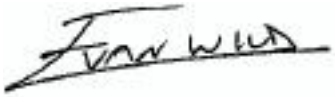
**ENBRIDGE PIPELINES (SASKATCHEWAN) INC.**

# Proposed Manitoba Interconnect Project

**14-17-09-28 W1M to 12-16-09-28 W1M**
**Near Cromer, Manitoba**

**Manitoba Innovation, Energy and Mines**
**Project Application**

**File #: CC 13 06**
**Date: July 7, 2014**



**Project Manager**

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# 1. Background

Enbridge Pipeline (Saskatchewan) Inc. ("EPSI") is proposing to build the following facilities:

I. Westspur Interconnect Facility

This will be a Greenfield site and requires full development. It will be located adjacent to the Enbridge Pipelines Inc. (EPI) Cromer Terminal and south of EPSI's NGL Cromer Terminal Lease. This facility will allow EPSI the capability of diverting product from two existing pipelines upstream of EPI's Cromer Terminal and ultimately transport the product to the Tundra Energy Marketing Limited (Tundra) Cromer Terminal for further shipment. The site will include a new electrical building, a riser for each pipeline, and individual line density measurement speed loops to track product batches for line swings.

II. Manitoba Interconnect Custody Transfer Facility

This will be a Greenfield site and requires full development. It will be located adjacent to EPI's Cromer Terminal and east of the Bakken Metering Line 26 receiving trap site. This facility will allow EPSI to meter the product prior to final shipment to Tundra's Cromer Terminal. In addition to the product from the Westspur Interconnect Facility, piping will be installed to connect the directly adjacent Bakken Metering Line 26 pig receiver site to enable the ability to divert Bakken product to the Tundra Cromer Terminal as well. The site will include a sample building, laboratory building, electrical building, skid of three 10" positive displacement meter runs, an 18" ball prover and a 3,000 bbl tank for full flow and thermal relief.

III. Tundra Delivery Facility

This site is located within the confines of the Tundra Cromer Terminal and does not require civil development. This site will allow EPSI to transfer the product to Tundra's terminal piping. The site will include a pipeline pig receiver, Coriolis meter for line balancing and an electrical building. The EPSI tie-in to Tundra will occur at the end of Tundra's pipe rack, close to the receiving trap area.

IV. NPS 16 Pipeline

The proposed 16" pipeline, named ZML-WV-01, will run from the Westspur Interconnect Facility at 14-17-09-28 WPM to the Manitoba Interconnect Custody Transfer Facility at 09-17-09-28 WPM. This new pipeline will require new Right-Of-Way and is considered Greenfield. This underground facility will allow the product to be transported to the Manitoba Interconnect Custody Transfer Facility.

V. NPS 12 Pipeline

The proposed 12" pipeline, named ZML-VT-01, will run from the Manitoba Interconnect Custody Transfer Facility at 09-17-09-28 WPM to the Tundra Delivery Facility at 12-16-09-28 WPM. This new pipeline will require new Right-Of-Way and is considered Greenfield. This underground facility will allow the metered product to be transported to Tundra's Cromer Terminal.

This document will serve as an application to the Manitoba Innovation, Energy and Mines - Petroleum Branch to seek approval for the above noted facilities. The application was prepared in accordance with the following acts and regulations:

- Section 149 (2) of the Oil and Gas Act (applicable to the proposed pipelines and site facilities).

This document provides detailed information regarding the applicant, EPSI; detailed plans and information regarding the proposed Pipelines and Site Facilities; a summary of landowners and occupants correspondence and a summary of other approvals and permits being applied for concurrently.

## 2. Applicant Information

Enbridge Pipeline (Saskatchewan) Inc. ("EPSI") owns and operates crude oil and liquids pipeline systems in Southeastern Saskatchewan and Southwestern Manitoba. These systems are comprised of approximately 356 km of trunk line and approximately 1,900 km of crude oil and liquids gathering system pipeline, along with related terminals and storage facilities. The crude oil and natural gas liquids are transported to Cromer, Manitoba and from there to Eastern Canada and the United States via connecting pipeline systems.

## 2.1 Technical Qualifications

The EPSI Gathering System was built in 1955 to transport Crude Oil and Natural Gas Liquids to Eastern markets. EPSI has many years of experience designing and operating pipeline facilities in a safe and efficient manner.

## 2.2 Financial Qualifications

EPSI is financially capable to undertake a project of this magnitude and has completed the due diligence to ensure that the project is feasible and that project funding is secured.

### 2.2.1 EPSI Qualifications

EPSI is part of Enbridge Income Fund Holding Inc. ("EIFH"). EIFH is underpinned by a 50% interest in the Alliance Canada Pipeline, a 100% interest in EPSI and Green Power assets which include a 50% interest in NRGreen Power Limited Partnership and interests in three wind power projects in Western Canada.

### 2.2.2 Project Qualifications

The Project will be fully backstopped by Tundra under a 5-year Financial Support Agreement (FSA) where Tundra will be responsible for paying to Enbridge a calculated annual revenue requirement based on a Capital Multiplier, which is designed to cover the return of and on the invested capital. Operating expenses will flow through to Tundra as incurred. Beyond the initial contract term of 5 years, Enbridge will pass through any operating costs and maintenance capital associated with the facilities and will earn an operating management fee of 15% of the total cost to provide service on an annual basis.

# 3. Project Need

In 2012, Tundra Energy Marketing Limited (Tundra) was created to house all of the assets related to blending, terminals and pipelines originally held by Tundra Oil & Gas Limited. Tundra Oil & Gas Limited is a private Winnipeg-based company that engages in the exploration, development, production and marketing of crude oil and natural gas primarily in the Canadian portion of the Williston basin, with core properties located in southwestern Manitoba and southeast Saskatchewan.

The proposed Manitoba Interconnect project will provide a connection from the Enbridge Pipelines (Westspur) Inc. ("EPWI") and Enbridge Bakken Pipelines Inc. ("EBPI") systems to the Tundra terminal near Cromer, Manitoba. Once completed, the project will provide the capabilities of delivering segregated batches of Westspur Midale (MSM), South East Sask (SES), or US High Sweet - Clearbrook (UHC) through a single 12" pipeline to Tundra's Cromer Terminal.

This Manitoba Interconnect project will provide additional demand pull on the EPWI and EBPI pipelines, along with the EPSI Gathering System, during times where long haul export rail-based transportation economics outweigh pipeline alternatives. Offering customers access to a common rail alternative will help preserve EPSI's market share and encourage volumes to return to the crude oil gathering pipelines. A significant benefit of this project is that it will be able to offer this modal flexibility to its EPWI and EBPI customer base without having to directly charge any incremental toll or incur any capital or volume risk. In addition, any diverted crude oil will allow EPI to transport other products in larger quantities through the EPI Cromer Terminal to Eastern Canadian and U.S. markets.

# 4. Facility/Pipeline Description

The scope of work the Manitoba Interconnect project includes the development of two greenfield facilities, installation of two new pipelines, installation of assets within Tundra's Cromer Terminal and modifications to an existing pig receiver site that is owned by EBPI.

## 4.1 Survey and Legal Description

I. The proposed Westspur Interconnect Facility will be located at 14-17-09-28 WPM and will be approximately 9,000 $m^2$ in size.

II. A proposed 16" pipeline will originate at the Westspur Interconnect Facility at 14-17-09-28 WPM and terminate at the Manitoba Interconnect Custody Transfer Facility at 09-17-09-28 WPM.

III. The proposed Manitoba Interconnect Custody Transfer Facility will be located at 09-17-09-28 WPM and will be approximately 19,000 $m^2$ in size.

IV. A proposed 12" pipeline will originate at the Manitoba Interconnect Custody Transfer Facility at 09-17-09-28 WPM and terminate at the Tundra Delivery Facility at 12-16-09-28 WPM.

V. The proposed Tundra Delivery Facility will be located at 12-16-09-28 WPM (Tundra's Cromer Terminal) and will utilize Tundra's existing terminal land for asset placement.

The surveys of the proposed facilities and pipelines will be provided in Appendix A and includes the location of all facility crossings and proximities to the facility area and the pipeline Right-Of-Ways.

## 4.2 Substance Description

The proposed Manitoba Interconnect Project will transport/divert crude oil produced from North Dakota, southeastern Saskatchewan, and southwestern Manitoba. Current types of crude oil include Westspur Midale (MSM), South East Sask (SES), and US High Sweet - Clearbrook (UCH). See Table 1 for each product's crude characteristics. Also, all types of crude contain trace amounts of BS&W (Basic Sediments and Water).

**Table 1: Substance Description**

| Product Identifier | Crude Type (Long Name) | Total Sulphur (% by weight) | Pour Point (°C) | Reid Vapour Pressure (kPa) | Density (kg/m$^3$) | Viscosity (cSt) at Specified Temperature (°C) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 10.0 | 20.0 | 30.0 | 40.0 | 45.0 |
| MSM | Westspur Midale | 2.30 | -3 | 39.5 | 877.3 | 25.0 | 14.0 | 8.91 | 6.55 | 5.79 |
| SES | South East Sask | 1.14 | -21 | 58.7 | 839.3 | 6.66 | 5.05 | 3.84 | 3.07 | 2.78 |
| UHC | US High Sweet - Clearbrook | 0.18 | -20 | 74.3 | 815.0 | 3.90 | 3.12 | 2.53 | 2.11 | 1.93 |

*Reference: 2013 Crude Characteristics Booklet (Enbridge)*

## 4.3 Project Operation

The proposed project is expected to have an operating flow rate of 325 m$^3$/hr to 1,100 m$^3$/hr. The flow rate will be dependent on the operating conditions of the entire upstream system and the type of product diverted from Line 23A, Line 23B, or Line 26. See Table 2 for the anticipated flow rates from each of the main pipelines.

**Table 2: Pipeline Flow Rate Ranges**

| Pipeline | Min. Flow (m$^3$/hr) | Max. Flow (m$^3$/hr) | Avg. Flow (m$^3$/hr) |
|---|---|---|---|
| 23A (16") | 350 | 1,100 | 900 |
| 23B (12") | 325 | 650 | 350 |
| 26 (16") | 325 | 1,100 | 750 |

The design of the project does not include any type of pumps to assist the delivery of the products to Tundra's Cromer Terminal. As a result, the two newly proposed facilities and the two newly proposed pipelines are designed to ensure that a minimum delivery pressure of 50 psi can be achieved to overcome the back pressure that is created by Tundra's facilities.

The main function of the Westspur Interconnect Facility at 14-17-09-28 WPM is to enable the capability to divert products from EPWI's two main pipelines, Line 23A and Line 23B, and transfer the product to the proposed 16" pipeline, ZML-WV-01. The products will be diverted from the main lines via actuated control valves, which will be installed on the new risers. The control valves will be operated by Enbridge's Control Centre, which is based in Edmonton, Alberta. The diverted product, or batched swings, will be monitored by individual line density measurement speed loops. The product will flow past the speed loops, with a small amount of the product diverted and flowing through the speed loop. The speed loops will analyze the product's density, which will identify the specific crude product. The speed loops are the main tools for the Control Centre to identify and control the different batches being diverted to Tundra's Cromer Terminal.

The main function of the Manitoba Interconnect Custody Transfer Facility at 09-17-09-28 WPM is to meter the product that is being transferred to Tundra's Cromer Terminal, sample the products for their crude characteristics and BS&W content, and provide full flow and thermal pressure relief for emergency situations. The 3,000 bbl tank can also provide pressure and product relief for maintenance type work at the facility. SES and MSM products will enter the facility via pipeline ZML-WV-01 and, the UHC product will enter the facility via piping that connects the proposed facility to the existing Bakken Metering Line 26 Pig Receiving Site. The products will first flow through the automated sample building, where samples of the product will be taken automatically during shipment. The sample jugs will be carried to the on-site laboratory building by EPSI operations personnel, where the product will be analyzed for its crude characteristics and BS&W content. Sampling of the product is critical in order to verify the type of product being shipped and to document the BS&W content. The product will flow from the sample building to the meter skid, where the product will be metered for custody transfer purposes. The meter skid is designed for the expected flow rates and contains three 10" PD meters. The flow of product through the three meters will be controlled by control valves, where any combination of the three meters can be in operation depending on the flow rate. The PD meters will measure and record the volume of product throughput and provide the necessary documentation for transferring the custody of the product to Tundra. Next, the product will either flow from the meter skid to the ball prover or to the 12" pig launcher (ZML-VT-01). The purpose of the ball prover

is to prove that the PD meters are measuring the volume accurately, and within tolerances. The prover will be used to individually prove each of the PD meters as often as required, which will be set out by the Enbridge Measurement department.

The main function for EPSI's assets on Tundra's Cromer Terminal (Tundra Delivery Facility) is to ultimately transfer the products to Tundra's tankage. The products will enter the facility via the 12" pipeline ZML-VT-01. The products will then flow through a Coriolis meter before being transferred to Tundra. The Coriolis meter will measure the volume throughput and ensure that the pipelines are balanced, providing leak detection capabilities.

The proposed facilities and pipelines will be continuously flooded with one of the three transported products. The daily flow rates will fluctuate, as per Table 2, and be solely dependent on monthly volumes nominated by Tundra.

## 4.4 Proposed Project Construction

I. Westspur Interconnect Facility

The Westspur Interconnect Facility site is a Greenfield location and will be approximately 9,000 $m^2$ in area. The site requires full development and will be an added new site for EPSI operations to manage. Prior to installment of the buildings and equipment on site, the site will be developed first by removing all top soil and levelling the ground with compacted lifts of clay and gravel, as per site design referenced by the geotechnical report. Next, a combination of screw and driven piles will be installed as per specified locations. Piles will be driven to provide a foundation support for the proposed electrical building and a combination of driven and screw piles will be installed for pipe and equipment supports.

The electrical building (ESB) will be pre-fabricated in a shop with the electrical wiring and components pre-installed, as per the latest edition of the Canadian Electrical Code (CEC). The completed ESB will be mobilized to site and installed on the specified piles. An electrical feeder cable will be installed below grade from the ESB to Manitoba Hydro's service system, with the electrical service being 400A. The ESB will provide service for the facility lighting, pressure transmitters, automatic valves, and associated instrumentation and equipment.

Two pipeline risers will be installed on site, one for the 12" ZML-AC-01 (Line 23B) and one for the 16" ZML-AC-02 (Line 23A). These risers will allow EPWI to install

control equipment to divert products from the EPWI main line pipelines to the new 16" pipeline ZML-WV-01 that is to be constructed as part of this project. The riser bends will be pre-bent through a hot induction bending process at the manufacturer's facility. The portion of the risers that requires to be tied-in below grade will be coated with Fusion Bonded Epoxy (FBE). The above grade portion of the risers will be painted as per EPSI's coating specs to mitigate corrosion. See drawing #s D-MIW-420 SHT. 1 and D-MIW-420 SHT. 2 for the riser designs and instrumentation details. The risers will be constructed with CSA Z245.1, Grade 359, Cat. II line pipe. The wall thicknesses for the 16" and 12" risers will be 9.5 mm. The risers will be tested for an MOP of 7,380 kPa, with a maximum test pressure of 11,512 kPa and a minimum test pressure of 11,070 kPa. The tests will be conducted as 1 hour visual hydrostatic pressure tests in shop and will be installed pre-tested.

In addition to the above proposed facility assets, the site will also include the 16"pipeline ZML-WV-01 pig launcher and two line density measurement speed loops. The pig launcher will be designed to the MOP of the pipeline and the test pressure limits, see subsection 4.1.3.IV for more details on the pipeline. See drawing # D-MIW-420 SHT. 3 for the pig launcher design details. The line density measurement speed loops will consist of a 1" Coriolis mass meter, globe valve, and ball valves for isolation.

The remaining facility assets to be installed on site are the facility piping and fittings, the stairs and platforms for the risers, the perimeter fence, facility berm and access to site. The facility piping and fittings will connect the products from Lines 23A and 23B to the speed loops, and ultimately to the ZML-WV-01 pig launcher. The piping and fittings will be designed for a MOP of 7,380 kPa, with a maximum hydrostatic test pressure of 11,512 kPa and a minimum test pressure of 11,070 kPa. The piping and fitting material will consist of ASME material. The stairs and platforms will be pre-fabricated as per Enbridge Design Standard D05-401: Platforms, Stairs, and Ladders, and will be erected on site prior to commissioning of facility. The perimeter fence will also be installed prior to commissioning activities to maintain the facility's security. A berm will be constructed around the facility, situated on the inside of the perimeter fence. The berm will consist of compacted clay and gravel. Lastly, an access ramp to the facility site will be constructed of compacted clay and gravel, in order to access the site over the facility berm. A rolling gate will be installed at the access ramp location. See drawing # D-MIW-410 SHT. 1 for the overall design layout of the facility site.

II. Manitoba Interconnect Custody Transfer Facility

The Manitoba Interconnect Custody Transfer Facility site is a Greenfield location and will be approximately 19,000 $m^2$ in area. The site requires full development and will be an added new site for EPSI operations to manage. Prior to installment of the buildings and equipment on site, the site will be developed first by removing all top soil and levelling the ground with compacted lifts of clay and gravel, as per site design referenced by the geotechnical report. Next, a combination of screw and driven piles will be installed as per specified locations. Piles will be driven to provide a foundation support for the proposed facility buildings and a combination of driven and screw piles will be installed for pipe and equipment supports. Once the site is developed, a sample building, a laboratory building, an ESB, skid containing three PD meter runs, a ball prover and a 3,000 bbl tank will be installed.

The ESB will be fabricated in a shop with the electrical wiring and components installed as per the latest edition of the CEC. The completed ESB will be delivered to site and installed on the specified piles. An electrical feeder cable will be installed below grade from the ESB to Manitoba Hydro's service system to provide a 400 amp service. The ESB will provide service for the facility lighting, pressure transmitters, automatic valves, sample building, laboratory building and associated instrumentation and equipment.

The laboratory and sample buildings will also be fabricated in a shop with the building's electrical and mechanical components installed. They shall be wired as per the latest edition of the CEC. The buildings will then be delivered to site and installed on the specified piles.

The three positive displacement (PD) meter runs will be installed on a meter skid that will be pre-fabricated in shop. The meter skid will consist of a skid platform, three individual meter runs, associated inlet and outlet manifolds, and will be fitted for electrical and network cables to be connected to the meter run equipment and instrumentation. The PD meters will be the 10" FMC model JB10-S6 designed for ANSI 300 service. The piping and fittings will consist of ASME material and be hydrostatically tested for a MOP of 4,960 kPa. The maximum test pressure will be 7,737 kPa and the minimum test pressure will be 7,440 kPa. The fabricated meter skid will be transported to site in two sections and assembled on the specified piles.

The ball prover will be fabricated in the manufacturer's shop and will be sold as a complete unit on a skid base. The ball prover will be designed to fit an 18" stainless steel sphere ball, which will be used to prove the proposed 10" PD meters. The ball prover skid will consist of 18" piping in the shape of a "U" with the ends of the "U" consisting of oversized 24" pipe, an internal stopper for the ball, four way valve, and inlet and outlet piping. The piping will consist of ASME material and be rated for ANSI 300 service. The ball prover will be capable of proving the full rated capacity of an individual PD meter. The skid unit will be shipped from the manufacturer and installed on the specified piles. See drawing # D-MIC-420 SHT. 4 for the ball prover design details.

The 3,000 bbl storage tank will be completely fabricated off-site at the manufacturer's shop. The tank will be approximately 24 ft. in diameter and 44 ft. in height. The tank will be constructed as per the current edition of API 650 and installed as per the current edition of the National Fire Code of Canada. The tank will be situated within a tank containment berm. The tank berm will consist of steel berm walls approximately 3 ft. high from ground level with a high density polyethylene (HDPE) liner that covers the entire area of the berm and will be bolted to the inside of the berm walls. The HDPE liner will be installed in sections and welded together by fusing the individual liner sheets. The proposed berm will have an approximate containment volume of 700 $m^3$. Driven piles will be installed as the tank's foundation, along with a steel tank base. The tank will be delivered from the manufacturer as a whole unit and installed on the steel base. An internal floating roof will be installed on site. A common tank line will connect the tank to the facility's piping system and will accommodate full flow and thermal relief. The tank line will consist of ASME material and will be 10" in diameter, hydrostatically tested for an MOP of 4,960 kPa. Electrical cables will be installed from the ESB to the tank for servicing the tank mixer, radar gauge, and level switch. Lastly, gravel will be placed inside the berm, on top of the HDPE liner, in order to protect the berm liner.

In addition to the above proposed facility assets, the site will also include the pipeline ZML-WV-01 pig receiver and the pipeline ZML-VT-01 pig launcher. The pig receiver will be designed to the MOP of the pipeline and the expected test pressure limits, see subsection 4.1.3.IV for more details on pipeline ZML-WV-01. The pig launcher will be designed to the MOP of the pipeline and the expected test pressure limits, see subsection 4.1.3.V for more details on pipeline ZML-VT-01. See drawing # D-MIC-420 SHT. 1 for the ZML-WV-01 pig receiver design details and drawing # D-MIC-420 SHT. 5 for the ZML-VT-01 pig launcher design details.

The remaining facility assets to be installed on site are the facility piping and fittings, the stairs and platforms for accessing valves, and the perimeter fence. The piping and fittings will be designed for a MOP of 4,960 kPa, with a maximum hydrostatic test pressure of 7,737 kPa and a minimum test pressure of 7,440 kPa. The piping and fitting material will consist of ASME material. The stairs and platforms will be fabricated as per Enbridge Design Standard D05-401: Platforms, Stairs, and Ladders, and will be erected on site prior to commissioning of facility. The perimeter fence will also be installed prior to commissioning activities to maintain the facility's security. The facility will be developed by an existing access road, therefore no approaches or roads will need to be constructed. The perimeter fence will have two rolling gates to allow traffic into the facility as well as through to the Bakken Metering Line 26 Receiving Trap Site. See drawings D-MIC-410 SHT. 1 and D-CBK-410 SHT. 1 for the overall design layout of the facility.

In order to tie-into Line 26, rework must be completed at the Bakken Metering Line 26 Receiving Trap site. All work on assets associated with EBPI falls under regulatory jurisdiction of the NEB and a Section 58 Streamlining Order is being completed for said activities. EPSI will take custody of the crude and will own assets as soon as the crude is diverted off of the Bakken Metering Line 26 Receiving Trap piping. There will be approximately 130 m of buried piping that will connect the Bakken Metering Line 26 Receiving Trap site to the Manitoba Interconnect Custody Transfer Facility. This will be a 16" line that will be designed for a MOP of 9,930 kPa, with a minimum hydrostatic test pressure of 14,892 kPa and a maximum hydrostatic test pressure of 15,485 kPa. The piping will be constructed of Grade 359 CAT II NPS 16 steel pipe (406.4 mm OD) x 9.5 mm wall thickness, and will be coated with Fusion Bonded Epoxy (FBE). See drawing D-CBK-410 SHT. 1 for the plot plan of the Bakken Line 26 pig receiver site, see D-CBK-420 SHT. 1D for the Bakken Line 26 pig receiver demolition drawing and see D-CBK-420 SHT. 1 for the Bakken Line 26 pig receiver installation drawing.

III. Tundra Delivery Facility

The Tundra Delivery Facility will be constructed within the confines of Tundra's Cromer Terminal, which is owned and operated by Tundra. Therefore this site does not require civil development. The 12" ZML-VT-01 pipeline will enter Tundra's facility near the proposed receiver trap location, directly adjacent to Tundra's current pipeline header area. EPSI assets to be installed at the Tundra facility are the ZML-VT-01 pig receiver, a Coriolis meter, an ESB and associated

piping and fittings. See drawing D-MIT-410 SHT. 1 for the plot plan of EPSI's assets at the Tundra Delivery Facility.

The ESB will be fabricated in a shop with the electrical wiring and components installed, as per the latest edition of the CEC. The completed ESB will be delivered to site and placed and installed on the specified piles. Tundra will run an electrical feeder cable from their current service to the EPSI ESB in order to provide EPSI with the required electrical load. The ESB will provide service for the automated valves on site, the Coriolis meter, and the associated instrumentation.

The pipeline ZML-VT-01 pig receiver will be designed to the MOP of the pipeline and test pressure limits, see subsection 4.1.3.V for more details on the pipeline. See drawing D-MIT-420 SHT. 1 for the ZML-VT-01 pig receiver design details.

The remaining facility assets to be installed on site are the facility piping, fittings, and the Coriolis meter. The piping and fitting material will consist of ASME material. The piping and fittings will be designed for a MOP of 4,960 kPa, with a maximum hydrostatic test pressure of 7,737 kPa and a minimum test pressure of 7,440 kPa.

IV. 16" Pipeline (ZML-WV-01)

The total length of the proposed ZML-WV-01 pipeline will be approximately 1,200 metres and will include five (5) third-party pipeline crossings and one (1) third-party road crossing. The pig launcher will be installed above grade at the Westspur Interconnect Facility and a pig receiver will be installed above grade at the Manitoba Interconnect Custody Transfer Facility. Drawings such as the pipeline route/design, typical pipeline profile, cross-section of pipeline installation, and pipeline, road, and buried cable crossing typicals are provided in Appendix B. The pipeline will be constructed using generally accepted installation practices, as per CSA Z662-11, with the pipeline having a minimum depth of cover of 1.5 m. The pipeline construction method will include both boring and trenching. EPSI will acquire the necessary crossing agreements and ensure that there is a minimum of 0.3 m cover between the proposed pipeline and third-party utilities. Pipeline construction will also adhere to conditions as outline in the environmental assessment approval by Manitoba Conservation.

The pipeline is proposed to be constructed of NPS 16 steel pipe. Specifically, the pipe will be 406.4 mm (OD) x 9.5 mm (WT) and will be constructed of Grade 359, Category II, FBE coated steel line pipe as per CSA regulation Z245.1 – Steel Line Pipe. The pipeline is designed for a 7,380 kPa MOP. The pipeline will be hydrostatically tested for 8 hours immediately following installation with a maximum test pressure of 11,512 kPa and a minimum test pressure of 11,070 kPa. The hydrostatic test will consist of a 4 hour strength test and a 4 hour leak test, as per CSA Z662-11 – Oil & Gas Pipeline Systems. See the pipeline construction alignment sheet SM-0112-13-3-CON-R2.

V. 12” Pipeline (ZML-VT-01)

The total length of the proposed ZML-VT-01 pipeline will be approximately 350 metres and will include three (3) third-party pipeline crossings, one (1) third-party road crossing, seven (7) third-party buried cable crossings, and three (3) third-party overhead electrical cable crossings. The pig launcher will be installed above grade at the Manitoba Interconnect Custody Transfer Facility and the pig receiver will be installed above grade at the Tundra Delivery Facility. Drawings such as the pipeline route/design, typical pipeline profile, cross-section of pipeline installation, and pipeline, road, and buried cable crossing typicals are provided in Appendix B. The pipeline will be constructed using generally accepted installation practices, as per CSA Z662-11, with the pipeline having a minimum depth of cover of 1.5 m. The pipeline construction method will include both boring and trenching. EPSI will acquire the necessary crossing agreements and ensure that there is a minimum of 0.3 m cover between the proposed pipeline and third-party utilities. Pipeline construction will also adhere to conditions as outline in the environmental assessment approval by Manitoba Conservation.

The pipeline is proposed to be constructed of NPS 12 steel pipe. Specifically, the pipe will be 323.9 mm (OD) x 7.1 mm (WT) and will be constructed of Grade 359, Category II, FBE coated steel line pipe as per CSA regulation Z245.1 – Steel Line Pipe. The pipeline is designed for a 4,960 kPa MOP. The pipeline will be hydrostatically tested for 8 hours immediately following installation with a maximum test pressure of 7,737 kPa and a minimum test pressure of 7,440 kPa. The hydrostatic test will consist of a 4 hour strength test and a 4 hour leak test, as per CSA Z662-11 – Oil & Gas Pipeline Systems. See the pipeline construction alignment sheet SM-0112-13-4-CON-R2.

# 5. Facility/Pipeline Safety Systems

The design of this project will incorporate corrosion control, leak detection and pressure relief.

## 5.1 Corrosion Control

The two proposed pipelines will be constructed with line pipe that is externally coated with FBE. All girth welds below grade will also be coated with FBE. The piping and fittings above grade at all three facilities will be primed and painted as per Enbridge Construction Specification FCS019 – External Paint to Enbridge paint standard P-210. The two proposed pipelines will also be pigged at regular intervals to remove paraffins and waxes that may cause corrosion on the interior of the pipeline. In addition, both pipelines and the buried segment of 16" pipe that connects the Bakken Metering Line 26 Pig Receiving Site to the Manitoba Interconnect Custody Transfer Facility will have cathodic protection (CP). The proposed corrosion control system will comply with CSA Z662-11 – Oil & Gas Pipelines Systems.

## 5.2 Leak Detection and Emergency Shutdowns

EPSI intends to have a robust leak prevention and detection system in place along with an Emergency Shutdown plan for each facility and pipeline. The proposed plan will include the following:

- Installation and monitoring of a Coriolis meter at the Tundra Delivery Facility. The meter will measure any deviations to the output volume and can be compared to other meters on the Enbridge system as required. This will be completed via the ATMOS leak detection program.
- Pigging of the pipelines at regular intervals to remove any build up of potentially corrosive material in the pipeline. Pigging schedules will be developed by EPSI operations.
- Pressure Indicating Transmitters (PITs) installed at each facility to monitor the pressures and pressure drops.
- Control Centre in Edmonton will have the capability of shutting down all facilities via control valves, in case of an emergency.
- Operation personnel on site can also shut down the facilities, in case of an emergency.

# 6. Landowner and Occupant Consultations

The consultation program for this Project was designed and implemented to ensure all potentially affected parties were engaged and provided with detailed and timely information regarding the Project.

**DESIGN & IMPLEMENTATION OF THE CONSULTATION PROGRAM**

Through experience gained from other projects in the Southwestern Manitoba area, the anticipated impacts on stakeholders were identified and assessed to determine expected levels and areas of public interest in the Project. EPSI also took into account the nature and type of work to be undertaken as part of the construction and operation of the Project. An appropriate consultation program was then designed. The following is a list of the drivers that influenced the design of the consultation program:

- The Project work proposed is modest in scope, the nature, magnitude and potential impacts associated with the Project are not expected to be extensive or long-lasting.
- The Project's impacts with respect to construction noise, dust, traffic, and disruptions due to equipment movement are expected to be low. There will be an increase in noise arising from construction activities, such as pile installation, but in short intervals and will cease upon completion of activity and construction.
- At any given time, the work force on each site will not exceed twenty people. The Project will have a negligible impact on local infrastructure (such as roads, power utilities, water, and solid waste facilities) and on local services (such as accommodation, recreation, emergency and health care).
- The construction crews will be working no more than six days a week, during daylight hours; the construction window may be up to 8 months.
- Enbridge has typically had positive relationships with local landowners and regional stakeholders.
- There is a significant amount of oil and gas development taking place in this area, which means the landowners are sensitized to development of this nature.

**STAKEHOLDER GROUPS CONSULTED & METHOD OF CONSULTATION**

The following stakeholders have been identified by EPSI as being potentially affected by the Project:

**DIRECTLY IMPACTED LANDOWNER**

**There is one tenant on Enbridge property where the Project is proposed.**

- EPSI has and will continue to consult personally with this tenant. Tenant consent has been discussed and acquired.

**PRIMARY STAKEHOLDER GROUPS**

**Landowners and Tenants within a 1.5 km radius of the tie-in points and 0.5 km distance along the centerline of the pipeline.**

- Project information packages were mailed to the respective landowners and tenants, within the radii mentioned above.

**OTHER STAKEHOLDERS GROUPS – potentially affected**

**RM of Pipestone**

- Project information packages were emailed (same packages that were sent to landowners and tenants).
- EPSI is currently in the process of obtaining RM of Pipestone's approval.

**SUMMARY OF COMPLETED ACTIVITIES & RESULTS**

| ACTIVITY | TIMING | DETAILS | ISSUES AND/OR CONCERNS RAISED |
|---|---|---|---|
| Face-To-Face Visit with all directly impacted landowners and tenant | Completed on May 17th, 2014 | An EPSI land agent met with the directly impacted tenant to discuss the Project details, answer questions, and address any potential concerns.<br><br>During this meeting, the land agent also secured the Grant of Consent of Lessee Agreement for the Project. | The tenant had no issues or concerns with the Project. |
| Mailed project information packages to landowners and tenants within a 1.5 km radius of the tie-in points and 0.5 km from the centerline of the pipeline | Completed on May 12th, 2014 | A description of the Project scope and a map of the proposed project area were sent by regular mail to the adjacent landowners located within the radii established by the Manitoba Innovation, Energy and Mines – Petroleum Branch. | To date no issues or concerns have been raised. |
| RM of Pipestone Approval | In Progress | EPSI is currently pursuing approval from the RM for the Project. | No issues or concerns have been raised to date. |
| | Completed on May 12th, 2014 | The same Project information package that was mailed to the adjacent landowners and tenants was also mailed to the RM. | No issues or concerns were raised. |

# 7. Environment, Health and Safety

EPSI will utilize standard practices, existing manuals and procedures, as well as project specific plans and procedures during the construction of the facilities and over the course of operation.

## 7.1 Environmental Protection Plan

EPSI will utilize company manuals (Environmental Guidelines for Construction, Waste Management Plan, Environmental Protection Plan, and Vegetation Management Plan) and procedures (Operating and Maintenance Procedures) to develop this project in an environmentally responsible manner. Relevant topics included in our documents include, but not are limited to:

- Site and right of way access
- Erosion and silt control
- Topsoil salvage
- Pipeline installation techniques
- Trench (Bell hole) water management
- Vegetation, habitat, and wildlife protection measures
- Environmental inspection
- Reclamation
- Spill reporting
- Emergency mitigation procedures

## 7.2 Emergency Response Plan

A site-specific Emergency Response Plan will be developed for the construction of the pipelines and facilities, and will include the nearest hospital, emergency service numbers, and a map for specific emergency routes to and from the construction location.

# 8. Other Approvals

In addition to the Petroleum Branch approval, EPSI is either concurrently seeking or intends to seek the additional approvals and permits outlined below.

**Manitoba Conservation**

EPSI will be notifying Manitoba Conservation with an Environmental Overview (EO) of the Project concurrently with this application. EPSI expects that an Environmental Licence will not be required for this Project.

**Manitoba Infrastructure and Transportation**

EPSI intends to notify Manitoba Infrastructure and Transportation of the proposed highway crossing and obtain the required approval(s).

**Other Utilities and Right of Ways**

EPSI intends to notify and obtain required crossing and proximity agreements for all utilities and existing rights of way.

**Affected Municipalities**

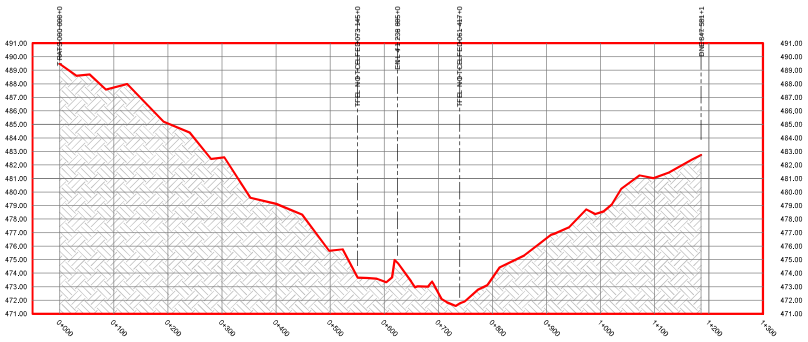
EPSI intends to notify and obtain required approvals from the RM of Pipestone for the proposed project.

**Department of Municipal Affairs, Culture and Housing (Heritage Branch)**

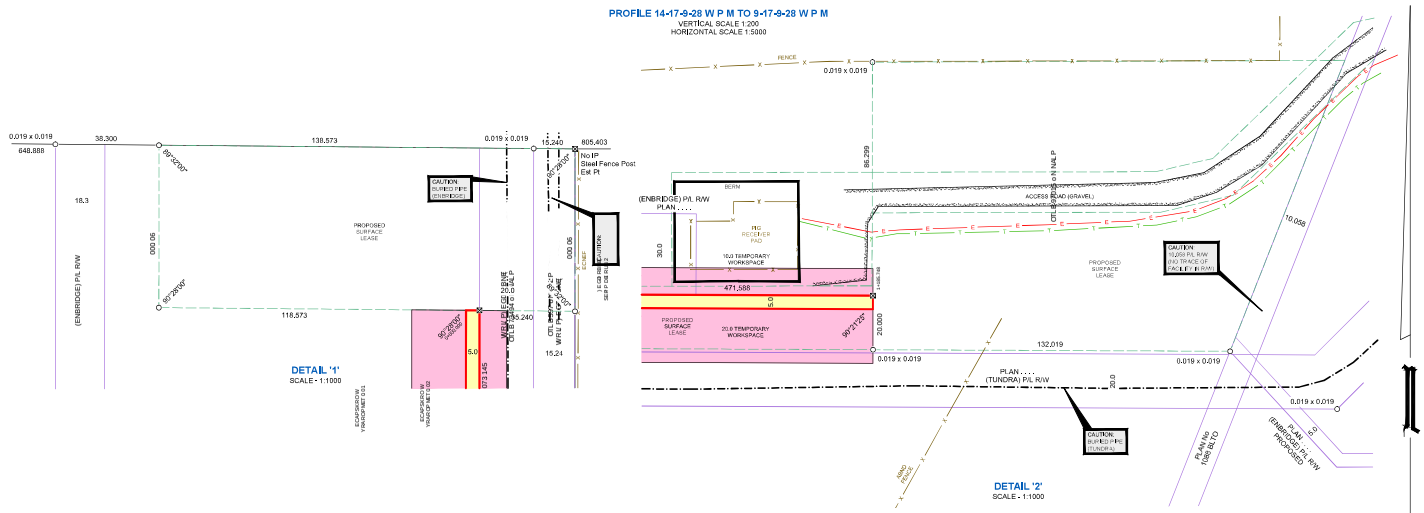
Should any archeological sites along the pipeline right of ways or facility boundaries be identified through desktop reviews of available information, EPSI will seek the necessary approvals to install the proposed pipelines and facilities.

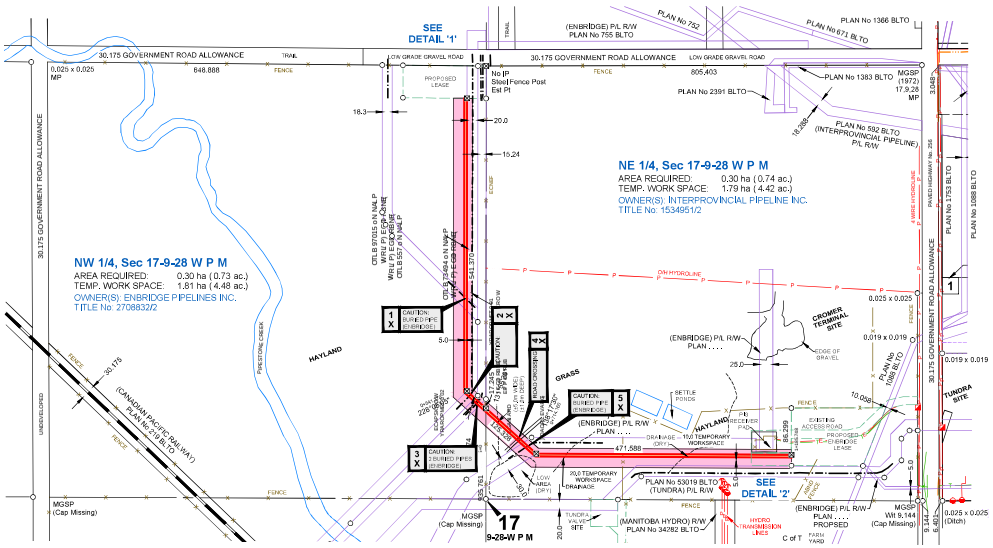
# Appendix A
# Pipeline Right of Way & Facility Survey Plans

| Drawing Name | Drawing Number |
|---|---|
| 16” (ZML-WV-01) Pipelines Construction Alignment | SM-0112-13-3-CON-R2 |
| 12” (ZML-VT-01) Pipelines Construction Alignment | SM-0112-13-4-CON-R2 |
| Westspur Interconnect Facility Lease IOP | SM-0112-13-1-IOP-1-R2 |
| Westspur Interconnect Facility Lease IOP | SM-0112-13-1-IOP-2-R2 |
| Manitoba Interconnect Facility Lease IOP | SM-0112-13-2-IOP-1-R2 |
| Manitoba Interconnect Facility Lease IOP | SM-0112-13-2-IOP-2-R2 |




**PROFILE 14-17-9-28 W P M TO 9-17-9-28 W P M**
VERTICAL SCALE 1:200
HORIZONTAL SCALE 1:5000




## BOOK OF REFERENCE

| STATION TO STATION | DISTANCE (Meters) | R.O.W Width | AREA (Hectares) | LEGAL DESCRIPTION | OWNER |
|---|---|---|---|---|---|
| 0+000.000 - 0+588.832 | 588.832 | 5.0 | 0.30 | NW 1/4, Sec 17-9-28 W P M | ENBRIDGE PIPELINES INC. |
| 0+588.832 - 1+185.748 | 596.916 | 5.0 | 0.30 | NE 1/4, Sec 17-9-28 W P M | INTERPROVINCIAL PIPELINE INC. |

## CROSSING / REFERENCE DRAWINGS

| No. | DESCRIPTION | LOCATION | DRAWING No. |
|---|---|---|---|
| 1X | (ENBRIDGE) P/L R/W - PLAN No 51079 BLTO (BURIED PIPE) | NW 1/4, Sec 17 | SM-0112-13-3-XEB-1-R2 |
| 2X | (ENBRIDGE) P/L R/W - PLAN No 49437 BLTO (BURIED PIPE) | NW 1/4, Sec 17 | SM-0112-13-3-XEB-2-R2 |
| 3X | (ENBRIDGE) P/L R/W - PLAN No 755 BLTO (2 BURIED PIPES) | NW 1/4, Sec 17 | SM-0112-13-3-XEB-3-R2 |
| 4X | GRAVEL ROAD | NE 1/4, Sec 17 | SM-0112-13-3-XNG-4-R2 |
| 5X | (ENBRIDGE) P/L R/W - PLAN No .....(BURIED PIPE) | NE 1/4, Sec 17 | SM-0112-13-3-XEB-5-R2 |

## REVISION / ISSUED

| No. | DATE | DESCRIPTION | JOB NO. |
|---|---|---|---|
| 0 | FEBRUARY 18, 2014 | - PLAN ISSUED | SM-0112-13-3 |
| 1 | APRIL 28, 2014 | - REVISED PIPELINE ROUTE, R/W WIDTH & REVISED TEMPORARY WORKSPACE | SM-0112-13-3-R1 |
| 2 | JUNE 5, 2014 | - REVISED LANDOWNER OF NW 1/4, Sec 17, REVISED DRAWING NAME & PIPELINE NAME | SM-0112-13-3-R2 |
| 3 | | | |
| 4 | | | |
| 5 | | | |

### LEGEND:

Survey Monuments found shown thus: ○
Survey Monuments planted shown thus: ●
0.025 x 0.025 Iron Posts planted shown thus: ■
Temporary Point shown thus: ⊠
Distances are in metres and decimals thereof.
Distances shown as 'Calc' are NOT to be included in total lengths.

Buried Pipe shown thus:
Buried Electrical Cable shown thus: E
Buried Cable shown thus: C
Buried MTS Cable shown thus: T
Hydro Pole shown thus:
Overhead Hydro line shown thus: P
Utility Gas line shown thus:
Fence line shown thus: X
Tree / Bush line shown thus:
Portions referred to shown thus:
Temporary Work Space shown thus:

### WELL LEGEND:

LOCATION / STANDING
GAS WELL
OIL WELL
INJECTION WELL
GAS INJECTION WELL
SERVICE WELL
SUSPENDED WELL
ABANDONED WELL
ABANDONED GAS WELL
SUSPENDED GAS WELL
ABANDONED OIL WELL
SUSPENDED OIL WELL
WATER SOURCE WELL
WATER WELL

**NOTE:**
Information Provided by SER and IHS Energy

### PIPE SPECIFICATIONS:

CARRIER PIPE #1
Carrier Line Size: 406.4 mm O.D. x 9.5 mm W.T.
Carrier Line Spec.: Steel, CSA Z245.1 G359 CAT. II
Max. Operating Pressure: 7378 kPa
Product Conveyed: Clean Oil

### FACILITIES SOURCE DATA:

| | Yes | No | N/A |
|---|---|---|---|
| Legal Plans | ■ | □ | □ |
| Land Titles | ■ | □ | □ |
| Manitoba Telephone | ■ | □ | □ |
| Manitoba Hydro | ■ | □ | □ |
| Website Listing | ■ | □ | □ |
| Other 3 Way Sweep | □ | ■ | □ |

**NOTE:** Positions of buried facilities shown are derived from interpretations of signals from electronic devices. Reception of electronic signals is subject to interference and has limitations, therefore it should not be assumed that all buried facilities are shown, and facilities which are shown should not be construed as "located" until physically exposed. All underground installations should be marked by the respective authorities prior to excavation or construction.

### LICENCE INFORMATION:

THE PROPOSED PIPELINE RIGHT OF WAY IS:
- More than 1.5 km from the nearest urban or rural centre

### CERTIFICATION:

I certify that the survey represented by this plan is correct to the best of my knowledge and was completed on the 30th day of January, 2014.

David J. Quirk
Manitoba Land Surveyor
**MIDWEST SURVEYS**

### RIGHT OF WAY INFORMATION:

| | | Yes | No |
|---|---|---|---|
| Right-of-way Boundaries: | Flagged | □ | ■ |
| Buried Facilities: | Located | ■ | □ |
| | Flagged | □ | ■ |

| SURVEYED BY: MH/MC | CALCULATED BY: CO/SD | DRAWN BY: JB |
|---|---|---|

**TOTAL LENGTH OF RIGHT-OF-WAY ALONG POSTED BOUNDARY = 1185.748**

**ENBRIDGE PIPELINES (SASKATCHEWAN) INC.**

P. ENG.

**PROJECT NAME: 14-17-9-28 PROPOSED LEASE TO 9-17-9-28 W P M PROPOSED LEASE**

PLAN SHOWING
# PIPELINE CONSTRUCTION ALIGNMENT
# PROPOSED 16" LINE ZML-WV-01
IN
## N 1/2, Sec 17,
## Twp 9, Rge 28, W P M

R.M. OF PIPESTONE

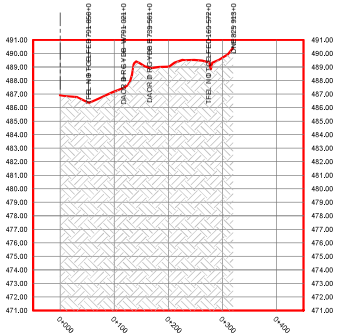
SCALE 1:5000

SHEET No. 1 of 1

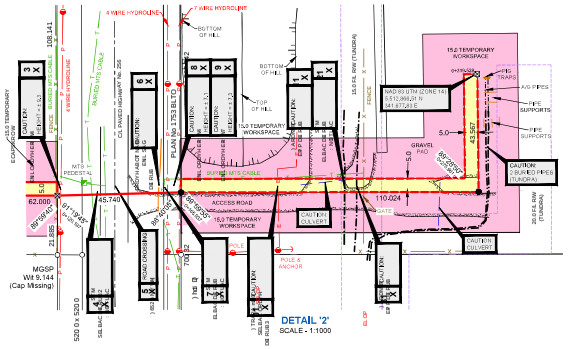

MIDWEST SURVEYS
DAVID J. QUIRK M.L.S.
ESTEVAN - PHONE: 306-634-2635
FAX: 306-634-3164


REVISION 2

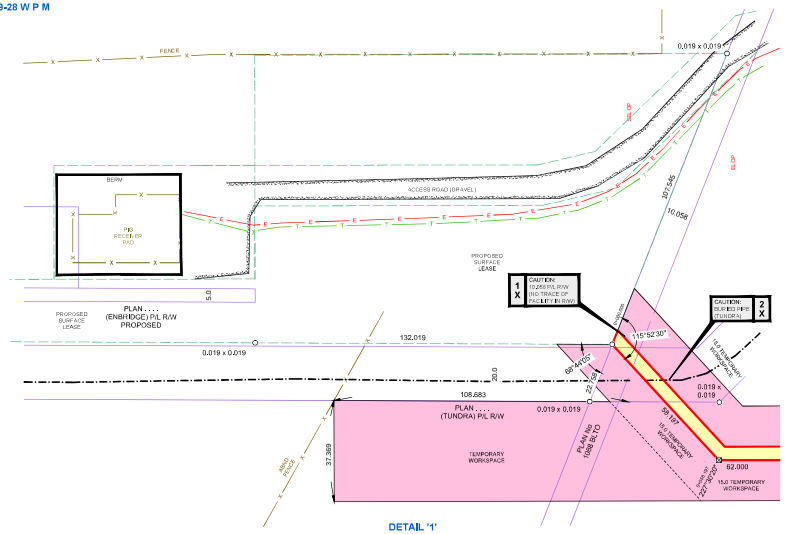
SM-0112-13-3-CON-R2



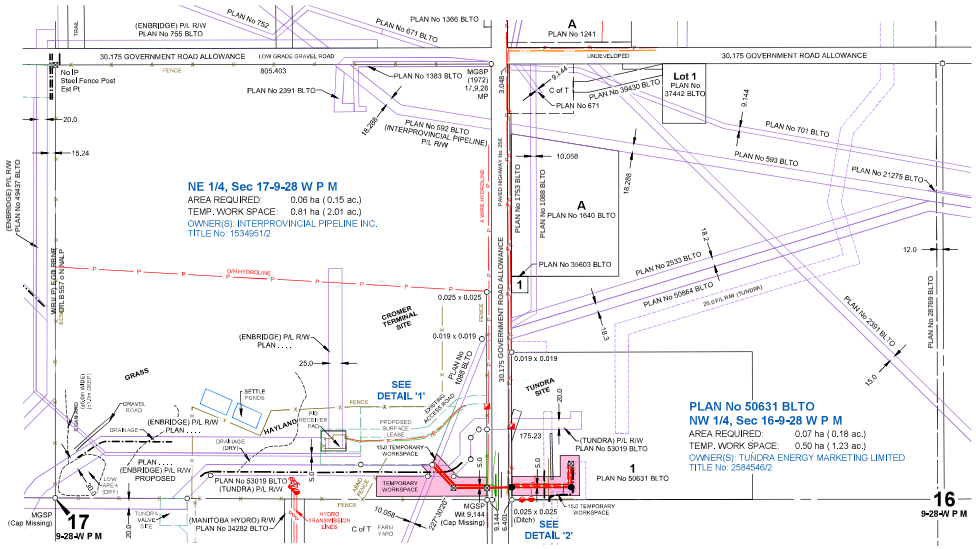
PROFILE 9-17-9-28 W P M TO 12-16-9-28 W P M
VERTICAL SCALE 1:200
HORIZONTAL SCALE 1:5000



DETAIL '2'
SCALE - 1:1000



DETAIL '1'
SCALE - 1:1000



NE 1/4, Sec 17-9-28 W P M
AREA REQUIRED: 0.06 ha ( 0.15 ac.)
TEMP. WORK SPACE: 0.81 ha ( 2.01 ac.)
OWNER(S): INTERPROVINCIAL PIPELINE INC.
TITLE No: 1534951/2

PLAN No 50631 BLTO
NW 1/4, Sec 16-9-28 W P M
AREA REQUIRED: 0.07 ha ( 0.18 ac.)
TEMP. WORK SPACE: 0.50 ha ( 1.23 ac.)
OWNER(S): TUNDRA ENERGY MARKETING LIMITED
TITLE No: 2584546/2

## BOOK OF REFERENCE

| STATION TO STATION | DISTANCE (Meters) | R.O.W Width | AREA (Hectares) | LEGAL DESCRIPTION | OWNER |
|---|---|---|---|---|---|
| 0+000.000 - 0+120.197 | 120.197 | 5.0 | 0.15 | NE 1/4, Sec 17-9-28 W P M | INTERPROVINCIAL PIPELINE INC. |
| 0+165.937 - 0+319.528 | 153.591 | 5.0 | 0.07 | NW 1/4, Sec 16-9-28 W P M | TUNDRA ENERGY MARKETING LIMITED |

## CROSSING / REFERENCE DRAWINGS

| No. | DESCRIPTION | LOCATION | DRAWING No. |
|---|---|---|---|
| 1X | 10.058 P/L R/W - PLAN No 10888 BLTO (NO TRACE OF FACILITY IN R/W) | NE 1/4, Sec 17 | SM-0112-13-4-XNG-1-R2 |
| 2X | (TUNDRA) P/L R/W - PLAN No ..... (BURIED PIPE) | NE 1/4, Sec 17 | SM-0112-13-4-XNG-2-R2 |
| 3X | 4 WIRE HYDROLINE (HEIGHT = ± 9.3) | NE 1/4, Sec 17 | SM-0112-13-4-XNG-3-R2 |
| 4X | 2 BURIED MTS CABLES | NW 1/4, Sec 16 | SM-0112-13-4-XNG-4-R2 |
| 5X | 45.72 ROAD - PLAN No 1753 BLTO (PAVED HIGHWAY No 256) | NW 1/4, Sec 16 | SM-0112-13-4-XRD-5-R2 |
| 6X | BURIED GAS LINE (MANITOBA HYDRO) | NW 1/4, Sec 16 | SM-0112-13-4-XNG-6-R2 |
| 7X | BURIED MTS CABLE | NW 1/4, Sec 16 | SM-0112-13-4-XNG-7-R2 |
| 8X | 4 WIRE HYDROLINE (HEIGHT = ± 7.1) | NW 1/4, Sec 16 | SM-0112-13-4-XNG-8-R2 |
| 9X | 7 WIRE HYDROLINE (HEIGHT = ± 7.3) | NW 1/4, Sec 16 | SM-0112-13-4-XNG-9-R2 |
| 10X | 3 BURIED HYDRO CABLES (2.0m APART) | NW 1/4, Sec 16 | SM-0112-13-4-XNG-10-R2 |
| 11X | BURIED PIPE (TUNDRA) | NW 1/4, Sec 16 | SM-0112-13-4-XNG-11-R2 |
| 12X | BURIED MTS CABLE | NW 1/4, Sec 16 | SM-0112-13-4-XNG-12-R2 |
| 13X | BURIED PIPE (TUNDRA) (SPARE PIPE) | NW 1/4, Sec 16 | SM-0112-13-4-XNG-13-R2 |

## REVISION / ISSUED

| No. | DATE | DESCRIPTION | JOB NO. |
|---|---|---|---|
| 1 | FEBRUARY 10, 2014 | - PLAN ISSUED | SM-0112-13-4 |
| 2 | APRIL 28, 2014 | - REVISED R/W WIDTH IN NE 1/4, Sec 17 & REVISED TEMPORARY WORKSPACE | SM-0112-13-4-R1 |
| 3 | JUNE 5, 2014 | - REVISED R/W ROUTE IN NE 1/4, Sec 17, REVISED PIPELINE NAME, DRAWING NAME & PIPE SPECIFICATIONS | SM-0112-13-4-R2 |
| 4 | | | |
| 5 | | | |
| 6 | | | |

**LEGEND:**
Survey Monuments found shown thus:
Survey Monuments planted shown thus:
0.025 x 0.025 Iron Posts planted shown thus:
Temporary Point shown thus:
Distances are in metres and decimals thereof.
Distances shown as 'Calc' are NOT to be included in total lengths.

Buried Pipe shown thus:
Buried Electrical Cable shown thus: E
Buried Cable shown thus: C
Buried MTS Cable shown thus:
Hydro Pole shown thus:
Overhead Hydro line shown thus: P
Utility Gas line shown thus:
Fence line shown thus: X
Tree / Bush line shown thus:
Portions referred to shown thus:
Temporary Work Space shown thus:

**WELL LEGEND:**
LOCATION / STANDING
GAS WELL
OIL WELL
INJECTION WELL
GAS INJECTION WELL
SERVICE WELL
SUSPENDED WELL
ABANDONED WELL
ABANDONED GAS WELL
SUSPENDED GAS WELL
ABANDONED OIL WELL
SUSPENDED OIL WELL
WATER SOURCE WELL
WATER WELL

**NOTE:** Information Provided by SER and IHS Energy

**PIPE SPECIFICATIONS:**

CARRIER PIPE #1
Carrier Line Size: 323.8 mm O.D. x 7.1 mm W.T.
Carrier Line Spec.: Steel, CSA Z245.1 G359 CAT. II
Max. Operating Pressure: 4960 kPa
Product Conveyed: Clean Oil

**FACILITIES SOURCE DATA:**

| | Yes | No | N/A |
|---|---|---|---|
| Legal Plans | ■ | □ | □ |
| Land Titles | ■ | □ | □ |
| Manitoba Telephone | ■ | □ | □ |
| Manitoba Hydro | ■ | □ | □ |
| Wellsite Listing | ■ | □ | □ |
| Other 3 Way Sweep | □ | ■ | □ |

**NOTE:** Positions of buried facilities shown are derived from interpretations of signals from electronic devices. Reception of electronic signals is subject to interference and has limitations, therefore it should not be assumed that all buried facilities are shown, and facilities which are shown should not be construed as "located" until physically exposed. All underground installations should be marked by the respective authorities prior to excavation or construction.

**LICENCE INFORMATION:**
THE PROPOSED PIPELINE RIGHT OF WAY IS:
- More than 1.5 km from the nearest urban or rural centre

**RIGHT OF WAY INFORMATION:**

| | | Yes | No |
|---|---|---|---|
| Right-of-way Boundaries: | Flagged | □ | ■ |
| Buried Facilities: | Located | ■ | □ |
| | Flagged | □ | ■ |

**CERTIFICATION:**
I certify that the survey represented by this plan is correct to the best of my knowledge and was completed on the 30th day of January, 2014.

David J. Quirk
Manitoba Land Surveyor
MIDWEST SURVEYS

| SURVEYED BY: MH/MC | CALCULATED BY: CO/SD | DRAWN BY: JB |
|---|---|---|

TOTAL LENGTH OF RIGHT-OF-WAY ALONG POSTED BOUNDARY = 319.528

ENBRIDGE PIPELINES (SASKATCHEWAN) INC.

P. ENG.

PROJECT NAME: 9-17-9-28 PROPOSED LEASE TO 12-16-9-28 W P M TUNDRA SITE

PLAN SHOWING
# PIPELINE CONSTRUCTION ALIGNMENT
# PROPOSED 12" LINE ZML-VT-01
IN
## NW 1/4, Sec 16 & NE 1/4, Sec 17, Twp 9, Rge 28, W P M

R.M. OF PIPESTONE

SCALE 1:5000

SHEET No. 1 of 1

MIDWEST SURVEYS
DAVID J. QUIRK M.L.S.
ESTEVAN - PHONE: 306-634-2635
FAX: 306-634-3164

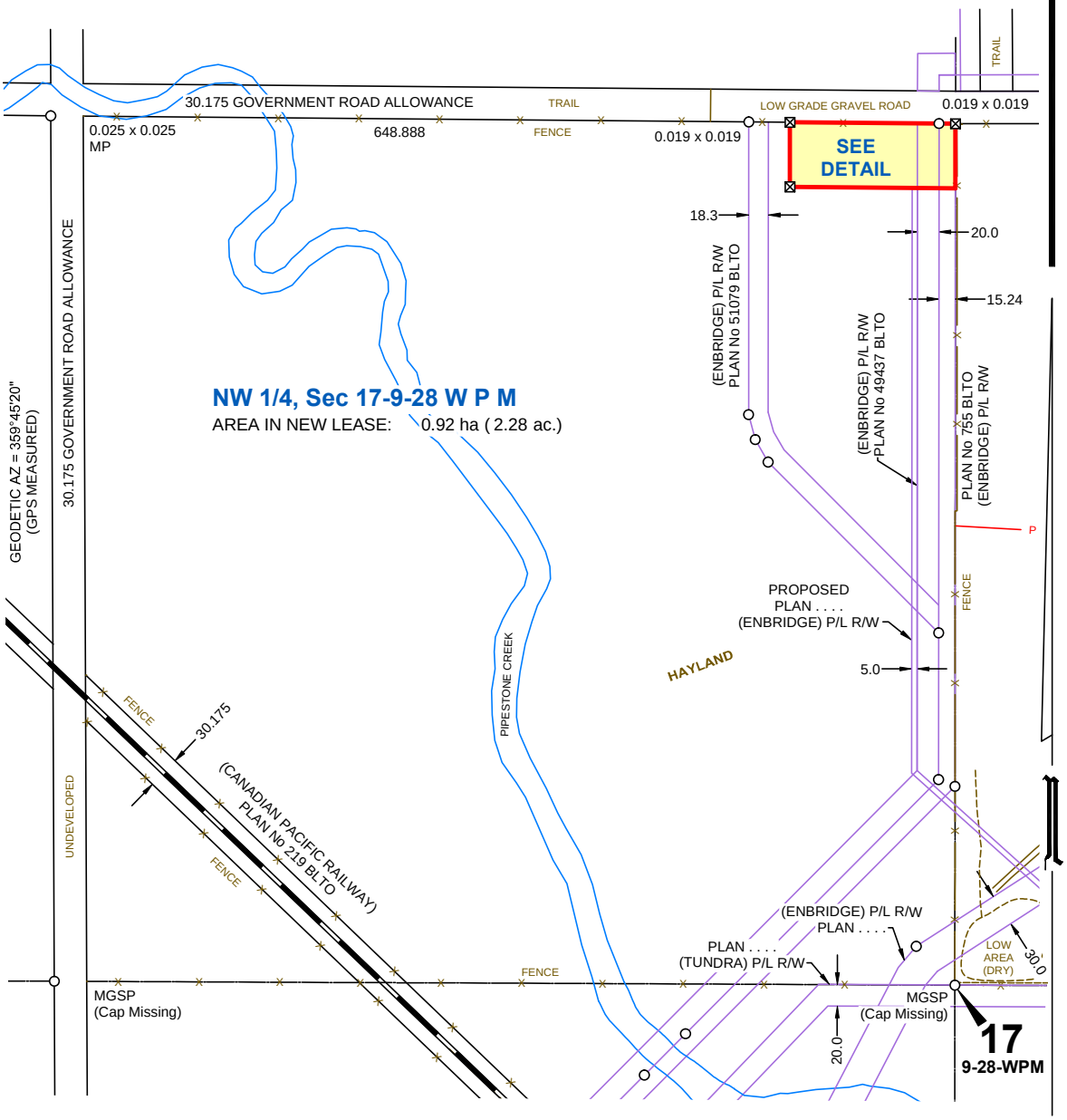
REVISION 2

SM-0112-13-4-CON-R2

REVISION 2

ENBRIDGE

# LEASE SITE
# INDIVIDUAL OWNERSHIP PLAN




OWNER(S): ENBRIDGE PIPELINES INC.

TITLE No.: 2708832/2

**This plan certified correct this 5th day of June, 2014.**

David J. Quirk
**Manitoba Land Surveyor**

**NOTE: NOT TO BE USED FOR CONSTRUCTION PURPOSES**

**LEGEND:**

Survey Monuments found shown thus: ○
0.019 x 0.019 Iron Posts planted shown thus: ●
0.025 x 0.025 Iron Posts planted shown thus: ■
Temporary Point shown thus: ⊠
Portions referred to shown thus:
Temporary Work Space shown thus:
Distances are in metres and decimals thereof.

| No. | DATE | REVISION / ISSUED | JOB No. | SCALE 1:5000 |
|---|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-1 | |
| 1. | APR. 28, 2014 | REDUCED LEASE SIZE BY 20m (WEST SIDE) | SM-0112-13-1 | |
| 2. | JUN. 5, 2014 | REVISED LANDOWNER & REVISED DRAWING NAME | SM-0112-13-1 | |

SURVEYED BY: MC | CALC'D BY: CO | DRAWN BY: JB

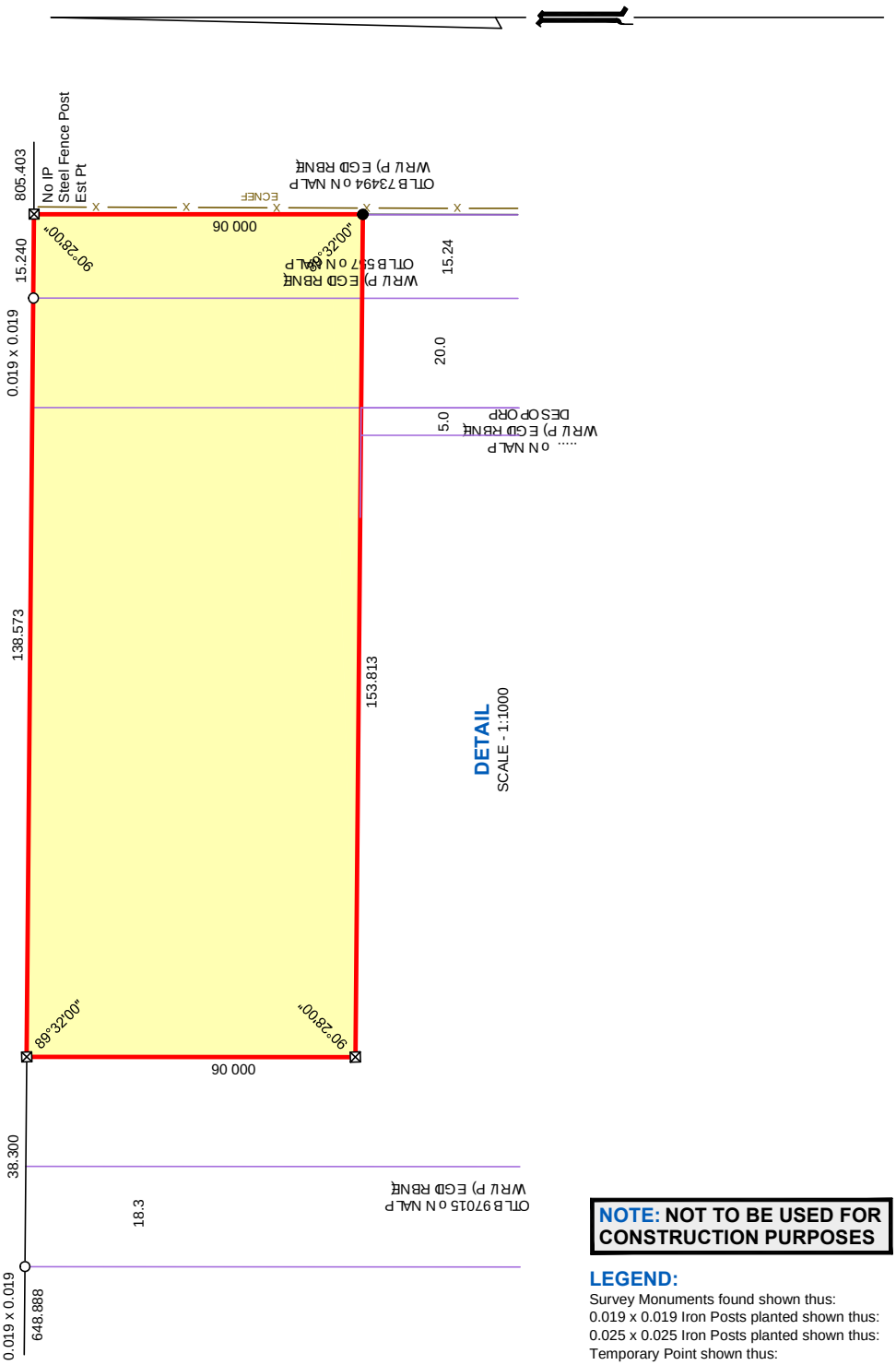
**David J. Quirk M.L.S.**
130 King Street
Estevan, SK
S4A 2T5
Tel: 306-634-2635
MIDWEST SURVEYS

SM-0112-13-1-IOP-1-R2

REVISION 2

ENBRIDGE

# LEASE SITE
# INDIVIDUAL OWNERSHIP PLAN




**NOTE: NOT TO BE USED FOR CONSTRUCTION PURPOSES**

**LEGEND:**

Survey Monuments found shown thus: ○
0.019 x 0.019 Iron Posts planted shown thus: ●
0.025 x 0.025 Iron Posts planted shown thus: ■
Temporary Point shown thus: ⊠
Portions referred to shown thus:
Temporary Work Space shown thus:
Distances are in metres and decimals thereof.

| No. | DATE | REVISION / ISSUED | JOB No. | SCALE 1:1000 |
|---|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-1 | |
| 1. | APR. 28, 2014 | REDUCED LEASE SIZE BY 20m (WEST SIDE) | SM-0112-13-1 | |
| 2. | JUN. 5, 2014 | REVISED LANDOWNER & REVISED DRAWING NAME | SM-0112-13-1 | |

SURVEYED BY: MC | CALC'D BY: CO | DRAWN BY: JB

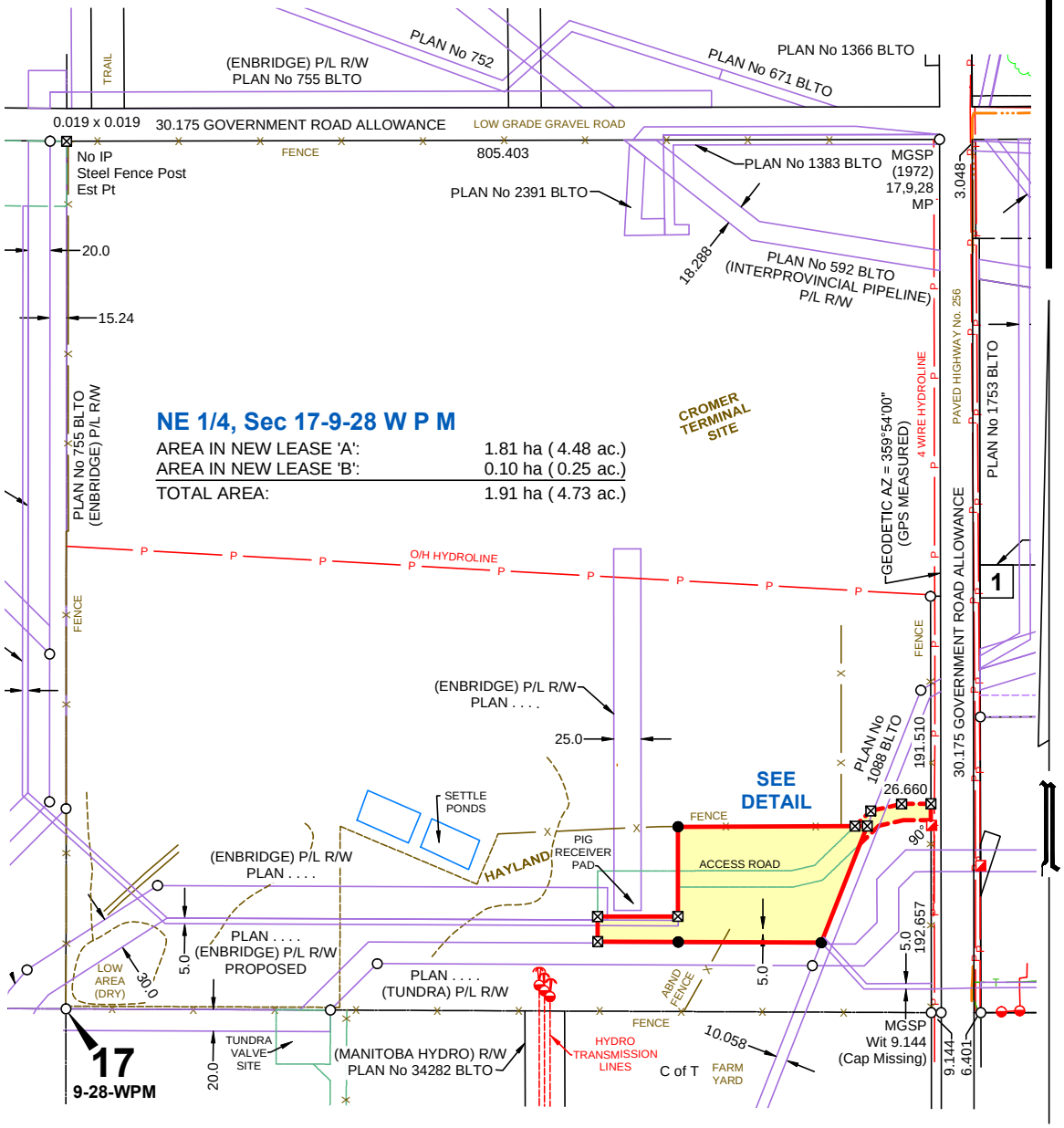
David J. Quirk M.L.S.
130 King Street
Estevan, SK
S4A 2T5
Tel: 306-634-2635
MIDWEST SURVEYS

SM-0112-13-1-IOP-2-R2

REVISION 2

ENBRIDGE

# LEASE SITE
# INDIVIDUAL OWNERSHIP PLAN




OWNER(S): INTERPROVINCIAL PIPELINE INC.

TITLE No.: 1534951/2

**This plan certified correct this 5th day of June, 2014.**

David J. Quirk
**Manitoba Land Surveyor**

**NOTE: NOT TO BE USED FOR CONSTRUCTION PURPOSES**

**LEGEND:**

Survey Monuments found shown thus: ○
0.019 x 0.019 Iron Posts planted shown thus: ●
0.025 x 0.025 Iron Posts planted shown thus: ■
Temporary Point shown thus: ⊠
Portions referred to shown thus:
Temporary Work Space shown thus:
Distances are in metres and decimals thereof.

| No. | DATE | REVISION / ISSUED | JOB No. | SCALE 1:5000 |
|---|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-2 | |
| 1. | APR. 28, 2014 | ADDED EXISTING ACCESS ROAD & ADDED LEASE AREA IN THE SW CORNER | SM-0112-13-2 | |
| 2. | JUN. 5, 2014 | REVISED DETAIL ON PAGE 2 & REVISED DRAWING NAME | SM-0112-13-2 | |

SURVEYED BY: MC | CALC'D BY: CO | DRAWN BY: JB

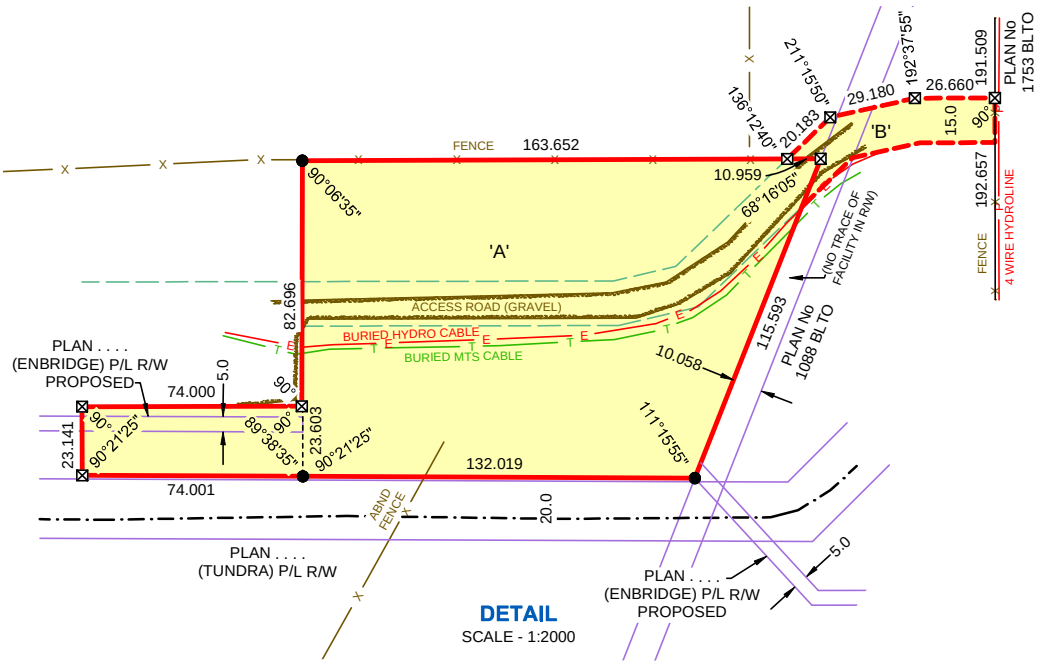
**David J. Quirk M.L.S.**
130 King Street
Estevan, SK
S4A 2T5
Tel: 306-634-2635
MIDWEST SURVEYS

SM-0112-13-2-IOP-1-R2

REVISION 2

ENBRIDGE

# LEASE SITE
# INDIVIDUAL OWNERSHIP PLAN




**DETAIL**
SCALE - 1:2000

**NOTE: NOT TO BE USED FOR CONSTRUCTION PURPOSES**

**LEGEND:**

Survey Monuments found shown thus: ○
0.019 x 0.019 Iron Posts planted shown thus: ●
0.025 x 0.025 Iron Posts planted shown thus: ■
Temporary Point shown thus: ⊠
Portions referred to shown thus:
Temporary Work Space shown thus:
Distances are in metres and decimals thereof.

| No. | DATE | REVISION / ISSUED | JOB No. | SCALE 1:2000 |
|---|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-2 | |
| 1. | APR. 28, 2014 | ADDED EXISTING ACCESS ROAD & ADDED LEASE AREA IN THE SW CORNER | SM-0112-13-2 | |
| 2. | JUN. 5, 2014 | REVISED DETAIL ON PAGE 2 & REVISED DRAWING NAME | SM-0112-13-2 | |

SURVEYED BY: MC | CALC'D BY: CO | DRAWN BY: JB

**David J. Quirk M.L.S.**
130 King Street
Estevan, SK
S4A 2T5
Tel: 306-634-2635
MIDWEST SURVEYS

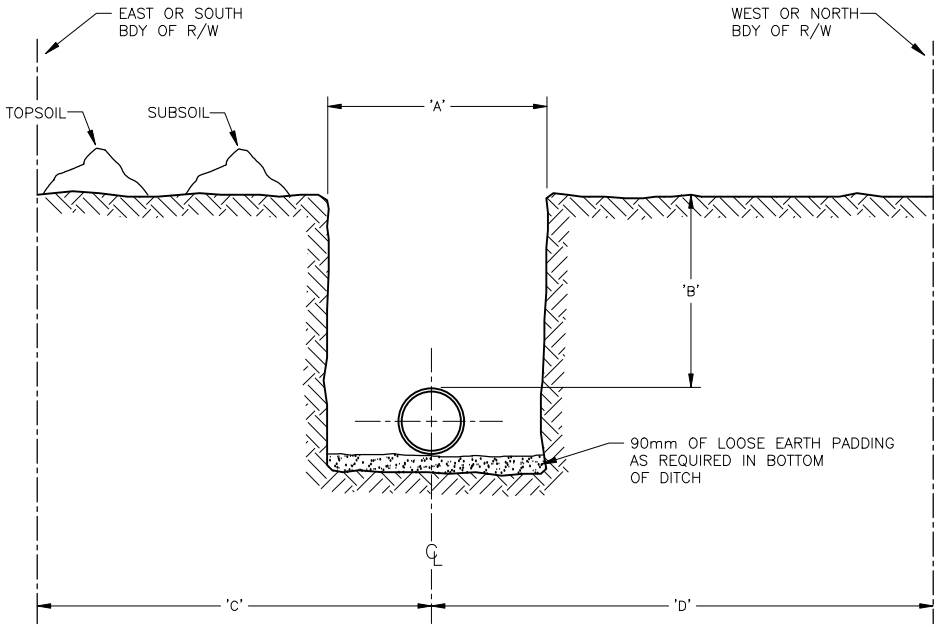
SM-0112-13-2-IOP-2-R2

# Appendix B
# Typical Profile and Cross-Sections of Pipeline, Road, and Utility Crossings

| Drawing Name | Drawing Number |
|---|---|
| Typical Pipeline Installation | A-PPD-590 SHT. 153 Rev. A |
| Typical Foreign Pipeline Crossing | A-TYP-590 SHT. 155b Rev. 2 |
| Typical Foreign Cable Crossing | A-TYP-590 SHT. 155c Rev. B |

| NOMINAL PIPE DIAMETER | MINIMUM DIMENSION 'B' IN EARTH | IN ROCK | MINIMUM DIMENSION 'A' IN EARTH IN ROCK |
|---|---|---|---|
| 88.9mm | 1.5m | .65m | 375mm |
| 114.3mm | 1.5m | .65m | 400mm |
| 168.3mm | 1.5m | .65m | 450mm |
| 219.1mm | 1.5m | .65m | 600mm |
| 273.1mm | 1.5m | .65m | 600mm |
| 323.9mm | 1.5m | .65m | 600mm |
| 406.4mm | 1.5m | .65m | 600mm |

| | NORMAL PIPE LOCATION UNLESS OTHERWISE SPECIFIED BY COMPANY INSPECTOR OR BY CONTRACT DRAWING | | |
|---|---|---|---|
| | | DIMENSION 'C' | DIMENSION 'D' |
| 15m R.O.W. | TRUNK LINES | 8m | 7m |
| | GATHERING LINES | 8m | 7m |
| 20m R.O.W. | TRUNK LINES | 10m | 10m |
| | GATHERING LINES | 10m | 10m |




SECTION

| REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

J:\DWG\TYP

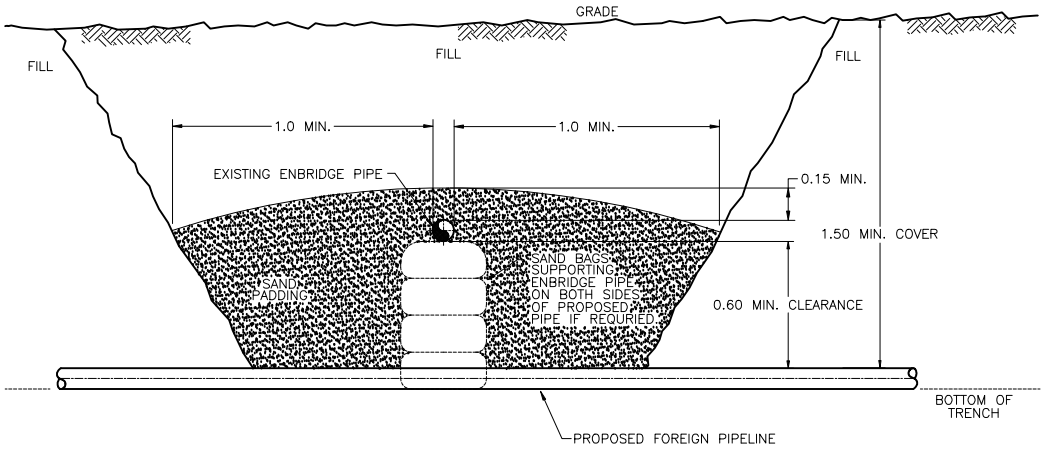
| ENGINEERING RECORD | | |
|---|---|---|
| PROJECT | | |
| AFE No. | PROJECT No. | |
| DRAWN BY J.D. MICHEL | DATE 1993-12-01 | |
| CHKD BY J.T. ZELAZNY | DESIGNED BY | |
| ENGINEER | LAST UPDATE: 2013-09-23, 09:09 | |
| ACAD DWG No. TYP590153.DWG | SCALE N.T.S. | |

ENBRIDGE

TITLE

ENBRIDGE PIPELINES (SASKATCHEWAN) INC.
TYPICAL PIPELINE INSTALLATION
DITCH & PIPE CROSS SECTION

| DRAWING No. | SHT. | REV |
|---|---|---|
| A-PPD-590 | 153 | A |




NOTES:

1. ALL DIMENSIONS IN METERS.
2. TRENCH AT EXISTING ENBRIDGE PIPELINE TO BE EXPOSED BY WATER WASHING OR BY HAND PRIOR TO ANY MECHANICAL EXCAVATION.
3. WHERE FOREIGN PIPELINE IS ALUMINUM, CLEARANCE SHALL BE INCREASED TO 0.8 m MINIMUM.
4. IN CASES WHERE EXISTING ENBRIDGE PIPELINE IS AT ABNORMAL DEPTH, THE NEW PIPELINE MAY BE ABOVE IF APPROVED BY ENBRIDGE. 0.6 m MINIMUM CLEARANCE SHALL BE MAINTAINED.
5. SAND PADDING NOT REQUIRED FOR STEEL PIPELINES. SELECTED FILL MATERIAL MAY BE SUBSTITUTED IF APPROVED BY ENBRIDGE.
6. ADEQUATE NOTICE SHALL BE GIVEN TO ENBRIDGE SO THAT THEIR REPRESENTATIVE MAY BE PRESENT WHEN CROSSING INSTALLATION IS MADE.
7. IF CATHODIC PROTECTION IS REQUIRED SEE DRAWING No. A-PPD-590 Sht. 156.
8. THE TEST LEADS, WHERE TEST LEADS TO FOREIGN LINES ARE REQUIRED, SHALL BE ATTACHED TO THE FOREIGN LINE BY EMPLOYEES OF FOREIGN COMPANY OR UNDER THEIR DIRECT SUPERVISION.
9. CROSSING SHALL BE MADE AT A 90° ANGLE (±5°). OTHER CROSSING ANGLES MAY BE APPROVED PROVIDED THE ANGLE WILL NOT HINDER LOCATING THE FACILITY IN THE FUTURE. CSA Z662 WILL NOT PERMIT CROSSINGS AT LESS THAN 45°.

| REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|
| 0 | ORIGINAL ISSUE | JDM | 1999-07-21 | DAC | |
| 1 | REVISED NOTES | JDM | 2011-04-13 | TJB | |
| 2 | REVISED NOTES | JDM | 2011-07-26 | LM | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

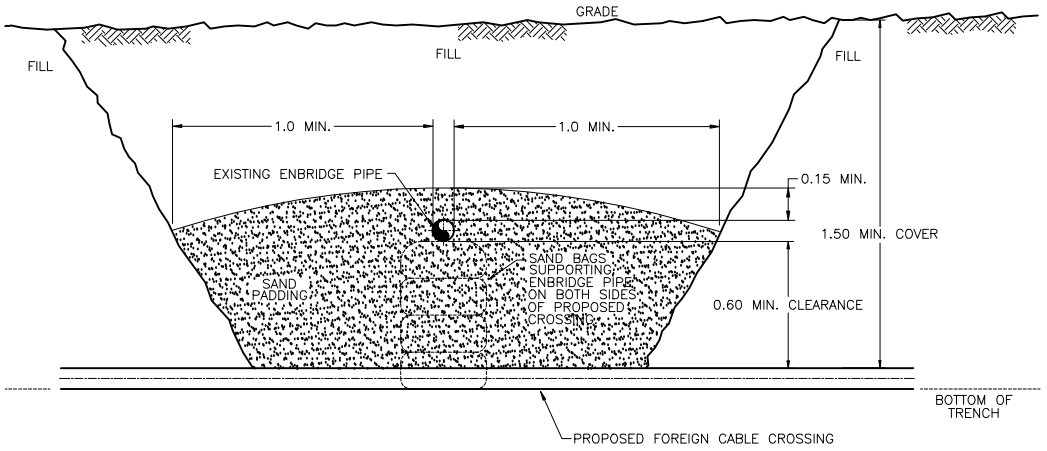
| ENGINEERING RECORD | | |
|---|---|---|
| PROJECT | | |
| AFE/FILE | DATE | 1999-07-21 |
| DRAWN BY J.D. MICHEL | DESIGNED BY | |
| CHKD BY D.A. COOK | ACAD DWG No. | TYP590155b.DWG |
| ENGINEER | LAST UPDATE: | 20110413.1636 |
| J:\DWG\TYP\ | SCALE | N.T.S. |

U:\Def\Public Relations\PR\Enbridge Logos\EN_b.pcx

TITLE

# ENBRIDGE PIPELINES (SASKATCHEWAN) INC.
# TYPICAL FOREIGN PIPELINE CROSSING
# CROSS SECTION

| DRAWING No. | SHT. | REV |
|---|---|---|
| A-TYP-590 | 155b | 2 |




NOTES:
1. ALL DIMENSIONS IN METERS.
2. TRENCH AT EXISTING ENBRIDGE PIPELINE TO BE EXPOSED BY WATER WASHING OR BY HAND PRIOR TO ANY MECHANICAL EXCAVATION.
3. IN CASES WHERE EXISTING ENBRIDGE PIPELINE IS AT ABNORMAL DEPTH, THE CABLE CROSSING MAY BE ABOVE IF APPROVED BY ENBRIDGE PIPELINES. 0.6 m MINIMUM CLEARANCE SHALL BE MAINTAINED.
4. SAND PADDING NOT REQUIRED FOR STEEL PIPELINES. SELECTED FILL MATERIAL MAY BE SUBSTITUTED IF APPROVED BY ENBRIDGE.
5. ADEQUATE NOTICE SHALL BE GIVEN TO ENBRIDGE SO THAT THEIR REPRESENTATIVE MAY BE PRESENT WHEN CROSSING INSTALLATION IS MADE.

| REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|
| B | UPDATED NOTES | JDM | 2011-07-26 | LM | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| ENGINEERING RECORD | |
|---|---|
| PROJECT | |
| AFE/FILE | DATE 1999-07-21 |
| DRAWN BY J.D. MICHEL | DESIGNED BY |
| CHKD BY D.A. COOK | ACAD DWG No. TYP590155c.DWG |
| ENGINEER | LAST UPDATE: 20110726.1156 |
| J:\DWG\TYP\ | SCALE N.T.S. |

U:\Def\Public Relations\PR\Enbridge Logos\EN_L.pcx

TITLE

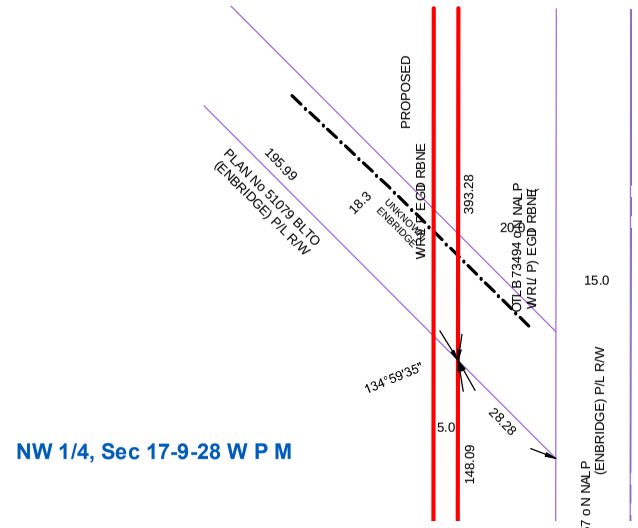
ENBRIDGE PIPELINES (SASKATCHEWAN) INC.
TYPICAL FOREIGN CABLE CROSSING
CROSS SECTION

| DRAWING No. | SHT. | REV |
|---|---|---|
| A-TYP-590 | 155c | B |

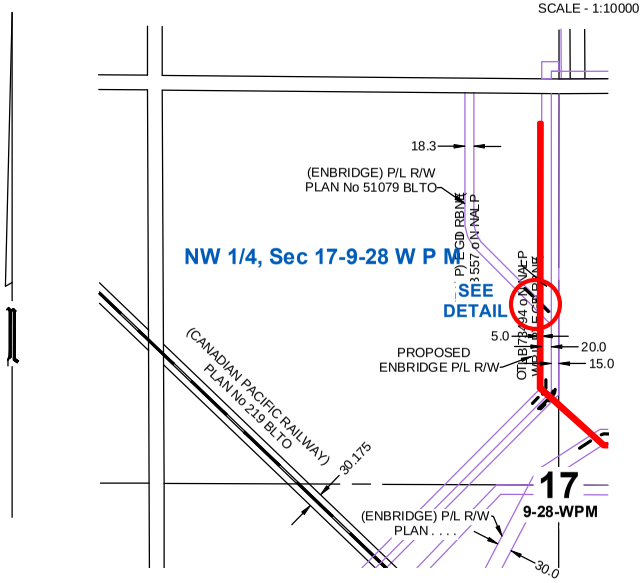
# Appendix C
# Pipeline ZML-WV-01 Crossing Plans

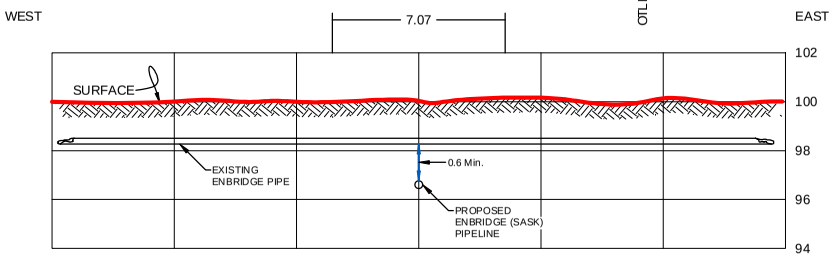
| Drawing Name | Drawing Number |
|---|---|
| Enbridge Pipeline Crossing (Xing #1) | SM-0112-13-3-XEB-1-R2 |
| Enbridge Pipeline Crossing (Xing #2) | SM-0112-13-3-XEB-2-R2 |
| Enbridge Pipeline Crossing (Xing #3) | SM-0112-13-3-XEB-3-R2 |
| Enbridge Pipeline Crossing (Xing #5) | SM-0112-13-3-XEB-5-R2 |
| Access Road Crossing (Xing #4) | SM-0112-13-3-XNG-4-R2 |

## DETAIL
SCALE - 1:1000

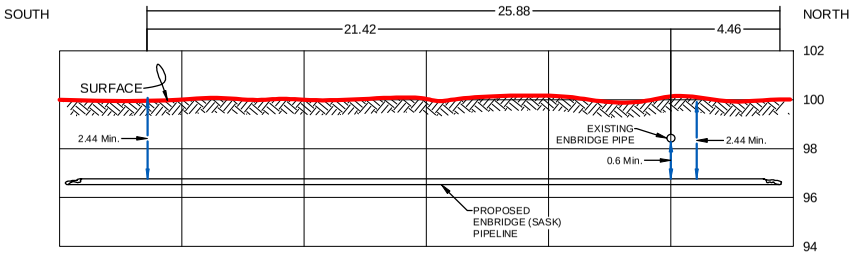



## LOCATION PLAN
SCALE - 1:10000




## CROSS-SECTION
HORIZONTAL SCALE - 1:200
VERTICAL SCALE - 1:200




## PROFILE
HORIZONTAL SCALE - 1:200
VERTICAL SCALE - 1:200

**NOTE:** Positions of buried facilities shown are derived from interpretations of signals from electronic devices. Reception of electronic signals is subject to interference and has limitations, therefore it should not be assumed that all buried facilities are shown, and facilities which are shown should not be construed as "located" until physically exposed. All underground installations should be marked by the respective authorities prior to excavation or construction.

| No. | DATE | REVISION / ISSUED | JOB No. |
|---|---|---|---|
| 0. | FEB. 20, 2014 | PLAN ISSUED | SM-0112-13-3 |
| 1. | APR. 28, 2014 | REVISED PIPELINE ROUTE & R/W WIDTH | SM-0112-13-3 |
| 2. | JUN. 5, 2014 | REVISED PIPE SPECIFICATIONS & REVISED DRAWING NAME | SM-0112-13-3 |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB

| PIPE SPECIFICATIONS: ENBRIDGE(SASK) | CARRIER PIPE |
|---|---|
| Outside Diameter: | 406.4 mm |
| Wall Thickness: | 9.5 mm |
| Specification / Grade: | CSA Z245.1 G359 CAT. II |
| Pipe Material: | Steel |
| Year of Installation: | 2014 |
| Type of Joint: | Welded |
| Protection: | FBE |
| Max. Operating Pressure: | 7378 kPa |
| Min. Test Pressure: | 11067 kPa |
| Product Conveyed: | Clean Oil |

| PIPE SPECIFICATIONS: ENBRIDGE | CARRIER PIPE |
|---|---|
| Outside Diameter: | 914.0 mm |
| Wall Thickness: | 10.32 mm |
| Specification / Grade: | X-70 |
| Pipe Material: | Steel |
| Year of Installation: | 2008/2009 |
| Type of Joint: | N/A |
| Protection: | API5LPSL-2FBE |
| Max. Operating Pressure: | N/A |
| Min. Test Pressure: | N/A |
| Product Conveyed: | Crude Oil |

# ENBRIDGE PIPELINES (SASKATCHEWAN) INC.

**CROSSING PLAN OF**
**ENBRIDGE PIPELINES INC.**
**PLAN No 51079 BLTO**
IN THE NW 1/4, Sec 17, Twp 9, Rge 28, W P M
MANITOBA

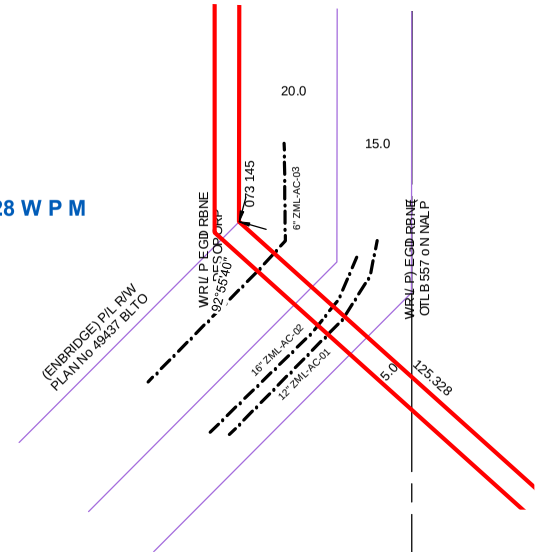
CERTIFIED CORRECT: David Quirk
DATE: June 5th, 2014


MIDWEST SURVEYS
DAVID J. QUIRK M.L.S.
ESTEVAN - PHONE: 306-634-2635
FAX: 306-634-3164

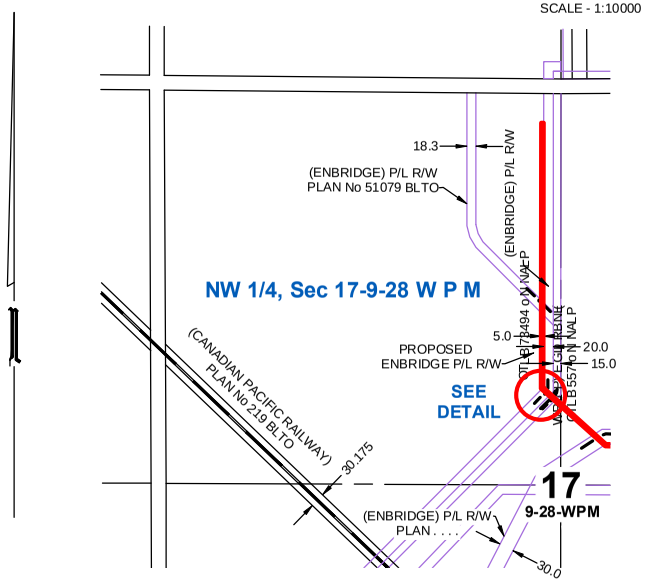

REVISION 2

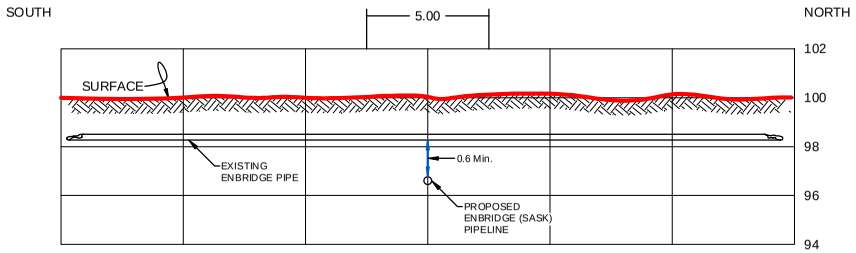
SM-0112-13-3-XEB-1-R2

## DETAIL
SCALE - 1:1000

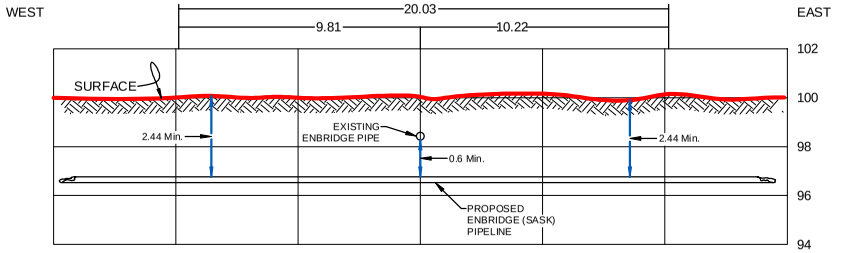



## LOCATION PLAN
SCALE - 1:10000




## CROSS-SECTION
HORIZONTAL SCALE - 1:200
VERTICAL SCALE - 1:200




## PROFILE
HORIZONTAL SCALE - 1:200
VERTICAL SCALE - 1:200

**NOTE:** Positions of buried facilities shown are derived from interpretations of signals from electronic devices. Reception of electronic signals is subject to interference and has limitations, therefore it should not be assumed that all buried facilities are shown, and facilities which are shown should not be construed as "located" until physically exposed. All underground installations should be marked by the respective authorities prior to excavation or construction.

| No. | DATE | REVISION / ISSUED | JOB No. |
|---|---|---|---|
| 0. | FEB. 20, 2014 | PLAN ISSUED | SM-0112-13-3 |
| 1. | APR. 28, 2014 | REVISED PIPELINE ROUTE & R/W WIDTH | SM-0112-13-3 |
| 2. | JUN. 5, 2014 | REVISED PIPE SPECIFICATIONS & REVISED DRAWING NAME | SM-0112-13-3 |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB

| PIPE SPECIFICATIONS: ENBRIDGE(SASK) | CARRIER PIPE |
|---|---|
| Outside Diameter: | 406.4 mm |
| Wall Thickness: | 9.5 mm |
| Specification / Grade: | CSA Z245.1 G359 CAT. II |
| Pipe Material: | Steel |
| Year of Installation: | 2014 |
| Type of Joint: | Welded |
| Protection: | FBE |
| Max. Operating Pressure: | 7378 kPa |
| Min. Test Pressure: | 11067 kPa |
| Product Conveyed: | Clean Oil |

| PIPE SPECIFICATIONS: ENBRIDGE(WESTSPUR) | CARRIER PIPE |
|---|---|
| Outside Diameter: | 168.3 mm |
| Wall Thickness: | 4.8 mm |
| Specification / Grade: | CSA 245.1 G290 |
| Pipe Material: | Steel (6" ZML-AC-03) |
| Year of Installation: | 2008 |
| Type of Joint: | Welded |
| Protection: | YJ1 |
| Max. Operating Pressure: | 9930 kPa |
| Min. Test Pressure: | 14822 kPa |
| Product Conveyed: | Natural Gas Liquids |

# ENBRIDGE PIPELINES (SASKATCHEWAN) INC.

**CROSSING PLAN OF**
**ENBRIDGE PIPELINES (WESTSPUR) INC.**
**PLAN No 49437 BLTO**
IN THE NW 1/4, Sec 17, Twp 9, Rge 28, W P M
MANITOBA

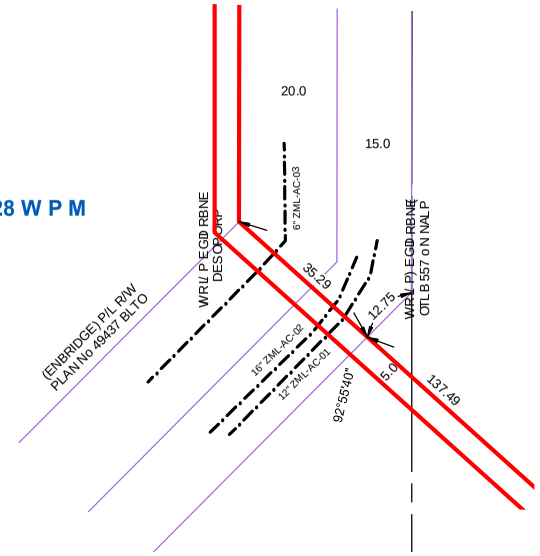
CERTIFIED CORRECT: David Quirk
DATE: June 5th, 2014


MIDWEST SURVEYS
DAVID J. QUIRK M.L.S.
ESTEVAN - PHONE: 306-634-2635
FAX: 306-634-3164


REVISION 2

SM-0112-13-3-XEB-2-R2

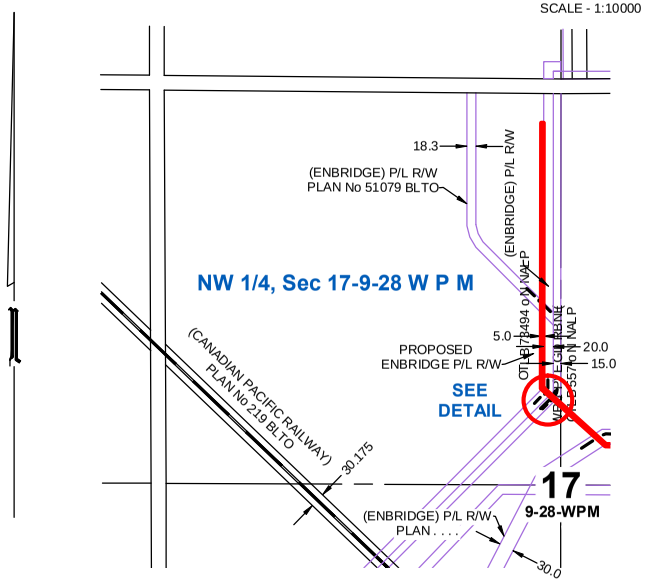
## DETAIL
SCALE - 1:1000

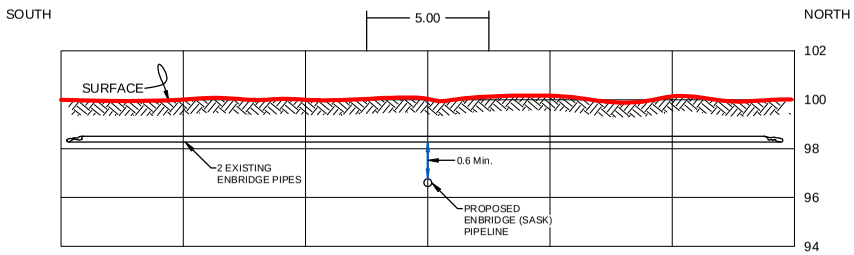



## PIPE SPECIFICATIONS: ENBRIDGE(WESTSPUR)

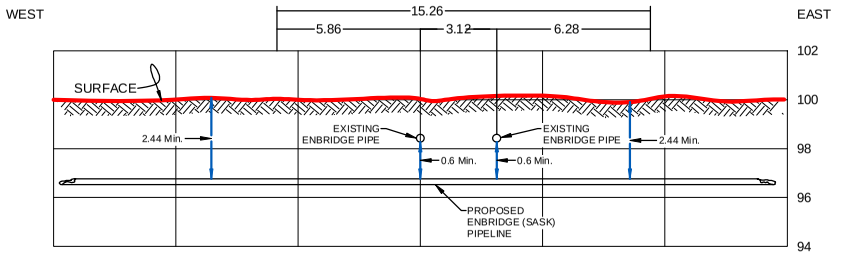
| | CARRIER PIPE |
|---|---|
| Outside Diameter: | 406.4 mm |
| Wall Thickness: | 7.1 mm |
| Specification / Grade: | API 5LX-52 |
| Pipe Material: | Steel (16" ZML-AC-02) |
| Year of Installation: | 1957 |
| Type of Joint: | Welded |
| Protection: | CT |
| Max. Operating Pressure: | 7378 kPa |
| Min. Test Pressure: | N/A |
| Product Conveyed: | Clean Oil |

## LOCATION PLAN
SCALE - 1:10000




## CROSS-SECTION
HORIZONTAL SCALE - 1:200
VERTICAL SCALE - 1:200




## PROFILE
HORIZONTAL SCALE - 1:200
VERTICAL SCALE - 1:200

**NOTE:** Positions of buried facilities shown are derived from interpretations of signals from electronic devices. Reception of electronic signals is subject to interference and has limitations, therefore it should not be assumed that all buried facilities are shown, and facilities which are shown should not be construed as "located" until physically exposed. All underground installations should be marked by the respective authorities prior to excavation or construction.

| No. | DATE | REVISION / ISSUED | JOB No. |
|---|---|---|---|
| 0. | FEB. 20, 2014 | PLAN ISSUED | SM-0112-13-3 |
| 1. | APR. 28, 2014 | REVISED PIPELINE ROUTE & R/W WIDTH | SM-0112-13-3 |
| 2. | JUN. 5, 2014 | REVISED PIPE SPECIFICATIONS & REVISED DRAWING NAME | SM-0112-13-3 |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB

## PIPE SPECIFICATIONS: ENBRIDGE(SASK)

| | CARRIER PIPE |
|---|---|
| Outside Diameter: | 406.4 mm |
| Wall Thickness: | 9.5 mm |
| Specification / Grade: | CSA Z245.1 G359 CAT. II |
| Pipe Material: | Steel |
| Year of Installation: | 2014 |
| Type of Joint: | Welded |
| Protection: | FBE |
| Max. Operating Pressure: | 7378 kPa |
| Min. Test Pressure: | 11067 kPa |
| Product Conveyed: | Clean Oil |

## PIPE SPECIFICATIONS: ENBRIDGE(WESTSPUR)

| | CARRIER PIPE |
|---|---|
| Outside Diameter: | 323.9 mm |
| Wall Thickness: | 7.1 mm |
| Specification / Grade: | API 5LX-46 |
| Pipe Material: | Steel (12" ZML-AC-01) |
| Year of Installation: | 1956 |
| Type of Joint: | Welded |
| Protection: | CT |
| Max. Operating Pressure: | 7380 kPa |
| Min. Test Pressure: | 9652 kPa |
| Product Conveyed: | Clean Oil |

# ENBRIDGE PIPELINES (SASKATCHEWAN) INC.

**CROSSING PLAN OF**
**ENBRIDGE PIPELINES (WESTSPUR) INC.**
**PLAN No 755 BLTO**
IN THE NW 1/4, Sec 17, Twp 9, Rge 28, W P M
MANITOBA

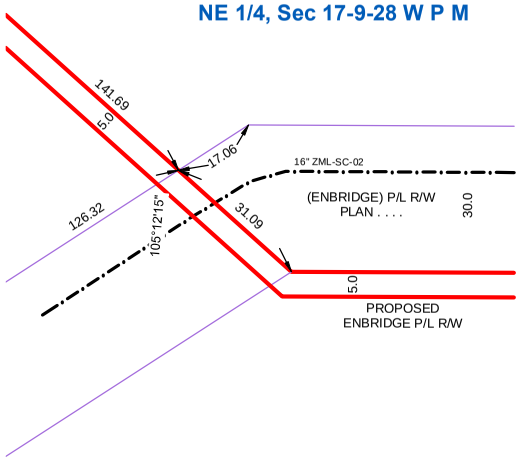
CERTIFIED CORRECT: David Quirk
DATE: June 5th, 2014


MIDWEST SURVEYS
DAVID J. QUIRK M.L.S.
ESTEVAN - PHONE: 306-634-2635
FAX: 306-634-3164

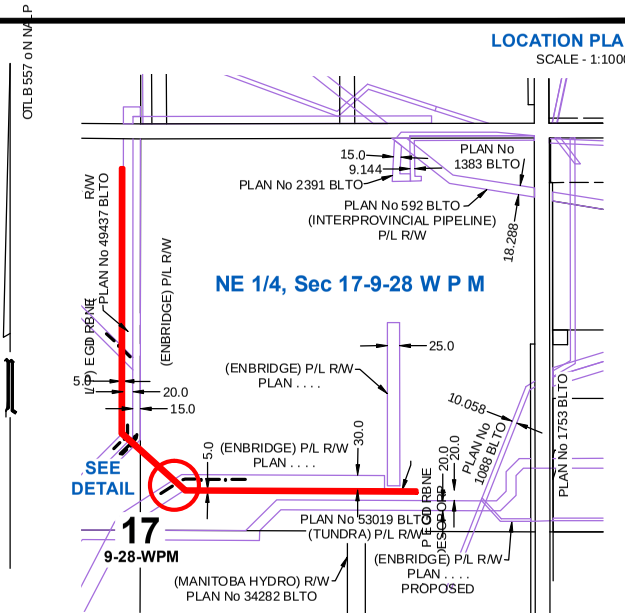

REVISION 2

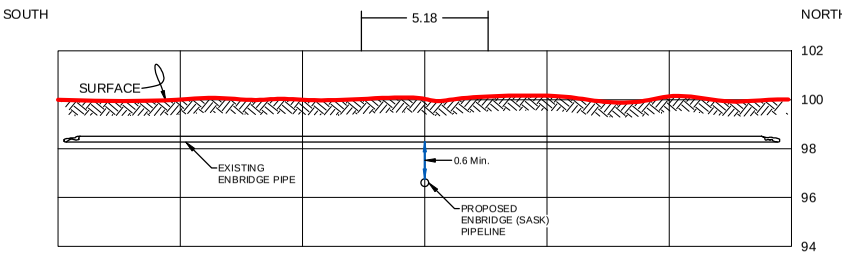
SM-0112-13-3-XEB-3-R2

## DETAIL
SCALE - 1:1000

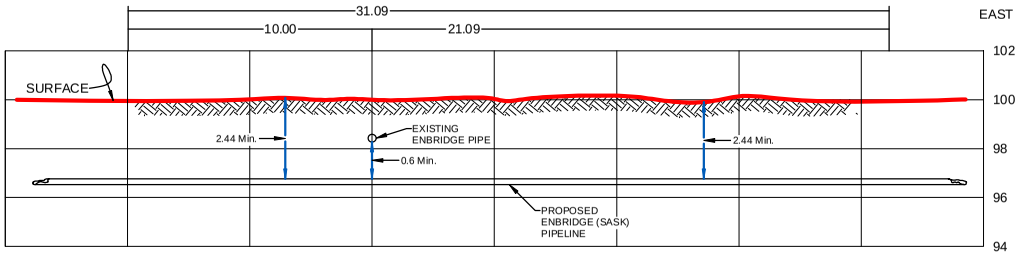



## LOCATION PLAN
SCALE - 1:10000




### CROSS-SECTION
HORIZONTAL SCALE - 1:200
VERTICAL SCALE - 1:200




### PROFILE
HORIZONTAL SCALE - 1:200
VERTICAL SCALE - 1:200

**NOTE:** Positions of buried facilities shown are derived from interpretations of signals from electronic devices. Reception of electronic signals is subject to interference and has limitations, therefore it should not be assumed that all buried facilities are shown, and facilities which are shown should not be construed as "located" until physically exposed. All underground installations should be marked by the respective authorities prior to excavation or construction.

| No. | DATE | REVISION / ISSUED | JOB No. |
|---|---|---|---|
| 0. | FEB. 20, 2014 | PLAN ISSUED | SM-0112-13-3 |
| 1. | APR. 28, 2014 | REVISED PIPELINE ROUTE & R/W WIDTH | SM-0112-13-3 |
| 2. | JUN. 5, 2014 | REVISED PIPE SPECIFICATIONS & REVISED DRAWING NAME | SM-0112-13-3 |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB

| PIPE SPECIFICATIONS: ENBRIDGE(SASK) | CARRIER PIPE |
|---|---|
| Outside Diameter: | 406.4 mm |
| Wall Thickness: | 9.5 mm |
| Specification / Grade: | CSA Z245.1 G359 CAT. II |
| Pipe Material: | Steel |
| Year of Installation: | 2014 |
| Type of Joint: | Welded |
| Protection: | FBE |
| Max. Operating Pressure: | 7378 kPa |
| Min. Test Pressure: | 11067 kPa |
| Product Conveyed: | Clean Oil |

| PIPE SPECIFICATIONS: ENBRIDGE BAKKEN | CARRIER PIPE |
|---|---|
| Outside Diameter: | 406.4 mm |
| Wall Thickness: | 7.14 mm |
| Specification / Grade: | API 5LX-52 |
| Pipe Material: | Steel (16" ZML-SC-02) |
| Year of Installation: | 1957 |
| Type of Joint: | Welded |
| Protection: | CT |
| Max. Operating Pressure: | 7378 kPa |
| Min. Test Pressure: | N/A |
| Product Conveyed: | Clean Oil |

# ENBRIDGE PIPELINES (SASKATCHEWAN) INC.

**CROSSING PLAN OF**
**ENBRIDGE BAKKEN PIPELINES INC.**
**PLAN No .....**
IN THE NE 1/4, Sec 17, Twp 9, Rge 28, W P M
MANITOBA

CERTIFIED CORRECT: David Quirk
DATE: June 5th, 2014


MIDWEST SURVEYS
DAVID J. QUIRK M.L.S.
ESTEVAN - PHONE: 306-634-2635
FAX: 306-634-3164


REVISION 2

SM-0112-13-3-XEB-5-R2

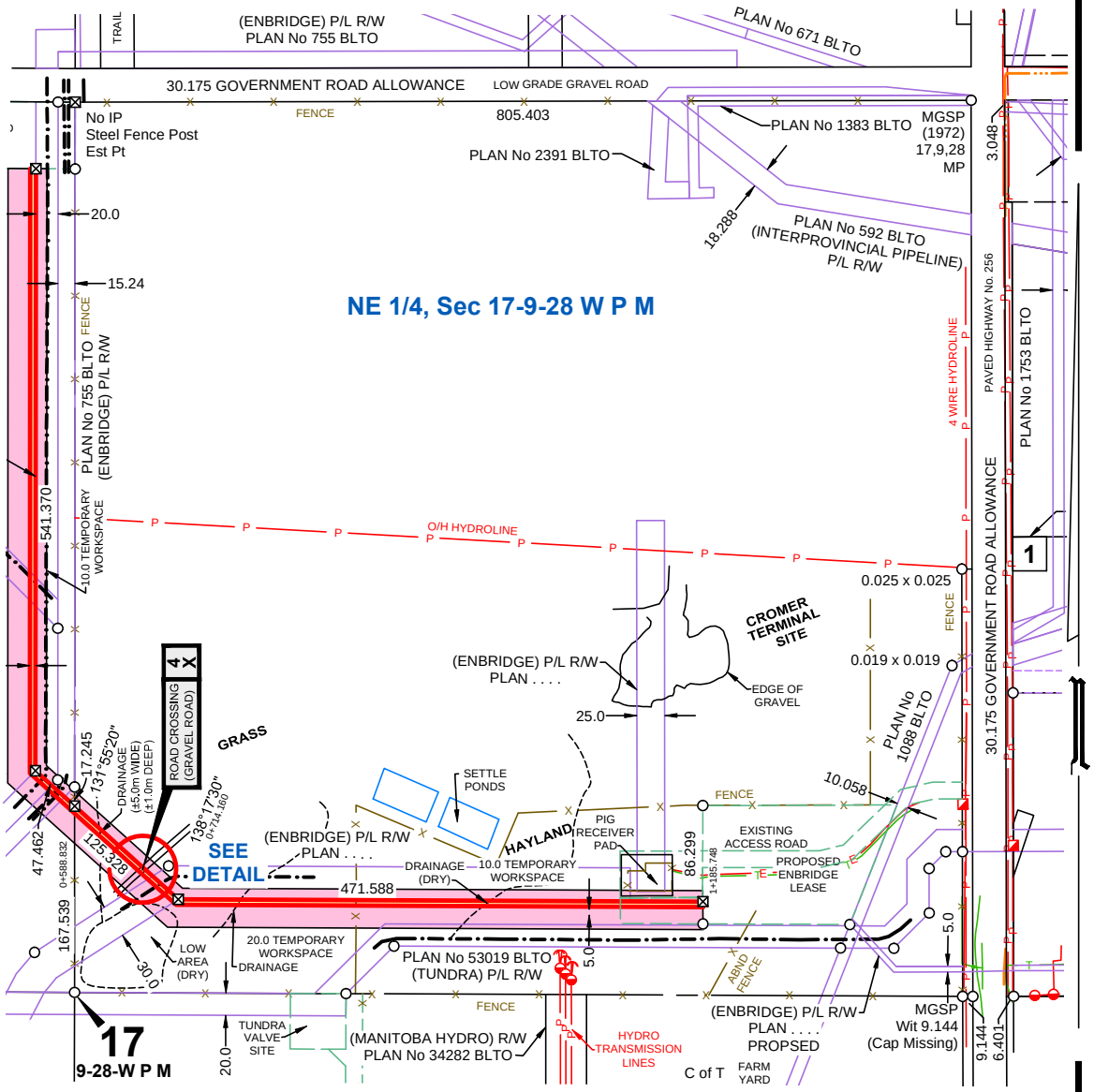
REVISION 2

ENBRIDGE

PLAN SHOWING

# Typical Access Road Crossing

## NE 1/4, Sec 17, Twp 9, Rge 28, W P M

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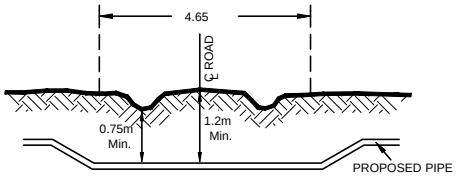


**TYPICAL CROSSING DETAIL**

Not to Scale

Distances are in metres and decimals thereof.

| No. | DATE | REVISION / ISSUED | JOB No. | SCALE 1:5000 |
|---|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-3 | |
| 1. | APR. 28, 2014 | REVISED PIPELINE ROUTE, R/W WIDTH & REVISED TEMPORARY WORKSPACE | SM-0112-13-3 | |
| 1. | JUN. 5, 2014 | REVISED DRAWING NAME | SM-0112-13-3 | |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB


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SM-0112-13-3-XNG-4-R2

# Appendix D
# Pipeline ZML-VT-01 Crossing Plans

| Drawing Name | Drawing Number |
|---|---|
| Pipeline Crossing (Xing #1) | SM-0112-13-4-XNG-1-R2 |
| Pipeline Crossing (Xing #2) | SM-0112-13-4-XNG-2-R2 |
| Overhead Hydro Crossing (Xing #3) | SM-0112-13-4-XNG-3-R2 |
| Telephone Cable Crossing (Xing #4) | SM-0112-13-4-XNG-4-R2 |
| Pipeline Crossing (Xing #6) | SM-0112-13-4-XNG-6-R2 |
| Telephone Cable Crossing (Xing #7) | SM-0112-13-4-XNG-7-R2 |
| Overhead Hydro Crossing (Xing #8) | SM-0112-13-4-XNG-8-R2 |
| Overhead Hydro Crossing (Xing #9) | SM-0112-13-4-XNG-9-R2 |
| Buried Cable Crossing (Xing #10) | SM-0112-13-4-XNG-10-R2 |
| Flowline Crossing (Xing #11) | SM-0112-13-4-XNG-11-R2 |
| Telephone Cable Crossing (Xing #12) | SM-0112-13-4-XNG-12-R2 |
| Flowline Crossing (Xing #13) | SM-0112-13-4-XNG-13-R2 |
| Highway Crossing (Xing #5) | SM-0112-13-4-XRD-5-R2 |

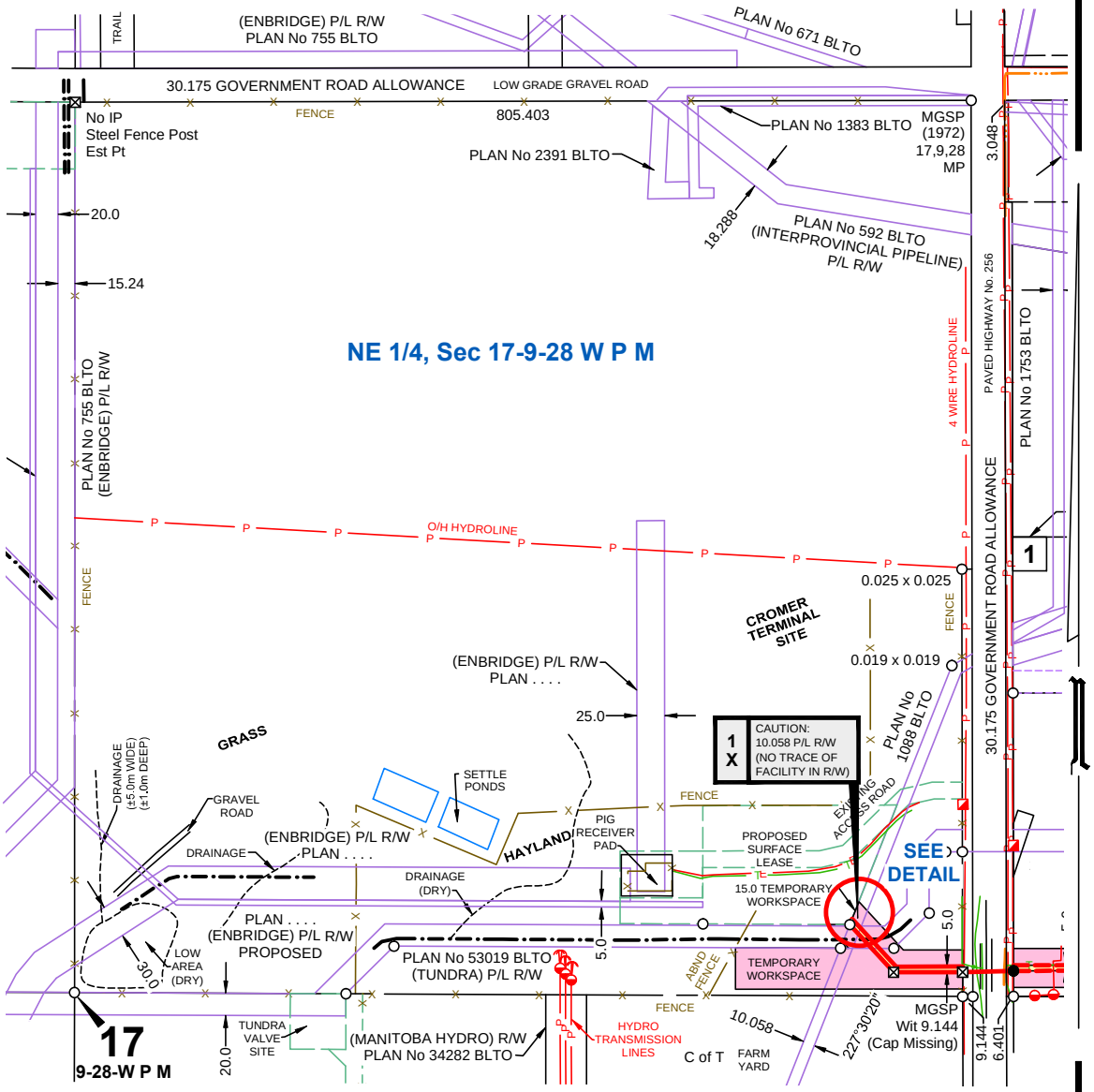
REVISION 2

ENBRIDGE

PLAN SHOWING

# Typical Pipeline Crossing

## NE 1/4, Sec 17, Twp 9, Rge 28, W P M

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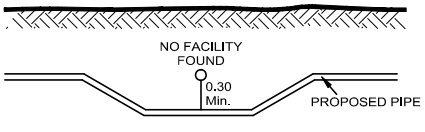


**TYPICAL CROSSING DETAIL**

Not to Scale

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| No. | DATE | REVISION / ISSUED | JOB No. | SCALE 1:5000 |
|---|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-4 | |
| 1. | APR. 28, 2014 | REVISED PIPELINE ROUTE, R/W WIDTH & REVISED TEMPORARY WORKSPACE | SM-0112-13-4 | |
| 2. | JUN. 5, 2014 | REVISED R/W ROUTE IN NW 1/4, Sec 17 & REVISED DRAWING NAME | SM-0112-13-4 | |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB


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SM-0112-13-4-XNG-1-R2

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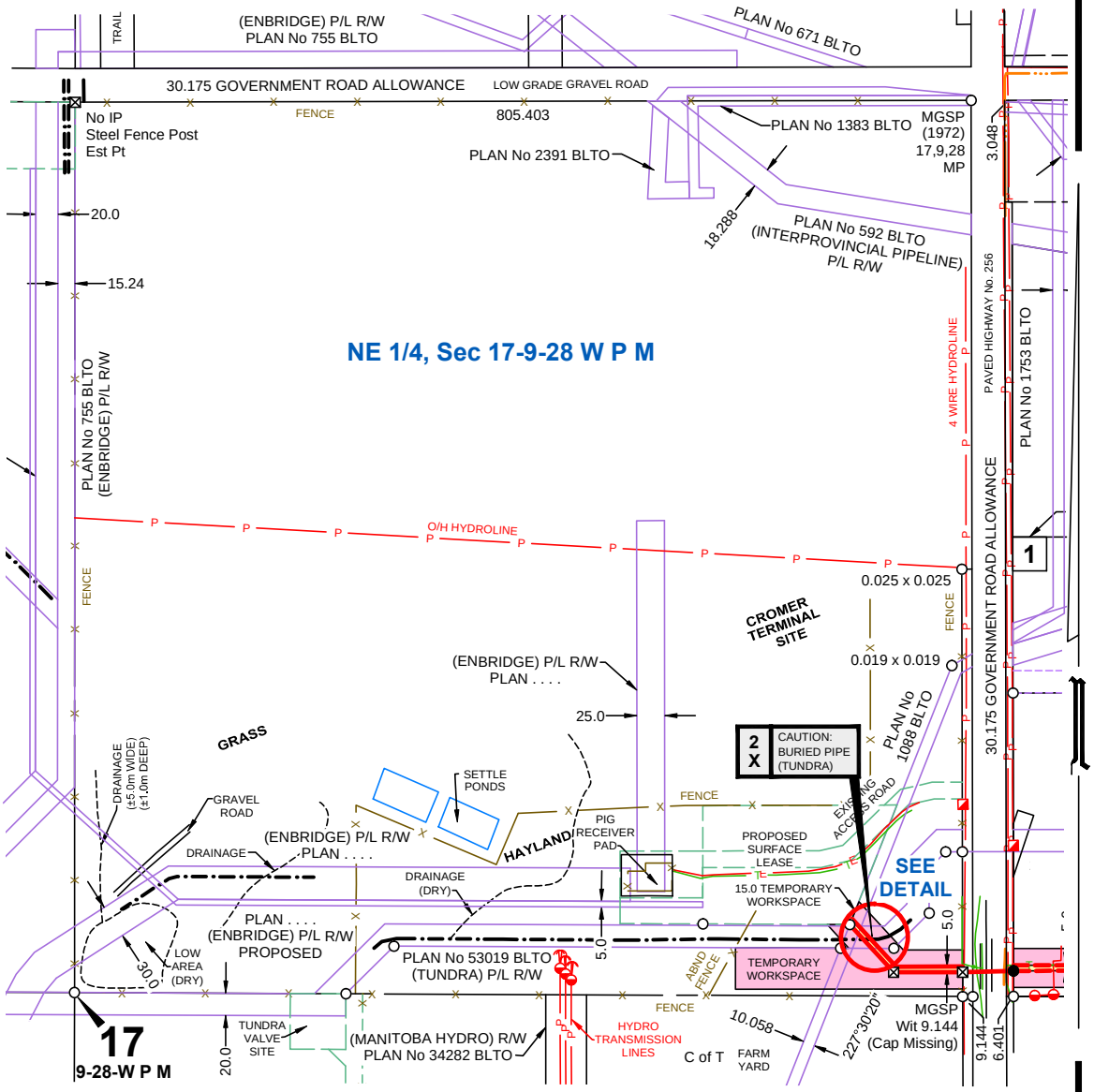
ENBRIDGE

PLAN SHOWING

# Typical Pipeline Crossing

## NE 1/4, Sec 17, Twp 9, Rge 28, W P M

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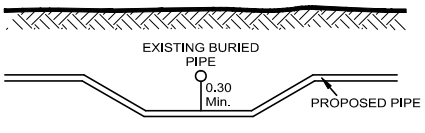


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| 2. | JUN. 5, 2014 | REVISED R/W ROUTE IN NW 1/4, Sec 17 & REVISED DRAWING NAME | SM-0112-13-4 | |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB


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SM-0112-13-4-XNG-2-R2

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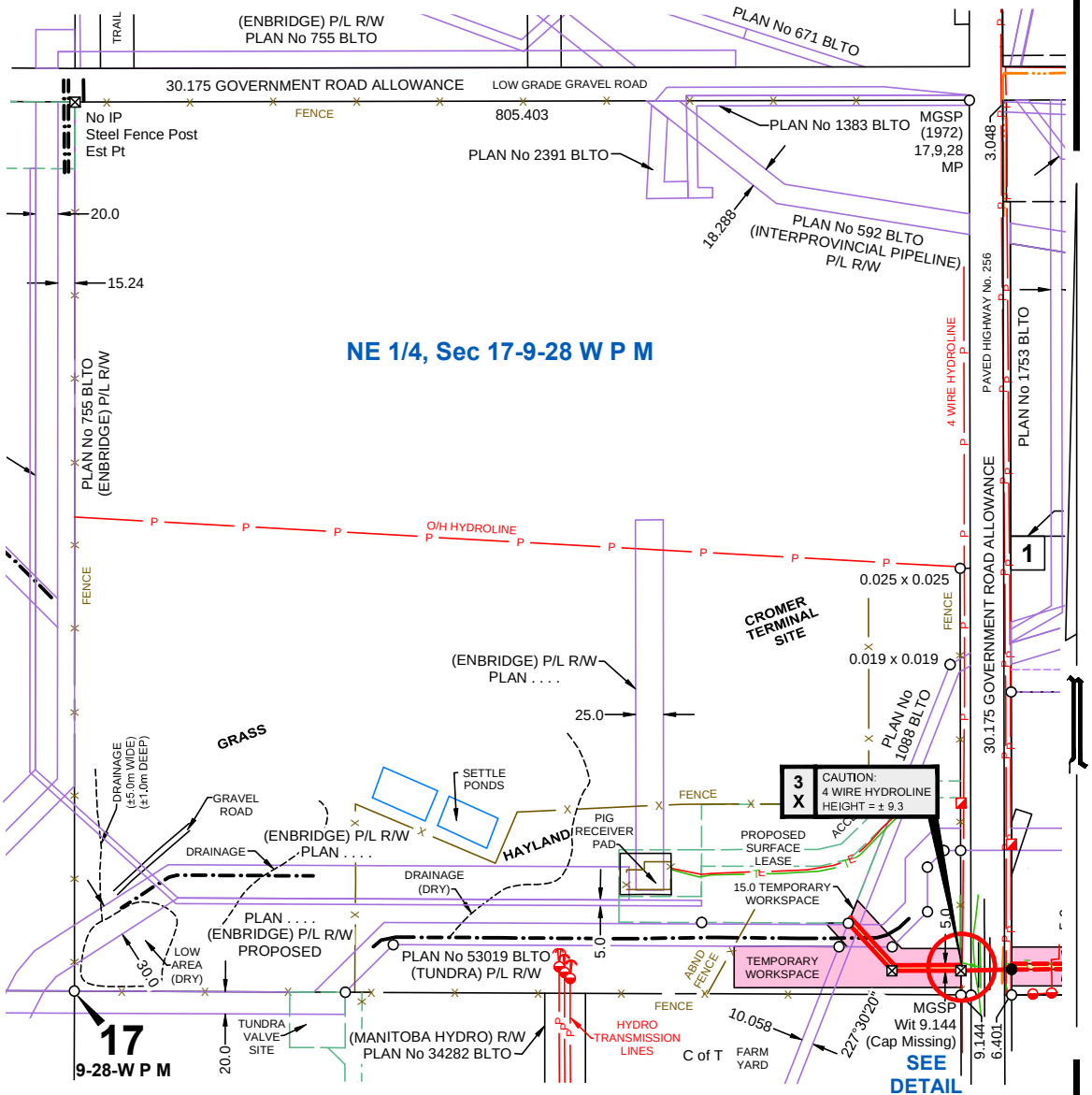
PLAN SHOWING

# Typical Overhead Hydroline Crossing

## NE 1/4, Sec 17, Twp 9, Rge 28, W P M

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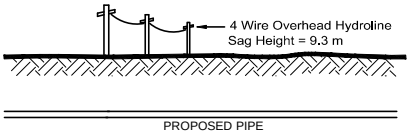


**TYPICAL CROSSING DETAIL**
Not to Scale

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|---|---|---|---|---|
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| 2. | JUN. 5, 2014 | REVISED R/W ROUTE IN NW 1/4, Sec 17 & REVISED DRAWING NAME | SM-0112-13-4 | |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB


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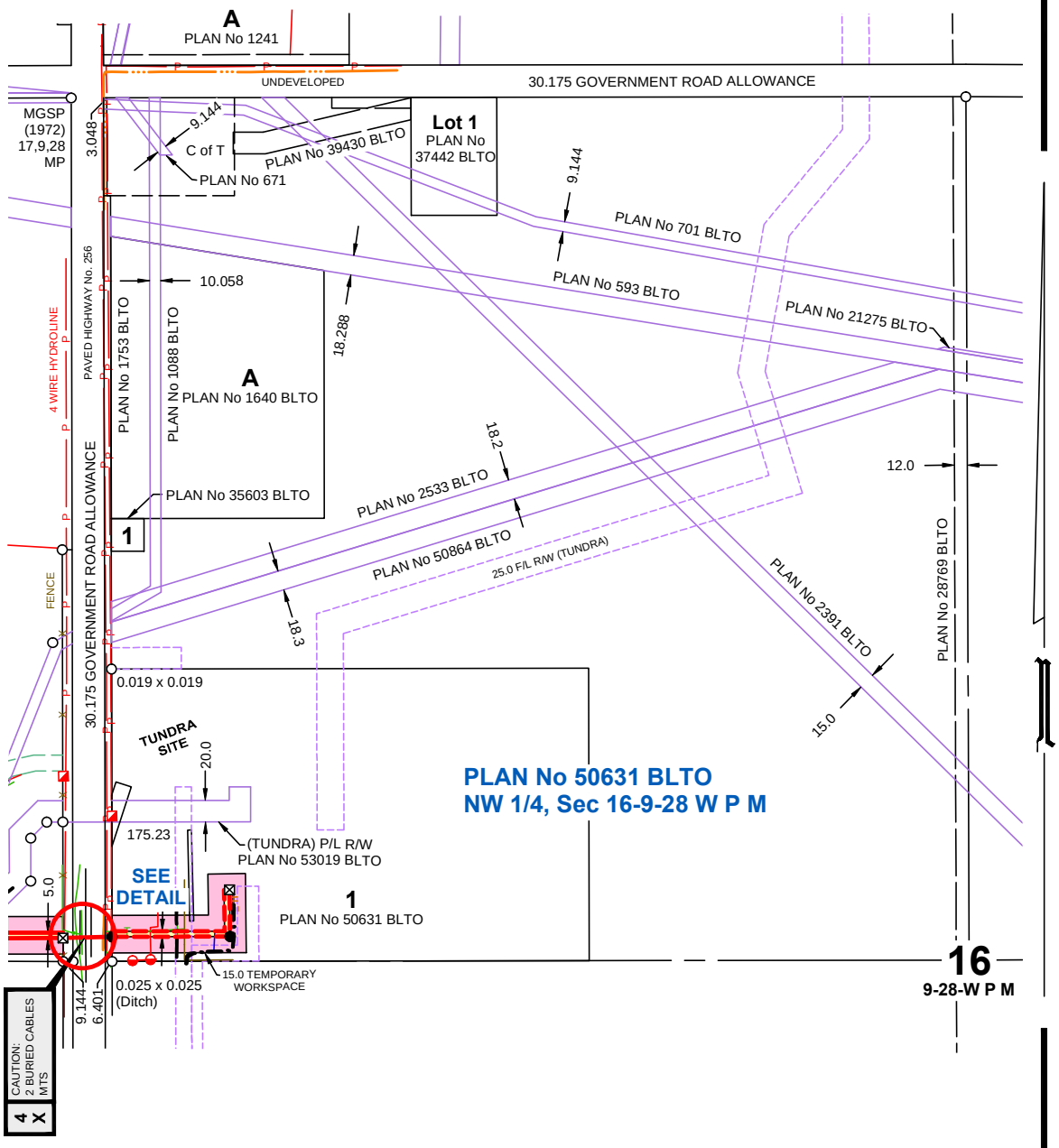
REVISION 2

ENBRIDGE

PLAN SHOWING

# Typical Telephone Cable Crossing

## NW 1/4, Sec 16, Twp 9, Rge 28, W P M

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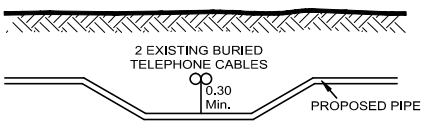


**TYPICAL CROSSING DETAIL**
Not to Scale

Distances are in metres and decimals thereof.

| No. | DATE | REVISION / ISSUED | JOB No. | SCALE 1:5000 |
|---|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-4 | |
| 1. | APR. 28, 2014 | REVISED TEMPORARY WORKSPACE | SM-0112-13-4 | |
| 2. | JUN. 5, 2014 | REVISED DRAWING NAME | SM-0112-13-4 | |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB


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SM-0112-13-4-XNG-4-R2

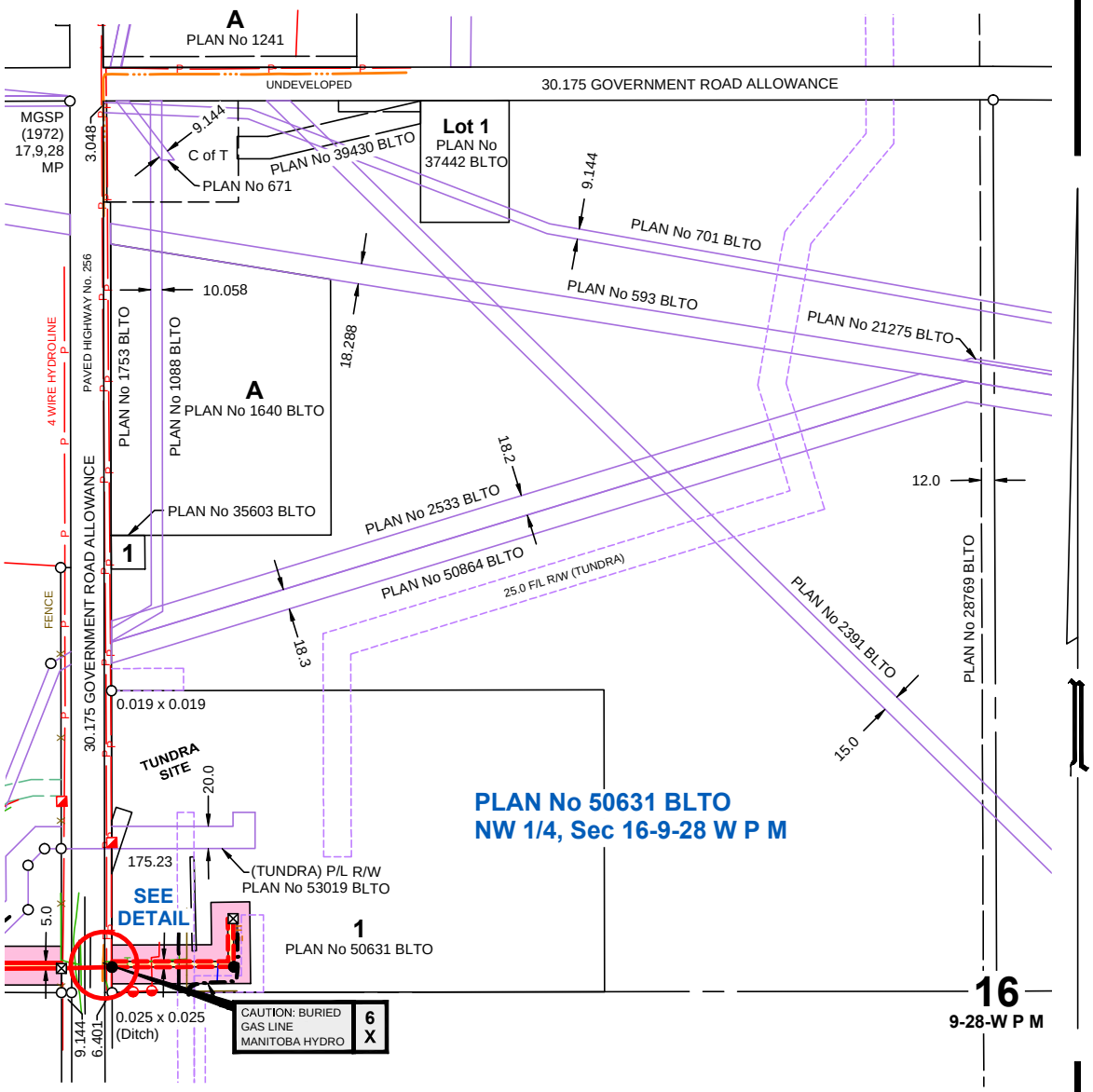
REVISION 2

ENBRIDGE

PLAN SHOWING

# Typical Pipeline Crossing

## NW 1/4, Sec 16, Twp 9, Rge 28, W P M

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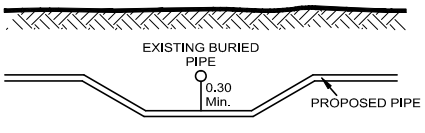


**TYPICAL CROSSING DETAIL**

Not to Scale

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|---|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-4 | |
| 1. | APR. 28, 2014 | REVISED TEMPORARY WORKSPACE | SM-0112-13-4 | |
| 2. | JUN. 5, 2014 | REVISED DRAWING NAME | SM-0112-13-4 | |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB


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MIDWEST SURVEYS


SM-0112-13-4-XNG-6-R2

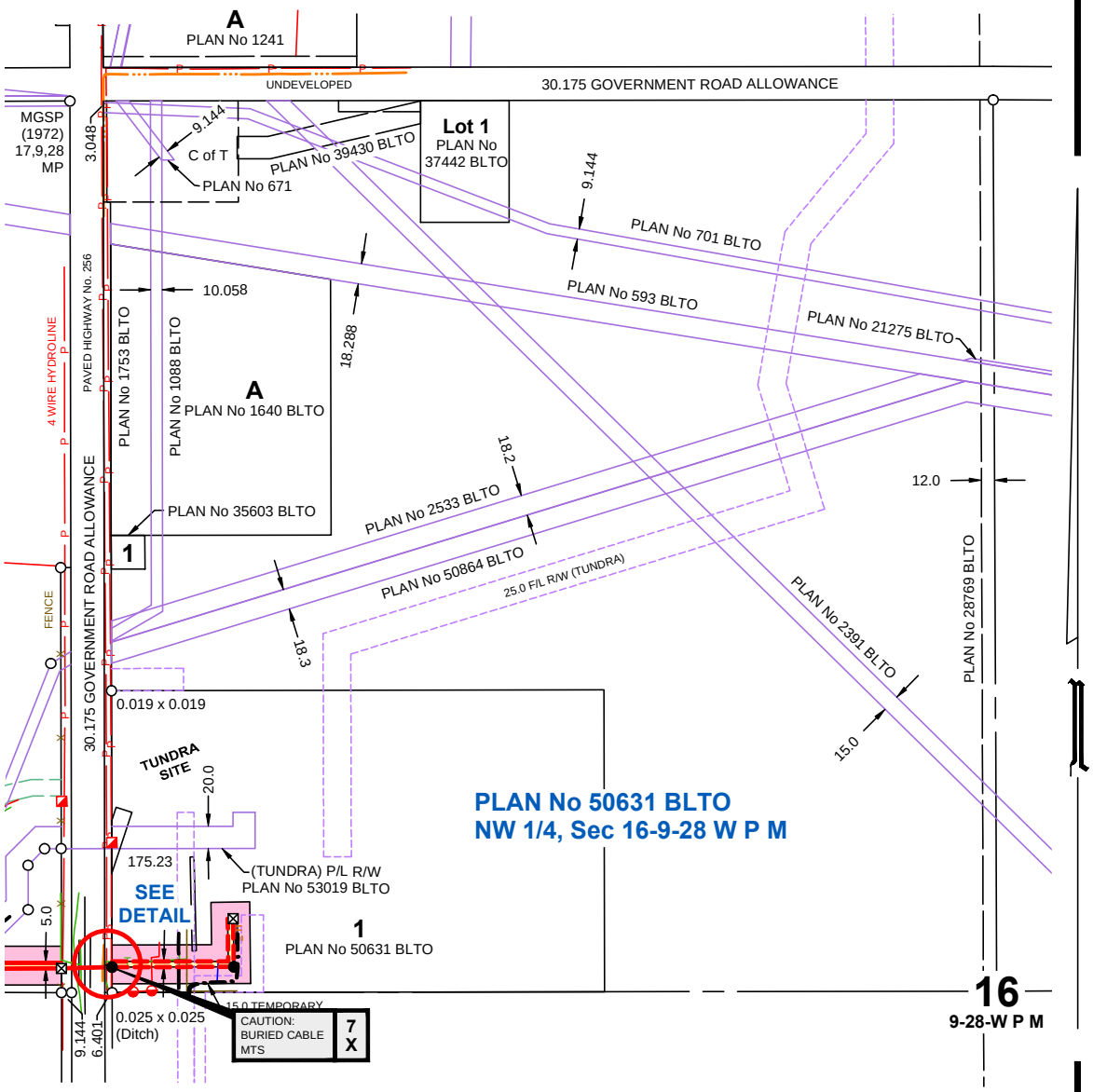
REVISION 2

ENBRIDGE

PLAN SHOWING

# Typical Telephone Cable Crossing

## NW 1/4, Sec 16, Twp 9, Rge 28, W P M

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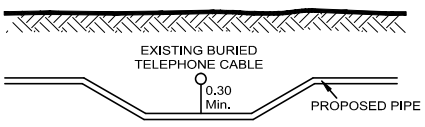


**TYPICAL CROSSING DETAIL**
Not to Scale

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|---|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-4 | |
| 1. | APR. 28, 2014 | REVISED TEMPORARY WORKSPACE | SM-0112-13-4 | |
| 2. | JUN. 5, 2014 | REVISED DRAWING NAME | SM-0112-13-4 | |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB


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MIDWEST SURVEYS


SM-0112-13-4-XNG-7-R2

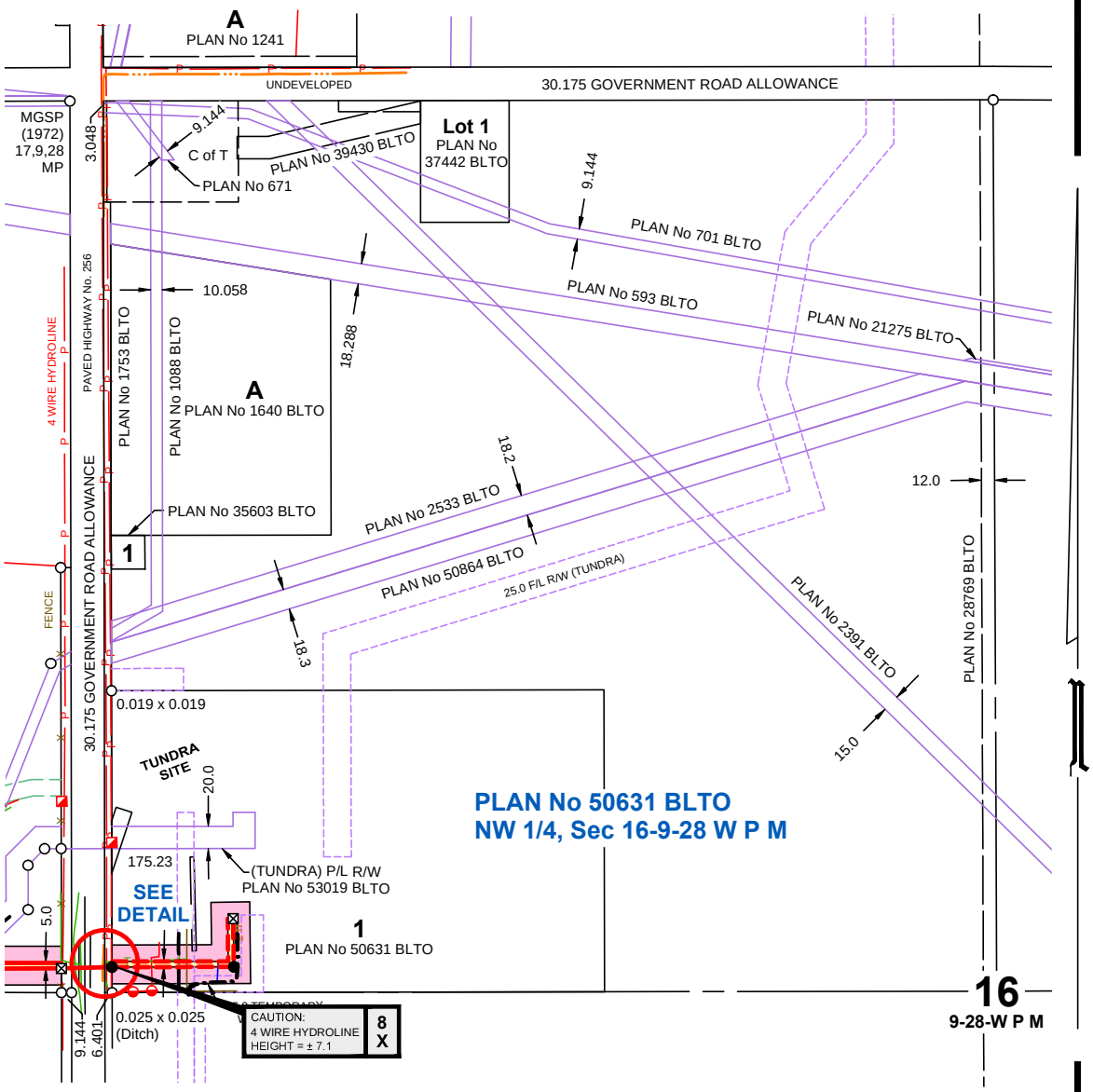
REVISION 2

ENBRIDGE

PLAN SHOWING

# Typical Overhead Hydroline Crossing

## NW 1/4, Sec 16, Twp 9, Rge 28, W P M

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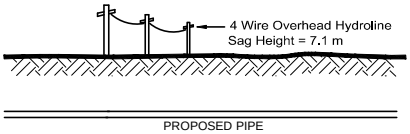


**TYPICAL CROSSING DETAIL**
Not to Scale

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| No. | DATE | REVISION / ISSUED | JOB No. | SCALE 1:5000 |
|---|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-4 | |
| 1. | APR. 28, 2014 | REVISED TEMPORARY WORKSPACE | SM-0112-13-4 | |
| 2. | JUN. 5, 2014 | REVISED DRAWING NAME | SM-0112-13-4 | |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB


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MIDWEST SURVEYS


SM-0112-13-4-XNG-8-R2

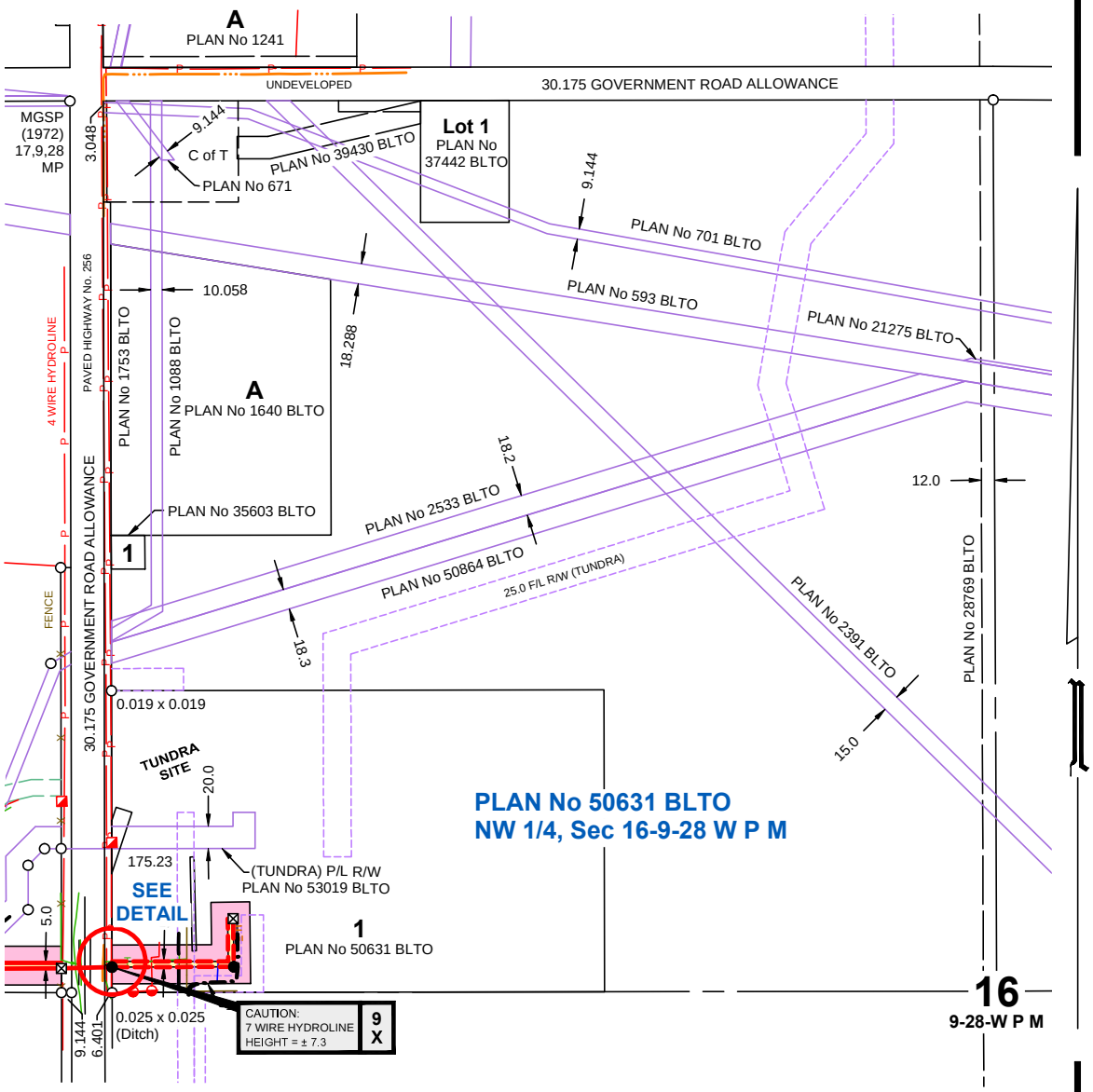
REVISION 2

ENBRIDGE

PLAN SHOWING

# Typical Overhead Hydroline Crossing

## NW 1/4, Sec 16, Twp 9, Rge 28, W P M

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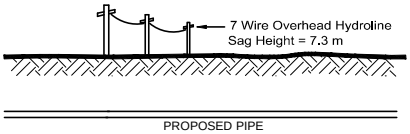


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|---|---|---|---|---|
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| 2. | JUN. 5, 2014 | REVISED DRAWING NAME | SM-0112-13-4 | |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB


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SM-0112-13-4-XNG-9-R2

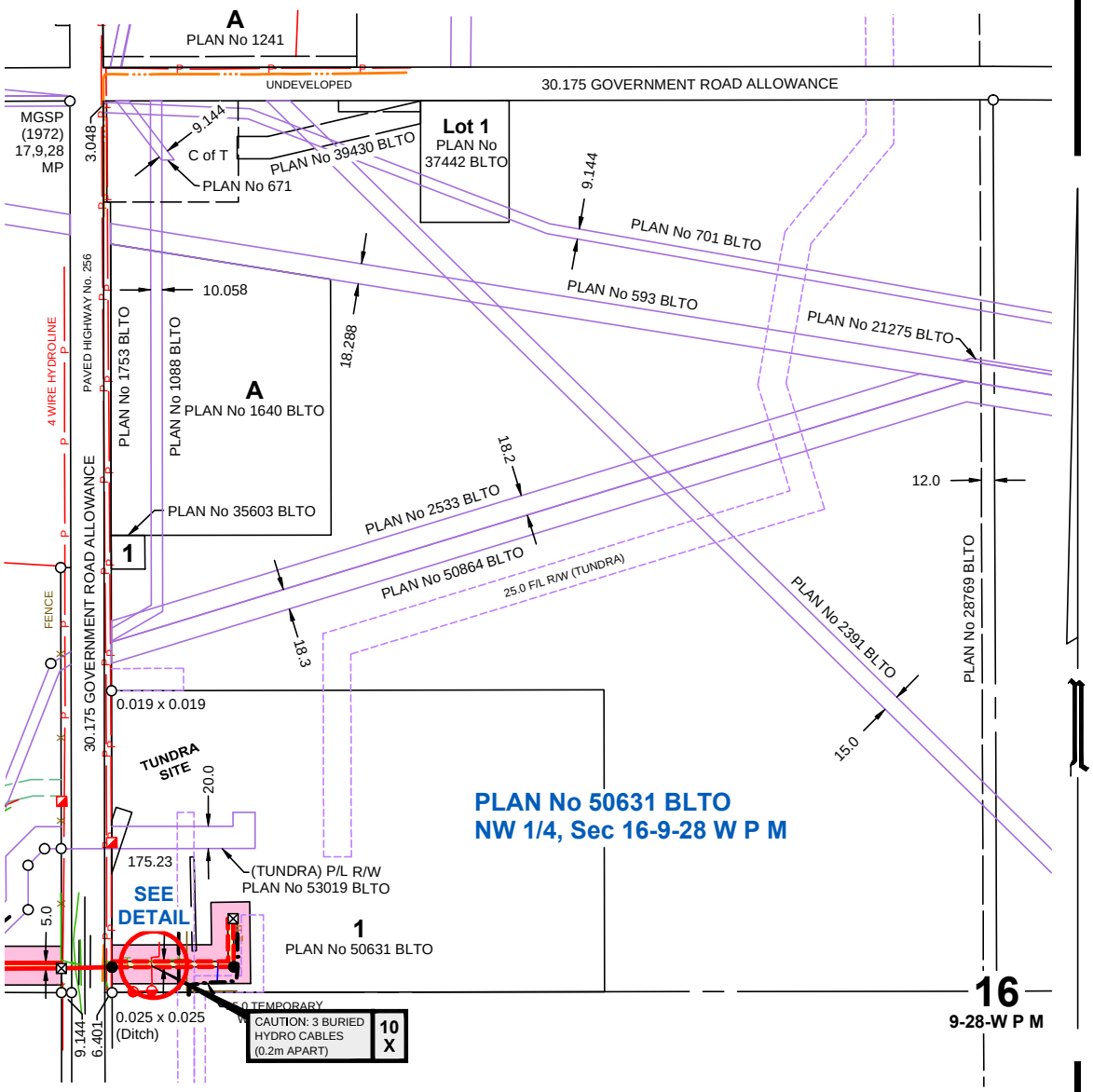
REVISION 2

ENBRIDGE

PLAN SHOWING

# Typical Buried Hydro Cable Crossing

## NW 1/4, Sec 16, Twp 9, Rge 28, W P M

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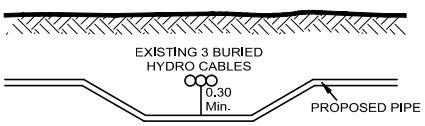


**TYPICAL CROSSING DETAIL**

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| 2. | JUN. 5, 2014 | REVISED DRAWING NAME | SM-0112-13-4 | |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB


**MIDWEST SURVEYS INC.**
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Tel: 306-634-2635


MIDWEST SURVEYS

SM-0112-13-4-XNG-10-R2

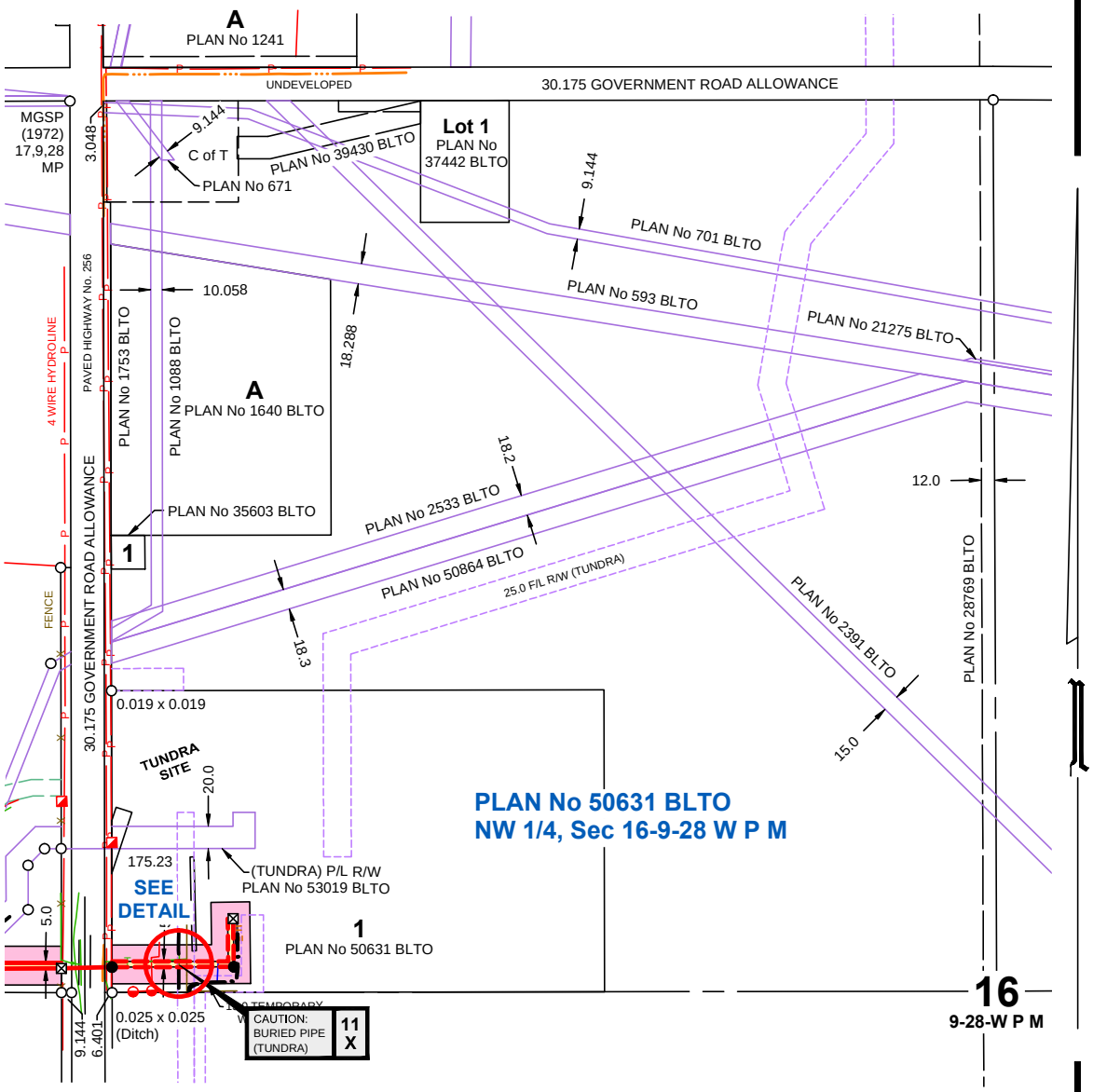
REVISION 2

ENBRIDGE

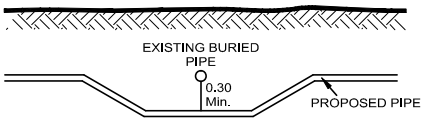
PLAN SHOWING

# Typical Flowline Crossing

## NW 1/4, Sec 16, Twp 9, Rge 28, W P M




**NOTE:** Positions of buried facilities shown are derived from interpretations of signals from electronic devices. Reception of electronic signals is subject to interference and has limitations, therefore it should not be assumed that all buried facilities are shown, and facilities which are shown should not be construed as "located" until physically exposed. All underground installations should be marked by the respective authorities prior to excavation or construction.




**TYPICAL CROSSING DETAIL**

Not to Scale

Distances are in metres and decimals thereof.

| No. | DATE | REVISION / ISSUED | JOB No. | SCALE 1:5000 |
|---|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-4 | |
| 1. | APR. 28, 2014 | REVISED TEMPORARY WORKSPACE | SM-0112-13-4 | |
| 2. | JUN. 5, 2014 | REVISED DRAWING NAME | SM-0112-13-4 | |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB


David J. Quirk M.L.S.
130 King Street
Estevan, SK
S4A 2T5
Tel: 306-634-2635
MIDWEST SURVEYS


SM-0112-13-4-XNG-11-R2

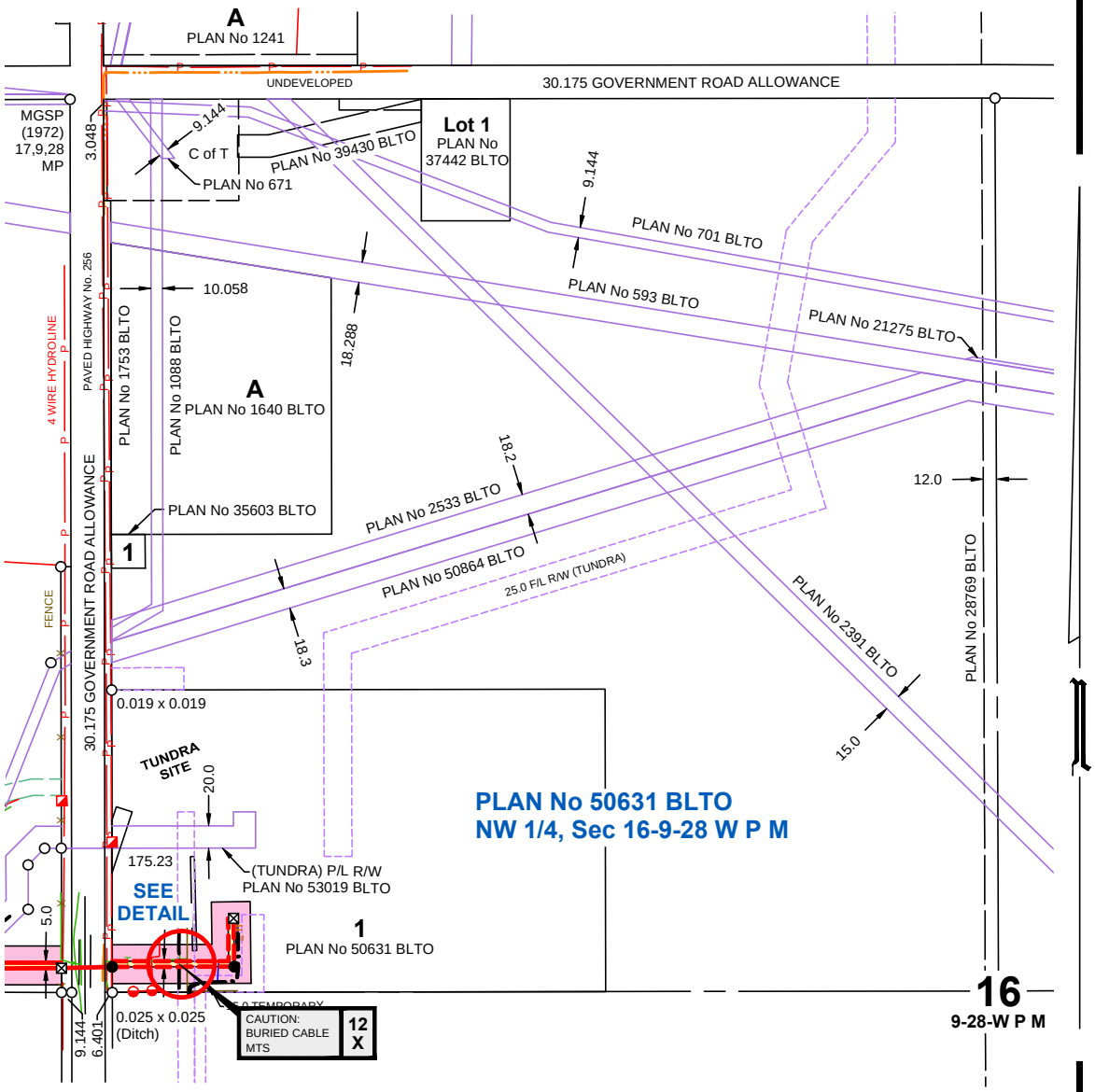
REVISION 2

ENBRIDGE

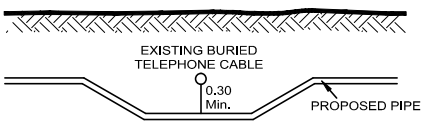
PLAN SHOWING

# Typical Telephone Cable Crossing

## NW 1/4, Sec 16, Twp 9, Rge 28, W P M




**NOTE:** Positions of buried facilities shown are derived from interpretations of signals from electronic devices. Reception of electronic signals is subject to interference and has limitations, therefore it should not be assumed that all buried facilities are shown, and facilities which are shown should not be construed as "located" until physically exposed. All underground installations should be marked by the respective authorities prior to excavation or construction.




**TYPICAL CROSSING DETAIL**
Not to Scale

Distances are in metres and decimals thereof.

| No. | DATE | REVISION / ISSUED | JOB No. | SCALE 1:5000 |
|---|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-4 | |
| 1. | APR. 28, 2014 | REVISED TEMPORARY WORKSPACE | SM-0112-13-4 | |
| 2. | JUN. 5, 2014 | REVISED DRAWING NAME | SM-0112-13-4 | |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB


**David J. Quirk M.L.S.**
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S4A 2T5
Tel: 306-634-2635
MIDWEST SURVEYS


SM-0112-13-4-XNG-12-R2

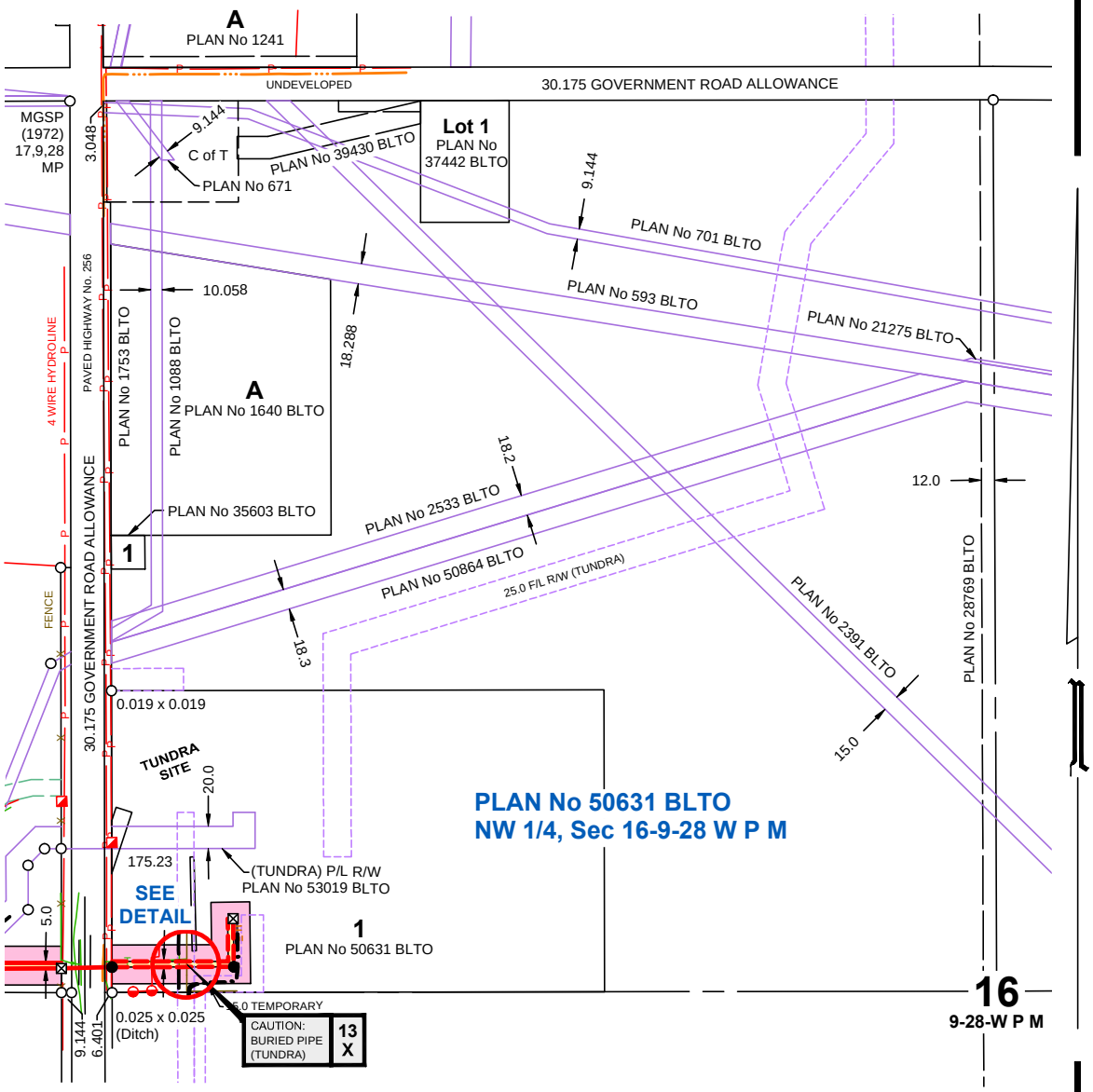
REVISION 2

ENBRIDGE

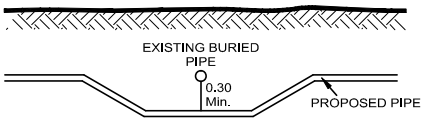
PLAN SHOWING

# Typical Flowline Crossing

## NW 1/4, Sec 16, Twp 9, Rge 28, W P M




**NOTE:** Positions of buried facilities shown are derived from interpretations of signals from electronic devices. Reception of electronic signals is subject to interference and has limitations, therefore it should not be assumed that all buried facilities are shown, and facilities which are shown should not be construed as "located" until physically exposed. All underground installations should be marked by the respective authorities prior to excavation or construction.




**TYPICAL CROSSING DETAIL**

Not to Scale

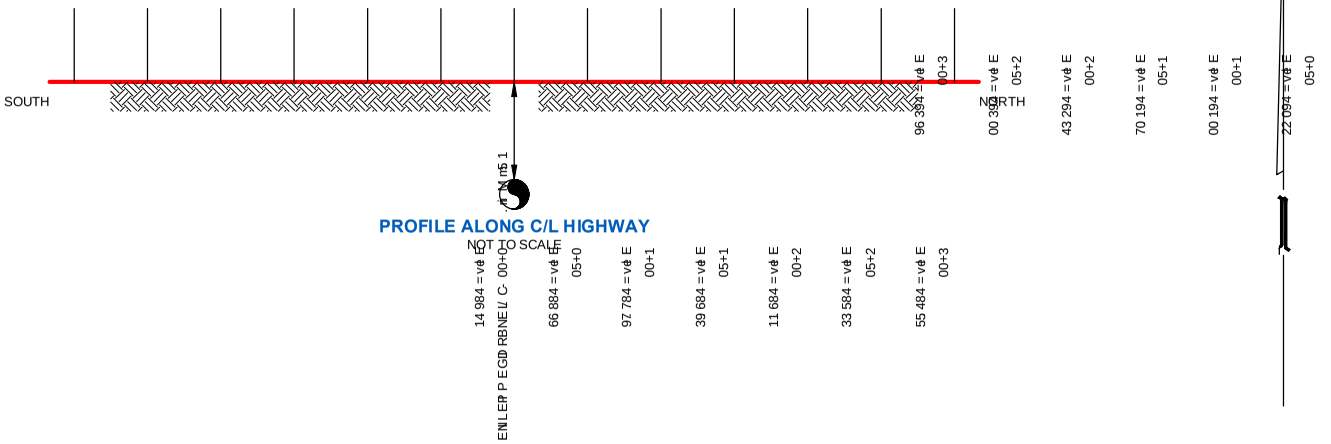
Distances are in metres and decimals thereof.

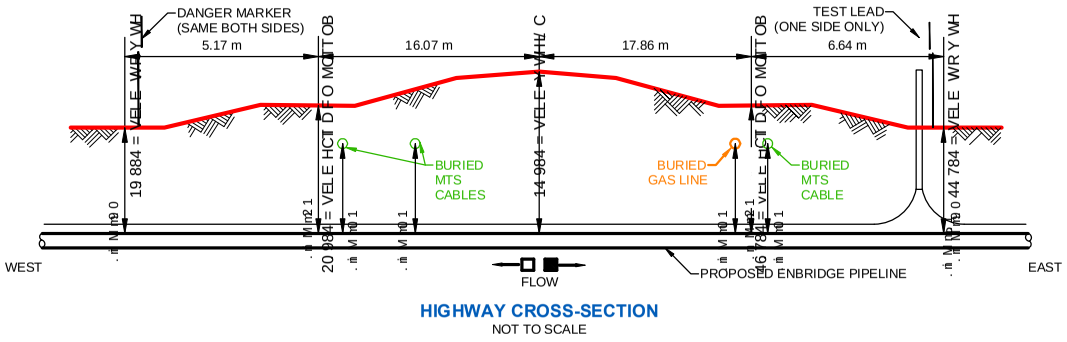
| No. | DATE | REVISION / ISSUED | JOB No. | SCALE 1:5000 |
|---|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-4 | |
| 1. | APR. 28, 2014 | REVISED TEMPORARY WORKSPACE | SM-0112-13-4 | |
| 2. | JUN. 5, 2014 | REVISED DRAWING NAME | SM-0112-13-4 | |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB


David J. Quirk M.L.S.
130 King Street
Estevan, SK
S4A 2T5
Tel: 306-634-2635
MIDWEST SURVEYS

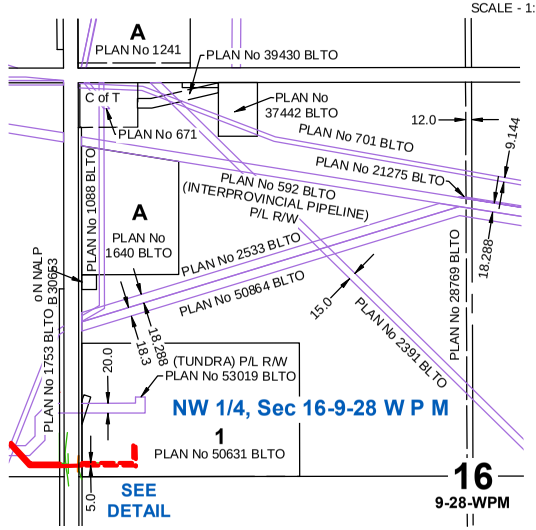

SM-0112-13-4-XNG-13-R2



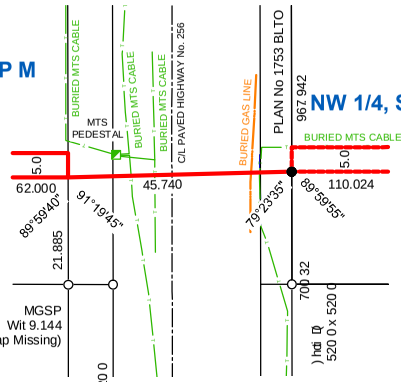

HIGHWAY CROSS-SECTION
NOT TO SCALE

## LOCATION PLAN
SCALE - 1:10000




NE 1/4, Sec 17-9-28 W P M

NW 1/4, Sec 16-9-28 W P M




DETAIL
SCALE - 1:1000

**NOTE:** Positions of buried facilities shown are derived from interpretations of signals from electronic devices. Reception of electronic signals is subject to interference and has limitations, therefore it should not be assumed that all buried facilities are shown, and facilities which are shown should not be construed as "located" until physically exposed. All underground installations should be marked by the respective authorities prior to excavation or construction.

**NOTES:**
1. Construction to be in accordance with department of highways regulations.
2. Danger markers and test lead assembly to be placed over pipeline on edge of highway right of way.

| No. | DATE | REVISION / ISSUED | JOB No. |
|---|---|---|---|
| 0. | FEB. 18, 2014 | PLAN ISSUED | SM-0112-13-4 |
| 1. | APR. 28, 2014 | REVISED PIPELINE ROUTE & WIDTH OF R/W IN NE 1/4, Sec 17 | SM-0112-13-4 |
| 2. | JUN. 5, 2014 | REVISED PIPE SPECIFICATIONS & REVISED DRAWING NAME | SM-0112-13-4 |

SURVEYED BY: MH/MC | CALC'D BY: CO | DRAWN BY: JB

**SPECIFICATIONS:**

| | CARRIER PIPE | CASING PIPE |
|---|---|---|
| Outside Diameter: | 323.8 mm | N/A |
| Wall Thickness: | 7.1 mm | N/A |
| Specification / Grade: | CSA Z245.1 G359 CAT. II | N/A |
| Pipe Material: | Steel | N/A |
| Year of Installation: | 2014 | N/A |
| Type of Joint: | Welded | N/A |
| Protection: | FBE | N/A |
| Cathodic Protection: | Yes | N/A |
| Method of Installation: | Boring | N/A |
| Max. Operating Pressure: | 4960 kPa | N/A |
| Min. Test Pressure: | 7440 kPa | N/A |
| Product Conveyed: | Clean Oil | N/A |

**ENBRIDGE PIPELINES (SASKATCHEWAN) INC.**

CROSSING PLAN OF
HIGHWAY No 256
PLAN No 1753 BLTO
IN THE NW 1/4, Sec 16, Twp 9, Rge 28, W P M
MANITOBA

CERTIFIED CORRECT: David Quirk
DATE: June 5th, 2014

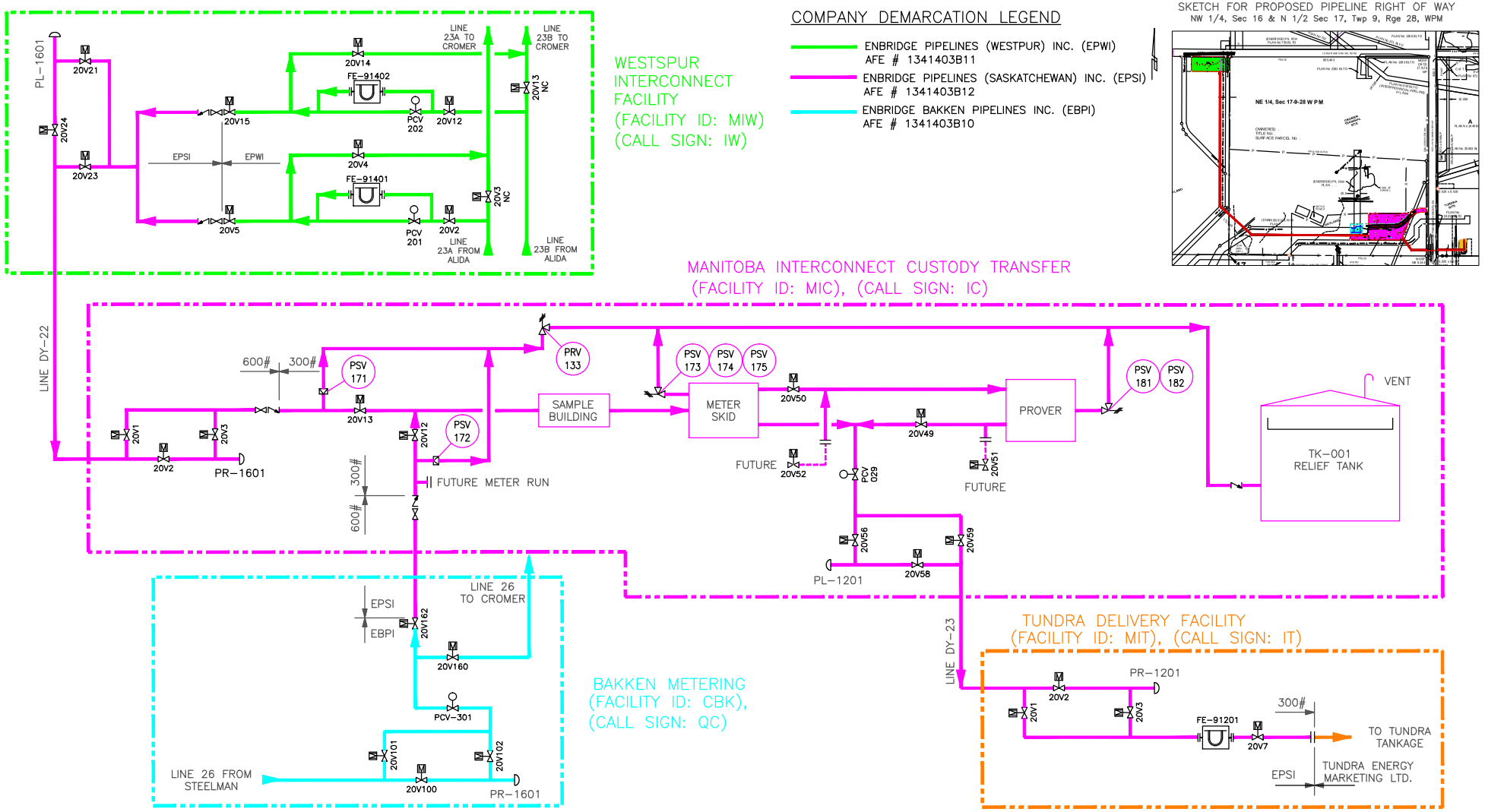
MIDWEST SURVEYS
DAVID J. QUIRK M.L.S.
ESTEVAN - PHONE: 306-634-2635
FAX: 306-634-3164

REVISION 2

SM-0112-13-4-XRD-5-R2

# Appendix E
# Manitoba Interconnect Project Site Breakdown

| Drawing Name | Drawing Number |
|---|---|
| Company Demarcation / Site Breakdown | D-PFD-421 SHT. 1 |




| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|---|---|
| | | A | ISSUED FOR REVIEW (GENUS 100-02-02) | GJ | 2014-01-22 | | |
| | | B | ISSUED FOR REGULATORY (GENUS 100-02-02) | AA | 2014-06-27 | | |

ENGINEER'S STAMP

ENGINEERING RECORD

| | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No. | FILE No.: CC 13 06 |
| DRAWN BY: G. JULSON | DATE: 2014-01-22 |
| CHKD BY | DESIGNED BY: G. McCASKILL |
| ENGINEER | LAST UPDATE: 2014-07-02, 17:22 |
| ACAD DWG No.: PFD42101.DWG | SCALE: N.T.S. |

G:\DRAFTING\100 ENBRIDGE\100-02 CROMER\100-02-02 CROMER TUNDRA TIE\N\5000 DRAFTING\420 PROCESS AND MECHANICAL FLOW SHEETS (PID)

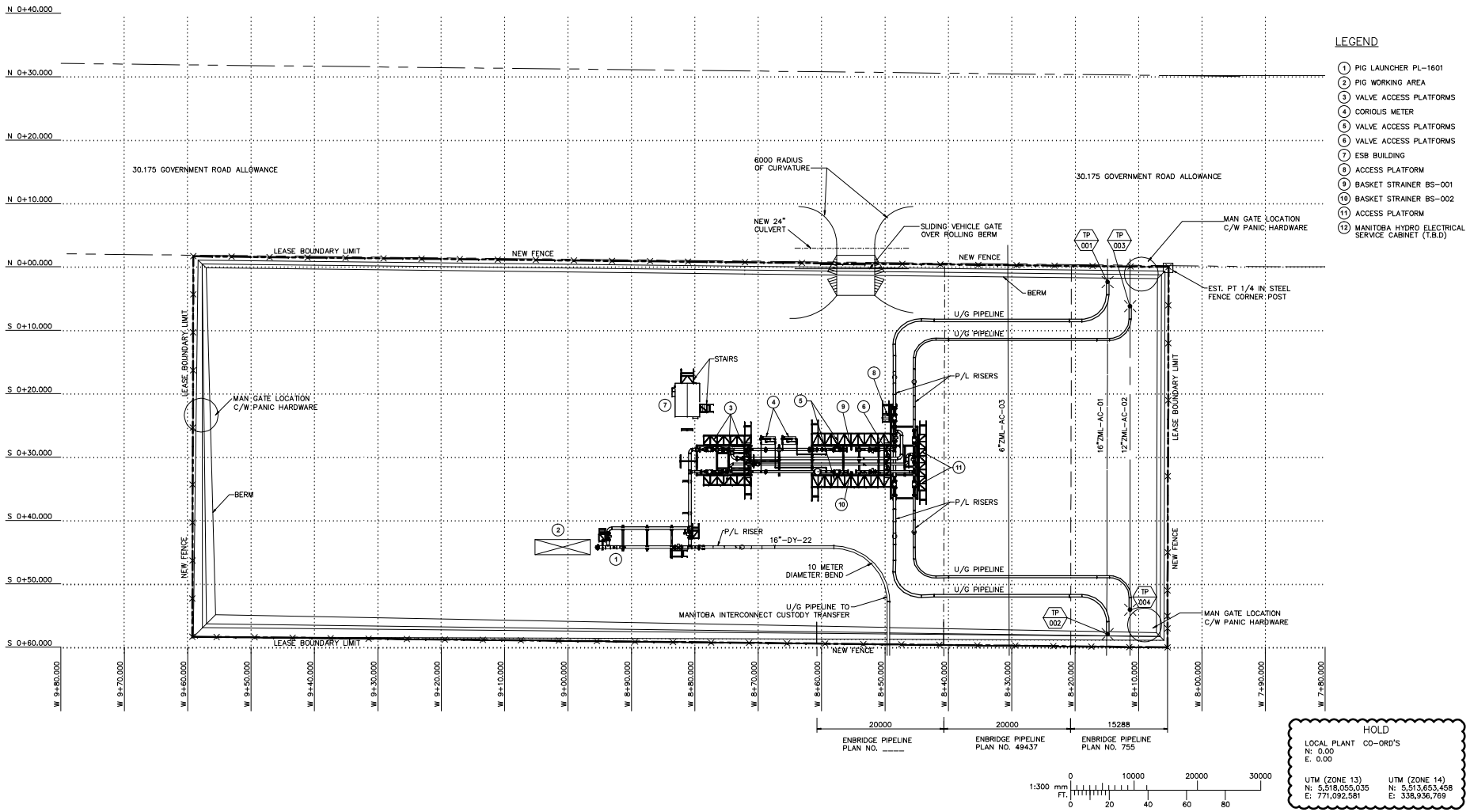
ENBRIDGE

TITLE: MANITOBA INTERCONNECT COMPANY DEMARCATION / SITE BREAKDOWN

DRAWING No. D-PFD-421 | SHT. 01 | REV B

# Appendix F
# Westspur Interconnect Facility Drawings

| Drawing Name | Drawing Number |
|---|---|
| 14-17-09-28 WPM Plot Plan | D-MIW-410 SHT. 1 |
| 16” Mainline Take Off P&ID (Line 23A) | D-MIW-420 SHT. 1 |
| 12” Mainline Take Off P&ID (Line 23B) | D-MIW-420 SHT. 2 |
| 16” Outgoing Sending Trap Area P&ID (ZML-WV-01) | D-MIW-420 SHT. 3 |




LEGEND

1. PIG LAUNCHER PL-1601
2. PIG WORKING AREA
3. VALVE ACCESS PLATFORMS
4. CORIOLIS METER
5. VALVE ACCESS PLATFORMS
6. VALVE ACCESS PLATFORMS
7. ESB BUILDING
8. ACCESS PLATFORM
9. BASKET STRAINER BS-001
10. BASKET STRAINER BS-002
11. ACCESS PLATFORM
12. MANITOBA HYDRO ELECTRICAL SERVICE CABINET (T.B.D)

HOLD

LOCAL PLANT CO-ORD'S
N: 0.00
E. 0.00

| UTM (ZONE 13) | UTM (ZONE 14) |
|---|---|
| N: 5,518,055,035 | N: 5,513,653,458 |
| E: 771,092,581 | E: 338,936,769 |

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|---|---|
| | | G | ISSUED FOR BID (GENUS 100-02-02) | MPH | 2013-06-20 | CJE | – |
| | | B | RE-ISSUED FOR REVIEW (GENUS 100-02-02) | AR | 2013-12-16 | – | – |
| | | C | ISSUED FOR HAZOP (GENUS 100-02-02) | AR | 2013-12-20 | – | – |
| | | D | RE-ISSUED FOR HAZOP (GENUS 100-02-02) | AR | 2014-01-17 | – | – |
| | | E | RE-ISSUED FOR REGULATORY (GENUS 100-02-02) | AR | 2014-03-25 | – | – |
| | | F | RE-ISSUED FOR REGULATORY (GENUS 100-02-02) | HK | 2014-06-05 | – | – |

G:\drafting\100 Enbridge\100-02 Cromer\100-02-02 Cromer Tundra Tech\5000 Drafting\410 Facility Plot and Grading Plans (Plot Plan)\MIW41001.dwg

ENGINEER'S STAMP

ENGINEERING RECORD

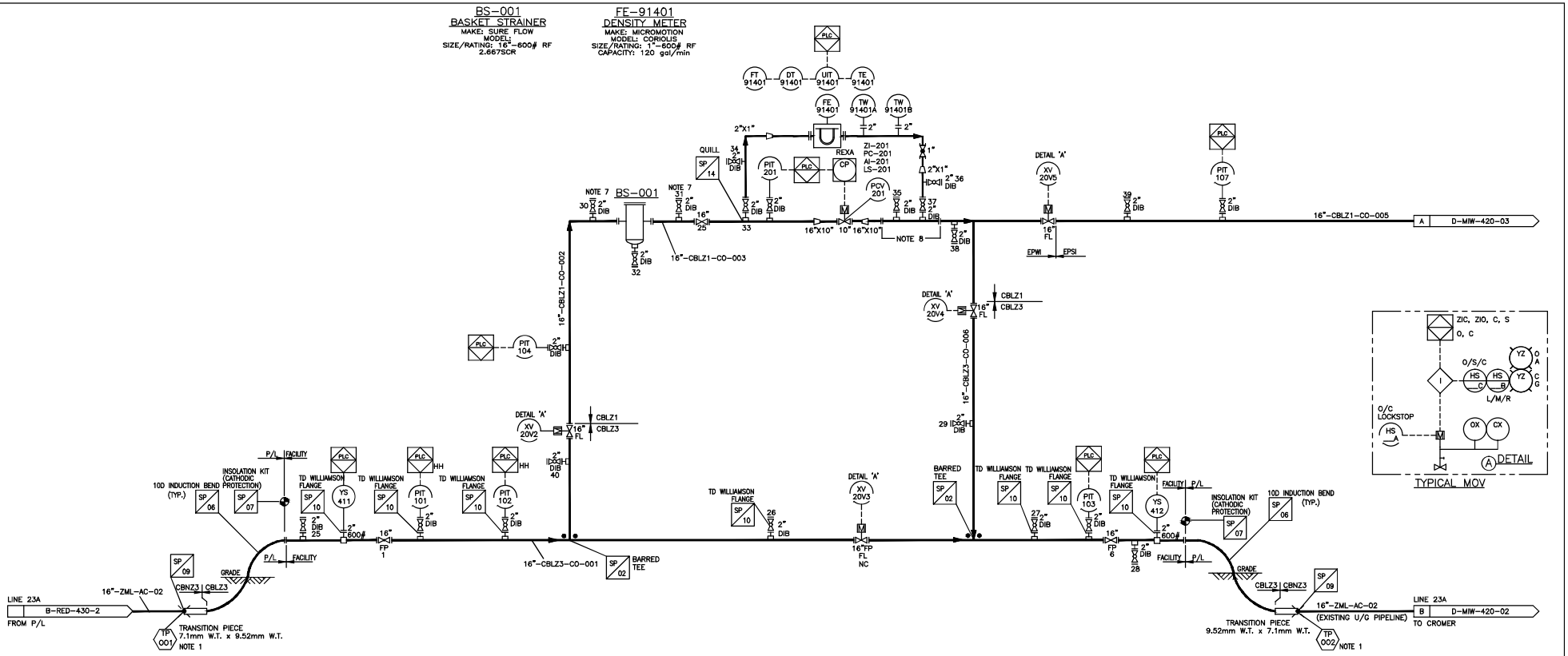
| | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: WV4140-03172 | FILE No.: CC 13 06 |
| DRAWN BY: A. RAMOS | DATE: 2010-07-23 |
| CHKD BY: – | DESIGNED BY: G. McCASKILL |
| ENGINEER: – | LAST UPDATE: 2014-06-23, 15:56 |
| ACAD DWG No.: MIW41001.dwg | SCALE: 1:300 |

ENBRIDGE

TITLE

WESTSPUR INTERCONNECT FACILITY
14-17-09-28 WPM
PLOT PLAN

| DRAWING No. | SHT. | REV |
|---|---|---|
| D-MIW-410 | 1 | G |




NOTES:
1. EXACT TIE-POINT LOCATION TBD BY CONSTRUCTION.
2. ALL INSTRUMENT & EQUIPMENT TAG NUMBERS SHALL BE PREFIXED BY "MIW-"
3. ALL SIGNALS TO GO FROM NEW ESB TO EPSI VIA CROMER VIRDEN TOWER.
4. STATIC MIXER TO BE INSTALLED WITHIN 0.5-4 PIPE DIAMETERS UPSTREAM OF SAMPLE PROBE AND MANUAL SAMPLER.
5. DO NOT INSTALL IF AMBIENT <0°C.
6. ALL DRAIN CONSTRUCTIONS SHALL BE INSTALLED ON THE TOP OF PIPE.
7. PI'S ARE NOT PERMANENTLY INSTALLED. A PLUG SHALL BE INSTALLED FOR NORMAL OPERATION.
8. ALLOW ADEQUATE SPOOL FOR FUTURE BU-001. SAMPLE BUILDING AND MX-001 STATIC MIXER.

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|---|---|
| | | 0 | ISSUED FOR CONSTRUCTION (GENIUS 100-002-02) | HS | 2014-06-06 | | |

ISSUED FOR INFORMATION ONLY

ENGINEER'S STAMP

ENGINEERING RECORD

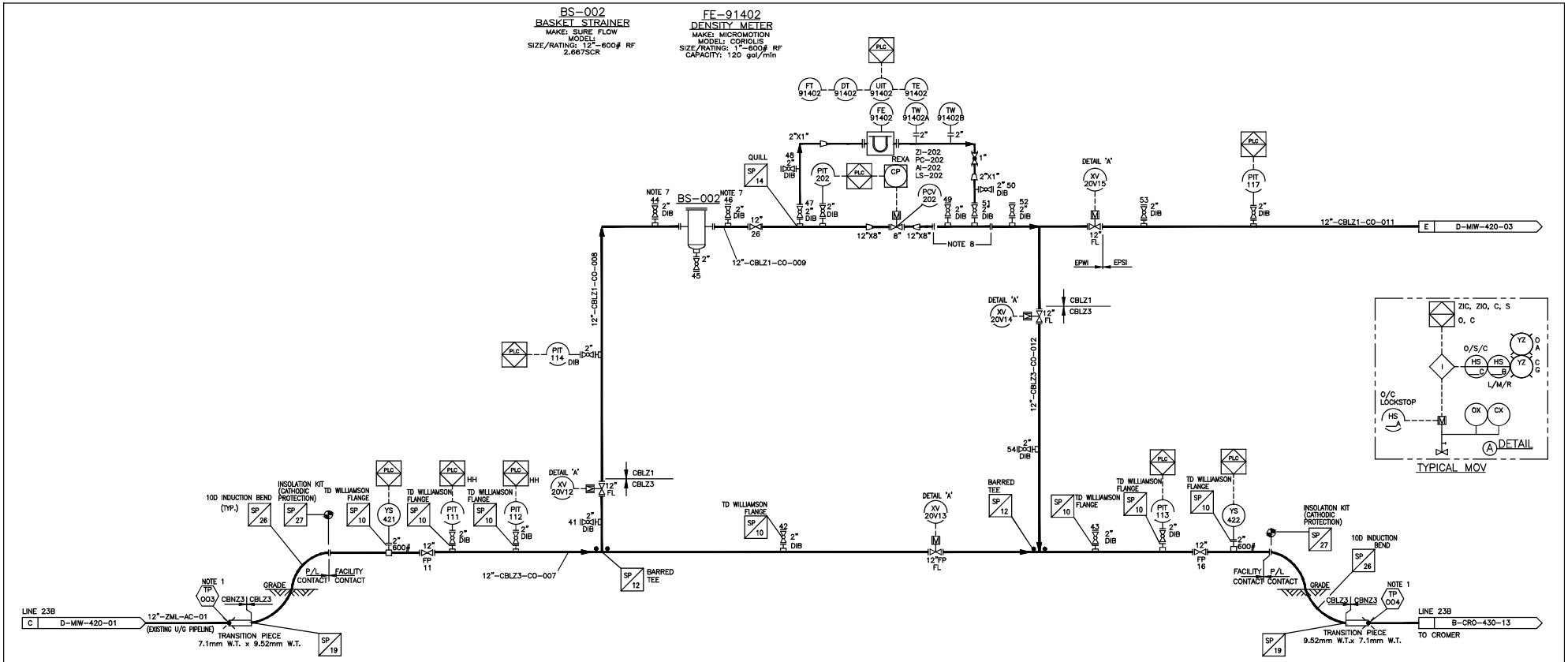
| | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: WV41410-03172 | FILE No.: CC 13 06 |
| DRAWN BY: N.RADMANESH | DATE: 2013-12-20 |
| CHKD BY: A. NUYNH | DESIGNED BY: G. McCASKILL |
| ENGINEER: D. LIM | LAST UPDATE: 2014-06-17, 11:27 |
| ACAD DWG No.: MIW42001.DWG | SCALE: N.T.S. |

ENBRIDGE

TITLE
WESTSPUR INTERCONNECT FACILITY
16" MAINLINE TAKE OFF
PROCESS & INSTRUMENTATION DIAGRAM

| DRAWING No. | SHT. | REV |
|---|---|---|
| D-MIW-420 | 01 | 0 |

G:\DRAFTING\100 ENBRIDGE\100-02 CROMER\100-02-02 CROMER TUNDRA TIE-IN\5000 DRAFTING\420 PROCESS AND MECHANICAL FLOW SHEETS (PID)




NOTES:
1. EXACT TIE-POINT LOCATION TBD BY CONSTRUCTION.
2. ALL INSTRUMENT & EQUIPMENT TAG NUMBERS SHALL BE PREFIXED BY "MIW-"
3. ALL SIGNALS TO GO FROM NEW ESB TO EPSI VIA CROMER VIRDEN TOWER.
4. STATIC MIXER TO BE INSTALLED WITHIN 0.5-4 PIPE DIAMETERS UPSTREAM OF SAMPLE PROBE AND MANUAL SAMPLER.
5. DO NOT INSTALL IF AMBIENT <0°C.
6. ALL DRAIN CONSTRUCTIONS SHALL BE INSTALLED ON THE TOP OF PIPE.
7. PI'S ARE NOT PERMANENTLY INSTALLED. A PLUG SHALL BE INSTALLED FOR NORMAL OPERATION.
8. ALLOW ADEQUATE SPOOL FOR FUTURE BU-002. SAMPLE BUILDING AND MX-002 STATIC MIXER.

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|---|---|
| | | 0 | ISSUED FOR CONSTRUCTION (GENIUS 100-02-02) | MH | 2014-06-06 | | |

ISSUED FOR INFORMATION ONLY

ENGINEER'S STAMP

ENGINEERING RECORD

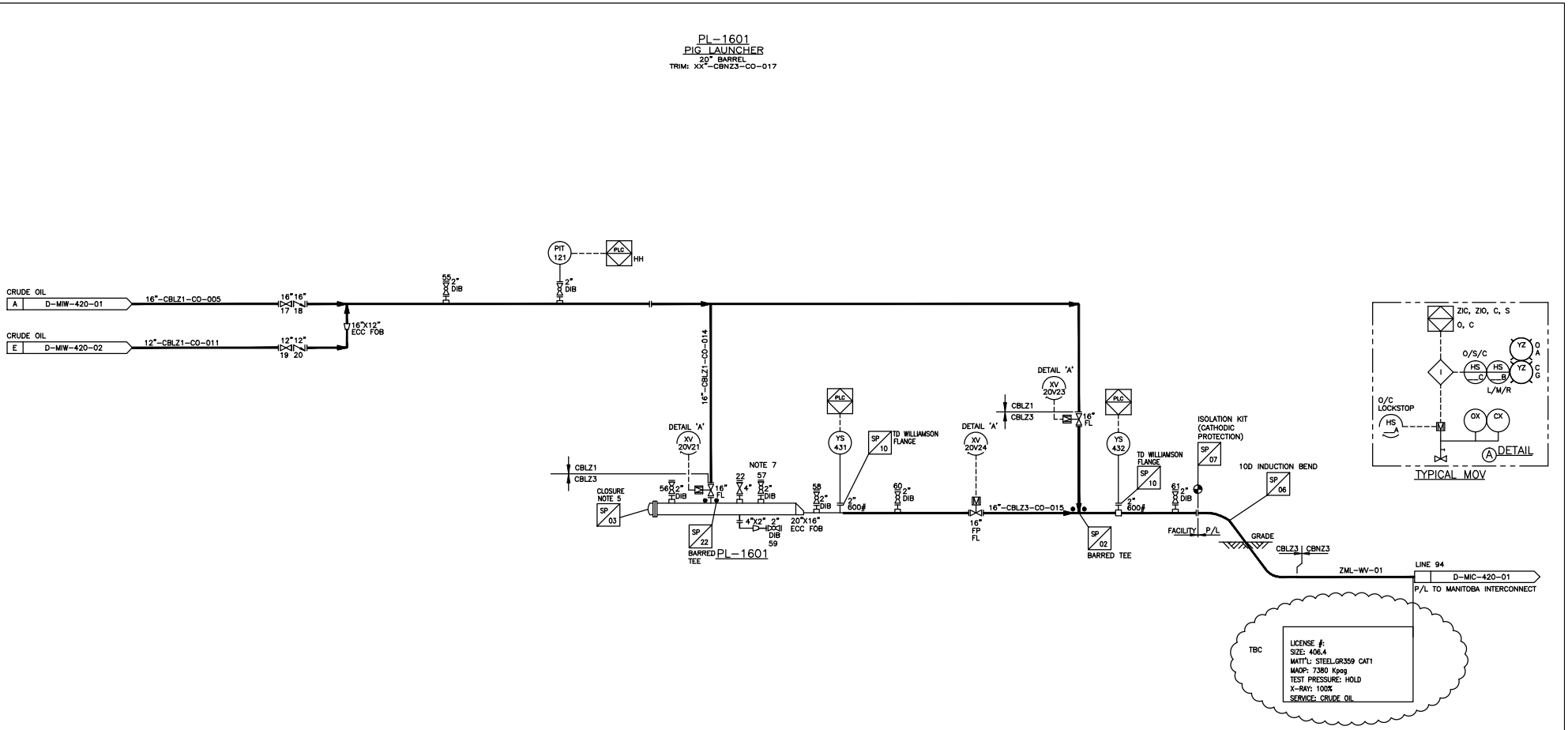
| | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: WV41410-03172 | FILE No.: CC 13 06 |
| DRAWN BY: N.RADMANESH | DATE: 2013-12-20 |
| CHKD BY: A. HUYNH | DESIGNED BY: G. McCASKILL |
| ENGINEER: D. LIM | LAST UPDATE: 2014-06-17, 11:28 |
| ACAD DWG No.: MIW42002.DWG | SCALE: N.T.S. |

ENBRIDGE

TITLE
WESTSPUR INTERCONNECT FACILITY
12" MAINLINE TAKE-OFF
PROCESS & INSTRUMENTATION DIAGRAM

| DRAWING No. | SHT. | REV |
|---|---|---|
| D-MIW-420 | 02 | 0 |

G:\DRAFTING\100 ENBRIDGE\100-02 CROMER\100-02-02 CROMER TUNDRA NEW\5000 DRAFTING\420 PROCESS AND MECHANICAL FLOW SHEETS (PID)




NOTES:
1. EXACT TIE-POINT LOCATION TBD BY CONSTRUCTION.
2. ALL INSTRUMENT & EQUIPMENT TAG NUMBERS SHALL BE PREFIXED BY "MIW-".
3. ALL SIGNALS TO GO FROM NEW ESB TO EPSI VIA CROMER VIRDEN TOWER.
4. DO NOT INSTALL IF AMBIENT <0°C.
5. HINGE TO BE ON SAME SIDE OF THE BARREL AS KICK-OUT LINE.
6. ALL DRAIN CONNECTIONS SHALL BE INSTALLED ON THE TOP OF PIPE.
7. PI'S ARE NOT PERMANENTLY INSTALLED BUT SHOWN FOR CLARITY A PLUG SHALL BE INSTALLED FOR NORMAL OPERATION.

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP | ENGINEER'S STAMP |
|---|---|---|---|---|---|---|---|---|
| | | 0 | ISSUED FOR CONSTRUCTION (GENUS 100-02-08) | HG | 2014-06-06 | | | |
| | | | ISSUED FOR INFORMATION ONLY | | | | | |

G:\DRAFTING\100 ENBRIDGE\100-02 CROMER\100-02-02 CROMER TUNDRA TIE-IN\5000 DRAFTING\420 PROCESS AND MECHANICAL FLOW SHEETS (PID)

| ENGINEERING RECORD | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: WV41410-03172 | FILE No.: CC 13 06 |
| DRAWN BY: N.RADMANESH | DATE: 2013-12-20 |
| CHKD BY: A. HUYNH | DESIGNED BY: G. McCASKILL |
| ENGINEER: D. LIM | LAST UPDATE: 2014-06-17, 11:28 |
| ACAD DWG No.: MIW42003.DWG | SCALE: N.T.S. |

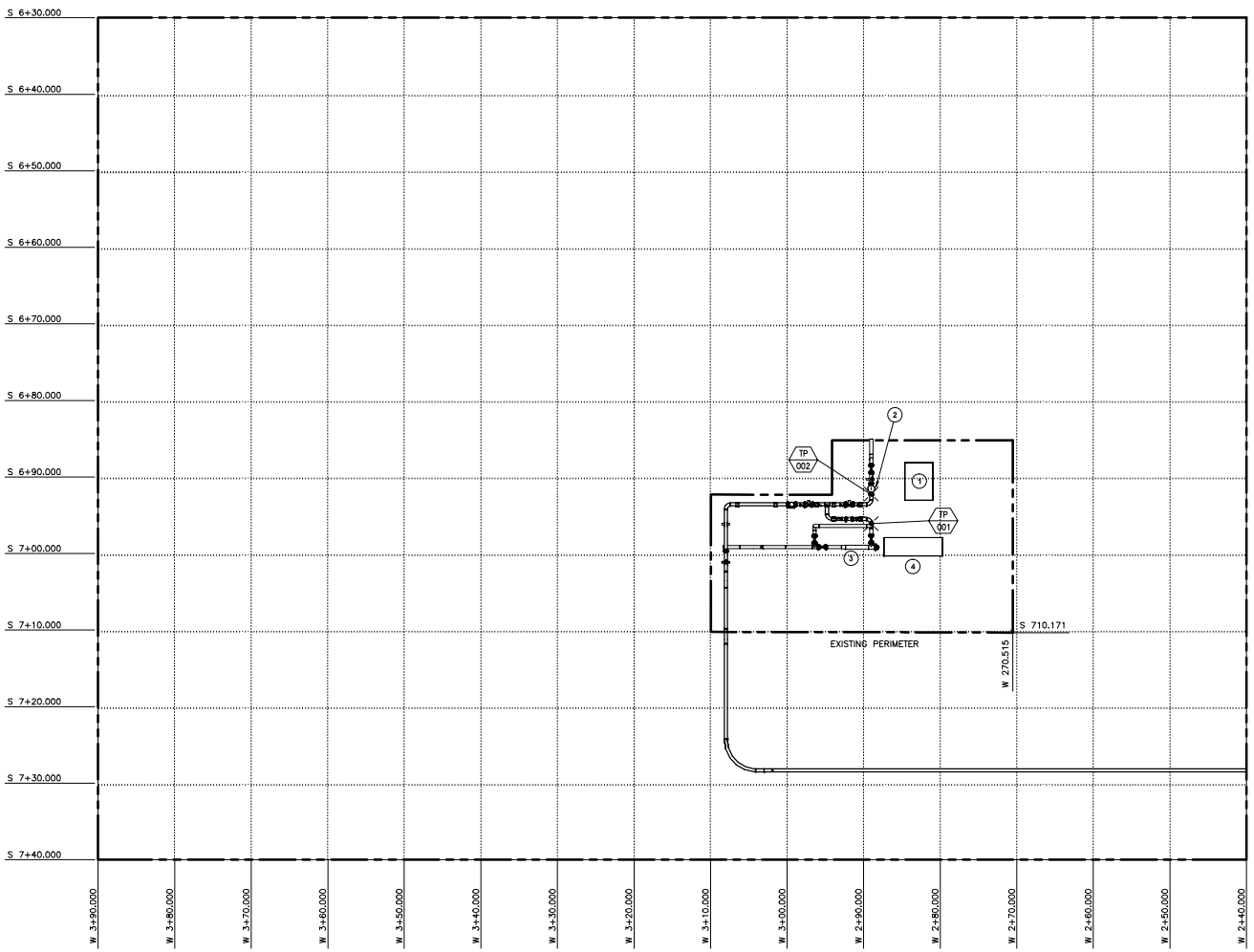
ENBRIDGE

TITLE
WESTSPUR INTERCONNECT FACILITY
16" OUTGOING SENDING TRAP AREA
PROCESS & INSTRUMENTATION DIAGRAM

| DRAWING No. | SHT. | REV |
|---|---|---|
| D-MIW-420 | 03 | 0 |

# Appendix G
# Bakken Metering Line 26 Receiving Trap Site Drawings

| Drawing Name | Drawing Number |
|---|---|
| 9-17-9-28 WPM Plot Plan | D-CBK-410 SHT. 1 |
| Incoming Trap Area P&ID (demolition) | D-CBK-420 SHT.1D |
| Incoming Trap Area P&ID (installation) | D-CBK-420 SHT.1 |




LEGEND

1. EXISTING ESB BLDG
2. EXISTING BS–1004
3. EXISTING RECEIVER TRAP PR–1601
4. EXISTING PIG WORK AREA

1:300 mm 0 10000 20000 30000
FT. 0 20 40 60 80

HOLD

LOCAL PLANT CO–ORD'S
N: 0.00
E. 0.00

UTM (ZONE 13)
N: 5,518,055.035
E: 771,092.581

UTM (ZONE 14)
N: 5,513,653.458
E: 338,936.769

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|---|---|
| | | A | ISSUED FOR INFORMATION ONLY (GENUS 100–02–02) | AR | 2014–02–13 | – | – |
| | | B | ISSUED FOR REGULATORY (GENUS 100–02–02) | AR | 2014–06–20 | – | – |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| G:\DRAFTING\100 ENBRIDGE\100–02 CROMER\100–02–02 CROMER TUNDRA TEIN\5000 DRAFTING\410 FACILITY PLOT AND GRADING PLANS (PLOT PLAN) | | | | | | | |

ENGINEER'S STAMP

ENGINEERING RECORD

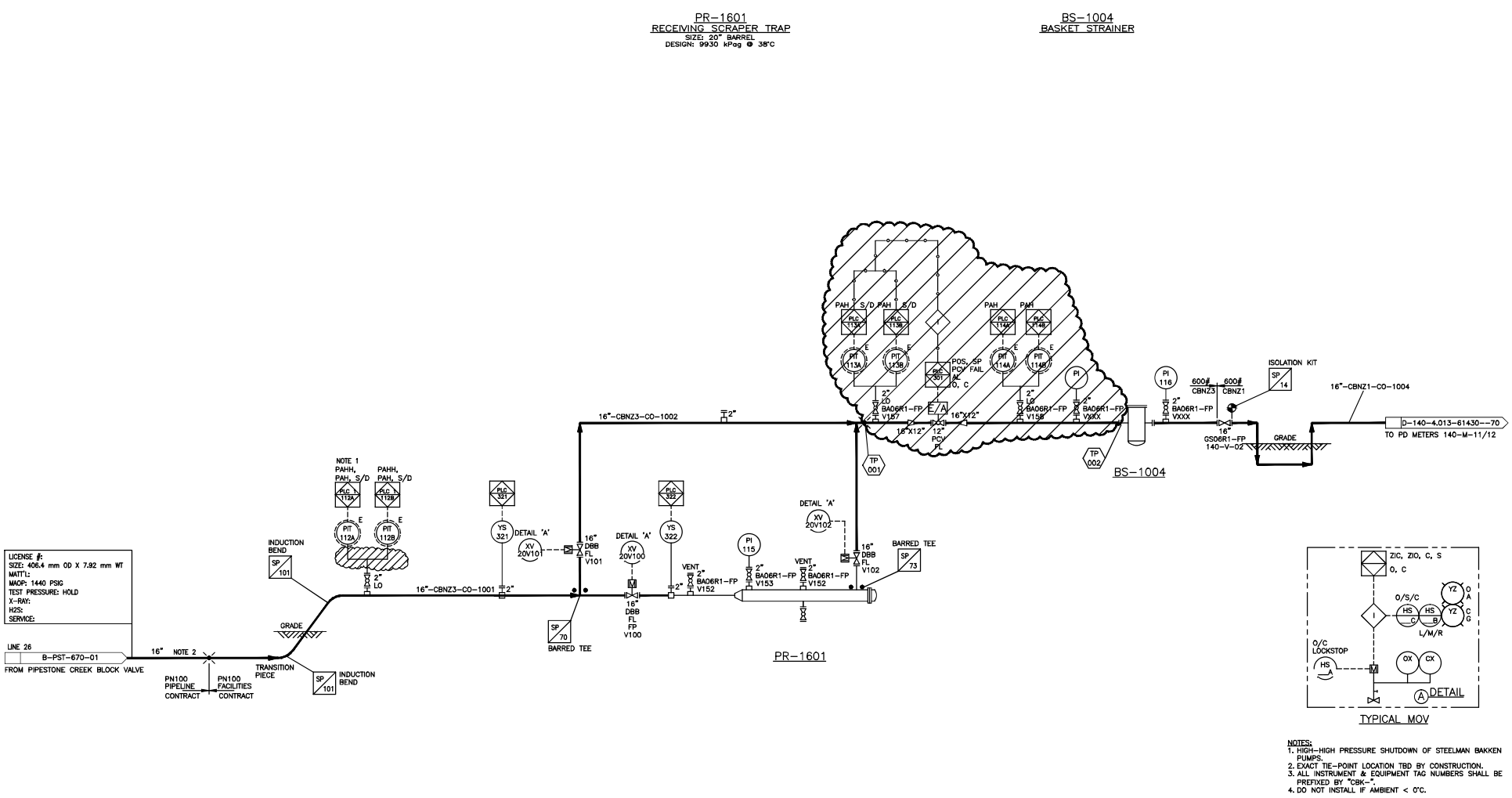
| | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: B41403B10/1341403B12 | FILE No.: CC 13 06 |
| DRAWN BY: A. RAMOS | DATE: 2014–01–17 |
| CHKD BY: – | DESIGNED BY: G. McCASKILL |
| ENGINEER: – | LAST UPDATE: 2014–06–23, 16:00 |
| ACAD DWG No.: CBK41001.DWG | SCALE: 1:300 |

ENBRIDGE

TITLE

BAKKEN METERING
9–17–9–28 WPM
PLOT PLAN

| DRAWING No. | SHT. | REV |
|---|---|---|
| D–CBK–410 | 1 | B |




NOTES:
1. HIGH-HIGH PRESSURE SHUTDOWN OF STEELMAN BAKKEN PUMPS.
2. EXACT TIE-POINT LOCATION TBD BY CONSTRUCTION.
3. ALL INSTRUMENT & EQUIPMENT TAG NUMBERS SHALL BE PREFIXED BY "CBK-".
4. DO NOT INSTALL IF AMBIENT < 0°C.

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|---|---|
| | | 0 | ISSUED FOR CONSTRUCTION (GENIUS 100-TM-02) | NH | 2014-06-06 | | |

ISSUED FOR INFORMATION ONLY

ENGINEER'S STAMP

ENGINEERING RECORD

| | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: WV41410-03172 | FILE No.: CC 13 06 |
| DRAWN BY: N.RADMANESH | DATE: 2013-11-28 |
| CHKD BY: A. NUYNH | DESIGNED BY: G. McCASKILL |
| ENGINEER: D. LIM | LAST UPDATE: 2014-06-12, 16:45 |
| ACAD DWG No.: CBK42001D.DWG | SCALE: N.T.S. |

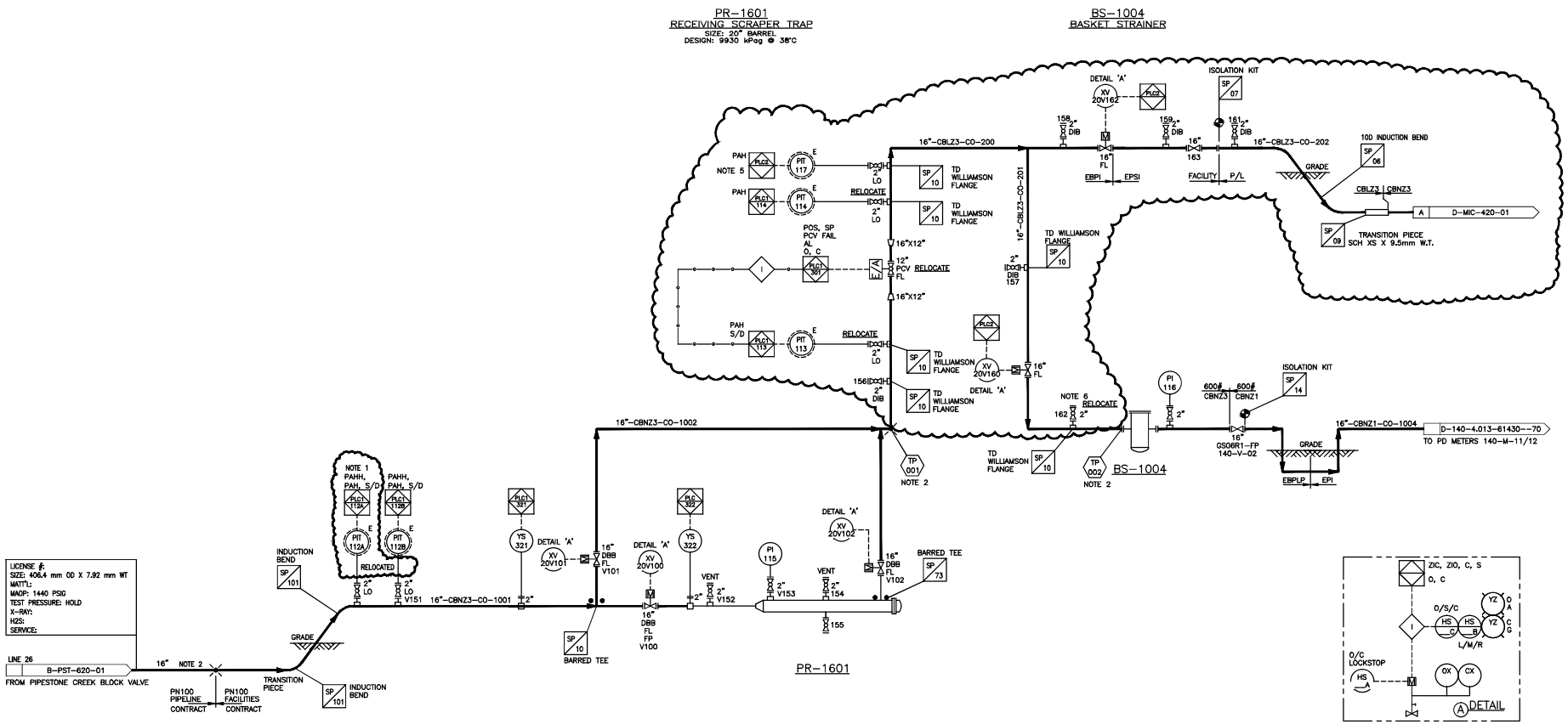
ENBRIDGE

TITLE

BAKKEN METERING FACILITY
INCOMING TRAP AREA
PROCESS & INSTRUMENTATION DIAGRAM

| DRAWING No. | SHT. | REV |
|---|---|---|
| D-CBK-420 | 01D | 0 |

G:\DRAFTING\100 ENBRIDGE\100-02 CROMER\100-02-02 CROMER TUNDRA NEW\5000 DRAFTING\420 PROCESS AND MECHANICAL FLOW SHEETS (PID)




NOTES:
1. HIGH-HIGH PRESSURE SHUTDOWN OF STEELMAN BAKKEN PUMPS.
2. EXACT TIE-POINT LOCATION TBD BY CONSTRUCTION.
3. ALL INSTRUMENT & EQUIPMENT TAG NUMBERS SHALL BE PREFIXED BY "CBK-".
4. DO NOT INSTALL IF AMBIENT <0°C.
5. PLC1 IS LOCATED IN THE CBK ESB.
   PLC2 IS LOCATED IN THE MIC ESB.
6. PI'S ARE NOT PERMANENTLY INSTALLED BUT SHOWN FOR CLARITY A PLUG SHALL BE INSTALLED FOR NORMAL OPERATION.

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|---|---|
| | | 0 | ISSUED FOR CONSTRUCTION (ENBRIDGE) | KS | 2014-06-06 | | |

ISSUED FOR INFORMATION ONLY

ENGINEER'S STAMP

ENGINEERING RECORD

| | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: WV41410-03172 | FILE No.: CC 13 06 |
| DRAWN BY: N.RADMANESH | DATE: 2013-11-28 |
| CHKD BY: A. NUYNH | DESIGNED BY: G. McCASKILL |
| ENGINEER: D. LIM | LAST UPDATE: 2014-06-17, 12:19 |
| ACAD DWG No.: CBK42001.DWG | SCALE: N.T.S. |

ENBRIDGE

TITLE

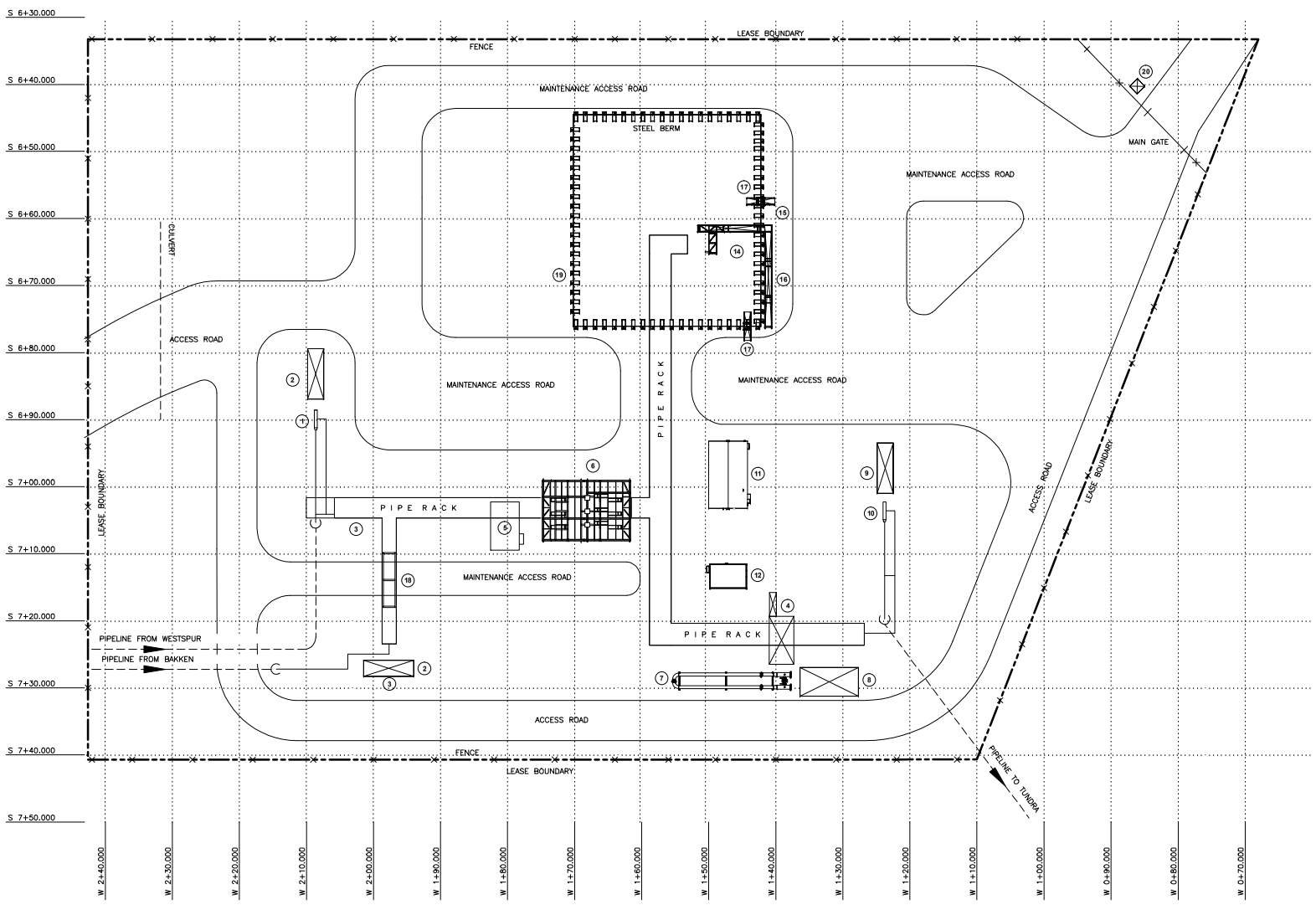
BAKKEN METERING
INCOMING TRAP AREA
PROCESS & INSTRUMENTATION DIAGRAM

| DRAWING No. | SHT. | REV |
|---|---|---|
| D-CBK-420 | 01 | 0 |

G:\DRAFTING\100 ENBRIDGE\100-02 CROMER\100-02-02 CROMER TUNDRA TEIN\5000 DRAFTING\420 PROCESS AND MECHANICAL FLOW SHEETS (PID)

# Appendix H
# Manitoba Interconnect Facility Drawings

| Drawing Name | Drawing Number |
|---|---|
| Manitoba Interconnect Facility Plot Plan | D-MIC-410 SHT. 1 |
| Incoming Trap Area P&ID | D-MIC-420 SHT. 1 |
| Sampling / Metering Skid #1 P&ID | D-MIC-420 SHT. 2 |
| Meter Prover Area P&ID | D-MIC-420 SHT. 4 |
| Outgoing Trap Area P&ID | D-MIC-420 SHT. 5 |
| 16” Sample Building BU-101 | D-MIC-420 SHT. 6 |
| Relief Tank 1 | D-MIC-420 SHT. 8 |




## LEGEND

1. PIG RECEIVER PR-1601
2. PIG RECEIVER WORKING AREA
3. VALVE ACCESS PLATFORM
4. VALVE ACCESS PLATFORM
5. SAMPLE BUILDING BU-101
6. METERING SKID-MIC
7. MP-900 / PROVER SKID-MIC
8. PROVER WORKING AREA
9. PIG LAUNCHER WORKING AREA
10. PIG LAUNCHER PL-1201
11. NEW ESB BLDG
12. LAB BLDG
13. NOT USED
14. RELIEF TANK TK-001
15. ENVIRO BOX (TRUCK CONN.)
16. TANK STAIR / PLATFORM
17. TANK ACCESS STAIRS
18. 3.5 METER HIGH BRIDGE
19. TANK CONTAINMENT
20. MANITOBA HYDRO METER CABINET (CSTE)

1:300 mm 0 10000 20000 30000
FT. 0 20 40 60 80

**HOLD**

LOCAL PLANT CO-ORD'S
N: 0.00
E: 0.00

| UTM (ZONE 13) | UTM (ZONE 14) |
|---|---|
| N: 5,518,055.035 | N: 5,513,653.458 |
| E: 771,092.581 | E: 338,936.769 |

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
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| | | G | ISSUED FOR BID (GENUS 100-02-02) | CJE | 2014-06-20 | CJE | – |
| | | B | RE-ISSUED FOR REVIEW (GENUS 100-02-02) | AR | 2013-12-16 | – | – |
| | | C | ISSUED FOR HAZOP (GENUS 100-02-02) | AR | 2013-12-20 | – | – |
| | | D | RE-ISSUED FOR HAZOP (GENUS 100-02-02) | AR | 2014-01-17 | – | – |
| | | E | ISSUED FOR INFORMATION ONLY (GENUS 100-02-02) | AR | 2014-02-13 | – | – |
| | | F | ISSUED FOR REGULATORY (GENUS 100-02-02) | GR | 2014-02-20 | – | – |

G:\drafting\100 Enbridge\100-02 Cromer\100-02-02 Cromer Tundra Tie-in 9000 Drafting\410 Facility Plot and Grading Plans (Plot Plan)\MIC41001.dwg

ENGINEER'S STAMP

ENGINEERING RECORD

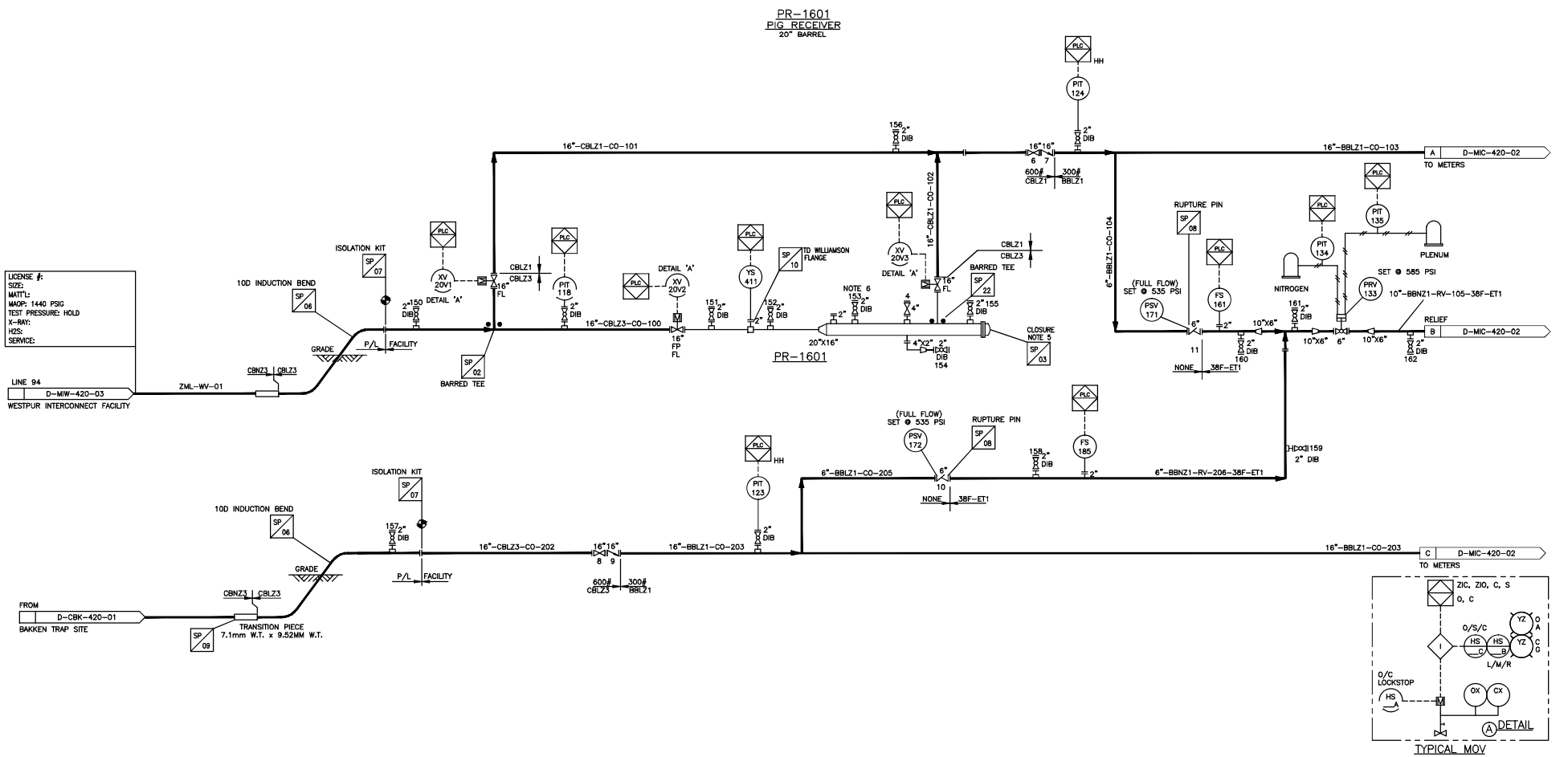
| | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: 1341403B12 | FILE No.: CC 13 06 |
| DRAWN BY: J.D. MICHEL | DATE: 2014-01-17 |
| CHKD BY: – | DESIGNED BY: G REPCHIN |
| ENGINEER: – | LAST UPDATE: 2014-06-20, 10:57 |
| ACAD DWG No.: MIC41001.dwg | SCALE: 1:300 |

ENBRIDGE

TITLE

MANITOBA INTERCONNECT CUSTODY TRANSFER
9-17-9-28 W1M
PLOT PLAN

| DRAWING No. | SHT. | REV |
|---|---|---|
| D-MIC-410 | 01 | G |




NOTES:

1. EXACT TIE-POINT LOCATION TBD BY CONSTRUCTION.
2. ALL INSTRUMENT & EQUIPMENT TAG NUMBERS SHALL BE PREFIXED BY 'MIC-'
3. ALL SIGNALS TO GO FROM NEW ESB TO EPSI VIA CROMER VIRDEN TOWER.
4. DO NOT INSTALL IF AMBIENT <0°C.
5. HINGE TO BE ON THE SAME SIDE OF THE BARREL AS KICK-OUT LINE.
6. PI'S ARE NOT PERMANENTLY INSTALLED BUT SHOWN FOR CLARITY A PLUG SHALL BE INSTALLED FOR NORMAL OPERATION.

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|---|---|
| | | 0 | ISSUED FOR CONSTRUCTION (GENIUS 100-02-02) | NM | 2014-06-06 | | |

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G:\DRAFTING\100 ENBRIDGE\100-02 CROMER\100-02-02 CROMER TUNDRA TIE-IN\5000 DRAFTING\420 PROCESS AND MECHANICAL FLOW SHEETS (PID)

ENGINEER'S STAMP

ENGINEERING RECORD

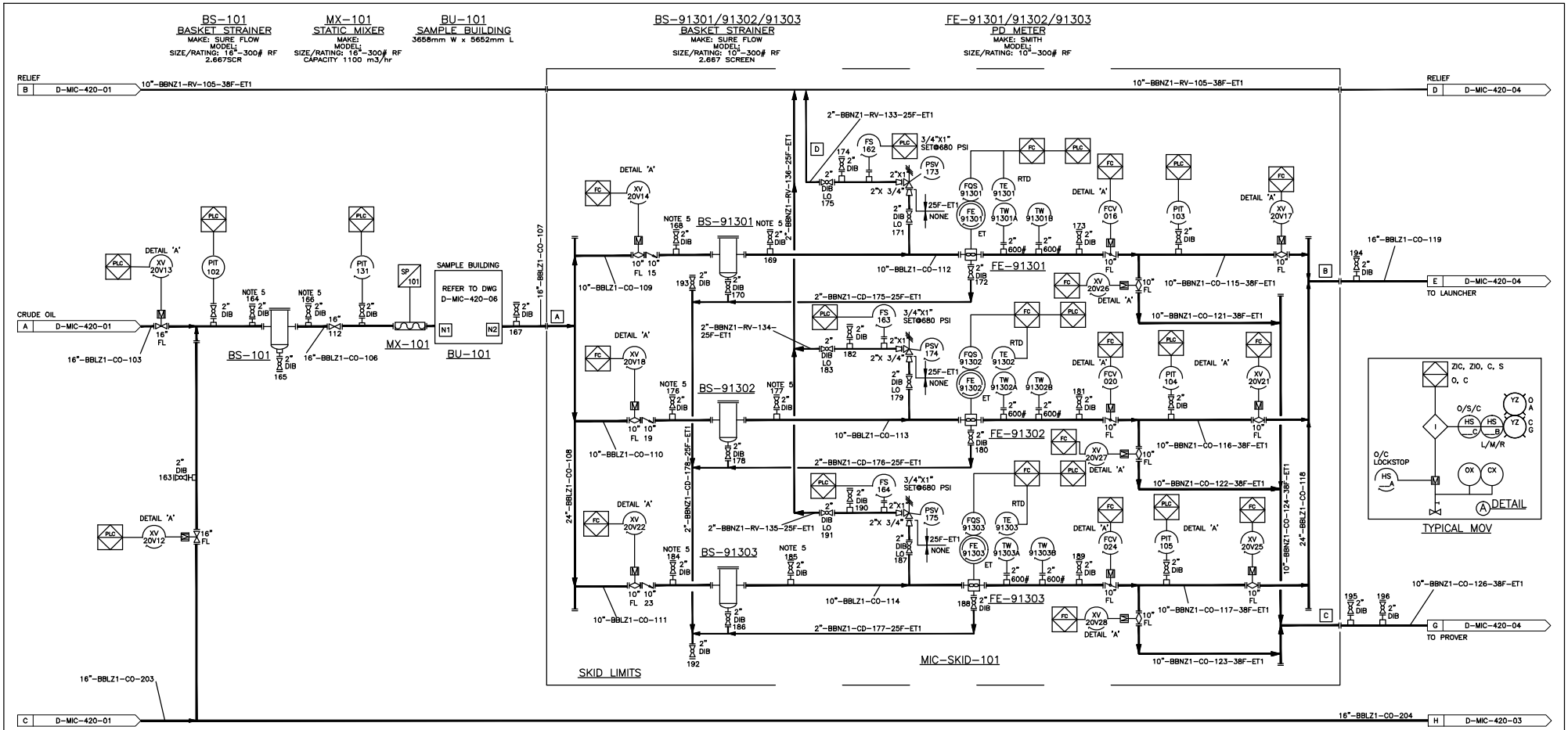
| | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: WV41410-03172 | FILE No.: CC 13 06 |
| DRAWN BY: N.RADMANESH | DATE: 2013-11-28 |
| CHKD BY: A. NUYNH | DESIGNED BY: G. McCASKILL |
| ENGINEER: D. LIM | LAST UPDATE: 2014-06-12, 11:16 |
| ACAD DWG No.: MIC42001.DWG | SCALE: N.T.S. |

ENBRIDGE

TITLE

MANITOBA INTERCONNECT CUSTODY TRANSFER
INCOMING TRAP AREA
PROCESS & INSTRUMENTATION DIAGRAM

| DRAWING No. | SHT. | REV |
|---|---|---|
| D-MIC-420 | 01 | 0 |




NOTES:
1. EXACT TIE-POINT LOCATION TBD BY CONSTRUCTION.
2. ALL INSTRUMENT & EQUIPMENT TAG NUMBERS SHALL BE PREFIXED BY MIC.
3. ALL SIGNALS TO GO FROM NEW ESB TO EPSI VIA CROMER VIRDEN TOWER.
4. DO NOT INSTALL IF AMBIENT <0°C.
5. ALL DRAINS CONNECTION SHALL BE INSTALLED ON THE TOP OF PIPE.
6. PI'S ARE NOT PERMANENTLY INSTALLED BUT SHOWN FOR CLARITY. A PLUG SHALL BE INSTALLED FOR NORMAL OPERATION.

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP | ENGINEER'S STAMP |
|---|---|---|---|---|---|---|---|---|
| | | 0 | ISSUED FOR CONSTRUCTION (GENUS 100-02-02) | HS | 2014-06-06 | | | |

ISSUED FOR INFORMATION ONLY

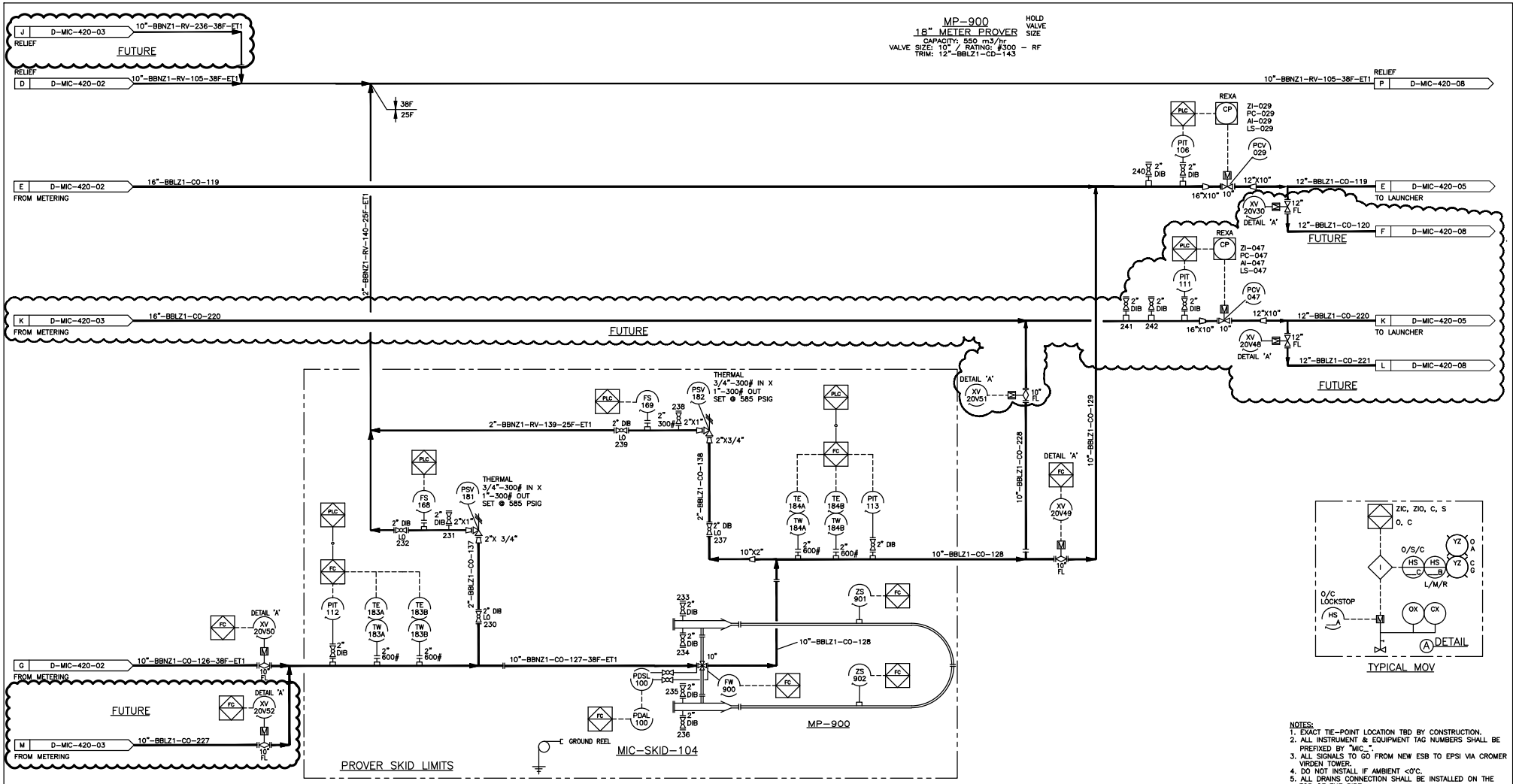
| ENGINEERING RECORD | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: WV4140-03172 | FILE No.: CC 13 06 |
| DRAWN BY: N.RADMANESH | DATE: 2013-11-28 |
| CHKD BY: A. NUYNH | DESIGNED BY: G. McCASKILL |
| ENGINEER: D. LIM | LAST UPDATE: 2014-06-11, 13:42 |
| ACAD DWG No.: MIC42002.DWG | SCALE: N.T.S. |

ENBRIDGE

TITLE
MANITOBA INTERCONNECT CUSTODY TRANSFER
SAMPLING/METERING SKID #1
PROCESS & INSTRUMENTATION DIAGRAM

| DRAWING No. | SHT. | REV |
|---|---|---|
| D-MIC-420 | 02 | 0 |

G:\DRAFTING\100 ENBRIDGE\100-02 CROMER\100-02-02 CROMER TUNDRA TIE-IN\5000 DRAFTING\420 PROCESS AND MECHANICAL FLOW SHEETS (PID)




| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|---|---|
| | | 0 | ISSUED FOR CONSTRUCTION (GENIUS 100-02-08) | HG | 2014-06-06 | | |

ISSUED FOR INFORMATION ONLY

ENGINEER'S STAMP

ENGINEERING RECORD

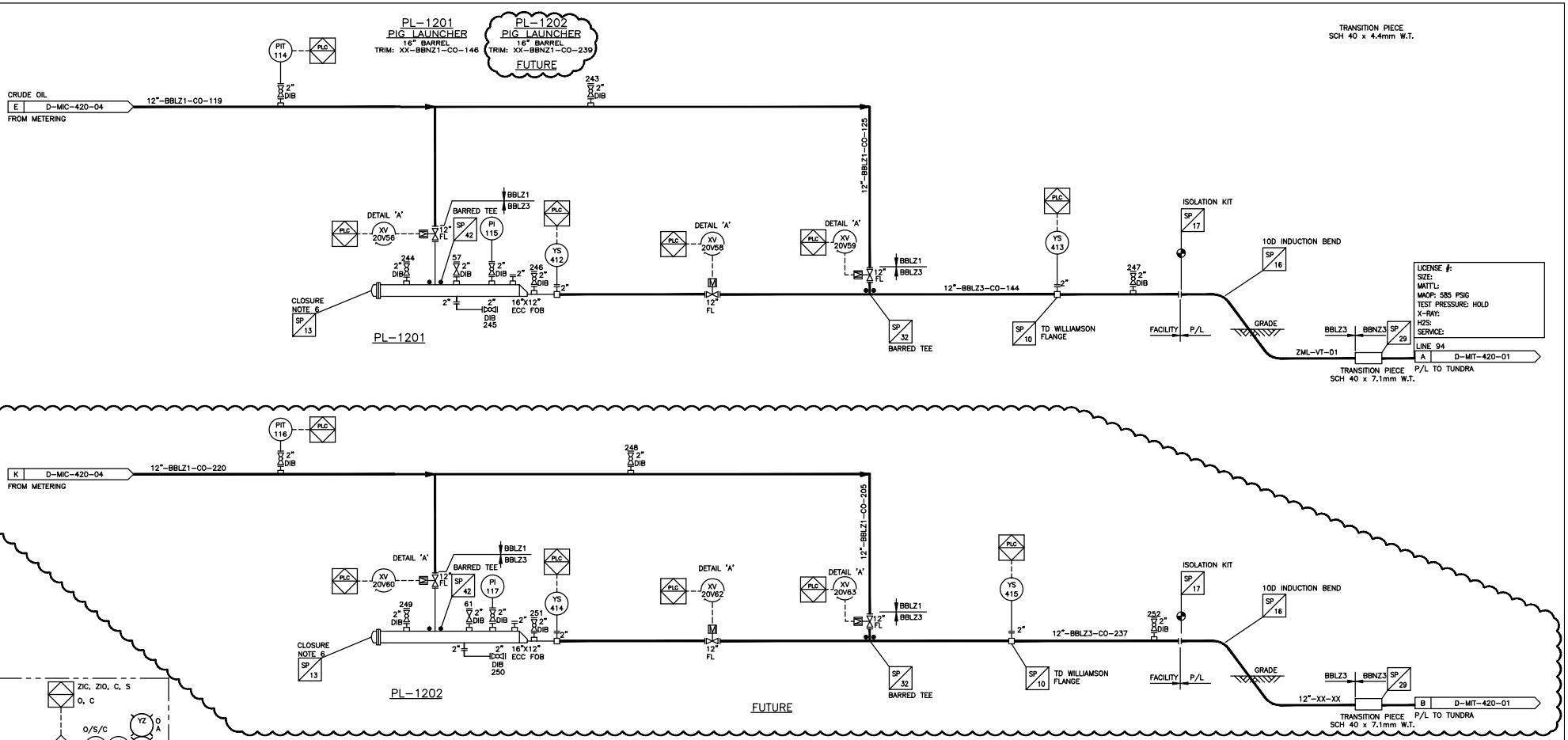
| | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: WV4140-03172 | FILE No.: CC 13 06 |
| DRAWN BY: N.RADMANESH | DATE: 2013-11-28 |
| CHKD BY: A. HUYNH | DESIGNED BY: G. McCASKILL |
| ENGINEER: D. LIN | LAST UPDATE: 2014-06-12, 14:38 |
| ACAD DWG No.: MIC42004.DWG | SCALE: N.T.S. |

ENBRIDGE

TITLE
MANITOBA INTERCONNECT CUSTODY TRANSFER
METER PROVER AREA
PROCESS & INSTRUMENTATION DIAGRAM

DRAWING No. D-MIC-420 | SHT. 04 | REV 0

G:\DRAFTING\100 ENBRIDGE\100-02 CROMER\100-02-02 CROMER TUNDRA TIE-IN\5000 DRAFTING\420 PROCESS AND MECHANICAL FLOW SHEETS (PID)




NOTES:
1. HIGH-HIGH PRESSURE SHUTDOWN OF STEELMAN BAKKEN PUMPS.
2. EXACT TIE-POINT LOCATION TBC BY CONSTRUCTION.
3. ALL INSTRUMENT & EQUIPMENT TAG NUMBERS SHALL BE REFIXED BY "MIC-".
4. ALL SIGNALS TO GO FROM NEW ESB TO EPSI VIA CROMER VIRDEN TOWER.
5. DO NOT INSTALL IF AMBIENT <0°C.
6. HINGE TO BE ON SAME SIDE OF THE BARREL AS KICK-OUT LINE.

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|---|---|
| | | 0 | ISSUED FOR CONSTRUCTION (GENUB_100_02_08) | HG | 2014-06-06 | | |

ISSUED FOR INFORMATION ONLY

ENGINEER'S STAMP

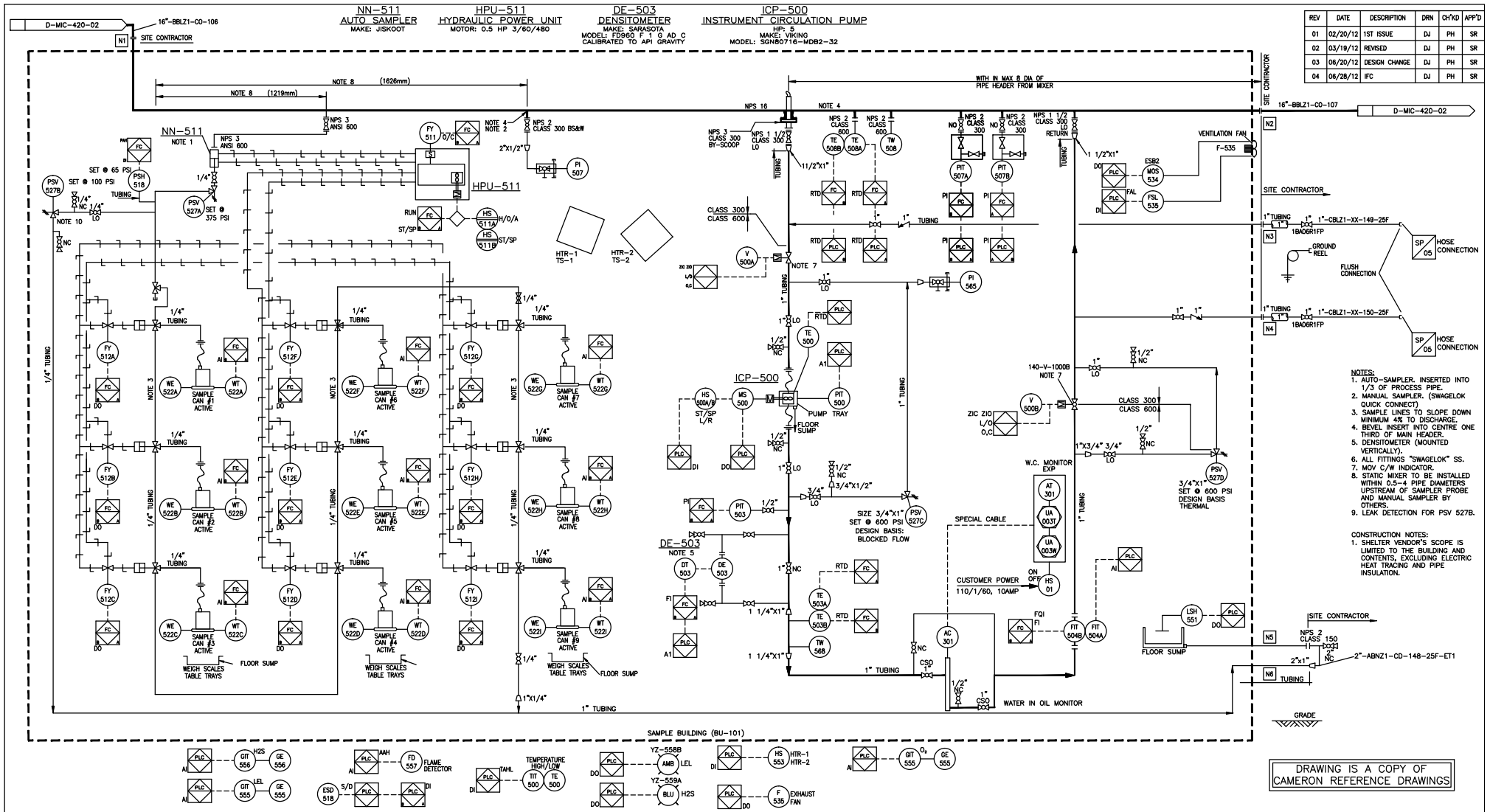
| ENGINEERING RECORD | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: WV41410-03172 | FILE No.: CC 13 06 |
| DRAWN BY: N.RADMANESH | DATE: 2013-11-28 |
| CHKD BY: A. NUYNH | DESIGNED BY: G. McCASKILL |
| ENGINEER: D. LIM | LAST UPDATE: 2014-06-05, 09:13 |
| ACAD DWG No.: MIC42005.DWG | SCALE: N.T.S. |

ENBRIDGE

TITLE
MANITOBA INTERCONNECT CUSTODY TRANSFER
OUTGOING TRAP AREA
PROCESS & INSTRUMENTATION DIAGRAM

| DRAWING No. | SHT. | REV |
|---|---|---|
| D-MIC-420 | 05 | 0 |

G:\DRAFTING\100 ENBRIDGE\100-02 CROMER\100-02-02 CROMER TUNDRA TIE-IN\5000 DRAFTING\420 PROCESS AND MECHANICAL FLOW SHEETS (PID)




NOTES:
1. AUTO-SAMPLER. INSERTED INTO 1/3 OF PROCESS PIPE.
2. MANUAL SAMPLER. (SWAGELOK QUICK CONNECT)
3. SAMPLE LINES TO SLOPE DOWN MINIMUM 4% TO DISCHARGE.
4. BEVEL INSERT INTO CENTRE ONE THIRD OF MAIN HEADER.
5. DENSITOMETER (MOUNTED VERTICALLY).
6. ALL FITTINGS "SWAGELOK" SS.
7. MOV C/W INDICATOR.
8. STATIC MIXER TO BE INSTALLED WITHIN 0.5-4 PIPE DIAMETERS UPSTREAM OF SAMPLER PROBE AND MANUAL SAMPLER BY OTHERS.
9. LEAK DETECTION FOR PSV 527B.

CONSTRUCTION NOTES:
1. SHELTER VENDOR'S SCOPE IS LIMITED TO THE BUILDING AND CONTENTS, EXCLUDING ELECTRIC HEAT TRACING AND PIPE INSULATION.

| REV | DATE | DESCRIPTION | DRN | CH'KD | APP'D |
|---|---|---|---|---|---|
| 01 | 02/20/12 | 1ST ISSUE | DJ | PH | SR |
| 02 | 03/19/12 | REVISED | DJ | PH | SR |
| 03 | 06/20/12 | DESIGN CHANGE | DJ | PH | SR |
| 04 | 06/28/12 | IFC | DJ | PH | SR |

DRAWING IS A COPY OF CAMERON REFERENCE DRAWINGS

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|---|---|
| SK-2690093 SHT 01 | CAMERON BLDG VENDOR DWG | 0 | ISSUED FOR CONSTRUCTION (GENUS 100-02-08) | HG | 2014-06-06 | | |
| SK-2690093 SHT 02 | CAMERON BLDG VENDOR DWG | | | | | | |

ISSUED FOR INFORMATION ONLY

ENGINEER'S STAMP

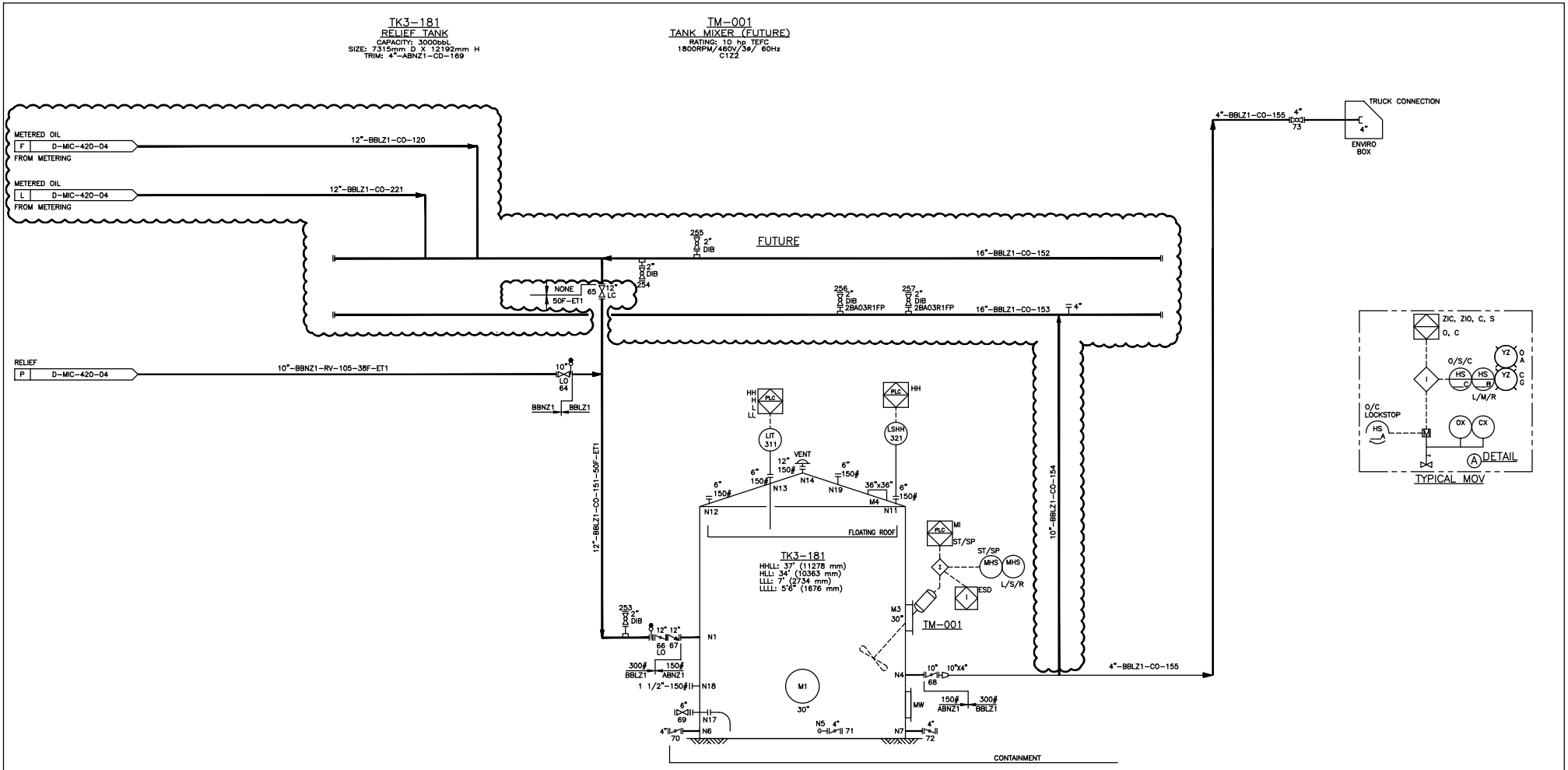
| ENGINEERING RECORD | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: WV41410-03172 | FILE No.: CC 13 06 |
| DRAWN BY: N.RADMANESH | DATE: 2013-11-28 |
| CHKD BY: A.HUYNH | DESIGNED BY: G. McCASKILL |
| ENGINEER: D.LIM | LAST UPDATE: 2014-06-05, 09:01 |
| ACAD DWG No.: MIC42006.DWG | SCALE: N.T.S. |

ENBRIDGE

TITLE
MANITOBA INTERCONNECT CUSTODY TRANSFER
16" SAMPLE BUILDING BU-101
PROCESS & INSTRUMENTATION DIAGRAM

| DRAWING No. | SHT. | REV |
|---|---|---|
| D-MIC-420 | 06 | 0 |

G:\DRAFTING\100 ENBRIDGE\100-02 CROMER\100-02-02 CROMER TUNDRA TIE-IN\5000 DRAFTING\420 PROCESS AND MECHANICAL FLOW SHEETS (PID)




NOTES:
1. ALL INSTRUMENT & EQUIPMENT TAG NUMBERS SHALL BE PREFIXED BY 'MIC-'
2. DO NOT INSTALL IF AMBIENT <0°C.
3. PIPE DRAIN CONNECTIONS SHALL BE MOUNTED ON THE TOP OF PIPE.

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|---|---|
| | | 0 | ISSUED FOR CONSTRUCTION (GENUS 100-02-02) | HG | 2014-06-06 | | |

ISSUED FOR INFORMATION ONLY

ENGINEER'S STAMP

ENGINEERING RECORD

| | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: WV4140-03172 | FILE No.: CC 13 06 |
| DRAWN BY: N.RADMANESH | DATE: 2013-11-28 |
| CHKD BY: A. HUYNH | DESIGNED BY: G. McCASKILL |
| ENGINEER: D. LIM | LAST UPDATE: 2014-06-04, 13:52 |
| ACAD DWG No.: MIC42008.DWG | SCALE: N.T.S. |

ENBRIDGE

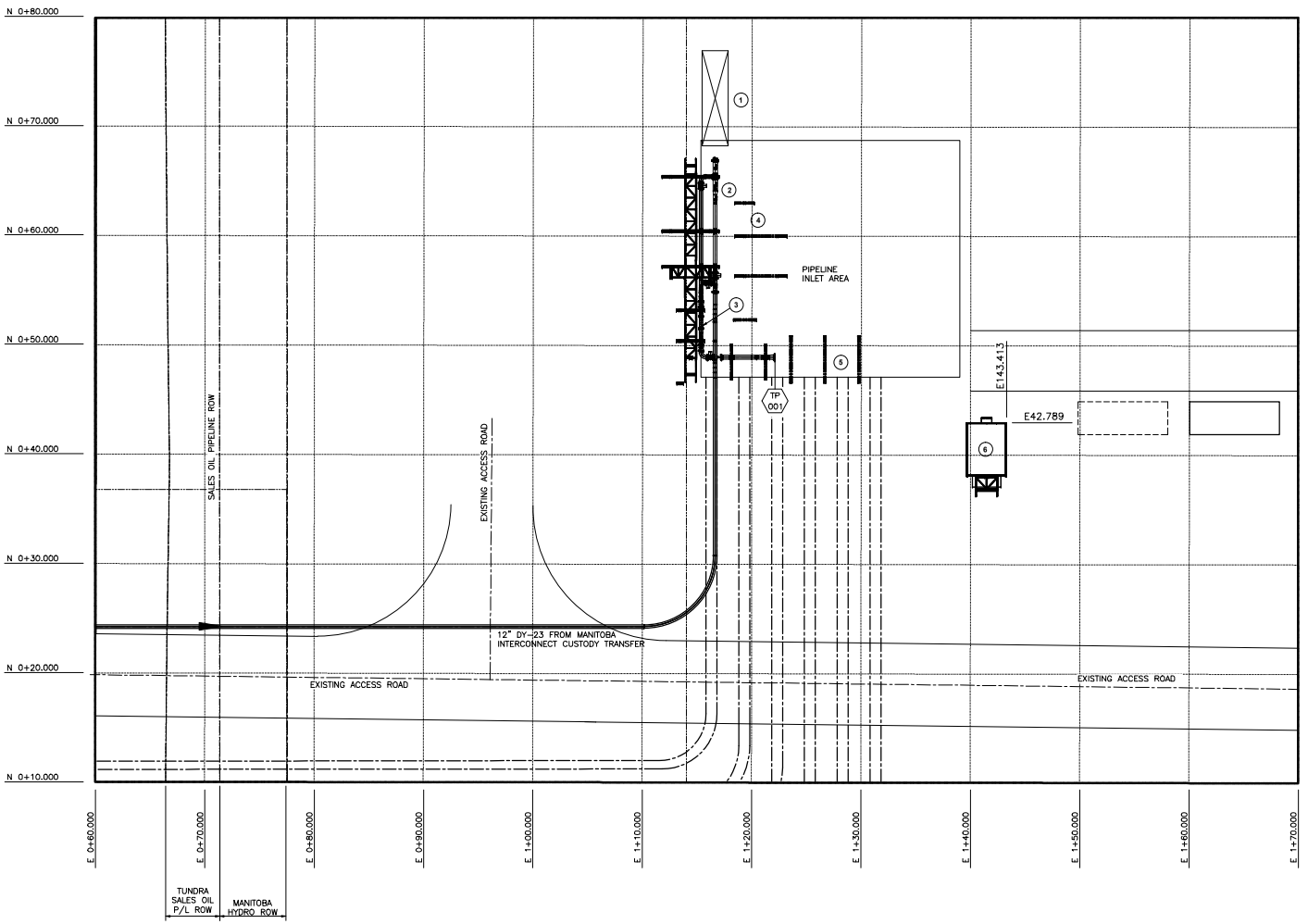
TITLE
MANITOBA INTERCONNECT CUSTODY TRANSFER
RELIEF TANK 1
PROCESS & INSTRUMENTATION DIAGRAM

| DRAWING No. | SHT. | REV |
|---|---|---|
| D-MIC-420 | 08 | 0 |

G:\DRAFTING\100 ENBRIDGE\100-02 CROMER\100-02-02 CROMER TUNDRA TIE-IN\5000 DRAFTING\420 PROCESS AND MECHANICAL FLOW SHEETS (PID)

# Appendix I
# Tundra Delivery Facility Drawings

| Drawing Name | Drawing Number |
|---|---|
| 12-16-09-28 W1M Plot Plan | D-MIT-410 SHT. 1 |
| Incoming Trap Area | D-MIT-420 SHT. 1 |




LEGEND

1. PIG WORKING AREA
2. PIG RECIEVER PL-1201
3. CORIOLUS FE-91201
4. ASHER PIGS (EXISTING)
5. EXISTING TUNDRA PIPERACK
6. ENBRIDGE ESB BUILDING

HOLD

LOCAL PLANT CO-ORD'S
N: 0.00
E: 0.00

UTM (ZONE 13)
N: 5,518,055.035
E: 771,092.581

UTM (ZONE 14)
N: 5,513,653.458
E: 338,936.769

1:200 mm 0 10000 20000
FT. 0 20 40 60

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP | ENGINEER'S STAMP |
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| | | A | ISSUED FOR REVIEW (GENUS 100-02-02) | AR | 2013-11-21 | – | – | |
| | | B | RE-ISSUED FOR REVIEW (GENUS 100-02-02) | AR | 2013-12-16 | – | – | |
| | | C | ISSUED FOR HAZOP (GENUS 100-02-02) | AR | 2013-12-20 | – | – | |
| | | D | ISSUED FOR REGULATORY (GENUS 100-02-02) | GR | 2014-02-21 | – | – | |
| | | | | | | | | |
| | | | | | | | | |

G:\drafting\100 Enbridge\100-02 Cromer\100-02-02 Cromer Tundra Tie-in\5000 Drafting\410 Facility Plot and Grading Plans (Plot Plan)\MIT41001.dwg

ENGINEERING RECORD

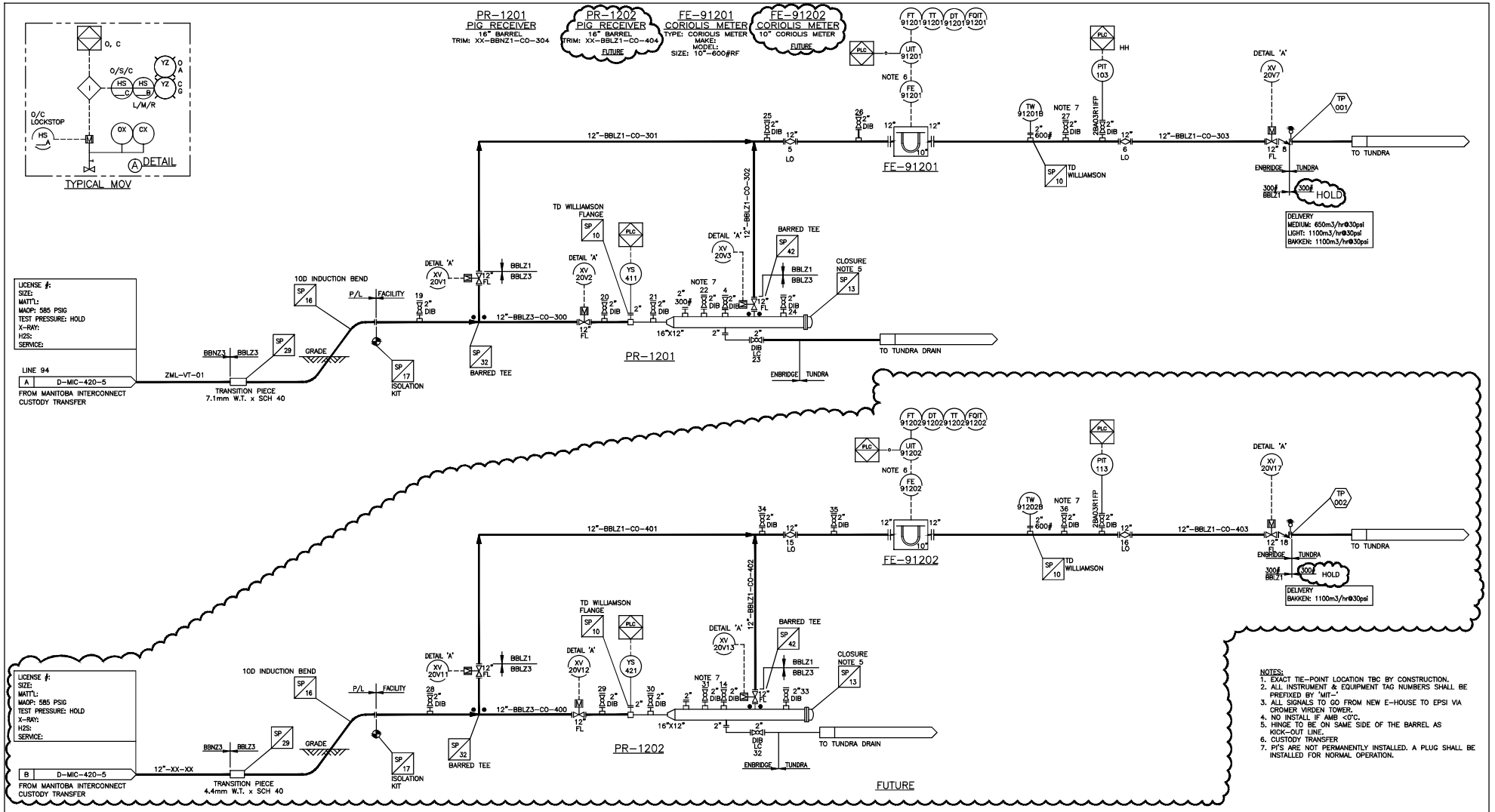
| | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: W41410-03172 | FILE No.: CC 13 06 |
| DRAWN BY: J.D. MICHEL | DATE: 2014-01-17 |
| CHKD BY: – | DESIGNED BY: G. REPCHIN |
| ENGINEER: – | LAST UPDATE: 2014-07-02, 10:46 |
| ACAD DWG No.: MIT41001.dwg | SCALE: 1:200 |

ENBRIDGE

TITLE

# TUNDRA DELIVERY FACILITY
## 12-16-09-28 W1M
## PLOT PLAN

| DRAWING No. | SHT. | REV |
|---|---|---|
| D-MIT-410 | 01 | D |




NOTES:
1. EXACT TIE-POINT LOCATION TBC BY CONSTRUCTION.
2. ALL INSTRUMENT & EQUIPMENT TAG NUMBERS SHALL BE PREFIXED BY 'MIT-'
3. ALL SIGNALS TO GO FROM NEW E-HOUSE TO EPSI VIA CROMER VIRDEN TOWER.
4. NO INSTALL IF AMB <0°C.
5. HINGE TO BE ON SAME SIDE OF THE BARREL AS KICK-OUT LINE.
6. CUSTODY TRANSFER
7. PI'S ARE NOT PERMANENTLY INSTALLED. A PLUG SHALL BE INSTALLED FOR NORMAL OPERATION.

| DRAWING No. | REFERENCE DRAWINGS | REV | REVISION DESCRIPTION | BY | DATE | CHKD | APP |
|---|---|---|---|---|---|---|---|
| | | 0 | ISSUED FOR CONSTRUCTION (CODES 100/01/102) | HD | 2014-06-06 | | |

ISSUED FOR INFORMATION ONLY

ENGINEER'S STAMP

ENGINEERING RECORD

| | |
|---|---|
| PROJECT: MANITOBA INTERCONNECT | |
| AFE No.: WV41410-03172 | FILE No.: CC 13 06 |
| DRAWN BY: N.RADMANESH | DATE: 2013-11-28 |
| CHKD BY: A. HUYNH | DESIGNED BY: G. McCASKILL |
| ENGINEER: D. LIM | LAST UPDATE: 2014-06-17, 11:24 |
| ACAD DWG No.: MIT42001.DWG | SCALE: N.T.S. |

ENBRIDGE

TITLE
TUNDRA DELIVERY FACILITY
INCOMING TRAP AREA
PROCESS & INSTRUMENTATION DIAGRAM

DRAWING No. D-MIT-420 | SHT. 01 | REV 0

C:\DRAFTING\100_ENBRIDGE\100_02_CROMER\100_02_02_CROMER_TUNDRA_TIEIN_5000_DRAFTING\420_PROCESS_AND_MECHANICAL_FLOW_SHEETS_(PID)