



834 Mountjoy Street South
P.O. Box 120
Timmins, Ontario P4N 7C5
Tel. (705) 264-9413
Fax. (705) 267-2725

September 2, 2010

Jim Millard, M. Sc., P. Geo.
Environmental Superintendent
Mary River Project
Baffinland Iron Mines Corporation
Suite 1016, 120 Adelaide Street West
Toronto, Ontario M5H 1T1

Dear Jim,

RE:

**MARY RIVER PROJECT
MARY RIVER LANDFILL
QA/QC REPORT (As-Built Report)
OUR REFERENCE NO. 09-162**

Genivar Consultants LP (Genivar) was retained by Baffinland Iron Mines Corporation (BIMC) to design the Solid Waste Landfill and its associated access road in Nunavut, provide QA/QC services during construction and subsequently to compile the required documentation of as-built conditions of the facility.

BACKGROUND

Part J, Part J (3), of the Water Licence (#2BB-MRY0710) for the Mary River Project issued by the Nunavut Water Board (NWB) states that:

"The Licensee shall provide as-built plans and drawings, stamped and sealed by a professional Engineer registered in Nunavut, within ninety (90) days of completion of all construction works, ..."

Additionally, Qikiqtani Inuit Association (QIA) in their letter of August 27, 2009 entitled "QIA Response, BIMC Request to Commence Inert Landfill Construction and Operation" have made some requirements for As-Built conditions of the landfill which is the subject of this report.

The Construction of the Access Road and the landfill commenced in the first week of July 2010 and was completed within 3 weeks.

PROPOSED DESIGN OF THE ACCESS ROAD AND LANDFILL

Figure 1 shows the site map indicating the Mary River Project sites from Steensby in the south to Mary River Camp in the north and Milne Inlet Camp in the north. Figure 2 shows the site plan arrangements of the Access Road and Landfill at Mary River Site.

As shown in the related drawings in Appendix 1, the Access Road was designed to take off from the existing Explosives Magazines Road. This access road crosses two low areas where culverts were needed to allow for drainage. The Access Road was designed to be constructed of granular material from the nearby borrow pits and the quality of the granular material were to be observed visually by the site engineer performing QA/QC during construction.

The landfill was designed to have containment berms constructed of granular material. The containment berms are approximately 2-m in height with 3:1 inside slopes and 2:1 outside slopes.

AS-CONSTRUCTED CONDITIONS OF THE FACILITY

Genivar provided full-time QA/QC inspection of the construction activities for the Access Road and the Landfill containment berms. Attached in Appendix 2 are the As-Constructed Drawings and photographs of construction activities.

Access Road construction

The Access Road was constructed in general conformance to the design. Granular material was brought in from nearby borrow pits and placed and compacted. Two culverts at station 0+118 and at station 0+383 were constructed. It should be noted that from Station 0+500 to station 0+600, the road was constructed of blasted inert waste rock for better compaction and drainage. For details on the as-built profile and sections of the Access Road, please refer to drawings AC1 and AC2 in Appendix 2.

Containment construction

The containment for the Landfill Facility was constructed in general conformance with the design. For details on the plans and sections of the containment construction, please refer to drawings AC1 and AC2 in Appendix 2.

The material used for the containment berms and base was obtained from nearby borrow sources. The material was free of any deleterious substances and was reviewed by Genivar QA/QC inspector.

It is our opinion that the Landfill Facility containment was designed and built in general conformance with our original design.

We trust this report is satisfactory and meets your requirements. However, should you have any questions, please do not hesitate to contact the undersigned for further discussion.

Yours truly,

Genivar Consultants LP

A handwritten signature in black ink, appearing to read "F. G. Kord". The signature is written in a cursive, slightly stylized font.

Marz G. Kord, P. Eng., M.Sc., MBA



APPENDIX 1

- **DESIGN BRIEFS**
- **DESIGN DRAWINGS**



834 Mountjoy Street South
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August 7, 2009

Dick Matthews
Director, Technical Services
Baffinland Iron Mines Corporation
Suite 1016, 120 Adelaide Street West
Toronto, Ontario M5H 1T1

Dear Dick,

RE:

**MARY RIVER PROJECT
ACCESS ROAD TO SOLID WASTE DISPOSAL SITE
DESIGN REPORT
OUR REFERENCE NO. 09-162**

Genivar Consultants LP (Genivar) has been retained by Baffinland Iron Mines Corporation (BIMC) to design the access road to the solid waste disposal site at their Mary River Camp site in Nunavut. The purpose of this report is to provide you with the design parameters as well as the methodology in the construction of the access road.

PROPOSED DESIGN OF THE FACILITIES AT MARY RIVER CAMP SITE

Figure C01 shows the site plan including a key map indicating the access road to the proposed solid waste disposal site. Figures C02 to C05 show the plan, profiles and sections of the road including the culverts associated with our design.

The access road shall be built over relatively flat stony surfaced areas of the tundra with two lower areas where water may migrate under the road.

The intent is not to excavate into the tundra but to build on top of the stony surface on the flat areas and the minor organics in the depressed areas.

This should minimize to the melting of wedge ice or tabular ice below the surface of the road if it should exist in the permafrost.

Although there is no specification available for the select granular fill, the Contractors have been constructing roads on site with this material including the road to the bulk sample pit on top of the ore body as well as roads about the site.

There are two types of fill found in the borrow pits that have been used in construction in the past. One is a sandy fill with little gravel and the other is a well graded gravel with just adequate fines to construct a stable base that packs readily with the travel from the bulldozers and trucks. This material is what we term as select granular fill and it was identified in the nearby designated borrow pit to mine personnel and was approved by the engineer to be used on the road base and wearing surface.

As shown in the related drawings in Appendix 1, the access road requires two culverts to be installed at two locations to ensure proper drainage away from the road. These culverts were sized based on the precipitation information provided from the nearest measuring station (Pond Inlet) and the availability of culverts at the site. We enclose our design basis for the calculation of culverts to this letter.

The following is a summary of the required material for the proposed access road:

Road Length:	660 meters
Culverts:	1 @ 1-m dia. CSP culverts 11 meters
	1 @ 0.3 m dia. CSP culvert 10 meters
Cut:	0 C.M.
Fill (Road base aggregate)	2332 C.M. select granular fill.

The 1.0m culvert being utilized is considerably larger than required but is used due to availability on site.

An explosive magazine designed for 20,000 kg of explosive is located approximately 70 meters from the proposed access road to the solid waste disposal (SWD) site.

Although a majority of the 20,000 kg of explosives were used during the bulk sampling program in 2008, we have ensured that the access road to the SWD site meets the guidelines for Quality Distance to Explosives storage as set out by Natural Resources Canada (NRC).

We trust this report is satisfactory and meets your requirements. However, should you have any questions, please do not hesitate to contact the undersigned for further discussion.

Yours truly,

Genivar Consultants LP


Barry H. Martin, P. Eng., MRAIC
BHM/jw
c.c. Derek Chubb
Dave McCann

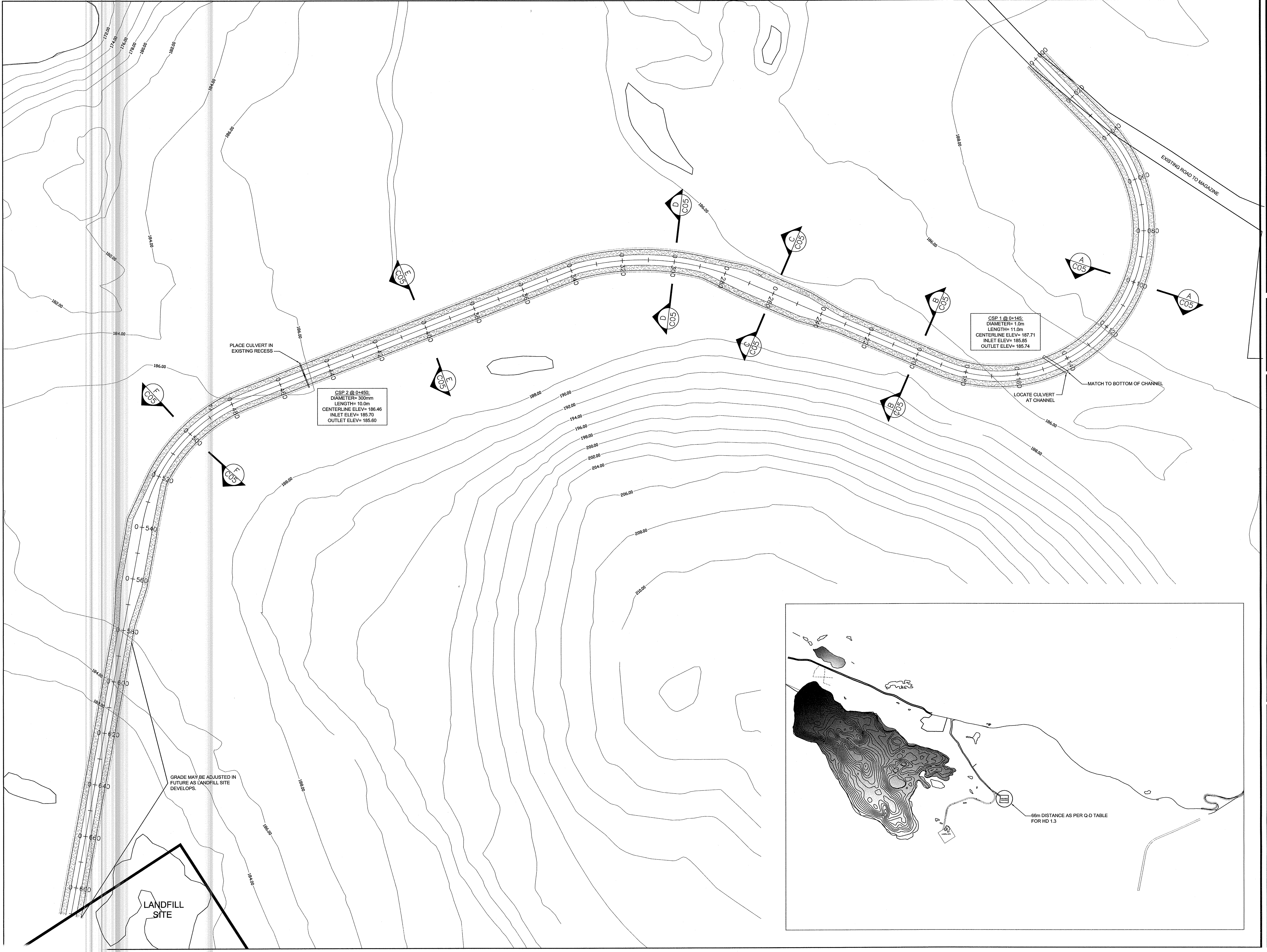




APPENDIX 1

DRAWINGS

(Forwarded July 20, 2009)



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Contractors shall verify and be responsible for all dimensions and conditions on the job and report any discrepancies to the Consultant before proceeding with the work.

Drawings shall not be scaled.

Description	Date	No.
Revisions and Issues		

NORTH

Date Printed

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ARCHITECT	STRUCTURAL/CIVIL
_____	_____
MECHANICAL	ELECTRICAL
_____	_____

Project

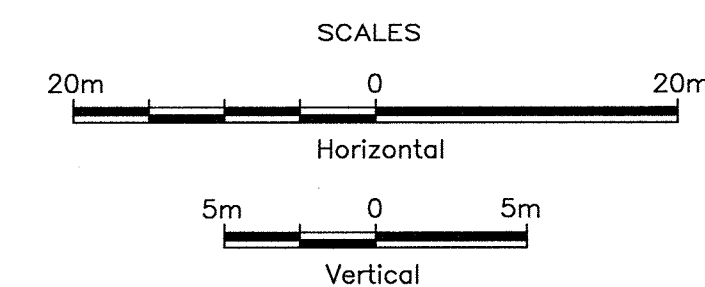
MARY RIVER PROJECT
BAFFINLAND IRON
MINES CORPORATION

BAFFINLAND NUNAVUT

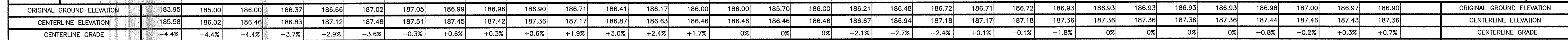
Drawing

NEW ROAD TO LANDFILL
SITE PLAN VIEW

Date	JUNE 2009	CADD File Number	design/new road sections.dwg
Scale	AS NOTED	Job Number	
Drawn	S.S.	09-162	
Checked	B.M.	Drawing Number	
Approved	B.M.	C01	



SCALE 1:125

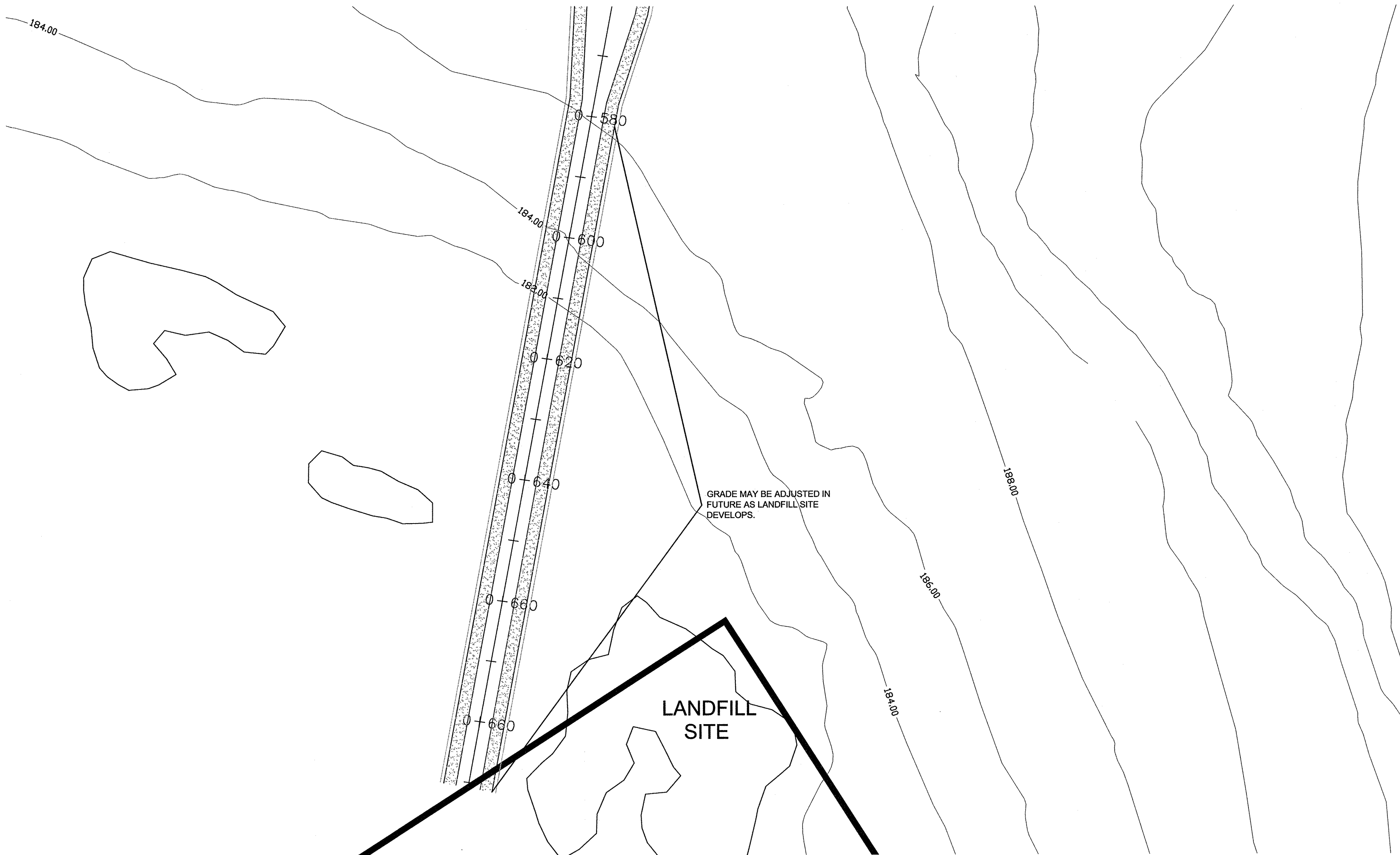


Description	Date	No.
Revisions and Issues		

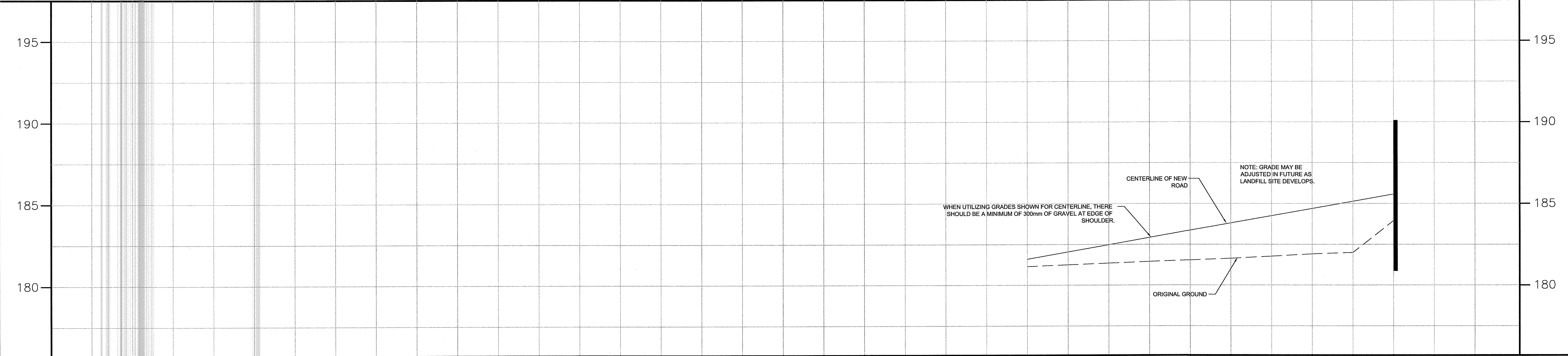
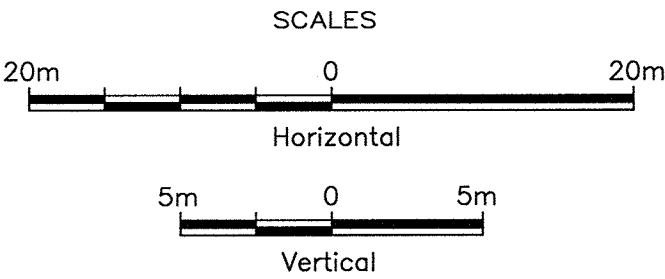


ELECTRICAL

Date JUNE 2009	CADD File Number civil/design/plan and profile
Scale AS NOTED	Job Number 09-162
Drawn S.S.	
Checked	Drawing Number
Approved	C03



NEW ROAD- PLAN VIEW
SCALE 1:125



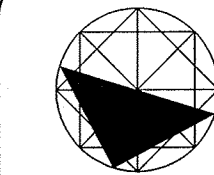
ORIGINAL GROUND ELEVATION	181.15	181.25	181.35	181.45	181.54	181.64	181.77	181.91	182.00	183.95	ORIGINAL GROUND ELEVATION
CENTERLINE ELEVATION	181.60	182.04	182.50	182.92	183.37	183.81	184.25	184.70	185.14	185.58	CENTERLINE ELEVATION
CENTERLINE GRADE		-4.4%	-4.6%	-4.2%	-4.5%	-4.4%	-4.4%	-4.5%	-4.4%	-4.4%	CENTERLINE GRADE
STATION	0+690	0+680	0+670	0+660	0+650	0+640	0+630	0+620	0+610	0+600	STATION
AS CONSTRUCTED NOTES											AS CONSTRUCTED NOTES

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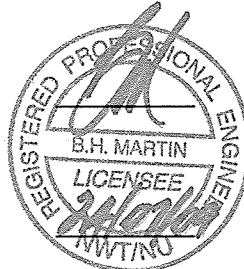
654 Murray Street South
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ARCHITECT

STRUCTURAL/CIVIL

MECHANICAL

ELECTRICAL



Project

MARY RIVER PROJECT
BAFFINLAND IRON
MINES CORPORATION

BAFFINLAND

NUNAVUT

Drawing

PLAN AND PROFILE
STA. 0+600 to 0+690

Date

JUNE 2009

CADD File Number

civil/design/plan and profile

Scale

AS NOTED

Job Number

09-162

Drawn

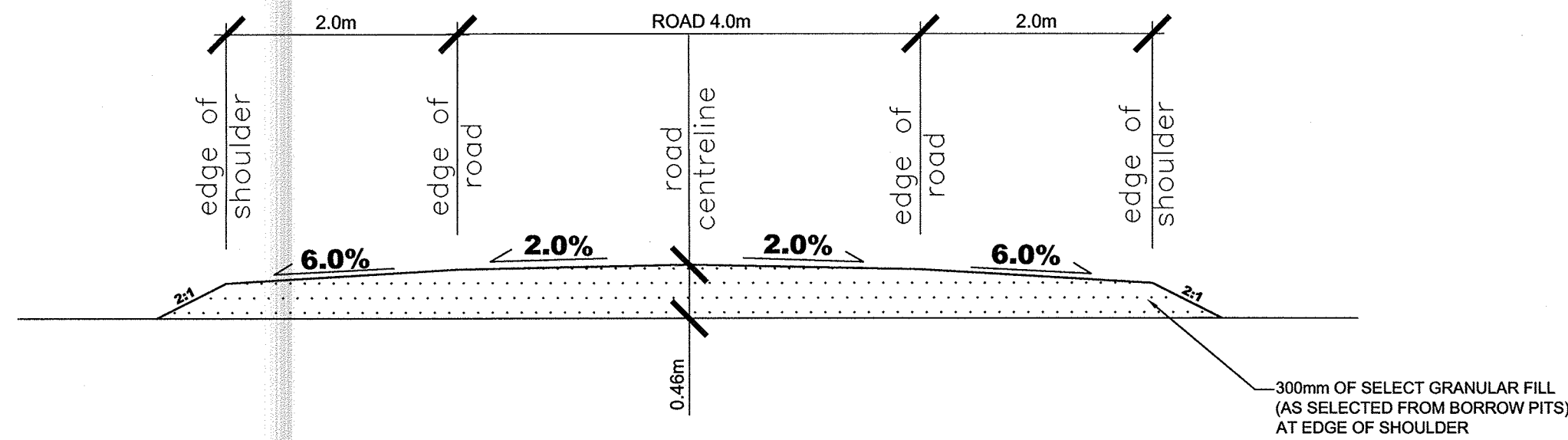
S.S.

Drawing Number

Checked

Approved

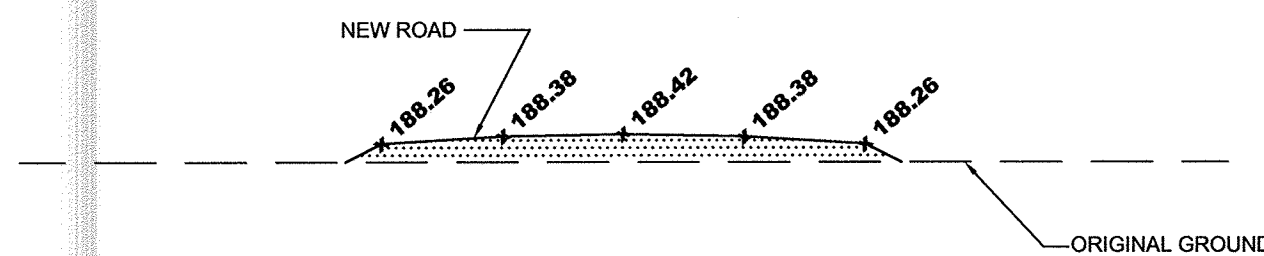
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NEW ROAD SECTION TYPICAL

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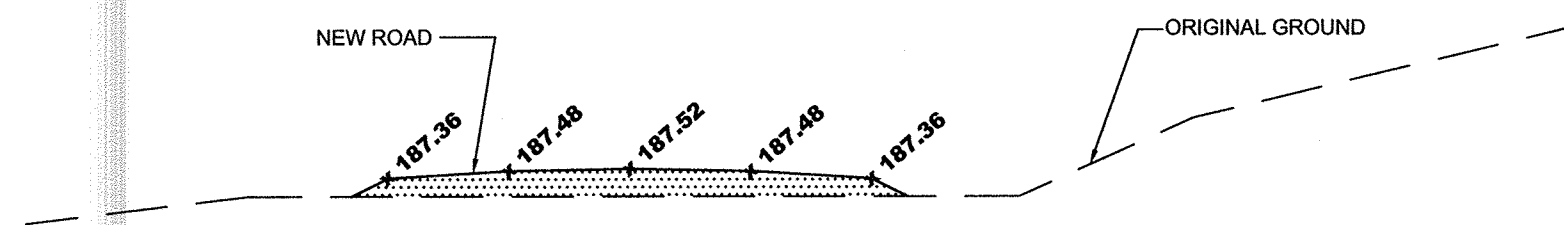
1
C05



STATION 0+100

SCALE 1:125

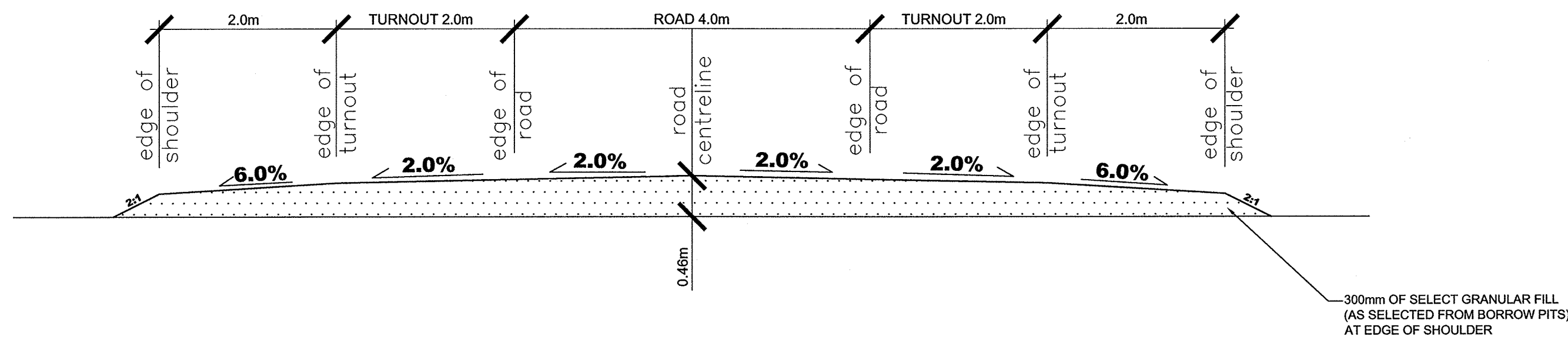
A
C05



STATION 0+200

SCALE 1:125

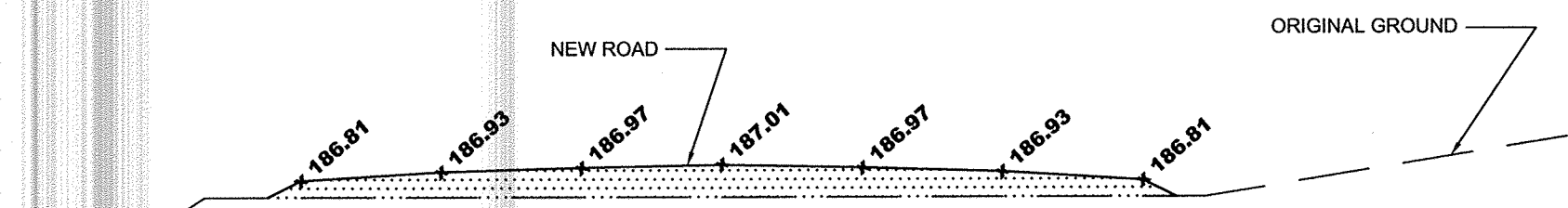
B
C05



NEW ROAD SECTION W/ TURNOUT TYPICAL

SCALE 1:100

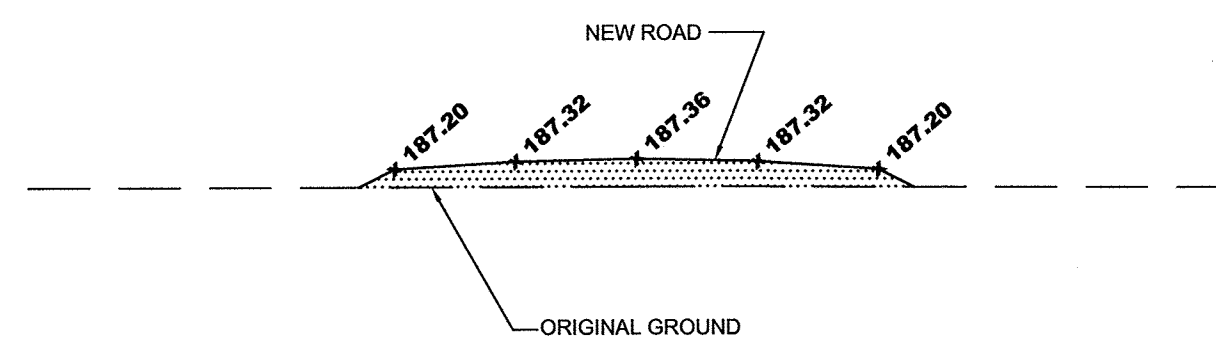
2
C05



STATION 0+260 W/ TURNOUT

SCALE 1:100

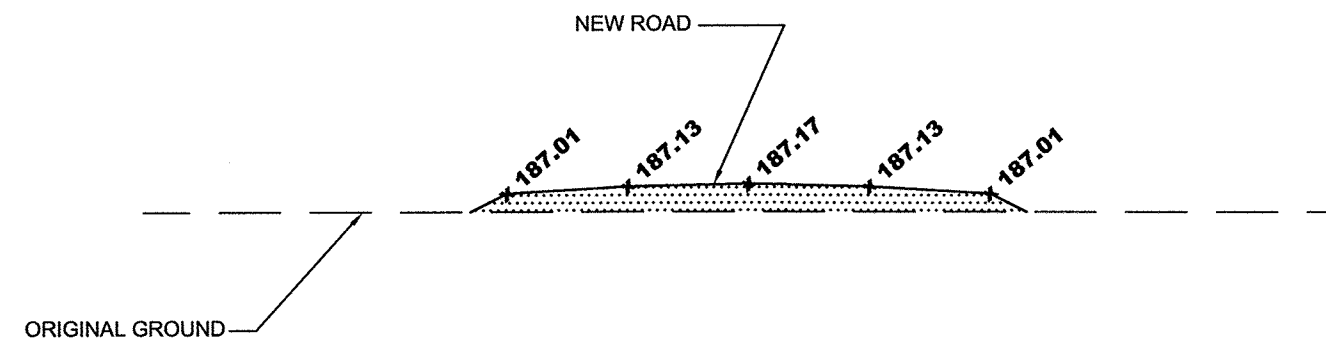
C
C05



STATION 0+300

SCALE 1:125

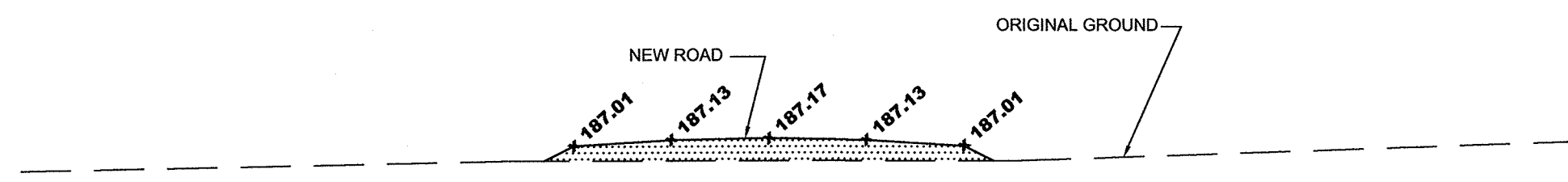
D
C05



STATION 0+400

SCALE 1:125

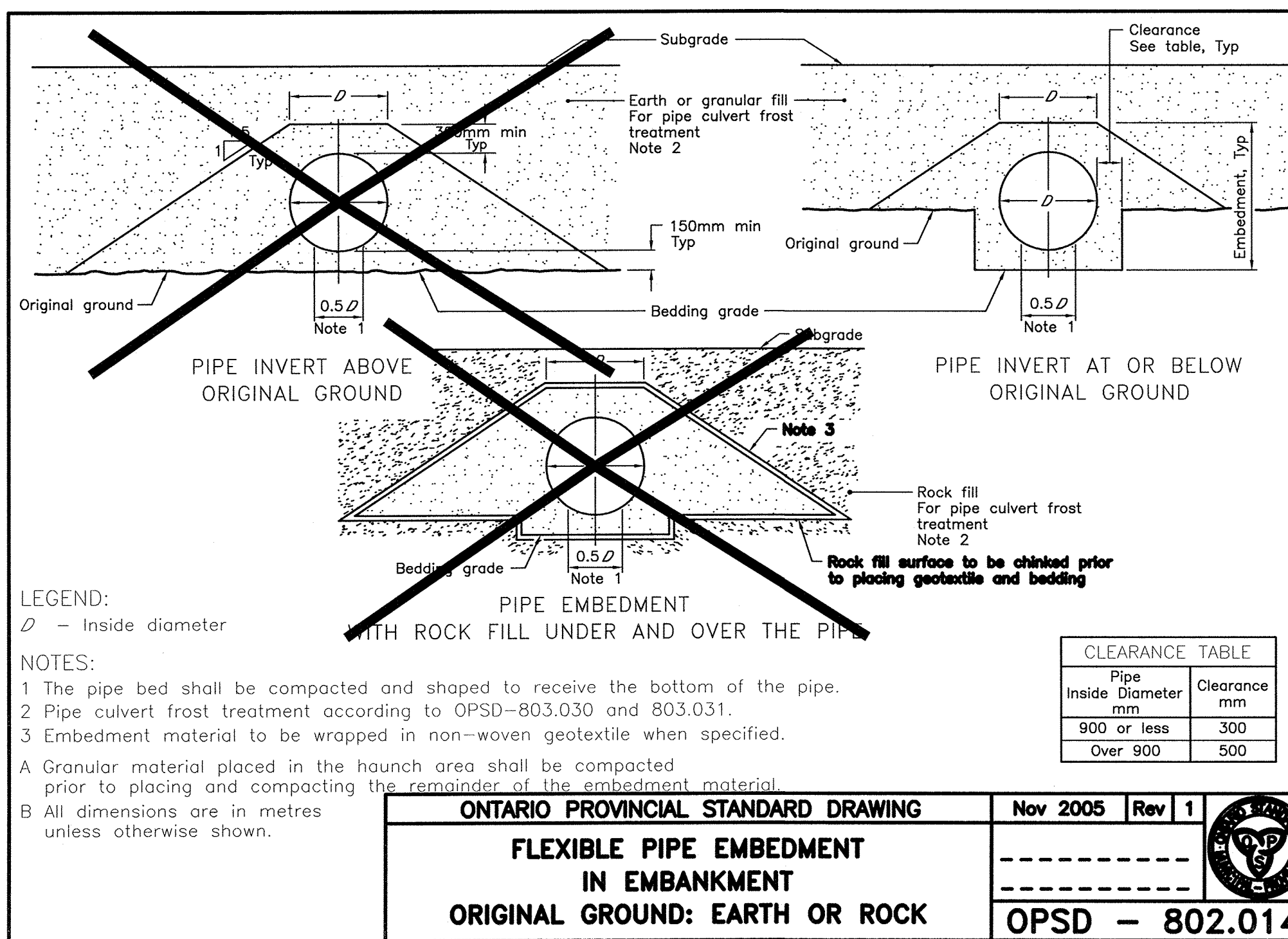
E
C05



STATION 0+500

SCALE 1:125

F
C05

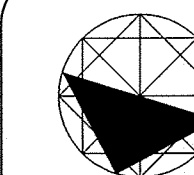


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Revisions and Issues		



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ARCHITECT STRUCTURAL/CIVIL



MECHANICAL ELECTRICAL

Project
MARY RIVER PROJECT
BAFFINLAND IRON
MINES CORPORATION
BAFFINLAND NUNAVUT
Drawing
CROSS SECTIONS & CULVERT DETAIL

Date JUNE 2009	CADD File Number design\new road sections.dwg
Scale AS NOTED	Job Number 09-162
Drawn S.S.	Drawing Number C05
Checked	
Approved	

Design Chart 1.07: Runoff Coefficients (Continued)**- Rural**

Land Use & Topography ³	Soil Texture		
	Open Sand Loam	Loam or Silt Loam	Clay Loam or Clay
CULTIVATED			
Flat 0 - 5% Slopes	0.22	0.35	0.55
Rolling 5 - 10% Slopes	0.30	0.45	0.60
Hilly 10- 30% Slopes	0.40	0.65	0.70
PASTURE			
Flat 0 - 5% Slopes	0.10	0.28	0.40
Rolling 5 - 10% Slopes	0.15	0.35	0.45
Hilly 10- 30% Slopes	0.22	0.40	0.55
WOODLAND OR CUTOVER			
Flat 0 - 5% Slopes	0.08	0.25	0.35
Rolling 5 - 10% Slopes	0.12	0.30	0.42
Hilly 10- 30% Slopes	0.18	0.35	0.52
BARE ROCK	COVERAGE³		
	30%	50%	70%
Flat 0 - 5% Slopes	0.40	0.55	0.75
Rolling 5 - 10% Slopes	0.50	0.65	0.80
Hilly 10- 30% Slopes	0.55	0.70	0.85
LAKES AND WETLANDS	0.05		

² Terrain Slopes³ Interpolate for other values of % imperviousness

Sources: American Society of Civil Engineers - ASCE (1960)
U.S. Department of Agriculture (1972)

CULVERT @ STATION 0+145

Total Area= 4.85 ha

Two Areas

Area 1 (A1)= 2.40 ha

Area 2 (A2)= 2.45 ha

Flow Line

A1= 172m

A2= 224m

A1 Slope (Equivalent Slope Method):

Elevation	Fall (m)	Length (m)	Sn (m/m)	Sn ^{-0.5}
212.00	1.22	43	0.028	5.98
210.78	4.07	43	0.095	3.24
206.71	17.89	43	0.416	1.55
188.82	2.82	43	0.066	3.89
186.00				
Total	26.00	172		14.66

Sw:

$$\begin{aligned} &= 100 (n/S_{n\text{total}}^{-0.5})^2 \\ &= 100 \times (4 / 14.66)^2 \\ &= 7.45\% \end{aligned}$$

Time of Concentration (tc):

$$\begin{aligned} &= (0.057 \times L) / (S^{0.2} \times A^{0.1}) \\ &= (0.057 \times 172) / (7.45^{0.2} \times 2.40^{0.1}) \\ &= 6.01 \text{ minutes} \end{aligned}$$

A2 Slope (Equivalent Slope Method):

Elevation	Fall (m)	Length (m)	Sn (m/m)	Sn ^{-0.5}
190.00	0.58	56	0.010	10.00
189.42	0.66	56	0.012	9.13
188.76	0.76	56	0.014	8.45
188.00	2.00	56	0.036	5.27
186.00				
Total	4.00	224		32.85

Sw:

$$\begin{aligned} &= 100 (n/S_{n\text{total}}^{-0.5})^2 \\ &= 100 \times (4 / 32.85)^2 \end{aligned}$$

$$= 1.48\%$$

Time of Concentration (tc):

$$\begin{aligned} &= (0.057 \times L) / (S^{0.2} \times A^{0.1}) \\ &= (0.057 \times 224) / (1.48^{0.2} \times 2.45^{0.1}) \\ &= 10.79 \text{ minutes} \end{aligned}$$

Weighted Average tc:

$$\begin{aligned} &= [(2.40 \times 6.01) + (2.45 \times 10.79)] / (2.40 + 2.45) \\ &= 8.43 \text{ minutes} \end{aligned}$$

Using IDF Curve, Rainfall Intensity= 9.6 mm/hr

$$\begin{aligned} \text{Flow, Q:} \quad &= 2.78 \times A_t \times I \times C \\ &= 2.78 \times 4.85 \times 9.6 \text{ mm/hr} \times 0.22 \\ &= \mathbf{28.48 \text{ L/s}} \\ &= \mathbf{0.029 \text{ m}^3/\text{s}} \end{aligned}$$

tmp#35.txt

Culvert Calculator @ Station 0+145

All calculator output should be verified prior to design use

Entered Data:

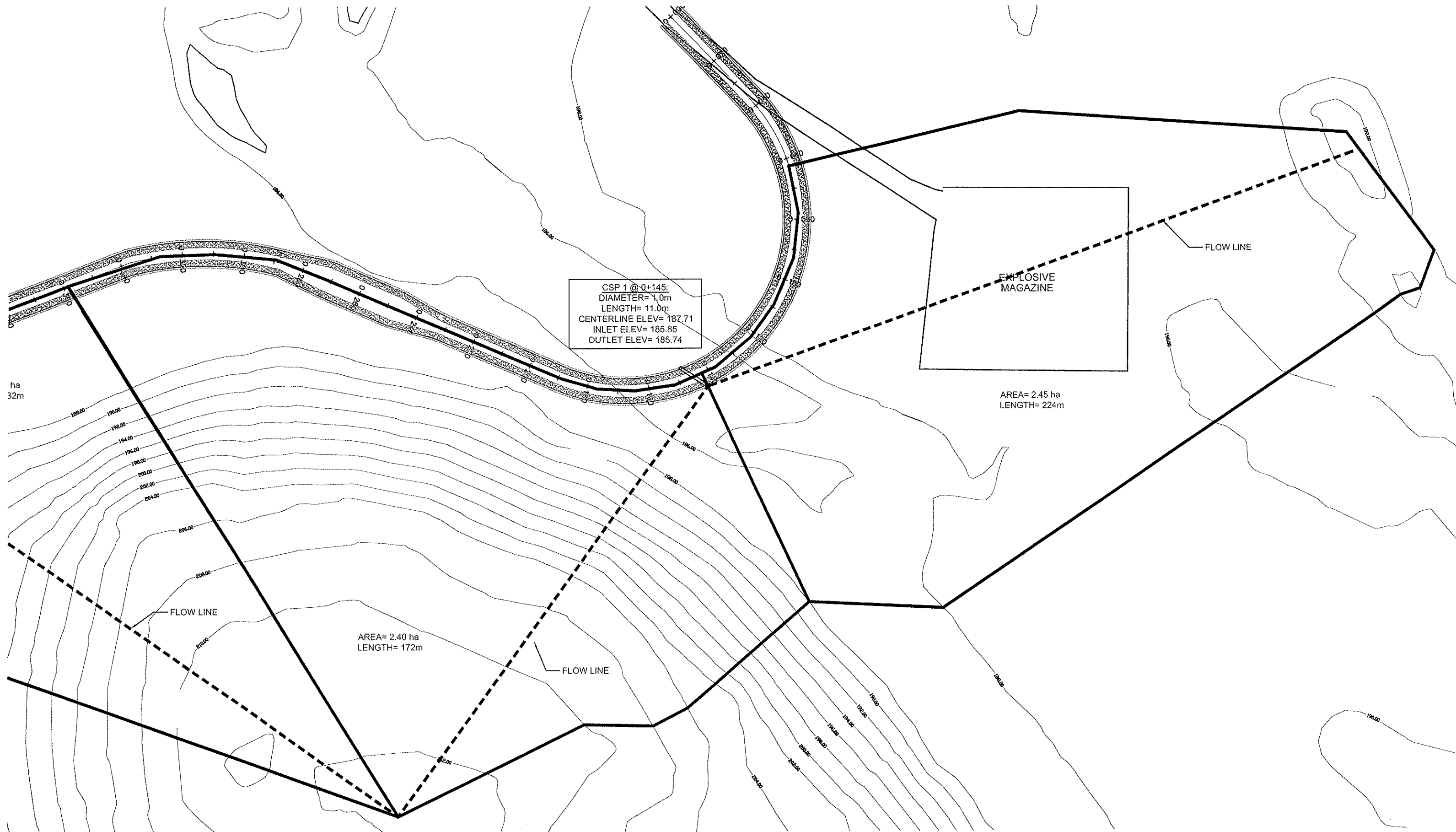
Shape	Circular
Number of Barrels	1
Solving for	Headwater
Chart Number	2
Scale Number	3
Chart Description	CORRUGATED METAL PIPE CULVERT
Scale Description	PIPE PROJECTING FROM FILL
Overtopping	off
Flowrate	0.0290 cms
Manning's n	0.2600
Roadway Elevation	187.7100 m
Inlet Elevation	185.8500 m
Outlet Elevation	185.7400 m
Diameter	1000.0000 mm
Length	11.0000 m
Entrance Loss	0.0000
Tailwater	1.0000 m

Computed Results:

Headwater	186.7465 m	Outlet Control
Slope	0.0100 m/m	
velocity	0.0369 mps	

Messages:

Outlet head > Inlet head.
Computing Outlet Control headwater.
Outlet submerged.
Full flow.
Headwater depth computed using FHWA equation.
Headwater: 186.7465 m



CULVERT @ STATION 0+450

Total Area= 1.84 ha

Flow Line= 232m

Slope (Equivalent Slope Method):

Elevation	Fall (m)	Length (m)	Sn (m/m)	Sn^{-0.5}
212.00	1.5	58	0.026	6.20
210.50	5.5	58	0.095	3.24
205.00	12.5	58	0.216	2.15
192.50	4.9	58	0.085	3.43
187.60				
Total	24.40	232		15.02

Sw:

$$\begin{aligned} &= 100 (n/S_{n\text{total}}^{-0.5})^2 \\ &= 100 \times (4 / 15.02)^2 \\ &= 7.09\% \end{aligned}$$

Time of Concentration (tc):

$$\begin{aligned} &= (0.057 \times L) / (S^{0.2} \times A^{0.1}) \\ &= (0.057 \times 232) / (7.09^{0.2} \times 1.84^{0.1}) \\ &= 8.41 \text{ minutes} \end{aligned}$$

Using IDF Curve, Rainfall Intensity= 9.6 mm/hr

$$\begin{aligned} \text{Flow, Q:} &= 2.78 \times A_t \times I \times C \\ &= 2.78 \times 1.84 \times 9.6 \text{ mm/hr} \times 0.22 \\ &= \mathbf{10.80 \text{ L/s}} \\ &= \mathbf{0.011 \text{ m}^3/\text{s}} \end{aligned}$$

tmp#33.txt

Culvert Calculator @ Station 0+450

All calculator output should be verified prior to design use

Entered Data:

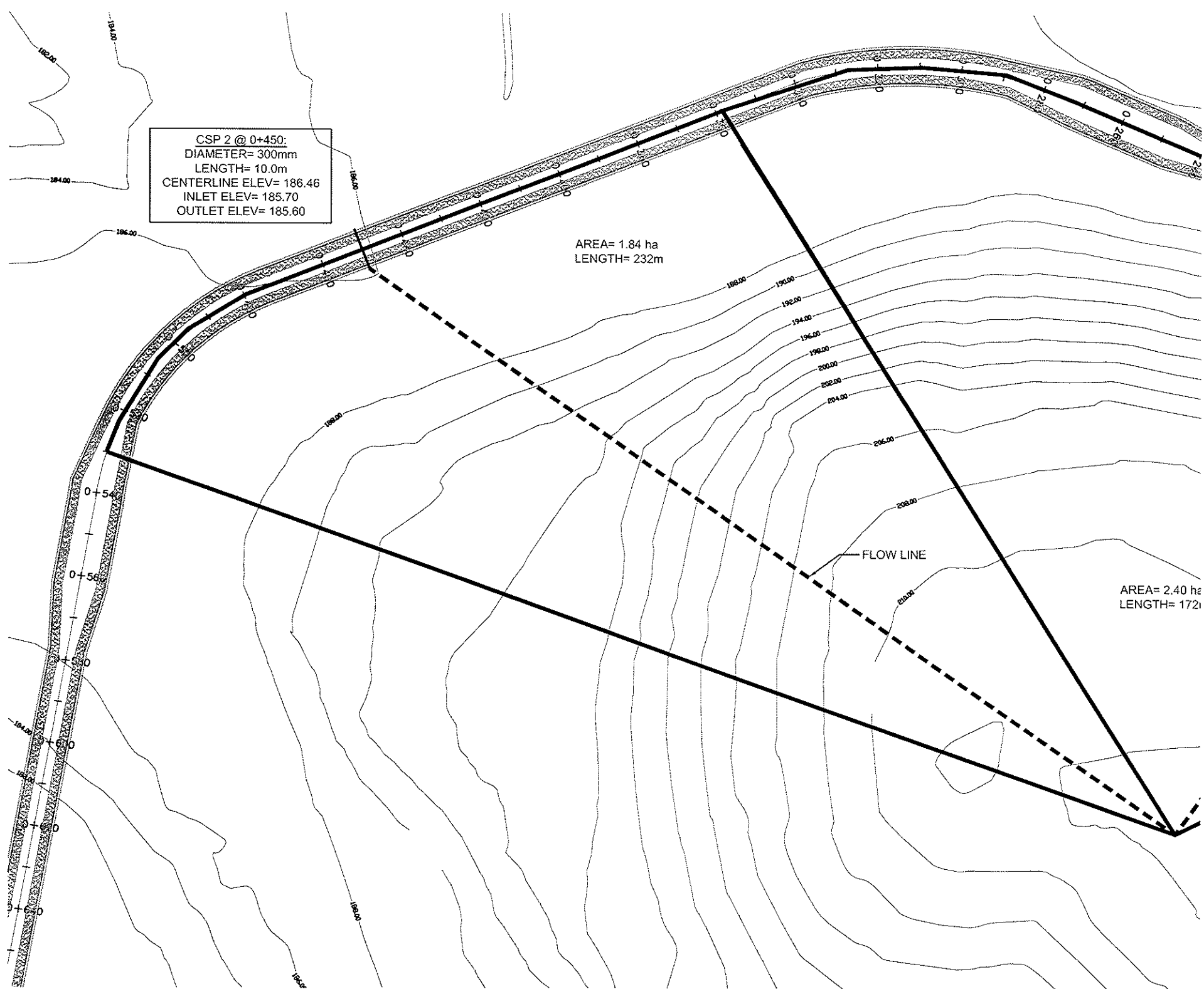
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Number of Barrels	1
Solving for	Headwater
Chart Number	2
Scale Number	3
Chart Description	CORRUGATED METAL PIPE CULVERT
Scale Description	PIPE PROJECTING FROM FILL
Overtopping	Off
Flowrate	0.0110 cms
Manning's n	0.2600
Roadway Elevation	186.4600 m
Inlet Elevation	185.7000 m
Outlet Elevation	185.6000 m
Diameter	300.0000 mm
Length	10.0000 m
Entrance Loss	0.0000
Tailwater	0.3000 m

Computed Results:

Headwater	186.4163 m	Outlet Control
Slope	0.0100 m/m	
Velocity	0.1556 mps	

Messages:

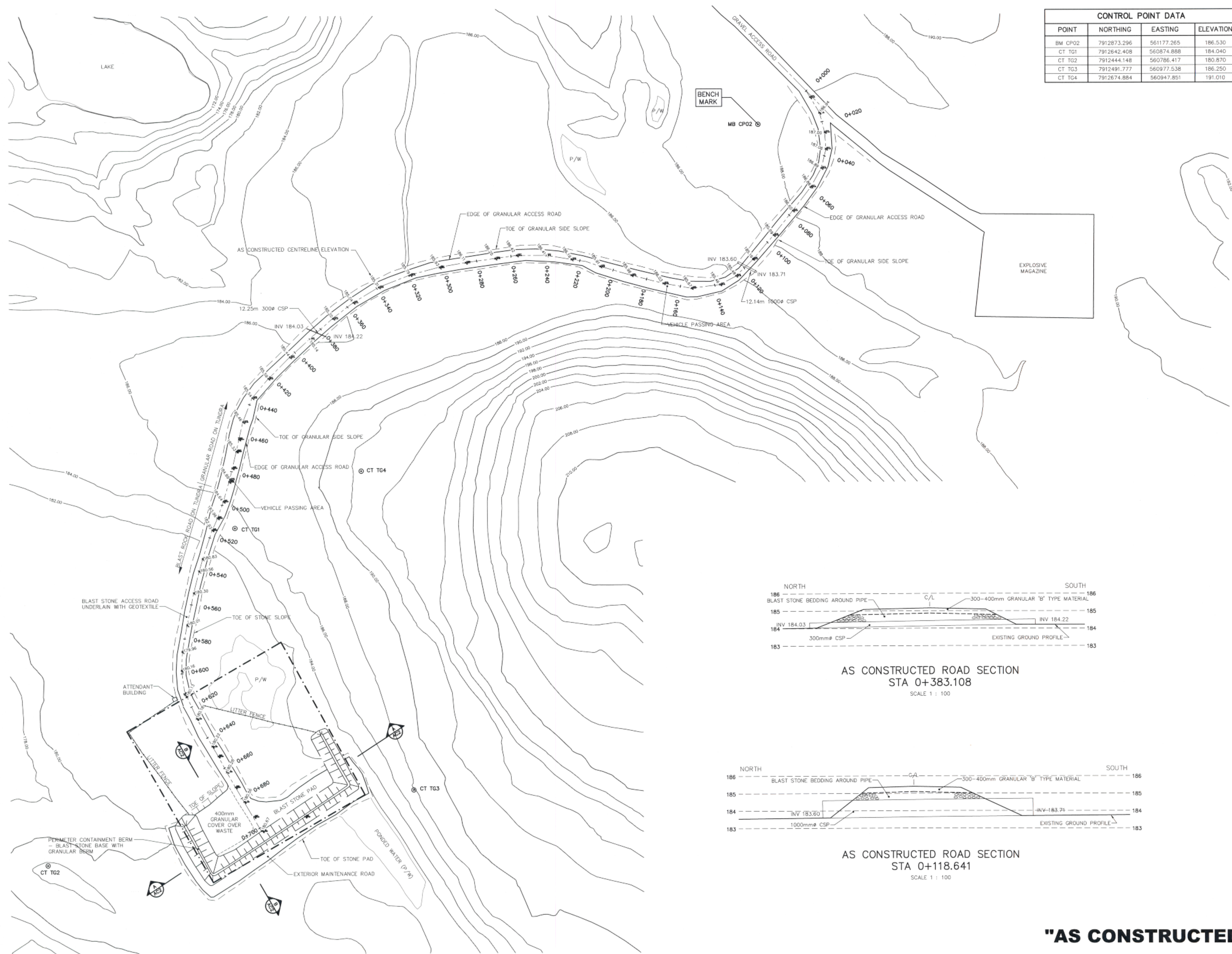
Outlet head > Inlet head.
Computing Outlet Control headwater.
Outlet submerged.
Full flow.
Headwater depth computed using FHWA equation.
Headwater: 186.4163 m



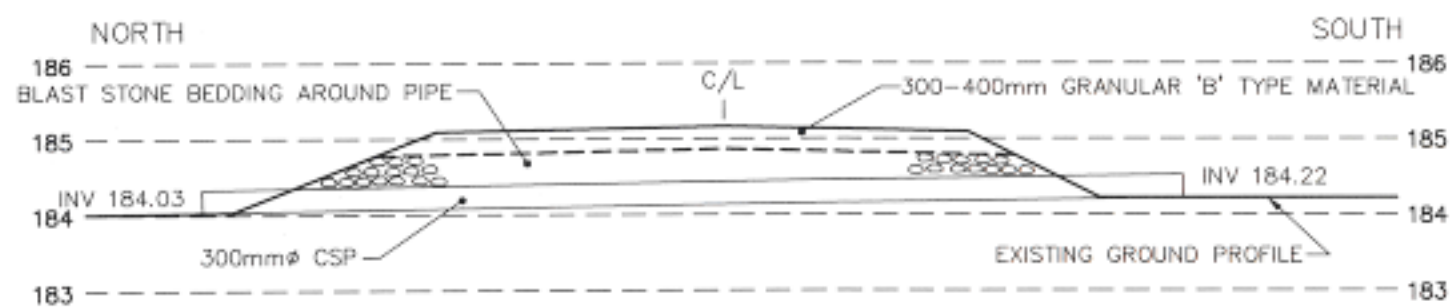


APPENDIX 2

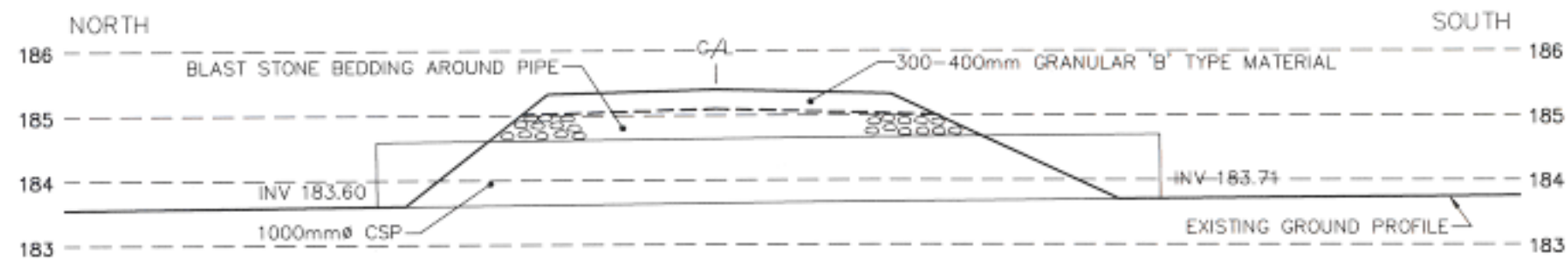
- **AS-CON STRUCTED DRAWINGS**
- **CONSTRUCTION PHOTOGRAPHS**



CONTROL POINT DATA			
POINT	NORTHING	EASTING	ELEVATION
BM CP02	7912873.296	561177.265	186.530
CT TG1	7912642.408	560874.888	184.040
CT TG2	7912444.148	560786.417	180.870
CT TG3	7912491.777	560977.538	186.250
CT TG4	7912674.884	560947.851	191.010



AS CONSTRUCTED ROAD SECTION
STA 0+383.108
SCALE 1 : 100



AS CONSTRUCTED ROAD SECTION
STA 0+118.641
SCALE 1 : 100

"AS CONSTRUCTED"

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Drawings shall not be scaled.

Description	Date	No.
Revisions and Issues		



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Date Printed



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ARCHITECT

STRUCTURAL/CIVIL



MECHANICAL

ELECTRICAL

Project

**MARY RIVER PROJECT
NUNAVUT, CANADA**

Drawing

**LANDFILL
ACCESS ROAD AND
CONTAINMENT**

Date

AUG 20, 2010

CADD File Number

0916200-AC1

Scale

1 : 1000

Job Number

09-162

Drawn

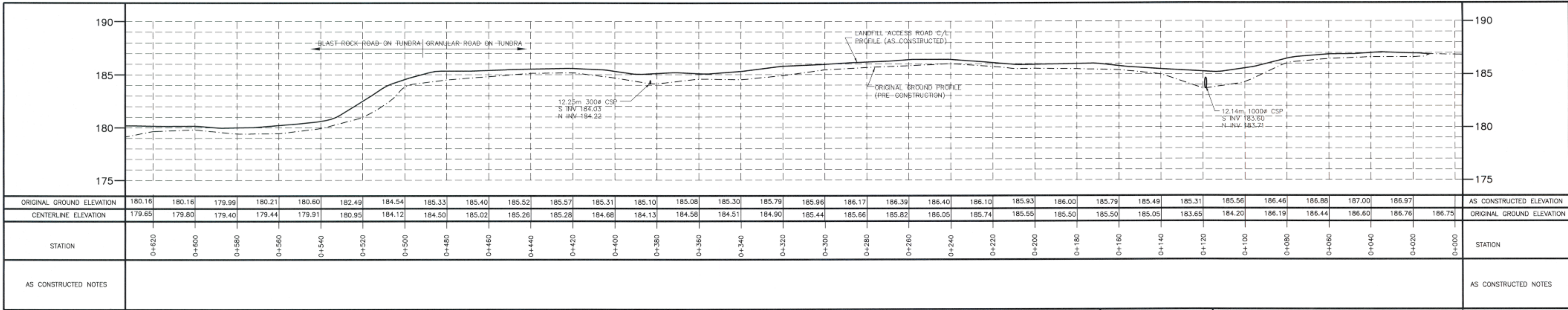
T.C.G.

Drawing Number

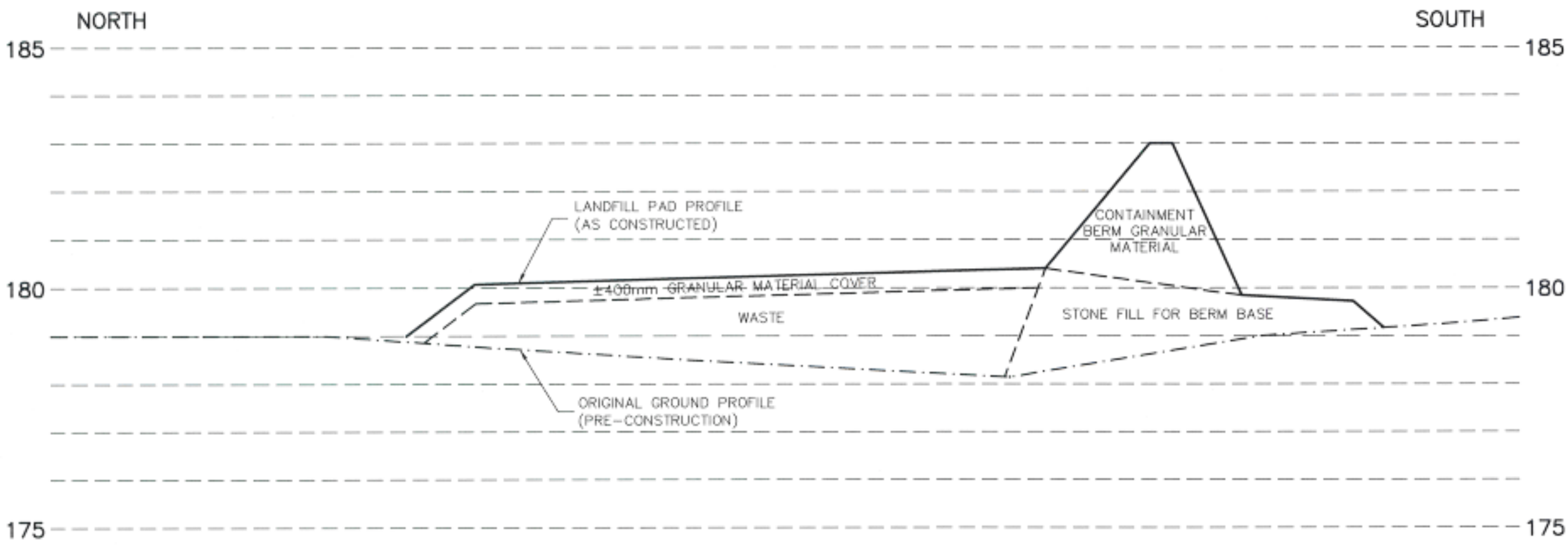
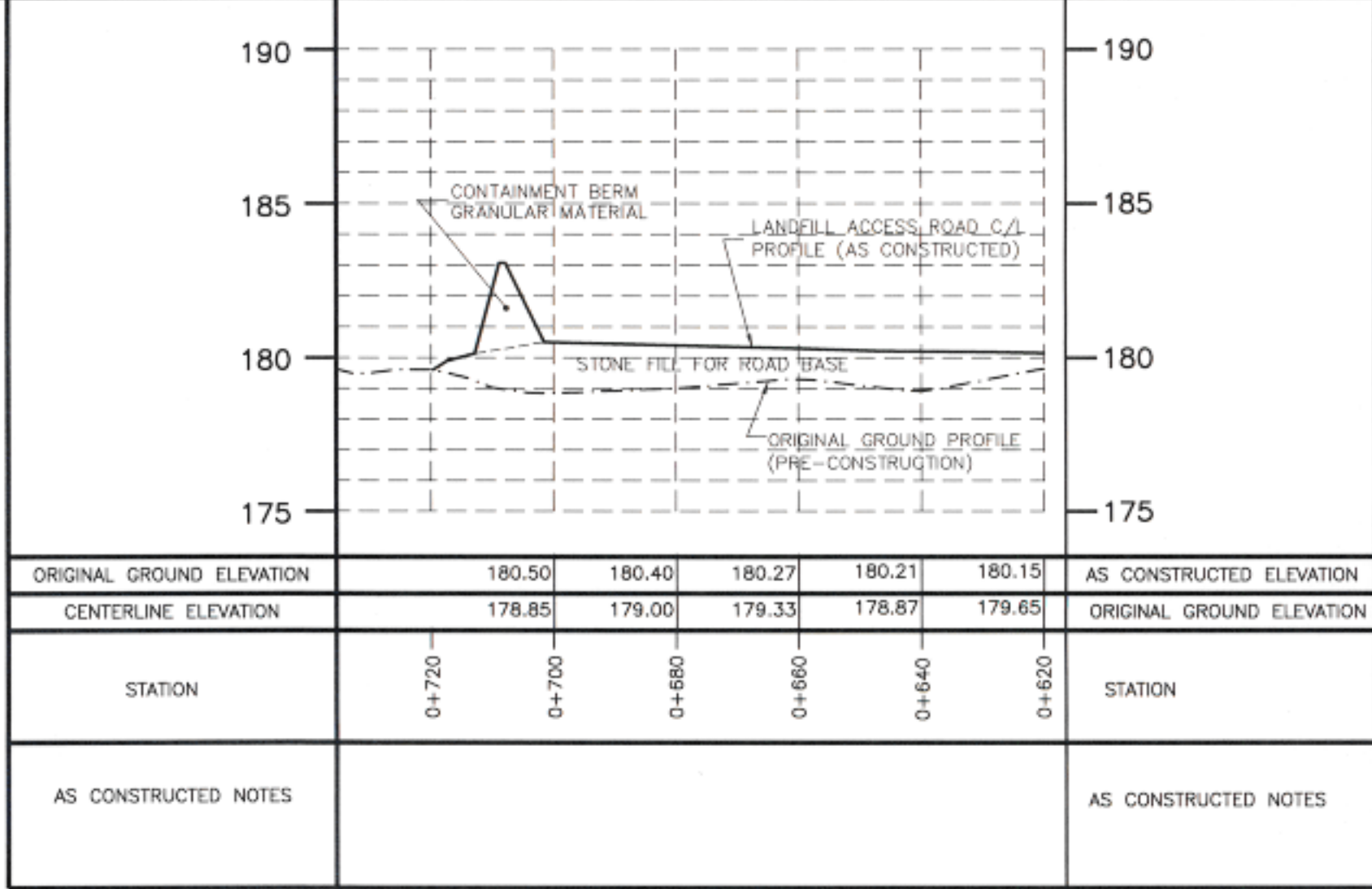
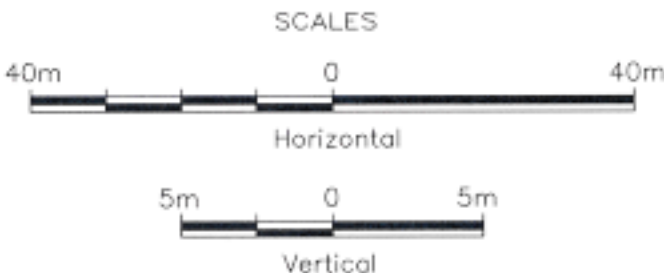
AC1

Checked

B.H.M.

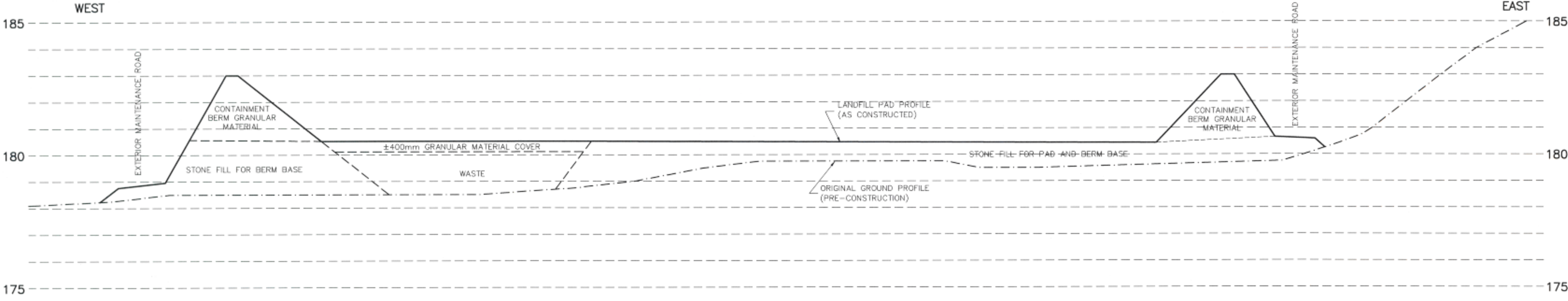


LANDFILL ACCESS ROAD PROFILE



LANDFILL CONTAINMENT BERM SECTION B/AS1

1 : 250 HORIZONTAL
1 : 100 VERTICAL



LANDFILL CONTAINMENT BERM SECTION A/AS1

1 : 250 HORIZONTAL
1 : 100 VERTICAL

"AS CONSTRUCTED"

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Description	Date	No.
Revisions and Issues		



NORTH

Date Printed



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ARCHITECT STRUCTURAL/CIVIL

MECHANICAL ELECTRICAL



Project
**MARY RIVER PROJECT
NUNAVUT, CANADA**

Drawing
**LANDFILL
ACCESS ROAD PROFILE
CONTAINMENT SECTIONS**

Date AUG 20, 2010	CADD File Number 0916200-AC1
Scale 1 : 1000	Job Number 09-162
Drawn T.C.G.	Checked Drawing Number AC2
Approved B.H.M.	