

A. SOIL PREPARATION NOTES:

- The contractor shall be responsible for protecting the highway and all appurtenances from damage resulting from the Contractor's activities. The Contractor shall be solely responsible for repairing any damage resulting from the clearing and/or other construction activities.
- The contractor shall protect the traffic on the highway from any rockfall hazards at all times during the contractor's activities.
- Prior to structural excavation, the Contractor shall layout the grading limits in accordance with plans after clearing and grubbing, to verify the grading requirements. The Contractor shall notify the Engineer immediately if existing ground conditions are different from what were shown on the plans
- Prior to drilling the soil/rock anchors for the anchored wire mesh, the slope face shall be cleared of vegetation.
- The slope face to receive the anchored wire mesh shall be excavated in stages to required inclination with loose and/or excess materials removed to a firm substrate on the slope face to the Engineer's satisfaction.
- The tops of all slopes shall be rounded to the Engineer's satisfaction.
- The Contractor shall exercise extra care in the excavation work and shall avoid over-steepening the slope face that may cause instability of the slope face. If the Contractor encounters unstable slope conditions that may constitute a potential landslide during the slope preparation work, notify the Engineer immediately. The Contractor shall verify the existing slope conditions and incorporate these potential landslide or unstable conditions into the price of their bid.
- Debris or other materials that hang up on the slope during the slope preparation operations shall be removed and completed to the satisfaction of the Engineer.
- The Contractor shall maintain equipment on-site at all times to remove debris from the highway to allow the passage of emergency vehicles in the event that emergency vehicles require passage through the project area along the highway during the lane closure times. The slope preparation activities shall be temporarily suspended to allow the passage of the emergency vehicles through the project area along the highway.

B. ANCHORED WIRE MESH CONSTRUCTION SEQUENCE:

- Clear and grub slope face of vegetation and loose materials in accordance with Specifications Section 201 - Clearing and Grubbing.
- Excavate slope in stages with no more than 10-foot height (measured along slope surface) exposed at any time.
- Stake out grouted soil and/or rock anchors in general accordance with the project spacing requirements.
- Excavate the dell for pre-tensioning of the anchored wire mesh before drilling the grouted soil and/or rock anchors.
- Install the grouted soil and/or rock anchors (final anchor heads shall not project above the terrain line or predominant slope line).
- Excavate next stage and repeat Steps 3 to 5 until all anchors are installed.
- Plant hydromulch seeding on the slope.
- Lay and anchor erosion control matting on the slope (in accordance with manufacturer's recommendations).
- Lay the steel wire mesh panels on the slope.
- Join the steel wire mesh panels together with compression claws.
- Fit the boundary wire ropes around the perimeter of the anchored wire mesh system, and fasten the wire mesh to the boundary ropes with compression claws.
- Install the spike plates and pre-tension the anchors with torque wrench in order to tension the anchored wire mesh to the grouted soil and/or rock anchors to at least 6.7 kips.

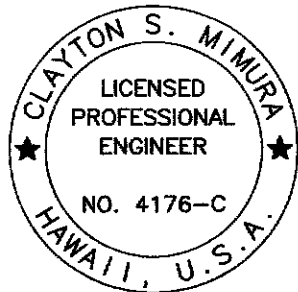
C. ANCHORED WIRE MESH SYSTEM MATERIALS:

- All hardware for the anchored wire mesh system shall be powder coated with a black pigment, and boundary wire rope shall be powder coated or PVC coated (black in color).
- Boundary wire rope and grouted soil and/or rock anchors (including the steel reinforcing bar for the grouted anchor, wire rope, heavy duty wire rope thimbles, wire rope clips such as cable clamps, steel plates, heavy hex nuts, washers, etc.) shall be hot dipped galvanized. All exposed hardware shall be powder coated black.
- Heavy-duty wire rope thimble shall not be in contact with the threads of the steel reinforcing bar.
- The Contractor shall follow the wire rope manufacturer's recommendation for the installation sequence and procedures.
- The grouted soil and/or rock anchors shall have a design pullout capacity (design load), as shown on the following table. The Contractor shall test a minimum number of the grouted soil and/or rock anchors (as shown on the following table) for pullout in accordance with the specifications in the presence of the Engineer. The test anchors shall be selected by the Engineer.
- The steel wire mesh for the anchored wire mesh system shall be manufactured from 0.157-inch (4 mm) diameter high-tensile steel wire. The high-tensile steel wire shall have a minimum tensile strength of 256,000 psi.
- The grouted soil and/or rock anchor shall consist of an encapsulated #11 epoxy coated bars, See Special Provisions. The grout shall have a minimum unconfined compressive strength of 4,000 psi or greater, See Special Provisions and S0.1 for additional requirements.
- Additional 5-foot long Anchors (Type E) shall be installed in the areas where a smooth slope surface is not achieved.

SOIL AND/OR ROCK ANCHOR SCHEDULE

TYPE OF SOIL NAIL	NAIL LENGTH (FEET)	NO. OF NAIL	REBAR SIZE	NUMBER OF ANCHOR TEST (VERIFICATION)	NUMBER OF ANCHOR TEST (PROOF)
A	35	116	Encapsulated #11 Epoxy Coated Bar	4	19
B	30	72	Encapsulated #11 Epoxy Coated Bar	3	11
C	25	48	Encapsulated #11 Epoxy Coated Bar	2	7
D	15	21	Encapsulated #11 Epoxy Coated Bar	1	3
E	5	38	Encapsulated #11 Epoxy Coated Bar	0	0
Sacrificial Pre-Production Testing Anchor	30	4	#14 Bar	(Full Scale Instrumentation with Strain Gages)	

- For upper wall details and location of Anchor Types A, B, C, D, or E, see Upper Anchor Wire Mesh Wall Plans, Sheets S1.1 to S1.3 and Sheets S2.2 to S2.5.
- For lower wall details and location of Anchor Type A, see Lower Shotcrete Wall Plans, Sheets S3.1, S3.2, and S4.1.
- Two Sacrificial Pre-Production Anchors for each upper Anchor Wire Mesh Wall and lower Shotcrete Wall shall be installed and tested prior to Production Anchor installation.



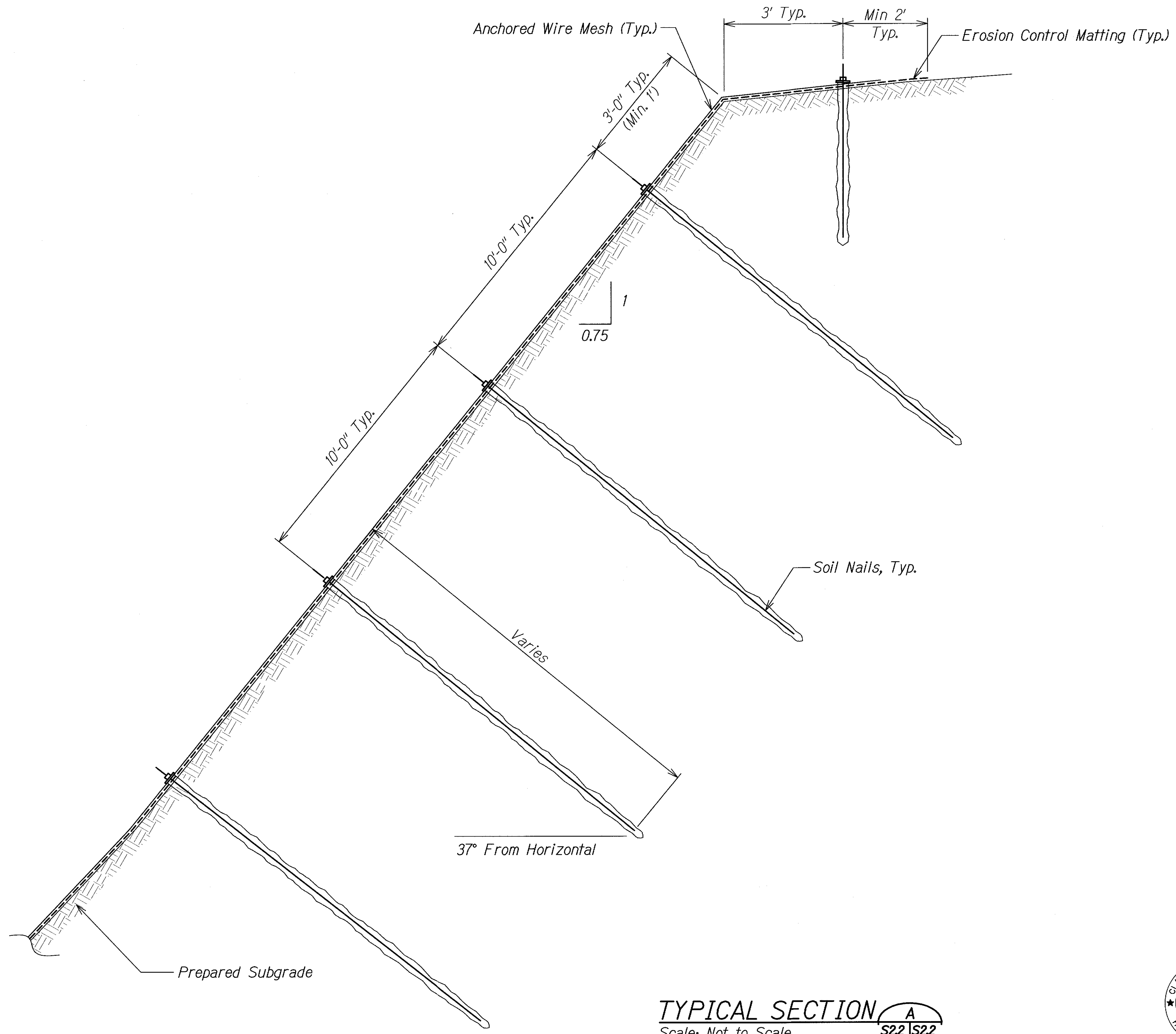
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Clayton S. Mimura
SIGNATURE APRIL 30, 2014
LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ANCHORED WIRE MESH SYSTEM NOTES
*** SOIL AND/OR ROCK ANCHOR SCHEDULE**
KUHIO HIGHWAY EMERGENCY SLOPE REPAIRS
Vicinity of Lumahai
Project No. 560A-02-12
Scale: None Date: Oct. 17, 2011
SHEET No. S21 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	560A-02-12	2012	29	36

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	560A-02-12	2012	30	36

FINAL



TYPICAL SECTION A
Scale: Not to Scale

SURVEY PLOTTED BY	DATE
DRAWN BY	"
DESIGNED BY	"
NOTED BY	"
CHECKED BY	"
ORIGINAL PLAN	No.

DRAWING NAME: Z:\00_000000\10-031-KUHIO HWY EMER SLOPE REPAIRS (LUMAHAI) CAD\07-05-13_458\30-5202.DWG PLOT TIME: 07-02-13, 10:24 AM

CLAYTON S. MIMURA
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NO. 4176-C
HAWAII, U.S.A.

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[Signature]
SIGNATURE

APRIL 30, 2014
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ANCHORED WIRE MESH SYSTEM
TYPICAL SECTION

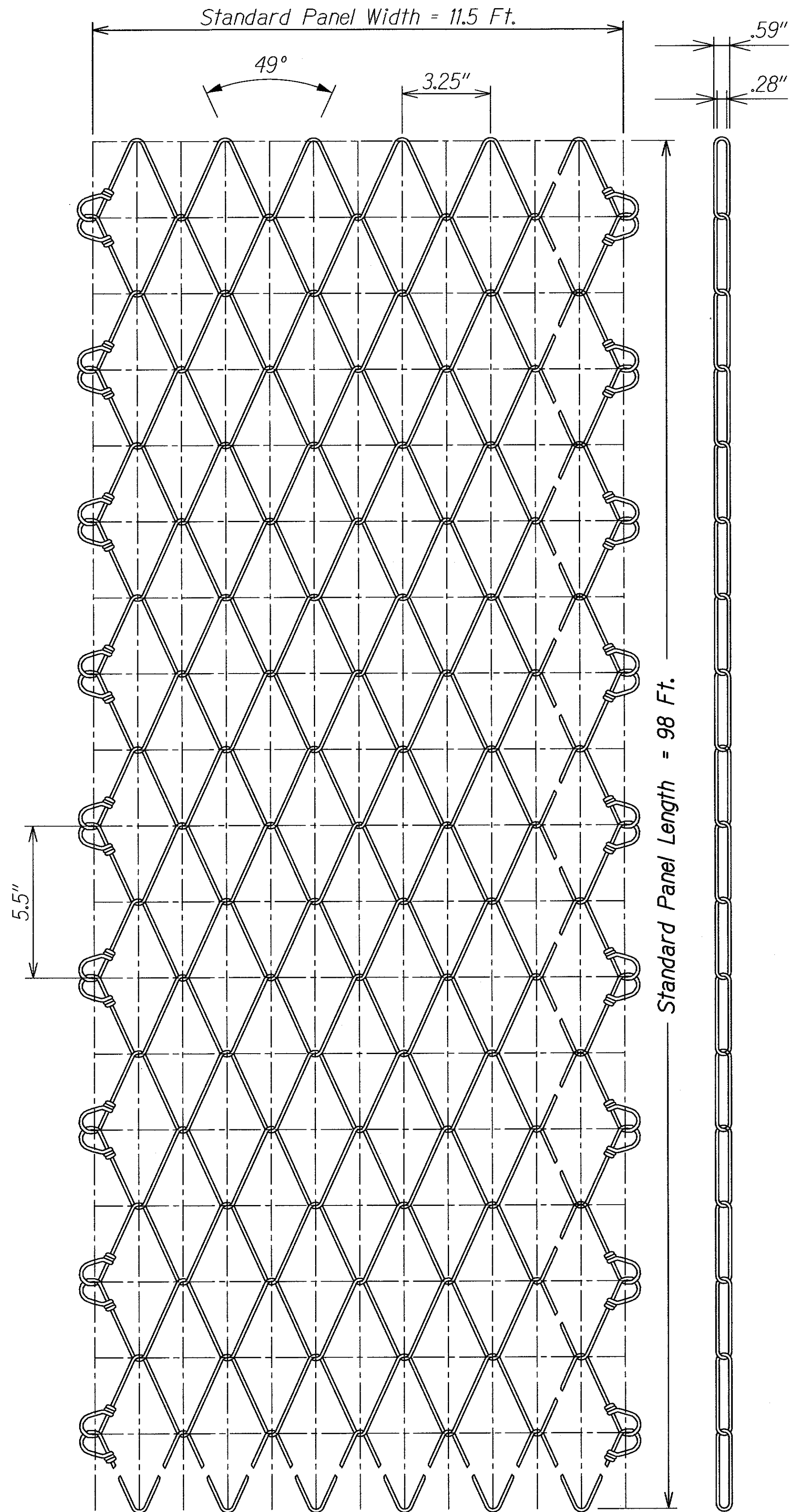
KUHIO HIGHWAY EMERGENCY SLOPE REPAIRS
Vicinity of Lumahai
Project No. 560A-02-12

Scale: As Shown Date: Oct. 17, 2011

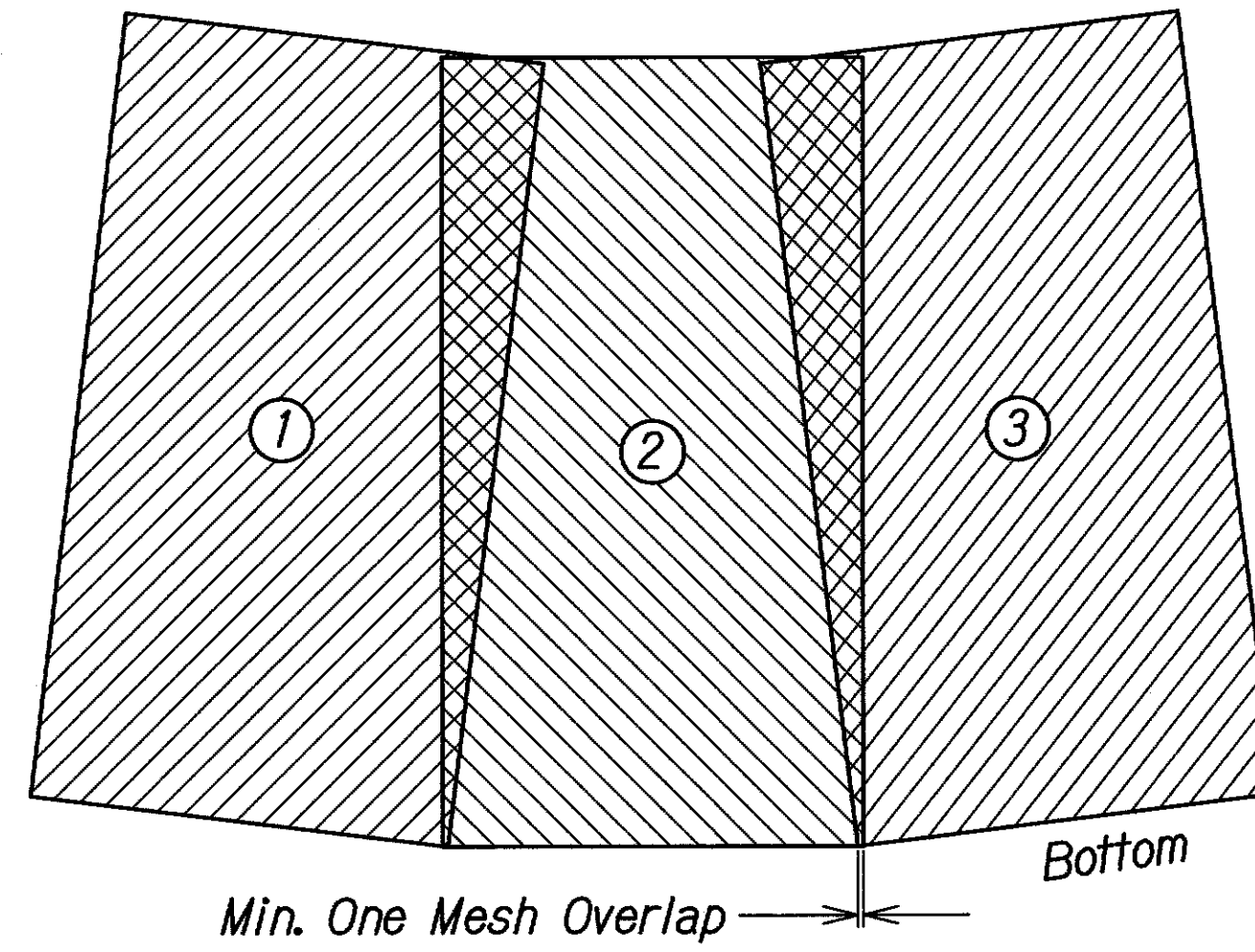
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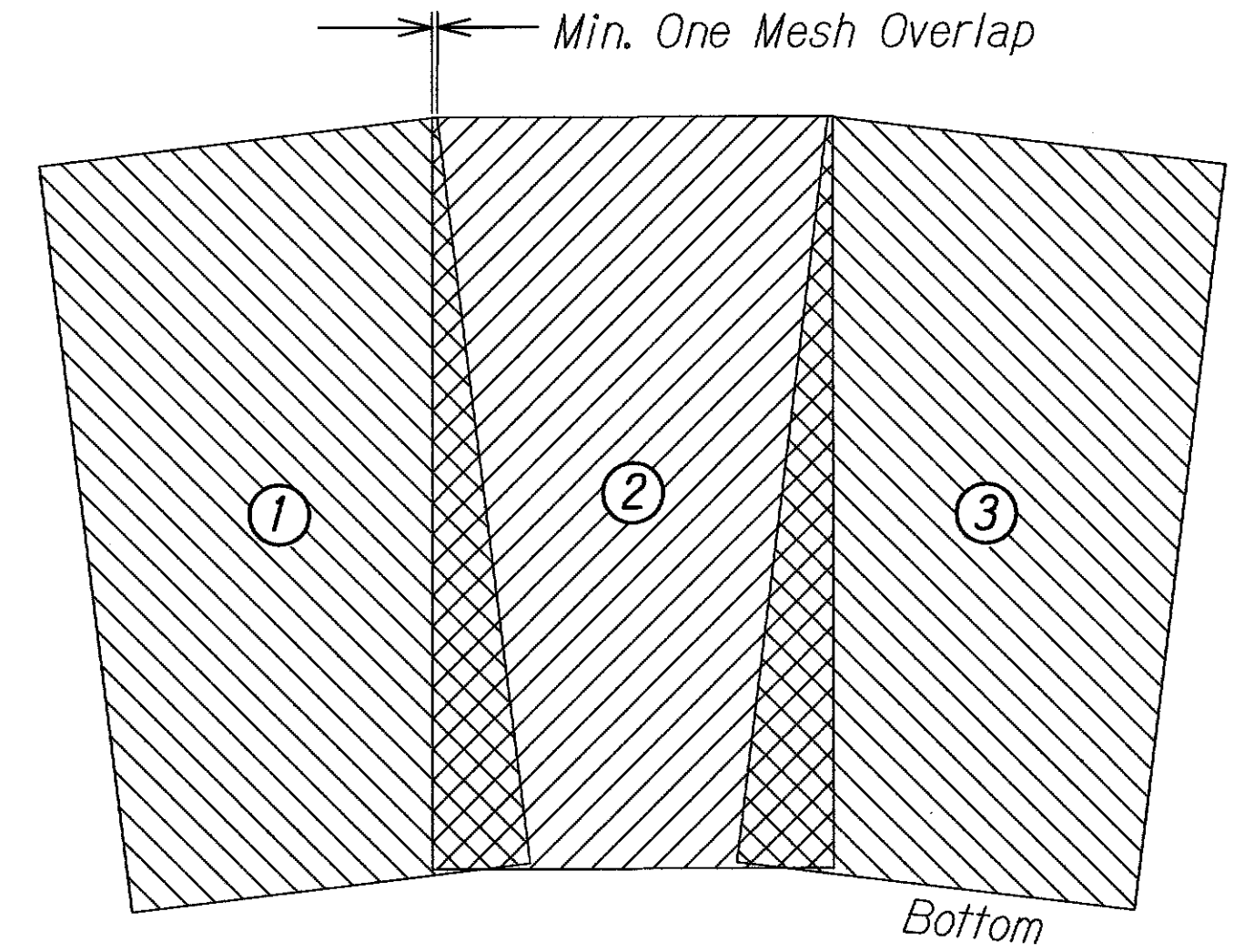
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WIRE MESH PANEL (TYP.)
Not to Scale

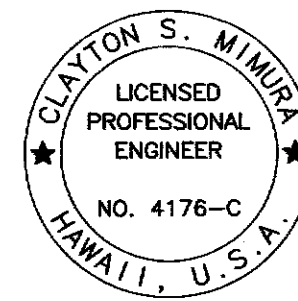


MESH OVERLAP FOR CONVEX SLOPE
Not to Scale



MESH OVERLAP FOR CONCAVE SLOPE
Not to Scale

Wire Diameter = 0.157 Inches (4 mm)
Tensile Strength of Wire = 4.95 Kips

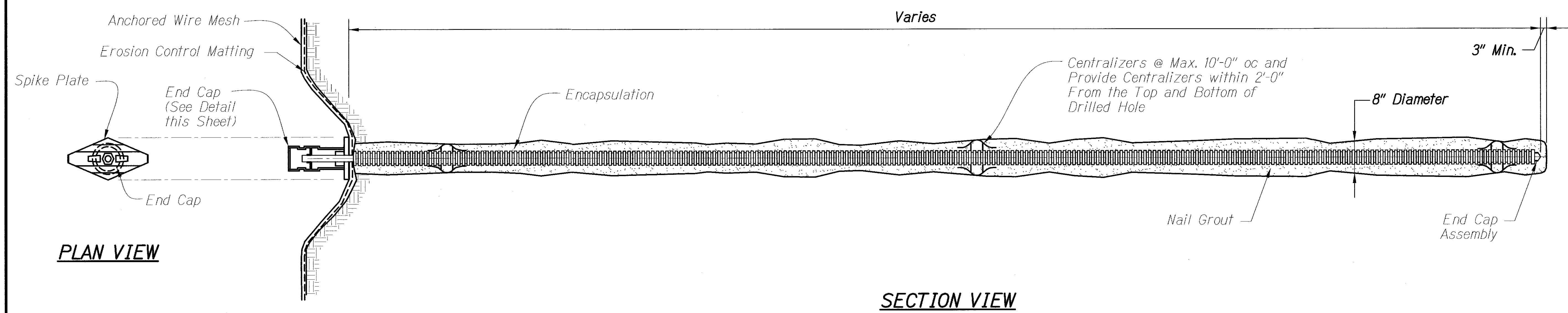


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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ANCHORED WIRE MESH SYSTEM
ANCHOR WIRE MESH DETAILS
KUHIO HIGHWAY EMERGENCY SLOPE REPAIRS
Vicinity of Lumahai
Project No. 560A-02-12
Scale: None Date: Oct. 17, 2011
SHEET No. S23 OF 5 SHEETS

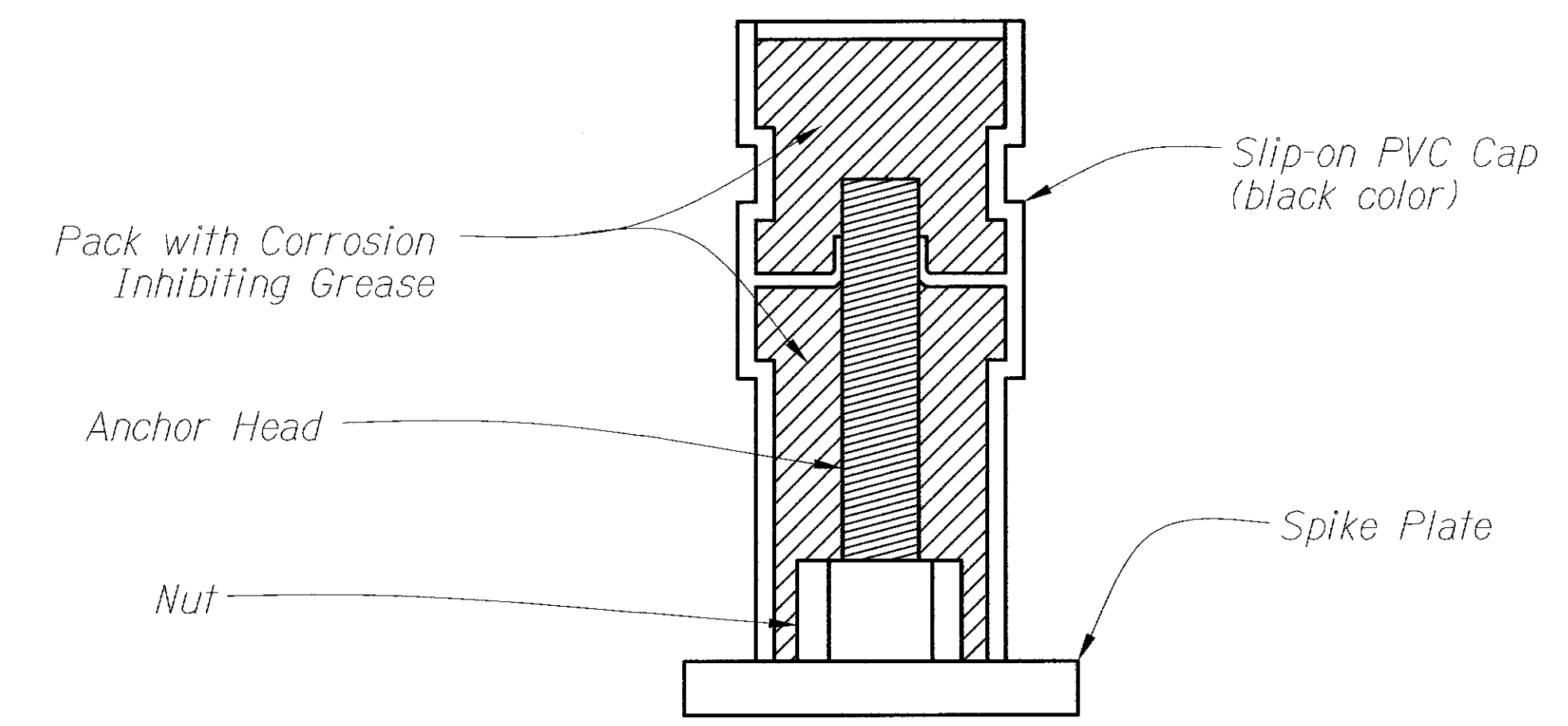
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HAWAII	HAW.	560A-02-12	2012	32	36

FINAL

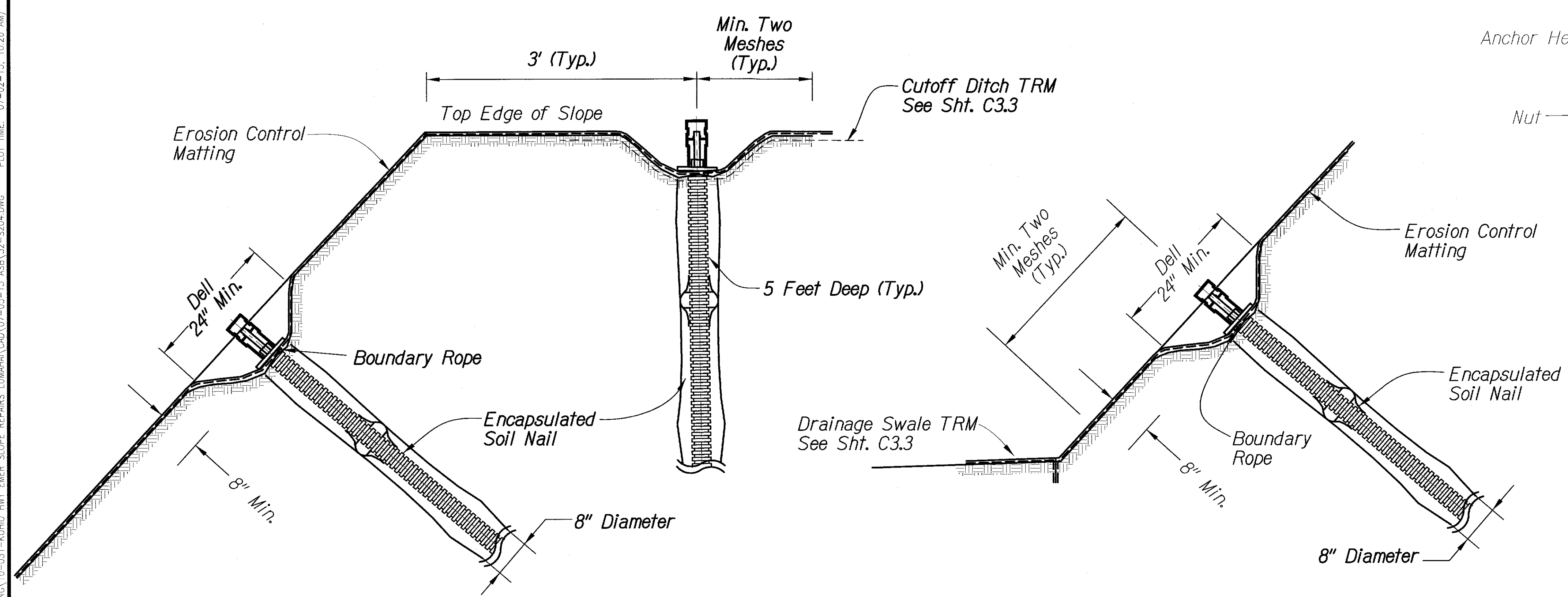


PLAN VIEW

SECTION VIEW



END CAP ELEVATION



TYPICAL DELL OR DEPRESSION AROUND GROUTED ANCHOR CONDITION AT TOP EDGE OF ANCHORED WIRE MESH

TYPICAL DELL OR DEPRESSION AROUND GROUTED ANCHOR CONDITION AT BOTTOM EDGE OF ANCHORED WIRE MESH

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

DRAWING NAME: Z:\00_ONGOING\10-031-KUHIO HWY EMER SLOPE REPAIRS\LUMAHAI CAD\07-05-13_ASR\32-5204.DWG PLOT TIME: 07-02-13, 10:26 AM

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ANCHORED WIRE MESH SYSTEM
GROUTED SOIL / ROCK ANCHOR DETAIL
KUHIO HIGHWAY EMERGENCY SLOPE REPAIRS

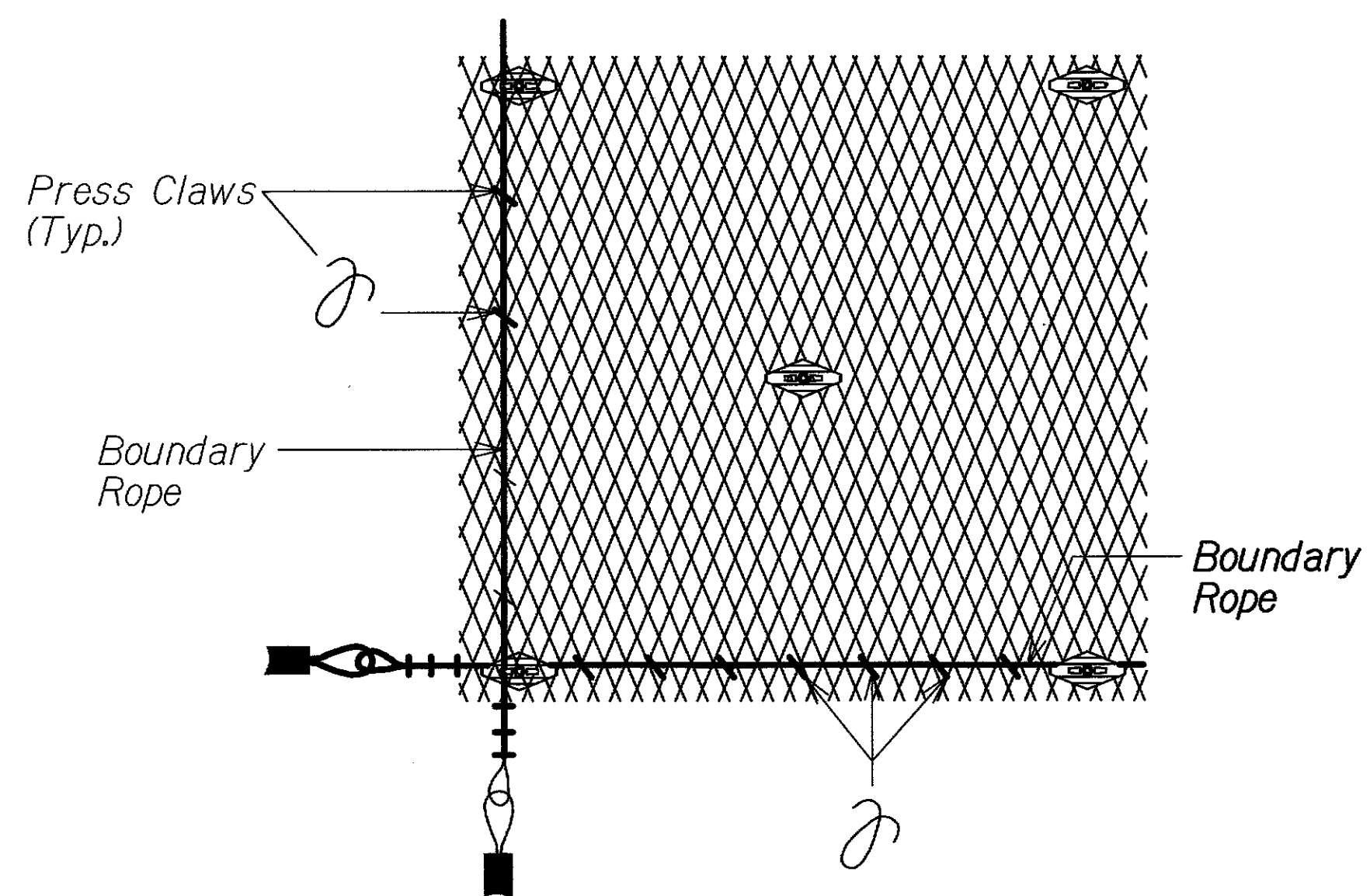
Vicinity of Lumahai
Project No. 560A-02-12

Scale: None Date: Oct. 17, 2011

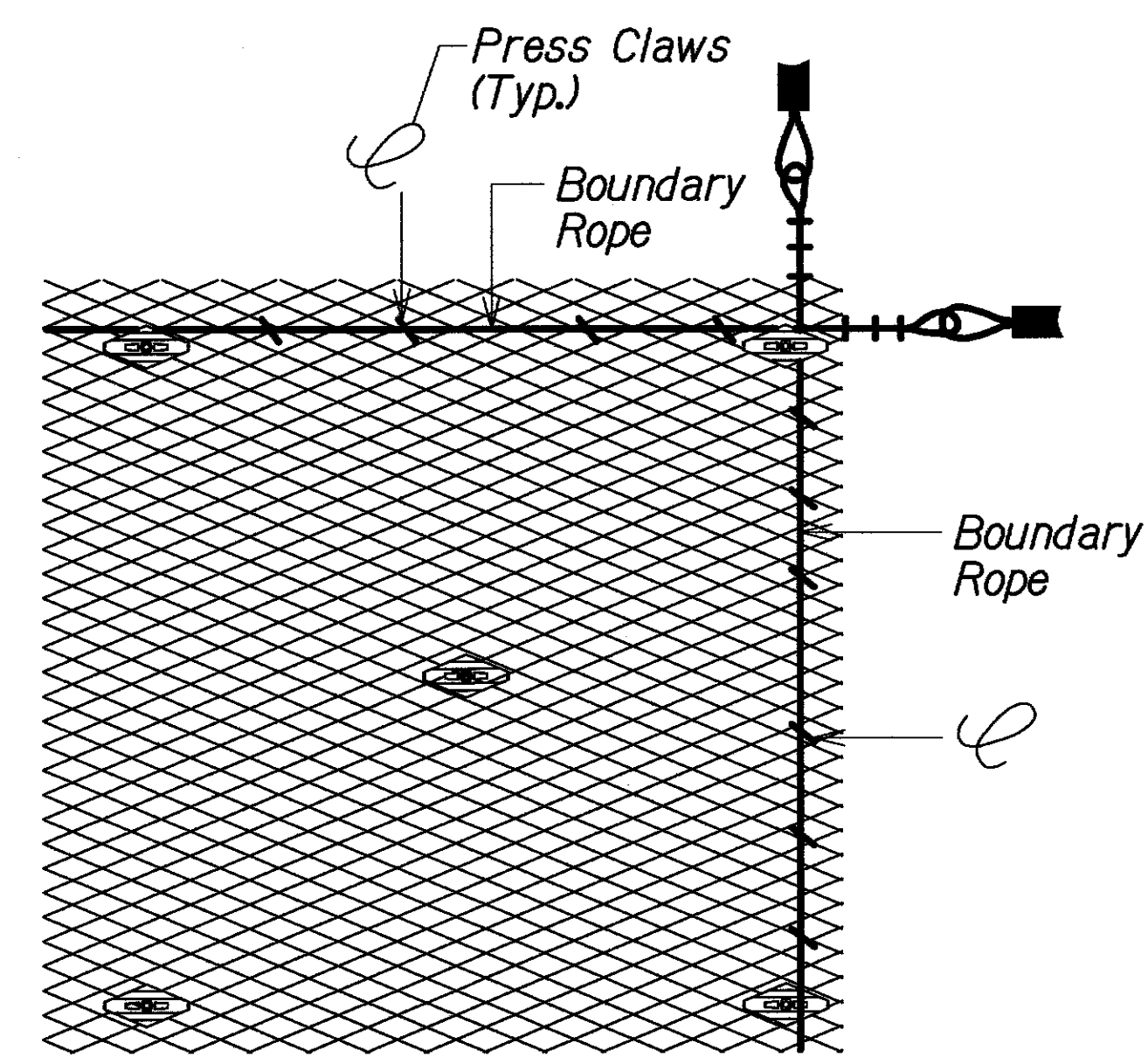
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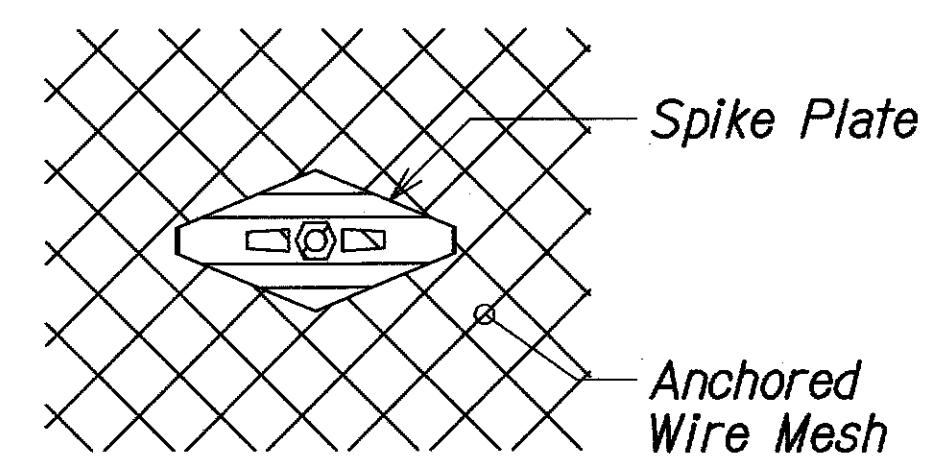
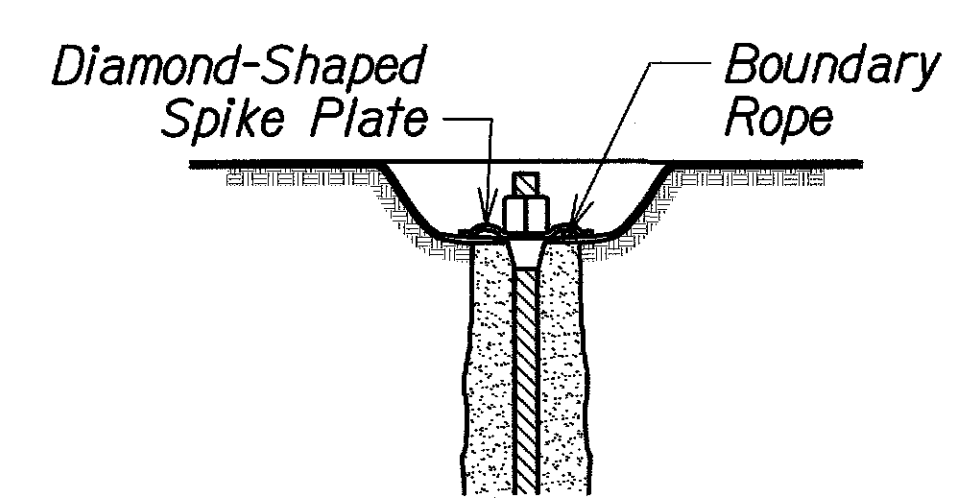
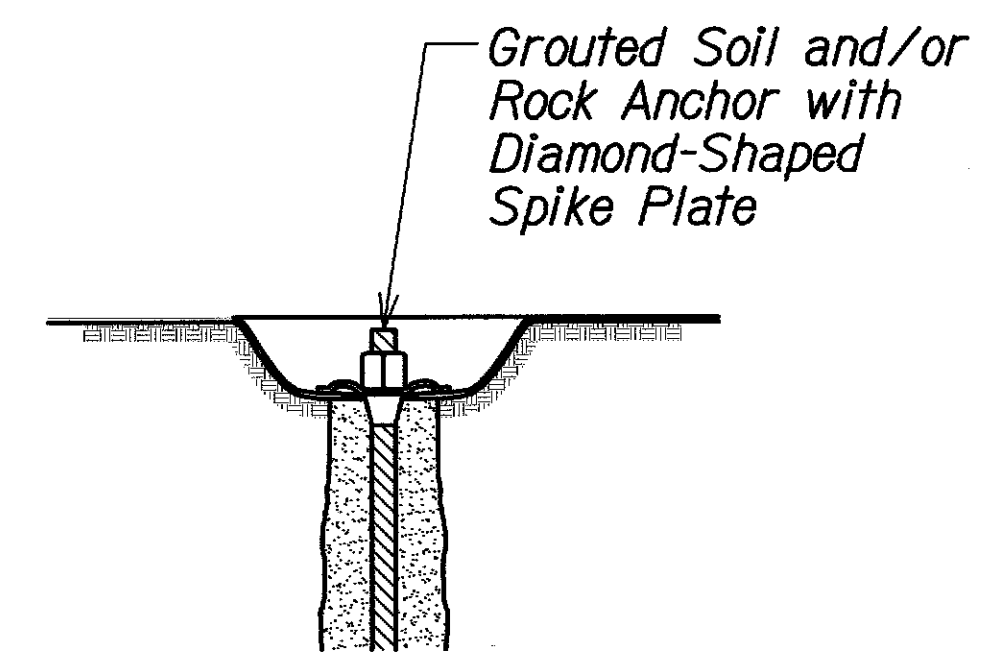
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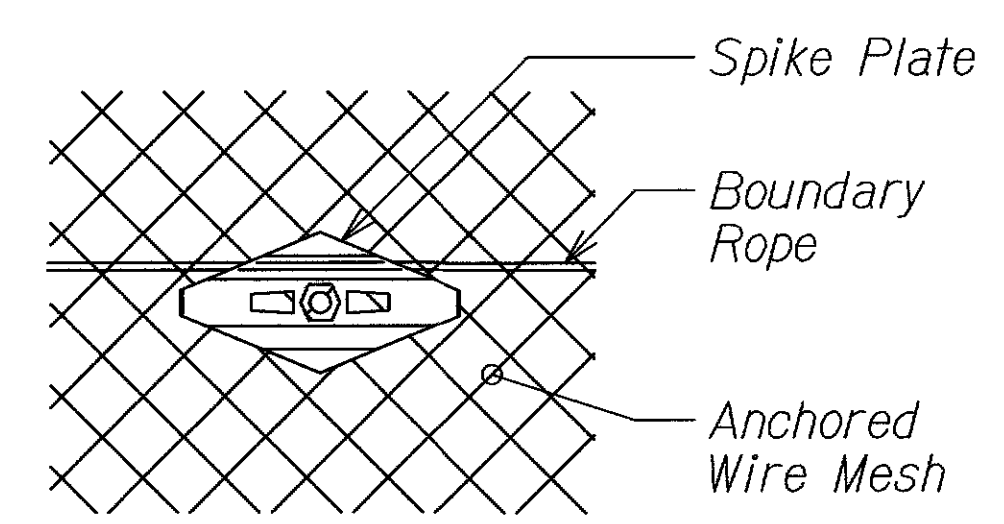
BOUNDARY ROPE AT THE BOTTOM AND SIDE OF ANCHORED WIRE MESH SYSTEM



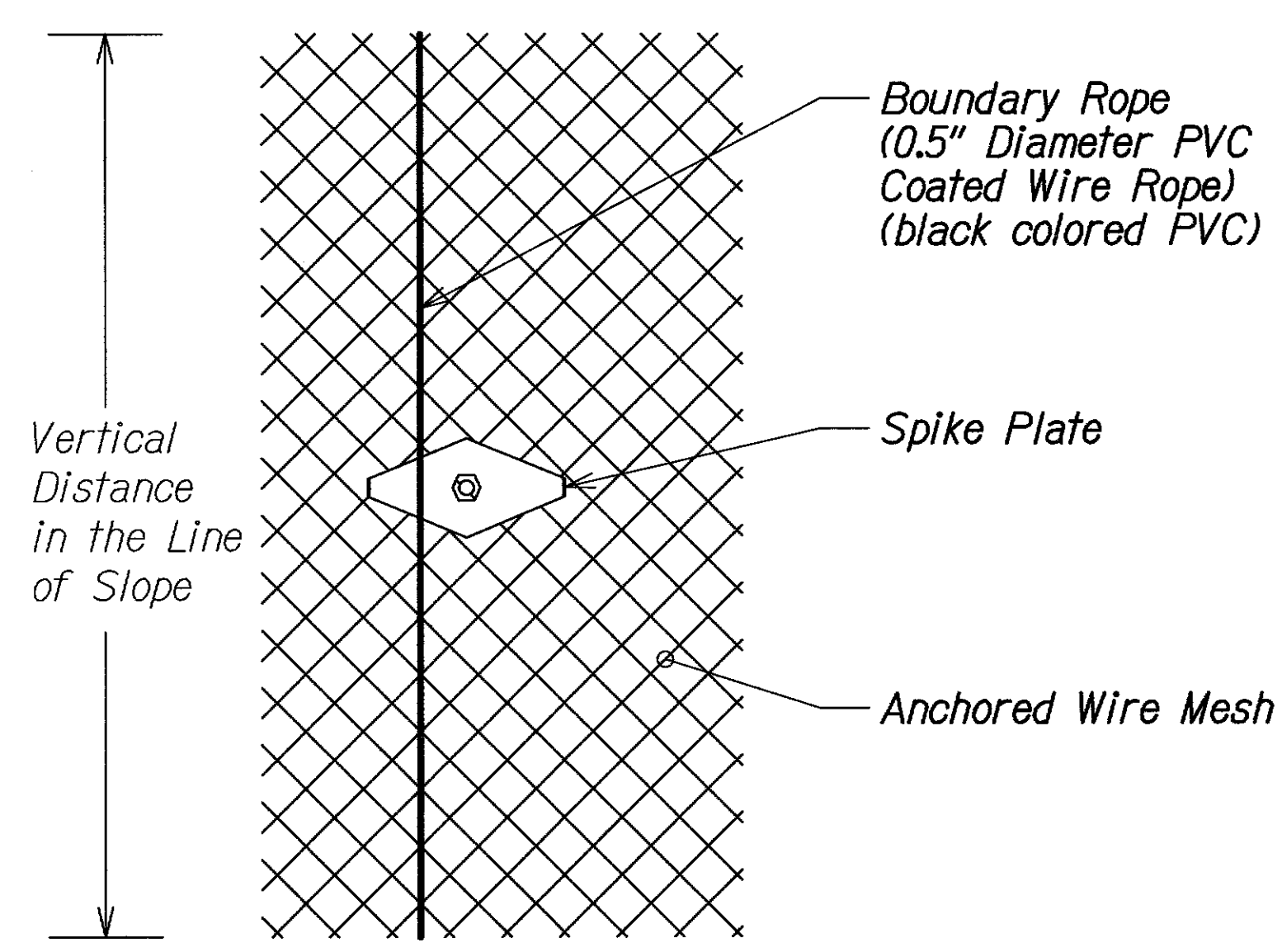
BOUNDARY ROPE AT THE TOP AND SIDE OF ANCHORED WIRE MESH SYSTEM



GROUTED SOIL AND/OR ROCK ANCHOR AND SPIKE PLATE



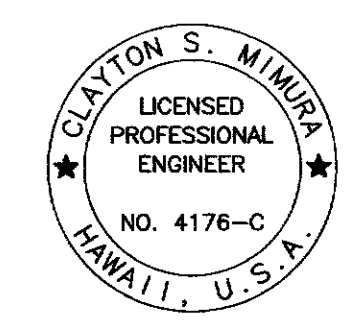
GROUTED SOIL AND/OR ROCK ANCHOR AND SPIKE PLATE WITH HORIZONTAL BOUNDARY ROPE



GROUTED SOIL AND/OR ROCK ANCHOR AND SPIKE PLATE WITH VERTICAL BOUNDARY ROPE

ORIGINAL PLAN	DATE
DESIGNED BY	
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NOTED BY	
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DRAWING NAME: Z:\00 ONGOING\10-031-KUHIO HWY EMER SLOPE REPAIRS LUMAHAI CAD\07-05-13 ASE\33-5205 DWG PLOT TIME: 07-02-13, 10:33 AM



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STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION
ANCHORED WIRE MESH SYSTEM
BOUNDARY ROPE DETAILS
 KUHIO HIGHWAY EMERGENCY SLOPE REPAIRS
 Vicinity of Lumahai
 Project No. 560A-02-12
 Scale: None Date: Oct. 17, 2011
 SHEET No. S25 OF 5 SHEETS