

IMPERIAL OIL LIMITED AND SHELL CANADA PIPELINES RELOCATIONS WORKS

PHASE II- HORIZONTAL DIRECTIONAL DRILL (HDD) CROSSING

Engineering Work Package
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1.0 Project Overview

The widening and expansion of Plessis Road in Winnipeg, Manitoba will require several pipelines to be relocated within their existing right of way. Specifically, pipelines belonging to Shell Oil will require relocation due to the underpass as-designed for the Canadian National (CN) Rail Redditt Subdivision crossing at Plessis Road. Installation of the relocated pipelines will be completed before certain construction works associated with the rail crossing are begun.

As part of the design process, we will provide liaison with CN Rail, Shell Oil and the City of Winnipeg to confirm that permits required during construction, such as a City of Winnipeg Excavation Cut Permit are addressed prior to construction commencing. We will confirm agency needs and requirements at project outset.

2.0 Terminology

This section defines the terms used in this Engineering Work Package.

Term	Description
Work	The scope shown on the referenced drawings and described in this Engineering Work Package and C1.1 (ii)
Owner	Shell Oil
Contract Administrator	AECOM/City of Winnipeg
Contractor	General mainline contractor hired to perform the Work described in this Engineering Work Package and C1.1 (ii)
“must”	Signifies a legal or statutory requirement
“shall”	Signifies a requirement made mandatory by this Engineering Work Package
“may”	Signifies a feature which is discretionary in the context in which it is applied

3.0 Scope of Work

The pipeline Engineering Work Package includes, but is not limited to, the following:

- a. Prepare of the ROW for construction.
- b. Install carrier pipes under Plessis Rd. utilizing horizontal directional drilling methodology,
 - Install approximately 200 m of 219.1 mm OD (NPS 8), 0.322" WT (8.18 mm WT) SMLS CSA Z245.1, API 5L Grade X52 (52,000 psi), Category II pipe, externally coated with 16-18 mils FBE / 20 mils ARO Coatings for carrier pipe north of Shell 1962 existing line.
 - Install approximately 200 m of 219.1 mm OD (NPS 8), 0.322" WT (8.18 mm WT) SMLS CSA Z245.1, API 5L Grade X52 (52,000 psi), Category II pipe, externally coated with 16-18 mils FBE / 20 mils ARO Coatings for carrier pipe south of Shell 1975 existing line.

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- c. Excavate tie-in pits per drawing U238-2014-3007.
- d. Hydrovac tie-in locations and pipeline/utility crossings. Test for disposal suitability and disposal of hydrovac fluid waste.
- e. Verify prior to construction the wall thickness and grade of original pipe that is to be tied-into to ensure there is no material mismatch. A spark test shall be conducted on the original pipe, on the same joints where the tie-in welds will be competed, to verify that the carbon equivalency is in accordance with the welding specification being used.
- f. Complete all bedding, welding, coating of field welds, trench, bedding and padding, and backfilling. Sand shall be used as bedding and for material surrounding the pipe. The sand bedding shall have a minimum thickness of 150 mm.
- g. Develop a pig survey plan and perform caliper/geometry pig runs in accordance to Owner's guidance. Contractor shall use third party in-line inspection outfits such as T.D. Williamson and ROSEN Inspection, or approved equivalent to perform the work.
- h. Clean and run a sizing and bend plate prior to hydrostatic testing, including location and repair of any dents or ovalities concluded unacceptable by the sizing plate. The sizing plate shall be 95% of the nominal internal diameter of the pipe, and the bend shall be 3D.
- i. Hydrostatic test of the replacement pipes including filling, dewatering, and drying of the pipeline. The pipeline shall be dried to a level of dryness acceptable to the Owner.
- j. Remove and dispose of existing Shell 8" lines and cased crossings under Plessis Rd. in accordance with regulator and environmental requirements.
- k. Restore ROW to its original condition.
- l. Redline all construction drawings (as well as survey drawings), including collecting weld map of all welds, NDE numbers, clearances from crossed pipelines, bends, facility layout and boundaries.

The Contractor is to perform work in accordance with the construction drawings.

4.0 Location

The work described in this work package will take place within the City of Winnipeg, Manitoba.

5.0 Technical Documents

The design and construction of the pipeline system will be in accordance with the Manitoba Innovation, Energy and Mines – Petroleum Division. In complying with the pipeline regulations, the pipeline system will meet or exceed the requirements of the Canadian Standards Association (CSA) standard CSA Z662-11, Oil and Gas Pipeline Systems, and other codes and standards referenced therein.

CSA Z662 invokes a series of industry standards and practices for material, components and construction. Section 2.1 of CZA Z662 lists reference publications and standards, which are

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supplemented and or qualified by CSA Z662. These publications and standards are grouped by organizations including the Canadian Standards Association (CSA), the American National Standards Institute (ANSI), the American Society of Mechanical Engineers (ASME), the American Petroleum Institute (API), and the American Society for Testing Material (ASTM), the Manufacturer's Standardization Society (MSS) and others. The materials and equipment to be purchased shall meet all required applicable standards, specifications and codes for the relevant jurisdiction.

Codes, rules, standards, and specifications listed or referenced in this section are a minimum and are not intended to represent the full scope of required or applicable standards.

5.1 Design Guidelines, Procedures and Specifications

The following drawings and data sheets will form part of this work package:

Drawing Title	Drawing Number
HDD Plan & Profile (2) Shell 200mm Pipelines (1962 & 1975) – Plessis Rd. Crossings	U238-2014-3007
Transcona Valve Station - Winnipeg Terminal Tie-In Location Piping Plan	U238-2014-3008
Transcona Valve Station - Winnipeg Terminal Tie-In Location Piping Sections	U238-2014-3009

5.2 Regulations, Standards and Specifications

The following specifications will form part of this work package:

No.1	Description	Document Number	Effective Date
1	Shell Onshore Pipeline Installation	-	2013
2	Hydrostatic Pressure Testing of Pipeline Facilities	-	2013
3	Application of Fusion-Bonded Epoxy Coating on Line Pipe	26TS-001	2011
4	Manitoba Oil and Gas Act	C.C.SM. c. 034	2013
5	Oil and Gas Pipeline Systems	CSA Z662-11	2012

6.0 Surveys

6.1 Construction Survey

The Contract Administrator will engage a construction survey contractor that will complete the following activities:

- Locate and stake construction ROW boundaries, including the extra temporary work spaces as specified in the drawing or as directed by the Contract Administrator. Boundaries shall be established from existing legal monuments along the ROW.

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- In areas where clearing is required, all foreign line crossings will be staked and the nearest Contract Administrator pipeline will also be staked to keep equipment away from existing pipelines.
- Locate environmental, archaeological, and historical sites and identify other items on the lands line list such as trees or shrubs to be saved, tree windbreaks to be bored, and other special concerns to be staked. Survey Contractor is responsible to make arrangements for all utility locates.
- Locate, stake, and flag any pertinent adjacent crossings of third party or Contract Administrator lines.
- Stake and reference the centerline of the proposed pipeline on offset measurements from the nearest existing parallel pipeline, legal limit or proposed legal limit, as defined by the drawings or as directed by field inspection. The proposed ditch line will normally be staked only once by the survey Contractor. All points of inflections (PIs) shall be referenced by the Contractor for recovery during construction.
- The survey contractor will station the centerline of the proposed pipeline along the work side every 50 m. The mainline Contractor will be responsible for maintaining the proposed or surveyed location of the pipeline centerline while construction activities progress on the ROW.
- Stake and reference the various topsoil stripping widths and erosion protection procedures in accordance with Chief Inspector's instructions, pipeline alignment sheets or both.

6.2 Geotechnical Survey Data

Geotechnical data in the immediate area of the proposed HDD crossing has been obtained and is available for the Contractor's review and use. A geotechnical firm drilled several soil borings to a depth greater than the maximum depth of the proposed HDD, and soil analyses were performed. The geotechnical data is presented to the Contractor for information only. The Contractor may drill additional borings if it feels that additional information is required. The Contractor shall be responsible for the cost of these additional explorations. Any additional exploration work shall first be coordinated with, and approved by, the Owner or Owner's Engineer.

6.3 Mapping of Horizontal Directionally Drilled Pipeline

The Contractor shall document the three dimensional (x,y,z) location of the directionally drilled pipeline prior to placing pipeline in service. This shall be accomplished through the use of Geo-spatial Smart Probe Technology, or approved equal. Deliverable shall include an AutoCAD plan and profile as-built, referenced to the project survey coordinate system; a PDF version of the AutoCAD depiction; and a Comma Separated Value (CSV) file documenting the horizontal coordinates (X,Y) and elevation (Z) in 0.30-meter intervals along the length of the directional drilled pipeline. The Contractor shall submit the mapping documentation within 5 days of completion of the HDD installation. Mapping shall be tied to the established construction survey reference points.

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7.0 HDD Crossing

7.1 General

The Contract Administrator will provide the Contractor with preliminary Drawings indicating the designed alignment and drill profile for the proposed HDDs. The Contractor agrees that it has full responsibility for the final HDD design in the Project and that the Contractor shall furnish the HDD design of the Project, regardless of the fact that certain preliminary design work occurred and is provided to the Contractor prior to the date of execution of the Contract. The Contractor specifically acknowledges and agrees that:

1. The Contractor is not entitled to rely on and has not relied on: (i) the informational documents; or (ii) any other documents or information provided, unless such reliance is specifically permitted in the Contract.
2. The Contractor's Warranties and indemnities hereunder cover any error, omission, inconsistency, inaccuracy, deficiency or other defect in the Scope of Work even though they may be related to error, omission, inconsistency, inaccuracy, deficiency or other defect in the informational documents.

Prior to mobilization, the Contractor shall review the geotechnical survey data and the drawings and conduct site inspections to determine if further geotechnical or other investigations are required. Contractor shall provide the results of the site inspections, as well as its recommendations, to the Contract Administrator.

The Contractor shall construct the HDD crossings in accordance with the drawings and crossing agreements. The Contractor shall ensure that the crossings are installed at the minimum depths of cover and at the set-back distances indicated in the HDD crossing drawing(s).

7.2 Submittals

The Contractor shall submit a preliminary Horizontal Directional Drilling Installation Plan for the HDD post tender process. At a minimum, the plan shall include the following information:

- Description of drilling equipment including a brief work history (pipeline diameters, length of drills, soil types, pull forces experienced) and rig capacities including maximum push/pull and rotational capabilities
- Description of drill rig anchoring systems, including sketches
- Description of auxiliary equipment (type and capacity), including high pressure fluid pumps and fluid recirculation and cleaning system
- Manufacturer and type of survey and tracking systems for pilot hole drilling and for documenting pipeline location after installation
- Facility layout sketches for entry point and exit point work sites, including location of mud pits
- Schedule indicating sequence and durations of the individual drilling operations
- Number of anticipated reaming passes and diameter of each pass, including the pilot hole

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- Anticipated drilling fluid properties for the expected drilling conditions, including additives
- Range of anticipated drilling fluid downhole pressures and flow rates
- Recovery method in case of lodged drill string or pipe string

This Plan will be finalized during the preconstruction phase of the project and submitted for approval by the Contract Administrator. The final Drilling Plan must be approved prior to the start of HDD activities.

The Contractor shall provide the following submittals for review and approval at least 4 weeks prior to HDD construction:

1. Design Calculations: Include pipe stress calculations for the critical proposed alignments (length, depth, and curvature), supervised and stamped by a qualified professional engineer and including the pipe manufacturer's recommended safe pull capacity.
2. Design Drawings: Submit intended HDD plan and profile alignment with stations, equipment staging areas, pit excavation locations and dimensions, underground utilities, and traffic control schematics.
3. A Drilling Fluid and Cuttings Management Plan, which may be incorporated in the Horizontal Directional Drilling Installation Plan, that will detail the fluid design, handling, storage, solids control, and containment method, clean up, disposal and monitoring processes and procedures for the management of the drilling fluids.

7.3 Drilling Fluids and Water

The Contractor shall use a high-quality bentonite and water mixture in the composition of the drilling fluids. Where appropriate, Contract Administrator approved benign polymers and other additives may be used. The composition of all drilling fluids proposed, as well as a Material Safety Data Sheet (MSDS) for each component, shall be provided to the Contract Administrator Representative. The composition of drilling mud, cement, cement-related additives and liquid shall be environmentally safe, acceptable to jurisdictional authorities and pre-approved by the Contract Administrator Representative.

The Contractor is responsible for containing, transporting and disposing of excess drilling fluid in conformance with applicable environmental regulations, ROW and work space agreements and permit requirements. Disposal of excess drilling fluid shall not be conducted without prior approval of the Contract Administrator Representative.

At all times during drilling operations, the Contractor shall strive to maintain full annular circulation of drilling fluids. Inadvertent drilling fluid returns (at locations other than the entry and exit points) shall be minimized. If annular circulation is lost, the Contractor shall take immediate action to restore circulation.

The Contractor shall check the HDD alignment a minimum of twice daily for signs of leaks or seeps of drilling fluid. In the event such inadvertent surface returns of drilling fluid are detected, drilling operations shall be suspended until the returns are contained. The Contractor shall contain inadvertent returns with barriers such as ground sheets, hay bales, silt fences, booms, absorbent pads and/or containment pits, as necessary.

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7.4 Pilot Hole Drilling and Tracking

At all times during drilling operations, the Contractor shall provide and maintain instrumentation that will perform the following functions:

- Locate the pilot hole position;
- Measure the drill string axial loads;
- Measure the drill string torsional loads;
- Measure drilling fluid discharge pressure and flow rate.

The Contractor shall provide Contract Administrator access to instrumentation and instrument readings at all times. The Contractor shall provide Contract Administrator with necessary conversion charts to convert control instrument readings (e.g. hydraulic pressures of travel and rotary motors) into applicable load value units.

The position of the pilot hole shall be monitored by the Contractor with downhole survey instruments and verified with a surface locating system (i.e. TruTracker, ParaTrack, or equivalent). Contractor shall use two independent methods to monitor the bore profile. The Contract Administrator Representative shall have access to these instruments and their readings at all times. Survey reports and data to calculate the minimum radius of each three-joint segment shall be submitted to the Contract Administrator Representative at the end of each shift during pilot hole operations and a final (all inclusive) report shall be submitted upon completion of pilot hole operations.

The Contractor shall compute the position in the X, Y and Z axes relative to ground surface from down-hole survey data a minimum of once per length of drill pipe. Upon exit of the pilot hole bit, the Contractor shall take the final survey with the survey probe at ground elevation. This survey shall be tied-in to the existing exit survey stake.

The Contractor shall maintain this information and provide it to the Contract Administrator upon request in a form allowing independent calculation of the pilot hole alignment and profile. Coordinate tabulation shall be referenced to the drilled entry point and accurately describe the pilot hole location. Contractor shall provide an as-built of the pilot hole drill position data in project specified X, Y, Z coordinates in accordance with As-Built survey plan for incorporation into the As-Built database.

All surveying equipment used for down-hole surveying and tracking of the bore path and drill head shall be inspected and calibrated by the equipment manufacturer prior to use. Proof of this inspection and calibration shall be provided to the Contract Administrator prior to commencement of drilling operations.

7.5 Pilot Hole Drill Tolerances

The pilot hole shall be drilled along the axis shown on the Drawings in conformance with the tolerances indicated and subject to conditions discussed in part 7.4 and the following:

- 7.5.1 Elevation: ROW restrictions, foreign lines and utility crossings shall be considered in determining vertical deflection tolerances, however the pilot hole shall be installed at the maximum depth indicated on the Drawings with a tolerance not

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exceeding 0.25 meters above and 1.0 meters below the designed drill path elevation.

- 7.5.2 Axial Alignment: The pilot hole shall remain within the tolerances indicated on the Drawings, however, the horizontal deflection shall not exceed the limits of the permanent ROW, jurisdictional permits and/or ROW agreements.
- 7.5.3 Entry Angle: Increase/decrease in angle is allowed, however the maximum required depth, within the tolerances noted in 17.5.1, shall be maintained.
- 7.5.4 Exit Angle: Increase/decrease in angle is allowed, however the maximum required depth, within the tolerances noted in 17.5.1, shall be maintained.
- 7.5.5 Curve Radius: The pilot hole shall be drilled to a radius of curvature specified on the Drawings. In no case shall the pilot hole be constructed to a curve radius less than the minimum allowable radius as specified by the Contract Administrator.

7.6 Pipe Pullback


During pullback, the pull section shall be supported on rollers and/or with pipe handling equipment in order to provide straight entry into the drilled hole at the required inclination. The pipe shall be supported so that it does not touch the ground between support points as it enters the hole. Once the Contractor has commenced the pullback operation, work shall proceed continuously until installation is complete.

While installing the pull section, the Contractor shall inspect 100% of the section length for pipe coating holidays. Pipe coating shall pass a holiday detector test at a voltage specified by the Contract Administrator Representative. The Contractor shall supply a Contract Administrator-approved holiday detector that operates at the specified voltage range for the type and thickness of pipeline coating used. Coating holidays shall be repaired in accordance with the applicable Project Pipeline Coating Specification.

The Contractor shall provide and maintain instrumentation that will accurately measure drill string axial and torsional loads during pullback. The Contract Administrator Representative shall have access to instruments and their readings at all times. The Contractor shall provide the Contract Administrator Representative with necessary conversion charts to convert control instrument readings (e.g. hydraulic pressures of travel and rotary motors) into applicable load values.

A swivel connection shall be connected to the pull section to minimize torsional stress imposed on the pipeline pull section during pullback.

Upon completing the pullback, but prior to acceptance, the Contractor shall furnish and run an approved electronic caliper pig or a gauging pig through the pipe section. Results of the caliper pigging shall be provided to the Contract Administrator.

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8.0 Welding

The Contractor shall be responsible for having developed and qualified welding procedure specifications (WPS) for use during construction. The WPS shall be signed and stamped by a qualified professional engineer (P. Eng.) registered in Manitoba. The qualified WPS shall be supplied to the Owner for review and approval before any welding can commence.

9.0 Non-Destructive Testing

The Contract Administrator and Owner shall have right to inspect and monitor all aspects of production welding to ensure that the welding procedures have been followed, and shall reserve the right to reject any welds not in compliance with the qualified welding procedure specification.

The Contractor will engage a third-party non-destructive examination (NDE) Contractor to inspect the mainline welds as well as the repair welds. The NDE Contractor shall supply at minimum a technician with a Level II certification for radiographic interpretation.

All production wells will be subjected to 100% NDE by an independent third party per CSA Z662-11. The Contractor shall ensure that sufficient inspection units shall be made available to avoid impeding the progress of the Work. If the Contractor fails to do so, the Contractor will assume any costs associated with the work delay.

A record of all golden welds shall be completed. The bead and hot-pass on tie-in welds shall be inspected using magnetic particle inspection (MPI) prior to completing the weld. The final tie-in welds shall be examined using UT with a 60 degree probe, followed by X-ray or gamma ray radiography after the weld has been completed, followed by an additional UT and radiography inspection 24 hours later.

10.0 Field Weld Coating


The Contractor shall provide qualified welders and equipment to weld the pipe for the HDD pull section. Welding shall be performed, and all girth welds shall be 100% radiographically inspected, in accordance with API Standard 1104, "Welding of Pipelines and Related Facilities" and Specification 39910882-29-025, "Specification for Pipeline Welding for Gas Transmission Pipelines."

To coat the girth welds, the Contractor shall be use Polyguard RD6 coating, installed in accordance with the manufacturer's coating applications specifications.

11.0 Hydrostatic Test

Contractor is to develop and a detailed pressure test plan of pipeline system for Owner to review and approve prior to performing the work. Hydrostatic pressure test plans and procedures shall be generated in accordance Owner's guidelines and specifications.

The entire pull section shall be hydrostatically tested as a unit or as sub-assemblies prior to pullback. The below parameters are considered for the hydrostatic test based on the wall thickness, pipe grade, the elevation profile of the new relocation:

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Parameter	Value
Pipe OD	NPS 8
Grade	API 5L X52 (52,000 psi)
Licensed MOP	1000 psig
Minimum Wall Thickness (WT) in the New Section	0.322 inch
Service	Refined Product
100% Specified Minimum Yield Stress (SMYS)	26,790 kPa (3885 psig)
Maximum Test Pressure	12,970 kPa (1800 psig)
Minimum Test Pressure	9,930 kPa (1440 psig)
Test Section Length	(2) 200m

The expected highest pressure value at the low point during the strength test will be limited to below 12,970 kPa, which is equivalent to 48% of the pipe SMYS.

A pressure-volume plot shall be prepared during the course of the hydrotest to ensure the pipe does not yield during the test. The pressure volume plot shall be signed and stamped by a qualified P. Eng.

If the hydrotest is performed while temperatures are below 0°C, freeze retardants, such as the addition of the methanol, may be used to ensure the test is completed satisfactorily. If a freeze retardant is used, it shall be ensured that the hydrotest medium is disposed of in accordance with local environmental requirements.

Subsequent to the successful hydrostatic test, the pipeline shall be dried using a displacement pig propelled by either pumped nitrogen or dry air with a dewpoint below -45 °C. A second cleaning pig shall be run after the displacement pig to ensure all water and methanol is removed from the line.


At the tie-in locations, the pipe ends, including the heat affected zone, shall be cleaned and buffed to ensure all residue from the water/methanol mixture has been removed prior to performing the tie-in welds.

12.0 Backfilling

12.1 Material Specification for Backfill

There are two options for the backfill material, depending on weather conditions:

1. Cold weather specification – utilize Concrete Low Shrink Fill (CLSF) under road way to ensure compaction.
2. Warm weather specification – may use CLSF or sand bedding with hydraulic compaction – Sand bedding could be native material if on site inspector and contractor confirms clean material.

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12.2 Backfill Procedure

The bedding and surrounding of all pipe work trench back filling shall be carried out using natural sand well graded and free from contamination and deleterious material. A bed of sand backfill material shall be laid and compacted to 150 mm thickness over the full width of the trench. The maximum grain size of the bedding sand shall be 5 mm.

The sand shall be delivered on a just-in-time basis and stored in a covered location to ensure minimal moisture and ice is present when the bedding and haunch are installed.

The pipe shall be adjusted to line and level to ensure that pipe barrels rest uniformly on the bedding. Where side fill is required, further selected backfill material shall be laid and compacted uniformly by hand halfway up each side of the pipes, pipes shall not be placed on blocks, bricks etc.

Continue in lifts of 150mm to 1.0m above the pipe. All lifts to conform to 97% maximum dry density as determined by the dry proctor test. Vibratory compaction shall not be used during the backfilling procedure. All compaction is to be achieved using dead weight.


Once 1.0m of the engineered fill has been added above the pipe, standard road backfill material will be placed in 150mm lifts. Compaction standard road building equipment will be utilized for the standard road backfill.

12.3 Quality Control

Contractor Administrator's QC Soils Inspector will approve via ITP (Inspection and Test Plan), and the Contractor will verify the following:

- Trench is free of frozen soils, ice, and snow
- Backfill material is free of frozen material, ice, and snow

In general, quality control (QC) is the Contractor responsibility, while quality assurance (QA) is the Contract Administrator responsibility.

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13.0 Equipment and Materials

The following provides Bill of Materials (BOM) for the work contained in this EWP. Contractor is to refer to attachments No.1 and No.2 of this EWP for detailed BOM. Contractor shall perform their own material take-off and verify the materials listed. If the Contractor identifies equipment, services, or materials that are not specified in Section 13.1.1 of this EWP below, Contractor Shall notify the Contract Administrator for resolution.

13.1 Contractor Supplied Material

The following material will be supplied by the Contractor and will be made available on-site:

13.1.1 Contractor Supplied Material

Pipe Description	Coating Description
NPS 8, 0.322" WT, API 5L X52, Cat. II, Cold Bends	16-18 mils FBE / 20 mils ARO Coatings
NPS 8, 0.322" WT, API 5L X52, Cat. II, DRL, Mainline Pipe	16-18 mils FBE/ 20 mils ARO Coatings
Elbow, 45 °, 5D, NPS 8, 0.322" WT, API 5L X52, Cat. II	16-18 mils FBE/ 20 mils ARO Coatings
Elbow, 90 °, 5D, NPS 8, 0.322" WT, API 5L X52, Cat. II	16-18 mils FBE/ 20 mils ARO Coatings

In general, all equipment, materials, and services required to complete the work in accordance with the contract documents, shall be provided by the Contractor. The fusion bonded epoxy (FBE) coating shall be in accordance to Shell 26TS-001 Application of Fusion-Bonded Epoxy Coating on Line Pipe or equivalent acceptable to the pipeline Owner. The abrasion resistant coating (ARO) shall be PowerCrete® DD, or equivalent acceptable to the pipeline Owner. The Contractor shall coordinate the selection of the Coating Applicator, Coating manufacturer or supplier with the pipeline Owner.

14.0 Quality Surveillance Requirements

14.1 Overview

A quality program shall be implemented to provide the assurance that all material and services provided by the Contractor are completed in accordance with the Contract, including the Drawings, Contract Administrator specifications, Owners specifications, environmental and permit requirements, and landowner requirements.

14.2 Responsible for Quality

The Contractor is responsible for quality of the Work performed, which includes the systems, and practices to assure that the work on the project comply with the specifications.

The Contract Administrator's inspection team will carry out regular inspections and audits of Contractor construction activities. This will help to identify non-compliance items, and will ensure

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that appropriate corrective action, when required, is taken and the inspection team will audit the Contractor's compiled construction quality records.

14.3 Quality Control System

The Contractor shall provide its own quality control system that is acceptable to the Contract Administrator to ensure that the Work conforms to the requirements of the Contract prior to submitting any portion of the Work to the Contract Administrator for acceptance. The Quality control system shall be approved in advance.

The Contractor's quality management system, usually documented as a Quality Manual, shall be submitted by the Contractor with the Contractor's proposal. The Contractor shall also draft and submit a project-specific inspection and Test Plan that describes how the Contractor plans to staff, use resources, control and document evidence of compliance to the Contract requirements. The inspection and Test Plan shall be submitted at least two weeks prior to the kick-off meeting and be approved prior to the start of construction. The inspection and Test Plan needs to address the following as a minimum:


- What operations or activities will be inspected for compliance
- The type, extent and frequency of inspection versus criticality of repair or rate of repair
- The processes in place to monitor and reduce rework
- Records and forms used to record quality inspections
- Material receiving and control
- Organization for quality control
- Responsibilities and duties of quality control supervisor.
- Compilation of quality records for turnover to the Contract Administrator at project completion.

If not already detailed in the Contractor's Quality Manual, the Contractor shall describe and include the following in its proposal:

- The processes for identifying, recoding, and obtaining owner approval of non-conforming items, explaining the disposition of non-conforming items, documentations (forms used), authority for disposition and an example scenario of how non-conformance will be addressed, by a technical corrective action plan.
- Document control, including Drawings and specifications.
- The Contractor's requirements for subcontractors including inspection and verification.

14.4 Quality Assurance

The Contract Administrator will conduct quality audits and reviews with the Owner to verify and provide the assurance that all material and services provided by the Contractor are completed in

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accordance with all Contract Documents, including the Drawings and Construction Specifications, environmental and permit requirements, and landowner requirements.

15.0 Safety

15.1 Meetings, Reports, and Forms

The contractor will attend the following meetings during the administration of the Contractor

- Kick-off meeting:
 - During the kick-off meeting following items will be reviewed.
 - Persons responsible for execution of the contract and their qualifications (Project Supervisor, Safety Supervisor, Quality Supervisor)
 - Scope of work
 - Contract execution plan
 - Safety plan
 - Quality plan & ITP
 - No work will take place without the kick-off meeting and acceptance of the Safety Quality and inspection test plan
- Progress review/planning meeting: one per shift
- Tool talks: one per shift
- Near miss and accident investigation meetings


The following reports or documentation are required during administration of the Contract:

- Progress & planning report: one per shift
- Safety and Loss Management Reports
 - Loss Control reports
 - Incident/investigation reports
 - Contractor safety activity report
 - Safety Statistics Reports

15.2 Safety and Loss Management

Below is a list of safety requirements to be adhered to by the contractor while on the construction site.

- All site personnel will be familiarized with the site safety requirements.
- The Contractor will submit a copy of their Loss Management program and/or safety manual for review upon award of the contract prior to the kick-off meeting.

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- The minimum requirements for Personnel Protective Equipment are:
 - Head Protection
 - Eye Protection
 - Foot Protection
 - CSA 196-02 Class II Level 2 high visibility safety vest
 - Hearing protection for noise level exceeding 85 decibels.

15.3 Ground Disturbance Activity

As part of the construction ROW staking program, the Contractor shall notify “OneCall” and arrange to have a line sweep completed to determine whether other buried utilities or facilities exist. Further to this, the Contractor shall arrange to have a third party to carry out an independent line sweep. The Contractor shall follow the minimum guidelines in conjunction with the Contract Administrator’s and Owner’s Ground Disturbance Standard:

- All supervisors and persons directing equipment and operators involved in ground disturbance activities need to attend ground disturbance training and need to be in possession of a valid Ground Disturbance Certificate.
- Only designated operators shall be allowed to excavate within 5 m of a buried facility.
- No ground disturbance activity shall occur within the ROW of a buried foreign facility or within 5 m of a buried facility not located within a ROW until:
 - The required notification has been made to the owner of the buried facility
 - A Ground Disturbance checklist has been completed
 - A Crossing agreement is on site
 - The buried facility is fully exposed
 - The owner, or a representative, of the buried facility is on site.
- After a pipeline has been located, no person shall use or cause to be used mechanical excavation equipment within 600 mm of the pipeline or beneath the pipe except under the direct supervision of a representative of the Owner.
- Contractor shall give 72 hours’ notice prior to undertaking ground disturbance, excluding weekends and statutory holidays
- The person undertaking ground disturbance who exposes any part of the pipeline must give 24 hours’ notice to the Owner prior to backfilling.

15.4 Pipe Demolition and Tie-in

During the demolition and final tie-in procedures, the following safety procedures shall be in place in the event hydrocarbons are encountered:

- Muster points shall be identified and communicated to all personnel on-site

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- A shutdown and evacuation plan shall be developed and communicated to all personnel on-site
- Lower Explosive Limit (LEL) Detectors shall be on-site
- Cell phones (unless intrinsically safe) and pocket lighters shall not be allowed on the jobsite.
- All equipment on the jobsite shall have spark arrestors installed or be positive pressure inhibited
- All personnel on-site during the demolition and tie-in operations shall have H2S Alive certification

16.0 Environment


16.1 General

The Contract Administrator is committed minimizing adverse impacts on the environment during construction. Special attention and focus shall be directed the Contractor at all construction activities to ensure the complete implementation and enforcement of environmental requirements including, but not limited to the following:

- Environmental Protection Plan (EPP)
- Pipeline Environmental Field Reports
- CSA Z662 11
- Manitoba Oil & Gas Act
- Manitoba Workers Compensation Board Occupational Health and Safety Act and Regulations
- Manitoba Environment – Water Resources and Public Land Divisions
- Canadian Transportation of Dangerous Goods regulations

The Contractor shall:

- Work in accordance with the best pipeline construction practices to minimize impacts on environment
- Assess for potential impacts to the wildlife and propose mitigation measures for the wildlife as required
- Not harass wildlife
- Remove and dispose of the existing pipeline in accordance with regulator and environmental requirements
- Ensure no hydrocarbons are released during the demolition of the original pipe
- Protect any archaeological and heritage sites


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- Minimize all emissions of dust and noise
- Limit all types of pollution to acceptable levels
- Prevent the spread of weeds
- Advise Contract Administrator who will in turn notify Owner of any suspected contamination from existing pipelines or soil conditions which do not meet environmental standards

16.2 Adverse Weather Conditions

The Contractor shall suspend all construction activities during adverse weather or under wet construction ROW conditions. Throughout the execution of the Work the Contractor shall make its best efforts to remedy and mitigate the impacts of weather weather-related conditions on the ROW and the Work, and shall justify to the Contract Administrator's satisfaction any and all circumstances which prevent the Contractor from fully or partially engaging its workers and equipment affected by weather or weather-related events elsewhere on the Work.


Written requests by the Contractor for any extension of the Contract Schedule as a result of the Contract Administrator's decision to implement an environmental shutdown of all or part of the Work must be received within 2 days of each such environmental shutdown being ordered.

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Appendix A – Attachments


This appendix lists the attachments to this scope of work.

No.	Description
1	Pipeline Material Take-off
2	Construction Alignment Sheets
3	ROW Cross-Section Configuration
4	Tie-in Detail

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ATTACHMENT 1: PIPELINE MATERIAL TAKE-OFF


Item	NS	Description	QTY
1	8"	PIPE, 8.625" OD (219.1 mm OD), 0.322" WT (8.18 mm WT), CS, API 5L CAT II, CLASS 600, X52, SMLS CSA Z245.1, EXTERNALLY COATED USING 16-18 mills FBE / 20 mills ARO Coatings , DSAW	400 m
2	8"	ELBOW, 45°, 8.625" OD (219.1 mm OD), 5D, 0.322" WT (8.18 mm WT), CS, API 5L CAT II, CLASS 600, X52, CLASS 600, CSA Z245.11, EXTERNALLY COATED USING 16-18 mills FBE / 20 mills ARO Coatings	16 EA.
3	8"	ELBOW, 90°, 8.625" OD (219.1 mm OD), 5D, 0.322" WT (8.18 mm WT), CS, API 5L CAT II, CLASS 600, X52, CLASS 600, CSA Z245.11, EXTERNALLY COATED USING 16-18 mills FBE / 20 mills ARO Coatings	3 EA.
4	8"	FLANGE, WN, ANSI 600, RF, 8.125" BORE (206.375 mm BORE), CSA Z245.12, CAT II	2 EA.
5	1 1/8"	BOLT, 7 3/4" L, STUD, ASTM A-193 GR. B, w/2 HEAVY HEX NUTS ASTM A-194 GR. 2HM, (FOR 8.625" ANSI 600 RF FLG.).	24 EA.
6	8"	GASKET, ANSI 600, 1/8" WT, SPIRAL WOUND, FLEXIBLE GRAPHITE FILLER, SS INNER AND CS OUTER RING, ASME B16.5 & ASME B16.20	2 EA

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ATTACHMENT 2: CONSTRUCTION ALIGNMENTS

Refer to drawing numbers:


- U238-2014-3007 - HDD Plan & Profile (2) Shell 200mm Pipelines (1962 & 1975)
– Plessis Rd. Crossings

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ATTACHMENT 3: ROW Cross – Section Configuration

Refer to drawing numbers:

- U238-2014-3007 - HDD Plan & Profile (2) Shell 200mm Pipelines (1962 & 1975)
– Plessis Rd. Crossings

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ATTACHMENT 4: Tie-in Detail

Refer to drawing numbers:

- U238-2014-3008 – Transcona Valve Station - Winnipeg Terminal Tie-In Location Piping Plan
- U238-2014-3009 – Transcona Valve Station - Winnipeg Terminal Tie-In Location Piping Sections