

CHAPTER 4 – PLANS

PLANS

In this chapter, the items found in typical standalone traffic control signal and lighting plans will be presented. Typical plan sheet layouts and wiring diagrams are also presented.

4.1 Traffic Control Signal Plan

Traffic control signal plans are prepared on 11" x 17" plan sheets. The scale is indicated on the individual layout sheets. Each sheet of the plan will be properly identified with the State or State Aid Project Number and sheets after the title sheet will also be labeled as Sheet XX of XX. For traffic control signals the legend will be located on the title sheet and a sheet border with signature block, which, as shown in Figure 4-1, has important information such as the State Project Number, Trunk Highway Number, System Identification Number, Meter Address, T.E. Request Number, and Certified Signature will be on each of the plan sheets following the title sheet.

Traffic control signal plan sets typically include:

- Title sheet
- Detail sheets
- Intersection layout sheets
- Field Wiring Diagram
- Utility layout sheets
- Field wiring diagram sheets
- Utility layout sheets

BY	DATE	REVISIONS	SYSTEM ID: XXXXX	T.E. XXXX	INTERSECTION LAYOUT TRAFFIC CONTROL SIGNAL SYSTEM T.H. 156 AT C.S.A.H. 14 (GRAND AVE.) IN SOUTH ST. PAUL, DAKOTA COUNTY	S.A.P. NO.	DRAWN BY:	CHK BY:	DATE:
			METER ADDRESS: 9999 GRAND AVE.			CERTIFIED BY:	LIC. NO.:	DATE:	
			MASTER ID:	T.E.		STATE PROJ. NO. XXXX-XX (T.H. 156)			SHEET NO. 14 OF 19 SHEETS

Figure 4-1: Example of Sheet Border with Signature Block

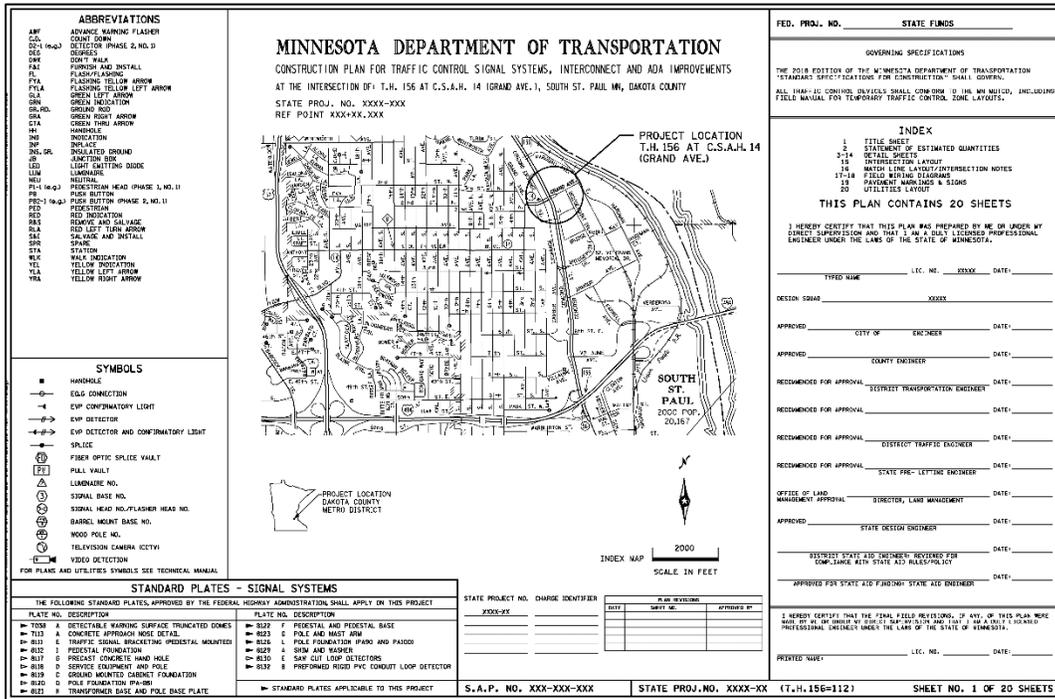


Figure 4-2: Traffic Control Signal Plan Title Sheet

4.1.1 TITLE SHEET

The title sheet is required for all plans. The title sheet contains the index for the sheets contained within the plan. It also includes content such as the following:

- Plan description
- Project location
- Governing specifications
- Plan preparation certification
- Signature block
- Plan revisions block
- Standard plates
- Statement of estimated quantities

Additional detail on title sheet content is presented below.

Plan Description

As presented in Figure 4-3, the plan description and location defines the type of work being performed and the location of the work.

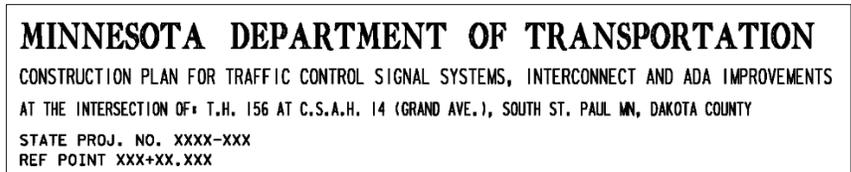


Figure 4-3: Example of Plan Description

Signal and lighting work can be part of a larger roadwork plan or they can be standalone projects.

Project Location

As shown in Figure 4-4, the index map is used to identify the exact location of the project(s). The generalized location (county and office) is shown on the title sheet in Figure 4-5.

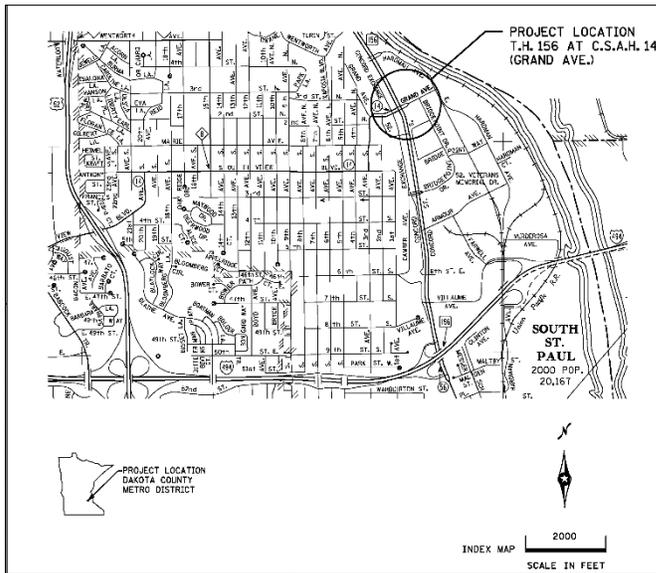


Figure 4-4: Example of Index Map

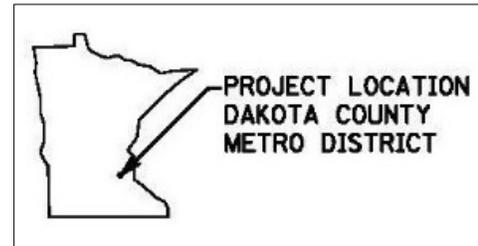


Figure 4-5: Generalized Location Example

Governing Specifications

As shown in Figure 4-6, the governing specifications for the project are defined.

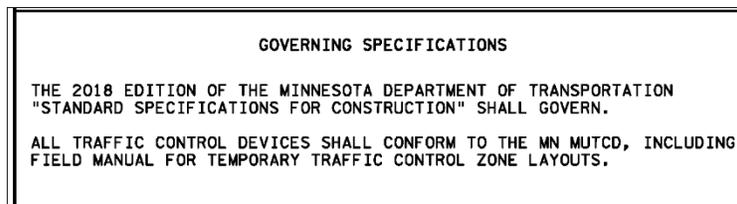


Figure 4-6: Example of Governing Specifications

Plan Preparation Certification

The plan preparation certification note shown in Figure 4-7 identifies:

- The individual who developed the plan set (and/or direct supervisor)
- The individual's state license information.

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

_____ LIC. NO. _____ DATE: _____

TYPED NAME

DESIGN SQUAD _____ XXXXX

Figure 4-7: Example of the Plan Preparation Certification Note

Signature Block

The signature block, as shown in Figure 4-8, is contained on the title sheet and varies depending on the type of project. Not all signature fields may be required on every project.

Plan Revisions Block

The plan revisions block is also included so that future plan revisions can be documented.

For revisions to the plan made after project advertisement, an "R" shall be used after the sheet number.

Standard Plates

A list of applicable standards plates for the project, as shown in Figure 4-10, is included in the plan set. The bold/darkened standard plates are applicable to that specific project.

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

TYPED NAME _____ LIC. NO. XXXXX DATE _____

DESIGN SQUAD _____ XXXXX

APPROVED _____ CITY OF _____ ENGINEER _____ DATE _____

APPROVED _____ COUNTY ENGINEER _____ DATE _____

RECOMMENDED FOR APPROVAL _____ DISTRICT TRANSPORTATION ENGINEER _____ DATE _____

RECOMMENDED FOR APPROVAL _____ DISTRICT TRAFFIC ENGINEER _____ DATE _____

RECOMMENDED FOR APPROVAL _____ STATE PERMITTING ENGINEER _____ DATE _____

OFFICE OF LAND MANAGEMENT APPROVAL _____ DIRECTOR, LAND MANAGEMENT _____ DATE _____

APPROVED _____ STATE DESIGN ENGINEER _____ DATE _____

DISTRICT STATE AID ENGINEER REVIEWED FOR COMPLIANCE WITH STATE AID RULES/POLICY _____ DATE _____

APPROVED FOR STATE AID FUNDING _____ STATE AID ENGINEER _____ DATE _____

I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, OF THIS PLAN WERE MADE BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINTED NAME _____ LIC. NO. _____ DATE _____

Figure 4-8: Signature Block Example

PLAN REVISIONS		
DATE	SHEET NO.	APPROVED BY
01-27-00	12	TR S

Figure 4-9: Example of Plan Revisions Block

STANDARD PLATES - SIGNAL SYSTEMS			
THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT			
PLATE NO.	DESCRIPTION	PLATE NO.	DESCRIPTION
▼ 7038	A DETECTABLE WARNING SURFACE TRUNCATED DOMES	▶ 8122	F PEDESTAL AND PEDESTAL BASE
▼ 7113	A CONCRETE APPROACH NOSE DETAIL	▶ 8123	G POLE AND MAST ARM
▼ 8111	E TRAFFIC SIGNAL BRACKETING (PEDESTAL MOUNTED)	▶ 8126	L POLE FOUNDATION (PA90 AND PA100)
▼ 8112	I PEDESTAL FOUNDATION	▶ 8129	A SHIM AND WASHER
▼ 8117	G PRECAST CONCRETE HAND HOLE	▼ 8130	E SAW CUT LOOP DETECTORS
▼ 8118	D SERVICE EQUIPMENT AND POLE	▶ 8132	B PREFORMED RIGID PVC CONDUIT LOOP DETECTOR
▼ 8119	C GROUND MOUNTED CABINET FOUNDATION		
▼ 8120	Q POLE FOUNDATION (PA-85)		
▼ 8121	H TRANSFORMER BASE AND POLE BASE PLATE		
		▶ STANDARD PLATES APPLICABLE TO THIS PROJECT	

Figure 4-10: Example of Standard Plates

Statement of Estimated Quantities

The statement of estimated quantities as shown in Figure 4-11, may be included on a separate sheet or shown on the title sheet (if there is room). Traffic control signal interconnection, emergency vehicle preemption system and other items such as conduit and handholes for future traffic control signal systems may be itemized separately from the traffic control signal system being installed due to cost participation.

STATEMENT OF ESTIMATED QUANTITIES				COST BREAKDOWN			
ITEM NO.	DESCRIPTION	UNIT	TOTAL ESTIMATED QUANTITIES	STATE SP XXXX-XX	COUNTY SAP XXX-XXX-XXX	FEDERAL SP XXXX-XX	CITY SAP XXX-XXX-XXX
2021.501	MOBILIZATION	LUMP SUM					
2104.501	REMOVE CURB AND GUTTER	LN FT					
2104.503	REMOVE CONCRETE WALK	SQ FT					
2104.503	REMOVE BRICK MEDIAN	SQ FT					
2104.503	REMOVE BRICK SIDEWALK	SQ FT					
2104.603	REMOVE AND REPLACE BITUMINOUS PAVEMENT	LN FT					
2104.618	SALVAGE BRICK PAVERS	SQ FT					
2232.603	MILL AND PATCH BITUMINOUS PAVEMENT	LN FT					
2521.618	CONCRETE WALK	SQ FT					
2531.603	CONCRETE CURB AND GUTTER	LN FT					
2565.511	CONCRETE CURB DESIGN V	LN FT					
2531.618	TRUNCATED DOMES	SQ FT					
2565.601	TRAFFIC CONTROL	LUMP SUM					
2565.511	TRAFFIC CONTROL SIGNAL SYSTEM	SIG SYS					
2565.601	EMERGENCY VEHICLE PREEMPTION SYSTEM	LUMP SUM					
2565.601	TRAFFIC CONTROL INTERCONNECTION	LUMP SUM					
2565.616	REVISE SIGNAL SYSTEM	SYSTEM					

Figure 4-11: Example of Statement of Estimated Quantities

The appropriate specification item numbers, item descriptions, and units using the state's computerized pay item list shall be included.

4.1.2 DETAIL SHEETS

The detail sheets show the details that are applicable to the project. Details may include the following:

- Service equipment detail
- Equipment pad layout
- Loop detector details
- Advance warning flasher details
- Pavement markings detail
- Type "D" and/or Type "C" sign details
- Wood pole and span wire mounting
- Any other details specific to the traffic control signal system

Equipment Pad Layout

The signal service cabinet (Type SSB) with battery backup capabilities pad detail is shown in the plan set. The equipment pad layout sheet in the plan shows the details for the equipment pad. Figure 4-12 shows a SSB signal service cabinet.



Figure 4-12: Examples of SSB Signal Service Cabinets

Figure 4-13 provides an example of a SSB concrete pad for the traffic control signal cabinet and the SSB signal service cabinet.



Figure 4-13: Example of an SSB Concrete Pad

Advance Warning Flasher Details

The detail sheet for the advance warning flasher (AWF) is also shown in the plan set.

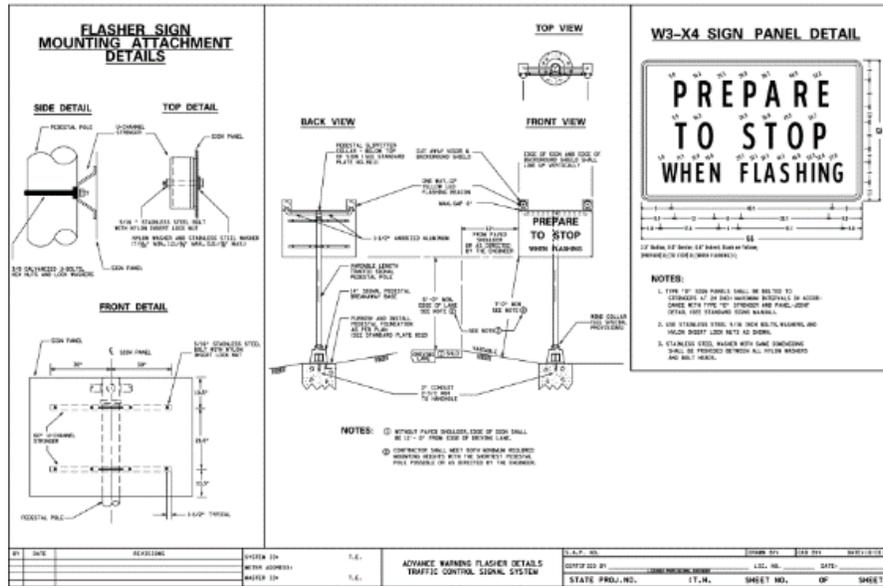


Figure 4-14: Example of AWF Detail Sheet



Figure 4-15: Typical AWF Setup

4.1.3 SIGNAL INTERSECTION LAYOUT SHEET

Figure 4-16 shows a typical traffic control signal intersection layout.

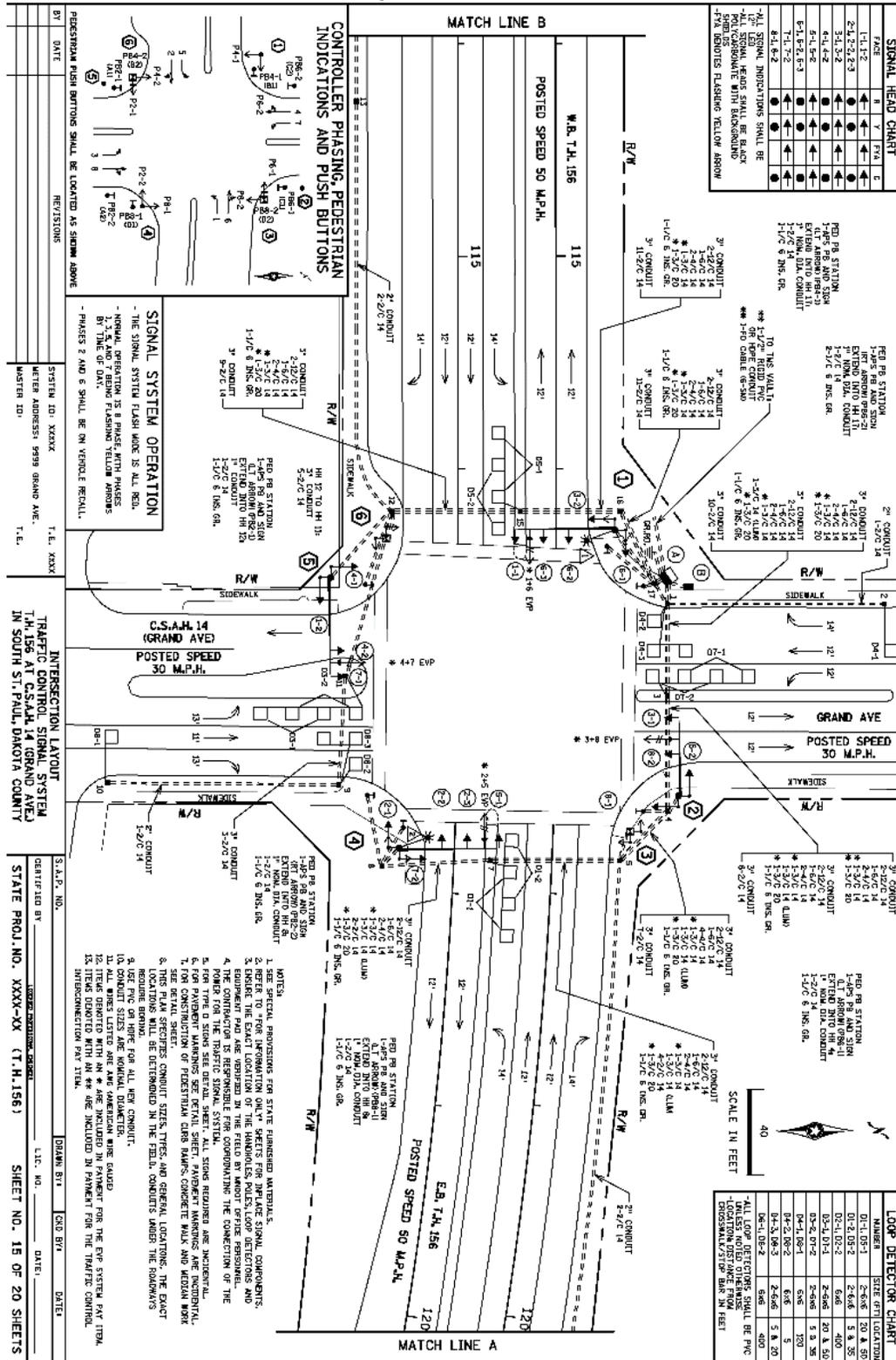


Figure 4-16: Signal Intersection Layout Sheet

Equipment Pad Note

An equipment pad note is shown in Figure 4-18 as a circled "A."

A solid (filled) symbol identifies new equipment and an open symbol identifies in-place equipment.

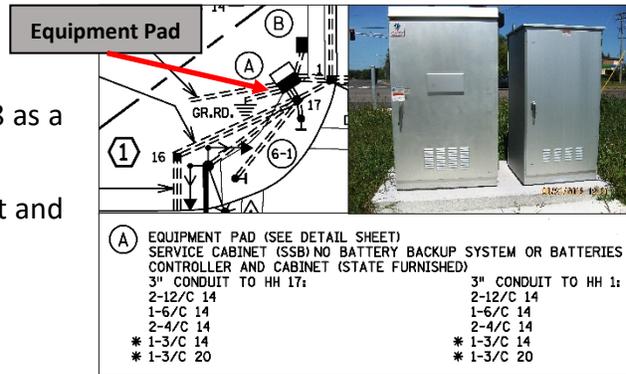


Figure 4-18: Example of Equipment Pad Detail

Signal Pole Notes

The signal pole notes are shown in a hexagon as indicated in Figure 4-19. The signal pole bases are labeled clockwise around the intersection with Number 1 being adjacent to or near the controller cabinet. A solid filled symbol identifies new equipment and an open symbol identifies in-place equipment.

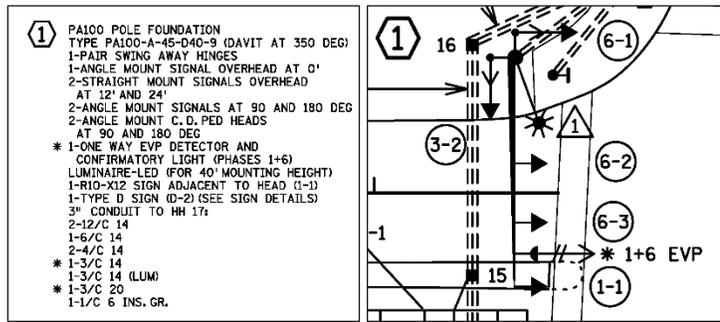


Figure 4-2: Example of Signal Pole Notes

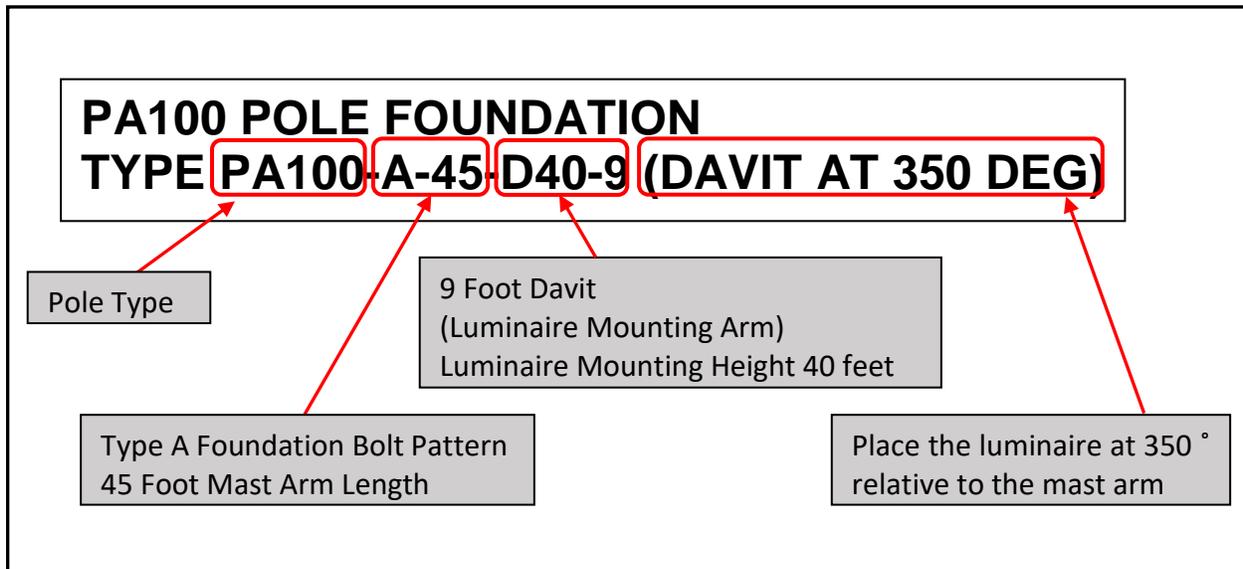


Figure 4-20: Signal Pole Type Description

Figure 4-21 shows the signal pole notes identifying the mast arm at a right angle to the center line of the road. Signal heads and luminaires mounted to the pole reference the mast arm for proper mounting orientation. For signal head and luminaire orientation the mast arm is considered 0 degrees.

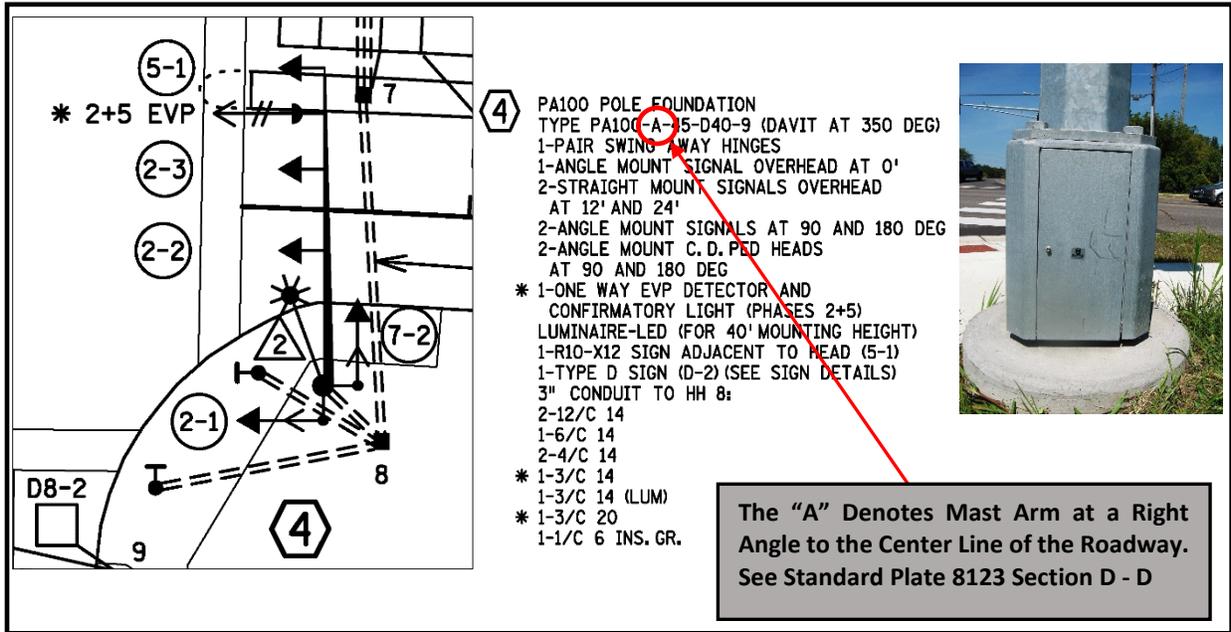


Figure 4-21: Example of Signal Pole Notes with Mast Arm at a Right Angle to the Center Line of the Roadway.

In Figure 4-22, the mast arm pole is shown on the plans and in the field.

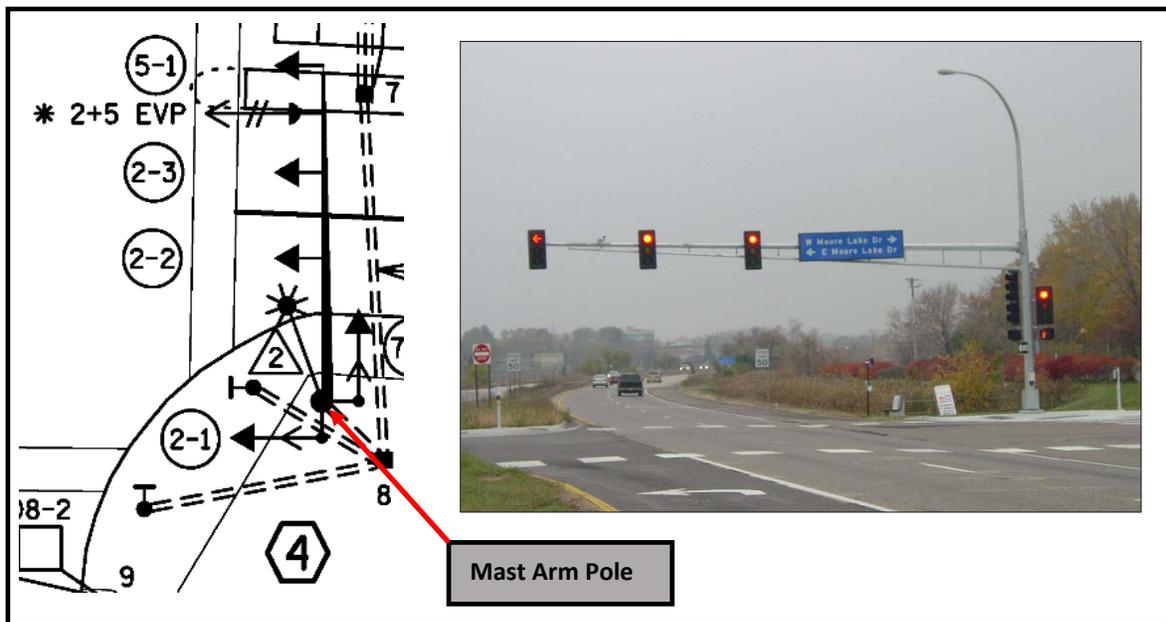


Figure 4-22: Example of Mast Arm Pole Shown in the Plans and in the Field

Emergency vehicle preemption (EVP) is shown in Figure 4-23 with the arrow and two lines. Luminaires are labeled with a star shaped symbol.

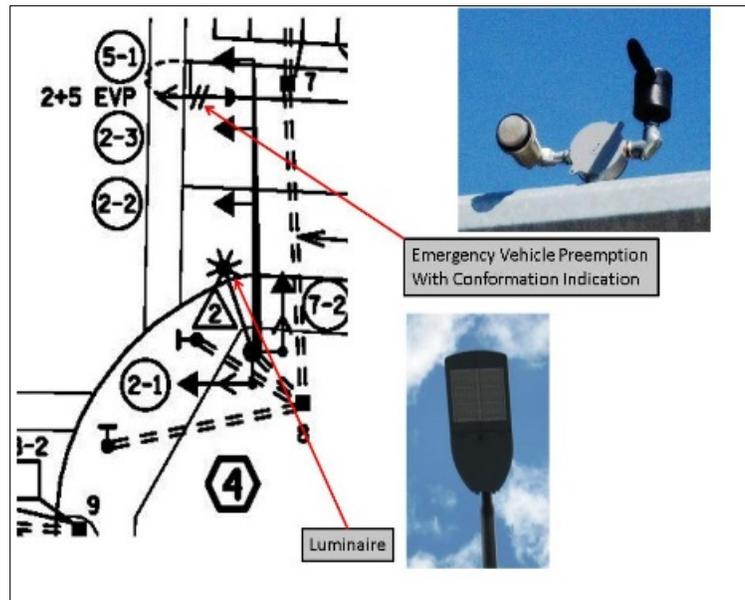


Figure 4-23: Example of EVP Detail

The vehicle signal head is identified with the triangle. The heads are labeled from right to left as the intersection is approached. Signal heads are numbered inside of a circle with the controller phase first, followed by the head number (for example 2-1, 2-2, etc.).

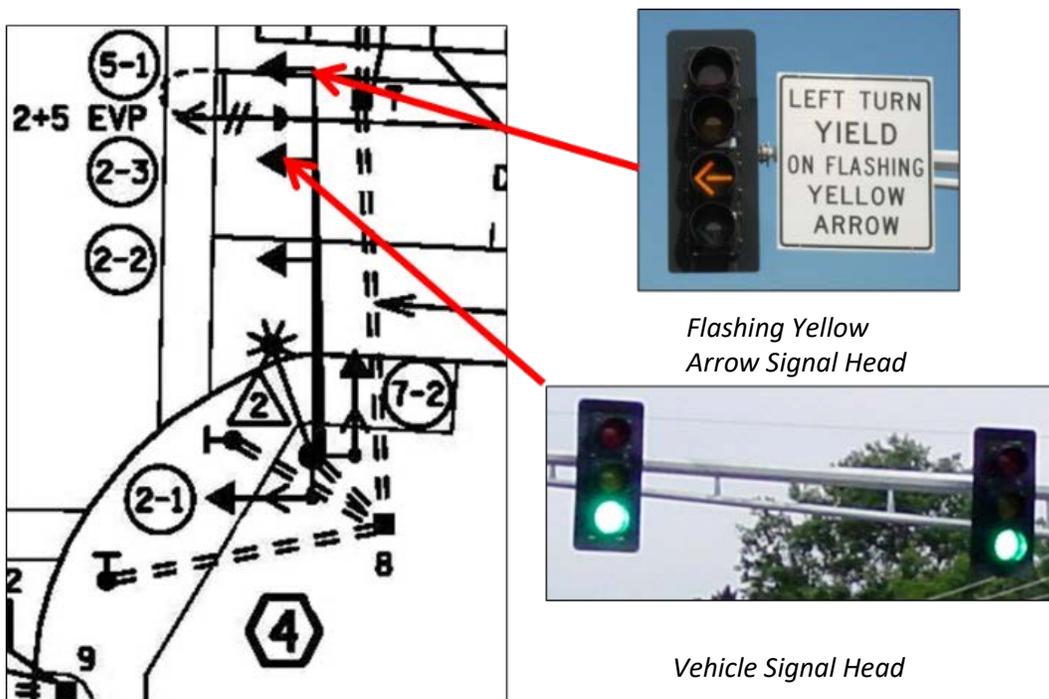


Figure 4-24: Example of Vehicle Signal Head Detail

Signal Head Table

The signal indications table identifies the head configuration for the signals shown on the plan sheet. The head identification number refers to the signal head shown on the plan sheet.

R = Red indication

Y = Yellow indication

G = Green indication

FYA = Flashing Yellow Arrow

LED = Light Emitting Diode

SIGNAL HEAD CHART				
FACE	R	Y	FYA	G
1-1, 1-2	←	←	←	←
2-1, 2-2, 2-3	●	●		●
3-1, 3-2	←	←	←	←
4-1, 4-2	●	●		●
5-1, 5-2	←	←	←	←
6-1, 6-2, 6-3	●	●		●
7-1, 7-2	←	←	←	←
8-1, 8-2	●	●		●

-ALL SIGNAL INDICATIONS SHALL BE 12" LED
 -ALL SIGNAL HEADS SHALL BE BLACK POLYCARBONITE WITH BACKGROUND SHIELDS
 -FYA DENOTES FLASHING YELLOW ARROW



Figure 4-25: Example of Signal Indications Table

The pedestrian signal head is illustrated with an arrow. The head is numbered as the intersection is approached with number 1 being the first on the right and numbers 2, 3, and 4 as the intersection is entered. These numbers are preceded by a P and the controller phase number (for example P4-3, P4-4, etc.). The pedestrian push button is labeled with a PB and the controller phase number.

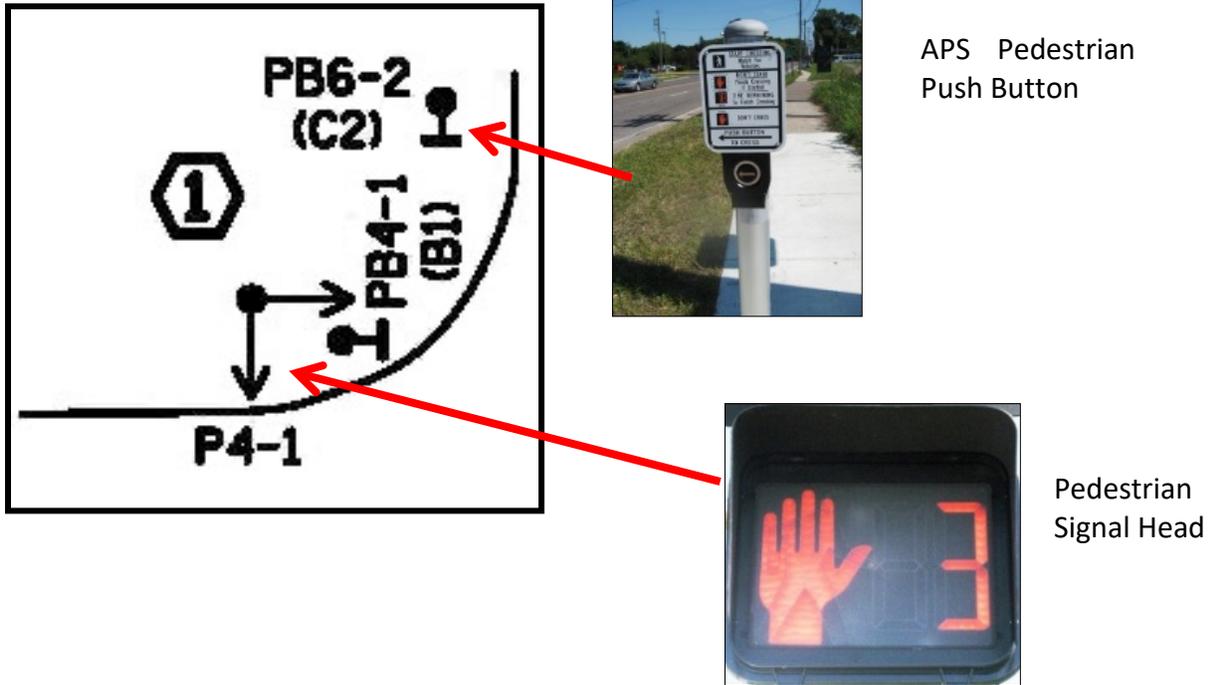


Figure 4-26: Example of Pedestrian Signal Head Detail

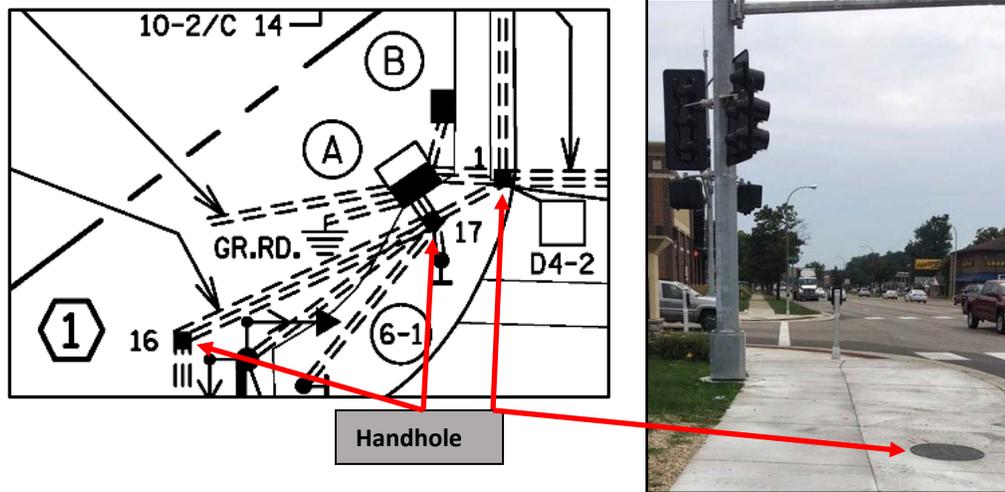


Figure 4-27: Example of Handhole Detail Shown as Solid Black Square

Loop Detectors

Loop detectors are shown in Figure 4-28 with a square or rectangle. The detectors are normally labeled as the intersection is approached, from right to left with number 1 usually a detector back from the stop line and number 2 to the left. These numbers are preceded by a D and the controller phase number (for example D1-1, D1-2, etc.).

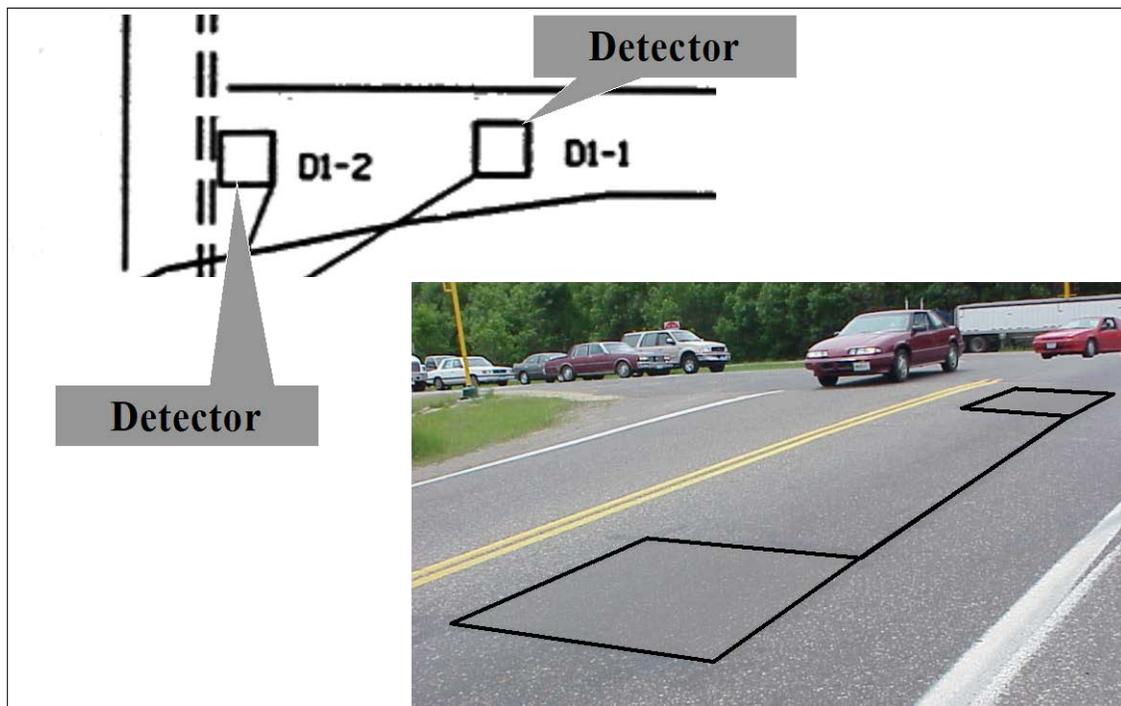


Figure 4-28: Example of Loop Detector Detail

The loop detector table identifies the size, function and location of the detector shown on the plan sheet. The detector number refers to the detector shown on the intersection plan sheet. The location shows the distance from the stop line to the detector.

LOOP DETECTOR CHART		
NUMBER	SIZE (FT)	LOCATION
D1-1, D5-1	2-6x6	20 & 50
D1-2, D5-2	2-6x6	5 & 35
D2-1, D2-2	6x6	400
D3-1, D7-1	2-6x6	20 & 50
D3-2, D7-2	2-6x6	5 & 35
D4-1, D8-1	6x6	120
D4-2, D8-2	6x6	5
D4-3, D8-3	2-6x6	5 & 20
D6-1, D6-2	6x6	400

-ALL LOOP DETECTORS SHALL BE PVC
UNLESS NOTED OTHERWISE
-LOCATION: DISTANCE FROM
CROSSWALK/STOP BAR IN FEET

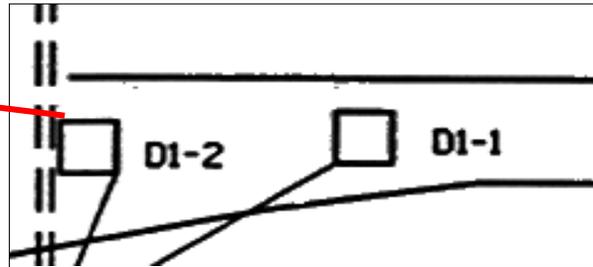


Figure 4-29: Example Loop Detector Table

4.1.4 FIELD WIRING DIAGRAM SHEET

All electrical components are shown on the wiring diagram in Figure 4-31.

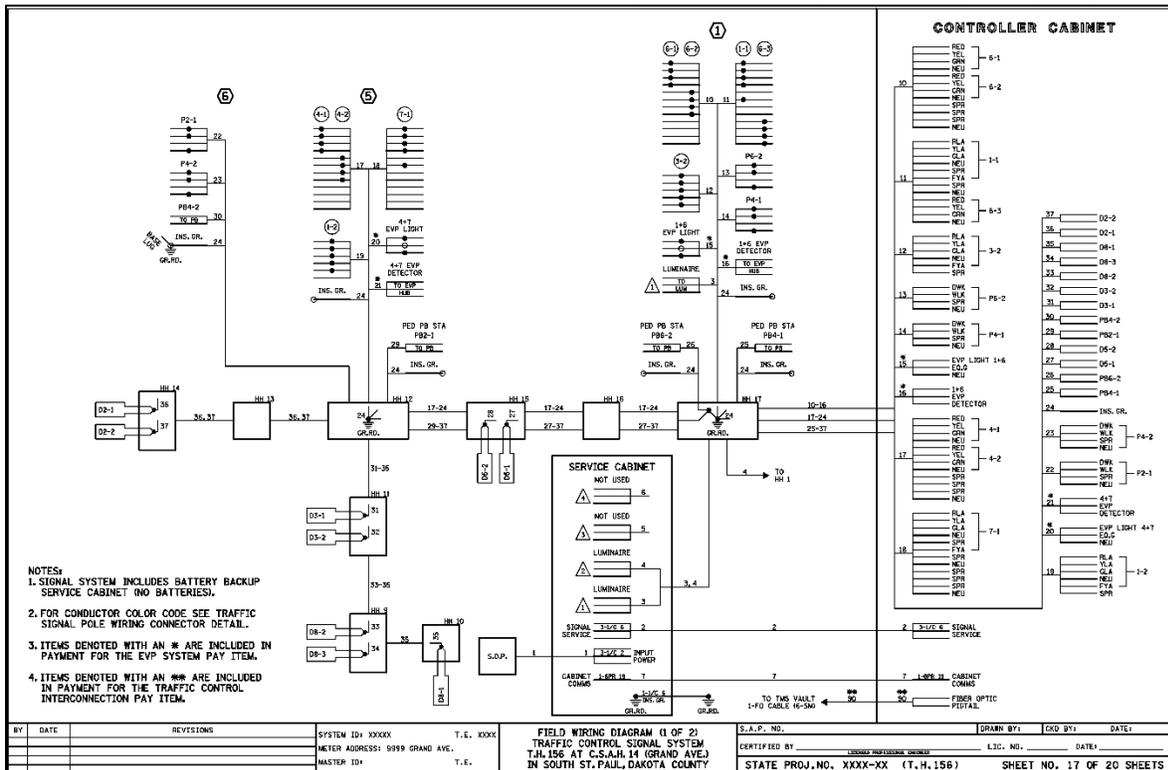


Figure 4-30: Example Intersection Wiring Diagram

The pole base wiring connector detail sheet includes a wire specification chart.

WIRE SPECIFICATION CHART		
Type	Name	Specification Number
1/C 2	Power Conductors	3815.2B.1
1/C 6	Power Conductors	3815.2B.1
1/C 6 INS.GR.	Grounding Conductors	3815.2B.5
2/C 14	Loop Detector Lead-In Cable	3815.2C.4
3/C 14	Signal Control Cable	3815.2C.3
4/C 14	Signal Control Cable	3815.2C.3
6/C 14	Signal Control Cable	3815.2C.3
12/C 14	Signal Control Cable	3815.2C.3
6PR 19	Telephone Cables Outdoor	3815.2C.6.b
3/C 20	EVP Detector Cable	3815.2C.5

Figure 4-34: Wire Specification Reference Chart

Some of the graphics used on the field wiring diagrams are shown here. Also, see the standard symbols from the MnDOT Technical Manual.

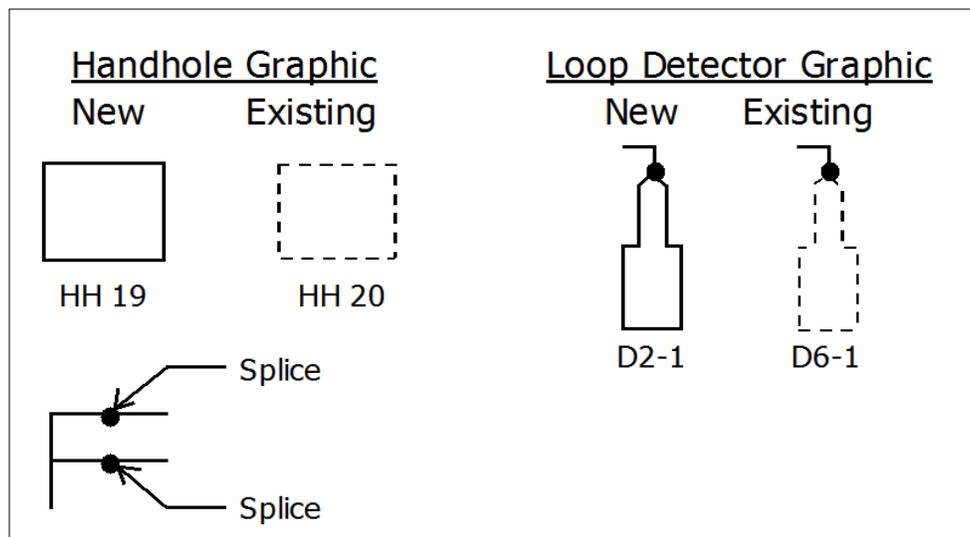


Figure 4-35: Example Field Wiring Symbols

4.1.5 UTILITIES SHEET

Figure 4-36 provides an example of a utilities layout sheet.

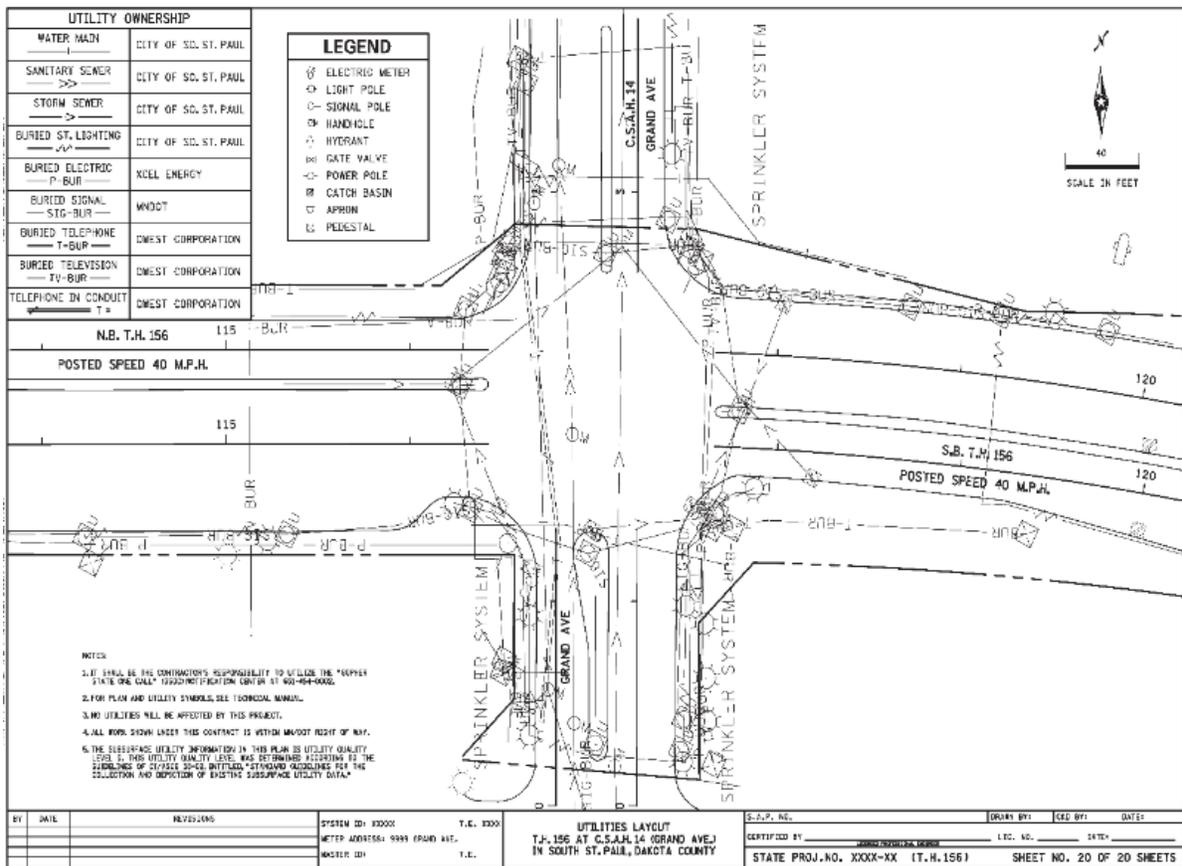


Figure 4-36: Example of Utilities Layout Plan Sheet

4.2 Typical Lighting Plan

Similar to traffic control signal plans, lighting plans are also prepared on 11" x 17" plan sheets. The scale is indicated on the individual layout sheets. Each sheet of the plan will also be properly identified with the State or State Aid Project Number and labeled as Sheet XX of XX. All sheets after the title sheet will include a sheet border with signature block, which has important information such as the State Project Number, Trunk Highway Number, Feed Point Number, Meter Address, and Certified Signature.

BY:	DATE:	REVISIONS:	CERTIFIED BY: <i>Michael P. Gibeault</i> <small>REGISTERED PROFESSIONAL ENGINEER</small> L.C. NO. 19863 DATE: 8/18/2013	LIGHTING QUANTITIES	
DRAWN BY: PS	CKD BY: GB	DATE: 7/2013		STATE PROJ. NO. 8280-46 (T.H. 35)	SHEET NO. 2 OF 9 SHEETS

Figure 4-37: Example of Sheet Border with Signature Block

Lighting plan sets include:

- Title sheet
- Quantities sheet
- Lighting Detail sheets
- Removal Sheets
- Lighting plan sheets (including wiring diagram)
- Utilities

MINNESOTA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLAN FOR ELECTRIC LIGHTING SYSTEM
LOCATED ON T.H. 35 AT C.S.A.H. 2 & T.H. 8 IN FOREST LAKE

END PROJECT
S.P. 8280-46 (TH 35)
REF. PT. 132+00.939

BEGIN PROJECT
S.P. 8280-46 (TH 35)
REF. PT. 131+00.973

FOR PLANS & UTILITIES SYMBOLS, SEE TECHNICAL MANUAL
PROJECT NO. 8280-46
CHARGE IDENTIFIER

PROJECT LOCATION
WASHINGTON COUNTY
METRO DISTRICT

STATE FUNDS

GOVERNING SPECIFICATIONS
THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF
TRANSPORTATION "STANDARD SPECIFICATIONS FOR
CONSTRUCTION" SHALL GOVERN.

INDEX

DESCRIPTION	SHEET NO.
TITLE SHEET	1
QUANTITIES	2
DETAILS	3-5
REMOVAL PLAN	6-7
LIGHTING PLAN	8-9

THIS PLAN CONTAINS 9 SHEETS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: MICHAEL GERBENSKY LICENSE # 19863
SIGNATURE: *[Signature]* DATE: 8/21/13

DESIGN SOUND: Greg Brondt Paul Bebi
RECOMMENDED FOR APPROVAL: *[Signature]* DATE: 8/21/13
RECOMMENDED FOR APPROVAL: *[Signature]* DATE: 8/22/13
RECOMMENDED FOR APPROVAL: STATE PRE-LETTING ENGINEER DATE: _____
RECOMMENDED FOR APPROVAL: _____ DATE: _____
RECOMMENDED FOR APPROVAL: _____ DATE: _____
OFFICE OF LAND MANAGEMENT APPROVAL: _____ DATE: _____
APPROVED: _____ STATE DESIGN ENGINEER

I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, OF THIS PLAN WERE MADE BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: _____ LICENSE # _____
DATE: _____ SIGNATURE: _____

STATE PROJ. NO. 8280-46 (T.H. 35 = 390) SHEET NO. 1 OF 9 SHEETS

TITLE SHEET

BY	DATE	REVISIONS

INDEX MAP NOT TO SCALE
PLAN SCALE 1"=100'
SCALE IN FEET

DRAWN BY: PB CKD BY: GB DATE: 7/2013

Figure 4-38: Typical Lighting Plan Title Sheet

4.2.1 TITLE SHEET

Similar to traffic control signal plan detail as presented above in 4.1, the title sheet of the lighting plan includes a map that indicates the location of the lighting project, an index for the lighting plan, approval signatures, and the governing specifications for the lighting project.

The title sheet is required for all plans. The title sheet contains the index for the sheets contained within the plan. It also includes content such as the following:

- Plan description
- Project location
- Governing specifications
- Plan preparation certification
- Signature block
- Plan revisions block
- Standard plates
- Statement of estimated quantities

4.2.2 QUANTITIES SHEET

For itemized projects, the lighting quantities sheet includes a statement of estimated quantities for each pay item as seen in Figure 4-39. A standard plates chart for the specific project is provided on all lighting plans.

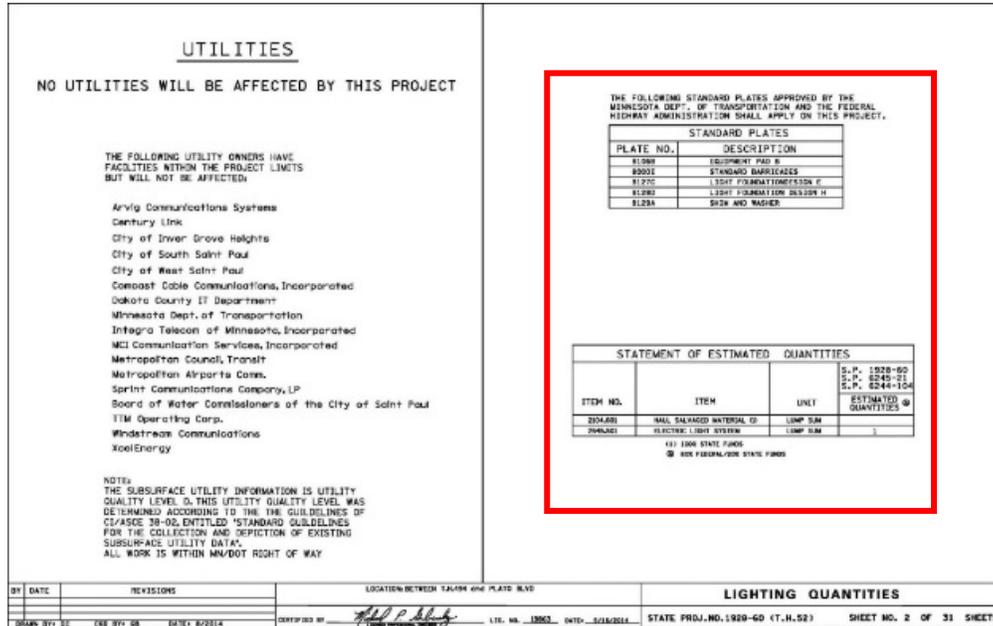
For lump sum projects, the lighting quantities sheet includes only the lump sum pay item of estimated quantities and a standard plates chart for the specific project.

ITEM NO.	ITEM	UNIT	S.P. 2783-113 ESTIMATED QUANTITIES
2104.501	REMOVE CABLES	LN. FT.	
2104.501	REMOVE CONDUIT SYSTEM	LN. FT.	630
2104.509	REMOVE LIGHT FIXTURE	EACH	42
2104.509	REMOVE LIGHTING UNIT	EACH	196
2104.509	REMOVE LIGHT STANDARD BASE	EACH	49
2104.509	REMOVE LUMINAIRE	EACH	6
2104.509	REMOVE EQUIPMENT PAD	EACH	5
2104.509	REMOVE HANDHOLE	EACH	5
2104.523	SALVAGE SERVICE CABINET	EACH	5
2545.511	LIGHTING UNIT TYPE 9-48	EACH	29
2545.511	LIGHTING UNIT TYPE 6B-48	EACH	1
2545.511	LIGHTING UNIT TYPE 6B-49	EACH	7
2545.511	LIGHTING UNIT TYPE 9-49	EACH	1
2545.511	LIGHTING UNIT TYPE 6B-49	EACH	9
2545.511	LIGHTING UNIT TYPE VM-48	EACH	3
2545.511	LIGHTING UNIT TYPE VM9-48	EACH	2
2545.511	LIGHTING UNIT TYPE VM9-49	EACH	3
2545.511	LIGHTING UNIT TYPE VM-49	EACH	58
2545.511	LIGHTING UNIT TYPE VM9-49	EACH	7
2545.511	LIGHTING UNIT TYPE SPECIAL	EACH	1
2545.513	LUMINAIRE	EACH	6
2545.514	UNDERPASS LIGHTING FIXTURE TYPE L	EACH	35
2545.515	LIGHT BASE DESIGN E	EACH	32
2545.515	LIGHT BASE DESIGN H	EACH	59
2545.521	.75" RIGID STEEL CONDUIT	LN. FT.	
2545.521	1" RIGID STEEL CONDUIT	LN. FT.	
2545.521	1.5" RIGID STEEL CONDUIT	LN. FT.	600
2545.521	2" RIGID STEEL CONDUIT	LN. FT.	
2545.523	3" NON-METALLIC CONDUIT (DIRECTIONAL BORE)	LN. FT.	2000
2545.523	4" NON-METALLIC CONDUIT (DIRECTIONAL BORE)	LN. FT.	200
2545.531	UNDERGROUND WIRE 1 COND NO 2	LN. FT.	1000
2545.531	UNDERGROUND WIRE 1 COND NO 4	LN. FT.	8100
2545.531	UNDERGROUND WIRE 1 COND NO 10	LN. FT.	
2545.533	ARMORED CABLE 4 COND NO 4	LN. FT.	35000
2545.541	SERVICE CABINET SECONDARY TYPE L1	EACH	5
2545.545	EQUIPMENT PAD B	EACH	5
2545.551	JUNCTION BOX	EACH	70
2545.553	HANDHOLE	EACH	
2545.582	LIGHT SUPPORT BRACKET	EACH	5
2545.582	LIGHT STANDARD NUMBERING	EACH	
2557.516	PEDESTRIAN DATE	EACH	1

STANDARD PLATES	
PLATE NO.	DESCRIPTION
81148	P.V.C. HANDHOLE/PULLBOX
81279	LIGHT BASE DESIGN E
81289	LIGHT BASE DESIGN H
9322 J	CHAIN LINK FENCE

THE FOLLOWING STANDARD PLATES APPROVED BY THE DEPT. OF TRANSPORTATION AND THE FEDERAL HIGHWAY ADMINISTRATION SHALL APPLY ON THIS PROJECT.

Figure 4-39: Example of Itemized Lighting Quantities Plan Sheet



4.2.3

Figure 4-40: Lump Sum Statement of Estimated Quantities Standard Plates

LIGHTING DETAIL SHEET

This lighting detail sheets presents lighting units, light foundation, and the placement of lighting units in relation to the roadway (Figure 4-42). Detail sheets may include:

- Placement detail
- Underpass detail
- Lighting unit detail
- Foundation detail
- Median lighting detail

The detail sheets also have a legend. Note that a filled symbol on the legend indicates new equipment and a hollow symbol indicates in place, as presented on Figure 4-41.

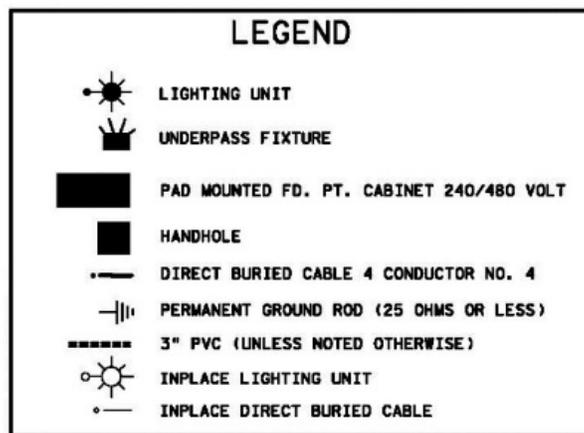


Figure 4-41: Lighting Plan Legend Example

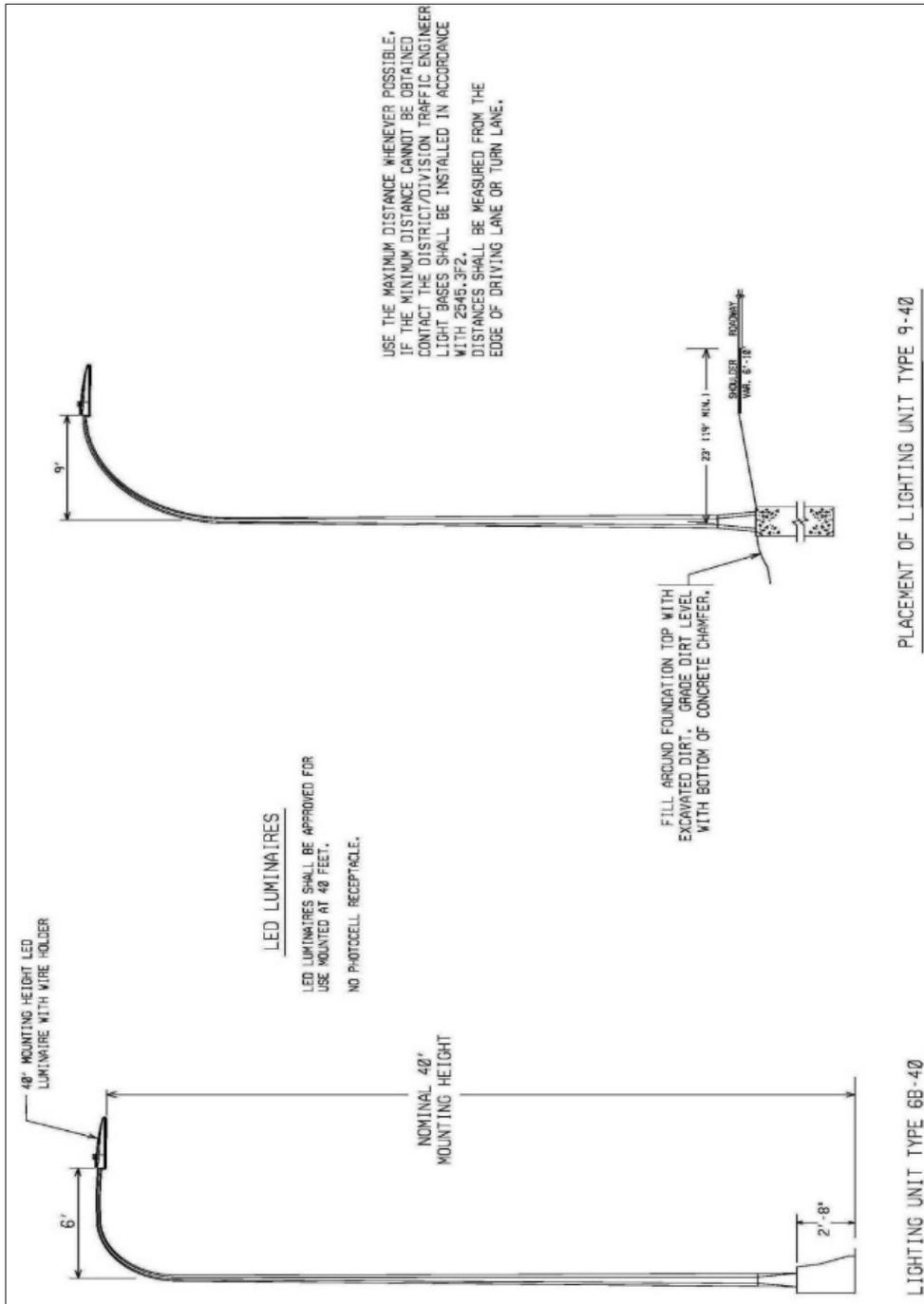


Figure 4-42: Example Lighting Detail Sheet

Examples of Lighting Detail Sheets

The lighting detail below shows an example of how underpass luminaires are to be installed on bridges, including the location of conduits and junction boxes.

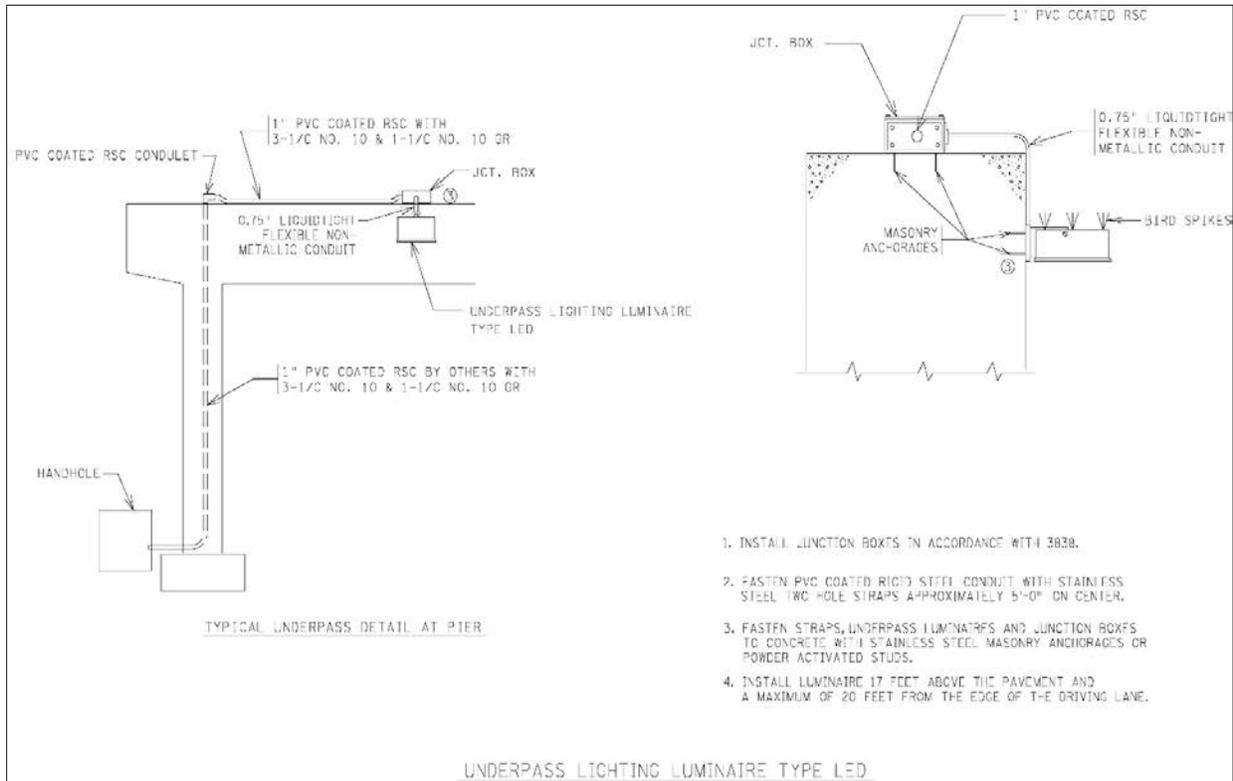


Figure 4-43: Example Lighting Detail Sheet Showing Underpass Luminaires

4.2.5 LIGHTING PLAN SHEETS

The lighting plan sheets typically include:

- Legend
- Wiring diagram
- Lighting unit and foundations table
- Location of lighting units
- Source of power
- Service equipment note
- Equipment pad note
- Construction notes
- Scale
- North arrow
- Street names

If there is not room for the wiring diagram or lighting unit and foundation table they will go together on their own sheet.

A description of lighting plan sheet contents follows.

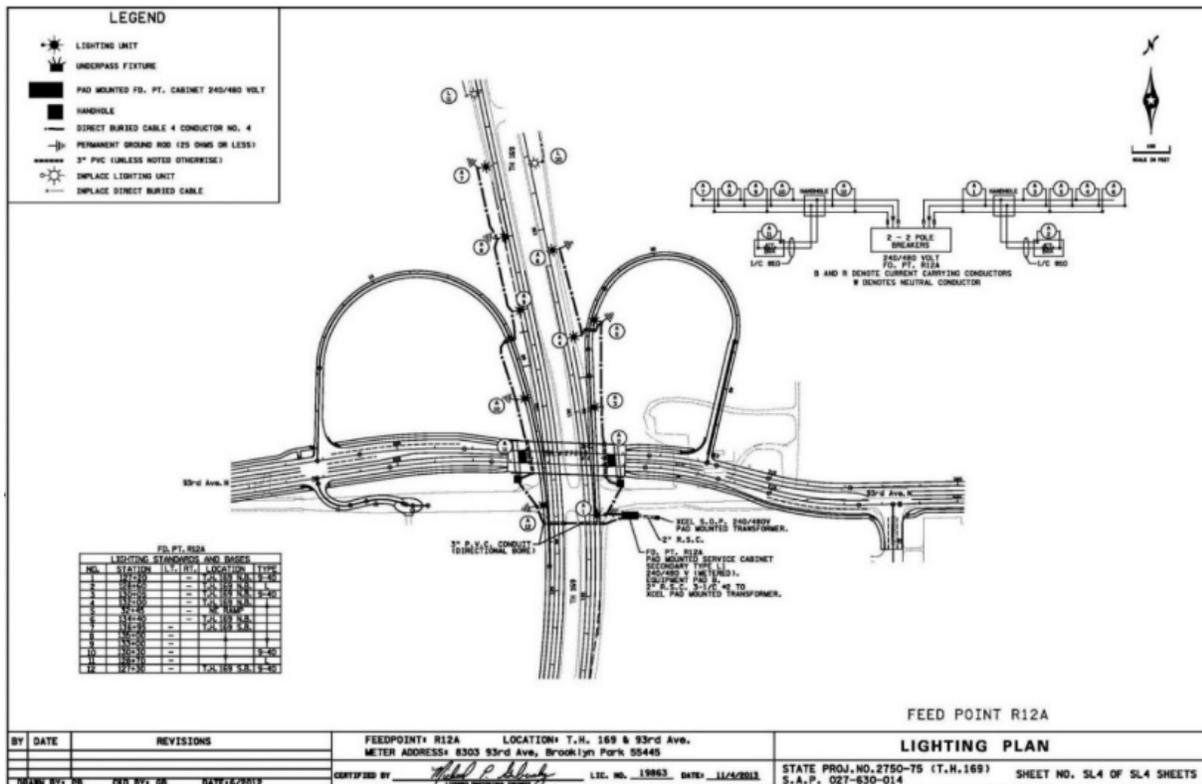


Figure 4-46: Example Lighting Plan Sheet

Source of Power

The SOP note gives information about the SOP provided by the local power utility, the lighting service cabinet, and equipment pad.

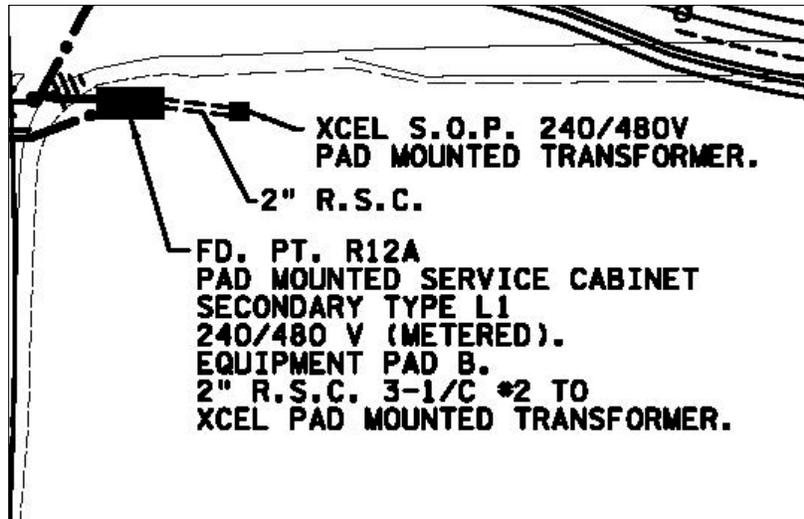


Figure 4-47: Example Source of Power Note

Lighting Units and Foundations Table

The lighting units and foundations table shows the foundation locations and lighting unit types on the plan.

FEEDPOINT J7V LIGHTING STANDARDS AND FOUNDATIONS					
NO.	STATION	LT.	RT.	LOCATION	TYPE
1	403+45	X		T.H. 52 S.B.	9-49
2	400+75	X		↑	9-49
3	398+40	X			9-49
4	395+70	X			9-49
5	393+00	X			9-49
6	390+25	X			9-49
7	387+60	X			9-49
8	384+50	X			9-49
9	381+75	X			9-49
10	378+85	X			9-49
11	376+25	X			9-49
12	373+60	X			9-49
13	370+95	X			9-49
14	368+30	X			9-49
15	365+65	X			9-49
16	363+05	X			9-49
17	360+45	X			9-49
18	357+80	X		↓	9-49
19	355+20	X		T.H. 52 S.B.	9-49
20	352+65	X		T.H. 494 N.W. RAMP	9-40
21	385+05	X		SOUTHVIEW BLVD N.W. RAMP	9-40
22	382+65	X		SOUTHVIEW BLVD N.W. RAMP	9-40
23	380+10	X		SOUTHVIEW BLVD S.W. RAMP	9-40
24	377+95	X		↑	9-40
25	375+75	X		↓	9-40
26	373+55	X		SOUTHVIEW BLVD S.W. RAMP	9-40

Figure 4-48: Example Lighting Units and Foundations Table

Wiring Diagram

This part of the plan shows the wiring diagram (ladder diagram) for the lighting system. Note that every other luminaire is connected to the opposite leg to balance the electrical load.

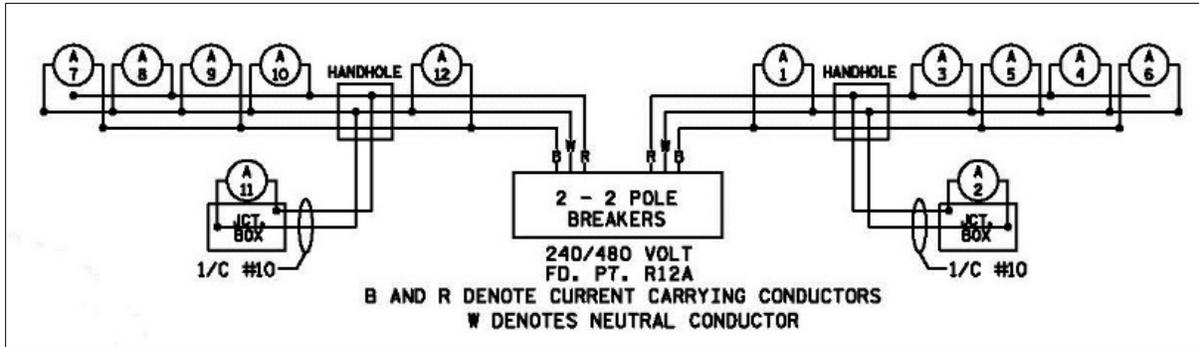


Figure 4-49: Example Ladder Wiring Diagram

This lighting plan sheet details a bridge lighting layout, a wiring diagram, and feed point chart.

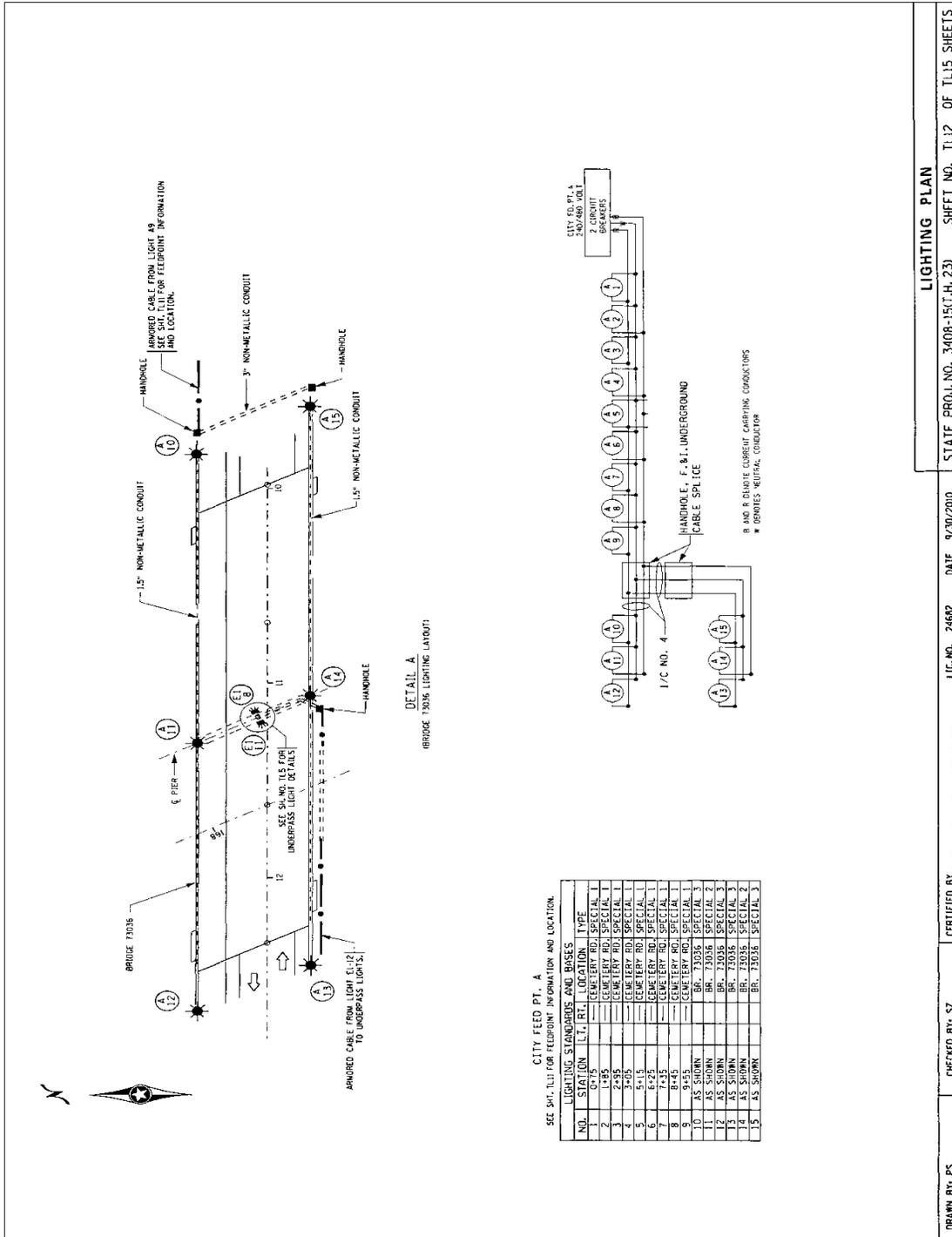


Figure 4-50: Example of Bridge Lighting Plan Sheet

DRAWN BY: PS CHECKED BY: SZ CERTIFIED BY: _____ LIC. NO. 24682 DATE 9/20/2010 STATE PROJ. NO. 3408-15(K-H, 23) SHEET NO. TL12 OF TL15 SHEETS

4.2.2 UTILITIES SHEET

This is a plan sheet view of the public utilities within the project limits.

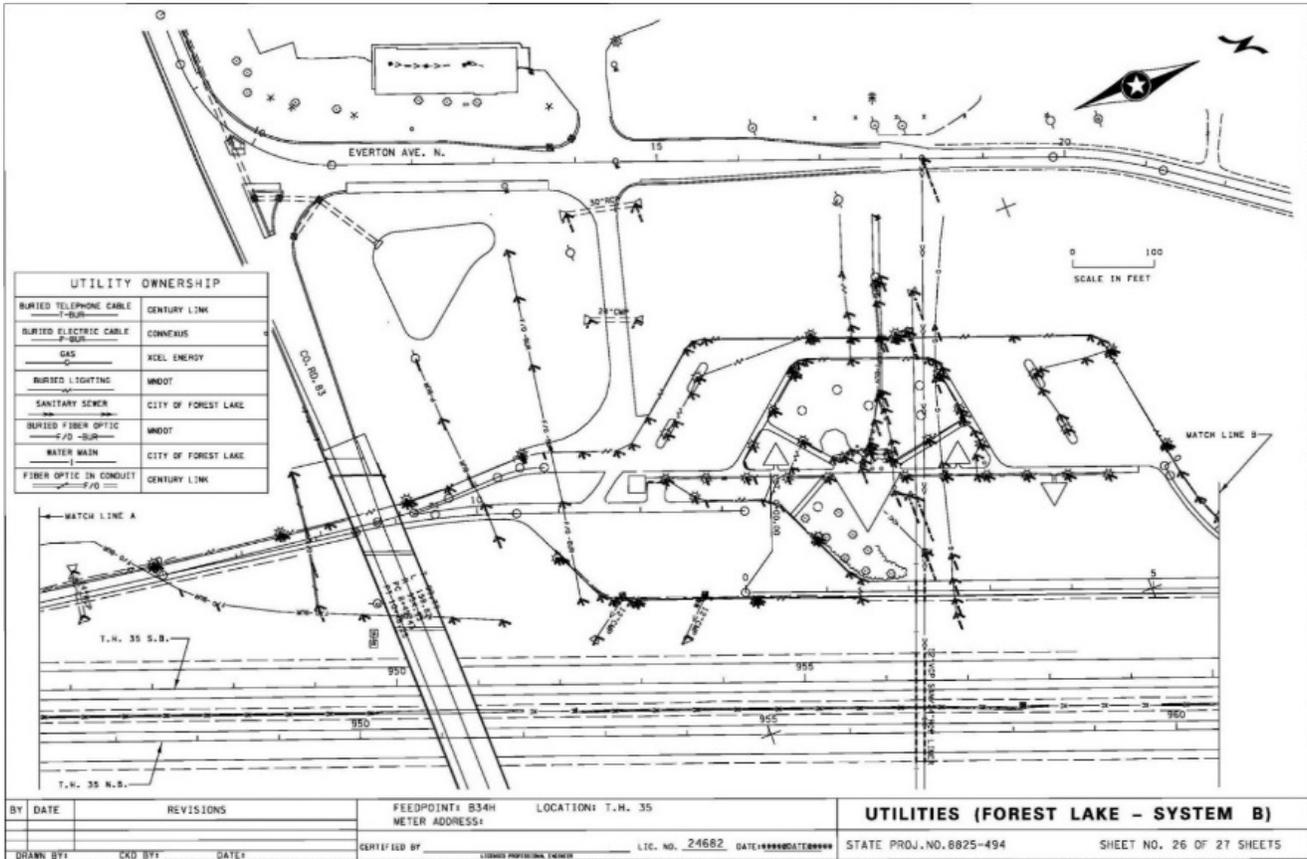


Figure 4-51: Example of Utilities Layout Sheet

4.3 Chapter 4 Resources

- Sample traffic control signal plan
- Sample lighting plan
- Signal Design Manual
- Lighting Design Manual

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