

CHAPTER 29 – PROJECT COMPLETION DOCUMENTS

PROJECT COMPLETION

Upon completion of traffic control signal system and lighting projects, there are forms and checklists to ensure that the project is closed out correctly.

29.1 Traffic Control Signal System Final Inspection Forms

The forms on the following pages may be used for the final inspection of signal poles, handholes, service equipment, and signal cabinets.

Table 29-1: Signal Pole Inspection Form

Signal Pole	SYSTEM ID #	LOCATION							
		Pole 1	Pole 2	Pole 3	Pole 4	Pole 5	Pole 6	Pole 7	Pole 8
Item	Spec #								
Signal Heads Plumb	2565.3L1,L2								
Background Shields	3834.2A9								
Visors	3834.2A2								
Heads Aimed	Traffic Office								
Paint (colors)	2565.3X								
EVP Installed / Working	2565.3W								
Bonding / Grounding (Oxide Inhibitor)	2565.3H.7								
Conduit 2"-3" Stub	2565.3D.2.b								
Conduit Sealed	2565.3D.2.b								
Conduit Bushing / Lug & Wire	2565.3D.4.b								
Signal Control Cable	3815.2C.3								
Cable Slack 24"	2565.3J.1								
Cables Labeled	2565.3J.1								
Pole Base Connectors	2565.3J.6								
Sig Head Term Block/Forks Down/Sprayed	2565.3J.7								
Luminaire/ Wires (14-3 Signal Control)	3815.2C.3								
Ped. Button Elevation (3' 6")	APS Station Detail								
Ped. Signs Mounted	APS Station Detail								
Walk/ Don't Walk Heads Mounted	2565.3L								
Seal Pole/ Mast Arm Handhole	2565.3Q								
Woven Wire Cloth	2565.3Q								
Wind Collars	Std. Plate 8122								
Pole Plumb	2565.3Q								
Mast Arm Signs Installed	2565.3T								
Pedestrian Ramps Installed	Std. Plans								
Removals	2104 & Spec. Prov.								
Restoration/ Clean-up	1407, 1712, 2565.3BB								

Certificate of Disposal turned into Inspector?

Yes/
No

Table 29-2: Handhole Inspection Form

HANDHOLE FINAL INSPECTION LIST										
S.P.	T.H. &			DATE:			INSP.:			
H H. NUM	CONDITION 2565.3E				CONDUIT 2565.3D			CABLE 2565.3J		
	GRADE	COVER	DRY	CLEAN (ROCK)	BSHNG 4b, 5b	SEAL .D2b	GRD WIRE	LABEL	SLACK	OTHER
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Table 29-3: Service Equipment Final Inspection

SERVICE EQUIPMENT FINAL INSPECTION						
S.P.	T.H. &				DATE	INSP.
ITEM	SYS. A	SYS. B	SYS. C	SYS. D	OTHER	SPECS
MISC. MATERIALS						2565.2S
METER SOCKET (approved)						2565.3K, 3837.2A
CIRCUIT BREAKER LOAD CENTER & BREAKERS						3837.2A and Contract Documents
SIGNAL SERVICE CABINET – TYPE SSB						Approved/Qualified Products List (APL)
GENERAL DUTY SAFETY SWITCH						3837.2A4
RISER & WEATHER HEAD						2565.3K
CONDUCTOR SIZE ABOVE METER SOCKET CONDUCTOR SIZE BELOW METER SOCKET						Contract Documents
LABELING (breakers, neutral)						3837.2A3
GROUND ROD AND BONDING & GROUNDING						2565.3H and Contract Documents
SEAL CONDUITS						2565.3D
CABINET FINISH & PAINTING						Contract Documents
CABINET BASE GASKET						Contract Documents

Table 29-4: Signal Cabinet Final Inspection

SIGNAL CABINET FINAL INSPECTION						
S.P.	T.H. &				DATE	INSP.
ITEM	SYS. A	SYS. B	SYS. C	SYS. D	OTHER	SPECS
MISC. MATERIALS						2565.2S
ANCHR.RODS(SIZE)						2565.2F2
CONDUIT						2565.3D, and Contract Documents
NUMBER						
SIZE						
PROJECTION (1" - 2")						
CNDT.FTTNG.						2565.3D
BONDING & GROUNDING GROUND ROD						2565.3H and Contract Documents
CONC.FNSH						2565.3F Contract Documents
BASE GSKT.						
FLD.WIRE LENGTH						2565.3J
LABELING CABLES & CONDUCTORS						2565.3J and Contract Documents
SEAL CONDUITS						2565.3D

29.2 Electrical System Testing and Acceptance Checklist (2545.3K)

General testing and acceptance requirements must be in accordance with 2545.3K.

CHECKLIST FOR ELECTRICAL SYSTEMS

The following list is a minimum and does not replace applicable specifications in The National Electrical Code (NEC). All specification references are from the current Spec Book.

1. Check SOP

- A. Meg all cables. Isolate neutral and ground. (2545.3K)
- B. All wires must Meg greater than 100 Meg ohms to earth ground. (2545.3K)
- C. All breakers labeled to indicate what poles are included in system per (NEC)
- D. Make sure wiring is neat. (2545.3G)
- E. Feed point number and "MnDOT ESS" labels should be on the cabinet. (2545.3P)
- F. Available Fault Current Calculations and Cabinet Label. (2545.3A.1) (2565.3CC)

2. Check Random Poles

- A. Check no less than 5 poles or up to one-third of system.
- B. Check fuse holder and fuse. (2545.3G3)
- C. Conduits right length. (Standard Plates 8127 and 8128)
- D. Splices insulated as per specs. (2545.3G4)
- E. Outside jacket of Direct Buried Lighting Cable striped back flush to 4 inches above the conduit opening. (2545.3G2)
- F. Cable depth consistent no less than 24 inches direct buried and conduit depth no less than 18 inches below finished grade. (2545.3G2) (2565.3D2b)
- G. Direct buried cable must be approximately 24 inches up into pole. (2545.3G.2)
- H. Handholes and lighting foundations to finish grade. (2545.3F2 and 2565.3E)
- I. Feed point and light pole numbers should be put on all poles. (2545.3P)
- J. Cable routing changes must be noted on prints.
- K. Check wiring diagram for accuracy.
- L. Poles and system must be effectively grounded. (2545.3R)
- M. Poles plumb and luminaires are level. (2545.3H and 2545.3Q)

I certify that this project has met the above checklist criteria. Locating responsibility will be taken over when final is done and as-built is received.

(Name)

(Date)

29.3 Warranties (2454.2A.5 and 2565.2A.5)

The warranty period starts on the day the traffic control signal or lighting system is turned on. Turn-on date is defined as:

Lighting: The lighting system meets all the installation, operational, and testing requirements of the contract.

Traffic Control Signals: The traffic control signal system meets all the installation and operational requirements of the contract and is placed in automatic operation.

29.3.1 IN-SERVICE WARRANTY

An in-service warranty is provided by the contractor for a period of one year after the system is accepted by MnDOT based on the turn on date. Excluded from the in-service warranty period are:

1. All state furnished material.
2. Any parts or materials that in the opinion of the engineer have been subjected to misuse, negligence or accidents by anyone other than the contractor.



Figure 29-5: Misused Material

29.3.2 MANUFACTURER'S WARRANTY

A manufacturer's warranty is supplied by the manufacturer of each individual product. The length of the warranty differs based on the specific product. For equipment that is placed into operation after the signal is turned-on (for example signal interconnect cables), the warranty must begin on the date the equipment is placed into service and to the satisfaction of the engineer.

The warranty must include all the components of the lighting system including (but not limited to): poles, luminaires, photoelectric controls, cable, service cabinets, etc.

All the documents of the manufacturer's warranty, instruction sheets and parts lists must be submitted to the engineer prior to the final acceptance of the project or when requested by the engineer.

29.4 As Built Plans

If specified in the contract documents (special provisions), the contractor shall furnish "As Built Plans" that include any changes in the following:

- Pole locations
- Handhole locations
- Length of mast arms
- Types of handholes
- Signal bracketing or signal mounts
- Wiring
- Size of detection
- Conduit sizes
- Type of detection
- Conduit runs
- Cable path
- Number of handholes
- Other items as required by the engineer

Any discrepancy or change(s) between the final plan and how the signal was actually built must be indicated on the “As Built Plans”.

The “As Built Plans” shall be in a form that is satisfactory to the engineer.

A copy of the corrected plans shall be sent to the district traffic office and Electrical Services Section (ESS) at Fort Snelling.

Projects may require global positioning system (GPS) coordinates be captured for the new and existing installed infrastructure within the construction project limits. Consult the contract documents for specific project requirements.



Figure 29-6: GPS Capture

29.4.1 GLOBAL POSITIONING SYSTEM (GPS) SYSTEM COMPONENT AND UTILITY LOCATION DATA

A. As Built Drawings and GPS Coordinates

As Built drawings and GPS coordinates in accordance with Division S Special Provisions “AS-Builts” including Pay Item No. 2011.601 (AS BUILT).

Figure 29-7: Special Provision Language

The Division S Special Provisions language referenced in Figure 29-3 is presented in S-1 (2011 AS-BUILTS).

S-1. (2011) AS BUILTS

REVISED 08/09/19 ◀DO NOT REMOVE THIS "REVISED" DATE. IT NEEDS TO STAY IN FOR THE CONTRACTORS.

Include in most Metro Projects and most signal and lighting projects.

S-2. SP2018-62

S-1.1 DESCRIPTION

This work shall consist of providing MnDOT with as-built electronic data and mark-up drawings, as described by asset class, method, and mark-up requirement below:

Add/Remove asset classes included in project.

1)	Drainage/Stormwater	Method (1), Mark-up Drawings and MN Board Professional Land Surveyor signed submittal letter Required
2)	Traffic Management Systems	Method (2) and Mark-up Drawings Required
3)	Lighting	Method (2) and Mark-up Drawings Required
4)	Signage	Method (2) Required
5)	Traffic Control Signals	Method (2) Required
6)	Traffic Barrier	Method (2) Required
7)	Earth Retaining Systems	Method (2) Required
8)	Noisewalls	Method (2) Required
9)	Contaminated Material Management	Method (2) Required
10)	Landscaping	Only Mark-up Drawings Required
11)	Rumble Strips	Method (2) Required

If an asset class is added to this specification that is not listed above, please provide the asset class name and the following information directly in this specification:

- **Required Method (1) or (2) or describe new method.**
- **If mark-up drawings are required:**
 - **Feature code(s) for feature(s) within the class.**
 - **Describe collection type and frequency of the feature (e.g. point every 50' and change in direction or line along toe).**

As-builts shall capture all new asset features, and shall capture existing features if they are modified or connected to any new asset features (storm sewer or traffic barrier, etc.) and/or run through existing conduits (new fiber optics or power cables). The work shall occur in accordance with MnDOT Standard Specifications, MnDOT Standard Plans/Plates, the Plans, and the following:

S-1.2 MATERIALS - BLANK

S-1 CONSTRUCTION REQUIREMENTS

A Electronic Data Collection and Submittal

The following provisions shall apply to the data collection and submittal requirements for As-builts:

A.1 Contractor shall notify the Engineer at least 24-hours prior to beginning field collection of data.

A.2 Contractor shall utilize one of the following methods for the collection of data.

A.2.a Method (1): All coordinates shall be sub-foot accurate x, y and one-tenth-foot accurate z and coordinates and data shall be collected using County Coordinate Systems.

A.2.b Method (2): All coordinates shall be sub-meter accurate x, y and unless otherwise specified, the coordinates and data shall be collected using County Coordinate Systems.

A.3 Contractor or sub-contractor must obtain the x, y, and z of underground facilities prior to backfilling any trenches. If underground facilities are installed using directional borings the x, y and z must be collected in a manner that meets the requirements of Method (1) or Method (2) and the corresponding collection location requirements of Table K and Table Z.

A.4 The data collector shall coordinate with the facility installer to exchange information on placement changes or the addition of any items, and on the timing of the work.

Figure 29-8: As Built Special Provisions

A.5 Data dictionaries can be provided by MnDOT if contractor requests them. Contractor shall collect the attributes described in Table K or Table Z. Refer to [S-68.3.A.9](#).

A.6 Electronic formats shall be made in American Standard Code for Information Interchange (ASCII), Comma Separated Value file (CSV), and/or Environmental Systems Research Institute (ESRI) shapefiles.

A.7 The Contractor will send final As-Built submittal package(s) to [MnDOT Project Engineer](#) and copy AsBUILTS.DOT@state.mn.us no later than [20 working days](#) after the Project Construction is Complete (MnDOT 1516.2) and receives MnDOT acceptance. Include the project number in the subject or body of the email, as follows: *S.P. ####-### GPS As-Built Deliverable Data*. Submittal folder and/or file name should include: State Project number, Asset Class, Date. Example: "0282-34_TMS_12-15-2012".

A.8 The Contractor will receive comments or approval of the data no later than [15 working days](#) after initial submittal of the final package to MnDOT. Any discrepancies will be resolved by the Contractor prior to final approval and/or acceptance by MnDOT.

A.9 Refer to website (<http://www.dot.state.mn.us/gisspec/>) for feature specific collection guidance, district contact information, and additional submittal procedures.

B Mark-Up Drawings

The following provisions shall apply for mark-up drawings:

B.1 Contractor shall submit an "As-Built" plan set that includes mark-ups showing additions, deletions, and other changes made during construction; these plan sheets shall be marked as "as-built". If work was done as-designed and no changes were made, these plan sheets shall be marked as "As-Built – no field changes".

B.1.a Track any plan note modifications.

B.1.b Two copies of the marked up plans must be submitted to the Construction Project Engineer in .PDF format at the time of initial submittal of the electronic data as specified in Section [S-68.3.A.7](#).

B.1.c As-built drawings shall be accurate, and are an official record of the project at the time of construction completion.

o **METHOD OF MEASUREMENT**

The Engineer will pay for As-BUILTS upon receipt and approval of submittal documents as required by this specification.

o **BASIS OF PAYMENT**

The Department will pay for as-builts on the basis of the following schedule:

Figure 29-9: As-Built Payment

29.5 Chapter 29 Resources

- MnDOT Standard Specifications for Construction 2545.3K, 2554.2A.5 and 2565.2A.5
- Special Provisions Division S