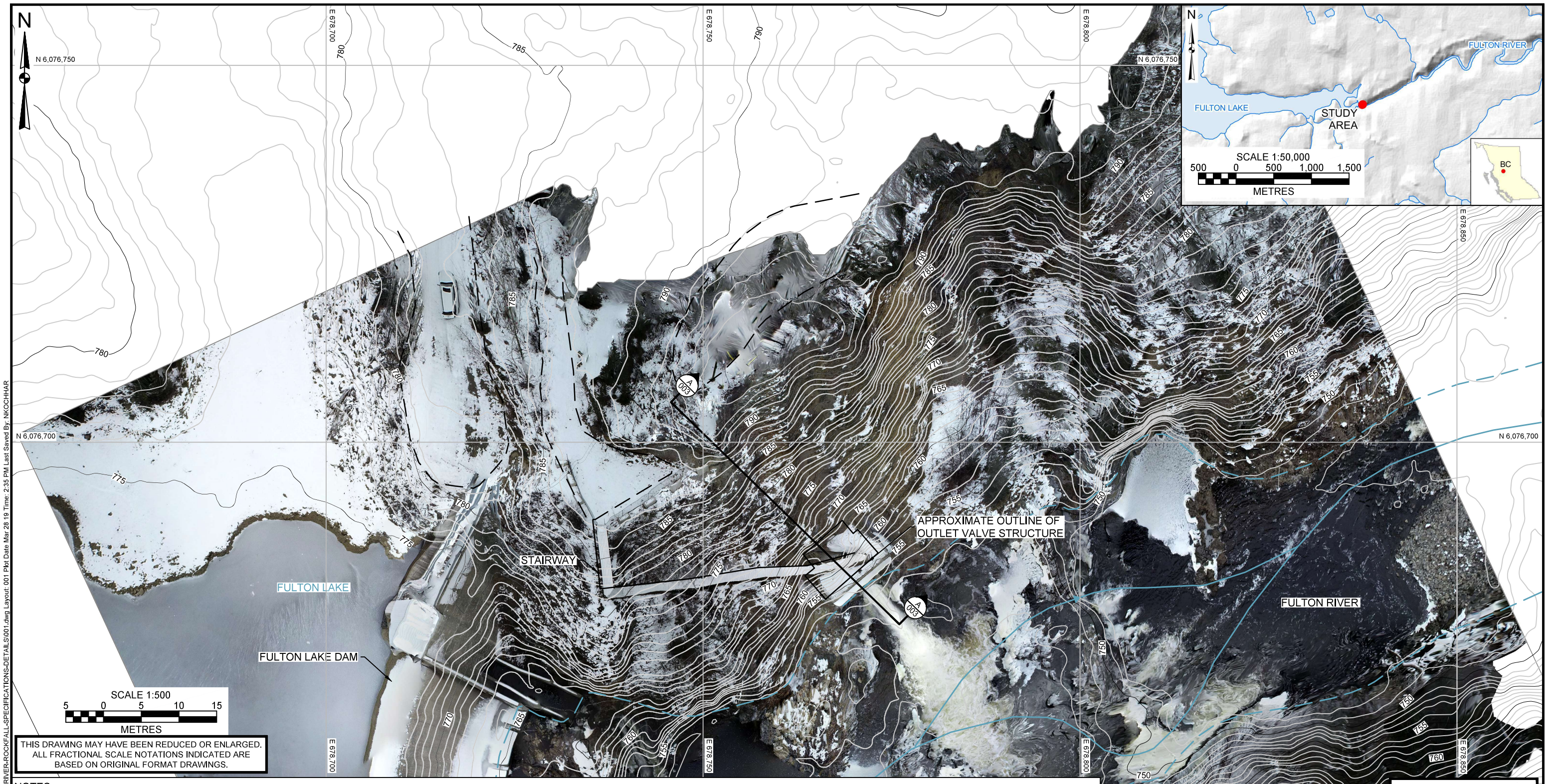

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2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SHOULD UNCERTAINTIES ARISE WITH THE DRAWINGS, SCOPE, AND/OR TECHNICAL SPECIFICATIONS.
3. FOR A SUMMARY OF SYSTEM DESIGN, REFER TO THE REPORT "FULTON RIVER ROCK FALL PROTECTION SPECIFICATIONS AND DETAILS", AND DATED NOVEMBER 2018.
4. BASE TOPOGRAPHIC DATA AND ORTHOPHOTO IS BASED ON UAV SURVEY PROVIDED UAVIATION AERIAL SOLUTIONS (UAS), DATED DECEMBER 6, 2018. CONTOUR NTERVAL IS 1 m.
5. HORIZONTAL PROJECTION IS NAD 1983 UTM ZONE 9N. VERTICAL DATUM IS CGVD28.
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LEGEND
- APPROXIMATE FULTON RIVER SHORELINE
- VEHICLE ACCESS AREA

REVISION INFORMATION

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DESIGN BY: SF	CHECK DESIGN: MAP		TITLE: LOCATION MAP AND SITE PLAN - REV A
LEAD ENGINEER: SF	APPROVAL DATE: -	CLIENT: FISHERIES AND OCEANS CANADA AND THE CANADIAN COAST GUARD	SCALE: AS SHOWN / DWG NO.: 001 / REV.: A
PROJECT MANAGER: SF	APPROVAL DATE: -		

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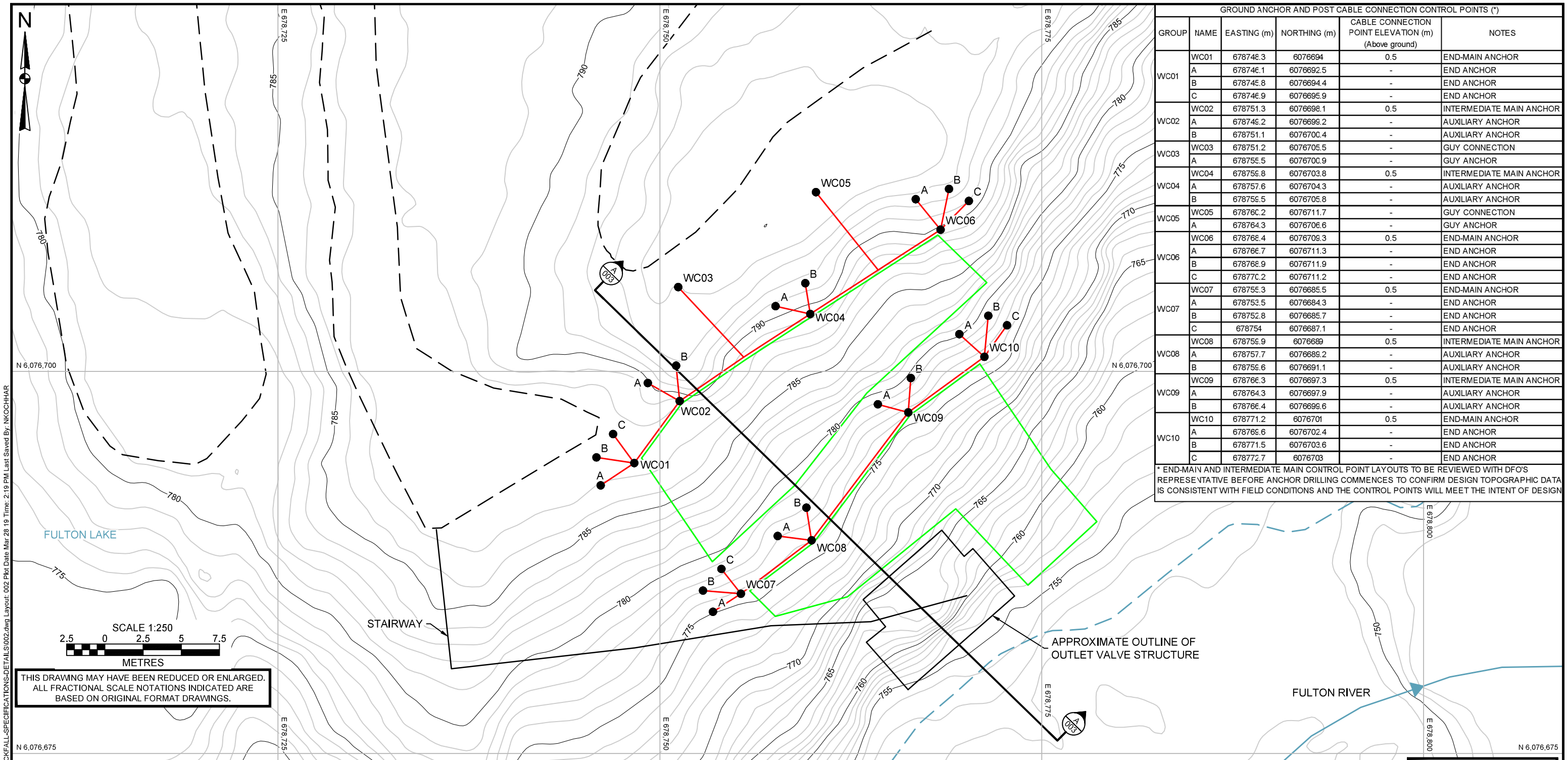

THIS DRAWING MAY HAVE BEEN REDUCED OR ENLARGED. ALL FRACTIONAL SCALE NOTATIONS INDICATED ARE BASED ON ORIGINAL FORMAT DRAWINGS.

GROUND ANCHOR AND POST CABLE CONNECTION CONTROL POINTS (*)

GROUP	NAME	EASTING (m)	NORTHING (m)	CABLE CONNECTION POINT ELEVATION (m) (Above ground)	NOTES
WC01	WC01	678748.3	6076694	0.5	END-MAIN ANCHOR
	A	678746.1	6076692.5	-	END ANCHOR
	B	678745.8	6076694.4	-	END ANCHOR
	C	678746.9	6076695.9	-	END ANCHOR
WC02	WC02	678751.3	6076698.1	0.5	INTERMEDIATE MAIN ANCHOR
	A	678748.2	6076699.2	-	AUXILIARY ANCHOR
	B	678751.1	6076700.4	-	AUXILIARY ANCHOR
WC03	WC03	678751.2	6076705.5	-	GUY CONNECTION
	A	678755.5	6076700.9	-	GUY ANCHOR
WC04	WC04	678756.8	6076703.8	0.5	INTERMEDIATE MAIN ANCHOR
	A	678757.6	6076704.3	-	AUXILIARY ANCHOR
	B	678756.5	6076705.8	-	AUXILIARY ANCHOR
WC05	WC05	678760.2	6076711.7	-	GUY CONNECTION
	A	678764.3	6076706.6	-	GUY ANCHOR
WC06	WC06	678768.4	6076709.3	0.5	END-MAIN ANCHOR
	A	678766.7	6076711.3	-	END ANCHOR
	B	678768.9	6076711.9	-	END ANCHOR
	C	678770.2	6076711.2	-	END ANCHOR
WC07	WC07	678755.3	6076685.5	0.5	END-MAIN ANCHOR
	A	678753.5	6076684.3	-	END ANCHOR
	B	678752.8	6076685.7	-	END ANCHOR
	C	678754	6076687.1	-	END ANCHOR
WC08	WC08	678756.9	6076689	0.5	INTERMEDIATE MAIN ANCHOR
	A	678757.7	6076689.2	-	AUXILIARY ANCHOR
	B	678756.6	6076691.1	-	AUXILIARY ANCHOR
WC09	WC09	678766.3	6076697.3	0.5	INTERMEDIATE MAIN ANCHOR
	A	678764.3	6076697.9	-	AUXILIARY ANCHOR
	B	678766.4	6076699.6	-	AUXILIARY ANCHOR
WC10	WC10	678771.2	6076701	0.5	END-MAIN ANCHOR
	A	678769.6	6076702.4	-	END ANCHOR
	B	678771.5	6076703.6	-	END ANCHOR
	C	678772.7	6076703	-	END ANCHOR

* END-MAIN AND INTERMEDIATE MAIN CONTROL POINT LAYOUTS TO BE REVIEWED WITH DFO'S REPRESENTATIVE BEFORE ANCHOR DRILLING COMMENCES TO CONFIRM DESIGN TOPOGRAPHIC DATA IS CONSISTENT WITH FIELD CONDITIONS AND THE CONTROL POINTS WILL MEET THE INTENT OF DESIGN.

NOTES:
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2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SHOULD UNCERTAINTIES ARISE WITH THE DRAWINGS, SCOPE, AND/OR TECHNICAL SPECIFICATIONS.
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5. HORIZONTAL PROJECTION IS NAD 1983 UTM ZONE 9N. VERTICAL DATUM IS CGVD28.
6. ELEVATION OF BOTTOM OF MESH SUBJECT TO REVIEW AND FIELD FITTING BY DFO'S REPRESENTATIVE. ELEVATION OF TOP OF MESH SUBJECT TO DFO REPRESENTATIVE REVIEW OF END MAIN ANCHOR AND INTERMEDIATE MAIN ANCHOR FIELD LAYOUTS PRIOR TO DRILLING TO CONFIRM THE ANCHOR LAYOUT WILL CONFORM TO THE INTENT OF DESIGN.
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LEGEND
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- PROPOSED ROCK FALL MESH AREA
- VEHICLE ACCESS AREA
- MESH SUSPENSION AND ANCHOR LAYOUT

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DESIGN BY: SF	CHECK DESIGN: MAP		TITLE: ROCK FALL PROTECTION DESIGN PLAN - REV A
LEAD ENGINEER: SF	APPROVAL DATE: -	CLIENT: FISHERIES AND OCEANS CANADA AND THE CANADIAN COAST GUARD	SCALE: 1:250 / DWG NO.: 002 / REV.: A
PROJECT MANAGER: SF	APPROVAL DATE: -		

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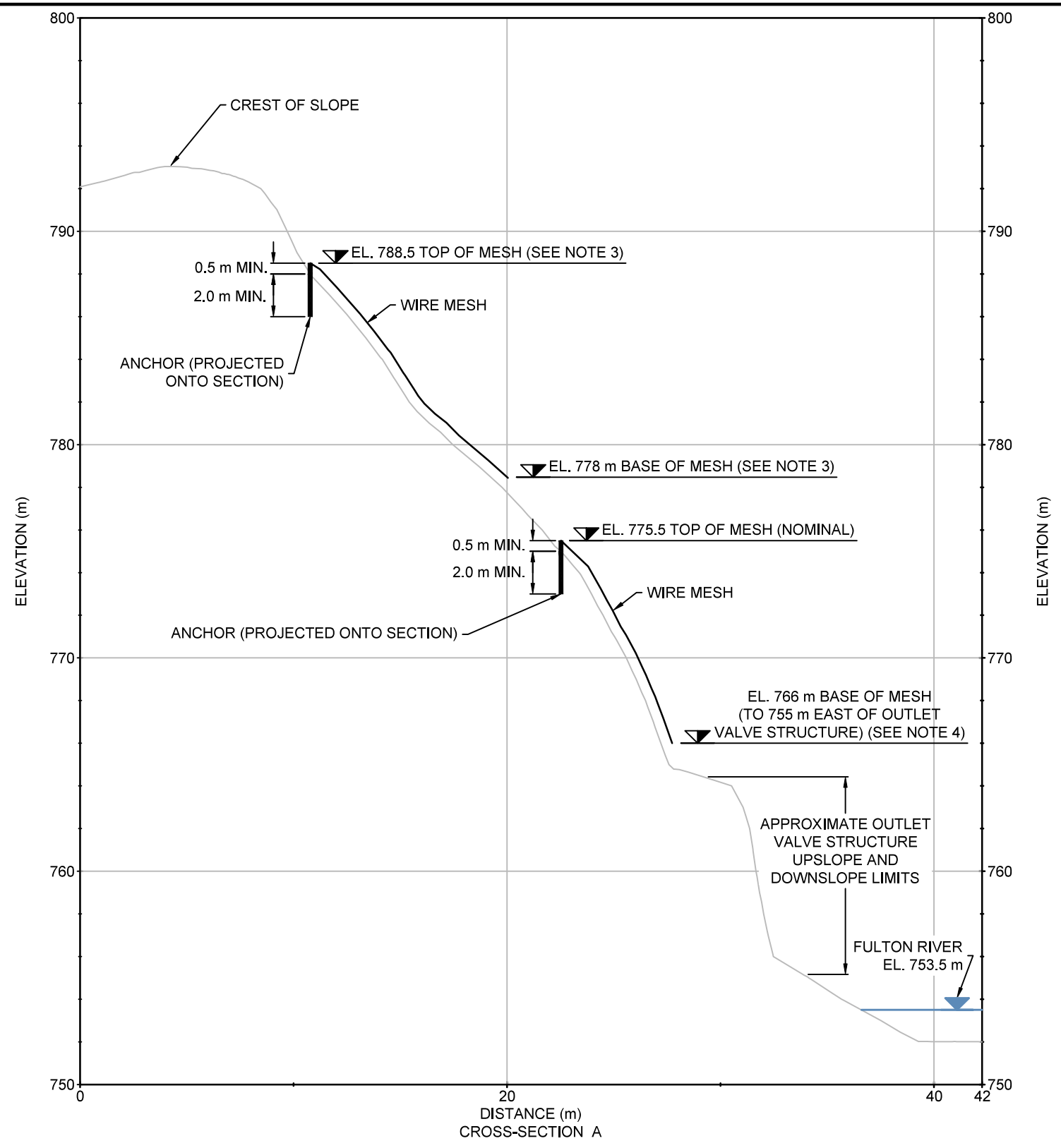

CROSS-SECTION A

CROSS-SECTION AT BEARING 134.2°

SCALE 1:250

2.5 0 2.5 5 7.5

METRES

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CLIENT: FISHERIES AND OCEANS CANADA AND THE CANADIAN COAST GUARD

PROJECT: FULTON RIVER ROCK FALL PROTECTION SPECIFICATIONS AND DETAILS

TITLE: DESIGN SECTION A

SCALE:	DWG NO.:	REV.:
1:250	003	A

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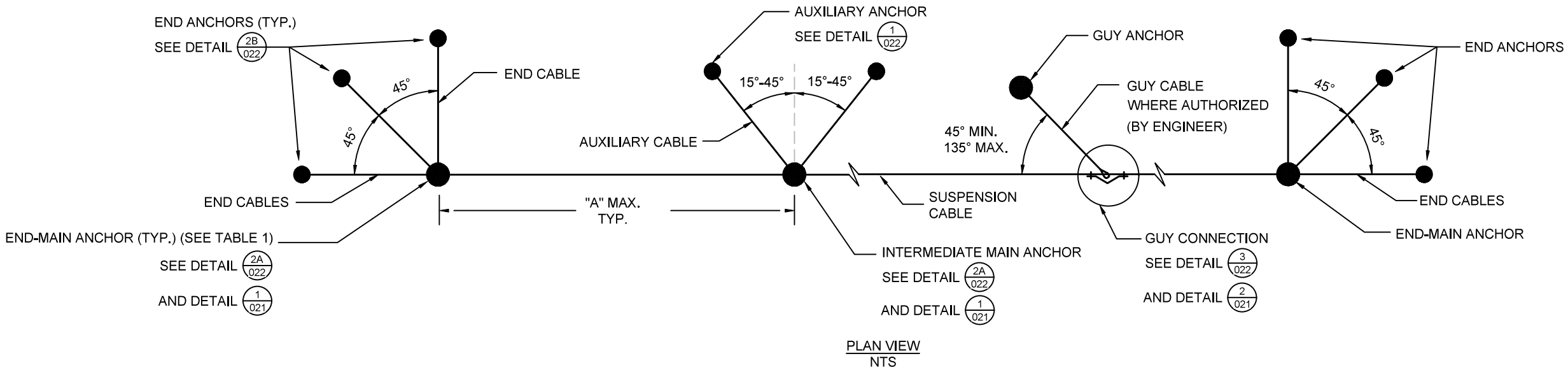
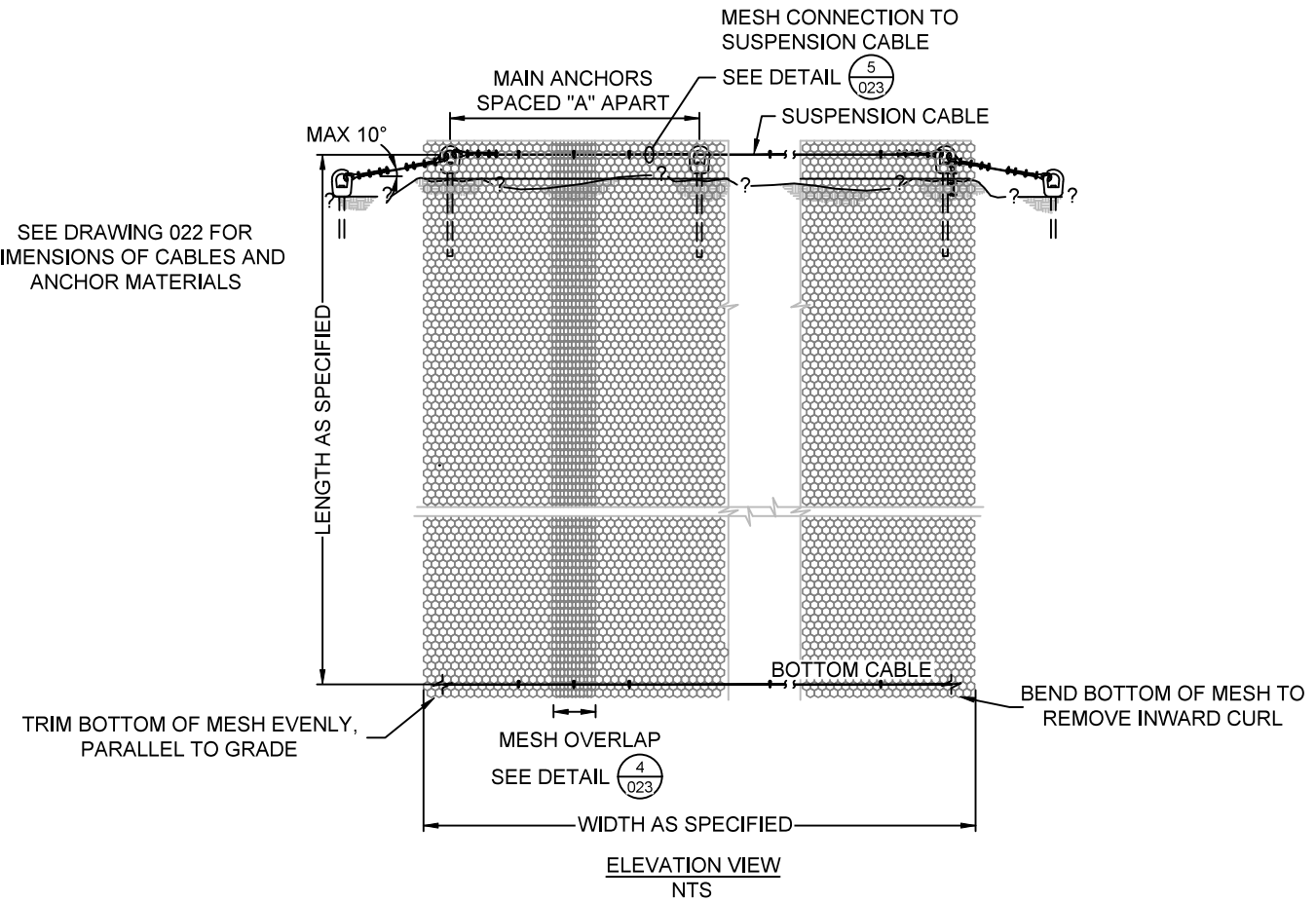


PLAN VIEW
NTS

SEE DRAWING 022 FOR DIMENSIONS OF CABLES AND ANCHOR MATERIALS



ELEVATION VIEW
NTS

TABLE 1: MAXIMUM SUSPENSION CABLE SPAN DIMENSIONS

SLOPE HEIGHT	MAXIMUM CONTINUOUS SUSPENSION CABLE LENGTH BETWEEN END MAIN ANCHORS	ANCHOR SPACING "A"
≤30 m	60 m	15 m
30 TO 60 m	30 m	10 m
60 TO 90 m	22 m	5 m

NOTES:
1. SEE DRAWING 024 FOR DETAILED SPECIFICATIONS AND ADDITIONAL NOTES ON DRAWING USE.
2. ACKNOWLEDGEMENT: SOME OF THESE DRAWING DETAILS ARE ADAPTED TO THIS PROJECT FROM SECTION 207 SLOPE MESH FOR ROCK CUTS FROM THE BRITISH COLUMBIA MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE 2012 STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
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PROJECT: FULTON RIVER ROCK FALL PROTECTION SPECIFICATIONS AND DETAILS

TITLE: SLOPE PROTECTION WIRE MESH AND ANCHOR LAYOUT

SCALE:	DWG NO.:	REV.:
NTS	020	A

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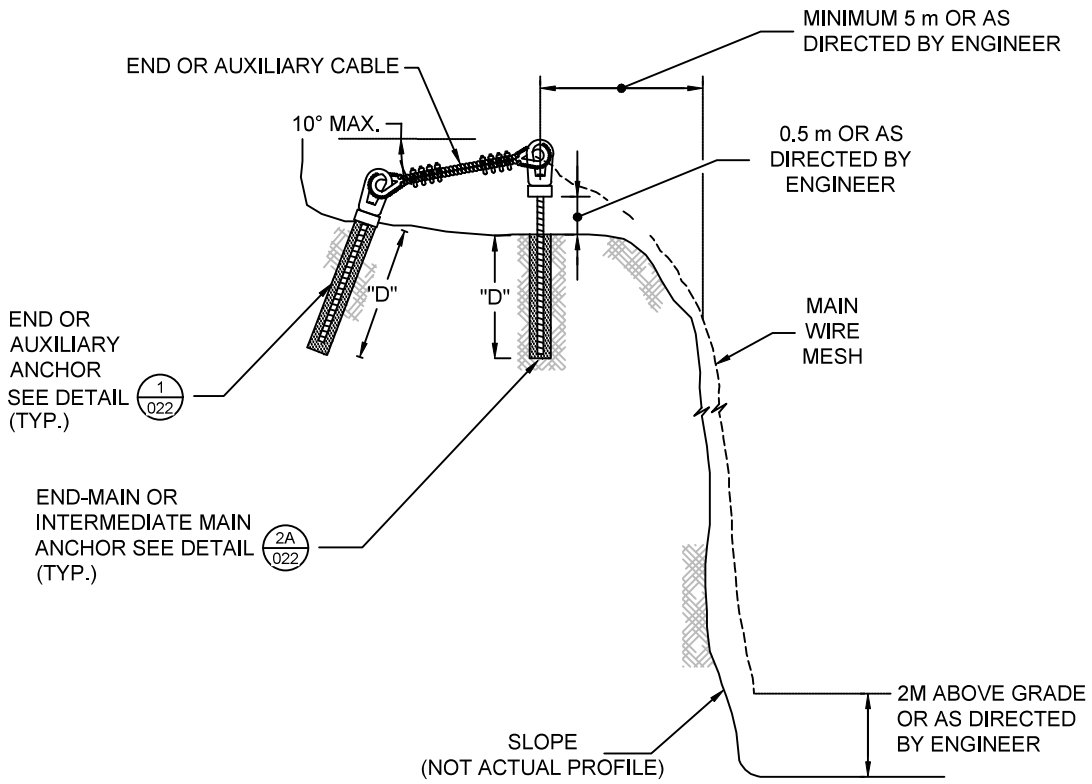
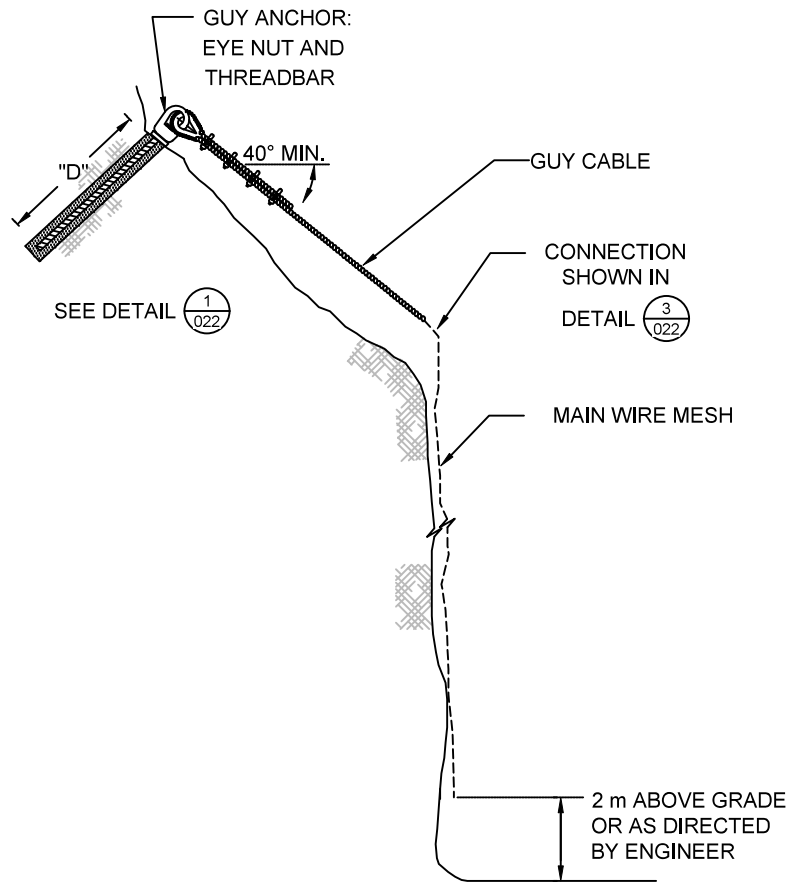


SIDE VIEW AT END-MAIN AND MAIN ANCHOR (NTS)

DETAIL 1/020



GUY CABLE ALTERNATIVE TO INTERMEDIATE MAIN ANCHOR DUE TO FIELD CONDITIONS (NTS)

DETAIL 2/020

NOTES:
1. SEE DRAWING 020 FOR GENERAL NOTES.
2. SEE DRAWING 022 FOR "D" DIMENSION.
3. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SHOULD UNCERTAINTIES ARISE WITH THE DRAWINGS, SCOPE, AND/OR TECHNICAL SPECIFICATIONS.
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PROJECT MANAGER: SF	APPROVAL DATE: -

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CLIENT: FISHERIES AND OCEANS CANADA AND THE CANADIAN COAST GUARD

PROJECT: FULTON RIVER ROCK FALL PROTECTION SPECIFICATIONS AND DETAILS

TITLE: SLOPE PROTECTION WIRE MESH PROFILES

SCALE:	DWG NO.:	REV.:
NTS	021	A

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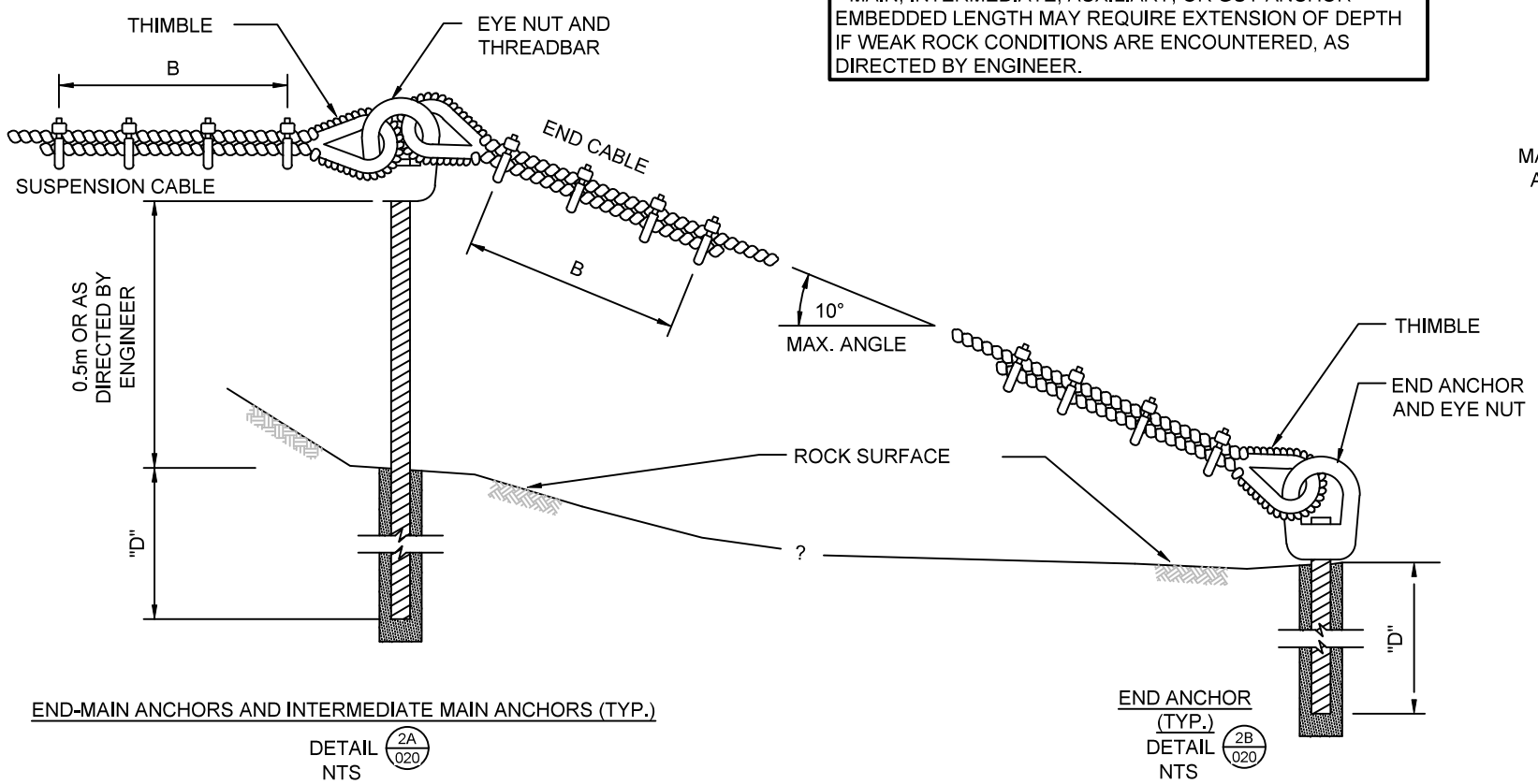
TABLE A					
CABLE TYPE	CABLE DIA. (mm)	CABLE CLAMP SIZE (mm)	No. OF CABLE CLAMPS PER LOOP	DIMENSION "B"	U-BOLTS TORQUE NM (ft-lbs)
SUSPENSION, END, GUY	19	19	4	500	175 (130)
AUXILIARY	13	13	3	300	113 (95)
BOTTOM CABLE	13	13	-	-	-

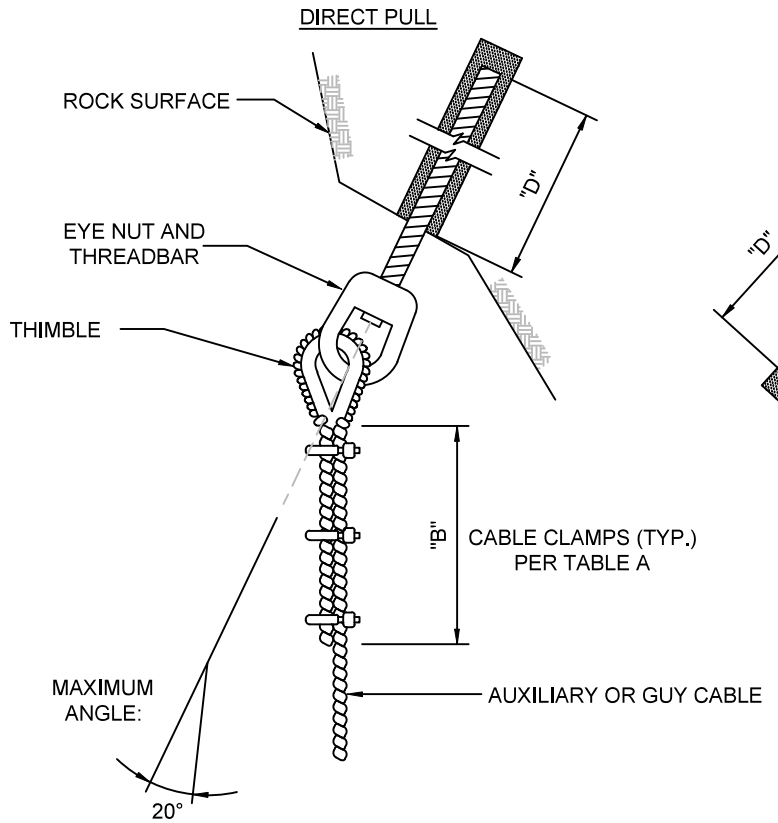
TABLE B				
ANCHOR TYPE	ANCHOR THREADBAR SIZE (mm)	ANCHOR EYE, NUT SIZE (mm)	THIMBLE TYPE	GROUTED LENGTH OF ANCHOR IN COMPETENT ROCK DEPTH "D" (m)
END, MAIN, GUY	32	32	HEAVY	2.0 *
INTERMEDIATE MAIN	32	32	HEAVY	2.0 *
AUXILIARY	25	25	HEAVY	2.0 *

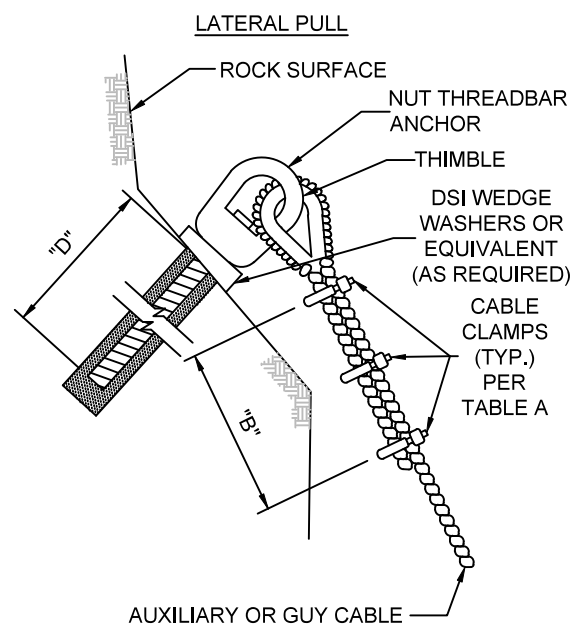
* MAIN, INTERMEDIATE, AUXILIARY, OR GUY ANCHOR EMBEDDED LENGTH MAY REQUIRE EXTENSION OF DEPTH IF WEAK ROCK CONDITIONS ARE ENCOUNTERED, AS DIRECTED BY ENGINEER.



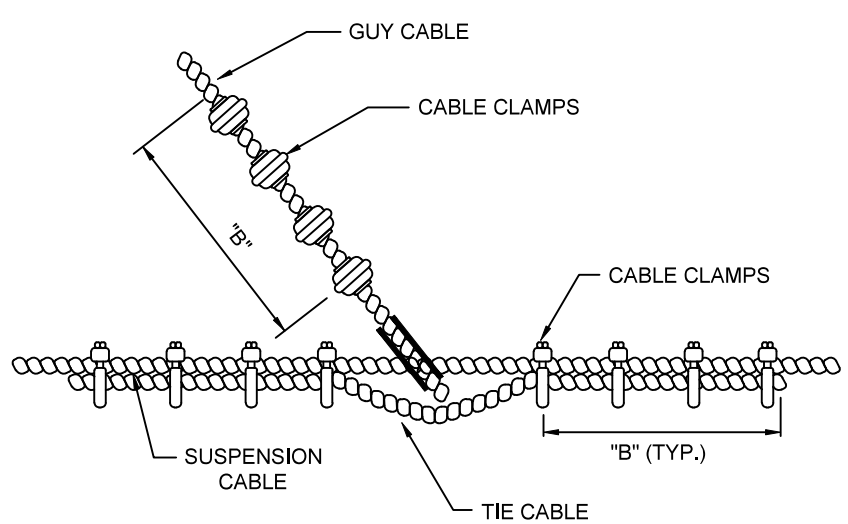
END-MAIN ANCHORS AND INTERMEDIATE MAIN ANCHORS (TYP.)
DETAIL 2A/020
NTS

END ANCHOR (TYP.)
DETAIL 2B/020
NTS





AUXILIARY OR GUY ANCHORS
DETAIL 1/020
NTS



GUY CABLE ALTERNATIVE DUE TO FIELD CONDITIONS
DETAIL 3/020
NTS

NOTES:
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DESIGN BY: SF	CHECK DESIGN: MAP		TITLE: SLOPE PROTECTION WIRE MESH ANCHOR DETAILS
LEAD ENGINEER: SF	APPROVAL DATE: -	CLIENT: FISHERIES AND OCEANS CANADA AND THE CANADIAN COAST GUARD	SCALE: NTS / DWG NO.: 022 / REV.: A
PROJECT MANAGER: SF	APPROVAL DATE: -		

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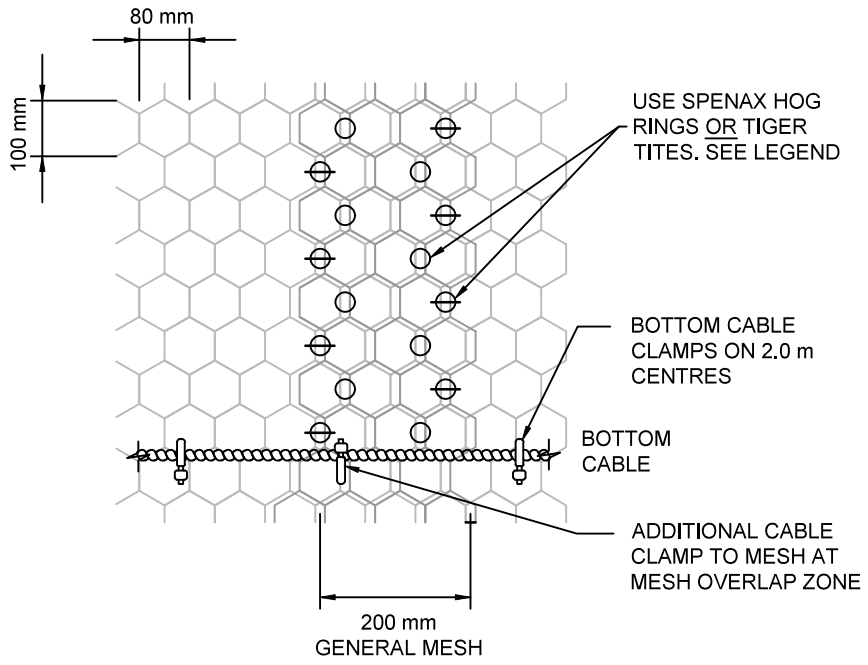
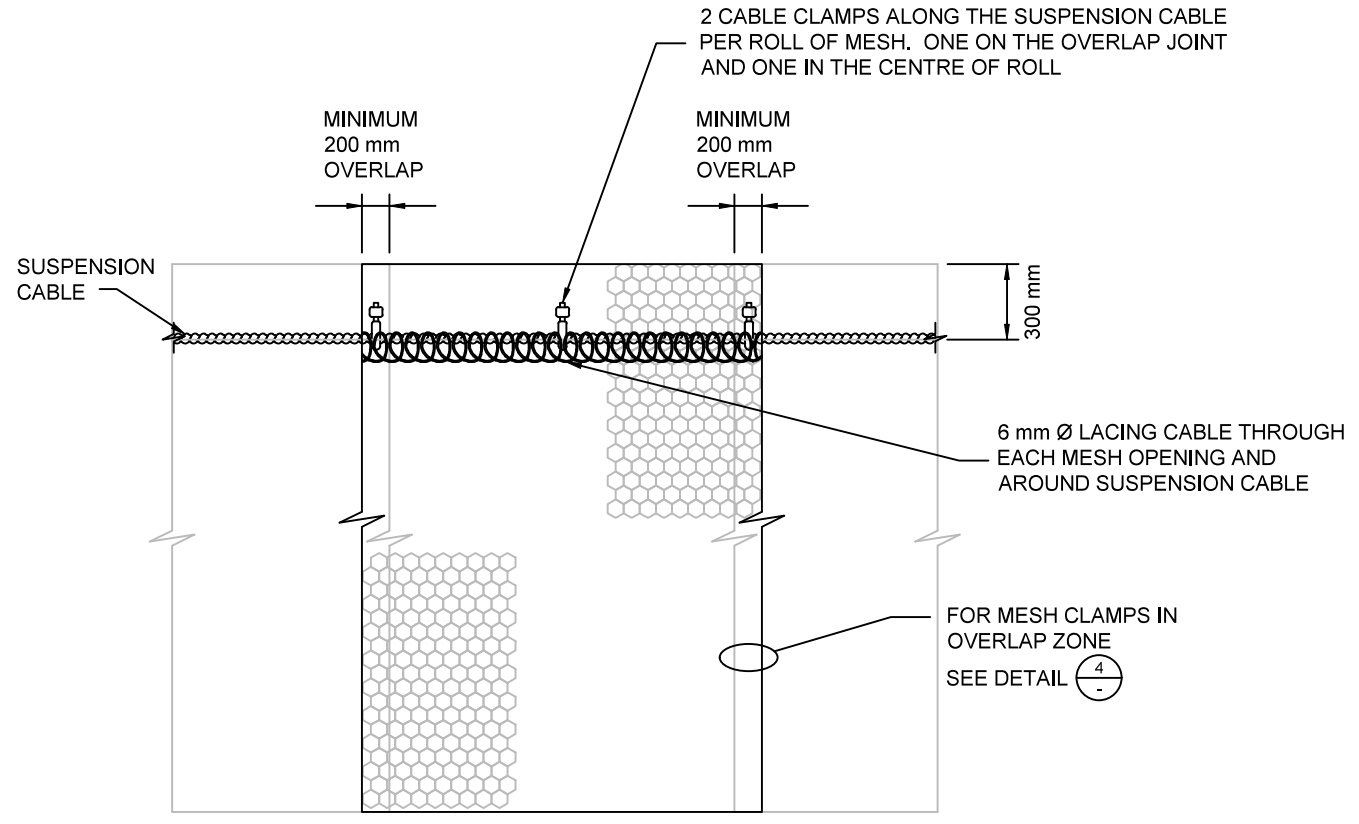


MESH OVERLAP CONNECTION

DETAIL 4/020
NTS



MESH TO SUSPENSION CABLE CONNECTION

DETAIL 5/020
NTS

LEGEND FOR 80 mm x 1000 mm MESH CLIPS

- ○ SPENAX HIGH TENSILE 11G40 HOG RINGS ARRANGEMENT
- — TIGER TITES ARRANGEMENT

NOTES:
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DRAWN BY: LS	CHECK DRAWING: NAK	PROJECT: FULTON RIVER ROCK FALL PROTECTION SPECIFICATIONS AND DETAILS	
DESIGN BY: SF	CHECK DESIGN: MAP	TITLE: SLOPE PROTECTION WIRE MESH CONNECTION DETAILS	
LEAD ENGINEER: SF	APPROVAL DATE: -	CLIENT: FISHERIES AND OCEANS CANADA AND THE CANADIAN COAST GUARD	
PROJECT MANAGER: SF	APPROVAL DATE: -	SCALE: NTS	DWG NO.: 023 / REV.: A

BGC ENGINEERING INC. AN APPLIED EARTH SCIENCES COMPANY

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WIRE MESH SPECIFICATION

1. GENERAL

1.1. DESCRIPTION OF THE WORK
1.1.1. SUPPLY AND INSTALLATION OF WIRE FABRIC SLOPE PROTECTION. IT SHALL INCLUDE THE SUPPLY AND INSTALLATION OF CABLE SUPPORTED MESH, SUPPORTED BY ROCK ANCHORS, IN ACCORDANCE WITH THE REFERENCE DRAWINGS IN AREAS DESIGNATED BY THE ENGINEER.

1.2. REFERENCE STANDARDS
CONFORM TO THE CURRENT VERSIONS OF THE FOLLOWING:
1.2.1. BRITISH COLUMBIA BUILDING CODE.
1.2.2. CAN/CSA G164 HOT DIP GALVANIZING OF IRREGULARLY SHAPED ARTICLES (WHERE APPROPRIATE) OR ASTM A123M-15: STANDARD SPECIFICATION FOR ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS, OR ASTM A153M-09: STANDARD SPECIFICATION FOR ZINC (HOT-DIP GALVANIZED) COATINGS ON HARDWARE.
1.2.3. CAN/CSA G4-15: STEEL WIRE ROPE FOR GENERAL PURPOSE AND FOR MINE HOISTING AND MINE HAULAGE.
1.2.4. G30.18-09 (R2014): CARBON STEEL BARS FOR CONCRETE REINFORCEMENT.
1.2.5. ASTM A975-11: STANDARD SPECIFICATION FOR DOUBLE-TWISTED HEXAGONAL MESH GABIONS AND REVET MATTRESSES.
1.2.6. ASTM A641M-09A (2014): STANDARD SPECIFICATION FOR ZINC-COATED (GALVANIZED) CARBON STEEL WIRE.
1.2.7. ASTM A239-14: STANDARD PRACTICE FOR LOCATING THE THINNEST SPOT IN A ZINC (GALVANIZED) COATING ON IRON OR STEEL ARTICLES.
1.2.8. ASTM A90M-13: STANDARD TEST METHOD FOR WEIGHT OF COATING ON IRON AND STEEL ARTICLES WITH ZINC OR ZINC-ALLOY COATINGS.

1.3. ADDITIONAL DEFINITIONS
1.3.1. ENGINEER: GEOTECHNICAL ENGINEER OR OWNER'S REPRESENTATIVE AS DESIGNATED BY THE OWNER.

1.4. SUBMITTALS
THE CONTRACTOR SHALL SUBMIT THE FOLLOWING ITEMS TO THE ENGINEER AT LEAST 7 DAYS PRIOR TO THE START OF WORK:
1.4.1. A DETAILED DESCRIPTION OF PROPOSED WIRE MESH INSTALLATION PROCEDURE.
1.4.2. MANUFACTURER'S MILL CERTIFICATES OR OTHER DOCUMENTS OF CONFORMANCE TO PROJECT SPECIFICATIONS OF ALL MATERIALS TO BE USED.
1.4.2.1. WIRE MESH
1.4.2.2. ROCK ANCHORS
1.4.2.3. CABLES FOR END, AUXILLIARY, OR GUY CABLES
1.4.2.4. CABLES FOR MESH SUSPENSION, AND LACING.
1.4.2.5. CABLES CLAMPS AND CLIPS FOR JOINING MESH
1.4.2.6. GALVANIZING METHOD AND SCOPE OF APPLICATION
1.4.3. CREW QUALIFICATIONS:
1.4.3.1. THE FOREMAN SHALL HAVE A MINIMUM OF THREE (3) YEAR'S EXPERIENCE SUPERVISING CREWS ON SIMILAR PROJECTS, AS DETERMINED BY THE ENGINEER. THE WIRE MESH WORKERS SHALL HAVE AT LEAST TWO (2) YEAR'S DEMONSTRATED EXPERIENCE ON SIMILAR PROJECTS.
1.4.3.2. ONLY EXPERIENCED INSTALLERS PROFICIENT WITH WORKING AT HEIGHTS SHALL BE EMPLOYED ON WIRE MESH WORK.

1.5. RESTRICTIONS
1.5.1. ANY DAMAGE TO PROPERTY, SERVICES, AND INSTALLATIONS DUE TO LACK OF GOOD WORKMANSHIP SHALL BE MADE GOOD AT THE CONTRACTOR'S EXPENSE.
1.5.2. THE CONTRACTOR SHALL ADHERE TO REGULATIONS OF AUTHORITIES HAVING JURISDICTION FOR SCALING.

2. PRODUCTS

2.1. WIRE MESH
2.1.1. WIRE MESH SHALL BE DOUBLE TWIST GABION TYPE MESH, HEXAGONAL IN SHAPE AND UNIFORM IN SIZE, WITH OPENING SIZE MEASURING NOT MORE THAN 80 MM X 100 MM. MESH WIRE SHALL MEET ASTM A975 STYLE 1 CONSISTING OF CARBON STEEL WITH A CLASS 3 ZINC OR ZINC ALLOY COATING OF NOT LESS THAN 244 g/m2 MEETING ASTM A641. THE WEIGHT OF ZINC COATING SHALL BE DETERMINED BY ASTM A90.
2.1.2. CABLES TO BE FIBER CORE, GALVANIZED AND CONFORM TO CSA G4_15 WITH CABLE DIAMETERS CONFORMING TO THE REFERENCE DRAWINGS.
2.1.3. ANCHORAGE FOR CABLES TO BE GALVANIZED THREADBAR ANCHORS CONFORMING TO CSA G30.18-09, GRADE 517/690 MPA STEEL MANUFACTURED BY DYWIDAG SYSTEMS INTERNATIONAL (DSI) OR APPROVED EQUIVALENT, DIAMETERS AS SHOWN ON THE DRAWINGS.
2.1.3.1. CORRESPONDING GALVANIZED EYE NUTS TO BE CAST OR MANUFACTURED BY DSI OR APPROVED EQUIVALENT.
2.1.3.2 THIMBLES TO BE GALVANIZED AND TO MEET FF-T-276B TYPE III (EXTRA HEAVY G-414 STANDARDS).
2.1.3.3. CABLE CLAMPS SHALL BE GALVANIZED DROP FORGED OR CAST STEEL U-BOLTS AS NECESSARY FOR CABLE SIZE, MEETING FF_C_450 TYPE 1, CLASS 1 (G450 CROSBY CLIP OR APPROVED EQUIVALENT).
2.1.3.4. MESH CLAMPS TO BE SPENAX 11G40 HOG RING OR TIGER-TITE LOCKING CLIP FASTENERS, ALL GALVANIZED.

2.1. ANCHOR GROUT
2.1.1. CEMENTITIOUS OR RESIN GROUT AS NOTED BELOW, OR OTHER GROUT PRODUCT AS APPROVED BY THE ENGINEER.
2.1.2 CEMENTITIOUS GROUT TO BE CEMENTITIOUS ANCHOR GROUT, UNSANDED, NON-METALLIC, NON-SHRINK, PORTLAND CEMENT GROUT (BASALITE MICROSIL OR APPROVED EQUIVALENT). GROUT SHALL BE MIXED TO THE MANUFACTURER'S RECOMMENDATIONS. STRENGTH PARAMETERS ARE MIN 20 MPA IN 24 HOURS, 40 MPA IN 28 DAYS.
2.1.3 RESIN GROUT TO BE POLYESTER RESIN GROUT THAT IS MANUFACTURED SPECIFICALLY FOR ROCK BOLTING AND ROCK ANCHORING APPLICATIONS AND SHALL BE APPROVED BY THE ENGINEER. RESIN SHOULD BE NON-SHRINK AFTER GEL TIME. RESIN GROUT SHALL HAVE A MINIMUM UNCONFINED COMPRESSIVE STRENGTH WHEN FULLY MIXED AND CURED OF 90 MPA.

3. EXECUTION
3.1. OVERBURDEN TO BE EXCAVATED TO ROCK AT ANCHOR LOCATIONS, UNLESS SPECIFIED OTHERWISE. EXCAVATION TO MINIMIZE DISTURBANCE TO SUBRROUNDING SOIL AND ROCK.

3.2 ALL ANCHOR BOREHOLES TO BE DRILLED INTO COMPETENT ROCK WITH BOREHOLES CLEANED OF DUST OR DEBRIS.

3.3. END-MAIN AND INTERMEDIATE MAIN ANCHORS TO BE VERTICAL AND LOCATED AT LOCAL HIGH POINTS WHERE PRACTICABLE TO MAXIMIZE CLEARANCE BETWEEN SUSPENSION CABLE AND GROUND SURFACE. END MAIN OR INTERMEDIATE MAIN ANCHOR HEIGHT ABOVE GROUND SURFACE MAY BE REDUCED AS AUTHOURIZED BY THE ENGINEER TO SUIT GROUND CONDITIONS.

3.4 ANCHORS TO BE INSTALLED INTO COMPETENT ROCK TO THE DEPTH INDICATED ON THE DRAWINGS, OR AS OTHERWISE DIRECTED BY THE ENGINEER, AND BE CENTERED IN HOLES AND GROUTED. LONGER ANCHORS MAY BE REQUIRED FOR WEAK GROUND CONDITIONS IF THE ENGINEER DIRECTS.

3.5 GUY CABLES AS INDICATED ON THE REFERENCE DRAWINGS MAY BE SUBSTITUTED FOR INTERMEDIATE MAIN ANCHORS, WHERE NO SUITABLE INTERMEDIATE MAIN ANCHOR LOCATION CAN BE FOUND AND WHERE AUTHOURIZED BY THE ENGINEER. GUY CABLES AND THEIR ANCHORAGE TO BE LOCATED TO MAXIMIZE THE SUSPENSION CABLE ELEVATION.

3.6. ALL CABLES TO BE INSTALLED WITH NO SPLICING AND NOMINAL TENSION PRIOR TO INSTALLATION OF MESH. CABLES SHALL NOT CONTACT THE GROUND SURFACE.

3.7 ONCE UNROLLED DOWN THE SLOPE, THE MESH SHALL NOT BE DRAGGED BACK UP WITHOUT PRECAUTIONS TAKEN TO AVOID TEARING THE MESH.

3.8. HORIZONTAL SEAMS TO JOIN MESH PANELS ARE TO BE MINIMIZED. USE NO MORE THAN TWO HORIZONTAL MESH SEAMS OVER THE MESH HEIGHT. DOWNSLOPE MESH PANELS TO OVERLAP ON THE OUTSIDE OF UPSLOPE PANELS. HORIZONTAL MESH SEAM CONNECTION DETAIL TO MATCH VERTICAL CONNECTION DETAIL ON REFERENCE DRAWINGS WITH RESPECT TO THE NUMBER OF CLIPS PER METRE OF SEAM.

3.9. BOTTOM OF THE MESH TO BE NO CLOSER THAN 2 m VERTICALLY ABOVE THE GROUND SURFACE, OR AS DIRECTED BY THE ENGINEER TO SUIT LOCAL CONDITIONS. BEND THE BOTTOM OF THE MESH TO REMOVE INWARD CURL THAT COULD TRAP ROCK FALL.

END OF SPECIFICATION

NOTES:
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING DRAWINGS AND SPECIFICATIONS. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER SHOULD UNCERTAINTIES ARISE WITH THE DRAWINGS, SCOPE, AND/OR TECHNICAL SPECIFICATIONS.
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