



TETRA TECH
ARCHITECTS & ENGINEERS

Cornell Business + Technology Park
10 Brown Road
Ithaca, New York 14850
Tel. (607) 277-7100
Fax (607) 277-1410

Addendum

Wallkill Central School District
Wallkill, New York

SED NO. 62-18-01-06-0-005-017
62-18-01-06-0-002-015
62-18-01-06-0-007-019

Reconstruction to
Plattekill Elementary School
John G. Borden Middle School
Wallkill Senior High School

Tt Project No. 17597-22002 – Phase 2

BID Addendum No. 2 to Drawings and Project Manual

February 27, 2024

To: ALL BIDDERS

This ADDENDUM forms a part of the BIDDING AND CONTRACT DOCUMENTS and modifies the following documents:
Original DRAWINGS dated June 30, 2023.
PROJECT MANUAL dated June 30, 2023 and BID ADDENDUM NO. 1, dated February 21, 2024.

Acknowledge receipt of the ADDENDUM in the space provided on the FORM OF PROPOSAL

This ADDENDUM consists of (2) pages and the following:

ATTACHMENTS

PRE-BID MEETING AGENDA
PRE-BID MEETING SIGN-IN SHEET

NEW PROJECT MANUAL SECTIONS

SECTION 23 62 13 – UNITARY HEAT PUMP EQUIPMENT

PROJECT MANUAL MODIFICATIONS

ITEM 2-C-1: Refer to SECTION 00 01 10 – TABLE OF CONTENTS – VOLUME 2

1. Division 23, ADD the following:

“23 62 13 Unitary Heat Pump Equipment”

ITEM 2-C-2: Refer to SECTION 01 10 00 – SUMMARY OF WORK

1. Paragraph 1.10, A., 5., ADD the following:

“u. Provide a total of Four (4) isolation valves to be installed in Storage room B39 & 150A as directed by the CM to be completed in summer of 2024”.

DRAWING MODIFICATIONS - ARCHITECTURAL

ITEM 2-C-3: Refer to DRAWING AA103

1. Detail 1, Library 129, ADD the following note:

“OWNER WILL REMOVE, STORE AND REINSTALL ALL BOOKSHELVES AND BOOKS WITHIN THE CENTER OF THE ROOM. PERIMETER SHELVING TO REMAIN AND BOOKS TO REMAIN. PROTECT EXISTING TO REMAIN BOOKS AND SHELVING DURING CONSTRUCTION.”

ITEM 2-C-4: Refer to DRAWING AA131

1. Detail 1, Gymnasium 150, ADD the following notes:

“PREPARE, PRIME AND PAINT EXISTING OPERABLE PARTITION FULL HEIGHT BOTH SIDES INCLUDING ALL ASSOCIATED COMPONENTS AND TRIM WITHIN GYMNASIUM 150. REFER TO SPECIFICATION 09 91 00 AND 09 96 00 FOR ADDITIONAL INFORMATION.”

“PREPARE, PRIME AND PAINT ALL EXISTING CEILINGS WITHIN GYMNASIUM 150. REFER TO SPECIFICATION 09 96 00 FOR ADDITIONAL INFORMATION.”

END OF ADDENDUM



BARONE CONSTRUCTION GROUP, INC.
"BUILDING A FUTURE OF EXCELLENCE"

Wallkill Central School District

RECONSTRUCTION TO

Wallkill Senior High School	62-18-01-06-0-007-019
John G. Border Middle School	62-18-01-06-0-002-015
Plattekill Elementary School	62-18-01-06-0-005-017

PRE-BID MEETING AGENDA

February 22, 2024, 3:00pm

Introduction

- Project Team
 - Owners
 - Architect/Engineer
 - Construction Manager

Bid Information

- Bid Due: March 7, 2024 at 2:30pm. Location: Wallkill Central School District Administration Building, 1500 Rt 208 Wallkill, NY 12589.
Bid Opening: March 7, 2023 at 3:30pm. Location: Wallkill Senior High School Library 90 Robinson Dr. Wallkill, NY 12589. At which time they will be publicly opened and read aloud.
- 5% Bid Security is required in the form of a (certified check or Bid Bond). Review Instructions to Bidders for additional information.
- Prevailing Wage Rates Apply. The NYS Prevailing Wage PRC Number 2023007495. Follow the direction on the spec page to access the NYS website to view the wage rates. The Wage Rate Schedule for each trade is included in the specifications.
- Time of completion: will be a 2- summer project. Summer of 2024 and 2025. Milestone dates have been attached to addendum 1.
- Documents are available as a digital set at www.tetrachaeoprojectplanroom.com for a non-refundable fee of \$100.00 or Hard Copies are available for \$100.00 for each set made. Please follow the Notice to Bidders for more info.
- Pre-Bid Request for Interpretation shall be filled out on the form in the spec (attachment 1 of the instructions to Bidders)
 - Via email to INE.Wallkill@tetrachae.com
- Follow Notice to Bidders and Instructions to Bidders in the specification package for additional info.
- Contractors are required to provide coordination drawings. Review specification for these requirements.
- Contingency Allowances as follows: These allowances shall be included in the contractor's base bid. See specification section 01 21 00 for more info.
 - Contract GC-1 General Work Contract (HS) - \$150,000.00
 - Contract GC-2 General Work Contract (MS)- \$100,000.00
 - Contract GC-3 General Work Contract (PES) - \$35,000.00
 - Contract PC-1 Plumbing Work Contract (HS & MS) - \$50,000.00
 - Contract HVAC-1 Mechanical Work Contract (HS & MS) - \$100,000.00
 - Contract EC-1 Electrical Work Contract (HS) - \$85,000.00
 - Contract EC-2 Electrical Work Contract (MS)- \$45,000.00
- Alternates are shown in Spec section 01 23 00.
 - HS-1
 - HS-2



BARONE CONSTRUCTION GROUP, INC.
"BUILDING A FUTURE OF EXCELLENCE"

- HS-3
- Addendum #1 has been issued.
- Addendum #2 will be issued February 27, 2024, if necessary.
- Addendum #3 will be issued on March 4, 2024, if necessary.

Summary of Contracts- (High level scopes)

- Contract GC-1 (HS) - General Construction including asbestos abatement.
 - Asbestos Abatement
 - Ceiling Replacement
 - Boys and Girls Locker rooms renovations
 - Team room renovations
 - Bathroom Renovations
- Contract GC-2 (MS) - General Construction including asbestos abatement.
 - Asbestos Abatement
 - Ceiling Replacement
 - Boys and Girls Locker rooms renovations
 - Team room renovations
 - Bathroom Renovations
 - Masonry Repointing
- Contract GC-3 (PES)
 - Window Replacement
 - Masonry Repoint and Repairs
- Contract PC-1 (HS & MS) – Plumbing Work
 - Locker room at HS Boys and Girls Removals and Replacement of fixtures.
 - Team Locker rooms at HS Removals and Replacement of fixtures.
 - Bathrooms at HS Removals and Replacement of fixtures.
 - Locker rooms at MS Boys and Girls Removals and Replacement of fixtures.
- Contract HVAC-1 (HS & MS) – Mechanical Work
 - Installation of HVAC Equipment for the Locker rooms, Cafeteria, Guidance at HS. Please review equipment schedule for equipment purchased by this contract and equipment purchased by owner.
- Contract EC-1 (HS) – Electrical Work
 - Lighting replacement
 - Locker room upgrades
 - Bathroom upgrades
 - HVAC equipment power
- Contract EC-2 (MS)- Electrical Work
 - Lighting replacement
 - Locker room upgrades
 - Bathroom upgrades
 - HVAC equipment power

Owner supplied materials and scope.

- Furnished and Install
 - HS Gym Floor
 - Roofing RC-4 HS (including asbestos abatement on Roof)
 - Roofing RC-5 MS (including asbestos abatement on Roof)
- Furnish Only
 - HVAC Equipment

Schedule

- Substantial completion



BARONE CONSTRUCTION GROUP, INC.
"BUILDING A FUTURE OF EXCELLENCE"

- Review Milestone dates in addendum #1

Questions

Site Visit



BARONE CONSTRUCTION GROUP, INC.
"BUILDING A FUTURE OF EXCELLENCE"

Meeting Agenda Sign In Sheet

February 2024, 3:00 p.m.

(Please Print)

Name	Representing Company	Title or Position
Robert Armistead	Armistead Mechanical	Project Engineer
Travis Klemm	Armistead Mechanical	Senior Estimator
Bob Nickol	HYGRADE INSULATORS	SALES
BRIAN CUNNINGHAM	BARONE	
John Neal	PERU	Estimator
Ed RILEY	Paint Your World	owner.
Todd Meyer	TM COAT	owner
SAIB, Radosiech	Kasselman Elec.	Senior P.M.
Joshua Smith	OCS INDUSTRIES, INC.	ESTIMATOR / P.M.
JOE JASIEL	MOS HVAC-R	ESTIMATOR / PM
Nic Lopez	TT	CQ
Tim Stevens	TT	Project Architect
Samuel Smale	TT	Construction Admin
Jesse Rosenthal	AGL Development	PM
Aranas Nakev	UniMAK, LLC	member



BARONE CONSTRUCTION GROUP, INC.
"BUILDING A FUTURE OF EXCELLENCE"

DARRO NOVKOVIC	Neoplanta reg.	superior-efficiency
Eleanor Pelc	DJHVAC	estimating
Pete Best (Hill)	Iron sword	estimator
Ben Baker	IRON SWORD	
Jon Sobol	IOZ Assoc.	PM

SECTION 23 62 13 – UNITARY HEAT PUMP EQUIPMENT**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Split System Heat Pumps.
- B. Products Furnished but not Installed Under this Section
 - 1. Associated refrigerant piping and condensate drain piping.

1.3 SYSTEM DESCRIPTION

- A. Design Requirements
 - 1. Cooling performance rated in accordance with ARI Testing.
 - 2. Unit efficiencies meet scheduled performance and exceed Energy Code Requirements.
 - 3. Units listed and labeled by UL and ETL.
 - 4. Provide all refrigeration equipment and related installation in compliance with the latest editions of the Mechanical Code of NYS chapter 11, the safety code for mechanical refrigeration ASHRAE Standard 15, and ANSI Refrigeration Safety Code B 9.1.

1.4 SUBMITTALS

- A. Comply with requirements of SECTION 01 33 00 - Submittals and as modified below.
- B. Product Data: Provide manufacturer's specification data for each unit, showing operating weight, all sizes, dimensions, capacity, operating and performance characteristics, motor horsepower, and other pertinent data including color chart.
- C. Contract Closeout Submittals: Comply with requirements of SECTION 01 77 00, including submission of operating and maintenance instructions as item in "Operating and Maintenance Data" manual described in that section.

PART 2 - PRODUCTS

2.1 DUCTLESS SPLIT HEAT/COOL HEAT PUMP UNIT

- A. Unit Description: Unit bearing ARI Certification Symbol and listed by ETL Testing Laboratories, Inc. consisting of outdoor unit which contains refrigerant compressor and can provide cooling only or heating and cooling of spaces, indoor unit connected by insulated copper refrigerant tubing with flare type fittings. System equipped with factory-installed solid core filter drier, large capacity suction accumulator, low ambient controls, and other accessories as specified and as scheduled.
 - 1. Refrigerant Run Capability: 130 feet of lift with maximum tubing length of 130 feet of interconnecting piping for up to 1.5 ton capacity unit, and 50 feet of lift with maximum tubing length of 164 feet for unit with greater than 1.5 ton capacity up to 3.5 ton capacity.
 - 2. Refer to drawings for capacities and performance ratings.
- B. Refrigerant: Sufficient R-410A or 407C refrigerant provided in outdoor unit to charge complete system.
- C. Outdoor Condensing Unit: Outdoor with inverter driven variable speed compressors which provides efficient cooling and heating performance.
 - 1. General data:
 - a. Factory assembled and pre-wired with all necessary electronic and refrigerant controls.
 - b. Refrigeration circuit consisting of a digital scroll compressor, motors, fans, condenser coil, electronic expansion valve, solenoid valves, 4 way valve, distribution headers, capillaries, filters, service isolation valves, oil separators, service ports, liquid receivers and accumulators.
 - c. Both liquid and suction lines must be individually insulated between the outdoor and indoor units on heat pump units. Liquid line insulation is not required on cooling only units.
 - d. The outdoor unit can be wired and piped with outdoor unit access from left, right, rear or bottom.
 - e. The sound pressure at rated conditions: maximum of 58 decibels dB(A) at 3 feet from the front of the unit. Provide with night operation mode capable of operating at further reduced noise.
 - f. The system will automatically restart operation after a power failure and will not cause any settings to be lost, thus eliminating the need for re-programming.
 - g. The outdoor unit shall be modular in design and should allow for side-by-side installation with minimum spacing.

- h. The following safety devices shall be included on the condensing unit; high pressure switch, control circuit fuses, crankcase heaters, fusible plug, high pressure switch, overload relay, inverter overload protector, thermal protectors for compressor and fan motors, over current protection for the inverter and anti-recycling timers, and sub-cooling feature. Oil recovery cycle shall be automatic occurring 1 hour after start of operation and then every 6 hours of operation.
 - i. The outdoor unit shall be capable of full heat pump heating operation at 0°F dry bulb ambient temperature without additional low ambient controls.
- 2. Unit Cabinet:
 - a. The outdoor unit shall be completely weatherproof and corrosion resistant. The unit shall be constructed from rust-proofed mild steel panels coated with a baked enamel finish.
- 3. Fan:
 - a. The outdoor unit shall consist of one or two propeller type, direct-drive fan motors that have multiple speed operation via a DC inverter.
 - b. The outdoor unit fan motor shall have multiple speed operation of the DC inverter type, controlled to modulate as required to maintain head pressure.
 - c. The fan motor shall have internal thermal overload protection and permanently lubricated bearings and be mounted on rubber in shear isolators.
 - d. Provide a fan guard to prevent contact with moving parts, constructed of welded wire and plated or painted for corrosion resistance.
- 4. Outdoor Coil:
 - a. Manufactured from copper tubes expanded into aluminum fins to form a mechanical bond.
 - b. The coil shall be of a waffle louver fin and high heat exchanger, rifled bore tube design to ensure highly efficient performance.
 - c. The coils shall be complete with corrosion treatment of an acrylic resin type. The thickness of the coating must be between 2.0 to 3.0 microns.
- 5. Compressor:
 - a. The scroll compressor shall be variable speed (PWM inverter) controlled, changing speed to follow the variations in total cooling load as determined by the suction gas pressure as measured in the condensing unit.
 - b. The inverter driven compressor in each condensing unit shall be of highly efficient reluctance DC, hermetically sealed scroll type with a maximum speed of 6,480 rpm.
 - c. Neodymium magnets shall be adopted in the rotor construction to yield a higher torque and efficiency in the compressor instead of the normal ferrite magnet type. At complete stop of the compressor, the neodymium magnets will position the rotor into the optimum position for a low torque start.
 - d. The capacity control range shall be modulating from 37% to 100%.

- e. Each compressor shall be equipped with a crankcase heater, high pressure safety switch, and internal thermal overload protector.
 - f. Oil separators shall be standard with the equipment together with an oil balancing circuit.
 - g. The compressor shall be mounted to avoid the transmission of vibration.
6. Electrical:
- a. The power supply to the outdoor unit shall be in voltage and phasing as shown on the drawings, with a tolerance of +/- 10% from nominal indicated.
 - b. The control voltage between the indoor and outdoor unit shall be low voltage control wiring compatible with the energy management and control system as specified in Section 23 09 00. The control wiring shall be a multiplex communication system, making it possible to connect multiple indoor units to one outdoor unit with one cable, thus simplifying the wiring operation.

D. Indoor Unit – Ceiling Cassette Unit

- 1. General: The indoor unit model shall be a ceiling cassette fan coil unit, operable with scheduled refrigerant, for installation into the ceiling cavity with an air panel grille. It shall be a four-way air distribution type, ivory white, impact resistant, and washable decoration panel. The supply air is distributed via motorized louvers which can be horizontally and vertically adjusted from 0° to 90°. Computerized control shall be used to maintain room temperature within 1°F. The indoor units sound pressure shall range from 28 dB(A) to 33 dB(A) at low speed measured at 5 feet below the unit.
- 2. Indoor Unit:
 - a. The indoor unit shall be completely factory assembled and tested. Included in the unit is factory wiring, piping, electronic proportional expansion valve, control circuit board, fan motor thermal protector, flare connections, condensate drain pan, condensate drain pump, self-diagnostics, auto-restart function, 3-minute fused time delay, and test run switch.
 - b. Indoor unit and refrigerant pipes will be charged with dehydrated air prior to shipment from the factory.
 - c. Both refrigerant lines shall be insulated from the outdoor unit.
 - d. The 4-way supply air flow can be field modified to 3-way and 2-way airflow to accommodate various installation configurations including corner installations.
 - e. Return air shall be through the concentric panel, which includes a resin net mold resistant filter.
 - f. Indoor units shall be capable of accepting outside air delivered through sidewall knock-outs sized for acceptance of scheduled outside air flow rates.

- g. The indoor units shall be equipped with an insulated corrosion proof condensate pan under the coil capturing and controlling all condensate.
 - h. Provide a condensate pump with a 21 inch lift located below the coil in the condensate pan, complete with a built in safety high level alarm and interlock.
 - i. The indoor units shall be equipped with a return air thermistor.
3. Unit Cabinet:
- a. The cabinet shall be space saving and shall be located into the ceiling.
 - b. Three auto-swing positions shall be available to choose, which include standard, draft prevention and ceiling stain prevention.
 - c. The airflow of the unit shall have the ability to shut down one or two sides allowing for simpler corner installation.
 - d. The cabinet shall be constructed with sound absorbing foamed polystyrene and polyethylene insulation.
4. Fan:
- a. The fan shall be direct-drive turbo fan type with statically and dynamically balanced impeller with high and low fan speeds available.
 - b. The fan motor shall operate on 208/230 volts, 1 phase, 60 hertz with a motor output range from 0.06 to 0.12 HP.
 - c. The air flow rate shall be available in high and low settings.
 - d. The fan motor shall be thermally protected.
5. Filter:
- a. The return air shall be filtered by means of a washable long-life filter with mildew proof resin.
6. Coil:
- a. Coils shall be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond.
 - b. The coil shall be of a waffle louver fin and high heat exchange, rifled bore tube design to ensure highly efficient performance.
 - c. The coil shall be a 2 row evaporator coil completely factory tested.
 - d. A thermistor will be located on the liquid and gas line.

E. Indoor, Suspended, Ceiling-Mounted Units

- 1. Description: Factory-assembled complete unit with components, piping, wiring, and controls required for mating to piping, power, and controls field connections.
- 2. Cabinet:
 - a. Material: Painted steel, or coated steel frame covered by a plastic cabinet, with an architectural acceptable finish suitable for tenant occupancy on exposed surfaces.

- b. Insulation: Manufacturer's standard internal insulation[, **complying with ASHRAE 62.1,**] to provide thermal resistance and prevent condensation.
 - c. Mounting: Manufacturer-designed provisions for field installation.
 - d. Internal Access: Removable panels of adequate size for field access to internal components for inspection, cleaning, service, and replacement.
- 3. DX Coil Assembly:
 - a. Coil Casing: Aluminum, galvanized, or stainless steel.
 - b. Coil Fins: Aluminum, mechanically bonded to tubes, with arrangement required by performance.
 - c. Coil Tubes: Copper, of diameter and thickness required by performance.
 - d. Expansion Valve: Electronic modulating type with linear or proportional characteristics.
 - e. Internal Tubing: Copper tubing with brazed joints.
 - f. Internal Tubing Insulation: Manufacturer's standard insulation, of thickness to prevent condensation.
 - g. Field Piping Connections: Manufacturer's standard.
 - h. Factory Charge: Dehydrated air or nitrogen.
 - i. Testing: Factory pressure tested and verified to be without leaks.
- 4. Drain Assembly:
 - a. Pan: Non-ferrous material, with bottom sloped to low point drain connection.
 - b. Condensate Removal: Gravity.
 - 1) If a floor drain is not available at unit, provide unit with field-installed condensate pump accessory.
 - c. Field Piping Connection: Non-ferrous material[**with threaded NPT**].
- 5. Fan and Motor Assembly:
 - a. Fan(s):
 - 1) Direct-drive arrangement.
 - 2) Single or multiple fans connected to a common motor shaft and driven by a single motor.
 - 3) Fabricated from non-ferrous components or ferrous components with corrosion protection finish.
 - 4) Wheels statically and dynamically balanced.
 - b. Motor: Brushless dc or electronically commutated with permanently lubricated bearings.
 - c. Motor Protection: Integral protection against thermal, overload, and voltage fluctuations.

- d. Speed Settings and Control: Two (low, high), three (low, medium, high), or more than three speed settings or variable speed with a speed range of least 50 percent.
 - e. Vibration Control: Integral isolation to dampen vibration transmission.
- 6. Filter Assembly:
 - a. Access: Front, to accommodate filter replacement without the need for tools.
 - b. Efficiency: <Insert efficiency>.
 - c. Washable Media: Manufacturer's standard filter with antimicrobial treatment.
- 7. Discharge-Air Grille Assembly: Mounted in front of unit cabinet.
 - a. Discharge Pattern: One-way throw.
 - b. Discharge Pattern Adjustment: Field-adjustable limits for range of pattern.
 - c. Motorized Vanes: Modulating up and down flow pattern for uniform room air distribution.
- 8. Return-Air Grille Assembly: Manufacturer's standard.
- 9. Unit Accessories:
 - a. Remote Room Temperature Sensor Kit: Wall-mounted, hardwired room temperature sensor kit for use in rooms that do not have room temperature measurement.
 - b. Condensate Pump: Integral reservoir and control with electrical power connection through unit power.
- 10. Unit Electrical:
 - a. Transmission (control) wiring between the indoor and outdoor unit shall be a maximum of 3,280 feet (total 6,560 feet).
 - b. Transmission (control) wiring between the indoor and remote controller shall be a maximum distance of 1,640 feet.

F. Indoor Unit – Wall Mount Unit

- 1. General: The indoor unit shall be a wall mounted fan coil unit, operable with refrigerant R410A, for installation onto a wall within a conditioned space, with a white casing. Computerized control shall be used to maintain room temperature within 1°F. A mildew-proof, polystyrene air filter and condensate drain pan shall be included as standard equipment. The indoor units sound pressure shall range from 32 dB(A) to 35 dB(A) at low speed measured at 3.3 feet below and from the unit.

2. Indoor Unit:

- a. The indoor unit shall be completely factory assembled and tested. Included in the unit is factory wiring, piping, electronic proportional expansion valve, control circuit board, fan motor thermal protector, flare connections, condensate drain pan, self-diagnostics, auto-restart function, 3-minute fused time delay, and test run switch. The unit shall have an auto-swing louver which ensures efficient air distribution, which closes automatically when the unit stops. The remote controller shall be able to set five (5) steps of discharge angle. The front grille shall be easily removed for washing. The discharge angle shall automatically set at the same angle as the previous operation upon restart. The drain pipe can be fitted to from either left or right sides.
- b. Indoor unit and refrigerant pipes will be charged with dehydrated air prior to shipment from the factory.
- c. Both refrigerant lines shall be insulated from the outdoor unit.
- d. Return air shall be through a resin net mold resistant filter.
- e. The indoor units shall be equipped with an insulated corrosion proof condensate pan under the coil capturing and controlling all condensate.
- f. Provide a condensate pump with a 21 inch lift located below the coil in the condensate pan, complete with a built in discharge check valve and safety high level alarm with interlock.
- g. The indoor units shall be equipped with a return air thermistor.

3. Unit Cabinet:

- a. The cabinet shall be affixed to a factory supplied wall mounting template and located in the conditioned space.
- b. The cabinet shall be constructed with sound absorbing foamed polystyrene and polyethylene insulation.

4. Fan:

- a. The fan shall be a direct-drive cross-flow fan, statically and dynamically balanced impeller with high and low fan speeds available.
- b. The fan motor shall operate on 208/230 volts, 1 phase, 60 hertz with a motor output range 0.054 to 0.058 HP.
- c. The air flow rate shall be available in high and low settings.
- d. The fan motor shall be thermally protected.

5. Coil:

- a. Coils shall be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond.
- b. The coil shall be of a waffle louver fin and high heat exchange, rifled bore tube design to ensure highly efficient performance.

- c. The coil shall be a 2 row cross fin copper evaporator coil completely factory tested.
- d. The refrigerant connections shall be flare connections and the condensate will be 1-1/4 inch outside diameter PVC.
- e. A thermistor will be located on the liquid and gas line.
- f. A condensate pan shall be located in the unit.

G. Electrical:

- 1. Transmission (control) wiring between the indoor and outdoor unit shall be a maximum of 3,280 feet (total 6,560 feet).
- 2. Transmission (control) wiring between the indoor and remote controller shall be a maximum distance of 1,640 feet.

H. Controls:

- 1. Provide intelligent touch controller to control entire system. Provide gateway to seamlessly interface with EMCS.
- 2. Provide Simplified wired remote controller for each space. All room controllers to wire to intelligent touch controller which can be monitored at the OWS.

I. Manufacturers:

- 1. Basis of design is as scheduled on the drawings.
- 2. Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Carrier / Toshiba.
 - b. Daikin.
 - c. Sanyo.
 - d. Trane / Mitsubishi.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Examine conditions under which unitary heat pump equipment is to be installed and notify affected Contractors and Architect in writing of any conditions detrimental to proper and timely installation. Do not proceed with installation until unsatisfactory conditions have been corrected in an acceptable manner.
 - 1. When conditions are confirmed to be acceptable to ensure proper and timely installation and to ensure requirements for applicable warranty or guarantee can be satisfied, submit to Architect written confirmation. Failure to submit written confirmation and subsequent installation will be assumed to indicate conditions are acceptable.

3.2 INSTALLATION

- A. Install in strict accordance with manufacturer's recommendations and as follows.
 - 1. Provide combination equipment / piping curb in proper position on roof, secured and leveled as recommended by manufacturer. Provide sufficient portals in pipe penetration portion of curb for refrigerant, electrical power, and control wiring.
- B. Provide all required supports, attachment devices, vibration isolators, gasketing, sealants, and accessories needed to insure stable, quiet, leak free operation.
- C. Provide all refrigerant piping in strict accordance with section 23 23 00 – Refrigerant Piping.
- D. Run insulated condensate drain line to approved point of indirect waste disposal through properly sized P-trap. Pitch drain line continuously in direction of flow. If gravity drain is not possible, provide condensate removal pump as specified, piped to nearest approved point of indirect waste disposal.

3.3 FACTORY START UP AND FIELD QUALITY CONTROL

- A. Provide authorized factory representative to start-up unit, check following items, and furnish report:
 - 1. Measure and check voltage of components.
 - 2. Check removal of shipping bracing.
 - 3. Proper connection of drains.
 - 4. Check control circuitry, operation, and performance during all modes of operation.
 - 5. Fan check (RPM, motor amps, rotation, belt tension, etc.).
 - 6. All wiring circuits.
 - 7. All accessory equipment operation, such as filters, controls, condensate drain, etc.

END OF SECTION 23 62 13