REQUEST FOR QUOTATIONS

Title: West Village Energy Centre - Hot Water Boilers

Reference No. 1220-040-2023-014

FOR THE SUPPLY OF GOODS AND SERVICES

(General Services)

Issue Date: March 15, 2023

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REQUEST FOR QUOTATIONS

1. INTRODUCTION

The City of Surrey (the "**City**") invites contractors to provide a quotation on the form attached as Schedule B – Form of Quotation to Attachment 1 – Agreement – Goods and Services (the "**Quotation**") for the supply of the goods (if any) and services described in Schedule A – Specifications of Goods and Scope of Services to Attachment 1 – Agreement – Goods and Services (the "**Goods and Services**"). The description of the Goods and Services sets out the minimum requirements of the City. A person that submits a Quotation (the "**Contractor**") should prepare a Quotation that meets the minimum requirements, and may as it may choose, in addition, also include goods, services or terms that exceed the minimum requirements.

2. ADDRESS FOR DELIVERY

The Contractor should submit the Quotation **electronically** in a single pdf file which must be delivered to the City by email at: purchasing@surrey.ca

Confirmation of receipt of email will be issued. Quotations that cannot be opened or viewed may be rejected. A Contractor bears all risk that the City's receiving equipment functions properly so that the City receives the Quotation.

Note: The maximum file size the City can receive is 10Mb. If sending large email attachments, Contractors should phone [604-590-7274] to confirm receipt.

3. DATE

The City would prefer to receive Quotations on or before **April 5, 2023** (the "**Date**").

4. INQUIRIES

All inquiries related to this RFQ should be directed in writing to the person named below (the "**City Representative**"). Information obtained from any person or source other than the City Representative may not be relied upon.

Name:	Sunny Kaila, Manager, Procurement Services
E-mail:	purchasing@surrey.ca
Reference:	1220-040-2023-014

Inquiries should be made no later than 7 business days before the Date set out in Section 3. The City reserves the right not to respond to inquiries made within 7 business days of the Date set out in Section 3. Inquiries and responses will be recorded and may be distributed to all Contractors at the discretion of the City.

Contractors finding discrepancies or omissions in the Agreement or RFQ, or having doubts as to the meaning or intent of any provision, should immediately notify the City Representative. If the City determines that an amendment is required to this RFQ, the City Representative will issue an addendum in accordance with Section 5. No oral conversation will affect or modify the terms of this RFQ or may be relied upon by any Contractor.

5. ADDENDA

If the City determines that an amendment is required to this RFQ, the City Representative will issue a written addendum by posting it on the BC Bid Website at www.bcbid.gov.bc.ca and the City Website at www.surrey.ca (collectively, the "**Websites**"), and upon posting, any addenda will form part of this RFQ. It is the responsibility of Contractors to check the Websites for addenda. The only way this RFQ may be added to, or amended in any way, is by a formal written addendum. No other communication, whether written or oral, from any person will affect or modify the terms of this RFQ or may be relied upon by any Contractor. By delivery of a Quotation, the Contractor is deemed to have received, accepted and understood the entire RFQ, including any and all addenda.

6. NO CONTRACT

This RFQ is simply an invitation for quotations (including prices and terms) for the convenience of all parties. It is not a tender or a request for proposals and no obligations of any kind will arise from this RFQ or the submission of Quotations.

Notwithstanding any other provision in this RFQ, each Contractor, by submitting a Quotation, irrevocably:

(a) agrees that it will not bring any claim, demand, action, cause of action, suit or proceeding, whether arising in contract, tort (including negligence) or otherwise (a "Claim") against the City or any of its employees, directors, officers, advisors or representatives, or any one of them, for any costs, damages or other compensation in excess of an amount equivalent to the actual and reasonable costs directly and demonstrably incurred by the Contractor in preparing its Quotation for any matter relating directly or indirectly to this RFQ (including in the event that the City rejects or disqualifies or for any other reason fails to accept a Quotation, accepts a non-compliant Quotation or otherwise breaches, or fundamentally breaches, the terms of this RFQ or any duties arising from this RFQ); and

(b) waives any Claim against the City and its employees, directors, officers, advisors or representatives for any compensation of whatsoever nature or kind, including for loss of anticipated profits, loss of opportunity, indirect, incidental or consequential damages or losses if no contract between the Contractor and the City is entered into for the supply and delivery of the Goods for any reason whatsoever, including in the event that the City rejects or disqualifies or for any other reason fails to accept a Quotation, accepts a non-compliant Quotation or otherwise breaches, or fundamentally breaches, the terms of this RFQ or any duties arising from this RFQ.

7. SELECTION AND NEGOTIATION

The City's evaluation team will recommend to the City the Quotation that it determines is most advantageous in accordance with this RFQ. The City may accept or reject the evaluation team's recommendation.

The City may negotiate changes to any terms of a Quotation, including terms in Attachment 1 – Draft Quotation Agreement – Goods and Services, and without limitation

Schedule A – Specifications of Goods and Scope of Services and Schedule B – Form of Quotation and including prices.

If the City selects a preferred Contractor then such preferred Contractor will use good faith commercial efforts to negotiate and enter into an agreement with the City. During negotiations the City may:

(a) Negotiate any aspect of a preferred Contractor's Quotation, including reductions in the prices as set out in the preferred Contractor's Quotation;

(b) Negotiate the incorporation of the preferred Contractor's suggested amendments to the agreement as may be included in its Quotation; and

(c) Negotiate terms and conditions different than those contained in the RFQ and other documents referred to in the RFQ, the Quotation or both, and

(d) If at any time the City reasonably forms the opinion that a mutually acceptable contract is not likely to be reached within a reasonable time, give the preferred Contractor written notice to terminate discussions, in which event the City may then either open discussions with another Contractor or terminate this RFQ in whole or in part and obtain the supply and delivery of the Goods and Services in some other manner, or not at all.

The City has no duty or obligation to advise any other Contractors or to allow them to modify their Quotations, and the City will have no liability to any Contractor as a result of such negotiations or modifications.

The City may, at its sole discretion, require the preferred Contractor to attend and participate in a pre-award meeting prior to award, the purpose of which will be to confirm project details and expectations of the City.

8. EVALUATION OF QUOTATIONS

The City will compare and evaluate the Quotations received to identify the Quotation which the City, in its sole and absolute discretion, determines to be the most advantageous.

The City is not obligated to complete a detailed evaluation of all Quotations and may, after completing a preliminary review of all Quotations, identify and drop from any detailed evaluation any Contractor which, when compared to the other Contractors, the City determines, in its sole discretion, to not be in contention to be selected as the Contractor.

The City in its absolute discretion may apply some or all of the following evaluation criteria:

(a) Technical – (design, performance, maintenance, warranty);
(b) Qualifications (resources, management, engineering, etc.);
(d) Quotation Price;
(e) Delivery; and
(f) Past Performance in supply and delivering goods similar to the Goods.

9. ACCEPTANCE

A Quotation will be an offer to the City which the City may accept at any time by signing the copy of the Quotation and delivering it to the Contractor. A Quotation is not accepted by the City unless and until both the authorized signatory of the Contractor and the authorized signatory of the City have signed. Delivery of the signed Agreement by the City may be by fax or pdf e-mail or hard copy. In that event, the contract will be comprised of the documents included in the definition of Agreement in Attachment 1 – Quotation Agreement – Goods and Services.

Not withstanding any other provision in this RFQ:

(a) The City need not necessarily consider the Quotation with the lowest Quotation Price, or any Quotation, and the City reserves the right to reject any and all Quotations at any time, or cancel the RFQ process, without further explanation, and to accept any Quotation the City considers to be in any way advantageous to it.; and

(b) The City's acceptance of any Quotation is contingent on having sufficient funding for the purchase and achieving a mutually acceptable contract for the supply and delivery of the Goods. If the City determines that all Quotations are priced too high, it may reject them all.

10. CONTRACTOR'S EXPENSES

Contractors are solely responsible for their own expenses in preparing and submitting Quotations, and for any meetings, negotiations or discussions with the City or its representatives and consultants, relating to or arising from this RFQ. The City and its representatives, agents, consultants and advisors will not be liable to any Contractor for any claims, whether for costs, expenses, losses or damages, or loss of anticipated profits, or for any matter whatsoever, incurred by the Contractor in preparing and submitting a Quotation, or participating in negotiations for a contract, or other activity related to or arising out of this RFQ.

11. CONTRACTOR'S QUALIFICATIONS

By submitting a Quotation, a Contractor represents that it has the expertise, qualifications, resources, and relevant experience to supply the Goods (if any) and perform the Services.

12. CONFLICT OF INTEREST

A Contractor should disclose in its Quotation any actual or potential conflicts of interest and existing business relationships it may have with the City, its elected or appointed officials or employees. The City may rely on such disclosure.

13. SOLICITATION OF COUNCIL MEMBERS, CITY STAFF AND CITY CONSULTANTS

Contractors and their agents will not contact any member of the City Council, City staff or City consultants with respect to this RFQ, other than the contact person named in Section 4, at any time prior to the award of a contract or the cancellation of

this RFQ and which could be viewed as one Contractor attempting to seek an unfair advantage over other Contractors.

14. CONFIDENTIALITY

All Quotations become the property of the City and will not be returned to the Contractor. All Quotations will be held in confidence by the City unless otherwise required by law. Contractors should be aware the City is a "public body" defined by and subject to the *Freedom of Information and Protection of Privacy Act* of British Columbia.

15. SIGNATURE

The legal name of the person or firm submitting the Quotation should be inserted in the Quotation. The Quotation should be signed by a person authorized to sign on behalf of the Contractor and include the following:

(a) If the Contractor is a corporation then the full name of the corporation should be included, together with the names of authorized signatories. The Quotation should be executed by all of the authorized signatories or by one or more of them provided that a copy of the corporate resolution authorizing those persons to execute the Quotation on behalf of the corporation is submitted;

(b) If the Contractor is a partnership or joint venture then the name of the partnership or joint venture and the name of each partner or joint venturer should be included, and each partner or joint venturer should sign personally (or, if one or more person(s) have signing authority for the partnership or joint venture, the partnership or joint venture should provide evidence to the satisfaction of the City that the person(s) signing have signing authority for the partnership or joint venture). If a partner or joint venturer is a corporation then such corporation should sign as indicated in subsection (a) above; or

(c) If the Contractor is an individual, including a sole proprietorship, the name of the individual should be included.

16. EQUIVALENTS, SUBSTITUTIONS, ALTERNATIVES

Unless otherwise expressly stated, if and wherever the specifications set out in Schedule A Specification of Goods and Scope of Services to Attachment 1 – Agreement Goods and Services, use a brand name of a manufacturer, make, trade name, or catalogue designation in specifying an item, it does not restrict Contractors to the identified manufacturer, make, trade name, or catalogue designation. The usage of such identification is simply to indicate the character, quality and/or performance equivalence of the commodity identified.

Prior to the Date, a Contractor may request, pursuant to Section 3 the City to approve a commodity(ies) (each, an "**Equivalency**") to be included in a Quotation in substitution for a commodity(ies), indicated in Schedule A - Specification of Goods and Scope of Services to Attachment 1 – Quotation Agreement - Goods and Services, on the basis that the substitution of the same or better character, quality and/or performance as the commodity(ies) indicated in Schedule A - Specification of Goods and Scope of Services and to Attachment 1 – Quotation Agreement - Goods and Services, such that that the

proposed Equivalency will serve the purpose for which it is intended to be used equally as well. Quotations for an Equivalency should be in writing delivered to the City Representative, accompanied by appropriate supporting information, data, specifications and documentation. The City may request any additional supporting information, data, specifications and documentation it considers necessary to make a decision with respect to the application. If the City decides in its sole discretion to accept an Equivalency, then the City will provide written confirmation of such acceptance to the Contractor, without notification to other Contractors (subject to the City's discretion under Section 4). The City is not obligated to review or accept any application for an Equivalency. Without limiting the City's discretion as set out in this Section 16, the City may specifically refuse to approve an application for an Equivalency with which there may be an associated increase to a Quotation Price or a delay to the supply and delivery of the Goods and Services.

The Contractor should clearly identify in its Quotation any Equivalencies approved by the City under this Section 16.

If the Contractor does not in its Quotation indicate any Equivalencies, the Contractor will be deemed to accept the commodity(ies) described in Schedule A - Specification of Goods and Scope of Services to Attachment 1 – Quotation Agreement - Goods and Services.

17. PROCUREMENT AND INSTALLATION

The delivery date of the boilers will be based on the estimated construction schedule as shown below. Contractors should provide methods used for price adjustments if any, at time of procurement.

Item	Tentative Date
Boiler Selection	April 2023
Issue Tender for Construction Contractor	Q1 2024
Award Contract to Construction Contractor	Q1 2024
Boiler Delivery	May 2024
Completion of District Energy Centre	August 2024

The installation and connection of the boilers will be procured separately to a qualified Construction Contractor. The Construction Contractor will be responsible for the receipt, storage, handling and installation of the boilers from the moment the boilers are delivered on site. The approved shop drawings of the boilers will be forwarded to the Construction Contractor for their information and use.

The City reserves the right to procure the boilers directly or to have the Construction Contractor procure the Boilers.

ATTACHMENT No. 1 – QUOTATION AGREEMENT – GOODS AND SERVICES

Reference Title: West Village Energy Centre - Hot Water Boilers

RFQ No.: 1220-040-2023-014

THIS AGREEMENT dated for reference this _____ day of _____, 2023.

BETWEEN:

CITY OF SURREY
13450 - 104 Avenue
Surrey, B.C., V3T 1V8

(the "**City**")

AND:

_____ ***(Insert Full Legal Name and Address of Contractor)***

(the "**Contractor**")

WHEREAS the City wishes to engage the Contractor to provide Goods and Services and the Contractor agrees to provide Goods and Services.

West Village Energy Centre - Hot Water Boilers

THEREFORE in consideration of the payment of one ($1.00) dollar and other good and valuable consideration paid by each of the parties to the other (the receipt and sufficiency of which is hereby acknowledged) the City and the Contractor agree as follows:

1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement, in addition to any terms defined elsewhere in this Agreement, the following definitions apply:

(a) "Agreement" means this agreement and all schedules attached hereto;
(b) "City" means the City of Surrey;
(c) "Contractor" means a contractor whose Quotation has been accepted by the City and who is providing the Goods and Services under this Agreement;
(d) "Delivery Point" means City of Surrey, West Village & District Energy Centre, 13231 – 103A Avenue, Surrey, British Columbia, Canada, or such other location as advised by the City;
(e) "Fees" means the price set out in Schedule B – Quotation Extracts, for the provision of the Goods and Services, unless otherwise agreed by the parties in writing, and includes all taxes;
(f) "Goods" means the equipment or materials (if any) as described generally in Schedule A, including anything and everything required to be done for the fulfilment and completion of this Agreement;
(g) "Indemnitees" has the meaning described in Section 17.2;
(h) "RFQ" means the Request for Quotations; and
(i) "Services" means the services as described generally in Schedule A including anything and everything required to be done for the fulfilment and completion of this Agreement; and
(j) "Term" has the meaning described in Section 3.1.

1.2 This Agreement may be modified only by express and specific written agreement. In the event of a conflict between the provisions of any documents listed below, then the documents shall govern and take precedence in the following order:

(a) this Agreement;
(b) Schedule B – Quotation Extracts;
(c) Schedule A – Specifications of Goods and Scope of Services; and
(d) other terms, if any, that are agreed to by the parties in writing.

1.3 The following attached Schedules are a part of this Agreement:

(a) Schedule A – Specifications of Goods and Scope of Services;
(b) Schedule A-1 – Supplementary Specifications (Project);
(c) Schedule A-2 – Contract Drawings;
(d) Schedule B – Quotation Extracts;
(e) Schedule B-1 – West Village Energy Centre, Phase 2 Hot Water Boiler; Specifications 42 22 13, Response Form; and
(f) Schedule B-2 – Performance Data Sheet Response Form.

2. GOODS AND SERVICES

2.1 The Contractor covenants and agrees with the City to provide the Goods and Services in accordance with this Agreement. The Goods and Services provided will meet the specifications and scope set out in Schedule A – Specifications of Goods and Scope of Services of this Agreement, Schedule A-1 – Supplementary Specifications (Project) and as described in Schedule B – Quotation Extracts of this Agreement.

2.2 The Contractor will complete and deliver to the Delivery Point each Good in accordance with the following schedule, unless this Agreement has been terminated sooner in accordance with its provision:

	Completion Date	**Delivery Date**
Boiler #1	_____	_____
Boiler #2	_____	_____

2.3 The Contractor will, if requested in writing by the City, provide additional goods or services. The terms of this Agreement will apply to any additional goods or services, and the fees for additional goods or services will generally correspond to the fees as described in Schedule B – Quotation Extracts of this Agreement. The Contractor will not provide any additional goods or services in excess of the specification of Goods and scope of Services requested in writing by the City.

2.4 The Contractor will perform the Services with that degree of care, skill and diligence normally provided by a qualified and experienced practitioner performing services similar to the Services, and on the understanding that the City is relying on the Contractor's experience and expertise. The Contractor represents that it has the expertise, qualifications, resources, and relevant experience to supply the Goods and Services.

2.5 The Contractor will deliver the Goods free and clear of all liens and encumbrances in the manner and to the destination stipulated. In the event of the Contractor's failure to meet this condition, the Contractor will, on written notice from the City, forthwith return

all monies paid by the City on account of the Goods and in addition the City may by written notice terminate this Agreement without liability, and in such event, in addition to the above, the Contractor will be liable for any and all expenses or losses incurred by the City resulting from such failure.

2.6 The Contractor shall provide to the City written notice of delivery of the Goods not less than five (5) business days prior to expected date of delivery of the Goods to the Delivery Point, to permit final inspection scheduling. An authorized representative of the Contractor shall supervise delivery to the City.

3. TERM

3.1 The Contractor will provide the Goods and Services for the period commencing on **(START DATE)** and terminating on **(END DATE)** (the "**Term**").

4. TIME

4.1 Time is of the essence.

5. FEES

5.1 The City will pay the Fees to the Contractor in accordance with this Agreement. Payment by the City of the Fees will be full payment for the Goods and Services and the Contractor will not be entitled to receive any additional payment from the City.

5.2 For greater certainty, costs of general management, non-technical supporting services and general overhead are deemed to be covered by the Fees and will not be subject to additional payment by the City. The Fees shall also include without limitation all costs of boxing, packing, crating, and loading and unloading the Goods at the prescribed destination.

6. PAYMENT

6.1 Subject to any contrary provisions set out in Schedule B – Quotation Extracts of the Agreement, the Contractor will submit an invoice to the City requesting payment of the portion of the Fees relating to the Goods and Services provided. Invoices should include the Contractor's name, address and telephone number, the City's purchase order number <<insert purchase order or contract reference number>, the Contractor's invoice number, the names, charge-out rates and number of hours worked of all employees of the Contractor that have performed Services; the percentage of Services completed and Goods delivered at the end of the previous month; the total budget for the Goods and Services and the amount of the budget expended to the date of the invoice; taxes (if any); and grand total of the invoice.

6.2 If the City reasonably determines that any portion of an invoice is not payable, then the City will so advise the Contractor.

6.3 The City will pay the portion of an invoice which the City determines is payable within 30 days of the receipt of the Invoice, except the City may hold back from payments 10% of the amount the City determines is payable to the Contractor until such time as the Contractor provides its final report to the City.

6.4 If the Contractor offers the City a cash discount for early payment, then the City may, at the City's sole discretion, pay the portion of an Invoice which the City determines is payable at any time after receipt of the Invoice.

Invoices will be submitted by the Contractor electronically to: surreyinvoices@surrey.ca

6.5 Unless otherwise provided, all dollar amounts referred to in this Agreement are in lawful money of Canada.

6.6 If the Contractor is a non-resident of Canada and does not provide to the City a waiver of regulation letter, the City will withhold and remit to the appropriate governmental authority the greater of:
(a) 15% of each payment due to the Contractor; or
(b) the amount required under applicable tax legislation.

7. DELIVERY POINT

7.1 The Contractor will take steps as required so that all the Goods are properly prepared for delivery. The Contractor shall ensure the integrity of the Goods, during transportation, handling and temporary storage. Due regard shall be given by the Contractor to protection from loss and pilferage, physical damage, and the effect of the elements and environmental conditions.

7.2 The Contractor shall deliver the Goods to the Delivery Point between the hours of 8:30 a.m. to 3:30 p.m., Monday through Friday. The City will not assume any liability for the Goods delivered to an unauthorized location.

8. STANDARD OF PERFORMANCE

8.1 The Contractor will supply and deliver the Goods and perform other services as described in this Agreement in accordance with:
(a) this Agreement;
(b) all applicable laws; and
(c) the standards, practices, methods and procedures to the best professional and commercial standard in the industry with respect to the design, manufacture, assembly and delivery of the goods similar to the Goods, conforming to all applicable laws and exercising that degree of skill, care, diligence, prudence and foresight which would reasonably and ordinarily be expected from a qualified, skilled and experienced person engaged in a similar type of undertaking under the same or similar circumstances ("Good Industry Practice").

8.2 If more than one standard, including governmental requirements, work practices and procedures, and specifications, applies to the supply and delivery of the Goods or the performance of other services as described in this Agreement, then the strictest of such will apply.

9. PRE-PRODUCTION MEETING

9.1 If and when requested by the City, and at a time and location designated by the City, the Contractor will hold and/or attend a pre-production meeting(s). During this meeting, the Contractor will present the project team, and discuss any special provisions, the Contractor's draft project approach and demonstrate an understanding of the Agreement. The Contractor will accept questions and feedback from the City and adjust the project approach and progress schedule accordingly. At this meeting the Contractor will present the Contractor's draft Production Schedule, the warranty plan, quality assurance plan, preliminary test plan outline, and monthly progress report format. In addition, the Contractor will ensure that its authorized representatives for the pre-production meeting will include the Contractor's applicable sales and engineering personnel. The meeting will be held at during normal business hours in Surrey, British Columbia at a location, date and time agreed to by the parties.

10. PRODUCTION SCHEDULE

10.1 The Contractor shall:

(a) commence the design, manufacturing and assembly of the Goods promptly following the date of this Agreement;

(b) within ten (10) days after the pre-production meeting prepare and submit to the City a horizontal bar chart final build schedule including a critical path method satisfactory to the Department Representative, acting reasonably, indicating the timing (start and completion date of activities noting the first work day of each week) of all major activities of the design, manufacturing and assembly of the Goods, and providing details of the critical events and their inter-relationship to demonstrate the work will be performed in conformance with the Agreement (the "Production Schedule"); and

(c) update the Production Schedule to the satisfaction of Department Representative, acting reasonably, on no less than a monthly basis so as to incorporate any time adjustments as permitted under this Agreement or as otherwise agreed to in writing by the City;

(d) pursue the design, manufacturing and assembly of the Goods diligently to ensure that each of the milestone events for the completion of each component of the design, manufacturing and assembly of the Goods as identified in the then current Production Schedule is achieved at or before the time specified in that Production Schedule; and

(e) if for any reason the design, manufacturing and assembly of the Goods falls behind the schedule as set out in the then current Production Schedule and if, in accordance with this Agreement, the delay does not entitle the Contractor to an extension of time, then the Contractor will, as part of the supply and delivery of the Goods take all such steps as are required to bring the design, manufacturing and assembly of the Goods back into conformity with the then current Production Schedule.

Failure to comply with this Section will be deemed to be a default under this Agreement.

10.2 If in the reasonable opinion of the City, the actual progress of the design, manufacturing and assembly of the Goods does not conform with the then current Production Schedule, then the Contractor shall at its sole expense:

(a) within ten (10) working days:

(i) submit to the City a report satisfactory to the Department Representative, acting reasonably, identifying the reasons for such nonconformity with the then current Production Schedule and outlining the Contractor's plan to address such nonconformity;
(ii) submit to the City for review a revised Production Schedule, which shall:
(A) be in accordance with Good Industry Practice; and
(B) satisfy the requirements of the Agreement.

(b) immediately upon acceptance by the City of such plan and revised Production Schedule, diligently pursue the plan so as to bring the design, manufacturing and assembly of the Goods into conformity with the revised Production Schedule.

11. TESTS AND INSPECTIONS

11.1 The Contractor shall as part of the supply and delivery of the Goods perform, or cause to be performed all tests, inspections and approvals for the Goods (whether required by this Agreement, or by the Department Representative's instructions, or by applicable laws) and if a test, inspection or approval requires a representative sample of materials or workmanship the Contractor shall at the Contractor's own cost supply the labour and materials necessary to provide the sample.

11.2 If any portion of the work is designated for special tests, inspections of approvals (either as a requirement in this Agreement, or by the Department Representative's instructions, or by the laws), then:
(a) if the Department Representative is to perform or arrange for the test, inspection or approval, the Department Representative shall give the Contractor timely notice requesting such test, inspection or approval; and
(b) if other authorities are to perform the test, inspection or approval, the Contractor shall arrange for such test, inspection or approval and shall give the Department Representative timely notice of the date and time for such test, inspection or approval.

11.3 The Contractor will comply with any order or directions given by the Department Representative for inspection or testing that was not called for in the Agreement, and the following will apply:
(a) if such inspection or testing is required to be carried out in advance of the design, manufacturing or assembly of the Goods, then such inspection or testing will be a change to which Sections 13.1 through 13.4 apply;
(b) if such inspection or testing is required to be carried out on any design, manufacturing or assembly of the Goods that has been completed then:
(i) if the inspection or testing determines that the design, manufacturing or assembly of the Goods is not in accordance with this Agreement, then the Contractor shall correct such design, manufacturing or assembly and pay all costs of the inspection or testing and all costs of the correction and the restoration; and
(ii) if the inspection or testing determines that the design, manufacturing or assembly of the Goods is in accordance with this Agreement, then the City shall pay all costs of the inspection or testing and all costs of the restoration.

11.4 If the Contractor disagrees with the results of any inspection or testing required in this Agreement or ordered by the Department Representative, then the Contractor may elect to carry out such further inspection or testing the Department Representative agrees is acceptable for the purpose of determining whether the design, manufacturing or assembly of the Goods complies with this Agreement. If such further inspection or testing determines the design, manufacturing or assembly of the Goods is not in accordance with this Agreement, then the Contractor shall correct such the design, manufacturing or assembly of the Goods and pay all costs of the initial inspection or testing, all costs of the further inspection or testing, and all costs of the correction. If such further inspection or testing determines that the design, manufacturing or assembly of the Goods is in accordance with this Agreement, then the City shall pay all costs of the further inspection and testing.

11.5 If the Contractor covers or permits to be covered any part of the Goods that has been designated for special tests, inspections or approvals, before such special tests, inspections or approvals are made, given or completed, then the Department Representative may direct the Contractor to uncover such part, in order that the inspections or tests may be satisfactorily completed, and make good such part at the Contractor's own expense, and the Contractor shall comply with such direction.

11.6 The Department Representative will be entitled to observe all tests, inspections and approvals for the Goods, including factory or other tests performed at the Contractor's facility or at the facility of any subcontractor or supplier of the Contractor, and the Contractor will give written notice to the Department Representative of such tests, inspections and approvals for the Goods.

11.7 The Contractor shall promptly provide the Department Representative with two (2) copies of all certificates, inspection and testing reports.

12. USE OF WORK PRODUCT

12.1 The Contractor hereby sells, assigns and transfers to the City the right, title and interest required for the City to use and receive the benefit of all the reports, drawings, plans, designs, models, specifications, computer software, concepts, products, designs or processes or other such work product produced by or resulting from the Services rendered by the Contractor. This Section does not give the City the right to sell any such work product to any third party and the City may sell the work product only with the prior approval of the Contractor. The Contractor may retain copies of the work product.

13. CHANGE ORDERS

13.1 The City may at any time propose changes to the Contractor's scope by altering, adding to or deducting from the Contractor's scope, including by altering, adding to or deducting from the specifications, as the City in its sole discretion considers necessary to accomplish the general purposes of the Agreement, by issuing written notice to the Contractor of the proposed changes. The prices will be increased or decreased by written agreement of the City and the Contractor according to the prices (including any applicable discount(s) as set out in, and/or determined in accordance with, Schedule B (Quotation Extracts). The Contractor may request changes to the Specifications by submitting to the City a written notice of the requested change

detailing the reason for the change and including supporting documentation acceptable to the City with respect to the requested changes.

13.2 The Contractor shall, within a reasonable time of receiving notice of a proposed change or at the time that it requests a change, present in a form acceptable to the City, a method of adjustment or an amount of adjustment for price set out in Schedule B (Quotation Extracts) (whether a net increase, or net decrease), if any, and the adjustment in the then current Production Schedule, if any, for the proposed change.

13.3 When the City and the Contractor agree to the adjustments, if any, in the Purchase Price and the then current Production Schedule, or to the method to be used to determine the adjustments, such agreement shall be effective immediately and shall be recorded in a written change order ("**Change Order**"), signed by the City and the Contractor.

13.4 The Contractor shall furnish the services or deliverables in the Change Order in accordance with the requirements of the Agreement and any written provisions, specifications, or special instructions issued by the City with respect to the Change Order.

13.5 The Contractor shall not make any changes to the specifications as set out in Schedule A – Specifications of Goods without a Change Order. The City may refuse to accept all or a part of the Goods if changes are made by the Contractor without a Change Order. The City will not be responsible for costs incurred by the Contractor with respect to unauthorized changes.

14. PERSONNEL AND SUBCONTRACTORS

14.1 The Contractor will provide only personnel who have the qualifications, experience and capabilities to provide the Goods and perform the Services.

14.2 The Contractor will provide the Goods and Services using the personnel and sub-contractors as may be listed in the Quotation, and the Contractor will not remove any such listed personnel or sub-contractors from the Services without the prior written approval of the City.

14.3 If the City reasonably objects to the performance, qualifications, experience or suitability of any of the Contractor's personnel or sub-contractors then the Contractor will, on written request from the City, replace such personnel or sub-contractors.

14.4 Except as provided for in Section 14.2, the Contractor will not engage any personnel or sub-contractors, or sub-contract or assign its obligations under this Agreement, in whole or in part, without the prior written approval of the City.

14.5 The Contractor will preserve and protect the rights of the City with respect to any Services performed under sub-contract and incorporate the conditions of this Agreement into all sub-contracts as necessary to preserve the rights of the City under this Agreement. The Contractor will be as fully responsible to the City for acts and omissions of sub-contractors and of persons directly or indirectly employed by them as for acts and omissions of persons directly employed by the Contractor.

15. LIMITED AUTHORITY

15.1 The Contractor is not and this Agreement does not render the Contractor an agent or employee of the City, and without limiting the above, the Contractor does not have authority to enter into any contract or reach any agreement on behalf of the City, except for the limited purposes as may be expressly set out in this Agreement, or as necessary in order to provide the Goods and Services. The Contractor will make such lack of authority clear to all persons with whom the Contractor deals in the course of providing the Goods and Services.

15.2 The Contractor is an independent contractor. This Agreement does not create the relationship of employer and employee, a partnership, or a joint venture. The City will not control or direct the details, means or process by which the Contractor performs the Services. The Contractor will determine the number of days and hours of work required to properly and completely perform the Services. The Contractor is primarily responsible for performance of the Goods and Services and may not delegate or assign any Services to any other person except as provided for in Section 14.4. The Contractor will be solely liable for the wages, fringe benefits, work schedules and work conditions of any partners, employees or sub-contractors.

16. CONFIDENTIALITY AND DISCLOSURE OF INFORMATION

16.1 Except as provided for by law or otherwise by this Agreement, the Contractor will keep strictly confidential any information supplied to, obtained by, or which comes to the knowledge of the Contractor as a result of the provision of the Goods or performance of the Services and this Agreement, and will not, without the prior express written consent of the City, publish, release, disclose or permit to be disclosed any such information to any person or corporation, either before, during or after termination of this Agreement, except as reasonably required to complete the Goods and Services.

16.2 The Contractor acknowledges that the City is subject to the *Freedom of Information and Protection of Privacy Act* of British Columbia and agrees to any disclosure of information by the City required by law.

16.3 The Contractor agrees to return to the City all of the City's property at the completion of this Agreement, including any and all copies or originals of reports provided by the City.

17. WARRANTIES AND INDEMNITIES

17.1 The Contractor warrants that the Goods shall be free from defects in design, materials, workmanship and title, shall conform in all respects to the terms of this Agreement, shall be fit and suitable and perform satisfactorily for the purposes and under the conditions made known to the Contractor by the City or which were reasonably inferable. The Goods shall be at least equal to the higher of national standards or codes (such as, by way of illustration, CSA or ASTM), or standards and codes customarily applicable at the place where the City will use the Goods. The Goods shall be of the best quality, if no quality is specified. This general warranty is independent of and without prejudice to any specific warranty or service guarantee offered by the Contractor or third party manufacturer or supplier of the Goods in connection with the purpose for which the Goods were purchased. The Contractor shall assign to the City

any warranty or service guarantee offered by a third party manufacturer or supplier of the Goods. Notwithstanding this assignment, if at any time up to one year from the date of delivery or installation (if applicable) the City determines the Goods or any part do not conform to these warranties, the City shall notify the Contractor within a reasonable time after such discovery, and the Contractor shall then promptly correct such nonconformity at the Contractor's expense. Goods used to correct a nonconformity shall be similarly warranted for one year from the date of installation. The Contractor's liability shall extend to all liabilities, losses, damages, claims and expenses incurred by the City caused by any breach of any of the above warranties.

17.2 The Contractor warrants and guarantees that Goods and Services delivered under this Agreement do not infringe any valid patent, copyright or trademark, foreign or domestic, owned or controlled by any other corporation, firm or person, and agrees to indemnify and save harmless the City and all of its elected and appointed officials, officers, employees, servants, representatives and agents (collectively the "**Indemnitees**"), from and against any and all claims, demands, causes of action, suits, losses, damages and costs, liabilities, expenses and judgments (including all actual legal costs) by reason of any claim, action or litigation arising out of any alleged or actual infringement of any patent, copyright or trademark, foreign or domestic, relating to the Goods and Services supplied under this Agreement.

18. ASSIGNMENT OF WARRANTIES

18.1 Without limiting the generality of Section 17, the Contractor shall assign to the City, any warranty or service guarantee offered by a third-party manufacturer, distributor, installer or supplier of the Goods. Nothing in this Section relieves the Contractor from any responsibilities under any of the warranty provisions in this Agreement.

19. ON-CALL SUPPORT AND ON-SITE SERVICE

19.1 The Contractor shall, at its own expense, make available a competent engineering service representative(s) available on request to assist the City in the resolution of engineering or design problems that may arise during any applicable warranty period.

19.2 Nothing in Section 19.1 relieves the Contractor from any responsibilities under any of the warranty provisions in this Agreement.

20. WARRANTY REPAIR OR REPLACEMENT

20.1 On written notice from the City or latent defects discovered in the Goods (including in any materials or equipment forming part of the Goods) within any applicable warranty period, or other non-compliance covered by any warranty under this Agreement, given to the Contractor promptly following such defect of non-compliance becoming apparent, the Contractor will promptly, upon being given access to the affected Goods by the City, commence to remedy such non-compliance, and any damage to the Goods and any other equipment or property resulting from the non-compliance, and will without delay proceed to complete the repair and remediation so that the affected Goods are in compliance with this Agreement.

20.2 After completing the repair and remediation of the affected Goods the Contractor may apply to the Department Representative for acceptance of that repair and remediation. The Department Representative will, no later than 14 days after the

receipt of such an application, inspect the repaired or remediated Goods and will, no later than a further seven days after the inspection, notify the Contractor in writing of the acceptance, or the reasons for refusal, of the application. If the application is refused, then the Contractor will address the reasons for refusal and may re-apply for acceptance of the repaired or remediated Goods. If for any reason the Department Representative fails, within 30 days of an application to accept or give reasons for the refusal of that application, the Department Representative will be deemed to have accepted that application.

20.3 If the repair or remediation of the affected Goods cannot promptly be commenced and/or completed by the Contractor because of an interruption or unavailability of access because of the occurrence of any emergency circumstances or the operational interests of the City, then the Contractor will use commercially reasonable efforts to recommend a temporary repair acceptable to the City and will carry out such a temporary repair in a timely manner and then complete the final repair promptly when full access is available. If the City for its operational convenience delays providing access to the Contractor to complete the final repair then additional costs of the final repair resulting from such delay will be a change to which Sections 13.1 through 13.4 apply.

20.4 If the Contractor reasonably determines that a temporary repair of the affected Goods is not possible or advisable in the circumstances, it will promptly advise the City, providing reasons and a recommendation as to whether the City can safely continue to use and operate the affected Goods without material risk of incurring additional incremental loss, damage, cost or expense beyond that already suffered as a result of the non-compliance. If the City continues to use the affected Goods notwithstanding the Contractor's recommendation, the Contractor will be relieved of all further warranty obligations to the extent of any incremental defects arising out of such continued use and operation of the affected Goods.

20.5 The Contractor will carry out all repair and remediation of the affected Goods, including any temporary repair accepted by the City, at its own cost and without any right to reimbursement by the City with respect to such costs. The Contractor will be responsible for all costs associated with such repairs and replacements and will indemnify and save harmless the Indemnitees from any resulting damages. Other Goods, components of Goods or property damaged due to the defects, or in repairing such defects, will also be restored by the Contractor in accordance with Sections 20.1 through 20.4, without additional payment by the City, to a state at least as good as prior to the removal of or damage to that other Goods or property due to the defects, or prior to the repair to such defects.

20.6 The Contractor shall be liability for all losses, damages, claims, costs or expenses incurred by the Indemnitees in connection with any defect, latent defect or non-compliance covered by any warranty under this Agreement. Despite the foregoing, the Contractor will not be liable for any losses, damages, claims, costs or expenses suffered as a result of the Contractor's inability to promptly commence and/or complete any repair or remediation of the affected Goods because of an unavailability or interruption of access, as provided above, not caused by any act, error or omission of the Contractor or any of its employees, agents, representatives or subcontractors, or any other person for whom the Contractor is legally responsible.

20.7 Nothing in Sections 20.1 through 20.6 will be interpreted as precluding the City from carrying out repair or remediation of the Goods as permitted under this Agreement.

21. INSURANCE AND DAMAGES

21.1 The Contractor will indemnify and save harmless the Indemnitees from and against all claims, demands, causes of action, suits, losses, damages and costs, liabilities, expenses and judgments (including all actual legal costs) for damage to or destruction or loss of property, including loss of use, and injury to or death of any person or persons which any of the Indemnitees incur, suffer or are put to arising out of or in connection with any failure, breach or non-performance by the Contractor of any obligation of this Agreement, or any wrongful or negligent act or omission of the Contractor or any employee or agent of the Contractor.

21.2 The indemnities described in this Agreement will survive the termination or completion of this Agreement and, notwithstanding such termination or completion, will continue in full force and effect for the benefit of the Indemnitees.

21.3 The Contractor will, without limiting its obligations or liabilities and at its own expense, provide and maintain throughout this Agreement the following insurances in forms and amounts acceptable to the City from insurers licensed to conduct business in Canada:

(a) commercial general liability insurance on an occurrence basis, in an amount not less than five million ($5,000,000) dollars inclusive per occurrence against death, bodily injury and property damage arising directly or indirectly out of the work or operations of the Contractor, its employees and agents. The insurance will include cross liability and severability of interests such that the coverage shall apply in the same manner and to the same extent as though a separate policy had been issued to each insured. The insurance will include, but not be limited to: premises and operators liability, broad form products and completed operations, owners and contractors protective liability, blanket contractual, employees as additional insureds, broad form property damage, non-owned automobile, contingent employers liability, broad form loss of use, personal injury, and incidental medical malpractice. The City will be added as additional insured;

(b) automobile liability insurance on all vehicles owned, operated or licensed in the name of the Contractor in an amount not less than three million ($3,000,000) dollars per occurrence for bodily injury, death and damage to property; and

(c) contractors' equipment insurance in an all risks form covering construction machinery and equipment used for the performance of the Services.

21.4 The Contractor will provide the City with evidence of the required insurance prior to the commencement of this Agreement. Such evidence will be in the form of a completed certificate of insurance acceptable to the City. The Contractor will, on request from the City, provide certified copies of all of the Contractor’s insurance policies providing coverage relating to the Services, including without limitation any professional liability insurance policies. All required insurance will be endorsed to provide the City with thirty (30) days advance written notice of cancellation or material change restricting coverage. To the extent the City has an insurable interest, the builder's risk policy will have the City as first loss payee. The Contractor will be responsible for deductible amounts under the insurance policies. All of the Contractor's insurance policies will be primary and not require the sharing of any loss by the City or any insurer of the City.

21.5 The Contractor acknowledges that any requirement by the City as to the amount of coverage under any policy of insurance will not constitute a representation by the City that the amount required is adequate and the Contractor acknowledges and agrees that the Contractor is solely responsible for obtaining and maintaining policies of insurance in adequate amounts. The insurance policy coverage limits shall not be construed as relieving the Contractor from responsibility for any amounts which may exceed these limits, for which the Contractor may be legally liable.

21.6 The Contractor shall place and maintain, or cause any of its sub-contractors to place and maintain, such other insurance or amendments to the foregoing policies as the City may reasonably direct.

21.7 The Contractor hereby waives all rights of recourse against the City for loss or damage to the Contractor's property.

22. CITY RESPONSIBILITIES

22.1 The City will, in co-operation with the Contractor, make efforts to make available to the Contractor information, surveys, and reports which the City has in its files and records that relate to the Goods and Services. The Contractor will review any such material upon which the Contractor intends to rely and take reasonable steps to determine if that information is complete or accurate. The Contractor will assume all risks that the information is complete and accurate and the Contractor will advise the City in writing if in the Contractor's judgment the information is deficient or unreliable and undertake such new surveys and investigations as are necessary.

22.2 The City will in a timely manner make all decisions required under this Agreement, examine documents submitted by the Contractor and respond to all requests for approval made by the Contractor pursuant to this Agreement.

22.3 If the City observes or otherwise becomes aware of any fault or defect in the delivery of Goods or the provision of Services, it may notify the Contractor, but nothing in this Agreement will be interpreted as giving the City the obligation to inspect or review the Contractor’s performance with regards to delivering Goods or the performance of the Services.

23. DEFICIENCIES

23.1 The City shall have a reasonable time to inspect and to accept the Goods and Services. The City may reject any Goods or Services not in accordance with this Agreement, whether due to damage resulting from improper packing, loading, unloading or otherwise. The City shall notify the Contractor of rejection of the Goods whereupon the Goods will be held subject to the disposition by the Contractor. Any costs or expenses incurred by the City as a result of the rejection of the Goods or Services are, immediately upon written demand by the City, payable by the Contractor, and may be set off against any payments owing by the City to the Contractor.

23.2 Despite transfer of title or the transfer of risk of loss, the City may reject Goods in whole or in part, not in accordance with this Agreement, whether due to damage resulting from improper packing, loading, unloading or otherwise. The City shall notify the Contractor of rejection, whereupon those Goods will be held subject to the disposition by the Contractor. The rejected Goods will be held by the City at the sole

risk of the Contractor and the Contractor will promptly remove or cause to be removed the rejected Goods. The Contractor will be responsible for all costs of the removal and disposition of any rejected Goods. Any costs or expenses incurred by the City on account of any rejected Goods will, upon written demand by the City, be immediately due and payable by the Contractor, and the City may set-off such costs and expenses against any payment owing by the City to the Contractor.

23.3. Promptly after receiving a notice of rejection, the Contractor will deliver to the Department Representative a written plan describing the steps the Contractor will take to remedy that non-compliance and ensure the Goods are in accordance with this Agreement, and describing any impacts on the Production Schedule. Such steps shall include any re-testing reasonably required to establish the Goods comply with the Agreement.

23.4. If in the opinion of the Department Representative it is not expedient to correct the rejected Goods, then the Department Representative may direct such Goods remain with the City and the City may deduct from the monies otherwise due to the Contractor the difference in value to the City, considering the City's intended use of the Goods between the work as performed and that required by this Agreement. The amount of such deduction will be determined in the first instance by the Department Representative. If such amount is not acceptable to the Contractor, then the parties shall make reasonable efforts to resolve the dispute by amicable negotiations and shall provide frank, candid and timely disclosure of all relevant facts, information and documents to facilitate negotiations.

23.5. The City will not accept, nor be responsible for, any restocking charges for any Goods shipped to the City and returned to the Contractor. The Contractor is to bear all costs including shipping and handling of returned Goods.

23.6 The City may hold back from payments otherwise due to the Contractor up to 150% of a reasonable estimate, as determined by the City, on account of deficient or defective Goods or Services. This holdback may be held, without interest, until replacement Goods are received or such deficiency or defect is remedied.

24. DEFAULT AND TERMINATION

24.1 In the event the Contractor does not deliver the Goods or perform the Services by the date specified in this Agreement, then:

(a) the City reserves the right to terminate this Agreement, in whole or in part, and in the event of such termination no payment will be owing by the City on account of this Agreement and the Contractor will be liable for any and all expenses or loss resulting from such failure or delay and will return all monies paid by the City; or

(b) if the City does not terminate this Agreement for late delivery or performance, the City may deduct and setoff from any payments owing to the Contractor all additional costs the City reasonably incurs on account of the late delivery or performance.

24.2 The City may by written notice at any time cancel this Agreement with respect to Goods which, as of the date of cancellation, have not been shipped.

24.3 The City may at any time and for any reason by written notice to the Contractor terminate this Agreement before the completion of all the Goods and Services, such notice to be determined by the City at its sole discretion. Upon receipt of such notice, the Contractor will perform no further Goods and Services other than the work which is reasonably required to complete the Goods and Services. Despite any other provision of this Agreement, if the City terminates this Agreement before the completion of all the Goods and Services, the City will pay to the Contractor all amounts owing under this Agreement for Goods and Services provided by the Contractor up to and including the date of termination, plus reasonable termination costs in the amount as determined by the City in its sole discretion. Upon payment of such amounts no other or additional payment will be owed by the City to the Contractor, and, for certainty, no amount will be owing on account of lost profits relating to the portion of the Goods and Services not performed or other profit opportunities.

24.4 The City may terminate this Agreement for cause as follows:

(a) If the Contractor is adjudged bankrupt, or makes a general assignment for the benefit of creditors because of its insolvency, or if a receiver is appointed because of its insolvency, the City may, without prejudice to any other right or remedy the City may have, terminate this Agreement by giving the Contractor or receiver or trustee in bankruptcy written notice; or

(b) If the Contractor is in breach of any term or condition of this Agreement, and such breach is not remedied to the reasonable satisfaction of the City within 5 days after delivery of written notice from the City to the Contractor, then the City may, without prejudice to any other right or remedy the City may have, terminate this Agreement by giving the Contractor further written notice.

24.5 If the City terminates this Agreement as provided by Section 15.4 then the City may:

(a) enter into contracts, as it in its sole discretion sees fit, with other persons to complete the Goods and Services;

(b) withhold payment of any amount owing to the Contractor under this Agreement for the performance of the Goods and Services;

(c) set-off the total cost of completing the Goods and Services incurred by the City against any amounts owing to the Contractor under this Agreement, and at the completion of the Goods and Services pay to the Contractor any balance remaining; and

(d) if the total cost to complete the Goods and Services exceeds the amount owing to the Contractor, charge the Contractor the balance, which amount the Contractor will forthwith pay.

25. CURING DEFAULTS

25.1 If the Contractor is in default of any of its obligations under this Agreement, then the City may without terminating this Agreement, upon 5 days written notice to the Contractor, remedy the default and set-off all costs and expenses of such remedy against any amounts owing to the Contractor. Nothing in this Agreement will be interpreted or construed to mean that the City has any duty or obligation to remedy any default of the Contractor.

26. DISPUTE RESOLUTION

26.1 The parties will make reasonable efforts to resolve any dispute, claim, or controversy arising out of this Agreement or related to this Agreement ("Dispute") using the dispute resolution procedures set out in this Section 26.

26.2 Negotiation: The parties will make reasonable efforts to resolve any Dispute by amicable negotiations and will provide frank, candid and timely disclosure of all relevant facts, information and documents to facilitate negotiations.

26.3 Mediation: If all or any portion of a Dispute cannot be resolved by good faith negotiations within 30 days, either party may by notice to the other party refer the matter to mediation. Within 7 days of delivery of the notice, the parties will mutually appoint a mediator. If the parties fail to agree on the appointment of the mediator, then either party may apply to the British Columbia International Commercial Arbitration Centre for appointment of a mediator. The parties will continue to negotiate in good faith to resolve the Dispute with the assistance of the mediator. The place of mediation will be Surrey, British Columbia. Each party will equally bear the costs of the mediator and other out-of-pocket costs, and each party will bear its own costs of participating in the mediation.

26.4 Litigation: If within 90 days of the request for mediation the Dispute is not settled, or if the mediator advises that there is no reasonable possibility of the parties reaching a negotiated resolution, then either party may without further notice commence litigation.

27. WCB AND OCCUPATIONAL HEALTH AND SAFETY

27.1 The Contractor agrees that it shall, at its own expense, procure and carry, or cause to be procured, carried and paid for, full Workers' Compensation Board coverage for itself and all workers, employees, servants and others engaged in the supply of the Goods and Services. The Contractor agrees that the City has the unfettered right to set off the amount of the unpaid premiums and assessments for the Workers' Compensation Board coverage against any monies owing by the City to the Contractor. The City will have the right to withhold payment under this Agreement until the Workers' Compensation Board premiums, assessments or penalties in respect of the Goods and Services have been paid in full.

27.2 The Contractor will provide the City with the Contractor's Workers' Compensation Board registration number and a letter from the Workers' Compensation Board confirming that the Contractor is registered in good standing with the Workers' Compensation Board and that all assessments have been paid to the date thereof prior to the City having any obligations to pay monies under this Agreement.

27.3 The Contractor agrees that it is the prime contractor for the Goods and Services as defined in the *Workers Compensation Act, R.S.B.C. 2019, c.1,* as amended. The Contractor will have a safety program in place that meets the requirements of the Workers' Compensation Board Occupational Health and Safety Regulation and the *Workers Compensation Act*. As prime contractor, the Contractor will be responsible for appointing a qualified coordinator for insuring the health and safety activities for the location of the Goods and Services. That person will be the person so identified in this Agreement, and the Contractor will advise the City immediately in writing if the name or contact number of the qualified coordinator changes.

27.4 Without limiting the generality of any other indemnities granted by the Contractor in this Agreement, the Contractor shall indemnify and save harmless the Indemnitees from and against all claims, demands, causes of action, suits, losses, damages, costs, liabilities, expenses, judgements, penalties and proceedings (including all actual legal costs) which any of the Indemnitees incur, suffer or are put to arising out of or in any way related to unpaid Workers' Compensation Board assessments owing from any person or corporation engaged in the performance of this Agreement or arising out of or in any way related to the failure to observe safety rules, regulations and practices of the Workers' Compensation Board, including penalties levied by the Workers' Compensation Board.

27.5 The Contractor will ensure compliance with and conform to all health and safety laws, by-laws or regulations of the Province of British Columbia, including without limitation the *Workers Compensations Act* and Regulations pursuant thereto.

27.6 The City may, on twenty-four (24) hours written notice to the Contractor, install devices or rectify any conditions creating an immediate hazard existing that would be likely to result in injury to any person. However, in no case will the City be responsible to ascertaining or discovering, through inspections or review of the operations of the Contractor or otherwise, any deficiency or immediate hazard.

27.7 The Contractor understands and undertakes to comply with all Workers' Compensation Board Occupational Health and Safety Regulations for hazardous materials and substances, and in particular with the "Workplace Hazardous Materials Information System (WHMIS)" Regulations. All "Material Safety Data Sheets (MSDS)" shall be shipped along with the Goods and any future MSDS updates will be forwarded.

28. BUSINESS LICENSE

28.1 The Contractor will obtain and maintain throughout the term of this Agreement a valid City of Surrey business license.

29. GENERAL PROVISIONS FOR GOODS

29.1 Documentation for shipments of Goods from outside Canada shall be provided by a Contractor by airmail and shall include all documents as required by law or customary practice. All packages shall be marked as follows:

"Upon arrival, please contact customs broker:
Livingston International Inc.
Telephone: 604-685-3555
Fax: 604-605-8231
Email: cst19@livingstonintl.com"

29.2 Should the customs duties or taxes payable by the Contractor on the Goods supplied hereunder be increased subsequent to the receipt of quotation, excerpts of which are set out in Schedule B – Quotation Extracts, the amount of the said increase, without markup will be added to the Quotation Price and will be paid by the City to the Contractor.

29.3. Alternatively, should the customs duties or taxes payable by the Contractor on the Goods supplied hereunder be decreased subsequent to the receipt of quotation, excerpts of which are set out in Schedule B – Quotation Extracts, the amount of the said decrease will be deducted from the Purchase Price and will be credited by the Contractor to the City.

29.4 If this Agreement pertains to the fabrication, assembly or other processing of the Goods, representatives of the City shall be permitted free access at all reasonable times for the purpose of inspection, testing or obtaining information as to the progress of the fabrication, assembly or processing.

29.5 The City may require that shop drawings be submitted by the Contractor for review prior to the delivery of the Goods. The City may require that a qualified registered professional engineer stamp and approve a shop drawing prior to submission. Any review of shop drawings by the City will not relieve the Contractor from its obligation to deliver Goods in full compliance with all requirements of this Agreement.

30. COMPLIANCE

30.1 The Contractor will provide the Goods and Services in full compliance with all applicable laws, building codes and regulations.

30.2 The Contractor will, as a qualified and experienced practitioner, interpret applicable codes, laws and regulations applicable to the performance of the Services. If an authority having jurisdiction imposes an interpretation which the Contractor could not reasonably have verified or foreseen prior to entering into this Agreement, then the City will pay the additional costs, if any, of making alterations so as to conform to the required interpretation.

30.3 The Contractor shall comply with all applicable policies, procedures and instructions provided by the City.

31. JURISDICTION OF COUNCIL AND NON-APPROPRIATION

31.1 Nothing in this Agreement limits or abrogates, or will be deemed to limit or abrogate, the jurisdiction of the Council of the City in the exercise of its powers, rights or obligations under any public or private statute, regulation or by-law or other enactment.

31.2 The Contractor recognizes and agrees that the City cannot make financial commitments beyond the City's current fiscal year. The City will annually make bonafide requests for appropriation of sufficient funds to cover all payments covered by this Agreement. If City Council does not appropriate funds, or appropriates insufficient funds, the City will notify the Contractor of its intention to terminate or reduce the services so affected within 30 days after the non-appropriation becomes final. Such termination shall take effect 30 days from the date of notification, shall not constitute an event of default and shall relieve the City, its officers and employees, from any responsibility or liability for the payment of any further amounts under this Agreement.

32. WAIVER

32.1 Any failure of the City at any time or from time to time to enforce or require the strict keeping or performance of any of the terms and conditions contained in this Agreement shall not constitute a waiver of the terms and conditions and shall not affect or impair the terms or conditions in any way or the City's right at any time to avail itself of any remedies as the City may have for any breach of the terms and conditions.

33. APPLICABLE LAW AND CITY POLICIES

33.1 This Agreement shall be governed by and construed in accordance with the laws of the Province of British Columbia. The City and the Contractor accept the jurisdiction of the courts of British Columbia and agree that any action under this Agreement shall be brought in such courts.

33.2 The Contractor shall comply with all applicable policies, procedures and instructions provided by the City.

34. NOTICES

34.1 Any notice, report or other document that either party may be required or may wish to give to the other should be in writing, unless otherwise expressly provided for, and will be deemed to be validly given to and received by the addressee:

(a) by hand, on delivery;
(b) by facsimile, on transmission; or
(c) by mail, five calendar days after posting.

34.2 The addresses for delivery will be as shown in the Quotation. In addition, the City may give notice to the Contractor by email at the Contractor's email address as shown in the Quotation, which email will be deemed to be validly given and received by the Contractor on transmission. The Contractor may not give notice to the City by email.

35. MERGER AND SURVIVAL

35.1 The representations, agreements, covenants and obligations set out in this Agreement shall survive the delivery of the Goods and performance of the Services and payment of the Fees and Disbursements.

36. ENTIRE AGREEMENT

36.1 This Agreement, including the Schedules and any other documents expressly included by reference in this Agreement, contains the entire agreement of the parties regarding the provision of the Goods and Services, and no understandings or agreements, oral or otherwise, exist between the parties except as expressly set out in this Agreement. This Agreement supersedes and cancels all previous agreements between the parties relating to the Goods and Services.

36.2 In the event that the Contractor issues an invoice, packing slip, sales receipt, or any like document to the City, the City accepts the document on the express condition that any terms and conditions in it which constitute terms and conditions which are in

addition to or which establish conflicting terms and conditions to those set out in this Agreement are expressly rejected by the City.

37. SIGNATURE

37.1 This Agreement shall be signed by a person authorized to sign on behalf of the Contractor.

37.2 This Agreement may be executed in or one or more counterparts all of which when taken together will constitute one and the same Agreement, and one or more of the counterparts may be delivered by fax transmission or as a PDF file.

38. ENUREMENT

38.1 This Agreement shall enure to the benefit of and be binding upon the respective successors and permitted assigns of the City and the Contractor.

This Agreement is executed by the City of Surrey this _____ day of _____, 2023.

CITY OF SURREY
by its authorized signatory(ies):

_____	_____
(Signature of Authorized Signatory)	(Signature of Authorized Signatory)
_____	_____
(Print Name and Position of Authorized Signatory)	(Print Name and Position of Authorized Signatory)

This Agreement is executed by the Contractor this _____ day of _____, 202_.

<<NAME OF CONTRACTOR>>

I/We have the authority to bind the Contractor.

_____
(Legal Name of Contractor)

_____	_____
(Signature of Authorized Signatory)	(Signature of Authorized Signatory)
_____	_____
(Print Name and Position of Authorized Signatory)	(Print Name and Position of Authorized Signatory)

SCHEDULE A – SPECIFICATIONS OF GOODS AND SCOPE OF SERVICES

1. SPECIFICATIONS OF GOODS AND SCOPE OF SERVICES

The Contractor shall furnish all necessary labour, materials, supplies, and transportation necessary to supply and deliver the Good(s) and any spare parts and performance of the Services in accordance with this Agreement.

The project is located at the West Village Park District Energy Centre, 13231 103A Avenue, Surrey, British Columbia, CANADA.

The scope of work generally includes the supply, and commissioning of two complete hot water boiler packages. The boilers will be a forced draft water tube design. The boilers will be packaged with a natural gas fuel fired fully modulating burner, complete with controls, burner management system, and other accessories as described in this specification. The boilers shall be capable of operating to provide hot water continuously at a supply temperature of up to 115 C (240 F) at a minimum operating pressure of 275 kPag (40 psig). The boilers design pressure (pressure relief setting) will be 1103 kPa (160 psig).

Each boiler will be installed and operated as parallel units, (lead, lag).

The supplied boilers will replace two existing boilers, at the Owners district heating plant and will work in parallel with an existing hot water boiler already installed.

The detailed scope of Goods and Services is as described in the Schedule A-1- Supplementary Specifications (Project) and Schedule A-2 Contract Drawings (listed below)

The lack of and/or omission of detailed specifications does not minimize the acceptable levels of service and only the best commercial practices are acceptable.

Contractor to comply with all BC Plumbing Code, BC Fire Marshal, BC Workers' Compensation Board, National Building Code of Canada, BC Boiler Inspector, BC Electrical Inspector, National Fire Protection Association, and any other authorities having local jurisdiction. Failure to abide by these rules and regulations will result in being immediately escorted from the work site.

2. LIST OF CONTRACT DRAWINGS

The following Contract Drawings are included as part of this RFQ.

List of Contract Drawings				
	TITLE OF DRAWING	**SHEET No.**	**REVISION No.**	**REVISION DATE**
	M101 – Housekeeping Pad/Plumbing layout – Basement Plan	1	3	Apr 14/16

SCHEDULE A-1 – SUPPLEMENTARY SPECIFICATIONS (PROJECT)

West Village Energy Centre Phase 2 Hot Water Boiler Specification 42 11 13

Issue - February 14, 2023

Prepared By:

FVB ENERGY INC

Suite 210, 4180 Lougheed Hwy
Burnaby, BC, V5C 6A7

CONTENTS

SECTION 42 11 13 – PACKAGED HOT WATER BOILER

PART 1 – GENERAL

1.1 INTENT

1.1.1 This specification is intended to describe the major requirements for the equipment to be supplied. The boiler packages shall include all details and components necessary to be operated in the manner described in this document even though every miscellaneous item may not be mentioned in these specifications.

1.2 SYSTEM DESCRIPTION

1.2.1 The project is located at the West Village Park District Energy Centre, 13231 103A Avenue in the City of Surrey, British Columbia

1.2.2 The scope of work generally includes the supply, and commissioning of two complete hot water boiler packages. The boilers will be a forced draft water tube design. The boilers will be packaged with a natural gas fuel fired fully modulating burner, complete with controls, burner management system, and other accessories as described in this specification. The boilers shall be capable of operating to provide hot water continuously at a supply temperature of up to 115 □C (240 F) at a minimum operating pressure of 275 kPag (40 psig). The boilers design pressure (pressure relief setting) will be 1103 kPa (160 psig).

1.2.3 Each boiler will be installed and operated as parallel units, (lead, lag).

1.2.4 The supplied boilers will replace two existing boilers, at the Owners district heating plant and will work in parallel with an existing hot water boiler already installed.

1.3 REQUEST FOR QUOTATION (RFQ) REQUIREMENTS

1.3.1 This specification describes the desired performance and is intended to establish an acceptable standard. All deviations from this specification must be identified in the proposal. Failure to note deviations will imply conformance with this specification as written.

1.3.2 The Vendor's proposal will contain a Technical Proposal, Commercial Proposal, and Exceptions or Clarifications section.

1.3.3 Provide a narrative statement of specification compliance, including a specific list of specification deviations, exceptions, and or exclusions.

1.3.4 Engineering data to be included in RFQ response and with formal submittal shop drawings:

.1 Manufacturer or vendor to provide unit performance data at full load and part load for summer and winter, in their standard format.

.2 Submit data in the format of the data sheets found in the appendices for base and optional boiler selections.

.3 Performance is based on constant flow through each boiler, with the following winter and summer normal operating conditions.

.i Summer Operation, 45 ^{O}C Plant Return Temperature with blended Boiler Inlet Temperature of 60.0 ^{O}C & Outlet / Supply Temperature of 80 ^{O}C.

.ii Shoulder Operation, 50 ^{O}C Plant Return Temperature with blended Boiler Inlet Temperature of 68.0 ^{O}C & Outlet / Supply Temperature of 88 ^{O}C.

.iii Winter Operation, 55 ^{O}C Plant Return Temperature with blended Boiler Inlet Temperature of 75.0 ^{O}C, & Outlet/Supply Temperature of 95 ^{O}C

.4 Descriptions of complete boiler system proposed, including controls and communication interfaces.

.5 Flowsheet describing the process and utility connections for each boiler skid along with controls and instrumentation supplied.

.6 Package general arrangement drawings with maintenance space requirements, including access platform support points. General arrangement drawings must represent the total unit on a single drawing and will include the boiler vessel, burner, FD fan, and relief valves.

.7 Sizes, type of, locations, and details of process and utility connections will be provided on drawings.

.8 Maximum allowable differential water temperature across boiler at minimum inlet temperature.

.9 Minimum allowable differential water temperature across boiler.

.10 Minimum water flow and inlet temperature allowed through boiler for continuous operation.

.11 Maximum rate of heat up (degrees C per hour)

.12 Guaranteed Minimum continuous output; i.e. turndown capability, assuming the gas pressure delivered to the inlet of the gas train is between 55 kPag to 90 kPag. Vendor shall provide additional on skid pressure regulator(s) as needed to reduce natural gas pressure to an acceptable level for the proposed boiler package fuel gas train, if applicable.

.13 Required boiler gas train, flow, connection location, type and size.

.14 Amount of combustion air for the boilers, including any air preheating which may be required.

.15 The maximum electric power requirements for the skid package. Include a complete list of all electric motors, complete with sizing in connected kW_e, motor type, drive type and type of service (continual while firing, intermittent, etc.) include the total connected and an estimate of peak electrical demand impact of aggregate system.

.16 Bidders shall provide sound level data in octave bands for both the boiler (all exposed surfaces) and the boiler exhaust stack. The sound level data should be presented as either sound power levels, or sound pressure levels measured in free field at a distance of minimum 1 metre from the boiler surfaces and boiler exhaust outlet. Sound measurements shall follow either standard ISO 3744 or Standard ISO 3746.

.17 Guaranteed NOx and CO emission data in mg/m^3 (milligram per cubic meter) units corrected to 3% O2, dry basis at 20° Celsius and a pressure of 101.325 kilopascals.

.18 List of communicated control and operational parameters that are available for monitoring by the plant control system.

.19 Factory recommended planned maintenance schedule and description of maintenance tasks and frequency, based on 30 year life.

.20 Provide guaranteed maximum time to respond to an emergency service request.

.21 Identify nearest service centre / technician to project site that can provide boiler repairs/troubleshooting; burner repairs/trouble shooting; burner controls repairs/troubleshooting.

.22 Provide a recommended list of spare parts for the first 2 years of operation with pricing.

.23 Provide list of installation references with contact information, for boilers in hot water service of the same size(s) being proposed.

.24 Provide an estimate of reliability or availability of the type/model of boiler proposed.

.25 Provide an outline of course topics to be covered during each training session.

.26 Provide a list of items or assemblies that are expected to be shipped loose in order to prevent damage or to facilitate shipping.

1.3.5 Service Contract – Optional

.1 The proponents are requested to provide with the RFQ response a separate proposal for three scheduled service contracts based on the following durations:

.i One (1) Year
.ii Two (2) Year
.iii Five (5) Year.

.2 Provide list of scheduled service tasks to be performed based on a unit operating 6000 hrs per year.

.3 Provide a list of scheduled service tasks in addition to the annual scheduled maintenance that would be required to be performed at 3, 5 and 10 year intervals.

1.3.6 Operator Training

.1 The training described in item 1.8.2 below shall be proposed.

1.3.7 Post Startup Visits

.1 The post startup site visits described in item 1.9.4 below shall be proposed.

1.4 STANDARDS

1.4.1 The Manufacturer shall comply with all regulations of Authorities having jurisdiction, where applicable, including, but not limited to the following:

.1 ANSI/ASME Boiler and Pressure Vessel Code, Section IV, Latest Edition; Hot Water Boilers.

.2 ANSI/ASME Boiler and Pressure Vessel Code, Section VIII, Latest Edition;

Unfired Pressure Vessels.

.3 ANSI/ASME B31.1 Power Piping Code, Latest Edition

.4 ANSI/ASME B31.9 Building Service Piping Code, Latest Edition

.5 ANSI Z21.13 – Latest Edition, Gas-Fired Low-Pressure Steam and Hot Water Boilers.

.6 ASHRAE – Design Standards applicable to exhaust gas or combustion air duct design

.7 The Power Engineer, Boiler, Pressure Vessel, and Refrigeration Safety Regulation (Power Engineers Regulation), as enforced by Technical Safety BC (TSBC) in the Province of British Columbia.

.8 CAN1 – 3.1 – (Latest Edition), Industrial and Commercial Gas-Fired Package Boilers.

.9 CAN/CGA – B149.1 M Latest Edition, Natural Gas Installation Code.

.10 CAN/CGA – B149.3 – Latest Edition, Field Approval of Fuel Related Components on Appliances and Equipment.

.11 CSA B51 – Latest Edition, Boiler, Pressure Vessel, and Pressure Piping Code.

.12 CCME – National Emission Guideline for Commercial/Industrial Boilers and Heaters [1998]

.13 CSA C22.1-Latest Edition – Canadian Electrical Code, BC Electrical Safety Code and Bulletins, latest Edition, and regulations of the local inspection authority.

.14 IEEE Standard 519-1992 – Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems.

.15 NBIC – National Board Inspection Code; Latest

.16 The National Fire Safety Code and the Fire Safety Regulations of the Province of British Columbia.

.17 Safety Standards for Electrical Equipment, Canadian Electrical Code, Part II.

.18 SMACNA – Duct Construction Standard

.19 City of Surrey Noise Standards

.20 Greater Vancouver Regional District Air Quality Management Bylaw No. 1082.

.21 Metro Vancouver Regional District – Boilers and Process Heaters Emission Regulation Bylaw No. 1087 - Consolidated.

.22 The Environmental Protection and Enhancement Act enforced by British Columbia Environment.

1.5 RELATED DOCUMENTS

1.5.1 Appendix I: Central Energy Plant Equipment Layout.

1.5.2 Appendix II: Hot Water Boiler Performance Datasheet.

1.5.3 Appendix III: Hot Water Boiler Pricing Schedule.

1.6 PRODUCT DELIVERY REQUIREMENTS

1.6.1 Each boiler package must be fully assembled and wired at the supplier's facility. The

unit would then be prepared for delivery.

1.6.2 Drain boilers and dry completely for freeze protection, prior to shipment. Seal off all pipe and electrical openings to prevent ingress of weather. Wrap and or cover all exterior surfaces to protect from damage during transit to the project site. Ship boilers pre-assembled complete with lifting lugs and weather protected bearing in mind the hazards of transportation and construction sites. Quotations should include a complete list of loose-shipped items and field installation requirements.

1.6.3 All necessary field connections, wire jumpers, bolts, nuts, etc. shall be suitably packed and identified to facilitate field assembly.

1.6.4 Quotations shall allow for delivery to job site.

1.6.5 Provide optional pricing for storage of boilers in the event the site is not ready for delivery. Refer to Appendix III: Hot Water Boiler Pricing Schedule.

1.7 SUBMITTALS FOLLOWING AWARD

1.7.1 The Manufacturer shall furnish to the Owner one set of shop drawings within 15 working days of receipt of order to be reviewed for compliance with this and other specifications, to determine the adequacy of engineering, drawing presentation and information content. The submittals shall also include other information that the Engineer may deem necessary in order to make clear the Work intended or to show its relation to adjacent Work of other trades. The Manufacturer shall make any changes in such drawings or diagrams that the Engineer may require consistent with the Contract and shall submit four copies of the revised prints to the Engineer. When submitting shop and setting drawings the Manufacturer shall notify the Engineer in writing of changes. The Manufacturer should include for the cost of “certified drawings“.

1.7.2 The Manufacturer shall submit certified information on all products included in the work. All drawings shall be prepared and submitted to the Engineer in printed and electronic form. Indicate the following:

.1 Complete Bill of Materials

.2 Descriptions of all boiler package component systems to be supplied.

.3 Piping and instrumentation diagram / flowsheet.

.4 General arrangement showing dimensions, weights, center of gravity, interface points, instrumentation test connections complete with drawings of the boilers.

.5 Boiler layout including required additional services such as floor drains, embedded conduits, compressed air connections.

.6 Skid Package anchoring requirements and details. Include centre of gravity, static, and dynamic loading information.

.7 Burner assembly and gas train details

.8 Burner management system details

.9 Draft Control systems details

.10 Emission control system details

.11 Safety system details

.12 Electrical power and control system details

.13 Control description and remote control system details

.14 Minimum system water quality requirements.

.15 Combustion air requirements.

.16 Submit for review complete electrical power and control system details. Provide diagrams, which are fully comprehensive, so that any circuit, including conductors can be followed completely. The wiring diagrams shall show wiring between panel components and devices, panel terminal blocks and all remote equipment and devices. Number or identify each component including conductors and terminals blocks with a unique tag. Include the following:

- .i Power wiring diagrams.
- .ii Control wiring diagrams (panel, interconnection, loops, etc.).
- .iii Control panel and components layout.
- .iv Complete Bills of materials (motors, modulating valves, instrumentation, control equipment and devices, etc.)
- .v Electrical and control equipment and devices boiler plan.

.17 Boiler control system description including start-up and shut down sequence, normal operation (local and remote control mode), emergency shutdowns, and restart requirements following an outage. All programming instructions, data addresses, and serial communication protocols required to allow the boiler to be remotely monitored, and remotely controlled from the central plant operating control room. Plant control is via digital controller.

.18 Boiler and Performance test reports.

.19 Preparation and submission of all documentation needed to obtain ASME, CRN, and CSA approval certifications, and gas train approvals.

.20 A description of reassembly of ship loose parts for the installing Contractor to follow

.21 Boiler control system programmed settings following onsite commissioning.

1.8 OPERATION & MAINTENANCE TRAINING & MANUALS;

1.8.1 Manuals

.1 The Manufacturer shall supply four (4) binders containing a complete system manual, including all manufacturers' documentation. The O&M manuals to include recommended operating procedures for normal and emergency situations, troubleshooting guideline, illustrated parts lists complete with catalogue numbers, electrical and controls schematic diagrams, flow diagrams for fuel system, copy of commissioning reports, and recommended maintenance instructions and schedules. The manuals, including installation guidelines, to be provided with delivery of the boilers.

.2 The manufacturer will also supply one (1) Flash Drive/Memory Stick of the above manual in searchable Adobe PDF format.

.3 Provide Record Documents:

- .i Factory Test Reports such as: Non-Destructive Testing, Hydrotest, Functional Control Test, and Wiring Continuity.
- .ii The test results shall be documented, certified and provided to the Owner with the delivered boilers.
- .iii Submit manufacturers installation instructions.

1.8.2 Training:

.1 The manufacturer shall provide three (3) onsite training session(s) to the Owner.

.2 Session 1 will be provided prior to the installation of the boilers and would be

aimed at a larger target audience of Owner Staff. Duration of session 1 should be a minimum of one half day.

.3 Session 2 would be delivered to the Owners plant operators at the time of commissioning. The training should be a minimum of one day (8hr) in duration. This will include for both classroom instruction and hands on training in normal operation and maintenance of the equipment and associated control system. The training session shall cover:

- .i Equipment/component/control system description and overview,
- .ii equipment operation and recommended procedures,
- .iii equipment troubleshooting,
- .iv scheduled maintenance tasks,
- .v Lifecycle maintenance tasks such as overhauls and component replacement.

.4 The third training session would occur 6 months after Session 2. It is intended to be a follow up training session to respond to questions. Duration would be a minimum one half day.

.5 The proponent to include a course outline in their quotation and indicate the time allowed for providing this training.

.6 Provide reimbursable rates for additional training shall be provided should the Owner wish to obtain more specific instruction in certain areas.

1.9 WARRANTY & POST STARTUP INSPECTION

1.9.1 Refer to Owners commercial terms and conditions section of the RFQ package for warranty requirements.

1.9.2 Provide guarantee that the boilers supplied are capable of operating continuously without water hammer when operating at 275 kPag minimum operating pressure, over the entire operating water temperature range indicated.

1.9.3 The Boilers shall be warranted against thermal stress failures for a minimum ten (10) years.

1.9.4 The Manufacturer to offer the following visits to be provided.

.1 Two (2) post startup site visits.

.2 First visit during the warranty/guarantee period. The date and time of this visit shall be coordinated with the Owner.

.3 The Manufacturer shall carry out the following procedures during the visit;

- .i Operate the boiler if not running.
- .ii Check and adjust the control system and measure & record boiler performance;
- .iii Visually inspect the entire system.
- .iv Produce and submit a report to the Engineer and Owner of the results of each visit including adjustments made to control.

.4 Second visit to occur 12 months after the first, with the same tasks to be performed.

.5 Provide optional pricing for a third visit to conduct boiler full load testing when the district energy system is capable of accepting 100% boiler load. Refer to Appendix III: Hot Water Boiler Pricing Schedule.

1.9.5 Manufacturer Inspection reports shall be provided to the Owner, after each visit during installation, commissioning, startup, and post startup.

1.9.6 Manufacturer shall provide a certification letter to the Owner following startup

confirming that specified NOx emission limits have been met. The letter shall be supported by printed results from an NOx concentration analysis.

1.9.7 Should the NOx emission limits be exceeded, the Manufacturer, at their cost, shall adjust, repair, or replace their equipment until the emission limits are achieved. The Manufacturer will be required to pay for follow up NOx emission testing needed to confirm the emission levels meet specification requirements.

1.10 TERMS AND CONDITIONS

1.10.1 The successful Manufacturer shall be required to conform to Owner's Instructions to Proponents and General Conditions identified in the Instructions document.

2 PART 2 – PRODUCTS

2.1 SCOPE OF WORK

2.1.1 The project generally includes the supply, and commissioning of:

.1 Two (2) - packaged hot water boilers with the following output capacities:

- .i Boiler Package #1: 1500 BHP (15 MW) output
- .ii Boiler Package #2: 1500 BHP (15 MW) output

.2 Spare Parts (per boiler package):

- .i Two (2) spare pressure safety valves.
- .ii One (1) spare low water cut off switches.
- .iii Two (2) spare high temperature cut outs.

2.1.2 The Manufacturer is requested to provide optional standalone pricing for the following:

.1 Boilers to meet reduced NOx performance as identified in item 2.2.4.9 below.

2.1.3 Dimensions: The boilers will be installed in place of the existing 500 BHP boiler locations indicated on the plant layout drawings attached. The boilers are expected to fit within the existing space. Units with dimensions that do not fit within the allocated space will be rejected.

.1 Refer to 2.2.5 for dimensional constraints.

2.1.4 Each boiler package supplied will be a complete and integrated package encompassing the boiler, gas train, burner, FD fan and all associated controls.

2.1.5 All of the boilers will be capable of operating on natural gas as the primary fuel.

2.1.6 The hot water boilers shall be configured, equipped, and locally controlled, to meet the operational and safety requirements identified in the Power Engineer, Boiler and Pressure Vessel Safety Regulation 104 for the Province of British Columbia and CSA B51 boiler code.

2.1.7 The manufacturer is responsible for complying with the safety regulations and requirements as enforced by the local provincial boiler safety authority (TSBC).

2.1.8 Access to skid mounted controls will be provided as required by TSBC based on National Board inspection code requirements.

2.1.9 The Manufacturer shall perform all work according to this request for proposal. The work shall include, but not be limited to, the supply and commissioning of the individual boiler packages, package design and drawings, supply and installation of mechanical, controls, and electrical components forming each boiler package, and the factory cleaning, testing and field commissioning of the supplied systems as described in this specification and drawings.

2.1.10 The Manufacturer will provide the components described in the specification as a base bid. Alternative products may be proposed but shall be clearly identified as options or alternates to the base bid. The pricing for these alternatives shall be separate from the base bid pricing.

2.2 GENERAL

2.2.1 Packaged boiler complete with:

.1 Fully modulating, 12.5% to 100%, burner and necessary accessories and controls to operate according to the regulations of the Operating Engineers Act as enforced by TSBC, and as described in this specification.

.2 Variable Frequency Drive for FD fan.

.3 FD fan air inlet silencer.

.4 Automatic boiler flue gas draft control system, integrated with boiler burner control system to allow code compliant startup, operation, and shutdown of the boiler.

.5 Factory tested for electrical and control function, pilot light off/fail test, low flame / flame fail test.

.6 Ready for connection to piping, electrical power, controls and flue gas exhaust breaching.

.7 Designed, constructed, and tested to ANSI/ASME Boiler and Pressure Vessel Code, Section IV or equivalent.

.8 CRN (Canadian Registration Number), to CSA B51.

.9 Boiler/burner package to bear CSA, CGA / ULC labels as applicable.

.10 Complete boiler package will be inspected, approved, with nameplates and labels as required by TSBC.

.11 A means will be provided to allow the skid package to be secured to the housekeeping pad. Manufacturer to describe proposed anchoring system.

2.2.2 All components forming the skid mounted boiler package shall be securely attached in order to resist damage due to seismic induced forces acting through the package centre of gravity, as per BC Building Code Requirements. The level of seismic acceleration is estimated at 0.46 G.

2.2.3 Package Configuration:

.1 FD Fan – to be centrally located on the package or offset to the right when facing the burner end. Complete with ducting to burner air inlet.

.2 The FD fan shall be supplied with vibration isolating spring mounts, if it is to be installed off of the boiler skid. The isolation springs shall be sized to achieve 99% isolation efficiency and shall include seismic restraints.

.3 The ducting conveying the combustion air from the FD fan to the burner will not have any 90 degree bends.

.4 Gas Train Connection: to be located on the left side of the package when facing the burner end.

2.2.4 Performance:

.1 The boiler will be provided a constant flow of water based on a 20°C temperature differential.

.2 Hot water Normal Operation: up to 95°C outlet water temperature, 75.0°C inlet

water temperature at design operation. Outlet water temperature is continuously reset between 80°C to 95°C based on outdoor ambient temperature.

.3 Each boiler shall be capable of continuous operation while delivering hot water at a temperature of 115°C

.4 Each boiler will operate at a minimum waterside pressure of 275 kPag when producing hot water in excess of 100°C.

.5 Boiler efficiency (Gas), (HHV): Minimum 80% at all firing rates between 12.5% and 100%.

.6 Maximum expected backpressure acting at boiler exhaust damper outlet: positive (+) 13 mm W.G.

.7 Minimum expected backpressure acting at boiler exhaust damper outlet: negative (-) 6 mm W.G.

.8 Flue gas temperature leaving boiler: Not to exceed 230□C

.9 NOx Emission Limits Required (at full and part load):

.i Base offering: 60 milligrams per cubic meter maximum.

.ii Optional offering: 20 milligrams per cubic meter maximum.

.iii All emission limit values are based on 3 percent oxygen content in stack gas corrected to dry conditions at 20° Celsius and a pressure of 101.325 kilopascals.

.10 Sound Level

.i 85 dBa maximum when measured at 1.5 m distance from each face of boiler skid.

.11 FD Fan motor size: 125 HP or less

.12 The water circulating through the boiler will be treated water with a pH range of 8.5 to 10.5.

2.2.5 Dimensional Constraints

.1 The boiler must be capable of being transported into the plant through existing openings in the building wall. The maximum allowable dimensions for the boiler package are:

.i Package Width: 3.8 meters

.ii Package Height: 4.6 meters

2.2.6 Electrical and Control System;

.1 A single point boiler package power supply connection will be provided. Supply Voltage: 575 V AC, 3 phase, 60 Hz. All power to the boiler package will be sourced from this point. Provide main disconnecting means.

.2 Boiler control system power: Manufacturer to provide on skid control power transformation.

.3 The 600 V power feed shall be terminated into a dedicated panel or junction box that is installed on skid, and fed to the power consumers from this point. 600 V and 120V/24V circuits and components to be housed in separate panels.

.4 Transformation from 600 V to lower voltages shall occur in the same panel as the 600 V feed is terminated in.

.5 All on skid interconnecting wiring shall be provided and installed at the factory.

.6 All on skid conduits shall be liquid tight. Wiring penetrations into electrical enclosures shall be sealed against water ingress.

.7 Power and control components: CSA certified with identified labels attached.

.8 The boxes, cabinets and enclosures shall be sized for control devices and equipment installed. Enclosure rating: EEMAC 12 or EEMAC 4 minimum.

.9 Provide each motor and other equipment with suitable controller and devices that will function as specified and shown. Provide magnetic motor controllers for induction motors rated in horsepower complete with overload protection and over current device (motor protector type circuit breaker).

.10 The operator interface devices shall be heavy-duty, watertight, unless listed otherwise. All pilot lights shall be transformer type with LED lamps.

.11 The control devices (control relays, timers, limit switches, pressure switches, temperature switches, etc.) shall meet the requirements of the application. The control device contacts shall be normally open, field convertible or SPDT type.

.12 Provide lockable power disconnecting means for skid electrical power supply.

.13 Motors: In accordance with electric motor specification, contained in this specification.

.14 Factory pre-wired control system. Boiler shall be capable of operation in local and remote control mode. All control operations and features shall be available from local control panel in local mode and selected control operations from remote controller in remote mode.

.15 All control panels when specified, shall be mounted and wired on the boiler skid. Panels shall be vibration isolated when mounted on skid.

.16 All VFD's supplied shall be shipped loose for remote mounting by the electrical contractor.

.17 Hardwired control interface:

- .i Boiler on/off status - dry contacts, rated 120V AC.
- .ii Boiler start/stop control input – dry contact, rated 120 V AC.
- .iii Boiler automatic / remote manual operating mode selector input signal; dry contact, rated 120V AC
- .iv Outlet water setpoint temperature: analog 4-20 ma input signal to boiler
- .v Firing rate setpoint: analog 4-20 ma signal to boiler
- .vi Combustion Air Damper interlock (run permissive); dry contact, rated 120V
- .vii Boiler General Alarm - dry contact, rated 120 V AC

.18 Each boilers controller will allow for remote monitoring of boiler data/status and remote control of the boiler from the existing plant control system.

- .i Refer to item 2.8 below for communicated input/output to the boiler controller.

.19 Use standard products of manufacturers regularly engaged in the production of such equipment, and conforming to manufacturer's latest standard design. Use materials, equipment, apparatus, or other products approved for the location or area classification.

.20 Provide lamicoid nameplates and labels describing the name or function of the labeled equipment; mechanically fasten labels (tape or adhesive fixings are only acceptable inside enclosures). Identify power, control and signal wiring with permanent markings (both ends). Maintain phase sequence and color

coding throughout. Identify all terminal blocks.

2.2.7 Thermal insulation:

.1 The Manufacturer shall provide sufficient thickness of insulation in conjunction with water cooled top, rear and side walls, to prevent the jacket operating temperature from exceeding 35 ^{O}C at all boiler loads. Seal insulation at all hand holes, manholes, mud holes, and piping connections with insulating cement or asphaltic paint. Finish with heat resisting paint.

.2 Insulation and or insulating media shall be securely fastened to the interior surface of the boiler case, in such a manner that also allows for removal and replacement.

2.2.8 Exhaust Gas Opening Connection:

.1 Provide – carbon steel exhaust opening flanged steel spool piece that allows for the mounting of exhaust sampling ports, exhaust gas sensing probe(s), temperature gauges, pressure gauges, or manometers and draft control damper.

2.2.9 Exterior Jackets:

.1 Heavy gauge metal, finished with heat resisting paint. The jacket to be installed in such a manner that also allows for removal and replacement.

.2 Manufacturer to identify exterior colors that are standard and alternate colors that are available.

2.2.10 Skid Mounting:

.1 Structural steel base, lifting lugs.

.2 Skid structure designed to be installed on vibration isolating matts located at spaced intervals under the skid rails.

.3 Skid structure designed strong enough to allow the skid package to be moved into final installed location using the jack up and rolling on skates/rollers method.

.4 The package must also be capable of being lifted by crane from attachment points at each skid corner, or from lifting points located on the top header.

2.3 WATER TUBE HOT WATER BOILER

2.3.1 Packaged water tube design with top outlet and bottom inlet headers and multiple tube passes.

.1 Note: Coil tube style boilers will not be accepted for this project.

2.3.2 Waterside Maximum Allowable Working Pressure: 1103 kPag at 121 °C.

2.3.3 Tube sheet thicknesses and tube wall thicknesses shall exceed ASME design requirements.

2.3.4 Single flanged water inlet and single flanged water outlet, installed along the longitudinal centerline.

2.3.5 Water connections to the boiler will be 150# ANSI raised face flanged connections.

2.3.6 Water and Fire side interior to be accessible for service and or inspection.

2.3.7 Exhaust outlet connection discharges vertically upwards.

2.3.8 ASME Heating surface: in m2. To be specified in quotation.

2.3.9 Water content: in liters to be specified in quotation.

2.3.10 Furnace heat release in kW/m2 to be specified in quotation.

2.3.11 Steel framing or structure shall be insulated to prevent hot spots from developing on the exterior shell of the boiler due to conduction from the interior to the exterior.

2.4 AUXILIARIES

2.4.1 Provide for each boiler and to meet ANSI/ASME requirements.

2.4.2 Hot water boilers:

.1 Control Panel Remote communications/operation hardware and software.

.2 Relief valves: ANSI/ASME rated, multiple relief valves set at vessel design pressure or maximum 1103 kPag, to release entire boiler capacity. Relief valves shall be steel or bronze body and self reseating in accordance with ASME Section IV Heating Boiler Requirements. Provide two (2) spares per boiler as per 2.1.1.2.i. Spares to be shipped loose.

.3 Pressure gauge (water side): 90 mm diameter complete with steel isolation valve, Range 0 to 1,378 kPa.

.4 Water side outlet thermometer: 115 mm diameter range 10 to 150 □C.

.5 Low water level fuel cutoff: in accordance with TSBC requirements; complete with manual reset. Low water cut-off to be wired to fuel valve control to shut off fuel valve on a low water condition. Each cut off is required to be capable of being tested in place by the plant operators. Provide one (1) spare per boiler as per 2.1.1.2.ii. Spares to be shipped loose.

.6 A minimum of two low water level cutoff switches are required.

.7 Low water level cut-offs to be in accordance with CSA B-51; complete with, visual and audible alarms.

.8 Paddle style mechanical Low flow water switch. Switch to be wired to boiler control panel to shut down the boiler on a low flow condition.

.9 High Temperature Cut-out; (manual reset) wired to boiler controller to shut boiler down on a rise in boiler temperature above the setpoint of 121 ^{o}C. Provide two (2) spares per boiler as per 2.1.1.2.iii. Spares to be shipped loose.

.10 Redundant High Temperature Cut-out; (manual reset) wired to boiler controller to shut boiler down on a rise in boiler temperature above the setpoint of 121 ^{o}C.

.11 Boiler local controller shall be capable of providing start/stop requests for the control of associated hot water boiler circulation pump.

.12 Boiler drain connection and carbon steel valve: NPS 2.

.13 Boiler top of vessel vent connection with steel isolating valve.

.14 Flue gas temperature connection and thermometer with stainless steel thermowell: Range 65 to 400 □C.

.15 Provide one spare 25 mm NPT connection, (waterside top header of boiler) for future instrumentation.

2.4.3 Utility Cooling Air

.1 Any utility cooling air required by the boiler package to be sourced from the FD fan air flow.

.2 Provide any cooling air piping/tubing that is needed

2.5 FORCED DRAFT FAN

2.5.1 The fan supplied will be sized to provide sufficient static pressure so as to overcome all system losses (including estimated external exhaust backpressure identified in specification item 2.2.4-Performance).

2.5.2 Airflow from fan to allow for any boiler package utility cooling air requirements, such as observation port cooling or scanner cooling.

2.5.3 The fan shall be heavy duty with backward inclined bladed wheel. Completely shop assembled, including heavy-duty bearings, radiation shields if required.

2.5.4 The fan is preferred to be floor mounted or skid mounted.

2.5.5 Provide an air intake silencer assembly for the FD fan to draw room air from a minimum elevation of 2.5 meters above the floor.

2.5.6 The FD fan will be equipped with an air intake modulating damper, controlled by the boiler control system in coordination with the VFD fan motor drive.

2.5.7 Fan inlet to be protected with an intake screen

2.5.8 The fan wheel will be statically and dynamically balanced to minimize vibration.

2.5.9 The fan rotating components shall be capable of operating at variable speeds.

2.5.10 The first critical speed shall be greater than the maximum fan operating speed plus 25%.

2.5.11 Provide noise attenuation for the FD fan and motor to mitigate fan noise being emitted into the room. Mitigation measures provided must be easily removed and reinstalled to allow the operator ease of access to the equipment for normal inspections and maintenance.

2.5.12 Shop drawings to provide noise level criteria to ensure compliance with specified noise limits.

2.5.13 Provide flex connectors at the fan inlet and fan outlet.

2.5.14 Air Ducting

.1 Provide combustion air duct between the fan discharge and burner combustion air inlet flange.

.2 Provide ducting as required on the suction side of fan

.3 Provide turning vanes in duct elbows that are greater than 45 degrees.

2.6 AUTOMATIC DRAFT CONTROL

2.6.1 General

.1 Application: Provide a self-contained automatic sequence draft controller for each boiler. The controller shall be microprocessor- based and suitable for flush, panel mounting. Provide a field mountable 4-20 mA pressure draft transmitter for measuring boiler outlet draft. Provide a high flue gas pressure (low draft) switch with 5 second delay for use in the flame safeguard limit circuit.

.2 The draft control system shall be monitored and managed by each boilers individual combustion control system.

2.6.2 Draft Controller

.1 Draft Controller: The Controller shall continuously indicate boiler draft, draft set point and alarm set point on a highly visible backlit LCD display. The control shall provide both automatic and manual damper control. Provide an integral or separate 4", 0.5% resolution (minimum) barograph display in engineering units with visual alarm indication. Provide a “High Boiler Pressure” alarm, “Alarm Silence” pushbutton and one 10 ampere alarm relay output. The housing shall be mounted in the burner control panel, and be fully gasketed with NEMA 4 front face. All adjustments shall be made from the front panel display in engineering units. The controller shall include setup menus for easy operation, tuning and troubleshooting from the Controller faceplate. No external configuration tools shall be required.

.2 Automatic Draft Sequence: The controller shall include an automatic draft sequence as follows: During burner “off” periods the draft control damper shall remain closed to hold residual heat within the boiler. On a call for burner operation the outlet damper shall be driven open for pre-purge. To prevent pressurizing the boiler, the burner fan shall start after a field adjustable time delay after starting to open the draft damper. The damper shall remain open for burner light-off. When the fuel valve opens, the draft control damper shall be released from the open position and modulate as required by the draft set point. During normal burner shut-down the damper shall be driven open during the post-purge period and then closed when the fan stops. Abnormal burner shut-down (safety lock-out of flame safeguard control) shall cause the damper to drive open where it shall remain until the flame safeguard system is reset. The controller shall interconnect with the flame safeguard system directly using 120Vac signals.

.3 Draft Damper Modulation: When the precise draft control mode is required, the controller shall provide boiler outlet damper modulating control based on characterizable firing rate feed-forward signal to assure stable draft during load changes and “GAP” PID Draft Control for improved stability. Provide a firing rate potentiometer or firing rate output from the firing rate controller. The controller shall be capable of establishing an adjustable position for burner light-off. Each fuel shall have an independent light-off position. The controller shall not close the light-off contact output unless the damper is above the proper position and the pressure is below the starting draft set point. Alternately, the controller shall be field selectable to provide “Floating” draft control. When “Floating” draft control is selected, the controller shall provide proportional control of the boiler outlet damper to maintain boiler draft at set point using a 24Vac, Triac positioning output.

.4 Draft Range Transmitter and High Pressure Switch: Provide a draft range transmitter and high pressure (low draft) switch with time delay relay. Both shall be supplied with field mountable, dust-tight, splash- proof enclosures. A single draft connection shall be piped to -1"wc to +1"WC 4-20 mA transmitter and an independent low draft switch. The low draft switch set point shall be field adjustable from +0.15"wc to +4.0"WC. The low draft switch shall be mounted and wired to a pilot light so as to illuminate when the low draft switch activates and to a 5 second time delay relay so as to provide an isolated “Low Draft Cut- Out”, 10 ampere contact for use in the flame safeguard limit circuit. The time delay feature helps avoid nuisance burner shutdowns due to momentary draft fluctuations.

.5 Draft Damper Actuator: Provide an electric Draft Damper Actuator for each boiler. The actuator shall have adequate power to automatically position the damper and shall be suitable for control by the Draft Controller. The actuator shall be totally enclosed in a dust-tight housing; have integral, snap-action,

travel limit and open proving switches, be capable of being stopped, started, or instantly reversed without loss of power or overloading. A double ended output shaft shall have an integral brake for precise positioning without backlash and rotate 90º in 30 seconds. When the precise draft control mode is selected, the actuator shall include an electrically isolated feedback potentiometer.

.6 Draft Damper Assembly: Provide a factory assembled boiler outlet damper assembly for each boiler. The draft damper shall be a circular dual opposed blade design, with appropriate inside diameter to match breeching size, constructed of 10 gauge rolled steel. Non-opposed blade damper designs are not acceptable. Factory mount the draft damper actuator, draft range transmitter and time delayed, high pressure (low draft) cut-out assemblies (described in the above paragraphs) on the damper assembly. The damper actuator and damper assembly shall be stroked at the factory to ensure proper alignment. "Shipped Loose" components will not be accepted.

.7 Communication: The Instrument shall include an interface to communicate to the burner management system.

.8 Quality Assurance: The Instrument shall be manufactured and labeled in accordance with UL508 (CSA C22.2 #14 for use in Canada). Inspection and labeling shall be supervised by UL or other OSHA approved Nationally Recognized Test Lab (NRTL).

2.7 FUEL GAS TRAIN AND BURNER – FULLY MODULATING

2.7.1 General:

.1 Forced draft operation with FD fan to supply required combustion air complete with modulating air damper, motor, high voltage ignition transformer, flame observation port.

.2 Provide easy access to nozzle-electrode-pilot assembly.

.3 Gas train connection will be located on the left hand side when facing the burner.

.4 Modulating gas flow control valve, modulating air damper, and modulating FGR flow control valve (if required) to be individually actuated directly by direct drive servomotors.

.5 The Manufacturer is responsible for providing boiler fuel trains that meet the requirements of CSA and the provincial fuel safety regulator.

.6 Provide one natural gas connection at skid edge that supplies fuel to the main and pilot gas train.

2.7.2 Main Burner:

.1 Fully modulating and setup for natural gas as primary fuel.

.2 Blast tube, combustion cone and diffuser to be constructed of high temperature stainless steel.

.3 Flue Gas Recirculation with direct servo actuated FGR flow control valve

.4 Burner system Turn down Ratio for continuous operation; a minimum of 8:1 (natural gas firing).

.5 Fan / burner noise level – Provide data as requested.

.6 Emissions Requirement: Refer to Section 2.2.4 Performance, above for emission limit requirements.

.7 Flame viewing port

2.7.3 Combustion air damper

.1 Fully modulating and works with variable speed fan to obtain stable low turndown burner operation

.2 Zero leakage when shut

.3 To be directly actuated by servo motor.

2.7.4 Main gas train:

.1 Natural gas is provided at an operating pressure between 55 kPag and 90 kPag, at the entrance to each fuel gas train. It is the vendors responsibility to provide additional pressure regulation as required to allow their fuel gas trains to operate to meet the boiler performance requirements specified.

.2 Gas pressure regulator(s) shall be provided on the boiler skid that is adequately sized for the available gas pressure and will be capable of controlling gas pressure to the burner throughout the firing range.

.3 High and low gas pressure interlocks will be provided, to prevent burner operation due to high or low natural gas pressure condition.

.4 Two motorized direct driven gas shutdown valves with proof of closure switches and automatic vent solenoid valve will be provided to positively prevent gas from entering the burner in the event of the opening of any boiler or combustion system limit switch. Safety shut off valves will be interlocked with the flame safeguard control.

.5 Manufacturer shall confirm with the local boiler authority if automatic reset of gas valves is allowed. If not, the gas valves shall be provided with operator manually operated reset latches.

.6 Fuel flow control valve will be direct servo motor driven.

.7 Provide a test fire valve for the gas supply line connecting to the main burner.

.8 Gas trains will be supplied with TSBC and CSA approvals, with individual components CGA/UL approved as a minimum standard of acceptance. Manual shut off valves, leak test connections and pressure gauges are to be provided in accordance with code requirements.

.9 All components including main shut-off cock, pressure regulator, motorized electric shut-off valve, downstream block/test cock with test connection and gas pressure gauge, used to construct the complete factory assembled gas train, shall bear CRN numbers for province of installation, and meet all boiler safety authority, local code, and provincial regulations. All electrical components shall be CSA approved and stickered.

2.7.5 Gas pilot:

.1 The pilot gas line will take its supply from the main gas supply line connected to the main fuel gas train.

.2 A gas pressure regulator shall be provided that is adequately sized for the available gas pressure and will be capable of controlling gas pressure to the burner for pilot gas.

.3 Two solenoid operated gas shutdown valves will be provided to positively prevent gas from entering the burner in the event of the opening of any boiler or combustion system limit switch. Safety shut off valves will be interlocked with the flame safeguard control.

.4 Provide a test fire valve for the gas supply line connecting to the pilot burner.

.5 Pilot gas trains will be designed to comply with CSA requirements, with individual components CGA/UL approved as a minimum standard of acceptance. Manual shut off valves are to be provided in accordance with code requirements.

.6 Components to meet all boiler and fuel safety authority, local code, and provincial regulations.

.7 The supplier is responsible for obtaining all provincial fuel safety certifications/approvals required for the fuel train.

.8 All relief's and vents shall be piped to skid edge as applicable for installation contractor to tie vent line(s) to.

2.8 CONTROLS

2.8.1 General

.1 Meet the requirements of CSA B-51, CSA B149.3, and provincial boiler safety authority's, operating engineers' regulation.

.2 Provide dedicated controllers, one for combustion control and one for burner management as required by CSA codes.

.3 Electronic combustion control relay with a CSA/TSBC approved flame detection sensor to supervise flame when operating beyond 24 hours. Control function is to shut off fuel upon pilot flame or main flame failure or in response to a safety interlock signal within code requirements, and to ensure, in sequence:

.i Pre-purge,
.ii Pilot ignition and supervision,
.iii Main gas valve opening,
.iv Pilot cut-off,
.v Burner operation.

.4 Provision of Standard Boiler Safeties with visual and audible alarms for;

.i Burner shut-down due to flame failure
.ii Low combustion air pressure
.iii Low fuel pressure
.iv Low water level cutoff.

.5 Provision of General Supervision / unattended operation related plant safeties with visual and audible alarms for;

.i High Temperature Cut-out; hard wired to boiler control circuit to shut down boiler on a rise in boiler temperature. Set point to be: 121 □C (250 F).
.ii Combustion Air Interlock; shut-off burner on loss of status from combustion air fan.

.6 Manage the draft control sub-system.

.7 On startup the FGR damper (if provided), will remain closed to allow exhaust temperature to warmup before starting to modulate. This is to minimize condensation in the burner housing at startup.

.8 Boiler controller is capable of automatically keeping unit in standby condition when next in line for operation, in order to minimize wait time (<5 minutes) when the boiler is requested to start.

.9 Boiler controller will limit firing rate as required to ensure maximum warm up rate from a cold start or maximum heat up rate from a standby temperature is not exceeded in order to prevent damage to the boiler.

.10 Provision for hardwired boiler fail general alarm contact that will collectively include flame fail, combustion air fail, and low water cutoff events.

.11 Provision of contacts to allow the wiring of the boiler room combustion air inlet damper end switch as a safety interlock.

.12 Factory mount all boiler control panels on skid, and prewire to all sensors/control elements.

.13 Allow the plant control system to monitor start and stop sequences, operating parameters, and alarms.

.14 Allow the plant control system to start stop the boiler, alter outlet temperature setpoint or firing rate remotely.

2.8.2 Burner Control Cabinet

.1 Provide burner control cabinet for each burner. The cabinet will be designed and factory mounted on skid, adjacent to the burner to form an integral part of the boiler package. The control cabinet will house the burner management controller, operator interface display, fuses, relays, transformers, control switches and indicating lights as specified herein.

.2 The control cabinet will be complete with individual lights with nameplates to indicate "Power On", “Fuel On”, "Load Demand", "Flame Failure", and “General Fault”.

.3 The following control switches will be provided as a minimum. “On / Off”, “Hand / Auto”, “Low Fire Hold”, “Fuel Curve Select”, “Reset”, “Flame Failure Reset”, and “Manual Increase / Decrease Firing Rate Push Buttons”.

.4 Cabinet Enclosure rating: Nema 12

2.8.3 Combustion Control and Burner Management

.1 Provide a fully integrated controller(s) that will be fully capable of fuel / air ratio control throughout the entire firing range of the burner, such that no mechanical linkages are required for operating the combustion air inlet damper, fuel flow control valves, and or auxiliary dampers. The control for the specified burner and selected fuel(s) will include all necessary interface wiring, software and hardware for a complete fuel / air metering and flame safeguard system. The system will be easily programmable with the flexibility of optimizing combustion quality and fuel efficiency throughout the load range.

.2 The controller will employ PID control loop(s) to maintain the boiler outlet temperature at set point.

.3 The combustion and burner management controller(s) shall be housed in a control cabinet or panel that is mounted to the boiler skid. The control panel will also contain a minimum 10 inch display panel, power supply, and graphical operator interface with keypad, auxiliary relays, and other control devices as required.

.4 The control display screen will display process data and status indication. Individually selectable displays will also be available to provide the following continuously updated information:

.i Status display – fuel fired, % firing rate, setpoint temperature, actual temperature, run hours.

.ii Control Inputs and Outputs - Servo motor position, Analogue inputs including O2 trim values.

.iii Real time values of measured O2, exhaust gas temperature, differential temperature and combustion efficiency.

.iv Sequencing Status - Boiler designation, lead boiler designation, reduced set point, lag boiler hot standby firing sequence and current status.

.v Variable Speed – display of analogue input and output from VSD.

.vi Display of current burner safety / safeguard sequence logic, with indication of current status showing:

i. Flame intensity signal strength for flame.
ii. Post purge time and actual position in cycle.
iii. Pre Purge time and actual position in cycle.
iv. Combustion air damper / VSD speed position.
v. Current firing rate status.
vi. Main fuel valve status (open or closed).
vii. Pilot fuel valve status (open or closed).
viii. Spark ignition status.
ix. Combustion air fan (running or standby).
x. Lockout or run status message.
xi. Lockout reset capability.

.vii Fuel Gas Valve Proving - Graphical display of main fuel shutdown valves and vent valve during each valve proving sequence will be provided.

.viii Combustion Air Sensor - Graphical display will indicate commissioned and on line combustion air pressures.

.ix Flame Scanner – Display and continuous monitoring of the minimum required flame signal strength.

.x Lockout History - Display of the last first out annunciated 15 limit circuit lockouts, controller error history with a description of the lockout or error the time and date occurred and the reset time and date.

.xi The controller will provide a first out annunciation functionality that outputs the first out fault to the plant control system.

.5 The boiler controller will allow the boiler outlet water temperature set point to be set remotely from the plant control system at any time or locally adjusted at the boiler control panel via increase/decrease setpoint buttons on the panel.

.6 Interlocks shall be provided to continuously monitor and prove air flow at all times during purge cycles and operation.

.7 Combustion air inlet damper shall close when boiler is off.

.8 Electronic safety control shall be interlocked with a self checking flame scanner signal providing continuously monitored and verified flame signal intensity by detection of ultraviolet radiation.

.9 The controller will be capable of setting commissioned options and parameters to suit the specific application including but not limited to the following:

.i Designation of boiler operating range.

.ii Adjustable burner modulating ramp up speed.

.iii External modulation control.

.iv Automatic Cold Start routine to prevent thermal shock or excessive condensation.

.v Flue gas recirculation (FGR) management.

.vi Alarm signal outputs.

.vii Outside temperature compensation.
.viii Adjustable purge time.
.ix Adjustable pilot and main flame proving time.
.x Adjustable flame signal strength threshold.
.xi Selection for operation with a standard or self checking UV or IR scanner.
.xii Fuel valve and vent valve proving with adjustable high and low gas pressure limits.
.xiii Adjustable wind box pressure limits.
.xiv Password settings to prevent unauthorized access to commissioning routines.
.xv Independent adjustable Proportional Band, Integral Time and Derivative (PID) control loops.

.10 The controller setup and operating parameters shall be field adjustable.

.11 Password protection to be provided to prevent unauthorized access to settings and or commissioning routines.

.12 The controller provided must also be capable of performing the following functions or interfacing with the following manufacturer supplied peripheral equipment:

.i O2 trim system
.ii Flue gas recirculation system
.iii Gas valve proving sensor
.iv Combustion air sensor
.v Flue gas draft control damper system

.13 The existing plant control system will monitor and manage the operation of the boilers to be supplied. The communication interface between the boiler controllers and plant control system will utilize the following connection type.

.i Modbus TCP/IP interface over Ethernet connection.

.14 Provide the communication data reference addresses for the monitoring of the following minimum process parameters on each boiler:

.i Boiler startup sequence of events including fan start, prepurge start, prepurge finish, gas on, ignition, flame confirmed, load % ramp up, normal operation.
.ii Boiler shutdown sequence of events including fan stop, post run purge start, post run purge finish, gas off, flame off confirmed, load % ramp down, boiler off.
.iii Burner firing status
.iv Percent Firing Rate.
.v Required outlet temperature
.vi Actual outlet water temperature.
.vii Fuel selected natural gas or oil
.viii Low water level alarm.
.ix Flame Failure alarm.
.x Combustion air failure alarm
.xi High Water temperature shutdown alarm
.xii Low waterside flow alarm
.xiii Controller fault
.xiv Low gas pressure alarm
.xv High gas pressure alarm

.15 Hardwired Controls. Provide the following hard wired control points:

.i Boiler enable/disable
.ii Combustion air damper open permissive interlock
.iii Boiler outlet water temperature setpoint
.iv Emergency shutdown

.16 The controller housings or panel in which it is installed shall be rated NEMA 12 or NEMA 4.

2.8.4 Boiler Exhaust Gas Trim System

.1 Provide an O2 Trim System that shall be fully capable of fuel / air ratio control throughout the entire firing range of the burner, by controlling the operations of the combustion air input damper, FD fan speed, and fuel input valves. The trim system shall be furnished by the boiler supplier for the specified burner and selected fuel(s) and shall include all necessary interface wiring, software and hardware for a complete fuel / air metering and trim system.

.2 Provide monitoring devices for continuously sensing exhaust gases for O_2, and stack temperature.

.3 The system shall measure and display O_2, exhaust gas temperature and boiler combustion efficiency. Concurrently, the system shall provide the necessary control signals to automatically adjust the air damper position, flue gas damper position, and or FD fan speed to ensure that the originally entered commissioning values are maintained, regardless of variations in stack pressure, fuel pressure, or barometric conditions.

.4 A visual display will be provided that graphically displays operating components and current value data labels.

.5 The trim system component housings or enclosures shall be rated for NEMA 12 service.

2.8.5 First Out Indication (Remote Output)

.1 Provide “First Out Indication” (originating cause of failure) for all alarms, shutdown devices, and or controller errors, as remote outputs to the plant control system.

2.9 VARIABLE FREQUENCY (SPEED) DRIVE – FD FAN

2.9.1 The combustion air fan shall be operated with a Variable Frequency Drive (VFD). Each fan will be equipped with a separate, dedicated VFD rated for 115% of the full load amperage rating of the fan motor.

2.9.2 Each VFD shall be supplied with bypass.

2.9.3 The drive package shall be a complete factory wired and tested system consisting of:

.1 A padlockable disconnect device

.2 Drive output contactor,

.3 Bypass contactor,

.4 Drive input fuses.

2.9.4 VFD shall be supplied with input disconnect switch with VFD fuses, the short circuit current rating shall be 100KA.

2.9.5 The bypass shall be designed for stand-alone operation and be completely functional in both

Hand and Automatic modes, even if the drive and/or drive's control board has failed. Network communications shall remain functional. Bypass systems that do not maintain full functionality in the event of a drive failure, are not acceptable.

2.9.6 The VFD shall be suitable for use with Premium Efficiency, EEMAC Class F insulation, Class B, 600V motors.

2.9.7 The VFD shall be fully digital microprocessor based pulse width modulated type (PWM).

2.9.8 The power cable run length from each VFD to its associated motor shall be as per manufacturer requirements. Each VFD must be capable of delivering power at the motors minimum acceptable power quality over this distance

2.9.9 All VFD cables to equipment shall be VFD rated cable and shall be supplied with corrugated aluminum sheath and three bonding conductors.

2.9.10 Provide VFD with input passive harmonic filter.

2.9.11 The manufacturer shall supply Passive harmonic filter with following features:

.1 Shall meet the standard 1519 for both current and voltage distortion.

.2 The passive harmonic filter shall eliminate all harmonics generated by the VFD, The total harmonic distortion shall be less than 5%.

.3 The passive harmonic filter shall be capable to overload up to 150% for 60 second each 10 minute.

.4 The short circuit current rating shall be 100KA.

.5 Efficiency of the passive harmonic filter shall be 99% and the enclosure shall be type NEMA 3R.

.6 Standard of Acceptance: Mirus, TCI, or equivalent

2.9.12 The contractor shall provide optional price for load side reactor with following features:

.1 Shall be dv/dt output filter.

.2 Voltage: 600V.

.3 Imedance value: Low Z.

.4 Shall be UL listed.

.5 Enclosure Class: NEMA 3R

.6 Standard of acceptance: TCI or equivalent

2.9.13 Provide VFD two (2) year warranty

2.9.14 Provide VFD factory-start-up/commissioning

2.9.15 Control Transformer 600 / 120V

2.9.16 Approvals:

.1 CSA approved.

.2 CUL Listed

2.9.17 Enclosure: NEMA 12

2.9.18 Provide free standing mounted cabinet.

2.9.19 Interface:

.1 Local fusible disconnect switch.

.2 Door Interlock Disconnect Switch

.3 Control Features

.4 Push Buttons

.5 Indicating Lights

.6 E-Stop

.7 Elapse Time Meter

2.9.20 Control panel c/w backlit display with full graphic display, bypass shall have separate display.

2.9.21 Input keypad for manual operation.

2.9.22 Analog speed reference output

2.9.23 0-10VDC isolated control input and output signals.

2.9.24 Dry-contact for VFD fault and VFD run status.

2.9.25 Hand/Off/Auto buttons/switches

2.9.26 Modbus TCP/IP over Ethernet Protocol

2.9.27 Ethernet IP Adaptor

2.9.28 Performance:

.1 5% Input Line Impedance

.2 97% or greater efficiency at full load

.3 Power factor greater than 0.95 at all loads

.4 +/-10% voltage tolerance with no change in output

.5 Input power passive harmonic filter to limit harmonic distortion to less than 5% at the point of VFD connection to main 600V power supply.

.6 No single harmonic to be greater than 3%.

2.9.29 Protection:

.1 Electronic Motor overload protection

.2 Transient voltage surge suppression.

.3 Phase to phase short circuit.

.4 Phase to ground short circuit.

.5 Over temperature sensor

.6 Rotating motor start

.7 Overload current versus time function

.8 Over/undervoltage protection

.9 Ground fault protection.

.10 Over/under frequency

.11 Loss of phase

2.9.30 Service Conditions:

.1 Ambient temperature: -15°C to 40°C

.2 Relative Humidity: 0 to 95%, non-condensing

2.9.31 Display: Over Voltage, Under voltage, Overcurrent, Overload, Overload Temperature, Ground Fault, Output Speed, Motor Amps, Output Motor Volts, GPM, Inverter fault, kWh, Elapsed Time.

2.9.32 The VFD and all components will be located in the process area.

2.9.33 Standard of Acceptance: ABB, Danfoss, Schnieder or equivalent

2.9.34 The VFD and all components shall be located local to the boiler and interlocked with the combustion control system. Factory test and pre- commission the VFD system prior to shipping to project site.

2.10 MOTORS

2.10.1 575V motors shall be suitable for across-the-line starting and operation on the following system:

.1	Nominal System Voltage:	575V □ 10%
.2	Phases:	3
.3	Frequency:	60 Hz □ 1 Hz
.4	System Neutral:	Solidly grounded
.5	Ambient Temperature Operating Range:	Max. 40□C; Min. -45□C

2.10.2 Motor Ratings: Motors shall be Premium Efficiency, EEMAC Class F insulation with Class B rise, 1.15 service factors, TEFC and shall be selected as follows:

.1 Motor 2 HP up to and including 200 HP shall be rated 575V, 3-Phase, 60 Hz.

.2 Motor less than 2.0 HP shall be rated 230V, 1-Phase, 60 Hz.

.3 Motors for use with variable frequency drives shall be certified as Inverter Duty and meet the requirements for inverter duty motors, in accordance with NEMA MG-1 Part 31.

2.10.3 Enclosures: Motors shall be NEMA T-frame unless otherwise noted. Motor frames shall be of cast iron and end shields shall be cast iron or pressed steel. External hardware, external and internal surfaces shall have corrosion resistance treatment. Frames shall have a tapped and plugged drain hole to allow drainage of moisture from low spots of motors.

2.10.4 Starting Requirements, Torque Classification and Running Conditions

.1 Motors shall be suitable for across-the-line starting and shall be capable of making the number of starts stated in NEMA MG 1-20.50.

.2 Motors shall be capable of accelerating the load in accordance with NEMA MG 1-12.39 design 'B' (80□C).

.3 The locked rotor torque of EEMAC design 'B' motors shall be in accordance with NEMA MG 1-12.37.

.4 Motors shall operate successfully under running conditions at rated load with a variation in the voltage or the frequency in accordance with NEMA MG 1-12.45.

.5 Motor starting current shall not exceed 6.5 times rated full load current. Motors shall be capable of withstanding the number of starts imposed by the driven equipment without appreciable loss of service life.

.6 Motors shall be capable of producing satisfactory operation of the driven equipment

during short duration (up to one minute) dips to 75% of rated voltage.

2.10.5 Windings:

.1 The end windings and terminal leads shall be suitably braced to prevent movement under heavy starting conditions.

.2 All windings shall be insulated with a non-hygroscopic Class F (155□C) varnish and suitably vacuum impregnated and dipped to provide full protection against humid conditions.

2.10.6 Bearings and Balancing:

.1 Bearings shall be provided with seals so that direct moisture or lubricant leakage around the seals will not enter the motor.

.2 20 Hp & Less: Double shielded permanently lubricated ball bearings.

.3 25 Hp & More: Bearings shall be provided with lubricant fittings and removable drain plugs which are made completely accessible to allow Owner's Plant maintenance crew to lubricate them while in service.

.4 Bearings on motors provided with variable frequency drives shall be insulated for inverter duty.

.5 Bearings shall meet the requirements of the referenced standards and shall be chosen to have a minimum rated life of 100,000 hours.

.6 1800 and 3600 RPM motors of 100 HP and over shall not exceed the dynamic balance limit of 1 mil (amplitude).

2.10.7 Shaft Grounding Rings:

.1 Provide Aegis shaft grounding ring for electric motors driven by VFD controller.

.2 Quantity and location of ring(s) are as recommended by Aegis, based on motor size and service.

2.10.8 Terminal Boxes and Terminals:

.1 Terminal boxes shall be located on the right hand side of the motor when viewed from the driving end (F-2 mounting), located approximately on the horizontal centre line of the motor, unless otherwise stated.

.2 Terminal boxes shall be oversized and equipped with a gland plate, which shall be of adequate thickness to accommodate mechanical type compression glands and shall allow for grounding of the terminal box.

.3 Terminal box covers shall be designed to permit the terminal box assembly to be rotated in any one of four directions at 90 deg. displacements to facilitate easy cable/ conduit access.

.4 Each terminal box shall have the facility to accommodate an incoming 4 conductor copper cable (3 power and 1 ground), and shall be complete with connections and through a neoprene or butyl rubber seal plug of watertight design.

.5 Terminal box shall be suitable for the incoming cable sizes as per the CSA requirements.

.6 The leads shall be identified by means of sleeves marked as follows: T1, T2, and T3.

2.10.9 Other Motors:

.1 Single-phase motors shall be totally enclosed capacitor type 120V, 1- Phase, 60

Hz, with integral thermal overload protection.

.2 Direct current motors shall be rated 120V DC and shall be capable of operation from 105V DC to 140V DC.

2.10.10 Space Heaters: Space heaters shall be provided for motors located outdoors, in accordance with the motor data sheets.

2.10.11 Grounding Termination: The grounding lug shall be located on the main terminal box side of the motor and preferably in the web of the support frame. Each conduit box shall be provided with a ground connection point.

2.10.12 Nameplates:

.1 Nameplates shall be of stainless-steel construction and stamped in accordance with NEMA MG 1-10.38.

.2 The equipment tag number and purchase order number shall be stamped on the nameplate or on a separate plate firmly fixed to the motor frame.

2.10.13 Painting: Metal surfaces that are to be painted shall be cleaned to the equal of a commercial finish as defined in the Steel Structures Painting Council Manual (SSPC-SP6) and shop painted with the manufacturer's standard finish.

2.10.14 Noise Level: The motor no-load overall sound level when measured at a distance of 1.0 meter shall not exceed:

.1 Up to and including 30 HP: 75 dBa

.2 Larger than 30 HP up to and including 150 HP: 80 dBa

.3 Larger than 150 HP: 85 dBa

2.10.15 Factory Tests:

.1 Each motor shall be subject to routine tests in accordance with NEMA Standard MG 1-12.51 and IEEE Standard 112A.

.2 For motors greater than 100 HP, the Seller shall provide the test reports to the Owner prior to shipment.

.3 The Seller shall guarantee the motor losses quoted in the motor data sheet. Motors that fail to meet the guaranteed losses shall be replaced with motors that meet or exceed the efficiency, at no cost to the Owner.

2.10.16 Standard of Acceptance:

.1 For Motors powered by VFD's: Premium Efficiency Inverter Duty

.2 For Motors 3 HP and greater: Manufacturer's Premium Efficiency.

.3 For Low Voltage Motors: Manufacturer's Premium Efficiency

3 PART 3 - EXECUTION

3.1 GENERAL

3.1.1 The boilers will be installed by the Owners Installation Contractor in accordance with ANSI/ASME Boiler and Pressure Vessels Code Section IV, regulations of the Province having jurisdiction, except where specified otherwise, and manufacturer's recommendations. This will include the following devices which will be provided by the manufacturer and shipped loose or installed on the boiler skid;

.1 Water temperature transmitters

.2 Water level and flow switches

.3 Gas line vent valves – Owner's installation contractor to provide all pipe and fittings for vent lines leading from vent valves

.4 Pilot Gas train - Owners installation contractor to provide all pipe and fittings to connect natural gas supply to gas train.

.5 Relief valves

3.1.2 The boiler will be set and secured to a concrete housekeeping pad.

3.1.3 Natural gas fired installations - in accordance with CAN/CGA-B149.1, and B149.3.

3.1.4 Fuel oil fired installations (if applicable) - in accordance with CAN/CGA-B139.

3.2 CONTROL INTEGRATION WITH BALANCE OF PLANT

3.2.1 Successful boiler supplier shall provide technical support to the controls contractor or automation engineer during the design of the control interface between the boiler controls and the plant control system.

3.2.2 Technical support from the Manufacturer shall be provided by a controls technician with factory training and proven experience in the specific burner management/boiler controls system supplied.

3.2.3 The owner shall reserve the right to review and accept the proposed control technician based on their qualifications.

3.3 ELECTRICAL INSTALLATION

3.3.1 Installation shall be done in accordance with:

.1 CSA C22.1– Canadian Electrical Code, Latest edition.

.2 Provincial Electrical Safety Code and Bulletins, latest edition.

.3 Regulations and requirements of the local inspection authority.

.4 Original equipment or device manufacturer's instructions.

.5 Standard practice.

3.3.2 VFD's preferred to be mounted on skid by boiler manufacturer. Alternatively, the VFD's can be shipped loose for installation on free standing panel near

boiler by the installing mechanical contractor. Coordinate with the electrical contractor.

3.3.3 Do not install electrical and control equipment at locations where other equipment is to be installed, obstruct walkway, or makes inaccessible or hard maintenance access.

3.3.4 Do not install electrical power, control wiring, instrumentation or data cables in the same conduit. Use dedicated conduits. Control wiring into and out of control panels having more than three devices, must go through rail mounted terminal strips. Keep up adequate clearance between electrical raceways and piping or mechanical equipment.

3.3.5 Provide equipment grounding and bonding to meet regulatory requirements. Bond together individual boiler structural elements, metallic piping, tanks and other metal object. Ground electrical systems and control circuits.

3.4 PAINTING

3.3.6 All fabricated components shall be supplied with a minimum of primer and two coats of finish paint. High temperature rated primer and paint shall be used throughout.

3.5 INSTALLATION AND COMMISSIONING

3.5.1 The Owner's Commissioning Authority or designated representative shall coordinate the commissioning of the complete facility.

3.5.2 Manufacturer to:

.1 Provide commissioning services as part of a coordinated effort for the total facility.

.2 Review installation using factory trained service personnel.

.3 Start up and commission each boiler with a factory trained technology center engineer or technician, and burner management system factory trained technology center engineer or technician.

.4 Carry out on-site operating and performance verification tests.

.5 Confirm correct interface and remote operation with plant digital control system.

.6 Demonstrate operation and maintenance.

.7 Operate boiler to demonstrate that each is capable of attaining full load output at the minimum efficiency identified in the submitted datasheets.

.8 Extended continuous operational testing to be accomplished when the heat demand from the district heating system is large enough. This may require a return trip to site by the boiler supplier for final full load setup, within the first 5 years of operation.

3.5.3 Manufacturer Inspection reports shall be provided to the Owner, after each visit during installation, commissioning, startup, and post startup.

3.5.4 The manufacturer shall indicate in their quotation the amount allocated for start-up and commissioning (minimum of seven working days). Field time allocated for field installation assistance and rates for additional field time.

3.5.5 The Manufacturer shall properly flush, clean, and dry all boiler piping and or control air tubing internal surfaces in factory prior to delivery.

3.5.6 The Manufacturer or designated representative will directly review the boiler water side chemical cleaning proposed procedures and approve the type of cleaning agent proposed. The Manufacturer or designated representative will be witness to the cleaning. Cleaning will be complete upon approval of the results by the Manufacturer or designated representative.

3.5.7 Provide Engineer at least 48 hour's notice prior to inspections, tests, and demonstrations. Submit written report of inspections and test results.

3.6 TESTING, TRIAL OPERATIONS AND ADJUSTMENTS

3.6.1 The Manufacturer shall test controls, all moving parts and their electric motors and/or pneumatic operations before trial operation. Coordinate expected impact due to boiler testing with other suppliers of equipment installed in the plant, prior to the beginning of any test. Specifically, ensure that no instruments can be damaged due, for example, to abnormal input conditions, and that no motors can cause damage due to reverse rotation, etc. In case tests are not satisfactory to the Manufacturer or the Commissioning Authority, the Manufacturer shall immediately proceed to correct the Work, then another test shall be applied and this will continue until the Commissioning Authority is satisfied. The Contractor would remain in charge of the facilities during all tests. The manufacturer is required to conform to all contractor safety protocols while onsite, and to coordinate with the contractor as it relates to safety.

3.6.2 After the testing is satisfactorily carried out the Manufacturer shall undertake trial operations and performance tests with the burning of natural gas of a minimum quality listed in the Manufacturers quotation.

3.6.3 The Manufacturer shall provide a method, to be approved by the Commissioning Authority, how to measure and prove the performance of the installed boilers. The Owner has an energy meter installed as part of the hot water plant piping system. The energy meter consists of an energy integrator, flow meter, and two temperature sensors.

3.6.4 The Manufacturer shall carry out the trial operation and the performance verification tests in the presence of the Commissioning Authority and/or any person and authority the Owner nominates to be in attendance.

3.6.5 The performance and capacity verification at 100% output is expected to take place during the first winter of operation when there is sufficient heating load on the system. If the trial operation or the performance tests reveals any shortcomings of the boiler system, the Manufacturer must rectify the deficiency immediately, adjust the boiler system and carry out new trial operations in the presence of same persons as the first trial operations.

3.6.6 Demonstrate that the equipment and devices, power and control systems actually meet the design intentions and specified requirements. Verify and test operation of remote control system.

3.7 FINAL INSPECTION

3.7.1 After testing, trial operation(s), adjustments and the Manufacturer's own final inspection, the Manufacturer shall request a final inspection.

3.7.2 The final inspection by the Owner and other personnel authorized by the Owner shall begin within eight working days of the Manufacturer's request.

3.7.3 Final deficiencies list will be issued after the inspection by the Engineer.

3.8 PERFORMANCE VERIFICATION

3.8.1 Following the completion of testing, trial operations, and adjustment, the Owner or designated representative shall operate each boiler such that the following can be confirmed, when firing on natural gas:

.1 Full load output is achieved and maintained continuously for a minimum half hour by each boiler.

.2 NOx levels remain at or below specified limits during full load and part load operation.

.3 Minimum turndown is to be verified when the boiler is operated continuously at minimum output for 2 hours.

3.9 ACCESS AND SERVICES BY OTHERS

3.9.1 The Owners Installation Contractor and Owners representative to provide a visual inspection of the boilers when they arrive at the site. Any deficiencies will be forward to the manufacturer.

3.9.2 Crane and forklift services for the unloading and hoisting into place of equipment and materials will be provided by the Owners Installation Contractor.

3.9.3 The owner will provide the heating load from the closed hot water heating system for use during boiler testing.

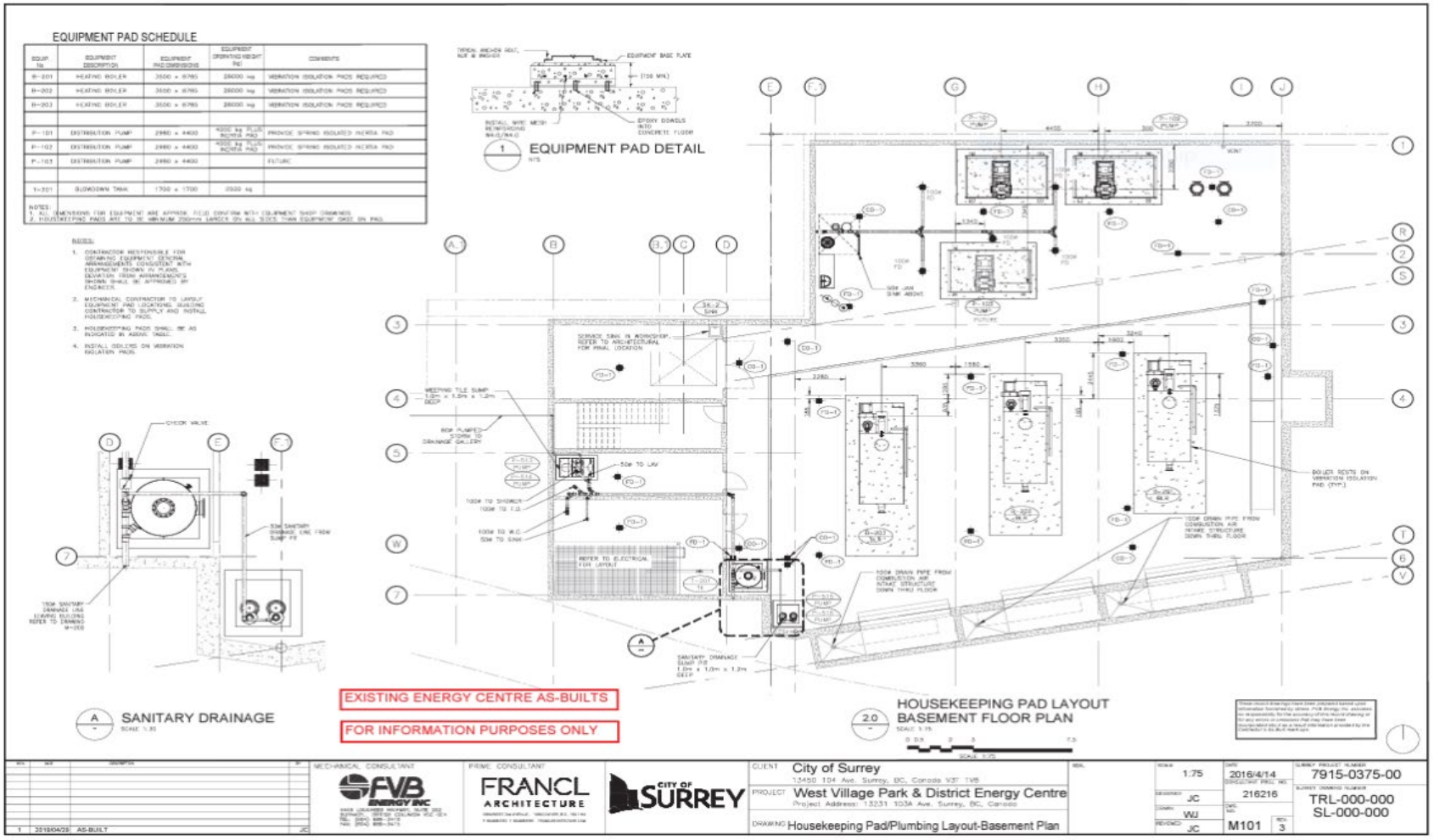
3.9.4 The owner will provide qualified operating engineer who will be responsible for the operation of the boiler systems but the boiler supplier will provide a boiler package that can meet the requirements for unattended operation.

3.9.5 The water treatment for the closed hot water heating system will consist of fabric filters, softened water, and the addition of caustic soda to control the pH in the system between

8.5 and 10.5. The owner will provide corrosion coupons to monitor the rate of corrosion in the system.

End of Section

SCHEDULE A-2 – CONTRACT DRAWINGS (PROJECT)



SCHEDULE B – FORM OF QUOTATION

RFQ Title: West Village Energy Centre - Hot Water Boilers

RFQ No: 1220-040-2023-014

CONTRACTOR

Legal Name: _____

Contact Person and Title: _____

Business Address: _____

Business Telephone: _____

Business Fax: _____

Business E-Mail Address: _____

CITY OF SURREY

City Representative: Sunny Kaila, Manager, Procurement Services

E-mail for PDF Files: purchasing@surrey.ca

1. If this Quotation is accepted by the City, a contract will be created as described in:
   (a) the Agreement;
   (b) the RFQ; and
   (c) other terms, if any, that are agreed to by the parties in writing.

2. Capitalized terms used and not defined in this Quotation will have the meanings given to them in the RFQ. Except as specifically modified by this Quotation, all terms, conditions, representations, warranties and covenants as set out in the RFQ will remain in full force and effect.

3. I/We have reviewed the RFQ Attachment 1 – Draft Quotation Agreement – Goods and Services. If requested by the City, I/we would be prepared to enter into that Agreement, amended by the following departures (list, if any):

Section	**Requested Departure(s)**

4. The City requires that the successful Contractor have the following in place **before providing the Goods and Services**:
   (a) Workers' Compensation Board coverage in good standing and further, if an "Owner Operator" is involved, personal operator protection (P.O.P.) will be provided, Workers' Compensation Registration Number _____;
   (b) Prime Contractor qualified coordinator is Name: _____ and Contact Number: _____;
   (c) Insurance coverage for the amounts required in the proposed Agreement as a minimum, naming the City as additional insured and generally in compliance with the City's sample insurance certificate form available on the City's Website at www.surrey.ca search Standard Certificate of Insurance;
   (d) City of Surrey or Intermunicipal Business License: Number _____;
   (e) If the Contractor's Goods and Services are subject to GST, the Contractor's GST Number is _____; and
   (f) If the Contractor is a company, the company name indicated above is registered with the Registrar of Companies in the Province of British Columbia, Canada, Incorporation Number _____.

   As of the date of this Quotation, we advise that we have the ability to meet all of the above requirements **except as follows** (list, if any):

   Requested Departure(s):

   _____

   _____

5. The Contractor acknowledges that the departures it has requested in Sections 3 and 4 of this Quotation will not form part of the Agreement unless and until the City agrees to them in writing by initialing or otherwise specifically consenting in writing to be bound by any of them.

Changes and Additions to Specifications:

6. In addition to the warranties provided in the Agreement, this Quotation includes the following warranties:

   _____

   _____

7. I/We have reviewed the RFQ Attachment 1, Schedule A – Specifications of Goods and Scope of Services. If requested by the City, I/we would be prepared to meet those requirements, amended by the following departures and additions (list, if any):

   Requested Departure(s)

   _____

   _____

Technical Proposal Form

8. Contractor should include in its technical submission information and documentation proposed for this project. Specifications and general information for the Goods listed above should be recorded on this form. Add rows as needed to include additional information.

Engineering Data: Contractors should complete, West Village Energy Centre, Phase 2 Hot Water Boiler, Specifications 42 11 13 Submittal Response Form attached to this Schedule B – Form of Quotation as Schedule B-1.

The Schedule B1 West Village Energy Centre, Phase 2 Hot Water Boiler, Specifications 42 11 13 Submittal Response Form is included to provide an example of information that is typically requested from Contractors.

Performance Data: Contractors should complete, Performance Data Sheet Response Form attached to this Schedule B – Form of Quotation as Schedule B-2.

The Schedule B-2 Performance Data Sheet Response Form is included to provide an example of information that is typically requested from Contractors.

Fees and Payments

10. The Contractor offers to supply to the City of Surrey the Goods and Services for the prices plus applicable taxes as follows:

F.O.B. Destination Freight Prepaid	**Payment Terms**: A cash discount of ____% will be allowed if invoices are paid within ___ days, or the ___ day of the month following, or net 30 days, on a best effort basis.			**Ship Via:**
Item	**Specifications / Description**	**Qty**	**Unit Price**	**Total Amount**
A	1500 BHP Hot Water Boiler Package	2	$	$
B	Engineering Submittals	1 Lot	$	$
C	Site Services, Training and Final Documentation	1 Lot	$	$
D	Delivery FOB Site	1 Lot	$	$
E	Spares (per Boiler) - Two (2) PSV - One (1) Low Water Cut Off - Two (2) High Temp Cut Off	2 Lot	$	$
G			Sub-Total:	$
H			Goods and Services Tax (5%):	$
I			B.C Provincial Sales Tax (7%), as applicable:	$

J	Total Quotation Price:	$
CURRENCY: Canadian Dollar Note: Overheads, General Conditions and Profit are to be included in the above amounts.		

Optional Pricing:

11. The following is a list of option prices to the Goods and forms part of this RFQ, upon the acceptance of any of the optional prices. The optional prices are an addition to the Total Quotation Price and do not include GST and PST. DO NOT state a revised Total Quotation Price.

Item	Description	Total Price
(a)	Optional reduced emission (NOx) boiler for both units.	$
(b)	Optional load side reactor for VFD's for both units.	$
(c)	Optional Boiler Storage for both units.	$
(d)	Optional Site Visit for Boiler Full Load Test.	$
(e)	One (1) year scheduled maintenance contract.	$
(f)	Two (2) year scheduled maintenance contract.	$
(g)	Five (5) year scheduled maintenance contract.	$
(h)	Recommended Spare Parts	$
CURRENCY: Canadian Dollar Note: Overheads, General Conditions and Profit are to be included in the above amounts.		

Delivery and Submittals:

12. Documentation Submittals will be provided _____ weeks after notice to proceed or purchase order.

13. Delivery of Equipment, FOB Site, will occur _____ weeks after receipt of submittal drawings with comments.

14. Delivery Delays due to rejected or unacceptable submittals will not be cause for the extension of delivery period indicated above.

Variations from Quotation:

15. We submit herein a list of alternatives (that will increase or reduce the base cost) including price revisions to our Quotation Price for the alternative and variations we propose to the Specification. The deduction may be applied singly or collectively to the Quotation Price.

We understand that should an alternative or variation be accepted by the City, it will be included in the contract documents as an addendum to the drawings and specification, and not issued as a change order.

None of the following variation sums have been included in the base Quotation Price. (Attach additional pages(s) as required).

Substitution/Alternates/Variations	**Add/Deduct**
	$
	$
	$
	$

Time Schedule:

16. Contractors should provide an estimated schedule, with major item descriptions and times indicating a commitment to provide the Goods and perform the Services within the time specified (use the spaces provided and/or attach additional pages, if necessary).

MILESTONE DATES _____

ACTIVITY	**SCHEDULE IN _____**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

Experience, Reputation and Resources:

17. Contractor's relevant experience and qualifications in delivering Goods and Services similar to those required by the Agreement (use the spaces provided and/or attach additional pages, if necessary):

_____

_____

18. Contractor's references (name and telephone number) (use the spaces provided and/or attach additional pages, if necessary). The City's preference is to have a minimum of three references. Previous clients of the Contractor may be contacted at the City’s discretion.

_____

_____

19. Contractors should identify and provide the background and experience of all key personnel proposed to provide the Goods and Services (use the spaces provided and/or attach additional pages, if necessary):

Key Personnel

Name: _____

Experience: _____
Dates: _____
Project Name: _____
Responsibility: _____

20. Contractors should identify and provide the background and experience of all sub-contractors and material suppliers proposed to undertake a portion of the Goods and Services (use the spaces provided and/or attach additional pages, if necessary):

Description of Goods & Services	*Sub-Contractors & Material Suppliers Names*	*Years of Working with Contractor*	*Telephone Number and Email*

21. I/We the undersigned duly authorized representatives of the Contractor, having received and carefully reviewed the RFQ and the Agreement, submit this Quotation in response to the RFQ.

This Quotation is offered by the Contractor this _____ day of _____, 2023.

CONTRACTOR

I/We have the authority to bind the Contractor.

_____
(Legal Name of Contractor)

_____ _____
(Signature of Authorized Signatory) (Signature of Authorized Signatory)

_____ _____
(Print Name and Position of Authorized Signatory) (Print Name and Position of Authorized Signatory)

SCHEDULE B-1 – WEST VILLAGE ENERGY CENTRE, PHASE 2 HOT WATER BOILER, SPECIFICATIONS 42 22 13. SUBMITTAL RESPONSE FORM

It shall be the Contractor's responsibility to carefully examine each item of the specification. All variances, exceptions and/or deviations from the preferred specification should be fully described.

Note: Contractors are directed to list complete manufacturers' details of model proposed in the right-most column.

Specifications	**Provided? (y/n)**	**Specifications of Goods Offered. (Contractor should complete all spaces in this column).**
1. Manufacturer or Contractor to provide unit performance data at full load and part load for summer and winter, in their standard format.		
2. Submit data in the format of the data sheets found in the appendices for base and optional boiler selections		
3. Performance is based on constant flow through each boiler, with the following winter and summer normal operating conditions.		
a. Summer Operation, 45C Plant Return Temperature with blended Boiler Inlet Temperature of 60.0C & Outlet / Supply Temperature of 80C.		
b. Shoulder Operation, 50C Plant Return Temperature with blended Boiler Inlet Temperature of 68.0C & Outlet / Supply Temperature of 88C.		
c. Winter Operation, 55C Plant Return Temperature with blended Boiler Inlet Temperature of 75.0C, & Outlet/Supply Temperature of 95C		
4. Descriptions of complete boiler system proposed, including controls and communication interfaces		
5. Flowsheet describing the process and utility connections for each boiler skid along with controls and instrumentation supplied.		
6. Package general arrangement drawings with maintenance space requirements, including access platform support points. General arrangement drawings must represent the total unit on a single drawing and will include the boiler vessel, burner, FD fan, and relief valves.		

7. Sizes, type of, locations, and details of process and utility connections will be provided on drawings.		
8. Maximum allowable differential water temperature across boiler at minimum inlet temperature.		
9. Minimum allowable differential water temperature across boiler.		
10. Minimum water flow and inlet temperature allowed through boiler for continuous operation.		
11. Maximum rate of heat up (degrees C per hour)		
12. Guaranteed Minimum continuous output; i.e., turndown capability, assuming the gas pressure delivered to the inlet of the gas train is between 55 kPag to 90 kPag. Vendor shall provide additional on skid pressure regulator(s) as needed to reduce natural gas pressure to an acceptable level for the proposed boiler package fuel gas train, if applicable.		
13. Required boiler gas train, flow, connection location, type and size.		
14. Amount of combustion air for the boilers, including any air preheating which may be required.		
15. The maximum electric power requirements for the skid package. Include a complete list of all electric motors, complete with sizing in connected kW_e, motor type, drive type and type of service (continual while firing, intermittent, etc.) include the total connected and an estimate of peak electrical demand impact of aggregate system.		
16. Contractor shall provide sound level data in octave bands for both the boiler (all exposed surfaces) and the boiler exhaust stack. The sound level data should be presented as either sound power levels, or sound pressure levels measured in free field at a distance of minimum 1 metre from the boiler surfaces and boiler exhaust outlet. Sound measurements shall follow either standard ISO 3744 or Standard ISO 3746.		
17. Guaranteed NOx and CO emission data in mg/m_3 (milligram per cubic meter) units corrected to 3% O2, dry basis at 20° Celsius and a pressure of 101.325 kilopascals.		

18. List of communicated control and operational parameters that are available for monitoring by the plant control system		
19. Factory recommended planned maintenance schedule and description of maintenance tasks and frequency, based on 30 year life.		
20. Provide guaranteed maximum time to respond to an emergency service request.		
21. Identify nearest service centre / technician to project site that can provide boiler repairs/troubleshooting; burner repairs/trouble shooting; burner controls repairs/troubleshooting.		
22. Provide a recommended list of spare parts for the first 2 years of operation with pricing.		
23. Provide list of installation references with contact information, for boilers in hot water service of the same size(s) being proposed.		
24. Provide an estimate of reliability or availability of the type/model of boiler proposed.		
25. Provide an outline of course topics to be covered during each training session		
26. Provide a list of items or assemblies that are expected to be shipped loose in order to prevent damage or to facilitate shipping.		
27. OPTIONAL – Service Contract The proponents are requested to provide with the RFQ response a separate proposal for three scheduled service contracts based on the following durations:		
a. One (1) Year		
b. Two (2) Years		
c. Five (5) Years		
28. Provide list of scheduled service tasks to be performed based on a unit operating 6000 hrs. per year.		
29. Provide a list of scheduled service tasks in addition to the annual scheduled maintenance that would be required to be performed at 3, 5 and 10 year intervals.		
30. Operator Training: Training described in item 1.8.2 of Schedule A-1		
31. Post Start-up Visit: The post startup site visits described in item 1.9.4 of Schedule A-1.		

SCHEDULE B-2 – PERFORMANCE DATA SHEET RESPONSE FORM

SEASON: WINTER

Boiler Model:_____; Output: 1500 BHP thermal
Fuel: Natural gas; 38.2 MJ/M^3 (HHV)
Ambient Air for Combustion: 10°C at 40% Relative Humidity
Site Elevation: 90 meters Above Sea Level

FIRING RATE	%	12.5	25	50	75	100
BOILER OUTPUT MWt		1.875	3.75	7.5	11.25	15
OUTLET OPERATING PRESSURE	kPag	275	275	275	275	275
FLOWRATE	L/s	180	180	180	180	180
ENTERING WATER TEMPERATURE	°C					75
LEAVING WATER TEMPERATURE	°C	95	95	95	95	95
WATER SIDE PRESSURE DROP	kPa					
FLUE GAS TEMP. LVG. BOILER	°C					
STACK TEMPERATURE	°C					
NOx @ 3% O2 dry	mg/M^3					
CO	ppm					
FUEL RATE	Kg/Hr					
EXCESS AIR	%					
COMBUSTION AIR RATE	Kg/Hr					
COMBUSTION AIR TEMPERATURE	°C					
FLUE GAS RATE	Kg/Hr					
RELEASE RATE	kW / M^2					
LIBERATION RATE	kW / M^3					
LOSSES						
Dry gas loss	%					
H2O+H2 in fuel	%					
H2O in air	%					
Radiation	%					
Manufacturer's margin	%					
Unaccounted for losses	%					
TOTAL LOSSES	%					
BOILER EFFICIENCY; Fuel to Water (HHV)	%					

FD Fan Motor Horsepower; HP	
ASME Boiler Heating Surface area (total), M^2	
Furnace Volume; M^3	
Minimum Flowrate (L/s)	

SEASON: SUMMER

Boiler Model:_____; Output: 1500 BHP thermal

Fuel: Natural gas; 38.2 MJ/M^3 (HHV)

Ambient Air for Combustion: 20°C at 40%
Relative Humidity Site Elevation: 90 meters
Above Sea Level

FIRING RATE	%	12.5	25	50	75	100
BOILER OUTPUT MWt		1.875	3.75	7.5	11.25	15
OUTLET OPERATING PRESSURE	kPag	275	275	275	275	275
FLOWRATE	L/s	180	180	180	180	180
ENTERING WATER TEMPERATURE	°C					60
LEAVING WATER TEMPERATURE	°C	80	80	80	80	80
WATER SIDE PRESSURE DROP	kPa					
FLUE GAS TEMP. LVG. BOILER	°C					
STACK TEMPERATURE	°C					
NOx @ 3% O2 dry	mg/M^3					
CO	ppm					
FUEL RATE	Kg/Hr					
EXCESS AIR	%					
COMBUSTION AIR RATE	Kg/Hr					
COMBUSTION AIR TEMPERATURE	°C					
FLUE GAS RATE	Kg/Hr					
RELEASE RATE	kW / M^2					
LIBERATION RATE	kW / M^3					
LOSSES						
Dry gas loss	%					
H2O+H2 in fuel	%					
H2O in air	%					
Radiation	%					
Manufacturer's margin	%					
Unaccounted for losses	%					
TOTAL LOSSES	%					
BOILER EFFICIENCY; Fuel to Water (HHV)	%					

SEASON: WINTER

Boiler Model:_____; Output: 1500 BHP thermal

20 mg/m^3 MAXIMUM NOx BURNER OPTION
Fuel: Natural gas; 38.2 MJ/M^3 (HHV)
Ambient Air for Combustion: 10°C at 40%
Relative Humidity Site Elevation: 90 meters Above Sea Level

FIRING RATE	%	12.5	25	50	75	100
BOILER OUTPUT MWt		1.875	3.75	7.5	11.25	15
OUTLET OPERATING PRESSURE	kPag	275	275	275	275	275
FLOWRATE	L/s	180	180	180	180	180
ENTERING WATER TEMPERATURE	°C					75
LEAVING WATER TEMPERATURE	°C	95	95	95	95	95
WATER SIDE PRESSURE DROP	kPa					
FLUE GAS TEMP. LVG. BOILER	°C					
STACK TEMPERATURE	°C					
NOx @ 3% O2 dry	mg/M^3					
CO	ppm					
FUEL RATE	Kg/Hr					
EXCESS AIR	%					
COMBUSTION AIR RATE	Kg/Hr					
COMBUSTION AIR TEMPERATURE	°C					
FLUE GAS RATE	Kg/Hr					
RELEASE RATE	kW / M^2					
LIBERATION RATE	kW / M^3					
LOSSES						
Dry gas loss	%					
H2O+H2 in fuel	%					
H2O in air	%					
Radiation	%					
Manufacturer's margin	%					
Unaccounted for losses	%					
TOTAL LOSSES	%					
BOILER EFFICIENCY; Fuel to Water (HHV)	%					

FD Fan Motor Horsepower; HP	
ASME Boiler Heating Surface area (total), M^2	
Furnace Volume; M^3	
Minimum Flowrate (L/s)	

SEASON: SUMMER

Boiler Model:_____; Output: 1500 BHP thermal

20 mg/m^3 MAXIMUM NOx BURNER OPTION
Fuel: Natural gas; 38.2 MJ/M^3 (HHV)
Ambient Air for Combustion: 20°C at 40%
Relative Humidity Site Elevation: 90 meters Above Sea Level

FIRING RATE	%	12.5	25	50	75	100
BOILER OUTPUT MWt		1.875	3.75	7.5	11.25	15
OUTLET OPERATING PRESSURE	kPag	275	275	275	275	275
FLOWRATE	L/s	180	180	180	180	180
ENTERING WATER TEMPERATURE	°C					60
LEAVING WATER TEMPERATURE	°C	80	80	80	80	80
WATER SIDE PRESSURE DROP	kPa					
FLUE GAS TEMP. LVG. BOILER	°C					
STACK TEMPERATURE	°C					
NOx @ 3% O2 dry	mg/M^3					
CO	ppm					
FUEL RATE	Kg/Hr					
EXCESS AIR	%					
COMBUSTION AIR RATE	Kg/Hr					
COMBUSTION AIR TEMPERATURE	°C					
FLUE GAS RATE	Kg/Hr					
RELEASE RATE	kW / M^2					
LIBERATION RATE	kW / M^3					
LOSSES						
Dry gas loss	%					
H2O+H2 in fuel	%					
H2O in air	%					
Radiation	%					
Manufacturer's margin	%					
Unaccounted for losses	%					
TOTAL LOSSES	%					
BOILER EFFICIENCY; Fuel to Water (HHV)	%					