

CLIENT



Environment and
Climate Change
Canada

Environnement et
Changement Climatique
Canada

ADDRESS / CONTACT INFO.

220 4 AVE SE - SUITE 854, CALGARY, AB T2G4X3

PROJECT NAME

05DB006 CLEARWATER RIVER NEAR DOVERCOURT
HYDROMETRIC CABLEWAY REBUILD

DESCRIPTION

ENGINEERING DESIGN SERVICES

McELHANNEY PROJECT

2531-36608-00

OTHER REFERENCE

STATUS

ISSUED FOR TENDER



McElhanney

Suite 203
502 Bow Valley Trail
Canmore AB
Canada T1W 1N9
T 403 609 3992

DRAWING LIST		
SHEET #S	SHEET TITLE	CURRENT REVISION
D001	GENERAL STRUCTURAL NOTES - SHEET 1	0
D002	GENERAL STRUCTURAL NOTES - SHEET 2	0
D100, D101, D202	SITE PLAN, OVERALL PLAN AND ELEVATION, A-FRAME AND CONCRETE ANCHOR	0
D304, D305, D306	CONCRETE ANCHOR, CONCRETE MASS ANCHOR, CONCRETE HARWARE ATTACHMENT	0
D501	CABLE TERMINATION DETAILS	0

DESIGN CRITERIA:

1. DESIGN STANDARDS:

CONCRETE: CSA-A23.3-19
STEEL: CSA-S16-19

2. DESIGN LOADS:

CABLE CAR: 0.9 kN (200 lb)
TWO PASSENGERS: 1.8 kN (400 lb)
REEL: 0.2 kN (50 lb)
SNAG LOAD OF WIRE ROPE: 7.1 kN (1600 lb)

3. BEARING CAPACITY:

FACTORED BEARING RESISTANCE: 50 kPa (1,000 psf) SLS (ASSUMED)
75 kPa (1,500 psf) ULS (ASSUMED)

THE ENGINEER SHALL BE NOTIFIED IF THE ENCOUNTERED BEARING CAPACITIES ARE LESS THAN THE VALUES LISTED ABOVE.

4. THE CONTRACTOR SHALL ENSURE THAT CONSTRUCTION LOADS DO NOT EXCEED THE DESIGN LOADS LISTED ABOVE.

GENERAL:

- 1. CODES AND STANDARDS REFERENCED ON THE DRAWINGS SHALL BE THE EDITIONS LISTED IN TABLE 1.3.1.2. OF DIVISION B OF THE CURRENT EDITION OF THE BUILDING CODE UNLESS NOTED OTHERWISE.
2. CONSTRUCTION SHALL COMPLY WITH THE CODES AND STANDARDS LISTED ON THE DRAWINGS AS WELL AS ALL APPLICABLE FEDERAL, PROVINCIAL AND MUNICIPAL REGULATIONS AND BYLAWS.
3. THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS BEFORE COMMENCING ANY WORK AND NOTIFY THE ENGINEER OF ANY ERRORS OR OMISSIONS.
4. THE CONTRACTOR SHALL COMPARE ALL RELATED DRAWINGS BEFORE COMMENCING ANY WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR INCONSISTENCIES BETWEEN DRAWINGS.
5. DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE. ELEVATIONS ARE IN METRES UNLESS NOTED OTHERWISE.
6. ONLY USE WRITTEN DIMENSIONS. DO NOT SCALE OFF THE DRAWINGS.
7. DRAWINGS SHALL NOT BE USED FOR CONSTRUCTION UNLESS MARKED ISSUED FOR CONSTRUCTION (IFC) AND SEALED BY A PROFESSIONAL ENGINEER.
8. THE SUPPLY OF RECORD DRAWINGS IS OUTSIDE THE SCOPE OF SERVICES.
9. THESE NOTES SHALL BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DOCUMENTS. THE MOST STRINGENT SPECIFICATIONS SHALL BE USED IF DISCREPANCIES OR INCONSISTENCIES ARE FOUND BETWEEN THE DRAWINGS AND OTHER CONTRACT DOCUMENTS, UNLESS APPROVED BY THE ENGINEER.
10. MATERIALS SHALL BE NEW AND BE PROTECTED FROM DAMAGE DURING SHIPPING, HANDLING, STORAGE AND INSTALLATION.
11. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE CORRECTION OF DEFICIENCIES, AS DIRECTED BY THE ENGINEER.
12. THESE DRAWINGS ARE FOR THE COMPLETED STRUCTURE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR DEMOLITION PROCEDURES, LIFT PLANS AND TEMPORARY SUPPORTS REQUIRED TO SUPPORT CONSTRUCTION LOADS AND TO KEEP THE STRUCTURE PLUMB AND LEVEL DURING CONSTRUCTION.
13. MATERIALS SHALL BE ORDERED IN A TIMELY MANNER TO ENSURE PROCUREMENT TIMES DO NOT NEGATIVELY IMPACT THE PROJECT SCHEDULE. SCHEDULING PROBLEMS WILL NOT JUSTIFY SUBSTITUTIONS.
14. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL COMPONENTS AND THEIR ATTACHMENT TO THE ENGINEER FOR REVIEW AT LEAST TWO WEEKS PRIOR TO FABRICATION.
15. THE REVIEW OF SHOP DRAWINGS BY THE ENGINEER IS FOR THE SOLE PURPOSE OF REVIEWING GENERAL CONFORMANCE WITH THE DESIGN CONCEPTS ONLY.
16. FOR CONDITIONS NOT EXPLICITLY SHOWN, THE CONTRACTOR SHALL IMMEDIATELY REQUEST CLARIFICATIONS FROM THE ENGINEER.
17. CONTRACTOR TO SUBMIT IN WRITING ALL PROPOSED ALTERNATE PRODUCTS, MATERIALS, AND STRUCTURAL SYSTEMS FOR REVIEW AT LEAST FOUR (4) WEEKS PRIOR TO THE START OF CONSTRUCTION.
18. CONTRACTOR SHALL MAINTAIN PROJECT RECORD DRAWINGS AND RECORD ACCURATELY SIGNIFICANT DEVIATIONS, INCLUDING OUT OF SIGHT DEVIATIONS FROM CONTRACT DOCUMENTS CAUSED BY SITE CONDITIONS AND CHANGES ORDERED BY ECCC.

FIELD REVIEWS:

- 1. THE ENGINEER SHALL BE NOTIFIED OF THE CONSTRUCTION SCHEDULE IN ORDER TO SCHEDULE FIELD REVIEWS. IF THE ENGINEER IS NOT AFFORDED THE OPPORTUNITY TO REVIEW THE STRUCTURAL WORKS PRIOR TO CONCEALMENT, THEN FINAL CERTIFICATION OF THE PROJECT WILL NOT BE ISSUED.
2. THE ENGINEER SHALL BE NOTIFIED AT LEAST 72 HOURS IN ADVANCE FOR INSPECTION AND APPROVAL OF THE FOLLOWING:
A-FRAME LOCATION, BEFORE EXCAVATION
CONCRETE ANCHORS' LOCATION, BEFORE EXCAVATION
FOUNDATION SOILS, BEFORE BACKFILLING OR CONCRETING
REINFORCING STEEL, BEFORE CONCRETING/GROUTING
STRUCTURAL STEEL, BEFORE CONCEALMENT
CABLE AND CABLE COMPONENTS, BEFORE FINAL COMPLETION AND DEMOBILIZATION
FINAL REVIEW, BEFORE DEMOBILIZATION
3. ALL WORK SHALL BE MADE ACCESSIBLE FOR INSPECTION. FAILURE TO GIVE THE REQUIRED NOTIFICATION AND ACCESSIBILITY MAY RESULT IN THE ENGINEER REQUIRING THE REMOVAL AND REPLACEMENT OF THE WORK AT THE CONTRACTOR'S EXPENSE.
4. THE CONTRACTOR SHALL REVIEW SUB-CONTRACTORS' WORK PRIOR TO THE ENGINEER'S FIELD REVIEW.
5. FIELD REVIEWS ARE PROVIDED ONLY FOR THE WORK SHOWN ON THE STRUCTURAL DRAWINGS PREPARED BY THE ENGINEER. REVIEWS ARE PERIODIC, AND AT THE PROFESSIONAL JUDGEMENT OF THE ENGINEER TO DETERMINE THAT THE WORK IS IN GENERAL CONFORMANCE WITH THE DRAWINGS AND CONTRACT DOCUMENTS, AND TO FACILITATE COMPLETION OF THE LETTERS OF ASSURANCE REQUIRED BY THE AUTHORITY HAVING JURISDICTION (AHJ).
6. FIELD REVIEWS SHALL NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITY AND OBLIGATION TO COMPLY WITH DRAWINGS AND CONTRACT DOCUMENTS. QUALITY CONTROL REMAINS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
7. ADDITIONAL FIELD REVIEWS THAT ARE REQUIRED DUE TO DEFICIENT OR INCOMPLETE WORK SHALL BE AT THE CONTRACTOR'S EXPENSE.

SUBMITTALS AND SHOP DRAWINGS

- 1. THE CONTRACTOR IS RESPONSIBLE FOR THE OVERALL COORDINATION OF THE SUB-TRADES.
2. SUBMITTALS ARE ITEMS REQUIRED BY THE CONTRACT DOCUMENTS TO BE SUBMITTED BY THE GENERAL CONTRACTOR, SUCH AS (BUT NOT LIMITED TO) REQUEST FOR PAYMENT, HEALTH AND SAFETY PLANS, SCHEDULES, PROGRESS REPORTS, SHOP DRAWINGS, ETC.
3. THE OWNER WILL NOT ASSUME RESPONSIBILITY FOR SUCH MATTERS AS DIMENSIONS OR QUANTITIES OF INSTALLED MATERIALS OR THE CONTRACTOR'S SAFETY MEASURES OR METHODS OF CONSTRUCTION.
4. SHOP DRAWINGS AND OTHER SUBMITTALS OF PRE-ENGINEERED OR PROPRIETARY ELEMENTS SHALL CLEARLY INDICATE TYPE, POSITION, AND CONNECTION TO ELEMENTS OF THE SYSTEM AS WELL AS THE CRITERIA AND LOADS USED FOR THE DESIGN.
5. SUBMITTALS MUST BE REVIEWED BY THE GENERAL CONTRACTOR PRIOR TO ENGINEER'S REVIEW.

SITE PREPARATION

- 1. PROTECT NATIVE SOILS FROM SOFTENING AND FROST. REMOVE ALL SOFTENED OR FROST DAMAGED SOILS PRIOR TO PLACEMENT OF FOOTINGS OR ANCHORS. PROTECT BEARING SOILS FROM FREEZING AFTER FOOTING CONSTRUCTION.
2. EXCAVATIONS TO BE FREE OF WATER PRIOR TO AND DURING CONCRETE PLACEMENT. PROVIDE ADEQUATE MEANS OF REMOVING WATER FROM EXCAVATIONS AND TRENCHES.
3. MINIMUM FROST COVER TO BE 1400 MM.
4. DEPTH OF EXCAVATION FOR ANCHORS TO BE APPROXIMATELY 2500MM. DEPTH OF EXCAVATION FOR A-FRAME FOUNDATIONS TO BE APPROXIMATELY 2000MM. DEPTH MAY VARY WITH SITE. THE CONTRACTOR IS OBLIGATED TO DIG AS DEEP AS REQUIRED TO ATTAIN PROPER PLACEMENT OF INFRASTRUCTURE.
5. LOOSE OR WET SUB-BASE UNDER FOOTINGS MAY REQUIRE REMOVAL, SUB EXCAVATION, AND REPLACEMENT WITH STRUCTURAL FILL.
6. COMPACT FILLS IN MAXIMUM LIFTS AND TO REQUIRED DENSITIES, AND TEST FOR COMPACTION AT SUFFICIENT INTERVALS TO VERIFY CONFORMANCE.

FOUNDATIONS:

- 1. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING STRUCTURES AND UTILITIES PRIOR TO EXCAVATION AND ENSURE THEY ARE PROTECTED DURING CONSTRUCTION.
2. THE CONTRACTOR IS RESPONSIBLE FOR TEMPORARY SITE DRAINAGE AND STABILITY OF EXCAVATIONS.
3. IF ANY FOOTING DEPTHS OR ELEVATIONS ARE SHOWN, THEY ARE FOR BIDDING PURPOSES ONLY, AND ARE NOT FINAL. DEPTHS AND ELEVATIONS MAY VARY DUE TO SITE CONDITIONS.
4. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF THE SUBGRADE FROM DISTURBANCE DUE TO CONSTRUCTION AND WEATHER INCLUDING FREEZING PRIOR TO AND AFTER FOOTINGS ARE PLACED. THE SUBGRADE PROTECTION, INCLUDING, BUT NOT LIMITED TO, CONCRETE MUD SLABS, HEATING AND HOARDING AS REQUIRED, SHALL BE CARRIED OUT AT THE CONTRACTOR'S EXPENSE.

REINFORCING STEEL:

- 1. REINFORCING STEEL SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH CSA-A23.1 AND THE RISC MANUAL OF STANDARD PRACTICE.
2. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND BAR LISTS OF ALL REINFORCING STEEL TO THE ENGINEER FOR REVIEW AT LEAST TWO WEEKS PRIOR TO FABRICATION. THE SHOP DRAWINGS SHALL SHOW THE QUANTITY, LENGTH, MARK, GRADE, LOCATION AND SPACING OF ALL REINFORCING STEEL.
3. REINFORCING STEEL SHALL CONFORM TO CSA-G30.18 GRADE 400 UNLESS NOTED OTHERWISE.
4. REINFORCING STEEL SHALL NOT BE WELDED UNLESS SPECIFIED OR AUTHORIZED BY THE ENGINEER. WELDING SHALL CONFORM TO CSA-W186.
5. REINFORCING STEEL SHALL BE CLEAN AND FREE OF MUD, OIL, EXCESSIVE RUST, MILL SCALE OR DAMAGE.
6. REINFORCING STEEL SHALL BE ACCURATELY PLACED, SECURED, AND SUPPORTED TO ENSURE PROPER CONCRETE COVER AND SPACING WITHIN ALLOWABLE TOLERANCES BEFORE AND DURING CONCRETING.
7. PROVIDE CLEAR CONCRETE COVER FOR REINFORCING STEEL IN CAST-IN-PLACE CONCRETE AS FOLLOWS, UNLESS NOTED OTHERWISE:
CONCRETE CAST AGAINST GROUND: 75 mm (3")
EXPOSED TO FREEZING/THAWING/SULPHATE: 40 mm (1 1/2")
8. REINFORCING STEEL SHALL BE BENT WITH THE FOLLOWING DIAMETERS UNLESS NOTED OTHERWISE:
15M: 100 mm (4")
9. REINFORCING STEEL SHALL BE CONTINUOUS, AND ADEQUATELY LAPPED AT SPLICES.
10. MINIMUM LAP LENGTHS SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE:
15M: 520 mm (1'-8") VERTICAL
11. MINIMUM DEVELOPMENT LENGTHS SHALL BE THE LAP LENGTHS DIVIDED BY 1.3.
12. SPLICES ARE NOT PERMITTED WHERE BAR LENGTHS HAVE BEEN SPECIFIED ON THE DRAWINGS UNLESS AUTHORIZED BY THE ENGINEER.
13. CONCRETE OR GROUT SHALL NOT BE POURED UNTIL REINFORCING STEEL HAS BEEN REVIEWED BY THE ENGINEER AND FOUND TO BE IN GENERAL CONFORMANCE WITH THE DRAWINGS AND CONTRACT DOCUMENTS.

CAST-IN-PLACE CONCRETE:

- 1. CONCRETE SHALL BE MIXED, PLACED, FINISHED AND CURED IN ACCORDANCE WITH CSA-A23.1.
2. CONCRETE SHALL BE NORMAL WEIGHT CONCRETE AND MIXED USING TYPE GU CEMENT UNLESS NOTED OTHERWISE. CONCRETE SHALL CONTAIN MAXIMUM 20 mm (3/4") AGGREGATE. CONCRETE SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:
ELEMENT EXPOSURE STRENGTH MAX W/C SLUMP/AIR CURING TYPE ADMIX
ANCHORS F-1 30 MPa 0.50 25 - 100 mm 5 - 8% 2
* SUPERPLASTICIZER SHALL BE ADDED AFTER SLUMP HAS BEEN MEASURED.
3. THE CONTRACTOR SHALL SUBMIT MIX DESIGNS TO THE ENGINEER FOR REVIEW AT LEAST TWO WEEKS PRIOR TO PLACING.
4. THE USE OF ADMIXTURES OTHER THAN AIR ENTRAINMENT, STANDARD WATER REDUCERS, OR SUPER PLASTICIZERS IS NOT PERMITTED UNLESS SPECIFIED OR AUTHORIZED BY THE ENGINEER.
5. WATER SHALL NOT BE ADDED TO THE CONCRETE AFTER LEAVING THE BATCH PLANT.
6. CONCRETE SHALL BE COMPLETELY DISCHARGED WITHIN 120 MINUTES OF INITIAL MIXING. CONCRETE SHALL BE REJECTED IF THIS TIME LIMIT CANNOT BE MET.
7. LAITANCE SHALL BE REMOVED, AGGREGATE SHALL BE PARTIALLY EXPOSED, AND THE SURFACE SHALL BE ROUGHENED TO A FULL AMPLITUDE OF AT LEAST 5 mm (3/16") WHERE FRESH CONCRETE IS CAST AGAINST HARDENED CONCRETE. THE HARDENED CONCRETE SHALL BE SATURATED WITH WATER AND BE IN A DAMP CONDITION WITH NO FREE SURFACE WATER (SATURATED SURFACE DRY) IMMEDIATELY BEFORE PLACING FRESH CONCRETE.
8. FORMWORK AND FALSEWORK SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH CSA-S269.1. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL FORMWORK AND FALSEWORK TO THE ENGINEER FOR REVIEW AT LEAST TWO WEEKS PRIOR TO PLACING. THE DRAWINGS SHALL BE SEALED BY THE CONTRACTOR'S ENGINEER.
9. CONCRETE SHALL BE CONSOLIDATED USING MECHANICAL VIBRATORS.
10. AIR-ENTRAINED CONCRETE SHALL BE FINISHED WITH A FLOAT OR BROOM. AIR-ENTRAINED CONCRETE SHALL NOT BE FINISHED WITH A STEEL TROWEL.
11. FORMWORK SHALL BE LEFT IN PLACE UNTIL THE CONCRETE HAS ATTAINED SUFFICIENT STRENGTH TO SUPPORT ITS OWN WEIGHT AND CONSTRUCTION LOADS.
12. CONCRETE CURING TYPE 1 SHALL BE CURED FOR A MINIMUM OF 3 DAYS OR UNTIL THE CONCRETE HAS REACHED 40% OF ITS DESIGN STRENGTH. CONCRETE CURING TYPE 2 SHALL BE CURED FOR A MINIMUM OF 7 DAYS OR UNTIL THE CONCRETE HAS REACHED 70% OF ITS DESIGN STRENGTH. REFER TO THE CONCRETE SPECIFICATION TABLE ON THIS DRAWING FOR SPECIFIED CURING TYPES.
13. CONCRETE CURING SHALL COMMENCE USING ONE OF THE FOLLOWING METHODS AS SOON AS THE CONCRETE HAS HARDENED SUFFICIENTLY:

CURING COMPOUNDS
PONDING OR CONTINUOUS SPRINKLING WITH WATER
APPLYING WATER AND COVERING WITH LAPPED POLYETHYLENE SHEETS
APPLYING WATER AND COVERING WITH ABSORPTIVE BURLAP FABRIC
FORMS IN CONTACT WITH CONCRETE SURFACE

CONCRETE TESTING:

- 1. CONCRETE SHALL BE TESTED IN ACCORDANCE WITH CSA-A23.2 BY A TESTING AGENCY CERTIFIED IN ACCORDANCE WITH CSA-A283.
2. THE CONTRACTOR SHALL COOPERATE WITH, AND PROVIDE CONCRETE FOR, THE CONCRETE TESTING.
3. SLUMP SHALL BE TESTED BEFORE SUPER PLASTICIZER IS ADDED ON SITE.
4. A MINIMUM OF 1 SET OF 3 TEST CYLINDERS SHALL BE CAST FOR EVERY 100 m³ (130 yd³) OF EACH TYPE OF CAST-IN-PLACE CONCRETE, PER SUPPLIER, PER DAY. 1 CYLINDER SHALL BE TESTED AT 7 DAYS, AND 2 SHALL BE TESTED AT 28 DAYS. COPIES OF THE TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER AND SHALL IDENTIFY THE LOCATION WITHIN THE STRUCTURE WHERE THE CONCRETE WAS PLACED.
5. CONCRETE TESTING, INCLUDING SUBSEQUENT TESTING REQUIRED BECAUSE OF SUBSTANDARD CONCRETE, SHALL BE CARRIED OUT AT THE CONTRACTOR'S EXPENSE.

STRUCTURAL STEEL:

- 1. STRUCTURAL STEEL ELEMENTS TO BE PROVIDED BY OWNER.
2. STRUCTURAL STEEL SHALL BE WELDED IN ACCORDANCE WITH CSA-W59 BY COMPANIES AND WELDERS CERTIFIED TO CSA-W47.1 BY CWB.
3. WELDS SHALL BE MADE USING E490XX (E70XX) ELECTRODES OR BETTER UNLESS NOTED OTHERWISE.
4. FIELD WELDING IS NOT PERMITTED UNLESS SPECIFIED OR AUTHORIZED BY THE ENGINEER.
5. EXTERIOR STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH CSA-G164 UNLESS NOTED OTHERWISE. GALVANIZED STRUCTURAL STEEL SHALL BE DETAILED IN ACCORDANCE WITH THE AGA DESIGN GUIDE TO ALLOW PROPER DRAINAGE AND VENTING.
6. EXTERIOR STRUCTURAL STEEL EXPOSED TO THE GROUND SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH CSA-G164 AND FIELD COATED WITH ONE COAT CLOVERDALE PAINT INC (CPI) 83022 CLOVATAR 22 OR APPROVED EQUIVALENT WITH A DRY FILM THICKNESS (DFT) OF 400 - 450 µm (16 - 18 mil). THE FIELD COATING SHALL BE CARRIED OUT AFTER THE ERECTION IS COMPLETED AND INCLUDE BOLTED AND WELDED CONNECTIONS.
7. EXTERIOR FASTENERS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.
8. DAMAGED GALVANIZING SHALL BE TOUCHED UP WITH TWO COATS OF LANCO GALVACON GC-243 COLD GALVANIZING COMPOUND OR APPROVED EQUIVALENT IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS.

Revision table with columns: Rev, Date, Description, Drawn, Design, App'd. Row 0: 2023-08-11, ISSUED FOR TENDER, SJS, DM, BB.

McElhanney logo and address: Suite 203, 502 Bow Valley Trail, Canmore AB, Canada T1W 1N9, T 403 609 3992.

PERMIT TO PRACTICE McELHANNEY LTD. RM SIGNATURE: [Signature] RM APEGA ID #: 117950 DATE: 11 August 2023 PERMIT NUMBER: P006383 The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

ID #117950 PROFESSIONAL ENGINEER ALBERTA BRYAN BAIN 11 August 2023 Approved Sealed

Environment and Climate Change Canada / Environnement et Changement Climatique Canada / Meteorological Services of Canada / Services météorologiques du Canada. 05DB006 CLEARWATER RIVER NEAR DOVERCOURT HYDROMETRIC CABLEWAY REBUILD GENERAL STRUCTURAL NOTES SHEET 1

Drawing No. D001 Project Number 2531-36608-00 Rev. 0

DATE: 2023-08-08, 11:53 FILE: X:\2531\2531-366 Environment Canada\08-00 Clearwater River Cableway\7.0 Drawings\7.1 Working Drawings\366-08-00 D001 General Structural Notes.dwg

CABLES, CABLE ACCESSORIES AND CABLE HARDWARE

1. CABLES, WIRES AND STRANDS:

- a. ALL CABLES, WIRE ROPES AND GUY STRANDS ARE TO BE BRIGHT AND DRAWN GALVANIZED IN ACCORDANCE WITH CAN/CSA G164 AND MANUFACTURER SPECIFICATIONS UNLESS NOTED OTHERWISE (U.N.O.)
- b. ALL WIRE ROPE CABLES ARE TO BE MINIMUM 6X26 IWRC EXTRA IMPROVED PLOW (EIPS), U.N.O. WIRE ROPE SHALL CONFORM TO THE FOLLOWING.

CABLE DIAMETER - mm (in)	MAX. CABLE WEIGHT - kg/m (lbs/ft)	MIN. BREAKING STRENGTH - kN (tons)
9.5 (3/8")	0.39 (0.26)	64.1 (7.2)
12.7 (1/2")	0.68 (0.46)	118 (13.3)
15.8 (5/8")	1.07 (0.72)	183 (20.6)
19.1 (3/4")	1.55 (1.04)	262 (29.4)
22.2 (7/8")	2.11 (1.42)	354 (39.8)
25.4 (1")	2.75 (1.85)	506 (56.9)

- c. ALL GUY STRANDS SHALL BE MINIMUM 1X7 GALVANIZED GUY WIRE GRADE GR180 U.N.O.
- d. MAIN CABLE IS NOT PRE-STRETCHED UPON PROCUREMENT. IT SHALL BE INSTALLED THEN STRETCHED BY THE CONTRACTOR. STRETCHING IS DONE BY RUNNING A LOADED CABLECAR ACROSS THE SPAN. AT LEAST 5 TRIPS MUST BE MADE.
- e. MAIN CABLE SHALL HAVE A SPECIFIED UNLOADED SAG AND A SPECIFIED LOADED SAG INDICATED IN SPECIFICATIONS. SUPPORTS SHALL BE SUFFICIENTLY HIGH THAT THE LOWEST POINT OF A LOADED CABLE CAR AT MID-SPAN WILL CLEAR THE HIGH WATER ELEVATION DURING A 100-YEAR FLOOD BY AT LEAST 1M (3FT).
- f. ELEVATION DIFFERENCE OF THE MAIN CABLE AT BOTH SUPPORTS SHALL BE A MAXIMUM OF 0.5% OF THE FULL SPAN. THE HIGHER ELEVATION SHALL BE AT THE "FAR SIDE" TO PERMIT EASY RETURN OF THE CABLE CAR. CONTRACTOR TO VERIFY TOP OF CABLE AND TOWER ELEVATION FOR CONFORMANCE PRIOR TO STARTING CONSTRUCTION.
- g. ALL BACKSTAY (TIEBACK) LINES SHALL BE TAUT AT THE TIME OF INSTALLATION.
- h. MESSENGER (MARKER) CABLE SHALL BE INSTALLED IMMEDIATELY ABOVE THE MAIN CABLE WITH THE SAME SAG AS THE MAIN CABLE.
- i. CABLES SHALL BE CONNECTED AND ATTACHED TO TOWERS IN ACCORDANCE WITH MCELHANNEY DRAWING SET, DWG-3136

2. CABLE HARDWARE:

- a. ALL CABLE HARDWARE AND CONNECTIONS, INCLUDING BUT NOT LIMITED TO THIMBLES, SHACKLES, CLIPS, TURNBUCKLES, SHACKLES, SADDLE BLOCKS, SHALL BE DESIGNED BY THE SUPPLIER TO DEVELOP A CAPACITY EQUAL TO 80% OF THE MINIMUM BREAKING FORCE OF THE CABLE.
- b. CABLE AND WIRE ROPE FITTINGS SHALL BE INSTALLED AND USED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATIONS. THIS INCLUDES CORRECTLY SIZED HARDWARE, SPACING, AND PROPER TORQUING.
- c. TURNBUCKLES, CLIPS, GRIPS, AND SHACKLES SHALL BE SIZED TO MATCH THE CABLE OR WIRE.
- d. ALL CABLE COMPONENTS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH CAN/CSA G164 U.N.O.

3. AIRCRAFT WARNING MARKERS:

- a. AIRCRAFT WARNING MARKERS SHALL BE SPECIFIED AND INSTALLED IN ACCORDANCE WITH TRANSPORT CANADA STANDARDS FOR CATENARY MARKERS.
- b. AIRCRAFT WARNING MARKERS ARE TO BE SPHERICAL WITH A DIAMETER OF 500MM WITH MAXIMUM SPACING OF 30M.
- c. MARKERS ARE TO BE ALTERNATING ORANGE AND WHITE IN COLOR IN ACCORDANCE WITH TRANSPORT CANADA STANDARDS.

4. CABLES ARE TO BE ANCHORED TO THE FOUNDATION AS SHOWN ON THE DRAWINGS:

- a. ALL ANCHOR COMPONENTS ARE TO BE HOT DIP GALVANIZED U.N.O.

5. SUBMITTALS:

- a. RAW SURVEY DATA WITH CONTROL POINTS PRIOR TO COMMENCING WORK FOR VERIFICATION OF A-FRAME TOWER ELEVATION, SETBACKS, CABLEWAY SPANS AND ANCHORS.
- b. RAW SURVEY DATA INDICATING THE AS-BUILT TOWER ELEVATIONS AND FINAL UNLOADED AND LOADED CABLE SAG.
- c. OWNER WILL BE ON-SITE AT COMPLETION OF PROJECT TO CONDUCT FINAL SURVEY AND COLLECT ABOVE INFORMATION.
- d. ALL OTHERS AS SPECIFIED IN THE STATEMENT OF WORK

6. CABLEWAY PRODUCT LIST:

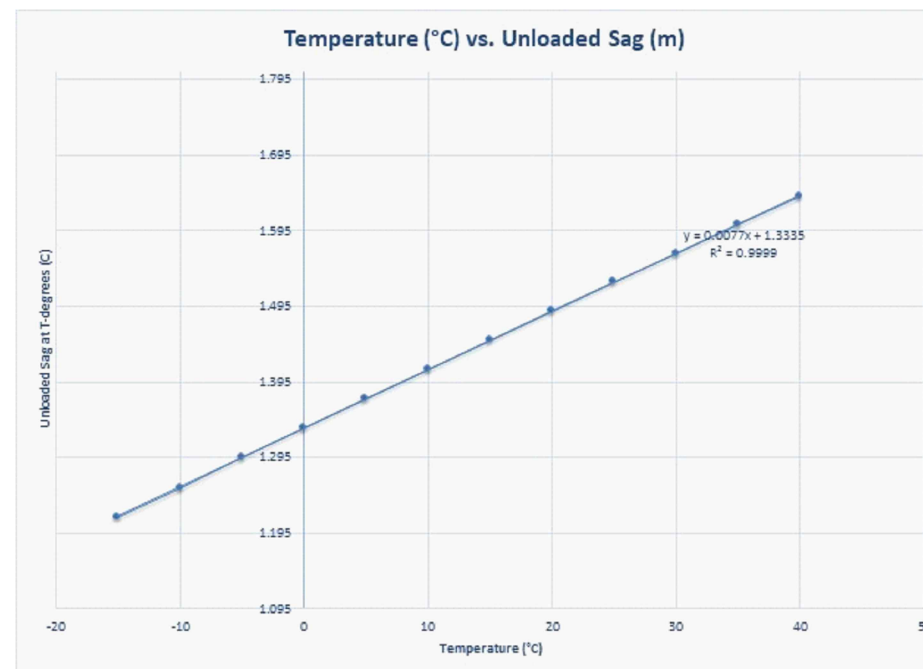
CABLEWAY ELEMENT	PRODUCT LIST
MAIN CABLE	1" (25.4MM) 6 X 26 IWRC GALVANIZED EIPS DRY
MAIN CABLE TURNBUCKLE	CROSBY TURNBUCKLE JAW & JAW 1-1/2" X 24" 1032974
MAIN CABLE FIST GRIP	CROSBY FIST GRIP G429
BACKSTAY CABLE / WIRE	1/2" (12.5MM) 6 X 26 IWRC GALVANIZED EIPS DRY
BACKSTAY CABLE TURNBUCKLE	CROSBY TURNBUCKLE JAW & JAW 3/4" X 18" 1032732
BACKSTAY CABLE FIST GRIP	CROSBY 1/2" G429 FIST GRIP
BRIDLE CABLE	6 X 26 IWRC GALVANIZED EIPS DRY
BRIDLE CABLE FIST GRIP	CROSBY FIST GRIP G429
MARKER CABLE	3/8" (9.5MM) 7 X 19 IWRC GALVANIZED EIPS DRY
MARKER CABLE TURNBUCKLE	CROSBY TURNBUCKLE JAW & JAW 3/4" X 18" 1032732
MARKER CABLE FIST GRIP	CROSBY 3/8" G429 FIST GRIP

7. CABLEWAY CABLE DETAILS

CABLEWAY CABLE DETAILS							
CABLE NAME	CABLE TYPE	CABLE DIAMETER	MIN. BREAKING FORCE	TURNBACK LENGTH	MIN. NUMBER WIRE ROPE CLIPS	SAG	COMMENTS
MAIN CABLE	6X26 IWRC EIPS GALVANIZED	25.4 mm	506 kN	2150 mm	5 CLIPS	UNLOADED SAG @ T0 = 1.22 m, LOADED SAG @ T0 = 2.95 m	
BACKSTAY CABLE	6X26 IWRC EIPS GALVANIZED	12.5 mm	118 kN	600 mm	4 CLIPS	TAUT AT TIME OF INSTALLATION	
MESSENGER CABLE	6X26 IWRC EIPS GALVANIZED	9.5 mm	64.1 kN	600 mm	3 CLIPS	SAG TO MATCH MAIN CABLE, UNLOADED	INSTALL DIRECTLY ABOVE MAIN CABLE
BRIDLE CABLE	6X26 IWRC EIPS GALVANIZED	22 mm	354 kN	1160 mm	5 CLIPS		

NOTES:
 - ALL CABLES, FITTINGS AND CONNECTIONS ARE TO BE GALVANIZED
 - INSTALL PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTION AND RECOMMENDATIONS
 - SUPPLIER IS TO DESIGN EYEBOLT, THIMBLE, SHACKLE AND CLIP CONNECTIONS TO DEVELOP A MAXIMUM OF 80% OF THE MINIMUM BREAKING FORCE OF THE CABLE
 - SUPPLIER MUST DESIGN AND SIZE THE SHEAVES, SADDLE BLOCKS, THIMBLES, CLIPS AND TURNBUCKLES TO MATCH THE SPECIFIC CABLE AND ACCOUNT FOR DECREASED CABLE CIRCUMFERENCE DUE TO STRETCHING WHERE NECESSARY
 - INSTALL SAFETY RIVETS OF BOLTS AND NUTS WITH END PEENED AT TURNBUCKLES LOCATION

CABLEWAY SAG TEMPERATURE VARIATION DETAILS		
TEMPERATURE (°C)	UNLOADED SAG (m)	UNLOADED SAG %
-15	1.216	1.466%
-10	1.255	1.513%
-5	1.294	1.559%
0	1.333	1.606%
5	1.373	1.654%
10	1.412	1.701%
15	1.451	1.748%
20	1.490	1.795%
25	1.529	1.842%
30	1.564	1.885%
35	1.603	1.931%
40	1.640	1.976%



Rev	Date	Description	Drawn	Design	App'd
0	2023-08-11	ISSUED FOR TENDER	SJS	DM	BB

McElhanney

Suite 203
 502 Bow Valley Trail
 Canmore AB
 Canada T1W 1N9
 T 403 609 3992

PERMIT TO PRACTICE
McELHANNEY LTD.

RM SIGNATURE: *[Signature]*
 RM APEGA ID #: 117950
 DATE: 11 August 2023
PERMIT NUMBER: P006383
 The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

ID #117950

PROFESSIONAL ENGINEER ALBERTA
 BRYAN BAIN
 11 August 2023

Approved Sealed

Environment and Climate Change Canada / Environnement et Changement Climatique Canada / Meteorological Services of Canada / Services météorologiques du Canada

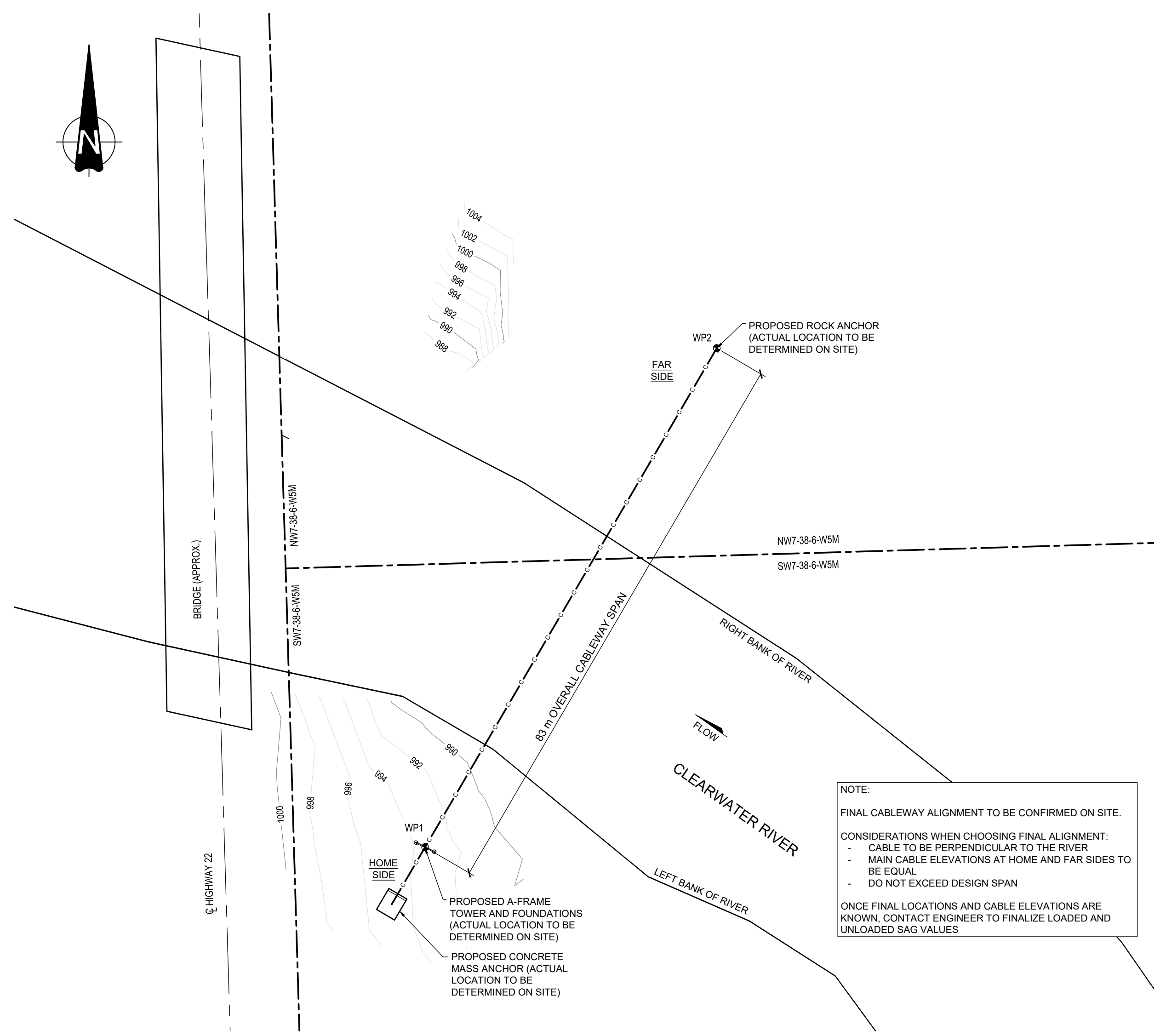
**05DB006 CLEARWATER RIVER NEAR DOVERCOURT
 HYDROMETRIC CABLEWAY REBUILD
 GENERAL STRUCTURAL NOTES
 SHEET 2**

Drawing No. **D002**

Project Number 2531-36608-00 Rev. 0

DESTROY ALL PRINTS BEARING PREVIOUS REVISION

DATE: 2023-08-10, 15:27 FILE: X:\2531\2531-366 Environment Canada\08-00 Clearwater River Cableway\7.0 Drawings\7.1 Working Drawings\366-08-00 D100 Site Plan.dwg McElhanney ANSIC - 2021-12-08



WORKPOINT TABLE			
WP NO.	DESCRIPTION	NORTHING	EASTING
WP1	HOME SIDE A-FRAME	5791359.95	646210.231
WP2	FAR SIDE ANCHOR	5791431.724	646252.191

- NOTES:**
1. SURVEY PREPARED BY ENVIRONMENT AND CLIMATE CHANGE CANADA
 2. WORK POINTS ARE PROVIDED FOR REFERENCE IN LOCATING THE NEW CABLEWAY AND MAY NEED TO BE ADJUSTED BASED ON SITE CONDITIONS.
 3. COORDINATES ARE IN GRID, USING NAD83 (CSRS) UTM ZONE 11N PROJECTION
 4. DIMENSIONS ARE SHOWN TO GROUND.
 5. INSTALL PERMANENT BENCHMARK (SUPPLIED BY ECCC) ONTO TOP OF MASS CONCRETE ANCHOR AT HOME SIDE

NOTE:

FINAL CABLEWAY ALIGNMENT TO BE CONFIRMED ON SITE.

CONSIDERATIONS WHEN CHOOSING FINAL ALIGNMENT:

- CABLE TO BE PERPENDICULAR TO THE RIVER
- MAIN CABLE ELEVATIONS AT HOME AND FAR SIDES TO BE EQUAL
- DO NOT EXCEED DESIGN SPAN

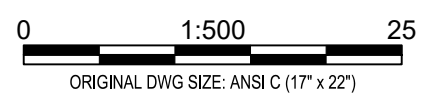
ONCE FINAL LOCATIONS AND CABLE ELEVATIONS ARE KNOWN, CONTACT ENGINEER TO FINALIZE LOADED AND UNLOADED SAG VALUES

THIS DRAWING AND DESIGN IS THE PROPERTY OF McElhanney AND SHALL NOT BE USED, REUSED OR REPRODUCED WITHOUT THE CONSENT OF McElhanney. McElhanney WILL NOT BE HELD RESPONSIBLE FOR THE IMPROPER OR UNAUTHORIZED USE OF THIS DRAWING AND DESIGN.

THIS DRAWING AND DESIGN HAS BEEN PREPARED FOR THE CLIENT IDENTIFIED, TO MEET THE STANDARDS AND REQUIREMENTS OF THE APPLICABLE PUBLIC AGENCIES AT THE TIME OF PREPARATION. McElhanney, ITS EMPLOYEES, SUBCONSULTANTS AND AGENTS WILL NOT BE LIABLE FOR ANY LOSSES OR OTHER CONSEQUENCES RESULTING FROM THE USE OR RELIANCE UPON, OR ANY CHANGES MADE TO, THIS DRAWING, BY ANY THIRD PARTY, INCLUDING CONTRACTORS, SUPPLIERS, CONSULTANTS AND STAKEHOLDERS, OR THEIR EMPLOYEES OR AGENTS, WITHOUT McElhanney's PRIOR WRITTEN CONSENT.

INFORMATION ON EXISTING UNDERGROUND FACILITIES MAY NOT BE COMPLETE OR ACCURATE. McElhanney, ITS EMPLOYEES AND DIRECTORS ARE NOT RESPONSIBLE NOR LIABLE FOR THE LOCATION OF ANY UNDERGROUND CONDUITS, PIPES, CABLES OR OTHER FACILITIES WHETHER SHOWN OR OMITTED FROM THIS PLAN. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING FACILITIES BY HAND DIGGING OR HYDROVAC AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.

1 SITE PLAN
SCALE: 1 = 500



Rev	Date	Description	Drawn	Design	App'd
0	2023-08-11	ISSUED FOR TENDER	SJS	DM	BB



Suite 203
502 Bow Valley Trail
Canmore AB
Canada T1W 1N9
T 403 609 3992

PERMIT TO PRACTICE
McELHANNEY LTD.

RM SIGNATURE: *[Signature]*
RM APEGA ID #: 117950
DATE: 11 August 2023
PERMIT NUMBER: P006383
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

ID #117950

11 August 2023
Approved Sealed

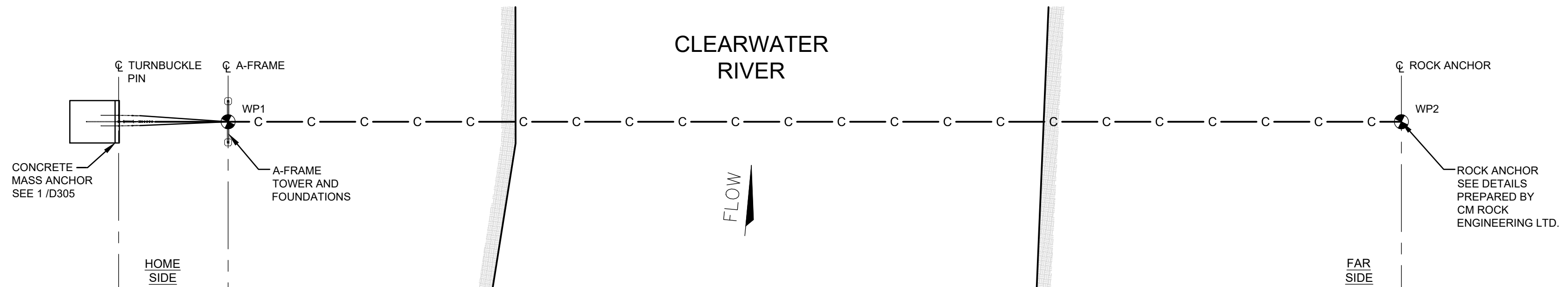
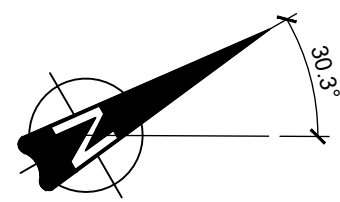
Environment and Climate Change Canada / Environnement et Changement Climatique Canada / Meteorological Services of Canada / Services météorologiques du Canada

05DB006 CLEARWATER RIVER NEAR DOVERCOURT HYDROMETRIC CABLEWAY REBUILD SITE PLAN

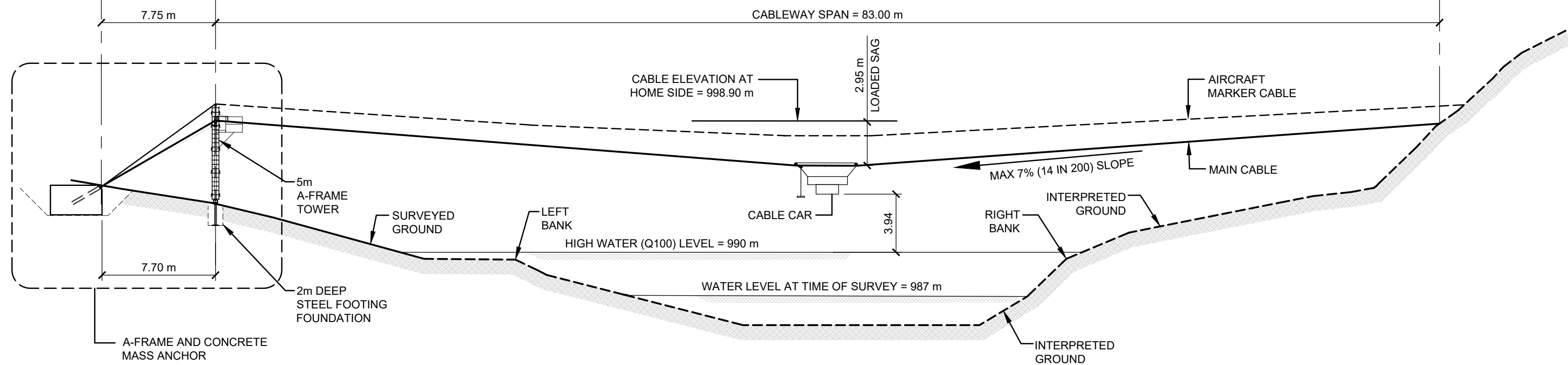
Drawing No. **D100**

Project Number 2531-36608-00 Rev. 0

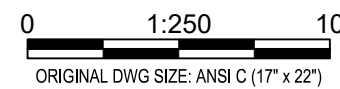
DESTROY ALL PRINTS BEARING PREVIOUS REVISION



1 OVERALL CABLEWAY & RIVER PLAN
SCALE: 1 = 250



2 OVERALL CABLEWAY & RIVER ELEVATION
SCALE: 1 = 250



THIS DRAWING AND DESIGN IS THE PROPERTY OF McELHANNEY AND SHALL NOT BE USED, REUSED OR REPRODUCED WITHOUT THE CONSENT OF McELHANNEY. McELHANNEY WILL NOT BE HELD RESPONSIBLE FOR THE IMPROPER OR UNAUTHORIZED USE OF THIS DRAWING AND DESIGN.

THIS DRAWING AND DESIGN HAS BEEN PREPARED FOR THE CLIENT IDENTIFIED, TO MEET THE STANDARDS AND REQUIREMENTS OF THE APPLICABLE PUBLIC AGENCIES AT THE TIME OF PREPARATION. McELHANNEY, ITS EMPLOYEES, SUBCONSULTANTS AND AGENTS WILL NOT BE LIABLE FOR ANY LOSSES OR OTHER CONSEQUENCES RESULTING FROM THE USE OR RELIANCE UPON, OR ANY CHANGES MADE TO, THIS DRAWING, BY ANY THIRD PARTY, INCLUDING CONTRACTORS, SUPPLIERS, CONSULTANTS AND STAKEHOLDERS, OR THEIR EMPLOYEES OR AGENTS, WITHOUT McELHANNEY'S PRIOR WRITTEN CONSENT.

INFORMATION ON EXISTING UNDERGROUND FACILITIES MAY NOT BE COMPLETE OR ACCURATE. McELHANNEY, ITS EMPLOYEES AND DIRECTORS ARE NOT RESPONSIBLE NOR LIABLE FOR THE LOCATION OF ANY UNDERGROUND CONDUITS, PIPES, CABLES OR OTHER FACILITIES WHETHER SHOWN OR OMITTED FROM THIS PLAN. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING FACILITIES BY HAND DIGGING OR HYDROVAC AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.

Rev	Date	Description	Drawn	Design	App'd
0	2023-08-11	ISSUED FOR TENDER	SJS	DM	BB



Suite 203
502 Bow Valley Trail
Canmore AB
Canada T1W 1N9
T 403 609 3992

PERMIT TO PRACTICE
McELHANNEY LTD.

RM SIGNATURE: *[Signature]*
RM APEGA ID #: 117950
DATE: 11 August 2023
PERMIT NUMBER: P006383
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

ID #117950

11 August 2023
Approved Sealed

Environment and Climate Change Canada / Environnement et Changement Climatique Canada / Meteorological Services of Canada / Services météorologiques du Canada

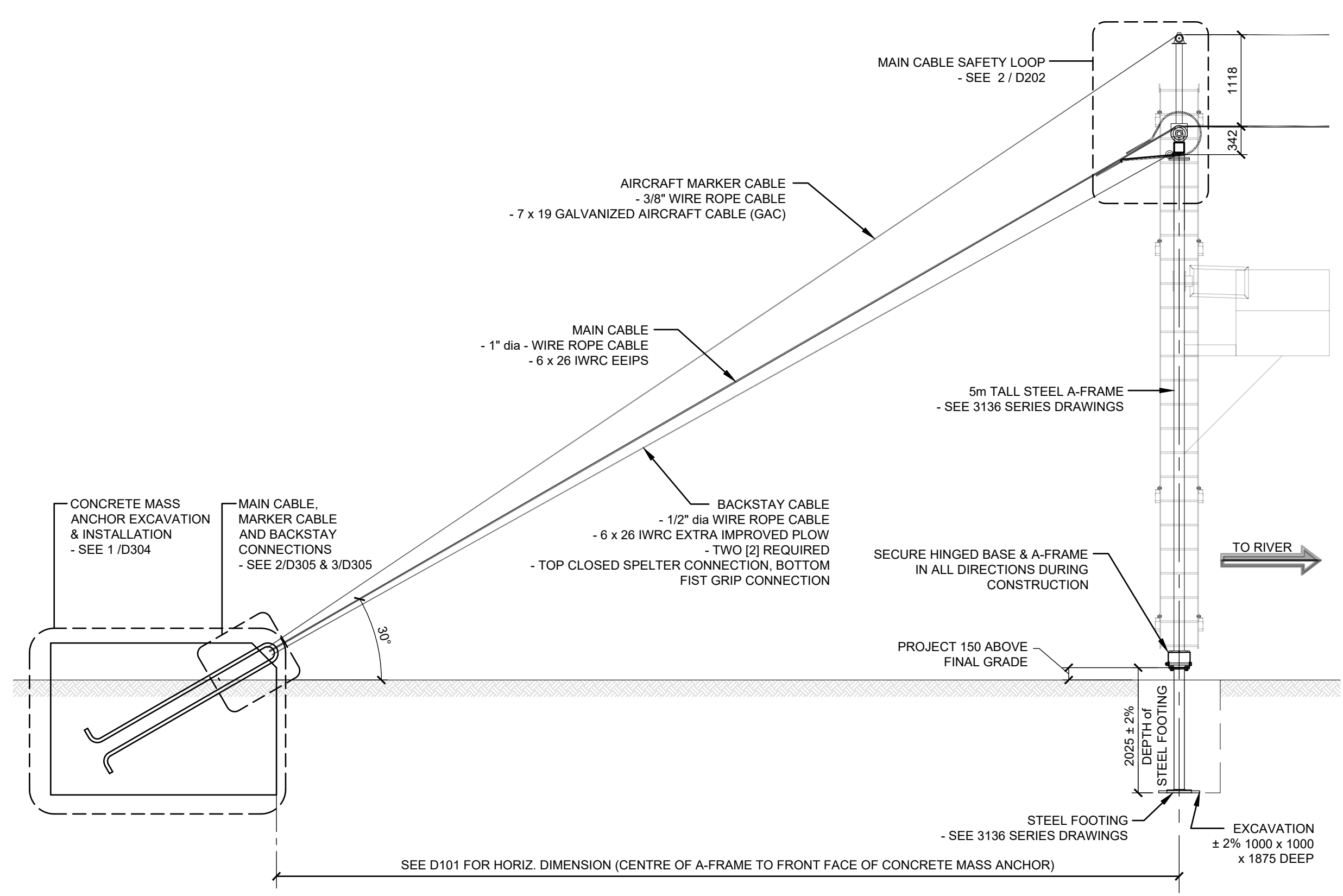
05DB006 CLEARWATER RIVER NEAR DOVERCOURT HYDROMETRIC CABLEWAY REBUILD OVERALL PLAN AND ELEVATION

Drawing No. **D101**

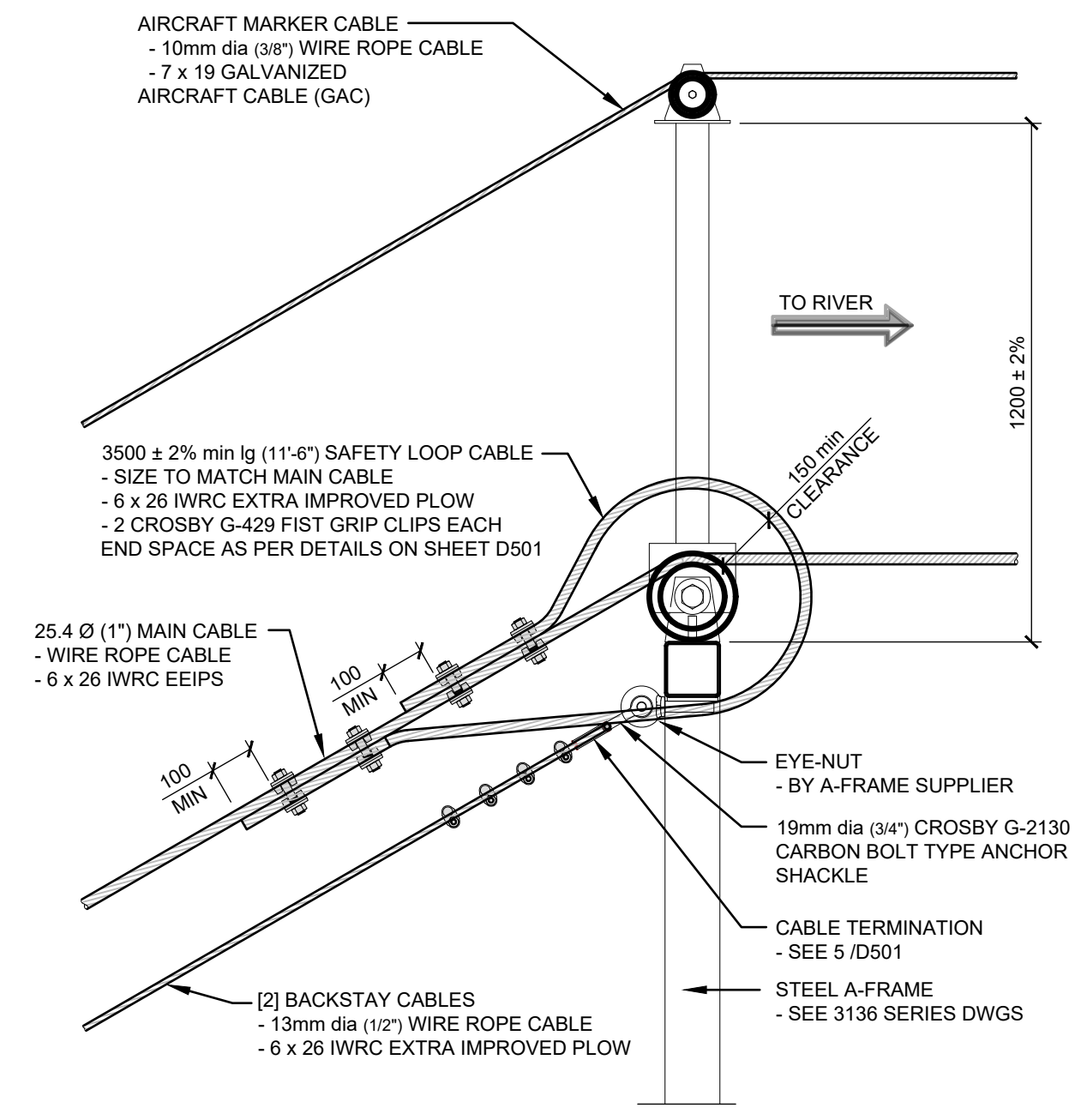
Project Number 2531-36608-00

Rev. 0

DATE: 2023-08-08, 12:56 FILE: X:\2531\2531-366 Environment Canada\08-00 Clearwater River Cableway\7.0 Drawings\7.1 Working Drawings\A-Frame & Anchorage Section-Concrete.dwg McElhanney ANSIC - 2021-12-08



1 A-FRAME & CONCRETE MASS ANCHOR SECTION
SCALE: 1 = 50



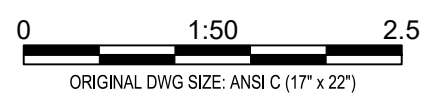
2 MAIN CABLE SAFETY LOOP DETAIL
SCALE: 1 = 15

NOTE: DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE

THIS DRAWING AND DESIGN IS THE PROPERTY OF McELHANNEY AND SHALL NOT BE USED, REUSED OR REPRODUCED WITHOUT THE CONSENT OF McELHANNEY. McELHANNEY WILL NOT BE HELD RESPONSIBLE FOR THE IMPROPER OR UNAUTHORIZED USE OF THIS DRAWING AND DESIGN.

THIS DRAWING AND DESIGN HAS BEEN PREPARED FOR THE CLIENT IDENTIFIED, TO MEET THE STANDARDS AND REQUIREMENTS OF THE APPLICABLE PUBLIC AGENCIES AT THE TIME OF PREPARATION. McELHANNEY, ITS EMPLOYEES, SUBCONSULTANTS AND AGENTS WILL NOT BE LIABLE FOR ANY LOSSES OR OTHER CONSEQUENCES RESULTING FROM THE USE OR RELIANCE UPON, OR ANY CHANGES MADE TO, THIS DRAWING, BY ANY THIRD PARTY, INCLUDING CONTRACTORS, SUPPLIERS, CONSULTANTS AND STAKEHOLDERS, OR THEIR EMPLOYEES OR AGENTS, WITHOUT McELHANNEY'S PRIOR WRITTEN CONSENT.

INFORMATION ON EXISTING UNDERGROUND FACILITIES MAY NOT BE COMPLETE OR ACCURATE. McELHANNEY, ITS EMPLOYEES AND DIRECTORS ARE NOT RESPONSIBLE NOR LIABLE FOR THE LOCATION OF ANY UNDERGROUND CONDUITS, PIPES, CABLES OR OTHER FACILITIES WHETHER SHOWN OR OMITTED FROM THIS PLAN. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING FACILITIES BY HAND DIGGING OR HYDROVAC AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.



Rev	Date	Description	Drawn	Design	App'd
0	2023-08-11	ISSUED FOR TENDER	SJS	DM	BB

Suite 203
502 Bow Valley Trail
Canmore AB
Canada T1W 1N9
T 403 609 3992

PERMIT TO PRACTICE
McELHANNEY LTD.

RM SIGNATURE: *[Signature]*
RM APEGA ID #: 117950
DATE: 11 August 2023
PERMIT NUMBER: P006383
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

ID #117950

11 August 2023
Approved Sealed

Environment and Climate Change Canada / Environnement et Changement Climatique Canada / Meteorological Services of Canada / Services météorologiques du Canada

05DB006 CLEARWATER RIVER NEAR DOVERCOURT HYDROMETRIC CABLEWAY REBUILD A-FRAME AND CONCRETE GRAVITY ANCHOR

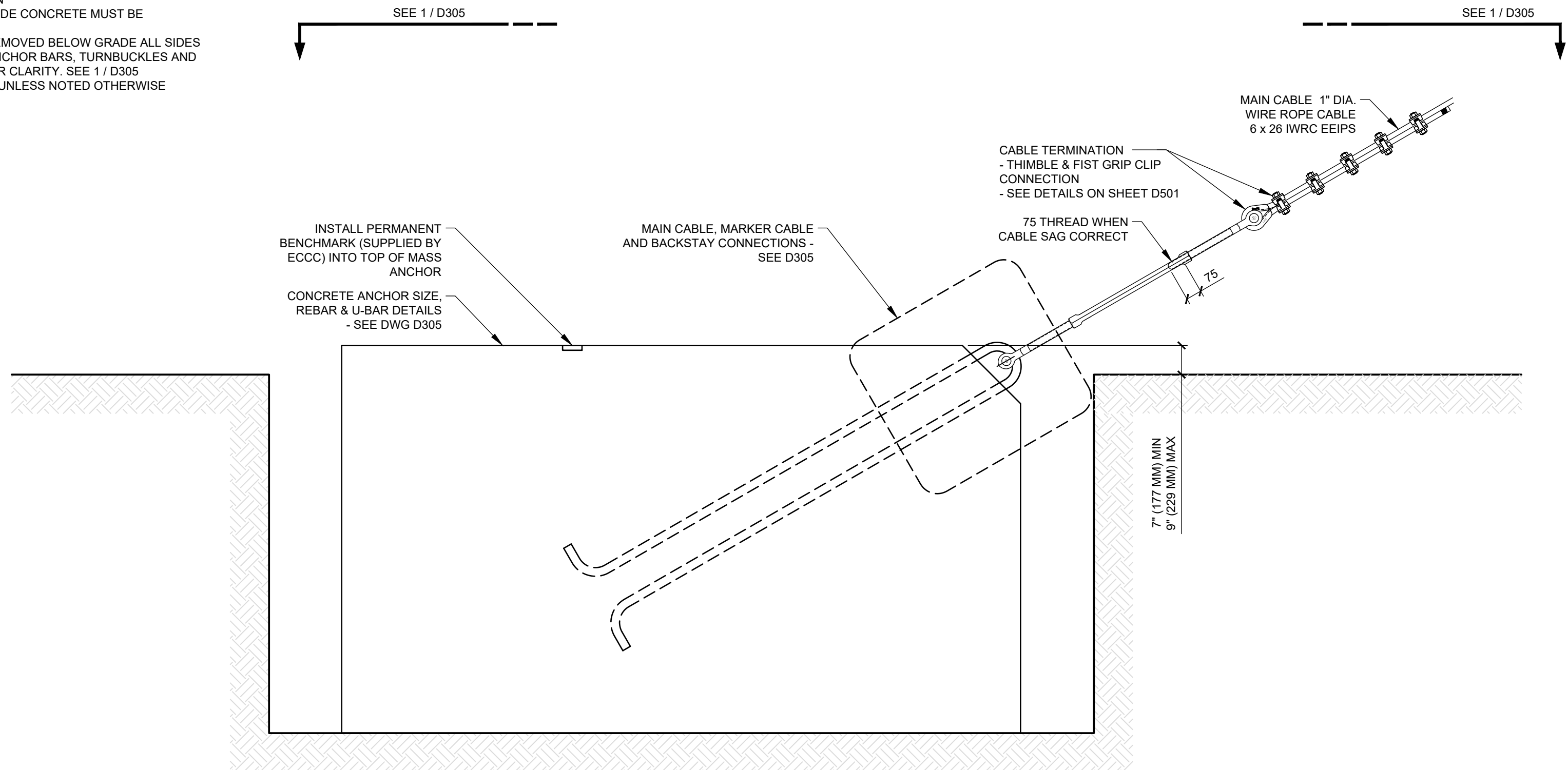
Drawing No. **D202**

Project Number 2531-36608-00 Rev. 0

DESTROY ALL PRINTS BEARING PREVIOUS REVISION

DATE: 2023-08-10, 13:29 FILE: X:\2531\2531-366 Environment Canada\08-00 Clearwater River Cableway\7.0 Drawings\7.1 Working Drawings\366-00 D304 Concrete Anchor.dwg

- UNDISTURBED SOIL OR SUFFICIENTLY COMPACTED SOIL AT BASE OF EXCAVATION
- FORMWORK ON RIVER SIDE CONCRETE MUST BE REMOVED
- FORMWORK MUST BE REMOVED BELOW GRADE ALL SIDES
- MARKER & BACKSTAY ANCHOR BARS, TURNBUCKLES AND CABLES NOT SHOWN FOR CLARITY. SEE 1 / D305
- DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE

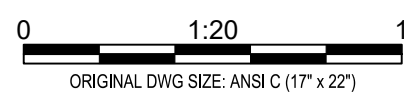


1 CONCRETE MASS ANCHOR - EXCAVATION & INSTALLATION SECTION
SCALE: 1 = 20

THIS DRAWING AND DESIGN IS THE PROPERTY OF McELHANNEY AND SHALL NOT BE USED, REUSED OR REPRODUCED WITHOUT THE CONSENT OF McELHANNEY. McELHANNEY WILL NOT BE HELD RESPONSIBLE FOR THE IMPROPER OR UNAUTHORIZED USE OF THIS DRAWING AND DESIGN.

THIS DRAWING AND DESIGN HAS BEEN PREPARED FOR THE CLIENT IDENTIFIED, TO MEET THE STANDARDS AND REQUIREMENTS OF THE APPLICABLE PUBLIC AGENCIES AT THE TIME OF PREPARATION. McELHANNEY, ITS EMPLOYEES, SUBCONSULTANTS AND AGENTS WILL NOT BE LIABLE FOR ANY LOSSES OR OTHER CONSEQUENCES RESULTING FROM THE USE OR RELIANCE UPON, OR ANY CHANGES MADE TO, THIS DRAWING, BY ANY THIRD PARTY, INCLUDING CONTRACTORS, SUPPLIERS, CONSULTANTS AND STAKEHOLDERS, OR THEIR EMPLOYEES OR AGENTS, WITHOUT McELHANNEY'S PRIOR WRITTEN CONSENT.

INFORMATION ON EXISTING UNDERGROUND FACILITIES MAY NOT BE COMPLETE OR ACCURATE. McELHANNEY, ITS EMPLOYEES AND DIRECTORS ARE NOT RESPONSIBLE NOR LIABLE FOR THE LOCATION OF ANY UNDERGROUND CONDUITS, PIPES, CABLES OR OTHER FACILITIES WHETHER SHOWN OR OMITTED FROM THIS PLAN. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING FACILITIES BY HAND DIGGING OR HYDROVAC AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.



Rev	Date	Description	Drawn	Design	App'd
0	2023-08-11	ISSUED FOR TENDER	SJS	DM	BB

McElhanney

Suite 203
502 Bow Valley Trail
Canmore AB
Canada T1W 1N9
T 403 609 3992

PERMIT TO PRACTICE
McELHANNEY LTD.

RM SIGNATURE: *[Signature]*
RM APEGA ID #: 117950
DATE: 11 August 2023
PERMIT NUMBER: P006383
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

ID #117950

11 August 2023
Approved Sealed

Environment and Climate Change Canada / Environnement et Changement Climatique Canada / Meteorological Services of Canada / Services météorologiques du Canada

**05DB006 CLEARWATER RIVER NEAR DOVERCOURT
HYDROMETRIC CABLEWAY REBUILD
CONCRETE ANCHOR**

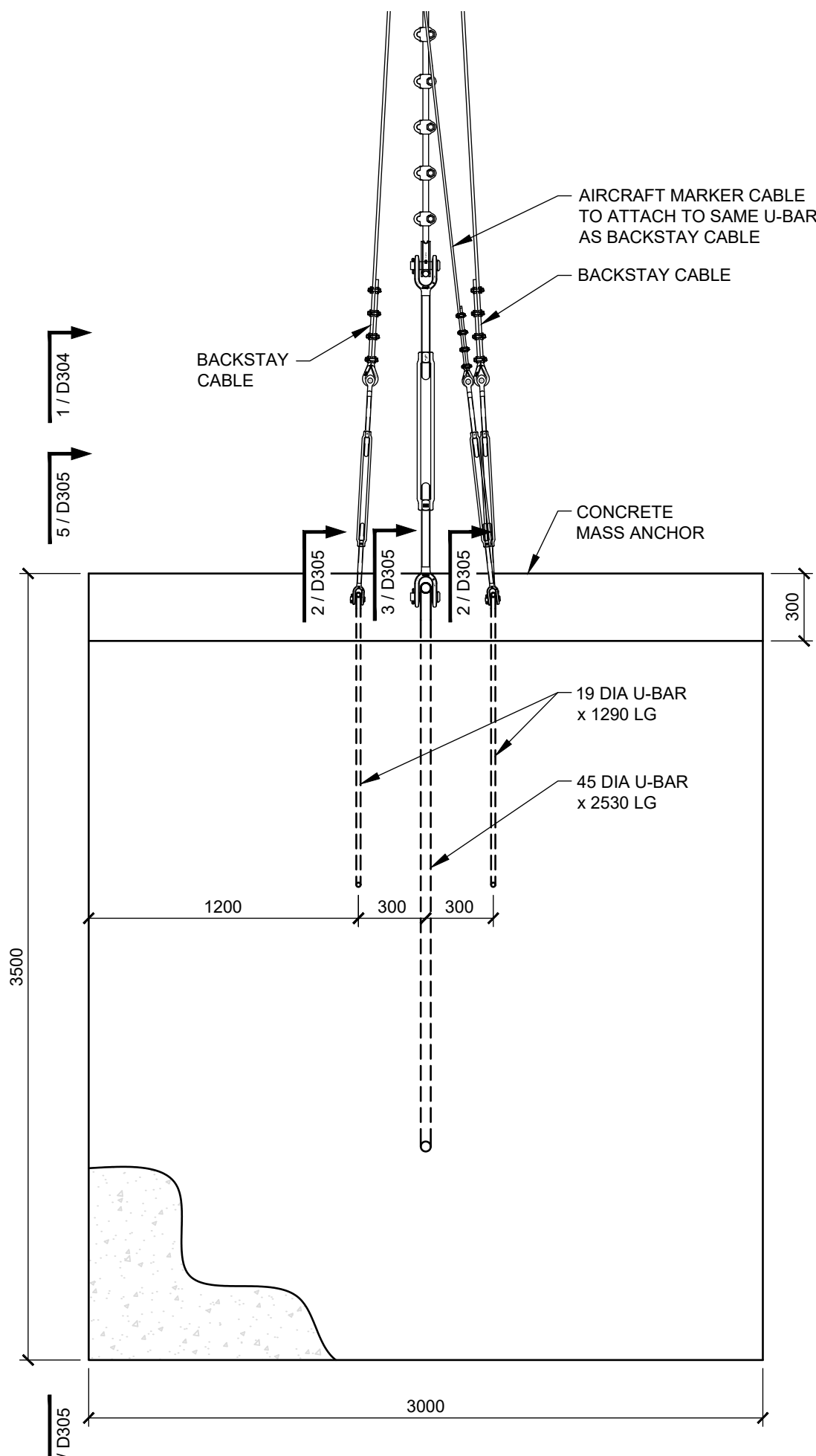
Drawing No. **D304**

Project Number 2531-36608-00

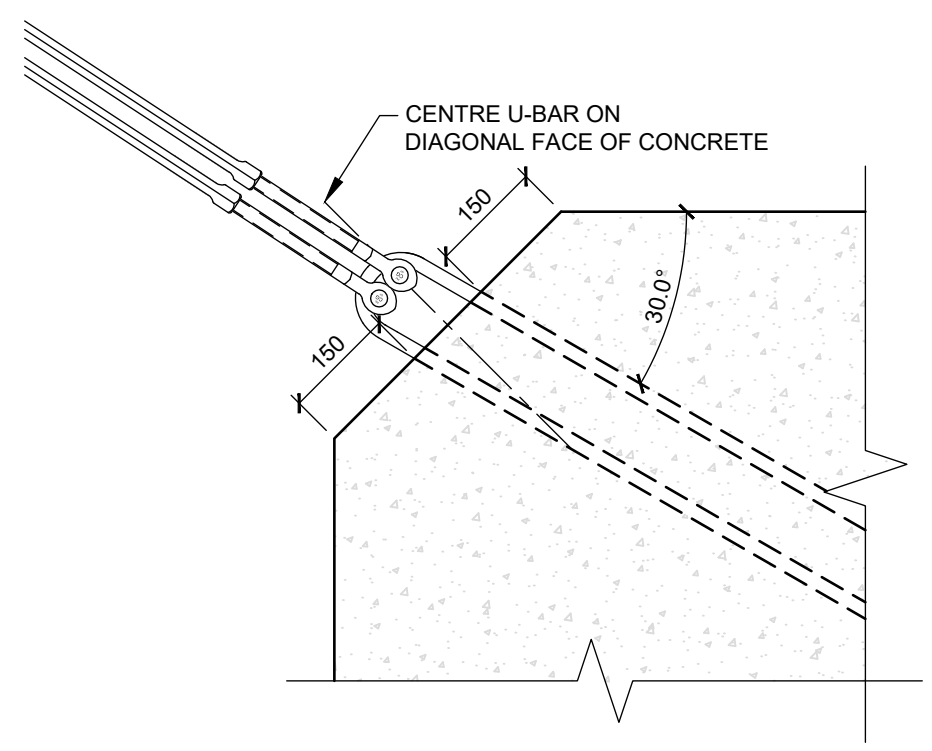
Rev. 0

DESTROY ALL PRINTS BEARING PREVIOUS REVISION

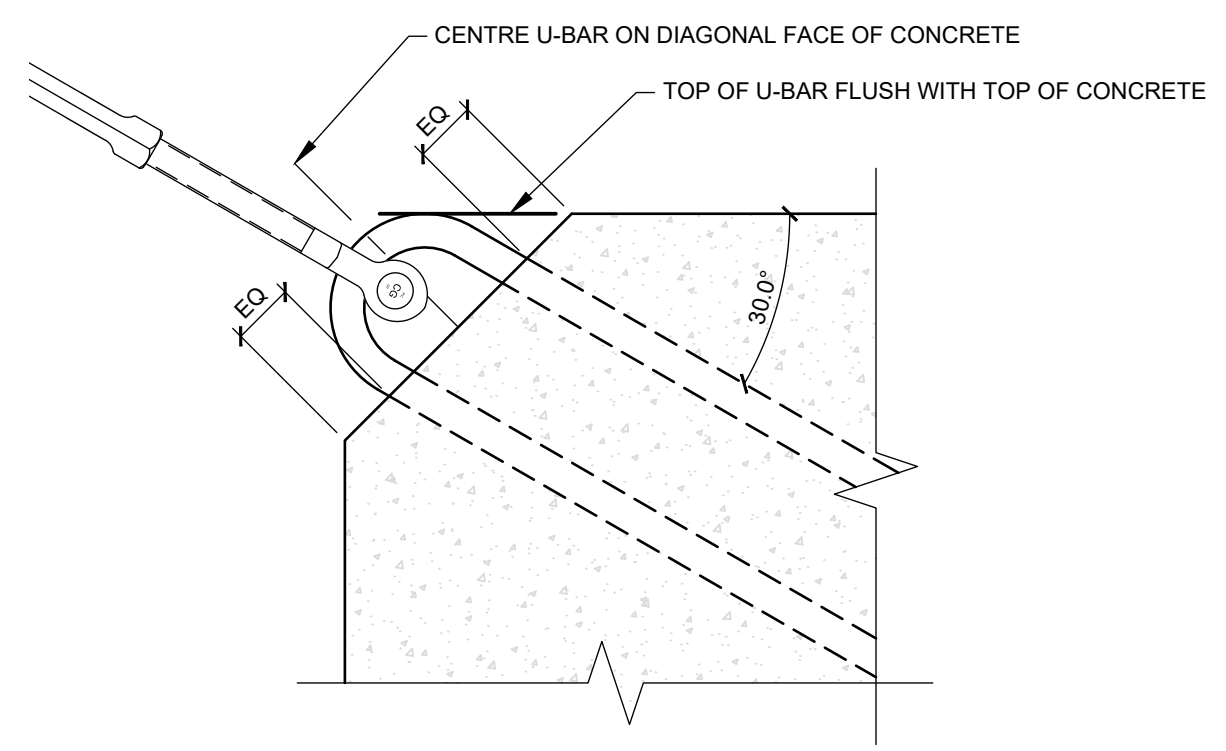
DATE: 2023-08-10, 13:49 FILE: X:\2531\2531-366 Environment Canada\08-00 Clearwater River Cableway\7.0 Drawings\7.1 Working Drawings\366-00 D305 Concrete Mass Anchor.dwg McElhanney ANSIC - 2021-12-06



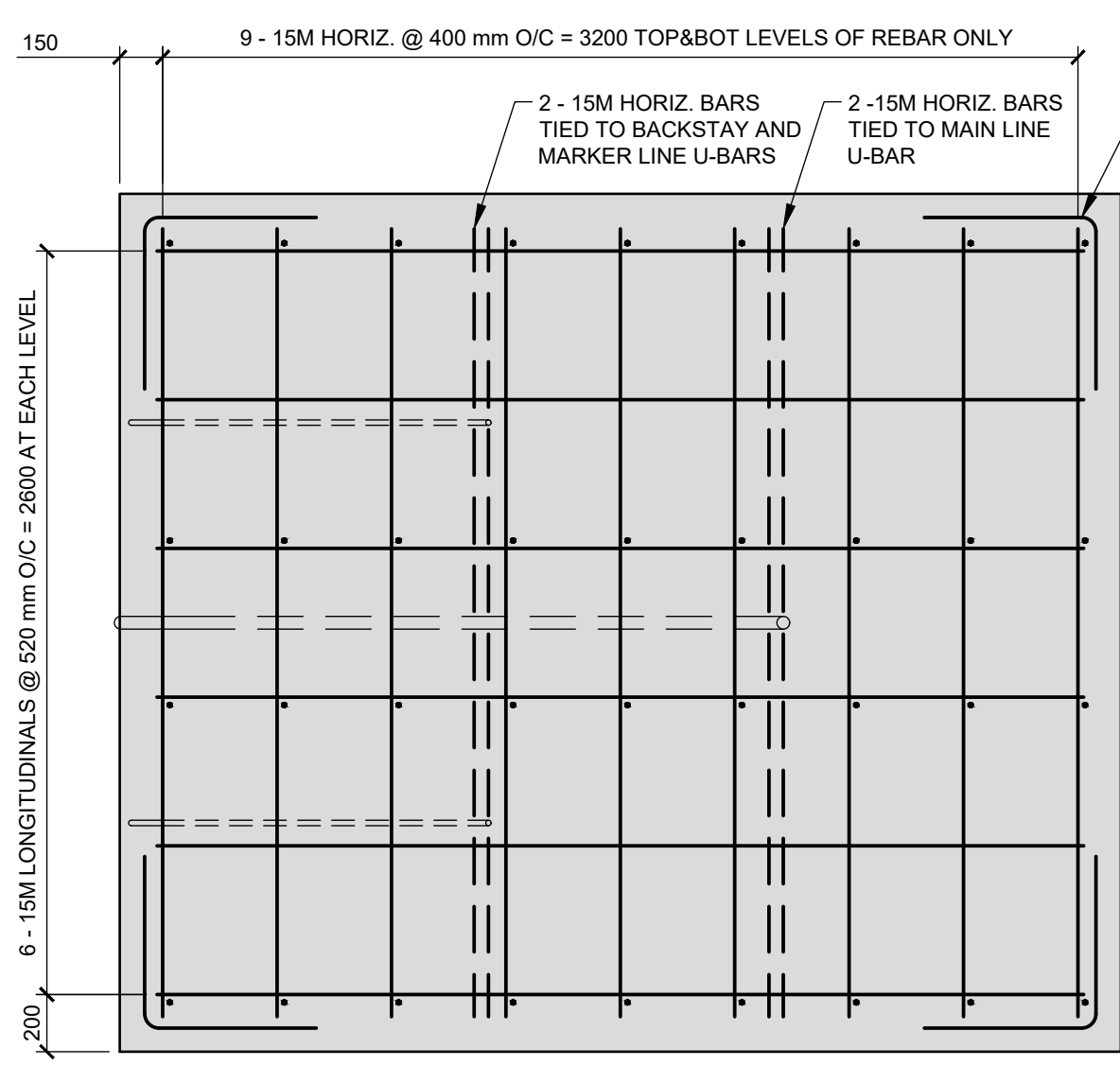
1 CONCRETE MASS ANCHOR ARRANGEMENT
SCALE: 1 = 25



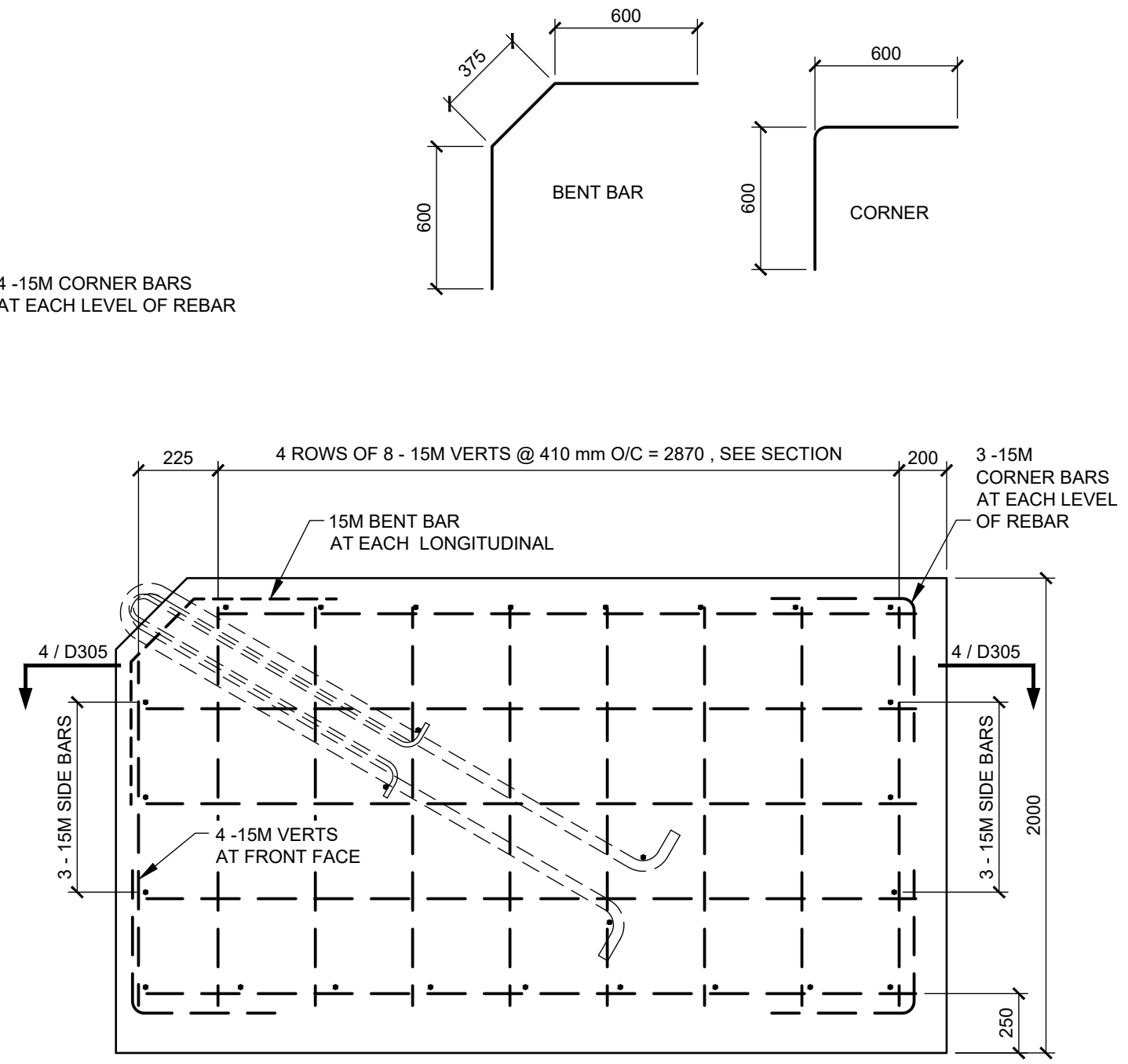
2 MARKER AND BACKSTAY CABLE U-BAR ATTACHMENT
SCALE: 1 = 10



3 MAIN CABLE U-BAR ATTACHMENT
SCALE: 1 = 10



4 SECTION - CONCRETE MASS ANCHOR REINFORCEMENT
SCALE: 1 = 25



5 ELEVATION - CONCRETE MASS ANCHOR REINFORCEMENT
SCALE: 1 = 25

NOTE: DIMENSIONS ARE IN mm UNLESS NOTED OTHERWISE

THIS DRAWING AND DESIGN IS THE PROPERTY OF McELHANNEY AND SHALL NOT BE USED, REUSED OR REPRODUCED WITHOUT THE CONSENT OF McELHANNEY. McELHANNEY WILL NOT BE HELD RESPONSIBLE FOR THE IMPROPER OR UNAUTHORIZED USE OF THIS DRAWING AND DESIGN.

THIS DRAWING AND DESIGN HAS BEEN PREPARED FOR THE CLIENT IDENTIFIED, TO MEET THE STANDARDS AND REQUIREMENTS OF THE APPLICABLE PUBLIC AGENCIES AT THE TIME OF PREPARATION. McELHANNEY, ITS EMPLOYEES, SUBCONSULTANTS AND AGENTS WILL NOT BE LIABLE FOR ANY LOSSES OR OTHER CONSEQUENCES RESULTING FROM THE USE OR RELIANCE UPON, OR ANY CHANGES MADE TO, THIS DRAWING, BY ANY THIRD PARTY, INCLUDING CONTRACTORS, SUPPLIERS, CONSULTANTS AND STAKEHOLDERS, OR THEIR EMPLOYEES OR AGENTS, WITHOUT McELHANNEY'S PRIOR WRITTEN CONSENT.

INFORMATION ON EXISTING UNDERGROUND FACILITIES MAY NOT BE COMPLETE OR ACCURATE. McELHANNEY, ITS EMPLOYEES AND DIRECTORS ARE NOT RESPONSIBLE NOR LIABLE FOR THE LOCATION OF ANY UNDERGROUND CONDUITS, PIPES, CABLES OR OTHER FACILITIES WHETHER SHOWN OR OMITTED FROM THIS PLAN. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING FACILITIES BY HAND DIGGING OR HYDROVAC AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.

Rev	Date	Description	Drawn	Design	App'd
0	2023-08-11	ISSUED FOR TENDER	SJS	DM	BB



Suite 203
502 Bow Valley Trail
Canmore AB
Canada T1W 1N9
T 403 609 3992

PERMIT TO PRACTICE
McELHANNEY LTD.

RM SIGNATURE: *[Signature]*
RM APEGA ID #: 117950
DATE: 11 August 2023
PERMIT NUMBER: P006383
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

ID #117950

11 August 2023
Approved Sealed

Environment and Climate Change Canada / Environnement et Changement Climatique Canada / Meteorological Services of Canada / Services météorologiques du Canada

05DB006 CLEARWATER RIVER NEAR DOVERCOURT HYDROMETRIC CABLEWAY REBUILD CONCRETE MASS ANCHOR ARRANGEMENT & REINFORCEMENT

Drawing No. **D305**

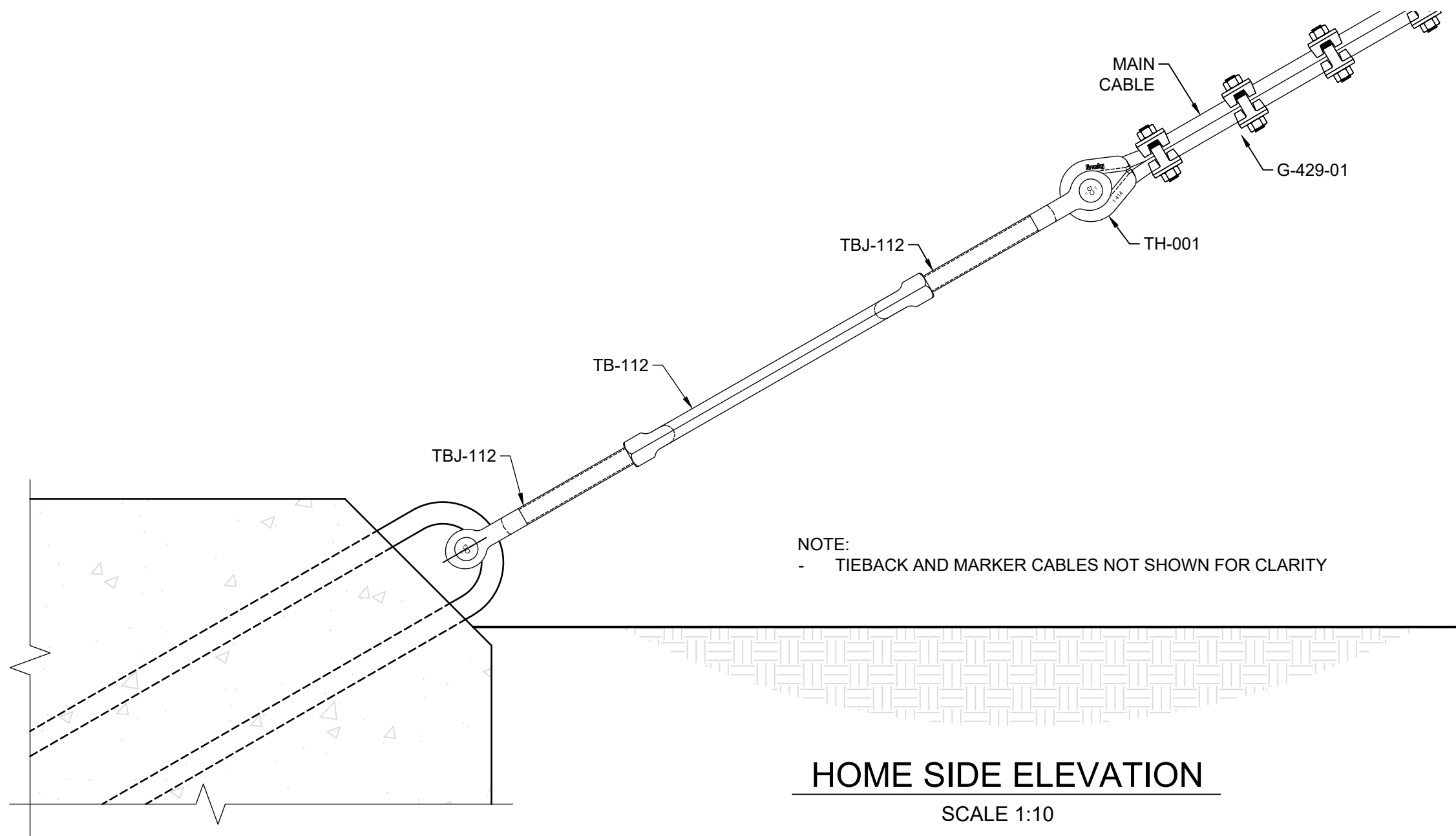
Project Number 2531-36608-00 Rev. 0

DESTROY ALL PRINTS BEARING PREVIOUS REVISION

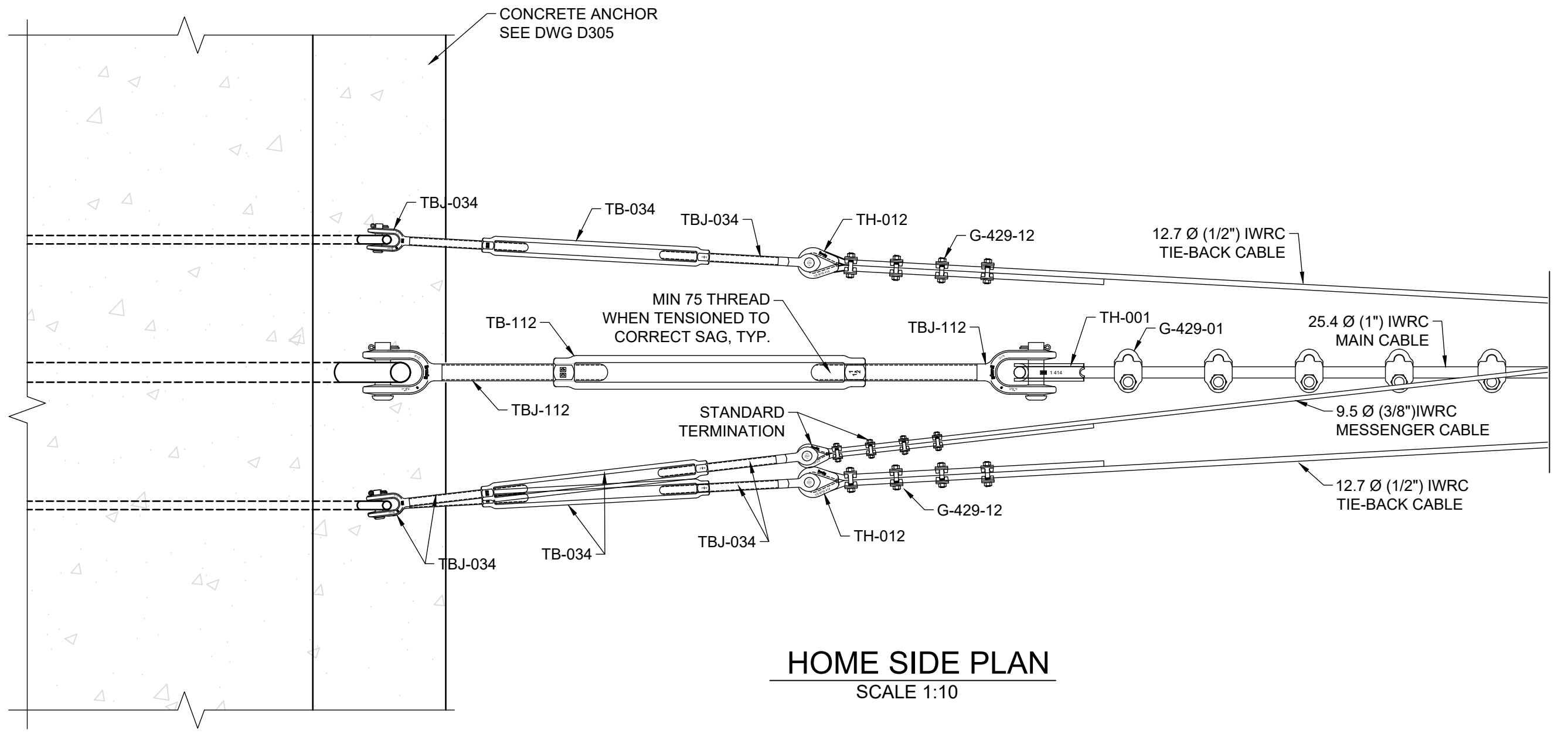
DATE: 2023-08-10, 14:35 FILE: X:\2531\2531-366 Environment Canada\08-00 Clearwater River Cableway\7.0 Drawings\7.1 Working Drawings\366-00 D306 Concrete Hardware Attachment.dwg

CABLE MATERIALS	
ID #	DESCRIPTION
G-429-01	CROSBY 429 GRIP CLIPS 1" DIA.
G-429-12	CROSBY 429 GRIP CLIPS 1/2" DIA.
TH-001	THIMBLE 1"
TH-012	THIMBLE 1/2"
TB-112	TURNBUCKLE 1 1/2"
TB-034	TURNBUCKLE 3/4"
TBJ-112	JAW END 1 1/2" DIA.
TBJ-034	JAW END 3/4" DIA.
MAIN CABLE & SAFETY LOOP WIRE ROPE	1" Ø GALV. 6X26 EEIPS IWRC
TIEBACK WIRE ROPE	1/2" Ø GALV. 6X26 EIPS IWRC

NOTE: DIMENSIONS IN mm UNLESS NOTED OTHERWISE.



HOME SIDE ELEVATION
SCALE 1:10



HOME SIDE PLAN
SCALE 1:10

THIS DRAWING AND DESIGN IS THE PROPERTY OF McELHANNEY AND SHALL NOT BE USED, REUSED OR REPRODUCED WITHOUT THE CONSENT OF McELHANNEY. McELHANNEY WILL NOT BE HELD RESPONSIBLE FOR THE IMPROPER OR UNAUTHORIZED USE OF THIS DRAWING AND DESIGN.

THIS DRAWING AND DESIGN HAS BEEN PREPARED FOR THE CLIENT IDENTIFIED, TO MEET THE STANDARDS AND REQUIREMENTS OF THE APPLICABLE PUBLIC AGENCIES AT THE TIME OF PREPARATION. McELHANNEY, ITS EMPLOYEES, SUBCONSULTANTS AND AGENTS WILL NOT BE LIABLE FOR ANY LOSSES OR OTHER CONSEQUENCES RESULTING FROM THE USE OR RELIANCE UPON, OR ANY CHANGES MADE TO, THIS DRAWING, BY ANY THIRD PARTY, INCLUDING CONTRACTORS, SUPPLIERS, CONSULTANTS AND STAKEHOLDERS, OR THEIR EMPLOYEES OR AGENTS, WITHOUT McELHANNEY'S PRIOR WRITTEN CONSENT.

INFORMATION ON EXISTING UNDERGROUND FACILITIES MAY NOT BE COMPLETE OR ACCURATE. McELHANNEY, ITS EMPLOYEES AND DIRECTORS ARE NOT RESPONSIBLE NOR LIABLE FOR THE LOCATION OF ANY UNDERGROUND CONDUITS, PIPES, CABLES OR OTHER FACILITIES WHETHER SHOWN OR OMITTED FROM THIS PLAN. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING FACILITIES BY HAND DIGGING OR HYDROVAC AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.

Rev	Date	Description	Drawn	Design	App'd
0	2023-08-11	ISSUED FOR TENDER	SJS	DM	BB

Suite 203
502 Bow Valley Trail
Canmore AB
Canada T1W 1N9
T 403 609 3992

PERMIT TO PRACTICE
McELHANNEY LTD.

RM SIGNATURE: *[Signature]*
RM APEGA ID #: 117950
DATE: 11 August 2023
PERMIT NUMBER: P006383
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

ID #117950

11 August 2023
Approved Sealed

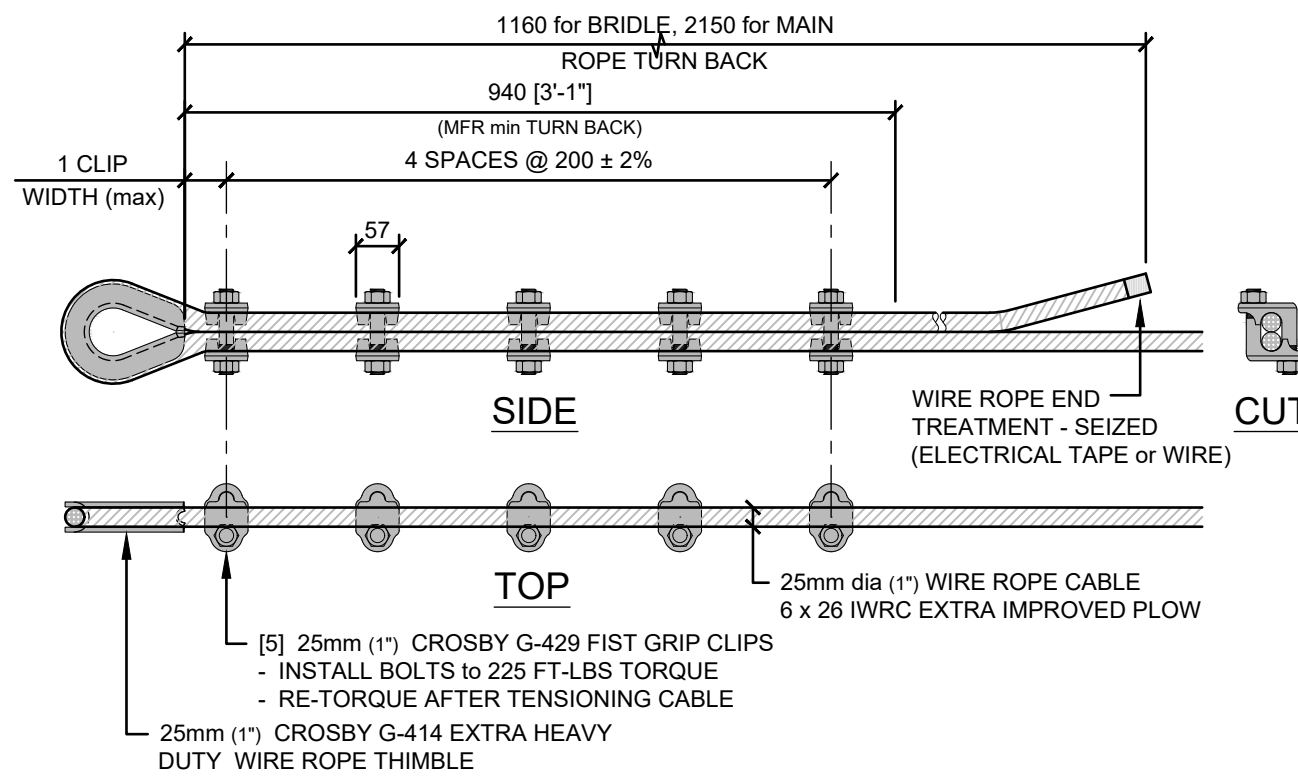
Environment and Climate Change Canada / Environnement et Changement Climatique Canada / Meteorological Services of Canada / Services météorologiques du Canada

**05DB006 CLEARWATER RIVER NEAR DOVERCOURT
HYDROMETRIC CABLEWAY REBUILD
CONCRETE HARDWARE
ATTACHMENT**

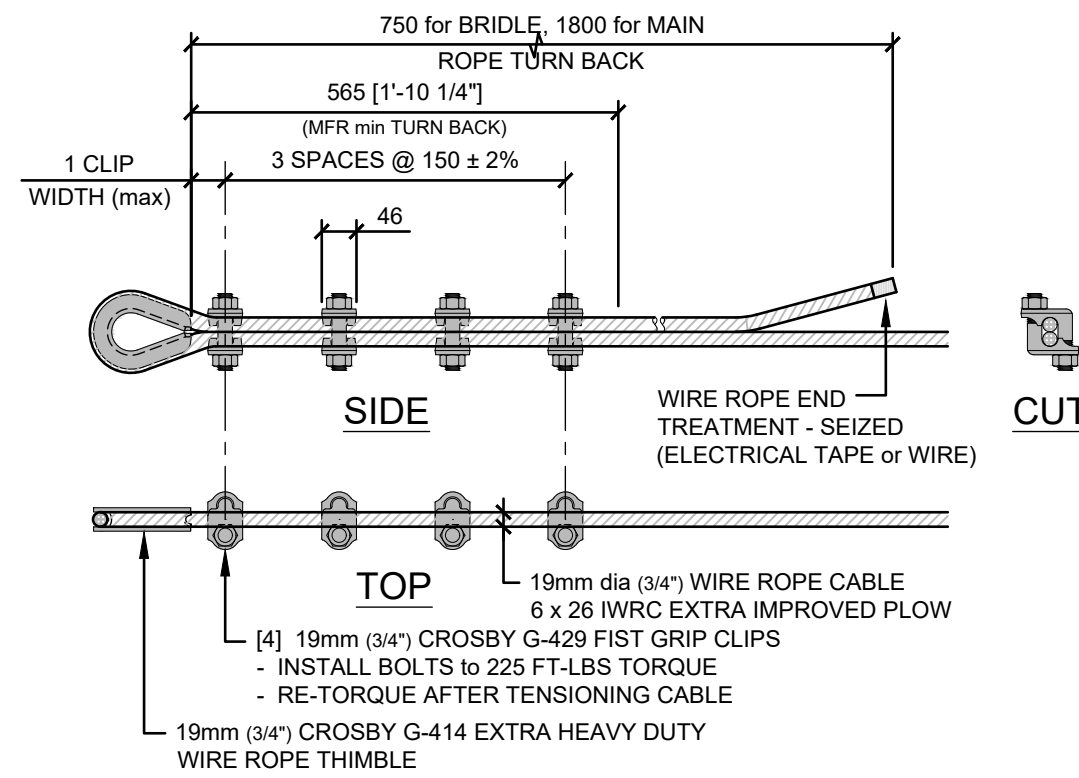
Drawing No. **D306**

Project Number 2531-36608-00 Rev. 0

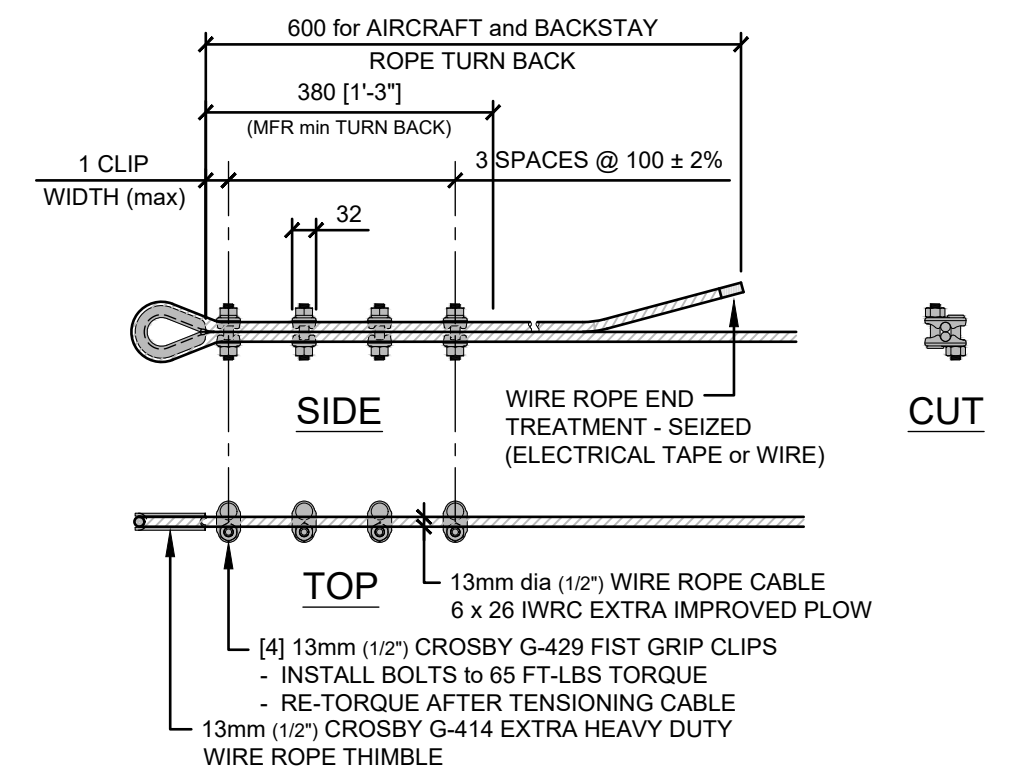
DESTROY ALL PRINTS BEARING PREVIOUS REVISION



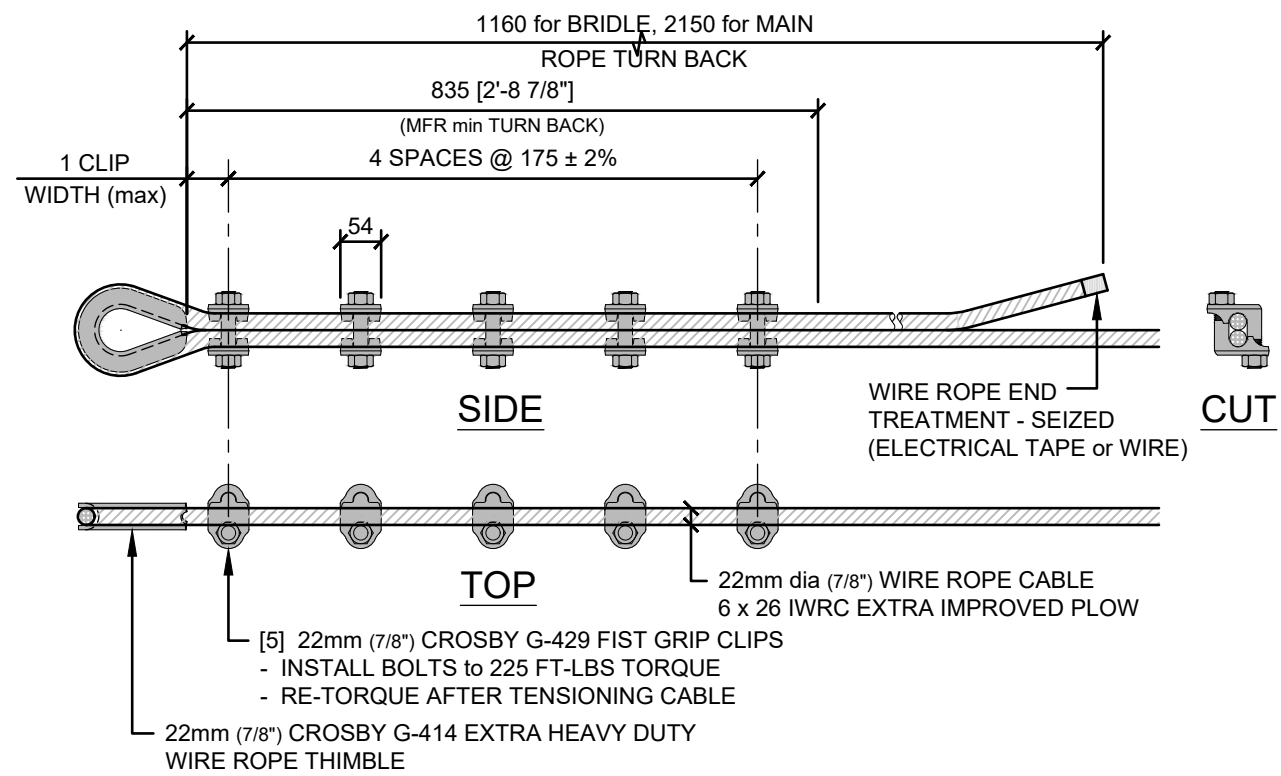
1 25mm dia (1") WIRE ROPE TERMINATION THIMBLE AND FIST GRIP CLIPS
SCALE: 1 = 10



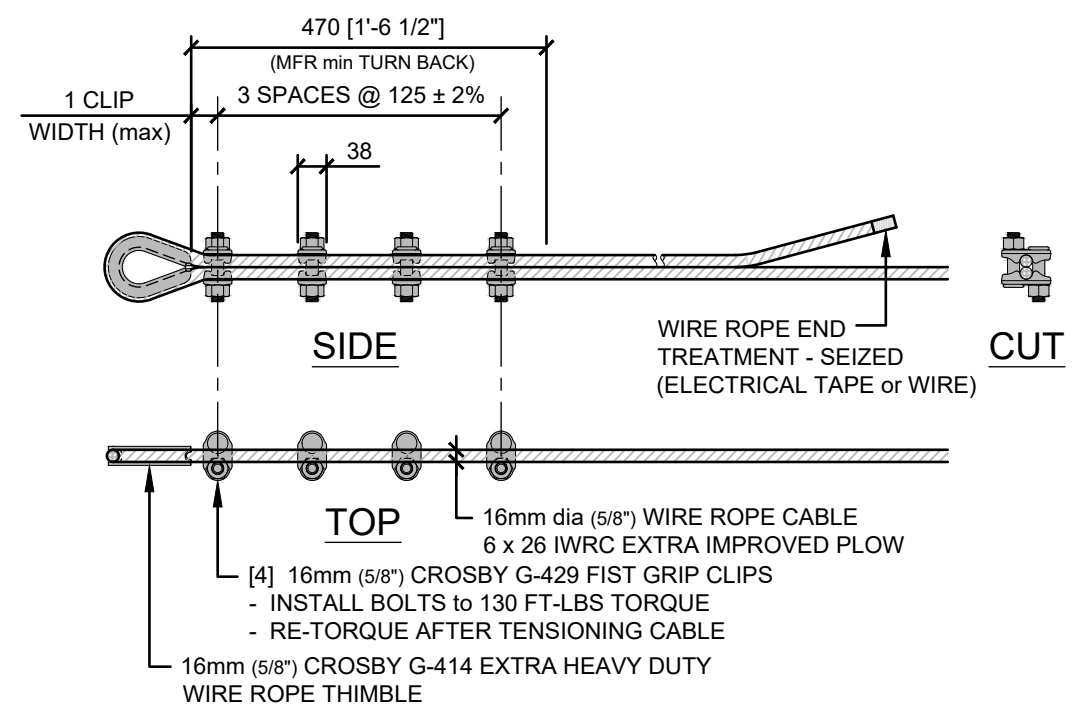
3 19mm dia (3/4") WIRE ROPE TERMINATION THIMBLE AND FIST GRIP CLIPS
SCALE: 1 = 10



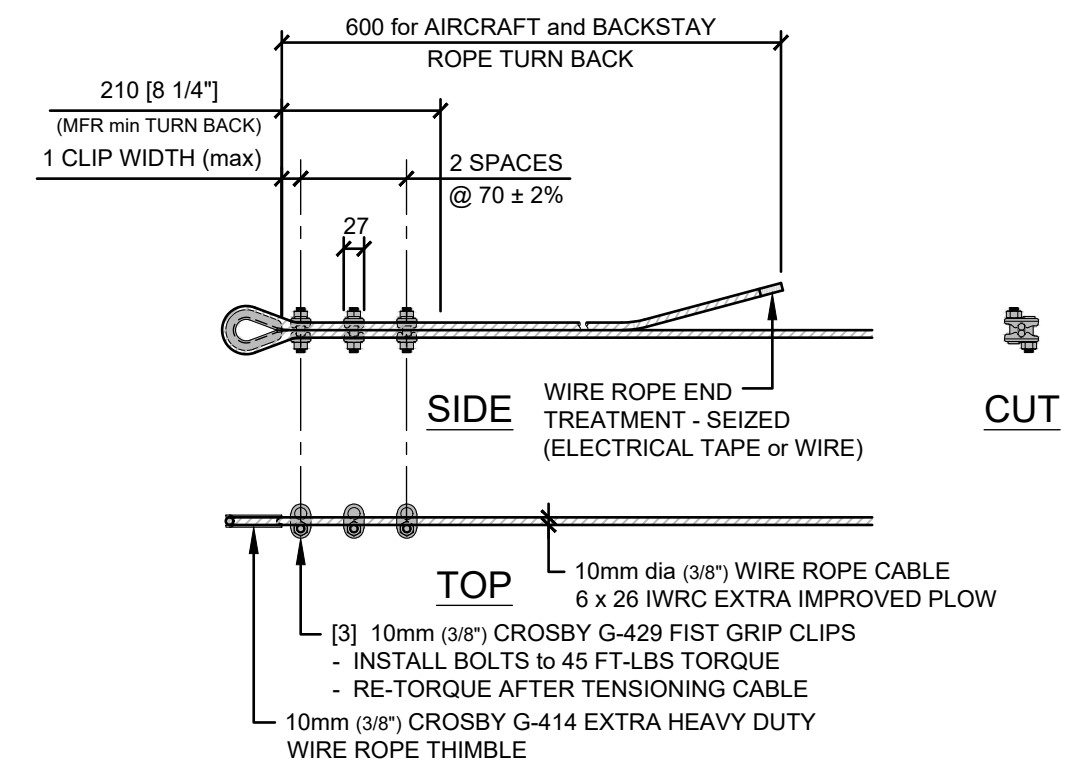
5 13mm dia (1/2") WIRE ROPE TERMINATION THIMBLE AND FIST GRIP CLIPS
SCALE: 1 = 10



2 22mm dia (7/8") WIRE ROPE TERMINATION THIMBLE AND FIST GRIP CLIPS
SCALE: 1 = 10



4 16mm dia (5/8") WIRE ROPE TERMINATION THIMBLE AND FIST GRIP CLIPS
SCALE: 1 = 10



6 10mm dia (3/8") WIRE ROPE TERMINATION THIMBLE AND FIST GRIP CLIPS
SCALE: 1 = 10

THIS DRAWING AND DESIGN IS THE PROPERTY OF McELHANNEY AND SHALL NOT BE USED, REUSED OR REPRODUCED WITHOUT THE CONSENT OF McELHANNEY. McELHANNEY WILL NOT BE HELD RESPONSIBLE FOR THE IMPROPER OR UNAUTHORIZED USE OF THIS DRAWING AND DESIGN.

THIS DRAWING AND DESIGN HAS BEEN PREPARED FOR THE CLIENT IDENTIFIED, TO MEET THE STANDARDS AND REQUIREMENTS OF THE APPLICABLE PUBLIC AGENCIES AT THE TIME OF PREPARATION. McELHANNEY, ITS EMPLOYEES, SUBCONSULTANTS AND AGENTS WILL NOT BE LIABLE FOR ANY LOSSES OR OTHER CONSEQUENCES RESULTING FROM THE USE OR RELIANCE UPON, OR ANY CHANGES MADE TO, THIS DRAWING, BY ANY THIRD PARTY, INCLUDING CONTRACTORS, SUPPLIERS, CONSULTANTS AND STAKEHOLDERS, OR THEIR EMPLOYEES OR AGENTS, WITHOUT McELHANNEY'S PRIOR WRITTEN CONSENT.

INFORMATION ON EXISTING UNDERGROUND FACILITIES MAY NOT BE COMPLETE OR ACCURATE. McELHANNEY, ITS EMPLOYEES AND DIRECTORS ARE NOT RESPONSIBLE NOR LIABLE FOR THE LOCATION OF ANY UNDERGROUND CONDUITS, PIPES, CABLES OR OTHER FACILITIES WHETHER SHOWN OR OMITTED FROM THIS PLAN. PRIOR TO CONSTRUCTION CONTRACTOR SHALL EXPOSE LOCATIONS OF ALL EXISTING FACILITIES BY HAND DIGGING OR HYDROVAC AND ADVISE THE ENGINEER OF POTENTIAL CONFLICTS.

Rev	Date	Description	Drawn	Design	App'd
0	2023-08-11	ISSUED FOR TENDER	SJS	DM	BB



Suite 203
502 Bow Valley Trail
Canmore AB
Canada T1W 1N9
T 403 609 3992

PERMIT TO PRACTICE
McELHANNEY LTD.

RM SIGNATURE: *[Signature]*
RM APEGA ID #: 117950
DATE: 11 August 2023
PERMIT NUMBER: P006383
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

ID #117950

11 August 2023
Approved Sealed

Environment and Climate Change Canada / Environnement et Changement Climatique Canada / Meteorological Services of Canada / Services météorologiques du Canada

05DB006 CLEARWATER RIVER NEAR DOVERCOURT HYDROMETRIC CABLEWAY REBUILD CABLE TERMINATION DETAILS

Drawing No.	
D501	
Project Number	Rev.
2531-36608-00	0