

SECTION 00990 - TRAFFIC SIGNALS

This Section title is replaced with the following:

SECTION 00990 - TRAFFIC SIGNALS, RAMP METERS, FLASHING BEACONS, INTERCONNECT SYSTEMS & AUTOMATIC TRAFFIC RECORDERS

(Follow all instructions and make all edits with "Track Changes" turned on. If there are no instructions [purple text] above a subsection, paragraph, sentence, or bullet, then include it in the Project. Delete all purple text before preparing the final document. All other modifications to this Section will require ODOT Technical Resource and State Specifications Engineer approval.)

Comply with Section 00990 of the Standard Specifications modified as follows:

00990.00 Scope - Replace this subsection, except for the subsection number and title, with the following:

In addition to requirements of Section 00960 and Section 00962, install traffic signals, ramp meters, flashing beacons, interconnect systems, and automatic traffic recorders according to the following Specifications.

(Use the following lead-in paragraph and subsection .10 when inductive loops are used.)

Add the following subsection:

00990.10 Materials - Furnish backer rod materials meeting the requirements of 02440.14. Furnish hot-melt loop sealant from the QPL.

00990.12 Traffic Signal Control Devices - Replace the paragraph that begins "The traffic signal controller ..." with the following paragraph:

Furnish the traffic signal controller cabinet and related green sheet Equipment according to requirements of the current edition of the ODOT Standard Specification for Microcomputer Signal Controller and errata.

00990.30 Video/Radar Detector Manufacturer's Representative - Replace this subsection, except for the subsection number and title, with the following:

When video/radar detection is shown, provide the services of a manufacturer's representative on-site within 1 week in advance of the anticipated electrical installation completion date to set-up devices with Agency electrical crew present.

(Use the following lead-in paragraph and subsection .40 when there is work at an existing controller cabinet.)

Add the following subsection:

00990.40 Work in Existing Controller Cabinets - Install new field wiring as shown into the existing controller cabinet without terminating.

New control equipment installed as shown in an existing controller cabinet ~~will be~~is tested prior to installation according to 00990.70.

At existing controller cabinets the Agency ~~will be~~is responsible for:

- Storage, delivery, installation, and activation of new control equipment
- Any required modifications to existing control equipment or existing field wiring terminations
- Terminating new field wiring

Prior to the anticipated installation of new control equipment, modification of existing control equipment, or modification of existing field wiring terminations, schedule field testing according to 00990.71. Field testing and activation of the new control equipment or modifications will occur within the same work shift. Be present at the Project Site during field testing.

(Use the following lead-in paragraph and subsection .41 when inductive loops are used.)

Add the following subsection:

00990.41 Inductive Loop Detectors:

(a) General - Do not begin sawcutting until the loop layout has been inspected by the Engineer.

Do not place wire in sawcuts until the cuts have been inspected by the Engineer.

(b) Sawcut and Wire Installation - Sawcut in a manner that is the most practicable, direct line between loops and junction boxes.

Immediately after sawcutting and before the cuttings dry, thoroughly flush each cut with a high-pressure water stream. Before the cuts dry, blow cuts free of water, debris, rock, and grit with compressed air. Slots may also be cleaned by means of a high-pressure water injection/vacuum extraction system. Remove rocks or other material that may be wedged in the cut. Remove and dispose of all cuttings according to 00290.20.

Dry cuts before placing wire.

After the sawcut is cleaned of debris, place the loop wire by pushing it into the slot with a blunt nonmetallic object. Use care to avoid damaging the insulation.

(c) Sealant - Install the sealant in slots according to the manufacturer's instructions. Furnish a copy of the manufacturer's specifications including application procedures. The Engineer may order a test run of any application method or material before filling sawcuts.

In order to prevent heat damage to the insulation, do not allow the temperature of the sealant to exceed 410 °F during application. Install hot-melt sealants in layers to prevent damage to wire insulation. Allow each layer to cool before the next layer is installed. Do not use water to accelerate cooling.

Sealants that crack or pull away from the sawcuts after curing will be rejected.

(d) Resistance and Continuity Testing - The resistance to ground of the loop and loop feeder combinations, shall be 500 MΩ or greater when checked at the following conditions:

- Before splicing and sealing - continuity test
- Before splicing after sealing - resistance test
- After splicing and sealing - resistance test

Furnish a report of the resistance and continuity results for each loop at each testing condition.

(Use the following lead-in paragraph and subsection .42(a) when inductive loops are used.)

Add the following subsection:

00990.42(a) Loop Feeder Cables — When terminating loop feeder cable inside the controller cabinet, do not remove the outside jacket and shield more than 6 inches from the end of the cable. Crimp lugs used for loop wire field terminals may be insulated or non-insulated. Terminate loop feeder shield drain wire to the cabinet input panel grounding bus nearest the feeder wire termination point.

00990.43 Traffic Control Signs - Replace this subsection, except for the subsection number and title, with the following:

Furnish and install the type of sign and mount as shown, according to the applicable portions of Section 00940.

Add the following subsection:

00990.45 Repair Open Holes in Metal Poles, Pedestals, and Mast Arms — Repair holes in metal poles, pedestals, and mast arms caused by removal of equipment using pipe plugs. For holes larger than 1 inch in diameter or of irregular shape, submit method and materials to be used.

(Use the following lead-in paragraph and subsection .47 when Railroad interconnect is required.)

Add the following subsection:

00990.47 Railroad Interconnect - Run the circuit conductors in underground electrical conduit of the size shown. Terminate the conduit at the Railroad cabinet at the location and in the manner directed by the Railroad company. Extend the ends of the wire at least 3 feet

beyond the end fitting of the supplied conduit. All other Work inside the Railroad cabinet is the responsibility of the Railroad.

Do not Work in the immediate vicinity of the Railroad cabinet without first notifying the Engineer and receiving permission. The Agency will obtain supervisory personnel from the Railroad company.

Do not place any Materials or Equipment in the vicinity of the tracks without observing proper clearance (see 00170.01(e)).

00990.50 Signal Covers - Add the following paragraph to the end of this subsection:

Signal covers may be omitted for flashing beacon bid items.

00990.70 Testing and Turn-On - Replace this subsection with the following subsection:

00990.70 Chamber Testing - This Work includes testing Equipment that requires chamber testing.

(a) **Delivery of Equipment** - Provide all Equipment requiring chamber testing for the Project according to the cabinet print(s), including all associated manuals, diagrams, and other documents. The cabinet print(s) ~~will be made~~are available ~~to the Contractor by~~from the Engineer. Deliver all Equipment, including wiring diagrams and operation manuals, in one shipment. Partial shipments will not be accepted and ~~will be~~returned to the Contractor at no additional cost to the Agency. Include the following information with the Equipment shipments:

- Contractor
- Location of Equipment on Project (i.e. street names of Intersection or street alignment/name plus station)
- For controller cabinets, TSSU ID number
- Contract number
- Completed Green Sheets

Deliver the Equipment and information for testing to:

Oregon Department of Transportation
Traffic Systems Services Unit
2445 Liberty St. NE
Salem, Oregon 97303-6738

(b) **Equipment Requiring Chamber Testing** - The following Equipment ~~will be~~is tested by the Agency before being installed:

- Controller unit
- Controller cabinet
- Power supplies
- Input devices

- Output devices
- Conflict monitors
- Flasher units
- Relays
- Preemption devices
- Auxiliary Equipment in the controller cabinet
- Other Equipment required for the operation of the installation
- Video/radar/hybrid detection systems
- Equipment listed as “chamber tested” on the green sheets

Equipment ~~will be~~is tested at no cost to the Contractor.

The Equipment ~~will be~~is tested in three categories: physical, functional, and environmental as specified in the *Standard Specification for Microcomputer Signal Controller*. ODOT will require at least 8 weeks for completion and evaluation of the testing.

(c) Equipment Failure - An Equipment failure is any occurrence that results in non-specified operation of the Equipment.

~~The Engineer will provide~~ Notification of any Equipment failures ~~will be provided~~. Make on-site repairs within 5 Days of receiving the notification.

Following repair of the Equipment, the testing ~~will be~~is resumed at the beginning of the test category ~~in which~~where the failure occurred.

(d) Equipment Rejection - The Equipment ~~will be~~is rejected under either of the following conditions:

(1) Twice Fail - The Equipment fails twice in the same testing category.

(2) Failure to Repair - The Contractor fails to repair the Equipment within 5 Days of receiving notification of the failure.

Pick up rejected Equipment within 10 Days of receiving the rejection notice, or it ~~will be~~is returned, at Contractor's cost, to the Contractor.

Replace rejected Equipment with Equipment having a different serial number.

Rejected Equipment will not be accepted for testing or installation on any subsequent project within the State of Oregon.

(e) Equipment Acceptance - Equipment that successfully passes the chamber testing procedure ~~will be~~is certified by the Agency as acceptable for installation. Acceptability for installation does not guarantee final acceptance of the completed installation.

The successful completion of the testing does not relieve the Contractor of the responsibility to furnish a complete working electrical installation at the time the Equipment is placed in operation.

The Contractor will be notified when the testing has been completed. Pick up the controller cabinet and video/radar/hybrid detection systems at the test facility.

(f) Controller Cabinet Control Equipment Installation - Be responsible for pick-up, delivery and installation of the controller cabinet and video/radar/hybrid detection systems.

The Agency ~~will be~~ is responsible for delivery and installation of the other control Equipment, such as controller units, input devices, switch packs, monitor units, miscellaneous plug-in devices and auxiliary devices not physically wired to the controller cabinet.

Equipment that the Agency ~~is to install~~ ~~s~~ ~~will be~~ is stored at the test facility until the electrical installation is ready to be turned on.

Add the following subsection:

00990.71 Field Testing - Field testing of electrical installations ~~will be~~ is performed by Agency electrical crews. Notify the Engineer one week in advance of the anticipated electrical installation completion date.

Field testing ~~will be~~ is performed within one week following the date of completion. The Engineer will notify the Contractor of the test results.

Information on Agency field testing procedures is available from the Engineer.

Add the following subsection:

00990.72 Turn-on - This Work includes turning on completed electrical installations.

(a) General - The Engineer ~~will~~ establish the date and time the electrical installation is to be turned on. The Agency will turn on the electrical installation within one week after completion of corrections identified during field testing.

Be present at the Project Site the date of the turn-on, for the duration of the turn-on process.

After electrical installations are turned on and operating as designed, the agency responsible for maintenance ~~will assume~~ s operation and maintenance of the electrical installation. Turn-on does not constitute final approval. The Contractor is still obligated to finish any incomplete portion of the electrical installation and correct problems with workmanship or replace material that does not meet Specifications. After turn-on, damage to the electrical installation caused by conditions beyond the Contractor's control ~~will be~~ is the responsibility of the maintaining agency.

(b) For Traffic Signals, Ramp Meters, and Automatic Traffic Recorders - The Agency ~~will be~~ is responsible for providing operating software and timing parameters for traffic signals, ramp meters and automatic traffic recorders. Do not turn on electrical installations without the Agency provided timing parameters.

(c) For Flashing Beacons and Other Electrical Installations - The Agency ~~will be~~ is responsible for providing the timing and setting parameters for the following flashing beacons and other electric installations as listed in the Green Sheets:

- 24/7 flashing beacon assembly, yellow + speed feedback
- Actuated flashing beacon assembly (all subcategories)
- Rectangular rapid flashing beacon (RRFB) assembly
- Unintegrated speed feedback assembly

Do not turn on electrical installations without the Agency provided parameters.

(Use the following subsection .80 when unintegrated speed feedback assemblies are required.)

00990.80 Measurement – Add the following paragraph to the end of this subsection:

Unintegrated speed feedback assemblies will be measured according to 00991.80.

~~*(Use the following subsection .90 when unintegrated speed feedback assemblies, installing conduit on or in a structure, or crosswalk closure supports are required.)*~~

00990.90 Payment - Replace the paragraph that begins "In items (a), (b), (c) ..." with the following paragraph:

In items (a), (b), (c), (e), and (f), the intersection location is inserted in the blank.

Replace the paragraph that begins "Payment will be payment ..." with the following paragraph:

Payment will be payment in full for furnishing and placing all Materials, and for providing all Equipment, labor, and Incidentals necessary to complete the Work as specified.

(Use the following paragraph and bullet when installing conduit on or in a structure)

In the paragraph that begins "No separate or additional payment will be...", add the following bullet to the bullet list:

- Conduit installed according to 00960.42(f)

(Use the following paragraph when crosswalk closure supports are required.)

Add the following paragraph to the end of this subsection:

Crosswalk closure supports will be paid for according to 00902.90.

(Use the following paragraph when unintegrated speed feedback assemblies are required.)

Add the following paragraph to the end of this subsection:

Unintegrated speed feedback assemblies will be paid for according to 00991.90.