

**NEW CANAAN PUBLIC SCHOOLS
39 LOCUST AVENUE
NEW CANAAN, CT 06840
203-594-4000**

**SPECIFICATION COVER SHEET
REQUEST FOR PROPOSAL #2017-05
HIGH SCHOOL DOMESTIC WATER HEATER INSTALLATION
NEW CANAAN, CT**

**VENDOR MUST ENCLOSE THREE COPIES OF THIS SPECIFICATION COVER SHEET
and THREE COPIES OF THE SPECIFICATIONS PRICING SHEETS WHEN RESPONDING
TO THIS REQUEST FOR PROPOSAL (RFP)**

The NEW CANAAN PUBLIC SCHOOLS reserves the right to reject any and all proposals, or separate parts thereof, requested herein before. When items are mentioned by a particular brand, substitution of equal quality items will be considered only if the proposed substitution is clearly stated. When a vendor fails to so identify a proposed substitution, it will be assumed that he is proposing the exact item requested. The NEW CANAAN PUBLIC SCHOOLS is exempt from the payment of Federal Excise Taxes and Connecticut Sales and Use Tax according to State Statute. Such taxes must not be included in bid prices nor added to any items specified.

INSTRUCTIONS ON RFP DEADLINES AND REQUIREMENTS:

NAME OF RFP: HIGH SCHOOL DOMESTIC WATER HEATER INSTALLATION
NEW CANAAN, CT

TYPE OF RFP: Sealed Proposal **QUOTATION #:** 2017-05

RFP CLOSURE DATE: Received Until: **DATE:** December 6, 2017 **TIME:** 1:00 PM, EST

LOCATION TO FORWARD RFPs:	Dr. Jo-Ann Keating, Director of Finance and Operations NEW CANAAN PUBLIC SCHOOLS 39 LOCUST AVENUE NEW CANAAN, CT 06840
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RFP SECURITY: RFP Security Required 5 % RFP Security *Not* Required

PREVAILING WAGE: Required *Not* Required X

FORMS TO COMPLETE RFP: Submit three copies of all required documentation in a sealed envelope.

Identify Name of RFP on Envelope: HIGH SCHOOL DOMESTIC WATER HEATER INSTALLATION
INSTALLATION RFP # 2017-05

Only fully completed RFP packages will be accepted. The following details describe fully completed RFP packages:

Base Proposal

- Proposal Sheet
- Schedule of Project: Schedule of installation, completion and inspection
- Appendix A – Insurance Procedure Form

NEW CANAAN PUBLIC SCHOOLS
INVITATION TO SUBMIT PROPOSAL

New Canaan Public Schools (NCPS) invites proposals from qualified companies for HIGH SCHOOL DOMESTIC WATER HEATER INSTALLATION, NEW CANAAN, CT

Sealed proposals will be received at the New Canaan Public Schools, 39 Locust Avenue, 3rd Floor, New Canaan, CT 06840 until December 6, 2017 at 1:00 pm, EST, at which time they will be opened publicly and read aloud.

The contractor selected for the above project(s) shall be required to enter into a contract with the NCPS. Such contract shall require the posting of performance and payment bonds, the submittal of insurance certificates and the compliance with Federal, State and Local Laws and ordinances. Proposal surety in the form of a bank check, bid bond or certified check in the amount of five percent (5%) of the total RFP price must be submitted with each proposal.

The Request for Proposal (RFP) is available online at www.ncps-k12.org or by contacting Daniel Clarke, Facilities Manager, at daniel.clarke@ncps-k12.org.

Three (3) copies of the submitted qualifications and proposals are to be placed in a sealed envelope and addressed to Dr. Jo-Ann Keating, Director of Finance & Operations, New Canaan Public Schools, 39 Locust Avenue, 3rd Floor, New Canaan, CT 06840. No proposals will be accepted after the date and time specified. No fax or email submissions will be accepted.

The New Canaan Public Schools reserves the right to accept or reject, without prejudice, any or all proposals or to waive any irregularities therein, or to accept the proposal deemed to be in the best interest of New Canaan Public Schools.

Dr. Jo-Ann Keating, Director of Finance and Operations
New Canaan Public Schools

PROJECT START DATE SHALL BE December 20, 2017 .

I have read and understand the RFP requirement of this RFP specification included for my review herein:

Signature of Company Representative

Date

TYPED NAME AND

TITLE: _____

COMPANY: _____

ADDRESS: _____

TOWN: _____ **STATE:** _____ **ZIP:** _____

TELEPHONE NUMBER: _____ **FAX:** _____

CELL NUMBER: _____

EMAIL ADDRESS: (Please print clearly or attach business card):

**NEW CANAAN PUBLIC SCHOOLS
Dr. Joann Keating
Office of Director of Finance and Operations
39 LOCUST AVENUE
NEW CANAAN, CT 06840
203-594-4025**

**1. REQUEST FOR PROPOSAL
RFP #2017-05
HIGH SCHOOL DOMESTIC WATER HEATER INSTALLATION
NEW CANAAN, CT**

Notice is hereby given that sealed RFPs on the following will be received at the Office of the Director of Finance and Operations until:

December 6, 2017 at 1:00 pm, EST

at which time they will be publicly opened and read aloud:

**RFP #2017-05
HIGH SCHOOL DOMESTIC WATER HEATER INSTALLATION
NEW CANAAN, CT**

Specifications, if not attached, may be obtained at the office of:

**Dr. Jo-Ann Keating
Director of Finance and Operations
New Canaan Public Schools
39 Locust Avenue
New Canaan, CT 06840**

The Board of Education reserves the right to reject any and all proposals, or any part thereof, to waive defects in the same, or to accept any proposal it deems to be in the best interest of the Board of Education and/or the Town of New Canaan.

Questions regarding the Town part of the bid should be directed to:

Daniel Clarke, Facilities Manager, at 203-594-4510.

Questions regarding the technical parts of the bid should be directed to:

**CES, 811 Middle Street, Middletown CT. Attn: Russell Knuth,
rpknuth@cesct.com,
860-632-1682**

NEW CANAAN PUBLIC SCHOOLS

REQUEST FOR PROPOSALS

Contractor Services Associated with:

**HIGH SCHOOL DOMESTIC WATER HEATER INSTALLATION
NEW CANAAN, CT**

GENERAL

New Canaan Public Schools (NCPS) solicits proposals from LICENSED CONTRACTORS to perform work for: HIGH SCHOOL DOMESTIC WATER HEATER INSTALLATION, NEW CANAAN, CT.

Furnish all materials, equipment, and labor related to project specifications. Work is to be scheduled as soon as possible and completed before school starts in the fall.

Project Drawings and Specifications are available online at www.ncps-k12.org

SCOPE OF WORK

The scope of work, without limiting the generality thereof, consists of furnishing all labor, material, equipment necessary to complete the project as indicated and as specified. The selected CONTRACTOR(S) will provide shop drawings, catalog cuts and all submissions for approval to CES, 811 Middle Street, Middletown CT. Attn: Russell Knuth, rpknuth@cesct.com. 860-632-1682.

PROPOSAL AND SUBMITTAL PROVISIONS

Proposal price is to be a complete turnkey price.

THE PROPOSALS SHALL INCLUDE:

1. Vendors will submit three (3) sets of their sealed proposal on enclosed PROPOSAL SHEET.
2. Vendors will submit three (3) sets of their qualifications to include:
 - a. A firm background or profile
 - b. A statement of experience
 - c. A statement of staff availability with their experiences and backgrounds. (Ensure that the Project Manager assigned to the job has knowledge of this proposal and is qualified by the membrane manufacturers to direct the effort.)
 - d. A list of any and all proposed subcontractors to be utilized on the project.
 - e. A projected time schedule of the work. It is expected that the work will be completed by **January 17, 2018**.
3. Project security payable to the New Canaan Public Schools in the form of a certified check or payment bond is required for five percent (5%) of the amount bid, issued by an acceptable surety on AIA document A311 or comparable legal bond form, and must accompany each proposal.
4. The successful vendor shall provide using AIA documentation forms for the following; Contract, Performance, and Payment bond within ten days of notification of project award.
5. The successful Contractor shall be required to provide a one (1) year contractor's labor and materials warranty.

SUBMISSION REQUIREMENTS

Respondents shall submit three (3) sets of their proposal. Proposals will be received at New Canaan Public Schools, 39 Locust Avenue, 3rd Floor, New Canaan, CT 06840, ATTN: Dr. Jo-Ann Keating, Director of Finance & Operations, until November 15, 2017 at 1:00 pm, EST, at which time they will be opened and publicly read aloud. No fax or email submissions will be accepted.

Dr. Jo-Ann Keating
Director of Finance & Operations
New Canaan Public Schools
39 Locust Avenue, 3rd Floor
New Canaan, CT 06840

Questions regarding this RFP may be directed to Daniel Clarke, Facilities Manager at 203-822-3162 or Daniel.clarke@ncps-k12.org.

A mandatory walk through is scheduled for November 28, 2017 at 10:30 am. Walk through to be held at New Canaan High School, 11 Farm Road, New Canaan, CT 06840.

All proposals must be signed by an Officer of the Company.

The following items are attached:

Terms and Conditions
Proposal Sheet

SPECIFICATIONS

RFP # 2017-05
HIGH SCHOOL DOMESTIC WATER HEATER INSTALLATION
NEW CANAAN, CT

Due on or before **December 6, 2017 1:00 pm** at the office of:

Dr. Jo-Ann Keating
Director of Finance and Operations
NEW CANAAN PUBLIC SCHOOLS
39 LOCUST AVENUE
NEW CANAAN, CT 06840

Sealed proposals will be received by the Business Department of the New Canaan PUBLIC SCHOOLS of the Town of New Canaan, Connecticut until 1:00 pm on December 6, 2017. Each proposal should be clearly marked (example) "RFP #2017-05 – HIGH SCHOOL DOMESTIC WATER HEATER INSTALLATION". Specifications, instructions and proposal forms may be obtained at the above address. Faxed copies of the proposal will not be accepted.

CONDITIONS FOR SUBMITTING PROPOSALS

1. The Board of Education reserves the right to reject any proposal if it is deemed to be in the best interests of the Town of New Canaan, Connecticut, New Canaan Public Schools and its students.
2. The Board of Education reserves the right to grant an award in total or for any part thereof for the items or services being proposed. In addition, the Board of Education reserves the right to award this project as a package in conjunction with other proposals for similar services/supplies/equipment. The Board reserves the right to award with preference to State of Connecticut contract holders and/or local vendors.
3. The submission of a proposal shall be conclusive evidence that the vendor has satisfied himself as to the requirements of the RFP specifications and any controlling conditions which may exist.
4. Vendors may not withdraw their proposal for a period of 120 days from the date of RFP opening. The Board of Education and the vendor may mutually agree to extend the time limit.
5. In determining the ranking of responsible vendors, the Board of Education may consider, in addition to price, the quality, availability and type of items, the experience of the vendor, the sufficiency of the financial resources of the vendor and the reputation of the vendor for ability, integrity, judgment and performance, as well as the ability of the vendor to provide future service/supplies/equipment.
6. It is anticipated that the goods will be needed for the current school year, but the Board of Education reserves the right to cancel or alter this service because of enrollment changes, budget consideration or unforeseen circumstances which require a change.
7. All proposal prices are to include the complete costs, which includes inside delivery to each school or location with installation and assembly of same, if applicable, and training, if

applicable. All deliveries must be made prepaid and must be delivered to the location subsequently designated on the purchase orders at no cost over and above the bid price indicated in your proposal. Deliveries must be made inside building indicated. In no case will collect shipments or sidewalk deliveries be accepted. A packing slip shall be included in each shipment. All packages must be clearly marked as to content.

8. The Board of Education of the Town of New Canaan supports efforts to reduce the use of illegal drugs in the workplace. In instances where responsible prospective bidders submit identical tie bids, preference shall be given to the businesses with drug-free workplace programs. Whenever two or more proposals which are equal with respect to price, quality, and service are received by the Board of Education for the procurement of commodities or contractual services which are proposed, a proposal received from a business which has certified that it has implemented a drug-free workplace program shall be given preference in the award process. The drug-free workplace program certification is attached and is to be submitted with the proposal package by the vendor along with other proposal documents in order to receive preference. This policy shall become effective in accordance with the provisions of the Charter of the Town of New Canaan regarding proposal procedures.
9. **ALTERNATIVES:** When proposing an alternate item, indicate the Brand and Model identification on the specification sheets. To have alternates considered, complete specifications must be provided and catalogues describing the product must accompany the bid. The New Canaan Public Schools reserves the right to request equipment samples on specific items.
10. **SUBSTITUTIONS: No substitutions**

The New Canaan Public Schools reserves the right to request equipment samples on specific items.
11. **FORM AND STYLE OF PROPOSAL:** All blanks on the Proposal Sheet, except where otherwise requested, shall be filled in by typewriter or manually in ink and must be completely legible.
12. **WARRANTIES:** Whenever an item or service is covered by a specified product or service warranty, such warranties must be submitted with the official proposal or quotation specification sheets. All such warranties shall inure to the benefit of the Board.
13. **INSURANCE REQUIREMENTS:** The successful vendor will be required to purchase from and maintain, for the life of the contract, in a company or companies with an A.M/Best rating of A- (VII) or better, such insurance as will protect the Board of Education from claims set forth below which may arise out of or result from the vendor's obligation under the Contract, whether such obligation is the vendor's or a subcontractor or any person or entity directly or indirectly employed by the successful vendor or anyone for whose acts said vendor may be liable.

14. **Workers Compensation:**

Vendor shall provide workers compensation insurance required by law with employer's liability limits for at least the amounts of liability for bodily injury by accident of \$ 500,000 each accident and bodily injury by disease of \$500,000.

15. **Commercial General Liability Insurance:**

Vendor shall provide commercial general liability insurance policy with an edition of 1986 or later including products and complete operations. Limits should be at least: Bodily injury and property with an occurrence limit of \$1,000,000; Personal & advertising injury limit of \$1,000,000 per occurrence; General aggregate limit of \$2,000,000 (other than products and completed operations); Products and completed operations aggregate limit of \$2,000,000. Coverage will continue three years after the completion of the work.

- The policy shall name the New Canaan Public Schools as an additional insured and include ISO Form CG2010 (07/04) and CG 2037 (07/04).
- Such coverage will be provided on an occurrence basis, and will be primary, and shall not contribute in any way to any insurance or self-insured retention carried by the Board of Education.
- The policy shall contain a waiver of liability in favor of the Board of Education.
- Such coverage shall contain a broad form contractual liability endorsement or wording within the policy form to comply with the hold harmless and indemnity provision of the contract.
- A per project aggregate limit of liability endorsement shall apply for any construction contract.
- Deductible and self-insured retentions shall be declared and are subject to approval by the Board of Education.

16. **Commercial Automobile Insurance:**

Vendor shall provide commercial automobile insurance for any owned autos (symbol 1 or equivalent) in the amount of \$1,000,000 each accident covering bodily injury and property damage on a combined single limit basis. Such coverage shall also include hired and non-owned automobile coverage. Policy shall name the Board of Education as an additional insured.

17. **Umbrella Liability Insurance:**

Vendor shall provide an umbrella or excess liability policy in excess (without restriction or limitation) of those limits and coverages described in items (A) through (C). Such policy shall contain limits of liability in the amount of \$5,000,000 each occurrence and \$5,000,000 in the aggregate.

As to the insurance required, the insurer(s) and/or their authorized agents shall provide the Board of Education certificates of insurance prior to execution of the agreement by the Board of Education describing said coverage.

18. **QUESTIONS:** For questions regarding the proposal process, contact Dr. Jo-Ann Keating, Director of Finance and Operations, at (203) 594-4015.

For questions regarding the project, contact:

Daniel Clarke, Facilities Manager at 203-822-3162.

Questions regarding the technical parts of the bid should be directed to:

CES, 811 Middle Street, Middletown CT.

att: Russell Knuth,

rpknuth@cesct.com,

860-632-1682.

NOTE: By submitting a proposal for this contract the vendor agrees that any or all past clients may be contacted by the New Canaan School District. The vendors quoting on this contract also agree to release and discharge by quoting on this contract for the vendor him/herself, his/her heirs executors administrators and assigns, release acquit and forever discharge the New Canaan School System, its Board of Education and all employees and any or all other persons, firms and corporations of and from any and all actions, causes of actions, claims or demands for damages, costs, loss of services, expenses, compensation, consequential damage or any other thing whatsoever, on account of, or in any way growing out of any former client contacted by the New Canaan School System to obtain an opinion regarding any work performed by your company. The above release shall also include and apply to any former client contacted.

DRUG-FREE WORKPLACE CERTIFICATE

I hereby certify that this company:

2. Has a published statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and that this statement specifies the actions which will be taken against employees for violations of such prohibition.
3. Has a written policy informing employees about the dangers of drug abuse in the workplace, the firm's policy of maintaining a drug free workplace, any available counseling, rehabilitation, and employee assistance programs, and the penalties which may be imposed upon employees for drug abuse violations.
4. Each employee engaged in providing the commodities or contractual services which are being bid was given a copy of the statements specified in paragraphs 1 and 2, above.
5. In the statement specified in paragraph 1, the employees have been notified that, as a condition of working on the commodities or contractual services which are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of "guilty" or of "nolo contendere" to any violation of any controlled substance law of the United States or of any state, for a violation occurring in the workplace no later than five (5) days after such conviction or plea.
6. This firm will impose a sanction on or require the satisfactory participation in a drug abuse assistance program or a rehabilitation program, if such are available in the employee's community, by any employee who is so convicted.
7. This firm will make a good faith effort to continue to maintain a drug free workplace.

As the person authorized to sign this statement, I certify that this firm fully complies with the above requirements.

Signature: _____ **Date:** _____

Print Name: _____

Company: _____

DrugFreeWkplaceCert (forms)

Appendix A
INSURANCE PROCEDURE
NEW CANAAN PUBLIC SCHOOLS
NEW CANAAN, CT

PLEASE NOTE:

RETURN THIS COMPLETED FORM WITH YOUR PROPOSAL. FAILURE TO DO SO MAY RESULT IN YOUR PROPOSAL BEING REJECTED.

Please take the insurance requirements of the PROPOSAL to your agent/broker immediately upon receipt of the RFP documents to determine your existing coverage and any costs for new or additional coverage required for the work noted in RFP. Any PROPOSALS's that contain exceptions to the insurance requirements may be considered non-responsive and may be rejected.

STATEMENT OF VENDOR:

I have read the insurance requirements for this work and have taken the documentation to my insurance agent/broker. BID/RFP cost reflects any additional costs relating to insurance requirements for this work.

If I am awarded this CONTRACT, I or my insurance agent shall submit all of the required insurance documentation to NEW CANAAN PUBLIC SCHOOLS Business Office within ten (10) days after the date of the award.

Signature

Date

Print Vendor Name

TERMS AND CONDITIONS

THIS IS A REQUEST FOR PROPOSALS AND THE NEW CANAAN PUBLIC SCHOOLS RESERVES THE RIGHT TO NEGOTIATE AND CONTRACT WITH ANYONE OR NO ONE IN THE BEST INTERESTS OF THE TOWN.

NCPS RESERVES THE RIGHT TO AWARD ONE, TWO, OR ALL OF THE PROJECTS TO THE SAME CONTRACTOR.

Unless otherwise modified, the following terms and conditions will apply to services rendered. The respondent may use a standard form of agreement incorporating the following provisions.

Services to be Provided

The winning vendor shall provide services as set forth in the RFP and in accordance with the terms identified herein. The services provided will be performed on behalf of and solely for the New Canaan Public Schools and any information, tests, reports, correspondence, and conclusions shall not be released to other parties unless authorized by NCPS or in accordance with any applicable state or federal law.

Billing and Payment

New Canaan Public Schools will pay the winning vendor for services performed in accordance with the signed Agreement. Invoices will be submitted periodically or upon completion of services rendered. The Town reserves the right to request substantiating information on any bill submitted. The Town will, within 30 days after receipt of an invoice requesting payment, and with the approval of the Town, indicate the approval of payment and process the invoice or indicate to the winning vendor in writing, the reason for refusing to approve said invoice. In the latter case, the winning vendor will make the necessary corrections and resubmit the invoice.

Court Litigation and Waiver of Jury Trial

Notwithstanding the existence of any provision for arbitration of disputes in the contract or any legislation providing for arbitration, any dispute arising under this contract shall not be submitted to arbitration and the parties shall be left to the remedies at law. It is further expressly agreed that both parties waive and relinquish their right to a trial by jury of any dispute arising out of this contract. The intent of the parties is not to have a jury decide any aspect of any dispute which may arise under this contract.

Mediation

All claims, disputes or other matters in question between the parties to this Agreement arising out of or relating to this Agreement or breach thereof shall be submitted to non-binding mediation. On the written notice of either party to the other of the election to submit any dispute under this Agreement to mediation, each party shall designate its representative and shall meet at the New Canaan Town Hall within ten (10) days after the service of notice. The parties themselves shall then attempt to resolve the dispute within ten (10) days of meeting.

Should the parties themselves be unable to agree on a resolution of this dispute, then the parties shall appoint a third party, who shall be a competent and impartial party and who shall be acceptable to each party, to mediate the dispute. Each party shall pay the fees and expenses of the party mediator and such

costs shall be borne equally by both parties. Upon agreement of the parties, either party may waive the first step in the mediation process and appoint a mutually acceptable mediator.

Any third party mediator designated to serve in accordance with the provisions of the Agreement shall be disinterested and shall be qualified to evaluate the performance of both parties.

This process shall be considered as a condition precedent to moving to court.

Equitable Relief

Nothing herein shall prevent either party from obtaining a court order enforcing the mediation process or such other temporary or equitable relief until such time that the dispute is settled or finally adjudicated.

PROPOSAL SHEET
NEW CANAAN PUBLIC SCHOOLS
DECEMBER 6, 2017 at 1:00 pm
RFP # 2017-05
HIGH SCHOOL DOMESTIC WATER HEATER INSTALLATION
NEW CANAAN, CT

Having carefully examined the Instructions to Vendors, Equipment / Material Specifications, Scope of Work, Standard Bid/RFP and Contract Terms and Conditions, the site(s) where the work is to be performed, all applicable legal requirements and having made such independent investigations as the respondent deemed necessary, the undersigned hereby submits a proposal to perform the HIGH SCHOOL DOMESTIC WATER HEATER INSTALLATION in New Canaan CT.

In submitting this proposal, the vendor represents that this proposal will remain effective for one hundred twenty (120) days following the proposal due date.

A. Project Cost and Construction Administration:

For providing all work, labor, materials, equipment, transportation, HIGH SCHOOL DOMESTIC WATER HEATER INSTALLATION:

<u>DHW Installation</u> – BASE	Written Amount \$ _____
1– PIPING RENOVATIONS -	Written Amount \$ _____
2– REPLACE SHOWER HEADS -	Written Amount \$ _____
3- ADD ALTERNATE 1-A pg. 17 (Backup Existing 750 Gal Tank)	Written Amount \$ _____
TOTAL Written Amount \$ _____	

If awarded this contract, we will execute an AIA contract with New Canaan Public Schools, Owner of the properties.

*Prices given are the final price to the Owner and include all permits, fees, overhead and profit of the Vendor.

Company Name: _____

Address: _____

Email: _____ Phone: _____

Name: _____ Title: _____

Signature: _____

SECTION 01000 – CONTRACT ADMINISTRATION

GENERAL

1.1 GENERAL REQUIREMENTS

- A. The General Conditions and Supplementary Conditions are hereby made a Part of this Division. See page 17 for the start of the technical specifications.
- B. All work and operations under this contract shall be in conformance with all applicable Federal, State and Local Codes and the regulations of all governing bodies with jurisdiction. Particular attention is directed towards OSHA Chapter XVII Part 1926 and all related amendments.
- C. Immediately on execution of the Contract the Contractor shall carefully study and compare the Contract Documents and shall report to the Engineer in writing any error, in consistency or omission he may discover well in advance of the pre-construction conference. The Contractor shall not proceed on any affected work without instruction from the Engineer. ALL ROOMS SHALL BE KEPT CLEAN AT END OF WORK DAY.

1.2 SUPERINTENDENT AND WORKMEN

- A. The Contractor must have a responsible superintendent at the building from the start to the finish of the job and during all working hours. It is expected that the same superintendent will be retained for the entire project. However, if the Contractor deems this not possible, a 1 week notice shall be given the Engineer prior to changes.
- B. Any individual judged unacceptable by the Engineer shall not be permitted as superintendent. In addition, the Contractor must give the work his personal supervision.
- C. Any instructions or notices given to the superintendent shall have the same force as if given to the Contractor in person. Any workman, including the superintendent, who in the opinion of the Engineer or the Owner is not capable or who is careless in the execution of the work, must be removed without question upon request of the Engineer.

1.3 TIME LINE

- A. All work for the school is intended to be completed by January 3, 2018. OWNER WILL OPEN SCHOOLS, AS NEEDED, FOR SECOND SHIFT OR WEEKEND WORK, AT NO COST TO THE CONTRACTOR.

PART 2 PRODUCTS - Not used

PART 3 EXECUTION - Not used

END OF SECTION

DOMESTIC WATER HEATER INSTALLATION - PERFORMANCE SPECIFICATIONS

PART 1 - SCOPE OF WORK AND SPECIFICATIONS

1.1 GENERAL SCOPE OF WORK

- A. The following Scope of Work shall be completed by the contractor, in its entirety. This scope of work will only describe the desired systems, some system sizes, and the final outcome for the owner. Basic equipment configuration is diagrammed. See drawings floor plan and piping on drawing noted specifically for the project at hand. Coordinate all work with lighting rebate structure supplied by the utility; the major items are detailed in this specification.
 - 1. Systems to be compliant with the New Canaan Public Schools Energy Opportunities Project to be applied for with the Utility Company(s).
- B. This document is to act as a guideline for the contractor; the final completed operational system installation is the sole responsibility of the contractor.
- C. It is the intent of this contract to have the Mechanical Contractor serve as the Prime Contractor and the Electrical Contractor, if hired, are hired as a subcontractor under the Mechanical Prime Contractor.
- D. The contractor is to visit the site, take all required notes and provide a complete bid. The contractor will be required to work with the owner and engineer to detail all of the specific requirements, once the contract is awarded. The system is described within the scope of work and the performance of the system is described within the specifications, schedules and details, no change orders will be allowed. The contractor will be required to provide, a full submission of shop drawings, and coordination services in the field.

1.2 DOMESTIC HEATER SCOPE

- A. Provide labor, material and all required equipment to completely remove and dispose offsite the failed 750 gallon vertical domestic hot water storage tank. Remove interconnected piping back to the existing system connections. Valve and cap piping that is remaining.
 - 1. The second storage tank and boiler connections will remain and be isolated, drained and cleaned after the new boiler and storage tanks have been commissioned into service.
 - a. This tank will have a second pump installed equal to - C - noted below and be piped in parallel to the new 200 gallon storage tanks. This system can then be used or not used for future emergencies.

1.3 DOMESTIC HEATER BILL OF MATERIALS.

- A. **BOILER** – Provide one LOCHINVAR #AWN400PM – 399mbh, 27” deep, 43” high, 16” wide. 2” water connections, 1” LP gas (convertible to natural gas), 4” diameter flue pipe out / air inlet, 306#, 39 gpm, 120 volt boiler with 120 volt pump and 6.5 amps total current draw. Stainless steel category IV concentric vent connection. Install with concrete

pad and 24" clearances on all sides. Coordinate boiler BMS connections with existing school Backnet protocol and Alerton BMS.

- B. STORAGE TANKS – Provide two LOCHINVAR #RJA200, ASME 200 gallon insulated tank. 77" high, 32" diameter. Glass lined with 5 year warrantee, 150 psi construction. 2" R13 foam insulation. Magnesium anode rods. 634#.
- C. PUMPS – Provide one Grundfos UPS 43-110, ¾ HP, 3 speed pump to provide boiler hot water to storage tanks indirect heat exchanger. 30 gpm at 33 ft of head. 120 volt, 5.1 amps. Coordinate 1 ½" flange with 2" boiler connections. 8.5" flange to flange, 12" deep.
- D. ALTERNATES – Base Price = pricing on replacing boiler, storage tanks, connecting piping BMS connections and required pumps, etc.
 - 1. Alternate 1 - separate pricing on 10 SHOWER HEAD REPLACEMENT –
 - a. SYMMONS #4-282M-2.0 – 2 gpm replacement head installed in the existing Symmons Hydapipe 1-903S system. Coordinate new head part number and the original installation with all shower systems.
 - 2. Alternate 2 - separate pricing for adding: SEISMIC BRACES FOR PIPING IN CORRIDORS.
- E. Vendor will perform all work during day or on second shift Monday thru Friday and NCPS will cover expense to have custodians opening and closing of buildings. We have attached school calendar on days contractor could possibly work straight time.
- F. Vendor will cover all necessary CT Prevailing Wage where needed.
- G. Owner will pick area outside building for vendor for storage trailer for tools, ladders, material. There will be no storage space available in the school.
- H. Vendor will supply list of any piping deficiencies found during installation of project.
- I. Bidders shall supply Town with schedule of completion after the Town issues the purchase order for the project.
- J. Vendor will have to pull town permit for project. There will be no charge for permit because it's a school. This is new policy that town requires on all projects at schools.

1.4 GENERAL SPECIFICATION REQUIREMENTS

- A. It is the intent of the Specifications to call for finished work, tested and ready for operation. Provide all materials, equipment and labor necessary to complete the work outline within this document. The contractor is to note that this document is schematic and not detailed and that final placement of all equipment, piping, thermostats, raceways, etc. will need to be reviewed in the field with the engineer. If a conflict in positioning systems or placement of equipment occurs, the contractor is to notify the engineer immediately to ascertain what the intent was by the design professional. Any apparatus, appliance, material or work, or any incidental accessories necessary to make the work complete and perfect in all respects and ready for operation as determined by good trade

practice even if not particularly specified, shall be furnished, delivered and installed without any additional expense to the Owner.

- B. Provide all necessary labor, materials and other miscellaneous equipment necessary to complete the work.
- C. The contractor shall be responsible for arranging for inspections by the authority having jurisdiction. The contractor shall be responsible for being available for inspections by the authority having jurisdiction.
- D. All work shall be completed in accordance with the latest edition of all applicable state and local building codes including The International Energy Conservation Code.
- E. The Control contractor shall provide all power and control wiring.
- F. The following definitions apply to this contract:
 - 1. Furnish: the term "furnish" is used to mean "supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations."
 - 2. Install: the term "install" is used to describe operations at project site including the actual "unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations."
 - 3. Provide: the term "provide" means "to furnish and install, complete and ready for the intended use."
 - 4. Remove: the term "remove" means "to disconnect from its present position, remove from the premises and to dispose of in a legal manner."
 - 5. Substitutions: requests for changes in products, materials, equipment, and methods of construction required by contract documents proposed by the contractor after award of the contract are considered requests for "substitutions."
- G. The Contractor shall give all necessary notices, obtain all permits; and pay all Government and State sales taxes and fees where applicable, and other costs, including utility connections or extensions in connection with the work, file all necessary drawings, prepare all documents and obtain all necessary approvals of all Governmental and State departments having jurisdiction, obtain all required certificates of inspection for his work, and deliver a copy to the Owner and Engineer before request for acceptance and final payment for the work. The contractor shall be responsible for arranging for inspections by the authority having jurisdiction. The contractor shall be responsible for being available for inspections by the authority having jurisdiction.
- H. Do not burn waste materials. Do not bury debris or excess materials on the owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove and dispose of all waste materials, packaging material, skids etc. from the site and dispose of in a lawful manner in accordance with municipal, state and federal regulations. Clean room at end of each day of work.

- I. Prior to ordering any materials and equipment, thoroughly review the site conditions to determine if adequate clearances and access is allowed to install the components. Order equipment broken down as necessary to allow for proper handling through the project area. Provide all necessary alterations to the structure of the building as necessary to rig the equipment in place. Carefully inspect all building elements prior to cutting or drilling into wall, floors or ceilings. Patch and paint surfaces disturbed by work under this contract as required to restore them to their original condition.
- J. The contractor shall be required to properly store materials and equipment so as to avoid theft or vandalism. If theft or vandalism occurs, the contractor shall repair or replace such items at the direction of the engineer. Contractor must use portable storage and holds the Town harmless of liability if equipment or materials are stolen. Coordinate placement of storage with the Town.
- K. The contractor must coordinate all interruptions of services and limitations of access with the Town no less than 3 days prior to the interruption.
- L. Provide seismic restraints for all fixtures specified herein in accordance with the International Building Code (IBC), IMC, IPC, NEC and all local codes.
- M. Clean, prime and paint newly installed equipment installed under this contract and the exposed portion of the piping systems to match the finish of the adjacent surfaces or to meet the indicated or specified safety criteria or to meet the color scheme set by the architect.

1.5 SCHEDULING/TESTING

- A. This Contractor shall include in their construction schedule milestone tasks for the following.
 - 1. As-Built Drawings/Documentation completed by Contractor and reviewed by Engineer.
 - 2. Pre-Functional Testing (Manufacturer Start Up Procedures)
 - a. All Scheduled equipment including pumping systems.
 - 1. Functional Testing
 - a. DHW System Sequence of Operations.
 - b. Operational check/test/start with Boiler representative present at startup to ensure systems function as designed and for all mfg requirements.
 - 2. Owner Training
 - a. Review general operation of the following with the owner:
 - 1) Boiler System Sequence of Operations.
 - 2) Location of O&M Manuals.

1.6 SHOP DRAWINGS

- A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the contract documents including specific make, model and options being substituted. Do not reproduce contract documents or copy standard information as the basis of shop drawings. Standard information prepared without specific reference to the project is not considered shop drawings.
- B. Shop drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
 - 1. Dimensions.
 - 2. Identification of products and materials included.
 - 3. Compliance with specified standards.
 - 4. Notation of coordination requirements.
 - 5. Notation of dimensions established by field measurement.
- C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- D. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for re-submittals.
 - 1. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Engineer will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
 - 2. If an intermediate submittal is necessary, process the same as the initial submittal.
 - 3. Allow two weeks for reprocessing each submittal.
 - 4. No extension of Contract Time will be authorized because of failure to transmit submittals to the Engineer sufficiently in advance of the Work to permit processing.

- E. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
1. Include the following information on the label for processing and recording action taken.
 - a. Project name.
 - b. Date.
 - c. Name and address of Engineer.
 - d. Name and address of Contractor.
 - e. Name and address of supplier and/or manufacturer.
- F. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Engineer using a transmittal form supplied by Town or submitted to Engineer by the contractor for approval of the form's content. Submittals received from sources other than the Contractor will be returned without action. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.
- G. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Engineer will review each submittal, mark to indicate action taken, and return promptly. Compliance with specified characteristics is the Contractor's responsibility.
- H. Action Stamp: The Engineer will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, to indicate the action taken.
- I. Do not use shop drawings without an appropriate final stamp indicating action taken in connection with construction.
- J. Do not order any materials or equipment prior to receiving final approved shop drawings.
- K. Upon completion of project, provide owner with bound notebook for:
 - 1) O&M manuals for every installed piece of equipment,
 - 2) "As Built" drawings
- L. Catastrophic protection storage media:
 1. All as built plans will be stored/backed up on a media (USB thumb drive) and given to the owner for proper protection and storage.

1.7 SUBSTITUTIONS

- A. Substitution request submittal: requests for substitution will be considered if received within 45 days before commencement of the work. Requests received more than 45 days

before commencement of the work may be considered or rejected at the discretion of the engineer.

- B. Submit electronic copies of each request for substitution for consideration.
- C. Identify the product, or the fabrication or installation method to be replaced in each request. Include related drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate.
 - 1. Product data, including drawings and descriptions of products, fabrication and installation procedures.
 - 2. Samples, where applicable or requested.
 - 3. A detailed comparison of significant qualities of the proposed Substitution with those of the work specified, significant qualities may include elements such as size, weight, durability, performance and visual effect.
 - 4. Coordination information, including a list of changes or modifications needed to other parts of the work and to construction performed by the owner and separate contractors that will become necessary to accommodate the proposed substitution.
 - 5. A statement indicating the substitution's effect on the contractor's construction schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall contract time.
 - 6. Cost information, including a proposal of the net change, if any in the contract sum.
 - 7. Certification by the contractor that the substitution proposed is equal to or better in every significant respect to that required by the contract documents and that it will perform adequately in the application indicated. Include the contractor's waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.
- D. Engineer's action: within one week of receipt of the request for Substitution, the engineer will request additional information or documentation necessary for evaluation of the request. Within 2 weeks of receipt of the request, or one week of receipt of the additional information or documentation, whichever is later, the engineer will notify the contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained with the time allocated, use the product specified by name. Acceptance of a product substitution will be in the form of a change order.
- E. Other conditions: the contractor's substitution request will be received and considered by the engineer when one or more of the following conditions are satisfied, as determined by the engineer; otherwise requests will be returned without action except to record noncompliance with these requirements.
 - 1. The request is directly related to an -or equal- clause or similar language in the contract documents.

1.8 AS-BUILT DRAWINGS

- A. Submit As-Built drawings to Engineer prior to January 31, 2018.
- B. Prepare CAD files, (hand drawn as approved by engineer) annotated As-Built drawings; detailing the actual installation of major elements, components, and systems of equipment and materials. Where shop drawings are used, record a cross-reference at the corresponding location on the as-built drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
- C. Provide cut sheets or approved shop drawings indicating make/model/option for major equipment and equipment ID tag which corresponds to As-Built drawings.
- D. Mark new information that is important to the owner, but was not shown on contract drawings or shop drawings.

1.9 GUARANTEES

- A. The Contractor shall guarantee all material and workmanship under these Specifications and the Contract for a period of two (2) year from the date of final acceptance by Owner. During this guarantee period, all defects developing through faulty equipment, materials or workmanship shall be corrected or replaced immediately by this Contractor without expense to the Owner. Such repairs or replacements shall be made to the Engineers satisfaction. Provide manufacturer warrantee submission to owner as applicable.
- B. Contractor shall provide name, address, and phone number of all contractors and subcontractors and associated equipment they provided.

1.10 PROJECT CLOSE-OUT

- A. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
- B. Deliver tools, spare parts, extra stock, and similar items.
- C. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
- D. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.
- E. Field Observation Procedures: On receipt of a request for a field observation, the Engineer will either proceed with field observation or advise the Contractor of unfulfilled requirements. The Engineer will advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
 - 1. The Engineer will repeat the field observation when requested and assured that the Work has been substantially completed.
 - 2. Results of the completed field observation will form the basis of requirements for final acceptance and payment.

- F. Service Contracts: Submit a 2 Year Service Contract addressed to the owner for Engineer Review. Provide manufacturer warrantees as applicable.
1. Include list of equipment/parts included in the service contract. Include maintenance items included in equipment manufacturer's installation guide.
 2. List Frequency of Preventive Maintenance site visits and services included; minimum 4 site visits 1st year.
 3. List Yearly Service Contract fee, hourly rate for service calls during normal hours, and hourly rate during non-normal hours. Include time and days of normal hours.
 4. Include report/service logs for each site visit.
 5. Include typical response time for service calls.

PART 2 - DHW SYSTEMS - SCOPE OF WORK

2.1 SYSTEM – GENERAL REQUIREMENTS

- A. SEE PARAGRAPH 1.2 - Systems shall include but are not limited to: Boiler, Storage tanks, piping, labor and all interconnecting power and control wiring.

2.2 SEQUENCE OF CONSTRUCTION

- A. SEE PARAGRAPH 1.2 FOR SEQUENCE OF CONSTRUCTION

2.3 GENERAL SPECIFICATION REQUIREMENTS

- A. Equipment Installation
1. Follow manufacturer's instructions. Adjust controls for proper operation. Provide Owner with necessary instructions for operation and maintenance of the system.
 2. Provide control wiring and final connections to power wiring. Power wiring shall be checked for continuity between the existing and new systems.
 3. Factory trained personnel to work on system with factory authorized representative for equipment start up and sign off of installations.
- B. Contractor is to complete the commissioning and testing of DHW systems during the installation of the boiler and storage tanks.
1. The contractor will supply a list with room locations of any deficiencies on or in room that require repair which is not included in RFP scope.
 2. The contractor will supply New Canaan Board of Ed pricing for repairs, good for 1 year from completion of installation of this project.

3. The intent is to allow the Town the ability to repair items during school breaks in areas as project repair funding becomes available.

2.1 DOMESTIC HOT WATER SYSTEMS

- A. Provide connections from existing piping to new domestic water heaters in accord with code.
- B. The existing storage water heater piping shall be reconnected to the new storage tanks. Provide all piping to system, isolation valves, T&P valve, controls and wiring.

2.2 FUEL SUPPLY SYSTEMS

- A. LP and natural gas piping, which is above grade, shall be Steel Pipe: ASTM A53 or A120, Schedule 40 black. Connect 1 ½" diameter pipe to LP inlet at existing boiler room. Provide for pipe to extend to a new natural gas meter at exterior wall. Weather proof wrapped black iron shall be used when exposed to weather. Run into mechanical rooms.
- B. Provide new gas piping with piping distribution system to gas boiler, in accord with code. Gas piping shall be checked for size in accordance with the requirements of the boiler manufacture installation instructions, the International Mechanical Code and local requirements.

2.3 HOT WATER BOILER AND ACCESSORIES

- A. The existing 750 gallon storage tank will be replaced with an LP (future natural) gas fired high efficiency boiler with: hot water piping, condensate neutralizer, digital control system, control valves, manufacturer supplied associated equipment. 2 inch iron gas pipe from meter to boiler.
- B. Performance Overview:
 1. Boiler shall operate with up to 99% thermal efficiency
 2. Heat exchanger shall be a fully condensing, cylindrical, vertical, two-pass, counter-flow, fire tube design with 304L/316L grade stainless steel construction and all welded design with constant allowable system return temperatures of 40F.
 3. Fine-tuned combustion premix providing homogeneous air and gas combustion mix to a radial burner incorporating a knitted stainless steel wrap ensuring stable light off and efficient clean combustion.
 4. Up to 25:1 gas input turn down ratio while maintaining excess air levels and sustaining condensing efficiencies throughout entire modulating range Oxides of Nitrogen (NOx) of 9 ppm corrected to 3% oxygen.
 5. Category II and IV venting options.
 6. The boiler shall be fully factory fire tested to obtain optimum combustion characteristics and to establish certified gas input rates.

7. System safety and operating devices and controls are fully configured, calibrated and factory tested.
8. The boiler shall comply with the energy efficiency requirements of the latest edition of the ASHRAE 90.1 Standard.
 - a. Provide required hardware to re-establish existing control connections for BMS monitoring and operation.

C. Heat Exchanger:

1. The heat exchanger shall be designed, inspected, and tested to A.S.M.E. Section IV requirements. The A.S.M.E. Section IV seal of approval will not be provided as standard for jurisdictions not requiring the A.S.M.E Section IV seal of approval.
2. The heat exchanger shall be of fully welded construction and have a maximum working pressure of 160 psig (1100 kPa). Configuration shall be a cylindrical, vertical, two-pass, counter-flow, fire tube design and consist of an integral combustion chamber with an inner tube bundle for primary heat transfer and an outer tube bundle for extracting latent heat from flue gases.
3. The combustion chamber, fire tubes, and tube sheets shall be constructed of 316L stainless steel. The remainder of the heat exchanger shall be constructed of 304L stainless steel.
4. The fire tubes shall be of an oval design with a minimum wall thickness of 0.061". The upper and lower tube sheets shall have a thickness of no less than 0.50".
5. The heat exchanger design shall be capable of 40 deg F constant system return temperatures and be fully condensing complete with condensate trap and drains. A pressure relief valve shall be furnished with the heater.

D. Combustion Chamber:

1. The combustion chamber shall be an all welded stainless steel construction and an integral part of the heat exchanger. The combustion chamber shall incorporate an easily removable radial fired knitted fiber stainless steel burner to access the internal combustion chamber for inspection, service, and cleaning. A window view port shall be provided for visual inspection of the boiler combustion during firing.

E. Gas Train:

1. The gas train shall consist of a pressure regulating electro-hydraulic proportional air/gas main gas actuator providing a slow opening, fast closing shutoff valve and proportional 1:1 air/gas ratio control, a fast closing safety shutoff gas pressure regulator with 1/2 PSI allowable static pressure, a low gas pressure switch, and a high gas pressure switch.

2. A factory pre-set combination metering valve and orifice shall be provided for setting combustion parameters. Model AV1800 shall operate with a minimum 22:1 turndown ratio.

F. Burner/Combustion:

1. The combustion air fan(s) draws gas under negative pressure and mixes it with air to generate a fine tuned air gas mixture which is delivered under positive pressure to the radial knitted stainless steel burner. Combustion modulation is established by a variable frequency drive.
2. The burner shall be a 100% stainless steel vertical mounted radial fired type with stainless knitted metal fiber construction. The burner shall combust a precise amount of premixed combustion air and gas to provide equal distribution of heat for heat transfer throughout the entire heat exchanger. Combustion products are exhausted under minimum back pressure. Combustion operates with a minimum of 22:1 turn down ratio on model AV1800 while sustaining combustion characteristics throughout the entire modulating range.
3. Operation of up to 99% thermal efficiency and shall be certified for Oxides of Nitrogen (NOx) of 9 ppm corrected to 3% oxygen.

2.4 CIRCULATOR PUMPS

- A. The building domestic water pumps will remain. The boiler circulator will feed to and from the new storage tanks as shown in attached details.
- B. Boiler Circulator shall have the following features:
 1. Shall be of the back pull-out design so that the rotating element can be removed from the casing without disconnecting the suction or discharge piping. The casing material shall be close-grained cast iron ASTM A48 - Class 30 with a minimum tensile strength of 30,000 P.S.I. Volute shall have integrally cast suction and discharge connections, gauge ports at nozzles, and vent and drain ports. Pumps with specific speed greater than 1600 shall have double volute casing. Pumps with discharge size 3" and larger shall have suction splitter to reduce pre-rotation and improve efficiency. Casings shall be designed for scheduled working pressure and can withstand hydrostatic test at 150% of the maximum working pressure under which the pump could operate at design speed.
 2. 3 speed motor shall be supplied with a built-in pump system controller. The complete motor assembly shall be built and tested as one unit by the same manufacturer.
 3. The motor shall have an IP55 (TEFC) enclosure rating as a complete assembly. The motor shall have a standard NEMA C-Face, Class F insulation with a Class B temperature rise.
 4. SEQUENCE OF OPERATION - The storage tank(s) sensor shall activate the pump and boiler when below set point.

2.5 HYDRONIC PIPING DESIGN INTENT

- A. Hydronic piping shall be designed with a maximum friction loss of 4 feet of head per hundred feet of piping. Flow rates shall be calculated based on the equipment manufacturer's suggested flow rates or a maximum water temperature change of 20 degrees F. Provide an air elimination system consisting of an air separator and a diaphragm type expansion tank for the domestic hot water system. Provide pumps, valves and controls as necessary to make the system complete and operable.

2.6 **HYDRONIC PIPING INSULATION SYSTEM**

- A. Install insulation on all boiler and heating piping. Heating piping insulation thickness shall be in accordance with latest edition of ASHRAE 90.2 and State Energy Conservation Code.
- B. Provide insulation for all new hot water and new cold water domestic piping located in the mechanical room. All hot water pipe insulation shall not be less than 1 1/2" thick, cold water piping shall not be less than 1" thick. Insulation shall be fiberglass self-sealing pipe insulation with all service jackets.

2.7 **SEQUENCE OF OPERATION**

- A. New domestic storage tank thermostats will operate new boiler operation and pump hot water to the storage tanks to satisfy the storage tank controls. The existing system will be reconnected to the new storage tank domestic system.
- B. **BURNER** - Power switch is placed in the "ON" position.
 - 1. Minimum 120 VAC 60Hz single phase (15A circuit) is supplied to the boiler field connection.
 - 2. 120 VAC power is supplied to the Boiler Controller which provides all setup and ignition control functions.
 - 3. Access to settings is through the use of a USB A-to-B cable using a laptop computer through the USB port on the boiler Control Panel.
 - 4. After the appliance water pump starts, flow is proven by the flow proving device or flow switch. The normally open dry contacts in the low water cutoff (LWCO), if supplied, is to be wired in series with the normally open contacts of the flow proving device.
 - 5. Locate the probe type LWCO in the piping at least 3 feet above the boiler/ inlet connection. In all cases check with local codes.
 - 6. The boiler Controller initiates a startup sequence once it receives a heat demand.
 - 7. The boiler Controller energizes the on- pump and starts to ramp up the voltage to the electrically commutated DC motor of the combustion fan.

8. The fan will run at pre-purge speed until the pre-purge timer is satisfied. Once this is complete the boiler controller provides a signal to modulate down to ignition fan speed.
 9. The boiler controller goes through internal safety checks and if this is satisfied the ignition sequence begins.
 10. The boiler Controller supplies voltage to the air/gas ratio control valve. The air/gas ratio control valve senses the pressure across the venturi and supplies gas to pre-mix with air.
 11. The igniter will continue to spark for 6 seconds, with the gas valve opened, and the fan running at ignition speed.
 12. Spark Igniter lights the air/gas mixture. The boiler Controller looks for a minimum flame rectification signal of 1.25 μ A DC from the flame sensor. If the signal is present the boiler Controller will allow the gas valve to remain open. The burner is now firing at starting input rate.
 13. Boiler will modulate to the correct fan speed to meet heat demand. The modulation rate is controlled via Pulse Width Modulation (PWM) signal.
 14. Fan speed will slowly decrease as heat request nears the heat demand. If heat demand is sustained for a long duration of time the boiler will get to a point of steady-state and the fan will rotate at constant speed.
 15. When the heat demand is satisfied or is removed the burner will shut off and the fan speed will ramp up to the preset post-purge speed until the post-purge timer is satisfied.
 16. The boiler will then go into standby as it waits for the next heat demand.
 17. Coordinate boiler controls with existing pumps as well as interface the boiler system controllers.
- C. Heat Transfer Process - Burner input continues to increase until outlet water temperature reaches the setpoint temperature.
1. Burner input may stabilize at a fixed rate where demand equals input.
 2. Burner input will decrease rate when outlet water temperature approaches temperature Set Point.
- D. End of Sequence - Setpoint temperature is satisfied.
1. Power to the gas valve is turned off.
 2. Combustion Air Fan ramps to a stop over the factory preprogrammed time period.
 3. Thermostat is now in standby mode waiting for the next "Call for Heat".

2.1 GENERAL SPECIFICATION REQUIREMENTS

A. Equipment Installation

1. Install all equipment in accord with the attached details.
2. Follow manufacturer's instructions. Adjust controls for proper operation. Provide Owner with necessary instructions for operation and maintenance of the system.
3. Provide control wiring and final connections to power wiring. Power wiring shall be included up to the existing junction box at the equipment.
4. Factory trained personnel to work on boiler with factory authorized and trained representative for equipment start up and sign off of installations.

B. Pipe Material and Testing Schedule

<u>SYSTEM</u>	<u>TEST PRESS.</u> psig (kpa)	<u>MATERIAL</u>
Above Grade Hot Water, Heating Hot Water	100 (690)	Carbon Steel; Schedule 40. Copper is acceptable for pipe sizes 2" and less. Mechanical couplings are acceptable alternates for joining.
Boiler Pressure Relief	100 (690)	Carbon Steel; Schedule 40 or copper

C. Carbon Steel Piping

1. Pipe: Welded or seamless carbon steel conforming to ASTM A53. Provide piping with threaded ends up to 2" (50 mm) and beveled ends in sizes over 2" (50 mm). At the contractor's option, piping fitted with mechanical couplings shall be roll grooved and shall be acceptable on piping systems as scheduled in Part 3 of this section of the specifications. Pipe schedule for roll grooved shall be the same as scheduled for general carbon steel pipe. Grooved pipe may have square cut ends or beveled ends.

D. Special duty valves

1. Pump discharge valves: 175 psig working pressure, 300 deg F maximum operating temperature, cast-iron body, bronze disc and seat, stainless steel stem and spring, and "Teflon" packing. Valves shall have flanged connections and straight or angle pattern as indicated. Features shall include non-slam check valve with spring-loaded weighted disc, and calibrated adjustment feature to permit regulation of pump discharge flow and shutoff.
2. Safety relief valves: 125 psig working pressure and 250 deg F maximum operating temperature; designed, manufactured, tested, and labeled in accordance with the requirements of section iv of the ASME boiler and pressure vessel code. Valve body shall be cast-iron, with all wetted internal working parts made of brass and rubber. Select valve to suit actual system pressure

3. Combined pressure/temperature relief valves: diaphragm operated, cast iron or brass body valve, with low inlet pressure check valve, inlet strainer removable without system shut-down, and non-corrosive valve seat and stem. Select valve size, capacity, and operating pressure to suit system. Valve shall be factory-set at operating pressure and have the capability for field adjustment. Safety relief valve designed, manufactured, tested, and labeled in accordance with the requirements of section IV of the ASME boiler and pressure vessel code. Valve body shall be cast-iron, with all wetted internal working parts made of brass and rubber; 125 psig working pressure and 250 deg f maximum operating temperature. Select valve to suit actual system pressure and BTU capacity. Provide with fast fill feature for filling hydronic system.

E. Hydronic specialties

1. Manual air vent: bronze body and nonferrous internal parts; 150 psig working pressure, 225 deg f operating temperature; manually operated with screwdriver or thumbscrew; and having 1/8 inch discharge connection and 3/8" inch inlet connection.
2. Automatic air vent: designed to vent automatically with float principle; bronze body and nonferrous internal parts; 150 psig working pressure, 240 deg F operating temperature; and having 1/8" discharge connection and 1/2" inlet connection.
3. Air separator: the existing welded black steel; ASME constructed and labeled for minimum 125 psig water working pressure and 375 f operating temperature; shall have the existing perforated stainless steel air collector tube removed cleaned and repaired.
4. Y-pattern strainers: 125 psig working pressure, cast iron body (ASTM A 126, class B), flanged ends for 2-1/2 inch and larger, threaded connections for 2 inch and smaller, bolted cover, perforated type 304 stainless steel basket, and bottom drain connection.

PART 3 - ELECTRICAL SYSTEMS - SCOPE OF WORK

3.1 GENERAL

- A. The Contractor shall be responsible for all costs connected with permitting and the supplying of power to the systems. Provide all necessary equipment, grounding, conduits, wire, etc., for the power connections for this project.

3.2. WIRING STANDARDS

- A. Included in the scope of this section is the provision of power and wiring to all equipment whether specifically stated or implied by the provision of electrical equipment elsewhere in the contract documents.
- B. Contractor shall size all wiring per the NEC recommendations for voltage drop of feeders and branch circuits.
- C. Provide all necessary wire, conduit and equipment to supply power to the boiler and associated equipment.

- D. The interior branch circuits shall be installed in non-metallic cable in accordance with the NEC. Type AC cable shall be used when required by the NEC. Metallic conduit at exposed interior surfaces.
- E. Provide insulated, green equipment grounding conductor in feeder and branch circuits, installed in conduit or raceways, including lighting circuits. Grounding conductor shall be separate from electrical system neutral conductor.
- F. Conductor's no. 8 awg and larger diameter shall be stranded annealed copper. Conductors no. 10 awg and smaller diameter shall be solid annealed copper, except that conductors for remote control, alarm, and signal circuits, classes 1, 2, and 3, shall be stranded unless specifically indicated otherwise. Conductor sizes and ampacities shown are based on copper, unless indicated otherwise. Unless specified or indicated otherwise or required by NFPA 70, power and lighting wires shall be 600-volt, type THWN/THHN annealed copper, remote-control and signal circuits shall be type TW, THW, or TF annealed copper. Unless otherwise indicated, minimum size of conductors shall be #12 AWG.
- G. Coordinate routing of AC wiring and low voltage wiring including:
 - 1. AC wiring shall not be run in parallel within 12" of low voltage wiring.
 - 2. AC wiring shall cross perpendicular to low voltage wiring.
 - 3. AC wiring shall not be run within the same stud wall cavity of low voltage wiring.
- H. Make all splices in accessible locations. Make splices in conductors #10 AWG and smaller diameter with insulated, pressure-type connector. Make splices in conductors #8 AWG and larger diameter with solderless connector, and cover with insulation material equivalent to conductor insulation.

3.3. **DEVICE STANDARDS**

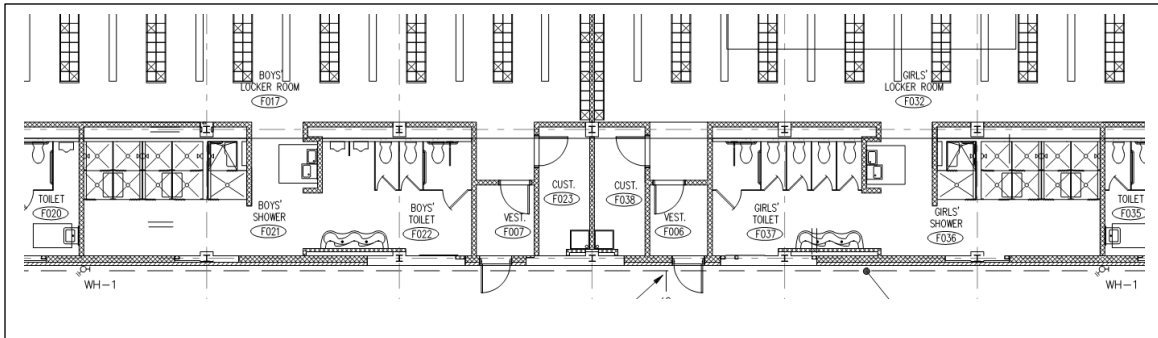
- A. Provide all necessary junction boxes, pull boxes, pull wires, cover plates and other miscellaneous equipment that is not shown on the contract documents but necessary to complete the work.

3.4. **GROUNDING**

- A. Grounding shall be completed in accordance with NFPA 70. Ground exposed, non-current-carrying metallic parts of electrical equipment, metallic raceway systems, grounding conductor in metallic and nonmetallic raceways, grounding conductor of nonmetallic sheathed cables, and neutral conductor of wiring systems.

SEE BELOW FOR THE 10 SHOWER HEAD REPLACEMENTS

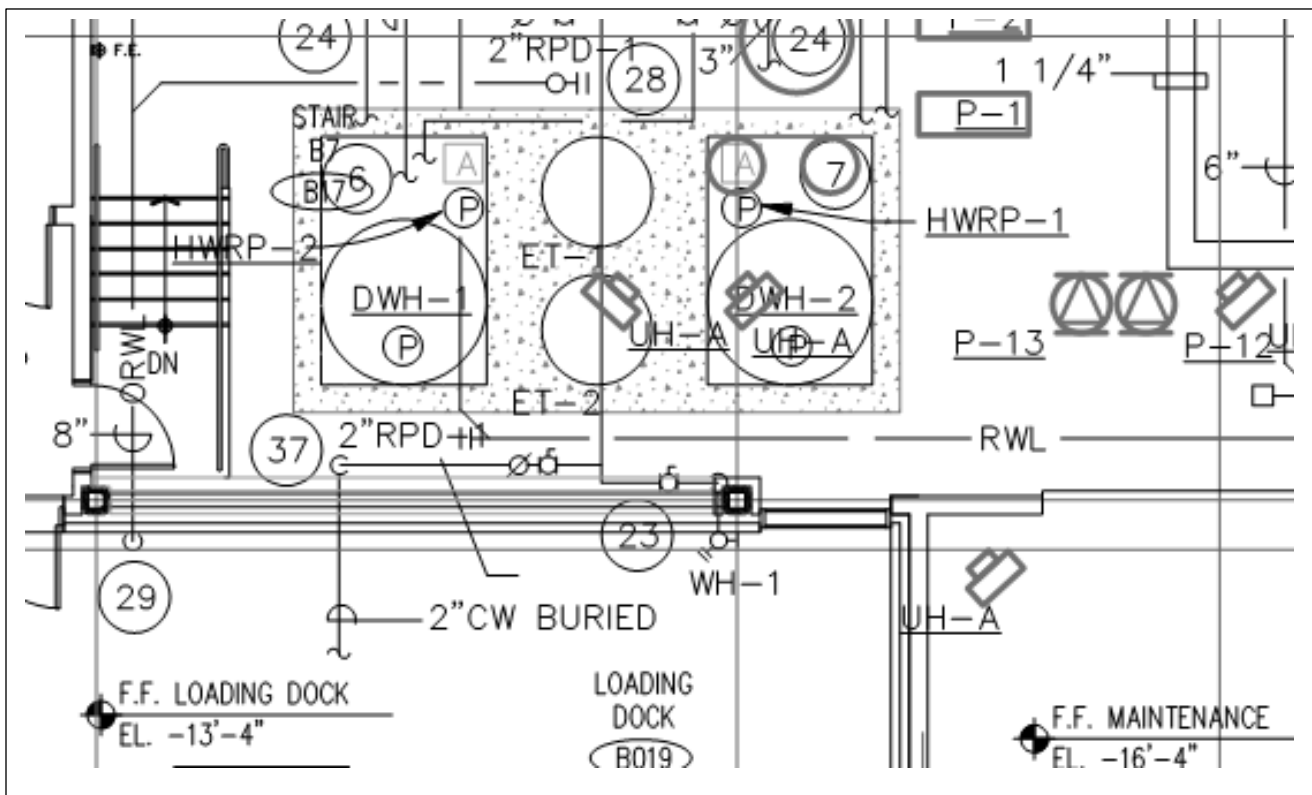
SYMMONS "HYDRAPIPE" SURFACE MOUNTED
SHOWER SYSTEM #1-9035, PRESSURE
BALANCING SHOWER VALVE UNIT, SUPER
SHOWER HEAD, INTEGRAL SERVICE STOPS.



EXISTING PLUMBING DRAWING EQUIPMENT TO BE REPLACED

DHW-2 TO REMAIN IN SERVICE UNTIL NEW DHW BOILER IS IN SERVICE

DHW-2 TO THEN BE ISOLATED FROM SYSTEM FOR FUTURE BACK-UP



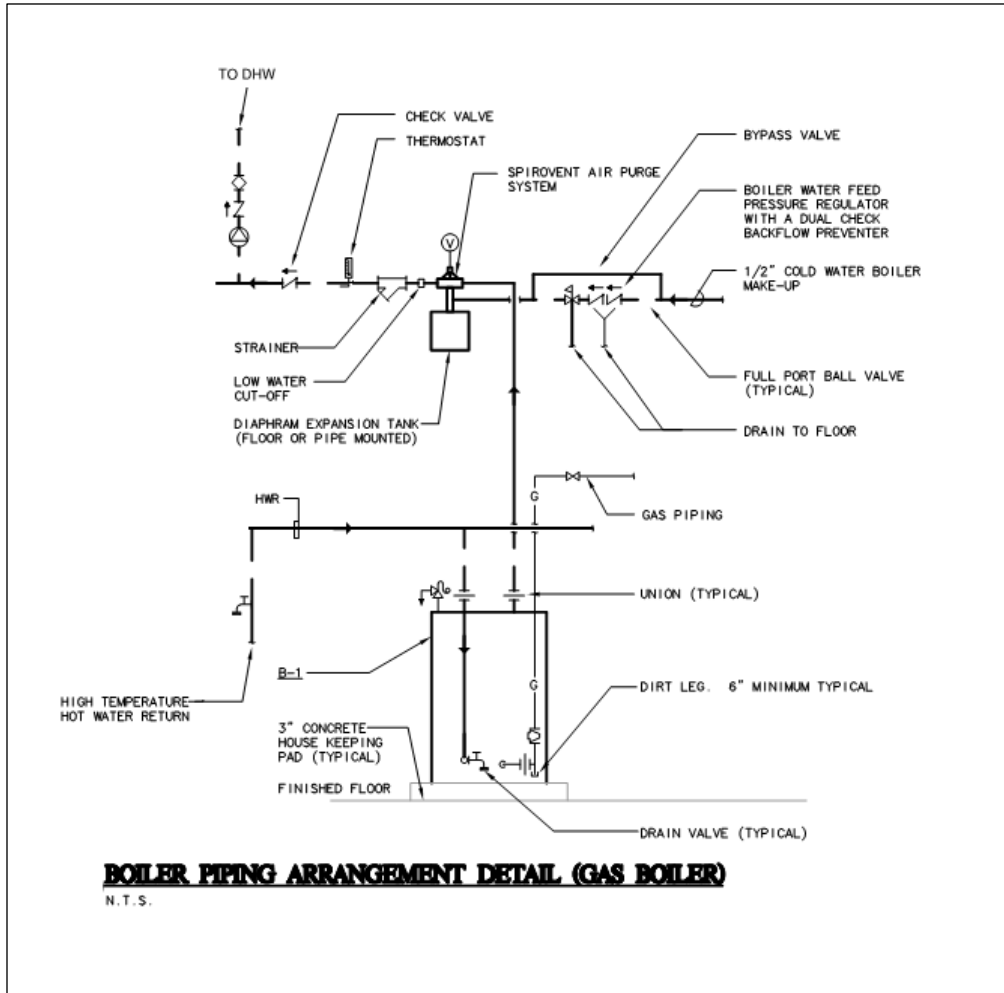
DHW-1 TO BE REMOVED IN ENTIRETY WITH ALL ASSOCIATED PIPING

EXISTING DHW STORAGE TANK SPECIFICATIONS – FOR REFERENCE ONLY

"DWH-1"	DOMESTIC WATER HEATER-KITCHEN	ACE VERTICAL PACKAGED STORAGE TYPE HOT WATER TO WATER HEAT EXCHANGER #PVG-4806-K-2.1248-WS150-J, ASME 125 PSIG SECTION VIII 700 GALLON STORAGE TANK WITH PIPE LEG SUPPORTS, STAINLESS STEEL CONNECTIONS AND H/X NOZZLE. LINING, TANK CONNECTIONS, AND NOZZLE ARE FACTORY WARRANTED FOR 10 YEARS. FACTORY JACKETED INSULATION, WITH STAINLESS STEEL OUTER JACKETING CONFORMING WITH ASHRAE 90.1 REQUIREMENTS. PERFORMANCE IS 1800 GPH @ 100 °F. RISE WHEN SUPPLIED WITH 78 GPM OF BIOLER WATER AT 200°F. EWT AND 160°F. LWT. H/X PRESSURE DROP NOT TO EXCEED 0.3 PSI. PACKAGE TO INCLUDE ALL ACCESSORIES SUCH AS GAUGE CONSOLE, ASME RELIEF VALVE, SHIPPING SKID, NON-FERROUS TANK CIRCULATION PACKAGE, SOLID STAINLESS STEEL TUBE SHEET, .049" WALL COPPER HEAT EXCHANGER TUBES AND 3-WAY SELF OPERATED CONTROL VALVE.
"DWH-2"	DOMESTIC WATER HEATER-GENERAL USE	ACE VERTICAL PACKAGED STORAGE TYPE HOT WATER TO WATER HEAT EXCHANGER #PVG-4806-K-2.1248-WS150-J, ASME 125 PSIG SECTION VIII 700 GALLON STORAGE TANK WITH PIPE LEG SUPPORTS, STAINLESS STEEL CONNECTIONS AND H/X NOZZLE. LINING, TANK CONNECTIONS, AND NOZZLE ARE FACTORY WARRANTED FOR 10 YEARS. FACTORY JACKETED INSULATION, WITH STAINLESS STEEL OUTER JACKETING CONFORMING WITH ASHRAE 90.1 REQUIREMENTS. PERFORMANCE IS 1500 GPH @ 100 °F. RISE WHEN SUPPLIED WITH 65 GPM OF BIOLER WATER AT 200°F. EWT AND 160°F. LWT. H/X PRESSURE DROP NOT TO EXCEED 0.3 PSI. PACKAGE TO INCLUDE ALL ACCESSORIES SUCH AS GAUGE CONSOLE, ASME RELIEF VALVE, SHIPPING SKID, NON-FERROUS TANK CIRCULATION PACKAGE, SOLID STAINLESS STEEL TUBE SHEET, .049" WALL COPPER HEAT EXCHANGER TUBES AND 3-WAY SELF OPERATED CONTROL VALVE.

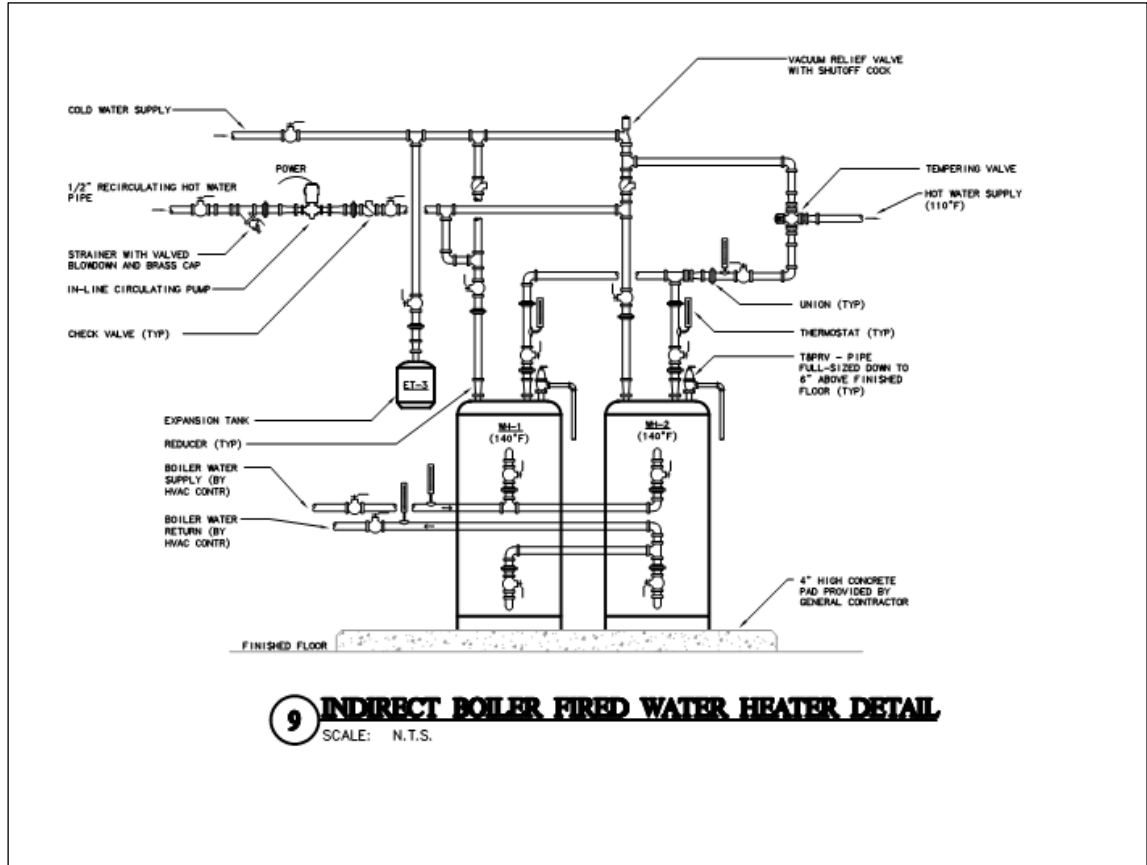
SEE NEXT PAGE FOR NEW BOILER DETAIL

NEW BOILER PIPING DETAIL



SEE NEXT PAGE FOR NEW DHW STORAGE TANK DETAIL

NEW DHW STORAGE TANK PIPING DETAIL



END OF SPECIFICATION