



wv engineering associates, pa. www.wvengineering.com
11 king court, keene, new hampshire 03431 t: 603.352.7007

August 6, 2019

Mr. Anthony Mento

Sheerr McCrystal Palson Architecture, Inc.
30 S. Main Street
Bldg. 2, Suite 401
Concord, NH 03301-4809

Re: **Wadleigh Memorial Library**
49 Nashua Street
Milford, New Hampshire
Schematic Report
WVA Project No. 18223

Dear Anthony:

Based off the observed existing conditions and proposed architectural floor plans dated June 18, 2019 we offer the following schematic recommendations:

Sprinkler

- Provide new sprinkler service from municipal main at the street.
- Given high density and high volume library racking not anticipated the building appears to qualify as light hazard. Estimated 273 gpm building demand with 100 gpm hose demand for a total estimated 373 gpm sprinkler demand.
- Provide a wet sprinkler valve with complete NFPA 13 distribution to serve the conditioned building. Provide dry head coverage at building entries and overhangs.
- Provide a dry sprinkler valve and air compressor with complete NFPA 13 sprinkler coverage at the unconditioned attics.

Plumbing

- Existing 1-1/4" cold water service to remain.
- Existing cold water and hot water piping to existing fixtures to remain.
- Provide cold water, hot water and hot water re-circulation piping to new fixtures.
- Provide hot water re-circulation piping to existing fixtures.
- Existing sanitary waste exit to remain. Provide 4" backwater valve at existing sanitary exit.
- Provide sanitary waste and vent piping to new fixtures.
- Remove and replace existing electric water heater with new 50 gallon 4.5 kW electric water heater.
- Existing basement and first floor plumbing fixtures to remain.
- Remove and replace existing second floor water closet and lavatory in place. Owner indicated drainage issues at existing water closet. Scope and replace existing water closet sanitary piping.
- Provide new floor mounted tank type water closets. Locations, accessibility and quantities as per architectural drawings.
- Provide new wall mounted ADA compliant lavatories with manual wrist blade faucets, locations and quantities as per architectural drawings.
- Provide new ADA compliant stainless steel single bowl drop in style sinks with manual gooseneck faucets, locations and quantities as per architectural drawings.
- Provide new floor mounted stone molded service sink with integral vacuum breaker faucet.
- Existing building roof drains to remain.
- Provide new primary and emergency roof drains for proposed building addition.

Mechanical

- Remove existing air cooled chiller and controls. Remove existing seasonal change over valve at basement boiler room and remove associated chilled water piping.
- Existing boiler to remain.
- Existing radiation to remain. Remove and replace existing control valves and thermostats.
- Existing entry hot water cabinet unit heaters (CUH) to remain.
- Remove and replace existing inline circulator pumps with variable speed pump controls, approximately 45 gpm.
- Provide 3-way control valve and radiant floor zone pump to serve building addition, approximately 5.6 gpm.
- Provide new wall mounted hot water CUH at proposed addition entry.
- Flush and clean existing hot water piping. Provide chemical treatment and refill system with 0% glycol concentration.
- Remove six (6) existing horizontal 2-pipe fan coil units serving existing Tech Services, Children’s Room, Adult and reference areas.
- Provide 6 ton VRF heat recovery heat pump with eight (8) wall mounted evaporators to serve the basement. Evaporator locations and capacities as follows:

Tech Services.	6,000 BTU/HR
Tech Offices.	6,000 BTU/HR
Staff Offices.	8,000 BTU/HR
Directors Office.	6,000 BTU/HR
Facilities Office.	6,000 BTU/HR
NH Room.	15,000 BTU/HR
Meeting Room (old tech services).	15,000 BTU/HR

- ▶ Remove existing supply and return duct.
- ▶ Remove existing outside air duct and louver.
- ▶ Remove existing barometric relief air louver, damper and duct.

Meeting Room (old AV room).	8,000 BTU/HR
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- Provide 675 cfm roof mounted Energy Recovery Ventilator (ERV) with bypass economizer and associated ductwork to serve the basement areas. ERV-1 supply and return air to be ducted above ceiling to each room served with sidewall or ceiling mounted diffusers and registers. ERV-1 to provide bathroom exhaust.
- Provide 16,000 BTU/HR duct mounted hot water heating coil for ERV-1. Coil sized to provide +/- 70° F discharge air, controlled by duct mounted thermostat.
- Provide 12 ton VRF heat recovery heat pump with (5) high static horizontal ducted evaporators to serve the first floor area. Evaporator locations and capacities as follows:

Adult #1. 36,000 BTU/HR

- ▶ Connect evaporator to existing supply and return duct.
- ▶ Remove existing outside air duct and louver.
- ▶ Remove existing barometric relief air louver, damper and duct.

Adult #2. 36,000 BTU/HR

- ▶ Connect evaporator to existing supply and return duct.
- ▶ Remove existing outside air duct and louver.
- ▶ Remove existing barometric relief air louver, damper and duct.

Children's Wing.. . . . 30,000 BTU/HR

- ▶ Remove existing supply and return duct.
- ▶ Remove existing outside air duct and louver.
- ▶ Remove existing barometric relief air louver, damper and duct.
- ▶ Provide supply and return duct to suit renovate3d Children's Wing.

Program Room. 24,000 BTU/HR

- ▶ Remove existing supply and return duct.
- ▶ Remove existing outside air duct and louver.
- ▶ Remove existing barometric relief air louver, damper and duct.
- ▶ Provide supply and return duct to suit proposed space.

Young Adult/Tech. 36,000 BTU/HR

- ▶ Connect evaporator to existing supply and return duct in attic.
- ▶ Remove existing outside air duct and louver.
- ▶ Remove existing barometric relief air louver, damper and duct.

- Provide 1,200 cfm roof mounted ERV with bypass economizer and associated ductwork to serve the first floor evaporators areas. Connect ERV-2 supply and return air duct to existing or new evaporator return air plenum. ERV-2 to provide bathroom exhaust.
- Provide 28,400 BTU/HR duct mounted hot water heating coil for ERV-2. Coil sized to provide +/- 70° F discharge air controlled by duct mounted thermostat.
- Provide 6 ton VRF heat recovery heat pump with five (5) wall mounted evaporators to serve the second floor. Evaporator locations and capacities as follows:

Meeting.	6,000 BTU/HR
Kitchenette.	6,000 BTU/HR
Hall.	6,000 BTU/HR
Keyes Meeting #1.	18,000 BTU/HR
Keyes Meeting #1.	18,000 BTU/HR

- Provide 600 cfm roof mounted ERV with bypass economizer and associated ductwork to serve the second floor areas. ERV-3 supply and return air to be ducted above ceiling to each room served with sidewall or ceiling mounted diffusers and registers. ERV-3 to provide bathroom exhaust.
- Provide 14,000 BTU/HR duct mounted hot water heating coil for ERV-3. Coil sized to provide +/- 70° F discharge air, controlled by duct mounted thermostat.
- Provide 7-1/2 ton packaged gas/DX Rooftop Unit (RTU) to serve the proposed addition. Provide dual enthalpy economizer and demand control ventilation with room mounted CO₂ sensor.
- RTU-1 to be located on the addition roof. Supply and return duct to be exposed round within the space. First 10' of supply and return duct to be internally lined. Return air to be low at the circulation desk ceiling. Supply air to be side wall double deflection registers and linear slot style at the exterior glazing.
- Provide radiant floor to serve the proposed addition first floor areas, approximately 2,800 sq. ft. with 56,000 BTU/HR capacity.
- Provide manufacturer or unity controls to control and monitor the new and existing mechanical equipment. Thermostats to be 7-day programmable with locking covers.

Electrical Power

Existing Areas:

- Existing 400 amp, 120/208 volt, 3-phase service to be replaced by 600 amp service, fed from same utility pole underground to CT cabinet and meter on same exterior building location as existing meter. Provide new 600 amp main service panel at location of existing.
- Replace existing Federal Pacific panels with new Square D panels, maintain existing wiring and feeders. Provide TVSS protection device at main panel.

New Areas:

- Provide distribution panel fed from breaker in replacement main service entrance panel for feeding receptacles, lights, and mechanical equipment in addition.
- Provide convenience receptacles throughout addition. Provide as GFCI, tamper proof, or AFCI where required by Code.
- Provide electrical connections to proposed mechanical equipment.
- Provide branch circuit wiring to lighting and receptacles as MC cable where concealed, wire in EMT conduit where exposed. Provide heavy duty fused disconnects at mechanical and elevator equipment.

Lighting

Existing Areas:

- Replace existing exterior metal halide wall packs with sharp cut-off LED lights.
- Replace existing baffle-style and wrap-style pendant mount fluorescent fixtures with pendant mount direct/indirect LED lights.
- Replace existing pendant drum lights with pendant LED bowl lights.
- Add emergency lighting battery units to create code compliant levels.
- Add exit signs to meet code.
- Add exterior egress emergency lighting to meet code.

New Areas:

- Provide linear pendant direct/indirect LED fixtures in high ceiling area.
- Provide linear LED down lights mounted to bottom of structure in circulation area and loft.
- Provide recessed round LED down lights in stair well and main vestibule.
- Provide recessed 2'x4' LED volumetric lights in study rooms.
- Provide sharp cut-off LED wall packs at building exits.
- Provide dimmer switches for lighting control.
- Provide occupancy sensors in study rooms.
- Provide emergency battery powered egress lights and exit signs.

Fire Alarm

Existing Areas:

- Existing fire alarm control panel is MirCom FA-1000 series. This panel can be retained and expanded to accommodate addition and renovation.
- Provide additional notification devices to meet code.

New Areas:

- Provide strobes and horn/strobes to meet code requirements. Provide signal booster panel for supplying necessary power to these devices.
- Provide smoke detector coverage throughout. Provide smoke detectors for elevator recall functions.
- Provide heat detectors for elevator shut down in elevator machine room and top and bottom of elevator shaft.
- Provide duct smoke detectors in supply and return ducts of air handlers over 2000 cfm.
- Provide sprinkler system flow, tamper, and pressure switch monitors.

Communications

New Areas:

- Provide telephone and data outlets at circulation desk and other areas where computers will be installed.
- Provide rack mounted patch panels in IT room for termination of voice and data cables from proposed outlets.
- Provide voice and data cable, jacks, and terminations as Category 6 rated.
- Provide cable in conduit where exposed in finished areas or where concealed in inaccessible wall and ceilings. Provide J-hook supports in utility areas and above accessible ceilings.
- Provide boxes and conduits for owner supplied and installed access control, video surveillance, and public address system.

END

WV Engineering Associates, PA

Richard A. Parks, III, PE

cc: Anthony Mento Sheerr McCrystal Palson Architecture, Inc.