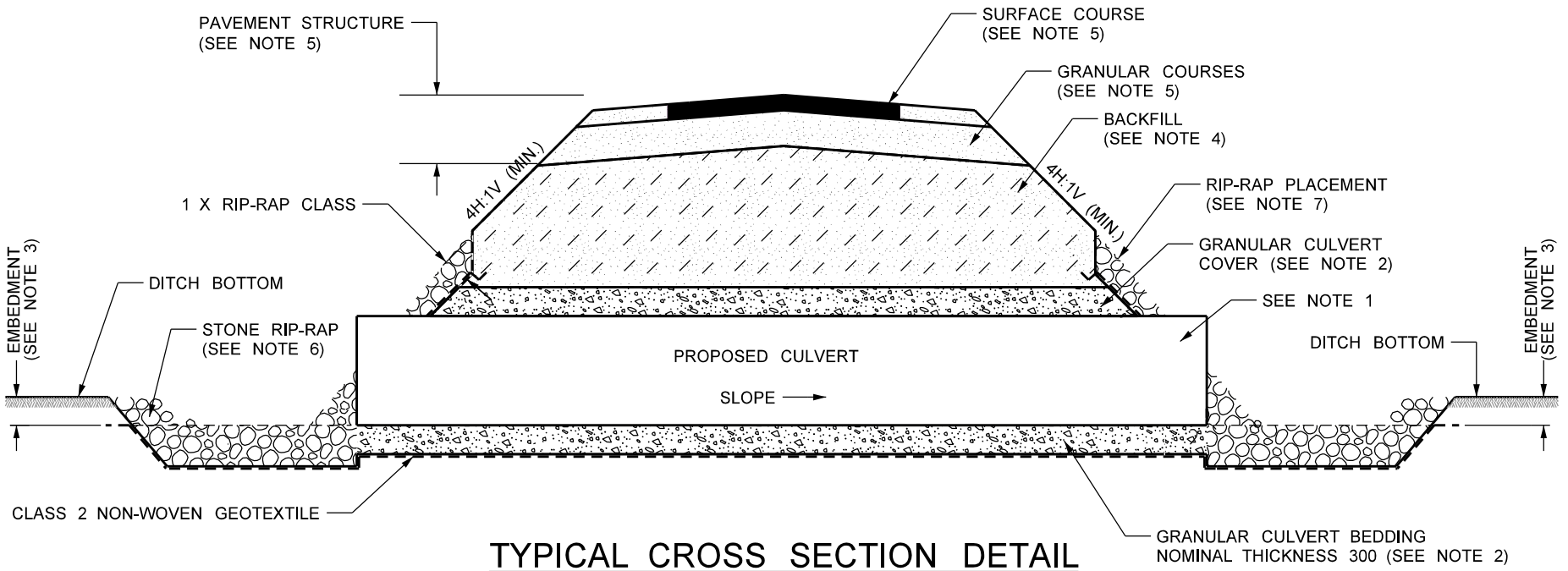

TYPICAL CROSS SECTION DETAIL

NOTES:

1. SLOPED CULVERT ENDS IF / AS SPECIFIED IN CONTRACT
2. GBC-I, GBC-II, GBC-M OR CULVERT GRAVEL
3. CULVERT EMBEDMENT (DEPTH OF CULVERT INVERT) SHALL MEET THE SITE SPECIFIC ENVIRONMENTAL OR CONTRACT REQUIREMENTS, MIN. 100
4. BACKFILL TYPE AS SPECIFIED IN CONTRACT. IF NOT SPECIFIED, BACKFILL SHALL BE GBC-I, GBC-II, GBC-M, GSB-C, GSB-F, CR-M50, CR-M100 OR CR-M125.
5. PAVEMENT STRUCTURE DIMENSIONS, MATERIALS, AND DEPTHS ARE TO MATCH EXISTING OR AS SPECIFIED IN CONTRACT / DESIGN. CR-M50 SHALL BE USED AS SUBBASE IF CR-M100 OR CR-M125 IS USED AS UNDERLYING BACKFILL MATERIAL.
6. STONE RIP-RAP CLASS/SIZE SHALL BE AS SHOWN ON SHEET 3 OR AS SPECIFIED IN CONTRACT
7. PLACE RIP-RAP AT THE END OF CULVERT SUCH THAT THE SURFACE OF THE RIP-RAP IS EVEN WITH THE GRADE OF EMBANKMENT SIDE SLOPE

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SPECIFIED OTHERWISE

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JEFF E. TALLIN, P.Eng.

October 28, 2025

APPROVALS

ORIGINAL SIGNED BY:

DUSTIN BOOY

EXECUTIVE DIRECTOR OF
HIGHWAY ENGINEERING SERVICES

ORIGINAL SIGNED BY:

TARA LISKE

EXECUTIVE DIRECTOR OF
REGIONAL OPERATIONS

REVISIONS

No.	DESCRIPTION	BY	DATE
1			
2			
3			

MANITOBA STANDARD DRAWING

DATE	
OCTOBER 2025	
SCALE	SHEET
N.T.S.	1 OF 4

MSD - 400.2

OPEN CUT INSTALLATION DETAILS FOR MULTIPLE CSC, PCC, AND HDPE CULVERTS, ≤1800 DIA.

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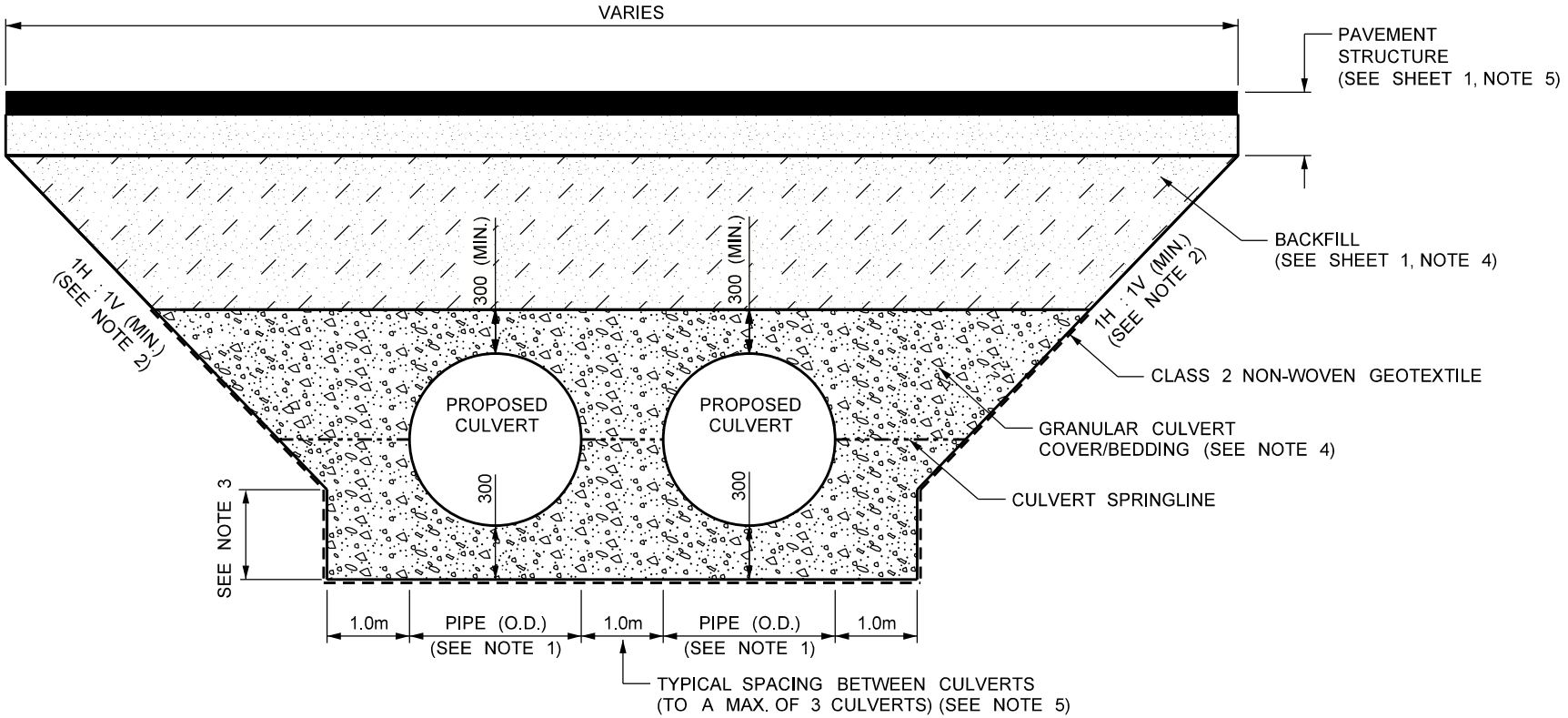

MULTIPLE CULVERT INSTALLATION DETAIL

NOTES:

GENERAL: ALL TRENCHING AND EXCAVATION SHALL COMPLY WITH MANITOBA'S WORKPLACE HEALTH AND SAFETY REGULATIONS

1. CULVERT DIAMETER AND TYPE AS SPECIFIED IN CONTRACT
2. FOR FROST SUSCEPTIBLE SOILS, REFER TO MSD 400.5. FROST TAPERS TO EXTEND 20m FROM CENTRES OF OUTER CULVERTS.
3. DEPTH OF VERTICAL CUT SHALL NOT EXCEED 1.0m
4. GBC-I, GBC-II, GBC-M OR CULVERT GRAVEL
5. FOR CULVERTS WITH FLARED ENDS, INCREASE SPACING TO PROVIDE 1.0m (MIN.) FROM EDGE TO EDGE OF FLARED ENDS UNITS

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SPECIFIED OTHERWISE

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ORIGINAL SEALED BY:

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DECEMBER 16, 2025

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OCTOBER 2025	
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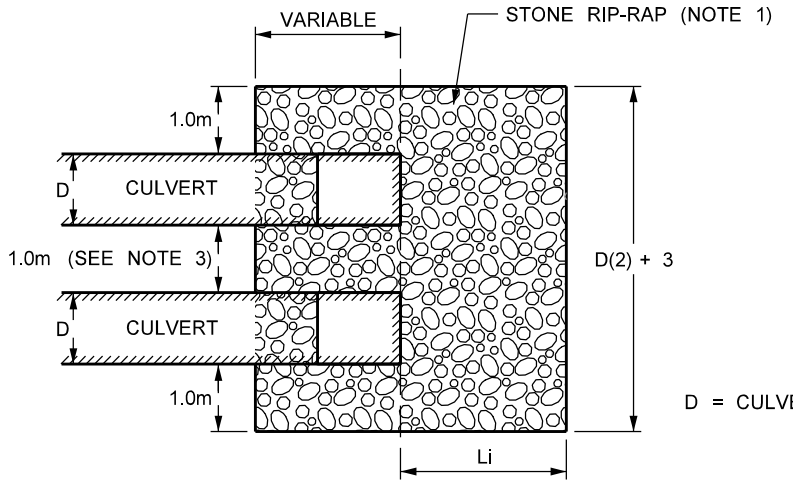
N.T.S.	2 OF 4

MSD - 400.2

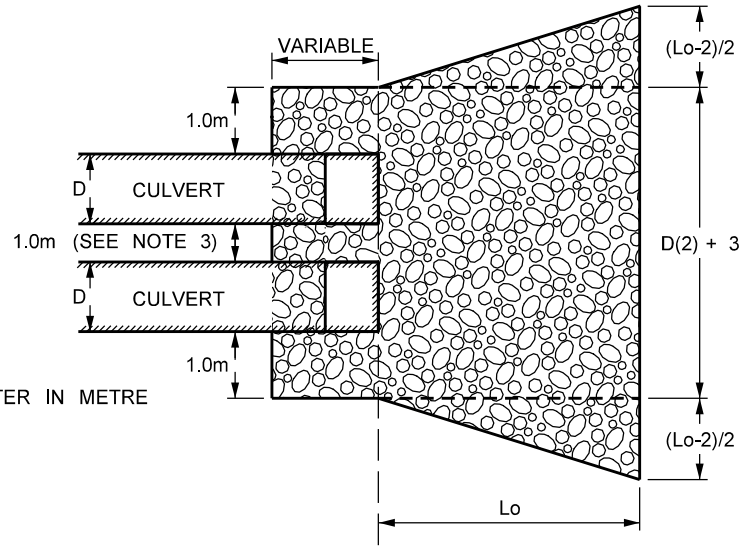
OPEN CUT INSTALLATION DETAILS FOR MULTIPLE CSC, PCC, AND HDPE CULVERTS, ≤1800 DIA.

Manitoba
Transportation and Infrastructure

OCTOBER 20, 2025



D = CULVERT DIAMETER IN METRE



INLET DETAIL - PLAN VIEW

OUTLET DETAIL - PLAN VIEW

INLET AND OUTLET APRON DIMENSIONS EXTENDED - HIGH FLOW VELOCITY AND EROSION SUSCEPTIBLE SITES			
Culvert Nominal Diameter D (mm)	Rip-Rap Class (mm)	Inlet Length Li (m)	Outlet Length Lo (m)
<800	350	2	4
800 to 1200	350	3	6
1200 to 1800	450	7	14

INLET AND OUTLET APRON DIMENSIONS LOW FLOW VELOCITY SITES (SEE NOTE 2)			
Culvert Nominal Diameter D (mm)	Rip-Rap Class (mm)	Inlet Length Li (m)	Outlet Length Lo (m)
<1200	350	2	3
1200 to 1800	350	4	6

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October 28, 2025

NOTE:
1. RIP-RAP THICKNESS SHALL BE THE GREATER OF 500 OR 1.5x RIP-RAP MAXIMUM SIZE
2. MAY BE USED WHERE EXIT FLOW VELOCITY IS LESS THAN 1.2m/sec.
3. FOR CULVERTS WITH FLARED ENDS, INCREASE SPACING TO PROVIDE 1.0m (MIN.) FROM EDGE TO EDGE OF FLARED END UNITS

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SPECIFIED OTHERWISE

APPROVALS

ORIGINAL SIGNED BY:
DUSTIN BOOY
EXECUTIVE DIRECTOR OF
HIGHWAY ENGINEERING SERVICES

ORIGINAL SIGNED BY:
TARA LISKE
EXECUTIVE DIRECTOR OF
REGIONAL OPERATIONS

REVISIONS

No.	DESCRIPTION	BY	DATE
1			
2			
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MANITOBA STANDARD DRAWING

DATE
OCTOBER 2025

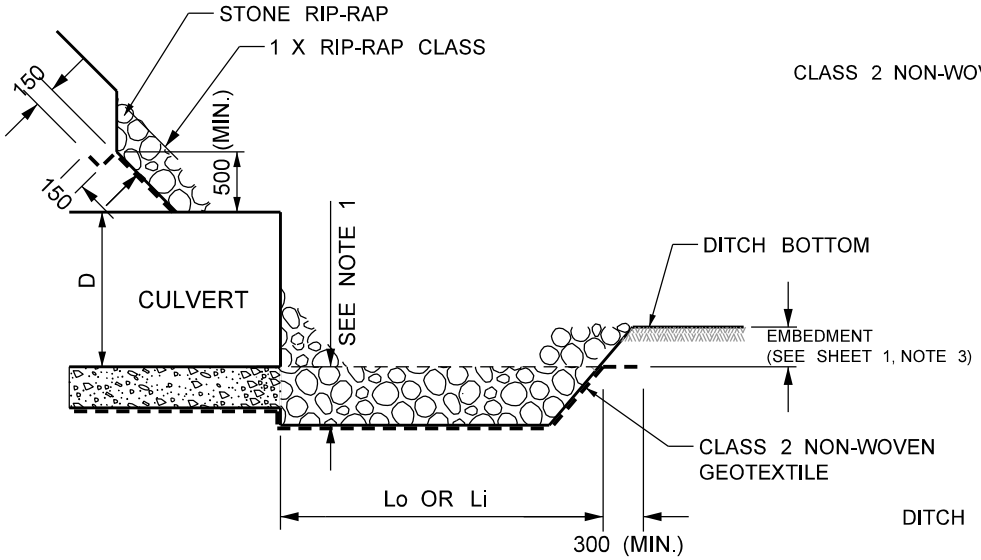
SCALE	SHEET
N.T.S.	3 OF 4

MSD - 400.2

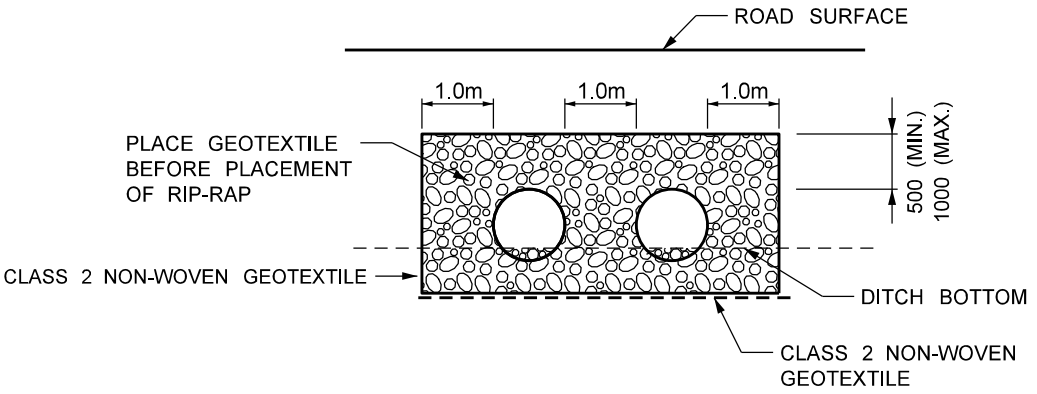
OPEN CUT INSTALLATION DETAILS FOR MULTIPLE CSC, PCC, AND HDPE CULVERTS, ≤1800 DIA.

Manitoba
Transportation and Infrastructure

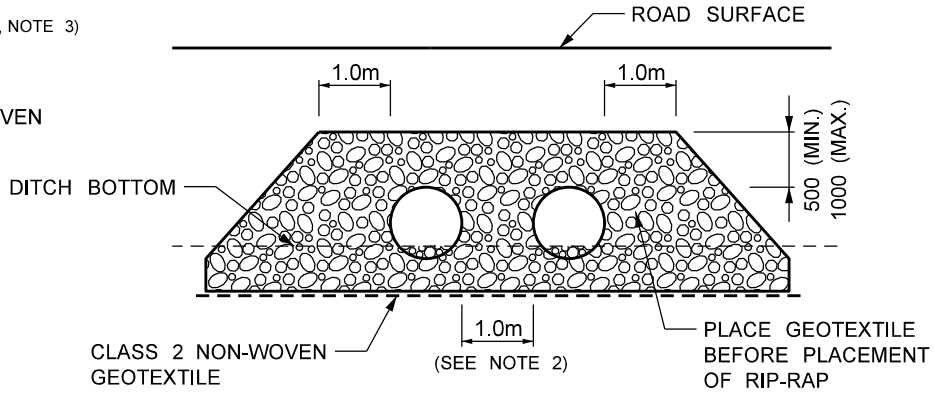
OCTOBER 30, 2025



INLET & OUTLET - SIDE VIEW FOR EMBEDDED CULVERTS



INLET END VIEW FOR EMBEDDED CULVERTS



OUTLET END VIEW FOR EMBEDDED CULVERTS

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JEFF E. TALLIN, P.Eng.

October 28, 2025

NOTE:

1. RIP-RAP THICKNESS SHALL BE THE GREATER OF 500 OR 1.5x RIP-RAP MAXIMUM SIZE
2. FOR CULVERTS WITH FLARED ENDS, INCREASE SPACING TO PROVIDE 1.0m (MIN.) FROM EDGE TO EDGE OF FLARED END UNITS

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SPECIFIED OTHERWISE

APPROVALS	REVISIONS				MANITOBA STANDARD DRAWING	
ORIGINAL SIGNED BY: **DUSTIN BOOY** EXECUTIVE DIRECTOR OF HIGHWAY ENGINEERING SERVICES	No.	DESCRIPTION	BY	DATE	DATE OCTOBER 2025	OPEN CUT INSTALLATION DETAILS FOR MULTIPLE CSC, PCC, AND HDPE CULVERTS, ≤1800 DIA.
ORIGINAL SIGNED BY: **TARA LISKE** EXECUTIVE DIRECTOR OF REGIONAL OPERATIONS	1				SCALE: N.T.S. / SHEET: 4 OF 4	
	2				MSD - 400.2	Manitoba Transportation and Infrastructure
	3					

OCTOBER 30, 2025