

SPECIFICATIONS
FOR
PROPOSED VILLAGE HALL
BOILER REPLACEMENT PROJECT
VILLAGE OF BUCHANAN WESTCHESTER COUNTY, NY

Prepared By

Hahn Engineering
Putnam Business Park
1689 Route 22
Brewster, New York 10509

November 2022

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NOTICE TO BIDDERS

Sealed proposals for performing the work herein described will be received by the Village Board of Buchanan, New York, at the Office of the Village Clerk, 236 Tate Avenue, Buchanan, New York 10511 on December 19, 2022 at 10:00 a.m. and immediately thereafter the bids will be publicly opened and read aloud in said office.

The work consists of the removal and replacement of an existing boiler with two (2) new boilers. The project is located in the Village of Buchanan. Other related work shall include all necessary work required for a complete installation of the proposed gas service connection, as well as preparing, restoring and cleaning the project area all in accordance with the plans and specifications as directed by the Village Engineer.

Contract Documents may be obtained at the above office of the Village Clerk on or after 2:00 P.M., November 21, 2022 upon payment of a cash deposit, certified check or company check of \$50.00 for each set, which will be refunded upon return of said Contract Documents in good condition within 10 days after receipt of Bids. Contract Documents will only be available for purchase and not for review. Contract Documents may be obtained from the Village web at www.villageofbuchanan.com **If the Village website is used to obtain documents, the Village Clerk must be notified** at (914) 737-1033, or ckempter@villageofbuchanan.com, and provided with contact information.

A pre-bid conference will be held at the site on December 7, 2022 at 10 am. The pre-bid conference is not mandatory however, attendance is highly recommended.

Bids shall be made on the Proposal Forms, furnished with the Specifications and must be accompanied by a Bid Bond acceptable to the Village, a certified cashier's check, drawn on a solvent bank in the amount of not less than 5% of the total amount of the Bid. Checks shall be made payable to the Village of Buchanan, New York, and are to be held by the Village as a guarantee for the proper execution and delivery of the Contract and bonds to secure the faithful performance thereof. In default of such execution and delivery of Contract and Bonds, the amount of the deposit represented by the check shall be forfeited to and retained by the Village of Buchanan as liquidated damages.

Bid Proposals shall be enclosed in a sealed envelope bearing the name and address of the Bidder, addressed to the Village of Buchanan, 236 Tate Avenue, Buchanan, New York 10511 and endorsed "Proposed Village Hall Boiler Replacement Project", Buchanan, New York.

The Village of Buchanan reserves the right to reject any and all Bids, to waive any informality in any Bid, and to award the Contract to other than the lowest Bidder if deemed in the best interest of the Village to do so.

Dated November 18, 2022
By Order of the Village Board
By Cynthia Kempter, Village Clerk

**PROJECT TITLE:
Proposed Village Hall
Boiler Replacement Project
Village of Buchanan
November 18, 2022**

DESCRIPTION OF BID

The Village of Buchanan, New York (the “Village”) is requesting a proposal to install two (2) new boilers in Village Hall located at 236 Tate Avenue, Buchanan, NY. Other related work shall include all necessary work required for a complete installation of the proposed gas service connection, as well as preparing, restoring and cleaning the project area all in accordance with the plans and specifications as directed by the Village Engineer.

PROPOSED WORK

The proposed work includes the removal and installation of two (2) new boilers. The project is located in the Village of Buchanan. Other related work shall include, all necessary work required for the complete installation of the proposed gas service, as well as preparing, restoring and cleaning the project area all in accordance with the plans and specifications as directed by the Village Engineer.

The Contractor is responsible to become familiar with the site and to verify all measurements and conditions in the field.

BID SUBMITTAL DATE AND TIME OF COMPLETION

The bid shall be submitted no later than December 19, 2022. All bids for performing the work herein described must be submitted to the Village Engineer.

The Contractor shall provide the required Village insurance documents. All documents are required to be complete for this agreement within ten (10) business days (in the State of New York) of notice of award.

References of work similar in size and scope shall be submitted upon the request of the Village Engineer. Work shall proceed in the field within five (5) business days of the Contract signing. Once work has started, it shall proceed continuously and diligently. All items of work shall be completed and approved within two hundred and ten (210) calendar days of the Contract date.

See section 1.2 C in technical specification section 23 70 00 Heating, Ventilating and Air Conditioning for a tentative construction schedule.

**PROJECT TITLE:
Proposed Village Hall
Boiler Replacement Project
Village of Buchanan
November 18, 2022**

AWARD AND AGREEMENT

The Contract will be awarded to the lowest responsible bidder with a formal written agreement pursuant to the provisions of the General Municipal Law. The Village reserves the right to determine responsibility based on an evaluation of the Contractor's qualifications, experience, organization, finances, past performances, and other applicable factors. The Village further reserves the right to reject any or all bids.

SALES TAX EXEMPTION

Under Chapter 513 of the Laws of New York 1974, all materials and supplies sold to a Contractor and which are to become an integral, component part of a structure, building or real property owned by an exempt organization such as the municipality, are exempt from the payment of New York State Sales or compensatory use taxes. Therefore, the Contractor should not include any amount in its bid price to cover sales taxes for the above items.

WAGES AND LABOR

The Contractor shall ensure that workers are paid the appropriate wages and supplemental (fringe) benefits. Throughout the contract, the Contractor shall obtain and pay workers in accordance with periodic wage rate schedule updates from the NYS Department of Labor (NYSDOL).

The Contractor shall comply with the applicable provisions of the "Labor Law" as amended, of the State of New York. This Contract shall be void unless applicable sections of said Labor Law are complied with. Each and every provision of law and clause required by law to be part of this Contract shall be deemed to be included herein and this Contract shall be read and enforced as though it were included herein, and if through mere mistake or otherwise any such provision is not included, then upon the application of either party hereto, the Contract shall forthwith be physically amended to make such inclusion. Specifically, section 200-e, of the Labor Law, as so amended, prohibits in contracts, discrimination on account of race, creed, color, or national origin in employment of citizens upon public works.

All contractors and vendors retained to perform services in connection with the project shall be authorized to do business in the State of New York and/or filed such documentation, certifications, or other information with the State or County as required in order to lawfully provide such services in the State of New York. In addition, said contractor/vendors shall possess and maintain all professional licenses and/or certifications required to perform the tasks undertaken in connection with the project.

**PROJECT TITLE:
Proposed Village Hall
Boiler Replacement Project
Village of Buchanan
November 18, 2022**

COMPLIANCE WITH IRAN DIVESTMENT ACT

Each bidder/proposer, any person signing on behalf of any bidder/proposer and any assignee or subcontractor and, in the case of a joint bid/proposer, each party thereto, certifies, under penalty of perjury, that to the best of its knowledge and belief, that each bidder/proposer and any subcontractor or assignee is not identified on the list created pursuant to paragraph (b) of subdivision 3 of section 165-a of the New York State Finance Law (the “Prohibited Entities List”).

During the term of any contract awarded pursuant to this bid, should the Village receive information that a bidder/proposer is in violation of the above-referenced certification, the Village will offer the person or entity an opportunity to respond. If the person or entity fails to demonstrate that he/she/it has ceased engagement in the investment which is in violation of the Act within 90 days after the determination of such violation, then the Village shall take such action as may be appropriate including, but not limited to, seeking compliance, recovering damages or declaring the bidder/proposer in default.

The Village reserves the right to reject any bid or proposal from a bidder/proposer that appears on the Prohibited Entities List prior to the award of a contract and to pursue a responsibility review with respect to any bidder/proposer that is awarded a contract and subsequently appears on the Prohibited Entities List.

COMPLIANCE WITH NYS SEXUAL HARASSMENT PREVENTION LAW

By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that the bidder has and has implemented a written policy addressing sexual harassment prevention in the workplace and provides annual sexual harassment prevention training to all of its employees. Such policy shall, at a minimum, meet the requirements of section 201-g of the labor law.

MEASUREMENT AND PAYMENT

Progress payments shall be made to the Contractor as a percentage of the lump sum amount for work completed. The value of the progress payment shall not exceed the value of the work completed as determined by the Village Engineer. A Schedule of values should be submitted for the Village Engineer’s review. Payments shall not be made for repairs to damaged areas or materials caused by the Contractor’s operations. No payment shall be made for work that has not been accepted by the Village Engineer or that has become defective due to the Contractor’s negligence, ignorance, error, material failure, or improper storage or handling of materials.

BID PROPOSAL
PROPOSED VILLAGE HALL
BOILER REPLACEMENT PROJECT
BUCHANAN, NY

Name of Bidder _____ Email: _____
 Address _____ Telephone: _____
 City, State Zip _____ Fax: _____

Note: The Lump Sum and Unit Price amount is to be written in both words and numbers. In case of discrepancy, the amount shown in words shall govern. The price shall be in dollars and cents. The Lump Sum amount shall include all labor, materials, equipment, services, etc. required to complete the work in accordance with the Plans, Specifications and all other Contract Documents within the specified completion date

SECT	BID	UNIT	EST. QUANT.	UNIT PRICE (IN NUMBERS)	UNIT PRICE (IN WORDS)	TOTAL PRICE
23 50 00	Supplemental Conditions for Mechanical and Electrical Work	LS	1			
23 70 00	Heating, Ventilating and Air Conditioning	LS	1			
TOTAL BASE BID						

The total bid shall be the sum of the extensions (unit price multiplied by estimated quantity, for each item). It is stated her only as a convenience for comparison or bids. If there are any errors in addition or multiplication, the unit prices for each item shall govern, and the bid comparison will be made on the basis of correct arithmetic applied to these unit prices. In case of a discrepancy between the unit price in words and the unit price in numbers, the unit prices in words shall govern. The estimated quantities are not guaranteed and are only for bid comparison purposes and final payment will be made for actual quantities regardless of the estimated quantities contained herein. The contractor is further advised that the estimated quantities shown in the Bid Sheets may be reduced or deleted in order to insure that this Contract can be completed within the budget established for this work. In the event that certain work is deleted or reduced, the Unit Price Bid shall remain in effect for this work.

BID PROPOSAL
PROPOSED VILLAGE HALL
BOILER REPLACEMENT PROJECT
BUCHANAN, NY

BID PROPOSAL:

The Bid Proposal information must be provided and signed by the contractor's representative. NYSDOL Prevailing Wage Rate requirements must be included in the bid amount. The Contractor must visit the site and understand any site constraints prior to submission of this bid.

(Signature)

(Print Name)

(Title)

(Date)

INSURANCE

1. The Contractor, prior to signing of the contract, shall provide to the Owner, and maintain throughout the life of the contract, at his own cost and expense, proof of the following insurance by insurance companies licensed in the State of New York, rated A or better by Best's, and otherwise acceptable to the Owner. Refer to Section C for additional insurance requirements.
 - a. Workmen's Compensation and Employer's Liability Policy: Covering operations in New York State. Statutory Workers' Compensation, Employer's Liability and N.Y.S Disability Benefits Insurance for all employees. Where applicable, U.S. Longshore and Harborworkers Compensation Act Endorsement shall be attached to the policy. Workers' Compensation must include a waiver of subrogation. This policy shall not exclude third part action over (a/k/a: labor law) claims. Coverage shall not exclude injuries in confined spaces. Coverage must specifically include all New York State work places.
 - b. Comprehensive General Liability Policy: With limits of no less than \$1,000,000/\$2,000,000 Bodily Injury and Property Damage, and including coverage for:
 - a. Products/Completed Operations.
 - b. Independent Contractors.
 - c. Explosive, collapse and underground losses (X.C.U.).
 - d. Contractual Liability (covering Hold Harmless attached).
 - e. Broad from property damage liability (including completed operations).
 - f. Personal Injury including hazards i,ii,iii.
 - g. Village of Buchanan shall be named as an "Additional Insured" and provided a waiver of subrogation endorsement on the policy and the Certificate of Insurance shall show this as to the liability coverage on the certificate.
 - h. The Contractor's insurance policy is primary and non contributory to any insurance the Village of Buchanan may maintain.
 - i. This policy shall not exclude third part action over (a/k/a: labor law) claims.
 - j. Coverage must be on a \$1,000,000 each occurrence per location or per project basis.
 - k. Coverage shall not exclude injuries in confined spaces.
 - c. Comprehensive Automobile Policy: With limits no less than \$1,000,000 Bodily Injury and Property Damage liability including coverage for owned, non-owned, and hired private passenger and commercial vehicle. Village of Buchanan and their agents, officers, directors and employees shall be included as additional insured on the auto policy. Also needs to include waiver of subrogation.
 - d. Umbrella Excess Liability: With Limits no less than \$5,000,000 each occurrence. This policy must provide the Village of Buchanan as additional insured and include a waiver of subrogation endorsement in their behalf. The Contractor's insurance policy

is primary and non-contributory to any insurance the Village of Buchanan may maintain. This Policy shall not exclude third part action over (a/k/a: labor law) claims.

- e. All Policies and Certificate of Insurance of the Contractor shall contain the following clauses:
 - a. Insurers shall have no right to recovery or subrogation against the Owner, Architect/Engineer and Construction Manager (including its employees and other agencies), it being the intention of the parties that the insurance policies so effected shall protect both parties and be primary coverage for any and all losses covered by the above-described insurance.
 - f. Certificates shall provide that thirty (30) days written notice, by registered mail with return receipt requested, prior to cancellation or expiration be given to the Owner. Policies that lapse and/or expire during term of work shall be re-certified and received by the Owner no less than thirty (30) days prior to expiration or cancellation.
2. All policies and certificates of insurance of the Contractor shall contain clauses as follows:
 - a. The insurance companies issuing the policy or policies shall have no recourse against the Owner for payment of any premiums or for assessments under any form of policy.
 - b. Any and all deductibles in the above described insurance policies shall be assumed by and be for the account of, and at the sole risk of the Contractor.
 - c. In case of cancellation or material change in any of the policies, thirty (30) days notice shall be given to Owner, by registered mail, return receipt requested.
3. All property losses shall be made payable to and adjusted with the Owner.
4. All policies of insurance shall be acceptable to and approved by the Department of Law prior to the inception of any work.
5. Other coverages may be required by the Owner based on specific needs.
6. If, at any time, any of the said policies shall be or become unsatisfactory to the Owner, as to form or substance, or if a company issuing any such policy shall be or become unsatisfactory to the Owner, the Contractor shall promptly obtain a new policy, submit the same to the Owner for approval and submit a certificate thereof as hereinafter provided. Upon failure of the Contractor to furnish, deliver and maintain such insurance as above provided, this Contract, at the election of the Owner, may be forthwith declared suspended, discontinued or terminated. Failure of the Contractor to take out and/or to maintain or the taking out and/or maintenance of any required insurance, shall not relieve the Contractor from any liability

under the Contract, nor shall the insurance requirements be construed to conflict with the obligations of the Contractor.

7. In the event that claims in excess of these amounts are filed by reason of any operations under the Contract, the amount of excess of such claims, or any portion thereof, may be withheld from payment due or to become due the Contractor until such time as the Contractor shall furnish such additional security covering such claims.
8. The Contractor agrees to protect, defend, indemnify and hold the Owner and its officers, employees and agents free and harmless from and against any and all losses, penalties, damages, settlements, costs, charges, professional fees of other expenses or liabilities of every kind and character arising out or relating to any and all claims, liens, demands, obligations, actions, proceedings or causes of action of every kind and character in connection with or arising directly or indirectly out of this agreement and/or the performance hereof. Without limiting the generality of the foregoing, any and all such claims, etc., relating to personal injury, death, damage to property, defects in materials or workmanship, actual or alleged infringement of any patent, trademark, copyright (or application for any thereof) or of any other tangible or intangible personal or property right, or any actual or alleged violation of any applicable statute, ordinance, administrative order, rule or regulation, or decree of any court, shall be included in the indemnity hereunder. The Contractor further agrees to investigate, handle, respond to, provide defense for and defend any such claims, etc., at his sole expense and agrees to bear all other costs and expenses related thereto, even if it (claims, etc.) is groundless, false or fraudulent. In any case in which such indemnification would violate Section 5-322.1 of the New York General Obligations Law, or any other applicable legal prohibition, the foregoing provisions concerning indemnification shall not be construed to indemnify the Owner for damage arising out of bodily injury to persons or damage to property caused by or resulting from the sole negligence of the Owner, or its employees.

HOLD HARMLESS AGREEMENT

(To be approved by your Attorney)

The Contractor (and all subcontractors) shall, during the performance of this work, take all necessary precautions and place proper safeguards for the prevention of accident and shall indemnify and save harmless, the Village of Buchanan, James J. Hahn Engineering, P.C. and its employees, Village representatives and its employees, officers and agents from all claims, suits and actions and all damages and costs to which they may put by reason of death or injury to all persons or property of another resulting from unskillfulness, willfulness, negligence or carelessness in the performance of the work or in guarding and protecting the same or from any improper methods, materials implements or appliances used in its performance or construction or by or on account of any direct or indirect act or omission of passive or concurrent negligent act or omission by the Village of Buchanan or any of its employees, officers or agents may have directly or indirectly caused or contributed thereto.

BIDDER/CONTRACTOR (Company Name) _____

ADDRESS _____

(Signature)

(Print Name)

(Title)

(Dated)

NOTARY:

Subscribed and sworn to before me
this _____ day of _____, 20__

Notary Public

NON-DISCRIMINATION CLAUSE

During the performance of the Contract, the Contractor agrees as follows:

- a. The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin, and will take affirmative action to ensure that they are afforded equal employment opportunities without discrimination because of race, creed, color, or national origin. Such action shall be taken with reference, but not limited to: recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff or termination, rates of pay or other forms of compensation, and selection for training or retraining, including apprenticeship and on-the-job training.
- b. The Contractor will send to each labor union or representative of workers with which he has or is bound by a collective bargaining or other agreement or understanding, a notice, to be provided by the Commission of Human Rights, advising such labor union or representative of the Contractor's agreement under clauses "a." through "h." hereinafter called "non-discrimination clauses", and requesting such labor union or representative to agree in writing, whether in such collective bargaining or other agreement or understanding or otherwise, that such labor union or representative will not discriminate against any member or applicant for membership because of race, creed, color, or national origin, and will take affirmative action to insure that they are afforded equal membership opportunities without discrimination because of race, creed, color, or national origin. Such action shall be taken with reference, but not be limited to: recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff or termination, rates of pay, or other forms of compensation, and selection for training or retraining including apprenticeship and on-the-job training. Such notice shall be given by the Contractor, and such written agreement shall be made by such labor union or representative, prior to the commencement of performances of this contract. If such labor union or representative fails or refuses so to agree in writing, the Contractor shall promptly notify the Commission for Human Rights of such failure or refusal.
- c. The Contractor will post and keep posted in conspicuous places, available to employees and applicants for employment, notices to be provided by the Commission for Human Rights setting forth the substance of the provisions of clauses "a." and "b." and such provisions of the State's Laws against discrimination as the Commission for Human Rights shall determine.
- d. The Contractor will state, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, that all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color, or national origin.
- e. The Contractor will comply with the provisions of Sections 291-299 of the Executive Law and the Civil Rights Law, will furnish all information and reports deemed necessary by the Commission for Human Rights under these non-discrimination clauses and such sections

of the Executive Law, and will, permit access to his books, records, and accounts by the Commission of Human Rights, and Owner representatives/counsel for purposes of investigation to ascertain compliance with these non-discrimination clauses and such sections of the Executive Law and Civil Rights Law.

- f. The Contract may be forthwith canceled, terminated, or suspended in whole or in part, by the contracting agency upon the basis of a finding made by the Commission of Human Rights that the Contractor has not complied with these non-discrimination clauses, and the Contractor may be declared ineligible for future contracts made by or on the behalf of the Owner/Contracting Agency until he satisfied the Commission for Human Rights that he has established and is carrying out a program in conformity with the provisions of these non-discrimination clauses. Such finding shall be made by the Commission for Human Rights after conciliation efforts by the Commission have failed to achieve compliance with these non-discrimination clauses and after a verified complaint has been filed with the Commission, notice thereof has been given to the Contractor and an opportunity has been afforded him to be heard publicly before three members of the Commission. Such sanctions may be imposed and remedies otherwise provided by law.
- g. If this Contract is canceled or terminated under clause “f.”, in addition to other rights of the Owner provided in this contract upon its breach by the Contractor, the Contractor will hold the Owner harmless against any additional expenses or costs incurred by the Owner in completing the work or in purchasing the services, materials, equipment, or supplies contemplated by this contract, and the Owner may withhold payments from the Contractor in an amount sufficient for this purpose and recourse may be had against the surety on the performance bond if necessary.
- h. The Contractor will include the provisions of clauses “a.”, through “g.” in every subcontract or purchase order in such a manner that such provisions will be binding upon each subcontractor or vendor as to operations to be performed within jurisdictional locale of the Project being contracted by the Owner. The Contractor will take such action in enforcing such provisions of such subcontract or purchase as the Owner/Contracting Agency may direct, including sanctions or remedies for noncompliance. If the Contractor becomes involved in or is threatened with litigation with a subcontractor or vendor as a result of such direction by the Contracting Agency/Owner, the Contractor shall promptly so notify the Owner’s representatives/counsel, requesting him to intervene and protect the interests of the Owner (Contracting Agency’s jurisdictional area).

STATEMENT OF NON-COLLUSION

(To be Completed by Each Bidder)

In accordance with Section 103-d General Municipal Law, effective September 1, 1966, every bid or proposal hereafter made to a political subdivision of the State or any public department, agency or official thereof or to a fire district or any agency or official thereof for work or services performed or to be performed or goods sold or to be sold, shall contain the following statement subscribed to by the bidder and affirmed by such bidder as true under the penalties or perjury; non-collusive bidding certification.

- a. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies and in the case of a joint bid, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
 - (1) The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or any competitor.
 - (2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor.
 - (3) No attempt has been made or will be made by the bidder to induce any other person, partnership, or corporation to submit or not to submit a bid for the purpose of restricting competition.

- b. The person signing this bid or proposal certifies that he has fully informed himself regarding the accuracy of the statements contained in this certification, and under the statements contained in this certification, and under the penalties of perjury, affirms the truth thereof, such penalties being applicable to the bidder, as well as the person signing in its behalf.

- c. That attached hereto (if a corporate bidder) is a certified copy of resolution authorizing the execution of this certificate by the signature of this bid or proposal in behalf of the corporate bidder.

Signed: _____

From: _____

Title: _____

Date: _____

AGREEMENT

FOR

**PROPOSED VILLAGE HALL BOILER
REPLACEMENT PROJECT
VILLAGE OF BUCHANAN**

THIS AGREEMENT, executed in quadruplicate, made this ____ day of _____, 20__, by and between the Village of Buchanan, a municipal corporation with offices at the Municipal Building, 236 Tate Avenue, Buchanan, NY 10511, County of Westchester, State of New York, party of the first part, hereinafter designated the VILLAGE and _____ a business authorized to do business in New York State with offices at _____, party of the second part, hereinafter designated the CONTRACTOR.

WITNESSETH, that the CONTRACTOR and the VILLAGE for the consideration hereinafter named, agree as follows:

ARTICLE I - PURPOSE:

The work consists of the removal and replacement of an existing boiler with two (2) new boilers. The project is located in the Village of Buchanan. Other related work shall include all necessary work required for a complete installation of the proposed gas service connection, as well as preparing, restoring and cleaning the project area all in accordance with the plans and specifications as directed by the Village Engineer and VILLAGE.

All of the above work and other related work is more fully described in the specifications and drawings.

In furtherance of this end, the VILLAGE prepared Specifications and Supporting Data, and has solicited bids for the work. When bids were opened, the bid prepared by the CONTRACTOR was the lowest bid received in compliance with the specifications and the VILLAGE awarded the work to the CONTRACTOR on _____.

ARTICLE II - SCOPE:

The VILLAGE accepts the CONTRACTOR'S bid proposal dated _____. The work to be done is shown and detailed on the following documents, which are collectively referred to herein as the "Contract Documents":

Notice to Bidders, Description of Bid, Proposed Work, Bid Submittal Date and Time of

Completion, Award and Agreement, Sales Tax Exemption, Wages and Labor, Compliance with Iran Divestment Act, Compliance with NYS Sexual Harassment Prevention Law, Measurement and Payment, Insurance Requirements, Indemnification and Hold Harmless Agreement, Non-Discrimination Clause, Statement of Non-Collusion, Technical Specifications, Addenda (if Applicable), and Construction Drawings.

All of the above items are dated _____ unless otherwise noted, and are attached hereto labeled as “Proposed Village Hall Boiler Replacement Project, Village of Buchanan, New York, Prepared by James J. Hahn Engineering, P.C., Putnam Business Park, 1689 Route 22, Brewster, New York 10509”, and made a part of this Agreement.

There is further attached hereto and made a part of this Agreement:

1. “Bid Proposal” to the Village of Buchanan, dated _____, executed by the CONTRACTOR, attached hereto and marked “EXHIBIT A”.
2. Notice of Award letter by the Village of Buchanan, dated _____, attached hereto and marked “EXHIBIT B”.
3. Drawings entitled as follows:
 - “Mechanical Plot Plan, Floor Plan, Schedules & Notes”, Dated 10/31/22, Drawing ME-1.
 - “Mechanical Floor Plan, Boiler Schematic & Schedules”, Dated 10/31/22, Drawing M-1.

Above mentioned drawings are deemed attached hereto.

ARTICLE III - TIME OF COMPLETION:

- (a) The CONTRACTOR shall commence work under this Agreement within _____ days of the Notice to Proceed or as soon as possible as directed by the VILLAGE.
- (b) The CONTRACTOR shall complete work by _____. The CONTRACTOR shall be responsible for completion of the Contract as required under BID SUBMITTAL DATE AND TIME OF COMPLETION.
- (c) If the CONTRACTOR is unable to satisfactorily complete all work by the time of completion, the VILLAGE may grant an extension of time, if, in the opinion of the VILLAGE the delay in completing work was due to causes beyond the CONTRACTOR’S control, and not due to the CONTRACTOR’S negligence, actions or inaction.

- (d) In the event the CONTRACTOR fails to commence the work under this Agreement on the date provided herein, the VILLAGE reserves the right to cancel this Agreement and re-advertise for bids for such work and/or the entire project.
- (e) As actual damages for any delay in completion of the work which the CONTRACTOR is required to perform under this Contract are impossible to determine, the CONTRACTOR and his Sureties shall be liable for and shall Pay to the VILLAGE the sum of Five Hundred Dollars (\$500.00) as fixed and agreed liquidated damages for each calendar day of delay from the above stipulated completion date, until such work is satisfactorily completed and accepted.

ARTICLE IV - PAYMENT:

- (a) The VILLAGE will pay the CONTRACTOR for services under this Agreement the unit prices and lump sums as shown in "EXHIBIT A".
- (b) It is the intention of the Agreement to include under the above unit prices and lump sums all necessary services required to complete this project. If additional work is required, such work may be done on a mutually agreed basis, and authorized in writing by the VILLAGE.
- (c) Payment to the CONTRACTOR requires execution of CONTRACTOR'S invoice. The payment form shall be in a format prescribed by the VILLAGE ENGINEER, in accordance with AIA document G702 and G703. The VILLAGE is a tax-exempt municipality.
- (d) Vouchers are paid _____ monthly and must be received by the Village Engineer no later than _____ days prior to Village Board Meetings for payment to be mailed to the CONTRACTOR within _____ days of the Village Board Meeting.

A retainage of five (5%) percent of completed and approved contract work shall be withheld from each voucher submitted for payment by the CONTRACTOR.

- (e) Following a final site inspection of the Contract work and prior to final payment, the CONTRACTOR shall submit the General Release form from the Contract Documents and a two (2) year Warranty. The General Release shall state that all obligations incurred by the CONTRACTOR in carrying out this Agreement have been satisfied including wages and costs of subcontractors, equipment and materials. The General Release and Maintenance Bond shall be acceptable in form and sufficiency to the Attorney and VILLAGE ENGINEER, in the amount of 100% of the final Contract Price, and shall ensure satisfactory repair or replacement of defective work as required under the General Conditions.
- (f) Pursuant to approval of the General Release and two (2) year Warranty, the

CONTRACTOR shall receive final payment for approved work including previous retainage withheld by the VILLAGE.

ARTICLE V - COMPLIANCE WITH LAWS AND REGULATIONS:

In carrying out the terms of this Agreement, the CONTRACTOR shall comply with all applicable laws, regulations and procedures of the United States of America, State of New York, County of Westchester and the VILLAGE. In particular, the CONTRACTOR's attention is directed to The Labor Law and other Department of Labor Regulations, Prevailing Wage requirements, "Non-Discrimination Clause", and any related addendum.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year first above written.

VILLAGE OF BUCHANAN

_____ By: _____
AFFIX CORPORATE SEAL _____, Village Administrator

STATE OF NEW YORK)
) SS.:
COUNTY OF WESTCHESTER)

On the ____ day of _____, 20__, before me personally came _____ to me known, who, being by me duly sworn, did depose and say that he resides at _____; that he is the Village Administrator, the municipal described in an which executed the foregoing instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the Village Board of said municipal; and that he signed his name thereto by like order.

NOTARY PUBLIC

TECHNICAL SPECIFICATIONS

SECTION 23 50 00
SUPPLEMENTARY CONDITIONS
MECHANICAL AND ELECTRICAL WORK

PART 1 – GENERAL

1.1 GENERAL

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. It is intent of Drawings and Specifications to call for finished work, tested and ready for operation. All materials, equipment and apparatus shall be new, of highest grade and quality and free from imperfections.
- C. Any apparatus, appliance, material or work not shown on Drawings, but mentioned in Specifications, or vice versa, or any incidental accessories or minor details now shown but necessary to make work complete and perfect in all respects and ready for operation, even if not particularly specified, shall be provided by Contractor without additional cost to Owner.
- D. With submission of Bid, Contractor shall give written notice to Architect of any materials, apparatus or omissions believed to be in violation of laws, ordinances, rules or regulations or authorities having jurisdiction. In absence of such written notice, it is mutually agreed that Contractor shall include cost of providing all systems in accordance with applicable regulations without additional cost to Owner.

1.2 ABBREVIATIONS

- A. The following abbreviations shall apply:

- HC - Heating (HVAC) Sub Contractor
 - PC - Plumbing Sub Contractor
 - EC - Electrical Sub Contractor

1.3 EXAMINATION

- A. Contractor, before submitting Bid, shall examine site, building and existing facilities, Drawings and Specifications, inform himself as to State and local codes and laws having jurisdiction, allow for licenses and fees to be paid as directed under his Contract and/or as required by law.

- B. Claims made for extra payment for the following reasons will not be allowed: Unfamiliarity with work to be performed by other trades, existing conditions at job site, local or State laws and codes and minor alterations due to field conditions.

1.4 CONTRACT DRAWINGS

- A. Drawings and Specifications: Drawings accompanying these Specifications are intended to show general arrangement and extent of work to be done. Work in all its details is subject to approval of Architect, whose decision on all points of difference shall be final and binding on Contractor. Any work or materials, which are rejected, must be immediately replaced by Contractor.
- B. Drawings and Specifications together mutually explain each other and indicate work to be done, and anything appearing in one and not in other shall be as if appearing in both. In case of disagreement between Drawings and Specifications or within either document itself as to better quality, greater quantity or more costly work shall be included in contract price and matter referred to Engineer's attention for decision or adjustment.

1.5 EQUIPMENT LOCATIONS

- A. Location of equipment, outlets, etc., as indicated on Drawings shall be considered as reasonably correct, but it shall be understood that they are subject to modifications as may be found necessary or desirable at time of installation in order to meet any unforeseen or design conditions. Such changes shall be made by Contractor without additional cost to Owner.
- B. Location of devices, fixtures, diffusers, registers, panels, sprinkler heads, equipment, etc., which are exposed in finished spaces, shall be coordinated and aligned with Architectural elements. Where on exposed masonry, they shall be coordinated with block or brick courses.
- C. Locations of pipes, ducts, electrical raceways, switches, panels, equipment, fixtures, etc., shall be adjusted to accommodate the work to interferences anticipated and encountered. The Contractor shall determine the exact route location of each pipe, duct and electrical raceway prior to fabrication.
- D. Offsets, transitions and changes in direction in pipes, ducts and electrical raceways shall be made as required to maintain proper headroom and pitch of sloping lines, whether or not indicated on the Drawings. The Contractor shall provide for all trades, air vents, pull boxes, etc. as required to effect these offsets, transitions and changes in direction.
- E. Architect reserves right to relocate any outlet or equipment to a distance of five feet in either direction from that indicated or described; said changes, if any, will

be requested prior to installation and shall be made without additional cost to Owner.

1.6 COOPERATION

- A. The Contractor shall compare the mechanical and electrical Drawings and Specifications with those for other trades and shall report any discrepancies between them to the Engineer and shall obtain from him written instructions for changes necessary in the mechanical and electrical work. The mechanical and electrical work shall be installed in cooperation with other trades installing interrelated work. Before installation, the Contractor shall make proper provision to avoid interference in a manner approved by the Architect. All changes required in the work of the Contractor caused by his neglect to do so shall be made by him at his own expense.
- B. Every effort shall be made not to damage, soil or scratch the work of other Contractors.
- C. In case of damage to work or materials of other Contractors, he shall be required to pay for such damage as may be incurred. Architect shall be sole arbitrator in this matter.

1.7 SPACE CONDITIONS

- A. Work shall be confined to space allowed for it. If space is not sufficient, Architect shall be notified. More space shall not be used unless authorized by Architect.

1.8 ACCESSIBILITY

- A. Contractor shall install all work so that all parts required are readily accessible for inspection, operation, maintenance and repair. Minor deviations from Drawings may be made to accomplish this, but changes of magnitude shall not be made without prior written approval from Architect.
- B. The Contractor shall install all mechanical and electrical work to permit removal (without damage to other parts) of coils, heat exchanger bundles, fan shafts and wheel, draw-out circuit breakers, filters, belt guards, sheaves and drives and all other parts requiring periodic replacement or maintenance. The Contractor shall arrange pipes, ducts, raceways, traps, starters, motors, control components to clear the openings of swinging doors and of access panels.

1.9 ACCESS DOORS

- A. Location: Access doors in building construction through which a man must pass to repair or operate valves and other apparatus will be provided by others. All other required access doors, panels, cabinets, etc. shall be furnished by

Contractor requiring same, for access to equipment provided under his Contract. Access doors shall be provided for valves, cleanouts, air vents, dampers, and for adjustments of apparatus where necessary and required. Access doors shall be installed by Contract No. 2. Doors must be made at job site so as not to cause delay to other trades.

- B. Type: Access doors shall have angle frame, cold rolled steel, shaped to provide a rabbet on all sides to house door and confine wall. Frames shall be 16-gauge steel, doors 14 gauge to 29" dimension vertical or horizontal and 12 gauge for larger sizes. Hinges shall be concealed type permitting a door swing of 175°. Panels shall have prime coat of gray rust inhibitive paint. Access panels shall be similar to "Milcor" as manufactured by Inland Steel Products Company, Style "K" for plastered surfaces and Style "M" for masonry and tile surfaces. Panels must be available at job site, not to cause delay to other trades.
- C. Size: Access door shall be of adequate size to permit ready servicing of intended equipment. Unless otherwise noted, the minimum size shall be 12" x 12".

1.10 DRIP PANS

- A. Examine the drawings, and in cooperation with the Electrical Trade, confirm the final location of all electrical equipment to be installed in the vicinity of piping. Plan and arrange all overhead piping no closer than 2 feet from a vertical line to electric motors and controllers, switchboards, panelboards or similar equipment.
- B. Where the installation of piping does not comply with the requirements of foregoing paragraph, where feasible, the piping shall be relocated.
- C. Furnish galvanized steel gutters as follows:
 - 1. Provide and erect a gutter of 18 gauge galvanized steel under every pipe which is within 2'-0" of being vertically over any motor, electrical controllers, switchboards, panelboards, or the like.
 - 2. Each gutter shall be welded and made watertight, properly suspended and carefully pitched to a convenient point for draining. Provide a 3/4" drain, with valve as directed, to nearest floor drain or slop sink.
 - 3. In lieu of such separate gutters, a continuous, adequately supported and braced, properly rimmed, pitched and drained, may be provided over any such motor, and extending 2'-0" in all directions beyond the motor, over which such piping has to run.

1.11 DAMAGE

- A. Each Contractor shall protect and leave in perfect condition materials, apparatus, fittings, fixtures and trim in scope of his Contract. Should any items be damaged or broken or workmanship molested, no matter by whom such damage is caused, work must be corrected and damaged items replaced with new units by Contractor at no additional cost to Owner. Work, which needs redoing because of damage, shall be done by skilled trade which originally performed such work.
- B. Any adjustments between Contractors relative to damage to work or materials shall not be responsibility of Owner, Architect or their representatives.

1.12 LAW, ORDINANCES, PERMITS AND FEES

- A. The Contractor shall give all necessary notices, obtain all permits, pay all governmental taxes, fees and other costs in connection with his work, file for necessary approvals with the Town or Village and all other State governmental departments having jurisdiction, obtain all required certificates of inspection for his work and deliver same to the Architect before request for acceptance and final payment for the work.

1.13 CODES AND STANDARDS

- A. Contractor shall include in his Contract any labor, materials, services, apparatus, Drawings (in addition to Contract Documents), necessary to comply with all applicable codes, specifications, local ordinances, industry standards and utility company regulations.
- B. In case of difference between building codes, specifications, State laws, local ordinances, industry standards and utility company regulations and Contract Documents, most stringent shall govern. Contractor shall promptly notify Engineer in writing of any such difference.
- C. Noncompliance: Should Contractor perform any work that does not comply with requirements of applicable building codes, State local ordinances, industry standards and utility company regulations, he shall bear all costs arising in correcting deficiencies.
- D. Applicable codes and standards for material furnished and work installed shall include all State laws, local ordinances, utility company regulations, special requirements of Owner's insurance underwriters, requirements of governmental agencies having jurisdiction, and applicable requirements of following nationally accepted codes and standards:
- E. Codes:

1. 2015 International Building Code.
2. 2015 International Plumbing Code.
3. 2015 International Fuel Gas Code.
4. 2015 International Fire Code.
5. 2015 International Energy Conservation and Construction Code.
6. National Electrical Code.
7. 2017 Uniform Code Supplement.

F. Industry Standards, Codes and Specifications:

1. AIEE American Institute of Electrical Engineers
2. ANSI American National Standards Institute
3. ASHRAE American Society of Heating, Refrigeration & Air Conditioning Engineers
4. ASME American Society of Mechanical Engineers
5. ASTM American Society of Testing Materials
6. AWWA American Water Works Association
7. IPCEA Insulated Power Cable Engineers Association
8. NBS National Bureau of Standards
9. NEMA National Electrical Manufacturers Association
10. NFPA National Fire Protection Association
11. NEC National Electrical Code
12. UL Underwriters' Laboratories
13. AGA American Gas Association

1.14 DEFINITIONS

- A. The term "Contractor" or "this Contractor" shall be interpreted to mean individual, partnership, or corporation to whom Contract has been awarded.
- B. Whenever the terms "provide" or "provided" are used in the specifications, they shall mean "furnish & install" or "furnished & installed," "connect" or "connected", "apply" or "applied", "erect" or "erected," "construct" or "constructed," or similar terms, unless otherwise indicated in the specifications.
- C. Words in the singular shall also mean and include the plural wherever the context to indicates, and words in the plural mean the singular wherever the context so indicates.
- D. Wherever the terms "shown on drawings" are used in the specifications, they shall mean, "noted", "indicated," "scheduled," "detailed," or any other diagrammatic or written reference made on the drawings.
- E. Wherever the terms "material" or "materials" are used in the specifications, they shall mean any "product," "equipment," "device," "assembly" or "item" required

under the contract, as indicated by trade or brand name, manufacturer's name, standard specification reference or other description.

- F. The terms "approved" or "approval" shall mean the written approval of the Engineer.
- G. The terms "specification" or "specifications" shall mean all information contained in the bound or unbound volume, including all "Contract Documents" defined therein, except for the drawings.
- H. The terms "directed," "required," "permitted," "ordered," "designated," "prescribed" and similar words shall mean the direction, requirement, permission, order, designation or prescription of the Engineer; the terms "approved," "acceptable," "satisfactory" and similar words shall mean approved by, acceptable or satisfactory to the Engineer; the terms "necessary," "reasonable," "proper," "correct" and similar words shall mean necessary, reasonable, proper or correct in the judgment of the Engineer.
- I. "Piping" includes, in addition to pipe or tubing, all fittings, flanges, unions, valves, strainers, drains, hangers and other accessories relative to such piping.
- J. "Concealed" means hidden from sight in chases, furred spaces, shafts, hung ceiling, embedded in construction or in crawl spaces.
- K. "Exposed" means not installed underground or "concealed" as defined above.
- L. "Invert Elevations" means the inside bottom of pipe.
- M. "Wiring" includes, in addition to wire, all conductors, raceways, boxes, devices, supports, hangers and other accessories relative to such wiring.
- N. Trade Contractors for this project shall be the PC, FPC, HC and the EC.

1.15 CUTTING AND PATCHING

- A. Contractor must lay out the work in advance to minimize unnecessary cutting and patching.
- B. Cutting and patching of holes in walls, partitions, ceilings and floors and building in of chases, recesses or other openings that may be required shall be done by Contractor requiring same. All such patching and chases shall be finished to match existing adjacent finishes. Provide all new acoustic tile ceilings in areas where such ceilings are disturbed. All final patching shall be done by Contractor normally employed for such work at expense of Contractor requiring same.

- C. Drilling and patching for expansion bolts, hangers and other supports shall be done by Contractor requiring same, subject to review by Architect.
- D. Pavements, sidewalks, roads and curbs, planted areas, fences and all other site structures shall be cut, patched, repaired and/or replaced as required to permit installation of work of various trades and such cutting, patching, repairing and replacing shall be responsibility of, and paid for by, Contractor under Section of Specifications for trade requiring work. Work shall be done by Contractor normally employed for such work at expense of Contractor requiring same.
- E. Each Contractor shall bear expense of all cutting, patching, repairing or replacing of work of other trades required because of negligence or tardiness or because of any damage caused by him.

1.16 USE OF PREMISES

- A. Each Contractor shall perform all work necessary to deliver, store, and protect his material and equipment and shall provide a locker for safe and orderly storing of materials and tools. Location of such locker shall be with approval of Architect. Contractor shall change location thereof when so directed by Architect.
- B. The Contractor shall confine his apparatus, storage of materials and construction operations to the limits indicated by ordinances or permits or as may be directed by the Architect. He shall not unreasonably encumber the premises with his materials.
- C. In the utilization of ground area, the protection of pavement, curbs, walks, structures, and other permanent improvements shall be installed and maintained.
- D. In storing materials within any structure, or when using structure as a shop, the Contractor shall consult with the Architect and shall restrict his storage to spaces designated for such purposes. The Contractor will be held responsible for repairs, patching or cleaning arising from such use.
- E. Ground storage shall be similarly restricted.
- F. The Contractor shall not trespass or enter upon areas that are noted as being restricted.
- G. Plumbing fixtures shall not be used for emptying water from buckets, pails or other containers. Notwithstanding any approvals or instructions which must be obtained by the Contractor from the Owner in connection with use of premises, the responsibility for the safe working conditions at the site shall be the Contractor's and the or Owner shall not be deemed to have any responsibility or liability in connection therewith.

1.17 CLEANING

- A. Each Contractor shall, while engaged in work, maintain everything used in conjunction therewith in an orderly and clean condition and shall periodically during progress of work, or when directed by Architect, clean up and remove from building rubbish accumulated from his work.
- B. Work areas shall be cleaned on a daily basis. Areas occupied by Owner shall be kept clean at all times.
- C. Before reporting for final inspection, preceding acceptance by Architect, Contractor shall thoroughly clean fixtures, and apparatus of dust, stains, grease, oil, etc., and touch up with enamel or paint any scratched or marred surfaces. Finish of all trim and equipment shall be in perfect condition.

1.18 MANUFACTURER'S REPRESENTATIVE

- A. Each Trade Contractor shall provide, at appropriate time or as directed by Architect, the services of a competent factory-trained Engineer of particular manufacturer of equipment or item involved so as to inspect, adjust, and place in proper operating condition any and all items of manufacturer. No additional compensation will be allowed Contractor for such services.

1.19 SUPERVISION AND LAYOUT

- A. The work called for under this Contract shall be carried on simultaneously with the work of other trades in a manner such as not to delay the overall progress of the work. Be prepared to furnish promptly to other trades involved at the project all information and measurements relating to the work which they may require. Cooperate with them in order to secure the harmony necessary in the interest of the project as a whole.
- B. Keep a competent Superintendent in charge of the work. Such Superintendent shall be replaced if unsatisfactory to the Owner or Architect. Dealings at the site will be made only with this person.
- C. Maintain a complete file of Contract shop drawings at the site available for inspection by Owner's representatives. Installation and equipment shop drawings shall be initialed and dated upon installation.
- D. Every facility shall be provided to permit inspection of the work by Owner's representative during the course of construction.
- E. Be responsible for work until its completion and final acceptance; replace any of the same, which may be damaged, lost or stolen, without additional cost to the Owner.

- F. Contractor shall not employ on job unfit persons or anyone not skilled in work assigned nor anyone considered detrimental to best interests of job.
- G. Contractor to provide supervision, layout the work, do necessary leveling and measuring or employ a competent person satisfactory to Architect.
- H. All work shall be executed at and from as many different points at such times and with such force as to meet completion schedules and/or as may be deemed necessary by Architect.

1.20 COORDINATION OF THE WORK

- A. Each Trade Contractor shall coordinate their work with that of the Contractor for General Construction's and with the other Trade Contractors. Work of the respective trades shall be scheduled in accordance with the Contractor for General Construction's schedule so that all of the work will be installed at the proper time without delaying completion of the project.
- B. Contractor shall check the Contract Drawings and Specifications for all of the other trades so as to become familiar with the various items of apparatus and equipment, which will be furnished or set under the different Contractors, that require connections or other coordination.
- C. Trade Contractor shall furnish to the Contractor for General Construction, detailed advance information regarding all the requirements related to work under other Divisions and/or Sections. Each Contractor shall furnish sizes, accurate data, and location of any and all pads, chases, sleeves, and slots through floor slabs, walls, foundations, ceilings, roof, and other special openings required.
- D. Trade Contractor shall carefully check space requirements with other Contractors to ensure that the equipment, fixtures, piping, conduits, ducts, etc. can be installed in the spaces allotted for same.
- E. Wherever the work of the various Trade Contractors interconnects each Contractor shall provide all information, as required for the equipment, to the connecting Contractor so that the connecting Contractor will be able to properly furnish and install all water and drain connections, gas connections, electrical connections or general construction provisions.
- F. Each Contractor shall check the Architectural Drawings for all ceiling height requirements.
- G. The HC shall provide reproducible drawings or electronic drawing files for trade coordination. These drawings shall show the duct layout and major piping layout

for the HVAC work. This coordination drawing shall be circulated in timely fashion to the other contractors for them to add their work to provide a fully coordinated drawing for the work of all trade. Coordination meetings shall be held in locations and at frequencies as required to develop full coordinated drawings. All coordinating Contractors shall "sign-off" the coordination drawings when coordination is complete.

- H. Final coordination drawing in electronic file format shall be provided to the Construction Manager, the Architect and the Engineer.

1.21 MATERIALS AND WORKMANSHIP - GENERAL REQUIREMENTS

- A. Guarantees of Performance: Contractor shall be held to have carefully examined and checked Drawings and Specifications before acceptance of Contract, starting any work, or purchasing any materials. Contractor shall inform Engineer of any changes or additions necessary to make possible fulfillment of any guarantees called for by this Specification, failing which, he shall be deemed to have accepted such guarantees and be bound thereby.
- B. Wherever hereinafter guarantees of durability, operating capacity, proper functioning or like are called for, or whenever it is specified that manufacturer shall furnish detail drawings, test certificates or performance curves, supervise installation of his apparatus, test or adjust it after installation, keep it in repair for a stated period, or render other similar services
- C. Contractor will be held responsible for thorough performance or specific services under actual conditions of installation. Same shall apply in cases where special adjustment or other services are necessary to insure proper and efficient functioning of apparatus, even though not specifically called for. It is intended that entire plant be ready for satisfactory operation, and Contractor is hereby made responsible for this result.
- D. In every case where Contractor's own employees cannot adequately perform above-described services, he shall stipulate such performance in his Contract with sub-contractors, manufacturers, etc., or else subsequently pay them any additional fees required therefor so that a satisfactory and ready plant will be secured without additional cost to Owner.

1.22 JURISDICTIONAL DISPUTES

- A. Contractor shall assume responsibility for resolving jurisdictional disputes and resolving all claims arising from factory vs. field installation, etc.
- B. Wherever factory mounting, piping or wiring of controls and accessories, etc., are called for, Contractor shall ascertain at time of Bid that all work is in accord with

local jurisdiction and shall allow for all costs to comply with same. Extras arising out of jurisdictional disputes will not be permitted.

1.23 FOUNDATIONS AND SUPPORTS

- A. All piers, supports, shelving, foundations, anchor bolts, hangers, auxiliary steel, etc., unless specified under other Sections, required by Mechanical or Electrical Contractors for support or hanging of their equipment shall be provided by Contractor requiring same. All such work shall be done by Contractor requiring same. All such work shall be done in a manner approved by Architect.
- B. The anchoring of all equipment to the structure shall comply with all applicable requirements of the local governing codes.
- C. Support and fastening of all mechanical and electrical equipment shall be by the Trade Contractors. All equipment hung from overhead construction shall have weight of equipment distributed by use of structural iron supports, as necessary and approved, substantially fastened to structural support system. Any wall-mounted equipment, which cannot be supported from architectural or structural materials shall have its own independent support system furnished by the Contractor. Proposed installation method shall be reviewed by the Architect.
- D. Refer to trade sections of the specification for equipment requirements.

1.24 ESCUTCHEONS

- A. Contractor shall provide escutcheons on pipes wherever they pass through floors, ceilings, walls or partitions.
- B. Escutcheons for pipes passing through outside walls shall be Ritter Pattern and Casting Company No. 1 solid, cast brass, flat type, secured to pipe with a set screw.
- C. Escutcheons for pipes passing through floors shall be Ritter Pattern and Casting Company No. 3A split-hinged, cast brass chromium plated type. Piping passing through exterior walls, floors below grade, etc., shall be made watertight with caulking compound and pipe sleeves with wall collar located at the center of the wall extending 8" all around the pipe. Collar to be 1/8" thick steel welded to sleeve.

1.25 PAINTING

- A. Painting and touching up shall be responsibility of Contractor installing equipment and/or materials as hereinafter described, including but not limited to following principal items:

1. Prime Coat: Suitable rust inhibiting metal primer.
2. Final Coat: Enamel of colors to be selected by Architect.
3. Galvanized and Copper Pipe: Uncovered piping shall be cleaned and left unpainted.
4. Materials Not Accessible: Hangers, metal supports, pipe, conduit and miscellaneous equipment, except copper and galvanized, which is above hung ceilings, in chases or areas not accessible when job is completed shall be given a prime coat of paint to prevent rusting or corroding of material.
5. Exposed Material: Hangers, metal supports, pipe and conduit, air handling units, tanks, electric fixture stems and canopies, and all material with exposed metal surfaces shall be finished as described above with prime and final coats of paint.
6. Equipment, which has factory enamel finished surfaces, and which has been slightly scratched or chipped shall be carefully cleaned and at discretion of the Architect, shall be touched up with factory paint. Equipment, which is more than slightly rusted, scratched or chipped, shall at discretion of the Architect be repainted in its entirety with a factory finish.

B. Underground metallic conduit shall be coated with Asphaltum.

C. Finish painting of patched architectural finishes will be provided by others.

1.26 MANUFACTURER'S IDENTIFICATION

- A. Manufacturer's nameplate, name or trademark shall be permanently affixed to all equipment and material furnished under this Specification. Nameplates of a contractor or distributor will not be acceptable.

1.27 NAMEPLATES

- A. Contractor shall provide for each item of equipment, including controls, a permanently attached nameplate made of black surface, white core, laminated bakelite with incised. Nameplates shall be a minimum of 3" long by 1-1/2" wide and shall bear equipment names and item numbers as designated in equipment schedule.

1.28 TAGS AND CHARTS

- A. Charts and diagrams listed below shall be provided by Contractor, mounted in separate glazed hardwood frames.
 1. Valve Charts: Furnish to Owner's representative three (3) complete framed plastic laminated valve tag schedules. Schedule shall indicate tag number, valve location by floor, and nearest column number, valve size and service control. Include reproducible Mylar copy with as-built drawings.

B. Valves

1. Attach a 2" round brass tag stamped with designating numbers 1" high filled in with black enamel to each valve.
2. Securely fasten valve tag to valve spindle or handle with a brass chain.
3. Appropriate ceiling tile markers, in areas where removable ceilings occur to indicate location of valves or other devices, shall be provided under the general construction division of these Specifications.

1.29 EXCAVATION AND BACKFILL

- A. Work for interior will be provided by Contractor requiring same.
- B. Excavation and backfill shall be provided by Contractor as noted on drawing.
- C. Trade Contractors shall layout routing and confirm depths with respective Utility Companies.
- D. Trade Contractors shall be present during backfilling to assure that no damage is done to their material by improper backfill operations.
- E. Trade contractors shall furnish all special backfill materials, sand, pea gravel or concrete as specified under Trade Sections or called for on the drawings.
- F. Trade contractors shall provide marker tapes to be incorporated into the backfill.
- G. Refer to applicable specification sections for site work, further requirements.

1.30 TEMPORARY OPENINGS

- A. Contractor shall ascertain from his examination of existing facilities and Drawings whether any special temporary openings in building will be required for admission of apparatus provided under his Contract, and he shall notify Engineer accordingly. In event of Contractor to give sufficient notice to Architect in time to arrange for these openings during construction, Contractor shall assume all costs of providing such openings thereafter.

1.31 WORK IN CONNECTION WITH BUILDING SERVICES

- A. Mechanical and Electrical Contractors shall include in Bid all work, labor, material, fees and costs, including charges imposed and work charged by any utility company or governmental agency, for introduction of building services from street terminal to building, unless another terminal location is specifically noted. Work shall be complete and in accordance with intent of Drawings and

Specifications. Contractor shall take special note to contact all agencies and utility company to account for and include in his Bid ALL charges.

1.32 EQUIPMENT START-UP AND TESTING

- A. Each Contractor shall furnish services of qualified person thoroughly familiar with job and installed work to operate and make adjustments so that equipment and work furnished under this Contract operates as required.
- B. Contractor shall instruct Owner's operating personnel during start up and separate operating tests of each major item of equipment. During operating tests, Contractor shall prove operation of each item of equipment to satisfaction of Architect.
- C. At least seven (7) days' notice of equipment start-up and operating tests shall be given to Architect. See technical sections of these specifications for additional field tests, factory tests and certifications required.

1.33 INSTRUCTIONS AND LITERATURE

- A. Contractor is to thoroughly instruct building custodian or person/persons designated by Owner in proper care and operation of work furnished and installed by him. Contractor shall prepare for use by Owner a detailed brochure of instructions in non-technical terms describing maintenance and operation of all apparatus, valves, controls, switches, fixtures, etc. provided.
- B. A preliminary copy shall be submitted for review, after which four (4) bound copies of corrected material along with an electronic copy shall be delivered to the Owner.
- C. Furnish required number of manuals in bound form containing data covering capacities, maintenance of operation of all equipment and apparatus. Operating instructions shall cover all phases of control and include the following:
 - 1. Performance Curves: For pumps, and similar equipment at the operating conditions.
 - 2. Lubrication Schedule: Indicating type and frequency of lubrication required.
 - 3. List of Spare Parts: Recommended for normal service requirements.
 - 4. Parts List: For identifying the various parts of the equipment for repair and replacement purposes.
 - 5. Instruction Books: May be standard booklets but shall be clearly marked to indicate applicable equipment.
 - 6. Wiring Diagrams: Generalized diagrams are not acceptable, submittal shall be specifically prepared for this project.
 - 7. Automatic Controls: Diagrams and functional descriptions.

8. List of Equipment: Furnish list including manufacturer's representative, address, phone number and e-mail for future use in obtaining replacement parts.
- D. Where applicable, one set of operating and maintenance instructions shall be neatly framed behind glass and hung adjacent to the equipment concerned.
- E. Tools: All special tools as are required for proper operation and maintenance of the equipment provided under this Specification shall be delivered to the Owner's representative and a receipt obtained as evidence of delivery.
- F. In addition to above, and to various other instructions called for under individual Specifications, Contractor shall make arrangements for formal "classroom" lecture type instruction seminar where Owner's maintenance and administrative personnel will receive detailed verbal and written instructions from Contractor and the various subcontractors and material and equipment suppliers and when instruction brochures will be turned over to the Owner. A video of these instruction sessions shall be provided to the Owner.
- G. At completion of instruction period, when Contractor and Owner are satisfied of Owner's knowledge to operate equipment, Contractor shall obtain in writing Owner's acceptance of instructions.

1.34 RECORD DRAWINGS

- A. Each Trade Contractor shall prepare a set of drawings on which shall be recorded any changes made so that at completion of work a complete record will be shown thereon of actual installation. At completion of work all of the information added to these drawings shall be transferred to the AutoCAD files which will be furnished to the Contractors. Drawings shall be certified to be complete and accurate. Contractor shall furnish two print copies and discs of this AutoCAD files.

1.35 SHOP DRAWINGS

- A. See individual Sections for items requiring submission of shop drawings. Contractor shall submit the shop drawings electronically.
- B. Ductwork, piping, wiring diagrams and other drawings prepared for this project shall be prepared using AutoCAD.
- C. The name of the manufacturer, model, accessories, size, etc. shall be clearly noted.
- D. Contractor shall review shop drawings prior to submission and all shop drawings shall be stamped by the Contractor. Any deviations or changes to Contract Documents shall be clearly noted.

- E. Review of shop drawings by the Architect/Engineer shall not relieve the Contractor of the responsibility of furnishing materials in accordance with the Contract Documents.
- F. Contractor shall be responsible for quantities, physical sizes, electrical characteristics, etc. Any additional costs incurred due to the substitution of equipment (e.g., electrical, structural, etc.) shall be borne by the Contractor.
- G. Project specific drawings for Ductwork piping, Fire Protection, Electrical Feeders, etc. shall be prepared using AutoCAD.

1.36 GUARANTEE AND SERVICE

- A. Guarantee and service the entire installation for a period of one year from the date of final completion.
- B. The final acceptance will be made after Contractor has adjusted his equipment, balanced the various systems, demonstrated that it fulfills the requirement of the drawings and specifications, and has furnished all the required certificates of inspection, drawings, instructions and approvals.
- C. Contractor shall, during the period of the guarantee, replace or repair at his/her own expense any piece of equipment and/or material which is found to be defective. The replacement or repair shall be performed the same day of notification in an emergency fashion when notified by the Owner or authorized representative. Contractor shall also repair all damage to surrounding work caused by the failure, repair or replacement of defective equipment.
- D. During guarantee period, Contractor shall provide full service and maintenance for all equipment and systems, including all necessary inspections, cleaning, servicing, lubrication, adjustments, belts, filters, refrigerant, replacements and cleaning necessary to maintain equipment and systems in top working efficiency. Service shall include preventive, normal and emergency.
- E. Response time for emergency service shall be four (4) hours during business hours and six (6) hours on nights, weekends or holidays, and two (2) days for routine servicing.
- F. Refer to technical sections for additional guarantee and servicing requirements for specific equipment and systems.

END OF SECTION 23 50 00

SECTION 23 70 00
HEATING, VENTILATING AND AIR CONDITIONING

PART 1 – GENERAL

1.1 GENERAL

- A. Heating contractor (HC) shall provide all Electrical and Plumbing work required for the project. HC shall pay the cost of these services and included in the bid price. Electrical work shall be performed by a licensed sub-contractor. Plumbing working shall be performed by a plumbing sub-contractor who is certified by Con-Edison to install fusion welded HDPE piping.
- B. All work shall be in accordance with state and local codes.
- C. HC shall be a firm regularly engaged in the installation of heating, ventilating and air conditioning systems for a period of at least five (5) years and shall have the licenses and certificates required by local, county and state regulations. License/Certificate holder shall be an officer of the firm and have a minimum of five (5) years employment with the firm.
- D. HC shall apply for, obtain and pay for any required permits.
- E. Refer to Section 23 50 00 for Supplementary Conditions for Mechanical and Electrical Work, the requirement of which are part of the Work.
- F. All materials shall be new and without blemish or defects.
- G. Cutting and patching shall be in accord with Section 23 50 00.
- H. Refer to Section 23 50 00 for Coordination Drawing requirements.
- I. All electrical components shall bear a UL label.
- J. HC shall provide Owner with invoices and other data required for utility rebates.
- K. HC shall fire-stop openings around pipes and ducts passing through floors and walls.
- L. HC shall visit site prior to submitting bid to obtain existing conditions.

1.2 PROJECT MILESTONE SCHEDULE

- A. Contractor to be aware that time is of the essence for this project and that completion date must be achieved.

B. Work shall be sequenced to maintain domestic water heating capacity at all times.

C. The following schedule outlines key tasks and dates which must be met:

November 21, 2022	Advertise for bids
December 7, 2022	Pre-Bid Walk Thru - 10am
December 19, 2022	Receive Bids
January 3, 2022	Award Contract
February 1, 2023	Submission of shop drawings for boiler replacement
April 3, 2023	Start of installation of gas service
April 14, 2023	Completion of gas service
May 17, 2023	Shutdown and removal of existing boiler
June 7, 2023	Start of installation of new boiler
August 2, 2023	Testing and completion of new boilers and piping
August 16, 2023	Punch list completed
September 18, 2023	Instruct Owner and Closeout Documents
September 29, 2023	Winter Start Up, Project Completion

1.3 SCOPE OF WORK

A. HC shall provide all labor, material and appliances required for replacement of existing boiler installation shown on drawings and hereinafter specified, including but not limited to, the following principal items:

1. Removals and Relocations
2. Piping, Fittings, Valves
3. Miscellaneous Water Specialties
4. Insulation and Covering
5. Foundations, Supports, Sleeves and Plates
6. Shop Drawings
7. Start-up, Tests and Adjustments
8. Boilers
9. Circulating Pumps
10. Electric Motors, Motor Controllers and Wiring
11. Equipment and Pipe Identification
12. Controls
13. Maintenance and Operating Manuals
14. Guarantee

1.4 REMOVALS AND RELOCATIONS

A. Refer to Section 235000.

1.5 COMBUSTION TESTS, START-UP, INSTRUCTION AND SERVICE

- A. Prior to conducting the combustion tests, all operating and safety controls shall be tested for proper operation.
- B. The HC, upon completion of the boiler conversion shall perform a combustion test and submit a written report on the operation of Boilers to the Owner and Engineer.
- C. Instruct Owner's maintenance personnel in the proper operation and maintenance of the converted boilers.

1.6 BOILER TRIM AND CONTROLS

- A. Provide each boiler trim as shown and as required to comply with State requirements.
- B. Included shall be:
 - 1. ASME relief valves
 - 2. Combination pressure/temperature gauge 0-100 psig, 0-250°F
 - 3. Low water cut-off with manual reset
 - 4. High limit aquastat-manual reset
 - 5. Header sensor(s) for control of boilers

1.7 MISCELLANEOUS WATER SPECIALTIES

- A. Air vents: provide at all high points to eliminate air binding. Use automatic air vents in Boiler Rooms and Equipment Rooms. All automatic air vents shall be approved heavy-duty type equipped with tubing and petcocks for manual key operated type. All vents concealed from view shall be of the manual key operated type. All vents concealed from view shall be accessible through access doors. Vents shall be by Hoffman, Anderson or Bell & Gossett.
- B. Pressure Gauges: Provide pressure gauges on suction and discharge sides of each pump and as required to check the operation of equipment; pressure gauges shall have 4 1/2" diameter dials. Ashton, Ashcroft or equivalent.
- C. Thermometers: Provide thermometers at all locations in piping system as note on plans and as required to check system performance. Moeller, Taylor or Tagliabue, with 9" face 6" well, spirit filled. Provide separable sockets for all thermometers.

1.8 PIPING, FITTINGS, VALVES

- A. Piping:

1. Circulating Hot Water: Copper tubing, type L hard temper for 2-1/2" and smaller, soldered; Schedule 40, ASTM A-53, seamless, black steel; for 3" and larger, welded fittings or grooved Victaulic fittings.

B. Fittings:

1. Circulating Hot Water: All fittings for black pipe 3" and over, within the Boiler Room shall be welded fittings. Flange connections shall be used as indicated on the Drawings and where required to facilitate removal of equipment, piping, valves or connecting accessories. On pipe 2" and smaller, unions may be used in lieu of flanges.
2. Victaulic fittings with rolled grooves and EDPM seals may be used in lieu of welded fittings on circulating hot water piping.
3. All fittings for copper tube shall be wrought copper joined using lead free solder. Unions of brass pattern shall be used as required to facilitate the removal of equipment or accessories in connection with copper tube. Flanges shall be used on connections greater than 2".

C. Valves:

1. Provide shut-off valves to isolate each item of equipment for maintenance service and replacement, provide balancing valve or cock to adjust flow.
2. Valves for pipe sizes of 2 1/2" or less shall be Apollo 70-200 or Milwaukee Series 150, for sizes 3" and larger Milwaukee Series C, lug type butterfly valves shall be provided.
3. Balancing valves shall be of the square head cock type. Provide custodian with at least two operators for use with balancing valves. Balancing valves shall be the same size as the adjacent piping.
4. Check valves shall be of the horizontal swing check type with brass or bronze working parts and removable disc except where lift check valves shall be used on the discharge side of circulating pumps.
5. Combination shut off and balancing valves 1 1/4" and smaller as noted on Plan, "Sarco Balance Master Combination and Shut-off".

- D. Dielectric Fittings: Piping connections between dissimilar metals shall be made with dielectric fittings or insulating fittings to prevent electrolytic corrosion. Dielectric fittings shall be of the screwed union type as manufactured by EPCO.

1.9 GAS SERVICE AND PIPING

A. General:

1. Provide new gas service as shown on drawings in accordance with Con Edison requirements. Coordinate with Con Edison and obtain certificate for submission to Building Department (**NOT IN CONTRACT**).
2. New gas service to be extended from the existing street main (**NOT IN CONTRACT**).
3. Meter and regulator furnished by Con Edison, installed by PC in accord with Con Edison requirements.
4. Building distribution piping to be provided as shown.

B. All work shall be in accord with New York State Fuel Gas Code, NFPA-53, Utility company, Con Edison and Village requirements.

C. Pipe:

1. Aboveground piping: Schedule 40 standard black steel pipe free from flaws or other defects and of true and uniform section. Minimum size of gas piping shall be $\frac{3}{4}$ ".
2. Underground piping: HDPE with fused joints. Piping to be installed as per Con Edison standards and by a Con Edison certified Contractor (**NOT IN CONTRACT**).

D. Fittings:

1. For exposed pipe $2\frac{1}{2}$ " and smaller – threaded heavy malleable iron beaded fittings.
2. For all piping 3" and larger shall be welded using standard weight, steel joints with welding fittings.

E. Installation of Pipe:

1. All connections shall be made with fittings. Whenever gas lines are unavoidably trapped, an accessible drip shall be provided. The bottom of all risers and all equipment connections shall be provided with a capped dirt leg. Threaded joints shall be made with approved joint compound. Burrs made in cutting pipe shall be removed.
2. Where piping of different sizes are joined, reducer fittings shall be used; bushings will not be permitted. All connections shall be taken from top or side of mains and not from bottom.

3. Provide gas tight metal sleeve, open at each end, to enclose gas piping where it passes through corridors, halls, stairs and vestibules.
4. Exterior piping at meter/regulators and interior piping shall be cleaned, primed and painted. Color for interior piping to be yellow. Primer and paint shall be Rustoleum or equivalent.

F. Gas Regulators and Meters:

1. Meter and regulators will be provided by utility company for new services.
2. Regulators will be furnished by Con Edison installed by PC.

G. Gas Valves:

1. General Use: Rockwell Fig. 143 or equivalent.
2. Wrenches shall be supplied for all wrench operated valves.
3. All regulators and reliefs shall be vented to outdoors. Vent lines shall be run full size, with vent line for each regulator or relief run separately and shall terminate in an approved vent cap.

H. Test of Gas Systems:

1. Tests shall be paid for PC and shall be made in presence of Architect, Engineer, Owner or their representatives, gas supply company representatives and local authorities having jurisdiction of the work to be tested, and as may be directed, and at least 72 hours advance notice shall be given.
2. Source of test pressure shall be isolated before pressure tests are performed.
3. Perform all tests as herein specified and as required by Con Edison and Village.

I. Gas Piping:

1. Aboveground Piping: Test with air at 50 psig for a period of not less than 2 hours without showing any drop in pressure. All joints and fittings shall be soap tested. In addition, piping system shall be tested using gas meter as outlined in NFPA-54.
2. Underground Piping: Test with air at 100 psig. All joints and fittings shall be soap tested. Prior to pressurizing line, back fill straight runs to restrain pipe (**NOT IN CONTRACT**).

3. After testing is successfully completed, the entire gas distribution system shall be purged, pilot lights on all equipment and appliances shall be lighted and the operation of all equipment and appliances shall be checked.
4. Defects disclosed by tests shall be repaired, if permitted by Architect, or replaced without extra charge if so directed.

1.10 GENERAL PIPING:

- A. Run, arrangement, position, connections, etc., of equipment and materials shown on the Drawings shall be taken as a close approximation to a true position and, while they shall be followed as closely as possible, right is reserved to change locations, etc., to accommodate any condition which might arise during progress of the work without additional compensation to Contractor for such changes.
- B. Runs shall be straight and direct, forming right angles or parallel lines with building walls and other pipes, and be neatly and evenly spaced. Offsets will be permitted only where necessary to allow pipes to follow walls. Responsibility for accurately laying out work rest with Contractor. Should interference occur, the Engineer's decision shall be final. Where so shown or required, piping shall be concealed in building walls or above ceilings.
- C. Horizontal runs, except where concealed in partitions shall be kept as high as possible and close to walls. Cooperate with other trades that grouped lines will not interfere with each other.
- D. Circulating hot water piping shall be pitched to provide for air removal and to permit drain down.
- E. Contractor shall take special care in supporting pipe to provide for expansion and venting. Pockets and traps shall be avoided but where required, shall be provided with drains. Provide air vents at all high points.

1.11 INSULATION AND COVERING

- A. General:
 1. Insulate all new and altered piping, and equipment as herein noted.
 2. All insulation work shall be performed under this Section. All joints shall be butted firmly together. All insulation shall be installed in accordance with best practice of the trade and in accordance with manufacturer's recommendations. All workmanship shall be done so as to leave a smooth finish with no raveled edges.

3. Provide high-density insulation inserts under pipe supports and hangers.
4. For all piping, end joint strips and overlap seams shall be adhered with vapor barrier mastic and stapled with outward clinch staples on 4" centers.
5. Exposed ends of insulation shall be vapor sealed with mastic.
6. All insulation materials, adhesives, mastics and jackets assemblies shall be UL rated and classified. Ratings shall not exceed:

Flame	25
Fuel Contributed	50
Smoke Developed	50

B. Circulating Hot Water:

1. Insulate all new and altered piping with 4 lb. per cubic feet density glass fiber with maximum "K" factor of .24 at 75° mean temperature, with factory applied ASJ vapor barrier jacket.

Thickness:

Circulating Hot Water	2" for pipe sizes 2" and larger 1" for pipe sizes 1 1/2" & smaller
Cold Water Make-up	1" for all pipe sizes.

- C. Fittings for circulating hot water and cold-water make-up shall be insulated with preformed sections and covered with Zeston fittings.

1.12 CONDENSING BOILERS

- A. Manufacturer and capacity shall be as noted on the drawings.
- B. Condensing boilers shall include controls for outdoor reset and boiler sequencing.
- C. Efficiency Data Points: Data shall be submitted per ASHRAE 155 Method of Testing for Rating Commercial Space Heating Boiler Systems. This data shall cover steady state thermal efficiency, part load efficiency, and idling energy input rate. Efficiency data not supported by a third party published test standard shall not be permitted.
- D. Warranty: Standard warranty specified in this Section.
- E. Quality Assurance

1. **Manufacturer Qualifications:** The manufacturer must have been involved in the manufacture of fire tube condensing hydronic boilers for no less than 10 years. The manufacturer must be headquartered in North America and manufacture in an ASME-certified facility wholly owned by the manufacturer. The specifying engineer, contractor and end customer must have the option to visit the factory to witness test fire and other relevant procedures.
2. **ASME Compliance:** Fabricate and label boilers to comply with ASME Boiler and Pressure Vessel Code.

F. Warranty

1. **Standard Warranty:** Boilers shall include manufacturer's standard form in which manufacturer agrees to repair or replace components of boilers that fail in materials or workmanship within specified warranty period.
 - a. **Warranty Period for Fire-Tube Condensing Boilers:**
 - 1) Heat Exchanger, Pressure Vessel and Condensation Collection Basin shall carry a 10-year limited warranty against defects in materials or workmanship.
 - 2) Heat exchangers/pressure vessel are warranted against thermal shock for the lifetime of the boiler.
 - 3) The burner shall carry a five (5) year limited warranty against defective material or workmanship from the date of shipment.
 - 4) All other components shall carry a one-year limited warranty from date of boiler start up or 18 months from date of manufacture if start up cannot be proven.

G. Products

1. **Trim**
 - a. **Safety Relief Valve:**
 - 1) Size and Capacity: 50lb
 - 2) Description: Fully enclosed steel spring with adjustable pressure range and positive shutoff; factory set and sealed.
 - b. **Pressure Gage:** Minimum 3-1/2-inch diameter. Gage shall have normal operating pressure about 50 percent of full range.
 - c. **Drain Valves:** Minimum NPS 3/4 or nozzle size with hose-end connection.

- d. Condensate Trap: Factory supplied condensate trap with condensate trap blocked drain sensor.

2. Controls

- a. Boiler controls shall feature the following standard features:

- 1) Variable Speed Boiler Pump Control: Boiler may be programmed to send a 0-10V DC output signal to an ECM or VFD boiler pump to maintain a designed temperature rise across the boiler heat exchanger. The boiler shall be able to operate in this mode with a minimum temperature rise of 20 degrees F and a maximum temperature rise of 60 degrees F. Project specific temperature rise shall be 30.
- 2) Password Security: Boiler shall have a password security code for the Installer to access adjustable parameters.
- 3) Outdoor air reset: Boiler shall calculate the set point using a field installed, factory supplied outdoor sensor and a 4-point adjustable re-set curve.
- 4) Pump exercise: Boiler shall energize any pump it controls for an adjustable time if the associated pump has been off for a time period of 24 hours.
- 5) Ramp delay: Boiler may be programmed to limit the firing rate based on six limits steps and six-time intervals.
- 6) Boost function: Boiler may be programmed to automatically increase the set point a fixed number of degrees (adjustable by installer) if the setpoint has been continuously active for a set period of time (time adjustable by installer). This process will continue until the space heating demand ends.
- 7) Domestic hot water priority (for future use): Boiler shall make the domestic hot water call for heat a priority over any space heating call and adjust the boiler setpoint to the domestic hot water boiler setpoint.
- 8) Domestic hot water modulation limiting (for future use): Boiler may be programmed to limit the maximum domestic hot water firing rate to match the input rating of the indirect tank coil.
- 9) Domestic hot water night setback (for future use): Boiler may be programmed to reduce the domestic hot water tank set point during a certain time of the day.
- 10) Time clock: Boiler shall have an internal time clock with the ability to time and date stamp lock-out codes and maintain records of runtime.
- 11) Service reminder: Boiler shall have the ability to display a yellow-colored service notification screen based upon months of installation, hours of operation, and number of boiler cycles. All notifications are adjustable by the installer.

- 12) Five pump control: Boiler shall have the ability to control the boiler pump, system pump, domestic hot water pump, domestic hot water recirculation pump, and the bypass pump.
 - 13) Anti-cycling control: Boiler shall have the ability to set a time delay after a heating demand is satisfied allowing the boiler to block a new call for heat. The boiler will display an anti-cycling blocking on the screen until the time has elapsed or the water temperature drops below the anti-cycling differential parameter. The anti-cycling control parameter is adjustable by the installer.
 - 14) Night setback: Boiler may be programmed to reduce the space heating temperature set point during a certain time of the day.
 - 15) Freeze protection: Boiler shall turn on the boiler and system pumps when the boiler water temperature falls below 45 degrees. When the boiler water temperature falls below 37 degrees the boiler will automatically turn on. Boiler and pumps will turn off when the boiler water temperature rises above 43 degrees.
 - 16) Isolation valve control: Boiler shall have the ability to control a 2-way motorized control valve. Boiler shall also be able to force a fixed number of valves to always be energized regardless of the number of boilers that are firing.
 - 17) BMS integration with 0-10V DC input (for future use): The Control shall allow an option to Enable and control set point temperature or control firing rate by sending the boiler a 0-10V input signal.
 - 18) Data logging: Boiler shall have non-volatile data logging memory including last 10 lockouts, hours running, recycling reporting, and ignition attempts and should be able to view on boiler screen.
 - 19) Interior service light: Boiler shall feature an LED service light to provide additional illumination to the interior of the boiler.
- b. The boiler shall have a built in Cascade controller to sequence and rotate lead boiler to ensure equal runtime while maintaining modulation of up to 8 boilers of different btu inputs without utilization of an external controller. The factory installed; internal cascade controller shall include:
- 1) Lead lag: The Control module shall minimize the number of boilers firing to achieve the heating load.
 - 2) Efficiency optimization: The Control module shall allow multiple boilers to fire at minimum firing rate in lieu of Lead/Lag.
 - 3) Front end loading: The Control modulate shall have the ability to communicate with other Lochinvar boilers featuring the Smart-Touch™ and Smart System™ control platforms. This allows for a combination of units that feature condensing and non-condensing operation if so desired.
 - 4) Rotation of lead boiler: The Control module shall change the lead boiler every hour for the first 24 hours after initializing the Cascade. Following that, the leader will be changed once every 24 hours.

- 5) Redundancy: The Control module shall have a built-in feature to continue operating with follower boilers if the Lead boiler is not operational.
- c. Boiler operating controls shall include the following devices and features:
- 1) Set- Point Adjust: Set points shall be adjustable.
 - 2) Operating Pressure Control: Factory wired and mounted to cycle burner.
 - 3) Sequence of Operation: Factory installed controller to modulate burner firing rate to maintain system water temperature in response to call for heat.
 - 4) Sequence of Operation: Electric, factory-fabricated and factory-installed panel to control burner firing rate to reset supply-water temperature inversely with outside-air temperature. At 10 deg F outside-air temperature, set supply-water temperature at 180 deg F; at 60 deg F outside-air temperature, set supply-water temperature at 140 deg F.
- d. Burner Operating Controls: To maintain safe operating conditions, burner safety controls limit burner operation.
- 1) High Temperature Limit: Automatic and manual reset stops burner if operating conditions rise above maximum boiler design temperature. Limit switch to be manually reset on the control interface.
 - 2) Low-Water Cutoff Switch: Electronic probe shall prevent burner operation on low water. Cutoff switch shall be manually reset on the control interface.
 - 3) Blocked Inlet Safety Switch: Manual-reset pressure switch field mounted on boiler combustion-air inlet.
 - 4) High and Low Gas Pressure Switches: Pressure switches shall prevent burner operation on low or high gas pressure. Pressure switches to be manually reset on the control interface.
 - 5) Proof of Closure Valve (FCB 6000 only): Proof of closure valve (POC) shall prevent the boiler from firing if the POC valve seat is detected open. Upon a call for heat, once the POC valve seat is proven to be closed, the pre-purge cycle will begin and the POC valve will begin to open.
 - 6) Blocked Drain Switch: Blocked drain switch shall prevent burner operation when tripped. Switch to be manually reset on the control interface.
 - 7) Low air pressure switch: Pressure switches shall prevent burner operation on low air pressure. Switch to be manually reset on the control interface.
 - 8) Audible Alarm: Factory mounted on control panel with silence switch; shall sound alarm for any lockout conditions.

- e. Building Automation System Interface (for future use): Factory installed Modbus and BACnet MSTP gateway interface to enable building automation system to monitor, control, and display boiler status and alarms.
 - 1) BACnet IP and LonWorks gateways are available as optional equipment.
- f. Software Update: The control shall have the ability to receive updates in the field without hardware component replacement. This update can be performed via USB flash drive, internet connection, or via wireless connection. This service shall be provided at no additional and/or annual cost to the owner.
- g. CON•X•US Remote Connect (for future use): Integral remote connectivity technology that allows a mobile device to monitor and control boiler functionality. Internet connection is available on the Crest via Wi-Fi or hardwired Ethernet connection. This service shall be provided at no additional and/or annual cost to the owner. Retain subparagraph and associated subparagraphs below if interface with building automation system is through hardwired points and minimal interface is required. If extensive interface is required, delete below and retain second subparagraph below.

3. Venting

- a. As shown on drawings.

H. EXECUTION

1. Examination

- a. Before boiler installation, examine roughing-in for concrete equipment bases, anchor-bolt sizes and locations, and piping and electrical connections to verify actual locations, sizes, and other conditions affecting boiler performance, maintenance, and operations.
 - 1) Final boiler locations indicated on Drawings are approximate. Determine exact locations before roughing-in of piping and electrical connections.
- b. Examine mechanical spaces for suitable conditions where boilers will be installed.
- c. Proceed with installation only after unsatisfactory conditions have been corrected.

2. Boiler Installation

- a. Install equipment on 4" concrete housekeeping pad.
- b. Install gas-fired boilers according to NFPA 54.
- c. Assemble and install boiler trim.
- d. Install electrical devices furnished with boiler but not specified to be factory mounted.
- e. Install control wiring to field-mounted electrical devices.

3. Connections

- a. Install boilers level on concrete bases. Concrete base is specified in Division 23 Section "Common Work Results for HVAC," and concrete materials and installation requirements are specified in Division 03.
- b. Install piping adjacent to boiler to allow service and maintenance.
- c. Install piping from equipment drain connection to nearest floor drain. Piping shall be at least full size of connection. Provide an isolation valve if required.
- d. Connect gas piping to boiler gas-train inlet with union. Piping shall be at least full size of equipment connection. Provide a reducer if required. Gas regulator shall also be installed per IOM. Manufacturer shall offer a 2 and 5 psi gas regulator offering for each boiler model.
- e. Connect hot-water piping to supply and return boiler tapping's with shutoff valve and union or flange at each connection.
- f. Install piping from safety relief valves to nearest floor drain.
- g. Boiler Venting:
 - 1) Install flue venting kit and combustion-air intake.
 - 2) Connect full size to boiler connections. Comply with requirements in Division 23 Section "Breechings, Chimneys, and Stacks."
- h. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems".
- i. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables".

4. Field Quality Control

- a. Perform tests and inspections and prepare test reports.
 - 1) Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- b. Test and Inspections:
 - 1) Perform installation and startup checks according to manufacturer's written instructions. Complete startup form included with Boiler and return to Manufacturer as described in the instructions.
 - 2) Leak Test: Hydrostatic test. Repair leaks and retest until no leaks exist.
 - 3) Operational Test: Start units to confirm proper motor rotation and unit operation. Adjust air-fuel ratio and combustion.
 - 4) Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - a) Check and adjust initial operating set points and high- and low-limit safety set points of fuel supply, water level and water temperature.
 - b) Set field-adjustable switches and circuit-breaker trip ranges as indicated.
- c. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other than normal occupancy hours for this purpose.
- d. Performance Tests:
 - 1) Engage a factory-authorized service representative to inspect component assemblies and equipment installations, including connections, and to conduct performance testing.
 - 2) Boilers shall comply with performance requirements indicated, as determined by field performance tests. Adjust, modify, or replace equipment to comply.
 - 3) Perform field performance tests to determine capacity and efficiency of boilers.
 - 4) Repeat tests until results comply with requirements indicated.
 - 5) Provide analysis equipment required to determine performance.
 - 6) Provide temporary equipment and system modifications necessary to dissipate the heat produced during tests if building systems are not adequate.
 - 7) Notify Architect in advance of test dates.

- 8) Perform a combustion analysis after installation and adjust gas valve per the Installation and Operations manual and note in startup report.
- 9) Document test results in a report and submit to Architect.

e. Annual Inspection/Maintenance Program

- 1) Manufacturer shall offer an annual inspection and maintenance program. Scope of work shall include inspecting key components, cleaning filters and burner, and reviewing findings with the property owner. Service shall be offered as an additional program.

5. Demonstration

- a. Engage a factory representative or a factory-authorized service representative for boiler startup and to train Owner's maintenance personnel to adjust, operate, and maintain boilers.

1.13 BOILER VENT/INTAKE

- A. Shall be polypropylene vent system by Centrotherm.

1.14 CIRCULATING PUMPS

- A. Type, capacity, manufacturer and model shall be as scheduled on drawings.

1.15 FOUNDATIONS, SUPPORTS, SLEEVES AND PLATES

- A. Unless otherwise noted, HC shall provide all foundations, hangers, and supports for his equipment including piping, air conditioning units, fans, fin pipe radiation and covers, ductwork, etc.
- B. All ductwork, piping, wiring, and equipment shall be hung or supported from structural members only.
- C. Ductwork shall be supported in accord with SMACNA Standards.
- D. Piping:
 1. All pipe shall be supported from building structure in a neat and workman-like manner wherever possible, parallel runs of horizontal piping shall be grouped together on trapeze hangers. Vertical risers shall be supported at each floor line with steel pipe clamps. Use of wire or perforated metal to support pipes will not be permitted.
 2. Piping shall be supported and braced to withstand seismic loads.

3. Spacing of pipe supports shall not exceed 8' for pipes up to 1-1/2" and 10' on all other piping.
 4. All horizontal pipe, where run overhead or on walls, shall be supported as follows, unless otherwise indicated:
 - a. On adjustable steel clevis type hangers suspended on hanger rods, pipe sizes up to and including 4".
 - b. All supports shall be fastened to structural members or additional steel supports provided by HC.
 - c. Where pipes pass through masonry, concrete walls, foundations, or floors, HC shall set such sleeves as are necessary for passage of pipes. These sleeves shall be of sufficient size to permit 1" of insulation to be provided around pipe passing through. HC shall be responsible for exact location of these sleeves.
 5. Sleeves shall not be used in any portion of building where use of same would impair strength or construction features of the building. Insert for supporting lateral pipes and equipment shall be placed and secured to form work, and all sleeve insert locations shall be thoroughly checked with Architect so as not to conflict with other trades.
 6. Where pipes pass through floor or walls, they shall be provided with chromium plated escutcheons.
- E. Unless otherwise noted, auxiliary steel supports for support of all mechanical equipment as required for particular applications or as directed and indicated on Drawings shall be by HC. All equipment hung from overhead construction shall have weight or equipment distributed by use of angel or channel iron beams as necessary and approved or substantially fastened to beams used for building structural support.
- F. All operating equipment shall be supported so as to produce the minimum amount of noise transmission.

1.16 START-UP, TESTS AND ADJUSTMENTS

- A. All new and altered water piping systems shall be hydrostatically tested to 100 psig. Test shall be four (4) hour duration, during which time piping shall show no leaks and during time no sealing of leaks will be permitted.
- B. Gas piping shall be tested at 50 psig for a period of two hours, all joints shall be soaped and inspected.
- C. HC shall furnish services of a qualified person, thoroughly familiar with job, to operate and make all adjustments so that system and control equipment shall operate as intended. This person shall make adjustments including balancing of water and air systems in cooperation with qualified representative of

mechanical equipment manufacturers and temperature control manufacturer. Architect is to be notified when this balancing is to be performed.

- D. When all work is in an acceptable operating condition, Owner shall be furnished with trade literature, parts lists, and operating instructions for all equipment furnished. Contractor shall furnish one glass framed set and two sets not framed of operating and maintenance instructions, control circuits, and charts with the number of all critical valves corresponding to 2" brass numbered valve discs chained to these valves to Architect.
- E. Final inspection and review shall be made only after proper completion of all of the above requirements.

1.17 ELETRIC MOTORS

- A. High efficiency motors shall be provided with all of the equipment furnished under this section.
- B. Minimum efficiencies for 1,800 RPM motors shall be in accordance with NEMA MG-1, shall be as follows:

Motor Size	Minimum Rated Efficiency
1HP	85.5%
1-1/2	86.5
2	86.5
3	89.5
5	89.5

1.18 MOTOR CONTROLLERS AND WIRING

- A. EC shall furnish all necessary electrical controls, motor starter, switches, etc., for proper operation of equipment furnished by him under this Contract, and as herein noted
- B. Separate magnetic starter with thermal overload protection shall be used for all motors 1/2 HP and over.
- C. Separate manual starter with thermal overload protection for all motors 1/3 HP and under.
- D. Electric service is 120/208 volt, 3 phase, 4 wire, 60 cycle. All motors 1/2 HP and under shall be wired for 120-volt, single phase, motor 1/2 HP and over shall be 208 volts, 3 phase, exceptions as specified.
- E. All starters have Hand-Off-Auto push buttons and pilot lights.

- F. All magnetic starters shall be provided with phase loss protection control.
- G. Provide all auxiliary contacts and controls required for interlocks and automatic operation of HVAC equipment as noted under temperature control specifications. Control circuit voltage shall not exceed 120 volts. Provide fused control transformers where required. EC shall be responsible for the proper electrical connections, which will be done by EC and shall supply said EC with all necessary wiring diagrams to complete this installation.

1.19 ELECTRIC WIRING

- A. Boiler control wiring (line and low voltage) shall be provided by the EC.

1.20 CONTROL

A. General

1. Provide necessary control components and all wiring to accomplish the sequences listed below.
2. Provide automatic pump alternation.

B. Boiler Operating Controls:

1. Boiler water supply temperature, boiler sequencing, lead-lag operation, and outdoor reset control shall be controlled by the controls furnished with the Boilers.

C. Sequence of Operations

1. Heating hot water system (boilers and pumps) to be enabled whenever outdoor air temperatures is 60°F or below (adjustable).
2. Control: Pump alternate controlled shall alternate the operating pump on starting and automatically if failure of the operating pump.
3. Boiler pumps to be enabled whenever associated boiler calls for heat.

1.21 ELECTRIC MATERIALS

- A. Enclosures for disconnect switches and starters should be NEMA 1.
- B. Raceways shall be EMT with compression fittings.
- C. Conductors shall be copper with THWN insulation.

1.22 SHOP DRAWINGS

- A. Submit shop drawings for the following:
 - Boilers

- Pumps
- Piping Materials
- Valves and Fittings
- Insulation
- Controls, including Wiring Diagrams

1.23 GUARANTEE AND SERVICE

A. Refer to Section 235000.

END OF SECTION