

**City of Burlington – Fletcher Free Library
HVAC Capital Improvements 2015
Project Scope
March 4, 2015**

- I. Definitions
 - a. CONTRACTOR refers to the firm who is the successful bidder for this project and their subcontractors.
- II. Introduction and General Scope of Work
 - a. This project involves the replacement and/or upgrade of HVAC equipment at the City of Burlington’s Fletcher Free Library. This project is mainly confined to the older, west facing “Carnegie” building.
 - b. Existing equipment was installed in 1980, is past its useful life, and is not connected to the building automation system. Spaces in Carnegie are currently conditioned by a mix of five approximately 2,000-4,000 CFM constant volume air handlers with hot and chilled water coils, and ten console fan coil units of various size between approximately 300 to 800 CFM with hot and chilled water coils. All current controls are pneumatic local controls, except HVAC-5, which was retrofit with a local electronic controller and motorized valves.
 - c. Emphasis of this project is on:
 - i. Energy efficiency
 - ii. Maintainability
 - iii. Reliable system operation
 - iv. Improving the comfort of those working in the building.
- III. Schedule

Milestone	Date Due
City Issues RFP	Wednesday, March 4 – 5:00 PM
Mandatory Pre-Bid Walkthrough	Tuesday, March 10 – 1:00 PM
Questions Due	Wednesday, March 11 – 5:00 PM
Responses Issued	Friday, March 13—5:00 PM
Contractor Bids Due	Wednesday, March 18—12:00 PM
Apparent Low Bidder Descoping Meeting	Thursday, March 19—9:00 AM
Bid Award	Thursday, March 19—5:00 PM
Engineering Package Ready for City Review	Monday, March 30
Equipment Submittal Review Completed	Friday, April 17
Start of Construction	Friday, May 11
Substantial Completion	Monday, June 8
Notes: All dates listed are in 2015.	

IV. Contractor Requirements

- a. This project will be managed by the City Of Burlington Capital Improvements office in the role of Construction Manager.
- b. This project will be executed using a design-build approach—this scope provides only the design intent and conceptual design framework. NOTE: All dimensions, capacities, model numbers and other information presented in this document must be confirmed by CONTRACTOR prior to bid in order to provide a reliable price.
- c. The CONTRACTOR will be responsible for providing written design drawings and construction phase submittals for review and approval by City during both the design and construction phase of this project. These include heating, cooling and ventilation load calculations to ensure proper equipment sizing, shop drawings, equipment submittals, test and balance information, etc. Specific submittal requirements are delineated in Appendix A.
- d. It is expected new replacement equipment will have lower capacity than existing equipment, due to load reductions over the years. New equipment to be sized according to heating and cooling load calculations.
- e. This project will be commissioning by a third party commissioning provider. The CONTRACTOR will be required to participate in the commissioning process.
- f. Equipment Controls
 - i. HVAC equipment will be specified as DDC-Ready/freely programmable without factory installed controls. The “integration” of a factory controller into the building automation system will not be permitted for AHUs and VAVs. Factory controls on Fan Coil Units is acceptable, however hardwired I/O points must be available for direct control of units. The intent is that the controls vendor has the ability to control every function of the unit.
 - ii. Controls vendor will provide control valves and actuators. Dampers will be provided by CONTRACTOR. Controls vendor and CONTRACTOR must coordinate during equipment selection to ensure compatibility.

V. Scope of Work

a. Contractor Scope

- i. This project work must comply with any applicable federal, state, and local building codes including (but not limited to) electrical, plumbing, life safety, and the 2015 VT Commercial Building Energy Standard.
- ii. The following are to be included in the CONTRACTOR’s scope:
 1. Mechanical and Electrical Demolition
 2. Mechanical and Electrical Engineering
 3. Permit Application and Fees
 4. Piping
 5. Ductwork
 6. Equipment
 7. Piping/Ductwork Insulation
 8. Plumbing
 9. Air and Water Test & Balance

10. Electrical, Including Local Disconnects. Wiring to be in rigid conduit except between disconnect and equipment.
 11. Permanently Affixed Phenolic Tags on all new equipment, identification labels and flow arrows on new piping or piping adjacent to new equipment.
- iii. The following trades are excluded from the CONTRACTOR scope, and will be managed by the City Burlington in coordination with the selected CONTRACTOR.
1. Building Automation System (Controls)
 2. Variable Frequency Drives
 3. Fire Alarm
 4. Sprinkler
 5. Masonry
 6. Drywall patching and painting
- b. New 2nd Floor HVAC-1 Air Handler**
- i. Demolish and remove HVAC-1 but leave all services in-place (h/c water, power, and ductwork).
 - ii. Install new HVAC-1 single zone air handler in place of old unit. New unit should have the following specifications:
 1. Hot and Chilled Water Coils
 - a. Design entering water temperatures are:
 - i. Heating hot Water: 180F
 - ii. Chilled Water: 45F
 - b. Design should assume a 30 degree delta-T for hot water.
 - c. Design should assume a 15 degree delta-T for chilled water.
 - d. Chilled water coil selections shall conform to ASHRAE Standard 62.1-2013 limits on rows and fin spacing.
 - e. Ensure CHW coil drain pans fully drain condensate with no residual standing water.
 2. Direct-drive fan
 3. VFD-capable fan motor with class-F insulation.
 4. Full economizer capable
 - iii. Existing ductwork may be cleaned, and reutilized if appropriately sized.
 - iv. All ductwork, whether new or existing, shall be sealed using a low VOC, LEED compliant, water based duct seal. All joints shall be sealed.
 - v. Volume dampers should be installed as required to achieve proper balance and distribution between within space served.
 - vi.
- c. New 2nd Floor HVAC-2 Air Handler and Associated VAV Zones**
- i. Safely abandon-in-place Attic Air Handler HVAC-2
 1. Disconnect and remove line-voltage wiring connected to HVAC-2.
 2. Disconnect and remove hot and chilled water piping risers serving HVAC-2 from the unit down to the office below.

3. The office space below HVAC-2 will be repurposed into a new mechanical room which will be referred to in this document as the "Carnegie 2nd Floor Mechanical Room".
- ii. Install new Variable Air Volume 2nd Floor Air Handler
 1. Install a new VAV air handler, with new tag # HVAC-2, in the Carnegie 2nd Floor Mechanical room.
 2. Unit will have the following capabilities:
 - a. Hot and Chilled Water Coils
 - i. Design entering water temperatures are:
 1. Heating hot Water: 180F
 2. Chilled Water: 45F
 - ii. Design should assume a 30 degree delta-T for hot water.
 - iii. Design should assume a 15 degree delta-T for chilled water.
 - iv. Chilled water coil selections shall conform to ASHRAE Standard 62.1-2013 limits on rows and fin spacing.
 - v. Ensure CHW coil drain pans fully drain condensate with no residual standing water.
 - b. Direct-drive fan
 - c. VFD-capable fan motor or ECM Motor (depending on motor size)
 - d. Full economizer capable with outdoor air and relief air connections.
 - e. Relief fan within unit or in attic space (if required, existing unit has no relief fan).
 3. This new unit should be capable of full economizer operation with relief (if required).
- iii. Install Two New Terminal VAV Boxes in New 2nd Floor Carnegie Mechanical room:
 1. Spaces served:
 - a. Pickering Room
 - b. Admin offices and admin conference room.
 2. Terminal VAVs will have the following general configuration
 - a. HW reheat coil assuming a 30 degree delta-T
 - b. Factory-installed access doors for coil.
- iv. Demo 2nd Floor Office FCUs
 1. Demo 2nd floor office FCUs 1, 2, 3 & 4.
 2. Disconnect and cap at branch chilled water connection for all four units.
 3. Disconnect and cap at branch heating hot water connection for FCU-4 only.
 4. Demo electrical on all four units in compliance with local AHJ requirements.

- v. Install new office Fin Tube Radiation
 - 1. Install three sections of commercial-grade hot water baseboard radiation underneath windows in each room (admin office, director's office, staff meeting room).
 - 2. FTR zones to be designed to meet reheat demand in space during shoulder season and supplemental heat during unoccupied hours during winter heating months.
- vi. Existing ductwork may be cleaned, and reutilized if appropriately sized.
- vii. All ductwork, whether new or existing, shall be sealed using a low VOC, LEED compliant, water based duct seal. All joints shall be sealed.
- viii. Volume dampers should be installed as required to achieve proper balance and distribution between and within spaces.
- d. Alternate #1 - In place of HVAC 2 and Terminal VAVs, Install 2 Single Zone AHUs**
 - i. One AHU (HVAC-2a) will serve the Pickering Room.
 - ii. One AHU (HVAC-2b) will serve the staff offices.
 - iii. Units to have VFD-capable motors or ECM motors.
 - iv. All other aspects of the design as outlined in section c above remain.
- e. Alternate #2 - Demo Carnegie Balcony FCUs 5 & 6**
 - i. Demo and remove from site FCU-5&6.
 - ii. Demo electrical serving FCUs per AHJ requirements.
 - iii. Remove any exposed hot/chilled water piping and cap at connection to distribution.
- f. New Controls Only for HVAC-3, Mechanical Scope**
 - i. Demo existing motor and replace with type F insulation, VFD capable motor.
 - ii. Install new outdoor air and return air dampers. Dampers shall be rated for air leakage of not more than 6 CFM per SF at 4 inch water gauge pressure differential.
 - iii. Install new balance and control valves (control valves supplied by controls contractor).
 - iv. Install new isolation ball valves (4 per unit).
 - v. Install new air vents and strainers.
 - vi. Install new local electrical disconnect.
- g. New Controls for HVAC-4, Mechanical Scope**
 - i. Scope identical to scope for HVAC-3 above.
- h. New Controls for HVAC-5, Mechanical Scope**
 - i. Scope identical to scope for HVAC-3 above.
- i. Cooling Tower Upgrades**
 - i. Tower is BAC Model VXT135CR, a 135 Ton open, blow-through cooling tower located on the roof of the new building.
 - ii. Tower Upgrade Scope
 - 1. **Alternate #3**—Install new automatic chemical treatment system consisting of a conductivity sensor, automatic blow-down valve, and chemical feed pumps.

2. **Alternate #4**—Replace tower fill with new fill approved by manufacturer for use with this make/model tower.

j. Post-Construction

- i. Complete a training agenda for review, and provide four hours of Owner training.
- ii. Provide electronically-revised as-built design drawings.

Appendix A – Required Contractor Submittals

Submittal for Review	Phase	When
Load Calculations	Design	Prior to equipment selection.
MEP Design Documents	Design	Prior to construction-phase.
Required Permits	Design	Prior to construction-phase.
Equipment Submittals	Construction	Prior to ordering equipment.
Contractor-Completed Commissioning Equipment Check sheets	Construction	As equipment is installed, prior to startup.
Equipment Startup Reports (if applicable)	Construction	After startup.
Test and Balance Report	Construction	After balancing.
O&M Documentation (electronic)	Post-Construction	Prior to training.
As-Built Design Documents	Post-Construction	Prior to training.
Training Plan	Post-Construction	Prior to training.

Appendix B – Floor Plans

A total of 10 pages of drawings have been provided as part of this RFP. These drawings are intended to communicate the intent of this project work and should be viewed as “cartoons”, not necessarily representative of actual configurations.