National Défense
Defence nationale

8 Wing Environmental Management
74 Polaris Avenue, Room 305
PO Box 1000 Stn Forces
Astra, ON K0K 3W0

22 August 2019

Licensing Department,
Nunavut Water Board
P.O. Box 119
Gjoa Haven, Nunavut X0B 1J0

Re: 8AC-ALT--- DEPARTMENT OF NATIONAL DEFENCE - CANADIAN FORCES STATION ALERT PROJECT; - RENEWAL APPLICATION FOR TYPE 'A' WATER LICENCE – ECCC FINAL SUBMISSION COMMENTS

Dear Licensing Department,

The Department of National Defence (DND) - 8 Wing Trenton Environmental Management Office is providing this response letter to the ECCC (Environment and Climate Change Canada) Technical Review Memorandum Comments for Type 'A' Water Licence application, 8AC-ALT----, Canadian Forces Station Alert Project dated June 18, 2019.

DND - 8 Wing Trenton Environmental Management Office appreciates the dedicated efforts of the NWB and the constructive recommendations by ECCC to collaborate and support the water licence renewal process for CFS Alert.

DND - 8 Wing Trenton Environmental Management Office's responses to the ECCC Comments:

1) **ECCC#1:** ECCC recommends that DND provides:
    - Details of the proposed package treatment plant under consideration, and the rationale for the conclusion that the system to be selected would be feasible to install and operate at Alert;
    - Information on treatment capabilities of the selected package treatment plant, and the effluent quality targets;

    DND Response: DND is supportive of this request and will provide this information when available. Currently, DND is in the definition phases of planning but expects that contracting / data collection will take place from year 2020-2023. Once completed, development of the project plans will be coordinated between years 2023-2024 with planned implementation in 2025.

Canada

2) **ECCC#2:** ECCC recommends that the Type A WL include requirements for effluent quality monitoring at a frequency that will provide information on current treatment performance and characterize ongoing variability of the effluent in order to inform the consideration of treatment systems under evaluation (e.g., weekly sampling to be conducted until results stabilize and / or a new system is in place).

   DND Response: DND is supportive in ECCC request and will increase sampling requirements biweekly in order to satisfy. It should be noted that due to logistical restraints (delays/ health and safety obtaining samples), sampling and hold times may hinder true biweekly sampling. Every effort reasonable will be given to obtain samples and subsequent laboratory results.

3) **ECCC#3** ECCC recommends that:
   - DND prepare a basic site water balance, including seasonal ranges of water used and discharged, to inform wastewater treatment system selection; and
   - Water management planning be initiated and completed on a shorter time frame in order to inform and potentially improve water management practices.

   DND Response: DND is supportive in ECCC request and will provide this information when available. A project was initiated this year to target and quantify water usage at the separate facilities in order to gain a better understanding of infrastructure usage needs. Until this component is completed, data gathered and analysed, DND will be in a better position to satisfy this request. However, this will take some time, currently DND is in the definition phases of planning but expects that contracting / data collection will take place from year 2020-2023. Once completed development of the project plans will be coordinated between years 2023-2024 with planned implementation in 2025. DND would like to remind ECCC that infrastructure projects in the High Arctic takes time (years) to plan and action, especially due to the logistical and transportation constraints in being at a remote high arctic location, budgetary restrictions and planning priorities.

4) **ECCC#4**: ECCC recommends that upgrades to the terrace wetland wastewater treatment system area be done in any event to stabilize the terrain and prevent transport of suspended solids into the marine environment, and that the design be reviewed prior to implementation to confirm it will be effective in preventing further erosion and transport of sediments from the terrace.

   DND Response: DND conducts weekly (summer) and monthly (winter) inspections of the terrace. DND annually repairs the terrace where deficiencies are found as part of the ongoing maintenance program in CFS Alert.

DND is supportive in respect to ECCC's request to review 60% design development review documents in order to facilitate cross boundary departmental environmental stewardship. Please see attached draft design drawings of the proposed sewage terrace upgrades and description of the proposed outcome.

DND - 8 Wing Trenton Environmental Management Office is committed to work with the NWB and ECCC; we are supportive of any teleconferences and technical meetings to collaboratively help establish an appropriate Water Licence for CFS Alert.

Should you have any further questions or comments, please do not hesitate to contact me.

Yours truly,

Nathan Koutroulides B.Sc.
Deputy 8 Wing Environment Officer
8 Wing Trenton Environmental Management Office
Department of National Defence
(613) 392-2811 ext 4821
Nathan.Koutroulides@forces.gc.ca

BRIEING NOTE FOR RP OPS NORTH

PROJECT 17-ESU–01 ALERT SEWAGE
TREATMENT TERRACE – PROPOSED DESIGN

ISSUE

1. Real Property Operations North (PR Ops N) has requested 1 Engineer Support Unit (1 ESU) to develop a design to improve sewage treatment at CFS Alert. Part of the solution is to improve the design of the sewage terrace to control flow and reduce erosion of the slope with the desired result of reduced total suspended solids (TSS) being discharged into Parr Inlet.

BACKGROUND

2. The existing soil consists of silty sand and silty gravel and the slope and berms that comprise the terraces are constructed from this soil. The spring freshet is eroding the slope and destroying existing berms, carrying the soil into the Parr Inlet.

3. The chosen course of action includes a sewage treatment package plant with improvement of the existing sewage treatment terraces to be used as back-up. While a feasible plant solution for sewage treatment is being developed, RP Ops N has requested a preliminary design proposal for terrace improvement.

DISCUSSION

4. By improving construction of the berms with material other than the native silty soil, erosion will be greatly reduced. Reducing erosion through soil retention mechanisms will improve the quality of the water being introduced into Parr Inlet.

5. The design incorporates gabion baskets keyed into the existing soil to allow permafrost to lock it in place. The gabions are to be placed at roughly the same location as the existing berms. Gabion openings will be specified to material the Alert quarry is capable of producing. The dimensions of the openings in the berms will be designed to control the locations of peak flows. These will be created by omitting 3 baskets from the top course at deliberate locations.

6. On the upstream side of the berms and the East side of the ridge, gabion wall with geotextile will be installed and specified to retain the silt while providing enough permeability to allow water to pass through.

7. The first berm adjacent to the outfall was eliminated with the intent of allowing the effluent to flow away from the pipe to increase the time it takes for the forming ice to reach the pipe in the winter.

8. Preliminary design drawings can be found at Annex A.

CONCLUSION

9. This is a proposed preliminary design of the sewage treatment terrace berms. Pending review by RP Ops N, 1 ESU will provide more detail for geotextile and gabion basket specifications.

Prepared by: G.G. McKay, Civil Engineering Technologist 1 ESU, (613) 541-5010 x 7459
Reviewed by: J.S. Kingswood, Capt, Acting OC 15 Engr Sqn 1 ESU, (613) 541-5010 x 7473
Approved by: J.R.M. Comeau, LCol, CO 1 ESU, (613) 541-5010 x 7401
Date Prepared:05 July 2019

ANNEXES:

Annex A – Preliminary Drawings, CFS Alert Wastewater Terrace

1 ENGINEER SUPPORT UNIT
1RE UNITÉ D'APPUI DU GÉNIE

LIST OF DRAWINGS - LISTE DES DESSINS

100 SITING / EMPLACEMENT

ESU-A28-8400-101
ESU-A28-8400-102

200 STRUCTURAL / STRUCTURE

ESU-A28-8400-201

600 CIVIL / CIVIL

ESU-A28-8400-601
ESU-A28-8400-602
ESU-A28-8400-603
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ESU-A28-8400-614

PRELIMINARY DRAWING

SET NO. - SÉRIE NO.

DATE 2017/07/10

DCC NO. - CDC NO.

WBS NO - NO. SRT

PF NO. - NO DP 17-ESU-01

JOB NO.

CFS ALERT
WASTE WATER TERRACE
CFS ALERT, QIKIQTAALUK REGION, NUNAVUT, CANADA

FOR REVIEW

LEVEL OF SECURITY | NIVEAU DE SÉCURITÉ

TO BE REVIEWED | À ÊTRE REVISER

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Canada

EXISTING GROUND
SCALE 1:750

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LEVEL OF SECURITY | NIVEAU DE SÉCURITÉ
TO BE REVIEWED | À ÊTRE RÉVISÉ

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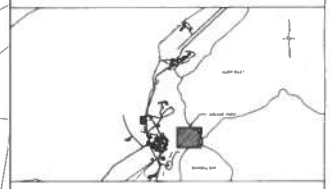

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 25N
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE 1:750

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE	METIER	DATE
SITING		2017/07/10

SUBJECT | SUJET
EXISTING GROUND

PRODUCTION	REVIEWED	REVU
DESIGNED	ETUDIE	PROJ O	O PROJ	DES O	AGENT CONC
MR. G. MCKAY		J. KINGSWOOD CAPT
DRAWN	DESSINE	PROJ MGR	GEST PROJ
J.A.P.	MR. G. MCKAY
CHECKED	VERIFIE	DES MGR	GEST CONC
S.J.C	
COORDINATION	FIRE	INCENDIE
RP DPS NORTH	

WBS NO. | NO. OTP
PF NO. | NO. DP 17-ESU-01

DWG. NO. | NO. DESSIN ESU-A28-8400-101

Canada

Sheet 1 of 17

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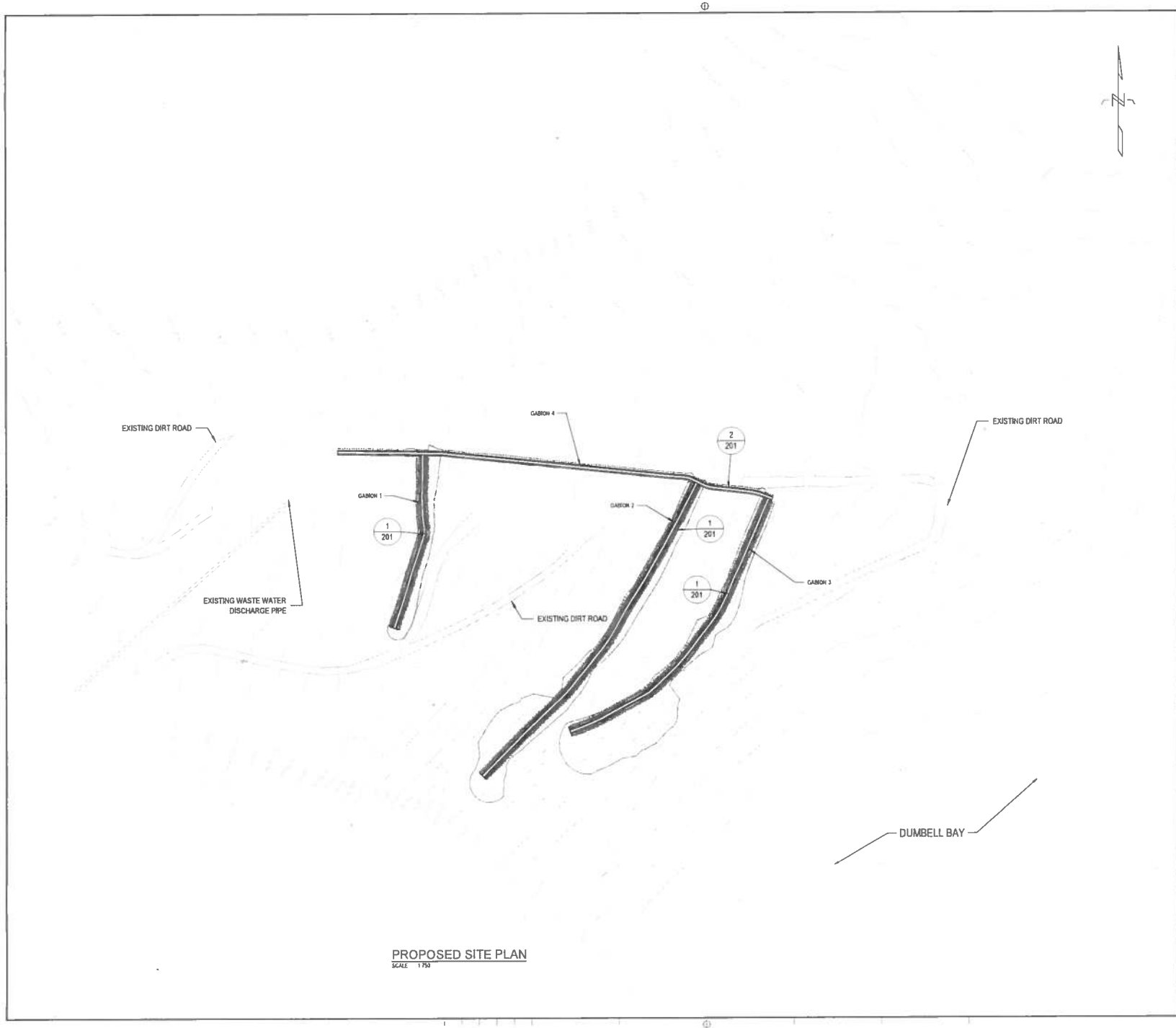

PROPOSED SITE PLAN
SCALE 1:750

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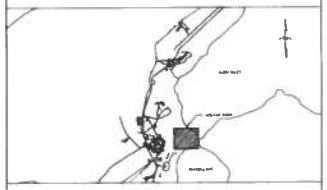

LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
————	EXTENTS OF EARTHWORKS

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 20N
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE 1:750

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER	DATE
SITING	2017/07/10

SUBJECT | SUJET
PROPOSED SITE PLAN

PRODUCTION	REVIEWED | REVU	
DESIGNED | ETUDIE MR. G. MCKAY	PROJ O | O PROJ	DES O | AGENT CONC J. KINGSWOOD CAPT
DRAWN | DESSINE J.A.L		PROJ MGR | GEST PROJ MR. G. MCKAY
CHECKED | VERIFIE S.J.C		DES MGR | GEST CONC
COORDINATION RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP	PF NO. | NO. DP
	17-ESU-01

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ESU-A28-8400-102

Canada

Sheet 2 of 11

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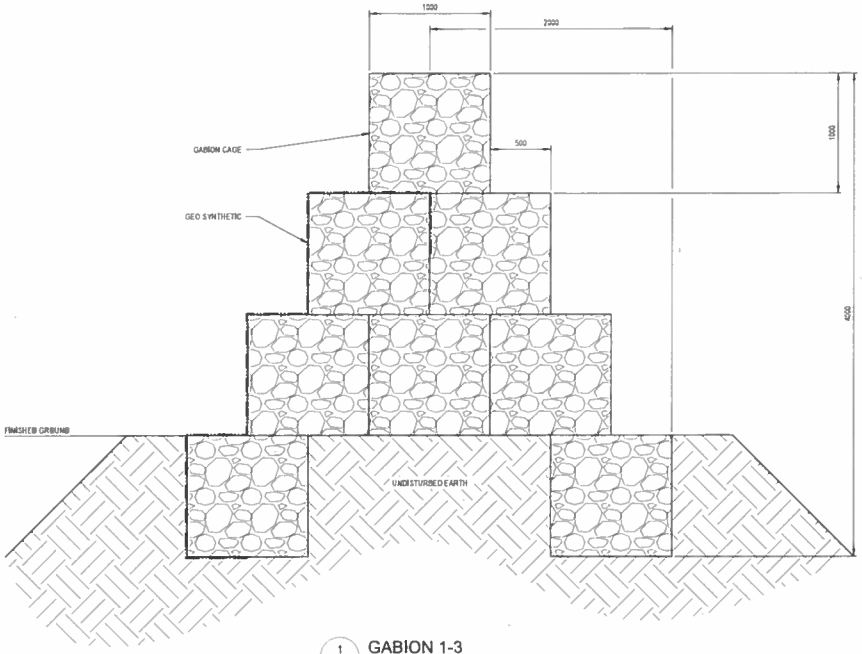

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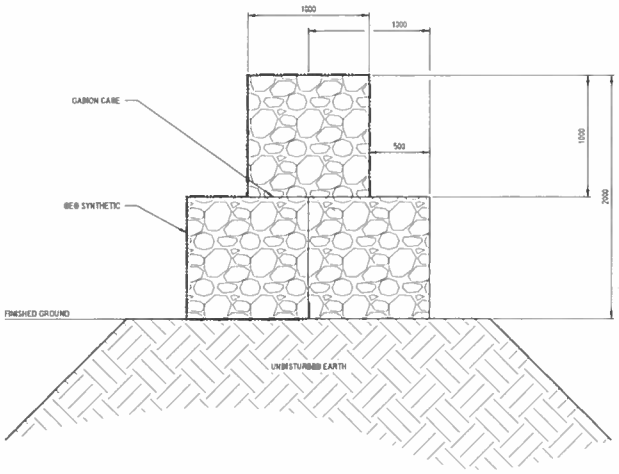

2 / 102 GABION 4
SCALE 1:20

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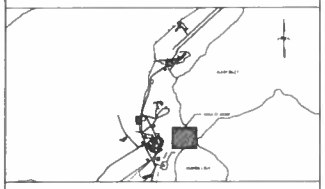

LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
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	GABION FILL

NOTES:

1. ALL DIMENSIONS ARE MILLIMETRES UNLESS OTHERWISE NOTED.

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE 1:20

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER: STRUCTURAL
DATE: 2017/07/10

SUBJECT | SUJET
GABION DETAILS

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DESIGNED | ETUDIE: MR. G. MCKAY	PROJ O | O PROJ	DES O | AGENT CONC: J. KINGSWOOD CAPT
DRAWN | DESSINE: J.A.L		PROJ MGR | GEST PROJ: MR. G. MCKAY
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COORDINATION: RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP
PF NO. | NO. DP: 17-ESU-01

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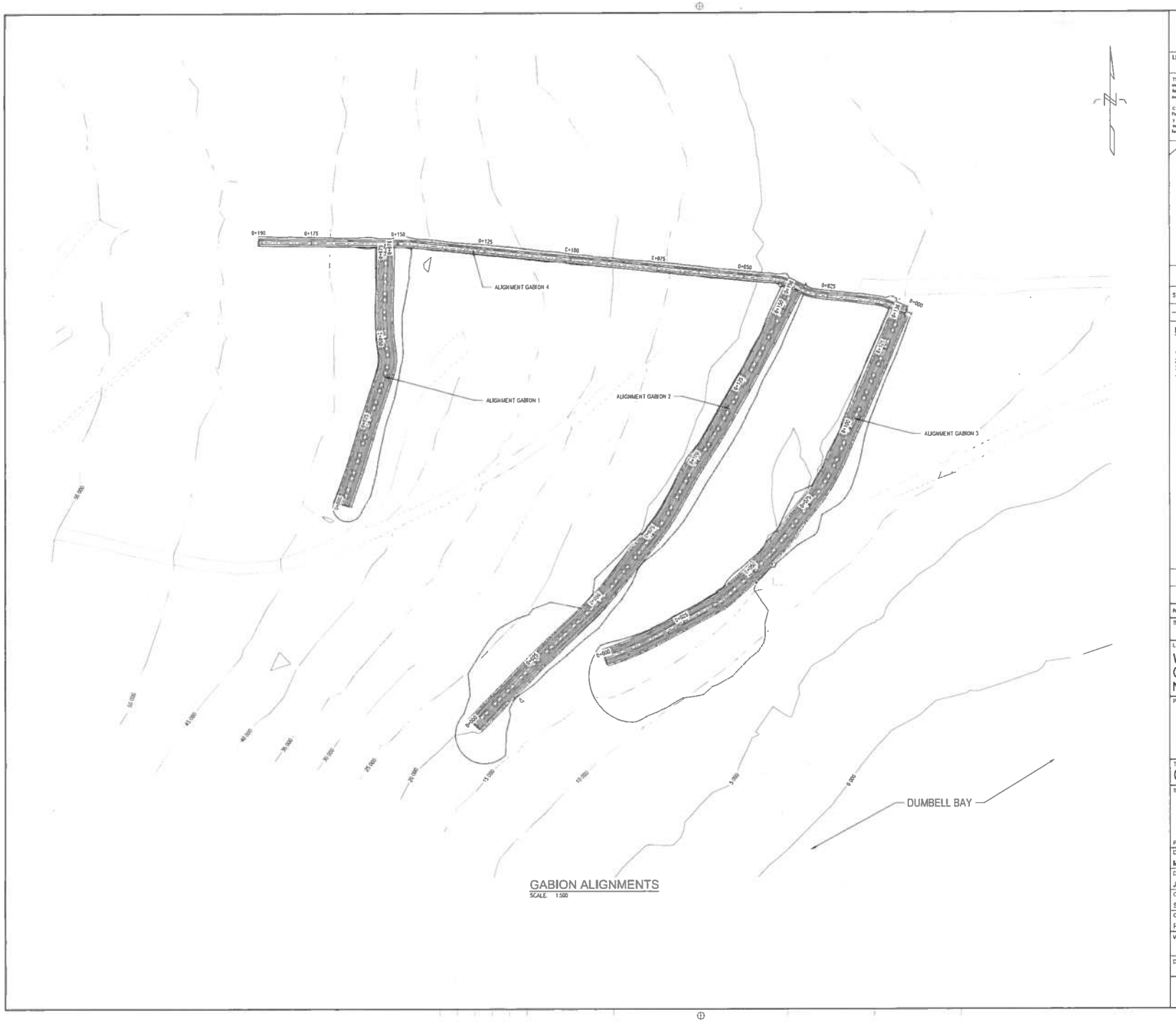

GABION ALIGNMENTS
SCALE 1:500

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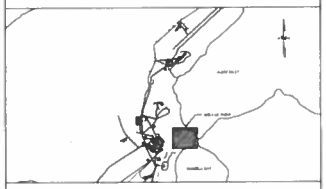

LEGEND - LEGENDE

SYMBOL	DESCRIPTION
.....	GABION DAYLIGHT (PLAN VIEW)

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 20N
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE 1:500

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | MÉTIER	DATE
CIVIL	2017/07/10

SUBJECT | SUJET
GABION ALIGNMENTS

PRODUCTION	REVIEWED | REVU	
DESIGNED | ÉTUDIÉ: MR. G. MCKAY	PROJ O | O PROJ	DES O | AGENT CONC: J. KINGSWOOD CAPT
DRAWN | DESSINÉ: J.A.L.		PROJ MGR | GEST PROJ: MR. G. MCKAY
CHECKED | VÉRIFIÉ: S.J.C.		DES MGR | GEST CONC
COORDINATION: RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP
PF NO. | NO. DP: 17-ESU-01

DWG. NO. | NO. DESSIN: ESU-A28-8400-601

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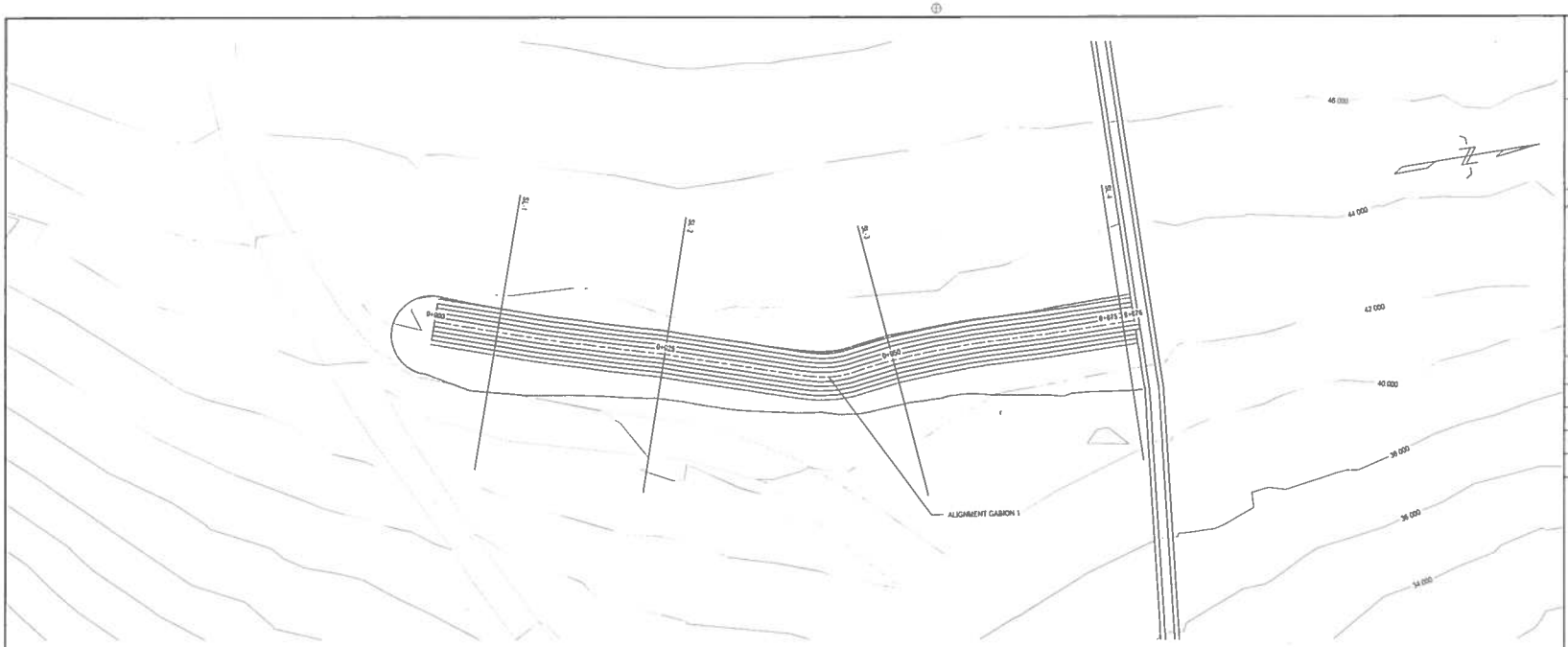
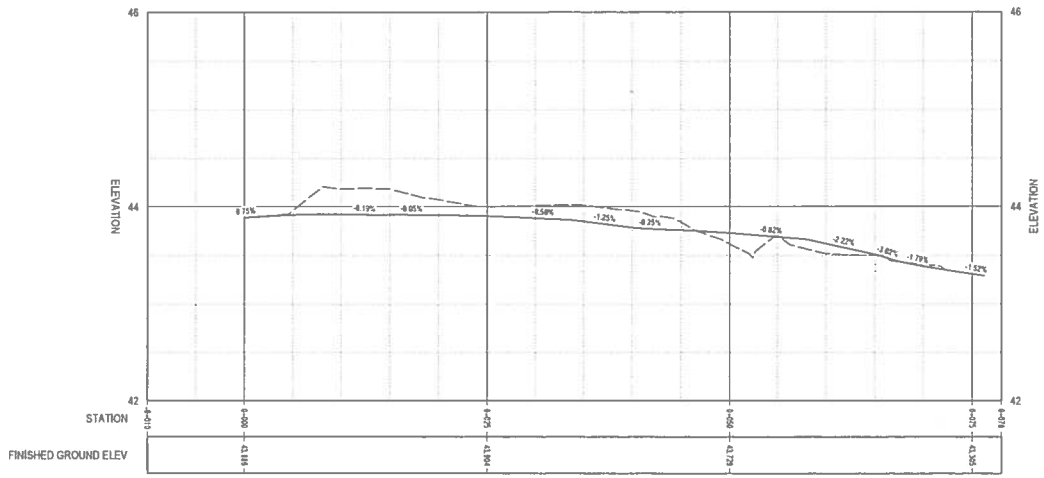
2018/Jun/07 12:42pm L.Lamotte J Y:\Drawings\Bases and Locations\N_NU\Alert\17-ESU-01 WWTP (Alert)\CIVIL\Designs\601 DESIGN SHEET.dwg ESU-A28-8400-601



GABION 1 PLAN VIEW

SCALE 1:250



GABION 1 PROFILE

SCALE HORIZONTAL 1:250
SCALE VERTICAL 1:10

1:250

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LEVEL OF SECURITY | NIVEAU DE SECURITE
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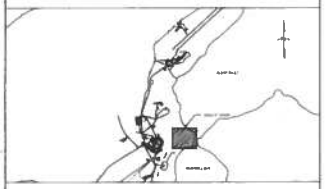

LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
	EXTENTS OF EARTHWORKS
	FINISHED GROUND (PROFILE VIEW)
	EXISTING GROUND (PROFILE VIEW)

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 20N
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ECHELLE
AS NOTED

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER: CIVIL
DATE: 2017/07/10

SUBJECT | SUJET
GABION 1
PLAN AND PROFILE VIEW
STA 0+000 TO 0+076

PRODUCTION	REVIEWED | REVU	
DESIGNED | ÉTUDIÉ: MR. G. MCKAY	PROJ ⊙ | O PROJ	DES ⊙ | AGENT CONC: J. KINGSWOOD CAPT
DRAWN | DESSINÉ: J.A.L.		PROJ MGR | GEST PROJ: MR. G. MCKAY
CHECKED | VERIFIÉ: S.J.C		DES MGR | GEST CONC
COORDINATION: RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP
PF NO. | NO. DP: 17-ESU-01

DWG. NO. | NO. DESSIN: ESU-A28-8400-602

Canada

BORDER | LAST UPDATED 2015-04-27

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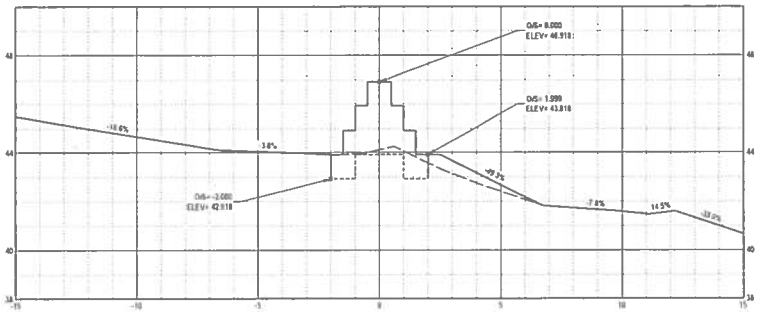
Sheet 5 of 17



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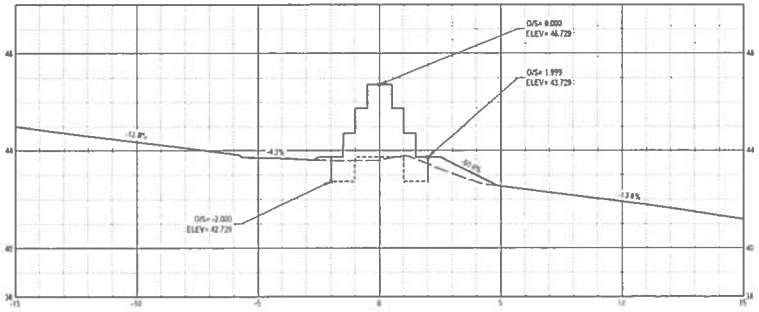

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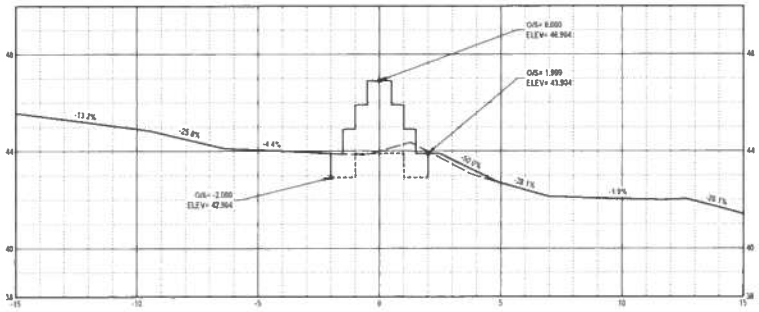

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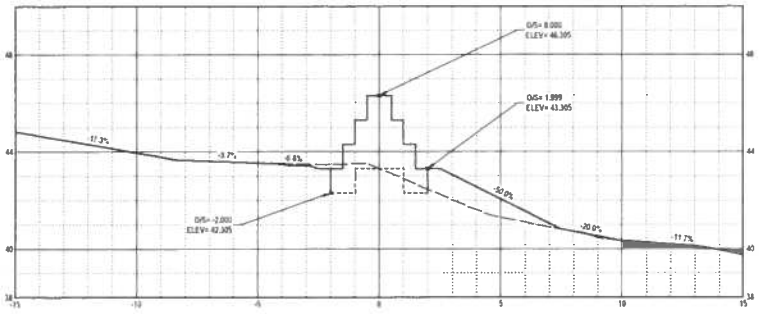

0+075

1 / 602 GABION 1 SECTION VIEWS
SCALE HORIZONTAL 1:100
SCALE VERTICAL 1:100

1:100

Government of Canada | Gouvernement du Canada

LEVEL OF SECURITY | NIVEAU DE SECURITE
TO BE REVIEWED | À ÊTRE REVISER

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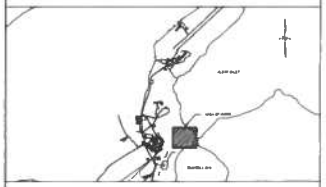


LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
	FINISHED GROUND
	EXCAVATED GROUND
	EXISTING GROUND

NOTES

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 20N
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE
AS NOTED

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER: CIVIL
DATE: 2017/07/10

SUBJECT | SUJET
GABION 1
SECTION VIEWS
STA 0+007 TO 0+075

PRODUCTION	REVIEWED | REVU	
DESIGNED | ETUDIE: MR. G. MCKAY	PROJ O | O PROJ	DES O | AGENT CONC: J. KINGSWOOD CAPT
DRAWN | DESSINE: J.A.L		PROJ MGR | GEST PROJ: MR. G. MCKAY
CHECKED | VERIFIE: S.J.C		DES MGR | GEST CONC
COORDINATION: RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP
PF NO. | NO. DP: 17-ESU-01

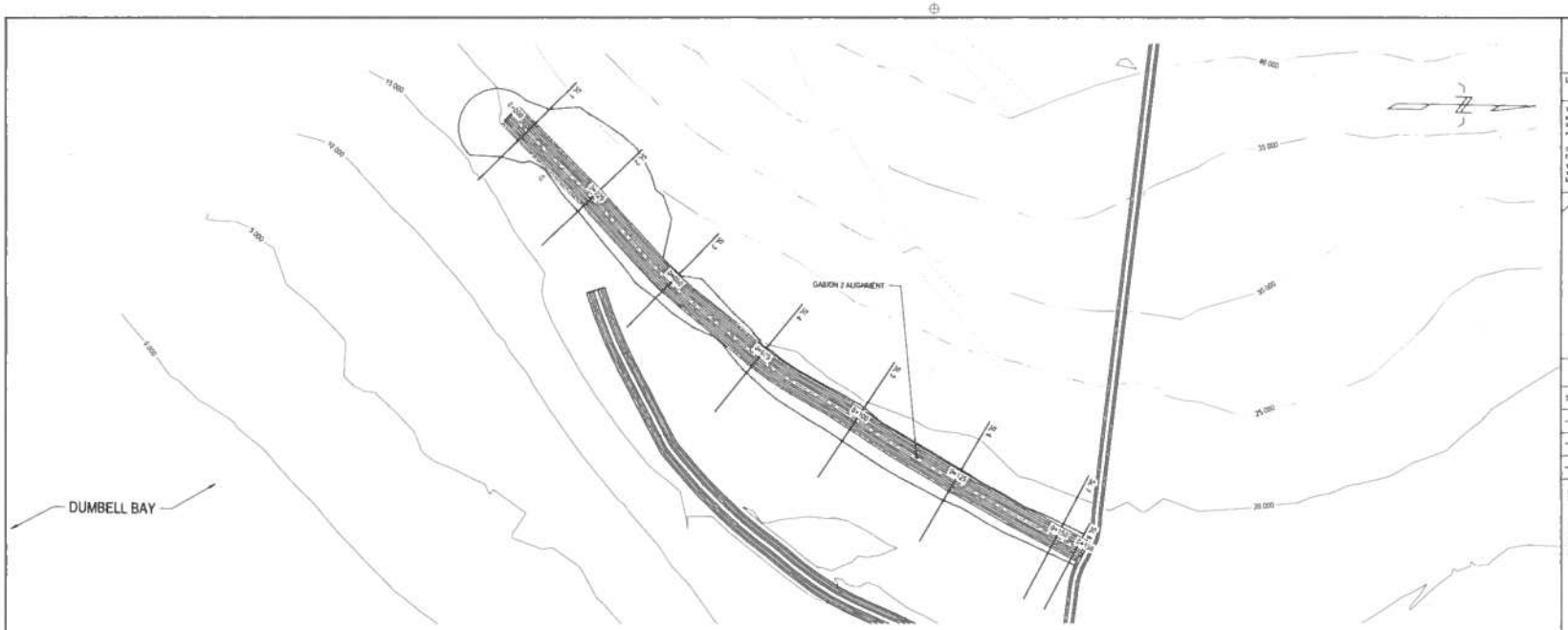
DWG. NO. | NO. DESSIN: ESU-A28-8400-603

Canada

BORDER LAST UPDATED 2012-04-21

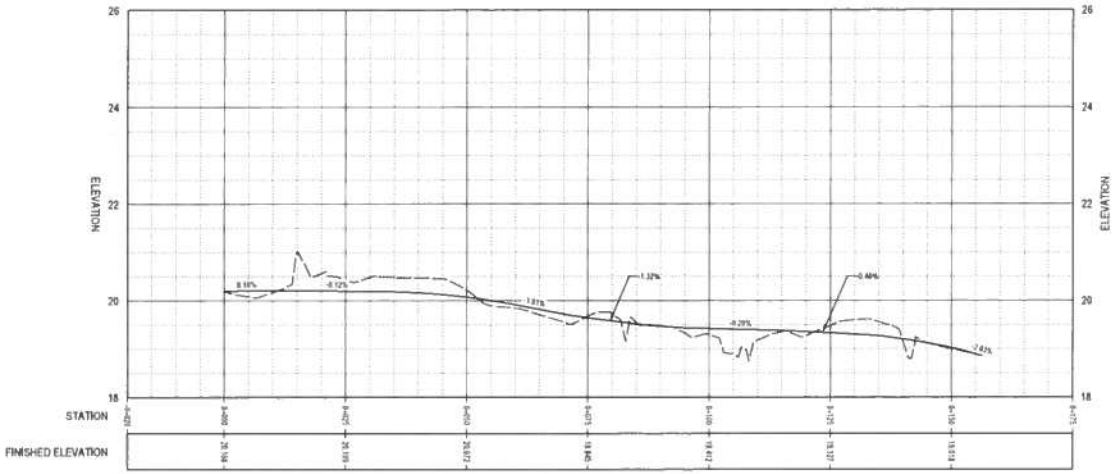
2018/Jan/07, 12:44pm Lamoine J ESU-A28-8400-603 Y:\Drawings\Bases and Locations\N-NU\Alert\17-ESU-01 WWTP (Alert)\4-Civil\Drawings\602 DESIGN SHEET.dwg

Sheet 6 of 17



GABION 2 PLAN VIEW

SCALE 1:500



GABION 2 PROFILE

SCALE HORIZONTAL 1:500
SCALE VERTICAL 1:50

1:500

Government of Canada | Gouvernement du Canada

LEVEL OF SECURITY | NIVEAU DE SECURITÉ
TO BE REVIEWED | À ÊTRE REVISER

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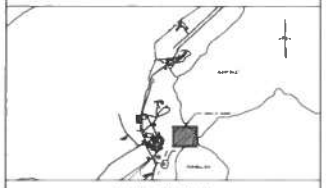


LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
	GABION DAYLIGHT (PLAN VIEW)
	FINISHED GROUND (PROFILE VIEW)
	EXISTING GROUND (PROFILE VIEW)

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 20H
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE
AS NOTED

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER: CIVIL
DATE: 2017/07/10

SUBJECT | SUJET
GABION 2
PLAN AND PROFILE VIEW
STA 0+000 TO 0+156

PRODUCTION	REVIEWED | REVU	
DESIGNED | ETUDIE: MR. G. MCKAY	PROJ O | O PROJ	DES O | AGENT CONC: J. KINGSWOOD CAPT
DRAWN | DESSINE: J.A.L		PROJ MGR | GEST PROJ: MR. G. MCKAY
CHECKED | VERIFIE: S.J.C		DES MGR | GEST CONC
COORDINATION: RP OPS NORTH		FIRE | INCENDIE

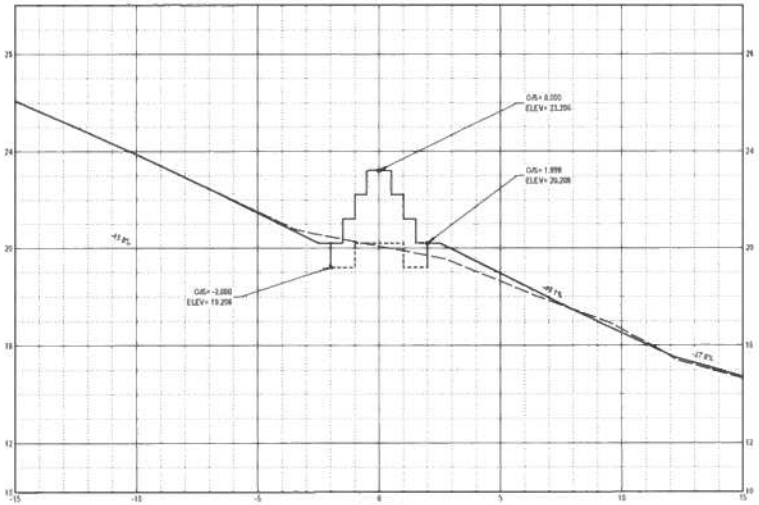
VIBS NO. | NO. OTP
PF NO. | NO. DP: 17-ESU-01
DWG. NO. | NO. DESSIN: ESU-A28-8400-604

Canada

BORDER | ÉTT (UPDATED 2015-04-01)

2016/Jun/07 12:45pm Lamothe J ESU-A28-8400-604 Y:\Drawings\Bases and Locations_NU\Alert\17-ESU-01 WWTP (User)\A-CIVIL\Sheets\100 STINGE\ESU-A28-8400-61 (1).dwg

Sheet 7 of 17



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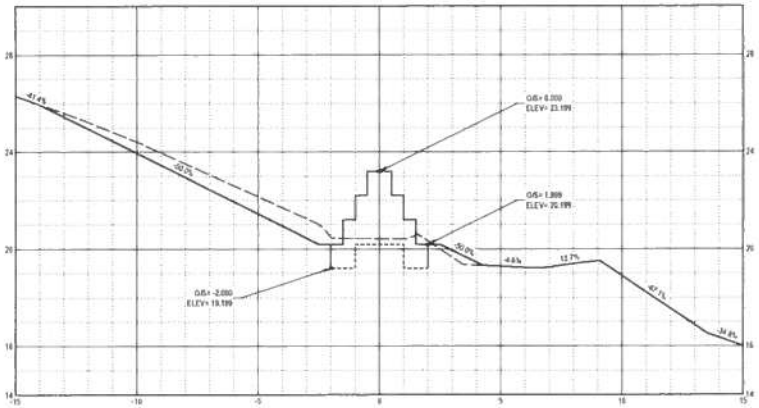

0+025

3 / 604 GABION 2 SECTION VIEWS
SCALE HORIZONTAL 1:100
SCALE VERTICAL 1:100

1:100

Government of Canada | Gouvernement du Canada

LEVEL OF SECURITY | NIVEAU DE SECURITE
TO BE REVIEWED | À ÊTRE REVISER

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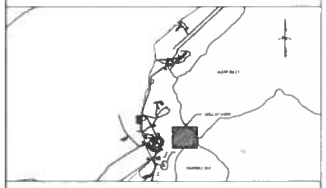

LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
———	FINISHED GROUND
- - - - - -	EXCAVATED GROUND
— — — —	EXISTING GROUND

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 20N
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE
AS NOTED

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER: CIVIL
DATE: 2017/07/10

SUBJECT | SUJET
GABION 3
SECTION VIEWS
STA 0+005 TO 0+025

PRODUCTION	REVIEWED | REVU	
DESIGNED | ETUDIE: MR. G. MCKAY	PROJ O | O PROJ	DES O | AGENT CONC: J. KINGSWOOD CAPT
DRAWN | DESSINE: J.A.L		PROJ MGR | GEST PROJ: MR. G. MCKAY
CHECKED | VERIFIE: S.J.C		DES MGR | GEST CONC
COORDINATION: RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP
PF NO. | NO. DP: 17-ESU-01

DWG. NO. | NO. DESSIN: ESU-A28-8400-605

Canada

2018/Jun/07, 12:45pm Lamont, J.J ESU-A28-8400-605 Y:\Drawings\Bases and Locations\N. Nat\Alert\17-ESU-01 WWTP (Alert)\4_Civil\Designs\604 DESIGN SHEET.dwg
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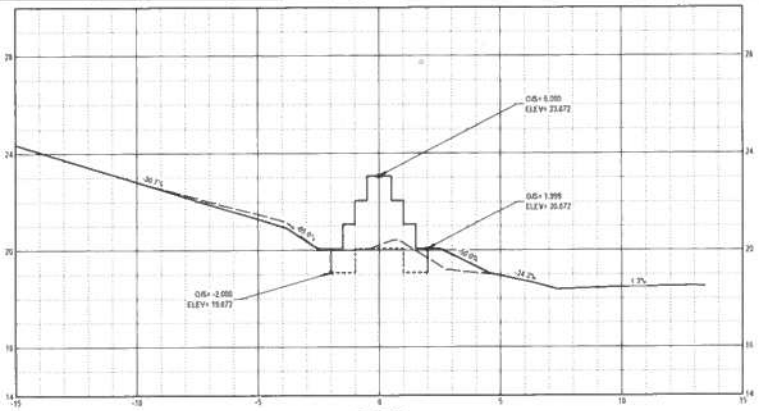

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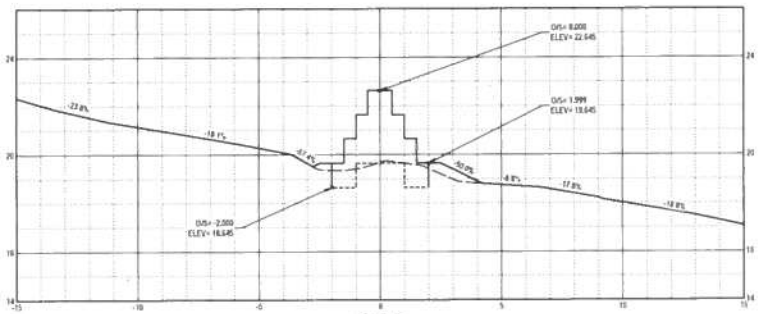

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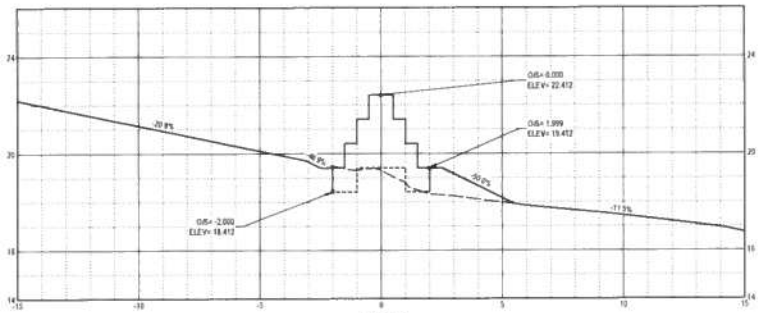

0+100

2 / 604 GABION 2 SECTION VIEWS
SCALE HORIZONTAL 1:100
SCALE VERTICAL 1:100

1:100

Government of Canada / Gouvernement du Canada

LEVEL OF SECURITY | NIVEAU DE SECURITÉ
TO BE REVIEWED | À ÉTRE REVISER

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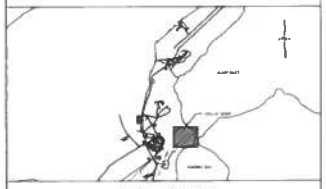


LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
————	FINISHED GROUND
- - - - - -	EXCAVATED GROUND
— — — —	EXISTING GROUND

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 20N
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE
AS NOTED

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER: CIVIL
DATE: 2017/07/10

SUBJECT | SUJET
GABION 2
SECTION VIEWS
STA 0+050 TO 0+100

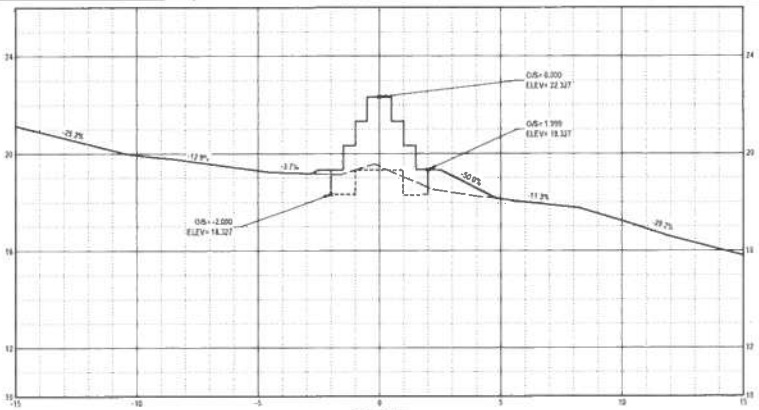
PRODUCTION	REVIEWED | REVU	
DESIGNED | ÉTUDIÉ: MR. G. MCKAY	PROJ O | O PROJ	DES O | AGENT CONC: J. KINGSWOOD CAPT
DRAWN | DESSINÉ: J.A.L		PROJ MGR | GEST PROJ: MR. G. MCKAY
CHECKED | VERIFIÉ: S.J.C		DES MGR | GEST CONC
COORDINATION: RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP
PF NO. | NO. DP: 17-ESU-01

DWG. NO. | NO. DESSIN: ESU-A28-8400-606

Canada

BORDER | ÉST UPDATED 2012-04-17
2018/Jun/07 12:45pm Lamontre,J ESU-A23-8400-606 Y:\Drawings\Bases and Locations\N_NU\Alert\17-ESU-01 WWTP (Alert)\4.CIVIL\Designs\604 DESIGN SHEET.dwg



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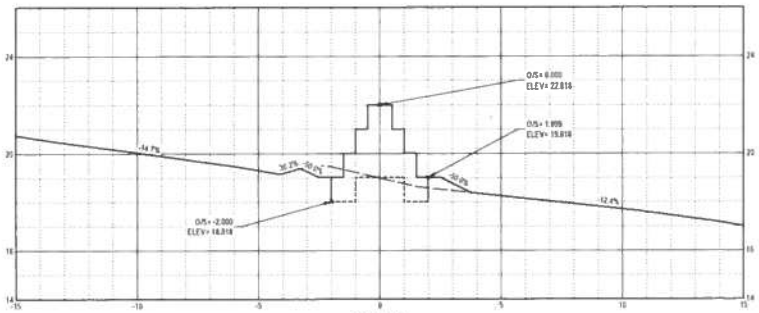

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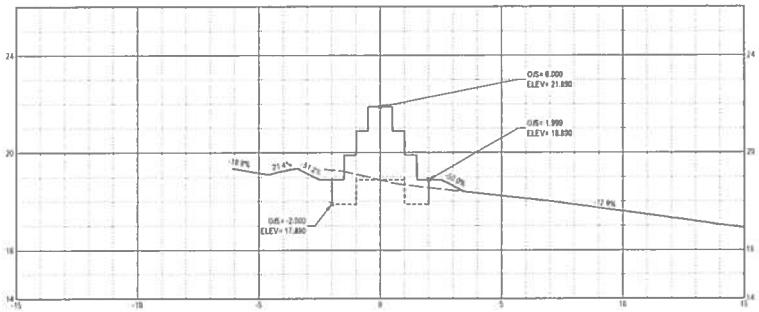

0+155

2 / 604 GABION 2 SECTION VIEWS

SCALE HORIZONTAL 1:100
SCALE VERTICAL 1:100

1:100

Government of Canada / Gouvernement du Canada

LEVEL OF SECURITY | NIVEAU DE SECURITE
TO BE REVIEWED | À ÊTRE REVISER

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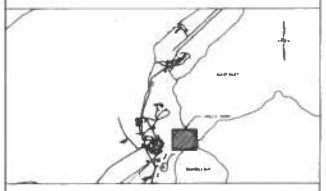


LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
———	FINISHED GROUND
———	EXCAVATED GROUND
— — — —	EXISTING GROUND

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 20N
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE
AS NOTED

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER: CIVIL
DATE: 2017/07/10

SUBJECT | SUJET
GABION 2
SECTION VIEWS
STA 0+125 TO 0+155

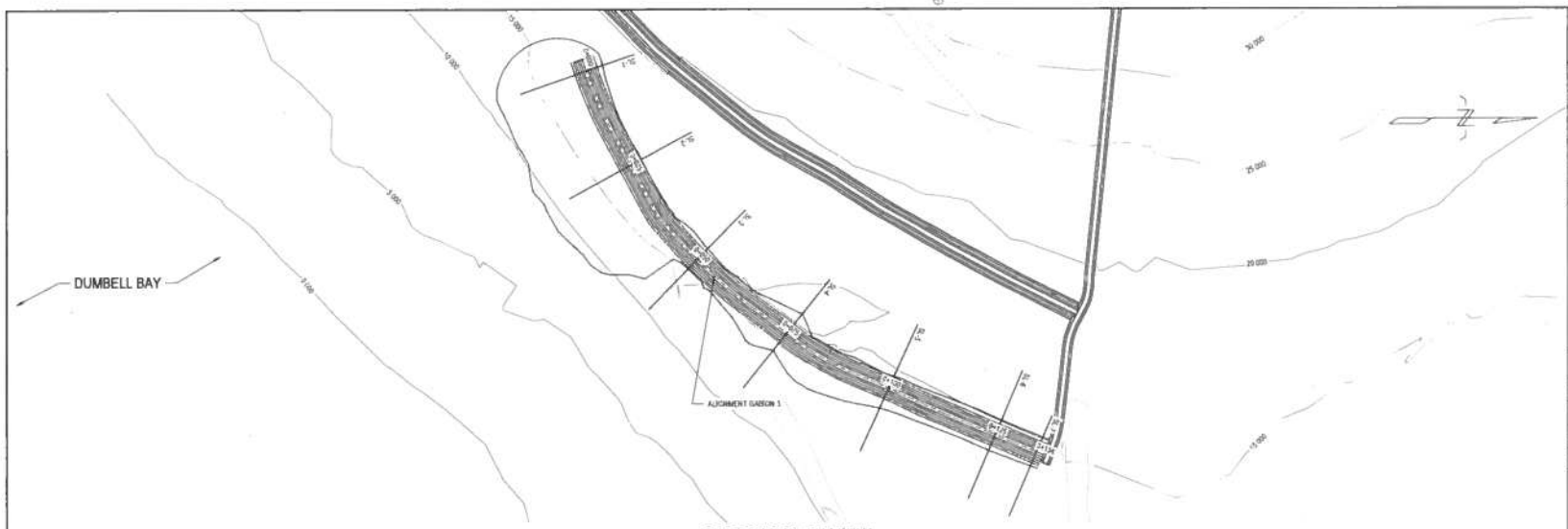
PRODUCTION	REVIEWED | REVU	
DESIGNED | ETUDIE: MR. G. MCKAY	PROJ O | G PROJ	DES O | AGENT CONC: J. KINGSWOOD CAPT
DRAWN | DESSINÉ: J.AL		PROJ MGR | GEST PROJ: MR. G. MCKAY
CHECKED | VERIFIE: S.J.C		DES MGR | GEST CONC
COORDINATION: RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP
PF NO. | NO. DP: 17-ESU-01

DWG. NO. | NO. DESSIN: ESU-A28-8400-607

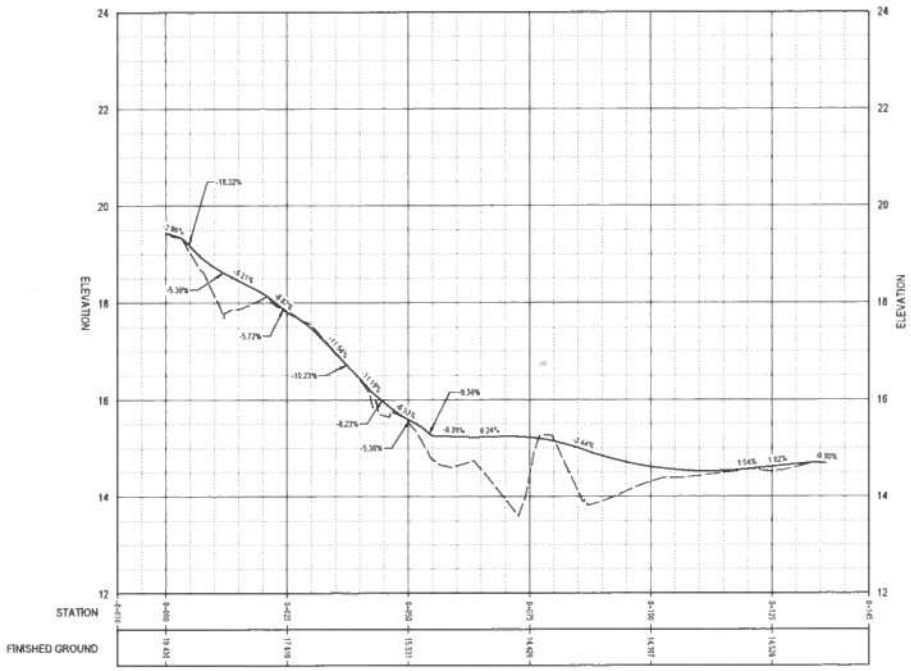
Canada

2019/Jun/07, 12:49pm Lamothe J Y:\Drawings\Bases and Locations\N. NU\Alert\17-ESU-01 WWTP (Alert)\4.CIVIL\Designs\604 DESIGN SHEET.dwg ESU-A28-8400-607 BORDER_11X17_UPDATED_2013-04-01



GABION 3 PLAN VIEW

SCALE 1:500



GABION 3 PROFILE

SCALE HORIZONTAL 1:500
SCALE VERTICAL 1:50

Government of Canada | Gouvernement du Canada

LEVEL OF SECURITY | NIVEAU DE SÉCURITÉ
TO BE REVIEWED | À ÊTRE REVISER

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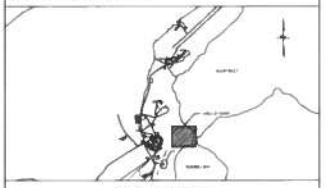


LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
	GABION DAYLIGHT (PLAN VIEW)
	FINISHED GROUND (PROFILE VIEW)
	EXISTING GROUND (PROFILE VIEW)

NOTES

1. ALL DIMENSION'S ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM: WGS 84
3. PROJECTION: UTM 20N
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE
AS NOTED

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER: CIVIL
DATE: 2017/07/10

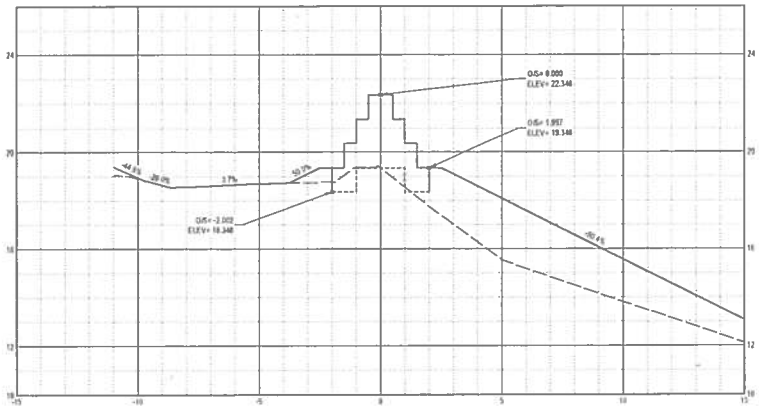
SUBJECT | SUJET
GABION 3
PLAN AND PROFILE VIEW
STA 0+000 TO 0+136

PRODUCTION	REVIEWED | REVU	
DESIGNED | ÉTUDIÉ: MR. G. MCKAY	PROJ O | O PROJ	DES O | AGENT CONC: J. KINGSWOOD CAPT
DRAWN | DESSINÉ: J.A.L.		PROJ MGR | GEST PROJ: MR. G. MCKAY
CHECKED | VERIFIÉ: S.J.C		DES MGR | GEST CONC
COORDINATION: RP OPS NORTH		FINE | INCENDIE

WBS NO. | NO. OTP
PF NO. | NO. DP: 17-ESU-01

DWG. NO. | NO. DESSIN: ESU-A28-8400-608

Canada



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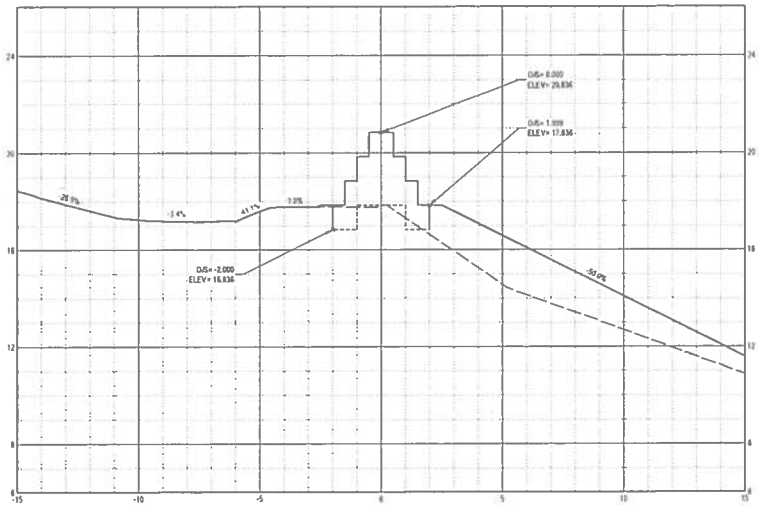

0+025

3 / 608 GABION 3 SECTION VIEWS
SCALE HORIZONTAL 1:100
SCALE VERTICAL 1:100

1:100

Government of Canada | Gouvernement du Canada

LEVEL OF SECURITY | NIVEAU DE SECURITÉ
TO BE REVIEWED | À ÊTRE REVISER

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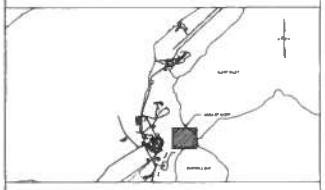

LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
	FINISHED GROUND
	EXCAVATED GROUND
	EXISTING GROUND

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 25N
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE
AS NOTED

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER: CIVIL
DATE: 2017/07/10

SUBJECT | SUJET
GABION 3
SECTION VIEWS
STA 0+003 TO 0+025

PRODUCTION	REVIEWED | REVU	
DESIGNED | ETUDIE: MR. G. MCKAY	PROJ O | O PROJ	DES O | AGENT CONC: J. KINGSWOOD CAPT
DRAWN | DESSINE: J.A.L		PROJ MGR | GEST PROJ: MR. G. MCKAY
CHECKED | VERIFIE: S.J.C		DES MGR | GEST CONC
COORDINATION: RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP
PF NO. | NO. DP: 17-ESU-01

DWG. NO. | NO. DESSIN: ESU-A28-8400-609

Canada

BORDER 11x17 UPDATED 2017-04-07

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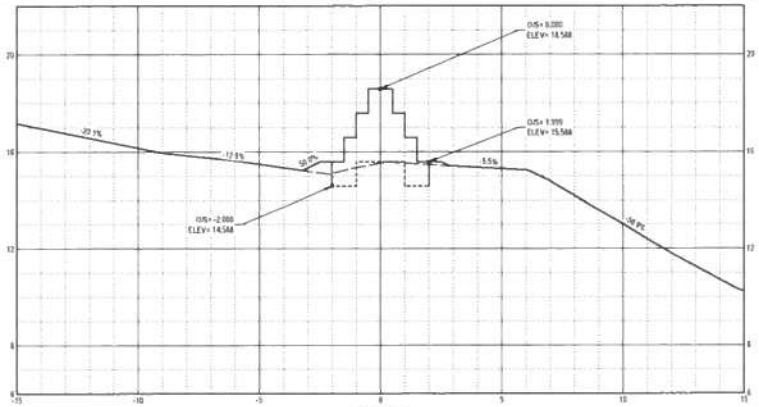
2016/Jun/07 12:47pm Lamothe J ESU-A28-8400-609

Sheet 12 of 17



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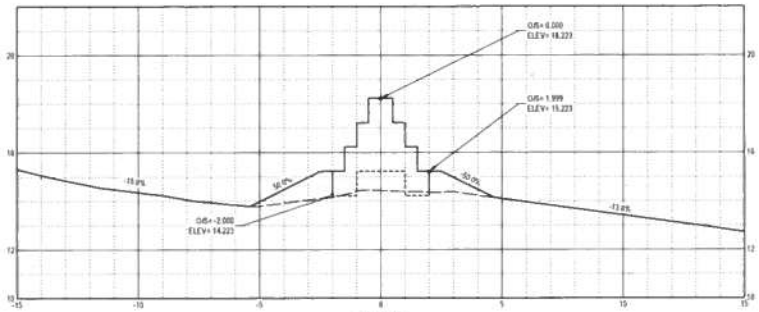

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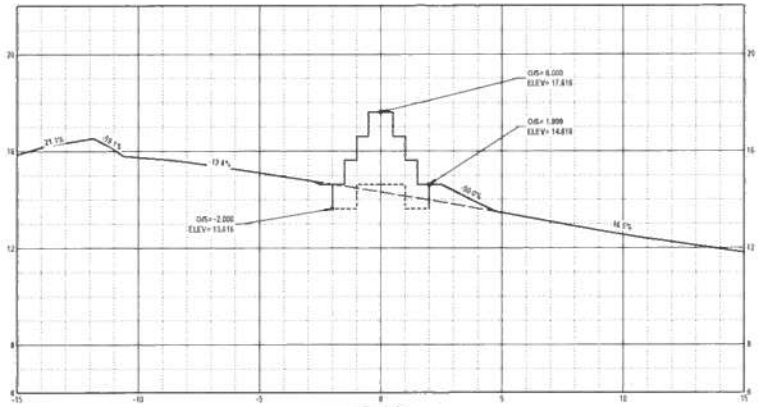

0+100

3 / 608 **GABION 3 SECTION VIEWS**

SCALE HORIZONTAL 1:100
SCALE VERTICAL 1:100

1:100

Government of Canada | Gouvernement du Canada

LEVEL OF SECURITY | NIVEAU DE SECURITE
TO BE REVIEWED | À ÊTRE REVISER

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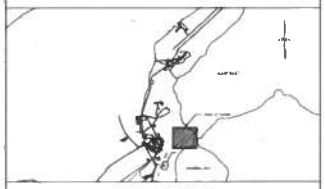


LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
———	FINISHED GROUND
- - - - -	EXCAVATED GROUND
— — — —	EXISTING GROUND

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 20H
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE
AS NOTED

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER: CIVIL
DATE: 2017/07/10

SUBJECT | SUJET
GABION 3
SECTION VIEWS
STA 0+050 TO 0+100

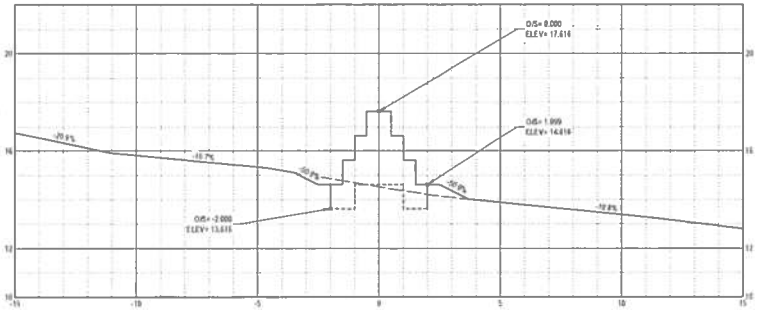
PRODUCTION	REVIEWED | REVU	
DESIGNED | ÉTUDIÉ: MR. G. MCKAY	PROJ O | O PROJ	DES O | AGENT CONC: J. KINGSWOOD CAPT
DRAWN | DESSINÉ: J.A.L		PROJ MGR | GEST PROJ: MR. G. MCKAY
CHECKED | VERIFIÉ: S.J.C		DES MGR | GEST CONC
COORDINATION: RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP
PF NO. | NO. DP: 17-ESU-01

DWG. NO. | NO. DESSIN: ESU-A28-8400-610

Canada

2019/Jun/07, 12:47pm Lamothe,J ESU-A28-8400-610 Y:\Drawings\Bases and Locations\N_NU\Alert\17-ESU-01 WWTP (Abri)\4.CFA\Designs\608 DESIGN SHEET.dwg



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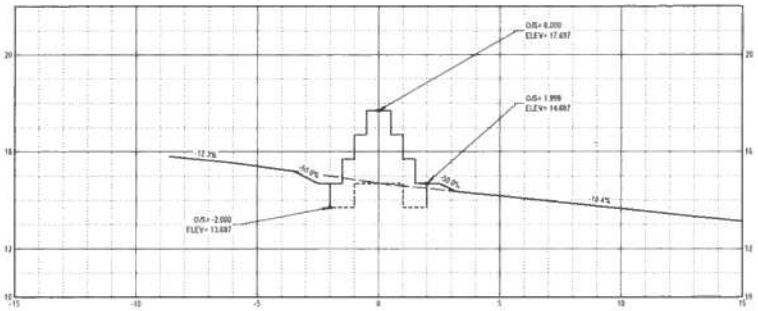

0+135

3 / 608 GABION 3 SECTION VIEWS

SCALE HORIZONTAL 1:100
SCALE VERTICAL 1:100

1:100

Government of Canada | Gouvernement du Canada

LEVEL OF SECURITY | NIVEAU DE SECURITÉ
TO BE REVIEWED | À ÊTRE REVISER

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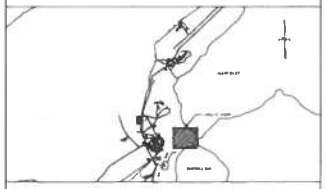


LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
————	FINISHED GROUND
- - - - - -	EXCAVATED GROUND
— — — —	EXISTING GROUND

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 20N
4. ORTHOMETRIC HEIGHTS DERIVED FROM COVD 2011

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE
AS NOTED

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER: CIVIL
DATE: 2017/07/10

SUBJECT | SUJET
GABION 3
SECTION VIEWS
STA 0+125 TO 0+135

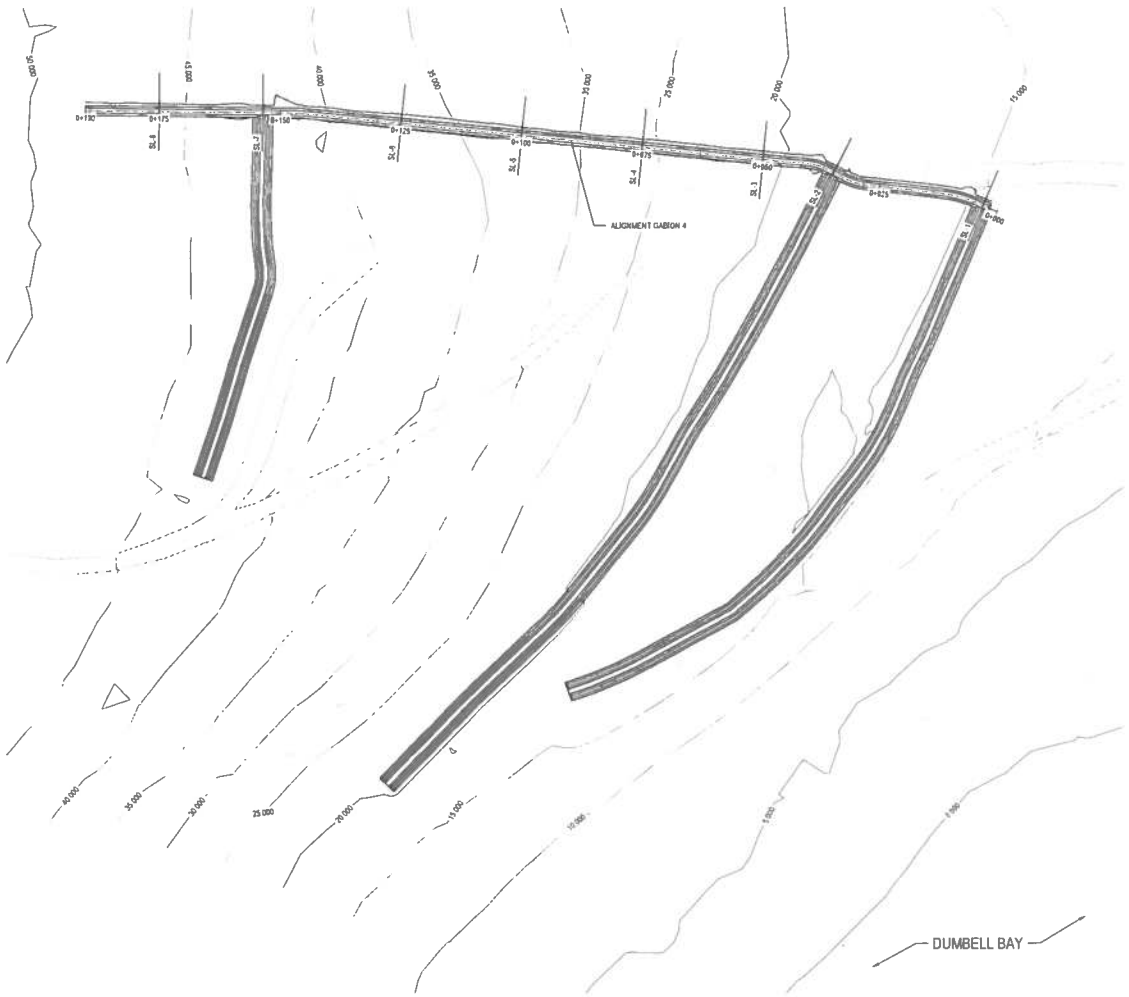
PRODUCTION	REVIEWED | REVU	
DESIGNED | ETUDIE: MR. G. MCKAY	PROJ O | O PROJ	DES O | AGENT CONC: J. KINGSWOOD CAPT
DRAWN | DESSINE: J.A.L		PROJ MGR | GEST PROJ: MR. G. MCKAY
CHECKED | VERIFIE: S.J.C		DES MGR | GEST CONC
COORDINATION: RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP
PF NO. | NO. DP: 17-ESU-01

DWG. NO. | NO. DESSIN: ESU-A28-8400-611

Canada

BORDER LAST UPDATED 2012-04-2
2018/Jun/07 12:47pm Lamoire J Y:\Drawings\Bases and Locations\N_NU\Alert\17-ESU-01 WWTP (Alert)\A-CIVIL\Designs\608 DESIGN SHEET.dwg ESU-A28-8400-611



GABION 4 PLAN VIEW
SCALE: 1:500

Government of Canada | Gouvernement du Canada

LEVEL OF SECURITY | NIVEAU DE SÉCURITÉ
TO BE REVIEWED | À ÊTRE REVISER

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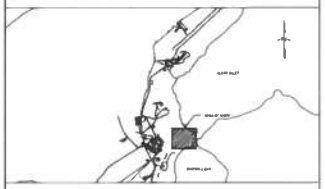

LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
———	GABION DAYLIGHT

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 20N
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE
1:500

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER	DATE
CIVIL	2017/07/10

SUBJECT | SUJET
GABION 4
PLAN VIEW
STA 0+000 TO 0+190

PRODUCTION	REVIEWED | REVU	
DESIGNED | ETUDIE MR. G. MCKAY	PROJ O | O PROJ	DES O | AGENT CONC J. KINGSWOOD CAPT
DRAWN | DESSINE J.A.L		PROJ MGR | GEST PROJ MR. G. MCKAY
CHECKED | VERIFIE S.J.C		DES MGR | GEST CONC
COORDINATION RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP	PF NO. | NO. DP
	17-ESU-01

DWG. NO. | NO. DESSIN
ESU-A28-8400-612

Canada

BORDER - AST UPDATED 2013-04-C
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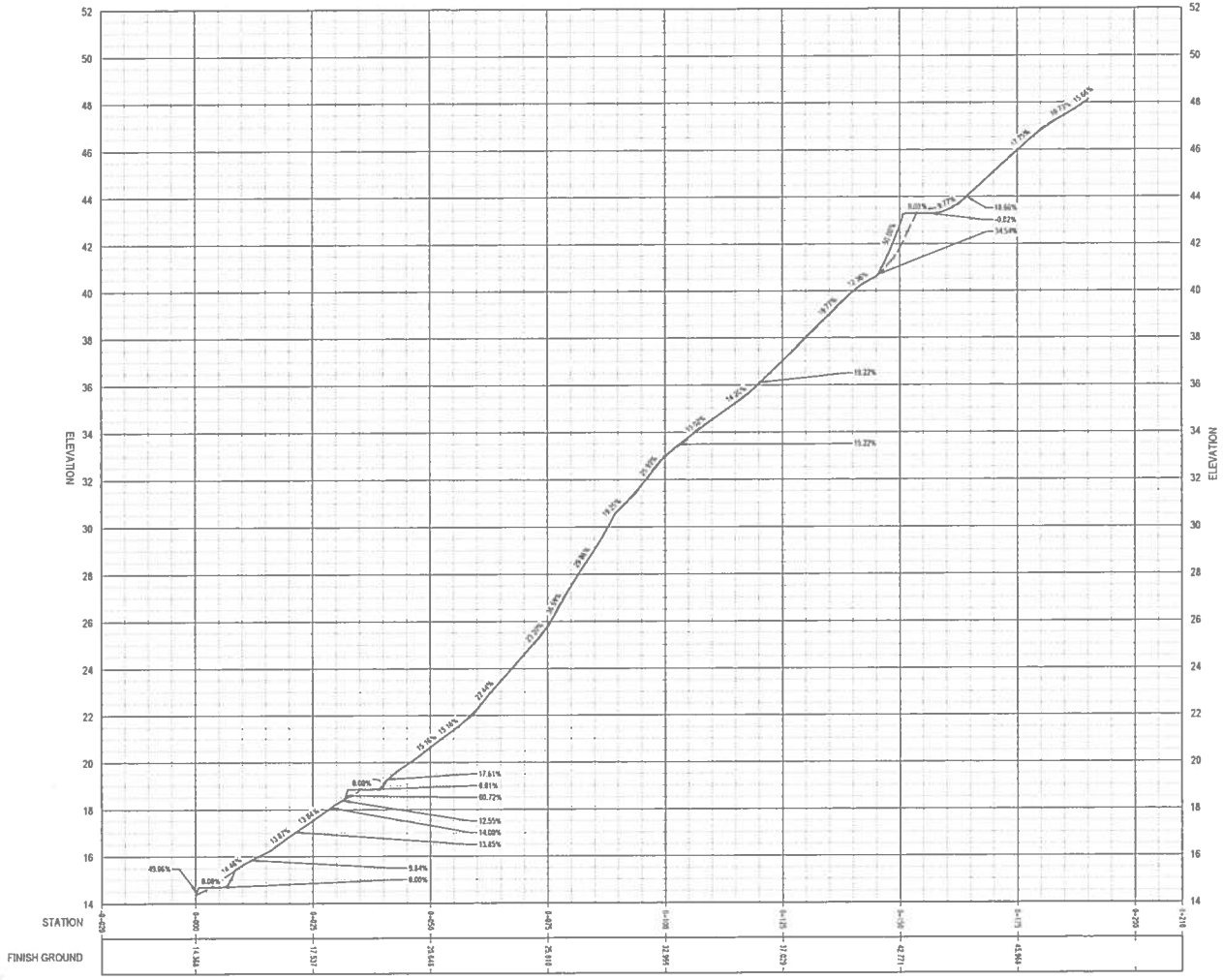

4 / 612 GABION 4 PROFILE

SCALE HORIZONTAL 1:500
SCALE VERTICAL 1:100

1:100

1:500

Government of Canada | Gouvernement du Canada

LEVEL OF SECURITY | NIVEAU DE SECURITE
TO BE REVIEWED | À ÊTRE REVISER

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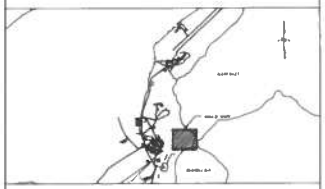

LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
———	FINISHED GROUND
— — — —	EXISTING GROUND

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM WGS 84
3. PROJECTION UTM 20N
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

PRELIMINARY DRAWING

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE
AS NOTED

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER	DATE
CIVIL	2017/07/10

SUBJECT | SUJET
GABION 4
PROFILE VIEW
STA 0+000TO 0+136

PRODUCTION	REVIEWED | REVU	
DESIGNED | ETUDIE MR. G. MCKAY	PROJ D | D PROJ	DES D | AGENT CONC J. KINGSWOOD CAPT
DRAWN | DESSINE J.A.L		PROJ MGR | GEST PROJ MR. G. MCKAY
CHECKED | VERIFIE S.J.C		DES MGR | GEST CONC
COORDINATION RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP	PF NO. | NO. DP
	17-ESU-01

DWG. NO. | NO. DESSIN
ESU-A28-8400-613

Canada

Sheet 18 of 17

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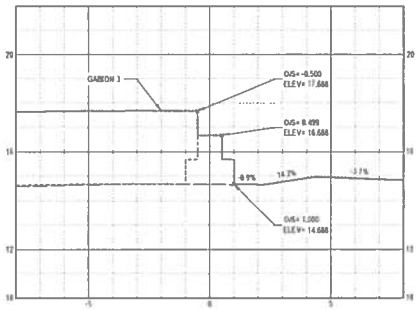

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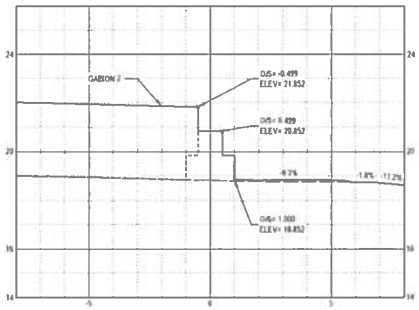

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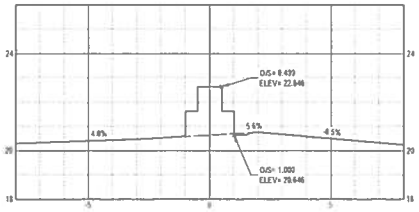

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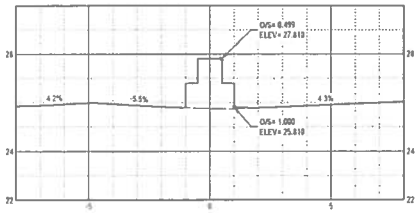

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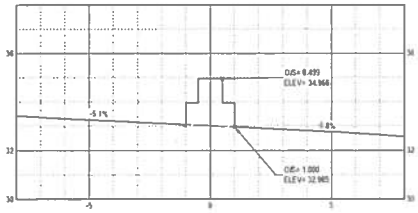

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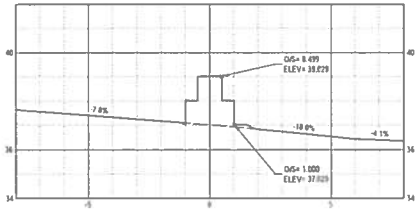

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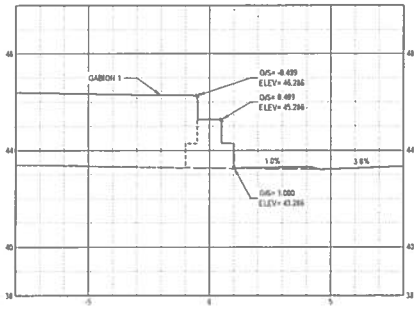

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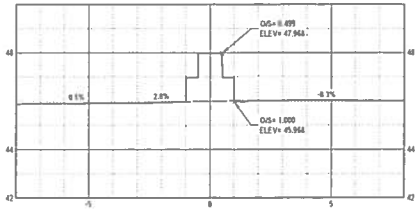

0+175

4 / 612 GABION 4 SECTION VIEWS

SCALE HORIZONTAL 1:100
SCALE VERTICAL 1:100

1:100

Government of Canada / Gouvernement du Canada

LEVEL OF SECURITY | NIVEAU DE SECURITE
TO BE REVIEWED | À ÊTRE REVISER

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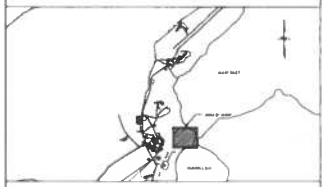

LEGEND - LÉGENDE

SYMBOL	DESCRIPTION
———	FINISHED GROUND
- - - - -	GABION ATTACHMENT
— — —	EXISTING GROUND

NOTES:

1. ALL DIMENSIONS ARE METRES UNLESS OTHERWISE NOTED.
2. DATUM: WGS 84
3. PROJECTION: UTM 20N
4. ORTHOMETRIC HEIGHTS DERIVED FROM CGVD 2013

NO.	DATE	REVISION	APPR.

SCALE | ÉCHELLE
AS NOTED

LOCATION | EMPLACEMENT
WASTE WATER TERRACE
CFS ALERT
NUNAVUT

PROJECT | PROJET
CFS ALERT
WASTE WATER TERRACE

TRADE | METIER: CIVIL
DATE: 2017/07/10

SUBJECT | SUJET
GABION 4
SECTION VIEWS
STA 0+003 TO 0+175

PRODUCTION	REVIEWED | REVU	
DESIGNED | ETUDIE: MR. G. MCKAY	PROJ O | O PROJ	DES O | AGENT CONC: J. KINGSWOOD CAPT
DRAWN | DESSINE: J.A.L		PROJ MGR | GEST PROJ: MR. G. MCKAY
CHECKED | VERIFIE: S.J.C		DES MGR | GEST CONC
COORDINATION: RP OPS NORTH		FIRE | INCENDIE

WBS NO. | NO. OTP
PF NO. | NO. DP: 17-ESU-01

DWG. NO. | NO. DESSIN: ESU-A28-8400-614

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