City of Winnipeg – Cell 35
Bid Opportunity 107-2025

**Issued for Tender Specifications** 

Prepared by:

Comcor Environmental Limited 320 Pinebush Road, Suite 12 Cambridge, ON, Canada N1T 1Z6 tel (519) 621-6669 fax (519) 621-9944

Project Number:

566-5

Date:

April 1, 2025





Project Title:

# Bid Opportunity – 107-2025

## DETAILED SPECIFICATIONS OF CONSTRUCTION

# DIVISION 33 – UTILITIES

<u>No. of Pages</u>

33 52 16 LANDFILL GAS PIPING

7

### 1 GENERAL

### 1.01 RELATED REQUIREMENTS

- 1. Section 31 05 16 Aggregate Materials.
- 2. Section 31 23 33.01 Excavation and Fill.
- 3. Section 31 32 19.20 Geocomposite.
- 4. Section 31 35 26.13 Recompacted Clay Base.
- 5. Section 33 35 26.16 HDPE Liner.

### 1.02 MEASUREMENT AND PAYMENT

- .1 Landfill Gas Lateral Piping and Liner Penetrations:
  - .1 Measurement Basis: By each installation as detailed on Drawing W-1001.
  - .2 Payment Basis: Unit price. Includes excavation, grading and bedding, pipe supply and installation, fittings, liner penetration boots, tracer wire, warning tape, surveying, pressure testing, backfill and compaction and restoration.

### 1.03 REFERENCE STANDARDS

- .1 ASTM International (ASTM):
  - .1 ASTM D3035 Standard specification for polyethylene plastic pipe (DR-PR) based on controlled outside diameter.
  - .2 ASTM D3261 Standard specification for butt heat fusion polyethylene plastic fittings.
  - .3 ASTM D3350 Standard specifications for polyethylene plastics pipe and fittings materials.
  - .4 ASTM F714 Polyethylene plastic pipe (SDR-PR) based on outside diameter.
  - .5 ASTM F2619 Standard specification for high-density polyethylene line pipe.
  - .6 ASTM F2620 Standard Specification for heat fusion joining of polyethylene pipe and fittings.
- .2 American Water Works Association (AWWA):
  - .1 AWWA C901-20 Polyethylene pressure pipe and tubing, 3/4 in. (19 mm) through 3 in. (76 mm), for water service.
  - .2 AWWA C906-21 Polyethylene pressure pipe and fittings, 4 in. through 65 in. (100 mm through 1,650 mm), for waterworks.
- .3 City of Winnipeg Standard Construction Specifications:
  - .1 CW2030 Excavation Bedding and Backfill.
  - .2 CW3110 Sub-Grade, Sub-base and base course construction.

### 1.04 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling:

- .1 Include detailed sequence of landfill gas piping and liner penetrations in Detailed Work Schedule.
- .2 Do not allow or cause work performed to be covered up or enclosed prior to required inspections, tests or approvals.
- .2 Coordination.
  - .1 Sequence and schedule landfill gas piping and liner penetrations with work of other Sections.
  - .2 Verify landfill gas piping and liner penetrations are coordinated with HDPE Liner, Geocomposite installation.
- .3 Samples:
  - .1 Allow continual sampling by Contract Administrator during construction.

### 1.05 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit the following action submittals a minimum of 4 weeks before starting work of this Section:
  - .1 Product Data:
    - .1 Submit manufacturer's instructions, printed product literature and data sheets for pipes and pipe fittings and include product characteristics, performance criteria, physical size, finish and limitation.
- .2 Manufacturer's Instructions:
  - .1 Special delivery, storage, and handling requirements.
  - .2 Recommended procedures for installation of pipes and liner boots.
- .3 Certificates:
  - .1 Manufacturer's test data and certification that the pipe materials meet requirements of this Section. This is to include quality control certificates pertaining to each lot of pipe produced.

### 1.06 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver and store piping with labelling in place.
- .2 Use every precaution to prevent damage to the pipe. Do not permit metal tools or heavy objects to unnecessarily come in contact with the pipe. Avoid excessive transportation and possible damage to the pipe.
- .3 Store and handle pipes, fittings and accessories to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.
- .4 Prevent damage to machined ends of pipes while handling and moving pipe.
- .5 Prevent animals from entering pipe when stored on site and during installation by temporarily sealing the pipe ends.

### 2 PRODUCTS

### 2.01 MATERIAL PROPERTIES

- .1 All polyethylene landfill gas, compressed air and forcemain piping shall conform to the following requirements:
  - .1 Meet ASTM F2619 or AWWA C901 or AWWA C906.
- .2 Landfill Gas Piping:
  - .1 All landfill gas piping, fittings, joints, elbows, etc. are to be DR 17 HDPE.
- .3 Compressed Air and Forcemain Piping:
  - .1 All compressed air and forcemain piping, fittings, joints, elbows, etc. are to be DR 11 HDPE.
- .4 Polyethylene Pipe Fittings:
  - .1 Fittings shall have the same DR rating as the pipe to which it is being fused.
  - .2 Butt fusion fittings shall be factory made of HDPE material with a minimum material designation code of PE4710 and shall meet the requirements of ASTM D3261.
- .5 Polyethylene Piping Boot for HDPE Liner penetration:
  - .1 Pipe boots shall be fabricated from the same material as the HDPE geomembrane liner.
  - .2 Refer to Section 31 35 26.16 HDPE Liner for product requirements.

### 2.02 PIPE BEDDING AND SURROUNDING MATERIALS

- .1 Bedding Sand:
  - .1 Aggregate required for the bedding sand layer is contractor supplied as indicated in Section 31 05 16 Aggregate Materials.
- .2 Recompacted Clay Base:
  - .1 Clay required as pipe bedding adjacent to recompacted clay base, as indicated in Section 31 35 26.13 Recompacted Clay Base.
- .3 Granular A for Protection of Exposed Lateral Piping:
  - .1 Granular A Base Course as per CW3110.

### 2.03 ACCESSORIES

- .1 Warning Tape:
  - .1 100 mm wide plastic tape, coloured yellow with suitable warning legend describing buried gas line.
- .2 Tracer Wire:
  - .1 AWG No.12 Gauge, High Strength, Copper Clad Steel (CCS) wire. Minimal break load of 452 lbs and 30 mil HDPE yellow jacket and rated for direct bury application.

### 3 EXECUTION

### 3.01 EXAMINATION

- .1 Verify that survey benchmarks and intended elevations for Works are as shown on the Drawings.
- .2 In case of discrepancy between the manufacturer's recommendations and these specifications, advise the Contract Administrator and request instructions before proceeding.
- .3 Verify that excavations, dimensions, and elevations are as shown on the Drawings.
- .4 Do not allow or cause any of work performed to be covered up or enclosed prior to required inspections, tests, or approvals.
- .5 Obtain approval from the Contract Administrator for completed excavations and previously placed material prior to placement of products associated with this Section.
- .6 Ensure areas to be backfilled are free from debris and water.
- .7 Do not permit traffic in restored/repaired area without approval from the Contract Administrator.

### 3.02 EXCAVATION

- .1 The Contractor shall excavate, by hand, by hydrovac, or by other appropriate measures, any trial excavations deemed necessary by the Contractor for locating the position of underground services.
- .2 When in the course of excavation, the Contractor encounters existing services or any other obstructions, they shall immediately seek instruction from the Contract Administrator as to the course of action. Services or other obstruction shall be physically marked on the ground.
- .3 Unless otherwise shown in the contract documents, the minimum trench width shall be the external diameter of the pipe plus 500 mm.
- .4 Carefully excavate trenches to the minimum depths and widths necessary for installing the pipeline and associated appurtenances. In the pipe embedment zone (pipe surround), the trench sidewalls shall be as nearly vertical as practical. From the top of the pipe embedment zone to the surface, the trench sidewalls shall be either sloped sufficiently to prevent sloughing or cave-in, or shall be properly supported in accordance with OH&S requirements.

### 3.03 METHOD OF PLACEMENT

- .1 Cut the pipe trench to the line and grade shown on the construction drawings. The bottom of the trench shall be clean and smooth.
- .2 Place bedding material prior to laying pipe. Place only as much bedding material as can be backfilled in one day's work.
- .3 Keep HDPE pipe clean and dry before installation, both externally and internally to avoid contaminating bedding materials.
- .4 Install all pipe according to the Drawings and include all required fittings and bedding materials.
- .5 Do not allow water to flow through pipe during construction, except as may be permitted by the Contract Administrator.
- .6 Do not bend HDPE pipe in a radius smaller than that recommended by the manufacturer when staged on Site or when being installed.

- .7 Whenever work is suspended, install removable watertight bulkhead at open end of last pipe laid to prevent entry of foreign materials.
- .8 Position and join pipes by methods approved by manufacturer/supplier.
- .9 Pipe jointing:
  - .1 Polyethylene pipe shall be assembled by thermal butt fusion into sections.
  - .2 Thermal butt fusion joining shall be carried out in accordance with the directions of and with the equipment supplied by the manufacturer, and under the direct supervision of a joining supervisor who is employed by the pipe manufacturer.
- .10 Variance from vertical alignment shall not vary more than 25 mm. Notwithstanding this tolerance, any vertical grade variation shall not result in a reversal of slope or grade from that indicated on the Drawings. The Contractor is solely responsible for correcting grade alignments that do not meet the design intent.
- .11 Variance from the horizontal alignment shall not exceed 200 mm.

### 3.04 HDPE LINER PENETRATION AND BOOT INSTALLATION

- .1 Install liner penetration boots on landfill gas, compressed air and forcemain piping where Lateral crosses through HDPE geomembrane liner as per manufacturer's instructions. Boots to be extrusion welded to geomembrane and piping.
- .2 Reweld seams cut into HDPE geomembrane liner for installation of landfill gas, compressed air and forcemain piping.
- .3 Refer to Section 31 35 26.16 HDPE Liner for installation requirements.
- .4 Replace geocomposite drainage layer over top of pipe boots.
- .5 Within 1000 mm of recompacted clay base, substitute sand bedding with compacted clay. Extend compacted clay 300 mm on all sides of piping.
- .6 Protect exposed landfill gas, compressed air and forcemain piping on Cell 35 side slope with compacted Granular A.
- .7 Restore perimeter berm to match final surface conditions.

### 3.05 SURVEYING, INSPECTION AND TESTING

- .1 The contractor shall survey top of end caps on both ends of landfill gas, compressed air and forcemain piping prior to backfilling and provide results to contract administrator.
- .2 Performance of various inspections, tests and check surveys will be conducted by the Contract Administrator.
- .3 Testing of materials, compaction and check surveys will be carried out by testing personnel designated by the Contract Administrator. Frequency of tests and check surveys will be determined by the Contract Administrator.
- .4 Contractor shall make Contract Administrator's test locations available and shall keep equipment away from the test location for the duration of tests.

### 3.06 PRESSURE TESTING – HDPE PIPING

- .1 Pressure testing of landfill gas, compressed air and forcemain piping may be performed on assembled 12.2 m (40 ft) sections prior to installation in trench.
- .2 Provide labour, equipment and materials to perform pressure tests specified herein. All costs for pressure testing shall be included in the unit bid price for each Landfill Gas Lateral Piping and Liner Penetration.
- .3 Notify Contract Administrator at least 24 hours in advance of all proposed tests.
- .4 Perform tests in the presence of the Contract Administrator as follows:
  - .1 Utilize compressed air to charge piping and maintain pressure for an adequate period to allow for expansion of piping.
  - .2 Test all landfill gas piping at a pressure of 3 psi.
  - .3 Test all compressed air and forcemain piping to 125 psi.
  - .4 Use pressure gauge with appropriate range and scale.
  - .5 Butt fusion end caps on exposed end of piping may be drilled and tapped with 3/4" NPT threads for use as pressure test ports.
  - .6 Ensure that safety precautions are observed for exposed piping.
  - .7 Pressure test shall be deemed successful if the designed pressure is maintained for a period of not less than 1 hour with no measurable drop in pressure. The temperature must be constant to within 1°C during this period or adjusted with the appropriate correction factor.
  - .8 Examine joints for leakage and remove any joints showing leakage from the piping, rejoin and retest the system. Repeat test until pressure drop is within specified allowance.
  - .9 Cap and seal all testing ports at the termination of the pressure test with Schedule 80 PVC MPT threaded plug.
  - .10 Submit pressure test report indicating date, test pressure, duration and pass/fail for each section of pipe tested.

### 3.07 CLEANING

.1 Upon completion of work, remove surplus materials and debris, trim slopes, and correct defects noted by the Contract Administrator.

- .2 Separate waste materials for reuse and recycling.
- .3 Remove and dispose of all packaging materials at appropriate recycling facilities

# END OF SECTION