# ADDENDUM #3

MAY 10, 2024

## REQUEST FOR TENDER FOR
## REGIONAL LANDFILL CELL 5 NORTH CONSTRUCTION
## CONTRACT 9-2024 APRIL 2024
## ESSEX-WINDSOR SOLID WASTE AUTHORITY

Please be advised that for this Addendum #3, the quantity in Line Item #10 has been increased to 60,000 m3 as shown below and on the attached updated/revised Form of Tender. Also, a new Line Item #50 (Landfill Gas Collection System Expansion) has been added as shown below and on the attached Form of Tender. The Landfill Gas (LFG) work includes header pipes, wellheads, connection to existing manholes and all other work outlined in the LFG supporting documents package.

Please ensure to review this addendum package, the attached revised Form of Tender and the supporting LFG package. Please include the detailed costs for the LFG expansion in the attached package and only include the total lump sum cost in Line Item #50 of the updated Form of Tender for this Contract.

| | | | | | | |
|---|---|---|---|---|---|---|
| 10.0 | 206 510 SP | **Provisional Item**: Extra cost, if any, associated with additional waste excavation in east side of Cell 4 North (waste covering, odour and litter control) | $m^3$ | 60,000 | $ | $ |

| | | | | | | |
|---|---|---|---|---|---|---|
| 50.0 | ADD 3 | Landfill gas collection system expansion including header pipes, wellheads, connection to existing manholes and all other work outlined in Addendum 3 | LS | LS | $ | $ |

The following item are included in this Addendum #3 package:

1. Updated Form of Tender (Item #10 is revised and Item #50 is added)
2. Scope and descriptions of LFG expansion work and Schedule of Prices
3. LFG Technical Specifications
4. LFG Design Drawings

**END**

# Division 1

# Form of Tender

**ESSEX-WINDSOR SOLID WASTE AUTHORITY**

TENDER FOR CONTRACT NO. 9-2024

TENDER CLOSING DATE ____ May 16, 2024 at 12:00 noon ____(Local Time)

TENDER FOR Essex-Windsor Regional Landfill, Cell 5 North Construction

_____

Tender submitted by _____

residing at (or place of business) [1] _____

and _____

residing at (or place of business) _____

comprising the firm of _____

a company duly incorporated under the laws of _____

and having its head office at _____

hereinafter called "the Tenderer".

Tenders shall be submitted in duplicate to:

Essex-Windsor Solid Waste Authority
360 Fairview Avenue
Suite 211
Essex ON N8M 3G4
Attention: Mr. Tom Marentette, P.Eng., Waste Disposal Manager

[1]NOTE: The Tenderer's name and residence must be inserted above and, in the case of a partnership, the name and residence of each member of the partnership must be inserted.

## SCHEDULE OF ADDITIONAL UNIT PRICES *

The Contractor hereby offers to complete the work specified in this Contract No. 9-2024 for the construction of Cell 5 North at the Essex-Windsor Regional Landfill for the following Tender Prices (refer to drawings and Division 5 of the specifications for details):

| Item No. | Spec No. | Description | Unit | Est. Qty | Unit Price | Contractor's Total Bid |
|---|---|---|---|---|---|---|
| 1.0 | SP | Mobilization and Demobilization | LS | LS | $ | $ |
| 2.0 | 206 SP | **Provisional Item**: Sludge Excavation and hauling to active landfill area including backfill with native material from Cell 5 North | $m^3$ | 22,000 | $ | $ |
| 3.0 | SP | **Provisional Item**: Odour control during sludge excavation and placement | LS | LS | $ | $ |
| 4.0 | 510 SP | Litter fence removal including salvaging/reuse of posts | m | 420 | $ | $ |
| 5.0 | 510 SP | Bird Pole Removal (reuse as perimeter fence pole, if suitable) | ea. | 6 | $ | $ |
| 6.0 | 206 510 SP | Clay stockpile removal including placing and grading over sludge pit area or as directed by owner | $m^3$ | 41,500 | $ | $ |
| 7.0 | 206 510 SP | Topsoil stockpile removal and placement at site as directed by owner | $m^3$ | 10,100 | $ | $ |
| 8.0 | 206 510 SP | Earth excavation and grading of Cell 5 North including disposal of excavated materials or on-site placement, as directed | $m^3$ | 400,600 | $ | $ |
| 9.0 | 206 510 SP | **Provisional Item**: Over-excavation of Cell 5 North to remove unsuitable material (sand) and backfill with suitable blue/gray clay material, including water for Compaction (quantities may vary and need to be confirmed) | $m^3$ | 40,000 | $ | $ |
| 10.0 | 206 510 SP | **Provisional Item**: Extra cost, if any, associated with additional waste excavation in east side of Cell 4 North (waste covering, odour and litter control) | $m^3$ | 60,000 | $ | $ |
| 11.0 | 1860 SP | Geotextile separator for base of Cell 5 North | $m^2$ | 33,000 | $ | $ |
| 12.0 | 206 511 SP | Primary drainage gravel for base of Cell 5 North | $m^3$ | 15,300 | $ | $ |
| 13.0 | 206 SP | **Provisional Item**: Clay berm along south limit of Cell 5 North to support access road north of sludge pits | m | 230 | $ | $ |
| 14.0 | 206 510 511 1860 SP | **Provisional Item**: Remove existing clay berm between Cell 4 North and Cell 5 North and construct floor clay liner then reconstruct the clay berm | m | 165 | $ | $ |

| Item No. | Spec No. | Description | Unit | Est. Qty | Unit Price | Contractor's Total Bid |
|---|---|---|---|---|---|---|
| 15.0 | 410 SP | 200 mm dia. HDPE LCS perforated pipe for Cell 5 North | m | 1,300 | $ | $ |
| 16.0 | 410 SP | 200 mm dia. HDPE LCS solid wall pipe for Cell 5 North | m | 400 | $ | $ |
| 17.0 | 409 SP | CCTV Inspection of Leachate Collection Piping, including Cleanup/Flushing for Cell 5 North | m | 1,700 | $ | $ |
| 18.0 | 407 904 SP | 2400 mm dia. pre-cast concrete manhole with cast-in-place concrete foundation and all specified accessories | ea. | 2 | $ | $ |
| 19.0 | 410 SP | Connection to existing LCS pipe | LS | LS | $ | $ |
| 20.0 | 206 SP | Runoff Separation Berm for Cell 5 North | m | 160 | $ | $ |
| 21.0 | 206 314 510 802 804 SP | Clay access road south of Cell 5 North | m | 240 | $ | $ |
| 22.0 | 206 310 314 510 802 804 SP | Resurface existing roads | | | | |
| | | a) Resurface road west of maintenance building | m | 280 | $ | $ |
| | | b) Resurface Road 'C' | m | 275 | $ | $ |
| | | c) Resurface Road 'D' | m | 505 | $ | $ |
| 23.0 | 206 310 314 510 802 804 SP | Widen existing roads | | | | |
| | | a) Road 'E' widening | m | 660 | $ | $ |
| | | b) Widen existing road to provide 20m turning radius | LS | LS | $ | $ |
| 24.0 | 206 310 314 510 802 804 SP | RAP waste haul road | m | 1,320 | $ | $ |
| 25.0 | 206 310 314 510 802 804 SP | Miscellaneous road items | | | | |
| | | a) Granular B Turning Area | LS | LS | $ | $ |
| | | b) 3m Wide Granular A Access Road | LS | LS | $ | $ |
| | | c) Granular A Access Ramp to Manholes | LS | LS | $ | $ |
| | | d) Granular A Path | LS | LS | $ | $ |
| | | e) **Provisional Item** - Granular A Pad and Access Road | LS | LS | $ | $ |
| 26.0 | 410 SP | New HDPE drainage pipe with rip rap and assess condition of existing HDPE drainage pipes | ea. | 6 | $ | $ |
| 27.0 | 412 SP | 900 mm dia. HDPE vertical sump | ea. | 2 | $ | $ |
| 28.0 | | Place final cover | | | | |

| Item No. | Spec No. | Description | Unit | Est. Qty | Unit Price | Contractor's Total Bid |
|---|---|---|---|---|---|---|
| | 206 802 804 SP | a) Clay capping of designated landfill area (Cells 2, 3 and 4), brown clay maybe arranged by EWSWA | $m^3$ | 26,500 | $ | $ |
| | | b) Place 150 mm topsoil over capped landfill area, topsoil maybe arranged by EWSWA | $m^2$ | 75,000 | $ | $ |
| | | c) Fertilize and seed topsoiled / capped part of landfill | $m^2$ | 75,000 | | |
| 29.0 | 206 310 314 510 SP | **Provisional Item** - Maintenance Building and Household Hazardous Waste Storage paving | LS | LS | $ | $ |
| 30.0 | 206 510 904 SP | Construct truck clean area including RAP pad, concrete push wall and realigned drainage ditch | LS | LS | $ | $ |
| 31.0 | 615 SP | Install litter fence along north and east side of Cell 5 North | | | | |
| | | a) With new poles | m | 1195 | $ | $ |
| | | b) With reused poles | m | 420 | $ | $ |
| 32.0 | 206 802 804 SP | Drainage ditches | | | | |
| | | a) New drainage ditch | m | 640 | $ | $ |
| | | b) Regrade existing drainage ditch | m | 310 | $ | $ |
| 33.0 | SP | Supply and install 2400 mm dia. risers to existing manholes | LS | LS | $ | $ |
| 34.0 | 421 SP | Supply and install CSP culvert | | | | |
| | | a) Supply and install CSP culvert (300mm) | m | 60 | $ | $ |
| | | b) Supply and install CSP culvert (400mm) | m | 35 | $ | $ |
| | | c) Supply and install CSP culvert (600mm) | m | 65 | $ | $ |
| 35.0 | 106 603 604 609 614 SP | All electrical work as required including wiring, ducts, power supply and other miscellaneous tasks as specified | LS | LS | $ | $ |
| 36.0 | 603 SP | Installation of conduit for future electrical, cable and data wiring | m | 1,290 | $ | $ |
| 37.0 | 206 510 SP | Earth shallow excavation (Cell 3 North area) and stockpile on site as directed | $m^3$ | 60,000 | $ | $ |
| 38.0 | 206 510 SP | **Provisional Item**: Earth shallow excavation (Cell 4 North area) and stockpile on site as directed | $m^3$ | 15,000 | $ | $ |
| 39.0 | 206 510 SP | **Provisional Item**: Haul road excavation (Cell 3 North area) and stockpile on site as directed | $m^3$ | 2,200 | $ | $ |

| Item No. | Spec No. | Description | Unit | Est. Qty | Unit Price | Contractor's Total Bid |
|---|---|---|---|---|---|---|
| 40.0 | 805 SP | **Provisional Item**: Heavy duty silt fence (OPSD 219.130) | m | 600 | $ | $ |
| 41.0 | 805 SP | **Provisional Item**: Straw bale flow check dam (OPSD 219.180) | ea | 2 | $ | $ |
| 42.0 | 805 SP | **Provisional Item**: Rock flow check dam (OPSD 219.210) | ea | 2 | $ | $ |
| 43.0 | SP | **Provisional Item**: Geogrid | $m^2$ | 10,000 | $ | $ |
| 44.0 | | **Provisional Item**: Import topsoil | $m^3$ | 16,500 | $ | $ |
| 45.0 | | **Provisional Item**: Import clay cap material | $m^3$ | 17,000 | $ | $ |
| 46.0 | SP | **Provisional Item**: Contingency Allowance | LS | LS | $ 1,000,000.00 | $ 1,000,000.00 |
| 47.0 | SP | **Provisional Item**: Labour and Equipment Contingency Allowance (refer to Pages 12 and 13 of Form of Tender) | LS | LS | $ | $ |
| 48.0 | SP | Supply and install manual electric submersible pump | LS | LS | $ | $ |
| 49.0 | SP | Bonding, Insurance and Permits | LS | LS | $ | $ |
| 50.0 | ADD 3 | Landfill gas collection system expansion including header pipes, wellheads, connection to existing manholes and all other work outlined in Addendum 3 | LS | LS | $ | $ |
| | | **Subtotal** | - | - | - | $ |
| 51.0 | SP | Harmonized Sales Tax (HST) Equal to Exactly 13.0% of the Above Subtotal | - | - | - | $ |
| Provisional Item Subtotal | | | | | | $ |
| Mandatory Item Subtotal | | | | | | $ |
| **TOTAL TENDER PRICE** | | | | | | $ |

*To be completed by Tenderer.

## Estimated Quantities

The quantities shown in the Schedule of Prices are estimated from the Contract Drawings and are for the sole purpose of establishing a dollar amount based on the unit price bid or lump sum price bid. For any work done or materials supplied on a unit price basis, the Contractor will be paid for the actual measured quantities at the respective unit rates tendered.

**Provisional Item**

The provisional items indicated in the Schedule of Prices and throughout the Contract Documents may or may not be completed under this Contract. Provisional items are only to be completed by the Contractor if directed by the Owner or Engineer.

**Contract Time**

All work under this contract must be completed to Substantial Performance in _____** days (130 working days maximum) from the date of the Engineer's written instructions to commence work, and this time will become the Contract Time.

** To be completed by the Tenderer

**List of Tender Documents**

**A. TENDER FORM (Division 1)**

**B. INFORMATION FOR TENDERERS (Division 2)**
As issued with the Tender

**C. STANDARD CONTRACT FORMS (Division 3)**
Samples issued with the Tender

**D. GENERAL SPECIAL PROVISIONS (Division 4)**
As issued with the Tender

**E. ITEM SPECIAL PROVISIONS (Division 5)**
As issued with the Tender

**F. CONTRACT DRAWINGS**
(a) As issued with the Tender and as listed below:

| Drawing No. | Title | Date |
|---|---|---|
| 0 | Title Sheet | April 2014 |
| C01 | Existing Conditions (West Side) | April 2014 |
| C02 | Existing Conditions (East Side) | April 2014 |
| C03 | Proposed Staging and Stockpile Areas | April 2014 |
| C04 | Proposed Removals | April 2014 |
| C05 | Proposed Clay Road and Sludge Pit Grading | April 2014 |
| C06 | Proposed Bottom of Cell 5N Excavation | April 2014 |
| C07 | Proposed Cell 5N Top of Drainage Layer | April 2014 |
| C08 | Cell 5N Cross-Sections | April 2014 |
| C09 | Cell 5N Typical Details | April 2014 |

| Drawing No. | Title | Date |
|---|---|---|
| C10 | Manhole Details | April 2014 |
| C11 | Proposed Final Cover Area | April 2014 |
| C12 | Proposed Access Roads | April 2014 |
| C13 | Waste Haul Road North and South Endings | April 2014 |
| C14 | Waste Haul Road Plan and Profile (Station 0+000 To 0+470) | April 2014 |
| C15 | Waste Haul Road Plan and Profile (Station 0+470 To 0+940) | April 2014 |
| C16 | Waste Haul Road Plan and Profile (Station 0+940 To 1+320) | April 2014 |
| C17 | Waste Haul Road Cross-Sections | April 2014 |
| C18 | Granular A Access Road Plan And Profile | April 2014 |
| C19 | Road "E" Widening Plan and Profile (Station 0+000 To 0+360) | April 2014 |
| C20 | Road "E" Widening Plan and Profile (Station 0+360 To 0+659) | April 2014 |
| C21 | Road "C" And Road "D" Resurfacing Plan | April 2014 |
| C22 | Proposed Paved Area | April 2014 |
| C23 | Typical Road Details | April 2014 |
| C24 | Typical Litter Fence and Paving Details | April 2014 |
| C25 | Proposed Truck Cleanout Area | April 2014 |
| S1 | Push Wall General Notes | April 2014 |
| S2 | Push Wall Plan and Detail | April 2014 |
| E01 | Proposed Electrical Works | April 2014 |
| E02 | Legend, Electrical Schematics, Panel Schedules and Details | April 2014 |

## G. STANDARD SPECIFICATIONS

### (a) Ontario Provincial Standard Specifications

The relevant municipal standard specifications (latest edition) in the Ontario Provincial Standard Specifications Manual are as follows:

| Standard No. | Date | Standard No. | Date | Standard No. | Date |
|---|---|---|---|---|---|
| 106 | Apr-23 | 206 | Apr-19 | 310 | Nov-17 |
| 311 | Nov-18 | 314 | Nov-23 | 407 | Nov-21 |

| Standard No. | Date | Standard No. | Date | Standard No. | Date |
|---|---|---|---|---|---|
| 408 | Nov-21 | 409 | Nov-23 | 410 | Nov-18 |
| 411 | Nov-21 | 412 | Nov-18 | 421 | Nov-18 |
| 510 | Nov-18 | 511 | Nov-19 | 603 | Apr-21 |
| 604 | Nov-17 | 609 | Nov-19 | 610 | Apr-17 |
| 614 | Nov-19 | 615 | Nov-22 | 802 | Nov-19 |
| 804 | Nov-14 | 805 | Nov-21 | 904 | Nov-23 |
| 1001 | Nov-21 | 1004 | Nov-21 | 1010 | Nov-13 |
| 1150 | Nov-18 | 1350 | Nov-23 | 1860 | Nov-18 |

(b) **Ontario Provincial Standard Drawings**

The relevant standard drawings (latest edition) in the Ontario Provincial Standard Drawings Manual are as follows:

| Standard No. | Name | Date | Revision |
|---|---|---|---|
| 219.130 | Heavy-Duty Silt Fence Barrier | Nov 2021 | 3 |
| 219.180 | Straw Bale Flow Check Dam | Nov 2021 | 3 |
| 219.210 | Rock Flow Check Dam - V-Ditch | Nov 2022 | 3 |
| 406.010 | Aluminum Ladder for Maintenance Holes | Nov 2018 | 3 |
| 701.013 | Precast Concrete Maintenance Hole, 2400 mm Diameter | Nov 2014 | 5 |
| 701.100 | Frost Strap Installation | Nov 2018 | 3 |
| 802.010 | Flexible Pipe Embedment and Backfill, Earth Excavation | Nov 2014 | 3 |
| 802.014 | Flexible Pipe Embedment in Embankment, Original Ground: Earth or Rock | Nov 2014 | 3 |
| 810.010 | Rip Rap Treatment for Sewer and Culvert Outlets | Nov 2018 | 3 |
| 2100.010 | Cable Installation in Trenches | Nov 2013 | 0 |
| 2101.010 | Duct Installation in Trenches | Nov 2013 | 1 |
| 2238.010 | Wooden Pole in Earth | Nov 2010 | 1 |

**H. LIQUIDATED DAMAGES (Division 6)**
As issued with the Tender

**I. SUPPLEMENTAL GENERAL CONDITIONS OF CONTRACT (Division 7)**
As issued with the Tender

**J. GENERAL CONDITIONS OF CONTRACT (Division 8)**
OPSS General Conditions of Contract - November 2006

**K. OPS DRAWINGS FOR CONTRACT (Division 9)**

As issued with the Tender

**L. OTHER DOCUMENTS (Division 10)**
As issued with the Tender

**LIST OF PROPOSED SUBCONTRACTORS***

| Sub Trade | Name of Proposed Contractor | Address of Subcontractor |
|---|---|---|
| Earthwork Contractor | | |
| Seeding Contractor | | |
| HDPE Pipe Supplier | | |
| Precast Structures Supplier | | |
| CCTV/Pipe Cleaning Contractor | | |
| Paving Contractor | | |
| Geotextile Supplier | | |
| Concrete Contractor | | |
| Metal Fabrications Supplier | | |
| Fencing Contractor | | |
| Electrical Contractor | | |
| HDPE Pipe Fusing Contractor | | |
| Drainage Gravel Supplier | | |
| Granulars Supplier | | |
| Geotextile Installer | | |
| Surveyor | | |
| Geogrid supplier | | |
| CSP culvert supplier | | |
| Diving Contractor | | |
| | | |
| | | |
| | | |

*To be completed by Tenderer. (Add sub-trades as appropriate, or indicate “By Own Forces”).

**TENDERER'S EXPERIENCE IN SIMILAR WORK***

| Year Completed | Description of Work | For Whom Work Performed | Value |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

*To be completed by Tenderer

**LIST OF TENDERER'S SENIOR STAFF TO BE EMPLOYED ON THE CONTRACT***

| Name | Position | Qualifications |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

*To be completed by Tenderer

## SCHEDULE OF ADDITIONAL UNIT PRICES (LABOUR & EQUIPMENT)*

All items must be priced; failure to do so may invalidate this Tender. Prices shall be fully inclusive of all costs in carrying out the work and shall include Harmonized Sales Tax where applicable.

The Tenderer shall list the hourly rates for labour and equipment owned or rented which he proposes to use on the work. These rates will apply to any extra work, which will be completed on a time and material basis, as outlined in Section 8.02.04 of the General Conditions. The equipment hourly rates listed herein will be used instead of the equipment rates outlined in Section 8.02.04.06 of the General Conditions for any part of the contract.

| DESCRIPTION | HOURLY RATE | HOURS | SUBTOTAL (BID PRICE) |
|---|---|---|---|
| **LABOUR** | | | |
| 1. General Labourer | $ | 25 | $ |
| 2. Equipment Operator | $ | 25 | $ |
| 3. Foreman | $ | 25 | $ |
| 4. Supervisor | $ | 25 | $ |
| 5. Project Manager | $ | 25 | $ |
| **EQUIPMENT** | | | |
| ***Compaction Equipment*** | | | |
| 6. Pad Foot Soil Compactor Cat 815 | $ | 25 | $ |
| 7. Sheepsfoot or Smooth Drum Vibratory Compactor (102" wide) | $ | 25 | $ |
| 8. Manually Guided Vibratory Plate (280 kg) | $ | 25 | $ |
| ***Earth Moving/Grading Equipment*** | | | |
| | | | |
| 10. Bulldozer (Cat D6 or equivalent) | $ | 25 | $ |
| 11. Bulldozer (Cat D8 or equivalent) | $ | 25 | $ |
| 12. Road Grader (Cat 120 or equivalent) | $ | 25 | $ |
| ***Excavation Equipment*** | | | |
| 13. Hydraulic Excavator (32,000 kg) | $ | 50 | $ |
| 14. Hydraulic Excavator (44,000 kg) | $ | 50 | $ |
| 15. Scraper, Twin Engine, Four Wheel Drive (16 $m^3$) | $ | 50 | $ |

| DESCRIPTION | HOURLY RATE | HOURS | SUBTOTAL (BID PRICE) |
|---|---|---|---|
| ***Haulage Equipment*** | | | |
| 16. Water Truck | $ | 25 | $ |
| 17. Float Truck | $ | 25 | $ |
| 18. Articulated Off Road Truck (30 tonnes) | $ | 25 | $ |
| 19. Articulated Off Road Truck (40 tonnes) | $ | 25 | $ |
| ***Other Equipment:*** | | | |
| 20. Rubber Tire Front End Loader (3 $m^3$ bucket) | $ | 25 | $ |
| | | TOTAL Items 1 to 20 | $ |

*To be completed by Tenderer

The total amount is referred to in this Tender as the Labour & Equipment Contingency Allowance and shall constitute Item 60.0 of the Form of Tender. The Tenderer agrees that he is not entitled to payment of any portion of this Allowance except for additional work carried out by him in accordance with the contract as directed by the Engineer in writing and only to the extent of such additional work.

## PERIOD OF VALIDITY OF TENDER

This offer shall be irrevocable for a period of sixty days (60 days) following the date of Tender Closing at the prices bid in the Tender Form.

## DECLARATION BY TENDERER

The Tenderer has carefully examined the Tender Documents listed herewith and understands and accepts the conditions set out therein.

Included with this Tender is a properly completed Agreement to Bond and a Tender Deposit in the form of a Bid Bond, a certified cheque or other acceptable security made payable to the Owner in the amount as set out in the Tender Documents. This deposit is subject to the conditions set out in the Information for Tenderers.

The Tenderer acknowledges that Addendum/Addenda No. ____ to ____***** inclusive has/have been received and that all changes specified in the Addendum/Addenda have been included in the prices submitted.

The Tenderer declares that no person, partnership or corporation other than the Tenderer has any interest in this tender or in the proposed contract for which this tender is made.

The Tenderer further declares that this tender is made without any connection, comparison of figures or arrangements with, or knowledge of, any other person, partnership or corporation making a tender for the same work and is in all respects made without collusion or fraud.

The Tenderer by this Tender offers to furnish all Labour, Equipment and Material, except as specified otherwise, for the performance of the Work for the item prices set forth in this Tender, all in accordance with the Tender Documents.

*** to be completed by Tenderer (enter nil if no addenda issued)**

DATED AT _____ THIS _____ DAY OF _____ 20___

_____ _____

Tenderer's Signature here and Seal, where applicable Position

*This is the 15th and last page of this Tender Form*

# Division 1

# Form of Tender

# ADDENDUM #3
# MAY 10, 2024
# REQUEST FOR TENDER FOR
# REGIONAL LANDFILL CELL 5 NORTH CONSTRUCTION CONTRACT 9-2024
# APRIL 2024
## ESSEX-WINDSOR SOLID WASTE AUTHORITY

The extension of the existing landfill gas header pipe on the south perimeter of the landfill has been added to the scope of the project. In addition, the connection of existing wells and manholes, protection of existing landfill gas lateral pipe, and installation of new landfill gas lateral pipe segments for future use have been added to the scope of the project.

The following documents are attached within Addendum 3 and are to become part of the contract documents:

- Technical Specification Sections
    - Section 31 22 19 – Finish Grading
    - Section 31 23 00 – Excavation, Backfilling and Compacting
    - Section 33 52 16 – HDPE Wellfield Piping
    - Section 33 52 17 – Landfill Gas Appurtenances
    - Section 33 52 18 – HDPE Chambers
- 2024 Landfill Gas Collection System Expansion Drawing Set – Issued for Tender – May 10, 2024

The Schedule of Prices included within this addendum must be completed and submitted by the Contractor with the Form of Tender and all other required bid documents. The "Total Bid" price on the Schedule of Prices within this Addendum 3 must be carried into the Form of Tender on Line Item 50.0.

# ADDENDUM #3
# MAY 10, 2024
# REQUEST FOR TENDER FOR
# REGIONAL LANDFILL CELL 5 NORTH CONSTRUCTION CONTRACT 9-2024
# APRIL 2024
## ESSEX-WINDSOR SOLID WASTE AUTHORITY

**Schedule of Prices – Landfill Gas Collection System**

| Item No | Spec No | Description | Unit | Est. Qty | Unit Price | Contractor's Total Bid |
|---|---|---|---|---|---|---|
| 50-1 | 33 52 16 | 450 mm HDPE landfill gas header pipe with 75 mm compressed air and 75 mm forcemain | m | 400 | $ | $ |
| 50-2 | 33 52 16 | **Provisional Item:** 450 mm HDPE landfill gas header pipe with 75 mm compressed air and 75 mm forcemain | m | 135 | $ | $ |
| 50-3 | 33 52 16 | 250mm HDPE landfill gas lateral pipe segments with 75mm compressed air and 75 mm forcemain | m | 61 | $ | $ |
| 50-4 | 33 52 16 | 100 mm HDPE landfill gas sublaterals | m | 158 | $ | $ |
| 50-5 | 33 52 16 | **Provisional Item:** 100 mm HDPE landfill gas sublaterals | m | 30 | $ | $ |
| 50-6 | 33 52 16 | Daylighting and installation of lean mix pipe bedding around existing laterals | m | 25 | $ | $ |
| 50-7 | 33 52 17<br>33 52 18 | 450 mm pump drain trap PDT3 | Ea | 1 | $ | $ |
| 50-8 | 33 52 17<br>33 52 18 | **Provisional Item:** 450 mm pump drain trap PDT4 | Ea | 1 | $ | $ |
| 50-9 | 33 52 17 | 450 mm flow control assembly | Ea | 1 | $ | $ |
| 50-10 | 33 52 17 | Renovation of existing extraction well | Ea | 4 | $ | $ |
| 50-11 | 33 52 17 | Connection of manhole MH10 to gas extraction system | Ea | 1 | $ | $ |
| 50-12 | 33 52 17 | **Provisional Item:** Connection of manhole MH12 to gas extraction system | Ea | 1 | $ | $ |
| 50-13 | 33 52 16 | Pressure testing | LS | 1 | $ | $ |
| 50-14 | 31 22 19 | Restoration | LS | 1 | $ | $ |
| Provisional Item Subtotal | | | | | | $ |
| Mandatory Item Subtotal | | | | | | $ |
| **Total** (Carry this total to Line Item No. 50.0 on the Form of Tender) | | | | | | $ |

**Contractor to complete and submit this form with all other required bid documents.**

**END**

# TABLE OF CONTENTS

# PART 1 GENERAL

## 1.1 DESCRIPTION

.1 Requirements for the restoration of areas disturbed during the installation of landfill gas collection piping and associated landfill gas collection infrastructure.

## 1.2 RELATED SECTIONS

.1 Section 31 23 00 – Excavation, Backfilling, and Compacting.

.2 Section 33 52 16 – HDPE Wellfield Piping: Installation of landfill gas piping below the final cover.

.3 Section 33 52 17 – Landfill Gas Appurtenances.

## 1.2 REFERENCES AND CODES

.1 OPSS 802 – Topsoil.

.2 OPSS 804 – Seed and Cover.

## 1.3 DELIVERY, STORAGE, AND HANDLING

.1 Stockpile material on Site in approved locations designated by Engineer, and as specified in Section 31 23 00.

## 1.4 ENVIRONMENTAL REQUIREMENTS

.1 Suspend operations whenever climatic conditions, as determined by Engineer, are unsatisfactory for placing material to the requirements of this Section.

.2 After occurrence of heavy rains, do not operate equipment on previously placed material or on approved excavations until the material has dried sufficiently to prevent occurrence of excessive rutting.

.3 Do not place fill in a frozen state or against frozen excavations or previously placed material. Do not place fill on snow, ice, water, or other objectionable material, or on improperly prepared excavations, or previously placed material.

.4 Where excavations or previously placed material have been softened or eroded, remove soft and yielding material or otherwise objectionable or damage areas and replace with compacted fill as specified.

## 1.5 SEQUENCING AND SCHEDULING

.1 Sequence delivery of materials to Site in a manner to minimize stockpiling and obtain approval from Engineer to stockpile.

.2 Schedule completion of piping and repair of final cover in waste prior to conducting works outside of waste footprint.

# PART 2 PRODUCTS

## 2.1 CLAY

.1 Existing clay excavated to be stockpiled and reused. Clay is to be clean and free of refuse/litter.

.2 Additional clay is available from on-site source as directed by Landfill Owner.

.3 Contractor responsible for transfer of owner supplied material from stockpile to construction area.

## 2.2 TOPSOIL

.1 Existing topsoil to be stockpiled and reused.

.2 Additional topsoil is available from on-site source as directed by Landfill Owner.

.3 Contractor responsible for transfer of owner supplied material from stockpile to construction area.

## 2.3 SEED AND MULCH AND EROSION BLANKET

.1 Utilize MTO seed mix. Water is <u>not</u> available from on-site hydrants for hydro-seeder.

.2 Mulch to be Type C (Cellulose Pulp).

.3 Application rate to be 100 kg per 10,000 sq. metres and conform to OPSS 804.

.4 Place Type 'S' erosion control blanket (OPSS 804) as per Manufacturer's specification on restored and seeded areas as directed by the Owner or Engineer. Straw fiber is to be a minimum 0.27 kg per sq. metre. Blanket to be type S75 as manufactured by North American Green, or an approved equivalent.

## PART 3 EXECUTION

### 3.1 GENERAL

.1 Restore all areas disturbed during the installation of landfill gas collection piping and associated landfill gas collection infrastructure to pre-construction conditions or better.

### 3.2 FINISH GRADING

.1 Restore all other locations affected by the Works of this Contract to pre-construction conditions.

### 3.3 TOPSOIL PREPARATION

.1 All surface areas designated for reseeding shall have a fine graded uniform surface free of humps and hollows.

.2 Apply a minimum of 50 mm of topsoil to all surface areas designated for reseeding.

## PART 4 MEASUREMENT AND PAYMENT

### 4.1 RESTORATION

.1 See Schedule of Prices Item No. 50-14.

.2 Measurement: Lump Sum.

.3 Payment: Includes supply of materials and labour for restoration to pre-construction conditions.

**SECTION 31 22 19**

# TABLE OF CONTENTS

# PART 1 GENERAL

## 1.1 DESCRIPTION

.1 Requirements for excavation, backfilling, and compacting during the installation of landfill gas collection piping and associated landfill gas collection infrastructure.

## 1.2 RELATED SECTIONS

.1 Section 33 52 16 – HDPE Wellfield Piping

.2 Section 33 52 17 – Landfill Gas Appurtenances

## 1.3 REFERENCES AND CODES

.1 OPSS 401 – Trenching, Backfill and Compaction.

.2 OPSS 402 – Excavating, Backfilling, and Compacting for Maintenance Holes, Catch Basins, Ditch Inlets and Valve Chambers.

.3 OPSS 491 – Preservation, Protection and Reconstruction of Existing Facilitates.

.4 OPSS 501 – Compacting.

.5 OPSS 506 – Dust Suppressants.

.6 OPSS 517 – Dewatering.

.7 OPSS 518 – Control of Water from Dewatering Operations.

.8 OPSS 1004 – Aggregates - Miscellaneous.

.9 OPSS 1010 – Aggregates - Base, Subbase Select Subgrade, and Backfill Material.

.10 OPSS 1359 – Unshrinkable Fill.

## 1.4 SUBMITTALS

.1 Certificates: Provide all necessary certificates prior to use of sheeting, shoring, trench boxes, or other facilities used for earth support.

## 1.5 ENVIRONMENTAL REQUIREMENTS

.1 Follow Health and Safety Plan at all times.

.2 Protect open excavations against damage due to surface runoff and run-on. Take necessary precautions to prevent erosion of excavated or disturbed surfaces.

.3 Suspend operation whenever climatic conditions, as determined by Engineer, are unsatisfactory for placing fill to the requirements of this Section.

.4 After occurrences of heavy rains, do not operate equipment on approved excavations until the material has dried sufficiently to prevent occurrence of excessive rutting.

.5 Where excavations have been softened or eroded, remove soft and yielding material or otherwise objectionable or damaged areas and replace with fill as specified by Engineer.

.6 Clean equipment involved in excavation activities, which may have come into contact with refuse before being removed from the landfill Site or being relocated to clean areas off Site.

.7 Do not obstruct flow of surface drainage or natural watercourses.

## 1.6 SEQUENCING AND SCHEDULING

.1 Sequence and schedule excavation activities with work of other Sections.

.2 Do not commence excavation operations until the Site-specific Health and Safety Plan has been reviewed by Engineer and implemented.

.3 Coordinate interruptions of utility services to existing facilities, which become necessary either directly or indirectly due to work required under this Contract through Engineer. Down time for service disruptions may be limited as to duration and time (weekend, nights, or holidays). Perform Works during the period designated.

.4 Coordinate and sequence excavation operations to minimize the need for temporary stockpiling excavated materials until required for back filling. Make every effort to balance cut and fill operations, and to ensure that any excavated material designated for backfill is immediately placed as backfill in Works. Keep the time during which excavations remain open to the practicable minimum.

.5 Do not allow or cause any of work performed to be covered up or enclosed prior to required inspections, tests, or approvals.

.6 The Contractor is to minimize amount of open trench on the landfill so as to minimize odours.

## PART 2 PRODUCTS

### 2.1 MATERIALS

.1 Granular "A": Conform to OPSS 1010.

.2 Granular "B": Conform to OPSS 1010.

.3 Sand Fill: Conform to OPSS 1004

.4 Unshrinkable Fill: Conform to OPSS 1359.

.5 Gabion Stone: Conform to OPSS 1004

.6 19.0 mm Clear Stone: Confirm to OPSS 1004.

### 2.2 ACCESSORIES

.1 Selected by Contractors for the purpose intended and subject to Engineer's approval prior to use.

## PART 3 EXECUTION

### 3.1 EXAMINATION

.1 Verify that survey benchmarks and intended elevations for Works are as indicated.

.2 Do not allow or cause any of the work performed or installed to be covered up or enclosed by work of this Section prior to required inspections, measurements, tests, or approvals.

.3 Obtain approval from Engineer for completed excavations and previously placed material prior to placement of successive lifts.

.4 Obtain approval from Engineer prior to placing fill against structures or around exposed buried utilities.

.5 Ensure areas to be backfilled are free from debris snow, ice, water, or frozen ground.

### 3.2 PREPARATION

.1 Identify required lines, levels, contours, and datum locations.

.2 Locate, identify, and protect utilities that remain from damage. Confirm locations of buried utilities and structures by careful test excavations or other suitable means.

.3 Protect plant life, lawns, and other features remaining as a portion of final landscaping.

.4 Protect benchmarks, survey control points, existing structures, fences, paving and curbs from excavating equipment and vehicular traffic.

.5 Maintain and protect from damage wells, utilities, and structures encountered. In the event of disturbance of, or damage to any utility or structure immediately notify Engineer. Repair or replace any utility or structure damaged by Contractor operations.

.6 Protect existing buildings and surface features, which may be affected while work is in progress.

.7 Protect existing building and structures where temporary unbalanced earth pressures are liable to develop on walls or other structures utilizing bracing, shoring, or other approved methods to counteract unbalance.

.8 Protect monitoring wells and any other structures and pipelines from any uplift and displacement or disturbance during excavation operations.

.9 Employ procedures for excavation and trenching such that disturbance of existing infrastructure, utilities, structures, and their foundations are avoided.

.10 Protect excavations and trenches from contamination.

.11 Obtain direction form Engineer before moving or otherwise disturbing utilities or structures.

.12 Remove surface features or obstructions including, but not necessarily limited to, trees, shrubs, bush, and other vegetation from surfaces to be excavated, as required to construct the finished work. Dispose of such obstructions to an on-Site disposal area as directed by Engineer.

.13 Compact sub grade to density requirements for subsequent backfill materials.

.14 Cut out soft areas of sub grade not capable of compaction in place. Backfill with approved native fill and compact to density equal to or greater than requirements for subsequent fill material.

.15 Remove debris, snow, ice, water, or frozen ground from areas to be backfilled.

.16 Proof roll sub grade surface to identify soft spots; fill and compact to density equal to or greater than requirements for subsequent fill material.

.17 Decontaminate equipment, which has been used in refuse prior to being used for back filling operations.

## 3.3 TRENCHING FOR WELLFIELD PIPING

.1 Excavate soil required for piping.

.2 Cut trenches sufficiently wide to enable installation and allow inspection. Remove water or materials that interfere with Works.

.3 Do not interfere with 45-degree bearing splay of foundations.

.4 The banks of trenches shall be as nearly vertical as allowable and in accordance with the current National, Federal, Provincial, and local safety legislation and requirements.

.5 In no case during performance of Works shall trenching advance ahead of the active installation more than necessary to facilitate proper placement.

.6 Accurately excavate and grade the bottom of trenches to provide uniform bearing and support for each section of the pipe on full thickness of approved bedding material at every point along its entire length.

.7 Remove lumped soil and boulders.

.8 Hand trim, make firm, and remove loose material, refuse and debris from trenches. Where natural or fill material at bottom of excavation is disturbed, compact disturbed soil to density at least equal to undisturbed soil or to the density specified for the succeeding layer of backfill, whichever is greater, or remove disturbed soil and refill the space as directed by Engineer.

.9 Do not disturb soil within the branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw. Seal cuts with approved tree wound dressing.

.10 Open trenches shall be Contractor's sole responsibility.

.11 Stockpile excavated material in area designated on Site.

## 3.4 BACKFILLING

.1 Granular materials: Place and compact materials in equal continuous layers not exceeding 200 mm (8 inches) uncompacted depth.

.2 Soil Native: Place and compact material in equal continuous layers not exceeding 200 mm compacted depth.

.3 Employ a placement method that does not disturb or damage other work.

.4 Maintain optimum moisture content of backfill materials required to attain specified compaction density of 95% Standard Proctor Density over, under and around all piping.

.5 Make gradual grade changes. Blend slope into level areas.

.6 Use fill types as specified. Completely use select native fill approved for backfilling before using imported fill.

.7 Do not use backfill material which is determined unsuitable by Engineer.

.8 Backfill around exposed utilities by placing layers simultaneously on all sides to equalize loading. Do not dump directly against monitoring wells, utilities, or foundations.

.9 Do not operate heavy compaction equipment closer than 1 metre to foundations, underground utilities, or monitoring wells.

.10 Backfill around installations as follows:

.1 Place bedding and surround material as specified in the Section.

.2 Place layers simultaneously, on both sides of installed work to equalize loading and minimize movement.

.3 Where temporary unbalanced earth pressures are liable to develop on walls or other structures, place material under, around, and over installations until 1.6 metres of cover is provided. Do not dump material directly on installations.

.11 Except as specified otherwise, place backfill continuously and in uniform layers not exceeding specified compacted thickness up to grades shown on Drawings.

.12 Compact each layer to the specified density before placing succeeding layers as specified in Section 3.5 - Compaction.

.13 Backfill material shall be free of refuse and litter.

## 3.5 COMPACTION

.1 Apply potable water as necessary during compaction to obtain the specified density. If the material to be compacted is excessively moist, aerate with suitable equipment and methods until the moisture content is corrected. In areas not accessible to rolling equipment, compact material to specified density with mechanical tampers approved by Engineer.

.2 When granular material is wetted by sprinkling, after being spread on material in place, sprinkling shall be done by method approved by Engineer. Do not direct jets of water at fill with such force that finer materials will be washed out.

.3 Compaction Equipment: The type, size, and efficiency of compaction equipment shall be capable of achieving specified degree of compaction. When operating equipment adjacent to and immediately above structures, exercise care so as not to cause damage or displacement of the structure.

## 3.6 EXCESS MATERIALS

.1 Dispose of surplus material on Site as directed by the Engineer.

.2 Dispose of excavated refuse on Site in area as directed by landfill owner.

## 3.7 FIELD QUALITY CONTROL

.1 Testing by Engineer:

.1 Engineer may select samples of uncompacted fill intended for Works and samples of compacted fill in Works.

.2 Engineer will perform tests in the field and in the laboratory on samples of backfill and imported fill to determine if materials meet specification. Testing of imported fill will include analysis for the presence of contaminates, grain size analysis, moisture content determination, bulk wet density, maximum dry density, and permeability. Testing for backfill will include moisture content determination, maximum dry density, and bulk wet density. Copies of test reports will be supplied to Contractor on request.

.3 Testing by Engineer will in no way relieve Contractor of his responsibility to test all material prior to notifying Engineer of the materials' suitability for the work involved.

.2 Methods of Testing: Testing will be performed in accordance with OPSS 501.08.

.3 Failure to Meet Specified Requirements: If tests indicate that material specifications have not been achieved or cannot be obtained with equipment in use, the procedure being followed, or the material being incorporated, remove, and replace work, as well as modify operations so that the equipment, procedures, and materials will produce the required results. Additional testing required by Engineer will be Contractor's responsibility.

## 3.8 ADJUSTING

.1 Finish compacted soil surfaces to within 25 mm of grades shown on Drawings but not uniformly high or low. Correct surface irregularities by loosening and adding or removing material until the surface is within specified grade.

.2 Leave work areas in a properly graded condition sloped as required to permit proper drainage and free of depressions that will pond or collect water or debris that will restrict flow.

## 3.9 CLEANING

.1 Clean and reinstate work areas affected by equipment outside area specified to be excavated, to specified restoration condition.

.2 Upon completion of backfilling, remove excess material and debris from work areas and travel routes.

## 3.10 TEMPORARY STOCKPILING

.1 Obtain Engineer's approval for locations of temporary stockpiles. Obtain Engineer's approval prior to placing material in such stockpiles.

.2 Construct stockpile sites so that they are level, well drained, free of foreign materials, and of adequate bearing capacity to support the weight of the materials to be placed thereon.

.3 Provide and maintain access to stockpiles.

.4 Separate differing materials with substantial dividers or stockpile apart to prevent mixing.

.5 Prevent intermixing of soil types, contamination, or segregation.

.6 Direct surface water away from stockpile site to prevent corrosion or deterioration of materials.

.7 Maintain temporary stockpile slopes not steeper than 1.5 horizontal to 1 vertical. In no instance shall stockpiles be greater than 3 metres in height above original surrounding grade. Place hay bales or other soil erosion and sediment control fencing at the base of and around each temporary stockpile to contain soil that may be washed off the stockpile.

.8 Maintain area surrounding stockpiles in neat and tidy condition.

## 3.11 PROTECTION OF FINISHED WORK

.1 Reshape and recompact fills subjected to vehicular traffic.

## 3.12 SCHEDULES

.1 Landfill Gas, Compressed Air, and Condensate Forcemain

.1 Cover pipe and bedding with sand fill and excavated clay cover that is free of refuse and litter compacted to 95 percent standard proctor density.

## PART 4 MEASUREMENT AND PAYMENT

### 4.1 EXCAVATION, BACKFILLING, AND COMPACTING

.1 No separate payment will be made.

.2 Payment: Included in other Payment Items.

**END OF SECTION 31 23 00**

# TABLE OF CONTENTS

# PART 1 GENERAL

## 1.1 DESCRIPTION

.1 Product and installation requirements for landfill gas collection piping in the wellfield.

## 1.2 RELATED SECTIONS

.1 Section 31 23 00 – Excavation, Backfilling, and Compacting.

.2 Section 33 52 17 – Landfill Gas Appurtenances.

## 1.3 REFERENCES AND CODES

.1 ASTM D3350 – Polyethylene Plastics (PE) Pipe and Fittings Material.

.2 ASTM F714 – Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter.

.3 ASTM D3035 – Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.

.4 ASTM D2837 – Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products.

.5 ASTM D2513 – Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings.

.6 ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

.7 ASTM F2619 – Standard Specification for High-Density Polyethylene (PE) Line Pipe.

.8 CSA B137.4 – Polyethylene (PE) Piping Systems for Gas Services.

.9 CSA Z662 – Oil and Gas Pipeline Systems

.10 OPSS 401 – Trenching, Backfilling and Compaction.

.11 OPSS 501 – Compacting.

.12 OPSS 517 – Dewatering of Pipeline, Utility and Associated Structure Excavation.

.13 OPSS 518 – Control of Water from Dewatering Operations.

## 1.4 SUBMITTALS

.1 Manufacturer's Certificate: Quality control certificates pertaining to each lot of pipes produced.

.2 Manufacturer's Instructions: Indicate special procedures required to install Products specified.

.3 Pressure Testing Plan

## 1.5 QUALITY ASSURANCE

.1 All high-density polyethylene pipe will conform to the following requirements:

.1 Meet ASTM F2619 or have the same compound standards specified in CSA B137.4, Clause 4.1.1, for negative landfill gas pressure, compressed air, and condensate applications.

.2 Comply with ASTM D2513 for positive landfill gas pressure applications.

.3 Raw material will contain a minimum 2 percent carbon black, well dispersed by recompounding to protect the pipe from degradation by ultraviolet light.

.4 Pipe will not contain any recycled compound except that generated in the manufacturer's own plant from resin of the same specification from the same raw material supplier.

.5 Pipe sizes will conform to ASTM F714. Pipe sizes are stated in metric units; however, equivalent IPS pipe sizes MUST be used to avoid fitting problems with valves and existing pipe.

## 1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver and store valves in shipping containers with labelling in place.

.2 Deliver, store, and handle pipe in accordance with applicable requirements of the specified references, the manufacturer's instructions and as specified herein.

.3 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.

# PART 2 PRODUCTS

## 2.1 HDPE LANDFILL GAS, COMPRESSED AIR, AND CONDENSATE FORCEMAIN

.1 Landfill Gas Headers and Sub-Laterals: HDPE SDR 17; size as shown on Drawings.

.2 Compressed Air piping: HDPE SDR 11; size as shown on Drawings.

.3 Forcemain piping: HDPE SDR 11; size as shown on Drawings.

.4 Piping Specifications:

.1 Landfill Gas:

.1 For Vacuum Service:

.1 Piping shall meet ASTM F2619 or have the same compound standards as specified in CSA B137.4, Clause 4.1.1.

.2 Approved Product: Chevron Performance Pipe Driscoplex 1000, 4000 or Engineer approved equivalent.

.2 For Positive Pressure service, not for distributing landfill gas off-site:

.1 Piping shall comply with ASTM D2513.

.2 Approved Product: Chevron Performance Pipe Driscoplex 6400, or Engineer approved equivalent.

.3 For Positive Pressure service where gas is being distributed off-site:

.1 Piping shall comply with CSA B137.4.

.2 Approved Product: Chevron Performance Pipe Driscoplex 8100, 8300 or Engineer approved equivalent.

.5 Accessories:

.1 Fittings: Fabricated sweeps shall be used where shown on the drawings. Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps, and other configurations required. Equivalent or greater pressure rating as pipe when installed.

.2 Joints: Thermal butt-fusion, except where connecting to valves, flanged connections at valves.

.3 Flanges:

.1 ASTM A536 ductile iron backing flanges with Class 150 ANSI B 16.5 standard drilling and corrosion resistant coatings. Complete with one-piece molded polyethylene stub ends. Connections to have same or greater pressure rating as pipe.

.2 Blind Flanges on Compressed Air Pipe must be 316 Stainless Steel.

.4 Gaskets:

.1 Landfill Gas

.1 Negative Pressure Applications: 150lb full face, Neoprene, 60 Durometer, suitable for use with R.F. or lap flanges, 1/8” thick, Garlock 7986 or Engineer approved equivalent.

.2 Positive Pressure Applications:

.1 Buna-N Full Face Flange Gasket, 1/16” thick, Garlock 3000 or Engineer approved equivalent.

.2 For Higher Temperature applications exceeding 100°C (212 °F):

.1 Teflon Ring Gasket, 1/16” thick.

.2 Spiral Wound Gasket, SS outer ring, SS304 inner ring, PTFE/SS304 Winding Material.

.3 Other Owner approved equivalent.

.2 Compressed Air Applications: 150lb full face, carbon black with nitrile, suitable for use with R.F. flanges, 1/8" thick, Garlock 9850 or Engineer approved equivalent.

.3 Cool Condensate Applications: 150lb full face, carbon black with nitrile, suitable for use with R.F. flanges, 1/8" thick, Garlock 9850 or Engineer approved equivalent.

.5 Bolts: When using flat faced flanges and Garlock Blue-Gard 3000, the use of high strength Type 2 bolts and nuts are required.

.6 Buried Flanges: Where necessary to bury flanged connection, wrap flange in Denso LT tape over Denso Mastic.

.7 Electrofusion Couplings: Friatec or approved equal.

## 2.2 BEDDING AND COVER

.1 Bedding for landfill gas headers, laterals and sub-laterals, compressed air, as well as condensate force main headers, laterals, and sub-laterals: Imported sand, or Granular A, unless indicated otherwise on the drawings.

.2 Cover: Final cover as specified in Section 31 22 19 – Finish Grading for pipes on landfill.

.3 Pipe bedding at all road crossings should be lean-mix concrete and extend 2.0 meters past the road edges unless otherwise indicated on the drawings.

## 2.3 CLAY PLUG

.1 Install a clay plug around gas pipe that penetrates from inside the waste to outside the waste.

.2 Clay is available onsite ~~for~~ use by Contractor.

## 2.4 UNDERGROUND WARNING TAPE

.1 Description: 100 mm wide plastic tape, coloured yellow with suitable warning legend describing buried gas line.

## 2.5 TRACER WIRE

.1 A.W.G. 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.

.1 Copperhead 1230-BHS or approved equivalent.

.2 Minimum Roll Length: 300 m.

.3 Connections: New connections (12-gauge AWG CCS wire) or connection to existing tracer wire (8–14-gauge AWG wire) shall use DryConn 3-way direct bury lug style connectors (Copperhead Model 3WB-01) or approved equivalent. All connectors shall be filled with a waterproof dielectric silicone and rated for direct bury application.

## 2.6 PIPE INSULATION

.1 Insulation shall be closed-cell, rigid sheets manufactured from polystyrene foam or approved equal suitable for buried installation. The material shall conform to the following specifications:

.1 Thermal Resistance 1.74 °C/m$^2$/50 mm as per ASTM C177 and C518.

.2 Compressive Strength 275 kPa (min.) as per ASTM D1621.

.3 Shear Strength 200 kPa (avg.) as per ASTM D1621.

.4 Water Absorption 0.7% by volume (max.) as per ASTM D2842.

.2 Shall be Dow HI 40 or approved equal.

# PART 3 EXECUTION

## 3.1 PIPING INTERCONNECTION PLAN

.1 Provide a written plan for making connections to existing landfill gas, compressed air, and/or forcemain piping, as requested by the Engineer. The plan shall include details on isolating landfill gas supply, pneumatic energy, condensate flow, etc. in order to safely tie into the existing system.

## 3.2 EXAMINATION

.1 Verify that excavation base is ready to receive work and excavations, dimensions, and elevations are as indicated on Drawings.

## 3.3 PREPARATION

.1 Hand trim excavations to required elevations. Correct over-excavation with Granular A.

.2 Remove large stones or other hard matter, which could damage piping or impede consistent backfilling or compaction.

## 3.4 BEDDING

.1 Excavate pipe trench in accordance with Section 31 23 00 for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.

.2 Place bedding material at trench bottom, level materials in continuous layer not exceeding 150 mm compacted depth.

.3 Maintain optimum moisture content of bedding material to attain required compaction density.

.4 Where laterals or sublaterals run under temporary or permanent road crossings, Contractor to replace granular A bedding with lean-mix concrete, as indicated on drawings.

.1 Locations of road crossings may be identified and adjusted throughout the Works. Engineer or Owner to direct Contractor on locations where additional bedding requirements are applicable.

## 3.5 HDPE PIPE

.1 Prevent debris and water from entering inside of pipe.

.2 Do not bend in a radius smaller than recommended by manufacturer when staged on Site or installed in the trench.

.3 The joining of HDPE pipe and fittings shall be performed in accordance with CSA Z662.

.4 Thermal fusion will be performed in an area near the installation location to avoid excessive transportation and possible damage to the pipe.

.5 Prior to initiating thermal fusion in the field on any pipe on a given day, Contractor will provide a test weld and operating data to Engineer including welding temperature, machine number, date of last service and clearance certificate.

.6 Install pipe, fittings, and accessories in accordance with ASTM D2321 and manufacturer's instructions.

.7 Place pipe on minimum 100 mm deep bed of sand on landfill.

.8 Lay pipe to slope gradients noted on Drawings with maximum variation from true slope of 5 mm in 3 m. Maintain positive drainage for condensate on all pipe sections.

.9 Engineer reserves right to modify design pipe alignments as deemed necessary.

.10 Install aggregate at sides and over top of pipe installation. Provide top cover to minimum compacted thickness of 300 mm, compact to 95 percent.

.11 Refer to Section 31 23 00 - Excavation, Backfilling, and Compacting for trenching requirements. Do not displace or damage pipe when compacting.

.12 Install tracer wire continuous along top of pipe. Install tracer wire as a single continuous wire. Splicing of wire, if necessary, shall be done in such a way to produce an electrically and mechanically sound connection. Coordinate with Section 31 23 00. Bring end of tracer wire above ground at each pipe riser or ground/pipe interface and terminate the wire about 300mm above ground by wrapping the end 600mm of wire around the pipe. Coordinate with Section 31 23 00 - Excavation, Backfilling, and Compacting.

.1 Where connecting new HDPE piping and tracer wire to existing installation, Contractor to connect tracer wire on existing pipe to new installation and ensure connectivity.

.13 Seal (cap) end of all landfill gas pipelines at the end of the working day or when work on a length of pipe is not scheduled to continue.

.14 Coordinate all thermal fusion joints to existing piping with the Engineer to minimize excessive air intrusion into the existing landfill gas extraction system.

.15 The Contractor is to ensure that thermal fusion is conducted in a safe manner and explosive levels of landfill gas do not exist in the pipe to be joined using thermal fusion.

.16 For areas where minimum cover cannot be maintained, install insulation over HDPE pipe.

.17 Extrusion welding will not be permitted unless approved by Engineer on a case-by-case basis.

## 3.6 INSTALLATION OF LEAN-MIX CONCRETE BEDDING AROUND EXISTING LATERAL

.1 Notify Owner and Engineer a minimum of five business days before starting works.

.2 Coordinate the works with the Owners landfill gas system operator. Landfill gas system operator may isolate the lateral, compressed air or forcemain pipe from the active system to reduce or eliminate the risk of a spill in the event that the pipe is damaged.

.3 Utilize excavation and daylighting techniques that will minimize risk of damage to the existing landfill gas lateral pipe, compressed air pipe and forcemain pipe. If existing HDPE is damaged, immediate notify Owner and Engineer.

.4 Contractor is responsible for repairing any pipe that is damaged as a result of the work.

.5 Daylight the existing HDPE pipes, remove existing bedding material and replace with lean-mix concrete, as indicated on drawings.

.6 Contractor to ensure daylighted sections of pipe are properly supported throughout the works to ensure the pipe does not belly and a minimum of 3% slope is maintained at completion.

.7 Replace/repair tracer wire and warning tape that may be damaged from the works.

.8 Backfill trench, following compaction requirements as stated under Section 31 23 00, and perform general restoration.

## 3.7 FIELD QUALITY CONTROL

.1 Request inspection prior to placing aggregate cover over pipe.

.2 Compaction testing will be performed in accordance with OPSS 501.

.3 If tests indicate Works does not meet specified requirements, remove Works, replace, and retest.

.4 Pressure and Leakage Test: Test as follows:

.1 Provide labour, equipment and materials required to perform leakage tests herein specified; notify Engineer at least 24 hours in advance of all proposed tests; perform tests in the presence of Engineer.

.2 Test at one time as much of the piping system as practical and authorized by Engineer.

.3 Test all landfill gas piping at a pressure of 3 psi. Utilize compressed air to charge the pipelines and maintain pressure for adequate period to allow for expansion of the piping. All fittings, valves, and expansion joints are to be accessible for inspection during the pressure test. A pressure test will 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 (33.8 °F) during this period or adjusted with the appropriate correction factor.

.4 Class 150 ANSI blind steel flanges shall be used for temporary pressure testing connections.

.5 Test all compressed air and forcemain piping at a pressure of 125 psi.

.6 Cap all seal and testing ports at the termination of the pressure test.

.7 Examine joints for leakage and remove any joints showing leakage from the pipeline, rejoin, and retest the system.

.8 Ensure that normal safety precautions are observed for exposed piping.

.9 Locate and repair defects if leakage occurs.

.10 Repeat test until no measurable pressure drop is recorded for full length of line.

.11 Use pressure gauge with appropriate range and scale.

.12 Submit pressure test report indicating date, test pressure, duration and pass/fail for each section of pipe tested.

.5 Verify tracer wire installation by using low frequency (512 Hz or similar) line locating equipment.

## 3.8 PROTECTION OF FINISHED WORK

.1 Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

# PART 4 MEASUREMENT AND PAYMENT

## 4.1 HDPE PIPING

.1 Schedule of Prices Item Nos. 50-1, 50-2, 50-3, 50-4, 50-5

.2 Measurement: By the linear metre along the centerline of pipe, per meter, as specified for each payment item.

.3 Payment: Includes excavation, bedding, pipe and fittings, tracer wire, warning tape, disposal of excess garbage, backfill and compaction, rough restoration. Includes supply and installation of lean mix concrete bedding, where indicated on drawings. Includes clay plug where piping crosses limit of waste.

## 4.2 INSTALLATION OF LEAN-MIX CONCRETE BEDDING AROUND EXISTING LATERALS

.1 Schedule of Prices Item No. 50-6.

.2 Measurement: By the linear metre along the centerline of pipe, per meter, as specified for each payment item.

.3 Payment: Includes daylighting and excavation of existing pipe, supporting existing HDPE pipes, supply and installation of lean-mix concrete, removal and disposal of excess materials. Includes backfill and general compaction, rough restoration.

## 4.3 PRESSURE TESTING

.1 Schedule of Prices Item No. 50-13.

.2 Measurement: Lump Sum.

.3 Payment: Includes submission of pressure testing plan for approval, pressure testing of piping and other components, as required.

**END OF SECTION 33 52 16**

# TABLE OF CONTENTS

# PART 1 GENERAL

## 1.1 DESCRIPTION

.1 Requirements for the supply and installation of various landfill gas collection system components including wellheads, flow control assemblies, and drain traps. Also includes renovation work as specified herein.

## 1.2 RELATED SECTIONS

.1 Section 31 23 00 – Excavation, Backfilling and Compacting.

.2 Section 33 52 16 – HDPE Wellfield Piping.

.3 Section 33 52 18 – HDPE Chambers.

## 1.3 REFERENCES AND CODES

.1 OPSS 401 – Trenching, Backfilling and Compaction.

.2 OPSS 402 – Excavating, Backfilling and Compacting for Maintenance Holes, Catchbasins, Ditch Inlets and Valve Chambers.

.3 OPSS 407 – Maintenance Hole, Catch Basins, Ditch Inlets and Valve Chamber Installation.

.4 OPSS 501 – Compacting.

.5 OPSS 517 – Dewatering of Pipeline, Utility and Associated Structure Excavation.

.6 OPSS 518 – Control of Water from Dewatering Operations.

.7 OPSS 1351 – Precast Reinforced Concrete Components for Maintenance Holes, Catch Basins, Ditch Inlets, and Valve Chambers.

.8 OPSS 1850 – Frames, Grates, Covers, and Gratings.

.9 ANSI B16.1 - Cast Iron Pipe Flanges and Flanged Fittings.

.10 ANSI B18.2 - Hex Bolts

.11 ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

.12 ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.

.13 ASTM A194 - Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.

.14 ASTM A536 - Standard Specification for Ductile Iron Castings.

.15 ASTM D1784 - Standard Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.

.16 ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.

.17 ASTM D2241 - Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).

.18 ASTM D2467 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.

.19 ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

.20 ASTM F438 - Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40.

.21 ASTM F439 - Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.

.22 ASTM F493 - Standard Specification for Solvent Cements for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.

## 1.4 SUBMITTALS

.1 Product Data: Provide manufacturer's data on valves and valve boxes, wellheads, pumps, and pipe seals.

.2 Submittals must be received by Engineer minimum of 14 days in advance of delivery to the Site.

## 1.5 ENVIRONMENTAL REQUIREMENTS

.1 Follow Health and Safety Plan at all times.

.2 Protect open excavations against damage due to surface runoff and run-on. Take necessary precautions to prevent erosion of excavated or disturbed surfaces.

## 1.6 SEQUENCING AND SCHEDULING

.1 Sequence and schedule excavation activities with work of other Sections.

.2 Do not commence excavation operations until the Site-specific Health and Safety Plan has been reviewed by Engineer and implemented.

.3 Coordinate and sequence excavation operations to minimize the need for temporary stockpiling excavated materials until required for back filling. Make every effort to balance cut and fill operations and to ensure that any excavated material designated for backfill is immediately placed as backfill in Works. Keep the time during which excavations remain open to the practicable minimum.

.4 Do not allow or cause any of work performed to be covered up or enclosed prior to required inspections, tests, or approvals.

# PART 2 PRODUCTS

## 2.1 HDPE PIPE AND FITTINGS

.1 All HDPE piping and fittings will conform to the requirements specified in Section 33 52 16 – HDPE Wellfield Piping.

## 2.2 PVC PIPE AND MISC. FITTINGS

.1 PVC pipe and fittings will be Schedule 80 Type IV, Grade 1, ASTM D1784. Schedule 40 pipe and fittings shall not be used.

.2 Socket type joints will be solvent welded or cemented as per ASTM F438, ASTM F439. Flanged connections will be provided as shown on the Drawings to permit future disassembly.

.3 Fittings will be as specified under Item 2.2.1. PVC fittings will be standard commercial products fabricated by moulding or by extrusion and machining and will conform to the requirements of ASTM D1785, ASTM D2241, and ASTM D2467.

.4 Flanges to be as specified under Item 2.2.3 faced and drilled to 125- pound ANSI B16.1 standard. Gaskets will be flat full faced, 3 mm thick, fabricated from neoprene with a hardness of 50 to 70 durometer A. When mating flange has raised face, use flat ring gasket, and provide filler gasket between OD of raised face and flange OD to protect PVC flange from bolting moment.

.5 All bolting to meet Type 316 stainless steel, ASTM A193, Grade BEM hex head bolts and ASTM A194, Grade 8M hex nuts. Bolts will be fabricated in accordance with ANSI B18.2 and provide with washers of the same material as the bolts.

.6 Anti-seize lubricant must be used on bolts and threaded fasteners.

.7 Thread sealing compounds/pipe thread PTFE sealants, such as Pipe-Dope or similar, may not be used on threaded fittings, unless approved by Engineer on a case-by-case basis.

.8 All socket connection will be joined with PVC solvent cement conforming to ASTM F493. Manufacture and viscosity will be as recommended by the pipe and fitting manufacturer to assure compatibility.

.9 Minimum strength of heavy-duty cement to be used for bonding of fittings.

.10 PVC fittings and pipe shall not be used for compressed air service.

## 2.3 FLOW CONTROL ASSEMBLIES

.1 Valves: See Article 2.4.

.2 Accessories: 50 mm operating nut, equipped and suitable for buried service, valve operator extension stem fabricated from 12 mm diameter steel rod with square socket on bottom and square nut on top and epoxy coated. Fabricate such that excessive torque will shear a shear pin holding square nut on top before damaging valve or valve operator. Submit sample for Engineer approval. Provide steel T-bar of sufficient length to operate valves from ground surface.

## 2.4 LANDFILL GAS FLOW CONTROL VALVES AND ISOLATION VALVES

.1 All Flow Control Assembly valves shall be Model 397-809 full lug butterfly valves as manufactured by ABZ, or Series 31 Trim 125 or Series 3A butterfly valves as manufactured by Bray or approved equal.

.2 Size: As shown on Drawings.

.3 The valve body shall be of Cast Iron ASTM A-126 Class B or Ductile Iron ASTM A536 grade 65-45-12 with drilled and tapped lugs. The neck of the valve shall be extended to allow 2” of insulation.

.4 The Disc and Stem shall be 316 Stainless Steel and the shaft shall engage the disc with an internal drive. No screws or pins shall be used on the disc allowing for positive engagement with no possibility of the screws or pins to vibrate or shearing free.

.5 The seat shall be Buna-N and shall be molded to the body to prevent collapsing or stretching and allowing for complete dead end service rating with one flange removed. The seat shall be suitable for methane gas service.

.6 Bushing: Bushings shall be wear resistant Graphite / Teflon impregnated or Acetal and shall be self-lubricating.

.7 All butterfly valves shall be supplied with a manual gear actuator suitable for buried service. The gear shall have a ductile iron worm gear and a bronze segment gear assembly. The gear set shall be permanently grease packed to stop any ingress of water. The gear casing and cover shall be ductile iron and shall be sealed with a suitable non degradable cover gasket. The gear shall have heavy duty adjustable travel stops. The input shaft shall be 316/304 stainless steel and shall have an O-ring or loaded packing seal. The lower gear casing shall have an oil type seal. The butterfly/gear assembly shall have a 2" operating nut assembly to drive the valve open and close with a "T" style handle. All fasteners shall be stainless steel. The operating nut pin shall be 316 stainless steel, suitable for buried service, and shall NOT SHEAR under a heavy load.

.8 HDPE spacers shall be used on both sides of the valve to allow for clearance of the disc into the HDPE pipe and flange. HDPE spacers not required when using Bray Series 3A valves. The flange shall not be modified (cut back) to allow for disc clearance. The spacer shall be of the full-face style with drilled holes that allow for the flanged bolts to pass through the spacer and into the valve body allowing for positive alignment even if the piping moves in the ground under load. The spacer shall have a grooved face for positive sealing under pressure. A full-face neoprene gasket shall be used to seal the spacer to the HPDE flange. Spacers provided shall be recommended and approved for use by the valve manufacturer for this application.

.9 The monitoring port box and valve operator extension (for buried gear operators) shall be manufactured of PVC, green sewer pipe meeting ASTM D3034 and shall be provided with a slip cap with the O-ring removed. White Sch. 40 DWV shall not be used unless approved by Engineer.

.10 EPDM seal and seat materials will not be accepted. Acceptable materials of construction will include Buna-N (nitrile), Teflon, or Viton.

.11 Approved Suppliers: John Brooks Company – 1-877-624-5757 or Bray, Dave Bramston – 905-569-2729, or approved equal.

## 2.5 MANHOLE GAS EXTRACTION WELLHEAD ASSEMBLIES

.1 Valve: 50 mm, QED precision wellhead with P/N ORP215M-R and orifice plate set with P/N 40770.

.2 Flex Hose: 50m, QED Solarguard flex hose secured with QED Banding Kit.

## 2.6 EXISTING EXTRACTION WELL ASSEMBLIES

.1 Flex Hose: 75 mm nominal diameter clear PVC hose and clamps. Hose to be Kanaflex 101PS with 89 mm I.D. Clamps to be 75 mm Powerlock Clamp PS.

## 2.7 PIPE SEALS

.1 The seal for pipe entries into the manholes shall be a modular mechanical type consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe and wall opening, as manufactured by Thunderline Corporation, Linkseal Model OS, or as manufactured by Advance Products & Systems, Inc. Innerlynx Model OS316.

.2 Wall Opening: The wall opening size and type shall be selected according to manufacturer's recommendations.

.3 The elastomeric element shall be sized and selected per manufacturer's recommendations and have the following properties as designated by ASTM:

.1 For hydrocarbon service applications (-40 deg F to 210 deg F) NITRILE = ASTM D2000 M1BF510

## 2.8 APPURTENANCES FOR PUMP DRAIN TRAPS

.1 The leachate extraction pump for pump drain traps will be a submersible pneumatic type capable of installation in 150 mm sumps. Pumps shall be QED Environmental Systems (QED) Aggressive Fluids Long AP-4/BL leachate pump, or approved equal, equipped as follows but not limited:

.1 FRP casing.

.2 Bottom Loading Intake with 3" extended screen.

.3 316 Stainless Steel 1" discharge check valve.

.4 316 Stainless Steel quick connects and tubing pigtails.

.5 SS support harness not required.

.6 Two (2) year parts and labour warranty.

.7 Jacketed tubing bundle. 3-Tube set (1" OD, ½" OD, 5/8" OD).

.8 316 Stainless Steel quick connect coupler fittings at the pump for all connections.

.1 For compressed air service – Dixon V-Series valved quick couplers.

.2 For all other service – Dixon V-Series unvalved quick couplers.

.2 Nylon rope to be 16mm (5/8") yellow, braided polypropylene rope.

.3 Compressed Air and Forcemain Hose: Rated for 300 psi service, constructed of oil and heat resistant synthetic rubber inner tube with MSHA approved weather, abrasion, and oil resistant cover (blue for compressed air, red for forcemain, green

for air discharge). RMA Class B minimum. Insta-Grip 300 or approved equal. Size as indicated on drawings.

.1 The pump will come complete with sufficient tubing, piping, and fittings for use within the pump drain trap.

.4 The well cap (QED drawing #912250-SUBM) shall be suitable for wells under pressure (vacuum) equipped as follows, but not limited to:

.1 316 Stainless Steel quick connect(s) on top of cap.
.2 316 Stainless Steel barbs on bottom of the cap.
.3 316 Stainless Steel Pressure relief valve.
.4 316 Stainless Steel eye bolt on the bottom of the cap.
.5 25 mm threaded monitoring port and 25 mm MPT plug.
.6 Flexible seal for the casing, sized as appropriately.

.5 FR-60 ¼" Filter regulator & pump cycle counter (QED drawing #922474), equipped as follows, but not limited to:

.1 5-micron filter element.
.2 Regulator and 160 psi/11 bar gauge assembly.
.3 Metal bowl.
.4 Automatic condensate drain.
.5 Mounting bracket.
.6 Inlet side – supply hose 316 SS quick connect.
.7 Outlet side – 316 SS elbow and pump cycle counter with digit counter with 6-digit counter, 316 SS barb for 3/8" ID pump air hose.

.6 Check valve for pump discharge cap shall be Chemkor PVC ball check valve, with threaded ends and Viton ball seat, or approved equal.

.7 Approved Supplier: QED Environmental Systems, Val Nielsen, Regional Sales Manager, (613) 983-1784.

## PART 3 EXECUTION

### 3.1 GENERAL

.1 Conduct the excavation, pipe and chamber installation and trench backfilling work in accordance with all applicable federal, provincial, and municipal regulations including the Ministry of Labour Occupational Health and Safety Act and Regulations for Construction projects.

## 3.2 EXCAVATION AND BACKFILLING

.1 Conduct all excavation and backfilling work required to install the gas and compressed air piping and condensate forcemain in accordance Section 33 52 16 – HDPE Wellfield Piping.

## 3.3 HDPE PIPING

.1 The installation, joining and testing of the HDPE components of the gas collection, compressed air, and condensate force main piping will be in accordance with the drawings and will conform to the requirements specified in Section 33 52 16 – HDPE Wellfield Piping.

## 3.4 PVC PIPE AND FITTINGS

.1 All rigid PVC pipe and fittings will be cut, assembled, and installed in accordance with the pipe manufacturer's recommendations.

.2 Pipe will not be laid when the temperature is below 4°C (39.2 °F), nor above 32° C (89.6 °F) when exposed to direct sunlight. Ends to be jointed will be shielded from direct sunlight prior to and during the laying operation.

.3 Provide adequate ventilation when working with pipe joint solvent cement. PVC components to be solvent welded will be clean and dry.

## 3.5 INSTALLING VALVES AND FITTINGS

.1 Install valves and fittings in accordance with manufacturer's instructions.

.2 Ensure proper operation of valves in both fully closed and fully open positions.

.3 Install pipe spacers to ensure full range of valve operations for all pipe/valve connections.

## 3.6 INSTALLING PIPING

.1 Install piping and connections as shown on the drawings.

.2 Join piping in accordance with Wellfield Piping sections.

.3 Provide adequate support for all piping.

.4 Coordinate installation of piping with other contractors.

## 3.7 RENOVATION OF EXISTING GAS WELL

.1 Notify Owner and Engineer a minimum of five business days before starting works.

.2 Coordinate the works with the Owners landfill gas system operator. Landfill gas system operator may isolate sections of the existing Big "O" and/or isolate the extraction well prior to Contractor performing the work.

.3 Disconnect existing Big "O" pipe and dispose of excess materials.

.4 Supply all new materials from the existing gate valve to the sublateral pipe, as indicated on drawings.

## 3.8 TOLERANCES

.1 Maximum Variation from Plumb: 1 degree.

.2 Maximum Offset from True Alignment: 100 mm.

# PART 4 MEASUREMENT AND PAYMENT

## 4.1 FLOW CONTROL ASSEMBLY

.1 See Form of Tender Item No. 50-9

.2 Measurement: Each.

.3 Payment: Includes supply and installation of all components in the flow control assemblies as shown on the contract drawings, including, but not limited to all valves, spacers, fittings, and pipe. Also includes excavation, bedding, backfill, and compaction.

## 4.2 CONNECTION OF MANHOLE TO GAS EXTRACTION SYSTEM

.1 See Form of Tender Item No. 50-11, 50-12

.2 Measurement: Each.

.3 Payment: Includes supply and installation of all components as shown on the drawings including, but not limited to, all fittings, pipe, valves, and pipe seals. Also includes excavation, bedding, backfill, compaction, and coring into manhole.

## 4.3 PUMP DRAIN TRAP

.1 See Form of Tender Item No. 50-7, 50-8

.2 Measurement: Each.

.3 Payment: Includes supply and installation of all components in the drain trap assembly as shown on the drawings including, but not limited to, all fittings, pipe,

valves, spacers, pump, and accessories. Includes supply and installation of HDPE chamber, lid, and warning sign. Also includes excavation, bedding, backfill and compaction.

## 4.4 RENOVATION OF EXISTING EXTRACTION WELL

.1 See Form of Tender Item No. 50-10.

.2 Measurement: Each.

.3 Payment: Includes supply and installation of all components shown on the wellhead renovation detail from the existing gas extraction well to the sub-lateral piping as shown on the drawings including, but not limited to, all fittings, flexible hose, pipe, and valves. Includes removal and disposal of existing, above ground Big "O" to each applicable well location.

**END OF SECTION 33 52 17**

# TABLE OF CONTENTS

## PART 1 GENERAL

### 1.1 DESCRIPTION

.1 Requirements for the supply and installation of HDPE chambers.

### 1.2 RELATED SECTIONS

.1 Section 31 23 00 – Excavation, Backfilling and Compacting.

.2 Section 31 22 19 – Finish Grading.

.3 Section 33 52 16 – HDPE Wellfield Piping.

.4 Section 33 52 17 – Landfill Gas Appurtenances.

### 1.2 SUBMITTALS

.1 Shop Drawings: chamber, lid, and warning sign.

.2 Product Data: Provide manufacturers data on padlocks.

### 1.3 EXISTING CONDITIONS

.1 Verify existing conditions and grades.

## PART 2 PRODUCTS

### 2.1 HIGH DENSITY POLYETHYLENE PIPE

.1 Provide 1200 mm diameter HDPE DR32.5 pipe, with polyethylene lid, HDPE bottom collar, pea stone base, access port, lock hasps, and padlocks.

.2 Pipe to conform to Section 33 52 16 – HDPE Wellfield Piping.

.3 Padlocks: Manufacturer American Lock Company, aluminum, Type 10 Lock. Provide padlocks for all chambers (2 per chamber).

### 2.2 WARNING SIGNS

.1 Warning Signs:

.1 Install on all condensate pump drain trap chamber lids.

.2 Constructed of aluminum plate stock.

.3 Approximately 450 mm by 450 mm.

.4 Red and black letters on white background reading:

WARNING
HAZARDOUS GASES PRESENT

PERSONNEL ENTERING THIS CHAMBER MUST FOLLOW CONFINED SPACE ENTRY PROCEDURES. CHECK FOR:

1) COMBUSTIBLE GAS
2) OXYGEN DEFICIENCY
3) TOXIC GAS

## 2.3 HARDWARE

.1 All hardware to be galvanized.

## 2.4 CHAMBER INSULATION

.1 Urtech RE insulation pre-formed shells or approved equivalent with protective exterior membrane, suitable for outdoor, buried use meeting the following:

.1 Minimum thermal resistance (R value) of 7.9 $ft^2$*h* ºF/Btu*in at 2 days at 23ºC,

.2 Water absorption of <1.50%,

.3 Sized for gapless fit around exterior of chamber.

.2 Fasteners: Stainless steel bands secured around pre-formed shells.

.3 Sealant: Silicone to seal between joints.

.1 Recommended Supplier: Isotex-Pro International Inc (IPI Isolation Thermique), Mathieu Bertrand – 418-839-6776 x 225, or approved equal.

## 2.5 UNDERSIDE LID GASKET SEAL

.1 Gasket material is to be installed on the under-side of the pump drain trap lid. Gasket shall be 9.5 mm in thickness, neoprene and cover the entire area on the bottom of the lid. The gasket shall be glued to the lid with constructive adhesive such as PL Premium, or approved equivalent.

# PART 3 EXECUTION

## 3.1 EXAMINATION

.1 Verify items provided by other Sections are properly sized and located.

## 3.2 TOLERANCES FOR PLACEMENT OF CHAMBERS

.1 Maximum Variation from Plumb: 1 degree.

.2 Maximum Offset from True Alignment: 100 mm.

# PART 4 MEASUREMENT AND PAYMENT

## 4.1 CHAMBERS

.1 No separate payment will be made.

.2 Payment: Included in other Payment Items.

**END OF SECTION 33 52 18**

ESSEX-WINDSOR SOLID WASTE AUTHORITY
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# 2024 LANDFILL GAS COLLECTION SYSTEM EXPANSION

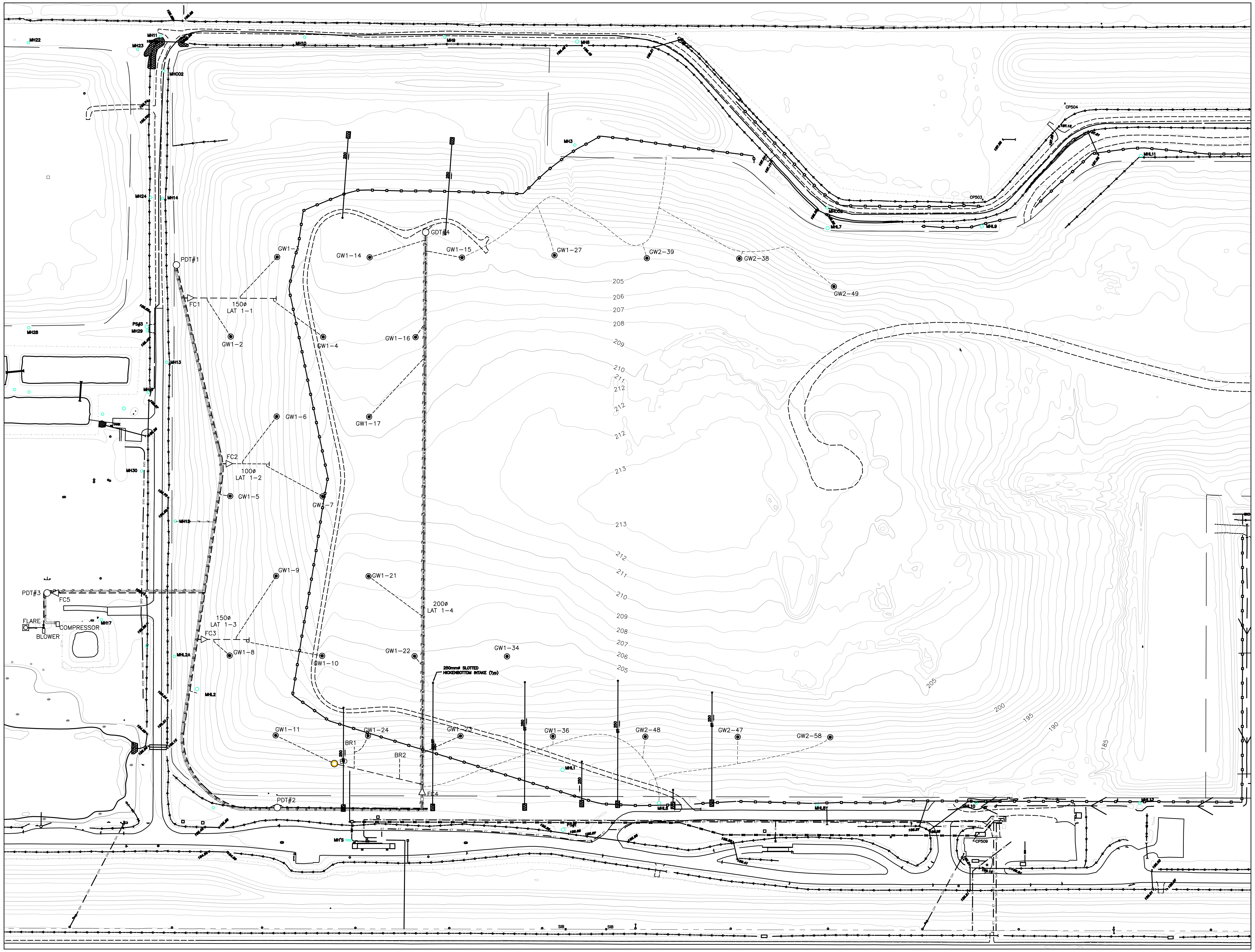
COMCOR
ENVIRONMENTAL LIMITED
Consulting Engineers and Landfill Gas Specialists

INTEGRATED GAS RECOVERY SERVICES
A Landfill Gas Utilization Company

## LIST OF DRAWINGS

**Issued for Tender**
**May 10, 2024**

May 10, 2024 12:56:43 PM



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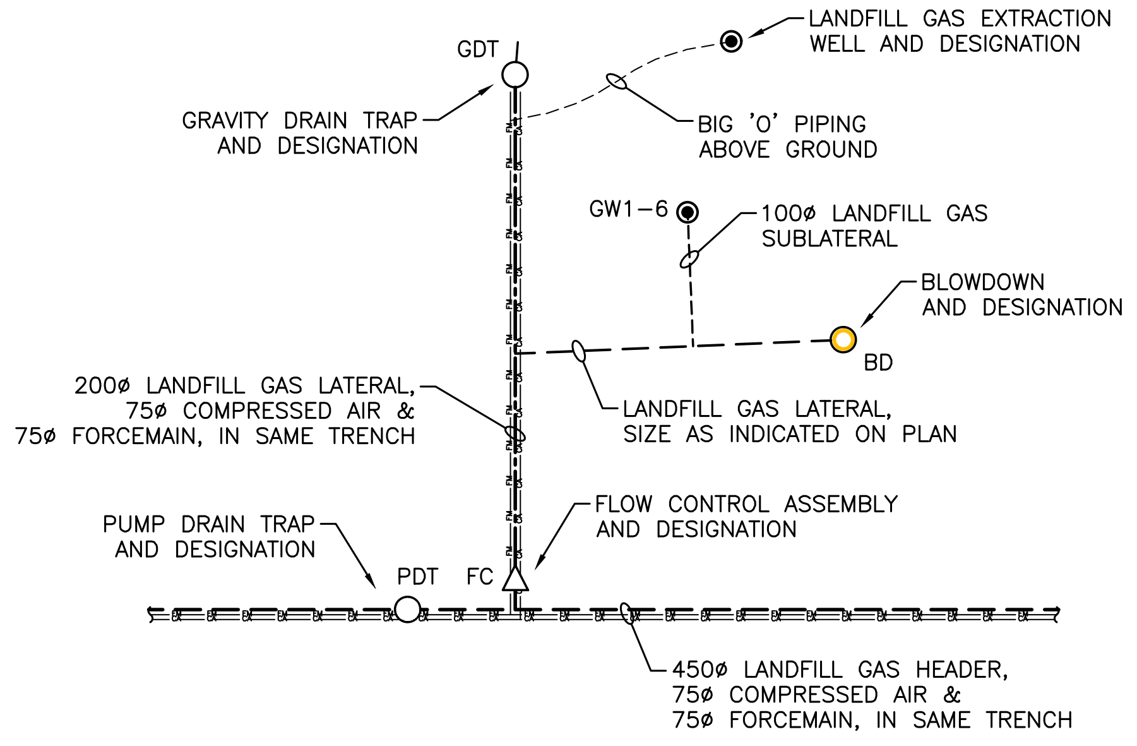

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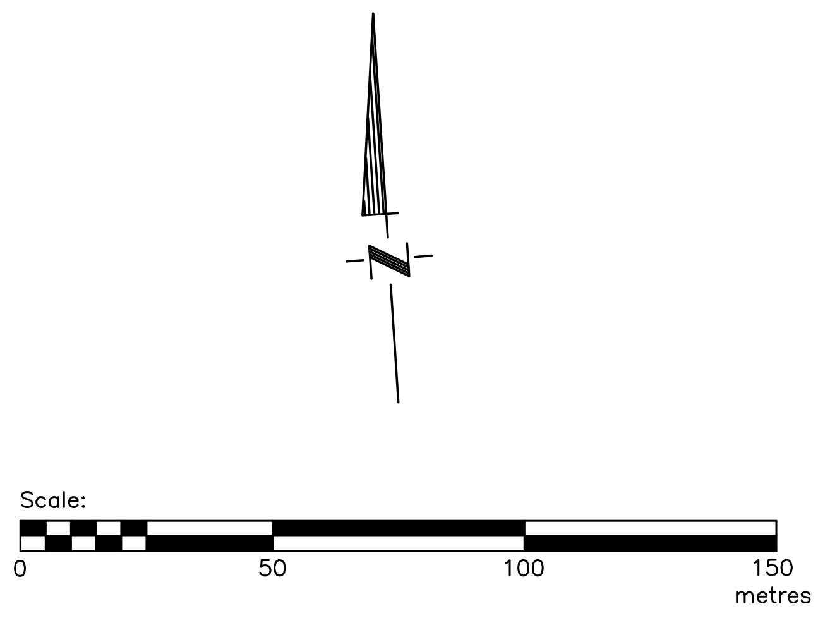

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| NO. | REVISION | DATE | DES. | DWN. | CHK. |
|---|---|---|---|---|---|
| 1 | ISSUED FOR REVIEW | May 8, 2024 | JDP | JDP | DPP |
| 2 | ISSUED FOR TENDER | May 10, 2024 | JDP | JDP | DPP |
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NOTES:
1. SITE INFORMATION PROVIDED BY WSP.
2. GROUND SURFACE BASED ON 2023 SURVEY PROVIDED BY WSP.

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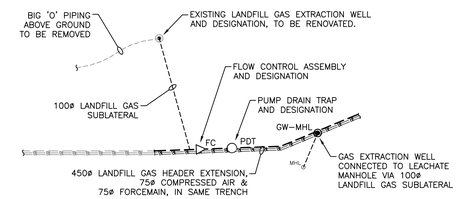
# 2024 LANDFILL GAS COLLECTION SYSTEM EXPANSION

## DRAWING # W1001
## EXISTING SITE CONDITIONS


LEGEND

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Scale:
0 50 100 150 metres

| NO. | REVISION | DATE | DES. | DWN. | CHK. |
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1. SITE INFORMATION PROVIDED BY WSP.
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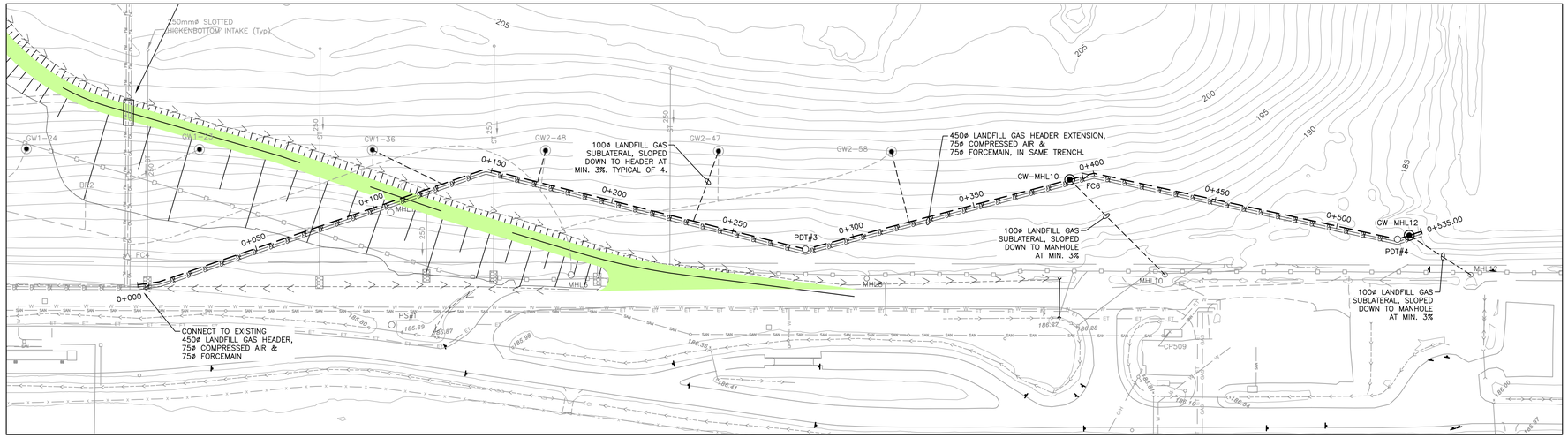
2024 LANDFILL GAS COLLECTION SYSTEM EXPANSION

DRAWING # W1002
PROPOSED SYSTEM LAYOUT




PLAN

Scale:
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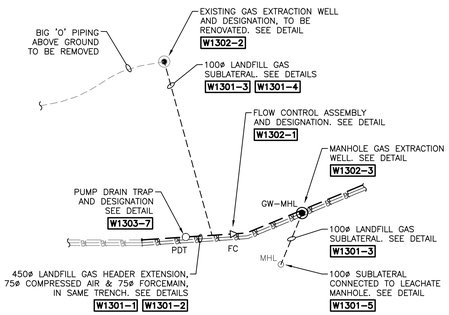
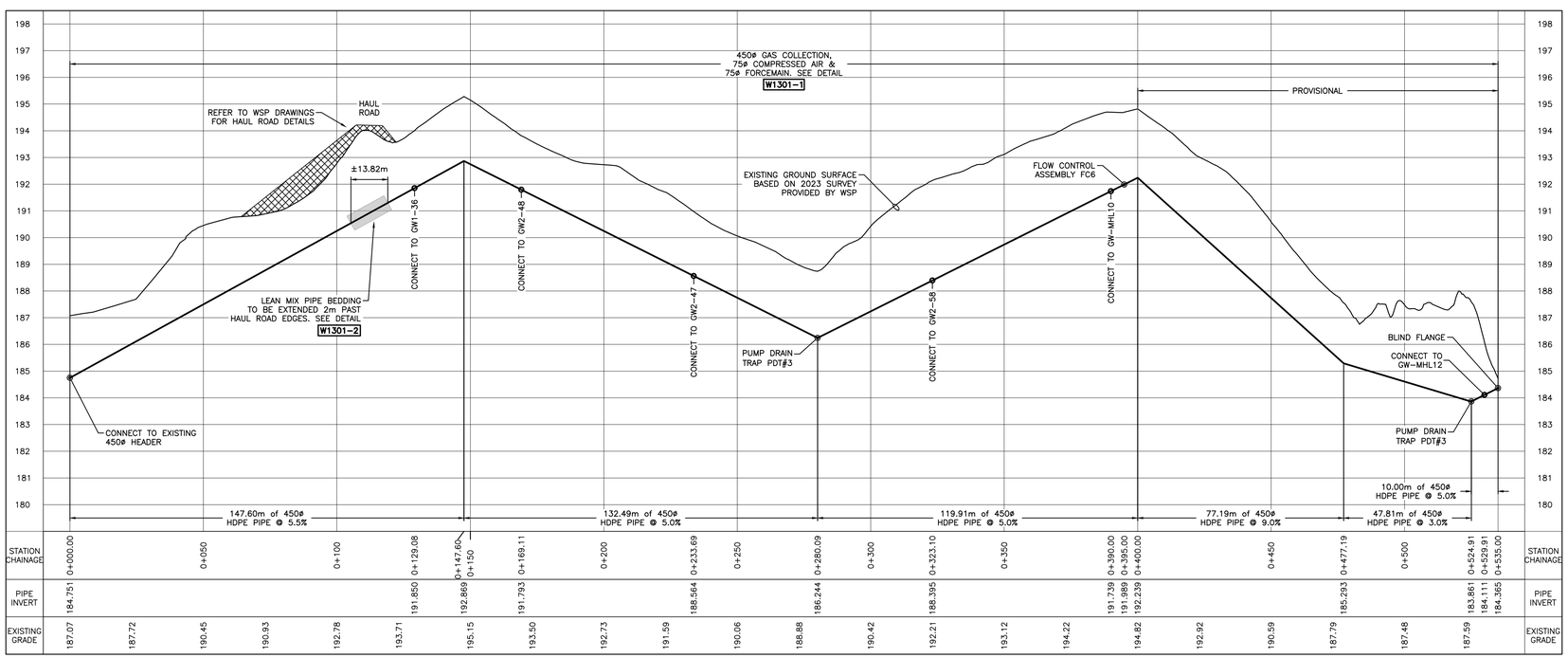
LEGEND




PROFILE

0 10 20 30 40 50 metres

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|---|---|---|---|---|---|
| 1 | ISSUED FOR REVIEW | May 8, 2024 | JDP | JDP | DPP |
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NOTES:
1. SITE INFORMATION PROVIDED BY WSP.
2. GROUND SURFACE BASED ON 2023 SURVEY PROVIDED BY WSP.
3. IN STEEPLY SLOPED AREAS WITHIN THE LIMIT OF WASTE OF THE LANDFILL AREA, INSTALL PIPING TO MAINTAIN MINIMUM COVER (1.2m) AND MINIMUM 3% SLOPE (OR SLOPE AS INDICATED). OUTSIDE THE LIMITS OF THE LANDFILL AREA, MAINTAIN MINIMUM COVER (1.2m) AND MINIMUM 1% SLOPE (OR SLOPE AS INDICATED).
4. CONTRACTOR TO VERIFY LOCATION AND INVERTS OF EXISTING PIPING WHERE NEW CONNECTIONS ARE TO BE MADE, AND NOTIFY THE ENGINEER OF THE RESULTS. ENGINEER RESERVES THE RIGHT TO MODIFY PIPE ALIGNMENTS AND PROFILES TO MAINTAIN REQUIRED MINIMUM COVER AND SLOPE OF LANDFILL GAS PIPING.

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320 Pinebush Road, Suite 12, Cambridge, Ontario N1T 1Z6
tel (519) 621-6669 • fax (519) 621-9944

INTEGRATED GAS RECOVERY SERVICES
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EWSWA
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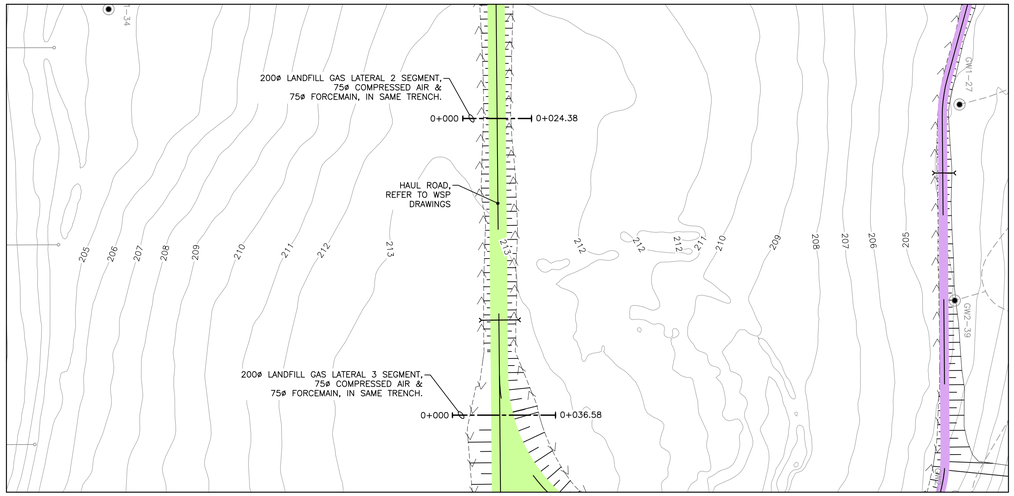
2024 LANDFILL GAS COLLECTION SYSTEM EXPANSION

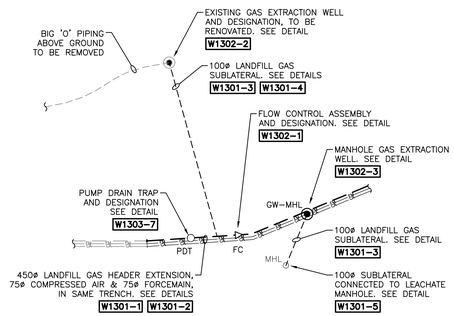
DRAWING # W1101
PLAN & PROFILE –
450ø HEADER EXTENSION

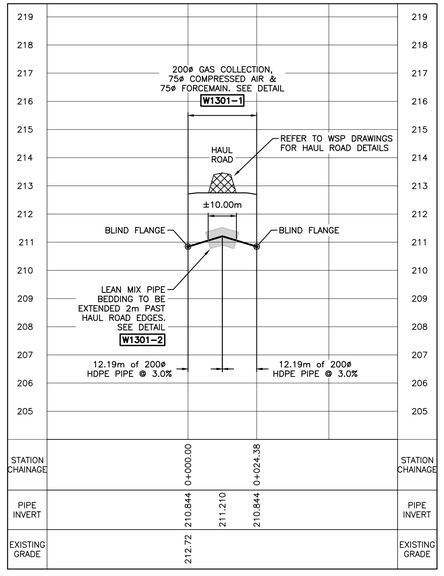



PLAN

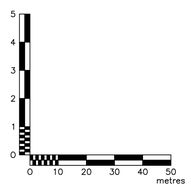
Scale:
0 25 50 100 metres

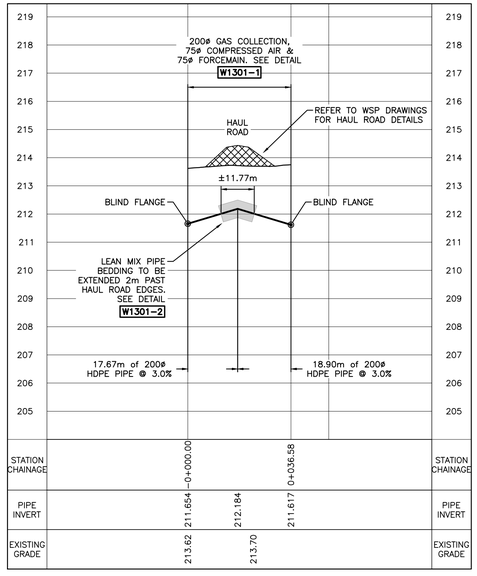
LEGEND




PROFILE – 200ø LATERAL 2 SEGMENT




PROFILE – 200ø LATERAL 3 SEGMENT

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**NOT FOR CONSTRUCTION**

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|---|---|---|---|---|---|
| 1 | ISSUED FOR REVIEW | May 8, 2024 | JDP | JDP | DPP |
| 2 | ISSUED FOR TENDER | May 10, 2024 | JDP | JDP | DPP |

NOTES:
1. SITE INFORMATION PROVIDED BY WSP.
2. GROUND SURFACE BASED ON 2023 SURVEY PROVIDED BY WSP.
3. IN STEEPLY SLOPED AREAS WITHIN THE LIMIT OF WASTE OF THE LANDFILL AREA, INSTALL PIPING TO MAINTAIN MINIMUM COVER (1.2m) AND MINIMUM 3% SLOPE (OR SLOPE AS INDICATED). OUTSIDE THE LIMITS OF THE LANDFILL AREA, MAINTAIN MINIMUM COVER (1.2m) AND MINIMUM 1% SLOPE (OR SLOPE AS INDICATED).
4. CONTRACTOR TO VERIFY LOCATION AND INVERTS OF EXISTING PIPING WHERE NEW CONNECTIONS ARE TO BE MADE, AND NOTIFY THE ENGINEER OF THE RESULTS. ENGINEER RESERVES THE RIGHT TO MODIFY PIPE ALIGNMENTS AND PROFILES TO MAINTAIN REQUIRED MINIMUM COVER AND SLOPE OF LANDFILL GAS PIPING.

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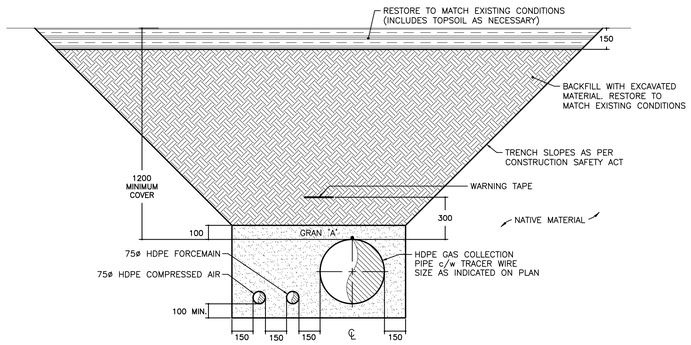
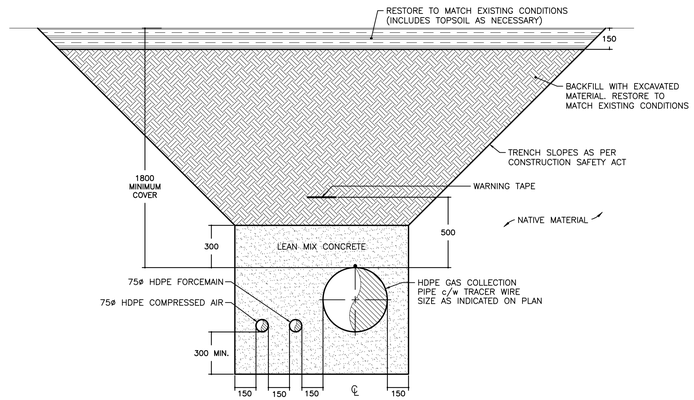
2024 LANDFILL GAS COLLECTION SYSTEM EXPANSION

DRAWING # W1201
PLAN & PROFILE – 200ø LATERAL SEGMENTS



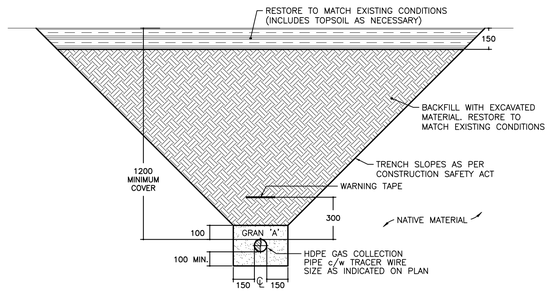

THREE (3) PIPE TRENCH DETAIL W1301–1

SEE SCALE BAR




THREE (3) PIPE TRENCH DETAIL AT ROAD CROSSINGS W1301–2

SEE SCALE BAR

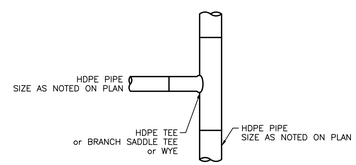



ONE (1) PIPE TRENCH DETAIL W1301–3

SEE SCALE BAR

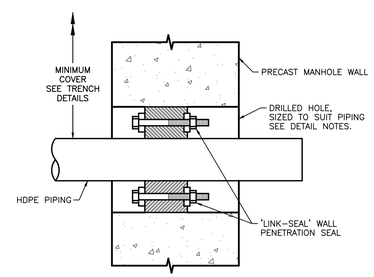
TRENCH DETAIL NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR THE REPAIR OF ANY EXISTING SUBSURFACE PIPING DAMAGED, INCLUDING WARNING TAPE, TRACER WIRE AND PIPE BEDDING, DURING THE INSTALLATION OF NEW PIPING.
2. WHERE ENCOUNTERED, RE–COMPACT CLAY COVER TO 95% S.P.D.
3. GRANULAR 'A' BEDDING EXCEPT:
   - 3.1. AT ALL ROAD CROSSINGS WHERE PIPE BEDDING TO BE LEAN MIX CONCRETE. LEAN MIX CONCRETE TO EXTEND 2m PAST ROAD EDGES.
   - 3.2. WHERE PIPE CROSSES THROUGH LIMIT OF WASTE, BEDDING SHALL BE COMPACTED CLAY, HORIZONTAL LENGTH OF 5m CENTERED AROUND LIMIT OF WASTE.




TYPICAL HDPE PIPE CONNECTION W1301–4

NOT TO SCALE




DETAIL NOTES:

1. GROUT OPENING WITH NON–SHRINK GROUT.

PIPE PENETRATION INTO CHAMBER DETAIL W1301–5

NOT TO SCALE

**FOR TENDER ONLY**
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Scale:
0 500 1000 2000 millimetres

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NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL HDPE PIPE SIZES ARE IPS UNLESS NOTED OTHERWISE.
3. ALL HDPE GAS COLLECTION PIPING IS DR17.
4. ALL HDPE COMPRESSED AIR & FORCEMAIN PIPING IS DR11.


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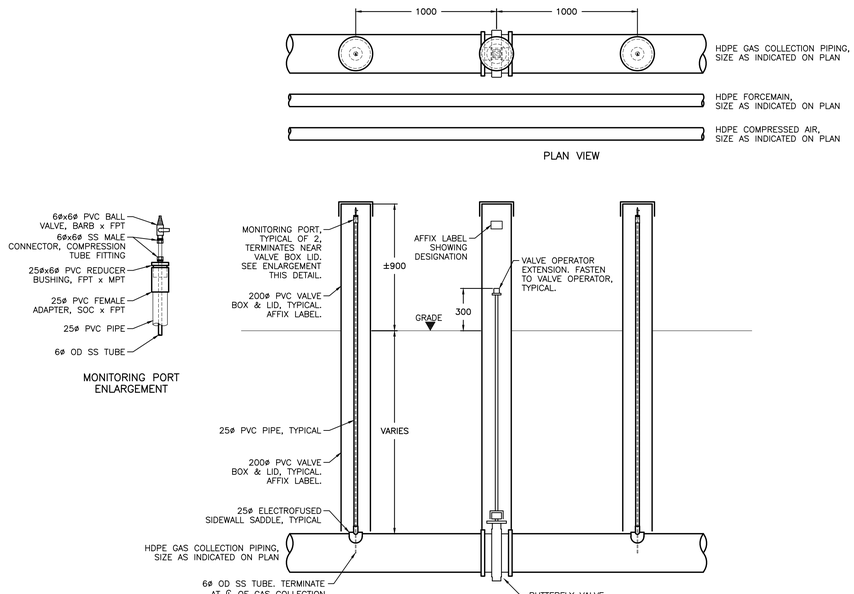
2024 LANDFILL GAS
COLLECTION SYSTEM EXPANSION

DRAWING # W1301
TRENCH & SYSTEM DETAILS




FLOW CONTROL DETAIL NOTES:
1. COMPRESSED AIR & FORCEMAIN PIPING NOT SHOWN IN SECTION, FOR CLARITY. REFER TO PLAN VIEW THIS DETAIL AND TRENCH DETAILS FOR ACTUAL LOCATIONS.

Scale:
0 500 1000 2000 millimetres

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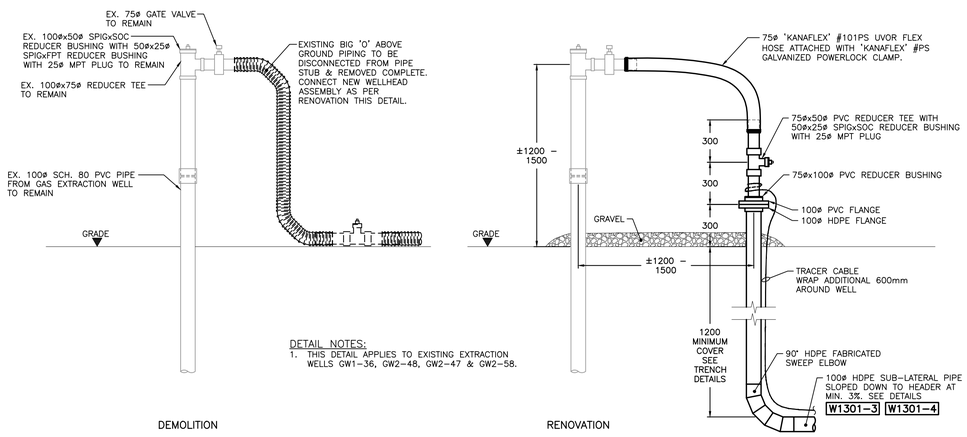
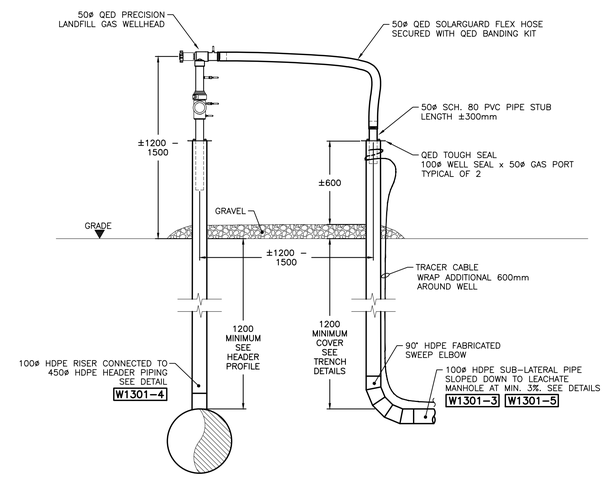
FLOW CONTROL ASSEMBLY (FC) DETAIL — W1302–1
SEE SCALE BAR




DETAIL NOTES:
1. THIS DETAIL APPLIES TO EXISTING EXTRACTION WELLS GW1–36, GW2–48, GW2–47 & GW2–58.

EXISTING EXTRACTION WELL RENOVATION DETAIL — W1302–2
SEE SCALE BAR




MANHOLE GAS EXTRACTION WELL DETAIL — W1302–3
SEE SCALE BAR

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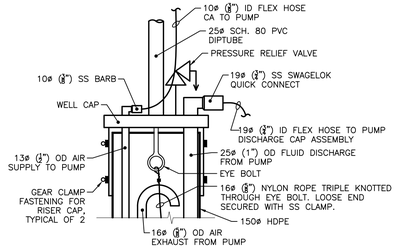
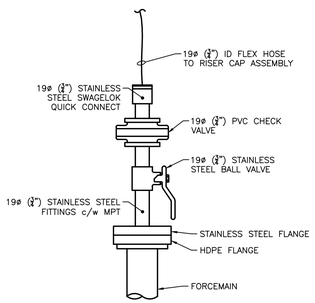
2024 LANDFILL GAS COLLECTION SYSTEM EXPANSION

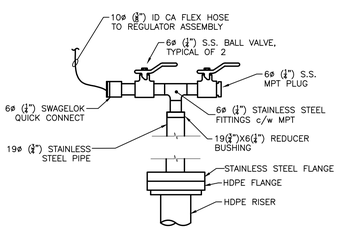
DRAWING # W1302
SYSTEM DETAILS



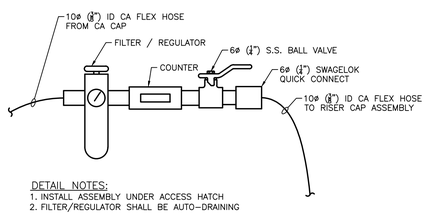

RISER CAP ASSEMBLY W1303–1
Not to Scale




FORCEMAIN CAP ASSEMBLY W1303–2
Not to Scale

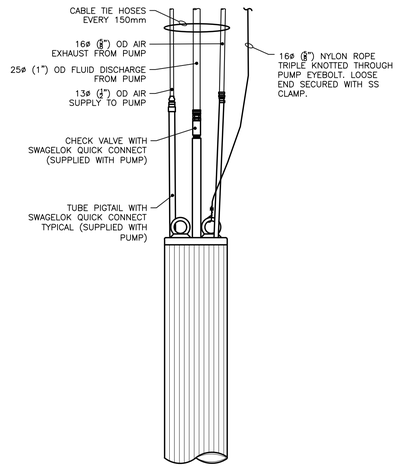



COMPRESSED AIR CAP ASSEMBLY W1303–3
Not to Scale




DETAIL NOTES:
1. INSTALL ASSEMBLY UNDER ACCESS HATCH
2. FILTER/REGULATOR SHALL BE AUTO–DRAINING

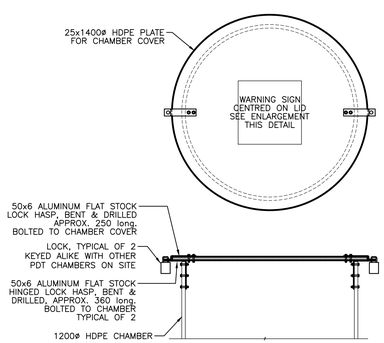
PUMP COUNTER AND FILTER / REGULATOR ASSEMBLY W1303–4
Not to Scale



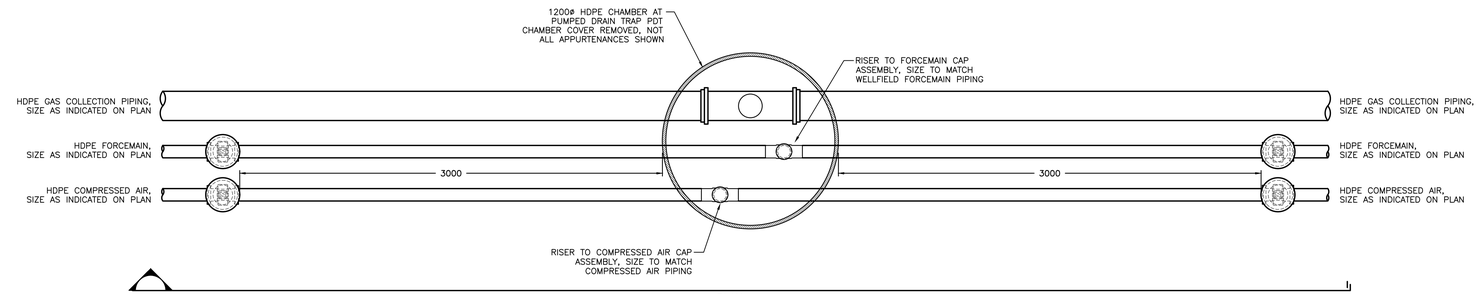

DETAIL NOTES:
1. PROVIDE SUFFICIENT LENGTH OF HOSES TO ALLOW REMOVAL OF PUMP FROM ABOVE GROUND.
2. NYLON ROPE FOR PUMP REMOVAL ATTACHED TO WELLCAP EYE BOLT.

PUMP ASSEMBLY W1303–5
Not to Scale

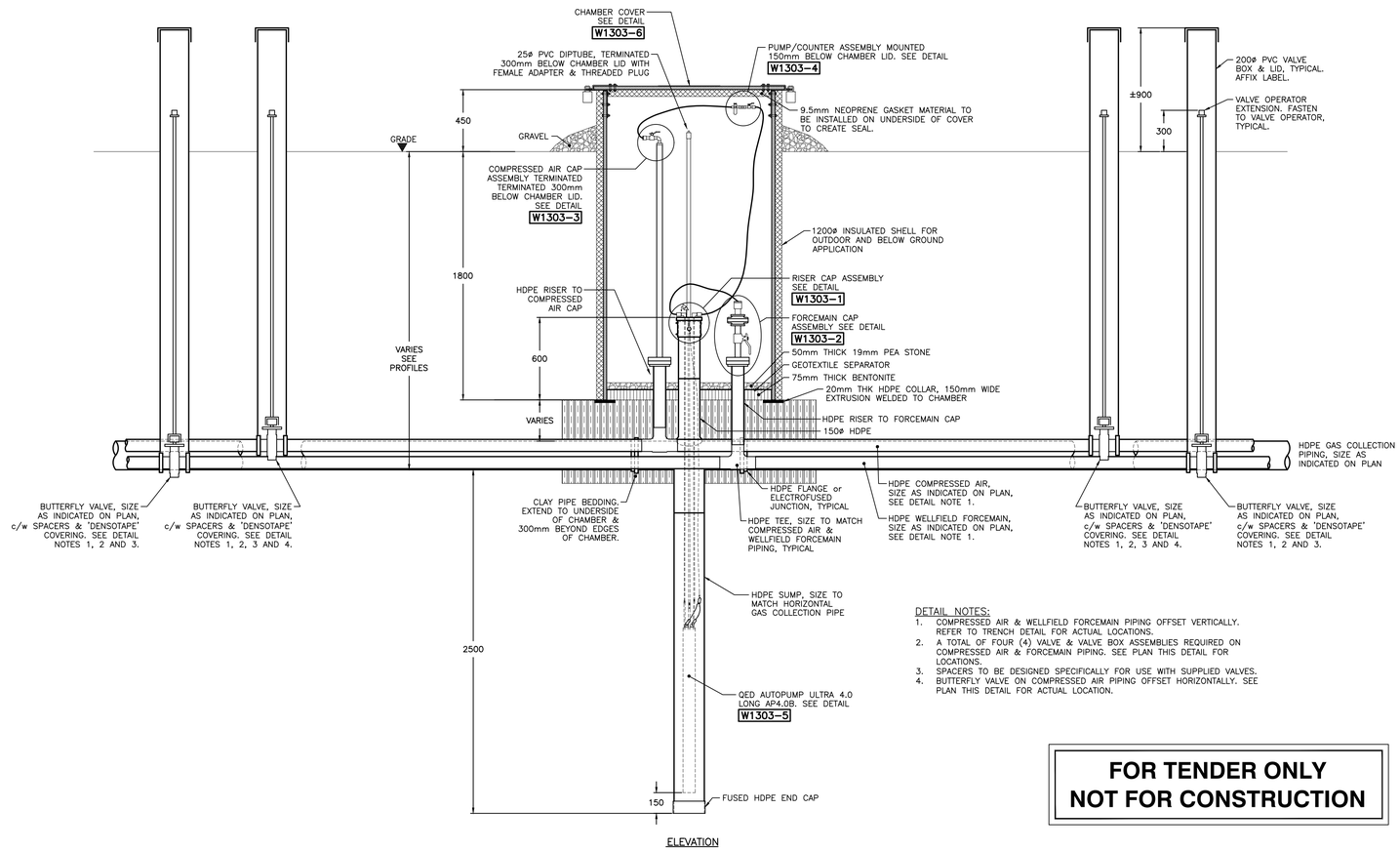

WARNING SIGN ENLARGEMENT




CHAMBER COVER W1303–6
SCALE: 1:20




PLAN




ELEVATION

DETAIL NOTES:
1. COMPRESSED AIR & WELLFIELD FORCEMAIN PIPING OFFSET VERTICALLY. REFER TO TRENCH DETAIL FOR ACTUAL LOCATIONS.
2. A TOTAL OF FOUR (4) VALVE & VALVE BOX ASSEMBLIES REQUIRED ON COMPRESSED AIR & FORCEMAIN PIPING. SEE PLAN THIS DETAIL FOR LOCATIONS.
3. SPACERS TO BE DESIGNED SPECIFICALLY FOR USE WITH SUPPLIED VALVES.
4. BUTTERFLY VALVE ON COMPRESSED AIR PIPING OFFSET HORIZONTALLY. SEE PLAN THIS DETAIL FOR ACTUAL LOCATION.

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PUMPED CONDENSATE DRAIN TRAP (PDT) DETAIL W1303–7
SCALE: 1:20

Scale:
0 500 1000 2000 millimetres

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DRAWING # W1303
PUMP DRAIN TRAP DETAILS