CONTRACTING PLAN

TY1505: Site C Transmission Interconnection

Supply of Lattice Towers

RFP No. 5710

CR No. 584691

Date: August 10, 2016

1. PURPOSE

The purpose of this Contracting Plan is to obtain internal stakeholder support and approval (at a summary level) for Capital Infrastructure Projects Supply Chain to commence formulation of the RFP document, prior to release. This Contracting Plan supplements, where applicable, the information in the Supply Chain Strategy document dated February 17, 2016 by introducing key concepts to be included in the proposed RFP and eventual contract.

As the lattice tower supply contract is on the critical path, this contracting plan is seeking approval to proceed with issuing of the RFP onto BC Bid while funding approval is being obtained. Award of the lattice tower contract will be subject to receipt of full funding approval. RFP will state award will be conditional on BC Hydro receiving full funding approval.

2. PROJECT DESCRIPTION

This project involves the interconnection of the future Site C Generating Station to the BC Hydro 500kV transmission system. Transmission lines, 5L005 and 5L006, will connect Site C Substation to the Peace Canyon Generating Station (PCN). 5L015, 5L016 and 5L017 will connect the Site C Generating Station (STC) to the new Site C Substation.

This Contract will cover the Supply of Lattice Type Steel Structures for the Site C 500kV Transmission Lines 5L005, 5L006, 5L015, 5L016 and 5L017.

3. CONTRACT REQUIREMENTS

3.1 Scope of Work

The Scope of Work will include:

- Performance of detailing, including connection design, based on tower designs (outline drawings) prepared by BC Hydro Transmission Engineering;
- Preparation of detail, assembly, erection and fabrication drawings required for various types of lattice towers;
- Full scale load testing of prototype delta towers;
- Full scale assembly testing of towers; and
- Fabrication, supply and delivery of complete lattice tower assemblies for 5L005, 5L006, 5L015, 5L016, and 5L017 including spare towers, body and leg extensions, base shoes, fasteners (bolts, nuts and washers) and accessories.

Additional information pertinent to this Work includes:

- Engineering Design: BC Hydro's lattice tower designs for delta and flat configuration will be utilized. For the delta towers, the supplier will use the BC Hydro design information to finalize the connection design and complete detailing. For the flat towers, complete designs will be provided and the supplier will be required to convert the existing designs from PDF to AutoCAD.
- Delivery: the steel tower parts (disassembled) will be packaged and shipped DDP (Delivered Duties Paid per Incoterms 2010) to the transmission line contractor's marshalling yard in the vicinity of Fort St. John, BC. Receiving and unloading will be done by the transmission line contractor.
- 5L015, 5L016 and 5L017 Towers: These 11 towers will not have adequate design information available and securing firm unit pricing is not feasible during the procurement period. These towers will be included in the Contract as provisional sum items. Proponents will be requested to provide preliminary pricing based on the estimated weight to be used as reference only. The final pricing for these 11 towers will be finalized under the Provisional

Sum condition of the Contract.

- Supply of Fasteners: The Contract will require the supply of fasteners from BC Hydro pre-qualified suppliers only. A list of BC Hydro pre-qualified fastener suppliers will be included in the Contract.

3.2 Financial

This procurement is part of the Transmission Component of the Site C Project, which consists of three Work Packages:

Work Package	Work Package Budget	Approval Date
Constructed Transmission Line 5L005 YM-80004.4.T.02.001	[redacted]	02 February 2016
Constructed Transmission Line 5L006 YM-80004.4.T.02.002		02 February 2016
Constructed Trans Lines PH- Substation YM-80004.4.T.03.001		02 February 2016
Subtotal:		

The current approved transmission budget is based on the 2013 cost estimate and preliminary design. The 2013 cost estimate was based on 392 “flat” towers, with a total estimated steel weight of 2.5 million kilograms.

The transmission line design has progressed since and it has been determined that the use of “flat” towers along the majority of the right-of-way is not technically feasible due to induction hazards on a CN rail line that parallels the new 500kV transmission lines for approximately 30 kilometers and numerous gas pipelines that cross and parallel the new 500kV transmission lines.

Based on the completed 65% design for 5L005 and 5L006, the total estimated steel weight for the transmission lines has increased to 4.5 million kilograms.

A preliminary layout and design has been developed for 5L15/16/17, which will be used to include a provisional sum in the lattice steel contract, until the design is known in sufficient detail to obtain a firm price from the lattice tower supplier.

The table below shows the approved budget for the supply of steel lattice structures, along with the forecast cost of the steel lattice structures based on the current design. The cost includes testing and design cost required by the supplier.

	Approved Budget	Forecast Cost
5L005 Steel Lattice Towers	[redacted]	
5L006 Steel Lattice Towers		
5L015/16/17 Steel Lattice Towers		
Total		

The forecast cost of the steel lattice towers exceeds the approved work package budget. A change control process is currently underway to approve the design change and resolve the funding shortfall through value engineering and a project contingency draw. It is expected that the transmission budget shortfall will be resolved by September 2016.

The lattice tower supply contract is on the critical path of the transmission line schedule, and in order to meet the transmission line construction scheduled in-service date for 5L006 of

December 2022, the lattice tower contract needs to be awarded no later than January 2017. This schedule is based on the use of delta towers (accepted by senior management on 21st July 2016) which will allow foundations to be installed for 5L006 in parallel with work on the construction of 5L005.

[redacted]

Conditions precedent will be added in the RFP indicating award of the contract will be subject to BC Hydro receiving financial approval. The Contract will be awarded only after the project change notice is approved and the project team has confirmed that there is sufficient funding to cover the contract.

4. MARKET SOUNDING

There are no known market constraints with respect to supply and there are no plans to conduct further market sounding at this time.

There are a number of firms who design and supply lattice towers in the North America and Asian region; including [redacted]

The following list provides BC Hydro's recent transmission projects and the associated lattice towers supplier:

- [redacted]

5. CONTRACT PLAN

5.1 Lessons Learned

In reviewing the lessons learned and knowledge of the evaluation team from previous similar projects, the following were identified as areas that could improve this particular RFP:

- Design by external Contractor was challenging to incorporate BCH review comments and feedback on design. BCH has internal design strength and this will be utilized to provide tower design outline drawings. Supplier expertise in tower detailing and drafting will be leveraged to produce detailed drawings based on the design information provided by BCH.
- Clarifications during negotiations must be captured in the final conformed contract to avoid disputes.
- Legal review and feedback on Contract and Specifications is recommended prior to issue of RFP.
- As there were inconsistencies from previous tower suppliers in managing sub-suppliers, a questionnaire should be included in the RFP to determine how suppliers are managing their sub-suppliers and ensuring they have an implemented Quality Program that is conforming to the RFP requirements.

- A lot of RFI's were generated as a result of unclear or conflicting specification/standards in the functional requirements. Need to include only those applicable and specific to the contract. Alternates as applicable are to be identified by the supplier in their Proposal for acceptance to prevent and minimize RFIs, change orders, etc. potentially affecting cost, schedule and quality. After award, the supplier is responsible for changes they make and subject to review / acceptance and incurred costs.
- Requirements for the supplier to demonstrate their quality assurance processes to ensure that materials supplied by the steel mills are conforming to the contract requirements.
- Be specific in the requirements as to what supplier submissions need to be reviewed by whom and when. Specify follow-up actions when submittals are rejected or returned with comments. Consider mandatory design review meetings.
- Identify critical components for third party testing in addition to test reports supplied by the steel mills; e.g. tower steel member's prior to type testing, mass production, etc. and that the quality records are traceable. Specify that the supplier submits reviewed quality records for acceptance by the Professional of Record (POR), otherwise they will be responsible for risks.
- Material origin test records should be traceable in the supplier's manufacturing and independent testing quality records. Proposal questionnaire to include records management processes emphasising records traceability.
- Provide a clear split of design responsibility; i.e., Transmission Engineering will be responsible for the structural design while the supplier will be responsible for connection design and detailing.
- Require submission of sample testing procedure, Inspection and Test Plan (ITP), identification of proposed testing facility and demonstrated detailing experience in the RFP.
- Provide clear requirements for packaging, bundling and transportation. Require supplier to provide the shipping plan(s) and procedures, including corrective and preventive action plan for misfits and missing parts.
- Milestone dates need to be provided in the contract for significant milestone events, and Liquidated Damages (LD) need to be tied to these milestones. LD's should not just be tied to the final completion of the contract.

5.2 Sourcing Mechanism

- RFP Supply Long Form is the recommended sourcing template for this requirement. No other alternative sourcing template was considered as this is a standard supply contract. The long form is suitable over the short form based on the anticipated contract value and risk.
- The delivery of Lattice Towers will be staged based on the anticipated materials requirement dates for 5L005 and 5L006. The intention is to award the contract to a single supplier.
- A Firm Lump Sum bid (based on a pre-determined tower quantity multiplied by the unit price per tower) will be requested for the 5L005 and 5L006 Lattice Towers. The availability of design information for both flat and delta towers supports this pricing approach. All flat towers have completed design and the overall weights for these towers are not anticipated to change significantly. The supplier will still need to complete connection design for delta towers but weight changes after final connection designs are anticipated to be small relative to the tower's total weight.
- Unit price per weight ($/kg) will be requested for provisional sum items.
- An option to issue an interim agreement will be included.

5.3 Contract Terms:

- Performance security, either in the form of a bond or letter of credit, will be required.
- The supplier will ship all the equipment and materials DDP, Delivered Duties Paid (INCOTERMS 2010). Unloading will be done by the line contractor.
- Payment: 95% of the value of goods to be paid within 30 days upon receipt of invoice. Supplier submits an invoice only after receipt of materials and agreement by Hydro's Representative to the Payment Request submitted by supplier. 5% of the value of goods will be retained as payment security and will be released upon Total Completion.
- Insurance: Supplier will be responsible for marine/cargo/goods insurance up to the delivery point. BC Hydro will secure an owner controlled insurance policy to cover broad form builder's risk and general liability.

5.4 Supplementary General Conditions

The following Supplemental General Conditions are anticipated:

- Three year extended warranty will be included.
- Liquidated Damages amounting [redacted] of delay in meeting the contract delivery milestones up to a maximum of 10% of the full contract value will be included.

5.5 Aboriginal Involvement

There is no known FN capacity for this type of work.

5.6 Evaluation

Evaluation shall proceed as per Section 4 "Evaluation and Contract Award" of the standard BC Hydro Supply RFP document.

The "High-Level Evaluation Criteria," presented in the following table, will be included within the RFP document.

High-level Evaluation Criteria	Weight (out of 100%)
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

5.7 Evaluation Committee (EC)

The Evaluation Committee (EC) will be composed of:

[redacted]

The EC will be responsible for the preparation of the evaluation report and recommendation to negotiate/award.

The EC may be provided with advice from Subject Matter Experts ("SMEs") from the following areas:

- Project Estimating and Scheduling
- Construction, Contract Management and Commissioning
- Stations
- Transmission Engineering
- Quality Assurance
- Project Safety Planning and Review
- Environment
- Safety

5.8 Procurement Schedule

The procurement schedule is anticipated to be as follows:

• Approve Contracting Plan and CR	August 16, 2016
• Release RFP	August 23, 2016
• Close RFP	November 3, 2016
• Financial Approval	August/September 2016
• Complete Evaluation	December 3, 2016
• Approve Recommendation for Award	January 19, 2017
• Award contract	February 16, 2017

6. KEY RISKS AND MITIGATION

This is a moderate complexity supply contract as there are some connection design and detailing activities required. The lattice towers are a key component required onsite to progress the Line Construction Work. The key risks identified were:

- Procurement risk
- Design risk
- Schedule risk
- Financial (cost) risk
- Quality risk
- Constructability risk
- Performance security risk

6.1 ***Procurement risk*** – receiving adequate numbers of competitive responses

- The contact details of all known suppliers will be verified to ensure that they get advised of the posting of the RFP on BC Bid. It is anticipated that due to the substantial value of the contract work there will be significant interest from international suppliers.

6.2 ***Design risk*** – includes unclear design responsibilities, tower testing failure, supplier non-compliance or misinterpretation to materials standard, design and detailing requirement.

- The contract will be structured to clearly identify each party's responsibility for design. BC Hydro Transmission Engineering will take design responsibility for the structural design and PLS models. The supplier will be responsible for connection design and detailing.
- Proponents will be required to include in their proposal an interpretation of the design and detailing requirements, and demonstrate experience and capability in questionnaire.
- Interface with foundation design and supply contract adds design complexity for detailing, potential schedule delays, and potential mis-fit. Detailing for the base connection will be included in the scope of the lattice tower supplier.

6.3 ***Schedule risk***

6.3.1 The delivery of lattice towers is delayed, thus delaying the Site C transmission work.

- Initiate early procurement in order to have enough lead time and a realistic schedule for the manufacturer to deliver the product. Provide schedule float for procurement, design submission and review, drawing submission and review, tower testing and other process related delays.
- Schedule risk present for time to complete a number of review cycles for the structural detail drawings. Plan that BCH designers will need to travel to meet with detailers to resolve design issues and move forward progress on drawing production.
- Include Liquidated Damages tied to delivery milestones.

6.3.2 Financial approval for the updated contract estimate is delayed, thus delaying the contract award and the Site C Transmission Interconnection ISD.

- An interim agreement to proceed with limited amount of work (i.e., engineering only) will be considered if there is no financial approval to proceed with a full contract value. An interim agreement in place will allow the supplier to proceed with detailing work which will allow the project to meet key milestones; i.e., issue the construction work for bid, while limiting BC Hydro's financial commitment.

6.4 ***Financial (cost) risk*** – the contracted work requires more scope than anticipated due to incomplete design and varying site conditions (i.e., lattice tower relocations).

- Transmission designer visited the sites to allow for more certainty and less changes to tower parameters (location, height, etc.). Include a pricing mechanism for additional tower leg and body extensions based on an agreed unit price (per kg).
- Transmission Engineering has updated the estimate taking into account all current factors (exchange rates, steel prices, etc.).
- Include sufficient contingency for quantity variations and design changes.

6.5 ***Quality risk***

6.5.1 Fasteners supplied do not meet the contract quality requirements.

- RFP will include the specifications for fasteners and a list of BC Hydro pre-qualified suppliers. Proponents will be requested to provide the name of proposed supplier and proof of compliance to the specifications, including submission of quality plans, ITP's and test reports (from a qualified third party testing agency).
- The contract will be structured to require sample fasteners for testing by BC Hydro before any shipment of fasteners can proceed (Testing will be conducted by Powertech.).

6.5.2 Potential new supplier with no performance record from BC Hydro encounters challenges meeting the quality requirements :

- Include RFP questionnaire requiring supplier to demonstrate acceptable Quality Plans, ITPs and provide copies of such, including quality records.
- Perform a plant audit prior to award of contract.
- Include questionnaire for the supplier to provide references and list of projects performed in that last 5 years in North America for similar RFP requirements.

6.5.3 Design quality does not meet contract requirements:

- Include RFP questionnaire requiring submission of design quality plan. RFP to provide specifics of the design quality plan requirements, acceptance and audit requirements during the design stages.
- Include RFP requirement for supplier to provide a sample tower type test Inspection and Test Plan (ITP).

6.5.4 Non-conformance to quality requirements and criteria:

- BC Hydro will review and accept quality submittals i.e. Quality Plans, Inspection and Test Plans for the type tests and production prior commencement of the activities.
- The Contract will require supplier to submit quality records for review and acceptance by the POR.

6.5.5 Performance quality: Non-conforming, missing, damaged parts arriving onsite, lack of proper shipping documentation, packaging inefficient for installation purposes, lack of material traceability and testing records.

- The contract documents will require the supplier to conform in accordance with the Quality requirements. BC Hydro will conduct quality audits; including factory inspections during the type tests and assembly tests, to verify lattice towers meet the contract requirements.
- The RFP and contract will require the supplier to submit proposed materials shipping and handling procedures for acceptance by BC Hydro.

6.5.6 Quality issues are not addressed in a timely fashion and recurring:

- Supplier's non-conformances processes will be reviewed to ensure timely corrective actions are implemented, including root cause analysis and preventive measures.
- Liquidated damages tied to key milestones will be included in the Contract to prompt the contractor to resolve the quality issues in a timely fashion and comply with the delivery schedule.

6.6 ***Constructability risk*** – materials supplied are difficult and unsafe to install / erect.

- Transmission designer will consult with the Construction Management Work Package Manager to ensure Constructability and Safety by Design is included in tower detailing. Constructability and Safety by Design requirements may include tower splices to allow for safe erection procedures, sufficient working holes for rigging purposes and fall protection anchor points.

6.7 ***Performance security risk -*** poor supplier performance negatively impacts the project in service date.

- This risk will be mitigated by requiring proponents to submit related experience, reference contact details and financial information for evaluation. The successful proponent will also be required to submit a performance security.

7. NEGOTIATION AND EXIT STRATEGIES

7.1 Negotiation is allowed under this RFP either serially or concurrently. If negotiations are required, the Procurement Lead will conduct the negotiations with assistance from the Evaluation Team and subject matter experts as required.

7.2 The following exit options are available:

- During the RFP process, BCH may cancel the RFP at any time.
- Prior to the award of the contract, BCH reserves the right to terminate negotiations.
- During the contract's implementation, the standard suspension or termination for convenience clause will be in effect.

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8. SUMMARY

Based on the assessment of the project requirements, market conditions and risks pertinent to this contract package, it is recommended that the subject Contracting Plan be approved for preparation of the RFP.

9. APPROVAL

Prepared	[redacted]	Aug. 11, 2016 Date
Reviewed By:		Aug 15, 2016 Date
Accepted		16 Aug 2016 Date
Reviewed By:		Aug 22/16 Date
Reviewed By:		19 Aug 2016 Date
Reviewed By:		24 Aug 2016 Date
Approved By:		SEP. 13/16 Date
Approved By:		Sept 13/16 Date
Approved By:		Sept 14/16 Date