SNC·LAVALIN

Bâtisseurs d'avenir

Parks Canada

Saint-Ours Canal – National Historic Site of Canada

Repairs to the dam, lock and fishway

CONSTRUCTION SPECIFICATION

641613-0000-40EF-0001

COUR-1525

Revision 01

August 2018

Seals Page
Section 00 01 07

Undersigned engineers have prepared and verified the various sections of this specification:

Prepared by :

26 juillet 2018

Adil Alj, Eng. (# OIQ : 129523)
Industrial Structures Engineer

26-07-2018

Idris Fodil, Eng. (# OIQ : 136301)
Civil Engineer

26.07.18

Jean-Philippe Brassard, Eng. (# OIQ : 133534)
Mechanical Engineer

26.07.18

Garen Tchakedjian, Eng. (# OIQ : 134921)
Electrical Engineer

2018/07/26

Raymond Moquin, Eng. (# OIQ : 44681)
Electrical Engineer

Approved by :

Stéphane Perron, Eng. (# OIQ : 99422)
Project Manager

Revision
approved by :

Christophe Rigny, Eng. (# OIQ : 108314) 2018-08-23
Director, Operations and Proposals

List of Revisions

Revision				Revised Pages	Comments
N°	By	App.	Date		
00	AA, JPB, IF, GT, RM	SP	2018-07-27		Issued for Tender
01	ST	CR	2018-08-23	- Seals Page – Section 00 01 07 page 1. - Table of Content and Drawing List – Section 00 01 10 page 3. - General Requirements – Documents and Samples to Submit – Section 01 33 00 Appendix A – Documents Required from the Contractor page 1. - Appendix A.	- Addition of the approval of the revision. - Modification of the description of Appendix A. - Replacement of “first payment request” by “mobilization” in the first line. - Modification of the description of Appendix A and removal of its content.

Table of Contents and Drawing List
Section 00 01 10

Table of Contents and Drawing List
Section 00 01 10

Table of Contents and Drawing List
Section 00 01 10

APPENDIX

Drawing List - Dam

PCA Drawing No.	*SNC Drawing No.*	*Sheet*	*Drawing Title*
RUO-11-127.00	641613-0000-40DD-0001	G0	Location Plan and Drawing List
RUO-11-127.01	641613-0000-45DD-0006	M1	Dam – Sector Gate – Paint – Elevation, Sections and Details
RUO-11-127.02	641613-0000-45DD-0007	M2	Dam – Piping Flow Diagram
RUO-11.127.03	641613-0100-45DD-0001	M3	Piping Pier 1 – Plan View, Sections and Details
RUO-11.127.04	641613-0100-45DD-0002	M4	Piping - Piers 2 to 5 – Plan View, Sections and Details
RUO-11.127.05	641613-0100-45DD-0003	M5	Piping - Pier 6 – Plan View, Sections and Details
RUO-11.127.06	641613-0100-45DD-0004	M6	Dam – Refurbishment of Downstream Stop Logs Elevation, Sections and Details
RUO-11.127.07	641613-0100-45DD-0005	M7	Dam – Cover for Embedded Parts - Plan, Elevation and Section
RUO-11.127.08	641613-0200-45DD-0001	M8	Fishway – Gate V-3 Anchors - Elevation, Sections and Details
RUO-11.127.09	641613-0200-45DD-0002	M9	Fishway – Extension of Monorail - Plan, Sections and Details
RUO-11.127.10	641613-0200-45DD-0003	M10	Fishway – Access Platform to Monorail - Plan, Sections and Details
RUO-11.127.11	641613-0200-45DD-0004	M11	Fishway – Trash Racks - Guides - Plan, Elevation, and Details
RUO-11.127.12	641613-0200-45DD-0005	M12	Fishway – Trash Racks - Section and Detail
RUO-11.127.13	641613-0000-41DD-1001	C1	Signage – Location of the Panels
RUO-11.127.14	641613-0000-41DD-0001	C2	Upstream Signage (Type 1)
RUO-11.127.15	641613-0000-41DD-0002	C3	Upstream/Downstream Signs (Types 2, 3 and 4)
RUO-11.127.16	641613-0000-41DD-0003	C4	Downstream Signage (Type 5)

Table of Contents and Drawing List
Section 00 01 10

PCA Drawing No.	*SNC Drawing No.*	*Sheet*	*Drawing Title*
RUO-11.127.17	641613-0000-41DD-0004	C5	Signage Foundation
RUO-11.127.18	641613-0100-42DD-1001	B1	Pier # 1 Concrete Repairs (Interior and Exterior)
RUO-11.127.19	641613-0100-42DD-1002	B2	Pier # 2 Concrete Repairs (Interior and Exterior)
RUO-11.127.20	641613-0100-42DD-1003	B3	Pier # 3 Concrete Repairs (Interior and Exterior)
RUO-11.127.21	641613-0100-42DD-1004	B4	Pier # 4 Concrete Repairs (Interior and Exterior)
RUO-11.127.22	641613-0100-42DD-1005	B5	Pier # 5 Concrete Repairs (Interior and Exterior)
RUO-11.127.23	641613-0100-42DD-1006	B6	Pier # 6 Concrete Repairs (Interior and Exterior)
RUO-11.127.24	641613-0100-42DD-1007	B7	Typical Concrete Repairs
RUO-11.127.25	641613-0100-42DD-1008	B8	Replacement of Existing Access Hatches Piers #1 to #6
RUO-11.127.26	641613-0100-42DD-1009	B9	Repairs Pier #1 to #6 Outside Slabs EL. : 10 973
RUO-11.127.27	641613-0100-43DD-2001	S1	Dam and Fish Ladder – Repairs Pier #1 to 6 Outside Slabs EL. : 10 973
RUO-11.127.28	641613-0100-43DD-2002	S2	Dam and Fish Ladder – Refection of Guardrails and New Retaining Device for Pedestrians and Cyclist New Layout – Plan View
RUO-11.127.29	641613-0100-43DD-2003	S3	Dam and Fish Ladder – Refection of Guardrails and New Retaining Device for Pedestrians and Cyclist - Details
RUO-11.127.30	641613-0100-43DD-2004	S4	Fish Ladder, New Maintenance Gangways, New Deflectors and New Hatch
RUO-11.127.31	641613-0100-43DD-3001	S5	Fish Ladder, New Maintenance Gangways Plan View and Section
RUO-11.127.32	641613-0100-43DD-3002	S6	Fish Ladder, New Maintenance Gangways Sections and Details (P.1 of 2)
RUO-11.127.33	641613-0100-43DD-3003	S7	Fish Ladder, New Maintenance Gangways Sections and Details (P.2 of 2)

Table of Contents and Drawing List
Section 00 01 10

PCA Drawing No.	*SNC Drawing No.*	*Sheet*	*Drawing Title*
RUO-11.127.35	641613-0100-47DD-0001	E1	Pier 1 - Layout - Valve's Electrical Actuators
RUO-11.127.36	641613-0100-47DD-0002	E2	Pier 1 – Main – Single Line Diagram
RUO-11.127.37	641613-0100-47DD-0003	E3	Pier 1 – Layout - Electrical Equipment
RUO-11.127.38	641613-0100-47DD-0004	E4	Piers 2 to 5 - Layout – Valve's Electrical Actuators
RUO-11.127.39	641613-0100-47DD-0005	E5	Pier 2 – Main – Single Line Diagram
RUO-11.127.40	641613-0100-47DD-0006	E6	Pier 2 - Layout – Electrical Equipment
RUO-11.127.41	641613-0100-47DD-0007	E7	Pier 3 – Main – Single Line Diagram
RUO-11.127.42	641613-0100-47DD-0008	E8	Pier 3 - Layout – Electrical Equipment
RUO-11.127.43	641613-0100-47DD-0009	E9	Pier 4 – Main – Single Line Diagram
RUO-11.127.44	641613-0100-47DD-0010	E10	Pier 4 – Layout – Electrical Equipment
RUO-11.127.45	641613-0100-47DD-0011	E11	Pier 5 – Main – Single Line Diagram
RUO-11.127.46	641613-0100-47DD-0012	E12	Pier 5 – Layout – Electrical Equipment
RUO-11.127.47	641613-0100-47DD-0013	E13	Pier 6 - Layout – Valves's Electrical Actuators
RUO-11.127.48	641613-0100-47DD-0014	E14	Pier 6 – Main – Single Line Diagram
RUO-11.127.49	641613-0100-47DD-0015	E15	Pier 6 – Layout – Electrical Equipment
RUO-11.127.50	641613-0100-47DD-0016	E16	Pier 1 to 6 – Schematic - PLC and Devicenet Networks
RUO-11.127.51	641613-0100-47DD-0017	E17	Pier 2 to 6 – Input/Output Cards – No. 1 and 3
RUO-11.127.52	641613-0100-47DD-0018	E18	Pier 1 – Equipment Wiring Diagram – Valve Actuators L, M, O, P and R
RUO-11.127.53	641613-0100-47DD-0019	E19	Piers 2 to 5 – PLC Cabinet
RUO-11.127.54	641613-0100-47DD-0020	E20	Piers 2 to 5 – Junction Box BJ-x0 and Equipment Wiring Diagram Valves and BJ-x0

Table of Contents and Drawing List
Section 00 01 10

PCA Drawing No.	*SNC Drawing No.*	*Sheet*	*Drawing Title*
RUO-11.127.55	641613-0100-47DD-0021	E21	Pier 6 – PLC Cabinet
RUO-11.127.56	641613-0100-47DD-0022	E22	Pier 6 – Junction Box BJ-61 and Equipment Wiring Diagram
RUO-11.127.57	641613-0100-47DD-0023	E23	U.C.L. – Opetator Screen Pages
RUO-11.127.58	641613-0100-47DD-0024	E24	Schematic – Access Control and Camera
RUO-11.127.59	641613-0100-47DD-0025	E25	Layout – Access Control and Camera
RUO-11.127.60	641613-0100-47DD-0026	E26	Cables List

Reference Drawing List

Drawing No.	*Drawing Title*
RU-23-101.03	5 sector gates cross frame
RU-23-101.04	5 sector gates skin plate - Side
RU-23-101.05	5 sector gates skin plate - Centre
RU-23-101.06	5 sector gates rear plate - Side
RU-23-101.07	5 sector gates rear plate - Centre
RU-23-101.08	5 sector gates seal and centre hinge details
RU-23-101.11	5 sector gates upstream seal transition
RU-23-101.17	5 sector gates hinge
RU-23-101.22	5 sector gates bearing - Bush - Axle and space washer
RU-23-101.37	5 sector gates intake structures
RU-23-101.50	5 sector gates cross frame - Detail
RU-23-101.51	Arrangement of concrete ballast
RU-23-101.56	Suspension eyes for erection

END OF SECTION

PART 1- GENERAL

1.1 DESCRIPTION OF FACILITIES

.1 The St-Ours Dam is located on the Richelieu River at 23 km upstream of Sorel. At this point, there is, on both side of the Darvard Island, the St-Ours dam and lock. The purpose of the dam is to raise and regulate the upstream water level to make the Richelieu River navigable between St-Ours and the Chambly Canal. The dam consists of five (5) low sluices surrounded by piers. There are five (5) sector gates and six (6) piers in this 180m long dam.

.2 A feeder tunnel connects the two water intakes located at both ends of the dam. A control system modulates the opening of the inlet and outlet motorized valves to position each sector gate. If the sector gate is to be raised, water in the feeder tunnel is conveyed through piping installed in the piers to the chamber under the sector gate by opening the valve (A). Pressure on the inner walls of the sector gate makes the gate come up. If the sector gate is to be lowered, Valve V1 (A) is closed and Valve V2 (B) is opened so that water is discharged downstream.

.3 The dam control system is composed of a C.C.U (Central Control Unit) located in the control room at the end of the dam on the St-Ours side. Moreover, each of the piers 2 to 6 has a L.C.U (Local Control Unit) allowing the control of the sector gate and the pier's equipment.

.4 The left bank of the dam has a fishway built in 2001.

1.2 OBJECT

.1 This document defines the works including labor supply, materials and equipment and all works required for the supply and the installation of electrical and mechanical equipment systems and associated civil work as part of the St-Ours Canal Dam, Sluice and Fishway Rehabilitation Project, in accordance with the drawings, the related technical specifications and the associated requirements from Parks Canada.

1.3 RELATED REQUIREMENTS

.1 Section 02 41 16 – Structure Demolition

.2 Section 02 50 13 – Management of Toxic Waste

.3 Section 03 10 00 – Concrete Forming and Accessories

.4 Section 03 20 00 – Concrete Reinforcing

.5 Section 03 30 00 – Cast-In-Place Concrete

.6 Section 03 30 150 – Injection Crack Sealing

.7 Section 03 30 175 – Repairs with Formwork without extra Thickness

.8 Section 05 12 23 – Structural Steel for Buildings

.9 Section 05 14 12 – Structural Aluminium for Buildings

.10 Section 05 50 00 – Metal Fabrications

.11 Section 07 92 00 – Joint Sealants

.12 Section 08 50 00 – Windows

.13 Section 09 91 13.0 – Paint – Exterior Re-Painting

.14 Section 10 14 53 – Trafic Signage

.15 Section 23 05 23.05 – Butterfly Valves

.16 Section 26 05 00 – Common Work Results for Electrical

.17 Section 26 05 01 – Motorization of Valves – Actuators

.18 Section 26 05 02 – Motorization of Valves – Local Instrumentation

.19 Section 26 05 03 – Commissioning

.20 Section 26 05 20 – Wire and Box Connectors (0-1000 V)

.21 Section 26 05 21 – Wire and Cables (0-1000 V)

.22 Section 26 05 22 – Connectors and Terminations

.23 Section 26 05 34 – Conduits, Conduit Fastenings and Conduit Fittings

.24 Section 26 24 16.0 – Pannelboard Breaker

.25 Section 28 13 00 – Access Control

.26 Section 28 23 00 – Video Surveillance

1.4 CONTRACT TYPE

.1 Work shall be subject to a fixed price contract.

1.5 WORK BY OTHERS

.1 Co-operate with other Contractors, if required, in carrying out their respective works and carry out instructions from Departmental Representative.

.2 Co-ordinate work with that of other Contractors, if required. If any part of work under this Contract depends for its proper execution or result upon work by another Contractor, report promptly to Departmental Representative, in writing, any anomalies or defects which may interfere with proper execution of Work.

1.6 WORK SEQUENCE

.1 Portion of works shall be executed during freshet period. The works on the downstream stoplogs shall be completed before the summer season. The dam shall be operational at all time.

.2 The tunnel will be emptied by PCA during freshet season.

.3 The fishway shall remain operational between May and July. Exact dates will be confirmed by PCA.

1.7 CONTRACTOR'S USE OF PREMISES

.1 The use of the premises is limited to required work areas to allow:

.1 Work by other contractors, if required;

.2 Co-ordinate use of premises under direction of Departmental Representative.

.3 Obtain and pay for use of additional storage or work areas needed for this Contract.

.4 Remove or alter existing work to prevent damage to portions of existing work which remain.

.5 Repair or replace portions of existing work which have been altered during construction to match existing or adjoining work, as directed by the Departmental Representative.

.6 At completion of construction, the existing works condition shall be equal to or better than that which existed before work.

1.8 OWNER OCCUPANCY

.1 The Owner will use the premises during entire construction period for normal operation.

.2 Co-ordinate with Owner in scheduling activities to minimize conflicts and facilitate operation by Owner.

1.9 EXISTING SERVICES

.1 Notify the Departmental Representative and utility companies of intended interruption of services and obtain required authorizations.

.2 Establish location and extent of existing services located in work area before starting work. Notify the Departmental Representative of any findings.

.3 Submit a schedule and obtain approval from Departmental Representative for any shut-down or temporary closure of services or facilities including power and communication services. Adhere to approved schedule and provide notices to affected parties.

.4 Provide temporary services as directed by Departmental Representative to maintain existing services.

.5 Where unknown services are encountered, immediately notify the Departmental Representative and record findings in writing.

.6 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by required authorities.

.7 Record location of maintained, re-routed and abandoned utility lines.

.8 Install barriers in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

1.10 RIGHTS, PERMITS AND INSPECTION

.1 The Navigation Protection Act (NPA) applies to this work. Submit all required documents (Notice of Works form and Works Plan) to the Departmental Representative so that he can obtain all approvals or permits required.

.2 Submit to Electrical Inspection Service and to the Electricity Supplier Authority, the required quantity of Drawings and Specification for them to study and approve before the start of the Work.

.3 Pay all required fees.

.4 If required, Drawings and Specifications required by the Electrical Inspection Service and the Electricity Supplier Authority will be providing free by the Departmental Representative.

.5 Notify the Departmental Representative for all modifications required by the Electrical Inspection Service before making any changes to Drawings and Specification.

.6 At the end of the work, obtain from authorities having jurisdiction, an acceptance certificate and forward it to Departmental Representative.

PARTIE 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PARTIE 3 - EXECUTION

3.1 SCOPE OF WORK

.1 General

.1 The work covered by this contract shall include the supply of all materials, labour, tools, equipment, protection and transportation required to complete the work in accordance with the requirements specified on the drawings and in the specification.

.2 The co-ordination and distribution of work for subcontractors is the Contractor's responsibility and any reference to documents referring to subcontractors shall not be construed as binding the Departmental Representative to such a distribution.

.2 Dam

.1 Civil Work

.1 The civil work covered by this contract shall include but not be limited to:

.1 Addition of guardrails (retaining device) on the deck;

.2 Replacement of existing fences;

.3 Replacement of missing anchors on the existing guardrails ;

.4 Moving of access doors on the existing guardrails;

.5 Repair of too short anchors;

.6 Repair of concrete piers;

.7 Replacement of access hatches located on the piers ;

.8 Repair of sealer around doors;

.9 Supply, fabrication and installation of signage panels around the dam including the foundation works ;

.10 Replacement of the existing windows of the control building.

.2 Mechanical Work

.1 The work covered by this contract shall include but not be limited to:

.1 Refurbishment of seven (7) downstream stoplogs and six (6) support beams, including transportation :

1. Removal of the existing wooden waterproofing system ;
2. Supply and replacement of ten (14) defective leaf springs ;
3. Supply and installation of the new seal system ;
4. Paint works on stoplogs and support beams.

.2 Supply, fabrication and transportation of thirty (30) covers for the embedded parts of downstream stoplogs.

.3 Paint work for the outside of a sector gate.

.4 Repair and painting work of the inside of a sector gate of the dam including :

1. Repair of all horizontal bracing as indicated on the drawings.
2. Filling by welding all defects as indicated on the drawings.
3. Replacement of bolts as indicated on the drawings.

.5 Removal and transportation of used valves to Parks Canada workshop.

.6 Supply, fabrication, transportation and installation of new butterfly valves with electrical actuators in the piers of the dam :

1. Base Works - Level 3 (EL. 9’-0’’) :
    a. Pier no 2 – Valves C, D and E;
    b. Pier no 3 – Valves C, D and E;
    c. Pier no 4 – Valves C, D and E;
    d. Pier no 5 – Valves C, D and E;
    e. Pier no 6 – Valves C, D and E;
2. Optional Works – Level 4 (EL. -2’-6’’):
    a. Pier no 1 – Valves L, M, O, P and R;
    b. Pier no 2 – Valves G, H, L, M, N, O, P, Q and R;
    c. Pier no 3 – Valves G, H, L, M, N, O, P, Q and R;
    d. Pier no 4 – Valves G, H, L, M, N, O, P, Q and R;
    e. Pier no 5 – Valves G, H, L, M, N, O, P, Q and R;
    f. Pier no 6 – Valves G, H, L, M, N, P and Q;

.7 Supply of shop drawings for approval.

.8 Supply of welding procedures, work plans, inspection and test plans, inspection and testing procedures and product data for all products used for fabrication and installation of equipment.

.3 Electrical Work

.1 The electrical work covered by this contract shall include but not be limited to the connection of the motorized valves actuators, the addition of an access control system and a video surveillance system for the gates and the Richelieu River upstream of the dam. The contractor shall provide I/O cards and connect the points with the operator screens and the current Dam Management System (DMS). The contractor shall do the testing and commissioning of the new equipment.

.2 All dismantling work shall be done in an order allowing to the dam and the fishway to remain operational during the work. For the valves replacement work, it is planned to carry out the work pier by pier successively. Before starting the work, Contractor shall obtain all authorizations required to dismantle control/regulation equipment and to put the equipment/system out of service. Any authorization shall be requested in writing to the Departmental Representative. The Contractor’s responsibility for the equipment to be incorporated into the Dam Management System (DMS) begins from the time he is cleared to disconnect or remove the equipment.

.3 Included work.

.1 The electrical work covered by this contract shall include but not be limited to:

.1 Connection and commissioning of fifteen (15) actuators supplied with the mechanical valves of the main piping system for each sector gate at level 3 (EL. 9'-0" / 2743.2), including supply and installation of their wiring:

.1 Pier no 2 – Valves C, D and E;

.2 Pier no 3 – Valves C, D and E;

.3 Pier no 4 – Valves C, D and E;

.4 Pier no 5 – Valves C, D and E;

.5 Pier no 6 – Valves C, D and E;

.2 OPTIONAL, connection and commissioning of forty-eight (48) actuators supplied with the mechanical valves of the auxiliary system for each sector gate at level 4 (EL. 2'-6" / -762), including the supply and installation of their wiring:

.1 Pier no 1 – Valves L, M, O, P and R;

.2 Pier no 2 – Valves G, H, L, M, N, O, P, Q and R;

.3 Pier no 3 – Valves G, H, L, M, N, O, P, Q and R;

.4 Pier no 4 – Valves G, H, L, M, N, O, P, Q and R;

.5 Pier no 5 – Valves G, H, L, M, N, O, P, Q and R;

.6 Pier no 6 – Valves G, H, L, M, N, P and Q.

.3 Supply, installation, connection and commissioning of a 120/208 V, 100A, 3 phases, 4 wires, 60 Hz distribution panel, including the supply and installation of its wiring at level 3 (EL. 9'-0" / 2743.2) for the following piers:

.1 Pier no 1 – PD-120-1;

.2 Pier no 2 – PD-120-2;

.3 Pier no 3 – PD-120-3;

.4 Pier no 4 – PD-120-4;

.5 Pier no 5 – PD-120-5;

.6 Pier no 6 – PD-120-6;

.4 Replacement of the existing digital output card with 16 points (card no 3) into the Local Control Unit (LCU) at each piers from no 2 to 5 by a digital output card with 32 points, including the supply, connection, testing and commissioning of existing signals.

.5 Signal connection for the valves actuators C, D and E to the interface modulus (input and output) to each pier from no 2 to 6.

.6 Design, supply, installation, connection, testing and commissioning of the access control system for the two dam gates, including the access controller, cards readers, unlocking push-button stations, magnetic locking systems and positional contacts of the barriers and wiring.

.7 Design, supply, installation, connection, testing and commissioning of the video surveillance system for the sector gates and the Richelieu River (upstream dam), including camera, support and housing, recorder, vision station, communication network and wiring.

.8 Complete electrical supply and installation, including cable ducts and/or cable tray, wires, junction box, distribution panels (at level 3 for each pier), etc., related to the valves control and regulation system, as shown in drawings and specifications, and all electrical connections required for distribution panels and other controls.

.9 Programming and complete databases for existing modified system, including the upgrade of the Human Machine Interface (HMI) charts at the control station and CCM of each pier.

.10 Writing of the testing and commissioning procedure for all equipment and system include in this contract.

.11 Supply of the operation and maintenance manuals for all electrical equipment supplied by the Contractor and associated systems.

.4 Excluded work

.2 Electrical work exclude from this contract are :

.1 The main electrical input and all work associated with the emergency generator.

.2 The access control system and the video surveillance system for the access doors of the six piers.

.3 The routing of a high speed internet link between the lock master former residence and the dam control building.

.3 Fishway

.1 Civil Work

.1 The work covered by this contract shall include but not be limited to:

.1 Addition of walkways to facilitate the fishway access ;

.2 Replacement of access hatch for cleaning the observation window.

.2 Mechanical Work

.1 The work covered by this contract shall include but not be limited to:

.1 The supply, fabrication, transportation and installation of a maintenance bridge for the motorised hoist on rails.

.2 The supply, fabrication, transportation and installation of the structure used to extend the motorised hoist rail.

.3 The supply and installation of new anchors in valve V-3 guides:

.1 Work for the Valve V-3 includes doubling the number of anchors for the guides and the sill with Hilti HIT-RE 500 V3 chemical anchors. Since existing anchors are completely corroded or non-existent, the V-3 valve can't be exposed to hydrostatic pressure until the installation of the new anchors is completed. Some of the new anchors shall be installed under water by certified divers.

.2 Some anchors are localised under the diffusing grid. When the anchors located above the grid are installed, the fishway may be dewatered so the installation of the anchors under the grid can be completed. Access under the diffusing grid is possible through the access hatch located in front of the V-5 valve.

.3 The contractor shall provide a tensile test at 25 kN minimum to confirm proper installation of the new anchors. The tensile test shall be done at least 24 hours after the installation of the new anchors.

.4 Installation of the nuts and washers can be completed once the tensile test has demonstrated the effective installation of the new anchors.

.4 The dismantling and the disposal of the existing debris trap as shown in drawings.

.5 The supply, fabrication, transportation and installation of new debris trap upstream V-1 and V-2 valves.

.6 The supply of shop drawings for approval.

.7 The supply of welding procedure, work plan, inspection and test plan, inspection, testing and commissioning procedures, and product data for all products used for the manufacture and installation of equipment.

END OF SECTION

PART 1 - GENERAL

1.1 CONSTRUCTION CONSTRAINTS

.1 Several constraints will affect the realization of work.

So, realisation of work shall take into account:

.1 Access availability according to weather conditions;

.2 Spaces availability for sites facilities ;

.3 Environmental restrictions;

.4 Security constraints.

.5 Dam operation during the works.

1.2 N/A

1.3 CONTRACTOR SITE ACCESS

.1 If Contractor causes damage to roads and installations, Contractor is responsible to repair or replace at his own cost to the complete satisfaction of Parks Canada Agency.

1.4 SITE CLEANING AND MAINTENANCE AND ENVIRONMENT PROTECTION

.1 Keep the site clear of all material accumulations, scrap and waste and make a complete and final cleaning to the satisfaction of Parks Canada Agency.

.2 Contractor is responsible to move the waste and scrap to appropriate places.

1.5 WINTER CONDITIONS

.1 Snow removal of the site is the responsibility of the Contractor. Contractor is also responsible for all its accesses off the existing roads.

1.6 WEEKEND WORK

.1 If the Contractor plan any work on Saturdays, Sundays, statutory holidays or nights, he shall give a written notice to Parks Canada Agency at least five (5) business days before the work.

1.7 WORK BY OTHERS

.1 Co-operate with other Contractors.

1.8 SITE INSPECTION

.1 Starting the work completely or partially means that the Contractor accepts the existing conditions of the site. If the Contractor performs its work on defective surfaces or conditions, corrections or rework will be made at his own cost.

1.9 DYNAMITING

.1 No blasting work of any kind is allowed.

1.10 ENVIRONMENTAL RESTRICTIONS

.1 Environmental restrictions are defined in section 01 35 43 – Environmental Procedures.

.2 Work shall meet federal, provincial and local noise requirements.

1.11 LAND-SURVEYING

.1 It is the Contractor responsibility to characterize the various structures according to Departmental Representative drawings. He shall do a survey of the existing all around the work to validate the connection to the existing. He shall notify to the Departmental Representative and to Parks Canada Agency any unforeseen of anomaly detected. He shall plan the time required for a possible verification by the Departmental Representative.

.2 Before the final acceptance of the work, the Contractor shall provide survey plans of the final work (Final Drawings) on a computer media.

1.12 WORK SCHEDULE

.1 Construction work is allowed between 7h00 and 19h00, Monday to Friday.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Inspection and testing to be carried out by Departmental Representative.

1.2 APPOINTMENT AND PAYMENT

.1 Departmental Representative will appoint laboratory services for testing. Parks Canada Agency will pay for laboratory services except follows:

.1 Inspection and testing required by laws, ordinances, rules, regulations or order of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Mill tests and certificates of compliance.

.4 Tests specified to be carried out by Contractor under supervision of Departmental Representative.

.2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.3 CONTRACTOR'S RESPONSIBILITIES

.1 Provide labour, equipment and facilities to :

.1 Provide access to Work for inspection and testing.

.2 Facilitate inspections and testing.

.3 Make good Work disturbed by inspection and test.

.4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

.2 Notify Departmental Representative 48 hours minimum sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.3 Where materials are specified to be tested, deliver representative sample in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 ADMINISTRATIVE

.1 Schedule project meetings throughout the progress of the work at the call of Departmental Representative who will manage them. Meetings will be scheduled with a maximal frequency of two weeks, as required by Departmental Representative. Meetings will be held in Saint-Ours in Contractor's facilities.

.2 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act, if required, on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

.1 Whitin 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Departmental Representative, Contractor and any other parties deemed required by Departmental Representative will be in attendance.

.3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.

.4 Agenda to include :

.1 Appointment of official representative of participants in the Work.

.2 Schedule of Work: in accordance with Section 01 32 16.07 – Construction Progress Schedules - Bar (GANTT) Chart.

.3 Schedule of submission of shop drawings, samples, and colour chips. Submit submittals in accordance with Section 01 33 00 – Submittal procedures.

.4 Requirements for temporary facilities, site sign, offices, storage shed, utilities, fences in accordance with section 01 52 00 – Construction Facilities.

.5 Site security in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

.6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.7 Record drawings in accordance with Section 01 33 00 – Submittal Procedures.

.8 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 – Closeout Submittals.

.9 Monthly progress claims, administrative procedures, photographs, hold backs.

.10 Appointment of inspection and testing agencies or firms.

.11 Insurances, transcript of policies.

1.3 PROGRESS MEETINGS

.1 Meetings will be held every two (2) weeks or as required by Departmental Representative.

.2 Agenda to include the following :

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Fields observations, problems and conflicts.

.4 Problems which impede construction schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain projected schedule.

.7 Revision of construction schedule.

.8 Revision of progress schedule, during succeeding work period.

.9 Review submittal schedules: expedite as required.

.10 Maintenance of quality standards.

.11 Review proposed changes for effect on construction schedule and on completion date.

.12 Other.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements
Construction Progress Schedule – Bar Chart (GANTT)
Section 01 32 16.07

PART 1 - GENERAL

1.1 DEFINITIONS

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GRANTT) Chart submission.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.6 Master Plan: summary-level schedule that identifies major activities and key milestones.

.7 Milestone: significant event in project, usually completion of major deliverable.

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Limit activity durations to maximum of approximately ten (10) working days, to allow for progress reporting.

.4 Ensure that it is understood that Award of Contract or beginning time, rate of progress, Interim Certificate and Final Certificates as defined times of completion are of essence of this contract.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Maximum ten (10) working days after contract award, provide to Departmental Representative a Bar Chart (GANTT Chart) that would serve as master plan and will be used for planning and monitoring Work and for progress reports.

1.4 PROJECT MILESTONES

.1 Project milestones from interim targets for Project Schedule.

.1 Project granting ;

.2 Start of Work (mobilization) ;

.3 End of Work and provisional acceptance ;

.4 Final acceptance.

1.5 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 Departmental Representative will review and return revised schedules within five (5) working days.

.3 Revise impractical schedule and resubmit within five (5) working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows :

.1 Award.

.2 Shop Drawings, Samples.

.3 Permits.

.4 Mobilization.

.5 Excavation.

.6 Backfill.

.7 Supplied equipment long delivery items.

1.7 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basin reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.8 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Weather related delays with their remedial measures will be discussed and negotiated.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

General Requirements – Submittal Procedures
Section 01 33 00

PART 1 - GENERAL

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in time is not considered a valid reason for extension of Contract Time and no claim for extension with such reason will be allowed.

.2 Do not proceed with Work where submittals are required until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.5 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents and stating reasons for deviations.

.6 Verify field measurements related to adjacent structures affected by Work.

.7 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.9 Keep one reviewed copy of each submission on site.

.10 Submitted document shall include a transmittal letter containing:

- .1 Date;
- .2 Project number and title;
- .3 Contractor’s name and adress;
- .4 Title and quantity of each submitted document;
- .5 Any other pertinent data.

.11 Submit required data sheets compliant with the Workplace Hazardous Materials Information System (WHMIS).

1.2 DOCUMENTS REQUIRED FROM CONTRACTOR

.1 Documents to be submitted are defined but not limited to in Appendix A.

1.3 CERTIFICATES AND TRANSCRIPTS

.1 Submit to Departmental Representative documents required by authorities having jurisdiction for the protection of workers in the case of a work accident immediately after contract award.

1.4 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Quality: Shop drawings will be provided by Email as an original electronic PDF format. No shop drawing will be accepted as a fax for clarity purpose.

.3 Submit drawings stamped and signed by professional engineer registered or licensed in Quebec, Canada

.4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Accompany submissions with transmittal letter, (Appendix B) , containing :

.1 Date and revision dates.

.2 Project title and number.

.3 Name and address of Contractor, Subcontractor, Supplier and Manufacturer

.4 Identification and quantity of each shop drawing, product data and sample.

.5 Other pertinent data.

.7 Contractor is responsible for the reproduction of the «Shop Drawings Presentation Sheet » and shop drawings in sufficient quantities for all subcontractors and suppliers, an additional copy for the Departmental Representative and copies for operation and maintenance books.

.8 No shop drawing will be verified if not submit in accordance with described procedure.

.9 Before submitting shop drawings to Departmental Representative, Contractor shall :

.1 Number each page;

.2 Point out all equipment and/or accessories include in shop drawings;

.3 Verify shop drawings are in accordance with plans and specifications for quality, specifications and space requirements.

.10 Departmental Representative will have ten (10) business days for the verification of shop drawings from the day of receipt.

.11 Verification of shop drawings by the Departmental Representative is an intermediate step of quality control and can not constitute an order of change to the Contract Documents.

.1 Departmental Representative will verify the drawings submitted by the Contractor in accordance with the general layout of the equipment. Examination of this document does not relieve the Contractor or the supplier of their responsibility for the accuracy of this document or its conformity with the contractual documents and the site conditions in any way. Annotations made by the Departmental Representative on the drawings are not exhaustive.

.12 Annotations on the Departmental Representative verification stamp are :

.1 « FINAL, NO FURTHER RESUBMITTAL » means Contractor may proceed as per its drawing, no modification is required;

.2 « FOR INFORMATION ONLY » means document is for informational purpose only;

.3 « SUITABLE, START FABRICATION, RESUBMIT CERTIFIED REPRODUCIBLE » means Contractor may proceed as per its drawings by incorporating annotations added by Departmental Representative, resubmit document in accordance with the execution;

.4 « MODIFY AS NOTED, COMMENCE FABRICATION AND RESUBMIT » means Contractor may proceed as per its drawing if modified as per Departmental Representative comments, resubmit drawing in accordance with comments added by Departmental Representative;

.5 « MODIFY AS NOTED, RESUBMIT BEFORE FABRICATION » means information contained in the drawing or the drawing itself is incomplete, illegible, etc., and this information does not allow Departmental Representative to make a judgment on compliance with drawings and specifications. In such case, Departmental Representative may indicate the points to be specified or completed by Contractor before resubmitting;

.6 « NOT SUITABLE, RESUBMIT BEFORE FABRICATION » means drawings concern materials or works not conform to drawings and specifications. In such case, Contractor shall submit another drawing to Departmental Representative.

.13 Make changes requested by Departmental Representative to shop drawings in accordance with Contract Documents requirements. When resubmitting, notice Departmental Representative in writing of changes made in addition of those required.

.14 Submit electronic one (1) copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of.

.15 Keep one (1) annotated copy of Appendix B « Shop Drawings – Presentation Sheet » and shop drawing on site and ensure its availability for future reference use.

.16 Submit [1] electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within three [3] years of date of contract award for project.

.17 Submit [1] electronic copy of certificates for requirements requested in specification Sections and as requested by [Departmental Representative.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.18 Submit [1] electronic copy of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.19 Submit [1] electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.

.20 Submit documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.21 Submit [1] electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

.22 Delete information not applicable to project.

.23 Supplement standard information to provide details applicable to project.

.24 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed

.25 The review of shop drawings by the Departmental Representative is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

.26 Upon receipt of the Parks Canada Agency intent letter, Contractor selected will have thirty (30) business days to provide all shop drawings for approval.

1.5 SAMPLES

.1 Contractor submits standard samples of manufacturers that Departmental Representative can require for the approval by Departmental Representative. Samples shall have a label indicating their origin and the purpose for which they are intended for the work and conform to the requirements of the contract documents

.2 Contractor provides specified samples of complex and dimensioned products.

.3 No order, purchase or products/materials production shall take place before written approval of the samples required in the specifications has been received.

.4 Products and works are similar to approved samples.

1.6 MIXTURES' DOSING AND TESTING

.1 Provide results of the mixtures' tests and dosage that may be requested by Departmental Representative to the Departmental Representative.

.2 No concrete pouring of paving will be authorized before proving the perfect conformity of the materials.

1.7 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic and hard copy of colour digital photography, fine resolution monthly with progress statement as directed by Departmental Representative.

.2 Project identification: name and number of project and date of exposure indicated.

1.8 FINAL DRAWINGS

.1 Documents to keep on Site :

.1 Provide one (1) set of drawings and indicate all changes made during the work.

.2 Report information every week noted on the copy of the reproducible drawings so that they show as it is actually installed.

.3 Use Parks Canada Agency specifications for drawings.

.4 Keep these drawings on site and make available for reference and verification.

.2 Final Drawings

.1 Before starting testing, system balances and adjustments, complete as-built drawings.

.2 Identify each drawing in the lower right corner, with letter at least 12 mm high, as follow : FINAL DRAWINGS : THIS DRAWING HAS BEEN REVISED AND INDICATES THE WORK AS BUILT [(Contractor signature)(Date)].

.3 Submit drawings for approval to Departmental Representative and make required corrections.

.4 Submit reproducible copies, complete as-built drawings with Operation and Maintenance Manual.

.5 Submit one copy of each as-built drawing and add to final testing, balancing and adjustment report.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END SECTION

PART 1 – DOCUMENTS REQUIRED AT THE BEGINING OF THE WORK

.1 These requirements must be completed before the mobilization :

- .1 Performance bond;
- .2 Bonding for liabilities, equipment and services;
- .3 Insurance certificate;
- .4 List of subcontractors and their contact information;
- .5 List of suppliers with addresses and contact information;
- .6 List of machinery to be used;
- .7 List of hourly rate for labour and machinery;
- .8 List of workers assigned to the project and their contact information;
- .9 Work schedule;
- .10 Health and Safety Plan;
- .11 Notice of opening of a construction site to CNESST;
- .12 RBQ valid licence for each subcontractor;
- .13 Localization copy from Info-Excavation for public utilities;
- .14 Health and safety prevention program;
- .15 Traffic plan;
- .16 List of emergency contact with phone number (traffic, environment, accidents, etc.);
- .17 Identify an emergency contact available 24 hours a day and 7 days a week ;
- .18 A copy of rights of way agreement for private areas (if required);
- .19 Environment protection plan (see template in appendix D);
- .20 A copy of the ISO 9001 registration for the paving plant.

PART 2 – DOCUMENTS REQUIRED DURING THE WORK UNTIL PROVISIONAL ACCEPTANCE

.1 These requirements must be completed before the provisional acceptance (essential prerequisite) in order to obtain the provisional approval with deductions:

- .1 Shop drawings list;
- .2 Shop drawings;
- .3 Test reports (by example leak testing of septic tank);
- .4 Manufacturers' instructions;
- .5 Tests and factory inspection reports;
- .6 Test and in situ verification plan;
- .7 Test reports;
- .8 Commissioning plan;
- .9 Operation manual;
- .10 Suppliers manual;
- .11 Final drawings;
- .12 Employee training plan;
- .13 Spare parts list;
- .14 Mixing formulas and data sheets required for concrete, bituminous concrete and bitumen;
- .15 Compliance certificates of materials;
- .16 Products data sheets;
- .17 Drawings of temporary work describing the recommended method for the construction/repairs of a permanent work.

PART 3 – DOCUMENTS REQUIRED FOR FINAL ACCEPTANCE

.1 These requirements must be completed for the final acceptance :

- .1 List of deficiencies fully completed and signed by the Departmental Representative.

END OF APPENDIX A

General Requirements – Submittal Procedures
Section 01 33 00
Appendix B – Shop Drawings – Presentation Sheet

CONTRACTOR:	
Supervisor :	
Phone: ( )	Email :

SUBCONTRACTOR: Address:	
Supervisor :	
Phone: ( )	Email :

SPECIALITY (discipline):	
Shop Drawing n° :	**Number of pages :**
Delivery Time (after verification):	
SHOP DRAWING DESCRIPTION:	
Drawing Reference:	
Technical Specification's Reference : Section : Article : Page :	

SUPPLIER: Adress:	
Supervisor :	
Phone: ( )	Fax: ( )
SUBMITTED PRODUCT :	**DRAWING ISSUED FOR:**

☐ As built ☐ Equivalent ☐ Substitution	☐ Verification ☐ Information ☐ Coordination ☐ Other:

REVISION	**DATE**

NOTES:

COMPLIANCE VERIFICATION

Nature et étendue de la vérification

☐ Compliance with drawings and specifications
☐ Other :

This audit does not constitute in any way a detailed and complete verification of the design.

☐ Approved
☐ Correct as indicated
☐ Correct and Re-submit
☐ Refused

Signature ☐ Engineer ☐ Other _____ Date _____

Name _____ OIQ No. _____

Verification of this document is restricted to the nature and extent indicated. It does not relieve in any way the person or company that prepared it from its obligations.

PART 1 - GENERAL

1.1 TRAFFIC PROTECTION

.1 Comply with existing laws, rules and orders governing the traffic and the use of roads where work or material transportation is required.

.2 Build and maintain an access road to Site and to any other area indicated except if another access road authorized by Departmental Representative is available.

1.2 INFORMATION AND WARNING DEVICE

.1 Provide and install delineators, barricades and other warning device in accordance with the Work Area Traffic Control Manual.

.2 Install signs and other devices at locations recommended in the Work Area Traffic Control Manual.

.3 Before the start of Work, consult with the Departmental Representative to make a list of the signs and other devices required for the Work. If the Site situation changes, review the list to the satisfaction of the Departmental Representative.

.4 Maintain signalling devices as follow :

.1 Check signs every day to ensure they are readable, in good condition, at the right place and meets requirements. If required, clean, fix or replace signs to keep the clarity and reflectance.

.2 Remove or cover signs that don't apply to existing situations as they may vary day by day.

1.3 TRAFFIC CONTROL

.1 Provide a signalman whose training and equipment are in accordance with the Work Area Traffic Control Manual for the following situations :

.1 When public traffic have to bypass vehicles or equipment blocking the roadway wholly or partly.

.2 When temporary protection measures are required for installation or removal of signalling devices.

.3 When emergency protection measures are required due to the impossibility to obtain signalling devices quickly.

.4 In any case where other signalling devices do not provide a total protection to workers, equipment or public traffic.

.5 Public traffic cannot be stopped for more than 15 minutes because of the work.

.6 PCA vehicles shall have access to the Dam to ensure operation.

.7 Public shall have access during the following periods:

.1 May 19th to June 22nd

.1 Saturdays, Sundays and holidays from 10h to 16h.

.2 June 23rd to sptember 17th

.1 Thursdays to Mondays from 10h to 18h

.2 Tuesdays to Wednesdays from 15h to 18h

.3 September 18th to October 8th

.1 Saturdays, Sundays and holidays from 10h to 16h.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 CONTENT

.1 Contractor shall manage its activities so that the health and safety of the public and of the site workers and the environmental protection always take precedence over cost and schedule issues. Works.

1.2 REFERENCE STANDARDS

.1 Latest available revision of the following documents shall be used :

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Canadian Standards Association (CSA)

.3 An Act Respecting Occupational Health and Safety, R.S.Q., c.S-2.1. (2002)

.4 Safety Code for the Construction Industry, S-2.1, r.6 (2001)

.5 Any other law or rule for health and safety that would be applicable depending on the company status or the context of the Work.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit to Departmental Representative a site-specific construction prevention plan in accordance with article 1.9 - Health and Safety Management of this Section at least ten (10) days before starting the work. Contractor shall update its prevention plan if the work differs from projections. Departmental Representative may, after receiving the plan or at any time during the work, require that the plan be amended or supplemented to better reflect the Site reality. Contractor shall then make the necessary corrections to the plan before the work begins.

.3 Submit to Departmental Representative a Site inspection chart completed to the frequency indicated at article 1.13 – Site Inspection and Dangerous Situations Corrections of this Section.

.4 Submit to Departmental Representative within 24 hours, a copy of any inspection report, correction or recommendation notice issued by federal or provincial inspectors.

.5 Submit to Departmental Representative within 24 hours, an investigation report for any accident involving injury and any incident highlighting potential risk.

.6 Submit to Departmental Representative identification sheets of all controlled products used on site at least three (3) days before using the products.

.7 Submit to Departmental Representative all training certificate required to meet the requirement of the Prevention Plan, in particular:

.1 Workplace and Corporate First Aid Courses and Cardiopulmonary resuscitation ;

.2 Enclosed space work;

.3 Lockout procedures;

.4 Personal protective equipment;

.5 And any other training required by law or prevention plan.

.8 Medical Examinations : when medical examinations are required by law, rule or to meet the prevention plan, Contractor shall:

.1 Submit to Departmental Representative the medical examination certificate for its supervisory staff and employees who will be present at the beginning of the work;

.2 Then, submit as soon as possible, medical examination certificate for any newcomer to the site.

.9 Emergency Plan: emergency plan shall be submit to Departmental Representative with the prevention plan as specified in article 1.9 – Health and Safety Management.

.10 Work Permit: Contractor shall obtain all municipal, provincial and federal permits required in accordance with the Contract requirements. A copy of the permit application shall be sent to Departmental Representative without delay.

.11 Plans and Statements of Conformity: Submit to Departmental Representative a signed and sealed by an engineer, working methods, drawings and statements of conformity for the following situation:

.1 Any modification to an equipment or machinery part that has not been authorized in writing by the supplier. A copy of these documents shall be available at all times at site.

1.4 SAFETY ASSESSMENT

.1 Identify all dangers related to any stages of the Work.

.2 Plan and organize the work to reduce on-site health hazards or collective protection and so, mitigate the need for personal protective equipment. When personal fall protection is required, workers shall use a safety harness in accordance with CSA-Z-259.10-M980. A safety belt shall not be use as personal fall protection.

.3 Any equipment, tool or protective means that cannot be installed or uses without compromising health and safety of workers and public is inappropriate for the work to be performed.

.4 Any mechanical equipment shall be inspected before being on Site. Before using mechanical equipment, Contractor shall submit to Departmental Representative a conformity statement signed by a competent mechanic. At any time, the Departmental Representative can order to stop the equipment and required a second inspection performed by the specialist of its choice if he suspects a defaults or safety hazard.

1.5 MEETINGS

.1 A decision-making representative of the Contractor shall attend all meetings when health and safety on site is discussed.

.2 Not used.

1.6 REGULATORY REQUIREMENTS

.1 Comply with laws, rules and standards related to Work.

.2 Especially, Contractor shall include all measures related to marine environment work (rescue boats, life jackets, buoys, poles, etc.) in its working plan.

1.7 PROJECT/SITE CONDITIONS

.1 On Site, Contractor shall consider the following particular conditions:

.1 Risk related to transhipment, handling and boarding of floating equipment as well as manual work near operating hydraulic or cable-operated excavator during dredging.

.2 Risk related to potential offshore oil spillage and its containing operation.

.3 Risk of drowning

.1 For all work involving drowning risks, respect the following requirements:

.1 Comply with article 2.10.13 of the Safety Code for the construction industry.

.2 (a) Wear lifejacket or floating device in accordance with the following standard:

- Standard CAN/CGSB-65.7-M88 from the Canadian General Standards Board (CGSB) titled Life Jackets, inherently buoyant, standard type.
- Or for some exceptions, be accepted by Transport Canada

(b) Or be protected by a safety net of any fall protection device.

.3 Obtain and submit to Departmental Representative a compliance letter provided by Transport Canada for the approval of any boat (transport, rescue, inspection or other) before starting the work.

.4 Make sure that a lifeboat moored and in the water is available for each work station. If a lifeboat is accessible by land, it may serve several work station provided that distance between each workstation and the boat is less than 100m.

.5 Make sure that the boat has the required characteristics to accommodate people that may participate in the rescue operation.

.6 Make sure that the lifeboat is always available for workers in an emergency.

.7 Make sure that a qualified person is available to operate emergency equipment. This person shall have its Pleasure Craft Operator Card according to the length of the boat used.

.8 Establish written emergency procedure in which there is the following information and make sure that all workers concerned by these procedures have received appropriate training and information to apply them:

- Procedures descriptions including the responsibilities of these allowed on Site;
- Location of the emergency equipment.

.9 When the workstation is a pier, pond, wharf or any other similar structure, a ladder with at least two steps below water level shall be installed on the front of the structure, every 60m. This applies even for a construction project. In this situation, a temporary (or portable) ladder can be used and removed at the end of the work if the owner does not have the basic facilities.

1.8 HEALTH AND SAFETY MANAGEMENT

.1 Accept and assume all duties and responsibilities assigned to the project owner and employer under applicable health and safety laws and rules.

.2 Develop a site-specific prevention plan based on risk identification and implement this program from the beginning to the final stage of demobilization of the work. The prevention plan shall consider all information given in article 1.8- Project/Site Conditions. This plan shall be given to all concerned people in accordance with Article 1.4-Submittal Procedures. This prevention plan shall include, at least:

.1 Company's health and safety policy;

.2 Work description, schedule an expected staffing curve;

.3 Organisation health and safety responsibilities chart;

.4 Physical and material disposition plan of the Site;

.5 First aid standards;

.6 Risk identification related to Site;

.7 Risk identification related to tasks performed, including preventives measures and implementation methods ;

.8 Training required ;

.9 Accident/injury procedure;

.10 Written commitment to respect this prevention plan from every concerned people ;

.11 A Site inspection grid based on the preventive measures included in the prevention plan.

.3 Develop an effective emergency plan, related to characteristics and constraints of the Site. The emergency plan shall be given to all concerned, in accordance with Article 1.4-Submittal Procedures. The plan shall include:

.1 Evacuation procedure;

.2 Ressources identification (police, firefighters, ambulances, etc.);

.3 People in charge of the Site;

.4 First-aid worker identification;

.5 Training required for the responsible people ;

.6 And any other information that may be required because of the Site characteristics.

1.9 RESPONSIBILITIES

.1 No matter the size of the Site or the quantity of workers, Contractor shall refer a competent person as supervisor and health and safety responsible. Take all measures required to ensure health and safety of people and property on the Site that may be affected by some work.

.2 Take all required measures to ensure effective implementation and enforcement regarding health and safety requirements in contract documents, federal or provincial rules, standards and site-specific prevention plan. Comply with all orders or correction notice issued by an inspector without delay.

.3 Take all measures required to keep work area clean and tidy during the work.

1.10 COMMUNICATION AND DISPLAY

.1 Make all arrangements required to ensure effective communication of health and safety information on Site. As soon as they are on Site, all workers shall be informed about the particularities of the prevention plan, their obligations and their rights. Contractor shall insist on the right of all workers to refuse to perform work if they believe that this work may compromise their or other health, safety or physical integrity. Contractor shall keep a register with the information transmitted and the signature of all workers who received this information on Site.

.2 Following information and document shall be displayed in an easily accessible place :

.1 Project owner identification.

.2 Company health and safety policy.

.3 Site-specific prevention plan.

.4 Emergency plan.

.5 Data sheets for all controlled products used at Site.

.6 Minute of workplace committee meetings.

.7 Names of representatives on Site committee.

.8 First-aid workers names.

.9 Intervention and correction reports issued by inspectors.

1.11 UNFORESEEN

.1 When a hazard situation not specified in the specifications and not identifiable during the preliminary inspection of Site appears by the fact of during execution of work, Contractor shall stop work immediately, implement temporary protection measures for workers and for the public and notify the Departmental Representative by writing. Contractor shall make the required modification to the Prevention plan so that the work stays safe.

1.12 SITE INSPECTION AND DANGEROUS SITUATIONS CORRECTIONS

.1 Inspect Site and complete site inspection schedule at least once a week.

.2 Take, without delay, all required measures to correct exceptions to the laws, regulations and hazardous situations identified by the Departmental Representative, the Parks Canada Agency's health and safety co-ordinator, or during periodic inspections.

.3 Submit to Departmental Representative written confirmation of all measures taken to correct the exemptions and hazardous situations.

.4 Stopping Work: Contractor shall designate a person hired solely for the health and safety aspect. The application of this person shall be approved by the Departmental Representative. Grant to the person authorized by the Contractor to take care of health and safety, all the authority necessary to order the stoppage and resumption of work, when it deems it necessary or desirable to health and safety reasons. It will ensure that the health and safety of the public and site workers and the protection of the environment always take precedence over cost and schedule issues. Without limiting the scope of the section "Management of Health and Safety" and the section "Accountability", the Departmental Representative or any person authorized by the Parks Canada Agency to deal with the management or project supervision may, at any time, order the work to be stopped if, in its opinion, there is a danger or risk to the health or safety of the site workers or the public to the environment.

1.13 BLASTING

.1 Blasting or other use of explosives is not permitted.

1.14 SAFETY MEASURES

.1 Recruit reliable security staff to ensure the supervision of the Site, materials and equipment after working hours and during holiday at Contractor's cost.

1.15 APPROVAL STAFF

.1 Not used.

1.16 SAFETY REQUIREMENTS

.1 Protective Equipment

.1 All site workers shall wear approved helmet and safety shoes, safety vest and glasses all the time.

.2 All visitors shall wear approved helmet and safety shoes, safety vest and glasses all the time.

.3 All other personal protective equipment is required depending on the type of work. Strict compliance with security standards as per rule s-2.1, r6.

.2 Prohibitions on Site

.1 Walkman, radio ;

.2 Alcohol, drugs (or under the influence of…);

.3 Tobacco ;

.4 Gum ;

.5 Games ;

.6 Weapons ;

.7 Theft, vandalism ;

.8 Fight ;

.9 Construction light ;

.10 All other activities that may cause a risk to persons or goods.

.11 Anyone who does not respect these prohibitions will be evicted from Site without further notice.

.3 Non-smoking Policy

.1 It is strictly **FORBIDDEN** to smoke on Parks Canada Agency Site.

.4 Guardrails, Temporary Openings and Dangerous Area

.1 Contractor is responsible to build, modify and replace all the fall protection (no deviation will be tolerate)

.2 Dangerous areas shall be identified with red or yellow band identified “Danger”. This procedure will be used indoor, that is a completely closed area with walls, floor and ceiling. For outdoor dangerous areas, Contractor shall identify the area with a yellow nylon rope with colored band properly tied every four (4) meters. These colour bands shall comply with the needs of the related work.

.3 All materials that may be blown away shall be sufficiently anchored to the ground or stored in closed container.

.5 Cleaning

.1 It is important to keep the Site clean all the time, to dispose waste daily and to hand hoses and extension cords. Contractor and subcontractor shall carry out a good cleaning once a week.

.6 Injuries and Accidents

.1 Contractor and each subcontractor shall appoint a first-aid worker before starting the work.

.2 Any accidents or near-accidents shall be stated to the immediate supervisor. The supervisor shall inform the Departmental Representative or the preventing officer designated by Parks Canada Agency.

.3 A first-aid kit is required in each Contractor’s trailer.

.7 Protect Traffic

.1 Contractor shall ensure that a signaling controller is available all the time to drive back dump trucs and any other delivery vehicle.

.8 Fire Protection

.1 Fire Protection Equipment. Contractor shall :

.1 Provide its own fire extinguisher of type ABC;

.2 Periodicly inspect its equipment;

.3 Provide fire extinguisher for each trailer and dredging equipment;

.4 Have the fire extinguisher pressure checked once a year.

.9 Enclosed space work

.1 Work and equipment comply with applicable codes and standards. Make sure that the Regulation Respectinf Occupational Health and Safety for enclosed space work is respected, especially articles 3.21.1, 3.21.2 and 3.21.3 of the Safety Code for the Construction Industry (RRQ, c S-2.1, r 4).

.2 Carry out contaminant concentration readings in access well. During reading, respirator selection is in accordance with CSA Z94.4.93.

.10 Environmental Protection

.1 Employers and workers shall comply with all rules, codes and laws promulgated by various government's level.

.2 Before mobilization, Contractor shall submit a complete list of contaminant to be used on site with their SIMDUT data sheets to Departmental Representative.

.3 Work shall be carry out in such way to prevent discharge of liquid or solid waste, fuel, lubricants or other on the ground or water according to laws and regulations.

.4 If a worker or any other person on site notices the presence of a contaminant on the ground, he must notify his immediate superior. Departmental Representative must be informed as soon as possible. A report received from an approved site for decontamination shall be provided to the Departmental Representative by the related contractor.

.5 Recovery, cleaning, and pumping of spills will be at Contractor's cost and to the satisfaction of Departmental Representative or its authorized representatives.

.6 See section 01 35 43 – Environmental Protection for more information.

.11 Temporary Markup

.1 All water structures and equipment must be marked during the work.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 FIRE DEPARTMENT BRIEFING

.1 Departmental Representative will take the required measures for the Fire Chief to forward the fire safety instructions to Contractor at the meeting prior to the start of the work.

1.2 REPORTING FIRES

.1 Know location of nearest fire alarm pull station and telephone, including emergency phone number.

.2 Report immediately fire incidents to Fire Department as follows:

.1 Phone.

.3 When reporting fire by telephone, give location of fire, name or number of building and be prepared to verify location.

1.3 FIRE PROTECTION SYSTEM

.1 Existing fire protection and alarm systems will not be:

.1 Obstructed;

.2 Shut off or disabled;

.3 Left inactive at end of each working day or shift without written authorization from Senior Fire Fighter.

.2 Use of fire hydrants, standpipes or hose systems for purposes other than firefighting unless authorized by Senior Fire Fighter, is prohibited.

1.4 FIRE EXTINGUISHERS

.1 Supply fire extinguishers, as scaled by Senior Fire Fighter, necessary to protect work in progress and contractor's physical plant on site.

1.5 OBSTRUCTION OF ROADS

.1 Notify the Fire Chief for any work that may interfere with the movement of fire fighting vehicles, deviation from the minimum clearances prescribed by the Fire Chief, installation of barricades and carrying out excavation work.

1.6 SMOKING PRECAUTIONS

.1 Obey posted signs and confine smoking only to designated smoking areas. Observe posted smoking restrictions near existing buildings

1.7 RUBBISH AND WASTE MATERIALS

.1 Keep rubbish and waste materials to a minimum.

.2 Burning of rubbish is prohibited.

.3 Waste removal:

.1 Remove rubbish from work site at end of each working day or shift or more frequently as directed.

.4 Storage:

.1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.

.2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and remove at end of each work day.

1.8 FLAMMABLE AND COMBUSTIBLE LIQUIDS

.1 Handle, store and use flammable and combustible liquids in accordance with National Fire Code of Canada).

.2 Store flammable and combustible liquids such as gasoline, kerosene and naphtha in quantities not exceeding 45 litres. Store in approved safety cans bearing Underwriters' Laboratory of Canada or Factory Mutual seal of approval. Obtain written authorization from Senior Fire Fighter for storage of quantities of flammable and combustible liquids exceeding 45 litres.

.3 Transfer of flammable or combustible liquids within buildings or on jetties is prohibited.

.4 Transfer of flammable or combustible liquids in vicinity of open flames or any type of heat-producing devices is prohibited.

.5 Use of flammable liquids having flash point below 38 degrees C such as naphtha or gasoline as solvents or cleaning agents is prohibited

.6 Keep on site the minimum quantity of flammable or combustible spent liquids; if required, store them in approved containers stored in a safe and well ventilated area. Send any request for evacuation of these products to the fire department.

1.9 HAZARDOUS SUBSTANCES

.1 Perform work involving the use of toxic or hazardous materials, chemicals or explosives, or otherwise creating hazard to life, safety or health, in accordance National Fire Code of Canada (NFC).

.2 Obtain a "Hot Works" permit from Senior Fire Fighter for hot works in construction area (welding or burning operations or the use of torches or heat-generating equipment).

.3 For work requiring the use of a heat source in areas where there is a risk of fire or explosion, ensure the presence of fire-safety officers equipped with appropriate extinguishing equipment. The Fire Chief will identify areas where there is a risk of fire or explosion and the safety measures to be taken in each case. It is the Contractor’s responsibility to retain the services of fire safety officers on the site, in accordance with the procedures previously established with the Chief of the Fire Department.

.4 Provide ventilation where flammable liquids, such as lacquers or urethanes are used. Eliminate sources of ignition. Provide written notification to the Senior Fire Fighter prior to starting work and immediately at completion of work.

1.10 QUESTIONS OR CLARIFICATION

.1 Direct questions or clarification on Fire Safety to Fire chief.

1.11 FIRE INSPECTION

.1 Co-ordinate site inspections by Senior Fire Fighter through Departmental Representative.

.2 Allow Senior Fire Fighter unrestricted access to work site.

.3 Co-operate with Senior Fire Fighter during routine fire safety inspection of work site.

.4 Immediately remedy unsafe fire situations observed by Senior Fire Fighter.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCE

.1 Definition

.1 Special Status Species: wildlife or flora species which are legally protected by the Act Respecting the Conservation and Development of Wildlife (Quebec) and/or Species at Risk Act (Canada).

.2 Exotic Invasive Species (EIS): species that are alien to the current ecosystem, but capable of reproducing and having the potential to have harmful effects on economy, environment, biodiversity or health (ex.: Warbler). In addition to plants, EIS include some animals, fungi and microorganisms.

.3 MSDEFACC: Ministry of Sustainable Development, Environment, and Fight against Climate Change.

.4 Environment Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.

.5 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Protection of soil, water, air, biological and cultural resources is covered by Environmental Protection, as well as the management of visual aesthetics, noise and vibration, solid, chemical, gaseous and liquid wasted, radiant energy, radioactive materials and other pollutants.

.2 Reference Standards

.1 Government of Quebec, Ministry of Sustainable Development, Environment, and Fight Against Climate Change

A. ENVIRONMENT QUALITY ACT (LRQ, ch. Q-2)

.1 Regulation respecting hazardous materials (Q-2, r. 32)

.2 Land Protection and Rehabilitation Regulation (Q-2, r. 37)

.3 Regulation respecting the burial of contaminated soils (Q-2, r. 18)

.4 Clean Air Regulation (Q-2, r. 4.1)

.5 Regulation respecting Solid Waste (Q-2, r. 13)

.6 Regulation respecting the Landfill and Incineration of Residual Materials (Q-2, r.19)

.7 Regulation respecting the Burial of Contaminated Soils (Q-2, r. 18)

.8 Regulation respecting Contaminated Soil Storage and Contaminated Soil Transfer Stations (Q-2, r. 46)

B. Quality Criteria for Surface Water (MSDEFACC, 2015)

C. Guide – Soil protection and rehabilitation of contaminated land, MSDEFACC, July 2016

.2 Government of Quebec, Minister for Forests, Wildlife and Parks.

A. ACT RESPECTING THE CONSERVATION AND DEVELOPMENT OF WILDLIFE (c. C-61.1)

B. Regulation respecting wildlife habitats (C-61.1, r.18)

.3 Government of Canada, Fisheries and Oceans Canada.

A. Canadian Environmental Protection Act (1999) (S.C. 1999, c. 33)

B. Migratory Birds Convention Act (S.C. 1994, c. 22)

C. Fisheries Act (R.S.C. (1985), Ch. F-14)

D. Transportation of Dangerous Goods Act (R.S.C. (1992), c. 34)

1.2 CONTRACTOR RESPONSIBILITIES

.1 Parks Canada Agency is taking steps to obtain environmental authorizations for planned work. Contractor shall comply with the requirements of the conditions associated with each environmental authorization.

.2 Work shall be performed to the satisfaction of the Parks Canada Agency or Departmental Representative for environment protection standards and regulations. Contractor shall comply with the environmental guidelines of this analysis and anticipate costs associated with these requirements.

.3 The Contractor shall ensure that the work complies with:

.1 The requirements of conditions associated with each environmental authorization.

.2 Laws and regulations of municipal, provincial and federal environmental authorities.

.3 Other standards and guidelines that may be established by the supervisor designated by Parks Canada Agency.

.4 The requirements set out in this specification.

.4 If work not planned in the environmental authorizations issued is required by Contractor, notify and obtain approval from Departmental Representative and obtain authorizations and permits required to carry out the work from required organizations. Anticipate and assume all fees and deadlines required for compliance with environmental requirements and permits.

.5 Contractor to preserve evidences to demonstrate the conformity of the Work.

1.3 NON-COMPLIANCE NOTICE

.1 A written non-compliance notice will be issued to the Contractor by the supervisor designated by the Parks Canada Agency whenever there is a finding of non-compliance with a federal, provincial or municipal law, regulation or permit, or any other element of the environmental protection plan to be implemented by the Contractor.

.2 Upon receipt of a non-compliance notice, Contractor shall propose corrective measures to Departmental Representative and implement them promptly with the approval of the Departmental Representative.

.3 Contractor shall wait for the written approval of Departmental Representative before proceeding with the implementation of the proposed measures.

.4 If required, Departmental Representative may stop work until satisfactory corrective action is taken.

.5 No additional time and no cost adjustment will be granted following the work stoppage.

PART 2 PREPARATION

2.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data (MSDS):

.1 Submit manufacturer's instructions, printed product literature and MSDS data sheets for hazardous materials used on Site. The data sheets shall indicate the characteristics of the products in compliance with Workplace Hazardous Materials Information System (WHMIS 2015).

.2 Environmental Protection and Emergency Plan:

.1 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan and Environmental Emergency Plan (including communication protocol) for review by Departmental Representative.

Plans shall include a complete review of known or potential environmental issues to resolve during construction.PCA’s emergency plan shall also be considered, as appropriate.

.3 Include in Emergency plan, as a minimum:

.1 Potential hazards.

.2 Protection measures.

.3 Procedures and actions to be taken and planned in response to an incident or a spill.

.4 Contact information of persons in charge.

.4 Include in Environmental Protection Plan, as a minimum:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.

.3 Names and qualifications of persons responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan to prevent erosion and sediment transport and to minimize risk of sedimentation of the waterway.

.6 Cutting and/or protection plan for plants. This plan shall be approved by Departmental Representative before starting excavation of deforestation work.

.7 IAS management plan including actions to be taken to prevent their introduction and/or disposal and disposal methods.

.8 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas (and maximum capacity), concrete washing areas (if required), structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.9 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.

.10 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

.11 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.12 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.

.13 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.14 Waste Water Management Plan identifying methods and procedures for management or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.

.15 If required, Contaminated Soil Management Plan to be submitted for approval by Departmental Representative before starting the Work. Complementary characterization may be required if the quality of the soils is not known precisely or in case of discover of potentially contaminated soil.

.16 Materials imported to Site shall come from authorized borrows pits and quarries, be clean and free from contaminants or undesirable species.

.17 Actions includes in the Environmental Protection Plan shall be sufficiently detailed to be in accordance with environmental issues and with construction and/or demolition work to be carried out.

2.2 USE OF THE LAND

.1 Notify Site users of work and work schedule.

.2 Co-ordinate with local stakeholders.

.3 Respect the work schedule of the municipal regulations.

.4 Display adequate ground and water signage for users.

.5 Do not interfere with recreational traffic and ensure workers' protection.

.6 No equipment, materials or debris shall be left in the waterway or obstruct navigation.

.7 Provide alternate routes and set up signage around the site for workers, pedestrians and vehicles.

.8 Limit the traffic of the machinery to predefined areas only.

.9 Leave the site in its original conditions at the end of the Work.

2.3 VEGETATION PROTECTION

.1 Plan the use of work zones already subjected to disturbance in order to minimize area of disturbance.

.2 Identify the boundaries of access roads and work areas in order to protect sensitive environment and preserve vegetation cover and prevent drainage or rejects to sensitive environment.

.3 No site clearing is planned during the works and deforestation is forbidden. However, in case this situation shall happen, measures shall be put in place after Departmental Representative approval and authorizations.

.4 Protect trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m minimum. If required, protect mature trees by establishing a 3m buffer zone around them. Encase trees with protective wood framework from grade level to height of 2 m minimum

.5 Carry out the removal of trees and shrubs outside the bird nesting period (between May 1st and August 15th). Shoreline deforestation is prohibited except for work planned and approved in environmental authorizations. If slaughter is to be done during this period of time, obtain a biologist's certification that no bird's nest is affected by the cut. Vegetative cover removal within 15m from the shoreline natural high water lines is forbidden in the exception of the works approved within the project and approved by Environmental authorities.

.6 Trees cannot be used as support in any cases.

.7 No herbicide is permitted near the waterway.

.8 Restore and revegetate the site at the end of Work includes re-establishing vegetation cover using a variety of fast-growing, low-maintenance, locally-adapted species to enhance vegetation. If seasons does not permit revegetation, banks will be temporary stabilized and erosion measures will be maintained. Revegetation will be done the following spring.

.9 During site restoration, erosion and sediment measures shall be put in place to permit soil stabilization in a permanent manner.

2.4 HISTORICAL/ARCHAEOLOGICAL CONTROL

.1 Provide historical, archaeological, cultural resources, biological resources, and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on project site: and identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.

.1 Contractor shall advise Departmental Representative 48h in advance of the works in order to plan archaeological surveillance.

.2 If project changes occur, excavation plans and other information shall be submitted by the Contractor for Departmental Representative approval.

.2 Where an archaeological remains (remnant of construction or development, object and fragment of object) is discover during excavations, Contractor shall suspend work in the immediate area of the discovery and notify the Departmental Representative, who will then take the necessary measures to protect and conserve the archeological remains. Work may continue in another area.

2.5 FISH HABITAT PROTECTION

Authorization under section 35 (1) of the Fisheries Act is required. This authorization will be obtained by Departmental Representative. Contractor shall take note of authorization and consequent requirements. Work shall be designed and planned to minimize the loss or disruption of aquatic habitat and the following measures shall be applied:

.1 Authorized permanent encroachment of fish habitat shall follow the directions outlined in the authorization.

.2 Temporary encroachments shall be minimized to avoid loss of fish habitat and shall be approved by the Departmental Representative.

.3 Work in the water shall be minimized. The use of a dry working method helps to minimize work in the water.

.4 Work in water should be planned outside periods of high water level, wind and rain, which can contribute to increase erosion and sedimentation.

.5 Work in the river shall be designed and planned to minimize disruption of aquatic habitat and to avoid sensitive spawning habitat.

.6 Temporary encroachment shall be minimized during the Work.

.7 Installation of temporary work shall be carried out according to the authorization.

.8 Construction materials used in a waterway shall be handled and used to prevent the release or leaching of substances that may be harmful to fish into water.

.9 An action plan shall be developed and implemented immediately in the case of a sediment release or spill of a deleterious substance, and keep on Site an emergency spill kit.

.10 Working area shall be clearly delineated from the water.

.11 No machinery and/or equipment movement is permitted directly in the water without the Departmental Representative authorization. Bank access method shall minimize the movement of machinery and include mitigation measures. This access method shall be approved by Departmental Representative.

2.6 EXOTIC INVASIVE SPECIES

.1 Machinery and equipment maintenance and cleaning shall be carried out before and after performing the Work to avoid colonization by Exotic Invasive Species (EIS), both terrestrial and aquatic.

.2 Cleaning of equipment that has been in contact with EIS shall be done 30m away of the river and areas suitable for seed germination.

.3 Banks and seagrass inspection for the various working zones shall be carried out before starting the work in order to identify the presence of EIS. Inspection shall be carried out after the end of the work (3 months deadlines or during the next growing season) to ensure that such species are not propagated. Corrective work could be requested from the Contractor if EIS are introduced into the environment.

PART 3 EXECUTION

3.1 SITE FACILITIES AND ACCESS

.1 Limit access to work site. Allow access to the Site to authorized persons only.

.2 Prioritize storage of construction materials on paved or concrete areas.

.3 Limit materials storage to predefined areas.

.4 Machinery can't be stored over tree root system in a 3m radius from the tree.

3.2 DRAINAGE

.1 Provide temporary drainage and pumping required to keep excavations and site free from water.

.2 Run off water into the workspace shall be confined, tested and treated, if required prior rejection into environment or sewer system

.3 Run off water into the workspace can be pumped on the ground to a vegetated area to allow suspended materials settling prior rejection into environment or sewer system.

.4 Ensure pumped water from work site into waterways, sewer or drainage systems is in accordance with surface water quality criteria of Ministry of Sustainable Development, Environment, and Fight Against Climate Change (MSDEFACC : Regulation respecting wildlife) for suspended materials, pH, C_{10}-C_{50}. Obtain authorization from Departmental Representative before proceeding with any release to the environment.

.5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

3.3 WILDLIFE PROTECTION

.1 Contractor shall comply with the requirements of the Environment Quality Act (RSQ, C.Q-2), the Act Respecting the Conservation and Development of Wildlife (RSQ. CéCé-61.1) and the Fisheries Act (RSC 1985, Chapter F14), in addition to complying with the requirements associated with each of the environmental authorizations for habitats and wildlife species to be protected (SNC-LAVALIN 2017[2]).

.2 Restriction

.1 Work is prohibited between March 31st and August 1st into the St-Ours Canal.

.2 Deforestation shall be carried out outside the breeding season of avian species (birds) and bats, which generally extends from April 10 to August 31 for the majority of species in the south of Quebec. Migratory bird species are protected, as well as their nest. Work during the breeding season involves the protection of nests and chicks until they have left the nest.

.3 If the Work have to be carried out during this period, an inventory shall be carried our prior to the planned activities that may have an impact on the nests (e.g. Deforestation). In the case of nesting discovery, and depending on the species listed, which would be protected under the Migratory Birds Convention Act, 1994, a protection zone may need to be established until the fledging of the chicks. Travel options could be considered after discussion with Environment and Climate Change Canada.

.4 Demolition and refurbishment works close to the bridge in the presence of bird nests is forbidden during nesting period. If Contractor wants to perform the works during this period, Contractor shall isolate area prior annual nesting period with nets, membranes or other appropriate means. Protection means shall prevent bird nesting in the work zone. Protection means shall be in place during all nesting period or until end of works.

.3 Water Withdrawal in the St-Ours Canal

.1 Water withdrawal in the St-Ours Canal is only authorized for the purpose of this project.

.2 Comply with the requirements for the pumping of water in fish habitat described in the Regulation respecting wildlife habitats (C-61.1, r 18). Contractor shall notify the Departmental Representative minimum 16 days before the scheduled start of pumping.

.3 If Contractor shall install a water intake, Contractor shall do it in accordance with the requirements of Fisheries and Oceans Canada: to install a fence to prevent the entrainment of fish. Measures related to the design and installations of fish screens at freshwater intakes are described on the Fisheries and Oceans Canada website.

.4 Minimize the daily volume of water pumped into the St-Ours Canal.

3.4 WORK ADJACENT TO OR IN WATERWAYS

.1 Work adjacent to waterways.

.1 Work adjacent to waterways shall be planned and carried out to prevent materials such as concrete, paint, primers, pickling abrasives, anti-rust solvents, degreasers, grout or any other chemical product to end up in the waterway.

.2 Erosion and sediment control measures shall be implemented until disturbed soils are permanently stabilized, suspended sediments are deposited in the bottom of the sedimentation pond, and reject water is clear. The maximum allowable release standard for suspended solids is 25 mg/L or 10% over background concentration.

.3 No debris, excavated materials or waste shall be released in the waterway. Any debris accidentally introduced into the aquatic environment shall be removed quickly to keep the water clean and free of contamination.

.4 Ensure that no deleterious substance is immersed or released in an aquatic environment or placed in a place that could contaminate the aquatic environment, as required by section 36 (3) of the Fisheries Act and section 5.1 of the Migratory Birds Convention Act, 1994.

.5 Provide debris collection measures during rehabilitation/demolition of the guardrails and anchorages of the dam, piers of the dam, the reconditioning of stop logs and cover of stop logs downstream of the dam, caisson works or other structures (e.g. footbridge, refurbishment of auxiliary system, replacement of access hatch, application of sealant around doors and panels, etc.) to prevent water from debris.

.6 Measures shall be provided to contain and recover debris before reaching the waterway. Pay attention to limit the movement of the particles in the body of water when removing the facilities.

.7 No piles, materials or equipment shall be stored in the aquatic environment and/or on the banks.

.2 Work in waterways.

.1 Contractor shall not carry out any work in the St-Ours Canal as well as in its riparian protection bands as defined in the Protection Policy for Lakeshores, Riverbanks, Littoral Zones and Floodplains, except for work specified in contract and approved in environmental authorizations.

.2 If Work is carried out in the water during the summer, measures implemented to drain a part of the waterway (e.g. temporary works) shall allow the free flow of water, both for the aquatic wildlife and for the recreational boating.

.3 All work in waterways shall be isolated from free water or stream to prevent the addition of sediments in the water.

.4 Minimize work in water.

.5 No borrow material to be taken from the waterway.

.6 No blasting in water is allowed.

.7 Underwater work required for the fishway rehabilitation shall follow the requirements of the authorization.

3.5 WORK AND MATERIAL CONTROL

.1 Soil, Materials and Sediment Control

.1 Contractor shall plan a drainage system for the work areas and provide stabilization measures at stacking sites to avoid runoff into the St-Ours Canal.

.2 Sediment barriers (barrier with geotextile or retaining strand) to be installed, but not limited to, at the following locations: at the bottom of slope, around the work area, parallel to waterways and around any piles of non-consolidated materials. Temporary non-consolidated material piles located within 30m of an aquatic environment and left in place for more than 24 hours shall be protected with a sediment barrier and cover with a geotextile to prevent sediment transportation in aquatic environment.

.2 Final management of sediments and contaminated soils

.1 Guidelines of the MSDEFACC Soil Protection and Contaminated Sites Rehabilitation Policy and the requirements of the Land Protection and Rehabilitation Regulation shall be respected during the storage and disposal of soils.

.2 Any discovery ok soil contamination (visual sign or smell) shall be reported immediately before proceeding with the work. Report any discovery of potential contaminated and uncharacterized material to Departmental Representative.

.3 If required, carry out a characterization of these soils prior to reusing or disposing. All requirements of this section shall be respected. When disposing soils and sediment off-site, a written admission proof (transport coupon indicating the nature of materials and their quantity) to an authorized MDDELCC site shall be submitted to the Departmental Representative.

.3 Water management

.1 Adapt work methods accordingly if a sudden increase in suspended particles occurs (e.g. Slowing down work, decreasing pumping rates, adding settling ponds, etc.).

3.6 CONCRETE WORK

.1 Carry out concrete work to comply with all special requirements of this site.

.2 Excess concrete and cement from concrete mixers shall be poured into sealed containers to facilitate their reuse or disposal. Concrete residue shall be managed with construction waste in an authorized disposal site.

.3 Concrete spill in work zones shall immediately be collected and disposed with construction wastes in an authorized disposal site.

.4 Washing water of concrete mixers shall be collected in a sealed basin arranged in such a way to avoid any leak into environment. Cleaning area shall be located more than 30 m from the waterway, within the boundaries of the site and shall be authorized by Departmental Representative. In case of impassability, cleaning area shall be impermeable and have the capacity to contain all washing water in case of spill or leaks. Work shall be carried out under the constant supervision of the Contractor.

.5 Washing water shall not be discharged directly into a waterway or on the ground. Washing water may be taken care of by the concrete supplier and brought back to the concrete plant for disposal. Otherwise, these waters shall be contained, sampled and treated (if applicable) to meet the surface water quality criteria of the MSDEFACC (protection of aquatic life - acute effect) prior to their release into environment, an evacuation or drainage system. In the event of leak into the storm water system or waterway, the concentration of TSS shall not exceed 25 mg/L or 10% increase over the background concentration.

3.7 EQUIPMENT, VEHICLES AND MACHINERY

.1 Traffic on Site

.1 The boundaries of the access road and work areas shall be clearly identified on Site. Machinery traffic shall be done within designated access roads and work areas, particularly within dry or dammed work areas in water environment as provided for in the environmental authorizations.

.2 It is forbidden to cross stream.

.3 Avoid movement of vehicles during strong rain when soils are saturated with water.

.4 Machinery and equipment traffic is strictly prohibited within the 15m protection strip of any waterway, unless provided for in environmental authorization or have previously obtained authorization from Departmental Representative.

.5 Contractor shall not leave equipment or machinery within 30 m of any waterway outside working hours or during prolonged site closures, unless not provided for in the environmental authorizations, or having obtained prior authorization from Departmental Representative. If not possible, soil protection measures shall be provided under the equipment or machinery for the entire period mentioned above (e.g. containment bins with a volume equivalent to at least 110% of the volume of the fuel tank of equipment or machinery).

.2 Machinery Fueling and Maintenance

.1 Machinery and equipment maintenance, refueling and cleaning or petroleum shall be carried out on a site designated for this purpose where there is no risk of soil and water contamination. This site shall be located more than 30 m from the St-Ours Canal. Otherwise, the surface of this site shall be impermeable and have the capacity to contain all hydrocarbons in case of spills or leaks. All these activities shall be carried out under constant surveillance.

.2 Mobile equipment oil changes are prohibited on site; only non-mobile equipment oil changes are permitted. When emptying non-mobile equipment, Contractor shall be equipped with a spill recovery device or a minimum soil protection (e.g. hydrophobic absorbent pads).

.3 Used oils shall be recovered, put in barrels, identified and disposed of with residual hazardous materials from a recycler authorized by the MSDEFACC

.4 Washing water of equipment shall not be discharged directly into a waterway, body of water or on the ground. These waters shall be tested and treated in such a way as to comply with the surface water quality criteria of MSDEFACC (Aquatic Life protection), for suspended solids, pH and C10 C50, before being discharged into the water. Contractor shall obtain authorization from Departmental Representative before proceeding with any release to the environment

.5 Equipment used shall be in good working order, clean and free of fuel, oil or grease leaks all the time. If not, they shall be immediately removed from Site. Machinery will be inspected and cleaned before starting the Work.

.6 Machinery used within 30m of waterway shall use vegetable or biodegradable hydraulic oil.

3.8 FIRES

.1 Fires and burning of rubbish on site is not permitted.

.2 Provide supervision, attendance and fire protection measures as directed.

3.9 AIR QUALITY PROTECTION

.1 No particle or dust emissions are tolerated on site above the standards established by the Clean Air Regulation (Q-2, r 4.1), that is dust that is visible to more than 2 m from the source.

.2 Contractor shall :

.1 Avoid idling any vehicle, equipment and machinery when not used.

.2 Avoid idiling of motors.

.3 Repair quickly equipment and machinery that produces excessive exhaust fumes emissions.

.4 Keep equipment pollution control system in good condition.

.3 Maintain temporary erosion and pollution control features installed under this Contract.

.4 Control emissions from equipment and plant in accordance with local authorities' emission requirements.

.5 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area. Provide temporary enclosures directed by Departmental Representative.

.6 For surface work preparation, if sandblasting is used:

.1 Treat sandblasting residue as a hazardous waste material as indicated in the hazardous waste material regulations. Put in place measures:

A. For the installation of a shelter and recuperation tarp in order to retain sandblasting and concrete particles. Shelter shall be waterproof to prevent wash-out in case of rain and shall have a catchment mechanism on the ground to prevent rejects in the river.

B. To capture the totality of sandblasting waste.

C. To store waste hermetically.

D. To dispose waste in MDDELCC authorized sites.

.2 Respect allowable concentration for silicate in abrasives as per regulations or use an abrasive with lower impact than silicate abrasive.

.7 Cover waste with tarp or geogrids to prevent wind from raising particles or debris. Remove dust from temporary road works.

3.10 PROTECTION AGAINST NOISE

.1 Contractor shall control sound levels at Site by the following measures :

.1 Machinery, equipment and any vehicles shall have functional silencers all the times.

.2 Slamming of the rear panels of dump trucks shall be avoided all the time.

.3 Promote the use of low noise level equipment.

.4 Install noise barrier for equipment generating a constant noise (ex.: generator, etc.) when work zones are close to a sensitive receptor.

3.11 HYDROCARBONS AND HAZARDOUS MATERIALS MANAGEMENT

.1 Petroleum products and all other hazardous materials shall be stored more than 30 m from any body of water. These pros shall be stored in dedicated and confined areas. The storage of hazardous materials shall comply with the requirements of the Regulation respecting hazardous materials (Q-2, r.32).

.2 Stationary equipment and machinery (generators, compressors, etc.) located on the shore or in dry work areas shall be equipped with oil recovery bins to prevent from leaks or spills (volume equivalent to at least 110% the fuel tank volume of the equipment or machinery). These bins shall be functional all the times.

.3 Provide data sheets for the products to be used, at least 48 hours before arriving at the site for review by Departmental Representative.

.4 Disposal of new hazardous materials is prohibited. Take back all unused hazardous materials in order to leave the site perfectly clean at the end of the Work.

.5 Hazardous residual materials shall be disposed in a Site authorized by MSDEFACC.

3.12 SPILLS AND ENVIRONMENTAL INCIDENTS PREVENTION

.1 Provide methods and facilities to avoid contamination of soil, water and atmosphere by harmful toxic substances and pollutants caused by the Work.

.2 Contractor shall be prepared to contain, clean and evacuate any spills or releases that may occur at the water and/or soil level; equipment and materials required to clean up spills or releases (kit) shall be readily available on Site.

.3 Immediately notify Departmental Representative for any environmental incident or spill and comply with the following:

.1 Check for leaks.

.2 Contain spilled material.

.3 Collect contaminants and contaminated materials.

.4 Prepare a detailed event report including the description and location of the incident, the spilled product and the quantity, date and time, and the name and phone number of the person who found the incident.

.5 For environmental incident, Contractor is responsible to communicate with the authorities quickly when becoming aware of the event. Contact Environment Canada Emergency Services (1-866-283-2333) and MSDEFACC Terrestrial Services (1-866-694-5454).

.6 For a marine source spill (e.g. from a barge), contact the Canadian Coast Guard (1-800-363-4735).

.4 Contractor is responsible for paying all costs related to decontamination and disposal of contaminated soil following a spill or leak of a contaminant arising directly or not from its activities. Dispose of these contaminated materials at a site authorized by MSDEFACC. Submit disposition evidence to Departmental Representative.

.5 It is forbidden to mix contaminated soils with clean soils or with less contaminated soils or material in order to dispose of them in a less restrictive way.

.6 Keep a sufficient number of emergency kits for the recovering of petroleum products on Site. Kit shall contain enough absorbent material to allow a quick and effective intervention, both in the water and across the waterway, as well as on the ground around the machinery involved. Kit shall include containment rods and related accessories (gloves, etc.) to deal with minor spills and containment, recovery and storage of soiled equipment and management of contaminated soils and equipment.

.7 Kits to be easily accessible all the time for quick response anywhere on the Site. Provide sufficient training to workers liable to use the kits. Provide the location of the kits on Site to Departmental Representative.

3.13 TEMPORARY SANITARY FACILITIES

.1 Contractor shall provide and maintain temporary sanitary facilities on site for workers and shall remove them upon completion of Work.

.2 Dispose of used water from temporary sanity facilities in accordance with the regulations in force and in a place authorized by the MSDEFACC. Provide disposition evidence to Departmental Representative.

3.14 DISPOSAL OF USED SNOW

.1 Snow from the clearing of work areas shall be disposed of at an authorized Site, in accordance with the Departmental Representative. No used snow can be disposed in the St-Ours Canal.

3.15 CLEANING

.1 Progress Cleaning

.1 Clean in accordance with Section 01 74 11 - Cleaning.

A. Leave Work area clean at end of each day.

B. Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

.2 Final Cleaning

.1 Upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

.3 Waste Management

.1 Separate waste materials in accordance with Section 017421- Construction/Demolition Waste Management and Disposal and Section 02 50 13– Management of Toxic Waste.

A. Remove recycling containers and bins from site and dispose of materials at appropriate facility. Provide the evidence of disposition in an area authorized by MSDEFACC to Departmental Representative.

PART 4 RESTORATION

4.1 SITE RESTORATION

.1 Restore the stream bed with the same profile and composition at the end of the Work. Comply with the requirements and recommendations made by the authorizations.

.2 Remove all sediment retention devices (sediment barriers, turbidity curtain, etc.) when work on shoreline is completed.

.3 Repair with turf patches grass surfaces damaged by Work.

.4 Cover with rip rap, peat moss or coconut mats all erodible surfaces. Only arable soil (topsoil) taken on site and set aside or certified seed free will be accepted.

.5 Restore Site to its original conditions at the end of the Work.

4.2 RESTORATION WORK

.1 Dismantle bank work areas.

.2 If bare surfaces can’t be stabilized quickly, provide temporary protective measures against soil erosion on the slope until final stabilization.

END OF SECTION

PART 1 - GENERAL

1.1 OBJECT

.1 This section provides information on the quality assurance program to be put in place by the Contractor, subcontractors and suppliers during the Work. This is not intended to replace the contractually requires a quality assurance program. It sets out the minimum quality activities to be performed by the Contractors, subcontractors and suppliers on site or at their facilities.

1.2 RESPONSIBILITIES

.1 Contractor is responsible for the application of the Quality Assurance Program.

.2 Contractor is responsible to ensure that subcontractors and suppliers implement the quality activities described in this section.

.3 Contractor, subcontractors and suppliers shall demonstrate the implementation of their quality assurance program and the conformity of their work with drawings and technical specifications during manufacture and construction.

.4 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.5 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.6 If contractor covers or permits to be covered Work that has been designated for special inspections, approvals or tests before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.7 Departmental Representative will part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.

1.3 INDEPENDENT TESTING AND INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by the Parks Canada Agency. Cost of such services will be borne by the Parks Canada Agency.

.2 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.3 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to the Parks Canada Agency. Pay costs for retesting and reinspection.

1.4 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

.1 Notify appropriate agency and Departmental Representative, within 3 working days, of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples

1.6 DOCUMENTS RELATED TO QUALITY

.1 Quality Manual

.1 Submit a Quality Manual to Departmental Representative for review and approval.

.2 If the Contractor has a Quality Assurance Program registered with an approved registrar, he shall submit a copy of its certificate and a copy of the table of contents instead of its entire manual.

.2 Quality Plan

.1 Submit a project specific quality plan to Departmental Representative for review and approval. See section 1.9 for more information on the content of the Quality Plan.

.2 Contractor is responsible for ensuring that subcontractors and supplier implement and respect their own quality assurance program.

.3 Inspection and Testing Plan (ITP)

.1 Before starting the Work, submit its ITP and those of subcontractors and suppliers for review and approval by the Departmental Representative. Contractor is responsible for the review and approval for the ITP of subcontractors and suppliers.

.2 Contractor is responsible for the implementation and respect of all quality activities described in its ITP.

.3 Contractor is responsible for ensuring that subcontractors and suppliers implement and respect their respective ITP.

.4 See Section 1.10 for more information on the preparation of ITP.

.4 Welding Procedures

.1 Submit work specific specifications of welding procedures for review and approval. The procedures require prior approval of the Departmental Representative and shall include all tests requires by the contract specification.

.5 Work Procedures

.1 Submit its work specific method and that of subcontractors and suppliers for review and approval. These procedures shall be in accordance with contractual specifications.

1.7 QUALITY ORGANIZATION

.1 Submit details for the quality organization intended to be set in place for the project.

.2 Don't replace key workers without notifying the Parks Canada Agency.

.3 Submit the organization chart of subcontractors and suppliers assigned to the project.

.4 All organization charts shall be added into the Contractor's Quality Plan (See section 1.9).

1.8 MANUFACTURING

.1 General

.1 Maintain on Site the quality assurance program approved by the Departmental Representative in accordance with:

.1 Contractor's Quality Manual (described in Section 1.6.1) and/or;

.2 Project specific Quality Plan described in Section 1.9 and/or;

.3 Project specific inspections and testing plan (ITP) described in Section 1.10 and/or;

.4 Construction and manufacturing activities described in subsections 1.8.1 to 1.8.9.

.2 Equipment Receipt

.1 Equipment provided by the Parks Canada Agency

.1 If the Parks Canada Agency provides materials or equipment for the Work, verify their condition before taking possession.

.2 Receipt of Materials purchased by the Contractor

.1 Contractor shall be able to demonstrate the conformity of all materials and equipment. These quality files shall be complete and available at Contractor, subcontractors and suppliers facilities.

.2 Perform a receiving inspection for each materials received on Site.

.3 Contractor, subcontractor and suppliers' Quality files shall provide the evidence that a receiving inspection has been performed and that conformity documents has been reviewed by the Contractor, which is materials analysis certificate and inspection reports, etc.

.4 Materials supplied by the Contractor shall be new. Identify the origin and source of materials. Refurbished materials are not acceptable.

.3 Non-Compliant Materials

.1 Identify non-compliant materials (labeled « hold » or « do not use ») and/or separate in an area / quarantine zone.

.3 Document Control

.1 Implement a document control system that controls the following activities:

.1 Ensure that only the latest revision of specifications, plans and procedures is accessible to the Contractor, subcontractor and suppliers' facilities.

.2 Identify as ''Out of Date'' kept obsolete revisions.

.3 Provide a functional distribution system for documents, drawings, procedures, reports, etc.

.4 Catalogue and store quality records in a controlled environment.

.4 Identification and Traceability

.1 Identification

.1 Contractor is responsible for ensuring that all materials and equipment incorporated in the works are identified and traceable until the completion of Work.

.2 Traceability

.1 It shall be possible to associate materials or equipment with documents establishing their conformity and their inspection status all the time.

.5 Measuring Equipment Calibration

.1 Contractor, subcontractors and suppliers shall maintain a control and recall system for calibrated measurements and tests equipment.

.2 Contractor, subcontractor and suppliers shall keep their equipment calibration certificate on Site.

.3 Contractor, subcontractor and suppliers shall store their measuring and test equipment in a safe and controlled place.

.6 Tests and Inspections

.1 Contractor, subcontractors and suppliers shall maintain an up-to-date list of its workers assigned to special processes and inspections for each discipline involved and their qualifications.

.2 Inspections and tests shall be performed in accordance with the technical specifications and the approved ITP.

.3 Contractor, subcontractors and suppliers shall implement a notification system so that the Departmental Representative can attend the tests prescribed in the technical specifications and identified in the ITP.

.7 Inspections

.1 Contractor shall be able to demonstrate inspections performed all the time during the Work.

.2 Inspections performed shall be verifiable in the Contractor's quality records. Depending on the discipline, monitor inspection levels using annotated drawings, computerized lists or databases.

.3 It shall be possible to check the inspections and testing's progress with references to reports all the time during Work.

.4 It shall be possible to demonstrate that all the work, inspections, tests and reports have been completed no matter the monitoring system used by the Contractor, subcontractors and suppliers.

.8 Final Acceptance

.1 After each manufacturing and construction stages, declare the complete and conforming parts, submit quality records and request for final acceptance by the Departmental Representative.

.2 Notify within a reasonable period of time the Departmental Representative for the request of the final acceptance as requested in Contract Documents.

.3 Upon receipt of the final acceptance request, Departmental Representative shall perform final inspection of materials and equipment prior issued an Inspection certificate.

.9 Quality Recordings

.1 Contractor, subcontractors and suppliers' quality records shall include, but not limited, the following documents :

.1 Inspections and Testing Plan (ITP) approved by Departmental Representative;

.2 Checklists;

.3 Relevant inspections and testing reports;

.4 Inspections and testing procedures;

.5 Materials analysis certificates;

.6 Conformity certificates;

.7 Non-conformity closing reports;

.8 Authorities with jurisdiction' statement;

.9 As built drawings;

.10 Welding procedures;

.11 Welding procedures qualifications record;

.12 List of welders and their qualification;

.13 Welding repair procedures;

.14 Approved deviations, if required.

1.9 QUALITY PLAN

.1 Quality Plan shall describe the organization, workers, quality assurance staffs, activities, responsibilities, resources, used documents and applicable quality procedures used to implement elements of the quality assurance program in accordance with standards and regulations applicable.

.2 Quality Plan shall include:

.1 Terms and definitions, including acronyms and abbreviations;

.2 Contractor's project team's organizational chart and quality assurance staffs with their qualifications and subcontractor and suppliers' organizational chart;

.3 Contractor, subcontractors and suppliers' scope of Work.

.4 Procedures and sections' reference's list of the Contractor's Quality Manual;

.5 Documents control;

.6 Measuring equipment calibration;

.7 Quality control records;

.8 Non-compliant materials control;

.9 Quality Manual reference's audit;

.10 Correctives actions applicable;

.11 Products' identification and traceability;

.12 Equipment's handling, storage, packaging, preservation and delivery;

.13 Specific exclusions not covered by the Quality Plan.

.3 « Quality Inspection Plan », « Inspections and Testing Plan (ITP) » and « Monitoring Plan » are synonymous and refer to the same type of documents.

1.10 INSPECTION AND TESTING PLAN (ITP)

.1 « Quality Inspection Plan », « Inspections and Testing Plan (ITP) » and « Monitoring Plan » are synonymous and refer to the same type of documents.

.2 This section defines the applicable instructions to Contractor for the preparation and issuance of inspection and testing plans for manufacturing, construction/installation or pre-operational verifications.

.3 This specification is intended for those who are responsible of quality on the project once applicable ITP have been submitted according to the contractual requirements.

.4 This specification includes a standard form that shall be used by quality control parties if their own ITP does not meet the requirements of these instructions.

.5 ITP review is based on the requirements of this document.

.6 Identification

.1 ITP code, including revision number and date.

.2 Identify the client, project, region and equipment tag number.

.3 Identify contract and component, work package, work, discipline or system where ITP applies.

.4 Identify the person in charge of Quality insurance and review in Contractor, subcontractors and suppliers facilities and on Site.

.5 Obtain signatures of the ITP verification and approval's responsible.

.6 Identify each page of the ITP (99 of 99).

.7 Elements and Work Steps

.1 This is normally based on the detailed work program. Specific details may be requested.

.8 Quality Control

.1 Identify quality review elements with their description for each step of the Work.

.9 Responsibilities

.1 Identify responsibilities position for quality review activities.

.10 Frequency

.1 Specify percentage, frequency or sampling applicable for quality review activities.

.11 Specification Reference

.1 Describe quality review activities with specific references, i.e. drawings, technical specification sections and/or applicable codes and specification as appropriate.

.12 Parameters and Characteristics

.1 Identify and list parameters and/or characteristics to be considered at quality review activities.

.13 Criteria and Tolerances

.1 Identify and list criterias and/or tolerances to be used for quality review activities acceptance.

.14 Procedures

.1 Identify and list procedures or instructions developed to control work performance or quality activities.

.15 Inspection Equipment

.1 Describe and identify equipment used to implement the measurement, inspection or testing. Provide a calibration proof.

.16 Checklists

.1 Information identified in paragraphs 1.10.3 to 1.10.10 above shall be incorporated into a list annexed to the ITP.

.17 Forms

.1 Identify forms to be used to record quality review results and joint forms to ITP. Results registered by Contractors include an inspection and test report.

.2 If the Contractor, subcontractors of supplier's forms and quality review procedures are not sufficient, the Departmental Representative can incorporate any required forms or quality review procedures in completion of the quality control program.

.18 Quality Recordings

.1 Identify type of inspections and tests reports to be submitted to Departmental Representative in batch or in part of the quality records in the ITP. Append the table of contents and the submission schedule for the quality register lots at the ITP.

.2 Contractor, subcontractors and suppliers shall keep records of all documents required to provide objective evidence, demonstrating and verifying compliance with the quality assurance requirements specified in the Contract Documents.

.3 Contractor is responsible for ensuring the security of these records throughout the contract period. Submit quality records to Departmental Representative within time and quantities specified in the Contract Documents.

.4 Unless otherwise agreed, original test certificates are required. If Contractor can't provide original test certificates for reasons accepted by Departmental Representative, certificate and reports copies will be accepted if they are individually certified as being copy of the original.

.5 No modifications or transcripts other than those authorized in this paragraph will be accepted. Certifier photocopies quality shall be sufficiently clear to allow scanning and photocopying; otherwise, they shall be subjected to non-acceptance. Transposing original datas is not acceptable.

.6 Tests and inspection documentation shall be provided with :

.1 Project number;

.2 Applicable tag number/part number;

.3 Project designation;

.19 Traceability

.1 General

.1 Complete definitions and contract compliance are detailed below.

.2 Total Traceability

.1 Full traceability is required for items requiring inspection certificate. Other items are to demonstrate the conformity of the Contract. For items required full traceability, Contractor, subcontractors and suppliers shall maintain a traceability system ensuring that all materials used can be identified towards manufacturer's original certificates. Contractor, subcontractors and suppliers shall take the following measures:

.1 Verify materials for compliance with specified requirements on receipt with manufacturer's original certificate.

.2 Identify (by permanent marking if possible) batches of materials, specification and grade details throughout the manufacturing.

.3 Keep equipment location record.

.4 Before applying the final treatment, compile an equipment location register to incorporate to into manufacturing data records:

- Construction records shall contain materials locations and manufacturer's original certificate.
- Maintain evidence record.

.3 Compliance with the Contract

.1 Maintain a traceability system so that the verification system can confirm compliance with the Contract requirements for items requiring compliance with Contract.

.2 Verify materials upon receipt in accordance with the Contract requirements. Maintain segregation and traceability of lots of all materials issued by batch (e.g. wires, welding consumables, etc.) until use.

.20 Quality Control Monitoring Activities

.1 Before starting the Work, quality control monitoring activities shall be identified during the ITP review and approval process.

.2 Choice of monitoring activities is based on the level of monitoring selected and requirements of the quality monitoring specifications.

.21 Review

.1 ITP and its appendices shall be reviewed and accepted by the Departmental Representative and/or the Parks Canada Agency's quality control monitoring before starting the Work.

.2 Inspection and test reports and road maps shall be prepared and reviewed by the Departmental Representative's quality control monitoring on an ongoing basis as the work progresses so the quality registration lots can be assembled before provisional acceptance.

.3 Les rapports d'inspection et d'essai, ainsi que les feuilles de route le cas échéant, doivent être préparés et revus par la surveillance du contrôle de la qualité du Représentant du Ministère sur une base continue durant que les travaux en question progressent de sorte que les lots d'enregistrement de la qualité peuvent être assemblés avant la réception provisoire.

.22 Typical ITP Forms

.1 A typical ITP form example will be provided by Departmental Representative at the beginning of the Work. Contractor may provide its own ITP

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 WORKSITE LOCATION

.1 The contractor shall provide his site facilities plan including:

.1 Areas available for work;

.2 Accesses;

.3 Authorized roadways;

.4 Spaces reserved for site and materials storage facilities and for the prefabricated construction elements;

.5 Authorized parking areas.

1.2 LIMIT OF RESPONSIBILITIES

.1 Contractor is responsible for :

.1 Site office;

.2 Premises for equipment storage;

.3 Outdoor storage for materials and equipment;

.4 Required access roads;

.5 Site toilets;

.6 Water for materials compaction and dust suppressant;

.7 Workers transportation;

.8 Workers and safety equipment on site;

.9 All loading/unloading work;

.10 Maintenance of access roads (summer cleaning, gravel road grafding and dust removal, snow removal);

.11 Debris disposal;

.12 Internet and phone links;

.13 Customs clearance if required;

.14 Construction fencing;

.15 Safe access for visitors to the National Historic Site;

.16 Lightning for night work.

1.3 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed locations and dimensions of areas to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.2 Identify areas which have to be graveled to prevent tracking of mud.

.3 Indicate required work areas or other staging areas.

.4 Clean, level and build the site facilities area.

.5 Provide construction facilities in order to execute work expeditiously.

.6 Remove and dispose from site all temporary material after use.

1.4 OFFICES

.1 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table. Submit office location to Departmental Representative for approval.

.2 Provide marked and fully stocked first-aid case in a readily available location.

.3 Subcontractors to provide their own offices as necessary. Direct location of these offices.

1.5 SERVICES

.1 Provide sufficient chemical toilets.

.2 Parks Canada does not supply any services (water, electricity or other).

1.6 PARKING ON SITE

.1 Parking is permitted on certain areas only and limited. Contractor shall supply number of places required for his need to Departmental Representative for approval.

.2 Provide and maintain suitable access roads to the site.

.3 Clean roadways where construction equipment has been used.

1.7 STORAGE AREA

.1 Storage is permitted in areas indicated in the drawings.

.2 Provide adequate and closed areas for the storage of Contractor’s equipment.

.3 Parks Canada Agency is not responsible for any theft of tools, equipment/materials. Contractor is responsible for securing its tools, equipment and materials.

1.8 CONSTRUCTION FENCING

.1 Provide construction fencing around work areas and site installation.

1.9 CONSTRUCTION SIGNAGE

.1 Construction signs are permitted on construction trailers only. Dimensions and position shall be approved by Parks Canada Agency.

1.10 LIGHTING SYSTEM FOR NIGHT WORK

.1 Provide and install lighting system for night works.

1.11 CONSTRUCTION SIGNAGE

.1 Install and maintain adequate and safe signage to indicate detours, bypasses and hazards caused by the Work.

.2 Maintain the signage in place throughout the Work according to safety codes in force and to the satisfaction of the Parks Canada Agency. If the signage is considered as inadequate or poorly maintained per Parks Canada Agency, costs to restore signage will be deducted directly from the amount owing to Contractor.

1.12 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

.4 Protect travelling public from damage to person and property.

.5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.7 Construct access and haul roads necessary.

.8 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.9 Dust control: adequate to ensure safe operation at all times.

.10 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.

.11 Provide snow removal during period of Work.

.12 Remove, upon completion of work, haul roads designated by Departmental Representative.

1.13 PEDESTRIAN AND CYCLING PROTECTION

.1 Maintain and protect pedestrian and cycling traffic on affected tracks during construction unless otherwise specified by Departmental Representative.

1.14 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Stack stored new or salvaged material not in construction facilities.

.5 Provide snow removal of haul and temporary roads if required.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Temporary Barriers and Enclosures
Section 01 56 00

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

1.2 REFERENCE STANDARDS

.1 Canadian General Standards Board (CGSB)

.1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 CSA Group (CSA)

.1 CSA-O121-M1978 (R2003), Douglas Fir Plywood.

1.3 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.4 PUBLIC TRAFFIC FLOW

.1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

.2 Provide a copy of the certificate of the Signal Flag Operator course for all signal flag operator.

1.5 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.6 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 For the bid, consider that paved areas (parking) and unpaved areas do not have the capacity to support construction loads (dump truck, wheel loaders, construction equipment, etc.).

.2 During the Work, protect all paved and unpaved areas. Return all paved and unpaved areas damaged by work in the same conditions it was at Contractor's cost. Traffic plans, protection and restoration methods shall be submitted to the Departmental Representative for approval before the beginning of the Work.

.3 Protect surrounding public and private areas from any damages resulting from the Work.

.4 Assume full responsibility for damages.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

2.1 FENCES

.1 Erect a temporary fence composed of a new fence, type Omega 1.8m high, attached with wire to T shaped posts installed at 2.4m center to center. Provide at least one lockable access barrier for trucks. Install fences around trees and plants to protect them from damages that may be caused by equipment or materials.

PART 3 - EXECUTION

3.1 MATERIAL INSTALLATION AND REMOVAL

.1 Provide and install all temporary protection and access work required to finish the work as quickly as possible.

.2 Dismantle and dispose equipment when no longer needed.

END OF SECTION

PART 1 - GENERAL

1.1 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

1.2 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.3 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction Departmental Representative.

.9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates

1.4 DELIVERY

.1 Pay delivery costs of products required.

.2 Unload, handle and store such products.

1.5 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.6 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.7 CO-ORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.8 CONCEALMENT

.1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

1.9 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.10 LOCATION OF FIXTURES

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform Departmental Representative of conflicting installation. Install as directed

1.11 PROGRESS WORK PROTECTION

.1 Do not overload any part of the structure.

1.12 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 QUALIFICATION OF SURVEYOR

.1 Qualified registered land surveyor, licensed to practise in Place of Work, acceptable to Departmental Representative.

1.2 SURVEY REFERENCE POINTS

.1 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

.2 Make no changes or relocations without prior written notice to Departmental Representative.

.3 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.4 Require surveyor to replace control points in accordance with original survey control.

1.3 SURVEY REQUIREMENTS

.1 Establish two (2) permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake for grading, fill placement and landscaping features.

.4 Stake slopes and berms.

.5 Establish pipe invert elevations.

1.4 EXISTING SERVICES

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.

.2 Remove abandoned service lines within [2] m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

1.5 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform Departmental Representative of impending installation and obtain approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

1.6 RECORDS

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

.3 Record locations of maintained, re-routed and abandoned service lines.

1.7 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit name and address of Surveyor to Departmental Representative.

.2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.

.3 Submit certificate signed by surveyor certifying [and noting] those elevations and locations of completed Work that conform with Contract Documents.

1.8 SUBSURFACE CONDITIONS

.1 Notify Departmental Representative in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After investigation, if Departmental Representative determines that conditions differ from these anticipated; instructions will be issued for changes in Work as provided in changes and change orders.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Project Document
Section 01 72 00

PART 1 - GENERAL

1.1 DRAWINGS

.1 Departmental Representative will provide two (2) sets of drawings for the Project Files.

.2 Keep drawings and record any deviations from the Contract Document's requirements, changes imposed by the nature of the Site and changes requested by the Departmental Representative.

.3 Note changes in red.

.4 Record the following informations:

.1 On-Site changes for dimensions and execution details.

.2 Changes made as per orders received, on-site or not.

.5 At the end of work and prior to final acceptance, transcribe corrections to the second set of drawings and return both complete set to Departmental Representative.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Execution
Section 01 73 00

PART 1 - GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00- Submittal Procedures.

1.2 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00- Submittal Procedures.

1.3 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching. Take pictures and videos of the current situation before starting the work and give copy to the Parks Canada Agency on DVD or USB Driver.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water

1.4 EXECUTION

.1 Execute partial demolition, excavation and fill to complete Work

.2 Fit several parts together, to integrate with other Work.

.3 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.4 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

.5 Restore work with new products in accordance with requirements of Contract Documents.

.6 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Cleaning
Section 01 74 11

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 02 50 13 – Management of Toxic Waste

1.2 REFERENCE STANDARDS

.1 Environment Quality Act (Ch. Q-2)

.2 Regulation Respecting Hazardous Materials (Q-2, r. 32)

.3 Regulation Respecting the Landfilling and Incineration or Residual Materials (Q-2, r. 19)

1.3 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Parks Canada Agency or other Contractors.

.2 Remove waste materials from site at regularly scheduled times to keep Site free from waste, residual hazardous materials, materials, substances or equipment not required for the Work and dispose it in accordance with applicable regulations. Disposal evidence in an authorized area by the Ministry of Sustainable Development, Environment, and Fight against Climate Change (MSDEFACC) shall be given to Departmental Representative.

.3 Do not burn waste materials on site.

.4 It is strictly forbidden to dispose of any material, waste, debris or residues in the St-Ours Canal or in the Richelieu River. If so, they shall be quickly recovered.

.5 Clear snow and ice from access roads. Snow from the cleaning of working areas shall be disposed by Contractor in an area authorized by MSDEFACC in agreement with Departmental Representative. No snow can be thrown in the St-Ours Canal.

.6 Keep public roads near the Site free from materials, waste, debris or residues and clean the roads quickly if required.

.7 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.8 Provide on-site container for waste products and debris disposal.

.9 Provide and use marked separate bins for recycling. Refer to Section 01 74 21- Construction/Demolition Waste Management and Disposal.

.10 Dispose of waste materials and debris off site.

.11 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.

.12 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

.13 Provide adequate ventilation during use of volatile or noxious substances.

.14 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.15 Concrete Mixers Wash Water

.1 Excess concrete and cement from concrete mixers shall be poured in a sealed container. Concrete residus shall be managed with construction waste.

.2 Wash water shall not be discharged directly into water or on the ground. The wash water can be taken care of by the concrete supplier and brought back to the concrete plant for disposal. Otherwise, these waters shall be contained, sampled and treated (is required) to meet surface water quality criteria of MSDEFACC (Aquatic Life Protection) for suspended solids, pH and C_{10}-C_{50}, before being released into environment. Contractor shall obtain permission from Parks Canada Agency or its Designated Representative before proceeding with any release to the environment.

1.4 FINAL CLEANING

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Dispose waste materials off-site in accordance with the regulations in force. Waste materials shall not be burned on site. Take the necessary arrangements and obtain permits from authorities with jurisdiction for the disposal of debris and waste materials. Provide evidence of disposition in a place authorized by the MSDEFACC to Departmental Representative.

.5 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

.6 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls and floors.

.7 Clean lighting reflectors, lenses, and other lighting surfaces.

.8 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.9 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.10 Clean and sweep roofs, gutters, areaways, and sunken wells.

.11 Sweep and wash clean paved areas.

.12 Clean roofs, downspouts, and drainage systems.

.13 Remove snow and ice from access to building.

.14 Contractor shall collect all hazardous residual materials (HRM) produced during work. All HRM shall be sorted and managed in accordance with the regulations in force, including the Hazardous Materials Regulations (Q-2, r.32).

.15 Dispose of HRM in a site authorized by MSDEFACC. Provide disposition evidence to Departmental Representative.

.16 Contractor shall collect all residual materials produced during work (waste, recyclable materials, construction debris, etc.). All residual materials shall be sorted and managed according to the regulations in force.

.17 The contractor shall dispose of its residual materials in a site authorized by the MSDEFACC. Provide disposition evidence to Departmental Representative.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials in accordance with Section 01 74 21- Construction/Demolition Waste Management and Disposal and Section 02 50 13 – Management of Toxic Waste.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 02 50 13 – Management of Toxic Waste

1.2 WASTE MANAGEMENT OBJECTIVES

.1 Prior to start the Work, meet with Departmental Representative to review Parks Canada Agency's waste management objectives and Contractor's proposed waste reduction plan for waste construction, renovation and demolition (CRD) generated by the Project.

.2 Parks Canada Agency's objective for waste management is to minimize flow of construction/demolition waste to landfills. Prior to end the Work, provide documentation certifying that comprehensive measures and procedures for waste management, recycling and reuse of recyclable materials have been implemented.

.3 Minimize the amount of non-hazardous solid waste generated by the Work; maximize source reduction, reuse and recycling of solid waste generated by CRD activities.

.4 Protect environment and prevent damage related to environment pollution.

1.3 REFERENCE

.1 Definitions

.1 Approved/Authorized Recycling Facility: Approved provincial recycler, or other material recyclers approved by the Departmental Representative.

.2 Class III Non-Hazardous Materials: Construction, Renovation and Demolition Waste.

.3 Construction, Renovation and/or Demolition Waste (CRD): Class III non-hazardous solid waste generated by construction, renovation and/or demolition activities.

.4 Discharge – inert waste: Bituminous and concrete materials.

.5 Source Waste Separation Program (SWSP) : On-going implementation and coordination of activities to ensure that designated waste are sorted into pre-defines categories and routed for recycling and reuse, maximizing value and potential for reducing disposal costs.

.6 Recyclability: Characteristics of a product that can be recovered at the end of its life cycle and transformed into a new product for reuse.

.7 Recycle: Collect of transformation process of waste and used materials to allow their reintroduction in a consumption cycle for new products.

.8 Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form; recycling does not include burning, incinerating, or thermally destroying waste.

.9 Reuse: Repeated use of a product/material in its original form in a different or similar way. Reuse include:

.1 The recovery of products/materials that can be reused generated by a modernization before their demolition, for resale, reuse or storage for later use.

.2 Return to suppliers products/materials that can be reused, such as pallets or unused products/materials.

.10 Recovery: Removal of load-bearing and non-load bearing components and materials during deconstruction or disassembly of industrial, commercial or institutional structures for reuse or recycling.

.11 Sorted waste: Type classified waste.

.12 Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

.13 Waste Recovery Report: Detailed final results report, which quantifies cumulative weights and percentages of waste reused, recycled and landfilled throughout the Work. Measure achievement of the Waste Reduction Plan (WRP) objectives and note lessons learned.

.14 Waste Management Coordinator (WMC): Contractor's supervisor for waste management activities and coordinator for reporting requirements, documents and samples to be submitted.

.15 Waste Reduction Plan (WRP): Written document considering the potential for reduction, reuse and recycling of waste generated by the Project. Describe valuation goals, implementation and reporting procedures, expected results and responsibilities. Waste reduction plan informations are from the waste audit.

.2 Reference

.1 Environment Quality Act (LRQ, ch. Q-2)

.2 Regulation respecting hazardous materials (Q-2, r. 32)

.3 Regulation respecting the landfilling and incineration of residual materials (Q-2, r. 19)

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit, at intervals set by the Departmental Representative, the following :

.1 Receipts, weight tickets, waybills and/or waste disposal receipts produced as part of the Work (hazardous residual materials, waste, recyclables, construction debris, etc.) indicating quantities and reused, recycled or disposed material types.

.2 Before final payment, submit the following :

.1 Provide receipts, weight tickets, consignment notes and waste disposal receipts produced as part of the Work (hazardous residual materials, waste, recyclables, construction debris, etc.) that confirm quantities and types of waste materials reused, recycled and disposed, as well as their destination.

1.5 FACILITIES USE

.1 Minimize disruption of normal use of the Site.

.2 Maintain safety measures established for the facilities. Implement temporary safety measures approved by the Departmental Representative.

1.6 WASTE TREATMENT SITE

.1 Contractor is responsible to provide resources for waste recovery and suppliers. Recovered waste materials shall be brought to approved and/or licensed recycling sites or equipment recyclers.

1.7 MATERIALS STORAGE, HANDLING AND PROTECTION

.1 Store waste materials recovered for reuse or recycling at zones indicated by the Departmental Representative.

.2 Unless otherwise indicated, waste materials to be disposed shall become Contractor's property.

.3 Protect, stockpile, store and catalogue recovered items.

.4 Hazardous Residual Materials (HRM) shall be sorted and managed in accordance with regulations in force, including Regulation Respecting Hazardous Material (Q-2, r.32).

.5 Separate non-recoverable from recoverable items. Deliver non-recoverable items to authorized disposal facility.

.6 Protect left in place structural members and recovered waste materials from movements and damages.

.7 Support structures affected by the Work. If the building safety is compromised, stop the Work and notify Departmental Representative immediately.

.8 Protect drainage work from surface water to prevent damage or obstruction; protect electrical and mechanical facilities.

.9 Provide on-site facilities and containers to collect and store reusable and recyclable materials.

.10 Sort and store waste materials generated by the Project in designated areas.

.11 Prevent contamination of waste materials destined for recovery and recycling in accordance with the acceptance conditions of designated treatment facilities.

.1 It is recommended to sort waste materials at source.

.2 Dispose of mixed waste materials collected to a treatment site outside worksite for sorting.

.3 Obtain waybills, receipts and/or weight tickets for sorted and removed from site waste materials and submit them to the Departmental Representative.

.4 On-site reused materials are valued and shall be included in any reports.

1.8 WASTE DISPOSAL

.1 Do not bury rubbish or waste.

.2 Do not dispose of materials, waste, hazardous residual materials (HRM), debris or residues in waterway or storm/sanitary sewer.

.3 Keep a construction waste register indicating the following :

.1 Bins size and quantities.

.2 Waste type for each bin.

.3 Generated waste's total tonnes.

.4 Reuse/recycled waste's total tonnes.

.5 Reuse/recycled waste's destination.

.4 Collect waste from site as work progresses.

.5 Collect HRM produced. HRM shall be sorted and managed in accordance with regulation in force, including the Regulation Respecting Hazardous Materials (Q-2, r. 32).

.6 Dispose of HRM in a site authorized by the MSDEFACC. Provide disposition evidence to Departmental Representative.

.7 Collect residual materials produced during the Work (waste, recyclable materials, construction debris, etc.) Sort and manage residual material according to the regulation in force.

.8 Dispose of residual materials in a site authorized by MSDEFACC. Provide disposition evidence to Departmental Representative.

1.9 WORK SCHEDULE

.1 Co-ordinate waste management with other activities to ensure an orderly work progress.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 GENERAL

.1 Handle waste not reused, recycled or recovered in accordance with appropriate codes and regulations.

3.2 CLEANING

.1 Cleaning during the Work: Clean up in accordance with Section 01 74 11 – Cleaning and Section 02 50 13 – Management of Toxic Waste.

.1 Leave the Site clean at the end of each working day.

.2 Final cleaning: Remove surplus materials, rubbish, tools and equipment from site in accordance with Section 01 74 11 – Cleaning and Section 02 50 13 – Management of Toxic Waste.

.3 Waste management: Separate waste for reuse, recycling or disposal.

.1 Remove bins and recycling bins from Site and dispose of materials in appropriate sites.

.2 Separate source materials for reuse/recycling and place them to indicated areas.

3.3 WASTE RECOVERY

.1 Separate waste materials from general waste stream into separate piles or containers with authorization from Departmental Representative and in accordance with applicable fire safety regulations.

.1 Identify containers and storage areas.

.2 Provide instructions for disposal practices.

END OF SECTION

General Requirements – Closeout Procedures
Section 01 77 00

PART 1 - GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures.

.2 Departmental Representative's Inspection :

.1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates in French that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Equipment and systems: tested and fully operational.

.4 Operation of systems: demonstrated to Parks Canada Agency's personnel.

.5 Work: complete and ready for final inspection.

.4 Final Inspection

.1 When completion tasks are done, request final inspection of Work by Departmental Representative and Contractor.

.2 When Work incomplete according to Parks Canada Agency, complete outstanding items and request re-inspection.

1.2 FINAL CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Waste Management: separate waste materials in accordance with Section 01 74 21-Construction/Demolition Waste Management and Disposal

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Closeout Submitals
Section 01 78 00

PART 1 - GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Two (2) weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, one (1) final copy of operating and maintenance manuals in English and French.

.2 Provide evidence, if requested, for type, source and quality of products supplied.

1.2 FORMAT

.1 Organize data as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used correlate data into related consistent groupings.

.1Identify contents of each binder on spine.

.4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by systems.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab.

.1 Bind in with text; fold larger drawings to size of text pages.

.9 Provide CAD files in DWG format on CD.

1.3 CONTENTS – PROJECT RECORD DOCUMENTS

.1 Table of Contents for Each Volume: provide title of project;

.1 Date of submission; names.

.2 Addresses and telephone numbers of Consultant and Contractor with name of responsible parties.

.3 Schedule of products and systems, indexed to content of volume.

.2 For each product or system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.2 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.3 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.4 Typewritten Text: as required to supplement product data.

1.4 EQUIPMENT AND SYSTEMS

.1 For each item of equipment and each system include description of unit or system, and component parts.

.1 Give function, normal operation characteristics and limiting conditions.

.2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications

.3 Provide cabling schematics of installed material.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.

.1 Include regulation, control, stopping, shut-down, and emergency instructions.

.2 Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.12 Include test reports.

1.5 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Departmental Representative approval.

.3 Warranty management plan to include required actions and documents to assure that Parks Canada Agency receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.6 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.

.2 Provide list for each warranted equipment, item, and feature of construction or system indicating.

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of manufacturers or suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.7 Respond in timely manner to oral or written notification of required construction warranty repair work.

.8 Written verification to follow oral instructions.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Commissioning Requirements
Section 01 91 13

PART 1 - GENERAL

1.1 SUMMARY

.1 Section Includes:

.1 General requirements relating to commissioning of project's components and systems.

.2 Acronyms:

.1 AFD - Alternate Forms of Delivery, service provider.

.2 DMM - DAM Management Manual.

.3 Cx - Commissioning.

.4 EMCS - Energy Monitoring and Control Systems.

.5 O&M - Operation and Maintenance.

.6 PI - Product Information.

.7 PV - Performance Verification.

.8 TAB - Testing, Adjusting and Balancing.

1.2 GENERAL

.1 Cx is a planned program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished Project. Cx is performed after systems and integrated systems are completely installed, functional and Contractor's Performance Verification responsibilities have been completed and approved. Objectives:

.1 Verify installed equipment and systems operate in accordance with Contract Documents and design criteria and intent.

.2 Ensure appropriate documentation is compiled into the DMM.

.3 Effectively train O&M staff.

.2 Contractor assists in Cx process, operating equipment and systems, troubleshooting and making adjustments as required.

.1 Systems to be operated at full capacity under various modes to determine if they function correctly and consistently at peak efficiency. Systems to be interactively with each other as intended in accordance with Contract Documents and design criteria.

.2 During these checks, adjustments to be made to enhance performance to meet user requirements.

.3 Design Criteria: as per client's requirements or determined by designer. To meet Project functional and operational requirements.

1.3 COMMISSIONING OVERVIEW

.1 Cx to be a line item of Contractor's cost breakdown.

.2 Cx activities supplement field quality and testing procedures described in relevant technical sections.

.3 Cx is conducted in concert with activities performed during stage of project delivery. Cx identifies issues in Planning and Design stages which are addressed during Construction and Cx stages to ensure the built [facility] is constructed and proven to operate satisfactorily under weather, environmental and occupancy conditions to meet functional and operational requirements. Cx activities includes transfer of critical knowledge to facility operational personnel

.4 Departmental Representative will issue Interim Acceptance Certificate when:

.1 Completed Cx documentation has been received, reviewed for suitability and approved by Departmental Representative.

.2 Equipment, components and systems have been commissioned.

.3 O&M training has been completed.

1.4 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS

.1 Should equipment, system components, and associated controls be incorrectly installed or malfunction during Cx, correct deficiencies, re-verify equipment and components within the unfunctional system, including related systems as deemed required by Departmental Representative, to ensure effective performance.

.2 Costs for corrective work, additional tests, inspections, to determine acceptability and proper performance of such items to be borne by Contractor. Above costs to be in form of progress payment reductions or hold-back assessments.

1.5 PRE-CX REVIEW

.1 Before start of Cx:

.1 Have completed Cx Plan up-to-date.

.2 Ensure installation of related components, equipment, sub-systems, systems is complete.

.3 Fully understand Cx requirements and procedures.

.4 Have Cx documentation shelf-ready.

.5 Understand completely design criteria and intent and special features.

.6 Submit complete start-up documentation to Departmental Representative.

.7 Have Cx schedules up-to-date.

.8 Ensure systems have been cleaned thoroughly.

.9 Complete TAB procedures on systems; submit TAB reports to Departmental Representative for review and approval.

.10 Ensure "As-Built" system schematics are available.

.2 Inform Departmental Representative in writing of discrepancies and deficiencies on finished works.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00- Submittal Procedures.

.1 Submit no later than four (4) weeks after award of Contract:

.1 Name of Contractor's Cx agent.

.2 Draft Cx documentation.

.3 Preliminary Cx schedule.

.2 Request in writing to Departmental Representative for changes to submittals and obtain written approval at least [8] weeks prior to start of Cx.

.3 Submit proposed Cx procedures to Departmental Representative where not specified and obtain written approval at least [8] weeks prior to start of Cx.

.4 Provide additional documentation relating to Cx process required by Departmental Representative.

.2 Provide completed and approved Cx documentation to Departmental Representative.

1.7 COMMISSIONING SCHEDULE

.1 Provide detailed Cx schedule as part of construction schedule in accordance with Section 01 32 16.07- Construction Progress Schedules - Bar (GANTT) Chart.

.2 Provide adequate time for Cx activities prescribed in technical sections and commissioning sections including:

.1 Approval of Cx reports.

.2 Verification of reported results.

.3 Repairs, retesting, re-commissioning, re-verification.

.4 Training.

1.8 STARTING AND TESTING

.1 Contractor assumes liabilities and costs for inspections. Including disassembly and re-assembly after approval, starting, testing and adjusting, including supply of testing equipment.

1.9 WITNESSING OF STARTING AND TESTING

.1 Provide fourteen (14) days' notice prior to commencement.

.2 Departmental Representative to witness of start-up and testing.

1.10 PROCEDURES

.1 Verify that equipment and systems are complete, clean, and operating in normal and safe manner prior to conducting start-up, testing and Cx.

.2 Conduct start-up and testing in following distinct phases:

- .1 Included in delivery and installation:
  - .1 Verification of conformity to specification, approved shop drawings and completion of PI report forms.
  - .2 Visual inspection of quality of installation.
- .2 Start-up: follow accepted start-up procedures.
- .3 Operational testing: document equipment performance.
- .4 System PV: include repetition of tests after correcting deficiencies.
- .5 Post-substantial performance verification: to include fine-tuning.

.3 Correct deficiencies and obtain approval from Departmental Representative after distinct phases have been completed and before commencing next phase.

.4 Document required tests on approved PV forms.

1.11 START-UP DOCUMENTATION

.1 Assemble start-up documentation and submit to Departmental Representative for approval before commencement of commissioning.

.2 Start-up documentation to include:

- .1 Factory and on-site test certificates for specified equipment.
- .2 Pre-start-up inspection reports.
- .3 Signed installation/start-up check lists.
- .4 Start-up reports,
- .5 Step-by-step description of complete start-up procedures, to permit Departmental Representative to repeat start-up at any time.

1.12 TEST RESULTS

.1 If start-up, testing and/or PV produce unacceptable results, repair, replace or repeat specified starting and/or PV procedures until acceptable results are achieved.

.2 Provide manpower and materials, assume costs for re-commissioning.

1.13 START OF COMMISSIONING

.1 Notify Departmental Representative at least [21] days prior to start of Cx.

.2 Start Cx after elements of building affecting start-up and performance verification of systems have been completed.

1.14 INSTRUMENTS/EQUIPMENT

.1 Provide a complete list of instruments proposed to be used.

.2 Provide listed data including, serial number, current calibration certificate, calibration date, calibration expiry date and calibration accuracy.

.3 Provide the following equipment as required:

.1 2-way radios.

.2 Ladders.

.3 Equipment as required to complete work

1.15 COMMISSIONING PERFORMANCE VERIFICATION

.1 Carry out Cx:

.1 Under actual operating conditions, over entire operating range, in all modes.

.2 On independent systems and interacting systems.

.2 Cx procedures to be repeatable and reported results are to be verifiable.

.3 Follow equipment manufacturer's operating instructions.

.4 EMCS trending to be available as supporting documentation for performance verification.

1.16 WITNESSING COMMISSIONING

.1 Departmental Representative to witness activities and verify results.

1.17 SUNDRY CHECKS AND ADJUSTEMENTS

.1 Make adjustments and changes which become apparent as Cx proceeds.

.2 Perform static and operational checks as applicable and as required.

1.18 DEFICIENCIES, FAULTS, DEFECTS

.1 Correct deficiencies found during start-up and Cx to satisfaction of Departmental Representative.

.2 Report problems, faults or defects affecting Cx to Departmental Representative in writing. Stop Cx until problems are rectified. Proceed with written approval from Departmental Representative.

1.19 COMPLETION OF COMMISSIONING

.1 Upon completion of Cx leave systems in normal operating mode.

.2 Cx to be considered complete when contract Cx deliverables have been submitted and accepted by Departmental Representative.

1.20 ACTIVITIES UPON COMPLETION OF COMMISSIONING

.1 When changes are made to baseline components or system settings established during Cx process, provide updated Cx form for affected item.

1.21 MAINTENANCE MATERIALS, SPARE PARTS, SPECIAL TOOLS

.1 Supply, deliver, and document maintenance materials, spare parts and special tools as specified in contract.

1.22 OCCUPATION

.1 Cooperate fully with Departmental Representative during stages of acceptance and occupancy of facility.

1.23 PERFORMANCE VERIFICATION TOLERANCES

.1 Application tolerances:

.1 Specified range of acceptable deviations of measured values from specified values or specified design criteria. Except for special areas, to be within +/- [10] % of specified values.

.2 Instrument accuracy tolerances:

.1 To be of higher order of magnitude than equipment or system being tested.

.3 Measurement tolerances during verification:

.4 Unless otherwise specified actual values to be within +/- [2] % of recorded values

1.24 OWNER'S PERFORMANCE TESTING

.1 Performances testing of equipment or system by Departmental Representative will not relieve Contractor from compliance with specified start-up and testing procedures.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

Existing Conditions – Demolition Conditions
Section 02 41 16

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

1.2 REFERENCE STANDARDS

.1 CSA International: CSA S350-FM1980 (R2003), Code of Practice for Safety in Demolition of Structures.

.2 U.S. Environmental Protection Agency (EPA)/Office of Water: EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit demolition procedures

.1 Submit to Departmental Representative, shoring and bracing drawings as required for approval and review at least seven (7) days before starting the work. Drawings shall be sealed and signed by an engineer recognized and licensed to practice in Canada, in the province of Quebec.

.2 Submit to Departmental Representative, demolition procedures, which shall meet the requirements for environmental protection, at least seven (7) days before starting the Work. These procedures shall include materials' method and location.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Inspect Site with Departmental Representative and verify location and extent of items to be removed, disposed of, salvaged and those to remain in place.

.2 Identify and protect utility lines and ensure remaining in good condition these still in operations.

.3 Notify utility companies and relevant departments and obtain necessary approvals from them before starting the demolition.

.4 If required, disconnect, shut off or re-route existing service lines located on Site, which interfere with the performance of the work, in accordance with the requirements of authorities with jurisdiction. Identify the location of these pipelines and those previously left in the field and indicate (on horizontal and vertical plans) on the as-built drawings. Support, counteract and maintain in place the pipes and conduits encountered.

.1 Notify Departmental Representative and applicable utility immediately of any damage to service line to be retained.

.2 Immediately notify Departmental Representative of discovery of any unregistered utility lines and wait for written instructions to proceed.

3.2 PREPARATION

.1 Protection of in-place conditions:

.1 Take necessary measures to prevent movement, settlement or other damage to existing structures. Provide shoring and structures bracing as required.

.2 Minimize amount of dust and noise produced by the work as well as the inconvenience to site users.

.3 Locate and protect electrical equipment, systems and installations, and service lines.

.4 Provide dust screens, tarpaulins, railings, support elements and other required protective devices.

.5 Perform work in accordance with health and safety requirements.

.2 Demolition/Removal Work

.1 Remove elements as indicated in drawings.

3.3 CLEANING

.1 Cleaning during work: Carry out cleaning work so that the Site is clean at the end of each working day.

.2 Final cleaning: Dispose of materials/equipment, tools, waste off site to the satisfaction of the Departmental Representative.

.3 Refer to drawings for materials to be recovered for reuse/recycle.

.4 Waste Management: separate waste materials for reuse recycling.

.5 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Existing Conditions – Management of Toxic Waste
Section 02 56 13

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures

.1 Section 01 35 29.06 – Health and Safety Requirements

.2 Section 01 35 43 – Environmental Procedures

.3 Section 01 74 11 – Cleaning

.4 Section 01 74 21 – Construction and Demolition Waste Management Disposal

1.2 REFERENCE STANDARDS

.1 Canadian Environmental Protection Act, 1999 (CEPA 1999).

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 WHMIS Safety Data Sheets (SDS).

.3 National Fire Code of Canada, 2010.

.4 Transportation of Dangerous Goods Act (TDGA), [1999] c. 34.

.5 Transportation of Dangerous Goods Regulations (TDGR), T-19.01-SOR/2003-400.

.6 Ozone-Depleting Substances Regulations, SOR/99-07.

.7 Environmental Code of Practice on Halons, July 1996.

.8 Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems, March 1996.

.9 Environment Quality Act (LRQ, c. Q-2)

.10 Regulation Respecting Hazardous Materials (Q-2, r.23).

1.3 DEFINITIONS

.1 Toxic: substance is considered toxic if it is listed on Toxic Substances List found in Schedule 1 of CEPA.

.2 List of Toxic Substances: found in Schedule 1 of CEPA, lists substances that have been assessed as toxic. Federal Government can make regulations with respect to a substance specified on List of Toxic Substances. Column II of this list identifies type of regulation applicable to each substance.

.3 PCBs: includes chlorobiphenyls referred to in Column I of item 1 of the List of Toxic Substances in Schedule I of Canadian Environmental Protection Act.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Submit WHMIS Safety Data Sheets (SDS) in accordance with Section 02 81 01- Hazardous Materials.

.2 Submit photocopy of shipping documents to Departmental Representative when shipping toxic wastes off site.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Store and handle toxic wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

.2 Store and handle flammable and combustible wastes in accordance with current National Fire Code of Canada (NFC) requirements.

.3 Co-ordinate storage of toxic wastes with Departmental Representative and follow internal requirements for labelling and storage of wastes.

.4 Observe smoking regulations, smoking is prohibited in area where toxic wastes are stored, used, or handled.

.5 Only certified persons who have successfully completed Environment Canada Environmental Awareness Course for Environmentally Safe Handling of Refrigerants are permitted to work on refrigeration and air conditioning systems.

.6 Report spills or accidents involving toxic wastes immediately to Departmental Representative and to appropriate regulatory authorities. Take reasonable measures to contain the release while ensuring health and safety is protected.

.7 Transport toxic wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations

.8 Use authorized/licensed carrier to transport toxic waste.

.9 Co-ordinate transportation and disposal of toxic wastes with Departmental Representative.

.10 Notify appropriate regulatory authorities and obtain required permits and approvals prior to exporting toxic waste.

.11 Dispose of toxic wastes generated on site in accordance with applicable federal and provincial acts, regulations, and guidelines.

.12 Ensure toxic waste is shipped to authorized/licensed treatment or disposal facility and that liability insurance requirements are met. Submit disposal evidence to Departmental Representative.

.13 Minimize generation of toxic waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not used.

ENF OF SECTION

Concrete Forming and Accessories
Section 03 10 00

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 03 20 00 – Concrete Reinforcing

.2 Section 03 30 00 – Cast-in-Place Concrete

1.2 REFERENCE STANDARDS

.1 Unless otherwise indicated, refer to latest edition and amendments of following standards prevailing at effective date of Contract.

.2 CSA Group (CSA)

.1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CAN/CSA O86, Engineering Design in Wood.

.3 CSA O121, Douglas Fir Plywood.

.4 CSA O151, Canadian Softwood Plywood.

.5 CSA O153, Poplar Plywood.

.6 CAN/CSA O325.0, Construction Sheathing.

.7 CSA O437 Series, Standards for OSB and Waferboard.

.8 CSA S269.1, Falsework and Formwork.

.9 CAN/CSA S269.3, Concrete Formwork.

.3 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit shop drawings for formwork and falsework.

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.

.3 Submit WHMIS Material Safety Data Sheets (MSDSs).

.4 Co-ordinate submittal requirements and provide submittals.

.5 Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners and locations of temporary embedded parts. Comply with CSA S269.1 for falsework drawings and with CAN/CSA-S269.3 for formwork drawings.

.6 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.

.7 Indicate sequence of erection and removal of formwork/falsework as directed by the Agency Representative.

.8 When slip forming is used, submit details of equipment and procedures for review by the Agency Representative.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Waste management and disposal

.1 Store and manage hazardous materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Divert wood materials from landfill to a recycling or reuse facility as approved by the Agency Representative.

.4 Divert plastic materials from landfill to a recycling or reuse facility as approved by the Agency Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Formwork materials

.1 For concrete presenting no special architectural features, use formwork materials to CAN/CSA-O86. Use of steel concrete forming is also permitted.

.2 For concrete with special architectural features, use formwork materials to CSA-A23.1/A23.2.

.3 Rigid insulation board: to CAN/ULC-S701.

.2 Pan forms: removable, permanent, steel, reinforced plastic, as indicated.

.3 Tubular column forms: round, steel spirally wound laminated fibre forms, internally treated with release material.

.4 Form ties

.1 For concrete not designated architectural, use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.

.2 For architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.

.5 Form liner

.1 Plywood: Douglas Fir to CSA O121, Canadian Softwood Plywood to CSA O151, Poplar to CSA O153.

.2 Waferboard: to CAN/CSA-O325.0.

.6 Form release agent: non-toxic, low VOC.

.7 Form stripping agent: colourless mineral oil, non-toxic, low VOC, free of kerosene.

.8 Falsework materials: to CSA-S269.1.

.9 Sealant: as recommended by the Agency Representative or in plan notes.

PART 3 - EXECUTION

3.1 FABRICATION AND ERECTION

.1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Obtain the Agency Representative's approval for use of earth forms framing openings not indicated on drawings.

.3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.4 Fabricate and erect falsework in accordance with CSA S269.1.

.5 Do not place shores and mud sills on frozen ground.

.6 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.7 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.

.8 Align form joints and make watertight.

.1 Keep form joints to minimum.

.9 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.

.10 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.11 Construct forms for architectural concrete, and place ties as directed.

.1 Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.

.12 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.

.1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.13 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

.14 When slip forming is used, submit details as per Article 1.3 of section 01 33 00 –Submittal Procedures.

.15 The surface features of all formwork ties shall be removed and the holes visible after backfilling, and sealed.

3.2 REMOVAL AND RESHORING

.1 Leave formwork in place for following minimum periods of time after placing concrete.

.1 3 days for walls and sides of beams.

.2 3 days for columns.

.3 28 days for beam soffits, slabs, decks and other structural members, or 7 days when replaced immediately with adequate shoring to standard specified for falsework.

.4 3 days for footings and abutments.

.2 Remove formwork when concrete has reached 80% of its design strength or minimum period noted above, whichever comes first, and replace immediately with adequate reshoring.

.3 Provide necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.

.4 Space reshoring in each principal direction at not more than 3000 mm apart.

.5 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

3.3 TEMPERATURE OF FORMWORK

.1 When pouring concrete, keep formwork at a temperature above 5°C.

END OF SECTION

Concrete Reinforcing
Section 03 20 00

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 03 10 00 – Concrete Forming and Accessories

.3 Section 03 30 00 – Cast-in-Place Concrete

1.2 REFERENCES

.1 Unless otherwise indicated, refer to latest edition and amendments of following standards prevailing at effective date of Contract.

.2 American Concrete Institute (ACI)

.1 SP-66, ACI Detailing Manual 2004.

.3 ASTM International

.1 ASTM A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM A143/A143M, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.

.3 ASTM A 1064/A 1064M, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

.4 CSA International

.1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA A23.3, Design of Concrete Structures.

.3 CSA G30.18, Carbon Steel Bars for Concrete Reinforcement.

.4 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.5 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction.

.5 Reinforcing Steel Institute of Canada (RSIC)

.1 RSIC, Reinforcing Steel Manual of Standard Practice.

1.3 DOCUMENTS/SAMPLES SUBMITTALS FOR APPROVAL/INFORMATION

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Prepare reinforcement drawings in accordance with Manual of Standard Practice.

.3 Shop Drawings

.1 Submit drawings stamped and signed by professional engineer registered or licensed in province of Quebec, Canada.

.1 Indicate placing of reinforcement and:

.1 Bar bending detail.

.2 Lists of reinforcement.

.3 Number of reinforcements.

.4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.

.5 Indicate sizes, spacings and locations of chairs, spacers and hangers.

.2 Detail lap lengths and bar development lengths to CAN/CSA A23.3, unless otherwise indicated.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.2 Storage and Handling Requirements

.1 Store materials off ground and in accordance with manufacturer's recommendations in clean area.

.2 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Substitute different size bars only if permitted in writing by Departmental Representative.

.2 Reinforcing steel: high-bond billet steel, grade 400 or 500, deformed bars to CSA-G30.18, unless indicated otherwise.

.3 Reinforcing steel: weldable low alloy steel deformed bars to CSA G30.18.

.4 Cold-drawn annealed steel wire ties: to ASTM A1064/A1064M.

.5 Deformed steel wire for concrete reinforcement: to ASTM A1064/A1064M.

.6 Welded steel wire fabric:

.1 Deformed in accordance to ASTM A1064/A1064M, fabricated from as drawn steel wire into flat sheets; sizes as indicated on Drawings.

.2 Provide in flat sheets only.

.7 Galvanizing of non-prestressed reinforcement: to ASTM A123/A123M, Coating Grade 85, minimum zinc coating 610 g/m2.

.1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.

.2 If chromate treatment carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic acid.

.1 Temperature of solution minimum 32 degrees and galvanized steels immersed for minimum 20 seconds.

.3 If galvanized steels at ambient temperature, add sulphuric acid as bonding agent at concentration of 0.5% to 1%.

.2 No restriction applies to temperature of solution.

.4 Chromate solution sold for this purpose may replace solution described above, provided if of equivalent effectiveness.

.3 Provide product description as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

.8 Chairs, bolsters, bar supports and spacers: to CSA-A23.1/A23.2.

.9 Mechanical splices: subject to approval of Departmental Representative.

.10 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 or Reinforcing Steel Manual of Standard Practice from Reinforcing Steel Institute of Canada (RSIC).

.2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval by Departmental Representative, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

.1 Provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis as well as reinforcement galvanization reports (if required), minimum 2 weeks prior to beginning work.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Galvanizing to include chromate treatment.

.1 Duration of treatment to be 1 hour per 25 mm of bar diameter.

.2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A143/A143M.

3.2 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.

.2 When field bending is authorized, bend without heat, applying slow and steady pressure.

.3 Replace bars which develop cracks or splits.

3.3 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on placing drawings in accordance with CSA-A23.1/A23.2.

.2 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.

.3 Ensure cover of reinforcement is maintained during concrete pour.

3.4 FIELD TOUCH-UP

.1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

3.5 CLEANING

.1 Progress Cleaning: carry out cleaning work.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion, remove surplus materials, rubbish, tools and equipment from Work site.

.3 Waste Management: separate waste materials for reuse or recycling.

END OF SECTION

Cast-In-Place Concrete
Section 03 30 00

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 45 00 – Quality Control

.2 Section 03 10 00 – Concrete Forming and Accessories

.3 Section 03 20 00 – Concrete Reinforcing

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C260/C260M, Standard Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM C494/C494M, Standard Specification for Chemical Admixtures for Concrete.

.4 ASTM C1017/C1017M, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

.2 CSA International

.1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A283-06, Qualification Code for Concrete Testing Laboratories.

.3 CSA A3000, Cementations Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.3 DEFINITIONS

.1 Portland cement: hydraulic cement, blended hydraulic cement (XXb – b denotes blended) and Portland-limestone cement.

.1 Type GU, GUb and GUL – General use cement.

.2 Type MS and MSb – Moderate sulphate-resistant cement.

.3 Type MH, MHb and MHL – Moderate heat of hydration cement.

.4 Type HE, HEb and HEL – High early-strength cement.

.5 Type LH, LHb and LHL – Low heat of hydration cement.

.6 Type HS and HSb – High sulphate-resistant cement

.2 Fly ash:

.1 Type F – with CaO content less than 8 %.

.2 Type CI – with CaO content ranging from 15 % to 20%.

.3 Type CH – with CaO greater than 20%.

.4 Type S – Ground, granulated blast-furnace slag.

1.4 DOCUMENTS/SAMPLES SUBMITTALS FOR APPROVAL/INFORMATION

.1 At least four (4) weeks prior to the work, submit the Departmental Representative samples of the following materials proposed for the work:

.1 five (5) liters of curing compound;

.2 Three (3) kg of each type of cement addition;

.3 Ten (10) kg of each type of hydraulic cement;

.4 Five (5) kg of each adjuvant.

.5 10 kg of each type of fine aggregate and coarse aggregate.

.2 Submit results and test reports to the Departmental Representative for review, and in case of any deviation or any deviation from the formula or dosing parameters prescribed for the concrete mixture, do not continue work without prior written permission

.3 Concrete batches: submit accurate records of concrete batch set up the date and location of each batch, concrete quality, air temperature and specimens taken as directed by Article 3.4 - Field Quality Control.

.4 Concrete Transfer time: Submit to the Departmental Representative, for consideration, any deviation greater than the allowable maximum of 105 minutes for the delivery of concrete to the construction site and pouring of the batch.

1.5 QUALITY ASSURANCE

.1 Submit to the Departmental Representative, minimum four (4) weeks prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

.1 Provide test data, compliance certificates, technical data sheets, and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture that meet specified requirements.

.2 Minimum four (4) weeks prior to starting concrete work, submit proposed quality control procedures for review by the Departmental Representative on following items:

.1 Erection of temporary shoring

.2 Hot weather concrete.

.3 Cold weather concrete.

.4 Curing.

.5 Finishes.

.6 Formwork removal.

.7 Execution of joints.

.3 Quality Control Plan: submit a written report to the Departmental Representative, certifying compliance of cast in place concrete to the performance requirements set out in Article 2.2 – Performance Criteria.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Concrete hauling time: deliver to site of Work and discharged within 105 minutes maximum after batching.

.1 Where applicable, any changes to the maximum transport time must be accepted in writing by the Departmental Representative and the producer of concrete, as indicated in CSA A23.1 / A23.2.

.2 Deviations must be submitted to the Departmental Representative for review.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

PART 2 - PRODUCTS

2.1 CALCULATIONS CRITERIA

.1 Alternative 1 - Performance: according to CSA A23.1/A23.2 and indications of Article 2.4 Mixes.

2.2 PERFORMANCE CRITERIA

.1 Quality Control Plan: ensure concrete supplier is able to provide satisfactory concrete performance criteria established by the Departmental Representative, and provide for monitoring compliance of the material according to the requirements of Article 1.5 Quality Assurance.

2.3 MATREIALS

.1 Portland cement: to CSA A3001, Type GU.

.2 Supplementary cementing materials: with minimum 8% silica fume, to CSA A3001.

.3 Water: to CSA A23.1.

.4 Aggregates: to CSA A23.1/A23.2.

.5 Admixtures:

.1 Air entraining admixture: to ASTM C260.

.2 Chemical admixture: to ASTM C494 and ASTM C1017. The Departmental Representative to approve set accelerating or set retarding admixtures during cold and hot weather placing.

.3 Cure Product: white, to CSA A23.1/A23.2 and ASTM C309 Type 1, chlorinated rubber.

2.4 MIXES

.1 Alternative 1 – Performance Method for specifying concrete: to meet the Departmental Representative performance criteria to CSA A23.1/A23.2.

.1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as in Quality Control Plan.

.2 Characteristics of fresh concrete:

.1 Slump: 80 mm ± 30 mm

.2 Air Content: 5% to 8%

.3 Maximum water/binder ratio: 0.45

.3 Provide concrete mix to meet following hard state requirements:

.1 Durability and class of exposure: C-1.

.2 Compressive strength: 35 MPa minimum at 28 days.

.3 Aggregate size: 19 mm.

.4 L max (µm) : 230

.4 Provide quality management plan to ensure verification of concrete quality to specified performance.

.5 Concrete supplier's certification: both batch plant and materials meet CSA A23.1 requirements.

.6 All aggregates proposed for exterior concrete shall be tested in accordance with CAN3-A23.2 for their alkali reactivity.

.2 Alternative 2 – Performance Method for specifying concrete: to meet the Departmental Representative performance criteria to CSA A23.1/A23.2.

.1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as in Quality Control Plan.

.2 Characteristics of fresh concrete:

.1 Spreading ability: 675 mm ± 50 mm

.2 Air Content: 6% to 9%

.3 Maximum water/binder ratio: 0.40

.3 Provide concrete mix to meet following hard state requirements:

.1 Durability and class of exposure: C-1.

.2 Compressive strength: 35 Mpa at 28 days (10 MPa minimum at 2 days).

.3 Aggregate size: 10 mm.

.4 L max (µm) : 230 (260 at the pump outlet)

.4 Provide quality management plan to ensure verification of concrete quality to specified performance.

.5 Concrete supplier's certification: both batch plant and materials meet CSA A23.1 requirements.

.6 All aggregates proposed for exterior concrete shall be tested in accordance with CAN3-A23.2 for their alkali reactivity.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Obtain Departmental Representative's written approval before placing concrete.

.1 Provide 24 hours minimum notice prior to placing of concrete.

.2 Place concrete reinforcing in accordance with Section 03 20 00 – Concrete Reinforcing.

.3 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Pumping of concrete is permitted only after approval of equipment and mix.

.5 Ensure reinforcement and inserts are not disturbed during concrete placement.

.6 Prior to placing of concrete obtain the Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.7 Protect previous Work from staining.

.8 Clean and remove stains prior to application for concrete finishes.

.9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.10 Do not place load upon new concrete until authorized by the Departmental Representative

3.2 INSTALLATION / APPLICATION

.1 Do cast-in-place concrete work to CSA A23.1/A23.2.

.2 Sleeves and inserts:

.1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through any element, except where indicated or approved by the Departmental Representative.

.2 Where approved by the Departmental Representative, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.

.3 Sleeves and openings greater than 100 mm x 100 mm not shown must be reviewed by Departmental Representative.

.4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Departmental Representative before placing of concrete.

.5 Confirm locations and sizes of sleeves and openings shown on drawings.

.6 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.

.3 Anchor bolts:

.1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.

.2 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from the Departmental Representative.

.1 The drilled holes should have a diameter of at least 100 mm.

.2 The diameter holes drilled after the concrete must exceed at least 25 mm of the used bolts and follow the manufacturer's recommendations.

.3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.

.4 Set bolts and fill holes with shrinkage compensating grout.

.4 Drainage holes and weep-holes:

.1 Form weep-holes and drainage holes in accordance with Section 03 10 00 – Concrete Forming and Accessories. If wood forms are used, remove them after concrete has set.

.2 Install weep hole tubes and drains as indicated.

.5 Apply non-shrink grout under the railing post bearing plates in accordance with manufacturer's recommendations to obtain a contact surface equal to 100% of the grouted area.

.6 Finishing and curing:

.1 Finish concrete to CSA A23.1/A23.2.

.2 Use procedures as reviewed by the Departmental Representative or those noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.

.3 Unless otherwise indicated, use a broom to do the finishing.

.4 Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.

.5 Take the necessary precautions to eliminate the causes of deterioration of the concrete arising from shocks or vibrations. The demolition of items continuous concrete using hammers and compaction of materials (soil, granular, coated material) is prohibited within 30 m concrete fresh, and, from its establishment and until it reaches a compressive strength of to the at least 70% of f'c verified by tests on samples witnesses ripened under the same conditions as the concrete of the book.

.6 Ensure damp cure of the concrete for seven (7) days following its placing.

.7 Obtain approval from the Departmental Representative with at least 24 hours' notice, the proposed curing method.

3.3 SURFACE TOLERANCE

.1 Concrete surface tolerances must comply with CSA A23.1, and the straight-edge method

3.4 CONCRETE CASTING DURING HOT TEMPERATURES

.1 When the outside temperature is greater than or equal to 25 ° C or is expected to be within 24 hours, the temperature of the concrete at the time of casting shall be less than 25 ° C.

.2 Take necessary measures to prevent overheating of thick concrete elements during the first three (3) days after casting.

3.5 CONCRETE CASTING DURING COLD TEMPERATURES

.1 When the outside temperature is less than or equal to 5 degrees C, or is expected to be within 24 hours, the temperature of the concrete at the time of casting shall be between 25 to 30 degrees C.

.2 For the first three (3) days following casting or until it is demonstrated that the concrete has reached a compressive strength of 7 MPa, maintain the concrete temperature at 10 degrees C minimum for the elements 0.3 m thick or less, and at 5 ° C minimum for thicker elements.

.3 When outdoor temperature is below 5 degrees C, protect concrete with insulation. If the outdoor temperature is below 0 degrees C provide suitable shelter and heat according to a method approved by the Departmental Representative.

.4 Protect concrete surfaces from direct contact with combustion gases in heating appliances.

3.6 FIELD QUALITY CONTROL

.1 Site tests: conduct following tests and submit report as described in Article 1.3 Documents/Samples Submittals for Approval/Information

.1 Concrete pours.

.2 Slump.

.3 Air content.

.4 Compressive strength: 7 day and 28 day.

.5 Air and concrete temperature.

.2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by the Departmental Representative for review to CSA A23.1/A23.2.

.3 Ensure test lab is certified to CSA A283.

.4 Ensure that test results are transmitted to the Departmental Representative and to the Test Laboratory Representative for them to exam during the meeting prior to the concrete casting.

.5 Parks Canada Departmental will pay for tests as specified in Section 01 29 83 – Payment Procedures for Testing Laboratory Services.

.6 Test laboratory representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.7 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2 at 3, 7, 14 and 28 days.

.8 Inspection or testing by the Departmental Representative or Test Laboratory Representative will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

END OF SECTION

Concrete – Injection Cracks Sealing
Section 03 30 150

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Not used.

1.2 REFERENCE STANDARDS

.1 Not used.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit required documents and samples in accordance with Section 01 33 00 – Submittal Procedures.
.2 Submit product data sheets
.3 Submit two (2) copies of the WHMIS Material Safety Data Sheets.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Filling material: Sikadur 31 Hi-mod Gel or equivalent approved.
.2 Injection product: SikaFix HH+ or equivalent approved.

PART 3 - EXECUTION

3.1 PREPARATION

.1 If the crack has an opening less than 3 mm, the crack should be enlarged and follow the manufacturer's recommendations.
.2 Clean with water jet of 5000 psi.
.3 Place a sealant around the injectors as well as cracks (width of at least 50 mm) to prevent loss of resin. The sealant must be an epoxy-modified mortar.
.4 Prior to injection, perform a leak test of the injectors and sealant.

3.2 APPLICATION

.1 Inject with moisture insensitive.
.2 For a vertical or inclined crack, start the injection from the lowest point. The injection must be made one crack at a time.
.3 Carry out the injection continuously, closing the next injector when the injection product flows there, and so on with the other injectors, until refusal. After a pressure hold for at least 10 minutes, the starting injector is closed and injection is resumed from the last injector where there was flow until the crack was completely filled.
.4 If there is leakage of the injection product, the injection must be discontinued, and resumed after the leakage of the leaks.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Not used.

1.2 REFERENCE STANDARDS

.1 Not used.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

1. Submit required documents and samples in accordance with Section 01 33 00 - Submittal Procedures.
2. Submit product data sheets.
3. Submit two (2) copies of the WHMIS Material Safety Data Sheets.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Concrete : alternative 2 (section 03 30 00).

PART 3 - EXECUTION

3.1 DEMOLITION

.1 Delimit the surface to be repaired with a saw blade 25 mm deep.

.1 Delaminated concrete surfaces to be repaired must be detected and specified using a geologist or mason hammer.

.2 The surfaces to be repaired must have a square or rectangular shape and protrude at least 150 mm from the periphery of the damaged surface.

.3 Saw lines must not intersect at the angles of a repair; the delimitation is finalized by means of a manual pneumatic hammer of 7 kg. The surfaces to be repaired must be integrated into one if they are within 600 mm of each other.

.4 Decrease the depth of the saw line if necessary to avoid damage to the rebar.

.2 Demolish the concrete to the sound concrete and to the required minimum depth, either:

.1 100 mm, when a concrete of normal density is used. For a large repair, a minimum demolition depth of 125 mm is recommended to be able to use standard formwork ties (length 100).

.2 80 mm, when self-placing concrete is used. For a large repair, a minimum demolition depth of 100 mm is recommended in order to use special formwork ties (length 75).

.3 A non-delaminated concrete is considered to be sound, the bond between the constituents of which is not destroyed by the impact of a mason's hammer or geologist.

.4 The depth of demolition may be less than 100 mm when there is a risk of affecting the integrity of fragile elements.

.5 Demolition equipment must be selected and handled in a way that respects the integrity of the component and the concrete to be retained.

.3 The general beacons for the demolition of concrete are as follows:

.1 For the demolition of the concrete opposite and under the first reinforcing ply, the manual pneumatic hammer with a maximum weight of 7 kg must always be used.

.2 For the demolition of concrete above the first reinforcement, the manual pneumatic hammer with a maximum weight of 30 kg must be used. A hydraulic hammer with a shock energy of less than 60 J can be accepted by equivalence.

.4 At least 25 mm clear the exposed frames by demolition.

.1 When demolition involves the release of a large number of reinforcements, these should be fixed to the concrete with anchorages located at a maximum distance of 600 mm c / c in both directions. For small repairs, the distance between the anchors may be reduced. The anchors can be steel rods with a diameter of 12 mm mechanically anchored in concrete at a minimum depth of 200 mm.

.5 Notes on demolition.

.1 To ensure that the durability of the repair without excess thickness is not compromised by corrosive activity, the reinforcements must be clear of 25 mm so that they can be cleaned under and above.

.2 The armature release also allows the existing reinforcements to be integrated into the new concrete and thus ensures better anchorage with the preserved concrete.

.3 In most cases, demolition over a depth of 100 mm ensures rebar release.

.4 Where there are more than two rows of reinforcements, only one row in each direction.

3.2 SURFACE PREPARATIONS

.1 Surface preparation must be carried out using a high-pressure water jet or a wet abrasive jet on:

.1 The reinforcing bars were exposed during the demolition, to remove all the detachable rust (strata, layers, ...). A highly adherent rust film can be tolerated in areas that are more difficult to access, such as the underside of rebar.

.2 Concrete surfaces to be kept to remove particles and aggregates.

.3 The structural steel surfaces in contact with the new concrete, where applicable, the intended purpose being the same as for reinforcing steel.

.2 After completing the basic preparation, clean the concrete surface with a pressurized water jet (pressure 15 MPa, flow rate 20 L / min, concentrated circular jet nozzle and nozzle-to-surface distance of Concrete 150 to 200 mm).

3.3 CONCRETE SURFACE RECONSTRUCTION

.1 If necessary, support or fix existing frames.

.1 The exposed reinforcements shall be secured to the tie rods when the smallest dimension of the repair is greater than 1500 mm, assuming that the depth of demolition permits the installation of tie rods.

.2 The rebar of vertical surfaces must be attached to the ties of the formwork; Plastic circular spacers can also be used to maintain the frames in a vertical position.

.3 If possible, reinforcements within 50 mm of the surface should be moved inwards in order to increase their coverage.

.2 If necessary, add reinforcements of the same diameter as existing ones to compensate for the loss of steel in bars whose section is reduced by more than 30%, either by corrosion or by demolition work.

.1 In general, loss of section on rebar can be compensated overall. Thus, in the case where several bars have a loss of cross section of the order of 30%, it would be possible to add only one additional bar for three deteriorated bars.

.2 To establish continuity, the required length of overlap on either side of the damaged section must be at least 600 mm. For structural reinforcement, this length must be calculated by a structural engineer.

.3 If necessary, install anchors and frames.

.1 When the demolition work does not reveal reinforcement, the repair concrete layer must be reinforced and anchored to the preserved concrete.

.2 The reinforcements shall be 15M bars spaced at 300 mm c / c in both directions and laid in such a way as to obtain a concrete covering of 50 mm.

The preferred option for fixing these frames is to attach them to the formwork ties previously installed at 600 mm c / c in both directions. Provide smaller spacing for small repair (eg smaller than 2m x 2m). Chemical anchors (epoxy) or by means of cement grout may be used. The anchors are 15M reinforcing bars with a 100 mm long hook. The anchorage depth is 300 mm if a cementitious grout is used, and 200 mm in the case of a chemical anchor.

.4 For all repairs, addition of a galvanized 50 x 50 mm mesh and an anchor with shotcrete.

.5 Install Forms.

.1 The formwork must be installed in such a way as to obtain a surface in the same plane as the surrounding surfaces while maintaining a covering of the 50 mm reinforcement and in order to avoid leakage of the concrete around the perimeter of the repair. However, a 30 mm overlap can be tolerated when the repair of elements such as beams does not make it possible to obtain a thicker covering.

.2 For normal vertical surface repair work, the smallest dimension of which is greater than 1500 mm, the anchors for fixing the reinforcements consist of the steel tie rods used to hold the formwork in place. However, this method of fixing reinforcements is only applicable when the demolition depth is at least 125 mm for standard formwork ties and at least 100 mm for special formwork ties.

.3 The formwork must be new, perfectly tight and rigid enough to withstand the thrust of a very fluid concrete without undergoing deformation.

.4 In the case where the complete surface of an element or part of the element has to be repaired, the formwork must be placed in order to obtain a covering of 50 mm.

.6 Make openings in the formwork for the placement of the concrete when the height of the intervention is greater than 1.5 m.

.1 The concreting apertures shall be so arranged as to limit the height of fall of the concrete to 1,5 m and to promote its placement.

.2 Where concreting is to be carried out on the circumference of small dimensions, the openings must be located on opposite sides of the element.

.3 For large dimensions or flat vertical surfaces (front wall of an abutment, keg of a pile, retaining wall, etc.), the horizontal distance between the openings should not exceed 2 m.

.4 In the case of repairs carried out with pumped self-laying concrete, the openings may be omitted as long as the maximum drop heights are respected .

.7 Clean the inside of the formwork of any debris using a jet of air or a jet of pressurized water or a vacuum cleaner.

.8 Moisten contact surfaces before placing new concrete.

.1 However, free water at the surface and at the bottom of formwork must be removed before concreting.

.2 Moistening the concrete surfaces to saturation and allowing them to dry out promotes the bond between the retained concrete and the new concrete.

.9 Proceed with the installation of the concrete.

.1 The most important properties of self-compacting concrete (Form 2) compared to normal density concrete are very high fluidity without segregation, and the ability to completely fill the space between the rebar. The fluidity of this concrete is obtained by the addition of a superplasticizer and a colloidal agent, as well as by the use of a large aggregate 2.5-10.

.2 If the self-placing concrete is placed using a concrete pump, the type of equipment used and the configuration of the pumping line must prevent the segregation of the concrete. Thus, the pumping line must always be full during pumping and must end with a reducing section of 75 mm.

.10 Concrete Notes.

.1 The characteristics of self-compacting concrete make it unnecessary to vibrate it.

.2 A settlement of the order of 0.5% is observed on the self-compacting concrete in the fresh state. In order to avoid the formation of a void zone at the top of a vertical repair, a funnel opening must be provided in the upper part of the formwork to create an overpressure on the repair concrete (see detail). Similarly for horizontal repair, measurements (such as vents) should be planned to evacuate air that can be trapped in the upper part of the operation.

3.4 CONCRETE CURING AND SURFACE CORRECTION

.1 Performing curing of concrete.

.1 After removal of the formwork, the treatment should be continued, if necessary, using one of the two methods of curing water-soaked fabrics and curing material forming membrane).

.1 Absorbent Water-Soaked Fabrics: This method consists of using water-saturated synthetic fiber fabrics when placed and then covered with impermeable sheets to maintain moisture on the surface of the concrete. The surfaces must be completely covered. The fabrics must be kept continually moist so that there is a thin layer of water on the surface of the concrete throughout the cure. The temperature of the water must not be less than 10°C.

.2 Membrane Curing Material: This method involves applying a translucent curing material with a fugitive dye to the concrete surfaces. It shall be applied so as to form a sufficiently thick and uninterrupted film over the entire area exposed to ambient air at the rate recommended by the manufacturer, but not less than 0.2 l / m.

.2 Carry out the removal of formwork.

.1 The time required for the removal of formwork for self-compacting concrete is longer than for concrete with a normal density. The compressive strength gain of a self-leveling concrete is longer term than for a normal density concrete; this is due to the use of overdosage-setting retarding adjuvant which has the effect of slowing the setting of the concrete and the gains in resistance at an early age

.2 If necessary, additional cylinders can be sampled during the acceptance check of the concrete to check its resistance gain.

.3 Check the adhesion of the repair concrete to the preserved concrete by hitting the surface with a mason's hammer or geologist. A hollow sound indicates a lack of adhesion and requires a resumption of repair in the deficient area.

.4 Correct the surfaces and remove the burrs from the concrete around the repaired surface.

.5 Fill the holes left by the fasteners of the forms and the cavities left by the concreting apertures with a cementitious mortar in a bag.

.6 For an apparent element, all surfaces should be cleaned to remove all traces of coating, paint, rust or other dirt and give the concrete a uniform appearance.

.3 General Notes.

.1 Repair with formwork without excess thickness is used to correct damage to concrete surfaces that are delaminated or burst when the concrete of the element appears to be of good quality and the scale of damage is low. Its main purpose is to restore the appearance of the element and to protect the reinforcements against corrosion. It can also restore the structural integrity of the element if the link is of good quality, but it is generally not used for this purpose.

.2 Repair should not normally be carried out in cold weather because of the high risks of freezing concrete (low volumes of concrete, large areas).

END OF SECTION

PART 1 - GENERAL

1.1 SCOPE OF WORK

.1 Supply and install steel parts shown on the drawings, including steel frame, skid plate, gratings, guardrails, stairs, etc.

.2 Put grout under base plates of the columns.

1.2 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM).

.1 ASTM A123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM A 36/A 36M-08, Standard Specification for Carbon Structural Steel.

.3 ASTM A 193/A 193M-10a, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature or High Pressure Service and Other Special Purpose Applications.

.4 ASTM A 307-10, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

.5 ASTM A 325-10, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 Ksi Minimum Tensile Strength.

.6 ASTM A 325M-09, Standard Specification for Structural Bolts, Steel, Heat Treaded 830 MPa minimum Strength (Metric).

.7 ASTM A 490-10a, Standard Specification for Structural Bolts Alloy Steel, Heated Treated, 150 Ksi Minimum Tensile Strength.

.8 ASTM A 490M-10, Standard Specification for High-Strength Steel Bolts, Classes 10.9 and class 10.9.3, for Structural Steel Joints [Metric].

.9 ASTM A1011/A1011M-10, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.40-97, Anticorrosive Structural Steel Alkyd Primer.

.2 CGSB 85-GP-14M-78, Painting Steel Surfaces Exposed to Normally Dry Weather.

.3 CAN/CGSB-85.100-93, Painting.

.3 Association canadienne de normalisation (CSA).

.1 CAN/CSA G30.18-F09, Billet-Steel Bars for Concrete Reinforcement.

.2 CAN/CSA-G40.20/G40.21-F04 (C2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.3 CAN/CSA-S16-F09, Limit States Design of Steel Structures.

.4 CAN/CSA-S136-F07, North American Specifications for the Design of Cold Formed Steel Structural Members.

.5 CSA W47.1-F09, Certification of Companies for Fusion Welding of Steel.

.6 CSA, W48-F06, Filler Metals and Allied Materials for Metal Arc Welding.

.7 CSA W55.3-F08, Certification of Companies for Resistance Welding of Steel and Aluminium.

.8 CSA W59-F03 (C2008), Welded Steel Construction (Metal Arc Welding).

.4 American Welding Society (AWS).

.1 AWS A2.4:2007 Standard symbols for welding, brazing, and non-destructive examination.

.5 Master Painter Institute.

.1 MPI-INT 5.1, structural steel and metal fabrications.

.2 MPI-EXT 5.1, structural steel and metal fabrications.

.6 Society for Protective Coating (SSPC).

.1 SSPC SP-6/NACE No. 3, commercial blast cleaning.

1.3 QUALITY CONTROL

.1 If required, provide three (3) certified copies of the steel mill inspection reports and the steel casting number regarding the chemical and physical characteristics to Departmental Representative.

1.4 ASSEMBLIES AND RELATED WORK DESIGN

.1 Assemblies and related works details shall be designed in accordance with CAN / CSA-S16 and CSA-S136 to withstand the specified loads and overloads

.2 Connections of the bracing members shall comply with clause 27 of CAN / CSA-S16 for the factors indicated in drawings.

.3 If calculation of the joints shall only consider the shear stresses (standard joints), proceed as follows:

.1 Retain shear-resistant, triangulated structural assemblies described in an industry-recognized document, such as the CISC Handbook of Steel Construction.

.2 If the shear stress is not specified, select or calculate assemblies capable of withstanding the constraints of the uniformly distributed maximum load that may support a flexural beam, provided that it is not subject to any concentrated load.

.3 For non-standard assemblies, submit sketches and calculation notes with seal and signature of an active member engineer of the “Ordre des ingénieurs du Québec”.

.4 Rigid assemblies shall transfer the resistance moment of the beam, unless otherwise indicated.

.5 Splices shall transfer 100% of the capacity of the piece in tension and in shear.

.6 Horizontal and vertical bracing assemblies shall have at least Class A friction surface.

1.5 SHOP DRAWINGS

.1 Unless otherwise specified, submit shop drawings in accordance with Section 013300, Submittal Procedures, as soon as possible after Contract award or at least three (3) weeks prior to completion of Work.

.2 Each drawing submitted shall include the signature and seal of an active member engineer of the "Ordre des ingénieurs du Québec".

.3 Shop drawings shall indicate fabrication and assembly details including cuts, nicks, joints, holes, threaded anchors, rivets and welds. Use AWS symbols to represent welds.

.4 Submit a description of the work methods, the assembly order of the elements and equipment to Departmental Representative. Even if this is completed and the document is approved, Contractor remains fully responsibilities for the use of methods and equipment, methods of execution and security measures.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Structural steel: to CAN/CSA G40.20/G40.21

.1 Standards profiles, angles : grade 300W.

.2 Standards I-beam (W) and plates: grade 350 W.

.3 Structural hollow sections (PCC or HSS): grade 350 W, class C.

.2 Bolts, nuts and washers: to ASTM A325, galvanized.

.3 High strength anchor bolts: to ASTM A36/A36M, for smooth steel or to CAN/CSA-G30.18, grade 400MPa for castellated steel.

.4 Welding materials: to CSA W59.

.5 Hot dip galvanizing in the shop in accordance with ASTM A123, latest edition. For on-site touch-ups, use Rust Anode Paint (Galvatech 2000), Zinga or equivalent submitted for acceptance. Application shall be completed in two (2) layers so that the final thickness is at least 125 microns (5 mils) dry film.

.6 Fisher-Ludlow type W-A-102 grating or approved equivalent, shown in drawing, minimum thickness 32 x 4.8 unless otherwise indicated. Panels to be belted in black. Steps and stairs steps shall have a nose consisting of a checker plate. Grating used outside to be galvanized. Grating to be fixed to the frame with Fisher & Ludlow Type D fixings at a maximum center of 300 mm on each chord.

.7 Zero shrinkage: pre-mixed product containing a non-metallic aggregate, cement, plasticizer and water reducer, of a consistency suitable for casting and able to achieve a compressive strength of 50 MPa at 28 days.

.8 Welding electrodes: to ACNOR W48.

2.2 FABRICATION

.1 Fabricate structural steel in accordance with CAN/CSA-S16 and in accordance shop drawings.

.2 Drill holes of 11 to 27 mm diameter for connecting other structures; refer to drawings for execution and location details. Provide oblong holes for connection to existing structures

.3 Reinforce openings to maintain the initial design resistance required.

.4 Unless otherwise specified, provide bridging edge angle at floor perimeter and perimeter of floor openings.

.5 Provide each face of posts and lintel beams in contact with concrete, 3 mm x 20 mm x 450 mm anchor welded to 100 mm and spaced 400 mm in the vertical plane.

.6 Make 12 mm diameter openings at the bottom of HSS (PCC) poles for ventilation.

PART 3 - EXECUTION

3.1 GENERAL

.1 Structural steel work: in accordance with CAN/CSA- S16.

.2 Welding: in accordance with CSA W59.

.3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.

3.2 CONNECTION TO EXISTING WORK

.1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Departmental Representative for direction before commencing fabrication. Verification shall be done early to avoid delays.

3.3 MARKING

.1 Mark materials in accordance with CSA G40.20/G40.21. Do not use die stamping. When steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.

.2 Match marking: shop mark bearing assemblies and splices for fit and match.

3.4 ERECTION

.1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16 and in accordance with drawings.

.2 If shown on drawings, all steel members shall be continuously seal welded. Welds shall be grinded.

.3 Field cutting or altering structural members: to approval of Departmental Representative.

.4 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection. Touch-up galvanized materials with « Galvicon ».

.5 Steel profiles shall be replaced without extra cost if damaged during construction.

.6 Do not oversize holes by flame cutting without Departmental Representative approval.

3.5 GROUT APPLICATION

.1 Apply non-shrinking grout under column sole plates as recommended by manufacturer.

3.6 SUBSTITUTION

.1 Substitutions to materials or steel profiles indicated on drawings shall be approved by the Departmental Representative: design brief shall be submitted on request to justify design changes.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCE STANDARDS

.1 Aluminum Association (AA).

.1 AA DAF 45-(R2009), Designation System for Aluminum Finishes.

.2 ASTM International.

.1 ASTM A123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM A325 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

.3 ASTM A490 Standard Specification for Structural Bolts Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.

.4 ASTM A490M Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3 for Structural Steel Joints Metric.

.5 ASTM B210M-07, Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes [Metric].

.6 ASTM B211M-05, Standard Specification for Aluminum and Aluminum Alloy Bar, Rod and Wire [Metric].

.7 ASTM F593 (2008), Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.

.3 American Welding Society (AWS.

.1 AWS - A5.10/A5.10M (R2007), Specification for Bare Aluminum and Aluminum Alloy Welding Electrodes and Rods.

.4 CSA International.

.1 CAN/CSA-S157/S157, Strength Design in Aluminium Welding Requirements.

.2 CSA W47.2 (C2008), Fusion Welding of Aluminium Company Certification.

.3 CSA W59.2 (C2008), Welded Aluminum Construction.

.5 Master Painters Institute (MPI).

.1 MPI - EXT 5.5D, Bituminous Finish.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data.

.1 Submit manufacturer's instructions, printed product literature and data sheets for structural aluminum and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop drawings.

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Quebec, Canada.

.2 Submit shop drawings to include fabrication and erection documents consisting of connection and design details, shop details, erection diagrams, erection procedures and material lists.

.3 Indicate cuts, copes, connections, holes, threaded fasteners, rivets, welds and other items. Indicate welds using welding symbols as shown in Appendix A of CSA W59.2.

.4 Include description of methods, sequence of erection and type of equipment used in erecting structural aluminum.

1.3 QUALITY ASSURANCE

.1 Submit four (4) weeks prior to fabrication of structural aluminum, Mill test reports which shall contain chemical and physical properties and other aluminium characteristics that will be used for the works. Mill test reports shall be certified by metallurgists qualified to practice in Quebec, Canada.

.2 Fabricator of structural aluminum to provide affidavit stating materials and products used in fabrication conform to applicable material and products standards called for by design drawings and specifications

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements.

.1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect structural aluminum from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Aluminum bar, rod, wire: to ASTM B211M.

.2 Aluminum and Aluminum-Alloy Extruded Bar, Rods, Wire, Shapes, and Tubes: to ASTM B221M.

.3 Aluminum sheet or plate: to ASTM B209M.

.4 Aluminum drawn tubes: to ASTM B210M.

.5 Aluminum bolts and rivets: to ASTM B316M.

.6 Aluminum welding wire: to AWS - A5.10/A5.10M.

.7 Stainless steel bolts: to ASTM F593.

.8 Steel bolts: to ASTM F3125/F3125M and ASTM A307.

.9 Bituminous paint: MPI - EXT 5.5D, without thinner.

.10 Galvanizing: Hot dips galvanize steel bolts to ASTM A123.

2.2 FABRICATION

.1 Fabricate to CAN/CSA-S157.

2.3 FINISHES

.1 Finish exposed surfaces of aluminum components to Aluminum Association (AA), Designation System for Aluminum Finishes.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for structural aluminum installation in accordance with manufacturer's written instructions.

.2 Visually inspect substrate in presence of Departmental Representative.

.3 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.4 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

.1 Do structural aluminum work: to CAN/CSA-S157.

.2 Do welding: to CSA W59.2.

.3 Companies certified under Division 1 or 2.1 of CSA W47.2 for fusion welding of aluminum.

3.3 ERECTION

.1 Erect structural aluminum as indicated and to CAN/CSA-S157 and approved erection drawings.

.2 Field cutting or altering structural members: to approval of Departmental Representative.

3.4 FIELD QUALITY CONTROL

.1 Inspection and testing of materials and quality of work by testing laboratory designated by Departmental Representative.

.2 Provide safe access and working areas for testing on site, as required by testing agency and as directed by Departmental Representative.

.3 Submit test reports to Departmental Representative.

.4 Departmental Representative will pay costs of tests as specified in Section 01 29 83- Payment Procedures - Testing Laboratory Services.

3.5 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

.2 Leave Work area clean at end of each day.

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

.4 Waste Management: separate waste materials for recycling/reuse in accordance with Section 01 74 21 – Construction and Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by structural aluminum for buildings installation.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for Generalities Service.

.3 ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 CSA International

.1 CSA G40.20/G40.21- General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA G164 - Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA S16 – Design of Steel Structures

.4 CSA W48 - Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).

.5 CSA W59 - Welded Steel Construction (Metal Arc Welding) [Metric].

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 WHMIS Safety Data Sheets (SDS)

.4 The Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for tubing, pipe, sections, plates and bolts and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two (2) samples of the MSDS data sheets as per WHMIS regulation.

.1 In case of paint, primers and other finishing products applied on site, indicate VOC content (g/L).

.1 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Quebec, Canada.

.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.3 QUALITY ASSURANCE

.1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in dry location off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Steel sections and plates: to CSA G40.20/G40.21, Grade 350W or 300W.

.2 Steel pipe: to ASTM A53/A53M, Class B.

.3 Welding materials: to CSA W59.

.4 Welding electrodes: to CSA W48 Series.

.5 Bolts and anchor bolts: to ASTM A307, except as identified on drawings.

.6 Structural bolts: to ASTM A-325, galvanized.

.7 Grout: non-shrink, non-metallic, flowable, 25 MPa at 24 hours.

2.2 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Exposed welds continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 SHOP PAINTING AND GALVANIZATION

.1 Structural components to be galvanized to CAN/CSA-G164 (600g/m2). Provide structural arrangements to galvanize the structure.

.2 Bollards and beacons to be painted in black.

.3 Galvanized steel painting for bollards and beacons :

.1 Preparation of steel SSPC-SP16, minimum profile 1.5 mils.

.2 Galvanized steel shop painting :

.1 Brush weld joints and sharp edges before each coat with spray gun for middle and top coat

.2 One primer coat: hot dip galvanizing.

.3 One intermediate layer: Amerlock 2, 6 to 7 mils dry.

.4 One coat (epoxy polysiloxane finish) : Amercoat PSX 700 4 to 6 mils dry.

.4 Color

.1 Intermediate : middle grey

.2 Finish : black

.3 Contractor shall select a paint system equivalent to that describe above, subject to approval by Departmental Representative.

2.4 BOLTS

.1 As shown on drawings.

PART 3 - EXECUTION

3.2 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for metal fabrications installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions remedied [and after receipt of written approval to proceed from Departmental Representative.

3.3 ERECTION

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable Parks Canada Agency such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Supply components for work by other trades in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CSA S16.

.7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.

3.4 GALVANIZATION

.1 Galvanizing

.1 Conformity certificate

.1 For each delivery of galvanized steel, provide a certificate of compliance containing the following information to Departmental Representative :

.1 Galvanizing company;

.2 Galvanizing date and place;

.3 Coating thickness;

.4 Coating adhesion;

.5 Coating quality.

.2 Reception check

.1 Reception check carried out by Departmental Representative is tests for thickness, adhesion and coating quality performed in accordance with ASTM A123/ A123M « Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products ».

.3 Surfaces preparation

.1 Surfaces to be galvanized shall be clean, free of paint, grease, rust, etc. Deposits and residues from welding work, mill scale and paint or thick rust deposits shall be removed by appropriate methods. Final stripping shall be done by submerging in a caustic solution followed by rinsing with clean water and submerged in dilute sulfuric or hydrochloric acid. After stripping, the parts shall be submerged in an aqueous solution of zinc chloride and ammonium

.4 Galvanizing process

.1 Galvanization to be in accordance with ASTM A123 / A123M "Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products".

.2 Steel surfaces of the bottom flange of the girders and bearings in contact with the welds to secure the beam supports shall be ground after galvanizing.

.3 The minimum thickness of galvanization is 100 µm, except for HSS steel tubes, where the minimum thickness is 75 µm.

.5 Protection of galvanized elements

.1 Protect galvanized elements from damage during handling and storage.

.2 Protect the element in contact with the lifting equipment, such as cables and chains.

.3 Storage of galvanized elements, except for reinforcement, shall be done so that the air circulates between the parts, that the water does not accumulate and drip freely, and that there is no metal-to-metal contact of the galvanized parts. During installation of the galvanized retainers, Contractor is fully responsible for ensuring that there is no white rust on these parts

.6 Repair after galvanizing

.1 Damaged surfaces less than 2.5 cm wide shall be repaired by adding 2 coats of zinc-rich plaster with a minimum of 87% zinc metal in the dry film. Total surface to be repaired by coating rich in zinc must be less than 0.5% of the total surface of the part. Damaged surfaces shall first be cleaned in accordance with SSPC-SP 11 "Power Tool Cleaning to Bare Metal". The minimum total thickness of the dry film of coating shall be 130 µm.

.2 Damaged surfaces with a width greater than 2.5 cm and parts with a damaged surface greater than 0.5% of the total area of the part shall be re-galvanized or repaired by metallization. Clean damaged surfaces according to the requirements of SSPC-SP 5 / NACE N ° 1 "White Metal Blast Cleaning" or SSPC-SP 11 "Power Tool Cleaning to Bare Metal". The minimum thickness of the metallized coating is 130 µm.

3.5 CLEANING

.1 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Parks Canada Agency requirements.

3.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCE STANDARDS

.1 Unless otherwise indicated, refer to the latest revision of the following standards, prevailing on the effective contract date.

.2 ASTM international

- .1 ASTM C920, Type S, Quality NS, Class 50.
- .2 ASTM C920, Type M, Grade P, Class 25.

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

- .1 Material Safety Data Sheets (SDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

- .1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Manufacturer's product to describe :
  - .1 Caulking compound.
  - .2 Primers.
  - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
- .3 Submit two [2] copies of WHMIS SDS.

.3 Samples s :

- .1 Submit two [2] samples of each type of material and color.
- .2 Cured samples of exposed sealants for each color where required to match adjacent material.

.4 Manufacturer's Instructions:

- .1 Submit instructions to include installation instructions for each product used.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials indoors, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area

.2 Store and protect joint sealants from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

1.4 SITE CONDITIONS

.1 Ambient Conditions:

.1 Proceed with installation of joint sealants only when:

.1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.

.2 Joint substrates are dry.

.3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.2 Joint-Width Conditions:

.1 Procéder à la mise en œuvre des produits d'étanchéité seulement lorsque la largeur des joints est supérieure à celle établie par le fabricant du produit pour les applications indiquées.

.3 Joint-Substrate Conditions:

.1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

1.5 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (SDS) acceptable to Health Canada.

PART 2 - PRODUCTS

2.1 SEALANT MATERIALS

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

.3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Two part sealant, to ASTM C920, Type M, Grade P, Class 25: Sikaflex 2c SL or approved equivalent.

.2 One part sealant, to ASTM C920, Type S, Qualité NS, Class 50: SikaHyflex -150LM or approved equivalent.

.3 Sikaflex 202 Primers or approved equivalent.

.4 Preformed compressible and non-compressible back-up materials:

.1 Polyethylene, urethane, neoprene or vinyl foam:

.1 Extruded cell foam backer rod.

.2 Size: oversize 30 to 50 %.

.2 Neoprene or butyl rubber:

.1 Round solid rod, Shore A hardness 70.

.3 High density foam:

.1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m^{3}density, or neoprene foam backer, size as recommended by manufacturer.

.4 Bond breaker tape:

.1 Polyethylene bond breaker tape which will not bond to sealant.

2.3 SEALANT SELECTION

.1 Seal perimeter of access door inside piers.

.2 Seal perimeter of prefabricated concrete panels.

.3 Seal between two (2) pours on piers.

.4 As shown on drawings.

2.4 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.

.2 Primer: in accordance with sealant manufacturer's written recommendations.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 APPLICATION

.1 Sealant:

.1 Apply sealant in accordance with manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

.5 Use sufficient pressure to fill voids and joints solid.

.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Remove excess compound promptly as work progresses and upon completion.

.2 Curing:

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

3.7 CLEANING

.1 Progress Cleaning:

.1 Leave Work area clean at end of each day.

.2 Clean adjacent surfaces immediately.

.3 Remove excess and droppings, using recommended cleaners as work progresses.

.4 Remove masking tape after initial set of sealant.

3.8 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by joint sealants installation.

END OF SECTION

Openings and Closures - Windows
Section 08 50 00

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 07 92 00 – Joint Sealants

1.2 REFERENCE STANDARDS

.1 Aluminum Association (AA)

.1 AA DAF 45-2003 (R2009), Designation System for Aluminum Finishes.

.2 Glass Association of North American (GANA)

.1 GANA Glazing Manual

.3 CSA Group (CSA)

.1 CAN/CSA-A440-00/A440.1-00 (R2005), A440-00, Windows / Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows.

.2 CAN/CSA-A440.2-14 /A440.3-14, Fenestration Energy Performance/User Guide to CSA A440.2–14, Fenestration energy Performance.

.3 CAN/CSA-A440.4-07 (C2016), Window, Door, and Skylight Installation.

.4 CAN/CSA-Z91-17, Health and Safety Code for Suspended Equipment Operations.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.

.5 Screen Manufacturers Association (SMA)

.1 SMA 1201-2007 (R-2012) Specification for Insect Screens for Windows, Sliding Doors and Swinging Doors.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data :

.1 Submit manufacturer's instructions, printed product literature and data sheets for windows, glazings, sealants and glazing accessories and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Shop Drawings:

.1 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim elevations of unit, anchorage details, description of related components fasteners, and caulking. Indicate location of manufacturer's nameplates.

.3 Samples

.1 Submit for review and acceptance of each unit.

.2 Include 150 mm long samples of head, jamb, sill to indicate profile.

.4 Test and Evaluation Reports :

.1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications.

.1 The product manufacturer.

.2 The type of product.

.3 The model number/series number.

.4 The primary product designation.

.5 The secondary product designation.

.1 Positive design pressure.

.2 Negative design pressure.

.3 Water penetration resistance test pressure.

.4 Canadian air infiltration and exfiltration levels.

.6 The test completion date.

.2 The report will also contain the following information.

.1 Test dates.

.2 Report preparation dates.

.3 Test information retention period.

.4 Location of testing facilities.

.5 Full description of test samples, including:

.1 Condensation resistance.

.2 Block operation.

.3 Forced entry resistance.

.6 Complete description of amendments, as applicable.

.7 Conclusion.

.8 Drawings signed by the testing laboratory, if provided.

1.4 QUALITY ASSURANCE

.1 Certifications: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions and with Section 01 61 00- Common Product Requirements.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect windows from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

1.6 WARRANTY

.1 Manufacturer's warranty: Submit, for Departmental Representative acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty in addition to and not limit other rights Owner may have under Contract Documents.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Materials: to CSA-A440/440.1 supplemented as follows:

.2 Windows by same manufacturer.

.3 Sash: thermally broken aluminum.

.4 Main frame: thermally broken aluminum.

.5 Glass: Sealed double glazing

.1 25 mm (1") full thickness, hot edged, double-sided polyisobutylene and polyurethane or polysufide borard, consisting of:

.1 Clear float glass, 6mm (1/4")

.2 Air space, filled with argon 12.7 mm (1/2")

.3 Clear float interior glass, 6 mm (1/4")

.6 Screens: to SMA 1201R on ventilating portion of windows with frame designed for indoor mounting.

.7 Metal sills and aluminum facings: extruded aluminum of type and size to suit job conditions; minimum [3] mm thick.

.8 Isolation coating: alkali resistant bituminous paint.

.9 Sealants :

.1 VOC limit 250 g/L maximum to SCAQMD Rule 1168.

2.2 WINDOW TYPE AND CLASSIFICATION

.1 Product type :

.1 HS - Horizontal sliding window.

.1 Classification rating: to CSA A440/A440.1 supplemented as follow:

.1 Airtightness : A3;

.2 Water tightness : B3;

.3 Resistance to wind load: C3;

.4 Forced entry resistance: F10;

.5 Condensation: temperature index , I40;

.6 Glazing: G1.

2.3 FABRICATION

.1 Fabricate in accordance with CSA A440/A440.1 supplemented as follows:

.2 Dimensions: as indicated in Appendix E.

.3 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less, and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.

.4 Face dimensions detailed maximum permissible sizes.

.5 Brace frames to maintain squareness and rigidity during shipment and installation.

.6 Finish steel clips and reinforcement with [380] [shop coat primer to MPI 380 g/m^2zinc coating to ASTM A123/A123M.

2.4 ALUMINUM FINISHES

Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.

.1 Clear anodic finish: designation AA-M12, C22, A31.

2.5 GLAZING

.1 Glaze windows in accordance with CSA A440/A440.1.

2.6 HARDWARE

.1 Hardware: stainless steel or white bronze sash locks and aluminum handles to provide security and permit easy operation of units.

.2 Locks: provide operating sash with spring loading locking device, to provide automatic locking in closed position

.3 Include special keyed opening device for windows normally locked.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for product installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

.1 Window installation :

.1 Install in accordance with CSA A440/A440.1.

.2 Arrange components to prevent abrupt variation in color.

.2 Sill installation:

.1 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece of appropriate lengths at each location.

.2 Cut sills to fit window opening.

.3 Secure sills in place with anchoring devices located at ends and evenly spaced 600 mm on center in between.

.4 Fasten expansion joint cover plates and drip deflectors with self-tapping stainless steel screws.

.5 Maintain 6 to 9 mm space between butt ends of continuous sills. For sills over 1200 mm in length, maintain 3 to 6 mm space at each end.

.3 Caulking:

.1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.

.2 Apply sealant in accordance with Section 07 92 00- Joint Sealants. Conceal sealant within window units except where exposed use is permitted by Departmental Representative.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

.3 Waste Management: separate waste materials in accordance with Section 01 74 21- Construction and Demolition Waste Management and Disposal.

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by window installation.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Not used.

1.2 REFERENCE STANDARDS

.1 Society for Protective Coating (SSPC).

.1 SSPC-SP 10/Nace No.2, Near-White Blast Cleaning.

1.3 QUALITY ASSURANCE

.1 Qualifications:

.1 Contractor: to have a minimum of 5 years satisfactory experience. When requested, provide list of last 3 comparable jobs including, job name and location, specifying authority, and project manager.

.2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work.

.3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.

.2 Retain purchase orders, invoices and documents to prove conformance with requirements when requested by Departmental Representative.

1.4 WORK SCHEDULE

.1 For the rehabilitation of a sector gate, Parks Canada Agency will allow a six (6) weeks period of dry dock to perform the work. Parks Canada Agency is responsible for the removal and installation of the seals on the gate after painting.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide documents and samples in accordance with Section 01 33 00- Submittal Procedures.

.1 Submit samples of all available colors for review and selection; specify when color range is limited.

.2 Submit data sheets and manufacturer's instructions for paint products and coatings.

.3 Submit Material Safety Data Sheets (MSDS) required by the Workplace Hazardous Materials Information System (WHMIS) for paint products and coatings

.4 Quality Assurance:

.1 Manufacturer's instructions: Submit manufacturer's instruction for application.

1.6 MAINTENANCE

.1 Replacement materials.

.1 Provide one (1) four (4) liter container of each type and color. Identify the product color and type according to the color schedule and system specified.

1.7 DELIVERY, STORAGE AND HANDLING

.2 Delivery, handling and unloading.

.1 Transport, store and handle paint products as specified below.

.2 Transport and store paint products in their original containers, sealed and with undamaged labels.

.3 Labels: to indicate:

- Name and address of the manufacturer;
- Type of paint or coating;
- Compliance with applicable standard;
- Color number in accordance with established color schedule.

.4 Remove degraded, opened or rejected products from site.

.5 Observe manufacturer's recommendations for storage and handling.

.6 Store materials in clean, dry, well-ventilated area, with temperature range 10 degrees C to 30 degrees C. Store materials and supplies away from heat generating devices and observe manufacturer's recommendations for the minimum temperature storage.

.7 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.

.8 Remove paint materials from storage only in quantities required for same day use.

.9 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.10 Fire Safety Requirements.

.1 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada (NFC).

.2 Waste management and disposal.

.1 Paints, stains, wood preservatives and other related products (thinners and solvents) are hazardous materials; their disposal is subject to various regulations. Information on relevant legislation can be obtained from provincial ministries responsible of the environment and government agencies of the region

.2 Products not reused shall be treated as hazardous waste and disposed of properly.

.3 Place hazardous or toxic products and materials, including used tubes and containers of adhesive and sealant, in areas or containers intended to receive hazardous waste.

.4 To reduce contamination of soil or waterways and sanitary and stormwater systems, follow the following guidelines :

.1 Maintain washing water for paints and other water-based products to allow filtration of various deposited materials. Recover washing water after cleaning used equipment.

.2 Store cleaning products, thinners, solvents and excess paint in designated containers and dispose of properly.

.3 Store oil and solvent soaked rags during painting to recover contaminants and proper disposal or cleaning, as appropriate.

.4 Contaminants disposal in accordance with the Hazardous Waste Regulations

.5 Dry empty paint containers before disposal or recycling (in appropriate facilities).

.6 Seal containers of partially used paint products, including adhesive and sealant containers, and store at moderate temperature in a well-ventilated, fire-resistant area.

.5 For paint recycling service, collect excess paint, classify by product type and ship to collection or recycling facility.

1.8 SITE CONDITIONS

.1 Application conditions :

.1 Interior of gate is considered as a confined space. Contractor is responsible to provide safety equipment and ventilation required for painting work in confined space.

.2 Perform painting in areas where ambient air is free from suspended dust generated by construction or windblown particles to not alter finished surface results.

.3 Paint and sand residues caused by the sandblasting of the valve shall be disposed of in accordance with the instructions in the specification.

.4 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.

.5 Apply paint when previous coat of paint is dry or adequately cured, à moins d'autres indications préalablement approuvées par le fabricant de la peinture ou de l'enduit mis en œuvre.

.6 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.

.7 Do not apply paint when:

- Substrate and ambient air temperatures are expected to fall outside paint manufacturer's prescribed limits;
- Surface to be painted is wet, damp or frosted.

.8 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.

.9 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow

or condensation. Prepare surface again and repaint.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Paint materials for paint systems: to be products of single manufacturer.

.2 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising there from, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).

.3 Paint materials must not be formulated or manufactured with formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavelant chromium or their compounds

2.2 COLOURS

.1 Submit proposed Colour Schedule to Departmental Representative.

.2 First coat in two coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 PAINT SYSTEM FOR REFURBISHED VALVE WORK

.1 Interior of valves.

.1 Sandblasting SSPC-SP 10 Near-White Blast Cleaning.

.2 Primer epoxy coat, AMERCOAT 240LT or equivalent approved by Departmental Representative, 8 to 10 mils DFT total.

.3 An epoxy topcoat, AMERCOAT 240LT or equivalent approved by Departmental Representative, 8 to 10 mils DFT total.

.2 Exterior of gate.

.1 Sandblasting SSPC-SP 10 Near-White Blast Cleaning.

.2 Primer epoxy coat, AMERCOAT 240LT or equivalent approved by Departmental Representative, 8 to 10 mils DFT total.

.3 An epoxy interlayer, AMERCOAT 240LT or equivalent approved by Departmental Representative, 8 to 10 mils DFT total.

.4 Polyurethane topcoat, AMERCOAT 450H or equivalent approved by Departmental Representative, 2 to 3 mils DFT total.

2.4 PAINT SYSTEMS FOR REFURBISHMENT WORKS OF TRASH RACKS, DOWNSTREAM STOPLOGS AND SUPPORT BEAMS OF DOWNSTREAM STOPLOGS

.1 Stoplogs, support beams and trash racks.

.1 Sandblasting SSPC-SP 10 Near-White Blast Cleaning.

.2 Primer epoxy coat, AMERCOAT 240LT or equivalent approved by Departmental Representative, 8 to 10 mils DFT total.

.3 An epoxy interlayer, AMERCOAT 240LT or equivalent approved by Departmental Representative, 8 to 10 mils DFT total.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

.2 Provide the scaffolding required.

3.2 EXAMINATION

.1 Exterior repainting work: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor to notify Paint Inspection Agency minimum of one (1) week prior to commencement of work and provide copy of project repainting specification and Finish Schedule, including drawings and elevations.

.2 Exterior surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify Departmental Representative in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.

3.3 PREPARATION

.1 Apply paint materials in accordance with paint manufacturer's written application instructions.

.2 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.

.3 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

3.4 EXISTING CONDITIONS

.1 Prior to start the work, review existing field conditions and exterior substrates to be refurbished, and report in writing to Departmental Representative any unsatisfactory or defective condition as applicable.

.2 Do not proceed with work until unsatisfactory condition or defects have been corrected, ands surfaces are acceptable to the Contractor and Paint Inspection Agency.

3.5 PROTECTION

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Departmental Representative.

.2 Protect factory finished products and equipment.

.3 Remove light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations, store items and re-install after painting is completed.

3.6 APPLICATION

.1 Conform to manufacturer's application instructions unless specified otherwise.

.2 Apply coats of paint as continuous film of uniform thickness. Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer. Repaint thin spots or bare areas before next coat of paint is applied.

.3 Sand and dust between coats to remove visible defects.

3.7 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Unless otherwise specified, refurbishment paint shall cover exterior exposed components of previously coated electrical and mechanical equipment (switchboards, piping, ducts and fittings, supports/suspension, etc.)

.2 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, duct work and other mechanical and electrical equipment with color and finish to match adjacent surfaces, except as noted otherwise.

.3 Do not paint over nameplates or informational plates.

3.8 FIELD QUALITY CONTROL

.1 Advise Departmental Representative when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.

.2 Cooperate with inspection firm and provide access to areas of work.

3.9 CLEANING

.1 Clean in accordance with Section 01 74 00 – Cleaning.

.2 Remove dripping, burrs, splashes, paint drippings and excess spray paint by using non damageable materials and methods as work progress.

.3 Quickly clear work area of surplus materials and debris, as well as tools, no longer needed materials and equipment.

.4 Remove combustible waste and empty paint containers from site daily and safely dispose in accordance with the requirements of authorities having jurisdiction.

.5 Clean equipment used. Remove the washing water from the water-based paint products, solvents used for oil products cleaning as well as cleaning and protective materials (rags, protective cloths, ribbons, cache and others), paint products, thinners, paint strippers and other stain removers, in accordance with the requirements of authorities with jurisdiction and instructions provided.

.6 Clean paint materials and equipment in sealed containers for deposition. Safely dispose of residues collected at the end of the cleaning process in accordance with the requirements of the authorities having jurisdiction.

.7 Recycle unused paint and coatings as indicated.

3.10 RESTORATION

.1 Clean and re-install hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Departmental Representative. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 SIGNAGE SCOPE OF WORK

.1 Dismantling and disposal of existing signage as specified by Departmental Representative.

.2 Manufacture, supply and installation of road signs around the dam, including supports.

.3 Foundation work.

.4 Clear vegetation around signage.

1.2 RELATED REQUIREMENTS

.1 Section 03 20 00 – Concrete Reinforcing.

1.3 REFERENCE STANDARDS

.1 American Association of State Highway and Transportation Officials (AASHTO)

.1 Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, (5th Edition).

.2 Canadian Dam Association (CDA)

.1 Technical publication: Signage for Public Safety Around Dams

.3 Canadian Standards Association (CSA)/ CSA International

.1 CSA G40.20/G40.21-F04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CSA S16, Design of Steel Structure.

.3 CSA S157-17, Strength Design in Aluminum.

.4 CSA W47.1, Fusion Welding of Steel Company Certification.

.5 CSA W47.2, Certification of Companies for Fusion Welding of Aluminum.

.6 CSA W55.3, Resistance Welding Company Certification.

.7 CSA W59 Welded Steel Construction (Metal Arc Welding).

.8 CSA W59.2-M1991 (Confirmed in 2018), Welded Aluminum Construction.

.4 ASTM International

.1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM B209M-10, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate Metric.

.3 ASTM B210M-05, Standard Specification for Aluminum-Alloy Drawn Seamless Tubes Metric.

.4 ASTM B211M-03, Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire Metric.

.5 ASTM E72-15, Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.

.5 American Welding Society (AWS).

.1 AWS A2.4:2007 Standard symbols for welding, brazing, and non-destructive examination.

.6 Government of Quebec

.1 Ministry of Transport, Urban Mobility and Electrification of Transportation of Quebec, *Manuel de conception des structures de signalisation, d'éclairage et de signaux lumineux.*

.7 Canadian General Standards Board (CGSB)

.1 CGSB 62-GP-11M-78, Marking Material, Retroreflective, Enclosed Lens, Adhesive Backing and Amendment.

.8 Green Seal Environmental Standards (GS)

.1 GS-11-11, Paints and Coatings.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for traffic signage, including product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Unless otherwise specified, submit shop drawing as soon as possible after contact award or minimum three (3) weeks prior to start the work.

.2 Submit drawings stamped and signed by professional engineer registered or licensed in Quebec, Canada.

.3 Shop drawings shall indicate fabrication and assembly details including cuts, joints, holes, anchors, rivets and welds. Use AWS symbols to represent welds

.4 Submit a description of the work methods and the assembly order to Departmental Representative. Even though this formality is completed and approved, Contractor remains fully responsible for the use of methods and equipment, execution methods and security measures.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove in accordance with Section 01 74 21- Construction/Demolition Waste Management and Disposal

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

.1 Sign supports to be capable of withstanding the combination of following loads:

.1 Wind loads in any direction of 1.11 kPa.

.2 Dead load of signboards and sign supports.

.3 Ice load of 0.26 kPa, applied on horizontal faces of signs and supports.

.2 Structural deflections and vibration in accordance with American Association of State Highway and Transportation Officials (AASHTO), "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals".

.3 Structures to be tested in accordance with ASTM E72.

2.2 MATERIALS

.1 Foundation

.1 Concrete: AMBEX SCC self-leveling concrete, KING MS6 or approved equivalent.

.2 Concrete reinforcement in accordance with Section 03 20 00 – Concrete Reinforcing.

.2 Sign supports:

.1 Les supports des panneaux doivent être en aluminium ou en acier galvanisé.

.2 Steel posts: to CSA G40.21, grade 260W or 300W. Hot dipped galvanized: to ASTM A123/A123M, minimum zinc coating 610 g/m².

.3 Aluminum supports: aluminum alloy 6061-T6.

.4 Standard tubular supports for small signs: to ASTM B210M.

.5 Vertical tubular supports and connecting diagonal members: to ASTM B210M.

.6 Aluminum tubular members: belt ground satin finish.

.7 Base plates for ground mounted signs: to ASTM B209M.

.8 Tubular support caps for ground mounted signs: to ASTM B210M or fabricated from aluminum plate as specified in ASTM B209M. Castings for overhead signs: to ASTM B211M.

.9 Aluminum flanges: to ASTM B211M.

.10 Fasteners: bolts, nuts, washers and other hardware for roadside signs to be cast aluminum alloy, or galvanized steel.

.3 Signboards:

.1 Aluminum sheet

.1 Aluminum sheet 5052-H32 minimum 3 mm thickness: to ASTM B209M, precut to required dimensions.

.2 Aluminum frame

.1 6063-T6 aluminum alloy profile is extruded.

.2 6061-T6 T-shape stiffeners for signboards: to ASTM B210M.

.3 Connecting straps and brackets: to ASTM B209M.

.4 Aluminum materials: to ASTM B209M.

.5 Primer for aluminum: to MPI # 8, VOC limit of 250 according to GS-11.

.6 Reflective sheeting and tape: to CGSB 62-GP-11M. Adhesive, class of reflectivity and colour as indicated.

.7 Transparent tape: flexible, smooth-surfaced, moisture resistant tape with pressure sensitive adhesive.

.8 Clear varnish protective coat: MPI-EXT 6.4H, VOC limit of 350, SCAQMD Rule 1113.

2.1 FABRICATION

.1 Signaling structures supplier shall be certified CSA-W47.2, CSA-W59.2 and able to calculate mechanical loads according to CAN/CSA S157-17.

.2 Foundation:

.1 New foundations to be built as indicated on drawings.

.2 Foundations shall meet off-ground projections of 200 mm from the surrounding ground level.

.3 Supports:

.1 Connect aluminum support members by bolting. Flame cutting of members not permitted.

.2 Reinforce in area of electrical hand holes to equal strength of full section member.

.3 Remove sharp edges and burrs.

.4 Signboards:

.1 The maximum permitted gap of flat appearance shall not exceed 0.1mm per 1cm width.

.2 No holes shall be made on the front face of the sign unless requested by Departmental Representative. Holes' sizes and positions will be provided to manufacturer. Holes shall be drilled and not punched.

.3 Aluminum blanks:

.1 Degrease, etch and bonderize with chemical conversion coating.

.2 Clean surfaces with xylene thinner. Dry.

.3 For non-reflective signs, spray face with one coat vinyl pretreatment coating and two finish coats of required color.

.4 Aluminum Structures :

.1 At mid-height, extruded aluminum alloy profile has a longitudinal stiffener. Both banks are shaped so that the head of a bolt can be inserted. Profile edges are drilled to allow bolting parts.

.2 Panels made from aluminum profiles with a maximum height of 3050 mm are pre-assembled with "T" stiffeners bolted to the back of the panels at the manufacture.

.3 For more information on aluminum structures, refer to “Transport Québec” standard drawings in Appendix D.

.5 Reflective background sheeting and lettering:

.1 Cut and apply in accordance with manufacturer's instructions.

.2 Apply adhesive coated material with heat lamp vacuum applicator or by squeeze roll application method. Apply pressure sensitive material with roller or squeegee.

.3 Edge wrap sheeting on each extrusion prior to bolting extrusions. Match pieces of sheeting from different rolls for each signboard to ensure uniform appearance and brilliance by day and night.

.4 Reflective signboard faces may be prepared using silk screen transparent ink.

.6 Non-reflective lettering and symbols: cut from vinyl film as specified in CGSB 62-GP-9M, or paint using required color of finish paint maximum VOC of 350, SCAQMD Rule 1113 or silk screen transparent ink.

.7 Clean signboards completely and apply transparent tape over top edge and extending 25 mm minimum down back and front of signboard.

.8 Protect finished signboard faces with one coat of clear varnish with maximum VOC limit of 350, SCAQMD Rule 1113.

.5 Sign identification:

.1 Apply sign number and date of installation with 25 mm high stencil painted black letters on lower left back face of each signboard.

.2 Signage structures must have a permanent nameplate and contain the following information :

.1 Manufacturer’s name or trade-mark,

.2 Pole dimensions (outside diameter and thickness)

.3 Material (Aluminum alloy)

.4 Year of manufacture.

PART 3 - EXECUTION

3.1 REMOVAL EF EXISTING SIGNS

.1 Dismantle and dispose signboards as specified by Departmental Representative.

3.2 INSTALLATION

.1 Areas where to install the sign structure are shown in drawings. Validate final location of the signs on site and obtain approval from the Departmental Representative.

.2 Pay attention to elements surrounding the structure and the positioning of the structure to ensure good visibility of the signs to be installed.

.3 Obtain approval from Departmental Representative prior to clearing vegetation around signs.

.4 Types 2 and 3 signs shall be installed at deck level on existing guardrails.

.5 Type 4 signs shall be installed on entry barriers.

.6 Drilling for the cylindrical concrete foundation as indicated on the drawings (type 1 and 5 signs).

.7 Concreting foundations after installing recessed parts :

.1 Comply with the requirements of Section 03 30 00 of this specification and the manufacturer's instructions.

.8 Sign support:

.1 Erect supports as indicated. Permissible tolerance: 10 mm maximum departure from vertical for direct buried supports.

.2 Close open aluminum tubes and posts with aluminum cap. Cut oblong holes in shoe bases to drain condensation. Install aluminum bolt cover on each base plate restraining nut.

.3 Erect posts plumb and square to details as indicated.

.9 Signboard:

.1 Place bottom of Type 1 and 5 signboards between 1200mm and 1500mm above ground.

.2 Fasten signboards to supporting posts and brackets as indicated.

.3 Use strapping with crimped or bolted connections where signs fastened to utility poles.

.4 Use T-shape aluminum stiffeners to join portions of sign panel on site. Cover face of T-stiffener with material identical to face of sign panel.

.10 This specification does not necessarily contain a complete and detailed description of all accessories and parts required for the performance of its work. Contractor undertakes to supply and install all accessories and parts required to complete the work according to the standards.

.11 Hardware required shall be new. Contractor is responsible for checking hardware tightening and adjustment on all bolted connections.

3.3 CORRECTING DEFECTS

.1 Correct defects, identified by Departmental Representative, in sign message, consistency of reflectivity, color or illumination. Correct angle of signboard and adjust luminaire aiming angle for optimum performance during night conditions to approval of Departmental Representative.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.

.1 Leave Work areas clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

.3 Waste Management: separate waste materials for reuse/recycling in accordance with Section 01 74 21- Construction/Demolition Waste Management and Disposal.

.1 Carefully dismantle and salvage wood, aluminum and steel materials for reuse and recycling.

.2 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by traffic signage installation and salvage operations.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 01 – Motorization of Valves - Actuators.

1.2 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI)/American Society of Mechanical Engineers (ASME).

.1 ASME B1.20.1, Pipe Threads, General Purpose (Inch).

.2 ASME B16.1, Grey Iron Pipe Flanges and Flanged Fittings: Classes 25, 125 and 250.

.3 ANSI/ASME B16.5, Pipe Flanges and Flanged Fittings: NPS ½ through 24.

.4 ANSI/ASME B16.1, Forged Fittings, Socket-Welding and Threaded.

.5 ANSI/ASME B16.25, Buttwelding Ends.

.6 ANSI/ASME B16.34, Valves - Flanged, Threaded and Welding Ends.

.2 American Petroleum Institute (API).

.1 API Std. 609, Butterfly Valves: Double Flanged, Lug- and Wafer-Type.

.3 ASTM International Inc.

.1 ASTM A126, Standard Specification for Grey Iron Castings for Valves, Flanges, and Pipe Fittings.

.2 ASTM A536, Standard Specification for Ductile Iron Castings.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheets for valves and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.2 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec.

1.4 CLOSEOUT SUBMITTALS

.1 Submit maintenance data for incorporation into manual specified in Section 0178 00 – Closeout Submittals.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements :

.1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

1.6 MAINTENANCE MATERIAL SUBMITTALS

.1 Furnish following spare parts :

.1 Valve seats: one for every ten (10) valves each size, minimum one (1).

.2 Discs: one for every ten (10) valves, each size, minimum one (1).

.3 Stem packing: one for every ten (10) valves, each size, and minimum one (1).

.4 Valve handles: Two (2) of each size.

.5 Gaskets for flanges: one for every ten (10) flanged joints.

PART 2 - PRODUCTS

2.1 BUTTERFLY VALVES, RESILIENT SEAT

.1 Except to specialty valves, to be of single manufacturer.

.2 CRN registration number required for products.

.3 Sizes:

.1 Wafer type: NPS 6, 8, 10, 16 and 20 inches.

.4 Pressure rating for tight shut-off at temperatures up to maximum for seat material.

.1 NPS 2 - 12 inches : 175 lb/po2.

.2 NPS 14 - 20 inches : 150 lb/po2.

.5 Application : on-off operation.

.6 Operators :

.1 Electric operators shall be used for the motorized valves operation:

.2 Manual enclosed gear operators (flywheel) with electric operator. As specified in Section 26 05 01 – Motorization of Valves – Actuators.

.7 Compatible with metric class PN 10. Existing flanges lines are type metric PN10.

.8 Construction:

.1 Body: ductile iron.

.2 Disc: Nylon 11 plated ductile iron.

.3 Seat: Buna-N.

.4 Shaft: 416 stainless steel.

.5 O-Ring: Buna-N.

.6 Bushings: Acetal.

2.2 IDENTIFICATION

.1 Each valve shall be provided with a stainless steel identification plate stamped with the letter corresponding to its location as indicated in mechanical drawings.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Valve and mating flange preparation.

.1 Inspect adjacent pipeline, remove rust, scale, welding slag, other foreign material.

.2 Ensure that valve seats and pipe flange faces are free of dirt or surface irregularities which may disrupt flange seating and cause external leakage.

.3 Install butterfly valves with disc in almost closed position.

3.2 INSTALLATION OF VALVES

.1 Install in accordance with manufacturer's instructions.

.2 Do not use gaskets between pipe flanges and valves unless instructed otherwise by valve manufacturer.

.3 Verify suitability of valve for application by inspection of identification tag.

.4 Mount actuator on to valve prior to installation.

.5 Handle valve with care so as to prevent damage to disc and seat faces.

.6 Ensure that valves are centered between bolts before bolts are tightened and then opened and closed to ensure unobstructed disc movement. If interference occurs due, for example to pipe wall thickness, taper bore adjacent piping to remove interference.

3.3 CLEANING

.1 Clean in accordance with Section 01 74 11 – Cleaning.

.2 Clean installed products in accordance to manufacturer’s recommendation.

END OF SECTION

Electricity – Common Work Results for Electrical
Section 26 05 00

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 01 – Motorization of Valves – Actuators

.2 Section 26 05 02 – Motorization of Valves – Local Instruments

.3 Section 26 05 03 – Commissioning

.4 Section 26 05 20 – Wire and Box Connectors (0-1000 V)

.5 Section 26 05 21 – Wires and Cables (0-1000 V)

.6 Section 26 05 22 – Connectors and Terminations

.7 Section 26 05 34 – Conduits, Conduit Fastenings and Conduit Fittings

.8 Section 26 24 16.01 – Panelboards Breaker Type

.9 Section 28 13 00 – Access Control

.10 Section 28 23 00 – Video Surveillance

1.2 REFERENCE STANDARDS

.1 CSA Group

.1 CSA C22.10, Code de construction du Québec, Chapitre V – Électricité.

.2 CAN3-C235, Preferred Voltage Levels for AC Systems, 0 to 50,000 V.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Quebec, Canada.

.2 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure coordinated installation.

.3 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between each item of equipment.

.4 Indicate of drawings clearances for operation, maintenance, and replacement of operating equipment devices.

.5 If changes are required, notify Departmental Representative of these changes before they are made.

.4 Certificates.

.1 Provide CSA certified equipment and material.

.2 Where CSA certified equipment or material is not available, submit such material or equipment to the Departmental Representative for approval before delivery to site

.3 Submit test results of installed electrical systems and instrumentation.

.4 Permits and fees: in accordance with General Conditions of contract.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

.1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel of Parks Canada.

.2 Operating instructions to include following:

.1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment;

.2 Start up, proper adjustment, operating, lubrication, and shutdown procedures;

.3 Safety precautions;

.4 Procedures to be followed in event of equipment failure;

.5 Other items of instruction as recommended by manufacturer of each system or item of equipment.

.3 Operating and maintenance instructions shall be provided in a manual. It shall be separated in two sections :

.1 Equipment for the motorization of valves.

.2 Equipment for access control and video surveillance.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect materials and equipment from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 DESIGN REQUIREMENTS

.1 Operating voltages: to CAN3-C235.

.2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.

.1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

.3 Language operating requirements: provide identification nameplates and labels for control items in French.

2.2 MATERIALS AND EQUIPMENT

.1 Provide material and equipment in accordance with Section 01 61 00 - Common Product Requirements.

.2 Assemble control panels and component assemblies in factory.

2.3 EQUIPMENT IDENTIFICATION

.1 Identify electrical equipment with labels and/or nameplates as follows.

.1 Nameplates: lamicoid 3 mm, matt white finish face, black core, lettering accurately aligned and engraved into core, mechanically attached with self-tapping screws

.2 Sizes as follows :

NAMEPLATE SIZES			
Size 1	10 mm x 50 mm	1 line	3 mm high letters
Size 2	12 mm x 70 mm	1 line	5 mm high letters
Size 3	12 mm x 70 mm	2 line	3 mm high letters
Size 4	20 mm x 90 mm	1 line	8 mm high letters
Size 5	20 mm x 90 mm	2 line	5 mm high letters
Size 6	25 mm x 100 mm	1 line	12 mm high letters
Size 7	25 mm x 100 mm	2 line	6 mm high letters

.3 Labels: embossed plastic labels with 6 mm high letters unless specified otherwise.

.4 Wording on labels and nameplates to be approved by Departmental Representative prior to manufacture.

.5 Nameplates for terminal cabinets and junction boxes to indicate system and/or voltage characteristics.

2.4 WIRING IDENTIFICATION

.1 Identify wiring with permanent indelible identifying markings, on both ends of phase conductors of feeders and branch circuit wiring.

.2 Maintain phase sequence and color coding throughout.

.3 Color coding: to CSA C22.10.

.4 Use color coded wires in communication cables, matched throughout system.

2.5 FINISHES

.1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two coats of finish enamel.

.1 Paint outdoor and indoor electrical equipment light gray to ANSI 61.

PART 3 - EXECUTION

3.1 PROTECTION AND PRECAUTIONS

.1 Perform the work in such a way as not to interfere with the normal operations of the dam. Cooperate with the site administrator and ensure that the arrangements are acceptable to the Departmental Representative.

.2 Execute the work in a manner that is the least likely to inconvenience the operation and users of government property and adjacent properties.

.3 Perform all necessary work to ensure continuity of existing services at all times.

3.2 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions

.1 Visually inspect surfaces and supports.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.3 INSTALLATION

.1 Do complete installation in accordance with CSA C22.10 except where specified otherwise.

.2 The location of the electrical equipment may be changed without additional charge or credit, provided that the displacement does not exceed 5000 mm and notice is given before installation.

.3 Note that drawings indicate the approximate location of the equipment, material, accessories and conduits. Contractor shall determine their exact location on site. In addition, check on site the space available before installing the equipment, material, accessories and conduits.

.4 Note that the dimensions and external distances of the site are approximate and not the result of a survey. The Contractor shall verify all distances and dimensions used for estimating, purchasing equipment, construction or any other reason.

.5 The Contractor is responsible for performing all necessary coordination of subcontractors and trades.

3.4 NAMEPLATE AND LABELS

.1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.5 MOUNTING HEIGHTS

.1 Mounting height of equipment is from finished floor to centerline of equipment unless specified or indicated otherwise.

.2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.

.3 Install electrical equipment at following heights unless indicated otherwise.

.1 Panel boards: 1800 mm or as indicated on drawings.

.2 Control panel / junction box: 1800 mm or as indicated on drawings.

3.6 CO-ORDINATION OF PROTECTED DEVICES

.1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.

3.7 FIELD QUALITY CONTROL

.1 Conduct following tests in accordance with Section 01 45 00 - Quality Control:

.1 Power distribution system including phasing, voltage, grounding and load balancing;

.2 Circuits originating from branch distribution panels;

.3 Motors, heaters and associated control equipment including sequenced operation of systems where applicable;

.4 Systems : access control and video surveillance;

.5 Insulation resistance testing:

.1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.

.2 Check resistance to ground before energizing.

.2 Carry out tests in presence of Departmental Representative.

.3 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.

3.8 SYSTEM STARTUP

.1 Instruct the operating personnel and the Departmental Representative in operation, care and maintenance of systems, system equipment and components.

.2 Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components and instruct operating personnel in regards to the motorization of valves, access control and video surveillance systems.

.3 Provide training for operations and maintenance personnel in all aspects of their maintenance and operation.

3.9 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

.1 The role of the dam is to regulate the water level upstream of the dam. The five (5) sector gates are automatically controlled by a computer program. Depending on whether the water in introduced or discharged, the sector gate raises or lowers. Operational piping is located in each pier, where we find the main piping, consisting of water intake pipe and a drain pipe complete with motorized butterfly valves (V1 and V2) connected to the control system. Valves C, D and E located on the main piping are operated manually. The piers are also equipped with auxiliary piping which consists of manual valves of various sizes and a centrifugal pump. The auxiliary piping performs various functions such as the operation of sector gate, the drainage of the water intake tunnel, etc.

.2 The dam is controlled by a dam management system (SGB). It consists of local control units (U.C.L.) consisting of programmable controllers located in the piers and a central control unit (U.C.C.) complete with a computer in the control room.

.3 The SGB provides information on the various parameters, including the upstream water level of the river, the position of the sector gates, the flow of the river, the position of the motorized butterfly valves, etc.

1.2 DESCRIPTION OF WORKS

.1 The work mainly includes the connection and commissioning of the motorized valves C, D, and E located at the piers n^{o} 2 to n^{o} 6, supplied with the mechanical valves of the main piping system of each sector gate located at Level 3 (EL. 9’-0’’/ 2743.2). These actuators shall be connected to the PLCs of the SGB and operator screens. The « open » and « closed » positions, the status of the handwheel, and the « Local-Off- Remote » status shall be visible on the operator screens.

.2 Other works mainly consist of the connection and commissioning of the actuators associated with the mechanical valves of the auxiliary system of each sector gate at Level 4 (EL. 2’- 6’’/ -762) of piers n^{o} 2 to n^{o} 6, as shown on the drawings. All these actuators shall be controlled locally and shall not be connected to the SGB.

1.3 RELATED REQUIREMENTS

.1 Section 23 05 23.05 – Butterfly Valves

.2 Section 26 05 02 – Motorization of Valves – Local Instruments

1.4 REFERENCE STANDARDS

.1 Not used.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedure

.2 Product Data:

.1 Submit manufacturer's instructions, printed literature and data sheets for the actuators and programmable logic controller I/O cards and include product characteristics, performance criteria, physical size, finish and limitations.

PART 2 - PRODUCTS

2.1 ELECTRICAL ACTUATORS

.1 General:

.1 The actuators shall be compact and low profile to minimize space requirements.

.2 The actuators shall be designed for direct mounting on the butterfly valves described in section 23 05 23.05 – Butterfly Valves.

.3 The actuators shall provide adjustable operation up to 90^{O}.

.4 The actuators shall provide easy access for field wiring and adjustment.

.5 The actuators shall be built to withstand line vibration and shock without failure.

.6 The actuators shall be supplied with an interposing relay board (IRB) for an On/Off direct command, without modulation.

.7 The actuators shall be selected by considering a 30 PSI differential pressure.

.8 The reducer associated with each actuator shall ensure uniform and continuous rotational force allowing automatic and precise positioning of the valve. CAM limit switches, which are adjustable, shall allow for a precise rotation of the shaft.

.9 Gear and pinion: hardened steel.

.10 Gear train: permanently lubricated.

.2 Enclosure :

.1 The enclosure shall be NEMA 4X.

.2 The enclosure shall be die-cast aluminum, painted red or green, corrosion and impact resistant.

.3 The enclosure shall have two conduit connections, one for power wiring and one for control signal wiring, with NPT threads.

.4 The actuator enclosure shall be provide with a high visibility valve position display prominently labeled and color coded (yellow for open and red for closed) to indicate the valve position throughout the full range of travel.

.5 The enclosure shall be supplied with self-regulating temperature control heater to prevent internal condensation build-up.

.3 Motor :

.1 The motor shall operate at 120 Vac, 60 Hz, 1Ø.

.2 The motor shall be permanent split capacitor induction type with Class F or better insulation.

.3 The motor shall contain a built-in automatic reset thermal overload protector embedded in the motor windings.

.4 Local Control Station :

.1 The actuators shall be provided with a local control station in order to permit local electrical operation of the actuator.

.2 The local control station shall flush mount to the actuator and include the following selector switches:

.1 « Local-Off-Remote ».

.2 « Open-Stop-Close ».

.3 The local control station shall be provided with two pilot lights indicating the open and closed valve position.

.4 The local control station shall be provided with two conduit entries in the base of the enclosure for customer wiring.

.5 Manual Override Hand wheel:

.1 The actuators shall be equipped with a manual override hand wheel to rotate the valve without electrical power.

.2 The manual override system shall ensure efficient manual operation without the use of extra tools or levers.

.3 A motor power cut-out switch shall be provided to remove power to the power when the actuator manual override is engaged.

.6 Mechanical Travel Stops :

.1 Mechanical travel stops shall be provide to limit the travel of the actuator in either direction to the full range of the valve.

.7 Travel Limit Switches :

.1 Travel limit switches shall limit the actuator travel in both the open and closed direction of travel.

.2 Travel limit switch cams shall be adjustable.

.3 All travel limit switches shall be single pole double throw (SPDT) with auxiliary contacts.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 The electric actuators shall be installed with a standard mounting position which corresponds to an orientation of the device so that the hand wheel is in a vertical plane and parallel to the pipe.

.2 When installing the actuator on vertical piping, the conduit entries shall be positioned downward to prevent condensation from entering from the conduits entries. In all cases, the Contractor shall position the conduit entry to prevent any flow of water into the actuator.

.3 Connect power cables and control/status signals to terminal blocks according to wiring diagrams or on-site connection requirements.

.4 Connections to conduits shall be properly sealed to maintain the integrity of the actuator enclosure.

.5 Travel limit switches shall be adjusted so that they are activated before the valve reaches the mechanical travel stops.

3.2 CONSTRUCTION

.1 Actuators :

.1 All actuators associated with the mechanical valves of the main piping system of each sector gate at Level 3 shall be connected to the existing network, as detailed on the drawings. These actuators shall be connected to the current dam management system (SGB) and operator screens. The « Open » and « Close » positions, the status of the hand wheel and the « Local-Off-Remote » status shall appear on the operator and HMI screens.

.2 All actuators associated with the mechanical valves of the auxiliary system of the sector gate at Level 4 shall be controlled locally. No remote operation is required for these actuators. The valve position during the opening and closing of the actuator will also be local.

.2 Software and Programming :

.1 The Contractor shall modify the program of each PLC to include the remote control and status of the new motorized valves C, D and E that will be replaced in piers n^{o} 2 to n^{o} 6.

.2 The exact needs of PCA will be discussed with the Department Representative and the PLC programmer. The Contractor shall ensure the commissioning of the programs.

.3 Graphic Interface :

.1 The Contractor shall modify the graphic interfaces, such as the U.C.L. HMI screens in piers n^{o} 2 to n^{o} 6. And on the U.C.P. computer screen in the control room.

.1 The Contractor shall modify « WATER LEVEL CONTROL » screen to ass the status of the motorized valves C, D and E for each sector gate.

.2 The Contractor shall modify the « POSITIONING OF SECTOR GATE » screen to add the status of the motorized valves C, D and E for each sector gate.

.3 The exact requirements will be discussed with the Departmental Representative and the programmer. The Contractor shall ensure the commissioning of the operator screen programs.

3.3 SYSTEM START UP

.1 Refer to Section 26 05 03 – Commissioning.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 01 – Motorization of Valves – Actuators

1.2 REFERENCE STANDARDS

.1 Not used.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Shop drawings and data sheets shall include or indicate the following :

.1 All prescribed information for each device;

.2 Detailed installation instructions provided by the manufacturer.

1.4 INSTRUCTIONS RELATED TO THE INSTALLATION

.1 Provide along with the shop drawings and data sheets, the manufacturer's instructions for installating the equipment.

PART 2 - PRODUCTS

2.1 GENERAL

.1 Devices of a certain category shall be of the same type and supplied by the same manufacturer.

.2 The external parts of devices shall be made of corrosion resistant materials and the internal parts shall be placed in a moisture-proof enclosure.

.3 For installations inside the piers, the enclosures shall be watertight, of NEMA 4X type and provided with a terminal block making it possible to cable wires by means of a flat screwdriver.

2.2 ELECTRIC RELAYS

.1 Characteristics:

.1 Relays shall be from the manufacturer Functional Devices, model RIBM24S.

.2 Plug0in relay with connection socket.

.3 Coils suitable for 24 V c.c.

.4 Contact suitable for ½ HP at 120 V c.a.

.2 The Contractor shall install the relays in the local control unit (U.C.L.) in piers n^{os} 2, 3, 4 and 5. For the U.C.L of pier n^{o} 6, provide a remote module / junction box.

2.3 INPUT / OUTPUT (I/O) MODULES

.1 Existing I/O modules:

.1 The programmable logic controller and I/O modules are of the GE Versamax type.

.2 The Contractor shall replace the 16 point discrete signal output card no. 3, IC200MDL740, installed in the U.C.L. of piers n^{os} 2, 3, 4 et 5.

.3 The Contractor shall supply, install and connect the a new 32 point discrete signal output module, GE Versamax, IC200MDL750, as indicated on the drawings.

PART 3 - EXECUTION

3.1 LOCATION

.1 The discrete signal output module shall be replaced and installed in cell # 6 of the U.C.L. in each piers n^{os} 2, 3, 4 et 5, as indicated on the drawings.

3.2 INSTALLATION

.1 Install all local instrumentation according to the procedures, instructions and methods recommended by the manufacturers.

.2 Provide the necessary power supply for all equipment from the 120 V local distribution service.

3.3 EQUIPMENT IDENTIFICATION

.1 Identify all local instruments. Refer to Section 26 05 00 – Common Work Results for Electrical.

3.4 TESTING

.1 Calibrate local instrumentation and then test it for accuracy and performance. Submit the test report, which shall detail the tests performed and the results obtained.

3.5 COMMISSIONING

.1 Refer to Section 26 05 03 – Commissioning.

END OF SECTION

Electricity – Commissioning
Section 26 05 03

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Not used.

1.2 GENERAL

.1 Obtain written permission from Departmental Representative to start commissioning, at least ten (10) days prior to scheduled start-up date. The application for authorization shall be accompanied with the following information :

- .1 The systems to be commissioned;
- .2 Commissioning procedures, including lockout and work permits;
- .3 The names of the persons who will participate in the commissioning.

.2 Systems subject to commissioning are :

- .1 Operating system of the valves (actuators);
- .2 Access Control System;
- .3 Video Surveillance System.

.3 The gate operating system of each pier shall be first verified and commissioned independently and then jointly with the main station and other related systems.

.4 Commission each system using procedures prescribed by suppliers and/or integrators.

1.3 GOAL

.1 Commissioning is intended to ensure that the facility is ready for full operation. It must include guarantees that the system will meet the intent of the concept and the requirements of the Departmental Representative.

1.4 COORDINATION

.1 Coordinate the commissioning procedures with the disciplines and trades involved as well as the personnel responsible for the dam operation.

1.5 SUPERVISION

.1 Commissioning shall be done under the supervision of qualified personnel and the Departmental Representative.

.2 Follow the progress of the commissioning work. Establish and maintain detailed records of activities and results.

1.6 DEMONSTRATION

.1 Demonstrate to Parks Canada and the Departmental Representative the operation of each system, including the sequence of operations in both normal and manual modes, under all possible conditions.

1.7 FINAL SETTINGS

.1 Upon completion of commissioning to the satisfaction of the Departmental Representative, place all equipment and instruments in their final positions and settings.

.2 Mark all settings permanently.

1.8 COMMISSIONING REPORT

.1 Submit a final commissioning report to the Departmental Representative; this report shall :

.1 Indicate final measurements and adjustments and certify test results.

.2 Bear the signature of the person responsible of the commissioning.

.2 The format of the report shall be approved by the Departmental Representative prior to system commissioning.

END OF SECTION

Electricity – Wire and Box Connectors (0-1000 V)
Section 26 05 20

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Not used.

1.2 REFERENCE STANDARDS

.1 CSA International

.1 CAN/CSA-C22.2 no.18.1 – Metallic outlet boxes (Tri-National Standard with ANCE NMX-J-023/1 and UL-514A).

.2 CAN/CSA-C22.2 no.18.3 – Conduit, tubing and Cable Fittings (Tri-National Standard with ANCE NMX- J-017 and UL-514B).

.3 CAN/CSA-C22.2 no. 65 – Wire Connectors (Tri-National Standard with UL 486A-486B and NMX-J-543-ANCE).

.2 National Electrical Manufacturers Association (NEMA).

1.3 ACTION AND INFORMATION SUBMITTALS

.1 Product Data :

.1 Submit manufacturer's instructions, printed product literature and data sheets for wire and box connectors and include product characteristics, performance criteria, physical size, finish and limitations.

PART 2 - PRODUCTS

.1 Materials

.1 Pressure type wire connectors to: [CAN/CSA-C22.2 No.65], with current carrying parts of copper sized to fit copper conductors as required.

.2 Clamps or connectors for TECK cable as required.

PART 3 - EXECUTION

3.1 EXAMEN

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for wire and box connectors installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

.1 Remove insulation carefully from ends of conductors cables and:

.1 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CAN/CSA-C22.2 No.65.

END OF SECTION

Electricity – Wires and Cables (0-1000 V)
Section 26 05 21

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Not used.

1.2 REFERENCE STANDARDS

.1 CSA International

.1 CSA C22.2 n^{o} 0.3 - Test Method for Electrical Wires and Cables.

.2 CAN/CSA-C22.2 n^{o} 131 – Type Teck 90 Cable.

1.3 ACTION AND INFORMATION SUBMITTALS

.1 Provide product data in accordance with Section 01 33 00 - Submittal Procedures.

PART 2 - PRODUCTS

2.1 TECK 90 CABLE

.1 Cable: in accordance with Section 26 05 00 - Common Work Results for Electrical.

.2 Conductors:

.1 Grounding conductor : copper.

.2 Circuit conductors: copper, size as indicated.

.3 Insulation:

.1 Cross-linked polyethylene (XLPE).

.2 Rating: 600 V for 120 V power cables and 300 V for control and instrumentation cables.

.4 Inner jacket: polyvinyl chloride material.

.5 Metallic armour.

.6 Overall covering: thermoplastic polyvinyl chloride.

.7 Connectors.

.1 Watertight, approved for TECK cable.

2.2 COMMUNICATION CABLES

.1 Communication cables are used for the following purposes :

.1 Supply cable for the cameras.

.2 Connection cables for Ethernet switches.

.2 Ethernet communication cables shall be CAT6 type (UTP, TE620R, 4 twisted pairs) or approved equivalent.

.3 Conductors shall be copper.

.4 Cable shall be installed in conduits.

2.3 ACCESS CONTROL SYSTEM CABLES

.1 Access control cables (barrier) shall meet the manufacturer's standards and have the following minimum ratings :

.1 Card readers : 6c #22 AWG;

.2 Locking system : 2c #18 AWG;

.3 Position contact : 2c #22 AWG.

.2 Conductors shall be copper.

.3 Access control system cables shall be installed in conduits.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

.2 Perform tests before energizing electrical system.

3.2 GENERAL CABLE INSTALLATION

.1 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - (0-1000 V).

.2 Cable colour coding shall be according to electrical code and standards.

3.3 INSTALLATION OF TECK90 CABLE (0 - 1000 V)

.1 Group cables wherever possible on channels.

.2 Install cable, securely supported by straps.

3.4 INSTALLATION OF COMMUNICATION AND ACCESS CONTROL SYSTEM CABLES

.1 The cables shall be installed in galvanized steel conduits on the dam and inside the existing duct bank between the dam (room C-2) and the control room.

.2 Unless otherwise indicated, cables splices are prohibited.

END OF SECTION

Electricity – Connectors and Terminations
Section 26 05 22

PART 1 – GENERAL

1.1 RELATED REQUIREMENTS

.1 Not used.

1.2 REFERENCE STANDARDS

.1 CSA Group

.1 CSA C22.10, Code de construction du Québec, Chapitre V – Électricité.

.2 CSA C22.2 no. 41, Grounding and Bonding (Tri-National Standard with NMX-J-590-ANCE and UL 467).

.3 CSA C22.2 no. 65, Wire Connectors (Tri-National Standard with UL 486A-486B and NMX-J-543-ANCE).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for connectors and terminations and include product characteristics, performance criteria, physical size, finish and limitations.

PART 2 - PRODUCTS

2.1 CONNECTORS AND TERMINATIONS

.1 Copper compression connectors to CSA C22.2 No.65 as required sized for conductors.

.2 «KS» type connectors are not acceptable. Use compression connectors at all times.

.3 Junction boxes for humid areas, in accordance with Section 26 05 33 - Raceway and Boxes for Electrical Systems.

2.2 INSTALLATION

.1 As required, grounding and bonding shall be in accordance with CSA C22.2 n^{o} 41.

PART 3 - EXECUTION

.1 Not used.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Not used.

1.2 REFERENCE STANDARDS

.1 Canadian Standards Association (CSA International).

.1 CAN/CSA C22.2 No. 18, Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware, A National Standard of Canada.

.2 CSA C22.2 No. 45, Rigid Metal Conduit.

.3 CSA C22.2 No. 56, Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.

.4 CSA C22.2 No. 83, Electrical Metallic Tubing.

.5 CSA C22.2 No. 211.2, Rigid PVC (Unplasticized) Conduit.

1.3 ACTION AND INFORMATION SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product data: submit manufacturer's printed product literature, specifications and datasheets.

PART 2 - PRODUCTS

2.1 CONDUITS

.1 Rigid metal conduit: to CSA C22.2 No. 45, galvanized steel threaded.

.2 Epoxy coated conduit: to CSA C22.2 No. 45, with zinc coating and corrosion resistant epoxy finish inside and outside.

.3 Electrical metallic tubing (EMT): to CSA C22.2 No. 83, with couplings.

.4 Rigid pvc conduit: to CSA C22.2 No. 211.2.

.5 Flexible metal conduit: to CSA C22.2 No. 56, liquid-tight flexible metal.

2.2 CONDUIT FASTENINGS

.1 One hole steel straps to secure surface conduits 50 mm and smaller. Two hole steel straps for conduits larger than 50 mm.

.2 Beam clamps to secure conduits to exposed steel work.

.3 Channel type supports for two or more conduits at 1.5 m on centre.

.4 Threaded rods, 6 mm diameter, to support suspended channels.

2.3 CONDUIT FITTINGS

.1 Fittings: to CAN/CSA C22.2 No. 18, manufactured for use with conduit specified. Coating: same as conduit.

.2 Ensure factory "ells" where 90 degrees bends for 25 mm and larger conduits.

.3 Watertight connectors and couplings for EMT.

.4 Set-screws are not acceptable.

2.4 EXPANSION FITTINGS FOR RIGID CONDUIT

.1 Weatherproof expansion fittings with internal bonding assembly suitable for 100 mm linear expansion.

.2 Watertight expansion fittings with integral bonding jumper suitable for linear expansion and 19 mm deflection.

.3 Weatherproof expansion fittings for linear expansion at entry to panel.

2.5 FISH CORD

.1 Polypropylene, diameter equal or superior to 6 mm, of industrial quality.

PART 3 - EXECUTION

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

.2 The conduits used to route the communication cable along the dam shall be fixed under the apron. They shall not be attached to the dam structure because it’s made of prestressed concrete.

3.2 INSTALLATION

.1 Install conduits to conserve headroom in exposed locations and cause minimum interference in spaces through which they pass.

.2 Conceal conduits except in unfinished areas, in mechanical and electrical service rooms.

.3 Use rigid galvanized steel threaded conduit except where specified otherwise.

.4 Minimum conduit size for lighting and power circuits: 19 mm.

.5 Use rigid PVC conduit underground or encased in concrete.

.6 Mechanically bend steel conduit over [19 mm] diameter.

.7 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.

.8 Install fish cord in empty conduits.

.9 Remove and replace blocked conduit sections.

.10 Dry conduits out before installing wire. Do not use liquids to clean out conduits.

.11 Seal conduit extremities after installing cables.

3.3 EXISTING CONDUITS

.1 Existing conduit are installed between the piers and the mechanical rooms and up to the control building.

.2 The Contractor shall use the duct bank to run the cables between the dam and the control room.

.3 Any use of existing conduit mentioned above shall be first authorized by the Departmental Representative.

END OF SECTION

Electricity – Panelboards Breaker Type
Section 26 24 16.01

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Not used.

1.2 REFERENCE STANDARDS

.1 CSA International.

.1 CSA C22.2 No.29, Panelboards and Enclosed Panelboards.

1.3 ACTION AND INFORMATION SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for panelboards and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Indicate the following information :

.1 Electrical detail of panel, branch breaker type, quantity, ampacity and enclosure dimension.

PART 2 - PRODUCTS

2.1 PANELBOARDS

.1 Panelboards: to CSA C22.2 No.29 and product of Square D (Schneider) or approved equivalent.

.1 Install circuit breakers in panelboards before shipment.

.2 In addition to CSA requirements manufacturer's nameplate must show fault current that panel including breakers has been built to withstand.

.2 120/208 V panelboards: bus and breakers rated for 10 kA interrupting capacity or as indicated.

.3 Sequence phase bussing with odd numbered breakers on left and even on right, with each breaker identified by permanent number identification as to circuit number and phase.

.4 Panelboards: mains, number of circuits, and number and size of branch circuit breakers as indicated.

.5 Copper bus with neutral of same ampere rating of mains.

.6 Trim with concealed front bolts and hinges.

.7 Isolated ground bus.

.8 Include grounding busbar with 3 of terminals for bonding conductor equal to breaker capacity of the panel board.

2.2 BREAKERS

.1 Breakers: molded case circuit breakers.

.2 Breakers with thermal and magnetic tripping in panelboards except as indicated otherwise.

.3 Lock-on devices for all breakers installed.

2.3 EQUIPMENT IDENTIFICATION

.1 Provide equipment identification in accordance with Section 26 05 00 - Common Work Results for Electrical.

.2 Nameplate for each panelboard size 4 engraved as indicated on the drawings.

.3 Nameplate for each circuit in distribution panelboards size 2 engraved as indicated on the drawings.

.4 Complete circuit directory with typewritten legend showing location and load of each circuit, mounted in plastic envelope at inside of panel door.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for panelboards installation in accordance with manufacturer's written instructions.

.1 Visually inspect.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after approval to proceed from Departmental Representative.

3.2 INSTALLATION

.1 Locate panelboards as indicated and mount securely, plumb, true and square, to adjoining surfaces.

.2 Mount panelboards to height specified in Section 26 05 00 - Common Work Results for Electrical or as indicated.

.3 Connect loads to circuits.

.4 Connect neutral conductors to common neutral bus.

END OF SECTION

Security and Protection – Access Control
Section 28 13 00

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 – Electricity – Common Work Results for Electrical.

.2 Section 26 05 03 – Commissioning.

.3 Section 26 05 21 – Wires and Cables.

.4 Section 26 05 34 – Conduit Fastenings.

.5 Section 28 23 00 – Video Surveillance.

1.2 REFERENCE STANDARDS

.1 Underwriters' Laboratories (UL).
  .1 UL 294, Access Control System Units.

.2 Underwriters' Laboratories of Canada (ULC)

PART 2 - PRODUCTS

2.1 GENERAL

.1 The equipment described below shall meet the project requirements. The contractor shall verify the compatibility of the components chosen to ensure the proper operation and reliability of the entire access control system.

.2 To ensure a good coordination between access control and video surveillance systems, both systems shall be provided by the same integrator.

.3 The access control system shall include the following components for both gates :

  .1 Magnetic lock.

  .2 Gate position contact.

  .3 Card reader (outside secure area).

  .4 Push button station (inside secure area).

  .5 Piers 1 and 6 access controllers.

.4 The communication network for routing information to the control room is covered in Section 28 23 00 – Video surveillance.

2.2 DESIGN CRITERIA

.1 Access control system shall include ULC / UL approved equipment only.
.2 Access control system design shall be made by a company specialized in access control.

2.3 ACCESS CONTROLLER

.1 Install the access controller in the communication panels located in the electrical rooms of Piers 1 and 6, at elevation 36'-0'' (Level 1).

.2 The dimensions of the communication cabinets (defined in Section 28 23 00 – Video Surveillance) at Piers 1 and 6 shall allow the installation of the access controller.

.3 All access control equipment listed below shall be connected to the access controller.

.4 Acceptable manufacturers and models or equivalent approved :

.1 KANTECH, model KT-1;

.2 CANDEM DOOR CONTROLS, model CV-352;

.3 AXIS, model A1001;

.4 SIEMENS, interface ADE5300.

.5 The access control system shall include a central unit to which local controllers shall be connected (eg Siemens Sipass AC5102 controller model).

2.4 CARD READERS

.1 The card readers shall be « proximity » type.

.2 The card readers shall allow activation and deactivation of cards remotely.

.3 Acceptable manufacturers and models or equivalent approved :

.1 HID, modèle RP40 multi class SE;

.2 CANDEM DOOR CONTROLS, model CV-7400;

.3 SIEMENS, model AR6111-MX.

2.5 PUSH BUTTON STATION

.1 A push button station shall be installed at each gate within the dam perimeter of the dam to allow the gate to be unlocked.

.2 The unlocking function shall be maintained so that the door can be opened for up to five minutes after pressing the button.

.3 Acceptable manufacturers and models or equivalent approved :

.1 CANDEM DOOR CONTROLS, models CM-40/3FWT, CM-4000G/7FBZ, CM-9080/7F;

.2 RUTHEFORD CONTROLS, model 908-MO.

2.6 GATES LOCKING DEVICES

.1 The locking devices shall be installed on the gates on each side of the dam.

.2 The doors integrated in the gates shall not have a locking system.

.3 The locking system shall be magnetic type (electromagnet).

.4 The minimum holding force of the locking device shall be 12000 lbs.

.5 Supply shall include the electromagnet power supply.

.6 Acceptable manufacturers and models (position contact included) or equivalent approved :

.1 SENTROL, model 2507AH-L + 8380.

.2 SECURITRON, model M62FGBD.

.7 Acceptable manufacturers and models (position contact not included) or equivalent approved :

.1 CANDEM DOOR CONTROLS, model CM-94S-12LS.

2.7 GATES POSITION CONTACTS

.1 Each gate shall incorporate a « closed gate » contact.

.2 A position contact can be integrated into the locking system.

.3 Acceptable manufacturers and models or equivalent approved.

.1 Tane Alarm Products, model 66WG/36.

2.8 SOFTWARE

.1 The software allowing the operation of the access control system shall be installed in the workstation dedicated to video surveillance. This is detailed in Section 28 23 00.

.2 Acceptable manufacturers and models or equivalent approved :

.1 CANDEM DOOR CONTROLS, logiciel Série CV-350).

.2 SIEMENS, logiciel Sipass Standard Edition.

.3 AXIS, logiciel Entry Manager.

.3 The software cost shall be a perpetual license without any periodic fees.

PART 3 - EXECUTION

3.1 EXISTING CONDITIONS

.1 Inspection of existing conditions: verify that existing surfaces are acceptable for the installation of the security door system in accordance with manufacturer's written instructions.

3.2 INSTALLATION

.1 Install the access control system and their components in accordance with applicable UL, ULC and CSA standards.

.2 Install the components in accordance with manufacturer's written installation instructions and according to locations, mounting heights and monitoring areas shown on approved shop drawings.

.3 Solidly fix the components to their supports.

.4 Install all required boxes in accessible and non-visible locations.

.5 Install all outdoor components in NEMA 4X stainless steel enclosures.

.6 The contractor shall consider the following :

.1 The security system is installed on existing gates. The contractor shall modify the existing gates to incorporate the new locking device.

.2 The card readers shall be installed outside the dam, near the gates.

.3 The push button stations shall not be accessible outside of the dam perimeter.

3.3 INSPECTION, TESTING AND DOCUMENTATION

.1 Perform inspections and tests with the presence of Departmental Representative.

.1 Provide all tools and equipment required.

.2 Ensure that the subcontractors are present for testing.

.2 Inspection.

.1 The Departmental Representative and the Contractor will do an area tour to ensure that the systems and subsystems are ready for testing.

.2 Visual inspection: inspection to assess the quality of the installation and assembly as well as the overall appearance of equipment to ensure that the system complies with the Contract Documents including the following:

.1 Hardware supports robustness.

.2 No damage during installation.

.3 Compliance of the device location with approved shop drawings.

.4 Compatibility of the equipment installation with the physical environment.

.5 Supply of all accessories.

.6 Devices and wiring identifications.

.7 Install decals indicating ULC approval where appropriate.

.3 Functional tests.

.1 The following tests shall be carried out :

.1 Unlocking gate with access card.

.2 Card reader's sensitivity validation.

.3 Unlocking the gates with the push button station.

.4 Unlocking period duration.

.5 System retention force.

.6 Activating an access card remotely.

.7 Disabling an access card remotely.

.2 The Departmental Representative will evaluate the acceptance of the test results.

.4 Documentation.

.1 Provide the following documents for the system: data sheets, drawings of installed equipment, test reports, etc. for examination.

.2 Security

.1 Demonstrate that the access control system meets the safety requirements of UL 294 with supporting documents.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 – Electricity – Common Work Results for Electrical

.2 Section 26 05 03 – Commissioning

.3 Section 26 05 21 – Wires and Cables (0-1000 V)

.4 Section 26 05 34 – Conduits, Fasteners and Conduit Fittings.

.5 Section 28 13 00 – Access Control

1.2 REFERENCE STANDARDS

.1 Underwriters' Laboratories of Canada (ULC).

.1 ULC-S317 – Installation and Classification of Closed Circuit Video Equipment (CCVC) Systems for Institutional and Commercial Security Systems.

PART 2 - PRODUCTS

2.1 GENERAL

.1 The Video Surveillance System (CCTV) includes:

.1 Six (6) outdoor cameras, including their supports, allowing the observation of valves 1 to 5 and the Richelieu River on the upstream side of the dam.

.2 Four (4) communication cabinets at piers 1, 3, 5 and 6, each of them including an Ethernet switch.

.3 The following equipment located in the control room :

.1 Camera control station.

.2 Digital recorder.

.3 Ethernet switch.

.4 Router.

.5 Modem.

.2 The equipment described below can individually meet the project requirements. Contractor shall ensure the compatibility of the equipment chosen to ensure the proper operation and reliability of the entire Video Surveillance System.

.3 To ensure a good co-ordination between the Control Access System and the Video Surveillance System, both systems shall be supplied by the same integrator.

2.2 DESIGN CRITERIA

.1 The camera images shall be transmitted by the communication link to the recorder installed in the control room.

.2 The camera images will be broadcast to Chambly via an Internet link provided by PCA and available in the control room.

.3 The operator shall have the ability to control all camera functions from Chambly.

.4 Switching:

.1 Provision to switch any camera manually or automatically;

.2 Switching cameras and the digital recorder.

.5 Set dwell time for viewing of any camera image.

.6 Define the sequence for viewing cameras on each monitor.

.7 Bypass cameras in system when sequencing to monitor.

.8 Outdoor environment: The video system and components shall operate under following ambient conditions:

.1 Temperature : from -40 to 50 degrees Celsius;

.2 Humidity: from 10 % to 100 %.

2.3 CAMERA

.1 Color Camera « Dome » type, fixed for outdoor installation.

.2 Equipped with heater/fan.

.3 Sensibility: effective up to 0.1 Lux.

.4 Resolution: 1.3 Mega Pixels.

.5 Mounting: visible.

.6 Lens: fixed focus lens.

.7 Non-motorized.

.8 Transmission mode: by PoE (Power Over Ethernet) cable.

.9 Camera power supply: 24 VAC fused (each input and output).

.10 The supply shall include all supports and accessories required for installation.

.11 Acceptable manufacturers and models or equivalent approved:

.1 PELCO (by Schneider Electric), approved models : Sarix Envir. IME129-1ES, IMEPM-E Envir;

.2 AXIS, approved models Q3515-LVE, Q3505-VE, P3225-VE;

.3 ILLUSTRA (by Tyco Security), approved models Flex;

.4 BOSH, approved model Flexidome IP 7000 RD.

2.4 LOCAL COMMUNICATION CABINETS

.1 The communication cabinets shall be located in electrical room of piers 1, 3, 5 and 6 as shown in drawings.

.2 The communication cabinets shall include the following equipment :

.1 Ethernet Switch;

.2 Access controller (see section 281300) to the pillars 1 and 6 panels;

.3 Heater;

.4 120 VAC outlet;

.5 Fuses for input/output of cameras;

.6 Terminal block;

.7 As free space available is limited, cabinet dimensions shall be optimized.

2.5 ETHERNET SWITCHES

.1 The Ethernet switches shall have the following characteristics:

.1 At least five (5) ports which four (4) are POE type;

.2 Power consumption : up to 30 W per port, 130 W maximum total;

.3 120 V Power supply;

.4 Capacity (Switching): 12 Gbps.

.2 Acceptable manufacturers and models or equivalent approved :

.1 TRENDNET, models TI-PG541 and TI-S24048;

.2 LUXUL, models XMS-1010P;

.3 CONMET, series CNGE3FE8MSPOE ;

.4 AXIS, model T8508;

.5 HP, model HP1920S.

2.6 CAMERA CONTROL STATION

.1 The camera control station is located in the St-Ours Dam control room.

.2 The control station shall be able to manage the camera system. The following requirements shall be met by the CCTV supplier:

.1 I3 – 6100 Processor;

.2 RAM : 6 GB or more, according to the camera system supplier;

.3 Hard drive : 64 GB SSD;

.4 Graphics card : Intel HD Graphics 530 or equivalent;

.5 Operating system: Windows 10.

.3 The control station shall include :

.1 24 inch monitor;

.2 Keyboard and mouse.

.4 Acceptable manufacturers or equivalent approved :

.1 HP;

.2 DELL;

.3 LENOVO.

.5 The contractor may propose a custom control station with the software and all the required components to operate the system. Example:

.1 PELCO, VideoXpert-Pro, model VXP-WKS;

.2 Equivalent approved.

2.7 VIDEOSURVEILLANCE SOFTWARE

.1 The video surveillance software shall control the six (6) cameras, the digital recorder and all other components required for the video surveillance system.

.2 The software shall be installed in the camera control station provided by the Contractor.

.3 Acceptable manufacturers and software or equivalent approved :

.1 SIVEILLANCE VMS-200;

.2 PELCO OPS Center;

.3 EXACQ Powerful Video Management System (VMS);

.4 AXIS Camera Station Licence Core Device.

.4 The access control software is covered in section 28 13 00 unless its functionality is included with the video surveillance operating system software.

.5 The software cost shall be a perpetual license with no periodic fees.

2.8 DIGITAL RECORDER

.1 The digital recorder shall have enough capacity to record data for four weeks.

.2 Images refresh rate: up to 15 frames per second (editable).

.3 The system shall include required licences to operate the six cameras.

.4 Acceptable manufacturers and models or equivalent approved :

.1 AXIS, model Companion;

.2 PELCO, model VXP-P-20-J-S-16;

.3 EXACQ (Tyco Security), model IP04-08T-R2A;

.4 QNAP, model TDS-16489U.

2.9 UNINTERRUPTIBLE POWER SUPPLIES (UPS)

.1 An UPS unit shall be installed in the control room to ensure continuity of power supply to equipment related to access control and camera.

.2 The UPS unit shall have sufficient capacity to operate the equipment for 30 minutes.

.3 Acceptable manufacturers and models or equivalent approved :

.1 MINUTEMAN, model E1500RTXL2UNC;

.2 SCHNEIDER, model SMX2000LV ;

.3 SIEMENS, model Smart3000 RM2UN.

2.10 OTHER EQUIPMENT

.1 The contractor shall provide any other equipment and accessories required to ensure the proper operation of the camera system including:

.1 Router in the control room. Acceptable manufacturers and models are as follows:

.1 LUXUL, model XBR-4500;

.2 FORTINET, model FWF-92D-BDL;

.3 SONIC WALL, model TZ500;

.4 Equivalent approved.

.2 Camera surge suppressor (in local control cabinets).

PART 3 - EXECUTION

3.1 EXISTING CONDITIONS

.1 Verification of Conditions: verify that the conditions of the existing surfaces are acceptable for video surveillance installation in accordance with manufacturer's written instructions including:

.1 Visually inspect surfaces in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

.1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Install the video surveillance equipment and components in accordance with ULC-S317.

.3 Install the required equipment (digital recorder, control station, router) in the control room.

.4 Install the communication panels including the access controller in locations shown on drawings.

.5 Install the required supports for the cameras.

.6 Install all cables, boxes, mounting hardware, brackets, video cameras and system components in accordance with manufacturer's written installation instructions.

.7 Install wiring.

.1 Between cameras and communication panels (Ethernet switch).

.2 Between communication panel (Ethernet switch) up to the control building.

.8 Connect the cameras in accordance with installation instructions.

.9 Install ULC labels where required.

3.3 COMMISSIONING

.1 Perform inspections and tests with the Departmental Representative.

.2 Visual inspection: the objective is to assess the quality of the installation, assembly and overall appearance to ensure compliance with Contract Documents.

.3 Technical inspection: the purpose is to ensure that all systems and devices are properly installed and free of defects and damage.

.4 Operational inspection: the purpose is to ensure that devices and systems' performance meet or exceed established functional requirements, including video transmissions and control of the complete video surveillance system from Chambly.

END OF SECTION

Appendix A – No Content

Appendix B – *Normalized Drawings, Signage in Structural Aluminium Profile*

Annexe B – Dessins normalisés
Panneau de signalisation en profilés de charpente d'aluminium

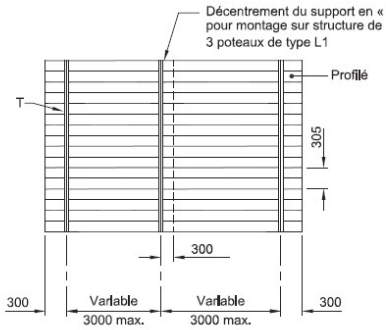
Tome	Chapitre	Numéro	Date
III	6	002	2018 01 30

DESSIN NORMALISÉ

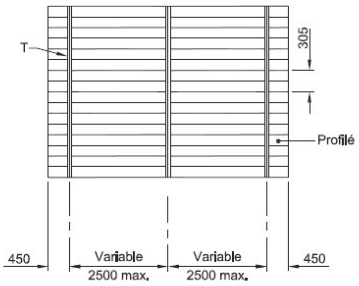
PANNEAU DE SIGNALISATION EN PROFILÉS D'ALUMINIUM

Transports, Mobilité durable et Électrification des transports Québec

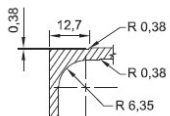
NORME



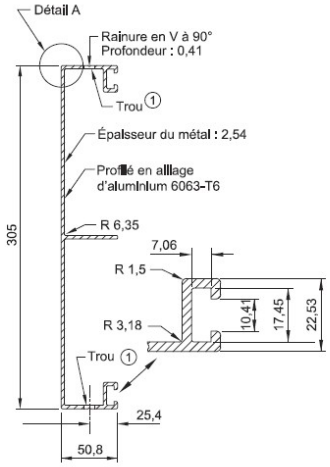
POUR PANNEAUX AU SOL



ESPACEMENT DES SUPPORTS EN « T » POUR PANNEAUX SUR STRUCTURES EN PORTIQUE



DÉTAIL A



DÉTAILS DES PROFILÉS

① **Important :**
Tous les trous des profilés doivent être placés à 152 mm d'intervalle, sauf le premier qui sera à 76 mm du début du profilé.

Notes :
- à moins d'indications contraires, les congés et arrondis du profilé sont R 0,57;
- le diamètre des boulons est exprimé en pouces;
- les cotes sont en millimètres.

MATÉRIAUX — NORMES APPLICABLES			
Aluminium	*Tome VII*, norme 6401	Boulons et écrous	*Tome VII*, norme 6201

Contenu normatif

Annexe B – Dessins normalisés
Panneau de signalisation en profilés de charpente d'aluminium

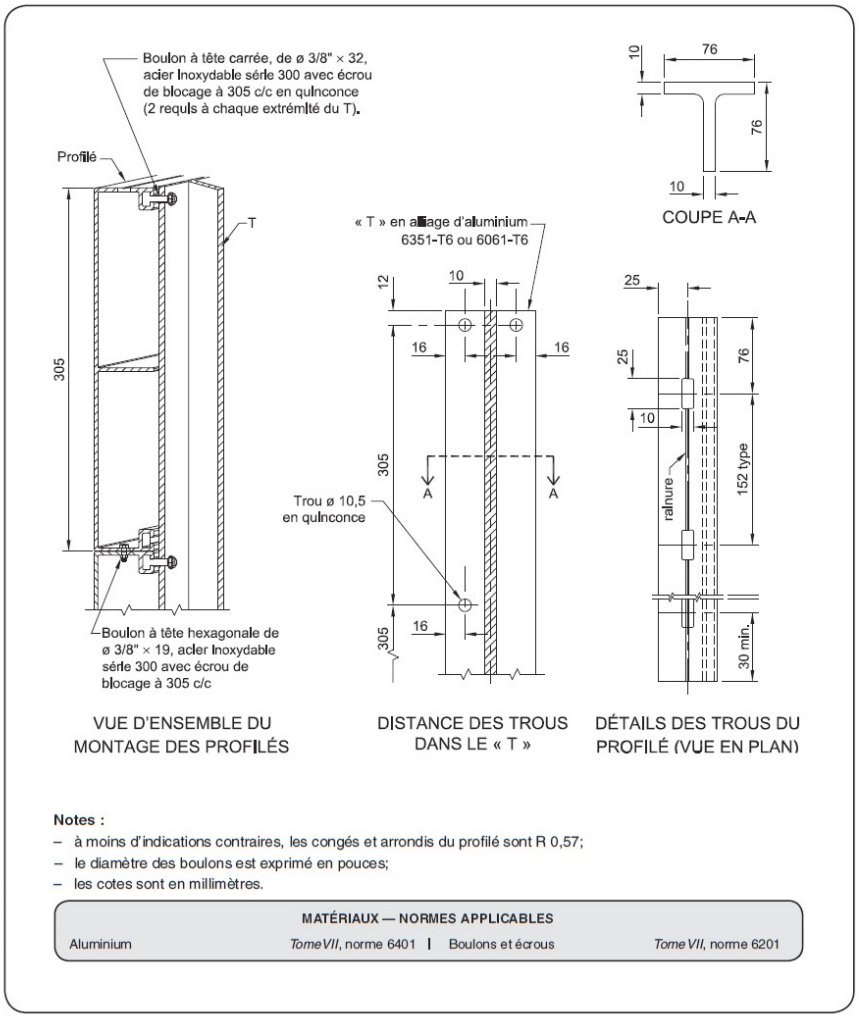
Transports, Mobilité durable et Électrification des transports
Québec

NORME

DESSIN NORMALISÉ

PANNEAU DE SIGNALISATION EN PROFILÉS D'ALUMINIUM – DÉTAILS

Tome III | Chapitre 6 | Numéro 003 | Date 2018 01 30



Notes :
- à moins d'indications contraires, les congés et arrondis du profilé sont R 0,57;
- le diamètre des boulons est exprimé en pouces;
- les cotes sont en millimètres.

MATÉRIAUX — NORMES APPLICABLES			
Aluminium	*Tome VII*, norme 6401	Boulons et écrous	*Tome VII*, norme 6201

Contenu normatif

Appendix C – Control Building Window Dimensions

Annexe C – Dimensions des fenêtres Bâtiment de contrôle

Bâtiment de contrôle		
Dimensions (1)	**Fenêtre 1**	**Fenêtre 2**
Largeur (2) (mm)	690	1090
Hauteur (2) (mm)	815	1220

(1) Dimensions extérieures des cadres (face à face).
(2) L'entrepreneur est responsable de faire les relevés et de valider toutes les dimensions qui peuvent affecter la fabrication et réalisation des travaux.

Appendix D – Environnemental Protection Plan (EPP

Company logo

Project Name

Location

Environnemental protection plan (EPP)

Project

Date

Contractor name

Table des matières

Document modifications follow-up

Modification number	Date	Author(s)	Brief modification description
1.0	[yyyy-mm-dd]	[Name of author]	Document Creation.

EPP Objective

An Environmental Protection Plan (EPP) is a document that describes site-specific environmental protection measures and responsibilities during the implementation of a project. An EPP is designed to ensure that the environmental mitigation commitments and measures outlined in the specifications are properly understood and implemented by the Contractor. The EPP must contain specific and direct guidelines to achieve the targeted environmental outcomes in the mitigation measures.

The "ENVIRONMENTAL PROTECTION" section of the quotation contains a non-exhaustive list of indications on the EPP. This list may include, for example, the following:

- The Contractor must submit an Environmental Protection Plan to the Government Representative for review and approval prior to the commencement of construction activities or the delivery of materials and equipment to the site;
- The plan should provide a comprehensive overview of known or potential environmental problems to be addressed during construction and of applicable safeguards to mitigate environmental impacts;
- The actions included in the environmental protection plan must be presented per a level of detail which agrees with the environmental problems and with the construction work to be carried out.

Environmental Protection Plan (EPP)

*Please insert a nomenclature into a subsection, ex 1.1, 1.2, 1.3, etc.

1. Contact Information

The objective of this section is to identify the persons responsible for the implementation of the EPP.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- The names of the persons responsible for ensuring compliance with the plan;
- The names and skills of the persons responsible for the exit signs for residual hazardous materials to be evacuated from the site.

Specifically, this section should include, but is not limited to:

- The name and contact information of the Contractor's representative responsible for the implementation of the EPP;
- The names of Parks Canada staff involved in the environmental component of the project;
- The names of other project contacts with key environmental responsibilities;
- Environmental responsibility of each stakeholder;
    - An organizational chart of the Contractor and the communication chain.

1. Worker awareness of EPP

The objective of this section is to describe the Entrepreneur's strategy to ensure that its staff is aware of the content of the EPP, is aware of the environmental issues at the site of work and is adequately trained in the implementation of the EPP.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- The names and qualifications of the persons responsible for the training of construction site personnel;
- A description of the training program for personnel assigned to the protection of the environment.

Specifically, this section should include, but is not limited to:

- Strategy for training workers prior to work;
- The EPP communication strategy for workers, for example:
- Review of environmental issues and measures at start-up and construction meetings;
    - Discussion of the environmental aspect in daily work planning meetings

2. Environmental Regulatory Framework

Include in this section a list of environmental notices, permits, approvals and approvals received prior to construction. A copy of these documents must be at all times at the site.

The main environmental restrictions and requirements outlined in these documents are to be found in this section.

Any other regulatory compliance measures affecting or restricting the construction project (ex critical periods for wildlife protection) should also be included in this section.

3. Erosion and sedimentation control

The purpose of this section is to develop an erosion and sediment control plan for all periods of construction and reclamation. This plan must be adapted to the scope of the project and the associated risks. The plan must define concretely the means and techniques used to control the sediments and the location of the facilities.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- *A plan for the prevention of erosion and sediment transport, indicating the measures to be implemented, including monitoring of work and reporting to verify compliance with federal laws and regulations, Provincial and municipal governments.*
- *Traffic control plans, including measures to reduce the erosion of temporary road platforms by the movement of construction vehicles, particularly in rainy weather. These plans must include measures to reduce the transport of materials on public roads by vehicles or runoff.*

Specifically, this section should include, but is not limited to:

- Identification of areas at risk (ex watercourses, wetlands, steep slopes, etc.);
- Erosion prevention procedures (ex timing of project implementation, minimization of site area to the minimum required, management of the area under construction, land cover measures);

- Sediment control measures (ex sediment barriers, filter berm, sediment traps, etc.), including the usual specifications and drawings of sediment control structures (may be included in the annex);
- Detailed work plans for aquatic structures, including site isolation and project timelines;
- Water management plans, including on-site controls, equipment, and proposed drainage areas;
- Areas where erosion and sediment control measures are applied (indicate on the plan in Appendix 1);
- Monitoring of control measures, preventive measures, and corrective measures (ex repairs);
- Removal of non-biodegradable materials when the area is stabilized.
    - Any other requirements specified in the specification and the mitigation table for erosion and sediment control.

4. Procedure for refueling and maintenance of equipment

The purpose of this section is to identify measures to protect the environment during maintenance and refueling of machinery and equipment. Planned supply areas should be identified on the mobilization plan in Appendix 1.

5. Wastewater, Stormwater and Pump Water Management Plan

The purpose of this section is to define on-site water management, including wastewater, storm water inside and outside the site, and pumping water (ex, drying a work area or keep dry excavations).

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- A run-off and leach management plan, indicating the measures that will be implemented to prevent any discharge of the water coming from the site into the surrounding aquatic environment;
- A wastewater management plan, indicating the methods and procedures to be used for the management or disposal of wastewater directly from construction activities, eg water used for concrete curing, Cleaning / discharging, grounding, disinfection, hydrostatic testing and rinsing of pipelines.

More specifically, this section should include, but is not limited to:

- Pre-discharge sites approved by Parks Canada;
- Methods of confinement and recovery of wastewater from the site (eg cleaning water from concrete surfaces, cleaning water from concrete pumps, runoff water, etc.);
- Water treatment methods, if required;
- Control of turbidity in the aquatic environment;

- Methods of verifying compliance with applicable quality criteria for water discharged into the aquatic environment;
- Any other requirements specified in the estimate and the mitigation measures table for on-site water management.

6. Excavated soil management plan

This section is complementary to section 4 on erosion and sediment control. It aims to detail temporary storage measures for excavated soil during the work, contaminated soil management methods, where appropriate, and protection of the environment during the period of soil disturbance.

More specifically, this section should include, but is not limited to:

- Temporary storage areas (indicate in the mobilization plan in Appendix 1);
- Methods for stabilizing slopes and disturbed soils;
- Methods for managing soils during temporary storage (excavated soil to be reused and soils disposed off-site);
- The name of the center (s) to which the contaminated soil will be sent, if applicable;
- Details on the concrete implementation of the measures specified in the estimate for contaminated soil management, where applicable;
- Any other requirements specified in the specification and the mitigation table for soil and excavation management.

7. Vegetation protection

The objective of this section is to indicate the means that will be put in place to protect the vegetation on the site and outside the site near taxiways and access roads, to plan for the management of undesirable species, and specify the trees and shrubs to be felled or pruned for the purposes of the work. Any intervention on vegetation must be validated and authorized by Parks Canada.

More specifically, this section should include, but is not limited to:

- Measures to manage irritant species and invasive alien species (ex, phragmite), including methods of cleaning machinery and means of disposing of plant residues;
- Measures to protect trees and shrubs against damage and disturbance caused by the work;
- Identification and location of trees to be felled and pruned, previously approved by Parks Canada;

- If required, a pesticide treatment plan approved by the Parks Canada process;
- Any other requirements specified in the specification and the mitigation table for vegetation management.

8. Residual Materials and Hazardous Materials Management Plan

Indicate in this section waste management measures, including hazardous and non-hazardous residual materials. This section should also include measures for the storage and handling of hazardous materials used on site.

The " CONSTRUCTION WASTE / DEMOLITION MANAGEMENT AND DISPOSAL " section of the estimate contains a non-exhaustive list of waste management and waste reduction measures. This list may include, for example, the following:

- Before starting work, meet with the Government Representative to review the waste management objectives and waste reduction plan for the construction, renovation and demolition (CRD) waste generated by the project.
- The waste management objective is to reduce as much as possible the total flow of construction / demolition waste to landfills.
- Provide the Government Representative with documents certifying that comprehensive measures and procedures for waste management, recycling, reuse / reuse of recyclable and reusable / re-employable materials have been implemented.
- Minimize the amount of non-hazardous solid waste generated by the work; Maximize the reduction at source, reuse / reuse and recycling of solid waste produced by CRD activities.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- A plan for the disposal of non-hazardous residual materials, hazardous or special residual materials including methods and sites for the disposal of solid waste and debris from clearing.
- A plan for the prevention of contamination indicating the potentially hazardous substances to be used on the site, measures to prevent the substances being suspended in the air or introduced into the soil, as well as the details of the measurements that will be taken to ensure that the storage and handling of these substances are in compliance with federal, provincial and municipal laws and regulations.

This section should include, but is not limited to:

- Waste management measures, including hazardous and non-hazardous waste;
- Measures for the storage and handling of hazardous materials used on site;
- Container and hazardous material shelter locations (indicate in the mobilization plan in Appendix 1);
- The procedure for the management and disposal of concrete surplus from concrete pumps;
- Any other requirements specified in the specification and the mitigation measures table for the management of residual materials and hazardous materials.

9. Protection of wildlife

Indicate in this section the requirements specified in the estimate and the table of mitigation measures to protect terrestrial, aquatic, and avian wildlife.

10. Protection of aquatic environments

The purpose of this section is to identify the means to meet the requirements of the estimate and the mitigation table to protect aquatic environments (rivers, canals, wetlands, etc.). Among other things, indicate ways of preventing the dispersal of invasive exotic species (ex zebra mussels).

11. Dust and emission control

Indicate in this section the requirements specified in the specification and the table of mitigation measures that aim to minimize emissions of fine particulate matter and greenhouse gases into the air.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- A plan for the prevention of air pollution, specifying measures to retain dust, debris, materials and residual materials inside the site.

12. Noise control

Indicate in this section the requirements outlined in the quote and the table of mitigation measures to minimize noise and inconvenience to site visitors and area residents as appropriate.

13. Modalities of restoration of the site at the end of the works

The objective of this section is to specify the planned restoration measures at the end of the work.

14. Emergency Response and Environmental Prevention

This section should specify steps for emergency response, particularly in the case of a spill of oil or other hazardous materials.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- A spill contingency plan that includes procedures to be followed, instructions to be followed and reports to be produced in the event of an unpredictable spill of a controlled substance.

Specifically, this section should include, but is not limited to:

- List of products and materials considered or defined as hazardous or toxic to the environment. These products include, but are not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot-melt rubber membrane materials, bituminous cement, sand blasting agents, paint, solvents, and hydrocarbons;
- Equipment required on site;
- The contents and location of on-site recovery kits;
- Procedures for refueling and storing fuel;
- Spill prevention procedures (containment and storage of materials, safety, handling, use and disposal of empty containers, surplus products or waste generated by the application of these products in accordance with federal and provincial force);
- The spill response procedure (containment, cleaning, disposal of contaminated materials, etc.);
- An Incident Report Form to report spills (if included as an appendix, refer to them here);
- An up-to-date contact list for emergency response (Parks Canada, Environment Canada, Coast Guard, etc.), including information required to report spills.
- A fire emergency response plan;
- Any other requirements specified in the specification and the mitigation measures table for the management of spills and environmental emergencies.

Annexe 1. Mobilization plan

This schedule must include a plan identifying all elements that can be located in relation to environmental issues and the protection of the environment in the mobilization area and the machinery lanes.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- Drawings showing the location of temporary excavations or site paths in embankments, materials, constructions, sanitary installations, deposits of surplus materials or contaminated materials; The drawings illustrating the methods that will be used to control runoff and to confine the materials to the site.
- A plan of the work area showing the activities planned in each part of the works area and indicating the areas of restricted use as well as the prohibited areas of use. This plan shall include measures to mark the boundaries of usable areas and methods of protection of the elements within authorized work areas to be preserved.

Specifically, this section should include, but is not limited to:

- Location of trees to be felled and trees to be protected (tree felling must be approved in advance by Parks Canada);
- Excavation areas;
- Temporary lanes and access;
- The location of temporary facilities (ex, platforms, cofferdams, etc.);
- Storage areas for excavated soils and other stacked materials, where applicable;
- Storage areas for building materials and debris;
- Location of erosion prevention equipment (ex, sediment barrier);
- Location of maintenance and refueling areas for machinery;
- Location of hazardous material shelters and waste containers;
- Location of oil recovery kits;
- The location of the confined enclosure for concrete surplus, where applicable;
- Location of water treatment facilities, where applicable (settling pond, etc.);
- Identified sites for the discharge of water into the environment.
- Etc.

Annexe 2. Environmental surveillance plan

Include a periodic monitoring report that captures the main measures of each section of the EPP to systematically check on their implementation and their proper functioning.

Additional Annexes

Add annexes to include the following:

- Material Safety Data Sheets;
- Data sheets on sediment containment methods (ex sediment barrier) or other specific equipment related to the environment used on the site;
- Management of nonconformities;
- Relevant shop drawings and drawings.