APPENDIX C

Construction Summary Letters

Knight Piésold CONSULTING

Management System Certified By:
bsi
ISO 9001 Quality Management Systems CERTIFIED FS 64925
ISO 14001 Environmental Management CERTIFIED EMS 550121
ISO 45001 Occupational Health and Safety Management CERTIFIED OHS 550122

August 28, 2024

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Mr. Jim Patterson
Mr. Rudolf Dietrich
Deputy Project Directors - Sustaining Projects
Baffinland Iron Mines Corporation
#300 - 360 Oakville Place Drive
Oakville, Ontario L6H 6K8
Canada

Dear Jim and Rudy,

RE: Construction Summary of BG-04 Remedial Measures

1.0 INTRODUCTION

Baffinland Iron Mines Corporation (Baffinland) completed remedial works on culverts installed on fish-bearing streams along the Milne Inlet Tote Road (Tote Road) between February 18, 2024 and May 13, 2024. The completed work was based on the design presented in the Knight Piésold Ltd. (KP) Design Report "*Tote Road Permanent Crossing Plan - Round CSP Culvert Installations*", (KP, 2024a). This letter summarizes the works completed at water crossing BG-04 on May 25, 2024, shortly after the as-built survey was completed. This letter will also be appended to the As-Built Summary Report for the February to May 2024 construction season, to be issued under separate cover.

2.0 BACKGROUND

Water crossing BG-04 is located at km 94.5 on the Tote Road which connects Milne Inlet Port Site and the Mary River Mine Site. The existing water crossing at BG-04 consisted of two x 1.2 m corrugated steel pipe (CSP) culvert barrels and one x 2 m CSP culvert barrel. The proposed (remediated) design for the crossing consisted of three round CSP culverts, two x 2 m diameter low flow CSP culverts, and one x 1.8 m diameter high flow CSP culvert. The two x 2 m diameter culverts were embedded 40% of the total diameter below grade, with protruding coarse riprap mixed with finer material similar to natural stream substrate to replicate the stream bottom and create velocity refuge for fish. The 1.8 m diameter high flow culvert was installed 0.15 m above the infill elevation (top of embedment material) of the 2.0 m diameter low flow culverts.

3.0 MATERIALS USED

The following materials were used for the installation of the BG-04 remediated water crossing.

- Culvert Backfill - Culvert Backfill material consisted of 32 mm minus material that was crushed and screened at the aggregate quarry located at the Milne Inlet Port. The material was backhauled to the km 94 laydown area on the Tote Road using Baffinland's ore hauling trucks (OHTs). The 32 mm minus material was stockpiled at the km 94 laydown area for use at water crossings CV-001 and BG-04. Particle size gradations from laboratory tests show that the process material met the material specifications and as shown on Figure 1.
- Bedding Material - 3/16 inch (4.75 mm) minus material was used in limited quantities for the 2 inch (50 mm) thick uncompacted bedding material beneath the low and high flow culverts at BG-04. Similar

to the Culvert Backfill material, the Bedding Material was crushed, screened, and hauled from the aggregate quarry at Milne Inlet Port and stockpiled at the km 94 laydown area. The maximum particle size for the Bedding Material was required to be half of the depth of the culvert undulations (corrugations), which are 13 mm as per the culvert Manufacturer's specifications. Particle size gradations from laboratory tests are shown on Figure 2 and show that approximately 3% of the particles in the record sample exceeded the maximum particle size of 6.5 mm. The small quantity of slightly larger particles was considered acceptable to meet the design intent.

- Riprap - Coarse and fine riprap were crushed and screened at the Mary River Mine Site. The riprap materials were hauled to the km 94 laydown area using CAT 745 articulated haul trucks on the Tote Road.
- Local Borrow Material - This material consisted primarily of reusing excavated existing road embankment. Excavation of this material was completed by blasting the frozen material that surrounded the existing culverts.
- Non-Woven Geotextile - 4.1 mm thick Texel 160E needle punched non-woven geotextile rolls was stored at the km 94 laydown. The non-woven geotextile was installed beneath the fine riprap on the road embankment slopes and adjacent ditches according to the manufacturer's recommendations and generally as shown on the design drawings.
- Round CSP Culverts - 9 m sections of the 2 m diameter CSP for low flow round culvert and 8 m sections of the 1.8 m diameter round CSP for high flow culvert were stored at the km 94 laydown.

4.0 CONSTRUCTION SEQUENCE

Construction activities for BG-04 began on March 20, 2024 and were completed on April 25, 2024; however, it is noted that additional riprap was placed in May 2024 for additional erosion protection. The construction sequence is described below:

1. Excavation
   a. Drilling of blast holes in the frozen road embankment and underlying foundations soils were completed on March 20, 2024.
   b. The drilled holes were loaded and blasted on March 20, 2024.
   c. Excavation of blasted material commenced on March 21, 2024 and was completed on March 28, 2024. This involved the removal of unsuitable materials (frozen blast material, previous culverts), preparation of the foundation surface and as-built survey. An additional 0.6 m of ripping was required below the blasted excavation to achieve the excavation design grade.
   d. As-built survey of the BG-04 excavation was completed on March 28, 2024.
2. Backfilling and Culvert Installation
   a. Backfilling of the excavation commenced on March 28, 2024 and was completed to the base of the 2.0 m diameter culverts on March 30, 2024. Culvert Backfill material was placed and compacted in 200 and 300 mm lifts (200 mm for material compacted using the hand-guided compactor and 300 mm where the 10 ton vibratory roller was used), prior to placement and compaction of the bedding layer for the low flow culvert.
   b. The western 2 m diameter round CSP low flow culvert was installed on March 30, 2024. The 2 m diameter low flow culvert was installed using two, 9 m sections followed by one, 2.8 m cut section and then one final 9 m section for a total length of 29.8 m.

c. The eastern 2 m diameter round CSP low flow culvert was installed between March 30 and 31, 2024. The 2 m diameter low flow culvert was installed using two, 9 m sections followed by a 2.9 m cut section, and then one final 9 m section for a total length of 29.9 m.
d. The 1.8 m diameter round CSP high flow culvert was installed on April 1, 2024. The 1.8 m diameter high flow culvert was installed using two, 8 m sections followed by a cut 2.4 m section, and then one final 8 m section for a total length of 26.4 m.
e. Backfill placement around the culverts continued until April 10, 2024. This included continued placement of Culvert Backfill and local borrow area fill.
f. Borrow Area Fill (April 7, 2024 to April 8, 2024) and road topping (April 17, 2024) was placed and compacted above culvert backfill material and culverts. Baffinland made the decision to use the frozen blasted material as “local borrow area fill” above the Culvert Backfill placed directly around the culverts.
g. Coarse riprap and stream substrate material were placed within the interior of the two, 2 m diameter round CSP low flow culverts from April 2 to 21, 2024.
h. Boulder clusters using 400 mm boulders were installed every 3.5 m within the two, 2 m diameter round CSP low flow culverts for the majority of the culvert lengths from April 2 to 21, 2024.
i. Fine riprap with non-woven geotextile placed underneath was installed along the upstream and downstream 2H:1V side slopes and adjacent slope stabilization areas between April 9, 2024 and April 25, 2024.
j. Fine riprap was placed over non-woven geotextile and rock check dams were installed within the existing drainage ditches/swales between April 24 and 25, 2024.
k. Mixed coarse riprap and stream substrate material were placed and graded for the inlet and outlet aprons between April 10 and 16, 2024.
l. An as-built survey of the in-culvert boulders and boulder clusters was not completed at BG-04.
m. An as-built survey of the completed road surface was completed on approximately April 23, 2024.
n. Riprap was placed in May 2024 for additional erosion protection. An as-built survey of the additional riprap placement was completed on May 25, 2024.

5.0 AS-BUILT DETAILS

Details of the water crossing installation are shown on Drawings 745 and 746 (attached).

Select photos taken during construction are included in Appendix A.

6.0 DESIGN CHANGES AND DEVIATIONS

The following design changes and deviations were made for water crossing BG-04 during construction:

1. Boulder Clusters: Four boulder clusters were not installed within the eastern low flow culvert and one boulder cluster was not installed within the western low flow culvert due to health and safety concerns with the lifting of large rock. As per the design, boulder clusters were to be installed within the culvert at a spacing of 3.5 m as specified on Drawing 746, Rev 2.
2. On April 2, 2024 it was observed that culvert infill material placed within the two low flow culverts at BG-04 for the first 8 m of the inlet ends contained entrained ice and snow. The work was stopped following the observation. KP recommended that the non-conforming material be removed and replaced with suitable material; however, based on discussions with Baffinland it was decided that heat would be applied to the material to melt the entrained snow/ice. Following the heating process additional stream substrate material was placed on top of the culvert infill material and flushed into

the voids using a low flow stream of water. This process was continued until the void spaces were adequately filled. This remedial action was completed on April 21, 2024.

3. Baffinland chose to re-use blasted frozen material from the existing road embankment as local borrow area fill placed outside of the Culvert Backfill material area (i.e. culvert structural backfill zones). KP recommended against the use of this material as road embankment fill during the round CSP culvert installations (KP, 2024c). It is highly possible that some of the excavated frozen material contained higher than desired ice content significantly increasing the likelihood of significant settlements of the fill material following thaw, given the inability to properly compact frozen material with higher ice content.
4. Design Change 01 (No. CVDC-01, KP, 2024b) was issued on February 28, 2024 documenting the approved design change to use a finer bedding material to meet the culvert manufacturer's recommendations. The specified 25 mm minus was changed to a 3/16 inch minus material to meet the revised recommendations.

The design change documentation is included in the As-Built Summary Report for the February to May 2024 construction season.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Culvert crossing BG-04 was generally constructed in agreement with the design (KP, 2024a). However, key construction deviations included not placing boulder clusters throughout the entire length of the culvert and the use of frozen blasted material as fill within the road embankment.

KP recommends monitoring of the final road surface elevation and side slopes for signs of settlement and instability as a result of the thaw or creep settlement of frozen blast material as backfill. As communicated during construction, Baffinland should be prepared for localized thaw settlement of the road surface leading to the requirement for repairs and/or maintenance of the road crossing over the initial years of operations of the crossing. Care will need to be taken to maintain and/or repair any softer areas or areas of settlement that may develop in close proximity to the culvert installations in order to minimize potential damage to the culverts.

Additionally, KP recommends monitoring the water crossing remediation in its entirety for signs of sloughing, erosion, or other potential issues. It is understood that this monitoring will be completed as part of the post-construction monitoring plan to be implemented by Baffinland.

8.0 REFERENCES

Knight Piésold Ltd. (KP), 2024a. *Tote Road Permanent Crossing Plan - Round CSP Culvert Installations.* February 8. North Bay, Ontario. Ref. No. NB102-181/77-4, Rev 2.

Knight Piésold Ltd. (KP), 2024b. Design Change (CVDC-01). Design Change 01 - Culvert Bedding Material to: Baruck Wile and Rudolf Dietrich, Baffinland Iron Mines Corporation. Re: *Culvert Bedding Design Change.* February 26. Ref. No. 11.

Knight Piésold Ltd. (KP), 2024c. Memorandum to: Michael Burns and Rudolf Dietrich, Baffinland Iron Mines Corporation. Re: *Permanent Crossing Plan - Round CSP Culverts, Response to Baffinland Request for Information (RFI) No. 1.* March 8. North Bay, Ontario. Ref No. NB24-00286 (NB102-181/93).

Knight Piésold CONSULTING

Yours truly,
Knight Piésold Ltd.

REGISTERED PROFESSIONAL ENGINEER
G.M. JOHNSTONE
LICENSEE
2024-08-28
NT/NU

Prepared: _____
Greg Johnstone, P.Eng., CPESC
Project Engineer

Reviewed: _____
C. A. (Andy) Phillips, P.Eng.
Senior Engineer

Approval that this document adheres to the Knight Piésold Quality System: _____

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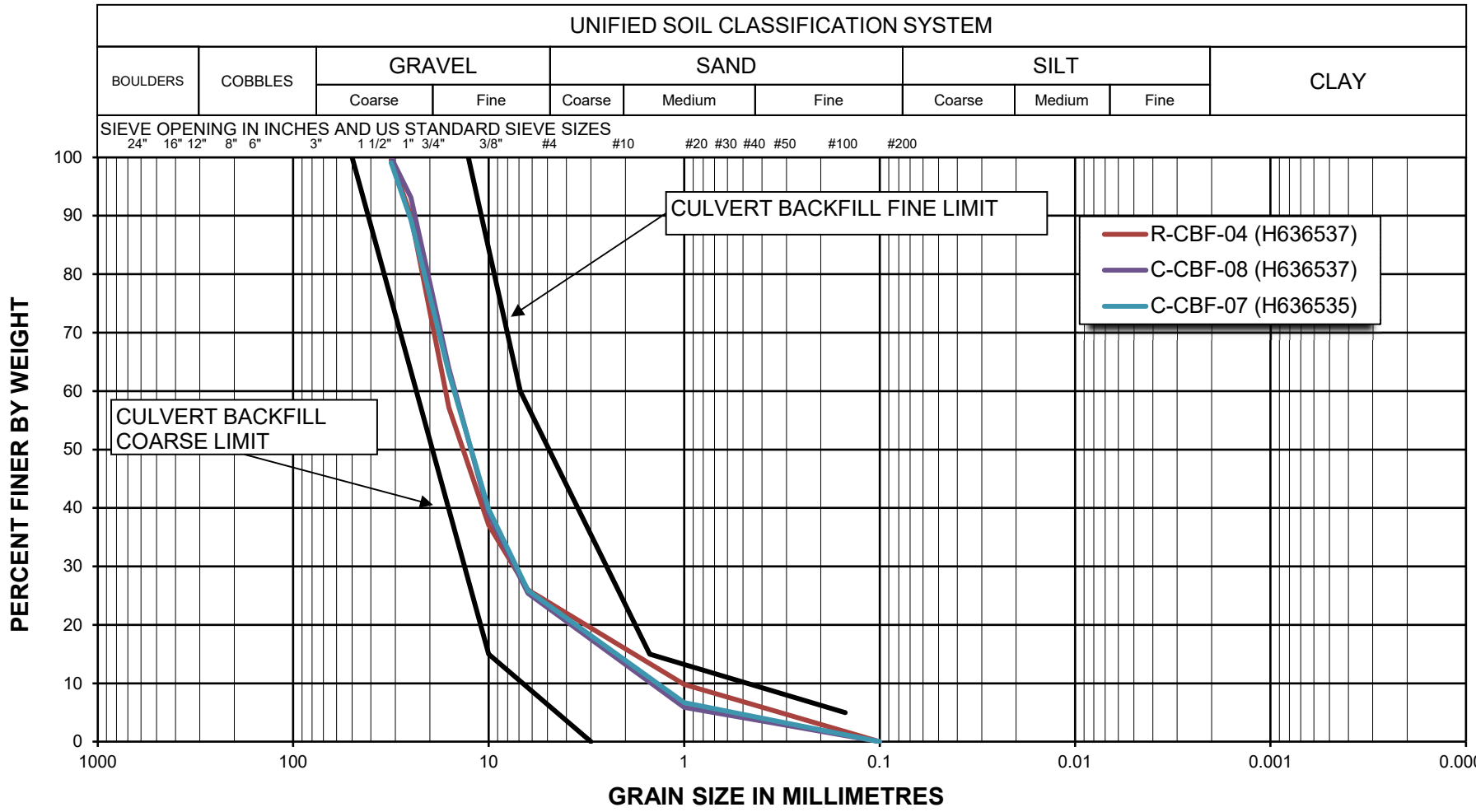
KNIGHT PIESOLD LTD.
Signature _____
Date 2024-08-28
PERMIT NUMBER: P 547
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

Attachments:

Figure 1 Rev 0	Grain Size Distribution - Culvert Backfill - BG-04
Figure 2 Rev 0	Grain Size Distribution - Culvert Bedding (3/16 Inch Minus) - BG-04
Drawing 745 Rev 3	BG-04 General Arrangement
Drawing 746 Rev 3	BG-04 Plan and Section
Appendix A	BG-04 As-Built Photo Log

Copy To:
Michael Burns, Baffinland Iron Mines Corporation
Jocelyn Larocque, Baffinland Iron Mines Corporation
George Liston, Baffinland Iron Mines Corporation
Connor Devereaux, Baffinland Iron Mines Corporation
Todd Swenson, Baffinland Iron Mines Corporation
Pat Smith, Baffinland Iron Mines Corporation
Shannon Mulhall, Baffinland Iron Mines Corporation

/gj



NOTES:

1. CONTROL TESTS (C) CARRIED OUT ON FILL MATERIALS SAMPLED FROM THE BORROW AREA AND STOCKPILE, PRIOR TO MATERIAL COMPACTION.
2. RECORD TESTS (R) CARRIED OUT ON PLACED AND COMPACTED FILL MATERIALS.

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	28AUG'24	ISSUED WITH LETTER NB24-00487	GMJ	CAP

BAFFINLAND IRON MINES CORPORATION

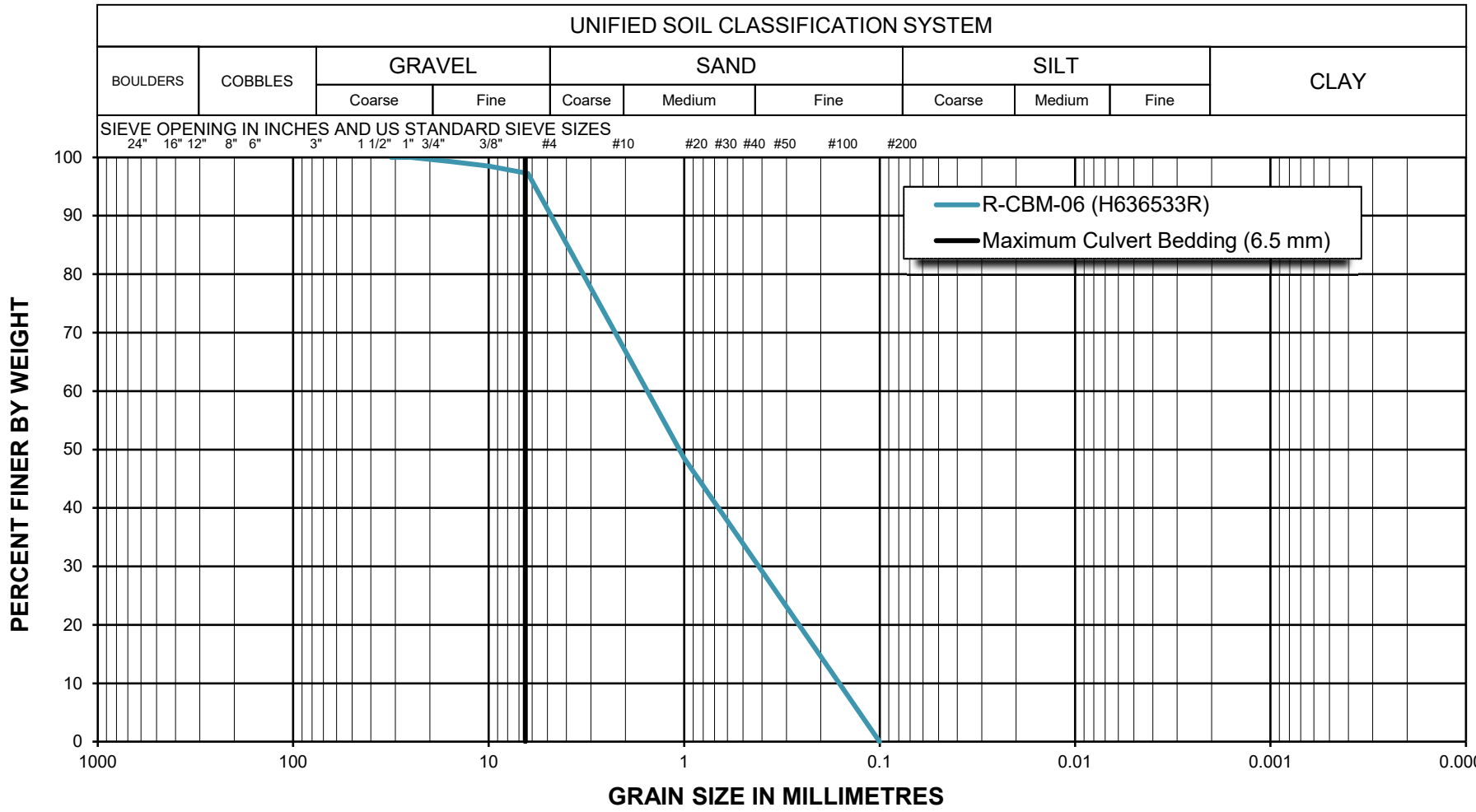
MARY RIVER PROJECT

GRAIN SIZE DISTRIBUTION
CULVERT BACKFILL - BG-04

Knight Piésold CONSULTING

P/A NO.	REF. NO.
NB102-00181/93	NB24-00487

FIGURE 1 REV 0



NOTES:

1. CONTROL TESTS (C) CARRIED OUT ON FILL MATERIALS SAMPLED FROM THE BORROW AREA AND STOCKPILE, PRIOR TO MATERIAL COMPACTION.
2. RECORD TESTS (R) CARRIED OUT ON PLACED AND COMPACTED FILL MATERIALS.

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

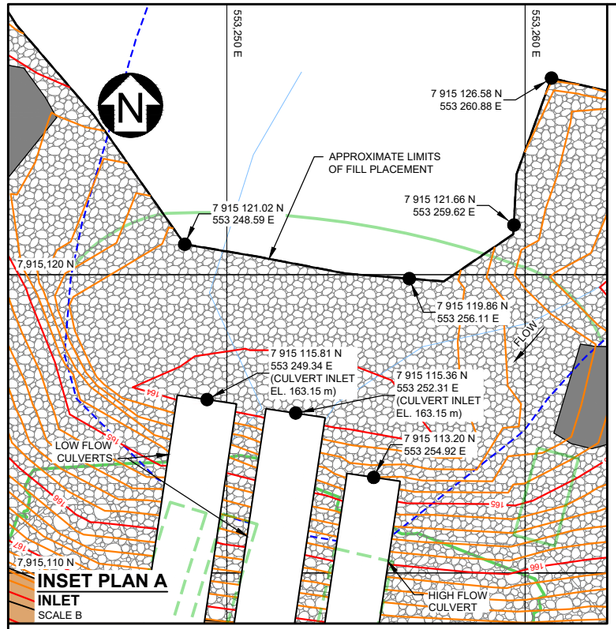
GRAIN SIZE DISTRIBUTION
CULVERT BEDDING (3/16 INCH MINUS) - BG-04

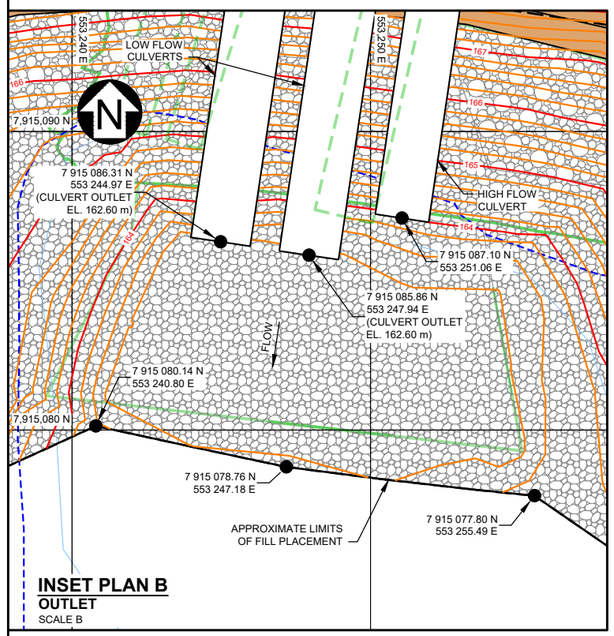
Knight Piésold CONSULTING

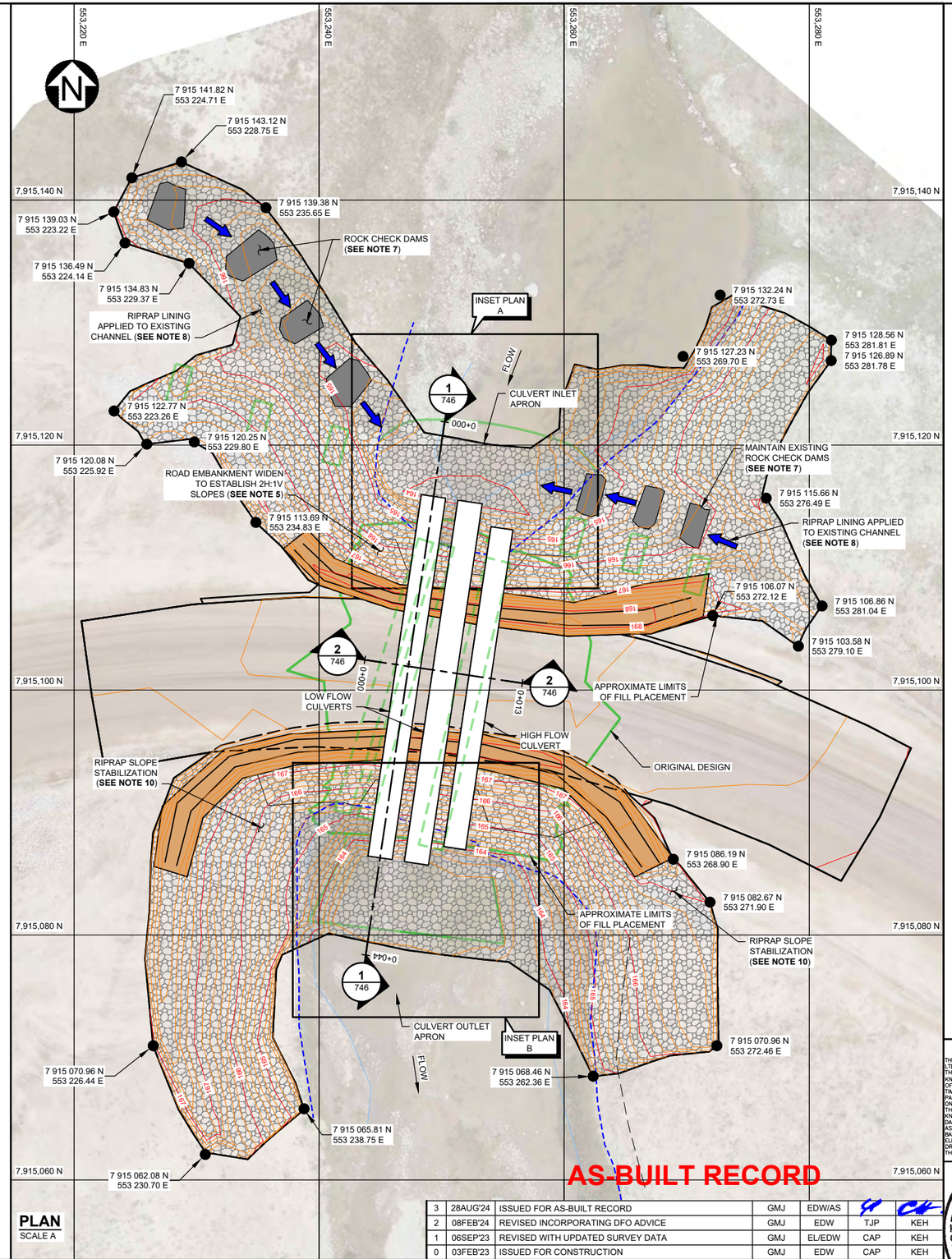
P/A NO.	REF. NO.
NB102-00181/93	NB24-00487

FIGURE 2 REV 0

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	28AUG'24	ISSUED WITH LETTER NB24-00487	GMJ	CAP







AS-BUILT RECORD

LEGEND:

- COARSE RIPRAP
- FINE RIPRAP
- SAFETY BERM
- CONTOUR
- ROCK CHECK DAM
- PREVIOUS CULVERT CONFIGURATION
- ORIGINAL DESIGN LINEWORK
- APPROXIMATE LIMITS OF FILL PLACEMENT
- APPROXIMATE HIGH WATER MARK (HWM)
- SURVEYED WETTED WIDTH
- RIPRAP LINED EXISTING CHANNEL
- AS-BUILT SURVEY POINT
- RIPRAP FOR BANK ARMOURING AND FIELD FIT CHANNEL OUTLET
- BOULDER LOCATION WITHIN CULVERT

NOTES:

1. COORDINATE GRID IS UTM NAD83, ZONE 17.
2. DRONE IMAGERY PROVIDED BY KITIKMEOT CHALLENGER, AUGUST 2023. CULVERT BG-04 AS-BUILT SURVEYS PROVIDED BY NUNA, APRIL 30 AND MAY 25, 2024. CONTOUR INTERVAL IS 0.2 m.
3. DIMENSION AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
4. ALL WORK WAS COMPLETED DURING FROZEN CONDITIONS.
5. ROAD EMBANKMENT FILL PLACEMENT TO ESTABLISH ROAD SIDE SLOPES AT MIN. 2H:1V. ALL SLOPES WERE STABILIZED WITH FINE RIPRAP OVERLYING NON-WOVEN GEOTEXTILE AS SHOWN ON **DRAWING 746 (SECTION 1)**.
6. MATERIAL SPECIFICATIONS INCLUDED ON **DRAWING 703**.
7. ROCK CHECK DAMS CONSTRUCTED OF FINE RIPRAP FREE OF FINE AND DELETERIOUS MATERIALS. CONSTRUCTED IN A STABLE MANNER TO REDUCE RUNOFF WATER FLOW VELOCITIES AND PROMOTE SETTLING OF SUSPENDED PARTICLES. PERIODIC MAINTENANCE WILL BE REQUIRED TO REMOVE ACCUMULATED SEDIMENT.
8. EXISTING DRAINAGE CHANNEL LINED WITH FINE RIPRAP OVERLAYING NON-WOVEN GEOTEXTILE. DITCH GEOMETRY FIELD FIT TO PROMOTE POSITIVE DRAINAGE.
9. EROSION AND SEDIMENT CONTROL MEASURES INCLUDED ARE LIMITED TO THE WATER CROSSING AND THE IMMEDIATE SURROUNDING AREA.
10. SLOPE STABILIZED WITH FINE RIPRAP OVERLYING NON-WOVEN GEOTEXTILE.

SCALE A: 4 2 0 4 8 12 16 20 m

SCALE B: 2 1 0 2 4 6 8 10 m

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Date 2024-08-28
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REFERENCE DRAWINGS	
703	CULVERT FILL MATERIALS AND GEOSYNTHETICS SPECIFICATIONS
746	ROUND CSP CULVERTS - BG-04 PLAN AND SECTION
DRG. NO.	DESCRIPTION

REVISIONS						
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

REVISIONS						
3	28AUG'24	ISSUED FOR AS-BUILT RECORD	GMJ	EDW/AS		
2	08FEB'24	REVISED INCORPORATING DFO ADVICE	GMJ	EDW	TJP	KEH
1	06SEP'23	REVISED WITH UPDATED SURVEY DATA	GMJ	EL/EDW	CAP	KEH
0	03FEB'23	ISSUED FOR CONSTRUCTION	GMJ	EDW	CAP	KEH
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

REGISTERED PROFESSIONAL ENGINEER
G.M. JOHNSTONE
LICENSEE
2024-08-28
NT/NU

Knight Piésold CONSULTING

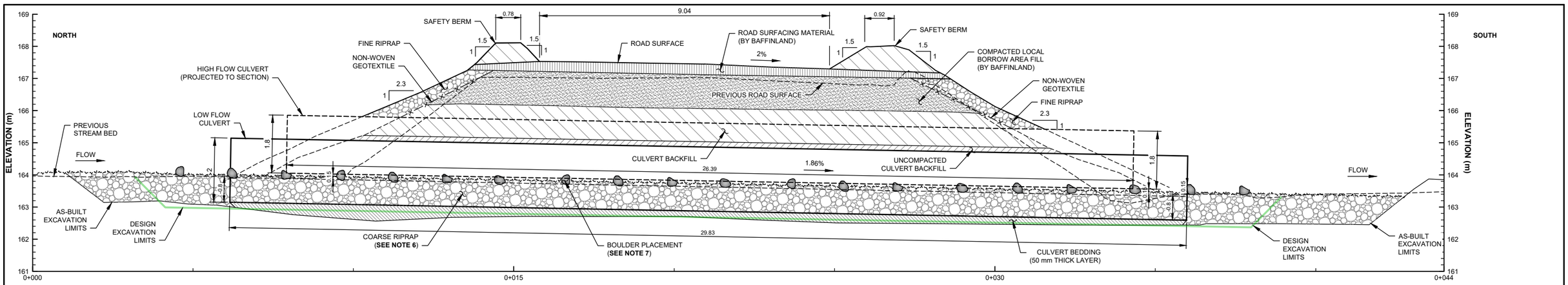
BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

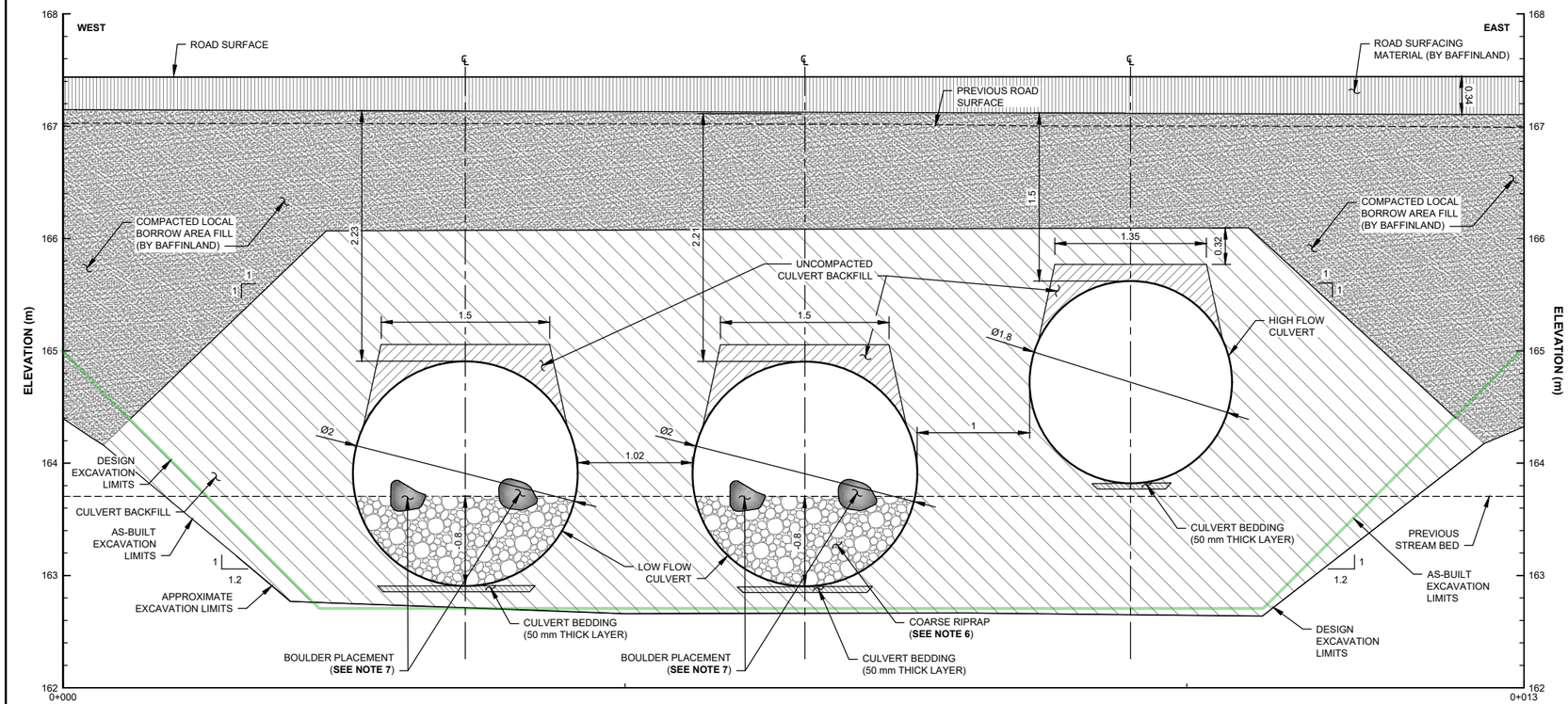
PERMANENT CROSSING PLAN
ROUND CSP CULVERTS - BG-04
GENERAL ARRANGEMENT

P/A NO.	DRAWING NO.	REVISION
NB102-181/93	745	3

SAVED: I:\1\02\00181\177\A\Acad\DWGS\745 746\745 746 R3, 8/28/2024 9:18:05 AM, EWARDELL PRINTED: 8/28/2024 9:28:21 AM, 745, EWARDELL ACAD VERSION: 25.0S (LMS TECH)



1/745 **SECTION**
BG-04 PROFILE
SCALE A



2/745 **SECTION**
BG-04 INSTALLATION DETAILS
SCALE B

SCALE A 1.2 0.6 0 2 4 6 m

SCALE B 0.5 0.25 0 0.5 1.0 1.5 2.0 2.5 m

LEGEND:

- COMPACTED LOCAL BORROW AREA FILL (BY BAFFINLAND)
- UNCOMPACTED CULVERT BACKFILL
- CULVERT BACKFILL
- ROAD SURFACING MATERIAL (BY BAFFINLAND)
- COARSE RIPRAP
- FINE RIPRAP
- CULVERT BEDDING MATERIAL
- DESIGN LINEWORK
- EXISTING STREAM BED
- NON-WOVEN GEOTEXTILE
- BOULDER PLACEMENT

NOTES:

1. CULVERT SURVEYS AND DRONE IMAGERY PROVIDED BY KITIKMEOT CHALLENGER, AUGUST 2023.
2. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
3. VEHICLE SAFETY BERMS ARE REQUIRED IN AREAS WITH A DROP OFF GREATER THAN 3.0 m.
4. MATERIAL SPECIFICATIONS INCLUDED ON **DRAWING 703**.
5. CULVERT INFILL MATERIAL TO BE INSPECTED DURING AND AFTER FIRST FRESHET FOLLOWING CONSTRUCTION TO DETERMINE IF ADDITIONAL MATERIAL IS REQUIRED.
6. RIPRAP INTERSTITIAL SPACE ON THE CHANNEL BED FILLED WITH MATERIAL SIMILAR TO THE ADJACENT CHANNEL BED MATERIAL (OR OTHER MATERIAL APPROVED BY THE ENGINEER). THE VOID SPACE MINIMIZED BETWEEN COARSE RIPRAP SUCH THAT CREEK FLOWS ARE MAINTAINED ABOVE THE CHANNEL BED DURING LOW-FLOW CONDITIONS. FINISHED SURFACE ROUGHENED TO MIMIC ADJACENT STREAM BED CONDITIONS.
7. IN-CULVERT AS-BUILT SURVEY NOT COMPLETED.

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AS-BUILT RECORD

DRG. NO.	DESCRIPTION
703	CULVERT FILL MATERIALS AND GEOSYNTHETICS SPECIFICATIONS
745	ROUND CSP CULVERTS - BG-04 GENERAL ARRANGEMENT

REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

REVISIONS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
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REVISIONS

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Knight Piésold CONSULTING

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

PERMANENT CROSSING PLAN
ROUND CSP CULVERTS - BG-04
PLAN AND SECTION

PROJECT NO.	DRAWING NO.	REVISION
NB102-181/93	746	3

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APPENDIX A

BG-04 As-Built Photo Log

(Pages A-1 to A-16)

BG-04 AS-BUILT PHOTO LOG

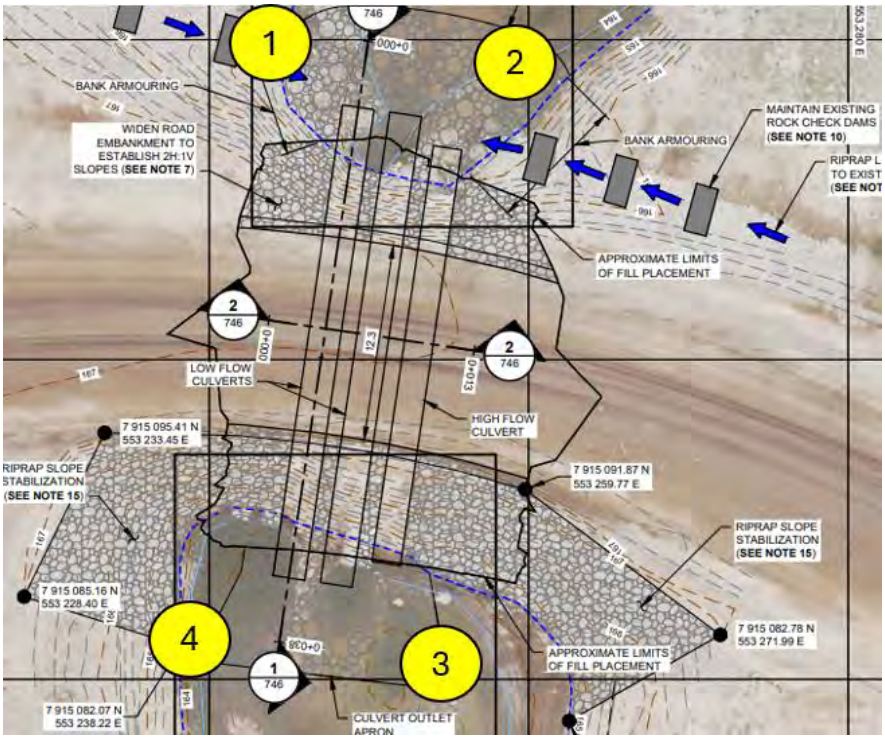

PHOTO 1. Culvert Crossing BG-04 - Photographic Vantage Points (Approximate Locations, Indicated with Yellow Circles).

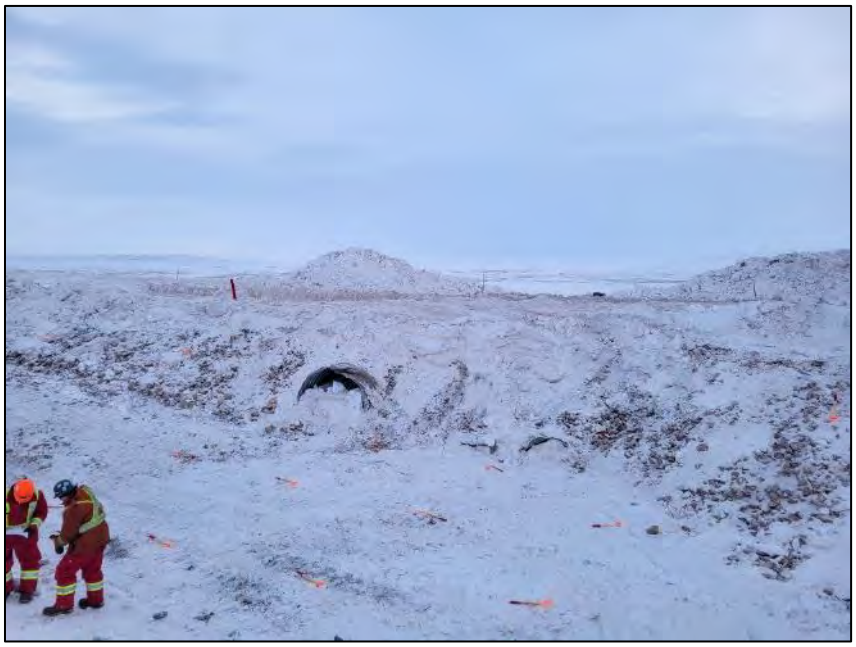

PHOTO 2. Prior to Construction - Vantage Point 1 - Upstream Inlet and Road Crossing - Looking North (March 01, 2024).

PHOTO 3. Prior to Construction - Vantage Point 2 - Upstream Inlet and Road Crossing - Looking West (March 01, 2024).

PHOTO 4. Prior to Construction - Vantage Point 3 - Downstream Outlet and Road Crossing - Looking Northwest (March 01, 2024).

PHOTO 5. Prior to Construction - Vantage Point 4 - Downstream Outlet and Road Crossing - Looking East (March 01, 2024).

PHOTO 6. During Construction - Vantage Point 4 - Excavation of Blasted Material on Road Crossing - Looking Northeast (March 25, 2024).

PHOTO 7. During Construction - Vantage Point 3 - Excavation of Blasted Material in Upstream Inlet and Road Crossing - Looking South (March 25, 2024).

PHOTO 8. During Construction - Vantage Point 4 - Preparation of Foundation Surface Under Road Crossing and Upstream Inlet - Looking Northeast (March 27, 2024).

PHOTO 9. During Construction - Vantage Point 2 - Preparation of Foundation Surface Under Road Crossing and Inlet and Outlet - Looking Southwest (March 28, 2024).

PHOTO 10. During Construction - Vantage Point 3 - Placement of Culvert Backfill Material Under Road Crossing and Downstream Outlet - Looking Northwest (March 28, 2024).

PHOTO 11. During Construction - Vantage Point 3 - Compaction of Culvert Backfill Material Under Road Crossing and Upstream Inlet - Looking North (March 29, 2024).

PHOTO 12. During Construction - Vantage Point 4 - Placement of 2.0 m Diameter Corrugated Steel Low Flow Culverts - Looking Northeast (March 30, 2024).

PHOTO 13. During Construction - Vantage Point 4 - Compaction of Culvert Backfill Under Road Crossing Around Low Flow Culverts - Looking North (March 31, 2024).

PHOTO 14. During Construction - Vantage Point 4 - Placement of 1.8 m Diameter Corrugated Steel High Flow Culvert - Looking South (April 01, 2024).

PHOTO 15. During Construction - Vantage Point 3 - Compaction of Culvert Backfill Material Around High Flow Culvert - Looking Northwest (April 01, 2024).

PHOTO 16. During Construction - Placement of Coarse Riprap and Stream Substrate Material in Low Flow Culverts - Looking North (April 03, 2024).

PHOTO 17. During Construction - Placement of Boulder Clusters in Low Flow Culverts - Looking North (April 03, 2024).

PHOTO 18. During Construction - Placement of Coarse Riprap and Stream Substrate Material in Low Flow Culverts - Looking North (April 06, 2024).

PHOTO 19. During Construction - Vantage Point 4 - Grading of Side Slopes - Looking Northeast (April 08, 2024).

PHOTO 20. During Construction - Vantage Point 4 - Completed Downstream Outlet and Slope Stabilization - Looking Southeast (April 11, 2024).

PHOTO 21. During Construction - Vantage Point 2 - Placement of Coarse Riprap and Stream Substrate Material in Upstream Inlet - Looking West (April 11, 2024).

PHOTO 22. Following Construction - Vantage Point 1 - Upstream Inlet and Road Crossing - Looking Southeast (May 15, 2024).

PHOTO 23. Following Construction - Vantage Point 2 - Upstream Inlet and Road Crossing - Looking West (May 15, 2024).

PHOTO 24. Following Construction - Vantage Point 3 - Downstream Outlet and Road Crossing - Looking West (May 15, 2024).

PHOTO 25. Material Stockpile - Fine Riprap - km 94 Laydown - Looking Southeast (April 09, 2024).

PHOTO 26. Material Stockpile - Coarse Riprap - km 94 Laydown - Looking Southwest (April 03, 2024).

PHOTO 27. Material Stockpile - Culvert Backfill - km 94 Laydown - Looking South (March 31, 2024).

PHOTO 28. Equipment - Mikasa MVH408 1000 lb Plate Compactor - km 60 Laydown (March 05, 2024).

PHOTO 29. Equipment - CAT 745C articulated dump truck - km 60 Laydown (April 09, 2024).

PHOTO 30. Equipment - CAT 374F Excavator - km 94 Laydown - Looking East (April 08, 2024).

PHOTO 31. Equipment - Ducar Motorized Wheelbarrow loaded with Coarse Riprap - CV-059 (April 04, 2024).

PHOTO 32. Equipment - CAT CS56B Smooth Drum Compactor (March 02, 2024).

Knight Piésold CONSULTING

Management System Certified By:
bsi
ISO 9001 Quality Management Systems CERTIFIED FS 64925
ISO 14001 Environmental Management CERTIFIED EMS 550121
ISO 45001 Occupational Health and Safety Management CERTIFIED OHS 550122

August 27, 2024

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Mr. Jim Patterson
Mr. Rudolf Dietrich
Deputy Project Directors - Sustaining Projects
Baffinland Iron Mines Corporation
#300 - 360 Oakville Place Drive
Oakville, Ontario L6H 6K8
Canada

Dear Jim and Rudy,

RE: Construction Summary of CV-216 Remedial Measures

1.0 INTRODUCTION

Baffinland Iron Mines Corporation (Baffinland) completed remedial works on culverts installed on fish-bearing streams along the Milne Inlet Tote Road (Tote Road) between February 18, 2024 and May 13, 2024. The completed work was based on the design presented in the Knight Piésold Ltd. (KP) Design Report "*Tote Road Permanent Crossing Plan - Round CSP Culvert Installations*", (KP, 2024a). This letter summarizes the work completed at water crossing CV-216 on May 24, 2024, shortly after the as-built survey was completed. There has been settlement at the culvert since this work was completed, and additional remediation measures are being evaluated. This letter will also be appended to the As-Built Summary Report for the February to May 2024 construction season, to be issued under separate cover.

2.0 BACKGROUND

Water crossing CV-216 is located at km 80.5 on the Tote Road which connects the Milne Inlet Port Site and the Mary River Mine Site. The existing crossing at CV-216 consisted of three x 1.2 m culvert barrels. The proposed (remediated) design for the crossing consisted of five round CSP culverts including three x 2 m diameter low flow CSP culverts and two x 1.8 m diameter high flow CSP culverts. The 2 m diameter low flow culverts were embedded 40% of the total diameter below grade, with protruding coarse riprap mixed with material similar to natural stream substrate to replicate the stream bottom and create velocity refuge for fish. The 1.8 m diameter high flow culverts were to be installed 0.15 m above the infill elevation (top of embedment material) of the 2 m diameter low flow culverts.

3.0 MATERIALS USED

The following materials were used for the installation of the CV-216 remediated water crossing.

- Culvert Backfill - Culvert Backfill material consisted of 32 mm minus material that was crushed and screened at the aggregate quarry located at the Milne Inlet Port. The material was backhauled to the km 80 laydown area on the Tote Road using Baffinland's ore hauling trucks (OHTs). Particle size gradations from laboratory tests show that the processed material met the material specifications, as shown on Figure 1.

- Bedding Material - 3/16 inch (4.75 mm) minus material was used in limited quantities for the 2 inch (50 mm) thick uncompacted bedding material beneath the low and high flow culverts. Similar to the 32 mm minus material, the 3/16 inch minus material was crushed, screened, and hauled from the aggregate quarry at Milne Inlet Port and stockpiled at the km 80 laydown area. The maximum particle size for the Bedding Material was required to be half of the depth of the culvert undulations (corrugations), which are 13 mm as per the Manufacturer's Specifications. Particle size gradations from laboratory tests are shown on Figure 2 and show that approximately 7% of the particles in the record samples exceeded the maximum particle size of 6.5 mm. This small quantity of slightly larger particles was considered acceptable to meet the design intent.
- Riprap - Coarse and fine riprap were crushed and screened at the Mary River Mine Site. The riprap materials were hauled to the km 80 laydown area using CAT 745 articulated haul trucks on the Tote Road.
- Local Borrow Material - This material consisted primarily of reusing excavated material from the existing road embankment. Excavation of this material was completed by blasting the frozen material surrounding the existing culverts.
- Non-Woven Geotextile - 4.1 mm thick Texel 160E needle punched non-woven geotextile rolls were stored at the km 80 laydown. The non-woven geotextile was installed beneath the fine riprap on the road embankment slopes and within the inlet and outlet key-in trench according to the manufacturer's recommendations and generally as shown on the design drawings.
- HDPE Geomembrane - 60 mm thick Layfield EL6060 HDPE geomembrane was stored at the km 80 laydown. The HDPE geomembrane was installed between two layers of non-woven geotextile within the inlet and outlet key-in trench.
- Insulation - 50 mm thick Styrofoam™ Highload 60 Extruded Polystyrene Insulation was stored at the km 80 laydown. Two layers of insulation (total thickness of 100 mm) was installed across the foundation beneath the culverts.
- Round CSP Culverts - 9 m sections of 2 m diameter round CSP low flow culvert, and 8 m sections of 1.8 m diameter round CSP high flow culvert were stored at the km 80 laydown.

4.0 CONSTRUCTION SEQUENCE

The construction activities for CV-216 began on April 9, 2024 and were completed on May 8, 2024. The construction sequence is described below.

1. Excavation
   a. Drilling of blast holes in the frozen road embankment and underlying foundations soils was completed on April 9, 2024.
   b. The drilled holes were loaded and blasted on April 9, 2024.
   c. The excavation of blast material commenced on April 12, 2024 and was completed on April 21, 2024. This involved the removal of unsuitable materials (frozen blast material, previous culverts), preparation of the foundation surface, and as-built survey. Massive ice was encountered during the excavation of the blasted materials. A design change was issued as a result of encountering the massive ice (KP, 2024d, 2024e).
   d. As-built survey of CV-216 excavation was completed April 21, 2024.

2. Backfilling and Culvert Installation
    a. Backfilling of the excavation commenced on April 21, 2024 and was completed to the base of the 2 m culverts on April 22, 2024. Culvert Backfill material was placed and compacted in 200 and 300 mm lifts (200 mm for material compacted using the hand-guided compactor and 300 mm where the 10 ton vibratory roller was used) prior to placement and compaction of the bedding layer for the 2 m low flow culvert.
    b. Key-in trenches consisting of a geomembrane between two geotextile cushion layers backfilled with ¾ inch minus material were installed beneath the inlet and outlet of the low flow culverts between April 19, 2024 and April 24, 2024.
    c. Two layers of Styrofroam™ Highload 60 extruded polystyrene insulation (total thickness of 0.1 m) were placed beneath the low flow culverts between April 21, 2024, and April 24, 2024. A 200 mm thick lift of Culvert Backfill material was placed on top of the insulation and compacted with one pass of the hand guided plate compactor.
    d. Three x 2 m diameter round CSP low flow culverts were installed between April 22, 2024 and April 24, 2024. The 2 m diameter low flow culverts were installed using two 9 m sections followed by one 3.1 m cut section and then one final 9 m section for a total length of 30.1 m.
    e. The southern 1.8 m diameter round CSP high flow culvert was installed on April 25, 2024. The 1.8 m diameter high flow culvert was installed using two 8 m sections followed by a cut 3.1 m section and then one final 8 m section for a total length of 27.1 m.
    f. The northern 1.8 m diameter round CSP high flow culvert was installed on April 26, 2024. The 1.8 m diameter high flow culvert was installed using two 8 m sections followed by a cut 3.1 m section and then one final 8 m section for a total length of 27.1 m.
    g. Backfilling around the culverts continued until May 4, 2024. This included continued placement of culvert backfill and local borrow area fill.
    h. Local Borrow Area Fill (April 26, 2024 to April 29, 2024) and road topping (May 4, 2024) was placed and compacted above culvert backfill material and culverts.
    i. Coarse riprap and stream substrate or 3/16 inch minus material was placed within the interior of the three 2 m diameter round CSP low flow culverts from April 28, 2024 to May 3, 2024.
    j. Boulder clusters using minimum 500 mm boulders were installed every 6.5 m within the three 2 m diameter round CSP low flow culverts from April 28, 2024 to May 3, 2024.
    k. Fine riprap placed over non-woven geotextile was installed along the upstream and downstream 2H:1V side slopes between April 30, 2024 and May 4, 2024.
    l. Fine riprap placed over non-woven geotextile and rock check dams was installed within the existing drainage ditches/swales between April 30, 2024 and May 3, 2024.
    m. Mixed coarse riprap and stream substrate material was placed and graded for the inlet and outlet aprons between May 2, 2024 and May 5, 2024.
    n. An as-built survey of the in-culvert boulders and boulder clusters was not completed at CV-216.
    o. An as-built survey of the completed road surface was completed on May 8, 2024.

5.0 AS-BUILT DETAILS

Details of the water crossing installation are shown on Drawings 735 and 736 attached to this letter. Select photos taken during the construction are included in Appendix A.

6.0 DESIGN CHANGES AND DEVIATIONS

The following design changes and deviations were made for water crossing CV-216 during construction.

1. Baffinland chose to re-use the blasted frozen material from the existing road embankment as local borrow area fill outside of the 32 mm minus culvert backfill area (i.e. culvert structural backfill zones). KP recommended against the use of frozen blasted material as local borrow area fill during the construction of CV-216 (KP, 2024c). It is highly possible that some of the excavated frozen material contained higher than desired ice content significantly increasing the likelihood of significant settlement of the fill material following thaw, given the inability to properly compact frozen material with higher ice content.
2. Design Change 01 (No. CVDC-01, KP, 2024b) was issued on February 28, 2024, documenting the approved design change to use a finer bedding material to meet the culvert manufacturer's recommendations. The specified 25 mm minus was changed to a 3/16 inch minus to meet the revised recommendations.
3. On April 17, 2024, due to the discovery of massive ice within the excavation at CV-216, KP issued a design change memorandum to Baffinland to account for the encountered massive ice (KP, 2024d). Following the issuance of this memorandum KP responded to RFI 14 on April 18, 2024, which included additional details (KP, 2024e). The design change consisted of over-excavating the massive ice below the culvert and within the inlet and outlet aprons, the addition of 0.1 m (two layers) of Styrofoam™ Highload 60 Extruded Polystyrene insulation, and the construction of a geomembrane key in trench at both the inlet and outlet of the low flow culverts consisting of geomembrane between two cushion layers of geotextile backfilled with 3/4 inch minus material. The purpose of this design change was to incorporate additional thermal safeguards at the culvert inlets and outlets, as well as within the foundation below the culverts to reduce the potential for thawing of the massive ice. No assurance against potential thawing-related issues was provided by KP, who advised Baffinland that KP would accept no responsibility for any settlement, slumping, damage or structural issues arising from culvert installations on massive ice or ice rich soils.

The design change documentation is included in the As-Built Summary Report for the February to May 2024 construction season.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Culvert crossing CV-216 was generally constructed in agreement with the design (KP, 2024a). However, a key construction deviation consisted of using frozen blasted material as local borrow area fill. In addition, massive ice was encountered below the culverts and this material was not removed.

Following completion of the installation, settlement of the culverts was observed along the culvert crossing alignment on approximately July 21, 2024. This change of condition and planned remediation measures will be documented under separate cover.

KP recommends monitoring of the final road surface elevation and side slopes for signs of settlement and instability as a result of the use of frozen blast material as backfill, and the encountered massive ice within the foundation and completion of the construction during the warmer temperatures near the end of the winter season. As communicated during construction, Baffinland should be prepared for localized thaw settlement of the road surface leading to the requirement for repair/maintenance over the initial years of operations of the crossing. Care will need to be taken to maintain and/or repair any softer areas or areas

of settlement that may develop in close proximity to the culvert installations in order to minimize potential damage to the culverts.

Additionally, KP recommends monitoring the water crossing remediation in its entirety for signs of sloughing, erosion, or other potential issues. It is understood that this monitoring will be completed as part of the post-construction monitoring plan to be implemented by Baffinland.

8.0 REFERENCES

Knight Piésold Ltd. (KP), 2024a. *Tote Road Permanent Crossing Plan - Round CSP Culvert Installations*. February 8. North Bay, ON. Ref. No. NB102-181/77-4, Rev 2.

Knight Piésold Ltd. (KP). 2024b. Design Change (CVDC-01) to: Baruck Wile and Rudolf Dietrich, Baffinland Iron Mines Corporation. Re: *Culvert Bedding Design Change.* February 26.

Knight Piésold Ltd. (KP). 2024c. Memorandum to: Michael Burns and Rudolf Dietrich, Baffinland Iron Mines Corporation. Re: *Permanent Crossing Plan - Round CSP Culverts, Response to Baffinland Request for Information (RFI) No. 1.* March 8. North Bay, Ontario. Ref No. NB24-00286 (NB102-181/93).

Knight Piésold Ltd. (KP). 2024d. Memorandum to: Jim Patterson, Baffinland Iron Mines Corporation. Re: *CV-216 Design Change due to Massive Ice.* April 17. North Bay, Ontario. Ref No. NB24-00434 (NB102-181/93).

Knight Piésold Ltd. (KP). 2024e. Memorandum to: Baruck Wile and Rudolf Dietrich, Baffinland Iron Mines Corporation. Re: *Permanent Crossing Plan - Round CSP Culverts, Response to Request for Information (RFI) No. 014.* April 18. North Bay, Ontario. Ref No. NB24-00434 (NB102-181/93).

Yours truly,
Knight Piésold Ltd.

Prepared: Greg Johnstone

Greg Johnstone, P.Eng., CPESC
Project Engineer

Reviewed:

C. A. (Andy) Phillips, P.Eng.
Senior Engineer

REGISTERED PROFESSIONAL ENGINEER
G.M. JOHNSTONE
LICENSEE
2024-08-27
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Approval that this document adheres to the Knight Piésold Quality System:

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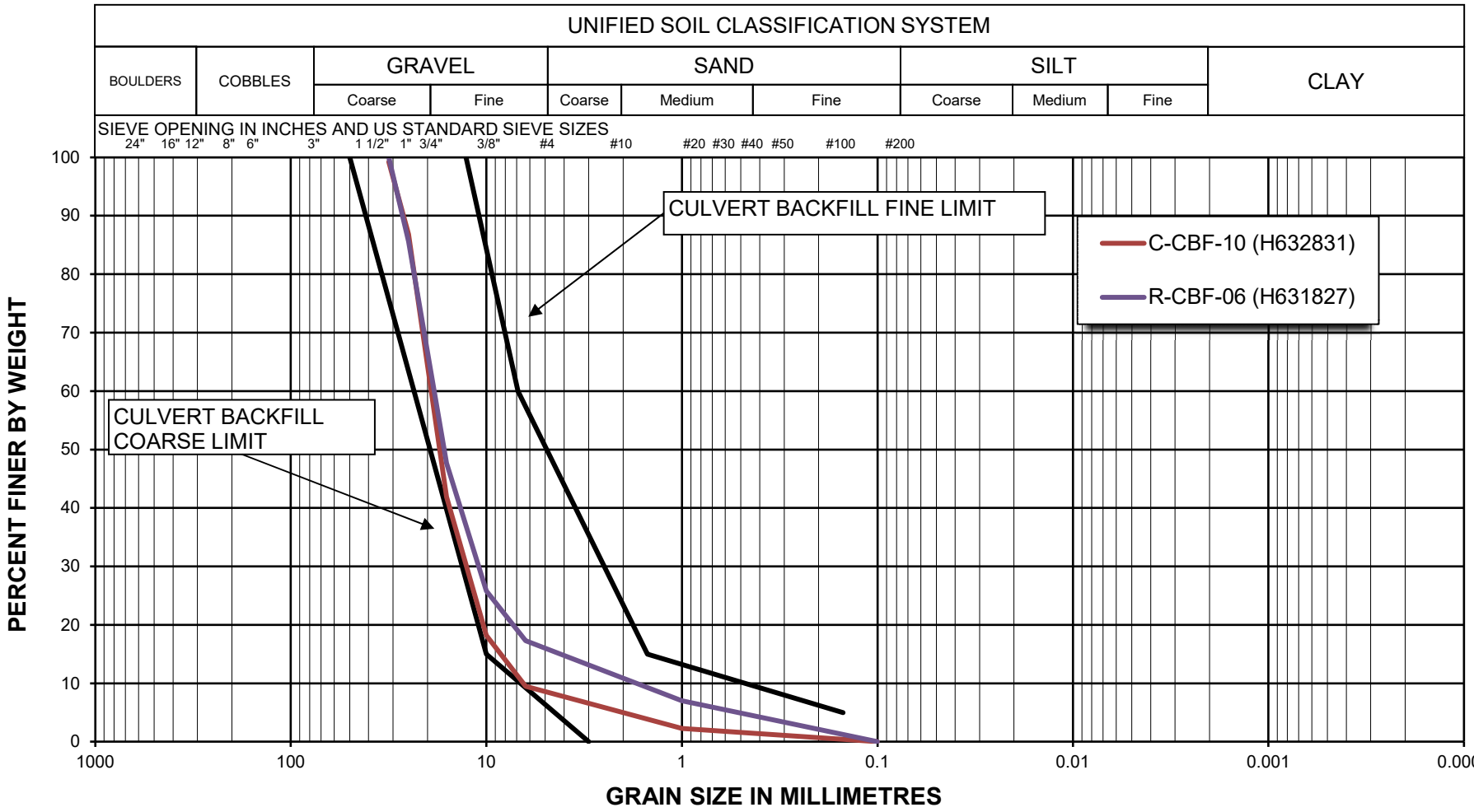
Attachments:

Figure 1 Rev 0	Grain Size Distribution - Culvert Backfill - CV-216
Figure 2 Rev 0	Grain Size Distribution - 3/16 Inch Minus - CV-216
Drawing 735 Rev 3	CV-216 General Arrangement
Drawing 736 Rev 3	CV-216 Plan and Section
Appendix A	CV-216 As-Built Photo Log

Copy To: Michael Burns, Baffinland Iron Mines Corporation
Jocelyn Larocque, Baffinland Iron Mines Corporation
George Liston, Baffinland Iron Mines Corporation
Connor Devereaux, Baffinland Iron Mines Corporation
Todd Swenson, Baffinland Iron Mines Corporation

/gj



NOTES:

1. CONTROL TESTS (C) CARRIED OUT ON FILL MATERIALS SAMPLED FROM THE BORROW AREA AND STOCKPILE, PRIOR TO MATERIAL COMPACTION.
2. RECORD TESTS (R) CARRIED OUT ON PLACED AND COMPACTED FILL MATERIALS.

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	27AUG'24	ISSUED WITH LETTER	GMJ	CAP

BAFFINLAND IRON MINES CORPORATION

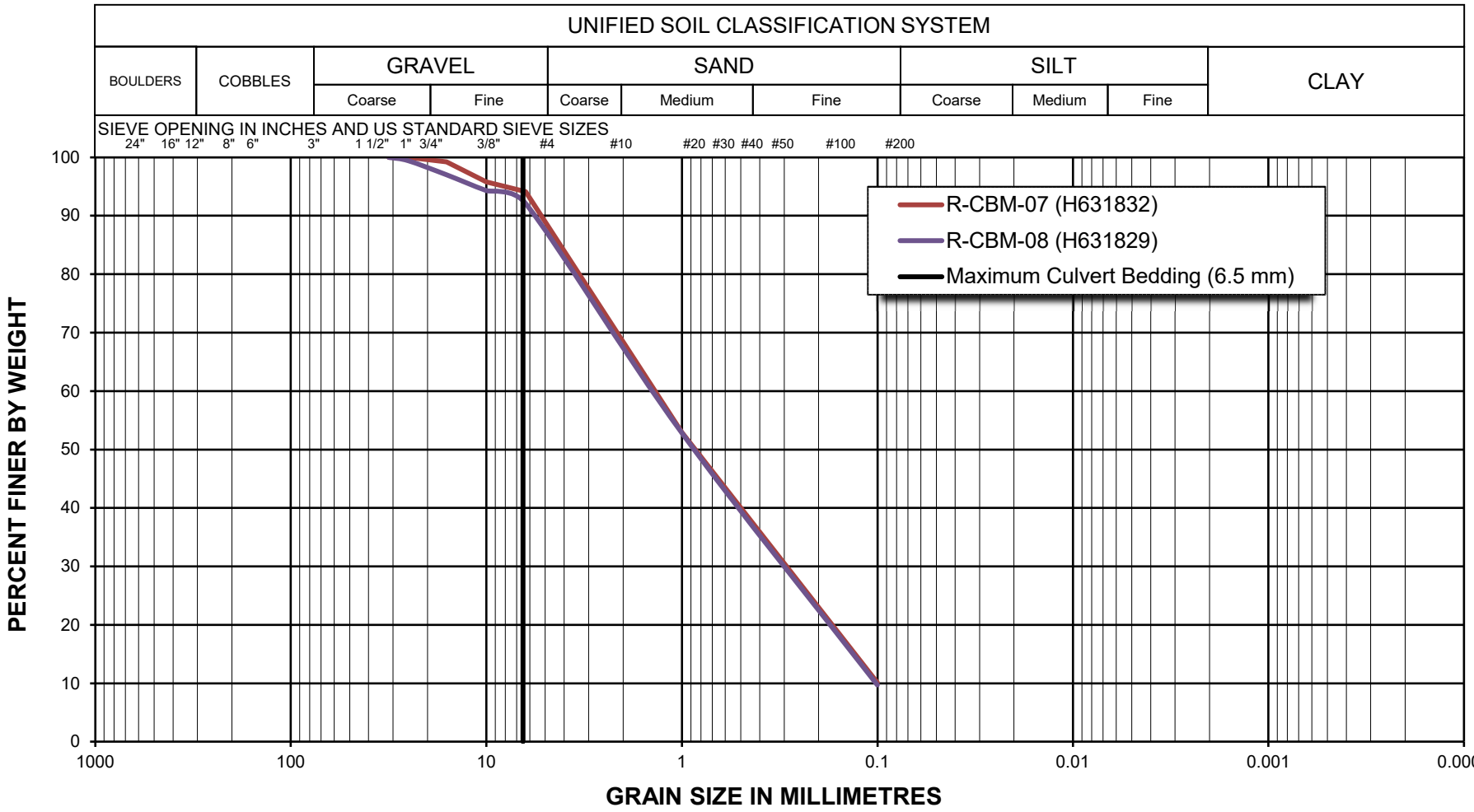
MARY RIVER PROJECT

GRAIN SIZE DISTRIBUTION
CULVERT BACKFILL - CV-216

Knight Piésold CONSULTING

P/A NO.	REF. NO.
NB102-00181/93	NB24-00502

FIGURE 1 REV 0



NOTES:

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2. RECORD TESTS (R) CARRIED OUT ON PLACED AND COMPACTED FILL MATERIALS.

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	27AUG'24	ISSUED WITH LETTER	GMJ	CAP

BAFFINLAND IRON MINES CORPORATION

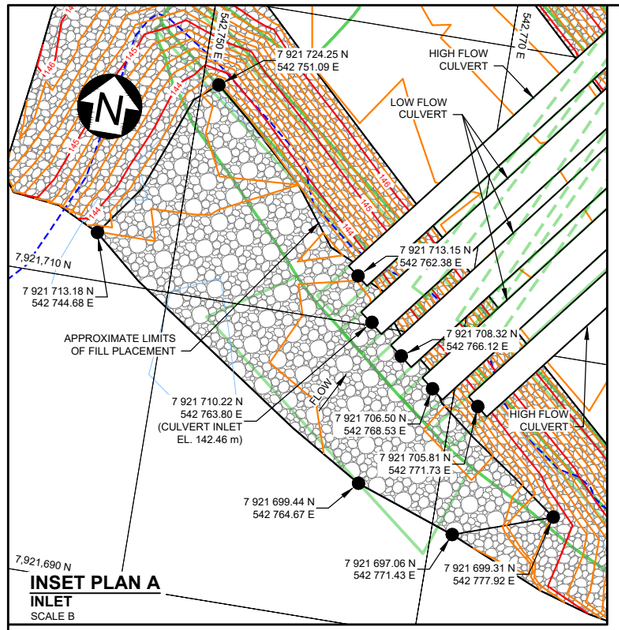
MARY RIVER PROJECT

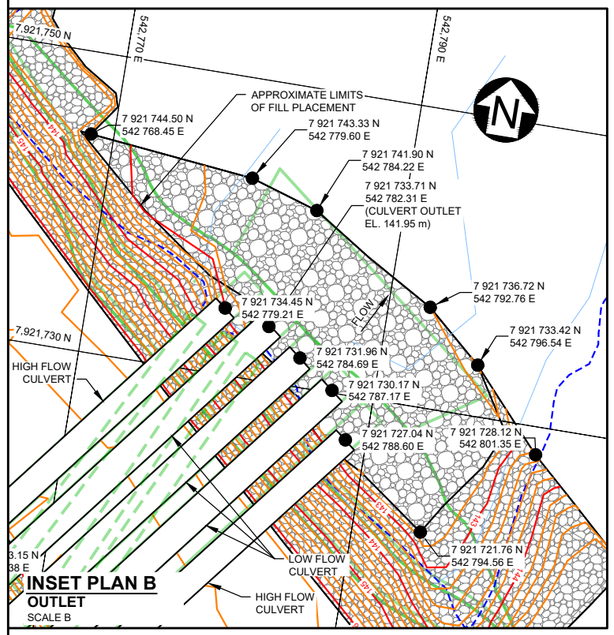
GRAIN SIZE DISTRIBUTION
CULVERT BEDDING (3/16 INCH MINUS) - CV-216

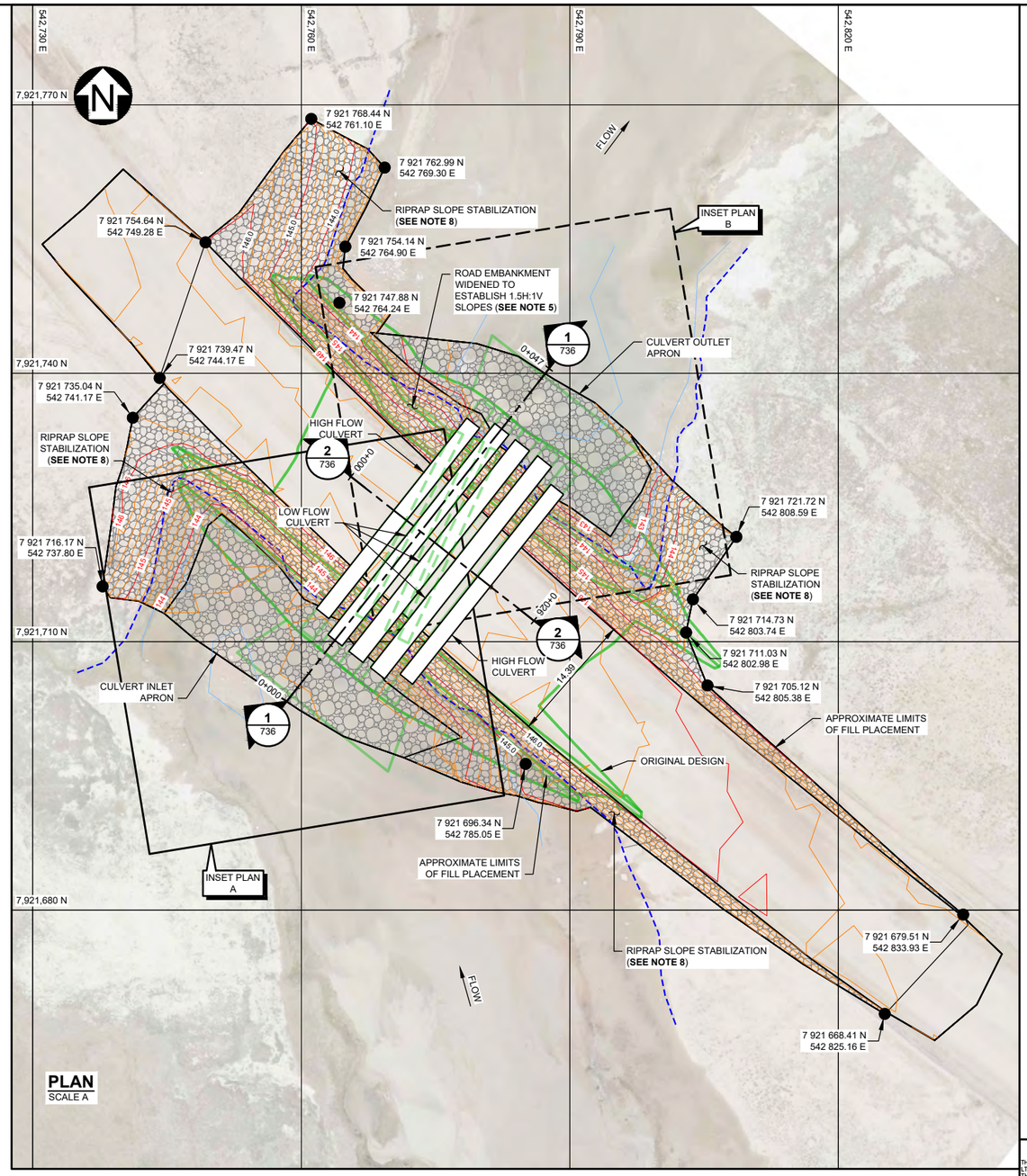
Knight Piésold CONSULTING

P/A NO.	REF. NO.
NB102-00181/93	NB24-00502

FIGURE 2 REV 0







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LEGEND:

- COARSE RIPRAP
- FINE RIPRAP
- CONTOUR
- PREVIOUS CULVERT CONFIGURATION
- ORIGINAL DESIGN LINEWORK
- APPROXIMATE LIMITS OF FILL PLACEMENT
- APPROXIMATE HIGH WATER MARK (HWM)
- SURVEYED WETTED WIDTH
- AS-BUILT SURVEY POINT
- RIPRAP FOR BANK ARMOURING AND FIELD FIT CHANNEL OUTLET

NOTES:

1. COORDINATE GRID IS UTM NAD83, ZONE 17.
2. DRONE IMAGERY PROVIDED BY KITIKMEOT CHALLENGER, AUGUST 2023. CULVERT AS-BUILT SURVEYS PROVIDED BY NUNA MAY 11, 2024 AND MAY 24, 2024. CONTOUR INTERVAL IS 0.2 m.
3. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
4. ALL WORK WAS COMPLETED DURING FROZEN CONDITIONS.
5. ROAD EMBANKMENT FILL PLACED TO ESTABLISH ROAD SIDE SLOPES AT MIN. 2H:1V. ALL SLOPES WERE STABILIZED WITH FINE RIPRAP OVERLYING NON-WOVEN GEOTEXTILE AS SHOWN ON **DRAWING 736 (SECTION 1)**.
6. MATERIAL SPECIFICATIONS INCLUDED ON **DRAWING 703**.
7. EROSION AND SEDIMENT CONTROL MEASURES INCLUDED ARE LIMITED TO THE WATER CROSSING AND THE IMMEDIATE SURROUNDING AREA. THE DESIGN AND INSTALLATION OF OTHER TOTE ROAD EROSION AND SEDIMENT CONTROL MEASURES WILL BE DOCUMENTED SEPARATELY.
8. SLOPE STABILIZED WITH FINE RIPRAP OVERLYING NON-WOVEN GEOTEXTILE.

SCALE A 6 3 0 10 20 30 m
SCALE B 4 2 0 4 8 12 16 20 m

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MARY RIVER PROJECT

PERMANENT CROSSING PLAN
ROUND CSP CULVERTS - CV-216
GENERAL ARRANGEMENT

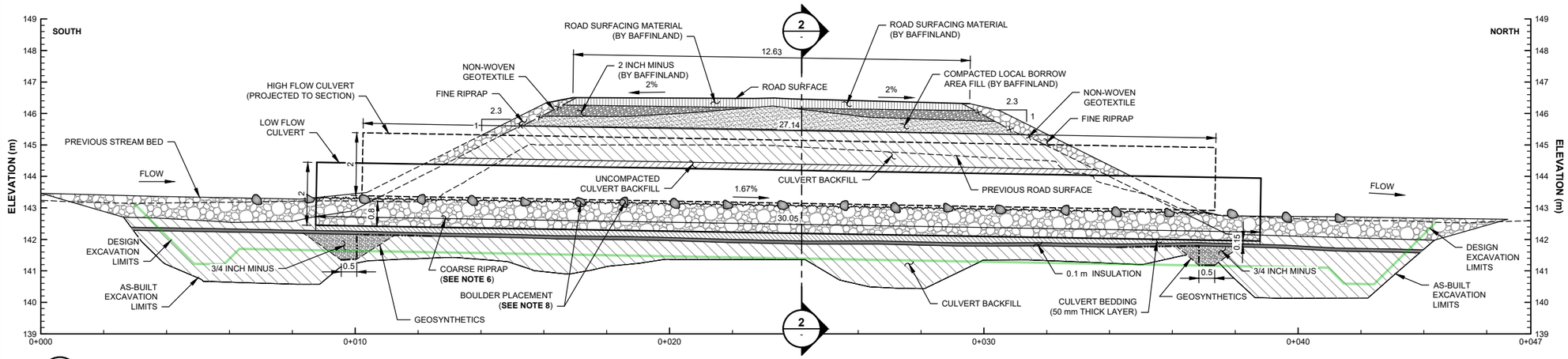
P/A NO.	DRAWING NO.	REVISION
NB102-181/77	735	3

AS-BUILT RECORD

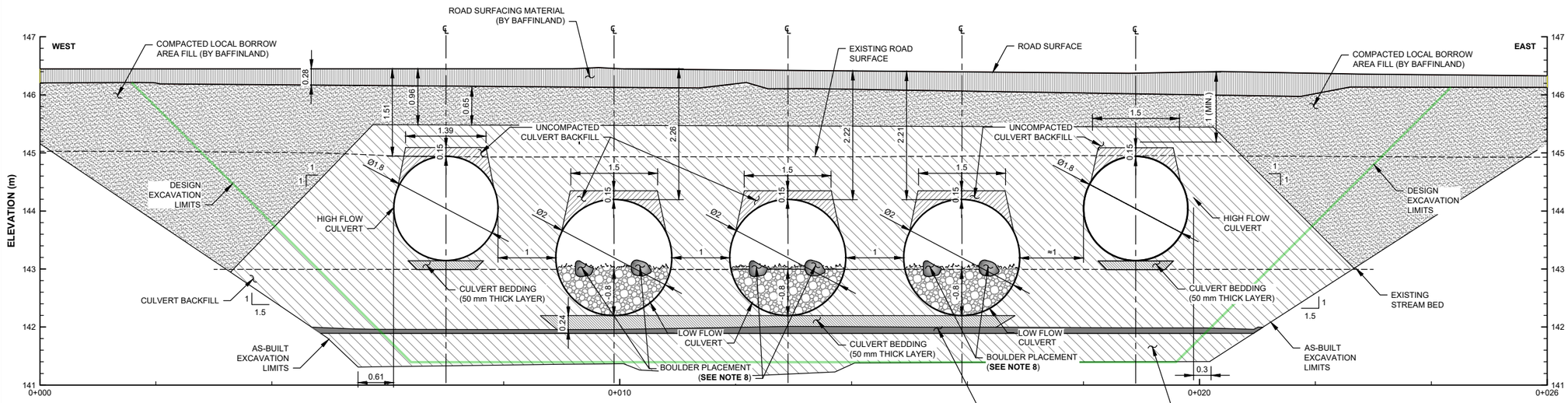
REFERENCE DRAWINGS	
703	CULVERT FILL MATERIALS AND GEOSYNTHETICS SPECIFICATIONS
736	CSP CULVERTS - CV-216 PLAN AND SECTION

REVISIONS							
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
3	27AUG'24	ISSUED FOR AS-BUILT RECORD	GMJ	EDW/AS		
2	08FEB'24	REVISED INCORPORATING DFO ADVICE	GMJ	EDW/AS	TJP	KEH
1	06SEP'23	REVISED WITH UPDATED SURVEY DATA	GMJ	EL/EDW	CAP	KEH
0	03FEB'23	ISSUED FOR CONSTRUCTION	GMJ	EDW/AS	CAP	KEH

SAVED: I:\1\02\00181\177\A\Acad\DWGS\735 736\735 736 R3, 8/27/2024 1:53:23 PM, EWARDELL PRINTED: 8/27/2024 1:53:45 PM, 735, EWARDELL ACAD VERSION: 25.0S (LMS TECH)



1/735 **SECTION**
CV-216 PROFILE
SCALE A



2/735 **SECTION**
CV-216 INSTALLATION DETAILS
SCALE B

NOTES:

1. CULVERT AS-BUILT SURVEYS PROVIDED BY NUNA MAY 11, 2024 AND MAY 24, 2024.
2. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
3. VEHICLE SAFETY BERMS ARE REQUIRED IN AREAS WITH A DROP OFF GREATER THAN 3.0 m.
4. MATERIAL SPECIFICATIONS INCLUDED ON **DRAWING 703**.
5. CULVERT INFILL MATERIAL WAS INSPECTED DURING AND AFTER FIRST FRESHET FOLLOWING CONSTRUCTION TO DETERMINE IF ADDITIONAL MATERIAL IS REQUIRED.
6. RIPRAP INTERSTITIAL SPACE ON THE CHANNEL BED FILLED WITH MATERIAL SIMILAR TO THE ADJACENT CHANNEL BED MATERIAL (OR OTHER MATERIAL APPROVED BY THE ENGINEER). THE VOID SPACE MINIMIZED BETWEEN COARSE RIPRAP SUCH THAT CREEK FLOWS ARE MAINTAINED ABOVE THE CHANNEL BED DURING LOW-FLOW CONDITIONS. FINISHED SURFACE ROUGHENED TO MIMIC ADJACENT STREAM BED CONDITIONS.
7. THE INSULATION USED WAS STYROFOAM™ HIGHLOAD 60 EXTRUDED POLYSTYRENE INSULATION.
8. IN-CULVERT AS-BUILT SURVEY NOT COMPLETED.

LEGEND:

- COMPACTED LOCAL BORROW AREA FILL (BY BAFFINLAND)
- UNCOMPACTED CULVERT BACKFILL
- CULVERT BACKFILL
- ROAD SURFACING MATERIAL (BY BAFFINLAND)
- 2 INCH MINUS (BY BAFFINLAND)
- 3/4 INCH MINUS (BY BAFFINLAND)
- COARSE RIPRAP
- FINE RIPRAP
- CULVERT BEDDING MATERIAL
- INSULATION
- DESIGN LINEWORK
- EXISTING STREAM BED
- NON-WOVEN GEOTEXTILE
- GEOSYNTHETICS
- BOULDER PLACEMENT

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AS-BUILT RECORD

SCALE A 1.5 0.75 0 2.5 5.0 7.5 m
SCALE B 0.8 0.4 0 1 2 3 4 m

DRG. NO.	DESCRIPTION
703	CULVERT FILL MATERIALS AND GEOSYNTHETICS SPECIFICATIONS
735	CSP CULVERTS - CV-216 GENERAL ARRANGEMENT

REFERENCE DRAWINGS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED

REVISIONS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
3	27AUG'24	ISSUED FOR AS-BUILT RECORD	GMJ	EDW/AS	GJ	CK
2	08FEB'24	REVISED INCORPORATING DFO ADVICE	GMJ	EDW/AS	TJP	KEH
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REVISIONS

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BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

PERMANENT CROSSING PLAN
ROUND CSP CULVERTS - CV-216
PLAN AND SECTION

P/A NO.	DRAWING NO.	REVISION
NB102-181/77	736	3

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APPENDIX A

CV-216 As-Built Photo Log

(Pages A-1 to A-17)

CV-216 AS-BUILT PHOTO LOG

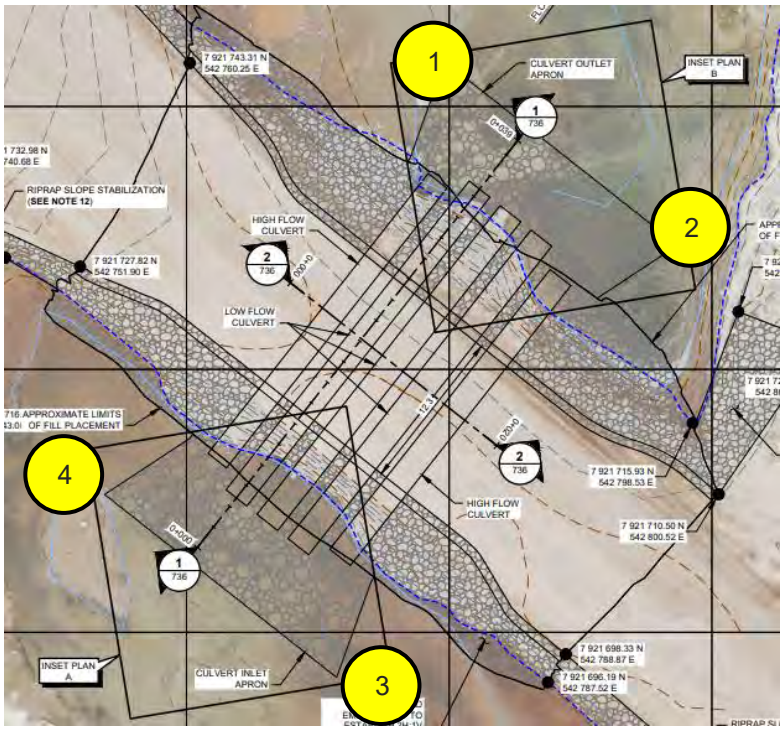

PHOTO 1. Culvert Crossing CV-216 - Photographic Vantage Points (Approximate Locations, Indicated with Yellow Circles).

PHOTO 2. Prior to Construction - Vantage Point 1 - Downstream Side of Crossing - Looking South (April 03, 2024).

PHOTO 3. Prior to Construction - Vantage Point 2 - Downstream Side of Crossing - Looking West (April 03, 2024).

PHOTO 4. Prior to Construction - Vantage Point 3 - Upstream Side of Crossing - Looking North (April 03, 2024).

PHOTO 5. Prior to Construction - Vantage Point 4 - Upstream Side of Crossing - Looking East (April 03, 2024).

PHOTO 6. During Construction - Vantage Point 2 - Blasted Downstream Side of Crossing - Looking South (April 17, 2024).

PHOTO 7. During Construction - Vantage Point 3 - Blast Excavation - Road Crossing and Downstream Outlet - Looking North (April 17, 2024).

PHOTO 8. During Construction - Vantage Point 2 - Blast Excavation with Ice Present - Road Crossing - Looking South (April 12, 2024).

PHOTO 9. During Construction - Vantage Point 4 - Compaction of Culvert Backfill Material - Upstream inlet - Looking East (April 18, 2024).

PHOTO 10. During Construction - Vantage Point 4 - Placement and Compaction of Culvert Backfill Material - Upstream inlet - Looking Northeast (April 19, 2024).

PHOTO 11. During Construction - Vantage Point 4 - Placement of Culvert Backfill Material - Road Crossing - Looking Northeast (April 19, 2024).

PHOTO 12. During Construction - Vantage Point 4 - Placement of Geomembrane and Geogrid Liner - Upstream Inlet - Looking Northeast (April 20, 2024).

PHOTO 13. During Construction - Vantage Point 3 - Compaction of 3/4 inch Material in Plug Trench - Looking West (April 20, 2024).

PHOTO 14. During Construction - Vantage Point 3 - Installation of 2.0 m diameter corrugated steel pipe low flow culvert - Looking North (April 23, 2024).

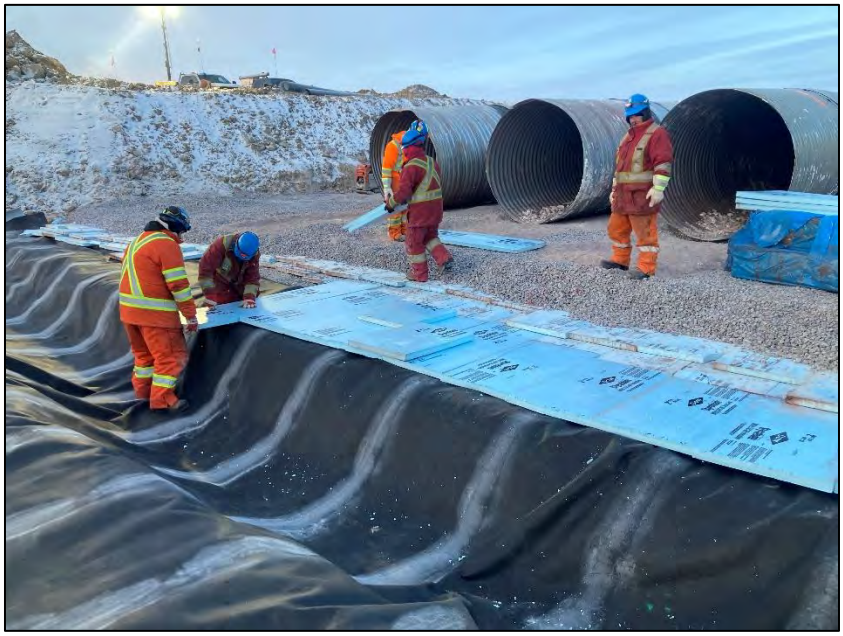

PHOTO 15. During Construction - Vantage Point 1 - Placement of Insulation - Road Crossing - Looking Northeast (April 23, 2024).

PHOTO 16. During Construction - Vantage Point 3 - Compaction of Culvert Backfill Material - Looking North (April 25, 2024).

PHOTO 17. During Construction - Vantage Point 3 - Placement of segment of 1.8 m diameter corrugated steel pipe high flow culvert - Looking Northeast (April 25, 2024).

PHOTO 18. During Construction - Vantage Point 2 - Compaction of Culvert Backfill Material - Road Crossing - Looking Southwest (April 28, 2024).

PHOTO 19. During Construction - Placement of Boulder Clusters in Low Flow Culvert - Looking North (May 01, 2024).

PHOTO 20. During Construction - Placement of Coarse Riprap and Stream Substrate Material in Low Flow Culvert - Looking South (May 02, 2024).

PHOTO 21. Following Construction - Vantage Point 2 - Completed north (outlet) apron with Coarse Riprap and Stream Substrate Material - Looking Northwest (May 04, 2024).

PHOTO 22. Following Construction - Vantage Point 3 - Completed south (inlet) apron with Coarse Riprap and Stream Substrate Material - Looking Northwest (May 04, 2024).

PHOTO 23. After Vantage Point 2 - Completed Downstream Outlet Apron and Slope Stabilization - Downstream Outlet Area - Looking North (May 03, 2024).

PHOTO 24. Following Construction - Vantage Point 3 - Completed Upstream Inlet Apron and Slope Stabilization -Upstream Inlet Area - Looking North (April 5, 2024).

PHOTO 25. Following Construction - Completed placement of boulder clusters and coarse riprap and stream substrate material within the interior of the low flow culvert (May 03, 2024).

PHOTO 26. Material Stockpile - 32 mm minus Culvert Backfill Material - km 60 Laydown - Looking Northeast (March 10, 2024).

PHOTO 27. Material Stockpile - Culvert Bedding Material - km 80 Laydown - Looking North (April 20, 2024).

PHOTO 28. Material Stockpile - Fine Rip Rap - km 80 Laydown (May 01, 2024).

PHOTO 29. Material Stockpile - Coarse Rip Rap - km 80 Laydown (May 01, 2024).

PHOTO 30. Equipment - CAT 349F Excavator - km 60 Laydown - looking East (May 02, 2024).

PHOTO 31. Equipment - CAT 745C articulated dump truck - km 80 Laydown (April 23, 2024).

PHOTO 32. Equipment - Mikasa MVH408 1000 lbs Plate Compactor - km 80 Laydown (April 20, 2024).

PHOTO 33. Equipment - Kubota SCL 100 Stand On Compact Loader - km 80 laydown (May 01, 2024).

PHOTO 34. Equipment - CAT CS56B Smooth Drum Compactor (March 02, 2024).