



**New England
Air Systems**

Complete Mechanical Systems & Service



July 14, 2020

ENVELOPE #1

Mr. John Johnston P.E.
Vice President of MEP Services
Bread Loaf Corporation
1293 Route 7 South
Middlebury, VT 05753

Re: Richmond Free Library
Mechanical HVAC Design-Build Proposal

Dear Mr. Johnston,

As requested, our lump sum fee for this work is \$121,900.00 including applicable taxes.

Please refer to our Envelope #2 for scope of work and system narratives.

Very truly yours,



Robert J. Favali
Executive Vice President

(Proposal Reference Number: O-701-20)



New England Air Systems

Complete Mechanical Systems & Service



July 14, 2020

ENVELOPE #2

Mr. John Johnston P.E.
Vice President of MEP Services
Bread Loaf Corporation
1293 Route 7 South
Middlebury, VT 05753

Re: Richmond Free Library
Mechanical Design-Build Proposal

Dear Mr. Johnston,

New England Air Systems is pleased to provide this proposal to you. This proposal is based on your RFP dated June 5, 2020 for the design-build mechanical renovation project at the Richmond Free Library in Richmond, VT. The RFP package also included the General Scope of Work and progress architectural drawings dated June 15, 2020. These documents together with the June 24, 2020 pre-bid meeting and Addendum #1 and #2 form the basis of our scope of work.

The project delivery method is design-build. New England Air Systems is prepared to work together with you and the design team to develop the project towards the goal of providing an upgraded and energy efficient HVAC system for the Library. It is expected that the system as proposed is open for discussion and revision based on both overall system simplicity/efficiency and the project budget.

As directed, this is the proposal and narrative describing our scope of work excludes our lump sum proposal. Please see **Envelope #1** for our fee associated with this proposal.

Scope of Work

New England Air Systems will provide the following mechanical-HVAC and plumbing systems. In order to avoid the requirements for system economizers (per *Vermont CBES-2015*, C403.3), we have elected to provide two stand-alone systems: Library Stacks and Offices.

1. Field visit for existing system discovery and space programming requirements
2. Advance the documents through design development and into final construction documentation. This includes developing coordination drawings (not less than 1/4"=1'-0" scale), equipment schedules, and details for review and field use.
3. Collaborate with the design team to finalize equipment selections, locations, and ductwork and piping layouts. This also includes review of basement access, demolition requirements, and equipment placement in the basement and other locations.
4. Gas-Fired Heating.
 - a. Provide (2) gas-fired furnaces based on Carrier 59MN Infinity+97 modulating and condensing furnaces. Units are Energy Star ver.4.0 compliant with variable speed blowers and modulating gas heating valves; 120V-1 phase electrical designed for light commercial applications. Gas-fired units are considered second stage heating based on heat pump operating as first stage.

- b. System #F-1 – Library Stacks is a nominal 80/32MBH input at 97%AFUE. Unit is horizontal configuration located in the basement suspended from the structure with vibration isolators.
- c. System #F-2 – Library Offices is a nominal 60/24MBH input at 97%AFUE. Unit is vertical configuration located in the basement mechanical room area.

Note that locations as noted are subject to design layout and actual conditions.

5. Electric Heat Pump Cooling.

- a. Provide (2) electric heat pump split system air conditioning units based on Carrier 25VNA-series heat pumps for each furnace. Units are variable speed with “Greenspeed Intelligence” via matched thermostats; R-410A operating to $\pm 20^{\circ}\text{F}$ designed for light commercial exterior applications.
- b. System #AC-1 – Library Stacks is a nominal 3.5-ton with matched CSPH-series D/X coil rated for 208V-1Phase electrical.
- c. System #AC-2 – Library Stacks is a nominal 2.0-ton with matched CSPH-series D/X coil rated for 208V-1Phase electrical.

6. Filtration.

- a. Furnace units are equipped with standard 16”x25”x1” filters.
- b. See requested alternate to replace with 2”thick, MERV13 filters and external filter rack.
- c. See comment below to upgrade with a Carrier Infinity Air Purifier filtration system.

7. Humidification.

- a. Provide (2) Carrier HUMWBP-series bypass-style, water-saver humidification systems. Units deliver only the water consumed; 24volt operation interfaced with Infinity controls.
- b. Item includes domestic water connection with new backflow prevention device, and piping to each humidification system; water filtration is not required.

8. Controls.

- a. Provide each furnace/AC system with a Carrier *Infinity System Control* 7-day programmable wi-fi thermostat that includes advanced features to address systems that include variable speed heat pumps, multi-stage heating, humidity control, set-back, and occupancy sensing options.
- b. Provide each ERV with a time clock for start/stop control

9. Ventilation Air.

- a. Provide (2) energy recovery units based on Carrier ERVCRL-series indoor units. Each unit is a static plate style ERV with ductwork connections for outside air intake and exhaust air discharge through the exterior walls. Controls are interlocked with each furnace unit. Each unit is ducted to the return air ductwork side of each furnace for ventilation requirements.
- b. System ERV-1 – Dedicated to AC-1/F-1 (Library Stacks) is a nominal 195CFM unit, 120V-1Phase horizontal discharge located in the basement area.
- c. System ERV-2 – Dedicated to AC-2/F-2 (Office Area) is a nominal 100CFM unit, 120V-1Phase horizontal discharge located in the basement mechanical room.

10. Sheet Metal Distribution. Provide sheet metal supply air ductwork to each area. New floor registers will be distributed along the perimeter wall of the Stacks and Offices; sidewall and/or floor return air grilles will be located in each area (final locations TBD through collaboration with BreadLoaf and Library staff).



Floor registers are based on Price #LFG-series extruded aluminum pencil-proof flanged registers. Return air grilles are based on Price #630-series aluminum sidewall grilles.

11. Piping. Provide refrigeration piping for each AC system. See below for plumbing-specific work.
12. Supplemental Heat. Based on the requirement to demolish the existing boiler system, areas within the existing building are outside the accessible areas of the proposed furnace/AC systems. We will provide (5) fan-forced electric heating cabinet units for these areas based on QMark #AWH-architectural wall series cabinet heaters (or similar subject to final design loads). The areas are listed below; see *Comments* below for alternate consideration.
 - a. Entry. Cooling in an Entry is prohibited (*CBES 2015*, C402.4.7.1); therefore, it cannot be served by the new systems as they are both heating *and* cooling.
 - b. Level 1 – Rear Stairwell (one unit).
 - c. Level 2 Toilet Room #1 (one unit).
 - d. Level 2 Toilet Room #2 (one unit).
 - e. Level 3 Mechanical Room (one unit).
13. Basement Heat. Provide (1) single-stage, gas-fired sealed combustion unit heater with local thermostat and intake/discharge piping to the exterior. Based on Reznor model #UDAS, the system is designed to maintain 50°F in the basement area. Due to manufacturer venting limitations and the requirement to terminate 36” above grade, the unit will be located to permit venting going up through the existing 1st floor closet and through the exterior wall. Alternate units can be reviewed during the design phase.
14. Plumbing Systems.
 - a. Provide gas piping for each furnace system and basement-level unit heater.
 - b. Provide condensate piping for each AC system cooling coil.
 - c. Provide (2) new sump pumps (one per existing sump pit). Based on Zoeller-series pumps, each pump includes copper vertical piping with isolation and check valves. The pumps are individually piped to the exterior wall (PVC horizontal piping) with a single wall exit for connection at the exterior of the building. Pumps include start/stop floats and Zoller’s “A-Pak” high water with Wi-Fi alarms.

Note: The pump for the Elevator shaft is based on Zoller *Oil Guard*[®] system and alarm.
15. Electrical Work. We have included Cummings Electrical, Inc. as our subcontractor for work related to the proposed HVAC systems. This work includes:
 - a. Demo of boiler system on 3rd floor.
 - b. New work for furnaces, AC systems, and associated devices.
 - c. New receptacles for direct basement-level plug-in devices (sump pumps, dehumidifiers, etc.)
 - d. Electric heating requirements.

Note: We have also added new lighting fixtures for the existing basement mechanical room and an additional fixture for the mechanical equipment located outside the room.
16. Additional scope of work and HVAC system items included.
 - a. Demolition of the existing 3rd level boiler system with associated piping; piping in the basement level (radiant floor system is abandoned in place); and finned tube radiation (capped at walls). Piping demo is limited to accessible sections of piping (gas, water, venting, etc.) Inaccessible piping within walls and floors is abandoned in place.
 - b. Fire caulking of pipe penetrations.



- c. Ductwork and Piping insulation and labels.
- d. Test and Balance subcontractor (air side).
- e. System check, start, and functional testing with factory and NEAIR staff. Written reports of each system functional testing are included. Formal Cx documentation is not included.
- f. Four (4) hours of Owner system operating instruction.
- g. Trade permits where applicable.
- h. Submittals, record drawings and O&M Manuals.
- i. Standard 12-month workmanship, material, and equipment warranty. The compressors in the heat pump system will covered by a seven-year parts warranty from the manufacturer. System and factory maintenance requirements are excluded (available as an additional cost).
- j. Collaboration with BLC and the Owner for Efficiency Vermont, GMP, and/or other rebates.

17. Alternates. The following alternates are as listed in the RFP and Addendums. See below for additional voluntary alternates and comments.

- a. MERV13 Filters. As noted above, for both furnace systems to replace the standard 1” filters. Per Addendum #2, the alternate for MERV17 has been deleted.
- b. UV-C Lamps. Our basis of design includes Carrier Germicidal Air Purifiers (UV-C lamps) that are installed inside each furnace at the cooling coil locations. Each lamp is interlocked with blower operation. This alternate eliminates the factory unit-mounted lamps and replaces them with duct-mounted devices based on UV Resources *Stinger* SEFQ-series 24volt fixture with transformer package. Price includes electrical requirements for both power and blower interface.
- c. Basement Summer Ventilation. This option includes one (1) wall-mounted fan system based on Tjernlund #X2R reversible basement ventilation fan. Price includes limited ductwork assembly with a single louver through an existing opening on the southern exterior wall. System has (2) reversible in-line fans rated at 90CFM each (180CFM total) and is operated via a factory-mounted sensor. This is a ventilation fan only; it does not mechanically dehumidify. Price includes electrical requirements for local duplex GFCI receptacle.
- d. Basement Dehumidification. This option includes one (1) “whole house” ventilating dehumidification system based on Honeywell #DR90A3000. Nominal 300CFM with MERV11 filter, the unit rated to remove up to 90 pints per day (variable). The recirculating air system is operated via an unit mounted sensor; condensate is piped to the local drain sump. Price includes electrical requirements for local duplex GFCI receptacle.
- e. Office Area Zone Damper System. We understand that this option applies to a single system serving both the stacks and the offices (which also requires an economizer system). We believe our two independent dedicated variable air flow systems makes this option too costly and unnecessary therefore we have omitted this price option.
- f. Demand Control Ventilation. Similar to the zone damper option, we believe that this option best applies to a single outside air ventilation system that would serve both AC systems. We believe our two independent variable air flow systems *with dedicated ERVs interlocked with the blowers* makes this option too costly and unnecessary therefore we have omitted this price option
- g. Low Temperature Heat Pump Operation. This add option is not available for the selected units without changing the D/X coil and heat pump selections to a VRF-based manufacturer. However, the system offered here will operate to 0°F with the Carrier *Infinity* control included in our base design. There is no additional charge for this option.



- h. Duct Leak Testing. The add option for this includes material and labor to isolate and prepare ductwork for testing. Actual testing is performed by our TAB subcontractor under our supervision. Witness and sign-off of the test by BLC on-site staff is required.

18. Voluntary Alternates and Comments for Discussion.

- a. Alternate Basis of Design #1 – VRF System. In lieu of the gas-fired basis of design, this option offers a Mitsubishi VRF-based system rated for operation down to -13°F. This option includes the following items and modifications:
 - i. Two (2) Mitsubishi PVFY-series blowers with D/X coils.
 - ii. Two (2) Mitsubishi TUMY-series exterior heat pumps.
 - iii. Factory controls, refrigeration piping, and condensate piping.
 - iv. Two (2) RenewAire energy recovery units with timeclock control connected to the return air ductwork side of each system.
 - v. Ductwork distribution remains as noted above.
 - vi. Electric heating requirements remain as noted above.
 - vii. Gas piping remains for the basement unit heater requirement.
 - viii. Factory UV-C lamps are deleted; after-market is required.
 - ix. Factory humidification units are deleted; after-market is required.

It is not uncommon to propose a VRF heat pump system as an option for this application. There are inherent comfort risks associated with this system when applied to this building. Operating down towards its limit of -13°F also reduces the heating output of the system. Typically, this requires the heat pumps to be oversized and electric heating coils added for supplemental heat. With the availability of natural gas on the site, we would question the application as compliant with CBES-2015 for an all-electric system.

In addition, the envelope of the Library is undefined and any amount of infiltration or limitation in wall insulation will add to this comfort risk. The Library will be required to acknowledge and accept this risk if this option is adopted. We are prepared to discuss this further with you if the option wants to be considered as there may be cost savings over the gas-based system.

- b. Alternate Basis of Design #2– Hybrid VRF System. In lieu of the gas-fired basis of design, this option offers a Mitsubishi VRF-based system together with a new hydronic boiler system. This approach uses new horizontal VFR units (similar to Option #1) and includes duct-mounted heating coils in lieu of electric coils. This approach requires a new boiler and pump package but utilizes the existing heating piping infrastructure within the walls and the terminal units in the toilet rooms. New hydronic cabinet heaters will be used in the Vestibule and Stairwell.

Advantages are the elimination of electric heating requirements, utilizing the existing boiler area and adjacent walls for venting, and retains gas heating as supplemental and backup to the VRF system. As with all designs, the existing radiant floor is abandoned in place. We are prepared to discuss this further with you if the option is of interest to you; cost savings are not likely.

- c. Alternate System Location – Office Area Unit. One option that we believe is worth considering is locating the F-2/AC-2 system on the third floor in the location of the boiler system. This would permit the following:
 - i. Relocate one new system out of the basement.
 - ii. Allow for locating the remaining new unit into the basement mechanical room.



- iii. Simplify furnace venting and ERV ductwork (through roof and sidewall vs. another series of foundation / perimeter wall penetrations).
- iv. Provide HVAC for the 1st floor offices and 2nd floor toilet rooms thereby eliminating electric heat for the 2nd floor toilet rooms and 3rd floor mechanical room.

This option would require additional site review and discovery of shaft locations to determine if it is possible. Upon award of contract, we would recommend review of this option with the design team and Owner.

- d. Steam Humidification Generator. The add option replaces the Carrier bypass-style with an electric/electric steam humidifier. Each system includes electric heating tank with duct-mounted dispersion tube. Scope includes water piping, drain piping, and electrical requirements.
- e. Electrostatic Filters. Considered by some to be preferred over MERV13 filters, we believe this option is open for discussion. ASHRAE discussion papers suggest their effectiveness is mixed; maintenance is necessary; and some units may introduce small levels of ozone into the airstream. The Carrier *Infinity Air Purifier* is an option for these systems. If the Owner is interested, we can provide additional information on the units which have an effectiveness approximating a MERV15 filter plus works toward mitigating *selective* bacteria in the airstream.
- f. Wall Penetrations. We recognize that the systems as proposed for the basement level require multiple penetrations through the foundation walls and rim joists (furnace venting, ERV ductwork, etc.) and extending up to 36" above grade.

During the design phase, we recommend that alternate locations be reviewed to minimize foundation stone wall and rim joist penetrations (1st level penetrations / within millwork bases, etc.) Many of these penetrations will require ductwork and venting systems to extend up to 36" above grade (above nominal snowpack). The architectural impact of these requirements needs to be considered with a view towards flush-mounted wall penetrations above the finished grade.

Understandings and Exclusions

This proposal includes the following understandings and exclusions.

1. System design will maintain a 5°F deadband between heating at 70°F and cooling at 75°F maximum (*CBES 2015, 403.2.4.1.2*). Variable speed blowers comply with *CBES 2015, 403.4.1*.
2. BLC will provide AutoCAD architectural backgrounds for our use.
3. The existing electrical system is sufficient for the new work; the service will not be upgraded.
4. Toilet exhaust systems to remain; no work required.
5. The existing radiant floor tubing will be abandoned in place. Piping will be blown out with compressed air, cut as close to the floor as possible and mechanically terminated.
6. MEP design drawings are stamped by professional engineers licensed by the State of Vermont. Due to the short time frame for installation, documents will be limited to plans and schedules only. Installation details will be developed in conjunction with the field work.
7. Project-specific items excluded include (standard exclusions also attached):
 - a. Economizer systems (cooling is less than 4.5 tons).
 - b. Duct-mounted smoke detectors (system air flows are below Code requirements).
 - c. Costs associated with replacement of the gas regulator (if required).
 - d. Concrete pads for exterior condensing equipment.



- e. Work associated with the demo, waterproofing, grading, vapor barriers, etc. for the basement areas. It is expected that this work will not interfere with the demand to get the heating systems installed by the stated project completion date.
- f. Cut, patch, paint (interior and exterior walls, ceilings, roof, etc.) including wall opening requirements for the electric heating units and floor cutting for the registers and grilles.
- g. Foundation stone core drilling, removal, and/or patching.
- h. General construction requirements.
- i. Exterior condenser unit snow / roof slide damage deflection assemblies. We suggest consideration to locate the condensers on the east side of the building.
- j. Fire Protection work.

Project Schedule

The RFP indicates that the project completion date is September 15, 2020. This was before the RFP due date was extended by two weeks. The success of this date is subject to a timely – if not immediate – receipt of your verbal notice to proceed with contracts to follow. This would allow the initial design effort to begin the week of July 24 with demo to also follow as soon as possible.

The design phase (including meetings and reviews) will continue while equipment is submitted and released. Non-stock equipment is subject to 3 to 4-week deliveries due to material impacts from the COVID19 virus. Delays from virus impacts are out of our control therefore timely release is in order.

Proposal Costs and Schedule of Values

As directed, our lump sum fee for this work is provided within Envelope #1. Our *Exhibit A.1 – Schedule of Contract Values* is attached to this proposal.

New England Air Systems is pleased to have the opportunity to provide this proposal to you and to continue our relationship with the Bread Loaf Corporation. Please do not hesitate to call if you have any questions or would like to review this proposal.

Very truly yours,



Robert J. Favali
Executive Vice President

(Proposal Reference Number: O-701-20)



Exhibit A.1 – Schedule of Contract Values

Mechanical Schedule of Values	Amount
Demolition & Make safe Existing Abandoned System	\$4,500
Plumbing Piping	\$2,500
Plumbing Insulation	\$1,600
Sump Pumps and Controls	\$4,500
Refrigerant Piping	\$2,000
HVAC Major Equipment (with labor)	\$27,000
HVAC Ductwork (Fabricate & Install) & RGDs	\$34,000
HVAC Insulation (Ductwork)	\$6,000
Gas Piping	\$4,000
Controls	\$3,000
Test & Balance	\$1,500
Electrical	\$17,000
Start-up	\$6,000
Close Out Documents	\$1,500
Design	\$4,000
State and Local Tax	\$2,800
Base Contract Total	\$121,900

Alternates	
Add 100% P&P Bond	\$3,900
Alternate for 2" / MERV 13 Filters with Filter Frame Assembly	\$800
Alternate for UV-C Germicidal Disinfection	\$1,500
Alternate for Basement Summer Ventilation	\$1,800
Alternate for Basement Dehumidification	\$2,600
Alternate for Office Area Zone Damper System	<i>See Proposal</i>
DCV System	<i>See Proposal</i>
Low Temp Heat Pump Operation	<i>See Proposal</i>
Duct Leakage Testing	\$1,600
Voluntary Alternate: Steam Humidification	\$4,000



General Contract Exclusions

1. Any and all costs, expenses, fees or damages arising from delays beyond the control of NEAS, LLC.
2. Asbestos removal and/or other means of abatement, including without limitation lead, mercury, oil and other hazardous wastes, hazardous materials surveys and abatement action programs.
3. Architectural access panels and/or doors.
4. Breakout costs if provided, are for accounting purposes only and will not be considered final pricing for separate contracts or considered as stand-alone bid values.
5. Bonds (see Add Alternate).
6. Ceiling removal and/or replacement including without limitations replacement tiles or grid systems.
7. Concrete pads (interior and exterior), inertia base fill and/or thrust blocks, pour stops and concrete or masonry infill of floors, walls or roof openings; concrete or masonry saw-cutting, breakout, disposal and/or patching.
8. Core drilling larger than 8" in diameter.
9. Cutting & patching in conjunction with structural components or finished surfaces. Painting including prime & touch up
10. Duct cleaning and/or IAQ management services.
11. Duct leak testing and/or independent agency witness fees and verification reports.
12. Duct-mounted smoke detectors.
13. Dumpsters.
14. Electrical including without limitation furnishing starters and/or disconnects and whips, VFD's, speed controllers and replacement motors not integral to HVAC or plumbing equipment and/or lighting controls (unless specifically assigned to our controls sub's scope).
15. Site or civil work including Excavation, backfill and compaction, rock, boulder or ledge blasting or removal, trenching or hand digging for buried piping and/or dewatering of the same. Grading and finish and precast catch basins & grates.
16. Fire line stub outs up to 5' outside of building footprint.
17. Filter replacements, temporary filter media, IAQ management and/or mold remediation programs, final duct cleaning in conjunction with Construction Management project delivery and provisions for the same as they relate to pre-purchased equipment, terminal HVAC units, fixtures and/or devices furnished by others.
18. Flashing, blocking, leveling, and insulating of roof curbs or other roof penetrations.
19. Handling or setting of equipment furnished or pre-purchased by others. Warranties on equipment, fixtures and devices pre-purchased, pre-existing or furnished by others.
20. Heat tracing.
21. Insurance coverage beyond our standard coverage, which are as follows: General Liability limits of \$1,000,000 per occurrence, \$2,000,000 aggregate, Auto Liability limit of \$500,000 combined single limit, Workers Compensation Employer's Liability limits of \$500,000 each accident/\$500,000 each employee/\$500,000 policy limit and Umbrella limits of \$10,000,000.
22. Kitchen hoods and/or suppression systems including without limitation any skirting, hanger/support systems for hoods furnished by others, remote bottles and/or solenoid valves.
23. Life safety systems including without limitation fire sprinkler systems, fire suppression systems, smoke detectors, carbon monoxide detectors, radon and/or refrigerant detection systems.
24. Maintenance services and/or preventative maintenance agreements for equipment, fixtures and devices including items pre-purchased or furnished by others.
25. Manpower for this project was based on the preliminary construction schedule (dated 04/08/2020) provided at bid time. We reserve the right to review and price any major changes to this schedule or any project phasing that occurs once under contract. NEAS will not be held liable for any additional expenses derived from project phasing not previously agreed upon, hastened schedules due to other trades, or project delays outside of our control.
26. Overtime, off-shift, weekends and/or holiday work hours.
27. Permitting or fees related to land use, zoning, subdivision or other codes, laws, statutes, ordinances or other regulations, except to the extent compliance is a condition of licensure in the trades performed by NEAS, LLC.
28. Propane Tanks, LP or NG regulators, UG gas piping. Utility metering in general.
29. Roof perimeter or fall barriers, safety railings, and/ or flagging.
30. Rainwater boots, exterior storm lateral connections and/or roof drain sump pans.
31. Sound & vibration tests, surveys and reports.
32. Startup of equipment, terminal units, fixtures and/or devices pre-purchased or furnished by others.
33. Lintels – steel and/or masonry and steel (roof or wall or floor) for mechanical openings, structural steel equipment supports including without limitation any and all engineering surveys, stamping requirements or engineering fees associated with structural components.
34. Submittal review of pre-purchased or furnished by others equipment, terminal units, fixtures and/or devices.
35. Storage and staging of equipment, terminal units, fixtures and/or devices pre-purchased or furnished by others.
36. Temporary HVAC and plumbing systems or services.
37. Toilet accessories & wood blocking including furnish or installation thereof.
38. Undercutting of doors or door penetrations for door ventilation grilles.
39. MSDS Sheets - hard copies are excluded; we will provide in thumb drive electronic format only.

