

**PUBLIC SAFETY**  
**Fire Department**  
**Cash Corner Fire Station Renovation Project**



In the spring of 2017 it was determined the Cash Corner Station (a staffed station) had a significant mold issue. Environmental Safety and Hygiene conducted air sampling in February of 2017 which discovered some of the highest levels they have ever recorded in the walls and ceilings of the living spaces. With this information, the city contracted Sebago Technics to begin researching a renovation plan and costs. This renovation plan has been completed and is awaiting implementation.

Project Cost: \$1,500,000  
Funding Source: \$1,000,000 Prior Yrs' CIP  
\$ 500,000 Fund Balance

Source of Cost Estimate: Sebago Technics

Projected Useful Life: 30 years



December 18, 2017  
13246

Capt. Robb Couture  
South Portland Fire Department  
684 Broadway  
South Portland, Maine 04106

**Preliminary Design Report (PDR)**  
**Cash Corner Fire Station, South Portland, Maine**

Dear Robb:

Sebago Technics, Inc. in cooperation with Grant-Hayes Associates and Allied Engineering were retained by the City of South Portland to prepare a Preliminary Design Report (PDR) for improvements to the Cash Corner Fire Station. This planning level study is intended to provide the City of South Portland the information necessary to make an informed decision regarding the extent and probable improvements and associated costs for the renovation project. Following the PDR, the facility design, bidding and construction phase of the project will be undertaken should the City decide to move forward.

**Project Background:**

The need for the Cash Corner Fire Station renovation projects has stemmed from a 2017 mold study (refer to February 24, 2017 report prepared by ESH, Inc.) resulting in substantive health and safety concerns for station staff occupying the office and living quarters area. The results of the mold study concluded significant remediation and renovations are needed to address extensive mold accumulation in wall cavities, ceiling and insulation. Causes for the mold accumulation are mostly likely a function water damage and lack of air circulation including prior modifications to the building. It is apparent the extent of the mold will require a complete demolition and reconstruction of the living quarters.

**Cash Corner Fire Station History:**

The Fire Station is located at Cash Corner in South Portland and based upon historic plan information was designed by Leasure, Tuttle & Lee Architects & Engineers in the late 1960's and subsequently constructed/occupied in the early 1970's. The fire station contains approximately 7,400 square feet and is a single story reinforced concrete & masonry structure with a long span steel framed roof system. Utilized as a fully occupied (24/7) fire station, the building contains spaces typical for an emergency response facility. The building includes a multi-vehicle apparatus bay, a utility room for mechanical and electrical systems, gear repair area, hose and gear storage, lounge/meeting room, kitchen, fitness room, watch room, main office, single and multi-user toilet rooms and showers, laundry area, and multiple bedrooms.

### **Project Investigations and Requirements:**

The project team conducted a complete building assessment focusing on existing conditions, field measurements, evaluations of mechanical, electrical, heating, ventilation and structural systems. Additionally, planning meetings, we held with the fire department staff and architect to identify operational needs, special requirements, critical functions and to develop a functional layout plan. Additionally, the structural, mechanical, electrical, ventilation and heating systems were reviewed for effectiveness and need for improvement.

In general, the findings have determined the nearly 50-year-old building structure is in good condition with some general maintenance requirements but is deficient in the areas of heating and ventilation with outdated mechanical, electrical, heating and communications systems as well as needed life safety improvements to address current codes. The finding of mold through-out the living quarters requires complete renovation and modernization of 3,943 square feet of building area.

Included in this Preliminary Design Report (PDR) are the following documents:

1. A building narrative prepared by Grant Hays Associates addressing the existing conditions, building uses, code evaluation, basis of design and development of preliminary floor plans for the interior renovation.
2. Photo documentation of current condition.
3. Preliminary Design Report prepared by Allied Engineering addressing building structure, roofing, mechanical, electrical, heating and ventilation systems.
4. Preliminary improvement floor plan drawings.

### **Recommendations:**

Due to the advanced level of mold contamination, the entire living quarters will require removal of all materials to expose the structure allowing for cleaning, mold remediation and reconstruction of the interior building area. This will require a complete demolition project and installation of new partition walls, finishes, fixtures and furnishing together with new energy efficient mechanical, electrical, lighting, controls, ventilation and communication systems. The following provides a general summary of the project recommendations:

1. Demolition of office and living quarters areas, reconfiguration of walls, new wall construction and finishes throughout.
2. Once demolition is complete, inspect the building for mold and undertake any remaining remediation prior to renovation construction.
3. Replace the aged roofing membrane, add insulation and construct a parapet, replace flashing and complete misc. repairs.
4. Add an NFPA 13 compliant automatic sprinkler system to serve the entire facility.
5. Replace the existing 4" water service to the building to provide adequate fire flow.
6. Install new general exhaust fans meeting ASHRAE Standards, add exhaust fan in Decon Room, install energy recovery ventilators (ERV) to serve living and office areas.
7. New ducted heat pumps to serve functional spaces.
8. Replace Oil fired boiler with new natural gas fired condensing boiler with new variable speed circulator pumps and new control valves.
9. Add commercial exhaust hood with fire suppression to serve the kitchen range.
10. Add central direct control building automation system (BAS).
11. Plumbing improvements.

12. Demolish and reconstruct bathrooms to address gender considerations and provided for improved ventilation and usability.
13. Reconstruct and modernize the kitchen area addressing safety considerations.
14. Upgrade antiquated electrical services.
15. New efficient LED lighting.
16. New telecommunications system.
17. Access control system for building security.

**Probable Project Costs:**

The following table provides a summary of the probable costs for the fire station renovation. The costs are based upon information provided in the PDR assessment that is attached. When a cost range was indicated, the middle of the range was carried in the following cost summary.

<b>CASH CORNER FIRE STATION - OPINION OF RENOVATION COSTS</b>	
<i>Major Project Component</i>	<i>Estimated Costs</i> \$
Demolition, New Major Interior Construction	\$453,455.00
Roofing Improvements	- \$109,000.00
Structure Modifications	\$75,000.00
Fire Protection (Sprinkler System)	\$37,500.00
Heating, Ventilation and Air Conditioning	\$252,750.00
Plumbing	\$72,750.00
Electrical, Lighting, Security, Communications & Backup Generator	\$276,500.00
New Water Service	- \$15,000.00
Mold Remediation	\$20,000.00
Design, Engineering, Construction	\$157,434.60
FFE (allowance)	\$30,000.00
<b>Contingency (10%)</b>	<b>\$131,195.50</b>
<b>Total Project Cost</b>	<b>\$1,630,585.10</b>

**Closure:**

We are looking forward to assisting the South Portland Fire Department with this important and urgent project to correct environmental deficiencies at the Cash Corner Fire Station. As always, please contact me with any questions or if we can be of further assistance.

Sincerely,

SEBAGO TECHNICS, INC.

A handwritten signature in black ink, appearing to read "Owens A. McCullough". The signature is fluid and cursive, with the first name "Owens" being the most prominent.

Owens A. McCullough, P.E.; LEED A.P.  
Vice President of Engineering and Project Development

OAM: oam  
Att.

Cc: Scott Morelli, City Manager  
Brad Weeks, City Engineer  
Mike Hayes, Grant Hayes Associates  
Anthony Davis, Allied Engineering

## BUILDING USE REQUIREMENTS:

### A. Existing Facility

The existing Main Street Fire Station is located at Cash Corner in South Portland. The project was designed by Leasure, Tuttle & Lee Architects & Engineers in the late 1960's. The facility, originally designed at 6,930 square feet, is a single story reinforced concrete & masonry structure with a long span steel framed roof system. Utilized as a fully occupied (24/7) fire station, the building contains spaces typical for an emergency response facility. The building includes a multi-vehicle apparatus bay, a utility room for mechanical and electrical systems, gear repair area, hose and gear storage, lounge/meeting room, kitchen, fitness room, Watch room, main office, single and multi-user toilet rooms and showers, laundry area, and multiple bedrooms.

Building data tabulations of the existing square foot program have been compiled after field verification of the existing facility. Existing construction systems were verified, and furniture, fixtures, and equipment were noted. The Existing Facility Square Foot Analysis for the facility is as follows:

### B. Existing Facility Square Foot Analysis

Apparatus Bay	2669 sf
Mechanical/Electrical	368 sf
Gear Repair	144 sf
Gear Storage	240 sf
Apparatus Toilet/Shower	105 sf
Laundry/Showers & Toilets	288 sf
Watch Room	135 sf
Lounge/Meeting Room	588 sf
Kitchen	202 sf
Fitness	420 sf
Main Office	138 sf
Bedrooms	1012 sf
Circulation	1091 sf

**TOTAL EXISTING BUILDING (GROSS) 7400 SF**

### C. Existing Conditions

- 1. Apparatus Bay:** The Apparatus Bay currently stores two pieces of fire-fighting equipment and an ambulance. The bay also includes gear lockers, an open gear storage area, a single-user toilet room, a single-user shower room, a gear repair room, and the mechanical/electrical/communications room. The originally-designed west wall of the Apparatus Bay had large expanses of single-pane glass between the concrete structural piers, and has since been replaced with insulated framed walls with smaller thermal windows. The original overhead doors have been replaced with full glass thermal units. The finishes are

in fair-to-good condition, and are as follows: exposed concrete slab floors, suspended acoustical tile ceilings, FRP at the exterior infill walls, and painted CMU at the interior wall dividing the Apparatus Bay from the rest of the building.

2. **Mechanical/Electrical/Communication Room:** This room currently includes the heating system components, electrical panels, and communications panels for the facility. The water entrance is also located in this room. A small closet was added to this room to store uniforms, but is currently not utilized for this purpose. There is a small framed platform above this room for communications gear. The finishes are in fair condition, and are as follows: exposed concrete slab floors, suspended acoustical tile ceilings, painted concrete and CMU at the interior walls. The suspended ceiling system is in poor condition and should be completely replaced.
3. **Gear Repair Area:** This area includes a workbench, storage shelving, and miscellaneous items. Originally designed to be used for fire-fighting gear maintenance and repair, this room's function is not required any more, as most of the gear is sent out for repair to an off-site vendor. This space, along with the adjacent open area are underutilized, and could serve a better functional purpose. The finishes are as follows: exposed concrete slab floor, suspended acoustical ceiling, and painted CMU walls,
4. **Single-User Toilet Room & Shower Room:** Since the original toilet room and shower are multi-user spaces, accommodating both genders of fire-fighters was not convenient or practical from a privacy standpoint. The single-user Toilet and shower rooms added to the Apparatus Bay helped alleviate that situation, and have also acted as pseudo Decon rooms. Since these rooms are located in the Apparatus Bay, they do not actually conform to the intent of the Americans with Disabilities Act since they are located outside the residential area of the facility. They also do not meet the functional requirements of a suitable Decon room either. The finishes are as follows: exposed concrete slab floors, suspended acoustical tile ceilings, and painted CMU at the walls.
5. **Lounge/Meeting Room:** This is the main working and living area for the fire-fighters. This room is also open to the adjacent Kitchen. Utilized for meetings, relaxation, and other work-related activities, this room serves as the communal space for the occupants. The fitness room is also adjacent to this space, as well as the Watch Room. The space is accessed from the Apparatus Bay, Fitness Room, and the main corridor in the bedroom wing. The finishes are as follows: VCT flooring, suspended acoustical tile ceilings, wood-tone wall paneling.
6. **Watch Room:** Originally utilized as the control room for the shift Watch person, this room is accessed from the Lounge and Kitchen areas, and has a full glass wall separating it from the Apparatus Bay. There is a pass-thru at the glass wall from when the location of a fire was handed to the fire-fighters in written form. The Watch command was responsible for fielding the emergency call, waking the crew, and dispatching the information for the fire's location. These functions are now performed in the main Office via electronic communications. Currently, the Watch room has become an extension of the existing Kitchen. The finishes are as follows: VCT flooring, suspended acoustical tile ceilings, painted CMU walls.
7. **Kitchen:** The existing kitchen is directly adjacent to the Lounge/Meeting room, the Watch room, and the Apparatus Bays. Although moderate in size, it lacks good functionality due to the cabinetry/appliances layout. The needs to utilize the Watch room for additional functional space is further indicative of a need for improvement in this area. The kitchen layout at the Western Avenue Station was discussed as a layout that meets the needs of a Fire Station Kitchen from both a meal-preparation standpoint, and daily individual convenience. The finishes are as follows: Wood-tone cabinets, laminate countertops, stainless steel appliances, VCT flooring, suspended ceilings, and painted CMU walls.
8. **Fitness Room:** Formerly the original Courtyard, this area was enclosed to the weather to create an exercise room for staff. Accessed by a sliding glass door from the Lounge/Meeting Room, or from an exterior door off the exterior garden, this room houses the fitness equipment. Although its location is somewhat convenient, noise is sometimes an issue for the adjacent Lounge/Meeting area. The addition has several areas where water has leaked in and compromised the structure and surfaces. The finishes are as follows: sports flooring tiles, painted sheetrock ceilings, and painted sheetrock walls.

9. **Main Office:** Originally constructed as a Storage room, this space is now the office for the Station. It currently includes two workspaces at a continuous 3-wall countertop. This room is accessed from the corridor and the Lounge/Meeting room. The room appears to meet the current needs for the Station. The finishes are as follows: VCT flooring, suspended acoustical ceiling, and painted sheetrock walls. The wall adjacent to the Meeting Area has a sliding transaction window.
10. **Multi-user Toilet room/Laundry Room:** This room is located at the end of the corridor that the bedrooms are accessed from and serves as the main bathroom and laundry facility for the Station. The space includes 2 lavatories, 2 toilet stalls, one urinal, and a washer/dryer. The space also includes a gang-style shower room. None of the fixtures are ADA compliant. The finishes are mostly original and are in need of some replacement. The finishes are as follows: Ceramic mosaic tile flooring, painted CMU & sheetrock walls, suspended acoustical ceilings, wood veneer cabinets, laminate countertop, and painted metal toilet partitions.
11. **Bedrooms:** The eight bedrooms are all accessed from the main corridor running from the South entrance to the Lounge/Meeting room. There was also a Linen room in the original layout adjacent to the wide corridor leading to the Apparatus bay. These rooms were all constructed with a wood panel system that stop at the ceiling line in lieu of framed wall construction, and consequently do not offer any significant degree of acoustical performance. The rooms are set up as single-user per shift with a bed, desk, and dual storage units on each side of the entry door. This area of the building will be reconfigured to provide better space utilization, acoustics, and shift storage for staff. The finishes are as follows: VCT flooring, suspended acoustical ceilings, wood panel partitions, and painted sheetrock (exterior wall).
12. **Corridor:** This space is the primary circulation route in the non-apparatus side of the facility. As previously stated, the bedrooms, toilet/laundry room and main office are accessed from this space. The north and south ends lead to the Lounge/Meeting room and the south parking lot respectively. There is a T-corridor leading to the Apparatus Bay adjacent to the Main Office. The corridor does not have a vestibule at the south entrance door, as required by the Maine energy code. The finishes are as follows: VCT flooring, suspended acoustical ceilings, wood panel partitions, and painted sheetrock (exterior wall).

#### D. Design Overview Discussion

Through discussions with the City of South Portland Fire Department, Sebago Technics, and Allied Engineering, the determination was made to reassess the Fire Station's space needs in light of the extensive amount of demolition needing to occur to mitigate the current mold and hazardous materials conditions. Field measurements and visual observations were documented for the existing conditions. Interviews were completed with key Fire Department staff to determine the specific needs for this Fire Station location.

The following specific design goals guided the team in arriving at the proposed project parameters:

1. The determination that this facility is a Class IV Essential Emergency structure necessitates upgrading the fire protection systems for an NFPA 13 Sprinkler system and the subsequent Fire Alarm system. Additional requirements include compliance with NFPA 101 Life Safety Code, and the Americans with Disabilities Act.
2. Programming need for 6 bedrooms of a uniform size. Rooms shall have a single bed with the capability of bunking if the need arises at a later date. Storage for 4 staff members. Include a small desk and chair. Arrange rooms so 2 beds do not share a common wall to improve acoustical privacy. Reframed exterior wall to include an egress window in each bedroom.
3. Laundry room to separate from toilet rooms, have sufficient storage for clean and dirty linens, and include a laundry sink as well as a washer & dryer. Finishes shall be appropriate for a wet area. Floor shall have a floor drain.
4. Two single-user Unisex Toilet Rooms are needed to meet the Maine State Plumbing Code. Each toilet room shall have a vanity sink with a full height storage cabinet, toilet, and shower. All

components will be ADA compliant. Finishes will be typical for a wet area, floor will include a floor drain.

5. A separate room is needed for Custodial. This room should be centrally located in the facility and include a mop sink, mop rack, and storage shelving for cleaning supplies. Finishes should be similar to the Laundry room. The floor will have a floor drain.
6. A storage room for uniforms and other miscellaneous items is needed. Most of the products kept in this room would be in boxes, so shelving would be most appropriate.
7. The fitness room function should be moved to a location that provides more acoustical separation from the living areas (Lounge & Bedrooms). Ideally, staff would prefer to see it located adjacent to the Apparatus Bay. The existing addition that houses the fitness room will be demolished to correct the water/mold issues in this part of the building. Staff sees this area returning to its original function, which was an outdoor courtyard for grilling/dining.
8. The existing kitchen should be reconfigured to provide better dual zones of use, similar to Western Avenue. The meal preparation zone should be laid out to efficiently prepare multiple-person meals. The remaining portion of the kitchen should be designed to accommodate individual staff members access to convenience items such as toasters, coffee, a reheat microwave, and similar conveniences.
9. The existing Lounge/Meeting room is dark, has minimal windows, and should be reconfigured to be more conducive to staff's needs for training and down-time relaxation. Improved lighting, brighter finishes, and a slight shift in the furniture positioning will provide the necessary adjustments in the area to make it more conducive to staff needs.
10. The current Mechanical/Electrical/Communication room will be reconfigured as indicated in the MEP portion of this report. The existing uniform storage closet will be removed. A Work station will be added for general building maintenance and repair functions. The new sprinkler and fire alarm systems panels will also be located in this room.
11. The existing gear repair room and gear storage areas are not functionally necessary any more. This space would be better utilized for the Fitness Room, as it is separated from the sleeping and meeting functions sufficiently to provide acoustical relief of this activity. Staff has indicated locating it in the Apparatus bay would also promote increased usage.
12. A functional Decon Room is needed adjacent to the Apparatus Bay at this Station. The reconfiguration of the existing single-user toilet and shower rooms in the Apparatus bay is the logical location for this function. The room would contain an oversized shower, equipment-sized washer & dryer, and pretreatment stainless steel wash down station. The finishes would be wash-down type surface at the ceiling, walls and floor, with a floor drain. The drain would flow into a separator.
13. The Apparatus Bay does not have sufficient floor drainage, which can be hazardous at certain times of the year, particularly in the winter. Strategically placed trench drains would alleviate this problem.

#### **E. Basis of Design Recommendations**

After the hazardous materials mitigation has been completed, the non-apparatus bay portion of the building will be, in effect, a structural shell. Rebuilding the interior to the desired programmed spaces will be both opportune from a modernized facility standpoint, and accomplished more efficiently than if it were to be done as a partial renovation project. After multiple programming discussions, and having reviewed several floor plan schemes with Staff, we arrived at what would be considered a functional, cost-effective redesign of the interior uses of the building. Overall building requirements for special criteria (height, floor area, proportion) were established, taking into account code-related minimum construction standards. Cross-functional utilization of common needs were identified to establish factors for economizing on space without sacrificing functionality, flexibility, or future needs potential. Accommodations for storage, accessibility, and utilities were integrated

into the square foot requirements. The attached conceptual design drawings describe the proposed scope of the renovation work, and are as follows (post demolition activities):

1. **Apparatus Bay:** This area does not need any architectural upgrades or changes except for the installation of two sections of trench drains to better collect water runoff from the apparatus on rainy days or from melting snow accumulated on the vehicles.
2. **Mechanical/Electrical/Communications Room:** This room will receive the upgrades indicated in the MEP discussion portion of this report, as well as the removal of the existing uniform storage closet. A workbench area will be incorporated to allow space to store repair tools and provide a work surface to facilitate building maintenance needs. Finishes will be freshened up.
3. **Gear Repair & Gear Storage Areas:** These spaces will be repurposed for the relocated fitness room. The items in these areas that need to be kept will be relocated to more efficient existing storage areas within the Apparatus Bay and the adjacent structure.
4. **Fitness Room:** This new room is approximately the same net floor area as the existing fitness room, and will accommodate all the existing equipment. It will have an 8x8 glass overhead door to allow borrowed light from the Apparatus Bay into the room while also providing for a more open atmosphere for natural ventilation during the warmer times of the year when the Apparatus Bay doors are open.
5. **Decon Room:** This essential function for Staff will be located in the Apparatus Bay and will include the repurposing of the single-user toilet & shower rooms. The room will contain a hazmat shower, heavy-duty gear washer & dryer, and a hazmat wash-down station for pretreatment of gear prior to washing. A floor drain will lead to a separator, per plumbing code requirements.
6. **Laundry Room:** The new multi-user laundry room will include a washer, dryer, and utility sink, as well as space for dirty linen (laundry cart) and a cabinet for clean linen storage. Laundry detergent and similar items will also be accommodated in the storage cabinets and shelves. This room will have a floor drain.
7. **Single-User Toilet/Shower Rooms:** Two Unisex full bath rooms will provide sufficient facilities to meet the Staff's needs and the Maine State Plumbing Code requirements. Each Toilet room will have a water closet, lavatory, full-height storage cabinet, and a shower. Accessories will include a bench, robe and towel hooks, as well as mirror, dispensers, and waste receptacles. Both rooms will have floor drains.
8. **Custodial Room:** This new space will be central to the facility and will include a mop receptor, mop rack, and shelving for all the maintenance/cleaning products, as well as storage of bulk items (paper towels, toilet paper, etc.). This room will have a floor drain.
9. **Uniform Storage:** Relocated function from the Mechanical/Electrical/Communications room. This room will have shelving, and possibly hanging rods, for uniforms and other Staff items.
10. **Main Office:** This space is functioning well and will continue in its present location and size.
11. **Kitchen:** The reconfiguration of the kitchen will include the defunct Watch Room space, which it has already commandeered for kitchen-related small appliance storage. The new kitchen layout will allow for large-scale meal production in one zone while accommodating individual staff smaller food & beverage "convenience" activities in a separate zone. Each zone has food preparation appliances and prep/cleaning sinks for sanitation.
12. **Gathering/Training:** Similar in size to the existing space, the new finishes and the new windows & door at the exterior wall leading to the original courtyard will brighten this now-dreary room. A simple reorientation of the furniture will also enhance the room's functionality. Access to the reclaimed courtyard will provide another gathering/dining space when the weather permits.
13. **Bedrooms:** The new bedroom configuration will provide better acoustical separation from the other functions, and be more efficient in layout. Each bedroom will also have a code-compliant egress window, also improving daylighting and natural ventilation.

- 14. Corridors:** A Vestibule will be incorporated into the south end of the main corridor to provide a thermal break from the building to the exterior at the parking area entrance. This will meet energy code compliance as well as improve the mechanical system performance in this part of the Facility.
- 15. Courtyard:** In its original location, this outdoor space will be reclaimed from the demolished Fitness Room. The existing concrete slab and masonry privacy walls will remain to define the space. The fencing at the adjacent vegetable garden will need a slight adjustment to complete the enclosure of the area.

***Estimated Budget: 3,943 sf x \$115/sf = \$453,445.00***  
***(not including MEP & Roof estimated budget indicated elsewhere)***

**COMPLETED FACILITY SQUARE FOOT ANALYSIS**

Apparatus Bay	2669 sf
Mechanical/Electrical	368 sf
Fitness Room	384 sf
Decon Room	117 sf
Laundry Room	100 sf
Single-User Unisex Toilet/Shower Rooms	242 sf
Custodial	77 sf
Uniform Storage	72 sf
Kitchen	288 sf
Gathering/Training Room	620 sf
Main Office	138 sf
Bedrooms	816 sf
Circulation	1063 sf
Vestibule	26 sf

**TOTAL EXISTING BUILDING (GROSS) 6980 SF**

F. Building Code Analysis

**NFPA 101 Life Safety Code - 2009 Edition**

Building Classification:	Storage (3,199 SF) & Business (1,462 SF) Utility (341 SF), Residential (1,581 SF)
Hazard Classification:	Ordinary Hazard
Construction Type:	Type III (000)
Occupant Loads:	Storage @ 500sf/occ = 7 Business @ 100sf/occ = 15 Residential @ 200sf/occ = 8 Total Occupant Load = 30
Separation of Use Rating:	2 hours (1 hour if sprinkled)
Janitor, Mech, Stor Rating:	1 hour
Minimum Headroom:	7'-6" at occupied areas

<b><u>Building Uses</u></b>	<b><u>Business/Storage</u></b>	<b><u>Residential</u></b>
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“(x)” denotes if building is fully sprinkled

Max. Allowable Travel Distance:	200' (400')	100' (200')
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Max. Allowable Common Path:	50' (100')	35' (50')
Max. Dead End Corridor Length:	20' (50')	35' (50')
Minimum Egress Corridor Width:	44"	44"
Minimum Number of Required Exits	2	2
Minimum Horz Egress Enclosure rating:	1 hr (none)	1 hr (none)
Minimum Separation of Exits:	0.5 diagonal distance (0.33 if sprinkled)	
Fire Escapes as means of egress:	Allowed (NA)	Allowed (NA)
Minimum Egress Door Width:	36"	36"
Exit Lighting:	Required	Required
Emergency Lighting:	Required	Required
Fire Alarm System:	Required (Mixed Use)	Required
Fire Sprinkler System:	Required	Required
Portable Fire Extinguishers:	Required	Required
Exit Device Hardware	Required	Required

### 2009 INTERNATIONAL BUILDING CODE

“(x)” denotes if building is fully sprinkled

Use Group Classification:	1,462 sf Business (B), 1,581 sf Residential (R2), 3,199 sf Storage (S-2), 341 sf Utility (U)
Construction:	Type IIIB
Occupant Loads:	Business @ 100sf/occ = 15 Storage @ 300sf/occ = 11 Residential @ 200 sf/occ = 8 Utility @ 500 sf/occ = 1 Total Occupant Load = 35
Area Use Separation Ratings:	2 hours (1 hour if sprinkled)
Janitor, Mech & Storage Rooms:	1 hour

#### Building Limitations

Construction Type:	IIIB
Maximum Height:	3 Story @ B; 4 Story @ R-2; 3 Story @ S-2
Maximum Area / Floor:	19,000 @ B; 16,000 @ R-2; 26,000 @ S-2

#### Fire Resistance Ratings

Primary Structural Frame	None
Load Bearing Exterior Walls:	2 hours (none if fire separation greater than 30')
Load Bearing Interior Walls	None
Fire Separation of Uses:	2 hours (1 hour) @ R-2/S-2 None at B/S-2 and B/R-2

Other Assemblies:	1 hour @ U
Exit Corridors:	1 hour (none)
Minimum Number of Exits:	2
Minimum Separation of Exits:	0.5 diagonal (0.25 if sprinkled)
Maximum Dead-End Corridor Length:	20'
Maximum Common Travel Path:	75' (100'); 75' (125') @ R
Maximum Travel Distance:	200' (250') @ R; 200' (300') @ B; 300' (400') @ S-2
Minimum Corridor Width:	44"
Minimum Ceiling Height:	7'-6"

Fire Alarm System:	Required (mixed use)
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Fire Sprinkler System:	Required (mixed use)
Portable Fire Extinguishers:	Required
Exit Lighting	Required
Emergency Lighting	Required

Building Live Load:

Offices:	50 psf
Residential:	40 psf
Corridors:	100 psf
Storage:	125 psf @ light/250 psf @ heavy

<u>Interior Finish Requirements</u>	<u>Business</u>	<u>Residential/Storage</u>
Exit enclosures/passageways	Class A (B)	Class B (C)
Corridors	Class B (C)	Class B (C)
Rooms & enclosed spaces	Class C	Class C

**Maine State Plumbing Code/UPC Minimum Fixture Requirements**

Occupancy Classification:	Mixed – Business/Residential/Storage
Occupancy Area:	6,583 sf
Occupancy Load:	<u>35</u>

<b>Occupants (18 male/ 17 female)</b>					
<u>FIXTURES</u>	<u>TOILETS</u>	<u>URINALS</u>	<u>LAVS</u>	<u>SHOWERS</u>	
Men	1	1	1	1	
Women:	1	0	1	1	

**MUBEC (Maine Uniform Building Energy Code) MINIMUM INSULATION VALUES**

Per 2009 IECC; Table 502.1.2, 502.2(1) and 502.3

<u>ZONE 6A</u>	<u>R-VALUE</u>	<u>U-FACTOR</u>	<u>SHGC</u>
Exterior wall	18.5	0.054	NA
Roof (above deck)	20.0	0.048	NA
Slab (24" band)	15.0	0.052	NA
Frost Wall	7.5	0.133	NA
Doors – Opaque	2.0	0.50	NA
Doors – Glazed	1.25	0.80	NR
Windows	2.9	0.35	NR
Storefront	2.2	0.45	NR

G. Outline Specification – Architectural Technical Sections

- 024119 SELECTIVE DEMOLITION
- 042000 UNIT MASONRY
- 055000 METAL FABRICATIONS
- 061053 ROUGH CARPENTRY

061600 SHEATHING  
062013 EXTERIOR FINISH CARPENTRY  
062023 INTERIOR FINISH CARPENTRY  
072100 THERMAL INSULATION  
072119 FOAMED-IN-PLACE INSULATION  
072500 WEATHER BARRIERS  
072600 VAPOR RETARDERS  
075323 ETHYLENE-PROPYLENE-DIENE-MEMBRANE ROOFING (EPDM)  
076200 SHEET METAL FLASHING AND TRIM  
078413 PENETRATION FIRESTOPPING  
079200 JOINT SEALANTS  
079219 ACOUSTICAL JOINT SEALANTS  
081113 HOLLOW METAL DOOR FRAMES  
081416 FLUSH WOOD DOORS  
084113 ALUMINUM FRAMED ENTRANCES AND STOREFRONTS  
085413 FIBERGLASS WINDOWS  
087100 DOOR HARDWARE  
088000 GLAZING  
088813 FIRE-RESISTANT GLAZING  
092216 NON-STRUCTURAL METAL FRAMING  
092900 GYPSUM BOARD  
093013 CERAMIC TILING  
095123 ACOUSTICAL TILE CEILINGS  
096513 RESILIENT BASE AND ACCESSORIES  
096519 RESILIENT TILE FLOORING  
099113 EXTERIOR PAINTING  
099123 INTERIOR PAINTING  
101423.13 ROOM-IDENTIFICATION SIGNAGE  
102600 WALL AND DOOR PROTECTION  
102800 TOILET, BATH, AND LAUNDRY ACCESSORIES  
104413 FIRE EXTINGUISHER CABINETS  
104416 FIRE EXTINGUISHERS  
113100 RESIDENTIAL APPLIANCES  
123530 RESIDENTIAL CASEWORK  
123623.13 PLASTIC-LAMINATE-CLAD COUNTERTOPS  
124816 ENTRANCE FLOOR MATS



**APPARATUS BAY FLOOR DRAIN**



**APPARATUS BAY GEAR STORAGE**



**APPARATUS BAY GEAR STORAGE**



**APPARATUS BAY GEAR STORAGE**



**GEAR REPAIR AREA**



**GEAR REPAIR AREA**



**WATCH ROOM**



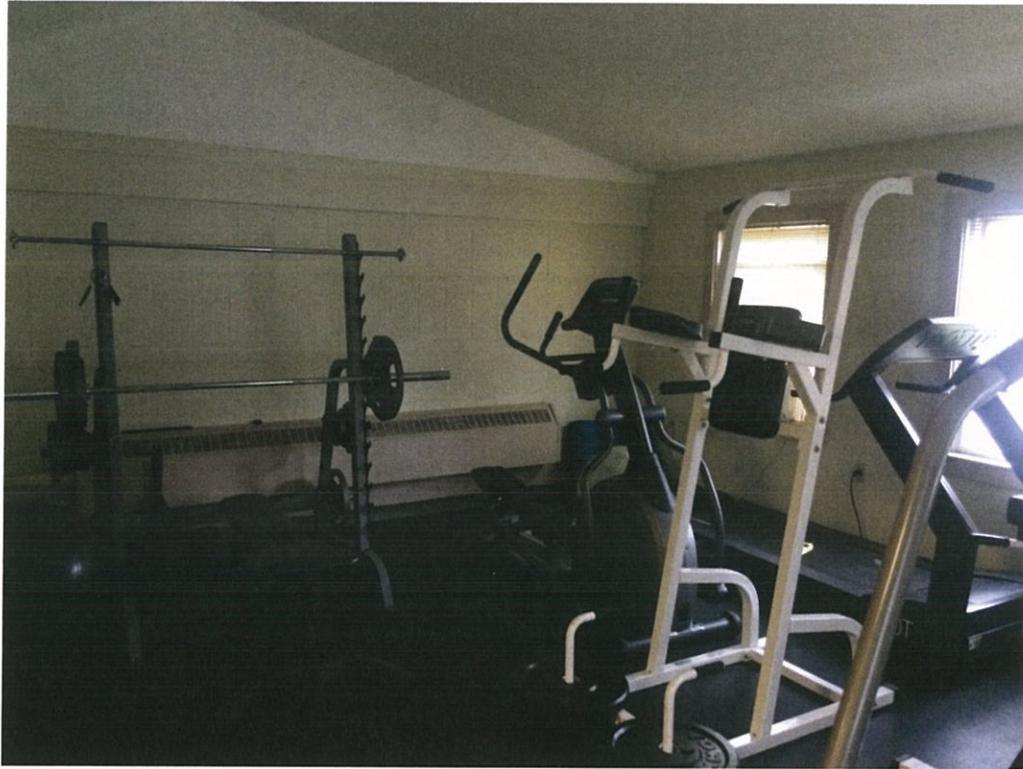
**WATCH ROOM**



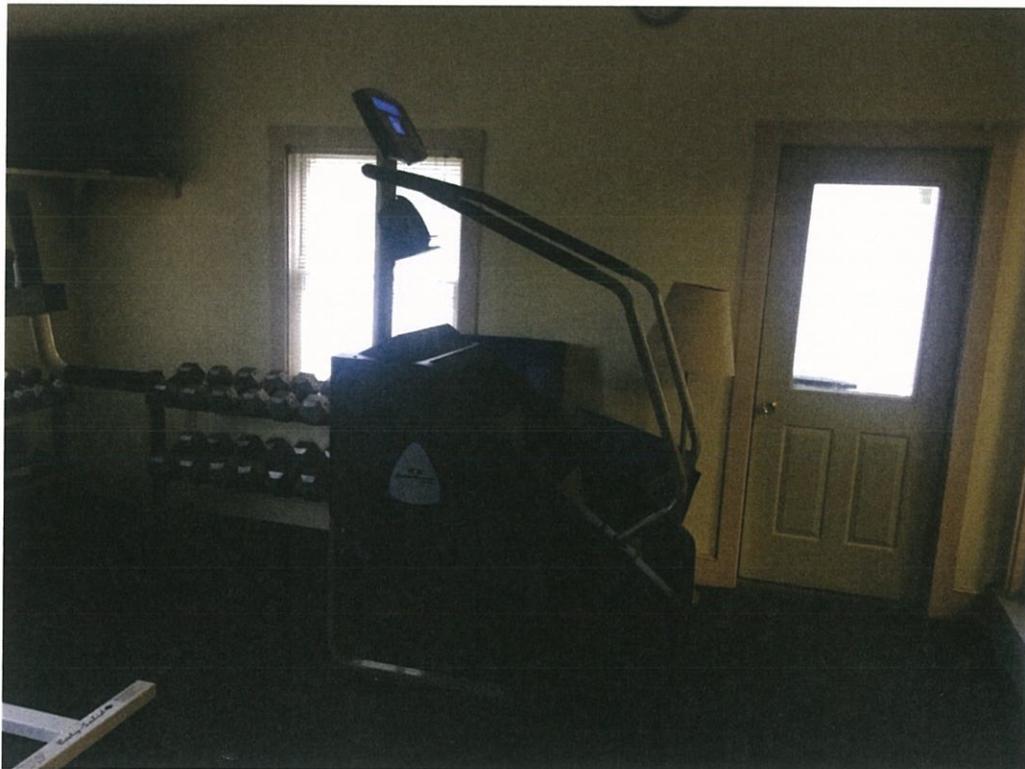
**KITCHEN**



**LOUNGE**



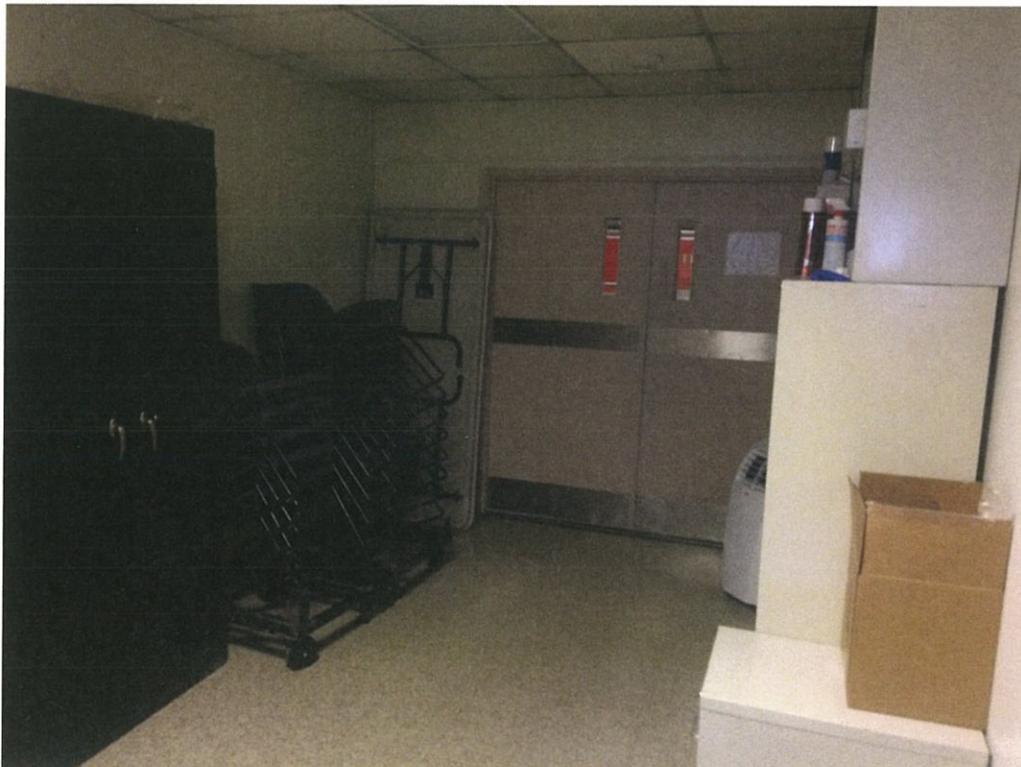
FITNESS ROOM



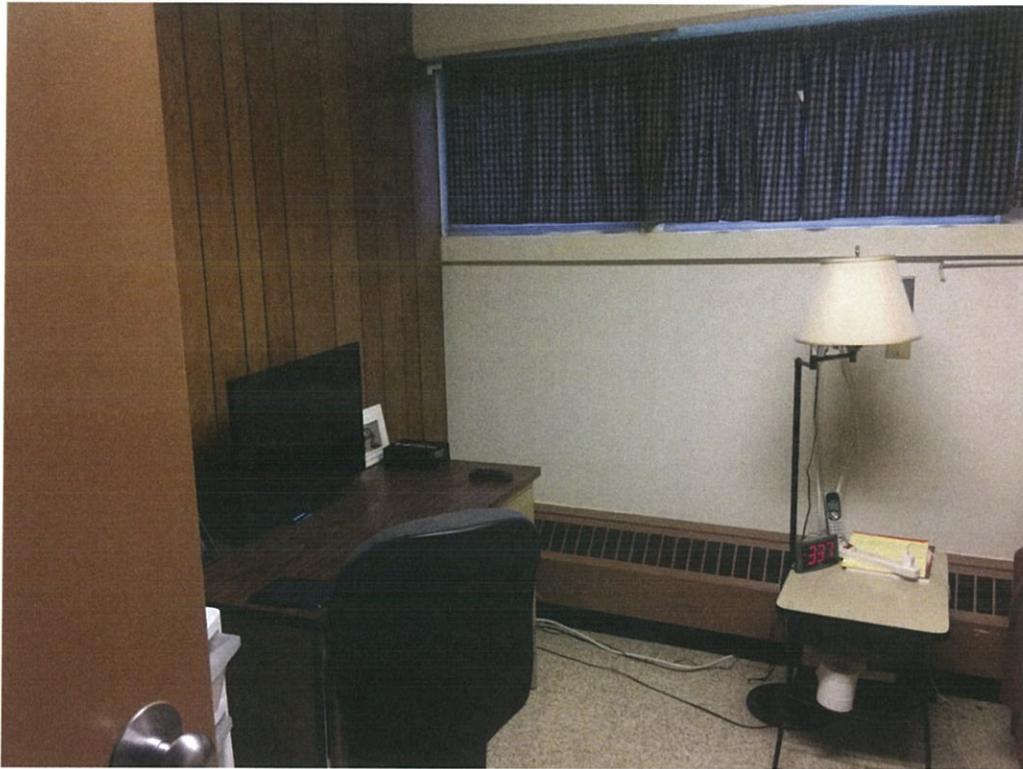
FITNESS ROOM



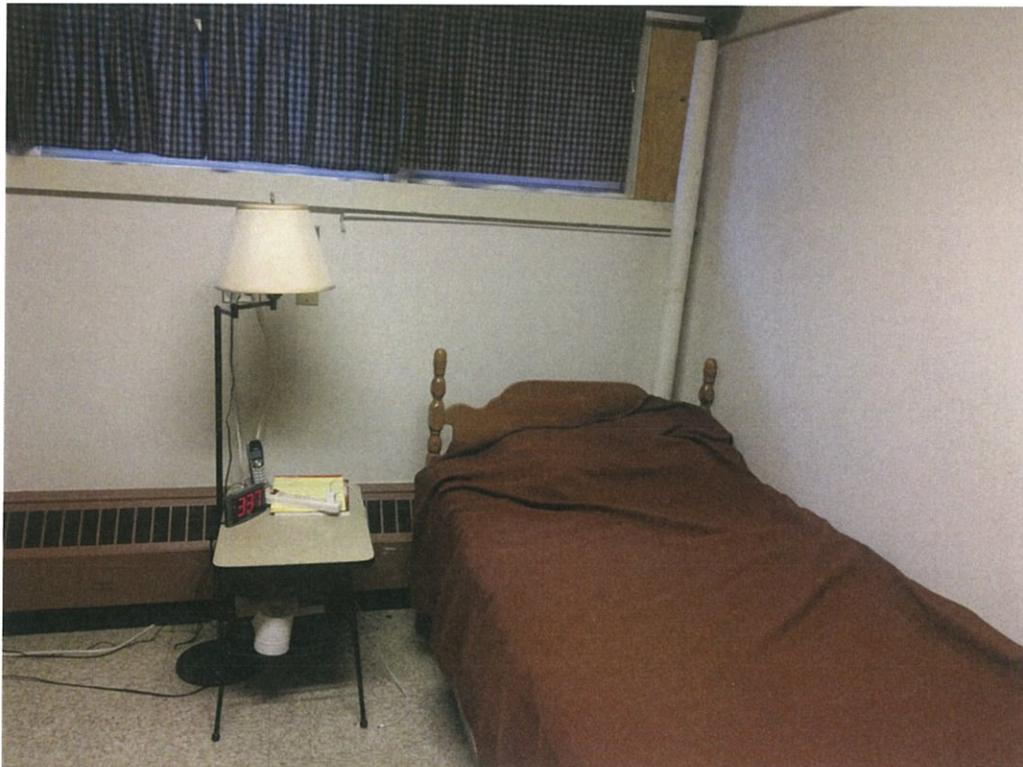
**MAIN OFFICE**



**STORAGE AT CORRIDOR**



TYPICAL BEDROOM



TYPICAL BEDROOM



CORRIDOR AT BEDROOMS



TYPICAL BEDROOM



**SOUTH ENTRANCE AT CORRIDOR**



**TYPICAL PARTITION AT BEDROOMS**



LAUNDRY/TOILET ROOM



LAUNDRY/TOILET ROOM



LAUNDRY/TOILET ROOM



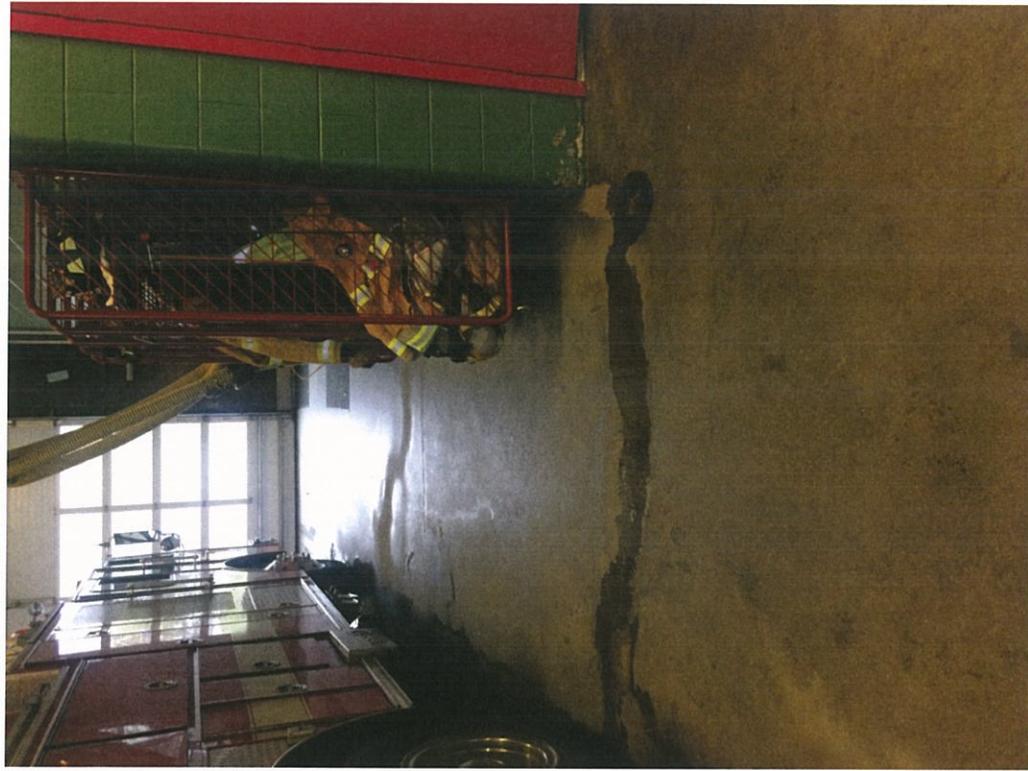
GANG SHOWER AT TOILET ROOM



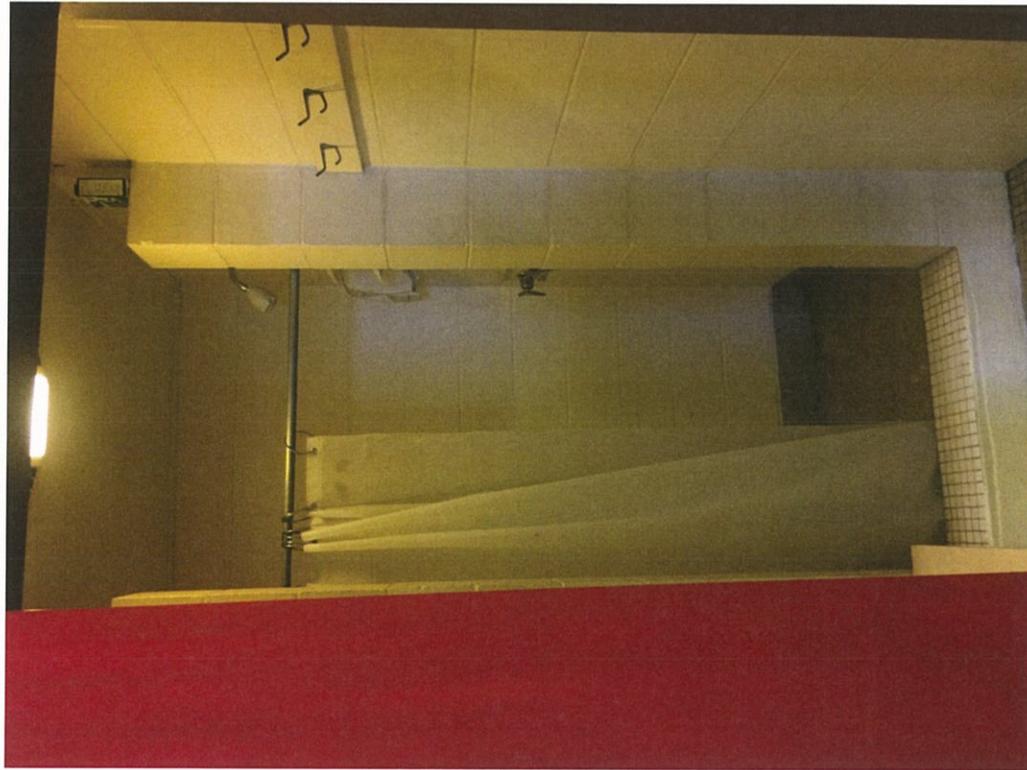
**OFFICE STORAGE AT CORRIDOR**



**SINGLE-USER TOILET AT APPARATUS BAY**



FLOOR DRAIN AT APPARATUS BAY



SINGLE-USER SHOWER AT APPARATUS BAY



VIEW OF WATCH ROOM FROM APPARATUS BAY



PLYMOVENT SYSTEM AT APPARATUS BAY



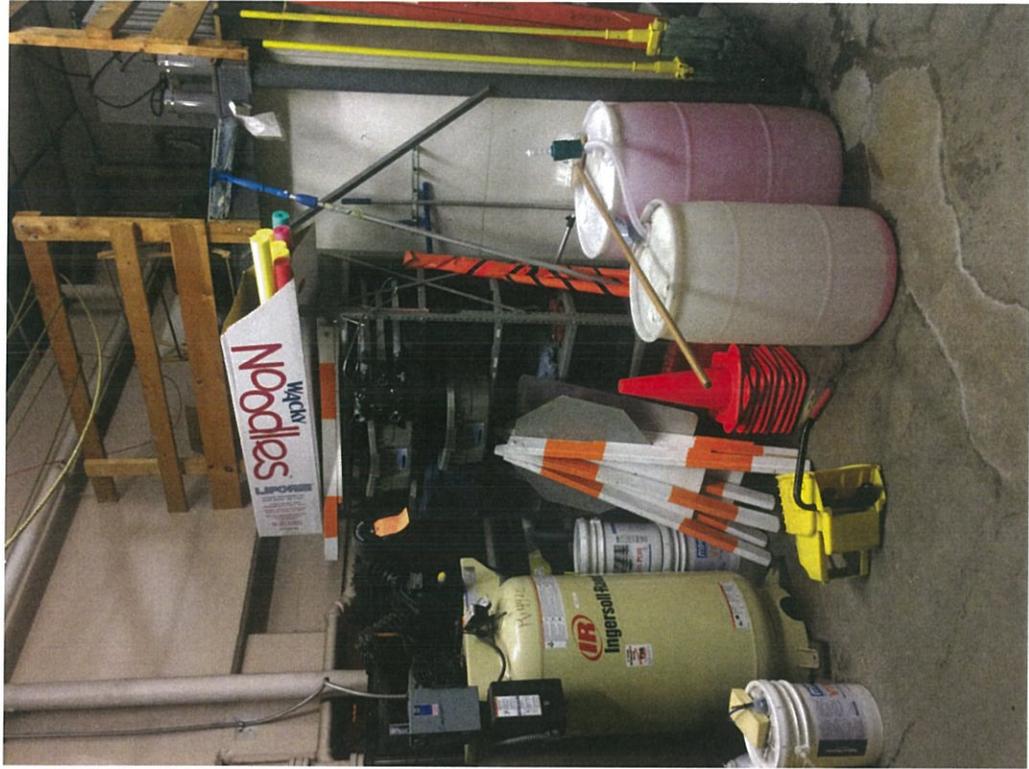
PLYMOVENT SYSTEM AT APPARATUS BAY



UNIFORM STORAGE AT UTILITY ROOM



BOILER AT UTILITY ROOM



STORAGE AT UTILITY ROOM



ELECTRICAL/FIRE ALARM AT UTILITY ROOM



COMMUNICATIONS AT UTILITY ROOM



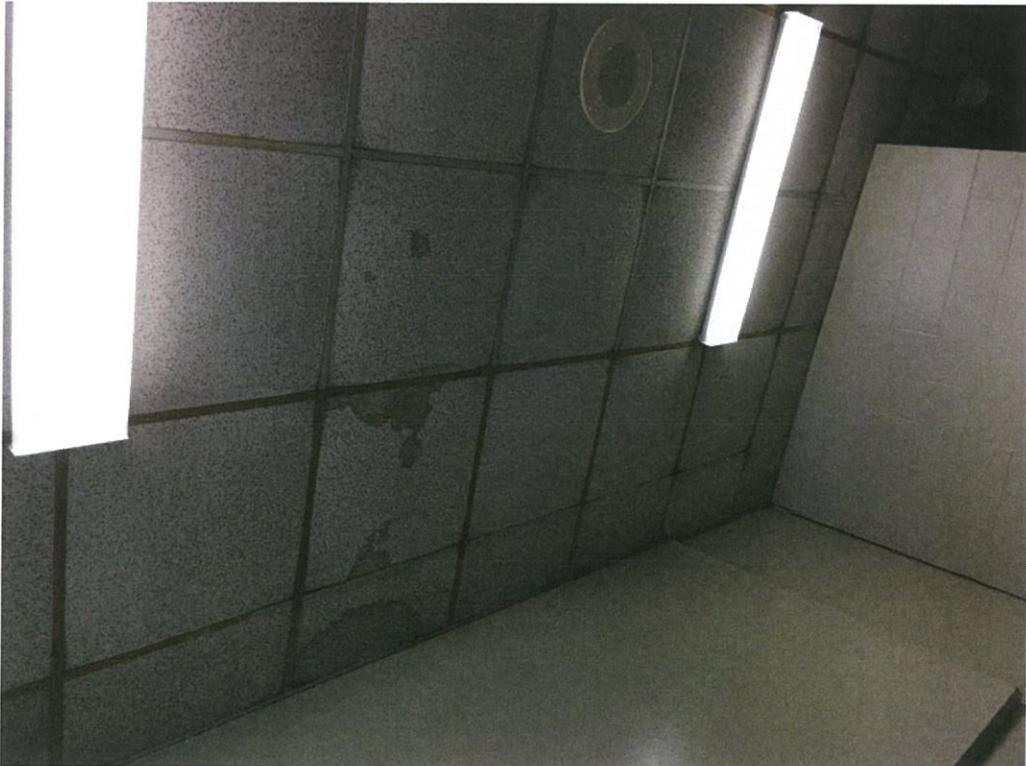
**LOUNGE/MEETING AREA**



**BEDROOM CEILING**



**SHOWER CEILING**



**LAUNDRY/TOILET ROOM CEILING**



**EXTERIOR AT BEDROOMS**



**EXTERIOR AT BEDROOMS**



**FITNESS ROOM ADDITION**



**FITNESS ROOM ADDITION**



**DETAIL OF EXISTING WALL**



**GARDEN FENCE AT FITNESS ROOM ADDITION**



November 27, 2017

Owens McCullough, P.E., LEED-AP  
Vice President, Engineering  
Sebago Technics  
75 John Roberts Rd., Suite 1A  
South Portland, ME 04106

**Re: Preliminary Design Report for Renovations to the Cash Corner Fire Station in South Portland, Maine**

Owens:

This letter is issued to document our preliminary design report for upgrades to the mechanical, plumbing, electrical, fire protection, structural, and roofing systems to support planned renovations at the Cash Corner Fire Station in South Portland, Maine. The scope for this report includes assessment for the existing Mechanical, Plumbing, Fire Protection, Structural, Roof, and Electrical systems, capacity for existing systems to support the proposed renovations, and establishes our recommended Basis of Design for the systems to support the proposed architectural renovations and address current moisture/contaminant intrusion that has led to mold growth as identified in separate documentation.

Our services include the following:

1. Meet with designated representatives of the facility to gain an understanding of the use and environmental requirements of each functional space.
2. Conduct field visits to assess the configuration and condition of existing systems, analyze existing building design documentation, become familiar with prior renovations and functional space changes throughout the facility, and interview occupants within each of the spaces to gain an understanding as to the adequacy of the current systems to maintain acceptable conditions based upon use and occupancy.
3. Collaboration with Sebago Technics and Grant Hays Architects to establish the scope for the proposed renovations and upgrades.
4. Develop a Basis of Design for upgrades and additions to the Mechanical, Plumbing, Fire Protection, Structural, and Electrical systems based upon information collected during the assessment phase, as required to remediate the current mold growth and prevent its re-occurrence.

The assessment incorporates the following items:

1. Visual assessment of systems condition and operation
2. Interview of designated facility personnel to gather information relative to space comfort, systems efficiency, maintainability, and other relevant information.
3. Review of system design documentation to analyze the ability for systems to meet current code requirements and industry standards for occupant comfort, indoor air quality, and efficiency of operations.

4. Report of recommendations for upgrades based upon current facility use and proposed renovations and upgrades.

## I. Existing Conditions

### A. Roofing/Flashing

#### **Roofing:**

1. Main Roof – Area 1: The roof is surfaced with a 0.060 mil EPDM membrane surfacing applied over Polyisocyanurate insulation which is mechanically fastened to the metal decking system. The thickness of the insulation was not determined by AEI, but could be from a coring sample performed by a roofing contractor.



2. Sloped Shed Roof - Area 2: There is a low slope roof constructed off the left side of the building and aligned with the front wall. This roof structure is shingled with asphalt/fiberglass roof shingles that are in good shape.



3. There are mansard roofs constructed along each of the left and right side main roof edges. On the left side, the mansard roof runs from the front to the rear. At the Area 2 shingled roof, this structure was built over the mansard roof and flashed into the main roof fascia metal.

The mansard along the right side of the roof edge is full length.



**Flashing:**

1. Main Roof – Area 1: The front and rear membrane roofing was constructed below the elevation of the top of a concrete beam which is a part of the main building structure. As such, the membrane was wrapped up the backside of these concrete beam/parapet elements and terminated immediately below the top. Along the length of this concrete beam is a constructed control where the parapet beam bears on a lower concrete beam. This joint is filled with a backer rod and sealant. The sealant in this area is in poor condition and is allowing water into both the concrete joint and to behind/beneath the membrane system.

This condition is consistent on both the front and rear wall concrete beam/parapet system. Additionally, there is a section of the rear beam/parapet that has spalled and is serving as another water source to beneath the roof membrane and into the building.



2. Flashing for roof vent pipes, goose neck vents, and various roof patches applied over the years are in fair to poor condition. There are a number of cracked or lifted sealant joints and edges where the bond has broken down, which is evidenced by the accumulation of moisture that is collecting beneath the flashing and patch joint/edges.



3. The flashing around the base of the chimney was reglet into the first mortar joint above the membrane termination. The mortar in this joint has very little bond remaining with the masonry or the flashing, allowing water penetrations along this joint to the spaces below.



4. There are 2 roof drains serving this main roof system. These roof drains are served by cast iron pipe that drops internally in to the occupied space below and turns out above grade through the side wall and again turns down to below grade where we believe the pipe connects up with the storm drain system in the roadway. Roof drainage to these drains is obstructed somewhat by dirt and debris that has accumulated over time.



5. A gutter system is provided to collect roof runoff from Roof area 2 which then runs through a downspout to grade.

**B. Structure**

1. The existing structure is currently a two bay, single story structure measuring approximately 77' wide x 90' long, containing a sloped roof that varied in height from approximately 18.5' at its highest point, down to approximately 10.8' at its lowest. The two bays measure approximately 28.7' and 48.5', respectively.
2. The roof structure consisted of longspan steel joists (24LJ10), spaced at approximately 5'-0", spanning approximately 48'-7" over the wide bay, and open web steel joists (24J7), spaced at approximately 5'-0", spanning approximately 28'-8" over the smaller bay. According to plans of the existing facility (and confirmed during our site visit on September 27, 2017), all joists appeared to be sloped at approximately 1.1875:12
3. All steel joist ends appeared to contain [2 ½"] joist seats that bore directly on top of reinforced concrete beams, which varied in length and spanned between reinforced concrete columns. According to plans of the existing facility, the concrete column sizes and steel reinforcement patterns varied throughout the structure. Based on our limited [non-destructive] observations in the field, we were unable to confirm reinforced concrete

beam and column sizes. Most of the [interior and exterior] walls appeared to consist of 8" concrete masonry block (CMU) infill.

4. Based upon the information of the existing structure provided within the drawings, we believe the reinforced concrete columns bear directly on pile caps, varying in size and design capacity. No field observations were made of the existing pile caps.

C. Fire Protection

1. There is currently no system of automatic sprinkler protection within the facility.

D. Mechanical

1. Heat for the facility is provided by a multi-zone pumped hot water system. The hot water is generated by a single cast iron sectional Weil McLain boiler sized at 453 MBH and firing #2 fuel.
2. Hot water is distributed through the facility for heating via two circulator pumps, one of which serves fintube radiation in the Living Areas and the other which serves unit heaters in the Apparatus Bay. Each unit heater in the Apparatus Bay is controlled by its own thermostat, one at the North end and one at the South end. Similarly, the Living Area contains two separate zones of heat, with thermostats located at the Break Room in the North End of the facility and one at the second bedroom from the South end of the facility, each of which cycles a control valve to control heat output.



3. Ventilation at the Apparatus Bay is provided by a vehicle exhaust system which incorporates three vehicle exhaust connections, each of which include a pressure switch to activate the associated exhaust fan and magnetic break away tailpipe connections. There is no system of mechanical makeup air in the Apparatus Bay. The exhaust fan serving the vehicle exhaust system is a utility set fan which is located in the mechanical room and ducted to a sidewall and terminates at a stack approximately 3' above the roof line.



4. The toilet room in the Apparatus Bay contains an exhaust fan located above the ceiling for ventilation. The fan is controlled by a wall switch and exhausts to a gooseneck located above the roof.
5. The shower room in the Apparatus Bay also used a switch controlled exhaust fan mounted above the ceiling for local ventilation. This fan currently exhausts through the sidewall of the shower room to the Apparatus Bay.
6. The Main Office in the Living area contains a local exhaust fan located above the ceiling and exhausting to a gooseneck on the roof. This fan does not currently appear operational.
7. The main shower room/bathroom contains two exhaust fans. The first, which is original to the facility, is located above the ceiling in the shower room and exhausts to a gooseneck on the roof. This fan does not appear to be operational currently. The second fan is wall mounted in the bathroom area and is controlled by a local switch.



8. The Break Room incorporates a recirculating residential style range hood over the range.



9. Like the Apparatus Bay, the Living Area has no system of central mechanical supply ventilation.
10. There is no central system of cooling within the facility.
11. The temperature controls for the facility are electric, standalone controls.

E. Plumbing

1. Domestic cold water enters the facility at the South wall of the facility in the mechanical room. The service is sized at 4" through the floor which splits to a 3" metered service to the main building and a 1 ½" unmetered service which appears to serve the hose connections at the Apparatus Bay. The 1 ½" branch includes an RPZ style backflow prevention device while the main building service contains no means for backflow prevention. Cold water piping is observed to be a mix of steel piping with threaded joints and copper piping with soldered joints.
2. Domestic hot water is generated by a 41 gallon Amtrol indirect water heater served by the boiler. The hot water service to the facility is sized at ¾" and is comprised of soldered copper.



3. The sanitary sewer where accessible, appears to be of cast iron with bell and spigot joints. The service, sized at 5" based upon as built information, exits the facility at the East wall.
4. The storm drainage is provided by two vertical rain leaders, exposed within the sleeping quarters at the East wall of the facility, each of which exit through the exterior wall above grade and drop below grade at the building exterior.
5. Bathroom fixtures consist of wall mounted water closets with counter mounted drop in lavatories, both of white vitreous china. The kitchen sink is a drop in double bowl stainless steel unit with gooseneck faucet and wrist blade faucet handles.
6. The main shower room incorporates a field built gang shower room with 5 heads. A separate shower room in the Apparatus Bay incorporates a single user fiberglass shower unit.



F. Electrical

1. The building has a 200-amp 208/120-volt three-phase, four-wire underground service from primary overhead utility lines. The service originates at a bank of three utility-owned pole mounted transformers and terminates at a fusible switch that is located in the Boiler Room. Power is distributed from the service disconnect switch via an automatic transfer switch to branch-circuit panels E1 and E2 that are located in the Boiler Room, and E3 and E4 that are located in the kitchen area.



2. All of the branch-circuit panels are Square D type QOB panelboards that appear to be in good condition but are at least 30 years old and have exceeded their anticipated useful lives. Panel E-1 is a 225-amp panelboard that supplies Panel E2 via a 100-amp circuit breaker. Panel E2 feeds Panel E4 via a 60-amp circuit breaker. Panel E4 supplies Panel E3.



3. The facility is equipped with a diesel-fueled Kohler 60kW generator that was installed in 2010 and is connected to provide standby power to the entire facility via a 200-amp 3-

phase automatic transfer switch with solid neutral connection. The generator and automatic transfer switch appear to be in very good to excellent condition.



4. Receptacles appear to be located appropriately for the existing uses of spaces. Receptacles throughout appear to have proper grounding. Based on what can be seen from a simple walk-through of the facility, general wiring appears to be a mixture of building wire in conduit, type NM nonmetallic sheathed cable (commonly referred to as “romex”), and type MC metal-clad cable. The type MC cable appears to be limited to circuits that have been added in more recent years, whereas much of the type NM cable that can be seen appears to be original to the building.



5. Interior Lighting is provided by a mixture of recessed troffers and surface mounted wraparound style luminaires that utilize linear T8 fluorescent lamps and, presumably, electronic ballasts. The fixtures appear to be older fixtures that have been retrofit with the T8 lamp/ballast systems. There is one incandescent luminaire in the corridor that is reportedly connected via the Zetron alert system to automatically turn on when the station receives an alarm. Except for the fixture connected to the Zetron alert system, the interior lighting is controlled by manual switches. There are no battery powered emergency lights for means of egress or internally illuminated exit signs marking means of egress.



The exterior lighting varies in type, age and condition. Incandescent wall mounted fixtures that appear to be original to the building are installed at the rear entrance. A quartz halogen floodlight illuminates the outdoor garden. A ground mounted metal halide flood light illuminates the building sign. There are compact fluorescent pedestrian-scale pole lights at the front entrance drive; one of these has a broken lens. The exterior lighting is control by a time clock.



6. The building has an underground telephone service in what appears to be a 1-1/2" conduit that originates at the same utility riser pole as the electrical service and terminates within

the Boiler Room. Cable television (CATV) service is overhead and enters the building above the ceiling at the southeast corner of the day room. A fiber optic data cable from the high school building also enters the building overhead above the ceiling at the east side and terminates at a wall mounted patch panel located in the office.



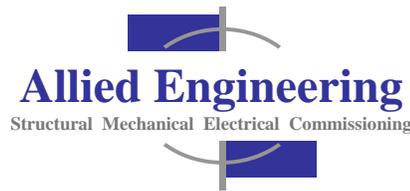
7. The facility is equipped with a Simplex addressable fire alarm system, but the system is not currently functioning, reportedly due to a defective mother board in the control panel. Occupant notification appliances are not located as would be required by current standards for a new facility; there are no notification appliances in the bunk rooms or apparatus bays.



8. The building is not equipped with intrusion detection or access control systems.

## **II. Discussion**

### **A. Roofing/Flashing**



## Roofing

1. Main Roof – Area 1: The roofing appears to be beyond its useful life and should be replaced as a part of the planned renovation. The insulation in the field and along all four edges is soft underfoot, which is an indication that moisture has been present in this system beneath the membrane for some time. When the roof is replaced, consideration should be given to providing a minimum R-30 roof insulation application beneath a 0.060 mil EPDM or TPO roofing application. The new insulation would be mechanically fastened and the membrane adhered.
2. Sloped Shed Roof - Area 2: This roof is in good condition, with the roof surface having in excess of 10-15 more years of service available. The breakdown in this system is the flashing between Area 1 and this roof. A parapet should have been constructed along this intersection to properly allow flashing and the Provided half-up roof vent to function as intended.

We understand that this roof structure may be removed as a part of the planned renovations. At that time, repair to the mansard roof shingles and Area 1 perimeter flashing should be planned for.

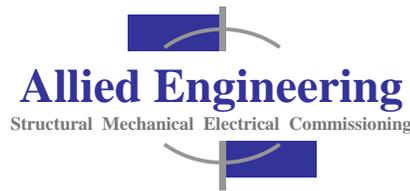
3. The mansard roofs along the left and right sides of the building are in good condition and should provide another 10-15 years of use.

## Flashings

1. Main Roof – Area 1: When this roof is resurfaced, proper detailing of the membrane applications up the interior face and over the top of the concrete beam/parapet with either a metal edge fascia or a full parapet cap should be considered. This will completely cover the construction joints and spalled areas along the beam lengths and will promote a more controllable and watertight system application.

If the sloped shed roof – Area 2 remains, a parapet should be incorporated between the Area 1 and Area 1 along this joint to allow for the two roofs to become watertight to the new parapet, respectively. This half-up ridge vent can be replaced and incorporated as well on the shed roof side of the parapet wall.

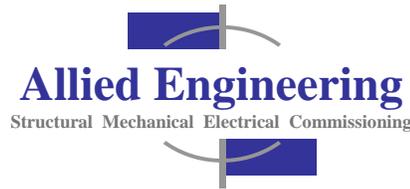
2. All non-functioning roof penetrations should be eliminated. Those to remain should be flashed according to the manufacturer's standards for warranty. The chimney should be sided with an appropriate finish, capped properly and flashed into the membrane at the base, again according to manufacturer's standard detailing.
3. The roof drain should be replaced with insert type roof drain system components. Also, the cast iron lines should be made to drain down the interior space and down through the slab to and pipe outlet cut through the foundation wall and then tied back into the storm drain line outlet toward the road.



Exposing the roof drain runoff by unprotecting piping through to the exterior before then going down below grade for distribution to the storm collection system is a real concern relative to flash freezing with the pipe and having a break flood the interior space.

## B. Structure

1. Codes, Standards and Authorities Having Jurisdiction:
  - a. International Building Code - 2009
  - b. American Society of Civil Engineers – Minimum Design Loads For Buildings and Other Structures – 2005
2. According to the design information, applicable to gravity loading, included on the drawings of the existing structure, the longspan and open web steel roof framing joists were originally designed for a dead load of 10 lbs. per square foot (psf), and a live load of 45 psf, combined, for a total of 55 psf.
3. Based upon the measurements we were able to take in the limited areas we had available to us in the field, and our assumption of the type of material used during the fabrication of the roof framing joists [A36 steel], our structural analyses of the two types of roof joists confirmed that the existing longspan and open web steel roof framing joists have the strength capacity to carry both dead and live loads, combined, at 55 psf.
4. Assuming the re-roofing, described above, takes place and does not increase the original design dead load of 10 psf, the available live load capacity of the steel roof framing joists (for snow) would be limited to 45 psf.
5. In accordance with the 2009 International Building Code, the minimum design snow load for this structure, assuming a “fully-exposed” structure, with an “Essential” Occupancy Category of IV, would be calculated at 50 psf. This reflects an 11% increase from the original design snow load of 45 psf.
6. By utilizing the updated minimum design snow load of 50 psf, our structural analyses showed that some members within the existing 24LJ10 longspan steel joists, spanning the larger (48.5 ft.) bay, were overstressed by approximately 15 – 18% beyond the strength capacity to carry both dead and live (snow) loads, combined, at 60 psf. The existing 24J7 open web steel joists spanning the smaller bay of 28.7', contained enough design redundancy to safely carry the combined dead and live (snow) load of 60 psf.
7. Due to our limited access during our initial site visit, we were unable to gather information regarding the reinforced concrete beams and columns that support the longspan and open web steel roof framing joists. In addition, the information regarding the reinforced concrete beams and columns shown on the drawings of the existing structure, is illegible. Therefore, our structural analyses is currently limited to the longspan (24LJ10) and open web (24J7) steel roof framing joists only.



Unfortunately, due to the lack of information regarding the reinforced concrete beams and columns, it is difficult to assess how the increase in the minimum design snow load would affect the existing design of these elements. It is possible that the snow load increase may warrant minor structural upgrades to the existing reinforced concrete beams and columns.

C. Fire Protection

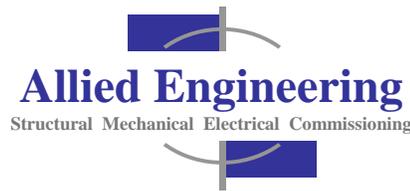
1. Currently there is no system of automatic sprinklers within the facility. Based upon discussions with both Grant Hays Architects and the Cash Corner Fire chief, being a class IV emergency response facility imposes the need for installation of an NFPA 13 compliant automatic sprinkler system.
2. A 4" water service currently enters the facility. The 4" service is marginal with respect to its ability to support such a system.

D. Mechanical Systems

1. The heating boiler appears to be original to the facility and is beyond its published dependable service life.
2. The vehicle exhaust system at the Apparatus Bay has been installed since the building was constructed and appears to be in good overall operating condition. This is the only source of mechanical ventilation within the Apparatus Bay. There is no source of makeup air for the vehicle exhaust. Current ASHRAE Standards require that the total exhaust ventilation rate for this type of space be sized at .75 cfm per sf of floor area. That equates to approximately 2,100 cfm. Although we have no data on the exhaust fan, it is estimated, based upon the size of the ducts, that each of the three drops provide approximately 400 cfm, for a total of 1,200 cfm.
3. The exhaust fan for the Apparatus Bay bathroom is original to the facility and has outlived its published dependable service life.
4. Although the exhaust fan for the Apparatus Bay shower has been installed recently, this fan exhausts within the Apparatus Bay, which does not comply with current ASHRAE Standards.
5. The exhaust fans for the main bathroom and Office do not appear operational and are beyond their published dependable service life.
6. The exhaust fan for the main bathroom, although operational, is not appropriately sized for the space and, combined with the fact that there is no source for makeup air, is creating a large negative pressure throughout the Living Area during operation.

E. Plumbing Systems

1. Most plumbing fixtures are original to the facility and have exceeded their published service life. Although fixtures are operational for the most part, there are signs of dilapidation.
2. The domestic water service for the main facility is not protected by a backflow prevention device as is required in most municipalities.



3. The domestic water serving the interior hose station does not appear to be metered. This likely does not meet with the approval of the local water district.
4. Much of the domestic hot and cold water piping throughout is uninsulated which is not compliant with the current energy code.
5. The Apparatus Bay contains a single floor drain sized at 4" diameter. It is reported that this floor drain is not adequate to support washing operations for the trucks.
6. It is reported that the main sewer line often drains improperly.

F. Electrical Systems

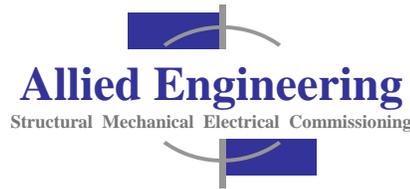
1. The service entrance does not have adequate capacity to support the proposed additional mechanical equipment.

If the building or a portion thereof is classified by a governmental agency having jurisdiction as a Critical Operations Power System in accordance with NEC Article 708, such classification will affect the design as the feeder distribution equipment to the Designated Critical Operations Area needs to be located in a 2-hour rated room. Please refer to the recommendations section of this report for further information.

2. The existing branch-circuit panelboards are not suitable for re-use. They have exceeded their anticipated useful lives, and two panels are located in a wall that is intended to be demolished.
3. The existing standby generator system provides a power density of approximately 11 volt-amperes (VA) per square foot. This would be adequate for the needs of the building most of the time, but may not support the entire proposed mechanical system in extremely warm or cold weather. The building automation system recommended in the mechanical section of this report could be configured to limit the amount of HVAC equipment that can operate simultaneously when the generator is powering the facility. In such an arrangement, operation of the mechanical equipment would be staged to limit the electrical demand, which would have some impact on space comfort. If such an arrangement is not acceptable, the generator will need to be replaced with a larger unit in order to operate the entire facility.

The National Electrical Code (NEC) requires the wiring of emergency systems, such as code-required means-of-egress illumination and fire alarm systems, to be separated from the normal wiring system. Because the existing standby generator system includes only one transfer switch, it does not provide the required separation. Provision of a separate automatic transfer switch, which would supply an emergency panel within the building would comply with the current standard.

If the building or a portion thereof is classified by a governmental agency having jurisdiction as a Critical Operations Power System in accordance with NEC Article 708, such classification will significantly affect cost and design of the standby generator system. Please refer to the recommendations section of this report for further information.



4. Much of the general wiring within the building appears to be original to the building and has exceeded its anticipated useful life. Much of the wiring is also located in walls that will be demolished.

If the building or a portion thereof is classified by a governmental agency having jurisdiction as a Critical Operations Power System in accordance with NEC Article 708, such classification will significantly affect cost and design of the wiring system. Please refer to the recommendations section of this report for further information.

5. The existing interior lighting fixtures are at or near the end of their anticipated useful lives and should be replaced as part of the renovations.

The existing exterior lighting fixtures are outdated and do not have modern full-cutoff optics to reduce light pollution. The facility would benefit from updating the exterior lighting as part of the proposed renovations.

6. The existing overhead CATV and fiber optic entrances will likely be disrupted by the demolition of the existing fitness room. The existing telephone entrance conduit is undersized for a modern fire station. The data patch panel should be located in a dedicated telecommunications room with suitable infrastructure for accommodating network connectivity and to support the desired access control system and security cameras.

If the building or a portion thereof is classified by a governmental agency having jurisdiction as a Critical Operations Power System in accordance with NEC Article 708, such classification will significantly affect cost and design of the telecommunications wiring system. Please refer to the recommendations section of this report for further information.

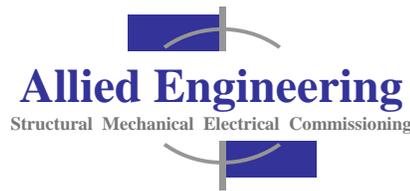
7. Fire alarm occupant notification generally does not comply with current standards. The existing fire alarm control system reportedly requires major repairs. Considering these facts and the scope of proposed floor plan modifications, we believe the most cost effective option is to include a complete new fire alarm system as part of the facility renovations.

If the building or a portion thereof is classified by a governmental agency having jurisdiction as a Critical Operations Power System in accordance with NEC Article 708, such classification will significantly affect cost and design of the fire alarm wiring. Please refer to the recommendations section of this report for further information.

### **III. Basis of Design Recommendations**

#### **G. Roofing**

1. Main Roof – Area 1:



- a. Replace membrane roofing and insulation to roof deck.
- b. Add minimum of R-30 insulation beneath either a 0.060 mil EPDM or TPO membrane surfacing.
- c. Construct a parapet to properly separate the main roof - Area 1 roof from the shed roof - Area 2 surface.

**Estimated Cost: \$100,000-\$110,000**

2. Shed Roof – Area 2:

The proposed architectural scope removes this roof. As such, no upgrade is required.

3. Mansard Roofs:

- a. Both mansards are in good condition with 10-15 years of shingle life expects.
- b. The mansard roof along the left side of the building is partially beneath the shed roof above. As such, removal of the shed roof below will require repair of the mansard in this area.

**Estimated Cost: \$3,000-\$5,000**

## **H. Flashing**

1. Main Roof – Area 1 and Shed Roof – Area 2:

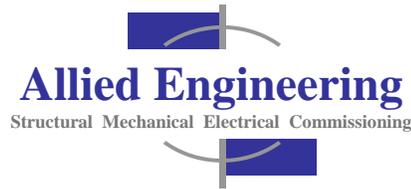
- a. All vent pipes and goose neck duct vents should be flashed per the manufacturer's recommendations with the reroofing application.
- b. The front and rear concrete beam/parapets should be wrapped and covered. Either a trim metal fascia or parapet cap should be incorporated.
- c. The chimney should be sided, capped and properly flashed at the base to the membrane per manufacturer's standard details.
- d. There should be a parapet introduced between these two roof areas, wrapped in membrane and capped on the Area 1 side
- e. Flashing on the shed roof side may incorporate the half-up ridge ventilation similar to current conditions, but the flashing should be integral with the cap flashing designed into the parapet system.

**Estimated Cost: Included in Roofing Cost Above**

## **I. Structure**

1. Longspan Steel Joist (24LJ10):

- a. Reinforce top chord of each joist (with plate/angle), to increase section properties.
- b. Reinforce 1<sup>st</sup> interior diagonal brace on each end of each joist (with plate/angle), to increase section properties.



**Estimated Cost: \$75,000-\$80,000**

2. Reinforced Concrete Beams and/or Columns:

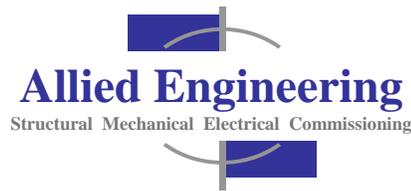
Due to the lack of information regarding the reinforced concrete beams and columns, it is difficult to assess how the increase in the minimum design snow load would affect the existing design of these elements. It is possible that the snow load increase may warrant minor structural upgrades to the existing reinforced concrete beams and columns.

**Estimated Cost: TBD**

**J. Fire Protection**

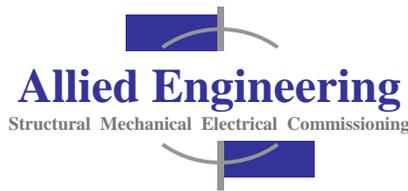
1. Codes, Standards and Authorities Having Jurisdiction:
  - a. State of Maine Fire Marshal's Office
  - b. Local Fire Department
  - c. Owner's Insurance Agent
  - d. International Building Code
  - e. Maine Uniform Building Code
  - f. NFPA 1 – Fire Prevention Code
  - g. NFPA 13 – Standard for the Installation of Sprinkler Systems.
  - h. NFPA 101 – Life Safety Code.
2. Design Conditions:
  - a. Light Hazard Occupancy: Offices, Gym, Corridors, Restrooms, and similar areas
  - b. Ordinary Hazard Group 1 Occupancy: Mechanical, Storage, and similar areas
3. General Fire Protection Requirements:
  - a. Light Hazard Occupancies:
    - 1) 0.10 GPM/SF over the most remote 1500 SF with a 100 GPM hose allowance.
    - 2) Max Coverage per Sprinkler Head: 225 SF
  - b. Ordinary Hazard Group 1 Occupancies:
    - 1) 0.15 GPM/SF over the most remote 1500 SF with a 2500 GPM hose allowance.
    - 2) Max Coverage per Sprinkler Head: 130 SF
4. Recommendations:
  - a. Add an NFPA 13 compliant automatic sprinkler system to serve the entire facility. Recent hydrant flow data will be required to ascertain whether an upgrade to the existing 4" water service will be required to satisfy the demand for flow.

**Estimated Cost (excludes new service entrance): \$35,000-\$40,000**



## **K. Heating, Ventilating, and Air Conditioning**

1. Codes, Standards and Authorities Having Jurisdiction:
  - a. State of Maine Fire Marshal's Office
  - b. Local Fire Department
  - c. International Building Code
  - d. Maine Uniform Building Code
  - e. 2015 Uniform Plumbing Code
  - f. NFPA 1 – Fire Prevention Code
  - g. NFPA 54: National Fuel Gas Code
  - h. NFPA 72: National Fire Alarm Code
  - i. NFPA 90A: Standard for the Installation of Air-Conditioning and Ventilating Systems
  - j. NFPA 101 – Life Safety Code.
  - k. IECC-2015 (Energy Standard)
  - l. ASHRAE 62.1-2010 Ventilation for Acceptable Indoor Air Quality
  - m. ASHRAE 90.1-2010 Energy Standard for Buildings Except Low-Rise Residential Buildings
  
2. Design Conditions:
  - a. Heating Outdoor DB / Indoor DB: -10°F / 68°F
  - b. Cooling Outdoor DB, WB / Indoor DB: 87°F, 74°F / 74°F (no cooling in the Apparatus Bay)
  
3. Recommendations for Upgrades to Existing Systems
  - a. Verify the flow rate for the existing vehicle exhaust system and adjust as required to obtain 400 cfm, minimum per drop.  
**Estimated Cost (assumes TAB only): \$1,500-\$2,000**
  
  - b. Add a general exhaust fan, sized to supplement the vehicle exhaust to provide total exhaust flow rate as dictated by ASHRAE Standards, add a sidewall louver to introduce makeup air, add carbon monoxide and NOX sensors to activate the fans and open the makeup air louver on detection of either above the PEL.  
**Estimated Cost: \$25,000-\$30,000**
  
  - c. Add an exhaust fan to serve the proposed Decon Room.  
**Estimated Cost: \$2,000-\$3,000**
  
  - d. Add energy recovery ventilators (ERV) to serve the Living Areas, Weight Room, Aerobic area, and Training room. The ERV will exhaust air from the bathroom areas and break room and provide tempered ventilation air throughout the occupied spaces, sized to provide slightly positive space pressurization in the Living Areas, to minimize the migration of contaminants from the Apparatus



Bay. One unit is proposed for the Living Areas, Aerobic, and Weight Room, with a second unit proposed for the Training Room. The units will each be ducted to serve the individual spaces throughout. Duct mounted hot water reheat coils will be added to insure that ventilation air is delivered at approximately room temperature.

**Estimated Cost: \$20,000-\$30,000**

- e. Add ducted heat pumps to serve each of the functional spaces throughout the Living Area. These units will provide cooling and first stage heating for each of the functional spaces throughout.

**Estimated Cost: \$70,000-\$80,000**

- f. Replace the oil fired boiler with a natural gas fired condensing boiler. The boiler will generate hot water to serve existing fintube radiation throughout to provide supplemental heat for the bedrooms. Additionally, the hot water will serve reheat coils, the Apparatus Bay unit heaters, and will provide the source for domestic hot water via the existing indirect water heater. New variable speed circulator pumps will replace the existing hot water pumps. New control valves will be installed at each terminal heating device.

**Estimated Cost: \$60,000-\$70,000**

- g. Add a commercial exhaust hood with fire suppression to serve the range. Add a gas fired makeup air unit to supplement the exhaust requirements for the hood.

**Estimated Cost: \$10,000-\$12,000**

- h. Add a central direct digital control building automation system (BAS) to monitor and control the mechanical systems throughout.

**Estimated Cost: \$40,000-\$50,000**

## **L. Plumbing**

- 1. Recommendations for upgrades to existing systems:

- a. Jet clean the existing underfloor sanitary waste line to remove sediment and debris.

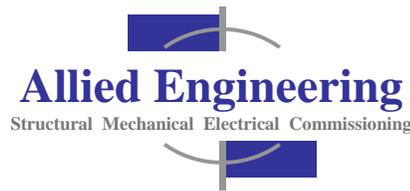
**Estimated Cost: \$1,000-\$1,500**

- b. Add a trench drain to replace the existing floor drain at the Apparatus Bay. Add a sand trap to prevent sediment from entering the main sanitary service.

**Estimated Cost: \$10,000-\$15,000**

- c. Add floor drains to the proposed bathrooms, Decon room, and Custodial Room.

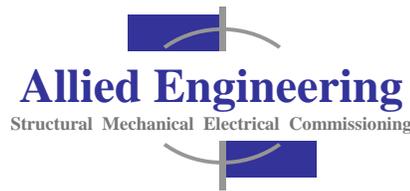
**Estimated Cost: \$5,000-\$8,000**



- d. Add a backflow preventer sized to handle the entire domestic water requirement for the facility. Relocate/re-size the water meter to meter the entire facility water usage. Revisions to the domestic hot and cold water distribution to facilitate the architectural renovations throughout. Insulate all piping per current energy standards.  
**Estimated Cost: \$20,000-\$25,000**
- e. New plumbing fixtures throughout the renovated areas.  
**Estimated Cost: \$25,000-\$35,000**

**M. Electrical**

- 1. All electrical work under scope of this Contract shall comply fully with the following codes and standards:
  - a. American Society for Testing and Materials (ASTM).
  - b. Underwriters' Laboratories, Inc. (UL)
  - c. Insulated Power Cable Engineers Association (IPCEA)
  - d. National Electrical Manufacturers Association (NEMA).
  - e. Institute of Electrical and Electronic Engineers (IEEE).
  - f. American National Standards Institute (ANSI).
  - g. National Fire Protection Association (NFPA).
  - h. National Electrical Code (NEC).
  - i. Occupational Safety and Health Act (Public) (OSHA).
  - j. International Energy Conservation Code (IECC).
  - k. Local Inspection Department.
  - l. Local Fire Department.
- 2. Recommendations and costs indicated below are based on a design that does not include designation of the facility or any portion thereof as a Critical Operations Power System. A summary of required design features if the facility is designated as a Critical Operations Power System, with an estimated cost to the electrical system as a whole is included at the end of these recommendations.
- 3. Upgrade the electrical service to 400 amps, 208/120 volts, 3-phase, 4-wire. The new service shall be underground and shall terminate in the new electrical room. Estimated cost includes and allowance of \$15,000 for utility construction charges.  
**Estimated Cost: \$29,000-\$34,000**
- 4. Provide branch-circuit panels located within the electric room and elsewhere as required to supply branch circuits for mechanical systems, administrative areas, support areas and equipment areas.
  - a. Shall be circuit-breaker type construction with bolt-on type connections and shall be U.L. listed.
  - b. All circuit breakers shall be quick-make, quick-break, trip free U.L. listed.
  - c. All panelboard bussing shall be aluminum.
  - d. Panelboards shall be furnished with lockable doors all keyed for a master key.



- e. Panelboards shall have 42 pole capacity and shall have mains rated at 100 amps minimum, single-phase, 3-wire with ground bus unless noted otherwise.

**Estimated Cost: \$10,500-\$12,500**

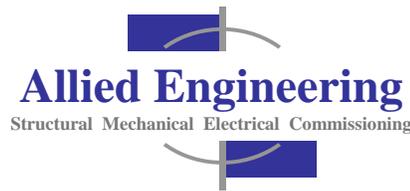
- 5. Provide a 100-kW, 208/120-volt, 3-phase, 4-wire diesel generator set to serve as the alternate power source. Provide a weatherproof generator enclosure with Level 2 sound attenuation. The generator shall include a subbase fuel tank with adequate capacity for at least 48 hours operation at full load. Provide separate automatic transfer switches for the emergency standby systems. The generator and automatic transfer switches shall be suitable for NFPA 110 level 1 emergency systems.

**Estimated Cost: \$38,000-\$43,000**

- 6. Provide a complete new general wiring system for the renovated facility.
  - a. Wiring insulation shall be Type "THWN/THHN" (75 de+grees C. minimum) for all single conductors in conduit. All insulation shall be rated for 600 volts, A.C. and will be color coded in accordance with the NEC. Minimum branch circuit wiring size shall be No. 12 A.W.G. with separate neutrals, except motor control circuit wiring and building interior fire alarm wiring may be No. 14 A.W.G. minimum.
  - b. All wiring and cable size 1/0 and smaller shall be copper. For conductors above 1/0 in copper size, aluminum may be used when proper de-rating is performed and confirmed with the engineer.
  - c. Wiring buried in earth or fill shall be single conductor installed in schedule 40 PVC conduit except at penetration of building where it shall be adapted to intermediate metal conduit, or where otherwise noted. Panelboard feeders within building shall be single conductor installed in electrical metallic tubing.
  - d. Interior branch circuit wiring shall be applied as follows:
    - 1) Branch-circuit wiring above hung or suspended ceilings, within furred spaces or metal partitions shall be Type MC, metal-clad cable with copper conductors and fully rated separate grounding conductor
  - e. In areas with exposed structure ceilings, exposed wiring in conduit shall be permitted at the ceiling.
  - f. Where subject to physical damage, conduit shall be type "IMC" intermediate metal conduit.
  - g. Minimum size conduit shall be ½ in. unless noted otherwise.
  - h. Low voltage wiring for lighting control shall be 18 A.W.G. minimum and be installed in accordance with the NEC standards for low voltage conductors.
  - i. Wiring and raceways in finished areas shall be concealed in walls and above ceilings.

**Estimated Cost: \$12,000-\$14,000**

- 7. Provide receptacle outlets throughout the facility as required to meet program needs.
  - a. All devices and switches shall be Specification grade and U.L. Listed.
  - b. Receptacle devices in toilet rooms, kitchen, near sinks and building exterior shall be GFCI protected.



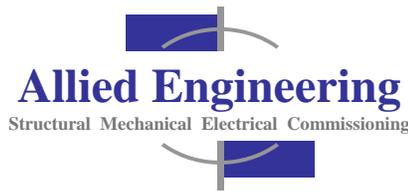
- 1) Exterior receptacle shall have weatherproof covers. The weatherproof integrity shall not be affected when heavy duty specification or hospital grade attachment plug caps are inserted.
- 2) Rooftop receptacles shall be located within 25 feet of mechanical units.
- c. Duplex receptacles will be provided in all areas in quantities suitable for space usage.
- d. Specialty receptacles shall be provided for specific equipment.
- e. Toggle switches shall be rated 20 amps.
- f. Device plates shall be high-abuse nylon. Plates shall be of appropriate size and type.

**Estimated Cost: \$7,000-\$8,000**

8. Provide LED lighting with high-performance optics throughout the building. Provide full cut-off LED exterior lighting for all exterior areas.
  - a. The lighting systems will be in compliance with the Illuminating Engineering Society (IES) recommendations for foot-candle levels.
  - b. Luminaires shall utilize factory-installed LED light engines. Luminaires shall qualify for Efficiency Maine rebates to the greatest extent possible based upon programming requirements.
  - c. Emergency egress lighting and Exit signs shall be provided to meet all code requirements with back-up power from the emergency generator.
  - d. Mechanical, storage and utilitarian spaces will be provided with LED lensed strip type fixtures.
  - e. Control of exterior shall be auto-on/auto-off by an astronomical time clock or photocell.
  - f. Ceiling mounted or switchbox type Occupancy sensors shall be utilized in areas subject to intermittent use. Areas 150 square feet and less shall utilize switch-box mounted occupancy sensors. Areas greater than 150 square feet shall be controlled by a power pack and a low voltage manual switch connected to a local occupancy sensor.
    - 1) Power pack shall be dual voltage and capable of loads rated 20 amps.
    - 2) Occupancy sensor shall be powered from the power pack and be dual technology capable (PIR and ultrasonic). The low voltage switch shall interface with the occupancy sensor to provide for manual-ON, occupancy sensor off. Sensor shall be capable of satisfying logic states using either or both technologies.
    - 3) Occupancy sensor shall be ceiling mounted for areas with recessed lighting and wall mounted for pendant lighting. Mounting height to match pendant height.
  - g. Lighting in selected areas shall be turned on automatically upon receipt of an alarm by the fire station.

**Estimated Cost: \$53,000-\$61,000**

9. Telecommunications:
  - a. Provide a new telecommunications underground duct bank to a telecommunications utility demarcation point in the new electrical room. The



duct bank shall consist of three 4" conduits: (1) for telephone, (1) for CATV and (1) spare.

- b. Telecommunications work shall comply with BICSI and EIA/TIA standards.
- c. Horizontal cabling and terminations shall be Category 6.
- d. Cables shall be riser rated.

**Estimated Cost: \$7,000-\$8,000**

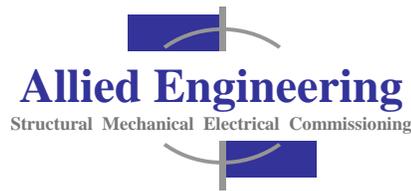
- 10. Provide an automatic, addressable electrically supervised, low-voltage fire alarm system.
  - a. Fire alarm systems shall generally comply with requirements of NFPA 72 for local building systems except as modified and supplemented by this specification.
  - b. All units of equipment shall be listed by Underwriters Laboratories and shall consist of a battery-backed fire alarm control panel, heat detectors, smoke detectors, and pull stations.
  - c. Occupant notification shall be audio/visual type with voice evacuation signals. Visual notification appliances shall be synchronized where multiple strobe flashes are visible.
  - d. Wiring shall be in accordance with NEC Article 760, and as recommended by the manufacturer of the fire alarm system and AHJ.
  - e. Duct smoke detectors shall be provided in all supplies that are 2000cfm or greater and returns that are 15,000cfm or greater.
  - f. System shall be connected to and monitor status of sprinkler devices.

**Estimated Cost: \$12,000-\$14,000**

- 11. Provide Access control, intrusion detection, and a security camera system to suit program needs.
  - a. The access control system shall be integrated with the city's On-Guard system and shall consist of card readers, duress buttons, and associated hardware and software.
  - b. Cameras will be power-over-ethernet (POE) type network.
  - c. Intrusion detection shall be controlled by a separate control panel, which shall monitor motion detectors and door switches and shall be connected to interface with the access control system.

**Estimated Cost: \$15,000-\$18,000**

- 12. The following features are required by NEC Article 708 if the building or a portion thereof is classified by a governmental agency having jurisdiction as a Critical Operations Power System. The estimated cost is in addition to the costs associated with the basic system recommendations
  - a. Underground feeders and service entrance conduits shall be concrete encased such that minimum concrete thickness is 2" around the entire conduit.
  - b. Feeder distribution equipment to the Designated Critical Operations Area needs to be located in a 2-hour rated room.
  - c. Selective coordination shall be provided for all overcurrent protection devices.



- d. Branch-circuit wiring for fire alarm, security, emergency communications, and signaling systems shall be type MI mineral insulated cable in order to provide a 2-hour fire rated wiring system.
- a. Branch-circuit wiring for power, control, and monitoring of HVAC systems shall be type MI mineral insulated cable in order to provide a 2-hour fire rated wiring system.
- b. All feeders shall be type MI mineral insulated cable in order to provide a 2-hour fire rated system.
- c. Wiring for HVAC control and monitoring shall be type MI mineral insulated cable in order to provide a 2-hour fire rated system.
- d. A manual transfer switch and means of connecting a portable generator will be needed in addition to the permanently installed standby generator.
- e. Fuel capacity to operate the generator for 72 hours at full load without refueling shall be provided.
- f. Critical communications systems wiring shall be a 2-hour rated wiring method.
- g. All wiring for fire alarm, security, and emergency communications and signaling systems shall be type MI mineral insulated cable in order to provide a 2-hour fire rated wiring system.

**Estimated Cost: \$70,000-\$85,000**

#### **IV. Closing**

It is with pleasure that this report is submitted for your use and consideration. We look forward to working with Sebago Technics in the design development for this exciting project.

Regards,  
**Allied Engineering, Inc.**

Anthony Davis, P.E., LEED AP  
Principal



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/T/A

REVISION

PROJECT NAME

RENOVATIONS TO THE MAIN STREET  
**SOUTH PORTLAND  
FIRE STATION**

360 MAIN STREET SOUTH PORTLAND, MAINE 04106

/FILE

**EXISTING FLOOR  
PLAN**

DATE

25 OCT 2017

/CAL 3/16" = 1'-0"

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① EXISTING FLOOR PLAN  
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REV./ROOM

PROJECT NAME

RENOVATIONS TO THE MAIN STREET  
**SOUTH PORTLAND  
FIRE STATION**

360 MAIN STREET SOUTH PORTLAND, MAINE 04106

/FILE

**PROPOSED FLOOR  
PLAN**

DATE 25 OCT 2017

/CAL 3/16" = 1'-0"

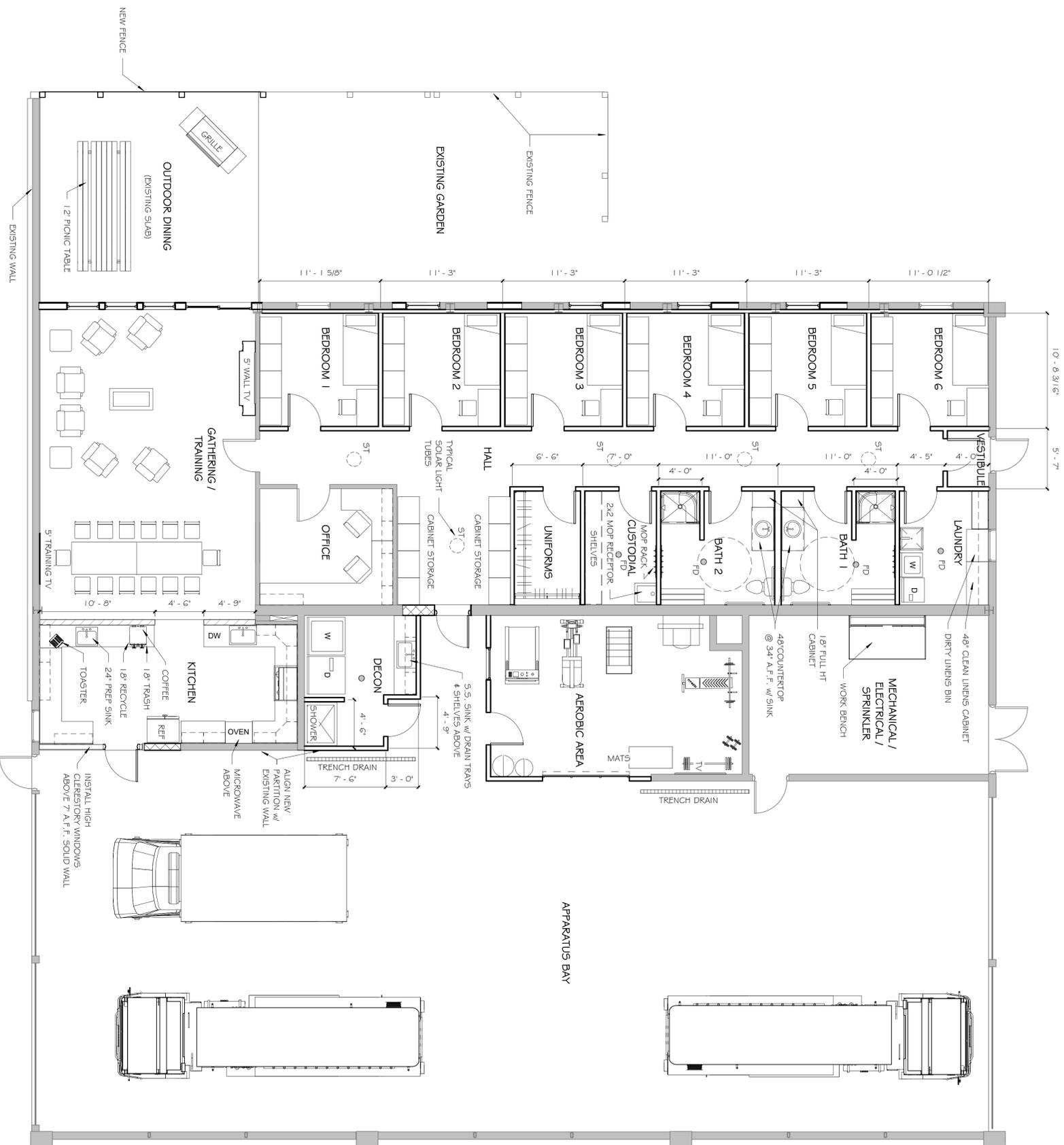
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1 PROPOSED FLOOR PLAN  
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REVISION

PROJECT NAME

RENOVATIONS TO THE MAIN STREET  
**SOUTH PORTLAND  
FIRE STATION**



360 MAIN STREET

SOUTH PORTLAND, MAINE 04106

/FILE

**DEPARTMENT PLAN**

DATE 25 OCT 2017

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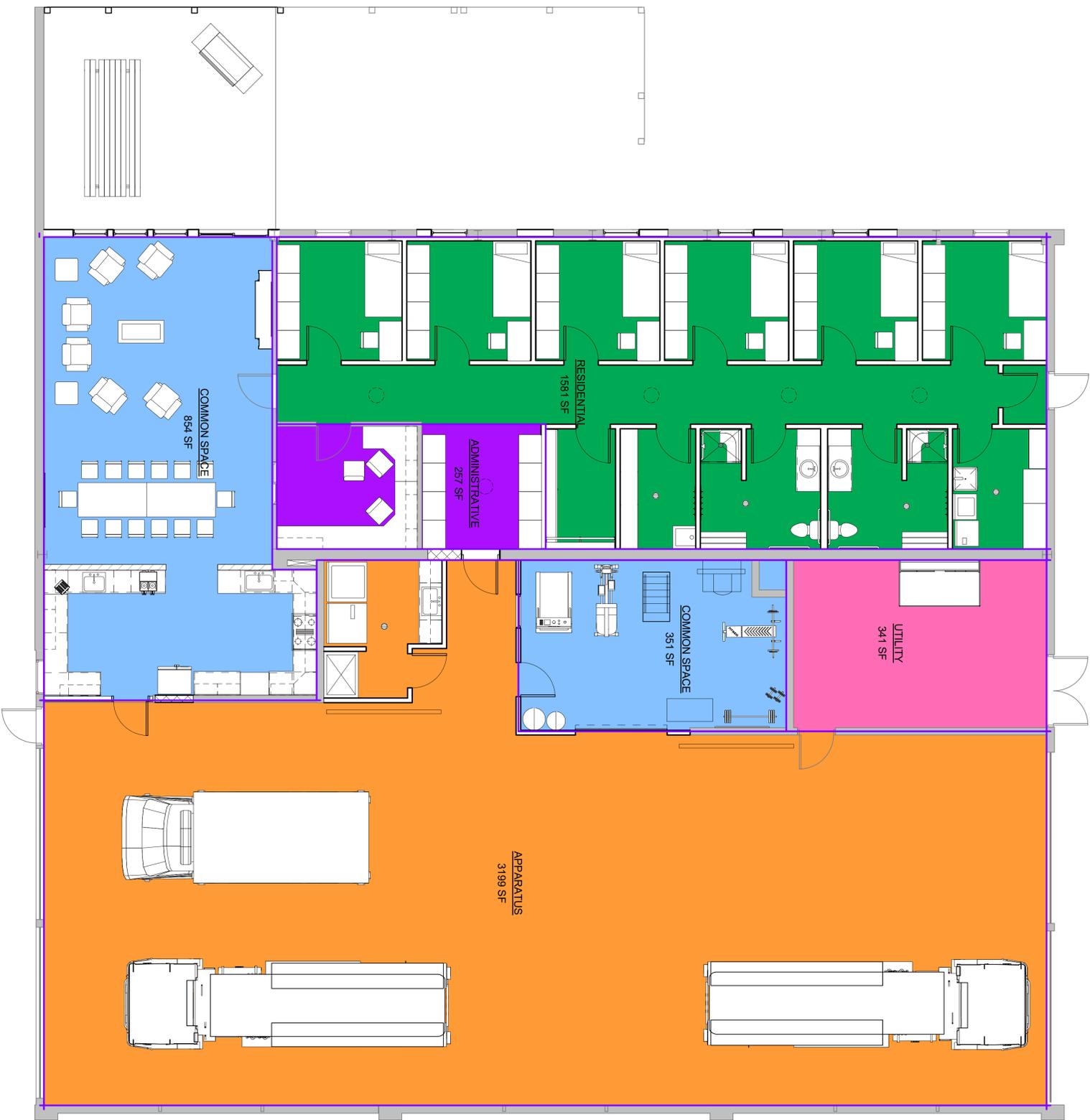
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- DEPARTMENT LEGEND**
- ADMINISTRATIVE
  - APPARATUS
  - COMMON SPACE
  - RESIDENTIAL
  - UTILITY

1 PROPOSED FLOOR PLAN  
3/16" = 1'-0"



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PROJECT NAME

RENOVATIONS TO THE MAIN STREET  
**SOUTH PORTLAND  
FIRE STATION**



360 MAIN STREET

SOUTH PORTLAND, MAINE 04106

/N/E

**EXTERIOR  
ELEVATIONS**

DATE  
25 OCT 2017

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1/4" = 1'-0"

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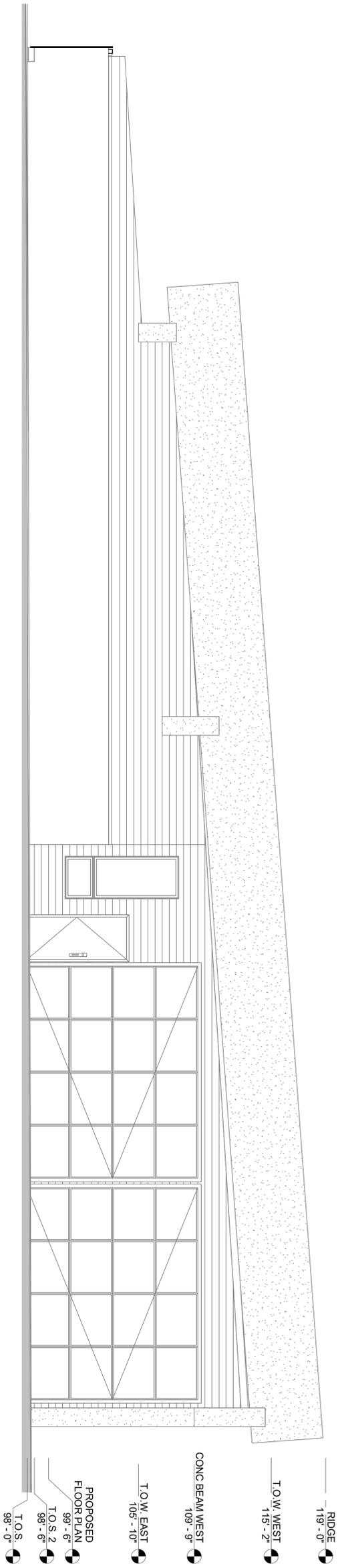
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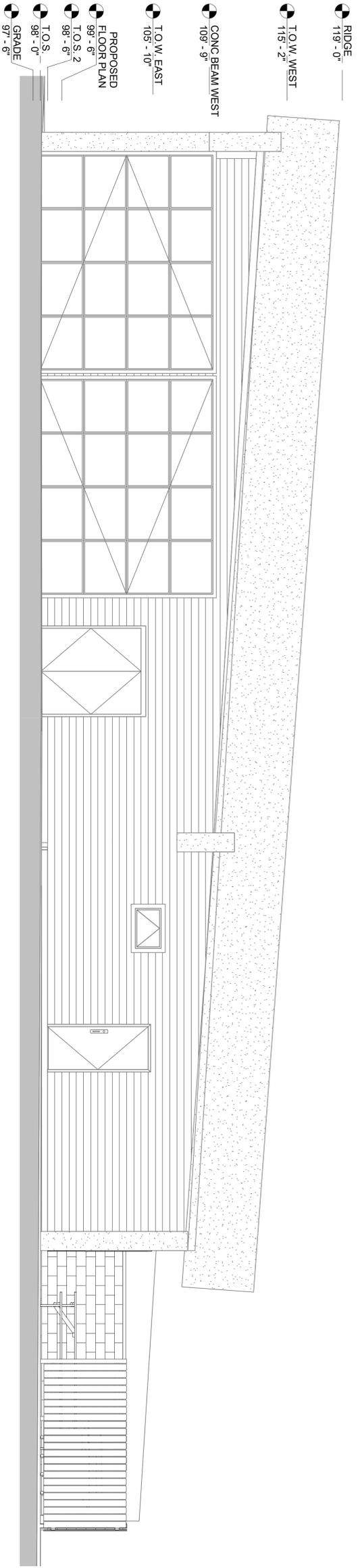
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1 PROPOSED NORTH ELEVATION  
1/4" = 1'-0"



2 PROPOSED SOUTH ELEVATION  
1/4" = 1'-0"





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REV: 001

PROJECT NAME:

RENOVATIONS TO THE MAIN STREET  
**SOUTH PORTLAND  
FIRE STATION**



360 MAIN STREET

SOUTH PORTLAND, MAINE 04106

/FILE

**EXTERIOR  
ELEVATIONS**

DATE: 25 OCT 2017

/CAL: 1/4" = 1'-0"

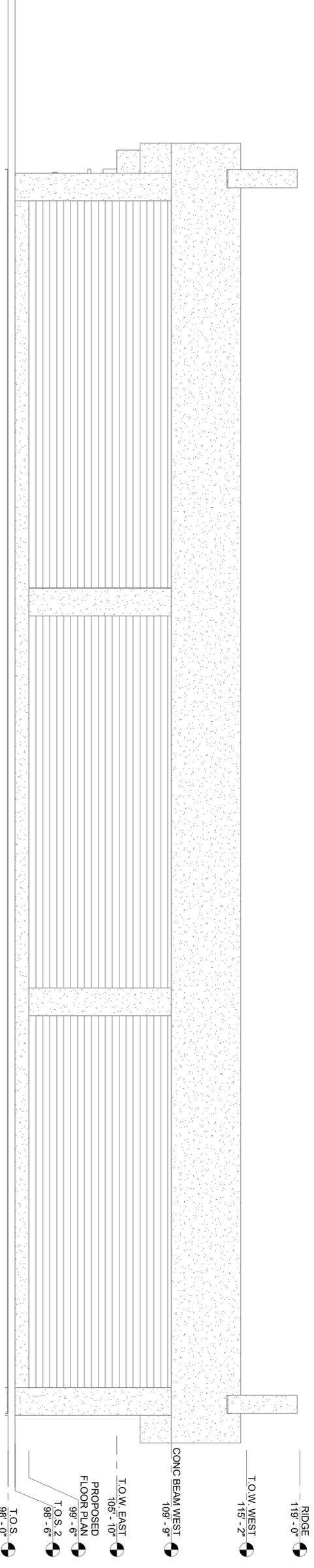
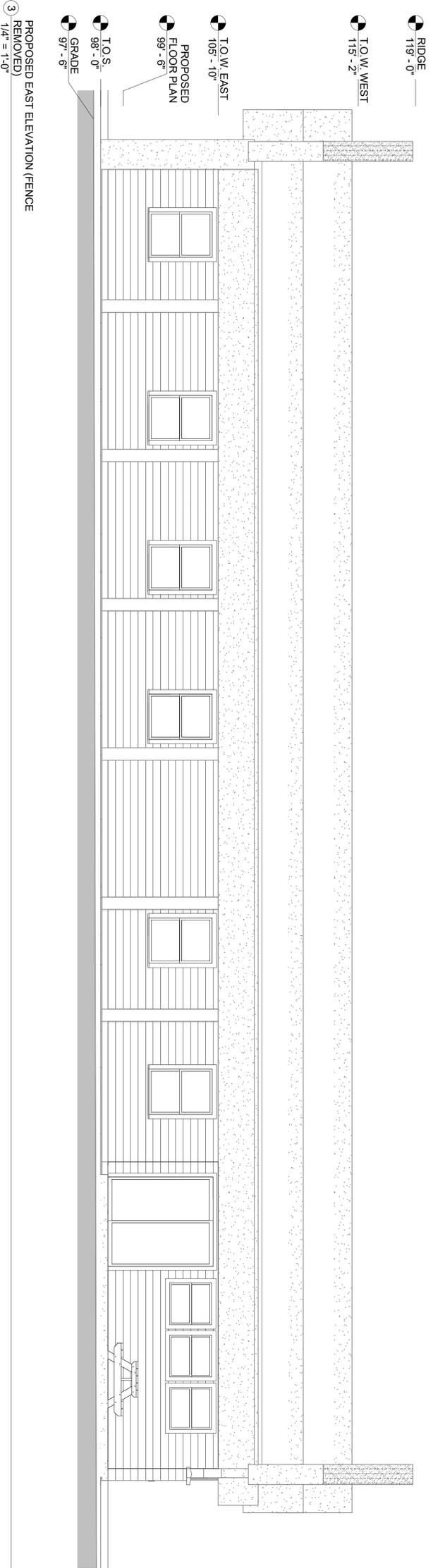
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**PUBLIC SAFETY**  
**Fire and Police Departments**  
**Computer Aided Dispatch (CAD) Upgrade**

As a partner in the Portland Regional Dispatch Center, a portion of the operating costs includes the dispatching software or CAD. This software handles all Police and Fire/EMS 911 calls for the three municipalities received in the dispatch center and then assigned the appropriate resources depending on location and emergency type. The current CAD used by both the Police and Fire Departments is starting to become obsolete, as well as, being difficult to integrate with the newer programs. This purchase will be split between Portland and South Portland Departments using the per capita formula. The anticipated total cost is \$2,000,000 with South Portland responsible for \$500,000, split between the Police and Fire Departments, over a two-year period.

Project Cost:	\$250,000FY19
Funding Source:	\$250,000 Fund Balance
Source of Cost Estimate:	Portland IT Department
Projected Useful Life:	10 years

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# **PUBLIC SAFETY**

## **Fire Department Replacement Ambulance**



The fire department maintains four ambulances in its fleet; two are front line and two reserved. With annual EMS calls of around 3,800 (as well as another 500+ fire calls) these units are very busy every year and require regular maintenance. When one of the primary units is out for maintenance one of the reserve units is moved up. Currently the department has a 2016, 2014, 2010, and 2006 units. Based on a 12-year life span, the 2006 unit is due for replacement this CIP year. This unit is the fourth unit and, due to its current condition, it is used very sparingly. The motor has been rebuilt at least once and is close to another rebuild. In the past, we have purchased ambulances on Portland Fire Department's bid and have been very happy with the three units we have purchased in this manner. Our intention is to bid this new vehicle in the same method.

Project Cost: \$290,000  
Funding Source: \$272,699 General Fund Reserves/Operating  
\$ 17,000 Fund Balance  
\$ 301 Prior Yrs' CIP

Source of Cost Estimate: Autotronics

Projected Useful Life: 12 years

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## **PUBLIC SAFETY**

### **Police Department**

#### **Mobile Computer Replacement**

Mobile Computer Replacement-Request is for four new replacement in-car tablet computers as we continue to replace our old laptops. The cost is \$20,470 with \$20,000 coming from Homeland Security grant funds.

Project Cost: \$20,470

Funding Source: \$20,000 Homeland Security Grant  
\$470 Fund Balance

Source of Cost Estimate: Patrol PC

Projected Useful Life: 5 years



MADE IN USA  
www.Patrol PC.com

Quote  
Date: 3/1/18  
Expiration 3/31/18

To: South Portland, ME PD  
30 Anthonie St South Portland, ME 04106  
Attn: John Benner

Rep	Job	Shipping Method	Shipping Terms	Delivery Date	Terms	Due Date
Ryan G		UPS	FOB North Attleboro		Net 30 Days	

Qty	Item #	Description	Unit Price	Line Total
4	RH-M1-I5-KV	PatrolPC® RhinoTab® M1 Core i Intel Generation 5 - (12.1" Sunlight Readable Display - 1200NITS+, Projected Capacitive Touch Screen, Core i5-5300U 5th Gen 2.3-2.7Ghz 3MB Cache, 2 core, HD5500 graphics, 2 USB 3.0, 2 Mini-PCIe half card slots, RhinoDock Value with 1 10/100/1G Ethernet, 4 USB 3.0, 4 RF Pass-Thru, 2 Ports for external power control and ignition sense, Internal Battery, Ambient Light Sensor, WiFi 802.11 2.45Ghz B/G/N/AC + Bluetooth, GPS, Front 2MP Camera, Rear 5MP Camera w/flash, dual digital microphones, TPM v2.0, stereo speakers)and Dock combination	\$ 3,699.00	\$ 14,796.00
<b>Tablet Add-ons / Upgrade</b>				
4	PPC-OS-WIN10-64	Windows 10 Pro 64 bit w/Win 10 Pro COA	\$ 209.00	\$ 836.00
4	RH-HD-SSD-240	240GB mSATA 6GB/sec SSD (Solid State Hard Drive) with computer purchase	NC	NC
4	RH-RAM-8GB	8GB RAM with computer purchase	NC	NC
4	RH-Han	RhinoTab side mount strap handle	\$ 30.00	\$ 120.00
4	RH-ISCAN	Internal 2D Law Enforcement Imaging Scanner	\$ 353.00	\$ 1,412.00
<b>Keyboard</b>				
4	KBA-BLTX-UCNNR-US	Rugged Backlit Keyboard - TG3 KBA-BLTX 82 Key Backlit Red Illuminated Keyboard with Touchpad/Coiled Cord - 3 year manufacturer's warranty	\$ 207.00	\$ 828.00
<b>Mount + Install</b>				
3	TM-5126-FIU-18-COMBO	ON-DASH MOUNT with Single Arm / Double Pivot and G.R.I.P. Tilt/Swivel for Display/Tablet and Keyboard Mount with Double Arm and G.R.I.P. Tilt/Swivel for FORD POLICE INTERCEPTOR UTILITY (Specify Year of Vehicle) (Must Provide Console Make and Model) (TM-5126-PIU/AP-5120-PPC)	\$ 537.00	\$ 1,611.00
1	TM-5502-TAH-2018	TABLET / MODULAR MOUNT with Double Telescopic Post for Display/Tablet and Keyboard including G.R.I.P. Tilt/Swivel for CHEVY TAHOE (2015+) (Specify Year of Vehicle) (Display Holder sold separately)	\$ 463.00	\$ 463.00
1	DH-PPC-Rhino-DS	Display Holder for PatrolPC® RhinoTab® Dock (7")	\$ 84.00	\$ 84.00
4	PPC-Ship-Mount	Common Carrier Ground Shipping for Mount	\$ 42.00	\$ 168.00

Quotation prepared by: Ryan Garofano

Unpaid balances accrue 1.5% interest per month



Thank you for your business!

344 John L Dietsch Blvd, Unit #2, North Attleboro, MA 02763 508-699-0458 FAX:508-699-2531

Total Discount	
Subtotal	\$ 20,318.00
Shipping Cost	\$ 152.00
<b>Total</b>	<b>\$ 20,470.00</b>

Printed Name: \_\_\_\_\_  
Rank: \_\_\_\_\_  
Date of Approval: \_\_\_\_\_

Will a matching purchase order be issued for this order

YES	NO

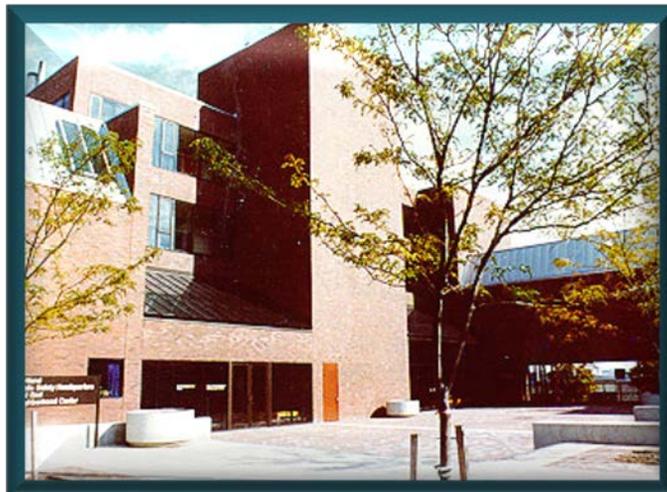
**PUBLIC SAFETY**  
**Police Department**  
**Regional Crime Lab**

On October 2, 2006 the City Council passed RESOLVE #2-07/08 joining the Metro Regional Coalition. This group, formed in April of 2006, consists of officials from several municipalities with the mission to study ways in which various municipal departments could be combined regionally as a cost savings measure, as well as provide improved services to the public.

One aspect of this undertaking was to research the creation of a regional crime lab. Since inception, member law enforcement agencies have worked collaboratively on this effort. Currently, Portland, Scarborough, Westbrook, Falmouth, Cape Elizabeth, Yarmouth, South Portland and Cumberland County share in this endeavor.

Each of the joining municipalities will pay a proportionate share (based on population) of the cost of renovations to the City of Portland's Public Safety building located at 109 Middle Street. South Portland's share was estimated at \$15,987 per year for 20 years, totaling \$319,740. Additionally, each municipality will contribute yearly for equipment purchase and replacement. South Portland's share was estimated at \$2,062 per year for 10 years, totaling \$20,620. The 2019 Capital Improvement Plan request is for \$13,955 to fund this project.

Project Cost: \$13,955  
Funding Source: Prior Years CIP Balance  
Source of Cost Estimate: Inter-local Agreement  
Projected Useful Life: 20 years



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**PUBLIC SAFETY**  
**Police Department**  
**Patrol Rifle Replacement**

Patrol Rifle Replacement-Request is for the replacement of the ten rifles that are carried in our patrol cars. We would expect the new rifles to be serviceable for 5-7 years. Each unit costs \$2,400 for a total of \$24,000.

Project Cost:	\$24,000
Funding Source:	Prior Yrs' CIP, Fund Balance
Source of Cost Estimate:	Ridgeline Outfitters, LLC
Projected Useful Life:	5 to 7 years

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# **PUBLIC SAFETY**

## **Police Department**

### **Digital Storage**

Request is to allow expansion of the department's video storage capability for body-worn and in-car video. At present, there is not enough storage room available to meet retention requirements. This \$24,000 purchase is expected to cover storage needs until FY/21.

Project Cost:	\$24,000
Funding Source:	Fund Balance
Source of Cost Estimate:	Staff
Projected Useful Life:	3 years

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