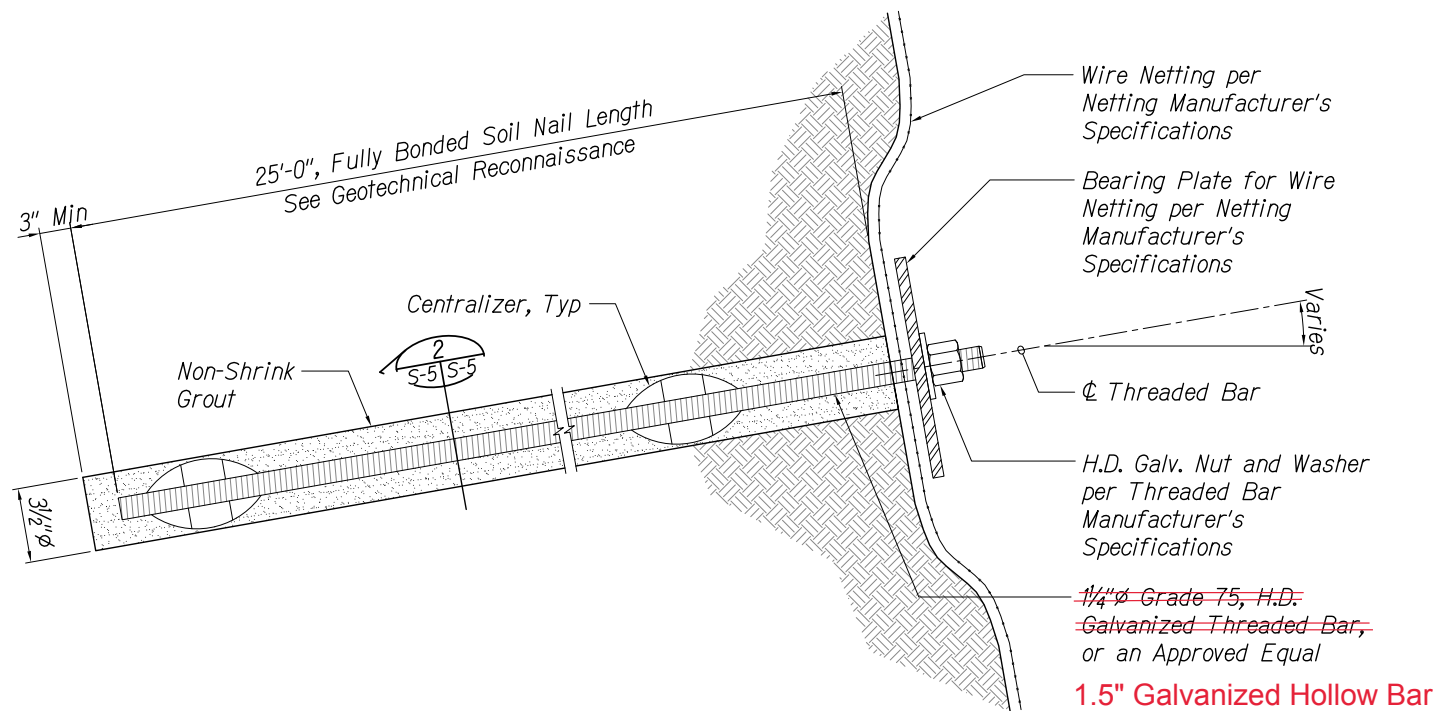


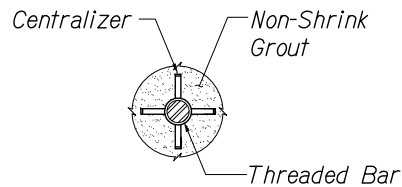
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	36C-01-10	2020	34	35

AS-BUILT

Name: *PM*
Date: 10/26/22



MAUKA SLOPE SOIL NAIL DETAIL
Not to Scale



SECTION
Not to Scale

Mauka Slope Soil Nail Notes:

1. Mauka Slope Soil Nails shall be spaced maximum 10 feet on center, both horizontally and vertically.
2. Mauka Slope Soil Nail threaded bars shall be ASTM A615, Grade 75 and galvanized per ASTM A153. Yield strength shall not be reduced by more than 5% after galvanizing. If required, bevel washers shall be galvanizing per ASTM A123.
3. Per the Geotechnical Reconnaissance and Evaluation Report, a soil nail skin friction of 2000 psf was used to determine the soil nail hole diameter for an allowable pullout capacity of 22 kips with a factor of safety of 2.0.
4. Centralizers shall be placed at 10'-0" max intervals, with the bottom centralizer located 2'-0" from the bottom.
5. Grout shall be non-shrink Type K and shall have a minimum compressive strength of 4,000 psi in 3 days and 7,000 psi in 28 days.
6. The grout shall have cured for at least 72 hours and attained the specified 3 day compressive strength prior to stressing. Stressing within 72 hour curing period shall be allowed, provided the Contractor submits compressive strength test results verifying the grout mix has attained the specified 3 day compressive strength in the same curing time tested. Testing for compressive strength shall conform to ASTM C109 mortar and sand.
7. When lifting the soil nails for installation into the holes, multiple pick points shall be used to avoid bending or damaging the threaded bars.
8. Soil nail threaded bars shall be new and free of any surface damage, kinks, and sharp bends.
9. A Civil Engineer, licensed in the State of Hawaii and who specializes in Geotechnical Engineering, shall be present to monitor the installation and testing of the soil nails. Contractor shall coordinate the installation and testing schedule with the State's Project Engineer. Contractor is responsible for paying for Geotechnical services and for testing services.
10. Pullout proof test loads is 44 kips and should be performed on 20% of the installed soil nails in accordance with ASTM D3689. See special provision 695 for details.
11. Soil nails shall conform to special provision 695.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	TRACED BY	
	QUANTITIES BY	
	CHECKED BY	
No.		

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION IS SET FORTH IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES, ENTITLED "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS AND LANDSCAPE ARCHITECTS".

R. M. Towill 4/30/22
SIGNATURE LIC. EXPIRATION
R. M. TOWILL CORPORATION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**MAUKA SLOPE
SOIL NAIL DETAILS**

HANA HIGHWAY ROCKFALL
MITIGATION MP12
PROJECT NO. 36C-01-10

Scale: MARCH 2020

SHEET No. S-5 OF 35 SHEETS

"AS-BUILT"

34