

NOTES:

- Grout strength shall be 6 KSI minimum. Assumed grout-to-ground nominal bond is 16.5 psi.
- One verification test pile shall be installed at 100' maximum spacing along wall with a minimum two per wall; one the vertical and one for the slanted piles in accordance with ASTM D1143 (Compressive) and ASTM D3689 (Uplift/Tension).
- Micropile design per 5'-0" typical spacing shall satisfy at a minimum, 16.5 psi bond strength with the applied Vehicular collision force (CT) with extreme event II load combination.
Axial Compression = 8.663 KIP/Ft, Impact Load for vertical pile.
Axial Tension = 9.970 KIP/Ft, Impact Load for slanted pile.
Max. Vert. Displacement @ 1.0 DL = 1/4"
Min. Bond Length L1=L2= 10'-0"
- Refer to specifications for permanent casing yield strength.
- Project inspectors shall note actual bedrock elevations on as-built drawings.
- The vertical and slanted piles are staggered, not in the same plane.
- Both vertical and slanted piles have the same micropile/casing pay length.
- Vertical pile casing shall maintain a minimum 6" clearance to the back facing of the element and may be cored through leveling pad.
- To accommodate asphalt pavement, curb height shall be raised 3 inches.
- For penetrating rock, starter casing shall have carbide sinter bits and may be reused.
- For deep seated slope stability (FS > 1.3) the typical 5'-0" micropile spacing may be increased to a maximum of 10'-0" according to the geotechnical report, grouting methods, and site specific bond strength.
- For B-504-V6, the vertical and slanted piles must be constructed in the same plane.

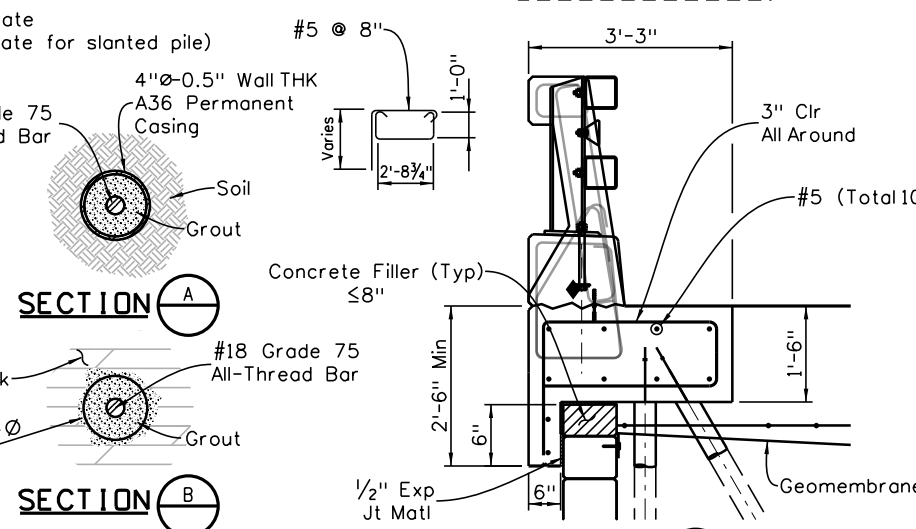
DESIGN CRITERIA:

- Settlement from backfill/soil reinforcement occurs after Phase II (MSE blocks and MSE backfill) construction completed and Phase I construction micropile installed.
- Rail, Curb, and Micropile are externally stabilized and independent of design height.
- Spacing of micropiles is determined by three-force free body diagram from TL4 (54 KIP) rail impact to micropile with 10.83' spread length; A-Frame (Rail, Cap, and (2) Piles) load transfer from rail to bedrock via piles with no contribution of soil/structure interaction.
- Casing is embedded into bedrock to start of usable micropile bond length.
- Buckling is not a concern for micropile in soil.

Note to Designer and Detailer:
Design must be updated for current MASH loads.

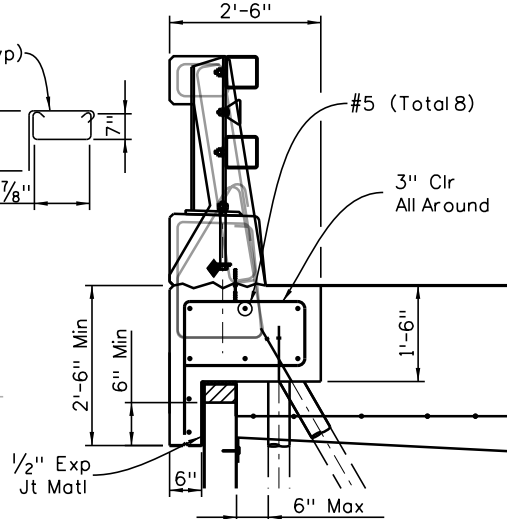
Station	Top of Cap Beam Elev	Estimated Bedrock Elevation	DH or Casing Pay Length Ft	Minimum Bond Length Ft	Micropile Pay Length Ft	Actual Bedrock Elevation

DETAILER: Turn off level for Bridge Rail not needed.



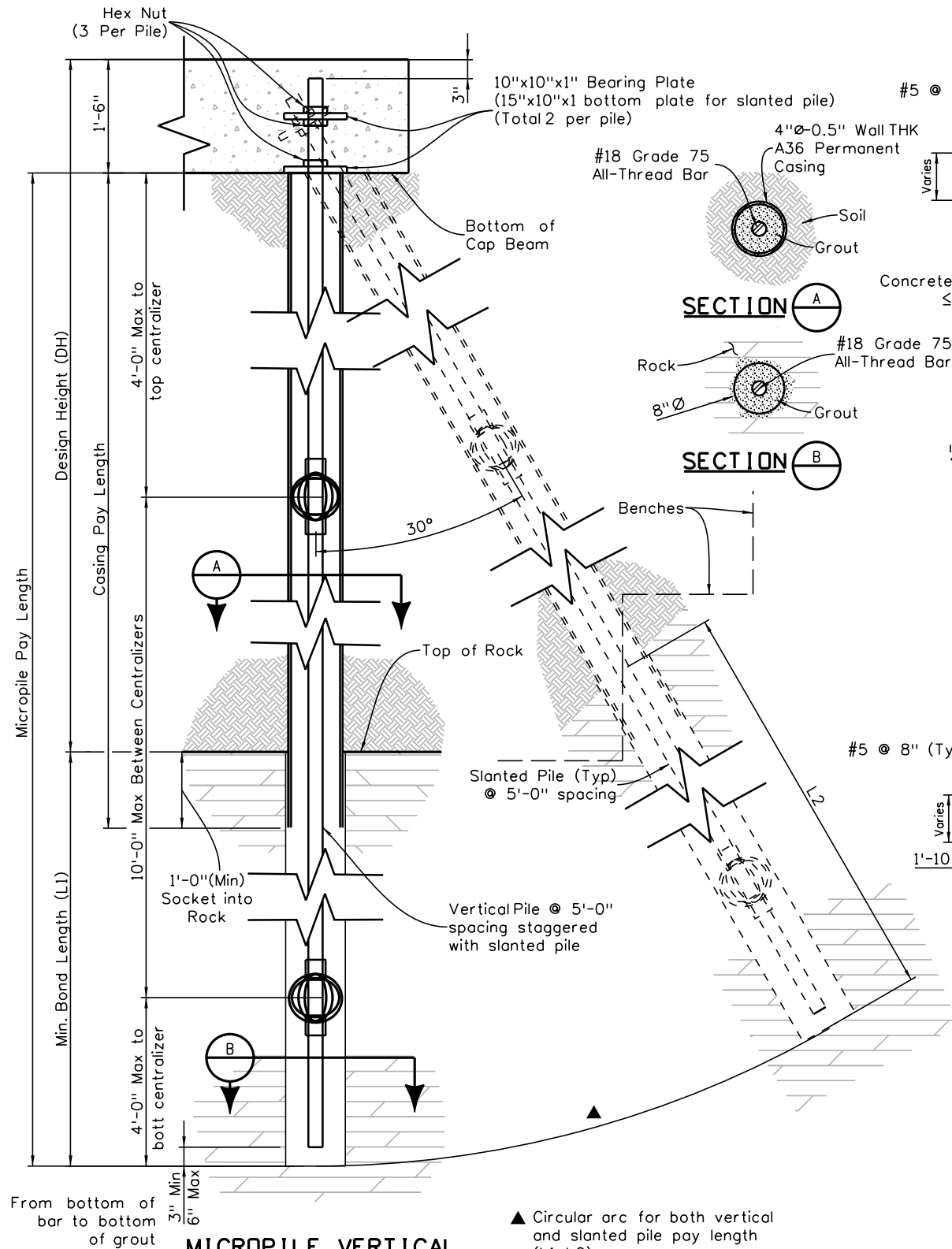
DETAIL 1 BXX
CAP DETAIL A-FRAME BLOCK
(For Information Only)

Item No.	Description	Unit	Quantity
601	Concrete Class D	CY/LF	0.1936
602	Reinforcing Steel (Epoxy Coated)	LB/LF	24.98
518	Waterstop (6 Inch)	LF/Ft	1



DETAIL 2 BXX
CAP DETAIL A-FRAME PANEL
(For Information Only)

Item No.	Description	Unit	Quantity
601	Concrete Class D	CY/LF	0.1482
602	Reinforcing Steel (Epoxy Coated)	LB/LF	20.61
518	Waterstop (6 Inch)	LF/Ft	1



MICROPILE VERTICAL AND SLANTED DETAIL

- ▲ Circular arc for both vertical and slanted pile pay length (L1=L2)
- ◆ Continuous 6" neoprene waterstop with 3" min projection above deck for rail by flow line

REVISION DATES
09-16
10-24

INITIALS	DESIGN	DATE	DETAIL	DATE	QUANTITY	DATE

All seals for this set of drawings are applied to the cover page(s)	Print Date: \$DATE\$	Sheet Revisions			Colorado Department of Transportation		As Constructed	BLOCK OR PANEL FACING		Project No./Code
	File Name: Sheet_B-504-V2 .dgn	Date:	Comments	Init.	2829 West Howard Place, 3rd Floor Denver, CO 80204 Phone: 303-512-4079 FAX: 303-757-9197		No Revisions:	A-FRAME WALL		
	Horiz. Scale: Vert. Scale: As Noted					Staff Bridge Branch	Revised:	Designer: XXXXXXXX	Structure Numbers: XXXXXXXXXXXXX	Sheet Number
	Unit Information Unit Leader Initials									
							Void:	Sheet Subset: WALL	Subset Sheets: WXX of XXX	