GENERAL INFORMATION

FOR PROJECT SPECIFICATIONS SEE REFERENCE NO. 10 MONTECITO DEBRIS FLOW MITIGATION PROJECT SPECIFICATIONS.

1. DETAILS SHOWN ON THE DRAWINGS ARE TYPICAL AND SIMILAR. DIMENSIONS, SCHEDULES, SPECIFIC NOTES, AND DETAILS TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. DIMENSIONS SHOWN ON THE DRAWINGS ARE BASED ON BEST AVAILABLE INFORMATION PROVIDED TO AND MAY NOT BE PRECISELY INDICATIVE OF FIELD CONDITIONS.

2. THE CONTRACTOR SHALL VERIFY ALL UTILITY LINES, DIMENSIONS, AND ELEVATIONS, AS WELL AS ANCHOR LOCATIONS, INDICATED ON THE DRAWINGS PRIOR TO ANY CLEARING, EXCAVATION, FABRICATION, OR CONSTRUCTION. CALL BEFORE YOU DIG.

3. ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS SHALL BE REVIEWED AND VERIFIED BY THE CONTRACTOR PRIOR TO THE START OF ANY CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY FOR CLARIFICATION.

SITE LAYOUT

1. PRIOR TO ORDERING MATERIALS FOR THE GEOBRUGG MITIGATION SYSTEMS, FIELD STAKE-OUT LIMITS, AND ANCHOR LOCATIONS SHALL BE ACCOMPLISHED USING THE DRAWINGS AS A GUIDE. NO MATERIALS SHALL BE ORDERED OR ANY CONSTRUCTION ACTIVITIES COMMENCED UNTIL THE GEOBRUGG MITIGATION SYSTEM STAKE-OUT HAVE BEEN REVIEWED AND APPROVED BY THE OWNER, CONTRACTOR, AND ENGINEER.

SITE ACCESS

1. SITE ACCESS TO REACH DEBRIS FLOW MITIGATION LOCATIONS SHALL BE AS DESCRIBED IN REFERENCE NO.1, SECTION 3.0 - DEBRIS FLOW MITIGATION TECHNICAL APPROACH.

CONTRACTOR QUALIFICATIONS

1. PRIOR TO PROJECT BIDDING, THE CONTRACTOR SHALL MEET THE REQUIRED QUALIFICATIONS NOTED IN THE REFERENCED PROJECT SPECIFICATIONS SECTION 1-2 "CONTRACTOR QUALIFICATIONS".

CONTRACTOR SUBMITTALS

1. THE CONTRACTOR SHALL DEVELOP AND SUBMIT A "PROJECT SUBMITTAL DOCUMENT PACKAGE" TO THE ENGINEER NO LESS THAN ONE WEEK PRIOR TO CONSTRUCTION COMMENCEMENT. THE SUBMITTAL PACKAGE DOCUMENT SHALL BE IN PORTABLE DOCUMENT FORMAT (PDF) FORM AND ALL INFORMATION CONTAINED SHALL BE LEGIBLE. THE SUBMITTAL PACKAGE SHALL INCLUDE;

   1.1. CONTRACTOR QUALIFICATIONS AS DESCRIBED IN THE REFERENCED PROJECT SPECIFICATIONS SECTION 1-2 "CONTRACTOR QUALIFICATIONS".

   1.2. PROJECT START DATE AND SCHEDULE THAT INCLUDES A DETAILED CONSTRUCTION SEQUENCE.

   1.3. DRILLING, GROUTING METHODS AND EQUIPMENT TO BE USED ON THE PROJECT.

   1.4. ALL APPROPRIATE MATERIAL AND INSTALLATION DOCUMENTATION TO BE USED ON THE PROJECT INCLUDING; MATERIAL SPECIFICATION SHEETS, MANUALS, PRODUCT TECHNICAL DATA, MANUFACTURER'S NAMES, ASTM CONFORMANCE, MATERIAL HANDLING SHEETS AND WARRANTIES.

   1.5. PROPOSED GROUT MIX DESIGN AND COMPRESSIVE STRENGTH DATA
   1.5.1. TO THE ENGINEER FOR APPROVAL A MINIMUM OF ONE WEEK PRIOR TO GROUTING COMMENCEMENT.

   1.6. ANCHOR TESTING EQUIPMENT, CALIBRATION CERTIFICATES, AND LOADING GRAPHS TO THE ENGINEER FOR APPROVAL A MINIMUM ONE WEEK PRIOR TO TESTING.

   1.7. ANCHOR TESTING CRIBBING (LOAD FRAME) INFORMATION FOR MATERIALS TO BE USED.

2. THE ENGINEER SHALL APPROVE OR REJECT THE CONTRACTORS SUBMITTAL WITHIN FIVE (5) WORKING DAYS AFTER RECEIPT. WORK SHALL NOT BE STARTED NOR MATERIALS ORDERED UNTIL THE CONTRACTOR'S SUBMITTAL HAS BEEN APPROVED BY THE ENGINEER. APPROVAL OF THE CONSTRUCTION PLAN DOES NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY FOR THE SUCCESSFUL COMPLETION OF THE WORK.

REQUESTS FOR INFORMATION (RFI)

1. SUBSTITUTION REQUESTS OR REQUESTS FOR INFORMATION (RFI) SHALL BE SUBMITTED BY THE CONTRACTOR IN WRITING AND APPROVED BY THE ENGINEER PRIOR TO ANY CHANGE IMPLEMENTATION.

PERMITTING

1. THE CONTRACTOR SHALL MEET ALL STATE OF CALIFORNIA AND LOCAL PERMITTING REQUIREMENTS AND SHALL OBTAIN ALL NECESSARY PERMITS BEFORE CONSTRUCTION COMMENCES. CONTRACTOR SHALL OBTAIN SITE-SPECIFIC PERMITS INCLUDING, BUT NOT LIMITED TO, HOT WORK PERMITS (IF APPLICABLE) WHEN REQUIRED FOR ANY ACTIVITY THAT CAN BE A SOURCE OF IGNITION WHEN FLAMMABLE MATERIAL IS PRESENT OR CAN BE A POTENTIAL FIRE HAZARD.

ON-SITE SPECIAL INSPECTIONS

1. ON-SITE SPECIAL INSPECTIONS ARE RECOMMENDED TO BE PERFORMED FOR THE PROJECT TO ENSURE CONSTRUCTION IS IN CONFORMANCE WITH THE ENGINEERING DESIGN, SPECIFICATIONS, AND CONSTRUCTION DRAWINGS. SEE THE PROJECT SPECIFICATIONS SECTION 7 "SPECIAL INSPECTIONS" FOR ADDITIONAL INFORMATION. ON-SITE SPECIAL INSPECTIONS INCLUDE;
   1.1. SITE LAYOUT / FIELD STAKEOUT
   1.2. ANCHOR TESTING OBSERVATION
   1.3. FINAL INSPECTION

CONSTRUCTION OVERSIGHT

1. TO ENSURE THAT THE PROJECT DURING CONSTRUCTION IS IN CONFORMANCE WITH THE ENGINEERING DESIGN, SPECIFICATIONS, AND CONSTRUCTION DRAWINGS IT IS RECOMMENDED THAT KANE GEOTECH, INC. BE RETAINED TO OBSERVE CONSTRUCTION OVERSIGHT DURING THE PROJECT. KANE GEOTECH, INC. IS NOT RESPONSIBLE FOR CONSTRUCTION PERFORMED WITHOUT ITS OVERSIGHT.

DISCLAIMER

1. DEBRIS FLOW EVENTS CAN BE SPORADIC AND UNPREDICTABLE. CAUSES RANGE FROM HUMAN CONSTRUCTION TO ENVIRONMENTAL EFFECTS (WEATHER, EARTHQUAKES, ETC.). BECAUSE OF THE MULTIPLICITY OF FACTORS AFFECTING SUCH EVENTS IT IS NOT, AND CANNOT BE, AN EXACT SCIENCE THAT GUARANTEES THE SAFETY OF INDIVIDUALS AND PROPERTY. HOWEVER, BY THE APPLICATION OF SOUND ENGINEERING PRINCIPLES TO A PREDICTABLE RANGE OF PARAMETERS, THE RISK OF INJURY AND PROPERTY LOSS CAN BE SUBSTANTIALLY REDUCED USING PROPERLY DESIGNED PROTECTION MEASURES IN IDENTIFIED RISK AREAS.

2. INSPECTION AND MAINTENANCE OF SUCH SYSTEMS ARE NECESSARY TO ENSURE THE DESIRED PROTECTION LEVEL IS NOT DEGRADED BY IMPACT DAMAGE, CORROSION, OR OTHER FACTORS.

REFERENCES

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2. GEOBRUGG NORTH AMERICA (2017). WIRE ROPE STRENGTH PROPERTIES CHART. 22 CENTRO ALGODONES, NEW MEXICO.

3. GEOBRUGG AG (2018). DEBFLOW ONLINE TOOL. CH-8590 ROMANSHORN, SWITZERLAND.

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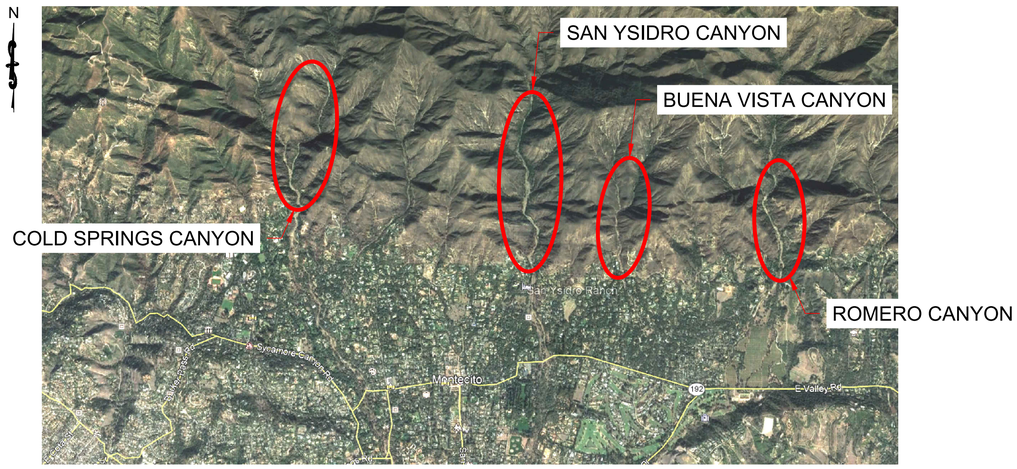
MONTECITO DEBRIS FLOW MITIGATION

GEOBRUGG SVX AND VX
DEBRIS FLOW MITIGATION SYSTEMS
SANTA BARBARA COUNTY, CALIFORNIA

INDEX OF SHEETS



P-1 / 1 PROJECT LOCATION
SCALE: N.T.S.

TITLE SHEET

2018 10-23: Buena Vista Canyon Site BV-1 Location Removed.
2018 12-12: Hot Springs Canyon Layout Sheet Removed.

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Montecito Debris Flow Mitigation
Debris Flow Mitigation Systems
Santa Barbara County, California

PREPARED AT THE REQUEST OF
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Montecito, California

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SHEET 1 OF 15

DRAWN BY: BJF/JAM
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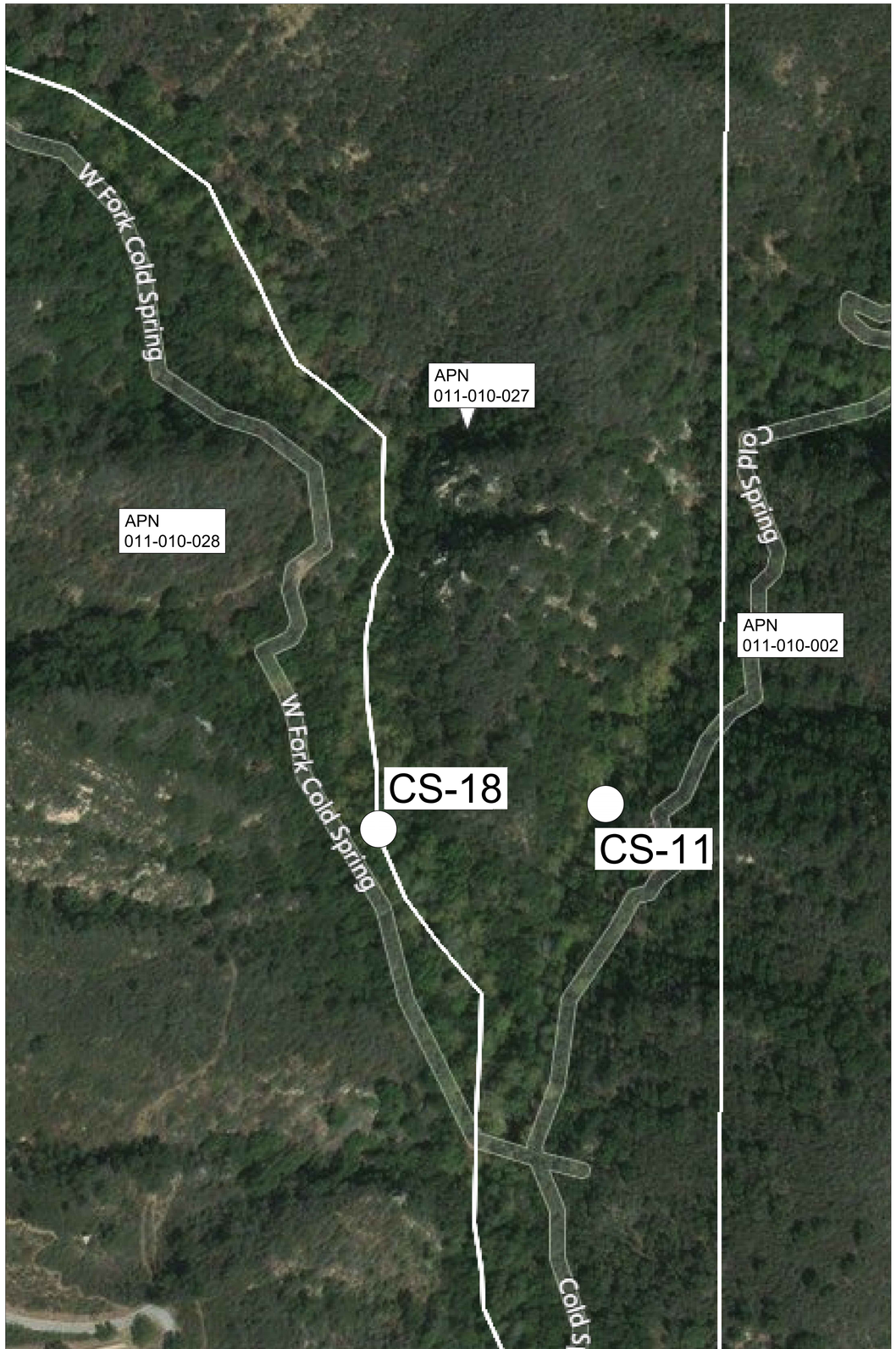
CHECKED BY: WFK
SCALE: N.T.S.
DATE: 2018 10-04
PROJECT NO: KGT18-18



IMAGERY LOCATION NOTE:

1. LOCATIONS OF STREAMS AS DEPICTED ON THE AERIAL IMAGES ARE NOT PRECISE SHOULD BE CONSIDERED APPROXIMATE. DEBRIS NETS WERE LOCATED IN THE FIELD USING GPS EQUIPMENT AND SHOULD BE CONSIDERED ACCURATE.

COLD SPRING CANYON DEBRIS FLOW MITIGATION LOCATION SCHEDULE

NET DESIGNATION	GEOBRUGG SYSTEM TYPE	GPS LOCATION COORDINATES	EST. DEBRIS RETENTION VOLUME
CS-11	VX160-H6	N 34° 27.613' W 119° 39.245'	3,850 CY
CS-18	SVX180-H6	N 34° 27.615' W 119° 39.300'	5,800 CY
		TOTAL	**9,650 CY**

NOTE: ESTIMATED DEBRIS FLOW RETENTION VOLUME UNIT: CUBIC YARDS (CY)

N

100' 50' 0' 100' 200' 300'

LAYOUT SCALE
SCALE: 1 INCH = 100 FEET

COLD SPRING CANYON DEBRIS FLOW MITIGATION LOCATIONS

2018 12-12: Revised Plan Sheet Numbering. Sheet 2 of 15.

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SHEET 2 OF 15

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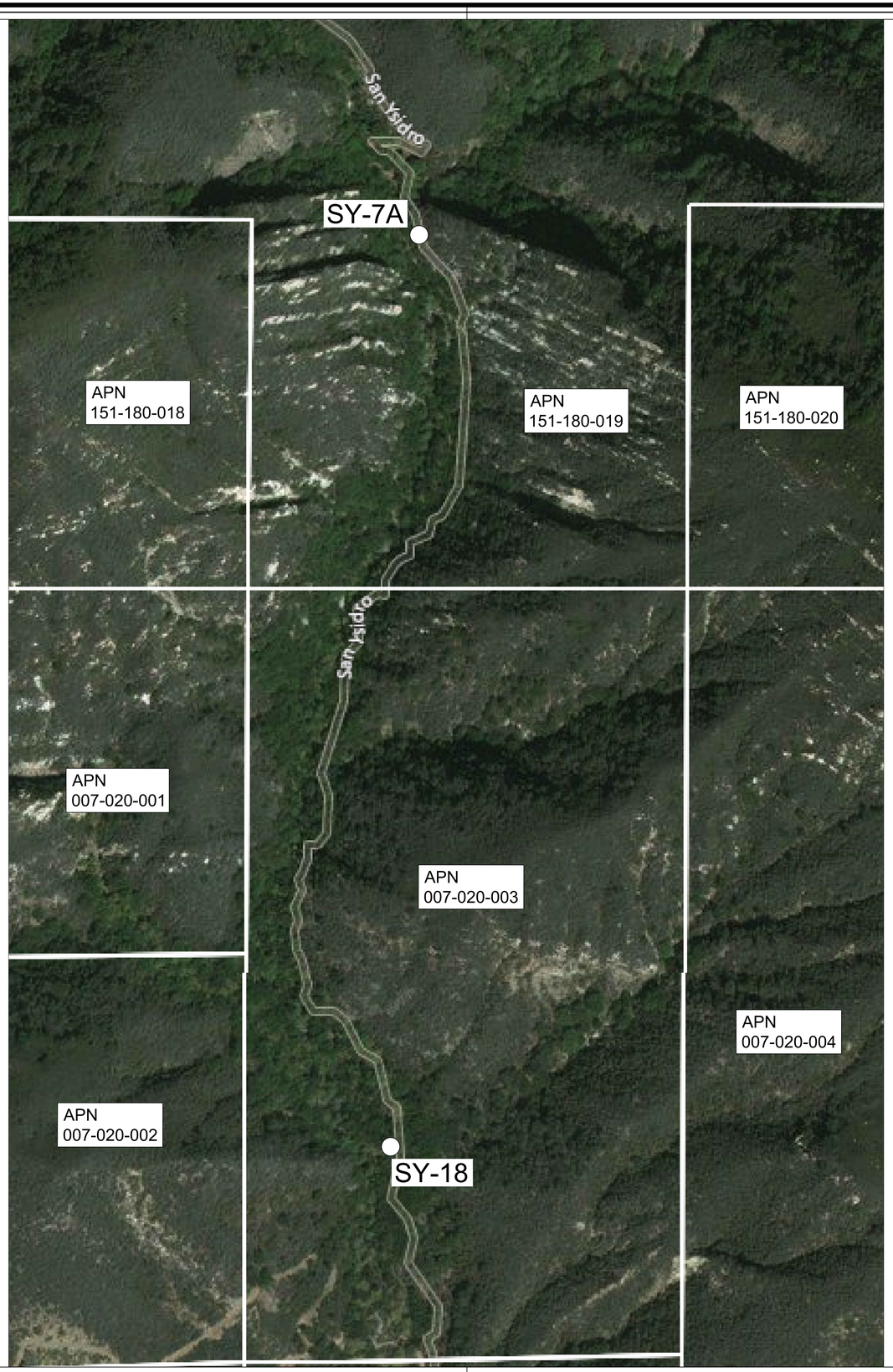

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SAN YSIDRO CANYON DEBRIS FLOW MITIGATION LOCATION SCHEDULE			
NET DESIGNATION	GEOBRUGG NET TYPE	GPS LOCATION COORDINATES	EST. DEBRIS RETENTION VOLUME
SY-7A	SVX180-H6	N 34° 28.087' W 119° 37.378'	9,750 CY
SY-18	SVX180-H6	N 34° 27.573' W 119° 37.399'	6,200 CY
		TOTAL	**15,950 CY**

NOTE: ESTIMATED DEBRIS FLOW RETENTION VOLUME UNIT: CUBIC YARDS (CY)

N

500' 250' 0' 500' 1,000' 1,500'

LAYOUT SCALE
SCALE: 1 INCH = 500 FEET

SAN YSIDRO CANYON DEBRIS FLOW MITIGATION LOCATIONS

2018 12-12: Revised Plan Sheet Numbering. Sheet 3 of 15.

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SHEET 3 OF 15

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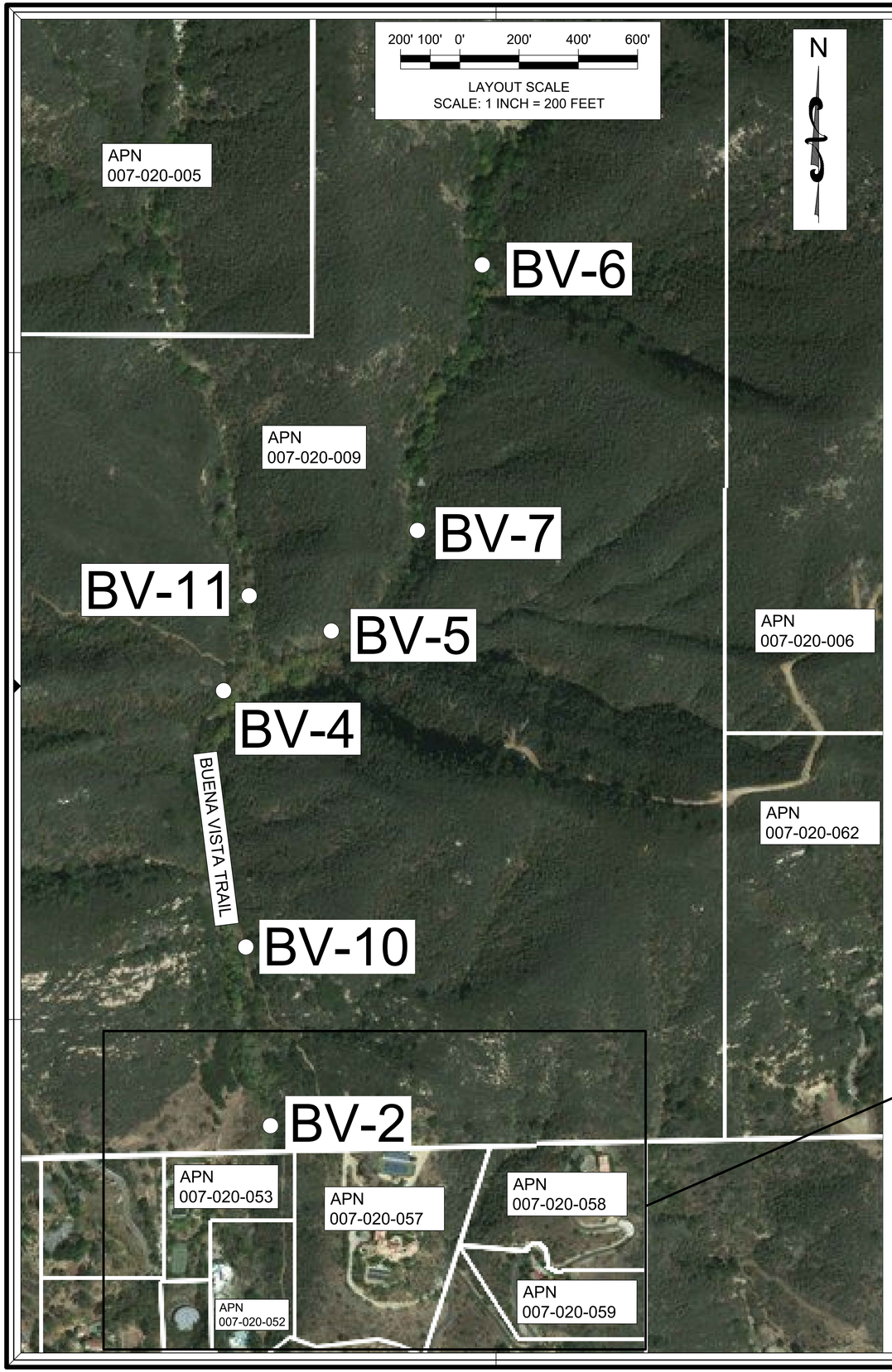

IMAGERY LOCATION NOTE:

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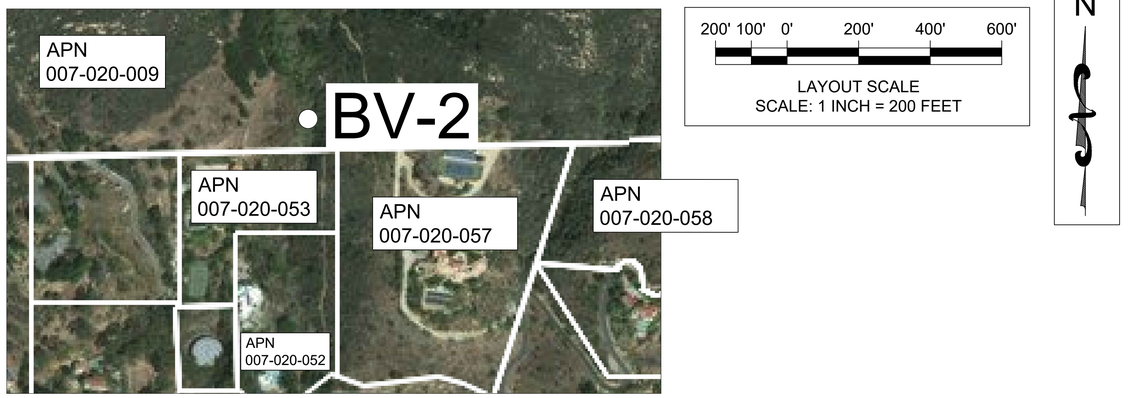
BUENA VISTA CANYON DEBRIS FLOW MITIGATION LOCATION SCHEDULE

NET DESIGNATION	GEOBRUGG NET TYPE	GPS LOCATION COORDINATES	EST. DEBRIS RETENTION VOLUME
BV-2	VX140-H4	N 34° 27.048' W 119° 36.664'	1,300 CY
BV-4	SVX180-H6	N 34° 27.284' W 119° 36.690'	7,200 CY
BV-5	VX140-H4	N 34° 27.317' W 119° 36.622'	1,900 CY
BV-6	VX160-H6	N 34° 27.502' W 119° 36.527'	2,350 CY
BV-7	VX160-H6	N 34° 27.368' W 119° 36.568'	6,950 CY
BV-10	VX160-H6	N 34° 27.146' W 119° 36.676'	4,500 CY
BV-11	SVX180-H6	N 34° 27.338' W 119° 36.677'	14,400 CY
		TOTAL	**42,100 CY**

NOTE: ESTIMATED DEBRIS FLOW RETENTION VOLUME UNIT: CUBIC YARDS (CY)



BUENA VISTA CANYON DEBRIS FLOW MITIGATION LOCATIONS

REVISED
2018 10-23: Removed Site BV-1.
2018 12-12: Revised Plan Sheet Numbering. Sheet 4 of 15.

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SHEET 4 OF 15

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SCALE: 1" = 200'-0"
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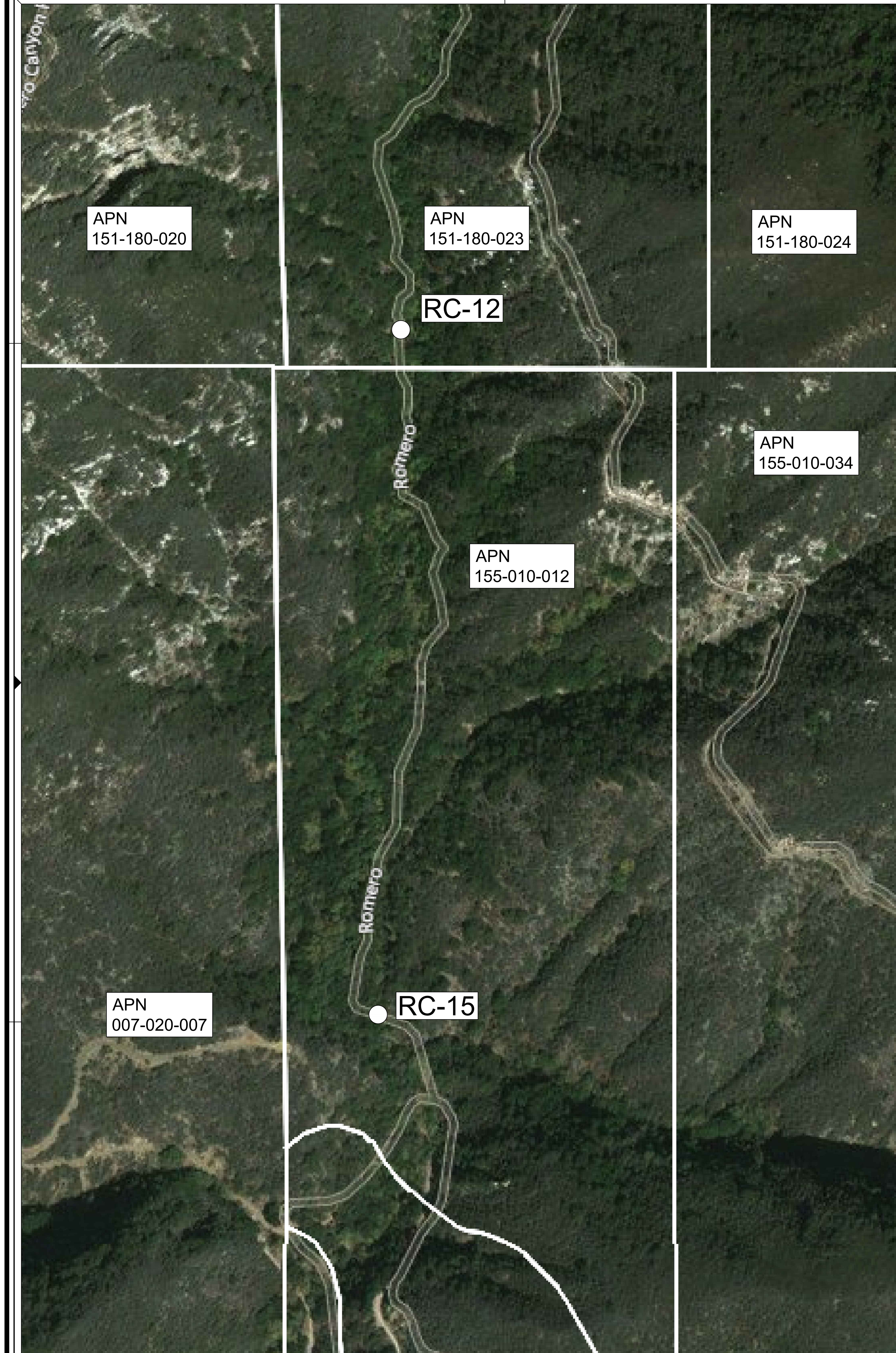

IMAGERY LOCATION NOTE:

1. LOCATIONS OF STREAMS AS DEPICTED ON THE AERIAL IMAGES ARE NOT PRECISE SHOULD BE CONSIDERED APPROXIMATE. DEBRIS NETS WERE LOCATED IN THE FIELD USING GPS EQUIPMENT AND SHOULD BE CONSIDERED ACCURATE.

ROMERO CANYON DEBRIS FLOW MITIGATION LOCATION SCHEDULE

NET LOCATION DESIGNATION	GEOBRUGG SYSTEM TYPE	GPS LOCATION COORDINATES	EST. DEBRIS RETENTION VOLUME
RC-12	SVX180-H6	N 34° 27.908'	2,700 CY
		W 119° 35.457'	
RC-15	VX160-H6	N 34° 27.525'	1,250 CY
		W 119° 35.490'	
		TOTAL	**3,950 CY**

NOTE: ESTIMATED DEBRIS FLOW RETENTION VOLUME UNIT: CUBIC YARDS (CY)

N

200' 100' 0' 200' 400' 600'

LAYOUT SCALE
SCALE: 1 INCH = 200 FEET

ROMERO CANYON DEBRIS FLOW MITIGATION LOCATIONS

2018 12-12: Revised Plan Sheet Numbering, Sheet 5 of 15.

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SHEET 5 OF 15

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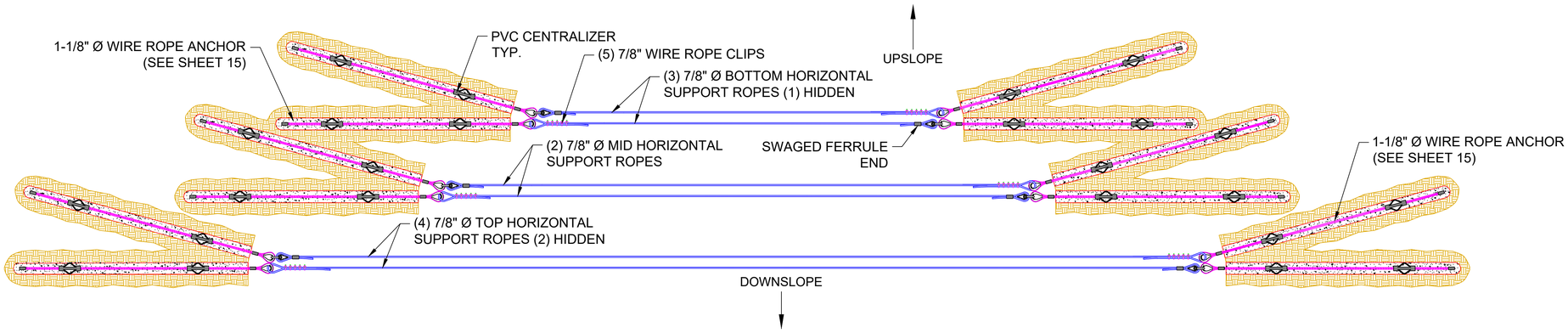
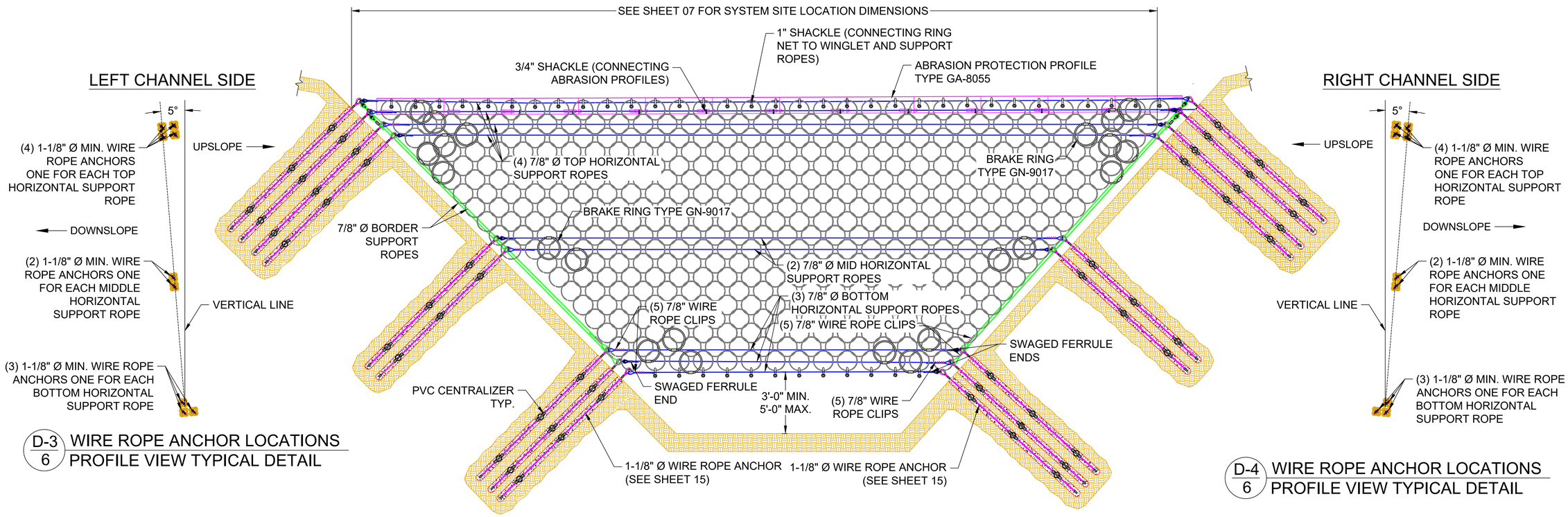


D-1 / 6 GEOBRUGG VX140-H4 DEBRIS FLOW MITIGATION SYSTEM PLAN VIEW

SCALE: N.T.S.



D-3 / 6 WIRE ROPE ANCHOR LOCATIONS PROFILE VIEW TYPICAL DETAIL

D-4 / 6 WIRE ROPE ANCHOR LOCATIONS PROFILE VIEW TYPICAL DETAIL

D-2 / 6 GEOBRUGG VX140-H4 DEBRIS FLOW MITIGAITON SYSTEM ELEVATION VIEW

SCALE: N.T.S.

NOTES:

1. MIDDLE HORIZONTAL SUPPORT ROPES INSTALLED ON THE DOWNSLOPE (VALLEY) SIDE OF THE GEOBRUGG ROCCO® RING NET
2. DETAIL D-2/6 ELEVATION VIEW IS LOOKING UPSTREAM DIRECTION.
3. ANCHORS SHALL NOT BE INSTALLED WITHIN 0.5 x BOREHOLE DIAMETER OF EACH OTHER.

GEOBRUGG VX140-H4 ELEVATION AND PLAN TYPICAL DETAILS

2018 12-12: Revised Plan Sheet Numbering. Sheet 6 of 15.

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SHEET 6 OF 15

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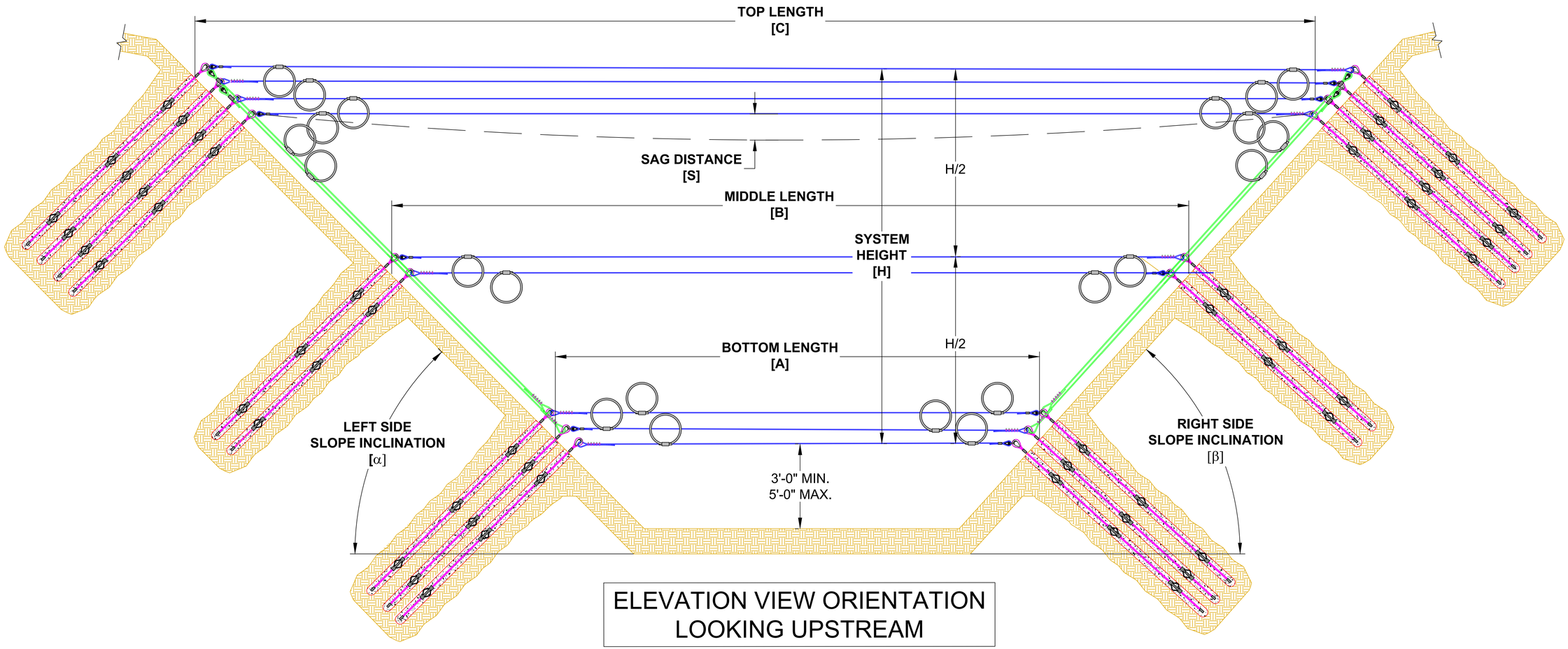
GEOBRUGG VX140-H4 DEBRIS FLOW MITIGATION SYSTEM DIMENSIONAL SCHEDULE							
LOCATION DESIGNATION	SYSTEM HEIGHT [**H**] (FT)	BOTTOM LENGTH [**A**] (FT)	MIDDLE LENGTH [**B**] (FT)	TOP LENGTH [**C**] (FT)	ALLOWABLE SAG DISTANCE [**S**] (FT)	LEFT SIDE AVG. SLOPE INCLINATION [α](DEG.)	RIGHT SIDE AVG. SLOPE INCLINATION [β](DEG.)
BUENA VISTA BV-2	10	14	30	41	1	35	33
BUENA VISTA BV-5	12	27	34	37	1	70	80

NOTE: SLOPE INCLINATIONS FROM HORIZONTAL PROVIDED ARE AVERAGED.



ELEVATION VIEW ORIENTATION
LOOKING UPSTREAM

NOTES:

1. GEOBRUGG VX140-H4 DEBRIS FLOW MITIGATION SYSTEM DIMENSIONS AND CHANNEL GEOMETRIES ARE APPROXIMATE.
2. DETAIL D-1/7 ELEVATION VIEW IS LOOKING UPSTREAM DIRECTION.

D-1/7 GEOBRUGG VX140-H4 DEBRIS FLOW MITIGATION SYSTEM
TYPICAL DIMENSIONAL ELEVATION VIEW

SCALE: N.T.S.

GEOBRUGG VX140-H4 LOCATION DIMENSIONS

2018 12-12: Revised Plan Sheet Numbering. Sheet 7 of 15.

REVISED

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SHEET 7 OF 15

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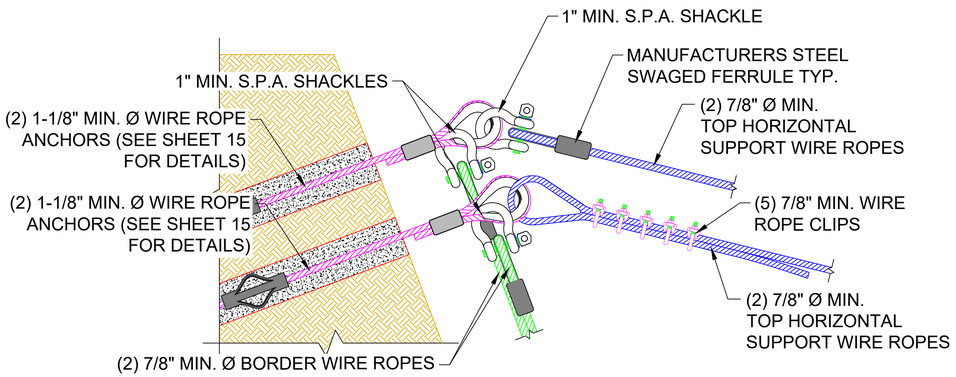
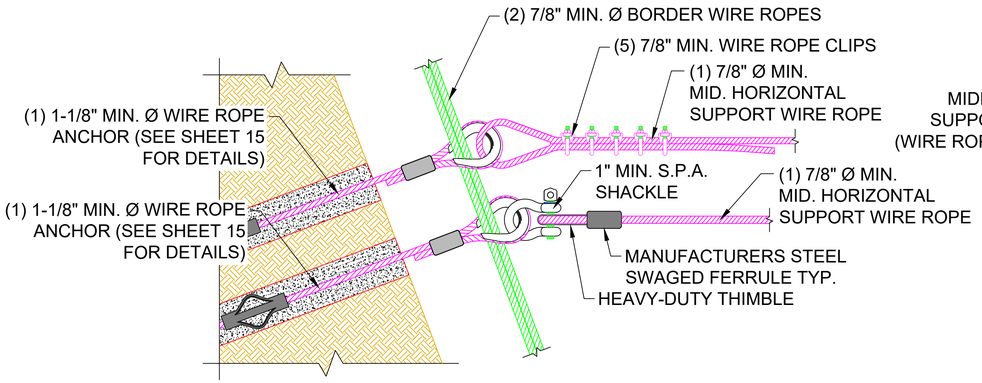
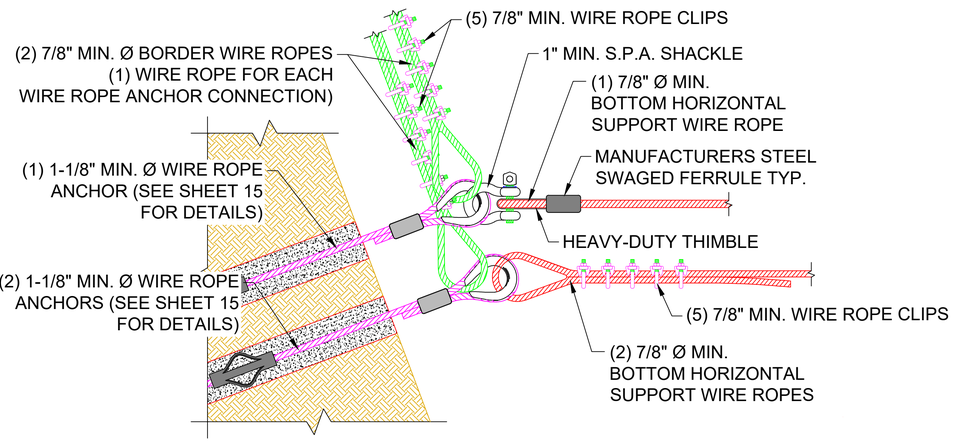


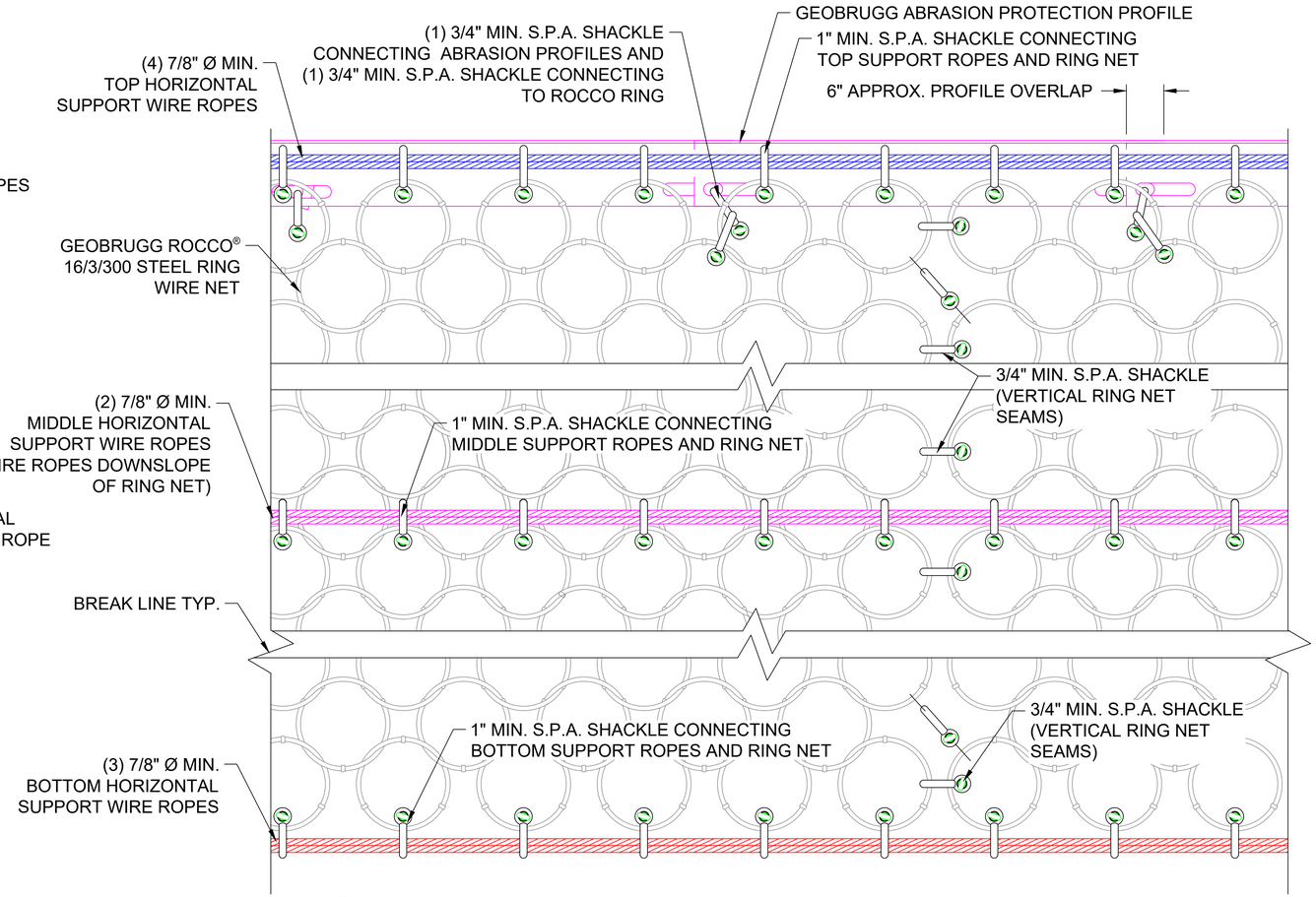
D-1 / 8 GEOBRUGG VX140-H4 TOP SUPPORT ROPES ASSEMBLY
ELEVATION VIEW TYPICAL DETAIL
SCALE: N.T.S.



D-2 / 8 GEOBRUGG VX140-H4 MID. SUPPORT ROPES ASSEMBLY
ELEVATION VIEW TYPICAL DETAIL
SCALE: N.T.S.



D-3 / 8 GEOBRUGG VX140-H4 BOTTOM SUPPORT ROPES ASSEMBLY
ELEVATION VIEW TYPICAL DETAIL
SCALE: N.T.S.



D-4 / 8 GEOBRUGG VX140-H4 RING NET AND SUPPORT ROPE ASSEMBLY
ELEVATION VIEW TYPICAL DETAIL
SCALE: N.T.S.

NOTES:

1. MIDDLE HORIZONTAL SUPPORT ROPES INSTALLED ON THE DOWNSLOPE (VALLEY) SIDE OF THE GEOBRUGG ROCCO® RING NET
2. FOR WIRE ROPE ANCHORAGE LOCATIONS BENEATH SHOWN ELEVATION VIEWS SEE ELEVATION AND PLAN DETAILS FOR PROFILE VIEW.

GEOBRUGG VX140-H4 ROPE ASSEMBLY TYPICAL DETAILS

2018 12-12: Revised Plan Sheet Numbering. Sheet 8 of 15.

REVISED

Montecito Debris Flow Mitigation
Debris Flow Mitigation Systems
Santa Barbara County, California

PREPARED AT THE REQUEST OF
Partnership For Resilient Communities
Montecito, California

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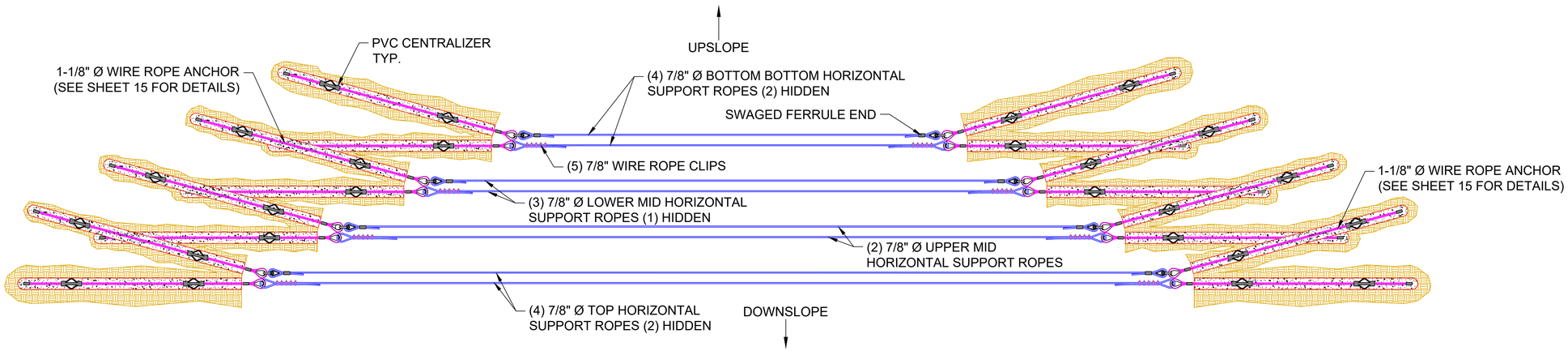
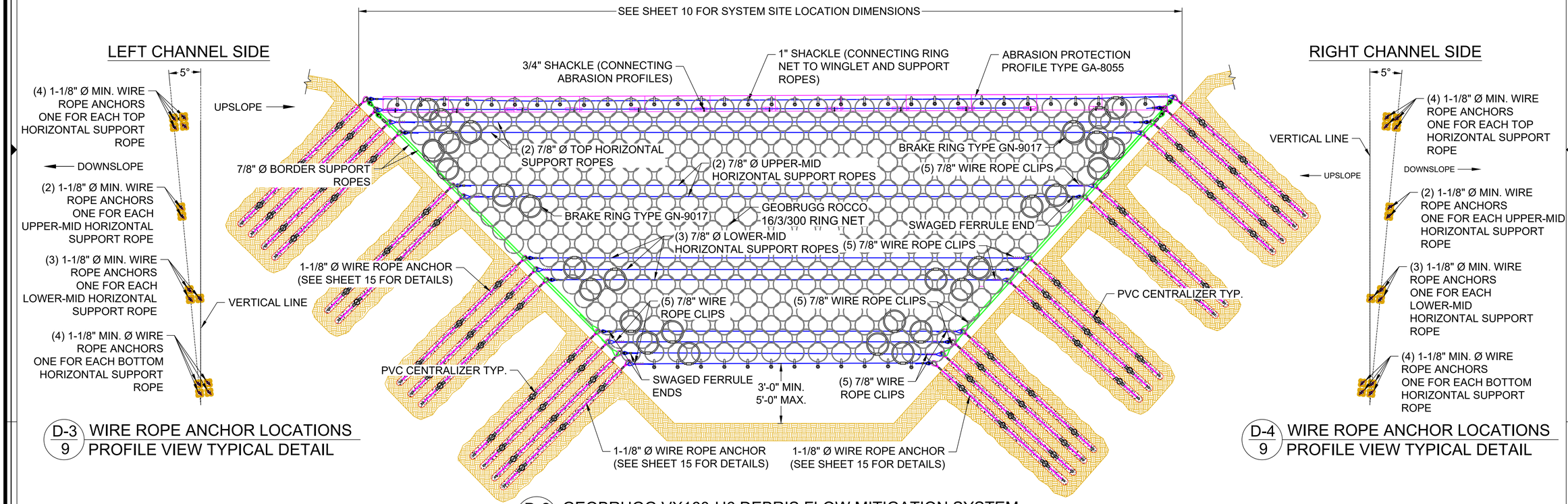
SHEET 8 OF 15

DRAWN BY:	DESIGNED BY:	CHECKED BY:
BJF/JAM	WFK	WFK
SCALE: N.T.S.	DATE: 2018 10-04	PROJECT NO: KGT18-18



D-1 / 9 GEOBRUGG VX160-H6 DEBRIS FLOW MITIGATION SYSTEM PLAN VIEW

SCALE: N.T.S.



D-3 / 9 WIRE ROPE ANCHOR LOCATIONS PROFILE VIEW TYPICAL DETAIL

D-4 / 9 WIRE ROPE ANCHOR LOCATIONS PROFILE VIEW TYPICAL DETAIL

D-2 / 9 GEOBRUGG VX160-H6 DEBRIS FLOW MITIGATION SYSTEM ELEVATION VIEW

SCALE: N.T.S.

NOTES:

1. MIDDLE HORIZONTAL SUPPORT ROPES INSTALLED ON THE DOWNSLOPE (VALLEY) SIDE OF THE GEOBRUGG ROCCO® RING NET
2. DETAIL D-2/9 ELEVATION VIEW IS LOOKING UPSTREAM DIRECTION.
3. ANCHORS SHALL NOT BE INSTALLED WITHIN 0.5 x BOREHOLE DIAMETER OF EACH OTHER.

GEOBRUGG VX160-H6 ELEVATION AND PLAN TYPICAL DETAILS

REVISED
2018 12-12: Revised Plan Sheet Numbering. Sheet 9 of 15.

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SHEET 9 OF 15

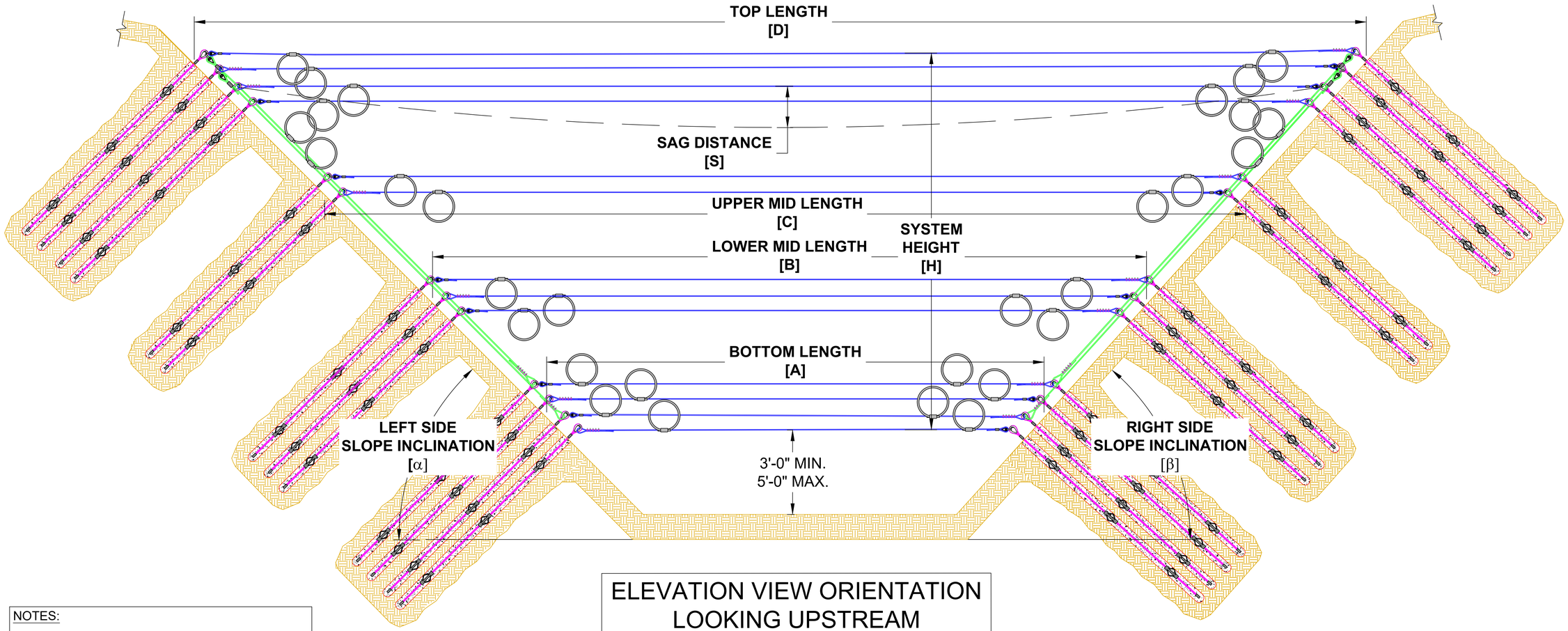
DRAWN BY:	DESIGNED BY:	CHECKED BY:
BJF/JAM	WFK	WFK

SCALE: N.T.S.	DATE: 2018 10-04	PROJECT NO: KGT18-18

GEOBRUGG VX160-H6 DEBRIS FLOW MITIGATION SYSTEM DIMENSIONAL SCHEDULE

LOCATION DESIGNATION	SYSTEM HEIGHT [**H**] (FT)	BOTTOM LENGTH [**A**] (FT)	LOWER MID LENGTH [**B**] (FT)	UPPER MID LENGTH [**C**] (FT)	TOP LENGTH [**D**] (FT)	ALLOWABLE SAG DISTANCE [**S**] (FT)	LEFT SIDE AVG. SLOPE INCLINATION [A] (DEG.)	RIGHT SIDE AVG. SLOPE INCLINATION [β](DEG.)
BUENA VISTA BV-6	15	22.5	29	34	44	1	65	50
BUENA VISTA BV-7	20	20	33	41	50	1	70	65
BUENA VISTA BV-10	15	14	26	50	56	1	55	25
COLD SPRING CS-11	15	35	40	52	66	1	45	50
ROMERO RC-15	10	18	33	39	50	1	55	55

NOTE: SLOPE INCLINATIONS FROM HORIZONTAL PROVIDED ARE AVERAGED.



ELEVATION VIEW ORIENTATION
LOOKING UPSTREAM

NOTES:

1. GEOBRUGG VX160-H6 DEBRIS FLOW MITIGATION SYSTEM DIMENSIONS AND CHANNEL GEOMETRIES ARE APPROXIMATE.
2. DETAIL D-1/10 ELEVATION VIEW IS LOOKING UPSTREAM DIRECTION.

D-1/10 GEOBRUGG VX160-H6 DEBRIS FLOW MITIGATION SYSTEM
TYPICAL DIMENSIONAL ELEVATION VIEW

SCALE: N.T.S.

GEOBRUGG VX160-H6 LOCATION DIMENSIONS

2018 12-12: Revised Plan Sheet Numbering. Sheet 10 of 15.

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SHEET 10 OF 15

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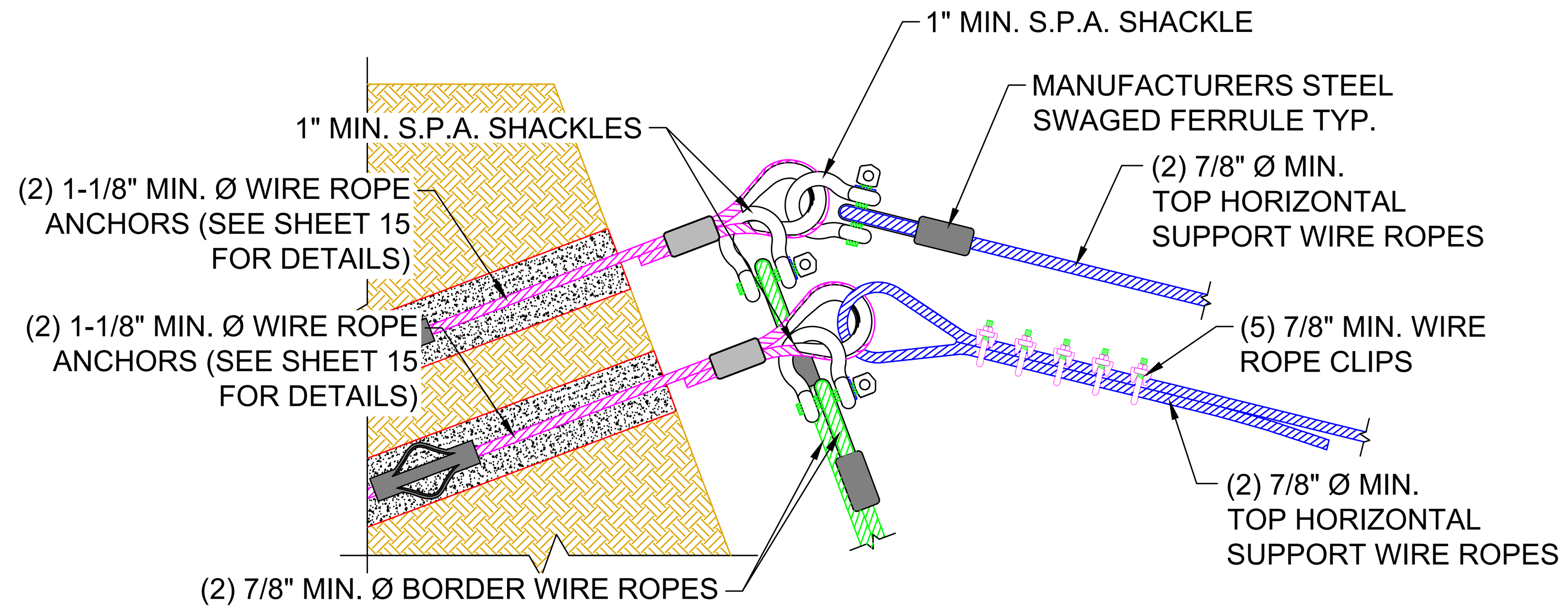
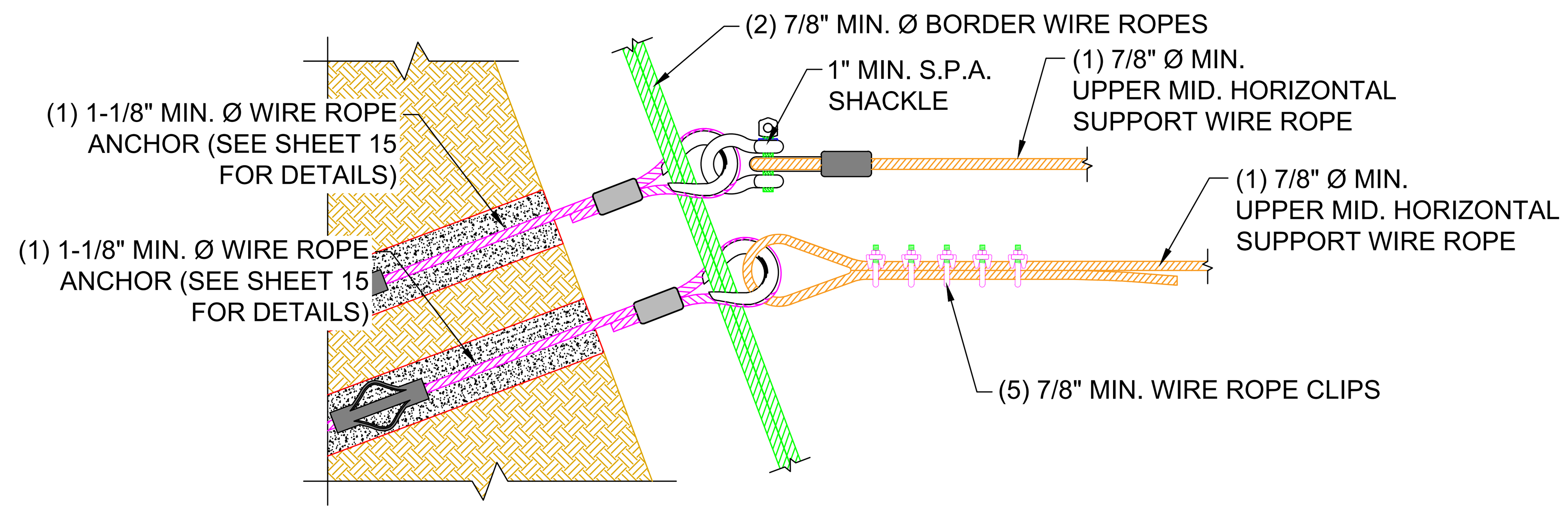
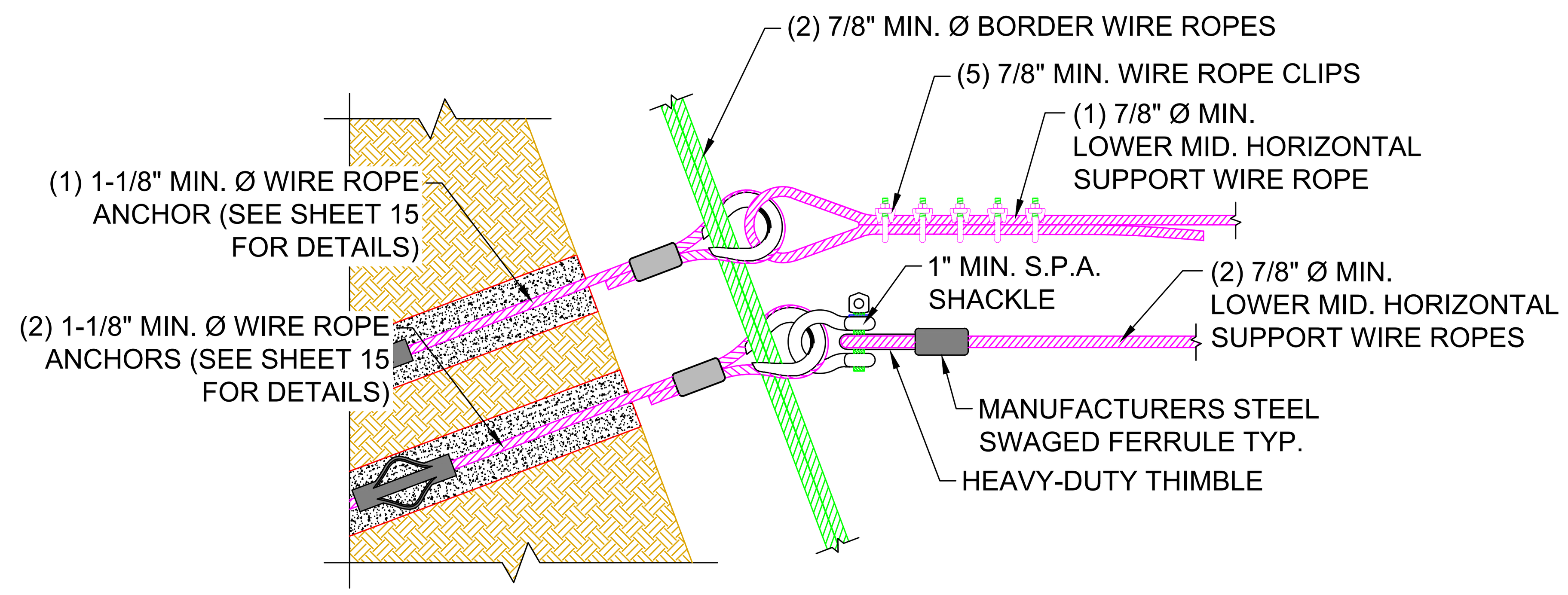
DATE: 2018 10-04
PROJECT NO: KGT18-18



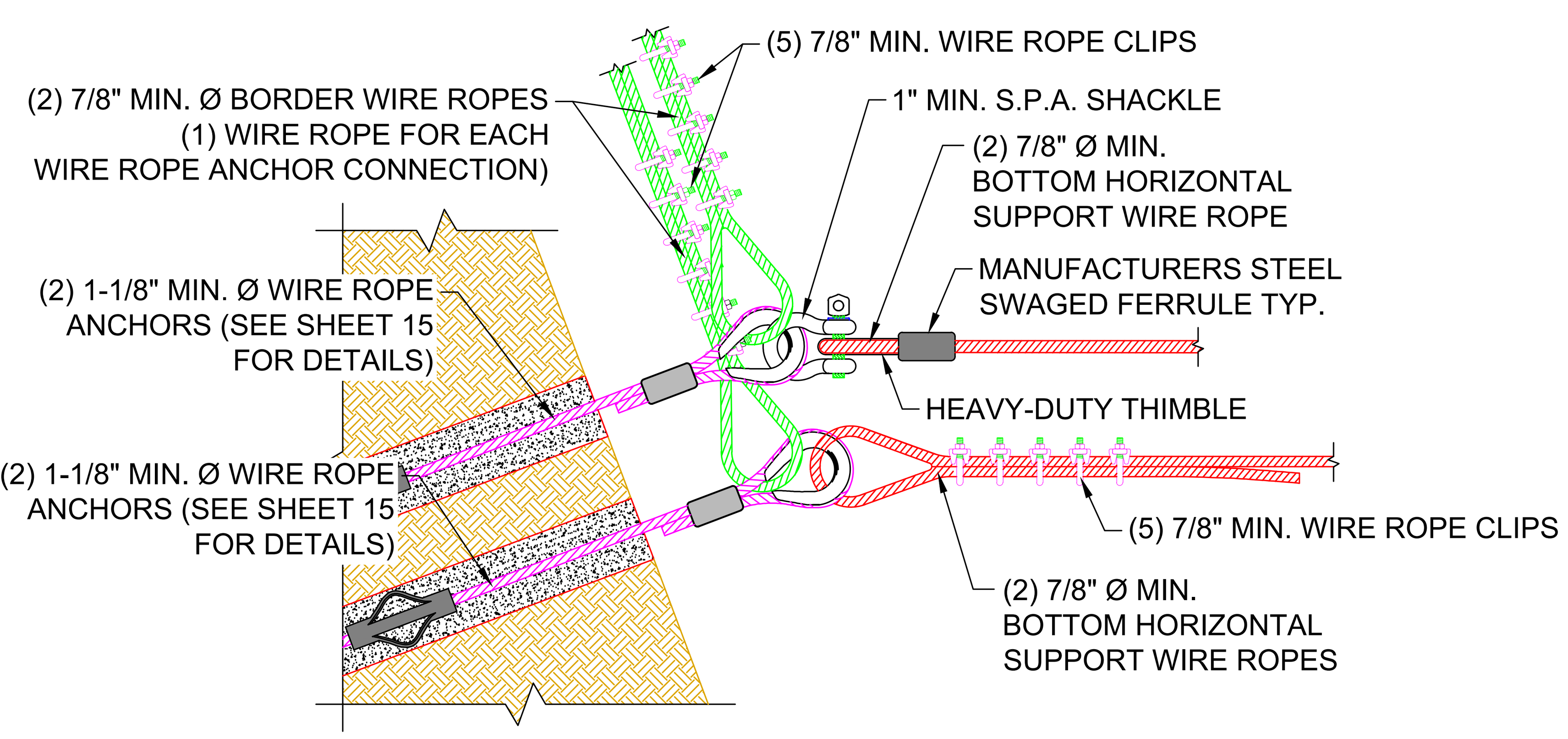
D-1 / 11 GEOBRUGG VX160-H6 TOP SUPPORT ROPES ASSEMBLY
ELEVATION VIEW TYPICAL DETAIL
SCALE: N.T.S.



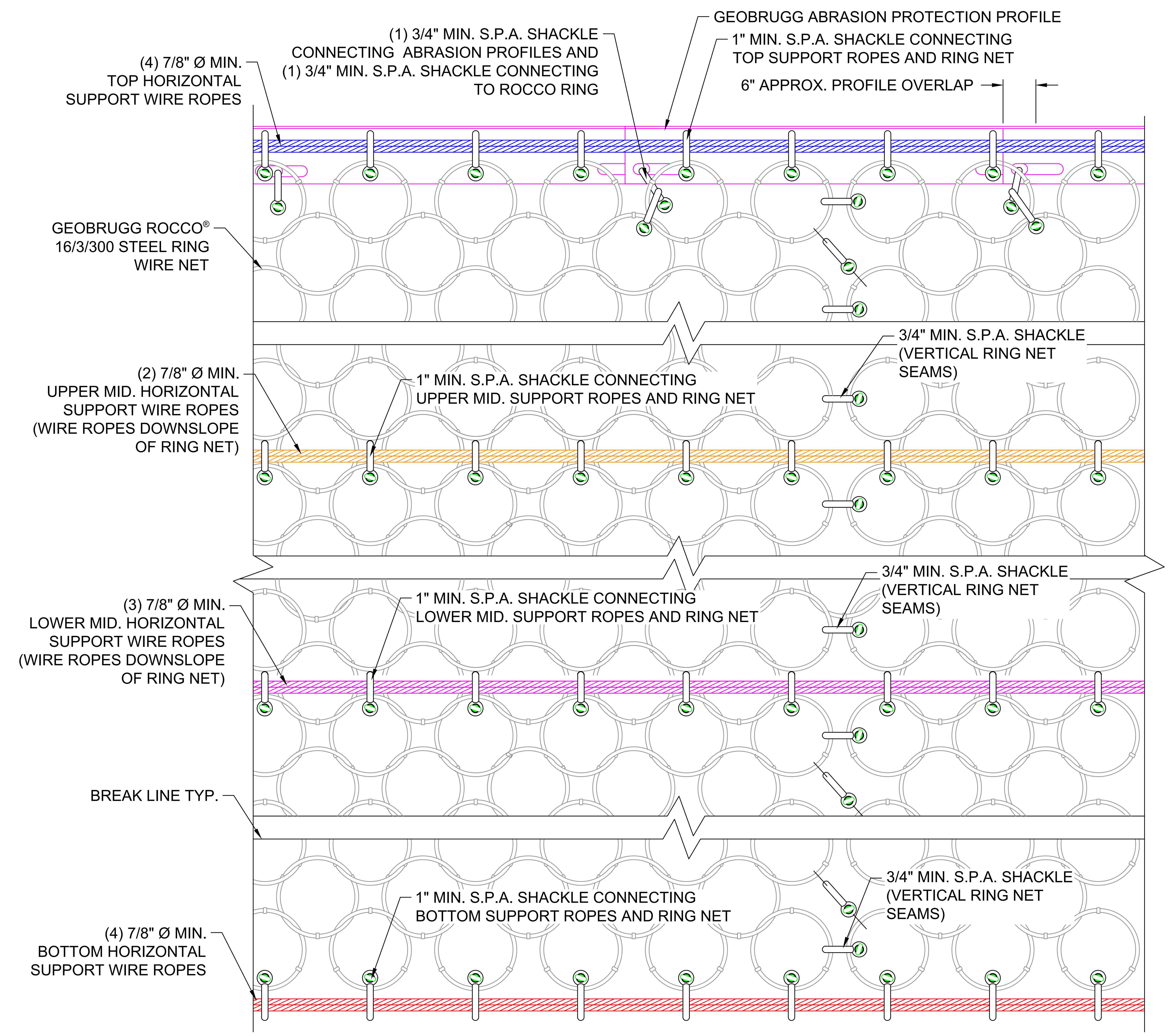
D-2 / 11 GEOBRUGG VX160-H6 UPPER MID. SUPPORT ROPES ASSEMBLY
ELEVATION VIEW TYPICAL DETAIL
SCALE: N.T.S.



D-3 / 11 GEOBRUGG VX160-H6 LOWER MID. SUPPORT ROPES ASSEMBLY
ELEVATION VIEW TYPICAL DETAIL
SCALE: N.T.S.



D-4 / 11 GEOBRUGG VX160-H6 BOTTOM SUPPORT ROPES ASSEMBLY
ELEVATION VIEW TYPICAL DETAIL
SCALE: N.T.S.



D-5 / 11 GEOBRUGG VX160-H6 RING NET AND SUPPORT ROPE ASSEMBLY
ELEVATION VIEW TYPICAL DETAIL
SCALE: N.T.S.

NOTES:

1. MIDDLE HORIZONTAL SUPPORT ROPES INSTALLED ON THE DOWNSLOPE (VALLEY) SIDE OF THE GEOBRUGG ROCCO® RING NET
2. FOR WIRE ROPE ANCHORAGE LOCATIONS BENEATH SHOWN ELEVATION VIEWS SEE ELEVATION AND PLAN DETAILS FOR PROFILE VIEW.

GEOBRUGG VX160-H6 ROPE ASSEMBLY TYPICAL DETAILS

2018 12-12: Revised Plan Sheet Numbering, Sheet 11 of 15.

REVISED

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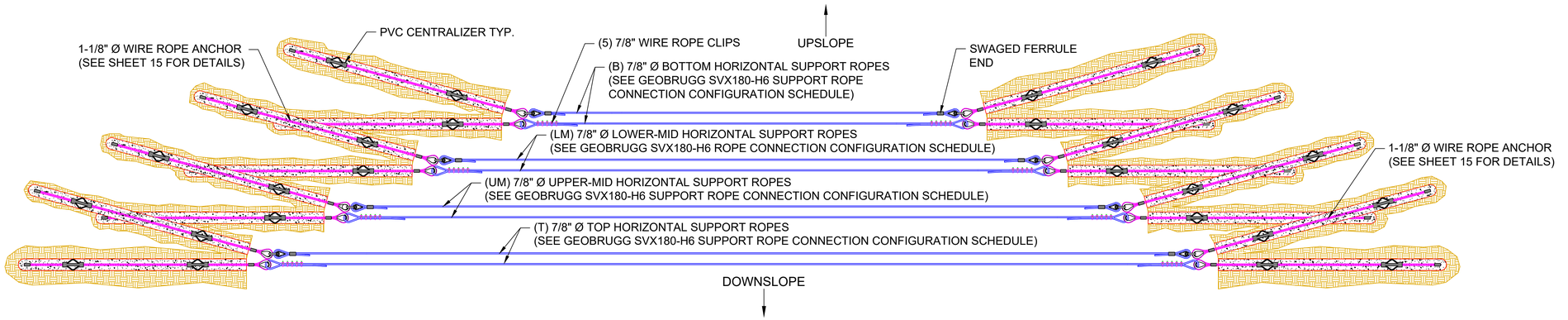
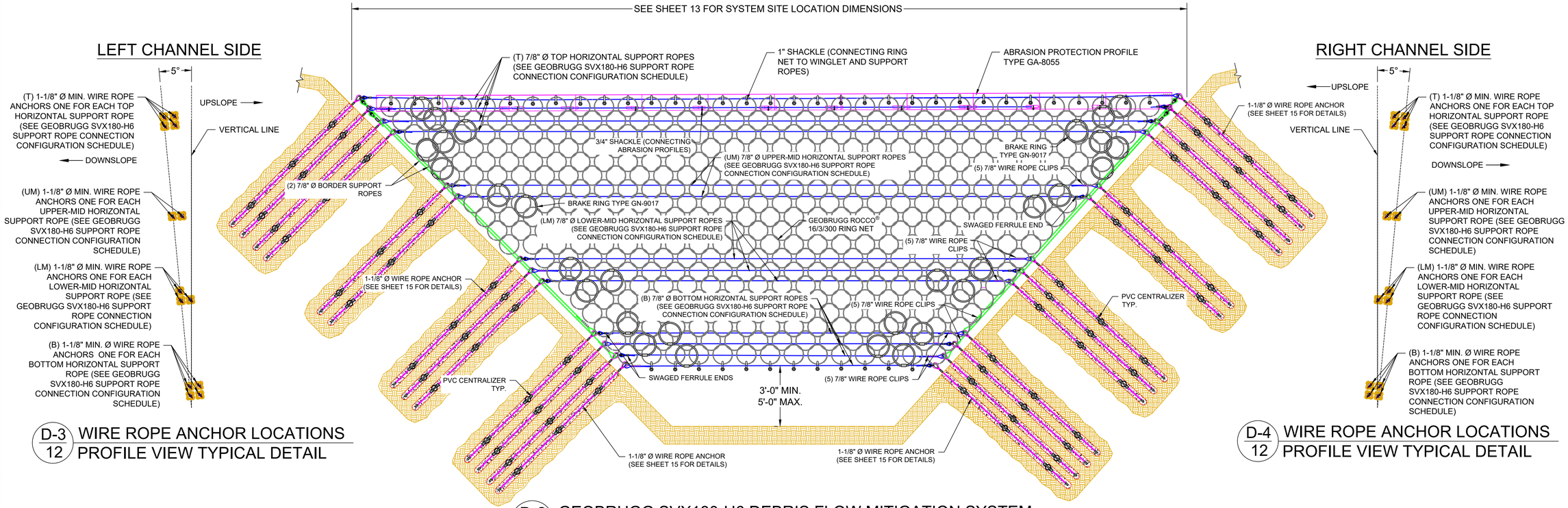


D-1 / 12 GEOBRUGG SVX180-H6 DEBRIS FLOW MITIGATION SYSTEM
TYPICAL PLAN VIEW

SCALE: N.T.S.



D-3 / 12 WIRE ROPE ANCHOR LOCATIONS
PROFILE VIEW TYPICAL DETAIL

D-4 / 12 WIRE ROPE ANCHOR LOCATIONS
PROFILE VIEW TYPICAL DETAIL

D-2 / 12 GEOBRUGG SVX180-H6 DEBRIS FLOW MITIGATION SYSTEM
TYPICAL ELEVATION VIEW

SCALE: N.T.S.

GEOBRUGG SVX180-H6 SUPPORT ROPE CONFIGURATION SCHEDULE				
LOCATION DESIGNATION	BOT. SUPPORT ROPE QUANTITY (B)	LOWER MID SUPPORT ROPE QUANTITY (LM)	UPPER MID SUPPORT ROPE QUANTITY (UM)	TOP SUPPORT ROPE QUANTITY (T)
BUENA VISTA BV-4	5	5	7	7
BUENA VISTA BV-11	7	8	9	9
COLD SPRING CS-18	6	6	8	7
SAN YSIDRO SY-7A	4	5	6	6
SAN YSIDRO SY-18	3	4	6	4
ROMERO RC-12	2	3	4	3

NOTES:

1. MIDDLE HORIZONTAL SUPPORT ROPES INSTALLED ON THE DOWNSLOPE (VALLEY) SIDE OF THE GEOBRUGG ROCCO® RING NET
2. DETAIL D-2/12 ELEVATION VIEW IS LOOKING UPSTREAM DIRECTION.
3. ANCHORS SHALL NOT BE INSTALLED WITHIN 0.5 x BOREHOLE DIAMETER OF EACH OTHER.

GEOBRUGG SVX180-H6 ELEVATION AND PLAN TYPICAL DETAILS

REVISED
- 2018 10-23: Removed Site BV-1 From Schedule.
- 2018 12-12: Revised Plan Sheet Numbering. Sheet 12 of 15.
- 2018 12-12: Removed Hot Springs HS-6.
- 2018 12-12: Revised San Ysidro Canyon SY-7 to SY-7A.

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SHEET 12 OF 15

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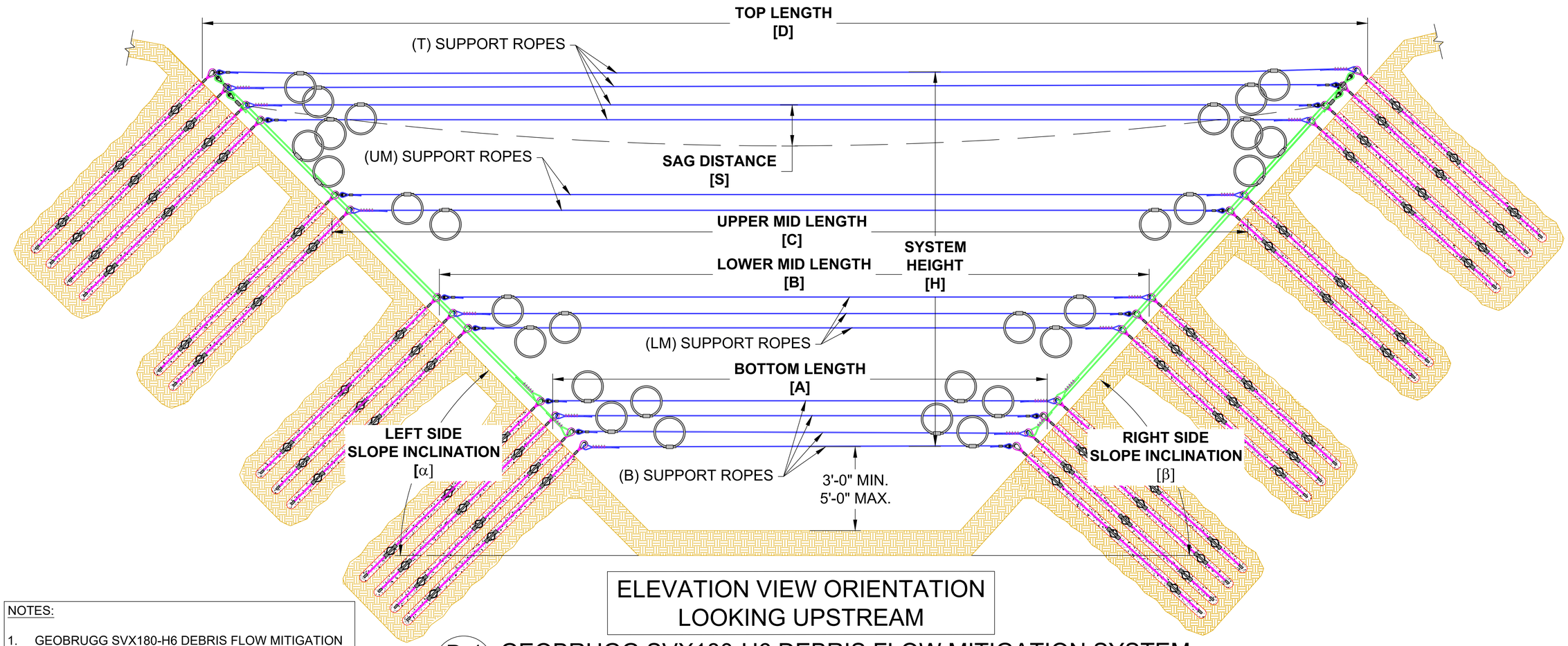
CHECKED BY: WFK
SCALE: N.T.S.
DATE: 2018 10-04
PROJECT NO: KGT18-18

GEOBRUGG SVX180-H6 DEBRIS FLOW MITIGATION SYSTEM DIMENSIONAL SCHEDULE - 1								
LOCATION DESIGNATION	SYSTEM HEIGHT [H] (FT)	BOTTOM LENGTH [A] (FT)	LOWER MID LENGTH [B] (FT)	UPPER MID LENGTH [C] (FT)	TOP LENGTH [D] (FT)	SAG DISTANCE [S] (FT)	LEFT SIDE AVG. SLOPE INCLINATION [α] (DEG.)	RIGHT SIDE AVG. SLOPE INCLINATION [β] (DEG.)
BUENA VISTA BV-4	17	45	54	69	77	1.5	55	66
BUENA VISTA BV-11	20	98	116	134	150	3	30	30
COLD SPRING CS-18	12	47	60	70	81	1.5	45	30
SAN YSIDRO SY-18	16	13	47	57	67	1.5	60	60
SAN YSIDRO SY-7A	20	22	40	50	60	1.5	50	60
ROMERO RC-12	12	40	45	52	61	1	55	60

NOTE: SLOPE INCLINATIONS FROM HORIZONTAL PROVIDED ARE AVERAGED.

GEOBRUGG SVX180-H6 SUPPORT ROPE CONFIGURATION SCHEDULE - 2				
LOCATION DESIGNATION	BOT. SUPPORT ROPE QUANTITY (B)	LOWER MID SUPPORT ROPE QUANTITY (LM)	UPPER MID SUPPORT ROPE QUANTITY (UM)	TOP SUPPORT ROPE QUANTITY (T)
BUENA VISTA BV-4	5	5	7	7
BUENA VISTA BV-11	7	8	9	9
COLD SPRING CS-18	6	6	8	7
SAN YSIDRO SY-18	3	4	6	4
SAN YSIDRO SY-7A	4	5	6	6
ROMERO RC-12	2	3	4	3



ELEVATION VIEW ORIENTATION
LOOKING UPSTREAM

D-1 / 13 GEOBRUGG SVX180-H6 DEBRIS FLOW MITIGATION SYSTEM
TYPICAL DIMENSIONAL ELEVATION VIEW

SCALE: N.T.S.

NOTES:

1. GEOBRUGG SVX180-H6 DEBRIS FLOW MITIGATION SYSTEM DIMENSIONS AND CHANNEL GEOMETRIES ARE APPROXIMATE.
2. DETAIL D-1/13 ELEVATION VIEW IS LOOKING UPSTREAM DIRECTION.
3. SUPPORT WIRE ROPE CONFIGURATIONS VARY BASED ON SITE LOCATION. SEE SCHEDULE 2 FOR WIRE ROPE QUANTITIES FOR EACH SECTION.

GEOBRUGG SVX180-H6 LOCATION DIMENSIONS

2018 12-12: Revised Plan Sheet Numbering. Sheet 13 of 15.

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SHEET 13 OF 15

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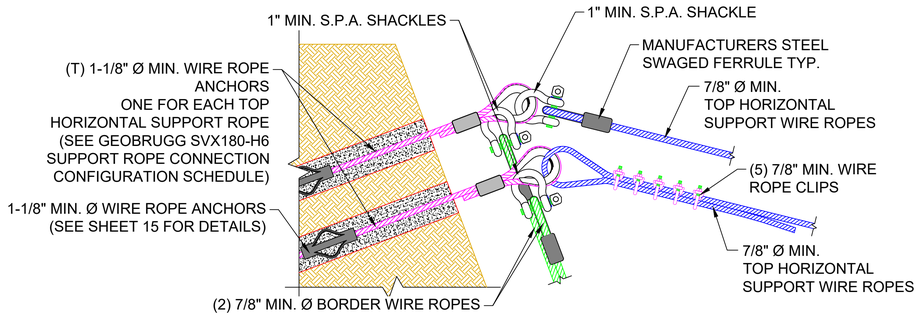
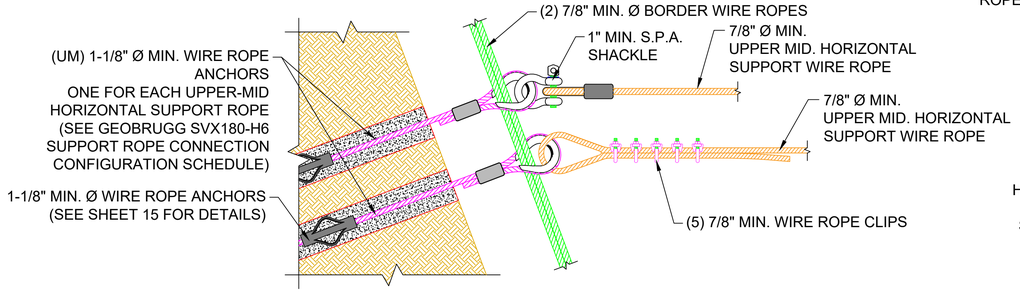


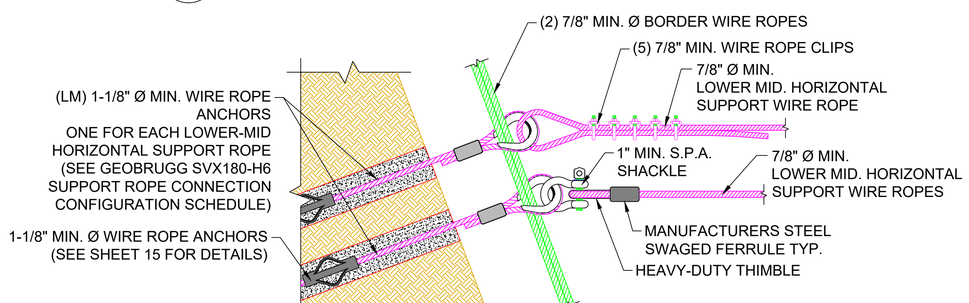
D-1 / 14 GEOBRUGG SVX180-H6 TOP SUPPORT ROPES ASSEMBLY ELEVATION VIEW TYPICAL DETAIL

SCALE: N.T.S.



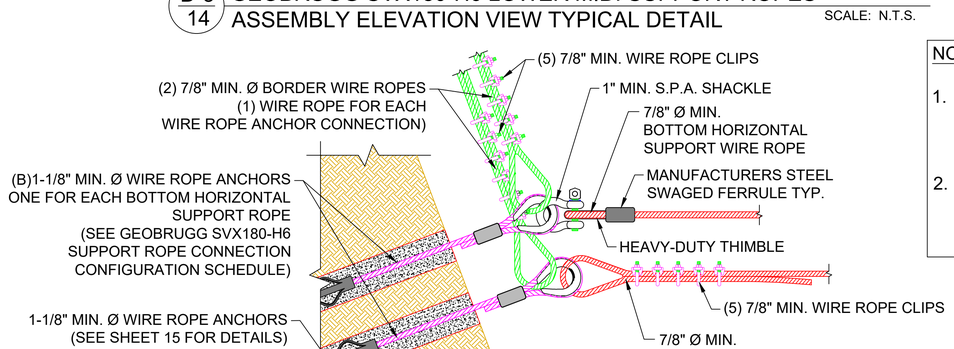
D-2 / 14 GEOBRUGG SVX180-H6 UPPER MID. SUPPORT ROPES ASSEMBLY ELEVATION VIEW TYPICAL DETAIL

SCALE: N.T.S.



D-3 / 14 GEOBRUGG SVX180-H6 LOWER MID. SUPPORT ROPES ASSEMBLY ELEVATION VIEW TYPICAL DETAIL

SCALE: N.T.S.

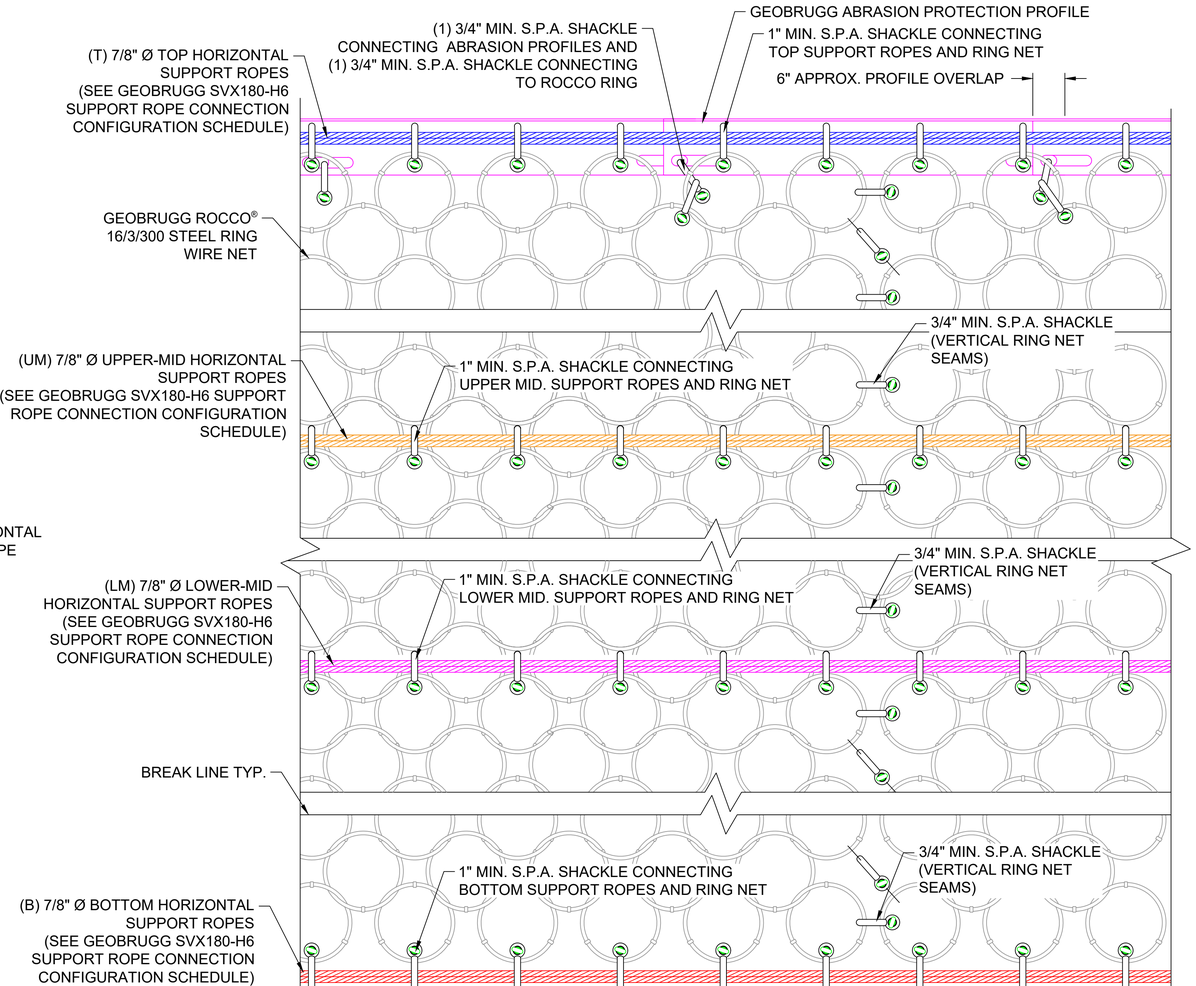


D-4 / 14 GEOBRUGG SVX180-H6 BOTTOM SUPPORT ROPES ASSEMBLY ELEVATION VIEW TYPICAL DETAIL

SCALE: N.T.S.

NOTES:

1. MIDDLE HORIZONTAL SUPPORT ROPES INSTALLED ON THE DOWNSLOPE (VALLEY) SIDE OF THE GEOBRUGG ROCCO® RING NET
2. FOR WIRE ROPE ANCHORAGE LOCATIONS BENEATH SHOWN ELEVATION VIEWS SEE ELEVATION AND PLAN DETAILS FOR PROFILE VIEW.



D-5 / 14 GEOBRUGG SVX180-H6 RING NET AND SUPPORT ROPE ASSEMBLY ELEVATION VIEW TYPICAL DETAIL

SCALE: N.T.S.

GEOBRUGG SVX180-H6 SUPPORT ROPE CONFIGURATION SCHEDULE				
LOCATION DESIGNATION	BOT. SUPPORT ROPE QUANTITY (B)	LOWER MID SUPPORT ROPE QUANTITY (LM)	UPPER MID SUPPORT ROPE QUANTITY (UM)	TOP SUPPORT ROPE QUANTITY (T)
BUENA VISTA BV-4	5	5	7	7
BUENA VISTA BV-11	7	8	9	9
COLD SPRING CS-18	6	6	8	7
SAN YSIDRO SY-7A	4	5	6	6
SAN YSIDRO SY-18	3	4	6	4
ROMERO RC-12	2	3	4	3

GEOBRUGG SVX180-H6 ROPE ASSEMBLY TYPICAL DETAILS

2018 12-12: Revised Plan Sheet Numbering. Sheet 14 of 15.

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SHEET 14 OF 15

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DESIGNED BY: WFK
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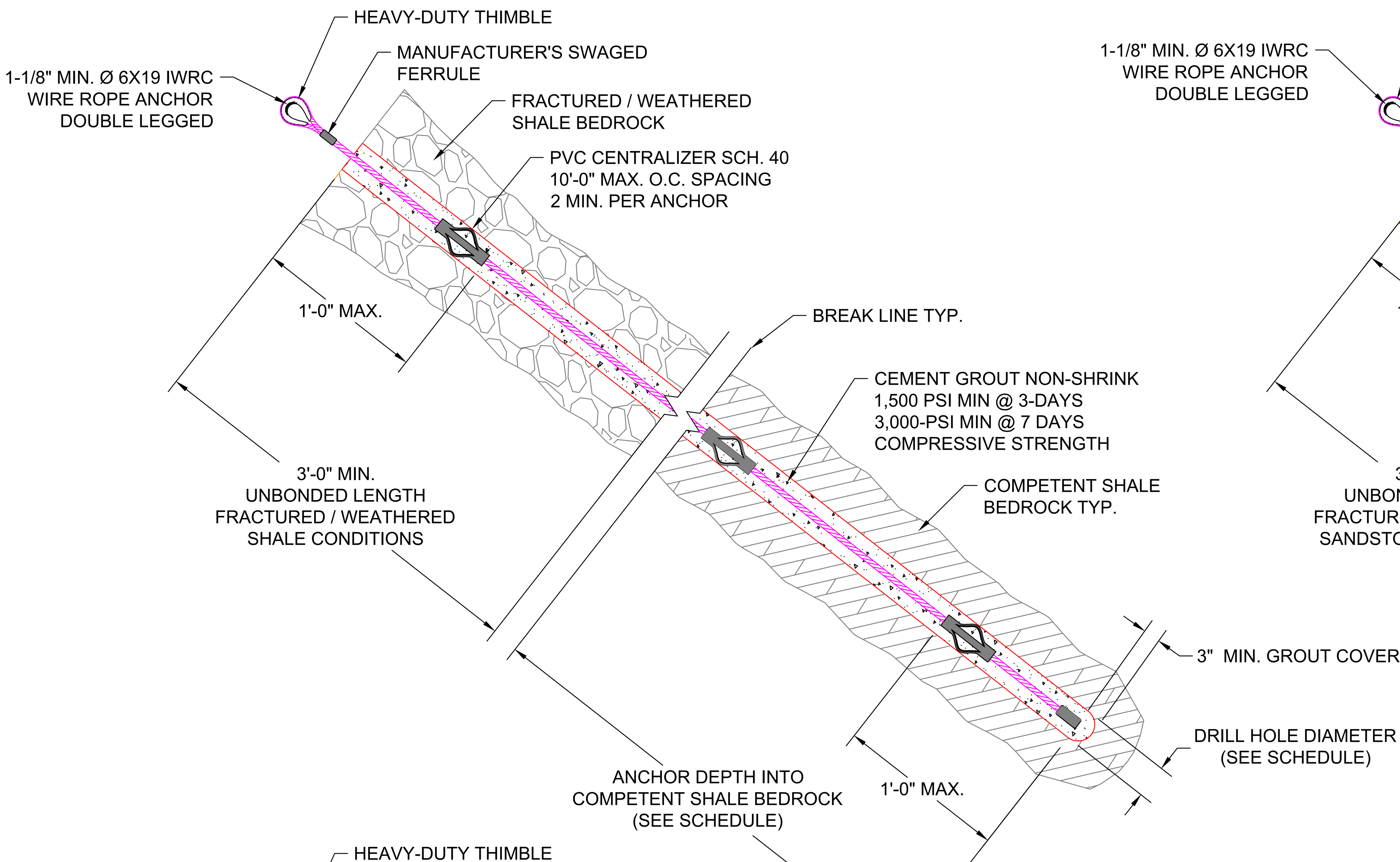
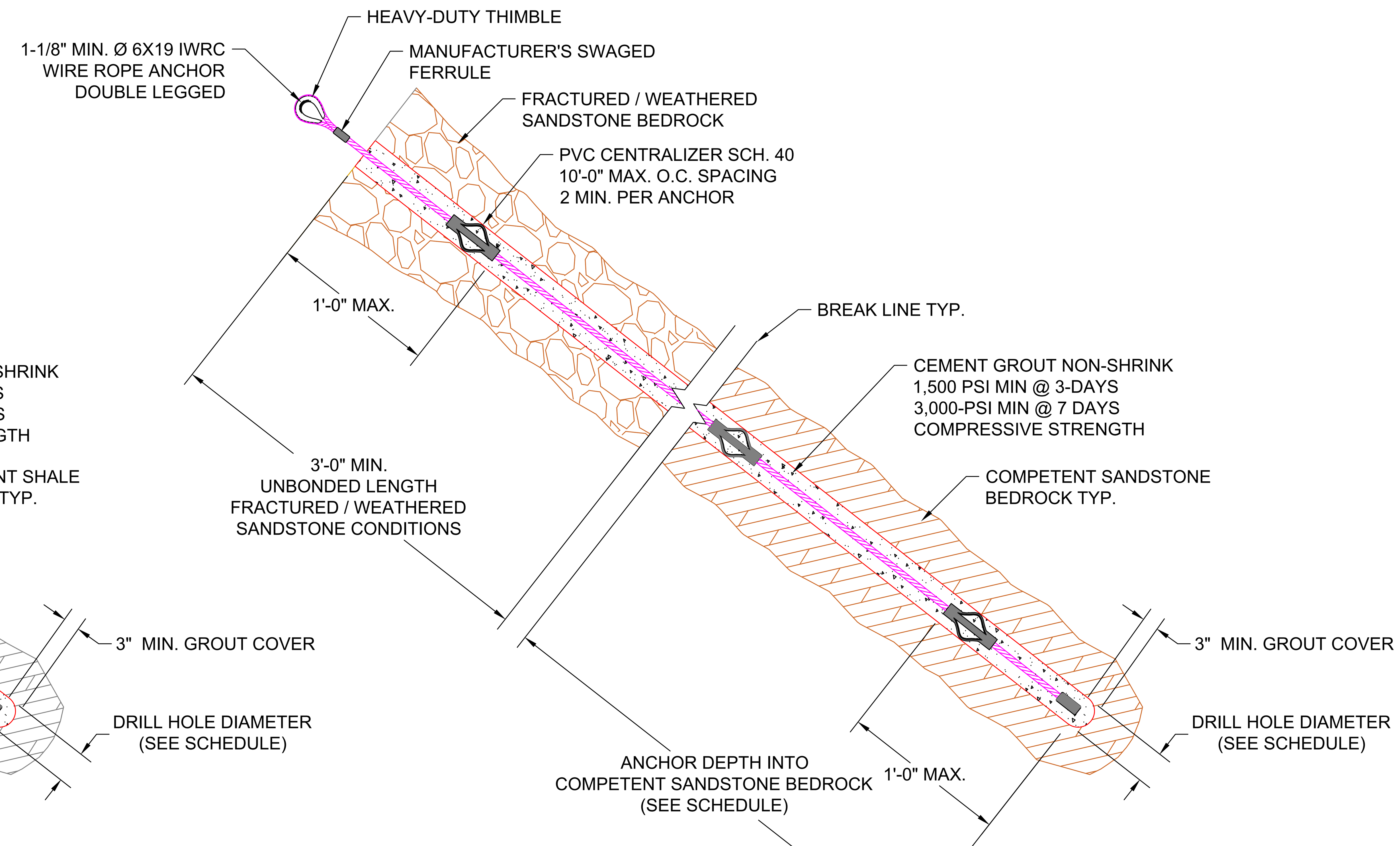
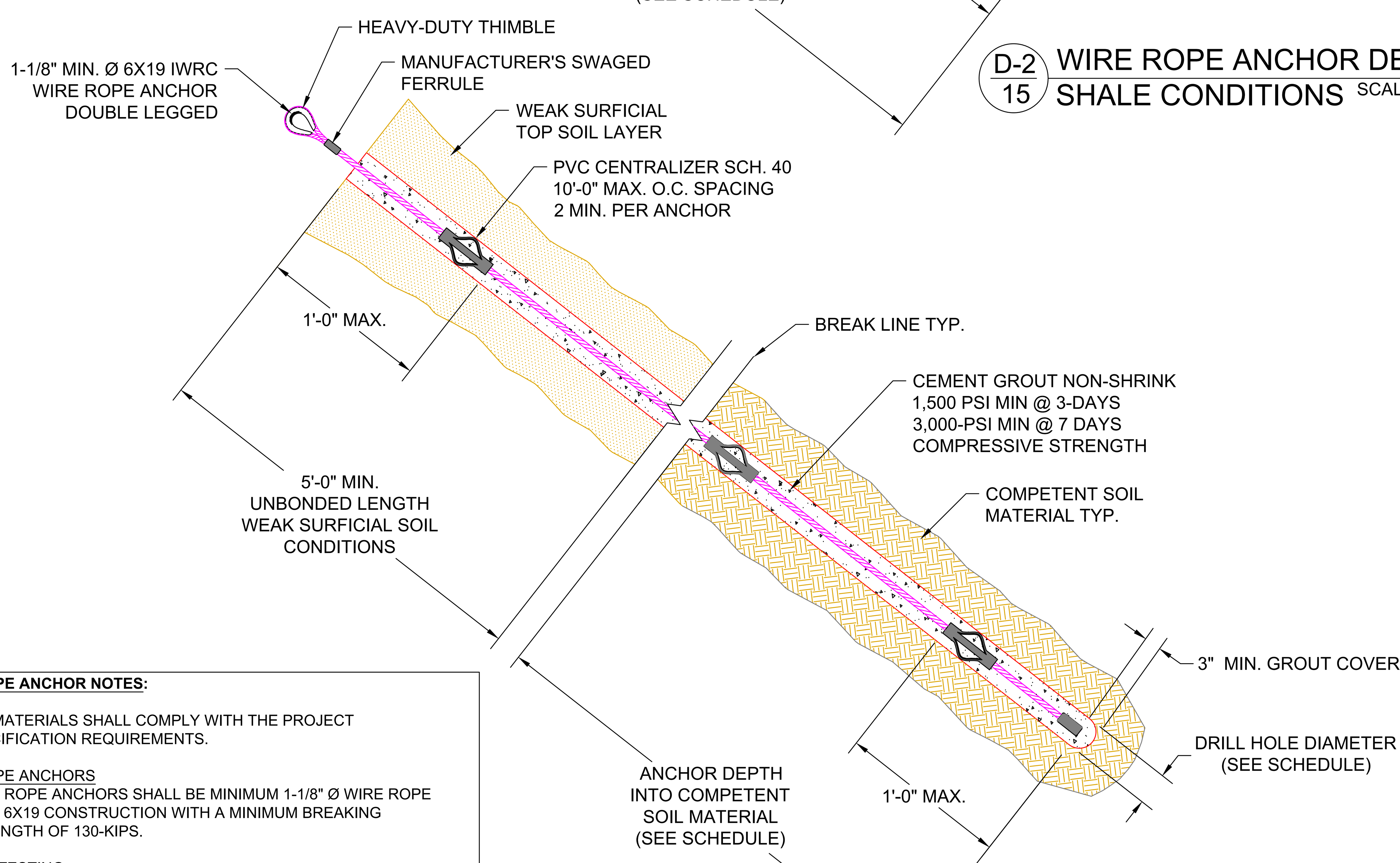
DATE: 2018 10-04
PROJECT NO: KGT18-18



D-2 / 15 WIRE ROPE ANCHOR DETAIL SHALE CONDITIONS SCALE: N.T.S.



D-3 / 15 WIRE ROPE ANCHOR DETAIL SANDSTONE CONDITIONS SCALE: N.T.S.



D-1 / 15 WIRE ROPE ANCHOR DETAIL SOIL CONDITIONS SCALE: N.T.S.

WIRE ROPE ANCHOR NOTES:

GENERAL
1. ALL MATERIALS SHALL COMPLY WITH THE PROJECT SPECIFICATION REQUIREMENTS.

WIRE ROPE ANCHORS
1. WIRE ROPE ANCHORS SHALL BE MINIMUM 1-1/8" Ø WIRE ROPE IWRC 6X19 CONSTRUCTION WITH A MINIMUM BREAKING STRENGTH OF 130-KIPS.

ANCHOR TESTING
1. ANCHORS DRILLING LOCATIONS SHALL NOT DEVIATE FROM ±10% FROM THE ANCHOR SPACING INDICATED ON THE PLANS.
2. WIRE ROPE ANCHORS SHALL BE PERFORMANCE TESTED. SEE PROJECT SPECIFICATIONS FOR TESTING, TESTING SETUP, PROCEDURE, QUANTITY AND ADDITIONAL REQUIREMENTS.
3. ANCHOR TESTING SHALL BE COMPLETED UNDER OBSERVATION BY THE ENGINEER IN THE FIELD.

WIRE ROPE ANCHOR DEPTH SCHEDULE

ANCHOR TYPE	GEOLOGIC MATERIAL	* MIN. DRILL HOLE DIAMETER (IN)	** ANCHOR DEPTH INTO COMPETENT MATERIAL (FT)	*** EST. MIN. ANCHOR EMBEDMENT DEPTH (FT)	**** ALLOWABLE ANCHOR EMBEDMENT RESISTANCE (KIPS/FT)	TENSILE LOAD (KIPS)	MAX. TESTING LOAD (KIPS)
WIRE ROPE	SOIL	6	36	41	2.3	80	106.4
WIRE ROPE	SHALE	6	9	12	9.0	80	106.4
WIRE ROPE	SANDSTONE	6	8	11	11.3	80	106.4

SCHEDULE NOTES:
1. SCHEDULE SHALL APPLY TO DRAWING SHEET 15, DETAIL D-1, D-2, D-3.
2. ANCHOR DEPTHS SPECIFIED ARE PER ANCHOR.
3. (*) MINIMUM DRILL HOLE DIAMETER REQUIRED.
5. (**) MINIMUM ANCHOR DEPTH INTO COMPETENT GEOLOGIC MATERIAL.
6. (***) ESTIMATED MINIMUM ANCHOR EMBEDMENT DEPTH.
7. (****) ALLOWABLE ANCHOR EMBEDMENT RESISTANCE INTO COMPETENT GEOLOGIC MATERIAL.
8. ANCHOR TESTING SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND PTI 2014 PTI DC35.1-14 GUIDELINES.

GEOBRUGG VX/SVX SYSTEM ANCHORAGE TYPICAL DETAILS

2018 12-12: Revised Plan Sheet Numbering, Sheet 15 of 15.

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SHEET 15 OF 15

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