

INTRODUCTION

Plymouth Engineering, Inc. was invited to do a feasibility investigation of the existing Greenville Maine Fire Department. The intent of the investigation is to create a cost analysis for the renovation of the building vs. creating a new building on site. Along with this analysis, the reconstruction of the building will be enough to trigger the existing building code be updated to adhere to current building codes of the ASCE 7-10 and IBC 2015.

The existing fire station is a 6,400 square-foot, steel-frame structure that was originally built in 1963. The interior consists of CMU and wood framing. The building condition is worn and dated but structurally sound even if it does not meet existing building code requirements. The building currently houses the Greenville Fire Department.

Plymouth Engineering will investigate renovating the building to house both the fire department and the police department. With determining the renovation details, the cost of a new building will also be included.

OBSERVATIONS:

Plymouth Engineering, Inc. performed a building investigation on October 6, 2021.

The existing building housing the Greenville Fire Department is 6,400 square feet. The building is 1,950 square feet of office/conference area and 4,450 square feet of vehicle storage. There are two mezzanine spaces in the vehicle storage.

The building is a 1963 steel space frame building with masonry separation wall between the spaces and wood stud interior walls. The walls are covered with paneling in the offices/conference area. The floors are 12x12 vinyl composition tile with carpet over them. The carpet is over some of the tile. The flooring in the conference room is sheet goods and will need to be reviewed for asbestos. The vehicle bays have vinyl batt ceilings and painted plywood walls.

The exterior of the building is steel siding and a brick façade with four overhead doors. There are three passage doors. A T-11 addition is on the eave end of the building used for storage. There is a standing seam roof system under the existing EPDM roof. This roof has not been fully reviewed at this point but appears to be about 12 years old and will need to be replaced.

There is also a 24'x42' three bay garage that is being used by the police and fire department for storage. There are five fire trucks stored in the building along with the trailer and snowmobile.

Heating system:

The existing heating system is an existing boiler in one room and a solar heat tube system attached to the existing building. They are not currently working based upon the conversation on site. Each of the fire bays are heated by a heating unit suspended from the frames with 80% of the heat requirement for the bays.

Electric System:

The electric system will need to be reviewed more in depth before any upgrades are documented. The entrance has been upgraded; the existing panels look original.

Plumbing System:

There is a single bathroom on site. It does not meet ADA requirements and will require upgrades to address the requirements of the Americans with Disabilities act. If any upgrades to the building are undertaken, the bathroom will also need to be updated to address the plumbing code.

There were no drains in the mechanical room observed, and there are no apparent drains in the truck bays.

Structural Review:

Roof

Since the building was constructed in 1963, it is likely that the roof structure was designed for a 50 pound per square foot ground snow load which does not meet current design standards. according to Figure 7-1, ASCE 7-10, Greenville's current snow load is 100 psf. Even though the building has stood for the last 58 years, the roof structure would have to be reviewed further to see if it meets current standards.

Garage Bay

In one location, the slab around a steel column appears to have a structural crack. This crack is located near the main garage bay off the meeting room and will need to be addressed.

CMU Walls

The CMU walls have shrinkage cracks in them but are structurally sound.

Mezzanine Storage Area

Existing structural members are for 40 psf. Additional to increase storage capacity.

ARCHITECTURAL REVIEW

Exterior

The exterior metal siding is highly faded and could use replacement.
The brick facade has spalling and will need to be replaced.
The solar tube heating units will need to be removed.

All exterior front doors will be needed be removed and replaced.

Overhead Doors

Overhead doors were observed to be a good condition but, for air seal and insulation, should be upgraded.

Roof

The building's EPDM roof appears to be in adequate condition. Currently inoperable solar panels are on the poof, which will have to be either removed or fixed.

Interior

All of the interior walls, excluding the garage bays, have plywood paneling and will need to be upgraded.

The kitchen will need a full upgrade. This includes removing wall paneling, new floors, cabinets and appliances. A hood for the stove will also need to be added.

The bathroom will have to be upgraded and an additional bathroom will be needed to ensure it meets code.

Lighting is antiquated and needs be changed out for energy efficient LED fixtures.

The hallway and office carpet is worn out and needs to be removed. PEI recommends not continuing to use carpet and instead use LVT.

Gym has a windowsill that is missing and will need to be replaced.

It is also recommended that the garage CMU is repainted.

The current building could be renovated to fit:

- De-contamination room (DECON)
- Cascade
- ADA Bathroom
- Fire Chief Office
- Report room for fire fighters
- Dayroom

It will not fit the following desired rooms:

- Police Chief Office
- Police Sargent Office
- Bull Pen
- Interview Room
- Patrol Equipment Room
- Evidence Room
- Reception

All of these rooms will need to be in the addition. Once the addition is undertaken the current Police Station (Office) will be turned into a “Vault” to store documents. The Code Enforcement office & Code Enforcement Storage will be planned for the new building.

COST BREAK DOWNS.

We were asked to work up a rough potential cost for renovating the existing building compared to a new building on the existing site.

Renovation:

For the renovation of the existing building, the estimate does not include any site work, nor any other work on the project other than the renovation of the building and construction of the addition. These costs are a projection of the construction cost:

Renovation Cost	\$728,701.30	
Addition Cost	\$505,730.60	
Renovation Contingency (20%)	\$246,886.38	
Contractor Overhead and Profit (20%)	\$246,886.38	
Engineering Fee	\$120,000	
Total Estimated cost		\$1,861,746.92

New Construction:

The other option is removing the existing building and replacing with a new facility using a floor plan similar to that attached. Potential cost based on current construction fees is:

Demo Cost	\$59,600.30	
New building Cost	\$1,469,378.16	
Renovation Contingency (20%)	\$146,937.82	
Contractor Overhead and Profit (20%)	\$293,875.63	
Engineering Fee	\$96,000	
Total Estimated cost		\$2,065,791.91

CONCLUSION

Plymouth Engineering, Inc. appreciates the opportunity to assist the Town of Greenville to review the options they have for replacing or upgrading the existing fire station building.

In the above pages, we discussed the reuse of the building on Minden St, the current fire station building. The building will need structural and architectural upgrades in order to meet current code standards. Some of the building systems will require replacement.

After reviewing the building, PEI is of the opinion that the building has served the Town of Greenville many years and needs retrofitting. It may be wise to look into demoing the existing building and constructing a new building. The new building can have a better layout and better fit the needs of the fire and police departments. A new building would also be more energy efficient which would reduce future heating and cooling costs. If the Town is interested in pursuing the new construction option, PEI will work on a proposed new building layout. PEI has provided a preliminary floor plan for the addition to be reviewed.

Plymouth Engineering Inc. looks forward to working with the Town. If you have any additional question, please do not hesitate to contact us.

APPENDIX A

PHOTOS



Existing Meeting room



Existing Bathroom needs upgrades



Fire Department Entrance

APPENDIX B
PRELIMINARY PLANS

APPENDIX C
PRELIMINARY COST ESTIMATE