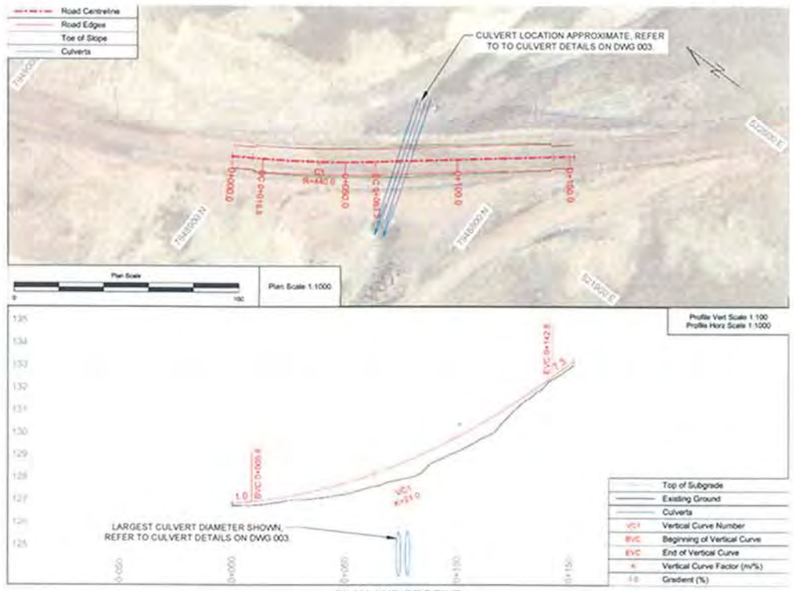
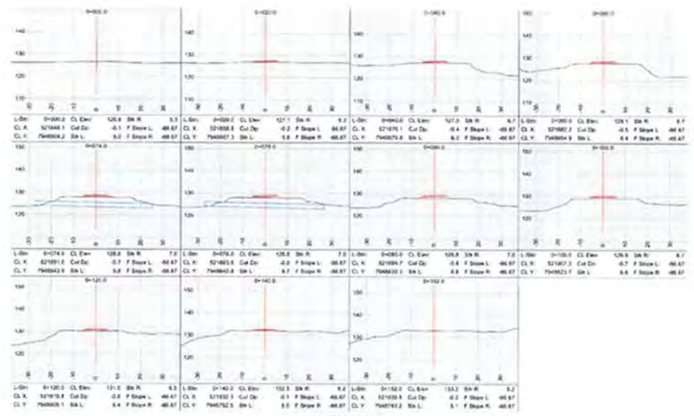
Reduced Size
NOT TO SCALE



PLAN AND PROFILE



SECTIONS
(REFER TO GENERAL CONSTRUCTION NOTE 17)

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	JJL	CK/RAD	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	JJL	CK/RAD	MJT	RAD
0	2017-03-09	ISSUED FOR CONSTRUCTION	JJL	CK/RAD	MJT	RAD
A	2017-02-24	ISSUED FOR CLIENT REVIEW	JJL	CK/RAD	MJT	RAD

PERMIT TO PRACTICE
GOLDER ASSOCIATES LTD.
Signature
Date 17-04-03
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
2017-04-03
NORTHWEST TERRITORIES AND NUNAVUT

Baffinland

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PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
ROAD PLAN, PROFILE AND SECTIONS - CV099

PROJECT NO	PHASE	REV	4 of 4	DRAWING
1667708	3000	2		004

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BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT
TOTE ROAD EARTHWORKS
CV106

INDEX OF DRAWINGS		
DRAWING NO.	DRAWING SHEET TITLE	REVISION NO.
001	TITLE SHEET - CV106	2
002	PIPE CROSSING TYPICAL DETAILS & GENERAL NOTES - CV106	2
003	CULVERT INSTALLATION DESIGN RECOMMENDATIONS & DESIGN TABLES - CV106	2
004	ROAD PLAN, PROFILE AND SECTIONS - CV106	2

SPECIFICATIONS		
SPECIFICATION NO.	SPECIFICATION TITLE	REVISION NO.
1667708-S	TOTE ROAD EARTHWORKS	1

DESIGN REPORT		
REPORT NO.	REPORT TITLE	REVISION NO.
1667708	TOTE ROAD EARTHWORKS	0

KEY PLAN
NOT TO SCALE

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	CK/RAD	JJL	MJT	RAD
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0	2017-03-10	ISSUED FOR CONSTRUCTION	CK/RAD	JJL	MJT	RAD
A	2017-03-06	ISSUED FOR CLIENT REVIEW	CK/RAD	JJL	MJT	RAD

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Date 12-04-03
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
2017-04-03
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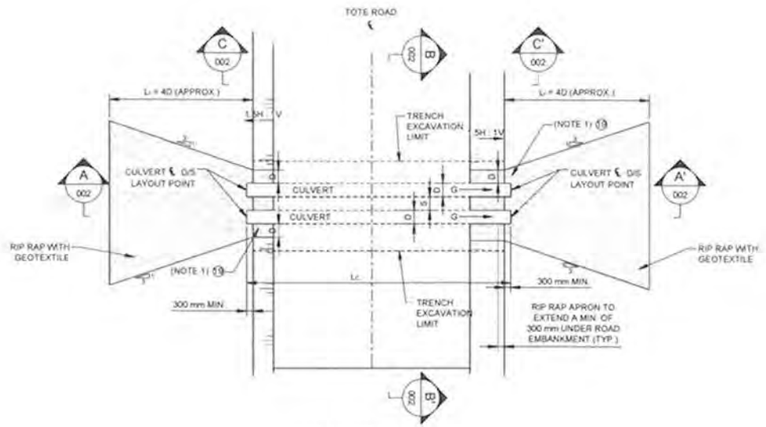
PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

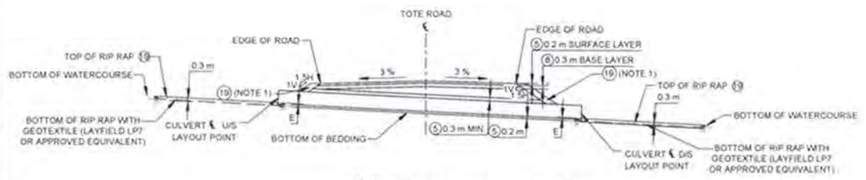
TITLE
TITLE SHEET - CV106

PROJECT NO.	PHASE	REV.	1 of 4	DRAWING
1667708	3000	2		001

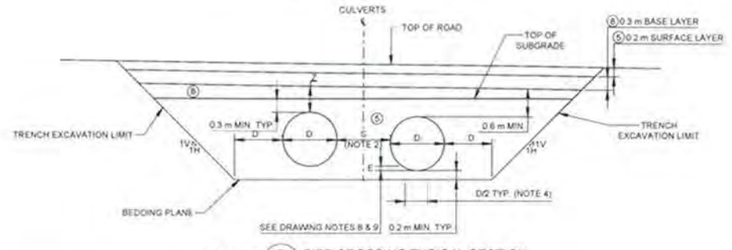
Reduced Size
NOT TO SCALE



PIPE CROSSING PLAN VIEW
SCALE 1:200 m



SCALE 1:200 m A 002 PIPE CROSSING TYPICAL PROFILE



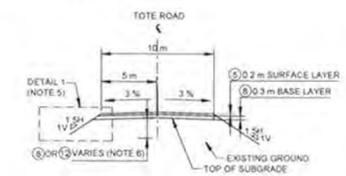
SCALE 1:50 m B 002 PIPE CROSSING TYPICAL SECTION

LEGEND

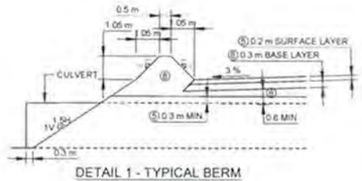
(5)	SCREENED MATERIAL	(12)	RUN OF QUARRY (ROQ)
(6)	JAW RUN	(19)	EROSION PROTECTION

DRAWING NOTES

1. EROSION PROTECTION SHALL BE PLACED AROUND THE CULVERT INLET AND OUTLET AS PER THE DIRECTION OF THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
2. THE MINIMUM SPACING (S) BETWEEN CULVERTS SHALL BE D, WHERE D IS THE CULVERT DIAMETER, OR 1.5 m, WHICHEVER IS GREATER.
3. THE MINIMUM COVER DEFINED AS THE DISTANCE BETWEEN THE TOP OF CULVERT TO THE TOP OF SUBGRADE SHALL BE 0.6 m OR D/4, WHERE D IS THE CULVERT DIAMETER, WHICHEVER IS GREATER.
4. THE BEDDING TO BE SHAPED TO RECEIVE PIPE.
5. SAFETY BERMS ARE REQUIRED FOR EMBANKMENTS GREATER THAN 3 m IN HEIGHT.
6. FOR EMBANKMENT FILL DEPTHS LESS THAN 0.6 m, TYPE B MATERIAL SHALL BE USED. FOR FILL DEPTHS GREATER THAN 0.6 m, AND DEPENDING ON THE FILL EXTENTS, TYPE 12 MATERIAL MAY BE USED.
7. DEFINITIONS AND VALUES OF D, L_C, L_T, AND G CAN BE FOUND IN DESIGN TABLES ON DRAWING 003.
8. FOR FISH BEARING CULVERT WITH MULTIPLE PIPES, ONLY ONE SHALL BE EMBEDDED BY "E" AND ALL OTHER PIPES SHALL BE PLACED ON GROUND / BOTTOM OF WATER COURSE.
9. AS PER CULVERT DETAILS (DWG 003) FOR FISH BEARING CULVERT; E = 0.1 D. FOR NON-FISH BEARING CULVERT E=0.



SCALE 1:200 m C 002 EMBANKMENT SECTION



DETAIL 1 - TYPICAL BERM
SCALE 1:100 m

GENERAL CONSTRUCTION NOTES

1. IT IS THE RESPONSIBILITY OF THE USER OF THIS DRAWING TO ENSURE THE USE OF ITS MOST RECENT REVISION.
2. THE INFORMATION PROVIDED ON THE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE MOST RECENT REVISION OF THE SPECIFICATIONS AND REPORT LISTED ON DWG. 001.
3. IN THE EVENT OF DISCREPANCY BETWEEN THE DRAWINGS AND THE SPECIFICATIONS CLARIFICATION AND/OR DIRECTION SHALL BE PROVIDED AS OUTLINED IN THE SPECIFICATIONS.
4. PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL BE FAMILIAR WITH THE SCOPE OF WORK.
5. THE INFORMATION PRESENTED ON THESE DRAWINGS IS INTENDED TO CONVEY THE PIPE CROSSING CONSTRUCTION DETAILS AND ROAD EMBANKMENT DETAILS.
6. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES UNLESS OTHERWISE NOTED.
7. COORDINATE SYSTEM IS UTM (NAD 83) ZONE 17N.
8. CONTOUR INTERVAL IS 1 M WITH EXISTING TOPOGRAPHY.
9. THE DESIGN OF EACH INSTALLATION ARE BASED ON A DESK STUDY USING A DIGITAL ELEVATION MODEL AND SATELLITE IMAGERY PROVIDED BY BAFFINLAND, AND ARE NOT SUPPORTED BY FIELD STUDY.
10. THE GROUND SURFACE ELEVATIONS ARE CONSIDERED TO BE APPROXIMATE.
11. A DECISION ON WHETHER TO EXTEND OR REPLACE EACH CULVERT WILL BE MADE BY THE OWNER'S REPRESENTATIVE.
12. FIELD FITTING OF CULVERTS (INCLUDING LOCATIONS, LENGTHS, INVERT DEPTHS, GRADIENTS, AND SKEWS) TO ACTUAL CONDITIONS AT EACH SITE SHALL BE AS DIRECTED BY THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
13. FILL MATERIALS SHALL BE HANDLED, SORTED, PLACED AND COMPACTED AS SHOWN ON THE DRAWINGS, DESCRIBED IN THE SPECIFICATIONS AND TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
14. NO GEOTECHNICAL OR STRUCTURAL ANALYSIS OF THE CULVERT INSTALLATIONS HAS BEEN CARRIED OUT. **A MINIMUM CULVERT COVER OF 0.6 m OR D/4 (WHERE D IS THE** DIAMETER OF THE CIRCULAR CULVERT PIPE) HAS BEEN ASSUMED TO BE APPROPRIATE FOR 10 TONNE AXLE LOADS. USE OF HEAVIER TRUCKS WILL REQUIRE STRUCTURAL ANALYSIS OF THE CULVERT INSTALLATION.
15. FISH BEARING STATUS IN CULVERT DETAILS TABLE ON DWG. 003 TAKEN FROM HATCH TOTE ROAD CULVERT DATA SHEETS H349000-3000-10-088-0030 THROUGH H349000-3000-10-088-0034.
16. NO HYDROLOGIC OR HYDRAULIC ANALYSIS WAS CARRIED OUT. NUMBER OF CULVERTS, CULVERT DIAMETER(S), CULVERT LENGTH(S), EMBEDMENT DEPTH (E), AND REQUIREMENTS FOR RIP RAP FROM HATCH TOTE ROAD CULVERT DATA SHEETS H349000-3000-10-088-0030 THROUGH H349000-3000-10-088-0034.
17. IN SECTIONS, SKEWED CULVERTS ARE PROJECTED ONTO PLANE OF CROSS-SECTIONS.
18. AT LIMITS OF CONSTRUCTION NEW PAVEMENT THICKNESS NEEDS TO BE TAPERED TO MATCH EXISTING PAVEMENT SURFACE.
19. THE OWNER'S REPRESENTATIVE WILL CONFIRM THE REQUIREMENT FOR SAFETY BERMS ALONG THE ROAD EDGES BASED ON ENCOUNTERED FIELD CONDITIONS. TYPICAL BERM DETAILS ARE SHOWN ON DWG 002.
20. SITE SPECIFIC NOTES ON DWG. 003 MUST BE READ IN CONJUNCTION WITH THESE GENERAL NOTES, AND THE SPECIFICATIONS AND DRAWINGS LISTED ON DWG 001.
21. BAFFINLAND IS RESPONSIBLE FOR PERMITTING OF THE PROPOSED WORKS (IF REQUIRED).
22. PRIOR TO CONSTRUCTION, BAFFINLAND'S ENVIRONMENTAL REPRESENTATIVE WILL BE CONSULTED TO APPROVE THE REQUIRED EROSION CONTROL AND MITIGATION MEASURES ADJACENT TO WATER BODIES.

0 2 4
1:50 METRES
0 5 10
1:100 METRES
0 10 20
1:200 METRES

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A	2017-03-06	ISSUED FOR CLIENT REVIEW	CK/RAD	JJL	MJT	RAD

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GOLDER ASSOCIATES LTD.
Signature
Date 17-04-03
PERMIT NUMBER: P 049
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REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
17-04-03
NORTHWEST TERRITORIES AND NUNAVUT

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PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
TYPICAL DETAILS AND GENERAL NOTES - CV106

PROJECT NO	PHASE	REV.	2 of 4	DRAWING
1667708	3000	2		002

Reduced Size
NOT TO SCALE

CULVERT DETAILS1

STATION (m)	FISH BEARING STATUS (REFER TO NOTE 15 ON DWG. 002)	EXISTING CULVERT DIAMETER (D) (mm) (REFER TO NOTE 16 ON DWG. 002)	EXISTING CULVERT LENGTH (m) (REFER TO NOTE 16 ON DWG. 002)	EXISTING CULVERT GRADIENT (%) (REFER TO NOTE 16 ON DWG. 002)	EMBEDMENT DEPTH (E) (mm) (REFER TO NOTE 16 ON DWG. 002)	PROPOSED CULVERT LENGTH (m)	DEPTH FROM SUBGRADE TO TOP OF CULVERT AT CENTRELINE OF ROAD (Z) (m)	EASTING OF CENTRELINE OF PIPE AT CENTRELINE OF ROAD (m)	NORTHING OF CENTRELINE OF PIPE AT CENTRELINE OF ROAD (m)	INLET INVERT ELEVATION (m)	OUTLET INVERT ELEVATION (m)	CULVERT GRADIENT (G) (%)	CULVERT SKEW (deg)	INLET RIP RAP REQUIRED?	OUTLET RIP RAP REQUIRED?	RIP RAP APRON LENGTH (Lr) (m)
0+076.5	POTENTIAL	1000	15	2.21		25	0.8	521670.5	7953387.9	113.4	113.1	1	135	N	Y	4

*CULVERT LOCATION DETAILS ARE BASED ON A DESK STUDY USING A DIGITAL ELEVATION MODEL AND SATELLITE IMAGERY PROVIDED BY BAFFINLAND, AND ARE NOT SUPPORTED BY FIELD STUDY (REFER TO GENERAL CONSTRUCTION NOTE 2.2 ON DWG. 001)

SITE SPECIFIC NOTES FOR CULVERT CV106

AS INDICATED IN THE GENERAL CONSTRUCTION NOTES ON DWG. 002, THE SITE SPECIFIC NOTES ARE BASED ONLY ON A DESKTOP STUDY OF THE SITE. NO FIELD WORK WAS CARRIED OUT TO SUPPORT THIS WORK. AN INSPECTION OF THE SITE SHALL BE CARRIED OUT BY THE OWNER'S REPRESENTATIVE AND/OR GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION. THE SITE SPECIFIC NOTES ARE INTENDED TO BE COMPREHENSIVE BUT NOT ALL-INCLUSIVE.

1. **RAISE THE ROAD EMBANKMENT TO PROVIDE ADEQUATE CULVERT PIPE COVER, MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL) AND THE ROAD RUNNING SURFACE A MINIMUM OF 10 m.**
2. CAP THE ROAD SURFACE WITH SUITABLE RUNNING SURFACE MATERIAL (SEE TYPICAL SECTION ON DWG. 002).
3. THE EXISTING CULVERT MAY BE PERCHED. REINSTALL CULVERTS TO DESIGN. THE EXISTING CULVERT MAY BE DAMAGED. REPLACE CULVERTS IF REQUIRED.
4. PROVIDE RIP RAP PROTECTION AT THE CULVERT INLET AND OUTLET.
5. MARK THE CULVERT ENDS WITH DELINEATORS OF SUFFICIENT SIZE AND HEIGHT TO REDUCE THE RISK OF DAMAGE TO THE CULVERT PIPE ENDS BY SNOW PLOWING, SIDE SLOPING, OR OTHER MAINTENANCE OPERATIONS.

ROAD LAYOUT DETAILS

STATION (m)	TOP OF SUBGRADE			CENTRELINE CUT DEPTH* (TOP OF SUBGRADE TO EXISTING ROAD SURFACE) (m)	TOE OF EMBANKMENT SLOPE		
	CENTRELINE EASTING (m)	CENTRELINE NORTHING (m)	CENTRELINE ELEVATION (m)		OFFSET TO LEFT TOE** (m)	OFFSET TO RIGHT TOE** (m)	GRADIENT TO NEXT POINT (%)
0+000.0	521658.5	7953463.2	112.3	-0.1	5.7	5.5	
0+020.0	521663.2	7953443.8	113.2	-0.2	6.3	6.1	3.7
0+023.8	521664.2	7953440.1	113.4	-0.3	6.6	6.3	3.7
0+040.0	521667.5	7953424.2	114	-0.8	7.7	6.6	3.7
0+048.5	521668.7	7953415.8	114.3	-1.1	7.9	7.2	3.0
0+060.0	521669.9	7953404.4	114.8	-1.3	7.9	7.8	1.5
0+076.5	521670.6	7953387.9	114.9	-1.4	8.2	8.0	0.4
0+080.0	521670.5	7953384.4	114.9	-1.4	8.4	8.0	-0.2
0+086.5	521670.4	7953378	114.9	-1.3	8.1	7.7	-1.0
0+095.0	521670	7953369.4	114.8	-1.1	7.7	7.3	-1.5
0+100.0	521669.8	7953364.4	114.7	-0.9	7.4	7.0	-1.5
0+120.0	521668.9	7953344.4	114.4	-0.4	6.1	6.4	
0+140.0	521668.1	7953324.5	114.1	-0.2	5.1	5.1	-2.3
0+141.3	521668	7953323.2	114.1	-0.1	5.0	5.0	

* NEGATIVE CUT DEPTH DENOTES FILL
** MEASURED ON GROUND SURFACE

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PERMIT-TO PRACTICE
GOLDER ASSOCIATES LTD.
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Date 17-04-03
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NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
17-04-03
NWT/NU

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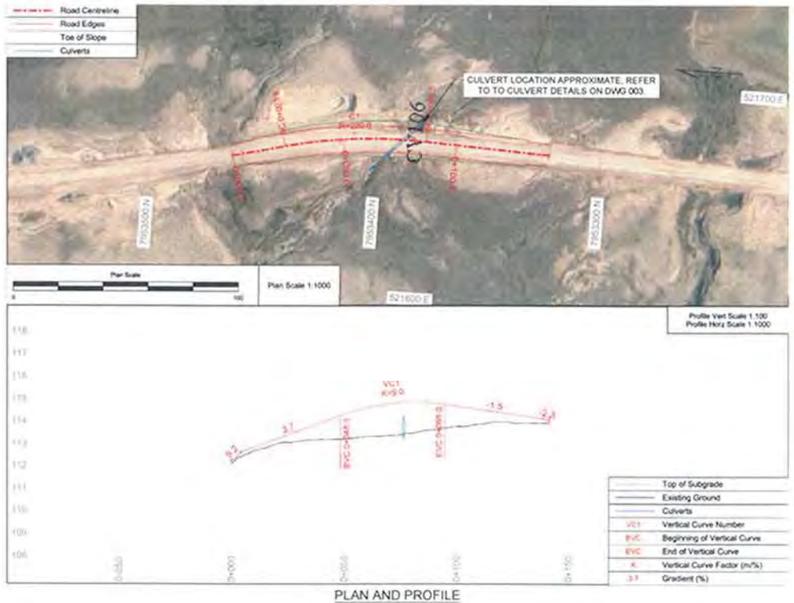
PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

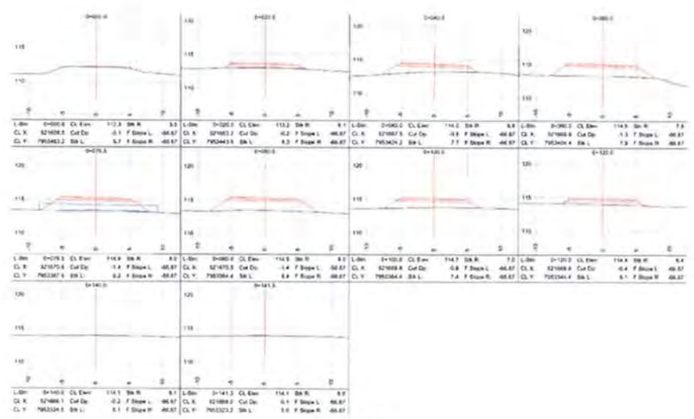
TITLE
CULVERT INSTALLATION DESIGN RECOMMENDATIONS & DESIGN TABLES - CV106

PROJECT NO.	PHASE	REV.	3 of 4	DRAWING
1667708	3000	2		003

Reduced Size
NOT TO SCALE



PLAN AND PROFILE



SECTIONS
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PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
ROAD PLAN, PROFILE AND SECTIONS - CV106

PROJECT NO	PHASE	REV	4 of 4	DRAWING
1667708	3000	2		004

Reduced Size
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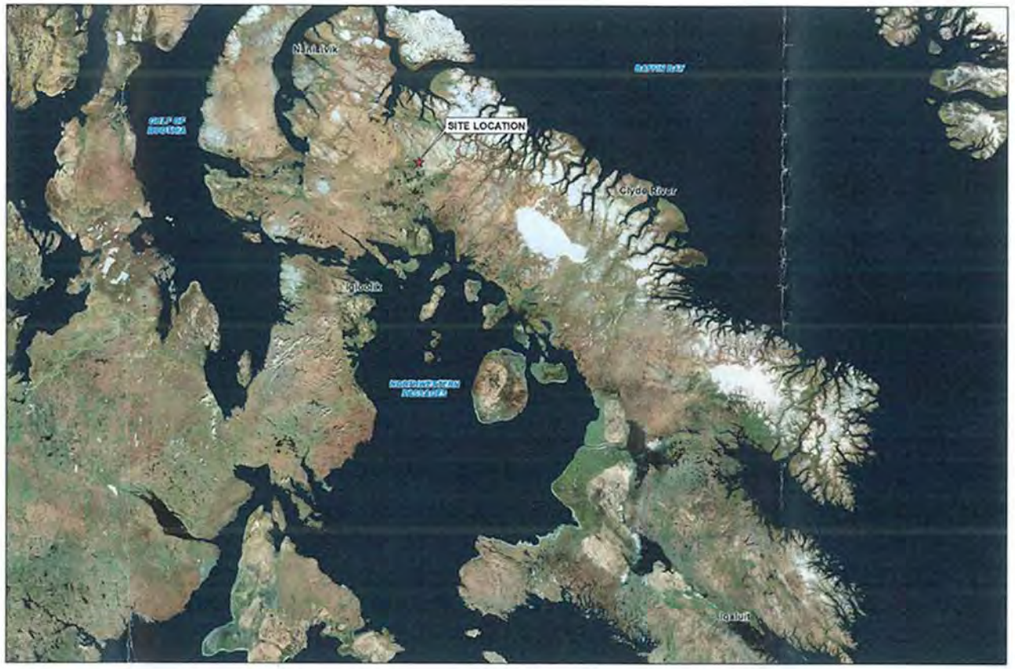
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT
TOTE ROAD EARTHWORKS
CV112

INDEX OF DRAWINGS		
DRAWING NO.	DRAWING SHEET TITLE	REVISION NO.
001	TITLE SHEET - CV112	2
002	PIPE CROSSING TYPICAL DETAILS & GENERAL NOTES - CV112	2
003	CULVERT INSTALLATION DESIGN RECOMMENDATIONS & DESIGN TABLES - CV112	2
004	ROAD PLAN, PROFILE AND SECTIONS - CV112	2

SPECIFICATIONS		
SPECIFICATION NO.	SPECIFICATION TITLE	REVISION NO.
1667708-S	TOTE ROAD EARTHWORKS	1

DESIGN REPORT		
REPORT NO.	REPORT TITLE	REVISION NO.
1667708	TOTE ROAD EARTHWORKS	0



KEY PLAN
NOT TO SCALE

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	J.J.L.	CK/RAD	M.J.T	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	J.J.L.	CK/RAD	M.J.T	RAD
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N.T./N.U. Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
2017-04-03
NUNAVUT

CLIENT: Baffinland

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PROJECT
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TOTE ROAD EARTHWORKS

TITLE
TITLE SHEET - CV112

PROJECT NO.	PHASE	REV.	1 of 4	DRAWING
1667708	3000	2		001

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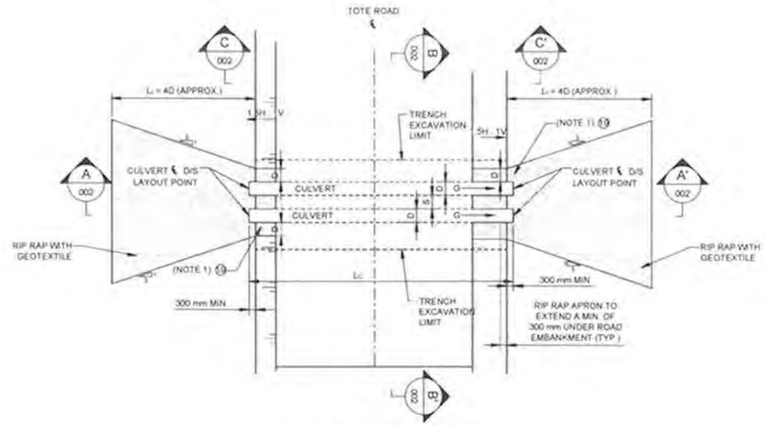
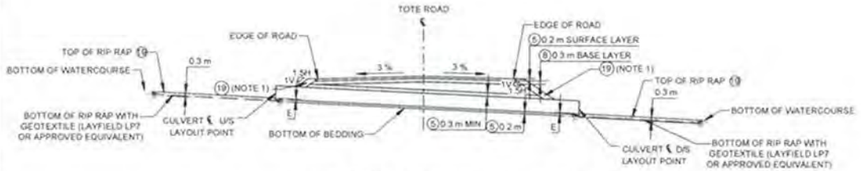
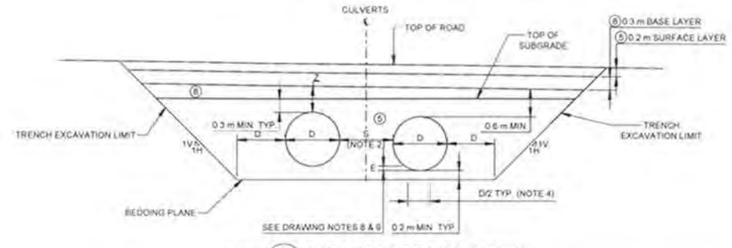


PIPE CROSSING PLAN VIEW
SCALE 1:200 m



SCALE 1:200 m (A 002) PIPE CROSSING TYPICAL PROFILE



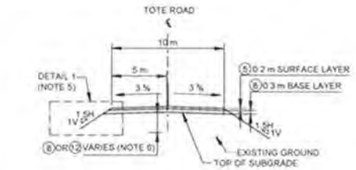
SCALE 1:50 m (B 002) PIPE CROSSING TYPICAL SECTION

LEGEND

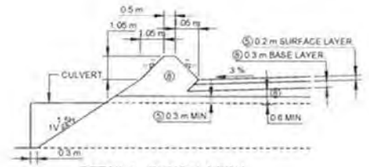
(5)	SCREENED MATERIAL	(13)	RUN OF QUARRY (ROQ)
(6)	JAW RUN	(19)	EROSION PROTECTION

DRAWING NOTES

1. EROSION PROTECTION SHALL BE PLACED AROUND THE CULVERT INLET AND OUTLET AS PER THE DIRECTION OF THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
2. THE MINIMUM SPACING (S) BETWEEN CULVERTS SHALL BE D, WHERE D IS THE CULVERT DIAMETER, OR 1.5 m, WHICHEVER IS GREATER.
3. THE MINIMUM COVER DEFINED AS THE DISTANCE BETWEEN THE TOP OF CULVERT TO THE TOP OF SUBGRADE SHALL BE 0.6 m OR D/4, WHERE D IS THE CULVERT DIAMETER, WHICHEVER IS GREATER.
4. THE BEDDING TO BE SHAPED TO RECEIVE PIPE.
5. SAFETY BERMS ARE REQUIRED FOR EMBANKMENTS GREATER THAN 3 m IN HEIGHT.
6. FOR EMBANKMENT FILL DEPTHS LESS THAN 0.6 m, TYPE 8 MATERIAL SHALL BE USED. FOR FILL DEPTHS GREATER THAN 0.6 m, AND DEPENDING ON THE FILL EXTENTS, TYPE 12 MATERIAL MAY BE USED.
7. DEFINITIONS AND VALUES OF D, L_c, L_f, AND G CAN BE FOUND IN DESIGN TABLES ON DRAWING 003.
8. FOR FISH BEARING CULVERT WITH MULTIPLE PIPES, ONLY ONE SHALL BE EMBEDDED BY "E" AND ALL OTHER PIPES SHALL BE PLACED ON GROUND / BOTTOM OF WATER COURSE.
9. AS PER CULVERT DETAILS (DWG 003) FOR FISH BEARING CULVERT, E = 0.1 D. FOR NON-FISH BEARING CULVERT E=0.



SCALE 1:200 m (C 002) EMBANKMENT SECTION



DETAIL 1 - TYPICAL BERM
SCALE 1:100 m

GENERAL CONSTRUCTION NOTES

1. IT IS THE RESPONSIBILITY OF THE USER OF THIS DRAWING TO ENSURE THE USE OF ITS MOST RECENT REVISION.
2. THE INFORMATION PROVIDED ON THE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE MOST RECENT REVISION OF THE SPECIFICATIONS AND REPORT LISTED ON DWG. 001.
3. IN THE EVENT OF DISCREPANCY BETWEEN THE DRAWINGS AND THE SPECIFICATIONS CLARIFICATION AND/OR DIRECTION SHALL BE PROVIDED AS OUTLINED IN THE SPECIFICATIONS.
4. PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL BE FAMILIAR WITH THE SCOPE OF WORK.
5. THE INFORMATION PRESENTED ON THESE DRAWINGS IS INTENDED TO CONVEY THE PIPE CROSSING CONSTRUCTION DETAILS AND ROAD EMBANKMENT DETAILS.
6. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES UNLESS OTHERWISE NOTED.
7. COORDINATE SYSTEM IS UTM (NAD 83) ZONE 17N.
8. CONTOUR INTERVAL IS 1 M WITH EXISTING TOPOGRAPHY.
9. THE DESIGN OF EACH INSTALLATION ARE BASED ON A DESK STUDY USING A DIGITAL ELEVATION MODEL AND SATELLITE IMAGERY PROVIDED BY BAFFINLAND, AND ARE NOT SUPPORTED BY FIELD STUDY.
10. THE GROUND SURFACE ELEVATIONS ARE CONSIDERED TO BE APPROXIMATE.
11. A DECISION ON WHETHER TO EXTEND OR REPLACE EACH CULVERT WILL BE MADE BY THE OWNER'S REPRESENTATIVE.
12. FIELD FITTING OF CULVERTS (INCLUDING LOCATIONS, LENGTHS, INVERT DEPTHS, GRADIENTS, AND SKEWS) TO ACTUAL CONDITIONS AT EACH SITE SHALL BE AS DIRECTED BY THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
13. FILL MATERIALS SHALL BE HANDLED, SORTED, PLACED AND COMPACTED AS SHOWN ON THE DRAWINGS, DESCRIBED IN THE SPECIFICATIONS AND TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
14. NO GEOTECHNICAL OR STRUCTURAL ANALYSIS OF THE CULVERT INSTALLATIONS HAS **BEEN CARRIED OUT. A MINIMUM CULVERT COVER OF 0.6 m OR D/4 (WHERE D IS THE** DIAMETER OF THE CIRCULAR CULVERT PIPE) HAS BEEN ASSUMED TO BE APPROPRIATE FOR 10 TONNE AXLE LOADS. USE OF HEAVIER TRUCKS WILL REQUIRE STRUCTURAL ANALYSIS OF THE CULVERT INSTALLATION.
15. FISH BEARING STATUS IN CULVERT DETAILS TABLE ON DWG. 003 TAKEN FROM HATCH TOTE ROAD CULVERT DATA SHEETS H349000-3000-10-088-0030 THROUGH H349000-3000-10-088-0034.
16. NO HYDROLOGIC OR HYDRAULIC ANALYSIS WAS CARRIED OUT. NUMBER OF CULVERTS, CULVERT DIAMETER(S), CULVERT LENGTH(S), EMBEDMENT DEPTH (E), AND REQUIREMENTS FOR RIP RAP FROM HATCH TOTE ROAD CULVERT DATA SHEETS H349000-3000-10-088-0030 THROUGH H349000-3000-10-088-0034.
17. IN SECTIONS, SKEWED CULVERTS ARE PROJECTED ONTO PLANE OF CROSS-SECTIONS.
18. AT LIMITS OF CONSTRUCTION NEW PAVEMENT THICKNESS NEEDS TO BE TAPERED TO MATCH EXISTING PAVEMENT SURFACE.
19. THE OWNER'S REPRESENTATIVE WILL CONFIRM THE REQUIREMENT FOR SAFETY BERMS ALONG THE ROAD EDGES BASED ON ENCOUNTERED FIELD CONDITIONS. TYPICAL BERM DETAILS ARE SHOWN ON DWG 002.
20. SITE SPECIFIC NOTES ON DWG. 003 MUST BE READ IN CONJUNCTION WITH THESE GENERAL NOTES, AND THE SPECIFICATIONS AND DRAWINGS LISTED ON DWG. 001.
21. BAFFINLAND IS RESPONSIBLE FOR PERMITTING OF THE PROPOSED WORKS (IF REQUIRED).
22. PRIOR TO CONSTRUCTION, BAFFINLAND'S ENVIRONMENTAL REPRESENTATIVE WILL BE CONSULTED TO APPROVE THE REQUIRED EROSION CONTROL AND MITIGATION MEASURES ADJACENT TO WATER BODIES.

0 2 4
1:50 METRES

0 5 10
1:100 METRES

0 10 20
1:200 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	JJL	CK/RAD	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	JJL	CK/RAD	MJT	RAD
0	2017-03-09	ISSUED FOR CONSTRUCTION	JJL	CK/RAD	MJT	RAD
A	2017-02-24	ISSUED FOR CLIENT REVIEW	JJL	CK/RAD	MJT	RAD

PERMIT TO PRACTICE
GOLDER ASSOCIATES LTD.
Signature
Date 17-04-03
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
NWT/NU

CONSULTANT
Golder Associates
MISSISSAUGA OFFICE
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CANADA
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CLIENT
Baffinland

PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
TYPICAL DETAILS AND GENERAL NOTES - CV112

PROJECT NO.	PHASE	REV.	2 of 4	DRAWING
1667708	3000	2		002

Reduced Size
NOT TO SCALE

CULVERT DETAILS†

STATION (m)	FISH BEARING STATUS (REFER TO NOTE 15 ON DWG. 002)	EXISTING CULVERT DIAMETER (D) (mm) (REFER TO NOTE 16 ON DWG. 002)	EXISTING CULVERT LENGTH (m) (REFER TO NOTE 16 ON DWG. 002)	EXISTING CULVERT GRADIENT (%) (REFER TO NOTE 16 ON DWG. 002)	EMBEDMENT DEPTH (E) (mm) (REFER TO NOTE 16 ON DWG. 002)	PROPOSED CULVERT LENGTH (m)	DEPTH FROM SUBGRADE TO TOP OF CULVERT AT CENTRELINE OF ROAD (Z) (m)	EASTING OF CENTRELINE OF PIPE AT CENTRELINE OF ROAD (m)	NORTHING OF CENTRELINE OF PIPE AT CENTRELINE OF ROAD (m)	INLET INVERT ELEVATION (m)	OUTLET INVERT ELEVATION (m)	CULVERT GRADIENT (G) (%)	CULVERT SKEW (deg)	INLET RIP RAP REQUIRED?	OUTLET RIP RAP REQUIRED?	RIP RAP APRON LENGTH (Lr) (m)
0+109.3	POTENTIAL	1200	15	2.47		24.4	1	521034.0	7954929.5	113	112.1	4	90	N	Y	4.8
0+112.0	POTENTIAL	500	15	2.99	50	24.7	1.7	521036.2	7954928.1	113	112	4	90	N	N	

† CULVERT LOCATION DETAILS ARE BASED ON A DESK STUDY USING A DIGITAL ELEVATION MODEL AND SATELLITE IMAGERY PROVIDED BY BAFFINLAND, AND ARE NOT SUPPORTED BY FIELD STUDY (REFER TO GENERAL CONSTRUCTION NOTE 12 ON DWG. 002)

SITE SPECIFIC NOTES FOR CULVERT CV112

AS INDICATED IN THE GENERAL CONSTRUCTION NOTES ON DWG. 002, THE SITE SPECIFIC NOTES ARE BASED ONLY ON A DESKTOP STUDY OF THE SITE. NO FIELD WORK WAS CARRIED OUT TO SUPPORT THIS WORK. AN INSPECTION OF THE SITE SHALL BE CARRIED OUT BY THE OWNER'S REPRESENTATIVE AND/OR GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION. THE SITE SPECIFIC NOTES ARE INTENDED TO BE COMPREHENSIVE BUT NOT ALL-INCLUSIVE.

1. **WIDEN THE ROAD RUNNING SURFACE AT THE CULVERT LOCATION TO A MINIMUM WIDTH OF 10 m, MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL).**
2. **WIDEN THE ROAD RUNNING SURFACE TO A MINIMUM OF 10 m ON THE APPROACHES TO THE CULVERT LOCATION. MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL).**
3. **ADD/ SHAPE EMBANKMENT FILL TO FLATTEN THE ROAD EMBANKMENT SIDE SLOPES TO NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL), MAINTAINING THE ROAD RUNNING SURFACE WIDTH A MINIMUM OF 10 m.**
4. **RAISE THE ROAD EMBANKMENT TO PROVIDE ADEQUATE CULVERT PIPE COVER, MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL) AND THE ROAD RUNNING SURFACE A MINIMUM OF 10 m.**
5. CAP THE ROAD SURFACE WITH SUITABLE RUNNING SURFACE MATERIAL (SEE TYPICAL SECTION ON DWG. 002).
6. PROVIDE SAFETY BERMS WHERE EMBANKMENT FILL IS GREATER THAN 3 m ABOVE EXISTING GROUND SURFACE.
7. PROVIDE RIP RAP PROTECTION AT THE CULVERT INLET AND OUTLET.
8. THE CULVERT MAY BE PERCHED. REINSTALL CULVERT. THE CULVERT END(S) MAY BE DAMAGED. REPLACE CULVERTS IF REQUIRED.
9. MARK THE CULVERT ENDS WITH DELINEATORS OF SUFFICIENT SIZE AND HEIGHT TO REDUCE THE RISK OF DAMAGE TO THE CULVERT PIPE ENDS BY SNOW PLOWING, SIDE SLOPING, OR OTHER MAINTENANCE OPERATIONS.

ROAD LAYOUT DETAILS

STATION (m)	TOP OF SUBGRADE			CENTRELINE CUT DEPTH* (TOP OF SUBGRADE TO EXISTING ROAD SURFACE) (m)	TOE OF EMBANKMENT SLOPE		
	CENTRELINE EASTING (m)	CENTRELINE NORTHING (m)	CENTRELINE ELEVATION (m)		OFFSET TO LEFT TOE** (m)	OFFSET TO RIGHT TOE** (m)	GRADIENT TO NEXT POINT (%)
0+000.0	520980.9	7955021.4	116.6	-0.1	5.0	5.1	-0.6
0+004.1	520982	7955017.5	116.6	-0.2	5.1	5.1	-1.0
0+020.0	520986.3	7955002.2	116.4	-0.1	5.9	6.0	-1.6
0+034.2	520990.2	7954988.5	116.2	-0.4	6.0	6.2	-2.3
0+038.4	520991.4	7954984.5	116.1	-0.4	6.2	6.2	-2.4
0+040.0	520991.9	7954983	116.1	-0.4	6.2	6.2	-2.4
0+060.0	521000.2	7954964.8	115.6	-0.6	6.5	6.6	-2.4
0+061.3	521000.9	7954963.7	115.6	-0.5	6.5	6.6	-2.0
0+080.0	521011.9	7954948.6	115.2	-0.5	6.4	6.7	-1.2
0+100.0	521026.4	7954934.9	114.9	-0.5	7.2	13.3	-0.7
0+105.1	521030.5	7954931.8	114.9	-0.5	6.3	14.2	-0.6
0+109.3	521033.9	7954929.5	114.9	-0.5	6.4	14.5	-0.6
0+112.0	521036.2	7954928.1	114.9	-0.5	6.4	14.5	-0.6
0+120.0	521043.2	7954924.2	114.8	-0.7	6.7	14.3	
0+129.5	521051.9	7954920.3	114.8	-0.7	6.8	13.8	-0.4
0+140.0	521061.6	7954916.4	114.7	-0.8	6.7	8.4	-0.4
0+141.3	521062.8	7954915.9	114.7	-0.8	6.7	8.1	0.1
0+160.0	521080.2	7954909	114.7	-0.5	6.1	7.0	1.0
0+180.0	521098.8	7954901.6	114.9	-0.3	5.9	7.1	2.0
0+200.0	521117	7954893.3	115.3	-0.5	6.1	7.6	2.9
0+216.0	521131.3	7954886.2	115.8	-0.3	5.8	8.5	3.3
0+220.0	521134.9	7954884.4	115.9	-0.3	5.1	5.3	3.3
0+226.2	521140.5	7954881.6	116.2	-0.2	5.1	5.1	

* NEGATIVE CUT DEPTH DENOTES FILL
** MEASURED ON GROUND SURFACE

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	JJL	CK/RAD	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	JJL	CK/RAD	MJT	RAD
0	2017-03-09	ISSUED FOR CONSTRUCTION	JJL	CK/RAD	MJT	RAD
A	2017-02-24	ISSUED FOR CLIENT REVIEW	JJL	CK/RAD	MJT	RAD

PERMIT TO PRACTICE GOLDER ASSOCIATES LTD.
Signature
Date 17-04-25
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
2017-04-25
NWT/NU

Baffinland

Golder Associates

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CANADA
905-567-4444
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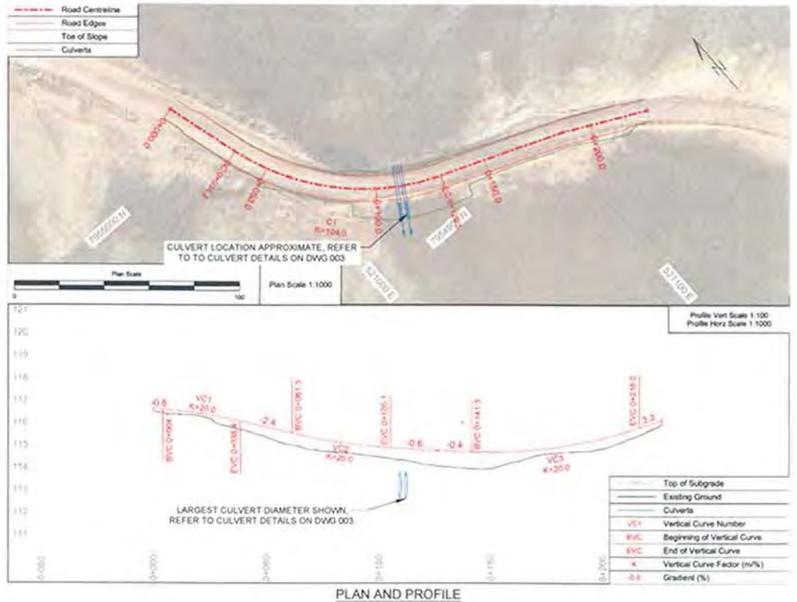
PROJECT:
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

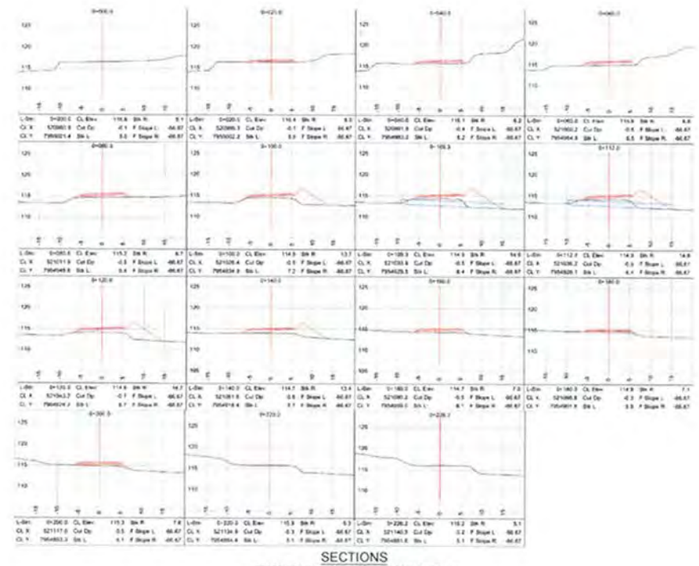
TITLE:
CULVERT INSTALLATION DESIGN RECOMMENDATIONS & DESIGN TABLES - CV112

PROJECT NO.	PHASE	REV.	3 of 4	DRAWING
1667708	3000	2		003

Reduced Size
NOT TO SCALE



PLAN AND PROFILE



SECTIONS
(REFER TO GENERAL CONSTRUCTION NOTE 17)

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	JJL	CK/RAD	MJT	RAD
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PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
ROAD PLAN, PROFILE AND SECTIONS - CV112

PROJECT NO	PHASE	REV	4 of 4	DRAWING
1667708	3000	2		004

Reduced Size
NOT TO SCALE

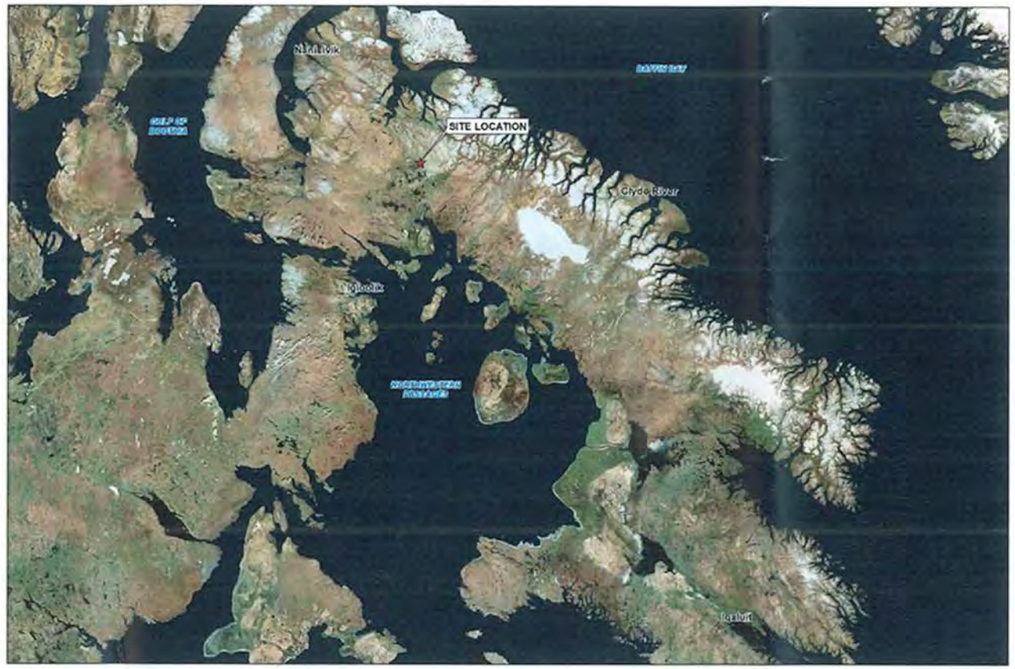
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT
TOTE ROAD EARTHWORKS
CV186

INDEX OF DRAWINGS		
DRAWING NO	DRAWING SHEET TITLE	REVISION NO
001	TITLE SHEET - CV186	2
002	PIPE CROSSING TYPICAL DETAILS & GENERAL NOTES - CV186	2
003	CULVERT INSTALLATION DESIGN RECOMMENDATIONS & DESIGN TABLES - CV186	2
004	ROAD PLAN, PROFILE AND SECTIONS - CV186	2

SPECIFICATIONS		
SPECIFICATION NO	SPECIFICATION TITLE	REVISION NO
1667708-S	TOTE ROAD EARTHWORKS	1

DESIGN REPORT		
REPORT NO	REPORT TITLE	REVISION NO
1667708	TOTE ROAD EARTHWORKS	0



KEY PLAN
NOT TO SCALE

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	CK/RAD	JJL	MJT	RAD
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0	2017-03-10	ISSUED FOR CONSTRUCTION	CK/RAD	JJL	MJT	RAD
A	2017-03-09	ISSUED FOR CLIENT REVIEW	CK/RAD	JJL	MJT	RAD

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GOLDER ASSOCIATES LTD.
Signature 2019-03-25
Date
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NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
2019-04-25
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CLIENT: Baffinland
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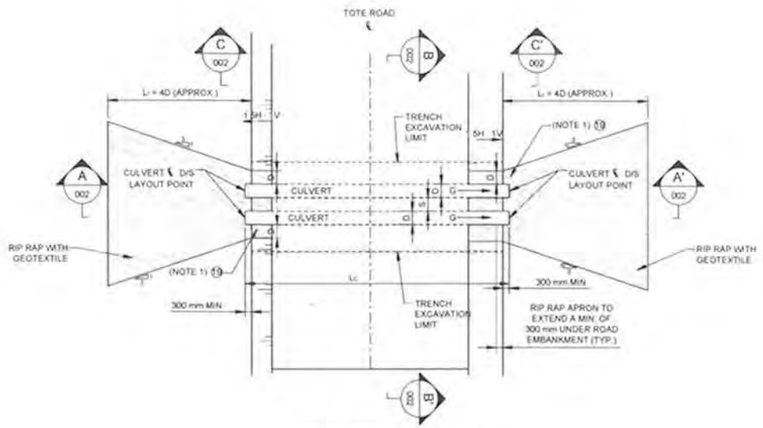
PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

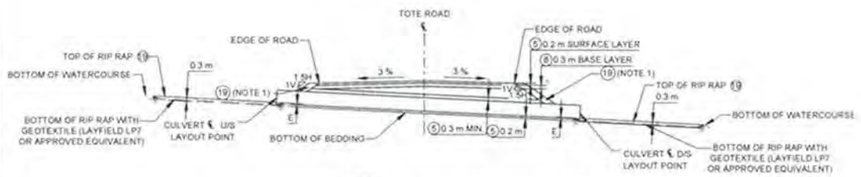
TITLE
TITLE SHEET - CV186

PROJECT NO	PHASE	REV		DRAWING
1667708	3000	2	1 of 4	001

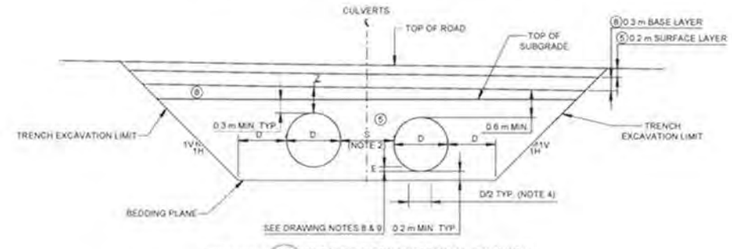
Reduced Size
NOT TO SCALE



PIPE CROSSING PLAN VIEW
SCALE 1:200 m



SCALE 1:200 m (A 002) PIPE CROSSING TYPICAL PROFILE



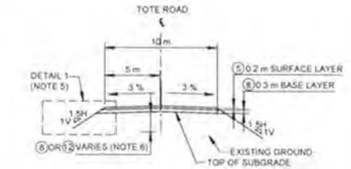
SCALE 1:50 m (B 002) PIPE CROSSING TYPICAL SECTION

LEGEND

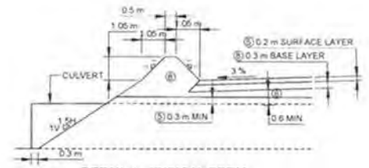
(5)	SCREENED MATERIAL	(12)	RUN OF QUARRY (ROQ)
(8)	JAW RUN	(19)	EROSION PROTECTION

DRAWING NOTES

1. EROSION PROTECTION SHALL BE PLACED AROUND THE CULVERT INLET AND OUTLET AS PER THE DIRECTION OF THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
2. THE MINIMUM SPACING (S) BETWEEN CULVERTS SHALL BE D, WHERE D IS THE CULVERT DIAMETER, OR 1.5 m, WHICHEVER IS GREATER.
3. THE MINIMUM COVER DEFINED AS THE DISTANCE BETWEEN THE TOP OF CULVERT TO THE TOP OF SUBGRADE SHALL BE 0.6 m OR D/4, WHERE D IS THE CULVERT DIAMETER WHICHEVER IS GREATER.
4. THE BEDDING TO BE SHAPED TO RECEIVE PIPE.
5. SAFETY BERMS ARE REQUIRED FOR EMBANKMENTS GREATER THAN 3 m IN HEIGHT.
6. FOR EMBANKMENT FILL DEPTHS LESS THAN 0.6 m, TYPE 8 MATERIAL SHALL BE USED. FOR FILL DEPTHS GREATER THAN 0.6 m, AND DEPENDING ON THE FILL EXTENTS, TYPE 12 MATERIAL MAY BE USED.
7. DEFINITIONS AND VALUES OF D,t,c,t,r, AND G CAN BE FOUND IN DESIGN TABLES ON DRAWING 003.
8. FOR FISH BEARING CULVERT WITH MULTIPLE PIPES, ONLY ONE SHALL BE EMBEDDED BY "E" AND ALL OTHER PIPES SHALL BE PLACED ON GROUND / BOTTOM OF WATER COURSE.
9. AS PER CULVERT DETAILS (DWG 003)FOR FISH BEARING CULVERT, E = 0.1 D. FOR NON-FISH BEARING CULVERT E=0.



SCALE 1:200 m (C 002) EMBANKMENT SECTION



DETAIL 1 - TYPICAL BERM
SCALE 1:100 m

GENERAL CONSTRUCTION NOTES

1. IT IS THE RESPONSIBILITY OF THE USER OF THIS DRAWING TO ENSURE THE USE OF ITS MOST RECENT REVISION.
2. THE INFORMATION PROVIDED ON THE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE MOST RECENT REVISION OF THE SPECIFICATIONS AND REPORT LISTED ON DWG. 001.
3. IN THE EVENT OF DISCREPANCY BETWEEN THE DRAWINGS AND THE SPECIFICATIONS CLARIFICATION AND/OR DIRECTION SHALL BE PROVIDED AS OUTLINED IN THE SPECIFICATIONS.
4. PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL BE FAMILIAR WITH THE SCOPE OF WORK.
5. THE INFORMATION PRESENTED ON THESE DRAWINGS IS INTENDED TO CONVEY THE PIPE CROSSING CONSTRUCTION DETAILS AND ROAD EMBANKMENT DETAILS.
6. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES UNLESS OTHERWISE NOTED.
7. COORDINATE SYSTEM IS UTM (NAD 83) ZONE 17N.
8. CONTOUR INTERVAL IS 1 M WITH EXISTING TOPOGRAPHY.
9. THE DESIGN OF EACH INSTALLATION ARE BASED ON A DESK STUDY USING A DIGITAL ELEVATION MODEL AND SATELLITE IMAGERY PROVIDED BY BAFFINLAND, AND ARE NOT SUPPORTED BY FIELD STUDY.
10. THE GROUND SURFACE ELEVATIONS ARE CONSIDERED TO BE APPROXIMATE.
11. A DECISION ON WHETHER TO EXTEND OR REPLACE EACH CULVERT WILL BE MADE BY THE OWNER'S REPRESENTATIVE.
12. FIELD FITTING OF CULVERTS (INCLUDING LOCATIONS, LENGTHS, INVERT DEPTHS, GRADIENTS, AND SKEWS) TO ACTUAL CONDITIONS AT EACH SITE SHALL BE AS DIRECTED BY THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
13. FILL MATERIALS SHALL BE HANDLED, SORTED, PLACED AND COMPACTED AS SHOWN ON THE DRAWINGS, DESCRIBED IN THE SPECIFICATIONS AND TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
14. NO GEOTECHNICAL OR STRUCTURAL ANALYSIS OF THE CULVERT INSTALLATIONS HAS **BEEN CARRIED OUT. A MINIMUM CULVERT COVER OF 0.6 m OR D/4 (WHERE D IS THE** DIAMETER OF THE CIRCULAR CULVERT PIPE) HAS BEEN ASSUMED TO BE APPROPRIATE FOR 10 TONNE AXLE LOADS. USE OF HEAVIER TRUCKS WILL REQUIRE STRUCTURAL ANALYSIS OF THE CULVERT INSTALLATION.
15. FISH BEARING STATUS IN CULVERT DETAILS TABLE ON DWG. 003 TAKEN FROM HATCH TOTE ROAD CULVERT DATA SHEETS H349000-3000-10-088-0030 THROUGH H349000-3000-10-088-0034.
16. NO HYDROLOGIC OR HYDRAULIC ANALYSIS WAS CARRIED OUT. NUMBER OF CULVERTS, CULVERT DIAMETER(S), CULVERT LENGTH(S), EMBEDMENT DEPTH (E), AND REQUIREMENTS FOR RIP RAP FROM HATCH TOTE ROAD CULVERT DATA SHEETS H349000-3000-10-088-0030 THROUGH H349000-3000-10-088-0034.
17. IN SECTIONS, SKEWED CULVERTS ARE PROJECTED ONTO PLANE OF CROSS-SECTIONS.
18. AT LIMITS OF CONSTRUCTION NEW PAVEMENT THICKNESS NEEDS TO BE TAPERED TO MATCH EXISTING PAVEMENT SURFACE.
19. THE OWNER'S REPRESENTATIVE WILL CONFIRM THE REQUIREMENT FOR SAFETY BERMS ALONG THE ROAD EDGES BASED ON ENCOUNTERED FIELD CONDITIONS. TYPICAL BERM DETAILS ARE SHOWN ON DWG 002.
20. SITE SPECIFIC NOTES ON DWG. 003 MUST BE READ IN CONJUNCTION WITH THESE GENERAL NOTES, AND THE SPECIFICATIONS AND DRAWINGS LISTED ON DWG 001.
21. BAFFINLAND IS RESPONSIBLE FOR PERMITTING OF THE PROPOSED WORKS (IF REQUIRED).
22. PRIOR TO CONSTRUCTION, BAFFINLAND'S ENVIRONMENTAL REPRESENTATIVE WILL BE CONSULTED TO APPROVE THE REQUIRED EROSION CONTROL AND MITIGATION MEASURES ADJACENT TO WATER BODIES.

0 2 4
1:50 METRES

0 5 10
1:100 METRES

0 10 20
1:200 METRES

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	CK/RAD	JJL	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	CK/RAD	JJL	MJT	RAD
0	2017-03-10	ISSUED FOR CONSTRUCTION	CK/RAD	JJL	MJT	RAD
A	2017-03-09	ISSUED FOR CLIENT REVIEW	CK/RAD	JJL	MJT	RAD

PERMIT TO PRACTICE
GOLDER ASSOCIATES LTD.
Signature
Date 17-04-05
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
17-04-05
NUNAVUT

CLIENT: Baffinland

CONSULTANT: Golder Associates

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PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
TYPICAL DETAILS AND GENERAL NOTES - CV186

PROJECT NO.	PHASE	REV.	2 of 4	DRAWING
1667708	3000	2		002

Reduced Size
NOT TO SCALE

CULVERT DETAILS†

STATION (m)	FISH BEARING STATUS (REFER TO NOTE 15 ON DWG. 002)	EXISTING CULVERT DIAMETER (D) (mm) (REFER TO NOTE 16 ON DWG. 002)	EXISTING CULVERT LENGTH (m) (REFER TO NOTE 16 ON DWG. 002)	EXISTING CULVERT GRADIENT (%) (REFER TO NOTE 16 ON DWG. 002)	EMBEDMENT DEPTH (E) (mm) (REFER TO NOTE 16 ON DWG. 002)	PROPOSED CULVERT LENGTH (m)	DEPTH FROM SUBGRADE TO TOP OF CULVERT AT CENTRELINE OF ROAD (Z) (m)	EASTING OF CENTRELINE OF PIPE AT CENTRELINE OF ROAD (m)	NORTHING OF CENTRELINE OF PIPE AT CENTRELINE OF ROAD (m)	INLET INVERT ELEVATION (m)	OUTLET INVERT ELEVATION (m)	CULVERT GRADIENT (G) (%)	CULVERT SKEW (deg)	INLET RIP RAP REQUIRED?	OUTLET RIP RAP REQUIRED?	RIP RAP APRON LENGTH (Lr) (m)
0+265.0	POTENTIAL	1000	21			37	0.9	560720.5	7913497.8	178.4	177.7	2	139	N	Y	4

†CULVERT LOCATION DETAILS ARE BASED ON A DESK STUDY USING A DIGITAL ELEVATION MODEL AND SATELLITE IMAGERY PROVIDED BY BAFFINLAND, AND ARE NOT SUPPORTED BY FIELD STUDY (REFER TO GENERAL CONSTRUCTION NOTE 12 ON DWG. 001)

SITE SPECIFIC NOTES FOR CULVERT CV186

AS INDICATED IN THE GENERAL CONSTRUCTION NOTES ON DWG. 002, THE SITE SPECIFIC NOTES ARE BASED ONLY ON A DESKTOP STUDY OF THE SITE. NO FIELD WORK WAS CARRIED OUT TO SUPPORT THIS WORK. AN INSPECTION OF THE SITE SHALL BE CARRIED OUT BY THE OWNER'S REPRESENTATIVE AND/OR GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION. THE SITE SPECIFIC NOTES ARE INTENDED TO BE COMPREHENSIVE BUT NOT ALL-INCLUSIVE.

1. CONSTRUCT THE ROAD ALONG THE REALIGNMENT (REFER TO DWG. 004).
2. **WIDEN THE ROAD RUNNING SURFACE AT THE CULVERT LOCATION TO A MINIMUM OF 10 m, MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL).**
3. **WIDEN THE ROAD RUNNING SURFACE TO A MINIMUM OF 10 m ON THE APPROACHES TO THE CULVERT LOCATION, MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL).**
4. **ADD/ SHAPE EMBANKMENT FILL TO FLATTEN THE ROAD EMBANKMENT SIDE SLOPES TO NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL), MAINTAINING THE ROAD RUNNING SURFACE WIDTH A MINIMUM OF 10 m.**
5. **RAISE THE ROAD EMBANKMENT TO PROVIDE ADEQUATE CULVERT PIPE COVER, MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL) AND THE ROAD RUNNING SURFACE A MINIMUM OF 10 m.**
6. CAP THE ROAD SURFACE WITH SUITABLE RUNNING SURFACE MATERIAL (SEE TYPICAL SECTION ON DWG. 002).
7. PROVIDE SAFETY BERMS WHERE EMBANKMENT FILL IS GREATER THAN 3 m ABOVE EXISTING GROUND SURFACE.
8. PROVIDE RIP RAP PROTECTION AT THE CULVERT INLET AND OUTLET.
9. MARK THE CULVERT ENDS WITH DELINEATORS OF SUFFICIENT SIZE AND HEIGHT TO REDUCE THE RISK OF DAMAGE TO THE CULVERT PIPE ENDS BY SNOW PLOWING, SIDE SLOPING, OR OTHER MAINTENANCE OPERATIONS.

ROAD LAYOUT DETAILS

STATION (m)	TOP OF SUBGRADE			CENTRELINE CUT DEPTH* (TOP OF SUBGRADE TO EXISTING ROAD SURFACE) (m)	TOE OF EMBANKMENT SLOPE		
	CENTRELINE EASTING (m)	CENTRELINE NORTHING (m)	CENTRELINE ELEVATION (m)		OFFSET TO LEFT TOE** (m)	OFFSET TO RIGHT TOE** (m)	GRADIENT TO NEXT POINT (%)
0+000.0	560480.3	7913604.8	181.1	-0.2	5.1	5.0	1.6
0+017.9	560496	7913596.3	181.4	-0.2	5.9	13.2	1.5
0+020.0	560497.9	7913595.4	181.4	-0.2	5.9	13.2	0.3
0+040.0	560515.5	7913585.9	181.4	-0.1	5.8	9.8	-2.0
0+060.0	560533.1	7913576.4	181.1	-0.2	6.2	11.4	-3.5
0+067.9	560540	7913572.7	180.8	-0.3	6.3	13.1	-3.9
0+068.2	560540.4	7913572.5	180.8	-0.3	6.3	13.1	-3.5
0+080.0	560550.7	7913566.9	180.4	-0.2	6.5	13.4	-2.6
0+087.7	560557.5	7913563.3	180.1	-0.4	6.2	13.8	-1.8
0+100.0	560568.5	7913557.7	179.9	-0.4	6.1	13.6	-0.5
0+119.6	560586.5	7913550.2	179.8	-0.2	6.0	11.0	0.3
0+120.0	560587	7913550.1	179.8	-0.2	6.0	11.0	0.3
0+140.0	560606	7913544.2	179.9	-0.1	5.9	10.9	
0+157.4	560623	7913540.4	179.9	-0.2	6.1	10.2	0.0
0+160.0	560625.6	7913540	179.9	-0.2	6.2	10.2	0.0
0+165.0	560630.6	7913539.1	179.9	-0.2	6.3	6.0	0.0
0+180.0	560645.1	7913535.8	179.9	-0.2	6.8	5.8	0.0
0+196.4	560660.7	7913530.6	179.9	-0.3	6.5	6.0	0.0
0+200.0	560664	7913529.3	179.9	-0.2	6.4	6.0	0.0
0+212.1	560675.3	7913524.9	179.9	-0.2	6.2	6.0	0.0
0+220.0	560682.6	7913521.8	179.9	-0.3	6.4	6.0	0.0
0+225.4	560687.5	7913519.5	179.9	-0.3	6.5	10.4	0.2
0+240.0	560700.3	7913512.5	179.9	-0.4	6.8	13.4	0.6
0+260.0	560716.7	7913501	180	-1.2	8.3	6.4	0.9
0+264.0	560719.8	7913498.5	180.1	-1.4	8.3	6.5	0.9
0+264.4	560720.1	7913498.2	180.1	-1.4	8.3	6.5	1.0
0+265.0	560720.5	7913497.9	180.1	-1.4	8.3	6.5	1.1
0+280.0	560732.5	7913488.8	180.3	-0.5	7.8	6.5	1.4
0+284.1	560735.9	7913486.5	180.3	-0.4	7.7	6.4	1.4
0+300.0	560749.7	7913478.6	180.5	-0.2	6.1	6.3	1.4
0+320.0	560768	7913470.6	180.8	-0.2	6.0	6.1	1.4
0+325.7	560773.3	7913468.7	180.9	-0.1	6.1	5.9	1.3
0+328.1	560775.6	7913468	180.9	-0.1	6.1	5.9	0.9
0+337.3	560784.4	7913465.3	181	-0.1	6.1	5.8	0.5
0+340.0	560787	7913464.5	181	-0.1	5.2	5.1	0.5
0+350.9	560797.4	7913461.3	181.1	-0.2	5.1	5.0	

* NEGATIVE CUT DEPTH DENOTES FILL
** MEASURED ON GROUND SURFACE

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1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	CK/RAD	JJL	MJT	RAD
0	2017-03-10	ISSUED FOR CONSTRUCTION	CK/RAD	JJL	MJT	RAD
A	2017-03-09	ISSUED FOR CLIENT REVIEW	CK/RAD	JJL	MJT	RAD

PERMIT-TO-PRACTICE
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Signature
Date 17-04-03
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
2017-04-03
NUNAVUT

Baffinland
IRON MINES CORPORATION

Golder Associates

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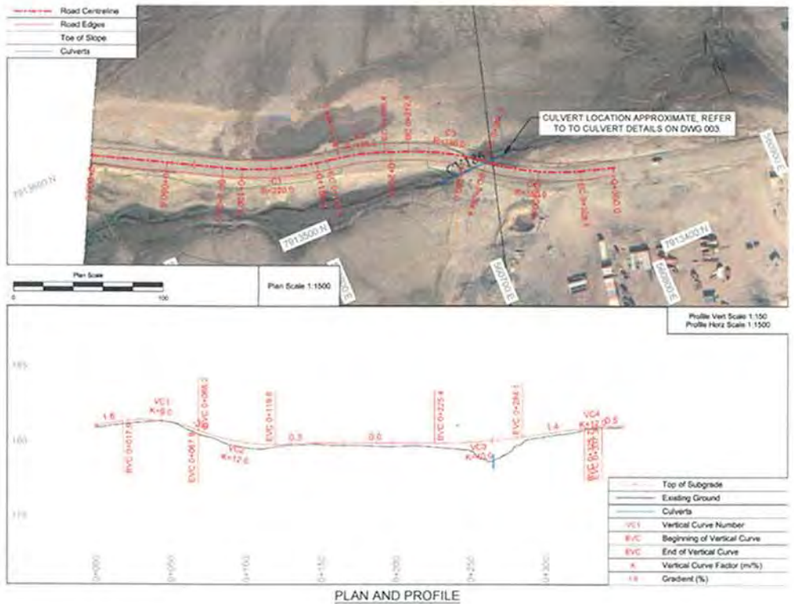
PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

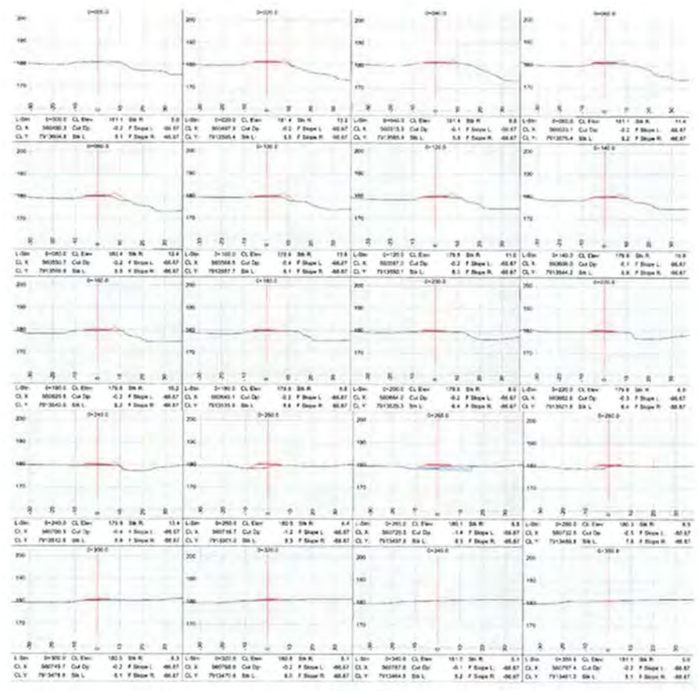
TITLE
CULVERT INSTALLATION DESIGN RECOMMENDATIONS & DESIGN TABLES - CV186

PROJECT NO.	PHASE	REV.	3 of 4	DRAWING
1667708	3000	2		003

Reduced Size
NOT TO SCALE



PLAN AND PROFILE



SECTIONS
(REFER TO GENERAL CONSTRUCTION NOTE 17)

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	CK/RAD	JJL	MJT	RAD
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NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
2017-04-03
NUNAVUT

Prepared for: Baffinland

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PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
ROAD PLAN, PROFILE AND SECTIONS - CV186

PROJECT NO	PHASE	REV	4 of 4	DRAWING
1667708	3000	2		004

Reduced Size
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BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT
TOTE ROAD EARTHWORKS
CV187

INDEX OF DRAWINGS		
DRAWING NO.	DRAWING SHEET TITLE	REVISION NO.
001	TITLE SHEET - CV187	2
002	PIPE CROSSING TYPICAL DETAILS & GENERAL NOTES - CV187	2
003	CULVERT INSTALLATION DESIGN RECOMMENDATIONS & DESIGN TABLES - CV187	2
004	ROAD PLAN, PROFILE AND SECTIONS - CV187	2

SPECIFICATIONS		
SPECIFICATION NO.	SPECIFICATION TITLE	REVISION NO.
1667708-S	TOTE ROAD EARTHWORKS	1

DESIGN REPORT		
REPORT NO.	REPORT TITLE	REVISION NO.
1667708	TOTE ROAD EARTHWORKS	0

KEY PLAN
NOT TO SCALE

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	JJL	CK/RAD	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	JJL	CK/RAD	MJT	RAD
0	2017-03-09	ISSUED FOR CONSTRUCTION	JJL	CK/RAD	MJT	RAD
A	2017-02-24	ISSUED FOR CLIENT REVIEW	JJL	CK/RAD	MJT	RAD

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REGISTERED PROFESSIONAL ENGINEER
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LICENSEE
2017-04-03
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CLIENT: Baffinland
CONSULTANT: Golder Associates

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PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
TITLE SHEET - CV187

PROJECT NO.	PHASE	REV.	1 of 4	DRAWING
1667708	3000	2		001

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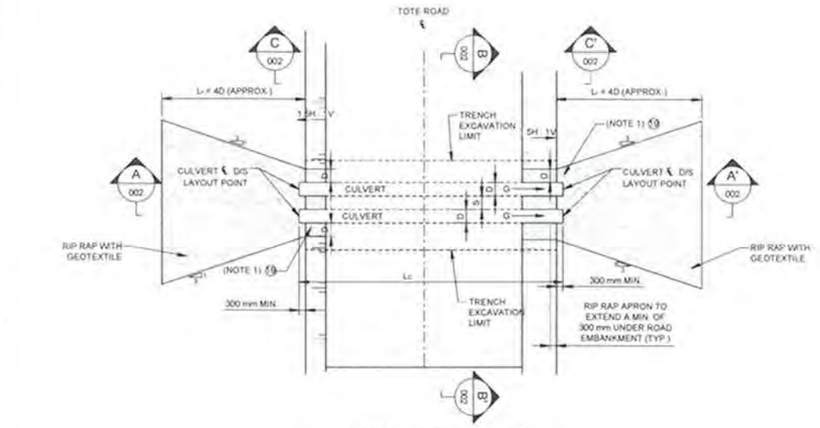
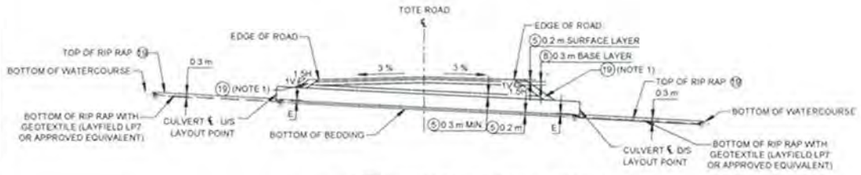
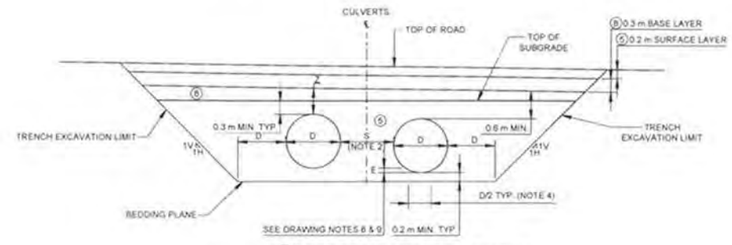
NOT TO SCALE



PIPE CROSSING PLAN VIEW
SCALE 1:200 m



SCALE 1:200 m (A 002) PIPE CROSSING TYPICAL PROFILE



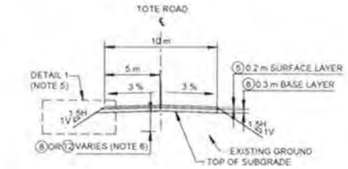
SCALE 1:50 m (B 002) PIPE CROSSING TYPICAL SECTION

LEGEND

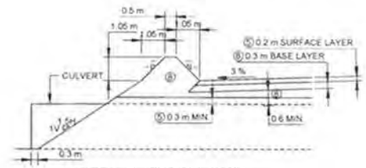
(5)	SCREENED MATERIAL	(12)	RUN OF QUARRY (ROQ)
(6)	JAW RUN	(19)	EROSION PROTECTION

DRAWING NOTES

1. EROSION PROTECTION SHALL BE PLACED AROUND THE CULVERT INLET AND OUTLET AS PER THE DIRECTION OF THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
2. THE MINIMUM SPACING (S) BETWEEN CULVERTS SHALL BE D, WHERE D IS THE CULVERT DIAMETER, OR 1.5 m, WHICHEVER IS GREATER.
3. THE MINIMUM COVER DEFINED AS THE DISTANCE BETWEEN THE TOP OF CULVERT TO THE TOP OF SUBGRADE SHALL BE 0.6 m OR D/4, WHERE D IS THE CULVERT DIAMETER WHICHEVER IS GREATER.
4. THE BEDDING TO BE SHAPED TO RECEIVE PIPE.
5. SAFETY BERMS ARE REQUIRED FOR EMBANKMENTS GREATER THAN 3 m IN HEIGHT.
6. FOR EMBANKMENT FILL DEPTHS LESS THAN 0.6 m, TYPE 8 MATERIAL SHALL BE USED. FOR FILL DEPTHS GREATER THAN 0.6 m, AND DEPENDING ON THE FILL EXTENTS, TYPE 12 MATERIAL MAY BE USED.
7. DEFINITIONS AND VALUES OF D,L,Lr, AND G CAN BE FOUND IN DESIGN TABLES ON DRAWING 003.
8. FOR FISH BEARING CULVERT WITH MULTIPLE PIPES, ONLY ONE SHALL BE EMBEDDED BY "E" AND ALL OTHER PIPES SHALL BE PLACED ON GROUND / BOTTOM OF WATER COURSE.
9. AS PER CULVERT DETAILS (DWG 003) FOR FISH BEARING CULVERT, E = 0.1 D. FOR NON-FISH BEARING CULVERT E=0.



SCALE 1:200 m (C 002) EMBANKMENT SECTION



DETAIL 1 - TYPICAL BERM
SCALE 1:100 m

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14. NO GEOTECHNICAL OR STRUCTURAL ANALYSIS OF THE CULVERT INSTALLATIONS HAS **BEEN CARRIED OUT. A MINIMUM CULVERT COVER OF 0.6 m OR D/4 (WHERE D IS THE** DIAMETER OF THE CIRCULAR CULVERT PIPE) HAS BEEN ASSUMED TO BE APPROPRIATE FOR 10 TONNE AXLE LOADS. USE OF HEAVIER TRUCKS WILL REQUIRE STRUCTURAL ANALYSIS OF THE CULVERT INSTALLATION.
15. FISH BEARING STATUS IN CULVERT DETAILS TABLE ON DWG. 003 TAKEN FROM HATCH TOTE ROAD CULVERT DATA SHEETS H349000-3000-10-088-0030 THROUGH H349000-3000-10-088-0034.
16. NO HYDROLOGIC OR HYDRAULIC ANALYSIS WAS CARRIED OUT. NUMBER OF CULVERTS, CULVERT DIAMETER(S), CULVERT LENGTH(S), EMBEDMENT DEPTH (E), AND REQUIREMENTS FOR RIP RAP FROM HATCH TOTE ROAD CULVERT DATA SHEETS H349000-3000-10-088-0030 THROUGH H349000-3000-10-088-0034.
17. IN SECTIONS, SKEWED CULVERTS ARE PROJECTED ONTO PLANE OF CROSS-SECTIONS.
18. AT LIMITS OF CONSTRUCTION NEW PAVEMENT THICKNESS NEEDS TO BE TAPERED TO MATCH EXISTING PAVEMENT SURFACE.
19. THE OWNER'S REPRESENTATIVE WILL CONFIRM THE REQUIREMENT FOR SAFETY BERMS ALONG THE ROAD EDGES BASED ON ENCOUNTERED FIELD CONDITIONS. TYPICAL BERM DETAILS ARE SHOWN ON DWG 002.
20. SITE SPECIFIC NOTES ON DWG. 003 MUST BE READ IN CONJUNCTION WITH THESE GENERAL NOTES, AND THE SPECIFICATIONS AND DRAWINGS LISTED ON DWG 001.
21. BAFFINLAND IS RESPONSIBLE FOR PERMITTING OF THE PROPOSED WORKS (IF REQUIRED).
22. PRIOR TO CONSTRUCTION, BAFFINLAND'S ENVIRONMENTAL REPRESENTATIVE WILL BE CONSULTED TO APPROVE THE REQUIRED EROSION CONTROL AND MITIGATION MEASURES ADJACENT TO WATER BODIES.

0 2 4
1:50 METRES

0 5 10
1:100 METRES

0 10 20
1:200 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	JJL	CK/RAD	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	JJL	CK/RAD	MJT	RAD
0	2017-03-09	ISSUED FOR CONSTRUCTION	JJL	CK/RAD	MJT	RAD
A	2017-02-24	ISSUED FOR CLIENT REVIEW	JJL	CK/RAD	MJT	RAD

PERMITTING PRACTICE
GOLDER ASSOCIATES LTD.
Signature
Date 17-04-03
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGH
CONSULTANT
LICENSEE
2017-04-03
NUNAVUT

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PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
TYPICAL DETAILS AND GENERAL NOTES - CV187

PROJECT NO.	PHASE	REV.	2 of 4	DRAWING
1667708	3000	2		002

Reduced Size
NOT TO SCALE

CULVERT DETAILS†

STATION (m)	FISH BEARING STATUS (REFER TO NOTE 15 ON DWG. 002)	EXISTING CULVERT DIAMETER (D) (mm) (REFER TO NOTE 16 ON DWG. 002)	EXISTING CULVERT LENGTH (m) (REFER TO NOTE 16 ON DWG. 002)	EXISTING CULVERT GRADIENT (%) (REFER TO NOTE 16 ON DWG. 002)	EMBEDMENT DEPTH (E) (mm) (REFER TO NOTE 16 ON DWG. 002)	PROPOSED CULVERT LENGTH (m)	DEPTH FROM SUBGRADE TO TOP OF CULVERT AT CENTRELINE OF ROAD (Z) (m)	EASTING OF CENTRELINE OF PIPE AT CENTRELINE OF ROAD (m)	NORTHING OF CENTRELINE OF PIPE AT CENTRELINE OF ROAD (m)	INLET INVERT ELEVATION (m)	OUTLET INVERT ELEVATION (m)	CULVERT GRADIENT (G) (%)	CULVERT SKEW (deg)	INLET RIP RAP REQUIRED?	OUTLET RIP RAP REQUIRED?	RIP RAP APRON LENGTH (Lr) (m)
0+054.6	POTENTIAL	500	10			39	1.6	560960.6	7913418.7	181.1	180.7	1	47	N	N	

†CULVERT LOCATION DETAILS ARE BASED ON A DEM STUDY USING A DIGITAL ELEVATION MODEL AND SATELLITE IMAGERY PROVIDED BY BAFFINLAND, AND ARE NOT SUPPORTED BY FIELD STUDY (REFER TO GENERAL CONSTRUCTION NOTE 12 ON DWG. 001)

SITE SPECIFIC NOTES FOR CULVERT CV187

AS INDICATED IN THE GENERAL CONSTRUCTION NOTES ON DWG. 002, THE SITE SPECIFIC NOTES ARE BASED ONLY ON A DESKTOP STUDY OF THE SITE. NO FIELD WORK WAS CARRIED OUT TO SUPPORT THIS WORK. AN INSPECTION OF THE SITE SHALL BE CARRIED OUT BY THE OWNER'S REPRESENTATIVE AND/OR GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION. THE SITE SPECIFIC NOTES ARE INTENDED TO BE COMPREHENSIVE BUT NOT ALL-INCLUSIVE.

1. **WIDEN THE ROAD RUNNING SURFACE AT THE CULVERT LOCATION TO A MINIMUM WIDTH OF 10 m, MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL).**
2. **WIDEN THE ROAD RUNNING SURFACE TO A MINIMUM OF 10 m ON THE APPROACHES TO THE CULVERT LOCATION, MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL).**
3. **ADD/ SHAPE EMBANKMENT FILL TO FLATTEN THE ROAD EMBANKMENT SIDE SLOPES TO NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL), MAINTAINING THE ROAD RUNNING SURFACE WIDTH A MINIMUM OF 10 m.**
4. CAP THE ROAD SURFACE WITH SUITABLE RUNNING SURFACE MATERIAL (SEE TYPICAL SECTION ON DWG. 002).
5. PROVIDE SAFETY BERMS WHERE EMBANKMENT FILL IS GREATER THAN 3 M ABOVE EXISTING GROUND SURFACE.
6. PROVIDE RIP RAP PROTECTION AT THE CULVERT INLET AND OUTLET.
7. MARK THE CULVERT ENDS WITH DELINEATORS OF SUFFICIENT SIZE AND HEIGHT TO REDUCE THE RISK OF DAMAGE TO THE CULVERT PIPE ENDS BY SNOW PLOWING, SIDE SLOPING, OR OTHER MAINTENANCE OPERATIONS.

ROAD LAYOUT DETAILS

STATION (m)	TOP OF SUBGRADE: CENTRELINE EASTING (m)	TOP OF SUBGRADE: CENTRELINE NORTHING (m)	TOP OF SUBGRADE: CENTRELINE ELEVATION (m)	CENTRELINE CUT DEPTH* (TOP OF SUBGRADE TO EXISTING ROAD SURFACE) (m)	TOE OF EMBANKMENT SLOPE: OFFSET TO LEFT TOE** (m)	TOE OF EMBANKMENT SLOPE: OFFSET TO RIGHT TOE** (m)	TOE OF EMBANKMENT SLOPE: GRADIENT TO NEXT POINT (%)
0+000.0	560907.4	7913430.9	182	-0.2	5.0	5.2	1.1
0+015.6	560922.6	7913427.4	182.2	-0.2	6.0	6.1	1.3
0+020.0	560926.9	7913426.4	182.2	-0.3	6.1	6.2	2.3
0+040.0	560946.4	7913422	182.7	-0.8	14.1	7.5	3.7
0+054.6	560960.6	7913418.7	183.2	-1	12.9	13.1	4.6
0+060.0	560965.9	7913417.5	183.5	-1	7.4	13.8	5.6
0+080.0	560985.4	7913413	184.6	-0.7	6.8	15.9	7.2
0+097.6	561002.5	7913409.1	185.9	-0.3	6.2	5.8	7.9
0+100.0	561004.9	7913408.5	186.1	-0.2	6.2	5.8	7.9
0+115.0	561019.5	7913405.2	187.2	-0.1	5.1	5.2	

* NEGATIVE CUT DEPTH DENOTES Fill
** MEASURED ON GROUND SURFACE

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	JJL	CK/RAD	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	JJL	CK/RAD	MJT	RAD
0	2017-03-09	ISSUED FOR CONSTRUCTION	JJL	CK/RAD	MJT	RAD
A	2017-02-24	ISSUED FOR CLIENT REVIEW	JJL	CK/RAD	MJT	RAD

PERMIT TO PRACTICE
GOLDER ASSOCIATES LTD.
Signature
Date 17-04-03
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
2017-04-03
NORTHWEST TERRITORIES AND NUNAVUT

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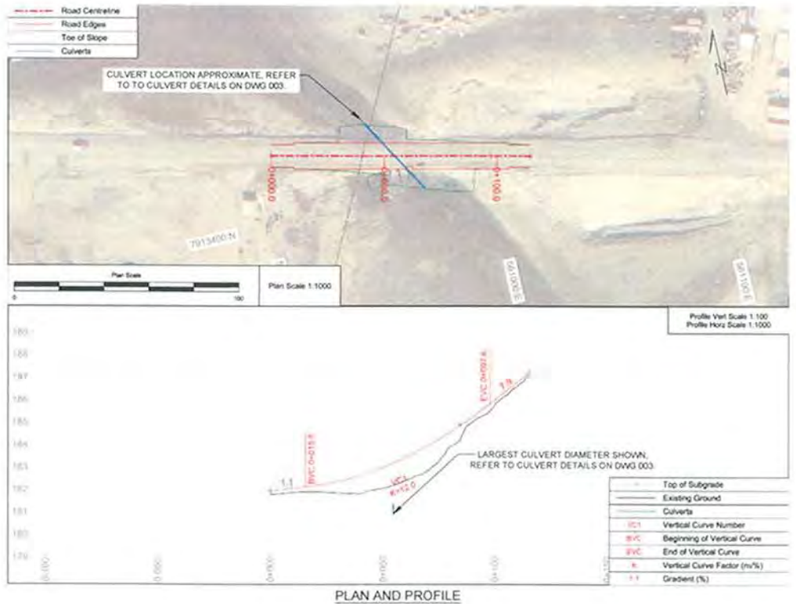
PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

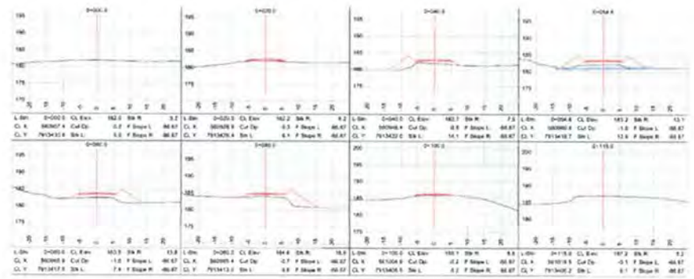
TITLE
CULVERT INSTALLATION DESIGN RECOMMENDATIONS & DESIGN TABLES - CV187

PROJECT NO	PHASE	REV	3 of 4	DRAWING NO
1667708	3000	2		003

Reduced Size
NOT TO SCALE



PLAN AND PROFILE



SECTIONS
(REFER TO GENERAL CONSTRUCTION NOTE 17)

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV 1 / REPORT REV 0	JJL	CK/RAD	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV 0	JJL	CK/RAD	MJT	RAD
0	2017-03-09	ISSUED FOR CONSTRUCTION	JJL	CK/RAD	MJT	RAD
A	2017-02-24	ISSUED FOR CLIENT REVIEW	JJL	CK/RAD	MJT	RAD

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PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
ROAD PLAN, PROFILE AND SECTIONS - CV187

PROJECT NO	PHASE	REV	4 of 4	DRAWING
1667708	3000	2		004

Reduced Size
NOT TO SCALE

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT
TOTE ROAD EARTHWORKS
CV216

INDEX OF DRAWINGS		
DRAWING NO.	DRAWING SHEET TITLE	REVISION NO.
001	TITLE SHEET - CV216	2
002	PIPE CROSSING TYPICAL DETAILS & GENERAL NOTES - CV216	2
003	CULVERT INSTALLATION DESIGN RECOMMENDATIONS & DESIGN TABLES - CV216	2
004	ROAD PLAN, PROFILE AND SECTIONS - CV216	2

SPECIFICATIONS		
SPECIFICATION NO.	SPECIFICATION TITLE	REVISION NO.
1667708-S	TOTE ROAD EARTHWORKS	1

DESIGN REPORT		
REPORT NO.	REPORT TITLE	REVISION NO.
1667708	TOTE ROAD EARTHWORKS	0

KEY PLAN
NOT TO SCALE

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	CK/RAD	JJL	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	CK/RAD	JJL	MJT	RAD
0	2017-03-10	ISSUED FOR CONSTRUCTION	CK/RAD	JJL	MJT	RAD
A	2017-03-08	ISSUED FOR CLIENT REVIEW	CK/RAD	JJL	MJT	RAD

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Signature
Date 17-Mar-17
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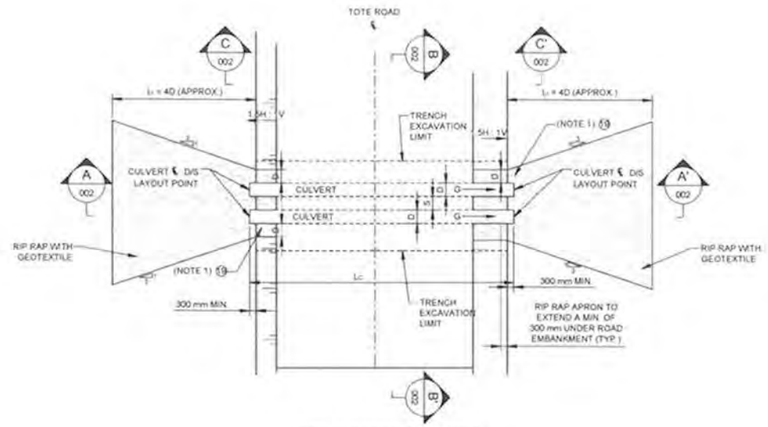
PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

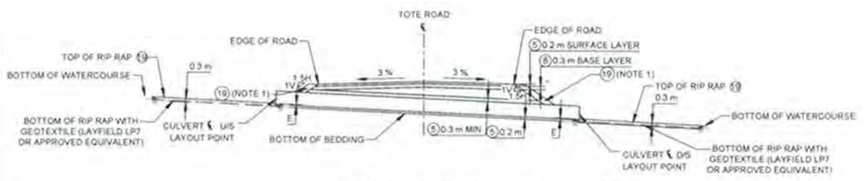
TITLE
TITLE SHEET - CV216

PROJECT NO.	PHASE	REV	1 of 4	DRAWING
1667708	3000	2		001

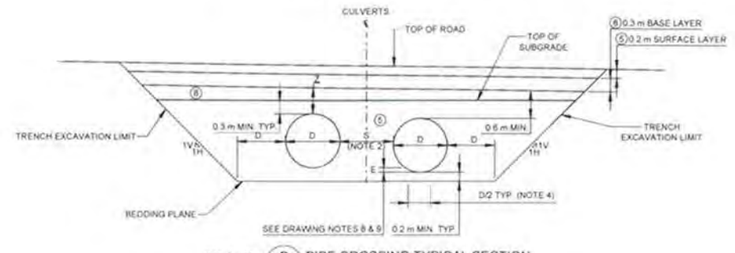
Reduced Size
NOT TO SCALE



PIPE CROSSING PLAN VIEW
SCALE 1:200 m



SCALE 1:200 m (A 002) PIPE CROSSING TYPICAL PROFILE



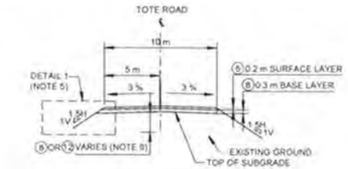
SCALE 1:50 m (B 002) PIPE CROSSING TYPICAL SECTION

LEGEND

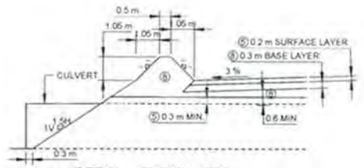
(5)	SCREENED MATERIAL	(13)	RUN OF QUARRY (ROQ)
(8)	JAW RUN	(19)	EROSION PROTECTION

DRAWING NOTES

1. EROSION PROTECTION SHALL BE PLACED AROUND THE CULVERT INLET AND OUTLET AS PER THE DIRECTION OF THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
2. THE MINIMUM SPACING (S) BETWEEN CULVERTS SHALL BE D, WHERE D IS THE CULVERT DIAMETER, OR 1.5 m, WHICHEVER IS GREATER.
3. THE MINIMUM COVER DEFINED AS THE DISTANCE BETWEEN THE TOP OF CULVERT TO THE TOP OF SUBGRADE SHALL BE 0.6 m OR D/4, WHERE D IS THE CULVERT DIAMETER, WHICHEVER IS GREATER.
4. THE BEDDING TO BE SHAPED TO RECEIVE PIPE.
5. SAFETY BERMS ARE REQUIRED FOR EMBANKMENTS GREATER THAN 3 m IN HEIGHT.
6. FOR EMBANKMENT FILL DEPTHS LESS THAN 0.6 m, TYPE 8 MATERIAL SHALL BE USED; FOR FILL DEPTHS GREATER THAN 0.6 m, AND DEPENDING ON THE FILL EXTENTS, TYPE 12 MATERIAL MAY BE USED.
7. DEFINITIONS AND VALUES OF D, L_c, L_T, AND G CAN BE FOUND IN DESIGN TABLES ON DRAWING 003.
8. FOR FISH BEARING CULVERT WITH MULTIPLE PIPES, ONLY ONE SHALL BE EMBEDDED BY "E" AND ALL OTHER PIPES SHALL BE PLACED ON GROUND / BOTTOM OF WATER COURSE.
9. AS PER CULVERT DETAILS (DWG 003) FOR FISH BEARING CULVERT, E = 0.1 D. FOR NON-FISH BEARING CULVERT E=0.



SCALE 1:200 m (C 002) EMBANKMENT SECTION



DETAIL 1 - TYPICAL BERM
SCALE 1:100 m

GENERAL CONSTRUCTION NOTES

1. IT IS THE RESPONSIBILITY OF THE USER OF THIS DRAWING TO ENSURE THE USE OF ITS MOST RECENT REVISION.
2. THE INFORMATION PROVIDED ON THE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE MOST RECENT REVISION OF THE SPECIFICATIONS AND REPORT LISTED ON DWG. 001.
3. IN THE EVENT OF DISCREPANCY BETWEEN THE DRAWINGS AND THE SPECIFICATIONS CLARIFICATION AND/OR DIRECTION SHALL BE PROVIDED AS OUTLINED IN THE SPECIFICATIONS.
4. PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL BE FAMILIAR WITH THE SCOPE OF WORK.
5. THE INFORMATION PRESENTED ON THESE DRAWINGS IS INTENDED TO CONVEY THE PIPE CROSSING CONSTRUCTION DETAILS AND ROAD EMBANKMENT DETAILS.
6. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES UNLESS OTHERWISE NOTED.
7. COORDINATE SYSTEM IS UTM (NAD 83) ZONE 17N.
8. CONTOUR INTERVAL IS 1 M WITH EXISTING TOPOGRAPHY.
9. THE DESIGN OF EACH INSTALLATION ARE BASED ON A DESK STUDY USING A DIGITAL ELEVATION MODEL AND SATELLITE IMAGERY PROVIDED BY BAFFINLAND, AND ARE NOT SUPPORTED BY FIELD STUDY.
10. THE GROUND SURFACE ELEVATIONS ARE CONSIDERED TO BE APPROXIMATE.
11. A DECISION ON WHETHER TO EXTEND OR REPLACE EACH CULVERT WILL BE MADE BY THE OWNER'S REPRESENTATIVE.
12. FIELD FITTING OF CULVERTS (INCLUDING LOCATIONS, LENGTHS, INVERT DEPTHS, GRADIENTS, AND SKEWS) TO ACTUAL CONDITIONS AT EACH SITE SHALL BE AS DIRECTED BY THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
13. FILL MATERIALS SHALL BE HANDLED, SORTED, PLACED AND COMPACTED AS SHOWN ON THE DRAWINGS, DESCRIBED IN THE SPECIFICATIONS AND TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
14. NO GEOTECHNICAL OR STRUCTURAL ANALYSIS OF THE CULVERT INSTALLATIONS HAS **BEEN CARRIED OUT. A MINIMUM CULVERT COVER OF 0.6 m OR D/4 (WHERE D IS THE** DIAMETER OF THE CIRCULAR CULVERT PIPE) HAS BEEN ASSUMED TO BE APPROPRIATE FOR 10 TONNE AXLE LOADS. USE OF HEAVIER TRUCKS WILL REQUIRE STRUCTURAL ANALYSIS OF THE CULVERT INSTALLATION.
15. FISH BEARING STATUS IN CULVERT DETAILS TABLE ON DWG. 003 TAKEN FROM HATCH TOTE ROAD CULVERT DATA SHEETS H349000-3000-10-088-0030 THROUGH H349000-3000-10-088-0034.
16. NO HYDROLOGIC OR HYDRAULIC ANALYSIS WAS CARRIED OUT. NUMBER OF CULVERTS, CULVERT DIAMETER(S), CULVERT LENGTH(S), EMBEDMENT DEPTH (E), AND REQUIREMENTS FOR RIP RAP FROM HATCH TOTE ROAD CULVERT DATA SHEETS H349000-3000-10-088-0030 THROUGH H349000-3000-10-088-0034.
17. IN SECTIONS, SKEWED CULVERTS ARE PROJECTED ONTO PLANE OF CROSS-SECTIONS.
18. AT LIMITS OF CONSTRUCTION NEW PAVEMENT THICKNESS NEEDS TO BE TAPERED TO MATCH EXISTING PAVEMENT SURFACE.
19. THE OWNER'S REPRESENTATIVE WILL CONFIRM THE REQUIREMENT FOR SAFETY BERMS ALONG THE ROAD EDGES BASED ON ENCOUNTERED FIELD CONDITIONS. TYPICAL BERM DETAILS ARE SHOWN ON DWG 002.
20. SITE SPECIFIC NOTES ON DWG. 003 MUST BE READ IN CONJUNCTION WITH THESE GENERAL NOTES, AND THE SPECIFICATIONS AND DRAWINGS LISTED ON DWG 001.
21. BAFFINLAND IS RESPONSIBLE FOR PERMITTING OF THE PROPOSED WORKS (IF REQUIRED).
22. PRIOR TO CONSTRUCTION, BAFFINLAND'S ENVIRONMENTAL REPRESENTATIVE WILL BE CONSULTED TO APPROVE THE REQUIRED EROSION CONTROL AND MITIGATION MEASURES ADJACENT TO WATER BODIES.

0 2 4
1:50 METRES

0 5 10
1:100 METRES

0 10 20
1:200 METRES

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	CK/RAD	JJL	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	CK/RAD	JJL	MJT	RAD
0	2017-03-10	ISSUED FOR CONSTRUCTION	CK/RAD	JJL	MJT	RAD
A	2017-03-06	ISSUED FOR CLIENT REVIEW	CK/RAD	JJL	MJT	RAD

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Signature
Date 17-04-03
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NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
2017-04-03
NWT/NU

Baffinland

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PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
TYPICAL DETAILS AND GENERAL NOTES - CV216

PROJECT NO.	PHASE	REV.	SHEET	DRAWING
1667708	3000	2	2 of 4	002

Reduced Size
NOT TO SCALE

CULVERT DETAILS†

STATION (m)	FISH BEARING STATUS (REFER TO NOTE 15 ON DWG. 002)	EXISTING CULVERT DIAMETER (D) (mm) (REFER TO NOTE 16 ON DWG. 002)	EXISTING CULVERT LENGTH (m) (REFER TO NOTE 16 ON DWG. 002)	EXISTING CULVERT GRADIENT (%) (REFER TO NOTE 16 ON DWG. 002)	EMBEDMENT DEPTH (E) (mm) (REFER TO NOTE 16 ON DWG. 002)	PROPOSED CULVERT LENGTH (m)	DEPTH FROM SUBGRADE TO TOP OF CULVERT AT CENTRELINE OF ROAD (Z) (m)	EASTING OF CENTRELINE OF PIPE AT CENTRELINE OF ROAD (m)	NORTHING OF CENTRELINE OF PIPE AT CENTRELINE OF ROAD (m)	INLET INVERT ELEVATION (m)	OUTLET INVERT ELEVATION (m)	CULVERT GRADIENT (G) (%)	CULVERT SKEW (deg)	INLET RIP RAP REQUIRED?	OUTLET RIP RAP REQUIRED?	RIP RAP APRON LENGTH (Lr) (m)
0+117.3	YES	1200	15	0.67	120	20.5	1	542770.8	7921717.1	143.4	143.2	-1	76	N	N	
0+120.0	YES	1200	15	0.9	120	20.5	0.9	542772.9	7921715.5	143.4	143.2	-1	77	N	N	

†CULVERT LOCATION DETAILS ARE BASED ON A DESK STUDY USING A DIGITAL ELEVATION MODEL AND SATELLITE IMAGERY PROVIDED BY BAFFINLAND, AND ARE NOT SUPPORTED BY FIELD STUDY (REFER TO GENERAL CONSTRUCTION NOTE 12 ON DWG. 002)

SITE SPECIFIC NOTES FOR CULVERT CV216

AS INDICATED IN THE GENERAL CONSTRUCTION NOTES ON DWG. 002, THE SITE SPECIFIC NOTES ARE BASED ONLY ON A DESKTOP STUDY OF THE SITE. NO FIELD WORK WAS CARRIED OUT TO SUPPORT THIS WORK. AN INSPECTION OF THE SITE SHALL BE CARRIED OUT BY THE OWNER'S REPRESENTATIVE AND/OR GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION. THE SITE SPECIFIC NOTES ARE INTENDED TO BE COMPREHENSIVE BUT NOT ALL-INCLUSIVE.

1. **WIDEN THE ROAD RUNNING SURFACE AT THE CULVERT LOCATION TO A MINIMUM WIDTH OF 10 m, MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL).**
2. **WIDEN THE ROAD RUNNING SURFACE TO A MINIMUM OF 10 m ON THE APPROACHES TO THE CULVERT LOCATION, MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL).**
3. **ADD/ SHAPE EMBANKMENT FILL TO FLATTEN THE ROAD EMBANKMENT SIDE SLOPES TO NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL), MAINTAINING THE ROAD RUNNING SURFACE WIDTH A MINIMUM OF 10 m.**
4. CAP THE ROAD SURFACE WITH SUITABLE RUNNING SURFACE MATERIAL (SEE TYPICAL SECTION ON DWG. 002).
5. PROVIDE SAFETY BERMS WHERE EMBANKMENT FILL IS GREATER THAN 3 m ABOVE EXISTING GROUND SURFACE.
6. PROVIDE RIP RAP PROTECTION AT THE CULVERT OUTLETS.
7. THE EXISTING CULVERT MAY BE PERCHED. REINSTALL CULVERTS TO DESIGN.
8. MARK THE CULVERT ENDS WITH DELINEATORS OF SUFFICIENT SIZE AND HEIGHT TO REDUCE THE RISK OF DAMAGE TO THE CULVERT PIPE ENDS BY SNOW PLOWING, SIDE SLOPING, OR OTHER MAINTENANCE OPERATIONS.

ROAD LAYOUT DETAILS

STATION (m)	TOP OF SUBGRADE			CENTRELINE CUT DEPTH* (TOP OF SUBGRADE TO EXISTING ROAD SURFACE) (m)	TOE OF EMBANKMENT SLOPE		
	CENTRELINE EASTING (m)	CENTRELINE NORTHING (m)	CENTRELINE ELEVATION (m)		OFFSET TO LEFT TOE** (m)	OFFSET TO RIGHT TOE** (m)	GRADIENT TO NEXT POINT (%)
0+000.0	542696.1	7921806.8	147.1	-0.1	5.1	5.4	0.7
0+020.0	542707.3	7921790.2	147.2	-0.2	5.9	6.1	0.7
0+034.2	542715.2	7921778.4	147.3	-0.1	5.9	6.1	0.4
0+039.7	542718.2	7921773.9	147.4	-0.1	5.9	6.0	0.1
0+040.0	542718.4	7921773.6	147.4	-0.1	5.9	6.0	-1.0
0+060.0	542730.2	7921757.5	147.2	-0.2	5.8	6.3	-3.2
0+078.7	542742.4	7921743.3	146.6	-0.2	6.3	5.9	-4.2
0+080.0	542743.3	7921742.4	146.5	-0.2	6.3	5.9	-4.2
0+082.7	542745.2	7921740.4	146.4	-0.3	6.3	6.0	-3.5
0+100.0	542757.6	7921728.3	145.8	-0.5	6.3	9.5	-2.0
0+117.3	542770.8	7921717.1	145.5	-0.2	5.9	9.2	-1.2
0+120.0	542772.9	7921715.5	145.4	-0.1	5.8	9.1	-1.1
0+120.0	542772.9	7921715.5	145.4	-0.1	5.8	9.1	-0.8
0+126.2	542777.6	7921711.8	145.4	-0.1	5.8	9.0	0.0

* NEGATIVE CUT DEPTH DENOTES FILL
** MEASURED ON GROUND SURFACE

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	CK/RAD	JJL	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	CK/RAD	JJL	MJT	RAD
0	2017-03-10	ISSUED FOR CONSTRUCTION	CK/RAD	JJL	MJT	RAD
A	2017-03-06	ISSUED FOR CLIENT REVIEW	CK/RAD	JJL	MJT	RAD

PERMIT-TO-PRACTICE
GOLDER ASSOCIATES LTD.
Signature
Date 2017-04-05
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
2017-04-05
NWT/NU

Baffinland

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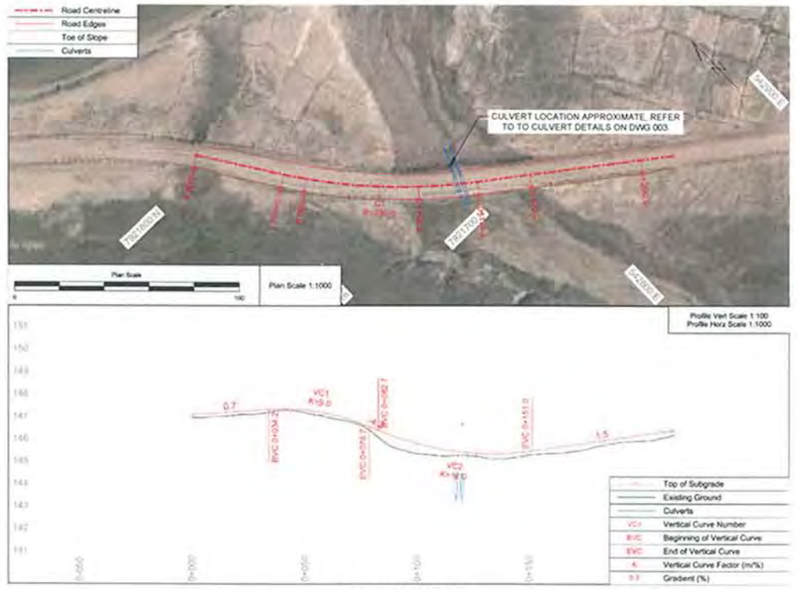
PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

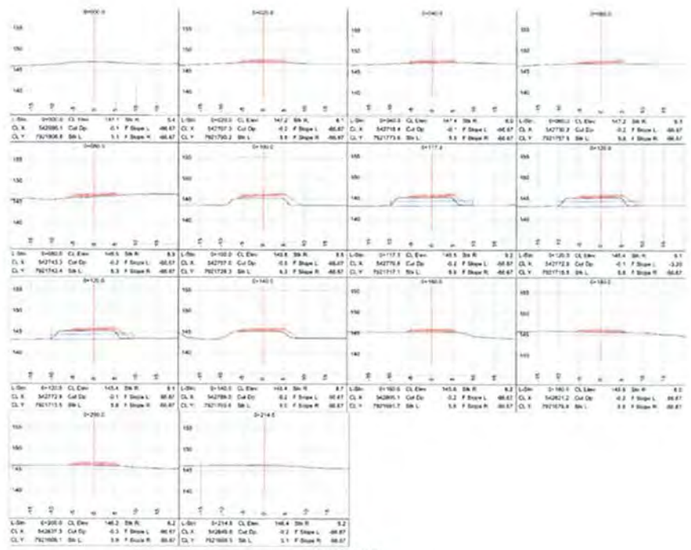
TITLE
CULVERT INSTALLATION DESIGN RECOMMENDATIONS & DESIGN TABLES - CV216

PROJECT NO.	PHASE	REV.	3 of 4	DRAWING
1667708	3000	2		003

Reduced Size
NOT TO SCALE



PLAN AND PROFILE



SECTIONS
(REFER TO GENERAL CONSTRUCTION NOTE 17)

REV	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	CK/RAD	JJL	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	CK/RAD	JJL	MJT	RAD
0	2017-03-10	ISSUED FOR CONSTRUCTION	CK/RAD	JJL	MJT	RAD
A	2017-03-08	ISSUED FOR CLIENT REVIEW	CK/RAD	JJL	MJT	RAD

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PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
ROAD PLAN, PROFILE AND SECTIONS - CV216

PROJECT NO	PHASE	REV	4 OF 4	DRAWING
1667708	3000	2		004

Reduced Size
NOT TO SCALE

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT
TOTE ROAD EARTHWORKS
CV224

INDEX OF DRAWINGS		
DRAWING NO.	DRAWING SHEET TITLE	REVISION NO.
001	TITLE SHEET - CV224	2
002	PIPE CROSSING TYPICAL DETAILS & GENERAL NOTES - CV224	2
003	CULVERT INSTALLATION DESIGN RECOMMENDATIONS & DESIGN TABLES - CV224	2
004	ROAD PLAN, PROFILE AND SECTIONS - 224	2

SPECIFICATIONS		
SPECIFICATION NO.	SPECIFICATION TITLE	REVISION NO.
1667708-S	TOTE ROAD EARTHWORKS	1

DESIGN REPORT		
REPORT NO.	REPORT TITLE	REVISION NO.
1667706	TOTE ROAD EARTHWORKS	0

KEY PLAN
NOT TO SCALE

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	JJL	CK/RAD	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	JJL	CK/RAD	MJT	RAD
0	2017-03-09	ISSUED FOR CONSTRUCTION	JJL	CK/RAD	MJT	RAD
A	2017-02-24	ISSUED FOR CLIENT REVIEW	JJL	CK/RAD	MJT	RAD

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CLIENT: Baffinland
CONSULTANT: Golder Associates

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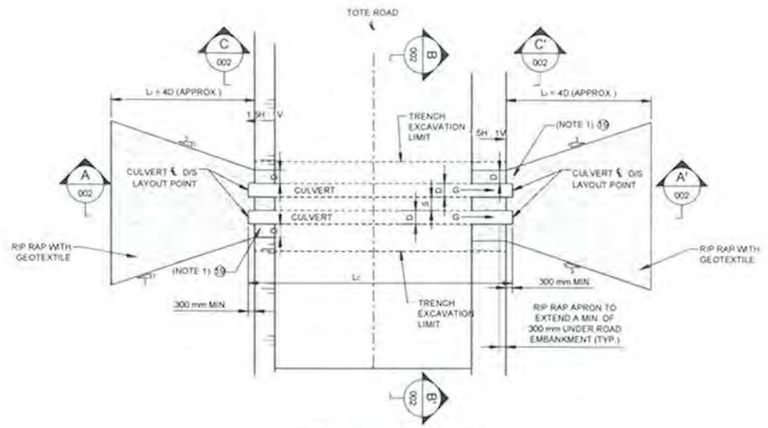
PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

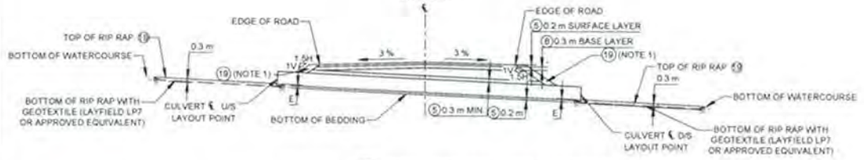
TITLE
TITLE SHEET - CV224

PROJECT NO.	PHASE	REV.	1 of 4	DRAWING
1667708	3000	2		001

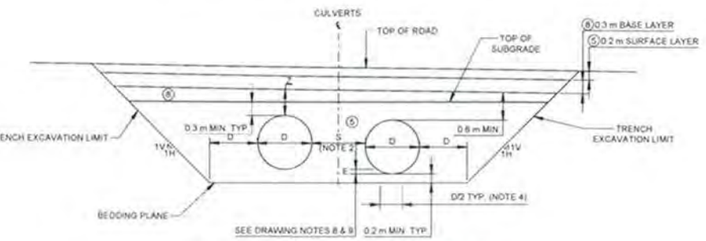
Reduced Size
NOT TO SCALE



PIPE CROSSING PLAN VIEW
SCALE 1:200 m



SCALE 1:200 m (A / 002) PIPE CROSSING TYPICAL PROFILE



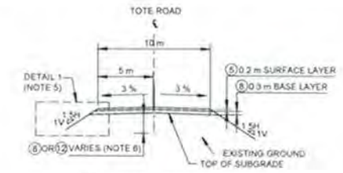
SCALE 1:50 m (B / 002) PIPE CROSSING TYPICAL SECTION

LEGEND

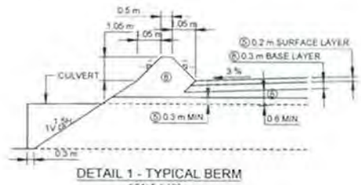
(5)	SCREENED MATERIAL	(12)	RUN OF QUARRY (ROQ)
(6)	JAW RUN	(19)	EROSION PROTECTION

DRAWING NOTES

1. EROSION PROTECTION SHALL BE PLACED AROUND THE CULVERT INLET AND OUTLET AS PER THE DIRECTION OF THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
2. THE MINIMUM SPACING (S) BETWEEN CULVERTS SHALL BE D, WHERE D IS THE CULVERT DIAMETER, OR 1.5 m, WHICHEVER IS GREATER.
3. THE MINIMUM COVER DEFINED AS THE DISTANCE BETWEEN THE TOP OF CULVERT TO THE TOP OF SUBGRADE SHALL BE 0.6 m OR D/4, WHERE D IS THE CULVERT DIAMETER, WHICHEVER IS GREATER.
4. THE BEDDING TO BE SHAPED TO RECEIVE PIPE.
5. SAFETY BERMS ARE REQUIRED FOR EMBANKMENTS GREATER THAN 3 m IN HEIGHT.
6. FOR EMBANKMENT FILL DEPTHS LESS THAN 0.6 m, TYPE 8 MATERIAL SHALL BE USED; FOR FILL DEPTHS GREATER THAN 0.6 m, AND DEPENDING ON THE FILL EXTENTS, TYPE 12 MATERIAL MAY BE USED.
7. DEFINITIONS AND VALUES OF D,Lc,Lr, AND G CAN BE FOUND IN DESIGN TABLES ON DRAWING 003.
8. FOR FISH BEARING CULVERT WITH MULTIPLE PIPES, ONLY ONE SHALL BE EMBEDDED BY "E" AND ALL OTHER PIPES SHALL BE PLACED ON GROUND / BOTTOM OF WATER COURSE.
9. AS PER CULVERT DETAILS (DWG 003) FOR FISH BEARING CULVERT, E = 0.1 D. FOR NON-FISH BEARING CULVERT E=0.



SCALE 1:200 m (C / 002) EMBANKMENT SECTION



DETAIL 1 - TYPICAL BERM
SCALE 1:100 m

GENERAL CONSTRUCTION NOTES

1. IT IS THE RESPONSIBILITY OF THE USER OF THIS DRAWING TO ENSURE THE USE OF ITS MOST RECENT REVISION.
2. THE INFORMATION PROVIDED ON THE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE MOST RECENT REVISION OF THE SPECIFICATIONS AND REPORT LISTED ON DWG. 001.
3. IN THE EVENT OF DISCREPANCY BETWEEN THE DRAWINGS AND THE SPECIFICATIONS, CLARIFICATION AND/OR DIRECTION SHALL BE PROVIDED AS OUTLINED IN THE SPECIFICATIONS.
4. PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL BE FAMILIAR WITH THE SCOPE OF WORK.
5. THE INFORMATION PRESENTED ON THESE DRAWINGS IS INTENDED TO CONVEY THE PIPE CROSSING CONSTRUCTION DETAILS AND ROAD EMBANKMENT DETAILS.
6. ALL DIMENSIONS AND ELEVATIONS ARE IN METRES UNLESS OTHERWISE NOTED.
7. COORDINATE SYSTEM IS UTM (NAD 83) ZONE 17N.
8. CONTOUR INTERVAL IS 1 M WITH EXISTING TOPOGRAPHY.
9. THE DESIGN OF EACH INSTALLATION ARE BASED ON A DESK STUDY USING A DIGITAL ELEVATION MODEL AND SATELLITE IMAGERY PROVIDED BY BAFFINLAND, AND ARE NOT SUPPORTED BY FIELD STUDY.
10. THE GROUND SURFACE ELEVATIONS ARE CONSIDERED TO BE APPROXIMATE.
11. A DECISION ON WHETHER TO EXTEND OR REPLACE EACH CULVERT WILL BE MADE BY THE OWNER'S REPRESENTATIVE.
12. FIELD FITTING OF CULVERTS (INCLUDING LOCATIONS, LENGTHS, INVERT DEPTHS, GRADIENTS, AND SKEWS) TO ACTUAL CONDITIONS AT EACH SITE SHALL BE AS DIRECTED BY THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
13. FILL MATERIALS SHALL BE HANDLED, SORTED, PLACED AND COMPACTED AS SHOWN ON THE DRAWINGS, DESCRIBED IN THE SPECIFICATIONS AND TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
14. NO GEOTECHNICAL OR STRUCTURAL ANALYSIS OF THE CULVERT INSTALLATIONS HAS **BEEN CARRIED OUT. A MINIMUM CULVERT COVER OF 0.6 m OR D/4 (WHERE D IS THE** DIAMETER OF THE CIRCULAR CULVERT PIPE) HAS BEEN ASSUMED TO BE APPROPRIATE FOR 10 TONNE AXLE LOADS. USE OF HEAVIER TRUCKS WILL REQUIRE STRUCTURAL ANALYSIS OF THE CULVERT INSTALLATION.
15. FISH BEARING STATUS IN CULVERT DETAILS TABLE ON DWG. 003 TAKEN FROM HATCH TOTE ROAD CULVERT DATA SHEETS H349000-3000-10-088-0030 THROUGH H349000-3000-10-088-0034.
16. NO HYDROLOGIC OR HYDRAULIC ANALYSIS WAS CARRIED OUT. NUMBER OF CULVERTS, CULVERT DIAMETER(S), CULVERT LENGTH(S), EMBEDMENT DEPTH (E), AND REQUIREMENTS FOR RIP RAP FROM HATCH TOTE ROAD CULVERT DATA SHEETS H349000-3000-10-088-0030 THROUGH H349000-3000-10-088-0034.
17. IN SECTIONS, SKEWED CULVERTS ARE PROJECTED ONTO PLANE OF CROSS-SECTIONS.
18. AT LIMITS OF CONSTRUCTION NEW PAVEMENT THICKNESS NEEDS TO BE TAPERED TO MATCH EXISTING PAVEMENT SURFACE.
19. THE OWNER'S REPRESENTATIVE WILL CONFIRM THE REQUIREMENT FOR SAFETY BERMS ALONG THE ROAD EDGES BASED ON ENCOUNTERED FIELD CONDITIONS. TYPICAL BERM DETAILS ARE SHOWN ON DWG 002.
20. SITE SPECIFIC NOTES ON DWG. 003 MUST BE READ IN CONJUNCTION WITH THESE GENERAL NOTES, AND THE SPECIFICATIONS AND DRAWINGS LISTED ON DWG 001.
21. BAFFINLAND IS RESPONSIBLE FOR PERMITTING OF THE PROPOSED WORKS (IF REQUIRED).
22. PRIOR TO CONSTRUCTION, BAFFINLAND'S ENVIRONMENTAL REPRESENTATIVE WILL BE CONSULTED TO APPROVE THE REQUIRED EROSION CONTROL AND MITIGATION MEASURES ADJACENT TO WATER BODIES.

0 2 4
1:50 METRES

0 5 10
1:100 METRES

0 10 20
1:200 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	J.E.	CK/RAD	M.T.	R.A.D.
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	J.E.	CK/RAD	M.T.	R.A.D.
0	2017-03-09	ISSUED FOR CONSTRUCTION	J.E.	CK/RAD	M.T.	R.A.D.
A	2017-02-24	ISSUED FOR CLIENT REVIEW	J.E.	CK/RAD	M.T.	R.A.D.

PERMIT-TO-PRACTICE GOLDER ASSOCIATES LTD.
Signature
Date 17-04-03
PERMIT NUMBER: P 049
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REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS
LICENSEE
2017-04-03
NWT/NU

CLIENT: Baffinland

CONSULTANT: Golder Associates

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PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
TYPICAL DETAILS AND GENERAL NOTES - CV224

PROJECT NO.	PHASE	REV.	2 of 4	DRAWING
1667708	3000	2		002

Reduced Size
NOT TO SCALE

CULVERT DETAILS1

STATION (m)	FISH BEARING STATUS (REFER TO NOTE 15 ON DWG. 002)	EXISTING CULVERT DIAMETER (D) (mm) (REFER TO NOTE 16 ON DWG. 002)	EXISTING CULVERT LENGTH (m) (REFER TO NOTE 16 ON DWG. 002)	EXISTING CULVERT GRADIENT (%) (REFER TO NOTE 16 ON DWG. 002)	EMBEDMENT DEPTH (E) (mm) (REFER TO NOTE 16 ON DWG. 002)	PROPOSED CULVERT LENGTH (m)	DEPTH FROM SUBGRADE TO TOP OF CULVERT AT CENTRELINE OF ROAD (Z) (m)	EASTING OF CENTRELINE OF PIPE AT CENTRELINE OF ROAD (m)	NORTHING OF CENTRELINE OF PIPE AT CENTRELINE OF ROAD (m)	INLET INVERT ELEVATION (m)	OUTLET INVERT ELEVATION (m)	CULVERT GRADIENT (G) (%)	CULVERT SKEW (deg)	INLET RIP RAP REQUIRED?	OUTLET RIP RAP REQUIRED?	RIP RAP APRON LENGTH (Lr) (m)
0+136.0	YES	1000	15	1.05		37.5	1.1	556232.2	7915066.6	154.8	154	2	122	N	N	

*CULVERT LOCATION DETAILS ARE BASED ON A DTM STUDY USING A DIGITAL ELEVATION MODEL AND SATELLITE IMAGERY PROVIDED BY BAFFINLAND, AND ARE NOT SUPPORTED BY FIELD STUDY (REFER TO GENERAL CONSTRUCTION NOTE 12 ON DWG. 002)

SITE SPECIFIC NOTES FOR CULVERT CV224

AS INDICATED IN THE GENERAL CONSTRUCTION NOTES ON DWG. 002, THE SITE SPECIFIC NOTES ARE BASED ONLY ON A DESKTOP STUDY OF THE SITE. NO FIELD WORK WAS CARRIED OUT TO SUPPORT THIS WORK. AN INSPECTION OF THE SITE SHALL BE CARRIED OUT BY THE OWNER'S REPRESENTATIVE AND/OR GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION. THE SITE SPECIFIC NOTES ARE INTENDED TO BE COMPREHENSIVE BUT NOT ALL-INCLUSIVE.

1. WIDEN THE ROAD RUNNING SURFACE AT THE CULVERT LOCATION TO A MINIMUM WIDTH OF 10 m, MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL).
2. WIDEN THE ROAD RUNNING SURFACE TO A MINIMUM OF 10 m ON THE APPROACHES TO THE CULVERT LOCATION, MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL).
3. ADD/ SHAPE EMBANKMENT FILL TO FLATTEN THE ROAD EMBANKMENT SIDE SLOPES TO NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL), MAINTAINING THE ROAD RUNNING SURFACE WIDTH A MINIMUM OF 10 m.
4. RAISE THE ROAD EMBANKMENT TO PROVIDE ADEQUATE CULVERT PIPE COVER, MAINTAINING THE ROAD EMBANKMENT SIDE SLOPES NO STEEPER THAN 1.5 : 1 (HORIZONTAL : VERTICAL) AND THE ROAD RUNNING SURFACE A MINIMUM WIDTH OF 10 m.
5. CAP THE ROAD SURFACE WITH SUITABLE RUNNING SURFACE MATERIAL (SEE TYPICAL SECTION ON DWG. 002).
6. PROVIDE SAFETY BERMS WHERE EMBANKMENT FILL IS GREATER THAN 3 m ABOVE EXISTING GROUND SURFACE.
7. PROVIDE RIP RAP PROTECTION AT THE CULVERT INLET AND OUTLET.
8. MARK THE CULVERT ENDS WITH DELINEATORS OF SUFFICIENT SIZE AND HEIGHT TO REDUCE THE RISK OF DAMAGE TO THE CULVERT PIPE ENDS BY SNOW PLOWING, SIDE SLOPING, OR OTHER MAINTENANCE OPERATIONS.

ROAD LAYOUT DETAILS

STATION (m)	TOP OF SUBGRADE			CENTRELINE CUT DEPTH* (TOP OF SUBGRADE TO EXISTING ROAD SURFACE) (m)	TOE OF EMBANKMENT SLOPE		
	CENTRELINE EASTING (m)	CENTRELINE NORTHING (m)	CENTRELINE ELEVATION (m)		OFFSET TO LEFT TOE** (m)	OFFSET TO RIGHT TOE** (m)	GRADIENT TO NEXT POINT (%)
0+000.0	556108.6	7914999	159.8	-0.3	5.2	5.5	-1.1
0+020.0	556126.8	7915007.8	159.5	-0.5	6.1	6.5	-1.1
0+036.4	556141.5	7915014.9	159.3	-0.5	6.3	6.4	-1.2
0+040.0	556144.7	7915016.5	159.3	-0.4	6.3	6.2	-1.7
0+060.0	556162.7	7915025.3	159	-0.4	6.8	6.1	-2.2
0+063.7	556166	7915026.9	158.9	-0.4	6.9	6.1	-2.2
0+080.0	556180.7	7915034.1	158.5	-0.4	6.5	6.2	-2.2
0+095.0	556194.1	7915040.7	158.2	-0.3	6.5	6.1	-2.2
0+100.0	556198.7	7915042.8	158.1	-0.2	6.1	6.0	-2.2
0+113.0	556210.6	7915048	157.8	-0.5	6.3	6.3	-1.9
0+120.0	556217.1	7915050.5	157.6	-1.1	11.7	6.5	-1
0+136.0	556232.3	7915055.6	157.5	-2.7	14.5	7.2	-0.2
0+140.0	556236.1	7915056.7	157.5	-2.7	14.5	7.3	0.8
0+160.0	556255.8	7915061.3	157.7	-2.4	13.4	7.6	1.9
0+164.8	556260.3	7915062.2	157.7	-1.5	13.7	7.4	2.7
0+180.0	556275.3	7915064.9	158.2	-0.7	7.2	6.5	4.2
0+200.0	556295	7915068.4	159	-0.2	6.5	5.9	5.8
0+220.0	556314.7	7915071.8	160.2	-0.4	6.4	5.9	7.2
0+233.2	556327.6	7915074.1	161.1	-0.4	6.4	6.4	7.8
0+240.0	556334.4	7915075.3	161.6	-0.5	6.5	6.4	7.8
0+260.0	556354	7915078.8	163.2	-0.8	7.1	7.0	7.8
0+280.0	556373.7	7915082.3	164.8	-0.3	5.7	6.4	7.8
0+289.4	556383	7915083.9	165.5	-0.2	5.3	5.2	

* NEGATIVE CUT DEPTH DENOTES FILL
** MEASURED ON GROUND SURFACE

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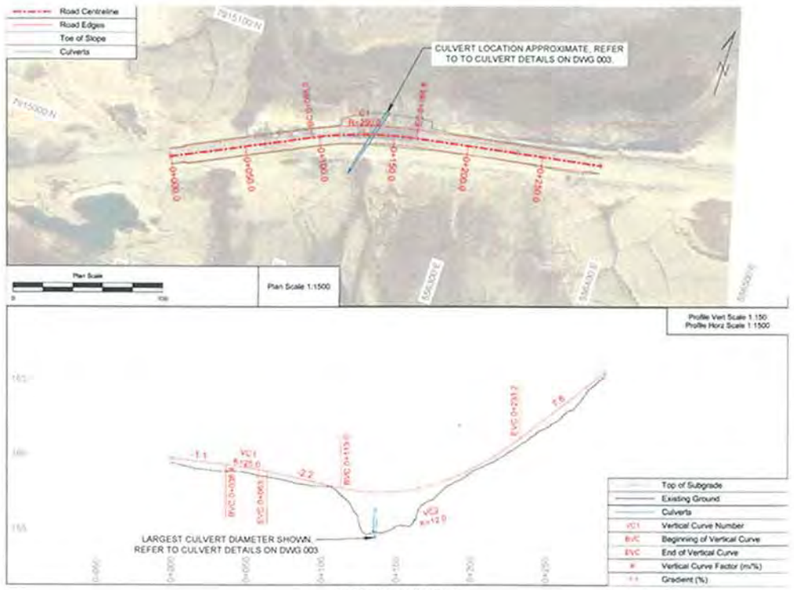
PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

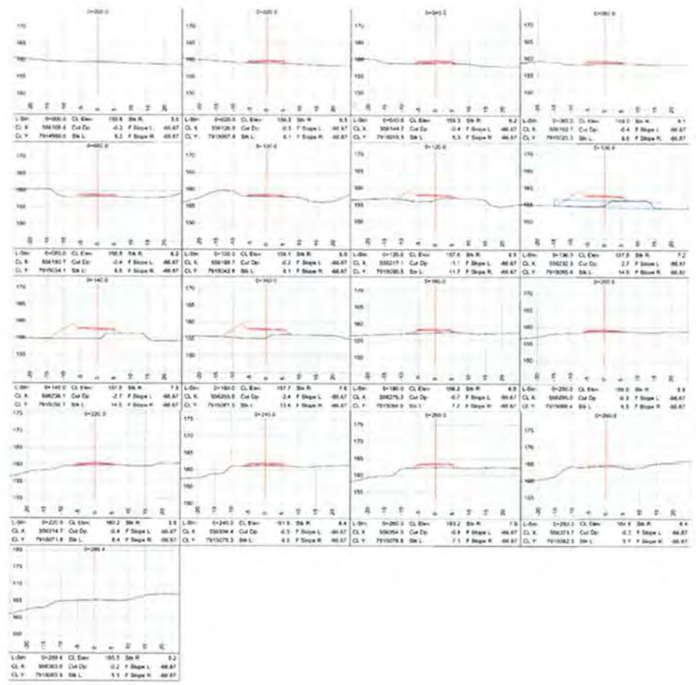
TITLE
CULVERT INSTALLATION DESIGN RECOMMENDATIONS & DESIGN TABLES - CV224

PROJECT NO.	PHASE	REV.	3 of 4	DRAWING
1667708	3000	2		003

Reduced Size
NOT TO SCALE



PLAN AND PROFILE



SECTIONS
(REFER TO GENERAL CONSTRUCTION NOTE 17)

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
2	2017-04-03	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 1 / REPORT REV. 0	JJL	CK/RAD	MJT	RAD
1	2017-03-24	ISSUED FOR CONSTRUCTION - SPECIFICATIONS REV. 0	JJL	CK/RAD	MJT	RAD
0	2017-03-09	ISSUED FOR CONSTRUCTION	JJL	CK/RAD	MJT	RAD
A	2017-02-24	ISSUED FOR CLIENT REVIEW	JJL	CK/RAD	MJT	RAD

PERMIT TO PRACTICE
GOLDER ASSOCIATES LTD.
Signature
Date 17-04-05
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

REGISTERED PROFESSIONAL ENGINEER
R.A. DOUGLAS CONSULTANT
LICENSEE
2017-04-05
NWT/NU

Baffinland

Golder Associates

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PROJECT
MARY RIVER PROJECT
TOTE ROAD EARTHWORKS

TITLE
ROAD PLAN, PROFILE AND SECTIONS - CV224

PROJECT NO	PHASE	REV	4 of 4	DRAWING
1667708	3000	2		004

APPENDIX C

Specifications

SPECIFICATION

The document revision number is indicated below. Please replace all revised pages of this document and destroy the superseded copies.

PROJECT:	MARY RIVER PROJECT		SPECIFICATION NO.: 1667708-S				REV 1
PROJECT NO:	1667708		GOLDER REFERENCE NO.: 1667708-S				
TITLE:	TOTE ROAD EARTHWORKS PROJECT						
ISSUED FOR	REV No.	ORIGIN	DATE		ISSUED-PAGES/SECTIONS		INITIAL
			OUT	IN			
Client Review	A	RAD	3-Mar-17				
Issued for Construction	0	RAD	24-Mar-17				
Re-issued for Construction	1	RAD	3-Apr-17				

New Issue _____

Revised Sheet Only Attached _____

Entire Document Re-issued X

PERMIT TO PRACTICE
GOLDER ASSOCIATES LTD.
Signature **Original Signed**
Date _____
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

FINAL DOCUMENT APPROVAL

BAFFINLAND APPROVAL		GOLDER APPROVAL	
Mine Manager:		Senior Review:	**Original Signed and Sealed**
Date:		Date:	April 3, 2017
Environmental Manager:		Project Manager:	**Original Signed**
Date:		Date:	April 3, 2017
Engineering Lead:		Originator:	**Original Signed**
Date:		Date:	April 3, 2017

Table of Contents

1.0 SCOPE OF WORK

1.1 General

.1 This Specification defines the requirements for furnishing of all labour, equipment and materials required for construction of Tote Road Earthworks as specified herein for Baffinland Iron Mine Corporation's Mary River Project in the Nunavut Territory of Canada.

.2 Modifications or deviations from this Specification and/or the Drawings listed herein shall only occur with the written approval of Golder Associates Ltd.

.3 The Scope of Work (hereafter referred to as the Work) defined herein includes the construction of culvert improvements including installation/extension of culverts, placement of erosion protection material, construction of road realignments, and pavement improvement/construction on the Tote Road, as indicated on the Drawings. Phased construction in support of the construction timeline is planned. Phase limits of works will be at the direction of the Owner's Representative based on the work schedule, weather, availability of construction materials, and the like.

.4 The Tote Road will remain active for the duration of the Work. The Contractor shall coordinate with the Owner's Representative such that interruptions to hauling activities are minimized.

.5 The Contractor shall perform the Scope of Work such that no damage to existing infrastructure occurs unless otherwise approved by the Owner's Representative.

.6 All Work shall conform to the lines, grades, cross-sections, and details indicated in the Drawings listed in Table 1. Included in the work is: care and control of water, processing of materials as necessary, material stockpiling, loading, hauling, fill placement, fill compaction, and finishing of all materials classified as acceptable for fill material. Excavation and backfilling of materials shall include sorting or screening that may be necessary to produce the required gradations.

1.2 Definitions

.1 The definition of primary terms used on the Construction Drawings and in the Specification for this contract is listed below:

.a	*Owner:*	*Baffinland Iron Mines Corporation*
.b	*Owner's Representative:*	*Baffinland Iron Mines Corporation or named representative.*
.c	*Geotechnical Engineer:*	*Golder Associates Ltd.*
.d	*Contractor:*	*Baffinland Iron Mines Corporation or Nunavut registered Company contracted to successfully carry out the Scope of Work described herein.*
.e	*Project Site:*	*Mary River Project.*
.f	*Work Site:*	*Limits of Work which is generally defined by the Tote Road and adjacent areas as shown on the Drawings.*
.g	*Quality Control*	*The planned system of inspections carried out to standard specifications that are used to directly monitor and control the quality of the construction project. Construction quality control is required to ensure that the work is carried out in compliance with the Drawings and this Specification.*
.h	*Quality Assurance*	*The planned system of activities that provide the Owner, lending institutions and permitting agencies assurance that the facilities were constructed as specified in the design. Quality Control forms a subset of the Quality Assurance program. Quality Assurance comprises inspections carried out during Quality Control and includes verification, evaluations of materials and workmanship necessary to determine and document the quality of the constructed facility. Quality Assurance refers to measures taken by the Quality Assurance organization to assess if the Contractor is in compliance with the design, Drawings, and this Specification.*
.i	*Passes*	*A pass, for compaction specification purposes, is defined as the complete passing over, and return, of the specified compaction equipment over a section of material. Material which has been compacted in one pass will have the equipment roll over it twice.*

1.3 Acronyms and Abbreviations

.1 The acronyms and abbreviations commonly used in the Drawings and in the Specification for this contract are listed below:

.a	*2H:1V*	*Slope of 2 horizontal units to 1 vertical unit.*
.b	*%*	*Percent.*
.c	*ASTM*	*ASTM International; formerly known as American Society for Testing and Materials.*
.d	*CSP*	*corrugated steel pipe.*
.e	*CSA*	*Canadian Standards Association.*
.f	*m*	*metre.*
.g	*mm*	*millimetre.*
.h	*N*	*Newton.*
.i	*t*	*tonne.*

1.4 Protection

.1 The Contractor is responsible for the care and protection of all existing utilities, instrumentation and site development that may be located within the Work Site areas.

.2 Confirmation of existing functioning culvert locations shall be completed by the Contractor prior to the start of work. The Contractor shall exercise care including but not limited to marking and protecting the culverts, such that these culverts are not damaged. Any damage caused, or suspected to have been caused by the Contractor, its Subcontractors and/or Sub-subcontractors shall be immediately reported to the Owner's Representative. Any damage to culverts caused by Contractor and its Subcontractors shall be repaired to the satisfaction of the Owner's Representative, with input from the Geotechnical Engineer.

.3 In areas where construction activities are carried out in or adjacent to existing site development, the location, isolation, and/or relocation of buried utilities shall be completed before any excavation commences. Care shall be exercised during excavation to avoid damage to existing buried pipes, structures, ducts, power and grounding cables. If damage to any of these occurs, the Owner's Representative shall be notified immediately, and corrective action shall be taken by the Contractor according to the instructions of the Owner's Representative.

1.5 Drawings

.1 This Specification defines the requirements for performing the work as outlined on the most recent revision of the Drawings presented in Table 1 for the culvert sites listed in Table 2. In the event of a discrepancy between the Specification and the Drawings, the discrepancy shall be reported to Geotechnical Engineer in writing; the Geotechnical Engineer shall provide clarification to the Owner. The Contractor shall proceed only upon receipt of written clarification from the Owner.

Table 1: Tote Road Earthworks Project Drawings Set Per Culvert Site Listed in Table 2

Drawing Number	Drawing Title
001	Title Sheet
002	Pipe Crossing Typical Details and General Notes
003	Culvert Installation Design Recommendations & Design Tables
004	Road Plan, Profile and Sections

Table 2: Tote Road Earthworks Culvert Sites

Culvert Site	Drawing Set Revision No.
BG01	2
BG04	2
BG29	2
BG32	2
CV001	2
CV046 A&B	2
CV059	2
CV099	2
CV106	2
CV112	2
CV186	2
CV187	2
CV216	2
CV224	2

1.6 Submissions

.1 The Contractor shall prepare and submit a Work Plan to the Owner for review and approval within five days of receipt of a Notice to Proceed. The Contractor shall revise the Work Plan to the satisfaction of the Owner, following review. The Contractor shall commence with the Scope of Work only upon written authorization from the Owner.

.2 In general, the Work Plan shall contain the following:

.a *A detailed Health, Safety and Environmental Plan for all the tasks within the Scope of Work. The Health, Safety and Environmental Plan shall satisfy all Project Site requirements and be to the satisfaction of the Owner.*

.b *The Contractor's understanding of the Scope of Work.*

.c *The Methods for performing the Scope of Work.*

.d *The list of equipment to be used to perform the Scope of Work, with the service records for all equipment for a two-year period prior to the start of the work.*

.e *A description of the Temporary Protection System to protect the stability and function of the Tote Road during construction.*

.f *A description of the dust control measures to be used.*

.g *A Quality Control Plan. The Contractor is responsible for controlling the quality of the Work including that performed by its Subcontractors, Sub-subcontractors, and Suppliers and for assuring that the specified quality is achieved. The Contractor, and its Subcontractors, Sub-subcontractors, and Suppliers shall be responsible for developing and maintaining a quality control program which is responsive to the requirements of the Specification.*

.h *A Schedule for performing the Scope of Work, including work activities and milestones. The schedule shall be revised and updated throughout the performance of the Work. Weekly updates of the Schedule shall be submitted by the Contractor in hardcopy and electronic formats for review and comment by the Owner.*

.i *A list of Personnel for performing the Scope of Work.*

.j *A list of proposed Subcontractors, Sub-subcontractors, and Suppliers. Use of Subcontractors, sub-Subcontractors and/or Suppliers shall be made only upon approval by the Owner.*

.k *Inclusion of additional requirements presented in the Specification.*

.3 The Contractor shall submit weekly as-built survey information in hardcopy and electronic formats to the Owner for review and comment. All as-built survey information may be checked by the Owner with input provided by the Geotechnical Engineer. The Contractor will revise as-built survey information as directed by the Owner. All as-built information mutually agreed upon between the Contractor and Owner shall not thereafter be subject to dispute.

.a *For earthworks: At the direction of the Owner's Representative, with input provided by the Geotechnical Engineer, the Contractor shall survey the limits of prepared surfaces. Cross sections and longitudinal profiles shall be obtained to define the form and elevations of the prepared surfaces. In areas of fill placement, accurate surveying shall be performed to determine the limits of fill placement and presentation of cross sections at no less than 5 m spacing along the culvert axis and 20 m spacing along the road centreline. All survey information may be checked at any time during the Work by the Owner's Representative and/or the Geotechnical Engineer.*

.b *For geosynthetic materials: At the direction of the Owner's Representative with input provided by the Geotechnical Engineer, the Contractor shall survey the limits of the prepared surfaces prior to the placement of geosynthetic materials. During placement, the Contractor shall record the limits of placement for each panel of geosynthetic material and include the type and roll number. All survey information may be checked at any time during the Work by the Owner's Representative and/or the Geotechnical Engineer.*

.c *The Contractor may be directed by the Owner's Representative, with input from the Geotechnical Engineer, to collect and present survey information outside of the requirements presented in the Specification. The details of this survey information shall be mutually agreed between the Contractor and Owner's Representative prior to the start of activity.*

.4 The Contractor shall submit daily and weekly Construction Activity Reports including, but not limited to the following:

.a *A description of work activities performed.*

.b *Lists of the equipment and personnel utilized.*

.c *Results and comments on quality of work performed.*

.d *A list of submissions.*

.e *A summary of progress relative to the schedule, and necessary updates and/or changes.*

.f *The quantities of materials placed, hauled and the like.*

.g *A summary of health and safety performance.*

1.7 Dust Control

.1 The dust resulting from construction activities shall be controlled by the Contractor to prevent the spreading of dust and to avoid creation of a nuisance in the surrounding area. The requirement and judgment of acceptability of dust control measures shall be at the direction of the Owner's Representative.

.2 During fill placement, dust control, such as watering the upper surface of the fill to maintain a damp condition, may be utilized. Any use of dust suppression chemicals shall only be used with the approval of the Owner's Representative.

1.8 Inspection and Testing

.1 The Owner will provide Quality Assurance measures to monitor for compliance with the Drawings and Specification requirements with input from the Geotechnical Engineer. Quality Assurance monitoring will be performed throughout the Work activities.

.2 The Contractor shall perform activities to meet the requirements of the Quality Control Plan. The results of these activities shall be provided to the Owner's Representative and Geotechnical Engineer in hardcopy and electronic format.

.3 The minimum requirements for Quality Control testing are presented in Table 3. It is important to note that additional requirements are presented throughout this Specification. It is the responsibility of the Contractor to ensure that all Quality Control requirements are satisfied. The Owner's Representative and/or Geotechnical Engineer shall monitor all Quality Control testing and results; the Contractor shall cooperate accordingly.

.4 When Checklist items (Section 8.0) are completed, the Contractor shall submit written requests for Quality Assurance approvals to the Owner's Representative.

Table 3: Minimum Requirements for Quality Control Testing

Material	Test	Frequency
Screened Material – Type 5	Lift thickness	Measured continually
	Elevation of compacted lift	Measured continually
	Compaction effort including number of passes and equipment traffic pattern	Monitored continually
	Particle-size analysis (ASTM D422 and ASTM D1140)	One test for every 750 m^3 placed
Jaw Run Material – Type 8	Lift thickness	Measured continually
	Elevation of compacted lift	Measured continually
	Compaction effort including number of passes and equipment traffic pattern	Monitored continually
	Maximum particle size (visual inspection)	Measured continually
Run of Quarry – Type 12	Lift thickness	Measured continually
	Elevation of compacted lift	Measured continually
	Compaction effort including number of passes and equipment traffic pattern	Monitored continually
	Maximum particle size (visual inspection)	Measured continually
Erosion Protection Material – Type 19	Lift thickness	Measured continually
	Elevation of compacted lift	Measured continually
	Maximum particle size (visual inspection)	Measured continually

.5 The Contractor shall cooperate and assist with the Quality Assurance monitoring activities including, but not limited to the following:

.a *Obtaining samples of materials.*

.b *Providing and reviewing of documentation.*

.c *Surveying the sampling locations.*

.6 The Contractor and the Owner's Representative will be made aware of the Quality Assurance monitoring results. The Geotechnical Engineer shall provide recommendations, if appropriate, to the Owner's Representative regarding corrective measures required to be carried out by the Contractor. At the direction of the Owner's Representative, the Contractor shall make reasonable efforts to address the identified deficiencies.

.7 Construction checklist forms included at the end of this Specification are required for documenting the quality control and other aspects of the construction activities as detailed in the quality control plan(s). The checklists included in Section 8.0 shall be finalized and signed off by the Contractor, the Owner's Representative, and the Geotechnical Engineer for acceptance of the construction activities. If the Geotechnical Engineer is not on site, the Owner's Representative is required to provide the information to the Geotechnical Engineer.

1.9 Codes and Standards

.1 Work shall conform to, but not be limited to, the requirements of the most recent editions of the following standards and codes which are part of this Specification. It is important to note that additional standards may be referenced by those listed below; it is the responsibility of the user of this document to be familiar with all the applicable standards.

.a	ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
.b	ASTM D422	Standard Test Method for Particle-Size Analysis of Soils.
.c	ASTM D4355	Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus.
.d	ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
.e	ASTM D4533	Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
.f	ASTM D4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
.g	ASTM D4751	Standard Test Method for Determining Apparent Opening Size of a Geotextile.
.h	ASTM D6241	Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.

.i	ASTM D5199	Standard Test Method for Measuring the Nominal Thickness of Geosynthetics.
.j	ASTM D5261	Standard Test Method for Measuring Mass per Unit Area of Geotextiles.
.k	CSA-G401	Corrugated Steel Pipe Products

.l Safety Act of Nunavut (Consolidation of Safety Act R.S.N.W.T. 1988,c.S-1)

.a Mine Health and Safety Act and Regulations for Nunavut.

1.10 Description of Items

.1 The Tote Road Culvert Improvement Project consists of the following:

.a Pipe Crossing Construction – The work shall include the construction of trenches, the supply and placement of bedding, the supply and laying of pipes, joining of pipes, backfilling of trenches, construction of culvert inlet end rip rap protection, construction of culvert outlet end rip rap protection, construction of the granular pavement, and site reinstatement as specified, and the supply of all materials, labour, plant, transport and tools required for proper completion of the work

.b Tote Road Pavement Reinstatement/Construction – The work shall include the supply and placement of fills for the reconstruction of granular road pavements over pipe crossings and approaches, and the construction of new granular pavements on Tote Road realignments, and reinstatement as specified, and the supply of all materials, labour, plant, transport and tools required for proper completion of the work.

.2 The Contractor is required to load and haul materials from the crusher, pits, quarries and other locations for placement at the Tote Road. These materials will be stockpiled by Others in locations as directed by the Owner's Representative. The Contractor shall load and haul from the stockpiles as directed by the Owner's Representative.

1.11 Dimensional Tolerances

.1 All excavations and fill shall be completed to be within 0.1 m horizontally and plus 0.1 m vertically of specified lines and grades unless otherwise approved by the Owner's Representative. Fill placement and/or removal to meet these tolerances to the lines and limits shown in the Drawings shall be performed by the Contractor at no additional cost to the Owner.

.2 Culvert pipe gradients shall be established within ±0.5% of those shown on the Drawings.

.3 Slopes shall not be steeper than those shown on the Drawings unless otherwise approved by the Owner's Representative with recommendations provided by the Geotechnical Engineer.

.4 Temporary excavation and fill slopes shall not be steeper than two horizontal to one vertical (2H:1V) unless otherwise approved by the Owner's Representative with recommendations provided by the Geotechnical Engineer.

.5 Temporary bedrock excavation slopes shall not be steeper than one tenth horizontal to one vertical (0.1H:1V) unless otherwise approved by the Owner's Representative with recommendations provided by the Geotechnical Engineer.

2.0 CARE OF WATER

.1 Excavation, fill and backfill work areas shall be continuously and effectively drained. Excessive water shall not be permitted to accumulate in excavations or areas for fill. The Contractor shall construct suitable dykes or drains, or provide pumping equipment, as required to divert water flows away from Work areas. The proposed points of discharge shall be approved by the Owner's Representative. The Contractor must also ensure that sediments contained in diverted water will not enter natural watercourses.

.2 The Contractor shall be responsible for the design and construction of all temporary diversion measures, dewatering systems, pumping facilities, siphons, snow/ice removal and the like, required for satisfactory management of water and ice on the Site. These shall be submitted for review and approval by the Owner's Representative prior to commencing construction.

.3 Backfill operations may not commence until all water and snow/ice has been drained or otherwise removed from the excavation and the Owner's Representative, with input from the Geotechnical Engineer, has approved the commencement of backfilling operations.

3.0 TRENCH EXCAVATION

3.1 Work Sequence

.1 The limits of works and elevations will be at the direction of Owner's Representative based on field conditions.

.2 The Contractor may start work after the following:

- Receipt of an Approval to Proceed from the Owner's Representative.
- Receipt of approval from the Owner's Representative of the as-built survey information submission for pre-work conditions.
- The implementation of the Temporary Protection System.
- Completion of the perimeter water control structures around the work area, thereby containing/diverting runoff.

3.2 Products

.1 Unsuitable Material includes topsoil, organic soils, vegetation, and boulders to a depth or in a location that will impede the placement and compaction of Competent Material. Unsuitable Material may be frozen in situ. Within the excavation limits of the pipe crossing, Unsuitable Material may include Mineral Soil that has high clay, silt, water, and/or ice content.

.2 Mineral Soil is the near-surface layer of earth materials generally composed of till-like soil, including but not limited to varying proportions of clay, silt, sand, gravel, cobbles, and boulders. Thawed Mineral Soil materials are normally suitable for mechanical excavation. Frozen Mineral Soil materials may require the use of drilling, blasting, ripping, and/or other techniques approved by the Owner's Representative with input from the Geotechnical Engineer to prepare the materials for excavation.

.3 Existing Fill is the soil and rock fill placed previously for the construction of the Tote Road. Thawed Existing Fill materials are normally suitable for mechanical excavation. Frozen Existing Fill materials may require the use of drilling, blasting, ripping and/or other techniques approved by the Owner's Representative (with input from the Geotechnical Engineer) to prepare the materials for excavation.

.4 Bedrock is the underlying rock formation composed of frost-shattered weathered bedrock and/or intact unweathered bedrock that will require the use of drilling, blasting, ripping, and/or other approved techniques to prepare the materials for excavation.

.5 Competent Material includes Mineral Soil, Existing Fill and the underlying Bedrock as determined by the Geotechnical Engineer.

.6 The determination of Unsuitable Material and Competent Material will be made by the Geotechnical Engineer. The Contractor may be required to assist during the determination by performing such work as proof rolling, test pit excavation, and sampling as directed by the Geotechnical Engineer.

3.3 Execution

.1 The Contractor shall ensure that the Temporary Protection System for the Tote Road is in place.

.2 The Contractor shall excavate Unsuitable Material, Mineral Soil, Existing Fill, and/or Bedrock for the pipe crossing construction in areas indicated in the Drawings and as directed by the Owner's Representative (with input from the Geotechnical Engineer).

.3 Excavation shall be to the lines, grades and dimensions specified in the Drawings and the Specifications.

.4 Excavations shall be kept stable and dry.

.5 Excavated Unsuitable Materials shall be disposed of at locations indicated by the Owner's Representative. Surfaces of disposed material shall be sloped such that no water ponds on the surface. Suitable erosion protection shall be installed to capture sediments (i.e. silt fencing) at the direction of the Owner's Representative.

.6 Excavated Mineral Soil, Existing Fill, and/or Bedrock which is considered by the Geotechnical Engineer suitable for reuse shall be stockpiled at locations indicated by the Owner's Representative. A determination of the acceptability of materials for reuse shall be made with input from the Geotechnical Engineer.

.7 The Contractor shall allow the Owner's Representative and the Geotechnical Engineer to review the excavation to evaluate conformance to the Drawings and Specifications. Acceptance of excavations shall be performed and recorded by the Owner's Representative.

.8 The disposal area for Unsuitable Material shall be shaped to smooth, uniform surfaces with side slopes not steeper than three horizontal to one vertical (3H:1V).

.9 The Contractor shall prepare and submit as-built information of excavation limits, disposal areas and stockpiles to Owner's Representative for review.

.10 The Contractor shall submit appropriate checklists according to Section 8.0.

4.0 CULVERT PIPE SUPPLY AND INSTALLATION

4.1 General

.1 The Owner shall provide CSPs for use in Pipe Crossing Construction as per the Drawings or as directed by the Owner's Representative.

.2 The Contractor shall be responsible for the installation of the CSP.

4.2 Handling and Storage

.1 Handling on site is the responsibility of the Contractor and/or Owner as directed by the Owner's Representative.

.2 The Contractor shall ensure the handling equipment used on the site is adequate and does not pose any risk of damage to the CSP. Any damage to a CSP shall be repaired by the Contractor as per Manufacturer's recommendations or shall be replaced, as directed by the Owner's Representative.

.3 Upon start-up of the Work, the Contractor and the Owner's Representative shall conduct a surface observation of all CSPs for defects and for damage.

.4 The Owner's Representative may identify the following:

.a CSPs or portions thereof, which should be rejected and removed from the site because they have severe flaws;

.b CSPs which include minor repairable flaws, which can be used follow repair.

.5 The Owner shall provide storage space in a location (or several locations) such that on-site transportation and handling are minimized.

4.3 Installation

.1 CSP shall be laid within the location, alignment, and grade tolerances specified in Section 1.11 and as per the Drawings.

.2 CSP shall be kept clean and dry as work progresses.

.3 CSPs shall be joined by means of steel couplers. Couplers shall be installed to lap approximately equal portions of the pipe being connected and such that the corrugations of the couplers properly engage the pipe corrugations. As the couplers are being tightened they shall be tapped with a mallet to take up the slack.

.4 The diameter or the span and rise of flexible culvert pipes shall not vary from the manufactured dimensions by more than 5% during cover and backfill placing operations.

.5 The Contractor shall submit checklists according to Section 8.0.

5.0 PIPE CROSSING CONSTRUCTION

5.1 Work Sequence

.1 The limits of works and elevations will be at the direction of Owner's Representative based on field conditions.

.2 The Contractor may start work after the following:

- Receipt of an Approval to Proceed from the Owner's Representative.
- Receipt of approval from Owner's Representative of the as-built survey information submission for pre-work conditions.
- Completion of Excavation, if applicable.

5.2 Products

.1 Pipe includes CSP as defined in Section 4.0.

.2 Fill Materials include excavated Mineral Soil or Existing Fill (as defined in Section 3.0), Screened Material – Type 5, Jaw Run Materials – Type 8, and/or other materials free from frozen lumps, ice, snow, cinders, ash, refuse, and cobbles and boulders over 150 mm approved by the Owner's Representative, with recommendations provided by the Geotechnical Engineer, for culvert construction.

.3 Screened Material – Type 5 consists of 32 mm minus material produced by a screening plant. This material will be stockpiled separately at the Crusher Site by Others. Placement of Screened Material – Type 5 will be within the areas as shown on the Drawings and/or as directed by the Owner's Representative. In general, the Screened Material will meet the gradation specifications shown in Table 4.

Table 4: Screened Material – Type 5 Gradation Specification

Sieve Designation	Percent Passing, by Weight
32 mm	100%
25 mm	70 – 100%
9.5 mm	40 – 70%
4.75 mm	30 – 55%
2.0 mm	22 – 42%
0.6 mm	15 – 30%
0.075 mm	4 – 8%

.4 Jaw Run Material – Type 8 consists of 150 mm minus material produced by the crusher. This material will be stockpiled separately at the Crusher Site by Others. Placement of Jaw Run Material will be within the areas as shown on the Drawings and/or as directed by the Owner's Representative. In general, the Jaw Run Material will meet the following gradation specifications (Table 5):

Table 5: Jaw Run Material – Type 8 Fill Gradation Specification

Sieve Designation	Percent Passing, by Weight
200 mm	100%
150 mm	95 - 100%
100 mm	50 - 100%
50 mm	30 - 60%
19 mm	15 - 35%
4.75 mm	10 - 25%
0.075 mm	0 - 5%

.1 Geotextile as defined in Section 7.0.

.2 Erosion Protection Material – Type 19 consists of selected Run of Quarry material. Erosion Protection Material will be stockpiled separately. The Contractor will be responsible for sorting the Run of Quarry material to meet the specifications for Erosion Protection Material. Placement of Erosion Protection Material will be within the areas shown on the Drawings and/or as directed by the Owner's Representative. In general, the Erosion Protection Material will meet the following gradation specification:

Table 6: Erosion Protection Material – Type 19 (D_{50} of 150 mm) Gradation Specification

Particle Diameter (mm)	Percent Passing, by Weight
300	100%
285	85 – 100%
240	65 – 85%
210	50 – 75%
150	25 – 50%
135	15 – 45%
75	0 – 15%

5.3 Execution

.1 Trench Excavation (Section 3.0) to be completed, if applicable.

.2 Culvert pipe trench is to be plane and uniform and to the lines and grades shown in the Drawings. No fill materials are to be placed on the prepared surface without approval from the Owner's Representative with input from the Geotechnical Engineer. The checklist (Section 8.0) shall be signed off by the Contractor, Owner's Representative and Geotechnical Engineer for acceptance of the surface before bedding or fill may be placed. The Owner's Representative is required to document and report observations to the Geotechnical Engineer.

.3 The Contractor shall develop and document a compaction equipment pattern to achieve required compaction of Fill Materials to the satisfaction of the Owner's Representative, with input from the Geotechnical Engineer.

.4 The Contractor shall haul materials to designated fill placement area(s) in the Pipe Crossing area and spread material in horizontal lifts starting from the lowest grade. The maximum loose lift thicknesses are as follows:

.a *0.2 m for Screened Material – Type 5.*

.b *0.3 m for all other Fill Materials.*

.c *0.3 m for Erosion Protection Material – Type 19.*

.d *Modifications to maximum loose lift thicknesses shall be at the direction of the Owner's Representative with recommendations provided by the Geotechnical Engineer. The Owner's Representative, with input from the Geotechnical Engineer, shall, with the cooperation of the Contractor, conduct field trials to assess material placement techniques and achieved placement densities to assess possible variations to the loose lift thicknesses.*

.5 Any Fill Materials which have become saturated, softened, loosened, or have undergone a reduction in density by precipitation, ponded water, construction traffic, or frost action are to be excavated and replaced with suitable material. The Owner's Representative with input from the Geotechnical Engineer shall identify areas in which material should be removed. This work shall be performed to the satisfaction of the Owner's Representative. The excavated material may be dried and/or thawed and used for fill upon approval from the Owner's Representative using recommendations provided by the Geotechnical Engineer.

.6 Before suspension of operations each day or before inclement weather, the in-place material shall be compacted and the surface smoothed and crowned to promote runoff of precipitation.

.7 Erosion Protection Material shall be placed around the culvert inlet and outlet at the direction of the Owner's Representative, with input from the Geotechnical Engineer.

.8 Geotextile is to be placed at areas shown on the Drawings or at the direction of the Owner's Representative (with input from the Geotechnical Engineer). Geotextile to be installed as per Section 7.4.

.9 Culvert pipe Bedding shall consist of Screened Material – Type 5 which shall be shaped to the dimensions specified in the Drawings, compacted and shaped to receive the shape of the pipe.

.10 Culvert Pipe to be installed as per Section 4.3.

.11 Screened Material – Type 5 placed in the pipe haunches must be compacted prior to continued placement of backfill material around the pipe.

.12 Screened Material – Type 5 shall be placed and compacted on both sides of the pipe simultaneously. At no time shall the levels of material on each side differ by more than 0.2 m.

.13 Cover material shall be placed so that damage to or movement of the pipe is avoided. Before allowing the movement of any construction equipment or vehicular traffic over the completed pipe culvert, the depth of cover over the pipe shall be at least 0.6 m or D/4 (where D is the pipe diameter) whichever is greater, and must be a sufficient depth required for protection.

.14 Oversize particles shall be removed from the fill. Where reduced lift thicknesses are required, particles larger than two-thirds (2/3) of the reduced lift thickness shall be removed prior to compaction. Requirements for reduced lift thicknesses shall be determined by the Owner's Representative with recommendations provided by the Geotechnical Engineer.

.15 Fill Materials shall be compacted using a vibratory plate tamper or other compaction equipment approved by the Geotechnical Engineer:

a. *Mineral Soil, Fill Materials, Erosion Protection Materials and other Materials shall be compacted using a performance-based requirement. It is expected that a minimum of 5 passes (see Section 1.2 for the definition of a "pass") of compaction equipment will be required for the Mineral Soil and Fill Materials. The compaction method and degree of compaction achieved in the field will be monitored by the Owner's Representative with input from the Geotechnical Engineer. The Contractor shall cooperate with the Owner's Representative and Geotechnical Engineer to develop methods to achieve a satisfactory degree of compaction for the Bedding and Fill Materials.*

.16 Pipe Crossings shall be constructed to the lines, grades and cross sections shown in the Drawings or as directed by the Owner's Representative with input from the Geotechnical Engineer.

.17 Stream bed approach to be re-trained to the satisfaction of the Owner's Representative, with input from the Geotechnical Engineer, if applicable.

.18 Fill Materials placed in the Trench shall be free from lenses, pockets, or layers of materials which are significantly different in gradation from the surrounding material. The Contractor shall employ methods to limit the amount and zones of segregated materials. The Contractor shall work with the Owner's Representative with input from the Geotechnical Engineer to develop such methods which may include, but not be limited to, the placement of parallel strips of Fill Materials within a given lift and/or material blending. The Geotechnical Engineer shall provide recommendations to the Owner's Representative as to the acceptability of the results of the placed materials. Fill Materials shall be placed and compacted to the satisfaction of the Owner's Representative.

.19 Sufficient survey control and records shall be maintained to provide the following:

.a *Layout of the work.*

.b *Measurement of in-place quantities of each product placed, including but not limited to, providing elevation of the prepared surface prior to fill placement.*

.c *Preparation of as-built information for hard copy and electronic submission to the Owner's Representative; the Contractor shall maintain as-built records suitable to update the Drawings upon completion.*

.d *Verification of the accuracy of the work.*

.e *Survey records which may be reviewed at any time by the Owner's Representative and/or Geotechnical Engineer.*

.f *Timely provision and quality of survey information to the satisfaction of the Owner's Representative with recommendations provided by the Geotechnical Engineer.*

.20 The Contractor shall submit appropriate checklists according to Section 8.0.

6.0 TOTE ROAD PAVEMENT CONSTRUCTION

6.1 Work Sequence

.1 The limits of works and elevations will be at the direction of Owner's Representative based on field conditions.

.2 The Contractor may start work after the following:

- Receipt of an Approval to Proceed from the Owner's Representative.
- Receipt of approval from Owner's Representative of as-built survey information submission for pre-work conditions.
- Completion of embankment filling operations and culvert installation as appropriate.

6.2 Products

.1 Fill Materials as defined in Section 5.2.

.2 Screened Material – Type 5 as defined in Section 5.2.

.3 Jaw Run Material – Type 8 as defined in Section 5.2.

.4 Run of Quarry – Type 12 consists of unsorted run of quarry material. This material will be stockpiled separately at the Quarry locations by Others. Placement of Run of Quarry Material will be within the areas as shown on the Drawings and/or as directed by the Owner's Representative. The Contractor will be responsible for removing oversized material. In general, the Run of Quarry Material will meet the gradation specification in Table 7:

Table 7: Run of Quarry Material – Type 12 Gradation Specification

Particle Diameter (mm)	Percent Passing, by Weight
1000	100%
600	95 – 100%
300	50 - 100%
150	0 – 80%
19	0 – 30%
4.75	0 – 10%

6.3 Execution

.1 Limits of Tote Road Pavements are shown on the Drawings.

.2 The pavement shall consist of a Surface layer 0.2 m thick, placed and compacted on a Base layer 0.3 m thick, placed and compacted on the new embankment fill or existing embankment.

.3 The Surface layer shall consist of Screened Material Type 5 material.

.4 The Base layer shall consist of Jaw Run Material Type 8 material.

.5 The Contractor shall haul materials to designated fill placement area(s) within the haul road area and spread material in horizontal lifts starting from the lowest grade. The maximum loose lift thicknesses will be:

.a 0.2 m for Screened Material – Type 5.

.b 0.3 m for Jaw Run Material – Type 8.

.c 1.0 m for Run of Quarry – Type 12.

.d Modifications to maximum loose lift thicknesses shall be at the direction of the Owner's Representative with recommendations provided by the Geotechnical Engineer. The Owner's Representative, with input from the Geotechnical Engineer, shall, with the cooperation of the Contractor, conduct field trials to assess material placement techniques and achieved placement densities to assess possible variations to the loose lift thicknesses.

.6 Surface layer and Base layer materials shall be compacted using equipment traffic approved by the Geotechnical Engineer.

.7 Surface layer and Base layer materials shall be compacted using a performance-based requirement. The Contractor shall cooperate with the Owner's Representative and the Geotechnical Engineer to develop methods to achieve a satisfactory degree of compaction for the Fill Materials: the Contractor shall develop and document a compaction equipment pattern to achieve required compaction of Fill Materials to the satisfaction of the Owner's Representative, with input from the Geotechnical Engineer. The compaction methods and degree of compaction achieved in the field will be monitored by the Owner's Representative with input from the Geotechnical Engineer.

.8 Sufficient survey control and records shall be maintained to provide the following:

.a Layout of the Work.

.b Measurement of in-place quantities.

.c Preparation of as-built information for hardcopy and electronic submission to the Owner's Representative.

.g Verification of the accuracy of the work.

.h Survey records which may be reviewed at any time by the Owner's Representative and/or Geotechnical Engineer.

.i Timely provision and quality of survey information to the satisfaction of the Owner's Representative with recommendations provided by the Geotechnical Engineer.

.9 The Contractor shall submit appropriate checklists according to Section 8.0.

7.0 GEOTEXTILE SUPPLY AND INSTALLATION

7.1 General

.1 The Work includes the handling and installation of non-woven needle-punched Geotextile for possible use in Ditch Repair/Construction, and/or Erosion Protection as directed by the Owner's Representative. The Contractor shall be responsible for the handling and installation of the Geotextile.

.2 The Owner will provide the Geotextile that meets the Specification.

7.2 Non-Woven Geotextile Material Properties

.1 The Owner shall furnish a Geotextile whose material properties meet or exceed the requirements of this Specification.

.2 The specific properties for non-woven Geotextile Layfield LP12 or its equivalent as listed in Table 8 shall be met.

Table 8: Property Specifications for Non-Woven Geotextile

Material Property	Qualifier	Unit	Specified Value	Test Method
Mass	minimum	g/m^2	407	ASTM D5261
Grab Tensile Strength	minimum	N	1330	ASTM D4632
Grab Elongation	minimum	%	50	ASTM D4632
Tear Resistance	minimum	N	511	ASTM D4533
Thickness	nominal	mm	3.0	ASTM D5199
CBR Puncture Strength	minimum	N	3510	ASTM D6241
Apparent Opening Size	maximum	mm	0.150	ASTM D4751
Permittivity	minimum	sec^{-1}	0.8	ASTM D4491
Water Flow Rate	minimum	$L/min/m^2$	2,650	ASTM D4491
UV Resistance	minimum	% @ 500 hr	70	ASTM D4355

7.3 Handling and Storage

.1 Handling on site is the responsibility of the Contractor and/or Owner as directed by the Owner's Representative.

.2 The Contractor shall ensure the handling equipment used on the site is adequate and does not pose any risk of damage to the Geotextile.

.3 Upon start-up of the Work, the Contractor and the Owner's Representative shall conduct a surface observation of all rolls or factory panels for defects and for damage. This inspection shall be conducted without unrolling rolls or unfolding factory panels unless defects or damages are found or suspected.

.4 The Owner's Representative may:

.a *Identify rolls, factory panels, or portions thereof, which should be rejected and removed from the site because they have severe flaws; and*

.b *Identify rolls or factory panels which include minor repairable flaws.*

.5 The Owner shall provide storage space in a location (or several locations) such that on-site transportation and handling are minimized.

.6 The Contractor shall ensure that storage of the Geotextile provides adequate protection against UV exposure, dirt, shock, and other sources of damage in accordance with the Manufacturer's recommendations.

7.4 Installation

.1 Geotextile sheet shall be installed with sufficient tension to preclude fold and wrinkles and the entire geotextile sheet shall be weighted with sandbags or equivalent to avoid wind damage until the Erosion Protection Material is placed.

.2 If weather damage should occur the Owner's Representative will determine if the geotextile shall be repaired or replaced. Weather damage to the geotextile will include tears and dirty fabric.

.3 All seams shall consist of minimum 0.6 m overlaps. Greater overlaps shall be provided if there is potential for the overlap to move.

.4 Overlaps shall be shingled in the direction of flow such that the upgradient sheet is installed on top of the downgradient sheet.

.5 Overlaps shall be arranged in the direction of slopes. Horizontal overlaps running across slopes are not acceptable.

.6 The Contractor shall ensure the handling equipment used on the site is adequate and does not pose any risk of damage to the Geotextile.

8.0 CONSTRUCTION CHECKLISTS

The following construction checklist forms documenting QA and QC and other aspects of the construction activities, by work activity, are attached:

- Tote Road Site Checklist – Pipe Crossing
  - Trench Excavation
  - Bedding and Pipe Installation
  - Trench Backfill
- Tote Road Site Checklist – Road Embankment Construction
- Tote Road Site Checklist – Granular Pavement Construction

The Contractor may propose alternative forms for approval by the Owner's Representative and the Geotechnical Engineer.

The checklists are to be signed by all parties prior to acceptance of each activity within the defined work area.

Tote Road Site Checklist – Pipe Crossing – Trench Excavation

CONTRACTOR:	DATE:	SHIFT: DAY - NIGHT
CULVERT ID:	STATION:	ROAD SIDE: LEFT - RIGHT

No.	ITEMS TO BE INSPECTED	INSPECTED BY CONTRACTOR	INSPECTED BY QA REPRESENTATIVE
1	Survey lines checked to ensure the locations conform with the Drawings.		
2	Storage areas planned for disposal/ stockpiling of removed materials.		
3	Occurrence of snow and removal method in place, if required.		
4	Occurrence of surface water and its impact mitigation, if required.		
5	Dewatering measures provided, if required.		
6	Pre-construction condition photographed (along alignment of planned excavation, both directions).		
7	Unsuitable materials, snow, ice, and saturated materials and Mineral Soils removed from area as indicated in the Drawings.		
8	Visual inspection during excavation performed and photographed (along alignment of excavation and sidewalls).		
9	Surface competent and free of major protrusions and photographed (along alignment of trench, both ways).		
10	Final surface conditions meets the Specification and photographed (along alignment of trench, both ways).		
11	As-built survey conducted pre- and post- excavation and disposal of Organic Material and Stockpiled Material.		

REMARKS:

DEVIATIONS: (Attach list if necessary)

DATE OF RECTIFICATION:

ACCEPTED BY QA REPRESENTATIVE	ACCEPTED BY CONTRACTOR	ACCEPTED BY OWNER'S REPRESENTATIVE
NAME: _____	NAME: _____	NAME: _____
SIGNATURE: _____	SIGNATURE: _____	SIGNATURE: _____
DATE: _____	DATE: _____	DATE: _____

Tote Road Site Checklist – Pipe Crossing – Bedding and Pipe Installation

CONTRACTOR:	DATE:	SHIFT: DAY - NIGHT
CULVERT ID:	STATION:	

No.	ITEMS TO BE INSPECTED	INSPECTED BY CONTRACTOR	INSPECTED BY QA REPRESENTATIVE
1	Survey lines and layout conform to the Drawings.		
2	Required visual inspection of existing condition before Fill Material placement (photographed after excavation).		
3	Required assessment of Fill Material before placement (Particle-size analysis for Type 5 – Screened Material).		
4	Unsuitable Materials, snow, ice and loose or saturated materials removed prior to placement.		
5	Dewatering measures provided, if required.		
6	Fill lift thickness according to Specifications.		
7	Fill materials contain no frozen lumps or Unsuitable Material.		
8	Bedding shaped to receive pipe and photographed.		
9	Pipe condition inspected prior to installation and photographed along pipe axis, both directions.		
10	Segregation of fill materials controlled during placement.		
11	Required visual inspection of placed materials performed.		
12	Weather conditions meet requirements during fill placement and compaction.		
13	As-built survey conducted pre- and post- construction. Final work photographed.		

REMARKS:

DEVIATIONS: (Attach list if necessary)

DATE OF RECTIFICATION:

ACCEPTED BY QA REPRESENTATIVE	ACCEPTED BY CONTRACTOR	ACCEPTED BY OWNER'S REPRESENTATIVE
NAME: _____	NAME: _____	NAME: _____
SIGNATURE: _____	SIGNATURE: _____	SIGNATURE: _____
DATE: _____	DATE: _____	DATE: _____

Tote Road Site Checklist – Pipe Crossing – Trench Backfill

CONTRACTOR:	DATE:	SHIFT: DAY - NIGHT
CULVERT ID:	STATION:	ROAD SIDE: LEFT - RIGHT

No.	ITEMS TO BE INSPECTED	INSPECTED BY CONTRACTOR	INSPECTED BY QA REPRESENTATIVE
1	Survey lines and layout conform to the Drawings.		
2	Required visual inspection of trench condition before Fill Material placement		
3	Required assessment of Fill Material before placement (particle- size analysis for Type 5 and visual inspection of Type 8 maximum particle size).		
4	Unsuitable Materials, snow, ice and loose or saturated materials removed prior to placement.		
5	Dewatering measures provided, if required.		
6	Fill lift thickness according to Specifications.		
7	Fill materials contain no frozen lumps or Unsuitable Material.		
8	Screened Material – Type 5 completed on each side of the pipe simultaneously. Material in the haunches placed and well compacted prior to continued fill placement.		
9	Segregation of fill materials controlled during placement.		
10	Required visual inspection of placed materials performed and photographed.		
11	Required compaction of fill materials performed.		
12	Weather conditions meet requirements during fill placement and compaction.		
13	As-built survey conducted pre- and post- construction. Final work photographed.		

REMARKS:

DEVIATIONS: (Attach list if necessary)

DATE OF RECTIFICATION:

ACCEPTED BY QA REPRESENTATIVE	ACCEPTED BY CONTRACTOR	ACCEPTED BY OWNER'S REPRESENTATIVE
NAME: _____	NAME: _____	NAME: _____
SIGNATURE: _____	SIGNATURE: _____	SIGNATURE: _____
DATE: _____	DATE: _____	DATE: _____

SPECIFICATION

Tote Road Site Checklist – Road Embankment Construction

CONTRACTOR:	DATE:	SHIFT: DAY - NIGHT
CULVERT ID:	STATION:	ROAD SIDE: LEFT - RIGHT

No.	ITEMS TO BE INSPECTED	INSPECTED BY CONTRACTOR	INSPECTED BY QA REPRESENTATIVE
1	Survey lines and layout conform to the Drawings.		
2	Required visual inspection of condition of footprint of new embankment on existing road embankment or existing ground before Fill Material placement		
3	Required assessment of Fill Material before placement (visual inspection of particle size Type 8 and/or Type 12 maximum particle size).		
4	Unsuitable Materials, snow, ice and loose or saturated materials removed prior to placement.		
5	Dewatering measures provided, if required.		
6	Fill lift thickness according to Specifications.		
7	Fill materials contain no frozen lumps or Unsuitable Material.		
9	Segregation of fill materials controlled during placement.		
10	Required visual inspection of placed materials performed and photographed.		
11	Required compaction of fill materials performed.		
12	Weather conditions meet requirements during fill placement and compaction.		
13	Surface of fill left compacted, smooth, and graded to promote drainage at end of every fill operation or the end of each shift, whichever occurs sooner.		
14	As-built survey conducted pre- and post- construction. Final work photographed.		

REMARKS:

DEVIATIONS: (Attach list if necessary)

DATE OF RECTIFICATION:

ACCEPTED BY QA REPRESENTATIVE	ACCEPTED BY CONTRACTOR	ACCEPTED BY OWNER'S REPRESENTATIVE
NAME: _____	NAME: _____	NAME: _____
SIGNATURE: _____	SIGNATURE: _____	SIGNATURE: _____
DATE: _____	DATE: _____	DATE: _____

Tote Road Site Checklist – Granular Pavement Construction

CONTRACTOR:	DATE:	SHIFT: DAY - NIGHT
CULVERT ID:	STATION:	ROAD SIDE: LEFT - RIGHT

No.	ITEMS TO BE INSPECTED	INSPECTED BY CONTRACTOR	INSPECTED BY QA REPRESENTATIVE
1	Survey lines and layout conform to the Drawings.		
2	Required visual inspection of condition of completed compacted subgrade before Fill Material placement		
3	Required assessment of Fill Material before placement (particle- size analysis for Type 5 and visual inspection of Type 8 maximum particle size).		
4	Unsuitable Materials, snow, ice and loose or saturated materials removed prior to placement.		
5	Dewatering measures provided, if required.		
6	Fill lift thicknesses according to Specifications.		
7	Fill materials contain no frozen lumps or Unsuitable Material.		
8	Segregation of fill materials controlled during placement.		
9	Required visual inspection of placed materials performed and photographed.		
10	Required compaction of fill materials performed.		
11	Weather conditions meet requirements during fill placement and compaction.		
12	Surface of fill left compacted, smooth, and graded to promote drainage at end of every fill operation or the end of each shift, whichever occurs sooner.		
13	As-built survey conducted pre- and post- construction. Final work photographed.		

REMARKS:

DEVIATIONS: (Attach list if necessary)

DATE OF RECTIFICATION:

ACCEPTED BY QA REPRESENTATIVE	ACCEPTED BY CONTRACTOR	ACCEPTED BY OWNER'S REPRESENTATIVE
NAME: _____	NAME: _____	NAME: _____
SIGNATURE: _____	SIGNATURE: _____	SIGNATURE: _____
DATE: _____	DATE: _____	DATE: _____

END OF SECTION: 1667708-S

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APPENDIX D

Inspection Form

APPENDIX D
Inspection Form

INSPECTOR:	DATE:
LOCATION (CULVERT ID, STATION):	

No.	INSPECTION QUESTIONNAIRE	INSPECTOR ANSWERS	ADDITIONAL COMMENTS
Culvert Sites			
1	Is the culvert inlet free of debris/ sediment?	Y N N/A	
2	Is the culvert inlet in good condition (i.e. no signs of erosion, erosion protection in good condition)?	Y N N/A	
3	Are the culverts sitting on the stream bed or embedded in the streambed (i.e. not perched)?	Y N N/A	
4	Is the culvert outlet free of debris/ sediment?	Y N N/A	
5	Is the culvert outlet in good condition (i.e. no signs of erosion, erosion protection in good condition)?	Y N N/A	
6	Is the streambed downstream of the outlet in good condition?	Y N N/A	
7	Are the culverts free draining? Are they free from blockage?	Y N N/A	
8	Is the culvert in good structural condition? (i.e. ends are not damaged, no buckling, etc.)	Y N N/A	
9	Is the water discharging from the culvert clear? [if no, comment on the colouring of the water] Did you take a sample of the water?	Y N N/A Y N N/A	
10	Is the road above the culvert in good condition (i.e. no signs of settlement)?	Y N N/A	
11	If there are constructed ditches that drain to the culvert, are the ditches free draining? Are they free from blockage? Do the ditches have sufficient freeboard (0.3 m min.) from the top of the tote road? [If no, note the locations in the comments]. Is the erosion protection in the ditch in good condition (i.e. no signs of erosion/ movement)? [If no, note the locations in the comments and photograph.] Is the water in the ditch clear? [If no, provide comment on the colouring of the water and note the location of change.] Did you take a sample of the water?	Y N N/A Y N N/A Y N N/A Y N N/A Y N N/A	
12	If there are any cut slopes in the area, are they adequately protected with erosion protection? [If no, note the locations in the comments and photograph.]	Y N N/A	
13	Did you take a photos of the site, culvert inlet and outlet, cut slopes, ditches and any other relevant observations? Record the photograph ID and description of the photograph on next page.	Y N N/A	

INSPECTOR RATING OF OVERALL CONDITION OF CULVERT CROSSING:

VERY POOR POOR MODERATE GOOD VERY GOOD

INSPECTOR OVERALL COMMENTS:

REVIEWER'S COMMENTS ON INSPECTION:

ACCEPTED BY REVIEWER

NAME: _____ SIGNATURE: _____ DATE: _____

MAINTENANCE/ REPAIR RECOMMENDATIONS:

MAINTENANCE COMPLETED SIGNOFF:

NAME: _____ SIGNATURE: _____ DATE: _____

INSPECTOR:		DATE:
LOCATION (CULVERT ID, STATION):		
PHOTO ID.	**DATE OF PHOTO CAPTURE**	**BRIEF PHOTO DESCRIPTION**

ADDITIONAL/ MISCELLANEOUS COMMENTS:
(i.e. weather, recent precipitation, nearby earthworks, recent grading, recent site upgrades?):

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Golder Associates

Appendix D:

Other Supporting Documentation

TRAIN
YDOWN
AREA

751'-5"
[229028mm]

196'-10"
[60000mm]

725'-5"
[221094mm]

38'-11"
[11863mm]

49'-3"
[15000mm]

T1

T2

T3

COLD STORAGE (x3)

STORAGE (x3)

40' x 60'
GARAGE

INCINERATOR

WS

WS

PWTP

WS

WWTP

TRANSFORMER ☒
FOR 5kV POWER

DIST.

BOOT ROOM

CHANGE ROOM

CHANGE ROOM

CHANGE ROOM

CHANGE ROOM

16 UNIT CAMP CORE

36 ROOM DORM

50 ROOM DORM

50 ROOM DORM

50 ROOM DORM

50 ROOM DORM

50 ROOM DORM

50 ROOM DORM

50 ROOM DORM

TRAINING FACILITY

REC / FITNESS

WASHCAR

WASHCAR

WASHCAR

WASHCAR

WASHCAR

LAUNDRY

WASHCAR

WASHCAR

RESERVED FOR PARKING
(2540 SM)

312'-5"
[95212mm]

24'-10"
[7570mm]

327'-2"
[99716mm]

ACCESS ROAD

DIMENSIONS ARE NOMINAL
SAMPLE DRAWING - TO BE USED AS A GUIDE ONLY

No.	Y	M	D	REVISION	BY	CHKD
6	17	05	02	UPDATED SITE PLAN	TS	RA
5	17	04	26	UPDATED SITE	TS	DG
4	17	04	25	UPDATED SITE	TS	DG
3	17	04	24	UPDATED SITE AND BED COUNT	TS	RS
2	17	02	14	ISSUED FOR BID	TS	CN
1	17	02	02	ISSUED FOR REVIEW	TS	CN

HORIZON NORTH

PROJ # : 24015
TN # :
SCALE : 1" = 70'-0"
DRAWN BY : TS
CHECKED : CN

BAFFINLAND IRON MINES

386 BED PORT SITE
BAFFINLAND
SITE PLAN

DWG No.:
AF-000-010

DRAWING INDEX

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A-018	Plan agrandi aile E-F (2e étage)	08/02/2011	11/42
A-019	Plan agrandi aile G-H (2e étage)	08/02/2011	11/42
A-020	Plan agrandi aile E-F (3e étage)	08/02/2011	12/42
A-021	Plan agrandi aile G-H (3e étage)	08/02/2011	12/42
A-022	Module type (Chambres)	08/02/2011	13/42
A-024	Plan de Toit Agrandi	08/02/2011	13/42
D-025	Plan de Toit -aile A&B	08/02/2011	14/42
D-026	Plan de Toit -aile C-D	08/02/2011	14/42
D-027	Plan de Toit -aile E-F	08/02/2011	14/42
D-028	Plan de Toit -aile G-H	08/02/2011	15/42
D-029	Plan de Toit -aile I-J	08/02/2011	15/42
-	Plan de clé -aile A-B-E	08/02/2011	16/42
	Type de Mur	08/02/2011	17/42
A-032	Échelle	08/02/2011	18/42
A-033	Détail Échelle	08/02/2011	18/42
-	Cédule de porte - aile "A" (1er étage)	08/02/2011	19/42
-	Cédule de porte - aile "A" (2e étage)	08/02/2011	19/42
-	Cédule de porte - aile "A" (3e étage)	08/02/2011	19/42
-	Cédule de porte - aile "B" (1er étage)	08/02/2011	20/42
-	Cédule de porte - aile "B" (2e étage)	08/02/2011	20/42
-	Cédule de porte - aile "B" (3e étage)	08/02/2011	20/42
-	Cédule de porte - aile "C" (1er étage)	08/02/2011	21/42
-	Cédule de porte - aile "C" (2e étage)	08/02/2011	21/42
-	Cédule de porte - aile "C" (3e étage)	08/02/2011	21/42
-	Cédule de porte - aile "D" (1er étage)	08/02/2011	22/42

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-	Cédule de porte - aile "D" (2e étage)	08/02/2011	22/42
-	Cédule de porte - aile "D" (3e étage)	08/02/2011	22/42
-	Cédule de porte - aile "E" (1er étage)	08/02/2011	23/42
-	Cédule de porte - aile "E" (2e étage)	08/02/2011	23/42
-	Cédule de porte - aile "E" (3e étage)	08/02/2011	23/42
-	Cédule de porte - aile "F" (1er étage)	08/02/2011	24/42
-	Cédule de porte - aile "F" (2e étage)	08/02/2011	24/42
-	Cédule de porte - aile "F" (3e étage)	08/02/2011	24/42
-	Cédule de porte - aile "G" (1er étage)	08/02/2011	25/42
-	Cédule de porte - aile "G" (2e étage)	08/02/2011	25/42
-	Cédule de porte - aile "G" (3e étage)	08/02/2011	25/42
-	Cédule de porte - aile "H" (1er étage)	08/02/2011	26/42
-	Cédule de porte - aile "H" (2e étage)	08/02/2011	26/42
-	Cédule de porte - aile "H" (3e étage)	08/02/2011	26/42
-	Cédule de porte - aile "I" (1er étage)	08/02/2011	27/42
-	Cédule de porte - aile "I" (2e étage)	08/02/2011	27/42
-	Cédule de porte - aile "I" (3e étage)	08/02/2011	27/42
-	Cédule de porte - aile "J" (1er étage)	08/02/2011	28/42
-	Cédule de porte - aile "J" (2e étage)	08/02/2011	28/42
-	Cédule de porte - aile "J" (3e étage)	08/02/2011	28/42
-	Cédule de porte - Core central	08/02/2011	28/42
-	Type de Porte	08/02/2011	29/42
-	Type de Fenêtre	08/02/2011	30/42
-	Coupe Type Chambre	08/02/2011	31/42
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A-075	Coupe escalier central	08/02/2011	34/42
A-076	Cage D'escalier 1er-2e-3e Étage Bout	08/02/2011	35/42
A-077	Coupe escalier Bout	08/02/2011	35/42
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A-079	Esc. Ext. Porte Double/Marquise 1er Étage	08/02/2011	36/42
A-080	Esc. Ext. Porte Double- Aile A	08/02/2011	37/42
A-082	Esc. Ext. Porte Double- Aile A	08/02/2011	38/42
A-083	Esc. Ext. Porte Simple- 1er Étage	08/02/2011	38/42
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A-085	Elev. Esc. Ext. Porte Simple- 2er Étage	08/02/2011	39/42
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A-090	Linteau / Élev.Esc. (porte double)	08/02/2011	42/42
A-091	Escalier & Marquise -module 002,005 &008/ Coupe	08/02/2011	42/42

CRITÈRES DE CALCUL

21- CATÉGORIE DE RISQUE DU BÂTIMENT :
- PROTECTION CIVILE

22- CHARGE PERMANENTE :
- MEMBRURE SUPÉRIEURE DES FERMES : 0,48 KPA
- MEMBRURE INFÉRIEURE DES FERMES : 0,48 KPA
- PLANCHER : 0,72 KPA
- CLOISON : 1,0 KPA

23- SURCHARGES D'UTILISATION
- PLANCHER DES CHAMBRES: 1,9 kPa
- PLANCHER DES SALLES MÉCANIQUES ET ÉLECTRIQUE : 4,8 kPa
- CORRIDORS ET ESCALIERS: 4,8 kPa
- PLANCHER DES CUISINES ET CAFÉTÉRIA: 4,8 kPa
- PLANCHER DES ENTREPOTS ET AIRES DE STOCKAGE: 4,8 kPa
- PLANCHER DE LA SALLE D'ENTRAINEMENT ET SALLE DE JEUX : 4,8 kPa
- TOITURE - MEMBRURE INFÉRIEURE DES FERMES : 0,48 KPA

24- CHARGES DE NEIGE AU TOIT CALCULÉE SELON SECTION 4.1.6 DU CNB 2005
- CHARGE DE NEIGE AU SOL : (Ss) = 4,7 Kpa
- CHARGE DE PLUIE : (Sr) = 0,3 Kpa
- COEFFICIENT DE RISQUE DE LA CHARGE DUE À LA NEIGE (Is) = 1,0
- COEFFICIENT DE CHARGE AU TOIT Cb = 1,0
- COEFFICIENT D'EXPOSITION AU VENT Cw = 1,0
- COEFFICIENT DE PENTE Cs = 1,0

25- CHARGES DU VENT : CONFORMÉMENT À LA SECTION 4.1.7 DU CNB 2005
- CHARGE DE VENT HORAIRE : ($q_{1/50}$) = 0,40 Kpa
- COEFFICIENT DE RISQUE DE LA CHARGE DUE AU VENT (Iw) = 1,0
- COEFFICIENT D'EXPOSITION Ce: 1,0

26- CHARGES ET EFFETS DES SÉISMES : CONFORMÉMENT À LA SECTION 4.1.8 DU CNB 2005
- DONNÉES SISMIQUES : Sa(0.2) = 0,116
  Sa(0.5) = 0,074
  Sa(1.0) = 0,038
  Sa(2.0) = 0,013
  PGA = 0,059
- COEFFICIENT DE RISQUE PARASISMIQUE (Ie) = 1,0
- CATÉGORIE D'EMPLACEMENT : D
- COEFFICIENT DE MODIFICATION DE FORCE LIÉE À LA DUCTILITÉ Rd: 3,0
- COEFFICIENT DE MODIFICATION DE FORCE LIÉE À LA SUR-RÉSISTANCE Ro: 1,7
- COEFFICIENT D'ACCÉLÉRATION DE L'EMPLACEMENT Fa : 1,3
- COEFFICIENT DE VITESSE DE L'EMPLACEMENT Fv : 1,4
- FACTEUR DE L'EFFET DU MODE SUPÉRIEUR Mv = 1,0
- COEFFICIENT DE RÉDUCTION DU MOMENT DE RENVERSEMENT J = 1,0
- MÉTHODE D'ANALYSE SISMIQUE UTILISÉE : FORCES SISMIQUES STATIQUES ÉQUIVALENTES

27- VIBRATION : CONFORMÉMENT À LA SECTION 4.1.3.6 DU CNB 2005.

28- DÉFLEXION MAXIMALE (SOUS LES SURCHARGES D'UTILISATION) :
- PLANCHER L/360
- TOITURE L/240

29- CONTREVENTEMENTS ET DIAPHRAGMES

LES MURS DE REFENDS ET LES DIAPHRAGMES SONT CONÇUS SELON LES EXIGENCES DE LA NORMES CSA O86-09. LES PANNEAUX STRUCTURUX EN BOIS APPOSÉS SUR LES MURS DE REFEND DOIVENT ÊTRE FIXÉS AVEC DES CLOUS 6D ESPACÉS DE 75MM AUX RIVES DU PANNEAU ET À 300 MM LE LONG DES SUPPORTS INTERMÉDIAIRES. LES PANNEAUX STRUCTURUX EN BOIS APPOSÉS SUR LES DIAPHRAGMES (TOITS ET PLANCHERS) DOIVENT ÊTRE FIXÉS AVEC DES VIS #8 X 1 ¾" ESPACÉS DE 150 MM AUX RIVES DU P PANNEAU ET À 300 MM LE LONG DES ÉLÉMENTS INTERMÉDIAIRES D'OSSATURE.

30- MÉTHODES DE CALCUL :

-CNB 2005 (PARTIE 4) ET COMMENTAIRES SUR LE CALCUL DES STRUCTURES

-STRUCTURE D'ACIER : CALCULS AUX ÉTATS LIMITES CONFORMÉMENT À LA NORME CAN/CSA-S16-09.

- STRUCTURE EN BOIS : CALCULS AUX ÉTATS LIMITES CONFORMÉMENT À LA NORME CSA O86-09.

- STRUCTURES EN BÉTON : CALCULS AUX ÉTATS LIMITES CONFORMÉMENT À LA NORME CAN/CSA A23.3-04 (R2010).

NOTES

GÉNÉRAL

1- NE SE SERVIR POUR LA CONSTRUCTION QUE DES PLANS MARQUÉS "ÉMIS POUR CONSTRUCTION".

2- SE RÉFÉRER UNIQUEMENT AUX DIMENSIONS INDIQUÉES AUX PLANS. NE PAS MESURER LES PLANS À L'ÉCHELLE.

3- L'ENSEMBLE DES TRAVAUX DE CONSTRUCTION, DE DÉMOLITION ET OEUVRES TEMPORAIRES CONNEXES DOIVENT ÊTRE EXÉCUTÉS CONFORMÉMENT AUX NORMES EN VIGUEUR, NOTAMMENT LE CODE DE SÉCURITÉ POUR LES TRAVAUX DE CONSTRUCTION S-2.1,r.6 AINSI QUE LES RÈGLEMENTS DE SÉCURITÉ EN VIGUEUR CHEZ LE PROPRIÉTAIRE, CECI JUSQU'À L'INSTALLATION COMPLÈTE DE LA NOUVELLE STRUCTURE.

4- L'ENTREPRENEUR DOIT MAINTENIR LES CONTREVENTEMENTS TEMPORAIRES JUSQU'À LA FERMETURE COMPLÈTE DU BÂTIMENT

CHARPENTE EN BOIS

5- BOIS DÉBITÉ DE RÉSINEUX CONFORME À LA NORME CAN/CSA O141-91(R1999), ESSENCE ÉPINETTE-PIN-SAPIN (SPF) DE CATÉGORIE NO1 /NO2. (SAUF OÙ INDIQUÉ AUTREMENT). LA TENEUR EN HUMIDITÉ DE TOUT LE BOIS DE CHARPENTE DEVRA ÊTRE ÉGALE OU INFÉRIEURE À 19% ET LE BOIS ESTAMPILLÉ "S-SEC" (S-DRY).

6- L'ASSEMBLAGE DES POTEAUX ET DES POUTRES (OU LINTEAUX), COMPOSÉS DE PLUSIEURS MEMBRURES, DOIT ÊTRE RÉALISÉ EN RESPECTANT LES SPÉCIFICATIONS CONTENUES DANS LE « MANUEL DE CALCUL DES CHARPENTES EN BOIS » PRODUIT PAR LE « CONSEIL CANADIEN DU BOIS ».

7- LES ASSEMBLAGE DE SOLIVE À SOLIVE OU DE SOLIVE À POUTRE DOIVENT ÊTRE FAITS AU MOYEN D'ATTACHES MÉTALLIQUES (ÉTRIERS) APPROUVÉS.

8- LE CALCUL ET LE DIMENSIONNEMENT DES FERMES DE TOIT SERONT EFFECTUÉS CONFORMÉMENT À LA NORME CSA O86-01 ET À LA PARTIE 4 DU CNB (DERNIÈRE ÉDITION) ET ÉGALEMENT SELON LES CRITÈRES DE CALCULS DE LA PUBLICATION TPIC-1996 (FERME DE TOIT À CONNECTEURS MÉTALLIQUES, MODE DE CALCUL ET DEVIS TECHNIQUE).

9- LE FABRICANT DES FERMES DEVRA SOUMETTRE POUR APPROBATION DE L'INGÉNIEUR DES DESSINS D'ATELIER INDIQUANT LE TYPE DE CHACUNE DES FERMES, LES NOTES DE CALCULS PORTANT LE SCEAU D'UN INGÉNIEUR RECONNU DANS LA PROVINCE DE QUÉBEC, AINSI QUE LES DÉTAILS DE FABRICATION À L'USINE ET D'ASSEMBLAGE AU CHANTIER.

10- CONTREPLAQUÉ : TYPE « CSP » CONFORME À LA NORME CSA O151-M78(R2003) OU TYPE « DFP » CONFORME À LA NORME CSA O121M-1978. LE CONTREPLAQUÉ DOIT ÊTRE BOUVETÉ, CLOUÉ OU VISSÉ ET COLLÉ À LA STRUCTURE DES PLANCHERS ET DE LA TOITURE.

11- TRAITEMENT DE PRÉSERVATION: LE BOIS DEVRA ÊTRE TRAITÉ POUR LA PRÉSERVATION CONFORMÉMENT AUX NORMES CAN/CSA SÉRIE O80-SERIES-97(R2002) ET CSA O322-2002.

12- LE BOIS D'INGÉNIERIE DE TYPE 1.9E MICROLAM L.V.L. ET 1.7E TIMBERSTRAND LSL DE WEYERHAEUSER DOIT ÊTRE INSTALLÉ SELON LES SPÉCIFICATIONS ET LES RECOMMANDATIONS DU MANUFACTURIER. L'ASSEMBLAGE DES POTEAUX ET DES POUTRES (OU LINTEAUX), COMPOSÉS DE PLUSIEURS MEMBRURES (PLIS), DOIT ÊTRE RÉALISÉ EN RESPECTANT LES SPÉCIFICATIONS MONTRÉES DANS LA BROCHURE DU MANUFACTURIER EN FONCTION DES CHARGES UNIFORMES PONDÉRÉES INDIQUÉES AU TABLEAU DES POUTRES ET LINTEAUX.

ACIER DE STRUCTURE

13- ACIER DE STRUCTURE CONFORME À LA NORME CAN/CSA-G40.20_1998 ET CAN/CSA-G40.21_1998, NUANCE 350W À L'EXCEPTION DES SECTIONS EN C, DES CORNIÈRES ET DES FERS PLATS, NUANCE 300W.

14- GALVANISATION À CHAUD : SELON LA NORME CAN/CSA-G164-M92(R2003), ASTM A123-02 ET ASTM A153-05.

15- PEINTURE - ACIER INSTALLÉ À L'INTÉRIEUR : CONFORMÉMENT À LA NORME 1-73A ICCA/AFPC (COUCHE D'APPRÊT SEULEMENT).

16- PEINTURE - ACIER INSTALLÉ À L'EXTÉRIEUR : CONFORMÉMENT À LA NORME 1-75 ICCA/AFPC.

17- L'ENTREPRENEUR OU SON SOUS-TRAITANT (LE CAS ÉCHÉANT) DOIT EXÉCUTER TOUS LES TRAVAUX DE SOUDURE CONFORMÉMENT À LA NORME CSA W59-2003. IL DOIT ÉGALEMENT ÊTRE ACCRÉDITÉ SELON LA NORME CSA W47.1-2003. LE PROPRIÉTAIRE ET/OU L'INGÉNIEUR SE RÉSERVE LE DROIT DE VÉRIFIER CES ACCRÉDITATIONS ET CE, AUTANT AVANT LE DÉBUT DES TRAVAUX QUE PENDANT LES TRAVAUX.

18- BOULONS ("BOLTS"), ÉCROUS ("NUTS"), CONTRE-ÉCROUS ("LOCK NUTS") ET RONDELLES D'ASSEMBLAGE ("WASHERS") SELON LA NORME ASTM-A325-2004.

19- TIGES FILETÉES SELON LA NORME ASTM-A307-2004.

20- L'ENTREPRENEUR DOIT FOURNIR LES DESSINS D'ATELIER À L'INGÉNIEUR AVANT LE DÉBUT DE LA FABRICATION POUR VÉRIFICATION. LES DESSINS DOIVENT INCLURE TOUS LES DÉTAILS QUI NE SONT PAS SPÉCIFIQUEMENT INDIQUÉS SUR LES PLANS MAIS QUI SONT REQUIS POUR LA FABRICATION ET L'INSTALLATION (EX. : CONNEXIONS). LES DESSINS DOIVENT RESPECTER LES RÈGLES DE L'ART ET DOIVENT ÊTRE SIGNÉS ET SCELLÉS PAR UN INGÉNIEUR MEMBRE EN RÈGLE DE L'ORDRE DES INGÉNIEURS DU QUÉBEC (O.I.Q.).

PROJET

ARCELORMITTAL
800 chambres
Mont-Wright

Tel que construit

Référence:
RCM Modulaire

ARCHITECTE

ALP SOYKANDAR
Architecte

ENTREPRENEUR

RCM
MODULAR LIVING

TOUTES LES DIMENSIONS DEVRONT ÊTRE VÉRIFIÉES SUR PLACE AVANT LE DÉBUT DES TRAVAUX ET SONT SOUS LA SEULE RESPONSABILITÉ DE L'ENTREPRENEUR GÉNÉRAL.

TOUTES LES INFORMATIONS RELATIVES À LA STRUCTURE ET À LA CHARPENTE INDIQUÉES SUR CES DOCUMENTS DEVRONT ÊTRE VÉRIFIÉES PAR UN INGÉNIEUR EN STRUCTURE RECONNU.

NONOBSTANT LES INFORMATIONS DONNÉES SUR CES DOCUMENTS, TOUS LES TRAVAUX DEVRONT RENCONTRER LES EXIGENCES DU CODE DE CONSTRUCTION DU QUÉBEC, DU CNB ÉDITION 1995, LES EXIGENCES MUNICIPALES ET TOUTE LA RÉGLEMENTATION RÉGISSANT CE TYPE DE PROJET.

TOUTES DIMENSIONS ET MESURES SONT À VÉRIFIER ET DEMEURENT LA RESPONSABILITÉ DE L'ENTREPRENEUR. TOUTES ERREURS OU OMISSIONS DEVRONT ÊTRE SIGNALÉES AVANT DE PROCÉDER AU TRAVAIL. AUCUNE DIMENSION NE DEVRA ÊTRE MESURÉE DIRECTEMENT SUR CE DESSIN.

Revisions

No.	Date	Remarques	Par
1		08 MARS 2012	
2			
3			
4			
5			
6			
7			
8			
9			

Ordre des architectes du Québec — ALP SOYKANDAR

ARCHITECTURE

LEGENDE & NOTE

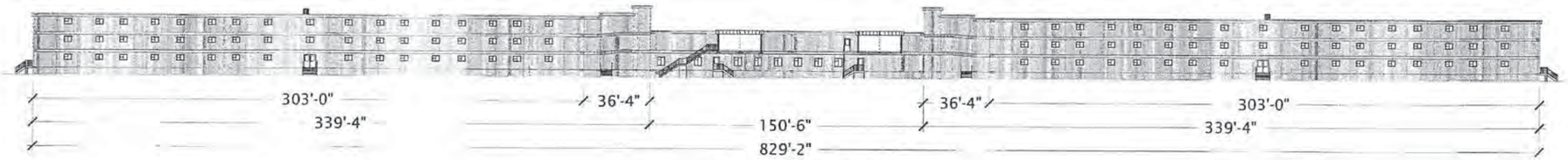
CAO/DAO	
DESIGN	ALP SOYKANDAR
DESSIN	MATHIEU GARNEAU
VÉRIFICATION	ALP SOYKANDAR
DATE	JANVIER 2012
ÉCHELLE	AUCUNE
No PROJET	9-856

R-1

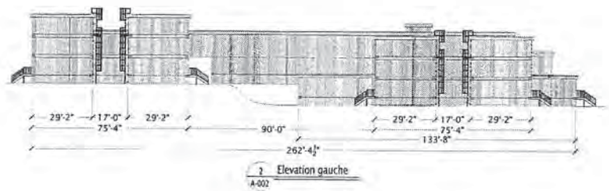
1/42

FORMAT ISO A2

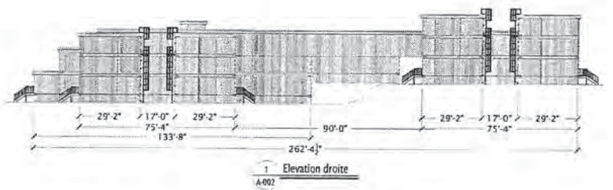
1 Elevation avant
A-001



2 Elevation arrière
A-001



2 Elevation gauche
A-002



1 Elevation droite
A-002

PROJET

ARCELORMITTAL
800 chambres
Mont-Wright

Tel que construit

Référence:
RCM Modulaire

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ENTREPRENEUR

RCM
MODULAR LIVING

TOUTES LES DIMENSIONS DEVRONT ÊTRE VÉRIFIÉES SUR PLACE AVANT LE DÉBUT DES TRAVAUX ET SONT SOUS LA SEULE RESPONSABILITÉ DE L'ENTREPRENEUR GÉNÉRAL.

TOUTES LES INFORMATIONS RELATIVES À LA STRUCTURE ET À LA CHARPENTE MODÉLISÉES SUR CES DOCUMENTS DEVRONT ÊTRE VÉRIFIÉES PAR UN INGÉNIEUR EN STRUCTURE RECONNU.

RENCONTRANT LES INFORMATIONS DONNÉES SUR CES DOCUMENTS, TOUS LES TRAVAUX DEVRONT RENCONTRER LES EXIGENCES DU CODE DE CONSTRUCTION DU QUÉBEC, DU CNB EDITION APPL. LES EXIGENCES MUNICIPALES ET TOUTE LA RÉGLEMENTATION RÉGISSANT CE TYPE DE PROJET.

TOUTES DIMENSIONS ET MESURES SONT À VÉRIFIER ET DÉGAGENT LA RESPONSABILITÉ DE L'ENTREPRENEUR. TOUTES ERREURS OU OMISSIONS DEVRONT ÊTRE SIGNALÉES AVANT DE PROCÉDER AU TRAVAIL. AUCUNE DIMENSION NE DOIVA ÊTRE MESURÉE DIRECTEMENT SUR CE DESSIN.

Revisions

No.	Date	Description	Par
1		09 MARS 2012	
2		06 MARS 2012	
3			
4			
5			
6			
7			
8			
9			

Ordre des architectes du Québec
ALP SOYKANDAR
ARCHITECTE

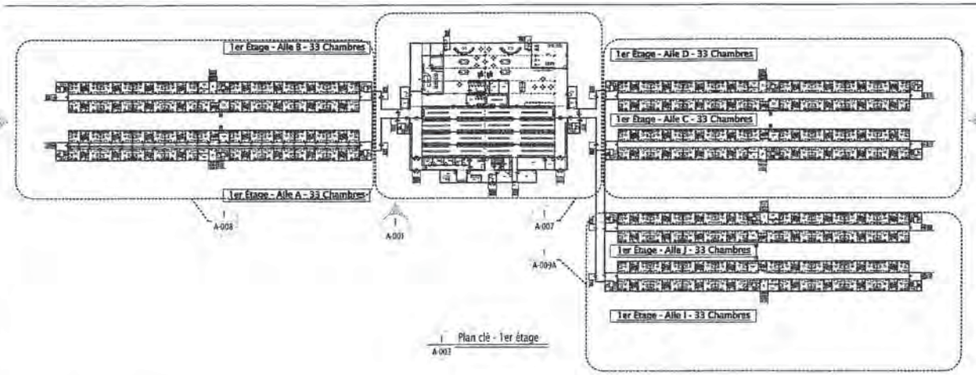
ARCHITECTURE

ELEVATIONS

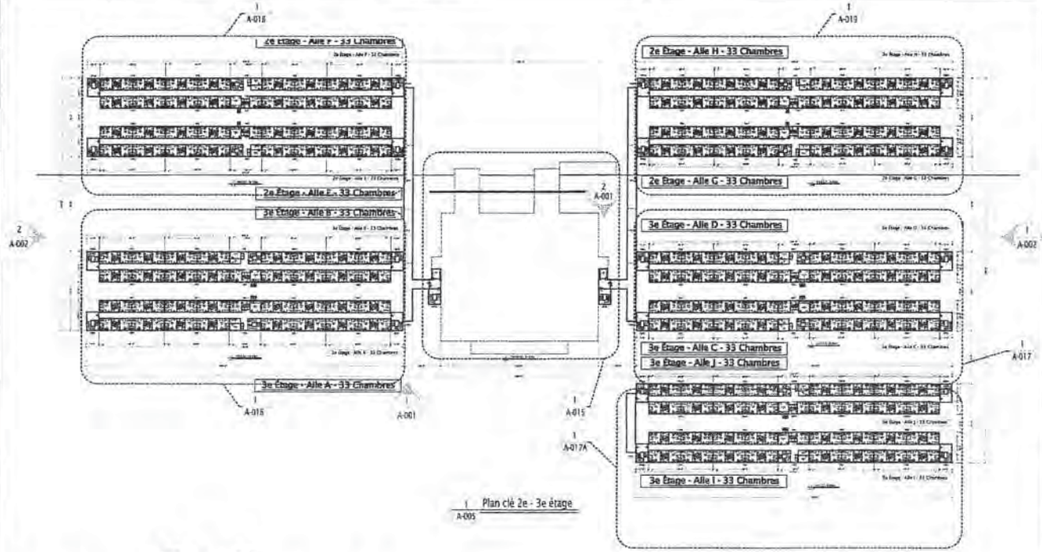
DESSIN	ALP SOYKANDAR
DESSIN	MATHIEU GARNEAU
VERIFICATION	ALP SOYKANDAR
DATE	JANVIER 2012
ECHELLE	1/32" = 1'-0"
N° PROJET	11-856

R-1

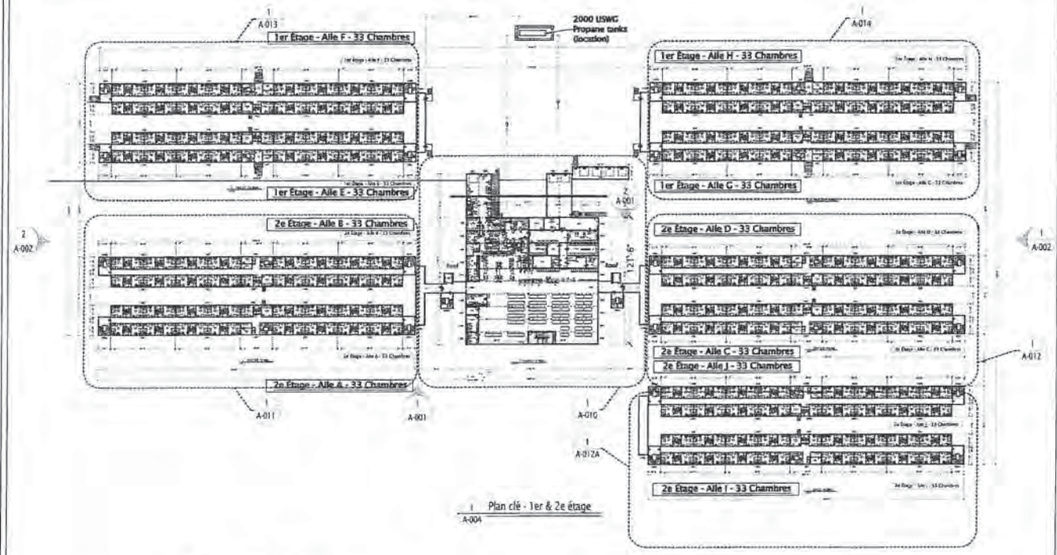
FORMAT ISO A2



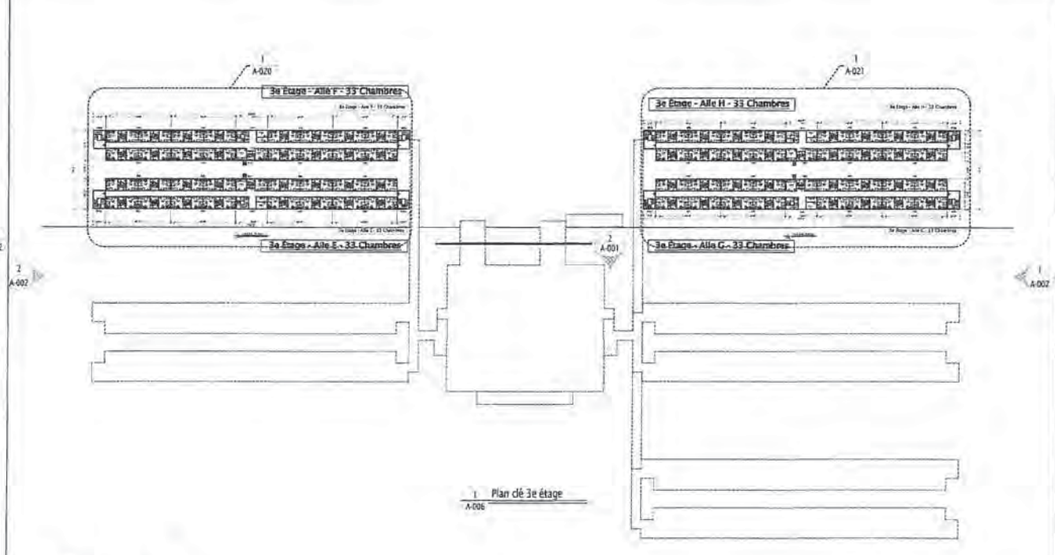
Plan clé
1er étage
(Ailes A,B,C,D,I,J)



Plan clé
3e étage (Ailes A,B,C,D,I,J)
2e étage (Ailes E,F,G,H)



Plan clé
2e étage (Ailes A,B,C,D,I,J)
1er étage (Ailes E,F,G,H)



Plan clé
3e étage
(Ailes E,F,G,H)

PROJET
ARCELORMITTAL
800 chambres
Mont-Wright

Tel que construit

Référence:
RCM Modulaire

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ENTREPRENEUR

RCM
MODULAR LIVING

TOUTES LES DIMENSIONS DEVRONT ÊTRE VÉRIFIÉES SUR PLACE AVANT LE DÉBUT DES TRAVAUX ET SONT SOUS LA SEULE RESPONSABILITÉ DE L'ENTREPRENEUR GÉNÉRAL.

TOUTES LES INFORMATIONS RELATIVES À LA STRUCTURE ET À LA CHARPENTE INDIQUÉES SUR CES DOCUMENTS DEVRONT ÊTRE VÉRIFIÉES PAR UN INGÉNIEUR EN STRUCTURE RECONNU.

RONFORMITÉ LES INFORMATIONS DONNÉES SUR CES DOCUMENTS, TOUS LES TRAVAUX DEVRONT RENCONTRER LES EXIGENCES DU CODE DE CONSTRUCTION DU QUÉBEC, DU CNB EDITION PMS, LES EXIGENCES MUNICIPALES ET TOUTE LA RÉGLEMENTATION RÉGISSANT CE TYPE DE PROJET.

TOUTES DIMENSIONS ET MESURES SONT À VÉRIFIER ET DÉGAGENT LA RESPONSABILITÉ DE L'ENTREPRENEUR. TOUTES ERREURS OU OMISSIONS DEVRONT ÊTRE SIGNALÉES AVANT DE PROCÉDER AU TRAVAIL. AUCUNE DIMENSION NE DEVRA ÊTRE MESURÉE DIRECTEMENT SUR CE DESSIN.

No.	Date	Remarques	Par
1			
2		10 MARS 2022	
3			
4			
5			
6			
7			
8			
9			

Ordre des architectes du Québec
ALP SOYKANDAR
Membre

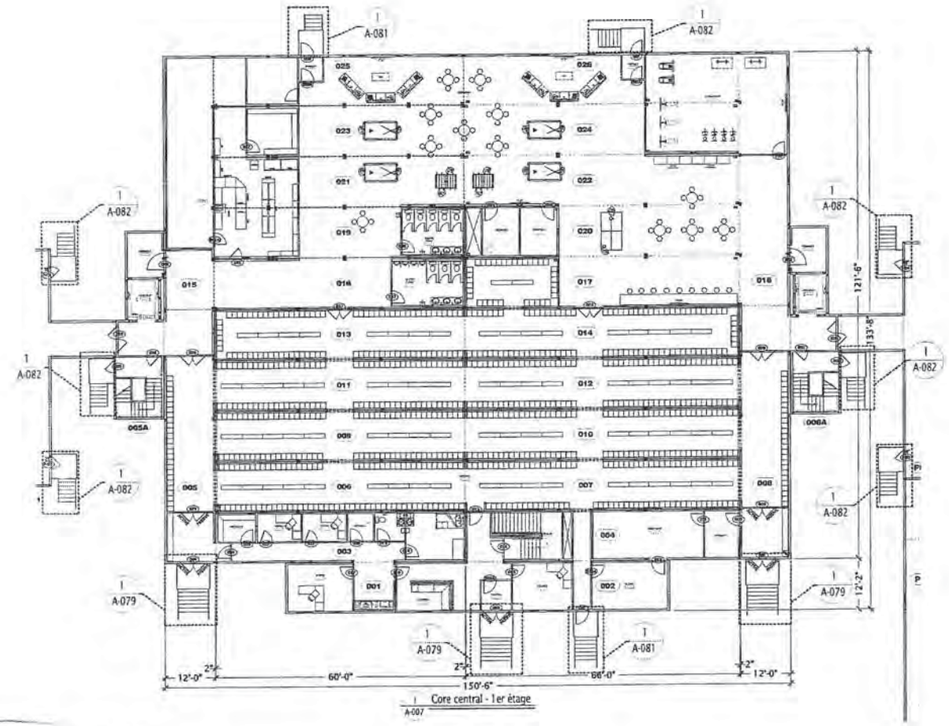
ARCHITECTURE

PLANS CLE

CAO/DAO	
DESSIN	ALP SOYKANDAR
DESSIN	MATHIEU GARNEAU
VÉRIFICATION	ALP SOYKANDAR
DATE	JANVIER 2022
ÉCHELLE	1/64" = 1'-0"
© PROJET	R-856

R-1

FORMAT ISO A2



1 A-087 Core central - 1er étage

Plan agrandi
Core central
1er étage

PROJET

ARCELORMITTAL
800 chambres
Mont-Wright

Tel que construit

Référence:
RCM Modulaire

ARCHITECTE

ALP SOYKANDAR
Architecte

121 ave. Plante Suite 103
Verdun, (QC), H3E 1S2
Tel.: (418) 881-2911
Fax.: (418) 881-3624
www.studios-international.com

ENTREPRENEUR

RCM
MODULAR LIVING

TOUTES LES DIMENSIONS DEVRONT ÊTRE VÉRIFIÉES SUR PLACE AVANT LE DÉBUT DES TRAVAUX ET SONT SOUS LA SEULE RESPONSABILITÉ DE L'ENTREPRENEUR GÉNÉRAL.

TOUTES LES INFORMATIONS RELATIVES À LA STRUCTURE ET À LA CHARPENTE INDIQUÉES SUR CES DOCUMENTS DEVRONT ÊTRE VÉRIFIÉES PAR UN INGÉNIEUR EN STRUCTURE RECONNU.

HONORISTANT LES INFORMATIONS DONNÉES SUR CES DOCUMENTS, TOUS LES TRAVAUX DEVRONT RENCONTRER LES EXIGENCES DU CODE DE CONSTRUCTION DU QUÉBEC, DU CNB ÉDITION PRÉS, LES EXIGENCES MUNICIPALES ET TOUTE LA RÉGLEMENTATION RÉGISSANT CE TYPE DE PROJET.

TOUTES DIMENSIONS ET MESURES SONT À VÉRIFIER ET DÉMEURENT LA RESPONSABILITÉ DE L'ENTREPRENEUR. TOUTES ERREURS OU OMISSIONS DEVRONT ÊTRE SIGNALÉES AVANT DE PROCÉDER AU TRAVAIL. AUCUNE DIMENSION NE DEVRA ÊTRE MESURÉE DIRECTEMENT SUR CE DESSIN.

Révisions		
No.	Date	Remarques
1		
2		30 MARS 2012
3		
4		
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7		
8		
9		

Ordre des architectes du Québec
ALP SOYKANDAR

ARCHITECTURE

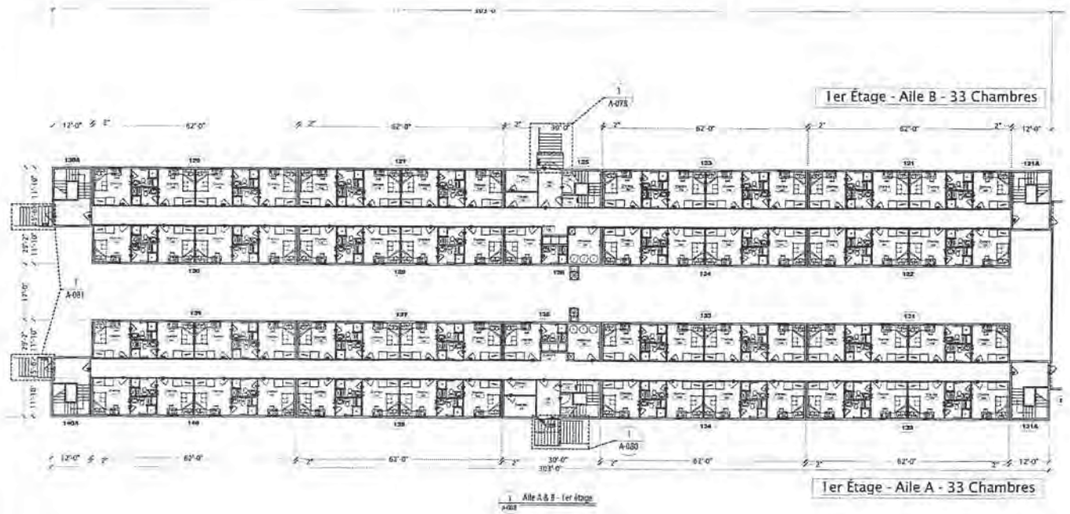
PLAN AGRANDI
CORE CENTRAL
1er ETAGE

CAO/DAO	
DESSIN	ALP SOYKANDAR
DESSIN	MATHIEU GARNEAU
VÉRIFICATION	ALP SOYKANDAR
DATE	JANVIER 2012
ÉCHELLE	1/16" = 1'-0"
NO PROJET	R-1004

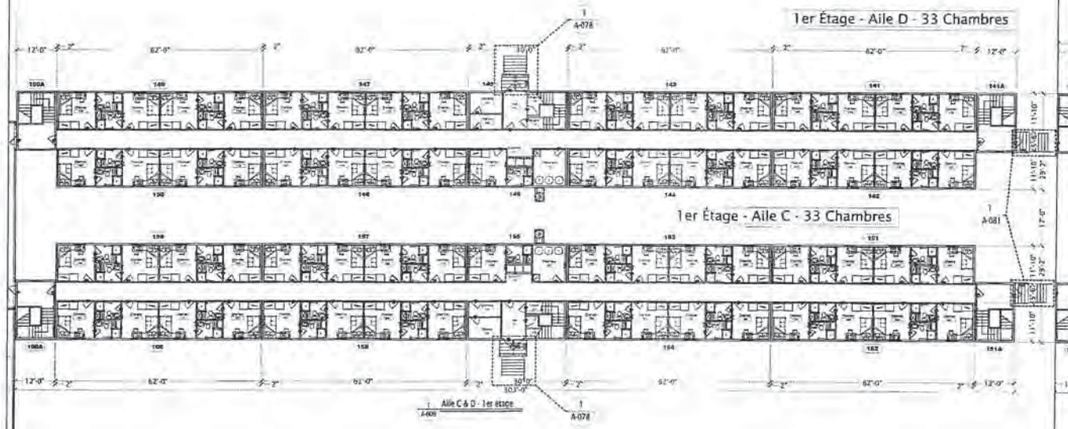
R-1

4/42

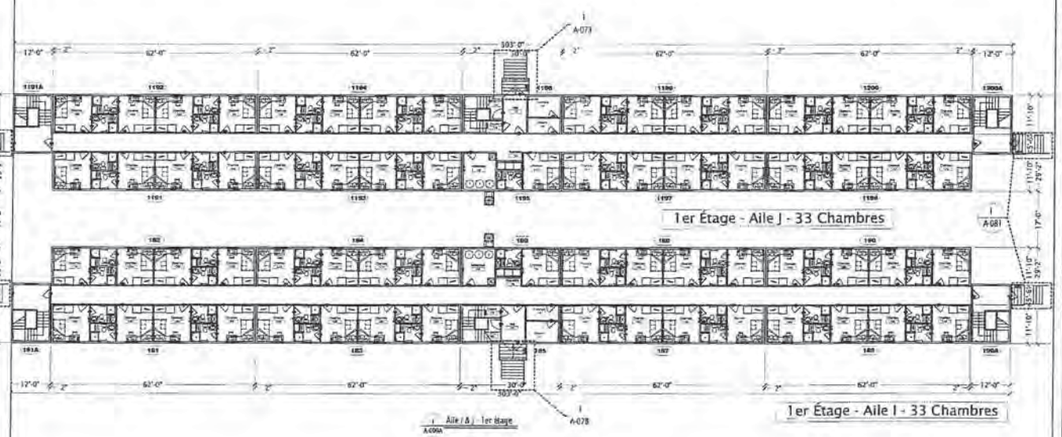
FORMAT ISO A2



Plan agrandi
1er étage
(Ailes A & B)



Plan agrandi
1er étage
(Ailes C & D)



Plan agrandi
1er étage
(Ailes I & J)

PROJET
ARCELORMITTAL
800 chambres
Mont-Wright

Tel que construit

Référence:
RCM Modulaire

ARCHITECTE

ALP BOYKANDAR
Architecte
121 ave. Florida Suite 103
Visitez, (QC), G7S# 1B2
Tel.: (418) 681-0911
Fax.: (418) 681-8834
www.alp-bus-international.com

ENTREPRENEUR
RCM
MODULAR LIVING

26, Rue Industrielle, Saint-Benoît Labre
Shawinigan, Québec G9N 1P3
Tél.: (819) 537-4444 Fax.: (819) 537-3911
www.rcmmodulaire.com

"TOUTES LES DIMENSIONS DEVRONT ÊTRE VÉRIFIÉES SUR PLACE AVANT LE DÉBUT DES TRAVAUX ET SONT SOUS LA SEULE RESPONSABILITÉ DE L'ENTREPRENEUR GÉNÉRAL.

TOUTES LES INFORMATIONS RELATIVES À LA STRUCTURE ET À LA CHARPENTE INDIQUÉES SUR CES DOCUMENTS DEVRONT ÊTRE VÉRIFIÉES PAR UN INGÉNIEUR EN STRUCTURE RECONNU.

NONOBSTANT LES INFORMATIONS CONTENUES SUR LES DOCUMENTS, TOUS LES TRAVAUX DEVRONT RENCONTRER LES EXIGENCES DU CODE DE CONSTRUCTION DU QUÉBEC, DU CNB ÉDITION PMS, LES EXIGENCES MUNICIPALES ET TOUTE LA RÉGLEMENTATION RÉGISSANT CE TYPE DE PROJET.

TOUTES DIMENSIONS ET MESURES SONT À VÉRIFIER ET DEMEURENT LA RESPONSABILITÉ DE L'ENTREPRENEUR. TOUTES ERREURS OU OMISSIONS DEVRONT ÊTRE SIGNALÉES AVANT DE PROCÉDER AU TRAVAIL. AUCUNE DIMENSION NE DEVRA ÊTRE MESURÉE DIRECTEMENT SUR CE DESSIN.

Révisions:

No.	Date	Remarques	Par
1			
2		06 MARS 2017	
3			
4			
5			
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7			
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9			

Ordre des architectes du Québec
ALP BOYKANDAR

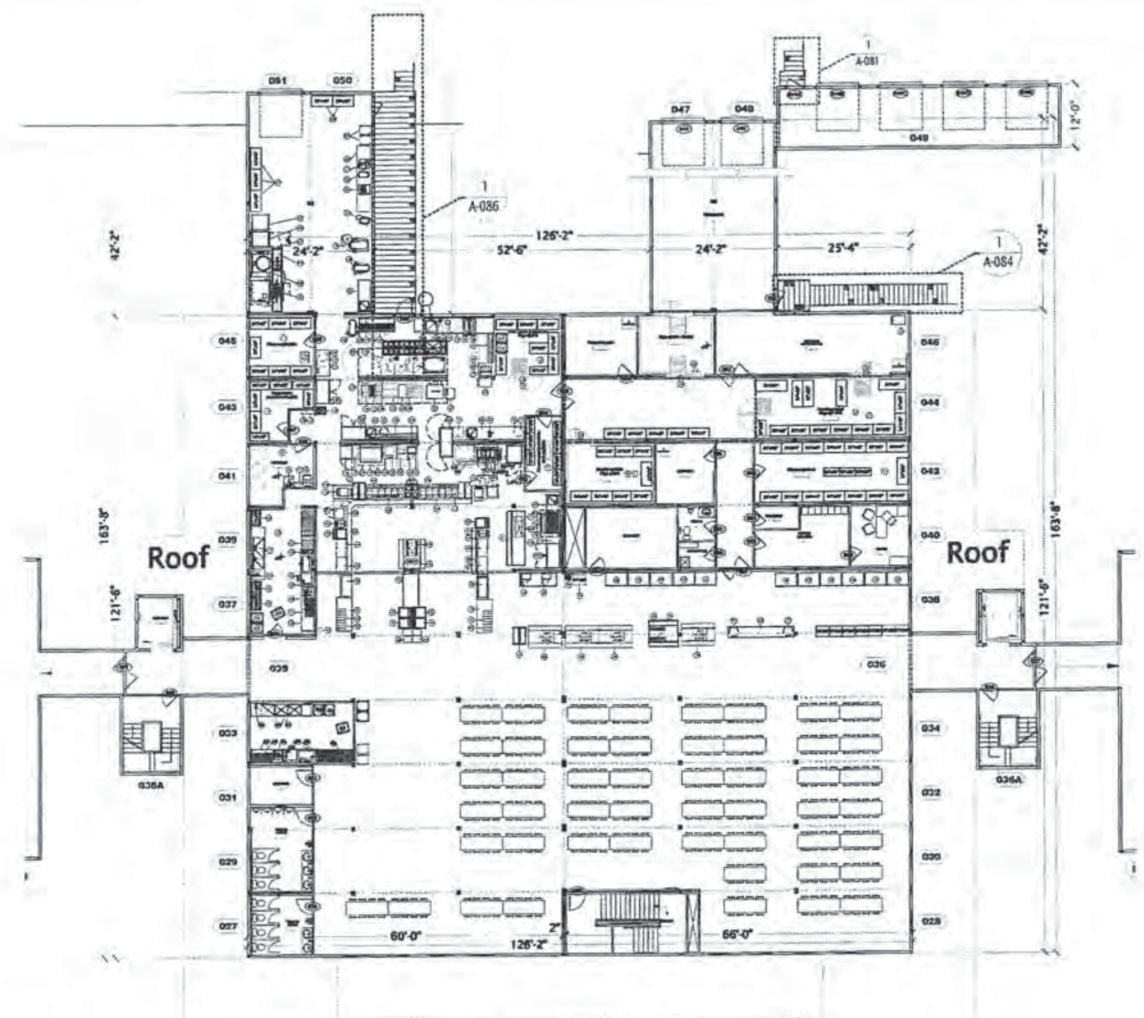
ARCHITECTURE

PLAN AGRANDI
1er ETAGE
AILE A&B
C&D
I&J

CAO/DAO	
DESSIN	ALP BOYKANDAR
DESSIN	MATHIEU GARNEAU
VÉRIFICATION	ALP BOYKANDAR
DATE	JANVIER 2017
ÉCHELLE	AUCUNE
NO PROJET	9-804

R-1

FORMAT ISO A2



Plan agrandi
Core central
2e étage

1 Core central - 2e étage
A-020

PROJET

ARCELORMITTAL
800 chambres
Mont-Wright

Tel que construit

Référence:
RCM Modulaire

ARCHITECTE

ALP SOYKANDAR
Architecte

121 ave. Plante Suite 103
Vanier, (QC), G1M 1G2
Tel.: (418) 681-6011
Fax.: (418) 681-5824
www.studios-international.com

ENTREPRENEUR

RCM
MODULAR LIVING

TOUTES LES DIMENSIONS DEVRONT ÊTRE VÉRIFIÉES SUR PLACE AVANT LE DÉBUT DES TRAVAUX ET SONT SOUS LA SEULE RESPONSABILITÉ DE L'ENTREPRENEUR GÉNÉRAL.

TOUTES LES INFORMATIONS RELATIVES À LA STRUCTURE ET À LA CHARPENTE INDIQUÉES SUR CES DOCUMENTS DEVRONT ÊTRE VÉRIFIÉS PAR UN INGÉNIEUR EN STRUCTURE RECONNU.

NONOBSTANT LES INFORMATIONS DONNÉES SUR CES DOCUMENTS, TOUS LES TRAVAUX DEVRONT RENCONTRER LES EXIGENCES DU CODE DE CONSTRUCTION DU QUÉBEC, DU CNB ÉDITION 1995, LES EXIGENCES MUNICIPALES ET TOUTE LA RÉGLEMENTATION RÉGISSANT CE TYPE DE PROJET.

TOUTES DIMENSIONS ET MESURES SONT À VÉRIFIER ET DEMEURENT LA RESPONSABILITÉ DE L'ENTREPRENEUR. TOUTES ERREURS OU OMISSIONS DEVRONT ÊTRE SIGNALÉES AVANT DE PROCÉDER AU TRAVAIL. AUCUNE DIMENSION NE DEVRA ÊTRE MESURÉE DIRECTEMENT SUR CE DESSIN.

Revisions

No.	Date	Remarques	Par
1			
2		[illegible]	
3			
4			
5			
6			
7			
8			
9			

Ordre des architectes du Québec
GUY ALP SOYKANDAR
Architecte

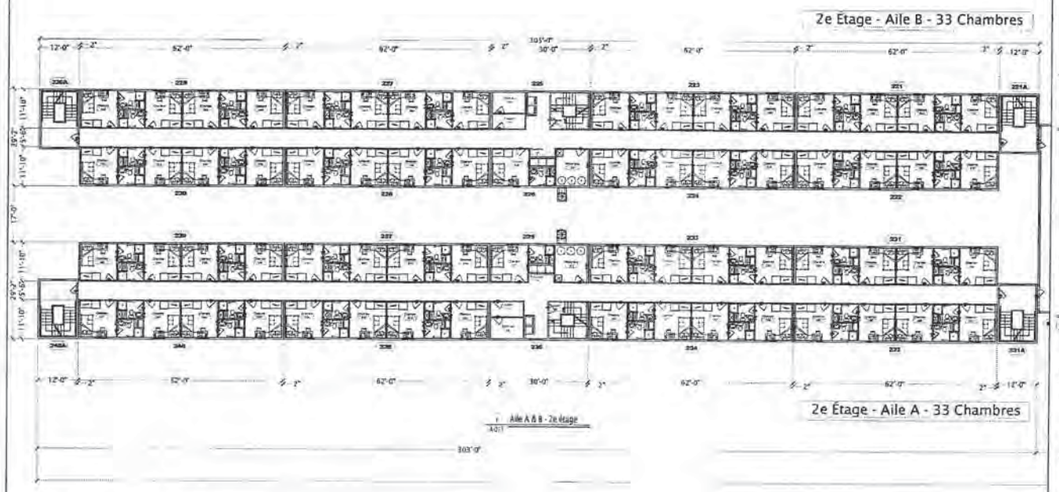
ARCHITECTURE

PLAN AGRANDI
CORE CENTRAL
2e ETAGE

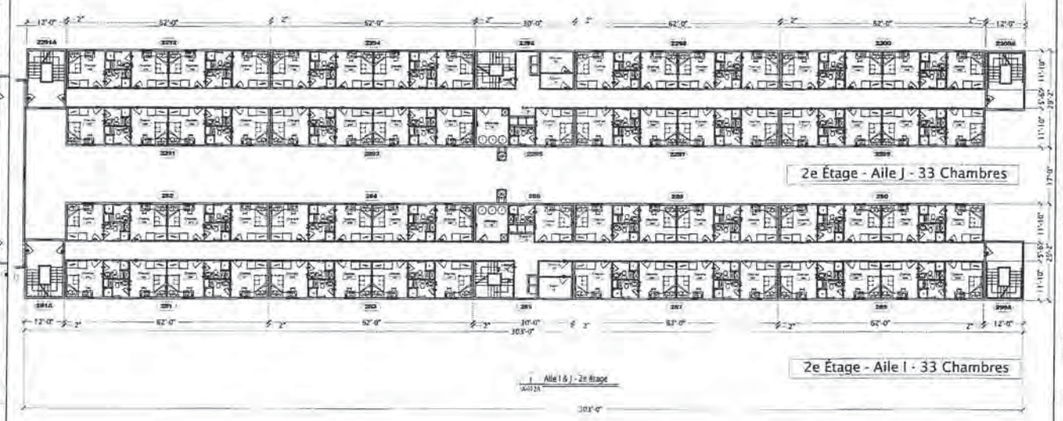
CAO/DAO	
DESIGN	ALP SOYKANDAR
DESSIN	MATHIEU GARNEAU
VÉRIFICATION	ALP SOYKANDAR
DATE	JANVIER 2012
ÉCHELLE	1/16" = 1'-0"
NO PROJET	1-856

R-1

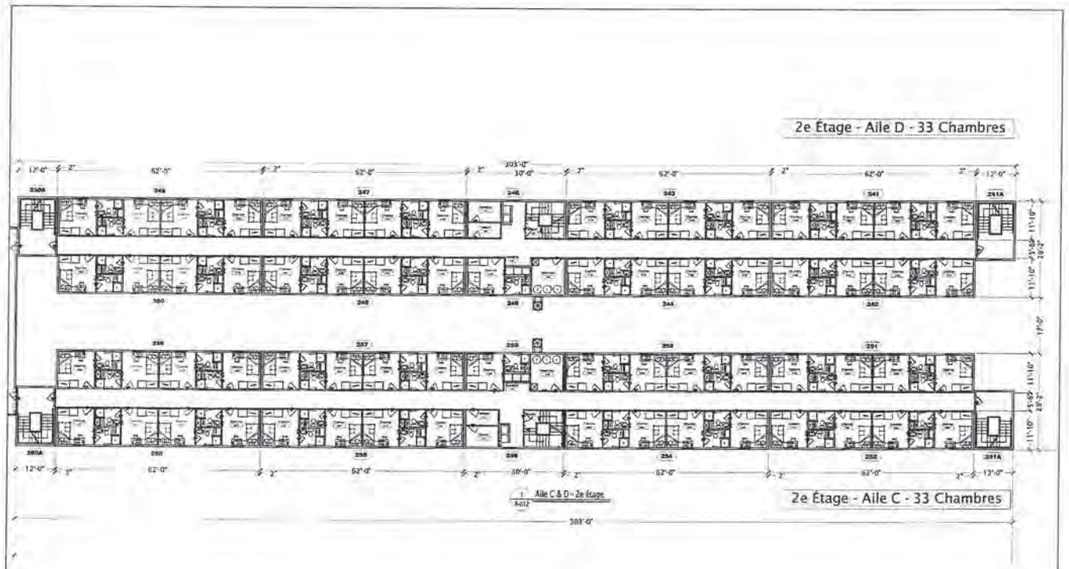
FORMAT ISO A2



Plan agrandi
2e étage
(Ailes A & B)



Plan agrandi
2e étage
(Ailes I & J)



Plan agrandi
2e étage
(Ailes C & D)

PROJET
ARCELORMITTAL
800 chambres
Mont-Wright

Tel que construit

Référence:
RCM Modulaire

ARCHITECTE
ALP SOYKANDAR
Architecte
121 ave. Pierre-Bédé #03
Verdun, (QC), H4H 1B2
Tél.: (418) 601-0211
Fax.: (418) 601-0634
www.studio-international.com

ENTREPRENEUR
RCM
MODULAR LIVING

TOUTES LES DIMENSIONS DEVRONT ÊTRE VÉRIFIÉES SUR PLACE AVANT LE DÉBUT DES TRAVAUX ET SONT SOUS LA SEULE RESPONSABILITÉ DE L'ENTREPRENEUR GÉNÉRAL.

TOUTES LES INFORMATIONS RELATIVES À LA STRUCTURE ET À LA CHARPENTE INDIQUÉES SUR CES DOCUMENTS DEVRONT ÊTRE VÉRIFIÉES PAR UN INGÉNIEUR EN STRUCTURE RECONNU.

NONOBSTANT LES INFORMATIONS DONNÉES SUR CES DOCUMENTS, TOUS LES TRAVAUX DEVRONT RENCONTRER LES EXIGENCES DU CODE DE CONSTRUCTION DU QUÉBEC, DU CNB ÉDITION PMS, LES EXIGENCES MUNICIPALES ET TOUTE LA RÉGLEMENTATION RÉGISSANT CE TYPE DE PROJET.

TOUTES DIMENSIONS ET MESURES SONT À VÉRIFIER ET DEMEURENT LA RESPONSABILITÉ DE L'ENTREPRENEUR. TOUTES ERREURS OU OMISSIONS DEVRONT ÊTRE SIGNALÉES AVANT DE PROCÉDER AU TRAVAIL. AUCUNE DIMENSION NE DEVRA ÊTRE MESURÉE DIRECTEMENT SUR CE DESSIN.

Révisions

No	Date	Remarques	Par
1			
2		6-6 MARS 2014	
3		6-6 MARS 2014	
4			
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Ordre des architectes du Québec
ALP SOYKANDAR

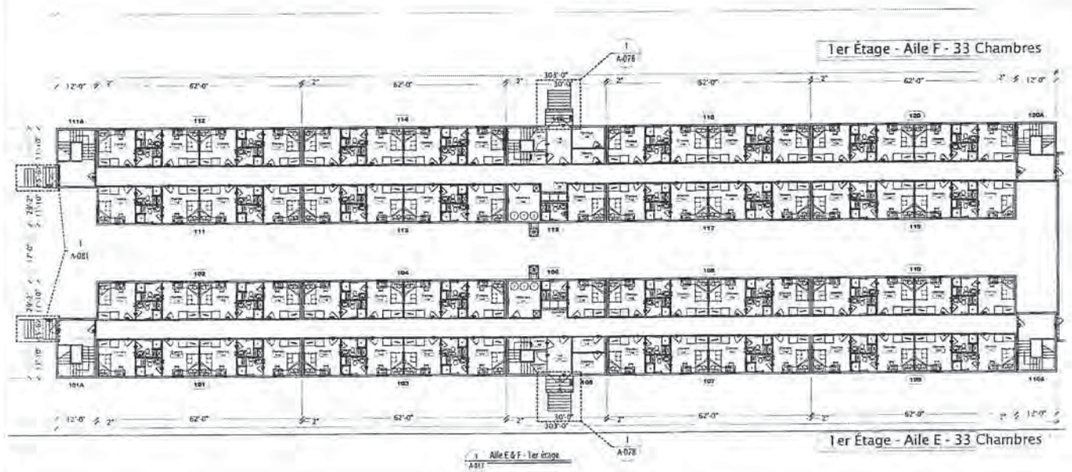
ARCHITECTURE

PLAN AGRANDI
2e ETAGE
AILE A-B
C&D
I&J

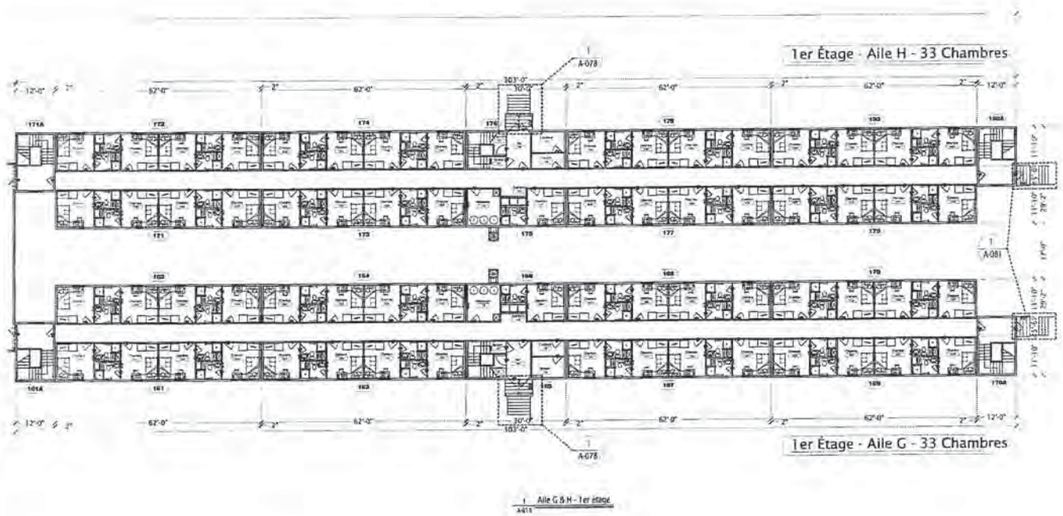
CAO/DAO	
DESSIN	ALP SOYKANDAR
DESSIN	MATHIEU GARNEAU
VÉRIFICATION	ALP SOYKANDAR
DATE	JANVIER 2012
ÉCHELLE	AUCUNE
ID PROJET	11-004

R-1

FORMAT ISO A2



Plan agrandi
1er étage
(Ailes E & F)



Plan agrandi
1er étage (Ailes G & H)
(Futur)

PROJET
ARCELORMITTAL
800 chambres
Mont-Wright

Tel que construit

Référence:
RCM Modulaire

ARCHITECTE
ALP SOYKANDAR
Architecte

ENTREPRENEUR
RCM
MODULAR LIVING

TOUTES LES DIMENSIONS DOIVENT ÊTRE VÉRIFIÉES SUR PLACE AVANT LE DÉBUT DES TRAVAUX ET SONT SOUS LA SEULE RESPONSABILITÉ DE L'ENTREPRENEUR GÉNÉRAL.

TOUTES LES INFORMATIONS RELATIVES À LA STRUCTURE ET À LA CHARPENTE INDIQUÉES SUR CES DOCUMENTS DOIVENT ÊTRE VÉRIFIÉES PAR UN INGÉNIEUR EN STRUCTURE RECONNU.

NONOBSTANT LES INFORMATIONS DONNÉES SUR CES DOCUMENTS, TOUS LES TRAVAUX DEVRONT RENCONTRER LES EXIGENCES DU CODE DE CONSTRUCTION DU QUÉBEC, DU CNB EDITION PRÉ, LES EXIGENCES MUNICIPALES ET TOUTE LA RÉGLEMENTATION RÉGISSANT CE TYPE DE PROJET.

TOUTES DIMENSIONS ET MESURES SONT À VÉRIFIER ET DEMEURENT LA RESPONSABILITÉ DE L'ENTREPRENEUR. TOUTES ERREURS OU OMISSIONS DEVRONT ÊTRE SIGNALÉES AVANT DE PROCÉDER AU TRAVAIL. AUCUNE DIMENSION NE DEVRA ÊTRE MESURÉE DIRECTEMENT SUR CE DESSIN.

Revisions

No.	Date	Revision	Par
1			
2			
3		6 MARS 2012	
4			
5			
6			
7			
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9			

Ordre des architectes du Québec
GUY ALP SOYKANDAR

ARCHITECTURE

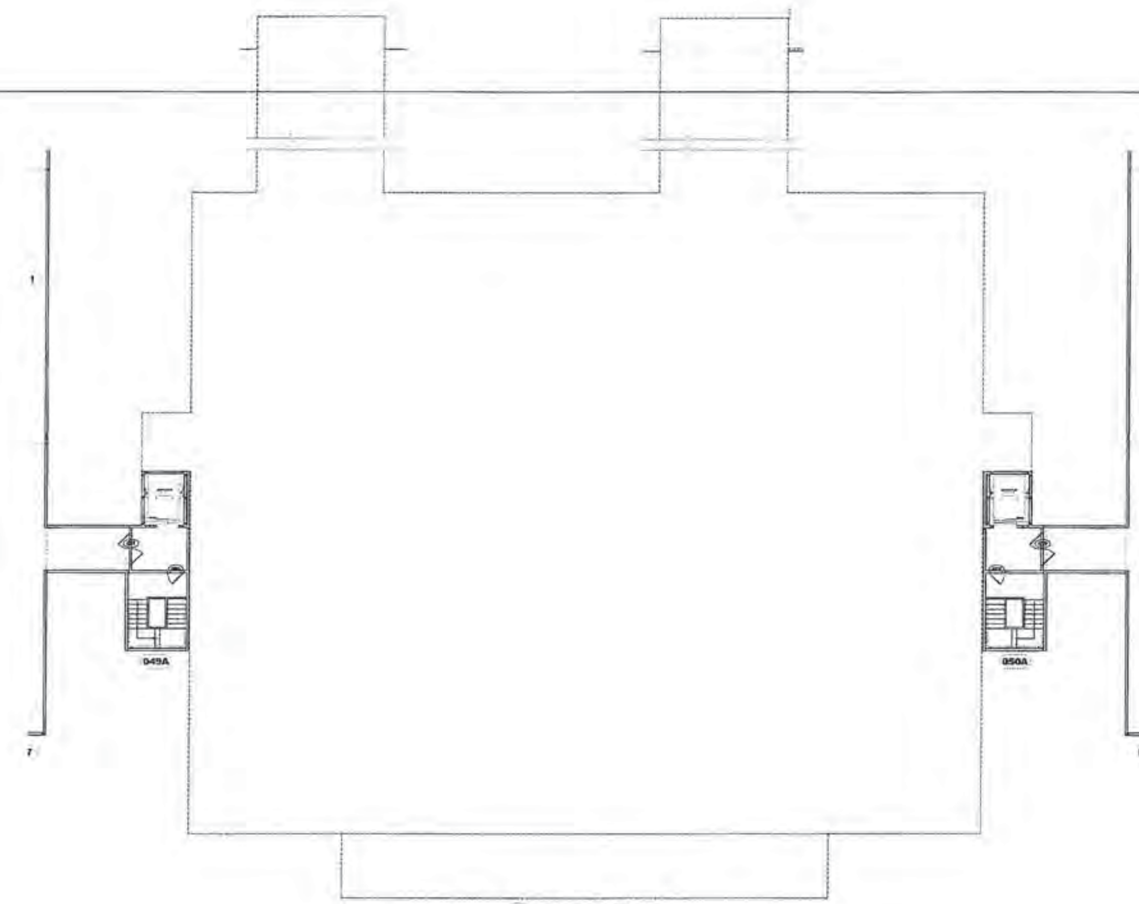
PLAN AGRANDI
1er ETAGE
AILE E&F
AILE G&H(FUTUR)

CAD/DAO	
DESSIN	ALP SOYKANDAR
DESSIN	MATHIEU GARNEAU
VERIFICATION	ALP SOYKANDAR
DATE	JANVIER 2012
ÉCHELLE	AUCUNE
NO PROJET	5-856

R-1

8/42

FORMAT ISO A2



1 Core central - 3e étage
A015

Plan agrandi
Core central
3e étage

PROJET

ARCELORMITTAL
800 chambres
Mont-Wright

Tel que construit

Référence:
RCM Modulaire

ARCHITECTE

ALP SOYKANDAR
Architecte

121 ave. Plando Suite 103
Vanier, (QC), G1M 1B2
Tel.: (418) 681-0011
Fax.: (418) 681-0624
www.studios-international.com

ENTREPRENEUR

RCM
MODULAR LIVING
www.rcmmodulaire.com

TOUTES LES DIMENSIONS DEVRONT ÊTRE VÉRIFIÉES SUR PLACE AVANT LE DÉBUT DES TRAVAUX ET SONT SOUS LA SEULE RESPONSABILITÉ DE L'ENTREPRENEUR GÉNÉRAL.

TOUTES LES INFORMATIONS RELATIVES A LA STRUCTURE ET A LA CHARPENTE INDIQUÉES SUR CES DOCUMENTS DEVRONT ÊTRE VÉRIFIÉES PAR UN INGÉNIEUR EN STRUCTURE RECONNU.

NONOBSTANT LES INFORMATIONS DONNÉES SUR CES DOCUMENTS, TOUS LES TRAVAUX DEVRONT RENCONTRER LES EXIGENCES DU CODE DE CONSTRUCTION DU QUÉBEC, DU CNB ÉDITION 1995, LES EXIGENCES MUNICIPALES ET TOUTE LA RÉGLEMENTATION RÉGISSANT CE TYPE DE PROJET.

TOUTES DIMENSIONS ET MESURES SONT A VÉRIFIER ET DEMEURENT LA RESPONSABILITÉ DE L'ENTREPRENEUR. TOUTES ERREURS OU OMISSIONS DEVRONT ÊTRE SIGNALÉES AVANT DE PROCÉDER AU TRAVAIL. AUCUNE DIMENSION NE DEVRA ÊTRE MESURÉE DIRECTEMENT SUR CE DESSIN.

Revisions

No.	Date	Remarques	Par
1			
2		0 8 MARS 2012	
3			
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5			
6			
7			
8			
9			

Ordre des architectes du Québec

ARCHITECTURE

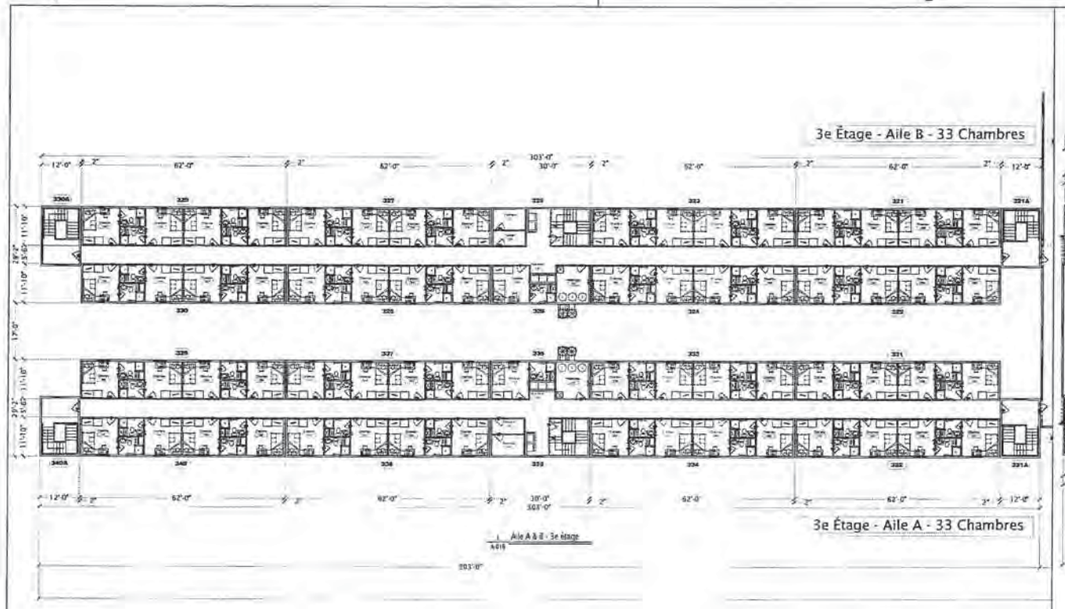
PLAN AGRANDI
CORE CENTRAL
3e ETAGE

CAO/DAO	
DESIGN	ALP SOYKANDAR
DESSIN	MATHIEU GARNEAU
VÉRIFICATION	ALP SOYKANDAR
DATE	JANVIER 2012
ÉCHELLE	1/16" = 1'-0"
No PROJET	11-556

R-1

9/42

FORMAT ISO A2



Plan agrandi
3e étage
(Ailes A & B)

Plan agrandi
3e étage
(Ailes I & J)

Plan agrandi
3e étage
(Ailes C & D)

PROJET
ARCELORMITTAL
800 chambres
Mont-Wright

Tel que construit

Référence:
RCM Modulaire

ARCHITECTE
ALP SOYKANDAR
Architecte

ENTREPRENEUR
RCM
MODULAR LIVING

TOUTES LES DIMENSIONS DEVRONT ÊTRE VÉRIFIÉES SUR PLACE AVANT LE DÉBUT DES TRAVAUX ET SONT SOUS LA SEULE RESPONSABILITÉ DE L'ENTREPRENEUR GÉNÉRAL.

TOUTES LES INFORMATIONS RELATIVES À LA STRUCTURE ET À LA CHARPENTE INDIQUÉES SUR CES DOCUMENTS DEVRONT ÊTRE VÉRIFIÉES PAR UN INGÉNIEUR EN STRUCTURE RÉGIONAL

NONOBSTANT LES INFORMATIONS DONNÉES SUR CES DOCUMENTS, TOUS LES TRAVAUX DEVRONT RENCONTRER LES EXIGENCES DU CODE DE CONSTRUCTION DU QUÉBEC, DU CNB (ÉDITION PRÉSENTE) LES EXIGENCES MUNICIPALES ET TOUTE LA RÉGLEMENTATION RÉGISSANT CE TYPE DE PROJET.

TOUTES DIMENSIONS ET MESURES SONT À VÉRIFIER ET DÉCOULENT LA RESPONSABILITÉ DE L'ENTREPRENEUR. TOUTES ERREURS OU OMISSIONS DEVRONT ÊTRE SIGNALÉES AVANT DE PROCÉDER AU TRAVAIL. AUCUNE DIMENSION NE DEVRA ÊTRE MESURÉE DIRECTEMENT SUR CE DESSIN.

Revisions

No.	Date	Remarques	Par
1		[illegible]	
2		[illegible]	
3			
4			
5			
6			
7			
8			
9			

Ordre des architectes du Québec
GUY ALP SOYKANDAR
ARCHITECTE

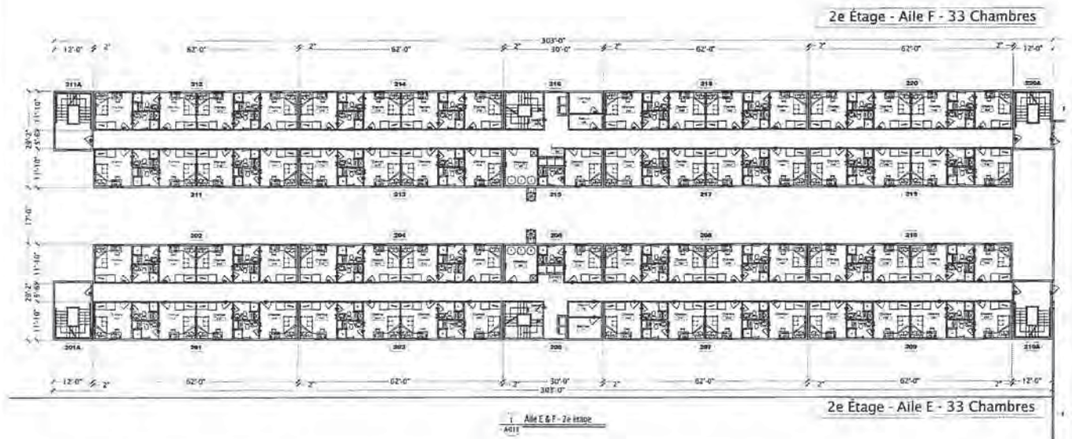
ARCHITECTURE

PLAN AGRANDI
3e ETAGE
AILE A&B
C&D
I&J

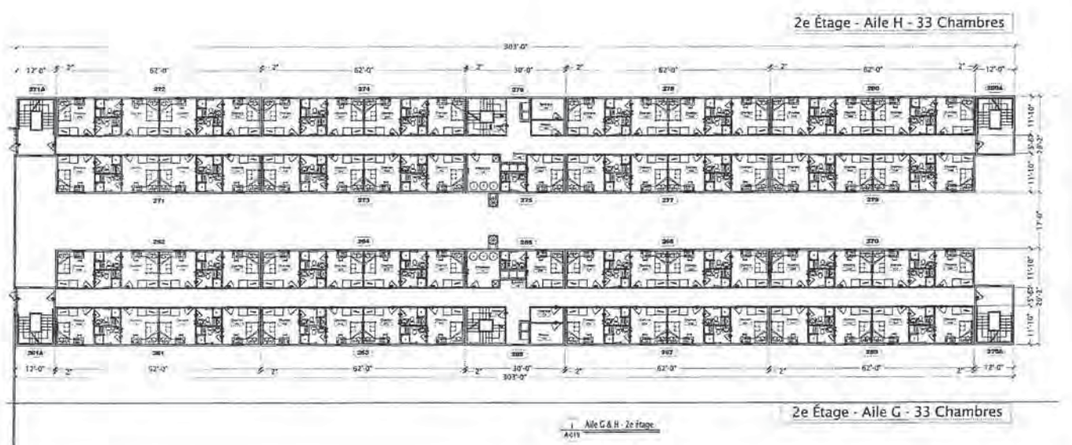
CAD/BIM	
DESSIN	ALP SOYKANDAR
DESSIN	MATHIEU GARNEAU
VÉRIFICATION	ALP SOYKANDAR
DATE	JANVIER 2012
ÉCHELLE	AUCUNE
N° PROJET	R-800

R-1

FORMAT ISO A2



Plan agrandi
2e étage
(Ailes E & F)



Plan agrandi
2e étage (Ailes G & H)
(Futur)

PROJET
ARCELORMITTAL
800 chambres
Mont-Wright

Tel que construit

Référence:
RCM Modulaire

ARCHITECTE

ALP SOYKANDAR
Architecte
121 ave. Pierre Suite 103
Vanier, (QC), G1M 1S2
Tel.: (418) 651-0014
Fax.: (418) 651-8634
www.alpdesign@hotmail.com

ENTREPRENEUR

RCM
MODULAR LIVING

TOUTES LES DIMENSIONS DEVRONT ÊTRE VÉRIFIÉES SUR PLACE AVANT LE DÉBUT DES TRAVAUX ET SONT SOUS LA SEULE RESPONSABILITÉ DE L'ENTREPRENEUR GÉNÉRAL.

TOUTES LES INFORMATIONS RELATIVES À LA STRUCTURE ET À LA CHARPENTE INDIQUÉES SUR CES DOCUMENTS DEVRONT ÊTRE VÉRIFIÉES PAR UN INGÉNIEUR EN STRUCTURE RECONNU.

NONOBSTANT LES INFORMATIONS DONNÉES SUR CES DOCUMENTS, TOUS LES TRAVAUX DEVRONT RENCONTRER LES EXIGENCES DU CODE DE CONSTRUCTION DU QUÉBEC, DU CNB EDITION 1995, LES EXIGENCES MUNICIPALES ET TOUTE LA RÉGLEMENTATION RÉGISSANT CE TYPE DE PROJET.

TOUTES DIMENSIONS ET MESURES SONT À VÉRIFIER ET DEMEURENT LA RESPONSABILITÉ DE L'ENTREPRENEUR. TOUTES ERREURS OU OMISSIONS DEVRONT ÊTRE SIGNALÉES AVANT DE PROCÉDER AU TRAVAIL. AUCUNE DIMENSION NE DEVRA ÊTRE MESURÉE DIRECTEMENT SUR CE DESSIN.

Revisions			
No.	Date	Remarque	Par
1			
2			
3		10 MARS 2012	
4			
5			
6			
7			
8			
9			

Ordre des architectes du Québec
GUY ALP SOYKANDAR

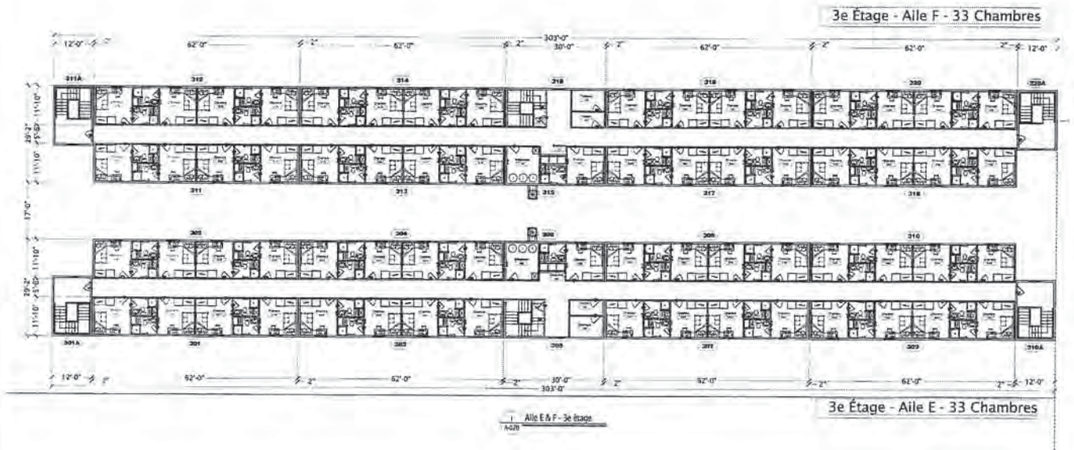
ARCHITECTURE

PLAN AGRANDI
2e ETAGE
AILE E&F
G&H(FUTUR)

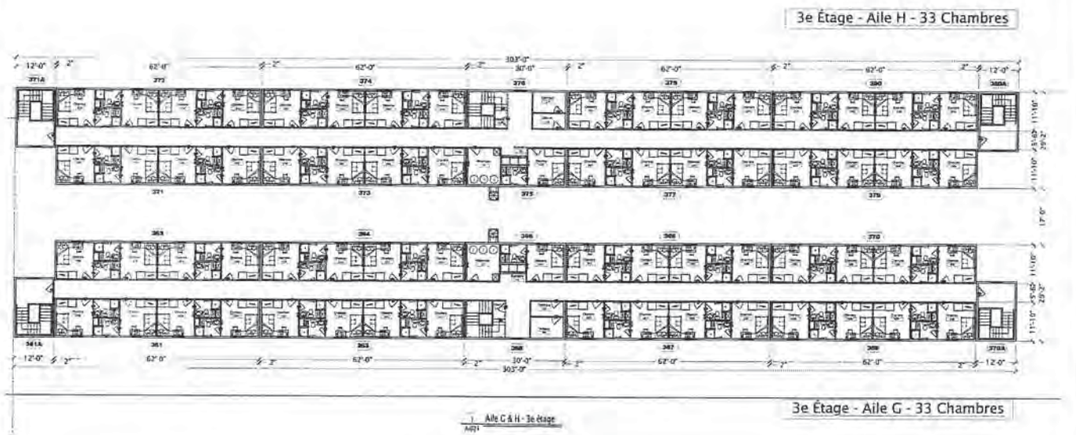
CAO/DAO	
DESIGN	ALP SOYKANDAR
DESSIN	MATHIEU GARNEAU
VÉRIFICATION	ALP SOYKANDAR
DATE	JANVIER 2012
ÉCHELLE	AUCUNE
RÉFÉRENCE	9-6556

R-1

FORMAT ISO A2



Plan agrandi
3e étage
(Alles E & F)



Plan agrandi
3e étage (Alles G & H)
(Futur)

PROJET
ARCELORMITTAL
800 chambres
Mont-Wright

Tel que construit

Référence:
RCM Modulaire

ARCHITECTE
ALP SOYKANDAR
Architecte

ENTREPRENEUR
RCM
MODULAR LIVING

TOUTES LES DIMENSIONS DEVRONT ÊTRE VÉRIFIÉES SUR PLACE AVANT LE DÉBUT DES TRAVAUX ET SONT SOUS LA SEULE RESPONSABILITÉ DE L'ENTREPRENEUR GÉNÉRAL.

TOUTES LES INFORMATIONS RELATIVES À LA STRUCTURE ET À LA CHARPENTE INDIQUÉES SUR CES DOCUMENTS DEVRONT ÊTRE VÉRIFIÉES PAR UN INGÉNIEUR EN STRUCTURE RECONNU.

NONOBSTANT LES INFORMATIONS DONNÉES SUR CES DOCUMENTS, TOUS LES TRAVAUX DEVRONT RENCONTRER LES EXIGENCES DU CODE DE CONSTRUCTION DU QUÉBEC, DU CNB ÉDITION 1995 LES EXIGENCES MUNICIPALES ET TOUTE LA RÉGLEMENTATION RÉGISSANT CE TYPE DE PROJET.

TOUTES DIMENSIONS ET MESURES SONT À VÉRIFIER ET DEMEURENT LA RESPONSABILITÉ DE L'ENTREPRENEUR. TOUTES ERREURS OU OMISSIONS DEVRONT ÊTRE SIGNALÉES AVANT DE PROCÉDER AU TRAVAIL. AUCUNE DIMENSION NE DEVRA ÊTRE MESURÉE DIRECTEMENT SUR CE DESSIN.

Révisions

No.	Date	Remarques	Par
1			
2		13 MARS 2019	
3			
4			
5			
6			
7			
8			
9			

Ordre des Architectes du Québec
ALP SOYKANDAR

ARCHITECTURE

PLAN AGRANDI
3e ETAGE
AILE E&F
G&H(FUTUR)

DESSIN	ALP SOYKANDAR
DESSIN	MATHIEU GARNEAU
VÉRIFICATION	ALP SOYKANDAR
DATE	JANVIER 2019
ÉCHELLE	AUCUNE
NO PROJET	1-1856

R-1

FORMAT ISO A2