

Document Front Sheet



NE-LCP Contractor/Supplier

Contract or Purchase Number and Description: LC-G-0002 (Project 505573)		Contractor/Supplier Name: SNC-Lavalin Inc.	
Document Title: CONSTRUCTION OF INTAKE AND POWERHOUSE, SPILLWAY AND TRANSITION DAMS SCOPE OF WORK SPECIFICATION		Total Number of Pages Incl. Front Sheet 24	
Contractor/ Supplier Document Number:		Revision Number:	
EPC(M) Document Number: 505573-3331-41EW-0001		Issue Number: 09	
NE-LCP Document Number: MFA-SN-CD-3300-CV-SP-0001-01		NE-LCP Issue Number: C1	
Approver's Signature: 		Date (dd-mmm-yyyy): 27 Sep '13.	Review Class:
Comments:		Equipment Tag or Model Number:	

NE-LCP or EPC(M)

REVIEW DOES NOT CONSTITUTE APPROVAL OF DESIGN DETAILS, CALCULATIONS, TEST METHODS OR MATERIAL DEVELOPED AND/OR SELECTED BY THE CONTRACTOR, NOR DOES IT RELIEVE THE CONTRACTOR FROM FULL COMPLIANCE WITH CONTRACTUAL OR OTHER OBLIGATIONS.

01 – REVIEWED AND ACCEPTED – NO COMMENTS

02 – REVIEWED – INCORPORATE COMMENTS, REVISE AND RESUBMIT


03 – REVIEWED - NOT ACCEPTED

04 – INFORMATION ONLY

05 – NOT REVIEWED

Lead Reviewer: 	Date (dd-mmm-yyyy): 25-Oct-2013	Project Manager: 	Date (dd-mmm-yyyy): 25 Oct 2013
NE-LCP or EPC(M) Management: 	Date (dd-mmm-yyyy): 25 Oct 2013		

General Comments:

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CH0007

CONSTRUCTION OF INTAKE AND POWERHOUSE, SPILLWAY AND TRANSITION DAMS

SCOPE OF WORK SPECIFICATION

Prepared by:



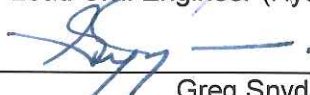
Andre Mosser
Package Engineer

Checked by:



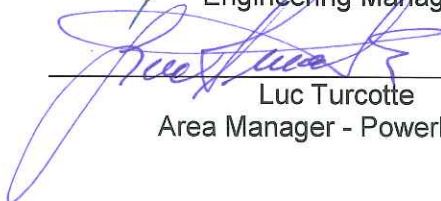
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REVISION LIST

Revision						Remarks
N°	By	Verif.	Appr.	Appr.	Date	
C1	AM	SC	GS	LT	27-Sep-2013	Issued for Construction

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PART 1 SPECIAL REQUIREMENTS

1.1 PROJECT DESCRIPTION

- 1.1.1 The Lower Churchill Project (LCP) located on the Churchill River in the Province of Newfoundland and Labrador, Canada, consists of the Muskrat Falls Generating Station with a capacity of eight hundred and twenty-four megawatts (824 MW) and associated transmission line works.
- 1.1.2 The project Site for Muskrat Falls is located on the lower reaches of the Churchill River approximately 35 km west of the Town of Happy Valley – Goose Bay. Permanent access to the Site is from the south shore, via a road extension from the existing Trans Labrador Highway. The Muskrat Falls Hydroelectric Development consists of the following main components:
- 1.1.2.1 Main access road, including upgrading and construction of over 22 km of new road with several stream crossings;
- 1.1.2.2 Approximately 20 km of Site roads to be constructed to reach the main structures, laydown areas, accommodation complex, borrow areas and spoil disposal area;
- 1.1.2.3 1,500 person accommodation complex;
- 1.1.2.4 Contractor and Company's laydown areas;
- 1.1.2.5 Reservoir preparation including some 130 km of forest access road, forest harvesting, and bank stabilization;
- 1.1.2.6 Intake, Powerhouse, Spillway, Transition Dams, North RCC Dam and South Dam;
- 1.1.2.7 North Spur stabilization works;
- 1.1.2.8 Switchyards at Muskrat Falls and Churchill Falls;
- 1.1.2.9 High voltage AC and DC overhead transmission lines and associated infrastructure; and AC/DC converter stations at Muskrat Falls and Soldiers Pond;
- 1.1.2.10 Environmental habitat (fish and terrestrial) protection, remediation and replacement.

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1.2 GENERAL DESCRIPTION OF PACKAGE CH0007

1.2.1 The Intake and Powerhouse, Spillway and Transition Dams Package (CH0007) consists generally of the construction of the Intake, Powerhouse, Spillway complete with Upstream and Downstream Permanent Bridges, Downstream Temporary Bridge, South, Centre and North Transition Dams, Separation Wall, concrete lining of Discharge Channel, access road between the Powerhouse and the Spillway, the Underground Piping and Duct Banks between the Powerhouse and the Switchyard and related work as described herein, in the Technical Specification and shown on the Drawings.

1.3 LANGUAGE AND UNITS

1.3.1 The language to be used for all nameplates and documentation is English.

1.3.2 The units of measurement shall be the International System of Units (SI).


1.3.3 All instruments graduations and inscriptions shall comply with the SI system.

1.4 CLIMATIC DATA

1.4.1 The Climatological Data is included in Exhibit 11 - Company Supplied Documents.

1.5 HYDROMETEOROLOGICAL DATA


1.5.1 Hydrometeorological data is summarized on Drawing MFA-SN-CD-2000-CV-DD-0003-01, Exhibit 1.

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PART 2 SCOPE OF WORK


2.1 WORK INCLUDED

- 2.1.1 The work listed in this Scope of Work Specification includes the supply of all labour, materials and equipment and the execution of all work required to construct all structures and related works as called for in the Technical Specification, as shown on the Drawings and as specified herein.
- 2.1.2 The term Technical Specification, refers to the document MFA-SN-CD-3300-CV-TS-0001, Exhibit 1.
- 2.1.3 The Work includes, but is not limited to:
- 2.1.3.1 Civil, Geotechnical/Embankment Work
- 2.1.3.1.1 Design, construction, maintenance, relocation, if required, and removal of all temporary construction roads to borrow pits, stockpile and spoil disposal areas, access ramps and work areas and as necessary for the execution of the Work as specified in the Contract or as indicated on the Drawings or as required by the Engineer;
- 2.1.3.1.2 Clearing, grubbing and stripping of the borrow areas and their access roads where needed;
- 2.1.3.1.3 Maintenance, dust control, snow removal and ice control, sanding, culvert maintenance and emergency repairs of all temporary and permanent roads including construction roads, access ramps, work areas, required to perform the Work (including the Contractor's laydown area). In addition, provide the same maintenance, dust control, snow removal and ice control, sanding, culvert maintenance, and emergency repairs for the following areas: permanent South Side Access Road running from the Trans Labrador Highway (Station 0+000 to 21+893); access to the Accommodation Complex from the South Side Access Road; all areas of the Accommodation Complex, which includes the general parking lot, bus depot, parking area and roads; and all areas of the Company's laydown area, including the access road and area within the laydown area.
- 2.1.3.1.4 Exploitation of borrow areas and blasted rock stockpile areas, including material processing and transportation, and rehabilitation of these Sites at the end of the Work;
- 2.1.3.1.5 Operation and maintenance of the existing dewatering systems and if required, design, supply, installation, operation and maintenance of additional necessary dewatering systems. This includes coordination with the Engineer for the

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dewatering layout and its integration with the permanent equipment. This also includes the removal of the dewatering systems at the end of the work;

- 2.1.3.1.6 Operation and maintenance of sedimentation ponds with associated ditches;
- 2.1.3.1.7 Not used;
- 2.1.3.1.8 Construction of the access road between the powerhouse and the spillway, including its maintenance during the work;
- 2.1.3.1.9 Removal of sand layer, placed for winter protection, on the foundations of transition dams and spillway;
- 2.1.3.1.10 Foundation preparation including dental excavation and scaling at the separation wall, south, centre and north transition dams;
- 2.1.3.1.11 Drilling for grouting, drainage, exploration and instrumentation, as indicated on the Drawings or as required by the Engineer;
- 2.1.3.1.12 Curtain grouting, consolidation grouting and contact grouting in the powerhouse, intake, south, centre and north transition dams and spillway foundations, including supply and installation of PVC pipe sleeves in concrete and installation and removal of the temporary instrumentation for grouting;
- 2.1.3.1.13 Excavation and backfill work for the tile field, underground piping between the Powerhouse and the converter station;
- 2.1.3.1.14 Excavation and backfill work for the electrical duct banks between the Powerhouse and the manholes;
- 2.1.3.1.15 Supply and installation of permanent geotechnical instrumentation as shown on the Drawings;
- 2.1.3.1.16 Removal of existing temporary fence around the top of the rock excavations in the structure areas;
- 2.1.3.1.17 Supply, installation and grounding of the chain link fences and gates in the powerhouse parking area and in the Contractor's laydown area.
- 2.1.3.2 Design, supply, installation and subsequent dismantlement and handover of the temporary downstream bridge over the spillway;
- 2.1.3.3 Supply, installation and subsequent removal of temporary lateral support and bracing for piers of the spillway, as shown on the Drawings.

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2.1.3.4 Concrete Work.

2.1.3.4.1 General

The Work described in this section includes: supply, transporting, handling, placing, finishing and curing of all concrete (including mix design and testing of the mix design); the design, construction, erection, maintenance and removal of all formwork and falsework; removal of the existing chain link wire mesh from excavated rock surfaces in the structure areas; all as called for the in the Technical Specification, as shown on the Drawings and specified herein.

2.1.3.4.2 Intake and Powerhouse

2.1.3.4.2.1 Supply and placing of concrete for the intake and powerhouse substructure, including south and north service bays, gate hoist building, downstream tailrace deck, oil/separator, retaining basins and bases for GSU transformers, retaining walls, slab on grade at the powerhouse entrance and as indicated on the Drawings;

2.1.3.4.2.2 Supply and placing of secondary concrete for the draft tube liner, stayring and generator pit cover at El. 15.5 m;

2.1.3.4.2.3 Supply and placing of overbreak concrete which is placed between the minimal excavation line and the actual rock surface;

2.1.3.4.2.4 Supply and placing of concrete for duct banks from the powerhouse to 3 metres beyond manhole # 3;

2.1.3.4.2.5 Supply and placing of backfill concrete in areas where the surface of natural bedrock is located below level shown on the Drawings or as indicated on the Drawings or as required by the Engineer;


2.1.3.4.2.6 Supply and placing of grout for base plates, rails and any component supplied and installed by Contractor;

2.1.3.4.2.7 Supply and installation of water stops;


2.1.3.4.2.8 Sealing of contraction and control joints, including supply and installation of asphalt impregnated fibre board;

2.1.3.4.2.9 Supply and installation of the bituminous coating at contraction joints;


2.1.3.4.2.10 Supply and installation of the prefabricated concrete fire walls at the tailrace deck and between the GSU transformers (above El. 16.80 m);

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- 2.1.3.4.2.11 Supply and placing of concrete for the retaining wall at the powerhouse parking area.
- 2.1.3.4.3 Spillway, Separation Wall and Discharge Channel
- 2.1.3.4.3.1 Supply and placing of concrete for the spillway, including base slab, piers and rollways;
- 2.1.3.4.3.2 Supply and placing of concrete for the upstream and downstream bridge deck for the spillway;
- 2.1.3.4.3.3 Supply and placing of concrete for the separation wall;
- 2.1.3.4.3.4 Supply and placing of Phase 1 concrete liner for the discharge channel for the spillway;
- 2.1.3.4.3.5 Supply and placing of Phase 2 and Phase 3 of the concrete lining for the spillway discharge channel to be completed after impoundment if required by Company based on assessment of erosion. Provide optional prices for such activities where indicated in the Schedule of Price Breakdown;
- 2.1.3.4.3.6 Supply and placing of overbreak concrete which is placed between the minimal excavation line and the actual rock surface;
- 2.1.3.4.3.7 Supply and placing of concrete for the retaining walls for the access road between the powerhouse and the spillway;
- 2.1.3.4.3.8 Supply and placing of grout for base plates, rails and any component supplied and installed by Contractor;
- 2.1.3.4.3.9 Supply and placing of water stops;
- 2.1.3.4.3.10 Supply and installation of the bituminous coating at contraction joints.
- 2.1.3.4.4 Transition Dams and Elevated Deck for Electrical Building
- 2.1.3.4.4.1 Supply and placing of concrete for the centre transition dam, including concrete bases for the elevated deck for electrical building, diesel fuel tank and stairs;
- 2.1.3.4.4.2 Supply and placing of concrete for the north transition dam including the connection section with the existing RCC cofferdam and concrete base for stairs;
- 2.1.3.4.4.3 Supply and placing of grout for base plates, rails and any component supplied and installed by Contractor;

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- 2.1.3.4.4.4 Supply and placing of water stops;
- 2.1.3.4.4.5 Supply and installation of the bituminous coating at contraction joints;
- 2.1.3.4.4.6 Supply and placing of concrete for the South Transition Dam, including the retaining wall for the South Rockfill Dam.
- 2.1.3.5 Reinforcement, Anchors and Dowels
- 2.1.3.5.1 Supply, fabrication and placing of reinforcement (reinforcing steel), including supply of all tie wire, spacers and supports, all as shown on the Drawings and indicated in the Technical Specification; includes the preparation of the bar lists and the placement drawings from the engineering Drawings provided by the Engineer, those documents shall be submitted to the Engineer for approval before any fabrication begins;
- 2.1.3.5.2 Supply and installation of threaded rebars with Couplers;
- 2.1.3.5.3 Drilling, grouting, installing and testing rock dowels, all as shown on the Drawings;
- 2.1.3.5.4 Drilling of the holes for anchors with epoxy adhesive.
- 2.1.3.6 Installation of primary anchors, templates and angles supplied by Company's Other Contractors as follows:
- 2.1.3.6.1 Installation of primary anchors, templates and angles in primary concrete, for the embedded parts for intake stoplogs;
- 2.1.3.6.2 Installation of primary anchors and templates in primary concrete, for the embedded parts for intake trash racks;
- 2.1.3.6.3 Installation of primary anchors, templates and angles in primary concrete, for the embedded parts for intake gates;
- 2.1.3.6.4 Installation of primary anchors, templates and angles in primary concrete, for the embedded parts for the draft tube stoplogs;
- 2.1.3.6.5 Installation of primary anchors and embedded parts in primary concrete, for turbine-generator units including the semi spiral case access door;
- 2.1.3.6.6 Installation of the lower portion of the circular passage for all four turbine-generator units, if required by Company, and as shown on Drawings provided by Turbine-Generator Contractor (CH0030). Provide optional prices for such activities where indicated in the Schedule of Price Breakdown;

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- 2.1.3.6.7 Installation of primary anchors, templates and angles in primary concrete for the embedded parts for the furthest upstream set of stoplogs for the spillway;
- 2.1.3.6.8 Installation of primary anchors, templates and angles in primary concrete, for the embedded parts for the second upstream set of stoplogs for the spillway;
- 2.1.3.6.9 Installation of primary anchors, templates and angles and miscellaneous embedded steel in primary concrete, for the embedded parts for spillway gates;
- 2.1.3.6.10 Installation of primary anchors, templates and angles in primary concrete, for the embedded parts for downstream stoplogs for the spillway;
- 2.1.3.6.11 Installation of liner plates in the sides of piers downstream of the spillway gates;
- 2.1.3.6.12 Installation of concrete anchors, in the primary concrete piers for the spillway gate hoist towers and steel walkways.
- 2.1.3.7 Structural Steel and Miscellaneous Metalwork
- 2.1.3.7.1 General
- The Work described in this section includes the supply, fabrication, painting, galvanizing or metallization if required, inspection and testing, connection design, shop drawings, transportation to the Site and installation of structural steel, miscellaneous metals and embedded parts, etc., all as called in the Technical Specification, as shown on the Drawings and specified herein.
- 2.1.3.7.2 Intake and Powerhouse
- 2.1.3.7.2.1 Supply and installation of the structural steel for the superstructure and mezzanines. The protective coatings shall be as per the Technical Specification and Drawings, using intumescent painting where required;
- 2.1.3.7.2.2 Supply and installation of all miscellaneous metals for the powerhouse and the intake, including access and service platforms, hatch and trench covers, stairs, ladders, grating, handrails and guardrails;
- 2.1.3.7.2.3 Supply and installation of all embedded miscellaneous metals for the powerhouse and the intake (frames, L-shapes, sleeves, anchor bolts etc.);
- 2.1.3.7.2.4 Supply and installation of the runway rails with Gantrex fastening system for the overhead cranes inside the powerhouse and at the draft tube gallery;
- 2.1.3.7.2.5 Supply and installation of the gantry rails on the intake road deck for the trash cleaning system, including fastening system and accessories;


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- 2.1.3.7.2.6 Supply and installation of support beam at the top of the elevator shaft;
- 2.1.3.7.2.7 Supply and installation of the monorail supporting beam in the dewatering gallery;
- 2.1.3.7.2.8 Supply and installation of the connections for the steel superstructure at column lines, to the downstream face of the intake for primary lateral support;
- 2.1.3.7.2.9 Supply and installation of the building column anchor bolts, including base plates, as well as the supply and installation of double templates for the correct positioning of the anchor bolts;
- 2.1.3.7.2.10 Supply and installation of all concrete anchorages required for the installation of the miscellaneous metal work;
- 2.1.3.7.2.11 Supply and installation of stainless steel anchor points at locations to be determined by Company inside the Powerhouse. The stainless steel anchor point assemblies are to consist of a steel host ring, steel attachment/base plate and anchors/bolts or clamps, such that the assemblies can be connected to concrete walls/floors/ceilings or to steel beams/columns;
- 2.1.3.7.2.12 Supply and installation of metal decking required for the roof and mezzanines;
- 2.1.3.7.2.13 Supply and installation of the miscellaneous rooms located at the north service bay on the generator floor;
- 2.1.3.7.2.14 Supply and installation of the miscellaneous rooms at the south end of the turbine floor.
- 2.1.3.7.3 Spillway and Transition Dams
- 2.1.3.7.3.1 Supply and installation of the steel structure for the upstream and downstream permanent bridges for the spillway including shear studs;
- 2.1.3.7.3.2 Supply and installation of the steel structure, including metal decking and shear studs for the elevated deck for the spillway electrical building;
- 2.1.3.7.3.3 Supply and Installation of all miscellaneous metals for the spillway and transition dams, including access and service platforms, hatch and trench covers, stairs, ladders, grating, handrails and guardrails as shown on the Drawings;
- 2.1.3.7.3.4 Supply and Installation of all embedded miscellaneous metals for the spillway and transition dams (frames, L-shapes, sleeves, anchor bolts etc.) as shown on the Drawings;
- 2.1.3.7.3.5 Supply and installation of the gantry rails on the centre transition dam road deck

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and spillway road deck for the trash cleaning system including fastening system and accessories;

- 2.1.3.7.3.6 Supply and installation of bearing pads for the upstream and downstream permanent bridges and for the elevated deck at the centre transition dam;
- 2.1.3.7.3.7 Supply and installation of anchor bolts, include the supply and installation of double templates for the correct positioning of the anchor bolts;
- 2.1.3.7.3.8 Supply and installation of all concrete anchorages required for the installation of miscellaneous metal work;
- 2.1.3.7.3.9 Supply and installation of stainless steel anchor points at locations to be determined by Company at the Spillway. The stainless steel anchor point assemblies are to consist of a steel host ring, steel attachment/base plate and anchors/bolts or clamps, such that the assemblies can be connected to concrete walls/floors/ceilings or to steel beams/columns.
- 2.1.3.8 Supply and Installation of Embedded/Exposed Piping and HVAC
- 2.1.3.8.1 Supply and installation of all embedded/exposed piping and various mechanical parts for the intake, powerhouse and centre transition dam, all as shown on the Drawings, including inspection and testing, cleaning, quality assurance and control of piping works;
- 2.1.3.8.2 Supply and installation of valves on various piping systems as shown on the Drawings;
- 2.1.3.8.3 Supply and installation of pipe supports and pipe insulation on various piping systems, as shown on the Drawings;
- 2.1.3.8.4 Supply and installation of underground buried piping, prefabricated septic tank, prefabricated septic distribution box and septic tile field between the powerhouse and the converter station;
- 2.1.3.8.5 Supply and installation of HVAC louvers, wall sleeves, flashing and framing, as shown on the Drawings.
- 2.1.3.9 Electrical Work
- 2.1.3.9.1 Supply and installation of embedded conduits and accessories of size and quantity as indicated and detailed on the Drawings;
- 2.1.3.9.2 Supply and installation of the grounding network including aluminothermy

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(Cadweld) welding at the intake, powerhouse, south, centre and north transition dams and spillway, as detailed on the Drawings;

- 2.1.3.9.3 Connections of grounding conductors to non-electrical equipment including structural and miscellaneous steel, stairs, columns, handrails, guardrails etc. as detailed on the Drawings;
- 2.1.3.9.4 Supply and install high bay lighting for the powerhouse generator floor, as detailed on the Drawings;
- 2.1.3.9.5 Supply and install lighting panels, transformers, disconnect switches, lighting contactors and light switches as indicated on the Drawings;
- 2.1.3.9.6 Supply, install and connect all the wiring required to form a complete and operational lighting system for the powerhouse generator floor, as indicated on the Drawings;
- 2.1.3.9.7 Supply and install power cables for the lighting system from the construction power 600 V switchgear, to the lighting distribution system. The 600 V switchgear is located outside the powerhouse (south-east side of the powerhouse);
- 2.1.3.9.8 Construction of concrete slabs for Construction Power Distribution Equipment at Powerhouse Parking Area and Contractor's Laydown Area;
- 2.1.3.9.9 Supply and installation of prefabricated manholes and construction of electrical duct banks from the powerhouse to 3 metres beyond manhole # 3;
- 2.1.3.9.10 Supply and install the permanent exterior lighting fixtures, wiring, conduits and junction boxes on the metal siding of the powerhouse building as indicated on the Drawings;
- 2.1.3.9.11 Supply and install metal sleeves through the roof for the power cable passage to the roof smoke exhaust fans as shown on the Drawings;
- 2.1.3.9.12 Supply and install sleeves in metal siding walls of the powerhouse for the passage of cables for CCTV, communications, intrusion and fire alarm signaling system as indicated in the Technical Specification.
- 2.1.3.9.13 Supply and installation of heat tracing cables, controllers and accessories for heat tracing the drains in the Intake area of the Powerhouse.
- 2.1.3.10 Architectural Work and Building Envelope
- 2.1.3.10.1 Supply and installation of the insulated metal wall panels for the powerhouse


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building;


- 2.1.3.10.2 Supply and installation of the preformed metal siding for the powerhouse building;
- 2.1.3.10.3 Supply and installation of the modified bituminous membrane roofing system;
- 2.1.3.10.4 Supply and installation of the exterior metal insulated doors;
- 2.1.3.10.5 Supply and installation of the windows;
- 2.1.3.10.6 Supply and installation of the multi-leaf vertical lift metal insulated door at the south service bay;
- 2.1.3.10.7 Supply and installation of other truck doors at the north and south ends of the Powerhouse;
- 2.1.3.10.8 Supply and installation of roof anchors and safety restraints.
- 2.1.3.11 Environmental Work
 - 2.1.3.11.1 Construction, maintenance and operation of all temporary mitigation measures to comply with Technical Specification Section 01 35 43 - General Environmental Requirements;
 - 2.1.3.11.2 Site restoration at completion of work.

2.2 WORK EXCLUDED

- 2.2.1 The following works are excluded from the Work and will be performed by Company's other Contractors:
 - 2.2.1.1 Excavation of the intake, powerhouse, spillway, intake approach channel and discharge channel, as well as rock excavation in Transition dams and separation wall foundations;
 - 2.2.1.2 Excavation of the tailrace rock plug;
 - 2.2.1.3 Construction of the riverside RCC cofferdam;
 - 2.2.1.4 Construction of North RCC overflow dam;
 - 2.2.1.5 Construction of South rockfill dam;
 - 2.2.1.6 Construction and removal of cofferdams;

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- 2.2.1.7 Removal of the downstream part of the riverside RCC cofferdam;
- 2.2.1.8 Removal of the access ramp left in the Tailrace Channel by the Bulk Excavation Contractor (CH0006). This ramp runs down from the top of Cofferdam 3 to the downstream edge of the Powerhouse;
- 2.2.1.9 Construction of the access road to the powerhouse;
- 2.2.1.10 Construction and removal of the upstream temporary bridge over the spillway approach channel;
- 2.2.1.11 Construction of the concrete pier and abutments for the upstream temporary bridge over the spillway approach channel
- 2.2.1.12 Construction and removal of the temporary access ramp to the temporary upstream bridge over the spillway approach channel;
- 2.2.1.13 Embankment required for the switchyard and converter station and their access roads;
- 2.2.1.14 With the exception of the supply of secondary concrete, supply and installation of intake trash racks, intake bulkhead gates, intake gates and draft tube stoplogs, including the embedded parts and placement of the secondary concrete for the embedded parts for these gates;
- 2.2.1.15 With the exception of the supply of the secondary concrete, supply and installation of the spillway upstream stoplogs, downstream stoplogs, and gates; including the embedded parts and the placement of the secondary concrete for the embedded parts for these stoplogs and gates;
- 2.2.1.16 Delivery of concrete from the batch plant to the pour location to the Spillway and Powerhouse Hydro-Mechanical Contractor (CH0032), unless otherwise agreed with Company;
- 2.2.1.17 Supply and installation of the turbine-generator units;
- 2.2.1.18 Supply of the lower portion of the circular passage for the turbine-generator units;
- 2.2.1.19 Supply and installation of the powerhouse elevator;
- 2.2.1.20 Supply and installation of the powerhouse main overhead cranes;
- 2.2.1.21 Supply and installation of the overhead crane for the draft tube gates;
- 2.2.1.22 Supply and installation of the spillway hoist superstructure;

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- 2.2.1.23 Interior architectural work except as noted;
- 2.2.1.24 Sanding and ice control for pedestrian areas at the Accommodation Complex and buildings on the Company's lay down area;
- 2.2.1.25 Supply and installation of the spillway electrical building;
- 2.2.1.26 Supply and installation of electrical and mechanical works related to the spillway electrical building;
- 2.2.1.27 Decommissioning and backfilling of sedimentation ponds No. 1 and 2;
- 2.2.1.28 All other services provided by Company as specified in Exhibit 12 - Site Conditions;
- 2.2.1.29 Supply and installation of the outdoor 600 V switchgear;
- 2.2.1.30 Removal of Construction Power (electrical equipment, concrete slab, grounding and fences);
- 2.2.1.31 Excavation and backfill work for the underground direct-buried cabling, between the manholes and the switchyard;
- 2.2.1.32 Supply and installation of underground buried piping, between the tile field and converter station;
- 2.2.1.33 Removal of all remaining temporary safety fences outside the structures area.

2.3 WORK PROVIDED TO COMPANY'S OTHER CONTRACTORS


- 2.3.1 The Contractor shall supply concrete to Company's Other Contractors, including the delivery of concrete from the batch plant to the pour location (except as indicated in 2.2.16), as well as design and testing of the mix.

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PART 3 SPECIAL REQUIREMENTS

3.1 GENERAL

- 3.1.1 The overall project schedule requires that some of the Work be performed during the winter period. The Contractor shall take all necessary measures for winter concreting, including the use of heated shelters. The Contractor shall design, supply, install and remove temporary shelters.
- 3.1.2 Where the building envelope is used by the Contractor as shelter for the execution of its work before the remainder of the building is completed, it is the responsibility of the Contractor to supply, install and subsequently remove any temporary bracing, walls and enclosure as may be required.
- 3.1.3 All temporary works shall be designed by a qualified Professional Engineer registered in the Province of Newfoundland and Labrador. The Professional Engineer shall be approved by the Engineer prior to starting any Work. All designs and drawings shall be submitted to the Engineer for review and approval before starting of any work.
- 3.1.4 The Contractor is responsible to supply, install and operate an appropriate heating and ventilation system as well as a lighting system for the duration of the Work. Those systems shall be installed as the Work progresses and as required and shall be transferred to the Company at the completion of the Work.
- 3.1.5 The Contractor shall supply, install, operate, dismantle and remove from the Site at the end of the Work a temporary construction overhead crane of a capacity to suit the Contractor's needs. The use of this crane by the Contractor will not be exclusive and the crane could be used from time to time by Company's other Contractors. In such case, the Contractor will be entitled to compensation for operating costs. This temporary construction crane will travel on the rails for the powerhouse permanent overhead cranes, and it is intended to limit, as much as possible, the use of the permanent powerhouse overhead crane by the Contractor, which will be principally, but not exclusively, used by the Turbine-Generator Contractor (CH0030). The use of all overhead cranes in the Powerhouse will be coordinated by the Engineer.
- 3.1.6 The Contractor is responsible for production of concrete including mobilization, installation, operation and demobilization of the batch plants at the end of concrete supply contract, fabrication of coarse and fine aggregates for concrete production from blasted rock stockpile and from granular borrow areas, the supply and storage of Portland cement, Fly Ash/Blast furnace slag and admixtures.

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- 3.1.7 Sampling and laboratory testing of all materials, including but not limited to soil, cement, grout, aggregates, aggregates for concrete production and concrete, including the concrete to be supplied to Company's Other Contractors, shall be performed by the Contractor through the use of the onsite services of a third party retained and paid by the Company. This shall not relieve either the Contractor or its suppliers of material of any responsibilities connected with the quality of the materials and the satisfactory design, production, delivery and performance of the installed materials.
- 3.1.8 Field compaction sampling and laboratory testing, including but not limited to in-situ density and moisture content, grain size analysis and compaction tests will be performed by the Contractor through the use of the onsite services of the third party retained and paid the Company. This shall not relieve either the Contractor or its supplier of materials of any responsibilities connected with the quality of the materials and their satisfactory performance.
- 3.1.9 The Contractor is responsible for all quality control for the fabrication of the concrete at the batch plant. The inspection and the quality control testing and sampling of the concrete at the batch plant and at the placement Sites will be performed through the use of the onsite services of a third party retained and paid by the Company. Concrete will be tested in accordance with CAN/CSA A23.1/A23.2-M standards. The Contactor shall provide full cooperation to the third party in charge of the onsite quality control sampling and testing of the concrete for obtaining specimens required. The Contractor shall provide heated shelters for the execution of this work, as approved by the Engineer.
- 3.1.10 The Contractor is responsible to perform the trial mixes for all classes of concrete specified. Those trial mixes shall be planned appropriately to allow enough time for all sampling and testing to be completed by the Contractor through the use of the onsite services of the third party retained and paid by the Company and then approved by the Engineer prior to any concreting of permanent work. The Contractor shall submit to the Engineer a detailed plan and schedule of all work related to the trial mixes for the approval by the Engineer.
- 3.1.11 Any offsite laboratory tests carried out by the Contractor will be at its own expense.
- 3.1.12 The Contractor shall submit the required documentation to the Engineer for review and approval in accordance with the Technical Specification and Supplier Document Requirement List (SDRL)
- 3.1.13 Where there are conflicts between or within the Technical Specification and the Drawings, the Technical Specification will have precedence. Where there are conflicts between or within Codes, Standards or Acts, priority shall be given to the more stringent.

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3.2 SITE CONDITIONS

3.2.1 This Scope of Work Specification shall be read in conjunction with Exhibit 12 - Site Conditions.

3.3 COMPANY SUPPLIED DOCUMENTS

3.3.1 Company supplied documents are listed in Exhibit 11. The Contractor shall observe all requirements of the Company Supplied Documents.

3.4 SETTING-OUT OR IMPLEMENTATION OF SURVEY POINTS AND LINES

3.4.1 The Contractor shall be responsible for:

3.4.1.1 Surveying required for setting-out the structures and for as-built profile of the excavation and structures;

3.4.1.2 Locate, confirm and protect control points prior to starting Site work. Preserve permanent reference points during construction;

3.4.1.3 Establish permanent benchmarks on Site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record documents;


3.4.1.4 The accurate setting-out of the Work in relation to reference points, lines and levels given by the Engineer in writing;

3.4.1.5 The correctness, subject as above mentioned, of the position, levels, dimensions and alignment of all parts of the Work;

3.4.1.6 The provision of all necessary instruments, appliances and labour in connection with the foregoing responsibilities;

3.4.2 If, at any time during the execution of the Work, any error appears in the position, levels, dimensions or alignment of any part of the Work, the Contractor, on being required to do so by the Engineer, shall, at its own cost, rectify such error to the satisfaction of the Engineer, unless such error is based on incorrect data supplied in writing by the Engineer, in which case the Engineer shall recommend a change to the work in accordance with Article 14;

3.4.3 The checking of any setting-out or of any line or level by the Engineer shall not in any way relieve the Contractor of its responsibility for the accuracy thereof and the Contractor shall carefully protect and preserve all bench-marks, sight-rails, pegs and other reference points used in setting-out the Work.


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3.5 SITE INFORMATION

- 3.5.1 The Company has made available to the Contractor, Site information (Exhibit 11 – Company Supplied Documents), before the submission by the Contractor of the Proposal. Such data on subsurface conditions have been obtained by or on behalf of the Company from investigations undertaken relevant to the Work but the Contractor shall be responsible for its own interpretation thereof.
- 3.5.2 The Contractor shall be deemed to have inspected and examined the Site and its surroundings, be fully knowledgeable of the information available in connection therewith and to have satisfied itself before submitting its Proposal, as to:
- 3.5.2.1 The form and nature thereof, including the subsurface conditions;
- 3.5.2.2 The hydrological and climatic conditions;
- 3.5.2.3 The extent and nature of work and materials necessary for the execution and completion of the Work and the remedying of any defects therein; and
- 3.5.2.4 The means of access to the Site and the accommodation it may require, when not provided for (Refer to Exhibit 12 – Site Conditions);
- 3.5.3 In addition, the Contractor, in general, shall be deemed to have obtained all necessary information, subject as above mentioned, as to risks, contingencies and all other circumstances which may influence or affect its Proposal.
- 3.5.4 The Contractor shall be deemed to have based its Bid on the data made available by the Company and on its own inspection and examination, all as aforementioned.
- 3.5.5 Subject to Sections 3.5.1 and 3.5.2, Company has identified borrow pits from which sufficient quantities of sand and aggregates of suitable quality can be developed to perform the Work.

3.6 SPECIALIST SUBCONTRACTOR

- 3.6.1 The Contractor may subcontract specialized services, such as design engineering services, but it shall obtain the approval of the Engineer prior to the award of any such subcontract. Such approval shall not relieve the Contractor from any liability or obligation under the Agreement and it shall be responsible for the acts, default and neglects of the Sub-Contractor, its agents, personnel as fully as if they were the acts, defaults and neglect of the Contractor. The Engineer reserves the right to refuse the services of a Sub-Contractor proposed by the Contractor.

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3.6.2 The Contractor shall submit to the Engineer for approval, details on the history of the Sub-Contractor (previous work done in similar conditions, etc), on the personnel the Sub-Contractor intends to use, inclusive of their detailed resumes, membership in professional organizations, their authority to sign and approve drawings, registration and/or eligibility to register with the Professional Engineers and Geoscientists of Newfoundland and Labrador (PEGNL). All calculations and such like shall be in accordance with Newfoundland and Labrador Regulations. Such approval by the Engineer does not change the full responsibility of the Contractor in the execution of the Work.

3.6.3 The Sub-Contractor may be requested to undertake its work or part of its work at the Work Site.

3.7 ENVIRONMENTAL REQUIREMENTS


3.7.1 Contractor shall comply with the Technical Specification Section 01 35 43 – General Environmental Requirements (Exhibit 1) and Environmental and Regulatory Compliance Requirements (Exhibit 6).

3.7.2 Prior to the start of Site work, the Contractor shall prepare a Work Specific Environmental Protection Plan (C-SEPP) for review and approval by the Engineer. The C-SEPP will detail the environmental protection measures that will be implemented by the Contractor for all components of the Work. The Contractor shall reference the General Environmental Requirements of the Specification, as well as Contract Drawings, as required. The template for preparation of the C-SEPP is attached in Exhibit 11 - Company Supplied Documents.

3.8 DOCUMENTS

3.8.1 Drawings Provided to the Contractor

3.8.1.1 The Drawings issued with the Request for Proposal (RFP) are intended to indicate the location, type and scope of work to be carried. They are not to be used for construction. At Effective Date, a schedule of issue of the Approved for Construction (AFC) Drawings will be provided. With those Drawings, the Contractor shall verify on Site all levels and dimensions before starting work and shall notify the Engineer of all differences and/or discrepancies with the AFC Drawings.

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- 3.8.1.2 Before the beginning of the Work, the Contractor shall submit for the Engineer's approval, the drawings required as per the Technical Specification and as provided in the SDRL (Exhibit 4 - Supplier Document Requirement List). The Contractor shall submit for review by the Engineer all test certificates, purchase orders, drawings and all details necessary for the execution of the Work as specified in the Technical Specification.
- 3.8.1.3 The turnaround time for Engineer's review of Contractor's drawings is 21 calendar days.
- 3.8.2 Drawings
- 3.8.2.1 The Drawings are included in Exhibit 1 and are listed in the Technical Document List, document number 505573-CH0007-40AL-I-0001.
- 3.8.2.2 The Drawings issued with the Request for Proposal are not to be used for Construction.
- 3.8.2.3 Contractor shall only execute the Work based on stamped and signed AFC Drawings.
- 3.8.3 Technical Specification
- 3.8.3.1 The Technical Specification related to the Work is provided in Exhibit 1.