APPENDIX H

Requests for Information

Request for Information

Department	Sustainability Projects		
Section		**Date**	March 6, 2024
Form Number		**Revision**	

Project Name:	Permanent Crossing Plan Round CSP Culverts	**Project #**	Tote Road Culvert Remediation
RFI #	1	**Contract #**	
Originator:	Michael Burns	**RFI Submitted On:**	March 6, 2024
Prepared By:	Michael Burns	**Requested Response By:**	March 7, 2024
Submitted To:	Greg Johnstone	**Company:**	Knight Piesold

Reference Document / Tag # / Attachment	**Rev**	**Comment**

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: Description of Issue / Clarification / Reason for Request

Greg / Andy

As per Zoom Meeting discussion today (March 6th, 2024) between site (Mike Burns, Jim Patterson & Baruck Wile) and Knight-Piesold (Greg Johnstone & Andy Phillips) at the North Bay office, I would like to summarize the following details with CV-057 & CV-059. (Attached is a photo (RFI) of the sketch used during conversation)

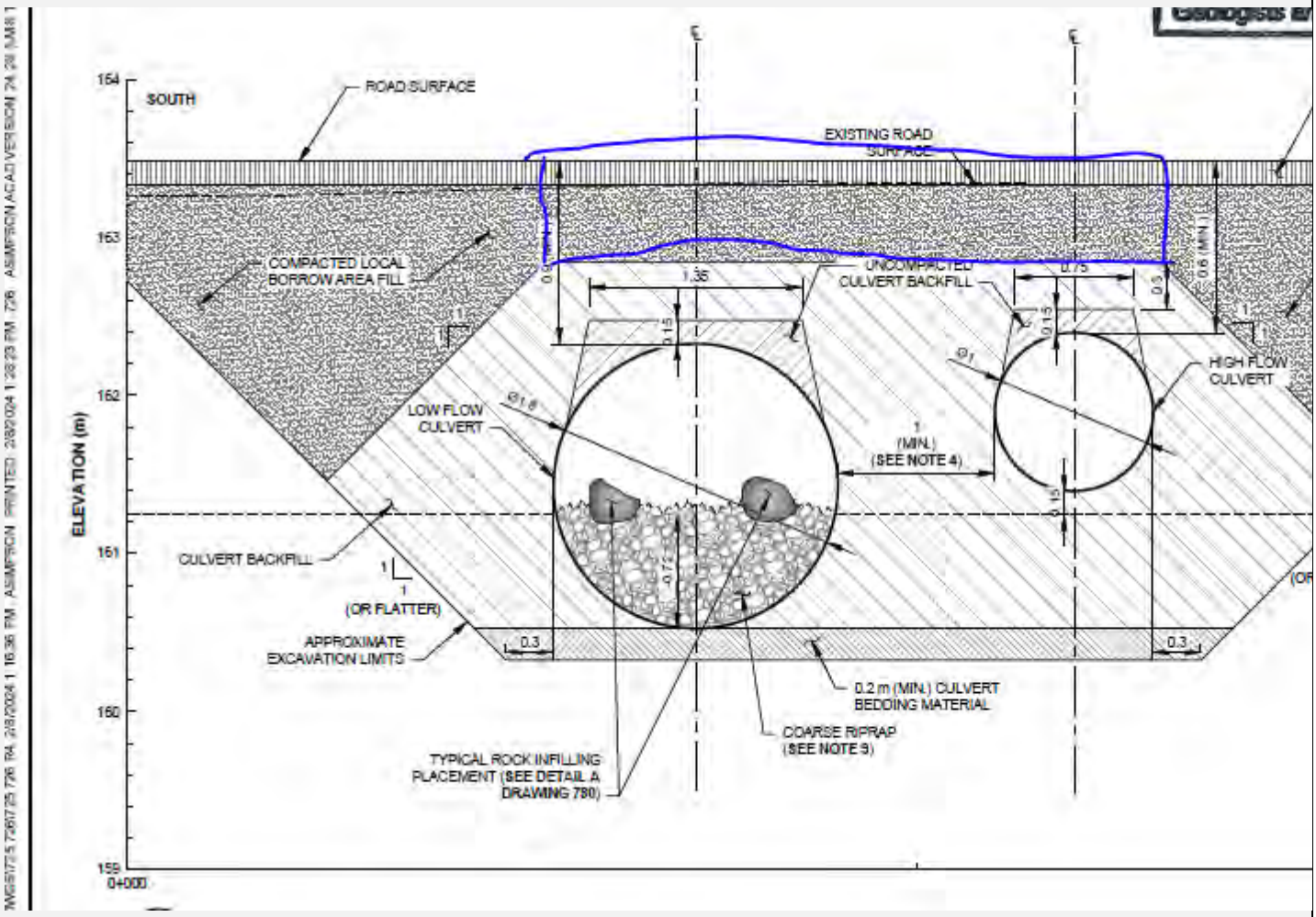
1. The as built excavation exceeds design requirements. To preserve structural integrity of the culverts, the 1 to 1 slope outline of the culvert backfill (32mm Special) will be extended to the floor elevation of the excavation. All 32mm Special will be compacted in 200mm lifts as per instructions. Agreed?
2. Between the outer wall and the 32mm Special profile, alternative material (blasted road material) will be placed in 200mm lifts and compacted. The blasted road material will be diligently sorted to eliminate larger material. Baffinland will assume the risk for re-using this material. However we agree that this will not impact the structural integrity of the culvert support system?
3. Regarding the Culvert Inlet Apron & Culvert Outlet Apron (cross sectional sketch with red hatch marks) the agreement was:

    - The 1:1 slope could be extended to the bottom elevation of the Apron. This delineation would mark the extents of the zone of structural support for the culvert. Substituting the 32mm Special with another material is a request by site. The Site Team will investigate the use of a readily

available substitute called 32mm Fines. The 32mm Fines will be sampled for suitability of use, by Knight Piesold on site personnel. Agreed?

4. Addendum to original discussion is an email sent by Knight Piesold and the concern was the upper horizontal horizon of 32mm Special. Knight Piesold email in ***bold italics below***

"Following our discussion today, we realized we misspoke regarding the fill directly above the culverts (screenshot below). The minimum cover above the culvert includes both the 32 mm minus material and the local borrow area fill. In order to ensure we meet the manufacturers specifications for the minimum culvert cover depth, we recommend using the 32 mm minus with additional fines for this area and not the blasted material. If you choose to use the blasted material in this area, it may settle and the fill above the culvert will be below the minimum cover depth."



Section 2: Corrective Action	☐ Taken	☐ Suggested	☒ Required

Section 2 Continued: Corrective Action	☐ Taken	☐ Suggested	☒ Required

Potential Cost Impact?	Yes ☒ No ☐ Unsure ☐	Potential Schedule Impact?	Yes ☒ No ☐ Unsure ☐

Section 3: Approval Required by	☐ Internal	☐ Client	☐ Required
March 7, 2024			

(Note Section 4 to be completed by the recipient of the RFI)			
Section 4: RFI Response	☐ Corrective action approved	☐ corrected as Follows	
Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman (applicable as per the following disciplines)			
☐ Civil	☐ Electrical	☐ Instrumentation	☐ Mechanical
☐ Const. Manager	☐ Management	☐ QC Department	☐ Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	**Signature:**	**Signature:**
Date:	**Date:**	**Date:**

MEMORANDUM

Date:	March 8, 2024	**File No.:**	NB102-00181/93-A.01
		Cont. No.:	NB24-00286
To:	Michael Burns, Rudolf Dietrich		
Copy To:	Dale Tulloch, Jim Patterson, Sharon Dyke, BIM Document Control		
From:	Greg Johnstone		
Re:	**Permanent Crossing Plan - Round CSP Culverts, Response to Baffinland Request for Information (RFI) No. 1**		

1.0 INTRODUCTION

This memo provides Knight Piésold Ltd.'s (KP) response to Request for Information (RFI) No. 1 provided by Baffinland Iron Mines Corporation (Baffinland) on the Permanent Crossing Plan - Round CSP Culverts Issued for Construction Drawings (IFC). Responses to the provided questions are included below.

2.0 RESPONSE

Baffinland Question No. 1:

The as built excavation exceeds design requirements. To preserve structural integrity of the culverts, the 1 to 1 slope outline of the culvert backfill (32mm Special) will be extended to the floor elevation of the excavation. All 32mm Special will be compacted in 200mm lifts as per instructions. Agreed?

KP Response No.1:

Agreed.

Baffinland Question No.2:

Between the outer wall and the 32mm Special profile, alternative material (blasted road material) will be placed in 200mm lifts and compacted. The blasted road material will be diligently sorted to eliminate larger material. Baffinland will assume the risk for re-using this material. However we agree that this will not impact the structural integrity of the culvert support system?

KP Response No.2:

KP does not recommend the use of the frozen blasted road material for this purpose as this may lead to road settlement, subsequently impacting the culverts. KP notes that this is Baffinland's decision to use this material in this location and they are assuming any risks/consequences of this change. In the event that the material is not ice rich nor frost susceptible, and placed/compacted as proposed, the change is expected to have limited potential impact on the structural integrity of the culverts.

Baffinland Question No.3:

Regarding the Culvert Inlet Apron & Culvert Outlet Apron (cross sectional sketch with red hatch marks) the agreement was:

- *The 1:1 slope could be extended to the bottom elevation of the Apron. This delineation would mark the extents of the zone of structural support for the culvert. Substituting the 32mm Special with another*

material is a request by site. The Site Team will investigate the use of a readily available substitute called 32mm Fines. The 32mm Fines will be sampled for suitability of use, by Knight Piesold on site personnel. Agreed?

KP Response No.3:

The slope of the road embankment is 2H:1V, not 1:1. This slope will be extended to the bottom elevation of the apron as specified. KP will review the laboratory results of the 32 mm with fines once it is available to determine their suitability for use.

Baffinland Question No.4:

Addendum to original discussion is an email sent by Knight Piesold and the concern was the upper horizontal horizon of 32mm Special. Knight Piesold email in ***bold italics below***

> ***"Following our discussion today, we realized we misspoke regarding the fill directly above the culverts (screenshot below). The minimum cover above the culvert includes both the 32 mm minus material and the local borrow area fill. In order to ensure we meet the manufacturers specifications for the minimum culvert cover depth, we recommend using the 32 mm minus with additional fines for this area and not the blasted material. If you choose to use the blasted material in this area, it may settle and the fill above the culvert will be below the minimum cover depth."***

KP Response No.4:

As stated in the email, 32 mm material with fines can be used above the culvert to ensure the minimum cover depth is maintained above the culvert. Use of frozen blasted material at this location is not recommended.

3.0 REFERENCES

Baffinland, 2024. Request for Information #1 to Greg Johnstone submitted by Michael Burns. March 7.

Yours truly,
Knight Piésold Ltd.

Prepared: Greg Johnstone

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:

Attachments:
Baffinland Request for Information #1

/gj

Request for Information

Department	Sustainability Projects		
Section		**Date**	March 6, 2024
Form Number		**Revision**	

Project Name:	Permanent Crossing Plan Round CSP Culverts	**Project #**	Tote Road Culvert Remediation
RFI #	1	**Contract #**	
Originator:	Michael Burns	**RFI Submitted On:**	March 6, 2024
Prepared By:	Michael Burns	**Requested Response By:**	March 7, 2024
Submitted To:	Greg Johnstone	**Company:**	Knight Piesold

Reference Document / Tag # / Attachment	**Rev**	**Comment**

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: Description of Issue / Clarification / Reason for Request

Greg / Andy

As per Zoom Meeting discussion today (March 6th, 2024) between site (Mike Burns, Jim Patterson & Baruck Wile) and Knight-Piesold (Greg Johnstone & Andy Phillips) at the North Bay office, I would like to summarize the following details with CV-057 & CV-059. (Attached is a photo (RFI) of the sketch used during conversation)

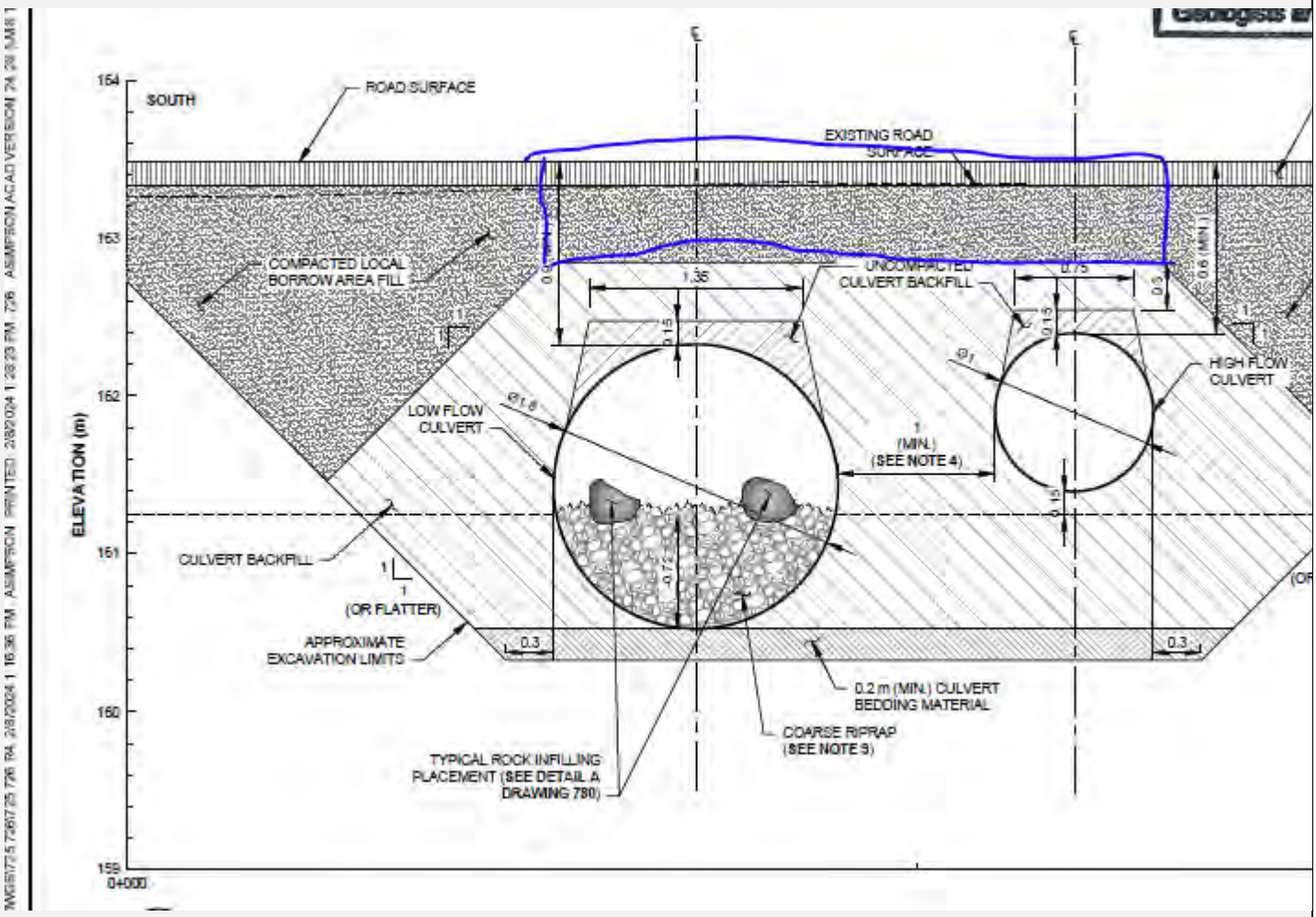
1. The as built excavation exceeds design requirements. To preserve structural integrity of the culverts, the 1 to 1 slope outline of the culvert backfill (32mm Special) will be extended to the floor elevation of the excavation. All 32mm Special will be compacted in 200mm lifts as per instructions. Agreed?
2. Between the outer wall and the 32mm Special profile, alternative material (blasted road material) will be placed in 200mm lifts and compacted. The blasted road material will be diligently sorted to eliminate larger material. Baffinland will assume the risk for re-using this material. However we agree that this will not impact the structural integrity of the culvert support system?
3. Regarding the Culvert Inlet Apron & Culvert Outlet Apron (cross sectional sketch with red hatch marks) the agreement was:

    - The 1:1 slope could be extended to the bottom elevation of the Apron. This delineation would mark the extents of the zone of structural support for the culvert. Substituting the 32mm Special with another material is a request by site. The Site Team will investigate the use of a readily

available substitute called 32mm Fines. The 32mm Fines will be sampled for suitability of use, by Knight Piesold on site personnel. Agreed?

4. Addendum to original discussion is an email sent by Knight Piesold and the concern was the upper horizontal horizon of 32mm Special. Knight Piesold email in ***bold italics below***

"Following our discussion today, we realized we misspoke regarding the fill directly above the culverts (screenshot below). The minimum cover above the culvert includes both the 32 mm minus material and the local borrow area fill. In order to ensure we meet the manufacturers specifications for the minimum culvert cover depth, we recommend using the 32 mm minus with additional fines for this area and not the blasted material. If you choose to use the blasted material in this area, it may settle and the fill above the culvert will be below the minimum cover depth."



Section 2: Corrective Action	☐ **Taken**	☐ **Suggested**	☒ **Required**

Section 2 Continued: Corrective Action	☐ **Taken**	☐ **Suggested**	☒ **Required**

Potential Cost Impact?	**Yes ☒ No ☐ Unsure ☐**	**Potential Schedule Impact?**	**Yes ☒ No ☐ Unsure ☐**

Section 3: Approval Required by	☐ Internal	☐ Client	☐ Required
March 7, 2024			

(Note Section 4 to be completed by the recipient of the RFI)			
Section 4: RFI Response	☐ Corrective action approved	☐ corrected as Follows	
Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman (applicable as per the following disciplines)			
☐ Civil	☐ Electrical	☐ Instrumentation	☐ Mechanical
☐ Const. Manager	☐ Management	☐ QC Department	☐ Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	**Signature:**	**Signature:**
Date:	**Date:**	**Date:**

Request for Information

Department	Sustainability Projects		
Section		**Date**	March 13, 2024
Form Number		**Revision**	

Project Name:	Permanent Crossing Plan Round CSP Culverts	**Project #**	Tote Road Culvert Remediation
RFI #	2	**Contract #**	
Originator:	Dale Tulloch	**RFI Submitted On:**	March 6, 2024
Prepared By:	Dale Tulloch	**Requested Response By:**	March 15, 2024
Submitted To:	Greg Johnstone	**Company:**	Knight Piesold

Reference Document / Tag # / Attachment	**Rev**	**Comment**

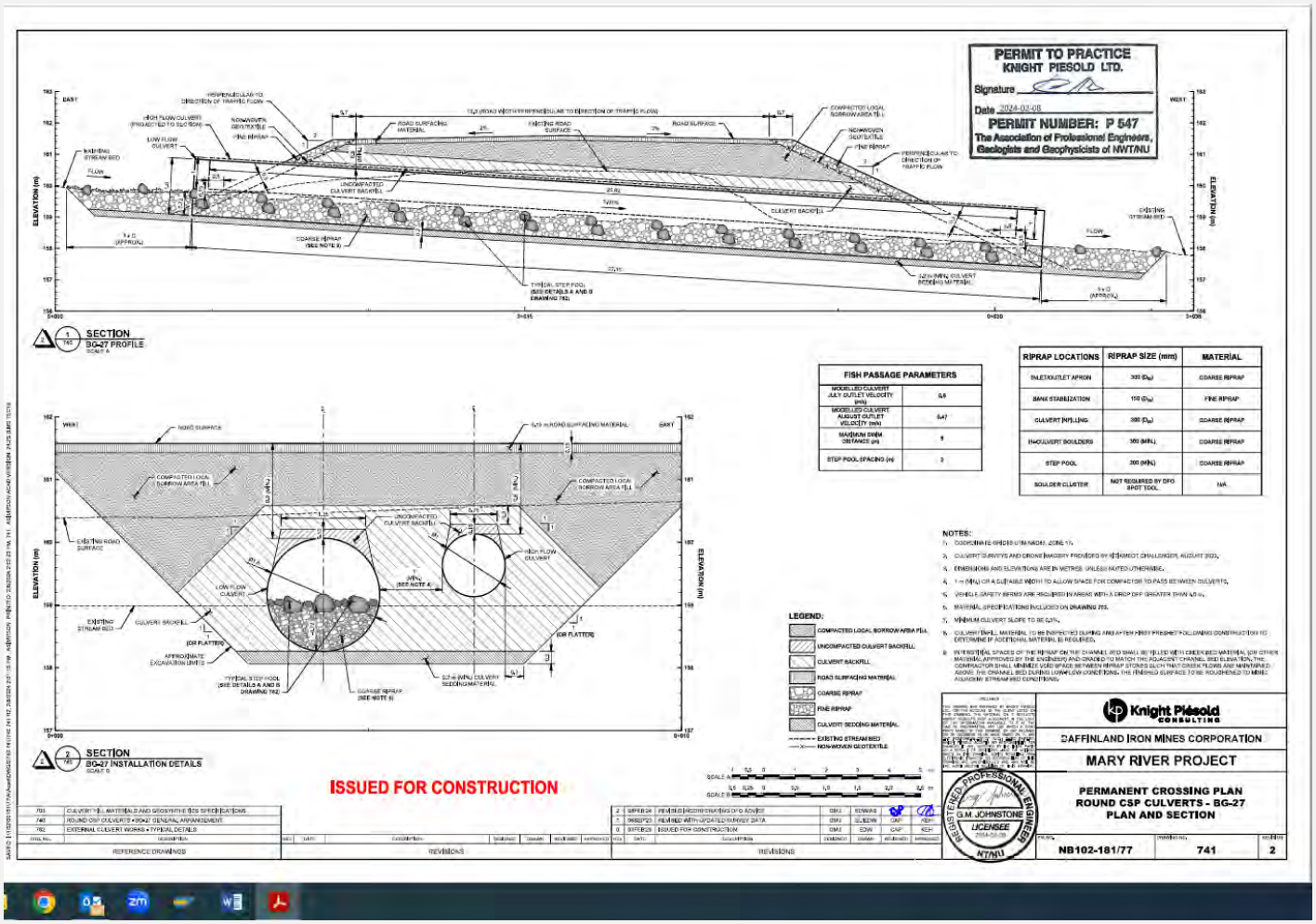
(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: Description of Issue / Clarification / Reason for Request

Greg

As per Zoom Meeting discussion today (March 13th, 2024) between site (Buck Wile, Dale Tulloch) and Knight-Piesold (Greg Johnstone) at the North Bay office, I would like to bring to your attention the following concerns with respect to culverts utilized as drop chutes in addition to water conveyance beneath the Tote Road (see Typical DWG741 attached).

BIM expresses reservations regarding KP's design, which suggests we incorporate 25-30% fine material as infill within the embedment riprap zone designed to go inside the culverts. This is particularly concerning for culverts designed to accommodate a significant drop in grade from the inlet to the outlet across the Tote Road. The embedment material specified for these culverts proposes a mixture utilizing frozen fine material, the specific type of which is yet to be determined. It is anticipated that this material will experience higher-than-normal velocities during seasonal freshet and rain events. These elevated velocities pose a risk of flushing fines placed between the coarse riprap layers, leading to degradation of the water surface profile above the rock surface. Such ongoing degradation of fines, could redirect water flow below the embedment rock surface and potentially impede fish passage through the culvert during low flows.



Section 2: Corrective Action	☐ Taken	☐ Suggested	☒ Required

Section 2 Continued: Corrective Action	☐ Taken	☐ Suggested	☒ Required

Potential Cost Impact?	Yes ☒ No ☐ Unsure ☐	Potential Schedule Impact?	Yes ☒ No ☐ Unsure ☐

Section 3: Approval Required by	☐ Internal	☐ Client	☐ Required
March 15, 2024			

(Note Section 4 to be completed by the recipient of the RFI)			
Section 4: RFI Response ☐ **Corrective action approved** ☐ **corrected as Follows**			
Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman (applicable as per the following disciplines)			
☐ Civil	☐ Electrical	☐ Instrumentation	☐ Mechanical
☐ Const. Manager	☐ Management	☐ QC Department	☐ Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	**Signature:**	**Signature:**
Date:	**Date:**	**Date:**

Knight Piésold CONSULTING

Management System Certified by: bsi ISO 9001 ISO 14001 ISO 45001 CERTIFIED

MEMORANDUM

Date:	February 9, 2024	**File No.:**	NB102-00181/93-A.01
		Cont. No.:	NB24-00154
To:	Baruck Wile Rudolf Dietrich		
Copy To:	Dale Tulloch Jim Patterson Sharon Dyke BIM Document Control		
From:	Greg Johnstone		
Re:	**Permanent Crossing Plan - Round CSP Culverts, Response to Request for Information (RFI) No. 001**		

1.0 INTRODUCTION

This memo provides Knight Piésold Ltd.'s (KP) response to Request for Information (RFI) No. 001 provided by Nuna on the Permanent Crossing Plan - Round CSP Culverts Issued for Construction Drawings (IFC). Responses to the provided questions are included below.

2.0 RESPONSE

Nuna Question No. 1:

To allow Nuna to construct road structure over the design culverts, a design centerline and profile is required. Nuna is unable to construct side slopes and determine a suitable tie in location with existing ground without this information.

Please provide a centerline alignment and profile for final grade for each crossing. The alignment and profile should extend to the tie in point on either side of the crossing.

a. This information could be added to the drawings (coordinates and necessary curve data for alignment, and profile view with elevations noted at grade breaks) OR

b. A 3D polyline that represents the final grade at the center line

KP Response No.1:

KP will provide AutoCAD format (.dwg and/or .dxf) versions of the drawings to assist with the layout of the culvert construction. The AutoCAD files should provide sufficient setting out details; however, KP is available to discuss if additional details are required.

Nuna Question No.2:

Invert Elevations for the inlet and outlet of culverts have not been provided in currently issued versions of the drawings. Please provide inlet and outlet invert elevations for all culverts with an associated northing and easting.

KP Response No.2:

Design inlet and outlet elevations will be provided for one culverts at each crossing location. The elevations will be added to the next version of the drawings (within Permanent Crossing Plan - Round CSP Culverts Report, Rev 2).

Nuna Question No.3:

The drawings do not include swale / rip rap information to allow for Nuna to complete the desired grading. Rip Rap information has been provided in 2D format only.

Please provide 3D linework for the bottom of rip rap swale to allow for Nuna to achieve the desired elevations and 1% sloping.

KP Response No.3:

The riprap lined ditches, bank armouring, and inlet and outlet aprons are to be field fit to suit site conditions. The proposed riprap extents will be included in the electronic drawings files in response to Question No. 1.

Nuna Question No.4:

Please provide the desired horizontal and vertical tolerances for culvert inverts.

KP Response No.4:

Vertical tolerance for the round culvert installation will be +0/-0.1 m.

Horizontal tolerance for the round culvert installation will be +/- 0.3 m.

Nuna Question No.5:

The drawings show a minimum of 1.0m spacing between culverts. Note 4 states that '1 m (MIN.) OR A SUITABLE WIDTH TO ALLOW SPACE FOR COMPACTOR TO PASS BETWEEN CULVERTS.'

Please confirm whether a minimum of 1.0m culvert spacing is to be held considering the planned packer width of roughly 0.5m. If 1.0m is to be held, Nuna may space the culverts at 1.10m apart. Please confirm this is acceptable / necessary.

KP Response No.5:

The culvert spacing should be approximately 1 m which has been selected based on the hand-guided plate compactor planned for use during culvert installations. The Nuna proposed spacing of 1.1 m is acceptable.

Nuna Question No.6:

Only 1 culvert per crossing has a coordinate and elevation shown. Please confirm that all low flow culverts are at the same elevation as the culvert with provided coordinates.

KP Response #6:

Coordinates are shown on the drawings for one of the low flow culverts for each water crossing.

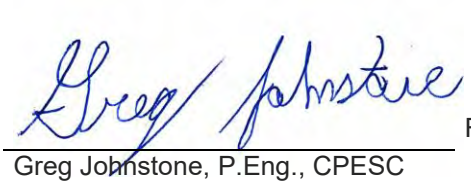
All low flow culverts at each water crossing are to be installed at the same elevation.

The high flow culverts are to be set 0.15 m above the elevation of the low flow culverts, as shown on the drawings.

3.0 REFERENCES

Nuna, 2024. Request for Information #001 to Baruck Wile and Rudolf Dietrich submitted by Jeff Roberts. January 9.

Yours truly,
Knight Piésold Ltd.

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: 

Attachments:
Nuna Request for Information #001

/gj

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.: N/A	ITP Activity No.:	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**		
RFI #	001	**Contract #**	4192708	
Originator:	Jeff Roberts	**RFI Submitted On:**	February 7, 2024	
Prepared By:	Jeff Roberts	**Requested Response By:**	February 9, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
NB102-181/77 (Dwg. No. 736)	2	(PROGRESS PRINT) CV-216 Plan and Section
NB102-181/77 (Dwg. No. 735)	2	(PROGRESS PRINT) CV-216 General Arrangement

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: ***Description of Issue / Clarification / Reason for Request***

1. **To allow Nuna to construct road structure over the design culverts, a design centerline and profile is required. Nuna is unable to construct side slopes and determine a suitable tie in location with existing ground without this information.**
2. **Invert Elevations for the inlet and outlet of culverts have not been provided in currently issued versions of the drawings.**
3. **The drawings do not include swale / rip rap information to allow for Nuna to complete the desired grading. Rip Rap information has been provided in 2D format only.**
4. **Horizontal and Vertical Tolerances for inverts are not included on the currently issued drawings.**
5. **The drawings show a minimum of 1.0m spacing between culverts. Note 4 states that '*1 m (MIN.) OR A SUITABLE WIDTH TO ALLOW SPACE FOR COMPACTOR TO PASS BETWEEN CULVERTS.'***
6. **Only 1 culvert per crossing has a coordinate and elevation shown.**

Section 2: ***Corrective Action*** ☐ **Taken** ☐ **Suggested** ☒ **Required**

1. **Please provide a centerline alignment and profile for final grade for each crossing. The alignment and profile should extend to the tie in point on either side of the crossing.**
   a. **This information could be added to the drawings (coordinates and necessary curve data for alignment, and profile view with elevations noted at grade breaks) OR**
   b. **A 3D polyline that represents the final grade at the center line**
2. **Please provide inlet and outlet invert elevations for all culverts with an associated northing and easting.**
3. **Please provide 3D linework for the bottom of rip rap swale to allow for Nuna to achieve the desired elevations and 1% sloping.**
4. **Please provide the desired horizontal and vertical tolerances for culvert inverts.**
5. **Please confirm whether a minimum of 1.0m culvert spacing is to be held considering the planned packer width of roughly 0.5m. If 1.0m is to be held, Nuna may space the culverts at 1.10m apart. Please confirm this is acceptable / necessary.**
6. **Please confirm that all low flow culverts are at the same elevation as the culvert with provided coordinates.**

Potential Cost Impact?	**Yes ☐ No ☒ Unsure ☐**	**Potential Schedule Impact?**	**Yes ☐ No ☒ Unsure ☐**

Section 3: ***Approval Required by*** ☐ **Internal** ☐ **Client** ☒ **Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: ***RFI Response*** ☐ **Corrective Action Approved** ☐ **Correct as Follows**

Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman **(applicable as per the following disciplines)**

☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:

Document Transmittal

NUNA_RFI-002 - CV 57 and CV 59 Invert Elevations

Transmittal Number	0002	**Date**	February 7, 2024
Job Name & Number	Tote Road Culvert Upgrade	**Revision**	0

Submitted To	Baffinland Iron Mine – Projects Team
Prepared By	BIM Document Control (N. Lenos)
Nuna Entity	Nuna East Ltd.
Special Instructions	Please return response to RFI to BIMDC@nunagroup.com

Document Listing

Item	Copies	Document #	Rev	Description
1	1	NUNA_RFI-002 - CV 57 and CV 59 Invert Elevations.docx	0	NUNA_RFI-002 - CV 57 and CV 59 Invert Elevations

Sign, Date & Return to Document Control

To Be Completed by Recipient			
Received By		**Date Received**	
Signature		**Comments**	

Knight Piésold CONSULTING

Management System Certified by: bsi ISO 9001 ISO 14001 ISO 45001 CERTIFIED

MEMORANDUM

Date:	February 9, 2024	**File No.:**	NB102-00181/93-A.01
		Cont. No.:	NB24-00161
To:	Baruck Wile Rudolf Dietrich		
Copy To:	Dale Tulloch Jim Patterson Sharon Dyke BIM Document Control		
From:	Greg Johnstone		
Re:	**Permanent Crossing Plan - Round CSP Culverts, Response to Request for Information (RFI) No. 002**		

1.0 INTRODUCTION

This memo provide Knight Piésold Ltd.'s (KP) response to the Request for Information (RFI) No. 002 provided by Nuna on the Permanent Crossing Plan - Round CSP Culverts Issued for Construction Drawings (IFC). The response to the provided question is included below.

2.0 RESPONSE

Nuna Question No.1:

Nuna has received the following revised IFC drawings for CV-57 and CV-59.

NB102-181/77 – 730 Rev2

NB102-181/77 – 731 Rev2

NB102-181/77 – 725 Rev3

NB102-181/77 – 726 Rev3

The drawings do not include inlet or outlet invert elevations. The drawing contains Northings and Eastings only.

Please provide an Inlet and Outlet invert elevation for each culvert with an associated Northing and Easting on the drawings noted above.

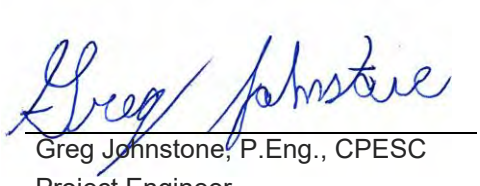
KP Response No.1:

Inlet and outlet elevations have been added to the drawings that will be issued with the Permanent Crossing Plan - Round CSP Culverts Report (181/77-4, Rev 2 IFC drawings).

3.0 REFERENCES

Nuna, 2024. Request for Information #002 to Baruck Wile and Rudolf Dietrich submitted by Jeff Roberts. January 9.

Yours truly,
Knight Piésold Ltd.

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: 

Attachments:
Nuna Request for Information #002

/gj

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:N/A		ITP Activity No.:N/A	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**			
RFI #	002	**Contract #**	4192708		
Originator:	Jeff Roberts	**RFI Submitted On:**	February 7, 2024		
Prepared By:	Jeff Roberts	**Requested Response By:**	February 9, 2024		
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team		

NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
NB102-181/77 (Dwg. No. 725)	3	CV-059 General Arrangement
NB102-181/77 (Dwg. No. 726)	3	CV-059 Plan and Sections
NB102-181/77 (Dwg. No. 730)	2	CV-057 General Arrangement
NB102-181/77 (Dwg. No. 731)	2	CV-057 Plan and Sections

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: *Description of Issue / Clarification / Reason for Request*

Nuna has received the following revised IFC drawings for CV-57 and CV-59.

NB102-181/77 – 730 Rev2
NB102-181/77 – 731 Rev2
NB102-181/77 – 725 Rev3
NB102-181/77 – 726 Rev3

The drawings do not include inlet or outlet invert elevations. The drawing contains Northings and Eastings only.

Section 2: *Corrective Action* ☐ **Taken** ☐ **Suggested** ☒ **Required**

1. **Please provide an Inlet and Outlet invert elevation for each culvert with an associated Northing and Easting on the drawings noted above.**

Potential Cost Impact?	Yes ☐ No ☒ Unsure ☐	Potential Schedule Impact?	Yes ☐ No ☒ Unsure ☐

Section 3: ***Approval Required by*** ☐ **Internal** ☐ **Client** ☒ **Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: ***RFI Response*** ☐ **Corrective Action Approved** ☐ **Correct as Follows**

Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman **(applicable as per the following disciplines)**

☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:

Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:

Document Transmittal

NUNA_RFI-003 - CV 216 Invert Elevations

Transmittal Number	0003	**Date**	February 7, 2024
Job Name & Number	Tote Road Culvert Upgrade	**Revision**	0

Submitted To	Baffinland Iron Mine – Projects Team
Prepared By	BIM Document Control (N. Lenos)
Nuna Entity	Nuna East Ltd.
Special Instructions	Please return response to RFI to BIMDC@nunagroup.com

Document Listing

Item	Copies	Document #	Rev	Description
1	1	NUNA_RFI-003 - CV 216 Invert Elevations.docx	0	NUNA_RFI-003 - CV 216 Invert Elevations

Sign, Date & Return to Document Control

To Be Completed by Recipient			
Received By		**Date Received**	
Signature		**Comments**	

Knight Piésold CONSULTING

Management System Certified by: bsi ISO 9001 ISO 14001 ISO 45001 CERTIFIED

MEMORANDUM

Date:	February 9, 2024	**File No.:**	NB102-00181/93-A.01
		Cont. No.:	NB24-00159
To:	Baruck Wile Rudolf Dietrich		
Copy To:	Dale Tulloch Jim Patterson Sharon Dyke BIM Document Control		
From:	Greg Johnstone		
Re:	**Permanent Crossing Plan - Round CSP Culverts, Response to Request for Information (RFI) No. 003**		

1.0 INTRODUCTION

This memo provides Knight Piésold Ltd.'s (KP) response to Request for Information (RFI) No. 003 provided by Nuna on the Permanent Crossing Plan - Round CSP Culverts Issued for Construction Drawings (IFC). The response to provided question is included below.

2.0 RESPONSE

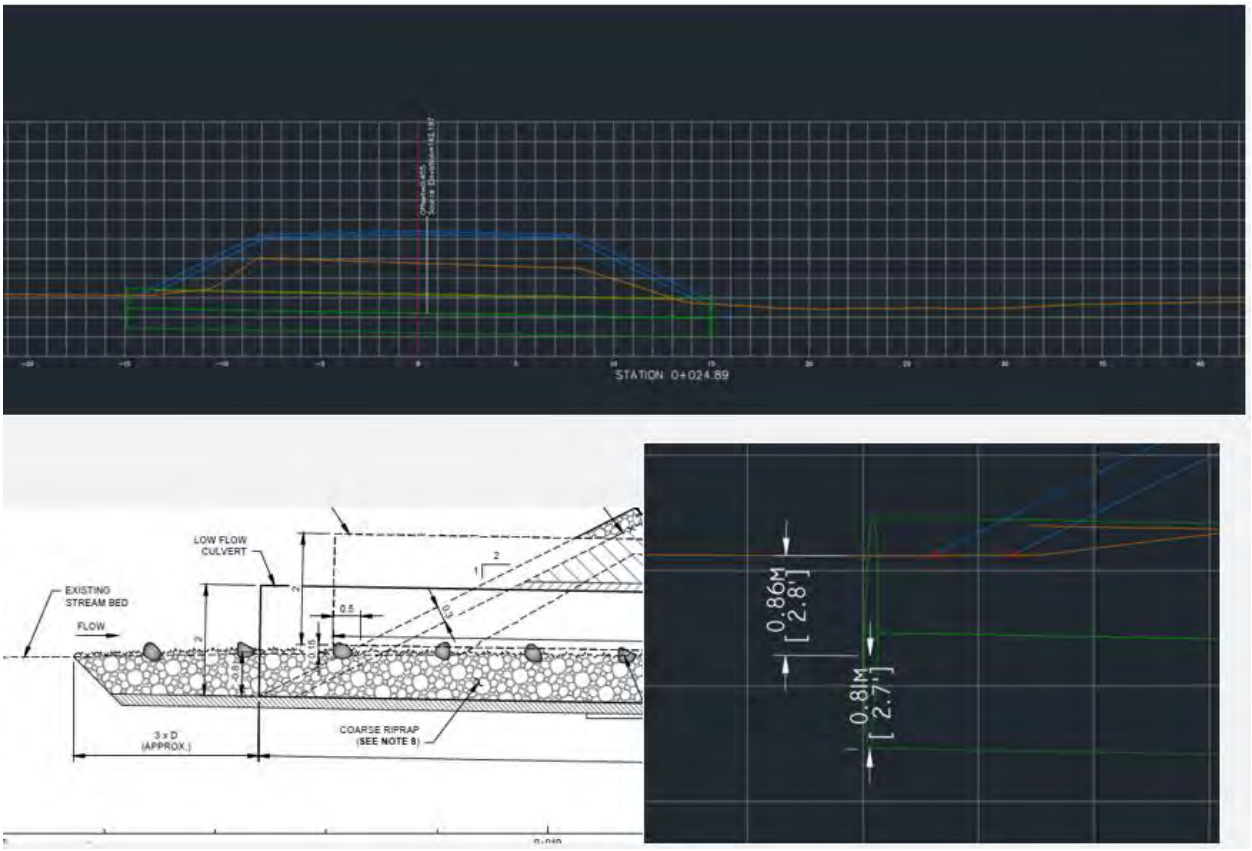
Nuna Question No.1:

Upon review of the drawings NB102-181/77 – 736 Rev2, it looks as though the invert elevations are about 0.80m too low to allow for the streambed material to tie into the existing stream bed.

The current elevations also show the downstream side slope covering the pipe. Assumptions have been made about the final grade for this exercise. Confirmation on road grade has been asked in a separate RFI, but will have an effect on this specific issue.

In the screenshots below, the orange line represents the existing ground elevation (Challenger, 2023). The green lines represent the 2.0m culvert (middle culvert).

Please provide revised invert elevations to allow for the culverts and installed streambed elevations to tie into existing elevations.



KP Response No.1:

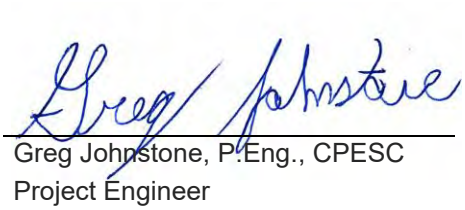
It appears that the provided sketch was drawn with the midpoint of the culvert set at the invert elevation. The inlet and outlet elevations shown on the drawings are for the bottom (invert) of the culvert.

Following the provided inlet and outlet invert elevations should allow for the culvert and streambed installation to tie into the existing elevations.

3.0 REFERENCES

Nuna, 2024. Request for Information #003 to Baruck Wile and Rudolf Dietrich submitted by Jeff Roberts. January 9.

Yours truly,
Knight Piésold Ltd.

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: 

Attachments:
Nuna Request for Information #003

/gj

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:	ITP Activity No.:N016	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**		
RFI #	003	**Contract #**	4192708	
Originator:	Jeff Roberts	**RFI Submitted On:**	February 7, 2024	
Prepared By:	Jeff Roberts	**Requested Response By:**	February 9, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
NB102-181/77 (Dwg. No. 736)	2	CV-216 Plan and Section
NB102-181/77 (Dwg. No. 735)	2	CV-216 General Arrangement

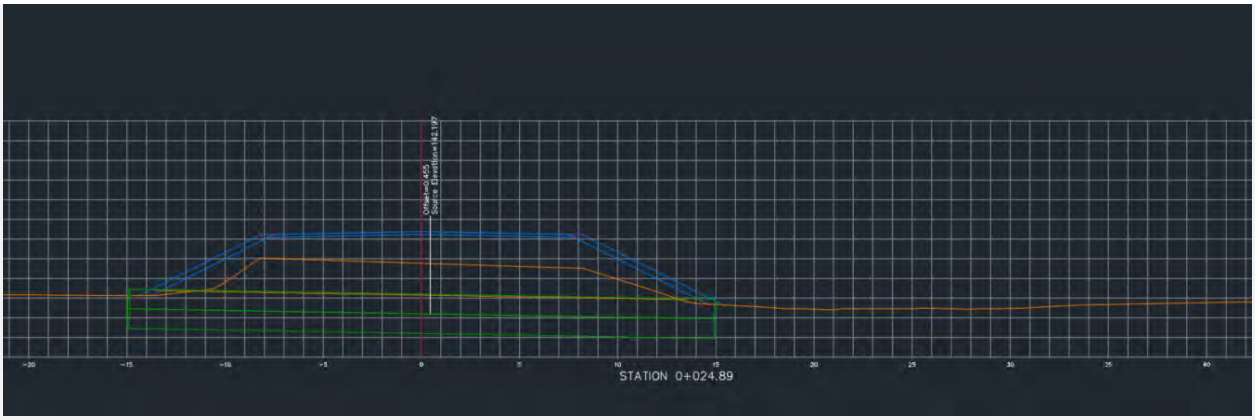
(Note: Sections 1, 2 & 3 are to be completed by the Originator)

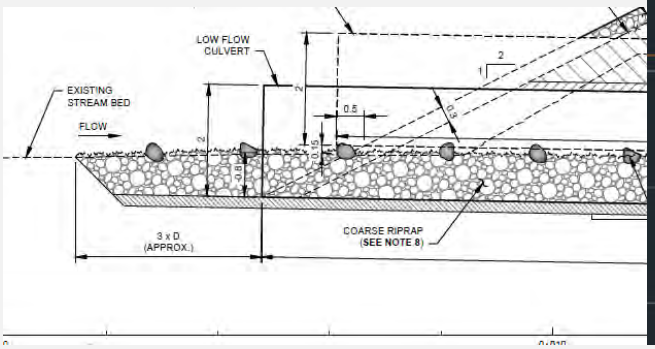
Section 1: ***Description of Issue / Clarification / Reason for Request***

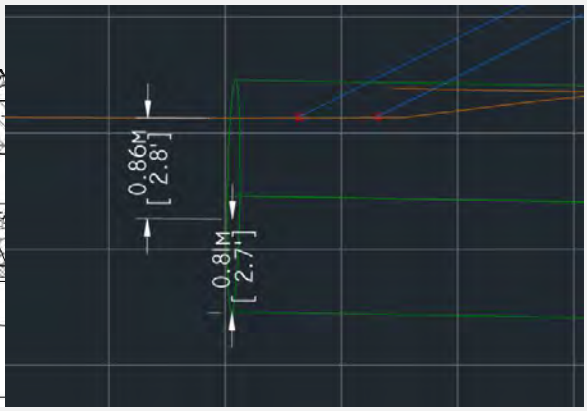
Upon review of the drawings NB102-181/77 – 736 Rev2, it looks as though the invert elevations are about 0.80m too low to allow for the streambed material to tie into the existing stream bed.

The current elevations also show the downstream side slope covering the pipe. Assumptions have been made about the final grade for this exercise. Confirmation on road grade has been asked in a separate RFI, but will have an effect on this specific issue.

In the screenshots below, the orange line represents the existing ground elevation (Challenger, 2023). The green lines represent the 2.0m culvert (middle culvert).







Section 2: ***Corrective Action***	☐ **Taken**	☐ **Suggested**	☒ **Required**

Please provide revised invert elevations to allow for the culverts and installed streambed elevations to tie into existing elevations.

Potential Cost Impact?	**Yes** ☐ **No** ☒ **Unsure** ☐	**Potential Schedule Impact?**	**Yes** ☐ **No** ☒ **Unsure** ☐

Section 3: ***Approval Required by***	☐ **Internal**	☐ **Client**	☒ **Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: ***RFI Response***	☐ **Corrective Action Approved**	☐ **Correct as Follows**

Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman (applicable as per the following disciplines)			
☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:	ITP Activity No.:N016	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**		
RFI #	003	**Contract #**	4192708	
Originator:	Jeff Roberts	**RFI Submitted On:**	February 7, 2024	
Prepared By:	Jeff Roberts	**Requested Response By:**	February 9, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
NB102-181/77 (Dwg. No. 736)	2	CV-216 Plan and Section
NB102-181/77 (Dwg. No. 735)	2	CV-216 General Arrangement

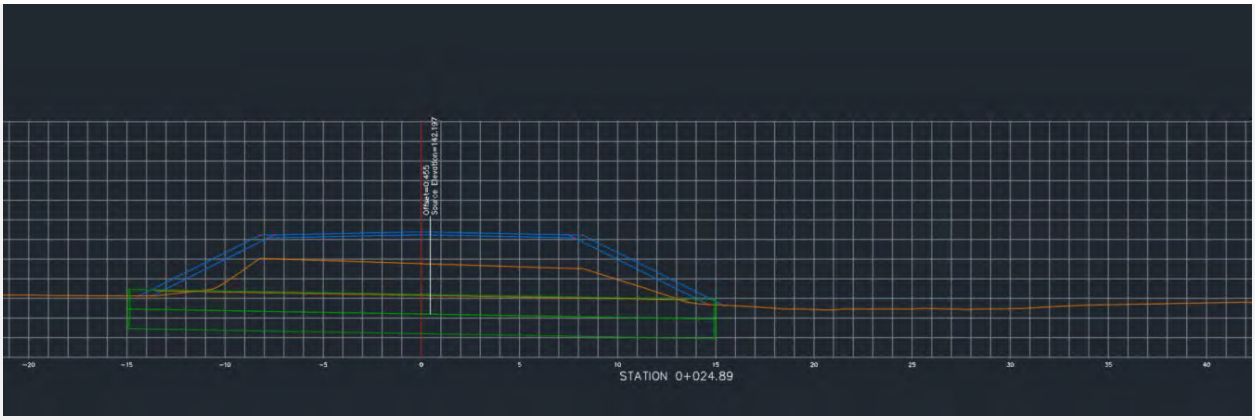
(Note: Sections 1, 2 & 3 are to be completed by the Originator)

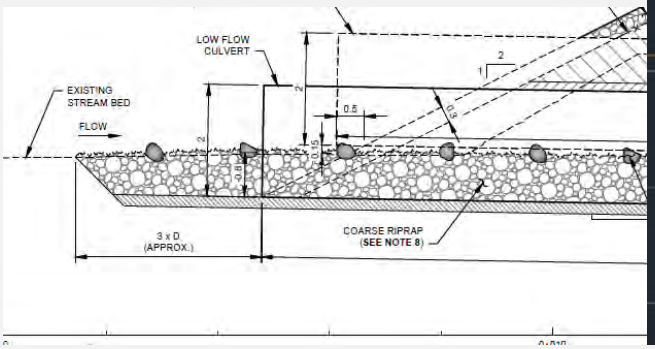
Section 1: ***Description of Issue / Clarification / Reason for Request***

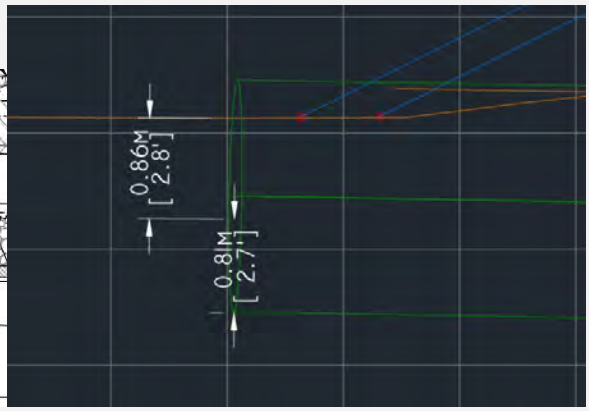
Upon review of the drawings NB102-181/77 – 736 Rev2, it looks as though the invert elevations are about 0.80m too low to allow for the streambed material to tie into the existing stream bed.

The current elevations also show the downstream side slope covering the pipe. Assumptions have been made about the final grade for this exercise. Confirmation on road grade has been asked in a separate RFI, but will have an effect on this specific issue.

In the screenshots below, the orange line represents the existing ground elevation (Challenger, 2023). The green lines represent the 2.0m culvert (middle culvert).







Section 2: ***Corrective Action***	☐ **Taken**	☐ **Suggested**	☒ **Required**

Please provide revised invert elevations to allow for the culverts and installed streambed elevations to tie into existing elevations.

Potential Cost Impact?	**Yes** ☐ **No** ☒ **Unsure** ☐	**Potential Schedule Impact?**	**Yes** ☐ **No** ☒ **Unsure** ☐

Section 3: ***Approval Required by***	☐ **Internal**	☐ **Client**	☒ **Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: ***RFI Response***	☐ **Corrective Action Approved**	☐ **Correct as Follows**

Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman (applicable as per the following disciplines)			
☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:

MEMORANDUM

Date:	February 12, 2024	**File No.:**	NB102-00181/93-A.01
		Cont. No.:	NB24-00167
To:	Baruck Wile, Rudolf Dietrich (BIM)		
Copy To:	Dale Tulloch, Jim Patterson, Sharon Dyke, Abid Najey, BIM Document Control (BIM)		
From:	Greg Johnstone		
Re:	**Permanent Crossing Plan - Round CSP Culverts, Response to Request for Information (RFI) No. 004**		

1.0 INTRODUCTION

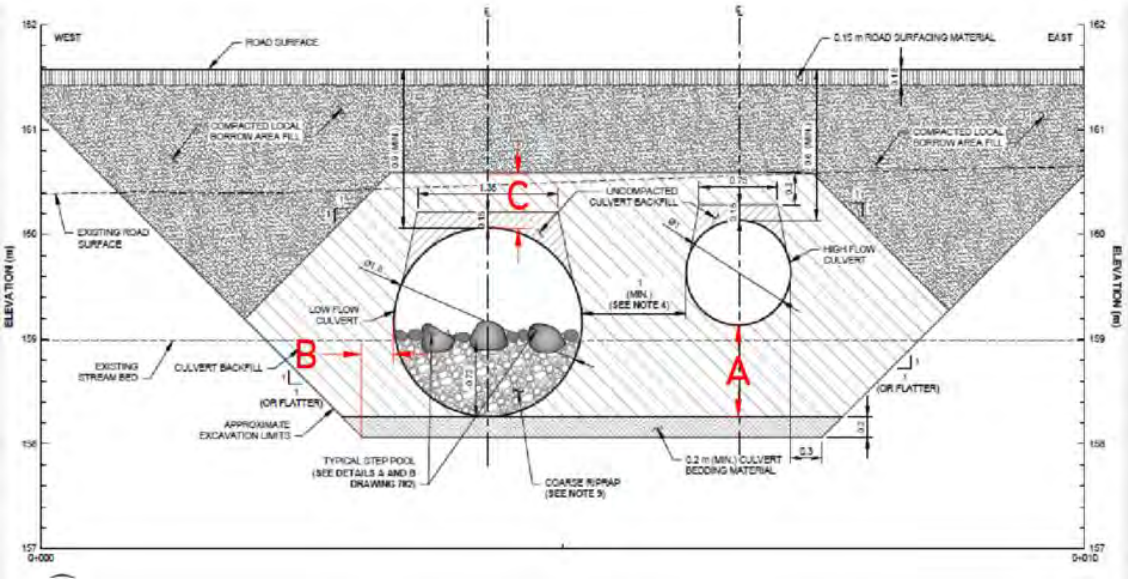
This memo provides Knight Piésold Ltd.'s (KP) response to Request for Information (RFI) No. 004 (Nuna, 2024) provided by Nuna on the Permanent Crossing Plan - Round CSP Culverts Issued for Construction Drawings (IFC). Responses to the provided questions are included below.

2.0 RESPONSE

Nuna Question No. 1:

The section view on Drawing NB102-181/77 – 741 Is missing key data to allow Nuna to determine the elevation of the High Flow Culvert, Bedding material extents, and Culvert Backfill Material cover depth.

- *Please provide Dimension A in the above screen shot. This will be used to confirm the invert elevation of the High Flow Culvert*
- *It is currently assumed that Dimension B is 0.30m. Please confirm.*
- *Please provide Dimension C. This will be used to determine the intended cover depth over the top of the Low Flow Culvert*



KP Response No.1:

The dimensions are as follows:

- Dimension A: The measurement for A is 0.87 m (0.72 m + 0.15 m). The 0.15 m dimension between the low flow culvert material and the invert of the high flow culvert was inadvertently left off Drawing 741.
- Dimension B: Nuna's assumption is correct. The measurement for B is 0.3 m. This dimension was inadvertently left off Drawing 741.
- Dimension C: For this location, the measurement for C is 0.52 m (0.15 m + 0.37 m).

3.0 REFERENCES

Nuna, 2024. *Request for Information #004*. Submitted by: Jeff Roberts. Submitted to: Baruck Wile and Rudolf Dietrich. January 9.

Yours truly,
Knight Piésold Ltd.

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:

Attachments:
Nuna Request for Information #004

/gj

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:	ITP Activity No.:N016	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**	4192708	
RFI #	004	**Contract #**	PO#	
Originator:	Jeff Roberts	**RFI Submitted On:**	February 8, 2024	
Prepared By:	Jeff Roberts	**Requested Response By:**	February 10, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

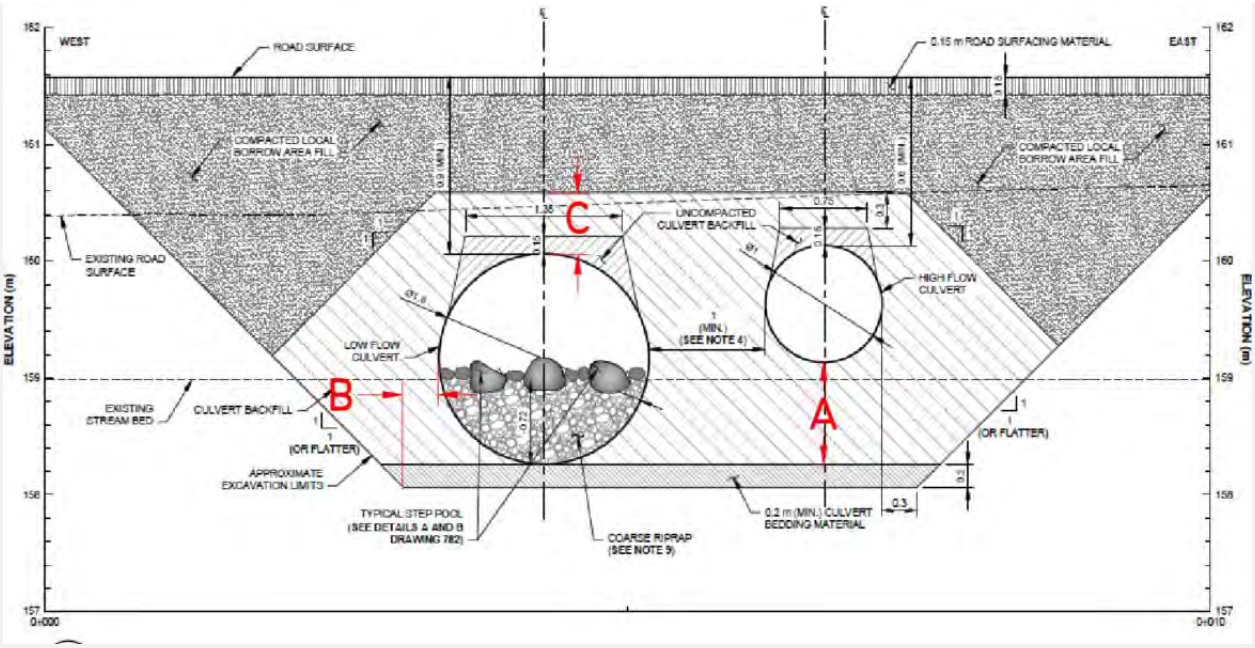
NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
NB102-181/77 (Dwg. No. 741)	**2**	**CV-216 Plan and Section**

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: ***Description of Issue / Clarification / Reason for Request***

The section view on Drawing NB102-181/77 – 741 Is missing key data to allow Nuna to determine the elevation of the High Flow Culvert, Bedding material extents, and Culvert Backfill Material cover depth



Section 2: ***Corrective Action*** ☐ **Taken** ☐ **Suggested** ☒ **Required**

1. **Please provide Dimension A in the above screen shot. This will be used to confirm the invert elevation of the High Flow Culvert**
2. **It is currently assumed that Dimension B is 0.30m. Please confirm.**
3. **Please provide Dimension C. This will be used to determine the intended cover depth over the top of the Low Flow Culvert**

Potential Cost Impact?	**Yes** ☐ **No** ☒ **Unsure** ☐	**Potential Schedule Impact?**	**Yes** ☐ **No** ☒ **Unsure** ☐

Section 3: ***Approval Required by*** ☐ **Internal** ☐ **Client** ☒ **Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: ***RFI Response*** ☐ **Corrective Action Approved** ☐ **Correct as Follows**

Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman (applicable as per the following disciplines)			
☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:N/A	ITP Activity No.:N/A	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**	4192708	
RFI #	005 **REV 1**	**Contract #**	PO#	
Originator:	Darko Filipic	**RFI Submitted On:**	March 4, 2024	
Prepared By:	Darko Filipic	**Requested Response By:**	February 10, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
20240212-IFC Permanent Crossing Plan - CSP Culvert Installations r2 - IFCs ONLY	**2**	**IFC Drawings provided by BIM on March 3, 2024**
NGCQF 08a IFC Drawing Index - As Built Log_240304		**Nuna IFC Drawing Log**

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: *Description of Issue / Clarification / Reason for Request*

REV 0: In order to ensure that Nuna is working from the most current IFC designs for the Tote Road culverts and to ensure that every member of our team is working from the same set of drawings, Nuna has set up an internal Document Control account for our Baffinland Iron Mines projects.
The email address for Nuna's Document Control is BIMDC@nunagroup.com

REV 1: NUNA received a copy of the Permanent Crossing Plan IFC drawings from BIM via thumb drive on March 3, 2024.

Section 2: *Corrective Action* ☐ **Taken** ☐ **Suggested** ☒ **Required**

REV 0: Please provide Nuna's Document Control with the most current IFC Drawings, Specifications and Shop Drawings for the Tote Road Culverts.
Nuna's Document Control will stamp them as "Received" and issue them for use by our team. We will also remove any superseded copies from circulation.

REV1: Please confirm that the drawings and revisions provided by BIM as listed on the attached IFC Drawing Log are the most complete and up-to-date drawings and specification for use on the 2024 Tote Road Culvert Upgrade project.

Potential Cost Impact?	Yes ☐ No ☒ Unsure ☐	Potential Schedule Impact?	Yes ☐ No ☒ Unsure ☐

Section 3: ***Approval Required by*** ☐ **Internal** ☒ **Client** ☒ **Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: ***RFI Response*** ☐ **Corrective Action Approved** ☐ **Correct as Follows**

REV 0: Permanent Crossing Plan IFC Drawings provided from BIM via thumb drive on March 3, 2024.

Rev 1:The Permanent Crossing Plan Round CSP Culverts drawings REV2, sealed by Greg Johnstone February 8, 2024 are the latest IFC drawings. They were forwarded to Nuna document controls via Kiteworks on March 12th.

Response by:	Michael Burns	Date:	March 12, 2024
Reference Document / Tag # / Attachment		Rev	Comment

5. Distribution: Superintendents and Area Foreman **(applicable as per the following disciplines)**

☒Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☒Management	☒QC Department	☐Originator

6. Completion:

Completion Manager/Supervisor:	Completion Signature for QA/QC:	Completion Red-Line Drawings:
Signature:	Signature:	Signature:
Date:	Date:	Date:

Document Transmittal

NUNA_RFI-007 Culvert Subbase Fill Material and Spec

Transmittal Number	0007	**Date**	March 2, 2024
Job Name & Number	Tote Road Culvert Upgrade	**Revision**	0

Submitted To	Baffinland Iron Mine – Projects Team
Prepared By	BIM Document Control (N. Lenos)
Nuna Entity	Nuna East Ltd.
Special Instructions	Please return response to RFI to BIMDC@nunagroup.com

Document Listing

Item	Copies	Document #	Rev	Description
1	1	NUNA_RFI-007 Culvert Subbase Fill Material and Spec.docx	0	NUNA_RFI-007 Culvert Subbase Fill Material and Spec

Sign, Date & Return to Document Control

To Be Completed by Recipient			
Received By		**Date Received**	
Signature		**Comments**	

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

ITP No.: N/A	ITP Activity No.:N/A	Seq. No.:

Project Name:	BIM Culvert	**Project #**	4192708
RFI #	007	**Contract #**	PO 950000
Originator:	Mason Fischer	**RFI Submitted On:**	March 1, 2024
Prepared By:	Darko Filipic	**Requested Response By:**	March 3, 2024
Submitted To:	Alan Knowlton	**Company:**	BIM

NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
NB24-00197 - Memo - Response to RFI-006 - Blasting Backfill Procedures.pdf	**0**	**KP Response to RFI-006 - Blasting Backfill Procedures**

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: ***Description of Issue / Clarification / Reason for Request***

As anticipated in RFI-006 the blasting of the culverts has created areas of over blast that are significantly deeper than the IFC design.

Nuna has received verbal direction in the field from the KP Engineer regarding the backfill material to be used in the over-blasted sections of the culverts as well as the placement specifications.
Nuna requires formal confirmation of the direction provided.

Section 2: ***Corrective Action*** ☐ **Taken** ☐ **Suggested** ☒ **Required**

Please confirm the following direction provided for the culvert subbase backfill material and placement specifications:

- **Material to be used is 32mm minus crushed aggregate (supplied by BIM).**
- **Lift thickness is to be 200mm compacted.**
- **Compaction method is to be 6 passes of 1000lb plate tamper.**
-

Potential Cost Impact?	**Yes ☐ No ☒ Unsure ☐**	**Potential Schedule Impact?**	**Yes ☐ No ☒ Unsure ☐**

Section 3: *Approval Required by* ☐ Internal ☐ Client ☒ Engineering

(Note Section 4 to be completed by the recipient of the RFI)			
Section 4: *RFI Response* ☐ **Corrective Action Approved** ☐ **Correct as Follows**			
Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman **(applicable as per the following disciplines)**			
☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:

Document Transmittal

RFI-008 Design Change 01

Transmittal Number	0009	**Date**	March 5, 2024
Job Name & Number	Tote Road Culvert Upgrade	**Revision**	0

Submitted To	Baffinland Iron Mine – Projects Team
Prepared By	BIM Document Control (N. Lenos)
Nuna Entity	Nuna East Ltd.
Special Instructions	Please return response to RFI to BIMDC@nunagroup.com

Document Listing

Item	Copies	Document #	Rev	Description
1	1	NUNA_RFI-008 - Design Change 01.docx	0	NUNA_RFI-008 - Design Change 01
2	1	Design Change 01 - Culvert Bedding Material.pdf	0	Design Change 01 - Culvert Bedding Material

Sign, Date & Return to Document Control

To Be Completed by Recipient			
Received By		**Date Received**	
Signature		**Comments**	

MARY RIVER – TOTE ROAD ROUND CSP CULVERTS

REQUEST FOR APPROVAL BY DESIGN OFFICE FOR CHANGE

February 26, 2024

CLIENT:	**Baffinland Iron Mines Corporation**	**PROJECT NO.:**	**181/93**
TO:	**Baruck Wile and Rudolf Dietrich**	**FILE NO:**	**.F11**
CC:	**Rudolf Dietrich, Baruck Wile, Michael Burns, Frank Hynes, Dale Tulloch, Abid Najey, Jim Patterson (Baffinland), Michael Johnson (NSC), Richard Cook, Greg Johnstone, Michael Bourdignon, Darren Kocken, Matthew Trask, Mackenzie Aiken (KP)**	**REF. NO.:**	**11**
CHANGE/SUBSTITUTION NO.:	**CVDC-01**	**PAGES:**	**2**

AREA OF WORK:

This design change form is for the culvert bedding material.

GENERAL AREA OF PROPOSED WORK:

The purpose of the design change is to change part of the 25 mm minus bedding material (Fine Culvert Backfill) to a finer 3/16 inch minus material to meet the culvert manufacturer's recommendations. The design change will result in a 50 mm (2 inch) minimum thick, ½ culvert diameter wide, uncompacted zone of 3/16 inch minus crushed material being placed under the culvert(s) in place of the 25 mm minus material (See Figure 1). This design change will apply to all 10 round CSP culvert installations.

This change was requested by KP following receipt of recommendations from the culvert manufacturer (Armtec) to use a smaller size material that will fit between the round CSP culvert corrugations.

No. of Sheets Attached: 0

Reference Drawings: Dwg. No. 706 R2

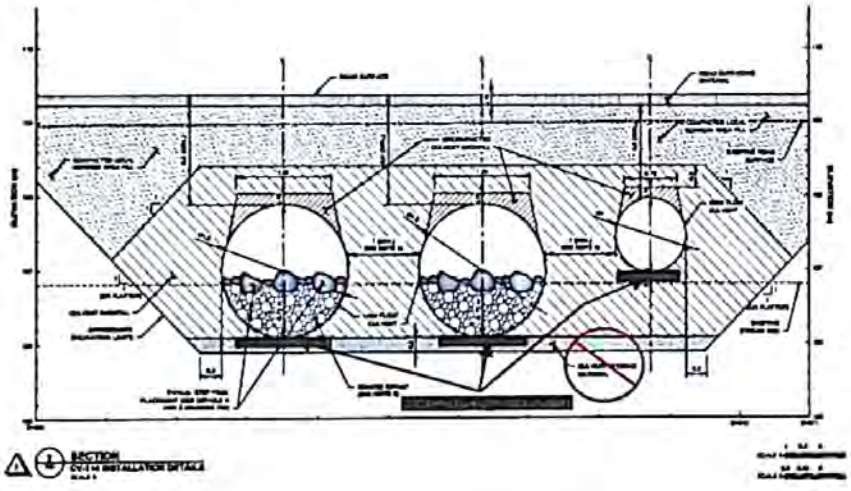


Figure 1 Example of design change shown on Drawing 706 R2 CV-114

REQUEST FOR APPROVAL BY DESIGN OFFICE FOR CHANGE

February 26, 2024

Prepared:

Name: For: Greg Johnstone — Michael Bourdignon
Title: Project Engineer — Geological Engineering
Signature:

FOR DESIGN OFFICE USE

Date Received: February 27, 2024

Proposed change substitution (*circle one*): Not Approved / Approved as Submitted / Approved as Amended:

No. of Sheets Attached: 0 (amendments only)

Reviewed:
Name: Andy Phillips
Title: Senior Engineer
Signature:

Approved:
Name:
Title: Specialist Engineer
Signature: KEVIN HAWTON

Date Returned:

Knight Piésold CONSULTING

MEMORANDUM

Date:	March 15, 2024	**File No.:**	NB102-00181/93-A.01
		Cont. No.:	NB24-00320
To:	Baruck Wile, Baffinland Iron Mines Corporation Rudolf Dietrich, Baffinland Iron Mines Corporation		
Copy To:	Dale Tulloch, Baffinland Iron Mines Corporation Jim Patterson, Baffinland Iron Mines Corporation Michael Burns, Baffinland Iron Mines Corporation Carla Crotty, Baffinland Iron Mines Corporation Sharon Dyke, Baffinland Iron Mines Corporation SCP Admin BIM Document Control		
From:	Greg Johnstone		
Re:	**Permanent Crossing Plan - Round CSP Culverts, Response to Request for Information (RFI) No. 008**		

1.0 INTRODUCTION

This memo provides Knight Piésold Ltd.'s (KP) response to Request for Information (RFI) No. 008 (attached) provided by Nuna on the Permanent Crossing Plan - Round CSP Culverts Issued for Construction Drawings (IFC). Responses to the provided questions are included below.

2.0 RESPONSE

Nuna Question No. 1 (Nuna, 2024):

Nuna has been provided with a copy of a Design Change Request 01 which affects the design of the culvert bedding material for all 10 round CSP culverts.

The details shown on Figure 1 of the scanned copy Nuna received are unclear.
Nuna is currently in the process of constructing the backfill in the over-blasted portion of CV-059, so if this design change is to be acted upon Nuna requires timely confirmation of this change from the BIM Project Representative.

Nuna also requires revised IFC drawings that clearly show the details of the change, so they can be modelled by our surveyors and laid out in the field.

KP Response No. 1:

As stated in Design Change 01, the 3/16" minus material will be placed in a minimum 50 mm (2") thick uncompacted lift. This material will be placed where the culvert has intimate contact with the foundation (approximately ½ the culvert diameter). Please see Figure 1 as an example.

Revised IFC drawings will not be provided for this design change. The surveyor can stake out the limits of the 3/16" minus material by offsetting from the culvert centreline.

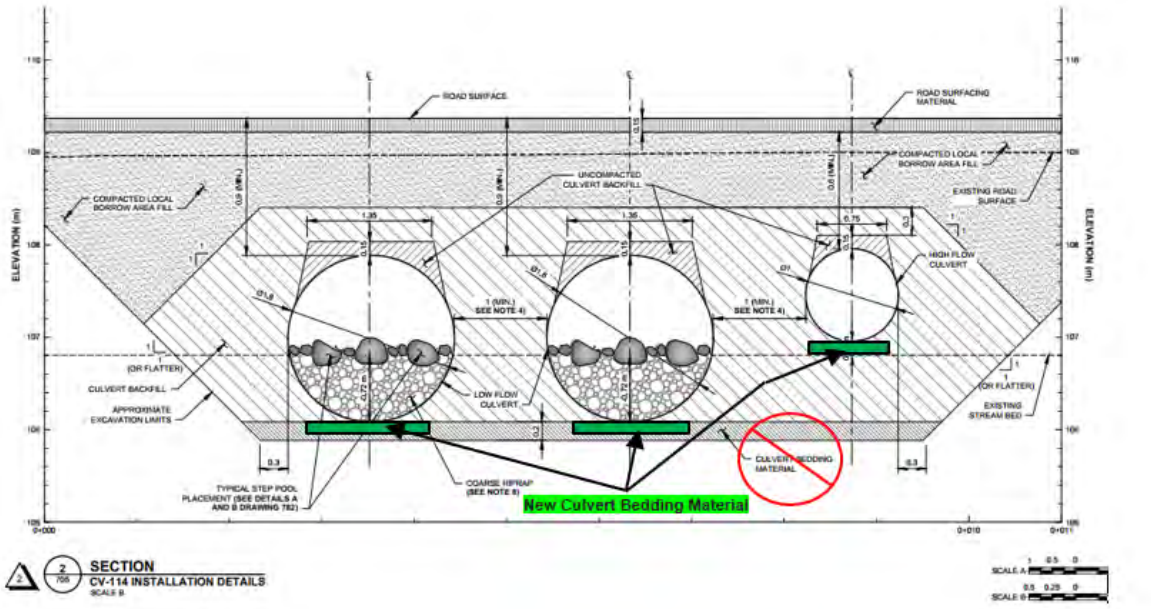


Figure 1 Example of Design Change Shown on Drawing No. 706 R2 CV-114

3.0 REFERENCES

Nuna, 2024. *Request for Information #008*. Submitted to: Baruck Wile and Rudolf Dietrich. Submitted by: Darko Filipic. March 5.

Yours truly,
Knight Piésold Ltd.

Prepared: Greg Johnstone

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:

Attachments:
Nuna Request for Information #008

/gj

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:N/A		ITP Activity No.:N/A	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**		PO 95000000473	
RFI #	008	**Contract #**		4192708	
Originator:	Mason Fischer	**RFI Submitted On:**		March 5, 2024	
Prepared By:	Darko Filipic	**Requested Response By:**		March 7, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**		BIM Projects Team	

NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
CVDC-01	0	Design Change 01 – Culvert Bedding Material

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: *Description of Issue / Clarification / Reason for Request*

Nuna has been provided with a copy of a Design Change Request 01 which affects the design of the culvert bedding material for all 10 round CSP culverts.

The description of the change is as follows: *The purpose of the design change is to change part of the 25 mm minus bedding material (Fine Culvert Backfill) to a finer 3/16 inch minus material to meet the culvert manufacturer's recommendations. The design change will result in a 50 mm (2 inch) minimum thick, 1/2 culvert diameter wide, uncompacted zone of 3/16 inch minus crushed material being placed under the culvert(s) in place of the 25 mm minus material (See Figure 1)…*

The details shown on Figure 1 of the scanned copy Nuna received are unclear.

Section 2: *Corrective Action* ☐ **Taken** ☐ **Suggested** ☒ **Required**

Nuna is currently in the process of constructing the backfill in the over-blasted portion of CV-059, so if this design change is to be acted upon Nuna requires timely confirmation of this change from the BIM Project Representative.

Nuna also requires revised IFC drawings that clearly show the details of the change, so they can be modelled by our surveyors and laid out in the field.

Potential Cost Impact?	**Yes ☒ No ☐ Unsure ☐**	**Potential Schedule Impact?**	**Yes ☒ No ☐ Unsure ☐**

Section 3: *Approval Required by*	☐ Internal	☒ Client	☒ Engineering

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: *RFI Response* ☐ **Corrective Action Approved** ☐ **Correct as Follows**

Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman (applicable as per the following disciplines)			
☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:N/A		ITP Activity No.:N/A	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**		PO 95000000473	
RFI #	008	**Contract #**		4192708	
Originator:	Mason Fischer	**RFI Submitted On:**		March 5, 2024	
Prepared By:	Darko Filipic	**Requested Response By:**		March 7, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**		BIM Projects Team	

NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
CVDC-01	0	Design Change 01 – Culvert Bedding Material

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: *Description of Issue / Clarification / Reason for Request*

Nuna has been provided with a copy of a Design Change Request 01 which affects the design of the culvert bedding material for all 10 round CSP culverts.

The description of the change is as follows: *The purpose of the design change is to change part of the 25 mm minus bedding material (Fine Culvert Backfill) to a finer 3/16 inch minus material to meet the culvert manufacturer's recommendations. The design change will result in a 50 mm (2 inch) minimum thick, 1/2 culvert diameter wide, uncompacted zone of 3/16 inch minus crushed material being placed under the culvert(s) in place of the 25 mm minus material (See Figure 1)…*

The details shown on Figure 1 of the scanned copy Nuna received are unclear.

Section 2: *Corrective Action* ☐ **Taken** ☐ **Suggested** ☒ **Required**

Nuna is currently in the process of constructing the backfill in the over-blasted portion of CV-059, so if this design change is to be acted upon Nuna requires timely confirmation of this change from the BIM Project Representative.

Nuna also requires revised IFC drawings that clearly show the details of the change, so they can be modelled by our surveyors and laid out in the field.

Potential Cost Impact?	**Yes ☒ No ☐ Unsure ☐**	**Potential Schedule Impact?**	**Yes ☒ No ☐ Unsure ☐**

Section 3: *Approval Required by*	☐ Internal	☒ Client	☒ Engineering

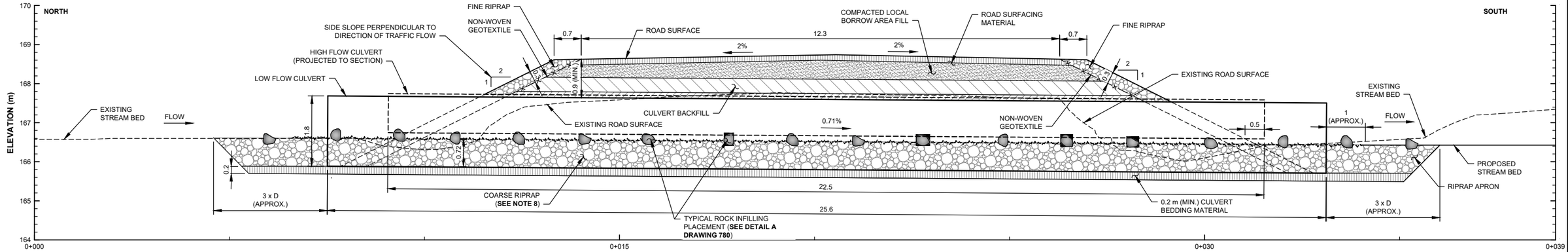
(Note Section 4 to be completed by the recipient of the RFI)

Section 4: *RFI Response* ☐ **Corrective Action Approved** ☐ **Correct as Follows**

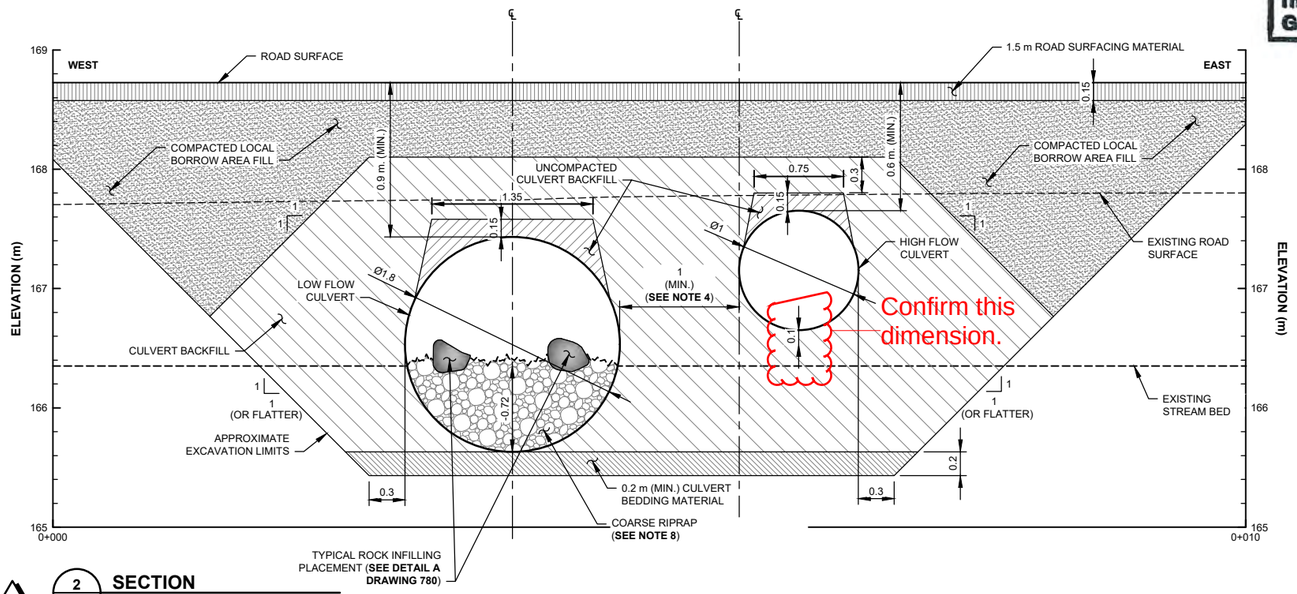
Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman (applicable as per the following disciplines)			
☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:



2 1/750 **SECTION**
CV-001 PROFILE
SCALE A



2 2/750 **SECTION**
CV-001 INSTALLATION DETAILS
SCALE B

PERMIT TO PRACTICE
KNIGHT PIESOLD LTD.
Signature
Date 2024-02-08
PERMIT NUMBER: P 547
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

Nuna Document Control Received 04-March-2024

Nuna Document Control Issued for Use

LEGEND:
- COMPACTED LOCAL BORROW AREA FILL
- UNCOMPACTED CULVERT BACKFILL
- CULVERT BACKFILL
- ROAD SURFACING MATERIAL
- COARSE RIPRAP
- FINE RIPRAP
- CULVERT BEDDING MATERIAL
- EXISTING STREAM BED
- NON-WOVEN GEOTEXTILE

FISH PASSAGE PARAMETERS	
MODELLED CULVERT JULY OUTLET VELOCITY (m/s)	0.33
MODELLED CULVERT AUGUST OUTLET VELOCITY (m/s)	0.26
MAXIMUM SWIM DISTANCE (m)	41

RIPRAP LOCATIONS	RIPRAP SIZE (mm)	MATERIAL
INLET/OUTLET APRON	300 (D_{50})	COARSE RIPRAP
BANK STABILIZATION	150 (D_{50})	FINE RIPRAP
CULVERT INFILLING	300 (D_{50})	COARSE RIPRAP
IN-CULVERT BOULDERS	300 (MIN.)	COARSE RIPRAP
STEP POOL	NOT REQUIRED	N/A
BOULDER CLUSTER	NOT REQUIRED BY DFO SPOT TOOL	N/A

NOTES:
1. COORDINATE GRID IS UTM NAD83, ZONE 17.
2. CULVERT SURVEYS AND DRONE IMAGERY PROVIDED BY KITIKMEOT CHALLENGER, AUGUST 2023.
3. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
4. 1 m (MIN.) OR A SUITABLE WIDTH TO ALLOW SPACE FOR COMPACTOR TO PASS BETWEEN CULVERTS.
5. VEHICLE SAFETY BERMS ARE REQUIRED IN AREAS WITH A DROP OFF GREATER THAN 3.0 m.
6. MATERIAL SPECIFICATIONS INCLUDED ON **DRAWING 703**.
7. CULVERT INFILL MATERIAL TO BE INSPECTED DURING AND AFTER FIRST FRESHET FOLLOWING CONSTRUCTION TO DETERMINE IF ADDITIONAL MATERIAL IS REQUIRED.
8. INTERSTITIAL SPACES OF THE RIPRAP ON THE CHANNEL BED SHALL BE FILLED WITH CREEK BED MATERIAL (OR OTHER MATERIAL APPROVED BY THE ENGINEER) AND GRADED TO MATCH THE ADJACENT CHANNEL BED ELEVATION. THE CONTRACTOR SHALL MINIMIZE VOID SPACE BETWEEN RIPRAP STONES SUCH THAT CREEK FLOWS ARE MAINTAINED ABOVE THE CHANNEL BED DURING LOW-FLOW CONDITIONS. THE FINISHED SURFACE TO BE ROUGHENED TO MIMIC ADJACENT STREAM BED CONDITIONS.

DRG. NO.	REFERENCE DRAWINGS
703	CULVERT FILL MATERIALS AND GEOSYNTHETICS SPECIFICATIONS
750	CSP CULVERTS - CV-001 GENERAL ARRANGEMENT
780	CULVERT WORKS - TYPICAL DETAILS

ISSUED FOR CONSTRUCTION

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

REVISIONS

REGISTERED PROFESSIONAL ENGINEER — G.M. JOHNSTONE — LICENSEE — 2024-02-08 — NT/NU

Knight Piésold CONSULTING

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

PERMANENT CROSSING PLAN
ROUND CSP CULVERTS - CV-001
PLAN AND SECTION

P/A NO.	DRAWING NO.	REVISION
NB102-181/77	751	2

SAVED: I:\102\00181177A\Acad\DWGS\750 751\750 751 R2_ 2/8/2024 2:06:06 PM, , ASIMPSON PRINTED: 2/8/2024 2:06:28 PM, 751, , ASIMPSON ACAD VERSION: 24.2S (LMS TECH)

Document Transmittal

RFI-009 CV-001 IFC Dimension (High Flow Invert)

Transmittal Number	0010	**Date**	March 7, 2024
Job Name & Number	Tote Road Culvert Upgrade	**Revision**	0

Submitted To	Baffinland Iron Mine – Projects Team
Prepared By	BIM Document Control (N. Lenos)
Nuna Entity	Nuna East Ltd.
Special Instructions	Please return response to RFI to BIMDC@nunagroup.com

Document Listing

Item	Copies	Document #	Rev	Description
1	1	NUNA_RFI-009 - CV001 IFC Dimension (High Flow Invert).docx	0	NUNA_RFI-009 - CV001 IFC Dimension (High Flow Invert)
2	1	751r2 PCP - Round CSP Culverts - CV-001 - Plan and Section.pdf	0	751r2 PCP - Round CSP Culverts - CV-001 - Plan and Section

Sign, Date & Return to Document Control

To Be Completed by Recipient			
Received By		**Date Received**	
Signature		**Comments**	

MEMORANDUM

Date:	March 15, 2024	**File No.:**	NB102-00181/93-A.01
		Cont. No.:	NB24-00321
To:	Baruck Wile, Baffinland Iron Mines Corporation Rudolf Dietrich, Baffinland Iron Mines Corporation		
Copy To:	Dale Tulloch, Baffinland Iron Mines Corporation Jim Patterson, Baffinland Iron Mines Corporation Michael Burns, Baffinland Iron Mines Corporation Carla Crotty, Baffinland Iron Mines Corporation Sharon Dyke, Baffinland Iron Mines Corporation SCP Admin BIM Document Control		
From:	Greg Johnstone		
Re:	**Permanent Crossing Plan - Round CSP Culverts, Response to Request for Information (RFI) No. 009**		

1.0 INTRODUCTION

This memo provides Knight Piésold Ltd.'s (KP) response to Request for Information (RFI) No. 009 (attached) provided by Nuna on the Permanent Crossing Plan - Round CSP Culverts Issued for Construction Drawings (IFC). Responses to the provided questions are included below.

2.0 RESPONSE

Nuna Question No. 1 (Nuna, 2024):

Upon review of the IFC drawing for CV001, the dimension for the distance between the bottom of the high flow culvert and streambed material is not consistent with the section views for the other culverts. The dimension arrows do not line up with the "Existing Stream Bed", making it unclear what the reference point for the highlighted dimension is.

KP Response No. 1:

This in an error in the presentation of this dimension. The dimension should be 0.15 m, consistent with the other IFC drawings (See Figure 1).

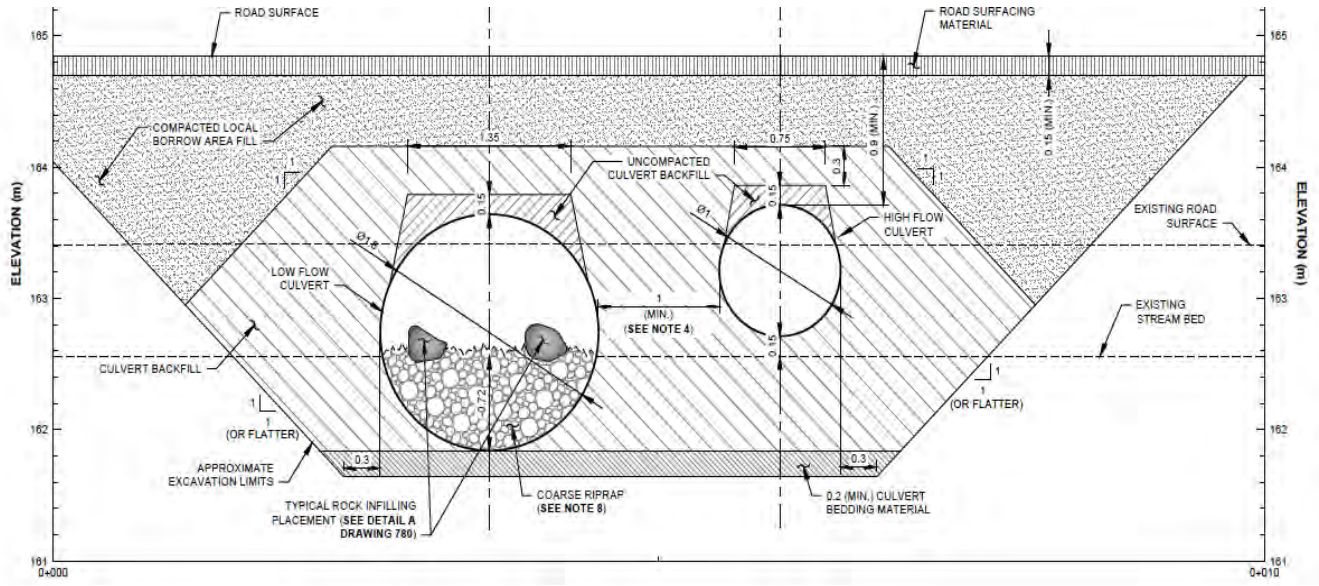


Figure 1 High Flow Culvert Dimension between Streambed and Invert

3.0 REFERENCES

Nuna, 2024. *Request for Information #009*. March 7. Submitted to: Baruck Wile and Rudolf Dietrich. Submitted by: Jeff Roberts.

Yours truly,
Knight Piésold Ltd.

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:

Attachments:
Nuna Request for Information #009

/gj

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.: N/A	ITP Activity No.:N/A	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**	PO 95000000473	
RFI #	009	**Contract #**	4192708	
Originator:	Jeff Roberts	**RFI Submitted On:**	Mar 7, 2024	
Prepared By:	Jeff Roberts	**Requested Response By:**	Mar 9, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

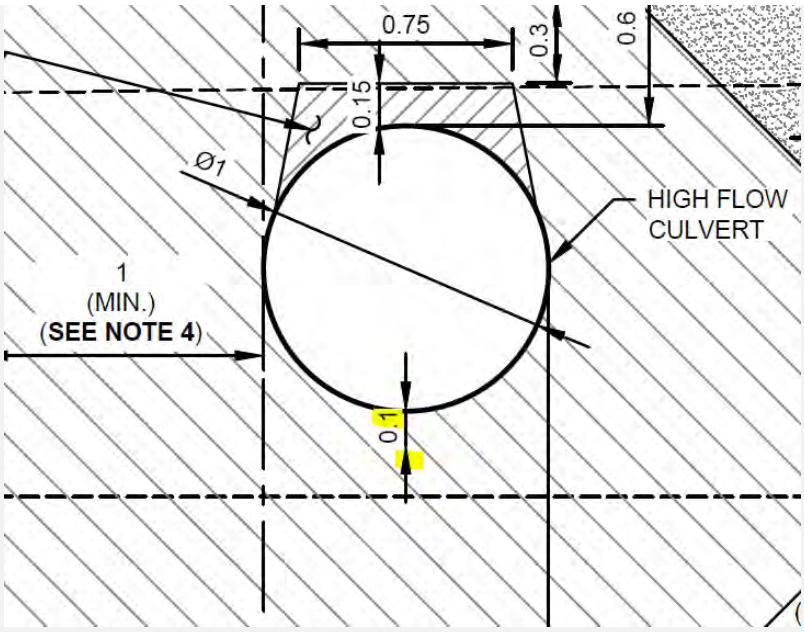
NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
751r2 PCP - Round CSP Culverts - CV-001 - Plan and Section	**2**	

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: ***Description of Issue / Clarification / Reason for Request***

Upon review of the IFC drawing for CV001, the dimension for the distance between the bottom of the high flow culvert and streambed material is not consistent with the section views for the other culverts. The dimension arrows do not line up with the "Existing Stream Bed", making it unclear what the reference point for the highlighted dimension is.



Section 2: ***Corrective Action*** ☐ **Taken** ☐ **Suggested** ☒ **Required**

1. **Please confirm the dimension between the streambed material elevation for the low flow culvert and the invert for the high flow culvert at culvert CV-001.**

Potential Cost Impact?	**Yes ☐ No ☒ Unsure ☐**	**Potential Schedule Impact?**	**Yes ☐ No ☒ Unsure ☐**

Section 3: ***Approval Required by*** ☐ **Internal** ☐ **Client** ☒ **Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: ***RFI Response*** ☐ **Corrective Action Approved** ☐ **Correct as Follows**

Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman (applicable as per the following disciplines)			
☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.: N/A	ITP Activity No.:N/A	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**	PO 95000000473	
RFI #	009	**Contract #**	4192708	
Originator:	Jeff Roberts	**RFI Submitted On:**	Mar 7, 2024	
Prepared By:	Jeff Roberts	**Requested Response By:**	Mar 9, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

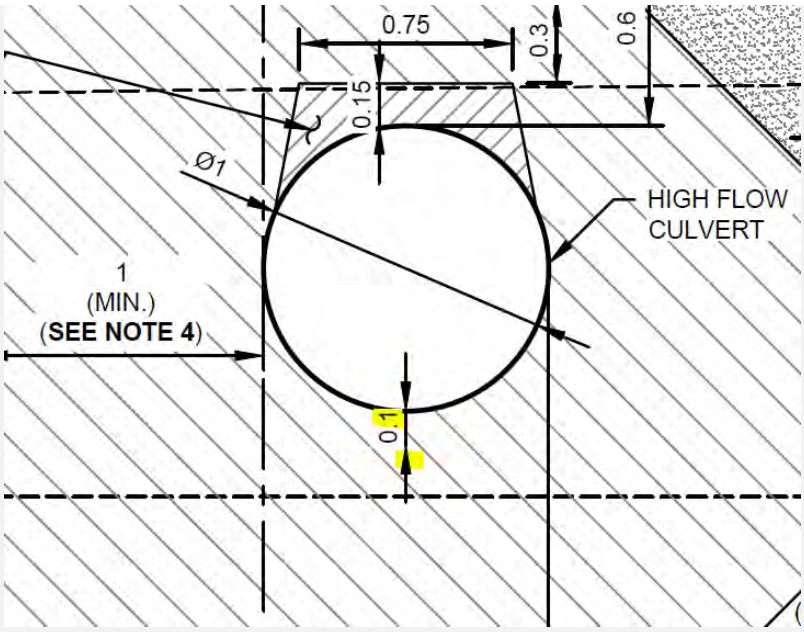
NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
751r2 PCP - Round CSP Culverts - CV-001 - Plan and Section	**2**	

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: *Description of Issue / Clarification / Reason for Request*

Upon review of the IFC drawing for CV001, the dimension for the distance between the bottom of the high flow culvert and streambed material is not consistent with the section views for the other culverts. The dimension arrows do not line up with the "Existing Stream Bed", making it unclear what the reference point for the highlighted dimension is.



Section 2: ***Corrective Action*** ☐ **Taken** ☐ **Suggested** ☒ **Required**

1. **Please confirm the dimension between the streambed material elevation for the low flow culvert and the invert for the high flow culvert at culvert CV-001.**

Potential Cost Impact?	**Yes ☐ No ☒ Unsure ☐**	**Potential Schedule Impact?**	**Yes ☐ No ☒ Unsure ☐**

Section 3: ***Approval Required by*** ☐ **Internal** ☐ **Client** ☒ **Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

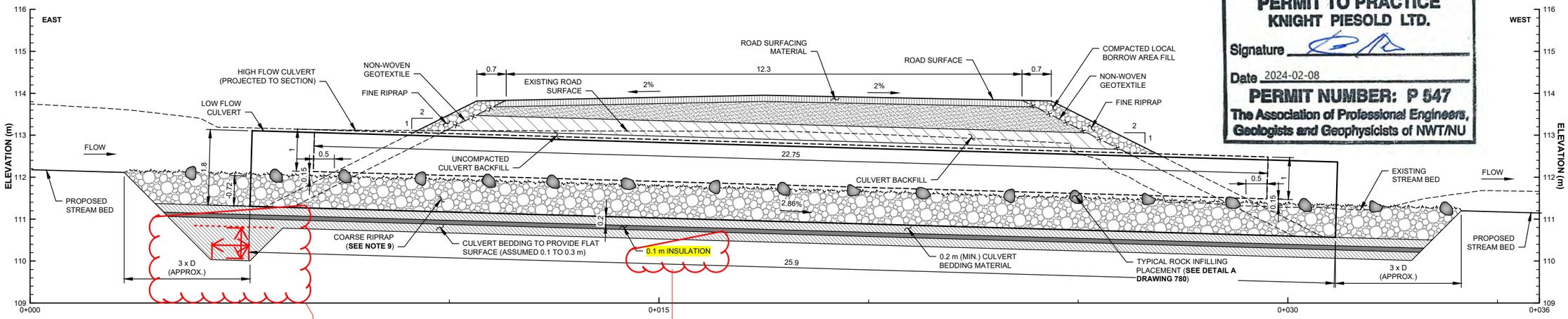
Section 4: ***RFI Response*** ☐ **Corrective Action Approved** ☐ **Correct as Follows**

Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman **(applicable as per the following disciplines)**

☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

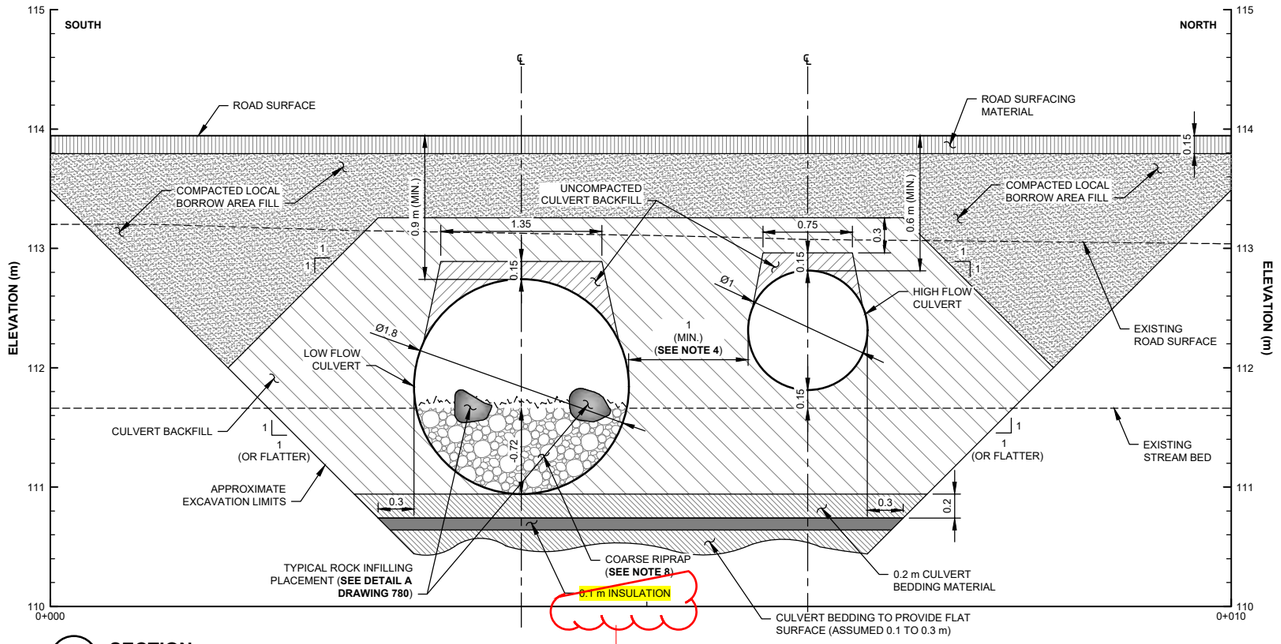
6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:



1/715 **SECTION**
CV-106 PROFILE
SCALE A

Missing dimensions

Missing specs



2/715 **SECTION**
CV-106 INSTALLATION DETAILS
SCALE B

Missing specs

FISH PASSAGE PARAMETERS	
MODELLED CULVERT JULY OUTLET VELOCITY (m/s)	0.63
MODELLED CULVERT AUGUST OUTLET VELOCITY (m/s)	0.5
MAXIMUM SWIM DISTANCE (m)	3.7
BOULDER CLUSTER SPACING (m)	3.5

RIPRAP LOCATIONS	RIPRAP SIZE (mm)	MATERIAL
INLET/OUTLET APRON	300 (D_{50})	COARSE RIPRAP
BANK STABILIZATION	400 (D_{50})	EXTRA COARSE RIPRAP
CULVERT INFILLING	300 (D_{50})	COARSE RIPRAP
IN-CULVERT BOULDERS	300 (MIN.)	COARSE RIPRAP
STEP POOL	NOT REQUIRED	N/A
BOULDER CLUSTER	300 (MIN.)	COARSE RIPRAP

LEGEND:

- COMPACTED LOCAL BORROW AREA FILL
- UNCOMPACTED CULVERT BACKFILL
- CULVERT BACKFILL
- ROAD SURFACING MATERIAL
- COARSE RIPRAP
- FINE RIPRAP
- CULVERT BEDDING MATERIAL
- INSULATION
- EXISTING STREAM BED
- NON-WOVEN GEOTEXTILE

SCALE A 1 0.5 0 1 2 3 4 5 m

SCALE B 0.5 0.25 0 0.5 1.0 1.5 2.0 2.5 m

NOTES:

1. COORDINATE GRID IS UTM NAD83, ZONE 17.
2. CULVERT SURVEYS AND DRONE IMAGERY PROVIDED BY KITIKMEOT CHALLENGER, AUGUST 2023.
3. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
4. 1 m (MIN.) OR A SUITABLE WIDTH TO ALLOW SPACE FOR COMPACTOR TO PASS BETWEEN CULVERTS.
5. VEHICLE SAFETY BERMS ARE REQUIRED IN AREAS WITH A DROP OFF GREATER THAN 3.0 m.
6. MATERIAL SPECIFICATIONS INCLUDED ON **DRAWING 703**.
7. CULVERT INFILL MATERIAL TO BE INSPECTED DURING AND AFTER FIRST FRESHET FOLLOWING CONSTRUCTION TO DETERMINE IF ADDITIONAL MATERIAL IS REQUIRED.
8. INTERSTITIAL SPACES OF THE RIPRAP ON THE CHANNEL BED SHALL BE FILLED WITH CREEK BED MATERIAL (OR OTHER MATERIAL APPROVED BY THE ENGINEER) AND GRADED TO MATCH THE ADJACENT CHANNEL BED ELEVATION. THE CONTRACTOR SHALL MINIMIZE VOID SPACE BETWEEN RIPRAP STONES SUCH THAT CREEK FLOWS ARE MAINTAINED ABOVE THE CHANNEL BED DURING LOW-FLOW CONDITIONS. THE FINISHED SURFACE TO BE ROUGHENED TO MIMIC ADJACENT STREAM BED CONDITIONS.

PERMIT TO PRACTICE
KNIGHT PIESOLD LTD.
Signature
Date 2024-02-08
PERMIT NUMBER: P 547
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

Nuna Document Control Received 04-March-2024

Nuna Document Control Issued for Use

DRG. NO.	DESCRIPTION
703	CULVERT FILL MATERIALS AND GEOSYNTHETICS SPECIFICATIONS
715	CSP CULVERTS - CV-106 GENERAL ARRANGEMENT
780	CULVERT WORKS - TYPICAL DETAILS

REFERENCE DRAWINGS

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
2	08FEB'24	REVISED INCORPORATING DFO ADVICE	GMJ	EDW	SP	CAP
1	06SEP'23	REVISED WITH UPDATED SURVEY DATA	GMJ	EDW	CAP	KEH
0	03FEB'23	ISSUED FOR CONSTRUCTION	GMJ	EDW	CAP	KEH

REVISIONS

REGISTERED PROFESSIONAL ENGINEER — G.M. JOHNSTONE — LICENSEE — 2024-02-08 — NT/NU

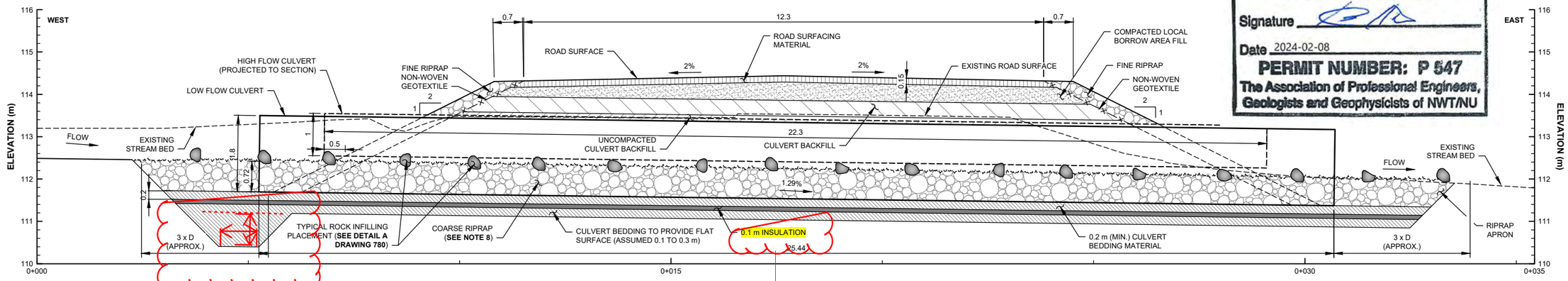
Knight Piésold CONSULTING

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

PERMANENT CROSSING PLAN
CULVERT CSP CULVERTS - CV-106
PLAN AND SECTION

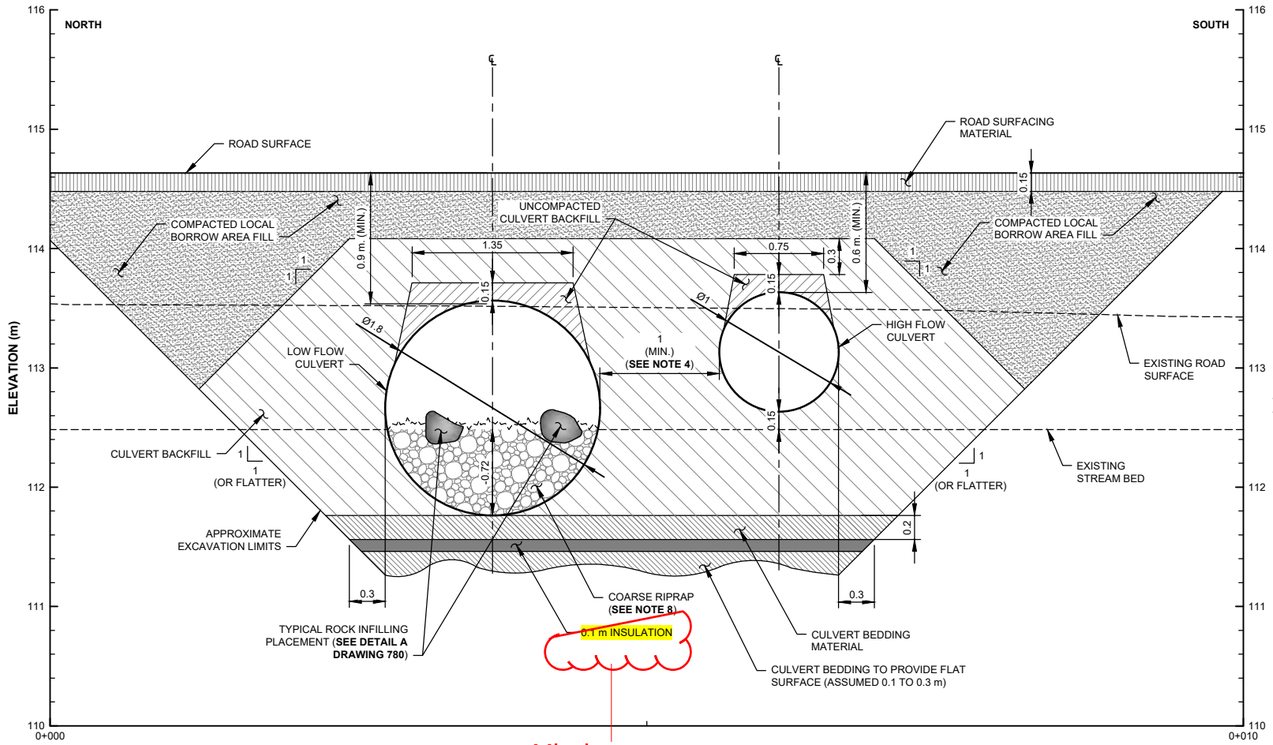
P/A NO.	DRAWING NO.	REVISION
NB102-181/77	716	2



2 1/720 **SECTION**
CV-102 PROFILE
SCALE A

Missing dimensions

Missing specs



2 2/720 **SECTION**
CV-102 INSTALLATION DETAILS
SCALE B

Missing specs

FISH PASSAGE PARAMETERS	
MODELLED CULVERT JULY OUTLET VELOCITY (m/s)	0.55
MODELLED CULVERT AUGUST OUTLET VELOCITY (m/s)	0.44
MAXIMUM SWIM DISTANCE (m)	5.4
BOULDER CLUSTER SPACING (m)	5

RIPRAP LOCATIONS	RIPRAP SIZE (mm)	MATERIAL
INLET/OUTLET APRON	300 (D_{50})	COARSE RIPRAP
BANK STABILIZATION	300 (D_{50})	COARSE RIPRAP
CULVERT INFILLING	300 (D_{50})	COARSE RIPRAP
IN-CULVERT BOULDERS	300 (MIN.)	COARSE RIPRAP
STEP POOL	NOT REQUIRED	N/A
BOULDER CLUSTER	300 (MIN.)	COARSE RIPRAP

NOTES:

1. COORDINATE GRID IS UTM NAD83, ZONE 17.
2. CULVERT SURVEYS AND DRONE IMAGERY PROVIDED BY KITIKMEOT CHALLENGER, AUGUST 2023.
3. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
4. 1 m (MIN.) OR A SUITABLE WIDTH TO ALLOW SPACE FOR COMPACTOR TO PASS BETWEEN CULVERTS.
5. VEHICLE SAFETY BERMS ARE REQUIRED IN AREAS WITH A DROP OFF GREATER THAN 3.0 m.
6. MATERIAL SPECIFICATIONS INCLUDED ON **DRAWING 703**.
7. CULVERT INFILL MATERIAL TO BE INSPECTED DURING AND AFTER FIRST FRESHET FOLLOWING CONSTRUCTION TO DETERMINE IF ADDITIONAL MATERIAL IS REQUIRED.
8. INTERSTITIAL SPACES OF THE RIPRAP ON THE CHANNEL BED SHALL BE FILLED WITH CREEK BED MATERIAL (OR OTHER MATERIAL APPROVED BY THE ENGINEER) AND GRADED TO MATCH THE ADJACENT CHANNEL BED ELEVATION. THE CONTRACTOR SHALL MINIMIZE VOID SPACE BETWEEN RIPRAP STONES SUCH THAT CREEK FLOWS ARE MAINTAINED ABOVE THE CHANNEL BED DURING LOW-FLOW CONDITIONS. THE FINISHED SURFACE TO BE ROUGHENED TO MIMIC ADJACENT STREAM BED CONDITIONS.

LEGEND:

- COMPACTED LOCAL BORROW AREA FILL
- UNCOMPACTED CULVERT BACKFILL
- CULVERT BACKFILL
- ROAD SURFACING MATERIAL
- COARSE RIPRAP
- FINE RIPRAP
- CULVERT BEDDING MATERIAL
- INSULATION
- EXISTING STREAM BED
- NON-WOVEN GEOTEXTILE

SCALE A: 1 0.5 0 1 2 3 4 5 m
SCALE B: 0.5 0.25 0 0.5 1.0 1.5 2.0 2.5 m

PERMIT TO PRACTICE
KNIGHT PIESOLD LTD.
Signature
Date 2024-02-08
PERMIT NUMBER: P 547
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

Nuna Document Control Received 04-March-2024
Nuna Document Control Issued for Use

DRG. NO.	DESCRIPTION
703	CULVERT FILL MATERIALS AND GEOSYNTHETICS SPECIFICATIONS
720	ROUND CSP CULVERTS - CV-102 GENERAL ARRANGEMENT
780	CULVERT WORKS - TYPICAL DETAILS

REFERENCE DRAWINGS

ISSUED FOR CONSTRUCTION

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED	APPROVED
2	08FEB'24	REVISED INCORPORATING DFO ADVICE	GMJ	EDW/AS	CAP	KEH
1	06SEP'23	REVISED WITH UPDATED SURVEY DATA	GMJ	EDW	CAP	KEH
0	03FEB'23	ISSUED FOR CONSTRUCTION	GMJ	EDW	CAP	KEH

REVISIONS

REGISTERED PROFESSIONAL ENGINEER
G.M. JOHNSTONE
LICENSEE
2024-02-08
NT/NU

Knight Piésold CONSULTING

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

PERMANENT CROSSING PLAN
ROUND CSP CULVERTS - CV-102
PLAN AND SECTION

P/A NO.	DRAWING NO.	REVISION
NB102-181/77	721	2

SAVED: I:\1\02\00181\77\A\Acad\DWGS\720 721\720 721 R2. 2/8/2024 1:53:39 PM. ASIMPSON. PRINTED: 2/8/2024 1:53:57 PM. 721. ASIMPSON ACAD VERSION: 24.2S (LMS TECH)

Document Transmittal

RFI-010 CV102 and CV106 Insulation and Sub-Cut

Transmittal Number	0011	**Date**	March 9, 2024
Job Name & Number	Tote Road Culvert Upgrade	**Revision**	0

Submitted To	Baffinland Iron Mine – Projects Team
Prepared By	BIM Document Control (N. Lenos)
Nuna Entity	Nuna East Ltd.
Special Instructions	Please return response to RFI to BIMDC@nunagroup.com

Document Listing

Item	Copies	Document #	Rev	Description
1	1	NUNA_RFI-010 - CV102 and 106 Insulation and Sub-Cut.docx	0	RFI-010 - CV102 and 106 Insulation and Sub-Cut
2	1	716r2 PCP - Round CSP Culverts - CV-106 - Plan and Section.pdf	2	716r2 PCP - Round CSP Culverts - CV-106 - Plan and Section – Markup
3	1	721r2 PCP - Round CSP Culverts - CV-102 - Plan and Section.pdf	2	721r2 PCP - Round CSP Culverts - CV-102 - Plan and Section - Markup

Sign, Date & Return to Document Control

To Be Completed by Recipient			
Received By		**Date Received**	
Signature		**Comments**	

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

MEMORANDUM

Date:	March 15, 2024	**File No.:**	NB102-00181/93-A.01
		Cont. No.:	NB24-00324
To:	Baruck Wile, Baffinland Iron Mines Corporation Rudolf Dietrich, Baffinland Iron Mines Corporation		
Copy To:	Dale Tulloch, Baffinland Iron Mines Corporation Jim Patterson, Baffinland Iron Mines Corporation Michael Burns, Baffinland Iron Mines Corporation Carla Crotty, Baffinland Iron Mines Corporation Sharon Dyke, Baffinland Iron Mines Corporation SCP Admin BIM Document Control		
From:	Greg Johnstone		
Re:	**Permanent Crossing Plan - Round CSP Culverts, Response to Request for Information (RFI) No. 010**		

1.0 INTRODUCTION

This memo provides Knight Piésold Ltd.'s (KP) response to Request for Information (RFI) No. 010 (attached) provided by Nuna on the Permanent Crossing Plan - Round CSP Culverts Issued for Construction Drawings (IFC). Responses to the provided questions are included below.

2.0 RESPONSE

Nuna Question No. 1 (Nuna, 2024):

Upon review of the Rev 2 IFC drawing for CV 102 and CV106, it has been noticed that a 0.1m layer of insulation has been added under the bedding material. The specifications are not included in the Revised IFC package.

Please provide the specifications for the required insulation

Is this material on site currently with sufficient quantity for both CV 102 and CV 106?

KP Response No. 1:

As discussed in the Permanent Crossing Plan detailed design report (Rev 2) the insulation should be Styrofoam Highload 40 extruded polystyrene insulation. This was specified based on the recommendation made by Allan Knowlton. Baffinland will need to state whether this is currently available on site.

Nuna Question No. 2:

For CV 106 and CV-102, a sub-cut has been added to the inlet under the Insulation but does not include dimensions. Please provide dimensions for the sub-cut at the Inlets at CV-106 and CV-102

KP Response No. 2:

Please see Drawing 781 Detail D for dimensions of the inlet excavation.

3.0 REFERENCES

Nuna, 2024. *Request for Information #010.* March 9. Submitted to: Baruck Wile and Rudolf Dietrich. Submitted by: Jeff Roberts.

Yours truly,
Knight Piésold Ltd.

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:

Attachments:
Nuna Request for Information #010

/gj

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:	ITP Activity No.:N016	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**	PO 95000000473	
RFI #	010	**Contract #**	4192708	
Originator:	Jeff Roberts	**RFI Submitted On:**	Mar 9, 2024	
Prepared By:	Jeff Roberts	**Requested Response By:**	Mar 11, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
721r2 PCP - Round CSP Culverts - CV-102 - Plan and Section	**2**	
716r2 PCP - Round CSP Culverts - CV-106 - Plan and Section	**2**	

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: ***Description of Issue / Clarification / Reason for Request***

1. **Upon review of the Rev 2 IFC drawing for CV 102 and CV106, it has been noticed that a 0.1m layer of insulation has been added under the bedding material. The specifications are not included in the Revised IFC package.**

2. **For CV 106 and CV-102, a sub-cut has been added to the inlet under the Insulation but does not include dimensions.**

Section 2: *Corrective Action*	☐ Taken	☐ Suggested	☒ Required

1. Please provide the specifications for the required insulation
1a. Is this material on site currently with sufficient quantity for both CV 102 and CV 106?

2. Please provide dimensions for the sub-cut at the Inlets at CV-106 and CV-102

Potential Cost Impact?	Yes ☐ No ☒ Unsure ☐	Potential Schedule Impact?	Yes ☒ No ☐ Unsure ☐

Section 3: *Approval Required by*	☐ Internal	☒ Client	☒ Engineering

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: *RFI Response*	☐ Corrective Action Approved	☐ Correct as Follows

Response by:		Date:	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman (applicable as per the following disciplines)

☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:

Completion Manager/Supervisor:	Completion Signature for QA/QC:	Completion Red-Line Drawings:
Signature:	Signature:	Signature:
Date:	Date:	Date:

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:	ITP Activity No.:N016	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**	PO 95000000473	
RFI #	010	**Contract #**	4192708	
Originator:	Jeff Roberts	**RFI Submitted On:**	Mar 9, 2024	
Prepared By:	Jeff Roberts	**Requested Response By:**	Mar 11, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
721r2 PCP - Round CSP Culverts - CV-102 - Plan and Section	**2**	
716r2 PCP - Round CSP Culverts - CV-106 - Plan and Section	**2**	

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: ***Description of Issue / Clarification / Reason for Request***

1. **Upon review of the Rev 2 IFC drawing for CV 102 and CV106, it has been noticed that a 0.1m layer of insulation has been added under the bedding material. The specifications are not included in the Revised IFC package.**
2. **For CV 106 and CV-102, a sub-cut has been added to the inlet under the Insulation but does not include dimensions.**

Section 2: ***Corrective Action*** ☐ **Taken** ☐ **Suggested** ☒ **Required**

1. **Please provide the specifications for the required insulation**
1a. **Is this material on site currently with sufficient quantity for both CV 102 and CV 106?**

2. **Please provide dimensions for the sub-cut at the Inlets at CV-106 and CV-102**

Potential Cost Impact?	**Yes ☐ No ☒ Unsure ☐**	**Potential Schedule Impact?**	**Yes ☒ No ☐ Unsure ☐**

Section 3: *Approval Required by* **☐ Internal** **☒ Client** **☒ Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: *RFI Response* **☐ Corrective Action Approved** **☐ Correct as Follows**

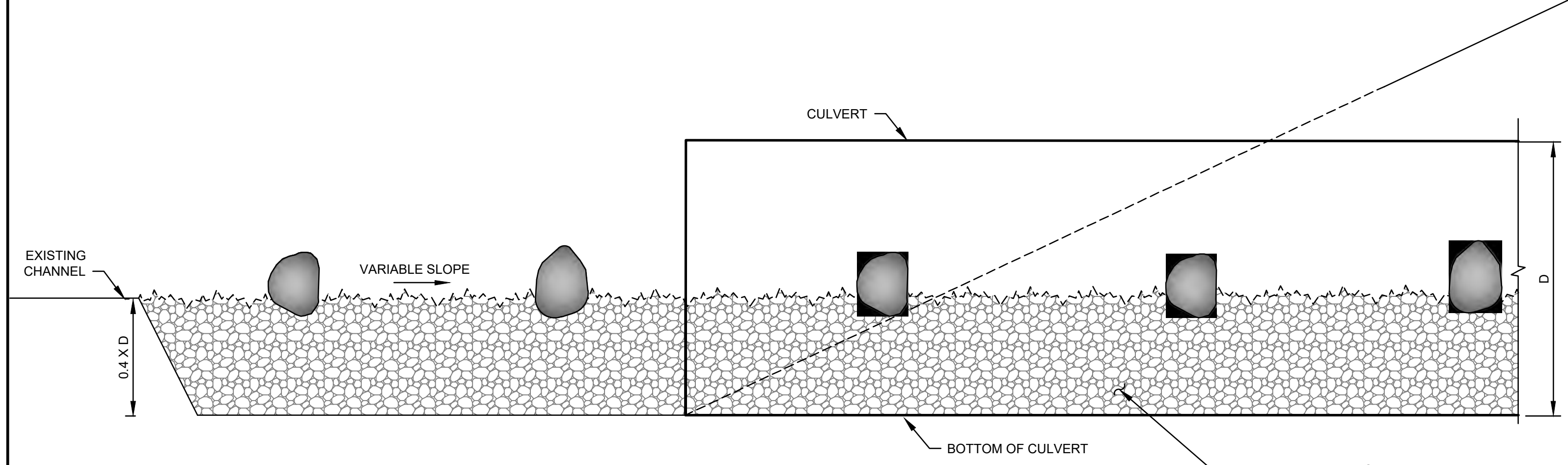
Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman (applicable as per the following disciplines)

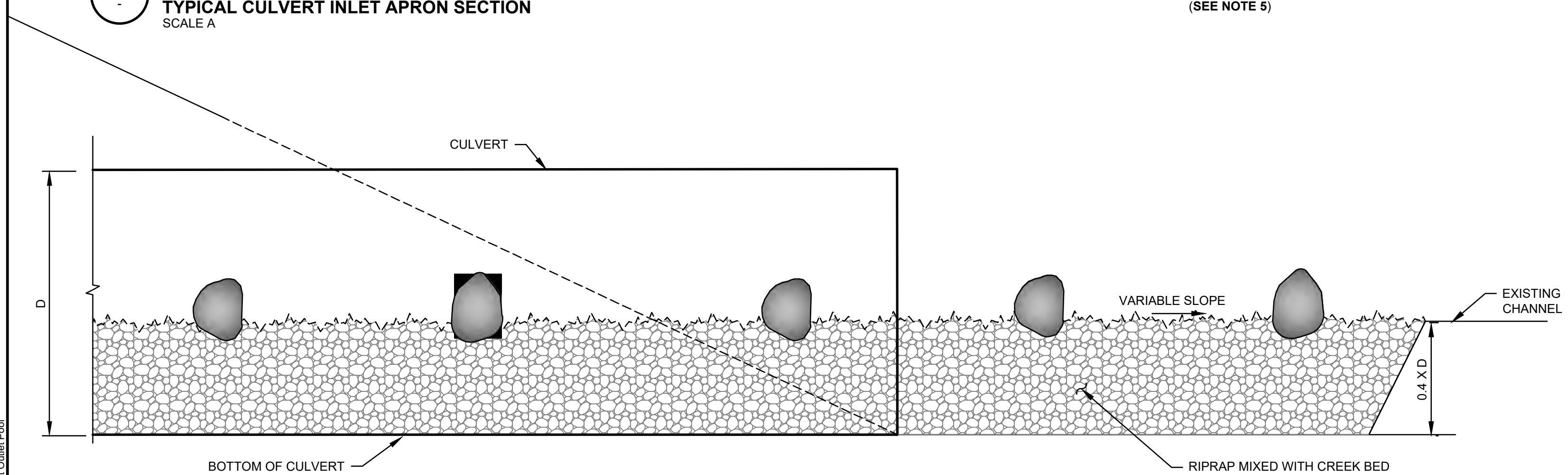
☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:

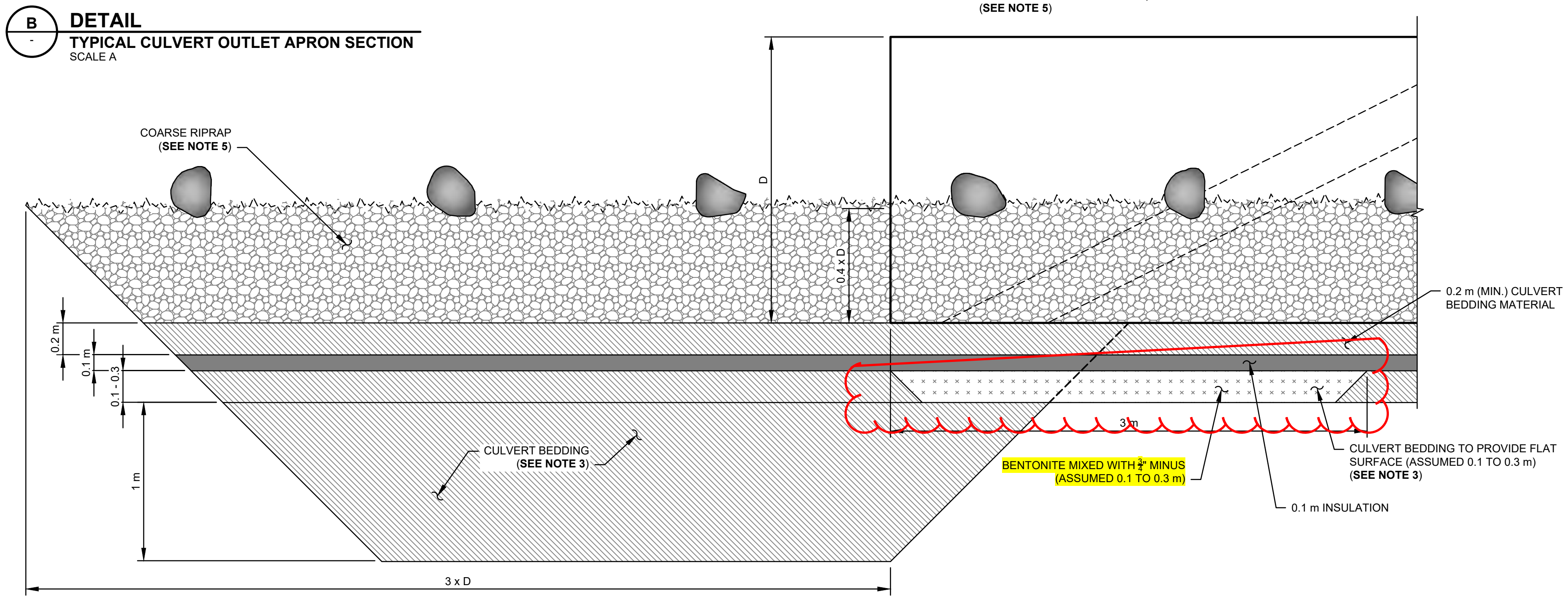
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:



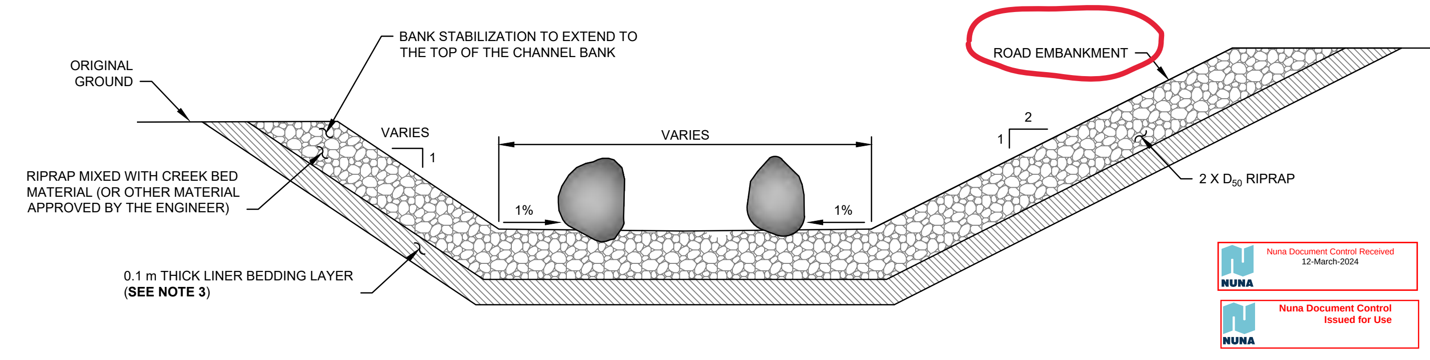
A DETAIL
TYPICAL CULVERT INLET APRON SECTION
SCALE A



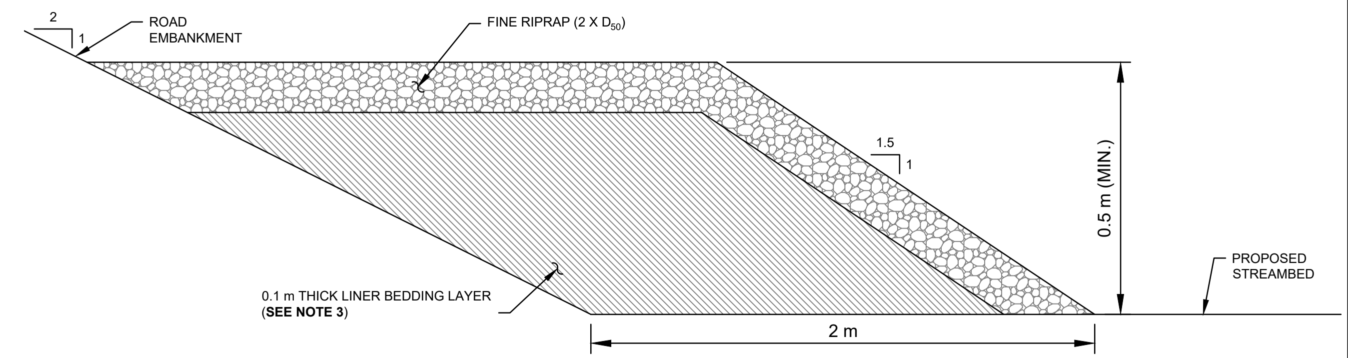
B DETAIL
TYPICAL CULVERT OUTLET APRON SECTION
SCALE A



D DETAIL
CV-102 AND CV-106 INLET APRON
SCALE A



C DETAIL
BANK STABILIZATION AND APRON SECTION
SCALE B



E DETAIL
CV-102 AND CV-106 THERMAL BERM
SCALE B

LEGEND:
- RIPRAP
- CULVERT BEDDING MATERIAL
- BENTONITE MIXED WITH 3/4" MINUS
- INSULATION

NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. RIPRAP TO BE CLEAN, DURABLE AND ANGULAR.
3. BEDDING LAYER TO BE THE SAME MATERIAL AS FINE CULVERT BACKFILL (**SEE DRAWING 703**).
4. MATERIAL SPECIFICATIONS INCLUDED ON **DRAWING 703**.
5. INTERSTITIAL SPACES OF THE RIPRAP ON THE CHANNEL BED SHALL BE FILLED WITH CREEK BED MATERIAL (OR OTHER MATERIAL APPROVED BY THE ENGINEER) AND GRADED TO MATCH THE ADJACENT CHANNEL BED ELEVATION. THE CONTRACTOR SHALL MINIMIZE VOID SPACE BETWEEN RIPRAP STONES SUCH THAT CREEK FLOWS ARE MAINTAINED ABOVE THE CHANNEL BED DURING LOW-FLOW CONDITIONS. THE FINISHED SURFACE TO BE ROUGHENED TO MIMIC ADJACENT STREAMBED CONDITIONS.

PERMIT TO PRACTICE
KNIGHT PIESOLD LTD.
Signature
Date 2024-02-08
PERMIT NUMBER: P 547
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

ISSUED FOR CONSTRUCTION

SCALE A 0.4 0.2 0 0.4 0.8 1.2 1.6 2.0 m
SCALE B 0.3 0.15 0 0.5 1.0 1.5 m

G.M. JOHNSTONE LICENSEE

DRG. NO.	DESCRIPTION
703	CULVERT FILL MATERIALS AND GEOSYNTHETICS SPECIFICATIONS

REFERENCE DRAWINGS

REVISIONS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
1	08FEB'24	REVISED INCORPORATING DFO ADVICE	GMJ	AS	DP
0	23JAN'24	ISSUED FOR CONSTRUCTION	GMJ	AS	CAP

REVISIONS

Knight Piésold CONSULTING

…AFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

…OTE ROAD CULVERT REMEDIATION
…ULVERT INLET AND OUTLET WORKS
TYPICAL PLAN AND DETAILS

	DRAWING NO.	REVISION
…B102-181/77	781	1

Document Transmittal

RFI-011 Bentonite at Inlets CV-102 & CV-106

Transmittal Number	0012	**Date**	March 14, 2024
Job Name & Number	Tote Road Culvert Upgrade	**Revision**	0

Submitted To	Baffinland Iron Mine – Projects Team
Prepared By	BIM Document Control (N. Lenos)
Nuna Entity	Nuna East Ltd.
Special Instructions	Please return response to RFI to BIMDC@nunagroup.com

Document Listing

Item	Copies	Document #	Rev	Description
1	1	NUNA_RFI-011 - Bentonite at CV-102 & CV-106.docx	0	NUNA_RFI-011 - Bentonite at CV-102 & CV-106
2	1	781r1 PCP - Tote Road Culvert Remediation - Culvert Inlet and Outlet Works - Typical Plan and Details_markup.pdf	0	781r1 PCP - Tote Road Culvert Remediation - Culvert Inlet and Outlet Works - Typical Plan and Details_markup

Sign, Date & Return to Document Control

To Be Completed by Recipient			
Received By		**Date Received**	
Signature		**Comments**	

MEMORANDUM

Date:	March 15, 2024	**File No.:**	NB102-00181/93-A.01
		Cont. No.:	NB24-00328
To:	Baruck Wile, Baffinland Iron Mines Corporation Rudolf Dietrich, Baffinland Iron Mines Corporation		
Copy To:	Dale Tulloch, Baffinland Iron Mines Corporation Jim Patterson, Baffinland Iron Mines Corporation Michael Burns, Baffinland Iron Mines Corporation Carla Crotty, Baffinland Iron Mines Corporation Sharon Dyke, Baffinland Iron Mines Corporation SCP Admin BIM Document Control		
From:	Greg Johnstone		
Re:	**Permanent Crossing Plan - Round CSP Culverts, Response to Request for Information (RFI) No. 011**		

1.0 INTRODUCTION

This memo provides Knight Piésold Ltd.'s (KP) response to Request for Information (RFI) No. 011 (attached) provided by Nuna on the Permanent Crossing Plan - Round CSP Culverts Issued for Construction Drawings (IFC). Responses to the provided questions are included below.

2.0 RESPONSE

Nuna Question No. 1 (Nuna, 2024):

Detail D on Drawing # 781r1 shows a zone of Bentonite mixed with ¾" minus aggregate under the insulation layer at the inlet of culverts CV-102 & CV-106.

This zone of bentonite is not shown on the profile and cross-sections on Drawings 716 & 721 for these culverts.

Please clarify the following:

What type of bentonite is to be used?

Is the bentonite available on site in sufficient quantity?

What ratio of bentonite to ¾" minus aggregate is to be used?

Does the bentonite zone span the entire width of the culvert excavation at the inlets, or is it limited to the same width as the insulation? (There is no section drawing showing this detail.)

KP Response No. 1:

The type of bentonite depends on what is available for use on site. Quantities of bentonite should be discussed with Baffinland.

The ratio should be 20% bentonite and 80% ¾" minus for this mixture.

The bentonite zone spans the entire width of the culvert excavation at the inlets.

3.0 REFERENCES

Nuna, 2024. *Request for Information #011*. March 14. Submitted to: Baruck Wile and Rudolf Dietrich. Submitted by: Darko Filipic.

Yours truly,
Knight Piésold Ltd.

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:

Attachments:
Nuna Request for Information #011

/gj

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:N/A	ITP Activity No.:N/A	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**	PO 9500000473	
RFI #	011	**Contract #**	4192708	
Originator:	Darko Filipic	**RFI Submitted On:**	March 14, 2024	
Prepared By:	Darko Filipic	**Requested Response By:**	March 16, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

NGC requires a response on this query within 48 hours of submission

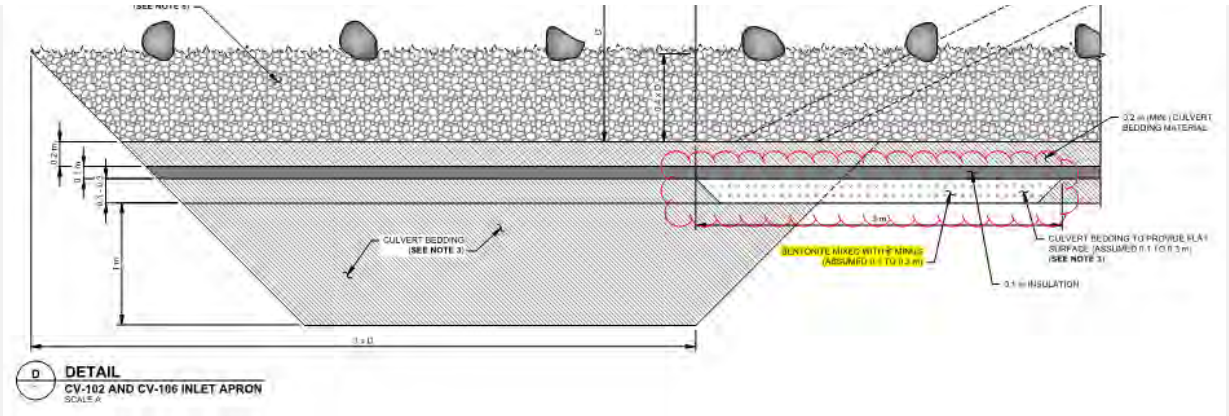
Reference Document / Tag # / Attachment	Rev	Comment
781r1 PCP - Tote Road Culvert Remediation - Culvert Inlet and Outlet Works - Typical Plan and Details	1	Drawing # 781
716r2 PCP - Round CSP Culverts - CV-106 - Plan and Section		Drawing # 716
721r2 PCP - Round CSP Culverts - CV-102 - Plan and Section		Drawing # 721

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: ***Description of Issue / Clarification / Reason for Request***

Detail D on Drawing # 781r1 shows a zone of Bentonite mixed with ¾" minus aggregate under the insulation layer at the inlet of culverts CV-102 & CV-106.

This zone of bentonite is not shown on the profile and cross-sections on Drawings 716 & 721 for these culverts.



Section 2: ***Corrective Action*** ☐ **Taken** ☐ **Suggested** ☒ **Required**

Please clarify the following:

- **What type of bentonite is to be used?**
- **Is the bentonite available on site in sufficient quantity?**
- **What ratio of bentonite to ¾" minus aggregate is to be used?**
- **Does the bentonite zone span the entire width of the culvert excavation at the inlets, or is it limited to the same width as the insulation? (There is no section drawing showing this detail.)**

Potential Cost Impact?	**Yes ☐ No ☒ Unsure ☐**	**Potential Schedule Impact?**	**Yes ☐ No ☒ Unsure ☐**

Section 3: ***Approval Required by*** ☐ **Internal** ☒ **Client** ☒ **Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: ***RFI Response*** ☐ **Corrective Action Approved** ☐ **Correct as Follows**

Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman **(applicable as per the following disciplines)**

☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:

Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:N/A		ITP Activity No.:N/A	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**	PO 9500000473		
RFI #	011	**Contract #**	4192708		
Originator:	Darko Filipic	**RFI Submitted On:**	March 14, 2024		
Prepared By:	Darko Filipic	**Requested Response By:**	March 16, 2024		
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team		

NGC requires a response on this query within 48 hours of submission

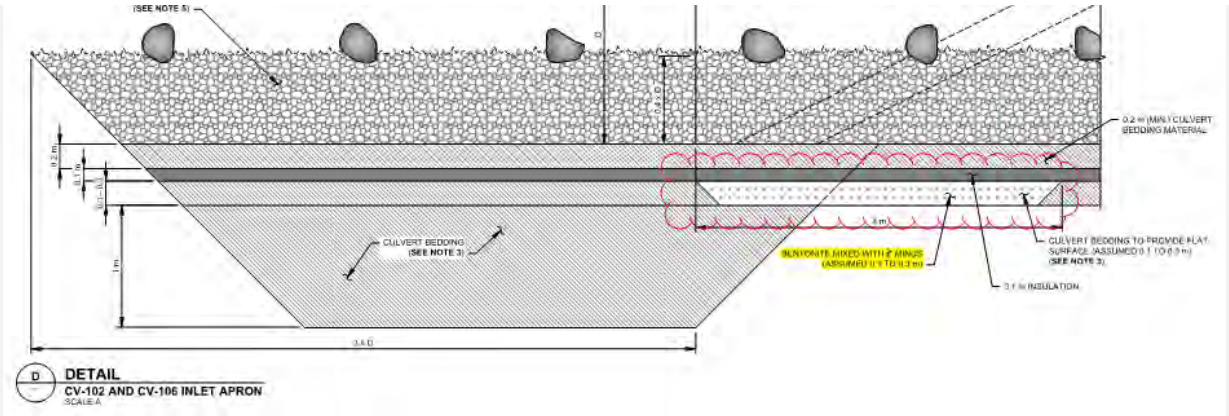
Reference Document / Tag # / Attachment	Rev	Comment
781r1 PCP - Tote Road Culvert Remediation - Culvert Inlet and Outlet Works - Typical Plan and Details	1	Drawing # 781
716r2 PCP - Round CSP Culverts - CV-106 - Plan and Section		Drawing # 716
721r2 PCP - Round CSP Culverts - CV-102 - Plan and Section		Drawing # 721

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: ***Description of Issue / Clarification / Reason for Request***

Detail D on Drawing # 781r1 shows a zone of Bentonite mixed with ¾" minus aggregate under the insulation layer at the inlet of culverts CV-102 & CV-106.

This zone of bentonite is not shown on the profile and cross-sections on Drawings 716 & 721 for these culverts.



Section 2: ***Corrective Action*** ☐ **Taken** ☐ **Suggested** ☒ **Required**

Please clarify the following:

- **What type of bentonite is to be used?**
- **Is the bentonite available on site in sufficient quantity?**
- **What ratio of bentonite to ¾" minus aggregate is to be used?**
- **Does the bentonite zone span the entire width of the culvert excavation at the inlets, or is it limited to the same width as the insulation? (There is no section drawing showing this detail.)**

Potential Cost Impact?	**Yes ☐ No ☒ Unsure ☐**	**Potential Schedule Impact?**	**Yes ☐ No ☒ Unsure ☐**

Section 3: ***Approval Required by*** ☐ **Internal** ☒ **Client** ☒ **Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: ***RFI Response*** ☐ **Corrective Action Approved** ☐ **Correct as Follows**

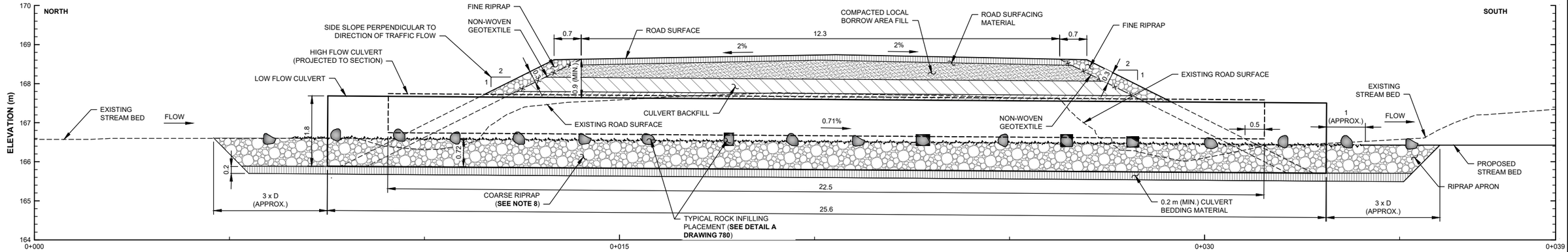
Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman **(applicable as per the following disciplines)**

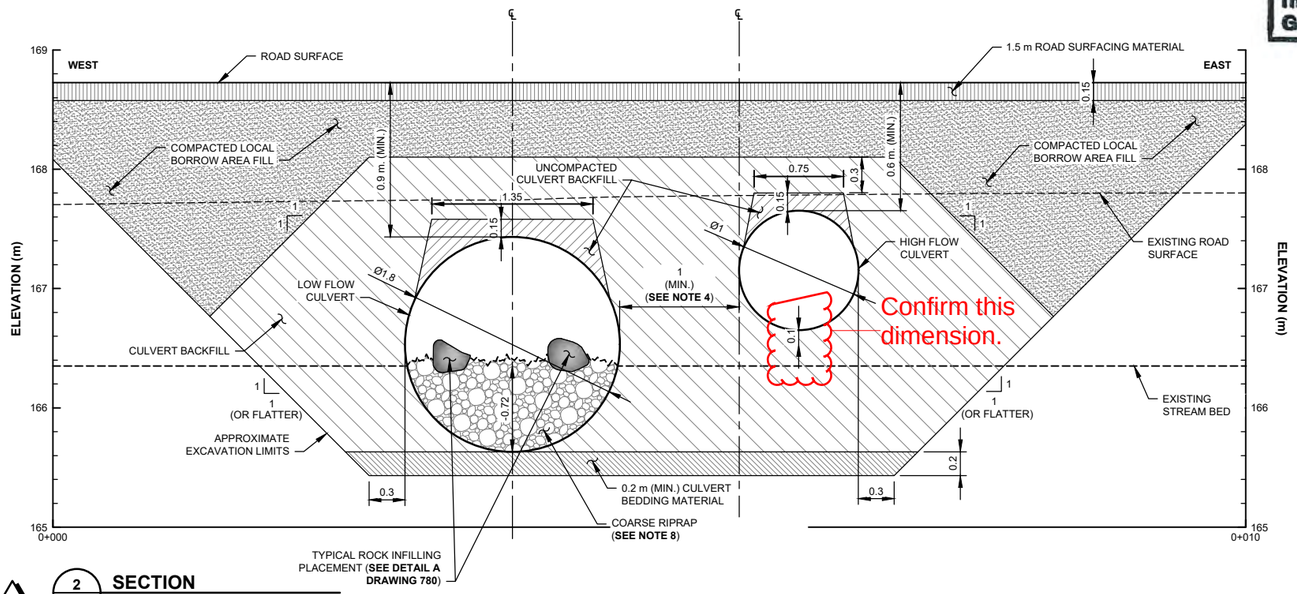
☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:

Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:



2 1/750 **SECTION**
CV-001 PROFILE
SCALE A



2 2/750 **SECTION**
CV-001 INSTALLATION DETAILS
SCALE B

PERMIT TO PRACTICE
KNIGHT PIESOLD LTD.
Signature
Date 2024-02-08
PERMIT NUMBER: P 547
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

Nuna Document Control Received 04-March-2024

Nuna Document Control Issued for Use

LEGEND:
- COMPACTED LOCAL BORROW AREA FILL
- UNCOMPACTED CULVERT BACKFILL
- CULVERT BACKFILL
- ROAD SURFACING MATERIAL
- COARSE RIPRAP
- FINE RIPRAP
- CULVERT BEDDING MATERIAL
- EXISTING STREAM BED
- NON-WOVEN GEOTEXTILE

FISH PASSAGE PARAMETERS	
MODELLED CULVERT JULY OUTLET VELOCITY (m/s)	0.33
MODELLED CULVERT AUGUST OUTLET VELOCITY (m/s)	0.26
MAXIMUM SWIM DISTANCE (m)	41

RIPRAP LOCATIONS	RIPRAP SIZE (mm)	MATERIAL
INLET/OUTLET APRON	300 (D_{50})	COARSE RIPRAP
BANK STABILIZATION	150 (D_{50})	FINE RIPRAP
CULVERT INFILLING	300 (D_{50})	COARSE RIPRAP
IN-CULVERT BOULDERS	300 (MIN.)	COARSE RIPRAP
STEP POOL	NOT REQUIRED	N/A
BOULDER CLUSTER	NOT REQUIRED BY DFO SPOT TOOL	N/A

NOTES:
1. COORDINATE GRID IS UTM NAD83, ZONE 17.
2. CULVERT SURVEYS AND DRONE IMAGERY PROVIDED BY KITIKMEOT CHALLENGER, AUGUST 2023.
3. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
4. 1 m (MIN.) OR A SUITABLE WIDTH TO ALLOW SPACE FOR COMPACTOR TO PASS BETWEEN CULVERTS.
5. VEHICLE SAFETY BERMS ARE REQUIRED IN AREAS WITH A DROP OFF GREATER THAN 3.0 m.
6. MATERIAL SPECIFICATIONS INCLUDED ON **DRAWING 703**.
7. CULVERT INFILL MATERIAL TO BE INSPECTED DURING AND AFTER FIRST FRESHET FOLLOWING CONSTRUCTION TO DETERMINE IF ADDITIONAL MATERIAL IS REQUIRED.
8. INTERSTITIAL SPACES OF THE RIPRAP ON THE CHANNEL BED SHALL BE FILLED WITH CREEK BED MATERIAL (OR OTHER MATERIAL APPROVED BY THE ENGINEER) AND GRADED TO MATCH THE ADJACENT CHANNEL BED ELEVATION. THE CONTRACTOR SHALL MINIMIZE VOID SPACE BETWEEN RIPRAP STONES SUCH THAT CREEK FLOWS ARE MAINTAINED ABOVE THE CHANNEL BED DURING LOW-FLOW CONDITIONS. THE FINISHED SURFACE TO BE ROUGHENED TO MIMIC ADJACENT STREAM BED CONDITIONS.

DRG. NO.	REFERENCE DRAWINGS
703	CULVERT FILL MATERIALS AND GEOSYNTHETICS SPECIFICATIONS
750	CSP CULVERTS - CV-001 GENERAL ARRANGEMENT
780	CULVERT WORKS - TYPICAL DETAILS

ISSUED FOR CONSTRUCTION

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

REVISIONS

REGISTERED PROFESSIONAL ENGINEER — G.M. JOHNSTONE — LICENSEE — 2024-02-08 — NT/NU

Knight Piésold CONSULTING

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

PERMANENT CROSSING PLAN
ROUND CSP CULVERTS - CV-001
PLAN AND SECTION

P/A NO.	DRAWING NO.	REVISION
NB102-181/77	751	2

SAVED: I:\102\00181177A\Acad\DWGS\750 751\750 751 R2_ 2/8/2024 2:06:06 PM, , ASIMPSON PRINTED: 2/8/2024 2:06:28 PM, 751, , ASIMPSON ACAD VERSION: 24.2S (LMS TECH)

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:	ITP Activity No.:N016	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**	PO# 9500000473	
RFI #	012	**Contract #**	4192708	
Originator:	Jeff Roberts	**RFI Submitted On:**	Mar 21, 2024	
Prepared By:	Jeff Roberts	**Requested Response By:**	Mar 23, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
20240217-TR Culvert Replacement-CV-057.dxf		Tote Road linework provided for CV-057
20240212-TR Culvert Replacement-CV-059.dxf		Tote Road linework provided for CV-059

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: *Description of Issue / Clarification / Reason for Request*

Nuna requires the final grade profile and centerline alignment of the road that is to be re-established to properly model the road and side slopes for all permanent culvert crossings on the Tote Road. The culvert IFC drawings do not show sufficient information to allow for Nuna to model the road as per the intended design.

The preferred format for this information is a 3D polyline in a DXF format that represents the centerline and top of surfacing material. To date, Nuna has only received the DXF's for CV-57 and CV-59.

Section 2: *Corrective Action* ☐ **Taken** ☐ **Suggested** ☒ **Required**

Please provide 3D polylines that represent the Final Grade elevation of the road for the following Crossings.

1. **BG-04**
2. **BG-27**
3. **CV-001**
4. **CV-102**
5. **CV-106**
6. **CV-112**
7. **CV-114**
8. **CV-216**

Potential Cost Impact?	**Yes ☐ No ☒ Unsure ☐**	**Potential Schedule Impact?**	**Yes ☐ No ☒ Unsure ☐**

Section 3: *Approval Required by*	☐ Internal	☒ Client	☒ Engineering

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: *RFI Response* ☐ **Corrective Action Approved** ☐ **Correct as Follows**

Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman (applicable as per the following disciplines)			
☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:

Document Transmittal

NUNA_RFI-013 Road Crest Cut for Geotextile -RipRap Tie-in

Transmittal Number	0014	**Date**	April 9, 2024
Job Name & Number	Tote Road Culvert Upgrade	**Revision**	0

Submitted To	Baffinland Iron Mine – Projects Team
Prepared By	BIM Document Control (D.Filipic)
Nuna Entity	Nuna East Ltd.
Special Instructions	Please return response to RFI to BIMDC@nunagroup.com

Document Listing

Item	Copies	Document #	Rev	Description
1	1	NUNA_RFI-013 Road Crest Cut for Geotextile -RipRap Tie-in.docx	0	NUNA_RFI-013 Road Crest Cut for Geotextile -RipRap Tie-in

Sign, Date & Return to Document Control

To Be Completed by Recipient			
Received By		**Date Received**	
Signature		**Comments**	

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:N/A	ITP Activity No.:N/A	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**	PO 9500000670	
RFI #	013	**Contract #**	4192708	
Originator:	Mason Fischer	**RFI Submitted On:**	April 9, 2024	
Prepared By:	Darko Filipic	**Requested Response By:**	April 11, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

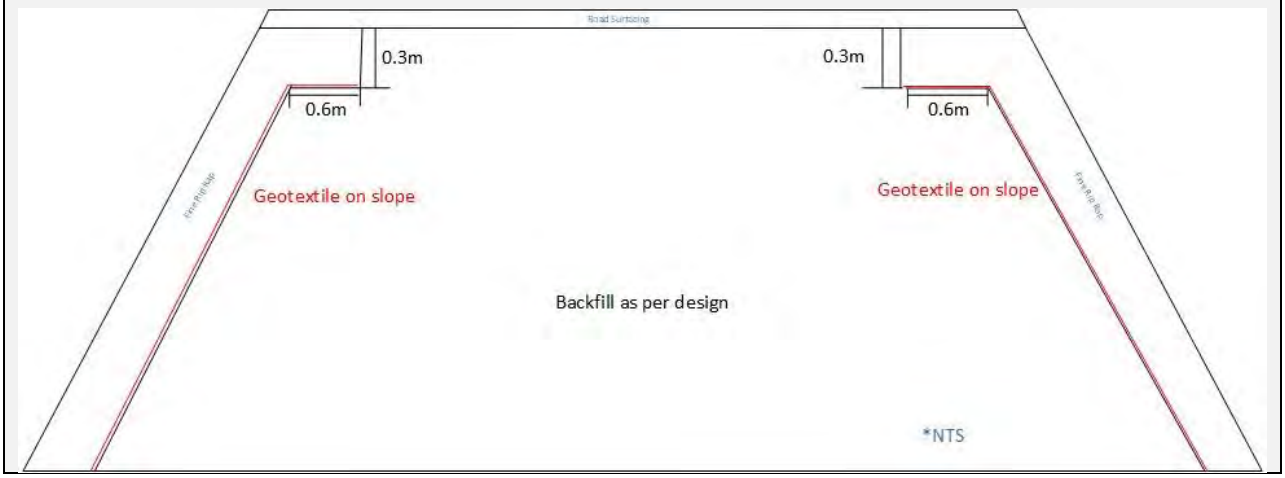
NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: *Description of Issue / Clarification / Reason for Request*

Nuna proposes to cut a notch into the borrow fill material at the crest of the road to better tie-in the geotextile and allow for better rip rap placement along the slope of the road, as shown in the sketch below.



Section 2: *Corrective Action*	☐ **Taken**	☐ **Suggested**	☒ **Required**

This proposal would affect the following culvert installations:

1. **CV216**
2. **BG27**
3. **CV102**
4. **CV106**
5. **CV112**
6. **CV114**

Please advise whether the above proposal is acceptable and approved.

Potential Cost Impact?	**Yes ☐ No ☒ Unsure ☐**	**Potential Schedule Impact?**	**Yes ☐ No ☒ Unsure ☐**

Section 3: *Approval Required by* ☐ **Internal** ☒ **Client** ☒ **Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: *RFI Response* ☐ **Corrective Action Approved** ☐ **Correct as Follows**

Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman (applicable as per the following disciplines)

☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:

Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:

Baffinland

Nuna Group of Companies

April 10, 2024

Subject: Mary River – Nuna RFI no. NGCQF 06 Road Crest Cut for Geotextile – Riprap Tie-in

In response to the above subject, the proposal provided by Nuna is not accepted due to safety and structural issues.

Nuna is required to:

1. Extended the Geotextile liner 0.7m – 1.0m above the top surface of the existing road.
2. Cover the 0.7m – 1.0m liner with a layer of fill/ topping according to the design provided by KP/ BIM.

Abid A. Najey P.Eng, MEng

Sr. Civil Engineer

Document Transmittal

NUNA_RFI-014 CV216 Design Change Due to Ice Mass

Transmittal Number	0015	**Date**	April 13, 2024
Job Name & Number	Tote Road Culvert Upgrade	**Revision**	0

Submitted To	Baffinland Iron Mine – Projects Team
Prepared By	BIM Document Control (D.Filipic)
Nuna Entity	Nuna East Ltd.
Special Instructions	Please return response to RFI to BIMDC@nunagroup.com

Document Listing

Item	Copies	Document #	Rev	Description
1	1	NUNA_RFI-014 CV216 Design Change Due to Ice Mass.docx	0	NUNA_RFI-014 CV216 Design Change Due to Ice Mass

Sign, Date & Return to Document Control

To Be Completed by Recipient			
Received By		**Date Received**	
Signature		**Comments**	

Knight Piésold CONSULTING

Management System Certified by: bsi ISO 9001 ISO 14001 ISO 45001 CERTIFIED

MEMORANDUM

Date:	April 18, 2024	**File No.:**	NB102-00181/93-A.01
		Cont. No.:	NB24-00444
To:	Baruck Wile Rudolf Dietrich		
Copy To:	Dale Tulloch Jim Patterson Sharon Dyke Michael Burns SCP Admin BIM Document Control		
From:	Greg Johnstone		
Re:	**Permanent Crossing Plan - Round CSP Culverts, Response to Request for Information (RFI) No. 014**		

1.0 INTRODUCTION

This memo provides Knight Piésold Ltd.'s (KP) response to Request for Information (RFI) No. 014 provided by Nuna on the Permanent Crossing Plan - Round CSP Culverts Issued for Construction Drawings (IFC). Responses to the provided questions are included below.

2.0 RESPONSE

Nuna Question No. 1:
A large ice mass has been encountered in the foundation of culvert CV216 (see photo below). The ice mass in this location has prompted a potential design change by the Engineer for this culvert.

Nuna requests the revised CV216 design to be provide through Document Control bimdc@nunagroup.com as soon as possible as the construction of this culvert is currently underway.

KP Response No.1:

KP provided a memorandum and figure to Baffinland on April 17 describing the design change details for the foundation at CV-216 (attached). Following the issuance of this memorandum Baruck Wile from Baffinland informed KP that there are not sufficient quantities of bentonite to construct the foundation per the design change. As such, KP has revised the design change to incorporate geomembrane with a key in trench in place of bentonite mixed with ¾" minus material. The proposed geomembrane key-in trench is shown on Figure 1. The key in trench is to be backfilled with compacted ¾" minus material.

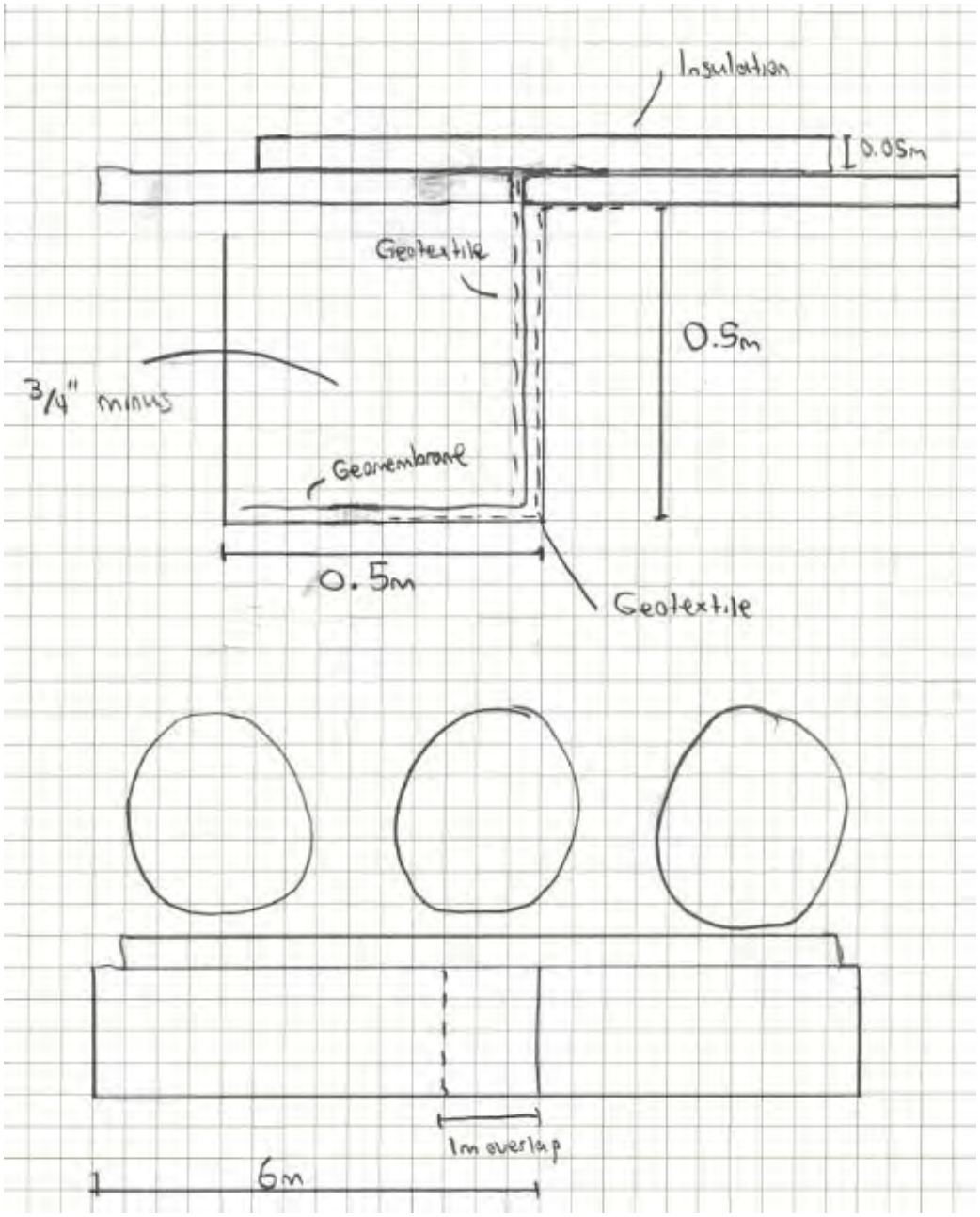


Figure 1 CV-216 Geomembrane Key-In Trench Design Change

3.0 REFERENCES

Nuna, 2024. Request for Information #014 to Baruck Wile and Rudolf Dietrich submitted by Darko Filipic. April 13.

Yours truly,
Knight Piésold Ltd.

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

Reviewed: Kevin Hawton, P.Eng.
Specialist Engineer | Associate

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

Attachments:
Nuna Request for Information #014
CV-216 Design Change Due to Massive Ice Memorandum

/gj

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:N/A	ITP Activity No.:N/A	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**	PO 9500000670	
RFI #	014	**Contract #**	4192708	
Originator:	Mason Fischer	**RFI Submitted On:**	April 13, 2024	
Prepared By:	Darko Filipic	**Requested Response By:**	April 15, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
735r2 PCP	**2**	**Round CSP Culverts - CV-216 - General Arrangment**
736r2 PCP	**2**	**Round CSP Culverts - CV-216 - Plan and Section**

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: *Description of Issue / Clarification / Reason for Request*

A large ice mass has been encountered in the foundation of culvert CV216 (see photo below). The ice mass in this location has prompted a potential design change by the Engineer for this culvert.

Section 2: *Corrective Action*	☐ **Taken**	☐ **Suggested**	☒ **Required**
Nuna requests the revised CV216 design to be provide through Document Control bimdc@nunagroup.com as soon as possible as the construction of this culvert is currently underway.			
Potential Cost Impact?	**Yes** ☐ **No** ☒ **Unsure** ☐	**Potential Schedule Impact?**	**Yes** ☐ **No** ☒ **Unsure** ☐
Section 3: *Approval Required by*	☐ **Internal**	☐ **Client**	☒ **Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: *RFI Response*	☐ **Corrective Action Approved**	☐ **Correct as Follows**

Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman **(applicable as per the following disciplines)**			
☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date:

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

MEMORANDUM

Date:	April 17, 2024	**File No.:**	NB102-00181/77-A.01
		Cont. No.:	NB24-00434
To:	Mr. Jim Patterson		
Copy To:	Connor Devereaux, Rudolf Dietrich		
From:	Greg Johnstone		
Re:	**CV-216 Design Change due to Massive Ice**		

1.0 INTRODUCTION

Knight Piésold Ltd. (KP) is providing Baffinland Iron Mines Corporation (Baffinland) with a design change to account for massive ice exposed during blasting and excavation of crossing CV-216 on the Milne Inlet Tote Road (Tote Road).

KP provided the attached Figure 1 on April 12, 2024 showing proposed foundation design changes to account for the massive ice. This memo provides additional details on the proposed design change.

2.0 BACKGROUND

KP provided the updated Tote Road Permanent Crossing Plan - Round CSP Culvert Installation on February 8, 2024 (KP, 2024). Following the completion of the design report, construction began on the round CSP culverts in mid-February 2024.

Drilling and blasting at CV-216 during the week of April 8, 2024 exposed massive ice in the northeast portion of the culvert excavation (Photos 1 and 2). Following the discovery of the massive ice on April 12, 2024, Baffinland halted excavation and informed KP. KP reviewed the photos and survey of the massive ice in relation to the design and developed the design change details illustrated on Figure 1.

Photo 1 **Looking at the Initial Discovery of Massive Ice at CV-216**

Photo 2 **Looking at the Massive Ice after further excavation at CV-216**

3.0 GEOTECHNICAL INVESTIGATIONS

No previous geotechnical investigations were completed at the culvert locations, therefore, the underlying foundation conditions and permafrost regime in these areas are not known. KP completed the design with the limited information available at the time and made some assumptions to the degree of ice rich soils in areas where construction is required outside the current normal streambed flow limits.

4.0 PROPOSED DESIGN

The proposed design change for CV-216 consists of over-excavation of the massive ice below the culvert and the installation of fill and insulation to minimize the impacts of ambient temperatures and heat laden water flows on the ice beneath the culvert foundation (i.e. minimize potential for thawing).

The culvert foundation construction will include installation of an insulation layer above a 0.5 m thick layer of compacted non-frost susceptible culvert backfill material. The insulation will consist of two layers of 2 inch (50 mm) thick Styrofoam™ Highload 60 Extruded Polystyrene, or approved equivalent. Joints in the insulation sheets will be offset to prevent gaps in the coverage and enhance effectiveness. Following the insulation installation, a 0.2 m thick layer of compacted culvert backfill will be placed over the insulation as the base course for culvert installation.

The inlet and outlet of the culvert will be over-excavated and backfilled with compacted non-frost susceptible culvert backfill material. Bentonite will be mixed with ¾ inch minus material for the initial and final 3 m of the culvert length to act as an impermeable layer to minimize the potential for water to migrate beneath the culvert/insulation and transmit heat into the underlying ice.

The CV-216 inlet and outlet areas will be constructed similar to locations CV-102 and CV-106 as shown on Drawing 781 Detail D provided with the original design report (KP, 2024). The proposed design change is shown on the attached Figure 1 and the inlet and outlet apron detail is shown on Figure 2.

The proposed design measures are intended to reduce the potential for settlement, slumping, damage, or other structural issues due to the installation of the culvert over massive ice; however, it is noted that there is no guarantee that issues related to thawing of ice will not occur. As such, KP takes no responsibility for any settlement, slumping, damage, or other structural issues due to the installation of culverts on or above ice-rich soils and/or massive ice. Ideally, this work will be completed and the culverts backfilled in a timely manner to reduce the risk of ice thaw. High ambient temperatures could result in increased temperatures locked into the fill zones, thereby increasing the risk of ice thaw.

Design alternatives, such as relocating the culvert within the streambed, were explored; however, due to the absence of prior geotechnical investigations, it remains uncertain whether massive ice persists throughout the entire streambed area. Additionally, through discussions with Baffinland it was determined to leave the culverts in the existing position since the drilling and blasting has already occurred.

5.0 SUMMARY

The design for Tote Road culvert location CV-216 was revised due to the discovery of massive ice below the culvert foundation. KP has prepared a revised design by incorporating extra thermal safeguards around the culvert's inlet and outlet, as well as within the foundation below the culvert. This revision was executed based on the current available data; however, it is important to acknowledge that there is no assurance against potential ice thawing-related problems. Therefore, KP does not take responsibility for any settlement, slumping, damage, or structural issues arising from culvert installation on ice-rich soils.

6.0 REFERENCES

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

7.0 CLOSING

We trust that meets with your present requirements. Please contact the undersigned with any questions.

Yours truly,
Knight Piésold Ltd.

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

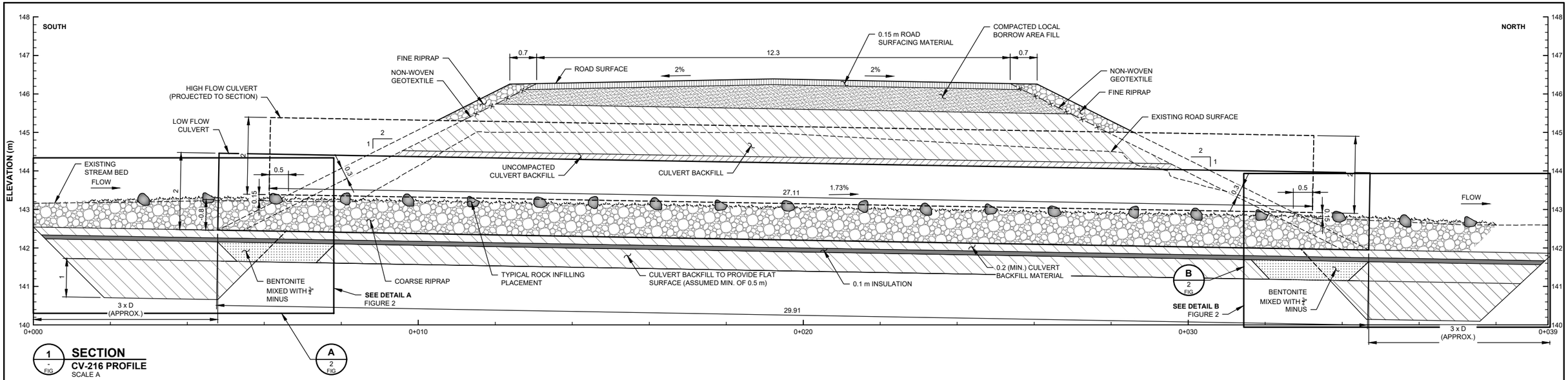
Reviewed: C. A (Andy) Phillips, P.Eng.
Senior Engineer

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

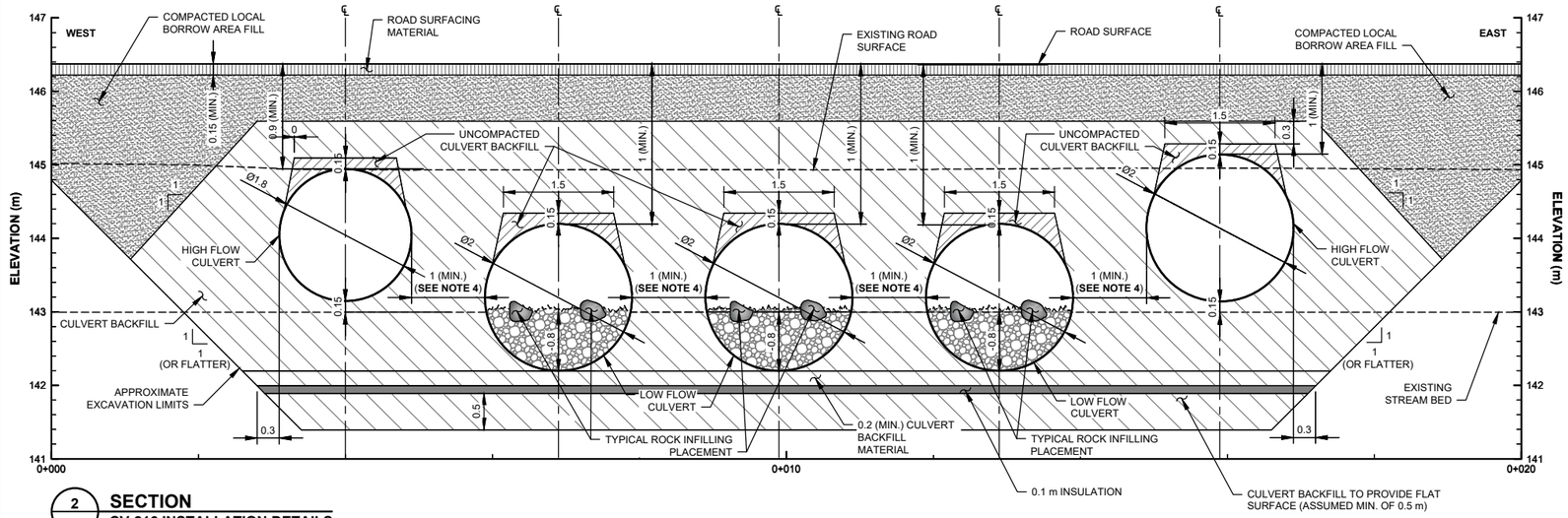
Attachments:

Figure 1 Rev 0	CV-216 Proposed Design Change
Figure 2 Rev 0	CV-216 Culvert Inlet and Outlet Apron Details

/gj



1 - FIG **SECTION**
CV-216 PROFILE
SCALE A



2 - FIG **SECTION**
CV-216 INSTALLATION DETAILS
SCALE B

LEGEND:

- COMPACTED LOCAL BORROW AREA FILL
- UNCOMPACTED CULVERT BACKFILL
- CULVERT BACKFILL
- ROAD SURFACING MATERIAL
- COARSE RIPRAP
- FINE RIPRAP
- BENTONITE MIXED WITH 3" MINUS
- INSULATION
- EXISTING STREAM BED
- NON-WOVEN GEOTEXTILE

NOTES:

1. COORDINATE GRID IS UTM NAD83, ZONE 17.
2. CULVERT SURVEYS AND DRONE IMAGERY PROVIDED BY KITIKMEOT CHALLENGER, AUGUST 2023.
3. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
4. 1 m (MIN.) OR A SUITABLE WIDTH TO ALLOW SPACE FOR COMPACTOR TO PASS BETWEEN CULVERTS.
5. VEHICLE SAFETY BERMS ARE REQUIRED IN AREAS WITH A DROP OFF GREATER THAN 3.0 m.

SCALE A: 1 0.5 0 1 2 3 4 5 m

SCALE B: 0.8 0.4 0 1 2 3 4 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	17APR'24	ISSUED WITH MEMO	GMJ	AS	CAP

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

CV-216 PROPOSED DESIGN CHANGE

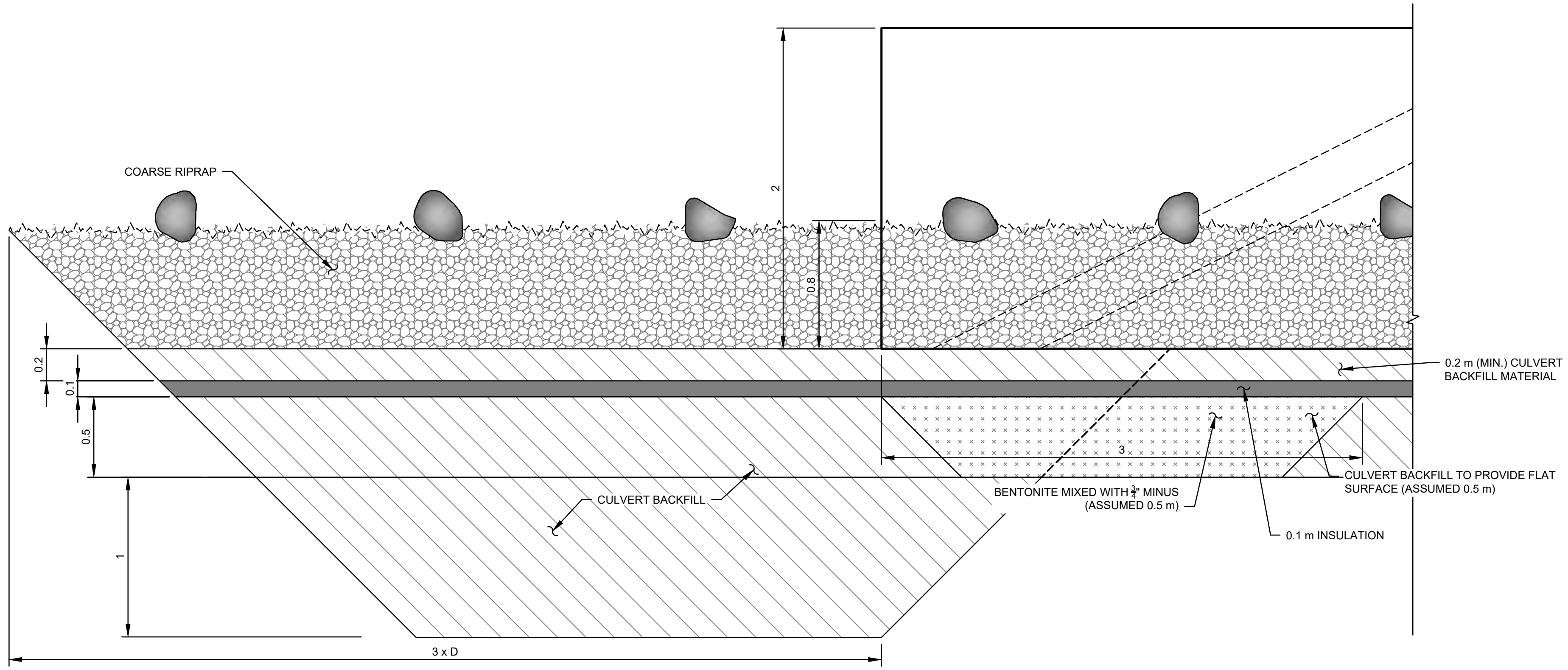
Knight Piésold CONSULTING

P/A NO. NB102-181/77

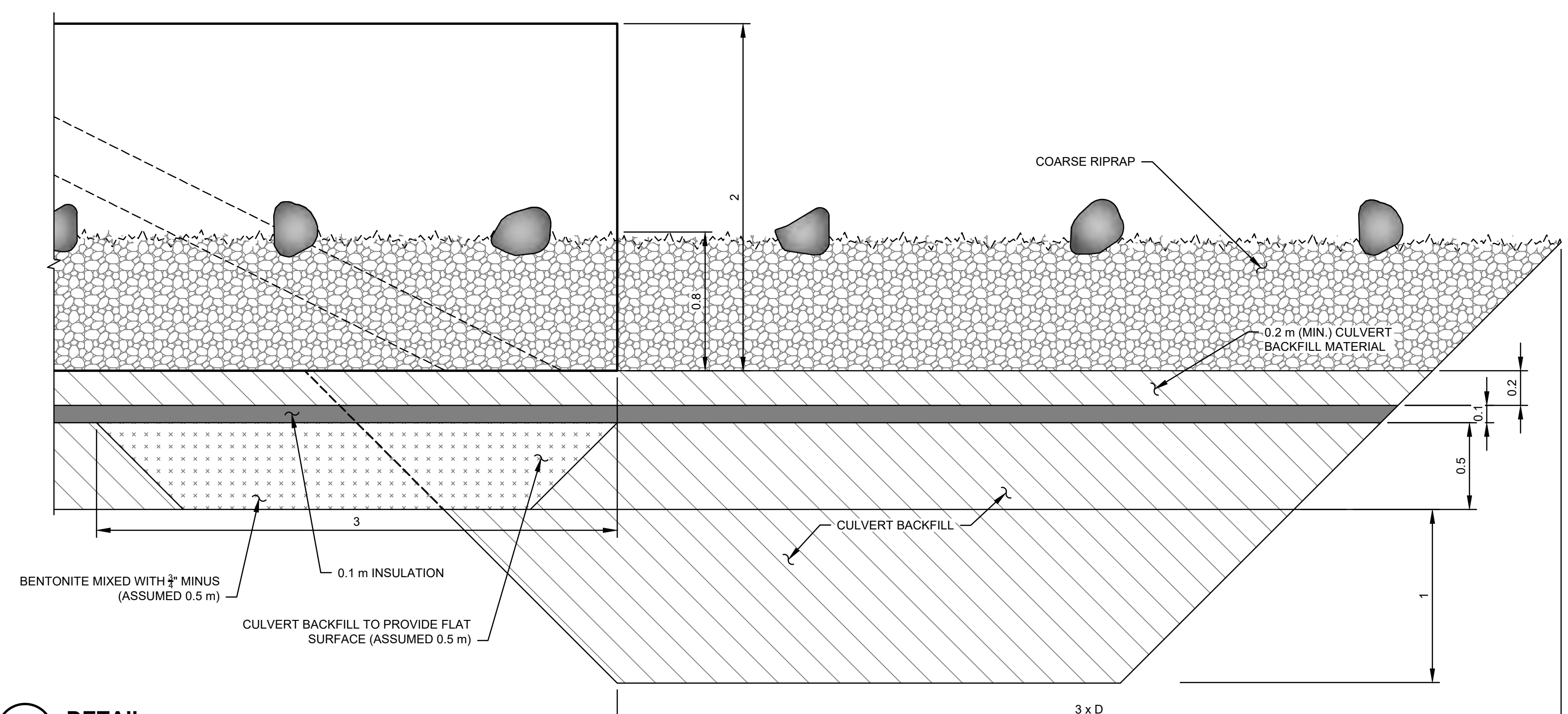
REF NO. NB24-00434

FIGURE 1

REV 0



A 1 FIG **DETAIL**
CV-216 INLET APRON
SCALE A



B 1 FIG **DETAIL**
CV-216 OUTLET APRON
SCALE A

LEGEND:

- RIPRAP
- CULVERT BACKFILL
- BENTONITE MIXED WITH ¾" MINUS
- INSULATION

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. FOR ADDITIONAL INFORMATION SEE THE PERMANENT CROSSING PLAN - ROUND CSP CULVERTS REV 2 REPORT.

SCALE A 0.4 0.2 0 0.4 0.8 1.2 1.6 2.0 m

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

CV-216 CULVERT INLET AND OUTLET APRON DETAILS

Knight Piésold CONSULTING

P/A NO.	REF NO.
NB102-181/77	NB24-00434

FIGURE 2 REV 0

0	17APR'24	ISSUED WITH MEMO	GMJ	AS	CAP
REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED

SAVED: I:\102\00181\77\A\Acad\FIGS\B38 R0, 4/17/2024 8:16:46 AM, FIG 2, ASIMPSON PRINTED: 4/17/2024 8:16:05 AM , ASIMPSON ACAD VERSION: 24.3S (LMS TECH)

Form

Request for Information

Department	QUALITY DEPARTMENT		
Section	Procedure Forms	**Date**	January 9, 2024
Form Number	NGCQF 06	**Revision**	1

		ITP No.:N/A	ITP Activity No.:N/A	Seq. No.:
Project Name:	Tote Road Culvert Upgrade	**Project #**	PO 9500000670	
RFI #	014	**Contract #**	4192708	
Originator:	Mason Fischer	**RFI Submitted On:**	April 13, 2024	
Prepared By:	Darko Filipic	**Requested Response By:**	April 15, 2024	
Submitted To:	Baruck Wile / Rudolf Dietrich	**Company:**	BIM Projects Team	

NGC requires a response on this query within 48 hours of submission

Reference Document / Tag # / Attachment	Rev	Comment
735r2 PCP	**2**	**Round CSP Culverts - CV-216 - General Arrangment**
736r2 PCP	**2**	**Round CSP Culverts - CV-216 - Plan and Section**

(Note: Sections 1, 2 & 3 are to be completed by the Originator)

Section 1: *Description of Issue / Clarification / Reason for Request*

A large ice mass has been encountered in the foundation of culvert CV216 (see photo below). The ice mass in this location has prompted a potential design change by the Engineer for this culvert.

Section 2: *Corrective Action*	☐ **Taken**	☐ **Suggested**	☒ **Required**
Nuna requests the revised CV216 design to be provide through Document Control bimdc@nunagroup.com as soon as possible as the construction of this culvert is currently underway.			
Potential Cost Impact?	**Yes ☐ No ☒ Unsure ☐**	**Potential Schedule Impact?**	**Yes ☐ No ☒ Unsure ☐**
Section 3: *Approval Required by*	☐ **Internal**	☐ **Client**	☒ **Engineering**

(Note Section 4 to be completed by the recipient of the RFI)

Section 4: *RFI Response*	☐ **Corrective Action Approved**	☐ **Correct as Follows**

Response by:		**Date:**	
Reference Document / Tag # / Attachment		**Rev**	**Comment**

5. Distribution: Superintendents and Area Foreman **(applicable as per the following disciplines)**			
☐Civil	☐Electrical	☐Instrumentation	☐Mechanical
☐Const. Manager	☐Management	☐QC Department	☐Originator

6. Completion:		
Completion Manager/Supervisor:	**Completion Signature for QA/QC:**	**Completion Red-Line Drawings:**
Signature:	Signature:	Signature:
Date:	Date:	Date: