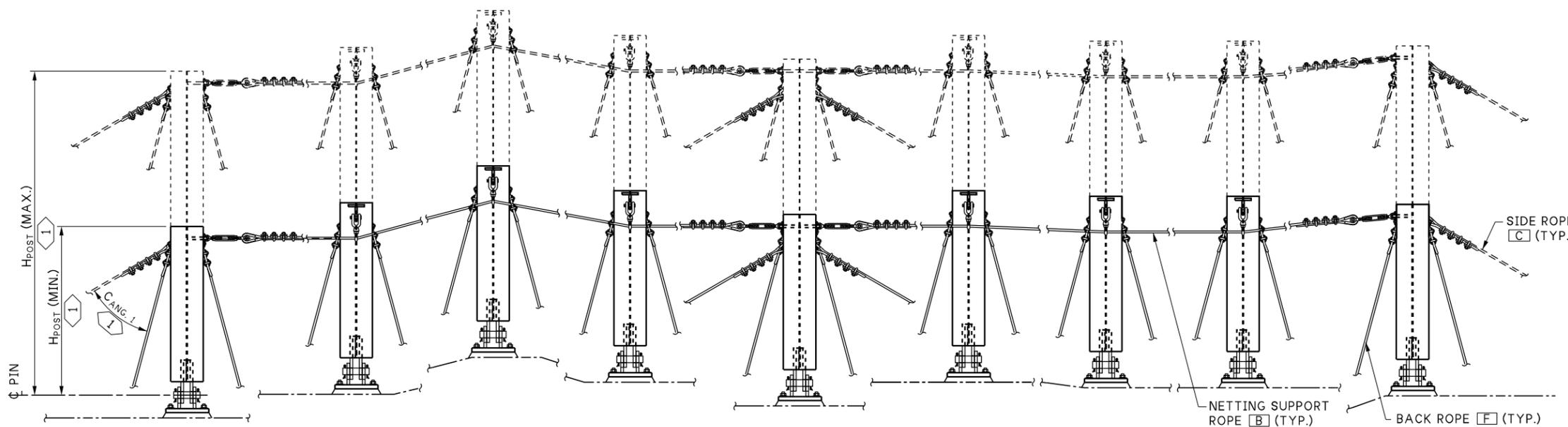
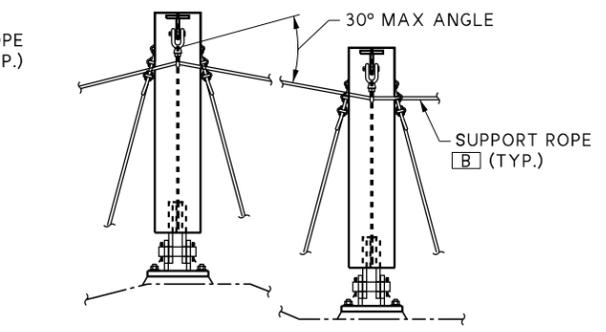


LAYOUT PLAN
NETTING NOT SHOWN FOR CLARITY

HORIZONTAL POST-TO-POST DEFLECTION ANGLE
NETTING NOT SHOWN FOR CLARITY



LAYOUT ELEVATION
NETTING AND CORNER ROPE [K] NOT SHOWN FOR CLARITY



VERTICAL POST-TO-POST DEFLECTION ANGLE
NETTING NOT SHOWN FOR CLARITY

KEY NOTES:

- ① SEE TABLE 1: GEOMETRIC EXTENTS ON SHEET SP2 FOR LIMITS.
- ② CONNECTION POSTS SHALL BE LOCATED SUCH THAT THE RUN LENGTH, L_{RUN} , ON EITHER SIDE ARE APPROXIMATELY EQUAL TO THE EXTENT POSSIBLE.

GENERAL NOTES:

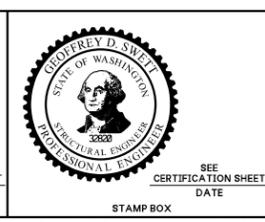
1. ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION DATED ==.
2. THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS 10th EDITION 2024 AND THE PROJECT BASIS OF DESIGN (BOD).
3. NETTING PANELS SHALL BE SEAMED WITH WIRE ROPES THROUGH EACH MESH OPENING AT THE HORIZONTAL AND VERTICAL SEAMS. ENDS OF SEAM ROPE SHALL BE LOOPED ONTO ITSELF AND SECURED WITH TWO (2) WIRE ROPE CLIPS. SEE SHEET SP14 FOR DETAILS.
4. MINIMUM ROPE ANCHOR AND BAR ANCHOR PULLOUT CAPACITY PER TABLES 11 AND 12 PROVIDED ON SHEET SP16.
5. ALL WIRE ROPE LOOPS SHALL INCLUDE A STANDARD WEIGHT THIMBLE.
6. BACK-UP SHACKLES CONNECTING SUPPORT ROPE [B] TO NETTING PANELS SHALL BE SPACED AT 4'-0" MAXIMUM AND SHALL BE SIZED TO ENGAGE SUPPORT ROPE [B], THE 3/16" Ø OR 1/4" Ø LACING ROPE, AND THE NETTING PANEL. SEE SHEET SP14 FOR DETAILS.
7. ALL WELDING OF STRUCTURAL STEEL COMPONENTS SHALL BE IN ACCORDANCE WITH AWS D1.1 STRUCTURAL WELDING CODE.

FILE NAME	SP1 Type 3 Slope Protection Details.dgn		
BRIDGE DES. ENG.	Leland, A		
BRIDGE PROJ. ENG.			
SUPERVISOR	Swett, G		
DESIGNED BY	Miller III, WJ		
CHECKED BY	Swett, G		
ENTERED BY	Fisher, J		
PRELIM. PLAN BY			
ARCH. / SPEC.			
	REVISION	DATE	BY

REGION NO.	STATE
10	WASH
JOB NUMBER	
CONTRACT NO.	



SEE CERTIFICATION SHEET DATE	SEE CERTIFICATION SHEET DATE
STAMP BOX	STAMP BOX



SR XXX	PROJECT TITLE
TYPE 3 SLOPE PROTECTION LAYOUT & GENERAL NOTES	

PLAN REF NO	SP1
SHEET OF SHEETS	

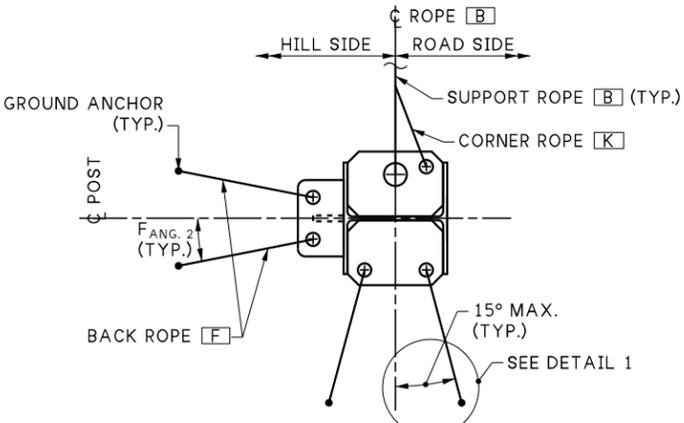
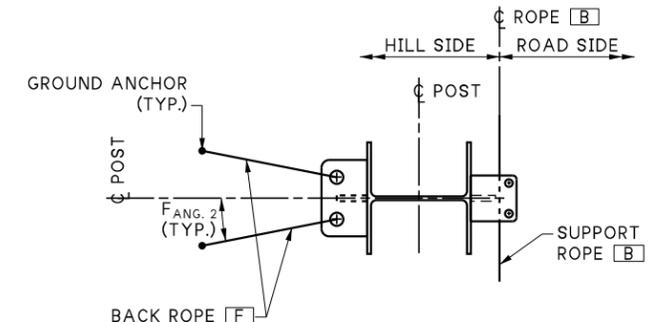
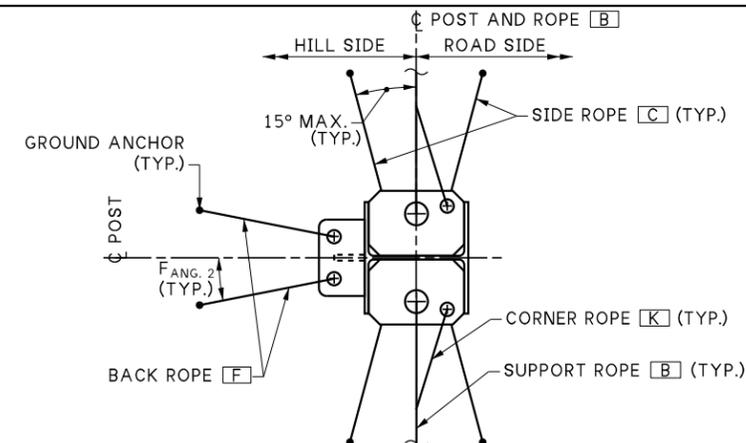
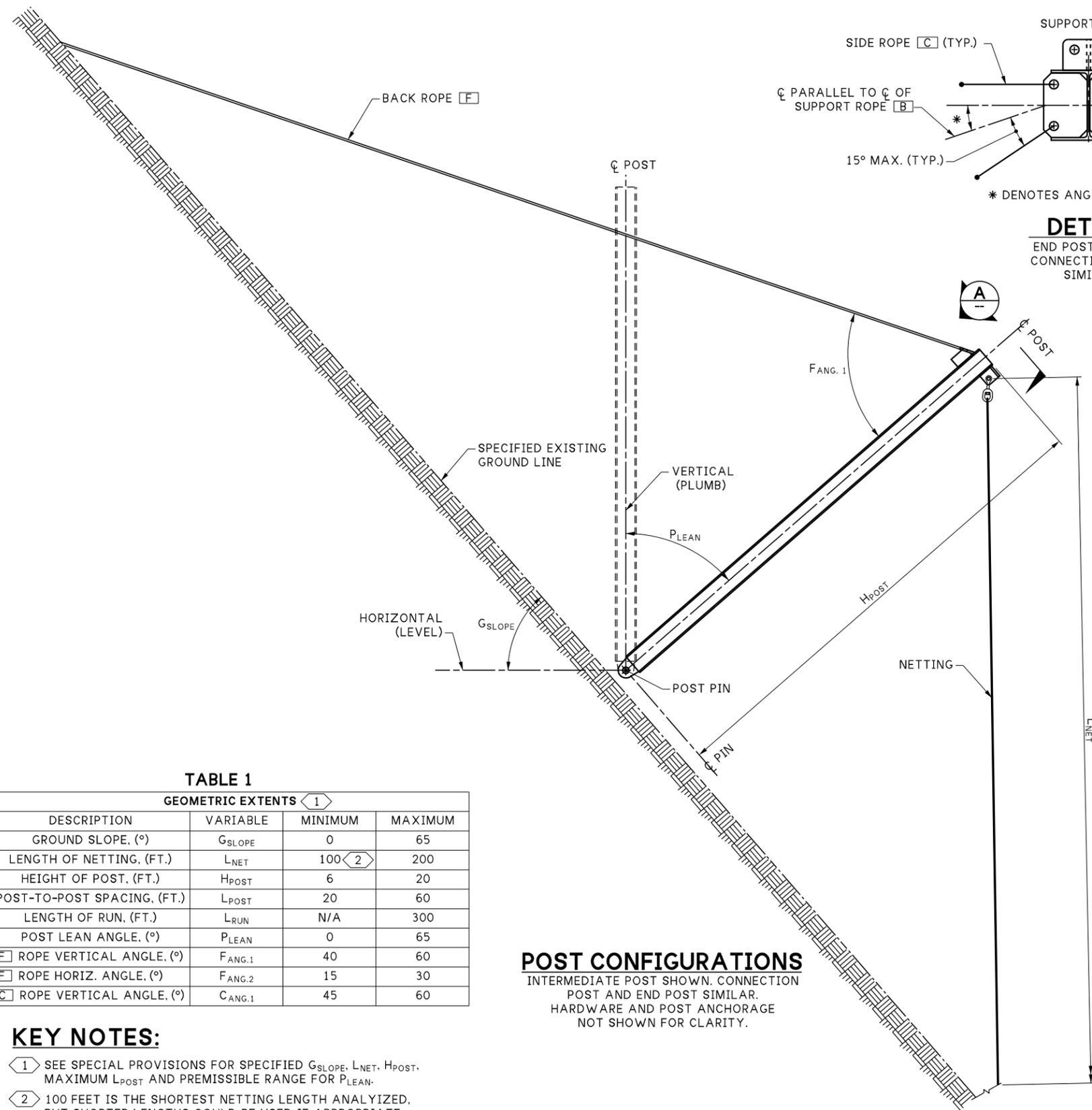


TABLE 1
GEOMETRIC EXTENTS 1

DESCRIPTION	VARIABLE	MINIMUM	MAXIMUM
GROUND SLOPE. (°)	G _{SLOPE}	0	65
LENGTH OF NETTING. (FT.)	L _{NET}	100 2	200
HEIGHT OF POST. (FT.)	H _{POST}	6	20
POST-TO-POST SPACING. (FT.)	L _{POST}	20	60
LENGTH OF RUN. (FT.)	L _{RUN}	N/A	300
POST LEAN ANGLE. (°)	P _{LEAN}	0	65
[F] ROPE VERTICAL ANGLE. (°)	F _{ANG.1}	40	60
[F] ROPE HORIZ. ANGLE. (°)	F _{ANG.2}	15	30
[C] ROPE VERTICAL ANGLE. (°)	C _{ANG.1}	45	60

KEY NOTES:

- 1 SEE SPECIAL PROVISIONS FOR SPECIFIED G_{SLOPE}, L_{NET}, H_{POST}, MAXIMUM L_{POST} AND PERMISSIBLE RANGE FOR P_{LEAN}.
- 2 100 FEET IS THE SHORTEST NETTING LENGTH ANALYZED, BUT SHORTER LENGTHS COULD BE USED IF APPROPRIATE FOR A GIVEN PROJECT.

POST CONFIGURATIONS

INTERMEDIATE POST SHOWN. CONNECTION POST AND END POST SIMILAR. HARDWARE AND POST ANCHORAGE NOT SHOWN FOR CLARITY.

FILE NAME	SP2 Type 3 Slope Protection Details.dgn		
BRIDGE DES. ENG.	Leland, A		
BRIDGE PROJ. ENG.			
SUPERVISOR	Swett, G		
DESIGNED BY	Miller III, WJ		
CHECKED BY	Swett, G		
ENTERED BY	Fisher, J		
PRELIM. PLAN BY			
ARCH. / SPEC.			
	REVISION	DATE	BY

REGION NO.	STATE
10	WASH
JOB NUMBER	
CONTRACT NO.	



SEE CERTIFICATION SHEET DATE
STAMP BOX

SEE CERTIFICATION SHEET DATE
STAMP BOX

SR XXX
PROJECT TITLE

TYPE 3 SLOPE PROTECTION
POST CONFIGURATIONS & GEOMETRICS

PLAN REF NO	SP2
SHEET OF SHEETS	

TABLE NOTES:

- SEE SPECIAL PROVISIONS FOR SPECIFIED LENGTH OF NETTING, L_{NET} , REQUIRED MINIMUM ROPE [B] DIAMETER AND MAXIMUM POST SPACING, MAX. L_{POST} .
- THE MAXIMUM ALLOWABLE NETTING SELF WEIGHTS, MAX. N_{DL} , PRESENTED IN TABLE 2 ASSUMES THE NETTING IS FREE HANGING FROM ROPE [B] AND CONSERVATIVELY CONSIDERS ZERO FRICTION ACTS ALONG THE NETTING-TO-SLOPE INTERFACE. VALUES FOR MAX. N_{DL} REPRESENTS NETTING DL AND INITIAL PRETENSIONED FORCES ACTING ON NETTING SUPPORT ROPE [B] WHICH CONSTITUTES 50% OF SUPPORT ROPE [B]'S CAPACITY, AS PRESENTED IN ASTM A1023, UNLESS OTHERWISE DENOTED BY A LOWER PERCENTAGE IN PARENTHESES NEXT TO THE PRESENTED WEIGHTS.
- MAXIMUM NETTING SUPPORT ROPE [B] LENGTH SHALL BE 300 FT. NETTING SUPPORT ROPE [B] SHALL BE TERMINATED AT A CONNECTION OR END POST.
- FALLING ROCK LOAD A IS EQUIVALENT TO 1.7 KLF OVER THE MIDDLE 4 FT. OF SUPPORT ROPE [B] AND CORRESPONDS TO A 1,000-LB. ROCK WITH A VELOCITY OF 100 FT./SEC. IMPACT (APPROX. 100-FT-TONS IN ENERGY). FALLING ROCK LOAD B IS EQUIVALENT TO 3.4 KLF OVER THE MIDDLE 4 FT. OF ROPE [B].

TABLE 2

MAXIMUM ALLOWABLE NETTING SELF WEIGHT, MAX. N_{DL} (PSF), BASED ON POST-TO POST SPACING, L_{POST} ^{1, 2, 3}												
ROPE [B] DIAMETER	MAXIMUM NETTING LENGTH, L_{NET}			MAXIMUM NETTING LENGTH, L_{NET}			MAXIMUM NETTING LENGTH, L_{NET}			MAXIMUM NETTING LENGTH, L_{NET}		
	100 FT.	150 FT.	200 FT.	100 FT.	150 FT.	200 FT.	100 FT.	150 FT.	200 FT.	100 FT.	150 FT.	200 FT.
0.750"Ø	3.25	2.17	1.63	2.38	1.58	1.19	1.88	1.25	0.94	1.56	1.04	0.78
0.875"Ø	4.00 (45%)	3.08	2.31	3.38	2.25	1.69	2.63	1.75	1.31	2.13	1.42	1.06
1.000"Ø	4.00 (36%)	4.00 (49%)	3.13	4.00 (46%)	3.00	2.25	3.50	2.33	1.75	2.88	1.92	1.44
1.125"Ø	4.00 (30%)	4.00 (40%)	4.00	4.00 (38%)	3.83	2.88	4.00 (46%)	3.00	2.25	3.88	2.58	1.94
1.250"Ø	4.00 (25%)	4.00 (34%)	4.00 (42%)	4.00 (32%)	4.00 (43%)	3.63	4.00 (39%)	3.83	2.88	4.00 (45%)	3.08	2.31
$L_{POST} \leq 30$ FT.			30 FT. < $L_{POST} \leq 40$ FT.			40 FT. < $L_{POST} \leq 50$ FT.			50 FT. < $L_{POST} \leq 60$ FT.			

TABLE 3

FALLING ROCK LOAD'S PERCENT OF ROPE [B]'S CAPACITY, % C_{LL}		
ROPE [B] DIAMETER	LOAD A ANTICIPATED	LOAD B ANTICIPATED
0.750"Ø	39%	66%
0.875"Ø	30%	53%
1.000"Ø	24%	43%
1.125"Ø	20%	36%
1.250"Ø	17%	30%

TABLE 4

ENVIRONMENTAL LOAD'S PERCENT OF ROPE [B]'S CAPACITY, % C_{EL}	
SNOW & ICE ANTICIPATED	RANGE
MINIMAL	5% - 10%
MODERATE	15% - 25%
SIGNIFICANT	30% - 40%

TABLE 5

REQUIRED HARDWARE			
ROPE DIAMETER	TURNBUCKLE (JAW TO JAW)	SHACKLE (SCREW PIN)	SWIVEL (JAW ENDS)
0.750"Ø	1.75x18/1.75x24	1.25	0.875
0.875"Ø	2x24	1.50	0.875
1.000"Ø	2x24	1.50	1.00
1.125"Ø	2.5x24	1.75	1.00
1.250"Ø	2.75x24	2.00	1.25

DESIGN STEPS:

TOTAL PERCENTAGE OF SUPPORT ROPE [B] CAPACITY UTILIZED (% C_{TOTAL}) SHALL BE LESS THAN 100%.

- DETERMINE THE NETTING SYSTEM'S ACTUAL DEAD LOAD (PSF):
ACTUAL N_{DL} = (PRIMARY NETTING WEIGHT) + (SECONDARY NETTING WEIGHT)
- DETERMINE THE MINIMUM ROPE [B] DIAMETER FROM TABLE 2:
MIN. ROPE [B] DIA. = BASED ON THE NETTING LENGTH, L_{NET} , MAXIMUM ALLOWABLE NETTING SELF WEIGHT, MAX. N_{DL} , AND THE POST-TO-POST SPACING, L_{POST} , EMPLOYED.
- DETERMINE THE TOTAL PERCENTAGE OF SUPPORT ROPE [B]'S CAPACITY UTILIZED BY DESIGN.
% C_{TOTAL} = % C_{NDL} + % C_{LL} + % C_{EL} < 100%
- a. DETERMINE THE PERCENTAGE OF SUPPORT ROPE [B]'S CAPACITY UTILIZED BY THE NETTING SYSTEM'S ACTUAL DEAD LOAD:
% C_{NDL} = (ACTUAL N_{DL} ÷ MAX. N_{DL}) X MAX. N_{DL} %
WHERE MAX. N_{DL} % = 50% UNLESS DENOTED AS A LOWER PERCENTAGE IN PARENTHESES (FROM TABLE 2).
- b. DETERMINE THE PERCENTAGE OF SUPPORT ROPE [B]'S CAPACITY UTILIZED BY THE FALLING ROCK LOAD (FROM TABLE 3):
% C_{LL} = BASED ON SUPPORT ROPE [B] DIAMETER AND ANTICIPATED FALLING ROCK LOAD A OR LOAD B.
- c. DETERMINE THE PERCENTAGE OF SUPPORT ROPE [B]'S CAPACITY UTILIZED BY THE ENVIRONMENTAL LOADS (FROM TABLE 4):
% C_{EL} = BASED ON ANTICIPATED SITE SPECIFIC SNOW AND ICE ACCUMULATION.

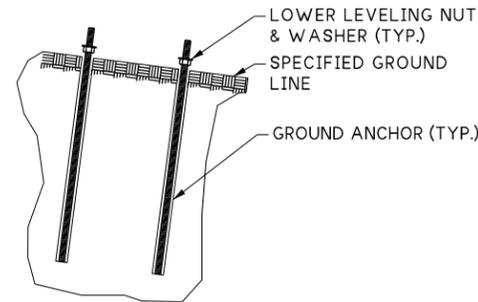
MATERIAL SPECIFICATION NOTES:

- SEE SPECIAL PROVISIONS FOR TYPE 3 SLOPE PROTECTION SYSTEM NETTING REQUIREMENTS.
- THIMBLES AND WIRE ROPE CLIPS SHALL CONFORM TO SECTION 9-16.4(4).
- WIRE ROPE 3/4" DIAMETER AND LARGER SHALL BE INDEPENDENT WIRE ROPE CLASS (IWRC), EIP STEEL, 6X19 CLASS, DRAWN-GALVANIZED MEETING ASTM A1023. SEAM AND LACING ROPE SHALL BE IWRC, EIP STEEL, 6X19 OR 7X19 CLASS, DRAWN-GALVANIZED MEETING ASTM A1023.
- THREADED BAR GROUND ANCHORS FOR TYPES A AND B POST ANCHORAGES AND ANCHOR BOLTS FOR TYPES C AND D POST ANCHORAGES SHALL CONFORM TO ASTM F1554 GR 105 WITH SUPPLEMENT S4 AT -20F. HARDENED WASHERS SHALL CONFORM TO ASTM F436.
- HOLLOW-CORE THREADED BAR GROUND ANCHORS SHALL CONFORM TO 9-16.4(6) EXCEPT STEEL TUBING MAY CONFORM TO ASTM A519 OR ASTM A513, AND SHALL HAVE A MINIMUM YIELD STRENGTH OF 85 KSI AND TENSILE STRENGTH OF 105 KSI.
- STEEL REINFORCING BARS SHALL CONFORM TO SECTION 9-07.2.
- THREADED BAR GROUND ANCHORS AND ANCHOR BOLTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM F2329. HOLLOW-CORE THREADED BARS, AND STEEL REINFORCING BARS SHALL BE EPOXY-COATED IN ACCORDANCE WITH SECTIONS 6-02.3(24)H AND 9-07.3 OR SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 CLASS A OR ASTM A767 CLASS 1. (CHROMATE TREATMENT NOT REQUIRED).
- COUPLERS AND NUTS FOR THE THREADED BAR GROUND ANCHORS AND HOLLOW-CORE THREADED BARS SHALL PROVIDE 100 PERCENT OF THE GUARANTEED MINIMUM TENSILE STRENGTH.
- TURNBUCKLES SHALL BE JAW AND JAW MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION FF-T-791B, TYPE 1, FORM 1, CLASS 7, AND ASTM F-1145. JAW END SWIVELS SHALL BE GALVANIZED AFTER FABRICATION AND SHALL MEET THE PERFORMANCE REQUIREMENTS OF FEDERAL SPECIFICATION RR-C-271D TYPE VII, CLASS 3, WITH THE APPROVAL OF THE ENGINEER, TWO 1 1/4"Ø SCREW PIN ANCHOR SHACKLES MAY BE SUBSTITUTED FOR THE JAW END SWIVELS AND SHALL MEET THE REQUIREMENTS OF NOTE M10.
- SCREW PIN ANCHOR SHACKLES SHALL BE GALVANIZED AFTER FABRICATION AND SHALL MEET THE PERFORMANCE REQUIREMENTS OF FEDERAL SPECIFICATION RR-C-271G TYPE IVA, GRADE A, CLASS 2. BACK-UP SHACKLES SHALL BE SCREW PIN OR MAY BE ROUND PIN ANCHOR TYPE AND SHALL MEET THE PERFORMANCE REQUIREMENTS OF FEDERAL SPECIFICATION RR-C-271G, TYPE IVA OR IVB, GRADE A, CLASS 1 AND SHALL BE GALVANIZED.
- STEEL POSTS SHALL CONFORM TO ASTM A992 OR ASTM A572 GR 50. BARS AND PLATES WELDED TO STEEL POSTS SHALL CONFORM TO ASTM A572 GR 50. NUTS SHALL CONFORM TO EITHER ASTM A563 GR B, HEXAGONAL, OR SECTION 9-07.11. WASHERS SHALL CONFORM TO ASTM F436, EXCEPT THAT PLATE WASHERS SHALL CONFORM TO ASTM A36 OR ASTM A572. WHEN WEATHERING STEEL IS SPECIFIED, ALL STEEL POSTS, BARS, PLATES AND PLATE WASHERS SHALL CONFORM TO ASTM A588.
- POSTS SHALL BE GALVANIZED, GALVANIZED AND PAINTED, HOT DIP GALVANIZED WITH NATINA REACTIVE COLOR TREATMENT, OR UNCOATED WEATHERING STEEL. SEE SPECIAL PROVISIONS FOR POST CORROSION PROTECTION REQUIREMENTS. HARDWARE, BARS AND PLATES SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M 111, AASHTO M 232, OR ASTM F2329 AS APPLICABLE.
- CONCRETE FOR GROUND ANCHORS SHALL CONFORM TO SECTION 9-16.4(6). CONCRETE FOR FOOTINGS SHALL BE CLASS 4000. ALL CONCRETE SHALL BE READY-MIX PER SECTION 6-02.3(4) UNLESS JOBSITE MIXING PER SECTION 6-02.3(4)B IS APPROVED BY THE ENGINEER.
- GROUT FOR ROPE AND BAR ANCHORS AND HOLLOW-CORE THREADED BARS SHALL CONFORM TO SECTION 9-20.3(2) AND BE A PROVEN, SAND-FREE, NO-SHRINK MATERIAL CAPABLE OF DEVELOPING THE BOND AND INTERNAL STRENGTH NECESSARY FOR THE REQUIRED CAPACITY. THE USE OF EPOXY OR POLYESTER RESIN AS BONDING AGENTS IS NOT ALLOWED. GROUT FOR GROUT PADS SHALL BE IN ACCORDANCE WITH SECTION 9-20.3(3).
- IF REQUESTED BY THE ENGINEER, SAMPLES OF GROUT AND/OR CONCRETE SHALL BE PROVIDED.
- THE REBOUND RESTRAINT CHAIN SHALL BE 5/8" DIAMETER MINIMUM, GALVANIZED, TYPE 1, CLASS 3, GRADE 43 (HIGH TEST CHAIN) IN ACCORDANCE WITH ASTM A413. SHACKLES SHALL BE SCREW PIN OR ROUND PIN PER NOTE M10 AND SHALL BE THE SAME DIAMETER AS THE CHAIN.

FILE NAME: SP3 Type 3 Slope Protection Details.dgn				REGION NO. 10	STATE WASH	 <p>DRAFT PLANS NOT FOR CONSTRUCTION</p>		SR XXX PROJECT TITLE		PLAN REF NO. SP3	
BRIDGE DES. ENG. Leland, A									TYPE 3 SLOPE PROTECTION TABLES WITH NOTES & MATERIAL SPECIFICATIONS		SHEET OF SHEETS
BRIDGE PROJ. ENG.											
SUPERVISOR Swett, G											
DESIGNED BY Miller III, WJ											
CHECKED BY Swett, G											
ENTERED BY Fisher, J											
PRELIM. PLAN BY											
ARCH. / SPEC.											
REVISION				DATE	BY	SEE CERTIFICATION SHEET DATE	SEE CERTIFICATION SHEET DATE				

STEP 1:

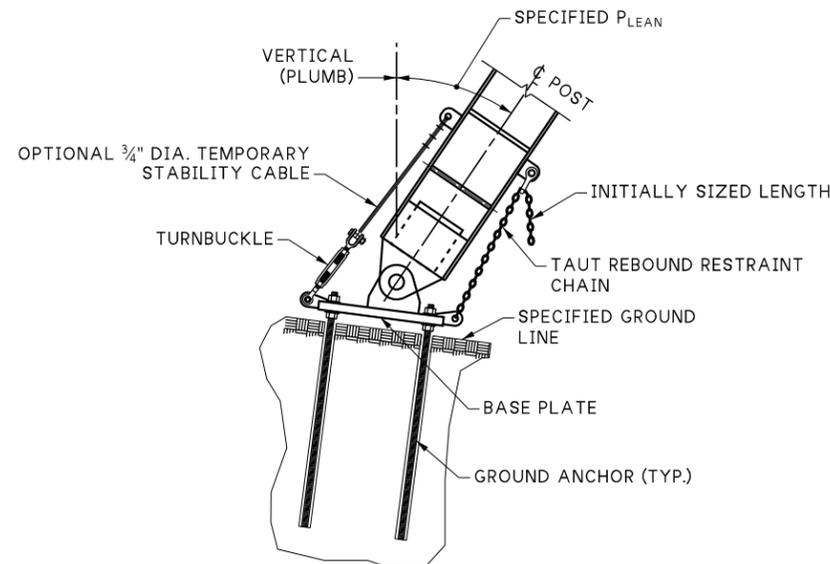
1. LOCATE AND VERIFY WITH THE ENGINEER ALL FINAL POST LOCATIONS.
2. INSTALL FOUNDATIONS PER SPECIFIED POST ANCHORAGE TYPE(S).
3. ALLOW CONCRETE AND/OR GROUT TO CURE AS APPLICABLE.
4. INSTALL LOWER LEVELING NUTS AND WASHERS OF BASE PLATE ASSEMBLY ON GROUND ANCHORS AND/OR ANCHOR BOLTS AS APPLICABLE AND ADJUST TO CREATE AN EVEN PLANE APPROXIMATELY PARALLEL WITH THE SPECIFIED GROUND LINE, LEAVING ENOUGH ANCHOR BOLT THREADS EXTENDED TO INSTALL BASE PLATE AND TOP WASHERS AND NUTS.



TYPE A POST ANCHORAGE SHOWN

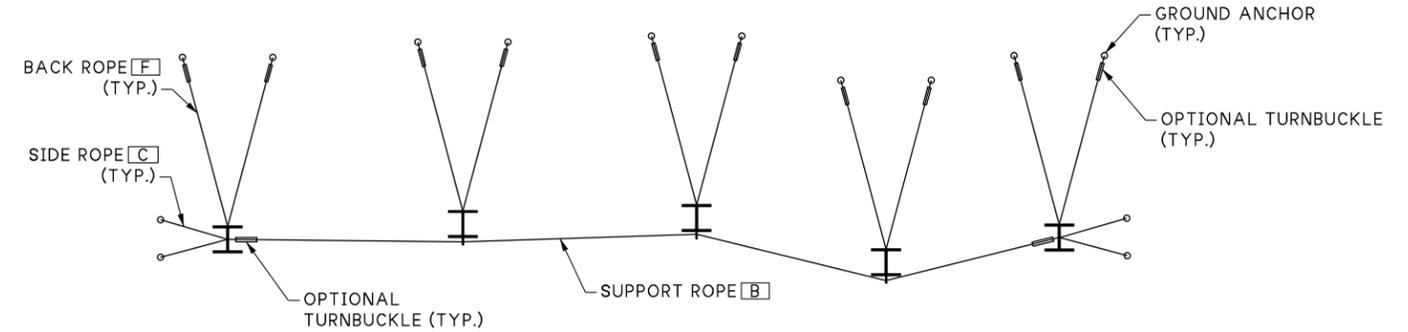
STEP 2:

1. INSTALL BASE PLATE AND POSTS ON GROUND ANCHORS OR ANCHOR BOLTS. POST AND BASE PLATE CAN BE INSTALLED SEPARATELY OR PINNED TOGETHER AS AN ASSEMBLY.
2. INSTALL PERMANENT REBOUND RESTRAINT CHAIN ON DOWNSLOPE SIDE OF POST AND OPTIONAL TEMPORARY STABILITY CABLE WITH TURNBUCKLE ON UPSLOPE SIDE OF POST. THE REBOUND RESTRAINT CHAIN'S LENGTH SHALL BE INITIALLY SIZED TO BE TAUT WHEN THE POST IS VERTICAL (PLUMB). SET THE TEMPORARY STABILITY CABLE AND TURNBUCKLE TO ACHIEVE THE POST LEAN SPECIFIED IN SPECIALS. ADJUSTMENTS TO THE THE POST'S LEAN (FORWARDS OR BACKWARDS) SHALL BE ACCOMPLISHED WITH THE TURNBUCKLE.
3. ENSURE ALL LOWER LEVELING NUTS AND WASHERS ARE IN FULL CONTACT WITH THE BOTTOM OF BASE PLATE. INSTALL TOP NUTS AND WASHERS AND TIGHTEN NUTS 1/4 TURN.
4. ONCE THE POST IS SET IN THE SPECIFIED POSITION, ADJUST REBOUND RESTRAINT CHAIN SO THAT IT IS TAUT.



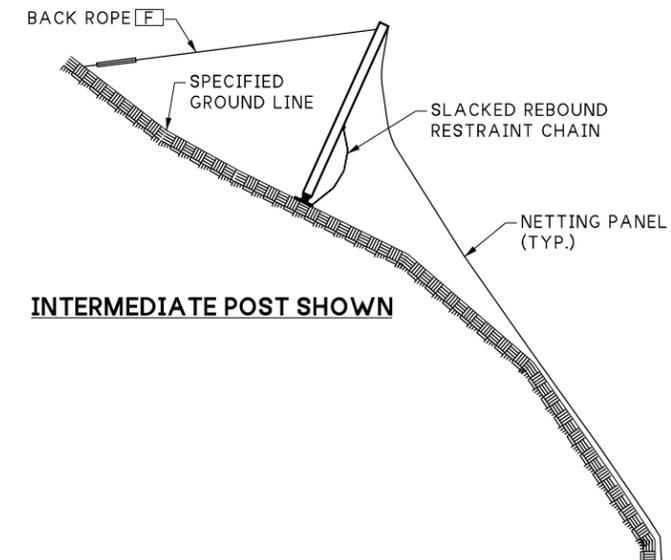
STEP 3:

1. INSTALL WIRE ROPE (OR BAR) ANCHORS FOR BACK ROPE [F] AND SIDE ROPE [C], THEN PROOF TEST PER THE SPECIAL PROVISIONS. ANCHORS MAY BE INSTALLED AT ANY PREVIOUS STEP AT THE CONTRACTOR'S DISCRETION.
2. CONNECT BACK ROPE [F] AND SIDE ROPE [C] TO THE ANCHORS AND POSTS, ENSURING THEY ARE NOT FULLY PRETENSIONED.
3. INSTALL SUPPORT ROPE [B] FROM END POST TO END POST OR END POST TO CONNECTION POST AS APPLICABLE. PRETENSION SUPPORT ROPE [B] TO SPECIFIED INITIAL CONDITION(S) FROM TABLE 10 ON SHEET SP15 FOR THE GIVEN ROPE DIAMETER AND POST SPACING USING OPTIONAL TURNBUCKLE OR ANOTHER APPROVED ALTERNATIVE.
4. ADJUST TENSION OF SIDE ROPE [C] TO SPECIFIED PRETENSION VALUE PER TABLE 13, ON SHEET SP16.



STEP 4:

1. INSTALL NETTING, LACING ROPES, SEAM ROPES, BACKUP SHACKLES, AND CORNER ROPE [K]. SEE SHEETS SP14 & SP15 FOR DETAILS.
2. ADJUST TENSION OF BACK ROPE [F] TO SPECIFIED PRETENSION VALUE PER TABLE 13, ON SHEET SP16. OPTIONAL TURNBUCKLES MAY BE USED TO FACILITATE PRETENSIONING.
3. RESET REBOUND RESTRAINT CHAIN TO FULL LENGTH TO PROVIDE SLACK IN CHAIN.
4. REMOVE TEMPORARY STABILITY CABLE AND TURNBUCKLE IF OPTION IS EMPLOYED.
5. PLACE GROUT PADS BELOW BASE. (GROUT PADS MAY BE INSTALLED ANY TIME AFTER STEP 2).



INTERMEDIATE POST SHOWN

FILE NAME	SP4 Type 3 Slope Protection Details.dgn		
BRIDGE DES. ENG.	Leland, A		
BRIDGE PROJ. ENG.			
SUPERVISOR	Swett, G		
DESIGNED BY	Miller III, WJ		
CHECKED BY	Swett, G		
ENTERED BY	Fisher, J		
PRELIM. PLAN BY			
ARCH. / SPEC.			
	REVISION	DATE	BY

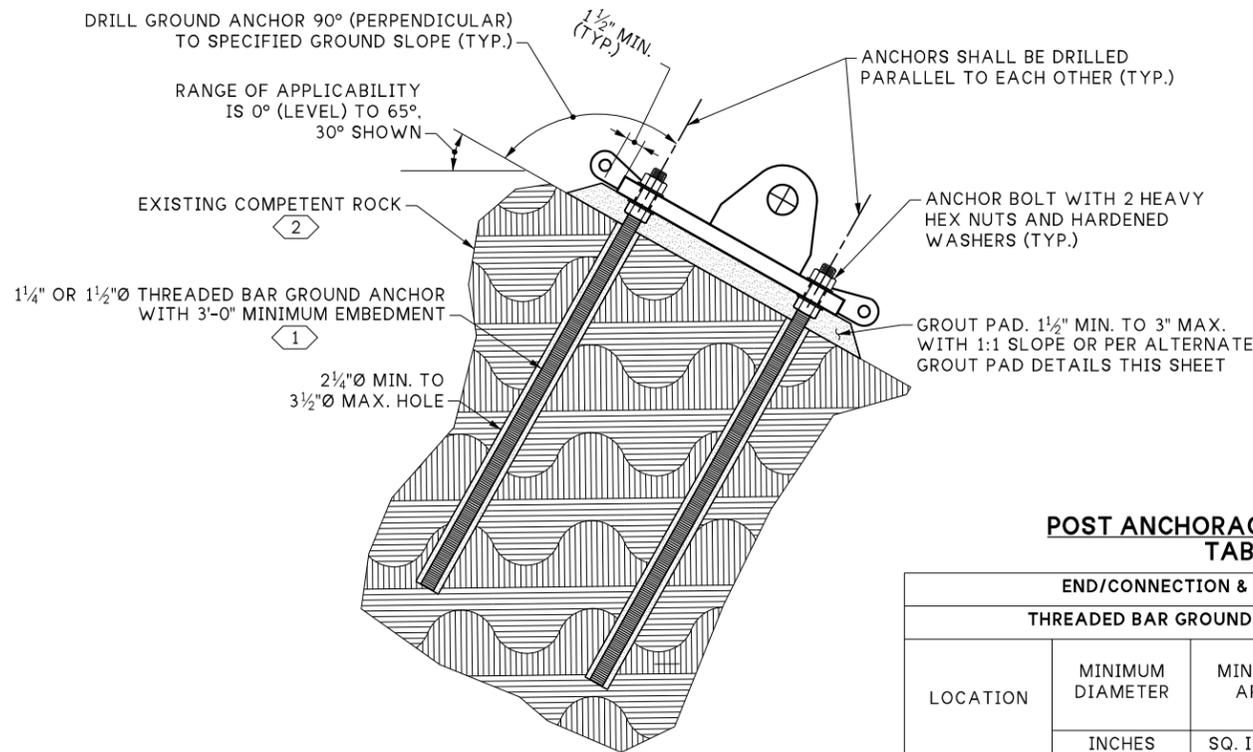
REGION NO.	STATE
10	WASH
JOB NUMBER	
CONTRACT NO.	



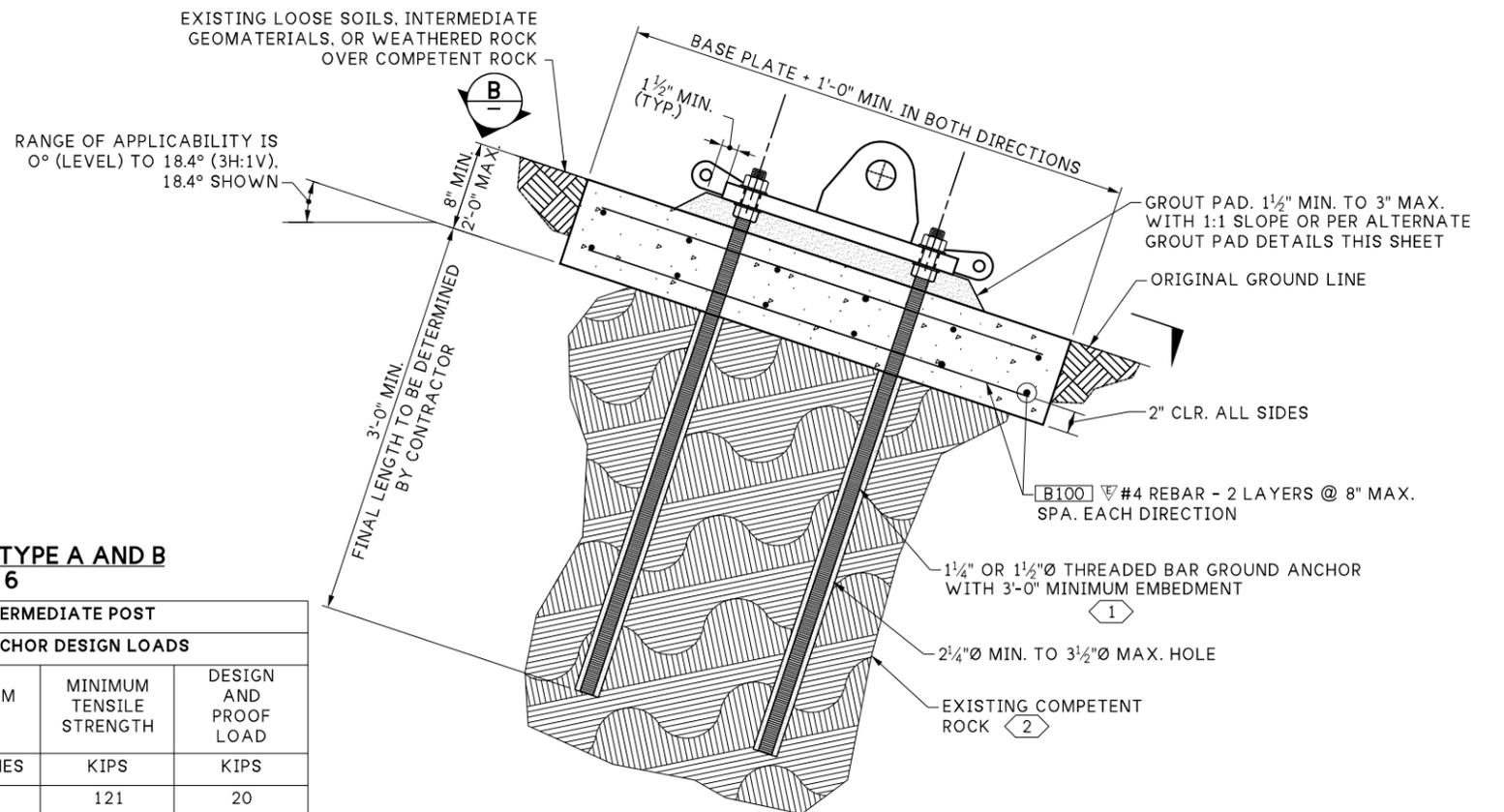
SR XXX
PROJECT TITLE

TYPE 3 SLOPE PROTECTION
SUGGESTED CONSTRUCTION SEQUENCE

PLAN REF NO	SP4
SHEET OF SHEETS	



TYPE A POST ANCHORAGE
POST NOT SHOWN FOR CLARITY



TYPE B POST ANCHORAGE
POST NOT SHOWN FOR CLARITY

POST ANCHORAGE TYPE A AND B
TABLE 6

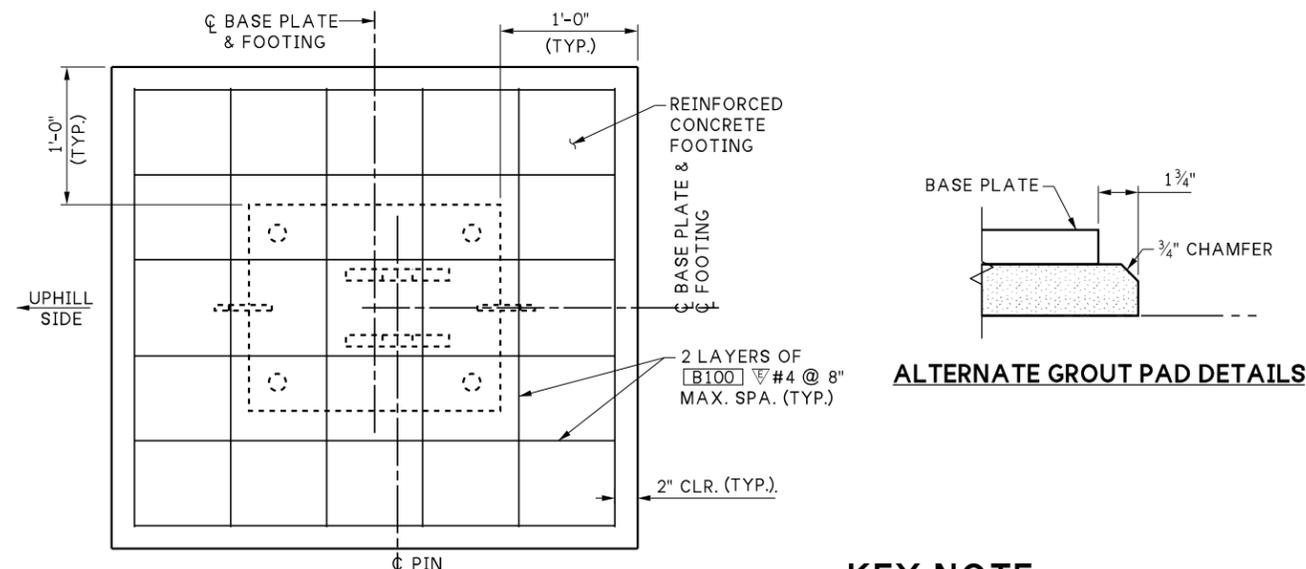
END/CONNECTION & INTERMEDIATE POST				
THREADED BAR GROUND ANCHOR DESIGN LOADS				
LOCATION	MINIMUM DIAMETER	MINIMUM AREA	MINIMUM TENSILE STRENGTH	DESIGN AND PROOF LOAD
	INCHES	SQ. INCHES	KIPS	KIPS
INTERMEDIATE	1.25	0.969	121	20
END/CONN.	1.50	1.405	176	35

TYPE A POST ANCHORAGE INSTALLATION SEQUENCE

1. LOCATE POST ANCHORAGE PER THE PLANS AND AS APPROVED BY THE ENGINEER.
2. PREPARE ROCK SURFACE BY CHIPPING OR SCALING TO PROVIDE A SURFACE THAT WILL RESULT IN A GROUT PAD THICKNESS OF 1 1/2" MIN. TO 3" MAX.
3. DRILL, INSTALL, AND GROUT GROUND ANCHORS USING THE BASE PLATE AS A TEMPLATE. ALTERNATIVE TEMPLATES WITH HOLE PATTERNS MATCHING THE GROUND ANCHOR SPACING ARE ACCEPTABLE.
4. AFTER THE GROUT HAS CURED AND ANCHORS PROOF TESTED AS REQUIRED PER THE SPECIAL PROVISIONS, PLACE LOWER LEVELING NUTS AND WASHERS TO CREATE A PLANE APPROXIMATELY PARALLEL WITH THE EXISTING GROUND SLOPE.
5. INSTALL BASE PLATE AND ADJUST LOWER NUTS AS NEEDED UNTIL TIGHT WITH BOTTOM OF BASE PLATE. INSTALL TOP NUTS AND WASHERS AND TIGHTEN TOP NUTS 1/4 TURN.
6. FORM AND PLACE GROUT PAD IN A FLOWABLE CONSISTENCY AND ENSURE FULL BEARING UNDER BASE PLATE. USE VENT HOLES TO VERIFY GROUT PLACEMENT. FOR SLOPING EXISTING GROUND SURFACES, TOP FORMS TO CONFINE GROUT MAY BE REQUIRED. CONTRACTOR SHALL SUBMIT A TYPE 2 WORKING DRAWING DESCRIBING FORMING AND PLACEMENT OF GROUT PAD.

TYPE B POST ANCHORAGE INSTALLATION SEQUENCE

1. LOCATE POST ANCHORAGE PER THE PLANS AND AS APPROVED BY THE ENGINEER.
2. REMOVE LOOSE SOILS, INTERMEDIATE GEOMATERIALS, AND/OR WEATHERED ROCK DOWN TO COMPETENT ROCK. PREPARE ROCK SURFACE BY CHIPPING OR SCALING TO PROVIDE A SURFACE THAT WILL RESULT IN A FOOTING OF EQUAL THICKNESS ± 1 1/2".
3. DRILL, INSTALL, AND GROUT GROUND ANCHORS USING THE BASE PLATE AS A TEMPLATE. ALTERNATIVE TEMPLATES WITH HOLE PATTERNS MATCHING THE GROUND ANCHOR SPACING ARE ACCEPTABLE. ENSURE GROUND ANCHORS ARE LONG ENOUGH TO EXTEND THROUGH FOOTING. GROUT PAD, AND TO BE BOLTED TO THE BASE PLATE.
4. AFTER THE GROUT HAS CURED AND ANCHORS PROOF TESTED AS REQUIRED PER THE SPECIAL PROVISIONS, INSTALL REINFORCEMENT AND CAST CONCRETE FOR FOOTING. AFTER FOOTING HAS CURED, PLACE LOWER LEVELING NUTS AND WASHERS TO CREATE A PLANE PARALLEL WITH TOP OF FOOTING.
5. INSTALL BASE PLATE AND ADJUST LOWER NUTS AS NEEDED UNTIL TIGHT WITH BOTTOM OF BASE PLATE. INSTALL TOP NUTS AND WASHERS AND TIGHTEN TOP NUTS 1/4 TURN.
6. FORM AND PLACE GROUT PAD IN A FLOWABLE CONSISTENCY AND ENSURE FULL BEARING UNDER BASE PLATE. USE VENT HOLES TO VERIFY GROUT PLACEMENT. FOR SLOPING EXISTING GROUND SURFACES, TOP FORMS TO CONFINE GROUT MAY BE REQUIRED. CONTRACTOR SHALL SUBMIT A TYPE 2 WORKING DRAWING DESCRIBING FORMING AND PLACEMENT OF GROUT PAD.



ALTERNATE GROUT PAD DETAILS

KEY NOTE:

- 1 CONTRACTOR TO DETERMINE FINAL LENGTH. SEE THREADED BAR GROUND ANCHOR DESIGN LOADS TABLE 6 ON THIS SHEET FOR SIZE AND SPECIFIED DESIGN LOADS.
- 2 SEE SPECIAL PROVISION FOR DEFINITION

SECTION B
TYPE B POST ANCHORAGE
REINFORCED CONCRETE FOOTING

FILE NAME	SP5 Type 3 Slope Protection Details.dgn	REGION NO.	10	STATE	WASH
BRIDGE DES. ENG.	Leland, A	JOB NUMBER			
BRIDGE PROJ. ENG.		CONTRACT NO.			
SUPERVISOR	Swett, G				
DESIGNED BY	Miller III, WJ				
CHECKED BY	Swett, G				
ENTERED BY	Fisher, J				
PRELIM. PLAN BY					
ARCH. / SPEC.					

REVISION	DATE	BY

WSDOT
DRAFT PLANS
NOT FOR CONSTRUCTION

SEE CERTIFICATION SHEET DATE

SEE CERTIFICATION SHEET DATE

STAMP BOX

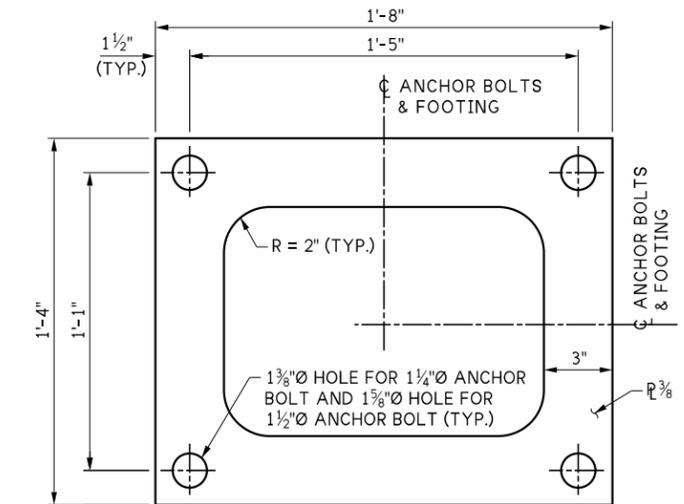
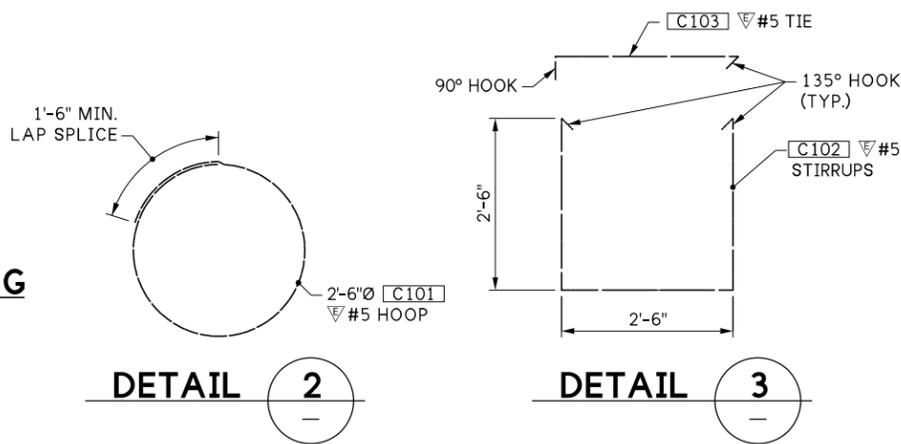
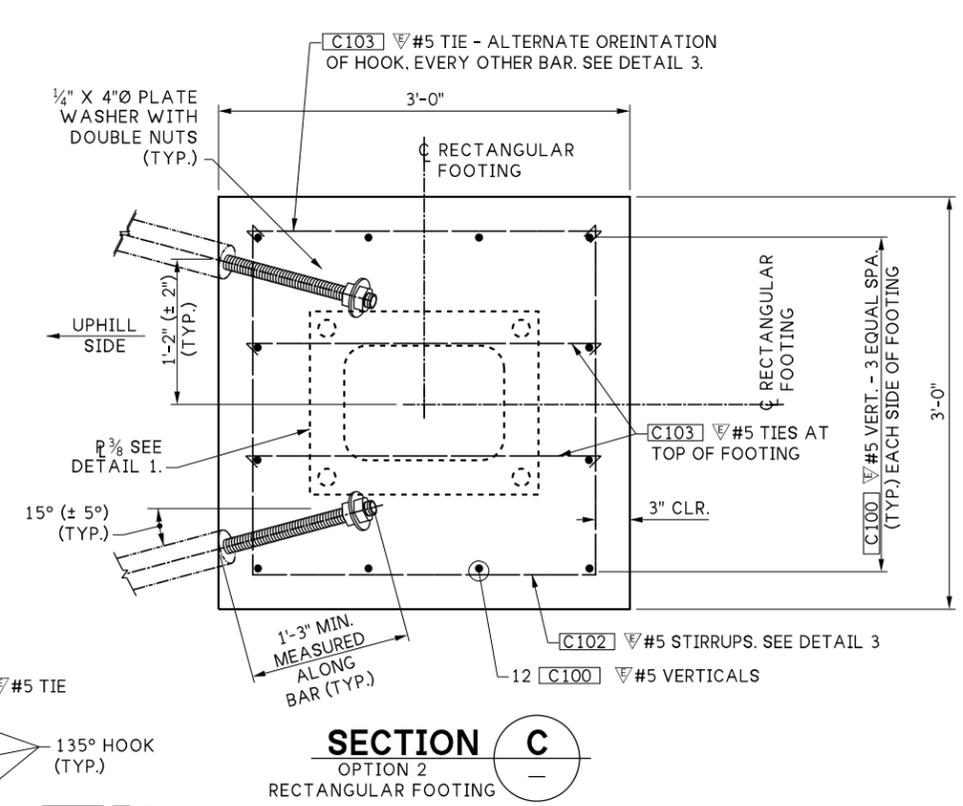
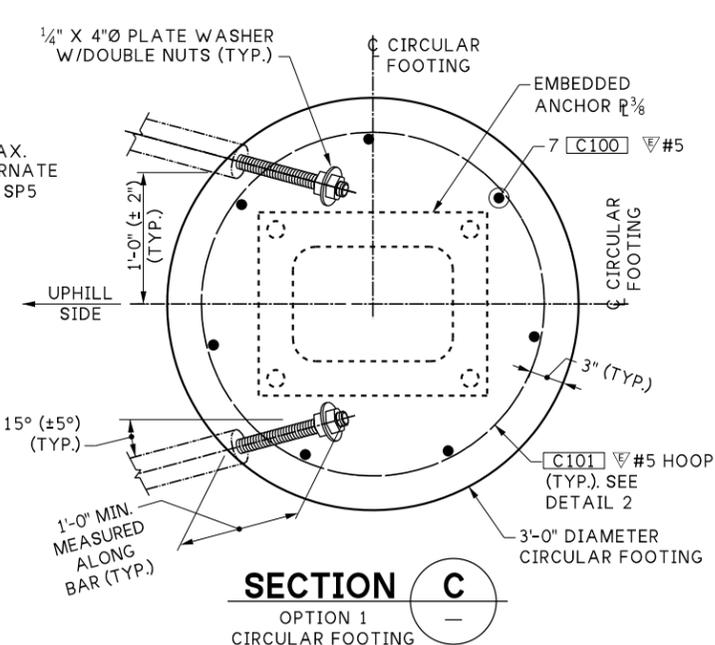
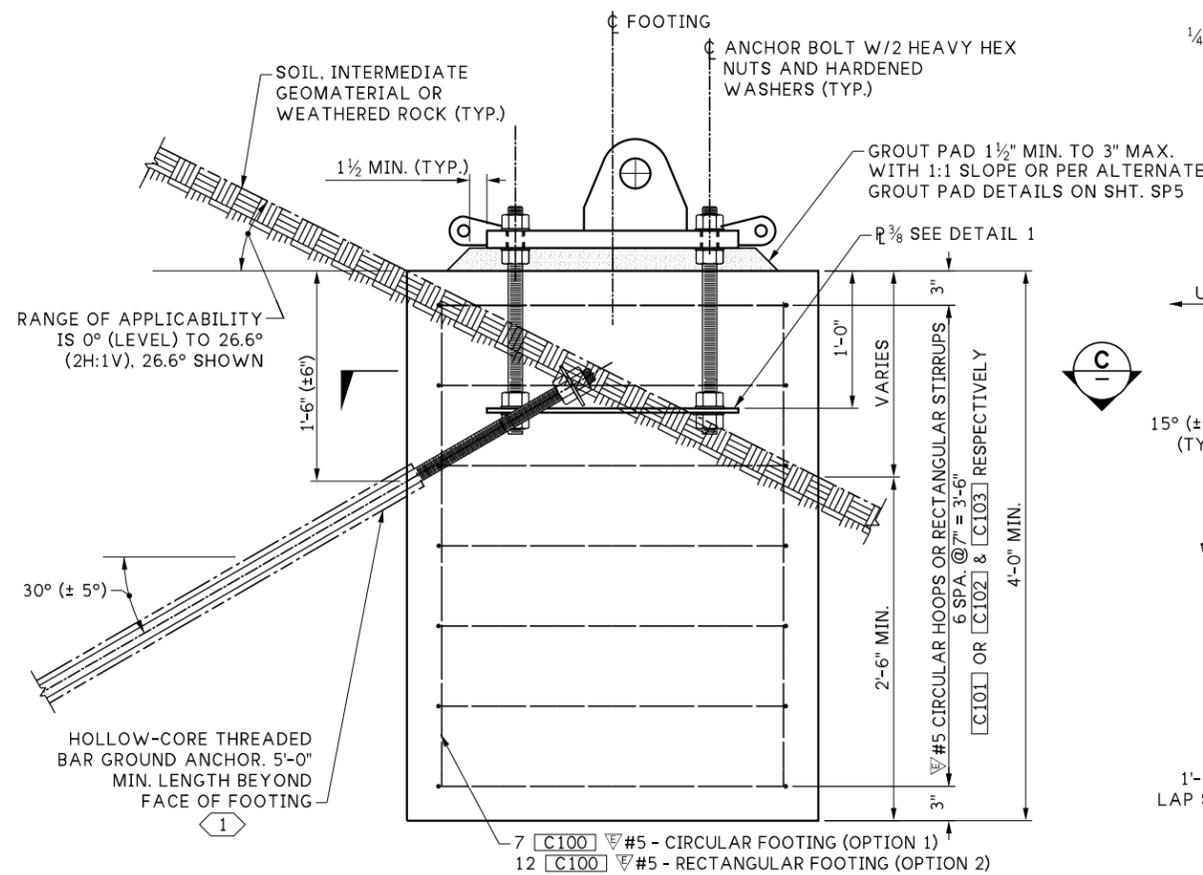
STAMP BOX

SR XXX
PROJECT TITLE

TYPE 3 SLOPE PROTECTION
TYPE A & TYPE B POST ANCHORAGES

PLAN REF NO
SP5

SHEET
OF
SHEETS



TYPE C POST ANCHORAGE REINFORCED CONCRETE CIRCULAR OR RECTANGULAR FOOTING

POST NOT SHOWN FOR CLARITY

TYPE C POST ANCHORAGE INSTALLATION SEQUENCE

1. LOCATE POST ANCHORAGE PER THE PLANS AND AS APPROVED BY THE ENGINEER.
2. EXCAVATE FOR CIRCULAR OR RECTANGULAR FOOTING. INSTALL FORMS AS REQUIRED.
3. DRILL, INSTALL, AND GROUT GROUND ANCHORS AT THE LOCATIONS SHOWN IN THE DETAILS. PROOF TEST ANCHORS AS REQUIRED, PER THE SPECIAL PROVISIONS.
4. AFTER THE GROUT HAS CURED AND ANCHORS PROOF TESTED, INSTALL REINFORCING BARS, ANCHOR BOLTS, AND CAST CONCRETE FOR FOOTING. AFTER FOOTING HAS CURED, PLACE LOWER LEVELING NUTS AND WASHERS TO CREATE A PLANE PARALLEL WITH TOP OF FOOTING.
5. INSTALL BASE PLATE AND ADJUST LOWER NUTS AS NEEDED UNTIL TIGHT WITH BOTTOM OF PLATE. INSTALL TOP NUTS AND WASHERS AND TIGHTEN TOP NUTS 1/4 TURN.
6. FORM AND PLACE GROUT PAD IN A FLOWABLE CONSISTENCY AND ENSURE FULL BEARING UNDER BASE PLATE. USE VENT HOLES TO VERIFY GROUT PLACEMENT. CONTRACTOR SHALL SUBMIT A TYPE 2 WORKING DRAWING DESCRIBING FORMING AND PLACEMENT OF GROUT PAD.
7. BACKFILL ANY VOIDS OR ANNULAR SPACE AROUND THE FOOTINGS WITH CDF PER THE SPECIALS.

**POST ANCHORAGE TYPE C
TABLE 7**

ROPE [B] DIAMETER	INTERMEDIATE & CONNECTION POSTS				END POSTS			
	HOLLOW-CORE THREADED BAR BATTERED GROUND ANCHOR DESIGN LOADS				HOLLOW-CORE THREADED BAR BATTERED GROUND ANCHOR DESIGN LOADS			
	MINIMUM DIAMETER	MINIMUM AREA	MINIMUM TENSILE STRENGTH	DESIGN & PROOF LOAD	MINIMUM DIAMETER	MINIMUM AREA	MINIMUM TENSILE STRENGTH	DESIGN & PROOF LOAD
INCHES	INCHES	SQ. INCHES	KIPS	KIPS	INCHES	SQ. INCHES	KIPS	KIPS
0.750	1.25	0.556	58.4	20	1.25	0.556	58.4	35
0.875	1.25	0.556	58.4	30	1.25	0.776	81.5	45
1.000	1.25	0.556	58.4	35	1.25	0.776	81.5	60
1.125	1.25	0.556	58.4	45	1.50	1.067	112	75
1.250	1.25	0.776	81.5	50	2.00	1.795	188	90

NOTE: BAR DIAMETER/AREA MAY BE INCREASED PROVIDED
MINIMUM TENSILE STRENGTH IS EQUAL OR GREATER

DETAIL 1

KEY NOTE:

- 1 CONTRACTOR TO DETERMINE FINAL LENGTH. SEE HOLLOW-CORE THREADED BAR GROUND ANCHOR DESIGN LOADS TABLE 7 THIS SHEET FOR SIZE AND SPECIFIED DESIGN LOADS.

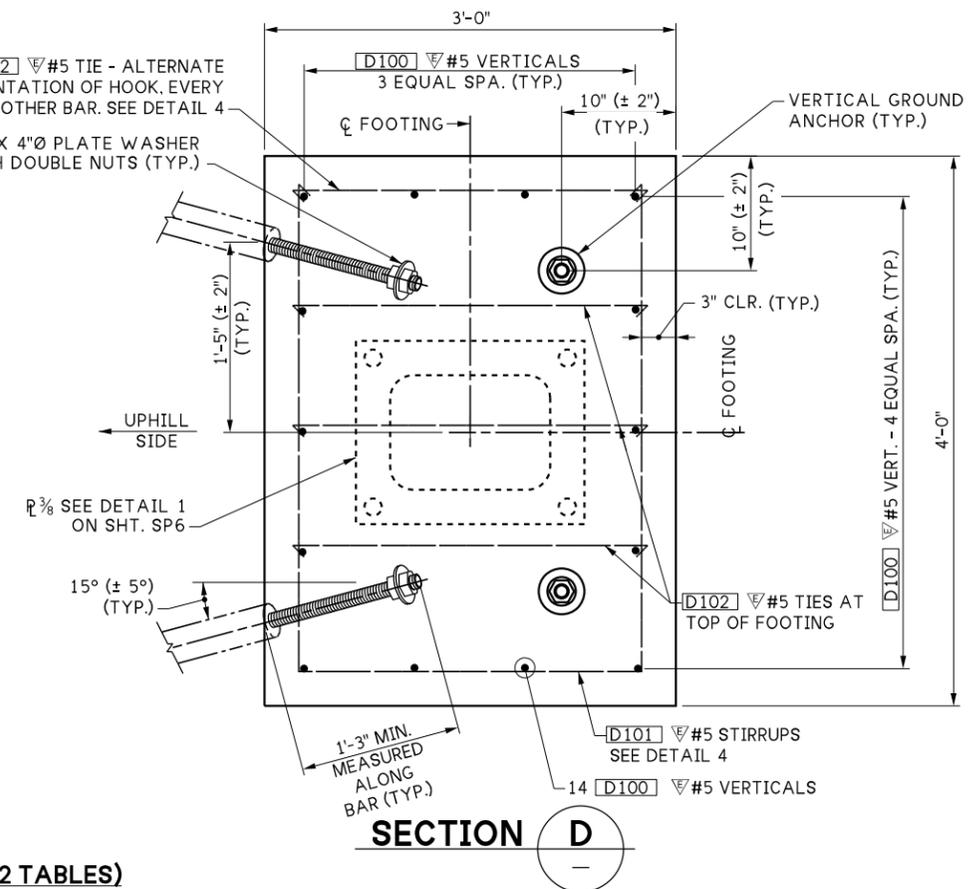
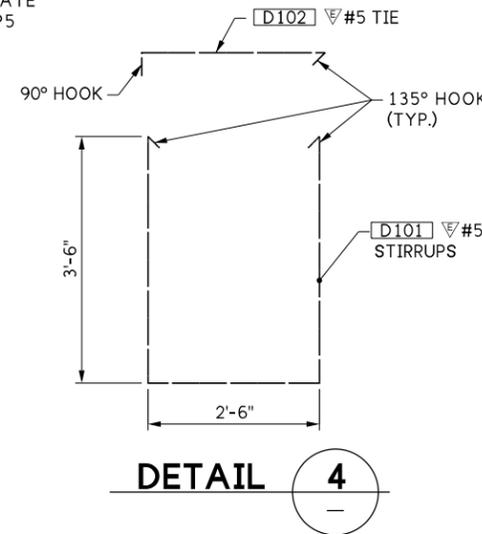
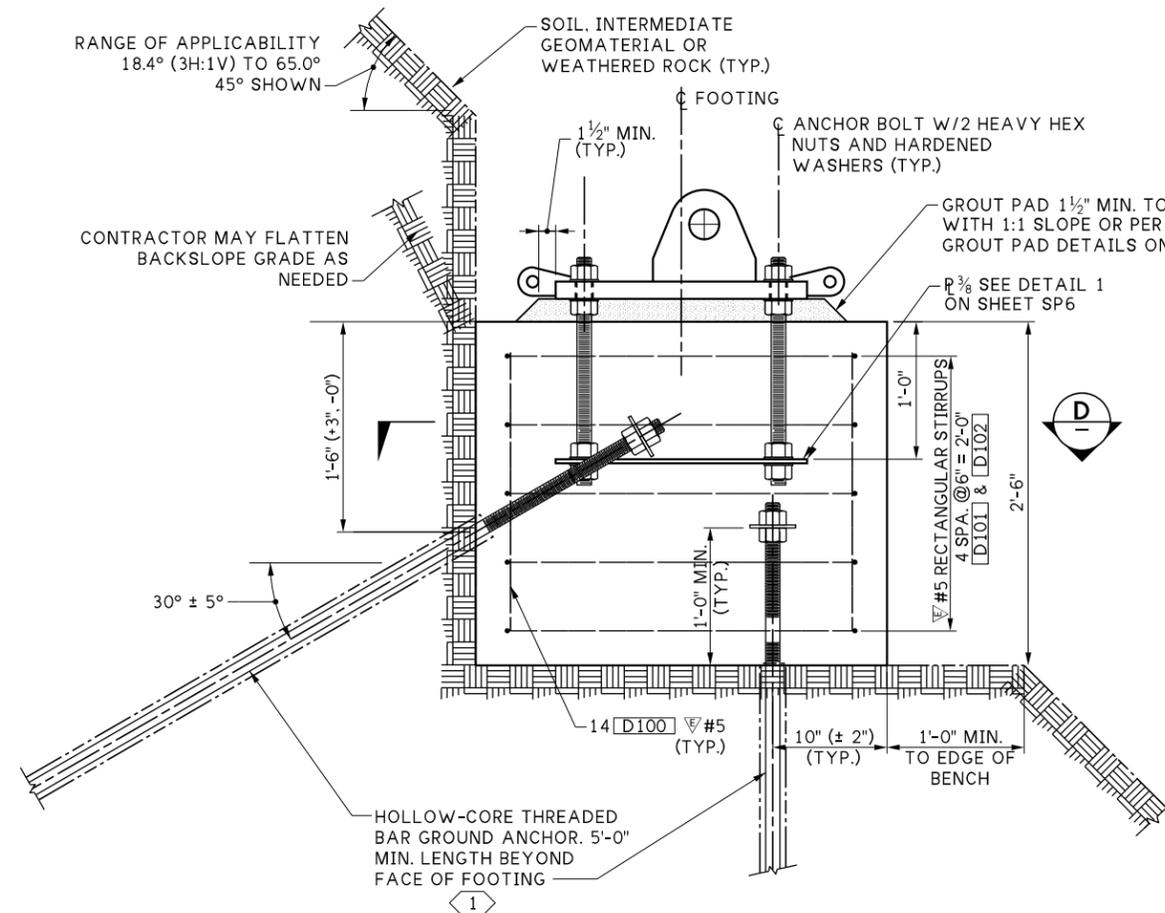
FILE NAME	SP6 Type 3 Slope Protection Details.dgn		
BRIDGE DES. ENG.	Leland, A	REGION NO.	10
BRIDGE PROJ. ENG.		STATE	WASH
SUPERVISOR	Swett, G	JOB NUMBER	
DESIGNED BY	Miller III, WJ	CONTRACT NO.	
CHECKED BY	Swett, G		
ENTERED BY	Fisher, J		
PRELIM. PLAN BY			
ARCH. / SPEC.			
	REVISION	DATE	BY

WSDOT

DRAFT PLANS
NOT FOR CONSTRUCTION

SEE CERTIFICATION SHEET
DATE

SR XXX PROJECT TITLE	PLAN REF NO SP6
TYPE 3 SLOPE PROTECTION TYPE C POST ANCHORAGE	SHEET OF SHEETS



TYPE D POST ANCHORAGE
POST NOT SHOWN FOR CLARITY

TYPE D POST ANCHORAGE INSTALLATION SEQUENCE

1. LOCATE POST ANCHORAGE PER THE PLANS AND AS APPROVED BY THE ENGINEER.
2. CONSTRUCT A BENCH FOR FOOTING PER THE DIMESIONS IN THE DETAILS.
3. DRILL, INSTALL, AND GROUT GROUND ANCHORS AT THE LOCATIONS SHOWN IN THE DETAILS. PROOF TEST ANCHORS AS REQUIRED.
4. AFTER THE GROUT HAS CURED AND ANCHORS PROOF TESTED, INSTALL FOOTING FORMS, REINFORCING BARS, ANCHOR BOLTS, AND CAST CONCRETE FOR FOOTING. AFTER FOOTING HAS CURED, PLACE LOWER LEVELING NUTS AND WASHERS TO CREATE A PLANE PARALLEL WITH TOP OF FOOTING.
5. INSTALL BASE PLATE AND ADJUST LOWER NUTS AS NEEDED UNTIL TIGHT WITH BOTTOM OF PLATE. INSTALL TOP NUTS AND WASHERS AND TIGHTEN TOP NUTS 1/4 TURN.
6. FORM AND PLACE GROUT PAD IN A FLOWABLE CONSISTENCY AND ENSURE FULL BEARING UNDER BASE PLATE. USE VENT HOLES TO VERIFY GROUT PLACEMENT. CONTRACTOR SHALL SUBMIT A TYPE 2 WORKING DRAWING DESCRIBING FORMING AND PLACEMENT OF GROUT PAD.
7. REMOVE FORMS. FILL ANY VOIDS ON UPHILL SIDE OF FOOTING WITH CDF PER THE SPECIALS. IF BACK (UHILL) SIDE OF FOOTING IS STABLE AFTER EXCAVATION, UPHILL SIDE FOOTING FORM MAY BE OMMITTED AND CONCRETE CAST DIRECTLY AGAINST GRADE.

POST ANCHORAGE TYPE D - (2 TABLES)

TABLE 8

ROPE [B] DIAMETER	INTERMEDIATE & CONNECTION POSTS				END POSTS			
	HOLLOW-CORE THREADED BAR BATTERED GROUND ANCHOR DESIGN LOADS				HOLLOW-CORE THREADED BAR BATTERED GROUND ANCHOR DESIGN LOADS			
	MINIMUM DIAMETER	MINIMUM AREA	MINIMUM TENSILE STRENGTH	DESIGN & PROOF LOAD	MINIMUM DIAMETER	MINIMUM AREA	MINIMUM TENSILE STRENGTH	DESIGN & PROOF LOAD
INCHES	INCHES	SQ. INCHES	KIPS	KIPS	INCHES	SQ. INCHES	KIPS	KIPS
0.750	1.25	0.556	58.4	20	1.25	0.556	58.4	35
0.875	1.25	0.556	58.4	30	1.25	0.776	81.5	45
1.000	1.25	0.556	58.4	35	1.25	0.776	81.5	60
1.125	1.25	0.556	58.4	45	1.50	1.067	112	75
1.250	1.25	0.776	81.5	50	2.00	1.795	188	90

NOTE: BAR DIAMETER/AREA MAY BE INCREASED PROVIDED MINIMUM TENSILE STRENGTH IS EQUAL OR GREATER

TABLE 9

ROPE [B] DIAMETER	INTERMEDIATE & CONNECTION POSTS				END POSTS			
	HOLLOW-CORE THREADED BAR VERTICAL GROUND ANCHOR DESIGN LOADS				HOLLOW-CORE THREADED BAR VERTICAL GROUND ANCHOR DESIGN LOADS			
	MINIMUM DIAMETER	MINIMUM AREA	MINIMUM TENSILE STRENGTH	DESIGN & PROOF LOAD	MINIMUM DIAMETER	MINIMUM AREA	MINIMUM TENSILE STRENGTH	DESIGN & PROOF LOAD
INCHES	INCHES	SQ. INCHES	KIPS	KIPS	INCHES	SQ. INCHES	KIPS	KIPS
0.750	1.25	0.556	58.4	20	1.25	0.556	58.4	20
0.875	1.25	0.556	58.4	20	1.25	0.556	58.4	30
1.000	1.25	0.556	58.4	25	1.25	0.556	58.4	40
1.125	1.25	0.556	58.4	30	1.25	0.776	81.5	55
1.250	1.25	0.776	81.5	35	1.25	0.776	81.5	65

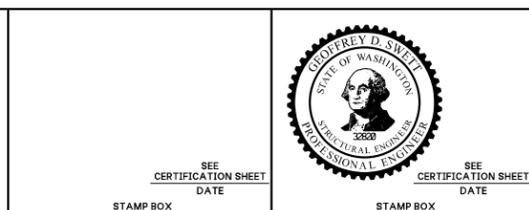
NOTE: BAR DIAMETER/AREA MAY BE INCREASED PROVIDED MINIMUM TENSILE STRENGTH IS EQUAL OR GREATER

KEY NOTE:

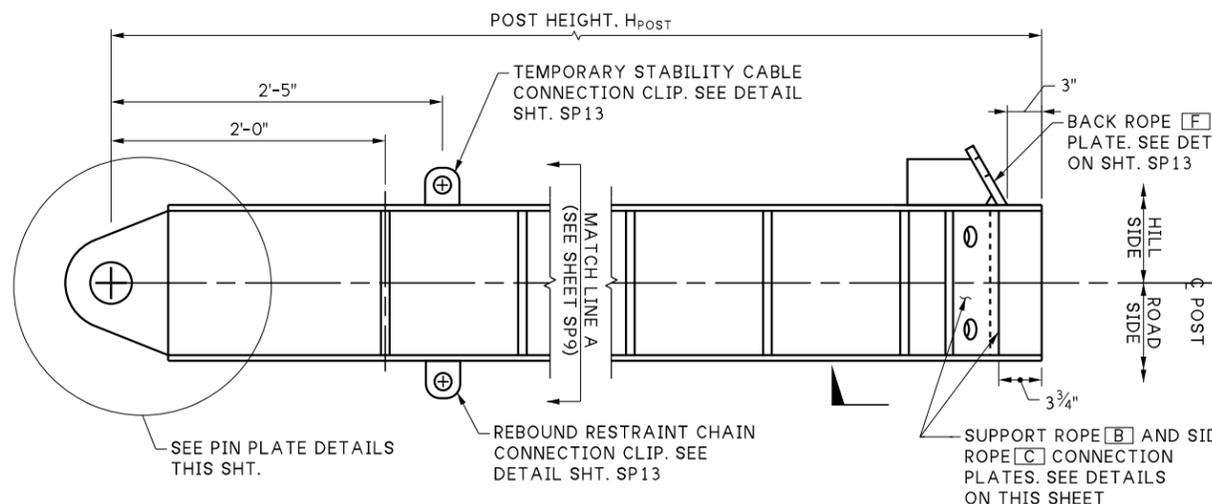
1 CONTRACTOR TO DETERMINE FINAL LENGTH. SEE HOLLOW-CORE THREADED BAR GROUND ANCHOR DESIGN LOADS TABLES 8 & 9 THIS SHEET FOR SIZE AND SPECIFIED DESIGN LOADS.

FILE NAME	SP7 Type 3 Slope Protection Details.dgn
BRIDGE DES. ENG.	Leland, A
BRIDGE PROJ. ENG.	
SUPERVISOR	Swett, G
DESIGNED BY	Miller III, WJ
CHECKED BY	Swett, G
ENTERED BY	Fisher, J
PRELIM. PLAN BY	
ARCH. / SPEC.	
REVISION	DATE BY

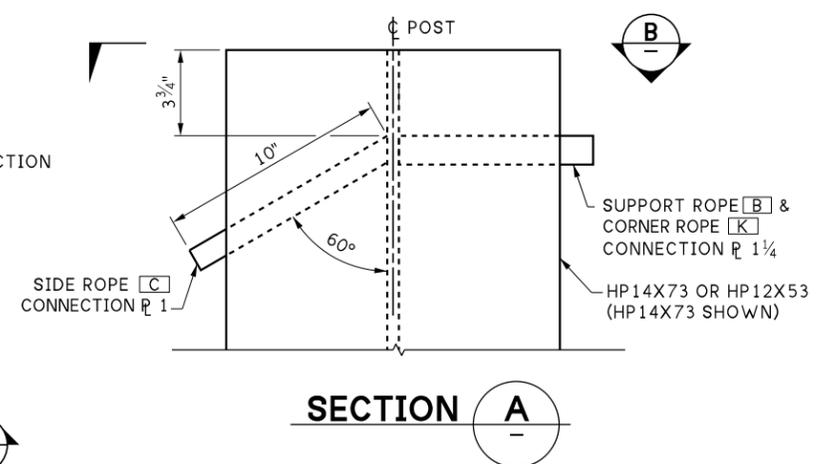
REGION NO.	STATE
10	WASH
JOB NUMBER	
CONTRACT NO.	



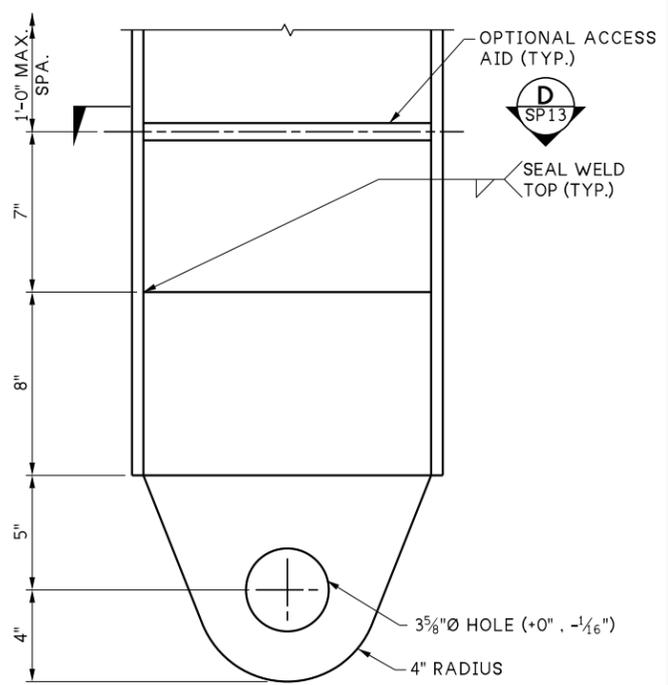
SR XXX	PROJECT TITLE
TYPE 3 SLOPE PROTECTION	
TYPE D POST ANCHORAGE	
PLAN REF NO	SP7
SHEET	OF
SHEETS	



END POST
HP14X73 OR HP12X53
(HP14X73 SHOWN)

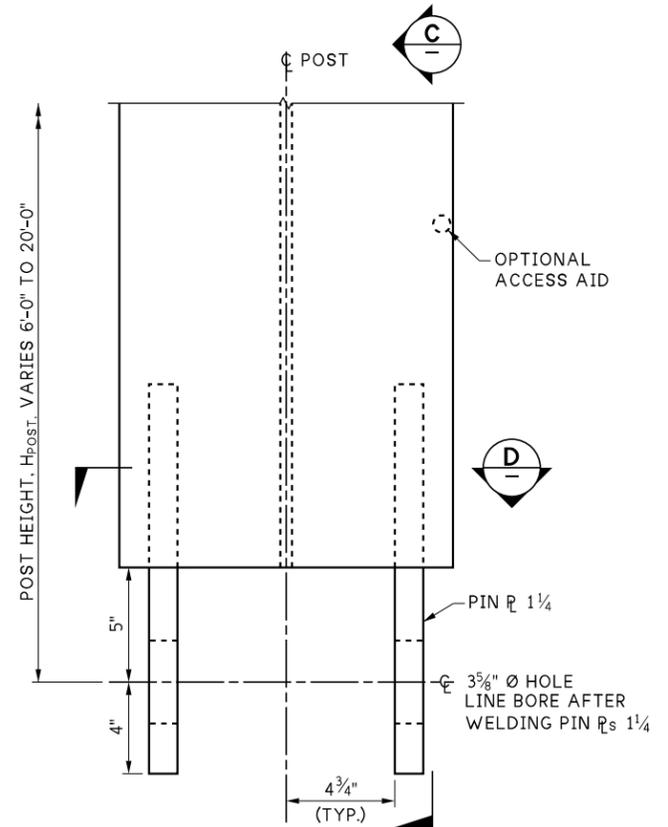


SECTION A

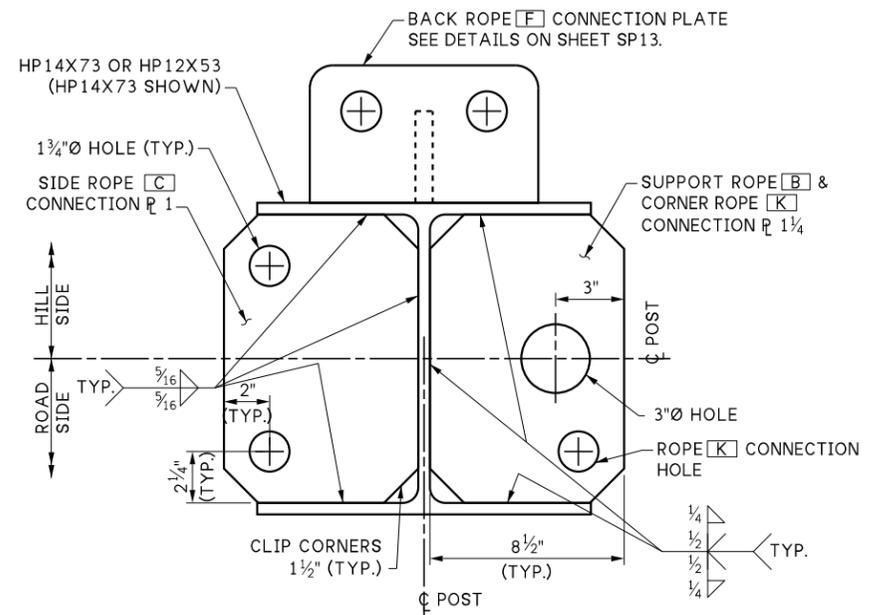


SECTION C

END POST - HP14X73
FOR POST HEIGHTS, H_{POST}, UP TO 20 FT.

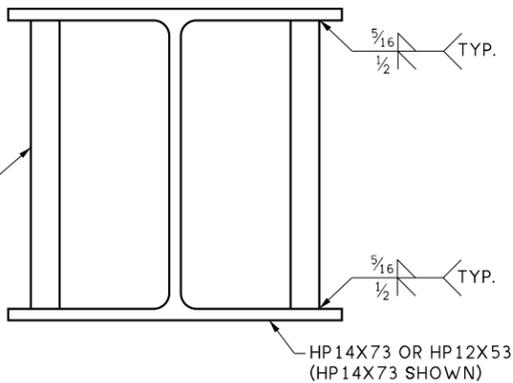


**END POST
PIN PLATE DETAILS**
HP14X73 OR HP12X53
(HP14X73 SHOWN)

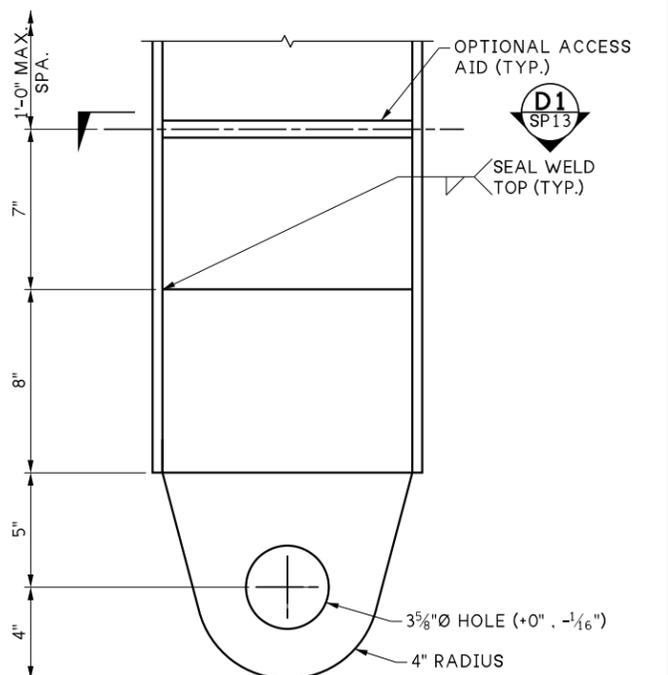


SECTION B
LEFT END POST SHOWN,
- RIGHT END OPPOSITE HAND

PIN R 1 1/4 (TYP.). CUT TO FIT BETWEEN INSIDE FACE OF FLANGES WITH 1/8" MAX. GAP EACH SIDE. INCREASE FILLET WELD LEG TO ACCOUNT FOR GAP IF GREATER THAN 1/16"



SECTION D



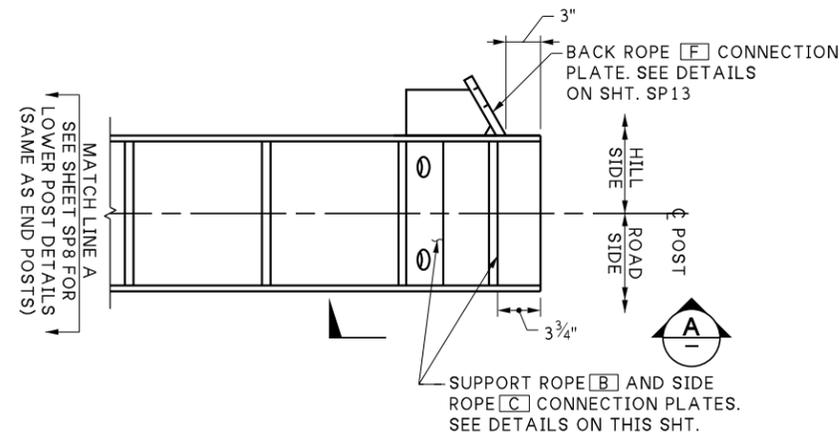
SECTION C

END POST - HP12X53
FOR POST HEIGHTS, H_{POST}, UP TO 15 FT.

FILE NAME	SP8 Type 3 Slope Protection Details.dgn	REGION NO.	10	STATE	WASH
BRIDGE DES. ENG.	Leland, A	JOB NUMBER			
BRIDGE PROJ. ENG.		CONTRACT NO.			
SUPERVISOR	Swett, G	DATE		BY	
DESIGNED BY	Miller III, WJ				
CHECKED BY	Swett, G				
ENTERED BY	Fisher, J				
PRELIM. PLAN BY					
ARCH. / SPEC.					

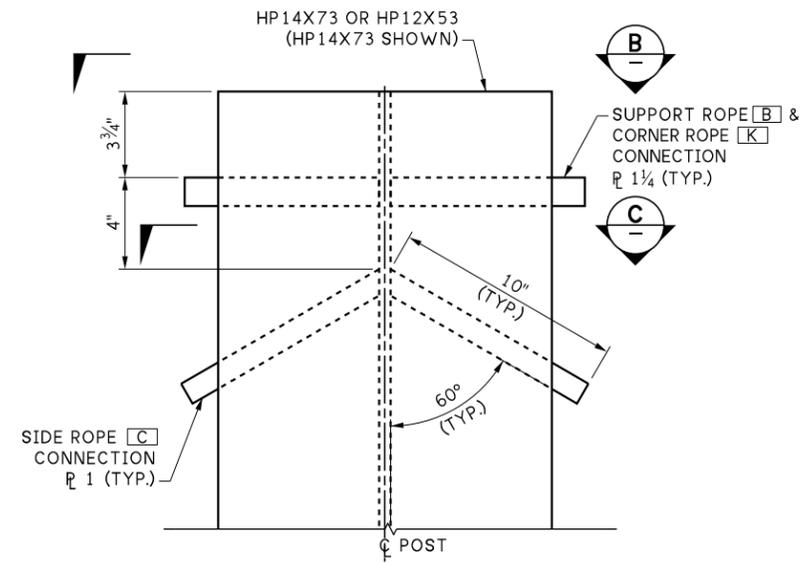
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		TYPE 3 SLOPE PROTECTION END POST DETAILS	SHEET OF SHEETS

SEE CERTIFICATION SHEET DATE STAMP BOX



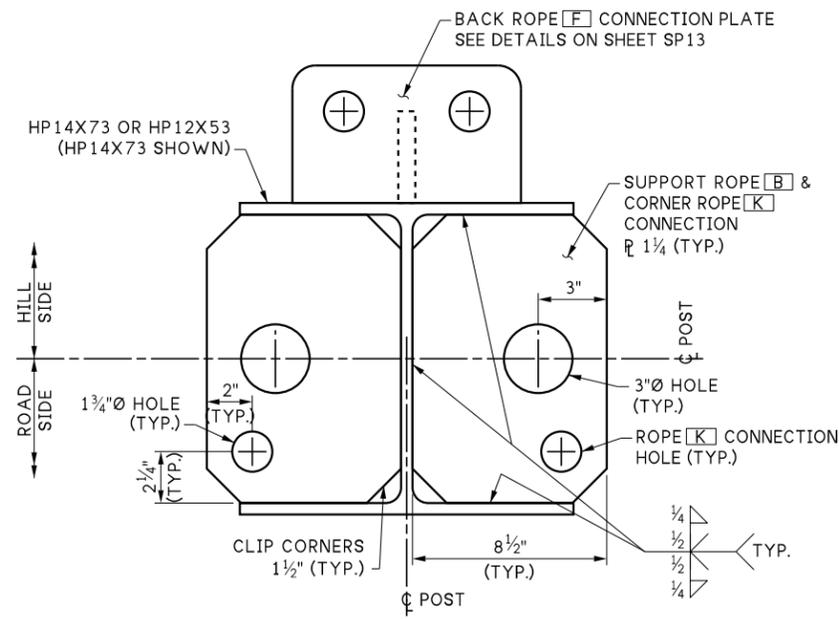
CONNECTION POST

HP14X73 OR HP12X53
(HP14X73 SHOWN)

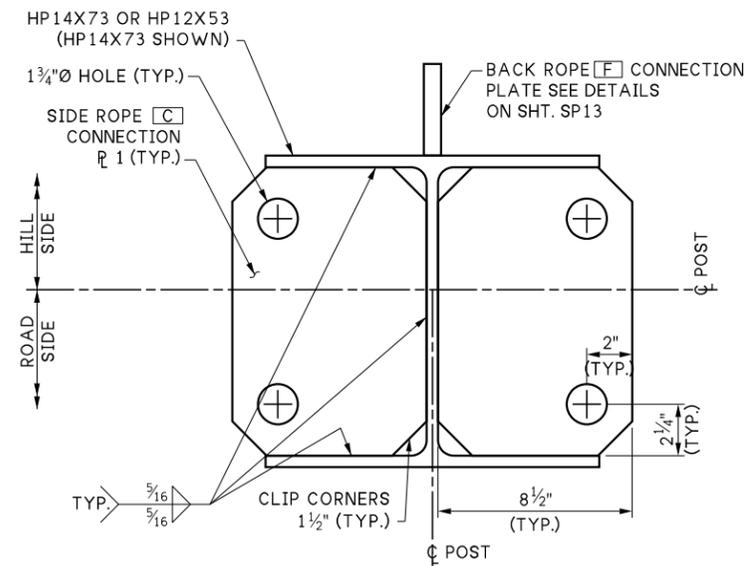


SECTION A

BACK ROPE [E] CONNECTION NOT SHOWN FOR CLARITY



SECTION B



SECTION C

FILE NAME	SP9 Type 3 Slope Protection Details.dgn
BRIDGE DES. ENG.	Leland, A
BRIDGE PROJ. ENG.	
SUPERVISOR	Swett, G
DESIGNED BY	Miller III, WJ
CHECKED BY	Swett, G
ENTERED BY	Fisher, J
PRELIM. PLAN BY	
ARCH. / SPEC.	
REVISION	DATE BY

REGION NO.	STATE
10	WASH
JOB NUMBER	
CONTRACT NO.	

WSDOT

DRAFT PLANS
NOT FOR CONSTRUCTION

SEE CERTIFICATION SHEET DATE

STAMP BOX

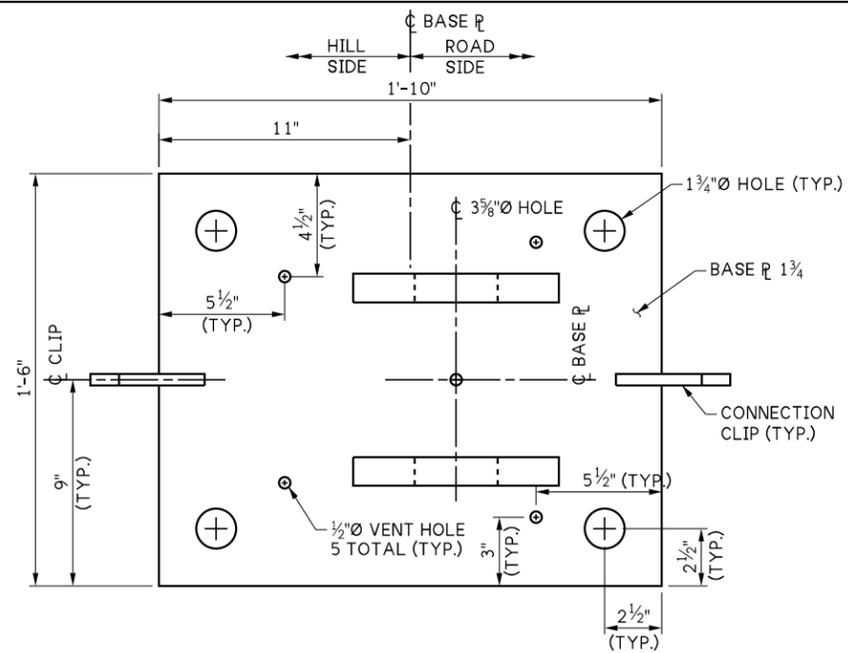
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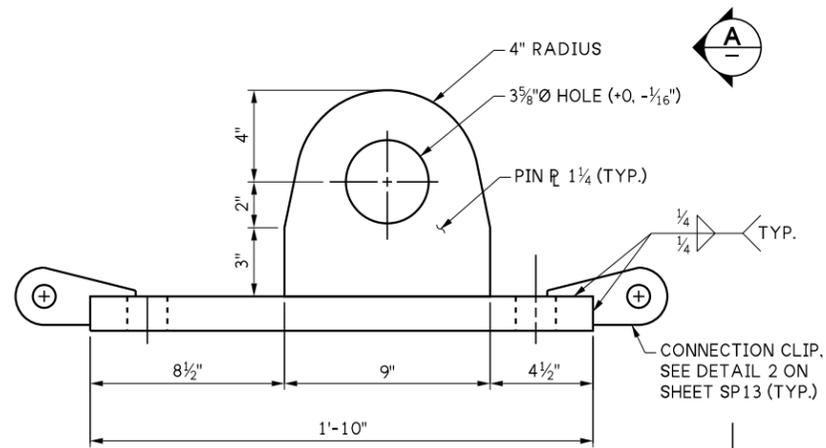
SR XXX
PROJECT TITLE

TYPE 3 SLOPE PROTECTION
CONNECTION POST DETAILS

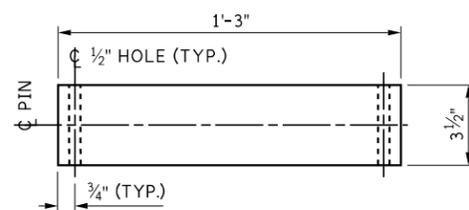
PLAN REF NO	SP9
SHEET OF SHEETS	



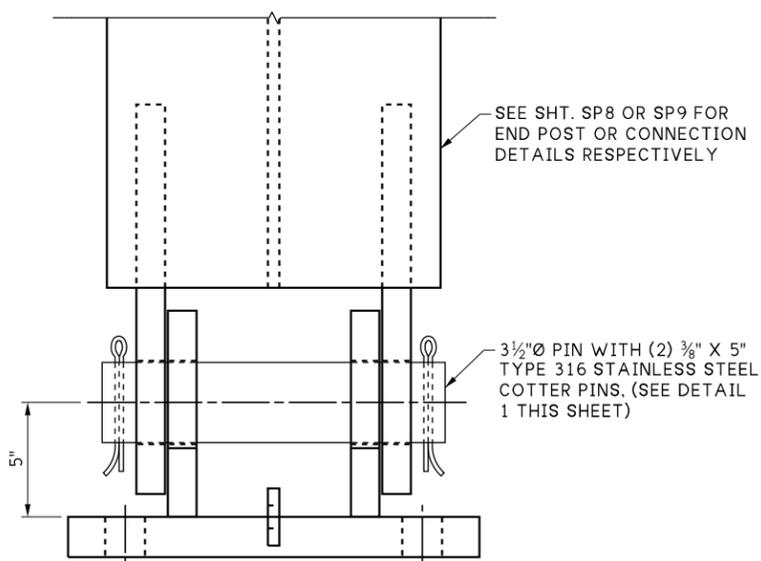
PLAN
END / CONNECTION POST BASE PLATE



ELEVATION
END / CONNECTION POST BASE PLATE

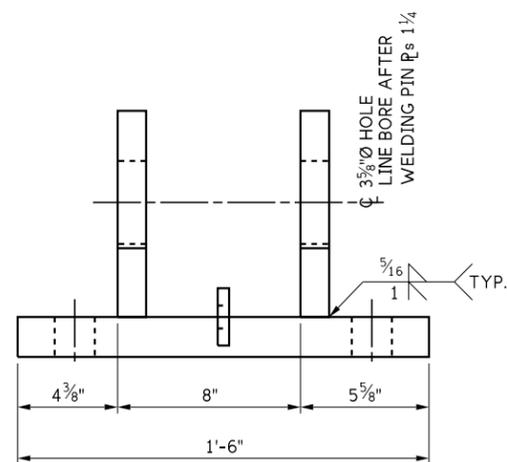


DETAIL 1



ELEVATION
END / CONNECTION POST TO
BASE PLATE CONNECTION

HP 14X73 OR HP12X53
(HP14X73 SHOWN)



SECTION A

FILE NAME	SP10 Type 3 Slope Protection Details.dgn	REGION NO.	10	STATE	WASH
BRIDGE DES. ENG.	Leland, A	JOB NUMBER			
BRIDGE PROJ. ENG.		CONTRACT NO.			
SUPERVISOR	Swett, G				
DESIGNED BY	Miller III, WJ				
CHECKED BY	Swett, G				
ENTERED BY	Fisher, J				
PRELIM. PLAN BY					
ARCH. / SPEC.					
		REVISION		DATE	BY

WSDOT

DRAFT PLANS
NOT FOR CONSTRUCTION

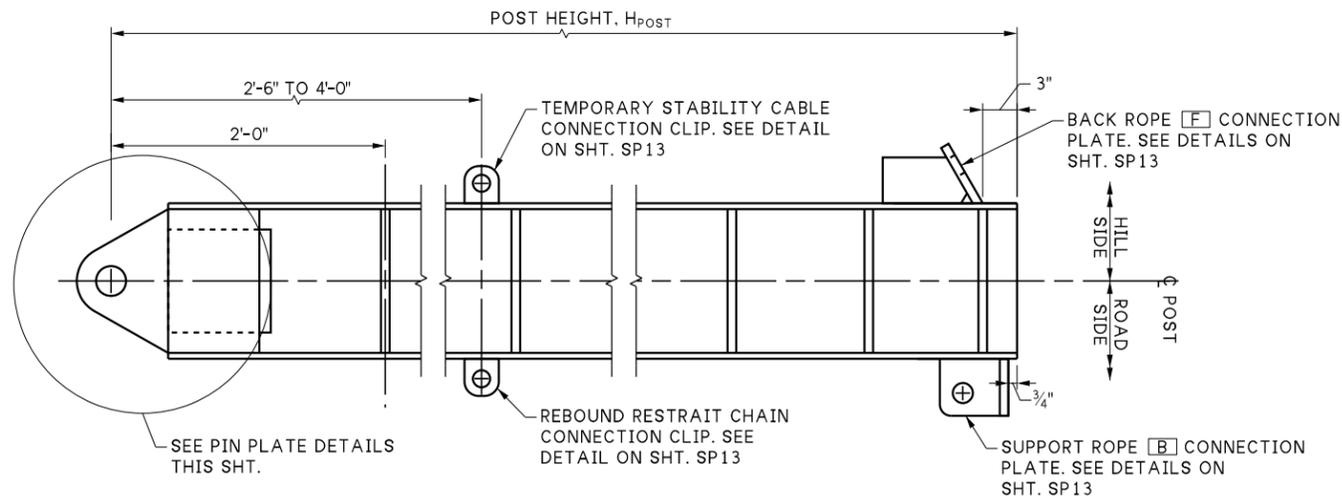
SEE CERTIFICATION SHEET	DATE
STAMP BOX	

SEE CERTIFICATION SHEET
DATE

STAMP BOX

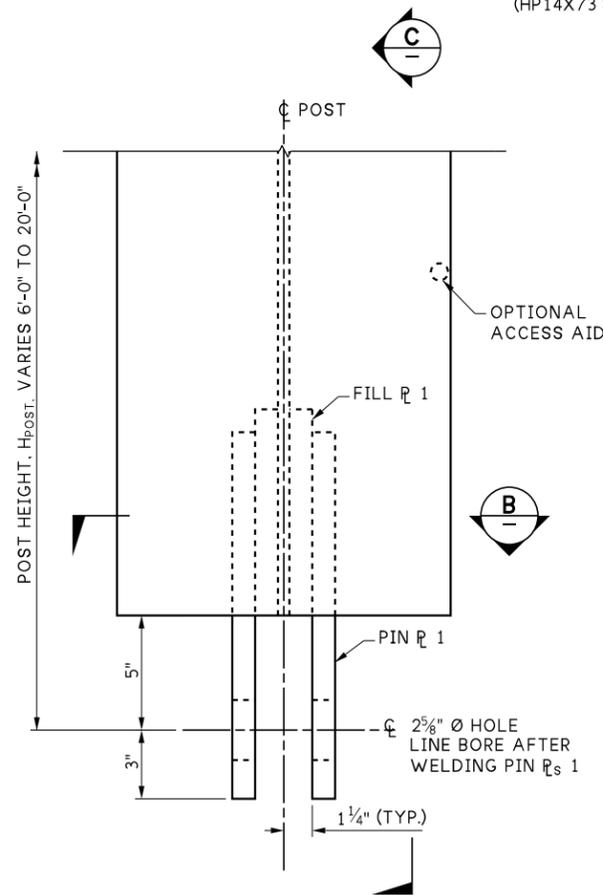
SR XXX	PROJECT TITLE
TYPE 3 SLOPE PROTECTION END & CONNECTION POST BASE DETAILS	

PLAN REF NO	SP10
SHEET	
OF	
SHEETS	



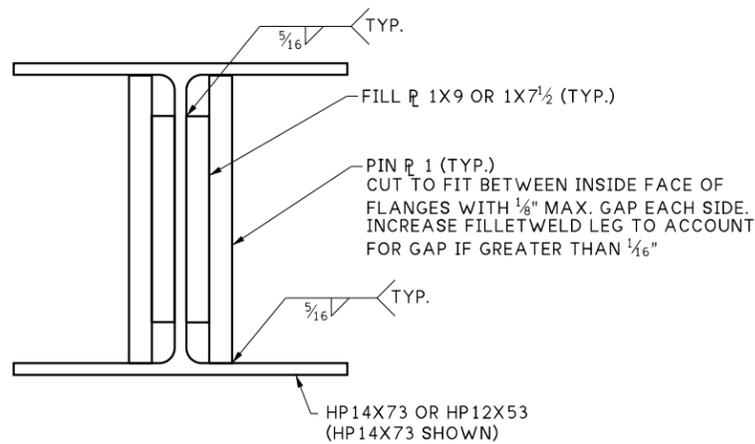
INTERMEDIATE POST

HP14X73 OR HP12X53
(HP14X73 SHOWN)

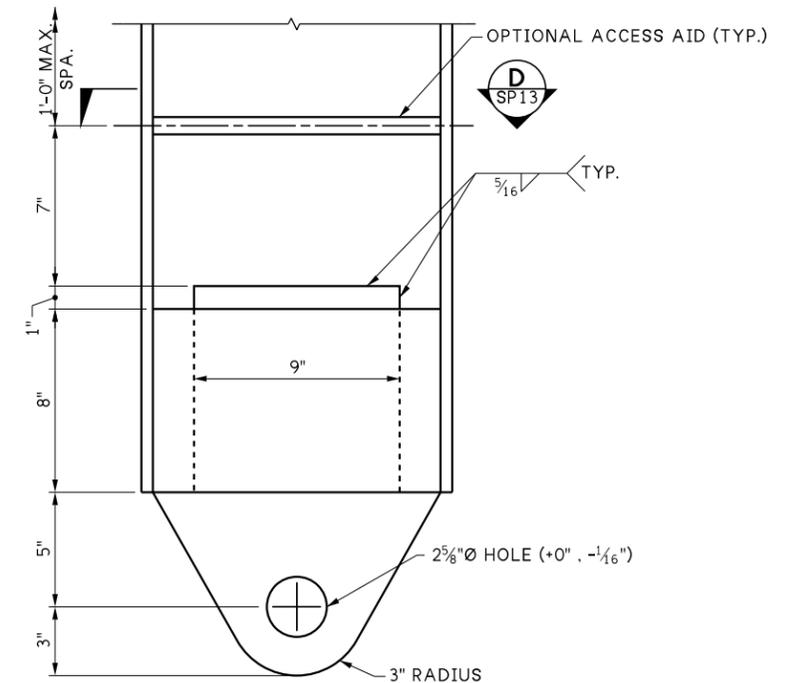


**INTERMEDIATE POST
PIN PLATE DETAILS**

HP14X73 OR HP12X53
(HP14X73 SHOWN)



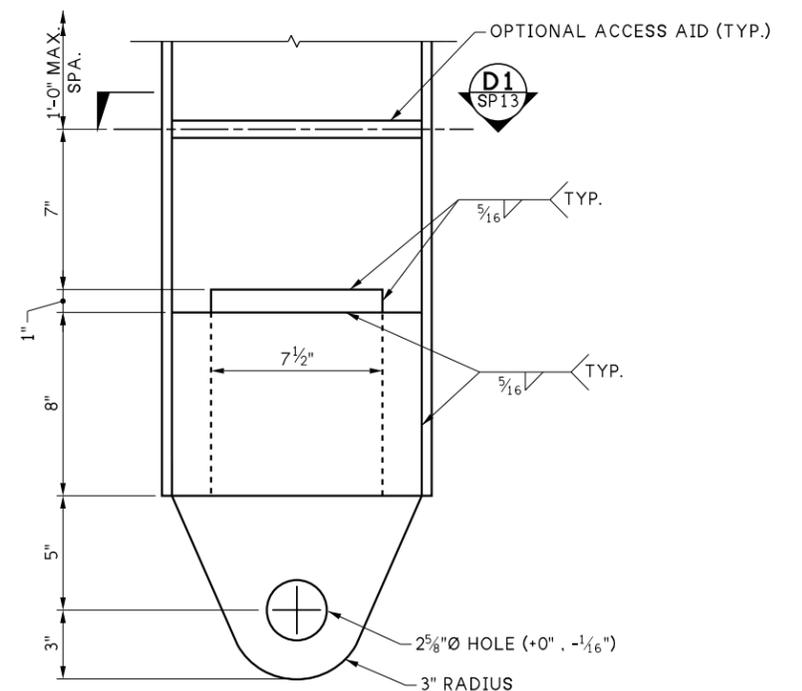
SECTION B



SECTION C

INTERMEDIATE POST - HP14X73

FOR POST HEIGHTS, H_{POST}, UP TO 20 FT.



SECTION C

INTERMEDIATE POST - HP12X53

FOR POST HEIGHTS, H_{POST}, UP TO 15 FT.

FILE NAME	SP11 Type 3 Slope Protection Details.dgn		
BRIDGE DES. ENG.	Leland, A		
BRIDGE PROJ. ENG.			
SUPERVISOR	Swett, G		
DESIGNED BY	Miller III, WJ		
CHECKED BY	Swett, G		
ENTERED BY	Fisher, J		
PRELIM. PLAN BY			
ARCH. / SPEC.			
	REVISION	DATE	BY

REGION NO.	STATE
10	WASH
JOB NUMBER	
CONTRACT NO.	

WSDOT

DRAFT PLANS
NOT FOR CONSTRUCTION

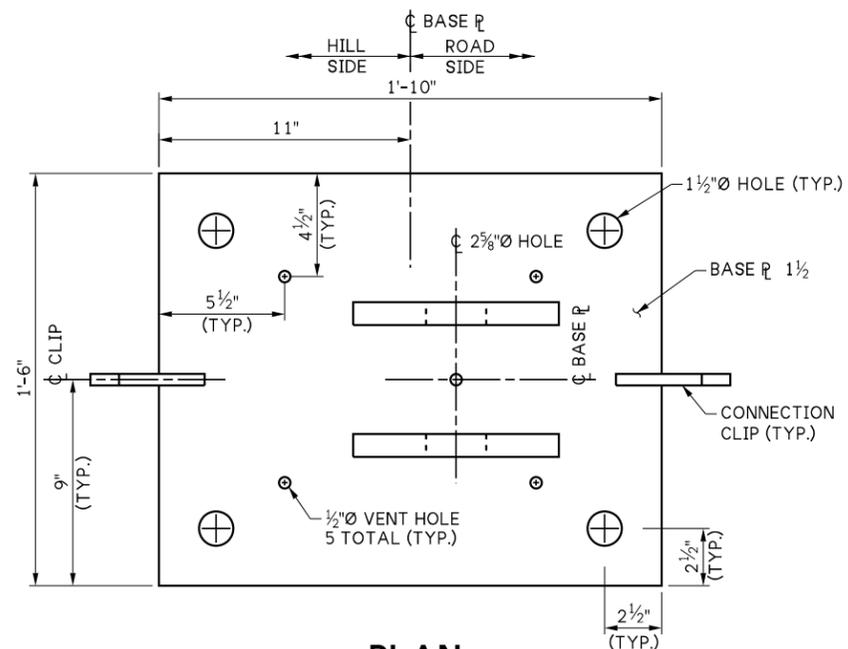
SEE CERTIFICATION SHEET DATE

STAMP BOX

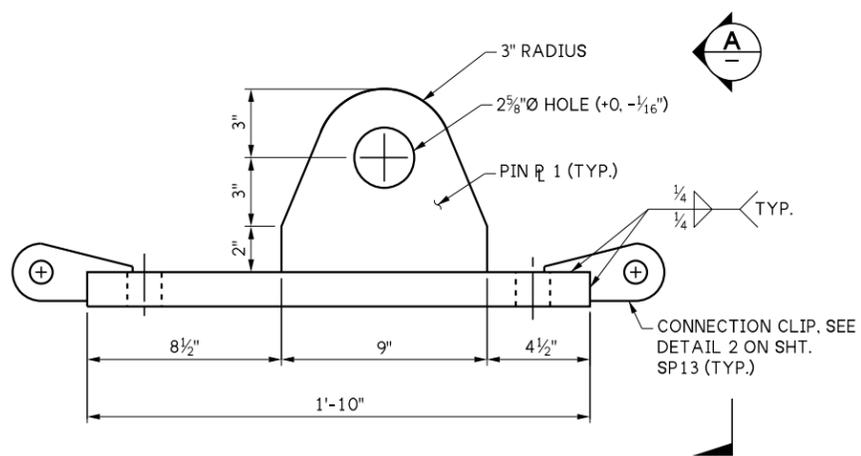
SR XXX
PROJECT TITLE

TYPE 3 SLOPE PROTECTION
INTERMEDIATE POST DETAILS

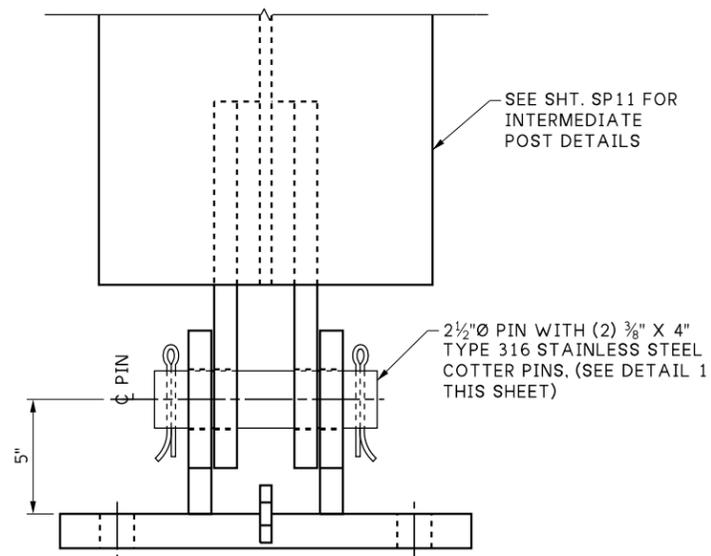
PLAN REF NO	SP11
SHEET OF SHEETS	



**PLAN
INTERMEDIATE POST BASE PLATE**

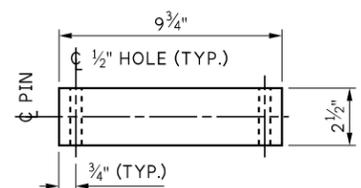


**ELEVATION
INTERMEDIATE POST BASE PLATE**

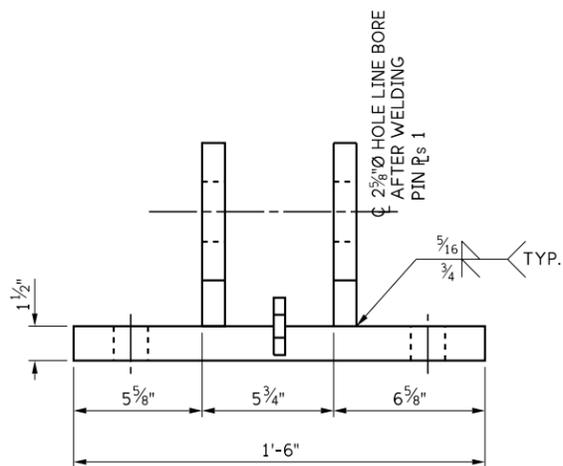


**ELEVATION
INTERMEDIATE POST TO
BASE PLATE CONNECTION**

HP14X73 OR HP12X53
(HP14X73 SHOWN)



DETAIL 1



SECTION A

FILE NAME	SP12 Type 3 Slope Protection Details.dgn		
BRIDGE DES. ENG.	Leland, A		
BRIDGE PROJ. ENG.			
SUPERVISOR	Swett, G		
DESIGNED BY	Miller III, WJ		
CHECKED BY	Swett, G		
ENTERED BY	Fisher, J		
PRELIM. PLAN BY			
ARCH. / SPEC.			
	REVISION	DATE	BY

REGION NO.	STATE
10	WASH
JOB NUMBER	
CONTRACT NO.	

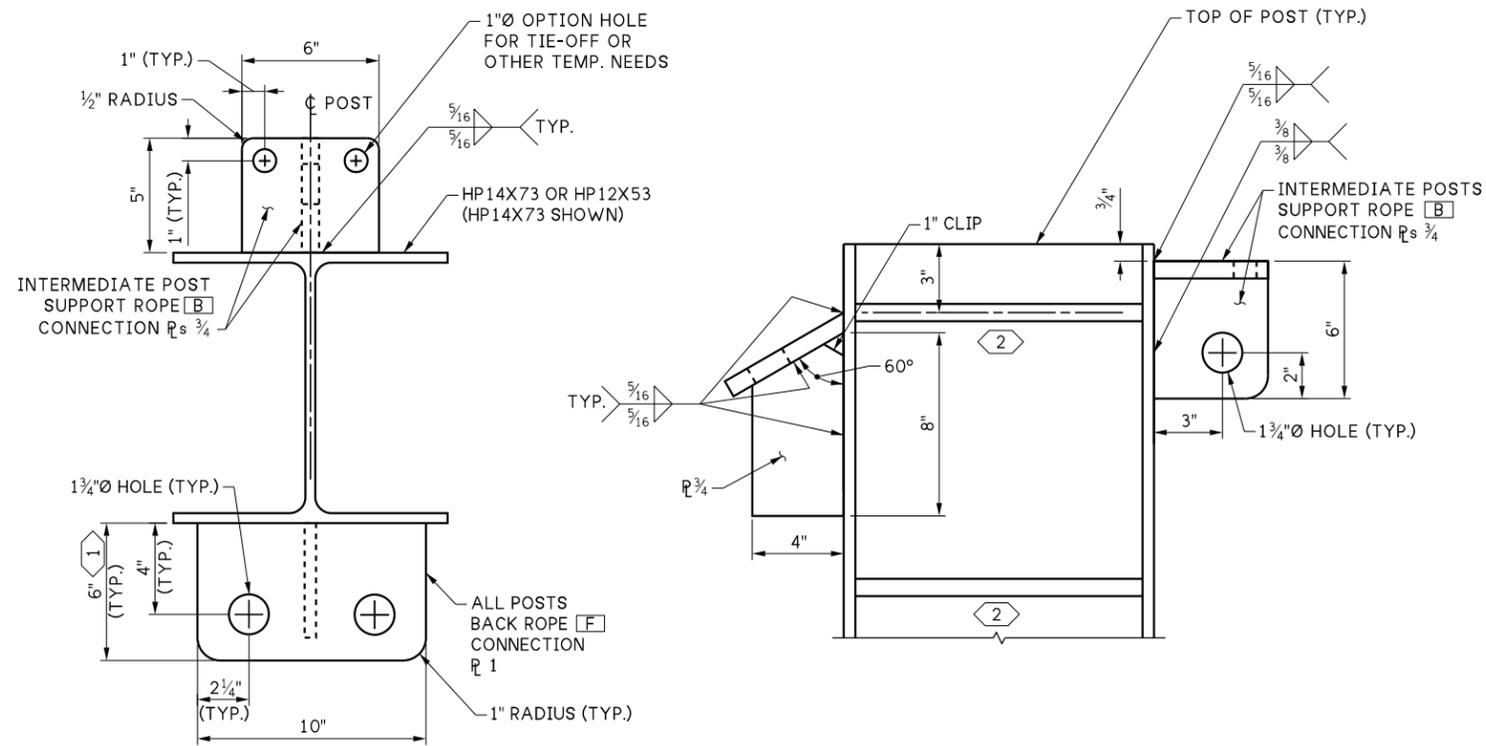


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SEE CERTIFICATION SHEET DATE	STAMP BOX
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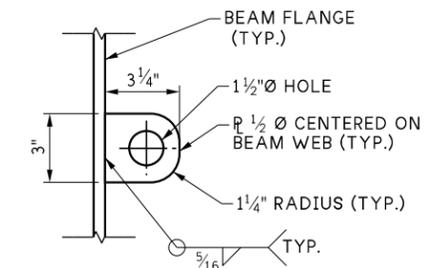
SR XXX PROJECT TITLE	PLAN REF NO SP12
TYPE 3 SLOPE PROTECTION INTERMEDIATE POST BASE DETAILS	
SHEET OF SHEETS	



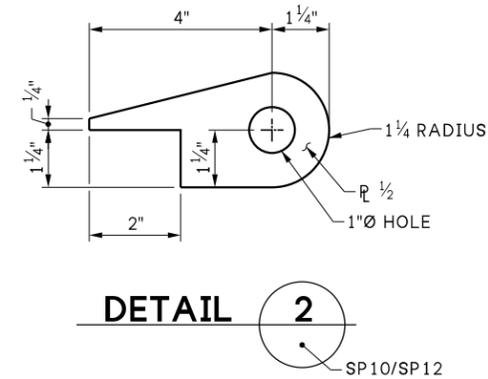
SUPPORT ROPE [B] & BACK ROPE [F] CONNECTION PLATE DETAILS
 INTERMEDIATE POSTS SHOWN. END AND CONNECTION POST SIMILAR

KEY NOTES:

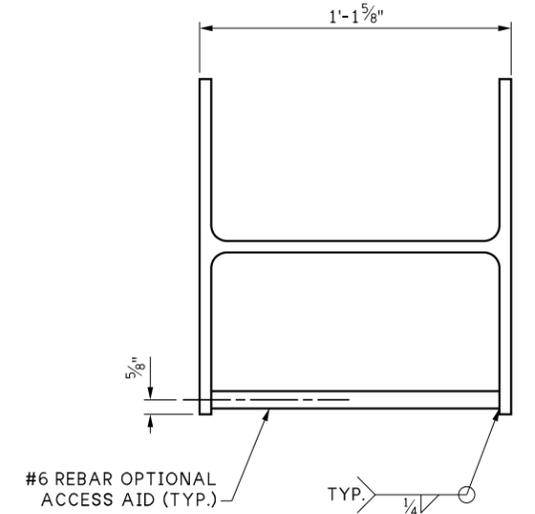
- ① MEASURED ALONG SLOPE.
- ② OMIT OR ADJUST OPTIONAL ACCESS AIDS FOR CONNECTION AND END POSTS.



CONNECTION CLIP

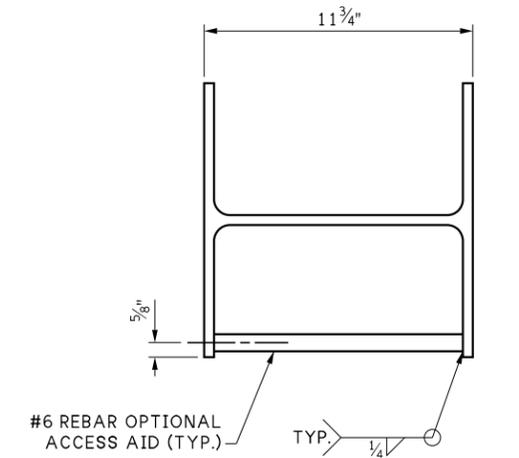


DETAIL 2
 SP10/SP12



SECTION D
 SP8/SP11

POST - HP14X73
 FOR POST HEIGHTS, H_{POST}, UP TO 20 FT.



SECTION D1
 SP8/SP11

POST - HP12X73
 FOR POST HEIGHTS, H_{POST}, UP TO 15 FT.

FILE NAME	SP13 Type 3 Slope Protection.dgn
BRIDGE DES. ENG.	Leland, A
BRIDGE PROJ. ENG.	
SUPERVISOR	Swett, G
DESIGNED BY	Miller III, WJ
CHECKED BY	Swett, G
ENTERED BY	Fisher, J
PRELIM. PLAN BY	
ARCH. / SPEC.	
REVISION	DATE BY

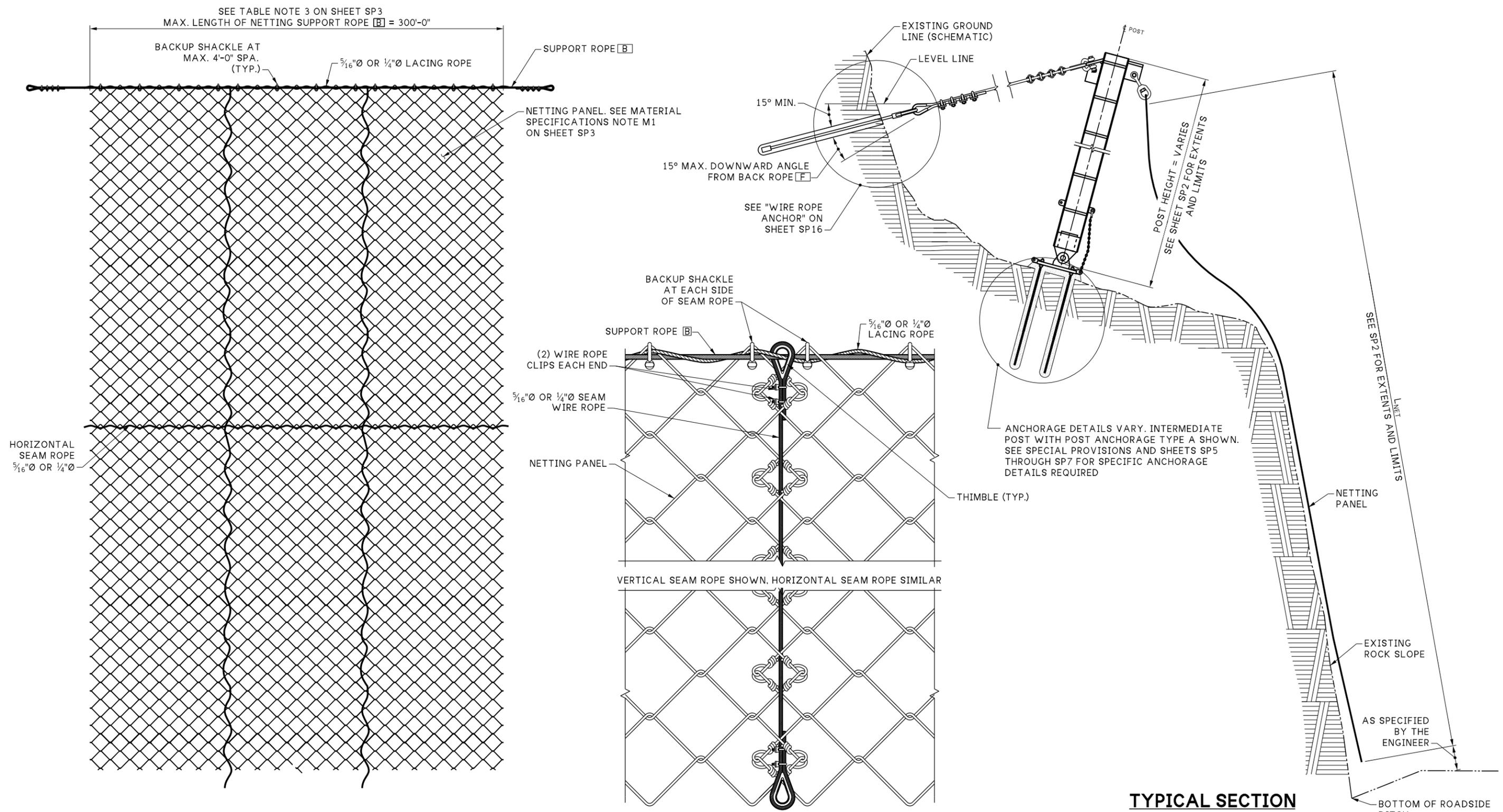
REGION NO.	STATE
10	WASH
JOB NUMBER	
CONTRACT NO.	

WSDOT
 DRAFT PLANS
 NOT FOR CONSTRUCTION

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SEE CERTIFICATION SHEET DATE
 STAMP BOX

SR XXX PROJECT TITLE	PLAN REF NO SP13
TYPE 3 SLOPE PROTECTION COMMON POST DETAILS	SHEET OF SHEETS



NETTING PANEL AND CONNECTION DETAIL

TYPICAL SECTION

FILE NAME	SP14 Type 3 Slope Protection Details.dgn		
BRIDGE DES. ENG.	Leland, A		
BRIDGE PROJ. ENG.			
SUPERVISOR	Swett, G		
DESIGNED BY	Miller III, WJ		
CHECKED BY	Swett, G		
ENTERED BY	Fisher, J		
PRELIM. PLAN BY			
ARCH. / SPEC.			
	REVISION	DATE	BY

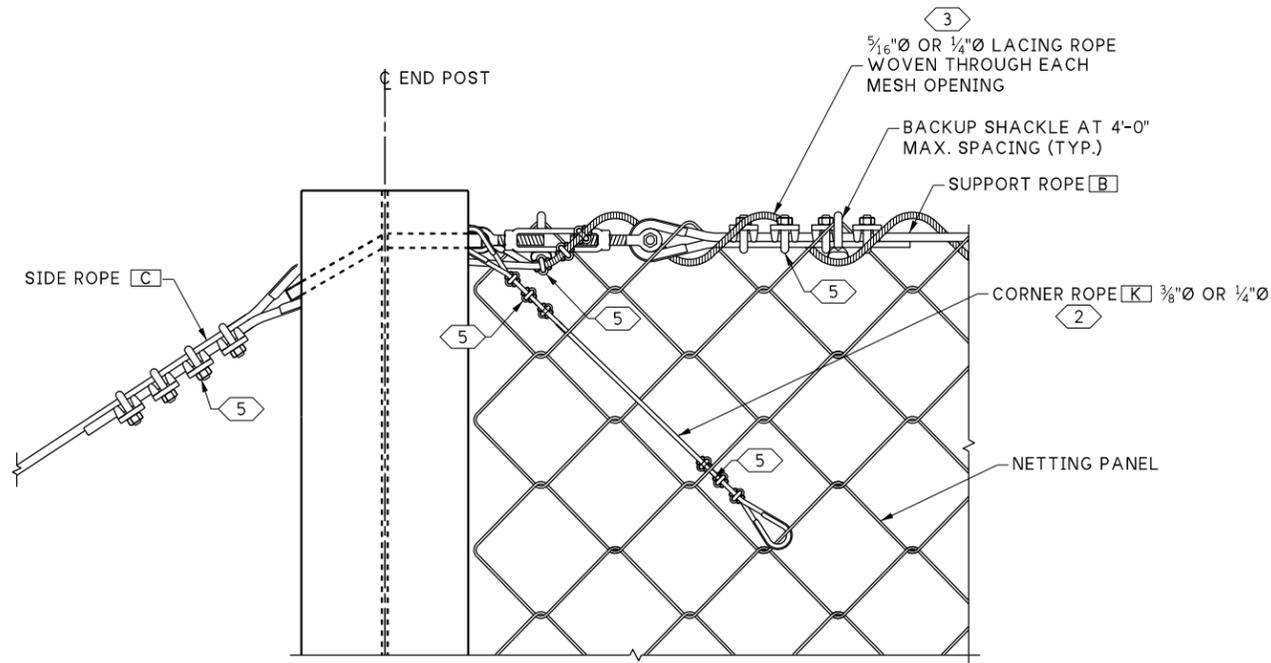
REGION NO.	STATE
10	WASH
JOB NUMBER	
CONTRACT NO.	



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STAMP BOX

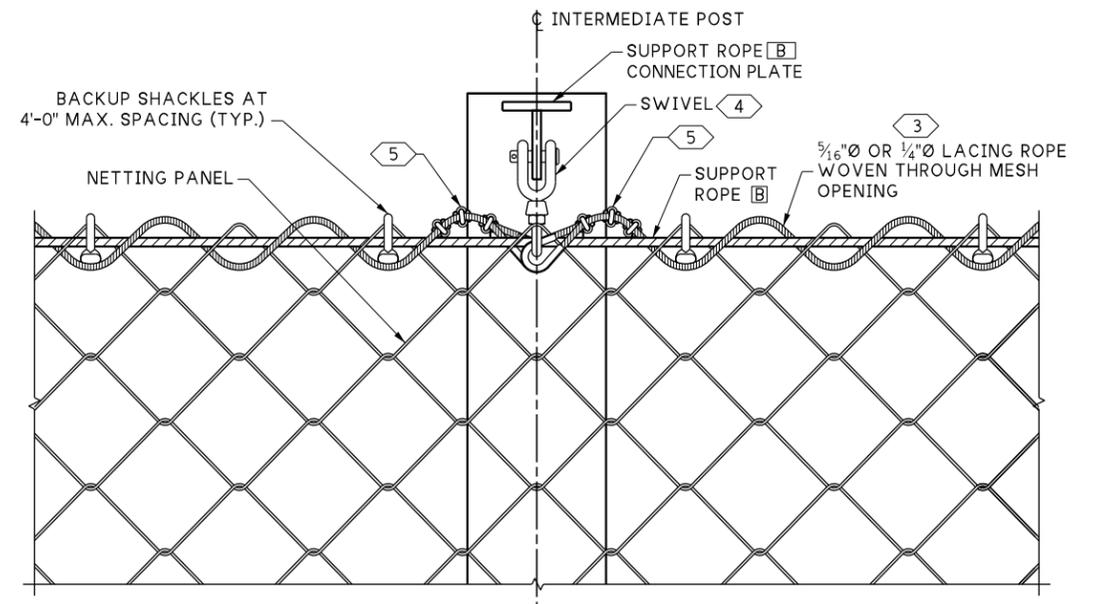
SEE CERTIFICATION SHEET DATE
STAMP BOX

SR XXX	PLAN REF NO
PROJECT TITLE	SP14
TYPE 3 SLOPE PROTECTION NETTING DETAILS & TYPICAL SECTION	
	SHEET OF SHEETS



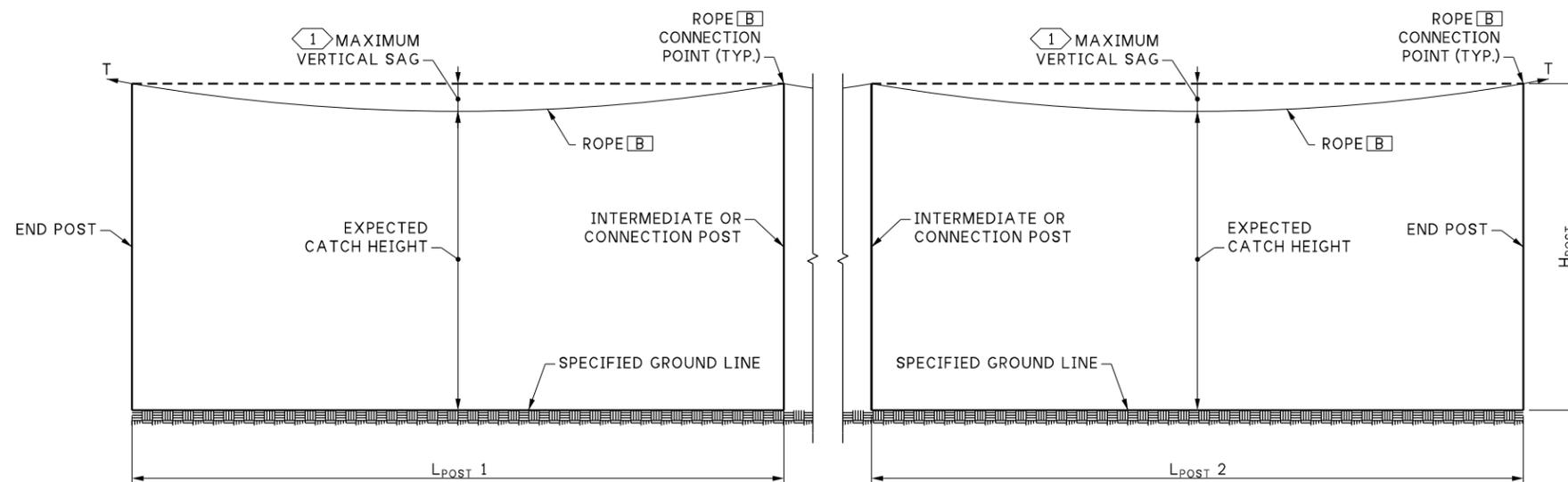
**NETTING PANEL, LACING & CORNER ROPE [K]
CONNECTION TO END POST**

ROPE [F] NOT SHOWN FOR CLARITY
END POST SHOWN. CONNECTION POST SIMILAR



**LACING & SUPPORT ROPE [B]
CONNECTION TO INTERMEDIATE POST**

ROPE [F] NOT SHOWN FOR CLARITY



SUPPORT ROPE [B] INITIAL CONDITIONS

NETTING NOT SHOWN FOR CLARITY

TABLE 10

SUPPORT ROPE [B] INITIAL CONDITIONS		TENSTON, T (LBS.)				
L _{POST} (FEET)	VERT. SAG (INCHES)	0.750"Ø	0.875"Ø	1.000"Ø	1.125"Ø	1.250"Ø
20	6	150	205	270	340	420
30	9	225	310	405	510	630
40	12	300	410	540	680	840
50	15	380	515	670	850	1,050
60	18	455	615	805	1,020	1,260

KEY NOTES:

- 1 IF POST-TO-POST SPACING, L_{POST}, FOR A GIVEN RUN LENGTH, L_{RUN}, VARIES (e.g. L_{POST} 1 ≠ L_{POST} 2), THE MAXIMUM VERTICAL SAG SPECIFIED IN TABLE 10 SHALL BE USED FOR EVERY POST-TO-POST SPACING FOR THE ENTIRE RUN LENGTH. VERTICAL SAG VALUES PRESENTED IN TABLE 10 DO NOT ACCOUNT FOR VERTICAL OFFSET(S) RESULTING FROM CONNECTION HARDWARE. VERTICAL SAG SHALL BE MEASURED FROM A STRAIGHT LINE DRAWN BETWEEN ROPE [B] CONNECTION POINTS OF ADJACENT POSTS.
- 2 LOOP CORNER CABLE [K] THROUGH ROPE [B] CONNECTION PLATE ON THE TOP END AND THROUGH THE 5TH DIAGONAL NETTING OPENING ON THE OPPOSITE END.
- 3 ATTACH LACING ROPE TO SWIVEL.
- 4 SEE TABLE 5 ON SHEET SP3 FOR HARDWARE SIZING.
- 5 WIRE ROPE TERMINATION. SEE DETAILS ON SHEET SP16.

FILE NAME	SP15 Type 3 Slope Protection Details.dgn		
BRIDGE DES. ENG.	Leland, A	REGION NO.	10
BRIDGE PROJ. ENG.		STATE	WASH
SUPERVISOR	Swett, G	JOB NUMBER	
DESIGNED BY	Miller III, WJ	CONTRACT NO.	
CHECKED BY	Swett, G	REVISION	
ENTERED BY	Fisher, J	DATE	
PRELIM. PLAN BY		BY	
ARCH. / SPEC.			

REGION NO.	10
STATE	WASH
JOB NUMBER	
CONTRACT NO.	



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STAMP BOX

SR XXX
PROJECT TITLE

TYPE 3 SLOPE PROTECTION
NETTING DETAILS

PLAN REF NO
SP15
SHEET
OF
SHEETS

TABLE 11 2 3

ROPE [C] DESIGN / PROOF LOADS

ROPE [B] DIAMETER	DESIGN (KIPS)	ROPE [C] DIAMETER
0.750"Ø	45	0.750"Ø
0.875"Ø	50	0.875"Ø
1.000"Ø	70	1.000"Ø
1.125"Ø	80	1.125"Ø
1.250"Ø	90	1.125"Ø

TABLE 12 2 3

ROPE [F] DESIGN / PROOF LOADS

ROPE [B] DIAMETER	DESIGN (KIPS)	ROPE [F] DIAMETER
0.750"Ø	40	0.750"Ø
0.875"Ø	50	0.875"Ø
1.000"Ø	60	0.875"Ø
1.125"Ø	65	1.000"Ø
1.250"Ø	75	1.000"Ø

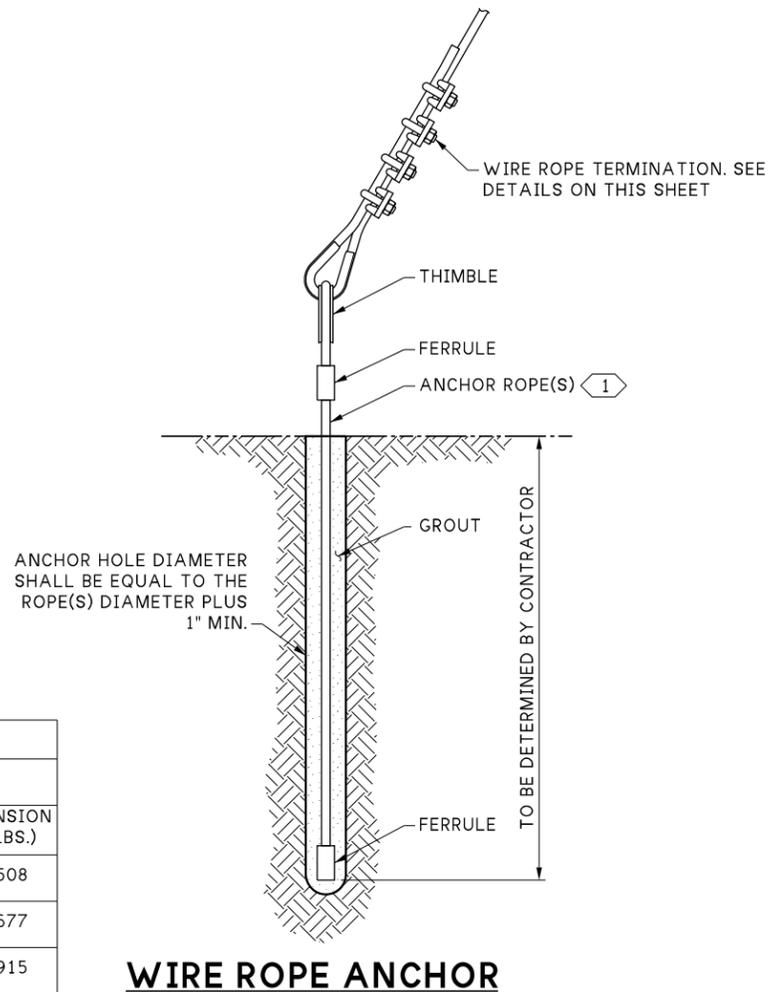
TABLE 13 4

ROPE [C] AND ROPE [F] PRETENSION CONDITIONS

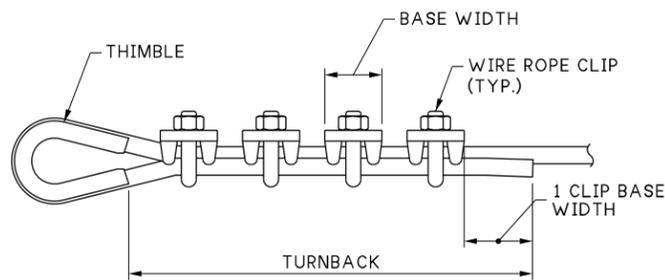
ROPE	0.750"Ø		0.875"Ø		1.000"Ø		1.125"Ø	
LENGTH (FT.)	SAG (IN.)	TENSION (LBS.)						
10.00	1.00	226	1.00	307	1.00	401	1.00	508
20.00	2.00	451	2.00	614	2.00	802	3.00	677
30.00	3.00	677	3.00	921	3.00	903	5.00	915
40.00	4.00	902	5.00	983	6.00	1,070	8.00	1,017
50.00	6.00	940	8.00	961	10.00	1,005	12.00	1,061
60.00	9.00	903	11.00	1,007	14.00	1,034	18.00	1,021

KEY NOTES:

- 1 ANCHOR ROPE(S) OR BAR SIZE SHALL BE ADEQUATE TO DEVELOP THE MINIMUM PULLOUT ROPE ANCHOR CAPACITY LISTED IN TABLES 11 AND 12 THIS SHEET.
- 2 FOR ROPES [C] AND [F], DOUBLE ANCHORS WITH INDIVIDUAL TAG LINES MAY BE USED AS AN ALTERNATIVE TO A SINGLE ANCHOR IN ORDER TO ACHIEVE THE REQUIRED CAPACITY. THE ANGLE BETWEEN A TAG LINE AND THE AXIS OF THE CORRESPONDING ANCHOR SHALL BE LESS THAN 30°. ANCHORS AND TAG LINES SHALL HAVE A MINIMUM OF 60% OF THE REQUIRED CAPACITY FOR A SINGLE ANCHOR.
- 3 CAPACITY SHALL BE OBTAINED BY PROOF TESTING. SEE THE SPECIAL PROVISIONS.
- 4 CONTACT THE ENGINEER FOR ROPE LENGTHS OVER 60 FEET.



WIRE ROPE ANCHOR



WIRE ROPE TERMINATION DETAIL

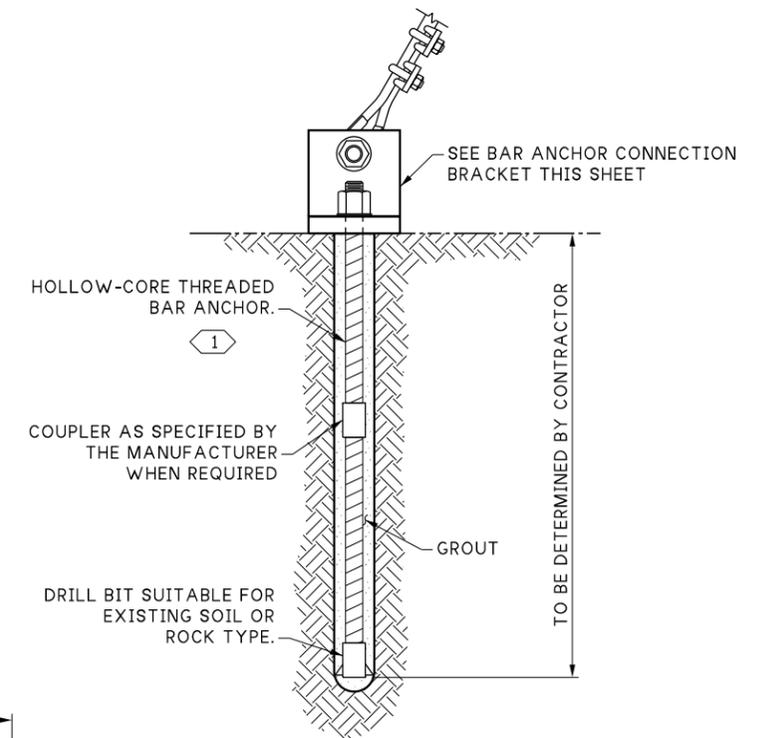
TURNBACK LENGTH AND NUMBER OF CLIPS PER MANUFACTURER SPECIFICATIONS TO DEVELOP WIRE ROPE CAPACITY. FOLLOW MANUFACTURER'S APPLICATION INSTRUCTIONS.

TABLE 14 2 3

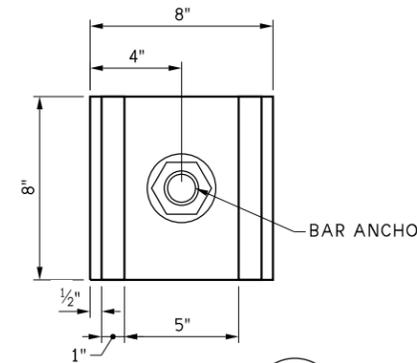
BAR ANCHOR CONN. BRACKET BOLT SIZE

[B] OR [C] ROPE PROOF LOAD (KIPS)	BOLT DIA. (IN)
40	1.125
45	1.250
50	1.250
60	1.375
70	1.375
75	1.375

NOTE: BAR ANCHOR NOT PERMITTED FOR LOADS GREATER THAN 75 KIPS.

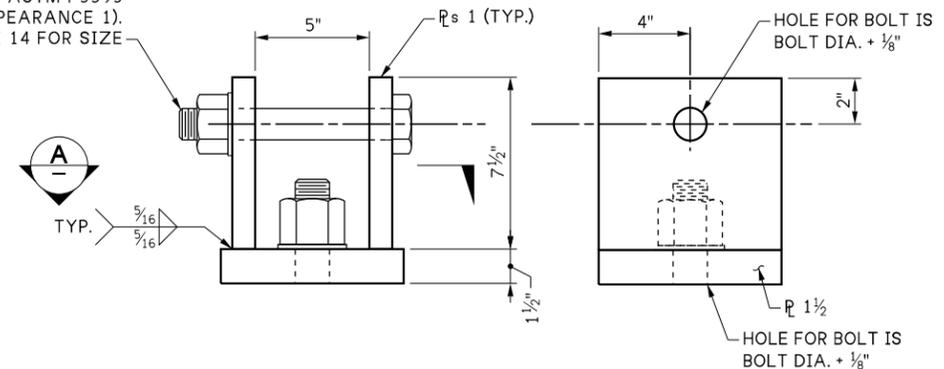


BAR ANCHOR
ALTERNATIVE TO WIRE ROPE ANCHOR



SECTION A
BRACKET

ASTM F3125 GR A 490 HIGH STRENGTH BOLT. BOLT SHALL BE TYPE 3 (WEATHERING) OR COATED PER ASTM F3393 (CORROSION D. APPEARANCE 1). SEE TABLE 14 FOR SIZE.



BAR ANCHOR CONNECTION BRACKET

FILE NAME	SP16 Type 3 Slope Protection Details.dgn		
BRIDGE DES. ENG.	Leland, A		
BRIDGE PROJ. ENG.			
SUPERVISOR	Swett, G		
DESIGNED BY	Miller III, WJ		
CHECKED BY	Swett, G		
ENTERED BY	Fisher, J		
PRELIM. PLAN BY			
ARCH. / SPEC.			
	REVISION	DATE	BY

REGION NO.	STATE
10	WASH
JOB NUMBER	
CONTRACT NO.	

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STAMP BOX

SR XXX
PROJECT TITLE

TYPE 3 SLOPE PROTECTION
ROPE AND BAR ANCHOR DETAILS

PLAN REF NO	SP16
SHEET	
OF	
SHEETS	