

MENDON POLICE STATION BUILDING REVIEW

EXECUTIVE SUMMARY

Through volunteer efforts and private donations the citizens of Mendon have started the construction of a new police station. Work completed so far includes site preparation, underground services, and a weather tight envelope. The work to date has involved no public funds and this has not needed to comply with MGL Chapter 149 requirements. This building is approximately 6,700 square feet, single story, wood framed, on a relatively flat town owned site. While the approach is unorthodox, the work in place, with some modifications will likely serve the needs of the police department well. It has also resulted in an approximately 25% savings in the construction cost of the building.

The value of construction work in place, at public construction rates, is estimated at \$642,394. We have calculated that the cost of the construction work remaining to be done is \$1,925,408. Additional "soft costs" for technology, equipment, fees, furnishings, contingencies, etc. brings the total cost to complete the project to \$3,364,702.

To complete the building, construction documents (complete drawings, details, and specifications) will need to be prepared. These documents would be put out to bid under the requirements of MGL Chapter 149 and the lowest eligible bidder would be awarded the contract and complete the building. The construction would be administered by the architect in accordance with the Massachusetts State Building Code requirements for "Controlled Construction".

CIVIL/SITE

Rough grading has been completed. All excavation associated with underground utilities and the building is also done. The septic system is complete and inspected.

Remaining work includes:

Final Paving	This includes surface preparation of base and finished bituminous pavement, pavement markings, and curbing.
Site Drainage	Catch basins, drain manholes, and outlet structures; underground piping connected to downspouts for the directing of roof runoff.
Site Improvements	Signage, fencing (at a dumpster and a possible impound yard), flagpole, and bollards (for the protection of overhead doors and other site items susceptible to damage). Exterior concrete work includes aprons at the front of overhead doors, walks, curbs, and pads for exterior equipment and the dumpster.
Landscaping	Landscaping is limited to loaming and seeding disturbed areas for stabilization.
Site Lighting	Exterior pole lighting should be provided for safety and security. Light poles will also provide for locations of CCTV cameras.

STRUCTURAL

The building foundation, exterior walls and roof have been constructed. It is currently an open “shell”. Structural work moving forward will include interior footings and a concrete slab. We recommend thickening the entire slab 6” so that bearing partitions and masonry may be placed without being limited to “haunched” concrete or separate interior footings.

This report cannot comment on the existing perimeter foundations. It is impossible to confirm the reinforcing steel, the concrete mix design, the quality of the concrete, or the condition of the underlying soils. This having been said, the building envelope has been completed for over a year and has endured a harsh winter and excessive snow loads. There are no observable failures in the structure (cracking, settlement, etc.). Further, it is our understanding that this work was overseen by qualified personnel.

It was observed that the building will require 2 “shear walls”. Currently the building is basically a wide open cavern (4 walls and a roof). Lateral loads (wind) can result in the building “racking”, making it want to lean over in the direction of its width. It is recommended that 2 continuous interior walls, perpendicular to the length of the building, spanning between the outside walls and the extending to the underside of the roof be constructed to stiffen the structure.

Exterior wall construction is 2x6 framing, 12’ high. This is light framing and may require some reinforcement/stiffening.

The roof trusses are part of a pre-engineered system and hence should be adequate for the loads and compliant with current codes.

ARCHITECTURAL

The remaining architectural work includes:

Slabs	Construct slabs with a moisture barrier, accommodation for drains, recesses for raised flooring, and sealant.
Masonry	Masonry includes cell and dispatch room walls. CMU in detention should be reinforced and grouted solid. Conventional block should be used and receive epoxy paint in this area. Other exposed CMU in the building should be ground-faced which may be used as a finish surface, as installed, without paint.
Cell block	Provide security equipment: cell fronts, security ceilings, detention benches and bunks (concrete), Murphy bars, and bullet resistant transaction windows.
Cabinetry	Provide countertops and cabinetry in booking, the kitchen space, report writing, evidence processing and dispatch (coffee area).
Envelope	Provide wall and roof insulation, caulking, and sealants. Icynene spray foam provides insulation and an air barrier (and an extremely tight building).
Doors	Provide all interior doors, door glazing, frames, hardware and interior glazing. Bullet resistance is required in the lobby. Q
Finishes	Gypsum wallboard partitions should be "high-impact" for durability and security. GWB ceilings and ACT (Acoustical Ceiling Tile) Ceramic tile on walls and floors Carpet, rubber flooring, and epoxy flooring (in detention)
Specialties	Raised access floor in dispatch and tech room Toilet partitions Pistol lockers for storing weapons before entering detention Evidence pass-through lockers to maintain chain of evidence Refrigerated locker for evidence Fume hood for evidence processing Property lockers in detention Wardrobe lockers for each officer: 2'x2', with ventilation and an electrical outlet in each Marker boards in conference and meeting rooms Projection screens for conference/meeting room

Appliances – refrigerator, dishwasher, range, and microwave for the kitchen and a microwave and an under-counter refrigerator in coffee areas
Fire extinguishers
Interior and exterior building signage
Dedication plaque

Floor Plan Changes

We recommend the review of parts of the floor plan to increase efficiency, flow and the operational characteristics of the building. In that none of the interior work (except for underground plumbing) has been done, there is some flexibility in redesigning the room configuration. We would not recommend a wholesale redesign that would impact the underground plumbing currently in place and the related \$24,000 savings. However, some modest adjustments could make it a better building.

Attached are diagrams that would reflect some proposed plan changes.

1. The cells in the current plan are larger than required by Department of Public Health regulations. Making them smaller allows additional evidence storage and processing space and a more efficient booking area.
2. Other items to be reviewed are the size of the tech room, locker rooms, and the location of interview.

We suggest that an exterior carport be considered to protect parked cruisers from weather. A simple canopy roof enables vehicles to be deployed without scraping off snow and ice, or leaving the cars running. A carport could be carried as an “alternate” in the bid documents, to be included in the project after bids are received if the budget allows.

HVAC

The system as designed is a conventional split system. Boilers provide hot water to coils in the air handling units that heat the air which is then distributed throughout the building. Cooling is accomplished through evaporator (DX) coils located in the air handling units. These coils cool the air which, like the heating system, is ducted throughout the building.

Separate stand-alone air conditioning units augment the cooling in the dispatch area and technology room where the cooling loads are greatest.

Ventilation is required by code. Fresh air coming in from the outside is tempered through an energy recovery ventilator with warm return air to save energy.

Direct exhaust fans in the toilet rooms, the locker rooms, and the evidence storage area are provided. These spaces would be vented directly to the outside. This is of particular importance in evidence storage because the smell of certain items (marijuana for example) can be strong and unpleasant.

Conceptually, the system as designed would work for the building. Its advantages are that it is a basic system without exotic components that make construction, maintenance, and repair straightforward and without the need for highly trained and specialized personnel. The disadvantage is that while simple, the system may not be as energy efficient as a more advanced design. A fair amount of space is needed for ductwork, boilers, air handlers, etc. Comfort may also suffer because the building is divided into 5 zones. Spaces within each zone lack customizable control.

We believe that a variable refrigerant flow (VRF) system for heating and cooling should be considered. This system involves a separate ceiling mounted unit in each room controlled by its own thermostat. Refrigerant is pumped to and in-between each of these units, drawing heat from spaces that need cooling and giving up heat to spaces that need heating, simultaneously.

For example, the system removes heat from spaces that need cooling in the winter (tech room and inside spaces) and delivers it to the spaces that need heating (outside rooms). The result is an energy efficient system.

A VRF system has few moving parts, takes up little space, and is easy to install. Programming the controls to properly redistribute refrigerant is a relatively technical exercise and requires qualified personnel.

The construction cost for either system is comparable.

Regardless of the direction taken, a final professional design of the HVAC system is required. The current drawings are adequate for residential or light commercial use but are unsuitable for police station bidding/construction and the requirements of MGL Chapter 149.

PLUMBING

The plumbing system as designed appears to provide for the building requirements.

We suggest the inclusion of floor drains in the sallyport with the required holding tank and interceptor. A wet floor during prisoner transfer can be a serious hazard.

Other suggested modifications include:

- An eye-wash in the sallyport for use by detainees that have been pepper sprayed.

- A small compressed air system with outlets in the armory, evidence processing, and the sallyport.

ELECTRICAL

Design for lighting, power, tel/data, and security systems appear complete and appropriate. Additional specification detail and a final coordination of the components and layout are recommended prior to bidding.

Utilization of the existing fire station emergency generator can be economical. The capacity of the generator may limit the systems in the police station that would be on emergency power (air conditioning for example). Transfer switching would be designed to provide emergency power to either or both stations in the event of an outage.

Site lighting should be provided for safety and security. Lights would be controlled via a timer and/or photo cell. The light poles could also provide mounting locations for exterior security cameras.