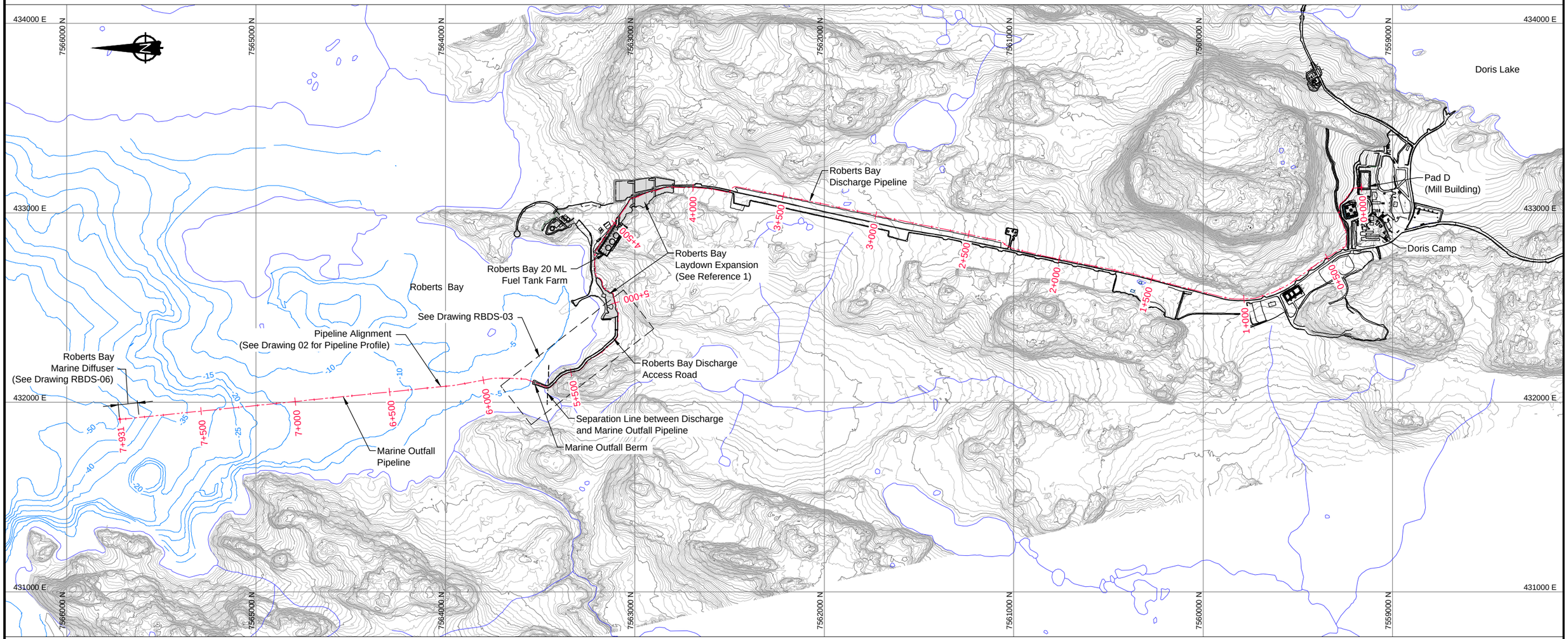

NOTES

1. Topographic contour data for the terrain model were provided by Hope Bay Mining, and is based on 2007 Aerial Photography. Contour intervals are 0.5m.
2. The co-ordinate system is UTM NAD 83, Zone 13.
3. All dimensions are in metric units, unless specifically mentioned.
4. Notes in this drawing apply to all other active drawings.

REFERENCE

1) SRK Consulting (Canada) Inc., 201 1. Engineering Drawings for the Roberts Bay Laydown Expansions , Doris North Project, Nunavut, Canada. Water License Amendment. Revision A. Issued for Discussion. Drawings p repared for Hope Bay Mining Limited. Project Number 1CH008.049. June 13, 2011

0 100 200 300 400 500
Scale in Metres

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
A	Issued for Discussion	LW	EMR	29May15

REVISIONS

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srk consulting

DESIGN:	DRAWN:	REVIEWED:
LW	NV	EMR
CHECKED:	APPROVED:	DATE:
LW/EMR	EMR	May 2015

FILE NAME: 1CT022.002_RB Outfall.dwg

TMAC RESOURCES

HOPE BAY PROJECT

SRK JOB NO.: 1CT022.002.200.900

Roberts Bay Discharge System

DRAWING TITLE:

General Arrangement
Roberts Bay Discharge System

DRAWING NO.	SHEET	REVISION NO.
RBDS-01	2 of 7	A

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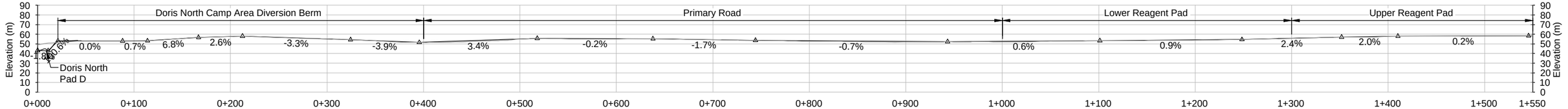

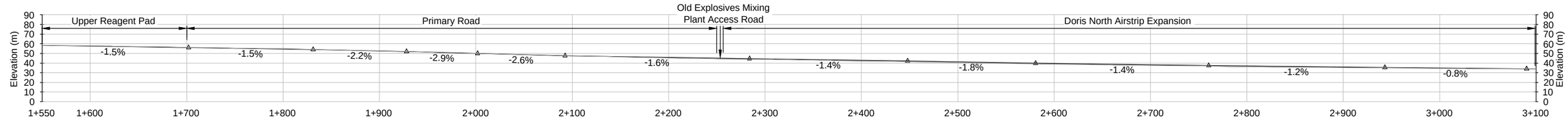

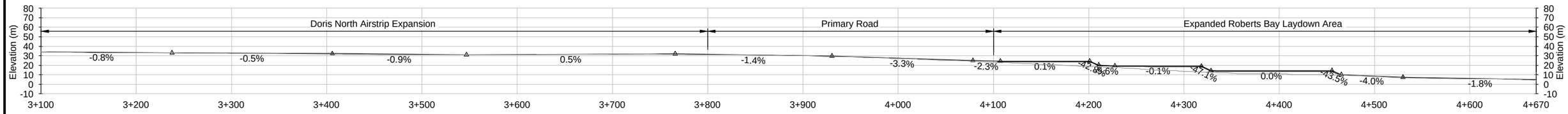

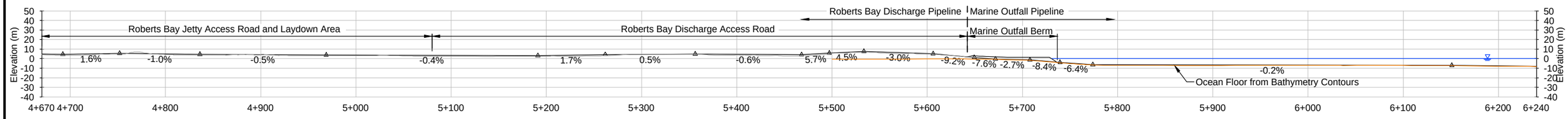

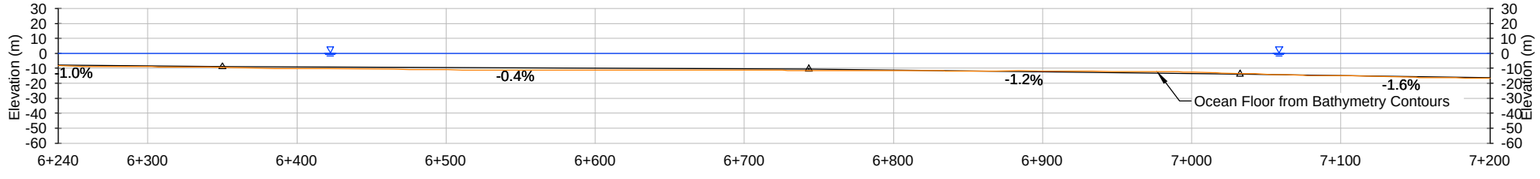

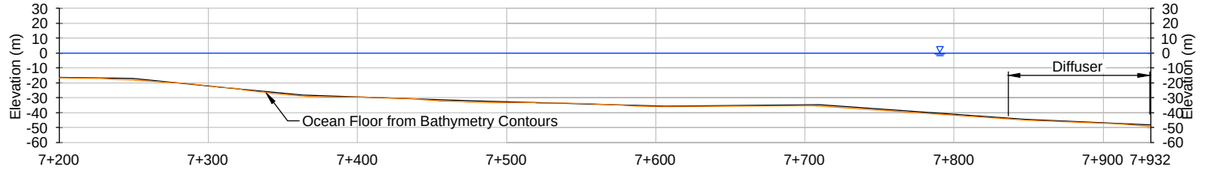

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CHECKED:	APPROVED:	DATE:
LW/EMR	EMR	May 2015

FILE NAME: 1CT022.002_RB Outfall.dwg

TMAC RESOURCES

HOPE BAY PROJECT

SRK JOB NO.: 1CT022.002.200.900

Roberts Bay Discharge System

DRAWING TITLE:
Roberts Bay Discharge and
Marine Outfall Pipeline Profile

DRAWING NO.	SHEET	REVISION NO.
RBDS-02	3 of 7	A

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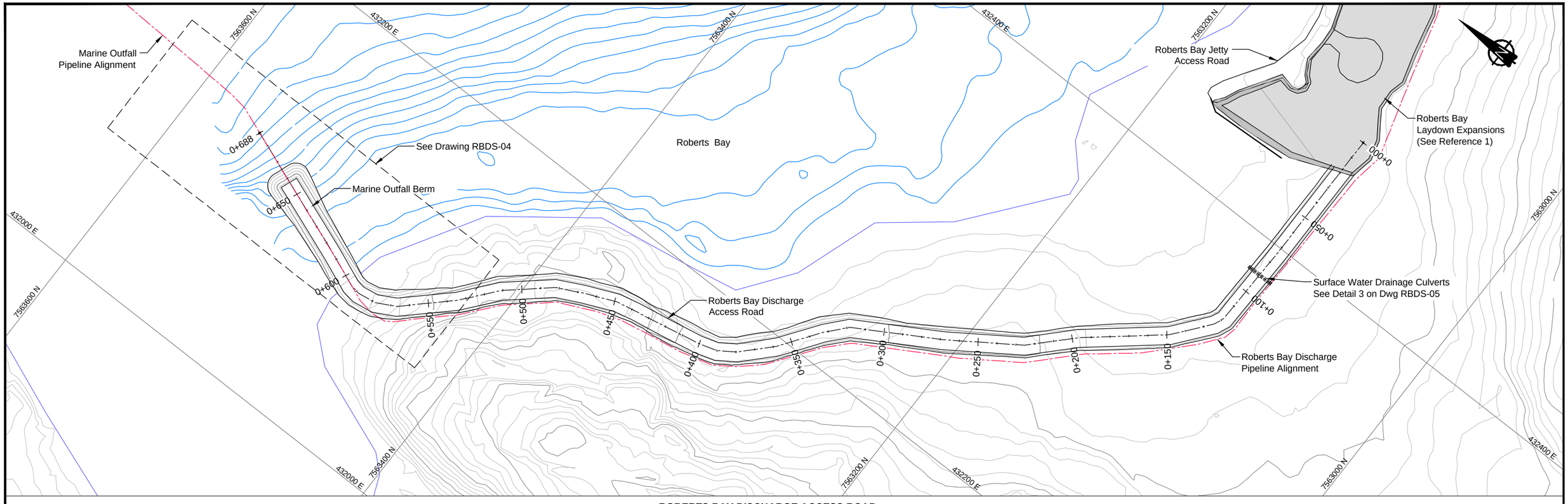

ROBERTS BAY DISCHARGE ACCESS ROAD AND MARINE OUTFALL BERM DESIGN

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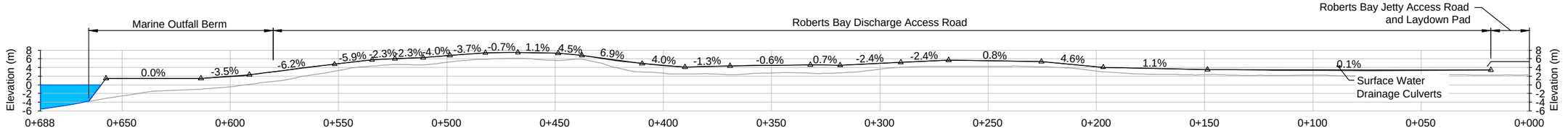
Scale in Metres



ROBERTS BAY DISCHARGE ACCESS ROAD AND MARINE OUTFALLL BERM PROFILE

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Horizontal Scale in Metres
Vertical Exaggeration X2

REFERENCE

1) SRK Consulting (Canada) Inc., 201 1. Engineering Drawings for the Roberts Bay Laydown Expansions, Doris North Project, Nunavut, Canada. Water License Amendment. Revision A. Issued for Discussion. Drawings prepared for Hope Bay Mining Limited. Project Number 1CH008.049. June 13, 2011

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
A	Issued for Discussion	LW	EMR	29May15

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DESIGN:	DRAWN:	REVIEWED:
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CHECKED: LW/EMR	APPROVED: EMR	DATE: May 2015

FILE NAME: 1CT022.002_RB Outfall.dwg

TMAC RESOURCES

HOPE BAY PROJECT

SRK JOB NO.: 1CT022.002.200.900

Roberts Bay Discharge System

DRAWING TITLE:
Roberts Bay Discharge Access Road and Marine Outfall Berm

DRAWING NO.	SHEET	REVISION NO.
RBDS-03	4 of 7	A

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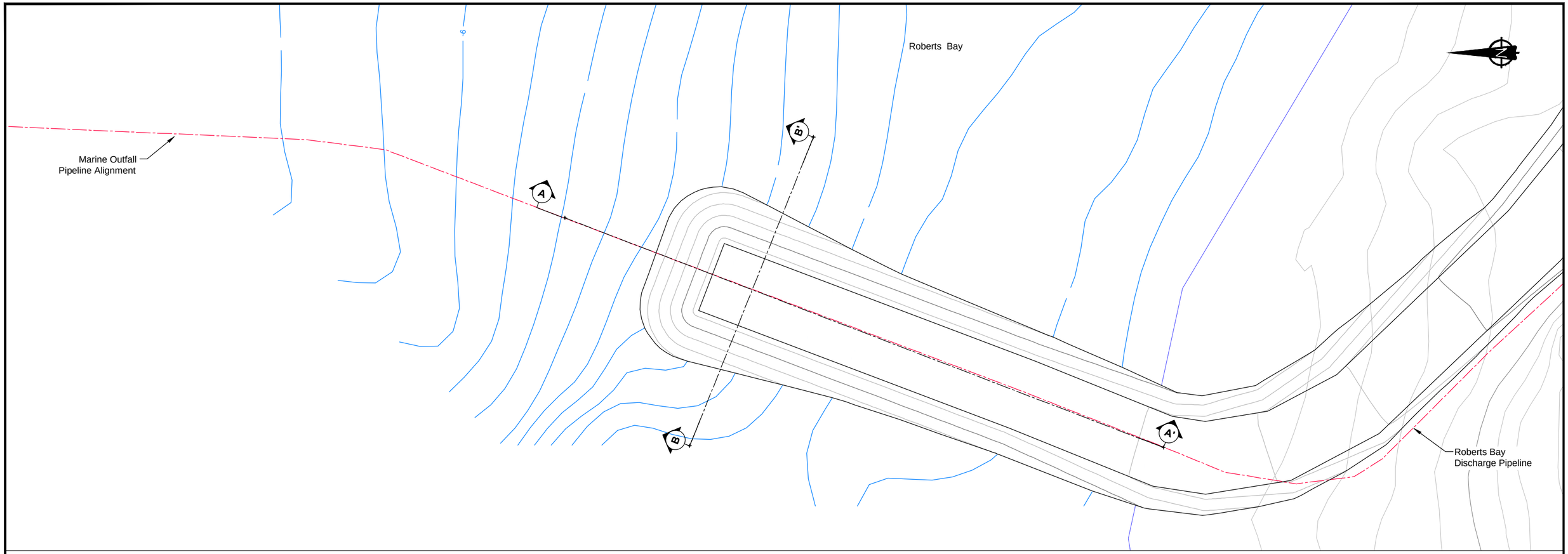
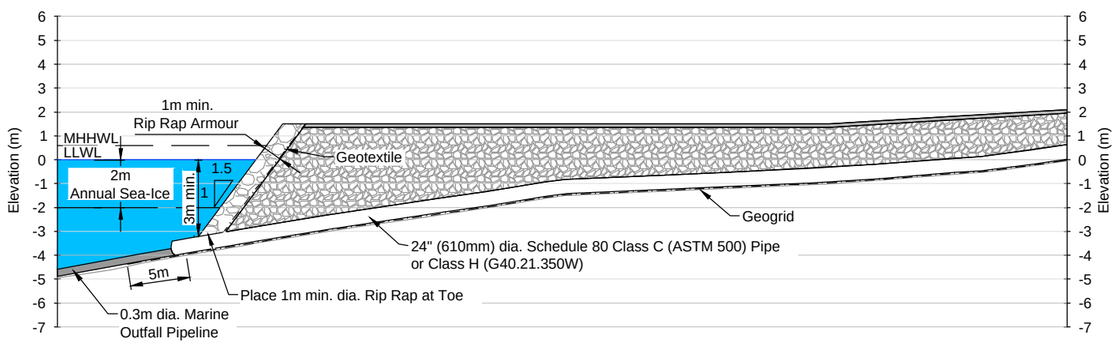


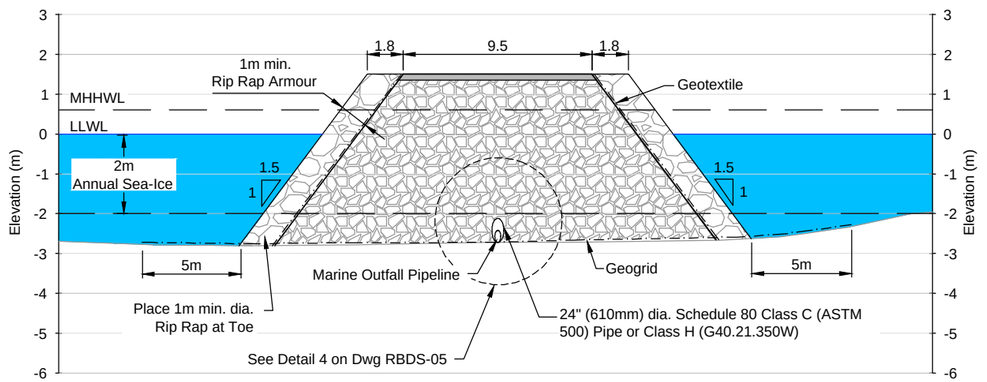
MARINE OUTFALL BERM DESIGN

0 2 4 6 8 10
Scale in Metres



A **SECTION A - A'**

0 2 4 6 8 10
Horizontal Scale in Metres
Vertical Exaggeration X2



B **SECTION B - B'**

0 1 2 3 4 5
Horizontal Scale in Metres
Vertical Exaggeration X2

LEGEND

- Surfacing Material
- Jetty Rip Rap Armour
- ROQ Material
- Geogrid

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
A	Issued for Discussion	LW	EMR	29May15

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FILE NAME: 1CT022.002_RB Outfall.dwg

TMAC RESOURCES

HOPE BAY PROJECT

SRK JOB NO.: 1CT022.002.200.900

Roberts Bay Discharge System

DRAWING TITLE:

Marine Outfall Berm Design
Plan and Profile

DRAWING NO.	SHEET	REVISION NO.
RBDS-04	5 of 7	A

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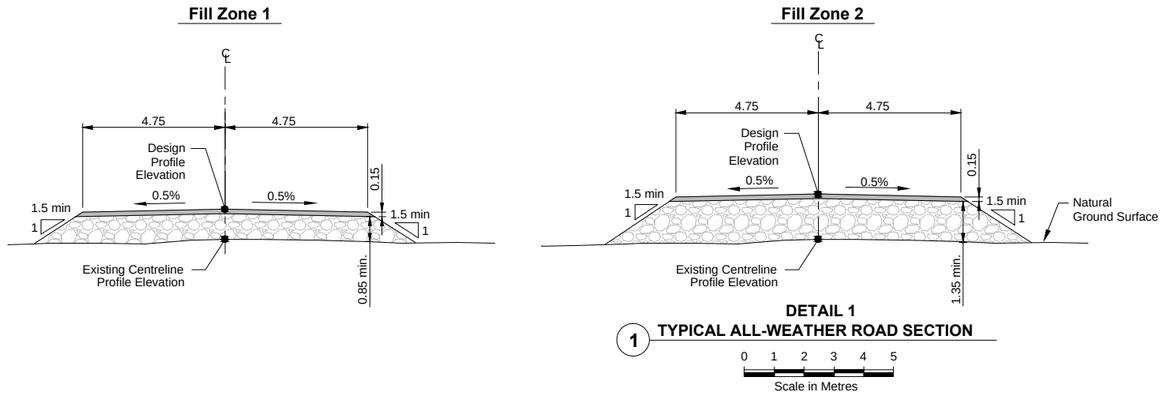
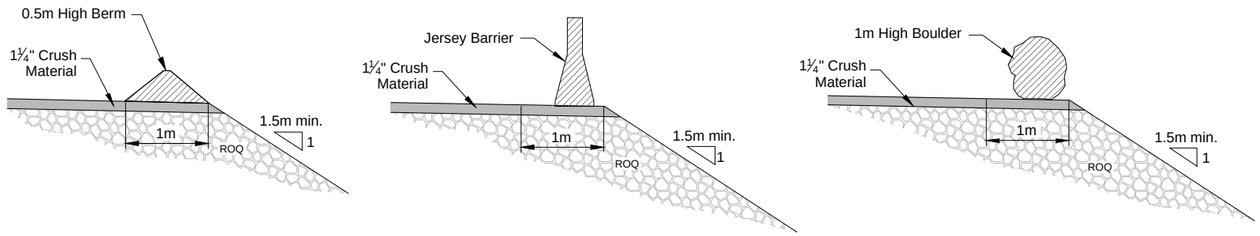


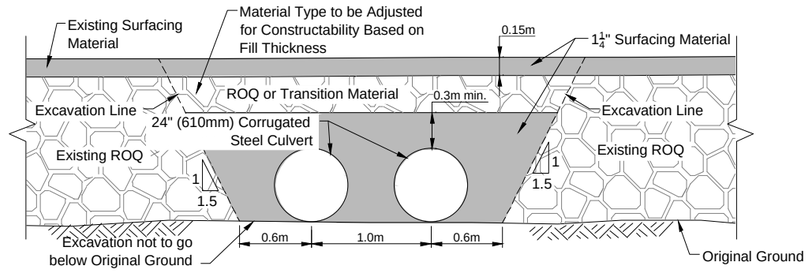
DETAIL 1
TYPICAL ALL-WEATHER ROAD SECTION
1

0 1 2 3 4 5
Scale in Metres



DETAIL 2
TYPICAL BERM BARRIER OPTIONS
2

NTS



DETAIL 3
TYPICAL CROSS SECTION OF CULVERT CROSSING
3

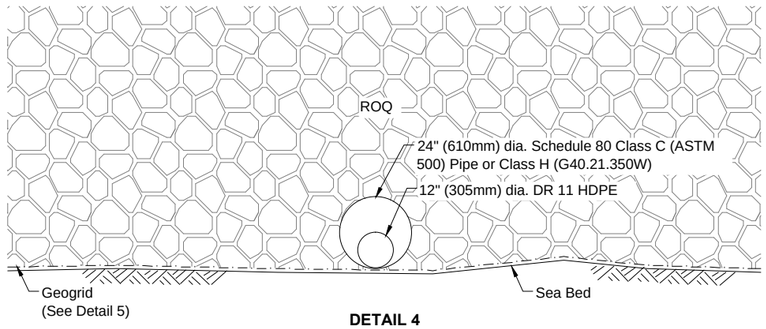
NOT TO SCALE

LEGEND

- Surfacing Material
- Run of Quarry Material

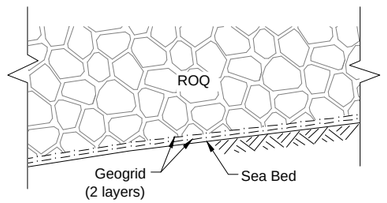
NOTES

1. All dimensions in metres unless noted otherwise.
2. Minimum design thickness must be maintained for all sections of the all-weather road including turnouts.
3. Locations for animal crossings will be identified by Land Owner and Elders once road construction is completed.
4. Notes in this drawing apply to all other active drawings.



DETAIL 4
TYPICAL CROSS SECTION OF CULVERT IN MARINE OUTFALL BERM
4

NOT TO SCALE



DETAIL 5
TYPICAL SECTION OF GEOGRID BENEATH MARINE OUTFALL BERM
5

NOT TO SCALE

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
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FILE NAME: 1CT022.002_RB Outfall details.dwg

TMAC RESOURCES

HOPE BAY PROJECT

SRK JOB NO.: 1CT022.002.200.900

Roberts Bay Discharge System

DRAWING TITLE: Typical Sections and Details

DRAWING NO.	SHEET	REVISION NO.
RBDS-05	6 OF 7	A

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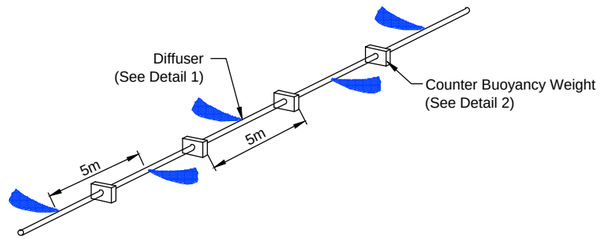

CONCEPTUAL VIEW OF DIFFUSER

not to scale

95m long diffuser with 20 horizontally discharging ports at 5m spacing

1 DIFFUSER DETAIL

0 0.1 0.2 0.3 0.4 0.5

Scale in Metres

20 counter buoyancy weights at 5m spacing placed along diffuser pipe

2 COUNTER BUOYANCY WEIGHT DETAIL

0 0.2 0.4 0.6 0.8 1

Scale in Metres

Materials List and Quantity Estimates

Item	Quantity / Area / Volume		Description
1. Run of Quarry Material		ROQ (cu.m.)	Approximate In-Place Neat-line Volume (3D volume based on Civil 3D surfaces - no allowance has been made for losses and/or tundra embedment)
	Roberts Bay Discharge Access Road	8,780	
	Marine Outfall Berm	2,960	
	Total	11,740	
2. Surface Grade Material		Surfacing Material (cu.m.)	Approximate In-Place Neat-line Volume
	Roberts Bay Discharge Access Road	820	
	Marine Outfall Berm	110	
	Total	930	
3. Rip Rap	Total	990 cu.m.	Based on Marine Outfall Berm Outer Surface 3D Area
4. Geogrid	Base of ROQ area	1,550 sq.m.	Based on Marine Outfall Berm Footprint
	5m extension beyond ROQ toe	940 sq.m.	
	Total	2,490 sq.m.	
5. Geotextile	Total	1,340 cu.m.	Based on Marine Outfall Berm Outer Surface 3D Area

Tolerances on Road Material Placement:

Location	Fill (mm)	Excavation (mm)
Vertical Tolerance on Roads	0 to +75	n/a
Horizontal Tolerance on Roads	-150 to +150	

Note: Grade shall not be uniformly high or low.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
A	Issued for Discussion	LW	EMR	29May15

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LW/EMR	EMR	May 2015

FILE NAME: 1CT022.002_RB Outfall.dwg

MAC RESOURCES

HOPE BAY PROJECT

SRK JOB NO.: 1CT022.002.200.900

Roberts Bay Discharge System

DRAWING TITLE:

Diffuser Details and Material Quantities

DRAWING NO.	SHEET	REVISION NO.
RBDS-06	7 of 7	A

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Package 6
Engineering and Design Documents

P6-8 Roberts Bay Discharge System: Pump and Pipe Requirements

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Memo

To:	John Roberts, TMAC	**Client:**	TMAC Resources Inc.
From:	Victor Muñoz S, MEng, PEng Lowell Wade, MSc, PEng	**Project No:**	1CT022.002.200.900
Reviewed By:	Maritz Rykaart, PhD, PEng	**Date:**	June 5, 2015
Subject:	Doris North Project: Roberts Bay Discharge System Pump and Pipeline Requirements		

1 Introduction

TMAC Resources Inc. (TMAC) have reviewed the disposal requirements of groundwater, from the Doris Mine and excess water from the Tailings Impoundment Area (TIA) for the Doris North Project (Project) in the Kitikmeot Region of Nunavut, Canada. This memo describes the pipe and pump requirements associated with the Roberts Bay Discharge System (SRK 2015), as illustrated on Figure 1.

2 Design Concept

Groundwater associated with the talik zones of Doris Mine will be pumped through a multiple stage pump and sump system, using an insulated pipeline to the Roberts Bay Outfall Discharge Mixing Box, located in, or immediately adjacent to the Mill Building on Pad D at the Doris North Camp. Excess water from the TIA, not required as reclaim water for mill processing will be combined with the pumped groundwater via the Roberts Bay Outfall Discharge Mixing Box, into an insulated pipeline, called the Roberts Bay Discharge Pipeline to Roberts Bay.

The Roberts Bay Discharge Pipeline will run from the Mill Building, adjacent to the east side of the Primary Road and the Airstrip. At the north end of the Airstrip, the Roberts Bay Discharge Pipeline will pass through the Primary Road via a culvert, and continue to follow the west side of the Primary Road out to the Roberts Bay Laydown Area. At the Roberts Bay Laydown Area, the pipeline will run in front of the Roberts Bay 20 Ml Fuel Tank Farm, along the south side of the Roberts Bay Jetty Access Road and Laydown Pads, to the Roberts Bay shoreline along the south side of the Roberts Bay Discharge Access Road. The Roberts Bay Discharge Pipeline will enter Roberts Bay through the Marine Outfall Berm, which extends from the shoreline to approximately the 4 m bathymetric contour. From the Marine Outfall Berm, the Marine Outfall Pipeline (known as “the Roberts Bay Discharge Pipeline” on land) will extend to the 40 m bathymetric contour and terminate at the Roberts Bay Marine Diffuser.

3 Design Criteria and Assumptions

Frictional losses in the pipelines were estimated using the Hazen-Williams expression, where the Hazen-Williams coefficient for roughness (C) was defined as 130 for the High Density Polyethylene (HDPE) pipe (Lindeburg 2012). The pipe material is HDPE PE4710 with maximum and minimum pressure ranges between DR 7.3 (320 psi) and DR 11 (202 psi).

The sum of all singular losses is equal to 10, which includes all the bends and check valves for each section of the pipeline system, represented as a blue arrow in Figure 1.

A typical pump system efficiency of 70% was assumed, with 20% being energy losses for transmission of energy within the pump's motor.

The minimum head requirement for the pump sizing was based on two conditions:

- A minimum Energy Grade Line (EGL) of 10 m above the highest elevation along the pipeline route. Given the length of the Roberts Bay Discharge Pipeline, this pipeline was evaluated as two separate sections to determine if an interim pump was required. This check point was located at the geographical maximum elevation of 60 m (masl) which is 1,550 m from the Mill, and 4,090 m from the Marine Outfall Berm as illustrated on Figures 1 and 2. The total length of the Roberts Bay Discharge Pipeline is therefore 1,550 + 4,090 = 5,640 m.
- A minimum EGL of a 10 m above Mean Annual Sea Level (masl) at the Marine Outfall Berm.

This design assumes full pipeline capacity without consideration for sediment accumulation, air containment, or air release valves.

3.1 TIA Pipeline

The pipeline from the TIA Reclaim Pond, which will be used to transfer excess TIA water to Roberts Bay, via the Roberts Bay Outfall Discharge Mixing Box, will extend for 2,150 m to the Mill Building, located on Pad D at Doris North Camp. The maximum pumping rate for excess TIA water will be 4,000 m³/day. The pump system will be located on a barge in the TIA, which for calculation purposes has been set at the lowest elevation water will generally be drawn down to of 28.3 m.

Normal TIA reclaim water from the TIA, required for mill processing will be a dedicated separate TIA Reclaim Pipeline (although the barge will be shared), and does not form part of the TIA Pipeline system as described herein.

3.2 Doris Mine Pipeline

Within Doris Mine, groundwater will be pumped through a multiple stage pump and sump system, using an insulated pipeline which will be based on the underground development and groundwater inflows encountered. For this design, a 500 m length HDPE pipeline was assumed.

The actual Doris Mine multiple stage pump and sump underground system assumes a maximum elevation of 260 m below masl. The primary sump will have the capacity to retain 6 hours of groundwater inflow, with a peak flow rate of 3,000 m³/day.

3.3 Roberts Bay Discharge and Marine Outfall Pipelines

The pipelines, from the TIA and Doris Mine, will be combined at the Roberts Bay Outfall Discharge Mixing Box at the Mill Building, located on Pad D at Doris North Camp. The TIA and Doris Mine pipelines will be pressurized when they connect to the 5,640 m long Roberts Bay Discharge Pipeline and the 2,300 m long Marine Outfall Pipeline. The design, of the Roberts Bay Discharge System considered three flow scenarios as described in Table 1.

Table 1: Synthesis of the Design Flow for the Roberts Bay Discharge System.

Case	Description	Flow (m³/d)	Flow (l/s)	Flow (gpm)
1	Only the pipeline from the TIA is in operation	4,000	46	733
2	Only the pipeline from Doris Mine is in operation	3,000	35	550
3	Both the TIA and Doris Mine pipelines are in operation	7,000	81	1,284

4 Design Results

The TIA Pipeline will require at least two 250 HP pumps with hydraulic head requirements between 86 m and 210 m.

Within Doris Mine, the multiple stage pump and sump system will require a minimum of 8 pump and sump elements. The combined pump power demand is 400 HP and the total hydraulic head will range between 346 m and 476 m. The primary sump will have a minimum capacity of 750 m³, which corresponds to a six hour dewatering time, based on the peak daily inflow rate of 3,000 m³/day.

Figure 2 shows the individual pump and pipeline requirements for the Roberts Bay Discharge System.

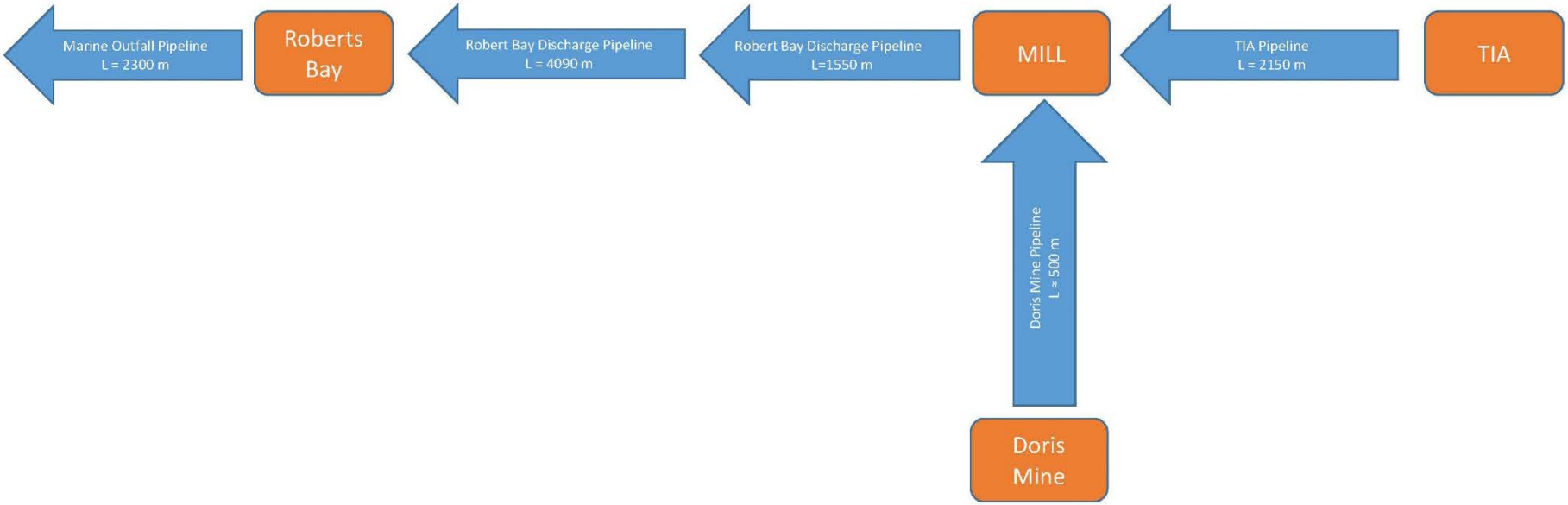
The Roberts Bay Discharge System is a pressurized hydraulic system, with fluid velocities ranging between 1.0 m/s and 2.4 m/s.

5 References

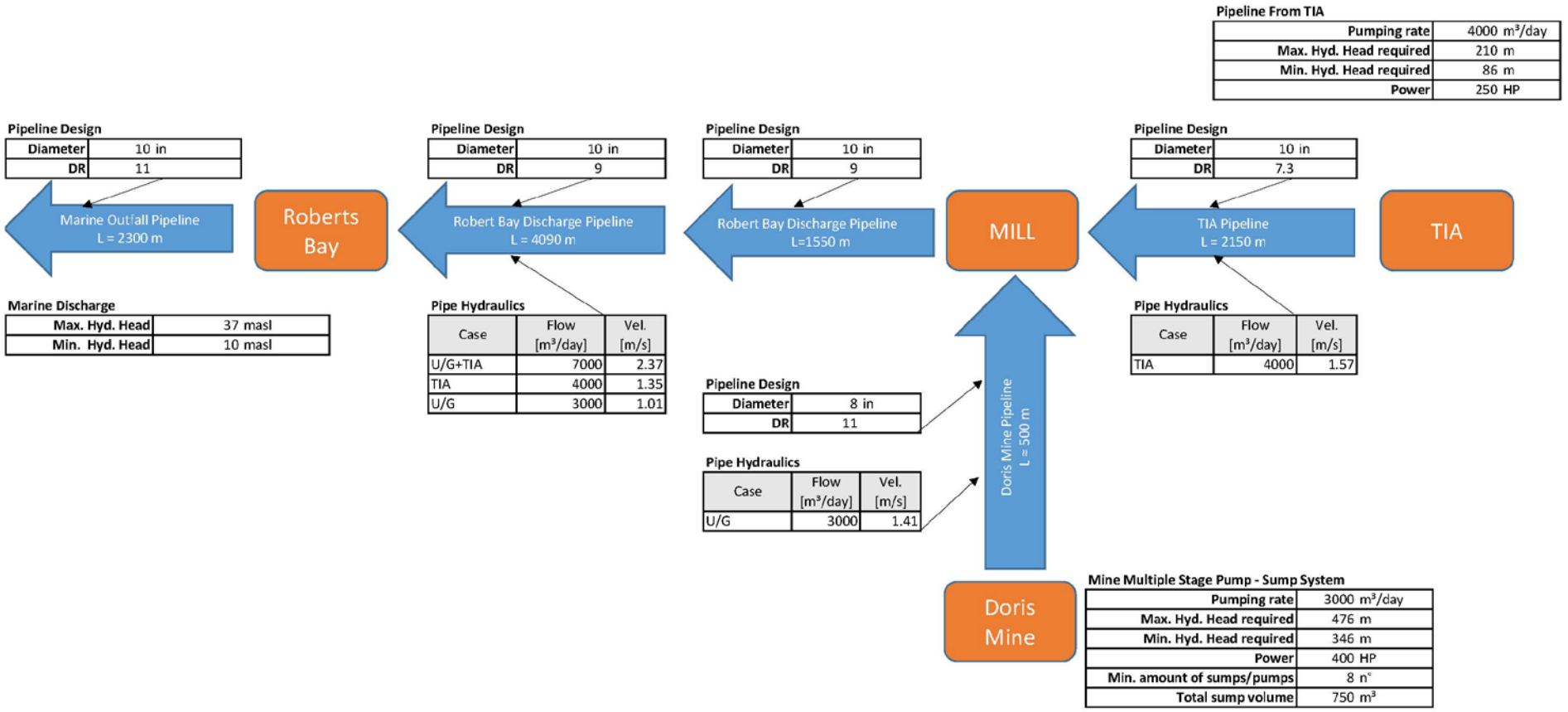
Lindeburg, M., 2012. Civil Engineering Reference Manual for the PE Exam. Belmont, CA: Professional Publications Inc. (PPI).

SRK Consulting (Canada) Inc., 2015. Doris North Project: Roberts Bay Discharge System Surface Infrastructure Design Brief. Project Number: 1CT022.002.200.900. May 2015.

Figures



srk consulting	MAC RESOURCES	ROBERT BAY DISCHARGE SYSTEM
		PIPELINE SCHEMATIC
Job No: 1CT022.002 Filename: Figures_1-2_1CT022-002-200-900_20150529	DORIS NORTH PROJECT	Date: May 29, 2015 / Approved: VM / Figure: **1**



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MAC RESOURCES

ROBERT BAY DISCHARGE SYSTEM

PIPE AND PUMP SIZING

Job No: 1CT022.002

Filename Figures_1-2_1CT022-002-200-900_20150529

DORIS NORTH PROJECT

Date: May 29. 2015 | Approved: VM | Figure: **2**

Package 6
Engineering and Design Documents

P6-9 Roberts Bay Expanded Laydown Pads

TMAC RESOURCES

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Memo

To:	John Roberts, TMAC	**Client:**	TMAC Resources Inc.
From:	Lowell Wade, SRK Maritz Rykaart, SRK	**Project No:**	1CT022.002.200.1300
Cc:		**Date:**	May 29, 2015
Subject:	Doris North Project: Roberts Bay Laydown Expansion Design Brief		

1 Introduction

TMAC Resources Inc. (TMAC) is currently in the process of constructing their Doris North Project (Project) in the Kitikmeot region of Nunavut, Canada. Concurrent with this TMAC recognizes that to expand the Project additional general laydown and staging areas at Roberts Bay are required to facilitate safer and more efficient annual sealift operations.

The Roberts Bay Laydown Expansion would consist of expanding existing infrastructure roads and pads at Roberts Bay in three areas (to the southwest, southeast and to the west of the main laydown area). Due to the terrain conditions, and to ensure maximum functionality, the proposed new pads will be constructed as tiered rock fill pads directly on the tundra. The pads will be graded and aligned to facilitate proper water management.

This memo describes the design details of the infrastructure associated with the Roberts Bay Laydown Expansion. This memo should be read in conjunction with the attached Issued for Discussion (IFD) engineering drawings (Attachment 1).

2 Design Concept

The Roberts Bay Laydown Expansion is made up of three additional rock fill pads in the Roberts Bay area, designated as the Southwest, Southeast and West Laydown Expansion. The width of each pad shall be maintained at a minimum of 25m to ensure functionality. Maximum fill thickness was limited to approximately 5 m, while minimum fill thickness was maintained at 1 m to ensure thermal protection of the permafrost foundation.

Access to the Laydown Expansion Pads will be gained from the Primary Road for the Southwest and Southeast Laydown Expansions and will be gained from the Beach Laydown Area (south of the Roberts Bay Jetty) for the West Laydown Expansion.

3 Expanded Laydown Alternatives

Two options were considered for the design of the Roberts Bay Southeast and Southwest Laydown Expansion:

- Sloped Southeast and Southwest Laydown Expansion. This option is a design based on the existing ore stockpile pad (Pad Q) and the current waste rock pile (Pad I), wherein the pad is designed on the basis that immediately overlaying the tundra, there will be a continuous 1 m thick layer of geochemically acceptable material, upon which the ore and/or waste rock can be stockpiled. Access to the sloped expanded laydown pad will be from along the Primary Road.

  This option was not selected as the sloped pad would not provide a suitable surface for handling as well as short or long term storage of materials and supplies due to the sloping ground conditions.

- Tiered Southeast and Southwest Laydown Expansion. This option maximizes the usable surface area within the footprint of the expanded laydown area. This will result in constructing the Southeast and Southwest Laydown Expansions as tiered structures, each with 3 tiers at 24.0, 19.0 and 16.0 m above sea level. The width of each tier shall be maintained a minimum of 25 m for practical reasons. Maximum fill thickness was limited to approximately 5 m, while minimum fill thickness was maintained at 1 m to ensure thermal protection of the foundation (SRK 2006). Access to the various tiers of the Southeast and Southwest Laydown Expansions will be along the Primary Road (SRK, 2011a).

  This option was selected as the preferred option as it maximizes the useable level surface area for material handling and laydown storage within the Roberts Bay Laydown Area.

4 System Design

The design of the rock fill pads for Roberts Bay Laydown Expansion are consistent with all other rock fill pads around the Project.

4.1 Design Criteria

The design criteria for the rock fill pads that make-up the Roberts Bay Laydown Expansion are as follows:

- No cut is allowed, except in designated rock quarries;
- Minimum 1 m fill thickness must be maintained;
- Wherever practical, maintain a maximum pad fill thickness of 5m;

- The maximum particle size for ROQ is 500 mm for fill thickness of 850 mm, and 900 mm for fill thickness exceeding 850 mm. This will be overlain by a 0.15 m surfacing material. All material shall be free from organic matter, soil, snow and ice;
- 1.5H:1.0V slopes are utilized with fill thickness less than 2 m;
- 2.0H:1.0V slopes are utilized with fill thickness greater than 2 m;
- Width of each of the pad tied shall be a minimum of 25m;
- Each tier shall be constructed with a general drainage gradient of 0.5% directed towards the tundra;
- Ramp grades shall not exceed 10%;
- Ramps shall have a minimum width of 8m and turning radius of 12 m;
- Ensure a minimum setback of 31 m from any water bodies;
- Manage surface water run-off so areas of ponding are not created along the edges of the pads, and water is shed from the surface of the pads; and
- Safety barricades (oversize ROQ boulders larger than 1 m diameter, Jersey Barriers, or berms) are to be placed along the crest where fill thicknesses are greater than 3 m.

4.2 Design

The ROQ fill of the pad, for the Southwest and Southeast Laydown Expansions, will be placed and shaped such that three benches will be created at the following elevations: 24.0, 19.0 and 16.0 m above sea level on either side of the Primary Road. The base areas of the Southwest and Southeast Laydown Expansions are 17,940 m^2 and 23,450 m^2, respectively. The West Laydown Expansion will be at a single elevation of 4.0 m with a base area of 9,100 m^2.

4.3 Survey Data

The design of the laydown expansions is based on 2010 Roberts Bay Laydown Area as-built information received from Nuna Logistics (SRK 2011a) and a topographic contour set provided by Hope Bay Mining Limited, based on 2007 aerial photography. Contour intervals shown are typically 1 m.

4.4 Foundation Conditions

Comprehensive geotechnical investigations have been carried out at the Hope Bay Site (SRK 2009). This information confirms that the area lies within the zone of continuous permafrost, with the permafrost being up to 550 m deep. Permafrost temperature at the surface is about -8ºC and the active layer is generally less than 1 m thick. Laboratory and in-situ tests on disturbed and undisturbed samples indicate that the overburden soils are predominantly comprised of marine silts and clays, and the pore-water in these soils has high salinity,

depressing the freezing point to -2ºC. The ice-rich overburden soils are typically between 5 and 20 m deep, before encountering competent bedrock, predominantly basalt. Bedrock is frequently exposed, rising columnar 5 to 100 m above the surrounding landscape.

Thermal modelling has determined that a 1 m minimum of rock fill cover would be required over the tundra to preserve the permafrost under the infrastructure pads (SRK 2006). Since all pads are designed to have a flat surface with minor grading for drainage, the ROQ fill thickness reaches up to 5 m at places due to underlying topography.

The geotechnical design parameters for Hope Bay have been summarized in SRK (2011b).

5 Construction Methodology

The laydown expansions will be constructed with ROQ material excavated from the permitted and approved Quarry #2. SRK (2007) discusses the complete details pertaining to geochemical characterization of these rock quarries confirming their suitability for use in construction. The management and monitoring of quarry development for the construction of the infrastructure pads and access roads is discussed in SRK (2014).

Surface grade material for the Roberts Bay Laydown Expansion will be from Quarry #2 and the crusher located in Quarry #2. Complete material quantities are included in Attachment 1.

The Roberts Bay Laydown Expansion will be constructed in accordance to SRK's Technical Specifications (SRK 2011c).

6 References

SRK Consulting (Canada) Inc., 2006. Doris North Project – Thermal modeling to support design thickness for granular pads. Technical Memorandum, Prepared for Miramar Hope Bay Limited, Project Number: 1CM014.008, August 20, 2006.

SRK Consulting (Canada) Inc., 2007. Geochemical Characterization of Quarry Materials, Doris North Project. Hope Bay, Nunavut, Canada (Revised March 2007). Report Prepared for Miramar Hope Bay Limited, Project Number 1CM014.008.241. March 2007.

SRK Consulting (Canada) Inc., 2009. Hope Bay Gold Project: Stage 2 Overburden Characterization Report, Prepared for Hope Bay Mining Limited, Project Number: 1CH008.002, September 2009.

SRK Consulting (Canada) Inc., 2011a. Engineering Drawings for the Roberts Bay Laydown Area, Doris North Project, Nunavut, Canada. Revision AB. As-Built Drawings Prepared for Hope Bay Mining Limited. Project Number 1CH008.027/033. December 16, 2011.

SRK Consulting (Canada) Inc., 2011b. Hope Bay Project – Geotechnical Design Parameters. Revision 0. Report Prepared for Hope Bay Mining Limited. Project Number: 1CH008.033.216. October 2011.

SRK Consulting (Canada) Inc., 2011c. Technical Specifications Earthworks and Geotechnical Engineering. Hope Bay Project, Nunavut, Canada. Revision G – Issued for Construction. Report Prepared for Hope Bay Mining Ltd. Project Number: 1CH008.027. March 2011.

SRK Consulting (Canada) Inc., 2014. Hope Bay Project Quarry Management and Monitoring Plan – Revision 02. Report prepared for TMAC Resources Inc. Project Number: 1CT022.001. December 2014.

Attachment 1

Engineering Drawings for the Roberts Bay Laydown Expansions

Engineering Drawings for the Roberts Bay Laydown Expansions, Doris North Project, Nunavut, Canada

ACTIVE DRAWING STATUS

SRK DWG NUMBER	DRAWING TITLE	REV.	DATE	STATUS
RB-LE-00	Engineering Drawings for the Roberts Bay Laydown Expansions	B	May 29, 2015	Issued for Discussion
RB-LE-01	Roberts Bay Laydown Expansions General Arrangement	B	May 29, 2015	Issued for Discussion
RB-LE-02	Roberts Bay Laydown Expansions Sections (1 of 2)	B	May 29, 2015	Issued for Discussion
RB-LE-03	Roberts Bay Laydown Expansions Sections (2 of 2)	B	May 29, 2015	Issued for Discussion
RB-LE-04	Material Specifications and Quantities	B	May 29, 2015	Issued for Discussion

TMAC RESOURCES

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PROJECT NO: 1CT022.002.200.1300
ISSUED FOR DISCUSSION
Revision B
May 29, 2015
RB-LE-00

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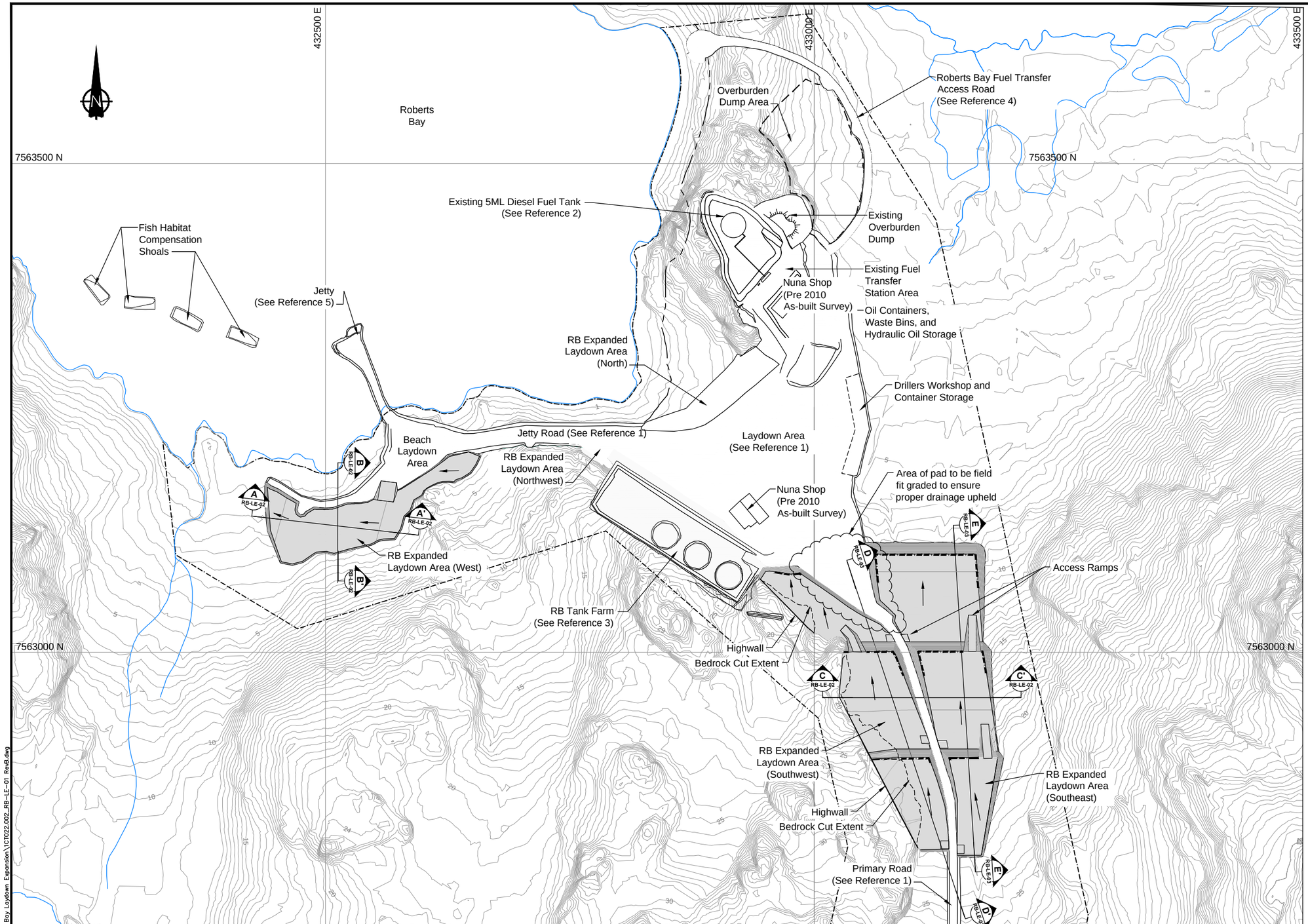

LEGEND

- New Infrastructure
- Commercial Lease Boundary
- Shoreline Setback
- Safety Berm (See Detail 1 on Dwg RB-LE-02)
- Pad Grading Direction (at 0.5%)

NOTES

1. The designs are based on the contour information shown on these drawings. It is however the Contractor's responsibility to confirm that the contours are a fair reflection of the ground levels in the vicinity of the works, and to advise the Construction Manager and Engineer of any differences.
2. The co-ordinate system is UTM NAD 83, Zone 13.
3. All dimensions are in metric units, unless specifically mentioned.
4. All drawings are scaled appropriately for D-Size construction drawings. Scales may not be correct if these drawings are reproduced and presented in any other size format.
5. The Engineer will provide the Construction Manager and Contractor with digital design files for setting out the works. The Engineer will instruct the Contractor to survey random spot checks to confirm whether the works have been set out correct.
6. Construction shall be in accordance with the following Technical Specifications: Earthworks and Geotechnical Engineering, Hope Bay project, Nunavut, Canada, Revision G -Issue for Construction.
7. Notes in this drawing apply to all other active drawings.

REFERENCES

1. SRK Consulting (Canada) Inc., 2011. Engineering Drawings for the Roberts Bay Laydown Area, Doris North Project, Nunavut, Canada. Revision AB. As-Built Drawings prepared for Hope Bay Mining Limited. Project Number 1CH008.027/033. December 16, 2011
2. SRK Consulting (Canada) Inc., 2011. Engineering Drawings for the Roberts Bay Quarry and Fuel Tank Farm, Doris North Project, Nunavut, Canada. Revision 2. Issued for Construction. Drawings prepared for Hope Bay Mining Limited. Project Number 1CH008.033. December 2, 2011
3. SRK Consulting (Canada) Inc., 2012. Engineering Drawings for the Roberts Bay Fuel Tank Farm, Doris North Project, Nunavut, Canada. Revision AB. As-Built Drawings prepared for Hope Bay Mining Limited. Project Number 1CH008.058. April 16, 2012
4. SRK Consulting (Canada) Inc., 2012. Engineering Drawings for the Roberts Bay Fuel Transfer Road, Doris North Project, Nunavut, Canada. Revision AB. As-Built Drawings prepared for Hope Bay Mining Limited. Project Number 1CH008.033. May 4, 2012
5. SRK Consulting (Canada) Inc., 2014. Doris North Project, 2014 Annual Roberts Bay Jetty Inspection. Technical Memorandum. Prepared for TMAC Resources Inc. Project Number 1CT022.001.130. December 22, 2014

0 20 40 60 80 100
Scale in Metres

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	Issued for Discussion	LW	EMR	29May15
A	Issued for Discussion	JBK	EMR	13Jun11

REVISIONS

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PROFESSIONAL ENGINEER'S STAMP

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DESIGN:	DRAWN:	REVIEWED:
JBK	NV	LW
CHECKED:	APPROVED:	DATE:
LW	EMR	May 29, 2015

FILE NAME: 1CT022.002_RB-LE-01 RevB.dwg

TMAC RESOURCES

HOPE BAY PROJECT

SRK JOB NO.: 1CT022.002.200.1300

Roberts Bay Laydown

DRAWING TITLE:

Roberts Bay Laydown Expansions
General Arrangement

SRK DWG NO.:	SHEET	REVISION NO.
RB-LE-01	2 OF 5	B

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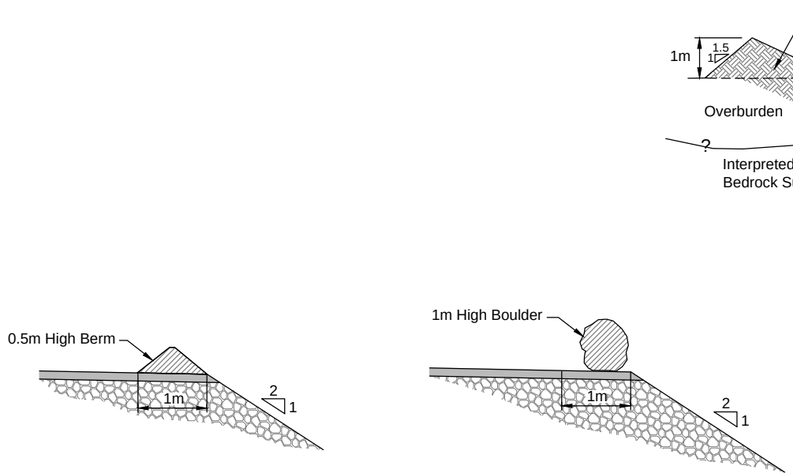

DETAIL 1
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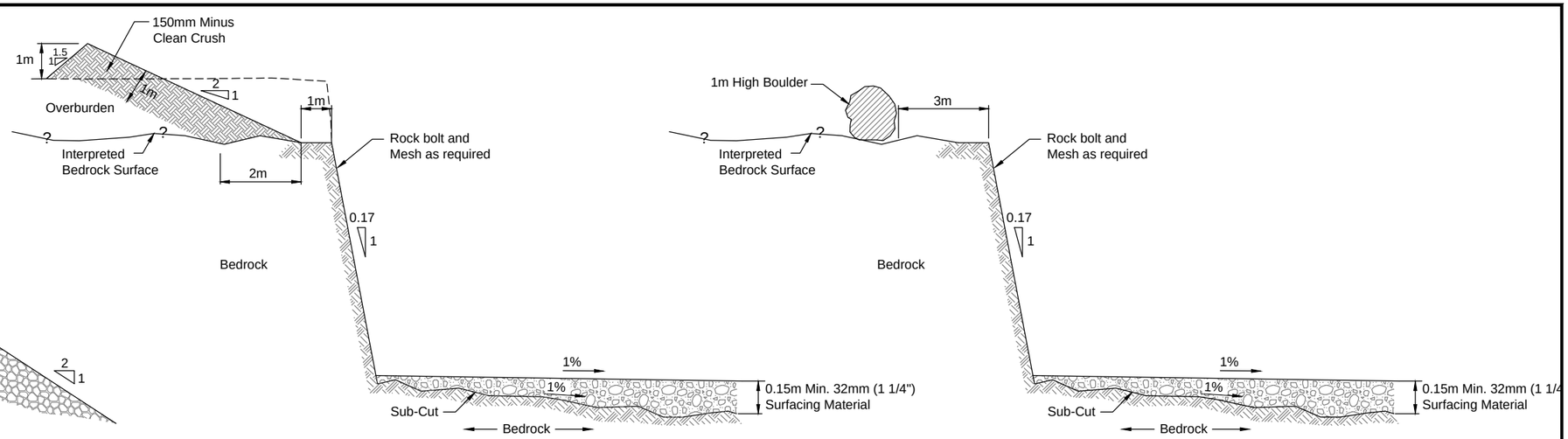
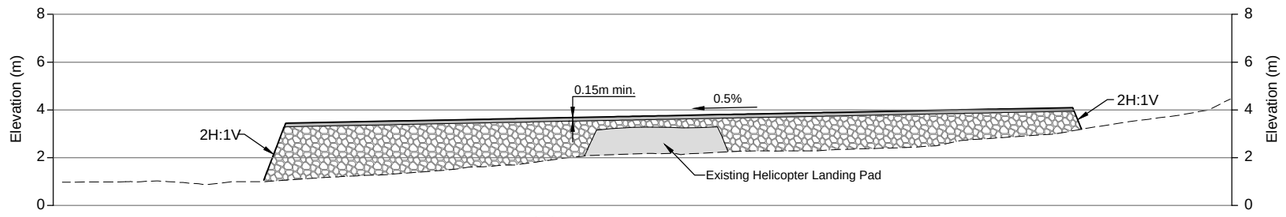
NTS

1 RB-LE-03

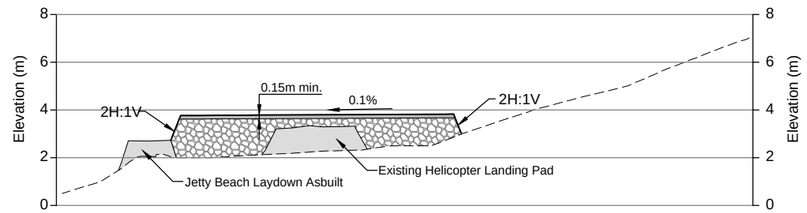


DETAIL 2
TYPICAL SECTIONS OF HIGHWALL SAFETY BERM/BARRIER
NTS

2 -



A RB-LE-01 **SECTION A - A'**



B RB-LE-01 **SECTION B - B'**

LEGEND

- Original Ground
- Surfacing Material
- Run of Quarry Material
- Existing Roberts Bay Infrastructure

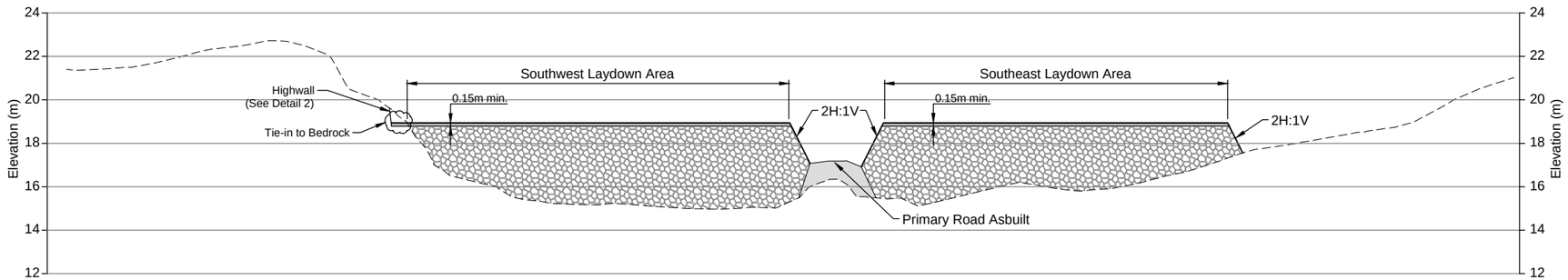
NOTES

1. All dimensions in metres unless noted otherwise.
2. Where the thickness of the pads is greater than 3.0m allow for the placement of barriers.
3. The barriers are to consist of boulders larger than 1m in diameter, or a rock fill berm 0.5m high. Maximum spacing between boulders is 3.3m.
4. Notes in this drawing apply to all other active drawings.

0 5 10 15 20 25 Scale in Metres (Horizontal)

0 1 2 3 4 5 Scale in Metres (Vertical)

4X VERTICAL EXAGGERATION



C RB-LE-01 **SECTION C - C'**

NO.	DESCRIPTION	CHK'D	APP'D	DATE
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A	Issued for Discussion	JBK	EMR	13Jun11

REVISIONS

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CHECKED:	APPROVED:	DATE:
LW	EMR	May 29, 2015

FILE NAME: 1CT022.002_RB-LE-02_03 RevB.dwg

MAC RESOURCES

HOPE BAY PROJECT

SRK JOB NO.: 1CT022.002.200.1300

Roberts Bay Laydown

DRAWING TITLE:
Roberts Bay Laydown Expansions
Sections (1 of 2)

SRK DWG NO.:	SHEET	REVISION NO.
RB-LE-02	3 OF 5	B

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