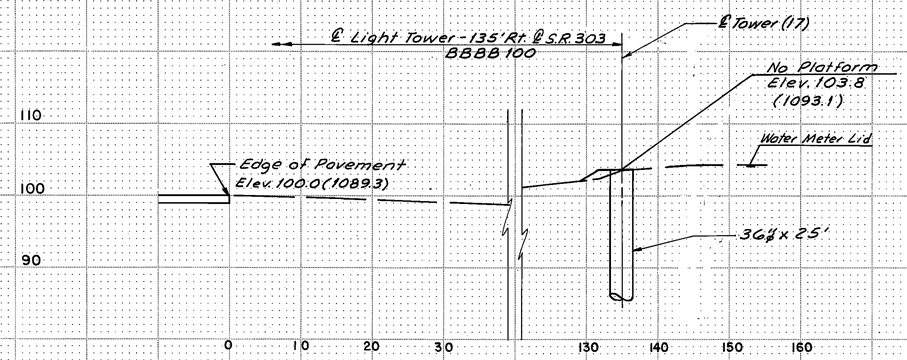
STA. 313+82 ℄ I-271
(14)



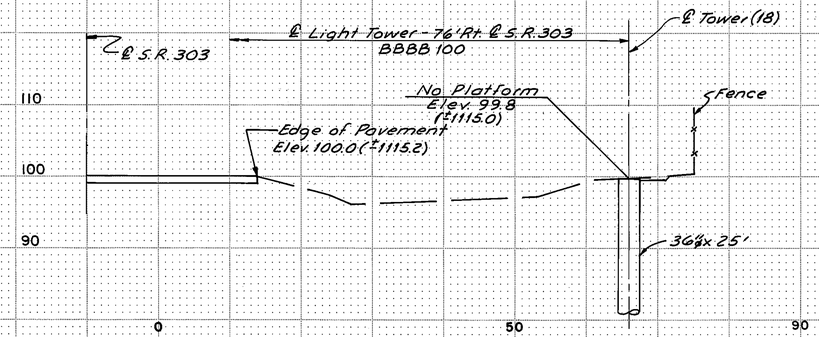
STA. 314+00 ℄ I-271
(15)



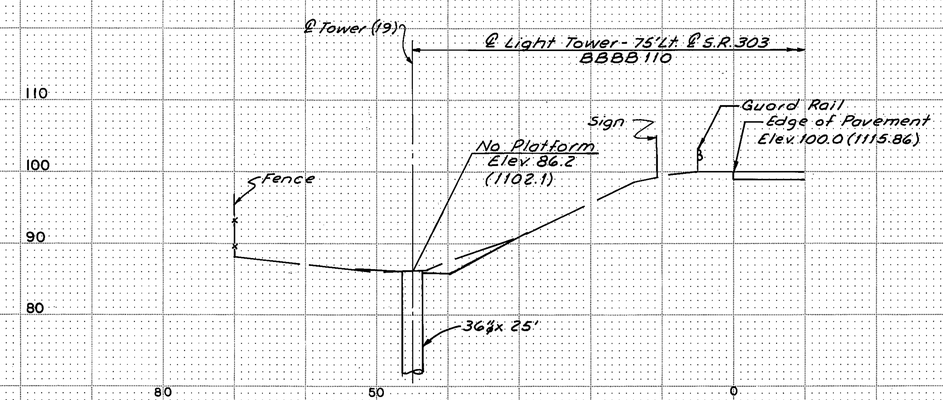
STA. 54+15 ℄ S.R. 303
(16)



STA. 58+50 ℄ S.R. 303
(17)



STA. 141+65 ℄ S.R. 303
(18)



STA. 45+50 ℄ S.R. 303
(19)

HORIZONTAL 10 0 10 20 30 40
VERTICAL 10 0 10 20 30 40
SCALE IN FEET

MADE R.D.J. DATE 3-14-86
TRACED DATE
CHECKED E.E.G. DATE 3-14-86
SCALE

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

HNTB

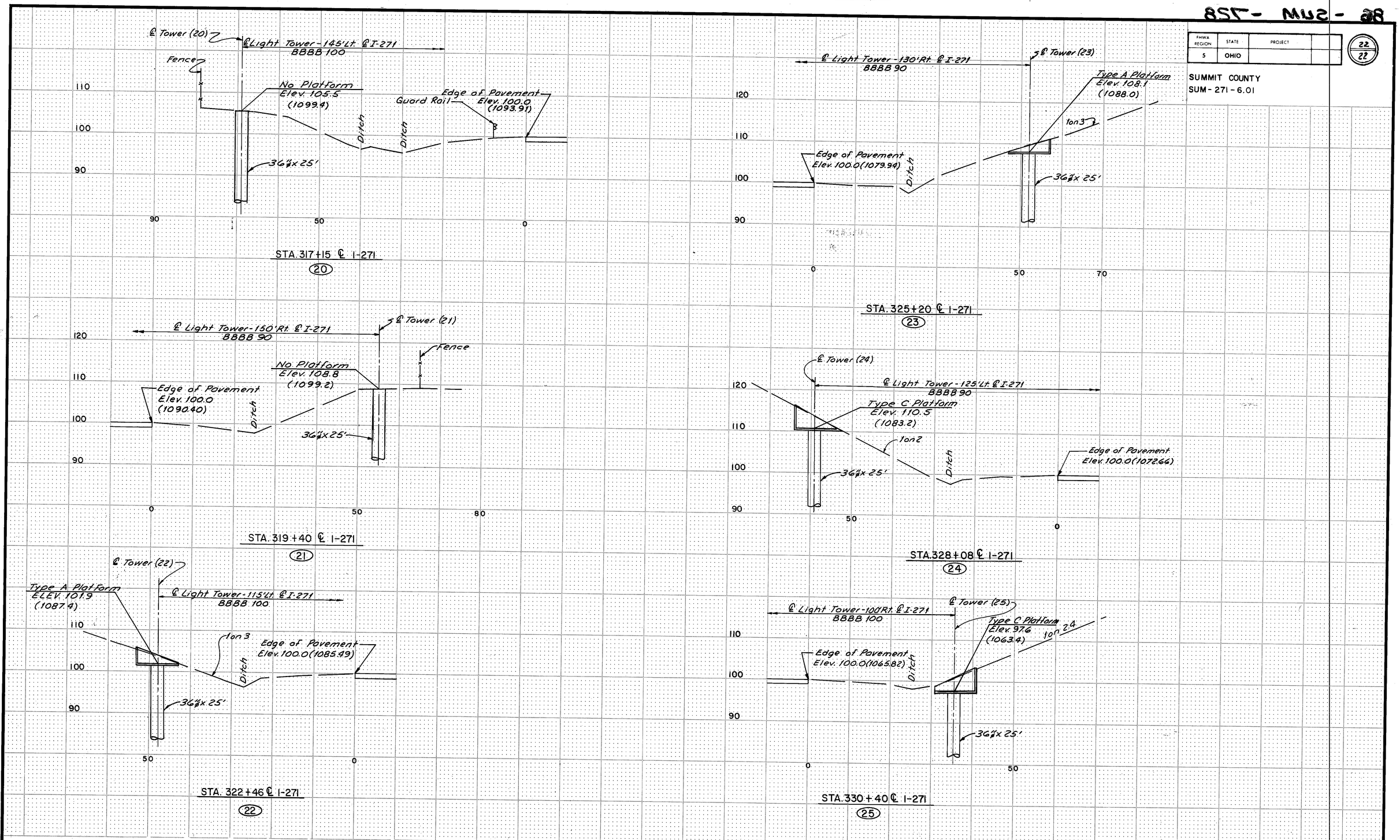
LIGHT TOWER (14) THRU (19)

Vk 33203

FHWA REGION	STATE	PROJECT	
5	OHIO		

22 / 22

SUMMIT COUNTY
SUM - 271 - 6.01



MADE R.D.J. DATE 3-14-86
TRACED DATE
CHECKED E.E.G. DATE 3-14-86
SCALE

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

HNTB

HORIZONTAL 10 0 10 20 30 40
VERTICAL 10 0 10 20 30 40
SCALE IN FEET

LIGHT TOWER 20 THRU 25

V.E. 35203