

AMENDMENT #1 TO 6515-C-235-007-230-REP-002:

DESIGN REPORT FOR CHANNEL 7 AND CHANNEL 8 CULVERT #20 ADDITION MELIADINE PROJECT, NUNAVUT



PRESENTED TO
Agnico Eagle Mines Ltd.

JULY 2019
ISSUED FOR USE
TETRA TECH PROJECT NUMBER: 28920
AGNICO EAGLE DOCUMENT NUMBER: 6515-C-235-007-230-REP-002_AMENDMENT01

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1.0 INTRODUCTION

1.1 Site Location and Access

Agnico Eagle Mines Limited (Agnico Eagle) is developing the Meliadine Project (the Project), a gold mine located approximately 25 km north from Rankin Inlet, and 80 km southwest from Chesterfield Inlet in the Kivalliq Region of Nunavut. The proposed project site is located on the peninsula between the East South, and West basins of basins of Meliadine Lake (63°01'23.8"N, 92°13'6.42"W) on Inuit Owned Land.

As presented in Design Report 6515-C-235-007-235-REP-002 issued for use in September 2017, Agnico Eagle built two channels to divert water around Portal #2 and into Channel 1.

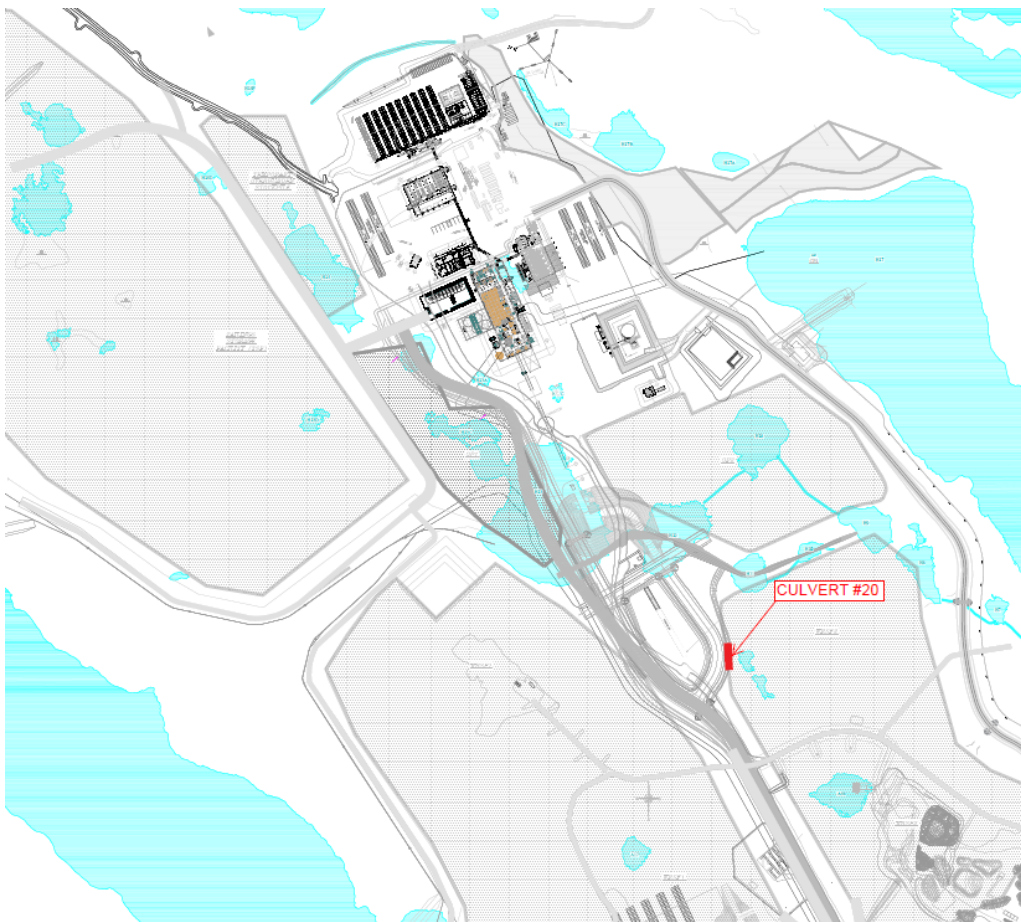
An access road is required to access WRSF2 and was decided to be placed traversing Channel 7. This requires the installation of a culvert to allow the waterflow in Channel 7 to remain unobstructed by the addition of the access road.

2.0 DESIGN

2.1 Site Location Plan

The figure below presents a site location plan for Culvert #20.

Figure 2.1: Site Location Plan



2.2 Culvert Design Basis and Water Management Strategy

The overall objective of the water management strategy of this project is to develop a practical and feasible site-wide water management plan to minimize the potential negative impacts of mining development on the surrounding environment including habitats for fish and wildlife, and to facilitate mine operation and long-term closure and reclamation of the mine site. To attain this objective, culverts are used to control and divert runoff crossing the road and new facilities.

The location and detail of proposed Culvert #20 is shown in Drawing 65-417-230-228 with typical cross-section of the culvert in Drawing 65-417-230-203 both located in Appendix A.

2.2.1 Erosion Control

Rip rap will be installed around the culvert inlet and outlet areas to control erosion. For an example of a rip rap section, see attached the typical culvert cross-section presented in Appendix A.

During the installation of the culverts, if required, straw logs will be used in the work area to prevent total suspended solids from reaching downstream water bodies.

2.2.2 Culvert Specifications

Standard galvanized, corrugated steel pipe culvert with a profile of 68 x13 mm and a minimum thickness of 2.8 mm is proposed. The culvert will be in service for up to 15 years. It is understood that the haul trucks to be used at the project site will be CAT AD60 for underground trucks and Komatsu HD465 model or equivalent for open pit trucks.

For the access road to WRSF2, a minimum of 850 mm granular fill cover should be placed on top of the Culvert #20 to allow heavy traffic access. The backfill around the culvert will be granular fill 50mm MINUS, or an approved equivalent, and shall be placed in lifts not greater than 0.3 m thick and compacted to a minimum of 95% of Standard Proctor Maximum Dry Density (ASTM D698).

The Table 2.1 below presents the characteristics of the proposed culvert:

Table 2.1: Culvert #20 Specifications

Item	Culvert #15
Location	WRSF2 Access Road
Number of pipes in culvert	2
Length of each culvert (m)	32
Diameter of each culvert (mm)	800
Min. Granular fill cover over culvert (m)	0.825
Corrugation profile of each culvert (mm)	68 x 13
Thickness of each culvert (mm)	2.8

According to the proposed configuration, the inverts of the pipes are indicated in Table 2.2.

Table 2.2: Culvert #20 Characteristics

Number of pipes and Diameter	S (%)	Invert Upstream (m)	Invert Downstream (m)	Length of each pipe (m)
2 Ø 800 mm	0.94	66.90	66.60	32

3.0 FIGURES AND DRAWINGS

The following construction drawings are presented in Appendix A and show details for the culvert construction:

- 65-417-230-228: Access Road to WRSF2 Plan View Profile, and Typical Detail
- 65-417-230-203: Typical Section Haul Road


4.0 LIMITATIONS OF REPORT

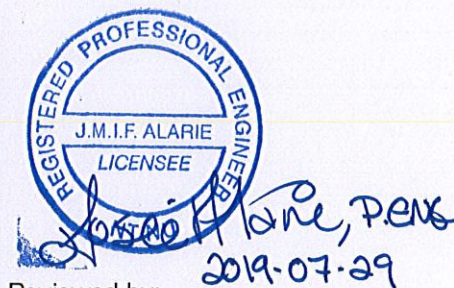
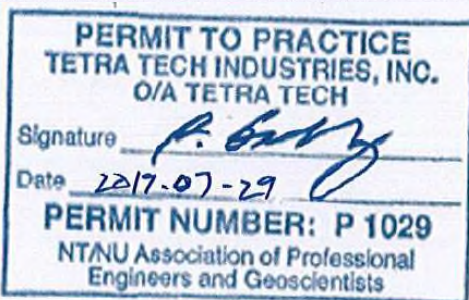
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5.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech

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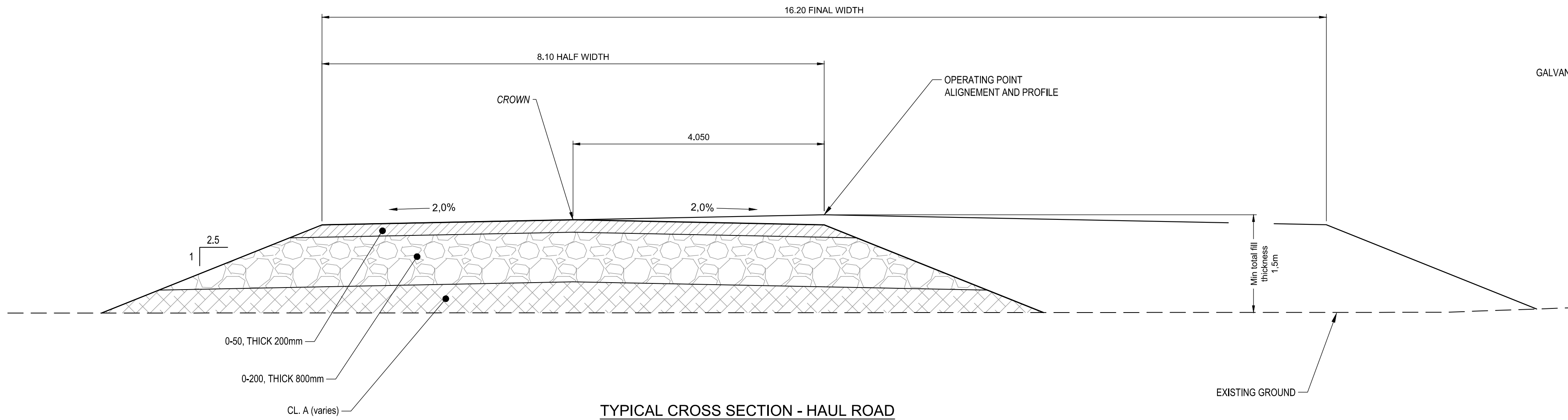


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APPENDIX A

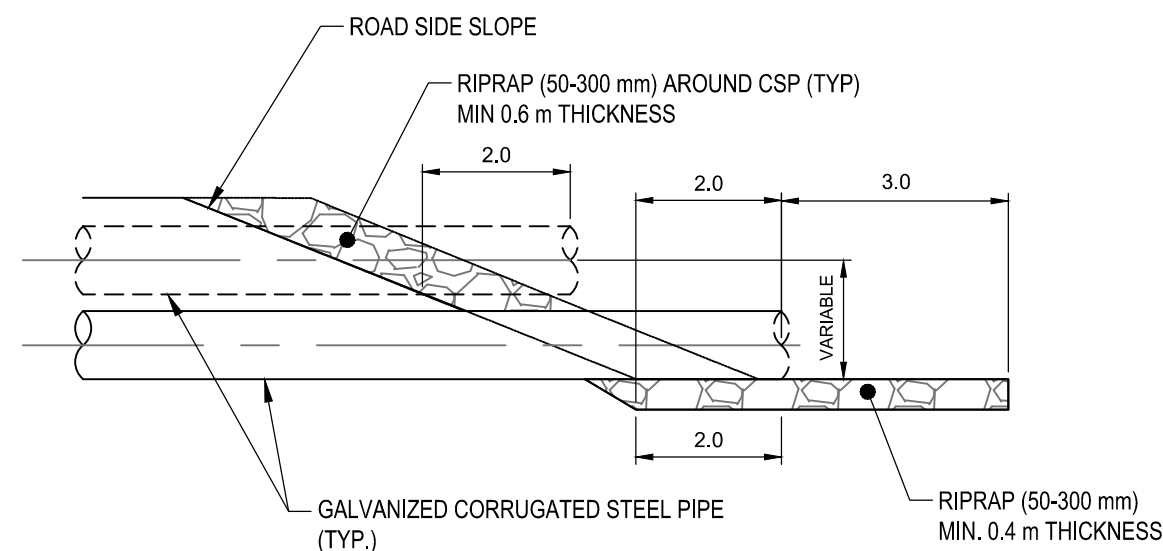
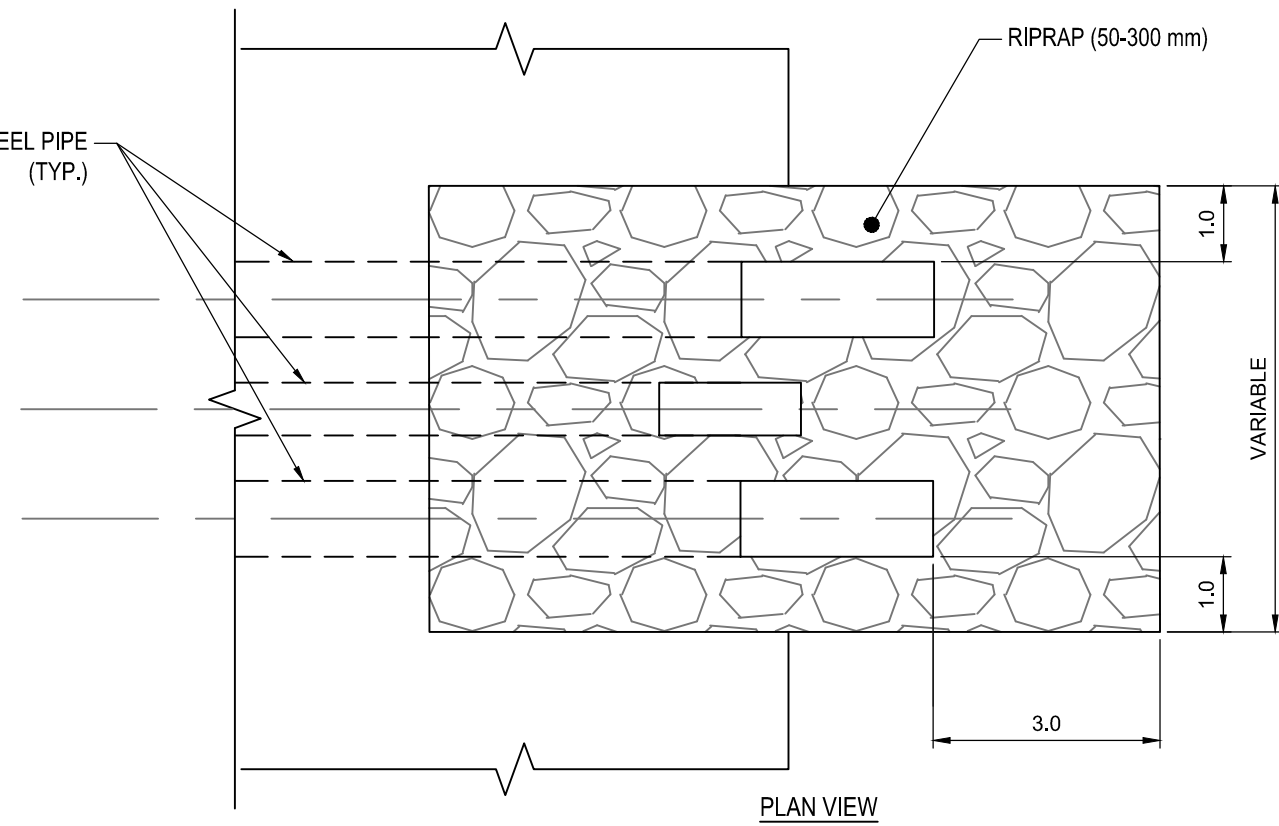
Construction Drawings :

- 65-417-230-228
- 65-417-230-203



TYPICAL CROSS SECTION - HAUL ROAD

SCALE 1:100



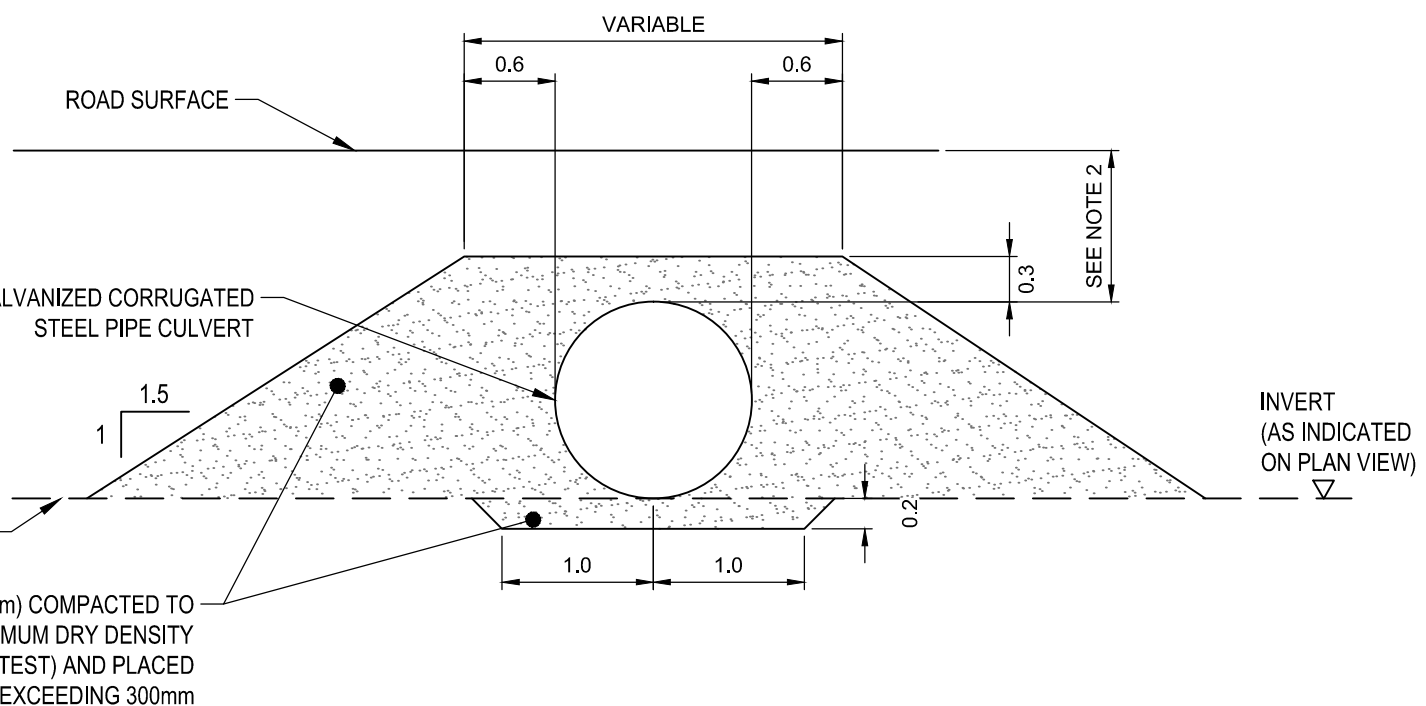
TYPICAL DETAIL - CULVERT RIPRAP FOR BOTH INLET AND OUTLET

SCALE = N.T.S

Notes:

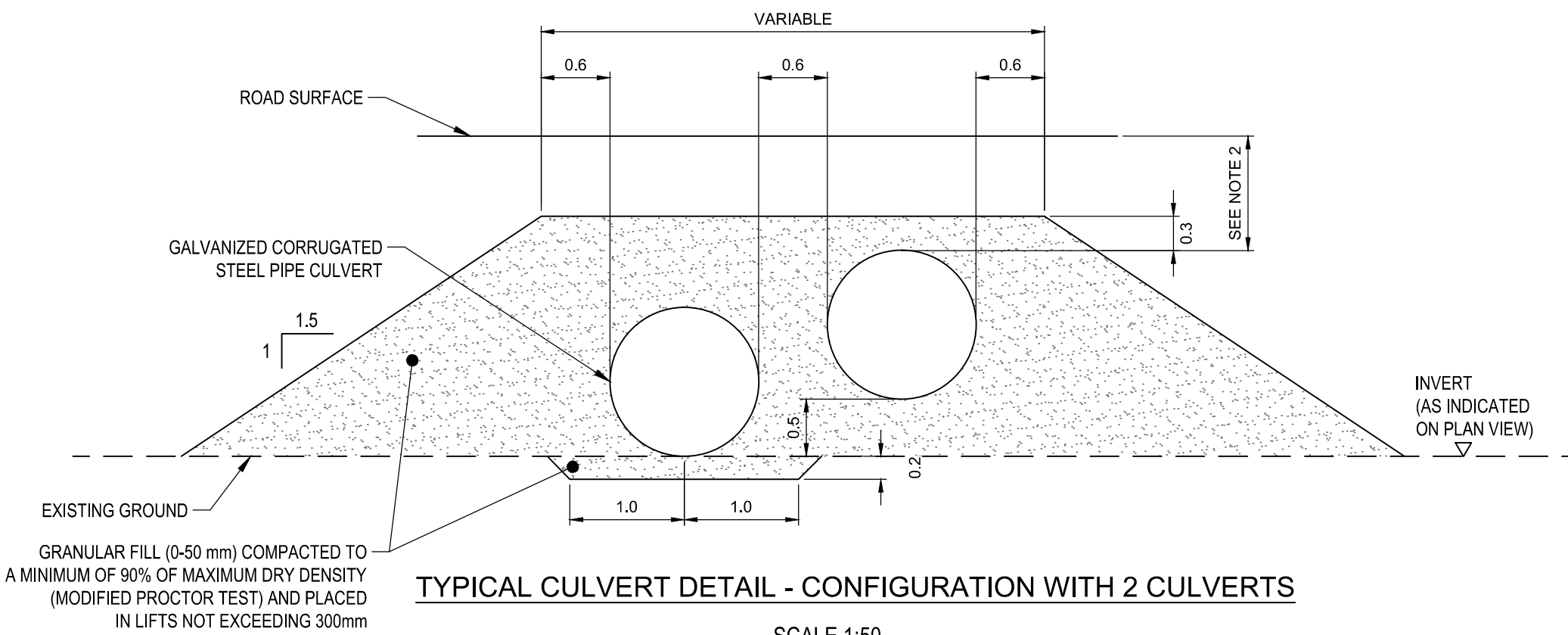
- Culverts are provided by AEM. Culverts will be Galvanized Corrugated Pipes, with a profile of 68x13 mm.
- At any time, the minimum backfill cover indicated in the table below shall be respected.
- The installation of the culverts shall be conform to the Manufacturer instructions.
- The maximum allowable slope for culverts is 6%. Install RipRap to fill the gap between the pipe bottom and the existing ground if required.

CULVERT DIAMETER (mm)	GAUGE (mm)	PROFILE (mm)	Min COVER (mm) (required at any time)
600	2	68x13	750
700	2	68x13	800
800	2.8	68x13	825
900	2.8	68x13	825
1000	2.8	68x13	850
1200	2.8	68x13	850



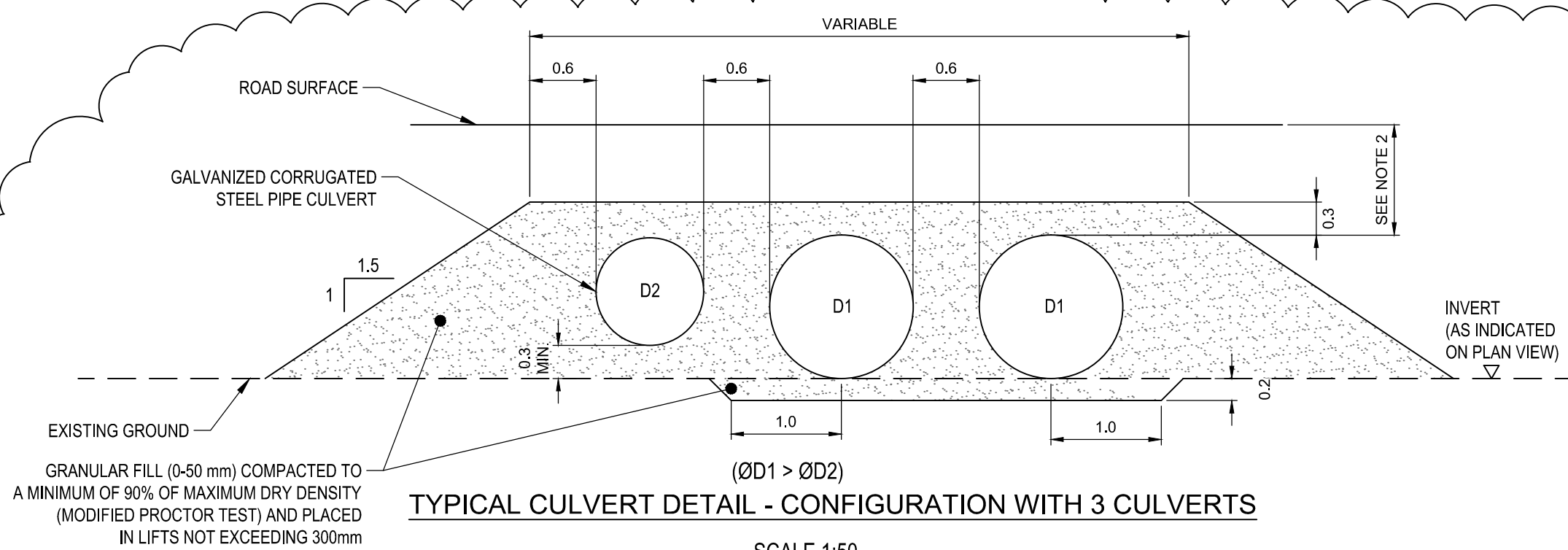
TYPICAL CULVERT DETAIL - CONFIGURATION WITH 1 CULVERT

SCALE 1:50



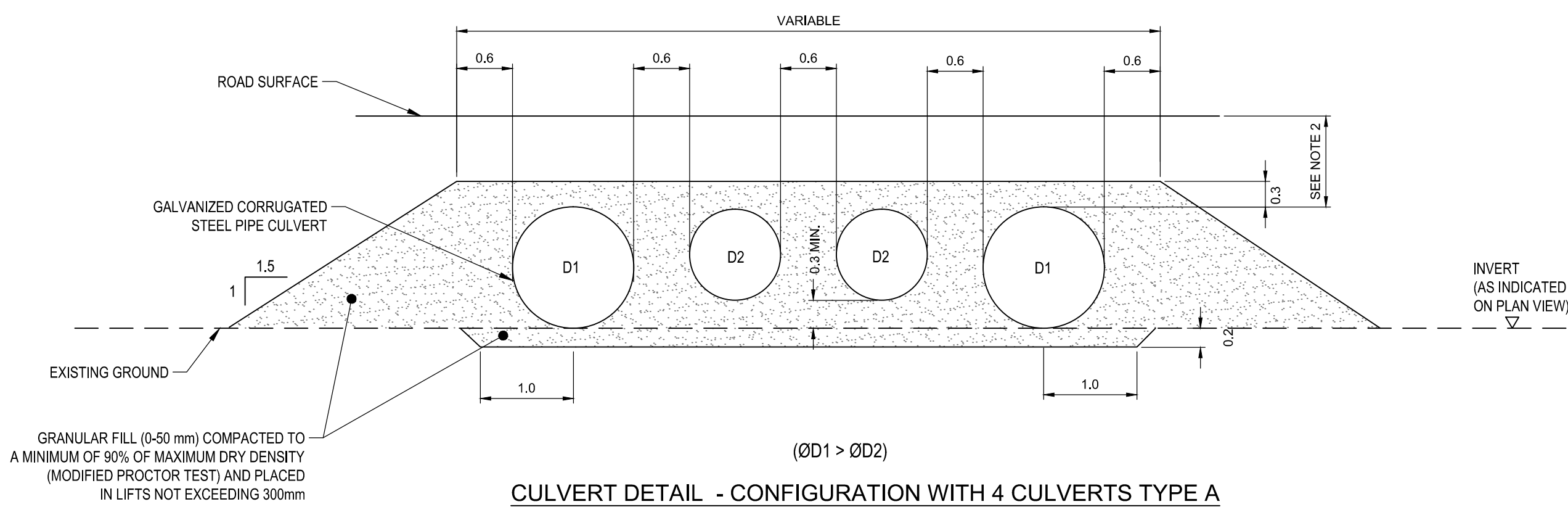
TYPICAL CULVERT DETAIL - CONFIGURATION WITH 2 CULVERTS

SCALE 1:50



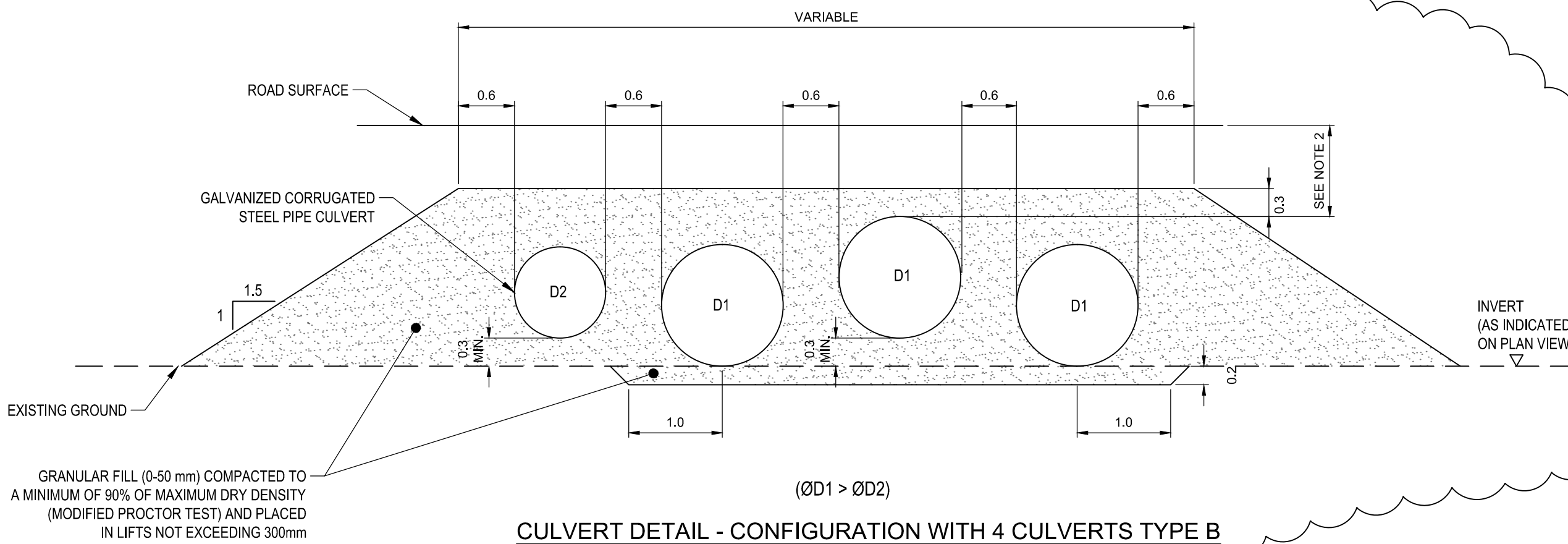
TYPICAL CULVERT DETAIL - CONFIGURATION WITH 3 CULVERTS

SCALE 1:50



CULVERT DETAIL - CONFIGURATION WITH 4 CULVERTS TYPE A

SCALE 1:50



CULVERT DETAIL - CONFIGURATION WITH 4 CULVERTS TYPE B

SCALE 1:50

PLAN CLÉ

KEY PLAN



NOTES GÉNÉRALES / GENERAL NOTES



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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG



3	2017-09-14	ISSUED FOR CONSTRUCTION	M.M.	J.A.
2	2017-07-28	ISSUED FOR CONSTRUCTION	S.M.	J.A.
1	2017-02-28	0-50mm AGGREGATE MATERIAL AND CULVERT	M.L.P.	J.A.
0	2015-10-07	ISSUED FOR CONSTRUCTION	A.B.	J.A.
B	2015-09-20	REVISED LAYERS	P.H.	J.A.
A	2015-08-18	PRELIMINARY	P.H.	J.A.

REVISIONS

Signature	Date	PERMIT NUMBER: P 1029
	2017-09-15	
NTNU Association of Professional Engineers and Geoscientists		

TITRE / TITLE
AGNICO-EAGLE - DIVISION
417 - HAUL ROAD - INDUSTRIAL SITE TO TIRIGANIAK
230-GENERAL EARTH WORKS
TYPICAL SECTION
HAUL ROAD

DESSINÉ PAR DRAWN BY	PATRICK HAMEL	DATE 2015-08-14
VÉRIFIÉ PAR CHECKED BY	SOLENE MOREAU	2015-08-18
APPROUVÉ PAR APPROVED BY	JOSÉE ALARIE	2015-08-18

ÉCHELLE
SCALE 1:50

NO. DESSIN DRAWING NO.	65-417-230-203
NO. PROJET PROJECT NO.	6515/28920
REVISION	3
FEUILLE / SHEET	/