

460-2017 ADDENDUM 1

2017 REGIONAL STREET RENEWAL PROGRAM – ELLICE AVENUE PAVEMENT REHABILITATION AND RECONSTRUCTION

URGENT

**PLEASE FORWARD THIS DOCUMENT TO
WHOEVER IS IN POSSESSION OF THE BID
OPPORTUNITY**

ISSUED: June 20, 2017
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**THIS ADDENDUM SHALL BE INCORPORATED
INTO THE BID OPPORTUNITY AND SHALL
FORM A PART OF THE CONTRACT
DOCUMENTS**

Template Version: A20160708

Please note the following and attached changes, corrections, additions, deletions, information and/or instructions in connection with the Bid Opportunity, and be governed accordingly. Failure to acknowledge receipt of this Addendum in Paragraph 10 of Form A: Bid may render your Bid non-responsive.

PART D – SUPPLEMENTAL CONDITIONS

- Revise: D18.1.2(a) to read: **Stage I** – Eastbound Underground Works (July 20 to August 25, 2017)
- Revise: D18.1.2(b) to read: **Stage II** – Eastbound Road Works (July 27 to September 13, 2017)
- Revise: D18.1.4(a) to read: **Stage I** – Westbound Underground Works (September 14 to October 11, 2017)
- Revise: D18.1.4(b) to read: **Stage II** – Westbound Road Works (September 19 to November 1, 2017)
- Revise: D19.1(a) to read: Phase I, as defined in the Sequence of Work, must be completed no later than September 13th, 2017

PART E – SPECIFICATIONS

Replace: E13 to read

E13. OPERATING CONSTRAINTS FOR WORK IN CLOSE PROXIMITY TO CRITICAL WATER INFRASTRUCTURE

DESCRIPTION

E13.1 General

E13.1.1 This Section details operating constraints for all work to be carried out in close proximity to the City feeder mains and other critical water infrastructure. Close proximity shall be deemed to be any construction activity within a 5 m horizontal offset from the centreline of the feeder main/water main, within 5 m of valve chambers and other appurtenances, and any other infrastructure identified below.

E13.2 The following shall be considered critical pipelines and water infrastructure for this project:

E13.2.1 Ingersoll Feeder Main:

- (a) 900 mm Prestressed Concrete Cylinder Pipe (PCCP) (Lined Core) water transmission pipe conforming to AWWA C301-58. The Ingersoll Feeder Main was manufactured and installed in 1959 in 4.88 m (16.02') pipe lengths.
- (b) The feeder main runs north-south within the Ingersoll Street right of way as shown on the Drawings.

(c) The following Ingersoll Feeder Main valve chambers are affected by the proposed work:

- (i) Air Valve Pit immediately south of Ellice Ave.
- (ii) Offtake Valve chamber on Ellice Ave at Ingersoll within eastbound lanes.

E13.2.2 400 mm Water Main:

- (a) 400 mm Asbestos Cement (AC) conforming to AWWA Standard C400-53T manufactured and installed in 1961.
- (b) The water main runs east-west along Ellice Ave from Downing Street to Lipton Street.
- (c) The following valve chambers are affected by the proposed work:
 - (i) Valve Chambers located at Lipton Street and Downing Street.

E13.3 General Considerations for Work in Close Proximity to Critical Water Infrastructure:

E13.3.1 Feeder mains and large diameter water mains are a critical component of the City of Winnipeg Regional Water Supply System and work in close proximity to feeder mains shall be undertaken with an abundance of caution. Large diameter feeder main and water mains cannot typically be taken out of service for extended periods to facilitate construction and inadvertent damage caused to the pipe would likely have catastrophic consequences.

E13.3.2 Work around critical water infrastructure shall be planned and implemented to minimize the time period that work is carried out in close proximity to the pipe and to ensure that the pipeline is not subjected to excessive construction related loads, including excessive vibrations and/or concentrated or asymmetrical lateral loads during backfill placement.

E13.3.3 Large diameter pressure pipe generally has limited ability to withstand increased earth and live loading. Therefore, every precaution must be undertaken to ensure that applied loading during all phases of construction is within accepted loading parameters. PCCP typically fails in a non-ductile mode with the potential to cause extensive consequential damage to infrastructure if failure should occur. All large diameter feeder mains/water mains have the potential to cause extensive flooding.

E13.3.4 Construction in close proximity to critical infrastructure shall not commence until both the equipment and construction method statements have been submitted, reviewed, and accepted by the Contract Administrator.

E13.4 Submittals

E13.4.1 Submit proposed construction equipment specifications to the Contract Administrator for review a minimum of five (5) Business Days prior to construction. The equipment submission shall include:

- (a) equipment operating and payload weights;
- (b) equipment dimensions, including: wheel or track base, track length or axle spacing, track widths or wheel configurations; and,
- (c) load distributions in the intended operating configuration.

E13.4.2 Submit a construction method statement to the Contract Administrator a minimum of five (5) business days prior to construction. The construction method statement shall contain the following minimum information:

- (a) proposed construction plan including excavation locations, haul routes, excavation equipment locations, and loading positions;
- (b) excavation plans, including shoring designs, for excavations occurring in close proximity to feeder mains (within 5 m horizontal of the pipe's centerline) where the excavation to be extended below the top of the feeder mains embedment zone (150 mm above the pipe);

- (c) trenchless construction methodology for feeder main crossings, including: installation methods, means of grade control, means of confirming clear separation between the new LDS and existing feeder main; and
- (d) any other pertinent information required to accurately describe the construction activities in close proximity to the feeder main and permit the Contract Administrator to review the proposed construction plans.

E13.4.3 Incomplete or partial submissions will not be reviewed and will be returned to the Contractor for re-submission.

E13.4.4 Allow five (5) Business Days for review by the Contract Administrator.

E13.5 Feeder Main Operational Limitations

E13.5.1 Feeder main shutdowns are scheduled based on a number of factors including water demand, weather, reservoir operation, routine maintenance and repair work within the regional distribution system, and other factors. If feeder main shutdowns are required, the City shall endeavour to make requested time periods available to the Contractor to schedule his/her work requiring removal of the feeder main from service, without limiting the City's control over the operation of the feeder main to complete other work, maintain adequate water supply and storage of water and maintain the integrity of the infrastructure. The City shall reserve the right to cancel and/or delay these schedule dates at any time, due to any circumstances that could adversely affect the feeder main or water supply including, but not limited to, high water demand, abnormal weather, failures of related water system components and/or security concerns.

E13.5.2 Scheduling Restrictions:

- (a) Temporary feeder main shutdowns are typically limited to off-peak demand seasons (September 15th to May 15th) and low demand hours including evenings or other low demand periods.

E13.5.3 The Contractor shall provide Notice to the Contract Administrator in writing, a minimum of fifteen (15) Business Days prior to requiring the shutdown. The City will endeavour to schedule the shutdown as requested.

CONSTRUCTION METHODS

E13.6 Pre-Work, Planning and General Execution

E13.6.1 No work shall commence in close proximity to feeder mains, chambers, and critical infrastructure until the equipment specifications and construction method statement have been submitted and accepted, and feeder main locations have been clearly delineated in the field. Work over feeder mains shall only be carried out with equipment that has been reviewed and quantified in terms of its loading implications on the pipe.

E13.6.2 Contact the City of Winnipeg Water and Waste Department, Construction Services Coordinator prior to construction.

E13.6.3 Locate feeder mains and water mains and confirm their position horizontally and vertically at the proposed the following locations prior to undertaking work in close proximity to the identified feeder mains. Note, exact locations to be identified in the field. Deviations from the elevations noted shall be reported to Contract Administrator for review prior to proceeding with work:

- (a) Ingersoll Feeder Main:

- (i) Ellice Ave Intersection.

- ◆ North Gutter Inv Elevation 231.70m
 - ◆ South Gutter Inv Elevation 231.70m

- (b) 400 mm Water Main:

- (i) Dominion Street - STA 1+505 Inv Elevation 230.64m;
 - (ii) Ingersoll Street – STA 1+738 Inv Elevation 231.07m
STA 1+746 Inv Elevation 229.91m; and,
 - (iii) Lipton Street – STA 1+826 Inv Elevation 230.43m.
- E13.6.4 Visually delineate all critical infrastructure identified herein on Site by use of paint, staking/flagging, construction fencing, snow fencing, or other suitable methods
- E13.6.5 Only utilize construction practices and procedures that do not impart excessive vibratory loads on feeder mains and chambers or that would cause settlement of the subgrade below feeder mains and critical pipelines.
- E13.6.6 Where the existing road structure must be removed, crossing of critical infrastructure shall be prohibited from the time the existing roadway structure is removed until the completion of granular base construction. At all times prior to completion of final paving; reduce equipment speeds to levels that minimize the effects of impact loading to the critical infrastructure.
- E13.6.7 Only equipment and construction practices stipulated in the accepted construction method statement and the supplemental requirements noted herein may be utilized in close proximity to feeder mains, chambers, and other critical infrastructure identified herein.
- E13.6.8 Construction operations should be staged in such a manner as to limit multiple construction loads at one time, (e.g., offset crossings sufficiently from each other, rollers should remain a sufficient distance behind spreaders to limit loads. A reasonable offset distance is 3 m between loads).
- E13.6.9 Granular material, construction material, soil, and/or other material shall not be stockpiled on the pipelines or within 5 m of any feeder main, valve chamber, or other critical infrastructure identified herein.
- E13.6.10 The Contractor shall ensure that all crew members understand and observe the requirements of working near feeder mains, valve chambers, and critical infrastructure. Prior to commencement of on-Site work, the Contractor shall jointly conduct an orientation meeting with the Contract Administer, all superintendents, foreman, and heavy equipment operators to make all workers on the Site fully cognizant of the limitations of altered loading on, the ramifications of inadvertent damage to, and the constraints associated with work in close proximity to feeder mains and critical pipelines. New personnel introduced after commencement of the Project need to be formally orientated as outlined herein. It is recommended that restrictions associated with the crossing, consistent with the Contractor's submitted method statement be posted on Site and near the crossing.
- E13.7 Demolition, Excavation, and Shoring
- E13.7.1 Use of pneumatic concrete breakers within 3 m of a feeder main, valve chamber, or critical pipeline is prohibited. Pavement shall be full depth sawcut and carefully removed. Use of hand held jackhammers for pavement removal will be allowed.
- E13.7.2 Offset excavation equipment a minimum of 3 m from the centerline of critical pipelines when undertaking excavations where there is less than 2.4 m of earth cover over the pipeline.
- E13.7.3 Excavation:
- (a) Utilize only smooth edged excavation buckets, soft excavation, or hand excavation techniques where there is less than 1.5 m of earth cover over the pipeline.
 - (b) Where there is less than 1.0 m of soil cover above the pipeline, provide full time supervision and complete the excavation utilizing hand excavation, soft excavation methods, or machine excavation. Where machine excavation is to be used the crown of the pipeline must be exposed (or suitable located) using hand or soft excavation methods a minimum of every 1.8 m.
 - (c) Where there is less than 0.5 m of soil cover above the pipeline, provide full time supervision and complete the excavation utilizing hand excavation or soft excavation methods only.

- E13.7.4 Equipment should not be allowed to operate while positioned directly over a feeder main or critical pipeline except where permitted herein, outlined in the reviewed and accepted construction method statement.
- E13.7.5 Excavations within 3 m of the outside edge of a feeder main (hydrovac holes for confirming trenchless installations excluded) and which extend below the top of the feeder main shall utilize shoring methods that preclude the movement of native in-situ soils (i.e. a tight shoring system).
- E13.7.6 Pre-bore all piles to below the invert of critical infrastructure within 5 m (horizontally) of the pipeline's outside edge.
- E13.7.7 Offset pile driving equipment a minimum of 3 m (horizontally) from the centerline of the pipeline during piling operations.
- E13.8 Underground Construction and Trenchless Pipe Installation
- E13.8.1 Install pipes to the grades shown on the Drawings. A minimum clear separation distance (outside to outside of pipe wall) of 500 mm shall be maintained between crossing pipes and the feeder mains.
- E13.8.2 The Contractor shall locate feeder mains and confirm their position horizontally and vertically prior to commencing with any trenchless pipe installations to ensure proper clearances are maintained. Under NO circumstances should blind coring proceed across feeder mains.
- E13.8.3 The Contractor shall visually confirm the location and alignment of the drill rods or jacking pipe (horizontally and vertically) prior to proceeding with the trenchless installation beneath the feeder main. It is recommended that the new pipe alignment be confirmed within 2 m of the outside of the feeder main pipe but no closer than 0.5 m from the outside edge of the pipe.
- E13.8.4 No trenchless methods involving soil displacement (plugs) shall be permitted in the vicinity of the Feedermain.
- E13.8.5 Pressure grouting or approved alternative methods shall be used to fill voids caused by the installation or if the bored hole diameter is greater than the outside diameter of the pipe by more than 25 mm.
- E13.8.6 Where excavation is required within the feeder main's embedment zone, the Contractor shall take steps to ensure the granular embedment material surrounding the feeder main remains stable during the work and the feeder main outside of the excavation is not undermined.
- E13.9 Insulation of Feedermain & Other Critical Water Infrastructure
- E13.9.1 Insulate feeder mains where specified on the drawings in accordance with CW2110, SD-018 and as shown on the Drawings.
- E13.9.2 Materials:
- (a) High Strength Rigid insulation for below grade: to CAN/ULC S701, Type 4, Styrofoam HI 40 by Dow Chemical, Foamular 400 by Owens Corning, or approved equal in accordance with B6.
 - (b) Insulation with a minimum compressive strength of 414 kPa (60 psi) shall be utilized on the roof of the air release chamber on Ingersoll Street, north of Ellice Ave.
 - (c) Rigid insulation shall be installed with the top of the insulation flush with the top of the subgrade.
 - (d) Rigid insulation sheets shall be installed in a staggered pattern to maximise joint overlap.
 - (e) Spray applied Polyurethane Insulation:
 - (i) Polyurethane foam shall be closed cell, less than 1% open cell content to ASTM D-6226.
 - (ii) BASF Wallite CT (Cold Temperature grade) or approved equal in accordance with B6.
- E13.9.3 Insulation for the Ingersoll Feeder Main shall conform to SD-018 and the following requirement:
- (a) Thickness: 100 mm

(b) Width: 3.6 m

- E13.9.4 The air release chamber on the Ingersoll Feeder Main (north of Ellice Ave) shall be insulated in conjunction with the feeder main. Vertical and horizontal insulation of 100 mm shall be installed. Insulation less than 100 mm may be utilised where conflicts with the concrete road slab are present.
- E13.9.5 The valve chambers on the 400 mm AC water main (Downing Street, Ingersoll Street, and Lipton Street) shall be insulated with rigid insulation or spray applied polyurethane insulation.
- E13.10 Subgrade Construction
- E13.10.1 Subgrade and backfill compaction within 3 metres (horizontal) of a critical pipeline or valve chamber shall be limited to non-vibratory methods only. Small walk behind vibratory packers will be permitted.
- E13.10.2 Subgrade, sub-base and base course construction shall be kept in a rut free condition at all times. Construction equipment is prohibited from crossing pipelines if the grade is insufficient to support the equipment without rutting.
- E13.10.3 Subgrade conditions should be inspected by personnel with competent geotechnical experience (e.g. ability to adequately visually classify soils and competency of subgrade, subbase, and base course materials). In the event of encountering unsuitable subgrade materials above the feedermain, proposed design revisions shall be submitted to this office for review to obtain approval from the Water and Waste Department relative to any change in conditions.
- E13.10.4 Fill material shall not be dumped directly on pipelines but shall be stockpiled outside the limits noted in these recommendations and shall be carefully bladed in-place
- E13.10.5 Only use compaction equipment approved by the contract administrator to compact fill materials above critical pipelines. Compaction of fill materials shall be completed using static methods only, no vibratory compaction will be allowed within the limits noted in these recommendations.
- E13.10.6 Construction operations shall be staged to minimize the time period between excavation to subgrade and placement of granular subbase materials. Should bare subgrade be left overnight, measures shall be implemented to protect the subgrade against inadvertent travel over it and to minimize the impact of wet weather.
- E13.11 Subbase and Base Course Construction
- E13.11.1 Subbase or base course materials shall not be dumped directly on pipelines but shall be stockpiled outside limits noted in these recommendations and shall be carefully bladed in-place.
- E13.11.2 Subbase compaction within 3 m horizontal of the centreline of a critical pipeline shall be either carried out by static methods (without vibration) or with smaller approved equipment such as hand held plate packers or smaller roller equipment.
- E13.12 Paving
- E13.12.1 When constructing asphalt pavements only non-vibratory compaction should be used within 3 m (horizontal) of the center of critical pipelines.
- E13.13 Ingersoll Feeder Main Inspection
- E13.13.1 The Contractor shall support third party inspections of the Ingersoll Feeder Main throughout completion of the work. The intention is to inspect the feeder main across the intersection in stages after completion of the subgrade excavation.
- E13.13.2 The pipeline shall be exposed as specified herein using soft dig or hand excavation methods down to springline of the pipe. The excavation shall be completed in such a manner as to permit inspection by third party staff.
- E13.13.3 The Contractor is responsible for any shoring required to complete the inspection.
- E13.13.4 The Contractor shall have means of washing off the exterior of the pipe using a pressure washer or similar.

- E13.13.5 The Contractor shall have provisions on site to repair cracking in the feeder main's mortar coating or grout diaphragms. This shall include but is not limited to the use of Type HS cement mortar products.
- E13.13.6 Upon completion of the inspection, the Contractor shall replace any of the pipeline's bedding that was damaged or disturbed as part of the inspection (below springline). Above springline, the Contractor shall place and compact Bedding Sand up to the top of the sub grade. Compaction shall be completed using small hand held/walk behind packers in such a manner as to preclude damage to the pipeline.

MEASUREMENT AND PAYMENT

- E13.14 Insulation of Feedermain, 400 Watermain and chambers will be measured and paid for in accordance with E15 Insulation of Existing Water Services.
- E13.15 Soft Excavation will be measured and paid for in accordance with E10 Hydro Excavation.
- E13.16 No separate measurement and payment will be made for sand backfilling, trenching or grouting of the feedermain.

Add: E19

E19. SUB-BASE AND BASE COURSE CONSTRUCTION

DESCRIPTION

- E19.1 The use of crushed recycled concrete as sub-base and/or base course will be permitted in accordance with CW 3110-R19.
- E19.2 Materials, Construction Methods, and Measurement and Payment shall be in accordance with CW 3110-R19.

DRAWINGS

Replace: 460-2017 _Drawing_P-3485-17-R1 with 460-2017 _Addendum_1 Drawing_P-3485-17-R2
460-2017 _Drawing_P-3485-18-R1 with 460-2017 _Addendum_1 Drawing_P-3485-18-R2
460-2017 _Drawing_P-3485-19-R1 with 460-2017 _Addendum_1 Drawing_P-3485-19-R2
460-2017 _Drawing_P-3485-20-R1 with 460-2017 _Addendum_1 Drawing_P-3485-20-R2

APPENDICES

Add: Appendix D Combined Load vs Soil Cover Graphs