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1.0 Scope

This specification covers the requirements for the installation of all poles used for the mounting of sign, traffic signal and control equipment, low voltage aerial cables and extra low voltage aerial cables.

2.0 References

This specification refers to the following standards, specifications or publications:

Toronto Transportation:

TS 1.00	Maintenance of Traffic
TS 13.10	Unshrinkable Fill
TS 801	Electrical Work
TS 803	Ducts
TS 807	Footings and Bays
TS 813	Grounding
TS 815	Removals

Ontario Provincial Standards

TS 1010	Aggregates - Granular A,B,M
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CSA Standards

CSA C83-96 (R2000) - Communication and Power Line Hardware.
CAN/CSA G12-92 (R2003) - Zinc Coated Steel Wire Strand.

3.0 Construction

3.1 General

3.1.1 Pole Orientation

Steel poles shall be installed with the handhole parallel to or perpendicular to the centreline of the roadway as specified and such that the mast arm bracket wiring aperture is at right angles to the centreline of the road being served.

3.1.2 Pole Handling

Poles shall be handled using suitable nonabrasive slings at the pole pick up points specified by the pole manufacturer.

3.1.3 Removals and Restoration Work

Removals and restoration work required shall conform to TS 815.

3.2 Direct Buried Poles

3.2.1 Installation in Earth

Wood poles shall conform to TTD 805.005.

Pole line hardware shall conform to CSA C83-96 (R2000).

Excavation shall be done by vacuum excavation, augering or other suitable means to obtain a hole large enough to accommodate wood pole and backfill. Backfill shall be native material placed and compacted in conformance to TS 1010.

3.2.2 Pole Alignment

Direct buried poles shall be held in plumb alignment by use of a suitable temporary support assembly during backfill operations.

3.3 Base Mounted Poles

3.3.1 Preparation

Steel poles for base mounting shall conform to TTS 805.200.

Anchor templates shall be removed prior to installation of poles.

All bolts and nuts shall be cleaned and coated with white lithium based grease.

Anchorage nuts shall be cleaned and coated with white lithium based grease.

3.3.2 Pole Erection

Poles shall be secured to the anchor assembly by setting all nuts to an initial torque of 75Nm. Poles shall then be set in plumb alignment by adjustments of combinations of pole shims and holding nuts. Final tightening of nuts shall be one-half turn past the initial setting or to a minimum torque of 150Nm.

3.4 Apertures

Drilled apertures shall be accurately aligned to suit pole attachments or equipment. Apertures in metal poles shall be deburred. Apertures in galvanized steel poles shall be coated with grey zinc rich paint and allowed to dry.

Wiring apertures in metal poles shall be provided with rubber grommets. Unused pole apertures shall be plugged with rubber neoprene or plastic plugs.

3.5 Guy Anchors

Steel guy cable shall conform to CAN/CSA G12-92 (R2003).

Guy anchors shall be of the helical power driven or direct buried expansible types with a minimum diameter of 250mm and a minimum anchor rod ultimate strength of 50kN and a length of 1800mm.

Guy anchors shall be an anchorage plate, galvanized steel rod, cable thimble, guy cables, preformed guy grips, strain relief insulators, three bolt clamps, guy guards, sidewalk strut, pole attachment hardware and fittings, and shall be installed to the full depth specified. Anchorage plates shall be installed at the specified guy lead distance, adjusted to remain clear of any existing guy anchors or by 600mm minimum distance. Native backfill shall be placed and compacted in conformance to TS 1010.

Guy anchors shall be installed with single or double guy cable sets as specified.

All guy cables shall be installed to a snug condition prior to aerial cable stringing and shall be readjusted upon completion to maintain pole in a plumb position. Guy cables shall be tightened to maintain pole alignment and aerial cable clearances.

3.6 Guy Spans

Guy spans consisting of guy cables, preformed guy grips, strain relief insulators, three bolt clamps and pole attachment hardware and fittings shall be installed at the clearance height specified in the contract.

One end of the guy span shall be connected with a three bolt clamp to allow for future cable tightening. Guy spans shall be tightened to maintain pole alignment and aerial cable clearances.

4.0 Measurement of Payment

4.1 Individual Item Method

4.1.1 Actual Measurement

Where the contract includes tender items, measurement will be made of each pole, guy anchor and guy span.

5.0 Basis of Payment

5.1 All Inclusive Price Method

5.1.1 Poles - Item

Payment at the contract price for the above tender item shall be full compensation for all labour, equipment and materials required for the installation of all types and sizes of poles including all assembly, preparation, earth excavation, back-filling and compaction, concrete work and the installation of all frangible bases, sealant, guy anchors, guy spans, rock anchors, rock mounts, steel dowel bars and pole modification

work. Such payment shall include compensation for the removal of pavement, sidewalk and curb and gutter and restoration work where such work is not included in other tender items.

5.2 Individual Item Method

5.2.1 Wood Poles, Direct Buried in Earth - Item

Payment at the contract price for the above tender item(s) shall be full compensation for all labour, equipment and materials required for the installation of each type of pole specified including assembly, all earth excavation, back-filling and compaction, concrete work and pole modification work. Such payment shall include compensation for the removal of pavement, sidewalk and curb and gutter and restoration work where such work is not included in other tender items.

5.2.2 Steel Poles, Base Mounted - Item

Payment at the contract price for the above tender item(s) shall be full compensation for all labour equipment and materials required for the installation of each type of pole specified including assembly, sealant and pole modification work.

5.2.3 Guy Anchors - Item

Payment at the contract price for the above tender item shall be full compensation for all labour, equipment and materials required to install all types and sizes of guy anchors including single or double guy cable sets, sidewalk struts, pole attachment hardware and fittings, earth excavation, backfill and compaction and tightening of guy cables as necessary.

5.2.4 Guy Spans - Item

Payment at the contract price for the above tender item shall be full compensation for all labour, equipment and materials required to install all types and sizes of guy spans, regardless of length, and including all pole attachment hardware and fittings and tightening of guy cables as necessary.