
PART 1 - GENERAL

1.1 SCHEDULING OF WORK

- .1 Schedule Work to minimize interruptions to existing services.
- .2 Submit schedule of expected interruptions to Departmental Representative for approval and adhere to interruption schedule.
- .3 Notify Departmental Representative and building superintendent minimum of 24 h in advance of interruption in service.
- .4 Do not interrupt water service for more than 4 hours unless otherwise authorized.
- .5 Notify fire department of any planned or accidental interruption of water supply to hydrants.

1.2 REFERENCES

- .1 CSA International
 - .1 CAN/CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Test and Standard Practices for Concrete.
 - .2 CSA A3000-08, Cementitious Materials Compendium.
- .2 City of Ottawa Concrete Thrust Blocks Details W25.3 W25.4.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Cast-in-place concrete:
 - .1 In accordance with CAN/CSA-A23.1-04.
 - .2 Cement: to CAN/CSA-A3001, Type GU.
 - .3 Concrete mix design to produce 21 MPa minimum compressive strength at 28 days and containing 25 mm maximum size coarse aggregate, with water/cement ratio to CAN/CSA-A23.1, C2 exposure.
 - .1 Air entrainment to CAN/CSA-A23.1, class C2 exposure.

2.2 PIPE FITTINGS

- .1 Watermain Cap: purpose-made mechanical joint cap.

2.3 UNSHRIINKABLE FILL

- .1 Unshrinkable fill: proportioned and mixed to provide:
 - .1 Maximum compressive strength of 0.4 MPa at 28 days.
 - .2 Maximum Portland cement content of 25 kg/m³.
 - .3 Minimum strength of 0.07 MPa at 24 h.
 - .4 Concrete aggregates: to CAN/CSA-A23.1.
 - .5 Portland cement: Type 10.
 - .6 Slump: 160 to 200 mm.

PART 3 - EXECUTION

3.1 REMOVALS

- .1 Remove and discard watermains, hydrants, valves and associated appurtenances as indicated, including non-native granular backfill.

3.2 PIPE ABANDONMENT

- .1 Abandon existing watermains as indicated.
 - .1 Expose and cut pipe ends.
 - .2 Drain pipe.
 - .3 Fill pipe with unshrinkable fill.

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- 3.3 CAPPING
- .1 Cap existing watermain as indicated and as per manufacturer's instructions.
 - .2 Do hydrostatic and leakage test and have results approved by Departmental Representative before covering fitting.
- 3.4 CONCRETE WORK
- .1 Provide concrete thrust blocks in accordance with City of Ottawa detail W25.3 and W25.4.
 - .2 Do not backfill over concrete within 24 hours after placing.
- 3.5 STOCKPILING
- .1 Stockpile materials in manner to prevent segregation.
 - .2 Protect fill materials from contamination.
 - .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.
- 3.6 EXCAVATION
- .1 Do not disturb soil within branch spread of trees or shrubs that are to remain.
 - .2 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of demolition operations and do not leave open more than 15 m at end of day's operation.
 - .3 Keep excavated and stockpiled materials safe distance away from edge of trench.
 - .4 Restrict vehicle operations directly adjacent to open trenches.
 - .5 Dispose of surplus and unsuitable excavated material off site.
 - .6 Do not obstruct flow of surface drainage or natural watercourses.
- 3.7 THRUST BLOCKS AND RESTRAINED JOINTS
- .1 Place concrete thrust blocks between valves, tees, plugs, caps, and undisturbed ground as indicated.
 - .2 Keep joints and couplings free of concrete.
 - .3 Do not backfill over concrete within 24 hours after placing.
 - .4 For restrained joints: only use restrained joints approved by Departmental Representative.
- 3.8 HYDROSTATIC AND LEAKAGE TESTING
- .1 Do tests in accordance with ANSI/AWWA C600.
 - .2 Provide labour, equipment and materials required to perform hydrostatic and leakage tests hereinafter described.
 - .3 Notify Departmental Representative at least 24 hours in advance of proposed tests.
 - .1 Perform tests in presence of Departmental Representative.
 - .4 Where section of system is provided with concrete thrust blocks, conduct tests at least 5 days after placing concrete or 2 days if high early strength concrete is used.
 - .5 Test pipeline in sections not exceeding 365 m in length.
 - .6 Leave cap and fittings exposed.

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- .7 When testing is done during freezing weather, protect cap and fittings from freezing.
 - .8 Strut and brace caps and tees to prevent movement when test pressure is applied.
 - .9 Open valves.
 - .10 Thoroughly examine exposed parts and correct for leakage as necessary.
 - .11 Apply hydrostatic test pressure for period of 1 hour.
 - .12 Examine exposed pipe, cap, fittings and appurtenances while system is under pressure.
 - .13 Remove cap, fittings and appurtenances found defective and replace with new sound material and make watertight.
 - .14 Repeat hydrostatic test until defects have been corrected.

3.9 BACKFILL

- .1 Backfill excavations to match existing grades.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 500 mm compacted thickness up to existing grades. Compact each layer before placing succeeding layer.

3.10 FLUSHING AND DISINFECTING

- .1 Flushing and disinfecting operations: under direct control of Departmental Representative and carried out by City of Ottawa water works department.

3.11 RESTORATION

- .1 Reinstate disturbed areas to elevation which existed before excavation.
- .2 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .3 Clean and reinstate areas affected by Work as directed by Departmental Representative.
- .4 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

- .1 CSA International
 - .1 CAN/CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Test and Standard Practices for Concrete.
 - .2 CSA A3000-08, Cementitious Materials Compendium.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Cast-in-place concrete:
 - .1 In accordance with CAN/CSA-A23.1-04.
 - .2 Cement: to CAN/CSA-A3001, Type GU.
 - .3 Concrete mix design to produce 21 MPa minimum compressive strength at 28 days and containing 25 mm maximum size coarse aggregate, with water/cement ratio to CAN/CSA-A23.1, C2 exposure.
 - .1 Air entrainment to CAN/CSA-A23.1, class C2 exposure.

2.2 CEMENT MORTAR

- .1 Portland cement: to CSA A3000, normal type 10.
- .2 Mix mortar 1 part by volume of cement to two parts of clean, sharp sand mixed dry.
 - .1 Add only sufficient water after mixing to give optimum consistency for placement.
 - .2 Do not use additives.

2.3 UNSHRIINKABLE FILL

- .1 Unshrinkable fill: proportioned and mixed to provide:
 - .1 Maximum compressive strength of 0.4 MPa at 28 days.
 - .2 Maximum Portland cement content of 25 kg/m³.
 - .3 Minimum strength of 0.07 MPa at 24 h.
 - .4 Concrete aggregates: to CAN/CSA-A23.1.
 - .5 Portland cement: Type 10.
 - .6 Slump: 160 to 200 mm.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .1 Proceed with installation/demolition only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 REMOVALS

- .1 Remove and discard sanitary piping and associated sanitary manholes as indicated, including non-native granular backfill.
- .2 Remove and discard storm sewer piping and associated catchbasins and manholes as indicated, including non-native granular backfill.

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- 3.4 PIPE ABANDONMENT
- .1 Abandon existing sewer in place as indicated.
 - .1 Expose and cut pipe ends.
 - .2 Drain pipe.
 - .3 Fill pipe with unshrinkable fill.
- 3.5 CONCRETE WORK
- .1 Cap removed sewer at manhole with concrete. Provide watertight seal using bituminous compound, epoxy resin cement or cement mortar.
 - .2 Re-bench existing sanitary manhole to provide smooth channel
 - .3 Do not backfill over concrete or disturb concrete within 24 hours after placing.
- 3.6 STOCKPILING
- .1 Stockpile materials in manner to prevent segregation.
 - .2 Protect fill materials from contamination.
 - .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.
- 3.7 EXCAVATION
- .1 Do not disturb soil within branch spread of trees or shrubs that are to remain.
 - .2 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of demolition operations and do not leave open more than 15 m at end of day's operation.
 - .3 Keep excavated and stockpiled materials safe distance away from edge of trench.
 - .4 Restrict vehicle operations directly adjacent to open trenches.
 - .5 Dispose of surplus and unsuitable excavated material off site.
 - .6 Do not obstruct flow of surface drainage or natural watercourses.
- 3.8 BACKFILL
- .1 Backfill excavations to match existing grades.
 - .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
 - .3 Do not use backfill material which is frozen or contains ice, snow or debris.
 - .4 Place backfill material in uniform layers not exceeding 500 mm compacted thickness up to existing grades. Compact each layer before placing succeeding layer.
- 3.9 CLEANING
- .1 Leave Work area clean at end of each day.
- 3.10 RESTORATION
- .1 Reinststate disturbed areas to elevation which existed before excavation.
 - .2 Reinststate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
 - .3 Clean and reinststate areas affected by Work as directed by Departmental Representative.
 - .4 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

PART 1 - GENERAL

- 1.1 SCHEDULING OF WORK
- .1 Schedule work to minimize interruptions to existing services.
 - .2 Submit schedule of expected interruptions to Departmental Representative for approval and adhere to interruption schedule.
 - .3 Notify Departmental Representative and building superintendent minimum of 24hrs in advance of interruption in service.
- 1.2 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- 1.3 QUALITY ASSURANCE
- .1 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.
 - .2 Regulatory Requirements:
 - .1 Perform Work to comply with applicable Provincial/Territorial regulations.
 - .2 Co-ordinate and meet requirements of power supply authority.
 - .1 Ensure availability of power when required.
 - .3 Certificates: submit certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical properties.
 - .4 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria.
- 1.4 DELIVERY, STORAGE AND HANDLING
- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
 - .2 Delivery and Acceptance Requirements:
 - .1 Deliver materials to site in original factory packaging, labeled with manufacturer's name, address.

PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Splice Kits:
 - .1 Provide splice kit to splice cable #14 & #15 in manhole.
 - .2 Cable #14 is 3c PILC and cable #15 is 3c Teck armoured power cable type TR-XLP.
 - .3 Cold shrink splice kit rated 15kV.
 - .4 Kit specially designed for connecting 3c shielded or belted paper insulated lead covered (PILC) cable to 3c shielded armoured Teck cable TR-XLP.
 - .5 Provide connectors recommended by splice kit manufacturer suitable for 500MCM copper cables.

PART 3 - EXECUTION

- 3.1 APPLICATION .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- 3.2 INSTALLATION .1 Work inside manhole is considered to be confined space and appropriate certification is required.
- .2 Isolate feeders #14 & #15 and lock off with appropriate tags.
- .3 Use cartridge spiking tool to drive steel spike through each cable prior to severing cables.
- .4 Disconnect cables from switchgear and pull back to manhole.
- .5 Ensure sufficient length of cables to splice in manhole.
- .6 Follow splice kit manufacturer's instructions for splicing of cables.
- 3.3 FIELD QUALITY CONTROL .1 Site Tests:
- .1 Perform tests as required by authority having jurisdiction.
- .2 Submit written test results to Departmental Representative for approval.
- 3.4 CLEANING .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .1 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION