Steensby Freight Dock Options Trade-off Study

Impact on Construction Capital Costs

Rev. 0

July 15, 2011

2011-07-15	0	Final	for K. Skebo	for L. Flowers	J. Casson	
DATE	REV.	STATUS	PREPARED BY	CHECKED BY	APPROVED BY	APPROVED BY
			HATCH			CLIENT

Table of Contents

1. General Background

1.1 Motivation

This trade-off study provides information on the cost of providing capital costs for constructing freight docks at Steensby Inlet.

The capital cost estimates of the proposed options is to assist Baffinland Iron Mines Corporation to determine the best cost benefit of either installing the base case concept using discrete caissons or changing the design and / or location.

1.2 Description of AMEC Sandwell Proposed Steensby Inlet Freight Dock

The AMEC / Sandwell baseline option (as defined in the Environmental Impact Study) proposed that the freight dock be constructed with 20 metre diameter, 19 metre high discrete concrete caissons at a 30 metre centre to centre spacing.

The dock structure is outlined in AMEC Document No. 165926-A004-A04_0015-01 and the location and plan view is as shown Figure 1 (AMEC Drawing Number A1-159952-8410-190-S005) and Figure 2 (AMEC Drawing Number A1-159952-8410-190-S006).

AMEC Document No.TDM-159952-000-000-019,identified a high level capital cost estimate for this dock of $29 million; but excluded all rock fill, indirect costs and contingencies.

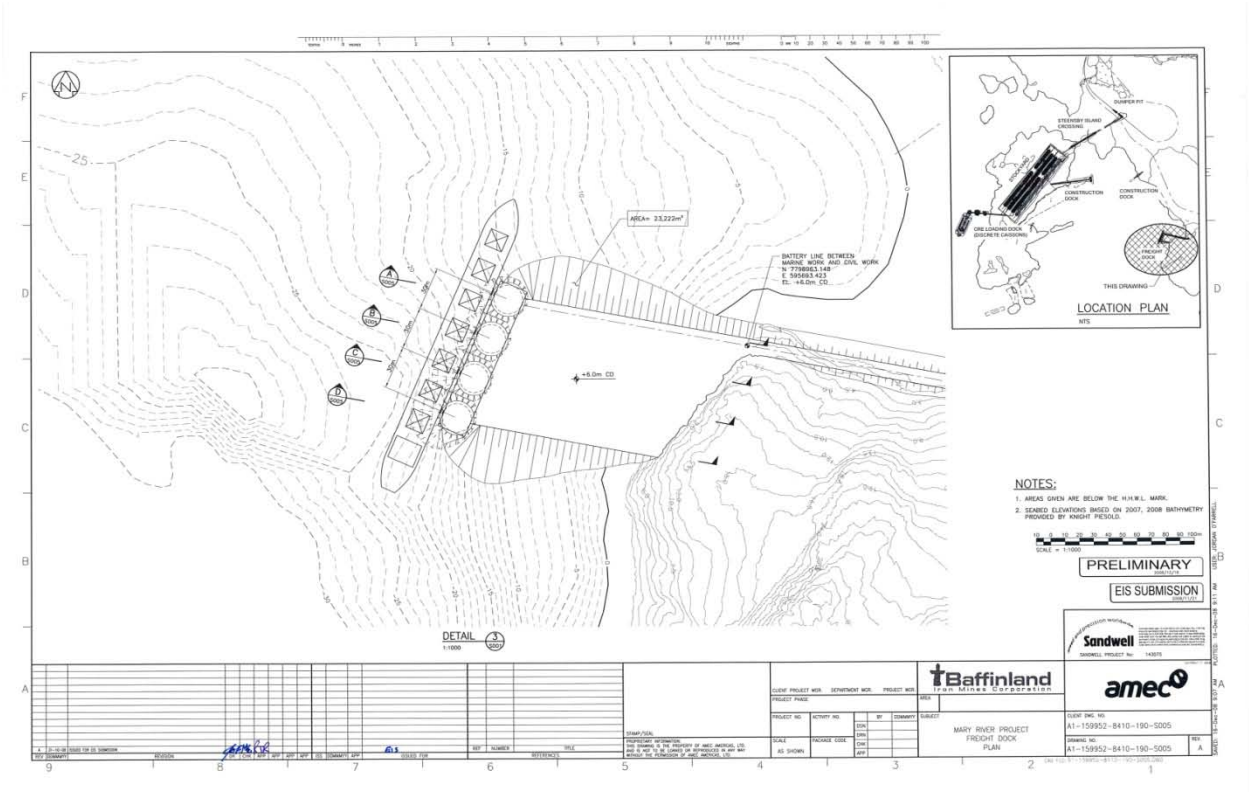


Figure 1: AMEC Drawing Number A1-159952-8410-190-S005

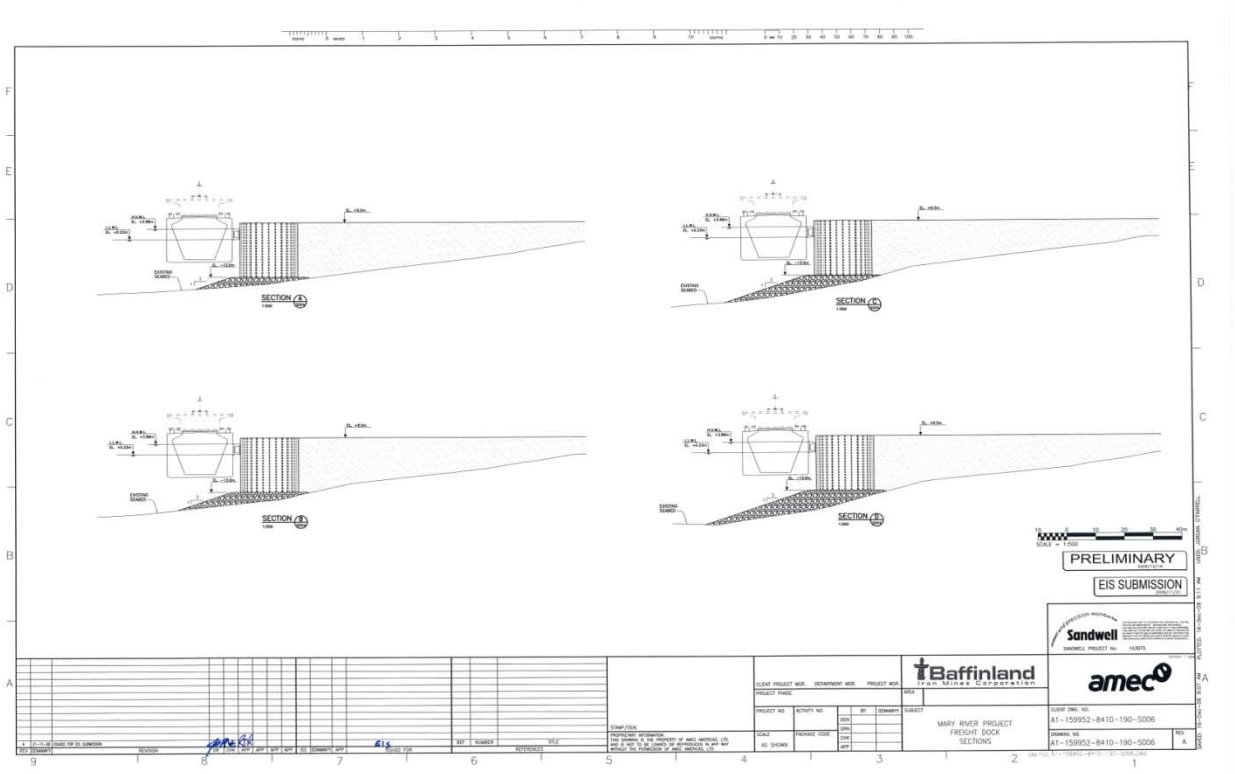


Figure 2: AMEC Drawing Number A1-159952-8410-190-S006

A basic description of the AMEC Proposed Steensby Inlet Freight Dock is as follows;

- 90 metre long breasting face
- Dock length - 110 metres outside caisson to outside caisson
- Water Depth at dock - 13 metres
- Concrete Caisson Construction – with 10 metre gap between caissons
- No dredging program – appears the assumption was the harbour bottom was rock
- Laydown area starts 20 metres behind the wharf face
- Approximately 1.0 hectare laydown / storage area
- No infrastructure identified on the drawings

1.3 Description of Trade off Study Options

The proposed Steensby Inlet Freight Dock trade off studies to be reviewed includes:

- Base case discrete concrete caissons constructability and cost estimate review
- 100 metre steel pile dock breasting face
- 100 metre steel circular cell
- Steel pile dock face with quarter aft ro-ro capabilities
- Steel circular cell dock face with quarter aft ro-ro capabilities
- As part of the ore dock trade off studies the following was added;
- 165 metre steel pile dock face with 135 metre long ice breaking tug dock facilities
- 165 metre steel circular cell dock face with 135 metre long ice breaking tug dock facilities

1.4 Description of Trade off Study Steensby Freight Dock

A basic description of a proposed Steensby Inlet Freight Dock is as follows;

- Support the docking of 30,000 DWT multipurpose vessels and 37,000 DWT Fuel Tankers including:
  - Irving Oil Tanker MV Acadian - LOA 176 metres – Draft 11.0 metres
  - Typical 30,000 DWT multipurpose – LOA 181 metres – Draft 10.9 metres
  - Typical sealift barges
- Length of wharf face as per options note in Section 1.3
- Water Depth of 13 metres
- Mooring buoys anchored to shore or gravity anchors as require to reduce length of wharf
- A 20 year plus life expectancy
- Dredging as required for each option

1.5 Environmental / Archaeological Impact of Change

The intent is to keep all proposed options in the general location of the EIS layout.

There is one apparent environmental impact of change for all options including the base case study in that dredging of unstable material will be required. (to be identified in Section 2)

Other than dredging there are no apparent additional environmental or archaeological impacts with the construction of construction dock that were identified in the EIS.

2. Technical Evaluation

2.1 2011 Geotechnical Inlet Geotechnical Design Criteria

In the spring of 2011 Hatch / Thurber completed a limited on-ice geotechnical program. The program was unable to complete any bore holes but did complete 11 probes to a refusal depth.

The probes determined that the surface of the top of the harbour bottom is not bedrock or a structurally sound material. The surface has an unstable/ unsuitable layer varying in thicknesses of 5.9 to 16.0 metres. (To be documented in 2011 Hatch / Thurber Geotechnical Report)

The initial results of this geotechnical program allow Hatch, with some confidence, to commence the design a dock to meet conditions identified; However a comprehensive geotechnical borehole program is required to;

- complete a final design,
- reduce risk to the Owner
- and complete a capital cost estimate to within 15%.

2.2 Freight Dock - Base Case Technical Evaluation

Based on the drawings completed by AMEC / Sandwell, there appear to be two significant flaws in the concept design;

1. The harbour bottom is not structurally sound and a significant amount of dredging is required before a structural rock fill mattress can be installed.
2. The 10 metre gap between the discrete caissons creates an issue where rock fill cascades into the ships berthing position. The rockfill would be required to move back approximately 14 metres to prevent rock fill spilling into the navigational channel – see Figure 3

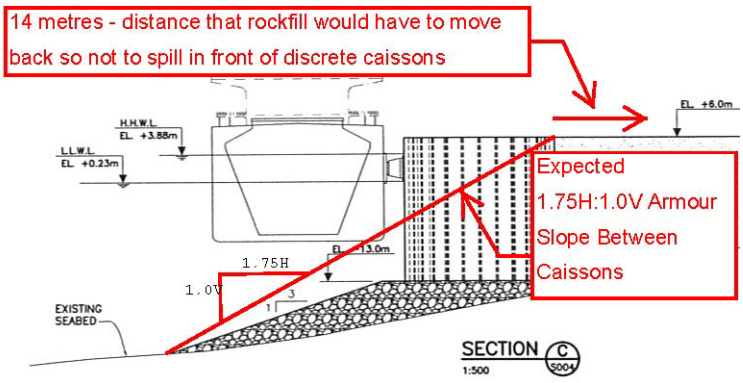


Figure 3: Cross Section – Base Case

1. An option to prevent the rockfill from spilling into the navigational channel is to add one more caisson and place the caissons side by side with a concrete key closing the gap.

2. The discrete caissons are not functionally workable as a freight dock, as trucks will not be able to accept freight at the dock face unless bridges are constructed between the discrete caissons.

The base case has sufficient technical challenges that it should only be reconsidered if there is a substantial capital cost savings.

2.3 Freight Dock – Trade off Study Options - Technical Evaluation

Based on the limited 2011 geotechnical program trade off study options considered included:

1. Moving the Freight dock to an alternate location – i.e. proposed Aker location or other sites within the inner harbour. This option was eliminated because Hatch / Thurber 2011 program identified that the entire inner harbour area has much the same geotechnical subsurface conditions, where there is varying thicknesses of unstable material.

2. Move the Freight Dock back towards shore to a position where it is technically possible to found and construct a steel sheet pile circular cell dock. This scenario will require some dredging in front of the dock. ***This option is considered as a viable option and a preliminary design was initiated.***

3. Move the Freight Dock back towards shore to a position where it is technically possible to found and construct a steel pipe pile dock face that requires pinning into the refusal (bedrock) layer at the base and tie back system at the top of the wall. This scenario will require some dredging in front of the dock. ***This option is considered as a viable option and a preliminary design was initiated.***

Further Geotechnical data is required to confirm any dock design in this area.

3. Technical Considerations

Technical considerations for all options include:

- Dredging of material that contains fines must be contained.
- Disposal of dredged material on land or at sea.
- Pile driving / vibrating sheet piles in the water which may cause disruption to marine mammals. (Possible mitigation may include the use of an air curtain)

There are no other anticipated technical issues.

4. Operational Considerations

Consideration has been given for operational aspects of the options in the following categories.

4.1 Safety / Environmental

There are no apparent additional safety issues with the construction of a trade-off study options versus the base case study option.

There is an environmental issue, that there will be a requirement under all options to dredge unsuitable material.

4.2 Labour

N / A

4.3 Time

N / A

4.4 Freight Dock Operations

Base Case – Discrete Caissons

The base case discrete caisson options will not function properly without the gap between the caissons and the edge of rockfill being resolved.

100 Metre Long Freight Dock

A 100 metre long freight dock will meet the requirements of BIM in loading and unloading 30,000 DWT multipurpose vessels, 37,000 DWT Fuel Tankers and Sealift Barges.

165 Metre Long Freight Dock

A 165 metre long freight dock will meet the additional requirements of BIM in loading and unloading 30,000 DWT multipurpose vessels with Quarter Aft Ramp.

300 Metre Long Freight Dock / Tug Berthing Dock

A 300 metre long freight dock / tug dock will meet the additional requirements of BIM in berthing two 125 metre long ice breaking tugs.

4.5 Costs

There may operational costs implications under all trade off study dock options because the laydown area behind the dock will be reduced.

This may be mitigated by blasting and excavating rock on shore directly behind the dock, thus expanding on the storage area.

4.6 Risks

The operational risks are noted above with regard to base case dock face laydown area challenges and loss of laydown space behind the dock as it is moved towards shore.

5. Constructability Considerations

The construction location of concrete caissons has not been resolved – i.e. constructed off site at an unknown location and towed to Steensby.

The constructability of a sheet pile / pipe pile dock and or a circular cell sheet pile dock is typical for the water depths and dock heights considered for the Steensby Freight dock.

Specific considerations for Steensby Inlet Dock includes are;

- 90 to 110 day open water construction season.
- Consolidation / settling of the fill behind the dock can be expected over the first year. Additional topping material will be required before the concrete deck / infrastructure / piping systems can be installed.
- Dredging and disposal of dredged material
- Reinforcement for ice loads against dock face are required for sheet pile options.

6. Project Impacts

6.1 Capital Costs

Concept drawings and capital costs for each of the options are listed in Appendices Appendix A to Appendix D and capital cost summarized as follows;

Base Line Discrete Concrete Caisson - See Appendix A

The estimated capital costs excluding taxes is $72.8 Million

The estimated capital cost excluding taxes of the modified concrete caisson option with five caissons to prevent rock fill spillage is $79.4 million

100 Metre Long Freight Dock - See Appendix B

The estimated capital costs for a pipe pile face dock excluding taxes is $40.7 Million

The estimated capital costs for a circular cell sheet pile dock excluding taxes is $39.0 Million

165 Metre Long Freight Dock - See Appendix C

The estimated capital costs for a pipe pile face dock excluding taxes is $63.3 Million.

The estimated capital costs for a circular cell sheet pile dock excluding taxes is $62.7 Million

300 Metre Long Freight and Tug Dock – See Appendix D

The estimated capital costs for a pipe pile face dock excluding taxes is $103.4 Million.

The estimated capital costs for a circular cell sheet pile dock excluding taxes is $102.8 Million

6.2 Schedule

Freight Dock – 20 year life expectancy – (2012 – 2014)

A high level schedule for a sheet pile freight dock is as follows;

- Deliver sheet piling and accessories September 2012
- Deliver working barge(s) and tug September 2012
- June 1st to July 15th process clear stone rock topping / sub armour and armour
- June 15th - commence filling storage area through breaking ice
- July 21st place air curtain piping in water
- July 21st place template and soldier piles
- August 1st to October30th – drive sheet piles
- September 15th to November 30th place concrete copewall
- September 10st to November 15th finish armour stone
- October to June – the Storage Area consolidates

- July /August 2014 place concrete pads / storm drainage etc and infrastructure as required

Tug Dock Extension – 20 year life expectancy (2014 – 2016)

A high level Tug Dock extension schedule is as follows;

- June 1st to July 15th 2014 process clear stone rock topping / sub armour and armour
- July 1st - commence filling storage area
- Deliver sheet piling and accessories September 2014
- Deliver working barge(s) and tug September 2014
- July 21st place air curtain piping in water
- July 21st place template and soldier piles
- August 1st to October30th – drive sheet piles
- September 15th to November 30th place concrete copewall
- September 10st to November 15th finish armour stone
- October to June – the Storage Area consolidates
- July /August 2016 place concrete pads / storm drainage etc and infrastructure as required

6.3 Conclusions and Recommendations

Hatch has concluded that based on the existing geotechnical conditions the base case concrete caisson option is not a viable solution.

Hatch recommends that BIM proceed with the following;

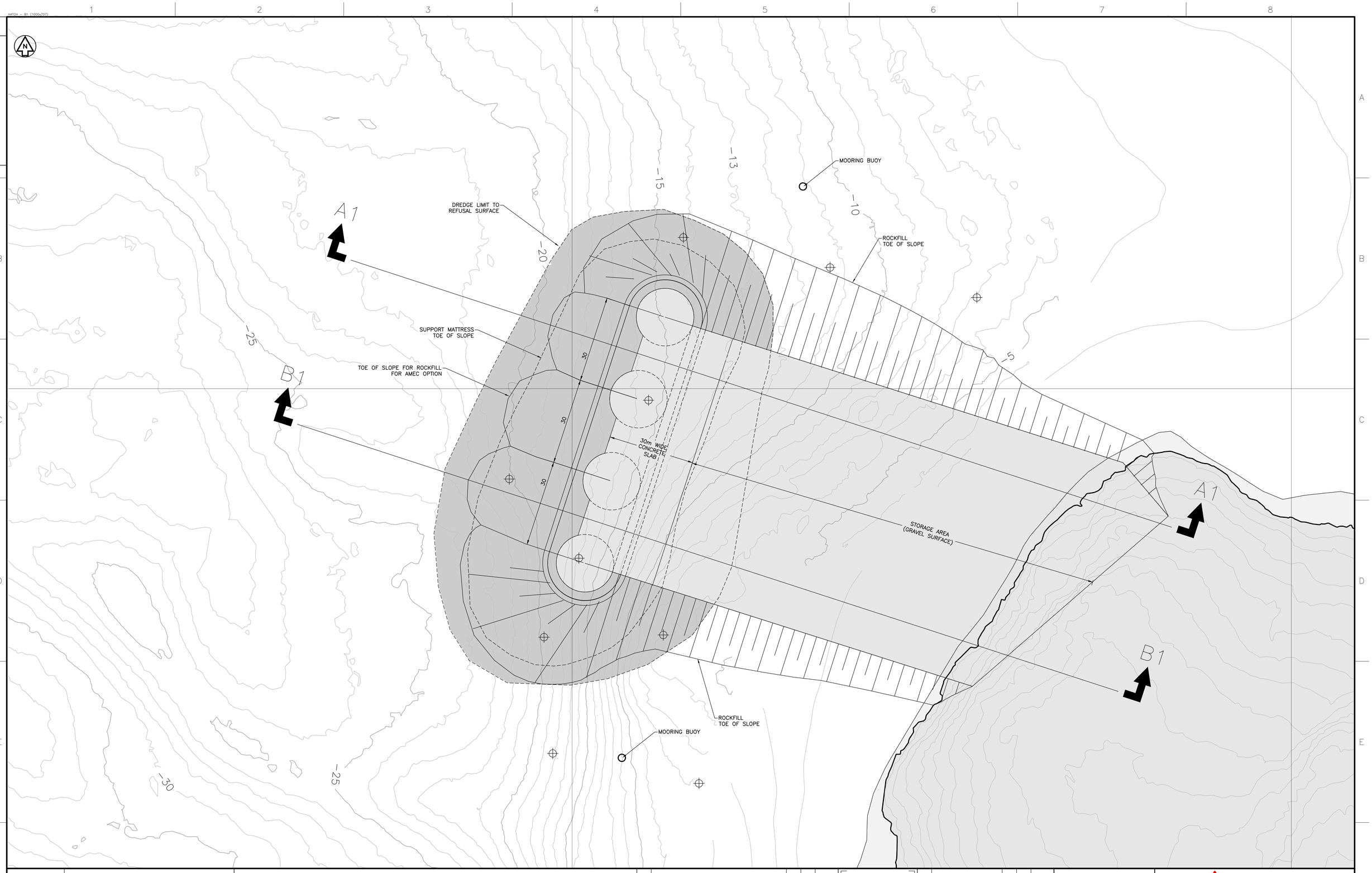
- 2011 borehole geotechnical program from ship
- Based on known geotechnical data, commence with a FEL 3 design of a circular cell steel sheet pile wharf, set back as required to found on suitable geotechnical conditions
- Complete the design of the 100 metres long Freight Dock to meet operation requirements – with the use of ro-ro barges.
- Use the existing rock shore as the source for rockfill and expand the storage area back on the shore.
- Proceed with the design of off shore anchorage points for the ice breaking tugs in the summer.
- Complete a utilization study of the freight dock to ensure the tugs can fuel at the dock in the summer.

Appendix A:

HATCH — B1 (1000x707)

REVISION A

DWG. NO. H337697-3100-12-041-0201



DESIGN ASSUMPTIONS:

1. SURFACE LOAD = 50 kPa
2. ICE LOAD =10.5 kPa
3. REFUSAL SURFACE ASSUMED TO BE ROCK LAYER
4. HARBOUR BOTTOM SLOPED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)

1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS	

NO.	DESCRIPTION	CHK'D	APP'D	DATE
REVISIONS				

REV.	ISSUE FOR	AUTH. BY	DATE
ISSUE AUTHORIZATION			

HATCH

DESIGNED BY	DRAWN BY: B. COOK
DATE	DATE: 05/27/2011
CHECKED BY	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	PROJECT NUMBER: H337697
DATE	

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

STEENSBY PORT FREIGHT DOCK LOCATION 1, BASE CASE CONCRETE CAISSONS PLAN

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0201	A

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

Jun 17, 2011 - 1:43pm Login name: cox43274 Layout: 201 Base
Drawing Name: P:\289980 Mary River H337697\Drawings\Freight Dock\Location 2\Freight Dock Options Case 3 20m back(Civil 3d).dwg

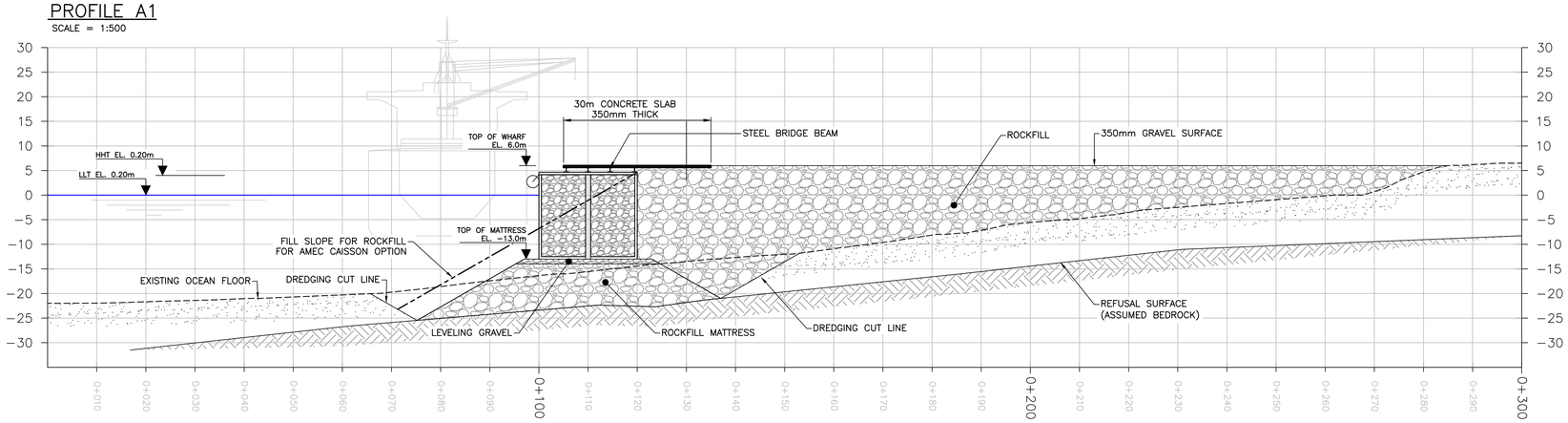
HATCH = B1 (1000x707)

REVISION A

DWG. NO. H337697-3100-12-041-0202

PROFILE A1

SCALE = 1:500

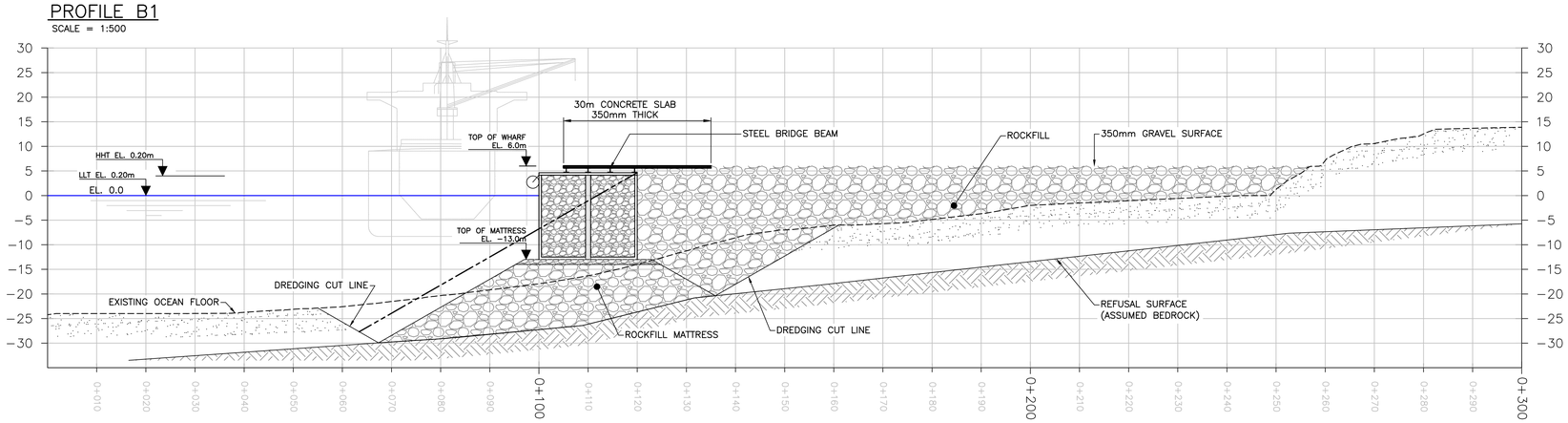


LEGEND:

- EXISTING SURFACE
- REFUSAL SURFACE (ASSUMED BEDROCK)
- ROCK FILL
- DREDGING

PROFILE B1

SCALE = 1:500



DESIGN ASSUMPTIONS:

1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)

1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

0 10 20 30 40 50m
Scale: 1:500

DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS	

NO.	DESCRIPTION	CHK'D	APP'D	DATE
REVISIONS				

REV.	ISSUE FOR	AUTH. BY	DATE
ISSUE AUTHORIZATION			

HATCH

DESIGNED BY / DATE	DRAWN BY / DATE: B. COOK 05/27/2011
CHECKED BY / DATE	DISCIP. ENGR. / DATE
PROJ. DES. COORD. / DATE	PROJ. ENGR. / DATE
PROJ. MGR. / DATE	PROJECT NUMBER: H337697

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

STEENSBY PORT FREIGHT DOCK
LOCATION 1, BASE CASE
CONCRETE CAISSONS
PROFILE

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0202	A

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

Jun 17, 2011 - 1:43pm Login name: coo43274 Layout: 202 Base Profile
Drawing Name: P:\289980 Mary River \337697\Drawings\Freight Dock\Location 2\Freight Dock Options Case 3 20m back(Civil 3d).dwg

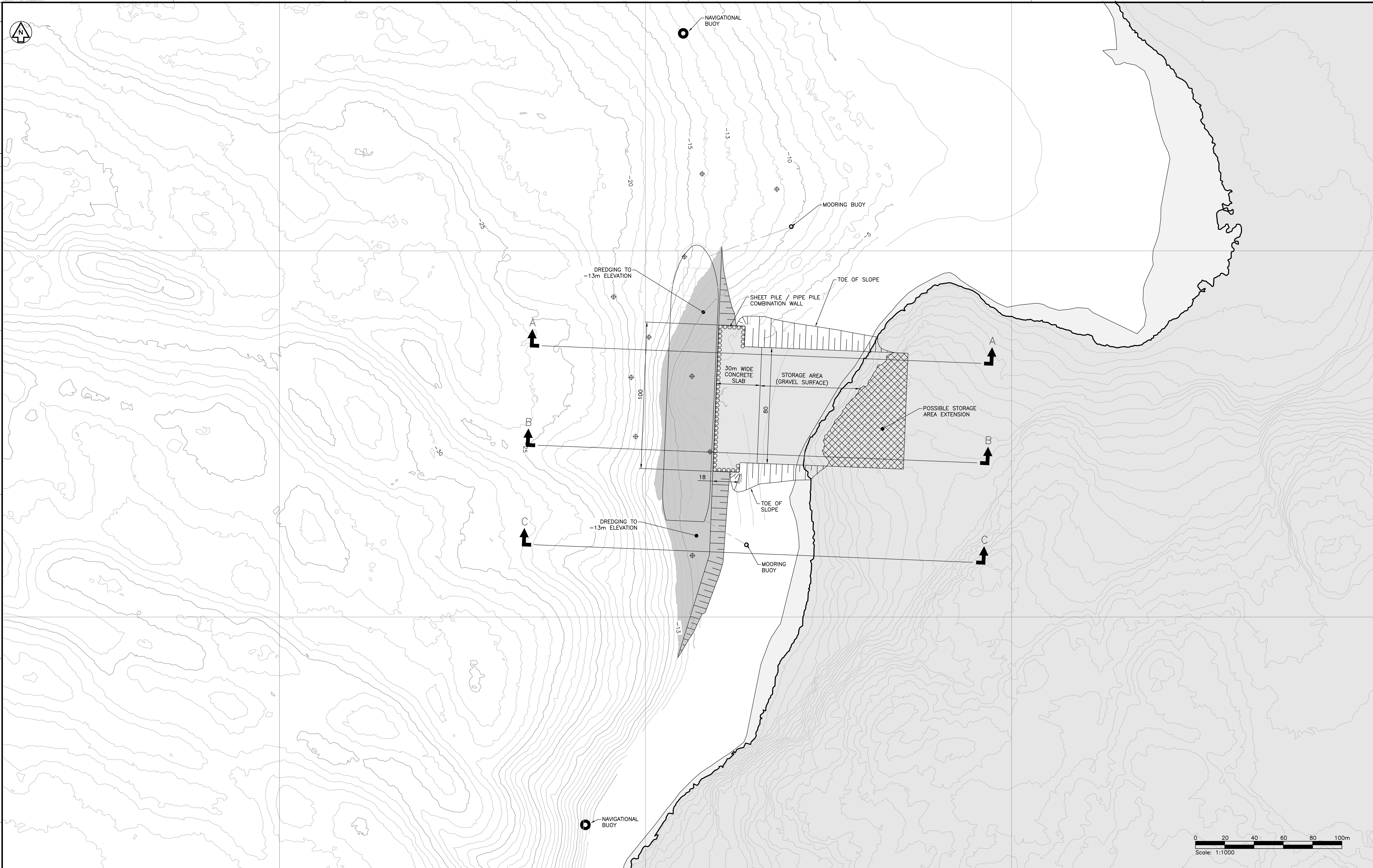
Steensby Inlet Freight Dock Options Analysis Cost Estimate

Project: Mary's River Iron Mine — **Option: 1 Base Option - 100m Concrete Caisson Dock**
Location: Steensby Inlet, Baffin Island
Owner: Arcelor Mittal
Consultant: Hatch

Element	Units	Elemental Cost: Quantity	Elemental Cost: Unit Rate	Elemental Amount: Sub-Total	Elemental Amount: Total
A Site Preparation					
Dredging and disposal to refusal surface for rock mattress installation	Cu.m.	100400	$ 150.00	$ 15,060,000.00	
Supply and placement of rock mattress under caissons	Cu.m.	64250	$ 85.00	$ 5,461,250.00	
Supply and placement of gravel leveling pad, 1m thickness	Cu.m.	3000	$ 85.00	$ 255,000.00	
Supply of caisson rock fill, 50 to 300mm	Cu.m.	20500	$ 75.00	$ 1,537,500.00	
Placement of caisson rock fill, 50 to 300mm	Cu.m.	20500	$ 40.00	$ 820,000.00	
Supply and placement of storage area armour stone	Cu.m.	18500	$ 85.00	$ 1,572,500.00	
Supply and placement of storage area sub armour stone	Cu.m.	9100	$ 85.00	$ 773,500.00	
Supply and placement of storage area rock fill	Cu.m.	195000	$ 75.00	$ 14,625,000.00	
Supply and placement of storage area surface gravels, 350mm thickness	Cu.m.	12750	$ 70.00	$ 892,500.00	
					$ 40,997,250.00
B Supply of Four Concrete Caissons as per AMEC Design: -8m to -13m Elevation					
Concrete supply - caisson floor, splay wall, etc.	Cu.m.	5350	$ 300.00	$ 1,605,000.00	
Form and place concrete	Cu.m.	5350	$ 1,000.00	$ 5,350,000.00	
Supply and installation of reinforcing steel	MT	750	$ 2,000.00	$ 1,500,000.00	
					$ 8,455,000.00
C Installation of Four Concrete Caissons as per AMEC Design: -8m to -13m Elevation					
Concrete caisson placement (to be confirmed by Hatch)	Each	4	$ 250,000.00	$ 1,000,000.00	
Tug and caisson installation equipment (to be confirmed by Hatch)	Month	2	$ 300,000.00	$ 600,000.00	
Concrete caisson transport (to be confirmed by Hatch)	Each	4	$ 400,000.00	$ 1,600,000.00	
					$ 3,200,000.00
D Supply and Installation of Concrete Wharf Deck and Storage Area					
Concrete supply - deck (35MPa)	Cu.m.	1050	$ 300.00	$ 315,000.00	
Concrete supply - parapet wall (35MPa)	Cu.m.	120	$ 300.00	$ 36,000.00	
Form and place concrete	Cu.m.	1170	$ 1,000.00	$ 1,170,000.00	
Supply and installation of reinforcing steel	MT	170	$ 2,000.00	$ 340,000.00	
					$ 1,861,000.00
E Wharf Fixtures and Equipment					
Supply and install 2.5Dia. x 5.5m pneumatic fenders and chain	Each	12	$ 30,000.00	$ 360,000.00	
Supply and install mooring buoys with chain and anchorage (winter storage onshore)	Each	2	$ 125,000.00	$ 250,000.00	
Allowance for wharf infrastructure (lights, storm sewer, etc.)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
Supply and install steel bollards	Each	7	$ 15,000.00	$ 105,000.00	
Supply and install ladders	Each	7	$ 5,000.00	$ 35,000.00	
Supply and install steel wheel guards	Lin.m.	120	$ 300.00	$ 36,000.00	
					$ 1,786,000.00
F General Requirements					
Mobilization (to be confirmed by Hatch)	Each	1	$ 600,000.00	$ 600,000.00	
Shipping of steel, equipment and supplies to site (to be confirmed by Hatch)	LS	1	$ 400,000.00	$ 400,000.00	
General Conditions (to be confirmed by Hatch)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
					$ 2,000,000.00
AMEC DESIGN CONSTRUCTION COST ESTIMATE SUB TOTAL					**$ 58,299,250.00**
G Construction Contingency					
Construction contingency - 25%	%	25%	$ 14,574,810.00	$ 14,574,810.00	
					$ 14,574,810.00
AMEC DESIGN CONSTRUCTION COST ESTIMATE TOTAL					**$ 72,874,060.00**
A-1 Modifications to AMEC Design to provide Functional Wharf					
Concrete supply for one additional caisson - caisson floor, splay wall, etc.	Cu.m.	1350	$ 300.00	$ 405,000.00	
Concrete supply - four concrete keys between caissons to retain fill	Cu.m.	400	$ 300.00	$ 120,000.00	
Formwork and concrete placement	Cu.m.	1750	$ 1,000.00	$ 1,750,000.00	
Supply and installation of reinforcing steel	MT	250	$ 2,000.00	$ 500,000.00	
Concrete caisson transport (to be confirmed by Hatch)	Each	1	$ 400,000.00	$ 400,000.00	
Concrete caisson placement	Each	1	$ 250,000.00	$ 250,000.00	
Supply of caisson rock fill	Cu.m.	5075	$ 75.00	$ 380,625.00	
Placement of caisson rock fill, 50 to 300mm	Cu.m.	5075	$ 40.00	$ 203,000.00	
Supply steel support beams for concrete deck overhang between caissons	MT	250	$ 2,500.00	$ 625,000.00	
Install steel support beams for concrete deck support between caissons	MT	250	$ 2,500.00	$ 625,000.00	
Construction contingency for modifications - 25%	%	25%	$ 1,314,660.00	$ 1,314,660.00	
REQUIRED MODIFICATIONS CONSTRUCTION COST ESTIMATE TOTAL					**$ 6,573,285.00**
CONSTRUCTION COST ESTIMATE TOTAL (INCLUDING CONTINGENCIES)					**$ 79,447,345.00**

Notes:
1. Baseline cost of $150/Cu.m. to dredge and dispose of unsuitable material used for cost comparison only. Cost of dredging to be finalized after summer 2011 Geotechnical Program.
2. Concrete caissons constructed at an unknown location - transportation cost is an estimate only.
3. Complete geotechnical information not available for trade-off study - estimates are based on best available information and are subject to change.

Appendix B:



DESIGN ASSUMPTIONS:

1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)

1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

⌖ BORE HOLE / PROBE

DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS	

NO.	DESCRIPTION	CHK'D	APP'D	DATE
REVISIONS				

REV.	ISSUE FOR	AUTH. BY	DATE
ISSUE AUTHORIZATION			

HATCH
Baffinland Iron Mines Corporation
MARY RIVER IRON ORE PROJECT

DESIGNED BY	DRAWN BY B. COOK
DATE	DATE 05/27/2011
CHECKED BY	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	PROJECT NUMBER H337697
DATE	

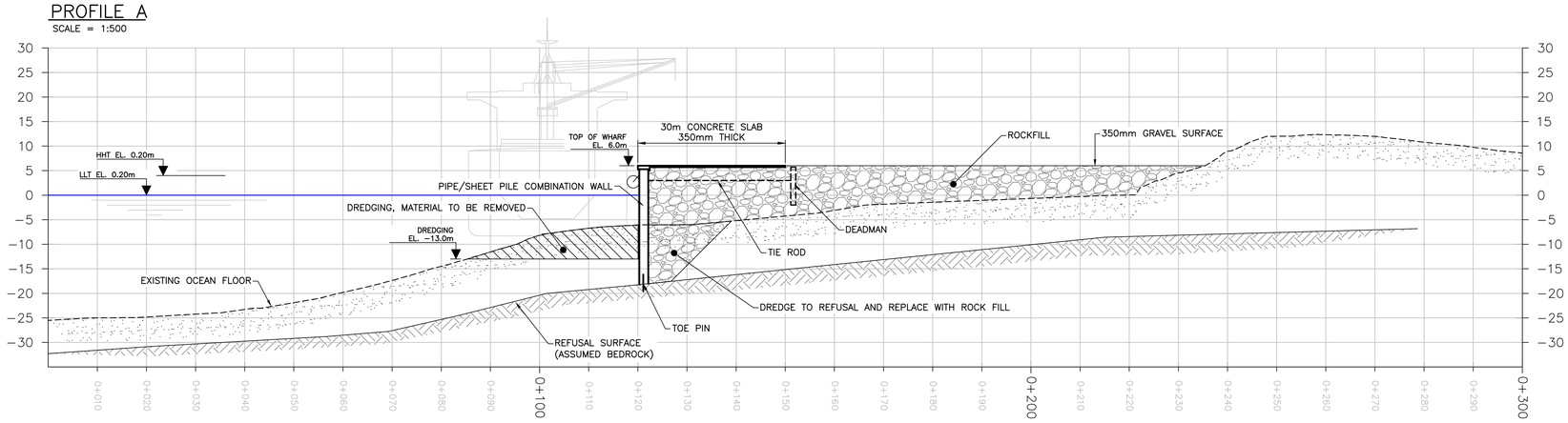
STEENSBY PORT FREIGHT DOCK
LOCATION 2 – 100m
STEEL WALL
PLAN

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0236	A

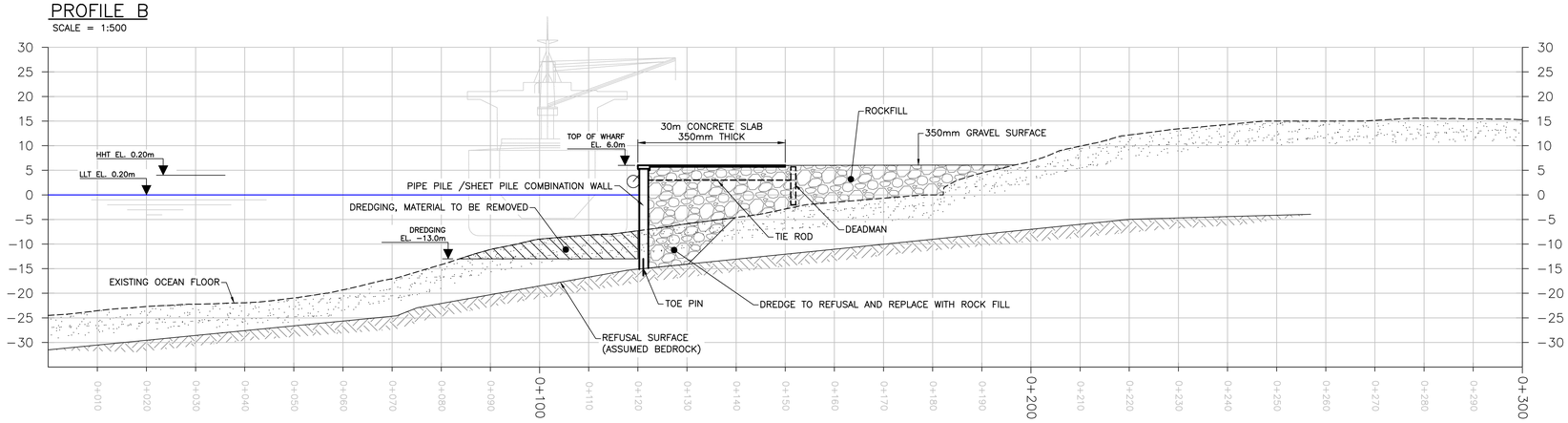
DWG. NO. H337697-3100-12-041-0236 REVISION A

Jun 17, 2011 1:44pm Login name: coo43274 Layout: 236 100 SW
Drawing Name: P:\389980 Mary River H337697\Drawings\Freight Dock\Location 2\Freight Dock Options Case 3 20m back(Civil 3d).dwg

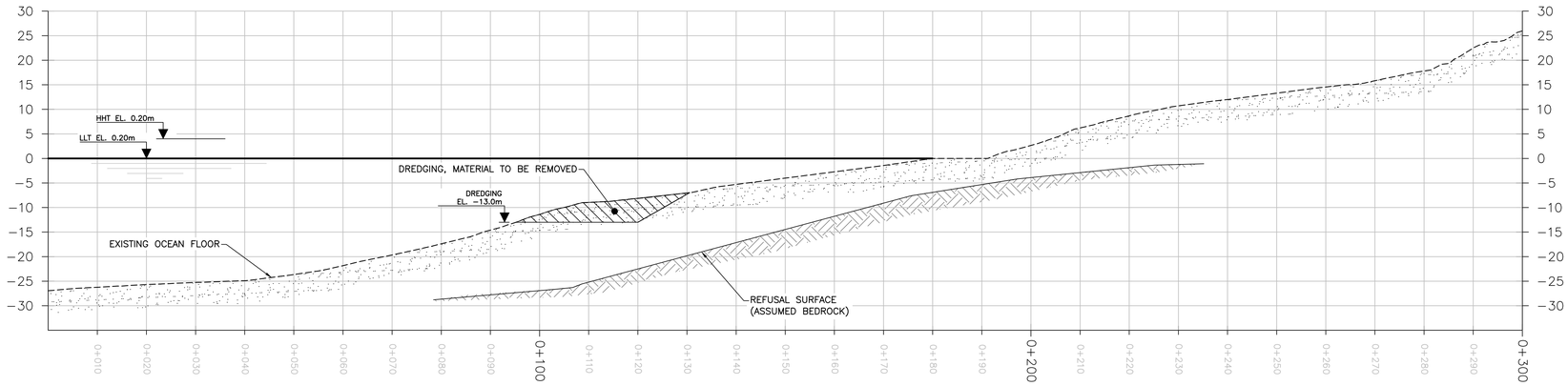
PROFILE A
SCALE = 1:500



PROFILE B
SCALE = 1:500



PROFILE C
SCALE = 1:500



LEGEND:
- EXISTING SURFACE
- REFUSAL SURFACE (ASSUMED BEDROCK)
- ROCK FILL
- DREDGING

DESIGN ASSUMPTIONS:
1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)
1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

0 10 20 30 40 50m
Scale: 1:500

DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS	

NO.	DESCRIPTION	CHK'D	APP'D	DATE
REVISIONS				

REV.	ISSUE FOR	AUTH. BY	DATE
ISSUE AUTHORIZATION			

HATCH

DESIGNED BY / DATE	DRAWN BY / DATE: B. COOK 05/27/2011
CHECKED BY / DATE	DISCIP. ENGR. / DATE
PROJ. DES. COORD. / DATE	PROJ. ENGR. / DATE
PROJ. MGR. / DATE	PROJECT NUMBER: H337697

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

STEENSBY PORT FREIGHT DOCK
LOCATION 2 – 100m
STEEL WALL
PROFILE

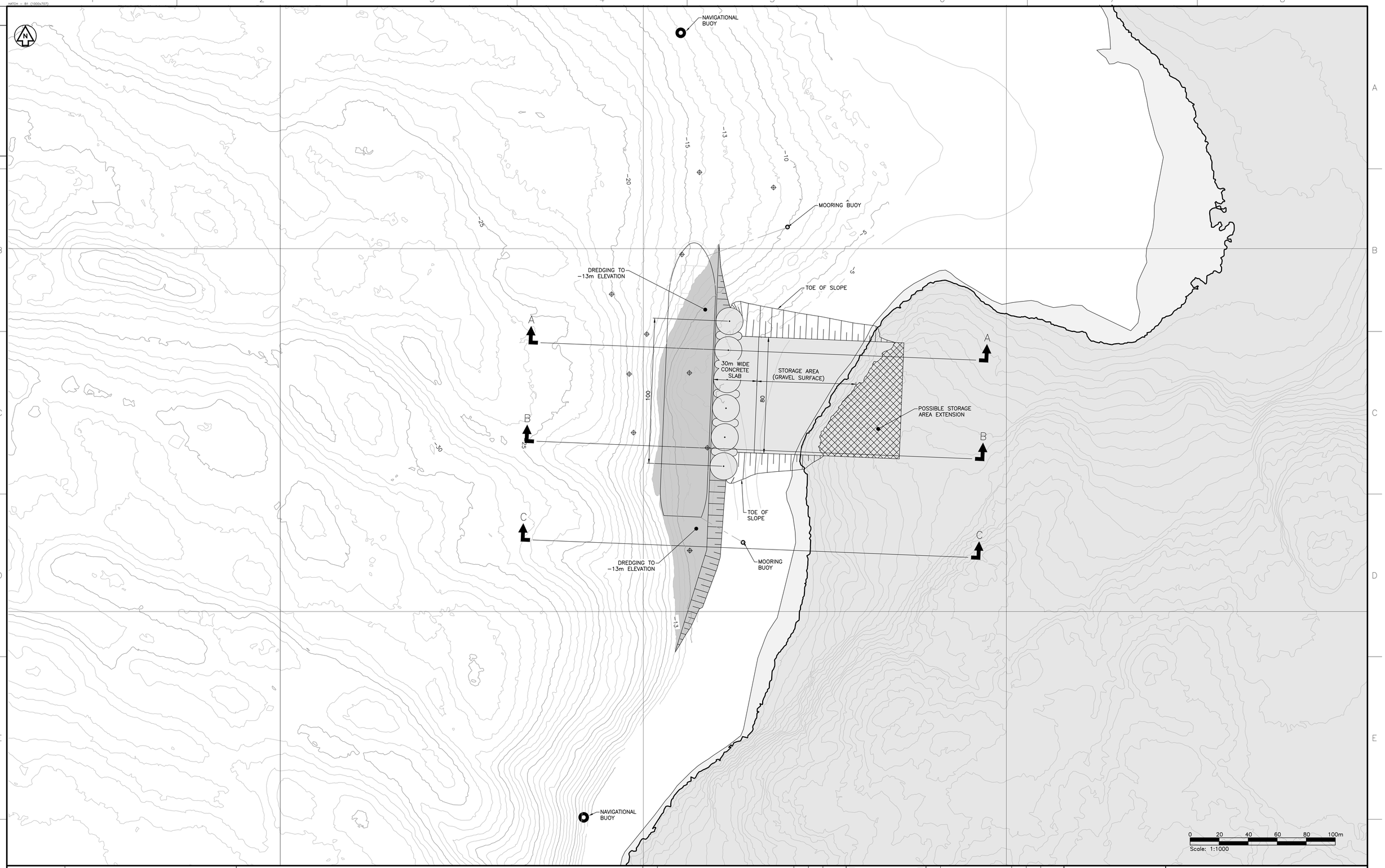
SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0237	A

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

HATCH - B1 (1000x707)

REVISION A

DWG. NO. H337697-3100-12-041-0251



DESIGN ASSUMPTIONS:

1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)

1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

⊕ BORE HOLE / PROBE

DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE

REVISIONS

REV.	ISSUE FOR	AUTH. BY	DATE

ISSUE AUTHORIZATION

HATCH

DESIGNED BY	DRAWN BY: B. COOK
DATE	DATE: 05/27/2011
CHECKED BY	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	PROJECT NUMBER: H337697
DATE	

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

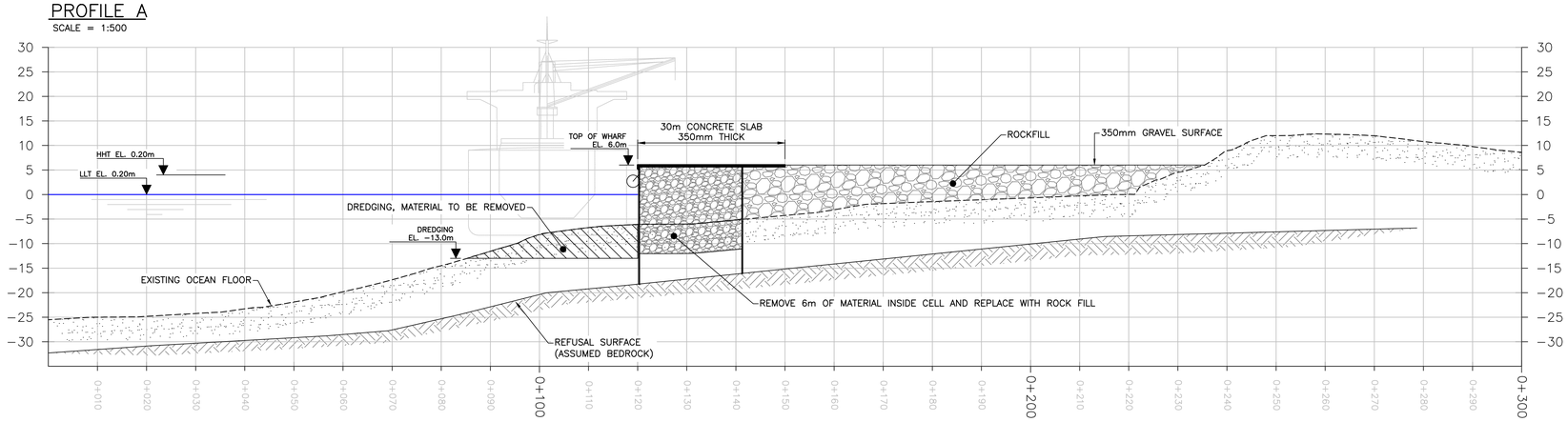
STEENSBY PORT FREIGHT DOCK LOCATION 2 – 100m CIRCULAR STEEL CELL PLAN

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0251	A

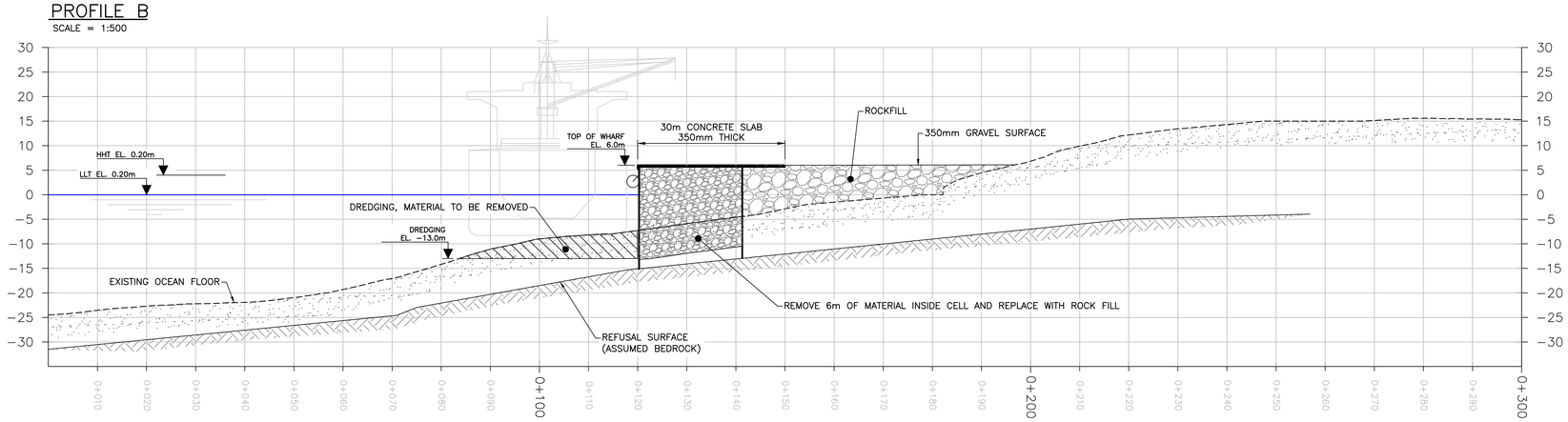
CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER

Jun 17, 2011 - 1:44pm Login name: coe4274 Layout: 251 100 CC
Drawing Name: P:\289980 Mary River H337697\Drawings\Freight Dock\Location 2\Freight Dock Options Case 3 20m back(Civil 3d).dwg

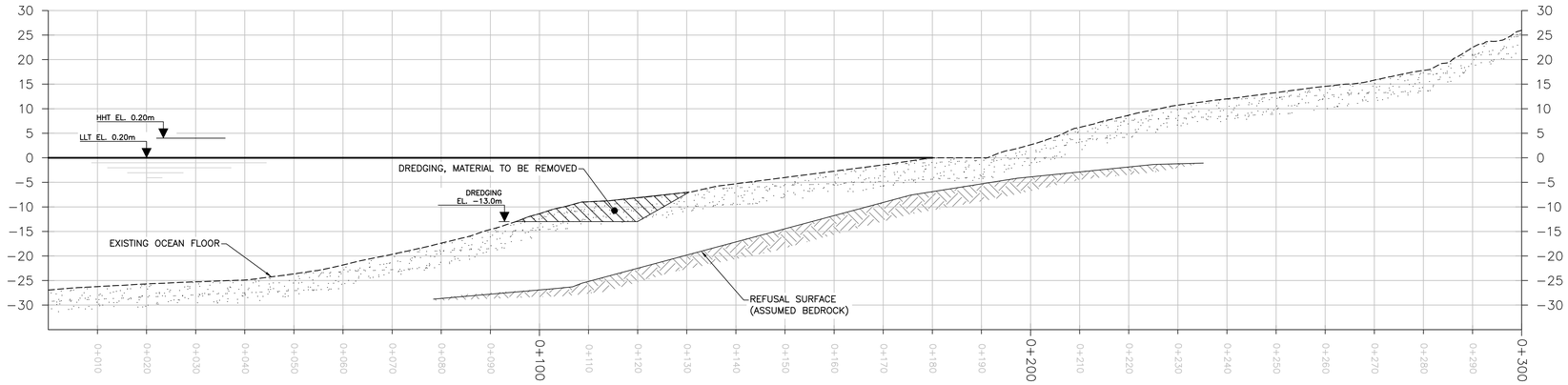
PROFILE A
SCALE = 1:500



PROFILE B
SCALE = 1:500



PROFILE C
SCALE = 1:500



LEGEND:
- EXISTING SURFACE
- REFUSAL SURFACE (ASSUMED BEDROCK)
- ROCK FILL
- DREDGING

DESIGN ASSUMPTIONS:
1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)
1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

0 10 20 30 40 50m
Scale: 1:500

DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS	

NO.	DESCRIPTION	CHK'D	APP'D	DATE
REVISIONS				

REV.	ISSUE FOR	AUTH. BY	DATE
ISSUE AUTHORIZATION			

HATCH

DESIGNED BY	DRAWN BY
DATE	B. COOK DATE 05/27/2011
CHECKED BY	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	PROJECT NUMBER
DATE	H337697

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

STEENSBY PORT FREIGHT DOCK
LOCATION 2 – 100m
CIRCULAR STEEL CELL
PROFILE

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0252	A

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

Steensby Inlet Freight Dock Options Analysis Cost Estimate

Project: Mary's River Iron Mine **Option: 2A-1, 100m Pipe Pile/Sheet Pile Wall**
Location: Steensby Inlet, Baffin Island
Owner: Arcelor Mittal
Consultant: Hatch

Element	Units	Elemental Cost Quantity	Elemental Cost Unit Rate	Elemental Amount Sub-Total	Elemental Amount Total
A Site Preparation					
Dredging to achieve -13m elevation	Cu.m.	29050	$ 150.00	$ 4,357,500.00	
Dredging behind wall to allow replacement with angular stone for stability	Cu.m.	11350	$ 150.00	$ 1,702,500.00	
Supply and placement of rock fill behind wall in dredged area for stability	Cu.m.	11350	$ 75.00	$ 851,250.00	
Supply and placement of storage area armour stone	Cu.m.	5600	$ 85.00	$ 476,000.00	
Supply and placement of storage area sub armour stone	Cu.m.	2270	$ 85.00	$ 192,950.00	
Supply and placement of storage area rock fill	Cu.m.	74500	$ 75.00	$ 5,587,500.00	
Supply and placement of storage area surface gravels, 350mm thickness	Cu.m.	4800	$ 70.00	$ 336,000.00	
					$ 13,503,700.00
B Supply of Sheet Pile, Pipe Pile, and Accessories					
Supply AZ26-700 sheet piles - wharf face	MT	210	$ 2,250.00	$ 472,500.00	
Supply AZ26-700 sheet piles - anchor wall	MT	120	$ 2,250.00	$ 270,000.00	
Supply 1829mm dia. pipe piles - 19mm wall thickness	MT	875	$ 3,000.00	$ 2,625,000.00	
Supply concrete infill for pipe piles (35MPa)	Cu.m.	2700	$ 300.00	$ 810,000.00	
Supply reinforcing cage for pipe piles	MT	380	$ 1,500.00	$ 570,000.00	
Supply Tie Rods, 100mm Dia.	MT	85	$ 2,500.00	$ 212,500.00	
Supply HP250x85 tie rod centre supports during construction	MT	55	$ 2,000.00	$ 110,000.00	
Supply Waler steel and fittings	MT	20	$ 2,500.00	$ 50,000.00	
Supply Toe pins for pipe piles, 200mm dia. x 3m	MT	70	$ 2,250.00	$ 157,500.00	
					$ 5,277,500.00
C Installation of Combination Sheet Pile/Pipe Pile Wall					
Installation of sheet piles - AZ26-700 wharf face	MT	210	$ 2,000.00	$ 420,000.00	
Installation of sheet piles - AZ26-700 anchor wall	MT	120	$ 2,000.00	$ 240,000.00	
Installation of 1829mm dia. pipe piles - 19mm wall thickness	MT	875	$ 2,500.00	$ 2,187,500.00	
Excavate, core, place, and grout toe pins	Each	92	$ 10,000.00	$ 920,000.00	
Place concrete infill for pipe piles (35MPa)	Cu.m.	2700	$ 400.00	$ 1,080,000.00	
Install reinforcing cage for pipe piles	MT	380	$ 2,250.00	$ 855,000.00	
Installation of tie rods including corrosion protection system	Each	46	$ 2,000.00	$ 92,000.00	
Install HP250x85 tie rod centre supports during construction	MT	55	$ 2,000.00	$ 110,000.00	
Installation of walers	Lin.m.	120	$ 500.00	$ 60,000.00	
Barge mounted crane, pile driver, tug and scow rental (to be confirmed by Hatch)	Month	2	$ 300,000.00	$ 600,000.00	
Shipping of steel to site (to be confirmed by Hatch)	MT	1815	$ 500.00	$ 907,500.00	
					$ 7,472,000.00
D Supply and Installation of Concrete Wharf Deck and Concrete Ice Defence					
Concrete supply - deck (35MPa)	Cu.m.	1050	$ 300.00	$ 315,000.00	
Concrete supply - parapet wall and sheet pile ice defence block (35MPa)	Cu.m.	650	$ 300.00	$ 195,000.00	
Form and place concrete	Cu.m.	1700	$ 1,000.00	$ 1,700,000.00	
Supply and installation of reinforcing steel	MT	240	$ 2,000.00	$ 480,000.00	
					$ 2,690,000.00
E Wharf Fixtures					
Supply and install 2.5Dia. x 5.5m pneumatic fenders and chain	Each	7	$ 30,000.00	$ 210,000.00	
Supply and install mooring buoys with chain and anchorage (winter storage onshore)	Each	2	$ 125,000.00	$ 250,000.00	
Allowance for wharf infrastructure (lights, storm sewer, etc.)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
Supply and install steel bollards	Each	7	$ 15,000.00	$ 105,000.00	
Supply and install ladders	Each	7	$ 5,000.00	$ 35,000.00	
Supply and install steel wheel guards	Lin.m.	120	$ 300.00	$ 36,000.00	
					$ 1,636,000.00
NET CONSTRUCTION ESTIMATED COST					**$ 30,579,200.00**
F General Requirements					
Mobilization (to be confirmed by Hatch)	Each	1	$ 600,000.00	$ 600,000.00	
Shipping of equipment and supplies to site (to be confirmed by Hatch)	LS	1	$ 400,000.00	$ 400,000.00	
General Conditions (to be confirmed by Hatch)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
					$ 2,000,000.00
CONSTRUCTION COST ESTIMATE SUB TOTAL (EXCLUDING CONTINGENCIES)					**$ 32,579,200.00**
G Construction Contingency					
Construction contingency - 25%	%	25%	$ 8,144,800.00	$ 8,144,800.00	
					$ 8,144,800.00
CONSTRUCTION COST ESTIMATE TOTAL (INCLUDING CONTINGENCIES)					**$ 40,724,000.00**

Notes:
1. Baseline cost of $150/Cu.m. to dredge and dispose of unsuitable material used for cost comparison only. Cost of dredging to be finalized after summer 2011 Geotechnical Program.
2. Complete geotechnical information not available for trade-off study - estimates are based on best available information and are subject to change.

Steensby Inlet Freight Dock Options Analysis Cost Estimate

Project: Mary's River Iron Mine — **Option: 2A-2, 100m Circular Sheet Pile Cell Structure**
Location: Steensby Inlet, Baffin Island
Owner: Arcelor Mittal
Consultant: Hatch

Element	Units	Elemental Cost: Quantity	Elemental Cost: Unit Rate	Elemental Amount: Sub-Total	Elemental Amount: Total
A Site Preparation					
Dredging to achieve -13m elevation	Cu.m.	29050	$ 150.00	$ 4,357,500.00	
Dredging inside cells to allow replacement with rock fill for stability	Cu.m.	10500	$ 150.00	$ 1,575,000.00	
Supply of caisson rock fill, 50-300mm (includes volume for dredged area)	Cu.m.	46400	$ 75.00	$ 3,480,000.00	
Placement of caisson rock fill, 50-300mm (includes volume for dredged area)	Cu.m.	46400	$ 40.00	$ 1,856,000.00	
Supply and placement of storage area armour stone	Cu.m.	5870	$ 85.00	$ 498,950.00	
Supply and placement of storage area sub armour stone	Cu.m.	2350	$ 85.00	$ 199,750.00	
Supply and placement of storage area rock fill	Cu.m.	53440	$ 75.00	$ 4,008,000.00	
Supply and placement of storage area surface gravels, 350mm thickness	Cu.m.	5100	$ 70.00	$ 357,000.00	
					$ 16,332,200.00
B Supply of Sheet Piles for Circular Cell Structures					
Supply of steel for reusable construction template - 2 required	MT	200	$ 2,250.00	$ 450,000.00	
Supply AS500-12.7 steel sheet piles (5 caissons x 128 piles + 8 int arcs x 23 piles)	MT	1400	$ 2,250.00	$ 3,150,000.00	
					$ 3,600,000.00
C Installation of Sheet Pile Circular Cell Structures					
Construction support template installation - 2 required	MT	200	$ 2,250.00	$ 450,000.00	
Caisson and int arc installation on template	MT	1400	$ 2,000.00	$ 2,800,000.00	
Barge mounted crane, pile driver, tug and scow rental (to be confirmed by Hatch)	Month	2	$ 300,000.00	$ 600,000.00	
Shipping of steel to site (to be confirmed by Hatch)	MT	1600	$ 500.00	$ 800,000.00	
					$ 4,650,000.00
D Supply and Installation of Concrete Wharf Deck and Concrete Ice Defence					
Concrete supply - deck (35MPa)	Cu.m.	1050	$ 300.00	$ 315,000.00	
Concrete supply - parapet wall and ice defence block behind piles (35MPa)	Cu.m.	870	$ 300.00	$ 261,000.00	
Form and place concrete	Cu.m.	1920	$ 1,000.00	$ 1,920,000.00	
Supply and installation of reinforcing steel	MT	270	$ 2,000.00	$ 540,000.00	
					$ 3,036,000.00
E Wharf Fixtures					
Supply and install 2.5Dia. x 5.5m pneumatic fenders and chain	Each	7	$ 30,000.00	$ 210,000.00	
Supply and install mooring buoys with chain and anchorage (winter storage onshore)	Each	2	$ 125,000.00	$ 250,000.00	
Allowance for wharf infrastructure (lights, storm sewer, etc.)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
Supply and install steel bollards	Each	7	$ 15,000.00	$ 105,000.00	
Supply and install ladders	Each	7	$ 5,000.00	$ 35,000.00	
Supply and install wheel guards	Lin.m.	120	$ 300.00	$ 36,000.00	
					$ 1,636,000.00
NET CONSTRUCTION ESTIMATED COST					**$ 29,254,200.00**
F General Requirements					
Mobilization (to be confirmed by Hatch)	Each	1	$ 600,000.00	$ 600,000.00	
Shipping of equipment and supplies to site (to be confirmed by Hatch)	LS	1	$ 400,000.00	$ 400,000.00	
General Conditions (to be confirmed by Hatch)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
					$ 2,000,000.00
CONSTRUCTION COST ESTIMATE SUB TOTAL (EXCLUDING CONTINGENCIES)					**$ 31,254,200.00**
G Construction Contingency					
Construction contingency - 25%	%	25%	$ 7,813,550.00	$ 7,813,550.00	
					$ 7,813,550.00
CONSTRUCTION COST ESTIMATE TOTAL (INCLUDING CONTINGENCIES)					**$ 39,067,750.00**

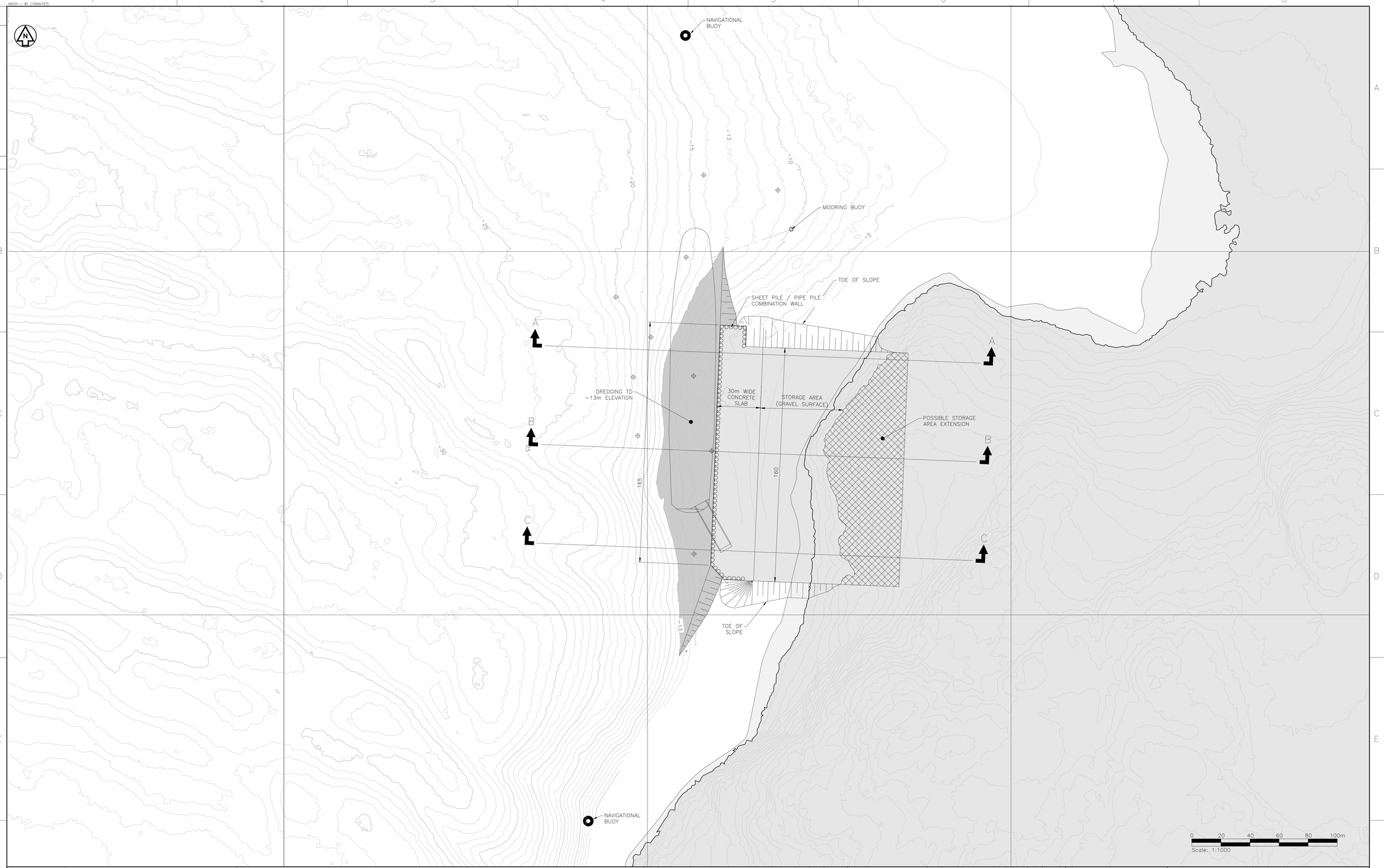
Notes:
1. Baseline cost of $150/Cu.m. to dredge and dispose of unsuitable material used for cost comparison only. Cost of dredging to be finalized after summer 2011 Geotechnical Program.
2. Complete geotechnical information not available for trade-off study - estimates are based on best available information and are subject to change.

Appendix C:

HATCH – B1 (1000x707)

REVISION A

DWG. NO. H337697-3100-12-041-0241



DESIGN ASSUMPTIONS:

1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)

1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

⊕ BORE HOLE / PROBE

DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE

REVISIONS

REV.	ISSUE FOR	AUTH. BY	DATE

ISSUE AUTHORIZATION

HATCH™

DESIGNED BY	DRAWN BY: B. COOK
DATE	DATE: 05/27/2011
CHECKED BY	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	PROJECT NUMBER: H337697
DATE	

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

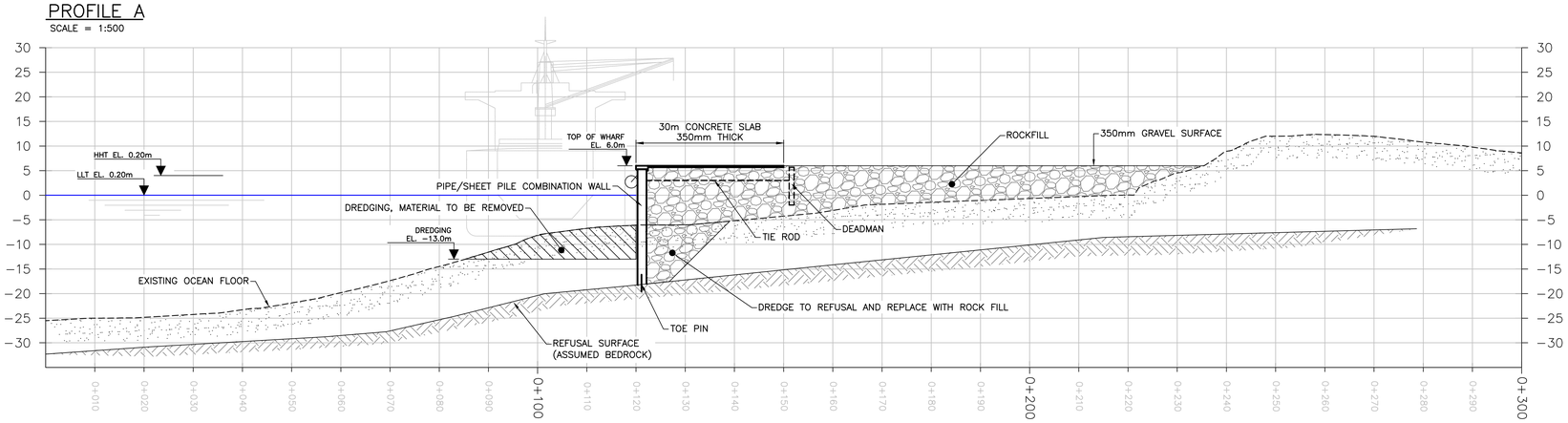
STEENSBY PORT FREIGHT DOCK
LOCATION 2 – 165m
STEEL WALL
PLAN

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0241	A

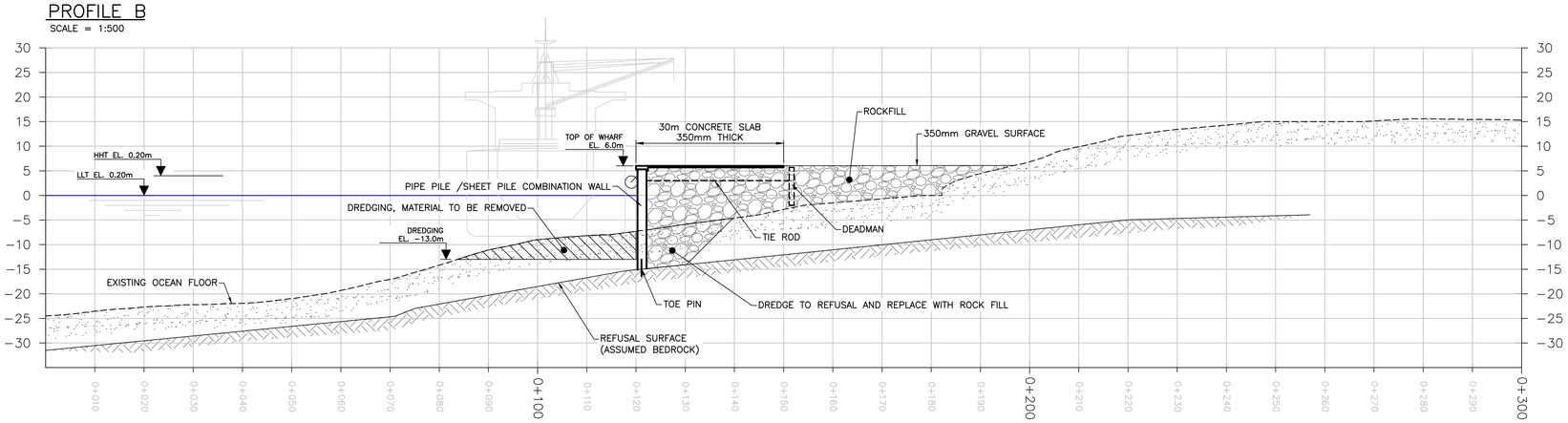
CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER

Jun 17, 2011 - 1:44pm Login name: cook3274 Layout: 241 165 SW
Drawing Name: P:\289980 Mary River H337697\Drawings\Freight Dock\Location 2\Freight Dock Options Case 3 20m back(Civil 3d).dwg

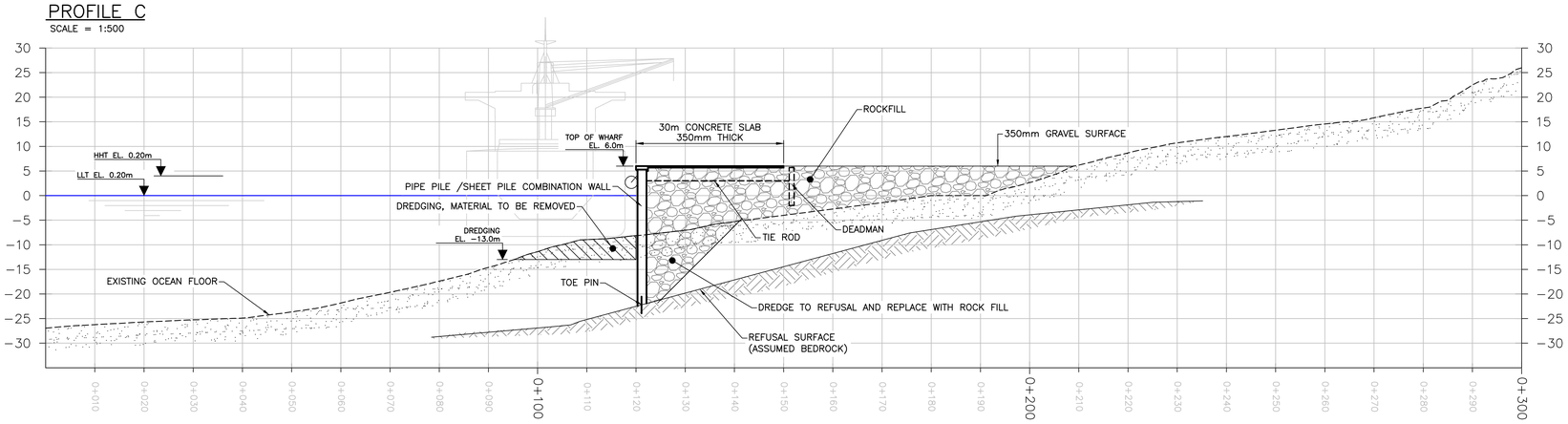
PROFILE A
SCALE = 1:500



PROFILE B
SCALE = 1:500



PROFILE C
SCALE = 1:500



LEGEND:
- EXISTING SURFACE
- REFUSAL SURFACE (ASSUMED BEDROCK)
- ROCK FILL
- DREDGING

DESIGN ASSUMPTIONS:
1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)
1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

0 10 20 30 40 50m
Scale: 1:500

DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE

REVISIONS

REV.	ISSUE FOR	AUTH. BY	DATE

ISSUE AUTHORIZATION

HATCH

DESIGNED BY	DRAWN BY: B. COOK
DATE	DATE: 05/27/2011
CHECKED BY	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	PROJECT NUMBER: H337697
DATE	

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

STEENSBY PORT FREIGHT DOCK
LOCATION 2 – 165m
STEEL WALL
PROFILE

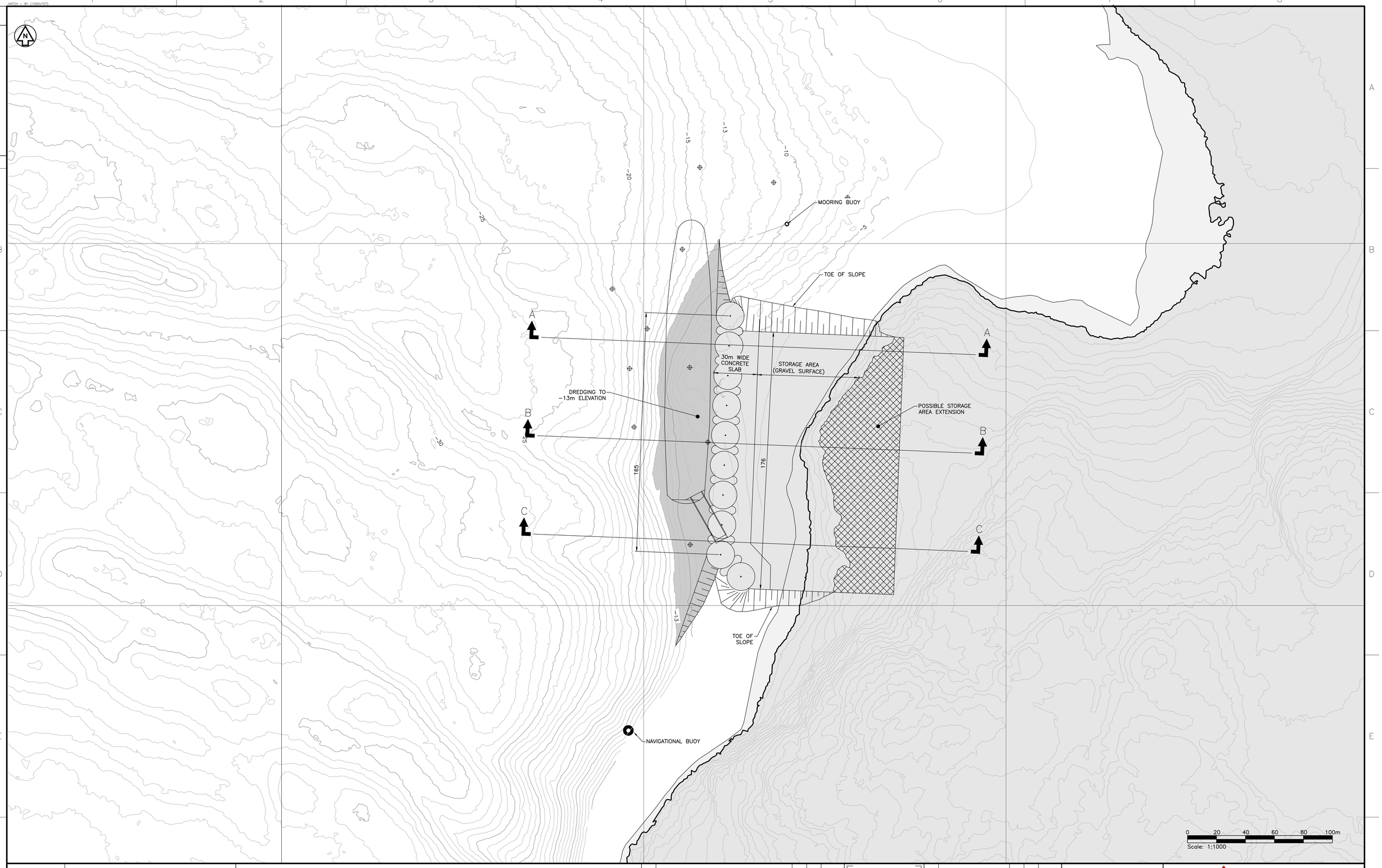
SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0242	A

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

HATCH – B1 (1000x707)

REVISION A

DWG. NO. H337697-3100-12-041-0256



DESIGN ASSUMPTIONS:

1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)

1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

⊕ BORE HOLE / PROBE

DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS	

NO.	DESCRIPTION	CHK'D	APP'D	DATE
REVISIONS				

REV.	ISSUE FOR	AUTH. BY	DATE
ISSUE AUTHORIZATION			

HATCH

DESIGNED BY / DATE	DRAWN BY: B. COOK / DATE: 05/27/2011
CHECKED BY / DATE	DISCIP. ENGR. / DATE
PROJ. DES. COORD. / DATE	PROJ. ENGR. / DATE
PROJ. MGR. / DATE	PROJECT NUMBER: H337697

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

STEENSBY PORT FREIGHT DOCK LOCATION 2 – 165m CIRCULAR STEEL CELL PLAN

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0256	A

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

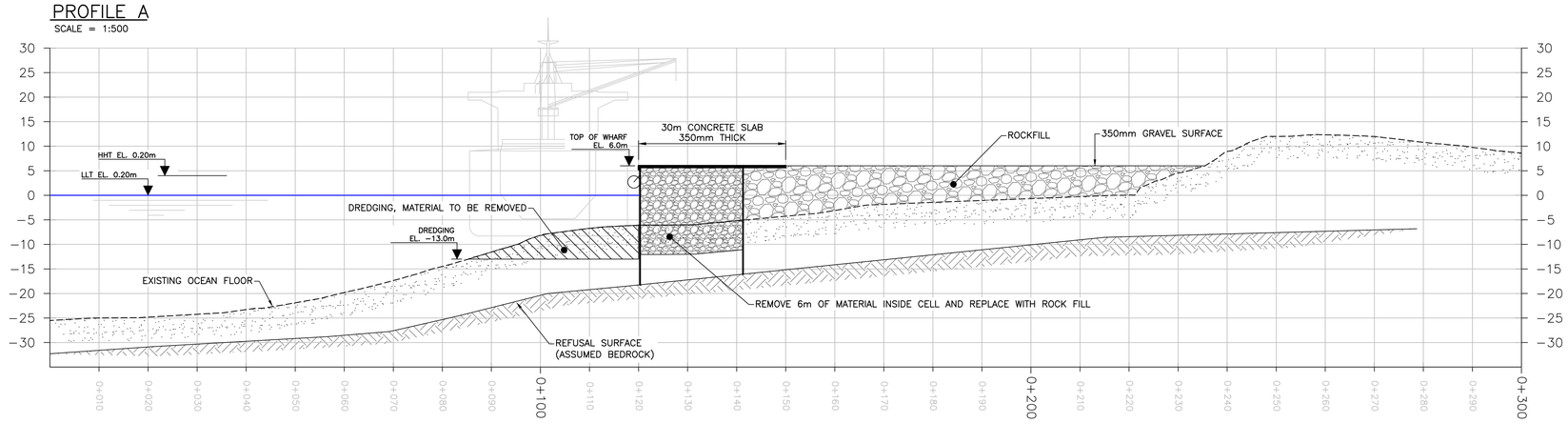
Jun 17, 2011 - 1:44pm Login name: cord3274 Layout: 256 165 CC
Drawing Name: P:\289880 Mary River H337697\Drawings\Freight Dock\Location 2\Freight Dock Options Case 3 20m back(Civil 3d).dwg

HATCH = B1 (1000x707)

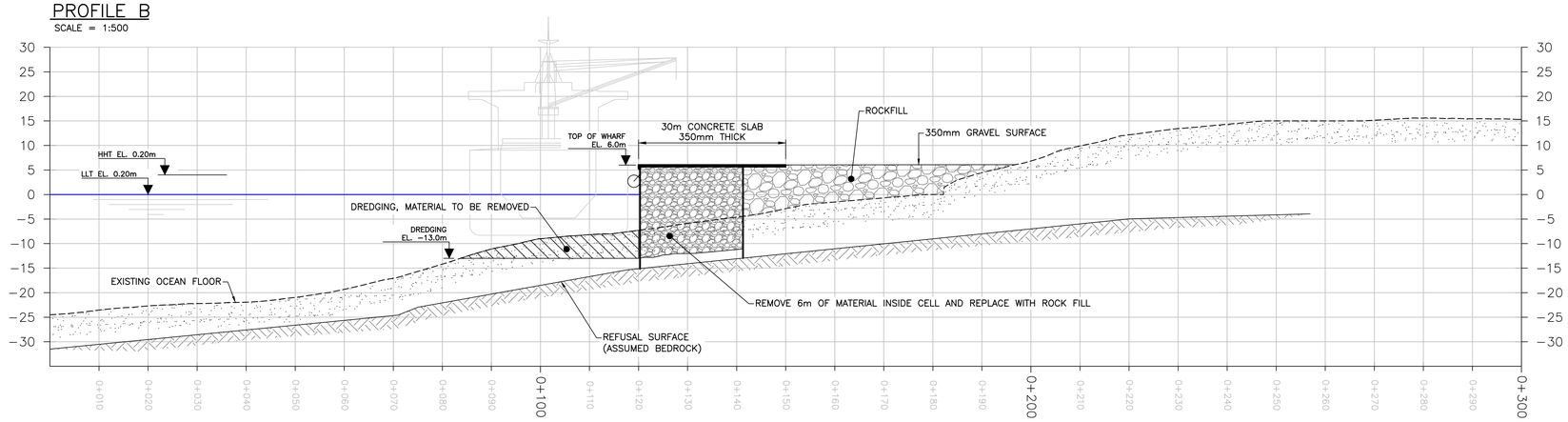
REVISION: A

DWG. NO. H337697-3100-12-041-0257

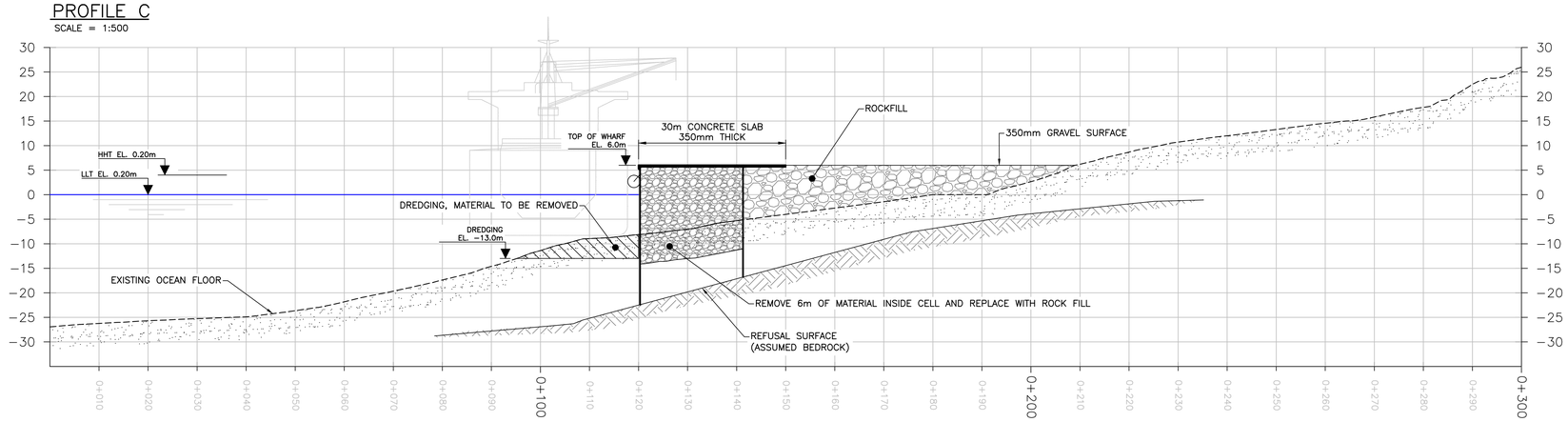
PROFILE A
SCALE = 1:500



PROFILE B
SCALE = 1:500



PROFILE C
SCALE = 1:500



LEGEND:
- EXISTING SURFACE
- REFUSAL SURFACE (ASSUMED BEDROCK)
- ROCK FILL
- DREDGING

DESIGN ASSUMPTIONS:
1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)
1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

0 10 20 30 40 50m
Scale: 1:500

DRAWING NO.	DRAWING TITLE
	REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
	REVISIONS			

REV.	ISSUE FOR	AUTH. BY	DATE
	ISSUE AUTHORIZATION		

HATCH

DESIGNED BY	DRAWN BY: B. COOK
DATE	DATE: 05/27/2011
CHECKED BY	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	PROJECT NUMBER: H337697
DATE	

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

STEENSBY PORT FREIGHT DOCK
LOCATION 2 – 165m
CIRCULAR STEEL CELL
PROFILE

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0257	A

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

Jun 17, 2011 - 1:44pm
Drawing Name: P:\289580 Mary River H337697\Drawings\Freight Dock\Location 2\Freight Dock Options Case 3 20m back(Civil 3d).dwg
Login name: cook3274
Layout: 257 165 CCP

Steensby Inlet Freight Dock Options Analysis Cost Estimate

Project: Mary's River Iron Mine **Option: 2B-1, 165m Pipe Pile/Sheet Pile Wall**
Location: Steensby Inlet, Baffin Island
Owner: Arcelor Mittal
Consultant: Hatch

Element	Units	Elemental Cost Quantity	Elemental Cost Unit Rate	Elemental Amount Sub-Total	Elemental Amount Total
A Site Preparation					
Dredging to achieve -13m elevation	Cu.m.	28600	$ 150.00	$ 4,290,000.00	
Dredging behind wall to allow replacement with angular stone for stability	Cu.m.	20570	$ 150.00	$ 3,085,500.00	
Supply and placement of rock fill behind wall in dredged area for stability	Cu.m.	20570	$ 75.00	$ 1,542,750.00	
Supply and placement of storage area armour stone	Cu.m.	6250	$ 85.00	$ 531,250.00	
Supply and placement of storage area sub armour stone	Cu.m.	2500	$ 85.00	$ 212,500.00	
Supply and placement of storage area rock fill	Cu.m.	140040	$ 75.00	$ 10,503,000.00	
Supply and placement of storage area surface gravels, 350mm thickness	Cu.m.	9300	$ 70.00	$ 651,000.00	
					$ 20,816,000.00
B Supply of Sheet Pile, Pipe Pile, and Accessories					
Supply AZ26-700 sheet piles - wharf face	MT	480	$ 2,250.00	$ 1,080,000.00	
Supply AZ26-700 sheet piles - anchor wall	MT	195	$ 2,250.00	$ 438,750.00	
Supply 1829mm dia. pipe piles - 19mm wall thickness	MT	1525	$ 3,000.00	$ 4,575,000.00	
Supply concrete infill for pipe piles (35MPa)	Cu.m.	4750	$ 300.00	$ 1,425,000.00	
Supply reinforcing cage for pipe piles	MT	670	$ 1,500.00	$ 1,005,000.00	
Supply Tie Rods, 100mm Dia.	MT	120	$ 2,500.00	$ 300,000.00	
Supply HP250x85 tie rod centre supports during construction	MT	85	$ 2,000.00	$ 170,000.00	
Supply Waler steel and fittings	MT	35	$ 2,500.00	$ 87,500.00	
Supply Toe pins for pipe piles, 200mm dia. x 3m	MT	100	$ 2,250.00	$ 225,000.00	
					$ 9,306,250.00
C Installation of Combination Sheet Pile/Pipe Pile Wall					
Installation of sheet piles - AZ26-700 wharf face	MT	480	$ 2,000.00	$ 960,000.00	
Installation of sheet piles - AZ26-700 anchor wall	MT	195	$ 2,000.00	$ 390,000.00	
Installation of 1829mm dia. pipe piles - 19mm wall thickness	MT	1525	$ 2,500.00	$ 3,812,500.00	
Excavate, core, place, and grout toe pins	Each	134	$ 10,000.00	$ 1,340,000.00	
Place concrete infill for pipe piles (35MPa)	Cu.m.	4750	$ 400.00	$ 1,900,000.00	
Install reinforcing cage for pipe piles	MT	670	$ 2,250.00	$ 1,507,500.00	
Installation of tie rods including corrosion protection system	Each	67	$ 2,000.00	$ 134,000.00	
Install HP250x85 tie rod centre supports during construction	MT	85	$ 2,000.00	$ 170,000.00	
Installation of walers	Lin.m.	185	$ 500.00	$ 92,500.00	
Barge mounted crane, pile driver, tug and scow rental (to be confirmed by Hatch)	Month	2	$ 300,000.00	$ 600,000.00	
Shipping of steel to site (to be confirmed by Hatch)	MT	3210	$ 500.00	$ 1,605,000.00	
					$ 12,511,500.00
D Supply and Installation of Concrete Wharf Deck and Concrete Ice Defence					
Concrete supply - deck (35MPa)	Cu.m.	1550	$ 300.00	$ 465,000.00	
Concrete supply - parapet wall and sheet pile ice defence block (35MPa)	Cu.m.	1000	$ 300.00	$ 300,000.00	
Form and place concrete	Cu.m.	2550	$ 1,000.00	$ 2,550,000.00	
Supply and installation of reinforcing steel	MT	360	$ 2,000.00	$ 720,000.00	
					$ 4,035,000.00
E Wharf Fixtures					
Supply and install 2.5Dia. x 5.5m pneumatic fenders and chain	Each	10	$ 30,000.00	$ 300,000.00	
Supply and install mooring buoys with chain and anchorage (winter storage onshore)	Each	2	$ 125,000.00	$ 250,000.00	
Allowance for wharf infrastructure (lights, storm sewer, etc.)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
Supply and install steel bollards	Each	11	$ 15,000.00	$ 165,000.00	
Supply and install ladders	Each	11	$ 5,000.00	$ 55,000.00	
Supply and install wheel guards	Lin.m.	185	$ 300.00	$ 55,500.00	
					$ 1,825,500.00
NET CONSTRUCTION ESTIMATED COST					**$ 48,494,250.00**
F General Requirements					
Mobilization (to be confirmed by Hatch)	Each	1	$ 600,000.00	$ 600,000.00	
Shipping of equipment and supplies to site (to be confirmed by Hatch)	LS	1	$ 600,000.00	$ 600,000.00	
General Conditions (to be confirmed by Hatch)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
					$ 2,200,000.00
CONSTRUCTION COST ESTIMATE SUB TOTAL (EXCLUDING CONTINGENCIES)					**$ 50,694,250.00**
G Construction Contingency					
Construction contingency - 25%	%	25%	$ 12,673,560.00	$ 12,673,560.00	
					$ 12,673,560.00
CONSTRUCTION COST ESTIMATE TOTAL (INCLUDING CONTINGENCIES)					**$ 63,367,810.00**

Notes:
1. Baseline cost of $150/Cu.m. to dredge and dispose of unsuitable material used for cost comparison only. Cost of dredging to be finalized after summer 2011 Geotechnical Program.
2. Complete geotechnical information not available for trade-off study - estimates are based on best available information and are subject to change.

Steensby Inlet Freight Dock Options Analysis Cost Estimate

Project: Mary's River Iron Mine **Option: 2B-2, 165m Circular Sheet Pile Cell Structure**
Location: Steensby Inlet, Baffin Island
Owner: Arcelor Mittal
Consultant: Hatch

Element	Units	Elemental Cost		Elemental Amount	
		Quantity	Unit Rate	Sub-Total	Total
A Site Preparation					
Dredging to achieve -13m elevation	Cu.m.	28600	$ 150.00	$ 4,290,000.00	
Dredging inside cells to allow replacement with rock fill for stability	Cu.m.	18950	$ 150.00	$ 2,842,500.00	
Supply of caisson rock fill, 50-300mm (includes volume for dredged area)	Cu.m.	85050	$ 75.00	$ 6,378,750.00	
Placement of caisson rock fill, 50-300mm (includes volume for dredged area)	Cu.m.	85050	$ 40.00	$ 3,402,000.00	
Supply and placement of storage area armour stone	Cu.m.	6400	$ 85.00	$ 544,000.00	
Supply and placement of storage area sub armour stone	Cu.m.	2560	$ 85.00	$ 217,600.00	
Supply and placement of storage area rock fill	Cu.m.	113520	$ 75.00	$ 8,514,000.00	
Supply and placement of storage area surface gravels, 350mm thickness	Cu.m.	10500	$ 70.00	$ 735,000.00	
					$ 26,923,850.00
B Supply of Sheet Piles for Circular Cell Structures					
Supply of steel for reusable construction template - 2 required	MT	200	$ 2,250.00	$ 450,000.00	
Supply AS500-12.7 steel sheet piles (9 caissons x 128 piles + 16 int arcs x 23 piles)	MT	2750	$ 2,250.00	$ 6,187,500.00	
					$ 6,637,500.00
C Installation of Sheet Pile Circular Cell Structures					
Construction support template installation - 2 required	MT	200	$ 2,250.00	$ 450,000.00	
Caisson and int arc installation on template	MT	2750	$ 2,000.00	$ 5,500,000.00	
Barge mounted crane, pile driver, tug and scow rental (to be confirmed by Hatch)	Month	2	$ 300,000.00	$ 600,000.00	
Shipping of steel to site (to be confirmed by Hatch)	MT	2950	$ 500.00	$ 1,475,000.00	
					$ 8,025,000.00
D Supply and Installation of Concrete Wharf Deck and Concrete Ice Defence					
Concrete supply - deck (35MPa)	Cu.m.	1550	$ 300.00	$ 465,000.00	
Concrete supply - parapet wall and ice defence block behind piles (35MPa)	Cu.m.	1350	$ 300.00	$ 405,000.00	
Form and place concrete	Cu.m.	2900	$ 1,000.00	$ 2,900,000.00	
Supply and installation of reinforcing steel	MT	410	$ 2,000.00	$ 820,000.00	
					$ 4,590,000.00
E Wharf Fixtures					
Supply and install 2.5Dia. x 5.5m pneumatic fenders and chain	Each	10	$ 30,000.00	$ 300,000.00	
Supply and install mooring buoys with chain and anchorage (winter storage onshore)	Each	2	$ 125,000.00	$ 250,000.00	
Allowance for wharf infrastructure (lights, storm sewer, etc.)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
Supply and install steel bollards	Each	11	$ 15,000.00	$ 165,000.00	
Supply and install ladders	Each	11	$ 5,000.00	$ 55,000.00	
Supply and install steel wheel guards	Lin.m.	185	$ 300.00	$ 55,500.00	
					$ 1,825,500.00
				NET CONSTRUCTION ESTIMATED COST	**$ 48,001,850.00**
F General Requirements					
Mobilization (to be confirmed by Hatch)	Each	1	$ 600,000.00	$ 600,000.00	
Shipping of equipment and supplies to site (to be confirmed by Hatch)	LS	1	$ 600,000.00	$ 600,000.00	
General Conditions (to be confirmed by Hatch)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
					$ 2,200,000.00
				CONSTRUCTION COST ESTIMATE SUB TOTAL (EXCLUDING CONTINGENCIES)	**$ 50,201,850.00**
G Construction Contingency					
Construction contingency - 25%	%	25%	$ 12,550,460.00	$ 12,550,460.00	
					$ 12,550,460.00
				CONSTRUCTION COST ESTIMATE TOTAL (INCLUDING CONTINGENCIES)	**$ 62,752,310.00**

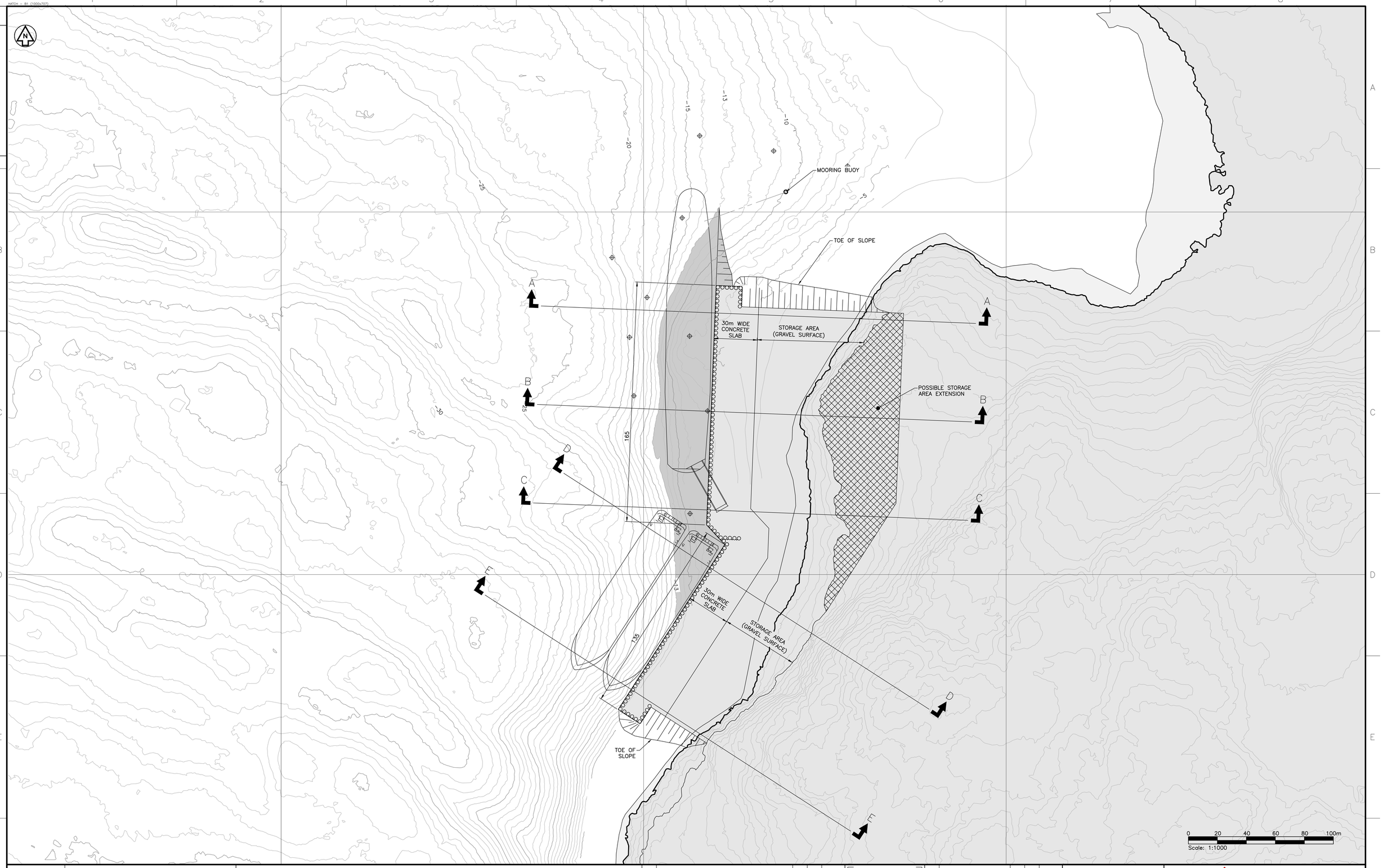
Notes:
1. Baseline cost of $150/Cu.m. to dredge and dispose of unsuitable material used for cost comparison only. Cost of dredging to be finalized after summer 2011 Geotechnical Program.
2. Complete geotechnical information not available for trade-off study - estimates are based on best available information and are subject to change.

Appendix D :

HATCH — B1 (1000x707)

REVISION A

DWG. NO. H337697-3100-12-041-0246



DESIGN ASSUMPTIONS:

1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)

1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

⊕ BORE HOLE / PROBE

DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE

REVISIONS

REV.	ISSUE FOR	AUTH. BY	DATE

ISSUE AUTHORIZATION

HATCH™

DESIGNED BY	DRAWN BY: B. COOK
DATE	DATE: 05/27/2011
CHECKED BY	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	PROJECT NUMBER: H337697
DATE	

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

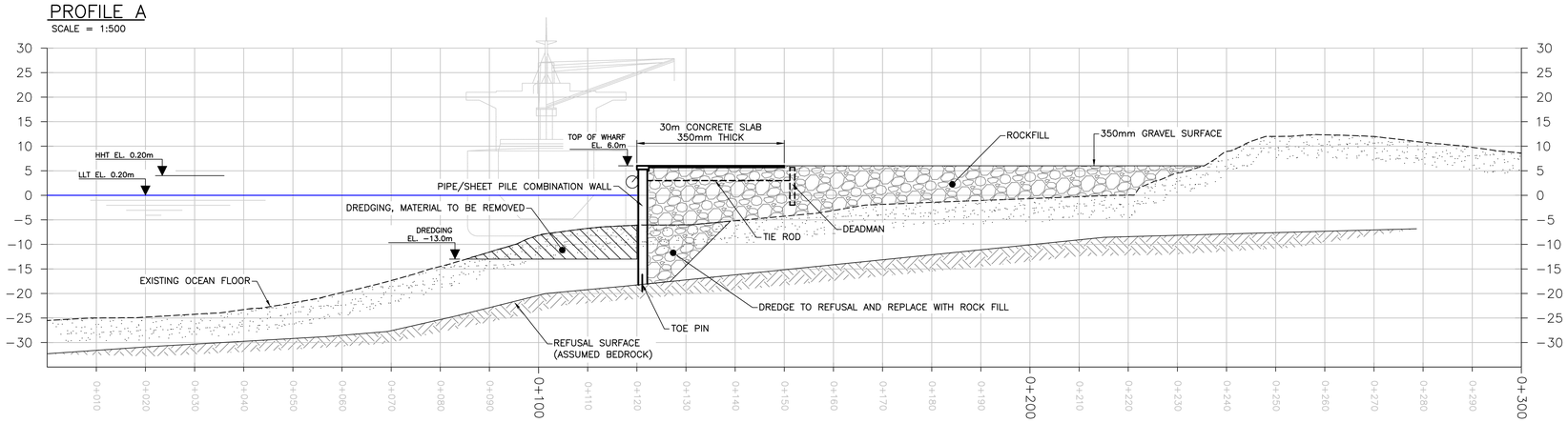
STEENSBY PORT
FREIGHT DOCK WITH TUG DOCK
LOCATION 2 – 300m
STEEL WALL
PLAN

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0246	A

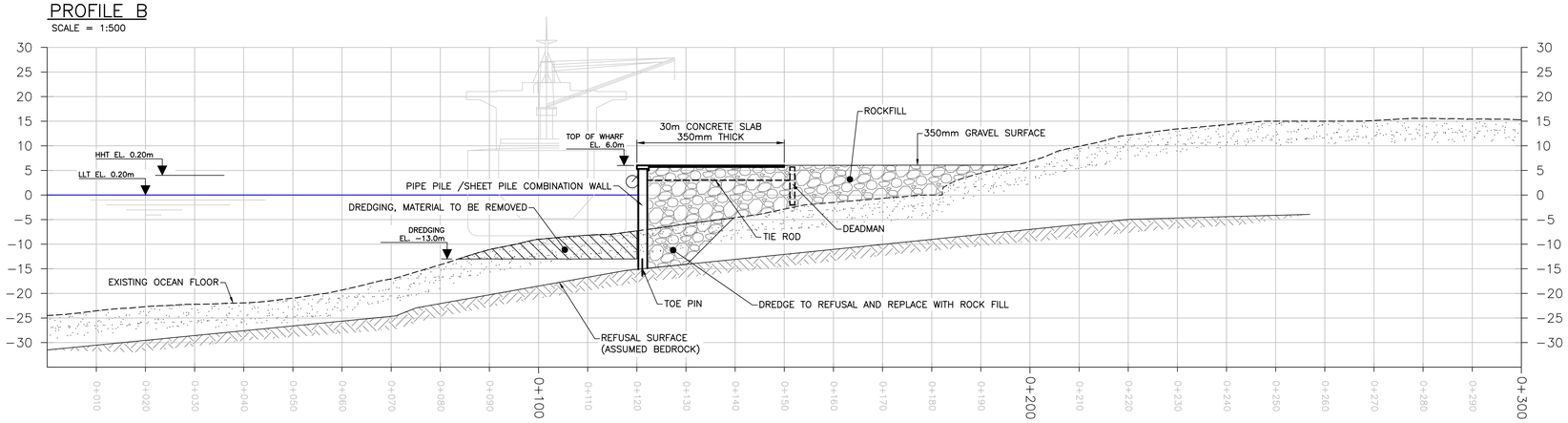
CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER

Jun 17, 2011 - 1:44pm Login name: cox43274 Layout: 246 300 SW
Drawing Name: P:\289980 Mary River H337697\Drawings\Freight Dock\Location 2\Freight Dock Options Case 3 20m back(Civil 3d).dwg

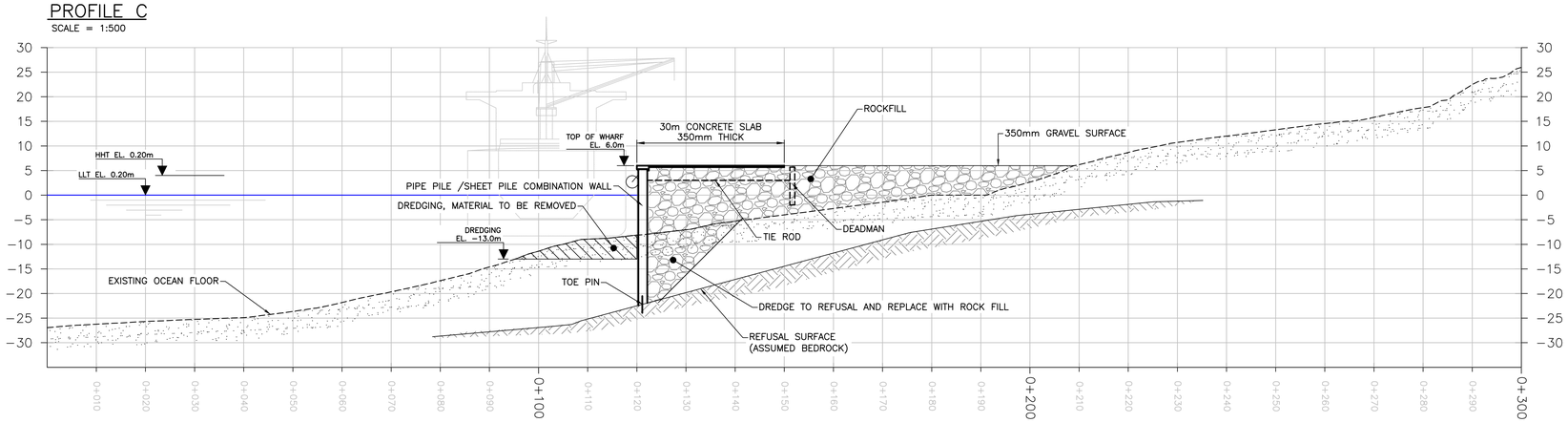
PROFILE A
SCALE = 1:500



PROFILE B
SCALE = 1:500



PROFILE C
SCALE = 1:500



LEGEND:
- EXISTING SURFACE
- REFUSAL SURFACE (ASSUMED BEDROCK)
- ROCK FILL
- DREDGING

DESIGN ASSUMPTIONS:
1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)
1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

0 10 20 30 40 50m
Scale: 1:500

DRAWING NO.	DRAWING TITLE
	REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
	REVISIONS			

REV.	ISSUE FOR	AUTH. BY	DATE
	ISSUE AUTHORIZATION		

HATCH

DESIGNED BY	DRAWN BY: B. COOK
DATE	DATE: 05/27/2011
CHECKED BY	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	PROJECT NUMBER: H337697
DATE	

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

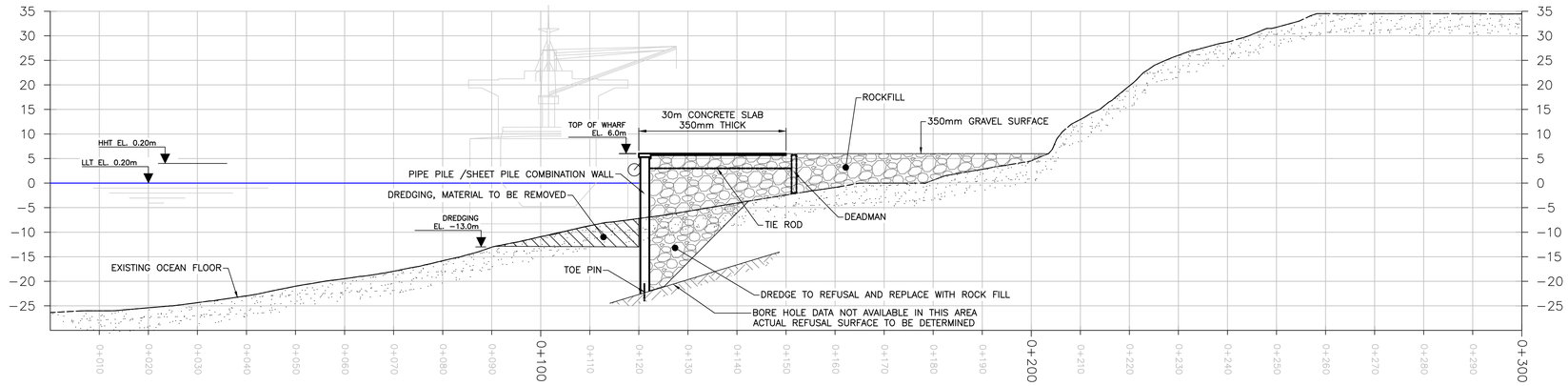
STEENSBY PORT
FREIGHT DOCK WITH TUG DOCK
LOCATION 2 – 300m
STEEL WALL
PROFILE SHEET 1

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0247	A

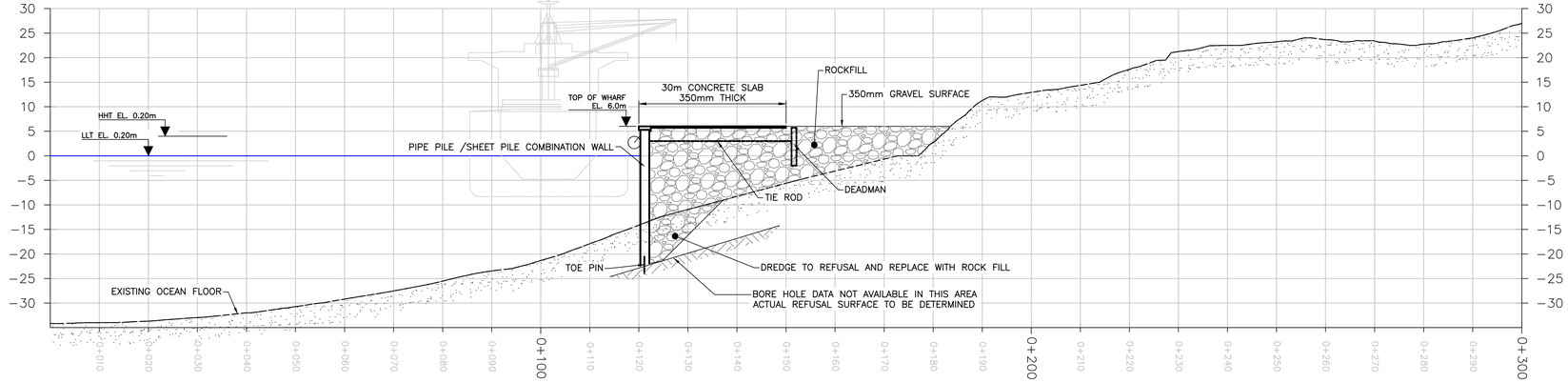
CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER

Jun 17, 2011 - 1:44pm Login name: cook3274 Layout: 247 300 SWP1
Drawing Name: P:\289580 Mary River H337697\Drawings\Freight Dock\Location 2\Freight Dock Options Case 3 20m back(Civil 3d).dwg

PROFILE D
SCALE = 1:500



PROFILE E
SCALE = 1:500



LEGEND:
- EXISTING SURFACE
- REFUSAL SURFACE (ASSUMED BEDROCK)
- ROCK FILL
- DREDGING

DESIGN ASSUMPTIONS:
1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)
1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

0 10 20 30 40 50m
Scale: 1:500

DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS	

NO.	DESCRIPTION	CHK'D	APP'D	DATE
REVISIONS				

REV.	ISSUE FOR	AUTH. BY	DATE
ISSUE AUTHORIZATION			

HATCH

DESIGNED BY	DRAWN BY: B. COOK
DATE	DATE: 05/27/2011
CHECKED BY	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	PROJECT NUMBER: H337697
DATE	

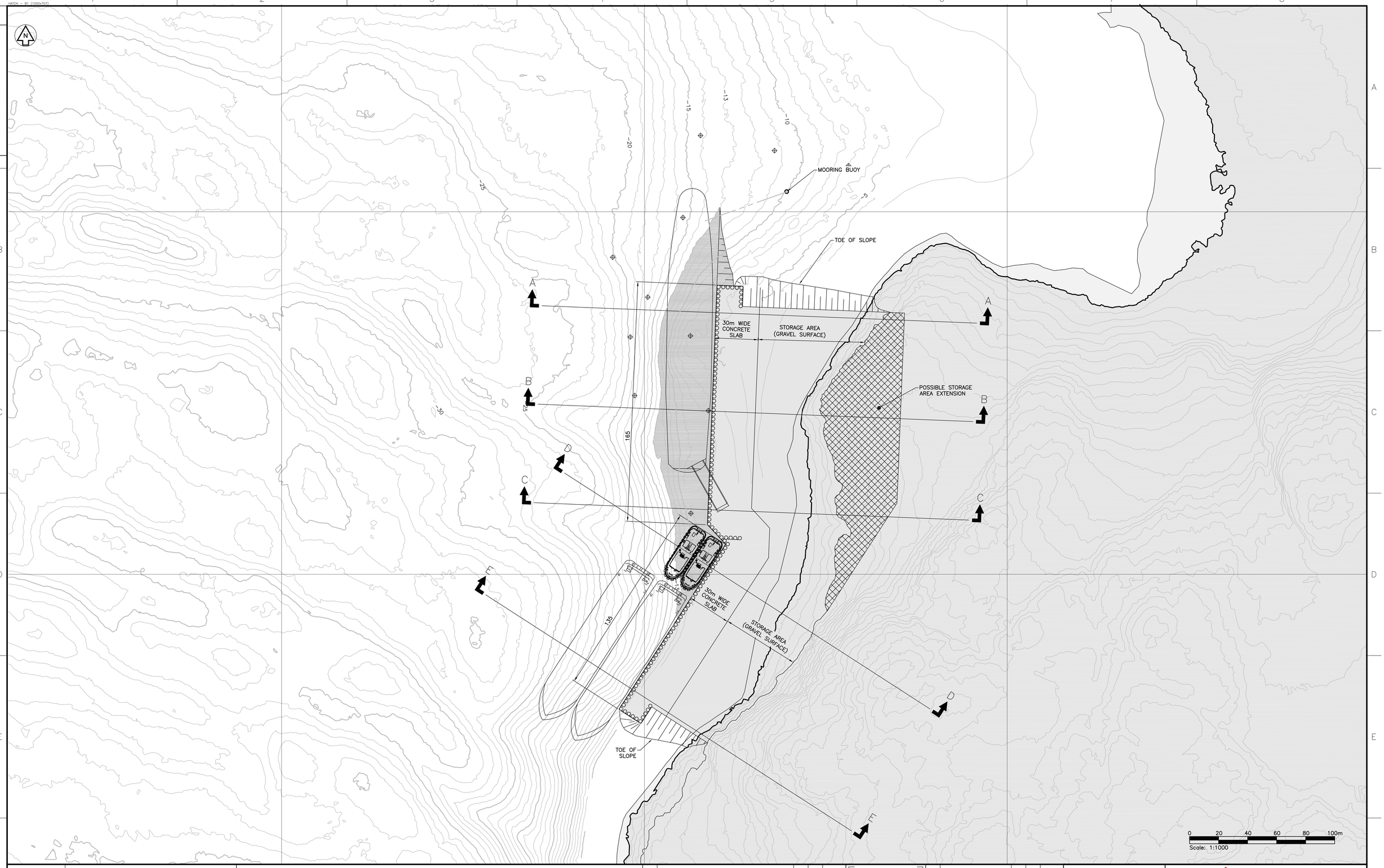
Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

STEENSBY PORT
FREIGHT DOCK WITH TUG DOCK
LOCATION 2 – 300m
STEEL WALL
PROFILE SHEET 2

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0248	A

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



DESIGN ASSUMPTIONS:

1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)

1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

⊕ BORE HOLE / PROBE

DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS	

NO.	DESCRIPTION	CHK'D	APP'D	DATE
REVISIONS				

REV.	ISSUE FOR	AUTH. BY	DATE
ISSUE AUTHORIZATION			

HATCH™

DESIGNED BY	DRAWN BY: B. COOK
DATE	DATE 05/27/2011
CHECKED BY	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	PROJECT NUMBER H337697
DATE	

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

STEENSBY PORT FREIGHT DOCK WITH TUG DOCK LOCATION 2 – 300m STEEL WALL PLAN

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0246	A

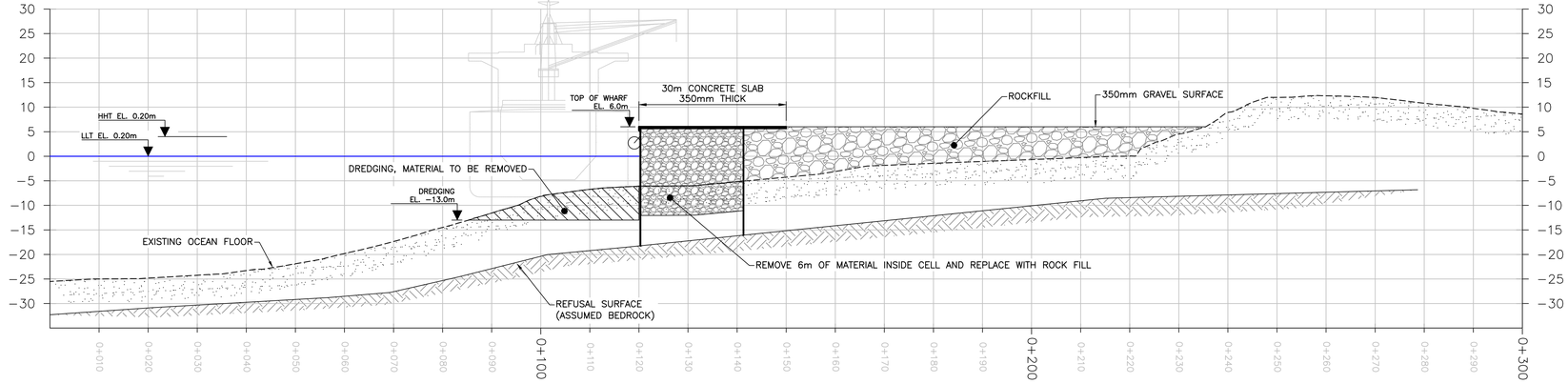
CIVIL | ELECTRICAL | MECHANICAL | GEOTECHNICAL | HYDROTECHNICAL | ARCHITECTURAL | OTHER

Jun 24, 2011, 10:03am Login name: cox43274 Layout: 246 300 SW
Drawing Name: P:\289980 Mary River\H337697\Drawings\Freight Dock\Location 2\Freight Dock Options (Civil 3d).dwg

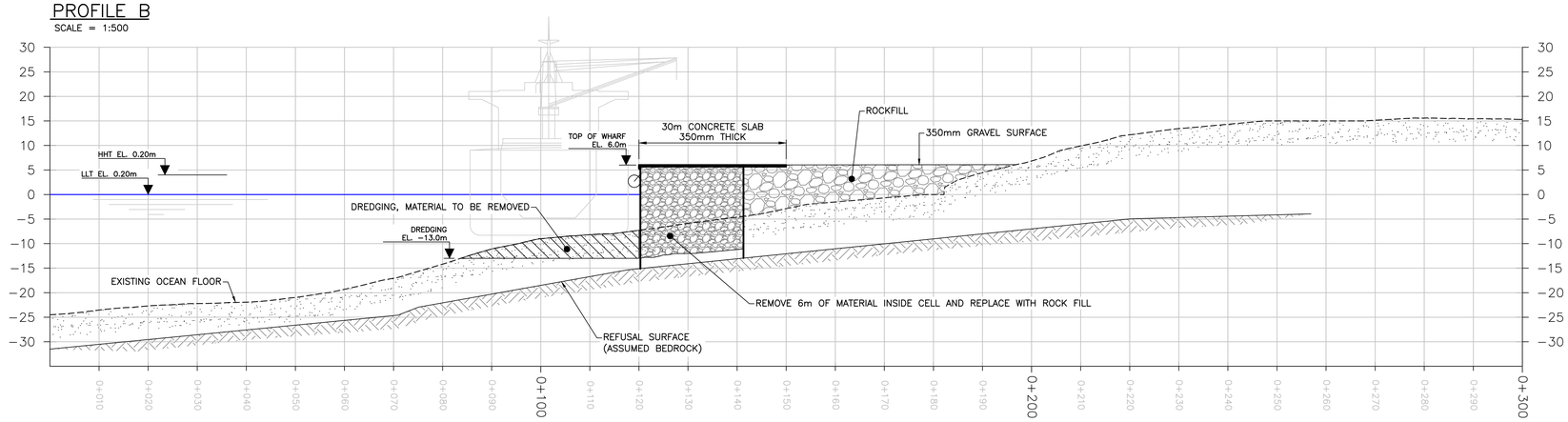
REVISION A

DWG. NO. H337697-3100-12-041-0262

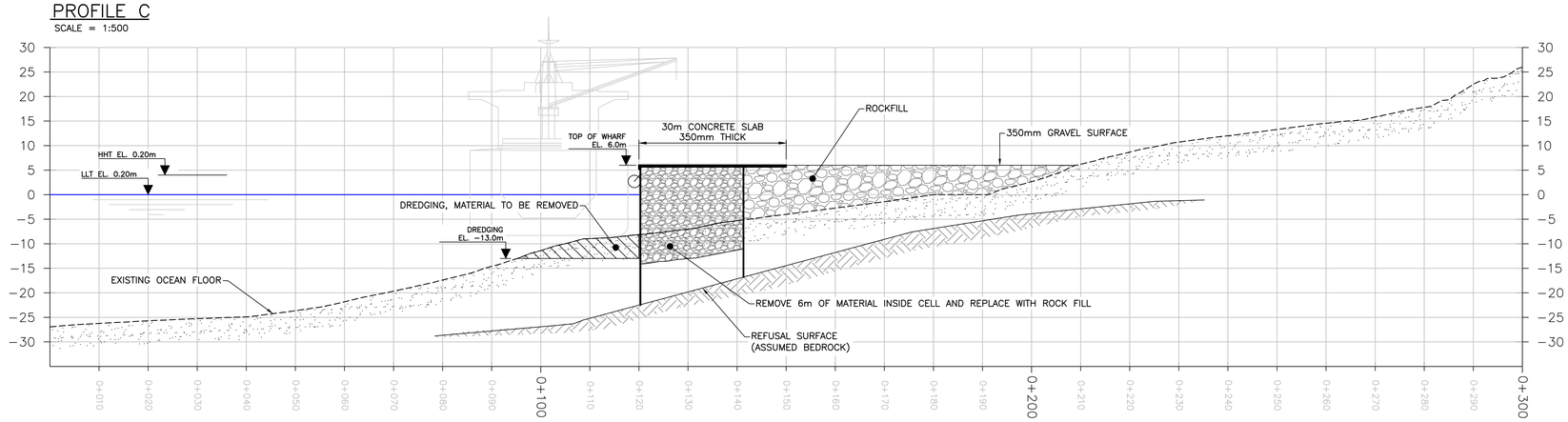
PROFILE A
SCALE = 1:500



PROFILE B
SCALE = 1:500



PROFILE C
SCALE = 1:500



LEGEND:
- EXISTING SURFACE
- REFUSAL SURFACE (ASSUMED BEDROCK)
- ROCK FILL
- DREDGING

DESIGN ASSUMPTIONS:
1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)
1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

0 10 20 30 40 50m
Scale: 1:500

DRAWING NO.	DRAWING TITLE
	REFERENCE DRAWINGS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
	REVISIONS			

REV.	ISSUE FOR	AUTH. BY	DATE
	ISSUE AUTHORIZATION		

HATCH

DESIGNED BY	DRAWN BY
DATE	B. COOK DATE 05/27/2011
CHECKED BY	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	PROJECT NUMBER
DATE	H337697

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

STEENSBY PORT
FREIGHT DOCK WITH TUG DOCK
LOCATION 2 – 300m
CIRCULAR STEEL CELL
PROFILE SHEET 1

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0262	A

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

Jun 17, 2011 - 1:45pm Login name: cook3274 Layout: 260_300 CCP1
Drawing Name: P:\v289580 Mary River H337697\Drawings\Freight Dock\Location 2\Freight Dock Options Case 3 20m back(Civil 3d).dwg

HATCH = B1 (1000x707)

REVISION A

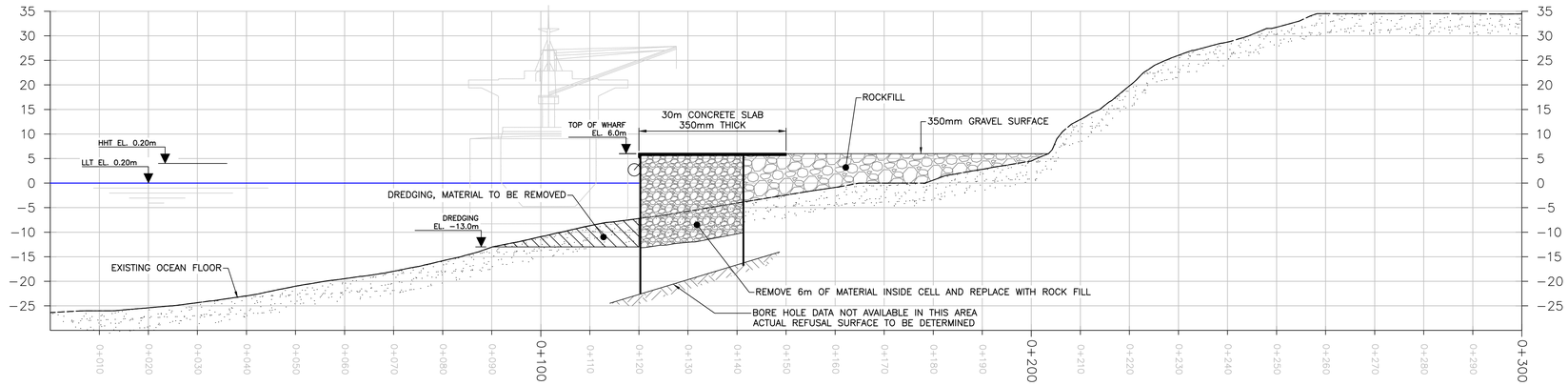
DWG. NO. H337697-3100-12-041-0263

LEGEND:

- EXISTING SURFACE
- REFUSAL SURFACE (ASSUMED BEDROCK)
- ROCK FILL
- DREDGING

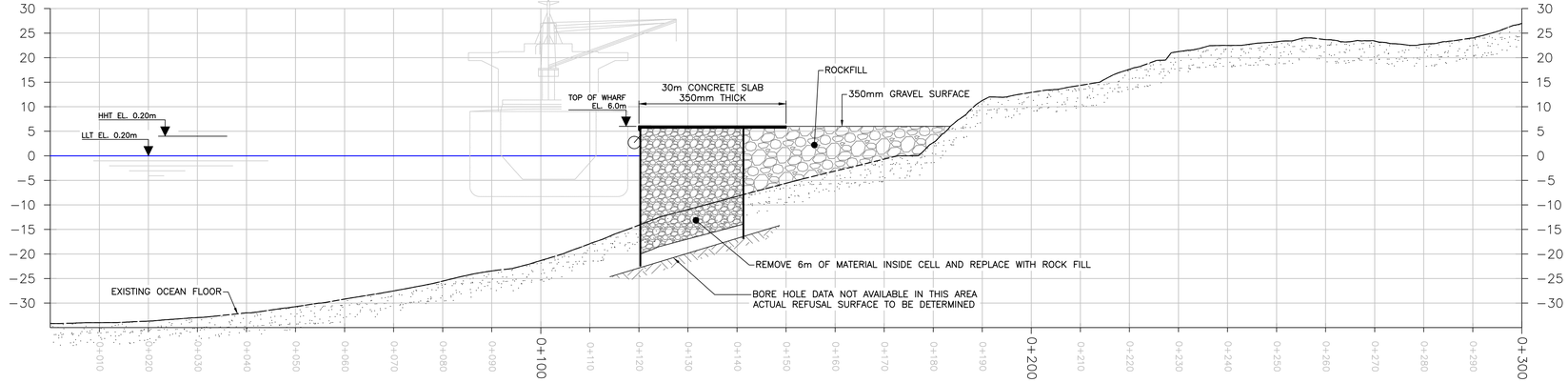
PROFILE D

SCALE = 1:500



PROFILE E

SCALE = 1:500



DESIGN ASSUMPTIONS:

1. SURFACE LOAD = 50 kPa
2. ICE LOAD = 1.5 kPa
3. REFUSAL SURFACE ASSUMED SOUND ROCK LAYER
4. HARBOUR BOTTOM COVERED TO REFUSAL SURFACE WITH FINE SAND. GEOTECHNICAL DATA NOT AVAILABLE AT TIME OF STUDY.
5. HHW (HIGH HIGH WATER) AT ELEVATION 4.0m

WHARF FIXTURES (NOT SHOWN)

1. 350mm THICK REINFORCED CONCRETE SLAB
2. REINFORCED CONCRETE PARAPET WALL
3. PNEUMATIC FENDERS @ 15m C.C ALONG WHARF FACE
4. STEEL LADDERS @ 15m C.C ALONG WHARF FACE
5. STEEL WHEEL GUARDS ALONG LENGTH OF WHARF
6. 50 TONNE BOLLARDS

PRELIMINARY
NOT FOR CONSTRUCTION

Scale: 1:500

DRAWING NO.	DRAWING TITLE
REFERENCE DRAWINGS	

NO.	DESCRIPTION	CHK'D	APP'D	DATE
REVISIONS				

REV.	ISSUE FOR	AUTH. BY	DATE
ISSUE AUTHORIZATION			

HATCH

DESIGNED BY	DRAWN BY: B. COOK
DATE	DATE: 05/27/2011
CHECKED BY	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	PROJECT NUMBER: H337697
DATE	

Baffinland Iron Mines Corporation

MARY RIVER IRON ORE PROJECT

STEENSBY PORT FREIGHT DOCK WITH TUG DOCK LOCATION 2 – 300m CIRCULAR STEEL CELL PROFILE SHEET 2

SCALE	DRAWING NO.	REVISION
AS SHOWN	H337697-3100-12-041-0263	A

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

Jun 17, 2011 1:45pm Login name: coe4274 Layout: 263_300 CCP2
Drawing Name: P:\289980 Mary River H337697\Drawings\Freight Dock\Location 2\Freight Dock Options Case 3 20m back(Civil 3d).dwg

Steensby Inlet Freight Dock Options Analysis Cost Estimate

Project: Mary's River Iron Mine — **Option: 2C-1, 290m Pipe Pile/Sheet Pile Wall 165m Main Dock + 125m Tug Dock**
Location: Steensby Inlet, Baffin Island
Owner: Arcelor Mittal
Consultant: Hatch

Element	Units	Elemental Cost: Quantity	Elemental Cost: Unit Rate	Elemental Amount: Sub-Total	Elemental Amount: Total
A Site Preparation					
Dredging to achieve -13m elevation	Cu.m.	31000	$ 150.00	$ 4,650,000.00	
Dredging behind wall to allow replacement with angular stone for stability	Cu.m.	37500	$ 150.00	$ 5,625,000.00	
Supply and placement of rock fill behind wall in dredged area for stability	Cu.m.	37500	$ 75.00	$ 2,812,500.00	
Supply and placement of storage area armour stone	Cu.m.	5650	$ 85.00	$ 480,250.00	
Supply and placement of storage area sub armour stone	Cu.m.	2260	$ 85.00	$ 192,100.00	
Supply and placement of storage area rock fill	Cu.m.	248500	$ 75.00	$ 18,637,500.00	
Supply and placement of storage area surface gravels, 350mm thickness	Cu.m.	16500	$ 70.00	$ 1,155,000.00	
					$ 33,552,350.00
B Supply of Sheet Pile, Pipe Pile, and Accessories					
Supply AZ26-700 sheet piles - wharf face	MT	920	$ 2,250.00	$ 2,070,000.00	
Supply AZ26-700 sheet piles - anchor wall	MT	355	$ 2,250.00	$ 798,750.00	
Supply 1829mm dia. pipe piles - 19mm wall thickness	MT	2670	$ 3,000.00	$ 8,010,000.00	
Supply concrete infill for pipe piles (35MPa)	Cu.m.	8300	$ 300.00	$ 2,490,000.00	
Supply reinforcing cage for pipe piles	MT	1170	$ 1,500.00	$ 1,755,000.00	
Supply Tie Rods, 100mm Dia.	MT	205	$ 2,500.00	$ 512,500.00	
Supply HP250x85 tie rod centre supports during construction	MT	145	$ 2,000.00	$ 290,000.00	
Supply Waler steel and fittings	MT	50	$ 2,500.00	$ 125,000.00	
Supply Toe pins for pipe piles, 200mm dia. x 3m	MT	175	$ 2,250.00	$ 393,750.00	
					$ 16,445,000.00
C Installation of Combination Sheet Pile/Pipe Pile Wall					
Installation of sheet piles - AZ26-700 wharf face	MT	920	$ 2,000.00	$ 1,840,000.00	
Installation of sheet piles - AZ26-700 anchor wall	MT	355	$ 2,000.00	$ 710,000.00	
Installation of 1829mm dia. pipe piles - 19mm wall thickness	MT	2670	$ 2,500.00	$ 6,675,000.00	
Excavate, core, place, and grout toe pins	Each	230	$ 10,000.00	$ 2,300,000.00	
Place concrete infill for pipe piles (35MPa)	Cu.m.	8300	$ 400.00	$ 3,320,000.00	
Install reinforcing cage for pipe piles	MT	1170	$ 2,250.00	$ 2,632,500.00	
Installation of tie rods including corrosion protection system	Each	115	$ 2,000.00	$ 230,000.00	
Install HP250x85 tie rod centre supports during construction	MT	145	$ 2,000.00	$ 290,000.00	
Installation of walers	Lin.m.	340	$ 500.00	$ 170,000.00	
Barge mounted crane, pile driver, tug and scow rental (to be confirmed by Hatch)	Month	2	$ 300,000.00	$ 600,000.00	
Shipping of steel to site (to be confirmed by Hatch)	MT	5690	$ 500.00	$ 2,845,000.00	
					$ 21,612,500.00
D Supply and Installation of Concrete Wharf Deck and Concrete Ice Defence					
Concrete supply - deck (35MPa)	Cu.m.	2650	$ 300.00	$ 795,000.00	
Concrete supply - parapet wall and sheet pile ice defence block (35MPa)	Cu.m.	1400	$ 300.00	$ 420,000.00	
Form and place concrete	Cu.m.	4050	$ 1,000.00	$ 4,050,000.00	
Supply and installation of reinforcing steel	MT	570	$ 2,000.00	$ 1,140,000.00	
					$ 6,405,000.00
E Wharf Fixtures					
Supply and install 2.5Dia. x 5.5m pneumatic fenders and chain	Each	20	$ 30,000.00	$ 600,000.00	
Supply and install mooring buoys with chain and anchorage (winter storage onshore)	Each	2	$ 125,000.00	$ 250,000.00	
Allowance for wharf infrastructure (lights, storm sewer, etc.)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
Supply and install steel bollards	Each	20	$ 15,000.00	$ 300,000.00	
Supply and install ladders	Each	20	$ 5,000.00	$ 100,000.00	
Supply and install wheel guards	Lin.m.	320	$ 300.00	$ 96,000.00	
					$ 2,346,000.00
				NET CONSTRUCTION ESTIMATED COST	**$ 80,360,850.00**
F General Requirements					
Mobilization (to be confirmed by Hatch)	Each	1	$ 600,000.00	$ 600,000.00	
Shipping of equipment and supplies to site (to be confirmed by Hatch)	LS	1	$ 800,000.00	$ 800,000.00	
General Conditions (to be confirmed by Hatch)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
					$ 2,400,000.00
				CONSTRUCTION COST ESTIMATE SUB TOTAL (EXCLUDING CONTINGENCIES)	**$ 82,760,850.00**
G Construction Contingency					
Construction contingency - 25%	%	25%	$ 20,690,210.00	$ 20,690,210.00	
					$ 20,690,210.00
				CONSTRUCTION COST ESTIMATE TOTAL (INCLUDING CONTINGENCIES)	**$ 103,451,060.00**

Notes:
1. Baseline cost of $150/Cu.m. to dredge and dispose of unsuitable material used for cost comparison only. Cost of dredging to be finalized after summer 2011 Geotechnical Program.
2. Complete geotechnical information not available for trade-off study - estimates are based on best available information and are subject to change.

Steensby Inlet Freight Dock Options Analysis Cost Estimate

Project: Mary's River Iron Mine
Location: Steensby Inlet, Baffin Island
Owner: Arcelor Mittal
Consultant: Hatch

Option: 2C-2, 290m Circular Sheet Pile Cell Structure 165m Main Dock + 125m Tug Dock

Element	Units	Elemental Cost Quantity	Elemental Cost Unit Rate	Elemental Amount Sub-Total	Elemental Amount Total
A Site Preparation					
Dredging to achieve -13m elevation	Cu.m.	31000	$ 150.00	$ 4,650,000.00	
Dredging inside cells to allow replacement with rock fill for stability	Cu.m.	34450	$ 150.00	$ 5,167,500.00	
Supply of caisson rock fill, 50-300mm (includes volume for dredged area)	Cu.m.	146900	$ 75.00	$ 11,017,500.00	
Placement of caisson rock fill, 50-300mm (includes volume for dredged area)	Cu.m.	146900	$ 40.00	$ 5,876,000.00	
Supply and placement of storage area armour stone	Cu.m.	6400	$ 85.00	$ 544,000.00	
Supply and placement of storage area sub armour stone	Cu.m.	2560	$ 85.00	$ 217,600.00	
Supply and placement of storage area rock fill	Cu.m.	183633	$ 75.00	$ 13,772,475.00	
Supply and placement of storage area surface gravels, 350mm thickness	Cu.m.	17200	$ 70.00	$ 1,204,000.00	
					$ 42,449,075.00
B Supply of Sheet Piles for Circular Cell Structures					
Supply of steel for reusable construction template - 2 required	MT	200	$ 2,250.00	$ 450,000.00	
Supply AS500-12.7 steel sheet piles (15 caissons x128 piles + 28 int arcs x23 piles)	MT	5550	$ 2,250.00	$ 12,487,500.00	
					$ 12,937,500.00
C Installation of Sheet Pile Circular Cell Structures					
Construction support template installation - 2 required	MT	200	$ 2,250.00	$ 450,000.00	
Caisson and int arc installation on template	MT	5550	$ 2,000.00	$ 11,100,000.00	
Barge mounted crane, pile driver, tug and scow rental (to be confirmed by Hatch)	Month	2	$ 300,000.00	$ 600,000.00	
Shipping of steel to site (to be confirmed by Hatch)	MT	5750	$ 500.00	$ 2,875,000.00	
					$ 15,025,000.00
D Supply and Installation of Concrete Wharf Deck and Concrete Ice Defence					
Concrete supply - deck (35MPa)	Cu.m.	2650	$ 300.00	$ 795,000.00	
Concrete supply - parapet wall and ice defence block behind piles (35MPa)	Cu.m.	1850	$ 300.00	$ 555,000.00	
Form and place concrete	Cu.m.	4500	$ 1,000.00	$ 4,500,000.00	
Supply and installation of reinforcing steel	MT	630	$ 2,000.00	$ 1,260,000.00	
					$ 7,110,000.00
E Wharf Fixtures					
Supply and install 2.5Dia. x 5.5m pneumatic fenders and chain	Each	20	$ 30,000.00	$ 600,000.00	
Supply and install mooring buoys with chain and anchorage (winter storage onshore)	Each	2	$ 125,000.00	$ 250,000.00	
Allowance for wharf infrastructure (lights, storm sewer, etc.)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
Supply and install steel bollards	Each	20	$ 15,000.00	$ 300,000.00	
Supply and install ladders	Each	20	$ 5,000.00	$ 100,000.00	
Supply and install steel wheel guards	Lin.m.	320	$ 300.00	$ 96,000.00	
					$ 2,346,000.00
				NET CONSTRUCTION ESTIMATED COST	**$ 79,867,575.00**
F General Requirements					
Mobilization (to be confirmed by Hatch)	Each	1	$ 600,000.00	$ 600,000.00	
Shipping of equipment and supplies to site (to be confirmed by Hatch)	LS	1	$ 800,000.00	$ 800,000.00	
General Conditions (to be confirmed by Hatch)	LS	1	$ 1,000,000.00	$ 1,000,000.00	
					$ 2,400,000.00
				CONSTRUCTION COST ESTIMATE SUB TOTAL (EXCLUDING CONTINGENCIES)	**$ 82,267,575.00**
G Construction Contingency					
Construction contingency - 25%	%	25%	$ 20,566,890.00	$ 20,566,890.00	
					$ 20,566,890.00
				CONSTRUCTION COST ESTIMATE TOTAL (INCLUDING CONTINGENCIES)	**$ 102,834,465.00**

Notes:
1. Baseline cost of $150/Cu.m. to dredge and dispose of unsuitable material used for cost comparison only. Cost of dredging to be finalized after summer 2011 Geotechnical Program.
2. Complete geotechnical information not available for trade-off study - estimates are based on best available information and are subject to change.