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Phyllis Beaulieu, Manager of Licencing
Richard Dwyer, Licencing Administrator
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0
Email: licensing@nunavutwaterboard.org

Attention: Mr. Dwyer and Ms. Beaulieu

Re: Action Plan for Decommissioning of Milne Inlet Bulk Fuel Storage Facility and the Construction of New Fuel Tank Storage, Notification for Water Licence Modification Type B Water Licence 2BB-MRY1114, Mary River Project

In accordance with Part J, Item 1, Baffinland Iron Mines Corporation (Baffinland) is pleased to submit, our notification for a Water Licence modification to the Nunavut Water Board (NWB) under the above referenced water licence. This letter also includes attachments that provide detailed information and designs regarding the planned modification. The planned construction works and activities associated with the modification involve the construction of a new steel fuel tank storage facility system in Milne Inlet Camp. An action plan for the decommissioning of the existing fuel storage facility is also provided.

The rationale for this modification is that the existing fuel storage facility consisting of bladders will reach the limit of its design life within the next year or two. As a result, there is a requirement for the construction of a longer term steel tank fuel facility. The construction of a steel tank facility will lower the potential risk associated with spills and thereby improve ongoing environmental performance.

In Baffinland's response to reviewers' comments on its water licence renewal application, dated March 21, 2011, the replacement of the existing Milne Inlet fuel containment facility was discussed by Baffinland as follows:

> *"Baffinland understands the need to implement an action plan to replace the bladders by 2012 at Milne Inlet. At the present time, a conceptual plan is being developed to replace the existing fuel bladder capacity with steel tanks. (Note that this activity was included in the annual work plan submitted to QIA on March 1, 2011, a requirement of the QIA commercial lease). Baffinland recognizes that modifications and other approvals will be required prior to the commencement of construction of new containment structures and fuel storage/distribution facilities. Baffinland will submit the required documentation, applications, and notifications to the NWB and QIA for review to support our action plan once finalized."*

The NWB acknowledged the above response and Baffinland's commitment to develop an action plan for replacing the existing bulk fuel storage facility at Milne Inlet on Page 3 of the NWB Water Licence document dated April 8, 2011 (Re: NWB Renewal of Licence No. 2BB-MRY0710, as Licence No. 2BB-MRY1114) by stating:

> *"The Licensee has stated in a letter to the Board dated March 21, 2011, that it intends to replace fuel bladders at the Milne Inlet site with steel tanks by 2012 and that it would develop an action plan and provide the NWB and QIA a copy of the conceptual plan prior to replacing*

the fuel bladders. The Board has therefore included the requirement that the Licensee provide details of the action plan and conceptual plan at least sixty (60) days prior to the replacement of the fuel bladders."

Baffinland has retained Hatch to provide ongoing construction and engineering design and management services for the new fuel storage facility and the decommissioning of the existing facility. The following documents were prepared by Hatch and provide engineering and design support for the planned work scope:

- Attachment A: *Action Plan for Decommissioning of Inlet Bulk Fuel Storage Facility and the Construction of New Fuel Tank Storage (Hatch document H337697-3110-126-0001).*
- Attachment B: Design Basis - *Milne Inlet Fuel Storage Facility (Hatch document H337697-3110-50-109-0001).*
- *Attachment C:* Drawings - *Milne Inlet Fuel System Upgrade.*

Please note that the proposed decommissioning and construction works that form this water licence modification do not include an expansion to the existing facility. The volume of fuel to be stored in the new fuel storage facility will not exceed the volume stored in the existing facility and, therefore, does not include an expansion or alter the purpose or function of the work as originally screened by the Nunavut Impact Review Board (NIRB).

The potential for environmental impacts such as spills and siltation associated with the planned construction activities this summer and fall season has been anticipated and can be minimized by means of employing technically proven construction and management practices. The application of environmental practices that are detailed in Baffinland's Spill Contingency Plan and Site Water Management Plan (2010 plans approved, updates provided March 31, 2011 with approvals pending) are adequate to minimize environmental risks associated with the project.

In accordance with Part I, item 3, Baffinland will provide as-built plans and drawings of the new bulk fuel storage facility and systems within 90 days of completion of the modification. The plans and drawings will be stamped by an Engineer registered in Nunavut.

I trust that the forgoing and attached information is sufficient for your review. Please do not hesitate to contact the undersigned via e-mail at jim.millard@baffinland.com should you have any questions regarding this submission.

Yours sincerely,
Baffinland Iron Mines Corporation

James Millard, M.Sc., P.Geo.
Senior Environmental Superintendent

Attach: Attachments A, B, and C.

cc: Salamonie Shoo, QIA.
Ian Rumbolt, INAC
Eric Madsen, Dick Matthews, Dave McCann, BIM

ATTACHMENT A

Action Plan for Decommissioning of Inlet Bulk Fuel Storage Facility and the Construction of New Fuel Tank Storage

(Hatch document H337697-3110-126-0001)

Project Report

June 11, 2011

Baffinland Iron Mines Corporation

Mary River Project

Action Plan for Decommissioning of Milne Inlet Bulk Fuel Storage Facility and the Construction of New Fuel Tank Storage

Table of Contents

1. Description and Overview

At Milne Inlet the existing bulk fuel storage facility, consisting of bladders and support infrastructure that is reaching its useful design life, will soon require replacement. This document outlines the plan and schedule for the construction of a 5 M liter storage tank and the decommissioning of the existing bulk fuel facility. These activities will comply with Nunavut and Federal regulatory requirements.

2. Scope

The decommissioning of the existing bulk fuel storage facility requires the construction of a containment area (or dyke) for the new storage tank and supporting facilities. The main components of the fuel storage system that will require delivery to Milne Inlet during the open water shipping season are the steel tank, dispensing unit, spill kits and fire safety system. The storage tank and dispensing unit need to be assembled and tested. Completion of these activities are required before transfer of fuel can occur between the existing and new bulk fuel storage facilities. At the completion of the fuel transfer, the existing bulk fuel storage facilities can be decommissioned. The sections that follow describe these activities in more detail.

2.1 Geotechnical Drilling

During June 2011, geotechnical drilling will confirm the integrity of the ground of the proposed tank location, in addition to the proposed dyke. During the drilling, soil sampling and testing will be done to validate the decision.

2.2 Sea Transport and Delivery

The tank sections, bulk dispensing module, dyke liner, lighting, spill kits and fire safety systems required for the 5M Liter storage tank will be procured in July and early August 2011 and shipped to Milne Inlet during August and September 2011.

2.3 Containment Dyke Construction

Based on the results of the geotechnical drilling, the containment dyke will be constructed during late August so that it is ready to receive the storage tank once it arrives in Milne Inlet (shipping season dependent).

2.4 Storage Tank and Bulk Dispensing Module Erection and Testing

The installation of tanks will be in accordance with API standard 650 and the National Fire Code of Canada. The contractors will take care not to puncture the dyke membrane with scaffolding and/or digging. If any damage to the membrane should occur, it shall be repaired.

The tank sections will be positioned using lifting lugs and hooks, and where necessary spreader bars. No chain will be used in the lifting of tank shell plate in order to prevent damage to the membrane. When installing the tank, sufficient bracing to partially assembled sections of the tank will be maintained to prevent movement and damage.

Field tests for leaks will be completed in accordance with API 650 which is acceptable evidence of testing. The testing will be non-destructive testing of 100% of all the welds. A contractor will

be responsible for confirming that the tank base finish grade elevation tolerances are within acceptable ranges as per API-650 before and after floor plate installation.

Once the non destructive testing has been completed the tank will be cleaned and all debris shall be completely removed from the tank.

The bulk dispensing module will arrive on a skid and be placed into position on the west side of the dyke and commissioned. The spill prevention materials, clean up kits and fire extinguishers will be situated around the dispensing module to effectively control any spills or fires associated with the tank and dispensing unit. To safeguard against spills between the tank and the dispensing unit, the dyke liner will be extended to encompass both the piping and dispensing unit. The bulk dispensing module will comply with the following codes: Canadian Electrical Code – CSA 22.1; National Fire Code of Canada; ASME A31.3 – Process Piping; and B346-M1980 Power Operated Dispensing Device.

2.5 Milne Inlet Fuel Consignment

Fuel for the 2011/2012 season is scheduled to arrive late September and pumped, as per normal, from the fuel supply ship to the bladders. The bladders will hold the fuel until the new storage tank is commissioned.

2.6 Transfer of Fuel

Once the storage tank is commissioned and signed off which could be as late as spring 2012, the fuel from the bladders will be transported by fuel truck between the bladders and the new storage tank.

2.7 Bladder Decommissioning

In the summer of 2012, the existing bulk fuel storage facility, consisting of bladders and support infrastructure will be decommissioned once the facility has been permanently removed from service.

The bladders will be drained of fuel and the vapors purged (aired) from the bladders, piping and support infrastructure. The equipment (including the bladders, piping, liner and support infrastructure) will be removed from site, once it is made safe for ship transportation, and shipped south to a permitted waste disposal facility.

Areas within the current existing storage facility containment area are contaminated with petroleum products. The facility will be characterized using established environmental assessment methodologies to quantify and qualify the extent of the potential soil and water impact. Impacted portions of the facility will be remediated to criteria to be established in consultation with applicable federal, territorial, and Inuit agencies and will be based on applicable federal and territorial guidelines such as:

- Canadian Council of Ministers of the Environment, 1999, Canadian Environmental Quality Guidelines, Winnipeg, Manitoba.
- Canadian Council of Ministers of the Environment, 2008, Canada Wide Standards for Petroleum Hydrocarbons in Soil (CWS PHC). Winnipeg, Manitoba.
- Government of the Nunavut, 2009, Environmental Guideline for Contaminated Site Remediation. Department of Environment.

Residual oily water within the containment facility will be treated and discharged by means of an oily water treatment system similar to that being successfully utilized by the current operation during the open water season. Residual oily concentrate will be stored, reused on site, or transported to Southern Canada for recycling or disposal at an approved waste disposal/recycling facility. The existing liner will be removed, appropriately stored, and shipped south for disposal. The residual contaminated soils will be transported to an on-site landfarm for treatment. The remaining clean soils under the liner and existing containment area will be regraded and reclaimed. In addition, the surrounding area will be tested for residual contamination and all impacted soils, if encountered, will either be treated in situ or removed and taken to an approved site location (landfarm) for disposal, as per the approved Abandonment and Reclamation Plan (2010) for the Mary River Project. A landfarm for receiving and treating contaminated soils has not yet been constructed at Milne Inlet, however, the development of a conceptual design and management plan is currently underway.

3. Schedule

See the schedule below for the activities described.

Activity	2011							2012						
	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July
2.1 Geotechnical Drilling														
2.2 Sea Transport and Delivery														
2.3 Containment Dyke Construction														
2.4 Storage Tank and Bulk Dispensing Module Erection, Testing & Commissioning														
2.5 Milne Inlet Fuel Consignment														
2.6 Transfer of Fuel														
2.7 Bladder Decommissioning														

Note: 2.6 Transfer of Fuel – Could occur earlier than May 2012, assuming successful testing and commissioning of new facilities and available resources.

2.7 Bladder Decommissioning – Soil remediation and land treatment will be undertaken past July 2012 and will likely occur for a further two years.

ATTACHMENT B

Design Basis - Milne Inlet Fuel Storage Facility

(Hatch document H337697-3110-50-109-0001)

Project Report

June 15, 2011

Baffinland Iron Mines Corporation
Mary River Project

DISTRIBUTION

Milne Inlet Fuel Storage Facility

Table of Contents

1. Background Information

1.1 Project Description and Overview

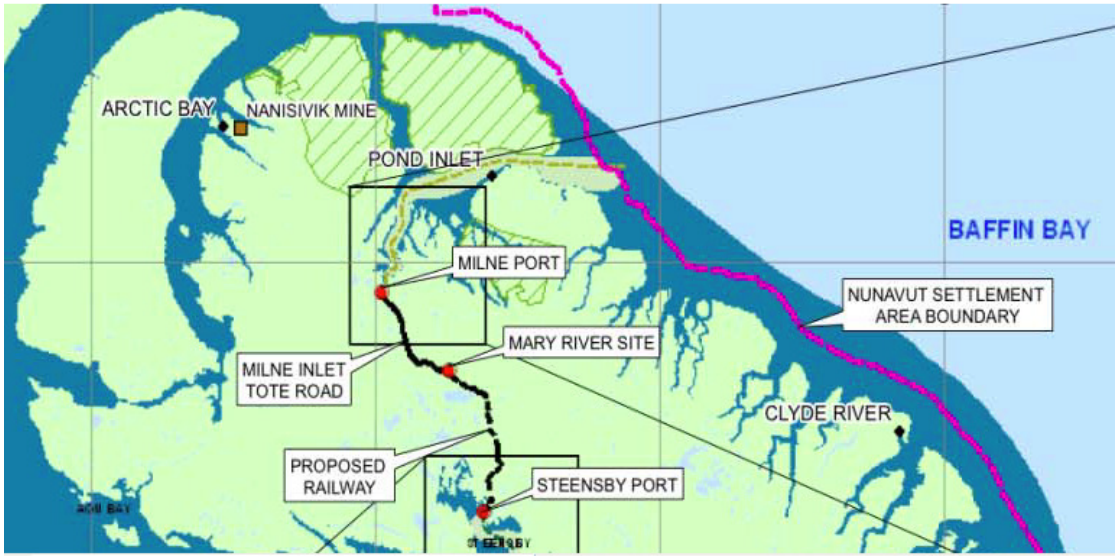
The Mary River Project is located on northern Baffinland, in the Nunavut Territory, of the Canadian Arctic. This report is submitted to the Nunavut Impact Review Board (NIRB) as part of the approval process for the installation of additional fuel storage facilities and the decommissioning of existing fuel bladders at the Milne Inlet. This report outlines the information that Baffinland will include as part of its implementation plan for this facility. The Project will be carried out in an environmentally and socially responsible manner. The Project will comply, and where it is economically and technically feasible, exceed Nunavut and federal regulatory requirements by applying technically proven and economically feasible environmental protection measures for each part of the Project.

1.2 Scope

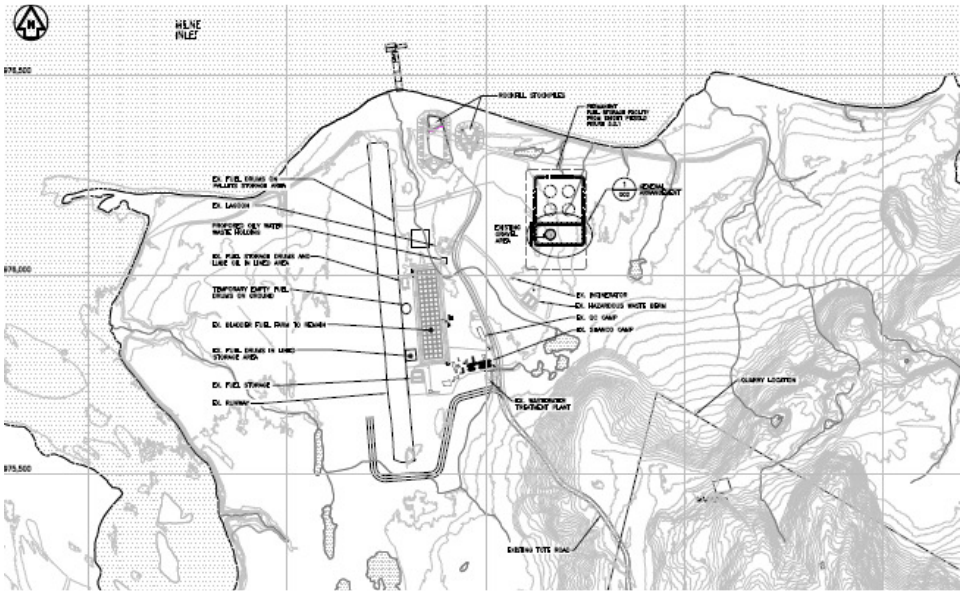
This document outlines the design requirements for the procurement and instillation of the first phase of the Milne Port fuel upgrade facility. This principally includes the addition of a 5 million liter storage tank with associated fuel dispensing unit and services to replace the existing bladder storage operation. The following sections describe the principle facility and components used for the construction and operation of the proposed Fuel Storage Facility at the Milne Inlet site. The report describes the specific details regarding layout, dimensions and make of various equipment required for the design, procurement and construction of the facility. Where applicable, sizes and description of how various components will be constructed with examples of typical equipment specifications have been provided.

1.3 Location and Layout

A general location is provided below:



The more detailed facility location is shown below:



1.4 Conformance with Regulations, Authorizations and References

The following codes and guidelines will be adopted where appropriate:

- All Applicable federal, provincial and territorial codes will be adhered to;
- Tank construction will adopt the API 650, 11th Edition, 2008, Welded Steel Tanks for Oil Storage including Addendums 1 and 2;
- Tank Inspection, Repair, Alteration and Reconstruction will use API 653 4th Edition, 2009;
- National Building Code of Canada (NBC) 2010;
- National Fire Code of Canada (NFCC) 2010;
- NFPA 30, 2008 Edition, Flammable and Combustible Liquids Code;
- CCME Environmental Code of Practice for Aboveground and Below Ground Storage Tank Systems containing Petroleum and Allied Petroleum, 2003;
- ANSI/ASME B31.3-2010, Process Piping;
- CSA W47.1-09, Certification of Companies for Fusion Welding of Steel;
- CSA W59-03 (R2008) - Welded Steel Construction (Metal Arc Welding);
- Canadian Environmental Protection Act 1999, (2008 Update), Storage Tank System for Petroleum Products and Allied Petroleum Products Regulations;
- CSA W178.2-08, Certification of Welding Inspectors.

1.5 Specification Requirements for Fuel Storage Tank and Dispensing Unit.

The tank will include the design, supply, fabrication, erection and testing of one (1) welded steel (Diesel) storage tank and dispensing unit meeting the following criteria:

- Number of tanks = 1
- Nominal capacity = 5,000,000 Liters
- Diameter: 25.6 meters
- Height: 9.75 meters
- Specific gravity of contents = 0.82 – 0.95.
- Appurtenances: (See Part 2 Products).
- Design metal temperature extremes to National Building Code of Canada (NBC) data for Arctic Bay, Nunavut.
- Design Pressure: Depth of fluid with tank at atmospheric pressure.

- The roof to shell connection shall be designed with a frangible joint.
- Location: FOB Milne Inlet, Baffin Island Nunavut.
- Permits and Fees for Construction: Owner's responsibility.
- Live Load (Wind Velocity): 1/10 = 0.40 kPa, 1/50 = 0.55 kPa
- Live Load (Ground Snow Load): S_s = 2.1 kPa
- Foundation Type: prepared sand and gravel bedding (by others)
- Operating Temperature Range: -46°C to 20°C.
- Plate and structural steel specification: (bottom, shell and roof) = CSA G40.21, Structural Quality Steels.
- Mill test reports on steel will be supplied by the Contractor.
- Tank Plate thicknesses will be as follows:
  - Bottom Plate, minimum thickness 6mm or to API 650 standards, whichever is greater;
  - Shell Plate, minimum thickness 6mm or to API 650 standards, whichever is greater;
  - Roof Plate, to API 650 minimum requirement.
  - Roof supports framing as required to API 650.
- Seismic data to National Building Code of Canada (NBC) edition for Arctic Bay, Nunavut.
- Allowable Site Sub Base Soil Bearing Resistance: 168 kPa (3500 psf).
- All shell/roof nozzles shall have welded neck flange openings unless noted otherwise.
- Tank Chime: Floor plate protection at shell connection shall be 75mm or to API 650, whichever is greater.
- All nozzle heights and projections shall be as noted on the drawings and exceed API 650 minimum requirements.
- Tank floor plates shall be overlapped in a manner to reduce the tendency for liquid to puddle during draw down towards the exterior shell.

The specification requirements for the dispensing unit will be in accordance with Specific Standards and are illustrated in Appendix A.

1.5.1 Environmental Requirements for facility

Based on the Fuel Storage Tank specifications and capacity, the design components of the Containment Dyke include a overall height of 1.5m, a crest width of 1m and freeboard of 0.15m. The total Containment Dyke volume is 5681m^3. The dispensing unit will fit in a separate containment of 6m maximum length. The connecting pipes between tank and dispensing unit will be

either double walled or contained entirely in the lined dyke area. Spill clean-up will be provided in the fuel dispensing area.

1.6 Vendor Submission Requirements

The following describes the process to be used for the control of contractor, purchases and work processes. Submissions will be coordinated with requirements of the work and Contact Documents. Individual submissions will not be reviewed until all related information is available. Owner or Owner's representatives will be allowed seven (7) days for review of each submission.

Submissions will be accompanied with transmittal letter containing:

- Date
- Project title and number
- Contractor's name and address
- Identification and quantity of each shop drawing, product data and sample
- Other pertinent data

Submissions shall include:

- Date and revision dates
- Project title and number
- Name and address of:
  - Subcontractor
  - Supplier
  - Manufacturer

Contractor's stamp, signed by Contractor's authorized representative, certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

Details of appropriate portions of Work as applicable:

- Fabrication.
- Layout, showing dimensions, including identified field dimensions, and clearances.
- Setting or erection details.
- Capacities.
- Performance characteristics.
- Standards.
- Operating weight.

- Relationship to adjacent work.

1.6.1 Vendor Quality Assurance

Contractor to submit quality inspection and test plan for tank construction. Include milestone signoff sheets and qualifications for inspection personnel.

2. Products

2.1 Steel Tank

The steel tank used for storage will be furnished to CSA G40.21-04 in Grade 260WT, rolled, kilned and made to fine grain practice. The tank will be constructed vertically according to API standard 650. All shell, floor and roof attachments are to have doubler plates and all column bases are to have doubler plates with a minimum of 150mm beyond column base plate bearing surfaces. The roof to the shell joint shall be a frangible joint which in the event of excessive internal pressure will fail before failure in the tank shell joint or the shell to floor joint as described in API 650, Section 5.10.2.6.

Tank appurtenances:

- See drawings for list and sizes and as described in this section.
- All internal studs, nuts and fasteners shall be stainless steel. ASTM A193, Grade B8M and ASTM A194, Grade 8/8M.
- Manway cover bolts and nuts shall be cadium plated. ASTM B766-86 (2008).

Railings, stairs and platform: Design to API standard 650, Table 5-19 and as shown on the drawings and outlined herein. Stair tread, platform grating, handrail and supports:

- Stair treads: Diamond grip, galvanized steel 12 gauge - 915 wide x 241 deep x 38.
- Platform Grating: Diamond grip, safety grating, pre-galvanized steel, 12 gauge with 38 mm channel, length and width to suit dimensions shown on the drawing.
- Guard rails at Walkways and Tank Roof:
  - Rails: 50 x 50 x 6 mm angle. Railing height on platform measured from top of grating to top of rail. Intermediate rail 610 mm from top of platform to centerline of rail.
  - Posts: 50 x 50 x 6 mm angle at 1500 mm c/c maximum spacing.
  - Toe Plate: 125 mm height x 6 mm thick plate.
- Handrails at Stairs:
  - Rails: 50 x 50 x 6 mm angle.
  - Railing height from toe of tread to top of rail: 1067 mm.

- Posts: 20 square bar x 1130 mm long.

- Loadings - complete structure shall be capable of supporting a moving concentration load of 455 kg, and the handrail structure shall be capable of withstanding a load of 91 kg applied in any direction at any point on the top rail.
- Steel support framing - structural steel to CSA G40.21, grade 350 W weldable Steel.
- Railing, stairs and platforms to meet all local, provincial, territorial and federal regulations.

All tank attachments are to be fastened by use of seal welded doubler plates.

API Inspection and testing of tank includes:

- Inspection of roof welds shall be as per API Standard 650, Section 8 – Methods of Inspecting Joints including complete visual inspections.
- Inspection of shell - radiograph inspections of butt welded shell seams shall be as per API 650 Code Section 8 including complete visual inspections.
- Inspection of floor welds shall be as per API 650 Section 8 including complete visual and complete vacuum box testing.
- Inspection of floor to shell joint shall be as per API Standard 650 Section 8 including complete visual, liquid penetrant and vacuum box testing.
- Inspection of roof to shell joint shall be as per API Standard 650 Section 8 including complete visual testing.
- Inspection of nozzle to shell or nozzle to reinforcing pad welds shall be as per API Standard 650 Section 8 including Mag Particle testing of the back gouged root pass weld and Mag Particle and UT of the completed weld. Reinforcing pad to shell welds shall be tested by Mag Particle and the Reinforcing pad shall be pressure tested.
- Inspection of doubler plates shall be as per API Standard 650 Section 8 and API Standard 653 including complete visual and vacuum box testing.
- All Visual Inspection shall be to API standard 650.
- All Dimensional Tolerances shall be to API standard 650.
- All Welding shall be to CSA W47.1, CSA W178.2, and CSA W59.
- Welders to be certified in accordance with CSA W47.1-03.
- Submit records of Welders' certification and test results to Owner or Owner's Representative.

2.2 Fuel Dispensing Unit

A fuelling skid capable of dispensing fuel at high flow bulk truck loading rates and low flow commercial truck refuelling will be designed in accordance with Standard Specification which can be seen in Appendix A.

3. Execution

3.1 Installation

The installation of tanks will be in accordance with API standard 650 and the National Fire Code of Canada. The contractors will take care not to puncture the dyke membrane with scaffolding and/or digging. If any damage to the membrane should occur, it shall be repaired as instructed by Owners or Owner's Representative at no additional cost to the Owner.

Tank sections will be positioned using lifting lugs and hooks, and where necessary spreader bars. Chain hitting of tank will not be permitted. When installing these tanks, sufficient bracing to partially assembled sections of the tank will be maintained to prevent movement and damage.

3.2 Field Quality Control

Tanks will be tested for leaks in the presence of the Owner or Owner's Representative. All the field tests for leaks will be done in accordance with API 650 which is acceptable evidence of testing. A contractor will be responsible for confirming that the tank base finish grade elevation tolerances are within acceptable ranges as per API-650 before and after floor plate installation.

In lieu of a hydrostatic test which is not practical in this instance, additional shell testing shall be performed on all welds by: (1) performing a penetrating oil test by applying oil to the interior side of the weld and examining the exterior or (2) by applying a soapy water solution and vacuum to either side of the weld as per Section 7.3.5 of API 650. The costs that are associated with testing shall be by the Contractor and all test results shall be provided to the Owner or Owner's Representative s for review upon completion.

3.3 Repair of Defective Welds

The requirements are outlined in API standard 650 and at the Contractor's expense. Additional testing as a result of defective welds is at the Contractor's expense.

4. Drawings and Technical Support Data

The following drawings have been prepared in line with this design basis document namely:

1. H337697-4020-G-001 - Milne Inlet Fuel System Upgrade Location Plan
2. H337697-4020-G-002 - Milne Inlet Fuel System Upgrade General Arrangement
3. H337697-4020-C-001 - Milne Inlet Fuel System Upgrade Site Grading
4. H337697-4020-C-002 - Milne Inlet Fuel System Upgrade Dyke Sections
5. H337697-4020-C-003 - Milne Inlet Fuel System Upgrade Dyke Sections and Details
6. H337697-4020-C-004 - Milne Inlet Fuel System Upgrade Section Thru Truck Loading Area
7. H337697-4020-F-001 - Milne Inlet Fuel System Upgrade Flow Sheet
8. H337697-4020-P-001 - Milne Inlet Fuel System Upgrade Piping General Arrangement
9. H337697-4020-P-002 - Milne Inlet Fuel System Upgrade Ø300 & Ø150 Pipeline Profile
10. H337697-4020-P-003 - Milne Inlet Fuel System Upgrade Miscellaneous Piping Details
11. H337697-4020-P-010 - Milne Inlet Fuel System Upgrade 5M Litre Diesel Storage Tank
12. H337697-4020-SC-001 – Milne Inlet Fuel System Upgrade Pipe Support Details
13. H337697-4020-SC-002 – Milne Inlet Fuel System Upgrade Marine Offload Spill Containment, Plan & Sections
14. H337697-4020-E-001 - Milne Inlet Fuel System Upgrade Electrical General Arrangement
15. H337697-4020-E-002 - Milne Inlet Fuel System Upgrade Electrical Grounding Plan
16. H337697-4020-E-003 - Milne Inlet Fuel System Upgrade Electrical Sections & Details

Appendix A – Standard Specifications for Fuelling Skid Performance Specification

Floyd Butts

Fuelling Skid - Performance Specification

2011-06-09	B					
DATE	**REV.**	**STATUS**	**PREPARED BY**	**CHECKED BY**	**APPROVED BY**	**APPROVED BY**
			HATCH			CLIENT

Table of Contents

1. General

1.1 Scope of Work

1.1.1 The project's intent is to provide a new operational fuelling skid for Arctic diesel. The skid shall be capable of dispensing fuel at high flow bulk truck loading rates and low flow truck refuelling. The hose reels shall be accessible by opening the container doors. The complete fuelling system shall be capable of being transported as a standard sea shipping container.

1.1.2 High flow rate 1500 lpm – bulk truck loading

1.1.3 Low flow rate 40 lpm – light vehicle refuelling

1.1.4 The fuelling skid will be installed on Baffin Island, Nunavut.

1.1.5 This contract covers the design, procurement and construction of the fuelling skid, generally described but not limited to the following:

1.1.5.1 Design, supply, construction, testing.

1.1.5.2 Construction of the complete skid including all structural, mechanical and electrical work.

1.1.5.3 Appurtenances and fitments as identified under this contract.

1.2 Work by Others

1.2.1 The following work is not included in this contract:

1.2.1.1 Shipping to site

1.2.1.2 Commissioning.

1.3 Design Requirements

1.3.1 Fuel Type Arctic Diesel

- Arctic Diesel specific gravity: 0.88

1.3.2 Climate Data:

- Temperature range: -50C to +21C

1.3.3 Overall dimensions

- 6.0 m maximum length
- Standard sea shipping container

1.3.4 Heating Requirements

- Enclosed section of container containing pumps and electrical equipment to be heated

1.3.5 Electrical

1.3.5.1 Power: 600V 60Hz 3 phase

1.3.5.2 Lighting: Provide overhead lights for fuel dispensing area

1.3.5.3 Grounding & Lightning Protection System:

1.3.5.4 Utilization Voltages – 60 Hz:

- 600 V 3 ph – motors.
- 120 V 1 ph – for controls

1.3.6 Fire Protection

1.3.6.1 General:

- Fire suppression system to utilize nitrogen charged extinguishers shall be in full compliance with NFC.
- Extinguisher system to provide coverage over all fuelling skid equipment.

1.4 Reference Standards

1.4.1 Canadian Electrical Code – CSA 22.1

1.4.2 National Fire Code of Canada

1.4.3 ASME A31.3 – Process Piping

1.4.4 B346-M1980 Power Operated Dispensing Device

1.5 Quality Assurance

1.5.1 Quality Assurance program details shall be provided by manufacture.

1.6 Submittals

1.6.1.1 Provide engineering design drawings and component data as necessary for the Engineer to review and determine that the design has complied with the design parameters specified.

1.7 Materials

1.7.1 Steel Pipe

- Piping ASTM A-53 Grade B
- ASME B31.3 Process Piping
- Butt Welded

- Schedule 40
- 100 mm ANSI 150 mm connection for fuel supply
- Provide thermal pressure relief back to storage tank

1.7.2 Pump High Flow

- Centrifugal or positive displacement pump
- Pump to bypass system capable of handling full pump flow
- Flow rate: 1500 litres per minute
- Pressure requirement: 27m head
- Pump Material: steel
- Mechanical Seal compatible with diesel fuel
- Spacer type motor coupling
- Coupling guard – non sparking
- Motor power to meet flow requirements, non overloading
- Motor: TEFC explosion proof - Class I Div I Groups C & D , S.F. 1.15
- Pump type: Blackmer or Gorman Rupp

1.7.3 Pump Low Flow or Diesel Dispenser

- Centrifugal or positive displacement pump
- Pump to bypass system capable of handling full pump flow
- Flow rate: 40 litres per minute
- Pressure requirement: 15m head
- Pump Material: steel
- Mechanical Seal compatible with diesel fuel
- Spacer type motor coupling with guard
- Diesel fuel filter
- Motor power to meet flow requirements, non overloading
- Motor: TEFC explosion proof - Class I Div I Groups C & D , S.F. 1.15
- Pump type: Blackmer or Gorman Rupp
- Optionally: Dispenser unit Gasboy 215A series or equivalent

1.7.4 Flow Meter and Strainer

- 75mm Positive displacement meter for high flow system
- Construction material : steel
- Meter type: Liquid controls MS series or equivalent
- Mechanical counter with ticket printer:
  - 5 digit resettable totalize
  - 8 digit non-resettable- totalize
  - Printer generate imprinted record of transaction
- Strainer type: Liquid Controls FS series with 40M basket or equivalent

1.7.5 Flow control valve complete with deadman control

- Valve size: 75mm
- Material: steel
- Pilot material: Stainless steel
- All materials to be suitable for use with diesel.
- Opening and closing speed control
- Flow clean strainer – X46A
- Solenoid control – CS3XM – Class 1 Zone 1
- Valve position indicator
- Diaphragm : Buna N
- Flow rate: 1500 lpm
- Control Valve type: Cla-Val model 94AF-3 series or equivalent
- Deadman control type: Gammon Deadman Control System or equivalent

1.7.6 Loading Hose and Dry Break Coupling

- High flow Loading hose diameter 75mm, hose length 6m
- Low flow loading hose diameter 25mm, hose length 6m
- Hose to be mounted on powered retractable hose reels
- Hose suitable for use with diesel
- High flow hose fitted with 100 mm API dry break coupler
- API coupler type: EMCO J 451 or equivalent
- Low flow hose fitted with hand nozzle

- Nozzle type: OPW 7H or equivalent

1.7.7 Truck Grounding

- Ground reel complete with tank truck grounding clamp
- Type: Gammon Technical Products or equivalent

1.7.8 Heating and Insulation

- Provide electrical heating, heater shall be explosion proof
- Blanket insulation shall be white vinyl-faced glass-fiber-blanket complying with ASTM C 991, Type II. Blankets shall be two-inch thick installed exterior walls and ceiling of container.

1.7.9 Finishes

1.7.9.1 Painting:

- Surface Preparation: Clean and prepare surfaces to be painted according to manufacturers written instructions.
- Epoxy coat all structural surfaces

1.7.10 Electrical

1.7.10.1 Switchgear:

- General:
  - Provide a single connection point for a 600V 60 Hz 3 phase supply.
  - Manufacturing and testing must conform to the latest CSA Standards.
  - Only crimp type compression lugs (copper) shall be used for wire terminations.
- Disconnect Switches:
  - Field mounted disconnect switches for protection of 600 V AC circuits shall be heavy duty, industrial type, visible break, NEMA 7 enclosure (or better), complete with circuit breakers for inside locations. Switches must be capable of being padlocked to the “OFF” position.
  - Typically motors do not require field disconnect switches, unless required for specific safety related reasons.
- Enclosures:
  - For hazardous areas enclosures must be approved for the classification of the respective area.

1.7.10.2 Pushbuttons, Selector Switches and Indicating Lights:

- Pushbuttons:
  - On all single row pushbutton stations, the stop button shall be located below or to the

right of all other associated buttons, indicating lights and selector switches.

- Field pushbutton stations shall be NEMA rated min class1, zone 2.

Colour	Meaning Of Colour	Typical Applications
RED MUSHROOM	Action in case of emergency	Emergency Stop Fire Fighting
RED	STOP	General Stop To stop one or more motors To stop a part of a machine To open a switching device Reset combined with STOP
GREEN	START	General start To start one or more motors To start a part of a machine To close a switching device

- Indicating Lights:
  - When a single indicating light is used to show the status of motors, the colour shall be WHITE and the light shall be so connected that it is ON when the motor is running or the device is energized. When two indicating lights are used, the second indicating light shall be GREEN and the arrangement shall be such that the GREEN light is ON when the controller is de-energized.

COLOUR	EXPLANATION	TYPICAL APPLICATIONS
Red	Running	Motor Operations
Green	Stopped, Ready to Start	Motor Operations
Amber	Alarm	Equipment Malfunction

- Lamps:
  - Low maintenance LED's shall be used in all pilot lights which use coloured lens.
  - Neon lamps to be used only in devices with a non-coloured clear lens.

Wire and Cable:

- General:
  - Wire and conduit shall be used for all electrical work in the container. Size wire and conduit per CSA 22.1.
  - Conductors shall be colour coded or numbered over the entire length:
    - 3 ph AC: 1 red (phase A); 1 black (phase B); 1 blue (phase C); 1 white (where neutral is required)
    - 1 ph AC: 1 black, 1 red and 1 white (3 wire)

- 1 ph AC: 1 black, 1 white (where identified conductor is required)
- Earthed neutral: white

- Enclosures:
  - For hazardous areas enclosures must be approved for the classification of the respective area.

ATTACHMENT C

Drawings - Milne Inlet Fuel System Upgrade

HATCH – A1 (841x594)

Baffinland
Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

MILNE INLET FUEL SYSTEM UPGRADE

ISSUED FOR PERMITTING

BAFFIN ISLAND, NUNAVUT

DESIGN ENGINEERS

HATCH™

PROJECT NO. H337697
JUNE, 2011

Jun 15 , 2011 , 7:56pm Login name: pat43268 Layout: Layout1
Drawing Name: P:\Projects\HMM – LAWSON PROJECTS\289980 – Baffinlands\Drawings\Current\H337697-4020-00-040-001.dwg

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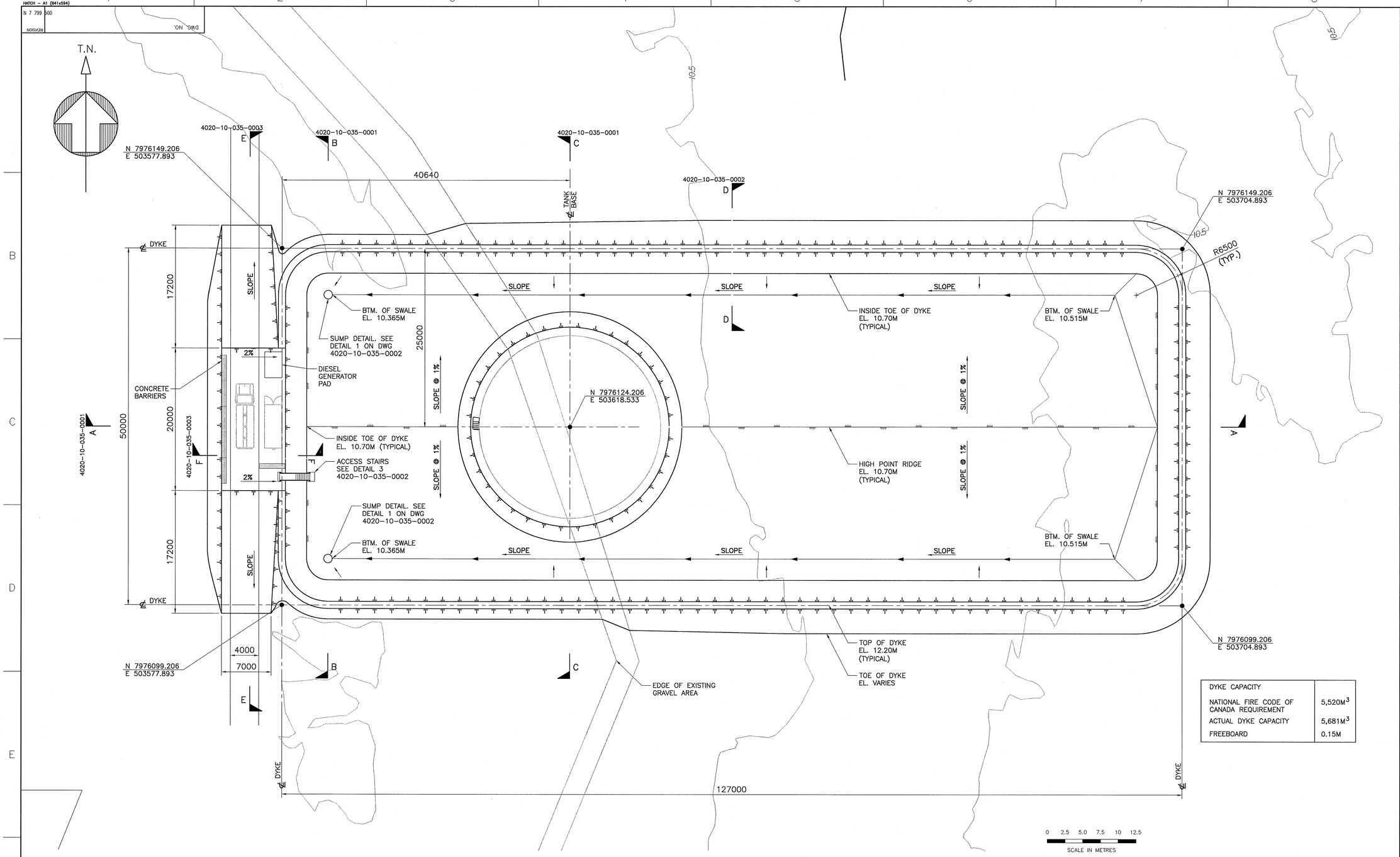

DYKE CAPACITY	
NATIONAL FIRE CODE OF CANADA REQUIREMENT	5,520M^3
ACTUAL DYKE CAPACITY	5,681M^3
FREEBOARD	0.15M

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MARY RIVER IRON ORE PROJECT

MILNE INLET
FUEL SYSTEM UPGRADE
SITE GRADING

DESIGNED BY	DRAWN BY
DS 11-05-13	MP 11-05-13
CHECKED BY	DISCIP. ENGR.
PJC 11-05-13	PJC
PROJ. DES. COORD.	PROJ. ENGR.
	JM
PROJ. MGR.	

PROJECT NUMBER	SCALE	DRAWING NO.	REVISION
H337697	1:250	H337697-4020-10-014-0001	A

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REVISION	DWG. NO.
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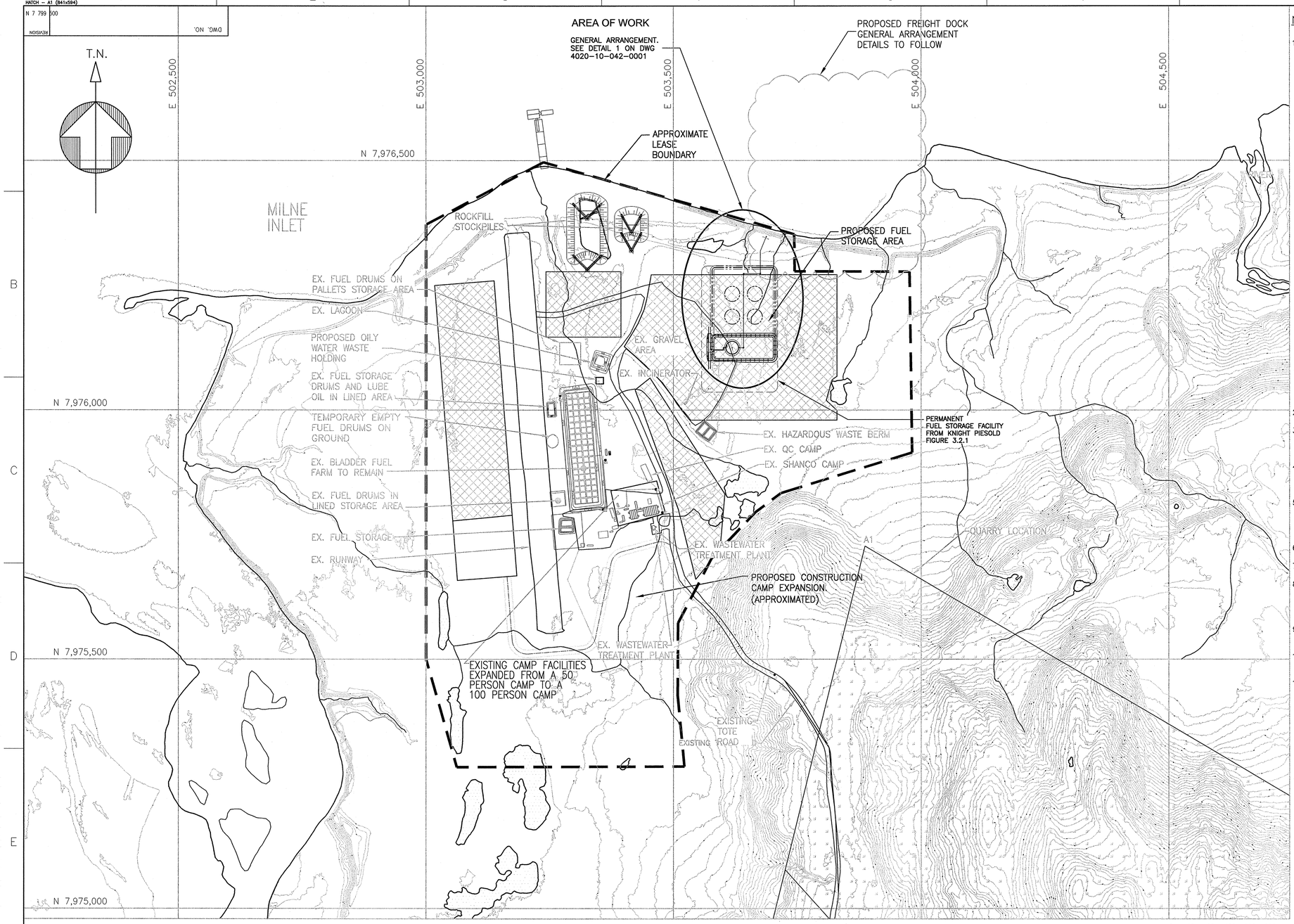

NOTES:

1. ALL WORK MUST CONFORM TO THE REQUIREMENTS OF THE MOST RECENT EDITION OF THE FOLLOWING CODES, ACTS AND STANDARDS:
   - 1.1. APPLICABLE FEDERAL, PROVINCIAL AND TERRITORIAL CODE
   - 1.2. NATIONAL BUILDING CODE OF CANADA (2010)
   - 1.3. NATIONAL FIRE CODE OF CANADA (2010)
   - 1.4. CANADIAN ELECTRICAL CODE (2009)
   - 1.5. CCME ENVIRONMENTAL CODE OF PRACTICE FOR ABOVEGROUND STORAGE TANK SYSTEMS CONTAINING PETROLEUM PRODUCTS
   - 1.6. API 650, 11TH EDITION, 2008, WELDED STEEL TANKS FOR OIL STORAGE INCLUDING ADDENDUMS 1 AND 2.
   - 1.7. API 653 4TH EDITION, 2009, TANK INSPECTION, REPAIR, ALTERATION AND RECONSTRUCTION.
   - 1.8. NFPA 30, 2008 EDITION, FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE.
   - 1.9. ANSI/ASME B31.3–2010, PROCESS PIPING.
   - 1.10. API 1104 2005 AND CSA W47.1–09, CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL.
   - 1.11. CSA W59–03 (R2008) – WELDED STEEL CONSTRUCTION (METAL ARC WELDING).
   - 1.12. CANADIAN ENVIRONMENTAL PROTECTION ACT 1999, (2008 UPDATE), STORAGE TANK SYSTEM FOR PETROLEUM PRODUCTS AND ALLIED PETROLEUM PRODUCTS REGULATIONS.
   - 1.13. CSA W178.2–08, CERTIFICATION OF WELDING INSPECTORS.
   - 1.14. OCCUPATIONAL HEALTH AND SAFETY.
   - 1.15. ENVIRONMENTAL PROTECTION ACT.
   - 1.16. API 2000 VENTING ATMOSPHERIC AND LOW PRESSURE STORAGE TANKS.
   - 1.17. API RECOMMENDED PRACTICE 2003 – PROTECTION AGAINST IGNITIONS ARISING OUT OF STATIC, LIGHTNING AND STAY CURRENTS.
   - 1.18. API STANDARD 2610 – DESIGN, CONSTRUCTION, OPERATION, MAINTENANCE AND INSPECTION OF TERMINAL & TANK FACILITIES.
   - 1.19. API MANUAL OF PETROLEUM MEASUREMENT STANDARDS.
   - 1.20. ASME SECTION VIII – NON FIRED PRESSURE VESSEL
   - 1.21. MEASUREMENT CANADA.
2. COORDINATES TO NAD–83 6 DEGREE UTM, ZONE 17.
3. ALL SURFACE DRAINAGE WILL BE SELF CONTAINED, COLLECTED AND DISCHARGED AT A LOCATION TO BE APPROVED BY THE LOCAL AUTHORITY.
4. THE WORK SHALL MEET OR EXCEED THE REQUIREMENTS OF THE SPECIFIED STANDARDS, CODES AND REFERENCE DOCUMENTS.
5. EXAMINE SITE OF WORK AND INVESTIGATE ALL MATTERS RELATING TO THE NATURE OF THE WORK TO BE UNDERTAKING. BEFORE COMMENCING WITH THE WORK OBTAIN ALL REQUIRED PERMITS.
6. DO NOT BURY RUBBISH AND WASTE MATERIALS ON SITE.
7. DIVERT SURFACE DRAINAGE WATER AWAY FROM EXCAVATION.
8. PROVIDE TEMPORARY DRAINAGE AND PUMPING AS NECESSARY TO KEEP EXCAVATIONS AND SITE FREE FROM WATER FROM WHATEVER SOURCE UNTIL BACKFILL OPERATIONS ARE COMPLETED.
9. DO NOT PUMP WATER CONTAINING SUSPENDED MATERIALS INTO WATERWAYS.
10. SEPARATE AND RECYCLE WASTE MATERIALS IN ACCORDANCE WITH LOCAL JURISDICTION.
11. ALL REFERENCE MATERIAL FROM KNIGHT PIESOLD REPORT FIGURE 3.2.1 REV 0 AND MILNE SITE LAYOUT DATED 11–06–01.

DRAWING NO.	DRAWING TITLE
	MILNE SITE LAYOUT (PROGRESS PRINT) 11–06–01
3.2.1 Rev–0	MILNE PORT LAYOUT (KNIGHT PIESOLD ENGINEERING)

REFERENCE DRAWINGS

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PROJ. MGR. DATE	PROJECT NUMBER H337697

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

MILNE INLET FUEL SYSTEM UPGRADE LOCATION PLAN

SCALE	DRAWING NO.	REVISION
1:4000	H337697–4020–10–017–0001	A

CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER

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HATCH – A1 (841x594)

N 7 799 500

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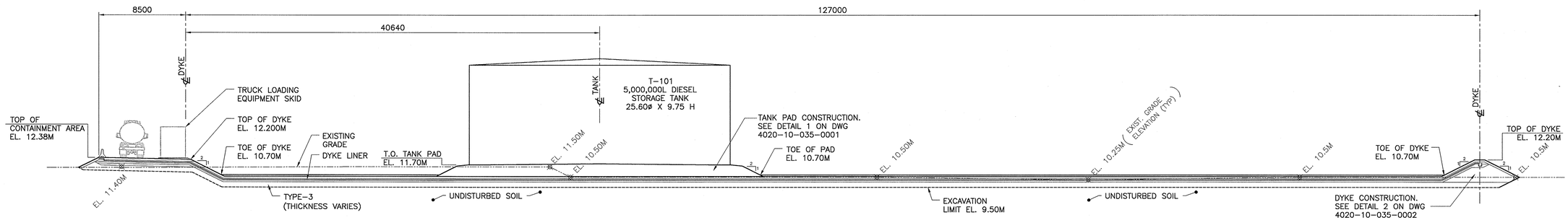

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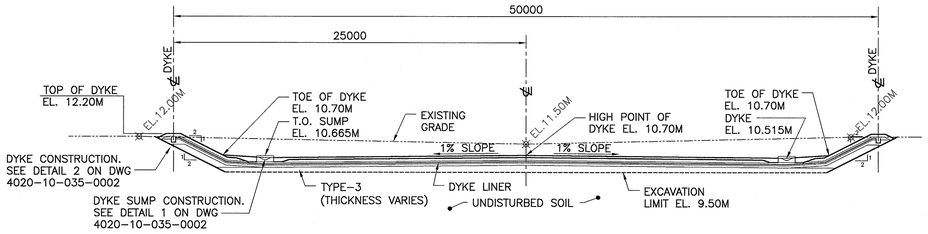

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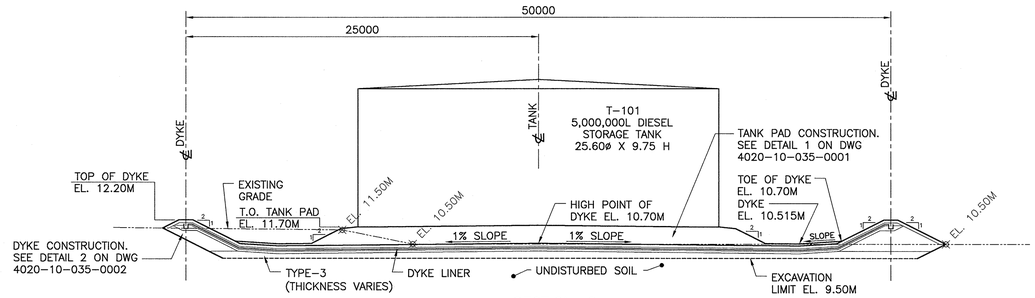

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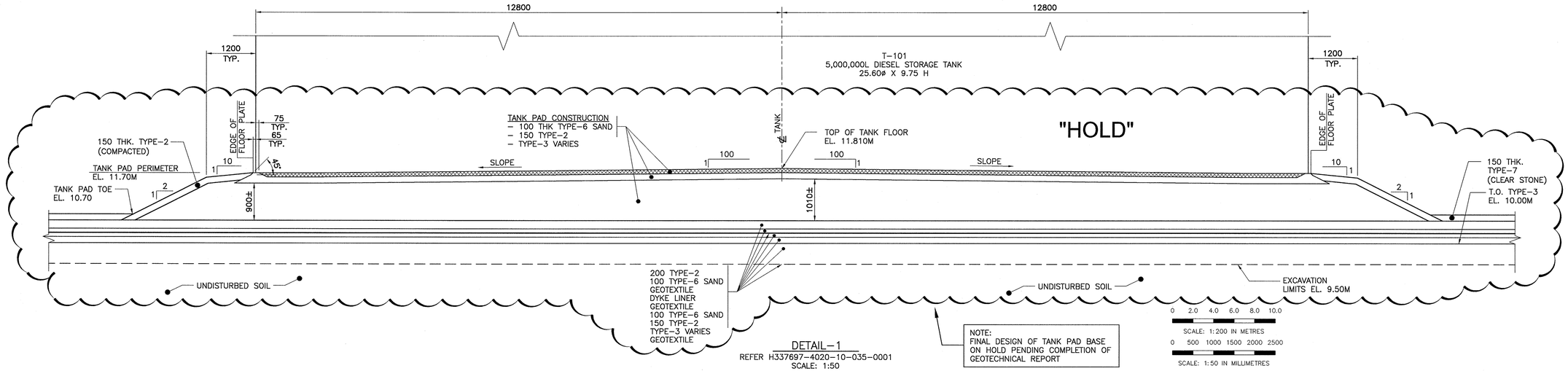

DETAIL–1
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NOTE:
FINAL DESIGN OF TANK PAD BASE ON HOLD PENDING COMPLETION OF GEOTECHNICAL REPORT

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PJC DATE 11–05–13	PJC DATE
PROJ. DES. COORD. DATE	PROJ. ENGR. JM DATE
PROJ. MGR. DATE	PROJECT NUMBER H337697

MILNE INLET FUEL SYSTEM UPGRADE DYKE SECTIONS

SCALE 1:200

DRAWING NO. H337697–4020–10–035–0001

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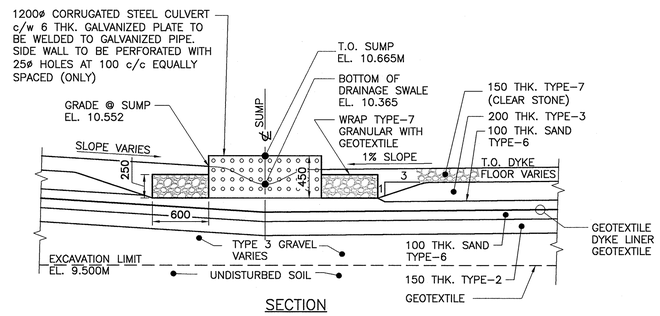

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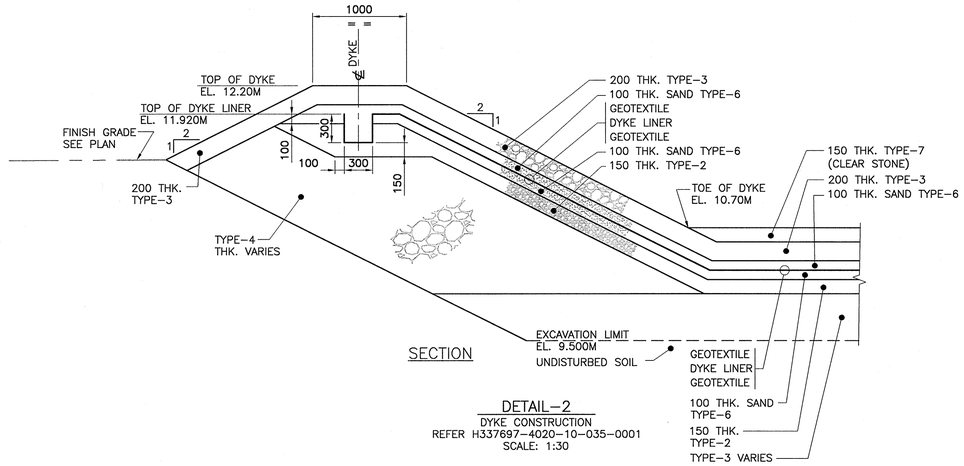

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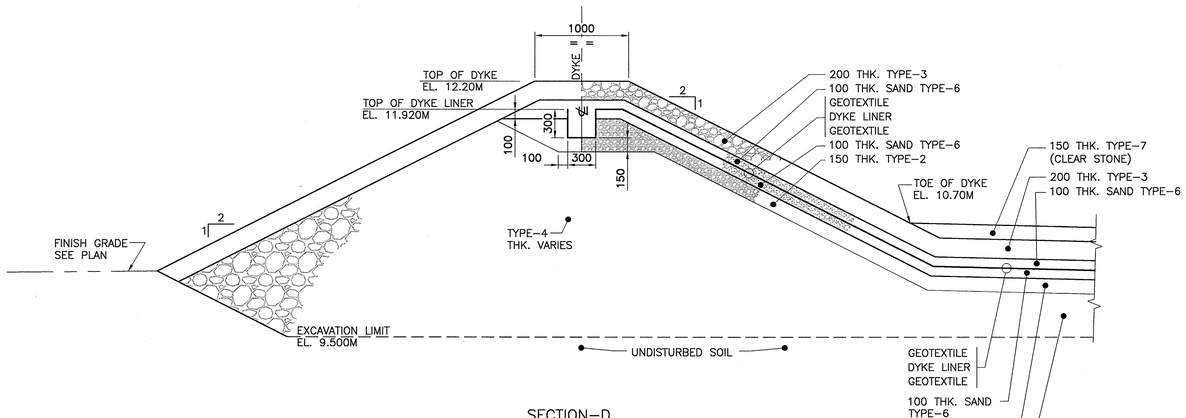

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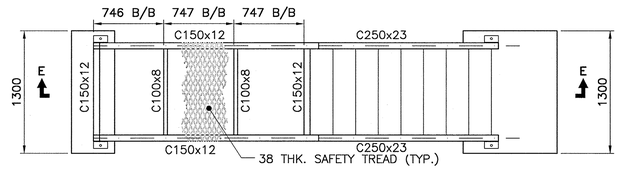

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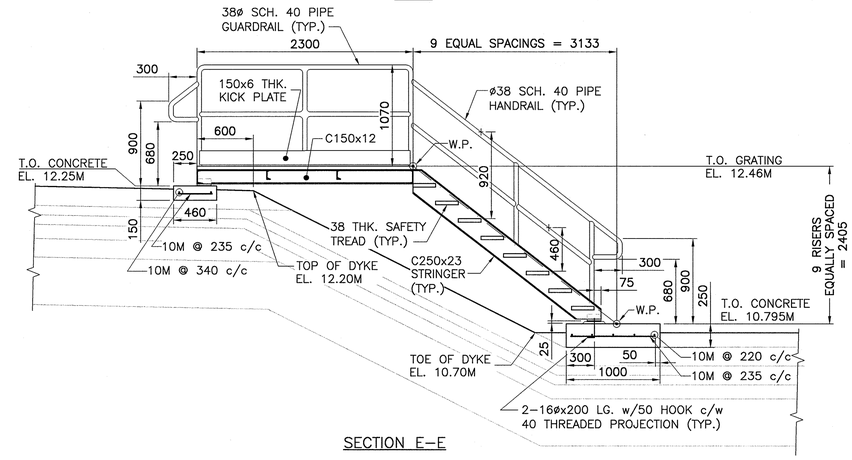

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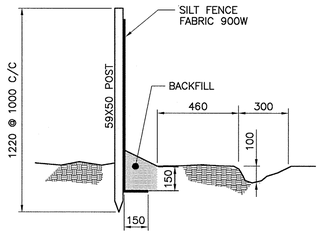
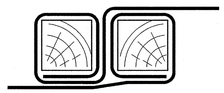


SILT FENCE



TYP. FENCE JOINT
NTS.

TEMPORARY SILT FENCE DURING CONSTRUCTION
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SCALE: 1:30 IN MILLIMETRES

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MARY RIVER IRON ORE PROJECT

MILNE INLET
FUEL SYSTEM UPGRADE
DYKE SECTIONS AND DETAILS

SCALE	DRAWING NO.	REVISION
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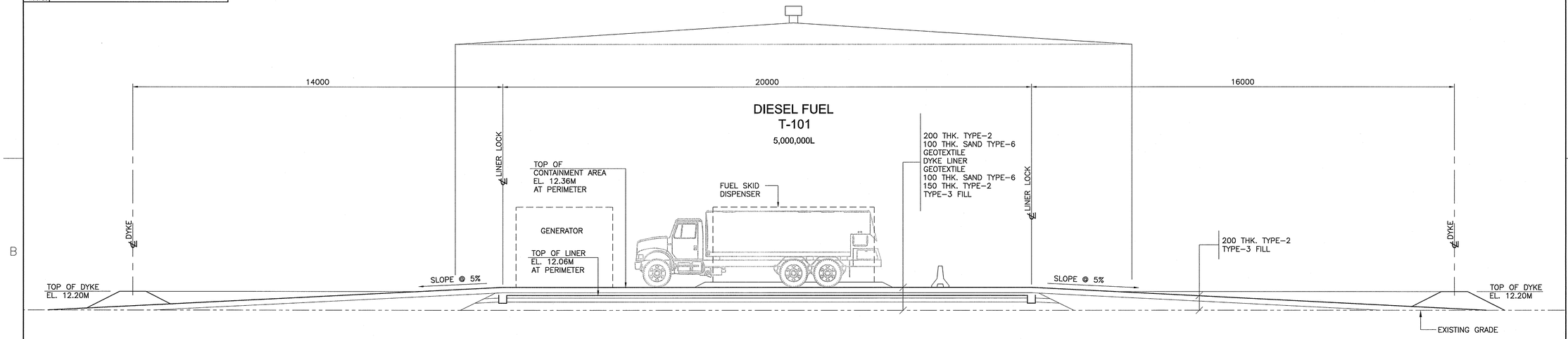

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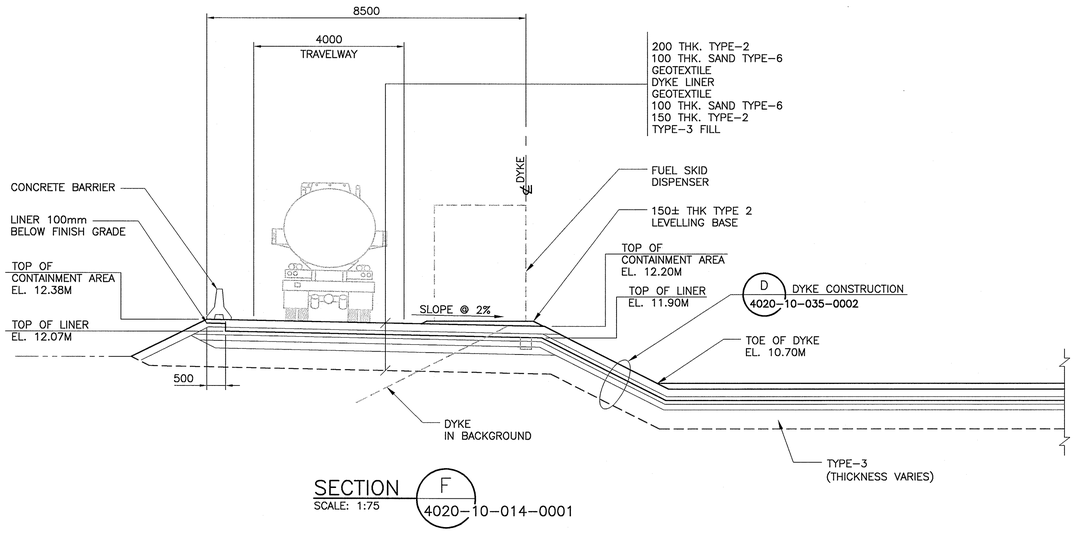

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PROJ. DES. COORD.	PROJ. ENGR. JM
DATE	DATE
PROJ. MGR.	PROJECT NUMBER H337697
DATE	

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

MILNE INLET FUEL SYSTEM UPGRADE SECTIONS THRU TRUCK LOADING AREA

SCALE	DRAWING NO.	REVISION
1:200	H337697–4020–10–035–0003	A

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HATCH – A1 (841x594)

N 7 799 500

REVISION	DWG. NO.

T.N.

150 GATE VALVE

TRUCK LOADING EQUIPMENT SKID

50 GATE VALVE c/w ø50 FLANGE HOSE ADAPTER

PS-051

PS-050 GUIDE

PS-049

PS-048 GUIDE

PS-047

ø150

INTERSECTION @ 90° ELBOW: N 7976119.706 E 503600.733

90.00°

150 GATE VALVE

PS-046

100 GATE VALVE

CENTER OF TANK: N 7976124.206 E 503618.533

5M LITRE DIESEL STORAGE TANK-101

300 GATE VALVE

300 CHECK VALVE

PS-045

90.00°

INTERSECTION @ 90° ELBOW: N 7976124.206 E 503641.393

PS-044

PS-043 GUIDE

PS-042

PS-041

PS-040

PS-039

PS-038 GUIDE

PS-037

PS-036

PS-035

PS-034 GUIDE

PS-033

PS-032

PS-031

PS-030 ANCHOR

PS-029

PS-028

PS-027

PS-026 GUIDE

PS-025

PS-024

PS-023

PS-022 GUIDE

PS-021

PS-020

FUTURE 10M LITRE DIESEL STORAGE TANK

FUTURE 10M LITRE DIESEL STORAGE TANK

FOR PIPING PROFILE SEE DWG 4020-60-012-0001

ø300 DIESEL

BLIND FLANGE CONNECTION

PIPE ANCHOR SUPPORT DETAIL-2 SEE DWG. 4020-30-035-0001

TYPICAL PIPE SUPPORT DETAIL-5 SEE DWG. 4020-60-035-0001

BLIND FLANGE CONNECTION

FUTURE 10M LITRE DIESEL STORAGE TANK

FUTURE 10M LITRE DIESEL STORAGE TANK

INTERSECTION @ 90° ELBOW: N 7976272.776 E 503641.393

PS-019

PS-018

PS-017

PS-016 GUIDE

PS-015

PS-014

PS-013 ANCHOR

PS-012

PS-011

PS-010

PS-009 GUIDE

PS-008

PS-007

PS-006

PS-005

PS-004 GUIDE

PS-003

PS-002

PS-001 ANCHOR

22.50°

90.00°

INTERSECTION @ 22½° ELBOW: N 7976318.218 E 503675.393

HOSE TIEBACK ANCHOR

ø300 DIESEL

PIPE ANCHOR SUPPORT DETAIL-2 SEE DWG 4020-30-035-0001

300 CHECK VALVE

300 GATE VALVE

MARINE OFFLOADING SPILL CONTAINMENT DETAIL SEE DWG. 4020-30-035-0002

INTERSECTION @ 90° ELBOW: N 7976272.776 E 503641.393

PIPE ANCHOR SUPPORT DETAIL-2 SEE DWG. 4020-30-035-0001

105 90 75 60 45 30 15

PLAN

REFER H337697-4020-10-042-0001

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SCALE IN METRES

Jun. 15, 2011 - 8:10pm Login name: pe43298 Layout: Layout1

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DATE 11-05-13	DATE 11-05-13
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PROJ. DES. COORD. –	PROJ. ENGR. JM
DATE	DATE
PROJ. MGR.	PROJECT NUMBER H337697
DATE	SCALE 1:400

Baffinland Iron Mines Corporation

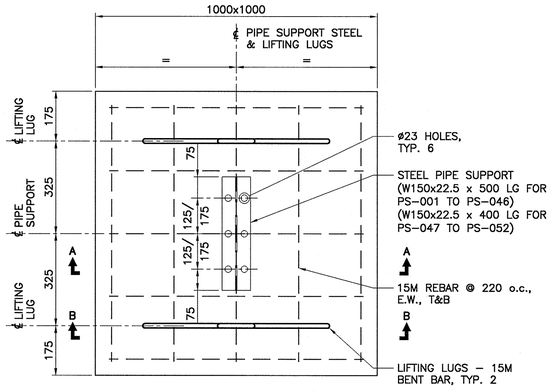
MARY RIVER IRON ORE PROJECT

MILNE INLET FUEL SYSTEM UPGRADE PIPING GENERAL ARRANGEMENT

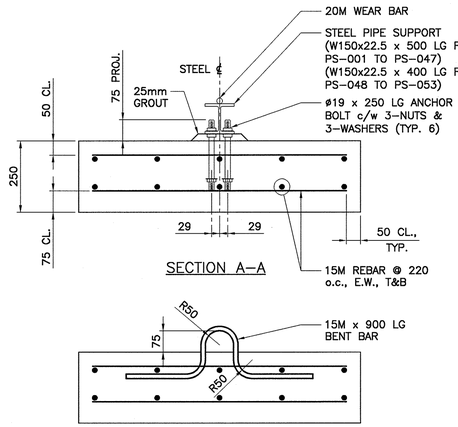
DRAWING NO. H337697-4020-60-042-0001 REVISION A

CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER

PIPE SIZE	U–BOLT ROD SIZE	'A' DIMENSION	'B' DIMENSION	GUIDES REQUIRED AT PIPE SUPPORTS
ø100	ø13	116	ø17	
ø150	ø16	171	ø20	PS–048, PS–050
ø300	ø22	327	ø26	PS–004, PS–009, PS–016, PS–022, PS–026, PS–038, PS–043

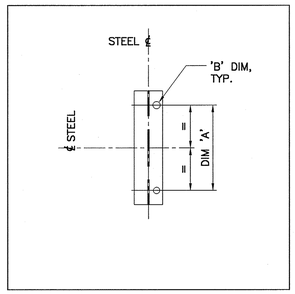


PLAN



SECTION A–A

SECTION B–B



U–BOLT ANCHOR LAYOUT FOR ø100, ø150 & ø300 PIPES

DETAIL–1

CONCRETE PIPE SUPPORT @ PS–002 TO PS–012, PS–014 TO PS–029, PS–031 TO PS–052
REFER H337697–4020–60–012–0001, H337697–4020–60–042–0001, H337697–4020–60–035–0001
SCALE: 1:10

PLAN

SECTION A–A

SECTION B–B

DETAIL–2

CONCRETE PIPE ANCHOR SUPPORT @ PS–001, PS–013 & PS–030
REFER H337697–4020–60–012–0001 & H337697–4020–60–042–0001
SCALE: 1:10

0 100 200 300 400 500
SCALE IN MILLIMETRES

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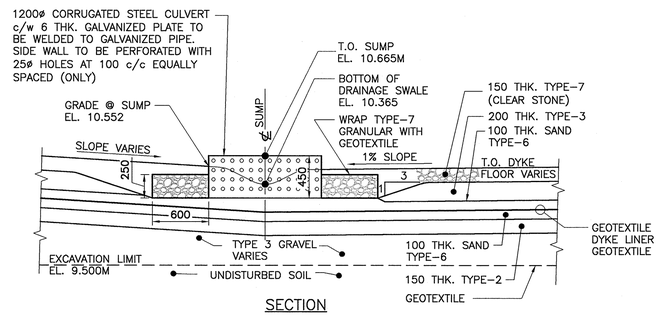
MARY RIVER IRON ORE PROJECT

MILNE INLET
FUEL SYSTEM UPGRADE
PIPE SUPPORT DETAILS

DESIGNED BY	DRAWN BY
DS	DM
DATE 11–06–10	DATE 11–06–10
CHECKED BY	DISCIP. ENGR.
PJC	PJC
DATE 11–06–10	DATE
PROJ. DES. COORD.	PROJ. ENGR.
–	JM
DATE	DATE
PROJ. MGR.	PROJECT NUMBER
DATE	H337697

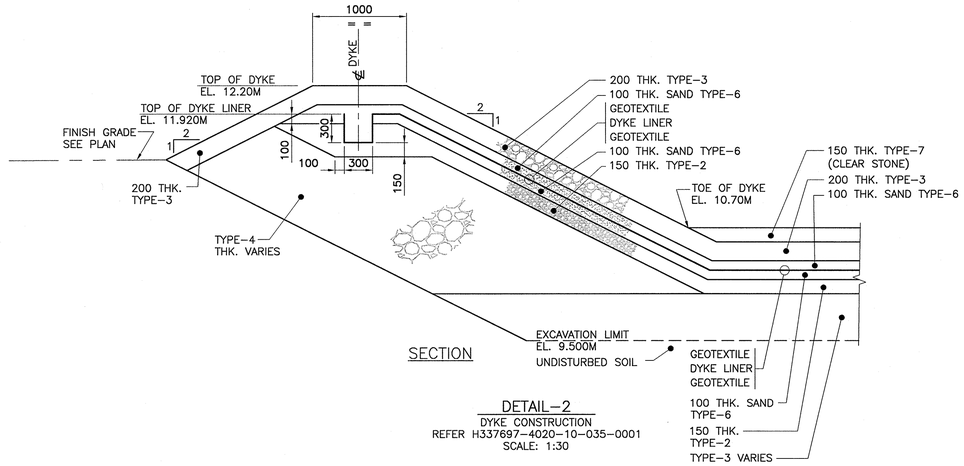
SCALE	DRAWING NO.	REVISION
1:10	H337697–4020–30–035–0001	A

CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER



SECTION

DETAIL-1
DYKE SUMP CONSTRUCTION
REFER H337697-4020-10-035-0001
H337697-4020-10-014-0001
SCALE: 1:30



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DETAIL-2
DYKE CONSTRUCTION
REFER H337697-4020-10-035-0001
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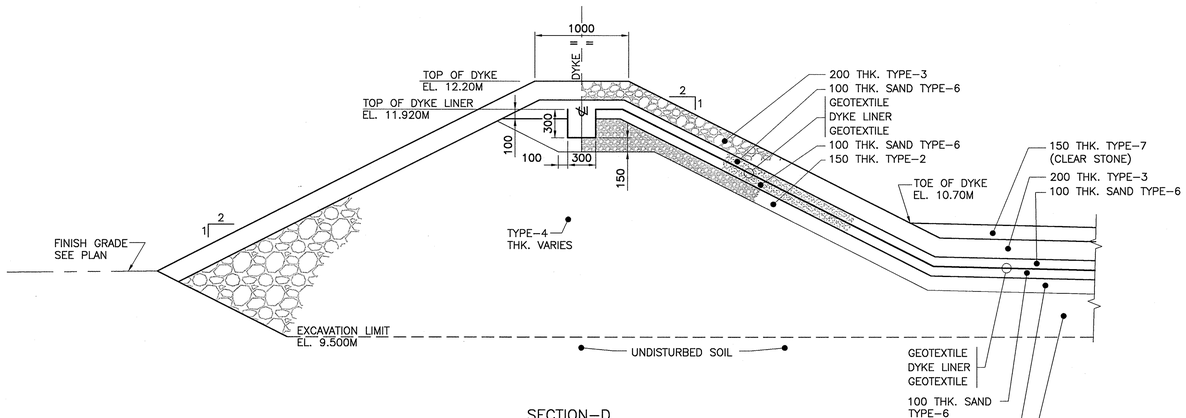
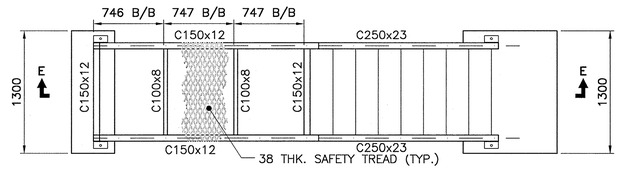
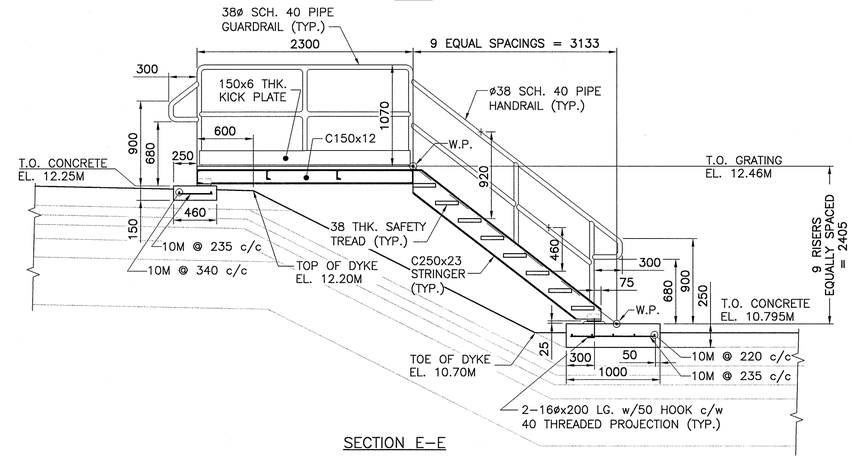


SECTION-D
DYKE CONSTRUCTION
REFER H337697-4020-10-014-0001
H337697-4020-035-0003
SCALE: 1:30

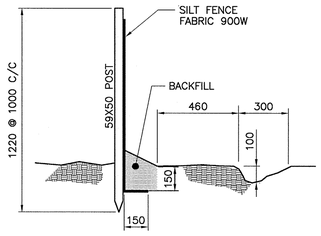


PLAN

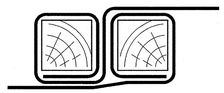


SECTION E-E

DETAIL-3
DYKE ACCESS STAIRS
REFER H337697-4020-10-014-0001
SCALE: 1:30



SILT FENCE



TYP. FENCE JOINT
NTS.

TEMPORARY SILT FENCE DURING CONSTRUCTION
REFER H337697-4020-10-014-0001
SCALE: 1:20

0 200 400 600 800 1000
SCALE: 1:20 IN MILLIMETRES

0 300 600 900 1200 1500
SCALE: 1:30 IN MILLIMETRES

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PROJ. MGR. DATE	PROJECT NUMBER H337697

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

MILNE INLET
FUEL SYSTEM UPGRADE
DYKE SECTIONS AND DETAILS

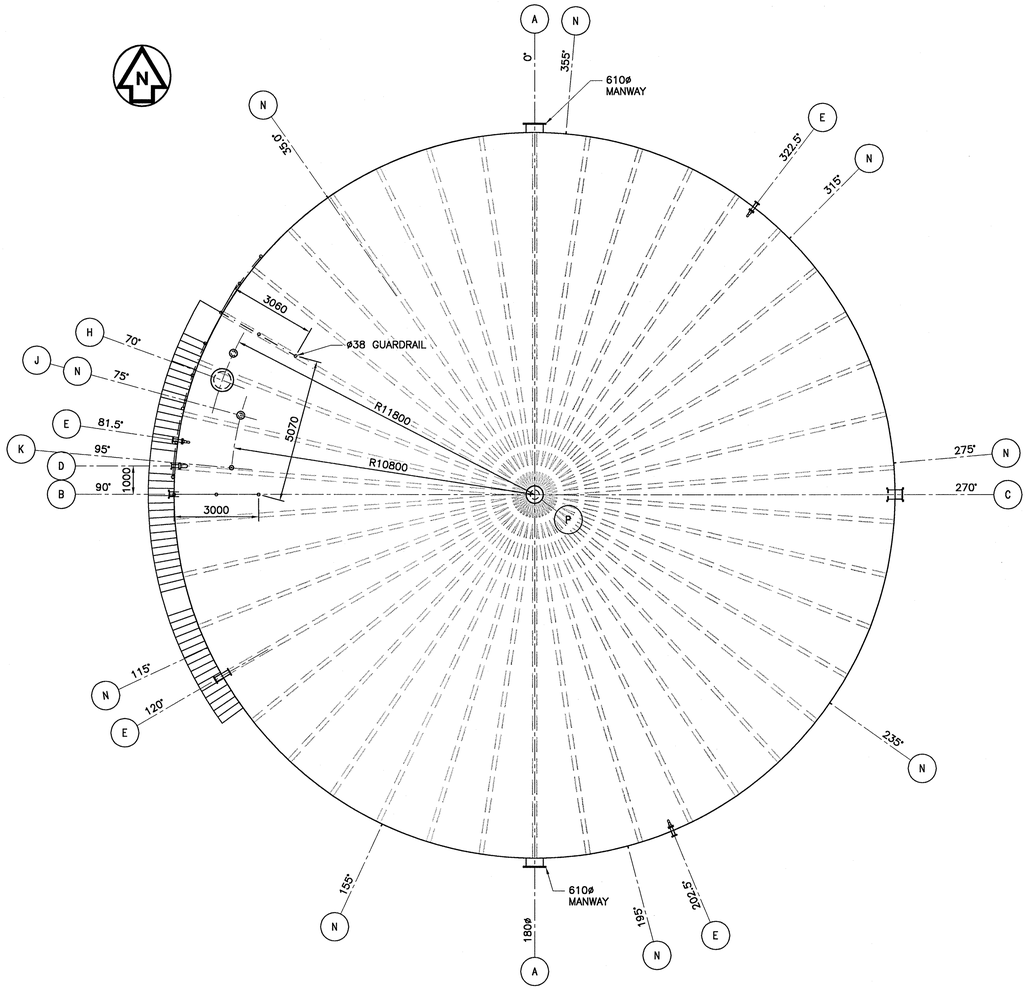
SCALE	DRAWING NO.	REVISION
1:30	H337697-4020-10-035-0002	A

CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER

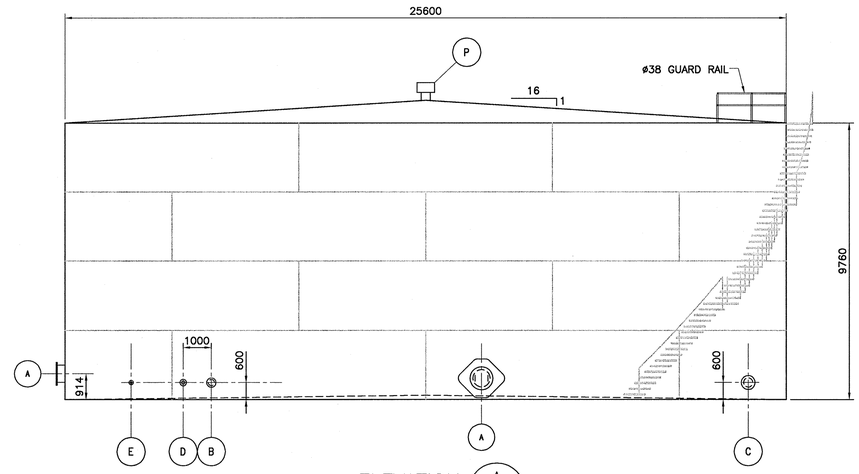
HATCH — A1 (841x594)

N 7 799 500

REVISION	DWG. NO.



PLAN–1
TANK ORIENTATION
REFER H337697–4020–10–042–0001
SCALE: 1:100



ELEVATION A
TANK ORIENTATION
SCALE: 1:100

TANK APPURTENANCES

ITEM	NO.	SERVICE	SIZE	RATING	TYPE	REMARKS
A	2	SHELL MANWAYS	610 (24")	API 650	FF	API 650 FIG. 5–7A
B	1	TANK SUCTION	150 (6")	CLASS 150	RFWN	DOUBLE FLANGED
C	1	TANK FILL C/W 300ø (12") INLET DIFFUSER	300 (12")	CLASS 150	RFWN	DOUBLE FLANGED
D	1	TANK DRAW–DOWN	100 (4")	CLASS 150	RFWN	DOUBLE FLANGED
E	1	WATER DRAW–OFF	50 (2")	CLASS 150	RFWN	DOUBLE FLANGED
F	1	SPARE SHELL NOZZLE	150 (6")	CLASS 150	RFWN	DOUBLE FLANGED w/ BLIND FLANGE
G						
H	1	ROOF MANWAY	610 (24")	API 650	FF	C/W COVER
J	1	GAUGE HATCH C/W STILLING WELL	150 (6")	CLASS 150	FF	SINGLE FLANGE
K	1	HIGH LEVEL SENSOR	50 (2")	CLASS 150	RF	BLIND FLANGE C/W #25 (1") THR'D COUPLING
L	1	LEVEL TRANSMITTERS (ROOF)	38 (1½")	3000# CPLG.	NPT	API 650 TYPE A
M						
N	8	GROUNDING LUGS				
P	1	ROOF VENT	305ø (12")	CLASS 150	FF	
Q						
R						
S						
T						
U						
V						
W						

0 1.0 2.0 3.0 4.0 5.0
SCALE IN METRES

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DATE 11–05–13	DATE
PROJ. DES. COORD.	PROJ. ENGR.
–	JM
DATE	DATE
PROJ. MGR.	
DATE	

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

MILNE INLET
FUEL SYSTEM UPGRADE
5M LITRE DIESEL STORAGE TANK

PROJECT NUMBER	SCALE	DRAWING NO.	REVISION
H337697	1:100	H337697–4020–50–035–0001	A

CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER

Jun 15 , 2011 , 8:04pm Login name: pet43298 Layout: Layout1
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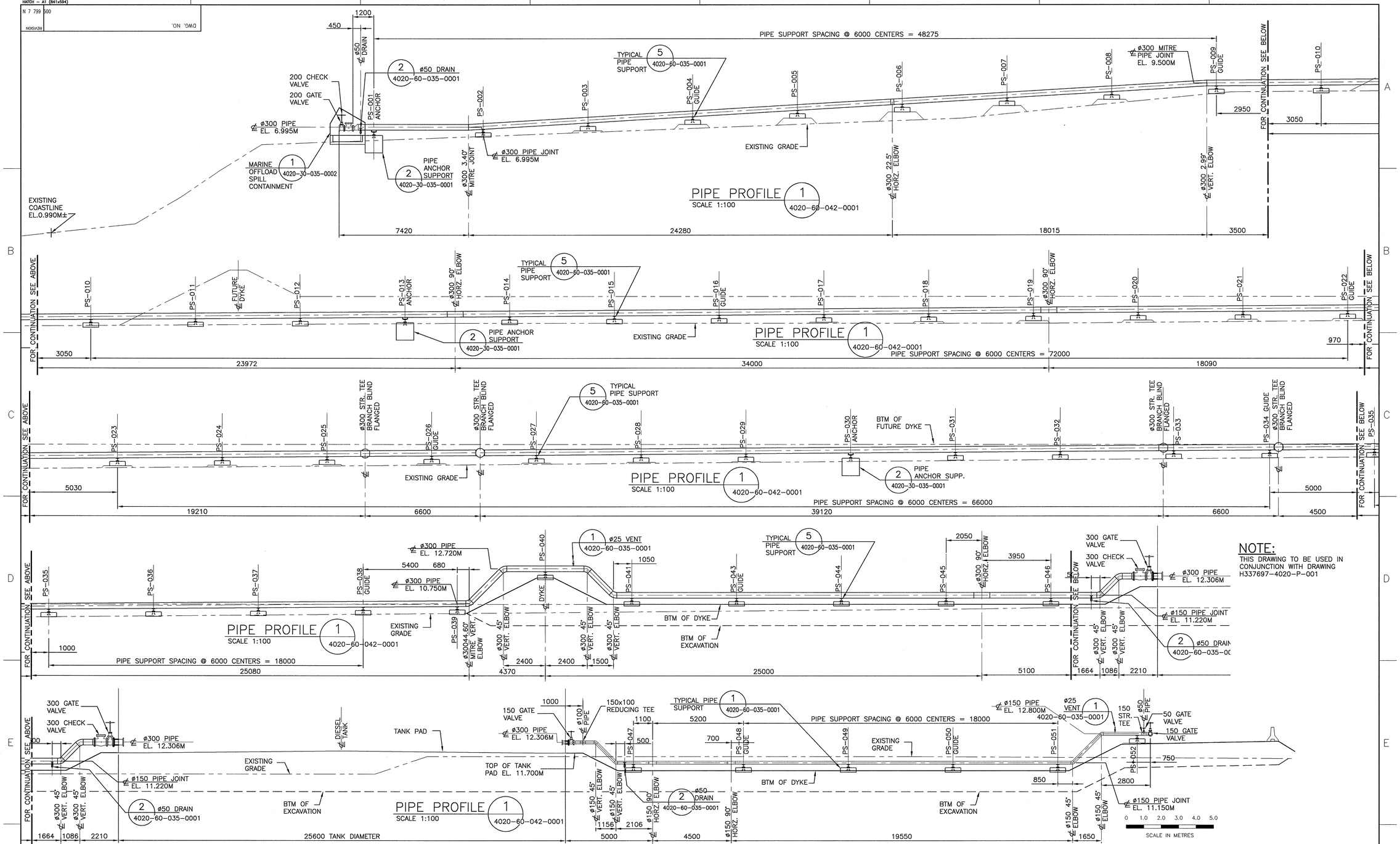
HATCH – A1 (841x594)

N 7 799 500

REVISION	DWG. NO.



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REFERENCE DRAWINGS	

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MARY RIVER IRON ORE PROJECT

MILNE INLET
FUEL SYSTEM UPGRADE
ø300 & ø150 PIPELINE PROFILE

DESIGNED BY	DRAWN BY
DS DATE 11-05-13	MWP DATE 11-05-13
CHECKED BY	DISCIP. ENGR.
FB DATE 11-05-13	JM DATE
PROJ. DES. COORD.	PROJ. ENGR.
– DATE	JM DATE
PROJ. MGR. DATE	PROJECT NUMBER
	H337697

SCALE	DRAWING NO.	REVISION
1:100	H337697-4020-60-012-0001	A

CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER

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Drawing Name: P:\Projects\HMM - LAWSON PROJECTS\289980 - Baffinlands\Drawings\Current\H337697-4020-60-012-0001-A.dwg

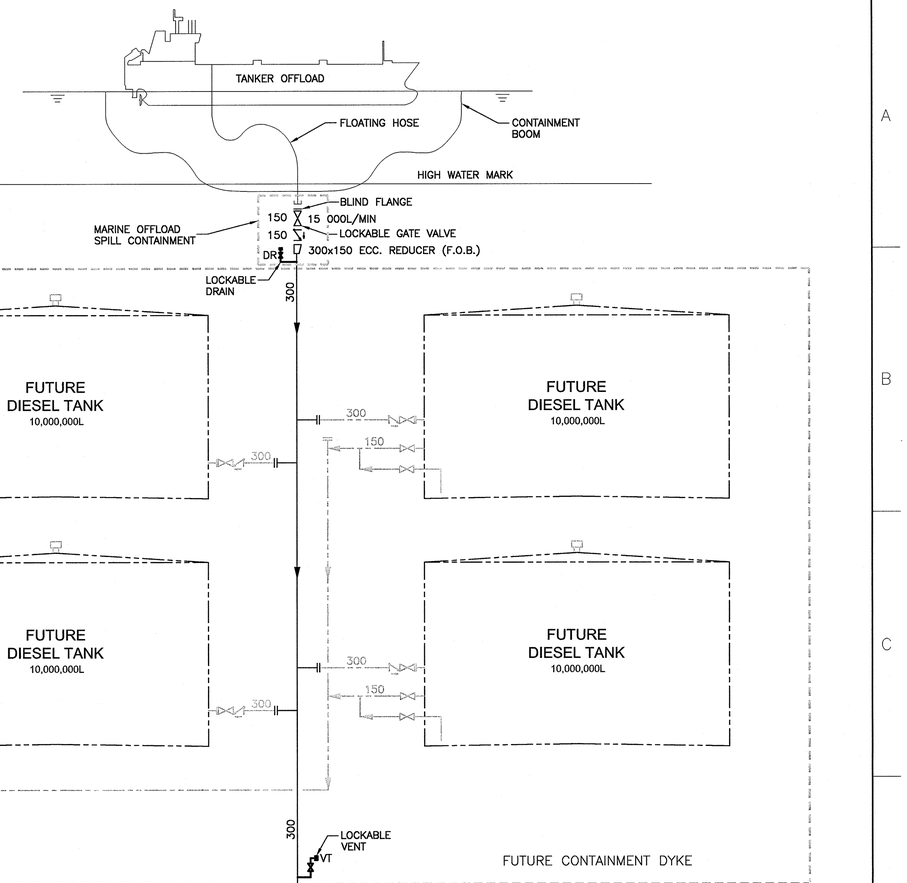
HATCH – A1 (841x594)

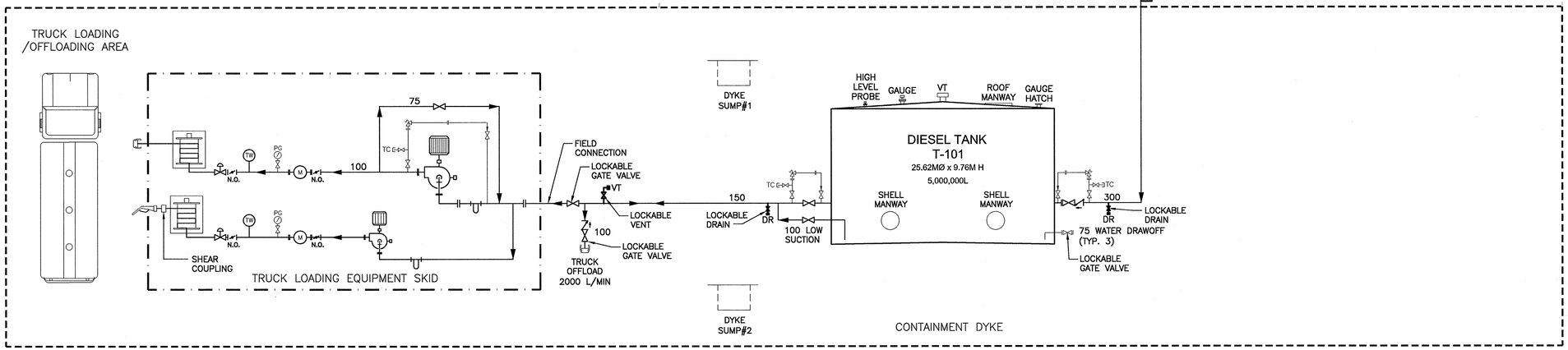
N 7 799 500

REVISION	DWG. NO.

LEGEND

SYMBOL	DESCRIPTION
	PROCESS LINE FLOW DIRECTION
	FUTURE PIPING/EQUIPMENT
	RELIEF VALVE
TC	TEST CONNECTION
	CONTROL VALVE
	BALL VALVE
	GATE VALVE
	CHECK VALVE
	GLOBE VALVE
	BUTTERFLY VALVE
P	PRESSURE GAUGE
	BLIND FLANGE
VT	VENT
DR	DRAIN
	FLANGED CONNECTION
	CONCENTRIC REDUCER
	BASKET STRAINER
	HOSE REEL
M	FLOW METER
TW	THERMOWELL
	DYKE SUMP
	CENTRIFUGAL PUMP
	A/G VERTICAL STORAGE TANK





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MARY RIVER IRON ORE PROJECT

MILNE INLET
FUEL SYSTEM UPGRADE
FLOW SHEET

DESIGNED BY	DRAWN BY
DS	MMI
DATE 11-05-13	DATE 11-05-13
CHECKED BY	DISCIP. ENGR.
FB	PJC
DATE 11-05-13	DATE
PROJ. DES. COORD.	PROJ. ENGR.
	JM
DATE	DATE
PROJ. MGR.	PROJECT NUMBER
DATE	H337697

SCALE	DRAWING NO.	REVISION
NTS	H337697–4020–60–013–0001	A

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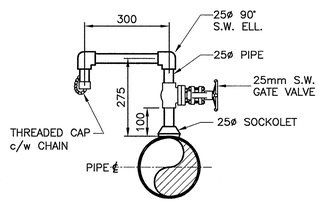
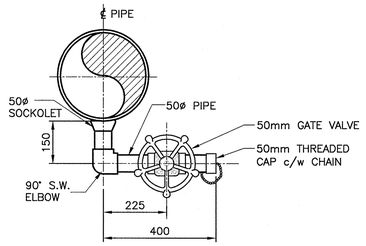
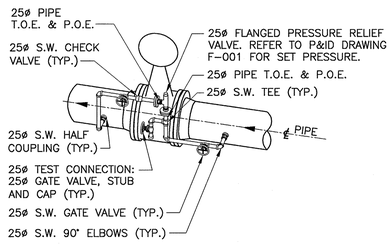


DETAIL–1
TYPICAL ø25 VENT
REFER H337697–4020–60–012–0001
SCALE: 1:30



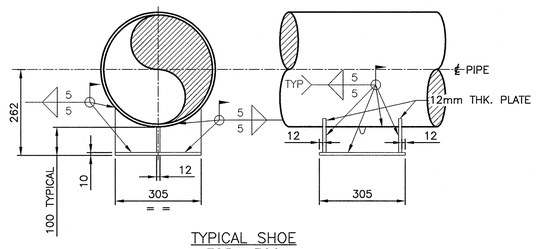
DETAIL–2
TYPICAL ø25 VENT
REFER H337697–4020–60–012–0001
SCALE: 1:30



NOTE:

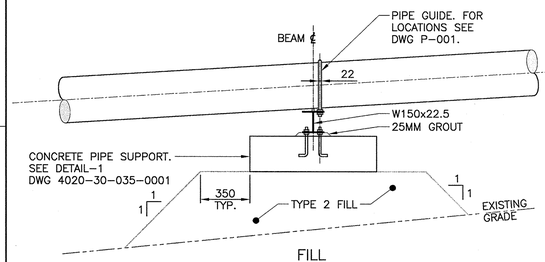
1. ALL PRESSURE RELIEF, AIR RELEASE, AND DRAIN PIPING AND FITTINGS TO BE SCH. 80 STEEL.

DETAIL
PERSPECTIVE OF 25ø RELIEF PIPING w/TEST CONNECTION
SCALE: 1:10

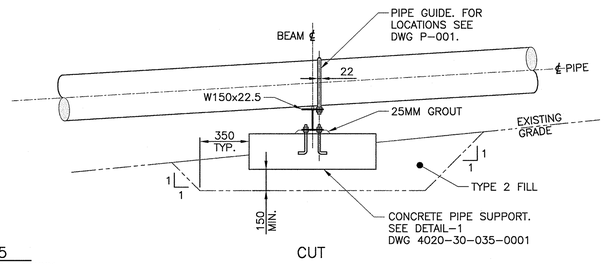


TYPICAL SHOE FOR ø300

DETAIL
PIPE SHOE
SCALE: 1:10



FILL



CUT

DETAIL–5
H337697–4020–60–035–0001
SCALE: 1:20

0 200 400 600 800 1000
SCALE IN MILLIMETRES

0 100 200 300 400 500
SCALE IN MILLIMETRES

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MARY RIVER IRON ORE PROJECT

MILNE INLET
FUEL SYSTEM UPGRADE
MISCELLANEOUS PIPING DETAILS

DESIGNED BY	DRAWN BY
DS DATE 11–05–13	DM DATE 11–05–13
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DS DATE 11–05–13	JM DATE
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– DATE	JM DATE
PROJ. MGR. DATE	PROJECT NUMBER H337697

SCALE	DRAWING NO.	REVISION
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SCALE: 1:500

CIVIL	ELECTRICAL	MECHANICAL	GEOTECHNICAL	HYDROTECHNICAL	ARCHITECTURAL	OTHER

HATCH – A1 (841x594)

N 7 799 500

REVISION	DWG. NO.

T.N.

150 GATE VALVE

TRUCK LOADING EQUIPMENT SKID

50 GATE VALVE c/w ø50 FLANGE HOSE ADAPTER

PS-051

PS-050 GUIDE

PS-049

PS-048 GUIDE

PS-047

ø150

INTERSECTION @ 90° ELBOW: N 7976119.706 E 503600.733

90.00°

150 GATE VALVE

PS-046

100 GATE VALVE

CENTER OF TANK: N 7976124.206 E 503618.533

5M LITRE DIESEL STORAGE TANK-101

300 GATE VALVE

300 CHECK VALVE

PS-045

90.00°

INTERSECTION @ 90° ELBOW: N 7976124.206 E 503641.393

PS-044

PS-043 GUIDE

PS-042

PS-041

PS-040

PS-039

PS-038 GUIDE

PS-037

PS-036

PS-035

PS-034 GUIDE

PS-033

PS-032

PS-031

PS-030 ANCHOR

PS-029

PS-028

PS-027

PS-026 GUIDE

PS-025

PS-024

PS-023

PS-022 GUIDE

PS-021

PS-020

FUTURE 10M LITRE DIESEL STORAGE TANK

FUTURE 10M LITRE DIESEL STORAGE TANK

FOR PIPING PROFILE SEE DWG 4020-60-012-0001

ø300 DIESEL

BLIND FLANGE CONNECTION

PIPE ANCHOR SUPPORT DETAIL-2 SEE DWG. 4020-30-035-0001

TYPICAL PIPE SUPPORT DETAIL-5 SEE DWG. 4020-60-035-0001

BLIND FLANGE CONNECTION

FUTURE 10M LITRE DIESEL STORAGE TANK

FUTURE 10M LITRE DIESEL STORAGE TANK

INTERSECTION @ 90° ELBOW: N 7976272.776 E 503641.393

PS-019

PS-018

PS-017

PS-016 GUIDE

PS-015

PS-014

PS-013 ANCHOR

PS-012

PS-011

PS-010

PS-009 GUIDE

PS-008

PS-007

PS-006

PS-005

PS-004 GUIDE

PS-003

PS-002

PS-001 ANCHOR

22.50°

90.00°

INTERSECTION @ 22½° ELBOW: N 7976318.218 E 503675.393

HOSE TIEBACK ANCHOR

ø300 DIESEL

PIPE ANCHOR SUPPORT DETAIL-2 SEE DWG 4020-30-035-0001

300 CHECK VALVE

300 GATE VALVE

MARINE OFFLOADING SPILL CONTAINMENT DETAIL SEE DWG. 4020-30-035-0002

INTERSECTION @ 90° ELBOW: N 7976272.776 E 503641.393

PIPE ANCHOR SUPPORT DETAIL-2 SEE DWG. 4020-30-035-0001

105 90 75 60 45 30 15

PLAN

REFER H337697-4020-10-042-0001

SCALE: 1:400

0 4.0 8.0 12.0 16.0 20.0

SCALE IN METRES

Jun. 15, 2011 - 8:10pm Login name: pe43298 Layout: Layout1

Drawing Name: P:\Projects\HMM - LAWSON PROJECTS\289980 - Baffinlands\Drawings\Current\H337697-4020-60-042-0001-A.dwg

DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

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A	ISSUED FOR PERMITTING	DS	JM	11-06-15

REVISIONS

REGISTERED PROFESSIONAL ENGINEER R.A. HALIM LICENSEE L1247 NWT/NU

REV.	ISSUE FOR	AUTH. BY	DATE

ISSUE AUTHORIZATION

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DESIGNED BY DS	DRAWN BY MP
DATE 11-05-13	DATE 11-05-13
CHECKED BY FB	DISCIP. ENGR. FB
DATE 11-05-13	DATE
PROJ. DES. COORD. –	PROJ. ENGR. JM
DATE	DATE
PROJ. MGR.	PROJECT NUMBER H337697
DATE	SCALE 1:400

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

MILNE INLET FUEL SYSTEM UPGRADE PIPING GENERAL ARRANGEMENT

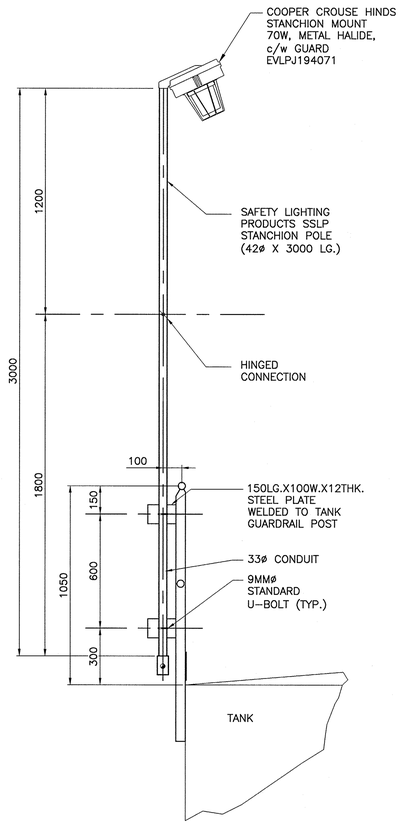
DRAWING NO. H337697-4020-60-042-0001 REVISION A

CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER

HATCH – A1 (841x594)

N 7 799 500

REVISION	DWG. NO.



DETAIL–2
STANCHION FIXTURE DETAIL
REFER H337697–4020–70–042–0002
SCALE: 1:15

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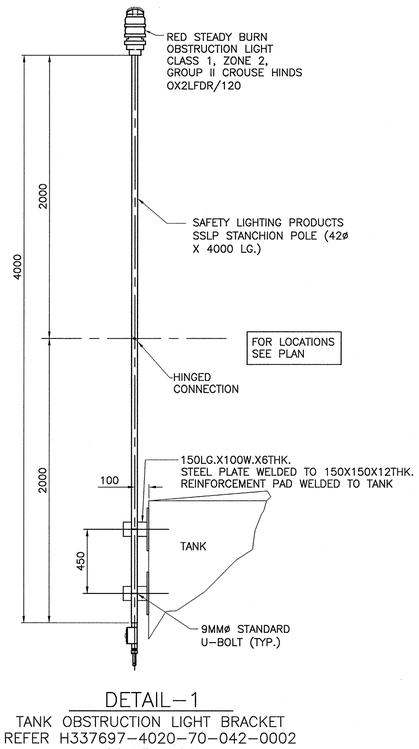
SCALE IN MILLIMETRES



DETAIL–1
TANK OBSTRUCTION LIGHT BRACKET
REFER H337697–4020–70–042–0002
SCALE: 1:20

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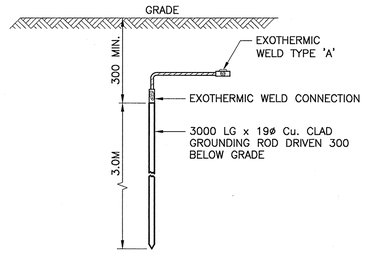
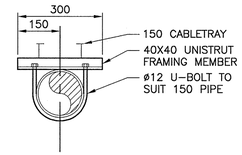


DETAIL–3
Cu. CLAD GROUNDING ROD
REFER H337697–4020–70–042–0002
SCALE: 1:10



DETAIL–4
CABLETRAY SUPPORT
REFER H337697–4020–70–042–0002
SCALE: 1:10

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SCALE IN MILLIMETRES

DRAWING NO.	DRAWING TITLE
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A	ISSUED FOR PERMITTING	DS	MML	11–06–15

REVISIONS

REGISTERED PROFESSIONAL ENGINEER
R. A. HALIM
LICENSEE
L1247
NWT/NU

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Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

MILNE INLET
FUEL SYSTEM UPGRADE
ELECTRICAL SECTIONS & DETAILS

DESIGNED BY	DRAWN BY
MML	MWP
DATE 11–06–14	DATE 11–06–14
CHECKED BY	DISCIP. ENGR.
EG	MML
DATE 11–06–14	DATE
PROJ. DES. COORD.	PROJ. ENGR.
	JM
DATE	DATE
PROJ. MGR.	PROJECT NUMBER
DATE	H337697

SCALE	DRAWING NO.	REVISION
NTS	H337697–4020–70–035–0001	A

CIVIL	ELECTRICAL	MECHANICAL	GEOTECHNICAL	HYDROTECHNICAL	ARCHITECTURAL	OTHER

SCALE: 1:500

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HATCH – A1 (841x594)
N 7 799 500
REVISION
DWG. NO.

T.N.

NOTE:

FOR GROUNDING SEE DWG
H337697–4020–70–041–0031

DYKE

GENERATOR
2.44M X 3.66M

ELECTRICAL DISTRIBUTION
PANEL

BURIED TECK
CABLE

4–3C #10 TECK CABLE
– HIGH LEVEL PROBE
– TANK RADAR GAUGE
– OBSTRUCTION LIGHT
– TANK LIGHTING

4–3C #10 TECK CABLE
– HIGH LEVEL PROBE
– TANK RADAR GAUGE
– OBSTRUCTION LIGHT
– TANK LIGHTING

DYKE

EDGE OF EXISTING
GRAVEL AREA

DYKE

DYKE

127000

10.5

0 0.25 0.50 0.75 1.00 1.25
SCALE IN METRES

DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS	

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NO.	DESCRIPTION	CHK'D	APP'D	DATE
A	ISSUED FOR PERMITTING	DS	MML	11–06–15

REVISIONS

REGISTERED PROFESSIONAL ENGINEER
R. A. HAUM
LICENSEE
L1247
NWT/NU

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ISSUE AUTHORIZATION

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Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

MILNE INLET
FUEL SYSTEM UPGRADE
ELECTRICAL GENERAL
ARRANGEMENT

DESIGNED BY	DRAWN BY
MML DATE 11–06–13	MP DATE 11–06–13
CHECKED BY: MML DATE 11–06–13	DISCIP. ENGR. MML DATE
PROJ. DES. COORD. DATE	PROJ. ENGR. JML DATE
PROJ. MGR. DATE	PROJECT NUMBER H337697

SCALE	DRAWING NO.	REVISION
1:250	H337697–4020–70–042–0001	A

CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER

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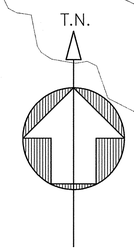
HATCH — A1 (841x594)

DWG. NO.	REVISION
N 7 799 300	



NOTES:

1. TIE CABLE TRAY GROUND TO BURIED GROUNDING CONDUCTOR AT EVERY THIRD SUPPORT ALONG PUMP PAD.

◉ – COPPER CLAD GROUND ROD 19ø X 3M DRIVEN 300 BELOW GRADE

● – BOLTED COMPRESSION OR THERMIT CONNECTION

——— – BURIED GROUND CONDUCTOR 2/0 AWG BARE CU.

— — – TRAY GROUND CONDUCTOR 2/0 AWG GREEN INSULATED CU.

DRAWING NO.	DRAWING TITLE
	REFERENCE DRAWINGS

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NO.	DESCRIPTION	CHK'D	APP'D	DATE
A	ISSUED FOR PERMITTING	DS	MML	11–06–15

REVISIONS

REGISTERED PROFESSIONAL ENGINEER — R. A. HALIM — LICENSEE L1247 — NWT/NU

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	PROJ. MGR.		DATE

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MARY RIVER IRON ORE PROJECT

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MML DATE 11–06–13	MP DATE 11–06–13
CHECKED BY	DISCIP. ENGR.
MML DATE 11–06–13	MML DATE
PROJ. DES. COORD. DATE	PROJ. ENGR. MML DATE
PROJ. MGR. DATE	PROJECT NUMBER H337697

MILNE INLET
FUEL SYSTEM UPGRADE
ELECTRICAL GROUNDING PLAN

SCALE	DRAWING NO.	REVISION
1:250	H337697–4020–70–042–0002	A

CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER