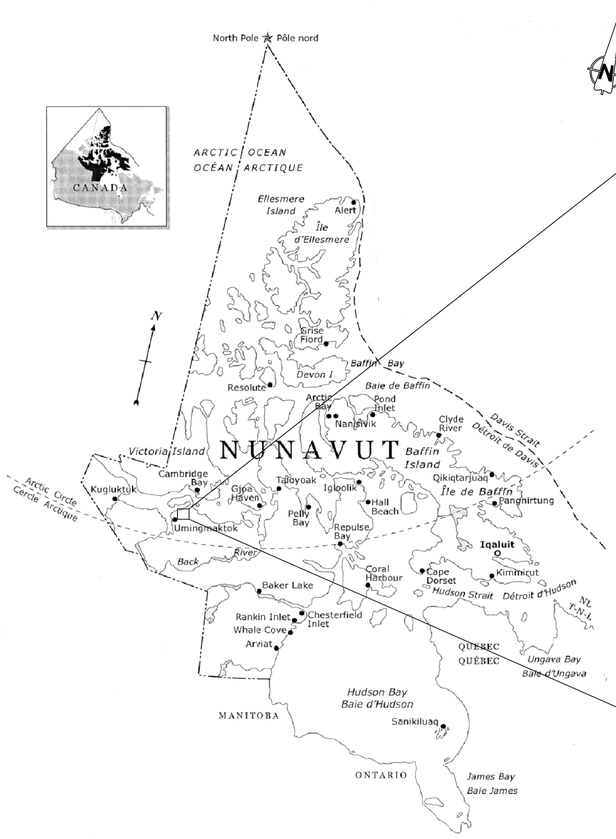
Engineering Drawings for Tailings Containment Area and Surface Infrastructure Components, Doris North Project, Nunavut, Canada

MIRAMAR HOPE BAY LTD.

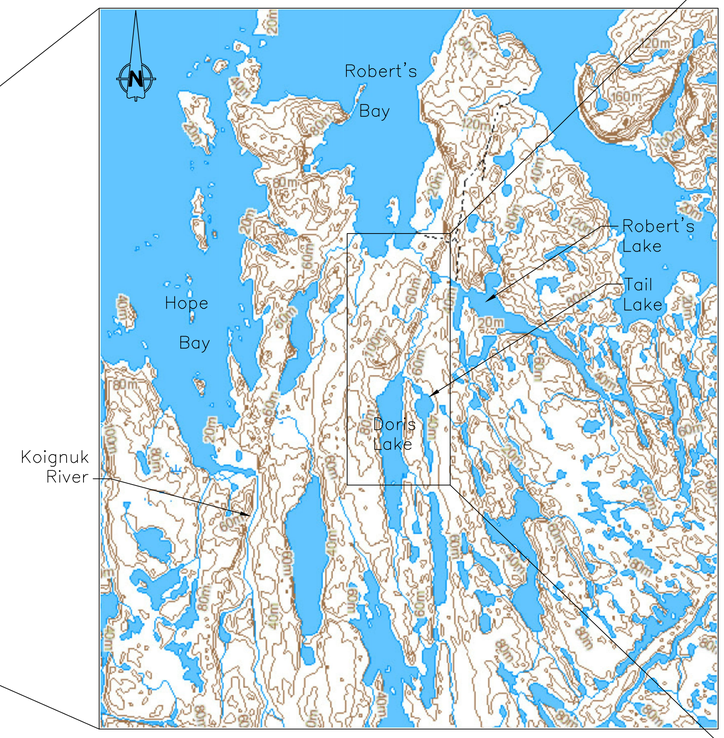
SRK Consulting
Engineers and Scientists
Vancouver

ROJECT NO: 1CM014.008
DRAWINGS ISSUED FOR WATER LICENCE APPLICATION
Revision **B** – Water License Application
March



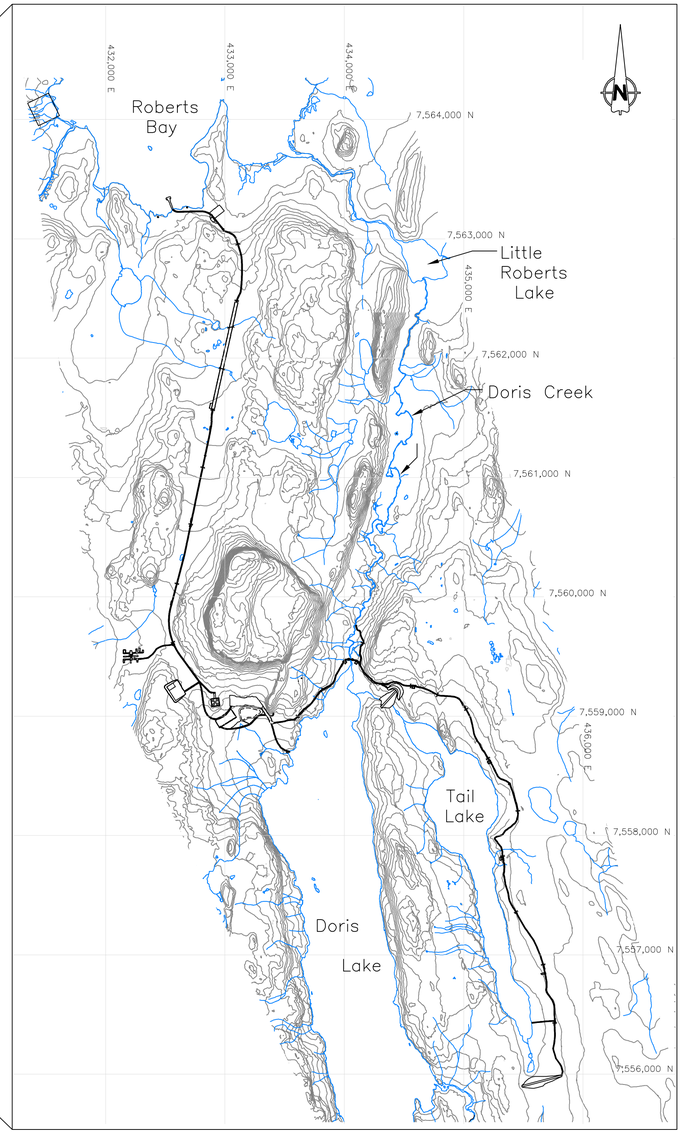
TERRITORIAL LOCATION

Approx. Scale 0 500 1000 Km



REGIONAL LOCATION

1:50000 0 1 2 3 4 5 Km



SITE LOCATION

1:25000 0 500 1000 1500 2000 2500 Metres

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

SRK Consulting Engineers and Scientists Vancouver

DESIGN: AT	DRAWN: JJH	REVIEWED: EMR
CHECKED: AT	APPROVED: EMR	DATE: Mar. 2007

FILE NAME: PROJECT_LOCATION.dwg

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DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

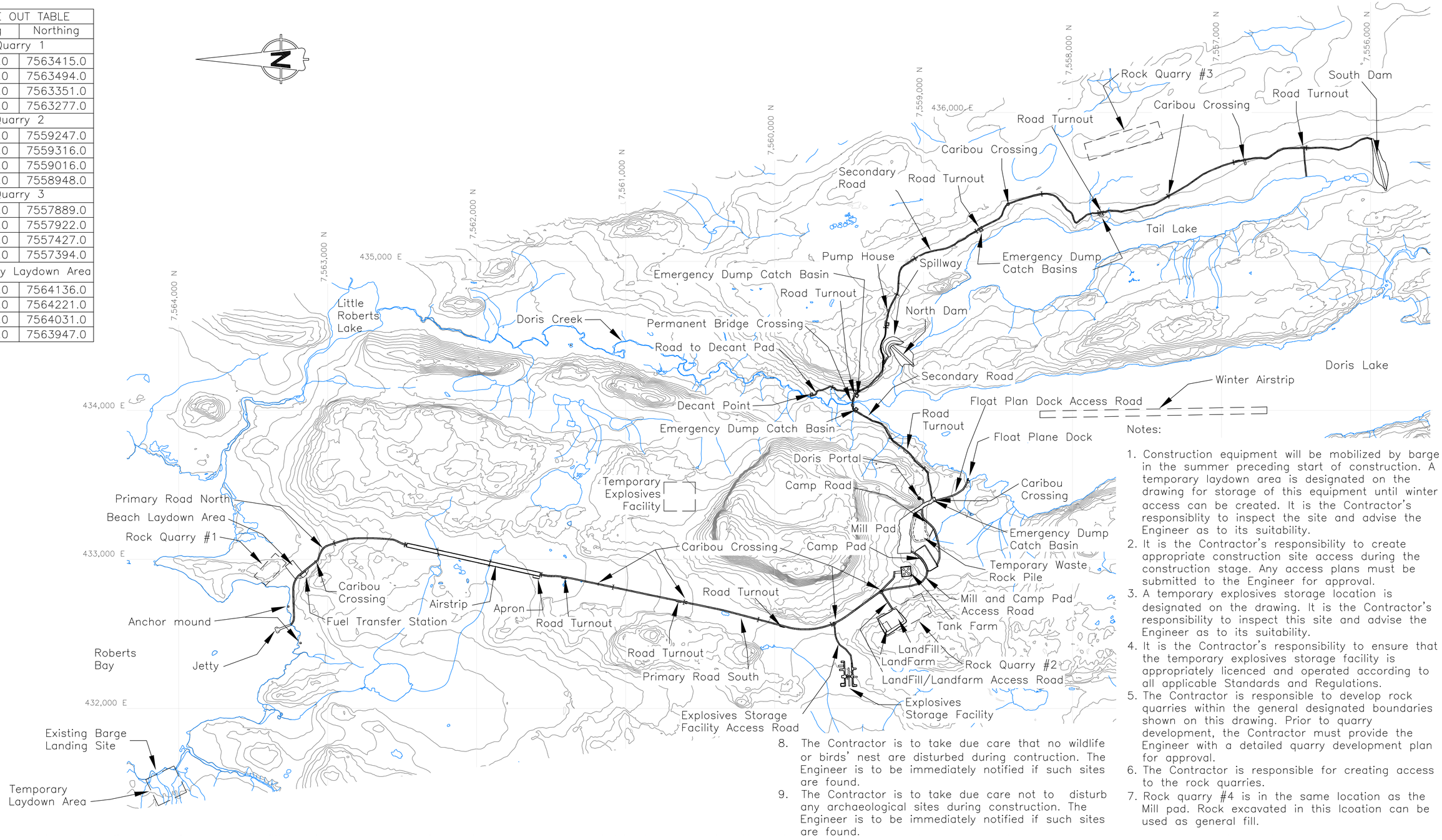
Doris North Project

DRAWING TITLE:

Location Plan

DRAWING NO.	SHEET	REVISION NO.
G-01	1 OF 49	B

STAKE OUT TABLE	
Easting	Northing
Quarry 1	
432825.0	7563415.0
432887.0	7563494.0
433040.0	7563351.0
432975.0	7563277.0
Quarry 2	
432482.0	7559247.0
432612.0	7559316.0
432772.0	7559016.0
432642.0	7558948.0
Quarry 3	
435680.0	7557889.0
435791.0	7557922.0
435939.0	7557427.0
435828.0	7557394.0
Temporary Laydown Area	
431346.0	7564136.0
431522.0	7564221.0
431613.0	7564031.0
431437.0	7563947.0



Notes:

1. Construction equipment will be mobilized by barge in the summer preceding start of construction. A temporary laydown area is designated on the drawing for storage of this equipment until winter access can be created. It is the Contractor's responsiblity to inspect the site and advise the Engineer as to its suitability.
2. It is the Contractor's responsibility to create appropriate construction site access during the construction stage. Any access plans must be submitted to the Engineer for approval.
3. A temporary explosives storage location is designated on the drawing. It is the Contractor's responsibility to inspect this site and advise the Engineer as to its suitability.
4. It is the Contractor's responsibility to ensure that the temporary explosives storage facility is appropriately licenced and operated according to all applicable Standards and Regulations.
5. The Contractor is responsible to develop rock quarries within the general designated boundaries shown on this drawing. Prior to quarry development, the Contractor must provide the Engineer with a detailed quarry development plan for approval.
6. The Contractor is responsible for creating access to the rock quarries.
7. Rock quarry #4 is in the same location as the Mill pad. Rock excavated in this lcoation can be used as general fill.
8. The Contractor is to take due care that no wildlife or birds' nest are disturbed during contruction. The Engineer is to be immediately notified if such sites are found.
9. The Contractor is to take due care not to disturb any archaeological sites during construction. The Engineer is to be immediately notified if such sites are found.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

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A	WATER LICENCE APPLICATION			

REVISIONS

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PROFESSIONAL ENGINEERS STAMP

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Engineers and Scientists
Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: PLAN VIEW.dwg

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DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
General Arrangement

DRAWING NO.	SHEET	REVISION NO.
G-02	2 OF 49	B

List of Drawings

Drg. No.	Drawing Title
G–01	Location Plan
G–02	General Arrangement
G–03	Index
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G–05	Construction Material Specifications
J–01	Jetty Plan
J–02	Jetty Typical Sections and Details – Sheet 1 OF 2
J–03	Jetty Typical Sections and Details – Sheet 2 OF 2
S–01	Beach Laydown Area and Fuel Transfer Station Plan
S–02	Beach Laydown Area and Fuel Transfer Station Typical Section and Details
S–03	Airstrip and Apron Plan, Typical Sections and Details
S–04	Explosives Facility Plan, Typical Sections and Details
S–05	Fuel Tank Farm Plan
S–06	Fuel Tank Farm, Typical Sections and Details
S–07	Camp and Mill Pad Plan
S–08	Camp and Mill Pad Typical Sections and Details
S–09	Float Plane Dock Plan, Typical Sections and Details
S–10	Caribou Crossing Typical Plan and Section
S–11	Culvert and Road Turnout Typical Plan, Sections and Details
S–12a	Bridge Crossing Plan and Typical Sections
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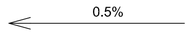
S–13	Landfill and Landfarm Typical Plan
S–14	Landfill and Landfarm Typical Sections and Details
S–15	North Primary Road Plan and Profile (Station 0+00 – 11+79)
S–16	South Primary Road Plan and Profile (Station 0+00 – 20+00)
S–17	South Primary Road Plan and Profile (Station 20+00 – 24+00) and Typical Section
S–18	Secondary Road Plan and Profile (Station 0+00 – 20+00)
S–19	Secondary Road Plan and Profile (Station 20+00 – 40+00)
S–20	Secondary Road Plan and Profile (Station 40+00 – 54+70) and Typical Section
S–21	Primary and Secondary Road Stake Out Points
S–22	Explosives Storage Facility and Landfill/Landfarm Access Road Plan and Profile
S–23	Camp and Fuel Tank Farm and Access Road Plan and Profile
S–24	Float Plane Dock and Portal Access Road Plan and Profile
S–25	Decant and Tail Lake Discharge Access Road Plan and Profile
S–26	Spillway Access Road Plan and Profile and All Access Road Stake Out Points
T–01	Tailings Containment Area Stage Curves and Deposition Plan
T–02	North Dam Layout and Key–Trench Details
T–03	North Dam Sections
T–04	North and South Dam Typical Details
T–05	South Dam Layout and Key–Trench Details
T–06	South Dam Sections
T–07	Typical Thermosyphon Details
T–08	Spillway Plan, Typical Sections and Details
T–09	North Dam Instrumentation Layout and Typical Details
T–10	South Dam Instrumentation Layout and Typical Details
T–11	Tailings Slurry, Reclaim, Fresh Water Make–Up and Decant Pipelines Layout
T–12	Typical Pipeline Details
T–13	Emergency Dump Catch Basin Layout and Typical Details
T–14	Shoreline Erosion Protection Typical Details

Reference Table:
Only drawings referred on this page will be listed in this table

Legend:



Slope Indicator:
Indicates the percentage and direction of the design slope grade.

Chainage Stations:
Indicates the chainage along corridors.
0+56.2 must be read as 56.2m from the chainage origin.

Section Lines:
Indicates the section label, reference drawing number, section location, length and view direction

Culverts:
Indicates the location of a culvert.
See drawing S–11 for details.

Center Line Marker

Water Level marker

Slope Indicator:
This indicates slope as 2 horizontal, 1 vertical, i.e. 2:1

Angle of Repose:
A side slope of 1.2 horizontal to 1 vertical, i.e. 1.2:1 implies angle of repose of the material in use.

Notes:

1. Topographic contour data for the terrain model were provided by Miramar Hope Bay Limited, and is based on 2001 Aerial Photography and manual surveys at select locations. Contour intervals are 1 m.
2. Bathymetric data is provided by Golder Associates, and are based on a 2006 survey. Contour intervals are 0.5 m.
3. The co–ordinate system is UTM NAD 83, Zone 13.
4. All dimensions are in metric units, unless specifically mentioned.
5. Typical Details are Not To Scale (N.T.S.) unless specifically mentioned.
6. 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.
7. Specifications in these drawings refer to the following collective volume of documents:
   a. These drawings
   b. SRK Consulting (Canada) Inc. (2006). Design of the Tailings Containment Area, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Limited, Project Number 1CM014.008, October.
   c. SRK Consulting (Canada) Inc. (2006). Design of the Surface Infrastructure Components, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Limited, Project Number 1CM014.008, October.
   d. SRK Consulting (Canada) Inc. (2006). Technical Specifications for Tailings Containment Area and Surface Infrastructure Components, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Limited, Project Number 1CM014.008, October.
   e. Any relevant reference documentation mentioned in these drawings.
8. All works are to be set out prior to the start of any construction, according to the Stake Out Tables provided. Should there be any difference between the co–ordinates provided and the field location, the Engineer is to be informed immediately.
9. 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 Engineer of any differences.
10. Subsurface soil conditions, including depth to bedrock have been interpreted from a series of geotechnical investigation programs. It is the Contractor's responsibility to familiarise himself with all this information. Actual subsurface soil conditions and bedrock contacts shall be determined on site. The Contractor shall notify the Engineer if conditions differ from what was inferred in the designs.
11. The Contractor shall notify the Engineer at least 12 hrs in advance if an inspection is required for acceptance of works at any stage.
12. The Contractor will inform the Engineer in advance of any specialist contractors and/or technicians that will be sub–contracted to carry out specialized works. The Engineer will approve all such sub–contractors.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

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Engineers and Scientists
Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: INDEX.dwg

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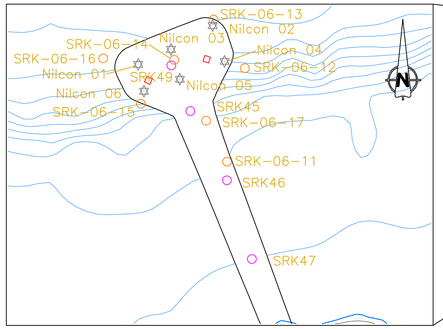
DORIS NORTH PROJECT
DETAIL DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

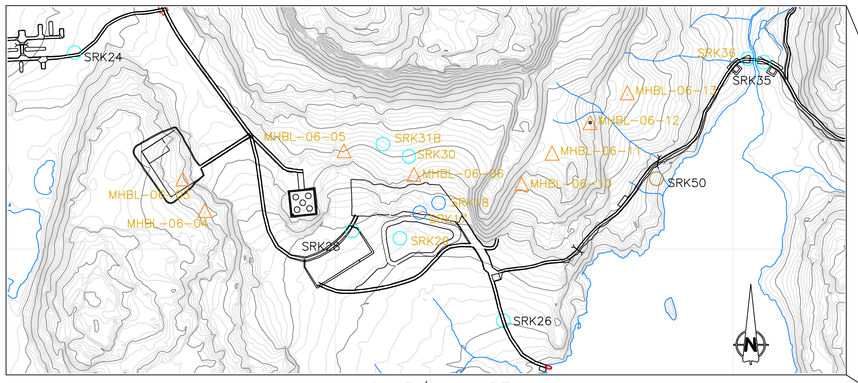
DRAWING TITLE:
Index

DRAWING NO.	SHEET	REVISION NO.
G-03	3 OF 49	B



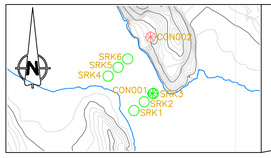
JETTY AREA

1:1000 0 20 40 60 80 100 Metres



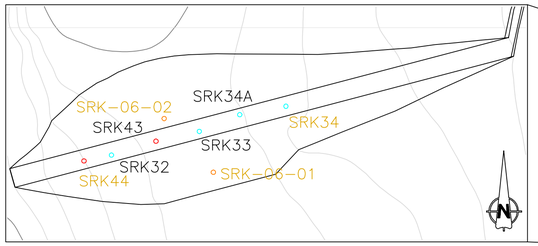
CAMP/MILL AREA

1:7500 0 100 200 300 400 500 Metres



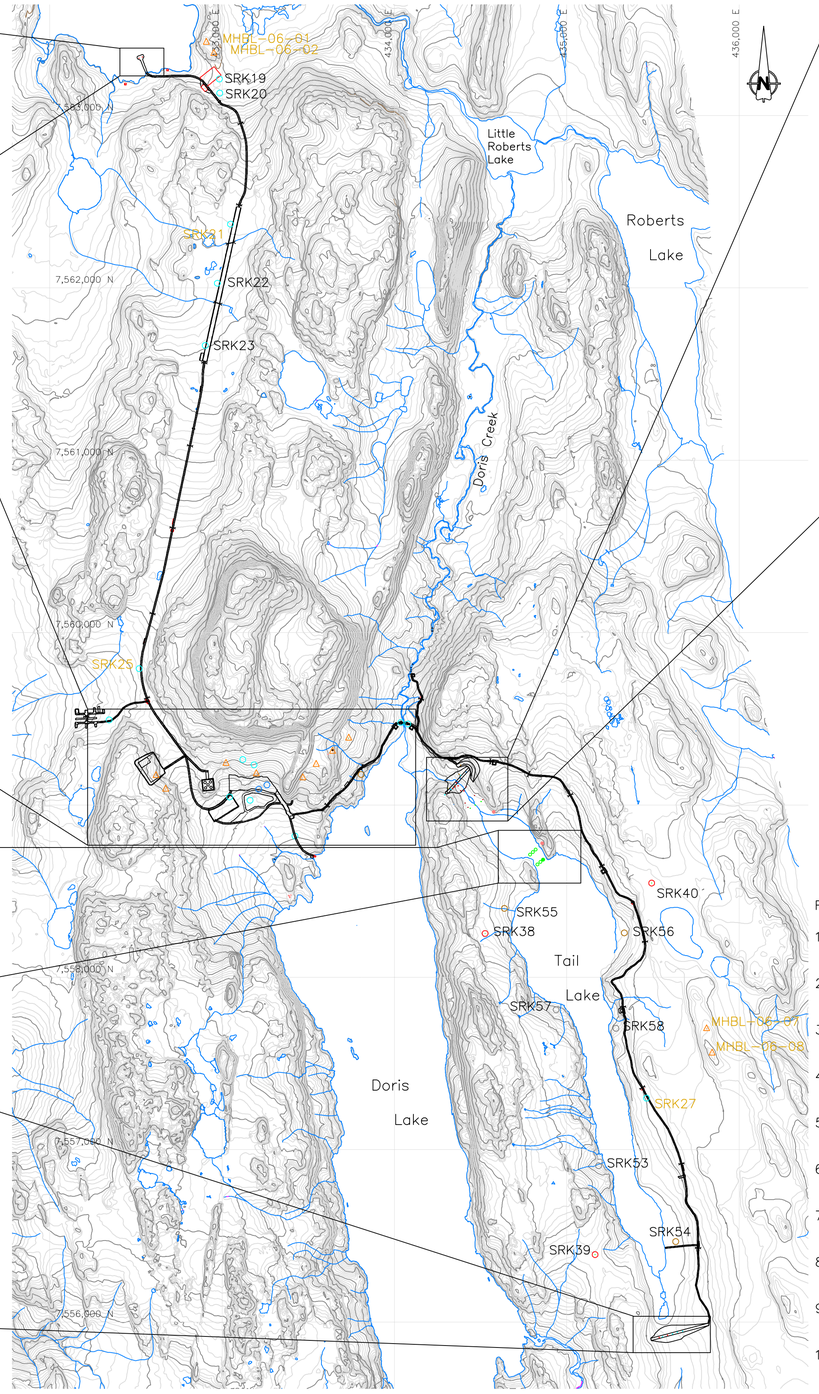
TAIL LAKE AREA

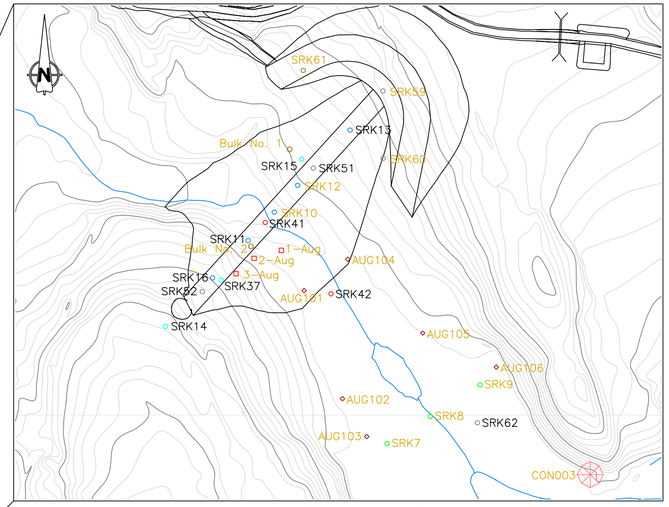
1:5000 0 100 200 300 Metres



SOUTH DAM AREA

1:2000 0 50 100 150 200 Metres





NORTH DAM AREA

1:2000 0 50 100 150 200 Metres

Legend

△	Geochemistry Drill Holes (Winter 2006)	#7, #8
□	Geotechnical Auger Drill Holes (Summer 2003)	#1
◇	Geotechnical Test Pits (Summer 2003)	#1
⬡	Geotechnical Bulk Sampling (Summer 2004)	#3
✡	Vane Shear Testing (Winter 2005)	#6
❀	Condemnation Holes	
SRK58	Geotechnical Drill Holes with Thermistor Strings	
SRK27	Geotechnical Drill Holes without Thermistor Strings	
○	Geotechnical Drill Holes (Fall 2002)	#1
○	Geotechnical Drill Holes (Winter 2002	#1
○	Geotechnical Drill Holes (Winter 2003)	#1, #2
○	Geotechnical Drill Holes (Summer 2003	#1
○	Geotechnical Drill Holes (Winter 2004)	#5
○	Geotechnical Drill Holes (Summer 2004)	#3
○	Geotechnical Drill Holes (Winter 2005)	#4
○	Geotechnical Drill Holes (Winter 2006)	#9, #10

References

Reference Documents

1. SRK Consulting (Canada) Inc. (2003). Tailings Impoundment Preliminary Design, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Limited, Project Number 1CM014.01, October.
2. SRK Consulting (Canada) Inc. (2003). Surface Infrastructure Preliminary Design, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Limited, Project Number 1CM014.01, October.
3. SRK Consulting (Canada) Inc. (2005). Summer 2004 Geotechnical Field Investigation at Tail Lake, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Limited, Project Number 1CM014.04–050, April.
4. SRK Consulting (Canada) Inc. (2005). Winter 2005 Geotechnical Field Investigation at Tail Lake, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Limited, Project Number 1CM014.04–0110, October.
5. SRK Consulting (Canada) Inc. (2004). Phase I Foundation Investigation, Proposed Roberts Bay Jetty Location, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Limited, Project Number 1CM014.02, April.
6. SRK Consulting (Canada) Inc. (2005). Phase II Foundation Investigation, Proposed Roberts Bay Jetty Location, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Limited, Project Number 1CM014.04–0110, May.
7. SRK Consulting (Canada) Inc. (2006). Geochemical Characterization of Quarry Rock, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Limited, Project Number 1CM014.008, October.
8. SRK Consulting (Canada) Inc. (2006). Geochemical Characterization of Portal Development Rock, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Limited, Project Number 1CM014.008, October.
9. SRK Consulting (Canada) Inc. (2006). Phase III Foundation Investigation, Proposed Roberts Bay Jetty Location, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Limited, Project Number 1CM014.008, October.
10. SRK Consulting (Canada) Inc. (2006). Winter 2006 Geotechnical Field Investigation at Tail Lake, Doris North Project, Nunavut, Canada. Report prepared for Miramar Hope Bay Limited, Project Number 1CM014.008, October.

REF:Site Plan.dwg (Infrastructure)

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

PROFESSIONAL ENGINEERS STAMP

SRK Consulting Engineers and Scientists Vancouver

DESIGN:	DRAWN:	REVIEWED:
EMR	DMC	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: DRILLHOLE PLAN_Thermistors and Geotech.dwg

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DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

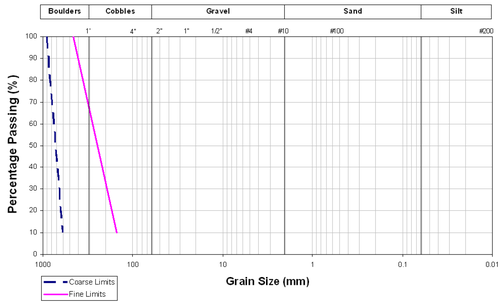
Doris North Project

DRAWING TITLE:

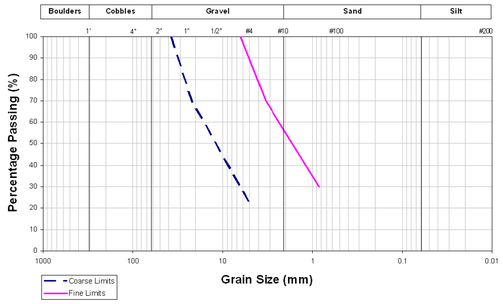
Thermistors and Geotechnical Drill Hole Plan and Details

DRAWING NO.	SHEET	REVISION NO.
G-04	4 OF 49	B

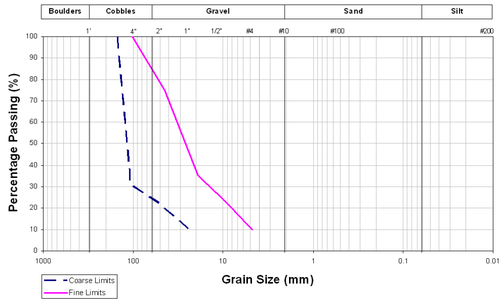
Riprap



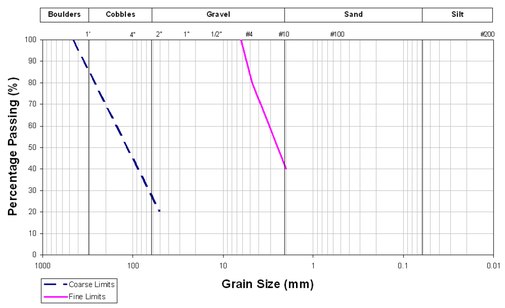
Surfacing Material



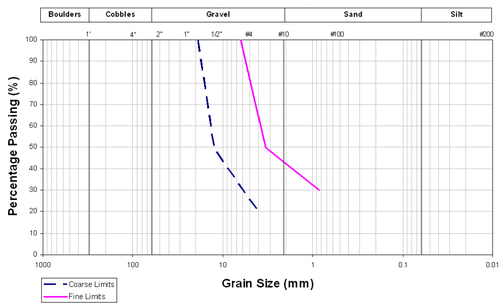
Transition Material



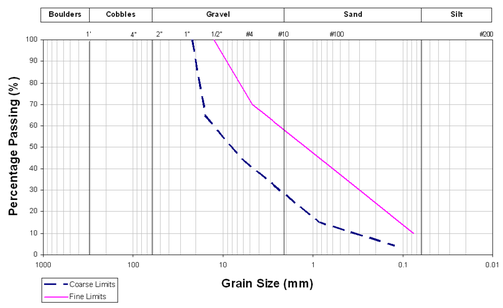
Run of Quarry (ROQ)



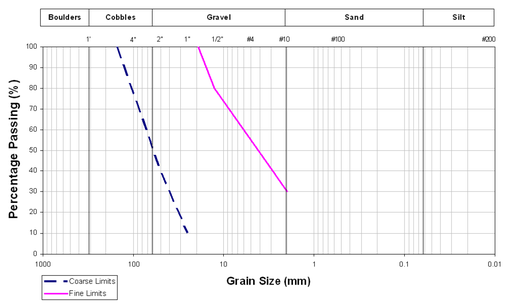
Pipe Bedding



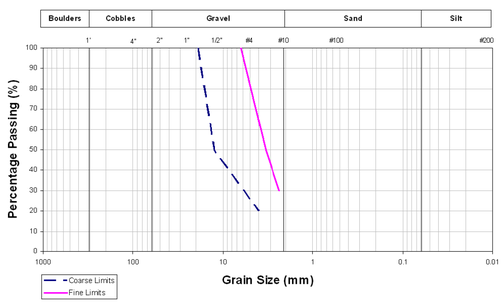
Core Material



Select Subgrade



Drainage Gravel



Legend:

— — — Coarse Envelope

——— Fine Envelope

Notes:

1. Soil classification for these works are based on the Unified Soil Classification System (USCS).
2. Prior to placement of any construction material, the receiving surface must be free of snow and ice.
3. The Engineer must approve all surfaces prior to placement of any construction material.
4. Snow and ice on construction material must be removed prior to loading for construction use.
5. The maximum single loose lift thickness of the Run of Quarry (ROQ) material is 500 mm.
6. The maximum single loose lift thickness of the Select Subgrade material is 300 mm.
7. The maximum single loose lift thickness of the Surfacing Material is 200 mm.
8. The maximum single loose lift thickness of the Transition Material is 300 mm.
9. The maximum single loose lift thickness of the Core Material is 300 mm.
10. Due care must be taken when placing riprap or drainage material such that no damage occurs to the subgrade and/or synthetic materials. Any damage must be immediately reported to the Engineer.
11. In areas where staged construction is required, each subsequent lift must be adequately keyed in to the preceding lift. The Engineer will approve such staged construction.
12. Run of Quarry, Select Subgrade, Surfacing–, Transition– and Core Material has to be compacted after placement.
13. Compaction will be a field specification, based on trial compaction tests to be carried out by the Contractor to the satisfaction of the Engineer.
14. The compaction equipment shall consist of at least a 15–Ton smooth–drum vibratory compactor, or equivalent.
15. Core Material shall be moisture conditioned to 90% saturation, without free ice lenses immediately prior to compaction.
16. It is the Contractor's responsibility to create the contruction materials as specified through appropriate crushing. Any deviations must be approved by the Engineer.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

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PROFESSIONAL ENGINEERS STAMP

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Engineers and Scientists
Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: FILL MATERIAL TYPE AND SPECS.dwg

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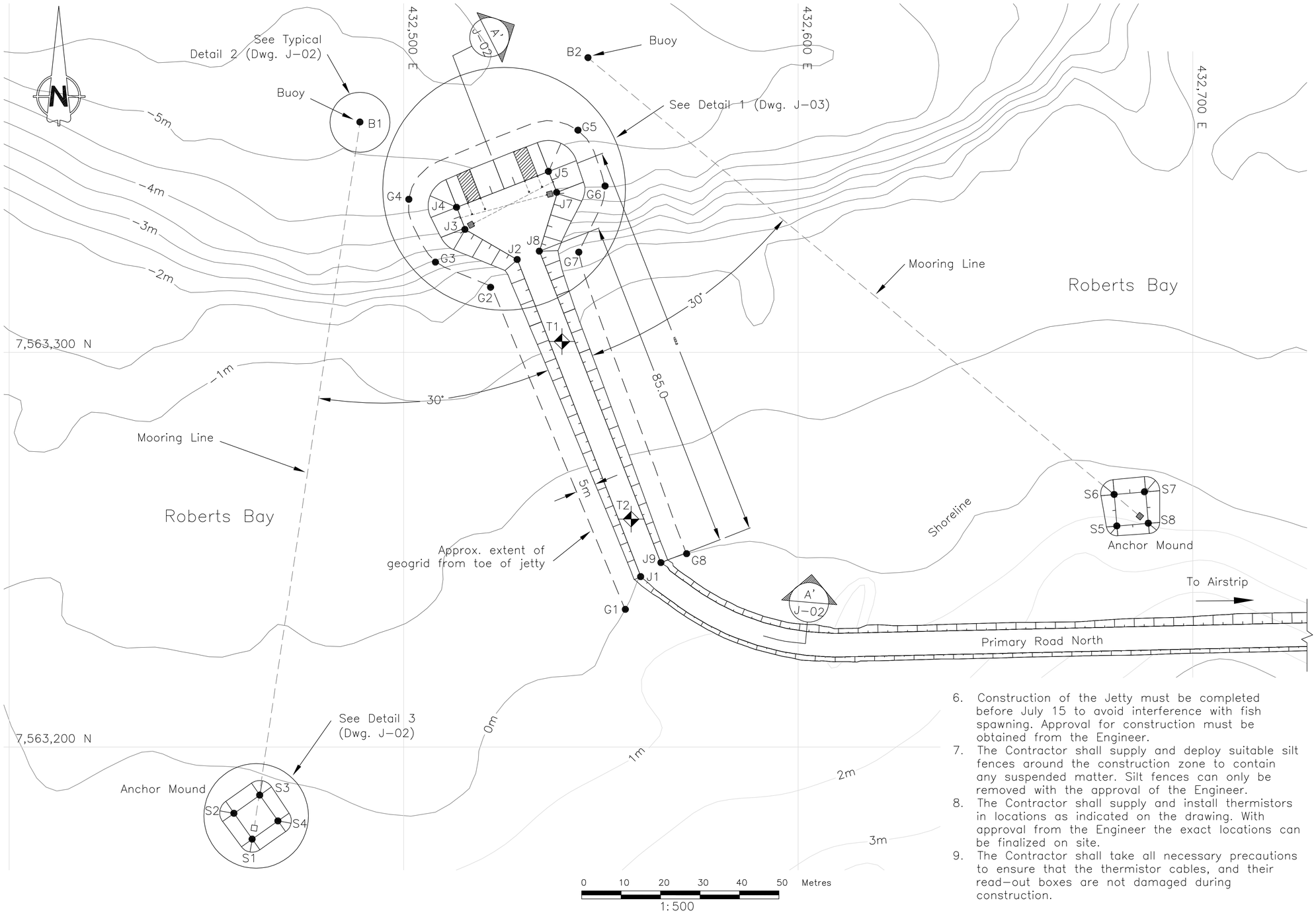
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
Construction Fill Material Specifications

DRAWING NO.	SHEET	REVISION NO.
G-05	5 OF 49	B



STAKE OUT TABLE		
Point	Easting	Northing
Jetty		
J1	432560.1	7563243.1
J2	432528.8	7563323.4
J3	432515.6	7563331.1
J4	432513.4	7563336.7
J5	432536.7	7563345.8
J6	432538.9	7563340.2
J7	432534.4	7563325.6
J8	432565.2	7563246.7
Anchor Mounds		
S1	432461.6	7563176.6
S2	432457.0	7563183.2
S3	432463.5	7563187.8
S4	432468.1	7563181.2
S5	432680.7	7563255.9
S6	432680.1	7563263.9
S7	432688.0	7563264.6
S8	432688.7	7563256.6
Floating Buoys		
B1	432488.9	7563358.3
B2	432546.7	7563374.6
Geogrid Extents		
G1	432556.1	7563234.8
G2	432522.2	7563316.7
G3	432508.1	7563322.9
G4	432501.2	7563338.7
G5	432544.1	7563356.2
G6	432551.0	7563342.0
G7	432544.3	7563325.3
G8	432571.6	7563248.9
Thermistor Locations		
T1	432540.1	7563302.7
T2	432557.6	7563257.7

Notes:

1. It is the Contractor's responsibility to ensure that the geogrid is installed in advance of the construction fill being placed. The Contractor must submit a construction procedure to the Engineer for approval before commencing this work.
2. Anchor blocks shall be 30 MPa reinforced concrete. Concrete curing time prior to putting the anchor blocks in use shall be at least 28 days. Reinforcing details will be provided by the Engineer.
3. Contractor shall supply and install all mooring hardware, including: mooring chains, mooring shackles (stud links), mooring lines and buoys.
4. The Contractor shall supply and install the blasting mat along the jetty face.
5. The final location of the anchor mounds and floating buoys can be adjusted in the field with approval from the Engineer.
6. Construction of the Jetty must be completed before July 15 to avoid interference with fish spawning. Approval for construction must be obtained from the Engineer.
7. The Contractor shall supply and deploy suitable silt fences around the construction zone to contain any suspended matter. Silt fences can only be removed with the approval of the Engineer.
8. The Contractor shall supply and install thermistors in locations as indicated on the drawing. With approval from the Engineer the exact locations can be finalized on site.
9. The Contractor shall take all necessary precautions to ensure that the thermistor cables, and their read-out boxes are not damaged during construction.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

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SRK Consulting Engineers and Scientists Vancouver

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AT	JJH	EMR
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AT	EMR	Mar. 2007

FILE NAME: JETTY_rev2.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT
DETAILED DESIGN

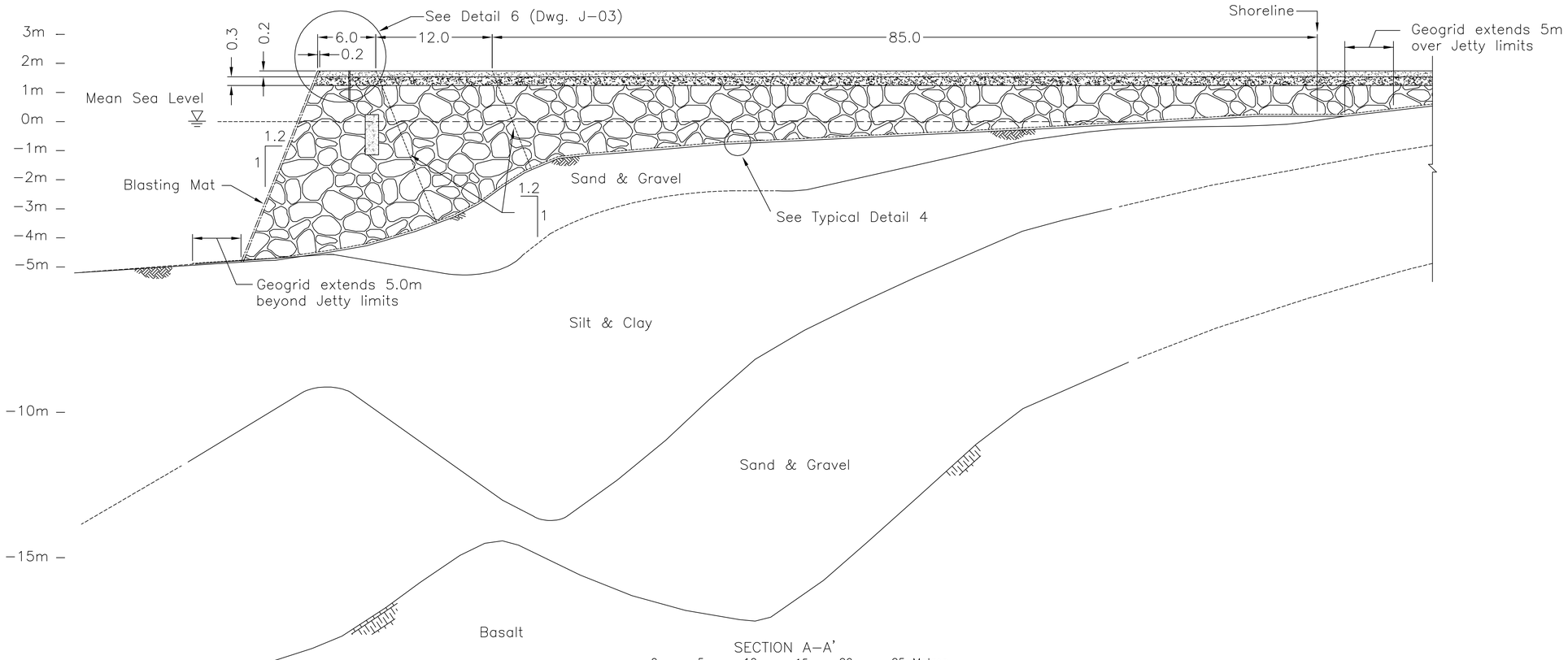
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

Jetty Plan

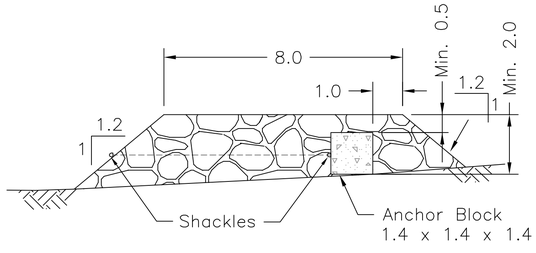
DRAWING NO.	SHEET	REVISION NO.
J-01	6 OF 49	B



SECTION A−A'

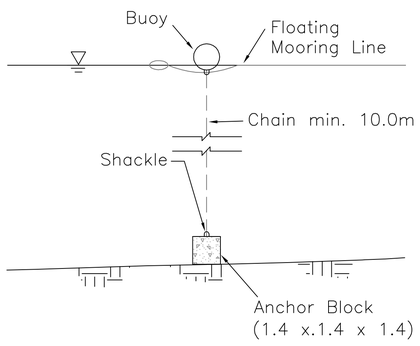
1:250 0 5 10 15 20 25 Metres

3X Vertical Exaggeration

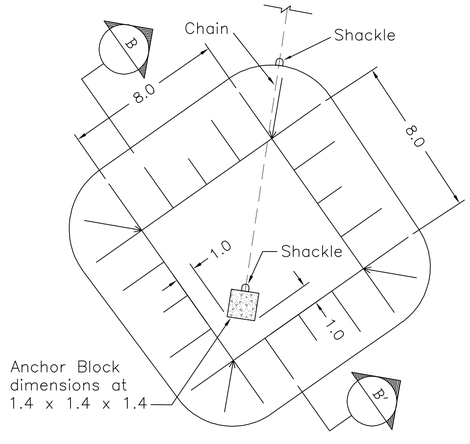


TYPICAL ANCHOR MOUND SECTION B−B'

1:100 0 2 4 6 8 10 Metres

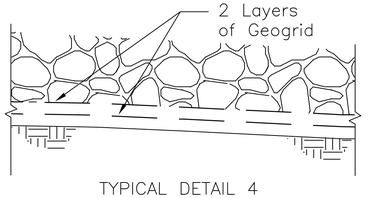


TYPICAL DETAIL 2
(NTS)



ANCHOR MOUND TYPICAL DETAIL 3

1:100 0 1 2 3 4 5 Metres



TYPICAL DETAIL 4

1:50 0 1 2 3 4 5 Metres

Legend:

- Natural ground
- Surfacing material
- Select subgrade
- Run of quarry

Notes:

1. Anchor blocks shall be 30 MPa reinforced concrete. Concrete curing time prior to putting the anchor blocks in use shall be at least 28 days. Reinforcing details will be provided by the Engineer.
2. Contractor shall supply and install all mooring hardware, including: mooring chains, mooring shackles (stud links), mooring lines and buoys.
3. The Contractor shall supply and install the blasting mat along the jetty face.
4. The geogrid shall be deployed in sheets parallel to the axis of the Jetty an shall overlap at least 1m. Overlap joints shall be tied according to Manufacturers specifications. The second layer of Geogrid shall be placed such that the overlap joints are midway between those and the first layer.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

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FILE NAME: JETTY_rev2.dwg

MIRAMAR HOPE BAY LTD.

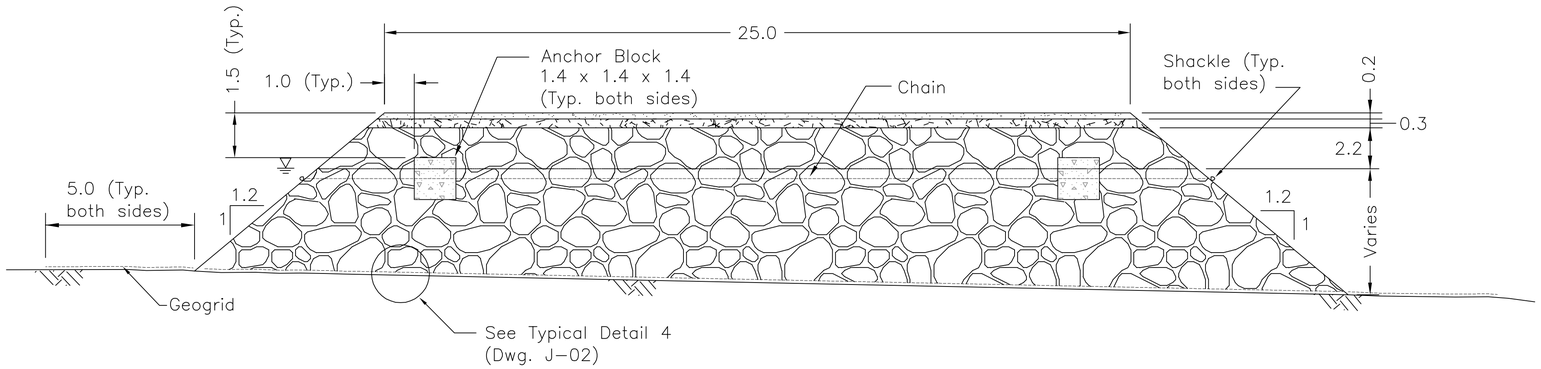
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

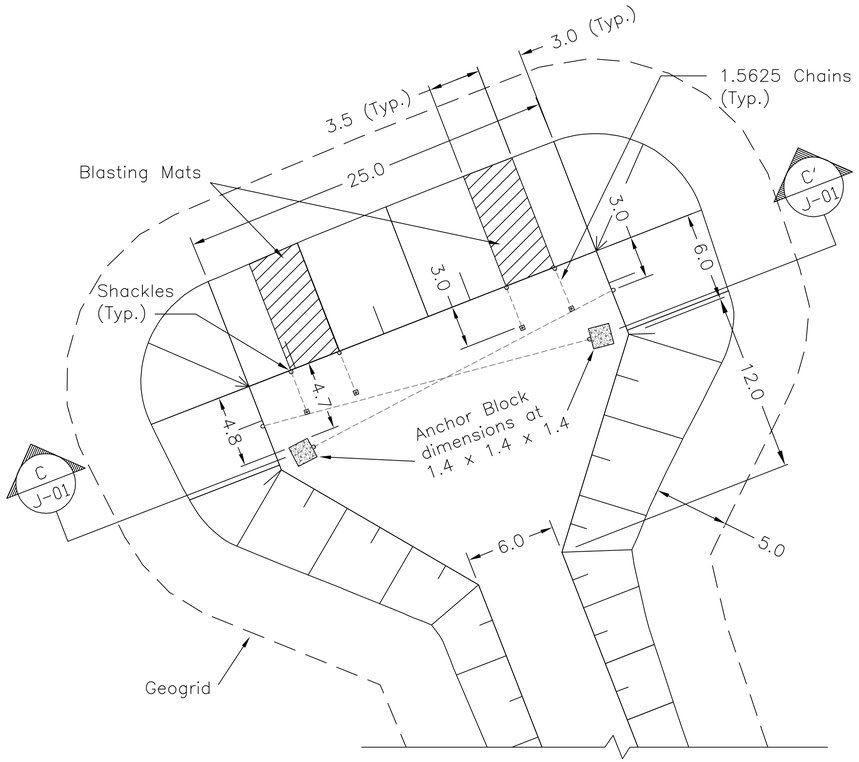
DRAWING TITLE:
Jetty Typical Sections and Details - Sheet 1 of 2

DRAWING NO.	SHEET	REVISION NO.
J-02	7 OF 49	B



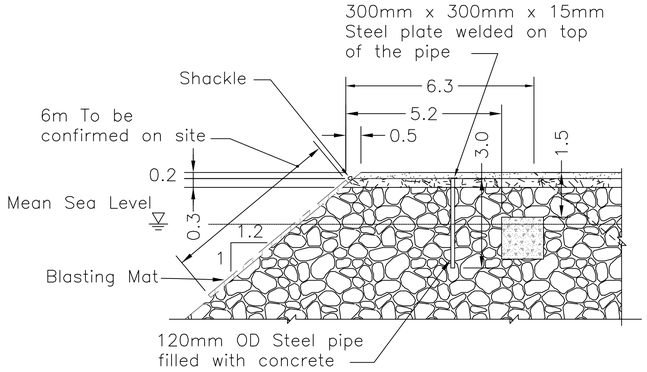
SECTION C–C'

1:100 0 1 2 3 4 5 Metres



TYPICAL DETAIL 1

1:200 0 50 100 150 200 Metres



TYPICAL DETAIL 6

1:100 0 1 2 3 4 5 Metres

Legend:

- Natural ground
- Surfacing material
- Select subgrade
- Run of quarry

Notes:

1. Anchor blocks shall be 30 MPa reinforced concrete. Concrete curing time prior to putting the anchor blocks in use shall be at least 28 days. Reinforcing details will be provided by the Engineer.
2. Contractor shall supply and install all mooring hardware, including: mooring chains, mooring shackles (stud links), mooring lines and buoys.
3. The Contractor shall supply and install the blasting mat along the jetty face.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

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AT	EMR	Mar. 2007

FILE NAME: JETTY_rev2.dwg

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DORIS NORTH PROJECT
DETAILED DESIGN

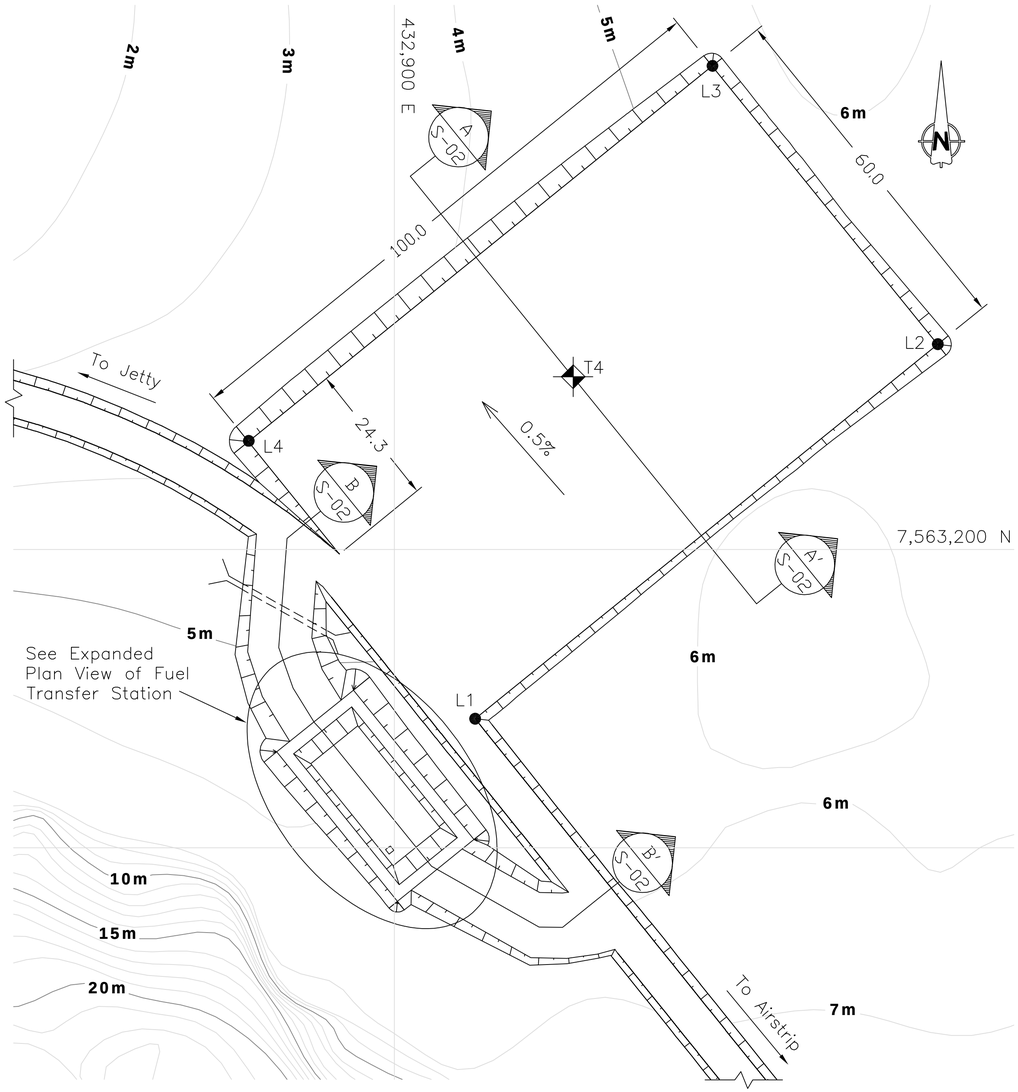
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

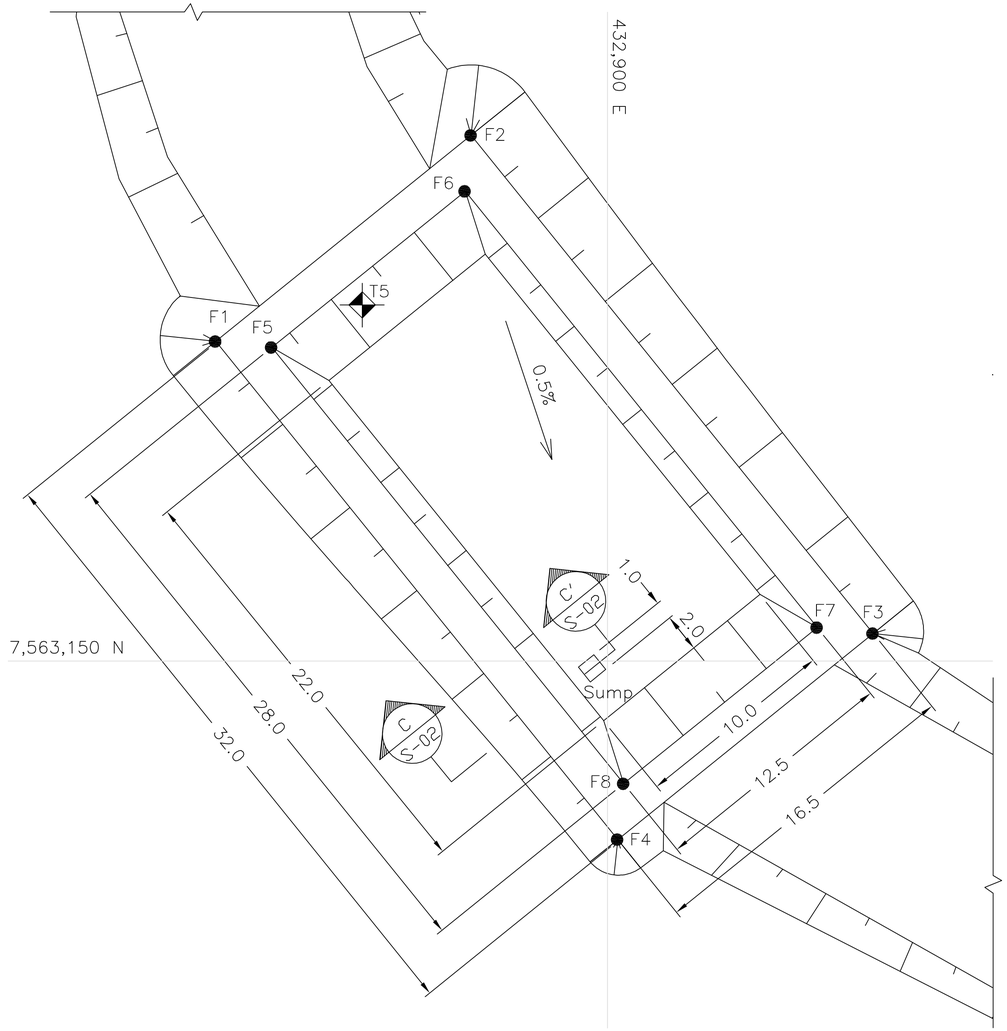
Jetty Typical Sections and Details - Sheet 2 of 2

DRAWING NO.	SHEET	REVISION NO.
J-03	8 OF 49	B



LAYDOWN AREA PLAN

1:500 0 10 20 30 40 50 Metres



FUEL TRANSFER STATION PLAN

1:150 0 2 4 6 8 10 Metres

STAKE OUT TABLE		
Point	Northing	Easting
Beach Laydown Area		
L1	432913.3	7563171.4
L2	432991.0	7563234.4
L3	432953.3	7563281.0
L4	432875.6	7563218.1
Fuel Transfer Station		
F1	432880.3	7563166.1
F2	432893.1	7563176.4
F3	432913.4	7563151.4
F4	432900.5	7563141.0
F5	432883.1	7563165.8
F6	432892.8	7563173.6
F7	432910.5	7563151.7
F8	432900.8	7563143.8
Thermistor Locations		
T4	432930.0	7563228.9
T5	432887.7	7563167.9

Legend:

Thermistor Location

Notes:

1. The Contractor shall supply and install thermistors in locations as indicated on the drawing. With approval from the Engineer the exact locations can be finalized on site.
2. The Contractor shall take all necessary precautions to ensure that the thermistor cables, and their read-out boxes are not damaged during construction.
3. The Contractor shall be responsible to keep the Fuel Transfer Station dry and free of snow and ice during the construction period.
4. A Specialist Contractor will be responsible for the design, procurement and installation of all mechanical and/or electrical equipment at the Fuel Transfer Station. The details of these elements are not indicated on the drawing.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

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REVISIONS

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AT	EMR	Mar. 2007

FILE NAME: FUEL TRANSFER AND LAYDOWNrev1.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT
DETAILED DESIGN

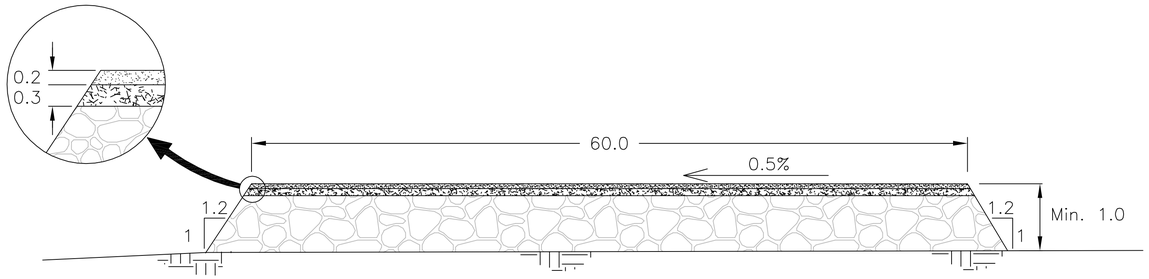
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

Beach Laydown Area and Fuel Transfer Station Plan

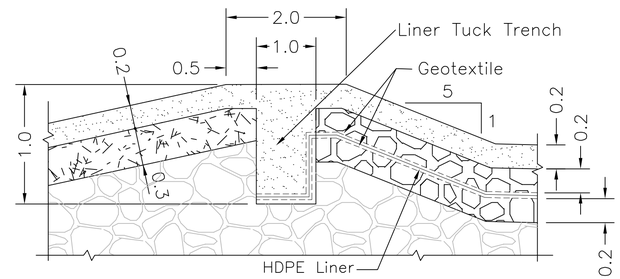
DRAWING NO.	SHEET	REVISION NO.
S-01	9 OF 49	B



TYPICAL SECTION A–A'

1:250 0 5 10 15 20 25 Metres

2x Vertical Exaggeration



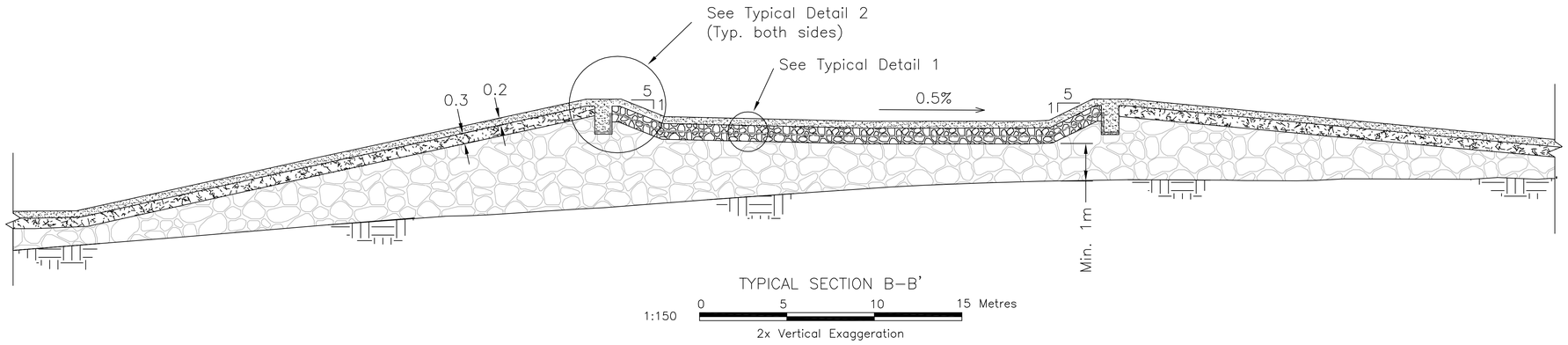
TYPICAL DETAIL 2

1:50 0 1 2 3 4 5 Metres

2x Vertical Exaggeration

Legend:

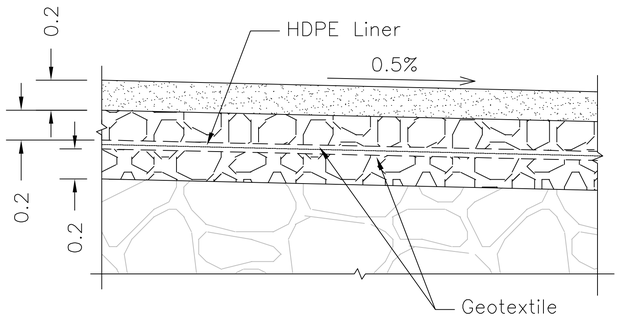
- Natural ground
- Surfacing material
- Select Subgrade
- Run of quarry
- Liner bedding material



TYPICAL SECTION B–B'

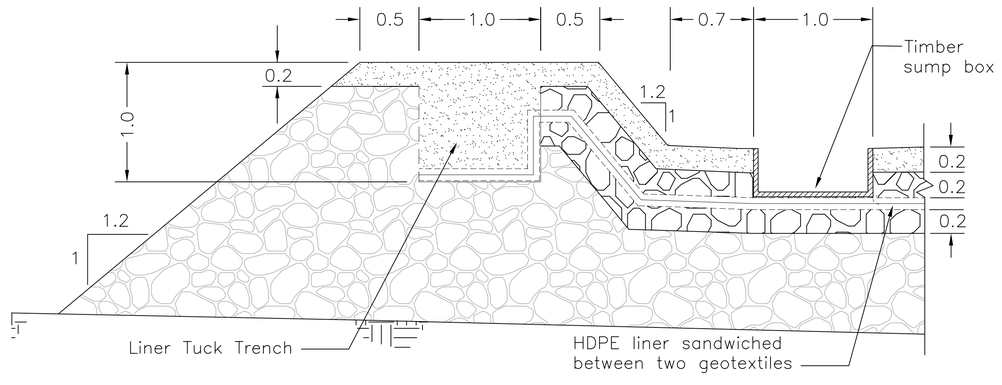
1:150 0 5 10 15 Metres

2x Vertical Exaggeration



TYPICAL DETAIL 1

1:20 0 0.5 1.0 1.5 2.0 Metres



TYPICAL SECTION C–C'

1:25 0 0.5 1.0 1.5 2.0 2.5 Metres

Notes:

1. The Contractor shall take due care so as not to damage the liner during construction. Special temporary liner protection measures must be taken in the event that construction equipment must pass over a liner before the final protective cover has been placed. The Engineer is to be notified of these occurrences.
2. Modifications to the liner tuck trench will be allowed if equipment access is a problem. The details of any such modifications must be presented to the Engineer for approval.
3. The timber sump box must be appropriately fixed by the Contractor, taking care not to damage the liner.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

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FILE NAME: FUEL TRANSFER AND LAYDOWNrev1.dwg

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DORIS NORTH PROJECT
DETAILED DESIGN

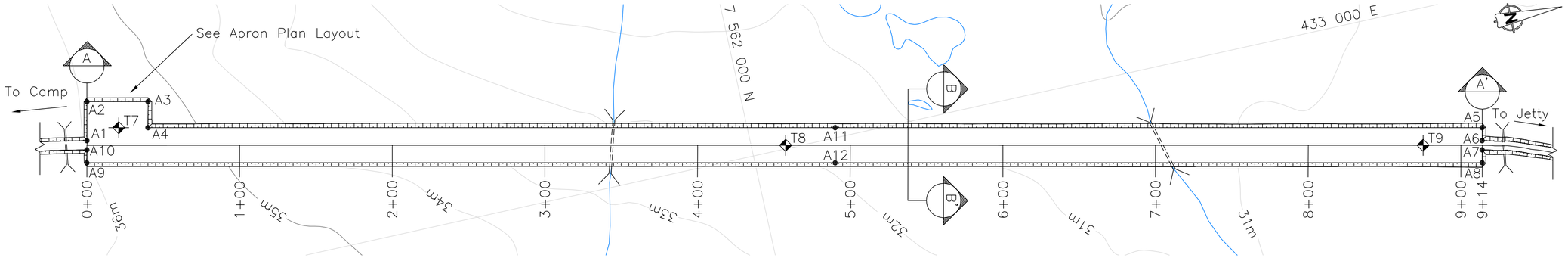
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

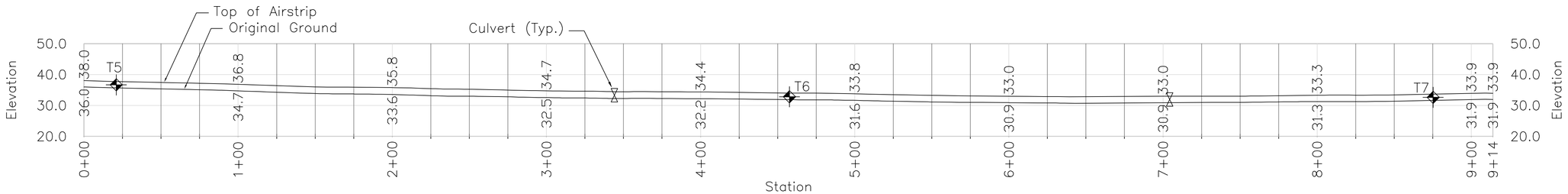
Beach Laydown Area and Fuel Transfer Station
Typical Section and Details

DRAWING NO.	SHEET	REVISION NO.
S-02	10 OF 49	B



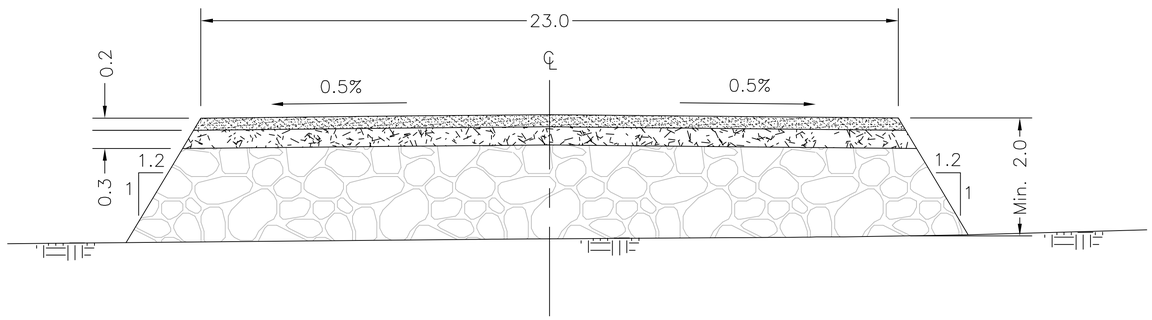
AIRSTRIP PLAN LAYOUT

1:1500 0 50 100 150 Metres



TYPICAL SECTION A–A'

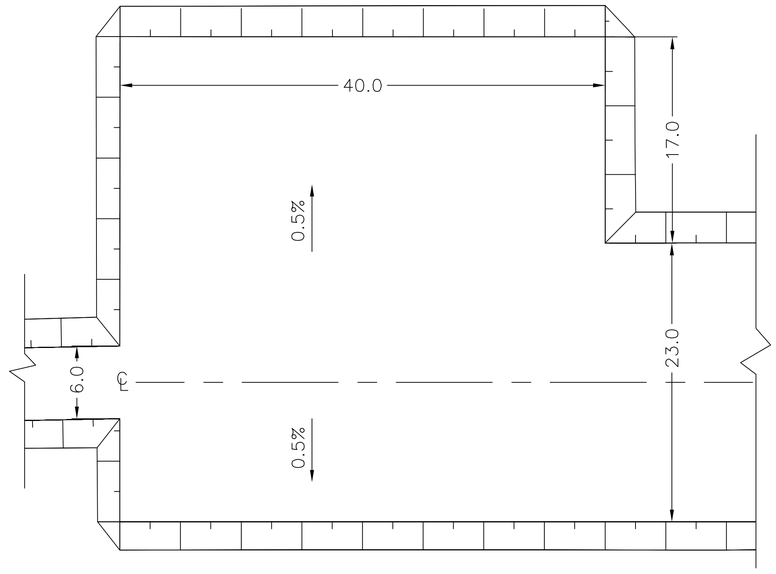
1:1500 0 50 100 150 Metres



TYPICAL SECTION B–B'

1:100 0 1 2 3 4 5 Metres

2x Vertical Exaggeration



APRON PLAN LAYOUT

1:250 0 5 10 15 20 25 Metres

STAKEOUT TABLE		
Airstrip and Apron		
Point	Easting	Northing
A1	432895.9	7561575.9
A2	432871.0	7561581.4
A3	432879.7	7561620.5
A4	432896.3	7561616.8
A5	433085.1	7562470.1
A6	433091.0	7562468.8
A7	433099.2	7562467.0
A8	433107.5	7562465.2
A9	432910.1	7561572.8
A10	432901.8	7561574.6
A11	433016.0	7562051.3
A12	432993.5	7562056.3
Thermistors		
T7	432892.1	7561598.0
T8	432997.7	7562022.0
T9	433087.9	7562429.8

Legend:

- Natural ground
- Surfacing material
- Select Subgrade
- Run of quarry
- T7 Thermistors

Notes:

1. The Contractor is to supply and install thermistors in locations as indicated on the drawing. With approval from the Engineer the exact locations can be finalized on site.
2. The Contractor is to take all necessary precautions to ensure that the thermistor cables, and their read–out boxes are not damaged during construction.
3. The final culvert locations will be determined on–site. The Contractor is to stake–out the approximate culvert locations as indicated on these drawings and after inspection by the Engineer, approval will be given for culvert placement.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

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FILE NAME: AIRSTRIP.DWG

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT
DETAILED DESIGN

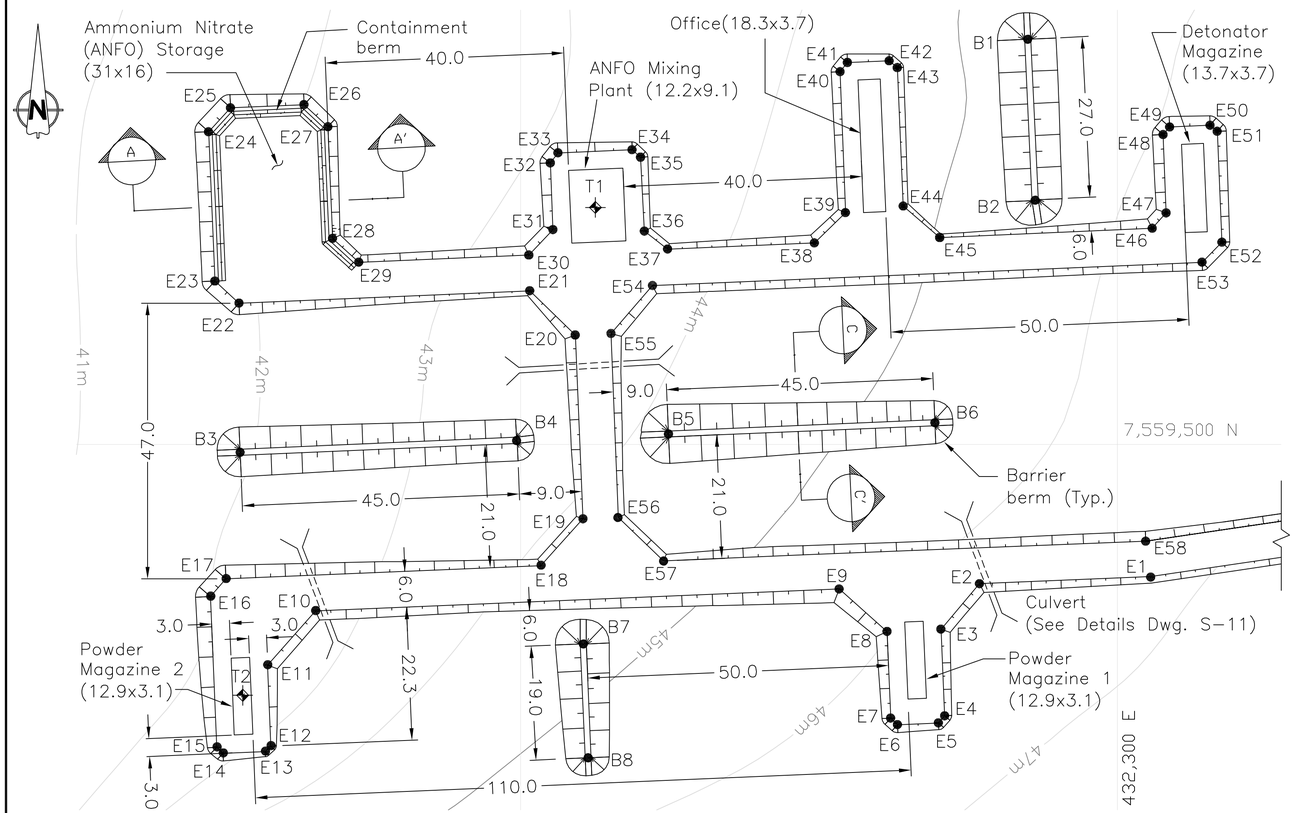
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

Airstrip and Apron Plan Typical Sections and Details

DRAWING NO.	SHEET	REVISION NO.
S-03	11 OF 49	B



EXPLOSIVES FACILITY PLAN LAYOUT

1:500 0 5 10 15 20 25 Metres

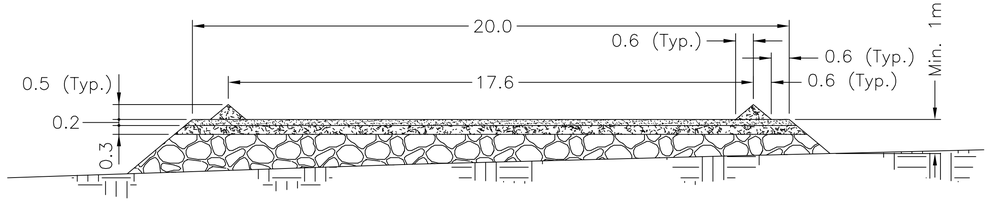
Legend:

- Surfacing Material
- Select Subgrade
- Run of Quarry
- Natural Ground
- Thermistors

STAKE OUT TABLE			
Explosives Storage Facility			
Point	Easting	Northing	Elev.
E1	432305.5	7559478.8	48.0
E2	432276.9	7559476.7	47.5
E3	432270.5	7559469.0	47.5
E4	432271.1	7559454.5	47.5
E5	432270.0	7559453.3	47.5
E6	432263.2	7559453.0	47.5
E7	432262.0	7559454.1	47.5
E8	432261.4	7559468.7	47.5
E9	432253.4	7559475.8	47.5
E10	432165.6	7559472.1	44.0
E11	432157.6	7559463.0	44.0
E12	432158.1	7559449.5	44.0
E13	432157.2	7559448.5	44.0
E14	432150.1	7559448.2	44.0
E15	432149.1	7559449.3	44.0
E16	432148.0	7559474.5	44.0
E17	432150.6	7559477.5	44.0
E18	432203.4	7559479.7	45.0
E19	432210.5	7559487.5	45.0
E20	432209.2	7559518.3	45.0
E21	432201.6	7559525.8	44.0
E22	432152.8	7559523.7	43.5
E23	432148.8	7559527.4	43.5
E24	432147.7	7559552.4	43.5
E25	432151.4	7559556.4	43.5
E26	432163.7	7559556.9	43.5
E27	432167.7	7559553.2	43.5
E28	432168.5	7559534.5	43.5
E29	432172.9	7559530.5	43.5

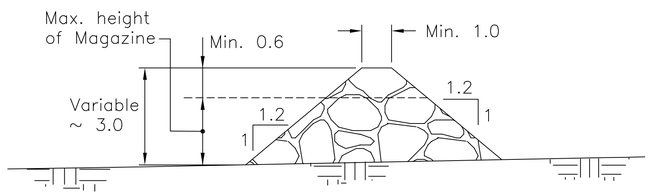
STAKE OUT TABLE (Cont.)			
Explosives Storage Facility			
Point	Easting	Northing	Elev.
E30	432201.4	7559531.7	44.5
E31	432205.4	7559536.0	44.5
E32	432205.0	7559547.2	44.5
E33	432206.3	7559548.9	44.5
E34	432218.7	7559549.4	44.5
E35	432220.1	7559548.1	44.5
E36	432220.8	7559535.8	44.5
E37	432224.7	7559532.7	44.5
E38	432249.3	7559533.8	45.5
E39	432254.5	7559538.9	45.5
E40	432253.6	7559562.5	45.5
E41	432254.8	7559564.0	45.5
E42	432261.8	7559564.3	45.5
E43	432263.2	7559563.1	45.5
E44	432264.1	7559540.0	45.5
E45	432270.3	7559534.7	45.5
E46	432305.9	7559536.2	47.5
E47	432308.2	7559538.8	47.5
E48	432307.7	7559551.9	47.5
E49	432308.8	7559553.2	47.5
E50	432315.6	7559553.5	47.5
E51	432316.8	7559552.5	47.5
E52	432317.6	7559533.9	47.5
E53	432314.2	7559530.5	47.5
E54	432225.6	7559526.8	47.5
E55	432215.3	7559515.7	45.0
E56	432216.3	7559487.7	45.0
E57	432223.9	7559480.4	45.0
E58	432304.8	7559483.8	48.0

STAKE OUT TABLE		
Barrier Berm		
Point	Easting	Northing
B1	432285.0	7559567.9
B2	432286.3	7559540.9
B3	432153.1	7559498.7
B4	432199.2	7559500.6
B5	432224.8	7559501.8
B6	432269.4	7559503.8
B7	432210.5	7559466.5
B8	432211.4	7559447.5
Thermistors		
T1	432212.6	7559539.7
T2	432153.5	7559458.0



TYPICAL SECTION A–A'

1:100 0 1 2 3 4 5 Metres



BARRIER BERM – TYPICAL CROSS SECTION C–C'

1:100 0 1 2 3 4 5 Metres

Notes:

1. The Contractor shall strictly adhere to the minimum layout distances on the drawing, since they are based on minimum design standards for operation of the facility.
2. The minimum distances applicable to this facility, as defined by the appropriate regulations are as follows:
   a. D1 = Not Applicable
   b. D2 = 50 m
   c. D3 = Not Applicable
   d. D4 = 170 m
   e. D5 = Not Applicable
   f. D6 = Not Applicable
   g. D7 = 465 m
   h. D8 = Not Applicable
3. The Owner will supply the Powder Magazines, Detonator Magazines, Explosives Mixing Facility and Portable Office Complex. The Contractor shall be responsible for the installation of these facilities according to the details shown on these drawings.
4. The Powder Magazine, Detonator Magazine, Explosives Mixing Facility and Portable Office construction pads must be a minimum 1.0 m thick, and must be at level. Connecting roads between these structures will vary in grade, but shall be at least 1.0 m in thickness.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS			

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			
REVISIONS				

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

SRK Consulting Engineers and Scientists Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: EXPLOSIVE FACILITY.dwg

MIRAMAR HOPE BAY LTD.

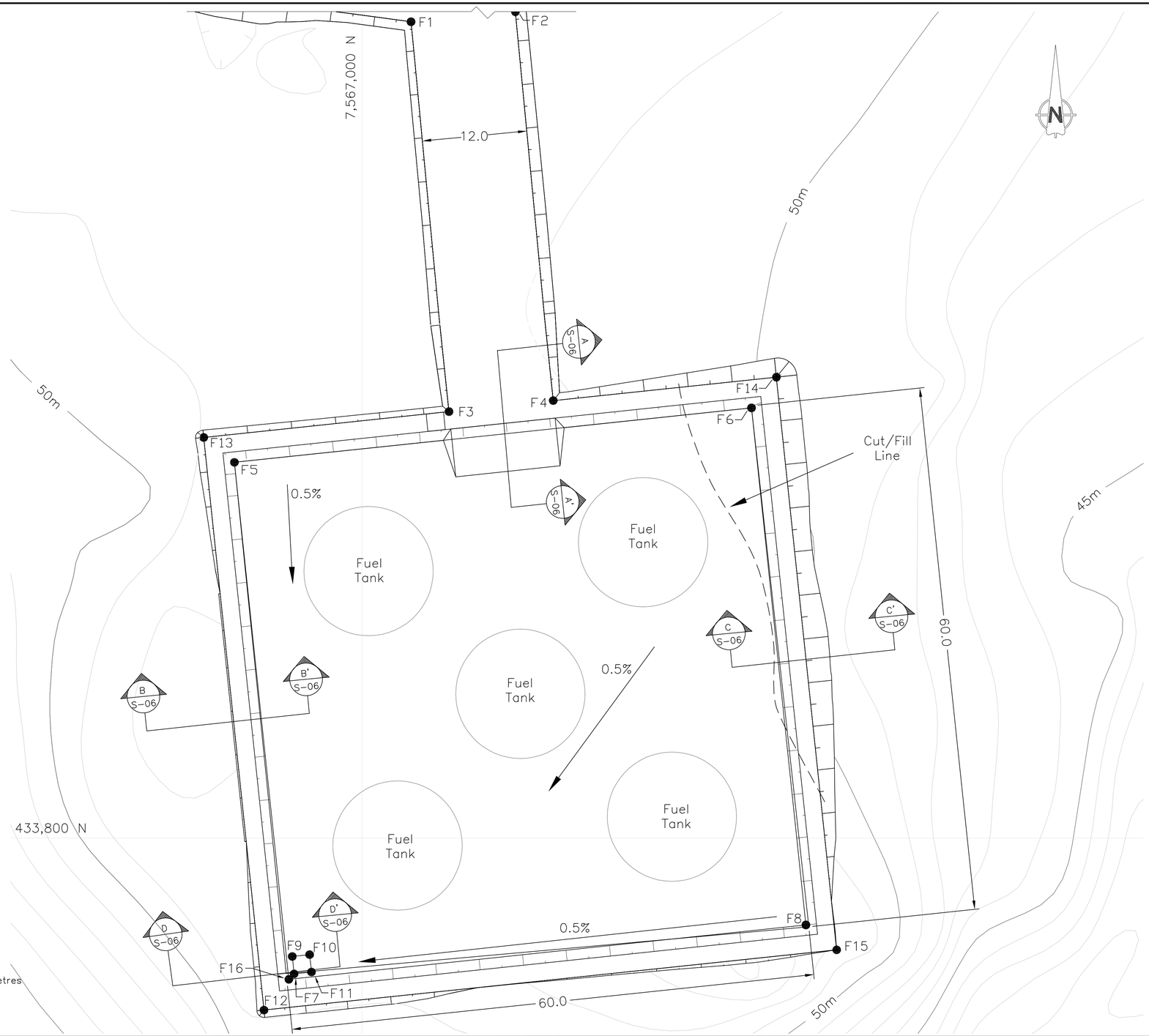
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
Explosives Storage Facility Plan, Typical Sections, Details

DRAWING NO.	SHEET	REVISION NO.
S-04	12 OF 49	B



STAKE OUT TABLE			
Point	Easting	Northing	Elev.
F1	432905.6	7559193.4	51.5
F2	432917.5	7559194.6	51.5
F3	432909.9	7559148.8	51.0
F4	432921.9	7559150.1	50.7
F5	432885.4	7559143.0	50.7
F6	432944.6	7559149.2	50.7
F7	432892.2	7559084.5	50.7
F8	432950.8	7559090.0	50.7
F9	432892.0	7559086.4	50.7
F10	432894.0	7559086.6	50.7
F11	432894.2	7559084.7	50.7
F12	432888.8	7559080.3	51.7
F13	432881.9	7559145.8	51.7
F14	432947.4	7559152.7	51.7
F15	432954.3	7559087.2	51.7
F16	432891.6	7559083.8	50.7

Notes:

1. The fuel tank farm must be founded predominantly on bedrock. If, after excavation to the lines and grades indicated on this drawing, sufficient bedrock is not exposed, the Engineer will instruct the Contractor to lower the level of excavation.
2. The finished grade of the fuel tank farm excavation shall be at least 50.5 m, and undulations in the surface of the excavation cannot be more than 0.2 m.
3. A nominal leveling layer of Surfacing material shall be spread over the exposed bedrock surface before proceeding with the tank farm construction.
4. The bedrock cut highwall for the fuel tank farm shall be site fitted with the direction from the Engineer. The maximum highwall height shall be 5 m.
5. The Contractor shall over excavate overburden on the highwall crest to ensure slope stability. The Engineer will confirm the slope finishing details on site.
6. The Contractor shall take due care so as not to damage the liner during construction. Special temporary liner protection measures must be taken in the event that construction equipment must pass over a liner before the final protective cover has been placed. The Engineer is to be notified of these occurrences.
7. Modifications to the liner tuck trench shall be allowed if equipment access is a problem. The details of any such modifications must be presented to the Engineer for approval.
8. All pumps, piping, tanking and electrical work are excluded from this scope of work.
9. The Contractorshall be responsible to keep the fuel tank farm dry and free of snow and ice during the construction period.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENSE APPLICATION			

REVISIONS

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SRK Consulting
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Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
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AT	EMR	Mar. 2007

FILE NAME: TANK FARM_rev1.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT
DETAILED DESIGN

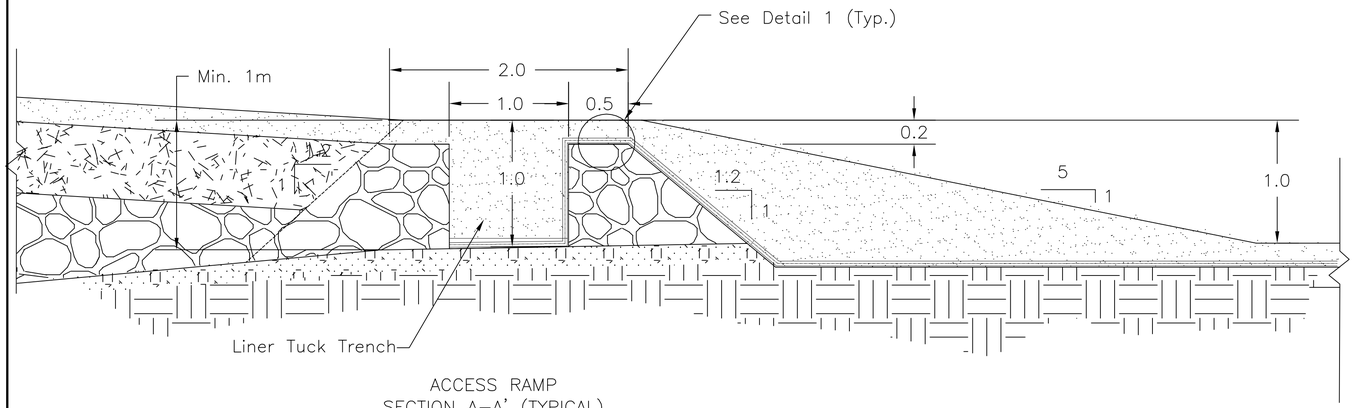
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

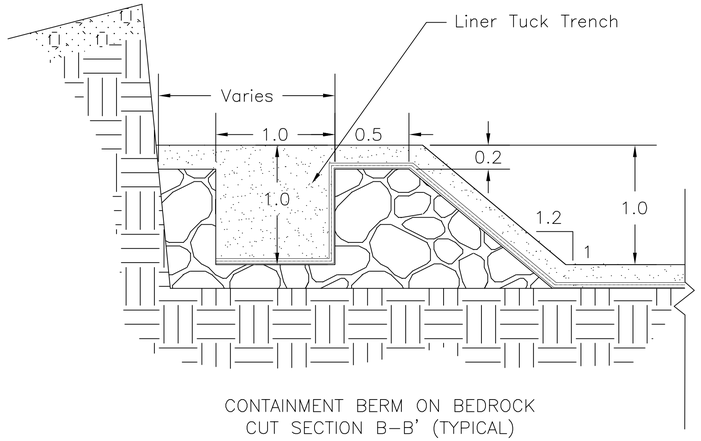
Fuel Tank Farm Plan

DRAWING NO.	SHEET	REVISION NO.
S-05	13 OF 49	B



ACCESS RAMP
SECTION A–A' (TYPICAL)

0 40 80 120 160 200 cm
1:25

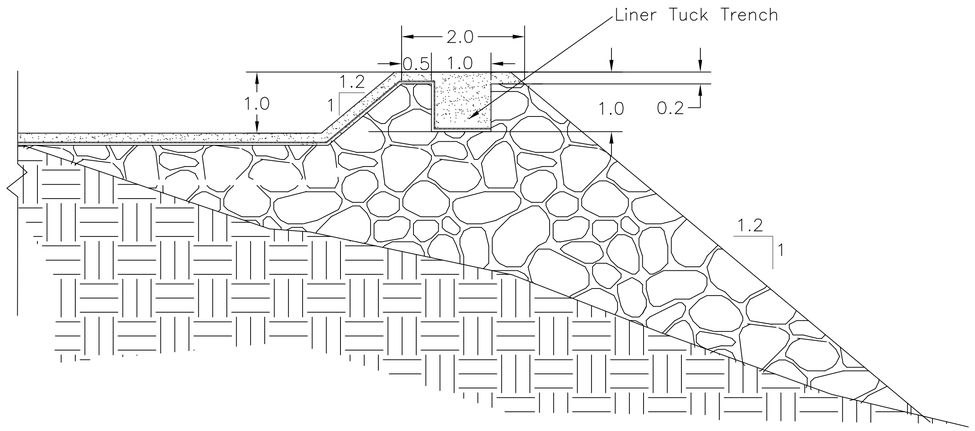


CONTAINMENT BERM ON BEDROCK
CUT SECTION B–B' (TYPICAL)

0 40 80 120 160 200 cm
1:25

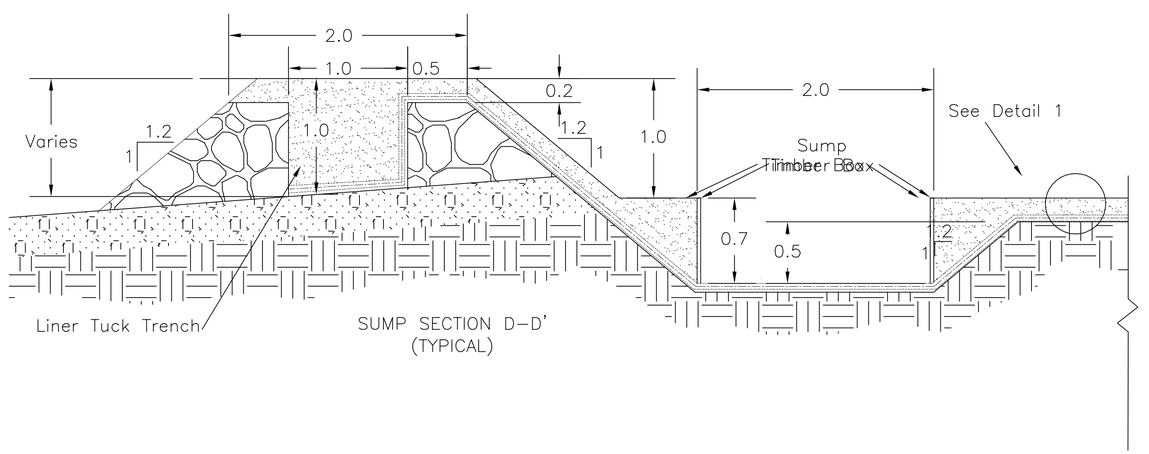
Legend:

- Overburden
- Natural ground
- Surfacing material
- Select Subgrade
- Run of quarry
- Drainage gravel

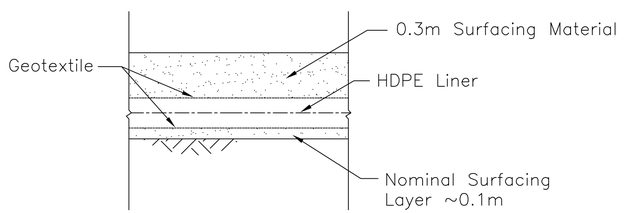


CONTAINMENT BERM ON FILL
SECTION C–C' (TYPICAL)

0 1 2 3 4 5 Metres
1:50



SUMP SECTION D–D'
(TYPICAL)



Detail 1
NTS

Notes:

1. A Specialist Contractor shall be responsible for the design, procurement and installation of all mechanical and/or electrical equipment at the fuel tank farm. The details of these elements are not indicated on the drawing.
2. The Contractor shall take due care so as not to damage the liner during construction. Special temporary liner protection measures must be taken in the event that construction equipment must pass over a liner before the final protective cover has been placed. The Engineer is to be notified of these occurrences.
3. Modifications to the liner tuck trench shall be allowed if equipment access is a problem. The details of any such modifications must be presented to the Engineer for approval.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

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B	WATER LICENSE APPLICATION			
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Vancouver

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AT	EMR	Mar. 2007

FILE NAME: TANK FARM_rev1.dwg

MIRAMAR HOPE BAY LTD.

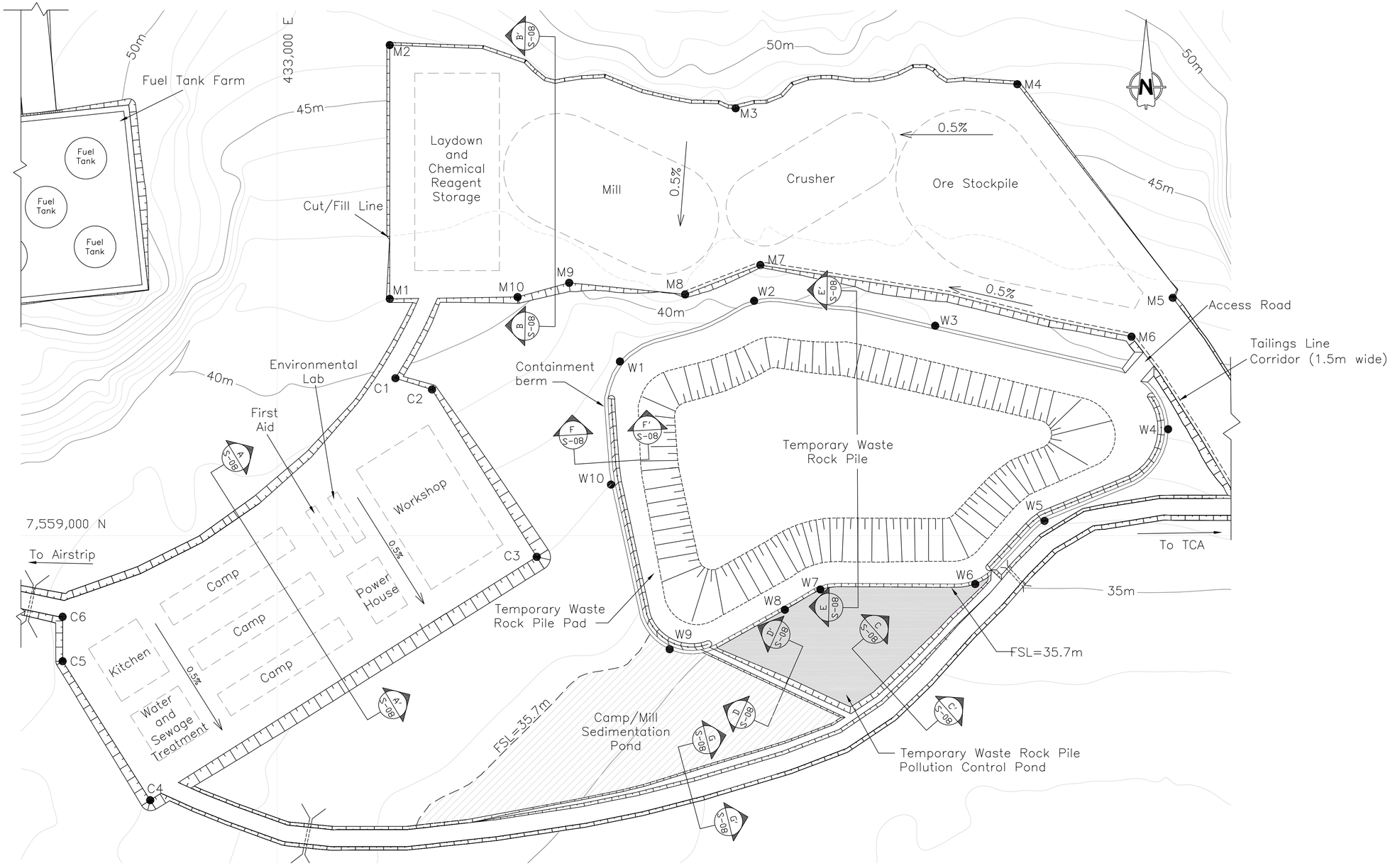
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
Fuel Tank Farm Typical Sections and Details

DRAWING NO.	SHEET	REVISION NO.
S-06	14 OF 49	B



STAKE OUT TABLE		
Point	Northing	Easting
Cam Pad		
C1	7559056.0	433042.0
C2	7559052.0	433055.0
C3	7558993.0	433092.0
C4	7558906.0	432955.0
C5	7558955.0	432924.0
C6	7558971.0	432924.0
Mill Pad		
M1	7559084.0	433040.0
M2	7559174.0	433040.0
M3	7559152.0	433162.0
M4	7559160.0	433162.0
M5	7559084.0	433317.0
M6	7559071.0	433303.0
M7	7559096.0	433171.0
M8	7559086.0	433145.0
M9	7559090.0	433103.0
M10	7559085.0	433085.0
Waste Rock Pile Pad		
W1	7559062.0	433121.0
W2	7559083.0	433169.0
W3	7559074.0	433233.0
W4	7559038.0	433316.0
W5	7559005.0	433272.0
W6	7558983.0	433247.0
W7	7558981.0	433194.0
W8	7558974.0	433180.0
W9	7558960.0	433139.0
W10	7559018.0	433119.0

Notes:

1. The finished grade of the Mill Pad cannot be lower than elevation 42 m, and undulations cannot be more than 0.2m.
2. A nominal leveling layer of Surfacing material shall be spread over the exposed bedrock surface before proceeding with foundation development.
3. The bedrock cut highwall for the Mill Pad shall be site fitted with the direction from the Engineer. The maximum highwall height will be 5m.
4. The Contractor shall over excavate overburden on the highwall crest to ensure slope stability. The Engineer will confirm the slope finishing details on site.
5. The Contractor shall be responsible for keeping the Ponds dry, and completely free of snow and water throughout the construction phase, or until otherwise instructed by the Engineer.
6. The Engineer will work with the Contractor to ensure that surface runoff drainage on the Camp and Mill pads are directed to the appropriate Pond as applicable.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

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PROFESSIONAL ENGINEERS STAMP

SRK Consulting
Engineers and Scientists
Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: MILL AND CAMP PLAN_rev1A.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT
DETAILED DESIGN

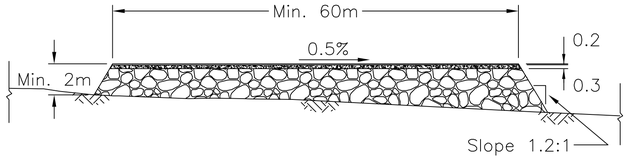
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

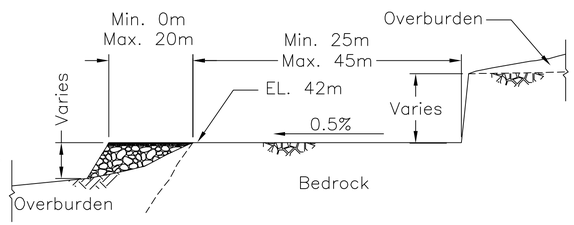
Camp and Mill Pad Plan

DRAWING NO.	SHEET	REVISION NO.
S-07	15 OF 49	B



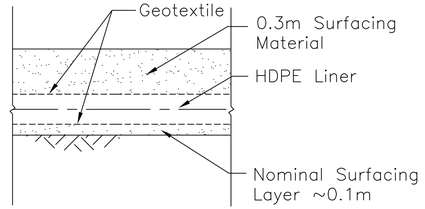
CAMP PAD SECTION A–A' (TYPICAL)

1:500 0 10 20 30 40 50 Metres

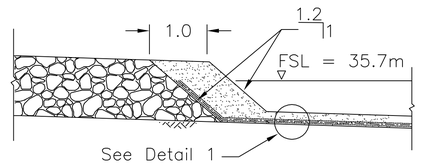


MILL PAD SECTION B–B' (TYPICAL)

1:500 0 10 20 30 40 50 Metres

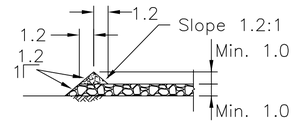


DETAIL 1
NTS



DETAIL 2

1:50 0 1 2 3 4 5 Metres

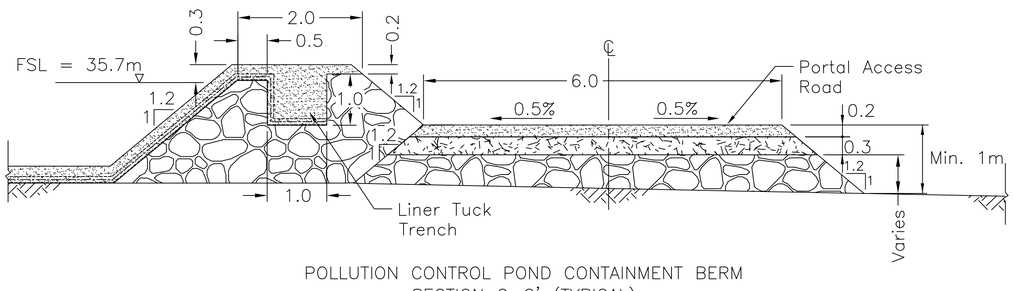


CONTAINMENT BERM
SECTION F–F' (TYPICAL)

1:25 0 0.5 1 1.5 2 2.5 Metres

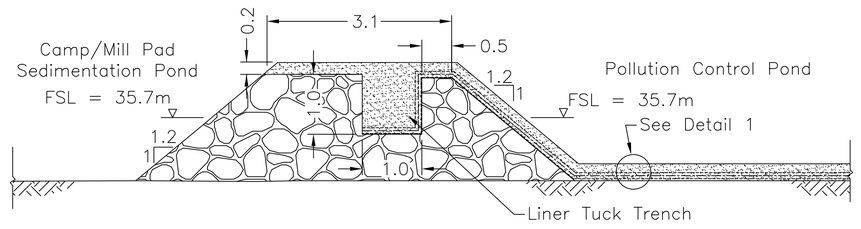
Legend:

- Natural ground
- Surfacing material
- Select subgrade
- Run of quarry
- Bedrock



POLLUTION CONTROL POND CONTAINMENT BERM
SECTION C–C' (TYPICAL)

1:50 0 1 2 3 4 5 Metres

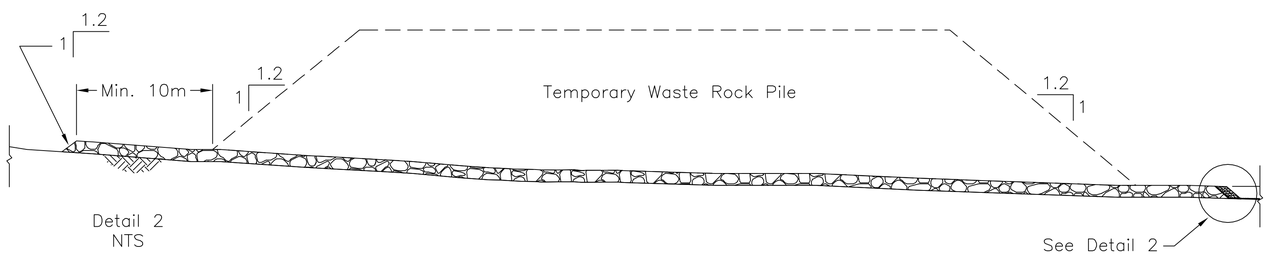


SEDIMENTATION AND POLLUTION CONTROL POND DIVIDER BERM
SECTION D–D' (TYPICAL)

1:50 0 1 2 3 4 5 Metres

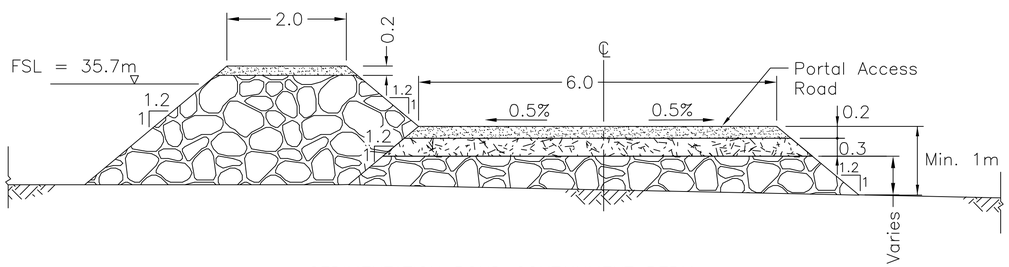
Notes:

1. The Contractor shall take due care so as not to damage the liner during construction. Special temporary liner protection measures must be taken in the event that construction equipment must pass over a liner before the final protective cover has been placed. The Engineer is to be notified of these occurrences.
2. Modifications to the liner tuck trench shall be allowed if equipment access is a problem. The details of any such modifications must be presented to the Engineer for approval.



TEMPORARY WASTE ROCK PILE PAD
SECTION E–E' (TYPICAL)

1:250 0 5 10 15 20 25 Metres



SEDIMENTATION POND CONTAINMENT BERM
SECTION G–G' (TYPICAL)

1:50 0 1 2 3 4 5 Metres

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

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SRK Consulting
Engineers and Scientists
Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: MILL AND CAMP PLAN_rev1A.dwg

MIRAMAR HOPE BAY LTD.

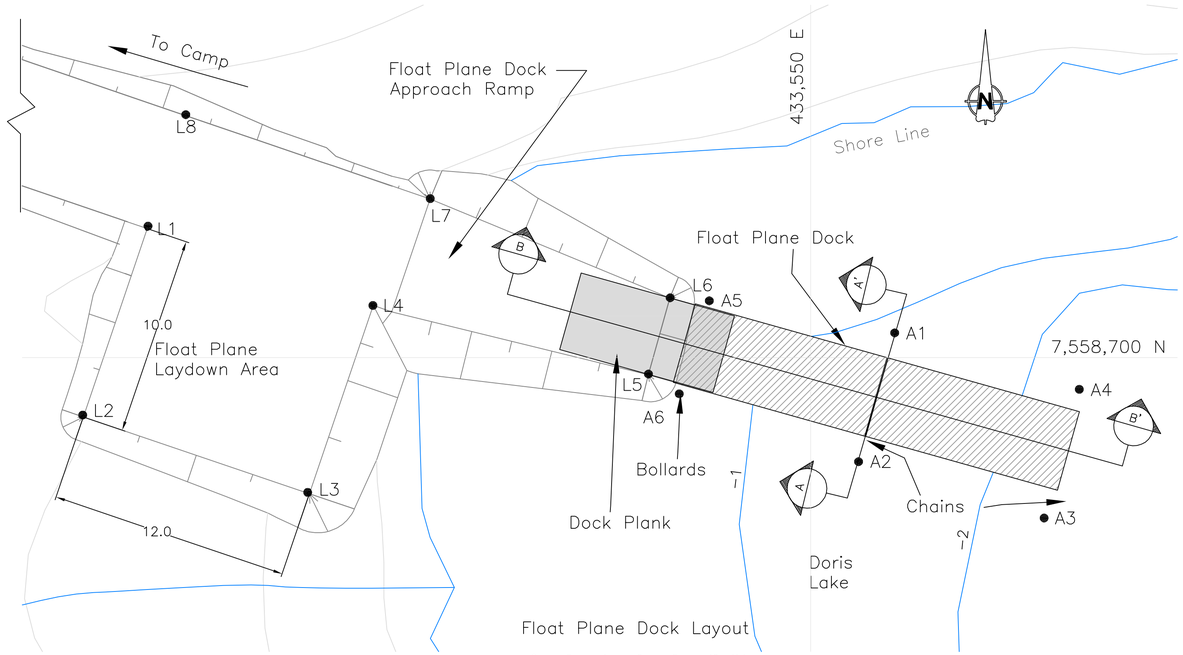
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

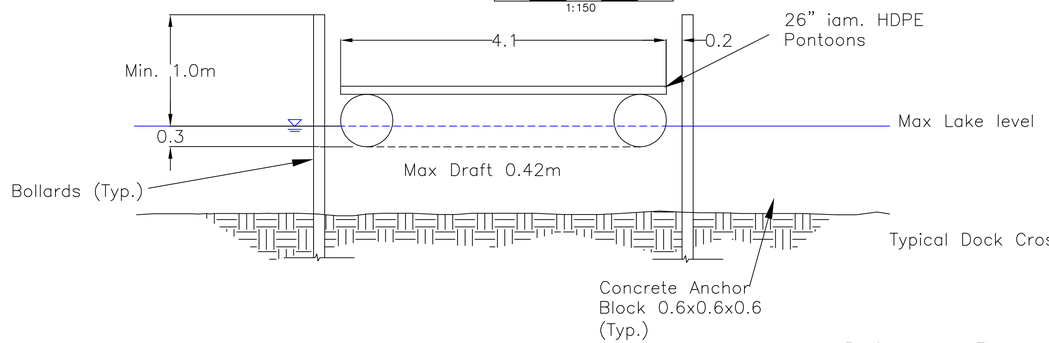
DRAWING TITLE:
Camp and Mill Pad
Typical Sections and Details

DRAWING NO.	SHEET	REVISION NO.
S-08	16 OF 49	B

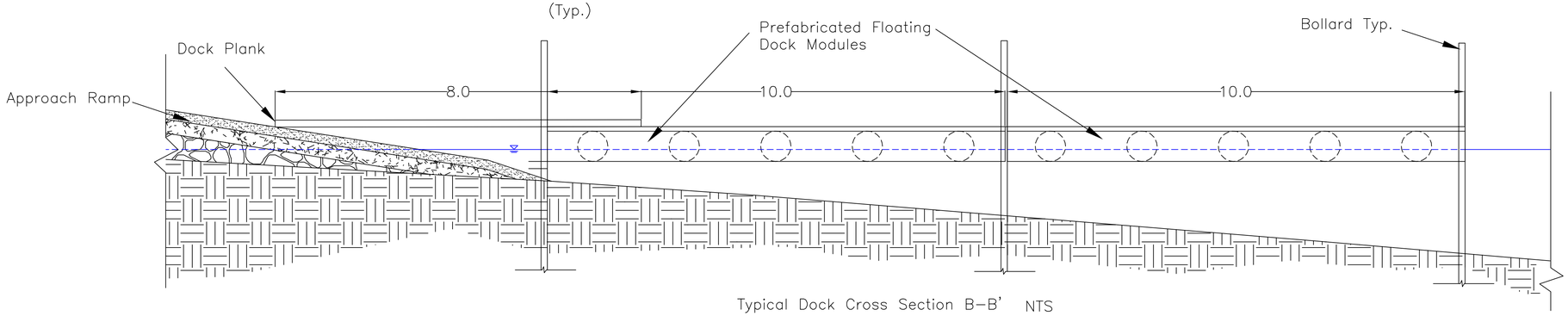


Float Plane Dock Layout

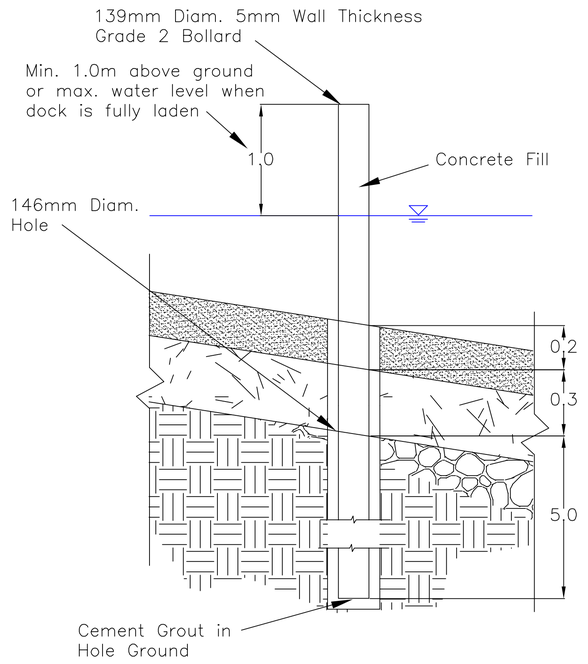
0 2 4 6 8 10 Metres
1:150



Typical Dock Cross Section A–A' NTS



Typical Dock Cross Section B–B' NTS



Typical Bollard
Installation Detail
NTS

STAKE OUT TABLE		
Point	Northing	Easting
Anchor Blocks		
A1	7558701.2	433554.2
A2	7558694.8	433552.4
A3	7558691.9	433562.7
A3	7558691.9	433562.7
A4	7558698.3	433564.5
Float Plane Dock		
A5	7558702.7	433544.2
A6	7558698.8	433543.1
Float Plane Laydown		
L1	7558706.5	433516.6
L2	7558697.0	433513.4
L3	7558693.2	433524.8
L4	7558702.6	433528.0
L5	7558699.1	433541.8
L6	7558703.0	433542.9
L7	7558708.0	433530.9
L8	7558712.2	433518.6

Legend:

- Natural ground
- Surfacing material
- Select subgrade
- Run of quarry

Notes:

1. Dock loading Pad and access ramp shall be constructed according to the Specification. The dock shall be constructed by the Specialist Contractor meeting the requirements shown on these Drawings and on the Specifications.
2. The submerged anchor tie–in hardware shall meet the requirements shown on Jetty Drawings and Jetty Specifications.
3. The tie in hardware shall be adjustable to suit the variation of the Lake levels.
4. The shore anchor locations can be adjusted by the Engineer to fit site conditions.
5. The minimum submergence of the dock shall be 0.5 m and maximum submergence 1.1 m.

REFERENCE DRAWINGS			
DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REVISIONS				
NO.	DESCRIPTION	CHK'D	APP'D	DATE
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A	WATER LICENSE APPLICATION			

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DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: Dock_and_Pad.dwg

MIRAMAR HOPE BAY LTD.

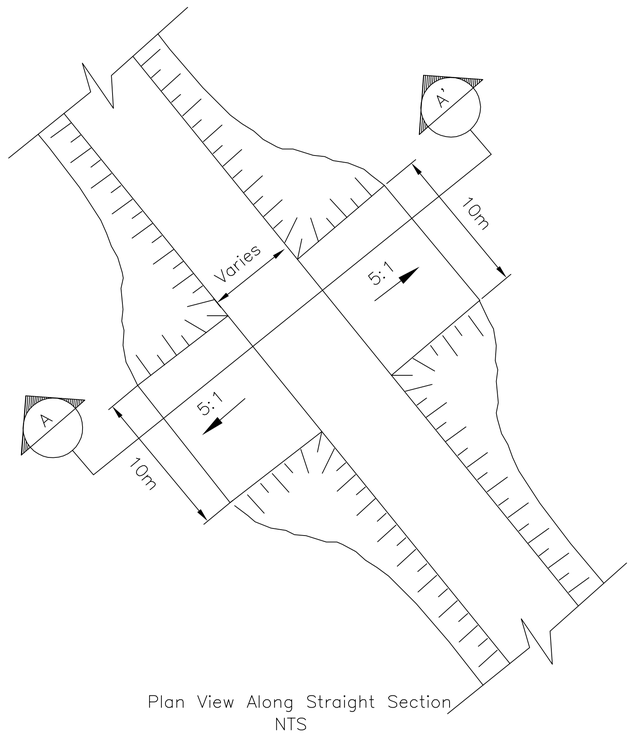
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

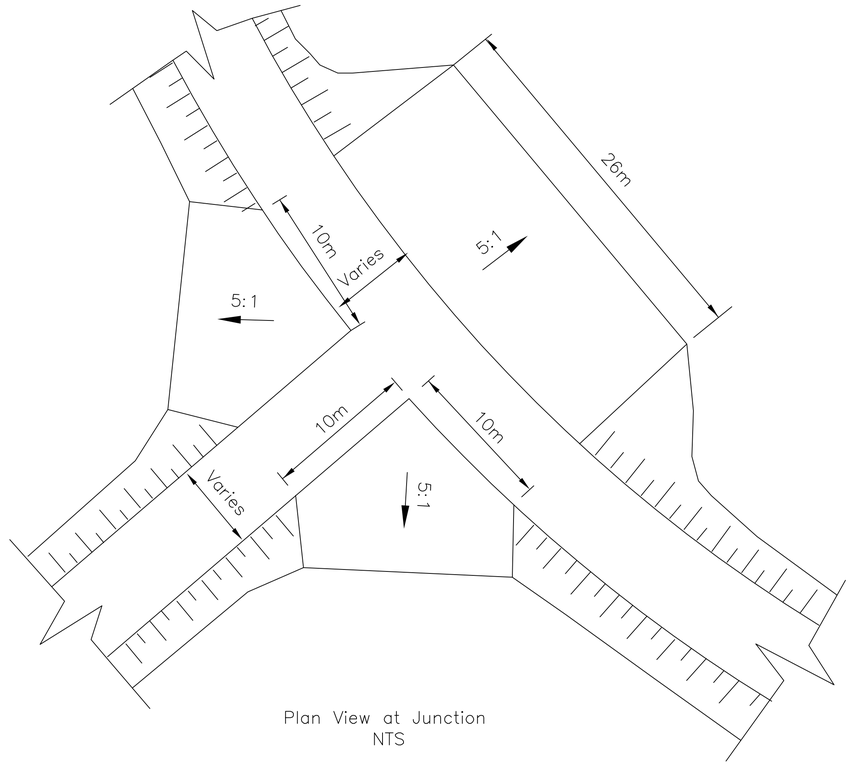
Doris North Project

DRAWING TITLE:
Float Plane Dock Typical Plan Sections and Details

DRAWING NO.	SHEET	REVISION NO.
S-09	17 OF 49	B



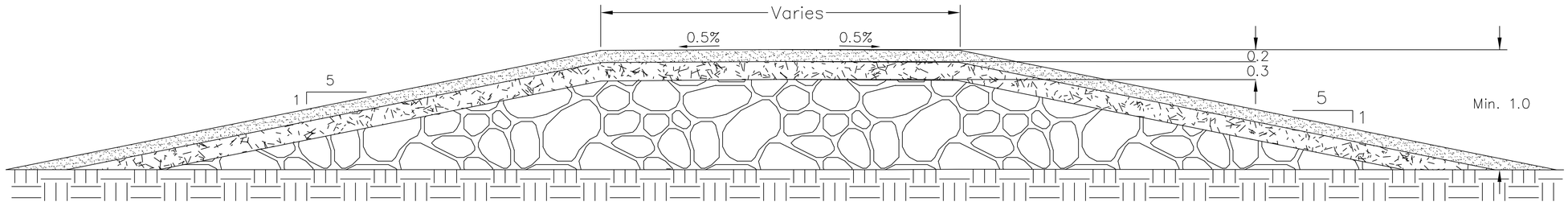
Plan View Along Straight Section
NTS



Plan View at Junction
NTS

Legend:

- Surfacing Material
- Select Subgrade
- Run of Quarry
- Natural Ground



Caribou Crossing Typical Section A–A'
NTS

Notes:

1. The final locations for the Caribou crossings shall be confirmed on site after consultation with the local landowner and Elders.
2. Caribou crossing dimensions are approximate and shall be site fitted to match each individual location.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

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Vancouver

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CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: caribou_crossing.dwg

MIRAMAR HOPE BAY LTD.

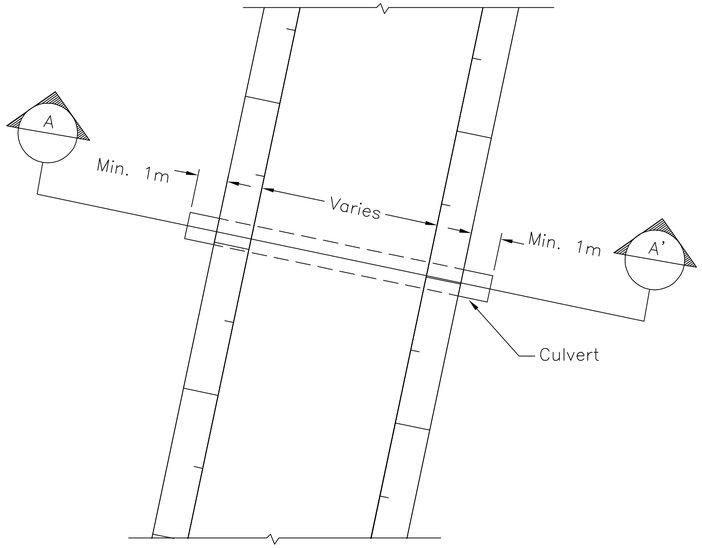
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

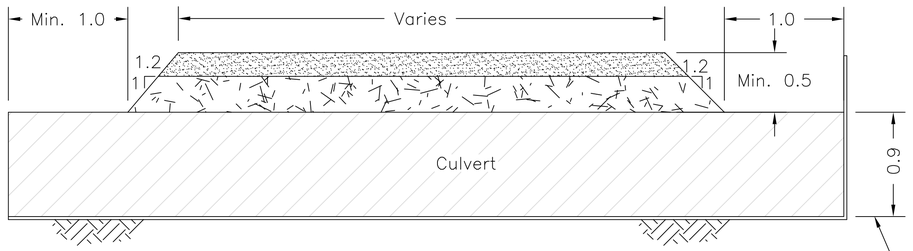
DRAWING TITLE:
Caribou Crossing Typical Plan and Sections

DRAWING NO.	SHEET	REVISION NO.
S-10	18 OF 49	B



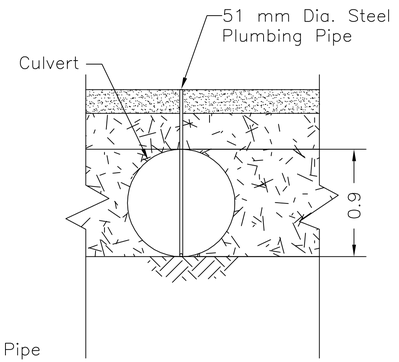
CULVERT PLAN LAYOUT (TYPICAL)

1:100 0 1 2 3 4 5 Metres

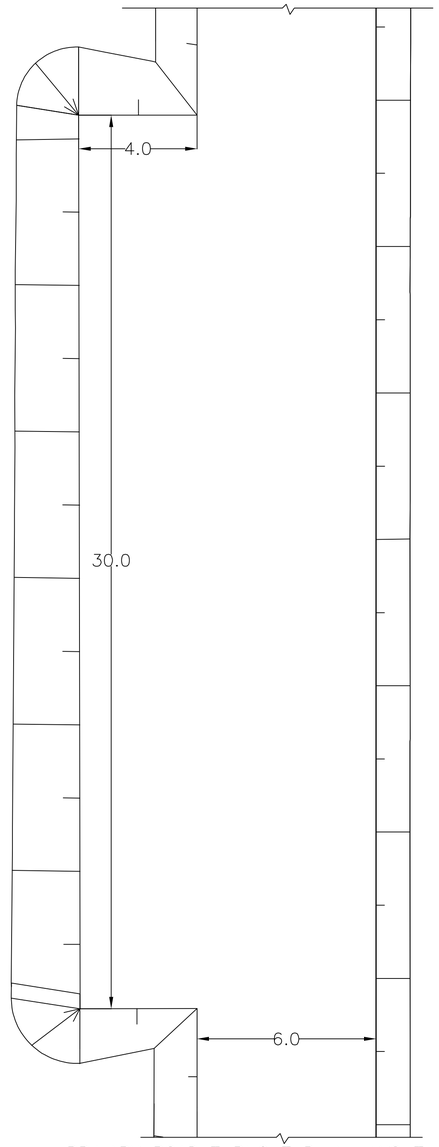


CULVERT SECTION (TYPICAL) A–A'

1:25 0 0.5 1.0 1.5 2.0 2.5 Metres



CULVERT INLET STEAM PIPE
RISER DETAIL (TYPICAL)
NTS



PRIMARY ROAD TURNOUT PLAN LAYOUT

1:100 0 2 4 6 8 10 Metres

Legend:

- Natural ground
- Surfacing material
- Select subgrade
- Run of quarry

Notes:

1. Culvert locations are approximate and based on best available information. The Engineer will inspect all indicated culvert locations and advise the Contractor if modifications are needed.
2. The Contractor shall make sure that the culverts shall be free draining, with no upstream or downstream ponding.
3. The installation of the steam pipes in all culverts shall be completed after culvert installation, to ensure fitting of the culvert to the full final culvert length.
4. The Contractor shall take all necessary precautions to ensure that the steam pipes are not damaged during construction, and that they are sufficiently well marked to ensure easy access in the spring.
5. Material immediately adjacent to the cluverts shall be Select Subgrade, so as not to damage the culvert. The Engineer will advise on site to the extent this will be required.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

SRK Consulting
Engineers and Scientists
Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: CULVERTS AND TURNOUTS.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT
DETAILED DESIGN

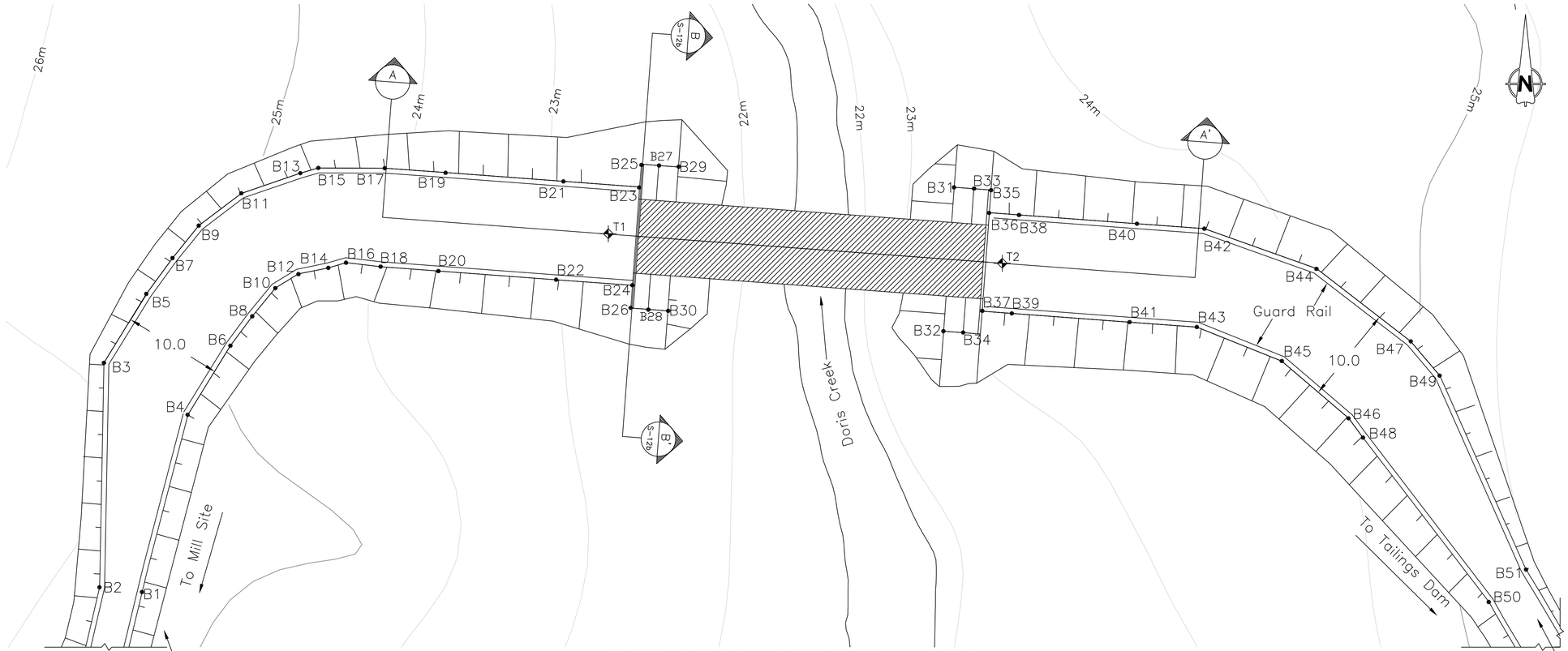
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

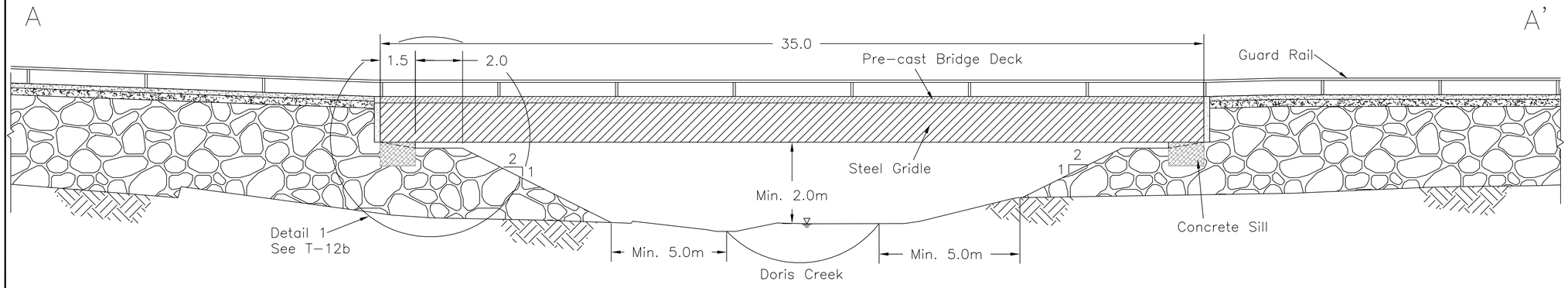
Culvert and Road Turnout
Typical Plan, Sections and Details

DRAWING NO.	SHEET	REVISION NO.
S-11	19 OF 49	B



BRIDGE ABUTMENT AND BRIDGE DECK LAYOUT PLAN

1:250 0 5 10 15 20 Metres



BRIDGE ABUTMENT AND BRIDGE DECK LAYOUT SECTION A–A'

1:200 0 5 10 15 20 Metres

Legend:

- Concrete
- Surfacing Material
- Select Subgrade
- Run of Quarry
- Natural Ground
- Concrete Sill
- Precast Bridge Deck
- Thermistor

Notes:

1. The Owner will supply the Bridge, including pre–cast wing walls. The Contractor shall be responsible for assembling and installing the bridge according to the Manufacturer's Specifications.
2. The Contractor shall take all necessary precautions to ensure that the flow in Doris Creek is not affected in any way, either during the bridge construction, or after construction. This includes complete removal of any temporary ice bridges.
3. The bridge abutments will be inspected by the Engineer prior to deployment.
4. The Contractor shall take all necessary precautions to ensure safety on the Bridge and Bridge abutments during the period leading up to the installation of the guard rails.
5. The toe of the abutment must be minimum 5m away from the river banks as approved by the Engineer.
6. Stake out points are listed on drawing S–12b.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

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Vancouver

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AT	EMR	Mar. 2007

FILE NAME: BRIDGE_FINALrev1.dwg

MIRAMAR HOPE BAY LTD.

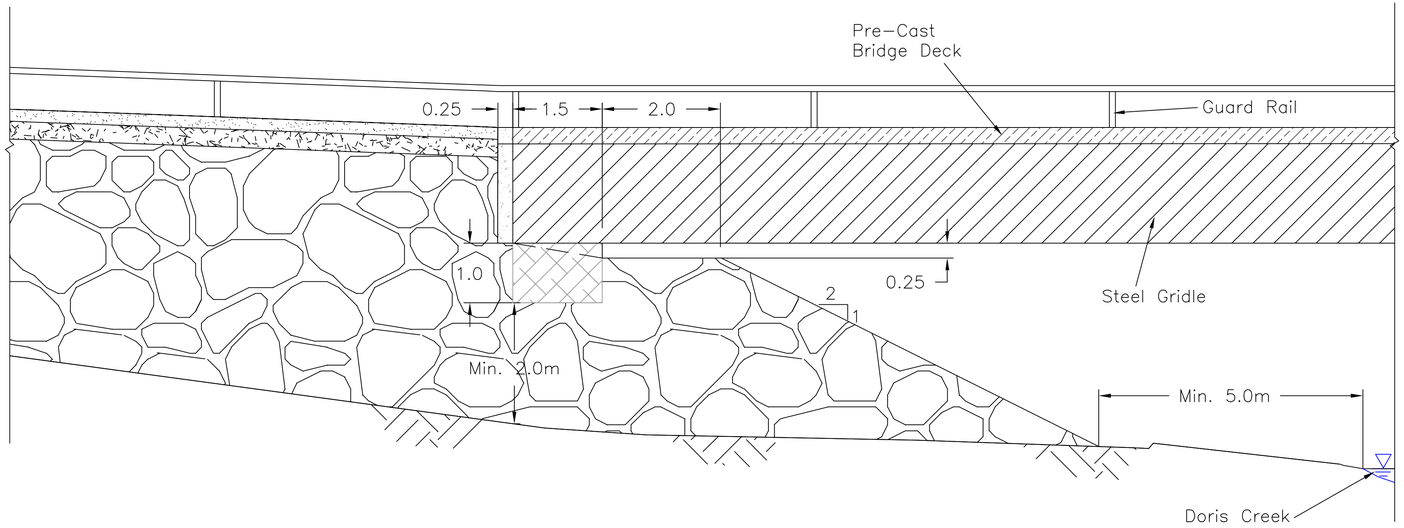
DORIS NORTH PROJECT
DETAIL DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
Bridge Crossing Plan and Typical Section

DRAWING NO.	SHEET	REVISION NO.
S-12a	20 OF 49	B



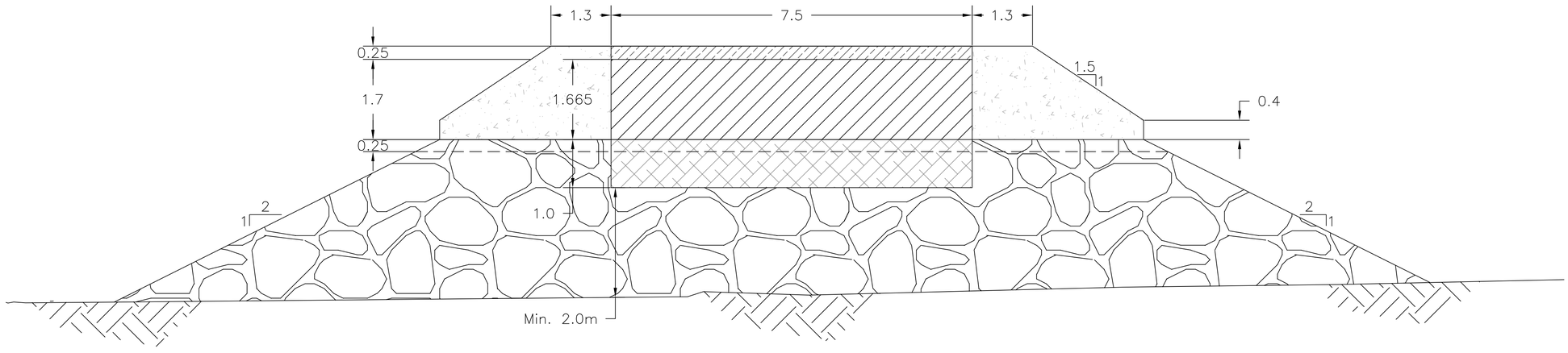
DETAIL 1 – BRIDGE ABUTMENT

1:25 0 1 1.5 2 2.5 Metres

Legend:

- Concrete
- Surfacing Material
- Select Subgrade
- Run of Quarry
- Natural Ground
- Concrete Sill
- Precast Bridge Deck

STAKE OUT TABLE			
Point	Northing	Easting	Elev.
Bridge			
B1	433985	7559441	27.6
B2	433980	7559442	27.6
B3	433981	7559465	27.5
B4	433989	7559459	27.5
B5	433985	7559472	27.5
B6	433994	7559466	27.5
B7	433988	7559475	27.5
B8	433996	7559469	27.5
B9	433990	7559479	27.4
B10	433998	7559472	27.4
B11	433995	7559482	27.4
B12	434000	7559474	27.4
B13	434001	7559484	27.4
B14	434003	7559474	27.4
B15	434002	7559484	27.4
B16	434005	7559475	27.4
B17	434009	7559484	27.4
B18	434009	7559474	27.4
B19	434015	7559484	27.3
B20	434015	7559474	27.3
B21	434027	7559483	26.5
B22	434027	7559473	26.5
B23	434035	7559482	26.3
B24	434034	7559473	26.3
B25	434035	7559485	24.4
B26	434034	7559470	24.4
B27	434037	7559485	24.4
B28	434036	7559470	24.4
B29	434039	7559485	24.1
B30	434038	7559470	24.1
B31	434067	7559482	25.1
B32	434066	7559468	25.1
B33	434069	7559482	25.4
B34	434068	7559468	25.4
B35	434071	7559482	25.4
B36	434070	7559480	27.3
B37	434070	7559470	27.3
B38	434073	7559480	26.1
B39	434073	7559470	26.1
B40	434085	7559479	26.7
B41	434085	7559469	26.7
B42	434092	7559478	26.8
B43	434091	7559468	26.8
B44	434104	7559474	27.1
B45	434100	7559465	27.1
B46	434107	7559459	27.4
B47	434113	7559467	27.4
B48	434108	7559457	27.5
B49	434116	7559463	27.5
B50	434121	7559440	26.5
B51	434125	755450	26.5
Thermistors			
T1	434032.0	7559477.0	
T2	434071.0	7559474.0	



BRIDGE ABUTMENT AND BRIDGE DECK LAYOUT SECTION B–B'

1:50 0 1.25 2.5 3.75 5 Metres

Note: Drawings plotted to half scale

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

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SRK Consulting Engineers and Scientists Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: BRIDGE_FINALrev1.dwg

MIRAMAR HOPE BAY LTD.

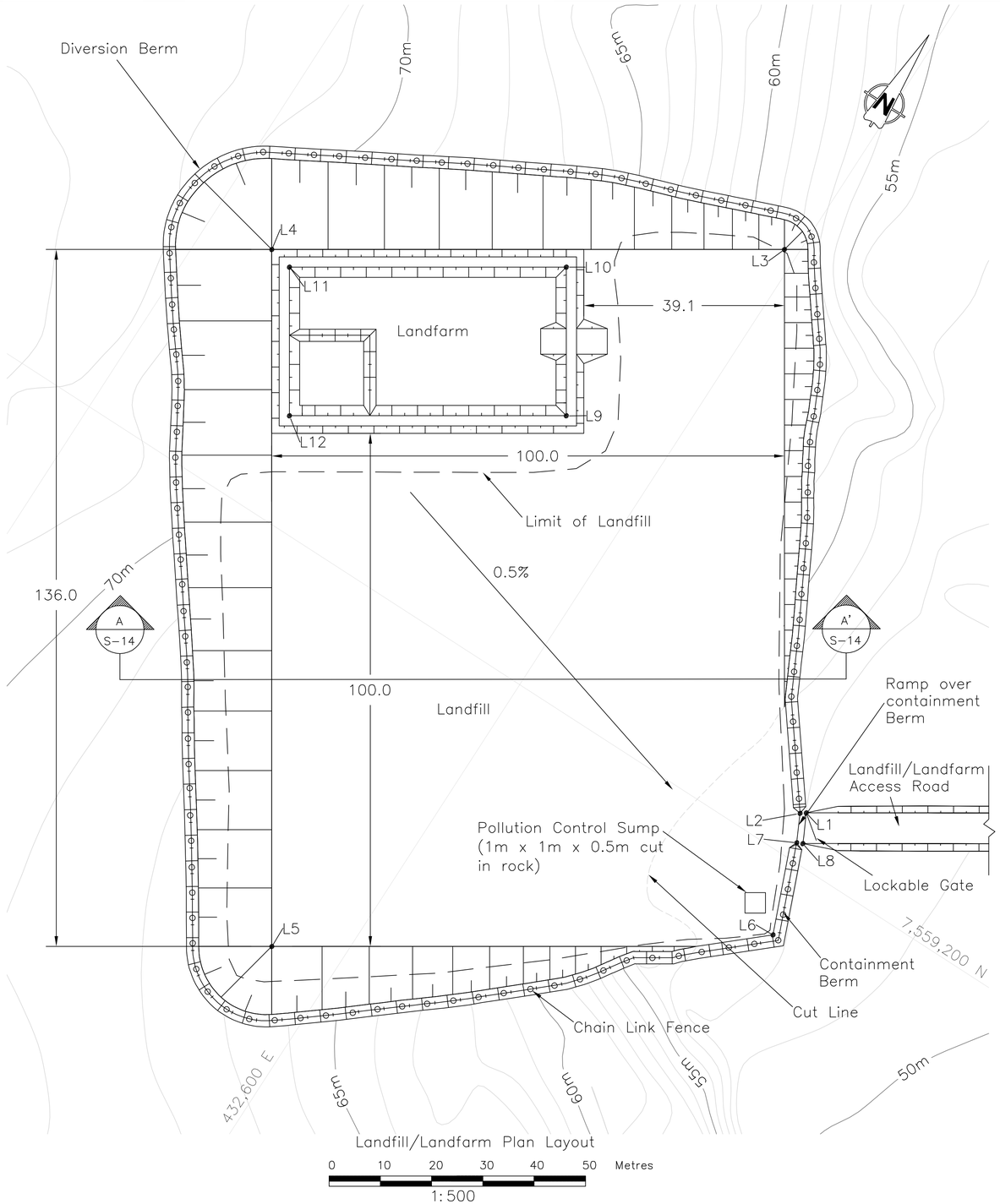
DORIS NORTH PROJECT
DETAIL DESIGN

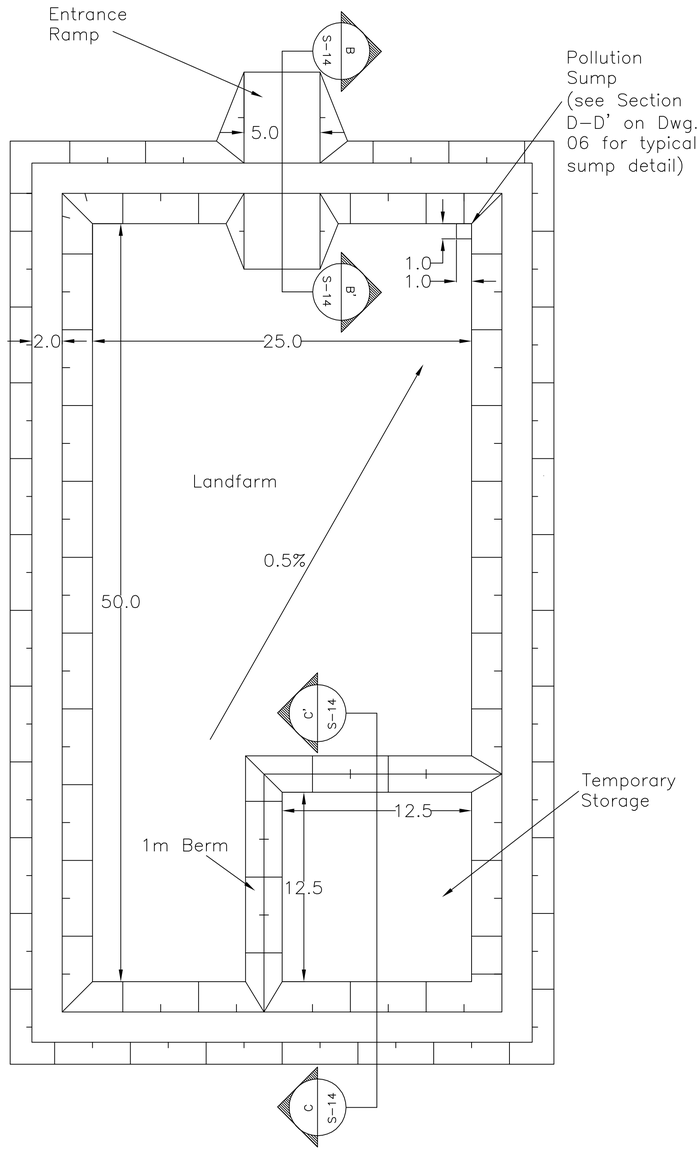
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
Bridge Crossing
Typical Section and Detail

DRAWING NO.	SHEET	REVISION NO.
S-12b	21 OF 49	B





STAKE OUT TABLE			
Point	Easting	Northing	Elev.
Landfill			
L1	432660.5	7559209.3	53.0
L2	432659.6	7559208.6	53.0
L3	432597.3	7559299.3	53.0
L4	432513.3	7559245.1	53.0
L5	432587.1	7559130.8	53.0
L6	432668.0	7559185.8	53.0
L7	432662.1	7559203.4	53.0
L8	432663.2	7559203.9	53.0
Landfarm			
L9	432579.2	7559249.0	54.2
L10	432563.4	7559273.4	54.2
L11	432518.1	7559244.1	54.2
L12	432533.8	7559219.7	54.2

Notes:

1. The landfill and landfarm shall be constructed in the developed quarry. The final configuration of the landfill shall be determined once the quarry development plan has been finalized.
2. The landfill and landfarm shall be founded predominantly on bedrock. If, after excavation to the lines and grades indicated on this drawing, sufficient bedrock is not exposed, the Engineer will instruct the Contractor to lower the level of excavation.
3. A nominal leveling layer of Surfacing material shall be spread over the exposed bedrock surface before proceeding with the landfarm construction.
4. The bedrock cut highwall for the landfill and landfarm shall be inspected by a qualified geotechnical Engineer to ensure safe operation within the landfill/landfarm area.
5. The Contractor shall over excavate overburden on the highwall crest to ensure slope stability. The Engineer will confirm the slope finishing details on site.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS			

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENSE APPLICATION			
A	WATER LICENSE APPLICATION			
REVISIONS				

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

SRK Consulting Engineers and Scientists Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: LANDFILL VIEW.DWG

MIRAMAR HOPE BAY LTD.

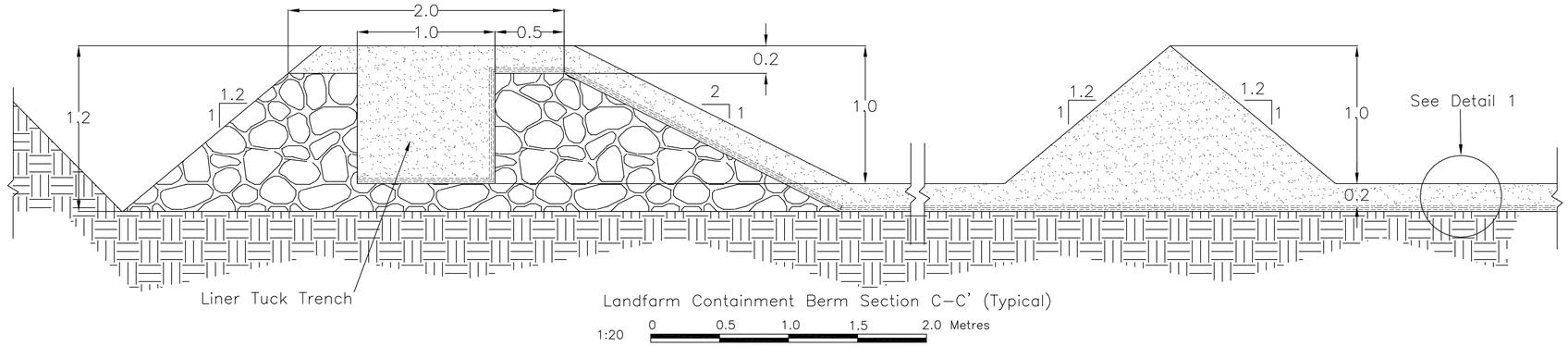
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

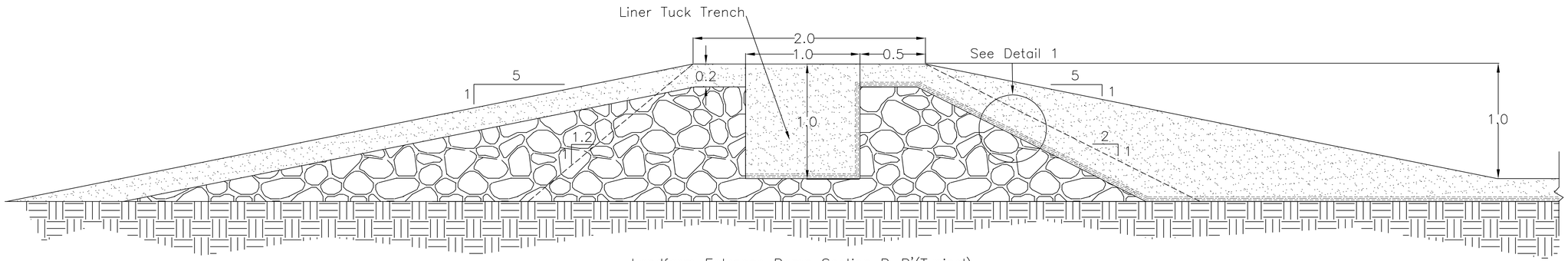
DRAWING TITLE:
Landfill and Landfarm Typical Plan

DRAWING NO.	SHEET	REVISION NO.
S-13	22 OF 49	B



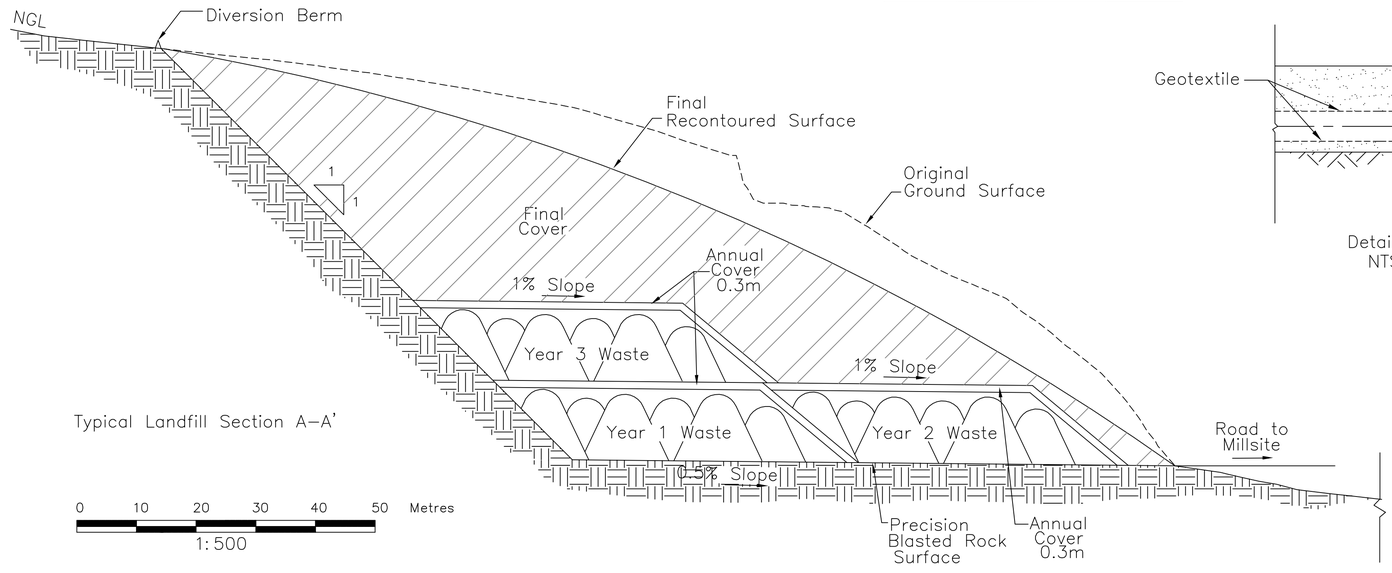
Landfarm Containment Berm Section C–C' (Typical)

1:20 0 0.5 1.0 1.5 2.0 Metres



Landfarm Entrance Ramp Section B–B'(Typical)

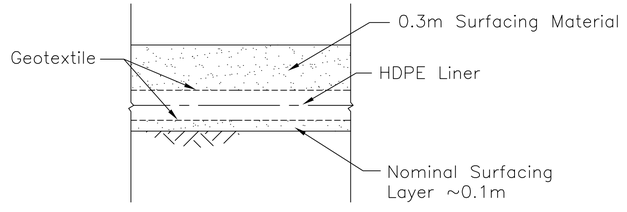
1:20 0 0.5 1.0 1.5 2.0 Metres



Typical Landfill Section A–A'

0 10 20 30 40 50 Metres

1:500



Detail 1
NTS

Notes:

1. The Contractor shall take due care so as not to damage the liner during construction. Special temporary liner protection measures must be taken in the event that construction equipment must pass over a liner before the final protective cover has been placed. The Engineer is to be notified of these occurrences.
2. Modifications to the liner tuck trench shall be allowed if equipment access is a problem. The details of any such modifications must be presented to the Engineer for approval.
3. The Contractor shall be responsible to keep the landfill and landfarm area free of snow and ice during the construction period.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENSE APPLICATION			
A	WATER LICENSE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

SRK Consulting
Engineers and Scientists
Vancouver

DESIGN: AT	DRAWN: JJH	REVIEWED: EMR
CHECKED: AT	APPROVED: EMR	DATE: Mar. 2007

FILE NAME: LANDFILL VIEW.DWG

MIRAMAR HOPE BAY LTD.

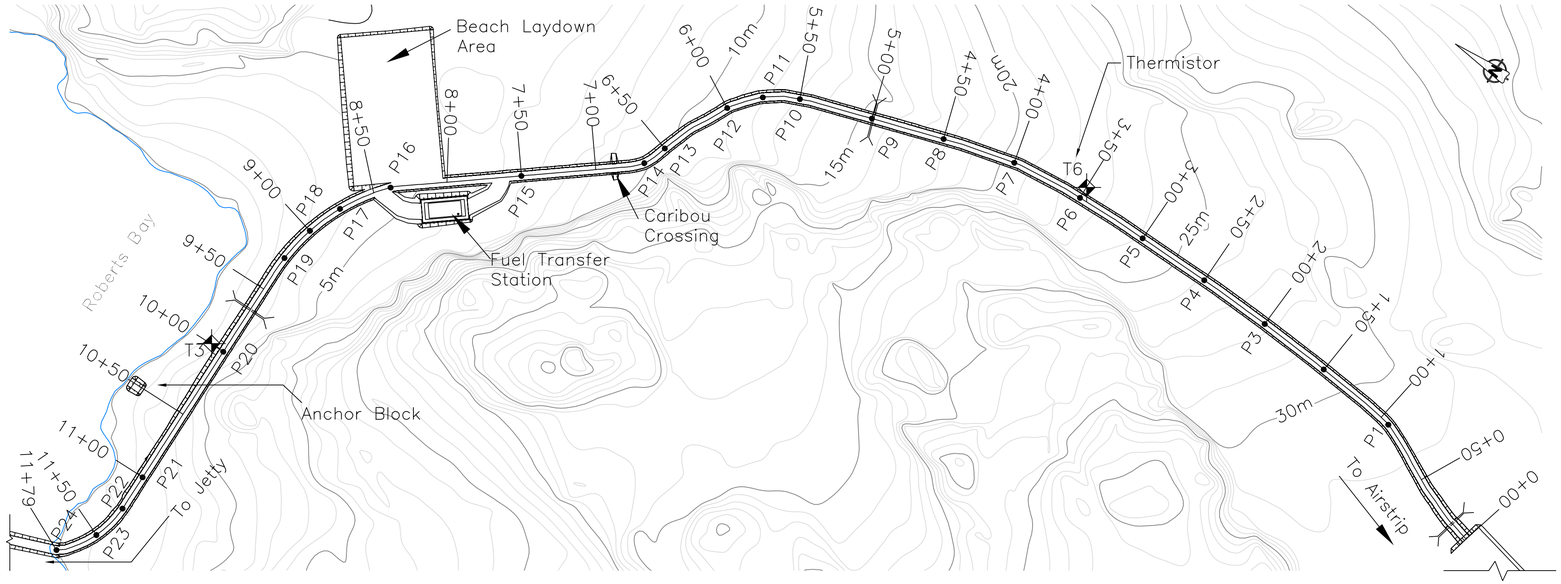
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

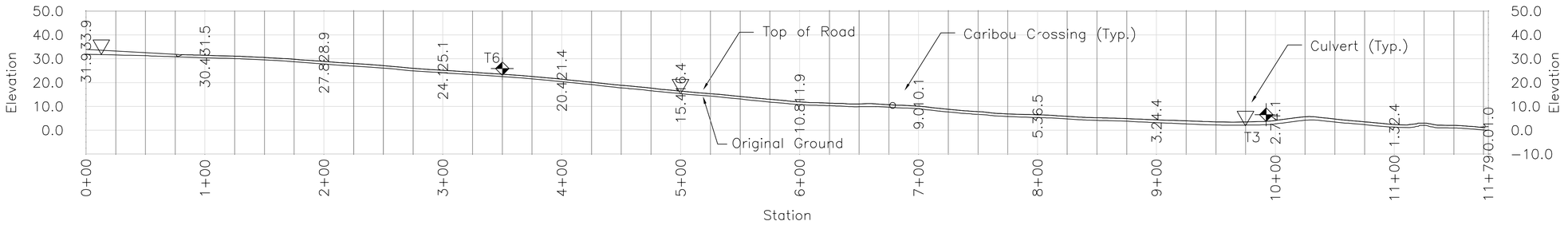
DRAWING TITLE:
Landfill and Landfarm
Typical Sections and Details

DRAWING NO.	SHEET	REVISION NO.
S-14	23 OF 49	B



NORTH PRIMARY ROAD PLAN LAYOUT

0 20 40 60 80 100 m
1:2000



NORTH PRIMARY ROAD PROFILE

0 20 40 60 80 100 m
1:2000

Legend:

T6 Thermistors

Notes:

1. The north primary road stretches from the Jetty to the northern end of the airstrip.
2. The primary road shall have a minimum crown width of 6 m, and a minimum overall fill thickness of 1 m.
3. Locations of culverts, road turnouts and caribou crossings will be confirmed on site by the Engineer.
4. Stake out points for the road are based on the road centerline. The Engineer will inspect and approve the staked out alignment before road construction can commence.
5. Stake out points are listed on drawing S−21.

Note: Drawings plotted to half scale

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

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DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: PRIMARY ROAD_rev4(black_lines).dwg

MIRAMAR HOPE BAY LTD.

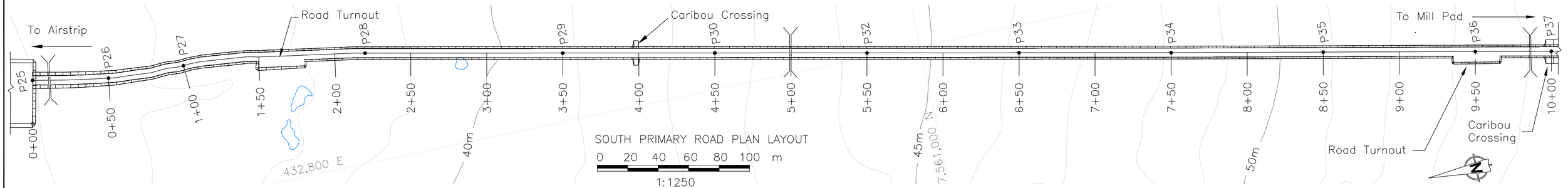
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
North Primary Road Plan and Profile (Station 00+00 - 11+79)

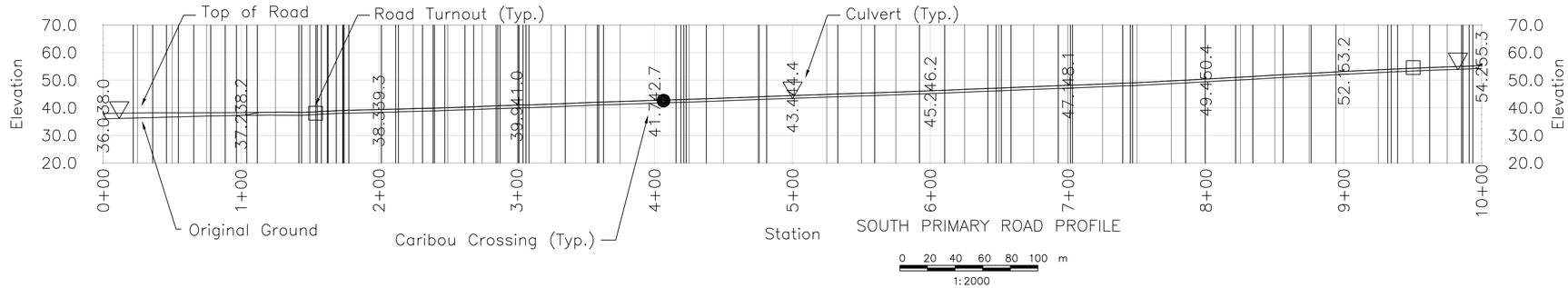
DRAWING NO.	SHEET	REVISION NO.
S-15	24 OF 49	B



SOUTH PRIMARY ROAD PLAN LAYOUT

0 20 40 60 80 100 m

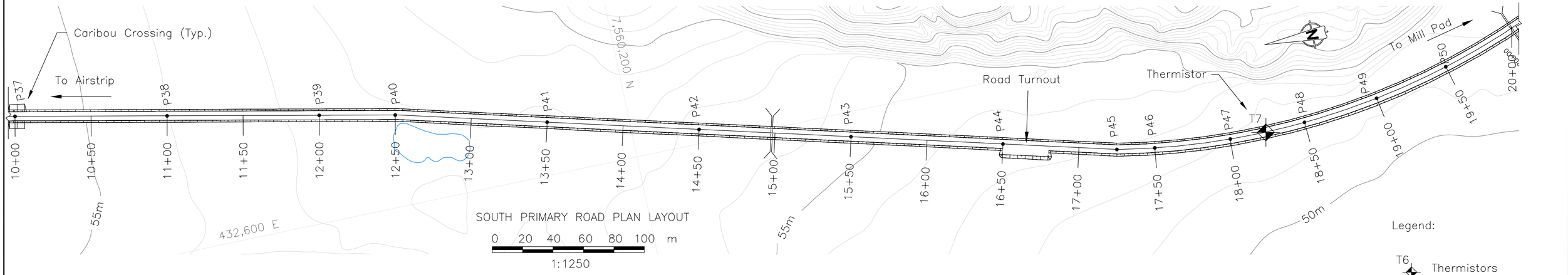
1:1250



SOUTH PRIMARY ROAD PROFILE

0 20 40 60 80 100 m

1:2000



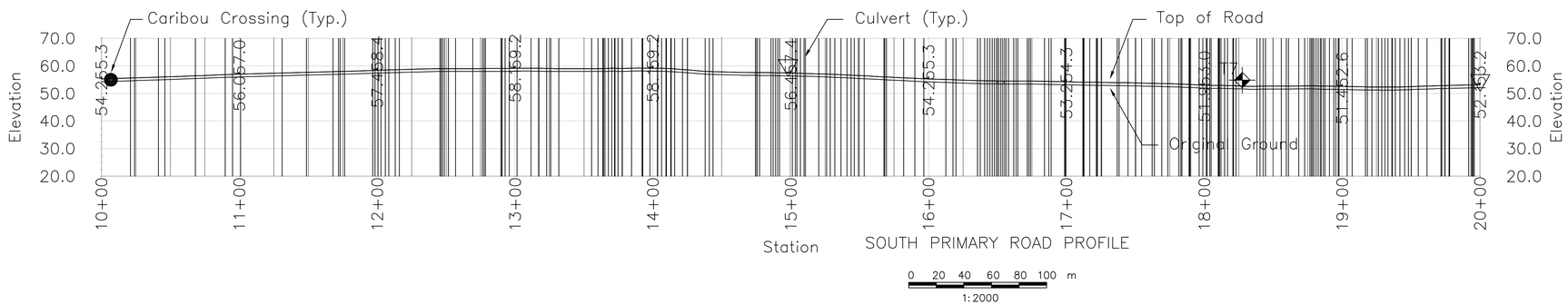
SOUTH PRIMARY ROAD PLAN LAYOUT

0 20 40 60 80 100 m

1:1250

Legend:

T6 Thermistors



SOUTH PRIMARY ROAD PROFILE

0 20 40 60 80 100 m

1:2000

Notes:

1. The south primary road stretches from the southern end of the airstrip to the junction leading to the fuel tank farm and the Camp/Mill complex.
2. The primary road shall have a minimum crown width of 6 m, and a minimum overall fill thickness of 1 m.
3. Locations of culverts, road turnouts and caribou crossings will be confirmed on site by the Engineer.
4. Stake out points for the road are based on the road centerline. The Engineer will inspect and approve the staked out alignment before road construction can commence.
5. Stake out points are listed on drawing S–21.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS			

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

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PROFESSIONAL ENGINEERS STAMP

SRK Consulting Engineers and Scientists Vancouver

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AT	EMR	Mar. 2007

FILE NAME: PRIMARY ROAD_rev3.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH DETAILED INFRASTRUCTURE DESIGN

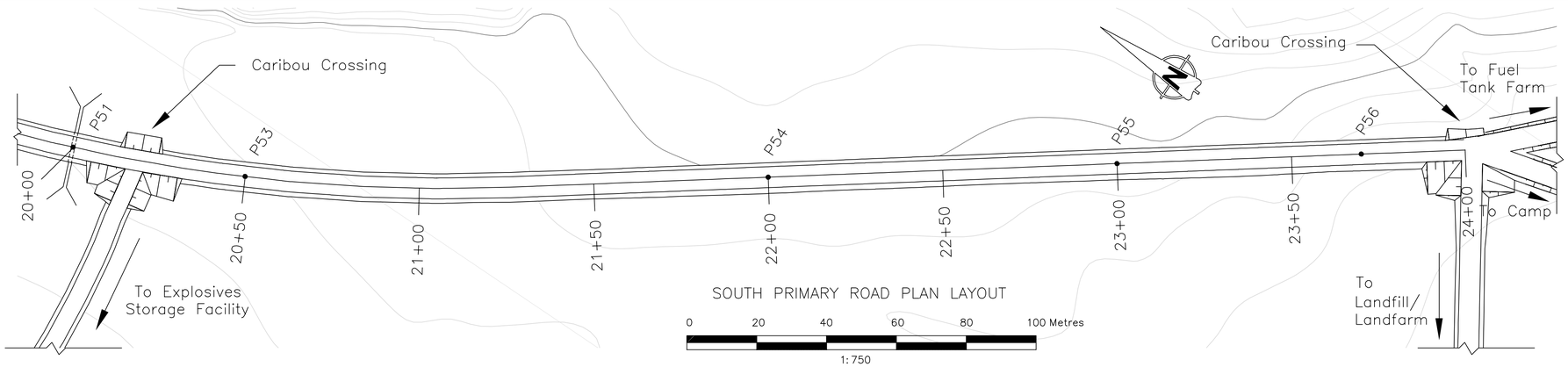
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

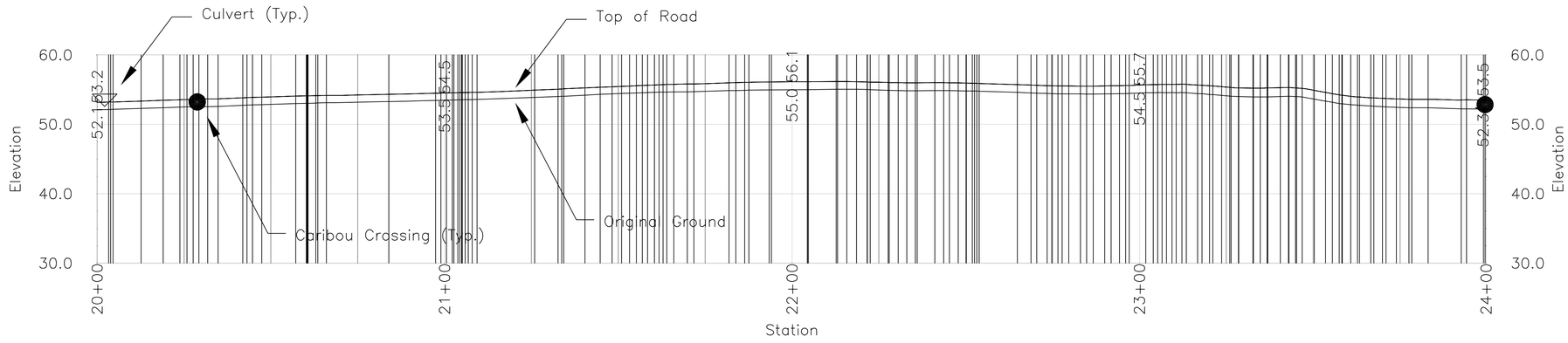
South Primary Road Plan and Profile (Station 00+00 - 20+00)

DRAWING NO.	SHEET	REVISION NO.
S-16	25 OF 49	B



Legend:

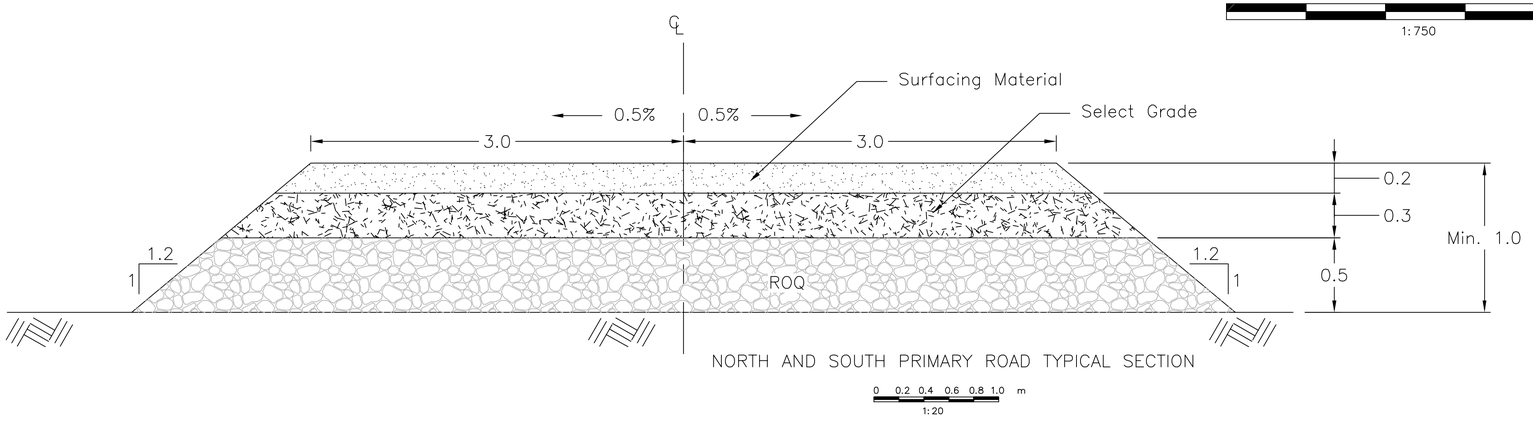
- Natural ground
- Surfacing material
- Select Subgrade
- Run of quarry
- Drainage gravel



SOUTH PRIMARY ROAD PROFILE

0 20 40 60 80 100 Metres

1:750



NORTH AND SOUTH PRIMARY ROAD TYPICAL SECTION

0 0.2 0.4 0.6 0.8 1.0 m

1:20

Notes:

1. The south primary road stretches from the southern end of the airstrip to the junction leading to the fuel tank farm and the Camp/Mill complex.
2. The primary road shall have a minimum crown width of 6 m, and a minimum overall fill thickness of 1 m.
3. Locations of culverts, road turnouts and caribou crossings will be confirmed on site by the Engineer.
4. Stake out points for the road are based on the road centerline. The Engineer will inspect and approve the staked out alignment before road construction can commence.
5. Stake out points are listed on drawing S-21.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

SRK Consulting
Engineers and Scientists
Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: PRIMARY ROAD_rev3.dwg

MIRAMAR HOPE BAY LTD.

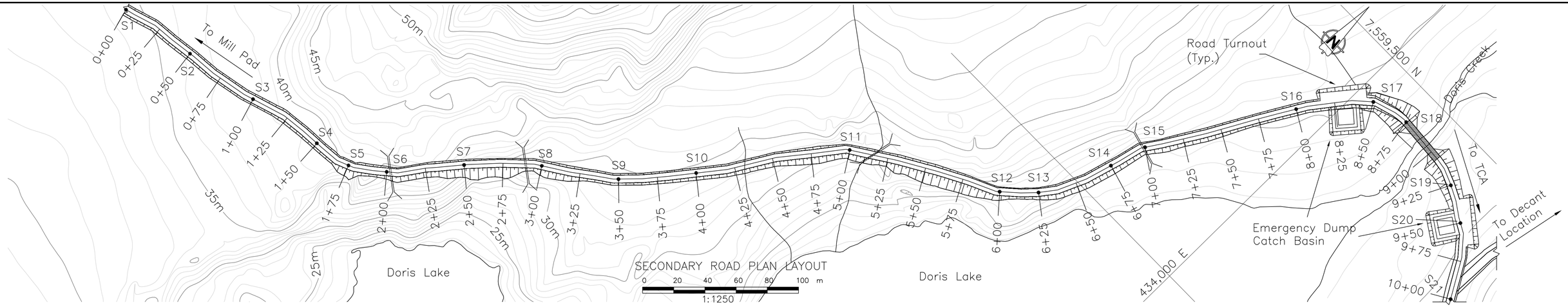
DORIS NORTH PROJECT
DETAILED DESIGN

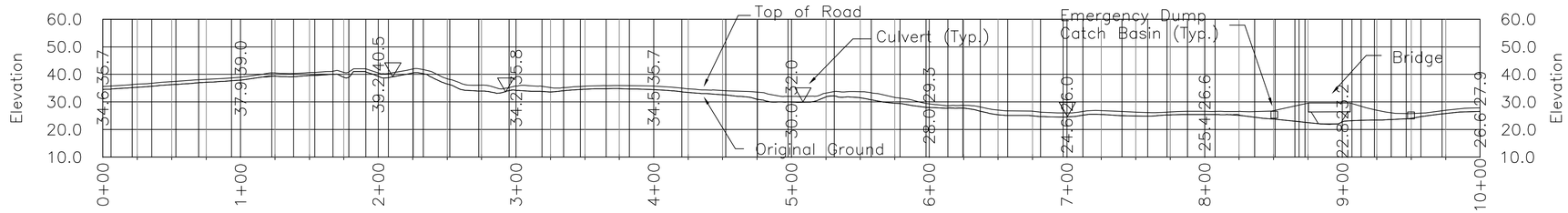
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
South Primary Road Plan and Profile (Station 20+00 - 24+00) and Typical Section

DRAWING NO.	SHEET	REVISION NO.
S-17	26 OF 49	B





SECONDARY ROAD PROFILE

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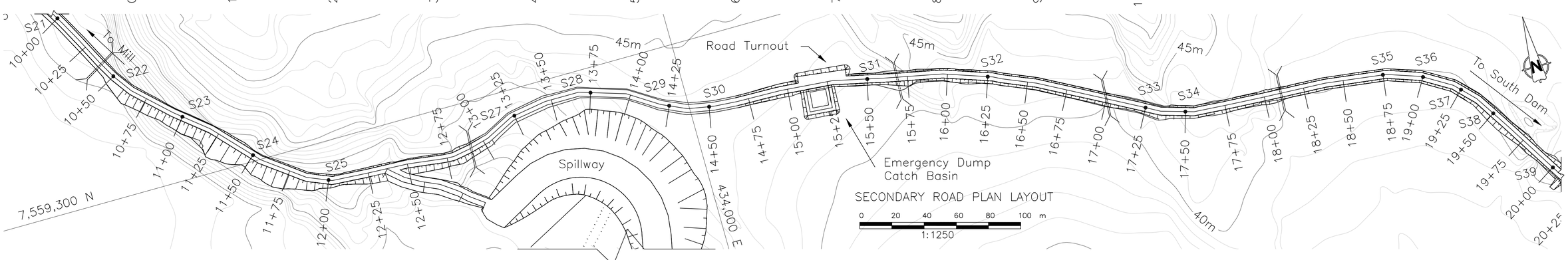
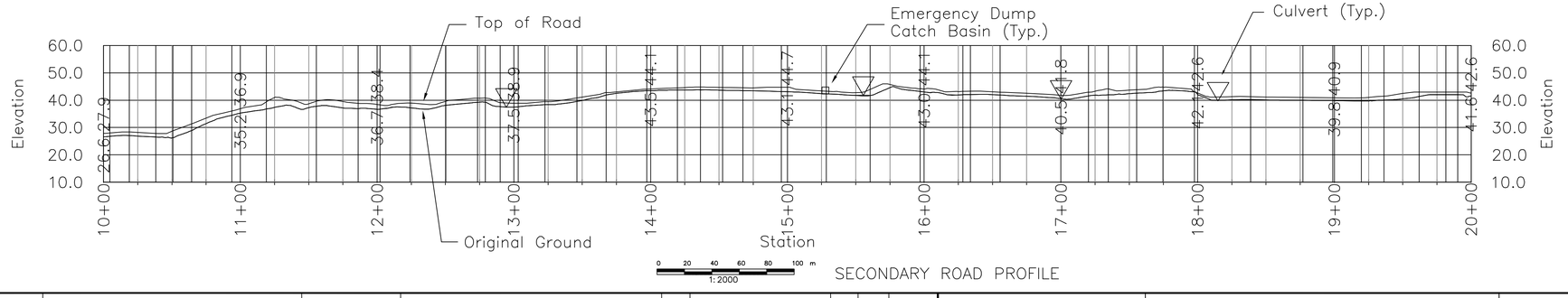
1:2000





0 20 40 60 80 100 m
1:2000

SECONDARY ROAD PROFILE

Notes:
1. The secondary road stretches from the junction leading to the Camp/Mill complex and the Doris Lake float plane dock to the South Dam.
2. The secondary road shall have a minimum crown width of 5 m, and a minimum overall fill thickness of 1 m.
3. Locations of culverts, road turnouts, caribou crossings and Emergency Dump Catch Basins will be confirmed on site by the Engineer.
4. Stake out points for the road are based on the road centerline. The Engineer will inspect and approve the staked out alignment before road construction can commence.
5. The tailings deposition line, return water line and discharge pipeline shall all be placed along sections of the secondary road.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENSE APPLICATION			
A	WATER LICENSE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

SRK Consulting
Engineers and Scientists
Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: SECONDARY ROAD_REV4.dwg

MIRAMAR HOPE BAY LTD.

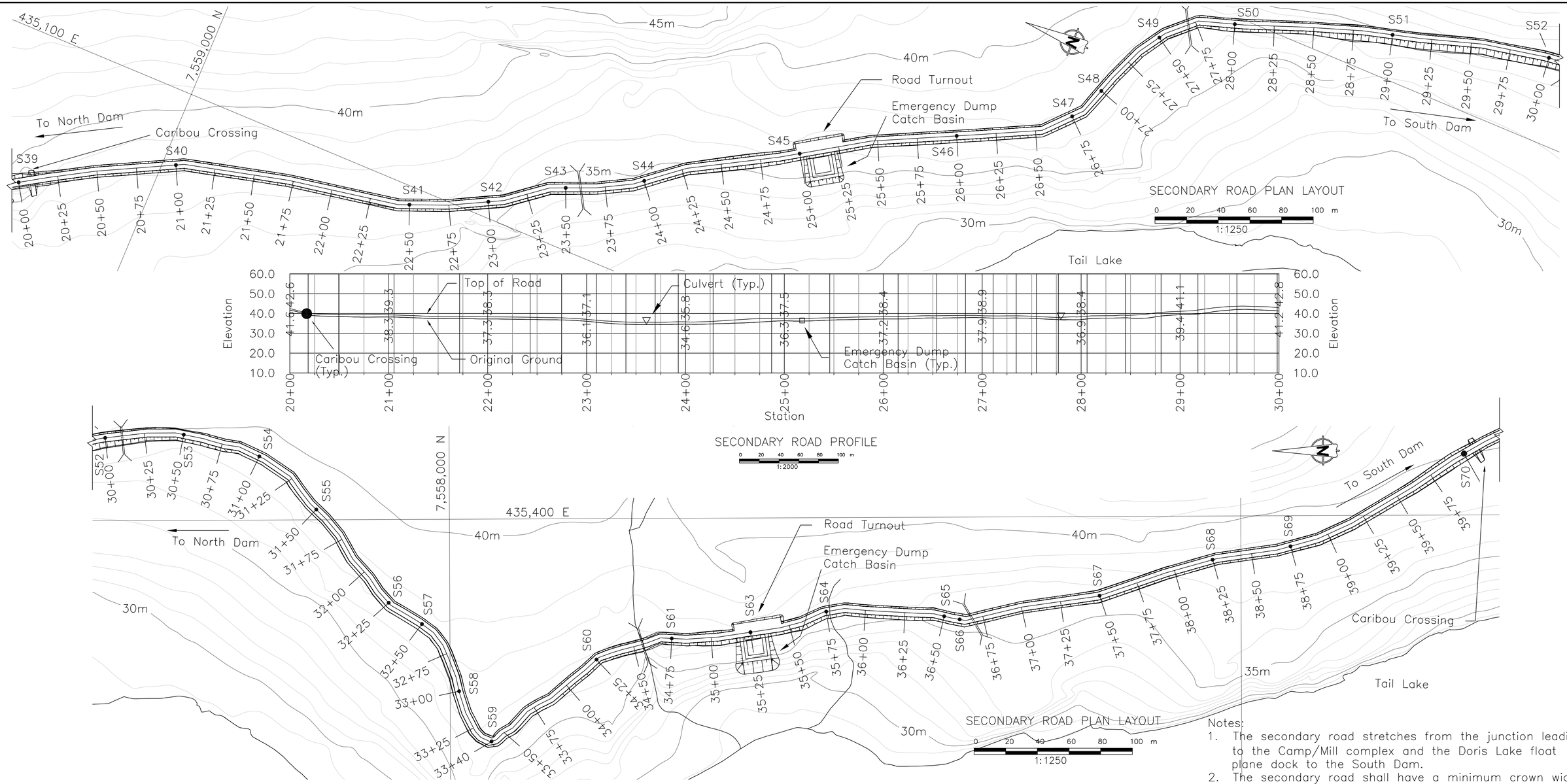
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
Secondary Road Plan and Profile (Station 0+00 - 20+00)

DRAWING NO.	SHEET	REVISION NO.
S-18	27 OF 49	B



Notes:

1. The secondary road stretches from the junction leading to the Camp/Mill complex and the Doris Lake float plane dock to the South Dam.
2. The secondary road shall have a minimum crown width of 5 m, and a minimum overall fill thickness of 1 m.
3. Locations of culverts, road turnouts, caribou crossings and Emergency Dump Catch Basins will be confirmed on site by the Engineer.
4. Stake out points for the road are based on the road centerline. The Engineer will inspect and approve the staked out alignment before road construction can commence.
5. The tailings deposition line, return water line and discharge pipeline shall all be placed along sections of the secondary road.

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FILE NAME: SECONDARY ROAD_REV4.dwg

MIRAMAR HOPE BAY LTD.

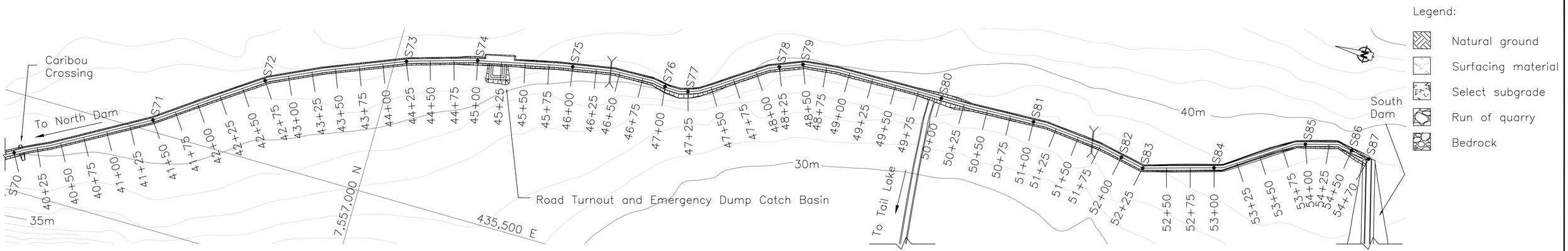
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
Secondary Road Plan and Profile
(Station 20+00 - 40+00)

DRAWING NO.	SHEET	REVISION NO.
S-19	28 OF 49	B



SECONDARY ROAD PLAN LAYOUT

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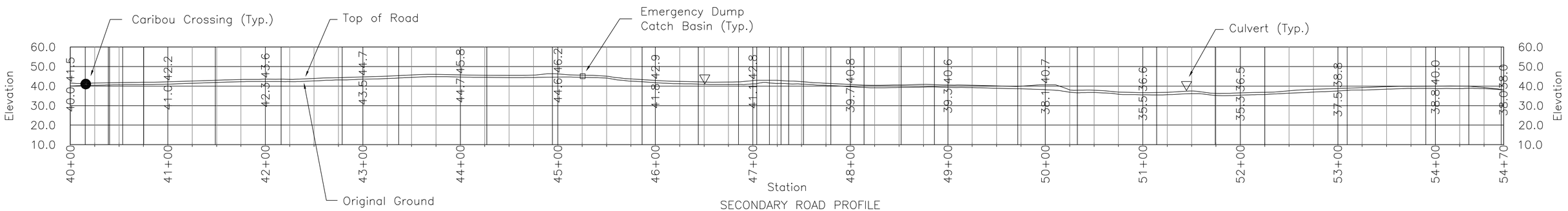
1:2000



SECONDARY ROAD PROFILE

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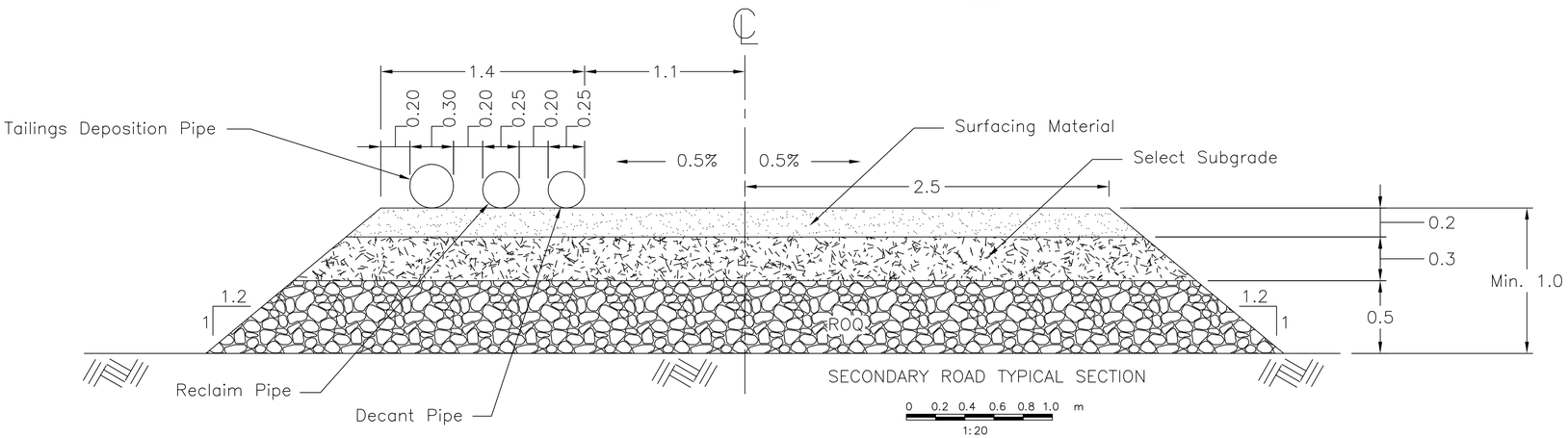

SECONDARY ROAD TYPICAL SECTION

0 0.2 0.4 0.6 0.8 1.0 m
1:20

Notes:
1. The secondary road stretches from the junction leading to the Camp/Mill complex and the Doris Lake float plane dock to the South Dam.
2. The secondary road shall have a minimum crown width of 5 m, and a minimum overall fill thickness of 1 m.
3. Locations of culverts, road turnouts, caribou crossings and Emergency Dump Catch Basins will be confirmed on site by the Engineer.
4. Stake out points for the road are based on the road centerline. The Engineer will inspect and approve the staked out alignment before road construction can commence.
5. The tailings deposition line, return water line and discharge pipeline shall all be placed along sections of the secondary road.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE
	REFERENCE DRAWINGS		

NO.	DESCRIPTION	CHK'D	APP'D	DATE
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A	WATER LICENSE APPLICATION			

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PROFESSIONAL ENGINEERS STAMP

SRK Consulting
Engineers and Scientists
Vancouver

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AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: SECONDARY ROAD_REV4.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
Secondary Road Plan and Profile (Station 40+00 - 54+70) and Typical Section

DRAWING NO.	SHEET	REVISION NO.
S-20	29 OF 49	B

STAKE OUT TABLE		
Primary Road North 0+00–11+79		
Point	Easting	Northing
P1	433130.7	7562553.7
P2	433137.3	7562610.2
P3	433140.5	7562660.1
P4	433142.1	7562710.1
P5	433142.3	7562760.1
P6	433141.3	7562810.1
P7	433136.2	7562859.7
P8	433122.8	7562907.9
P9	433107.3	7562955.4
P10	433091.2	7563002.7
P11	433078.3	7563024.0
P12	433059.0	7563039.7
P13	433013.2	7563059.3
P14	432997.3	7563065.2
P15	432944.2	7563128.8
P16	432888.7	7563197.1
P17	432857.8	7563217.2
P18	432834.4	7563225.7
P19	432809.7	7563229.7
P20	432734.7	7563228.6
P21	432634.8	7563226.4
P22	432609.8	7563225.8
P23	432585.4	7563230.4
P24	432562.1	7563247.0

STAKE OUT TABLE		
Primary Road South 0+00–24+00		
Point	Easting	Northing
P25	432898.9	7561575.5
P26	432890.0	7561526.3
P27	432887.9	7561476.5
P28	432871.1	7561357.9
P29	432844.2	7561230.7
P30	432823.6	7561132.8
P31	432823.6	7561132.8
P32	432803.0	7561035.0
P33	432782.3	7560937.1
P34	432761.7	7560839.3
P35	432741.3	7560741.4
P36	432721.0	7560643.5
P37	432710.8	7560594.5
P38	432690.4	7560496.6
P39	432670.1	7560398.7
P40	432659.9	7560349.8
P41	432634.6	7560253.0
P42	432609.2	7560156.3
P43	432583.9	7560059.5
P44	432558.5	7559962.8
P45	432539.5	7559890.3
P46	432535.3	7559865.6
P47	432530.7	7559815.9
P48	432531.4	7559765.9
P49	432537.0	7559716.2
P50	432547.9	7559667.4
P51	432563.6	7559620.0
P52	430722.2	7558603.6
P53	432584.2	7559574.5
P54	432667.8	7559450.2
P55	432726.9	7559369.5
P56	432768.2	7559313.0

STAKE OUT TABLE		
Secondary Road 0+00–28+00		
Point	Easting	Northing
S1	433409.3	7558941.7
S2	433458.2	7558951.2
S3	433507.3	7558959.7
S4	433556.1	7558969.1
S5	433580.4	7558973.7
S6	433600.6	7558988.3
S7	433632.2	7559026.8
S8	433667.5	7559062.0
S9	433708.0	7559091.2
S10	433748.1	7559123.2
S11	433798.7	7559210.1
S12	433885.1	7559260.1
S13	433902.9	7559277.5
S14	433923.2	7559322.7
S15	433930.1	7559346.6
S16	433980.6	7559432.8
S17	434012.0	7559471.4
S18	434035.9	7559477.4
S19	434084.9	7559469.5
S20	434106.4	7559457.0
S21	434136.8	7559418.3
S22	434160.6	7559374.3
S23	434195.2	7559338.5
S24	434231.0	7559303.8
S25	434262.5	7559253.1
S26	434345.3	7559244.7
S27	434393.9	7559283.7
S28	434443.3	7559284.8
S29	434488.3	7559263.7
S30	434512.0	7559256.5
S31	434611.2	7559246.6
S32	434683.7	7559227.9
S33	434773.0	7559183.0
S34	434796.1	7559174.0
S35	434920.5	7559162.9
S36	434944.1	7559155.0
S37	434964.7	7559141.1
S38	434980.1	7559121.5
S39	435006.7	7559079.2
S40	435055.1	7558991.8
S41	435088.9	7558846.0
S42	435109.8	7558800.6
S43	435136.8	7558758.9
S44	435160.1	7558714.9
S45	435213.8	7558630.9
S46	435262.4	7558543.7
S47	435301.9	7558481.1
S48	435324.0	7558470.3
S49	435369.1	7558449.5
S50	435395.4	7558408.8

STAKE OUT TABLE		
Secondary Road 28+00–57+00		
Point	Easting	Northing
S51	435427.6	7558314.2
S52	435452.3	7558217.4
S53	435454.2	7558167.7
S54	435440.2	7558120.0
S55	435406.5	7558084.1
S56	435347.4	7558038.6
S57	435333.9	7558017.7
S58	435291.3	7557994.4
S59	435259.5	7557974.0
S60	435311.0	7557907.4
S61	435324.1	7557859.9
S62	435327.8	7557810.1
S63	435327.8	7557810.1
S64	435340.7	7557762.2
S65	435337.4	7557687.7
S66	435335.4	7557677.9
S67	435350.0	7557589.4
S68	435372.4	7557517.9
S69	435380.7	7557468.6
S70	435438.8	7557358.8
S71	435511.9	7557227.8
S72	435584.1	7557125.8
S73	435644.3	7556988.6
S74	435665.7	7556916.7
S75	435687.0	7556819.0
S76	435693.6	7556719.9
S77	435695.2	7556695.3
S78	435746.5	7556610.0
S79	435755.9	7556586.8
S80	435761.8	7556437.2
S81	435764.5	7556337.3
S82	435754.2	7556238.1
S83	435749.3	7556213.6
S84	435770.2	7556141.5
S85	435820.4	7556056.0
S86	435827.3	7556007.3
S87	435823.8	7555987.7

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENSE APPLICATION			
A	WATER LICENSE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

SRK Consulting
Engineers and Scientists
Vancouver

DESIGN: AT	DRAWN: JJH	REVIEWED: EMR
CHECKED: AT	APPROVED: EMR	DATE: Mar. 2007

FILE NAME: SECONDARY ROAD_REV4.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

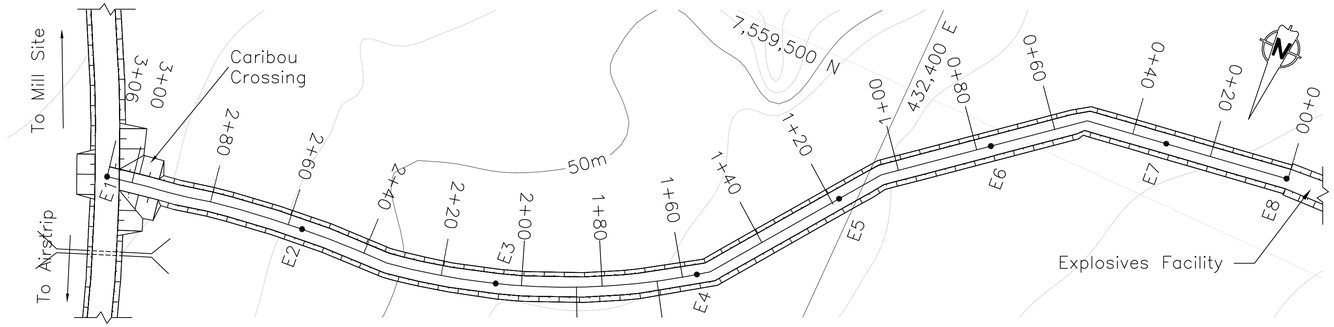
Doris North Project

DRAWING TITLE:
Primary and Secondary Road Stake Out Points

DRAWING NO.	SHEET	REVISION NO.
S-21	30 OF 49	B

EXPLOSIVES FACILITY ACCESS ROAD PLAN LAYOUT

0 10 20 30 40 50 Metres
1:750



EXPLOSIVES FACILITY ACCESS ROAD PROFILE

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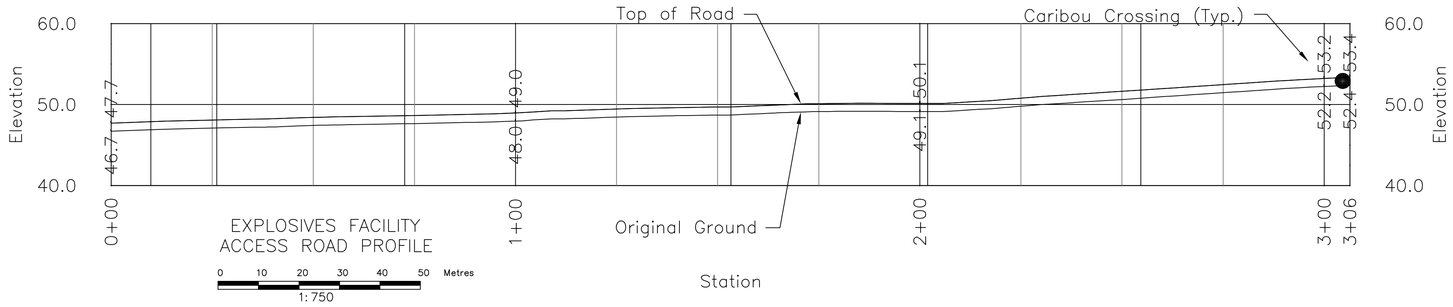

LANDFILL / LANDFARM ROAD PLAN LAYOUT

0 10 20 30 40 50 Metres
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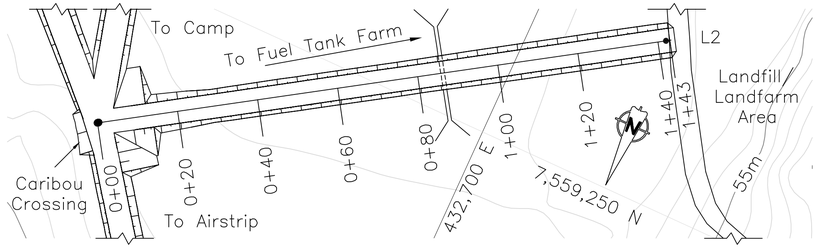

LANDFILL / LANDFARM ACCESS ROAD PROFILE

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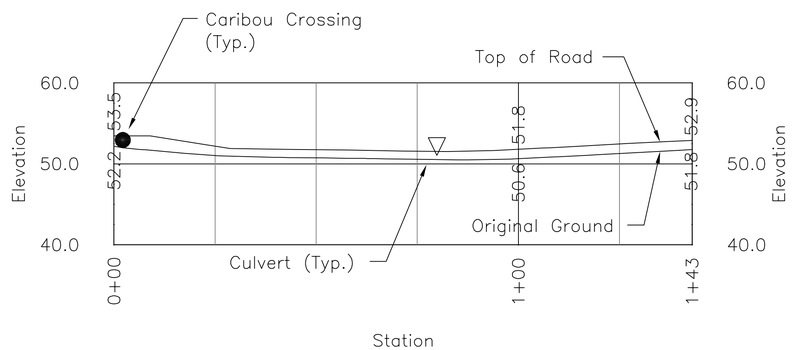

Notes:

1. The Explosives Facility access road junctions with the South Primary Road at Station 20+20.
2. The Landfill/Landfarm access road junctions with the South Primary Road at station 24+00.
3. These access roads shall have a minimum crown width of 6 m, and a minimum overall fill thickness of 1 m.
4. Locations of culverts, road turnouts and caribou crossings will be confirmed on site by the Engineer.
5. Stake out points for the road are based on the road centerline. The Engineer will inspect and approve the staked out alignment before road construction can commence.

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENSE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

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SRK Consulting Engineers and Scientists Vancouver

DESIGN:	DRAWN:	REVIEWED:
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CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: ROADS_side.dwg

MIRAMAR HOPE BAY LTD.

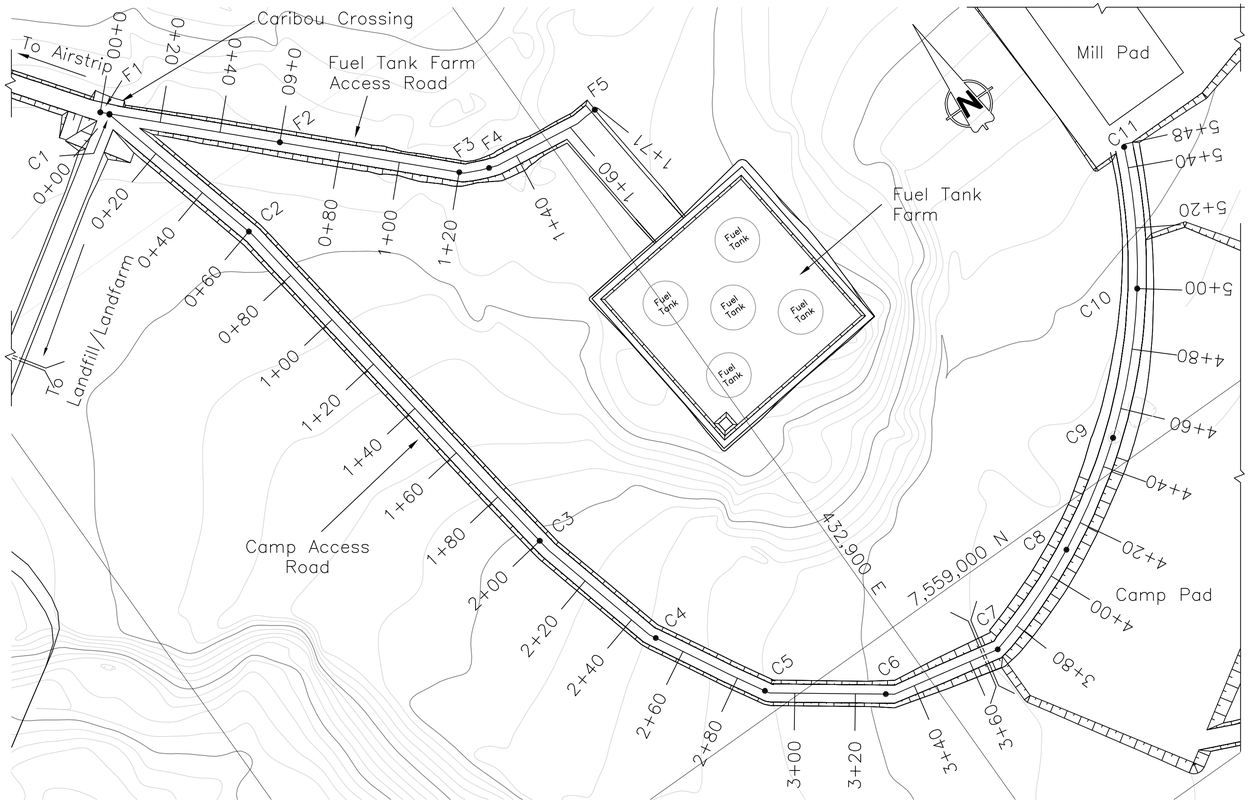
DORIS NORTH PROJECT DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
Explosives Storage Facility and Landfill/Landfarm Access Road Plan and Profile

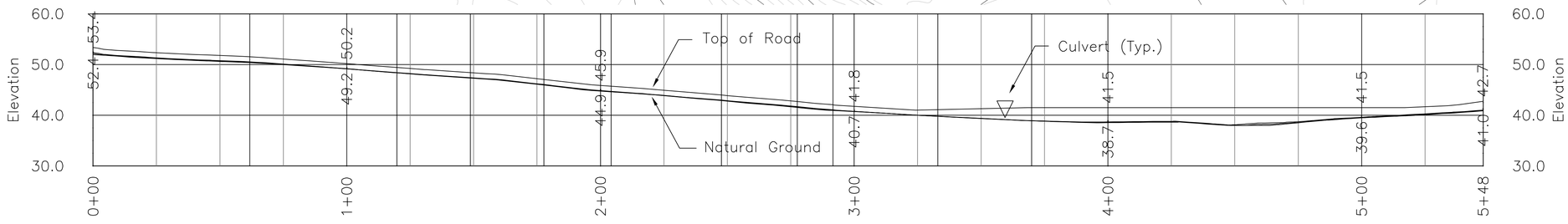
DRAWING NO.	SHEET	REVISION NO.
S-22	31 OF 49	B



FUEL TANK FARM AND
CAMP ACCESS ROAD PLAN LAYOUT

0 20 40 60 80 100 Metres

1:1000



CAMP ACCESS ROAD PROFILE

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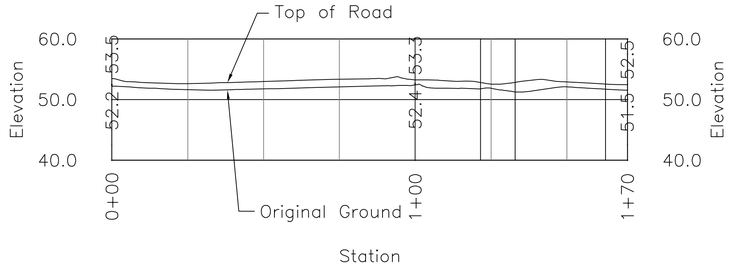
1:1000



FUEL TANK FARM ACCESS ROAD PROFILE

0 20 40 60 80 100 Metres

1:1000

Notes:

1. The Camp access road forks from the end of the South Primary Road.
2. The Fuel Tank Farm access road forks from the end of the South Primary Road.
3. These access roads shall have a minimum crown width of 6 m, and a minimum overall fill thickness of 1 m.
4. The camp access road fill thickness will increase where it meets up with the Camp Pad.
5. Locations of culverts, road turnouts and caribou crossings will be confirmed on site by the Engineer.
6. Stake out points for the road are based on the road centerline. The Engineer will inspect and approve the staked out alignment before road construction can commence.

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Engineers and Scientists
Vancouver

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AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: ROADS_side.dwg

MIRAMAR HOPE BAY LTD.

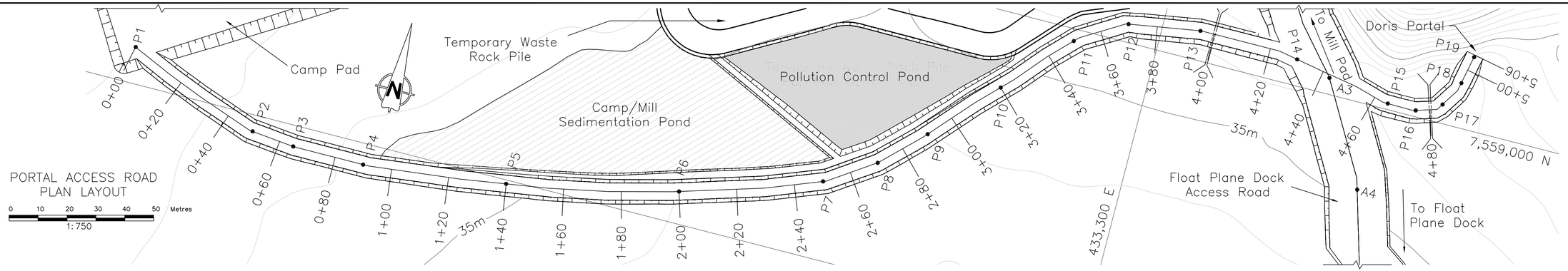
DORIS NORTH PROJECT
DETAILED DESIGN

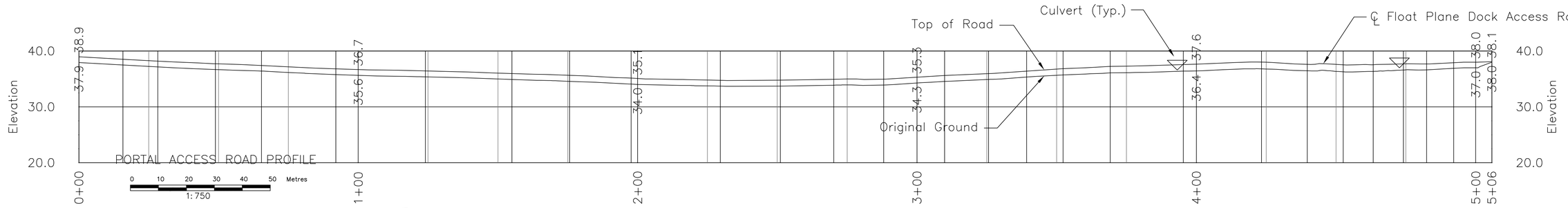
SRK JOB NO.: 1CM014.008

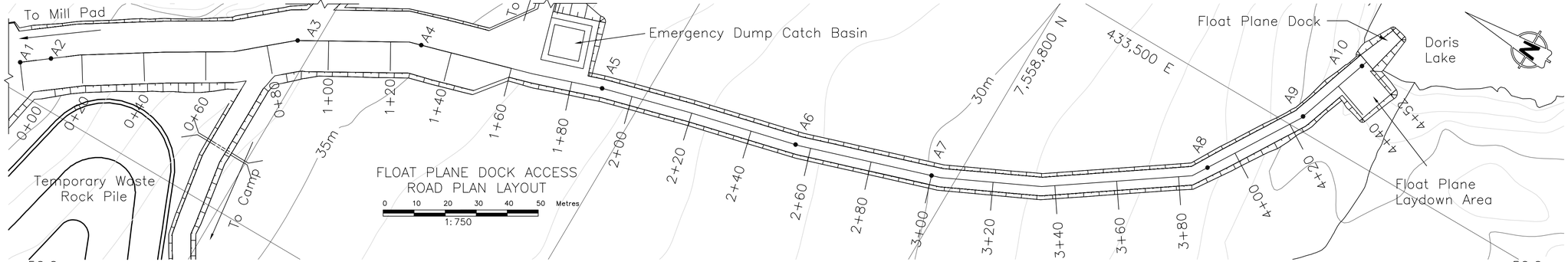
Doris North Project

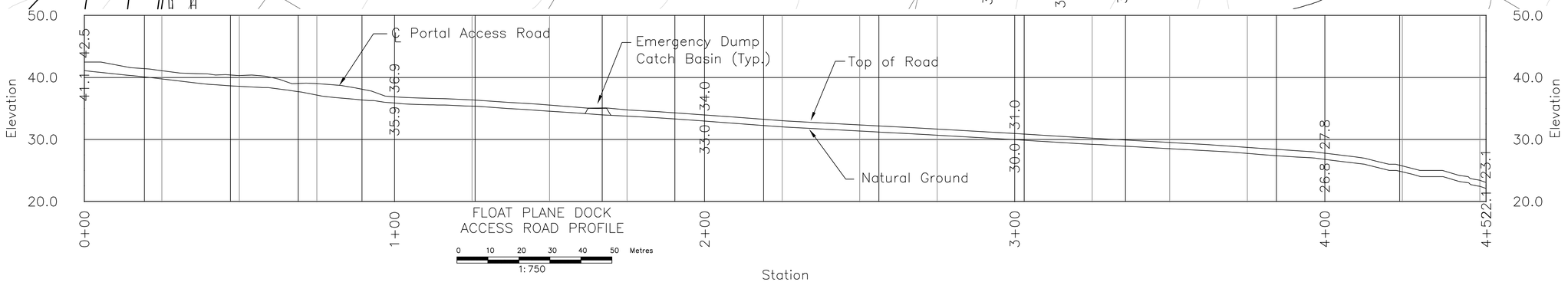
DRAWING TITLE:
Camp and Fuel Tank Farm Access Road Plan and Profiles

DRAWING NO.	SHEET	REVISION NO.
S-23	32 OF 49	B









Notes:

1. The Portal access road links the Camp Pad with the Portal via a route south of the temporary waste rock pile.
2. The Float Plane Dock access road links the Mill Pad with the Float Plane Dock at Doris Lake.
3. These access roads shall have a minimum crown width of 6 m, and a minimum overall fill thickness of 1 m.
4. From Station 0+00 to 1+60 the Float Plane Dock access road shall have a minimum crown width of 20 m.
5. Locations of culverts, road turnouts and caribou crossings will be confirmed on site by the Engineer.
6. Stake out points for the road are based on the road centerline. The Engineer will inspect and approve the staked out alignment before road construction can commence.
7. The fresh water make-up pipeline shall be placed on the shoulder of the Float Plane Dock access road.
8. The tailings deposition line, return water line and fresh water make-up pipelines shall all be placed along the widened section of the Float Plane Dock access road, from where it junctions with the Secondary Road.

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Engineers and Scientists
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CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: ROADS_side.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

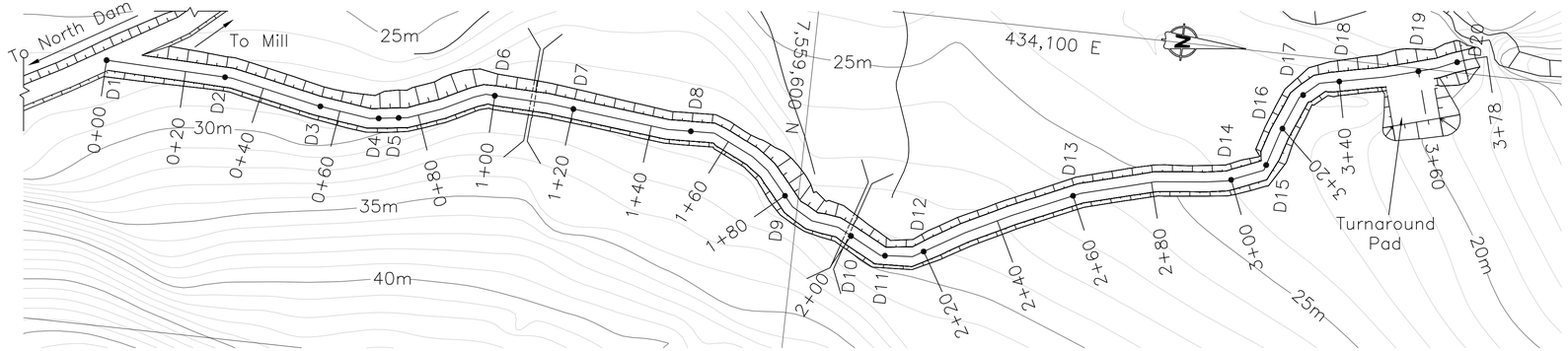
Float Plane Dock and Portal Access Road Plan and Profile

DRAWING NO.	SHEET	REVISION NO.
S-24	33 OF 49	B

DECANT ACCESS ROAD PLAN LAYOUT

0 10 20 30 40 50 Metres

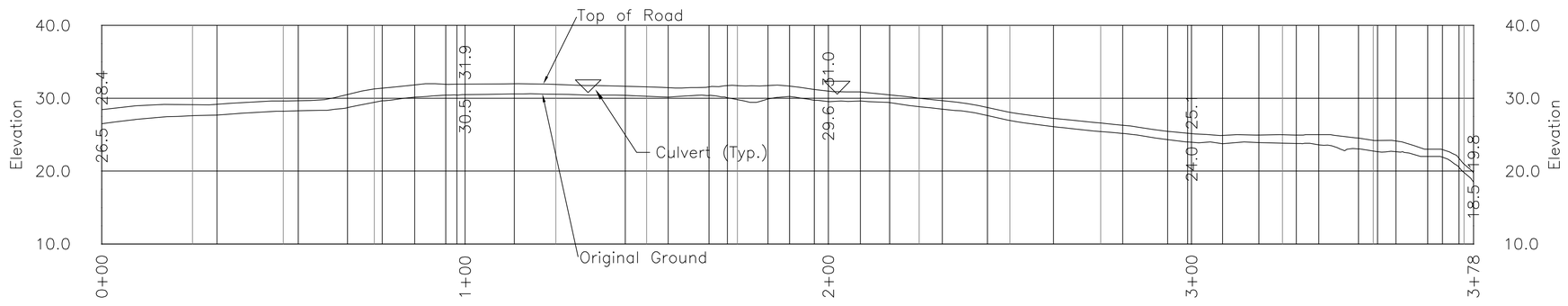
1: 750



DECANT ACCESS ROAD PROFILE

0 10 20 30 40 50 Metres

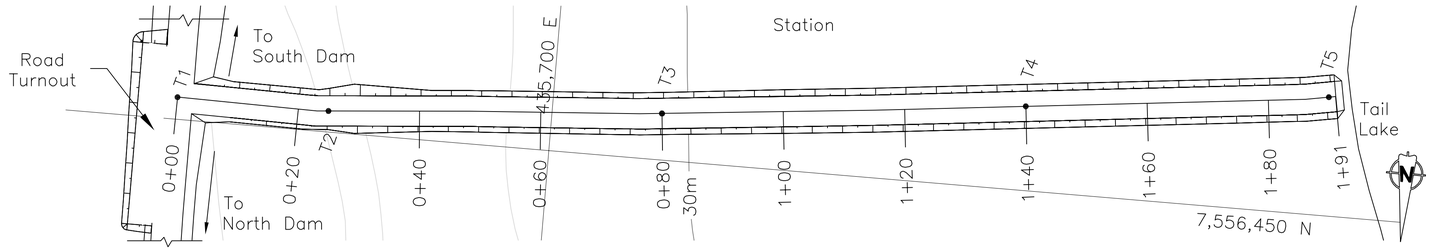
1: 750



TAIL LAKE DISCHARGE ACCESS ROAD PLAN LAYOUT

0 4 8 12 16 20 Metres

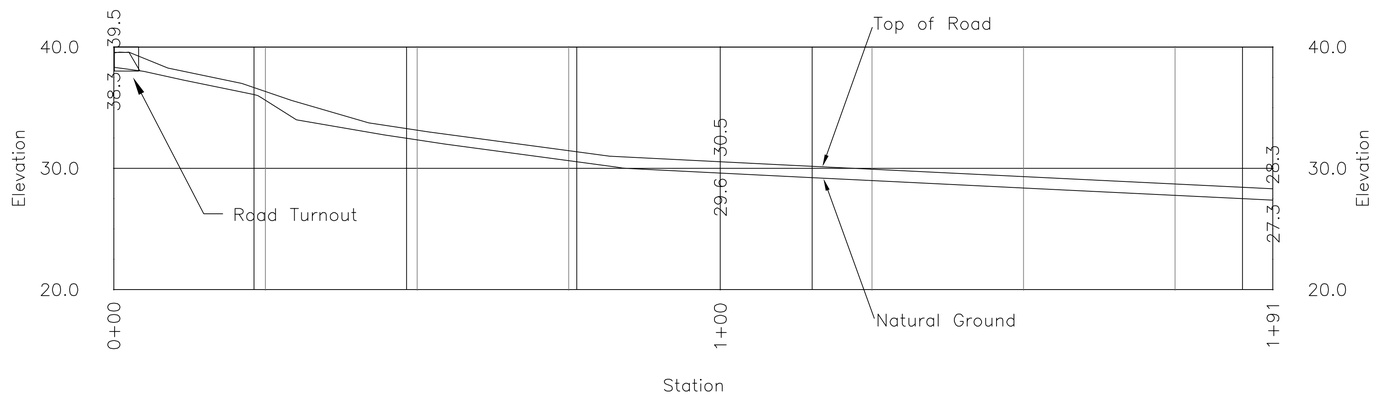
1: 500



TAIL LAKE DISCHARGE ACCESS ROAD PROFILE

0 4 8 12 16 20 Metres

1: 500



Notes:

1. The Decant access road junctions from the Secondary Road at Station 9+80.
2. The Tail Lake Discharge Point access road junctions from the Secondary Road at Station 49+90.
3. These access roads shall have a minimum crown width of 5 m, and a minimum overall fill thickness of 1 m.
4. Locations of culverts, road turnouts and caribou crossings will be confirmed on site by the Engineer.
5. Stake out points for the road are based on the road centerline. The Engineer will inspect and approve the staked out alignment before road construction can commence.
6. The decant pipeline shall be placed on the shoulder of the Float Plane Dock access road.
7. The tailings deposition pipeline shall be placed on the shoulder of the Tail Lake Discharge Point Access Road.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS			

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENSE APPLICATION			
A	WATER LICENSE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

SRK Consulting Engineers and Scientists Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: ROADS_side.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

Decant and Tail Lake Discharge Access Road Plan and Profiles

DRAWING NO.	SHEET	REVISION NO.
S-25	34 OF 49	B

STAKE OUT TABLE		
Explosive Facility Access Road		
Point	Easting	Northing
E1	432570.9	7559602.5
E2	432521.6	7559594.2
E3	432472.5	7559586.5
E4	432428.2	7559563.7
E5	432404.0	7559532.0
E6	432375.3	7559504.5
E7	432336.1	7559485.9
E8	432305.5	7559481.4

STAKE OUT TABLE		
Explosive Facility Access Road		
Point	Easting	Northing
L1	432787.4	7559287.6
L2	432668.1	7559210.6

STAKE OUT TABLE		
Camp Pad Access Road		
Point	Easting	Northing
C1	432787.3	7559287.4
C2	432802.4	7559229.4
C3	432821.6	7559090.7
C4	432834.2	7559042.4
C5	432853.5	7559007.4
C6	432885.3	7558983.4
C7	432924.0	7558974.1
C8	432961.5	7558987.8
C9	432995.3	7559008.9
C10	433030.3	7559044.4
C11	433053.9	7559085.0

STAKE OUT TABLE		
Fuel Tank Farm Access Road		
Point	Easting	Northing
F1	432785.3	7559289.8
F2	432827.8	7559247.5
F3	432870.3	7559205.2
F4	432879.1	7559200.6
F5	432918.7	7559196.1

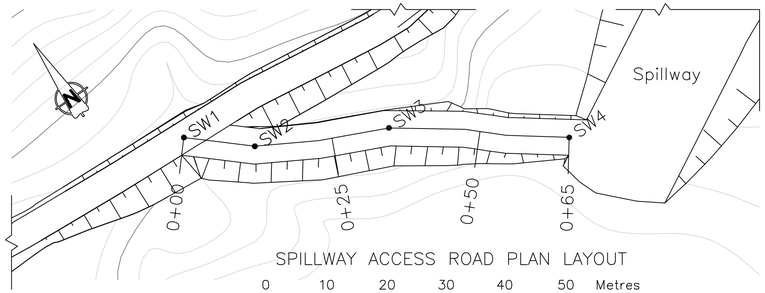
STAKE OUT TABLE		
Decant Access Road		
Point	Easting	Northing
D1	434133.5	7559423.9
D2	434134.5	7559453.9
D3	434139.2	7559478.4
D4	434140.6	7559493.3
D5	434140.0	7559498.2
D6	434131.9	7559521.6
D7	434133.0	7559541.6
D8	434135.4	7559571.4
D9	434148.9	7559596.6
D10	434157.2	7559614.2
D11	434161.2	7559623.1
D12	434159.1	7559632.7
D13	434141.1	7559668.4
D14	434132.9	7559707.4
D15	434128.2	7559715.7
D16	434118.7	7559718.7
D17	434109.7	7559723.0
D18	434105.4	7559731.6
D19	434100.7	7559751.1
D20	434097.4	7559760.5

STAKE OUT TABLE		
Decant Point Access Road		
Point	Easting	Northing
T1	435761.8	7556446.3
T2	435736.8	7556446.5
T3	435681.9	7556442.3
T4	435622.2	7556436.1
T5	435572.6	7556430.4

STAKE OUT TABLE		
Portal Access Road		
Point	Easting	Northing
P1	432957.6	7558912.5
P2	433004.1	7558894.3
P3	433019.0	7558892.8
P4	433044.0	7558892.7
P5	433093.6	7558898.7
P6	433152.2	7558911.1
P7	433199.6	7558926.9
P8	433216.3	7558937.9
P9	433230.6	7558951.9
P10	433251.0	7558973.9
P11	433271.5	7558995.8
P12	433288.4	7559006.2
P13	433313.1	7559010.2
P14	433348.0	7559009.0
P15	433382.2	7559002.0
P16	433392.2	7559002.2
P17	433400.7	7559006.5
P18	433405.1	7559015.3
P19	433407.1	7559025.1

STAKE OUT TABLE		
Float Plane Dock Access Road		
Point	Easting	Northing
A1	433308.8	7559079.1
A2	433314.9	7559071.1
A3	433360.4	7559005.6
A4	433379.4	7558970.5
A5	433397.1	7558913.2
A6	433413.2	7558850.2
A7	433426.9	7558807.3
A8	433474.4	7558732.0
A9	433504.3	7558713.9
A10	433528.0	7558705.8

STAKE OUT TABLE		
Spillway Access Road		
Point	Easting	Northing
SW1	434308.9	7559273.1
SW2	434317.9	7559265.2
SW3	434338.1	7559255.0
SW4	434362.1	7559236.5



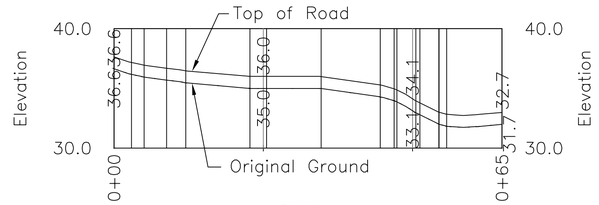
SPILLWAY ACCESS ROAD PLAN LAYOUT

0 10 20 30 40 50 Metres

1: 750

Legend:

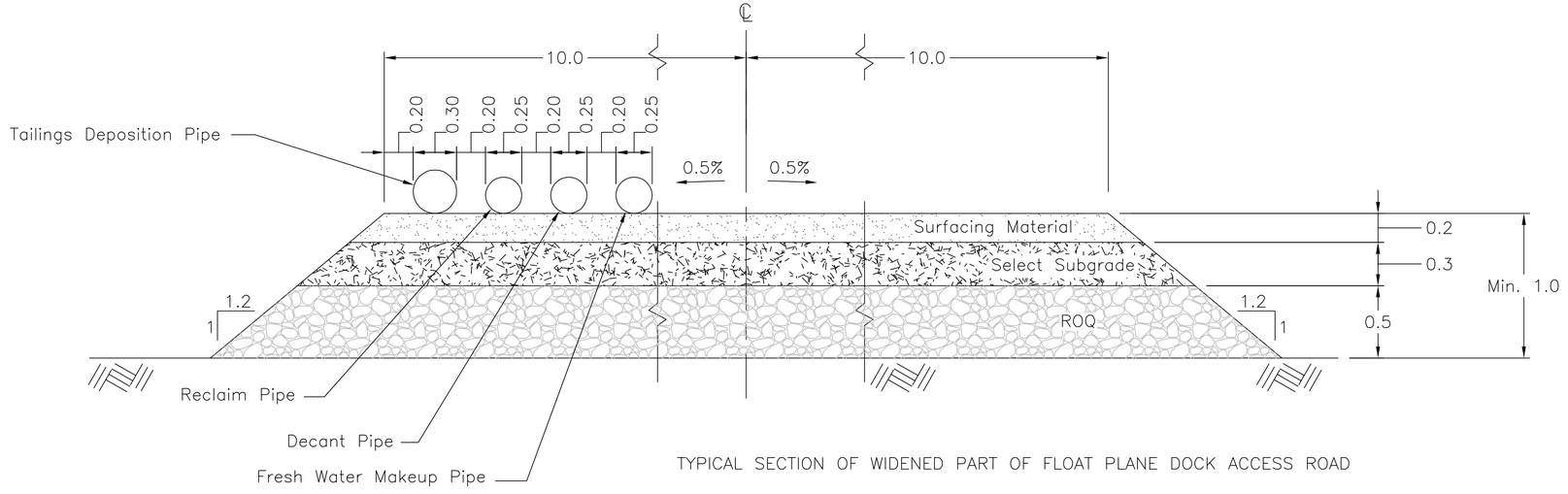
- Natural ground
- Surfacing material
- Select Subgrade
- Run of quarry
- Drainage gravel



SPILLWAY ACCESS ROAD PROFILE

0 10 20 30 40 50 Metres

1: 750



TYPICAL SECTION OF WIDENED PART OF FLOAT PLANE DOCK ACCESS ROAD

0 0.2 0.4 0.6 0.8 1.0 m

1: 20

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENSE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

DRAWING NO. | DRAWING TITLE | DRAWING NO. | DRAWING TITLE

REFERENCE DRAWINGS

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

SRK Consulting
Engineers and Scientists
Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
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AT	EMR	Mar. 2007

FILE NAME: ROADS_side.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH DETAILED INFRASTRUCTURE DESIGN

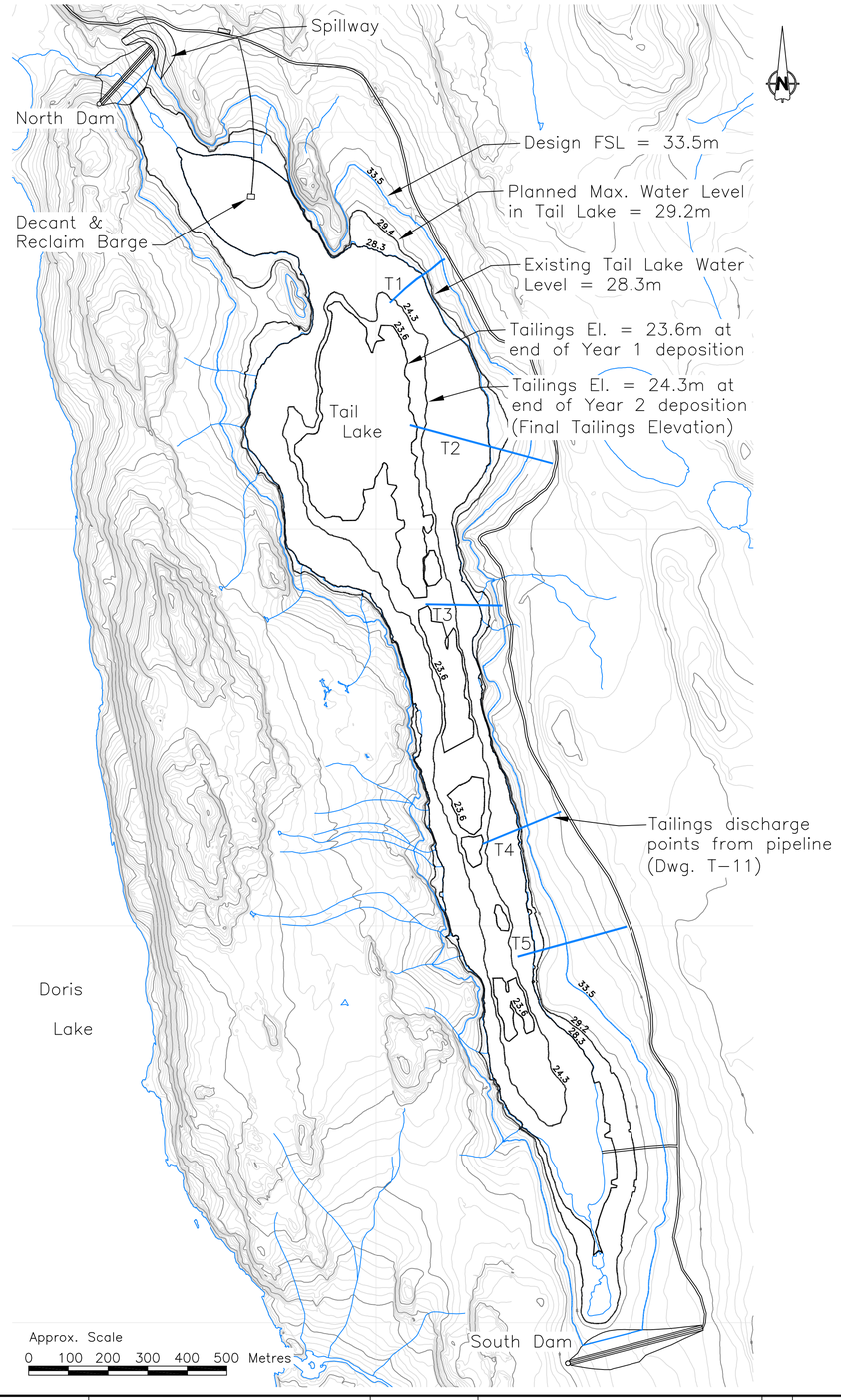
SRK JOB NO.: 1CM014.008

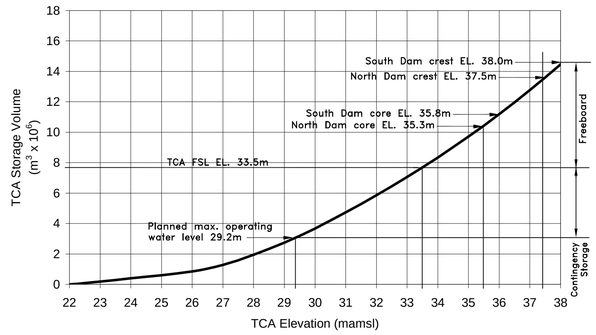
Doris North Project

DRAWING TITLE:

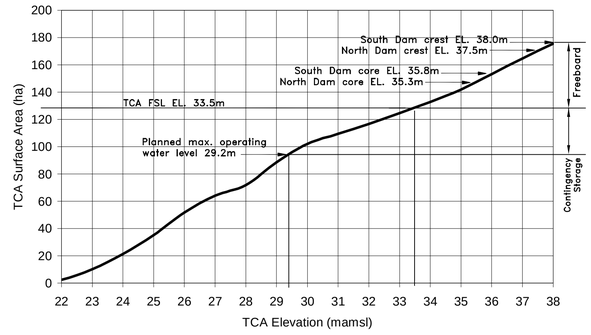
Spillway Access Road Plan and Profile and all Access Road Stake Out Points

DRAWING NO.	SHEET	REVISION NO.
S-26	35 OF 49	B

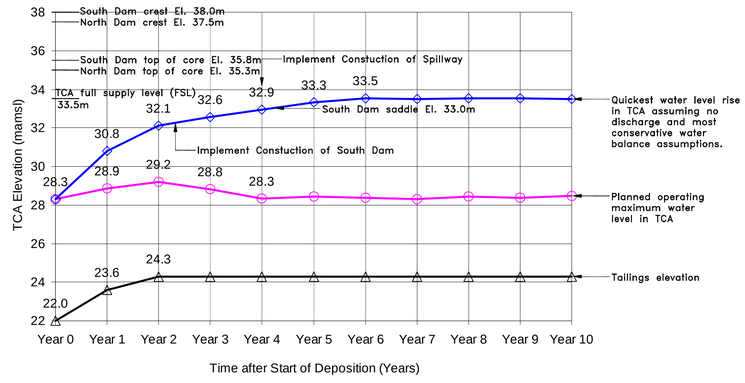




TCA STORAGE STAGE CURVE



TCA SURFACE AREA STAGE CURVE



WATER BALANCE CONDITIONS FOR TCA

Notes:

1. Topographic contour data for the terrain model were provided by Miramar Hope Bay Limited, and are based on 2001 Aerial Photography and manual surveys at select locations. Contour intervals are 1 m.
2. Bathymetric data were provided by Golder Associates, and are based on a 2006 survey. Contour intervals are 0.5 m.
3. The areas denoted for tailings deposition are approximate, and will be reviewed as part of the ongoing TCA management plan.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

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SRK Consulting Engineers and Scientists Vancouver

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AT	EMR	Mar. 2007

FILE NAME: Stage Curves.dwg

MIRAMAR HOPE BAY LTD.

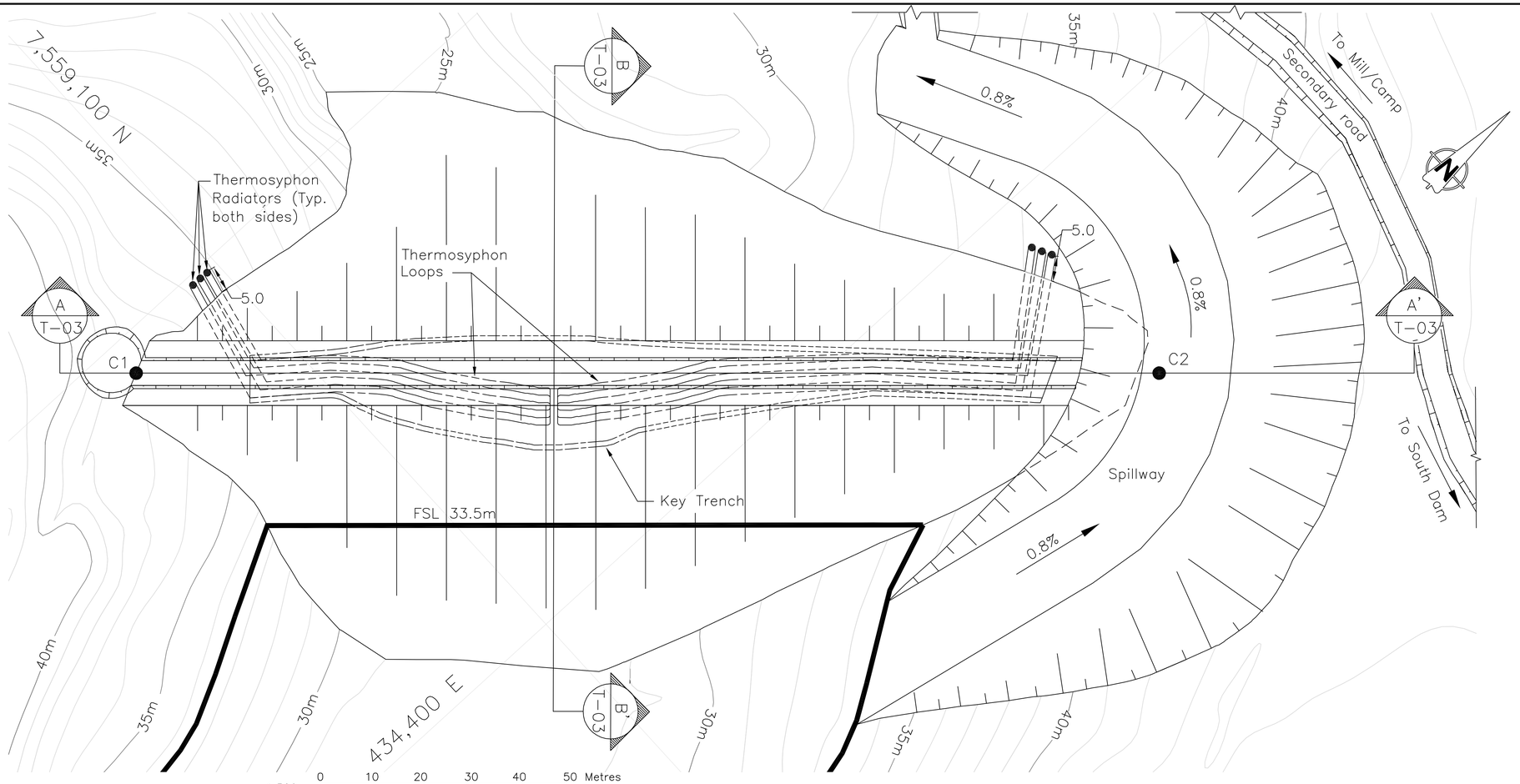
DORIS NORTH PROJECT
DETAILED DESIGN

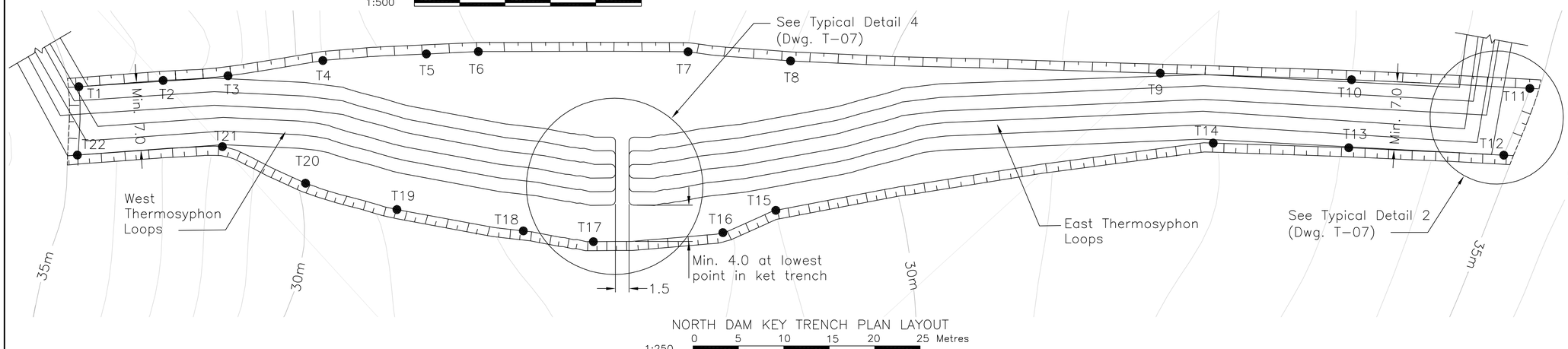
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
Tailings Containment Area Stage Curves and Deposition Plan

DRAWING NO.	SHEET	REVISION NO.
T-01	36 OF 49	B





STAKE OUT TABLE			
Crest			
Point	Northing	Easting	Elev.
C1	7559073.2	434307.2	37.5
C2	7559225.0	434445.8	37.5
Key Trench			
T1	7559092.8	434321.5	30.8
T2	7559100.1	434327.3	29.4
T3	7559105.7	434331.7	28.3
T4	7559114.6	434337.5	25.0
T5	7559123.5	434344.6	23.6
T6	7559127.9	434348.3	23.0
T7	7559144.9	434363.9	23.0
T8	7559152.6	434372.3	25.0
T9	7559181.7	434400.7	27.6
T10	7559196.8	434415.4	29.0
T11	7559210.7	434429.4	30.9
T12	7559203.6	434432.9	30.9
T13	7559191.5	434420.8	29.1
T14	7559180.8	434410.3	28.0
T15	7559140.3	434383.3	25.0
T16	7559134.3	434381.2	23.8
T17	7559123.1	434372.3	23.2
T18	7559118.2	434366.2	23.4
T19	7559109.5	434355.1	25.0
T20	7559104.1	434346.2	25.9
T21	7559100.0	434337.0	27.8
T22	7559087.6	434327.0	30.8

Notes:
1. The Contractor shall take extreme care not to disturb the permafrost in any areas other than those indicated on the drawings.
2. From the start of the construction season, the Contractor shall routinely clear snow from the dam footprint to promote freezing of the permafrost foundation.
3. The key trench must be excavated such that there are minimal undulations. The thermosyphon loops must follow a consistent grade as much as practical. The Engineer will inspect the grade and approve the excavation.
4. The dam must be completely constructed before excavation of the spillway may be started. Actual construction of the spillway may be deferred, and the Engineer will advise the Contractor if that is the case.
5. Thermosyphon installation must be carried out by a specialist Contractor qualified and experienced in these installations.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS			

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			
REVISIONS				

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Vancouver

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AT	EMR	Mar. 2007

FILE NAME: North Dam_rev2.dwg

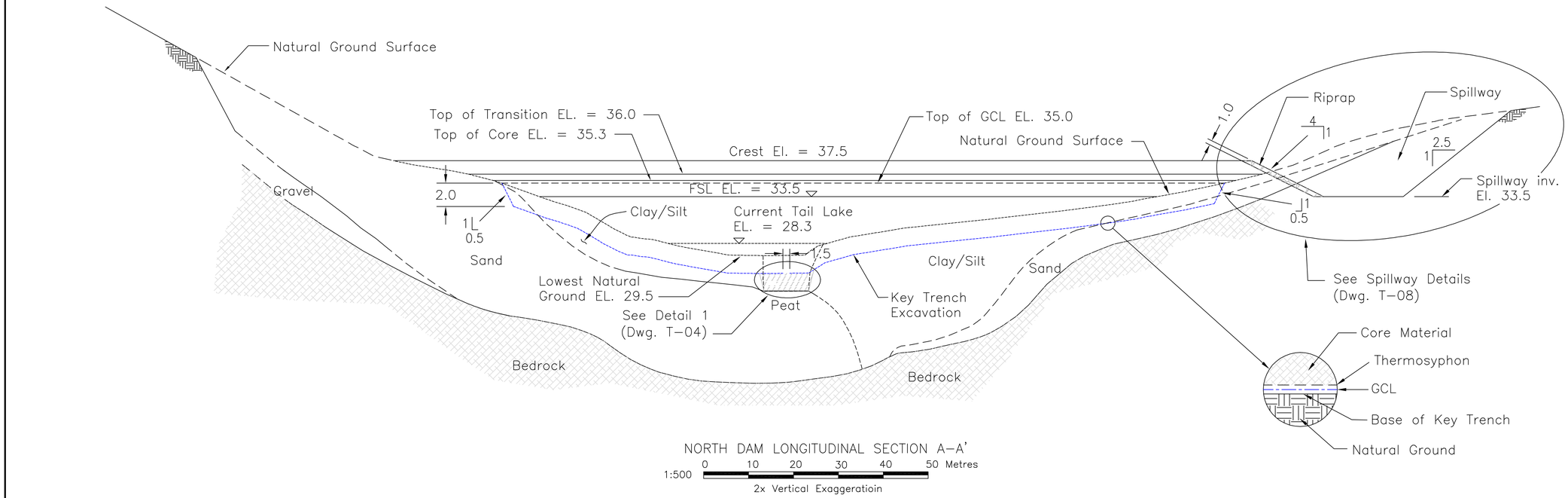
DORIS NORTH PROJECT
DETAILED DESIGN

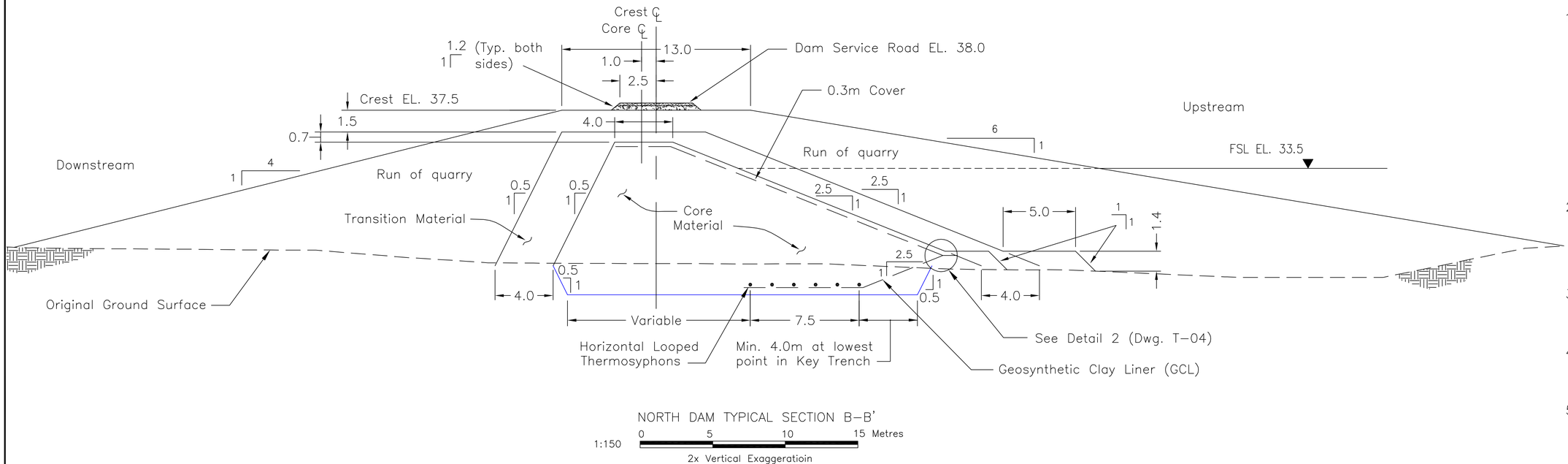
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
North Dam Layout and Key-Trench Details

DRAWING NO.	SHEET	REVISION NO.
T-02	37 OF 49	B





Legend:

- Overburden
- Natural ground
- Surfacing material
- Select Subgrade
- Run of quarry
- Core material
- Peat

Notes:

1. The subsurface geology has been extrapolated from a series of geotechnical investigations consisting of drill holes, auger holes and shallow test pits. Bedrock contact and geological unit contacts are therefore likely to vary somewhat during final excavation. The Engineer will inspect all excavations and approve the foundation conditions.
2. The actual extent of the key trench excavation will be confirmed on site by the Engineer after bulk excavation as indicated by the drawings.
3. The Contractor must ensure that all organic matter and peat is excavated from the dam foundation.
4. Overburden soils from the key trench must be stockpiled in an area designated by the Engineer.
5. The Contractor shall be responsible for water control during excavation and construction.

REFERENCE DRAWINGS				REVISIONS				
DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE	NO.	DESCRIPTION	CHK'D	APP'D	DATE
				B	WATER LICENCE APPLICATION			
				A	WATER LICENCE APPLICATION			

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AT	EMR	Mar. 2007

FILE NAME: North Dam_rev2.dwg

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DORIS NORTH PROJECT
DETAILED DESIGN

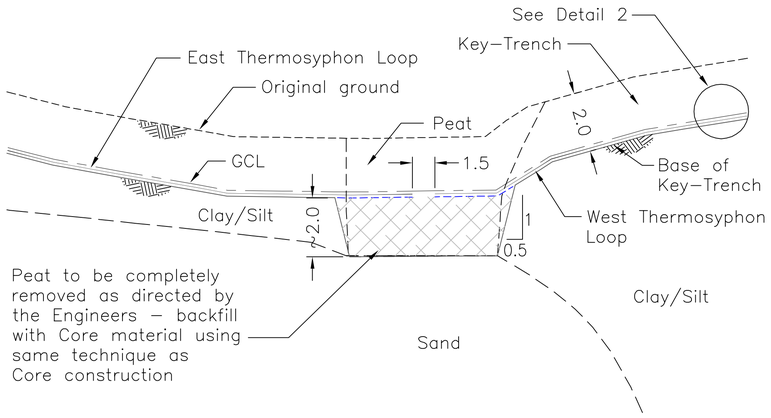
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

North Dam Sections

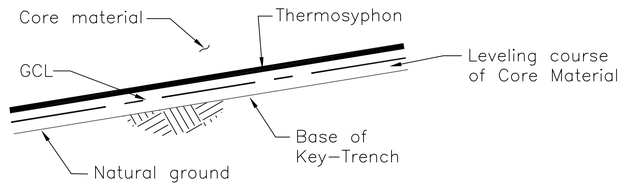
DRAWING NO.	SHEET	REVISION NO.
T-03	38 OF 49	B



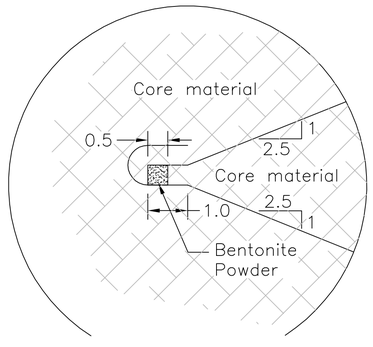
TYPICAL DETAIL 1

1:200 0 5 10 15 20 Metres

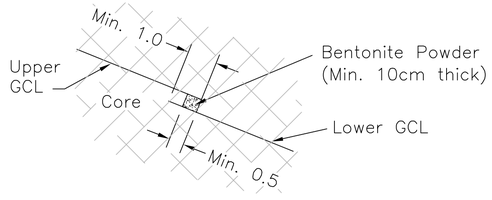
2x Vertical Exaggeration



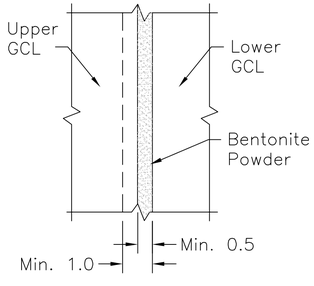
DETAIL 2
NTS



DETAIL 2
TYPICAL UPPER AND LOWER GCL JOINT
NTS



GCL OVERLAP DETAIL – TYPICAL SECTION A–A' OF SEAM
NTS



TYPICAL GCL OVERLAP DETAIL – TYPICAL PLAN SEAM
NTS

Notes:

1. The Contractor shall take extreme care not to disturb the permafrost in any areas other than those indicated on the drawings.
2. From the start of the construction season, the Contractor shall remove all snow from the dam footprint every day, to ensure adequate and rapid foundation freezing.
3. The key trench must be excavated such that there is only one low point as illustrated in the drawings. The thermosyphon loops must follow a consistent grade from the radiator down to this low point, and then back up to the radiator. The Engineer will inspect the grade and approve the excavation.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

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Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: North Dam_rev2.dwg

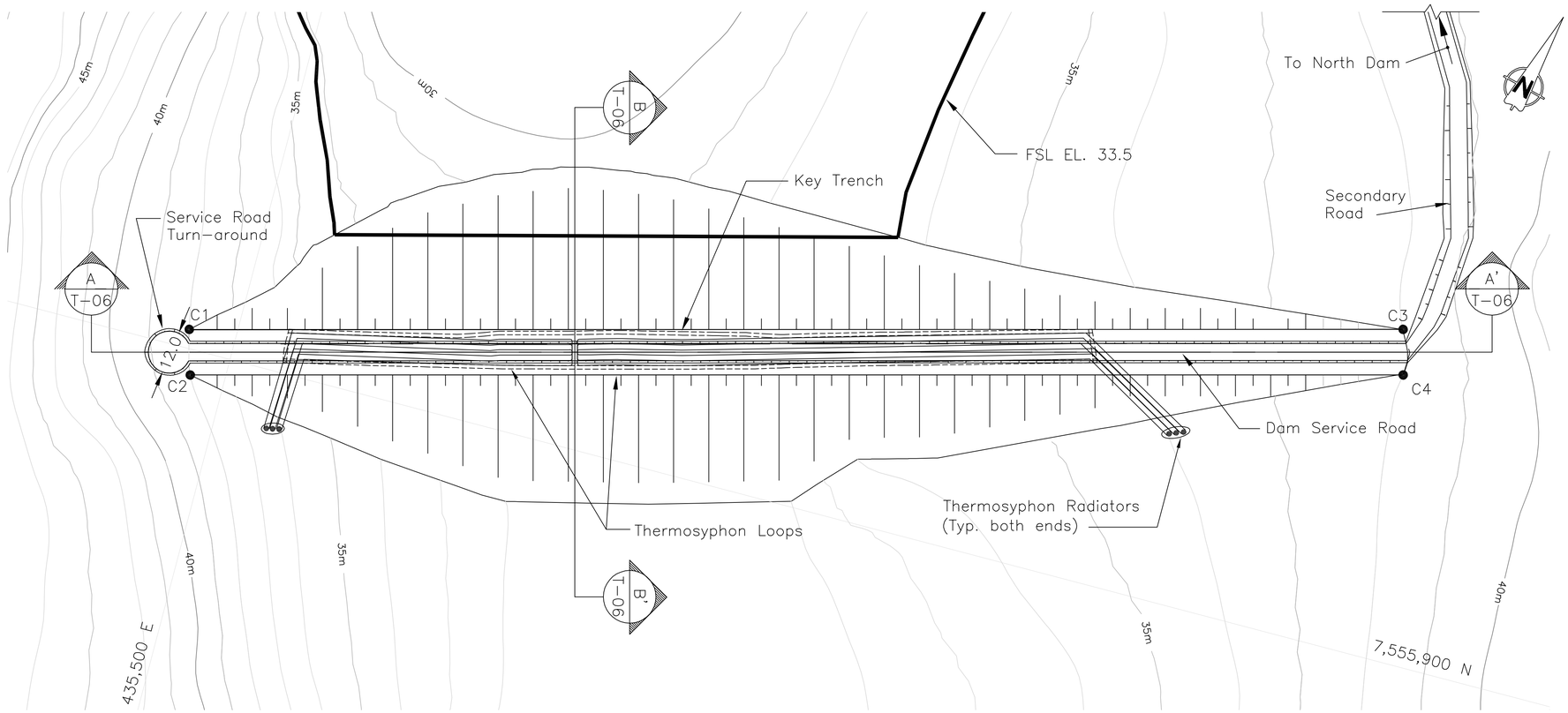
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

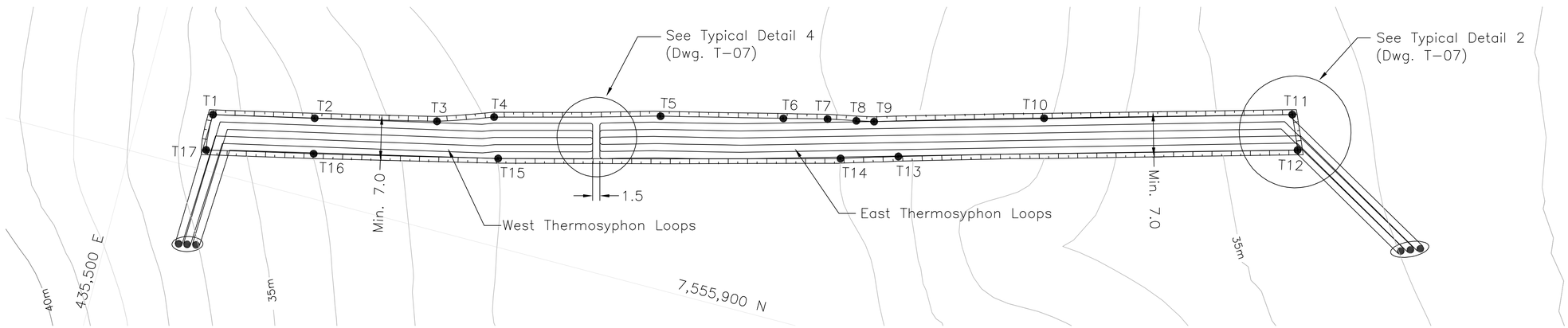
DRAWING TITLE:
North and South Dam
Typical Details

DRAWING NO.	SHEET	REVISION NO.
T-04	39 OF 49	B



SOUTH DAM PLAN LAYOUT

1:750 0 10 20 30 Metres



SOUTH DAM KEY TRENCH LAYOUT PLAN

1:500 0 10 20 30 40 50 Metres

STAKE OUT TABLE			
Dam Crest			
Point	Easting	Northing	Elev.
C1	7555905.3	435486.6	38.0
C2	7555892.8	435490.2	38.0
C3	7555993.3	435820.9	38.0
C4	7555980.8	435824.2	38.0
Key Trench			
T1	435514.1	7555911.6	33.5
T2	435535.9	7555916.5	31.9
T3	435572.3	7555926.3	30.5
T4	435560.9	7555922.4	30.0
T5	435606.1	7555935.4	30.0
T6	435631.2	7555941.6	30.0
T7	435640.3	7555943.8	30.0
T8	435646.2	7555945.0	30.1
T9	435649.9	7555945.8	30.3
T10	435684.3	7555955.6	32.0
T11	435735.6	7555969.9	33.5
T12	435738.6	7555962.9	33.5
T13	435656.7	7555940.0	30.8
T14	435645.0	7555936.5	30.0
T15	435575.4	7555918.1	30.0
T16	435537.6	7555909.2	32.0
T17	435514.7	7555904.0	33.5

Notes:
1. The Contractor shall take extreme care not to disturb the permafrost in any areas other than those indicated on the drawings.
2. From the start of the construction season, the Contractor shall routinely clear snow from the dam footprint to promote freezing of the permafrost foundation.
3. The key trench must be excavated such that there are minimal undulations. The thermosyphon loops must follow a consistent grade as much as practical. The Engineer will inspect the grade and approve the excavation.
4. The dam must be completely constructed before excavation of the spillway may be started. Actual construction of the spillway may be deferred, and the Engineer will advise the Contractor if that is the case.
5. Thermosyphon installation must be carried out by a specialist Contractor qualified and experienced in these installations.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

SRK Consulting
Engineers and Scientists
Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: South Dam_rev1.dwg

MIRAMAR HOPE BAY LTD.

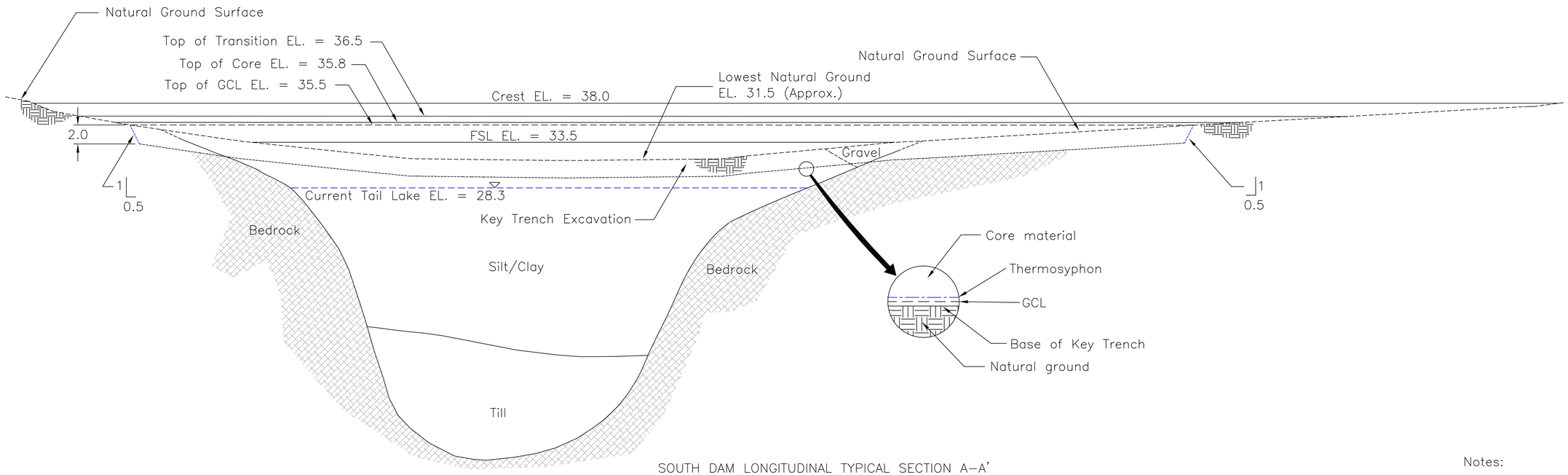
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
South Dam Layout
and Key-Trench Details

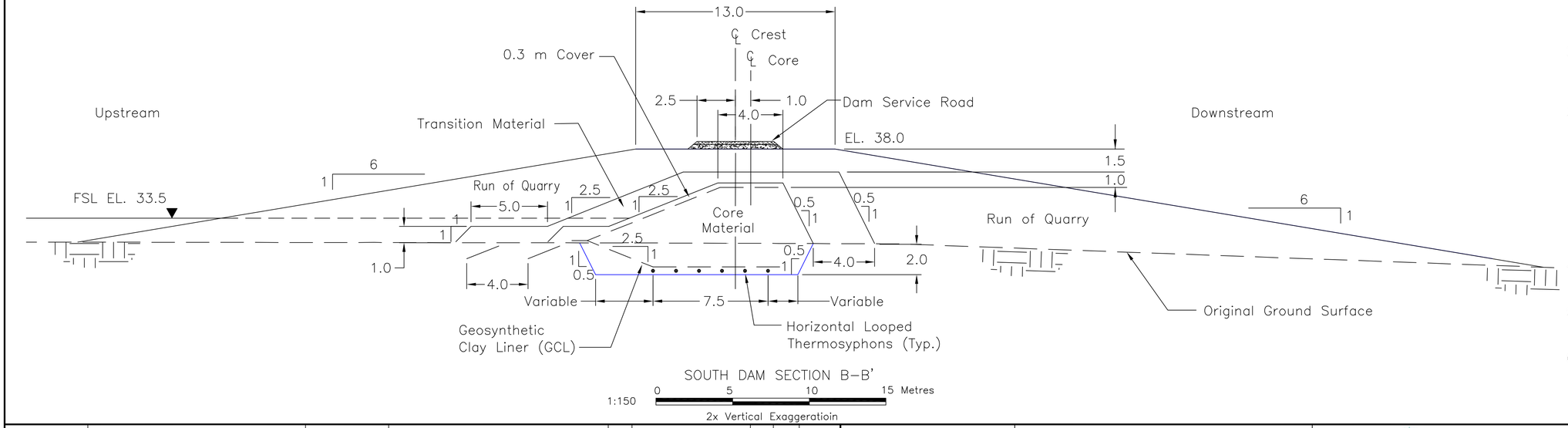
DRAWING NO.	SHEET	REVISION NO.
T-05	40 OF 49	B



SOUTH DAM LONGITUDINAL TYPICAL SECTION A–A'

1:500 0 10 20 30 40 50 Metres

2x Vertical Exaggeratioin



SOUTH DAM SECTION B–B'

1:150 0 5 10 15 Metres

2x Vertical Exaggeratioin

Legend:

- Natural ground
- Surfacing material
- Select Subgrade
- Run of Quarry
- Bedrock

Notes:

1. The subsurface geology has been extrapolated from a series of geotechnical investigations consisting of drill holes, auger holes and shallow test pits. Bedrock contact and geological unit contacts are therefore likely to vary somewhat during final excavation. The Engineer will inspect all excavations and approve the foundation conditions.
2. The actual extent of the key trench excavation will be confirmed on site by the Engineer after bulk excavation as indicated by the drawings.
3. The key–trench may not have to be cut 2.0 m deep into bedrock as shown on the Drawings. The Engineer will inspect the cleared and exposed bedrock prior to excavation and provide the Contractor with clear instructions if the key–trench can be shortened or be made less deep. The extent of the thermosyphon loops will however not be reduced.
4. The Contractor shall ensure that all organic matter and peat is excavated from the key trench.
5. Overburden soils from the key trench must be stockpiled in an area designated by the Engineer.
6. The Contractor shall be responsible for water control during excavation and construction.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

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PROFESSIONAL ENGINEERS STAMP

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Engineers and Scientists
Vancouver

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AT	EMR	Mar. 2007

FILE NAME: South Dam_rev1.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT
DETAILED DESIGN

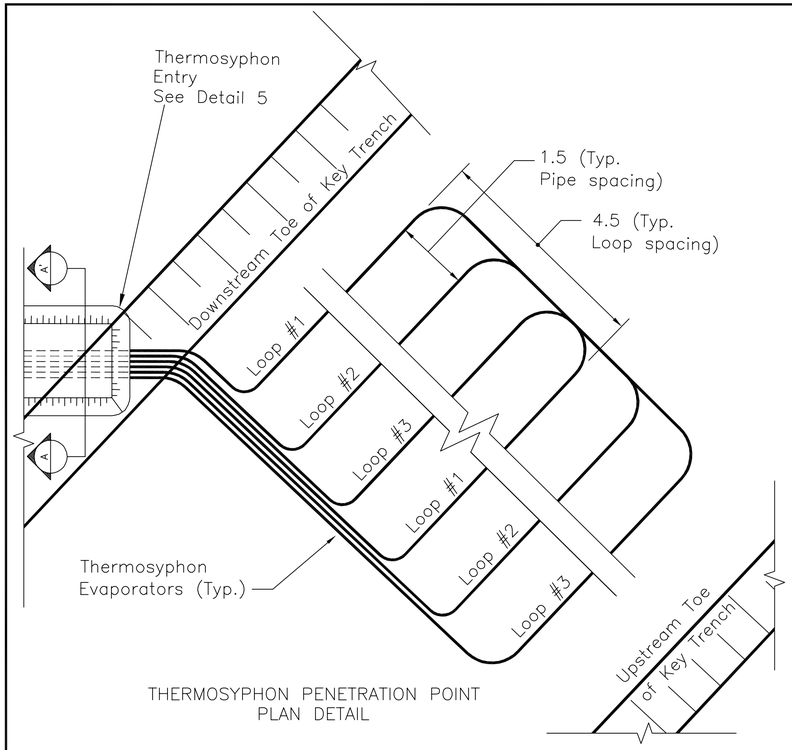
SRK JOB NO.: 1CM014.008

Doris North Project

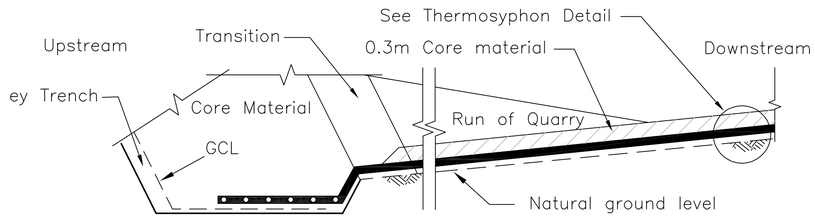
DRAWING TITLE:

South Dam Sections

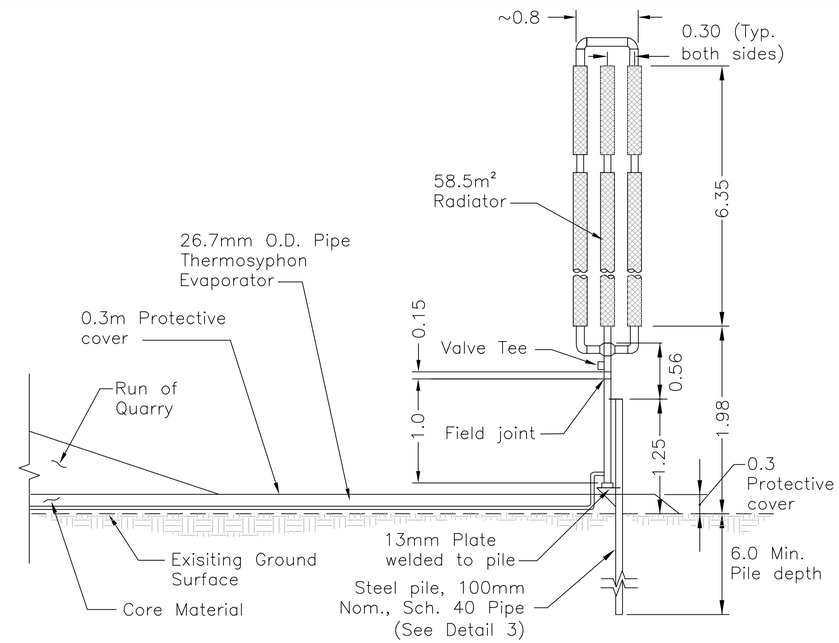
DRAWING NO.	SHEET	REVISION NO.
T-06	41 OF 49	B



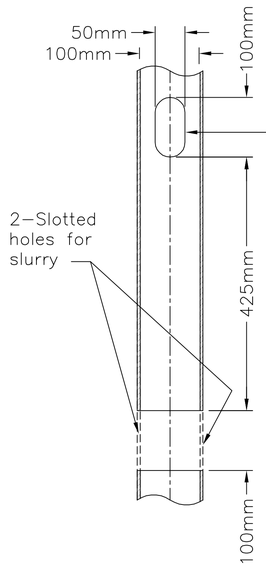
THERMOSYPHON PENETRATION POINT
PLAN DETAIL



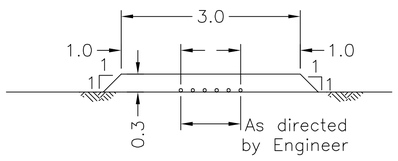
DETAIL 2 – THERMOSYPHON ENTRY SECTION
NTS



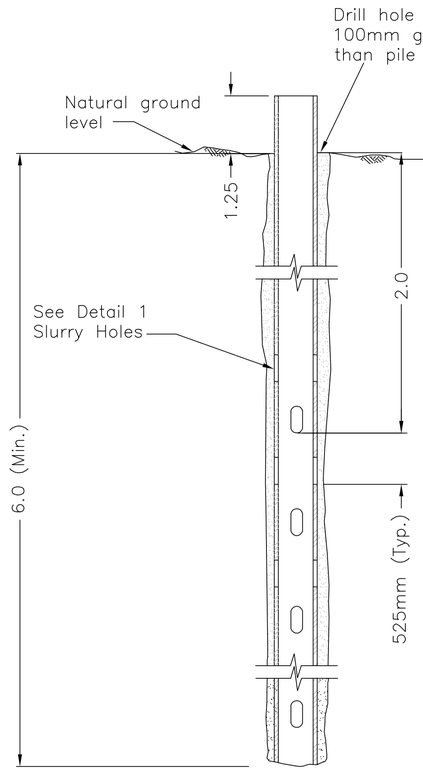
DETAIL 5 – TYPICAL THERMOSYPHON RADIATOR



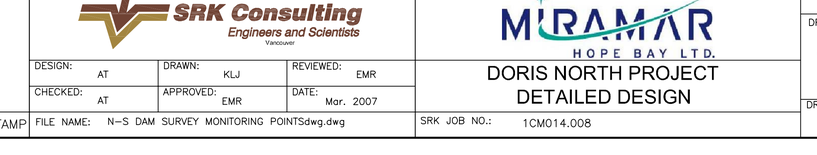
DETAIL 1 – SLURRY HOLES
NTS



TYPICAL SECTION A–A'
NTS



DETAIL 3 – STEEL PILE
NTS



DETAIL 4 – THERMOSYPHON MID–POINT
NTS

Notes:

1. Thermosyphon installation must be carried out by a specialist Contractor qualified and experienced in these installations.
2. The key trench must be excavated such that there is only one low point as illustrated in the drawings. The thermosyphon loops must follow a consistent grade from the radiator down to this low point, and then back up to the radiator. The Engineer will inspect the grade and approve the excavation.
3. The Contractor shall install the three thermosyphon piles that are required to support the vertical radiators.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

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SRK Consulting
Engineers and Scientists
Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	KLJ	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: N–S DAM SURVEY MONITORING POINTSdwg.dwg

MIRAMAR
HOPE BAY LTD.

DORIS NORTH PROJECT
DETAILED DESIGN

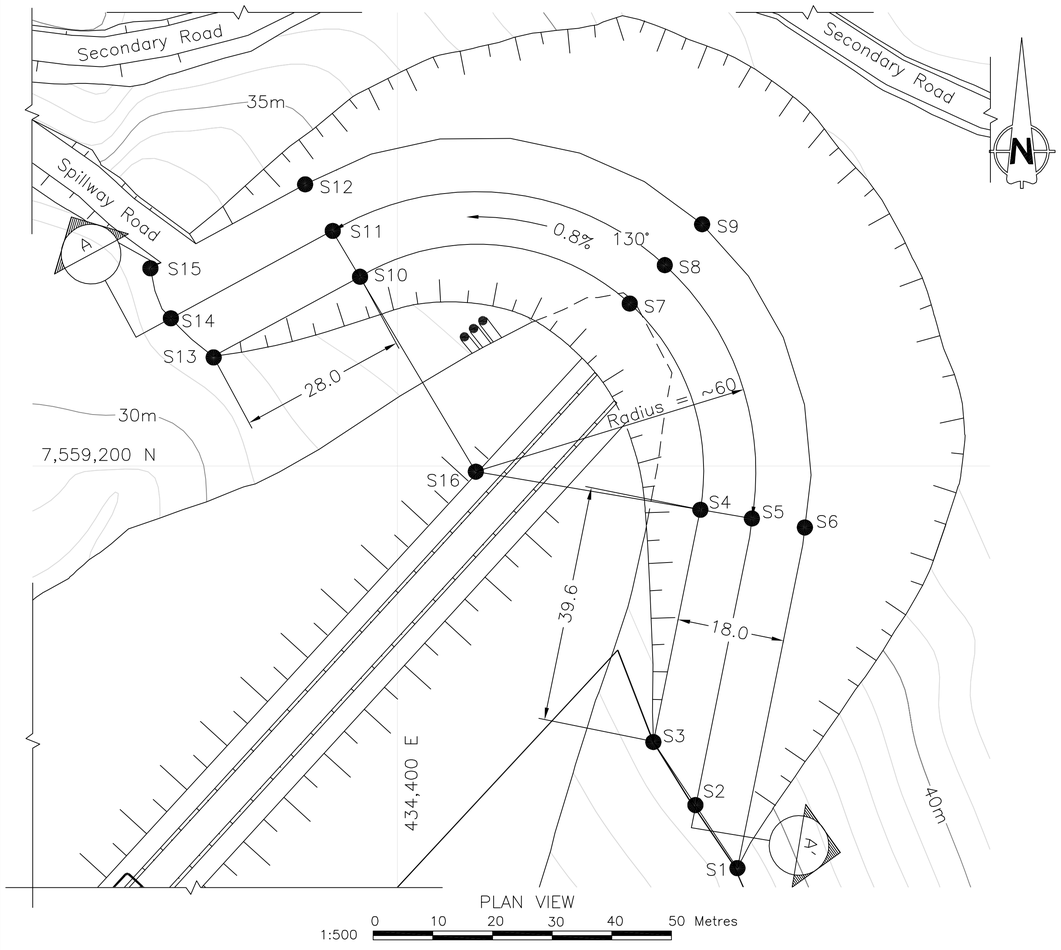
SRK JOB NO.: 1CM014.008

Doris North Project

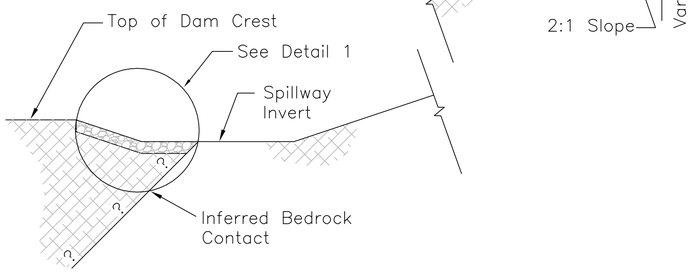
DRAWING TITLE:

Typical Thermosyphon Details

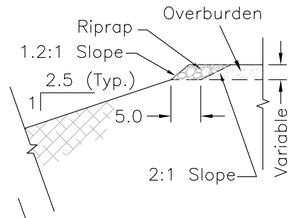
DRAWING NO.	SHEET	REVISION NO.
T-07	42 OF 49	B

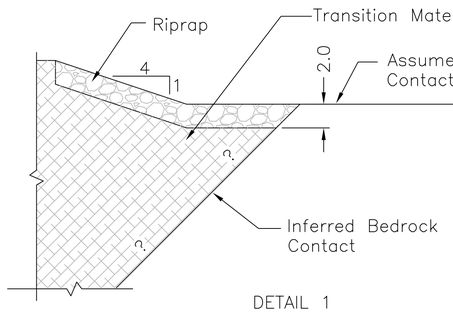


PLAN VIEW



TYPICAL SECTION
NTS



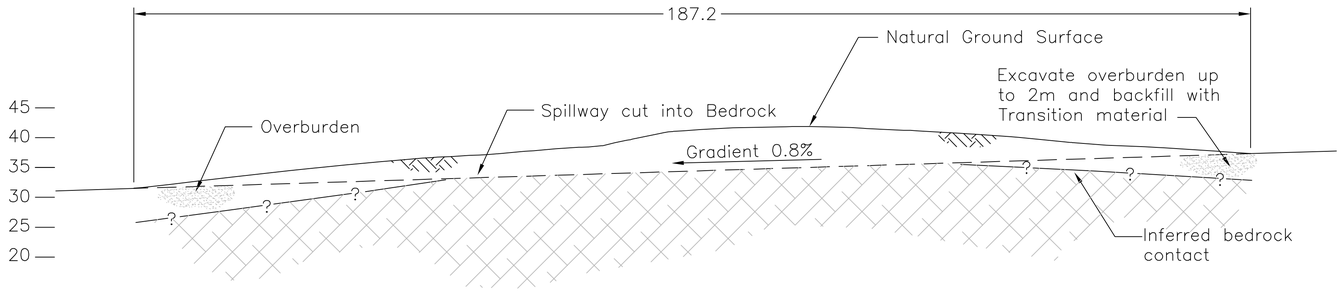


DETAIL 1
RIPRAP DETAIL AT DAM CREST
NTS

STAKE OUT TABLE			
Spillway			
Point	Northing	Easting	Elev.
S1	7559132.6	434457.0	33.5
S2	7559143.2	434449.9	33.5
S3	7559153.7	434442.9	33.5
S4	7559192.7	434450.8	33.0
S5	7559191.2	434459.4	33.1
S6	7559189.7	434468.3	33.2
S7	7559227.2	434438.9	32.5
S8	7559233.7	434444.8	32.5
S9	7559240.5	434451.0	32.6
S10	7559231.7	434393.7	31.9
S11	7559239.3	434389.1	31.8
S12	7559247.2	434384.5	31.8
S13	7559218.1	434369.2	31.5
S14	7559224.7	434362.0	31.5
S15	7559233.1	434358.5	31.5
S16	7559199.0	434413.1	37.5

Legend:

- Overburden
- Bedrock
- Riprap
- Natural Ground



TYPICAL CENTERLINE LONGITUDINAL SECTION A–A'
NTS

Notes:

1. Where the Spillway needs to be founded on overburden soils, including permafrost, the overburden shall be over excavated at least 2m. The over excavation shall be backfilled with compacted Transition material, or other suitable material as directed by the Engineer.
2. Exposed overburden in the slope cut of the Spillway shall be over excavated and replaced with competent material as directed by the Engineer.
3. The Contractor shall take all necessary precautions to ensure that no over excavation of the Dam materials takes place. The final excavated face of the Dam flank will be inspected and approved by the Engineer before placement of riprap may be done.
4. The Contractor shall take all necessary precautions to ensure that the thermosyphons and radiators are not damaged Spillway Construction.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS			

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			
REVISIONS				

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

SRK Consulting
Engineers and Scientists
Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: SPILLWAY PLAN AND SECTION.dwg

MIRAMAR HOPE BAY LTD.

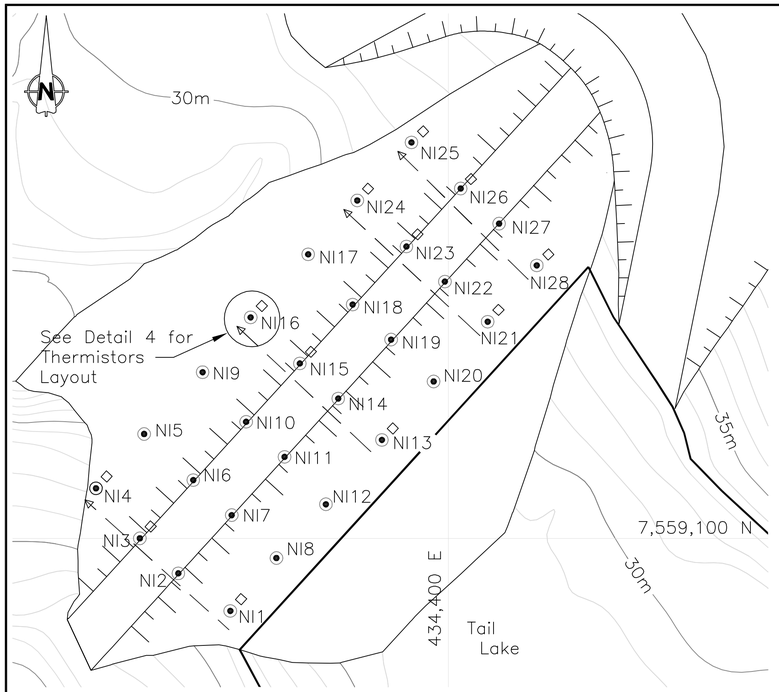
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

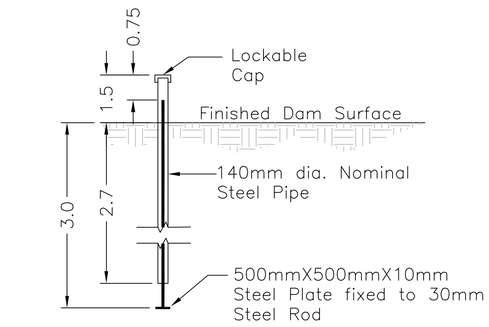
DRAWING TITLE:
Spillway Plan, Typical Sections and Details

DRAWING NO.	SHEET	REVISION NO.
T-08	43 OF 49	B

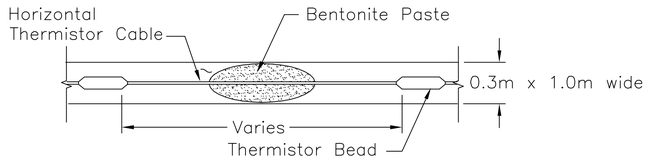


NORTH DAM PLAN VIEW

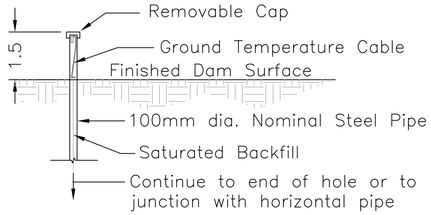
1:750 0 10 20 30 40 50 Metres



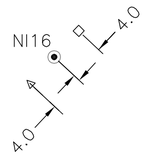
TYPICAL DETAIL 1 – SURVEY MONITORING POINTS
NTS



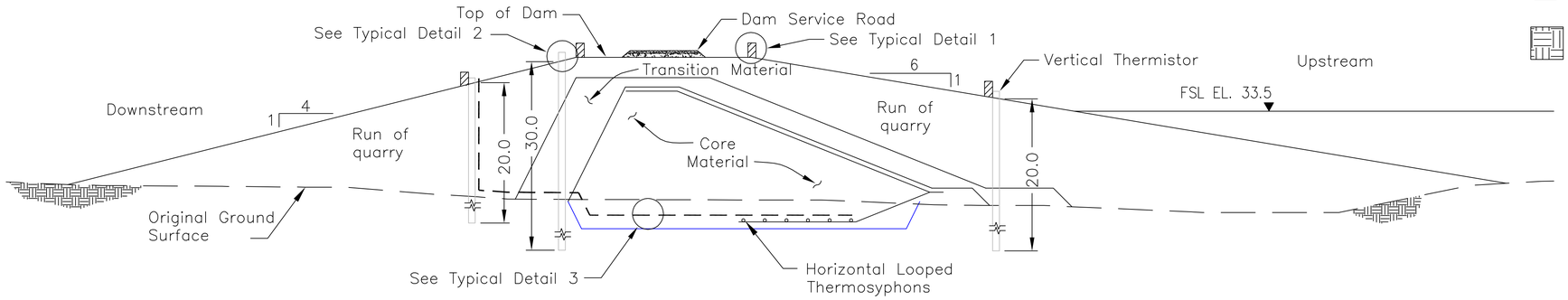
WATER STOP DETAIL 3 – HORIZONTAL THERMISTOR CABLE
NTS



TYPICAL DETAIL 2 – HORIZONTAL AND VERTICAL CABLE
NTS



THERMISTOR LAYOUT – TYPICAL DETAIL 4
NTS



TYPICAL NORTH DAM SECTION
NTS

Legend:

- Survey Monitoring Points (Section)
- SI13 Survey Monitoring Points (Plan)
- Vertical Thermistor
- Horizontal Thermistor (Plan & Section)
- Horizontal Thermistor (Readout)
- Natural ground

Notes:

1. The Contractor shall be responsible for the instrumentation installation, with supervision by the Engineer.
2. The Contractor shall take all necessary precautions to ensure that instrumentation are not damaged during construction. Regular testing of instrumentation shall be carried out to confirm functionality of the instrumentation.
3. Actual final location of instrumentation may be field fitted, with express approval from the Engineer.
4. Horizontal and vertical thermistor cable installations will be identical, with identical finishing.
5. The Engineer will provide exact details of thermistor bead spacing at the appropriate time.
6. The stake out points listed in this Drawing are for the Survey Monitoring Points only. The Contractor shall make the appropriate corrections to locate the horizontal and vertical thermistors.

STAKE OUT POINTS		
North Dam Instrumentation		
Point	Northing	Easting
NI1	7559081.8	434345.2
NI2	7559091.2	434332.1
NI3	7559100.0	434322.5
NI4	7559112.6	434311.4
NI5	7559126.3	434323.5
NI6	7559114.7	434335.9
NI7	7559105.9	434345.6
NI8	7559094.8	434357.3
NI9	7559141.8	434338.2
NI10	7559129.3	434349.2
NI11	7559120.5	434358.8
NI12	7559107.8	434369.9
NI13	7559124.0	434384.3
NI14	7559135.2	434372.3
NI15	7559144.0	434362.7
NI16	7559155.6	434350.3
NI17	7559171.4	434364.8
NI18	7559158.8	434375.9
NI19	7559150.0	434385.6
NI20	7559138.3	434397.5
NI21	7559153.2	434411.4
NI22	7559164.6	434399.1
NI23	7559173.4	434389.5
NI24	7559184.9	434377.1
NI25	7559199.5	434390.7
NI26	7559187.9	434403.1
NI27	7559179.1	434412.8
NI28	7559166.7	434423.8

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

Stamped, signed and dated originals submitted to the Nunavut Water Board

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SRK Consulting Engineers and Scientists Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	KLJ	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: N-S DAM SURVEY MONITORING POINTSdwg.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT DETAILED DESIGN

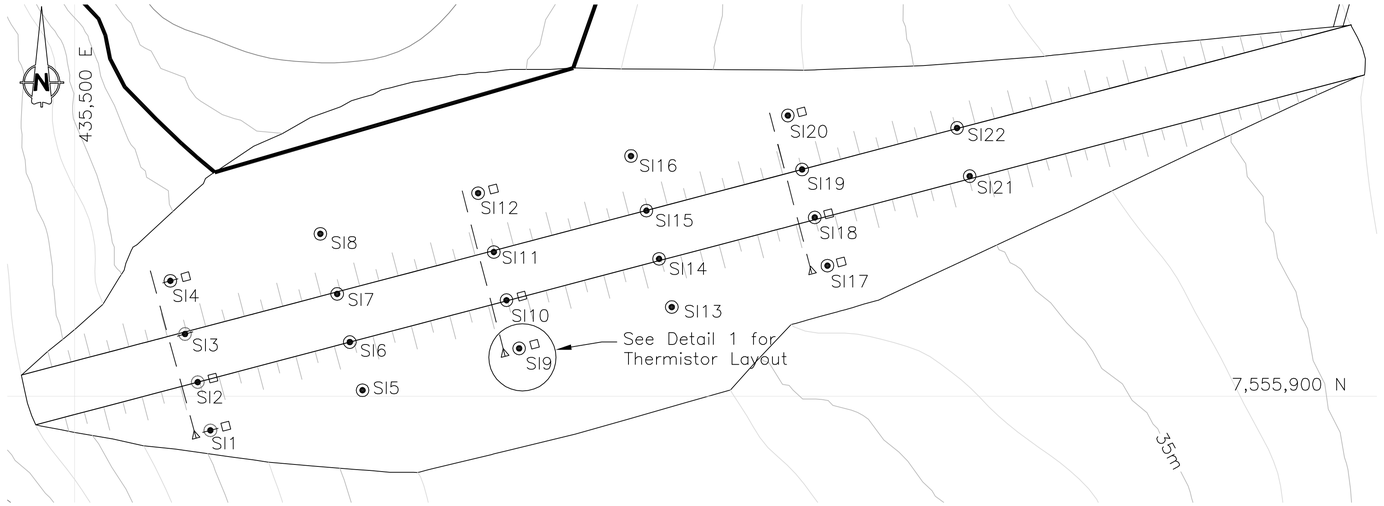
SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

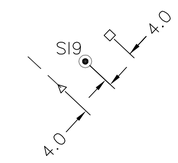
North Dam Instrumentation Layout and Typical Details

DRAWING NO.	SHEET	REVISION NO.
T-09	44 OF 49	B



SOUTH DAM PLAN VIEW

1:750 0 10 20 30 40 50 Metres

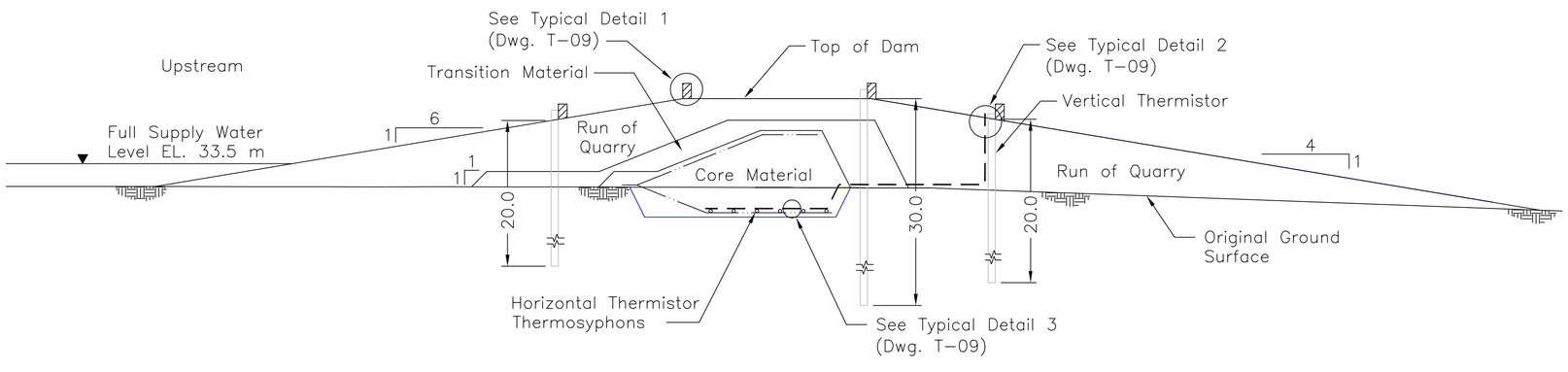


THERMISTOR LAYOUT – TYPICAL DETAIL 1
NTS

STAKE OUT TABLE		
South Dam Instrumentation		
Point	Northing	Easting
SI1	7555891.5	435534.1
SI2	7555903.6	435530.9
SI3	7555915.7	435527.7
SI4	7555929.0	435524.0
SI5	7555901.5	435572.3
SI6	7555913.6	435569.2
SI7	7555925.7	435566.0
SI8	7555940.9	435561.7
SI9	7555912.1	435611.7
SI10	7555924.2	435608.5
SI11	7555936.3	435605.3
SI12	7555951.1	435601.4
SI13	7555922.4	435650.1
SI14	7555934.6	435646.9
SI15	7555946.7	435643.7
SI16	7555960.4	435639.8
SI17	7555932.8	435689.2
SI18	7555945.0	435686.0
SI19	7555957.1	435682.8
SI20	7555970.6	435679.3
SI21	7555955.3	435725.0
SI22	7555967.5	435721.8

Legend:

- Survey Monitoring Points (Section)
- SI13 Survey Monitoring Points (Plan)
- Vertical Thermistor
- Horizontal Thermistor (Plan & Section)
- Horizontal Thermistor (Readout)
- Natural ground



TYPICAL SOUTH DAM SECTION
NTS

Notes:

1. The Contractor shall be responsible for the instrumentation installation, with supervision by the Engineer.
2. The Contractor shall take all necessary precautions to ensure that instrumentation are not damaged during construction. Regular testing of instrumentation shall be carried out to confirm functionality of the instrumentation.
3. Actual final location of instrumentation may be field fitted, with express approval from the Engineer.
4. Horizontal and vertical thermistor cable installations will be identical, with identical finishing.
5. The Engineer will provide exact details of thermistor bead spacing at the appropriate time.
6. The stake out points listed in this Drawing are for the Survey Monitoring Points only. The Contractor shall make the appropriate corrections to locate the horizontal and vertical thermistors.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

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AT	KLJ	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: N–S DAM SURVEY MONITORING POINTSdwg.dwg

MIRAMAR HOPE BAY LTD.

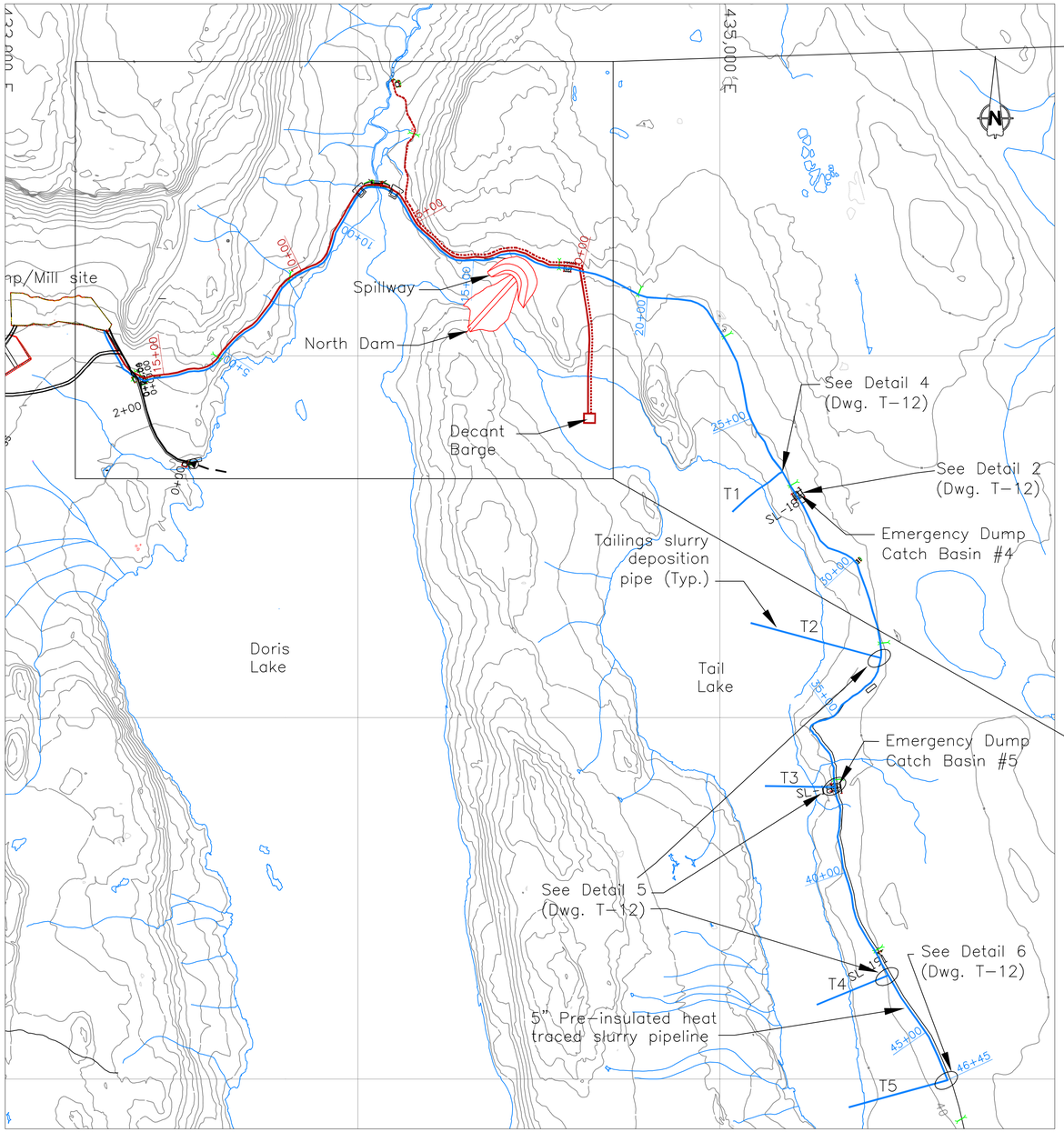
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

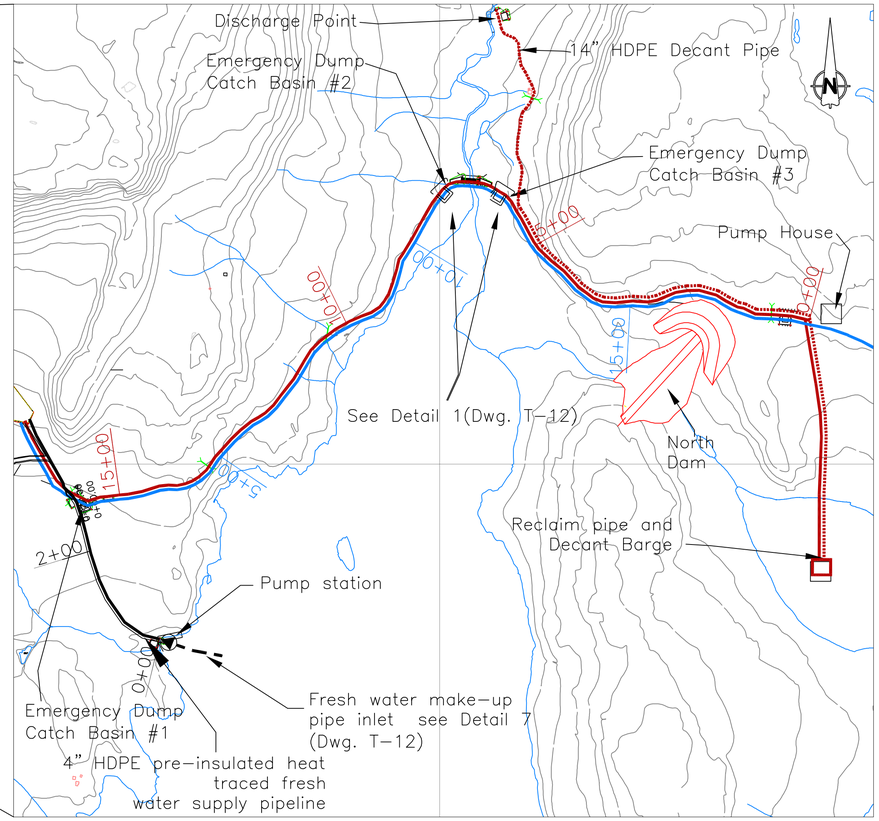
DRAWING TITLE:
South Dam Instrumentation Layout and Typical Details

DRAWING NO.	SHEET	REVISION NO.
T-10	45 OF 49	B



TAILINGS SLURRY PIPELINE LAYOUT

1:7500 0 200 400 600 800 1000 Metres



RECLAIM, FRESH WATER MAKE-UP AND DECANT PIPELINE LAYOUT

1:5000 0 200 400 600 800 1000 Metres

Legend:

- Reclaim water pipe
- Tailings slurry deposition pipe
- Fresh water make-up pipe
- Decant Pipe

Notes:

1. The earthworks to be performed along the pipeline route shall be modified on-site to eliminate localized high and low points to ensure pipeline drainage to the specified Emergency Dump Catch Basins.
2. The fresh water make-up pipeline shall be 4" diameter HDPE DR 17 pre-insulated and heat traced line.
3. The reclaim pipeline shall be 4" diameter HDPE DR 17 pre-insulated and heat traced line.
4. The tailings slurry pipeline shall vary from a 5" diameter PE/HDPE coated pre-insulated steel line, to 5" diameter HDPE DR 17 pre-insulated line. The Contractor shall ensure that all six pipe classes in use are correctly placed.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENSE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

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PROFESSIONAL ENGINEERS STAMP

SRK Consulting Engineers and Scientists Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
CHECKED:	APPROVED:	DATE:
AT	EMR	Mar. 2007

FILE NAME: PIPELINES PLAN.dwg

MIRAMAR HOPE BAY LTD.

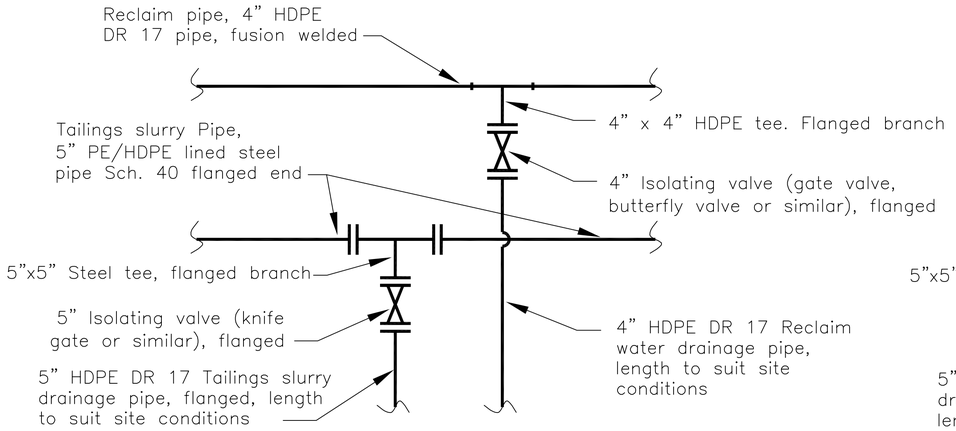
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

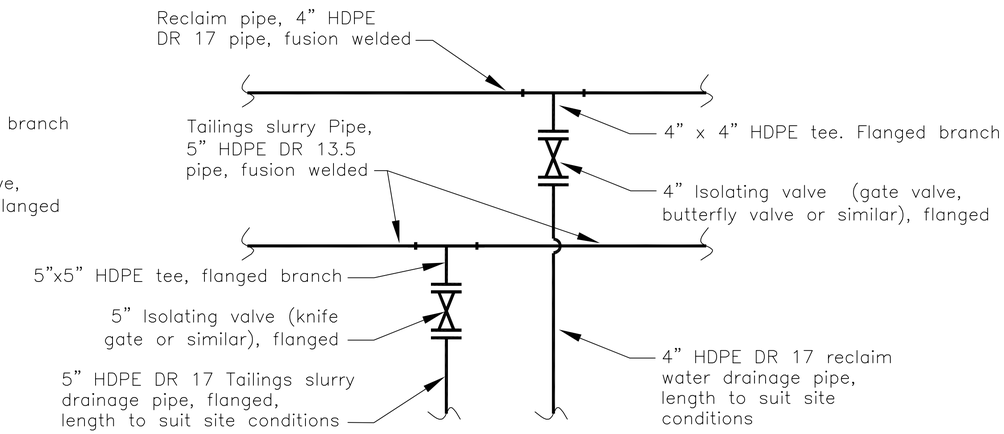
Doris North Project

DRAWING TITLE:
Tailings Slurry, Reclaim, Fresh-Water Make-Up and Decant Pipelines Layout

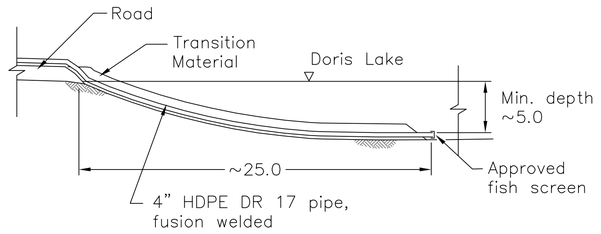
DRAWING NO.	SHEET	REVISION NO.
T-11	46 OF 49	B



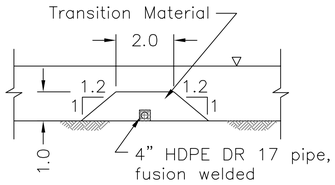
DETAIL 1
EMERGENCY DUMP CATCH BASIN #1, #2 and #3 DRAIN PIPES
NTS



DETAIL 2
EMERGENCY DUMP CATCH BASIN #4 DRAIN PIPES
NTS



DETAIL 7
TYPICAL FRESH WATER MAKE-UP INTAKE LONG SECTION
NTS



TYPICAL FRESH WATER MAKE-UP INTAKE CROSS SECTION
NTS

DETAIL 3
EMERGENCY DUMP CATCH BASIN #5 DRAIN PIPES
NTS

DETAIL 4
TAILINGS SLURRY DEPOSITION PIPE CONNECTION T1
NTS

DETAIL 5
TAILINGS SLURRY DEPOSITION PIPE CONNECTION T2, T3 & T4
NTS

DETAIL 6
TAILINGS SLURRY DEPOSITION PIPE CONNECTION T5
NTS

Notes:

1. Pipe crossings shall be installed in such a fashion that overlapping pipes do not buckle. The Engineer will inspect and approve each crossing and may instruct Contractor to place pipe bedding material to protect pipes at crossings.
2. The final location and orientation of all valves will be confirmed on site by the Engineer.
3. The tailings slurry and decant pipelines shall be pre-insulated in accordance with the approved Specifications.
4. The reclaim and fresh water make-up pipelines shall be pre-insulated and heat traced in accordance with the approved Specifications.
5. The fresh water make-up pipeline inlet in Doris Lake shall have an approved fish screen based on the 1995 Department of Fisheries and Oceans "Freshwater Intake End-of-Pipe Fish Screen Guidelines".
6. Tailings slurry and reclaim drain pipelines into Emergency Dump Catch Basins, shall terminate at the freeboard elevation within the Emergency Dump Catch Basin. This determination shall be made on site by the Contractor and confirmed by the Engineer.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

Stamped, signed and dated originals submitted to the Nunavut Water Board

PROFESSIONAL ENGINEERS STAMP

SRK Consulting
Engineers and Scientists
Vancouver

DESIGN:	DRAWN:	REVIEWED:
AT	JJH	EMR
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AT	EMR	Mar. 2007

FILE NAME: figure 1[1].1.dwg

MIRAMAR HOPE BAY LTD.

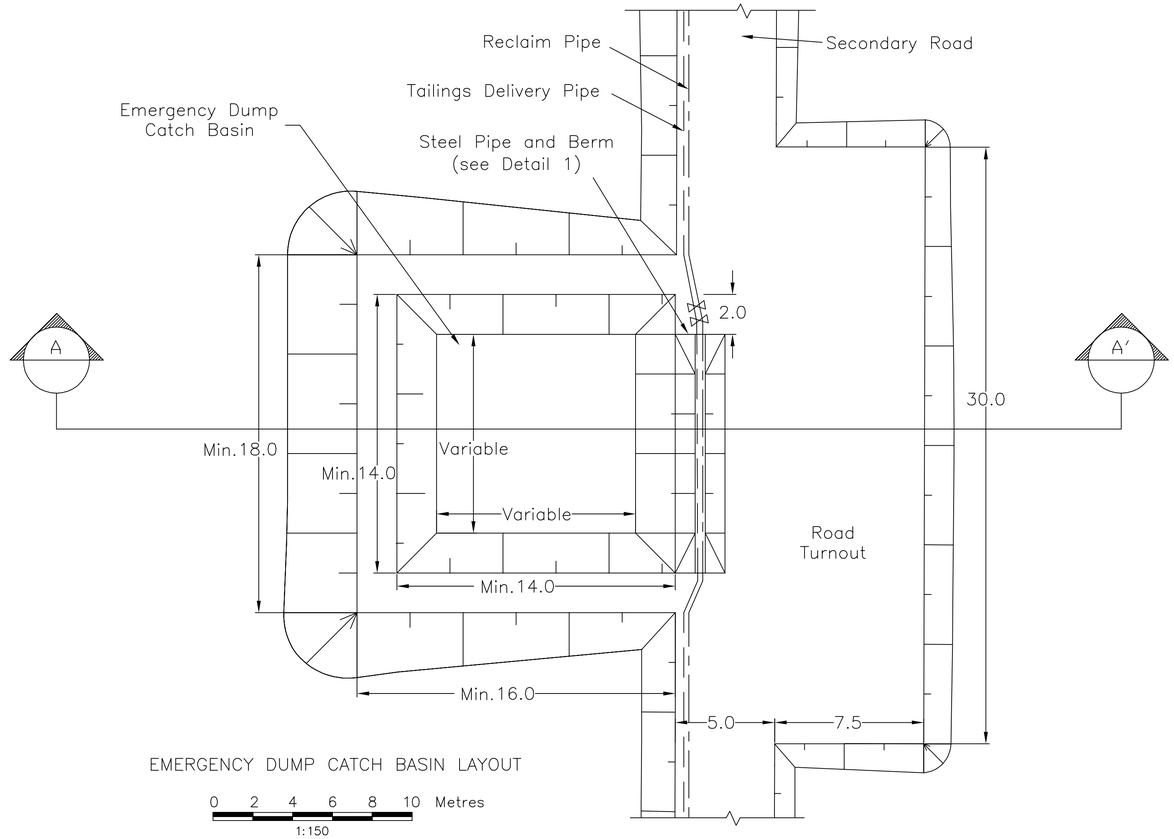
DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:
Typical Pipeline Details

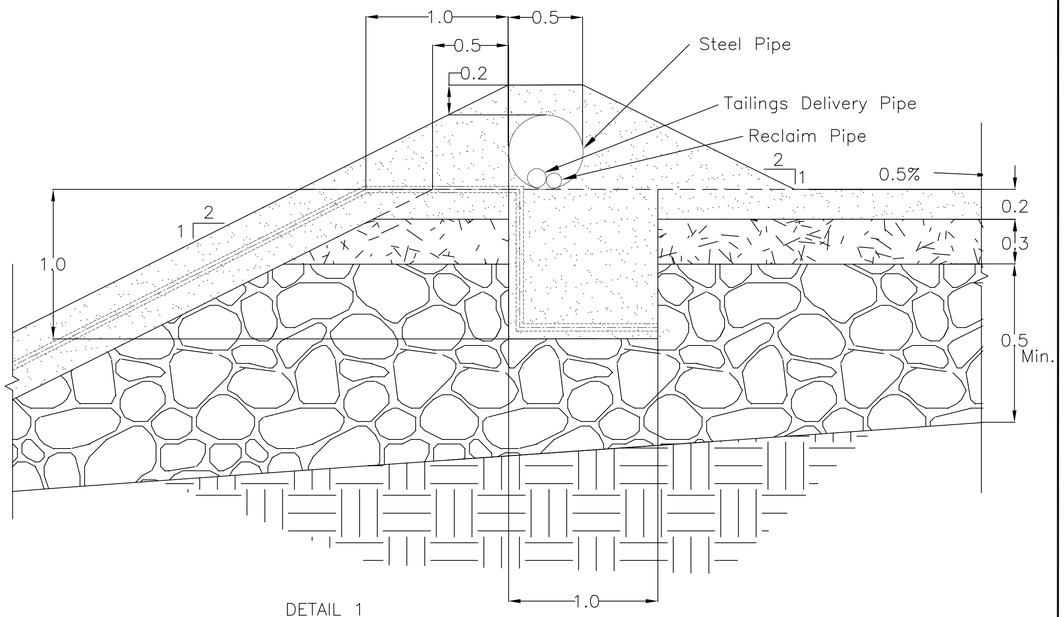
DRAWING NO.	SHEET	REVISION NO.
T-12	47 OF 49	B



EMERGENCY DUMP CATCH BASIN LAYOUT

0 2 4 6 8 10 Metres

1:150



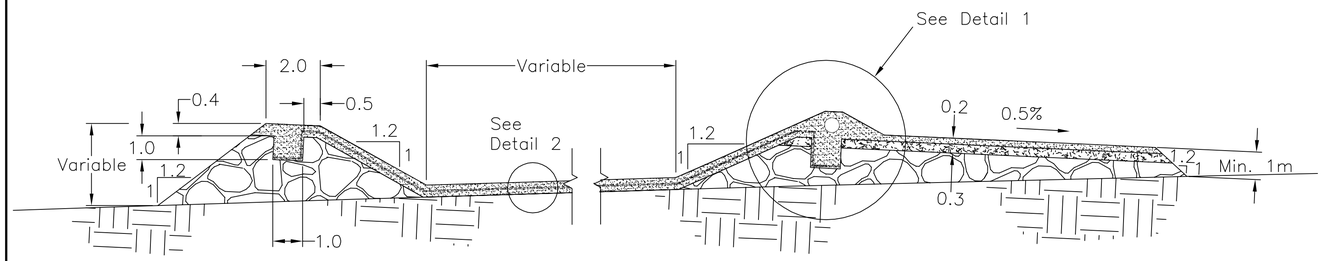
DETAIL 1

0 0.4 0.8 1.2 1.6 2 Metres

1:20

Legend:

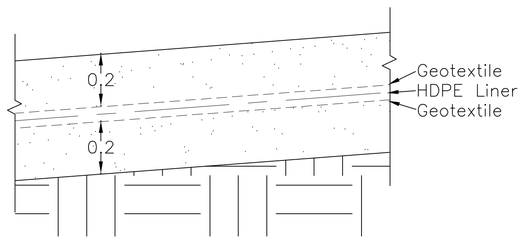
- Natural Ground
- Surfacing MateriaL
- Select Subgrade
- Run of Quarry



TYPICAL SECTION A–A'

0 1 2 3 4 5 Metres

1:100



DETAIL 2

Notes

1. The final locations of the Emergency Dump Catch Basins will be confirmed on site by the Engineer.
2. A road turnout shall always be constructed opposite the Emergency Dump Catch Basins. Local variations to the dimensions shall be allowed with approval from the Engineer.
3. The Contractor shall be responsible to keep the Emergency Dump Catch Basins dry and free of snow and ice during the construction period.
4. The Contractor shall take due care so as not to damage the liner during construction. Special temporary liner protection measures shall be taken in the event that construction equipment must pass over a liner before the final protective cover has been placed. The Engineer shall be notified of these occurrences.
5. Modifications to the liner tuck trench shall be allowed if equipment access is a problem. The details of any such modifications shall be presented to the Engineer for approval.

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENSE APPLICATION			
A	WATER LICENSE APPLICATION			

REVISIONS

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PROFESSIONAL ENGINEERS STAMP

SRK Consulting Engineers and Scientists Vancouver

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AT	EMR	Mar. 2007

FILE NAME: CATCH_BASINrev1.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT DETAILED DESIGN

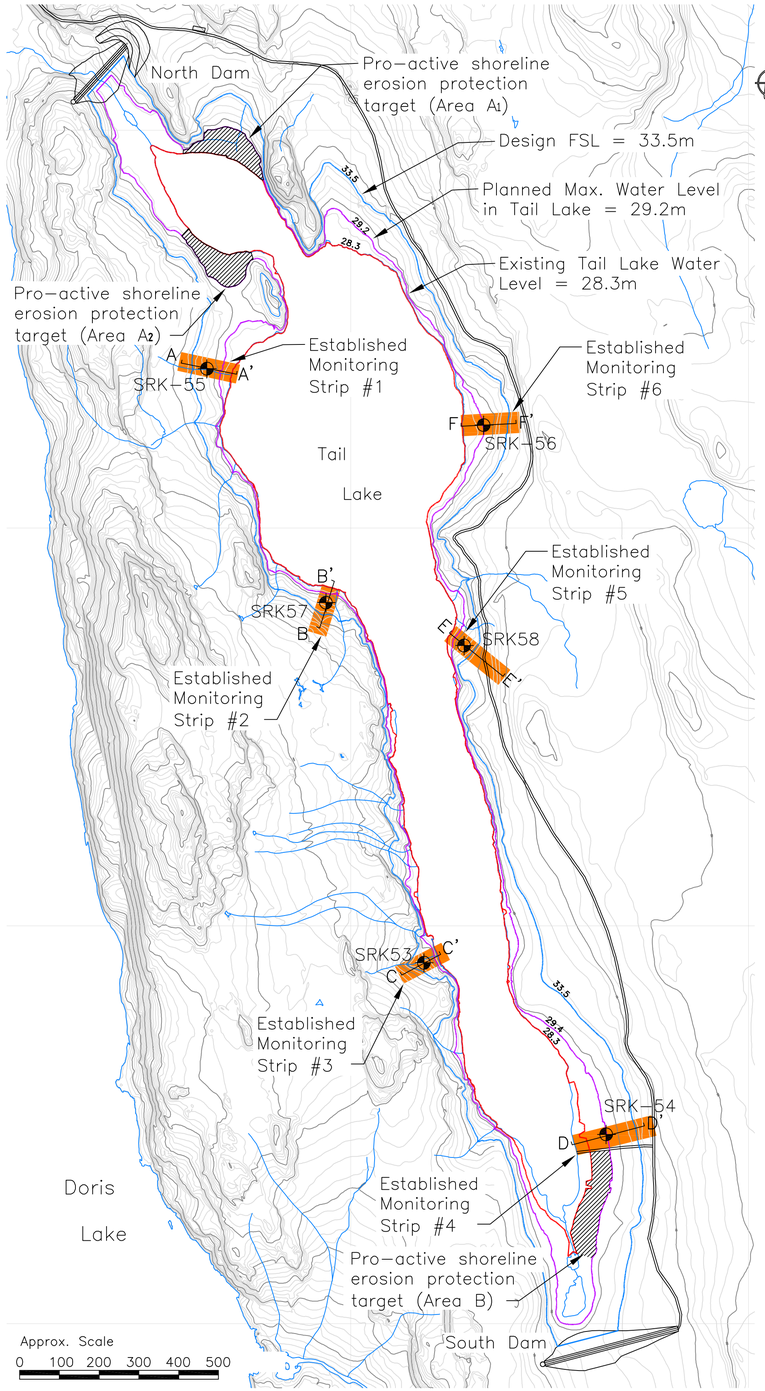
SRK JOB NO.: 1CM014.008

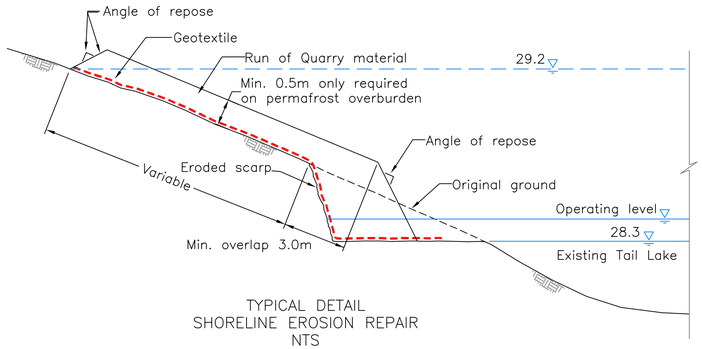
Doris North Project

DRAWING TITLE:

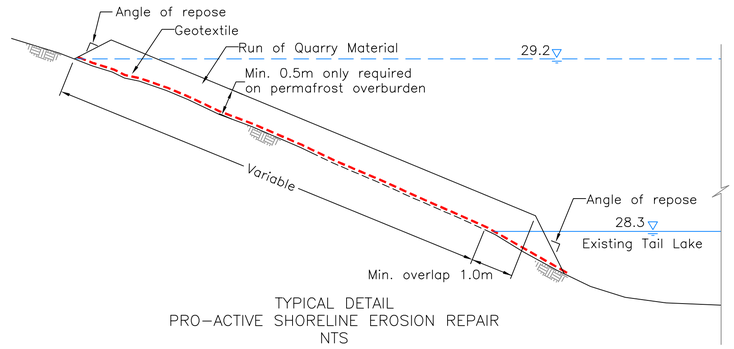
Emergency Dump Catch Basin Layout and Typical Details

DRAWING NO.	SHEET	REVISION NO.
T-13	48 OF 49	B

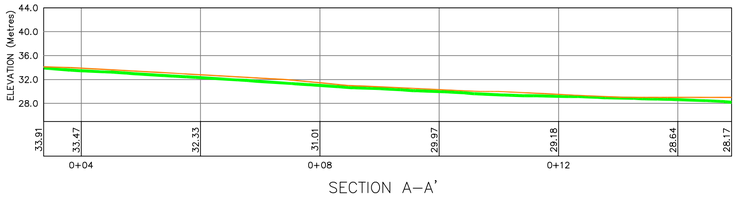




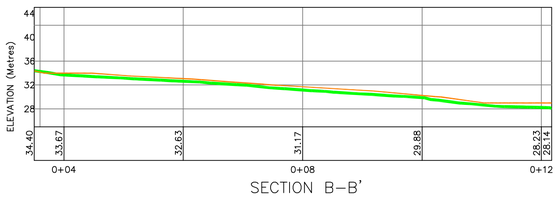
TYPICAL DETAIL
SHORELINE EROSION REPAIR
NTS



TYPICAL DETAIL
PRO-ACTIVE SHORELINE EROSION REPAIR
NTS



SECTION A-A'
ESTABLISHED MONITORING STRIP #1 PROFILE
NTS



SECTION B-B'
ESTABLISHED MONITORING STRIP #2 PROFILE
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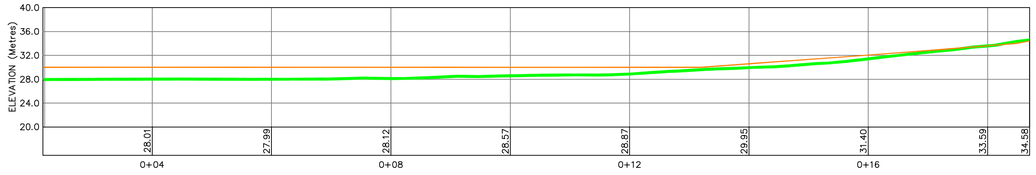

SECTION D-D'
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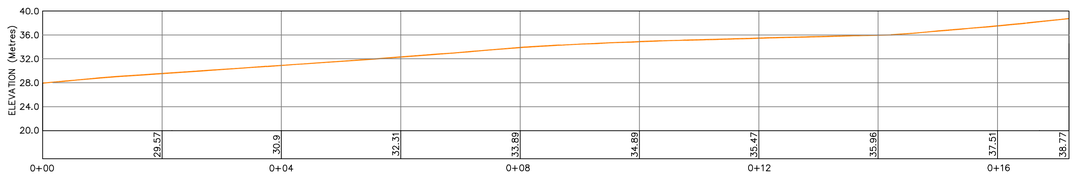

SECTION E-E'
ESTABLISHED MONITORING STRIP #5 PROFILE
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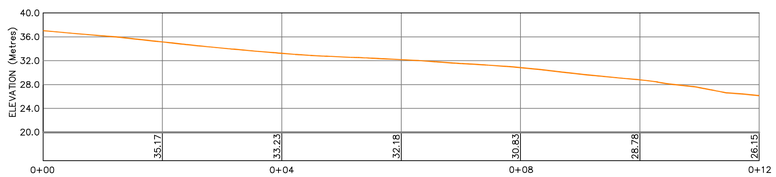
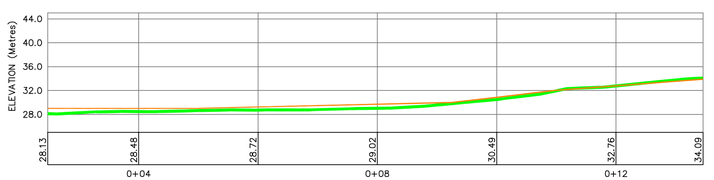


SECTION C-C'
ESTABLISHED MONITORING STRIP #3 PROFILE
NTS



SECTION F-F'
ESTABLISHED MONITORING STRIP #6 PROFILE
NTS

Legend

- Survey Data
- Topo Data
- SRK-54 Drill hole with Thermistor

Notes:

1. The location and extent of the pro-active shoreline erosion coverage is approximate, and will be confirmed on site by the Engineer.
2. The established monitoring strips are areas that have been selected for monitoring of the continued progression of shoreline erosion. Each of these strips includes a drill hole with a thermistor.
3. The Run of Quarry material to be used for erosion protection can include fines, and a deviation of this material from the standard material specifications may be requested from the Engineer.

STAKE OUT TABLE		
Point	Northing	Easting
Area A1		
A1-1	7558945	434579
A1-2	7558952	434586
A1-3	7558954	434594
A1-4	7558964	434602
A1-5	7558975	434630
A1-6	7558994	434632
A1-7	7559001	434641
A1-8	7559008	434684
A1-9	7559000	434717
A1-10	7558989	434734
A1-11	7558968	434750
A1-12	7558933	434771
A1-13	7558920	434773
A1-14	7558914	434771
A1-15	7558900	434776
A1-16	7558875	434780
Area A2		
A2-17	7558747	434587
A2-18	7558734	434576
A2-19	7558706	434599
A2-20	7558671	434620
A2-21	7558653	434634
A2-22	7558632	434642
A2-23	7558621	434665
A2-24	7558605	434691
A2-25	7558611	434714
A2-26	7558633	434735
A2-27	7558658	434739
A2-28	7558675	434755
A2-29	7558690	434751
Area B		
B-30	7556432	435612
B-31	7556435	435651
B-32	7556360	435657
B-33	7556328	435647
B-34	7556271	435626
B-35	7556219	435618
B-36	7556188	435618
B-37	7556164	435607
B-38	7556174	435576

DRAWING NO.	DRAWING TITLE	DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	WATER LICENCE APPLICATION			
A	WATER LICENCE APPLICATION			

REVISIONS

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PROFESSIONAL ENGINEERS STAMP

SRK Consulting Engineers and Scientists, Vancouver

DESIGN:	DRAWN:	REVIEWED:
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AT	EMR	Mar. 2007

FILE NAME: Shoreline Erosion.dwg

MIRAMAR HOPE BAY LTD.

DORIS NORTH PROJECT
DETAILED DESIGN

SRK JOB NO.: 1CM014.008

Doris North Project

DRAWING TITLE:

Shoreline Erosion Protection Typical Details

DRAWING NO.	SHEET	REVISION NO.
T-14	49 OF 49	B