

**City of Everett**

**Procurement Office**

484 Broadway ▪ Everett, MA 02149



**INVITATION FOR BIDS**  
NO. 25-06  
**SUPPLY & DELIVERY OF HVAC EQUIPMENT**

The City of Everett invites qualified bidders to submit bids for the supply and delivery of HVAC equipment for the Old High School located at 548 Broadway, Everett, MA.

## **I. GENERAL INFORMATION AND BID SUBMISSION REQUIREMENTS.**

Bids can be obtained from and will be accepted at the City of Everett, Procurement Office, 484 Broadway, Everett, MA 02149, **September 12, 2024, at 1:00 p.m.** and will be publicly opened in accordance with M.G.L. c 30B.

One (1) Original and one (1) copy of the bid are required. The bid envelope must be sealed and clearly marked:

*Bid for Supply and Delivery of HVAC Equipment*

- 1) Award date. Award will be made within thirty (30) days after bid opening unless otherwise stated in the specifications or the time for award is extended by mutual consent of all parties. All bids submitted shall be valid for a minimum period of thirty (30) calendar days following the date established for acceptance.
- 2) If any changes are made to this IFB, an addendum will be issued. Addenda will be posted to all bidders on record as having requested the IFB. Each responder shall acknowledge receipt of any and all addendum issues by submitting acknowledgement forms provided with any Addenda. **Failure to do so shall be cause to reject the submittal as being unresponsive.**
- 3) Questions concerning this IFB must be submitted in writing to: Chief Procurement Officer, 484 Broadway, Everett, MA 02149. Questions may be emailed to [allison.jenkins@ci.everett.ma.us](mailto:allison.jenkins@ci.everett.ma.us) by or before **September 9, 2024, at 2:00 p.m.** Written responses will be posted on the City website in the form of an Addendum and posted to all bidders on record as having requested the IFB.
- 4) Bids may be modified, corrected or withdrawn only by written correspondence received by the City of Everett prior to the time and date set for the bid opening. Bid modifications must be submitted in a sealed envelope clearly labeled "Modification No. \_\_\_" and must reference the original IFB.
- 5) The City of Everett will have a pre-bid walk thru at 9:00 am on September 9, 2024, please meet on the front steps on the building located at 548 Broadway. The meeting is not mandatory and the parking is extremely scarce. Please give yourself sufficient time to park and get to the site.
- 6) After the bid opening, a bidder may not change any provision of the bid in a manner prejudicial to the interests of the City of Everett or fair competition. Minor informalities will be waived or the bidder will be allowed to correct them. If a mistake and the intended bid are clearly evident on the face of the bid document, the mistake will be corrected to reflect the intended bid, and the bidder will be notified in writing; the bidder may not withdraw the bid. A bidder may withdraw a bid if a mistake is clearly evident on the face of the bid, but the intended

correct bid is not similarly evident.

- 7) The City of Everett reserves the right to reject any and all bids and to waive any informality in bids received whenever such rejection or waiver is in its best interest.
- 8) The City of Everett will not be responsible for any expenses incurred in preparing and submitting bids. All bids shall become the property of the City of Everett.
- 9) Responders must be willing to enter into the City of Everett's standard form of contract that will include the scope of services description of this IFB.

- 10) The bid, and any subsequent contract for the services, is hereby issued in accordance with applicable Massachusetts General Laws. The selected bidder shall be expected to comply with all applicable state and federal laws in performance of service.
- 11) Bids received prior to the date of opening will be securely kept, unopened. No responsibility will attach to an officer or person for the premature opening of a bid not properly addressed and identified.
- 12) Any bids received after the advertised date and time for opening will be returned to the responder unopened.
- 13) Purchases by the City of Everett are exempt from federal, state and municipal sales and/or excise taxes.
- 14) The Tax Compliance Certification and the Certificate of Non-Collusion must be included with the bid response. The bid must be signed by the authorized individual(s).
- 15) Unexpected closures. If, at the time of the scheduled bid opening, City Hall is closed due to uncontrolled events such as fire, snow, ice, wind or building evacuation, the bid opening will be postponed until 1:00 p.m. on the next normal business day. Bids will be accepted until that date and time.
- 16) The City of Everett is an Affirmative Action/Equal Opportunity Employer. The City encourages bids from qualified MBE/DBE/WBE firms.

## **II. SCOPE OF SERVICES.**

### **PROVISIONS INCLUDED**

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION -01 – GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

### **GENERAL REQUIREMENTS**

- A. Include General Conditions and applicable parts of Division 1 as part of this Section.
- B. Examine all other Sections of the Specifications for any Requirements that affect Work of this Section, whether or not such Work is specifically mentioned in this Section.
- C. Coordinate Work with that of all other Trades affecting, or affected by, Work of this Section. Cooperate with such Trades to assure the steady progress of all Work under the Contract.

## 1.01 SCOPE OF WORK N

- A. The work includes, but is not limited to, the following:
  1. Purchasing and Delivering Dedicated Outdoor Air Systems.
  2. Purchasing and Delivering Packaged Rooftop Units.
  3. Purchasing and Delivering Variable Refrigerant System – Indoor Units and Outdoor Heat Pumps Units.
  4. O&M Manuals.
  5. Operating Instructions.
  6. Record Drawings.

## 1.02 CODES, ORDINANCES AND PERMITS

- A. All material and work provided shall be in accordance with the following codes and standards:
  1. Massachusetts State Building Code.
  2. State Department of Public Safety.
  3. Local codes.
  4. Standards of the Underwriters Laboratories (UL).
  5. Occupational Safety and Health Act (OSHA).
  6. American Society of Mechanical Engineers (ASME).
  7. American National Standards Institute (ANSI).
  8. American Society of Testing Materials (ASTM).
  9. Manufacturer's Standardization Society of the Value and Fittings Industry (MSS).
  10. National Fire Protection Association (NFPA).
  11. Massachusetts and National Electrical Codes.
  12. International Mechanical Code (IMC) 2021.
  13. International Energy Conversation Code (IECC) 2021.
  14. International Plumbing Code.
- B. Where the contract documents indicate more stringent requirements than the above codes and ordinances, the Contract Documents shall take precedence.
- C. All necessary permits, inspections, approvals, etc. are to be obtained and paid for by this Contractor.

## 1.03 SHOP DRAWING AND MATERIALS SCHEDULE

- A. Within fifteen days after the date of notice to proceed and before purchasing any materials or equipment, submit for approval a complete list, in six copies, of all materials to be incorporated in the work. After the list has been processed, submit complete shop drawings of all equipment. These shop drawing submittals shall be submitted within fifteen days after the processing date of original submittal list.

- B. The approval of equipment does not relieve the HVAC Contractor from the responsibility for shop drawing errors in details, sizes, quantities, wiring diagram arrangements and dimensions which deviate from the specification, contract drawings and/or job conditions as they exist.
- C. Refer to General Requirements for substitution of equipment and submittal of shop drawings. If apparatus or materials are substituted for those specified and such substitution necessitates changes in or additional connections, supports or construction, same shall be provided. The HVAC Contractor shall assume cost and entire responsibility thereof.
- D. Submit the name(s) and contact information for a minimum of two qualified vendors that are eligible to provide operations and maintenance on the supplied HVAC system.

#### 1.04 RECORD DRAWINGS

- A. Provide two sets of black line prints to be used as working record drawings during purchase and delivery. The record drawings shall be available for review at the job site by the Owner's/Architect's/Engineer's field representative. All design drawings shall be marked up and maintained as Built Drawings under this section are Drawings.
- B. Any addenda sketches, supplementary drawings and change orders issued during the course of the project shall be transferred to the working record drawings.
- C. At the completion of all work submit an accurate, checked set of working record drawings. Non-availability of these drawings will postpone the final inspection until the record drawings are available.
- D. The HVAC Contractor shall incorporate all changes on the original drawings. The Contractor shall submit to the designer, disks of drawings on Auto CAD Version 2008 format with two sets of prints and reproducible drawings. Inaccuracies in Record Drawings, as determined by the designer, shall be corrected.
- E. All costs related to these requirements shall be paid for by the HVAC Contractor.

#### 1.05 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

- A. Provide operating instructions to the Owner's designated representatives with respect to operating functions and maintenance procedures for all equipment and systems supplied. The cost of providing a manufacturer's representative at the site for instructional purposes shall be included in the contract price. The operating instructions shall be presented in scheduled, pre-arranged formal periods.
- B. At the completion of the project, turn over to the Architect/Engineer, two complete manuals containing the following:
  1. Complete shop drawings of all equipment.
  2. Operation description of all systems.
  3. Names, addresses and telephone numbers of all major suppliers of equipment on a separate indexing sheet.
  4. Preventive maintenance instructions for all equipment.
  5. Spare parts list of all system components.

- C. The Contractor shall collect the operating instructions, bind them into two complete sets and deliver them to the Architect/Engineer who will check for completeness and deliver them to the Owner. All information shall be in three-ring, loose-leaf binders.
- D. All pertinent portions of the training sessions shall be video recorded with copies provided in the O&M manuals.
- E. Delivery of the operating and maintenance manuals shall be a condition precedent to final payment

#### 1.06 GUARANTEE

- A. This Contractor shall obtain, in the Owner's name, the standard written manufacturer's guarantee for one year and an extended 10 years warranty or greater of all materials furnished under this section where such guarantees are offered in the manufacturer's published product data. All these guarantees shall be in addition to, and not in lieu of, other liabilities which this Contractor may have by law or other provisions of the contract documents.
- B. This Contractor shall warranty workmanship and materials for a period of not less than one year from the date of substantial completion. Should any defects in materials or workmanship appear during this period, they shall be corrected or replaced by the Contractor to the satisfaction of the Architect, and at no expense to the Owner.

#### 1.07 PERMITS

- A. This Contractor shall be responsible for obtaining and paying for all permits and inspections required to complete all work described in this section. Refer to Division 1 specifications for more information.

#### 1.08 STORAGE OF MATERIALS

- A. Store materials where designated by the General Contractor. Be responsible for all stored equipment and materials and protect all supplied equipment and materials from damage.

#### 1.09 ELECTRICAL CHARACTERISTICS

- A. In general, and unless specifically indicated otherwise in the specifications or noted on the drawings, all HVAC equipment shall be of the HP, voltage, and phase as indicated on the drawings.
- B. Fractional horsepower motors wired for single phase operation shall have automatic reset overload protection built into the motor.

#### 1.10 DEFINITION OF TERMS

- A. "Furnish" or "Supply" means to purchase, procure, acquire and deliver.
- B. "Install" means to rig, erect, mount and connect, unless specifically noted otherwise.
- C. "Furnish and Install" means to supply, deliver, rig, erect, mount and connect in readiness for operation, unless specifically noted otherwise.

- D. "Provide" is synonymous with "Furnish and Install".
  - E. "Piping" means pipe, tubing, fittings, flanges, unions, valves, strainers, traps, hangers and other accessories related to such piping.
  - F. "Concealed" means hidden in chases, furred spaces and walls, above ceilings or enclosed in construction.
  - G. "Exposed" means visible or not installed "Concealed" as defined above.
  - H. "Approved Equal" or "or equal" means any equipment or material which is approved by the Engineer as equal in quality, durability, appearance, strength, design and performance to the equipment or material originally specified.
  - I. "Underground" means buried exterior to or within the building.
- 1.11 REBATES
- A. HVAC Contractor shall assist the Owner in obtaining all eligible utility rebates and transferring these rebates to the Owner pertaining to this section.

## **PART 2 - PRODUCTS**

### 2.1 VARIABLE REFRIGERANT FLOW SYSTEM (VRF)

- A. General: Furnish a VRF system as specified on the drawings. Units shall be in accordance with the schedule on the drawings for type, size, capacity, motor sizes, model numbers and components. Units shall be as manufactured by LG, Daikin, Carrier/Toshiba or approved equal. The VRF system shall be a variable capacity, heat pump heat recovery air conditioning system consisting of air-cooled outdoor condensing unit, BC (Branch Circuit) Controller, multiple indoor units, and DDC (Direct Digital Controls). Each indoor unit or group of indoor units shall be capable of operating in any mode independently of other indoor units or groups. System shall be capable of changing mode (cooling to heating, heating to cooling) with no interruption to system operation and shall be capable of simultaneous heating and cooling of various zones. To ensure owner comfort, each indoor unit or group of indoor units shall be independently controlled and capable of changing mode automatically when zone temperature strays 1.8 degrees F from set point for ten minutes. The sum of connected capacity of all indoor air handlers shall range from 50% to 150% of outdoor rated capacity. A full charge of R-410A for the condensing unit only shall be provided in the condensing unit.



B. Controls:

1. The control system shall consist of a low voltage communication network of unitary built-in controllers with on-board communications and a web-based operator interface. A web controller with a network interface card shall gather data from this system and generate web pages accessible through a conventional web browser on each PC connected to the network. Operators shall be able to perform all normal operator functions through the web browser interface.
2. System controls and control components shall be installed in accordance with the manufacturer's written installation instructions.
3. Furnish energy conservation features such as optimal start, night setback, request-based logic, and demand level adjustment of overall system capacity as specified in the sequence.
4. System shall provide direct and reverse-acting on and off algorithms based on an input condition or group conditions to cycle a binary output or multiple binary outputs.
5. Control system start-up shall be a required service to be completed by the manufacturer or a duly authorized, competent representative that has been factory trained in controls system configuration and operation.
6. Contractor shall coordinate with the ATC Sub-subcontractor and provide all required control components not supplied by the VRF system unit manufacturer for a complete operating system.

C. Air Cooled Outdoor Condensing Units: Hyper heat simultaneous heating/cooling (heat recovery), air-cooled outdoor units.

1. General: The outdoor condensing units shall be the type specifically used with VRF components. The outdoor units shall be equipped with multiple circuit boards that interface to the controls system and shall perform all functions necessary for operation. Each outdoor unit module shall be completely factory assembled, piped and wired and run tested at the factory.
  - a. The outdoor unit modules shall be air-cooled, direct expansion (DX), multi-zone units used specifically with VRF components described in this section and controls section. The outdoor unit modules shall be equipped with a single compressor which is inverter-driven and multiple circuit boards, all of which must be manufactured by the branded VRF manufacturer. Each outdoor unit module shall be completely factory assembled, piped and wired and run tested at the factory.

- b. Outdoor unit systems may be comprised of multiple modules with differing capacity if a brand other than basis of design is proposed. All units requiring a factory supplied twinning kits shall be piped together in the field, without the need for equalizing line(s). If an alternate manufacturer is selected, any additional material, cost, and labor to install additional lines shall be incurred by the contractor. Contractor responsible for ensuring alternative brand compatibility in terms of availability, physical dimensions, weight, electrical requirements, etc.
- c. The outdoor unit shall have an accumulator with refrigerant level sensors and controls.
- d. The outdoor unit shall have a high-pressure safety switch, over-current protection, crankcase heater and DC bus protection.
- e. VRF system shall meet performance requirements per schedule and be within piping limitations & acceptable ambient temperature ranges as described in respective manufacturers' published product catalogs. Non-published product capabilities or performance data are not acceptable.
- f. The outdoor unit shall be capable of continuous operation in heating mode down to -13°F ambient temperatures, simultaneous heating/cooling mode from 14-70°F ambient temperatures, and cooling mode up to 109°F without additional restrictions on line length & vertical separation beyond those published in respective product catalogs. Models with capacity data for required temperature range published as "for reference only" are not considered capable of continuous operation at those conditions and are not acceptable. If an alternate manufacturer is selected, any additional material, cost, and labor to meet ambient operating range and performance shall be incurred by the contractor.
- g. The outdoor unit shall have a high efficiency oil separator plus additional logic controls to ensure adequate oil volume in the compressor is maintained. Oil return sequences must be enabled only during extended periods of reduced refrigerant flow to ensure no disruption to correct refrigerant flow to individual zones during peak loads. Systems which might engage oil return sequence based on hours of operation risk oil return during inopportune periods are not allowed. Systems which rely on sensors (which may fail) to engage oil return sequence are not allowed.
- h. Unit must defrost all circuits simultaneously in order to resume full heating more quickly during extreme low ambient temperatures (adj.). Partial defrost, also known as hot gas defrost which allows reduced heating output during defrost, is permissible only when ambient temperature is above manufacturer set temp.
- i. The outdoor unit shall be provided with a manufacturer supplied 20-gauge hot dipped galvanized snow /hail guard. The snow/hail guard protects the outdoor coil surfaces from hail damage and snow build-up in severe climates.

- j.
- 2. Unit Cabinet:
  - a. The casing(s) shall be fabricated of galvanized steel, bonderized and finished. The outdoor unit shall be tested in compliance with ISO9277 such that no unusual rust shall develop after 960 hours of salt spray testing. Panels on the outdoor unit shall be scratch free at system startup. If a scratch occurs the salt spray protection is compromised and the panel should be replaced immediately.
- 3. Fan:
  - a. Each outdoor unit module shall be furnished with direct drive, variable speed propeller type fan(s). The fan shall be factory set for operation under 0 in. WG external static pressure, but capable of normal operation under a maximum of 0.24 in. WG external static pressure via dipswitch.
  - b. All fan motors shall have inherent protection, have permanently lubricated bearings, and be completely variable speed.
  - c. All fan motors shall be mounted for quiet operation.
  - d. All fans shall be provided with a raised guard to prevent contact with moving parts.
  - e. The outdoor unit shall have vertical discharge airflow.
- 4. Refrigerant
  - a. R410A refrigerant shall be required for the outdoor unit systems.
  - b. Polyester (POE) oil shall be required. Prior to bidding, manufacturers using alternate oil types shall submit material safety data sheets (MSDS) and comparison of hygroscopic properties for alternate oil with list of local suppliers stocking alternate oil for approval at least two weeks prior to bidding.
- 5. Coil:
  - a. The outdoor coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing.
  - b. The coil fins shall have a factory applied corrosion resistant blue-fin finish. Uncoated aluminum coils/fins are not acceptable.
  - c. The coil shall be protected with an integral metal guard.
  - d. Refrigerant flow from the outdoor unit shall be controlled by means of an inverter driven compressor.
- 6. Compressor:
  - a. Each outdoor unit module shall be equipped with one inverter driven scroll hermetic compressor. Non-inverter driven compressors, which cause inrush current (demand charges) and require larger wire sizing, shall not be allowed.
  - b. Compressor (or compressor circuit) must utilize hot gas injection circuit or two-stage compression to allow compression ratio (thus heating output) to increase during extreme cold ambient temperatures.

- c. Crankcase heat shall be provided via induction-type heater utilizing eddy currents from motor windings. Energy-wasting “belly-band” type crankcase heaters are not allowed.
  - d. All compressors shall have an inverter to modulate capacity. The capacity for each module/system shall be variable with a minimum turndown not greater than 20% of the scheduled nominal capacity.
  - e. The compressor shall be equipped with an internal thermal overload.
  - f. The compressor shall be mounted to avoid the transmission of vibration.
  - g. Field-installed oil equalization lines between modules are not allowed. Prior to bidding, manufacturers requiring equalization must submit oil line sizing calculations specific to each system and module placement for this project.
7. Base-pan heater:
- a. Each outdoor unit module shall be equipped with a base pan heater to protect coil against ice build-up during prolonged winter operation. Base pan heater shall activate only if compressor is operating in heating mode at an outdoor ambient temperature of 39F or below. Provide only when low ambient cooling is needed.
8. Controls:
- a. The unit shall be an integral part of the system & control network described in Controls section and react to heating/cooling demand as communicated from connected indoor units over the control circuit. Required field-installed control voltage transformers and/or signal boosters shall be provided by the manufacturer.
  - b. Each outdoor unit module shall have the capability of 4 levels of demand control based on external input.
9. Electrical:
- a. The outdoor unit electrical power shall be 208/230 volts, 3-phase, 60 hertz.
  - b. The outdoor unit shall be controlled by integral microprocessors.
  - c. The control circuit between the indoor units, BC Controller and the outdoor unit shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.
10. Provide 24” high mounting stands for the outdoor unit sized per manufacturer’s recommendations. Stand shall be heavy duty. Secure the stands rigidly to the concrete pad.

- D. Branch Circuit (BC) controllers: Required for simultaneous heat/cool systems.
1. General: The BC Controllers shall include multiple branches to allow simultaneous heating and cooling by allowing either hot gas refrigerant to flow to indoor unit(s) for heating or subcooled liquid refrigerant to flow to indoor unit(s) for cooling. Refrigerant used for cooling must always be subcooled for optimal indoor unit LEV performance; alternate branch devices with no subcooling risk bubbles in liquid supplied to LEV and are not allowed. The BC Controllers shall be specifically used with R410A R2-Series systems. These units shall be equipped with a circuit board that interfaces to controls system and shall perform all functions necessary for operation. The unit shall have a galvanized steel finish. The BC Controller shall be completely factory assembled, piped and wired. Each unit shall be run tested at the factory. This unit shall be mounted indoors, with access and service clearance provided for each controller. The sum of connected capacity of all indoor air handlers shall range from 50% to 150% of rated capacity. Provide an auxiliary drain pan and condensate drain piping for the BC controller.
  2. BC Unit Cabinet
    - a. The casing shall be fabricated of galvanized steel.
    - b. Each cabinet shall house a liquid-gas separator and multiple refrigeration control valves.
    - c. The unit shall house two tube-in-tube heat exchangers.
  3. Refrigerant
    - a. R410A refrigerant shall be required.
    - b. All refrigerant pipe connections shall be brazed.
    - c. Future changes to indoor unit quantities or sizes served by BC Controller or comparable branch device must be possible with no piping changes except between the branch device and indoor unit(s) changing. Systems which might require future piping changes between branch device and outdoor unit, if changes to indoor unit quantities or sizes are made, are not considered equal and are not acceptable.
  4. Refrigerant valves:
    - a. Service shut-off valves shall be field-provided/installed for each branch to allow service to any indoor unit without field interruption to overall system operation.
  5. Future Use
    - a. Each VRF system shall include at least one (1) unused branches or branch devices for future use. Branches shall be fully installed & wired in central location with capped service shutoff valve & service port.

- b.
- 6. Condensate Management:
  - a. An Integral drain pan and drain shall be provided.
  - b. BC Controller (or comparable branch device) must have integral resin drain pan or insulate refrigeration components with removable insulation that allows easy access for future service needs. Cabinets filled with solid foam insulation do not allow for future service and are not allowed.
- 7. Electrical:
  - a. The unit electrical power shall be 208/230 volts, 1 phase, 60 Hertz.
  - b. The BC Controller shall be controlled by integral microprocessors.
  - c. The control circuit between the indoor units and outdoor units shall be 24VDC completed using a 2-conductor, twisted pair shielded cable to provide total integration of the system.
- E. Indoor Air Conditioning Units:
  - 1. 4-way Ceiling-recessed Cassette with Grille Indoor Unit
    - a. General: The indoor unit shall be a four-way cassette style indoor unit that recesses into the ceiling with a ceiling grille. The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function and a test run switch. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory. The unit shall be suitable for use in plenums in accordance with UL1995 ed 4.
    - b. Unit Cabinet: The cabinet panel shall have provisions for a field installed filtered outside air intake. Four-way grille shall be fixed to bottom of cabinet allowing two, three or four-way blow. The cabinet shall be space-saving ceiling-recessed cassette. The grille vane angles shall be individually adjustable from the wired remote controller to customize the airflow pattern for the conditioned space.

- c. Fan: The indoor fan shall be an assembly with a turbo fan direct driven by a single motor. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings. The indoor unit shall include an AUTO fan setting capable of maximizing energy efficiency by adjusting the fan speed based on the difference between controller set-point and space temperature. The indoor fan shall be capable of five (4) speed settings, Low, Mid, High and Auto. The indoor unit shall have an adjustable air outlet system offering 4-way airflow, 3-way airflow, or 2-way airflow. Refer to drawings for blow information for the units. The auto air swing vanes shall be capable of automatically swinging up and down for uniform air distribution. Grille shall include a factory-installed “i-see” sensor, or equal, to work in conjunction with indoor unit control sequence to prevent unnecessary cooling or heating in unoccupied areas of the zone without decreasing comfort levels. Sensor must detect occupancy (not simply motion) and location of occupants by measuring size & temperature of objects within a 39’ detecting diameter (based on 8.8ft mounting height) with 1,856 or more measuring points.
- d. Filter: Return air shall be filtered by means of a long-life washable filter.
- e. Coil: The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phos-copper or silver alloy. The coils shall be pressure tested at the factory. A condensate pan and drain shall be provided under the coil. The unit shall be provided with an integral condensate lift mechanism that will be able to raise drain water 33 inches above the condensate pan. Provide mini condensate pump. Both refrigerant lines to the indoor units shall be insulated.
- f. Electrical: The unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.
- g. Controls:
  - 1) This unit shall use controls provided by LG to perform functions necessary to operate the system.
  - 2) Indoor unit shall compensate for the higher temperature sensed by the return air sensor compared to the temperature at level of the occupant when in HEAT mode. Disabling of compensation shall be possible for individual units to accommodate instances when compensation is not required.
  - 3) Control board shall include contacts for control of external heat source. External heat may be energized as second stage with 1.8°F – 9.0°F adjustable deadband from set point.
  - 4) Indoor unit shall include no less than four (4) digital inputs capable of being used for customizable control strategies.
  - 5) Indoor unit shall include no less than three (3) digital outputs capable of being used for customizable control strategies.

- 6) Manufacturer to provide drain pan level sensor powered by a 20-year life lithium battery. Sensor shall require no external power for operation and shall have an audible indication of low battery condition.
- 7) The drain pan sensor shall provide protection against drain pan overflow by sensing a high condensate level in the drain pan. Should this occur the control shuts down the indoor unit before an overflow can occur. A thermistor error code will be produced should the sensor activate indicating a fault which must be resolved before the unit re-starts.

## 2. Ceiling-concealed Ducted Indoor Units

- a. General: The ceiling-concealed ducted indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory. The unit shall be suitable for use in plenums in accordance with UL1995 ed 4.
- b. Unit Cabinet: The cabinet shall be ceiling-concealed, ducted with a 2-position, field adjustable return and a fixed horizontal discharge supply. The cabinet panel shall have provisions for a field installed filtered outside air intake.
- c. Fan: Indoor unit shall feature multiple external static pressure settings ranging from 0.14 to 0.60 in. WG. The indoor unit fan shall be an assembly with statically and dynamically balanced Sirocco fan(s) direct driven by a single motor with permanently lubricated bearings. The indoor fan shall consist of three (3) speeds, High, Mid, and Low plus the Auto-Fan function.
- d. Filter: Return air shall be filtered by means of a standard factory installed return air filter. Optional return filter box (rear or bottom placement) with high-efficiency filter shall be available for all indoor units.
- e. Coil: The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phos-copper or silver alloy. The coils shall be pressure tested at the factory. Coil shall be provided with a sloped drain pan. Units without sloped drain pans which must be installed cockeyed to ensure proper drainage are not allowed. The unit shall be provided with an integral condensate lift mechanism able to raise drain water 27 inches above the condensate pan. Provide a mini condensate pump.
- f. Electrical: The unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.



g. Controls:

- 1) Indoor unit shall compensate for the higher temperature sensed by the return air sensor compared to the temperature at level of the occupant when in HEAT mode. Disabling of compensation shall be possible for individual units to accommodate instances when compensation is not required.
- 2) Control board shall include contacts for control of external heat source. External heat may be energized as second stage with 1.8°F – 9.0°F adjustable deadband from set point.
- 3) Indoor unit shall include no less than four (4) digital inputs capable of being used for customizable control strategies.
- 4) Indoor unit shall include no less than three (3) digital outputs capable of being used for customizable control strategies.
- 5) Manufacturer to provide drain pan level sensor powered by a 20-year life lithium battery. Sensor shall require no external power for operation and shall have an audible indication of low battery condition.
- 6) The drain pan sensor shall provide protection against drain pan overflow by sensing a high condensate level in the drain pan. Should this occur the control shuts down the indoor unit before an overflow can occur. A thermistor error code will be produced should the sensor activate indicating a fault which must be resolved before the unit re-starts.

## 2.2 MOTOR STARTERS

- A. Furnish all motor starters required for HVAC equipment under this section if not factory installed by the equipment manufacturer. The starters shall be wired by a licensed Electrician.
- B. Motor Controls – Manual and Magnetic:
  1. The individually mounted magnetic starters indicated on the plans and as required shall be magnetic across-the-line starters with thermal overload on each phase.
  2. Starters shall be of the size and type required for particular motor horsepower and voltage. Minimum size starter to be Size 0.
    - a. All starters shall have OL reset button, pilot light to indicate on or off and hand-off-auto switch in cover, unless indicated otherwise.
    - b. All starters to have 120-volt control via individual control transformers fused on the secondary, where not fed at 120 volts.
  3. Manual motor starters shall be furnished with thermal overloads on each phase. Thermal switches shall be provided with pilot lights.
  4. Three (3) auxiliary contacts shall be furnished and installed in all motor starters (1 NC, 2 NO).

5. Motor starters shall be all manufactured by the same company and shall be one of the following: Square D Company, Allen Bradley, General Electric, Cutler Hammer or ITE.

### 2.3 VARIABLE FREQUENCY DRIVE (VFD):

- A. The supply and return air fans shall be controlled by variable frequency drives to insure maximum operating efficiency. Base mounted heating hot water circulating pumps shall be provided with remote VFDs and the boiler circulating pumps shall be provided with integral VFDs.
- B. Acceptable VFD manufacturers: Hitachi, Reliance, Sumitomo, Toshiba or approved equal.

### 2.4 DEDICATED OUTDOOR AIR SYSTEMS (DOAS)

- A. Warranty - Manufacturer shall provide a “parts only” warranty for a period of 10 years from the date of equipment shipment. Warranty shall cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer’s written instructions for installation, operation and maintenance have been followed. Warranty excludes parts associated with routine maintenance, such as belts and air filters.
- B. Provide unit per specifications below including but not limited to R-454B refrigerant, Inverter driven variable speed compressor, cold climate air-source heat pump heating down to zero degrees ambient, direct drive supply fans, double wall cabinet construction, insulation with a minimum R-value of 13, stainless steel drain pans etc.
- C. Products shall be provided by the following manufacturers:
  1. AAON, Greenheck, Addison or engineer approved equal.
- D. Rooftop Units
  1. Outdoor air handling unit shall include compressors, evaporator coils, filters, supply fans, dampers, air-cooled condenser coils, condenser fans, reheat coil, electric heaters, exhaust fans, energy recovery wheels, and unit controls.
  2. Unit shall be factory assembled and tested including leak testing of the DX coils, pressure testing of the refrigeration circuit, and run testing of the completed unit. Run test report shall be supplied with the unit in the service compartment’s literature pocket.
  3. Unit shall have decals and tags to indicate lifting and rigging, service areas and caution areas for safety and to assist service personnel.
  4. Unit components shall be labeled, including pipe stub outs, refrigeration system components and electrical and controls components.

5. Estimated sound power levels (dB) shall be shown on the unit ratings sheet.
6. Installation, Operation and Maintenance manual shall be supplied within the unit.
7. Laminated color-coded wiring diagram shall match factory installed wiring and shall be affixed to the interior of the control compartment's access door.
8. Unit nameplate shall be provided in two locations on the unit, affixed to the exterior of the unit and affixed to the interior of the control compartment's hinged access door.

#### E. Construction

1. All cabinet walls, access doors, and roof shall be fabricated of double wall, impact resistant, rigid polyurethane foam panels.
2. Unit insulation shall have a minimum thermal resistance R-value of 13. Foam insulation shall have a minimum density of 2 pounds/cubic foot and shall be tested in accordance with ASTM D-1929 for a minimum flash ignition temperature of 610°F.
3. Unit construction shall be double wall with G90 galvanized steel on both sides and a thermal break. Double wall construction with a thermal break prevents moisture accumulation on the insulation, provides a cleanable interior, prevents heat transfer through the panel, and prevents exterior condensation on the panel.
4. Unit shall be designed to reduce air leakage and infiltration through the cabinet. Cabinet leakage shall not exceed 1% of total airflow when tested at 3 times the minimum external static pressure provided in AHRI Standard 340/360. Panel deflection shall not exceed L/240 ratio at 125% of design static pressure, at a maximum 8 inches of positive or negative static pressure, to reduce air leakage.

Deflection shall be measured at the midpoint of the panel height and width. Continuous sealing shall be included between panels and between access doors and openings to reduce air leakage. Refrigerant piping and electrical conduit through cabinet panels shall include sealing to reduce air leakage.

5. Roof of the air tunnel shall be sloped to provide complete drainage. Cabinet shall have rain break overhangs above access doors.
6. Access to filters, dampers, cooling coils, reheat coil, heaters, exhaust fans, return fans, energy recovery wheels, compressors, water-cooled condensers, and electrical and controls components shall be through hinged access doors with quarter turn, zinc cast, lockable handles. Full-length stainless-steel piano hinges shall be included on the doors.
7. Exterior paint finish shall be capable of withstanding at least 2,500 hours, with no visible corrosive effects, when tested in a salt spray and fog atmosphere in accordance with ASTM B 117-95 test procedure.

8. Units with cooling coils shall include double sloped 304 stainless steel drain pans.
9. Unit shall be provided with base discharge and return air openings. All openings through the base pan of the unit shall have upturned flanges of at least 1/2 inch in height around the opening.
10. Unit shall include lifting lugs on the top of the unit.
  - a. Unit shall include factory installed, painted galvanized steel condenser coil guards on the face of the condenser coil.
11. Unit base shall be fabricated of 1-inch-thick double wall, impact resistant, rigid polyurethane foam panels.
12. Unit shall include factory wired control panel compartment LED service lights.

#### F. Electrical

1. Unit shall be provided with standard power block for connecting power to the unit.
  - a. Unit shall have a 5kAIC SCCR.
  - b. Unit shall be provided with factory installed and factory wired, non-fused disconnect switch.
  - c. Air-source heat pump shall include an optimized start defrost cycle to prevent frost accumulation on the outdoor coil during heat pump heating operation and to minimized defrost cycle energy usage. If the temperature of the outdoor heat exchanger and/or the suction line is less than a predetermined value, a deferred defrost cycle is initiated wherein the defrost cycle starts after a variable, continuously optimizing, time interval has elapsed. The defrost cycle is terminated when the relative temperatures of the outdoor heat exchanger and/or the suction line indicate that sufficient frost is melted from the heat exchanger to ensure adequate time between successive defrost cycles for optimizing the efficiency and reliability of the system, or after a predetermined time interval has elapsed, whichever condition occurs first. During defrost cycle all compressors shall energize, reversing valves shall de-energize, and auxiliary heat shall energize.
  - d. Unit shall be provided with a factory installed and factory wired 115V, 12-amp GFI outlet disconnect switch in the unit control panel.

- e. Weather proof utility type lights with a switch at unit.
- f. Unit shall be provided with phase and brown out protection which shuts down all motors in the unit if the electrical phases are more than 10% out of balance on voltage, the voltage is more than 10% under design voltage or on phase reversal.

#### G. Supply Fans

- 1. Unit shall include direct drive, unhooded, backward curved, plenum supply fans.
- 2. Blowers and motors shall be dynamically balanced and mounted on rubber isolators.
- 3. Motors shall be premium efficiency ODP with ball bearings rated for 200,000 hours service with external lubrication points.
- 4. Variable frequency drives shall be factory wired and mounted in the unit. Fan motors shall be premium efficiency.

#### H. Exhaust Fans

- 1. Exhaust dampers shall be sized for 100% relief.
- 2. Fans and motors shall be dynamically balanced.
- 3. Unit shall include factory provided motorized relief dampers. The dampers shall be field installed.
- 4. Unit shall include barometric relief dampers.
- 5. Motors shall be premium efficiency ODP with ball bearings rated for 200,000 hours service with external lubrication points.
- 6. Access to exhaust fans shall be through double wall, hinged access doors with quarter turn lockable handles.
- 7. Unit shall include belt driven, unhooded, backward curved, plenum exhaust fans.
- 8. Variable frequency drives shall be factory wired and mounted in the unit. Fan motors shall be premium efficiency.

#### I. Evaporator Coils

- 1. Coils shall be designed for use with R-454B refrigerant and constructed of copper tubes with aluminum fins mechanically bonded to the tubes and galvanized steel end casings. Fin design shall be sine wave rippled.
- 2. Coils shall have interlaced circuitry and shall be 6-row high capacity.
- 3. Coils shall be helium leak tested.
- 4. Coils shall be furnished with a factory installed thermostatic expansion valves.
  - a. Coils shall have a flexible, epoxy polymer e-coat uniformly applied to all coil surface areas without material bridging between fins. Humidity and water immersion resistance shall be up to a minimum 1,000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to no less than 6,000 hours salt spray per ASTM B117-90. Coated coils shall receive a spray-applied, UV-resistant polyurethane topcoat to prevent UV degradation of the e-coat. Coating shall carry a 5-year non-prorated warranty.

## J. Refrigeration System

1. Unit shall be factory charged with R-454B refrigerant.
2. Compressors shall be scroll type with thermal overload protection, independently circuited, and carry a 5-year non-prorated warranty from the date of original equipment shipment from the factory.
3. Compressors shall be mounted in an isolated service compartment which can be accessed without affecting unit operation. Lockable hinged compressor access doors shall be fabricated of double wall, rigid polyurethane foam insulated panels to prevent the transmission of noise outside the cabinet.
4. Compressors shall be isolated from the base pan with the compressor manufacturer's recommended rubber vibration isolators, to reduce any transmission of noise from the compressors into the building area.
5. Each refrigeration circuit shall be equipped with thermostatic expansion valve type refrigerant flow control.
6. Each refrigeration circuit shall be equipped with automatic reset low pressure and manual reset high pressure refrigerant safety controls, Schrader type service fittings on both the high pressure and low-pressure sides, and factory installed liquid line filter driers.
7. Unit shall include an inverter driven, variable speed scroll compressor on the refrigeration circuit which shall be capable of modulating refrigerant capacity.
8. Unit shall include an inverter driven, variable speed scroll compressor on the lead refrigeration circuit which shall be capable of modulating refrigerant capacity, and a two-stage compressor on the lag refrigeration circuit that shall modulate between two capacity settings, 67% and 100%.
9. Refrigeration circuit shall be provided with hot gas reheat coil, modulating valves, electronic controller, supply air temperature sensor and a control signal terminal which allow the unit to have a dehumidification mode of operation, which includes supply air temperature control to prevent supply air temperature swings and overcooling of the space.
10. Lead refrigeration circuit shall be provided with hot gas reheat coil, modulating valves, electronic controller, supply air temperature sensor and a control signal terminal which allow the unit to have a dehumidification mode of operation, which includes supply air temperature control to prevent supply air temperature swings and overcooling of the space.
11. Lag refrigeration circuits shall be provided with hot gas reheat coil, modulating valves, electronic controller, supply air temperature sensor and a control signal terminal which allow the unit to have a dehumidification mode of operation, which includes supply air temperature control to prevent supply air temperature swings and overcooling of the space.

12. Reheat coil shall be multi-pass and fabricated from aluminum microchannel tubes. The reheat coil shall be piped in series with the condensing unit.
13. Unit shall be configured as a cold climate air-source heat pump. Each refrigeration circuit shall be equipped with a factory installed liquid line filter drier with check valve, reversing valve, accumulator, and expansion valves on both the indoor and outdoor coils. Reversing valve shall energize during the heat pump cooling mode of operation.
14. Each refrigeration circuit shall be equipped with a liquid line sight glass.
15. Each refrigeration circuit shall be equipped with suction and discharge compressor isolation valves.
16. The factory installed controls shall include a 3 minute off delay timer to prevent compressor short cycling. The controls shall also include an adjustable, 20 second delay timer for each additional capacity stage to prevent multiple capacity stages from starting simultaneously and adjustable compressor lock out.
17. Refrigeration circuit shall be provided with factory installed hot gas bypass to protect against evaporator frosting and to prevent excessive compressor cycling.

#### K. Air-Cooled Condenser

1. Condenser fans shall be vertical discharge, axial flow, direct drive fans.
2. Heat pump outdoor coil shall be constructed of copper tubes with aluminum fins mechanically bonded to the tubes and aluminum end casings. Fin design shall be sine wave rippled.
3. Coils shall be designed for a minimum of 10°F of refrigerant sub-cooling.
4. Coils shall be helium leak tested.
5. Condenser fans shall be VFD driven variable speed for condenser head pressure control. Factory provided and factory programmed VFDs shall continuously modulate the fan air flow to maintain head pressure at acceptable levels. Cooling operation shall be allowed down to 35°F with adjustable compressor lockout.
6. Coils shall have a flexible, epoxy polymer e-coat uniformly applied to all coil surface areas without material bridging between fins. Humidity and water immersion resistance shall be up to a minimum 1,000 and 250 hours respectively (ASTM D2247-92 and ASTM D870-92). Corrosion durability shall be confirmed through testing to no less than 6,000 hours salt spray per ASTM B117-90. Coated coils shall receive a spray-applied, UV-resistant polyurethane topcoat to prevent UV degradation of the e-coat. Coating shall carry a 5-year non-prorated warranty.

#### L. Electric Heating

1. Unit shall include an electric heater consisting of electric heating coils, fuses and a high temperature limit switch, with capacities as shown on the plans.
2. Electric heating coils shall be located in the reheat position downstream of the cooling coil.
3. Electric heater shall have full modulation capacity controlled by an SCR (Silicon Controlled Rectifier). Supply air temperature sensor shall be factory provided and field installed in the supply air ductwork.
4. Auxiliary electric heating capacity shall be sized to meet heating leaving air temperature setpoint when heat pump heating is in operation. Dual fuel auxiliary heating capacity shall be available for operation when heat pump heating is in operation. Unit shall include modulating auxiliary electric heating capacity.

#### M. Filters

1. Unit shall include 2-inch thick, pleated panel filters with an ASHRAE MERV rating of 8, upstream of the cooling coil.
2. Unit shall include 4-inch thick, pleated panel filters with an ASHRAE MERV rating of 13, upstream of the cooling coil. Unit shall also include 2-inch thick, pleated panel pre filters with an ASHRAE MERV rating of 8, upstream of the 4-inch standard filters.
3. Unit shall include 1 inch aluminum mesh pre filters upstream of the outside air opening.
4. Unit shall include a clogged filter switch.

#### N. Outside Air

1. Unit shall include 0-100% economizer consisting of a motor operated outside air damper and return air damper assembly constructed of extruded aluminum, hollow core, airfoil blades with rubber edge seals and aluminum end seals. Damper blades shall be gear driven and designed to have no more than 20 cfm of leakage per sq ft. at 4 in. w.g. air pressure differential across the damper. Low leakage dampers shall be Class 2 AMCA certified, in accordance with AMCA Standard 511. Damper assembly shall be controlled by spring return enthalpy activated fully modulating actuator. Unit shall include outside air opening bird screen, outside air hood, and barometric relief dampers. Economizer shall be furnished with return air CO2 override.

#### O. Energy Recovery

1. Unit shall contain a factory mounted and tested energy recovery wheel. The energy recovery wheel shall be mounted in a rigid frame containing the wheel drive motor, drive belt, wheel seals and bearings. Frame shall slide out for service and removal from the cabinet.
2. Unit shall contain factory mounted and tested energy recovery wheels. The energy recovery wheels shall be mounted in a rigid frame containing the wheel drive motor,



drive belt, wheel seals and bearings. Frame shall slide out for service and removal from the cabinet.

3. The energy recovery component shall incorporate a rotary wheel in an insulated cassette frame complete with seals, drive motor and drive belt.
4. The energy recovery cassette shall be an Underwriters Laboratories Recognized Component for electrical and fire safety. The wheel drive motor shall be an Underwriters Laboratory Recognized Component and shall be mounted in the cassette frame and supplied with a service connector or junction box. Thermal performance shall be certified by the manufacturer in accordance with ASHRAE Standard 84, Method of Testing Air-to-Air Heat Exchangers and AHRI Standard 1060, Rating Air-to-Air Energy Recovery Ventilation Equipment. Cassettes shall be listed in the AHRI Certified Products.
5. Unit shall include 2-inch thick, pleated panel outside air filters with an ASHRAE MERV rating of 8, upstream of the wheels.
6. Unit shall include 2-inch thick, pleated panel outside air and exhaust air filters with an ASHRAE MERV rating of 8, upstream of the wheels.
7. Hinged service access doors shall allow access to the wheel.
8. Hinged service access doors shall allow access to the wheels.
  - a. Polymer Energy Recovery Wheels

- 1) Shall be provided with removable energy transfer matrix. Wheel frame construction shall be a welded hub, spoke and rim assembly of stainless, plated and/or coated steel and shall be self-supporting without matrix segments in place. Segments shall be removable without the use of tools to facilitate maintenance and cleaning. Wheel bearings shall be selected to provide an L-10 life in excess of 400,000 hours. Rim shall be continuous rolled stainless steel and the wheel shall be connected to the shaft by means of taper locks.
- 2) All diameter and perimeter seals shall be provided as part of the cassette assembly and shall be factory set. Drive belts of stretch urethane shall be provided for wheel rim drive.
- 3) Polymer Energy recovery wheel cassette shall carry a 5-year non-prorated warranty, from the date of original equipment shipment from the factory. The first 12 months from the date of equipment startup, or 18 months from the date of original equipment shipment from the factory, whichever is less, shall be covered under the standard AAON limited parts warranty. The remaining period of the warranty shall be covered by Airxchange. The 5-year warranty applies to all parts and components of the cassette, with the exception of the motor, which shall carry an 18-month warranty. Warranty shall cover material and workmanship that prove defective, within the specified warranty period, provided the Airxchange written instructions for installation, operation and maintenance have been followed. Warranty excludes parts associated with routine maintenance, such as belts. Refer to the Airxchange Energy Recovery Cassette Limited Warranty Certificate.
- 4) Total energy recovery wheels shall be coated with silica gel desiccant permanently bonded by a process without the use of binders or adhesives, which may degrade desiccant performance. The substrate shall be lightweight polymer and shall not degrade nor require additional coatings for application in marine or coastal environments. Coated segments shall be washable with detergent or alkaline coil cleaner and water. Desiccant shall not dissolve nor deliquesce in the presence of water or high humidity.

#### P. Controls

1. Factory Installed and Factory Provided Controller
  - a. Unit controller shall be capable of controlling all features and options of the unit. Controller shall be factory installed in the unit controls compartment and factory tested. Controller shall be capable of standalone operation with unit configuration, setpoint adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling available without dependence on a building management system.
  - b. Controller shall have an onboard clock and calendar functions that allow for occupancy scheduling.
  - c. Controller shall include non-volatile memory to retain all programmed values without the use of a battery, in the event of a power failure.
  - d. Variable Air Volume Controller
    - 1) Unit shall utilize a variable speed compressor system and a variable speed supply fan system to modulate cooling and airflow as required to meet space temperature cooling loads and to save operating energy. Supply fan speed shall modulate based on supply air duct static pressure. Cooling capacity shall modulate based on supply air temperature.
    - 2) With modulating hot gas reheat, unit shall modulate cooling and hot gas reheat as efficiently as possible, to meet space humidity loads and prevent supply air temperature swings and overcooling of the space.
    - 3) Unit shall modulate heating with constant airflow to meet space temperature heating loads. Modulating heating capacity shall modulate based on supply air temperature.
  - e. Unit configuration, setpoint adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling shall be accomplished with connection to interface module with LCD screen and input keypad, interface module with touch screen, or with connection to PC with free configuration software. Controller shall be capable of connection with other factory installed and factory provided unit controllers with individual unit configuration, setpoint adjustment, sensor status viewing, and occupancy scheduling available from a single unit. Connection between unit controllers shall be with a modular cable. Controller shall be capable of communicating and integrating with a LonWorks or BACnet network.

Q. Accessories

1. Unit shall be provided with a safety shutdown terminal block for field installation of a smoke detector which shuts off the unit's control circuit.

2.5 PACKAGED ROOFTOP UNITS (RTU)

- A. Warranty - Manufacturer shall provide a “parts only” warranty for a period of 10 years from the date of equipment shipment. Warranty shall cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer’s written instructions for installation, operation and maintenance have been followed. Warranty excludes parts associated with routine maintenance, such as belts and air filters.
- B. Provide unit per specifications below including but not limited to R-454B refrigerant, Inverter driven variable speed compressor, cold climate air-source heat pump heating down to zero degrees ambient, direct drive supply fans, double wall cabinet construction, insulation with a minimum R-value of 13, stainless steel drain pans etc.
- C. Products shall be provided by the following manufacturers:
  1. AAON, Greenheck, Addison or engineer approved equal.

#### D. General Description

1. Packaged rooftop unit shall include compressors, evaporator coils, filters, supply fans, dampers, air-cooled condenser coils, condenser fans, reheat coil, electric heaters, exhaust fans, energy recovery wheels, and unit controls.
2. Unit shall be factory assembled and tested including leak testing of the DX coils, pressure testing of the refrigeration circuit, and run testing of the completed unit. Run test report shall be supplied with the unit in the service compartment's literature pocket.
3. Unit shall have decals and tags to indicate lifting and rigging, service areas and caution areas for safety and to assist service personnel.
4. Unit components shall be labeled, including refrigeration system components, and electrical and controls components.
5. Estimated sound power levels (dB) shall be shown on the unit ratings sheet.
6. Installation, Operation, and Maintenance manual shall be supplied within the unit.
7. Laminated color-coded wiring diagram shall match factory installed wiring and shall be affixed to the interior of the control compartment's hinged access door.
8. Unit nameplate shall be provided in two locations on the unit, affixed to the exterior of the unit and affixed to the interior of the control compartment's hinged access door.

#### E. Construction

1. All cabinet walls, access doors, and roof shall be fabricated of double wall, impact resistant, rigid polyurethane foam panels.
2. Unit insulation shall have a minimum thermal resistance R-value of 13. Foam insulation shall have a minimum density of 2 pounds/cubic foot and shall be tested in accordance with ASTM D1929-11 for a minimum flash ignition temperature of 610°F.
3. Unit construction shall be double wall with G90 galvanized steel on both sides and a thermal break. Double wall construction with a thermal break prevents moisture accumulation on the insulation, provides a cleanable interior, reduces heat transfer through the panel, and prevents exterior condensation on the panel.
4. Unit shall be designed to reduce air leakage and infiltration through the cabinet. Cabinet leakage shall not exceed 1% of total airflow when tested at 3 times the minimum external static pressure provided in AHRI Standard 340/360. Panel deflection shall not exceed L/240 ratio at 125% of design static pressure, at a maximum 8 inches of positive or negative static pressure, to reduce air leakage. Deflection shall be measured at the midpoint of the panel height and width. Continuous sealing shall be included between panels and between access doors and openings to reduce air leakage. Piping and electrical conduit through cabinet panels shall include sealing to reduce air leakage.
5. Roof of the air tunnel shall be sloped to provide complete drainage. Cabinet shall have rain break overhangs above access doors.
6. Access to filters, dampers, cooling coils, reheat coil, heaters, energy recovery wheels, compressors, and electrical and controls components shall be through hinged access doors with quarter turn, zinc cast, lockable handles. Full-length stainless-steel piano hinges shall be included on the doors.
7. Exterior paint finish shall be capable of withstanding at least 2,500 hours, with no visible corrosive effects, when tested in a salt spray and fog atmosphere in accordance with ASTM B 117-95 test procedure.
8. Units with cooling coils shall include double sloped 304 stainless steel drain pans.
9. Unit shall be provided with base discharge and return air openings. All openings through the

base pan of the unit shall have upturned flanges of at least 1/2 inch in height around the opening.

10. Unit shall include lifting lugs on the top of the unit.

#### F. Electrical

1. Unit shall have a 5kAIC SCCR.
2. Unit shall be provided with factory installed and factory wired, non-fused disconnect switch.
3. Unit shall be provided with a factory installed and factory wired 115V, 12-amp GFI outlet disconnect switch in the unit control panel.
4. Unit shall be provided with phase and brown out protection which shuts down all motors in the unit if the electrical phases are more than 10% out of balance on voltage, the voltage is more than 10% under design voltage or on phase reversal.

#### G. Supply Fans

1. Unit shall include direct drive, unhooded, backward curved, plenum supply fans.
2. Blowers and motors shall be dynamically balance and mounted on rubber isolators.
3. Motors shall be premium efficiency ODP with ball bearings rated for 200,000 hours service with external lubrication points.
4. Variable frequency drives shall be factory wired and mounted in the unit. Fan motors shall be premium efficiency.

#### H. Exhaust Fans

1. Exhaust dampers shall be sized for 100% relief.
2. Fans and motors shall be dynamically balanced.
3. Unit shall include barometric relief dampers.
4. Motors shall be premium efficiency ODP with ball bearings rated for 200,000 hours service with external lubrication points.
5. Access to exhaust fans shall be through double wall, hinged access doors with quarter turn lockable handles.
6. Unit shall include belt driven, unhooded, backward curved, plenum exhaust fans.
7. Variable frequency drives shall be factory wired and mounted in the unit. Fan motors shall be premium efficiency.

#### I. Cooling Coils

1. Evaporator Coils
  - a. Coils shall be designed for use with R-454B refrigerant and constructed of copper tubes with aluminum fins mechanically bonded to the tubes and galvanized steel end casings. Fin design shall be sine wave rippled.
  - b. Coils shall have interlaced circuitry and shall be standard capacity.
  - c. Coils shall be hydrogen or helium leak tested.
  - d. Coils shall be furnished with factory installed expansion valves.

#### J. Refrigeration System

1. Unit shall be factory charged with R-454B refrigerant.
2. Compressors shall be scroll type with thermal overload protection and carry a 5-year non-prorated warranty, from the date of original equipment shipment from the factory.
3. Compressors shall be mounted in an isolated service compartment which can be accessed

without affecting unit operation. Lockable hinged compressor access doors shall be fabricated of double wall, rigid polyurethane foam injected panels to prevent the transmission of noise outside the cabinet.

4. Compressors shall be isolated from the base pan with the compressor manufacturer's recommended rubber vibration isolators, to reduce any transmission of noise from the compressors into the building area.
5. Each refrigeration circuit shall be equipped with expansion valve type refrigerant flow control.
6. Each refrigeration circuit shall be equipped with automatic reset low pressure and manual reset high pressure refrigerant safety controls, Schrader type service fittings on both the high pressure and low-pressure sides and a factory installed liquid line filter driers.
7. Unit shall include an inverter driven, variable speed scroll compressor on the refrigeration circuit which shall be capable of modulating refrigerant capacity.
8. Unit shall include factory provided and installed compressor sound jackets on all compressors.
9. Lead refrigeration circuit shall be provided with hot gas reheat coil, modulating valves, electronic controller, supply air temperature sensor and a control signal terminal which allow the unit to have a dehumidification mode of operation, which includes supply air temperature control to prevent supply air temperature swings and overcooling of the space.
10. Unit shall be configured as a cold climate air-source heat pump. Each refrigeration circuit shall be equipped with a factory installed liquid line filter drier with check valve, reversing valve, accumulator, and expansion valves on both the indoor and outdoor coils. Reversing valve shall energize during the heat pump cooling mode of operation.
11. Each refrigeration circuit shall be equipped with a liquid line sight glass.
12. The factory installed controls shall include a 3 minute off delay timer to prevent compressor short cycling. The controls shall also include an adjustable, 20 second delay timer for each additional capacity stage to prevent multiple capacity stages from starting simultaneously and adjustable compressor lock out.

#### K. Condensers

1. Air-Cooled Condenser
  - a. Condenser fans shall be a vertical discharge, axial flow, direct drive fans.
  - b. Heat pump outdoor coil shall be constructed of copper tubes with aluminum fins mechanically bonded to the tubes and aluminum end casings. Fin design shall be sine wave rippled.
  - c. Coils shall be designed for a minimum of 10°F of refrigerant sub-cooling.
  - d. Coils shall be hydrogen or helium leak tested.
  - e. Condenser fans shall be high efficiency electrically commutated motor driven with factory installed head pressure control module. Condenser airflow shall continuously modulate based on head pressure and cooling operation shall be allowed down to 35°F with adjustable compressor lockout.

#### L. Electric Heating

1. Unit shall include an electric heater consisting of electric heating coils, fuses and a high temperature limit switch, with capacities as shown on the plans.
2. Electric heating coils shall be located in the reheat position downstream of the cooling coil.
3. Electric heater shall have full modulation capacity controlled by an SCR (Silicon

Controlled Rectifier). A 0-10 VDC heating control signal shall be field provided to control the amount of heating.

4. Emergency electric heating capacity shall be sized to meet heating leaving air temperature setpoint when heat pump heating is not in operation. Auxiliary electric heating capacity shall be sized to meet heating leaving air temperature setpoint when heat pump heating is in operation. Unit shall include 1 stage of auxiliary electric heating capacity.

#### M. Filters

1. Unit shall include 4-inch thick, pleated panel filters with an ASHRAE MERV rating of 13, upstream of the cooling coil. Unit shall also include 2-inch thick, pleated panel pre filters with an ASHRAE MERV rating of 8, upstream of the 4-inch standard filters.
2. Unit shall include 1 inch aluminum mesh pre filters upstream of the outside air opening.
3. Unit shall include a clogged filter switch.

#### N. Outside Air/Economizer

1. Unit shall include 0-100% economizer consisting of a motor operated outside air damper and return air damper assembly constructed of extruded aluminum, hollow core, airfoil blades with rubber edge seals and aluminum end seals. Damper blades shall be gear driven and designed to have no more than 20 cfm of leakage per sq ft. at 4 in. w.g. air pressure differential across the damper. Low leakage dampers shall be Class 2 AMCA certified, in accordance with AMCA Standard 511. Damper assembly shall be controlled by spring return enthalpy activated fully modulating actuator. Unit shall include outside air opening bird screen and outside air hood. Unit, except for horizontal series, shall also include barometric relief dampers.
2. Economizer shall be furnished with return air CO2 override.

#### O. Energy Recovery

1. Unit shall contain a factory mounted and tested energy recovery wheel. The energy recovery wheel shall be mounted in a rigid frame containing the wheel drive motor, drive belt, wheel seals and bearings. Frame shall slide out for service and removal from the cabinet.
2. The energy recovery component shall incorporate a rotary wheel in an insulated cassette frame complete with seals, drive motor and drive belt.
3. The energy recovery cassette shall be an Underwriters Laboratories Recognized Component for electrical and fire safety. The wheel drive motor shall be an Underwriters Laboratory Recognized Component and shall be mounted in the cassette frame and supplied with a service connector or junction box. Thermal performance shall be certified by the manufacturer in accordance with ASHRAE

Standard 84, Method of Testing Air-to-Air Heat Exchangers and AHRI Standard 1060, Rating Air-to-Air Energy Recovery Ventilation Equipment. Cassettes shall be listed in the AHRI Certified Products.

4. Hinged service access doors shall allow access to the wheel.
  - a. Polymer Energy Recovery Wheels
    - 1) Shall be provided with removable energy transfer matrix. Wheel frame construction shall be a welded hub, spoke and rim assembly of stainless, plated and/or coated steel and shall be self-supporting without matrix segments in place. Segments shall be removable without the use of tools to facilitate maintenance and cleaning. Wheel bearings shall be selected to provide an L-10 life in excess of 400,000 hours. Rim shall be continuous rolled stainless steel and the wheel shall be connected to the shaft by means of taper locks.
    - 2) All diameter and perimeter seals shall be provided as part of the cassette assembly

and shall be factory set. Drive belts of stretch urethane shall be provided for wheel rim drive.

- 3) Polymer Energy recovery wheel cassette shall carry a 5-year non-prorated warranty, from the date of original equipment shipment from the factory. The first 12 months from the date of equipment startup, or 18 months from the date of original equipment shipment from the factory, whichever is less, shall be covered under the standard AAON limited parts warranty. The remaining period of the warranty shall be covered by Airxchange. The 5-year warranty applies to all parts and components of the cassette, with the exception of the motor, which shall carry an 18-month warranty. Warranty shall cover material and workmanship that prove defective, within the specified warranty period, provided the Airxchange written instructions for installation, operation and maintenance have been followed. Warranty excludes parts associated with routine maintenance, such as belts. Refer to the Airxchange Energy Recovery Cassette Limited Warranty Certificate.
- 4) Total energy recovery wheels shall be coated with silica gel desiccant permanently bonded by a process without the use of binders or adhesives, which may degrade desiccant performance. The substrate shall be lightweight polymer and shall not degrade nor require additional coatings for application in marine or coastal environments. Coated segments shall be washable with detergent or alkaline coil cleaner and water. Desiccant shall not dissolve nor deliquesce in the presence of water or high humidity.

#### P. Controls

##### 1. Factory Installed and Factory Provided Controller

- a. Unit controller shall be capable of controlling all features and options of the unit. Controller shall be factory installed in the unit controls compartment and factory tested. Controller shall be capable of standalone operation with unit configuration, setpoint adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling available without dependence on a building management system.
- b. Controller shall have an onboard clock and calendar functions that allow for occupancy scheduling.
- c. Controller shall include non-volatile memory to retain all programmed values without the use of a battery, in the event of a power failure.
- d. Variable Air Volume Controller
  - 1) Unit shall utilize a variable speed compressor system and a variable speed supply fan system to modulate cooling and airflow as required to meet space temperature cooling loads and to save operating energy. Supply fan speed shall modulate based on supply air duct static pressure. Cooling capacity shall modulate based on supply air temperature.
  - 2) With modulating hot gas reheat, unit shall modulate cooling and hot gas reheat as efficiently as possible, to meet space humidity loads and prevent supply air temperature swings and overcooling of the space.
  - 3) Unit shall modulate heating with constant airflow to meet space temperature heating loads. Modulating heating capacity shall modulate based on supply air temperature.
- e. Unit configuration, setpoint adjustment, sensor status viewing, unit alarm viewing, and occupancy scheduling shall be accomplished with connection to interface module with LCD screen and input keypad, interface module with touch screen, or with connection to PC with free configuration software. Controller shall be capable of connection with other factory



installed and factory provided unit controllers with individual unit configuration, setpoint adjustment, sensor status viewing, and occupancy scheduling available from a single unit. Connection between unit controllers shall be with a modular cable. Controller shall be capable of communicating and integrating with a LonWorks or BACnet network. [Orion Controls System]

Q. Accessories

1. Unit shall be provided with a safety shutdown terminal block for field installation of a smoke detector which shuts off the unit's control circuit.

**PART 3 - EXECUTION**

3.1 MATERIALS AND WORKMANSHIP

- A. All specified materials and equipment shall be furnished new and free of defects.
- B. Store all equipment and materials in a clean, dry place to preserve initial quality.
- C. Protect installed materials and equipment against damage and corrosion. All equipment shall be left in a first-class condition. The Architect shall determine the adequacy of equipment condition and appearance and it shall be the responsibility of this Contractor to rectify any deficiencies. This shall include, but is not limited to furnishing and applying paint in accordance with the manufacturer's recommendation.

3.2 PROTECTION AND CLEANUP

- A. Protection:
  1. Be responsible for the maintenance and protection of all material and equipment furnished during all phases of construction from loss, damage or deterioration until final acceptance by the Owner.
  2. All materials and equipment on the job site shall be suitably stored and protected from the weather.
  3. During the progress of the work all pipes, ducts and equipment openings shall be temporarily closed so as to prevent obstruction and damage.

3.3 SAFETY PRECAUTIONS

- A. Furnish, place and maintain proper guards for the prevention of accidents and any other necessary construction required to secure safety of life and property. Conform to all OSHA requirements.

**END OF SECTION**

#### A. DELIVERY SPECIFICATIONS

- a. All deliveries shall conform in every respect with all applicable laws of the Federal Government and/or the Commonwealth of Massachusetts and/or the City.
- b. The contractor must upon notice of the City or other Authorized Municipal Officer make prompt, and without charge, replacements of any Product furnished which fails to conform to specifications.
- c. In case any school or municipal property is damaged in the process of the delivery of product, the damage shall be the responsibility of the contractor and must be repaired or replaced to the satisfaction of the City.
- d. Product must be delivered within seventy-two (72) hours of receipt of the order, except as otherwise provided for in this invitation for bids.
- e. Deliveries made to the City of Everett or other political subdivision shall be in the presence of an authorized agent of that governmental entity. Deliveries shall be made between the hours of 8:00 a.m. and 4:00 p.m. Signed delivery slips are to be forwarded to the purchaser with invoices.
- f. The building receiving the HVAC equipment has a loading dock.

### **III. QUALITY REQUIREMENTS**

1. Bidders must provide all of the items described in Section II and comply with all of the bid submission requirements listed in Section I.
2. Bidder must have been in the business supply and delivery of HVAC equipment for a minimum of seven (7) years.
3. The Bidder shall submit the names and phone numbers, including 24-hour beeper or answering service numbers, for those individuals involved in direct customer service aspects of this contract. These contacts will be used for communication of routine or emergency information with contractor.

### **IV. REFERENCES**

Bidders must provide a list of for whom it supplied HVAC equipment in the past three years. Reference information must include Company Name, Contact Person, Phone Number, Fax Number and date of purchases.

Poor references may be a basis for determining that a bidder is not responsible. Reference questions will include but may not be limited to quality of equipment, timely delivery, customer service and general customer satisfaction.

### **V. RULE FOR AWARD**

One contract may be awarded to the responsible and responsive offering the total lowest price for all equipment.

In the event of a tie the City will conduct a coin toss to determine the contract award.

**FORM OF GENERAL BID  
CONTRACT NO. 24-48**

To - The City of Everett, acting by the mayor, as Awarding Authority.

- A. The undersigned proposes to furnish all materials and equipment
- B. The undersigned declares that no person in the employ of said City has any pecuniary interest in this bid or in the contract for the work he proposes to do and that he understands and agrees that the City, its agents and employees, are not to be in any manner held responsible for the accuracy of, or bound by, any estimates or plans relating to the work and that if any have been given or made they are to be considered solely as a base for filling out and comparing the several bids.
- C. The undersigned agrees that he will within seven (7) days, Sundays and holidays excluded, after receipt of a notice of award by the City, execute the contract and furnish the required insurance certificates .

**This Bid Includes Addenda Through No. \_\_\_\_\_ :**

TOTAL \_\_\_\_\_ \$ \_\_\_\_\_  
(written) (figures)

Name of Firm: \_\_\_\_\_

By: \_\_\_\_\_  
(Signed Name) (Title) (Date)

\_\_\_\_\_  
(Printed Name)

Business Address: \_\_\_\_\_

City, State, Zip Code: \_\_\_\_\_

Tel. No: \_\_\_\_\_

Email  
Address: \_\_\_\_\_

**CERTIFICATIONS**

**TAX COMPLIANCE**

Pursuant to Chapter 62C of the Massachusetts General Laws, Section 49A(b), I, the undersigned, authorized signatory for the below named contractor, do hereby certify under the pains and penalties of perjury that said contractor has complied with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

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**NON-COLLUSION**

The undersigned certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

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**COMPLETE AND SIGN BELOW:**

\_\_\_\_\_  
Authorized Person's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Print Name & Title of Signatory

\_\_\_\_\_  
Name of Contractor

## CITY OF EVERETT, MASSACHUSETTS

### AGREEMENT

THIS AGREEMENT made this \_\_\_\_ day of \_\_\_\_\_, 20\_\_ by and between the CITY of EVERETT, a municipal corporation duly organized under the laws of Massachusetts and having a usual place of business at 484 Broadway, Everett, Massachusetts, hereinafter referred to as the “CITY”, and \_\_\_\_\_, a \_\_\_\_\_ corporation having a usual place of business at \_\_\_\_\_, hereinafter referred to as the “CONTRACTOR”.

### WITNESSETH:

WHEREAS, the CITY invited the submission of bids for the supply and delivery of HVAC Equipment, hereinafter the “Project”; and

WHEREAS, the CONTRACTOR submitted a Bid to supply and deliver the HVAC equipment; and

WHEREAS, the CITY has decided to award the contract therefor to the CONTRACTOR.

NOW, THEREFORE, the CITY and the CONTRACTOR agree as follows:

1. CONTRACT DOCUMENTS. The Contract Documents consist of this Agreement, the Invitation to Bid, Instructions to Bidders, and the CONTRACTOR’s Bid. The Contract Documents constitute the entire Agreement between the parties concerning the work, and all are as fully a part of this Agreement as if attached hereto.
2. THE WORK. The Work consists of supplying and delivery of HVAC equipment, as more fully described in the Contract Documents as defined above.
3. MAYOR OF CONTRACT. This Agreement shall be in effect from September 2024\_ and shall expire on September 2025, unless terminated earlier pursuant to the terms hereof.
4. COMPENSATION.
  - A. The CITY shall pay the CONTRACTOR as full compensation for the supply and delivery of the HVAC equipment for contract sum of \$ \_\_\_\_\_.
  - B. The acceptance by the CONTRACTOR of final payment for items and/or services provided shall be deemed a release of the CITY from any and all claims and liabilities under this Agreement.
  - C. Neither the CITY's review, approval, or acceptance of, nor payment for any of the items and/or services provided shall be construed to operate as a waiver of any rights of the CITY under the Agreement or any cause of action arising out of the performance of the Agreement.
  - D. The CITY shall cancel this Agreement if funds are not appropriated or otherwise made available to support continuation of performance in any fiscal year succeeding the current fiscal year as required by G.L. c. 30B, sec. 12(c)(3).

5. PAYMENT OF COMPENSATION. The CITY shall make payments within thirty (30) days after its receipt of Invoice.
6. LIABILITY OF THE CITY. The CITY's liability hereunder shall be to make all payments when they shall become due, and the CITY shall be under no further obligation or liability. Nothing in this Agreement shall be construed to render the CITY or any elected or appointed official or employee of the CITY, or their successors in office, personally liable for any obligation under this Agreement.
7. INDEPENDENT CONTRACTOR. The CONTRACTOR acknowledges and agrees that it is acting as an independent contractor for all work and services rendered pursuant to this Agreement, and shall not be considered an employee or agent of the CITY for any purpose.
8. INDEMNIFICATION. The CONTRACTOR shall indemnify, defend, and hold the CITY harmless from and against any and all claims, demands, liabilities, actions, causes of actions, costs and expenses, including attorney's fees, arising out of the CONTRACTOR's breach of this Agreement or the negligence or misconduct of the CONTRACTOR, or the CONTRACTOR's agents or employees. This obligation shall survive the termination or expiration of this Agreement.
9. INSURANCE.
  - A. The CONTRACTOR shall obtain and maintain in full force and effect during the Mayor of this Agreement the insurance coverage in companies licensed to do business in the Commonwealth of Massachusetts, and acceptable to the CITY, as set forth below:

General Liability	
Bodily Injury Liability	\$1,000,000 per occurrence
Property Damage Liability	\$ 500,000 per occurrence
(or combined single limit)	\$1,000,000 per occurrence

Automobile Liability	
Bodily Injury Liability	\$1,000,000 per occurrence
Property Damage Liability	\$ 500,000 per occurrence
(or combined single limit)	\$1,000,000 per occurrence

Workers' Compensation Insurance  
 Coverage for all employees in accordance with Massachusetts General Laws

Professional Liability Insurance	
Minimum Coverage	\$1,000,000 per occurrence

- B. All policies shall identify the CITY as an additional insured (except Workers' Compensation) and shall provide that the CITY shall receive written notification at least 30 days prior to the effective date of any amendment or cancellation. Certificates evidencing all such coverages shall be provided to the CITY upon the execution of this Agreement. Each such certificate shall specifically refer to this Agreement and shall state that such insurance is as required by this Agreement. Failure to provide or to continue in force such insurance shall be deemed a material breach of this Agreement and shall be grounds for immediate termination.

10. ASSIGNMENT. The CONTRACTOR shall not assign, sublet, or otherwise transfer this Agreement, in whole or in part, without the prior written consent of the CITY, and shall not assign any of the moneys payable under this Agreement, except by and with the written consent of the CITY.
11. TERMINATION. A. Termination for Cause. If at any time during the Mayor of this Agreement the CITY determines that the CONTRACTOR has breached the terms of this Agreement by negligently or incompetently performing the work, or any part thereof, or by failing to perform the work in a timely fashion, or by failing to perform the work to the satisfaction of the CITY, or by not complying with the direction of the CITY or its agents, or by otherwise failing to perform this Agreement in accordance with all of its terms and provisions, the CITY shall notify the CONTRACTOR in writing stating therein the nature of the alleged breach and directing the CONTRACTOR to cure such breach within ten (10) days. The CONTRACTOR specifically agrees that it shall indemnify and hold the CITY harmless from any loss, damage, cost, charge, expense or claim arising out of or resulting from such breach regardless of its knowledge or authorization of the actions resulting in the breach. If the CONTRACTOR fails to cure said breach within ten (10) days, the CITY may, at its election at any time after the expiration of said ten (10) days, terminate this Agreement by giving written notice thereof to the CONTRACTOR specifying the effective date of the termination. Upon receipt of said notice, the CONTRACTOR shall cease to incur additional expenses in connection with this Agreement. Upon the date specified in said notice, this Agreement shall terminate. Such termination shall not prejudice or waive any rights or action which the CITY may have against the CONTRACTOR up to the date of such termination, and the CONTRACTOR shall be liable to the CITY for any amount which it may be required to pay in excess of the compensation provided herein in order to complete the work specified herein in a timely manner. Upon such termination, the CONTRACTOR shall be entitled to compensation for all satisfactory work completed prior to the termination date, as determined by the CITY.
- B. Termination for Convenience. The CITY may terminate this Agreement at any time for convenience by providing the CONTRACTOR written notice specifying therein the termination date which shall not be sooner than ten days from the issuance of said notice. Upon receipt of said notice, the CONTRACTOR shall cease to incur additional expenses in connection with this Agreement. Upon such termination, the CONTRACTOR shall be entitled to compensation for all satisfactory work completed prior to the termination date, as determined by the CITY, such payment not to exceed the fair value of the services provided hereunder.
12. INSPECTION AND REPORTS. The CITY shall have the right at any time to inspect the work of the CONTRACTOR, including the right to enter upon any property owned or occupied by CONTRACTOR, whether situated within or beyond the limits of the CITY. Whenever requested, CONTRACTOR shall immediately furnish to the CITY full and complete written reports of its operation under this Contract in such detail and with such information as the CITY may request.
13. ROYALTIES AND PATENTS. The CONTRACTOR shall pay all applicable royalties and license fees. In addition, the CONTRACTOR hereby represents that it is duly authorized to use any process or other intellectual property rights held by third parties in the performance of this Agreement, it shall defend all suits or claims for infringement of any patent or other intellectual property rights and shall indemnify and hold the CITY harmless from loss on account thereof.



14. SUCCESSOR AND ASSIGNS. This Agreement is binding upon the parties hereto, their successors, assigns and legal representatives. Neither the CITY nor the CONTRACTOR shall assign or transfer any interest in the Agreement without the written consent of the other.
15. COMPLIANCE WITH LAWS. The CONTRACTOR shall comply with all Federal, State, and local laws, rules, regulations and orders applicable to the work provided pursuant to this Agreement, such provisions being incorporated herein by reference, and shall be responsible for obtaining all necessary licenses, permits, and approvals required for the performance of such work.
16. NOTICE. Any and all notices, or other communications required or permitted under this Agreement, shall be in writing and delivered by hand or mailed postage prepaid, return receipt requested, by registered or certified mail or by other reputable delivery service, to the parties at the addresses set forth on Page 1 or furnished from time to time in writing hereafter by one party to the other party. Any such notice or correspondence shall be deemed given when so delivered by hand, if so mailed, when deposited with the U.S. Postal Service or, if sent by private overnight or other delivery service, when deposited with such delivery service.
17. SEVERABILITY. If any Mayor or condition of this Agreement or any application thereof shall to any extent be held invalid, illegal, or unenforceable by the court of competent jurisdiction, the validity, legality, and enforceability of the remaining terms and conditions of this Agreement shall not be deemed affected thereby unless one or both parties would be substantially or materially prejudiced.
18. GOVERNING LAW. This Agreement shall be governed by, construed, and enforced in accordance with the laws of the Commonwealth of Massachusetts and the CONTRACTOR submits to the jurisdiction of any of its appropriate courts for the adjudication of disputes arising out of this Agreement.
19. ENTIRE AGREEMENT. This Agreement, including all documents incorporated herein by reference, constitutes the entire integrated agreement between the parties with respect to the matters described. This Agreement supersedes all prior agreements, negotiations and representations, either written or oral, and it shall not be modified or amended except by a written document executed by the parties hereto.

**NOTICE:** The Contract, Purchase Order, or Agreement to which this Addendum is attached is made using federal assistance provided to the CITY OF EVERETT (“City” or “Owner”) the American Rescue Plan Act’s State and Local Fiscal Recovery Fund.

The City is funding this Contract, Purchase Order, or Agreement, in whole or in part, through a Federal award identified as ALN: 21.027 and FAIN: SLFRP1025.

The following contractual provisions are hereby incorporated into the Contract, Purchase Order, or Agreement, where applicable. In the event of any conflict between the below provisions and other provisions of this Contract, Purchase Order, or Agreement, the provisions in this Addendum shall control.

In the event of any inconsistency between the Davis-Bacon Wage Rates and any prevailing wage rates published by the Commonwealth of Massachusetts and applicable to this Contract / Agreement, the higher of the two wages shall apply.

## INDEX

1. Remedies for Breach of Contractual Agreement; Sanctions and Penalties.
2. Termination for Cause and Convenience.
3. Clean Air Act.
4. Debarment and Suspension (Executive Orders 12549 and 12689).
5. Procurement of recovered materials (2 C.F.R. § 200.323).
6. Prohibition on certain telecommunications and video surveillance services or equipment (2 C.F.R. § 200.216).
7. Domestic preferences for procurements (2 C.F.R. § 200.322).
8. Equal Employment Opportunity Clause.
9. Davis-Bacon Act.
10. Contract Work Hours and Safety Standards.
11. Byrd Anti-Lobbying Amendment (31 U.S.C. 1352).
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### **1. REMEDIES FOR BREACH OF CONTRACTUAL AGREEMENT; SANCTIONS AND PENALTIES**

APPLICABILITY: This provision shall apply in the event that the Contract or Purchase Order exceeds the Simplified Acquisition Threshold.  
See 2 CFR § 200 App. II(A).

It is hereby understood and mutually agreed, by and between the Contractor and the Owner, that the date of beginning and the time for completion of the work to be done hereunder are ESSENTIAL CONDITIONS of the Contract; and it is further mutually understood and agreed that the work embraced in this Contract shall be commenced on a date to be specified in the "Notice to Proceed".

The Contractor agrees that said work shall be prosecuted regularly, diligently and uninterruptedly at such rate of progress as will ensure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

If the said Contractor shall neglect, fail or refuse to complete the work within the time herein specified, or any extension thereof granted by the Owner, then the Contractor does hereby agree, as a partial consideration for the awarding of this Contract, to pay the Owner the amount specified in the Contract, not as a penalty but as liquidated damages for such Breach of Contract as hereinafter set forth, for each and every calendar day the Contractor shall be in default after the time stipulated in the Contract for completing the work.

The said amount of liquidated damages is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would sustain in such event and said amount shall be retained from time to time by the Owner from current periodic estimates.

It is further agreed that time is of the essence of each and every portion of this Contract and of any specifications wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract as additional time is allowed for the completion of any work, the new time limit fixed by such extension shall be of the essence of this Contract. Provided, that the Contractor shall not be charged with liquidated damages or any excess cost when the Owner determines that the Contractor is without fault and the Contractor's reasons for the time extensions are acceptable to the Owner; provided further, that the Contractor shall not be charged with liquidated damages or an excess cost when the delay in completion of the work is due to:

- (a) Any preference, priority or allocation order duly issued by the government;
- (b) Unforeseeable cause beyond the control and without fault of negligence of the Contractor, including, but not restricted to, acts of God or the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes and severe weather; or
- (c) Any delays of subcontractors or suppliers occasioned by any of the causes specified in subsections (a) and (b) of this article.

PROVIDED FURTHER, that the Contractor shall within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the Contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter. The amount of liquidated damages for this project shall be Five Hundred Dollars (\$500.00) per consecutive calendar day.

## **2. TERMINATION FOR CAUSE AND CONVENIENCE**

**APPLICABILITY:** This provision shall apply in the event that the Contract or Purchase Order exceeds \$10,000.00. See 2 CFR 200 App. II(B).

Where Contract exceeds \$10,000.00, the Owner may terminate this Contract by providing the Contractor and the Surety (if any there be) with ten (10) days written notice specifying the reasons for termination, as outlined below:

Violation of any of the provisions of this Contract by the Contractor or any of their subcontractors;

A determination by the Owner that the Contractor has engaged in fraud, waste, mismanagement, misuse of funds, or criminal activity with any funds provided by this Contract;

Failure of the Contractor, for any reason, to fulfill in a timely and proper manner their obligations under this Contract, including compliance with applicable Federal, State and/or local law or regulations, and such procedures or guidelines as may be established;

In the event if any such termination, the Surety shall have the right to take over and perform the Contract; provided, however, that if the Surety does not commence performance within ten (10) days from the date of the mailing to such Surety of notice of termination, the Owner may take over the work and prosecute the same to completion at the expense of the Contractor, and the Contractor and their Surety shall be liable to the Owner for any excess cost occasioned by the Owner thereby, and in such event the Owner may take possession of and utilize in completing the work, such materials, appliances and plants as may be on the site of the work and necessary therefore.

If the Owner determines that a continuation of work on the project would endanger the life, health or safety of those working or living at or near the project site, or that immediate action is necessary to protect public funds and/or property, the Owner may suspend work or terminate this agreement by providing notice to the Contractor in the form of a telegram, mailgram, hand-carried letter, or other appropriate written means.

In addition, notwithstanding anything to the contrary in the Contract, the Owner may also terminate this Contract for its conveniences, including due to the lack of sufficient funds to complete the work. In such event, the Owner shall provide written notice of termination to the Contractor, and the Contractor shall thereupon cease all work other than work that is required to make the work and surrounding property safe, and the Owner shall pay the Contractor for all work performed in accordance with the terms of the Contract up to the date of the Contract, provided the Contractor shall not be entitled to any termination (or similar) damages or other costs and expenses that may be associated with a termination for convenience.

### **3. CLEAN AIR ACT**

**APPLICABILITY:** This provision shall apply in the event that the Contract or any subgrant thereunder is a sum in excess of \$150,000.00.  
See 2 CFR § 200 App. II(G)

Contractor shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401–7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251–1387). Contractor further acknowledges and understands that Contractor shall be required to report any violations of said acts to the Federal awarding agency and the Regional Office of the Environmental Protection Agency.

### **4. DEBARMENT AND SUSPENSION (EXECUTIVE ORDERS 12549 AND 12689)**

**APPLICABILITY:** This provision shall apply to all Contracts.

Contractor certifies that neither Contractor nor any employer or subcontractor is a party listed on the government wide exclusions in the System for Award Management (SAM), in accordance with the OMB guidelines at 2 CFR 180 that implement Executive Orders 12549 (3 CFR part 1986 Comp., p. 189) and 12689 (3 CFR part 1989 Comp., p. 235), “Debarment and Suspension.” SAM Exclusions contains the names of parties debarred, suspended, or otherwise excluded by agencies, as well as parties declared in-eligible under statutory or regulatory authority other than Executive Order 12549.

### **5. PROCUREMENT OF RECOVERED MATERIALS (2 C.F.R. § 200.323)**

**APPLICABILITY:** This provision shall all apply to all Contracts.  
See 2 CFR § 200 App. II(J); 2 CFR § 200.323.

Contractor acknowledges and understands that, in performing the work specified under this contract, Contractor shall be required to comply with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act. The requirements of Section 6002 include procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeded \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

### **6. PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT (2 C.F.R. § 200.216)**

**APPLICABILITY:** This provision shall all apply to all Contracts.  
See 2 CFR § 200 App. II(K); 2 CFR § 200.216.

Contractor certifies that it shall not procure or obtain equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115–232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities);

Telecommunications or video surveillance services provided by such entities or using such equipment;

Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

## **7. DOMESTIC PREFERENCES FOR PROCUREMENTS (2 C.F.R. § 200.322)**

**APPLICABILITY:** This provision shall all apply to all Contracts.  
See 2 CFR § 200 App. II(L); 2 CFR § 200.322.

(a) As appropriate and to the extent consistent with law, the non-Federal entity should, to the greatest extent practicable under a Federal award, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this award.

(b) For purposes of this section:

(1) “Produced in the United States” means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States.

(2) “Manufactured products” means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

## **8. EQUAL EMPLOYMENT OPPORTUNITY CLAUSE**

**APPLICABILITY:** This provision shall apply in the event that the Contract meets the definition of “federally assisted construction contract” as set forth at 41 CFR § 60–§1.3, where not otherwise provided under 41 CFR Part 60. See 2 CFR § 200 App. II(C).

All contracts that meet the definition of “federally assisted construction contract” set forth at 41 CFR § 60–1.3.

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

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

- (3) The Contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Contractor's legal duty to furnish information.
- (4) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (5) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (6) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (7) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- (8) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:

## 9. DAVIS-BACON ACT

APPLICABILITY: This provision shall apply to all prime construction contracts in excess of \$2,000.00. See 2 CFR § 200 App. II(D). **For projects in which the only Federal funds used are ARPA State and Local Fiscal Recovery Funds, the below certification only need be provided if the total project value is \$10,000,000.00 or more.**

### DAVIS-BACON PREVAILING WAGE

The Contractor acknowledges that the decision to award this contract is conditioned upon Contractor's acceptance of the wage determination, and upon continuing compliance with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). Pursuant to the Davis-Bacon Act, Contractors must be required to pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in the Secretary of Labor's wage determinations, incorporated into this Contract and enclosed as "Attachment A." Contractor further acknowledges and understands that Contractor shall be required to pay wages not less than once a week.

DAVIS-BACON PREVAILING WAGE CERTIFICATION

Contractor certifies that Contractor and all subcontractors shall provide certified payroll affidavits verifying compliance with G.L. c.149 §§ 26–27H, the federal Davis Bacon Act, and other related acts.

\_\_\_\_\_  
Signature of Contractor’s authorized official

Date: \_\_\_\_\_

\_\_\_\_\_  
Name (printed)

\_\_\_\_\_  
Title (printed)

**10. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT**

APPLICABILITY: This provision shall apply in the event that the contract is awarded for a sum exceeding \$100,000.00 and involves the employment of mechanics or laborers.

Where the Contract: (1) is awarded for a sum exceeding \$100,000; and (2) will involve the employment of mechanics or laborers, the Contractor shall comply with the Contract Work Hours and Safety Standards Act, 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5).

Pursuant to 40 U.S.C. 3702 of the Contract Work Hours and Safety Standards Act, Contractor shall be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 shall apply construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

**11. BYRD ANTI-LOBBYING; COPELAND “ANTI-KICKBACK” ACT (40 U.S.C. § 3145)**

APPLICABILITY: This provision shall all apply to all Contracts. In the event that the Contract is for a sum exceeding \$100,000.00, the Contractor shall also certify and file the Byrd Anti-Lobbying Amendment Certification.

BYRD ANTI-LOBBYING AMENDMENT

Contractor certifies that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352.

Contractor further understands and acknowledges that it shall disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures shall be forwarded from tier to tier up to the non-Federal award.

COPELAND “ANTI-KICKBACK” ACT

Contractor acknowledges and understands that the awarding of this contract is conditioned upon Contractor’s compliance with the Federal Copeland “Anti-Kickback” Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, “Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States”). The Act provides that each Contractor or subrecipient must be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he or she is otherwise entitled. The non-Federal entity must report all suspected or reported violations to the Federal awarding agency.

BYRD ANTI-LOBBYING AMENDMENT:  
REQUIRED CERTIFICATION FOR AWARDS EXCEEDING \$100,000

The undersigned certifies, to the best of their knowledge and belief, that:

No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, “Disclosure Form to Report Lobbying,” in accordance with its instructions.<sup>1</sup>

The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all contractors shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Bidder certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the bidding party understands and agrees that the provisions of 31 U.S.C. Ch. 38, Administrative Remedies for False Claims and Statements, apply to this certification and disclosure, if any.

\_\_\_\_\_  
Signature of Contractor’s authorized official

Date: \_\_\_\_\_

\_\_\_\_\_  
Name (printed)

\_\_\_\_\_  
Title (printed)

<sup>1</sup> Standard Form-LLL available at <https://www.grants.gov/web/grants/forms/post-award-reporting-forms.html>.



**12. RIGHTS TO INVENTIONS MADE UNDER A CONTRACT OR AGREEMENT**

**APPLICABILITY:** This provision shall apply in the event that the Contract is funded by a Federal award meeting the definition of “funding agreement” under 37 CFR § 401.2(a). A “funding agreement” is “any contract, grant, or cooperative agreement entered into between any Federal agency... and any contractor for the performance of experimental, developmental, or research work funded in whole or in part by the Federal government.”

In the event that this Contract is funded by a Federal award meeting the definition of “funding agreement” under 37 C.F.R. § 401.2(a) and the recipient or subrecipient wishes to enter into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that “funding agreement,” the recipient or subrecipient must comply with the requirements of 37 C.F.R. Part 401, “Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements,” and any implementing regulations issued by the awarding agency.

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

**I certify that an appropriation is available in the amount of this Contract.**

**CITY OF \_\_\_\_\_, MA**

By its: \_\_\_\_\_

\_\_\_\_\_  
City Accountant

\_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_

Approved as to Form:

CONTRACTOR:

\_\_\_\_\_  
City Solicitor

\_\_\_\_\_  
(Signature)  
\_\_\_\_\_  
(Name and Title)  
\_\_\_\_\_  
(Date)