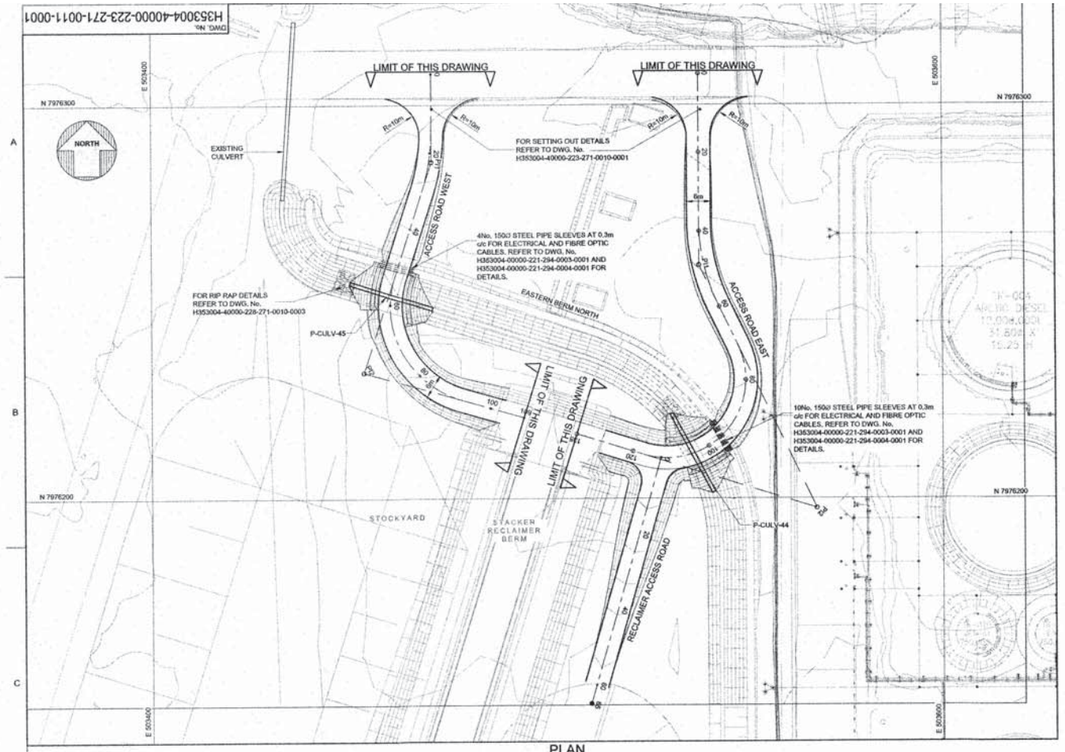
Attachment 12.8

Milne Port Site Road Drawings

(7 Pages)

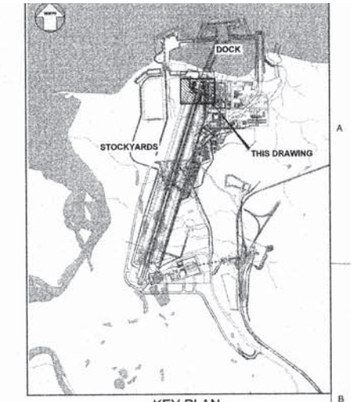


PLAN
SCALE 1:500

SETTING OUT DATA-RECLAIMER ACCESS ROAD				
NAME	CH	E	N	DETAILS
START	0.000	503528.641	7976210.298	L 65.000m
END	65.000	503510.764	7978147.804	L 0.001m

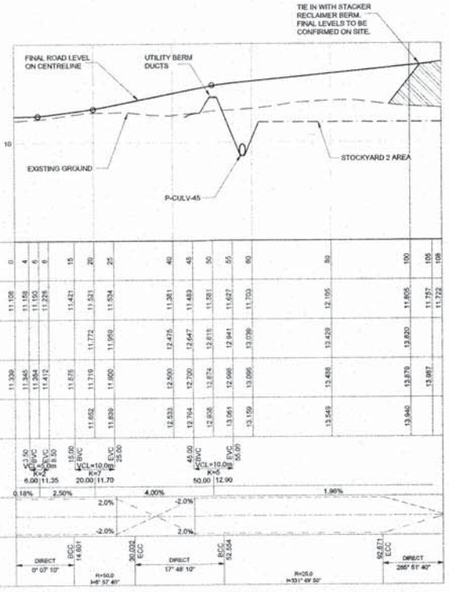
SETTING OUT DATA-RECLAIMER ACCESS ROAD - WEST				
NAME	CH	E	N	DETAILS
START	0.000	503470.902	7976307.871	L 14.801m
BCC1 PI1 ECC1	14.601 30.032	503470.872 503470.855 503468.477	7976293.270 7976285.493 7976278.068	R 50.000m DA 17°41'00" TL 7.777m AL 15.431m
BCC2 PI2 ECC2	52.554 92.871	503461.591 503453.885 503478.562	7976256.644 7976232.021 7976224.952	R 25.000m DA 91°56'30" TL 25.862m AL 40.117m
END	108.751	503494.029	7976220.558	L 16.080m

SETTING OUT DATA-RECLAIMER ACCESS ROAD - EAST				
NAME	CH	E	N	DETAILS
START	0.000	503538.441	7976307.871	L 37.229m
BCC1 PI1 ECC1	37.229 59.579	503538.441 503538.441 503543.353	7976270.642 7976259.277 7976249.029	R 50.000m DA 25°36'40" TL 11.365m AL 22.350m
BCC2 PI2 ECC2	70.830 117.229	503548.217 503568.063 503524.230	7976258.884 7976197.482 7976211.144	R 20.000m DA 132°55'20" TL 45.913m AL 46.399m
END	134.901	503507.358	7976216.403	L 17.673m

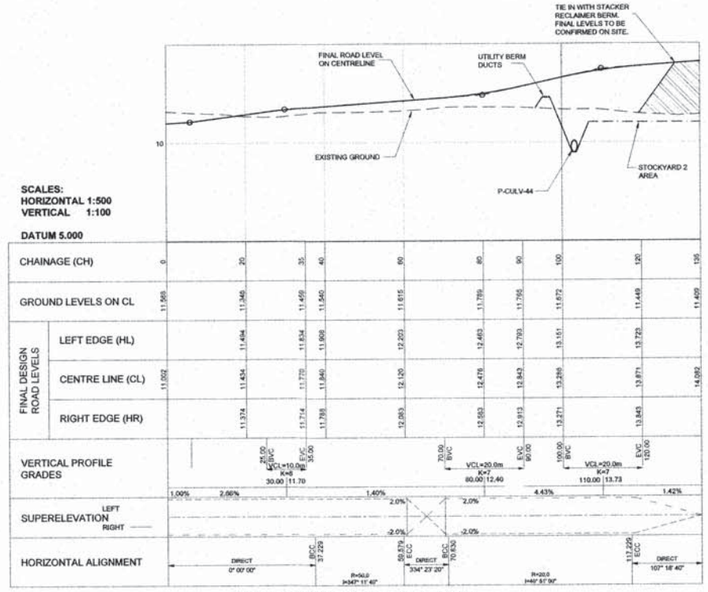


KEY PLAN

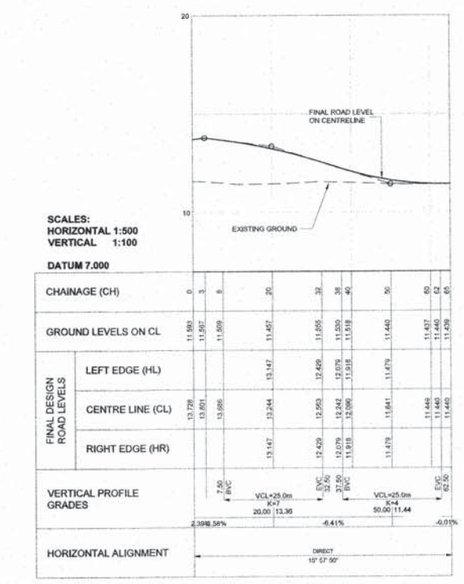
CULVERT SCHEDULE (THIS SCHEDULE TO BE READ IN CONJUNCTION WITH DRG. No. H353004-00000-221-294-0001-0001-TYPICAL CULVERT DETAILS)																			
								CULVERT AT UPSTREAM				CULVERT AT DOWNSTREAM				NOTE: FINAL U/S INVERT AND D/S INVERT LEVELS ARE TO BE CONFIRMED ON SITE			
CULVERT ID	FISH BEARING	NUMBER OF PIPES	D (mm)	LENGTH (m)	E (mm)	W (mm)	TYPE	NORTHING	EASTING	U/S INV. ELEV (m)	RIP RAP REQ'D	NORTHING	EASTING	D/S INV. ELEV (m)	RIP RAP REQ'D	C (mm)	L (m)	S (%)	SKEW (DEGREE)
P-CULV-44	N	1	900	22.54	0	900	CSP	7976201.604	503542.015	9.497	N	7976221.463	503531.367	9.452	Y	500	3.6	0.20	10
P-CULV-45	N	1	900	21.96	0	900	CSP	7976248.219	503471.058	9.317	N	7976254.910	503450.146	9.274	Y	500	3.6	0.20	18



RECLAIMER ACCESS ROAD - WEST
CH 0.000 TO CH 108.000



RECLAIMER ACCESS ROAD - EAST
CH 0.000 TO CH 134.901



RELAIMER ACCESS ROAD
CH 0 TO CH 65

NOTES:

1. LIDAR SURVEY PROVIDED BY PHOTSAT (2016)
2. CO-ORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
3. CONTOURS ARE IN METERS. CONTOUR INTERVAL IS 0.5m.
4. ALL DIMENSIONS SHOWN ARE IN METERS, UNLESS NOTED OTHERWISE.
5. FOR TYPICAL CROSS-SECTION DETAILS REFER TO THE PRIMARY ROAD SECTION ON DRAWING No. H353004-40000-221-273-0001-0001
6. SAFETY BERMS, 1m HIGH, TO BE CONSTRUCTED OVER THE ENTIRE WIDTH OF DITCH ON BOTH SIDES OF THE ROAD. FOR DITCH DETAILS REFER TO DRAWING No. H353004-40000-271-0010-0003.

CULVERT SCHEDULE LEGEND:

D	CULVERT DIAMETER
E	EMBEDMENT DEPTH
C	CULVERT SPACING AND BEDDING CLEARANCE C = 500 WHILE D < 900mm C = 300 WHILE D >= 900mm
W	CULVERT BACKFILL TOP WIDTH W = (n*D) + (n-1)*C n = no. of pipes/culvert
TYPE	CULVERT MATERIAL
U/S INV.	CULVERT UPSTREAM INVERT ELEVATION
D/S INV.	CULVERT DOWNSTREAM INVERT ELEVATION
L	RIPRAP APRON LENGTH L = 4xD (APPROX)
S	CULVERT SLOPE
LENGTH	CULVERT LENGTH
CSP	CORRUGATED STEEL PIPE

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date 2018-05-25
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

H353004-00000-221-294-0001-0001	TYPICAL CULVERT DETAILS
H353004-40000-221-273-0001-0001	TYPICAL CROSS SECTION DETAILS
H353004-40000-221-271-0003-0001	STOCKPILE 2 - STACKER RECLAIMER BERM
H353004-40000-228-271-0010-0003	STOCKPILE 2 - EASTERN BERM PLAN AND PROFILE SHEET 3 OF 3
DRAWING No.	DRAWING TITLE

REFERENCE DRAWINGS

REG. PROFESSIONAL: NORTHWEST TERRITORIES PROFESSIONAL ENGINEER, Name: B.A. HAUM, LICENCE: L2197, 2018-06-26

FOR CONSTRUCTION

THIS DRAWING WAS PREPARED BY HATCH LTD. (HATCH) FOR THE EXCLUSIVE USE OF EXPRESSED WITH MINES LP ("CLIENT") AND ITS USE IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT BETWEEN HATCH AND THE THE CLIENT, INCLUDING ANY LIMITATIONS ON LIABILITY CONTAINED THEREIN. THIS DRAWING AND ITS CONTENTS REMAIN THE INTELLECTUAL PROPERTY OF HATCH. NO OTHER PERSON OR ENTITY MAY USE OR RELY ON THIS DRAWING OR ITS CONTENTS UNLESS AUTHORIZED TO DO SO. THAT INCLUDES THE DRAWING FOR PURPOSES CONNECTED WITH THE PROJECT INCLUDED THE CONSTRUCTION, OPERATION, COMPLETION, MAINTENANCE, EXTENSION, REINSTATEMENT AND REPAIR OF THE PROJECT. THIS DRAWING AND THE INFORMATION CONTAINED HEREIN, WILL BE TREATED AS CONFIDENTIAL FOR ALL OTHER PURPOSES AND SHALL NOT BE DISCLOSED, WITHOUT THE WRITTEN CONSENT OF HATCH.

No.	DESCRIPTION	KVDM BY	FH CHK'D	14/06/2018 DATE	ROLE	NAME	SIGNATURE	DATE
0	APPROVED FOR CONSTRUCTION				DRAFTSPERSON	K VAN DER MERWE	NR	14/06/2018
					DESIGNER	H HIERBIST	NR	14/06/2018
					CHECKER	F HUGO		2018-06-22
					DESIGN COORD.	R GOOSEN		2018-06-21
					RESP. ENG.	R HALIM		2018-06-25
					LEAD DISC. ENG.	A GROBBELAAR		2018-06-25
					AREA LEAD	V LAVRIC		2018-06-25
					ENG. MANAGER	D STANGER		
					AREA MANAGER	T ATIBA		2018-06-25

REVISIONS

DRAWING APPROVAL STATUS: Approved for Construction

HATCH

Baffinland

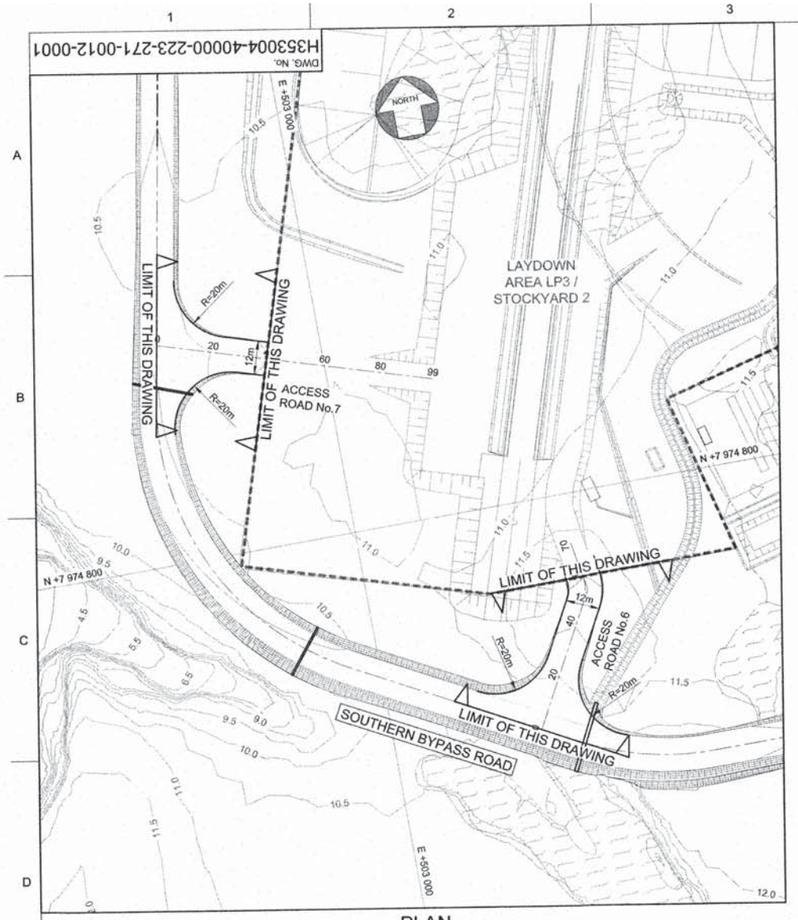
BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

PORT SITE - STOCKYARD 2
NORTHERN ACCESS ROADS
PLAN AND PROFILE

SCALE 1:500 OR AS NOTED | DWG. No. H353004-40000-223-271-0011-0001 | REV 0

SHEET SIZE: E

SCREENWARE STIMES SFILES



PLAN

SCALE 1:1000

ROAD DATA LEGEND:

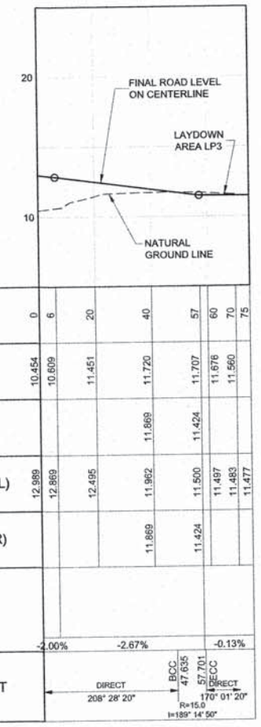
BVC	BEGINNING VERTICAL CURVE
EVC	END VERTICAL CURVE
BCC	BEGINNING CIRCULAR CURVE
ECC	END CIRCULAR CURVE
R	RADIUS (CURVE)
DA	DEFLECTION ANGLE (CURVE)
TL	TANGENT LENGTH (CURVE)
AL	ARC LENGTH (CURVE)

SETTING OUT DATA ACCESS ROAD No.7

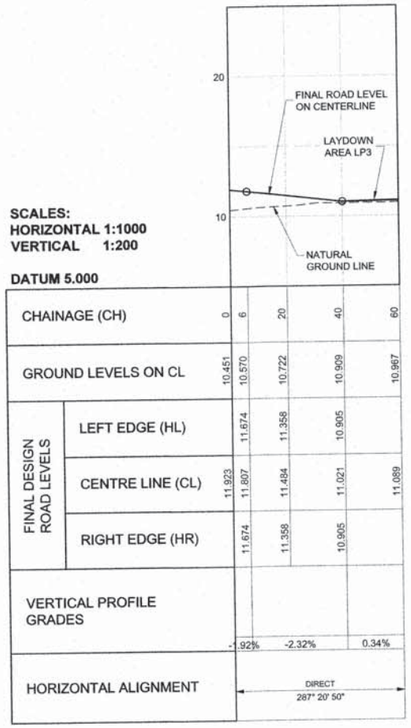
NAME	CH	E	N	DETAILS
START	0.000	502 942.589	7 974 878.453	
END	98.785	503 036.881	7 974 849.001	L 98.785m

SETTING OUT DATA ACCESS ROAD No.6

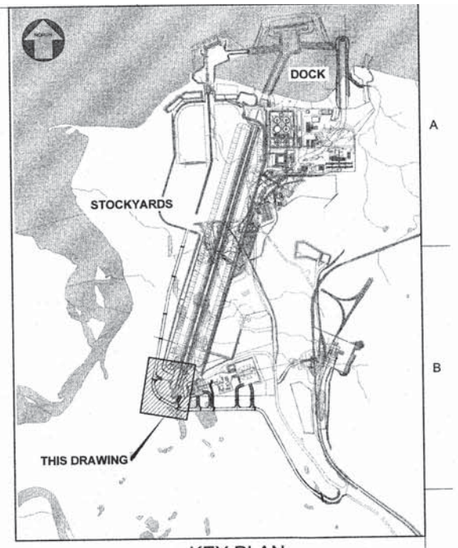
NAME	CH	E	N	DETAILS
START	0.000	503 052.575	7 974 718.485	L 47.635m
BCC1 PI1 ECC1	47.635 57.701	503 075.284 503 077.778 503 076.872	7 974 760.358 7 974 764.956 7 974 770.108	R 15.000m DA 38°27'00" TL 5.231m AL 10.066m
END	70.000	503 074.741	7 974 782.221	L 12.299m



ACCESS ROAD NO.6
FROM 0.000 TO 75.000



ACCESS ROAD NO.7
FROM 0.000 TO 60.000



KEY PLAN

NOTES:

1. LIDAR SURVEY PROVIDED BY PHOTSAT (2016)
2. CO-ORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
3. CONTOURS ARE IN METERS. CONTOUR INTERVAL IS 0.5m.
4. ALL DIMENSIONS SHOWN ARE IN METERS, UNLESS NOTED OTHERWISE.
5. FOR TYPICAL CROSS-SECTION DETAILS REFER TO THE PRIMARY ROAD SECTION ON DRAWING No. H353004-221-273-0001-0001

LEGEND:

- - - - - - - - LAYDOWN AREA BOUNDARY

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date 2018-06-25
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

DRAWING No.	DRAWING TITLE
H353004-40000-223-271-0006-0002	SOUTHERN BYPASS ROAD PLAN AND PROFILE SHEET 2
H353004-40000-223-271-0006-0001	SOUTHERN BYPASS ROAD PLAN AND PROFILE SHEET 1
H353004-10000-221-273-0001-0001	MODULE, PRIMARY AND SECONDARY ROADS - TYPICAL CROSS-SECTION

REFERENCE DRAWINGS

REGISTERED PROFESSIONAL ENGINEER
R. A. HALIM
LICENSEE
2019-06-25
NWT/NU

REG. PROFESSIONAL

FOR CONSTRUCTION

THIS DRAWING WAS PREPARED BY HATCH LTD. ("HATCH") FOR THE EXCLUSIVE USE OF BAFFINLAND IRON MINES LP ("CLIENT") AND ITS USE IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT BETWEEN HATCH AND THE THE CLIENT, INCLUDING ANY LIMITATIONS ON LIABILITY CONTAINED THEREIN. THIS DRAWING AND ITS CONTENTS REMAIN THE INTELLECTUAL PROPERTY OF HATCH SUBJECT TO CLIENT'S ROYALTY-FREE, IRREVOCABLE, PERPETUAL AND NON-EXCLUSIVE LICENSE TO USE AND REPRODUCE THE DRAWING FOR PURPOSES CONNECTED WITH THE PROJECT, INCLUDING THE CONSTRUCTION, COMPLETION, MAINTENANCE, EXTENSION, REINSTATEMENT AND REPAIR OF THE PROJECT. THIS DRAWING, AND THE INFORMATION CONTAINED HEREIN, SHALL BE TREATED AS CONFIDENTIAL FOR ALL OTHER PURPOSES AND SHALL NOT BE MODIFIED WITHOUT THE WRITTEN CONSENT OF HATCH.

No.	DESCRIPTION	BY	CHK'D	DATE
0	APPROVED FOR CONSTRUCTION	KVDM	FH	14/06/2018

REVISIONS

HATCH

DRAFTSPERSON	K VAN DER MERWE	NR	14/06/2018
DESIGNER	H HERBST	NR	14/06/2018
CHECKER	F HUGO		2018-06-21
DESIGN COORD.	R GOOSEN		2018-06-21
RESP. ENG.	R HALIM		2018-06-25
LEAD DISC. ENG.	A GROBBELAAR		2018-06-25
AREA LEAD	V LAVRIC		2018-06-25
ENG. MANAGER	D STANGER		2018-06-25
AREA MANAGER	T ATIBA		2018-06-26
ROLE	NAME	SIGNATURE	DATE

DRAWING APPROVAL STATUS: Approved for Construction

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

PORT SITE - STOCKYARD 2
SOUTHERN ACCESS ROADS
PLAN AND PROFILES

SCALE	DWG. No.	REV
1:1,000 OR AS NOTED	H353004-40000-223-271-0012-0001	0

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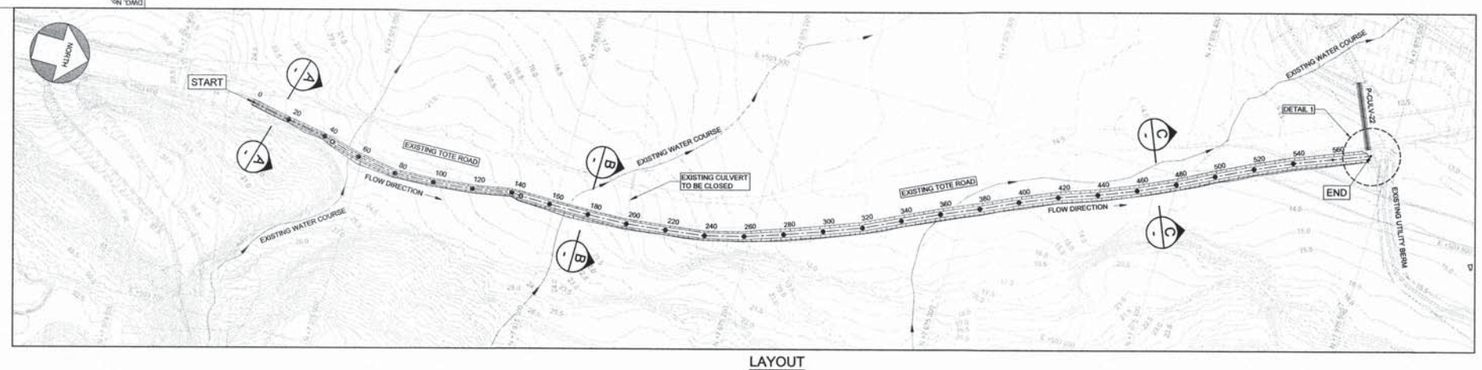
$DATES
$FILES
STIMES

DWG. No. H353004-40000-223-271-0009-0001



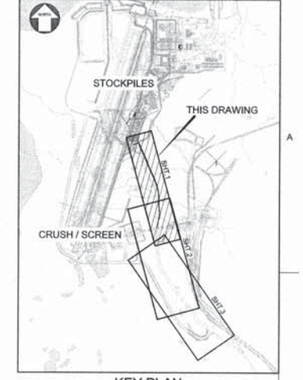
LAYOUT
SCALE 1:1000

NOTES:

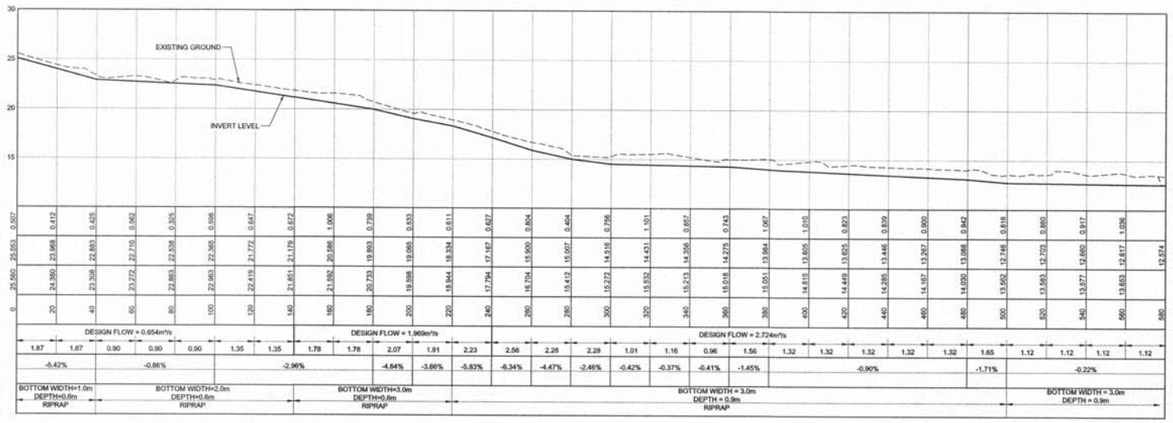
1. LIDAR SURVEY PROVIDED BY PHOTOSAT (2016)
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
3. EG CONTOURS AND ELEVATIONS ARE IN METERS. CONTOUR INTERVAL IS 0.5m.
4. ALL DIMENSIONS ARE IN MILLIMETER UNLESS NOTED OTHERWISE.

LEGEND:

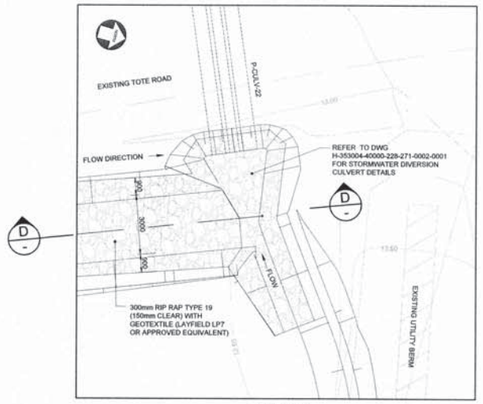
10.20	CONTOUR ELEVATION
EG	EXISTING GROUND



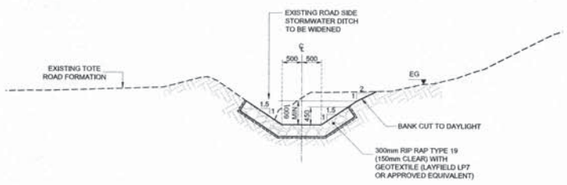
KEY PLAN



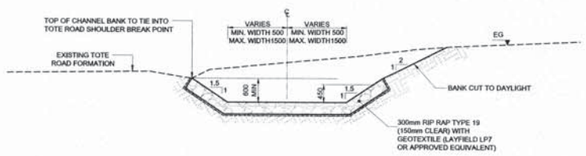
ROADSIDE CHANNEL LONGITUDINAL PROFILE



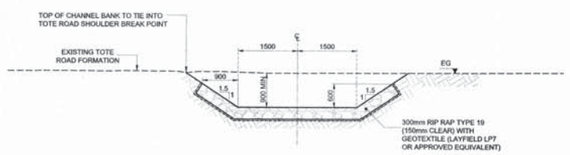
DETAIL 1
SCALE 1:100



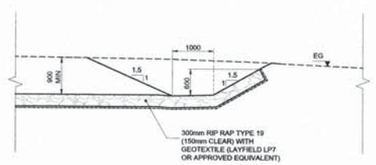
SECTION A-A
TYPICAL CROSS SECTION DETAIL OF EXISTING ROADSIDE STORMWATER DITCH UPGRADE
SCALE 1:50



SECTION B-B
TYPICAL CROSS SECTION DETAIL OF 600mm DEEP ROADSIDE CHANNEL
SCALE 1:50



SECTION C-C
TYPICAL CROSS SECTION DETAIL OF 900mm DEEP ROADSIDE CHANNEL
SCALE 1:50



SECTION D-D
SCALE 1:50

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

DRAWING No.	DRAWING TITLE
H353004-40000-223-271-0009-0002	TOTE ROAD UPGRADE - SHEET 2
H353004-40000-228-271-0002-0001	CONSTRUCTION PHASE- ACCESS ROADS DRAINAGE DETAILS
H353004-00000-221-294-0002-0010	STANDARD DRAWING - EARTHWORKS AND DRAINAGE
H353004-00000-221-294-0001-0001	STANDARD DRAWING - TYPICAL CULVERT DETAIL
H353004-00000-220-272-0001-0001	PORT SITE - BLOCK PLAN

REFERENCE DRAWINGS

REGISTERED PROFESSIONAL ENGINEER R. A. HALIM LICENSEE 2018-09-14 NWT/NU
REG. PROFESSIONAL

FOR CONSTRUCTION

THIS DRAWING WAS PREPARED BY HATCH LTD. ("HATCH") FOR THE EXCLUSIVE USE OF BAFFINLAND IRON MINES LP ("CLIENT") AND ITS USE IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT BETWEEN HATCH AND THE THE CLIENT, INCLUDING ANY LIMITATIONS ON LIABILITY CONTAINED THEREIN. THIS DRAWING AND ITS CONTENTS REMAIN THE INTELLECTUAL PROPERTY OF HATCH. NO OTHER PERSON MAY USE, RELY ON, OR REPRODUCE THIS DRAWING OR ITS CONTENTS, AND HATCH EXCLUDES ANY LIABILITY TO ANY PERSON WHO DOES SO. THE DRAWING AND ITS CONTENTS MAY NOT BE USED FOR ANY PURPOSE NOT INTENDED BY HATCH IN CONNECTION WITH THE PROJECT THAT THE DRAWING AND THE INFORMATION CONTAINED HEREIN, SHALL BE TREATED AS CONFIDENTIAL FOR ALL OTHER PURPOSES AND SHALL NOT BE DISCLOSED WITHOUT THE WRITTEN CONSENT OF HATCH.

No.	DESCRIPTION	BY	CHK'D	DATE
1	EDC STAMP REMOVED	KvdM	FH	17/09/2018
0	FOR CONSTRUCTION	HH	FH	10/04/2018

REVISIONS

HATCH

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	H HERBST	NR	10/04/2018
DESIGNER	H HERBST	NR	10/04/2018
CHECKER	F HUGO		2018-09-14
DESIGN COORD.	R GOOSEN		2018-09-13
RESP. ENG.	R HALIM		2018-09-14
LEAD DISC. ENG.	A GROBBELAAR		2018-09-13
AREA LEAD	V LAVRIC		2018-09-17
ENG. MANAGER	D STANGER		
AREA MANAGER	T ATIBA		18-09-18

DRAWING APPROVAL STATUS: Approved for Construction

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

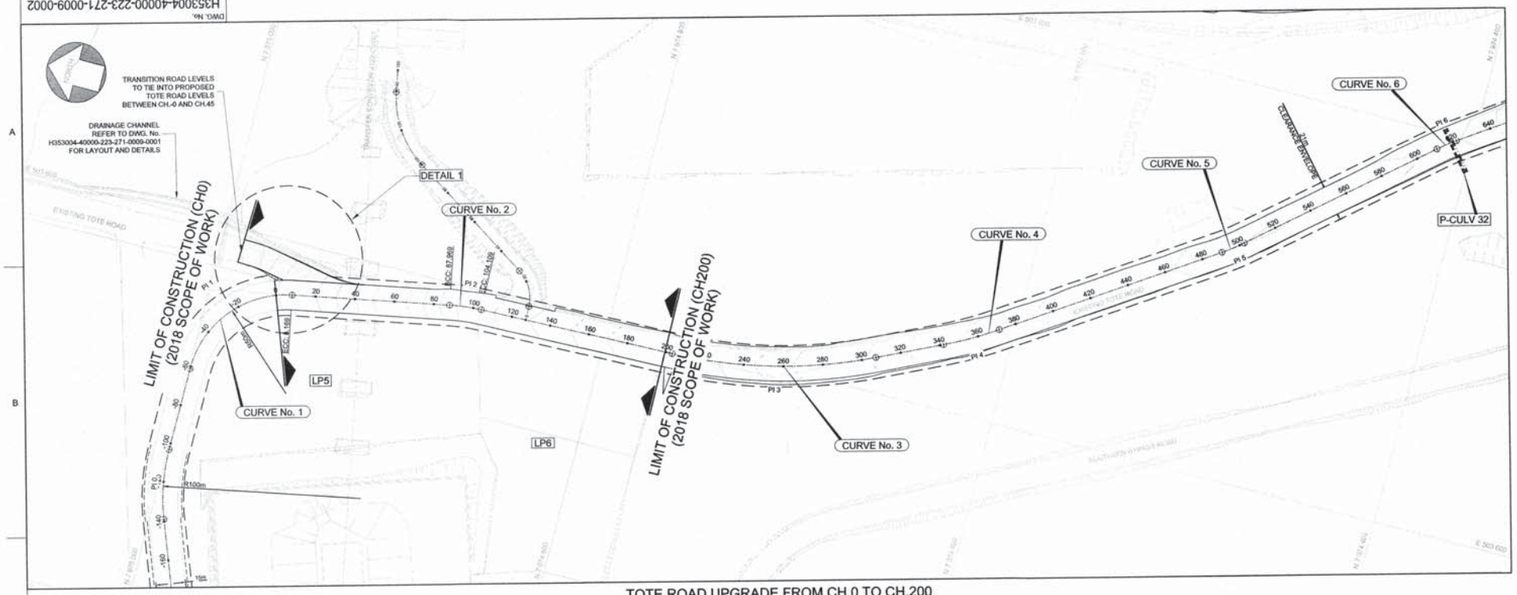
PORT SITE
TOTE ROAD DRAINAGE UPGRADE
PLAN AND PROFILE SHEET 1 OF 3

SCALE 1:1,000 OR AS NOTED | DWG. No. H353004-40000-223-271-0009-0001 | REV 1

SHEET SIZE: E

USERNAME
DATE
TIME
SCALE

DWG. No. H353004-40000-223-271-0009-0002



TOTE ROAD UPGRADE FROM CH.0 TO CH.200

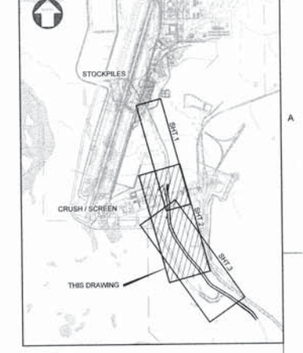
SCALE 1:1000

NOTES:

1. LIDAR SURVEY PROVIDED BY PHOTOSAT (2016)
2. CO-ORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
3. CONTOURS ARE IN METERS. CONTOUR INTERVAL IS 0.5m.
4. ALL DIMENSIONS SHOWN ARE IN METERS, UNLESS NOTED OTHERWISE.
5. REFER TO PRIMARY ROAD - TYPICAL CROSS SECTION ON DRAWING No.H353004-40000-221-273-0001-0001 FOR TYPICAL LAYER WORKS. ROAD WIDTH TO BE 15m.

LEGEND:

- 195 — CONTOUR ELEVATION
- 43 — SETTING OUT POINT NUMBER
- EG — EXISTING GROUND
- LIMIT OF CONSTRUCTION UNDER THIS CONTRACT



CH 0

LIMIT OF CONSTRUCTION 2018 SCOPE OF WORKS

CH 200

SETTING OUT DATA - TOTE ROAD UPGRADE

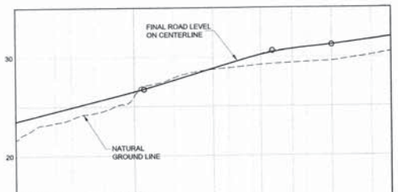
NAME	CH	E	N	DETAILS
START	-60.936	503 524.748	7 974 999.210	L 0.000m
BCC1 PI1 CH 0 ECC1	-60.936 0 8.169	503 524.748 503 566.133 503 571.670 503 573.888	7 974 999.210 7 974 999.238 7 974 966.471 7 974 958.622	R 50.000m DA 79°11'20" TL 41.355m AL 69.105m
BCC2 PI2 ECC2	87.969 104.109	503 588.910 503 590.433 503 590.659	7 974 880.248 7 974 872.305 7 974 864.221	R 100.000m DA 9°14'59" TL 8.067m AL 16.139m
BCC3 PI3 ECC3	203.298 307.159	503 593.434 503 594.908 503 617.514	7 974 765.070 7 974 712.400 7 974 664.806	R 250.000m DA 23°48'10" TL 52.690m AL 103.861m
BCC4 PI4 ECC4	342.041 371.248	503 632.479 503 638.756 503 646.888	7 974 633.297 7 974 620.083 7 974 607.923	R 200.000m DA 8°22'00" TL 14.629m AL 29.206m
BCC5 PI5 ECC5	490.493 502.610	503 713.178 503 716.550 503 720.507	7 974 508.800 7 974 503.758 7 974 499.160	R 100.000m DA 6°56'30" TL 6.066m AL 12.117m
BCC6 PI6 ECC6	611.118 621.845	503 791.287 503 794.789 503 797.836	7 974 416.916 7 974 412.847 7 974 408.426	R 100.000m DA 6°08'50" TL 5.369m AL 10.727m
BCC7 PI7 ECC7	722.946 764.756	503 855.201 503 867.238 503 885.332	7 974 325.176 7 974 307.767 7 974 296.630	R 100.000m DA 23°57'20" TL 21.215m AL 41.809m
END	865.116	503 987.982	7 974 233.787	L 120.360m

ROAD DATA LEGEND:

BVC	BEGINNING VERTICAL CURVE
EVC	END VERTICAL CURVE
BCC	BEGINNING CIRCULAR CURVE
ECC	END CIRCULAR CURVE
R	RADIUS (CURVE)
DA	DEFLECTION ANGLE (CURVE)
TL	TANGENT LENGTH (CURVE)
AL	ARC LENGTH (CURVE)
CH	CHAINAGE

SCALES:
HORIZONTAL 1:1000
VERTICAL 1:200

DATUM 15.000



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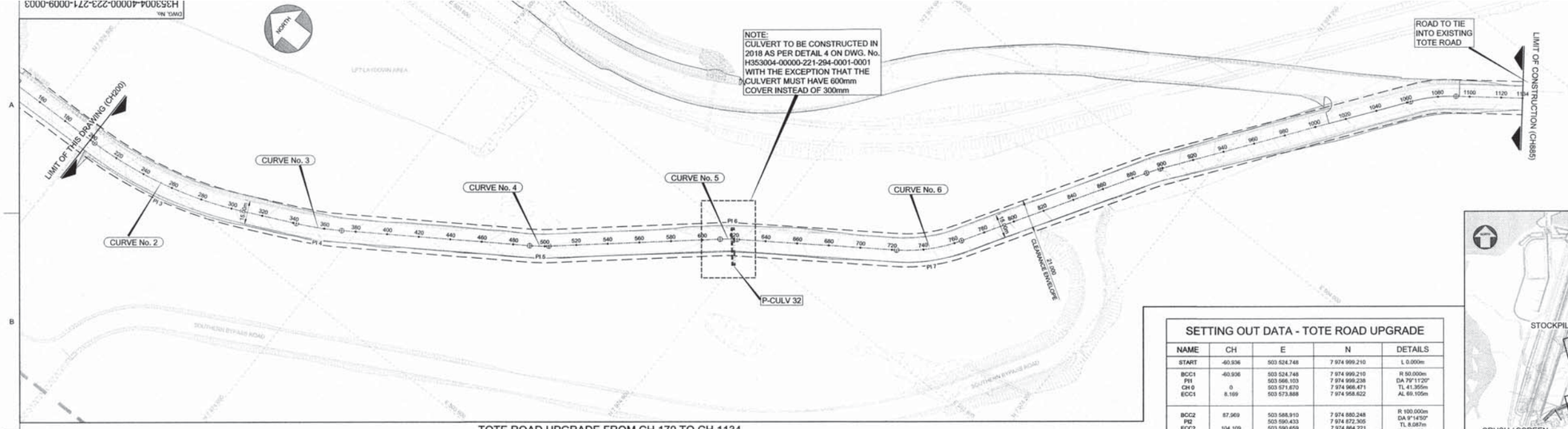
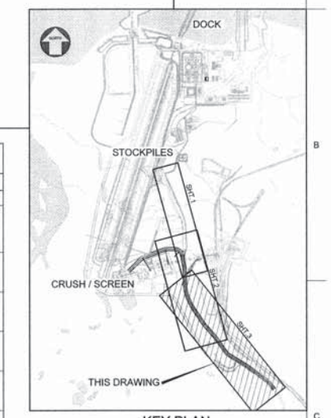


PERMIT TO PRACTICE
HATCH LTD.
Signature
Date
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

TOTE ROAD UPGRADE FROM CH.170 TO CH.1134

SCALE 1:1000



KEY PLAN

SETTING OUT DATA - TOTE ROAD UPGRADE

NAME	CH	E	N	DETAILS
START	-60.936	503 524.748	7 974 999.210	L 0.000m
BCC1 PI1 CH 0 ECC1	-60.936 0 8.169	503 524.748 503 588.103 503 571.670 503 573.888	7 974 999.210 7 974 999.238 7 974 968.471 7 974 958.622	R 50.000m DA 79°11'20" TL 41.355m AL 69.105m
BCC2 PI2 ECC2	87.969 104.109	503 588.910 503 590.433 503 590.659	7 974 880.248 7 974 872.305 7 974 864.221	R 100.000m DA 9°14'50" TL 8.087m AL 16.139m
BCC3 PI3 ECC3	203.298 307.159	503 593.434 503 594.908 503 617.514	7 974 765.070 7 974 712.400 7 974 664.806	R 250.000m DA 23°48'10" TL 52.690m AL 103.861m
BCC4 PI4 ECC4	342.041 371.248	503 632.479 503 638.756 503 646.888	7 974 633.297 7 974 620.083 7 974 607.923	R 200.000m DA 8°22'00" TL 14.629m AL 29.206m
BCC5 PI5 ECC5	490.493 502.610	503 713.178 503 716.550 503 720.507	7 974 508.800 7 974 503.758 7 974 499.160	R 100.000m DA 6°56'32" TL 6.066m AL 12.117m
BCC6 PI6 ECC6	611.118 621.845	503 791.287 503 794.789 503 797.836	7 974 416.916 7 974 412.847 7 974 408.426	R 100.000m DA 6°08'52" TL 5.369m AL 10.727m
BCC7 PI7 ECC7	722.948 764.756	503 855.201 503 867.238 503 885.332	7 974 325.176 7 974 307.707 7 974 296.630	R 100.000m DA 23°57'20" TL 21.215m AL 41.809m
END	885.116	503 987.982	7 974 233.787	L 120.360m

NOTES:

1. LIDAR SURVEY PROVIDED BY PHOTOSAT (2016)
2. CO-ORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
3. CONTOURS ARE IN METERS. CONTOUR INTERVAL IS 0.5m.
4. ALL DIMENSIONS SHOWN ARE IN METERS, UNLESS NOTED OTHERWISE.
5. REFER TO PRIMARY ROAD - TYPICAL CROSS SECTION ON DRAWING No.H353004-40000-221-273-0001-0001 FOR TYPICAL LAYER WORKS. ROAD WIDTH TO BE 15m.

LEGEND:

196 — CONTOUR ELEVATION

LIMIT OF CONSTRUCTION UNDER THIS CONTRACT

CULVERT SCHEDULE

(THIS SCHEDULE TO BE READ IN CONJUNCTION WITH DRG. No. H353004-00000-221-294-0001-0001-TYPICAL CULVERT DETAILS)

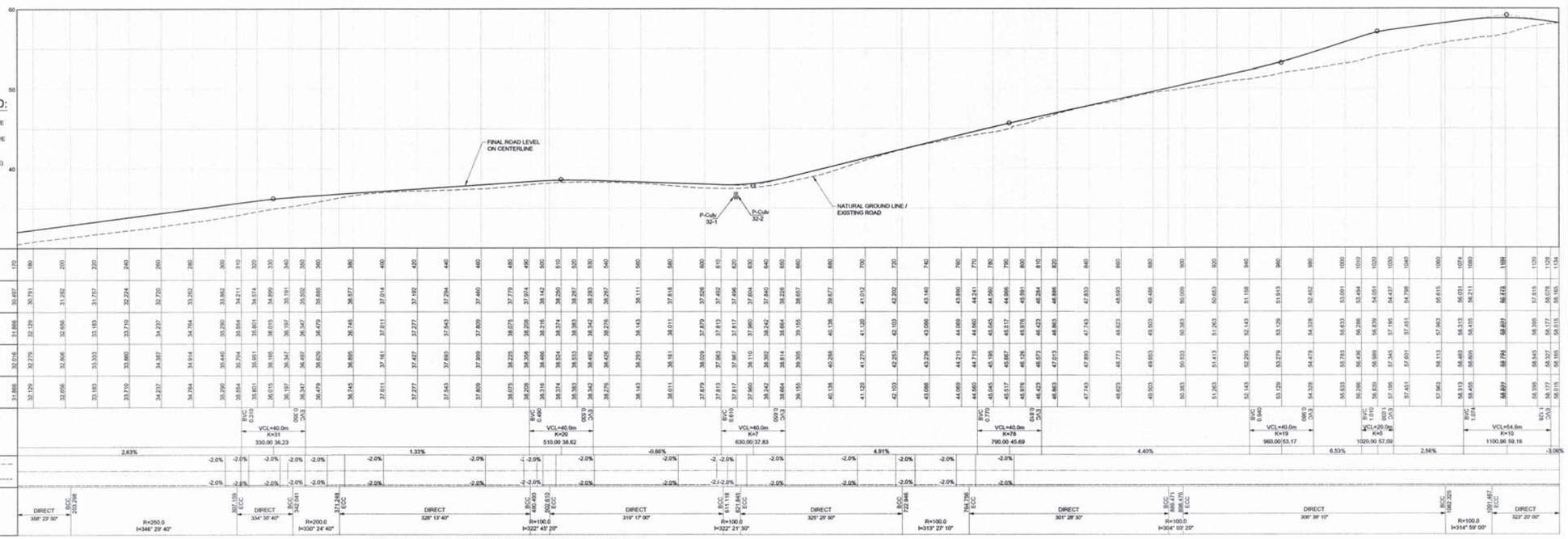
								CULVERT AT UPSTREAM				CULVERT AT DOWNSTREAM		NOTE: FINAL U/S INVERT AND D/S INVERT LEVELS ARE TO BE CONFIRMED ON SITE					
CULVERT ID	FISH BEARING	NUMBER OF PIPES	D (mm)	LENGTH (m)	E (mm)	W (mm)	TYPE	NORTHING	EASTING	U/S INV. ELEV (m)	RIP RAP REQ'D	NORTHING	EASTING	D/S INV. ELEV (m)	RIP RAP REQ'D	C (mm)	L (m)	S (%)	SKEW (DEGREE)
P-CULV. 32	N	2	900	24.150	0	2300	CSP	7974415.110	503802.11	36.500	Y	7974399.888	503783.482	35.350	Y	500	3.6000	4.7500	90

ROAD DATA LEGEND:

BVC	BEGINNING VERTICAL CURVE
EVC	END VERTICAL CURVE
BCC	BEGINNING CIRCULAR CURVE
ECC	END CIRCULAR CURVE
R	RADIUS (CURVE)
DA	DEFLECTION ANGLE (CURVE)
TL	TANGENT LENGTH (CURVE)
AL	ARC LENGTH (CURVE)
CH	CHAINAGE

SCALES:
HORIZONTAL 1:1000
VERTICAL 1:200

DATUM 30.000



LONGITUDINAL SECTION FROM CH.170 TO CH.885

DRAWING No.	DRAWING TITLE
H353004-00000-221-294-0001-0001	TYPICAL CULVERT DETAILS
H353004-40000-221-273-0001-0001	MODULE, PRIMARY AND SECONDARY ROADS - TYPICAL CROSS SECTIONS
H353004-40000-223-271-0009-0002	TOTE ROAD UPGRADE - PLAN AND PROFILE SHEET 2 OF 3

REFERENCE DRAWINGS

REG. PROFESSIONAL: R. A. HALM, LICENSEE 2018-09-14

FOR CONSTRUCTION

THIS DRAWING WAS PREPARED BY HATCH LTD. PLOTTED FOR THE EXCLUSIVE USE OF BAFFINLAND IRON MINES LP ("CLIENT") AND ITS USE IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT BETWEEN HATCH AND THE THE CLIENT (INCLUDES ANY LIMITATIONS ON LIABILITY CONTAINED THEREIN). THIS DRAWING AND ITS CONTENTS REMAIN THE INTELLECTUAL PROPERTY OF HATCH SUBJECT TO CLIENT'S ROYALTY-FREE, IRREVOCABLE, PERPETUAL AND NON-EXCLUSIVE LICENSE TO USE THE DOCUMENT FOR ANY PURPOSE RELATED TO THE PROJECT. ANY USE OF THE DOCUMENT FOR ANY PURPOSE OTHER THAN THE COMPLETION, MAINTENANCE, EXTENSION, REINSTATEMENT AND REPAIR OF THE PROJECT, THIS DRAWING, AND THE INFORMATION CONTAINED HEREIN, SHALL BE TREATED AS CONFIDENTIAL FOR ALL OTHER PURPOSES AND SHALL NOT BE DISCLOSED WITHOUT THE WRITTEN CONSENT OF HATCH.

No.	DESCRIPTION	BY	CHK'D	DATE
1	EDC STAMP REMOVED	KVDM	FH	21/08/2018
0	APPROVED FOR CONSTRUCTION	IB	FH	10/04/2018

REVISIONS

HATCH

DRAFTSPERSON	I BARNARD	NR	10/04/2018
DESIGNER	E BALEQUAMIRE	NR	10/04/2018
CHECKER	P HUGO		2018-09-14
DESIGN COORD.	R GOOSEN		2018-09-13
RESP. ENG.	R HALM		2018-09-14
LEAD DISC. ENG.	A GROBBELAAR		2018-09-13
AREA LEAD	V LAVRIC		2018-09-13
ENG. MANAGER	D STANGER		2018-09-13
AREA MANAGER	T ATIBA		18-09-13

DRAWING APPROVAL STATUS: Approved for Construction

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

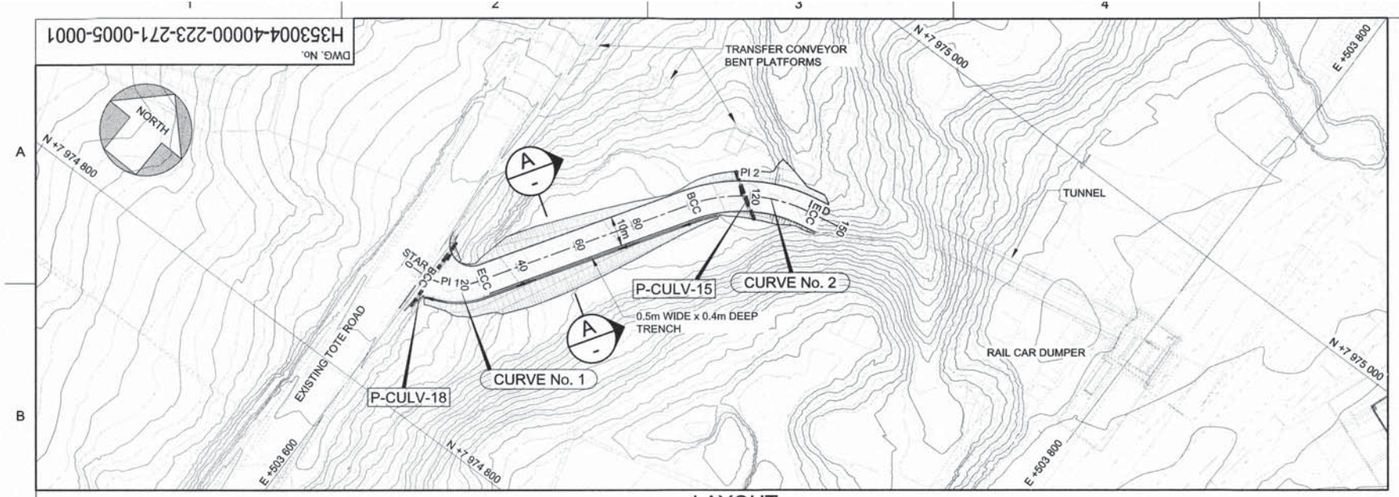
PORT SITE
TOTE ROAD UPGRADE
PLAN AND PROFILE SHEET 3 OF 3

SCALE 1:1,000 OR AS NOTED | DWG. No. H353004-40000-223-271-0009-0003 | REV 1

SHEET SIZE: E

$USERNAME$
$DATE$
$TIME$

DWG. No. H353004-40000-223-271-0005-0001



LAYOUT

SCALE 1:1000

NOTES:

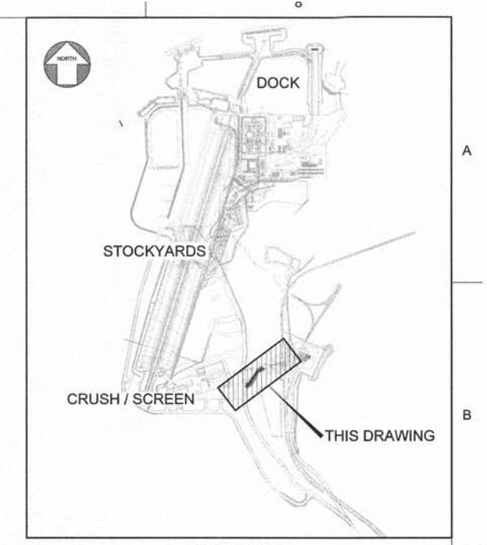
1. LIDAR SURVEY PROVIDED BY PHOTOSAT (2016)
2. CO-ORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
3. CONTOURS ARE IN METERS. CONTOUR INTERVAL IS 0.5m.
4. ALL DIMENSIONS SHOWN ARE IN METERS, UNLESS NOTED OTHERWISE.
5. REFER TO DRAWING No.H353004-40000-221-273-0001-0001 FOR TYPICAL PRIMARY ROAD CROSS SECTION.

LEGEND:

198 CONTOUR ELEVATION

CULVERT SCHEDULE LEGEND:

D	CULVERT DIAMETER
E	EMBEDMENT DEPTH
C	CULVERT SPACING AND BEDDING CLEARANCE C = 500 WHILE D > 900mm C = 300 WHILE D < = 900mm
W	CULVERT BACKFILL TOP WIDTH W = (n*D) + (n-1)*C n = No. OF PIPE/CULVERT
TYPE	CULVERT MATERIAL
U/S INV.	CULVERT UPSTREAM INVERT ELEVATION
D/S INV.	CULVERT DOWNSTREAM INVERT ELEVATION
L	RIPRAP APRON LENGTH L = 4xD (APPROX)
S	CULVERT SLOPE
LENGTH	CULVERT LENGTH
CSP	CORRUGATED STEEL PIPE



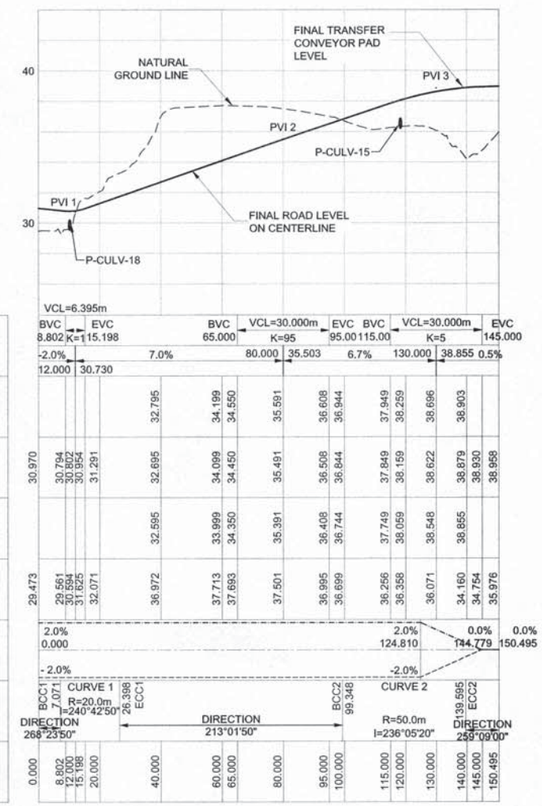
KEY PLAN

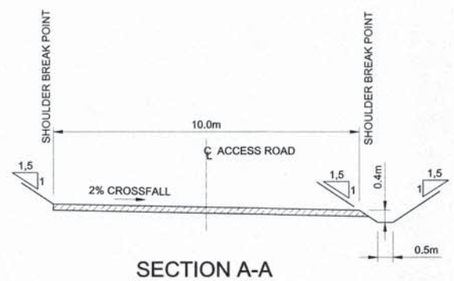
ROAD DATA LEGEND:

BVC	BEGINNING VERTICAL CURVE
EVC	END VERTICAL CURVE
BCC	BEGINNING CIRCULAR CURVE
ECC	END CIRCULAR CURVE
R	RADIUS (CURVE)
DA	DEFLECTION ANGLE (CURVE)
TL	TANGENT LENGTH (CURVE)
AL	ARC LENGTH (CURVE)

SCALES:
HORIZONTAL 1:1000
VERTICAL 1:200

DATUM 24.000





SECTION A-A

SCALE 1:100

CULVERT SCHEDULE

(THIS SCHEDULE TO BE READ IN CONJUNCTION WITH DRG. No. H353004-00000-221-294-0001-0001-TYPICAL CULVERT DETAILS

								CULVERT AT UPSTREAM				CULVERT AT DOWNSTREAM		NOTE: FINAL U/S INVERT AND D/S INVERT LEVELS ARE TO BE CONFIRMED ON SITE					
CULVERT ID	FISH BEARING	NUMBER OF PIPES	D (mm)	LENGTH (m)	E (mm)	W (mm)	TYPE	NORTHING	EASTING	U/S INV. ELEV (m)	RIP RAP REQ'D	NORTHING	EASTING	D/S INV. ELEV (m)	RIP RAP REQ'D	C (mm)	L (m)	S (%)	SKEW (DEGREE)
P-CULV-15	N	1	600	15.003	0	600	CSP	7 974 921.120	503 673.84	36.524	Y	7 974 929.046	503 661.112	35.946	Y	300	2.4	3.854	68
P-CULV-18	N	1	600	25.400	0	600	CSP	7 974 830.712	503 601.78	29.625	Y	7 974 856.116	503 601.143	29.498	Y	300	2.4	0.5	90

SETTING OUT DATA - DUMPER TUNNEL ACCESS ROAD

NAME	CH	E	N	DETAILS
START	0.000	503 591.305	7 974 841.126	L 7.071m
BCC1 PI1 ECC1	7.071 26.398	503 598.374 503 608.862 503 614.582	7 974 841.324 7 974 841.618 7 974 850.415	R 20.000m DA 55°22'00" TL 10.493m AL 19.327m
BCC2 PI2 ECC2	99.348 139.595	503 654.345 503 665.947 503 686.852	7 974 911.575 7 974 929.421 7 974 933.428	R 50.000m DA 46°07'10" TL 21.286m AL 40.247m
END	150.495	503 697.557	7 974 935.480	L 10.900m

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date 2018-05-14
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

DRAWING No.	DRAWING TITLE
H353004-40000-223-271-0009-0002	TOTE ROAD UPGRADE - PLAN AND PROFILE SHEET 2 OF 3
H353004-40000-221-272-0001-0001	ROTARY CAR DUMPER - LAYOUT PLAN
H353004-00000-221-294-0001-0001	STANDARD DRAWING - TYPICAL CULVERT DETAILS
H353004-40000-221-273-0001-0001	HAUL, PRIMARY AND SECONDARY ROADS - TYPICAL CROSS SECTIONS

REFERENCE DRAWINGS

REGISTERED PROFESSIONAL ENGINEER L247 R. A. HALIM LICENSEE 2018-09-14 NWT/NU

REG. PROFESSIONAL

FOR CONSTRUCTION

THIS DRAWING WAS PREPARED BY HATCH LTD. ("HATCH") FOR THE EXCLUSIVE USE OF BAFFINLAND IRON MINES LP ("CLIENT") AND ITS USE IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT BETWEEN HATCH AND THE THE CLIENT, INCLUDING ANY LIMITATIONS ON LIABILITY CONTAINED THEREIN. THIS DRAWING AND ITS CONTENTS REMAIN THE INTELLECTUAL PROPERTY OF HATCH SUBJECT TO CLIENT'S ROYALTY-FREE, IRREVOCABLE, PERPETUAL AND NON-EXCLUSIVE LICENSE TO USE AND REPRODUCE THE DRAWING FOR PURPOSES CONNECTED WITH THE PROJECT, INCLUDING THE CONSTRUCTION, COMPLETION, MAINTENANCE, EXTENSION, REINSTATEMENT AND REPAIR OF THE PROJECT. THIS DRAWING, AND THE INFORMATION CONTAINED HEREIN, SHALL BE TREATED AS CONFIDENTIAL FOR ALL OTHER PURPOSES AND SHALL NOT BE MODIFIED WITHOUT THE WRITTEN CONSENT OF HATCH.

No.	DESCRIPTION	BY	CHK'D	DATE
1	ENVIRO NOTE REMOVED	KvdM	FH	16/08/2018
0	APPROVED FOR CONSTRUCTION	KvdM	EB	19/04/2018

REVISIONS

HATCH

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	K VAN DER MERWE	NR	10/04/2018
DESIGNER	E BALEGAMIRE	NR	10/04/2018
CHECKER	E BALEGAMIRE		2018-09-14
DESIGN COORD.	R GOOSEN		2018-09-13
RESP. ENG.	R HALIM		2018-09-14
LEAD DISC. ENG.	A GROBBELAAR		2018-09-13
AREA LEAD	V LAVRIC		2018-09-17
ENG. MANAGER	D STANGER		2018-09-17
AREA MANAGER	T ATIBA		18-09-17

DRAWING APPROVAL STATUS: Approved for Construction

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

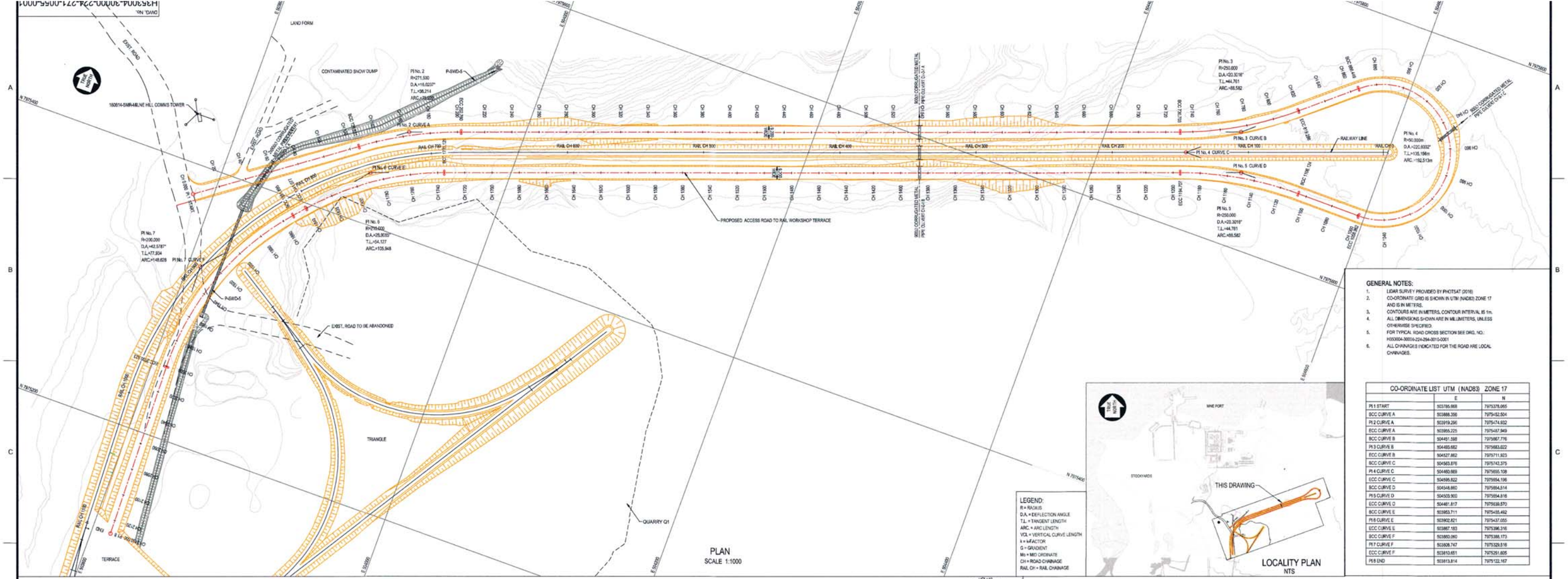
PORT SITE
DUMPER TUNNEL ACCESS ROAD
PLAN & PROFILE

SCALE 1:1,000 OR AS NOTED | DWG. No. H353004-40000-223-271-0005-0001 | REV 1

SHEET SIZE: D

$USERNAMES $TIMES
$DATES

DWG. No.
H353004-30000-224-271-0055-0001



PLAN
SCALE 1:1000

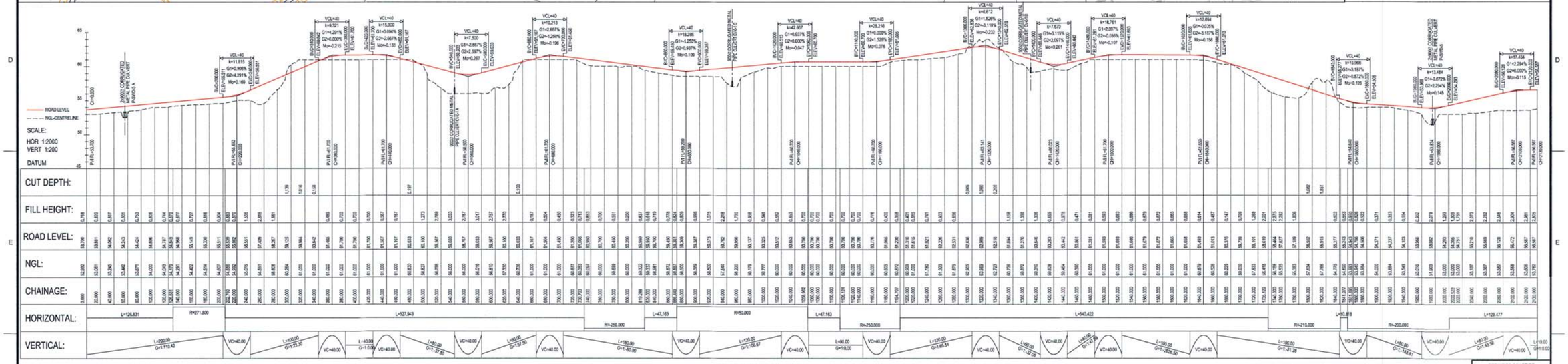
GENERAL NOTES:

1. LIDAR SURVEY PROVIDED BY PHOTSAT (2016)
2. CO-ORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
3. CONTOURS ARE IN METERS, CONTOUR INTERVAL IS 1m.
4. ALL DIMENSIONS SHOWN ARE IN MILLIMETERS, UNLESS OTHERWISE SPECIFIED.
5. FOR TYPICAL ROAD CROSS SECTION SEE DRG. NO.: H353004-30000-224-294-0010-0001
6. ALL CHAINAGES INDICATED FOR THE ROAD ARE LOCAL CHAINAGES.

CO-ORDINATE LIST UTM (NAD83) ZONE 17

	E	N
PI 1 START	503785.968	7975378.065
BCC CURVE A	503888.356	7975452.504
PI 2 CURVE A	503919.296	7975474.932
ECC CURVE A	503955.225	7975487.949
BCC CURVE B	504451.598	7975867.776
PI 3 CURVE B	504485.582	7975893.822
ECC CURVE B	504527.862	7975711.923
BCC CURVE C	504563.876	7975743.375
PI 4 CURVE C	504460.989	7975655.108
ECC CURVE C	504595.822	7975654.196
BCC CURVE D	504548.660	7975654.514
PI 5 CURVE D	504503.903	7975654.816
ECC CURVE D	504461.817	7975658.870
BCC CURVE E	503853.711	7975455.492
PI 6 CURVE E	503902.821	7975437.055
ECC CURVE E	503867.183	7975396.316
BCC CURVE F	503860.060	7975388.173
PI 7 CURVE F	503808.747	7975329.518
ECC CURVE F	503810.651	7975251.605
PI 8 END	503813.814	7975122.167

LEGEND:
R = RADIUS
D.A. = DEFLECTION ANGLE
T.L. = TANGENT LENGTH
ARC. = ARC LENGTH
VCL = VERTICAL CURVE LENGTH
k = k-FACTOR
G = GRADIENT
Mo = MID ORDINATE
CH = ROAD CHAINAGE
RAIL CH = RAIL CHAINAGE



LONGITUDINAL SECTION

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date
PERMIT NUMBER: P 012
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

H353004-30000-224-294-0010	TYPICAL HAUL ROAD CROSS SECTION
H353004-30000-224-273-0033	CROSS SECTIONS CH. 0+000 TO CH. 2+130km
DRAWING No.	DRAWING TITLE

REFERENCE DRAWINGS

REGISTERED PROFESSIONAL ENGINEER
N.W.T.
R. A. HALIM
LICENSEE
2018-09-05
NWT/NU

REG. PROFESSIONAL

FOR CONSTRUCTION

No.	DESCRIPTION	BY	CHK'D	DATE
0	APPROVED FOR CONSTRUCTION	AJVN	AA	2018/09/04

REVISIONS

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HATCH

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	A VAN NIEKERK	NR	2018/08/21
DESIGNER	A VAN NIEKERK	NR	2018/08/21
CHECKER	A AQUIL		2018/09/10
DESIGN COORD.	A AQUIL		2018/09/10
RESP. ENG.	R HALIM		2018-09-05
LEAD DESC. ENG.	F VAN BILJON		2018-09-11
AREA LEAD	F VAN BILJON		2018-09-11
ENG. MANAGER	D STANGER		
AREA MANAGER	F PITTMAN		2018-09-11

DRAWING APPROVAL STATUS: APPROVED FOR CONSTRUCTION

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER PROJECT

PORT RAIL SITE
LAYOUT AND LONGITUDINAL SECTION
ACCESS ROAD TO RAIL WORKSHOP

SCALE	DWG. No.	REV
1:1,000 (OR AS NOTED)	H353004-30000-224-271-0055-0001	0

SHEET SIZE: A0

SUBMARINES
STRUTS
SPILLS