Holley Hall Scope of Work

December 28, 2024

Bristol Holley Hall, a historic two-story building with a floor area of 7,800 square feet, serves as the town's municipal office and community space. The building underwent significant renovations in 2010, improving its structural and thermal performance; however, it remains energy-inefficient in several areas.

The building envelope includes one wythe brick exterior to 2x wood framed walls with minimal to no insulation, single-glazed windows, and non-insulated doors, contributing to significant heat loss. The entire building is heated with a hot water system consisting of a single oil-fired boiler, radiant floor, numerous fin tube radiators, and associated piping. Mechanical ventilation is limited to the lower level, with the upper level relying on natural airflow and exhaust fans. The lighting system includes a mix of fluorescent, CFL, and LED fixtures, with some areas over-illuminated. Although generally functional, the building's systems lack modern energy-efficient technologies, leading to high energy consumption and inconsistent occupant comfort.

Building Envelope Improvements

1. Air Sealing and Insulation: Upper Level and Tower (office).
    a. Air-seal gaps in exterior sheathing using low-expanding foam.
    b. Install a "smart" vapor control layer to manage moisture and improve thermal performance and air sealing.
    c. Dense-pack cavity walls with cellulose insulation for effective thermal resistance.
    d. Provide new furring on the inside face of the exterior wall studs and install continuous interior wood fiberboard insulation (1.5" thick).
    e. Conduct blower door testing at critical stages to confirm air tightness.
    f. Air seal the joint where the addition walls meet the brick walls of the main building. Sealing to be done from the interior.
2. Windows and Doors:
    a. Install narrow-profile Allied storm windows with operable lower sashes for ventilation and custom designs for arched windows.
    b. Add weather-stripping to all exterior doors, including insulation upgrades for the balcony-to-tower door.
    c. Flash window heads to prevent water intrusion.
    d. Weatherstrip existing windows by sealing at top, bottom and edges with v-shaped weather-strip. Top and bottom weather-strip can be installed on the window casing where the top and bottom sash close, with sash in place. Utilize bronze v-strip for durability. As an alternate, fixing the upper sashes and applying sealant could be considered.
3. Interior Surface Restoration

    a. Carefully remove, re-plaster, and repaint interior wall finishes after upgrades.
    b. Reinstall wainscoting, wood trim, and electrical/life safety devices with adjustments for added insulation thickness.
4. Baseboard Radiators
    a. Install high-output baseboard radiators to complement the upgraded building envelope.
5. Final Air Sealing
    a. Use blower door-guided caulking to address any remaining air leakage.

HVAC and Mechanical Upgrades

1. Electrical Service
    a. Determine electrical panel upgrades for HVAC needs to avoid a costly upgrade to the 400A service.
2. Heating, Cooling, and Ventilation
    a. Install a commercial-grade air-source ducted heat pump in the attic above the meeting hall. The system will condition the meeting hall and all upper-level spaces, including the office in the tower.
    b. Build a new insulated wood-framed mechanical space in the attic to house HVAC components. Air seal and sheath walls with fire-taped gypsum board. Provide lighting and electric convenience outlets.
    c. Add ductwork for supply and return air, insulated appropriately for the attic's unconditioned environment.
    d. Install new chases from the attic to understage areas to allow for return air ducts. Install two return grilles in the front apron of the stage.
    e. Provide heat recovery ventilation (HRV) to supply fresh air while maintaining efficiency.
    f. Upgrade existing thermostats to programmable units with setback function.
    g. Provide new programmable thermostat in the tower office area.
3. Ventilation:
    a. All Cooling/Partial Heating alternatives integrate the ventilation system with the ducting of the heat pump units.
4. Lighting:
    a. Replace all lamps (bulbs) in main hall with LEDs. Install new LED fixtures in tower office space. Install new LED utility fixtures in upper tower and backstage locations, as well as installation of recessed LED fixture(s) in the front lobby.
5. Alternate: Replace circulation pumps for the radiant heating.