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VX160-H6 DEBRIS FLOW NETS
SVX 180-H6 DEBRIS FLOW NETS ALL COMPONENTS FROM GEOBRUGG (AG)
REINFORCING STEEL: ASTM A-615 - GRADE 60
GROUND ANCHORS: 1-1/8" OR 1-1/4" DIA. 6x19 IWRC WIRE ROPE ANCHORS

CEMENTITIOUS
CEMENT: ASTM C-150, TYPE II / V
ANCHOR GROUT NEAT WATER/CEMENT GROUT 0.45 W/C RATIO F'C (28 DAY) = 4000PSI MIN.

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GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM VX TYPE: VX160-H6, DRAWING NO. GD-1004.2E.
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM UX TYPE: UX180-H6, DRAWING NO. GD-1008.1E. (AS APPLICABLE)
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM UX TYPE: UX180-H6, DRAWING NO. GD-1008.2E. (AS APPLICABLE)
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM UX TYPE: UX180-H6, DRAWING NO. GD-1008.3E. (AS APPLICABLE)
GEOBRUGG AG (2015). DEBRIS FLOW PROTECTION SYSTEM ABRASION PLATE, DRAWING NO. GA-8055.

EXCEPT AS MODIFIED BY THESE PLANS

GROUND ANCHOR INSTALLATION

DRILLING:
HOLES SHALL BE DRILLED TO THE DIAMETER, DEPTH AND LINE AS INDICATED ON THE DRAWINGS. THE HOLE SHALL BE DRILLED SO THAT ITS DIAMETER IS NOT MORE THAN 1/4 INCH SMALLER THAN THE SPECIFIED DIAMETER. HOLES SHALL BE DRILLED AT AN INCLINATION AS SHOWN ON THESE DRAWING. TOLERANCES FOR DRILL HOLE LOCATION SHALL BE +ONE FOOT FOR HORIZONTAL AND VERTICAL POSITION AND WITHIN 2.5 DEGREES OF THE SPECIFIED ANCHOR GRADIENT UNLESS OTHERWISE APPROVED BY THE ENGINEER

HOLES SHALL BE CLEANED TO REMOVE MATERIAL RESULTING FROM DRILLING OPERATIONS.

ANCHOR TENDONS SHALL BE INSTALLED IN DRILLED HOLES IN AN EXPEDITIOUS MANNER SO THAT CAVING OR DETERIORATION OF THE DRILLED HOLES DOES NOT OCCUR.

WHERE THE ANCHOR TENDON CANNOT BE COMPLETELY INSERTED, THE CONTRACTOR SHALL REMOVE THE TENDON AND CLEAN OR RE-DRILL THE HOLE TO PERMIT UNOBSTRUCTED INSTALLATION. PARTIALLY INSTALLED TENDONS SHALL NOT BE DRIVEN OR FORCED INTO THE DRILLED HOLE AND WILL BE REJECTED. WHEN OPEN-HOLE DRILLING METHODS ARE BEING USED, THE CONTRACTOR SHALL HAVE HOLE CLEANING TOOLS ON SITE SUITABLE FOR CLEANING DRILLED HOLES ALONG THEIR FULL LENGTH JUST PRIOR TO TENDON INSERTION AND GROUTING.

THE LENGTH OF DRILLED HOLE SHALL BE VERIFIED AND RECORDED BY THE DEPUTY INSPECTOR BEFORE GROUTING.

CENTRALIZERS SHALL BE USED DURING INSTALLATION TO SUPPORT THE TENDON IN THE DRILLED HOLE.

PRIOR TO PLACEMENT, TENDONS SHALL BE FREE OF DIRT, DETRIMENTAL RUST OR ANY OTHER DELETERIOUS SUBSTANCES. DRILLED HOLES SHALL BE CLEARED OF ANY LOOSE ROCK FRAGMENTS, SOIL OR OTHER SUBSTANCES WHICH MAY PREVENT THE PROPER PLACEMENT OF THE TENDON OR GROUT.

TENDONS SHALL BE SECURELY FASTENED IN PLACE TO PREVENT MOVEMENT DURING GROUTING AND TO ASSURE THAT THE TENDON IS CENTRALLY LOCATED IN THE DRILL HOLE. THE DRILLED HOLE SHALL BE FILLED WITH GROUT FREE OF VOIDS OR INCLUSION OF FOREIGN MATERIAL. THE CONTRACTOR SHALL COMPLETELY GROUT THE DRILLED HOLE IN ONE CONTINUOUS OPERATION. COLD JOINTS SHALL NOT BE USED IN GROUT PLACEMENT.

TENDONS SHALL BE INSTALLED AND GROUTED IN THE SAME WORK SHIFT AS THE DRILLING OPERATION.

AFTER GROUTING, THE TENDON SHALL REMAIN UNDISTURBED FOR A MINIMUM OF 72 HRS.

GROUND ANCHOR PROOF TESTING

UNLESS OTHERWISE DIRECTED BY THE ENGINEER, NO PROOF TESTING OF PRODUCTION GROUND ANCHORS IS ANTICIPATED AT THE NET LOCATION

DEBRIS NET MAINTENANCE

ON-GOING INSPECTION AND MAINTENANCE OF THE DEBRIS NET IS NECESSARY TO ENSURE THAT THE SYSTEM IS NOT DEGRADED BY IMPACT DAMAGE, CORROSION OR OTHER FACTOR. IT IS RECOMMENDED THAT THE SYSTEM BE INSPECTED AT A MINIMUM OF ONCE PER YEAR.

FOLLOWING ANY EVENT RESULTING IN THE ACCUMULATION OF DEBRIS IN THE NET THEN THE NET SHOULD BE CLEANED OUT AND ANY DAMAGED OR DEFORMED PARTS REPLACED.

ALL REMOVAL AND MAINTENANCE WORK SHALL BE DONE IN ACCORDANCE WITH ALL PROJECT AGREEMENTS REGARDING ACCESS AND DEBRIS DISPOSAL.

OWNER

SDF RESILIENCE INC
A CALIFORNIA PUBLIC BENEFIT CORPORATION
1470 EAST VALLEY ROAD
SUITE T, MONTECITO, CA 93108
TEL: (805) 689-6324

CONTRACTOR

ACCESS LIMITED CONSTRUCTION
1102 PIKE LANE
OCEANO, CA 93445
TEL: (805)592-2230

DISCLAIMER

THE VOLUME AND FORCE OF MATERIALS THAT MAY IMPACT THE DEBRIS FLOW NETS IN A RAINFALL EVENT IS UNPREDICTABLE AND SUBJECT TO SUCH FACTORS AS THE AMOUNT OF RAINFALL, THE CONDITION OF THE SOILS AND THE EXTENT OF VEGETATION UPSTREAM FOR THE NETS AT THE TIME OF THE EVENT. THE NET SIZES AND LOCATIONS HAVE BEEN DETERMINED USING SOUND ENGINEERING JUDGMENT IN ACCORDANCE WITH THE STANDARD OF PRACTICE AND ARE INTENDED TO REDUCE THE RISKS OF INJURY AND LOSS OF PROPERTY DOWNSTREAM FOR THE NETS. NO GUARANTEE OF THE THE SAFETY OF INDIVIDUALS AND PROPERTY DOWNSTREAM FROM THE NETS IS PROVIDED.

DRS Engineering Inc.
3564 SAGUNTO ST. BOX 486
SANTA YNEZ CA 93460
TEL: (818) 402-3962
FAX: (818) 276-1922
WWW.DRS-ENGINEERING.NET
DRS@DRS-ENGINEERING.NET

MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: CS-18
CONSTRUCTION NOTES

REGISTERED PROFESSIONAL ENGINEER
C 69911
Exp. 9.30.20
CIVIL
STATE OF CALIFORNIA

REV.	DESCRIPTION	DATE

PROJECT 2019-15

DATE	04-03-2019
DRAWN	ODO
CHECKED	DRS
SCALE	NOT TO SCALE
SHEET No.	SH-1.0

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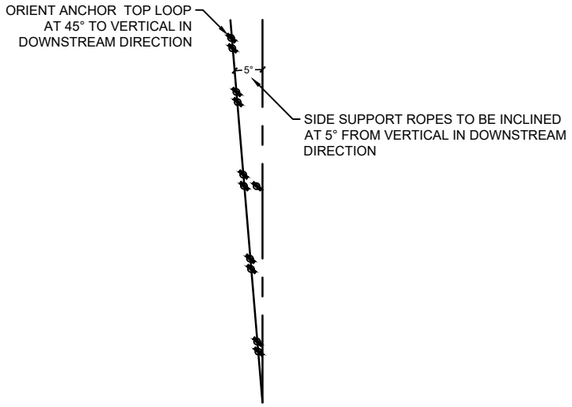
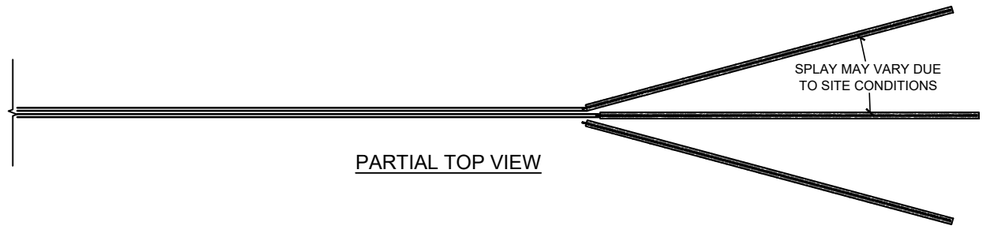
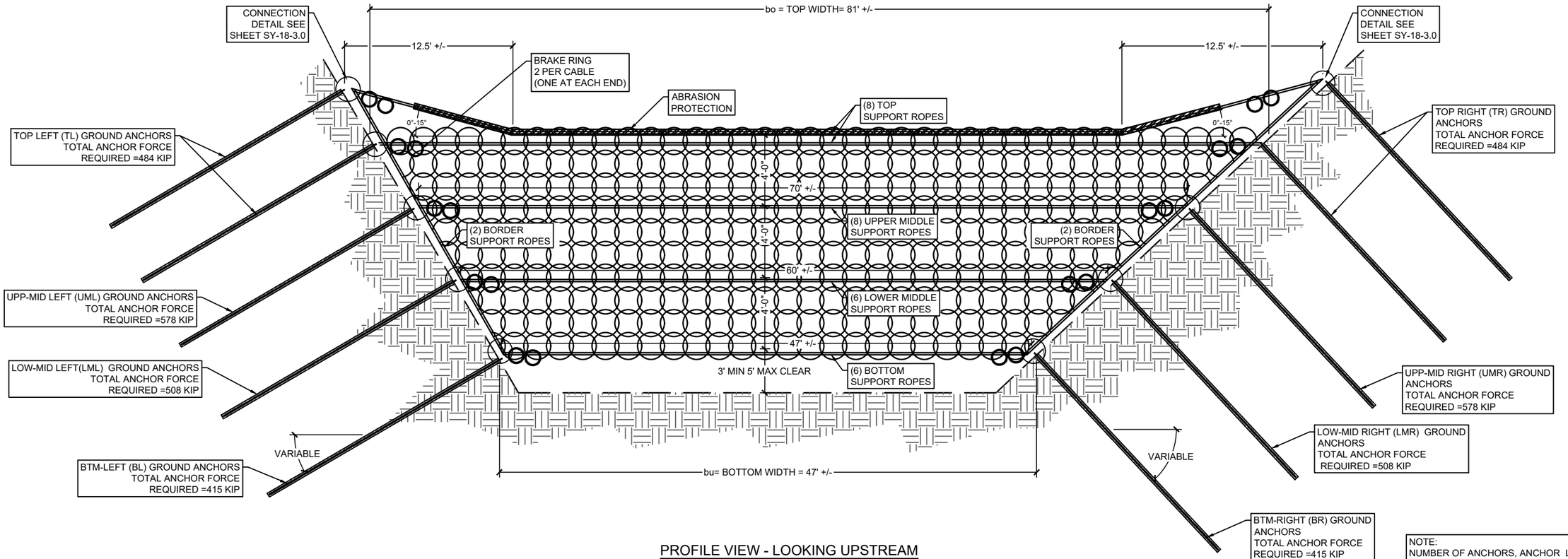


SIDE VIEW



PARTIAL TOP VIEW



PROFILE VIEW - LOOKING UPSTREAM

NOTE:
NUMBER OF ANCHORS, ANCHOR LENGTHS, DIAMETERS & DESIGN LOADS TO BE DETERMINED AFTER VERIFICATION TESTING.

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MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
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NET LAYOUT

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Exp. 9.30.20
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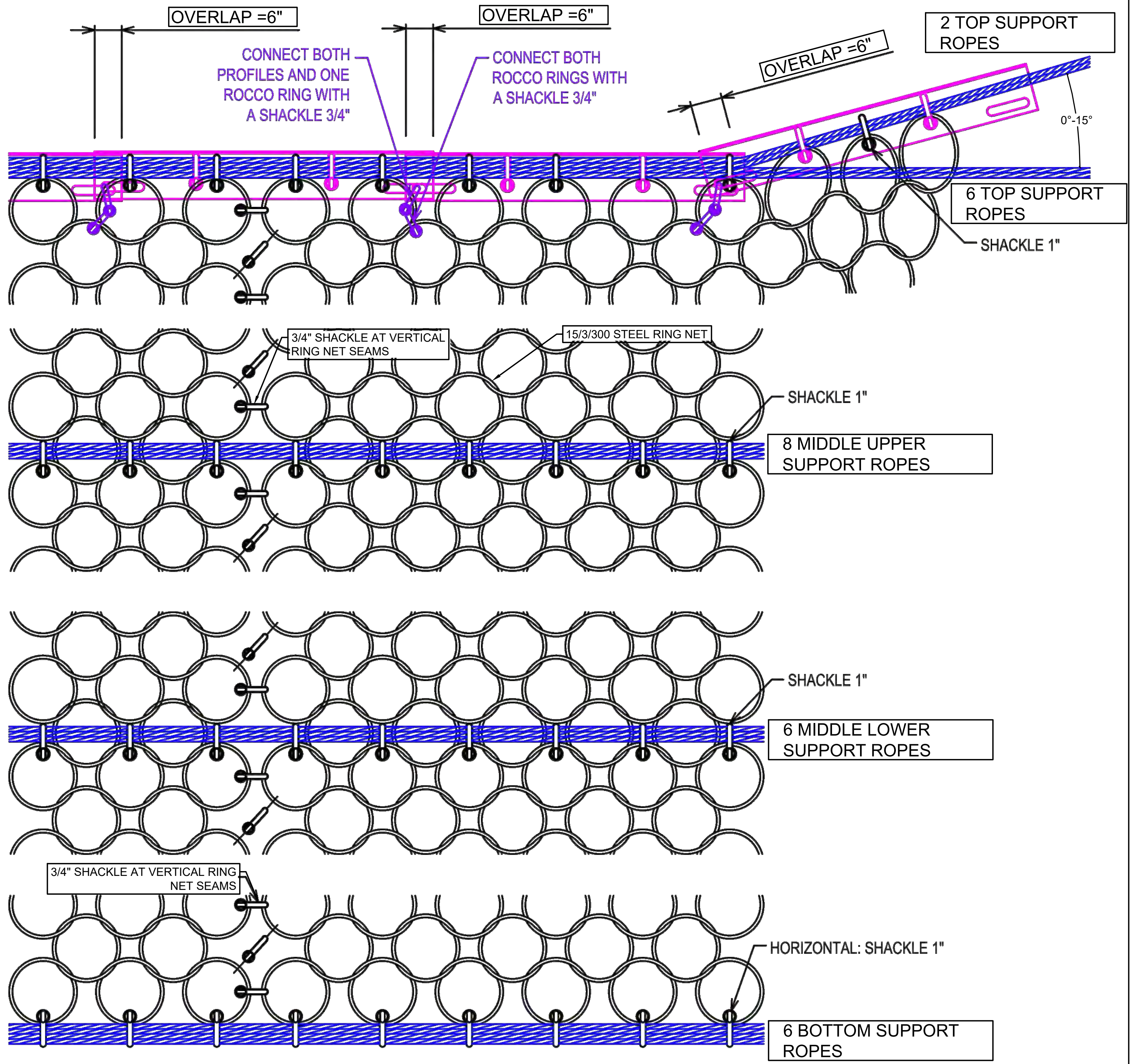
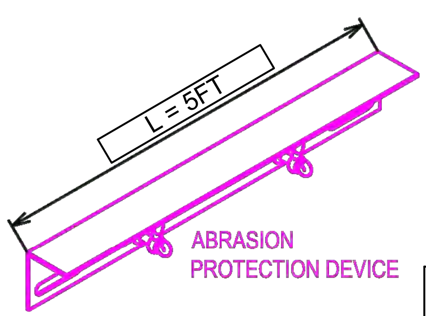
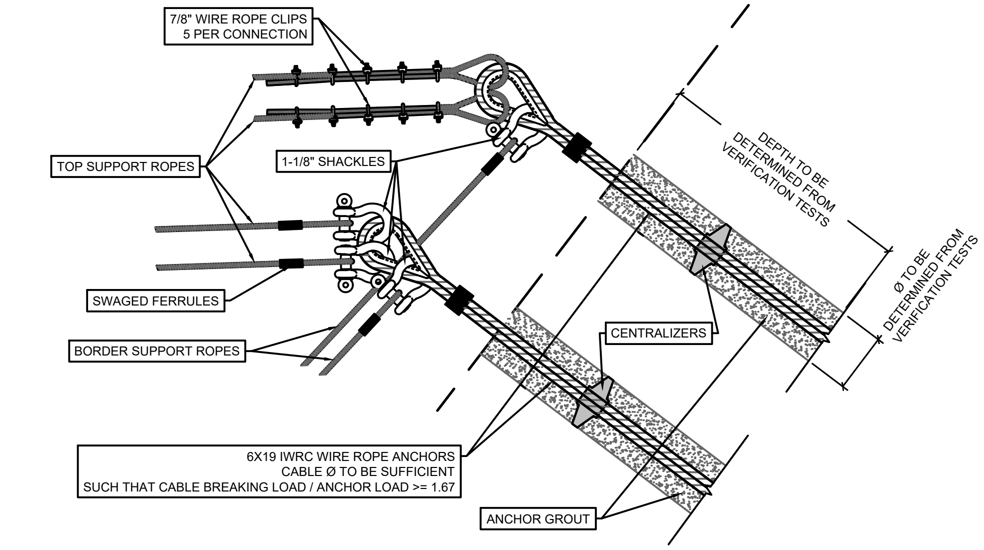


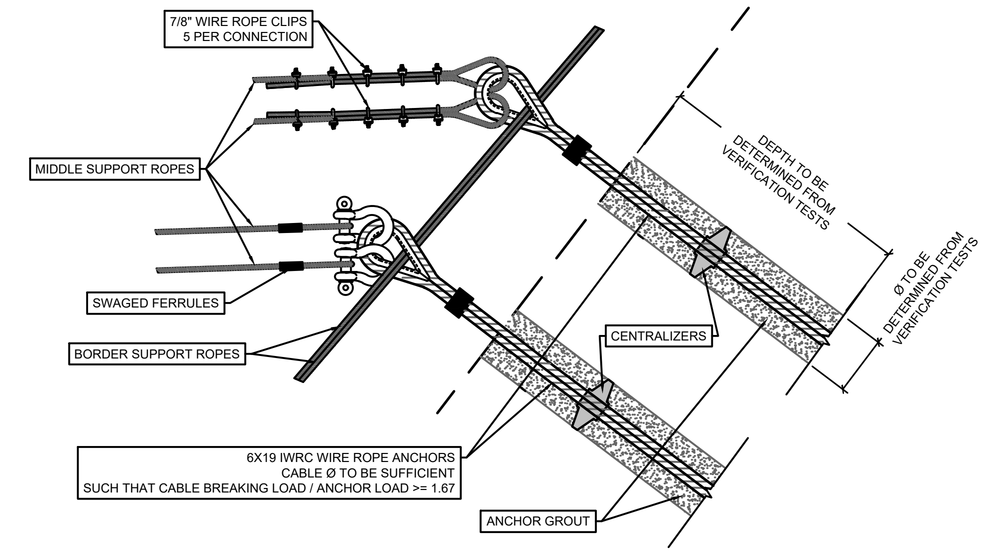


NOTE:
All SUPPORT ROPES AND BORDER ROPES TO BE 7/8" Ø IWRC
ALL BRAKE RINGS TO BE GN-9017 BRAKE RINGS

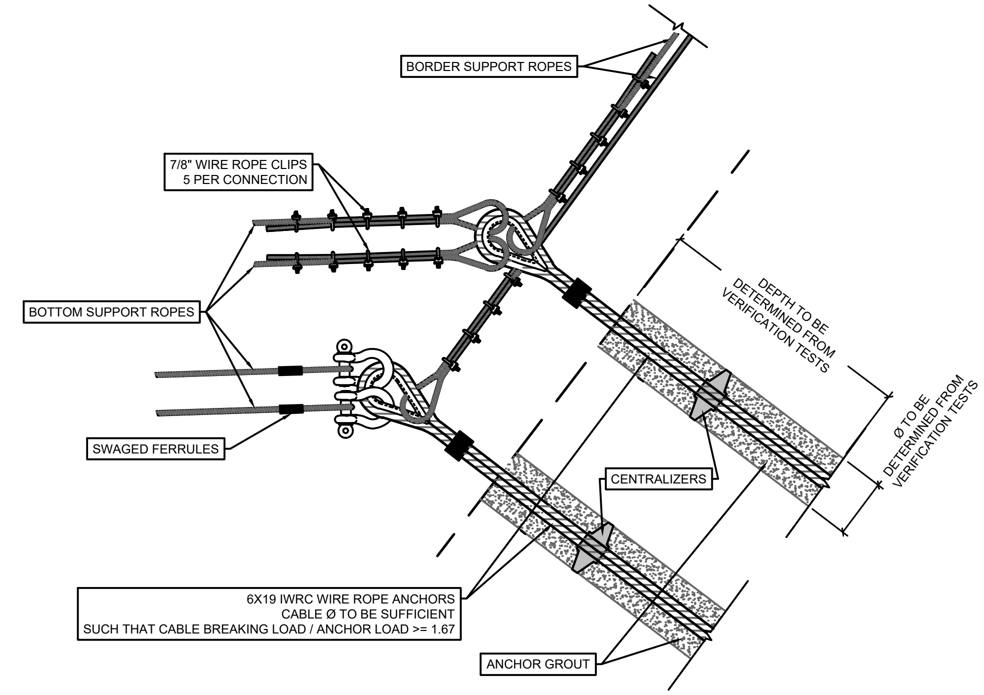
NOTE: ONLY TOP SUPPORT ROPES TO BE SHACKLED TO THE ABRASION DEVICE



TOP SUPPORT ROPE/ANCHOR CONNECTIONS



MIDDLE SUPPORT ROPE/ANCHOR CONNECTIONS



BOTTOM SUPPORT ROPE/ANCHOR CONNECTIONS

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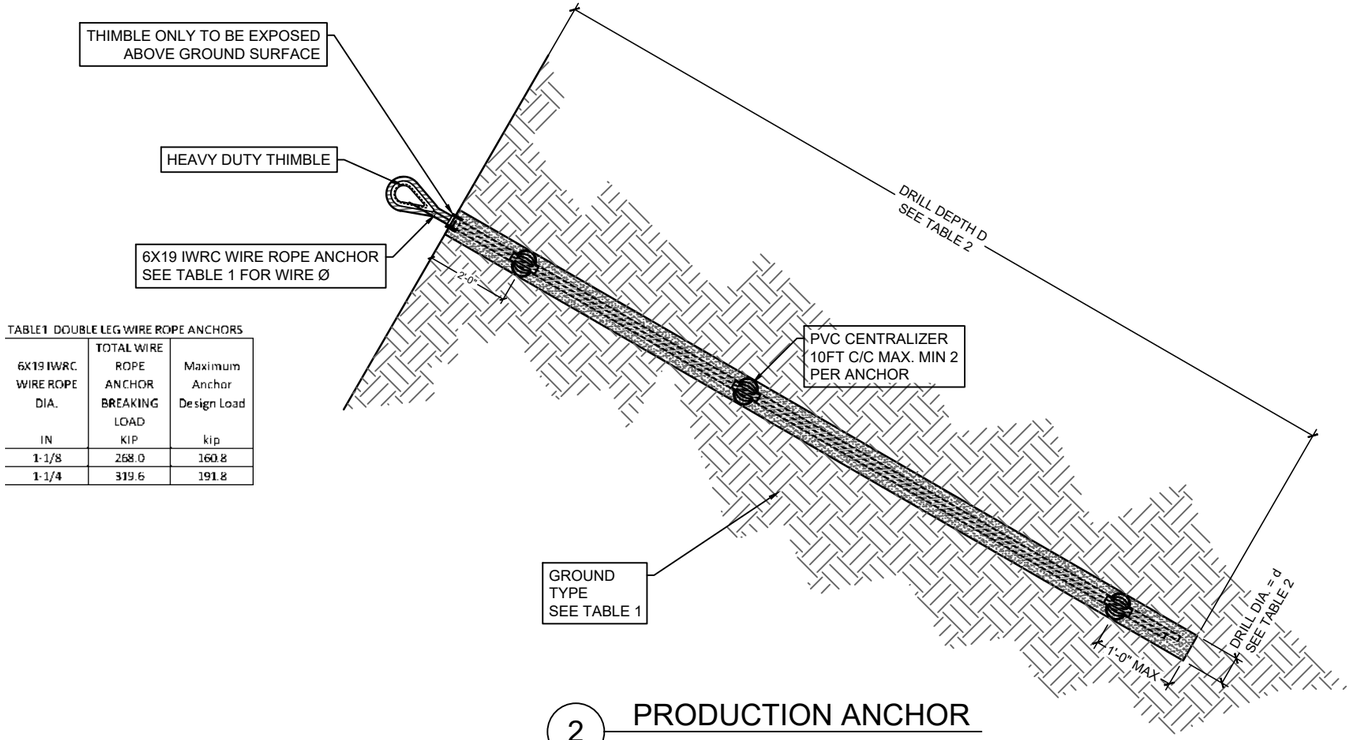

2 PRODUCTION ANCHOR

TABLE1 DOUBLE LEG WIRE ROPE ANCHORS

6X19 IWRC WIRE ROPE DIA. IN	TOTAL WIRE ROPE ANCHOR BREAKING LOAD KIP	Maximum Anchor Design Load kip
1-1/8	268.0	160.8
1-1/4	319.6	191.8

Trsnd = Allowable Load transfer rate in Sandstone (8kips/ft)
Trmixed = Allowable Load transfer rate in Mixed Soil and boulders (5 kips/ft)
P = Required Anchor Capacity

Table 2

Soil Type	Hole dia. in	Required Capacity kip	Drill Depth Required ft
Mixed Soil and Rock only	4.5	P	(P/5)+3
Sandstone only	4.5	P	(P/8)+1
Mixed Soil and Rock over Sandstone	4.5	P	((3*Dm) + P +23) / 8

Where Dm = Drill depth in mixed soil and rock

Table 3 CS-18 - Anchor Loads and Expected Quantities

Anchor Location	TL Total Anchor Load Reqd. kip	Expected No. Anchors	Average Design Load Each Anchor kip	Min. Anchor Size
Top Left	484	4	121	1-1/4" Double Leg
Top Right	484	4	121	1 1/4" Double Leg
Upper Middle Left	578	4	145	1-1/4" Double Leg
Upper Middle Right	578	4	145	1-1/4" Double Leg
Lower Middle Left	508	3	169	1-1/4" Double Leg
Lower Middle Right	508	3	169	1-1/4" Double Leg
Bottom Left	415	3	138	1-1/4" Double Leg
Bottom Right	415	3	138	1-1/4" Double Leg
Total No Anchors		28		

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REG. C 69911 Exp. 9.30.20 CIVIL STATE OF CALIFORNIA

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GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM VX TYPE: VX160-H6, DRAWING NO. GD-1004.1E.
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM VX TYPE: VX160-H6, DRAWING NO. GD-1004.2E.
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GEOBRUGG AG (2015). DEBRIS FLOW PROTECTION SYSTEM ABRASION PLATE, DRAWING NO. GA-8055.

EXCEPT AS MODIFIED BY THESE PLANS

GROUND ANCHOR INSTALLATION

DRILLING:
HOLES SHALL BE DRILLED TO THE DIAMETER, DEPTH AND LINE AS INDICATED ON THE DRAWINGS. THE HOLE SHALL BE DRILLED SO THAT ITS DIAMETER IS NOT MORE THAN 1/4 INCH SMALLER THAN THE SPECIFIED DIAMETER. HOLES SHALL BE DRILLED AT AN INCLINATION AS SHOWN ON THESE DRAWING. TOLERANCES FOR DRILL HOLE LOCATION SHALL BE +ONE FOOT FOR HORIZONTAL AND VERTICAL POSITION AND WITHIN 2.5 DEGREES OF THE SPECIFIED ANCHOR GRADIENT UNLESS OTHERWISE APPROVED BY THE ENGINEER

HOLES SHALL BE CLEANED TO REMOVE MATERIAL RESULTING FROM DRILLING OPERATIONS.

ANCHOR TENDONS SHALL BE INSTALLED IN DRILLED HOLES IN AN EXPEDITIOUS MANNER SO THAT CAVING OR DETERIORATION OF THE DRILLED HOLES DOES NOT OCCUR.

WHERE THE ANCHOR TENDON CANNOT BE COMPLETELY INSERTED, THE CONTRACTOR SHALL REMOVE THE TENDON AND CLEAN OR RE-DRILL THE HOLE TO PERMIT UNOBSTRUCTED INSTALLATION. PARTIALLY INSTALLED TENDONS SHALL NOT BE DRIVEN OR FORCED INTO THE DRILLED HOLE AND WILL BE REJECTED. WHEN OPEN-HOLE DRILLING METHODS ARE BEING USED, THE CONTRACTOR SHALL HAVE HOLE CLEANING TOOLS ON SITE SUITABLE FOR CLEANING DRILLED HOLES ALONG THEIR FULL LENGTH JUST PRIOR TO TENDON INSERTION AND GROUTING.

THE LENGTH OF DRILLED HOLE SHALL BE VERIFIED AND RECORDED BY THE DEPUTY INSPECTOR BEFORE GROUTING.

CENTRALIZERS SHALL BE USED DURING INSTALLATION TO SUPPORT THE TENDON IN THE DRILLED HOLE.

PRIOR TO PLACEMENT, TENDONS SHALL BE FREE OF DIRT, DETRIMENTAL RUST OR ANY OTHER DELETERIOUS SUBSTANCES. DRILLED HOLES SHALL BE CLEARED OF ANY LOOSE ROCK FRAGMENTS, SOIL OR OTHER SUBSTANCES WHICH MAY PREVENT THE PROPER PLACEMENT OF THE TENDON OR GROUT.

TENDONS SHALL BE SECURELY FASTENED IN PLACE TO PREVENT MOVEMENT DURING GROUTING AND TO ASSURE THAT THE TENDON IS CENTRALLY LOCATED IN THE DRILL HOLE. THE DRILLED HOLE SHALL BE FILLED WITH GROUT FREE OF VOIDS OR INCLUSION OF FOREIGN MATERIAL. THE CONTRACTOR SHALL COMPLETELY GROUT THE DRILLED HOLE IN ONE CONTINUOUS OPERATION. COLD JOINTS SHALL NOT BE USED IN GROUT PLACEMENT.

TENDONS SHALL BE INSTALLED AND GROUTED IN THE SAME WORK SHIFT AS THE DRILLING OPERATION.

AFTER GROUTING, THE TENDON SHALL REMAIN UNDISTURBED FOR A MINIMUM OF 72 HRS.

GROUND ANCHOR PROOF TESTING

UNLESS OTHERWISE DIRECTED BY THE ENGINEER, NO PROOF TESTING OF PRODUCTION GROUND ANCHORS IS ANTICIPATED AT THE NET LOCATION

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ON-GOING INSPECTION AND MAINTENANCE OF THE DEBRIS NET IS NECESSARY TO ENSURE THAT THE SYSTEM IS NOT DEGRADED BY IMPACT DAMAGE, CORROSION OR OTHER FACTOR. IT IS RECOMMENDED THAT THE SYSTEM BE INSPECTED AT A MINIMUM OF ONCE PER YEAR.

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OWNER

SDF RESILIENCE INC
A CALIFORNIA PUBLIC BENEFIT CORPORATION
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DRS Engineering Inc.
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SANTA YNEZ CA 93460
TEL: (818) 402-3962
FAX: (818) 276-1922
WWW.DRS-ENGINEERING.NET
DRS@DRS-ENGINEERING.NET

MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: SY-7A
CONSTRUCTION NOTES

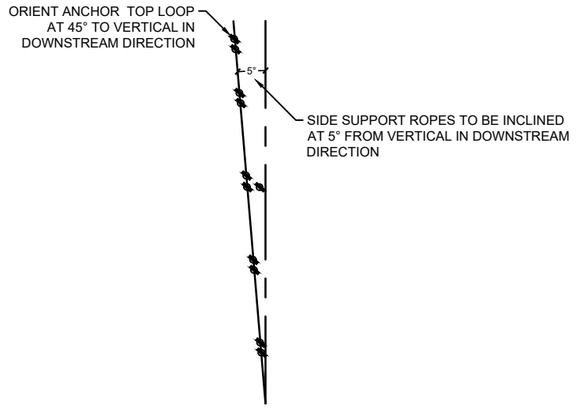
REGISTERED PROFESSIONAL ENGINEER
C 69911
Exp. 9.30.20
CIVIL
STATE OF CALIFORNIA

REV.	DESCRIPTION	DATE

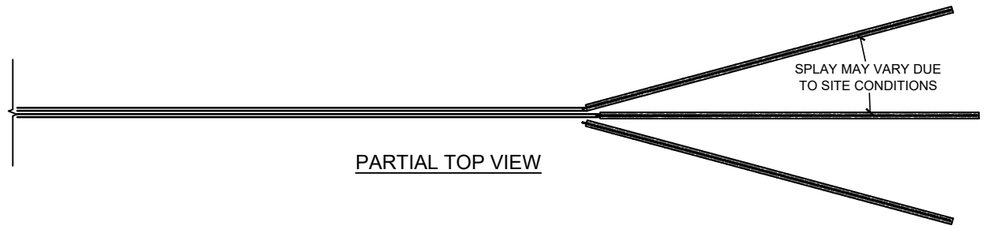
PROJECT 2019-15

DATE	04-03-2019
DRAWN	ODO
CHECKED	DRS
SCALE	NOT TO SCALE
SHEET No.	SH-1.0

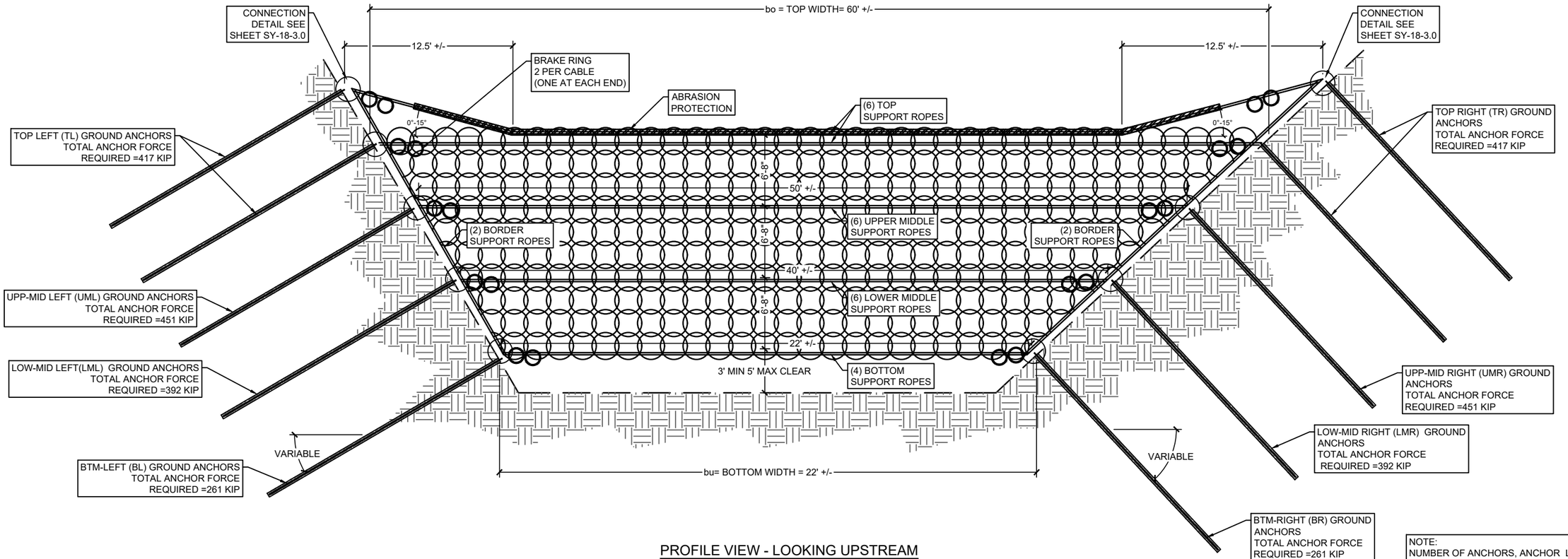
DRS Engineering Inc. 3564 SAGUNTO ST. BOX 486, SANTA YNEZ CA 93460 TEL: (818) 402-3962 FAX: (818) 276-1922 WWW.DRS-ENGINEERING.NET DRS@DRS-ENGINEERING.NET



SIDE VIEW



PARTIAL TOP VIEW



PROFILE VIEW - LOOKING UPSTREAM

NOTE:
NUMBER OF ANCHORS, ANCHOR LENGTHS, DIAMETERS & DESIGN LOADS TO BE DETERMINED AFTER VERIFICATION TESTING.

DRS Engineering Inc. 3564 SAGUNTO ST. BOX 486, SANTA YNEZ CA 93460 TEL: (818) 402-3962 FAX: (818) 276-1922 WWW.DRS-ENGINEERING.NET DRS@DRS-ENGINEERING.NET

DRS
Engineering Inc.
3564 SAGUNTO ST. BOX 486
SANTA YNEZ CA 93460
TEL: (818) 402-3962
FAX: (818) 276-1922
WWW.DRS-ENGINEERING.NET
DRS@DRS-ENGINEERING.NET

MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: SY-7A
NET LAYOUT

REGISTERED PROFESSIONAL ENGINEER
RICHARD D. SIMMONS
C 69911
Exp. 9.30.20
CIVIL
STATE OF CALIFORNIA

REV.	DESCRIPTION	DATE
		04-03-2019

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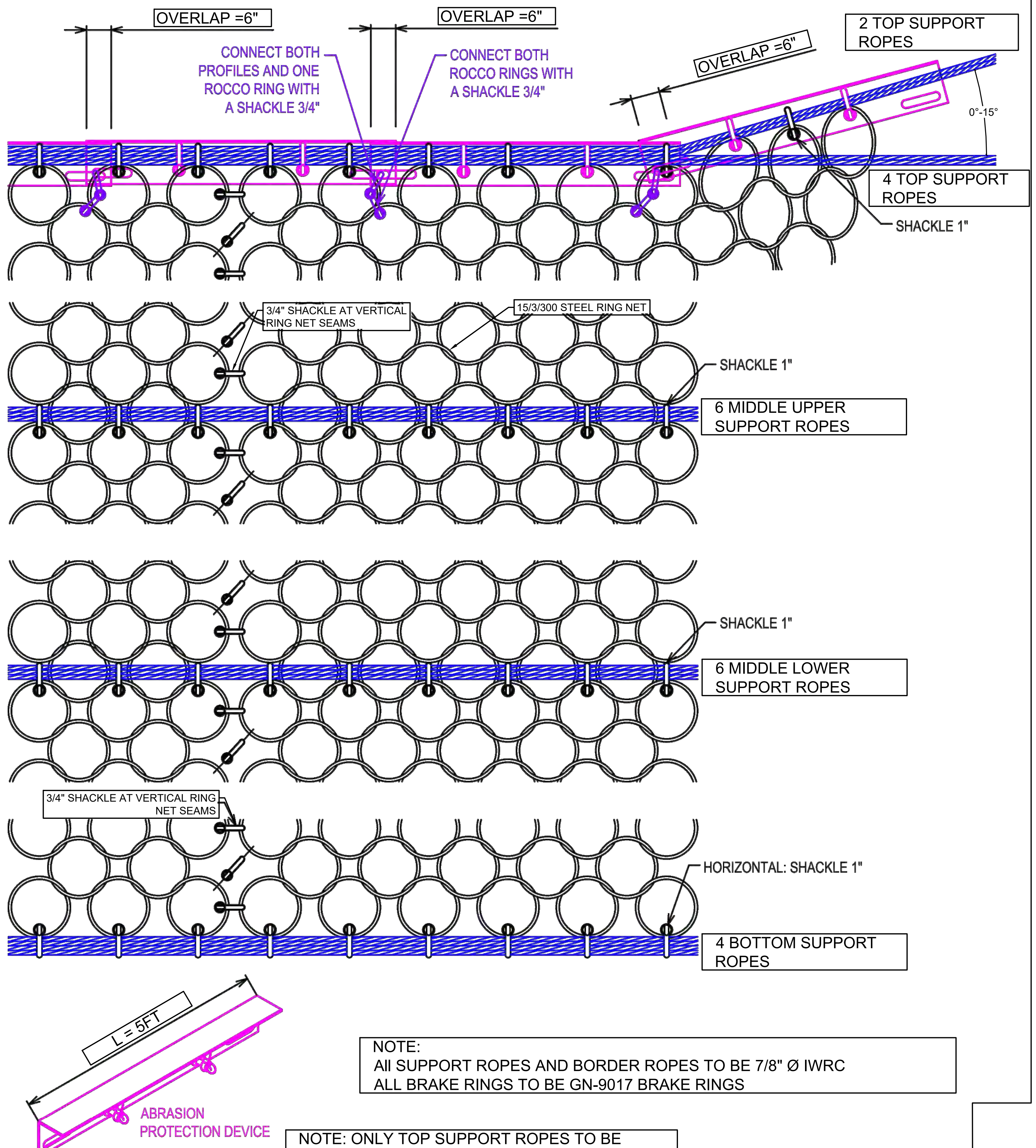
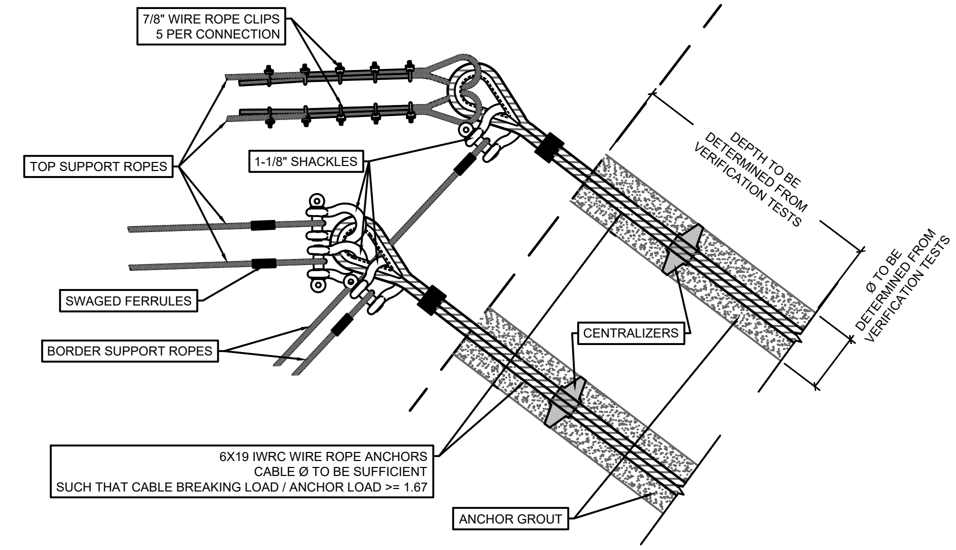
SHEET No. SH-2.0
PROJECT 2019-15

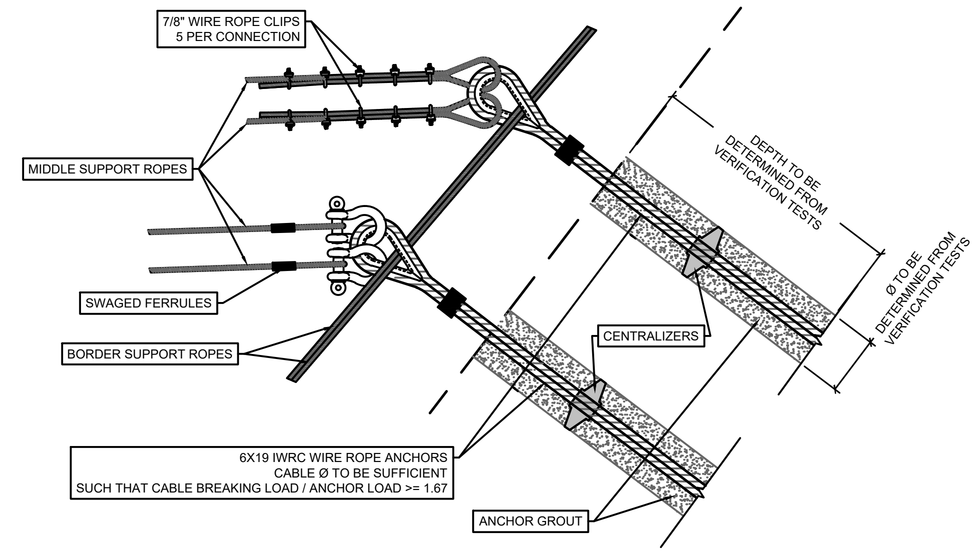


NOTE:
All SUPPORT ROPES AND BORDER ROPES TO BE 7/8" Ø IWRC
ALL BRAKE RINGS TO BE GN-9017 BRAKE RINGS

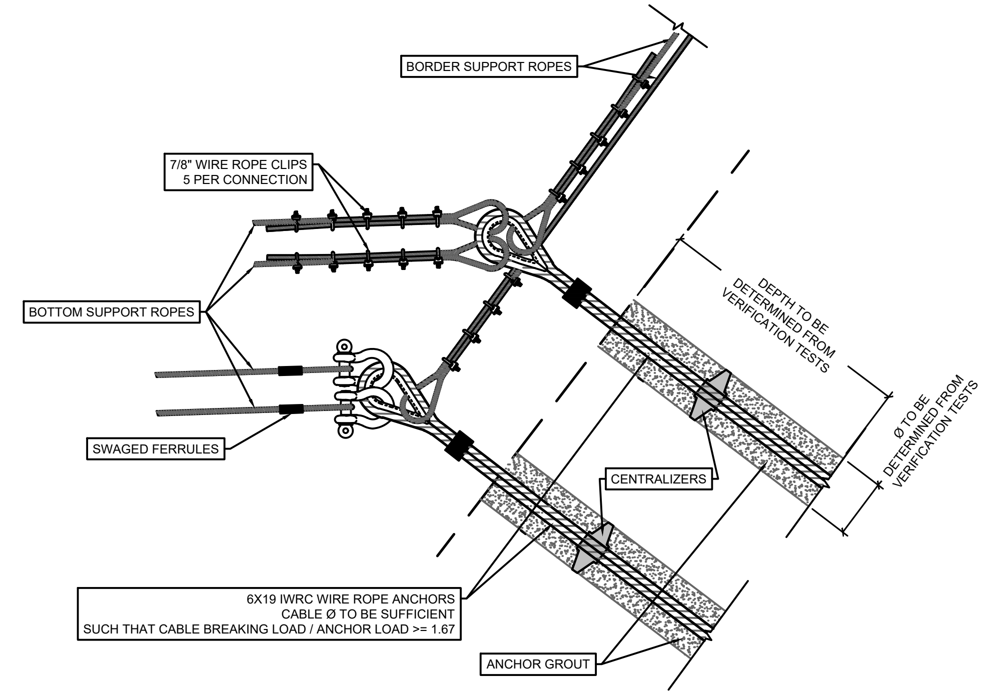
NOTE: ONLY TOP SUPPORT ROPES TO BE SHACKLED TO THE ABRASION DEVICE



TOP SUPPORT ROPE/ANCHOR CONNECTIONS



MIDDLE SUPPORT ROPE/ANCHOR CONNECTIONS



BOTTOM SUPPORT ROPE/ANCHOR CONNECTIONS

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TEL: (818) 402-3962
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DRS@DRS-ENGINEERING.NET

MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: SY-7A
NET DETAILS

REGISTERED PROFESSIONAL ENGINEER
C 69911
Exp. 9.30.20
CIVIL
STATE OF CALIFORNIA

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DRS Engineering Inc. 3564 SAGUNTO ST. BOX 486, SANTA YNEZ CA 93460 TEL: (818) 402-3962 FAX: (818) 276-1922 WWW.DRS-ENGINEERING.NET DRS@DRS-ENGINEERING.NET

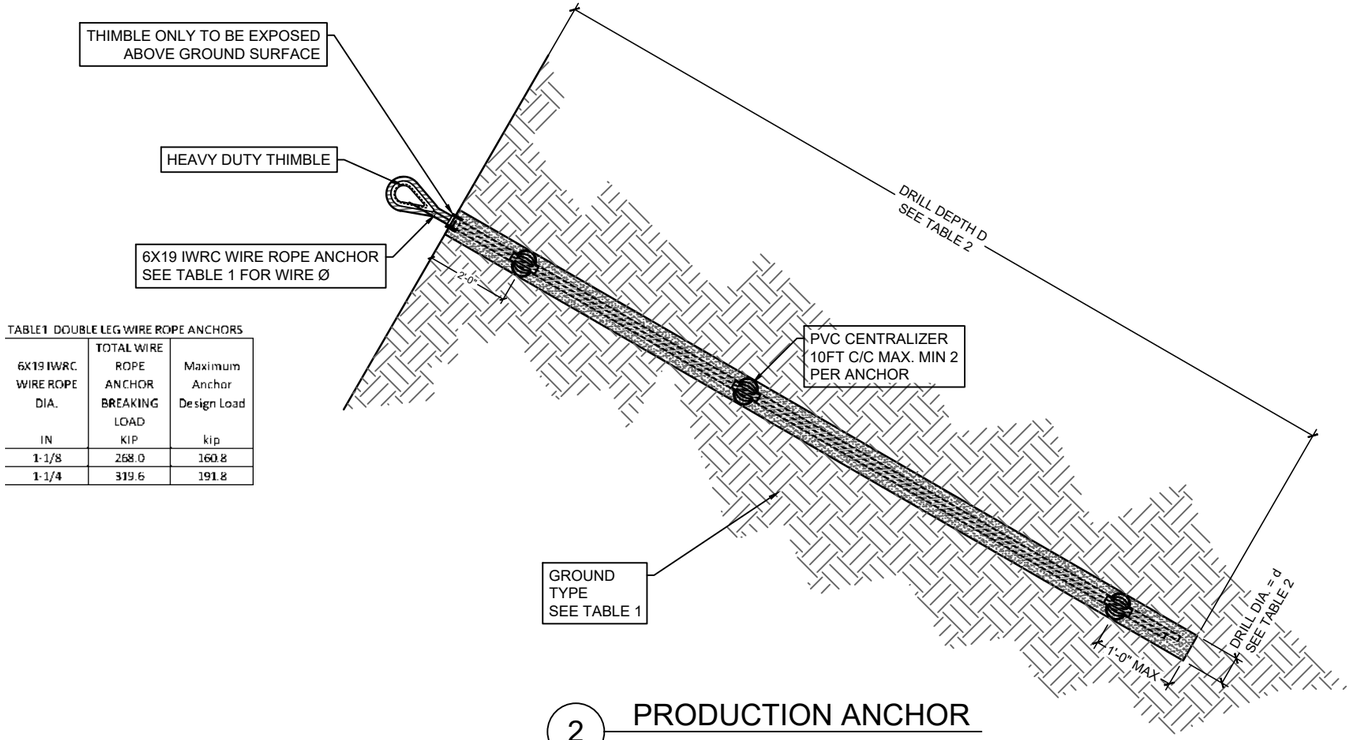

TABLE1 DOUBLE LEG WIRE ROPE ANCHORS

6X19 IWRC WIRE ROPE DIA. IN	TOTAL WIRE ROPE ANCHOR BREAKING LOAD KIP	Maximum Anchor Design Load kip
1-1/8	268.0	160.8
1-1/4	319.6	191.8

2 PRODUCTION ANCHOR

Trsnd = Allowable Load transfer rate in Sandstone (8kips/ft)
Trmixed = Allowable Load transfer rate in Mixed Soil and boulders (5 kips/ft)
P = Required Anchor Capacity

Table 2

Soil Type	Hole dia. in	Required Capacity kip	Drill Depth Required ft
Mixed Soil and Rock only	4.5	P	(P/5)+3
Sandstone only	4.5	P	(P/8)+1
Mixed Soil and Rock over Sandstone	4.5	P	((3*Dm) + P +23) / 8

Where Dm = Drill depth in mixed soil and rock

Table 3 SY-7A - Anchor Loads and Expected Quantities

Anchor Location	TL Total Anchor Load Reqd. kip	Expected No. Anchors	Average Design Load Each Anchor kip	Min. Anchor Size
Top Left	417	3	139	1-1/4" Double Leg
Top Right	417	3	139	1-1/4" Double Leg
Upper Middle Left	451	3	150	1-1/4" Double Leg
Upper Middle Right	451	3	150	1-1/4" Double Leg
Lower Middle Left	392	3	131	1-1/4" Double Leg
Lower Middle Right	392	3	131	1-1/4" Double Leg
Bottom Left	261	2	131	1-1/4" Double Leg
Bottom Right	261	2	131	1-1/4" Double Leg
Total No Anchors		22		

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MONTECITO DEBRIS FLOW MITIGATION
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ANCHOR DETAILS

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C 69911
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VICINITY MAP

GENERAL NOTES

THE LOCATION OF THE DEBRIS FLOW NETS AS DEPICTED ON THESE PLANS IS APPROXIMATE. THE EXACT LOCATION OF THE DEBRIS FLOW NETS AND ASSOCIATED ANCHORS SHALL BE DETERMINED IN THE FIELD BETWEEN THE ENGINEER AND THE THE CONTRACTOR. EXACT LOCATIONS SHALL BE APPROVED AND ACCEPTED BY SDF RESILIENCE INC. (AND ANY OTHER PARTIES HAVING JURISDICTION OF THE SITE) PRIOR TO CONSTRUCTION.

UNDERGROUND AND OVERHEAD UTILITIES SHOWN ARE AS INTERPRETED FROM INFORMATION PROVIDED TO DRS ENGINEERING DURING DESIGN. THE ACTUAL LOCATIONS OF ALL SUCH ITEMS SHALL BE FIELD VERIFIED PRIOR TO COMMENCING CONSTRUCTION OF THE DEBRIS FLOW NETS. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES IN THE VICINITY OF THE DEBRIS FLOW BARRIER AND OBTAIN AN UNDERGROUND SERVICE ALERT INQUIRY IDENTIFICATION NUMBER AT LEAST TWO WORKING DAYS BEFORE STARTING WORK. TELEPHONE NUMBER (800) 227-2600.

THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT THE WORKS ARE BUILT IN ACCORDANCE WITH THESE PLANS. IF THERE IS ANY QUESTION REGARDING THESE PLANS, THE CONTRACTOR SHALL REQUEST AN INTERPRETATION BEFORE DOING ANY WORK BY CONTACTING THE ENGINEER.

THE CONTRACTOR SHALL ALSO TAKE THE NECESSARY STEPS TO PROTECT ANY AND ALL ADJACENT PROPERTY FROM ANY EROSION AND SILTATION THAT RESULT FROM HIS OPERATIONS BY APPROPRIATE MEANS (SAND BAGS, HAY BALES, TEMPORARY DESILTING BASINS, DIKES, EARTH RETENTION, ETC.) UNTIL SUCH TIME THAT THE PROJECT IS COMPLETED AND ACCEPTED FOR MAINTENANCE BY THE OWNER. ALL CONSTRUCTION SHALL CONFORM TO ALL LOCAL CODES, ORDINANCES, RESTRICTIONS AND OSHA REQUIREMENTS.

SITE ACCESS METHODS SHALL BE DETERMINED BY THE CONTRACTOR IN ACCORDANCE WITH ALL AGREEMENTS IN PLACE RELATIVE TO THE PROJECT SITE.

EXCAVATION NOTIFICATION

CALL 1-800-422-4133 A MINIMUM OF TWO DAYS BEFORE COMMENCING EXCAVATION ENSURE ALL RELEVANT UTILITY COMPANIES HAVE CLEARED THE LOCATION. UPDATE ALL DIG ALERT NOTIFICATIONS EVERY TEN DAYS.

IF DRILLING IS TO OCCUR WITHIN THREE FEET OF A UTILITY, THEN UTILITY MUST BE EXPOSED TO CONFIRM LOCATION AND CLEARANCE DURING DRILLING/DRIVING.

CODES AND SPECIFICATIONS

GROUND ANCHOR DESIGN - RECOMMENDATIONS FOR PRESTRESSED ROCK AND SOIL ANCHORS. POST TENSIONING INSTITUTE 2004

MATERIALS

STEEL
VX160-H6 DEBRIS FLOW NETS
SVX 180-H6 DEBRIS FLOW NETS ALL COMPONENTS FROM GEOBRUGG (AG)
REINFORCING STEEL: ASTM A-615 - GRADE 60
GROUND ANCHORS: 1-1/8" OR 1-1/4" DIA. 6x19 IWRC WIRE ROPE ANCHORS

CEMENTITIOUS
CEMENT: ASTM C-150, TYPE II / V
ANCHOR GROUT NEAT WATER/CEMENT GROUT 0.45 W/C RATIO F'C (28 DAY) = 4000PSI MIN.

MISCELLANEOUS
GALVANIZING: ASTM A123. JOB SITE FABRICATION AND REPAIRS IN ACCORDANCE WITH ASTM A780.
MEMBERS OR DETAILS MAY BE SUBSTITUTED FOR EQUIVALENT OR BETTER, AS APPROVED BY ENGINEER.

INSPECTIONS

THE WORK SHALL BE SUBJECT TO CONTINUOUS AND PERIODIC INSPECTIONS AS FOLLOWS;

VERIFICATION TESTING	- CONTINUOUS INSPECTION BY ENGINEER
LAYOUT OF DEBRIS NETS AND ANCHORS	-CONTINUOUS INSPECTION BY ENGINEER
DRILLING OF ANCHORS	- CONTINUOUS INSPECTION BY DEPUTY INSPECTOR - PERIODIC INSPECTION BY ENGINEER
CONSTRUCTION OF NETS	- PERIODIC INSPECTION BY DEPUTY INSPECTOR AND ENGINEER -FINAL INSPECTION BY ENGINEER.

DEPUTY INSPECTOR SHALL BE TRAINED BY ENGINEER PRIOR TO COMMENCEMENT OF WORK.

DEPUTY INSPECTOR SHALL REPORT ALL VARIATIONS FROM THESE PLANS TO THE ENGINEER FOR REVIEW AND APPROVAL.

GROUND ANCHOR VERIFICATION TESTING

VERIFICATION TESTS SHALL BE PERFORMED AT A REMOTE LOCATION WHERE GEOLOGICAL CONDITIONS ARE SIMILAR TO THE ACTUAL NET LOCATIONS.

A MINIMUM OF 6 VERIFICATION ANCHORS SHALL BE INSTALLED, TWO IN SANDSTONE ROCK, TWO IN SHALE ROCK AND TWO IN COLLUVIUM SOILS.

VERIFICATION TESTS SHALL BE DESIGNED BY THE ENGINEER TO TO FACILITATE THE ESTIMATION OF THE ULTIMATE / ALLOWABLE GROUT TO GROUND BOND STRESS IN EACH GROUND TYPE .

VERIFICATION TEST ANCHORS SHALL BE CONSTRUCTED BY THE SAME METHODS / EQUIPMENT AND TO THE SAME DIAMETERS THAT SHALL BE USED FOR ALL PRODUCTION ANCHORS.

TENDONS FOR VERIFICATION TEST ANCHORS SHALL BE DETERMINED BY THE ENGINEER TO ENSURE THAT THE LOADING DURING THE TEST DOES NOT EXCEED 80% OF THE THEORETICAL FAILURE LOAD OF THE TENDON

SECURELY BLOCK OUT THE FRONT ONE FOOT OF THE VERIFICATION TEST ANCHOR HOLE WITH LOOSE SOIL OR OTHER FLEXIBLE MATERIAL TO AVOID LOADING THE GROUT COLUMN DURING THE TEST. PERFORM VERIFICATION TESTING BY LOADING THE ANCHOR IN INCREMENT OF 10% OF THE ESTIMATED FAILURE LOAD UNTIL ANCHOR FAILURE OR UNTIL THE MAXIMUM ALLOWABLE TEST LOAD OF THE TENDON IS REACHED.

ALL LOAD INCREMENTS SHALL BE MAINTAINED WITHIN 5 PERCENT OF THE INTENDED LOAD. EACH LOAD INCREMENT SHALL BE HELD FOR A MINIMUM FOR 2 MINUTES UNLESS LONGER LOAD HOLDS ARE DIRECTED BY THE ENGINEER TO OBSERVE CREEP BEHAVIOR OF THE ANCHORS

MOVEMENT WITH RESPECT TO A FIXED REFERENCE TO AN ACCURARY OF 5/1000 " SHALL BE MEASURED AND RECORDED AT ALL LOAD INCREMENTS AND AT PRESCRIBED TIMES DURING CREEP TESTING (AS DETERMINED BY THE ENGINEER).

THE ENGINEER SHALL BE RESPONSIBLE FOR ANALYZING THE VERIFICATION TEST DATA AND DETERMINING THE ULTIMATE LOAD FOR EACH GROUND TYPE.

DEBRIS NET ERECTION

THE DEBRIS NETS SHALL BE ERECTED BY A CONTRACTOR WITH A MINIMUM OF 3 YEARS EXPERIENCE IN CONSTRUCTION GEOBRUGG DEBRIS FLOW NETS.

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3564 SAGUNTO ST. BOX 486
SANTA YNEZ CA 93460
TEL: (818) 402-3962
FAX: (818) 276-1922
WWW.DRS-ENGINEERING.NET
DRS@DRS-ENGINEERING.NET

MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: BV-4
CONSTRUCTION NOTES

REGISTERED PROFESSIONAL ENGINEER
C 69911
Exp. 9.30.20
CIVIL
STATE OF CALIFORNIA

REV.	DESCRIPTION	DATE

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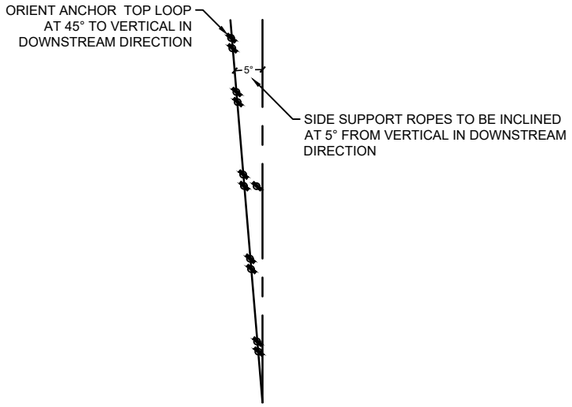
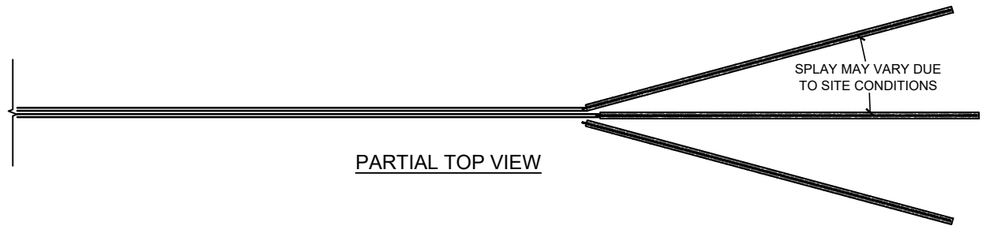
SHEET No.	SH-1.0

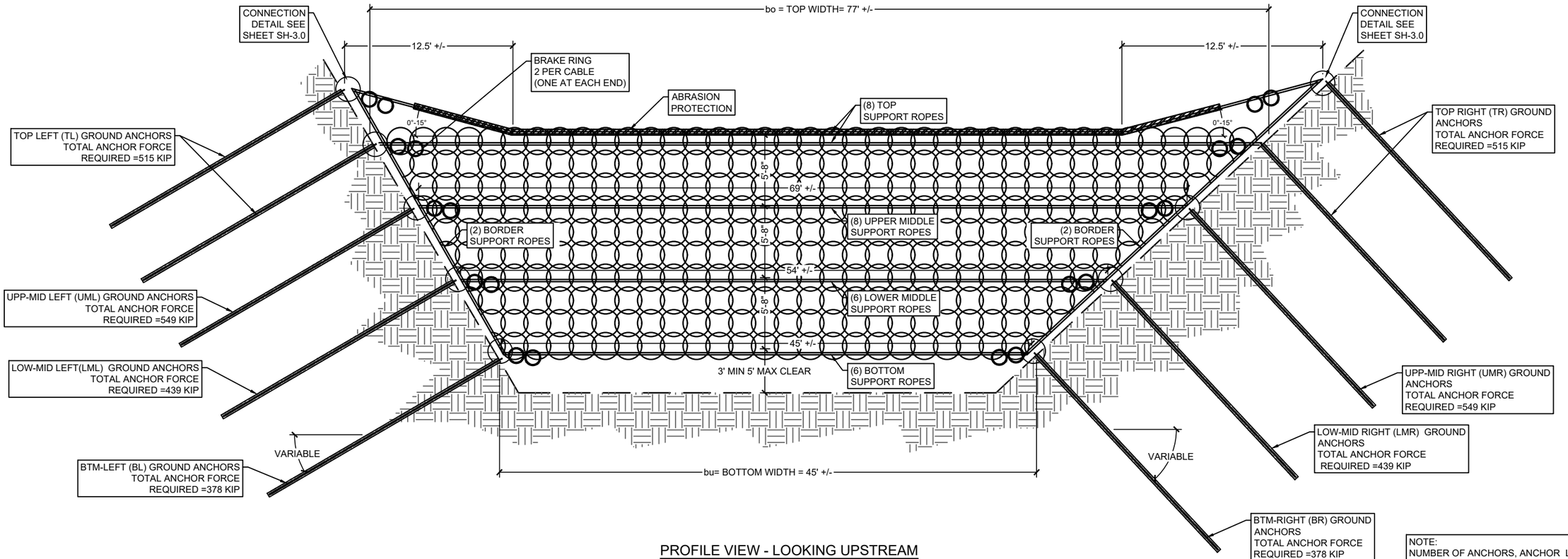
DRS Engineering Inc. 3564 SAGUNTO ST. BOX 486, SANTA YNEZ CA 93460 TEL: (818) 402-3962 FAX: (818) 276-1922 WWW.DRS-ENGINEERING.NET DRS@DRS-ENGINEERING.NET



SIDE VIEW



PARTIAL TOP VIEW



PROFILE VIEW - LOOKING UPSTREAM

NOTE:
NUMBER OF ANCHORS, ANCHOR LENGTHS, DIAMETERS & DESIGN LOADS TO BE DETERMINED AFTER VERIFICATION TESTING.

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SANTA YNEZ CA 93460
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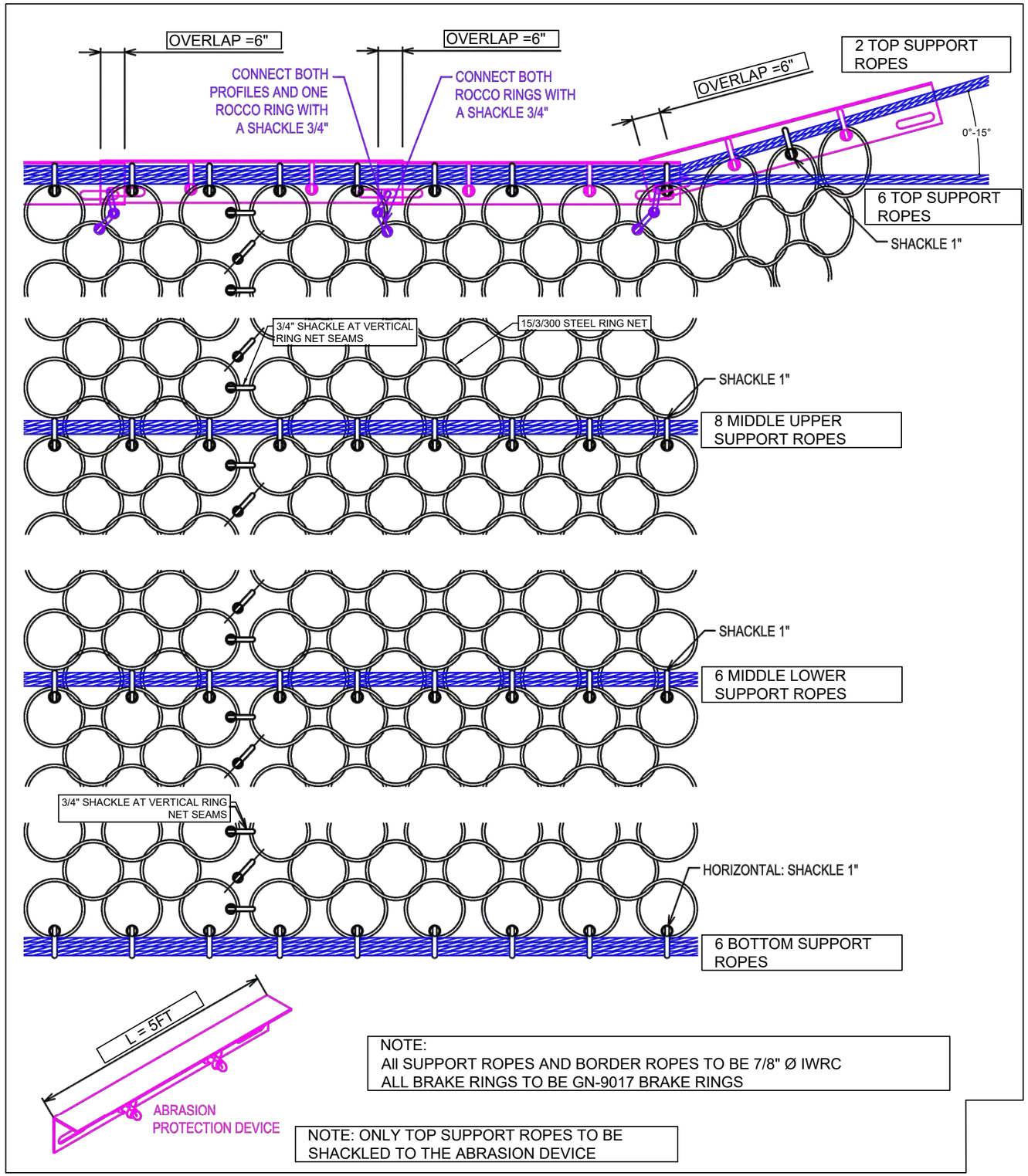
WWW.DRS-ENGINEERING.NET
DRS@DRS-ENGINEERING.NET

MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: BV-4
NET LAYOUT

REV.	DESCRIPTION	DATE
		04-10-2019

DRAWN: ODO
CHECKED: DRS
SCALE: NOT TO SCALE
SHEET No. SH-2.0
PROJECT 2019-15

REGISTERED PROFESSIONAL ENGINEER
C 69911
Exp. 9.30.20
STATE OF CALIFORNIA
CIVIL



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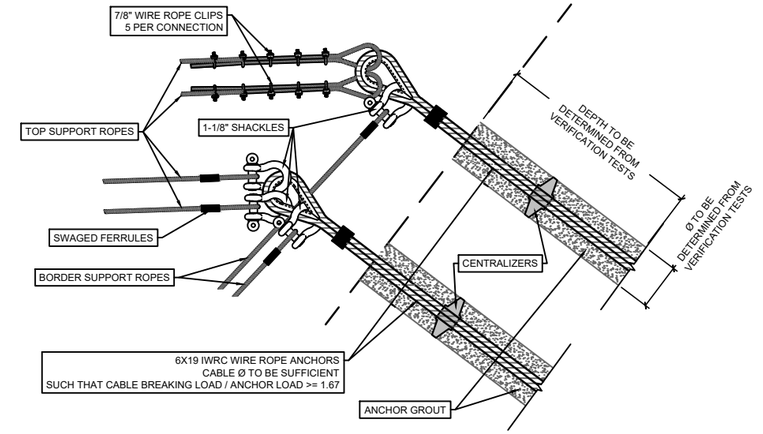
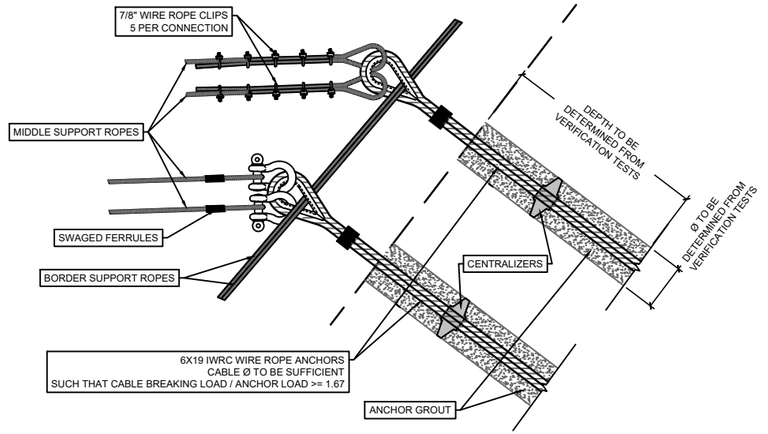


TOP SUPPORT ROPE/ANCHOR CONNECTIONS



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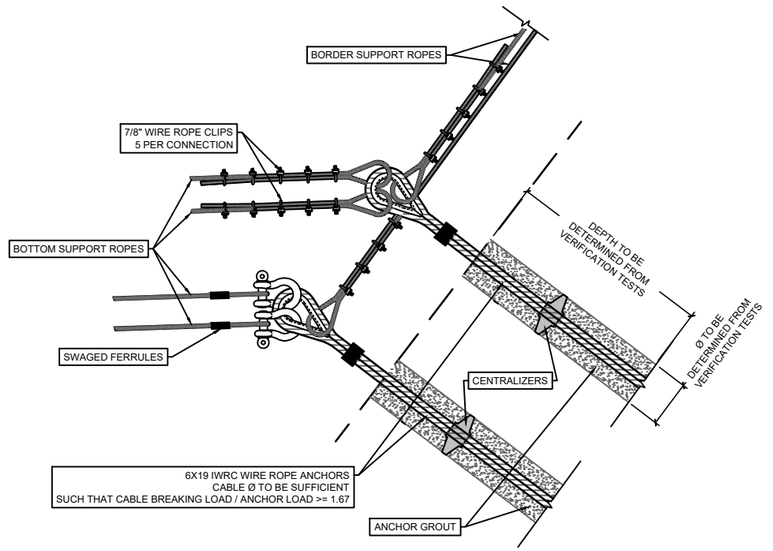

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DRS@DRS-ENGINEERING.NET

MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: BV-4
NET DETAILS

REGISTERED PROFESSIONAL ENGINEER
RICHARD O. DAVIS
RCE 69911
Exp. 9.30.20
STATE OF CALIFORNIA

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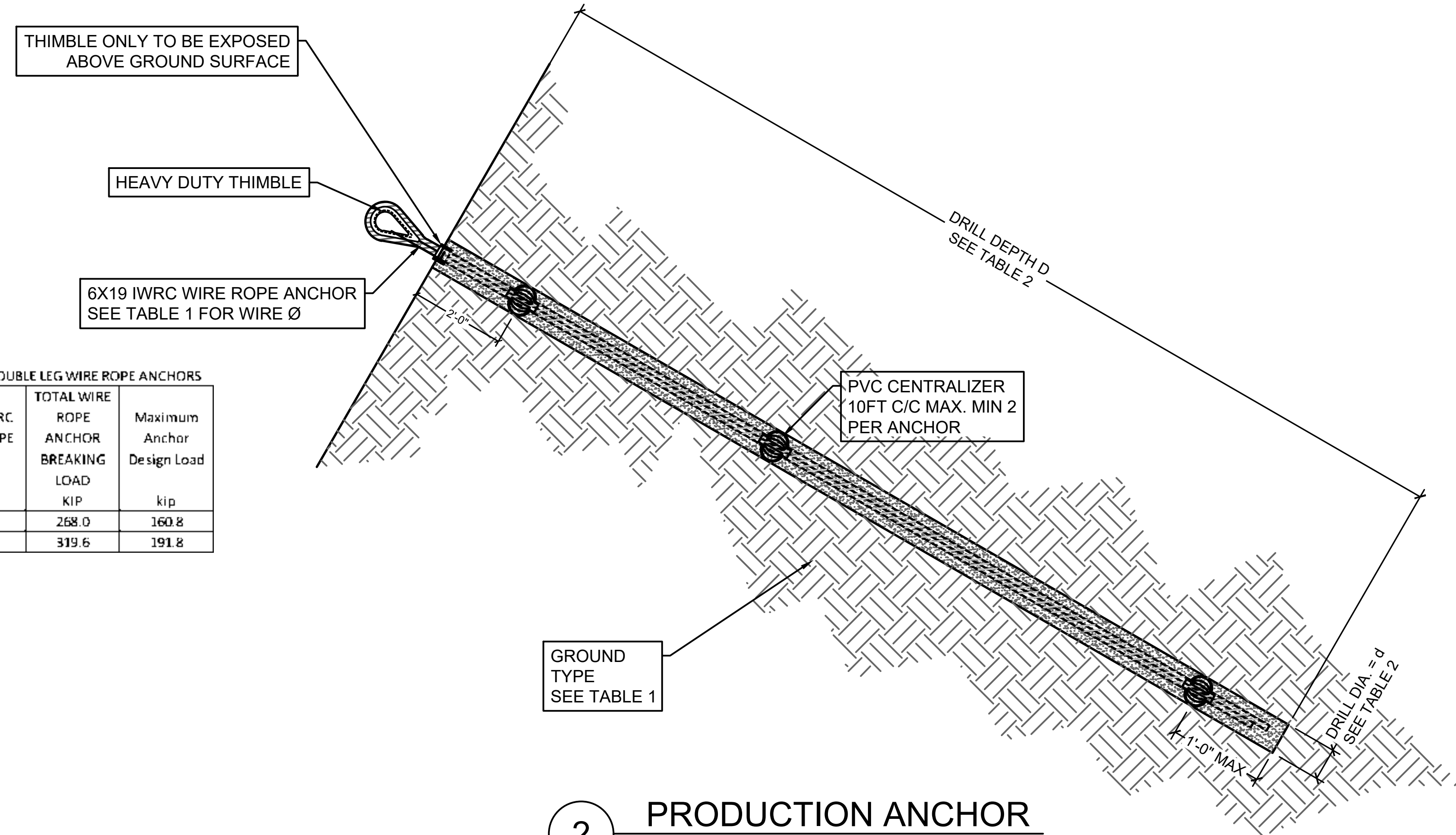

2 PRODUCTION ANCHOR

TABLE1 DOUBLE LEG WIRE ROPE ANCHORS

6X19 IWRC WIRE ROPE DIA. IN	TOTAL WIRE ROPE ANCHOR BREAKING LOAD KIP	Maximum Anchor Design Load kip
1-1/8	268.0	160.8
1-1/4	319.6	191.8

Trsnd = Allowable Load transfer rate in Sandstone (8kips/ft)
Trmixed = Allowable Load transfer rate in Mixed Soil and boulders (5 kips/ft)
P = Required Anchor Capacity

Table 2

Soil Type	Hole dia. in	Required Capacity kip	Drill Depth Required ft
Mixed Soil and Rock only	4.5	P	(P/5)+3
Sandstone only	4.5	P	(P/8)+1
Mixed Soil and Rock over Sandstone	4.5	P	((3*Dm) + P +23) / 8

Where Dm = Drill depth in mixed soil and rock

Table 3 BV-4 - Anchor Loads and Expected Quantities

Anchor Location	TL Total Anchor Load Reqd. kip	Expected No. Anchors	Average Design Load Each Anchor kip	Min. Anchor Size
Top Left	515	4	129	1-1/4" Double Leg
Top Right	515	4	129	1-1/4" Double Leg
Upper Middle Left	549	4	137	1-1/4" Double Leg
Upper Middle Right	549	4	137	1-1/4" Double Leg
Lower Middle Left	439	3	146	1-1/4" Double Leg
Lower Middle Right	439	3	146	1-1/4" Double Leg
Bottom Left	378	3	126	1-1/4" Double Leg
Bottom Right	378	3	126	1-1/4" Double Leg
Total No Anchors		28		

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ANCHOR DETAILS

REGISTERED PROFESSIONAL ENGINEER · C 69911 · Exp. 9.30.20 · CIVIL · STATE OF CALIFORNIA

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VICINITY MAP

GENERAL NOTES

THE LOCATION OF THE DEBRIS FLOW NETS AS DEPICTED ON THESE PLANS IS APPROXIMATE. THE EXACT LOCATION OF THE DEBRIS FLOW NETS AND ASSOCIATED ANCHORS SHALL BE DETERMINED IN THE FIELD BETWEEN THE ENGINEER AND THE THE CONTRACTOR. EXACT LOCATIONS SHALL BE APPROVED AND ACCEPTED BY SDF RESILIENCE INC. (AND ANY OTHER PARTIES HAVING JURISDICTION OF THE SITE) PRIOR TO CONSTRUCTION.

UNDERGROUND AND OVERHEAD UTILITIES SHOWN ARE AS INTERPRETED FROM INFORMATION PROVIDED TO DRS ENGINEERING DURING DESIGN. THE ACTUAL LOCATIONS OF ALL SUCH ITEMS SHALL BE FIELD VERIFIED PRIOR TO COMMENCING CONSTRUCTION OF THE DEBRIS FLOW NETS. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES IN THE VICINITY OF THE DEBRIS FLOW BARRIER AND OBTAIN AN UNDERGROUND SERVICE ALERT INQUIRY IDENTIFICATION NUMBER AT LEAST TWO WORKING DAYS BEFORE STARTING WORK. TELEPHONE NUMBER (800) 227-2600.

THE CONTRACTOR SHALL BE RESPONSIBLE TO ENSURE THAT THE WORKS ARE BUILT IN ACCORDANCE WITH THESE PLANS. IF THERE IS ANY QUESTION REGARDING THESE PLANS, THE CONTRACTOR SHALL REQUEST AN INTERPRETATION BEFORE DOING ANY WORK BY CONTACTING THE ENGINEER.

THE CONTRACTOR SHALL ALSO TAKE THE NECESSARY STEPS TO PROTECT ANY AND ALL ADJACENT PROPERTY FROM ANY EROSION AND SILTATION THAT RESULT FROM HIS OPERATIONS BY APPROPRIATE MEANS (SAND BAGS, HAY BALES, TEMPORARY DESILTING BASINS, DIKES, EARTH RETENTION, ETC.) UNTIL SUCH TIME THAT THE PROJECT IS COMPLETED AND ACCEPTED FOR MAINTENANCE BY THE OWNER. ALL CONSTRUCTION SHALL CONFORM TO ALL LOCAL CODES, ORDINANCES, RESTRICTIONS AND OSHA REQUIREMENTS.

SITE ACCESS METHODS SHALL BE DETERMINED BY THE CONTRACTOR IN ACCORDANCE WITH ALL AGREEMENTS IN PLACE RELATIVE TO THE PROJECT SITE.

EXCAVATION NOTIFICATION

CALL 1-800-422-4133 A MINIMUM OF TWO DAYS BEFORE COMMENCING EXCAVATION ENSURE ALL RELEVANT UTILITY COMPANIES HAVE CLEARED THE LOCATION. UPDATE ALL DIG ALERT NOTIFICATIONS EVERY TEN DAYS.

IF DRILLING IS TO OCCUR WITHIN THREE FEET OF A UTILITY, THEN UTILITY MUST BE EXPOSED TO CONFIRM LOCATION AND CLEARANCE DURING DRILLING/DRIVING.

CODES AND SPECIFICATIONS

GROUND ANCHOR DESIGN - RECOMMENDATIONS FOR PRESTRESSED ROCK AND SOIL ANCHORS. POST TENSIONING INSTITUTE 2004

MATERIALS

STEEL
VX160-H6 DEBRIS FLOW NETS
SVX 180-H6 DEBRIS FLOW NETS ALL COMPONENTS FROM GEOBRUGG (AG)
REINFORCING STEEL: ASTM A-615 - GRADE 60
GROUND ANCHORS: 1-1/8" OR 1-1/4" DIA. 6x19 IWRC WIRE ROPE ANCHORS

CEMENTITIOUS
CEMENT: ASTM C-150, TYPE II / V
ANCHOR GROUT NEAT WATER/CEMENT GROUT 0.45 W/C RATIO F'C (28 DAY) = 4000PSI MIN.

MISCELLANEOUS
GALVANIZING: ASTM A123. JOB SITE FABRICATION AND REPAIRS IN ACCORDANCE WITH ASTM A780.
MEMBERS OR DETAILS MAY BE SUBSTITUTED FOR EQUIVALENT OR BETTER, AS APPROVED BY ENGINEER.

INSPECTIONS

THE WORK SHALL BE SUBJECT TO CONTINUOUS AND PERIODIC INSPECTIONS AS FOLLOWS;

VERIFICATION TESTING - CONTINUOUS INSPECTION BY ENGINEER

LAYOUT OF DEBRIS NETS AND ANCHORS -CONTINUOUS INSPECTION BY ENGINEER

DRILLING OF ANCHORS - CONTINUOUS INSPECTION BY DEPUTY INSPECTOR
- PERIODIC INSPECTION BY ENGINEER

CONSTRUCTION OF NETS - PERIODIC INSPECTION BY DEPUTY INSPECTOR AND ENGINEER
-FINAL INSPECTION BY ENGINEER.

DEPUTY INSPECTOR SHALL BE TRAINED BY ENGINEER PRIOR TO COMMENCEMENT OF WORK.

DEPUTY INSPECTOR SHALL REPORT ALL VARIATIONS FROM THESE PLANS TO THE ENGINEER FOR REVIEW AND APPROVAL.

GROUND ANCHOR VERIFICATION TESTING

VERIFICATION TESTS SHALL BE PERFORMED AT A REMOTE LOCATION WHERE GEOLOGICAL CONDITIONS ARE SIMILAR TO THE ACTUAL NET LOCATIONS.

A MINIMUM OF 6 VERIFICATION ANCHORS SHALL BE INSTALLED, TWO IN SANDSTONE ROCK, TWO IN SHALE ROCK AND TWO IN COLLUVIUM SOILS.

VERIFICATION TESTS SHALL BE DESIGNED BY THE ENGINEER TO TO FACILITATE THE ESTIMATION OF THE ULTIMATE / ALLOWABLE GROUT TO GROUND BOND STRESS IN EACH GROUND TYPE .

VERIFICATION TEST ANCHORS SHALL BE CONSTRUCTED BY THE SAME METHODS / EQUIPMENT AND TO THE SAME DIAMETERS THAT SHALL BE USED FOR ALL PRODUCTION ANCHORS.

TENDONS FOR VERIFICATION TEST ANCHORS SHALL BE DETERMINED BY THE ENGINEER TO ENSURE THAT THE LOADING DURING THE TEST DOES NOT EXCEED 80% OF THE THEORETICAL FAILURE LOAD OF THE TENDON

SECURELY BLOCK OUT THE FRONT ONE FOOT OF THE VERIFICATION TEST ANCHOR HOLE WITH LOOSE SOIL OR OTHER FLEXIBLE MATERIAL TO AVOID LOADING THE GROUT COLUMN DURING THE TEST. PERFORM VERIFICATION TESTING BY LOADING THE ANCHOR IN INCREMENT OF 10% OF THE ESTIMATED FAILURE LOAD UNTIL ANCHOR FAILURE OR UNTIL THE MAXIMUM ALLOWABLE TEST LOAD OF THE TENDON IS REACHED.

ALL LOAD INCREMENTS SHALL BE MAINTAINED WITHIN 5 PERCENT OF THE INTENDED LOAD. EACH LOAD INCREMENT SHALL BE HELD FOR A MINIMUM FOR 2 MINUTES UNLESS LONGER LOAD HOLDS ARE DIRECTED BY THE ENGINEER TO OBSERVE CREEP BEHAVIOR OF THE ANCHORS

MOVEMENT WITH RESPECT TO A FIXED REFERENCE TO AN ACCURARY OF 5/1000 " SHALL BE MEASURED AND RECORDED AT ALL LOAD INCREMENTS AND AT PRESCRIBED TIMES DURING CREEP TESTING (AS DETERMINED BY THE ENGINEER).

THE ENGINEER SHALL BE RESPONSIBLE FOR ANALYZING THE VERIFICATION TEST DATA AND DETERMINING THE ULTIMATE LOAD FOR EACH GROUND TYPE.

DEBRIS NET ERECTION

THE DEBRIS NETS SHALL BE ERECTED BY A CONTRACTOR WITH A MINIMUM OF 3 YEARS EXPERIENCE IN CONSTRUCTION GEOBRUGG DEBRIS FLOW NETS.

ERECTION SHALL COMPLY WITH THE REQUIREMENTS AND DETAILS OF THE FOLLOWING DOCUMENTS:
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM VX TYPE: VX160-H6, DRAWING NO. GD-1004.1E.
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM VX TYPE: VX160-H6, DRAWING NO. GD-1004.2E.
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM UX TYPE: UX180-H6, DRAWING NO. GD-1008.1E. (AS APPLICABLE)
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM UX TYPE: UX180-H6, DRAWING NO. GD-1008.2E. (AS APPLICABLE)
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM UX TYPE: UX180-H6, DRAWING NO. GD-1008.3E. (AS APPLICABLE)
GEOBRUGG AG (2015). DEBRIS FLOW PROTECTION SYSTEM ABRASION PLATE, DRAWING NO. GA-8055.

EXCEPT AS MODIFIED BY THESE PLANS

GROUND ANCHOR INSTALLATION

DRILLING:
HOLES SHALL BE DRILLED TO THE DIAMETER, DEPTH AND LINE AS INDICATED ON THE DRAWINGS. THE HOLE SHALL BE DRILLED SO THAT ITS DIAMETER IS NOT MORE THAN 1/4 INCH SMALLER THAN THE SPECIFIED DIAMETER. HOLES SHALL BE DRILLED AT AN INCLINATION AS SHOWN ON THESE DRAWING. TOLERANCES FOR DRILL HOLE LOCATION SHALL BE +ONE FOOT FOR HORIZONTAL AND VERTICAL POSITION AND WITHIN 2.5 DEGREES OF THE SPECIFIED ANCHOR GRADIENT UNLESS OTHERWISE APPROVED BY THE ENGINEER

HOLES SHALL BE CLEANED TO REMOVE MATERIAL RESULTING FROM DRILLING OPERATIONS.

ANCHOR TENDONS SHALL BE INSTALLED IN DRILLED HOLES IN AN EXPEDITIOUS MANNER SO THAT CAVING OR DETERIORATION OF THE DRILLED HOLES DOES NOT OCCUR.

WHERE THE ANCHOR TENDON CANNOT BE COMPLETELY INSERTED, THE CONTRACTOR SHALL REMOVE THE TENDON AND CLEAN OR RE-DRILL THE HOLE TO PERMIT UNOBSTRUCTED INSTALLATION. PARTIALLY INSTALLED TENDONS SHALL NOT BE DRIVEN OR FORCED INTO THE DRILLED HOLE AND WILL BE REJECTED. WHEN OPEN-HOLE DRILLING METHODS ARE BEING USED, THE CONTRACTOR SHALL HAVE HOLE CLEANING TOOLS ON SITE SUITABLE FOR CLEANING DRILLED HOLES ALONG THEIR FULL LENGTH JUST PRIOR TO TENDON INSERTION AND GROUTING.

THE LENGTH OF DRILLED HOLE SHALL BE VERIFIED AND RECORDED BY THE DEPUTY INSPECTOR BEFORE GROUTING.

CENTRALIZERS SHALL BE USED DURING INSTALLATION TO SUPPORT THE TENDON IN THE DRILLED HOLE.

PRIOR TO PLACEMENT, TENDONS SHALL BE FREE OF DIRT, DETRIMENTAL RUST OR ANY OTHER DELETERIOUS SUBSTANCES. DRILLED HOLES SHALL BE CLEARED OF ANY LOOSE ROCK FRAGMENTS, SOIL OR OTHER SUBSTANCES WHICH MAY PREVENT THE PROPER PLACEMENT OF THE TENDON OR GROUT.

TENDONS SHALL BE SECURELY FASTENED IN PLACE TO PREVENT MOVEMENT DURING GROUTING AND TO ASSURE THAT THE TENDON IS CENTRALLY LOCATED IN THE DRILL HOLE. THE DRILLED HOLE SHALL BE FILLED WITH GROUT FREE OF VOIDS OR INCLUSION OF FOREIGN MATERIAL. THE CONTRACTOR SHALL COMPLETELY GROUT THE DRILLED HOLE IN ONE CONTINUOUS OPERATION. COLD JOINTS SHALL NOT BE USED IN GROUT PLACEMENT.

TENDONS SHALL BE INSTALLED AND GROUTED IN THE SAME WORK SHIFT AS THE DRILLING OPERATION.

AFTER GROUTING, THE TENDON SHALL REMAIN UNDISTURBED FOR A MINIMUM OF 72 HRS.

GROUND ANCHOR PROOF TESTING

UNLESS OTHERWISE DIRECTED BY THE ENGINEER, NO PROOF TESTING OF PRODUCTION GROUND ANCHORS IS ANTICIPATED AT THE NET LOCATION

DEBRIS NET MAINTENANCE

ON-GOING INSPECTION AND MAINTENANCE OF THE DEBRIS NET IS NECESSARY TO ENSURE THAT THE SYSTEM IS NOT DEGRADED BY IMPACT DAMAGE, CORROSION OR OTHER FACTOR. IT IS RECOMMENDED THAT THE SYSTEM BE INSPECTED AT A MINIMUM OF ONCE PER YEAR.

FOLLOWING ANY EVENT RESULTING IN THE ACCUMULATION OF DEBRIS IN THE NET THEN THE NET SHOULD BE CLEANED OUT AND ANY DAMAGED OR DEFORMED PARTS REPLACED.

ALL REMOVAL AND MAINTENANCE WORK SHALL BE DONE IN ACCORDANCE WITH ALL PROJECT AGREEMENTS REGARDING ACCESS AND DEBRIS DISPOSAL.

OWNER

SDF RESILIENCE INC
A CALIFORNIA PUBLIC BENEFIT CORPORATION
1470 EAST VALLEY ROAD
SUITE T, MONTECITO, CA 93108
TEL: (805) 689-6324

CONTRACTOR

ACCESS LIMITED CONSTRUCTION
1102 PIKE LANE
OCEANO, CA 93445
TEL: (805)592-2230

DISCLAIMER

THE VOLUME AND FORCE OF MATERIALS THAT MAY IMPACT THE DEBRIS FLOW NETS IN A RAINFALL EVENT IS UNPREDICTABLE AND SUBJECT TO SUCH FACTORS AS THE AMOUNT OF RAINFALL, THE CONDITION OF THE SOILS AND THE EXTENT OF VEGETATION UPSTREAM FOR THE NETS AT THE TIME OF THE EVENT. THE NET SIZES AND LOCATIONS HAVE BEEN DETERMINED USING SOUND ENGINEERING JUDGMENT IN ACCORDANCE WITH THE STANDARD OF PRACTICE AND ARE INTENDED TO REDUCE THE RISKS OF INJURY AND LOSS OF PROPERTY DOWNSTREAM FOR THE NETS. NO GUARANTEE OF THE THE SAFETY OF INDIVIDUALS AND PROPERTY DOWNSTREAM FROM THE NETS IS PROVIDED.

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SANTA YNEZ CA 93460
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MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: BV-10
CONSTRUCTION NOTES

REGISTERED PROFESSIONAL ENGINEER
C 69911
Exp. 9.30.20
CIVIL
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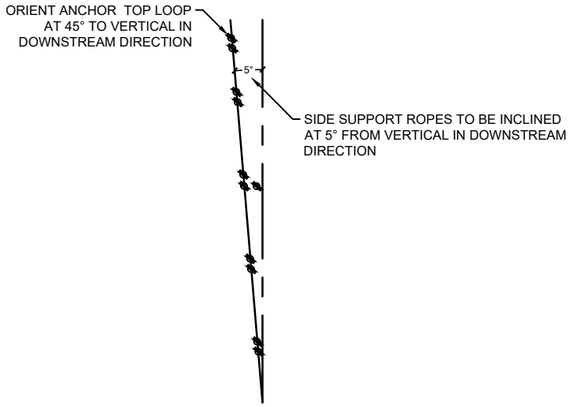

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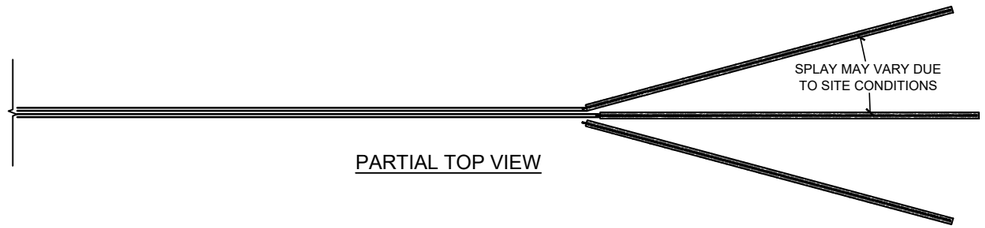

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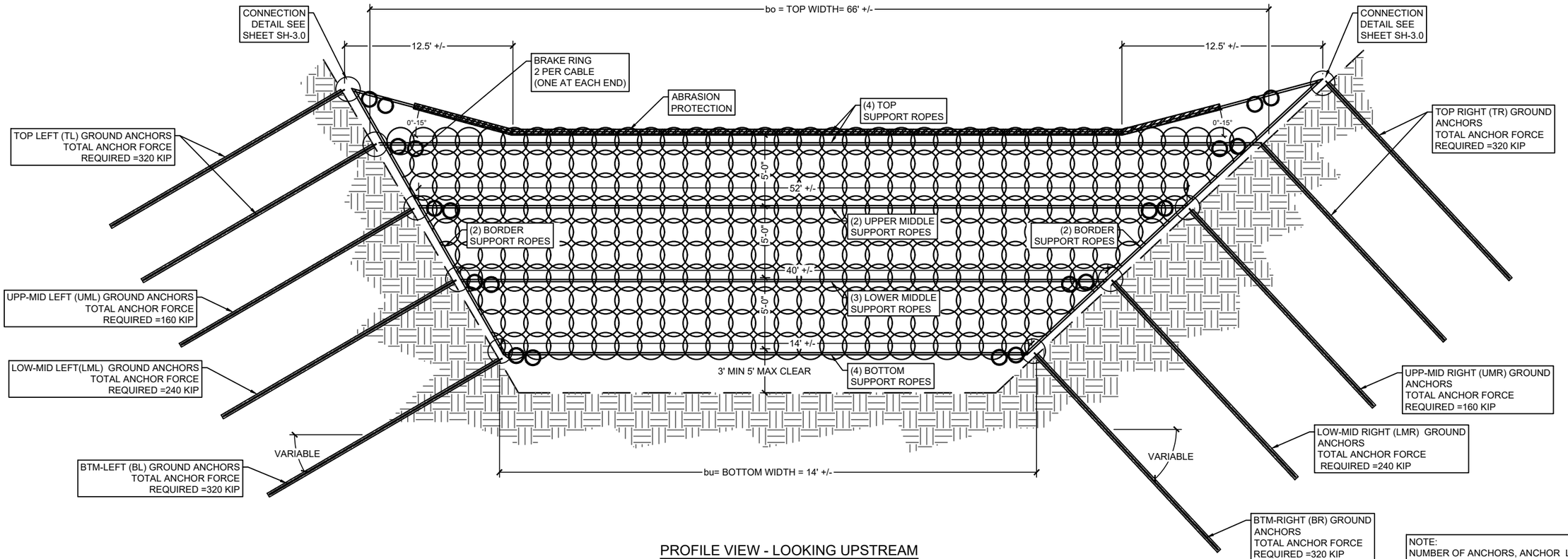

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MONTECITO DEBRIS FLOW MITIGATION
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RICHARD D. OLSEN
C 69911
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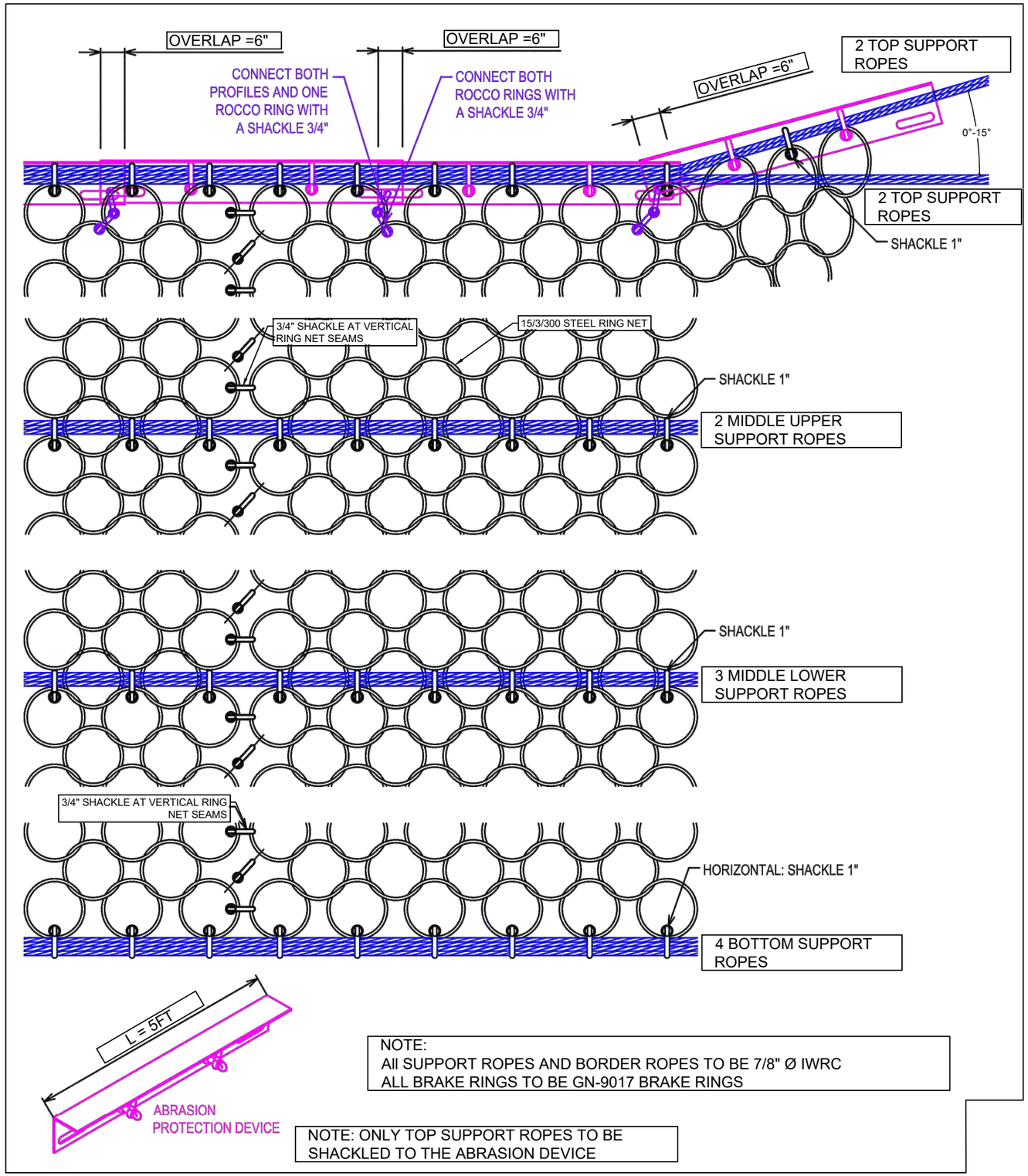

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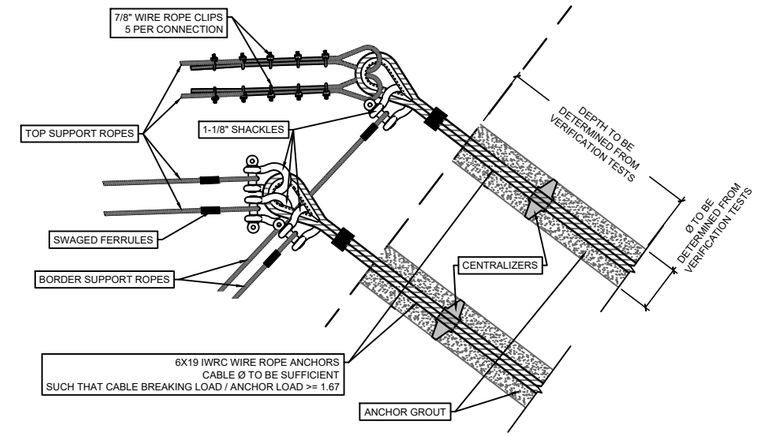

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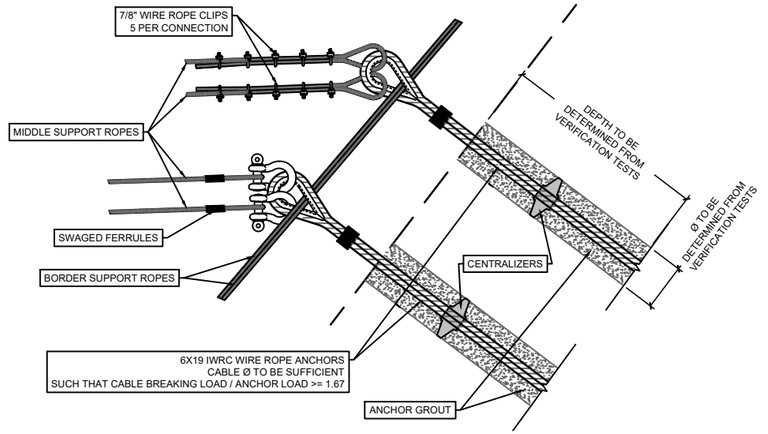

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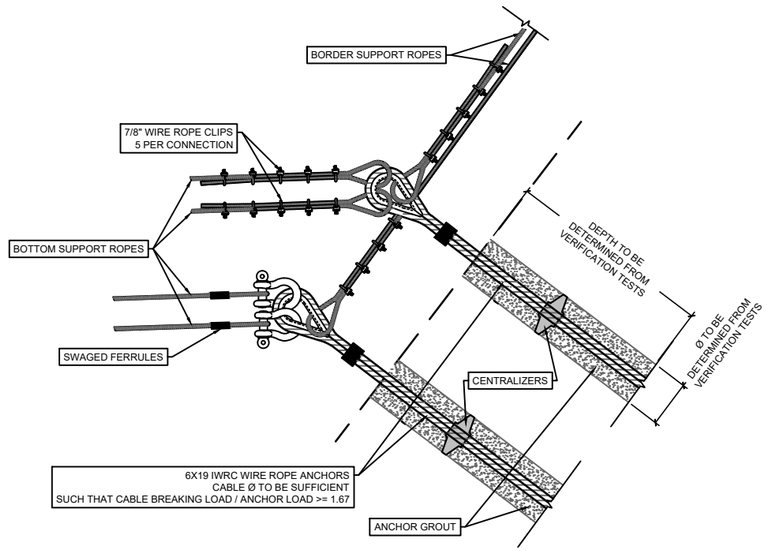

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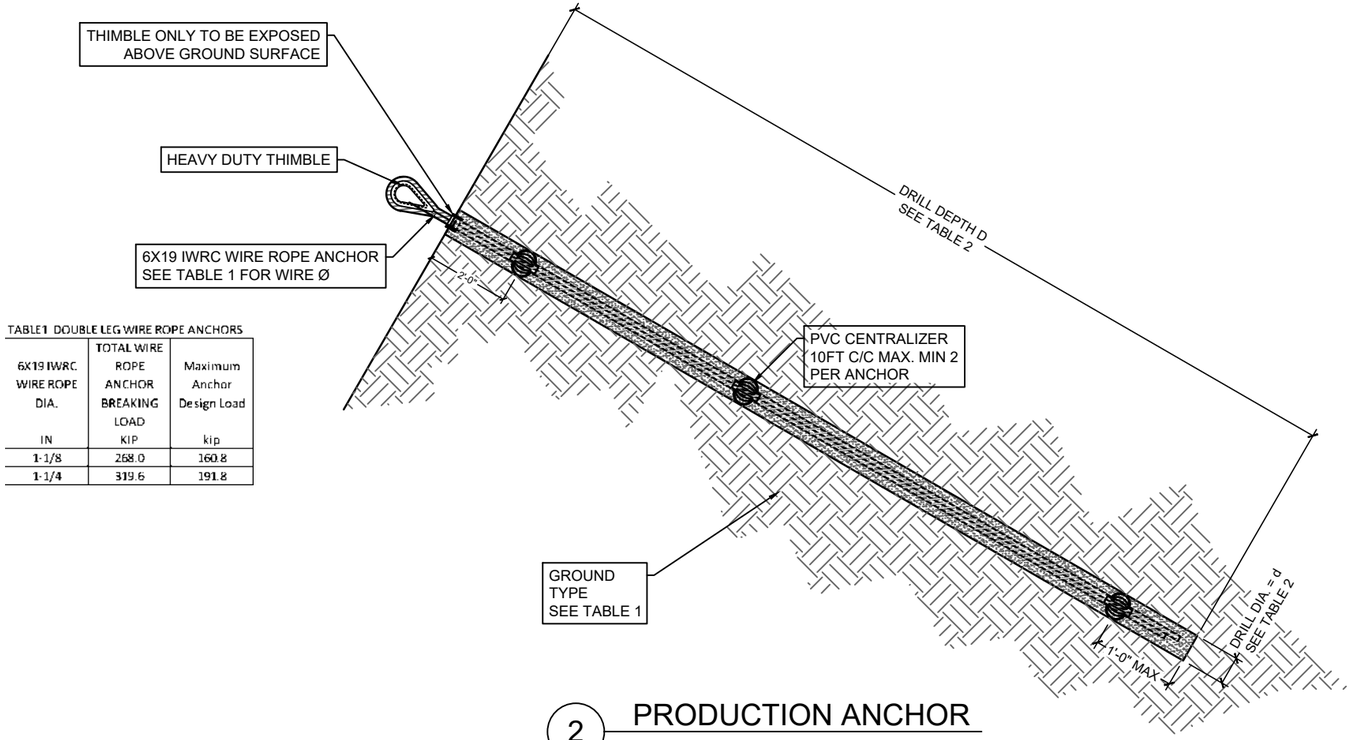

2 PRODUCTION ANCHOR

TABLE1 DOUBLE LEG WIRE ROPE ANCHORS

6X19 IWRC WIRE ROPE DIA. IN	TOTAL WIRE ROPE ANCHOR BREAKING LOAD KIP	Maximum Anchor Design Load kip
1-1/8	268.0	160.8
1-1/4	319.6	191.8

Trsnd = Allowable Load transfer rate in Sandstone (8kips/ft)
Trmixed = Allowable Load transfer rate in Mixed Soil and boulders (5 kips/ft)
P = Required Anchor Capacity

Table 2

Soil Type	Hole dia. in	Required Capacity kip	Drill Depth Required ft
Mixed Soil and Rock only	4.5	P	(P/5)+3
Sandstone only	4.5	P	(P/8)+1
Mixed Soil and Rock over Sandstone	4.5	P	((3*Dm) + P +23) / 8

Where Dm = Drill depth in mixed soil and rock

Table 3 BV-10 - Anchor Loads and Expected Quantities

Anchor Location	TL Total Anchor Load Reqd. kip	Expected No. Anchors	Average Design Load Each Anchor kip	Min. Anchor Size
Top Left	320	2	160	1-1/4" Double Leg
Top Right	320	2	160	1-1/4" Double Leg
Upper Middle Left	160	1	160	1-1/4" Double Leg
Upper Middle Right	160	1	160	1-1/4" Double Leg
Lower Middle Left	240	2	120	1-1/4" Double Leg
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Bottom Left	320	2	160	1-1/4" Double Leg
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Total No Anchors		14		

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DRS@DRS-ENGINEERING.NET

MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: BV-10
ANCHOR DETAILS

REV.	DESCRIPTION	DATE

DATE 04-10-2019
DRAWN ODO
CHECKED DRS
SCALE NOT TO SCALE
SHEET No. SH-4.0
PROJECT 2019-15

REG. C 69911 Exp. 9.30.20 CIVIL STATE OF CALIFORNIA

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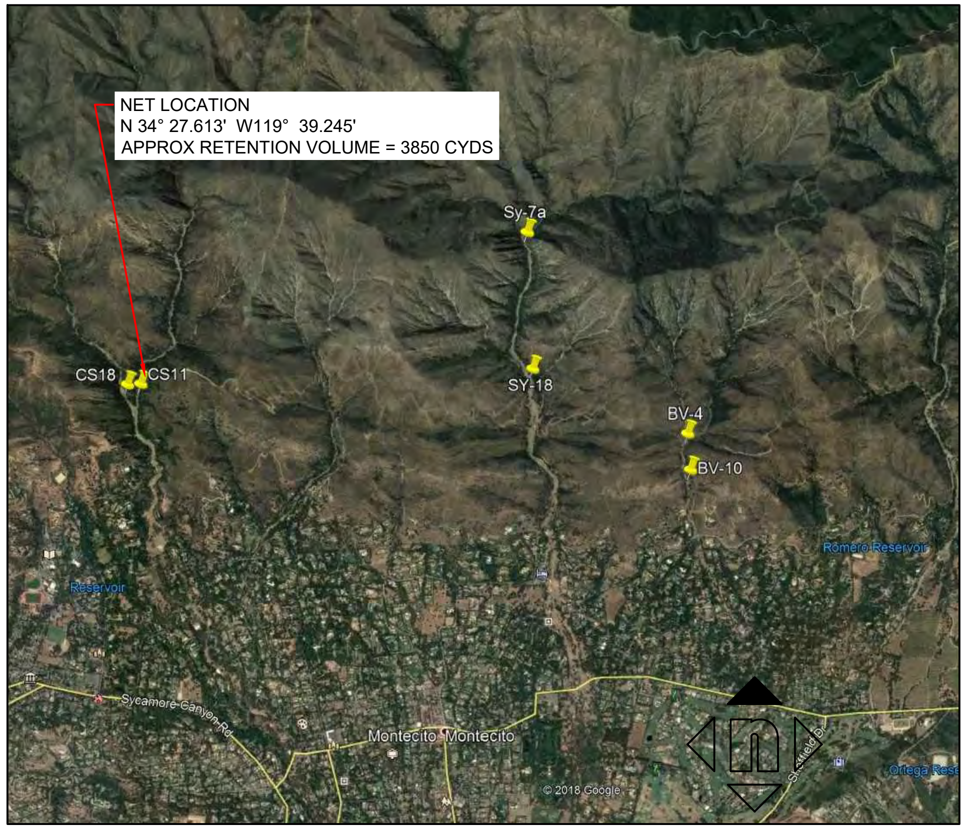
VICINITY MAP



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CODES AND SPECIFICATIONS

GROUND ANCHOR DESIGN - RECOMMENDATIONS FOR PRESTRESSED ROCK AND SOIL ANCHORS. POST TENSIONING INSTITUTE 2004

MATERIALS

STEEL
VX160-H6 DEBRIS FLOW NETS
SVX 180-H6 DEBRIS FLOW NETS ALL COMPONENTS FROM GEOBRUGG (AG)
REINFORCING STEEL: ASTM A-615 - GRADE 60
GROUND ANCHORS: 1-1/8" OR 1-1/4" DIA. 6x19 IWRC WIRE ROPE ANCHORS

CEMENTITIOUS
CEMENT: ASTM C-150, TYPE II / V
ANCHOR GROUT NEAT WATER/CEMENT GROUT 0.45 W/C RATIO F'C (28 DAY) = 4000PSI MIN.

MISCELLANEOUS
GALVANIZING: ASTM A123. JOB SITE FABRICATION AND REPAIRS IN ACCORDANCE WITH ASTM A780.
MEMBERS OR DETAILS MAY BE SUBSTITUTED FOR EQUIVALENT OR BETTER, AS APPROVED BY ENGINEER.

INSPECTIONS

THE WORK SHALL BE SUBJECT TO CONTINUOUS AND PERIODIC INSPECTIONS AS FOLLOWS;

VERIFICATION TESTING - CONTINUOUS INSPECTION BY ENGINEER

LAYOUT OF DEBRIS NETS AND ANCHORS -CONTINUOUS INSPECTION BY ENGINEER

DRILLING OF ANCHORS - CONTINUOUS INSPECTION BY DEPUTY INSPECTOR
- PERIODIC INSPECTION BY ENGINEER

CONSTRUCTION OF NETS - PERIODIC INSPECTION BY DEPUTY INSPECTOR AND ENGINEER
-FINAL INSPECTION BY ENGINEER.

DEPUTY INSPECTOR SHALL BE TRAINED BY ENGINEER PRIOR TO COMMENCEMENT OF WORK.

DEPUTY INSPECTOR SHALL REPORT ALL VARIATIONS FROM THESE PLANS TO THE ENGINEER FOR REVIEW AND APPROVAL.

GROUND ANCHOR VERIFICATION TESTING

VERIFICATION TESTS SHALL BE PERFORMED AT A REMOTE LOCATION WHERE GEOLOGICAL CONDITIONS ARE SIMILAR TO THE ACTUAL NET LOCATIONS.

A MINIMUM OF 6 VERIFICATION ANCHORS SHALL BE INSTALLED, TWO IN SANDSTONE ROCK, TWO IN SHALE ROCK AND TWO IN COLLUVIUM SOILS.

VERIFICATION TESTS SHALL BE DESIGNED BY THE ENGINEER TO TO FACILITATE THE ESTIMATION OF THE ULTIMATE / ALLOWABLE GROUT TO GROUND BOND STRESS IN EACH GROUND TYPE .

VERIFICATION TEST ANCHORS SHALL BE CONSTRUCTED BY THE SAME METHODS / EQUIPMENT AND TO THE SAME DIAMETERS THAT SHALL BE USED FOR ALL PRODUCTION ANCHORS.

TENDONS FOR VERIFICATION TEST ANCHORS SHALL BE DETERMINED BY THE ENGINEER TO ENSURE THAT THE LOADING DURING THE TEST DOES NOT EXCEED 80% OF THE THEORETICAL FAILURE LOAD OF THE TENDON

SECURELY BLOCK OUT THE FRONT ONE FOOT OF THE VERIFICATION TEST ANCHOR HOLE WITH LOOSE SOIL OR OTHER FLEXIBLE MATERIAL TO AVOID LOADING THE GROUT COLUMN DURING THE TEST. PERFORM VERIFICATION TESTING BY LOADING THE ANCHOR IN INCREMENT OF 10% OF THE ESTIMATED FAILURE LOAD UNTIL ANCHOR FAILURE OR UNTIL THE MAXIMUM ALLOWABLE TEST LOAD OF THE TENDON IS REACHED.

ALL LOAD INCREMENTS SHALL BE MAINTAINED WITHIN 5 PERCENT OF THE INTENDED LOAD. EACH LOAD INCREMENT SHALL BE HELD FOR A MINIMUM FOR 2 MINUTES UNLESS LONGER LOAD HOLDS ARE DIRECTED BY THE ENGINEER TO OBSERVE CREEP BEHAVIOR OF THE ANCHORS

MOVEMENT WITH RESPECT TO A FIXED REFERENCE TO AN ACCURARY OF 5/1000 " SHALL BE MEASURED AND RECORDED AT ALL LOAD INCREMENTS AND AT PRESCRIBED TIMES DURING CREEP TESTING (AS DETERMINED BY THE ENGINEER).

THE ENGINEER SHALL BE RESPONSIBLE FOR ANALYZING THE VERIFICATION TEST DATA AND DETERMINING THE ULTIMATE LOAD FOR EACH GROUND TYPE.

DEBRIS NET ERECTION

THE DEBRIS NETS SHALL BE ERECTED BY A CONTRACTOR WITH A MINIMUM OF 3 YEARS EXPERIENCE IN CONSTRUCTION GEOBRUGG DEBRIS FLOW NETS.

ERECTION SHALL COMPLY WITH THE REQUIREMENTS AND DETAILS OF THE FOLLOWING DOCUMENTS:
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM VX TYPE: VX160-H6, DRAWING NO. GD-1004.1E.
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM VX TYPE: VX160-H6, DRAWING NO. GD-1004.2E.
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM UX TYPE: UX180-H6, DRAWING NO. GD-1008.1E. (AS APPLICABLE)
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM UX TYPE: UX180-H6, DRAWING NO. GD-1008.2E. (AS APPLICABLE)
GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM UX TYPE: UX180-H6, DRAWING NO. GD-1008.3E. (AS APPLICABLE)
GEOBRUGG AG (2015). DEBRIS FLOW PROTECTION SYSTEM ABRASION PLATE, DRAWING NO. GA-8055.

EXCEPT AS MODIFIED BY THESE PLANS

GROUND ANCHOR INSTALLATION

DRILLING:
HOLES SHALL BE DRILLED TO THE DIAMETER, DEPTH AND LINE AS INDICATED ON THE DRAWINGS. THE HOLE SHALL BE DRILLED SO THAT ITS DIAMETER IS NOT MORE THAN 1/4 INCH SMALLER THAN THE SPECIFIED DIAMETER. HOLES SHALL BE DRILLED AT AN INCLINATION AS SHOWN ON THESE DRAWING. TOLERANCES FOR DRILL HOLE LOCATION SHALL BE +ONE FOOT FOR HORIZONTAL AND VERTICAL POSITION AND WITHIN 2.5 DEGREES OF THE SPECIFIED ANCHOR GRADIENT UNLESS OTHERWISE APPROVED BY THE ENGINEER

HOLES SHALL BE CLEANED TO REMOVE MATERIAL RESULTING FROM DRILLING OPERATIONS.

ANCHOR TENDONS SHALL BE INSTALLED IN DRILLED HOLES IN AN EXPEDITIOUS MANNER SO THAT CAVING OR DETERIORATION OF THE DRILLED HOLES DOES NOT OCCUR.

WHERE THE ANCHOR TENDON CANNOT BE COMPLETELY INSERTED, THE CONTRACTOR SHALL REMOVE THE TENDON AND CLEAN OR RE-DRILL THE HOLE TO PERMIT UNOBSTRUCTED INSTALLATION. PARTIALLY INSTALLED TENDONS SHALL NOT BE DRIVEN OR FORCED INTO THE DRILLED HOLE AND WILL BE REJECTED. WHEN OPEN-HOLE DRILLING METHODS ARE BEING USED, THE CONTRACTOR SHALL HAVE HOLE CLEANING TOOLS ON SITE SUITABLE FOR CLEANING DRILLED HOLES ALONG THEIR FULL LENGTH JUST PRIOR TO TENDON INSERTION AND GROUTING.

THE LENGTH OF DRILLED HOLE SHALL BE VERIFIED AND RECORDED BY THE DEPUTY INSPECTOR BEFORE GROUTING.

CENTRALIZERS SHALL BE USED DURING INSTALLATION TO SUPPORT THE TENDON IN THE DRILLED HOLE.

PRIOR TO PLACEMENT, TENDONS SHALL BE FREE OF DIRT, DETRIMENTAL RUST OR ANY OTHER DELETERIOUS SUBSTANCES. DRILLED HOLES SHALL BE CLEARED OF ANY LOOSE ROCK FRAGMENTS, SOIL OR OTHER SUBSTANCES WHICH MAY PREVENT THE PROPER PLACEMENT OF THE TENDON OR GROUT.

TENDONS SHALL BE SECURELY FASTENED IN PLACE TO PREVENT MOVEMENT DURING GROUTING AND TO ASSURE THAT THE TENDON IS CENTRALLY LOCATED IN THE DRILL HOLE. THE DRILLED HOLE SHALL BE FILLED WITH GROUT FREE OF VOIDS OR INCLUSION OF FOREIGN MATERIAL. THE CONTRACTOR SHALL COMPLETELY GROUT THE DRILLED HOLE IN ONE CONTINUOUS OPERATION. COLD JOINTS SHALL NOT BE USED IN GROUT PLACEMENT.

TENDONS SHALL BE INSTALLED AND GROUTED IN THE SAME WORK SHIFT AS THE DRILLING OPERATION.

AFTER GROUTING, THE TENDON SHALL REMAIN UNDISTURBED FOR A MINIMUM OF 72 HRS.

GROUND ANCHOR PROOF TESTING

UNLESS OTHERWISE DIRECTED BY THE ENGINEER, NO PROOF TESTING OF PRODUCTION GROUND ANCHORS IS ANTICIPATED AT THE NET LOCATION

DEBRIS NET MAINTENANCE

ON-GOING INSPECTION AND MAINTENANCE OF THE DEBRIS NET IS NECESSARY TO ENSURE THAT THE SYSTEM IS NOT DEGRADED BY IMPACT DAMAGE, CORROSION OR OTHER FACTOR. IT IS RECOMMENDED THAT THE SYSTEM BE INSPECTED AT A MINIMUM OF ONCE PER YEAR.

FOLLOWING ANY EVENT RESULTING IN THE ACCUMULATION OF DEBRIS IN THE NET THEN THE NET SHOULD BE CLEANED OUT AND ANY DAMAGED OR DEFORMED PARTS REPLACED.

ALL REMOVAL AND MAINTENANCE WORK SHALL BE DONE IN ACCORDANCE WITH ALL PROJECT AGREEMENTS REGARDING ACCESS AND DEBRIS DISPOSAL.

OWNER

SDF RESILIENCE INC
A CALIFORNIA PUBLIC BENEFIT CORPORATION
1470 EAST VALLEY ROAD
SUITE T, MONTECITO, CA 93108
TEL: (805) 689-6324

CONTRACTOR

ACCESS LIMITED CONSTRUCTION
1102 PIKE LANE
OCEANO, CA 93445
TEL: (805)592-2230

DISCLAIMER

THE VOLUME AND FORCE OF MATERIALS THAT MAY IMPACT THE DEBRIS FLOW NETS IN A RAINFALL EVENT IS UNPREDICTABLE AND SUBJECT TO SUCH FACTORS AS THE AMOUNT OF RAINFALL, THE CONDITION OF THE SOILS AND THE EXTENT OF VEGETATION UPSTREAM FOR THE NETS AT THE TIME OF THE EVENT. THE NET SIZES AND LOCATIONS HAVE BEEN DETERMINED USING SOUND ENGINEERING JUDGMENT IN ACCORDANCE WITH THE STANDARD OF PRACTICE AND ARE INTENDED TO REDUCE THE RISKS OF INJURY AND LOSS OF PROPERTY DOWNSTREAM FOR THE NETS. NO GUARANTEE OF THE THE SAFETY OF INDIVIDUALS AND PROPERTY DOWNSTREAM FROM THE NETS IS PROVIDED.

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SANTA YNEZ CA 93460
TEL: (818) 402-3962
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WWW.DRS-ENGINEERING.NET
DRS@DRS-ENGINEERING.NET

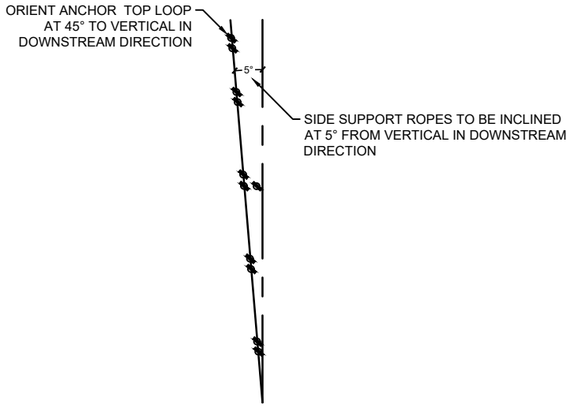
MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: CS-11
CONSTRUCTION NOTES

REGISTERED PROFESSIONAL ENGINEER
C 69911
Exp. 9.30.20
CIVIL
STATE OF CALIFORNIA

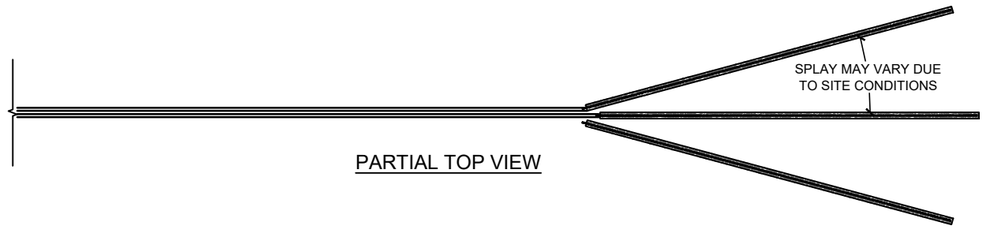
REV.	DESCRIPTION	DATE

PROJECT 2019-15

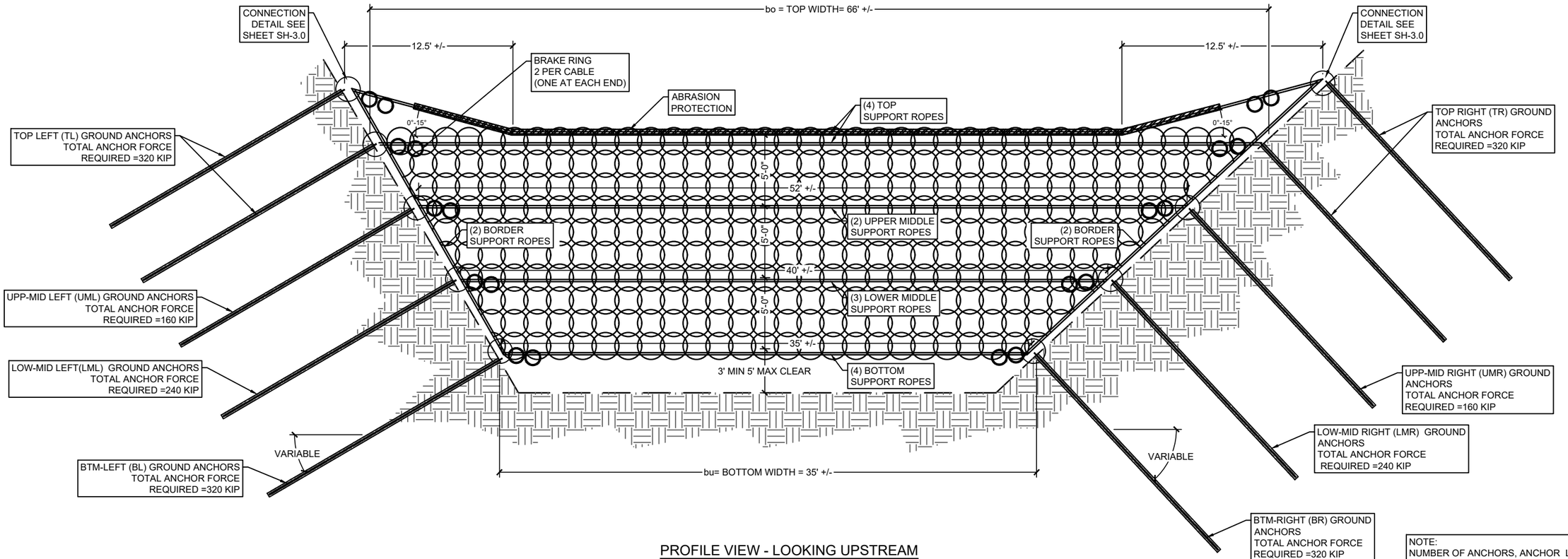
DATE	04-10-2019
DRAWN	ODO
CHECKED	DRS
SCALE	NOT TO SCALE
SHEET No.	SH-1.0



SIDE VIEW



PARTIAL TOP VIEW



PROFILE VIEW - LOOKING UPSTREAM

NOTE:
NUMBER OF ANCHORS, ANCHOR LENGTHS, DIAMETERS & DESIGN LOADS TO BE DETERMINED AFTER VERIFICATION TESTING.

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SANTA YNEZ CA 93460
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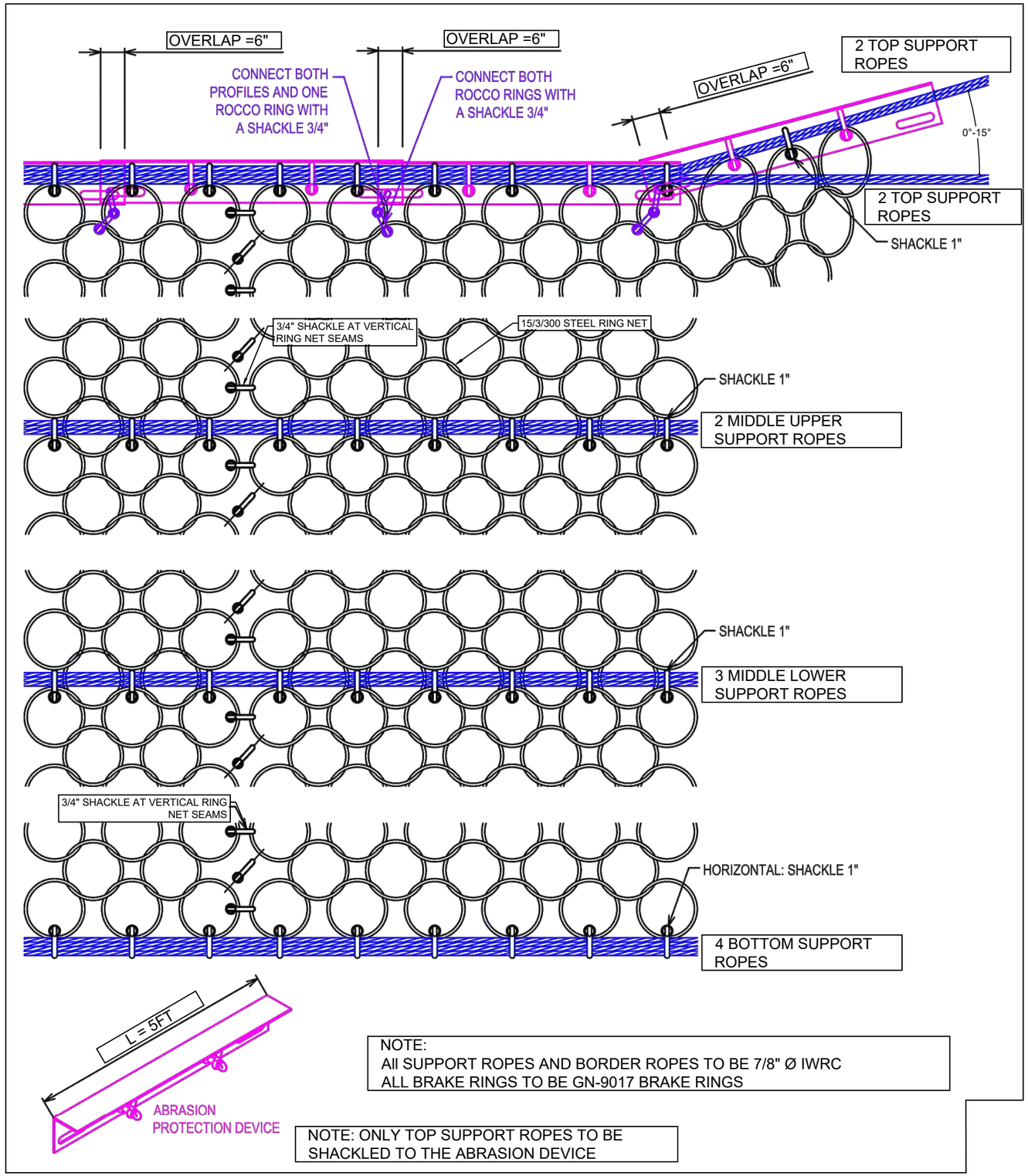
MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: CS-11
NET LAYOUT

REV.	DESCRIPTION	DATE
		04-10-2019

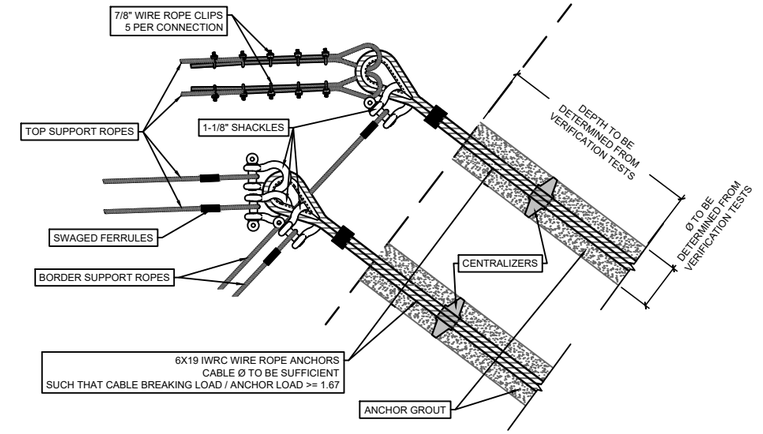
DRAWN: ODO
CHECKED: DRS
SCALE: NOT TO SCALE
SHEET No.: SH-2.0
PROJECT 2019-15

REGISTERED PROFESSIONAL ENGINEER
RICHARD S. DAVIS
C 69911
Exp. 9.30.20
STATE OF CALIFORNIA
CIVIL

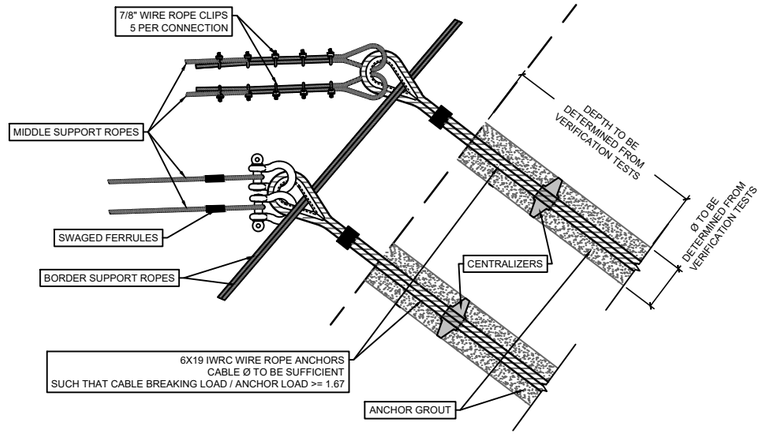


NOTE:
All SUPPORT ROPES AND BORDER ROPES TO BE 7/8" Ø IWRC
ALL BRAKE RINGS TO BE GN-9017 BRAKE RINGS

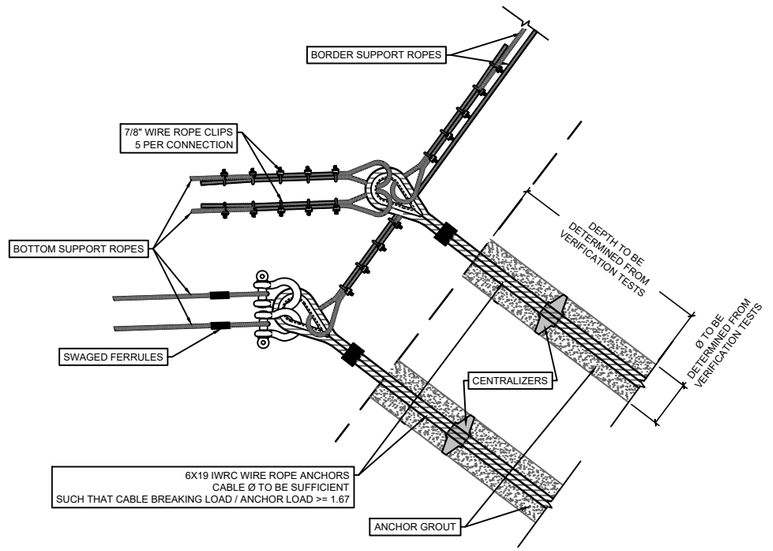
NOTE: ONLY TOP SUPPORT ROPES TO BE SHACKLED TO THE ABRASION DEVICE



TOP SUPPORT ROPE/ANCHOR CONNECTIONS



MIDDLE SUPPORT ROPE/ANCHOR CONNECTIONS



BOTTOM SUPPORT ROPE/ANCHOR CONNECTIONS

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PHASE IV - CONSTRUCTION
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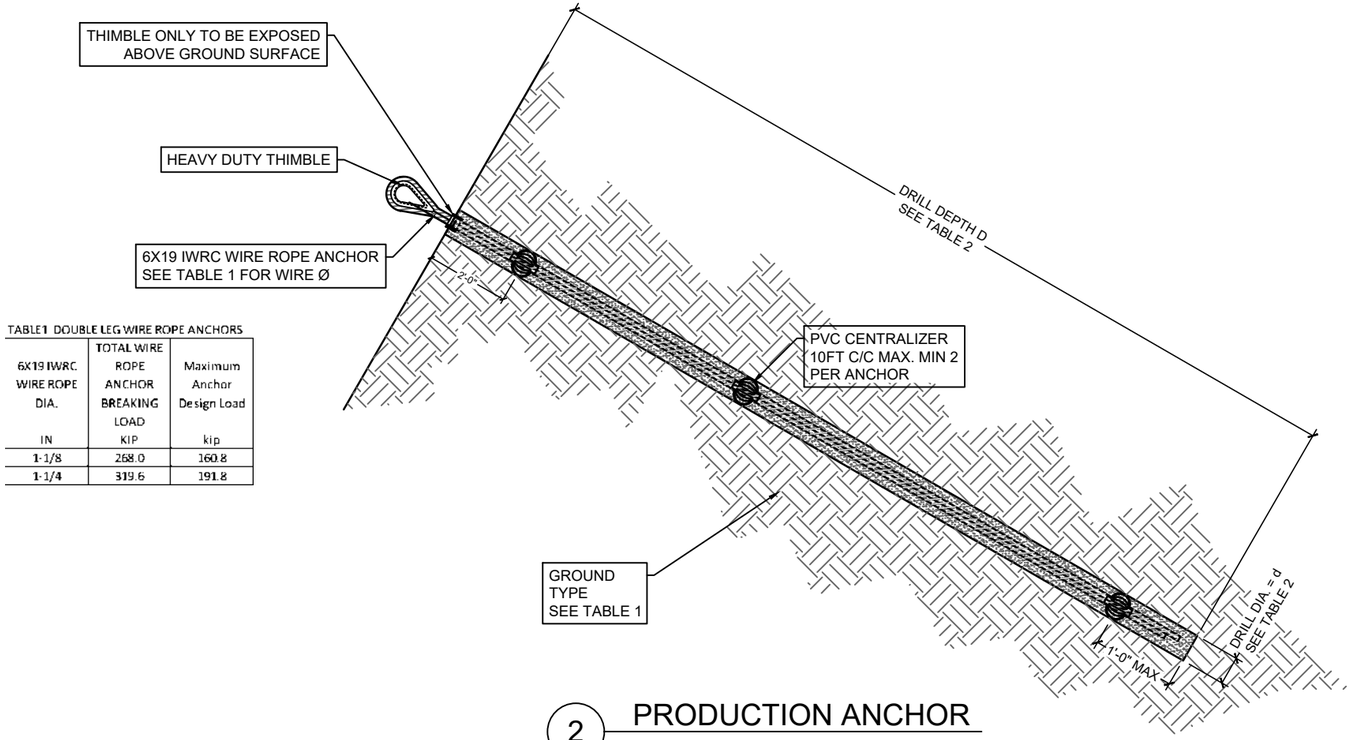

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MONTECITO DEBRIS FLOW MITIGATION
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Exp. 9.30.20
STATE OF CALIFORNIA
CIVIL

REV.	DESCRIPTION	DATE

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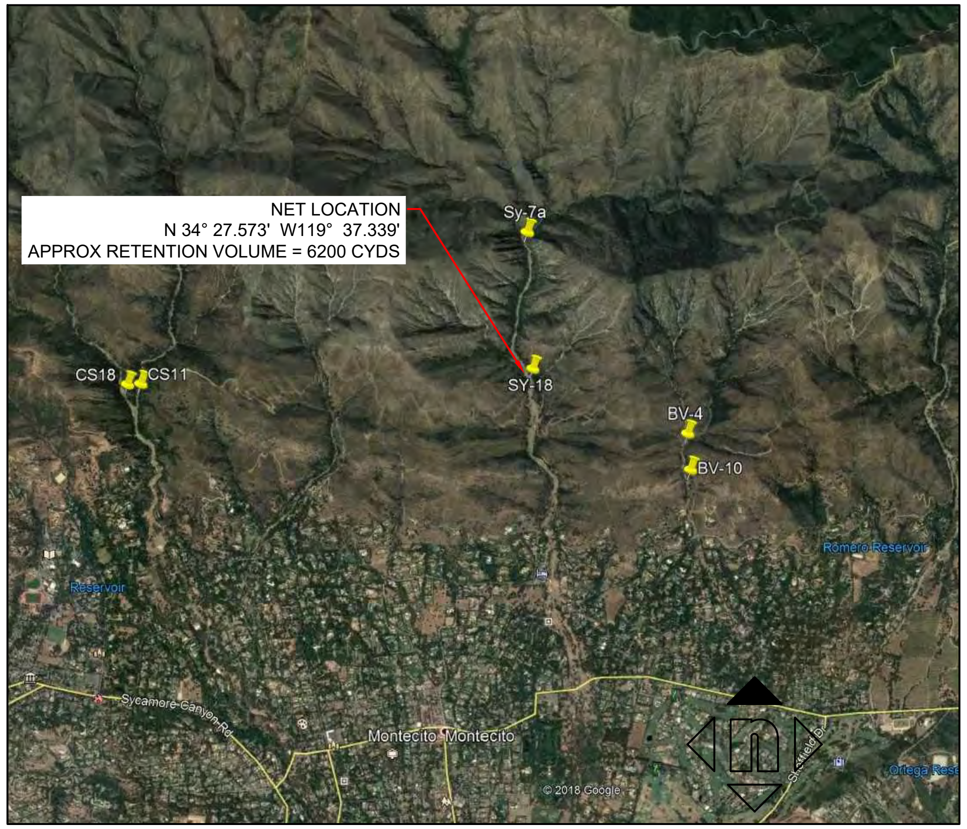
VICINITY MAP



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CODES AND SPECIFICATIONS

GROUND ANCHOR DESIGN - RECOMMENDATIONS FOR PRESTRESSED ROCK AND SOIL ANCHORS. POST TENSIONING INSTITUTE 2004

MATERIALS

STEEL
VX160-H6 DEBRIS FLOW NETS
SVX 180-H6 DEBRIS FLOW NETS ALL COMPONENTS FROM GEOBRUGG (AG)
REINFORCING STEEL: ASTM A-615 - GRADE 60
GROUND ANCHORS: 1-1/8" OR 1-1/4" DIA. 6x19 IWRC WIRE ROPE ANCHORS

CEMENTITIOUS
CEMENT: ASTM C-150, TYPE II / V
ANCHOR GROUT NEAT WATER/CEMENT GROUT 0.45 W/C RATIO F'C (28 DAY) = 4000PSI MIN.

MISCELLANEOUS
GALVANIZING: ASTM A123. JOB SITE FABRICATION AND REPAIRS IN ACCORDANCE WITH ASTM A780.
MEMBERS OR DETAILS MAY BE SUBSTITUTED FOR EQUIVALENT OR BETTER, AS APPROVED BY ENGINEER.

INSPECTIONS

THE WORK SHALL BE SUBJECT TO CONTINUOUS AND PERIODIC INSPECTIONS AS FOLLOWS;

VERIFICATION TESTING - CONTINUOUS INSPECTION BY ENGINEER

LAYOUT OF DEBRIS NETS AND ANCHORS -CONTINUOUS INSPECTION BY ENGINEER

DRILLING OF ANCHORS - CONTINUOUS INSPECTION BY DEPUTY INSPECTOR
- PERIODIC INSPECTION BY ENGINEER

CONSTRUCTION OF NETS - PERIODIC INSPECTION BY DEPUTY INSPECTOR AND ENGINEER
-FINAL INSPECTION BY ENGINEER.

DEPUTY INSPECTOR SHALL BE TRAINED BY ENGINEER PRIOR TO COMMENCEMENT OF WORK.

DEPUTY INSPECTOR SHALL REPORT ALL VARIATIONS FROM THESE PLANS TO THE ENGINEER FOR REVIEW AND APPROVAL.

GROUND ANCHOR VERIFICATION TESTING

VERIFICATION TESTS SHALL BE PERFORMED AT A REMOTE LOCATION WHERE GEOLOGICAL CONDITIONS ARE SIMILAR TO THE ACTUAL NET LOCATIONS.

A MINIMUM OF 6 VERIFICATION ANCHORS SHALL BE INSTALLED, TWO IN SANDSTONE ROCK, TWO IN SHALE ROCK AND TWO IN COLLUVIUM SOILS.

VERIFICATION TESTS SHALL BE DESIGNED BY THE ENGINEER TO TO FACILITATE THE ESTIMATION OF THE ULTIMATE / ALLOWABLE GROUT TO GROUND BOND STRESS IN EACH GROUND TYPE .

VERIFICATION TEST ANCHORS SHALL BE CONSTRUCTED BY THE SAME METHODS / EQUIPMENT AND TO THE SAME DIAMETERS THAT SHALL BE USED FOR ALL PRODUCTION ANCHORS.

TENDONS FOR VERIFICATION TEST ANCHORS SHALL BE DETERMINED BY THE ENGINEER TO ENSURE THAT THE LOADING DURING THE TEST DOES NOT EXCEED 80% OF THE THEORETICAL FAILURE LOAD OF THE TENDON

SECURELY BLOCK OUT THE FRONT ONE FOOT OF THE VERIFICATION TEST ANCHOR HOLE WITH LOOSE SOIL OR OTHER FLEXIBLE MATERIAL TO AVOID LOADING THE GROUT COLUMN DURING THE TEST. PERFORM VERIFICATION TESTING BY LOADING THE ANCHOR IN INCREMENT OF 10% OF THE ESTIMATED FAILURE LOAD UNTIL ANCHOR FAILURE OR UNTIL THE MAXIMUM ALLOWABLE TEST LOAD OF THE TENDON IS REACHED.

ALL LOAD INCREMENTS SHALL BE MAINTAINED WITHIN 5 PERCENT OF THE INTENDED LOAD. EACH LOAD INCREMENT SHALL BE HELD FOR A MINIMUM FOR 2 MINUTES UNLESS LONGER LOAD HOLDS ARE DIRECTED BY THE ENGINEER TO OBSERVE CREEP BEHAVIOR OF THE ANCHORS

MOVEMENT WITH RESPECT TO A FIXED REFERENCE TO AN ACCURARY OF 5/1000 " SHALL BE MEASURED AND RECORDED AT ALL LOAD INCREMENTS AND AT PRESCRIBED TIMES DURING CREEP TESTING (AS DETERMINED BY THE ENGINEER).

THE ENGINEER SHALL BE RESPONSIBLE FOR ANALYZING THE VERIFICATION TEST DATA AND DETERMINING THE ULTIMATE LOAD FOR EACH GROUND TYPE.

DEBRIS NET ERECTION

THE DEBRIS NETS SHALL BE ERECTED BY A CONTRACTOR WITH A MINIMUM OF 3 YEARS EXPERIENCE IN CONSTRUCTION GEOBRUGG DEBRIS FLOW NETS.

ERECTION SHALL COMPLY WITH THE REQUIREMENTS AND DETAILS OF THE FOLLOWING DOCUMENTS:
- GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM VX TYPE: VX160-H6, DRAWING NO. GD-1004.1E.
- GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM VX TYPE: VX160-H6, DRAWING NO. GD-1004.2E.
- GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM UX TYPE: UX180-H6, DRAWING NO. GD-1008.1E. (AS APPLICABLE)
- GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM UX TYPE: UX180-H6, DRAWING NO. GD-1008.2E. (AS APPLICABLE)
- GEOBRUGG AG (2017). DEBRIS FLOW PROTECTION SYSTEM UX TYPE: UX180-H6, DRAWING NO. GD-1008.3E. (AS APPLICABLE)
- GEOBRUGG AG (2015). DEBRIS FLOW PROTECTION SYSTEM ABRASION PLATE, DRAWING NO. GA-8055.

EXCEPT AS MODIFIED BY THESE PLANS

GROUND ANCHOR INSTALLATION

DRILLING:
HOLES SHALL BE DRILLED TO THE DIAMETER, DEPTH AND LINE AS INDICATED ON THE DRAWINGS. THE HOLE SHALL BE DRILLED SO THAT ITS DIAMETER IS NOT MORE THAN 1/4 INCH SMALLER THAN THE SPECIFIED DIAMETER. HOLES SHALL BE DRILLED AT AN INCLINATION AS SHOWN ON THESE DRAWING. TOLERANCES FOR DRILL HOLE LOCATION SHALL BE +ONE FOOT FOR HORIZONTAL AND VERTICAL POSITION AND WITHIN 2.5 DEGREES OF THE SPECIFIED ANCHOR GRADIENT UNLESS OTHERWISE APPROVED BY THE ENGINEER

HOLES SHALL BE CLEANED TO REMOVE MATERIAL RESULTING FROM DRILLING OPERATIONS.

ANCHOR TENDONS SHALL BE INSTALLED IN DRILLED HOLES IN AN EXPEDITIOUS MANNER SO THAT CAVING OR DETERIORATION OF THE DRILLED HOLES DOES NOT OCCUR.

WHERE THE ANCHOR TENDON CANNOT BE COMPLETELY INSERTED, THE CONTRACTOR SHALL REMOVE THE TENDON AND CLEAN OR RE-DRILL THE HOLE TO PERMIT UNOBSTRUCTED INSTALLATION. PARTIALLY INSTALLED TENDONS SHALL NOT BE DRIVEN OR FORCED INTO THE DRILLED HOLE AND WILL BE REJECTED. WHEN OPEN-HOLE DRILLING METHODS ARE BEING USED, THE CONTRACTOR SHALL HAVE HOLE CLEANING TOOLS ON SITE SUITABLE FOR CLEANING DRILLED HOLES ALONG THEIR FULL LENGTH JUST PRIOR TO TENDON INSERTION AND GROUTING.

THE LENGTH OF DRILLED HOLE SHALL BE VERIFIED AND RECORDED BY THE DEPUTY INSPECTOR BEFORE GROUTING.

CENTRALIZERS SHALL BE USED DURING INSTALLATION TO SUPPORT THE TENDON IN THE DRILLED HOLE.

PRIOR TO PLACEMENT, TENDONS SHALL BE FREE OF DIRT, DETRIMENTAL RUST OR ANY OTHER DELETERIOUS SUBSTANCES. DRILLED HOLES SHALL BE CLEARED OF ANY LOOSE ROCK FRAGMENTS, SOIL OR OTHER SUBSTANCES WHICH MAY PREVENT THE PROPER PLACEMENT OF THE TENDON OR GROUT.

TENDONS SHALL BE SECURELY FASTENED IN PLACE TO PREVENT MOVEMENT DURING GROUTING AND TO ASSURE THAT THE TENDON IS CENTRALLY LOCATED IN THE DRILL HOLE. THE DRILLED HOLE SHALL BE FILLED WITH GROUT FREE OF VOIDS OR INCLUSION OF FOREIGN MATERIAL. THE CONTRACTOR SHALL COMPLETELY GROUT THE DRILLED HOLE IN ONE CONTINUOUS OPERATION. COLD JOINTS SHALL NOT BE USED IN GROUT PLACEMENT.

TENDONS SHALL BE INSTALLED AND GROUTED IN THE SAME WORK SHIFT AS THE DRILLING OPERATION.

AFTER GROUTING, THE TENDON SHALL REMAIN UNDISTURBED FOR A MINIMUM OF 72 HRS.

GROUND ANCHOR PROOF TESTING

UNLESS OTHERWISE DIRECTED BY THE ENGINEER, NO PROOF TESTING OF PRODUCTION GROUND ANCHORS IS ANTICIPATED AT THE NET LOCATION

DEBRIS NET MAINTENANCE

ON-GOING INSPECTION AND MAINTENANCE OF THE DEBRIS NET IS NECESSARY TO ENSURE THAT THE SYSTEM IS NOT DEGRADED BY IMPACT DAMAGE, CORROSION OR OTHER FACTOR. IT IS RECOMMENDED THAT THE SYSTEM BE INSPECTED AT A MINIMUM OF ONCE PER YEAR.

FOLLOWING ANY EVENT RESULTING IN THE ACCUMULATION OF DEBRIS IN THE NET THEN THE NET SHOULD BE CLEANED OUT AND ANY DAMAGED OR DEFORMED PARTS REPLACED.

ALL REMOVAL AND MAINTENANCE WORK SHALL BE DONE IN ACCORDANCE WITH ALL PROJECT AGREEMENTS REGARDING ACCESS AND DEBRIS DISPOSAL.

OWNER

SDF RESILIENCE INC
A CALIFORNIA PUBLIC BENEFIT CORPORATION
1470 EAST VALLEY ROAD
SUITE T, MONTECITO, CA 93108
TEL: (805) 689-6324

CONTRACTOR

ACCESS LIMITED CONSTRUCTION
1102 PIKE LANE
OCEANO, CA 93445
TEL: (805)592-2230

DISCLAIMER

THE VOLUME AND FORCE OF MATERIALS THAT MAY IMPACT THE DEBRIS FLOW NETS IN A RAINFALL EVENT IS UNPREDICTABLE AND SUBJECT TO SUCH FACTORS AS THE AMOUNT OF RAINFALL, THE CONDITION OF THE SOILS AND THE EXTENT OF VEGETATION UPSTREAM FOR THE NETS AT THE TIME OF THE EVENT. THE NET SIZES AND LOCATIONS HAVE BEEN DETERMINED USING SOUND ENGINEERING JUDGMENT IN ACCORDANCE WITH THE STANDARD OF PRACTICE AND ARE INTENDED TO REDUCE THE RISKS OF INJURY AND LOSS OF PROPERTY DOWNSTREAM FOR THE NETS. NO GUARANTEE OF THE THE SAFETY OF INDIVIDUALS AND PROPERTY DOWNSTREAM FROM THE NETS IS PROVIDED.

DRS Engineering Inc.
3564 SAGUNTO ST. BOX 486
SANTA YNEZ CA 93460
TEL: (818) 402-3962
FAX: (818) 276-1922
WWW.DRS-ENGINEERING.NET
DRS@DRS-ENGINEERING.NET

MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: SY-18
CONSTRUCTION NOTES

REGISTERED PROFESSIONAL ENGINEER DAVID R. SHIELDS C 69911 Exp. 9.30.20 CIVIL STATE OF CALIFORNIA

REV.	DESCRIPTION	DATE

PROJECT 2019-15

DATE	04-10-2019
DRAWN	ODO
CHECKED	DRS
SCALE	NOT TO SCALE
SHEET No.	SH-1.0

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ORIENT ANCHOR TOP LOOP AT 45° TO VERTICAL IN DOWNSTREAM DIRECTION

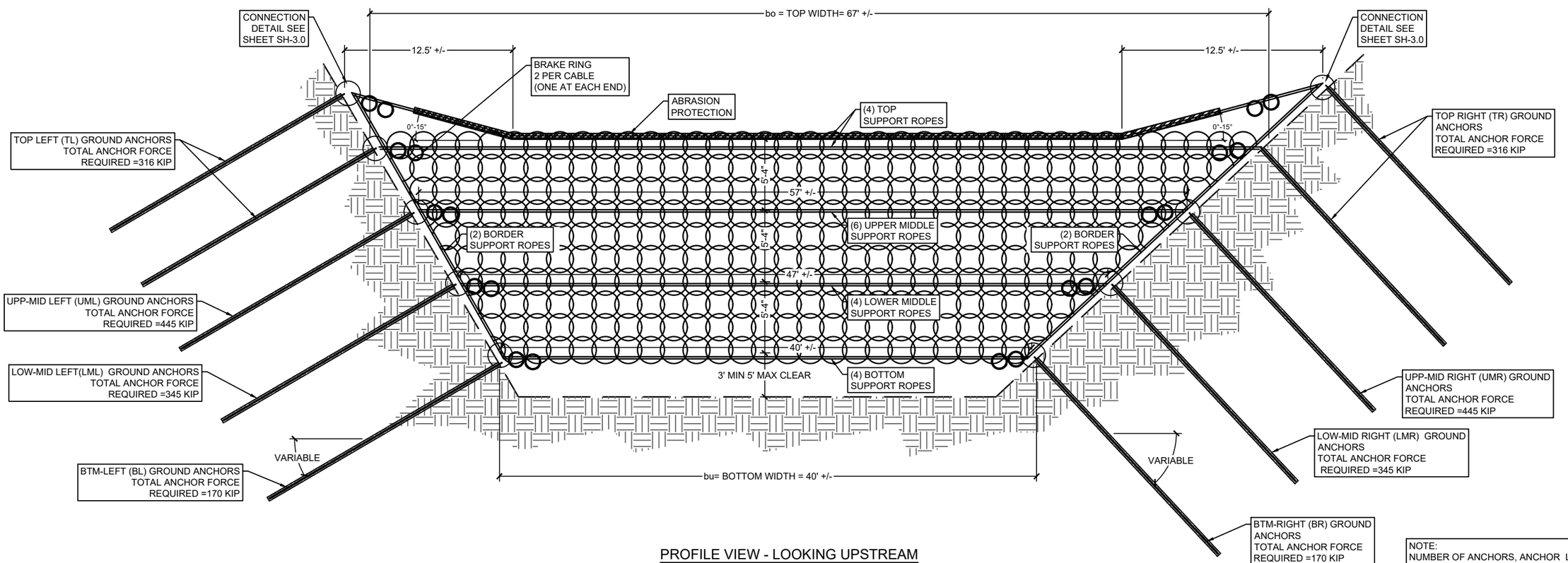
5°

SIDE SUPPORT ROPES TO BE INCLINED AT 5° FROM VERTICAL IN DOWNSTREAM DIRECTION

SIDE VIEW

SPLAY MAY VARY DUE TO SITE CONDITIONS

PARTIAL TOP VIEW



PROFILE VIEW - LOOKING UPSTREAM

NOTE:
NUMBER OF ANCHORS, ANCHOR LENGTHS, DIAMETERS & DESIGN LOADS TO BE DETERMINED AFTER VERIFICATION TESTING.

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Engineering Inc.
3564 SAGUNTO ST. BOX 486
SANTA YNEZ CA 93460
TEL: (818) 402-3962
FAX: (818) 276-1922
WWW.DRS-ENGINEERING.NET
DRS@DRS-ENGINEERING.NET

MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: SY-18
NET LAYOUT

REGISTERED PROFESSIONAL ENGINEER
RICHARD S. ORENSTEIN
C 69911
Exp. 9.30.20
STATE OF CALIFORNIA

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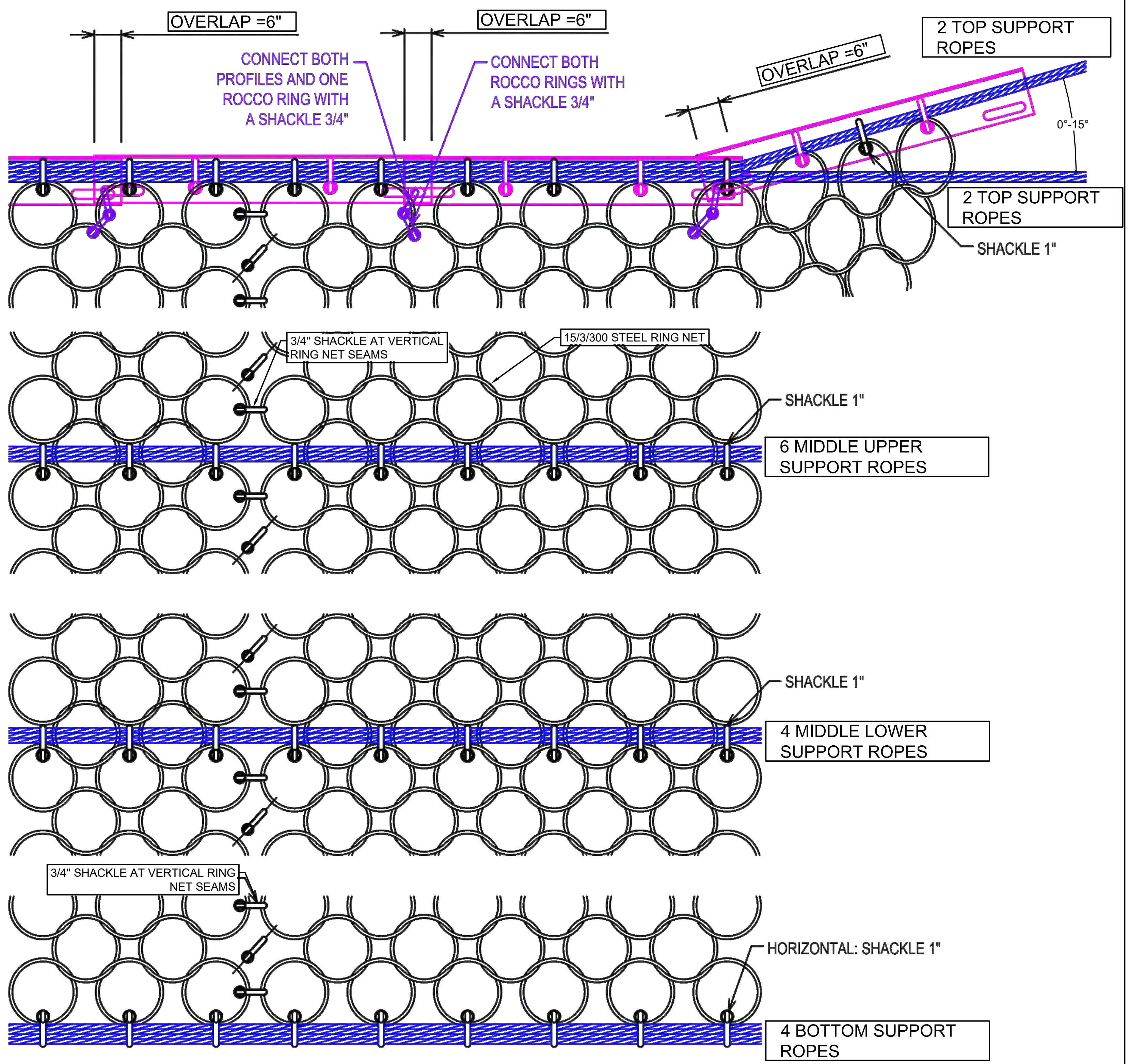
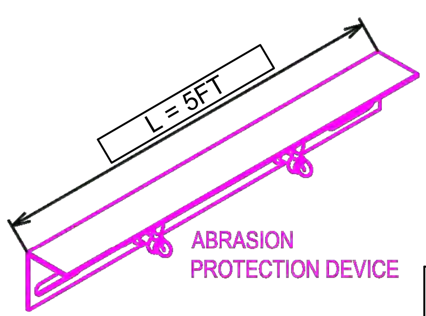
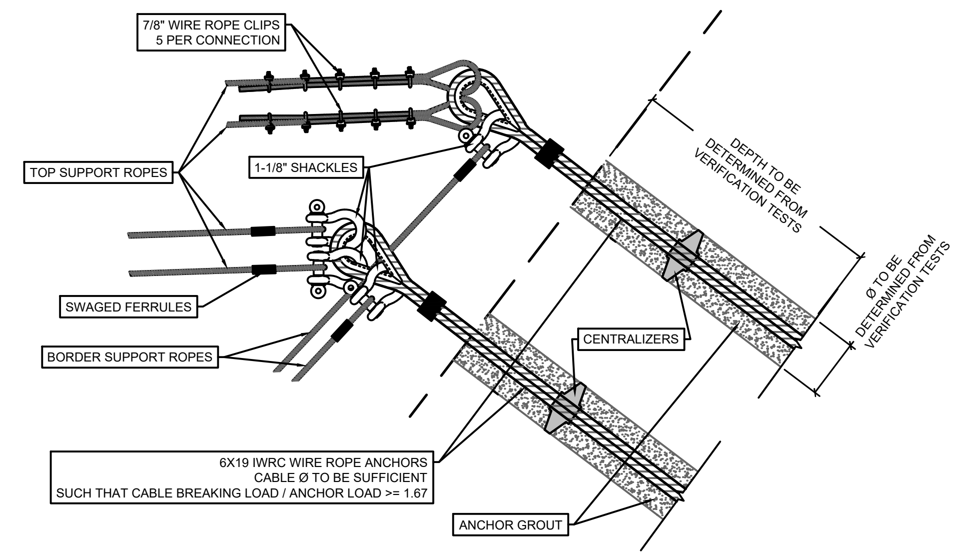
SHEET No. SH-2.0
PROJECT 2019-15



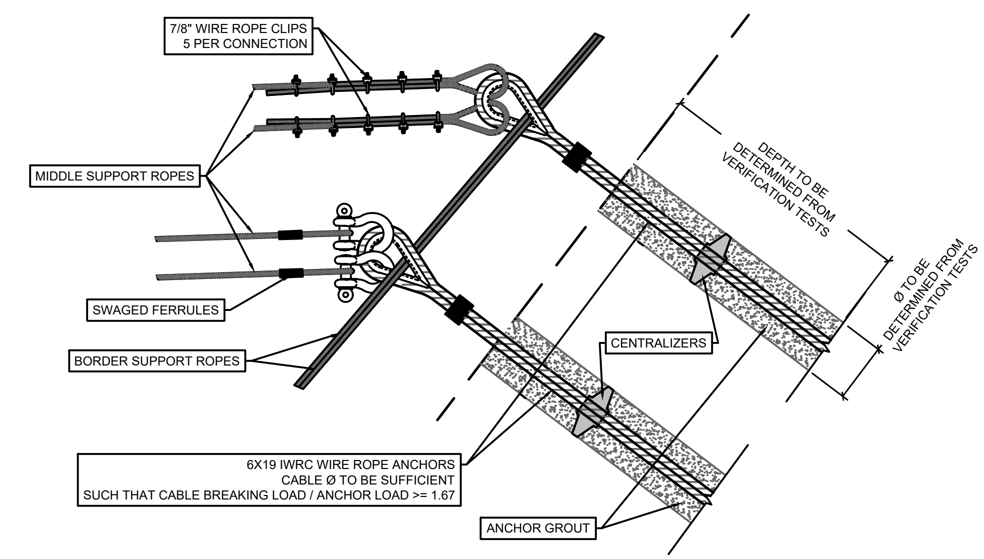


NOTE:
ALL SUPPORT ROPES AND BORDER ROPES TO BE 7/8" Ø IWRC
ALL BRAKE RINGS TO BE GN-9017 BRAKE RINGS

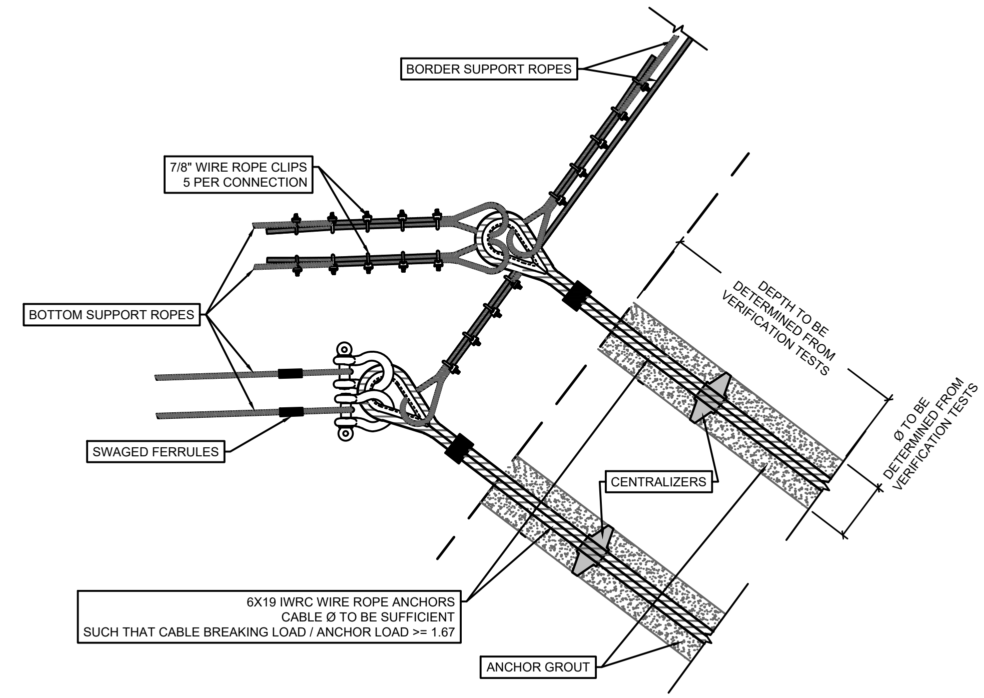
NOTE: ONLY TOP SUPPORT ROPES TO BE SHACKLED TO THE ABRASION DEVICE



TOP SUPPORT ROPE/ANCHOR CONNECTIONS



MIDDLE SUPPORT ROPE/ANCHOR CONNECTIONS



BOTTOM SUPPORT ROPE/ANCHOR CONNECTIONS

DRS Engineering Inc.
3564 SAGUNTO ST. BOX 486
SANTA YNEZ CA 93460
TEL: (818) 402-3962
FAX: (818) 276-1922
WWW.DRS-ENGINEERING.NET
DRS@DRS-ENGINEERING.NET

MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: SY-18
NET DETAILS

REGISTERED PROFESSIONAL ENGINEER
C 69911
Exp. 9.30.20
CIVIL
STATE OF CALIFORNIA

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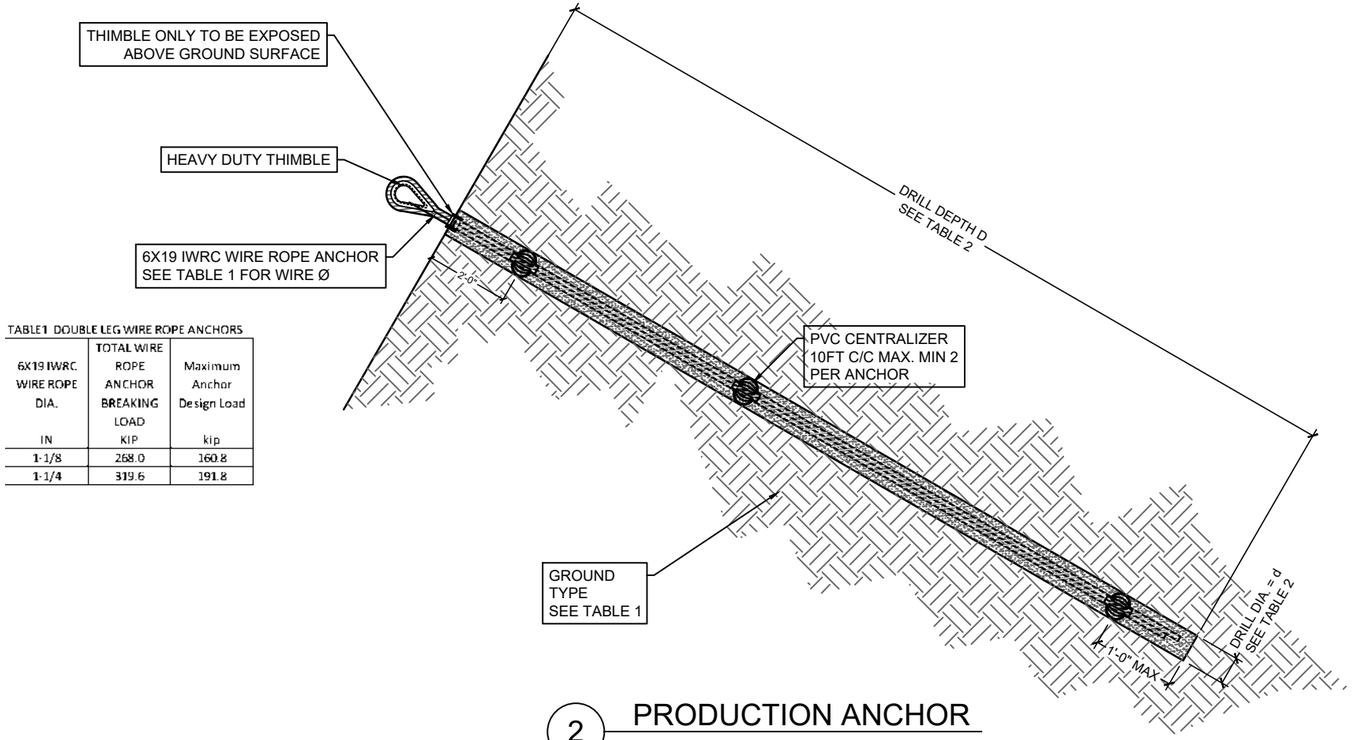

2 PRODUCTION ANCHOR

TABLE1 DOUBLE LEG WIRE ROPE ANCHORS

6X19 IWRC WIRE ROPE DIA. IN	TOTAL WIRE ROPE ANCHOR BREAKING LOAD KIP	Maximum Anchor Design Load kip
1-1/8	268.0	160.8
1-1/4	319.6	191.8

Trsnd = Allowable Load transfer rate in Sandstone (8kips/ft)
Trmixed = Allowable Load transfer rate in Mixed Soil and boulders (5 kips/ft)
P = Required Anchor Capacity

Table 2

Soil Type	Hole dia. in	Required Capacity kip	Drill Depth Required ft
Mixed Soil and Rock only	4.5	P	(P/5)+3
Sandstone only	4.5	P	(P/8)+1
Mixed Soil and Rock over Sandstone	4.5	P	((3*Dm) + P +23) / 8

Where Dm = Drill depth in mixed soil and rock

Table 3 Sy-18 - Anchor Loads and Expected Quantities

Anchor Location	TL Total Anchor Load Reqd. kip	Expected No. Anchors	Average Design Load Each Anchor kip	Min. Anchor Size
Top Left	316	2	158	1-1/4" Double Leg
Top Right	316	2	158	1-1/4" Double Leg
Upper Middle Left	445	3	148	1-1/4" Double Leg
Upper Middle Right	445	3	148	1-1/4" Double Leg
Lower Middle Left	345	2	173	1-1/4" Double Leg
Lower Middle Right	345	2	173	1-1/4" Double Leg
Bottom Left	170	2	85	1-1/4" Single Leg
Bottom Right	170	2	85	1-1/4" Single Leg
Total No Anchors		18		

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DRS@DRS-ENGINEERING.NET

MONTECITO DEBRIS FLOW MITIGATION
PHASE IV - CONSTRUCTION
NET: SY-18
ANCHOR DETAILS

REGISTERED PROFESSIONAL ENGINEER
DAVID R. SMITH
No. C 69911
Exp. 9.30.20
CIVIL
STATE OF CALIFORNIA

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