

900's – Permanent Traffic Control and Illumination Systems

Section 00905 – Removal and Reinstallation of Existing Sign Installations

This work consists of removing existing signs, as specified, and reinstalling them at new locations, when specified.

Quality

No quality documentation is generally required; however, ensure that:

- The removed material, if reinstalled, will provide an installation at the new location that meets the specified requirements. If not, notify the Project Manager.
- The reinstalled installation is constructed as specified. If needed, the Contractor furnishes and uses new parts.
- Each reinstallation properly serves its specified purpose.

Although no quality documentation is required, record pertinent information in the [General Daily Progress Report \(form 734-3474\)](#).

Construction

Ensure that:

- The location of each removal and reinstallation is located and marked and both the Contractor and Inspector understand the markings.
- The removed item or material, if it will not be reinstalled, shall be disposed of onsite or removed from the project site, as specified.
- Items to be salvaged or reinstalled are handled, with appropriate temporary support, to prevent damage.
- Reinstallation is done immediately, unless specified differently.
- If new or different materials are required to accomplish a reinstallation, the Contractor furnishes and uses the specified materials.
- Protect any/all business logos and tourist-oriented directional signs not to be reinstalled as they may be wanted by the Oregon Travel Experience (OTE) for reuse elsewhere.

- The reinstallation, and the resulting installation, comply with specified requirements, and provide specified guidance to traffic.
- The Contractor smoothes and finishes affected areas.

Measurement

No measurement of quantities will be made for this work. Payment is on a lump sum basis unless specified otherwise. As work is performed, prepare and submit a source document, such as an [Installation Sheet \(form 734-2605\)](#), to justify payment.

If specific business logos and tourist-oriented directional signs are out of service for more than 5 calendar days, prepare and submit a source document, such as a [General Daily Progress Report \(form 734-3474\)](#), to justify assessing the liquidated damages specified.

If new parts are needed and are not specified as incidental under the contract, notify the Project Manager. As the materials are incorporated, prepare and submit a source document, such as an [Installation Sheet \(form 734-2605\)](#), to justify payment and possible supporting documentation for a contract change order.

Section 00910 – Wood Sign Posts

This work consists of furnishing and installing preservative treated wood sign posts.

Quality

Quality requirements are specified and in the [Non-Field Tested Materials Acceptance Guide](#).

Check that:

- The Contractor is aware of the quality requirements.

Ensure that:

- The Contractor provides quality documentation before the material is incorporated.

Review the delivered wood posts for checking and other damage and ensure that unacceptable posts are not incorporated. .

Gather and submit required quality documentation.

Construction

Ensure that:

- Locations for wood sign posts are located and marked and both the Contractor and Inspector understand the markings.
- Post lengths are verified on the Sign Data Sheet in the plans. Contractor has information to know exact lengths and sizes of required posts. See Post Length Forms available on the ODOT Construction website.
- Holes for the posts are excavated to the specified depth or deeper. Caution should be exercised in going too deep as the result may affect the sign clearances and result in the Contractor needing a longer post.
- Rock or other hard material is removed to allow the specified depth of installation.
- The post is of the specified dimension and is placed in the specified orientation.
- If cutting of posts is required, only the bottom is cut.
- If required, holes for breakaway are drilled as specified (correct size hole, elevation, and orientation).
- The sign, or other device to be mounted on the post, will be at the specified elevation and orientation after installation.
- The hole is backfilled and compacted full depth and the post is vertical, as specified.
- The finished installation exhibits specified line and grade and that the posts have firm foundations to prevent settlement and loss of structural capacity.
- The Contractor cleans up and disposes of unwanted material.
- The affected area is smoothed and finished.

Measurement

Measurement for wood sign posts is on a foot board measure basis, unless specified otherwise. Record the information, by installation location as the work is performed on an [Installation Sheet \(form 734-2605\)](#) as a source document, calculate the quantity, and submit to justify payment.

Section 00920 – Sign Support Footings

This work consists of constructing major and minor sign support footings.

Quality

Quality requirements are specified, in the [Non-Field Tested Materials Acceptance Guide](#), and in the [Manual of Field Test Procedures](#) – Field Tested Materials Guide.

Check that:

- The Contractor is aware of quality requirements, arranges for specified inspection of manufactured material, performs required testing, and furnishes quality documentation before the material is incorporated.
- Manufactured materials are inspected, generally, by representatives of the ODOT Structure Services Engineer, sometimes at the manufacturer facility, and required documentation is furnished. Inspected signs should arrive onsite with an Inspection Sticker on the back.

Gather and submit required quality documentation.

Construction

Ensure that:

- Installations are accurately located and marked and both the Contractor and Inspector understand the markings.
- The installation, as located, will allow the sign(s) to be installed at the specified elevation and orientation.
- Utilities have located and marked their buried facilities. If conflicts exist with planned work, work with the Project Manager to resolve the conflicts.
- Excavation is performed to allow concrete to be placed against undisturbed material or to allow compaction of backfill materials, as specified.
- Forming, if performed, will result in specified dimensions of the installation.
- Reinforcement, conduit, ground rod, anchor bolts, and other devices are placed and secured against movement during concrete placement, as specified.
- Damage to coatings is repaired.
- Concrete is furnished, tested if required, placed, finished, cured, and protected against damage, as specified.

- Forms are removed and the resulting surface is finished as specified.
- Backfill materials meet specified requirements, are compacted to full depth, and are tested for density as specified.
- The Contractor cleans up and disposes of unwanted material.
- The affected area is smoothed, compacted if required, and finished.

Measurement

No measurement of quantities will be made for this work. Payment is on a lump sum basis unless specified otherwise.

As work is performed, prepare and submit a source document, such as an [Installation Sheet \(form 734-2605\)](#), to justify payment.

Section 00930 – Metal Sign Supports

This work consists of fabricating, galvanizing, furnishing and installing metal sign supports.

Quality

Quality requirements are specified, in the [Qualified Products List](#), and in the [Non-Field Tested Materials Acceptance Guide](#).

Check that:

- The Contractor is aware of quality requirements, arranges for inspection of manufactured material, and furnishes quality documentation before the material is incorporated.
- Manufactured materials are inspected, generally, by representatives of the ODOT Structure Services Engineer, sometimes at the manufacturer facility, and required documentation is furnished.

Gather and submit required quality documentation.

Construction

As needed, assist the Project Manager in reviewing working drawings for the sign supports. If the Contractor is performing the construction survey work for the project, the

Contractor's surveyor or others must field verify the elevations needed to calculate dimensions of each sign support.

Also, ensure that:

- Installations are accurately located and marked.
- The specified identifying tags are present.
- The sign support, with its support footing, will allow the sign(s) to be installed at the specified elevation and orientation. If the sign support is of the improper length or the footing is of improper elevation or orientation, notify the Project Manager.
- The sign supports are oriented so that no twist or warp will be imparted to the sign panels.
- All required parts of the connection to the footing support, as well as other portions of the installation, are furnished and installed.
- All connectors, bolts, and other parts of the installation are of the specified size and quality, and have the specified coating.
- Bolts have been tested as specified.
- Bolts have been tightened as specified.
- Any damage to coatings is repaired.
- As specified, the installation is painted or otherwise coated.
- The Contractor cleans up and disposes of unwanted material.

Measurement

No measurement of quantities will be made for this work. Payment is on a lump sum basis unless specified otherwise.

As work is performed, prepare and submit a source document, such as [an Installation Sheet \(form 734-2605\)](#), to justify payment.

Section 00940 – Signs

This work consists of furnishing, fabricating and erecting traffic signs.

Quality

Quality requirements are specified, in the [Qualified Products List](#) and in the [Non-Field Tested Materials Acceptance Guide](#).

Check that:

- The Contractor is aware of quality documentation requirements, arranges for inspection at the manufacturer facility, and furnishes required quality documentation before the material is incorporated.
- Manufactured materials are inspected, generally, by representatives of the ODOT Structure Services Engineer, sometimes at the manufacturer facility, and required documentation is furnished.

Ensure that:

- The signs, as delivered, have the specified construction, the legend is as specified, and are not damaged.

Gather and submit required quality documentation.

Construction

Ensure that:

- The location for each sign is accurately marked.
- The Contractor will have all signs installed before making any change in traffic control.
- Delivered signs are of specified construction and legend, and are not damaged.
- Signs are installed, as specified, on the proper support or post, including the specified number and type of fasteners.
- If installed and not per specification, signs are covered (with covers from the [Qualified Products List](#)) until ready for service.
- Signs are installed at the specified elevation with the specified angle and orientation to the roadway.
- Damaged signs are replaced or the damage is repaired.
- Mounting devices, including all specified components, are furnished and installed or constructed, as specified.
- The Contractor cleans up and disposes of unwanted material.

Measurement

Measurement for signs will be by area, unless specified otherwise. As work is performed sketch and calculate the area of signs installed daily and submit that calculation with an [Installation Sheet \(form 734-2605\)](#) as a source document to justify payment.

On that source document, list for each installation by pay item:

- Location of installation
- Type, legend, or other identification of sign, including pay item identification
- Dimensions of sign
- Calculated area of sign

Section 00960 – Common Provisions for Electrical Systems

This work consists of furnishing and installing materials for electrical systems and for modifying existing systems.

Inspection of Electrical System construction requires the Inspector to be a Certified Traffic Signal Inspector.

Certified Traffic Signal Inspectors will be issued an *Inspector's Manual for Signal Construction* during training that should be used and consulted throughout construction. Use the most current version (this manual is updated on a yearly basis in January). It can be downloaded or purchased at the following website:

http://www.oregon.gov/ODOT/HWY/CONSTRUCTION/pages/traffic_signal_manual.aspx

Work with the Project Manager to consult with the Region electrical crew, Traffic Signal Services Unit, or Region Traffic representative for assistance or guidance regarding this work.

Ensure that:

- The Contractor furnishes quality documentation before the material is incorporated.

Gather and submit required quality documentation for each associated pay item.

Construction

As needed, assist the Project Manager in reviewing shop drawings for the luminaire or signal poles. If the Contractor is performing the construction survey work for the project, the Contractor's surveyor or others must field verify the elevations needed to calculate dimensions of each pole.

Check that:

- The Region electrical crew or Region Traffic representative has been consulted for guidance, advice, or assistance in inspection or testing of the installation.
- The Contractor has furnished, and ODOT has reviewed and agreed to, equipment lists, drawings, and other information needed to perform the required work.
- The Contractor has provided a copy of the license or apprentice registration for each licensed electrician or registered apprentice to the Project Manager.
- The Contractor uses only correctly licensed electricians or registered apprentices to perform electrical work. Verification can be made by checking workers' electrical cards.
- For electrical services:
 - The Project Manager contacts the utility to arrange for the electrical hookup.

Ensure that:

- The Contractor accurately marks the locations for elements of the work, and both the Contractor and Inspector understand the markings.
- Utilities have located their facilities in areas of underground work
- As the Contractor performs the work, it must record, on the project plans or other document, all changes to the plans. When work is complete, the Contractor must submit the specified number of copies of those plans or documents, depicting the changes, to the Project Manager.
- For coatings, coatings have been applied and any damage is repaired.
- The Contractor cleans up and disposes of unwanted material.
- The affected areas are smoothed, finished, and restored.

Measurement

No measurement is required for this section. Work is measured and paid under other pay items.

Section 00962 – Metal Illumination and Traffic Signal Supports

This work consists of furnishing, fabricating, galvanizing and installing materials for illumination and traffic signal supports and foundations. The locations of illumination/signal material shown are approximate, with exact locations established in the field.

Inspection of Illumination/Signal Support construction requires the Inspector to be a Certified Traffic Signal Inspector.

Quality

Quality requirements are specified, in the [Qualified Products List](#), and in the [Non-Field Tested Materials Acceptance Guide](#). Quality requirements for field tested items are specified in the [Manual of Field Test Procedures](#) – Field Tested Materials Guide.

Check that:

- The Contractor is aware of quality requirements, arranges for inspection of manufactured material, and furnishes quality documentation before the material is incorporated.
- Manufactured materials are inspected, generally, by representatives of the ODOT Structure Services Engineer, sometimes at the manufacturer facility, and required documentation is furnished.

Gather and submit required quality documentation.

Construction

As needed, assist the Project Manager in reviewing working drawings for the sign supports. If the Contractor is performing the construction survey work for the project, the Contractor's surveyor or others must field verify the elevations needed to calculate dimensions of each sign support.

For the support foundation ensure that:

- Installations are accurately located and marked and both the Contractor and Inspector understand the markings.
- The installation, as located, will allow the support(s) to be installed at the specified elevation and orientation.

- Utilities have located and marked their buried facilities. If conflicts exist with planned work, work with the Project Manager to resolve the conflicts.
- Excavation is performed to allow concrete to be placed against undisturbed material or to allow compaction of backfill materials, as specified.
- Forming, if performed, will result in specified dimensions of the installation.
- Reinforcement, conduit, ground rod, anchor rods, and other devices are placed and secured against movement during concrete placement, as specified.
- Anchor rods are not adjusted after the concrete has set.
- Damage to coatings is repaired.
- Concrete is furnished, tested if specified, placed, finished, cured, and protected against damage, as specified.
- Forms are removed and the resulting surface is finished as specified.
- Backfill materials meet specified requirements, are compacted to full depth, and are tested for density as specified.
- The affected area is smoothed, compacted if required, and finished.

Also, ensure that:

- As needed, installations are accurately located and marked.
- The specified identifying tags are present.
- The support, with its support footing, will allow the support(s) to be installed at the specified elevation and orientation. If the support is of the incorrect length or the footing is of incorrect elevation or orientation, notify the Project Manager.
- The supports do not deviate from the specified straightness.
- All required parts of the connection to the footing support, as well as other portions of the installation, are furnished and installed.
- All connectors, bolts, and other parts of the installation are of the specified size and quality, and have the specified coating.
- Verify that the mast arm flanges are not warped to a point where the flanges cannot be bolted together or do not make a complete full contacted surface.
- Bolts have been tightened and tested as specified.
- As the Contractor performs the work, it must record, on the project plans or other document, all changes to the plans. When work is complete, it must submit the specified number of copies of those plans or documents, depicting the changes, to the Project Manager.
- Any damage to coatings is repaired.
- As specified, the installation is painted or otherwise coated.
- The Contractor cleans up and disposes of unwanted material.

Measurement

No measurement is required for this section. Work is measured and paid under other pay items.

Section 00963 – Signal Support Drilled Shafts

This work consists of excavating and constructing drilled, cast-in-place, reinforced concrete shafts for signal supports.

Quality

Quality requirements are specified, in the [Non-Field Tested Materials Acceptance Guide](#), and in the [Manual of Field Test Procedures](#) – Field Tested Materials Guide.

Check that:

- The Contractor is aware of quality requirements, arranges for specified inspection of manufactured material, performs required testing, and furnishes quality documentation before the material is incorporated.
- Manufactured materials are inspected, generally, by representatives of the ODOT Structure Services Engineer, sometimes at the manufacturer facility, and required documentation is furnished.

Gather and submit required quality documentation.

Record the pertinent information in the [Drilled Shaft Concrete Placement Log \(form 734-2597\)](#), [Drilled Shaft Concrete Volumes \(form 734-2603\)](#), [Drilled Shaft Excavation Log \(form 734-2604\)](#), and [Drilled Shaft Inspection Report \(form 734-2598\)](#).

Construction

Check that:

- The drilled shaft installation and repair plans have been submitted as specified.
- Prior to starting drilling work, appropriate Contractor and ODOT personnel meet for the required drilled shaft coordination meeting.

Ensure that:

- Installations are accurately located and marked and both the Contractor and Inspector understand the markings.
- The installation, as located, will allow the signal(s) to be installed at the specified elevation and orientation.
- Utilities have located and marked their buried facilities. If conflicts exist with planned work, work with the Project Manager to resolve the conflicts.
- The Contractor's drilled shaft installation plan has been reviewed prior to commencement.
- Excavation of the shaft is performed to the specified dimensions, elevations, and tolerances.
- Reinforcement, conduit, ground rod, anchor bolts, and other devices are placed and secured against movement during concrete placement, as specified.
- Damage to coatings is repaired.
- Concrete is furnished, tested if specified, placed, finished, cured, and protected against damage, as specified.
- The first drilled shaft foundation has been approved by the Project Manager before proceeding with additional shafts.
- The Contractor cleans up and disposes of unwanted material.
- The affected area is smoothed, compacted if required, and finished.

Measurement

Unless specified otherwise, measurement is by length. Measure and record the length of drilled shaft, as specified. As work is performed, sketch and total the length of each drilled shaft foundation completed and submit that calculation with an [Installation Sheet \(form 734-2605\)](#) as a source document to justify payment.

Section 00970 – Highway Illumination

This work, in conjunction with Section 00960 and Section 00962, involves installation of highway illumination.

Inspection of Highway Illumination construction requires the Inspector to be a Certified Traffic Signal Inspector.

Quality

Refer to the discussion and requirements of Section 00960 and Section 00962.

Also, check that the Contractor furnishes the required information regarding the luminaire(s) that it intends to install.

Gather and submit required quality documentation.

Construction

In addition to the requirements of Section 00960 and 00962, ensure that:

- Poles conform to approved shop drawings and contract requirements and welding is acceptable.
- Other components conform to the contract requirements and submittals approved by ODOT.
- The Contractor verifies the illumination pole height with the submitted shop drawings.
- Cable and wire are of the specified types and are installed as specified.
- The inspector should check that the Contractor installs all electrical systems with the “electrical safety requirement” in ODOT Specifications and according to the National Electric Code (NEC) for correct insulation, wire connections, grounding, etc.
- The Contractor does not de-activate existing or temporary systems until the new system is operating, unless specifically allowed.
- Each luminaire is marked with the date of installation, as specified.
- The Contractor performs specified testing, in the presence of the Project Manager or Inspector, prior to the field test of the illumination system.
- The Contractor successfully operates the system through the specified field test and performs all required replacement, modification, and maintenance.
- The Contractor cleans up and restores the affected areas and disposes of unwanted material.

Measurement

No measurement of quantities will be made for this work. Payment is on a lump sum basis unless specified otherwise.

As work is performed, prepare and submit a source document, such as an [Installation Sheet \(form 734-2605\)](#), to justify payment.

Section 00990 – Traffic Signals

This work, in conjunction with Section 00960, involves installation of traffic signals.

Inspection of Traffic Signal construction requires the inspector to be a Certified Traffic Signal Inspector.

Certified Traffic Signal Inspectors will be issued an *Inspector's Manual for Signal Construction* during training that should be used and consulted throughout construction. Use the most current version (This manual is updated on a yearly basis in January). It can be downloaded or purchased at the following website:
http://www.oregon.gov/ODOT/HWY/CONSTRUCTION/traffic_signal_manual.shtml

Work with the Project Manager to consult with the Region electrical crew, Traffic Signal Services Unit, or Region Traffic representative for assistance or guidance regarding this work.

Check that the Region electrical crew or Region Traffic representative has been consulted for assistance or guidance regarding this work.

Gather and submit required quality documentation.

Construction

Check that:

- The Contractor performs specified testing, in the presence of the Project Manager or Inspector, prior to the field test of the signal.
- The Contractor provides all manufacturer warranties or guaranties.
- The Contractor cleans up and restores the affected areas, including disposing of unwanted material.

Measurement

No measurement of quantities will be made for this work. Payment is on a lump sum basis unless specified otherwise.

As work is performed, prepare and submit a source document, such as an [Installation Sheet \(form 734-2605\)](#), to justify payment.