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Mechanical / Electrical Engineering Solutions

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Barre Family Health Center is first LEED certified healthcare building in Massachusetts...

The Barre Family Health Center in Barre, Massachusetts has become one of a few healthcare projects to become LEED certified in the United States and the only healthcare project to do so in Massachusetts.¹ The 19,800 sf primary care center is affiliated with UMass Memorial Health Care.

Fitzemeyer & Tocci provided MEP engineering services for this landmark project that incorporated several energy efficient features, including:

- Energy efficient interior lighting
- Water conserving plumbing fixtures
- Storm water runoff treatment system
- Exterior lighting designed to minimize light pollution
- Energy Efficient HVAC System

The new building also received the prestigious "Advanced Buildings" recognition by National Grid, the local electric utility company, for superior energy efficiency, responsible use of energy resources and supporting the well-being of occupants. The new building is the first healthcare building to qualify for National Grid's Advanced Building Program.¹

¹ Source: Contract Magazine



Dartmouth-Hitchcock Medical Center Patient Safety & Training Center Lebanon, New Hampshire

Architect: Lavallee Brensinger Architects

The **scope** of this project involved HVAC, plumbing, fire protection and electrical engineering services for renovation of 9,800 sf for the new Patient Safety & Training Center. The new Patient Safety & Training Center will be the hub for all simulation activities and a place to test new medical equipment, technologies, and processes.

Program Elements:

- Reception, Waiting, Conference Room, and Debriefing Rooms
- Learning Labs including a High Fidelity OR Room, Skills Lab, Oscopy Lab, and Cath Lab / Inter-radiology Lab each with an adjacent Control Room for observers
- Simulated Nursing Unit / Outpatient Primary Care setting
- Six (6) Medium Fidelity Inpatient / Exam Rooms
- Centralized Nurse Station and Clean Supply / Med Room
- Six (6) Exam Rooms in the adjacent Clinic for additional simulation and training exercises as needed



The design **challenge** was to evaluate existing capacity and re-use existing MEP systems to the maximum extent possible.

The HVAC heating **solution** for the renovated spaces is provided by a combination of hydronic reheat coils within VAV terminal boxes and hydronic radiant panels for perimeter areas. Cooling for the all areas is provided by reconfiguration of the existing ducted cool-air systems in the space and the associated VAV terminal boxes. Ductwork within the renovated spaces will be reconfigured as required. All new controls shall be provided via extension and expansion of the existing DDC building automation systems. DDC thermostats shall be provided for each temperature control zone. Separate thermostats shall be exterior wall mounted for control of the perimeter radiant heating panels.

The Electrical solution included new lighting, power distribution, nurse call systems and extension of the existing fire alarm system within the renovated spaces.

The Plumbing solution included extension of the existing domestic hot and cold water, storm drainage and sanitary waste and medical gas systems.

The Fire Protection solution included extension of the existing wet-type sprinkler system designed for Light Hazard occupancy throughout the renovated spaces.



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92 Montvale Avenue, Suite 4100, Stoneham, MA, 02180
Tel: 781-481-0210 / Fax: 781-481-0203
email: info@f-t.com / www.f-t.com

**Suffolk University
Science Department Master Plan
Boston, Massachusetts**

Architect: Martin Batt Architects, Inc.

The **scope** of this project was to evaluate the HVAC, plumbing, fire protection and electrical systems infrastructure for the Archer and Donahue Buildings (approximately 80,000 sf) to accommodate science classrooms and support functions at Suffolk University.

Our **solution** included reviewing all engineering systems; mechanical, electrical, plumbing, and fire protection. The work began with an identification of primary systems to be evaluated. This effort included gathering of all available system drawings, schematics, and reports, interviews with facility staff and personnel, and thorough site visits and walkthroughs. This large volume of information was compiled into several abbreviated drawings, schematics and charts to summarize the systems to be evaluated. The report included an executive summary with recommended projects. The recommendations were organized for prioritization as the Master Plan is further developed.

A multi-year master plan is typically incorporated into the Facility Master Plan and serves as an aid to planning and budgeting. Knowing that certain system deficiencies will exist for a year or two, but will be eliminated with a project in year three, helps the staff plan and efficiently utilize facility resources.

A full evaluation of an institution's infrastructure systems gives a facility an unmatched understanding of current operations. This understanding can be used by the institution to more efficiently plan, train, and budget. This improved efficiency equates directly into dollar savings and lower operating costs.



**Dr. Taylor's Office - Tenant Improvements
Reading Health Center
Reading, Massachusetts**

Architect: Caldarola Design Associates, PC

The **scope** of this project was to design HVAC, plumbing, fire protection and electrical systems for conversion of 1600 sf of existing office space into medical office space with exam, patient waiting area and conference rooms.

The **design challenge** was to provide cost effective HVAC, plumbing, electrical and fire protection systems with an aggressive design and construction schedule.

Our **solution** included a full survey and documentation of the existing systems and meeting with building personal to understand the building infrastructure prior to receiving architectural backgrounds.

HVAC design included providing new heat pumps to replace the existing heat pumps which were past their useful life and undersized for the new design intent. Duct work was extended out side of the area of renovation to provide fresh air to the inlet of the new heat pumps, which was not previously provided to the space.

Electrical design included new branch circuiting, utilizing the existing electric panel and breakers. New lighting, exit signs, emergency lighting and fire alarm devices were implemented as part of the new design.

Plumbing design included relocation of the existing accessible toilet room and the addition of hand sinks in all exam rooms. The addition of plumbing fixtures required a new, upsized domestic water line brought to the space from outside the area of renovation. All sanitary was located under slab. Design limited the amount of slab cutting by locating an existing sanitary clean out in the floor to estimate the location of the sanitary main to be tied into.

Sprinkler design included relocation of sprinkler heads to accommodate the new architectural partition layout and reflected ceiling plan.

The project was completed on schedule, with zero RFI's and zero Change Orders.

As always, we welcome your questions and comments. If you would like further information, please feel free to contact Stephen J. Montibello, PE, a Principal with F&T, who can be reached at 781-481-0210, ext. 175.

