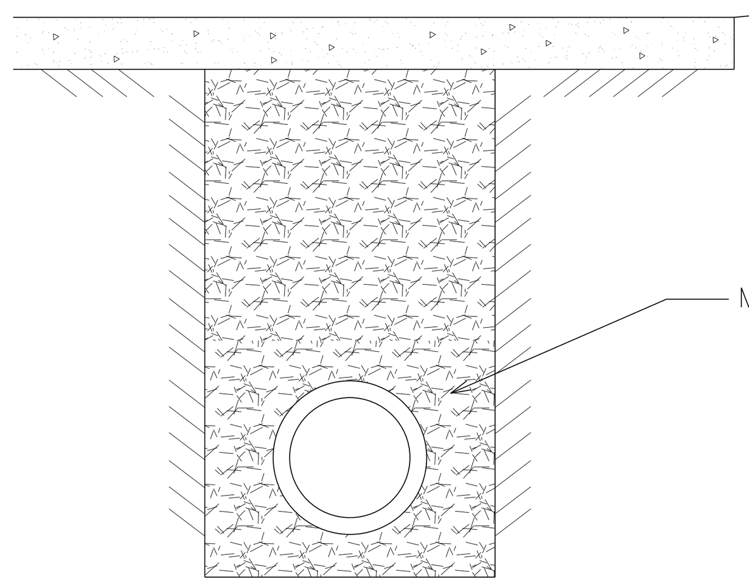
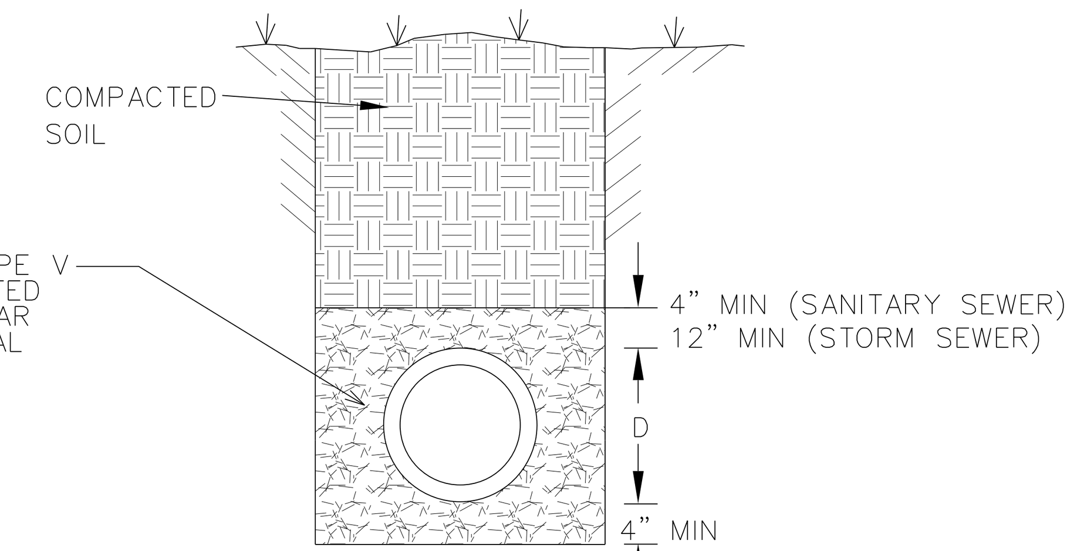


SANITARY & STORM SEWER PIPE EMBEDMENT BENEATH SIDEWALK, PAVEMENT, & FOOTINGS

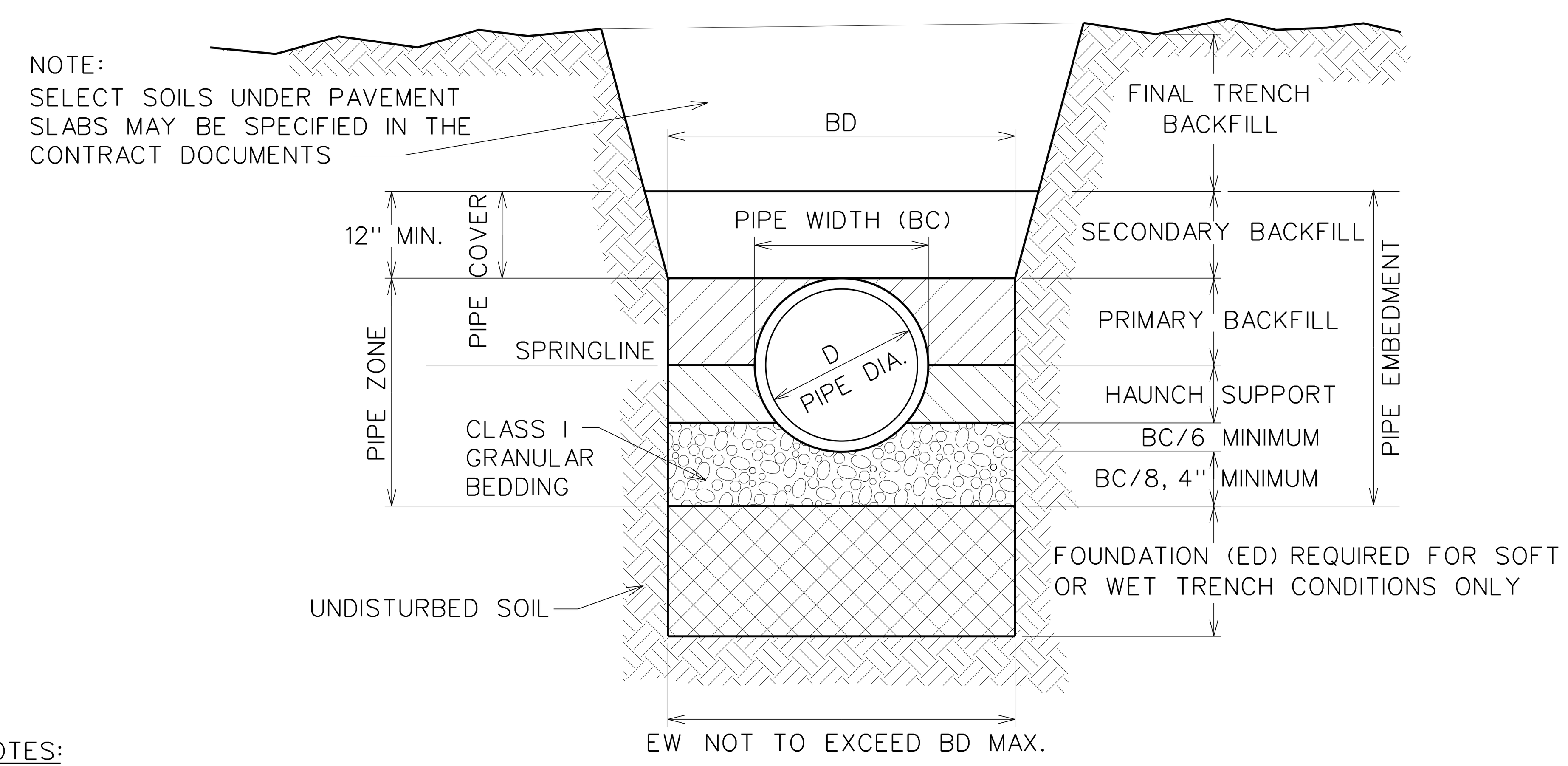


TYPICAL SANITARY & STORM SEWER PIPE EMBEDMENT DETAIL

COMPACTION REQUIREMENTS	
BACKFILL	% COMPACTION
FINAL	95%
PRIMARY OR SECONDARY	CLASS II-90% CLASS III-95% CLASS IVA-95%
HAUNCH	90%
PIPE BEDDING	90%

STORM SEWER PIPE EMBEDMENT

NOT TO SCALE



NOTES:

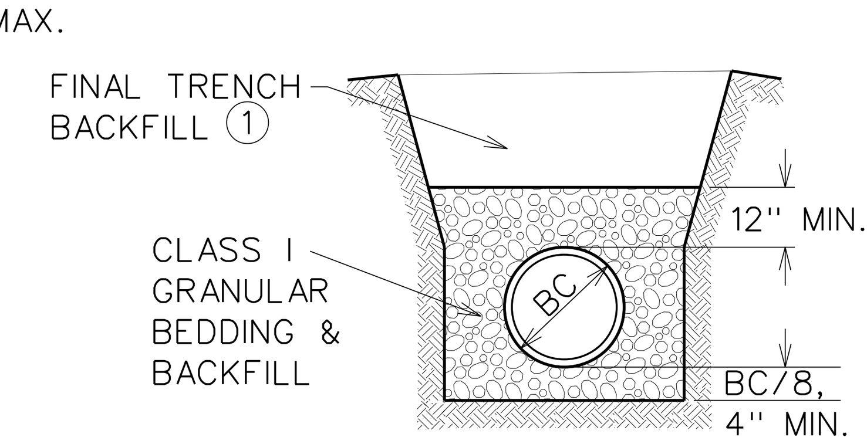
1. HAND PLACED BACKFILL SHALL BE SELECTED, FINELY DIVIDED EXCAVATED MATERIAL FREE FROM DEBRIS, STONES, ORGANIC MATTER OR FROZEN LUMPS AND CAREFULLY COMPACTED.
2. CLASS I GRANULAR BEDDING: SEE SECTION 3010, 2.03.
3. A. TRENCH WIDTH (RIGID PIPE)
   MIN. WIDTH: BD=BC+1.5'.
   MAX WIDTH: BD = 1.25BC+1' OR 54", WHICHEVER IS GREATER.
   B. TRENCH WIDTH (SEMI-RIGID AND FLEXIBLE PIPE)
   MIN. WIDTH: BD = 1.25BC+1' OR BC+1.5', WHICHEVER IS GREATER.
   C. TRENCH WIDTH REQUIREMENTS MAY BE MODIFIED BY JURISDICTIONAL ENGINEER BASED UPON SITE CONDITIONS.
   BD = TRENCH WIDTH AT TOP OF PIPE.
   EW=EXCAVATION WIDTH AT BOTTOM OF TRENCH.
   DEPTH OF BEDDING MATERIAL BELOW PIPE = BC/8, 4" MINIMUM.
4. FOUNDATION ROCK (CLEAN CRUSHED STONE - 2 1/2 " MATERIAL) WHEN REQUIRED SHALL BE PLACED BELOW NORMAL BEDDING. MEASUREMENT FOR FOUNDATION ROCK SHALL BE IN TONS; OVER EXCAVATION SHALL BE INCIDENTAL.
5. FOR ROCK EXCAVATION, THE TRENCH SHALL BE OVER EXCAVATED A MINIMUM OF 6" AND REFILLED WITH NORMAL BEDDING.

(1) FINAL TRENCH BACKFILL SHALL BE MINIMUM CLASS IV A. CLASS IVB MAY BE USED IF APPROVEDBY THE JURISDICTIONAL ENGINEER. CLASS II MATERIAL MAY BE SPECIFIED IN THE CONTRACT DOCUMENTS BY THE JURISDICTIONAL ENGINEER BETWEEN THE PIPE EMBEDMENT ZONE AND THE TOP 2' OF THE FINAL BACKFILL WHEN THE TRENCH IS UNDER THE PAVEMENT.

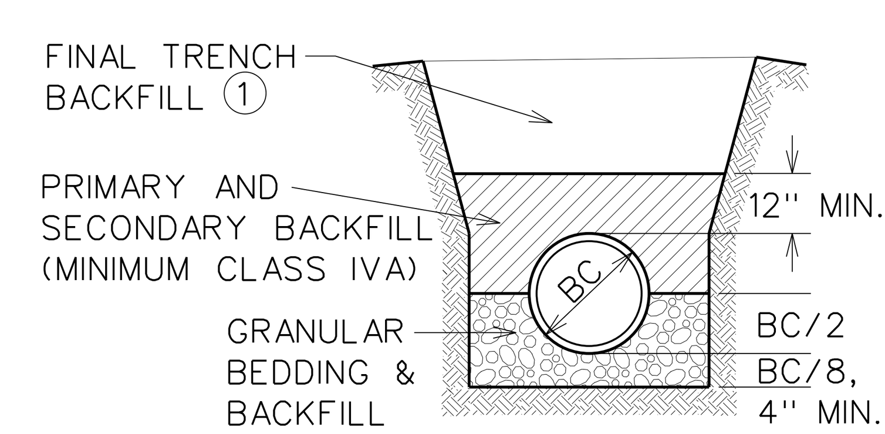
- THE CLASS OF MATERIAL STATED IS THE MINIMUM ALLOWED. HIGHER QUALITY MATERIALS (AS REPRESENTED BY LOWER CLASS NUMBERS) MAY ALSO BE USED. SEE SECTION 3010, 2.03 - 2.08 FOR MATERIAL PROPERTIES.

APPROVED PIPE MATERIALS

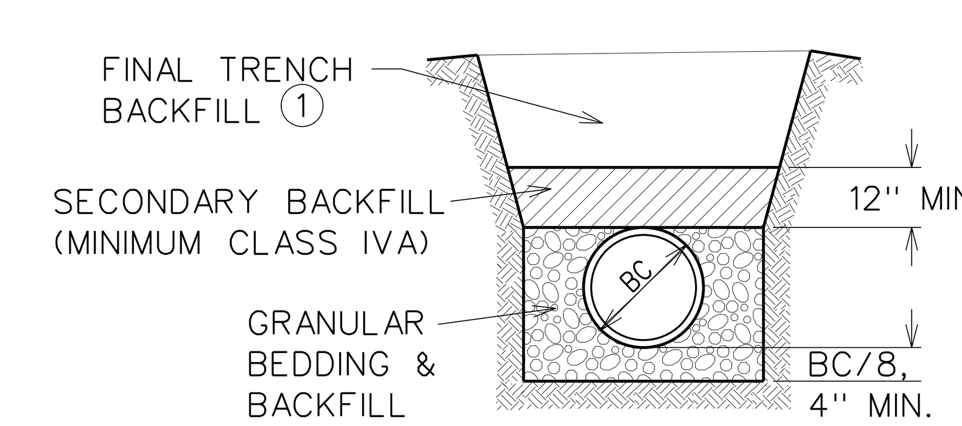
				ALLOWABLE DEPTH OF FILL ABOVE TOP OF PIPE			
	TYPE OF PIPE	MATERIAL	USE	TYPE C EMBED.	TYPE B EMBED.	CSE EMBED.	TYPE A-1 EMBEDMENT
RIGID	PIPE STIFFNESS >651 PSI	RCP; ASTM C 76 CLASS III; 12"-24"	STORM, GRAVITY	UP TO 8'	UP TO 10'	UP TO 10'	UP TO 10'
		RCP; ASTM C 76 CLASS III; 27"-84"	STORM, GRAVITY	UP TO 10'	UP TO 13'	UP TO 13'	UP TO 13'
		RCP; ASTM C 76 CLASS IV; 12"-24"	STORM, GRAVITY	UP TO 12'	UP TO 16'	UP TO 16'	UP TO 16'
		RCP; ASTM C 76 CLASS IV; 24"-27"	STORM, GRAVITY	UP TO 16'	UP TO 23'	UP TO 23'	UP TO 23'
		RCP; ASTM C 76 CLASS V; 12"-21"	STORM, GRAVITY	UP TO 19'	UP TO 25'	UP TO 25'	UP TO 25'
		RCP; ASTM C 76 CLASS V; 24"-84"	STORM, GRAVITY	UP TO 30'	UP TO 40'	UP TO 40'	UP TO 40'
		DUCTILE IRON; AWWA C151 (CLASS 52); 8"-54"	SANITARY, GRAVITY	UP TO 50', NO BEDDING REQUIRED			
		DUCTILE IRON; AWWA C151 (CLASS 52); 4"-64"	SANITARY, FORCE MAIN	UP TO 50', NO BEDDING REQUIRED			
		EXTRA STRENGTH, VCP; ASTM C 700 8"-10"	SANITARY, GRAVITY	UP TO 16'	UP TO 20'	UP TO 24'	UP TO 24'
		EXTRA STRENGTH, VCP; ASTM C 700 12"-21"	SANITARY, GRAVITY	UP TO 12'	UP TO 15'	UP TO 18'	UP TO 18'
		EXTRA STRENGTH, VCP; ASTM C 700 24"-42"	SANITARY, GRAVITY	UP TO 13'	UP TO 18'	UP TO 23'	UP TO 23'
SEMI-RIGID	PIPE STIFFNESS 151 PSI TO 650 PSI	PVC; ASTM D 3034 (SDR 23.5); 8"-15"	SANITARY, GRAVITY			UP TO 30'	UP TO 30'
		PVC; ASTM D 2680 (TRUSS); 8"-15"	SANITARY, GRAVITY			UP TO 30'	UP TO 30'
		PVC; AWWA C900 (DR18); 4"-12"	SANITARY, FORCE MAIN, WATER	UP TO 30', NO BEDDING REQUIRED			
		PVC; AWWA C905 (DR18); 14"-24"	SANITARY, FORCE MAIN	UP TO 30', NO BEDDING REQUIRED			
FLEXIBLE	PIPE STIFFNESS 46 PSI TO 150 PSI	PVC; ASTM D 3034 (SDR 35 & 26); 8"-15"	SANITARY, GRAVITY				UP TO 30'
		PVC; ASTM F 679 (T-1 WALL); 18"-27"	SANITARY, GRAVITY				UP TO 30'
		PVC; ASTM F 949 ; 8"-36"	SANITARY, GRAVITY				UP TO 30'
		PVC; ASTM F 1803 (CLOSED PROFILE); 21"-36"	SANITARY, GRAVITY				UP TO 30'
		PVC; ASTM F 949 ; 12"-36"	STORM, GRAVITY			UP TO 30'	UP TO 30'
		HDPE; AASHTO M 294	STORM, GRAVITY				UP TO 11'



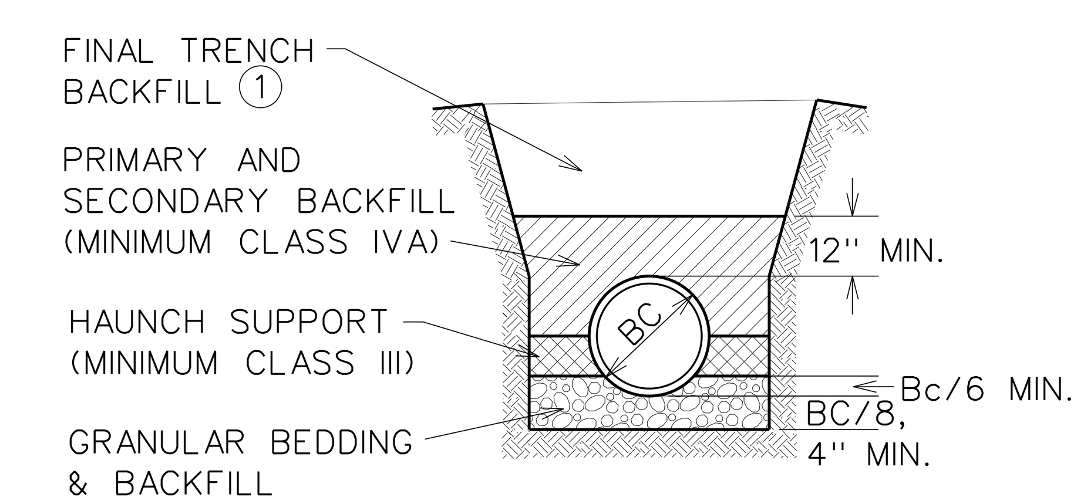
TYPE A-1 PIPE EMBEDMENT (GRANULAR EMBEDMENT 1' ABOVE TOP OF PIPE)



TYPE B PIPE EMBEDMENT



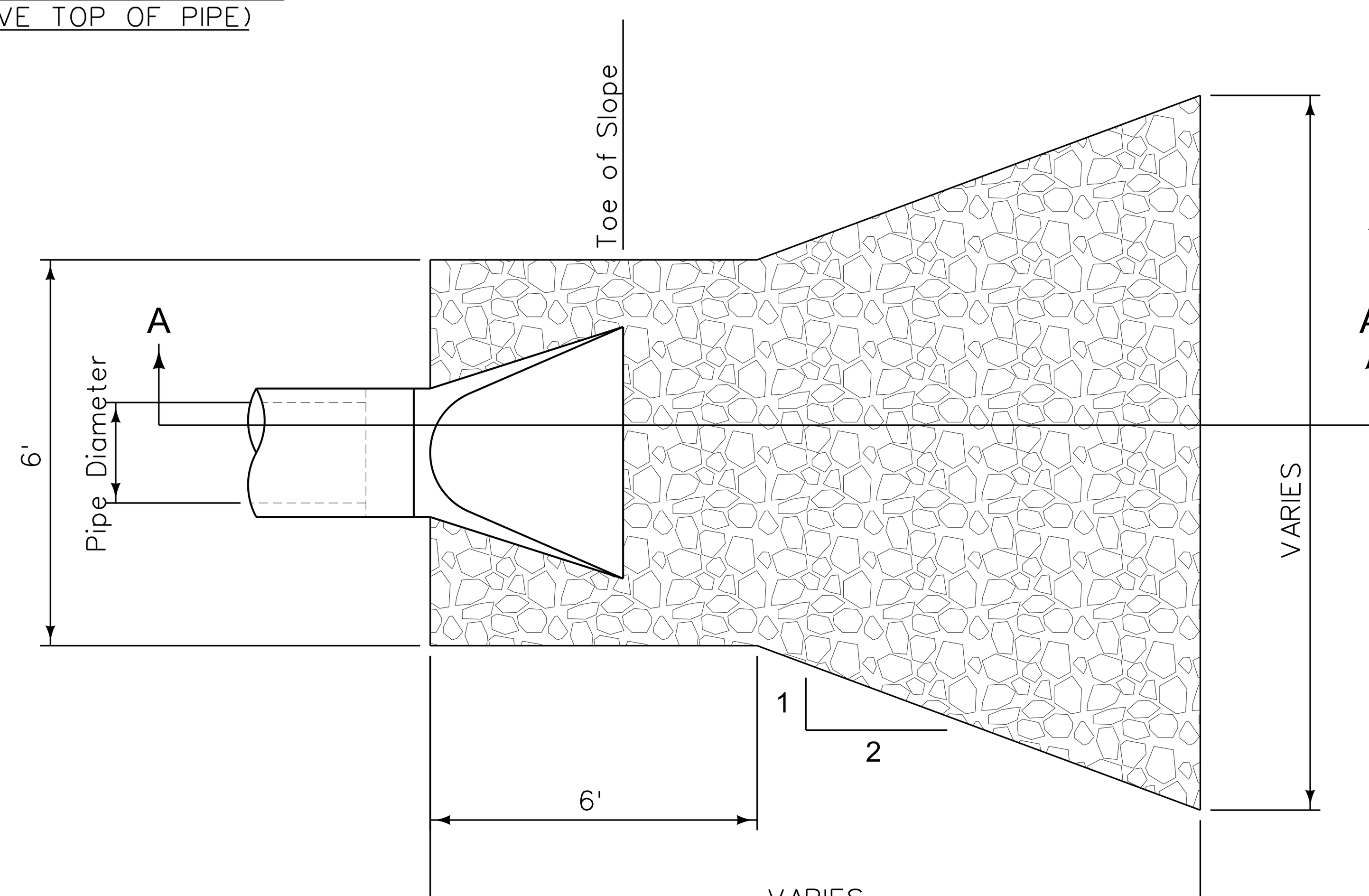
TYPE CSE PIPE EMBEDMENT (CRUSHED STONE ENCASEMENT)



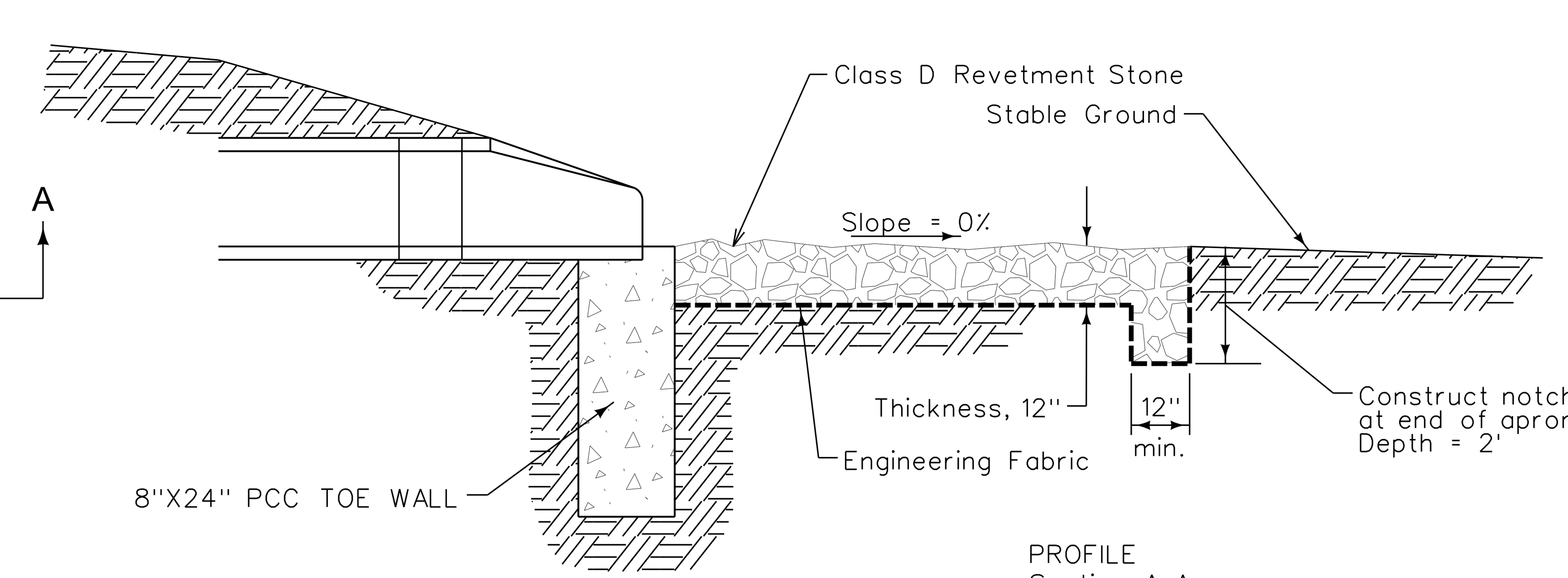
TYPE C PIPE EMBEDMENT

PIPE EMBEDMENT DETAIL

NOT TO SCALE



PLAN



PROFILE
Section A-A

END SECTION RIP RAP APRON DETAIL

NOT TO SCALE

MARK	REVISION	DATE	BY

Engineer: SD Checked By: AM Scale: 1"=
Technician: DB Date: 01/17 Field Bk: Pg:

Snyder & Associates Engineers & Planners, Inc.
Missouri State Certificate of Authority #2006008544

Sheet C3.2

SAINT JOSEPH, MISSOURI

ALTEC DESIGN ASSURANCE

DETAILS

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Project No: 1161183

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