

BC HYDRO SITE C CLEAN ENERGY PROJECT

GENERATING STATION AND SPILLWAYS CIVIL WORKS CONTRACT

for the Site C Clean Energy Project

Schedule 6

Specifications and Drawings

GENERATING STATION AND SPILLWAYS CIVIL WORKS CONTRACT

SCHEDULE 6

SPECIFICATIONS AND DRAWINGS

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SCHEDULE 6

SPECIFICATIONS AND DRAWINGS

1 INTERPRETATION

1.1 Definitions

In this Schedule 6 [Specifications and Drawings], in addition to the definitions set out in Schedule 1 [Definitions and Interpretation]:

“**APEGBC**” means the Association of Professional Engineers and Geoscientists of British Columbia;

“**Drawings**” means all drawings contained in Appendix 2-5 [Proposal Extracts], Appendix 6-3 [Drawings] and otherwise prepared in accordance with the Contract, as may be amended, deleted or added to pursuant to the terms of the Contract;

“**Engineering Manager**” has the meaning set out in Section 6.1 of this Schedule 6 [Specifications and Drawings];

“**Equivalent**” means any design, methodology, configuration, standard, material, product or equipment which:

- (a) is not in accordance with the applicable design, methodology, configuration, standard, material, product or equipment specified in the Contract;
- (b) has equal or better qualities and performance as the design, methodology, configuration, standard, material, product or equipment specified in the Contract; and
- (c) has been Accepted by Hydro’s Representative in accordance with Section 3.3 of Schedule 2 [General Conditions].

“**Marked Up IFC Drawing**” has the meaning set out in Clause 3.5(a) of this Schedule 6 [Specifications and Drawings];

“**Record Drawing**” has the meaning set out in Clause 3.4(a) of this Schedule 6 [Specifications and Drawings]; and

“**Specifications**” or “**Technical Specifications**” means the contents of Appendix 6-2 [Technical Specifications], as may be amended, deleted or added to pursuant to the terms of the Contract.

1.2 Read Together

The Specifications and Drawings are complementary and will be read and interpreted together and, as the context requires, what is required by any one Specification or Drawing will be deemed to be required by all Specifications and Drawings.

1.3 Section References

In this Schedule 6 [Specifications and Drawings]:

- (a) when the phrase “this Section” is used in Appendix 6-2 [Technical Specifications], it refers to the section in which the reference is made. For illustration, when the phrase “this Section” is used in

Section 03 30 00 [Cast-In-Place Concrete] of Appendix 6-2 [Technical Specifications], the reference is to Section 03 30 00 [Cast-In-Place Concrete] of Appendix 6-2 [Technical Specifications];

- (b) in Appendix 6-2 when the phrase “Section xx xx xx [Name of Section]” is used, it refers to another Section of Appendix 6-2 [Technical Specifications]. For illustration, “as specified in Section 26 05 10 [Grounding]” is a reference to Section 26 05 10 [Grounding] of Appendix 6-2 [Technical Specifications]; and
- (c) in Appendix 6-2 [Technical Specifications] when the phrase “Section x.x of Schedule x [Name of Schedule]” is used, it refers to the specified section of another Schedule. For illustration, “in accordance with Section 3.3 of Schedule 2 [General Conditions]” is a reference to Section 3.3 of Schedule 2 [General Conditions].

1.4 Miscellaneous

In this Schedule 6 [Specifications and Drawings]:

- (a) wherever the words “directed”, “required”, “permitted”, “approved”, “approval”, “specified”, “accepted” or “acceptance” are used, such words, as the context allows, will be deemed to be followed by the words “by Hydro’s Representative”, whether or not the latter words appear;
- (b) wherever the words “as indicated”, “where indicated” or “as otherwise indicated” are used, such words, as the context allows, will be deemed to be followed by the words “in the Contract”, whether or not the latter words appear;
- (c) wherever the capitalized term “Equal” is used, it will be deemed to mean Equivalent;
- (d) any reference to “Ministry of Transportation and Infrastructure Representative” will, as the context may require, be deemed to be a reference to Hydro’s Representative;
- (e) no revision of any Technical Specification or Drawing will be valid unless and until the revision is issued by Hydro’s Representative in writing;
- (f) any requirement for Work on Site to be accepted or approved by BC Hydro, including Hydro’s Representative, before proceeding will be deemed to be a Hold Point;
- (g) any reference to the Work or the performance of the Work will be deemed to include work to be performed by a Subcontractor;
- (h) the words “confirmed in writing” or words with similar meaning shall be deemed to mean confirmed in writing in advance of the applicable action being taken or activity performed;
- (i) the words ‘re-work’ or ‘replacement’ or words with similar meaning shall be deemed to be mean that the Contractor will perform such re-work or replacement as part of the Work at no additional cost or expense to BC Hydro;
- (j) the obligations are written as obligations of the Contractor except as expressly stated otherwise;
- (k) reference to “Laws” will be deemed to include a reference to “Permits”; and
- (l) unless expressly stated otherwise, each reference in this Schedule 6 [Specifications and Drawings] to a code, standard, specification, published data or guideline published by a standards organization will be deemed to mean the latest version of that code, standard,

specification, data or guideline as of the date the Contractor submitted its “Financial Submission” under RFP #6374 to BC Hydro.

2 ENGINEERING AND DRAFTING STANDARDS

Notwithstanding anything to the contrary in the Contract, the Contractor will, in preparing any Drawings, comply with the following, copies of which are in the Data Room and are included in the Contract by reference:

- (a) BC Hydro engineering standards as referenced in Appendix 6-2 [Technical Specifications]; and
- (b) BC Hydro’s drafting requirements for preparation of Drawings showing permanent works located in the Data Room (Data Room ID# 1016.REF.00670).

3 DRAWINGS

3.1 Drawings Provided to the Contractor

- (a) The Drawings in Appendix 6-3 [Drawings] include drawings provided to the Contractor, including as part of RFP #6374. Such Drawings are only intended to indicate the location, type and scope of Work and are not to be relied upon by the Contractor for construction of the Work.
- (b) As set out in Section 3.18 of Schedule 2 [General Conditions], only the IFC Drawings are to be used by the Contractor for construction of the Work.
- (c) The Contractor will verify on Site all levels and dimensions indicated on the IFC Drawings before commencing construction and will notify Hydro’s Representative of any differences or discrepancies between the levels and dimensions measured on Site and such levels and dimensions on the IFC Drawings.
- (d) The Contractor will not determine any dimensions by taking measurements from the Drawings.

3.2 Drawings Provided by the Contractor

- (a) The Contractor will prepare and issue IFC Drawings for those portions of the Work for which it is responsible for design in accordance with Clause 2.1.1.10 of Appendix 6-1 [Scope of Work].
- (b) All Drawings, including any IFC Drawings and shop drawings, required to be prepared by the Contractor under the Contract will comply with the applicable requirements of Appendix 6-2 [Technical Specifications] and the engineering and drafting standards specified in this Schedule 6 [Specifications and Drawings].

3.3 As-Constructed Information

- (a) For all Work, the Contractor will record as-constructed information concurrently with, and in any event no later than seven days after, the performance of such Work.
- (b) The Contractor will not conceal any Work until the required information is recorded in accordance with Sections 3.4 and 3.5 of this Schedule 6 [Specifications and Drawings].

3.4 Record Drawings

- (a) The Contractor will prepare Drawings that record the Work as-constructed by the Contractor ("**Record Drawings**"), for those portions of the Work for which the Contractor is responsible for design in accordance with Clause 2.1.1.10 of Appendix 6-1 [Scope of Work].
- (b) All Record Drawings will:
- (i) be marked "Record Drawing";
 - (ii) accurately show all as-constructed information, including:
 - (A) the final location, layout, dimensions and details of the Work in accordance with the Contract;
 - (B) field changes of dimensions and details;
 - (C) changes to the Work made by Change Orders and Change Directives;
 - (D) any details not included on the Drawings provided to the Contractor or on the drawings prepared by the Contractor; and
 - (E) any other deviations from the Contract;
 - (iii) be based on the IFC Drawings prepared by the Contractor in their native file format, which for works incorporated into the permanent Work, will be AutoCAD 2014 or other software Accepted by Hydro's Representative;
 - (iv) meet the requirements set out in APEGBC's Quality Management Guidelines entitled "Use of the APEGBC Seal"; and
 - (v) be sealed, signed and dated by a Professional Engineer in accordance with APEGBC acceptable practice.

3.5 Marked-Up IFC Drawings

- (a) For all Work, other than those portions of the Work for which the Contractor is responsible for design in accordance with Clause 2.1.1.10 of Appendix 6-1 [Scope of Work], the Contractor will mark-up the IFC Drawings provided to the Contractor for such Work to record any difference between such IFC Drawings and the Work constructed by the Contractor ("**Marked-Up IFC Drawings**").
- (b) All Marked-Up IFC Drawings will:
- (i) be marked "Marked-Up IFC Drawing";
 - (ii) accurately, neatly and legibly show all as-constructed information, including:
 - (A) the final location, layout, dimensions and details of the Work in accordance with the Contract;
 - (B) field changes of dimensions and details;
 - (C) changes to the Work made by Change Orders and Change Directives;

- (D) any details not included on the Drawings provided to the Contractor or on the drawings prepared by the Contractor; and
- (E) any other deviations from the Contract;
- (iii) be based on the IFC Drawings and supplementary Drawings (if any) provided by Hydro's Representative in PDF format; and
- (iv) be prepared using Autodesk Design Review, or other software Accepted by Hydro's Representative.

3.6 Review of Drawings

- (a) No later than 60 days after the end of each calendar year, the Contractor will submit to Hydro's Representative for Review a full set of the Marked-Up IFC Drawings and Record Drawings for Work completed during that year, as follows:
 - (i) two copies of each drawing in hard copy form;
 - (ii) one electronic copy of each Marked-Up IFC Drawing and any supplementary Drawing in its native Autodesk Design Review format, or other native file format Accepted by Hydro's Representative; and
 - (iii) one electronic copy of each Record Drawing in its native AutoCAD 2014 file format, or other native file format Accepted by Hydro's Representative.
- (b) Hydro's Representative, acting reasonably, may at any time request copies of the Record Drawings and Marked-Up IFC Drawings for review. The Contractor will submit electronic copies of the requested drawings no later than 72 hours after the later of:
 - (i) receiving such a request; or
 - (ii) expiry of the applicable seven day period referred to in Section 3.3(a) of this Schedule 6 [Specifications and Drawings].

4 TEST AND SURVEY REPORTS

4.1 Test and Survey Reports

- (a) Where testing is required pursuant to Appendix 6-2 [Technical Specifications] or Schedule 8 [Quality Management], the Contractor will submit the results of such testing to Hydro's Representative in a report which complies with the following requirements:
 - (i) reporting for each type of test will conform to the requirements of the relevant standards specified in Appendix 6-2 [Technical Specifications];
 - (ii) the report will include, at a minimum:
 - (A) the location of the test or of the sampling of material tested in accordance with the UTM Zone 10 NAD 83 system;
 - (B) for material sampled or tested at the fabrication site, the approximate location of the destination of the material representative of the sample;

- (C) the time, date and the weather conditions at the time of sampling or testing; and
 - (D) the names of the person(s) carrying out the sampling or testing; and
- (iii) in addition to the requirements of Appendix 6-2 [Technical Specifications], all data will be submitted in comma-separated-value (.csv) format.
- (b) Surveying of the final surfaces of excavations and structures specified in Clause 5.2.1.1.1 of Appendix 6-1 [Scope of Work] will be provided in accordance with the UTM Zone 10 NAD 83 system and supplied to Hydro's Representative in comma-separated-value (.csv) format.

5 RECORDS ON SITE

5.1 Records Available on-Site

Without limiting any other provisions of the Contract, the Contractor will maintain:

- (a) a complete set of all Quality Records on Site until Total Completion. The Quality Record set will be logically organized and structured and will be made available to Hydro's Representative upon request; and
- (b) a complete daily list of all Contractor Personnel engaged in performance of Work on the Site, together with evidence of their compliance with all applicable requirements of the Contract, including required experience, qualifications, certifications and professional designations and required training, including site, cultural awareness and other training. The list of Contractor Personnel will be logically organized and structured, will be maintained on Site and will be made available to Hydro's Representative within 72 hours of request.

6 ENGINEERING MANAGER

6.1 Engineering Manager

The Contractor will appoint a competent and qualified individual to be primarily responsible for management, oversight and coordination of all aspects of the Work requiring the services of, or oversight by, a Professional Engineer (the "**Engineering Manager**"). The Engineering Manager will be a Key Individual and will:

- (a) be a Professional Engineer, or be eligible to be registered as a professional engineer in British Columbia;
- (b) have at least 10 years' experience as a senior project engineer or engineering manager on large scale hydro-electric or civil infrastructure projects; and
- (c) have held a senior project engineer or engineering manager position on large scale hydro-electric or civil infrastructure projects within the past five years.

7 GENERAL

7.1 Language and Units

In the Specifications and Drawings:

- (a) The language to be used for all nameplates and documentation is English;
- (b) The units of measurement shall be the International System of Units (SI);
- (c) All instrument graduations and inscriptions shall comply with the SI system;
- (d) The Universal Transverse Mercator (UTM) LIDAR data produced for the Site C Project is to NAD-83 datum, UTM Zone 10 and orthometric heights; and
- (e) The standard drawing format is ISO A0.

7.2 Manufacturer's Instructions

In the performance of the Work, the Contractor will comply with all applicable written instructions, recommendations and guidelines issued by the manufacturer of any product, material or equipment used in, or incorporated into, the Work, unless:

- (a) otherwise specified in the Contract; or
- (b) there is any inconsistency or conflict between the applicable manufacturer's instructions, recommendations or guidelines and any other provision of the Contract.

In the event of an inconsistency or conflict between the applicable manufacturer's instructions, recommendations or guidelines and any other provision of the Contract, the provisions of Section 3.8 of Schedule 2 [General Conditions] will apply.