

SECTION 00984 - FIBERGLASS POLES FOR ITS

(Follow all instructions and make all edits with “Track Changes” turned on. This Section is not published in the Oregon Standard. If there are no instructions [purple text] above a subsection, paragraph, sentence, or bullet, then include it in the Project, unless the item(s) that are included in the subsection, paragraph, sentence, or bullet are not required on the Project and then they should be deleted. In general do not re-number or re-letter subsections when item(s) are deleted. Delete all purple text before preparing the final document.)

The Work covered under this Section is diverse and this boilerplate may not include Specifications for all the Work or ITS elements on the Project. Modify as necessary by adding, deleting, or revising language for the specific Project requirements. Modifications to this Section, other than deleting language not required, will require ODOT Technical Resource and State Specifications Engineer approval.)

Section 00984, ~~which~~ is not a Standard Specification ~~and~~, is included in this Project by Special Provision.

Description

00984.00 Scope - This Work consists of furnishing and installing fiberglass poles.

00984.01 Submittals - Submit stamped Working Drawings according to 00150.35. The stamped Working Drawings show the design standards and criteria, calculated wind loads and pressure, material description, dimensioning, member size and connection details. Material ordered or Work performed before the Engineer finishes and returns the documents ~~shall be~~ is at the Contractor's risk.

00984.02 Regulations, Standards, and Codes - Comply with the following standards where applicable:

- American Association of State Highway and Transportation Officials (AASHTO)
 - Standard Specification for Structural Support for Highway Signs, Luminaires and Traffic Signals 5th Edition with all interim revisions.
- American Society for Testing and Materials (ASTM)
 - D635 Standard Test Method for Rate of Burning or Extent and Time of Burning of Plastics in a Horizontal Position

00984.03 Design and Performance - Design the poles according to AASHTO and the following design factors:

Basic wind speed (3 second gust)	110 mph
Extreme I Wind Loading, Basic Wind Speed (3 second gust)	130 mph (1700-yr MRI)

Service I Wind Loading, Basic Wind Speed (3 Second gust)	82 mph (10-yr MRI)
Gust factor (G)	1.14
Importance factor (If)	1.0 (50-year occurrence)
Fatigue category	II
Safety factor	2.0

(a) Performance Calculations - Design the pole to support the specified devices and all associated accessories to be mounted on the pole as shown. Include all portions of the effective projected area (EPA) of the complete system, sensors, and Equipment to be mounted on the pole along with the weight when designing the pole to meet the specified deflection performance criteria. Pole top deflection cannot exceed 1/2 inch in a 30 mph (non-gust) wind. Design calculations include pole and ground anchorage embedment requirements in addition to meeting design demand at any other critical pole sections (e.g. base, handholes). At each of these locations, provide the following information:

- The pole's diameter, thickness, section modulus, moment of inertia, and cross sectional area.
- The axial force, shear force, primary moment, total moment, axial stress, bending stress, allowable axial stress, allowable bending stress, and combined stress ratio (CSR) at the maximum location.
- The pole's angular and linear deflection under service level wind loading.

00984.04 Additional Testing - Perform the following tests on the poles per AASHTO *Standard Specification for Structural Support for Highway Signs, Luminaires and Traffic Signals 5th Edition* with all interim revisions section 8.7.2:

- Weathering resistance according to ASTM G53
- Adhesion of coatings
- Color Change from UV Exposure

Materials

00984.10 Fiberglass Pole - Furnish fiberglass poles with one-piece construction (or breakaway as required) and include the pole shaft, handholes, top tenon assembly (if applicable), ground anchorage, and conduit penetrations. Furnish pole shaft with a round cross section having a constant linear taper of 0.14 inch per foot. Do not erect poles until the Engineer has made a visual inspection of poles.

Height and location of the poles are as shown. Furnish poles constructed of continuous fiberglass filament combined with thermosetting epoxy resin. Furnish direct burial style poles constructed of UV resistant materials. Furnish flame resistant poles according to ASTM D635.

00984.11 Coating - Color the pole SAE AMS-STD-595C color number 10059. [Provide](#) [Furnish](#) coating materials for field application, repairing damaged coatings, and coating hardware after installation.

Construction

00984.41 Excavation - Complete all excavation, backfilling and resurfacing work necessary to complete the Work, including removal and replacement of curbs, sidewalks, paved surfaces and other materials. On completion of the Work, replace and finish all surfaces to correspond with the existing surfaces.

~~Furnish~~Provide, place, and remove any shoring required to prevent caving of walls.

When excavating in paved areas, cut with an approved pavement cutting saw to a depth of at least 2 inches along the Neat Lines of the area to be removed. Cut sharp and well defined pavement edges with no evidence of cracking, delaminating, or stressing.

Restore all disturbed landscaping and underground systems to original condition at no additional cost to the Agency. Use hand excavation as needed and if directed.

(a) Excavation for Pole Foundations - Make all excavations for pole foundations to the Neat Lines of the foundations. Hand excavation may be required. Place the backfill material directly against the sides of the excavation in undisturbed or well-compacted material.

(b) Disposal of Waste Materials - Dispose of all waste materials according to 00290.20, or as directed.

00984.42 Foundations - Backfill excavated pole foundation holes with Selected Granular Backfill according to 00330.14. Excavate pole foundation holes to the lines and grades established and to the depth shown.

Where obstructions prevent the construction of planned foundations, construct the foundations in the location directed. Any extra cost due to the site change will be paid according to 00195.20.

If it is determined that foundations will extend deeper than shown, the extra foundation depth will be paid according to 00195.20.

00984.43 Fiberglass Poles -

(a) Deviation from Straightness - Any pole not meeting these requirements is rejected. After the poles are delivered to the Project Site, and before they are erected on the foundations, check all poles for deviation from straightness according to the following:

(1) Deviation in One Plane and One Direction Only - Verify that ~~A~~a straight line joining the surface of the pole at the base and the same surface of the pole at the top ~~shall is~~ not be more than 1/2 inch from the surface of the pole for each 10 feet of length from the closest of these points. Meet the same requirement for the opposite surface.

(2) Deviation in Any Plane - Ensure that a straight line connecting the midpoint of the pole at the base with the midpoint at the top does not pass through the surface of the pole at any intermediate point.

~~Any pole not meeting these requirements will be rejected.~~

(b) Identifying Tags - ~~Provide~~ Furnish a permanent identification tag and locate the pole tag approximately 2 feet above ground level.

Provide the following information for each pole identification tag:

- Manufacturer and Model
- Month and year of manufacture

(c) Handholes - ~~Provide~~ Furnish a handhole reinforced as necessary to meet the design demand with inside dimensions of 2.5 inches wide and 5 inches tall with a handhole for wiring access located near the base of the pole above grade, and a second handhole and a 1.5-inch threaded hub one foot down from the top of the pole or as shown. ~~Provide~~ Furnish a handhole cover attached with socket head screws.

(d) Tenons - Permanently bond tenons (as applicable) to the fiberglass shaft and hot-dip galvanize steel according to ASTM A153.

(e) Erecting Fiberglass Poles - Erect fiberglass poles according to the recommendations of the pole manufacturer and as shown. Exercise reasonable care to prevent marking the finish and damaging poles.

Repair damage according to the manufacturer and at no additional cost to the Agency.

Measurement

00984.80 Measurement - No measurement of quantities will be made for Work performed under this Section.

Payment

00984.90 Payment - The accepted quantities of Work performed under this Section will be paid for at the Contract lump sum amount for the item "Fiberglass Poles, Complete".

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