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ISSUED FOR BID	APR 06/16	SNM
ISSUED FOR 100% REVIEW	MAR 24/16	SNM
ISSUED FOR 99% REVIEW	FEB 23/16	SNM
ISSUED FOR PRICING	DEC 11/15	SNM

No.	Revision	Date	By
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Client/client

**CANADA BORDER SERVICES AGENCY**

Project title/Titre du projet  
**OSOYOOS BORDER CROSSING**  
 202 - 97TH STREET, OSOYOOS, B.C.

**ROOF REPLACEMENT**  
 PWGSC PROJECT NO.: R75896.0001

Consultant Signature Only

Designed by/Concept par  
**SNM**  
 Drawn by/Dessiné par  
 KJB Date  
 APRIL 06, 2016

PWGSC Project Manager/Administrateur de Projets TPSGC  
 Regional Manager, Architectural and Engineering Services  
 Gestionnaire régionale, Services d'architecture et de génie, TPSGC

Drawing title/ Titre du dessin

**FALL PROTECTION GENERAL NOTES**

Project No. / No. du projet <b>VAN.113499.0002</b>	Sheet / Feuille <b>R-1.3</b>	Revision no. / La Revision no. <b>0</b>
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**FALL PROTECTION CONSTRUCTION NOTES**

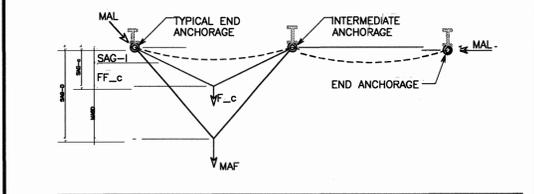
- MODIFICATIONS TO THE BASE BUILDING STRUCTURE ARE IN SUBSTANTIAL ACCORDANCE WITH THE CITY OF VANCOUVER BYLAW WHEN IN VANCOUVER OTHERWISE IN SUBSTANTIAL ACCORDANCE WITH THE BRITISH COLUMBIA BUILDING CODE.
- THE DRAWING DOES NOT INCLUDE COMPONENTS THAT MAYBE NECESSARY FOR CONSTRUCTION SAFETY. THE CONTRACTOR IS RESPONSIBLE FOR SAFETY IN AND ABOUT THE JOB SITE DURING CONSTRUCTION, AND THE DESIGN AND ERECTION OF ALL TEMPORARY STRUCTURES, FORM WORK, FALSE WORK, SHORING, ETC. REQUIRED TO COMPLETE THE WORK.
- LOCATIONS OF ANCHORAGES ARE APPROXIMATE. CONTRACTOR TO CHECK ACCEPTABILITY OF LOCATION PRIOR TO INSTALLATION AND ADVISE ENGINEER OF REQUIRED CHANGES.
- DO NOT CUT OR DRILL ANY OPENING IN ANY STRUCTURAL MEMBER WITHOUT WRITTEN APPROVAL FROM READ JONES CHRISTOFFERSEN LTD. CONTRACTOR IS RESPONSIBLE FOR LOCATING EMBEDDED REINFORCEMENT USING NON-DESTRUCTIVE TESTING (X-RAY, RADAR SCAN, ETC.) PRIOR TO PENETRATING ROOF SLAB.
- PROPRIETARY ANCHORAGES MAY BE SUBMITTED PENDING SUBMISSION OF SHOP DRAWINGS FOR REVIEW BY CONSULTANT. SHOP DRAWINGS FOR ALTERNATE OR PROPRIETARY ANCHORAGES (STAMPED BY A PROFESSIONAL ENGINEER) MUST BE SUBMITTED TO CONSULTANT FOR APPROVAL PRIOR TO FABRICATION.
- ALL ANCHORAGES SHALL BE LOAD TESTED ON SITE TO 50% OF THE DESIGN LOAD. RJC TO BE PRESENT DURING TESTING. COST BY CONTRACTOR.
  - LOAD TESTING TO BE CONDUCTED PRIOR TO FINAL ROOFING REPAIRS SO THAT ALL BOLTS ARE VISIBLE DURING TEST, AND:
  - ALL ANCHORS MUST BE TESTED IN MINIMUM TWO DIRECTIONS TO APPLY UPLIFT TO ALL BOLTS OR EACH BOLT TO BE TESTED INDIVIDUALLY WITH HILTI TEST KIT.
- CONTRACTOR SHALL MEASURE AND CONFIRM ALL DIMENSIONS ON SITE.
- ALL TESTING NOTED TO BE PAID BY THE CONTRACTOR AND INCLUDED IN CONTRACT PRICE.
- ROOFING REPAIRS ARE TO BE PERFORMED IN ACCORDANCE WITH RCABC GOOD ROOFING PRACTICE.
- ROOFING REPAIRS DETAIL TO BE CONTINUOUS AND WEATHER-TIGHT. SUBMIT DETAILS OR WRITTEN DESCRIPTION TO RJC FOR APPROVAL PRIOR TO STARTING WORK.
- ALL EXPOSED (EXTERIOR) STEEL AND HARDWARE TO BE STAINLESS STEEL OR HOT DIPPED GALVANIZED IN ACCORDANCE WITH CSA G184 AND REFERENCED DOCUMENTS UNLESS NOTED OTHERWISE.

**FALL PROTECTION HORIZONTAL LIFE LINE SYSTEM NOTES**

- ONLY ONE PERSON PERMITTED TO BE CONNECTED TO A LIFE LINE SYSTEM AT ONE TIME. UNLESS NOTED OTHERWISE.
- HORIZONTAL LIFE LINES ARE NOT TO BE USED FOR PRIMARY SUSPENSION.
- WORKER TO ENSURE PERSONAL FALL PROTECTION EQUIPMENT, RIGGING, AND WORK PROCEDURE IS CONFIGURED TO MINIMIZE FREE FALL AT ALL TIMES.
- SYSTEM DESIGNED IN ACCORDANCE WITH CSA Z259.16 AND BASED ON MANUFACTURER'S SPECIFICATIONS FOR ZORBIT ENERGY ABSORBER BY CAPITAL SAFETY.
- WORKERS MUST REVIEW LIFE LINE INFORMATION PROVIDED ON THE ENGINEERED DRAWINGS AND REVIEW LINES FOR COMPLIANCE WITH LINE SAGS AND CLEARANCE REQUIREMENTS. WORKERS ARE TO REVIEW ALLOWABLE CLEARANCES BELOW THE WORKING PLATFORM AND CONFIRM ACTUAL CLEARANCE IS AVAILABLE BELOW WORK AREA.

**HORIZONTAL LIFE LINE SAGS AND FORCES:**

F_c	FORCE REQUIRED TO PULL SLACK OUT OF ADJACENT SPANS (SEE Z259.16)	lbf
FF_c	FREE FALL DUE TO SLACK IN THE HLL CABLE	ft
MAF	MAXIMUM ARREST FORCE	lbf
MAL	MAXIMUM ARREST LOAD (FORCE VECTOR CO-LINEAR WITH THE CABLE)	lbf
MASD	MAXIMUM ANCHORAGE SYSTEM DEFLECTION	ft
SAG-c	CUSP SAG OF THE HLL DUE TO SLACK TAKEN OUT OF ADJACENT SPANS (SEE Z259.16)	ft
SAG-I	INITIAL SAG OF THE HLL DUE TO SELF WEIGHT	ft
SAG-D	MAXIMUM SAG OF THE HLL AT FALL ARREST (DUE TO APPLIED MAF)	ft

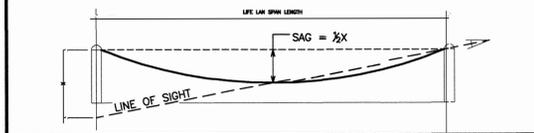


SEE SECTION 4000 OF THE FALL PROTECTION MANUAL FOR HLL FORCES AND FALL DISTANCES.

**HORIZONTAL LIFE LINE INSTALLATION SAG CHART**

TEMPERATURE (°C) AT INSTALLATION	INITIAL TENSION TO (lbf)	LIFE LINE SAGS (in)					
		LIFE LINE SPAN LENGTH (ft-in)					
-10	726	0.13	0.54	1.22	2.17	3.38	4.87
-5	621	0.16	0.63	1.43	2.53	3.95	5.69
0	516	0.19	0.76	1.71	3.05	4.76	6.85
5	411	0.24	0.96	2.15	3.83	5.98	8.61
10	305	0.32	1.29	2.89	5.15	8.04	11.58
15	200	0.49	1.98	4.42	7.85	12.27	17.67
20	95	1.04	4.14	9.31	16.65	25.89	37.30

- BASED ON 3/8" (10mm) 7x19 AIRCRAFT CABLE STAINLESS STEEL.
- CABLE WEIGHT = 0.243 lb/ft (3.55 N/M).
- NOMINAL CABLE CROSS SECTION AREA = 0.11 inch<sup>2</sup> (70.9mm<sup>2</sup>).
- EQUIVALENT CABLE ELASTIC MODULUS = 6887.5 Kai (47.5 GPa).
- THERMAL COEFFICIENT = 1.73x10<sup>-6</sup> mm/mm/°C (9.6x10<sup>-6</sup> in/in/°F).
- HOW TO MEASURE SAG:



**DRAWINGS**

- THIS SET OF DRAWINGS SHOWS THE COMPLETED PROJECT. THE DRAWINGS DO NOT SHOW COMPONENTS THAT MAY BE NECESSARY FOR CONSTRUCTION SAFETY. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR SAFETY IN AND ABOUT THE JOB SITE DURING CONSTRUCTION, AND THE DESIGN AND ERECTION OF ALL TEMPORARY STRUCTURES, FORMWORK, FALSE WORK, SHORING, ETC. REQUIRED TO COMPLETE THE WORK.
- THE USE OF THESE DRAWINGS IS LIMITED TO THAT IDENTIFIED IN THE REVISIONS COLUMN. DO NOT CONSTRUCT FROM THESE DRAWINGS UNLESS MARKED "ISSUED FOR CONSTRUCTION" IN THE REVISIONS COLUMN, BY READ JONES CHRISTOFFERSEN LTD. THE DRAWINGS SHALL NOT BE USED FOR PRICING, COSTING, OR TENDER UNLESS SO INDICATED IN THE REVISION COLUMN. PRICING OR COSTING DRAWINGS ARE NOT COMPLETE AND ANY PRICES BASED ON PRICING OR COSTING DRAWINGS MUST INCLUDE ALLOWANCES FOR THIS.
- THE INFORMATION ON THESE DRAWINGS SHALL NOT BE USED FOR ANY OTHER PROJECT OR WORKS. THE INFORMATION ON THESE DRAWINGS APPLIES SOLELY TO THIS PROJECT.

**STRUCTURAL STEEL NOTES**

- STRUCTURAL STEEL SECTIONS SHALL BE NEW AND CONFORM TO THE FOLLOWING:
  - WIDE FLANGE BEAMS AND WWF SECTIONS--- CSA G40.21 350W
  - MISCELLANEOUS ROLLED SECTIONS (EXCEPT WIDE FLANGES)----- CSA G40.21 300W
  - HOLLOW STRUCTURAL SECTIONS (CLASS C U.N.O.)----- CSA G40.21 350W
  - ROLLED PLATES----- CSA G40.21 300W
  - BOLTS (SEE PLANS AND DETAILS)----- ASTM A325 OR ASTM A490
  - STRUCTURAL STEEL ANCHOR BOLTS (U.N.O.) ASTM F1554
  - REINFORCING BAR ANCHOR BOLTS----- CAN/CSA-G30.18R, GRADE 400
- ALL CONNECTIONS TO BE DESIGNED BY FABRICATOR UNLESS NOTED OTHERWISE. ALL BEAM CONNECTIONS TO BE STANDARD FRAME BEAM CONNECTIONS OR EQUIVALENT, UNLESS NOTED OTHERWISE.
- PRIOR TO SUBMITTING SHOP DRAWINGS THE CONTRACTOR SHALL NOTIFY RJC IN WRITING THAT THE FABRICATOR IS CERTIFIED TO A MINIMUM OF DIVISION 2 OF CSA W47.1.
- DRAWINGS OF COMPONENTS AND CONNECTIONS DESIGNED BY THE FABRICATOR'S SPECIALTY STRUCTURAL ENGINEER SHALL BE SIGNED AND SEALED BY THIS ENGINEER OR A LETTER SHALL BE SUBMITTED AT THE END OF SHOP DRAWING PRODUCTION SIGNED AND SEALED BY THIS ENGINEER, IDENTIFYING WHAT WAS DESIGNED AND LISTING THE FINAL DRAWINGS WITH DATES AND REVISION NUMBERS.
- CONNECTIONS AND SPLICES NOT SHOWN ON THE STRUCTURAL DRAWINGS BUT REQUESTED BY THE FABRICATOR MUST BE ACCEPTABLE TO RJC AND DETAILED ON THE SHOP DRAWINGS. TESTING OF THESE CONNECTIONS SHALL BE AT THE DISCRETION OF RJC AND TO THE CONTRACTORS ACCOUNT.
- SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO START OF STEEL FABRICATION.
- FABRICATION, ERECTION, STRUCTURAL DESIGN, AND DETAILING OF ALL STEEL SHALL BE IN ACCORDANCE WITH CAN/CSA-S16.
- FILLET WELDS SHALL BE 5 mm MINIMUM U.N.O.
- BOLTS SHALL BE A325 19 mm Ø MINIMUM U.N.O.
- BOLTED CONNECTIONS SHALL HAVE A MINIMUM OF TWO BOLTS IN EACH CONNECTED PIECE AND BE DESIGNED AS BEARING CONNECTIONS, U.N.O.
- ALL WELDED HEADED STUDS AND WELDED DEFORMED BAR ANCHORS SHALL BE INSTALLED AS PER THE MANUFACTURERS SPECIFICATIONS AND RECOMMENDATIONS OR SHOP FILLET WELDED. ANY FIELD FILLET WELDED DEFORMED BARS OR STUDS WILL BE REJECTED. SEE PLANS, SECTIONS, DETAILS, AND SCHEDULES FOR LOCATIONS ETC., THE CONTRACTOR SHALL CO-ORDINATE THE DESIGN, SUPPLY, AND INSTALLATION OF ALL STUDS AND ANCHORS, INCLUDING, BUT NOT LIMITED TO STUDS AND DEFORMED BAR ANCHORS ON COMPOSITE BEAMS, DRAG STRUTS, EMBEDDED PLATES, ETC.
- UNLESS NOTED OTHERWISE, COLUMN CAP PLATES SHALL BE 16 mm THICK AND COLUMN BASE PLATES SHALL BE 20 mm MINIMUM THICK.
- PROVIDE 6 mm CAP PLATES FOR ALL HSS MEMBERS U.N.O.
- CONNECTION DETAILS SHOWN ON THE STRUCTURAL DRAWINGS SHALL NOT BE ALTERED BY THE CONTRACTOR WITHOUT WRITTEN APPROVAL FROM READ JONES CHRISTOFFERSEN LTD.

**STEEL FABRICATION NOTES**

- ALL STEEL WORK TO BE IN ACCORDANCE WITH CAN/CSA-S16.1 AND REFERENCED DOCUMENTS.
- ALL WELDING TO BE IN ACCORDANCE WITH CSA W59. FABRICATION SHOP TO HAVE FULL APPROVAL OF CWB TO THE REQUIREMENTS OF CSA W47. ALL WELDERS TO HAVE PASSED WITHIN THE PRECEDING SIX MONTHS, THE QUALIFICATION TEST AS SET FORTH WITHIN CSA W47.
- ALL WELDS TO BE VISUALLY REVIEWED BY CERTIFIED WELDING INSPECTION ORGANIZATION TO CSA W178.1.
- 1 IN 4 WELDS TO BE TESTED TO ASTM STANDARD E 709 MAGNETIC PARTICLE EXAMINATION OR APPROVED ALTERNATIVE.
- USE E49XX ELECTRODE STRENGTH U.N.O.

**STAINLESS STEEL NOTES**

- STAINLESS STEEL IN ACCORDANCE WITH CSA STANDARD S16-01 AND REFERENCED DOCUMENTS FOR PURPOSES OF STRUCTURAL ELEMENT RESISTANCES.
- STAINLESS STEEL TYPE 316 TO ASTM A276 AND COLD FORMED TO SEI/ASCE 8-02.
- BOLTS AND THREADED ROD TO ASTM F593 CW2 180 3506-1 A4-70 MIN. Fu = 586 MPa AND MIN. Fy = 310 MPa.

**FIELD WELDING NOTES**

- FIELD WELDING IS PERMITTED IN ACCORDANCE WITH PROCEDURES SET FORTH BY TRANSLINK AND BCRTC.
- BOLTED FRAMING CONNECTIONS MAY BE SUBSTITUTED WITH EQUIVALENT FIELD WELDED CONNECTIONS.
- FIELD WELDED CONNECTIONS WILL REQUIRE SUBMISSION OF SHOP DRAWINGS AND A DESCRIPTION OF PROCEDURES INCLUDING METHODS PROPOSED FOR PROTECTION OF ADJACENT ASSEMBLIES AND EQUIPMENT.