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1.0 Scope

This specification covers the requirements for the installation, adjustment and rebuilding of handwells.

The requirements of TS 1.00 and TS 801 shall apply to this work.

2.0 References

Toronto Transportation:

- TS 1.00 Maintenance of Traffic
- TS 2.10 General Excavation
- TS 5.00 Sodding
- TS 5.10 Topsoil
- TS 13.00 Non-Structural Concrete
- TS 13.10 Unshrinkable Fill
- TS 801 Electrical Work
- TS 803 Ducts
- TS 813 Grounding
- TS 815 Removals

American Standard for Testing and Materials:

ASTM A48/A48M-03 Standard Specification for Gray Iron Castings

Ontario Provincial Standards

OPSD 2112.02 Designated Sources List

- TS 904 Concrete Structures
- TS 904 Concrete Structures -Table 1
- TS 905 Steel Reinforcement for Concrete
- TS 919 Formwork and Falsework
- TS 1010 Aggregates - Granular A,B,M

3.0 Construction & Materials

3.1 Handwells

The work for handwells, regardless of type or sizes, shall include installation, frames and covers, duct entry, backfill, removals, and earth excavation.

3.1.1 Earth Excavation

Where handwells are to be installed in asphalt boulevards, the dry cutting of the asphalt shall include all applicable measures and procedures as per the City of Toronto Measures and Procedures for Roadwork with Asphalt Containing Asbestos Fibres.

Earth shall be excavated to accommodate at least 300mm of unshrinkable backfill around the outer walls of the unit.

3.1.2 Installation

Concrete shall conform to TS 13.00. Concrete shall be 30 MPa class.

The mortar shall consist of one part Portland cement and three parts of mortar sand conforming to TS 13.00 and shall be wetted with sufficient water to make the mixture plastic. Air entrainment shall be 12%.

Handwells shall be oriented such that ducts or duct bank entries will have an angle of 90 degrees between handwell wall and the axis of the ducts. If this is not possible, the angle shall not be less than 60 degrees.

All sharp projection and edges of concrete shall be ground smooth prior to installation of sleeves and wiring.

All liquid and debris shall be cleaned from the units upon completion and prior to the acceptance of work by the Contractor Administrator.

Where it is required to construct a handwell on existing runs of rigid duct, direct buried, the ducts shall be cut back and removed to suit the handwell dimensions.

Formwork on cast-in-place handwells shall be secured to form a concrete envelope of uniform wall thickness and shall be set plumb and firmly bedded on the drainage pocket backfill. The cast iron frame and all sleeves shall be installed in the formwork prior to pouring concrete. Concrete shall be poured, cured, protected and finished conforming to TS 13.00. The outside formwork shall be removed to at least 200mm below finished grade. The interior formwork shall be completely removed after the concrete sets.

Precast handwells shall be installed on a level surface, back-filled with unshrinkable fill to maintain the specified unit plumb and true to the required alignment and grades. Any adjustment of the unit for plumb, alignment or grade shall be carried out by lifting the unit free of the excavation, adjusting the bottom surface and replacing the unit to proper alignment and grade. During installation all duct openings shall be fitted to the required orientation.

In areas where the handwell is installed in concrete sidewalk or boulevard, the lid frame shall be floated into the concrete surface in accordance with the standard drawings.

3.1.3 Duct Entry

Duct entry holes shall be provided in the walls of handwells in the orientation and number indicated in the contract.

All unused duct entry holes shall be firmly plugged from the inside and outside with plastic plugs.

Where direct buried rigid ducts are installed in handwell, they shall be completely surrounded with concrete or grouted in place with mortar mix to the full thickness of the handwell wall.

3.1.4 Grounding and Bonding

Grounding and Bonding materials shall conform to TS 813.

Where a ground plate or ground rod is required at a handwell, the system ground wire shall exit and re-enter the handwell to enable ground rod connection as indicated in the contract.

3.1.5 Fittings

Fittings shall be suitable for and compatible with the class and type of pipe with which they will be used. All covers shall be provided with an identification "TRAFFIC" logo as indicated on the Toronto Transportation Standard Drawings.

Plugs where used shall be polyethylene.

3.1.6 Handwell Frames and Covers

Cast ferrous alloy frames and covers shall conform to ASTM A48/A48M-03, and the contract.

Cast iron frames for handwell covers shall be adjusted to the required elevation and crossfall. Mortar mix shall be used to smooth out any edges protruding above the concrete envelope.

Cast iron covers for handwells shall be secured as indicated in the contract.

3.1.7 Backfill

Granular material for bedding and backfill shall conform to TS 1010.

Backfill around the walls of units shall conform to TS 13.10.

3.2 Adjusting and Rebuilding Handwells

The work for adjusting and rebuilding handwells, regardless of type, size and depth or method of installation, shall include adjusting and rebuilding and the work described in subsection for frames and covers, duct entry, grounding, earth excavation and backfill.

4.0 Quality Assurance

The Engineer may perform all tests required for concrete conforming to TS 13.00. The Engineer may perform all tests required for compaction conforming to TS 1010.

Concrete will be tested in conformance to TS 13.00 or TS 904. Tests required for compaction will conform to TS 1010.

5.0 Measurement for Payment

5.1 Actual Measurement

5.1.1 Handwells

The unit of measurement is each.

5.1.2 Adjusting and Rebuilding Handwells

The unit of measurement is each.

5.2 Plan Quantity Measurement

5.2.1 Handwells

Measurement is by Plan Quantity as may be revised by Adjusted Plan Quantity. The unit of measurement is each.