

Existing Conditions Report and Program Analysis
For The
Town Hall, Fire Department,
Police Department, and Department of Public Works



March 3, 2017



Prepared for:
Town of Carlisle
66 Westford Street
Carlisle, MA 01741

Prepared by:
TBA Architects, Inc.
43 Bradford Street
Concord, MA 01742



Town of Carlisle

Existing Conditions Report and Program Analysis for Town Hall, Fire Department, Police Department, and the Department of Public Works

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1. Acknowledgments

Project Name and Building Address:

Town of Carlisle Public Buildings Assessment and Capital Program Study
66 Westford St., Carlisle, MA 01741

Project Team:

Town Hall

Timothy Goddard – Town Administrator
Bill Risso – Selectman
Jon Metivier – Building Commissioner

66 Westford Street
Carlisle, MA
978-369-6136

Fire Department

David Flannery – Chief
Jonathan White – Deputy Chief

80 Westford Street
Carlisle, MA
978-369-1442

Police Department

John Fisher – Chief

41 Lowell Street
Carlisle, MA
978-369-1155
978-369-1818

Department of Public Works

Gary Davis - Superintendent

59 Morse Road
Carlisle, MA
978-369-6156

Architect – TBA Architects, Inc.

M. Russel Feldman, AIA, Principal
Robert Jefferies, Principal
Justin Humphreys, AIA, Principal

TBA Architects, Inc.
43 Bradford St. Suite 300
Concord, MA 01742

Report and construction cost estimates prepared by TBA Architects

Site Visits:

10/18/16 – Russel Feldman and Justin Humphreys of TBA met with representatives of DPW (10 am) and Town Hall (1 pm). Programming and existing conditions discussion were had with representatives. Both buildings were toured with notes and pictures taken to facilitate report preparation.

10/20/16 – Robert Jefferies and Justin Humphreys of TBA met with representatives of the Police Department (10 am) and the Fire Department (1 pm). Programming and existing conditions discussion were had with representatives. Both buildings were toured with notes and pictures taken to facilitate report preparation.

11/7/16 – TBA prepared a ‘Goals and Scopes’ memorandum for review by Town officials. This was reviewed and responded to in agreement on 11/28/16.

12/12/16 – Russel Feldman, Robert Jefferies and Justin Humphreys met with Messrs. Goddard and Rizzo, and Chiefs Flannery and Fisher to discuss the draft existing conditions findings and recommendations report.

12/14/16 – Robert Jefferies and Justin Humphreys visited all buildings to confirm site conditions.

12/21/16 – TBA submitted the Draft Existing Conditions and Program Analysis, dated 12/21/16

2/6/17 – Russel Feldman, Robert Jefferies and Justin Humphreys met with Messrs. Goddard, Rizzo and Metiever, Chief Flannery and Ms. Pricilla Stevens to discuss the submitted draft existing conditions findings and recommendations report and capital projects estimates.

TBA would like to thank the staff and administration for their patience and assistance during our visits.

2. Executive Summary

TBA Architects was engaged by the Town of Carlisle to review the existing conditions, consider program and accessibility deficiencies, and develop conceptual design options for the Town Hall, Fire Station, Police Station, and Department of Public Works. In Report Section 3, Each of the four buildings receives a **Summary** of findings and then details an analysis of the **Existing Conditions** of building systems, organized along the ten section Uniformat system, accompanied by **Treatment Recommendations** to remedy observed deficiencies; evaluation of the **Accessibility Conditions**; and a **Program Review**. Recommendations to remedy program deficiencies are illustrated in **Site and Building Plans** in Section 4. **Estimated Construction and Project Costs** are detailed in Section 5, with line items associated with each Treatment Recommendations. Project Priorities are assigned for each line item.

Town Hall

Town Hall is in fair to good condition overall. It is the newest of the four buildings studied and has had some recent upgrades in both systems and finishes. The lighting was upgraded to LED in 2016, boiler was replaced in 2013 and carpeting replaced in 2009. Other than that the building is as it was in 1997. Some exterior work is needed to stabilize the cladding and insulation. The mechanical delivery systems need replacement. Some of the doors need adjustment. Parking configuration and quantity is a concern.

While the building may have complied with accessibility requirements at the time of construction, there are some areas that need modification to comply with current regulations.

Programmatically, the building is of sufficient size for the functions. Storage was noted by staff as lacking, but it appears that with some reconfiguration and review of items to be saved that the need can be accommodated. Noise is a problem, especially in the open office of the second floor. This can be addressed by partitioning of departments and the creation of some private offices.

Fire Station

The station is as it was when it was built in 1983. Overall, the building is in fair to good condition owing to its basic construction. Some displacement of cast concrete has occurred and there is some expansion cracking at a few of the garage bay doors.

Underground fuel tanks, no longer allowed in their current location, require replacement with above ground type. Pumps and pumping station need to be upgraded along with this replacement.

The public areas of the building are not accessible and are required to be. Expansion and reconfiguration of the building is required to create an accessible parking space, path to the entry, main entry and gendered public bathrooms.

The department has outgrown the facility and the building no longer complies with regulations. The station has no women's locker or restroom facilities. Men's locker and restrooms are undersized for the 30 plus staff. Storage is needed along with space for changing into uniforms.

Police Station

As with other buildings, the Police Station is much as it was when it was constructed. The building is in good condition with some repair needed to cladding and trim, but it is localized. Finishes are all original and so show their age. Replacement of finishes are needed as they are well past their expected life.

The station's greatest deficiencies are in accessibility and program. As it is, the building is not accessible and is also unable to be accredited. Therefore it is not compliant with state regulations and requires expansion and reconfiguration to remedy.

There is no accessible parking space, the stairs, railing, and lift at the front entry do not comply with regulations. Use of the restroom by the public requires escort by staff as it is inside the secure perimeter. Restrooms are not gendered. Once inside the building, there is no elevator, so the basement and second floor cannot be utilized by anyone but able bodied staff. This may be allowed, but only by variance from the MAAB.

Programmatically, the station is crowded in almost all areas. The configuration of the sallyport, lockup, armory and secure perimeter does not meet state and national standards and therefore keep the department from being accredited. Again, expansion and reconfiguration are needed to address these issues.

Department of Public Works

The building is in poor to fair condition with signs of wear from great use, overcrowding, and outdated systems throughout. Slab and frame are sound and can be reused. The shell (roof and siding) is in poor condition and should be replaced.

The building is not fully accessible. Areas not used by the public could receive a variance from MAAB requirements however office area entries, doors and clearances at doorways all require modification. The restrooms are not currently accessible and would require expanding rooms and new fixtures to comply. Likely the second level would be required to be accessible.

Programmatically, many of the existing spaces are makeshift and not outfitted as they should be for all of the operations this department performs. There are many spaces that the department does not have as well. The structure is large enough in footprint to accommodate most of the improvements necessary to make a modern facility, though the addition of another vehicle bay is recommended to house all of the equipment in a more efficient manner. Additionally, the salt shed should be expanded. Staff estimates that 50% increase is needed. Expansion is easiest at either of the gable ends and would involve adding bays in a similar construction as exists. There appears to be some room on the site that would allow for this expansion without impacting current vehicle travel lanes.

Cost Estimates

Costs assume general construction contracts publicly procured under the provisions of MGL chapter 149, unadjusted for inflation. Total Estimated Construction Costs represent the cost of the work by each trade as received by a general contractor. The Estimated Project Cost is 150% of the Total Estimated Construction Cost to include the general contractor's costs of mobilization, general conditions, profit and overhead; as well as design and engineering fees, and soils and hazardous materials testing. This estimate does not include the costs of project management, furniture, fixtures and equipment (FF&E), temporary facilities or moving expenses if required to maintain operations during renovation.

Priorities are established based on considerations of life safety, building stabilization, regulatory requirements and standards, and program needs.

Priority 1: Work that should be performed immediately.

Priority 2: Highly recommended due to deferred maintenance but not required to address life or environmental safety, or building stabilization; work that addresses serious operating deficiencies or which is required to maintain approvals by regulators overseeing departmental operations.

Priority 3: Recommended to improve operations and/or site design.

Priority 4: Work that would improve operations and facility longevity or which addresses the impending end of product or equipment life cycles.

Priority 5: Work that may be required in the medium-term but which does not affect operations at this time.

Costs are rounded and this table may not sum precisely due to rounding errors.

	Estimated Const. Cost	Priority					
		1	2	3	4	5	
1	Town Hall	\$ 530,000	\$ 30,000	\$ 178,700	\$ 299,600	\$ -	\$ 21,300
2	Fire Station	\$ 1,695,000	\$ 85,600	\$ 1,552,100	\$ 43,100	\$ 2,600	\$ 11,100
3	Police Station	\$ 2,378,000	\$ 1,552,400	\$ 636,200	\$ 61,500	\$ 126,200	\$ 1,400
4	Public Works	\$ 1,647,000	\$ 456,700	\$ 236,300	\$ 953,900	\$ -	\$ -
	All Buildings	\$ 6,249,000	\$ 2,124,700	\$ 2,603,400	\$ 1,358,100	\$ 128,800	\$ 33,700
	Estimated Project Cost	\$ 9,373,500	\$ 3,187,050	\$ 3,905,100	\$ 2,037,150	\$ 193,200	\$ 50,550

3. Summary / Existing Conditions and Treatment Recommendations

- a. Town Hall**
- b. Fire Station**
- c. Police Station**
- d. Department of Public Works**

3a. Town Hall, 66 Westford Street

Summary

Description of Building: The Carlisle Town Hall is a two-story clapboard structure with a storage attic area above [photo 1]. It is of a traditional Colonial design, with gable roofs and a walled central balustrade area inspired by a “widow’s walk” to conceal mechanical systems. It was built in 1997.

Construction Materials

Exterior: foundations of reinforced poured-in-place concrete with a steel frame, infilled by 2x6 batt-insulated wood stud walls above. Exterior cladding is wood clapboard on sheathing, roof is asphalt and EPDM in the central mechanical area. Windows are double hung vinyl clad wood, double glazed units, doors are metal clad wood with metal frames.

Interior: major posts and beams are steel with wood floor decks supported by TJI wood members, roof structure are trusses with metal plate joinery assembled of dimension lumber. Floor surfaces are carpet, VCT and tile; drywall walls, drywall and lay-in tile with exposed grid ceilings, solid wood doors and metal frames.

Area: approx. 80’x 45’ on two levels, 7200 sf

Yard: bituminous paving and parking area and a second gravel parking area, concrete aprons and walkways, some granite curbing; vegetated site boundary, bordered by wetland and walking trails.

General Observations

- A. The substructure is not visible, but is assumed sound as there are no signs of differential settlement.
- B. The shell is in fair to good condition. The roofs are original to the building. The asphalt roof is in generally good condition given its age, the membrane system around the mechanical area requires further investigation but shows signs of failure. Siding has mildew and some signs of wear, areas appear to be damaged due to water infiltration. Windows show signs of failure and doors need some repair.
- C. The interior finishes are largely original to the building, with some carpet and paint updated in 2009.

- D. Building systems have been modified as follows: modifications to the boiler, building management controls and motion sensors performed in 2013, and LED lighting installed in 2016.
- E. Services
 - Elevators: One elevator serves both floors, no problems reported.
 - HVAC systems: Performance problems reported, particularly inadequate heat delivered to NE corner of lower level.
 - Plumbing systems: No problems reported.
 - Electrical equipment: No problems reported.
 - Fire safety and alarm: Alarm systems appear sufficient, no fire suppression except in vault area. See below.
- F. Furnishings and equipment were not subject to review.
- G. Special Construction was not subject to review.
- H. Site: asphalt pavement is satisfactory with some repair required; back parking lot unpaved and poorly configured, some vehicular/pedestrian conflict possible.

Accessibility

The Town Hall was designed to meet the access standards of the time of construction including stairs, elevators, bathrooms and public area access. While a substantial renovation could trigger modifications to the main stair and some corridors, no such work is envisioned.

Program

The building appears to be large enough for staff and storage functions. Reorganization of departments may allow better allocation of space to provide the required storage of records and equipment. Several staff require private offices who do not have them and the open plan as currently configured may reduce productivity. Reconfiguration and modern office furniture and equipment should achieve desired goals.

The existing HVAC roof top unit (RTU) is original to the building and should be replaced. Current performance reduces indoor air quality and discomfort due to cold temperatures. There may be saturation of wall and roof insulation which should be tested.

Site parking can be expanded and traffic improved to reduce pedestrian/vehicular conflicts.

Existing Conditions and Treatment Recommendations

What follows reflects our observations of the condition of the structure. Recommended treatments will follow as part of Task 4. Systems are organized in the ten section Unifomat system, per Commonwealth of Massachusetts standards.

A. SUBSTRUCTURE

A10 Foundations

A1010 Standard Foundations: No signs of abnormal settling were seen that would indicate that the foundations are not stable. It is assumed they are in good condition and functioning as designed. See

A20 Substructure

A2020 Substructure: The building is founded on reinforced concrete footings with twelve inch poured in place foundation walls with 1½ inch rigid insulation on the exterior, faced with a stippled board facing for 8-10 inches exposed above grade, so the subsurface condition cannot be observed. The lower floor level is a 5-inch slab on grade.

Treatment Recommendation: None required.

B. SHELL

B10 Superstructure

The building is classified as type VB, unprotected, combustible structure constructed of steel frame and wood stud walls with wood sheathing and siding, gypsum wall board finish at the interior. It also has an unprotected steel posts and beams, unprotected wood roof framing and HVAC deck framing.

B1010 Floor Construction:

Ground floor: 6-inch PIP concrete slab.

First floor: steel posts and beams, infilled with TJI manufactured wood joists supporting a plywood deck, stairs are wood framed.

Attic floor is framed similarly as the first floor, accessed by a pull-down metal stair, in satisfactory condition.

Treatment Recommendation: none required.

B1020 Roof Construction: The sloped roof sections are framed by dimensional lumber trusses with metal plate connectors [2]. The roof deck is plywood and is uninsulated. The flat roof area for the HVAC core could not be directly observed. Construction drawings indicate it is framed with LVL and TJI members stabilized with steel angles. During inspection the access path around the HVAC units, comprised of EPDM and walkway pads, was spongy underfoot [3]. No leaks were directly observed however the sponginess may indicate water penetration and possible saturation of rigid insulation.

The curved main entry portico is supported by wood columns and framed with nominal 2x wood joists with a flat roof deck and low parapet wall [4]. Rainwater drains through flashed scuppers.

Treatment Recommendation: Sponginess in EPDM indicates possible saturation of insulation under membrane. This should be tested for condition. EPDM roof material appears to be original to the building and is at approximately 75% of life cycle. It should be replaced in coordination with HVAC unit replacement to avoid additional spending in the near term (see D30 below for discussion). If water penetration is observed, tests may be needed to confirm structural integrity of supporting wood deck and structure. As part of replacement, additional insulation may be installed with the new roof membrane to achieve operating savings and bring building closer to current code requirements.

B20 Exterior Closure

B2010 Exterior Walls: Walls are constructed of nominal dimension 2x6-inch wood studs with batt insulation. Sheathing, siding and trim are wood. Fascia is observed to be rotted at several roof corners (NE at SW sides); mildew is observed along front; damage to SE side wall has resulted in trim replacement [5]. Trim is out of plane, possibly reflecting damage to sheathing and wall structure. Rusted nail heads are observed at NE corner, possibly indicating condensation and water penetration in wall [6]. This damage is observed in areas reporting inadequate heat on interior. Remains of numerous hornet nests are visible however active infestation cannot be verified.

Eave soffits and fascia along the building perimeter show signs of damage associated with backups at gutters, particularly at corners [7]. Soffits have continuous ventilation open to roof trusses.

Attic area appears to be ventilated through round louvers in the gable ends with contoured trim.

There is evidence of periodic repair on the NE side of the building where trim has been replaced. Some deflection of walls is observed, particularly on the second story central four window unit, which would appear to indicate moisture penetration and some deterioration of sheathing and possibly structural connections.

In addition, visible rust of nail heads is observed at the lower several feet of clapboard and trim on the exterior wall in the N/E corner of the building. This may possibly be related to water infiltration associated with the deflection and trim damage mentioned above.

A makeshift roof lean-to has been constructed to protect the building gas service, suggesting that the gutter system allows icicles to build up and threaten the equipment [8].

Door and Window Openings: Window and door heads and jambs are framed in wood, with windows and doors anchored directly into wood studs. Exterior trim is flat stock wood.

Treatment Recommendation: Test lower wall section for saturation and, if evidence is found, identify source of water infiltration. If damaged, remove siding, sheathing, insulation; replace, reflash and rebuild areas identified as water source.

Repair eaves, soffits, fascia where damaged, reset gutters.

Remove dislocated trim, repair sheathing and framing, reflash, reside.

Remove the gas service lean-to and replace with new enclosure, shingled and properly flashed to the wall.

B2020 Exterior Windows: Windows are double hung vinyl clad wood, double glazed units. Balances feel too weak and squeak. Seals are failing, locks are failing [9, 10]. Drafts are reported, as is difficult operation. Some flashing and trim has aged poorly and appears to be failing. See B2010 above for additional discussion.

Caulk: Caulking is drying, cracking and separating at locations around doors and windows.

Treatment Recommendation: Test for water saturation of insulation and interior wall materials along the 10 feet of rear and side walls in each direction from the NE corner of the building.

The windows are approaching the end of their serviceable life and do not achieve levels of energy or comfort performance that contemporary replacement units would provide. Properly flashed replacement units should be considered. Should replacement of windows be done in phases, we recommend performing all exterior repair (windows, wall repair and fascia repair) for the chosen façade at one time.

B2030 Exterior Doors: A pair of main entry doors are metal clad wood, observed to be out of alignment. ADA automatic operator and actuators work satisfactorily and no problems are reported. The door threshold allows some movement and the left door leaf sticks.

There is one rear steel service door with hollow metal frame leading out grade in the vicinity of the boiler enclosure. This door is sound with minor rust observed.

Treatment Recommendation: Entry door: rehang doors, lag new hinge bolts. Remove and reset threshold. Consider refinishing wood. Rear door: remove rust, prime and paint exterior

B3020 Roof Coverings: Sloped area is asphalt (original, approximately 20 years old) with a cold attic insulated with 10-inch batt in the attic floor. The roof runs warm and has been reported to result in ice dams during winter.

HVAC core area enclosure is a flat deck with EPDM and walk pads around equipment, discussed in B1020 above. Rigid insulation below is spongy, may be saturated.

B3020 Roof Openings: Roof access to HVAC area is via door from attic. Access to pitched roof areas is via ladder only.

Treatment Recommendation: Repair minor damage at valleys.

HVAC roof: remove membrane and insulation, replace with additional insulation; install new deck, membrane and walking surface, reflash up walls. Work to proceed with replacement of RTU, see below.

Paint: Paint system is generally good on all doors, frames, siding and trim except in areas of eave, soffit and window damage and where nail heads have rusted through, both conditions noted above. Mildew is also noted but does not appear to have resulted in damage as yet.

Treatment Recommendation: none required.

C. INTERIORS

C 10 Interior Construction

Drywall and wood stud framed partitions, and wood trim window walls and doors at office entries make up most of the interior of this building. In addition there is a concrete walled vault with steel vault door system on the building lower level, which is being independently assessed by others and is therefore not the subject of this review.

C20 Stairs

C2010 Stair Construction: The building has two stairs linking each floor. Both are wood framed, with wood treads and risers covered in rubber treat flooring. Stair #1 is ornamental and part of the main public entry [11]; stair #2 is unadorned, in its own corridor. Stair #1 has painted metal railings with a round oak handrail; stair #2 has wood handrails mounted directly to the wall with painted steel brackets. Rails are sound. While compliant with requirements in place at the time of construction, they no longer meet contemporary code or accessibility standards. Metal rails have 4.75 inches clear between balusters with the handrail at 33 inch height.

Treatment Recommendation: None required unless scope of total renovation would require modification of railing to meet current standards.

Interior doors: solid wood with metal frames, some with glazing. Fire doors are rated however we observe that they are chocked open, which compromises the fire separation. Doors have brass hardware including lever handles and are of

satisfactory width to meet ADA requirements. Condition generally satisfactory with some repair required at thresholds, particularly in bathrooms where doors are out of alignment and do not close, apparently due to hinges pulled from the door. Door closers also appear to have pulled out of metal frame mountings.

Several doors including those into bathrooms, the conference room, the selectmen's office and certain others are out of alignment and rub against the frame. Hinges should to be adjusted, possibly with additional lag screws into frame.

C 30 Interior Finishes

C3010 Wall Finishes: Interior walls are painted GWB and natural wood trim around doors and interior partition windows [12]. Glass in good condition. Fire separations are maintained.

Treatment Recommendation: No treatment required except as part of other projects.

C 3020 Floor Finishes

VCT: Closets have 12x12 VCT flooring.

Sheet vinyl: kitchenettes, some delamination observed at the base of the cabinets.

Carpet: throughout office areas, installed in 2009, in generally good condition.

Limited areas need replacement where worn.

Porcelain Tile: Bathrooms have porcelain ceramic tile that is in good condition and appear to date from the time of the buildings construction. Thresholds are marble at the doorways and at the transition to VCT in the men's locker area. Some movement around door frame. test

Quarry Tile: corridors and public areas, original to the building and in good condition.

Rubber: preformed stair treads, original to the building and are in good condition.

Concrete: boiler room, elevator machine room, vault and other utility spaces. Floors are intact.

Treatment Recommendation: Consider minor repair of kitchenette flooring. No other treatment required except as part of other projects.

C3030 Ceiling Finishes: 2x2 ACT in most spaces with drywall soffits. Finishes in good condition.

Treatment Recommendation: No treatment required except as part of other projects.

D. SERVICES

D10 Conveying

D1010 Elevators and Lifts: There is one elevator in the building. Maker label is obscured but the speed is indicated at 100 fps. The door is 35 inches wide and the cab is 6'-8" deep x 4'-3" long, suitable for stretcher operation.

D20 Existing Plumbing Systems

Presently, the Plumbing Systems serving the building are cold water, hot water, sanitary, waste and vent systems, and natural gas. The building is serviced by Town well water and an on-site septic sewer systems.

D2010 Plumbing Fixtures: Plumbing fixtures generally are in good condition. The water closets are vitreous china floor, standard 1.6 gallon tank flush. All are in working order with no complaints from staff. Lavatories are vitreous china mounted in laminated counters with exposed drain and supply piping. Faucets are chrome hot and cold knob type and single spigot.

Each of two kitchenette areas have sinks, undercounter refrigerators, and base and overhead cabinets and laminated countertops. They are in fair condition. Sink or counters do not meet accessibility requirements. There is a separate service sink on the second floor. All in fair condition.

D2020 Domestic Water Distribution: The water supply service, distribution and waste piping were not observed in detail on our visit. No problems reported.

Water supplied from the well water supply system is held in a storage tank located at the back of the building. Rust is observed at the bottom of the tank but no problems reported.

D2030 Domestic Waste Water System: Building water waste is via an on-site leaching pit and was not inspected. The Town reports that the system is Title 5 compliant and is serviced regularly. There is a septic pump alarm in the first floor custodial closet. Toilets and valves show staining on the valves and on the floors.

D2040 Rain Water Drainage: Rainwater is collected at the perimeter of the building via aluminum gutters and diverted underground via aluminum downspouts, leaders and shoes. No surface flooding is reported.

D2090 Other Plumbing Systems (Natural Gas): The building is serviced by natural gas. The gas meter is located at the north elevation on the northwest corner of the building, adjacent to the locker room and air handling unit. Gas is supplied to the HVAC unit, unit heaters at the garage bays and domestic water heater. The gas piping is steel pipe with screwed joints. A makeshift cover protects the gas meter from ice falls from the roof above, see above.

Treatment Recommendation: Inspect water storage tank to assure integrity.

D30 Heating Ventilating and Air Conditioning (HVAC)

D3020 Heat Generating System: gas fired condensing boiler 2013 located in exterior structure, exposed supply pipes on exterior of building. Equipment appears to be running satisfactorily. Distribution: forced air with VAV in each room, ducted returns. Heat delivery is not satisfactory in all areas of the building. Concern with cold areas in lower floor, with 20 degree differences between floor and desk temperatures reported in the NE corner of the building. Concern that VAV water runs cool at the “end of the line” air temperature is reported set at 70 degrees to compensate for poor comfort.

Hot water supply to VAV units provided through two pumps to different areas. Reported that pumps are not properly sized, requiring frequent manual remedy. Operator recommends adjustment or replacement of pumps.

Mechanical Room: roof top unit is Carrier equipment, original to building. RTU only source of fresh air, dampered down to 2% which is inadequate. Ongoing monitoring of CO² to assure indoor air quality (IAQ), reported to be running at 400-600 ppm, which ASHRAE considers to be within acceptable levels.

Ventilation: janitor's room ventilation fan is nonfunctioning.

Automatic Temperature Control: Building has a Schneider Building Management System (BMS) installed in 2013. There are reported to be difficulties integrating the 20 year old RTU with the BMS.

HVAC Treatment Recommendation: Install a new HVAC RTU unit, integrate with existing DDC controls. Provide ERV systems to accommodate adequate fresh air without undue thermal loss. Coordinate replacement with membrane roof replacement (B3020 above).

Replace Janitor's Room ventilation fan.

D40 Existing Fire Protection Systems

D4020 Standpipes: There is no fire sprinkler system. There is a Simplex series 4020 fire alarm control system installed in 2013 and which functions satisfactorily.

D50 Electrical

The building has a Siemens 250 A service, panel has room for additional circuits

D5010 Electrical Distribution System: Existing service is original to the building. No problems reported.

D5020 LIGHTING AND BRANCH WIRING

D5021 Branch Wiring: Existing service is original to the building. No problems reported.

D5022 Lighting: all ceiling mounted LED lighting installed in 2016. No problems reported.

D5030 COMMUNICATIONS AND SECURITY

D5032 Security System: Keyed building security, no card readers. No concerns expressed.

D5033 Telephone System: The building is served by a fiber optic cable and was not inspected. No problems reported.

Computer room: server is in Janitor's closet, equipment to be moved to School Department linked by fiber optic system. Limited racked server systems and BMS will remain in Town Hall. Inadequate A/C delivered via a portable unit in room appears to be inadequate for the current equipment load. Load may reduce after relocation. Presence of electrical equipment in server room is noted, which is not optimal.

D5037 Fire Alarm: There is a Simplex series 4020 fire alarm control system installed in 2013 and which functions satisfactorily. Locations of fire and smoke alarms appears to be compliant although it was not inspected in detail.

D5090 OTHER ELECTRICAL SYSTEMS

D5092 Emergency Lighting: Emergency lighting was not reviewed, but appears generally compliant.

Treatment Recommendation: No modifications are required except in relation to other projects.

E. Equipment and Furnishings

Not reviewed except in relation to program issues, below.

F. Special Construction and Demolition

Not Reviewed

G. Building Sitework

G20 Site Improvements

Water/Wastewater

Water supplied from Town well, no problems reported.

Wastewater is delivered to a septic tank, no problems reported.

Public trail head at rear parking lot with narrow access to rear lot.

Pedestrian/vehicular conflicts reported between lots and also at Town Hall entry, where perpendicular parking has limited visual access to vehicles approaching along driveway from street.

G2030 Surfacing and Exterior Steps:

Parking: paved front lot, gravel/soil in rear lot.

Treatment Recommendation:

Possible reconfiguration of rear parking lot to better direct traffic.

Increase capacity of rear lot to create additional capacity on site or, alternatively, reduce spaces opposite main building entry to provide for accessible parking only.

Consider open-web unitized paving in rear lot to maintain site drainage, naturalize appearance and provide for striping.

4. Existing Conditions Photographs



1. Town Hall Front Approach



2. Attic Framing



3. HVAC Roof Area



4. Entry Portico



5. Trim replacement under upper floor, between 4 window units (not visible)



6. Rusted nail heads at building NE corner, lower level.



7. Fascia damage at corner



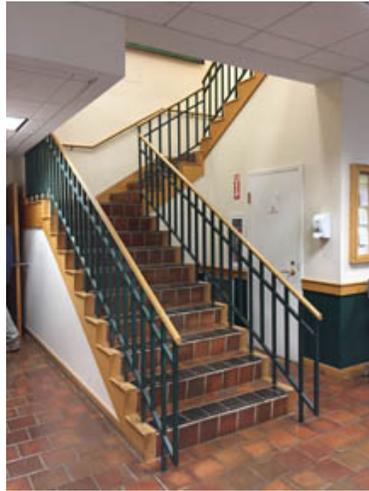
8. Gas meter, makeshift shed



9. Window condition



10. Window condition



11. Stair #1 at Main Entry



12. Typical finishes in public areas

Accessibility Conditions

The Town Hall was designed to meet the access standards of the time of construction including stairs, elevators, bathrooms and public area access.

Since the time of original construction, standards have changed relative to certain requirements however as an existing structure it is deemed compliant. Per the provisions of 521 CMR 3.3 for existing buildings, modifications to existing systems may be required when alterations:

1. exceed 30% of the full and fair cash value of the building; or
2. are in excess of \$500,000; or
3. when exempted work (e.g. electrical, mechanical and window replacement) is part of a larger project including nonexempt work; or
4. if the work is considered technically infeasible.

Entrance: front door systems are dimensionally and operationally adequate but need repair. Doors require alignment adjustment for fully satisfactory operation.

Stairs: Stair rails: While compliant with requirements in place at the time of construction, they no longer meet contemporary accessibility standards for level extensions beyond bottom tread, height from nosing to top of rail, and baluster (guard) spacing.

Elevator: One elevator provides access to all floors. Elevator dimensions meet current accessibility standards.

Program Review

Storage

Certain departments reported a lack of available storage space. However, it is reported that the total staff occupancy of the building is between 20 and 25 Full Time Employees, or between 288 and 360 square feet per employee. A detailed analysis of the storage requirements of each department is beyond the scope of this study however we observe that this occupancy concentration is within normal parameters of office operations. Our preliminary analysis is that sufficient storage space can be achieved by judicious reduction of obsolete or unused records, careful allocation of storage equipment and facilities.

Office Noise

Noise and distractions are reported as a problem in the open office areas. Physical privacy is required for the Town Accountant, with aural separation from the Town Clerk who works with members of the public. Privacy can be achieved with limited partition reconfiguration and reconfiguration of interior office areas, possibly through purchase of mid-height open-office partition systems. Town staff have stated that isolation of departments is a priority over individual offices. Reconfiguration of departments for better service should be considered as part of any plan to add partitions.

Indoor Air Quality

Poor levels of fresh air are reported. Performance deficiencies of the existing HVAC rooftop unit has led building operators to reduce fresh air supply down to 2%, which is below code standards. Additionally, the existing HVAC system is unable to integrate with the Building Management System, reducing performance and comfort. We therefore recommend replacement of the existing unit with a new, high performance system that will accommodate current IAQ standards and improve comfort and energy performance.

Site

The rear parking lot, which serves both the Town Hall and local walking trails, does not circulate well and is reported to be too small. Further, pedestrian/vehicular conflicts are reported at the main entrance of Town Hall, where vehicles parked across the access drive have poor visibility to incoming vehicles, and at the connection between the front (paved) and rear (unpaved) parking lots, where drivers backing into/out of spaces conflict with pedestrians heading up hill to the Town Hall. Reconfiguration of the rear lot can improve vehicular circulation to reduce pedestrian conflict in the parking lot area.

Initial analysis indicates a possible increase of approximately 12 spaces by expanding parking area, remaining within wetlands boundaries indicated on original plans. Some of this increased capacity can be used to offset non-accessible spaces to reduce conflict at the main entry.

3b. Fire Station, 80 Westford Street

Summary

The Carlisle Fire Station was designed in 1983 and completed in 1985. The building is a steel and masonry bearing structure of approximately 6,300 square feet, type IIB construction. Other than the creation and enclosure of a kitchen/break room on the first level within the envelope, the building is as built over 30 years ago. Several functions are housed in this mezzanine style garaging building with administrative function on the upper level mezzanine and fire and ambulance vehicles, equipment utility, storage and personnel functions on the first level. All spaces can be accessed by the staff internally with the equipment bays and break room linked by communicating stair between the operations and administration functions.

The building is in fair to good condition with signs of wear from 30 years of use, under programming for necessary uses, and systems at the end of their lifecycles.

We inspected the exterior visually from the ground levels; the interior was inspected visually top to bottom; and, the roof from the ground level. This description of existing conditions is based on the Uniformat Outline system for describing building assemblies. The following summary is based on that outline.

General Observations

- A. The substructure is not visible, but is assumed sound as there are no signs of differential settlement. There is a crack visible at the front basement wall likely due to corrosion of a reinforcing bar.
- B. The shell is in fair to good condition. Concrete block is in good condition with few areas with chips, displacement or cracking. Mortar at concrete block and brick areas are in good condition. Precast architectural stone banding indicates past remedial work to repoint areas of movement. Brick piers on the east façade have crack failures at the base. This cracking does not appear on the west façade. Condition requires destructive testing to determine extent and precise cause of failure.

Windows are thermally broken aluminum frames with insulating glass that are replacement windows. They are some 13 years old and approximately

halfway through their lifecycle. The EPDM membrane roof does not indicate failure but is at the end of its lifecycle. The interior has had minor reconfigurations over the years and the finishes throughout date to their original construction. They are tired and worn from years of regular use.

C. Services

- Elevators: No elevator exists.
- HVAC systems: See below for details. The boiler and distribution systems are at the end of their lifecycle as are the unit gas heaters present in the equipment bays. The RTU is undersized and needs to be replaced. The vehicle exhaust removal system is in good conditions and fully functional.
- Plumbing systems: See below for details. The station needs handicap facilities, a female locker room and upgraded existing fixtures.
- Electrical equipment: See below for details. The panels require replacement as they are Federal Pacific. The lighting should be upgraded to LED.
- Fire safety and alarm: See below for details. The present system is analog and not addressable. The system should be upgraded with an addressable panel and would need to be in an expansion scenario.

D. Furnishings and equipment were not subject to review but are commented under the program section of this report.

E. Special Construction was not subject to review.

F. Site Work was observed adjacent to the building. The pavement is in disrepair and edges are not well defined. The brick paving of the main entry walk is in disrepair and is not accessible. The entry stair is in fair condition but is not accessible. Small retaining walls require rebuilding. The underground fuel tanks and pumps should be removed and replaced with new pumps and above ground tanks.

Accessibility

The building is not handicap accessible and is not required to be so for staff if a waiver is obtained from the Massachusetts Architectural Access Board (MAAB) but is

required to be fully accessible to the public for a restroom, administrative offices and the community meeting room.

Program

Every square foot of the fire station is utilized for a multitude of functions. More space is needed in the vehicle bays, the training room is too small for the full staff, a women's locker and restroom is non-existent, and administrative space is at such a shortage that an auxiliary trailer is planned to house staff. Included below is a discussion of the shortfalls and potential solutions to ease overcrowding and to achieve accessibility.

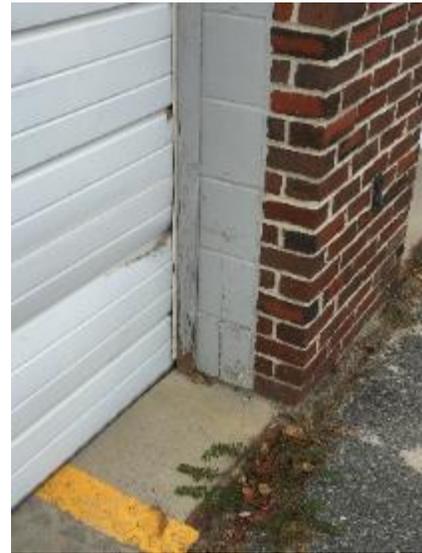
Existing Conditions and Treatment Recommendations

What follows reflects our observations of the condition of the structure and recommended treatments organized in the ten section Unifomat system, per Commonwealth of Massachusetts standards.

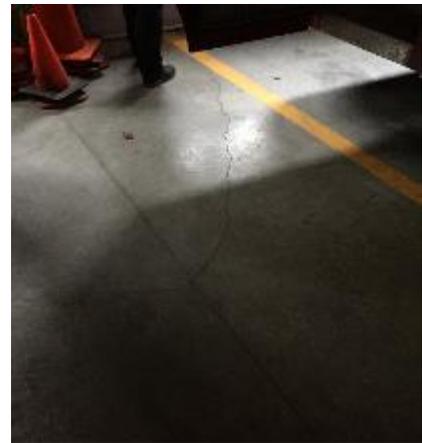
A. SUBSTRUCTURE

A10 Foundations

A1010 Standard Foundations: Visible areas of the foundation at the exterior indicate some localized shear failures. Base of brick and block wall systems adjacent to overhead door openings also reveal localized shear failures in the block. It is assumed foundations are fundamentally sound with the minor cracking or settlement failures observed not affecting the basic load carrying capacities of the overall structure.



A 1030 Slab on Grade: The lower level floors are 6" thick slab on grade reinforced with WWF (welded wire fabric) 6-6 x 10 /10. Concrete slab floors in the garage bays, utility rooms and storage areas are in fair to good condition with expected wear and cracking. Slab cracking follows a diagonal line from garage bay doors inward to original control joints. The cracking appears to be the result of the lack of a thermal break between the floor slab and the exterior apron as well as the heavy loads imposed by newer equipment at the apron and entry section of the slab. Concrete slab is under various floor finishes, from sealer in the equipment bays and vinyl sheet in the locker room and kitchen. There are no signs of unexpected deterioration in areas covered by sheet vinyl floors, so those slabs areas are assumed in fair to good condition as well.



A20 Substructure

A2020 Substructure – Basement Construction. The South (Front) Elevation is the only portion of the fire station that is built into the ground. The basement wall is a 1'1" thick reinforced concrete wall insulated with 2" of Styrofoam insulation. A significant thermal bridging occurs between the top of the basement wall and the exterior brick and block wall system above where there is no insulation present. The wall appears to be in good condition except at the corner where a shear failure was observed. Failure appears to be due to corrosion around the exposed reinforcing bar (clearly visible). Condition is considered minor but requires repair.



B. SHELL

B10 Superstructure

The building is classified as type IIB, unprotected, non-combustible structure constructed of masonry bearing exterior walls with painted CMU block finish at the interior habitable areas and unpainted concrete block at non-habitable areas, unprotected steel joist floor (second level) and roof framing and concrete slab floors at second level.

B1010 Floor Construction: The second level floor is supported by steel bar joist bearing on exterior and interior bearing walls and steel header beams. The bar joists support a metal deck with 3" thick concrete slab. This slab is covered by various floor finishes, quarry tile at the entrance and restroom and carpeting in the main office and community room. There are no signs of unexpected deterioration in areas covered by finish floors, so those slabs areas are assumed in fair to good condition as well. All components of the floor construction are in sound condition.

Treatment Recommendations

There is no visible displacement of slab areas across cracks and no treatment is recommended at this point.

B1020 Roof Construction: Steel bar joist and metal roof deck are in good condition, all visible from the interior. The roof is a flat roof structurally pitched 8” from the South façade to drain at the North side via three (3) scuppers and downspouts.

Treatment Recommendation:

Redesign the roof drainage to underground discharge system to prevent surface flow and resultant icing issues.

B20 Exterior Closure

B2010 Exterior Walls: The walls are constructed of brick, precast architectural stone banding and window sills, and CMU block. All brick and precast stone are exposed, CMU block walls are painted.

Mortar type is likely Type S in standard joints by appearance and because the walls are load bearing, CMU joints are not exposed to view as they are painted and cannot be confirmed by sight. The exterior walls are in good condition with only minor repair and repointing required at this time at the base of masonry piers at the east elevation. The precast artificial stone band extends on three sides, not at the rear elevation. The precast stone banding has been repointed at vertical joints in several locations with repointing work sound. All exposed CMU block are painted. The paint is in fair condition.

Door and Window Openings: Door and Overhead Door heads are constructed of steel lintels. The four windows on the South façade and two windows on the West façade do not appear to have any lintel support and rely upon spanning or cantilever sections of precast concrete artificial stone. The sections have displaced marginally and the joints of these cantilever sections have been repaired and repointed. The lack of support has allowed for some displacement.

All of the steel lintels, where they exist, appear to be painted and are in good condition without excessive rust.

Treatment Recommendation: None

B2010 Exterior Walls: Walls are in good condition with the exception of the basement wall at front eastern corner where spalling has occurred and at the masonry piers at the eastern façade.

1. The spalling at the front of the basement wall appears to be the result of corrosion of the reinforcing rod that was left exposed. (See paragraph A2020 above)
2. The base blocks of the masonry piers have cracked at each pier location. This condition does not exist on the western façade. It appears that a combination of thermal stress and loading stress contributed to the failures. Destructive investigation is required to determine the extent of the failure and best remedy.
3. Wood stop trim at the overhead doors has deteriorated especially at the bottom sections.



B2020 Exterior Windows: Windows are thermally broken aluminum frame and sash with double glazing and date from circa 2006. Operation was not checked in all locations, but the casement operation worked in the community room.

Treatment Recommendation: None

B2030 Exterior Doors: The man-doors are steel with hollow metal frames and vision panels. All are painted. Frames appear to be welded and grouted in place. Door hardware is fair to good, all being operational. All exterior man-doors swing to the exterior with one from the short bay area east elevation, one from the rack area of the north equipment bay, and one from the west side at the utility room area. All operate smoothly and closed. Light rust on frames was apparent especially at the east side.

The main entry door with sidelights at the second level South façade is single glazed aluminum with full vision panels and side lights. Door is fully functional and hardware is in good condition.

There are seven (7) insulated overhead doors all 14'0" x 14'0". There are four vision panels in each door. Seals have failed in these insulating glass panels and they are fogged by moisture.. All of the doors are motorized. Doors are in good condition, with panel replacements as required in the past. There are no reports of malfunction. The door seals have failed in most locations



Treatment Recommendation:

1. Main entry aluminum entry door and sidelights are single glazed. The lobby area is utilized for office work and as such the single glazed entry door system should be replaced with a thermally broken insulated glass system which will increase comfort levels at the lobby.
2. The wood stop trim at overhead door jambs require replacement.
3. Paint the exposed concrete block wall at rear façade.
4. Replace all failed overhead door seals and glazed panels.
5. Investigate the crack failures at the base of masonry piers.

B3020 Roof Coverings: The roof is a flat roof structurally pitched 8" from the South façade to drain at the North side via three (3) scuppers and downspouts.

The ballasted EPDM membrane roof appears in good condition and covers 2" thick insulation board for an estimated R value of 10. Based on its age of some 11 years it is at the mid-point of its life cycle.

Aluminum fascia and gravel stop surround the perimeter of the building and are sound and in good condition. Scuppers and downspouts are aluminum. Scuppers are in good condition at the north elevation. Downspouts are in fair condition with sections replaced in a few locations. All discharge by elbow at the base of the wall to surface flow at the rear paved lot.

B3020 Roof Openings: Roof access is via ladder only. There are various ventilation hoods and other mechanical and plumbing penetrations. All of the flashing, curbs

and boots appear in working condition as observed from the ground and based on no reported leak issues.

Treatment Recommendation: None required

Caulk: Caulking is drying, cracking and separating at locations around doors and windows.

Treatment Recommendation:

The caulking should be removed and replaced with a multi-part polyurethane or a single component silicone suitable for masonry to metal adhesion and seal.

Paint: Paint system is fair to good on all doors, frames and overhead doors. The exterior wall paint has failed and is peeling at rear wall in fair condition.

Treatment Recommendation:

Scrape and remove all loose and flaking paint at the exterior wall and trim. Remove all loose paint at door frames and doors. Scraping, priming with oil base primer and two coats of gloss paint for the door frame and door. Finish coats of enamel formulated to be compatible with and made by the same manufacturer of the primer.

C. INTERIORS

C 10 Interior Construction

CMU 8" block partitions make up the interior of this building. All appear to be sound in construction while showing some years of use.

Newer stud and drywall partition enclosing the kitchen/breakroom is in good condition. Door with vision panel, door hardware and interior lite in partition are in good condition

Treatment Recommendation: See finishes below.

C20 Stairs

C2010 Stair Construction: A single flight of stairs exists in the garage and traverse the 10'-0" floor to floor elevation between the administration second level and the first level equipment bays. Stairs are poured in place concrete and are in good condition while showing years of use. The treads and risers are **not** within current code required dimensions at 10 1/2" and 7 25/32" respectively nor was the tread

depth in compliance with the 4th edition of the Massachusetts Building code in effect at time of construction.

Treatment Recommendation:

None required as a built condition. Any expansion of the facility should include safety upgrade of the stair to modern standard of 7" riser and 11" tread.

C2014 Stair Handrails and Balustrades: Handrails at the interior stair are code compliant.

Treatment Recommendation:

None required. New Handrails and guardrails should be fashioned for replacement stair.

C 30 Interior Finishes

C3010 Wall Finishes: Interior walls are raw concrete block in the garage; a mix of painted concrete block and drywall at the breakroom/kitchen and mechanical rooms; and CMU block in administration areas. Most paint is intact but shows its age. Many of the walls are impossible to inspect due to the copious amount furniture, equipment and materials that this building is required to house. The restrooms have a wainscot of tile on the walls that is worn from use but is intact and functioning. Wall base, where visible, is worn and in poor to fair condition.

Treatment Recommendation:

Repaint all painted walls. Check the grout and repair as required at all tiled areas. Replace all vinyl base.

C 3020 Floor Finishes.

Sheet Vinyl: The break room/kitchen, locker and men's room sheet vinyl flooring. All areas are subjected to heavy traffic in a small area leading to excessive wear. Hazardous materials testing has not been performed and no destructive investigation was conducted.

Carpeting: Carpet broadloom is used in the mezzanine level meeting room and chief's office. It is fair to poor condition and is at the end of its useful life.

Quarry Tile: Mezzanine level restroom and lobby have quarry tile that is in good condition and appear to date from the time of the buildings construction.

Quarry tile at lobby and public restroom is in good condition

Thresholds are vinyl transition strips at the doorways and at the transition to sheet vinyl in the men's locker area.

Concrete: Garage bays, storage room and utility rooms have exposed, unfinished concrete surfaces that are in good condition with staining but minimal cracking.

Treatment Recommendation:

Flooring consisting of carpeting at chief's office and the meeting room should be replaced and consideration should be given to a more durable carpet. Sheet vinyl at the locker room and the kitchen/breakroom is in fair condition. It is near the end of its lifecycle and should be replaced. Replacement with more durable solid rubber flooring is recommended.

C3030 Ceiling Finishes: There are no ceilings in the high bays, or at first level beneath mezzanine at utility room and storage rooms. The painted exposed metal decking is in good condition. Lighting fixtures are surface mounted or suspended from the ceilings in the high bays and non-finished rooms under the mezzanine floor.

Four by two lay in tile ceilings with exposed T-grid are found in the administration rooms on the second level, second level meeting room, lobby, restroom and chief's office. These Acoustical Tile Ceilings (ACT) are in fair condition. The ACT ceilings also exist at the Locker Room, Kitchen/breakroom and are in similar condition. The tiles are in fair condition showing signs of their age including yellowing, staining from ventilation registers and displacement in some tiles. Garage bays have no ceilings; undersides of painted metal decks are exposed to view.

Treatment Recommendation:

ACT ceilings should be replaced when lighting is upgraded. 2 x 2 tegular ceilings are recommended at the office and meeting room, 2 x 4 lay-in ceilings with high moisture and mold resistance are recommended at the locker room and kitchen/breakroom.

D. SERVICES

D10 Conveying

D1010 Elevators and Lifts: There are no elevators or lifts in the building.

Treatment Recommendation:

Solution to the lack of barrier free accessibility to the main entry may entail a wheelchair lift as the present exterior stair and lack of accessible path or ramp from the parking lot is a violation of the Barriers Board requirements.

D20 Existing Plumbing Systems

Presently, the Plumbing Systems serving the building are cold water, hot water, sanitary waste and vent systems, and natural gas. The building is serviced by well water and a septic system.

D2010 Plumbing Fixtures:

Plumbing fixtures generally are in fair condition. The water closets are vitreous china wall mounted, two-piece tank type and standard 2+ gallon flush. All are in working order with no complaints from staff. Lavatories are vitreous china wall mounted with exposed drain and supply piping. Faucets are chrome hot and cold paddle type at public restroom and single lever and single spigot at Locker Room. None of the fixtures are handicap accessible.

Locker room showers are a site fabricated built concrete block surround with pressure balanced mixing shower valve. Showers do not meet accessibility code requirements as size is inadequate. This is not required to comply with MAAB as is for staff use only.

Break room kitchen area has a stainless double bowl drop in sink and a gooseneck faucet with single lever faucet. It is in fair condition. Sink does not meet accessibility requirements, nor is it required to be under MAAB for staff use only if a waiver is obtained from the Barriers Board.

There is no other service or slop sink in the facility. There is a kitchen style sink in a counter in the ambulance bay.

Treatment Recommendations: Install slop sink at main level to replace kitchen style sink. Replace water closets with low flow type. Rebuild the public toilet room to meet accessibility requirements. This work should be part of a building expansion if planned.

D2020 Domestic Water Distribution

The water supply service, distribution and waste piping were not observed in detail on our visit. Most waste piping is beneath the slab and exits either at the rear of the building according to the Plumbing Plan or at the front of the east façade according to the site plan. The water main shutoff and is located in the southwest corner of the utility room.

Domestic hot water is generated through a Slate tank type gas-fired water heater located in the building mechanical room. The heater has a maximum input of 120,000 btuh and 75 gallons of storage. The age of the heater is 13 years on an original 6 year warranty. It is vented in combination with the boiler through the membrane roof above via double wall B vent stack that extends above the roof. There was no thermostatic mixing valve observed.

D2040 Rain Water Drainage

Rainwater is collected at the rear of the building via aluminum scuppers through the gravel stop and connected to three downspouts that flow onto the paved area at the rear of the building, and delivered to underground tanks via five aluminum downspouts.

D2090 Other Plumbing Systems (Natural Gas):

The building is serviced by a 2 ½" natural gas service. The gas meter is located at the south side of the west elevation. Gas is supplied to the water heater, boiler and unit heaters at the garage bays. The gas piping is black iron pipe with screwed joints hung from roof deck.

Treatment Recommendations:

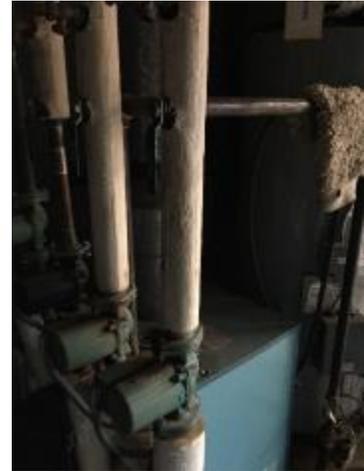
Renovate existing public toilet room to meet ADA/MAAB requirements and water conservation mandates. Install separate facilities for the public and staff. Install thermostatic mixing valve at domestic water heater to prevent scalding if not already present. The gas service would need to be reviewed further for an expansion of the facility.

D30 Heating Ventilating and Air Conditioning (HVAC)

D3020 Heat Generating System: The existing heating system comprises gas fired unit heaters at high bay garage areas and a gas fired boiler and hydronic heating

system for the locker room, kitchen/breakroom. There are exhausts which are located in the locker room and the public restroom.

Mechanical Room: The heating plant consists of one (1) gas fired Burnham Model #CF125 boiler original to the building in 1983. The boiler supports four zones via circulator pumps. Zone one supplies heat via unit heater to the locker room and baseboard fin tube to the locker restroom. Zones two and three supply the upper level administrative functions. The entire system is at the end of expected life.



Automatic Temperature Control: Automatic temperature controls for the entire building are controlled via thermostats. Equipment bays have four thermostats controlling four gas fired unit heaters and four stratification fans. All gas piping is fed down from the ceiling. Honeywell thermostats are not programmable and are not connected to a building management system.

Operations and Administration Space: Heating only is supplied by baseboard fin tube via two zones; zone two supplies the lobby, public restroom and Chiefs office and zone 3 supplies the meeting room only.

Ventilation is provided by the exhaust fans in the public restroom and the locker room with roof mounted exhaust fans.

Air Conditioning: The training/meeting room has a RTU which is undersized and does not meet cooling needs for training use.

Garage: Heat is provided by gas fired unit heaters with heating elements suspended below the underside of the structure two on the west side evenly divided between the four doors and two on the east side covering the three doors and the utility room. Ventilation is both by natural means (opening doors and windows) and by mechanical means via two restroom exhaust fans directly vented through the roof. Penetrations through the wall to the breakroom and ultimately the administration spaces can be seen that are not sealed to prevent air transfer.

Restrooms: The Restrooms are heated through hydronic baseboard fin tube. There is an exhaust in each space each vented through the roof.

Treatment Recommendation: Install a new HVAC system with separate zone control for the different functions. Ensure that air is not transferred between the administration and operations and garage spaces. Replace the undersized RTU air-conditioning unit with one properly sized for meeting room use and consider extending air conditioning throughout the administrative area. Provide treated ventilation air to all spaces especially at administrative, locker room, kitchen/breakroom and meeting room via Energy Recovery Ventilators (ERVs). This work is best accomplished with any planned expansion.

The existing boiler is past life expectancy and requires replacement. A high efficiency modular boiler is recommended as the replacement.

D40 Existing Fire Protection Systems

D 4010 Sprinklers: There is no fire sprinkler system.

D4020 Standpipes: There is no standpipe - fire sprinkler system.

Treatment Recommendation

Fully sprinkler the building at time of any future additions.

D50 Electrical

The building has been provided with few electrical updates. The most significant being a new (2014) Caterpillar Generator and emergency electric panel with Automatic Transfer Switch. The generator provides 100% backup to the existing facility. Has sufficient capacity to power a one bay expansion of the existing facility. The existing electrical service is provided underground to the building which feeds the existing main breaker panel board located in the southwest corner of the garage. The lighting throughout the building consists of fluorescent fixtures. Most of the lighting in the building is still original. The existing electrical equipment (main breaker panel board) is in good condition. The fire alarm system likely needs additional devices to provide the required coverage. Additional emergency lights and exit signs are likely required to provide full coverage.

D5010 Electrical Distribution System: Existing service consists of an underground service rated at 225A, 120/208V, 3Ø, 4 wire. The meter is located on the interior of the building below the panel. The main service consists of a 200A main circuit breaker panel located in the southwest corner of the garage bays.



The panel is original to the Building and was manufactured by Federal Pacific. This manufacturer no longer exists due to faulty breakers and fake UL testing results.

D5020 Lighting and Branch Wiring:

D5021 Branch Wiring: Most of the wiring devices are old with insufficient number of outlets located throughout the building. Where exposed, the cabling is through armored cable type bx or rigid conduit.

D5022 Lighting: Interior lighting consists of 2x4 surface mounted fluorescent fixtures with pebbled plastic lenses in offices, break room and bathrooms. Garage bays and workroom have 1x4 surface mounted fluorescent fixtures with no lenses. All are on standard switches without occupancy sensors. Given the age of the fixtures and building the lamps are at least T8 and possibly T12 sizes. Exterior lighting consists mainly of surface HID fixtures mounted at the entrance.

D5030 Communications and Security

D5032 Security System. There is no security alarm system.

D5033 Telephone System: The building is served by fifteen year Nortel old analog phone system.

D5037 Fire Alarm: Presently there is a Simplex 2001 existing fire alarm system with a primary box located in the southwest corner of the garage bay and an annunciator

panel by the main administration entrance. The entire system was not observed or analyzed for code compliance. Pull stations exist at each exit door. Horn/lights are present at the lobby and over the door at the north exterior wall. The system is original to the building with combination rate of rise heat detectors at the high bays and smoke detectors at the upper level lobby only. The analog system does not meet modern code requirements and replacement of defective sensors will become harder over time.

Treatment Recommendation: Replace existing fire alarm system with new fully addressable system. Size to accommodate any future additions to the facility.

D5090 Other Electrical Systems: New (2014) Caterpillar Generator and emergency electric panel with Automatic Transfer Switch. The generator provides 100% backup to the existing facility. Has sufficient capacity to power a one bay expansion of the existing facility. The emergency panel is a Square D and has a capacity of 200 AMPs

D5092 Emergency Lighting: Emergency lighting was not reviewed, but none is apparent. Exit signs do not appear to be present either.

Treatment Recommendation: Lighting should be upgraded to LED (presently planned) and placed on occupancy sensors. Convenience and data outlets should be augmented. Emergency lighting and exit signs should be installed meeting current code.

E. Equipment and Furnishings

Not Used

F. Special Construction and Demolition

F10 Special Construction

F1020 Special Facilities: The site contains a fueling station with two pumps serving diesel and gasoline. Both fuels are stored in underground, single wall, fiberglass tanks of 2000-gallon capacity each. The tanks are weighted and covered by a 6" drivable concrete slab. The pumps are protected by bollards from side approach but not front or rear approach.



Treatment Recommendation: Install additional bollard protection to front and rear approaches to fuel pumps. Removal of single wall underground tanks is a top priority for the site. Installation of above ground double wall tanks with monitoring alarms is highly recommended (this is already in the planning stage).

G. Sitework

G20 Site Improvements:

G2020 Parking Lot: The pavement abuts the building along most of the perimeter and is in varying states of repair. The eastern entry and pavement leading down to the fuel pumps is old and failing. Parking to the east side of the approach is newer pavement as is the rear and western sides of the parking lot. The paving around the fuel pumps is in fair to poor condition.

G2030 Pedestrian Paving: The brick paving from the parking lot at the eastern side to the front entry is in poor condition. The path is not accessible and has 9 steps of 6 1/2" rise.



Entry steps and pathway steps are not accessible. The main entry stair has a riser and tread added to make up for site subsidence. The risers are 7 ½" with a 12" tread. The handrail is not compliant with code.

Treatment Recommendation: Brick paving should be replaced with fully accessible route from an accessible parking spot to the front door.

The entry requires significant reworking to achieve accessibility. Stair issue should be resolved as part of entry modification to achieve and ADA and MAAB compliant entry.



G2040 Site Development: The retaining wall at the south east approach to the entry walk requires repair.

Treatment Recommendation: Damaged areas should be removed, weeps cleaned out and if necessary part of the wall should be rebuilt. This effort should be tied to accessibility improvements to the front entry.

G 30 Site Mechanical Utilities

G 3010 Water Supply: Water is supplied by an onsite well pumping capacity of 60 gallons per minute. Water is stored in an onsite cistern on the eastern side of the lot. Front lawn area of the station has an in-ground irrigation system.

G 3020 Sanitary Sewer: facility is serviced by an on-site septic system. Building sewer flows by gravity from the outlet at the southeastern corner of the building to a septic tank and then by gravity to a pump station via 4" line at the southwestern side of the building with force main 2" piping to a remote leach field.

The lower level is served by seven floor drains that tie into a gasoline and sand trap outside of the building at the north-eastern corner of the building. Town staff states that the oil-water separator is connected to the septic system and is operational.

Treatment Recommendation: Documentation of the oil water separation from the main trap being tied back to the main building drain and thus into the septic system was not reviewed by TBA. System should be documented and investigated and repairs if required instituted.

Accessibility Conditions

As a public building under CMR 521 Architectural Access Board, the fire station is required to conform to MAAB rules and regulations. The current firehouse is not fully accessible. The lower level equipment floor is not accessible. None of the three entries meets accessibility standards nor do the locker room or the breakroom/kitchen. The upper level is not accessible at entries, meeting room, office, or restroom. The main entry is blocked by a flight of stairs and no accessible path to those stairs. The upper level and lower level do not have an elevator. Any planned expansion of the firehouse would entail modifications to provide accessibility, especially at the upper level administrative portion of the firehouse.

Program Review

Comments on the program are based on the current needs of the department based on current functionality. They do not account for any changes in station staffing or service delivery methods. The current firehouse comprises three drive through vehicle bays and one half bay for the ambulance. The lower level also features a single locker room with showers, a kitchen/breakroom, a single utility room without fire rating which accommodates the main electrical panel, the emergency power panel, the automatic transfer switch, the hot water heater and boiler has the following program deficiencies:



1. Insufficient space to house all fire apparatus



2. Insufficient space to store all necessary equipment in an efficient, accessible and orderly manner.



- 2a. Insufficient space in existing male locker room, insufficient space to provide female locker room.



3. Undersized breakroom/kitchen.



4. Undersized and over utilized public meeting/training room



5. Cramped and inefficient alarm center and dispatch relay. This space exists in the lobby of the existing firehouse.



6. Inaccessible public restroom.

3c. Police Station, 41 Lowell Street

Summary

The Carlisle Police Station was designed in 1986 and completed in 1987. The building is a wood frame structure of type VB construction comprising some 6600 usable square feet. The style is a simple cape style with Ell. The building is in fair to good condition with signs of wear from 30 years of use, under programming for necessary uses, and systems at the end of their lifecycles.

We inspected the exterior visually from the ground levels; the interior was inspected visually top to bottom; and, the roof from the ground level. This description of existing conditions is based on the Unifomat Outline system for describing building assemblies. The following summary is based on that outline.

General Observations

- A. The substructure is not visible, but is assumed sound as there are no signs of differential settlement. There are minor cracks visible at the exposed basement wall on the north facade.
- B. The shell is in fair to good condition.
 - Basement walls are 10" cast in place concrete, with 1 1/2" of rigid insulation. And are in good condition with few areas with chips, displacement or minor cracking. The floor is a 4" slab on grade except at garage (5") and lockup (5" reinforced) all in good condition.
 - First and second floor structure consists of a mixture of steel beams,
 - First and second floor exterior walls are 2"x6" wood stud fully insulated with batt insulation, clad with painted clapboard in good condition.
 - The roof is 2"x12" rafters 24" inches on center fully insulated with batt insulation. Roof covering is asphalt shingle, second roof (2015), and in very good condition.
 - Windows are wood frames with insulating glass and applied muntins. They are some 30 years old and approximately 2/3rds through their

lifecycle. Caulking has failed at many locations at windows and doors.

- Exterior doors are generally sound insulated steel.
- Hardware is of minimal security standard for a police station especially at the interior.

C. Interiors

- The interior has had reconfigurations over the years. The second floor has been built out for offices and a training room.
- Partitions at the basement level are 8" concrete block elsewhere wood stud partitions with gypsum drywall.

D. Services

- Elevators: Exterior wheel chair lift is in poor condition. Duty cycle and exposure has shortened its lifecycle.
- HVAC systems: See below for details. The boiler was replaced in 2014, the distribution systems are original and at the end of their lifecycle, as is the ceiling hung gas furnace in the garage. The first and second floors are air conditioned via split systems. Units are within their service life.
- Plumbing systems: Systems are in good condition. The public restroom requires modification to achieve full accessibility.
- Electrical equipment: The service and equipment are in good condition with the exception of the emergency generator which requires replacement.
- Fire safety and alarm: Fire alarm system is out of date and should be upgraded to an addressable system.

E. Furnishings and equipment were not subject to review but are commented under the program section of this report.

F. Special Construction was not subject to review.

G. Site Work was observed adjacent to the building. The pavement is in good condition with some cracking. Concrete pads are in poor condition at condenser bases and antenna base. Entry concrete paving and entry stair is

in fair to good. The entry stair is in fair condition but is not accessible.
Provision of additional parking and new handicap space is recommended.

Accessibility

The building is not handicap accessible as the wheelchair lift itself is not accessible and the stair railings and rise run of the stair are not compliant. The lockup is accessible except the cells themselves are not accessible. The staff only areas of the building are not required to be compliant if a waiver is obtained from the Massachusetts Architectural Access Board (MAAB) but is required to be fully accessible to the public for a restroom, administrative offices doing business with the public, the community meeting room, and the booking/lockup facility.

Program

The current police station is in need of program improvements. As configured it does not meet standards for accreditation by the state, which uses a national accreditation standard. The police station also fails to meet the minimum standards for a Massachusetts police station serving a Town population in excess of 5000. Included is a discussion of the shortfalls and potential solutions to help achieve accreditation.

Existing Conditions and Treatment Recommendations

What follows reflects our observations of the condition of the structure and recommended treatments organized in the ten section Unifomat system, per Commonwealth of Massachusetts standards.

A. SUBSTRUCTURE

A10 Foundations

A1010 Standard Foundations: Visible areas of the foundation at the exterior indicate some localized shear failures. It is assumed foundations are fundamentally sound with the minor cracking or settlement failures observed not affecting the basic load carrying capacities of the overall structure.

A1030 Slab on Grade: The lower level floors are 5" thick slab on grade reinforced with WWF (welded wire fabric) 6-6 x 10 /10 at the garage and #4 bars 12" on center each direction tied to foundation poured wall at the lockup. The rest of the basement level slabs are 4" thick non-reinforced.

Concrete slab floor in the garage bay, lockup, and basement level are all in good condition. Concrete slab is under various floor finishes, from sealer in the garage bay, to paint in the lockup, carpet in the locker room, vinyl tile in bathrooms and in evidence and rubber floor in the training room. . There are no signs of unexpected deterioration in slab areas covered by flooring, so those slabs areas are assumed in good condition as well.

A20 Substructure

A2020 Substructure: Basement Construction

The North (Front), east and west elevations are the built into the ground. The basement wall is a 10" thick reinforced concrete wall insulated with 1 1/2" of rigid foam insulation. A significant thermal bridging occurs between the top of the lockup ceiling (4" reinforced poured in place concrete) and the basement wall where there is no insulation



present. The wall appears to be in good condition. Crack failures appear to be due to corrosion around the exposed reinforcing bar (clearly visible). Condition is considered minor but requires repair.

B. SHELL

B10 Superstructure

The building is classified as type VB, unprotected, combustible structure constructed of wood stud exterior bearing walls painted gypsum drywall surface at the interior habitable areas and unpainted poured in place concrete at non-habitable areas in the basement. Unprotected wood joist floors (first and second levels) and wood rafter roof framing at second level.

B1010 Floor Construction: The first level floor is supported by a combination of steel wide flange beams, concrete block bearing walls and the poured in place concrete exterior bearing walls. The 2 x 12 joists, spaced at 12" on center over the garage and 16" on center for the remainder of the floor, support a plywood deck. This floor is covered by various floor finishes, VCT at the entrance and restroom and carpeting in the offices and library and hardwood at the Chief's office. There are no signs of unexpected deterioration in areas covered by finish floors, so the floor deck in these areas is assumed in good condition as well. All components of the first floor construction are in sound condition.

The second level floor is supported by a combination exterior bearing walls and a single stud bearing partition down the center of the building. This design creates rather large spans (19'0") for the 2 x 12 floor joist system. The floor area of the training room has 8" o.c. joist spacing that supports a live load of 60 pounds per square foot (psf).

The remainder of the floor has 12" o.c. spacings and does meet code for live loading for corridors and office space but has little capacity to spare as the loading under the eaves is counted as dead load only. Expansion of the usable floor area by creating dormers will require strengthening the floor structure. This floor is covered by either VCT or carpeting. There are no signs of unexpected deterioration in areas covered by finish floors, so the floor deck in these areas is assumed in good condition as well. (exposed section of subfloor at the communication gear closet confirms this condition). All components of the second floor construction are in sound condition.



Treatment Recommendation: There is no visible displacement or deterioration of floor structure and no treatment is recommended at this point.

B1020 Roof Construction: The roof structure of 2 x 12 wood rafters, 24" on centers with plywood roof deck is in good condition, rafters and deck visible from the interior at closet locations. The roof is pitched 9 in 12. Roof drains by sheet flow from the eave.

Treatment Recommendation: Redesign the roof drainage through gutter and downspout to underground discharge system to prevent surface flow and resultant icing issues. This is especially true at the west eave where erosion has occurred on the ground below.

B20 Exterior Closure

B2010 Exterior Walls: The walls are constructed of poured in place concrete at the basement level left in raw state. The first and second levels are 2 x 6 wood stud construction with plywood and clapboard covering. All of these walls are painted.

The exterior walls are in good condition with only minor repair and caulking required at this time. The photo illustrates two issues with the wood enclosure. The lowest clapboard and the base trim board are deteriorating due to moisture intrusion. There is also no caulking present at the butt joint between the corner trim and the clapboard. This lack of caulking allows water to penetrate the end grain of the clapboard and hastens the deterioration of all clapboard at each unprotected end of board.



Treatment Recommendation:

Caulk all joints at time of repainting

B2010 Exterior Walls: Walls are in good condition with the exception of the paint and caulk concerns in various areas.

1. The paint failures a certain spot areas should be scrapped spot primed and repainted. These spots are most notable on the north elevation.
2. The trim at various locations require caulking and paint touchup especially at corner boards, interior corners and at front entry porch columns and trim.
3. Wood stop trim at the overhead doors has deteriorated especially at the bottom sections.



B2020 Exterior Windows: The 19 windows in the building are wood double hung insulating glass windows with applied muntins and full screens (5 missing). Operation was not checked in all locations.

The head trim at north facing windows at to a lesser degree at south face have rotted ends. Casings for windows also indicate some deterioration. Windows do not have caulking at the butt joint of casing and clapboard.



Treatment Recommendation: Replace deteriorated window heads and casings caulk all casing and head to clapboard joints.

B2030 Exterior Doors: The front entry doors and the garage level door are insulated steel doors. Front entry has sidelights and transom with wood frames, the garage level door is in a hollow metal frame. All doors and frames are painted. Frame at garage level door exhibits rust at the bottom of the jambs, jambs are not grouted. Wood frame at front entry door is in good condition. Neither entry door is secure in the sense that the frames are not security level frames. The front door with sidelights is especially vulnerable to attack. Door hardware is fair to good, all being operational. The exterior garage level door swings to the exterior without a vision panel. . All operate smoothly and closed.

The main entry door with sidelights and transom at the second level South façade is single glazed wood frame and insulated steel 6 panel doors. Door is fully functional and hardware is in good condition.

There is one (1) insulated overhead door all 15'4" x 8'6". There are four vision panels in the door. The door is motorized. Doors are in good condition.

There are no reports of malfunction.

The door seals have failed in most locations



Treatment Recommendation:

1. Main entry insulated steel entry door and sidelights are single glazed. The lobby area is utilized for public waiting and as such the single glazed entry door system

- should be replaced with a thermally broken insulated glass system which will increase comfort levels at the lobby.
2. The wood stop trim at overhead door jambs require replacement.
 3. Replace failed overhead door seals.
 4. Upgrade all hardware security levels if the secure perimeter is identified at the exterior wall.

B3020 Roof Coverings: The roof is a 9 in 12 pitch roof with asphalt shingle. Roof was replaced in 2014 and is in excellent shape with no reported leaks.” Gutters and downspouts do not exist. Roof discharges by sheet flow at the eaves to the ground. There does appear to be some erosion and subsidence at the north elevation E11 due to this runoff.

B3020 Roof Openings: Roof access is via ladder only. There are mechanical and plumbing penetrations. All of the flashing and boots appear in working condition as observed from the ground and based on no reported leak issues.

Treatment Recommendation: None required

Caulk: Caulking is mostly absent from the exterior. The lack of caulking increases water penetration into the end grains of the clapboard siding, the end grain of trim (as at window head molding). The absence of caulk also causes increased air exchange with the exterior that can result in loss of air conditioning efficiency and mold and mildew problems.

Treatment Recommendation: At the next repainting of the exterior all butt joints of clapboard and trim should be caulked.

Paint: Paint system is fair to good on all doors, frames and overhead doors. The exterior wall paint has failed and is peeling at north elevation and at many trim locations.

Treatment Recommendation: The building requires repainting with a few years, in the meantime problem areas should be addressed. Scrape and remove all loose and flaking paint at the various locations especially the north wall and trim. Scraping,

sanding and spot priming with oil base primer and two coats of gloss paint for trim and semigloss for clapboard is an immediate concern.

C. INTERIORS

C 10 Interior Construction

CMU 8" block partitions make up the primary interior partitioning of the basement level of this building. All appear to be sound in construction while showing some years of use.

Stud and drywall partitioning at the training room and locker rooms are in good condition.

Treatment Recommendation: See finishes below.

C20 Stairs

C2010 Stair Construction: Two flights of stairs exist. One traverses the 10'-0" floor to floor elevation between the basement and the administration first and second levels. The other stair connects the public lobby and the administrative first level to the second level. Stairs are supported by wood carriages and have treads of 10" and risers of 7 1/2". The treads and risers are **not** within current code required dimensions but was in compliance with the 4th edition of the Massachusetts Building code in effect at time of construction. .

Treatment Recommendation: None required, this is an as-built condition. Any expansion of the facility could include safety upgrades of the stair to modern standard of 7" riser and 11" tread should relocation become necessary.

C2014 Stair Handrails and Balustrades: Handrails at the interior stair are code compliant at the time of construction but do not meet requirements of the 8th edition of the building code nor CMR 521 Barriers Board.

Treatment Recommendation: New Handrails and guardrails should be fashioned for replacement stair.

C 30 Interior Finishes

C3010 Wall Finishes: Interior walls are raw concrete block in the garage; a mix of painted concrete block and drywall at other areas of the basement level. Most paint

is intact but shows its age. The restrooms have a wainscot of tile on the walls that is worn from use but is intact and functioning. Wall base, where visible, is worn and in poor to fair condition.

Treatment Recommendation: Repaint all painted walls. Check the grout and repair as required at all tiled areas. Replace all vinyl base.

C 3020 Floor Finishes.

Sheet Vinyl: The break room/kitchen, men's and women's locker rooms and men's room sheet vinyl flooring. All areas are subjected to heavy traffic in a small area leading to excessive wear. Hazardous materials testing has not been performed and no destructive investigation was conducted.

Carpeting: Broadloom carpet is used in all offices except the chief's office. Carpet is fair to poor condition and is at the end of its useful life. Men's and Women's locker rooms have open weave carpet over the concrete slab. This carpet is in poor condition.

VCT Tile: Entry lobby, first level restroom and corridor areas have vinyl composition tile that is in fair condition and appear to date from the time of the buildings construction.

Thresholds are metal transition strips at the doorways and at the transition to sheet vinyl in the men's and women's locker areas. Vinyl transition strips are used at transitions to concrete floors.

Concrete: Garage bays, storage room and utility rooms have exposed, unfinished concrete surfaces that are in good condition with staining but minimal cracking. The lockup area has painted concrete floors in good condition.

Treatment Recommendation: Flooring consisting of broadloom carpeting should be replaced and consideration should be given to a more durable carpet or carpet tile. Sheet vinyl at the locker room and the kitchen/breakroom is in fair condition. It is near the end of its lifecycle and should be replaced. Replacement with more durable solid rubber flooring is recommended.

C3030 Ceiling Finishes:

1. **Basement Level:** There are gypsum board ceilings at the garage (rated 2 hrs), training room, evidence room, records room and men's toilet room. Locker rooms, corridors and stairs at landings are 2 x 4 lay-in acoustic ceilings (ACT). The booking and cells have reinforced concrete ceilings. All gypsum board and concrete ceilings are in good condition. ACT ceilings are the end of their life cycle.
2. First level ceilings are primarily ACT in fair condition at the end of their life cycle. The stair has a gypsum board ceiling in good condition.
3. Second level ceilings are gypsum board in fair to good condition. An old ceiling leak has damaged a portion of the Training/Meeting room ceiling.

Treatment Recommendation: ACT ceilings should be replaced when lighting is upgraded. 2 x 2 tegular ceilings are recommended at the office and meeting room, 2 x 4 lay-in ceilings with high moisture and mold resistance are recommended at the locker room and kitchen/breakroom.

D. SERVICES

D10 Conveying

D1010 Elevators and Lifts: There are no elevators in the building. The external wheelchair lift at the front entry is in poor condition and requires frequent maintenance.

Treatment Recommendation: A new wheelchair lift with enclosure replacing the existing lift is recommended as the least costly remedy. A modification of the entry to provide full elevator access to all levels is recommended if an expansion of the facility is pursued.

D20 Existing Plumbing Systems

Presently, the Plumbing Systems serving the building are cold water, hot water, sanitary waste and vent systems, and natural gas. The building is serviced by well water and a septic system.

D2010 Plumbing Fixtures:

Plumbing fixtures generally are in good condition. The water closets are vitreous china wall mounted, single piece flush valve type and standard 2+ gallon flush. All are in working order with no complaints from staff. Lavatories are vitreous china wall mounted with exposed drain and supply piping. Faucets are chrome single lever and single spigot at Locker Rooms and first level restroom. . None of the faucet fixtures are handicap accessible.

Locker room showers are site fabricated built surround with pressure balanced mixing shower valve. Showers do not meet accessibility code requirements as size is inadequate. Is not required to be under MAAB for staff use only with a waiver from MAAB.

Break room kitchen area has a stainless single bowl drop in sink and a gooseneck faucet with single lever faucet. It is in fair condition. Sink does not meet accessibility requirements, nor is it required to be under MAAB for staff use only with a waiver from MAAB.

Lockup facilities have stainless one piece water closet and sink. Faucet and toilet controls are push button type. The fixtures are in good condition but are not accessible.

There is a service sink on the basement level.

D2020 Domestic Water Distribution

The water supply service, distribution and waste piping were not observed in detail on our visit. Most waste piping is beneath the slab and exits at the rear of the building according to the site plan. The water main shutoff and is located in basement utility room, the service enters at the approximate midpoint of the southern façade next to the gas service.

Domestic hot water is generated by a new high efficiency boiler with heating coil loop in an 80 gallon indirect water heater located in the building mechanical room.

The age of the indirect water heater is 2 years. There was no thermostatic mixing valve observed.

D2040 Rain Water Drainage

Rainwater is not collected and flows by sheet flow under the eaves.

D2090 Other Plumbing Systems (Natural Gas)

The building is serviced by a 1 1/4" natural gas service. The gas meter is located at the midpoint of the south side elevation. Gas is supplied to a high efficiency Lochinvar boiler and a gas fired furnace in the garage bay. The gas piping is black iron with screwed joints hung from floor deck.

Treatment Recommendation: Renovate existing public toilet Room to meet ADA/MAAB requirements and water conservation mandates. Install separate facilities for the public and staff. Install thermostatic mixing valve at domestic water heater to prevent scalding if not already present. The gas service would need to be reviewed further for any expansion of the facility.

D30 Heating Ventilating and Air Conditioning (HVAC)

D3020 Heat Generating System: The existing heating system comprises a gas fired furnace in the garage (original to the building) and a high efficiency gas fired boiler and hydronic heating system installed on the last day of 2014. The hydronic system provides heat to the basement, first and second level – training, evidence, and record rooms at the basements; all offices and lobby at the first level; and newer offices and meeting room at the second level. There are exhausts which are located in the locker rooms and the public restroom.

Mechanical Room: The heating plant consists of one (1) gas fired high efficiency Lochinvar boiler (not original to the building in 1986. The boiler supports three zones via circulator pumps and the indirect domestic hot water storage tank. Zone one supplies heat via baseboard fin-tube to the training, evidence and records room. Zones two supplies hydronic baseboard heat to the first level offices and lobby and zone three supplies the upper level office and meeting rooms. The entire system is in good condition with newer heating plant.



A gas fired unit hung from the ceiling of the garage supplies forced hot air heat to the basement level locker rooms, the booking room and cells. This unit is at the end of its useful life.

Automatic Temperature Control: Automatic temperature controls for the entire building are controlled via thermostats. All gas piping is fed down from the ceiling of the basement level. Honeywell thermostats are not programmable and are not connected to a building management system. Ventilation is provided by the exhaust fans in the public restroom and the locker rooms with roof mounted exhaust fans.



Air Conditioning: Mechanical space at second level under the eaves houses a fan coil unit that supplies cooling to the dispatch office. The unit is undersized to meet the cooling demand of newly installed E911 equipment in the mechanical room. The addition of an in room AC unit, in the mechanical room drawing outside air, supplies cooling when needed.

Lenox air conditioning split systems have been added to the first and second levels. The equipment for the second level is located above the ceiling in the meeting room and has no direct access, and in a closet under eave off the break room. Leaks from condensate have damaged the ceiling in the meeting room.

The units are at most 13 years old and are in good functioning order. Expected life 15 to 20 years..

Restrooms: The Restrooms are heated through hydronic baseboard fin-tube. There is an exhaust in each space each vented through the roof.

Treatment Recommendations: Replace existing fan coil unit at dispatch with an adequately sized unit capable of handling E911 equipment. Provide treated ventilation air to all spaces especially at administrative, locker room, kitchen/breakroom and meeting room via Energy Recovery Ventilators (ERVs). This

work is best accomplished with any planned expansion. Tie the new air conditioning equipment to the emergency panel.

D40 Existing Fire Protection Systems

D 4010 Sprinklers: There is no fire sprinkler system.

D4020 Standpipes: There is no standpipe - fire sprinkler system.

Treatment Recommendations: Fully sprinkler the building at time of any future additions.

D50 Electrical

The building has been provided with few electrical updates consisting primarily for the build out of the second floor. The generator and emergency electric panel with Automatic Transfer Switch provide 100% backup to the existing facility

The existing electrical service is provided underground to the building at the south elevation which feeds the existing main breaker panel board located in the southwest corner of the garage. The lighting throughout the building consists of fluorescent fixtures. Most of the lighting in the building is still original. The existing electrical equipment (main breaker panel board) is in good condition. The fire alarm system likely needs additional devices to provide the required coverage. Additional emergency lights and exit signs are likely required to provide full coverage.

D5010 Electrical Distribution System: Existing service consists of an underground service rated at 200A, 120/208V, 3Ø, 4 wire. The meter is located on the exterior of the building below the panel. The main service consists of a Siemens 200A main distribution circuit breaker panel located in the electrical room in the basement. The electrical room also houses an Automatic Transfer Switch (ATS and an emergency distribution panel.).

D5020 Lighting and Branch Wiring:

D5021 Branch Wiring: Most of the wiring devices are old with insufficient number of outlets located throughout the building. Where exposed, the cabling is through armored cable type bx or rigid conduit.

D5022 Lighting: Interior lighting consists of 4 lamp and 2 lamp 2x4 and 2x2 surface mounted fluorescent fixtures at gypsum board ceilings and 4 lamp and 2 lamp 2x4 troffer fixtures at ACT ceilings all with pebbled finish plastic lenses. Garage bay has 1x4 surface mounted fluorescent fixtures with no lenses. All are on standard switches without occupancy sensors. Given the age of the fixtures and building the lamps are at least T8 and possibly T12 sizes.

Additional interior lighting is supplied by incandescent downlights at communications dispatch. Exterior lighting consists mainly of pole mounted incandescent fixtures along entry drive.

D5030 Communications and Security

D5032 Security System. Security System was not observed.

D5033 Telephone System: The building is served by a fifteen year old analog phone system.

D5037 Fire Alarm: Presently there is an existing fire alarm system with a primary box located in the electrical room and an annunciator panel by the main administration entrance. The entire system was not observed or analyzed for code compliance. Pull stations exist at each exit stair door. Horn/lights are present at the corridors at each level. The system is original to the building with combination rate of rise heat detectors and smoke detectors. The analog system does not meet modern code requirements and replacement of defective sensors will become harder over time.

Fire Alarm Treatment Recommendations

Replace existing fire alarm system with new fully addressable system. Size to accommodate any future additions to the facility.

D5090 Other Electrical Systems: Onan Generator and emergency electric panel with Automatic Transfer Switch. The generator provides 50% backup (100 Amp 3 phase power) to the existing facility. Powers lighting, heating, cooling for dispatch, communications equipment, fire alarm and security. The generator has an unbalanced flywheel and is not considered to be 100% reliable. There is a backup to the generator that is portable and is specific to the needs of dispatch only. It is rated at 8000 watts continuous power, providing some 66 amps of 120 single phase power.



Emergency Power Treatment Recommendations:
Replacement of the generator is a top priority. Should the generator fail the use of a portable backup generator is not capable of supporting operations for a long duration electrical outage.



D5092 Emergency Lighting: Emergency lighting was not reviewed but lighting is on the emergency power distribution panel. Exit signs are present at all stairwell doors and at the two exit doors from the facility.

Lighting Treatment Recommendations

Lighting should be upgraded to LED (presently planned) and placed on occupancy sensors. Convenience and data outlets should be augmented.

E. Equipment and Furnishings

Not Used

F. Special Construction and Demolition

F10 Special Construction

F1020 Special Facilities: Antenna and antenna base.

Treatment Recommendation: Repair and resurface antenna base.

G. Sitework

G20 Site Improvements:

2020 Parking Lot: The driveway and parking lot pavement is in good condition. The parking lot is small with room for 12 cars maximum. The handicap parking spot does not meet standards.

Treatment Recommendations: Expansion of the lot area and provision of a new handicap parking place is a top priority. Expansion is possible to the rear of the cemetery.

2030 Pedestrian Paving: The concrete paving at the entry and across from the handicap parking spot is in fair to poor condition with some recent repairs. The path is not accessible. Entry steps and pathway steps are not accessible. The main entry stair has vertical risers and the handrail is not properly configured. The handrail is not compliant with code.



Treatment Recommendation: Concrete paving should be replaced with fully accessible route from an accessible parking spot to the front door.

The entry requires significant reworking to achieve accessibility. Stair issue should be resolved as part of entry modification to achieve ADA and MAAB compliant entry.

2040 Site Development: Grading against the north wall of the building has suffered some erosion and subsidence is evident.

Treatment Recommendation: Regrade and stabilize the embankment. Add gutters and downspouts to control storm water at this eave line.

G 30 Site Mechanical Utilities

G 3010 Water Supply: Water is supplied by and onsite well pumping capacity of 80 gallons per minute. Water is stored and pressurized by inside tanks in the mechanical room. New well pump was installed on February 12, 2012

Treatment Recommendation: None – improvements may be required if building is expanded especially concerning fire suppression sprinkler system demands for water storage and a fire pump required if the building exceeds 7500 square feet...

G 3020 Sanitary Sewer: facility is serviced by an on-site septic system. Building sewer flows by gravity from the outlet at the rear of the building to a septic tank and then by gravity to a pump chamber station via 4" line and by force main 2" piping to a remote leach field to the west of the building.

Treatment Recommendation: None – improvements may be required if building is expanded.

Accessibility Conditions

As a public building under CMR 521 Architectural Access Board, the police station is required to conform to MAAB rules and regulations. The current station is not fully accessible. The lower level floor is not accessible as the rear door is not a public door and the ramped concrete landing does not meet MAAB standards. The cell area does meet MAAB standards and there is no provision for handicap prisoners.. The first level is not fully accessible as the path to the wheelchair lift does not meet standards and the front stair is not accessible. The front stair has the wrong riser and tread dimensions and shape and the railing does not meet required accessibility standards. At a minimum the lobby and waiting areas must be accessible to the public. A case can be made for waivers concerning staff but all areas that the public are required to access must be accessible. The second floor is completely inaccessible. Again a case can be made for a waiver from MAAB concerning the requirement for staff areas to be accessible. Any planned expansion of the police station should carefully consider the inclusion of an accessible elevator connecting all floors.

Program Review

The current police station as configured does not meet standards for accreditation by the state, which uses a national accreditation standard. The police station also fails to meet the minimum standards for a Massachusetts police station serving a Town population in excess of 5000. The program deficiencies of the lockup are:

1. Provision of a female cell that is separated from the male cell by sight (many communities also separate by sound).
2. A juvenile cell that is separated from adult cells by sight and sound.
3. A group holding cell.
4. A visitation room for lawyers and others.
5. A garage sallyport for secure delivery of detainees to the lockup with a gun locker for sidearms.
6. A booking area of sufficient size to process detainees.
7. The station does not have fail secure exiting required for an I-3 use type.
8. Large evidence storage is not secure. The shed now used has a lower security level than the main evidence storage. Main evidence storage is done to standards as is the records room.



Other program deficiencies noted are not accreditation issues but are operational deficiencies.

1. No public meeting room outside the secure perimeter of police operations.
2. No permitting room with direct access by the public.
3. No interview room with recording and observation abilities for detectives.
4. E911 equipment should be housed with adequate cooling within the dispatch area.

5. Hardware upgrades are necessary at the secure perimeter of the operations areas of the station. Consideration should be given to hardware upgrades for all interior doorways as well.
6. The armory should be readily accessible to police operations and at high level of security in construction and hardware.
7. Training room is undersized for the present staff.
8. Staffing levels need to be explored based on policy and procedures manual for accreditation which may further effect overall program size.
9. Computer, communications, and data systems, both in building and vehicles require evaluation.

3d. Department of Public Works, 59 Morse Road Summary

The DPW building was designed in 1979 and occupied in 1980. It was formerly a horse-riding ring. The rigid frame steel bents and most of the enclosure were reused and modified for the DPW use. It is a type VB construction due to the second floor being constructed of wood. The building is not sprinklered. Floor area complies with current code for a building of business (B) and vehicles storage (S-1) use. A concrete slab, interior partitions, insulation, a new roof, modification to the exterior for new openings, and new mechanical, electrical and plumbing systems were all added in the reuse. Other than the construction of a break area on the loft and replacement of the stair with a spiral stair the building is as-built over 35 years ago.

Construction Materials:

Exterior: rigid steel frame, metal stud and drywall exterior walls, painted corrugated steel panel cladding, corrugated steel roof, single glazed steel windows, steel doors and frames.

Interior: unfinished concrete slab floors, carpet, VCT, drywall walls, drywall and lay-in tile with exposed grid ceilings, hollow core wood doors and wood frames, and steel doors and frames.

Area: approx. 60'x120', 7200 sf first floor; 20'x34', 680 sf second floor

Yard: bituminous paving, concrete aprons, gravel and soil, several rock outcroppings, bordered by wetland.

Overall, the building is in poor to fair condition with signs of wear from great use, overcrowding, and outdated systems throughout. We inspected the exterior walls, windows, doors, and roof visually from the ground levels; the interior was inspected visually top to bottom. No destructive testing or observation was done.

This description of existing conditions is based on the Uniformat Outline system for describing building assemblies. The following summary is based on that outline.

- A. The substructure is not visible, but is assumed sound as there are no signs of differential settlement.
- B. The shell is in poor condition (photos 1-10). The cladding finish has failed throughout and is damaged in many locations. Overhead door jambs are

damaged and have no protection. Windows are non-thermally broken aluminum frames with insulating glass that has failed and are beyond their expected lifetime. The EPDM roof is original to the building and has failed in many locations evidenced by signs of leaking throughout the ceiling. The membrane is in need of replacement.

- C. The interior has had reconfiguration in the office area only and the finishes throughout date to their original construction. They are tired and worn from years of regular use (photos 11-18).
- D. Services
- Elevators: No elevator exists.
 - HVAC systems: See below for details. The current system allows the transfer of vehicle exhaust and fuel fumes between the operations and administration spaces. Exhaust of fumes is via direct venting which short circuits the heating of garage spaces. No heat is supplied to the second floor area.
 - Plumbing systems: All are operational, but are dated.
 - Electrical equipment: All are operational, but are dated.
 - Fire safety and alarm: All are operational, but are dated.
- E. Furnishings were not subject to review, but are all worn and cobbled together. Equipment used for storage of items was observed and appears to function. DPW machine equipment was not subject to review but space needs are commented under the program section of this report.
- F. Special Construction.
- The salt shed was reviewed and is undersized and deteriorating. Repair is needed at a minimum, but expansion should be done (photos 33-36).
 - The vehicle storage garage (Morton building) was observed and with the exception of one damaged panel appears in good condition and is serviceable. Allowing room for storage of other department vehicles elsewhere would free up space for DPW vehicles currently parked outside (photos 37-41).
- G. Site Work was observed adjacent to the building. The pavement is in disrepair and edges are not well defined (photos 1, 6, 33, 37). Most of the site is

compacted gravel and has eroded in some spots. Erosion areas should be repaired. Pavement outside of the salt shed needs reconstruction (photo 33).

Accessibility

The DPW is currently not accessible per CMR 521 Massachusetts Architectural Access Board, but is required to have an accessible entrance, restrooms, and administrative offices.

Program

Programmatically, the DPW building is underserved. Many of the existing spaces are makeshift and not outfitted as they should be for all of the operations this department performs. There are many spaces that the department does not have as well. The structure is large enough in footprint to accommodate most of the improvements necessary to make a modern facility, though the addition of another vehicle bay is recommended to house all of the equipment in a more efficient manner. Further discussion of the program is included.

Existing Conditions and Treatment Recommendations

What follows reflects our observations of the condition of the structure and recommended treatments organized in the ten section Unifomat system, per Commonwealth of Massachusetts standards.

A. SUBSTRUCTURE

A10 Foundations

The building is founded on reinforced concrete pier foundation and footings at each steel bent landing and a four foot deep, eight inch thick reinforced perimeter foundation wall with no footing. It appears that the frame and pier foundations existed prior to the 1980 renovation of the structure into the DPW facility. The grade around the structure is almost level with the top of the foundation wall and floor slab, so it is not able to be observed. No signs of abnormal settling were seen that would indicate that the foundations are not stable. It is assumed they are in good condition and functioning as designed.

A20 Substructure – Not Observed

Treatment Recommendation: None required.

B. SHELL

B10 Superstructure

The building is classified as type VB, unprotected, combustible structure constructed of metal stud and corrugated metal panel walls with gypsum wall board finish at the interior, unprotected steel rigid frame (bents), unprotected steel roof framing and concrete slab floors. The loft space is constructed entirely of wood stud bearing walls, partitions and floor structure.

B1010 Floor Construction: The building is a single storey with a mezzanine area over the office quadrant. The first floor consists of a reinforced cast-in-place concrete slab throughout (photos 15, 22, 24). Concrete slab floors in the garage bays and workshop areas are in fair to good condition with expected wear but no signs of cracking. A trench drain runs the length of the storage and maintenance bays roughly at the middle of the building (photo 26). The slab is in good condition along the trench and the trench cover itself is in fair condition. It appears that the trench is functioning, but should be cleaned. The concrete slab in the office area is under vinyl

tile floor finish and was not viewed. There are no signs of unexpected deterioration of the finished floors, so the slab is assumed in fair to good condition as well. The flooring is discussed below. Concrete aprons are shown on the original drawings that have either been removed or were never installed. A steel edge was installed and is rotting. As a result the grade is uneven along the bay doorways and the slab edge is deteriorating quicker than it would have with the aprons (photo 9). The door seal steel angle called for in the slab for the overhead doors was never installed.

Originally built as a storage loft, the mezzanine has been modified to have full height walls and be separated from the maintenance bay. The floor construction is of wood 2x10s at 16" on center. A drop ceiling conceals the structure from below. The floor is supported by the furred out exterior walls and three lines of bearing wall that make up the office layout below. Use of the loft has changed to a break area and locker area (though used less than the one in the vehicle bays). See photos 16-18.

Treatment Recommendation:

Remove flooring at the office areas to confirm the slab is in good condition. Clean the full length of the trench drain. Replace sections of the trench cover that have been bent or are rusted from 35+ years of use. Aprons should be installed at all bay doors. Consideration should be given to redoing the edge of slab at bay doors that would create a thermal break between the interior and exterior slab and to install the overhead door seal angle.

B1020 Roof Construction: The roof is framed by 10" z-shaped purlins at five feet on center spanning over rigid frame steel bents at 24' on center (photo 25). The roofing material is called out as corrugated steel sheets that were in place prior to the 1979 renovation. At some time in the 1980's the roof was replaced with EPDM with an unfinished aluminum fascia (photo 2). Rain deflectors are above the overhead garage doors. The fascia is in poor condition with a great deal of denting. The roof is a low slope and was observed from the ground, so closer inspection may be warranted. It appears from the ceiling tiles that there have been and may still be several ongoing leaks (photo 25). Given the age of the roof, it should be replaced. Gutters and downspouts are shown on the original drawings, but appear to have been removed or were never installed. The roof is insulated in the z-purlins with only

6" of batt insulation. It is assumed this insulation has become discontinuous, wet, and flattened over the years. It is well under what current code would require for insulation. Interior ceiling finish is discussed below.

Treatment Recommendation:

The roofing should be replaced with either a PVC membrane or corrugated metal panels. A new fascia should be installed. Gutters should be installed with leaders taking water away from the building edge. Insulation should be removed and a new deeper layer of insulation installed between the purlins or better a continuous layer of rigid insulation installed above the deck. Snow guards should be installed above overhead and man doors.

B20 Exterior Closure

B2010 Exterior Walls: The walls are constructed of 6" metal studs running along the outer edge of the steel bents. Exterior cladding is wide-corrugated metal panels attached directly to the studs. The full depth of the stud cavity is insulated. Interior faces of the studs are finished with 5/8" gypsum wall board that appears to be taped and mudded at the office areas, but not in the garage bays. At the office areas there is an additional internal 2x4 wood stud wall with insulation. Columns are enclosed in the office areas and exposed in the garage bays (photos 5, 7-10). A majority (75%+) of the metal panel cladding is tired and beyond its useful life. Paint is peeling on all facades and most of the panels along the garage bay side have been severely dented and punctured. Edge protection is not-existent around the perimeter of the building and the driveway abuts on three of the four sides. Over half of the panels on the building should be replaced and the entire building requires refinishing.

At the interior, the drywall is dirty with exhaust and debris. The metal studs have telegraphed through as heat has transferred directly causing material to adhere in vertical lines. In the garage bays all of the seams are visible. See photos 25, 28, and 30. The bottom half of almost all walls is not visible as materials and equipment have been placed on and along them (photo 27). The visible areas of drywall, while dirty, do not appear to be damaged in the garage bays. Priming and painting may be all that is needed to renew the walls. Visible areas of drywall in the office area have been maintained.

Door and Window Openings: Window and door heads and jambs are framed in light gauge metal studs. Windows and doors are anchored directly into metal studs. The existing metal panel cladding was cut to create openings and the edges treated with aluminum flashing and panning to close gaps. All of this flashing and panning is dented and the finished is failing (photo 8). Overhead door openings are framed in 8" channels and anchored to existing horizontal girts with 3" angles. The finish is failing on the 8" channels. The jambs of the overhead doors have no corner guards or bollards and have all been damaged by vehicles and weather (photo 9).

Treatment Recommendation:

B2010 Exterior Walls: Replace over half of the corrugated metal panels. Check the fasteners on all remaining panels. The entire surface needs to be scraped, cleaned, primed and painted. New insulation should be installed when panels are replaced. The best solution would be to strip all of the cladding, reinsulate with closed cell foam insulation and a layer of continuous insulation, then re-clad the building. Window openings need all flashing and trim replaced. Detailing of openings should be considered to improve the thermal break between windows and framing, interior and exterior. Overhead door frames need to be repaired by welding new steel over the existing or cutting out the damaged steel and welding in new channels. Steel angle corner guards or bollards should be installed to protect the corners at the interior and exterior of the openings.

B2020 Exterior Windows: Windows are aluminum framed, non-thermally broken sliders. They are dual glazed but all of the seals have failed. Operation was not checked but it is assumed that they do not function properly given the age and observed condition from the interior and exterior (photos 8 and 13). They are anchored directly to the metal studs in the walls. The detailing of the windows allows for a great deal of thermal bridging which leads to premature sealant failure and condensation at the interior.

Treatment Recommendation:

The windows are beyond their serviceable life and should be replaced. Consideration should be given to enlarging some of the existing openings and adding more in spaces that have been occupied since 1979.

B2030 Exterior Doors: The man-doors are steel with hollow metal frames (photos 8 and 28). Doors in the garage bays have no vision panels. The entrance door to the office area has a half lite. All are painted. Frames are attached to metal studs with no thermal break. All frames have rust at the bottom three inches. All doors have rust at their base and around the lower hinges. Door hardware is fair to good, all being operational. None of the hardware is accessible, however only the office door would be required to be modified. All exterior man-doors swing to the exterior with one from the office area, one from the workshop / maintenance bay, and three from the garage bays. Four of the five doors are at grade on both sides. There is a 3” step from grade to the threshold at the office, making it not accessible. The fifth door, which appears to have been added since construction in 1979 has a sill approximately 6” above grade with no level landing at either side. All man doors are rusting and require scraping and repainting. The hardware is original to the building.

There are four overhead doors of two different sizes (photos 2-4). Doors were replaced in November of 2016. The three doors in the garage bays at the north elevation are insulated, segmented fiberglass overhead doors and are all the same size at 10’ wide x 12’ high. The single overhead door at the north elevation in the maintenance bay is a 10’-0” wide by 14’-0” tall insulated, segmented fiberglass overhead door (photo 24). The doors are six panels with the third panel being a single strip vision panel in each door. All four doors are motorized with ceiling mounted operators by Liftmaster and push button operators adjacent to the doors. Doors, seals and stops are in new condition and function properly.

Treatment Recommendation:

Steel entry doors and frames should be scraped free of rust, primed and painted. The maintenance bay man-door should be replaced. Hardware is original to the building and should be replaced. Handles should be lever and panic hardware should be considered for the maintenance bay.

B3020 Roof Openings: Roof access is via ladder only. There are various ventilation hoods (four mushroom vents at the ridge) and other plumbing stack penetrations

(photo 2). All of the flashing, curbs and boots are assumed at the end of their life with the rest of the roof membrane.

Treatment Recommendation:

The roof should be replaced and the boots and flashings along with it.

Caulk: Caulking is drying, cracking and separating at all locations around doors and windows.

Treatment Recommendation:

The caulking and should be removed and replaced with a single component silicone suitable for metal to metal joints and an acrylic at any wood joints. Backerrod should be used behind sealant joints.

Paint: Paint system is poor and failing on all doors, frames and overhead doors. The exterior wall paint has failed is peeling at most of the surface on all elevations (photos 1, 5, and 10).

Treatment Recommendation:

Test all paint for lead. Scrape and remove all loose and flaking paint at the exterior walls and trim. (See the recommendations under exterior walls for panel replacement.) Remove all rust and loose paint at door frames and doors. Scraping, priming with oil base primer and two coats of gloss paint for the siding, door frames and doors. Finish coats of enamel formulated to be compatible with and made by the same manufacturer of the primer. Given the damage to the siding, it may be more economical to replace the cladding.

C. INTERIORS

C 10 Interior Construction

Drywall and wood stud framed partitions make up most of the interior of this building. The office areas are of painted drywall with the director's office having a wainscot of hardboard panels. Visible areas of drywall in the office area are not damaged, but are tired.

At the garage bays and maintenance bay, the drywall is dirty with exhaust and debris. The metal studs have telegraphed through as heat has transferred directly

causing material to adhere in vertical lines. In the garage bays all of the seams are visible. See photos 25, 28, and 30. The bottom half of almost all walls is not visible as materials and equipment have been placed on and along them (photo 27). Where it was visible is heavily damaged from equipment and materials hits. The upper visible areas of drywall, while dirty, do not appear to be damaged in the garage bays. Plywood is used at the bottom eight feet of the wall between the maintenance bay and vehicle storage bays. This area is almost completely covered by racks, lockers and equipment.

Treatment Recommendation:

All partitions appear to be sound in construction while showing years of use. Priming and painting is needed to renew the walls above eight feet. The lower portion of drywall should be replaced with a more durable material – plywood at a minimum.

C20 Stairs

C2010 Stair Construction: A spiral staircase (salvaged from another building) provides access to the break area in the loft (photo 19). Handrails and post are of painted steel and the treads are slabs of oak. The risers are open. This stair appears to have replaced the originally designed straight run stair from the maintenance bay and uses an area that was originally for storage. Items continue to be stored under the stairs.

Treatment Recommendation:

While this type of stair and a single stair was allowed at the time of construction, the use of the loft has changed and it has been enclosed. Any further work in the loft area, as it is now an occupied space, may require construction of a current code compliant staircase. The existing spiral stair requires refinishing of the wood and repainting of the rails. Further consideration should be given to installing a current code compliant stair as the space is not used solely for storage.

C2014 Stair Handrails and Balustrades: There is a single pipe handrail and rod balustrade at the outer edge of the spiral. A post is at the center. As it exists and there is no plan to change it, it only requires refinishing. No evaluation has been done as to the stairs loading or structural stability.

Treatment Recommendation:

In the short term, the rail should be refinished with rails and balusters painted with an epoxy suitable to metals and high use areas. Further consideration should be given to installing a current code compliant handrail and guards as the space is not used solely for storage.

C 30 Interior Finishes

C3010 Wall Finishes: Interior walls are drywall with some hardboard wainscoting in the director's office and plywood wainscoting in the garage. Most paint is intact but shows its age. Much of the wall area is impossible to inspect due to the amount of furniture, equipment and materials that this multi-purpose building is required to house. In the garage bays all of the seams are visible and the drywall is very dirty (photo 22). The restroom is also drywall with no vitreous surfaces on the walls, making the surface very worn (photo 14). Wall base, where visible, is worn and in poor to fair condition. Hazardous materials testing has not been performed and no destructive investigation was conducted.

Treatment Recommendation:

Repaint all walls. Consider using an epoxy paint or gloss that would allow the surface to be cleaned easier. Seams should be mudded over and any holes and dents repaired. Cover restroom walls in a fiberglass reinforced panel for improved maintenance and durability.

C3020 Floor Finishes: Hazardous materials testing has not been performed and no destructive investigation was conducted

Vinyl: The superintendent's office has 1x1 vinyl tiles directly applied to the concrete slab. The floor is very worn and is delaminating around the edges and under the desks (photos 11 and 12). This is likely caused by extreme use and moisture brought into the building, rather than any moisture perking through the slab.

Carpet: Carpeting and area rugs have been put over the plywood deck in the loft break room (photo 17). All of them are worn, fraying and stretching and beyond their useful life. Replacement is necessary.

Plywood: Exposed plywood deck in part of the loft was painted, but much has worn off. Repainting is required (photo 16).

Concrete: Garage bays and workshop, second office and corridor have exposed, unfinished concrete surfaces that are in good condition with staining but minimal cracking (photos 15, 22, 24, 26). The restroom, locker and storage areas were painted at one time, but the majority has worn off (photo 14). The concrete is in good condition, but repainting is needed. A residential walkoff mat was observed by the office area door.

Treatment Recommendation:

Repaint all floors that have been painted using an oil on wood and epoxy on concrete. Tiles in the offices should be removed and new VCT installed. Moisture content of the concrete slab should be tested prior the installation of any floor finish. As an alternative, an *Ashford Formula* could be applied to the entire concrete slab that would improve its appearance as well as maintainability. The entire surface of the slab requires thorough cleaning to achieve the full benefit of this treatment.

C3030 Ceiling Finishes: All ceilings are 2x4 lay-in tile in an exposed T-grid (photos 13, 17, 25). They appear to be original to the 1980 construction. At the office areas the ceiling is hung horizontally with lights surface mounted on the grid. At the vehicle bays, maintenance bay and loft, the tiles have been hung on the slop parallel with the roof and at the underside of the purlins. Rigid frame bents are left exposed and painted. Lighting is surface mounted on the slope in the vehicle bay and suspended in the maintenance bay. All tiles and grid are caked with debris and yellowed with age. Numerous watermarks show active leaks in the roof above. In areas where tiles are missing or displaced the insulation can be seen to have dropped from its place between purlins.

Treatment Recommendation:

All of the ceiling tiles and grid should be removed. A new ceiling could be hung in the same manner as the existing, throughout. As part of a larger project, when the roof is replaced (as it is leaking and is at the end of its useful life) insulation can be installed above the deck allowing the ceiling in the maintenance and vehicle bays to be the exposed underside of deck and purlins.

D. SERVICES

D10 Conveying

D1010 Elevators and Lifts: There are no elevators or lifts in the building.

D20 Existing Plumbing Systems

Presently, the Plumbing Systems serving the building are cold water, hot water, sanitary, waste and vent systems, and natural gas. The building is serviced by private on-site well water and septic sewer systems.

D2010 Plumbing Fixtures: There is a single bathroom in the office area (photo 14). Plumbing fixtures of vitreous china generally are in fair condition. The water closet is floor mounted, two piece tank type and standard 1.6 gallon flush. There is also a wall mounted urinal with flush valve and wall mounted lavatory with a manual knob faucet. Faucets are chrome hot and cold knob type and single spigot. All are in working order with no complaints from staff. The facility is not accessible and there is no separation of male and female staff.

Part of the loft has been sub-divided into a makeshift bathroom with a single bowl stainless steel sink and a floor mounted toilet (photo 20). The sink is in fair condition but the counter and base are in poor condition and does not meet accessibility requirements. The toilet is in working order, but is surrounded by stored items.

A separate eyewash station with paddle operation and instructions is in the office bathroom as well. It was not tested, but there was no report of it not functioning properly.

Locker room shower is a fiberglass modular unit with pressure balanced mixing shower valves. Showers do not meet accessibility code requirements as wheel-in threshold exceeds 3/4".

There is a single deep basin service or slop sink in the maintenance bay.

D2020 Domestic Water Distribution: The water supply service, distribution and waste piping were not observed in detail on our visit. The water main shutoff and Well-x-troll treatment tank are located in the southwest corner of the repair bay.

Domestic hot water is generated through a GE SmartWater tank type gas-fired water heater located adjacent to the water treatment tank in the repair bay. The heater has a maximum input of 40,000 btuh and 40 gallons of storage. The unit was installed in September of 2004 appears to be in good condition. However, replacement should be considered as twelve years is the expected life of this unit. It is vented through the membrane roof. There was no thermostatic mixing valve observed.

D2030 Domestic Waste Water System: Building water waste is via an on-site 1000 gallon septic tank and adjacent leaching field. Inspections were not made, but both are located under the driveway at the northeast corner of the building. Waste exits the north side of the building via a four inch cast iron pipe into the septic tank and then fluid is pumped to a distribution box and leaching field. The system appears to function and is maintained. Evaluation will be required if the facility is expanded or renovated.

D2040 Rain Water Drainage: Rainwater is not collected at exterior. Stormwater and runoff from vehicles is collected via trench drains running the length of the garage bays at roughly the midpoint of the width. The trench box and the trench cover are in fair condition. It appears that the trench is functioning, but should be cleaned. Water is piped out the west end of the building via a four inch cast iron pipe into a 600 gallon grease trap and then discharges water via a four inch pipe to the south.

D2090 Other Plumbing Systems (Natural Gas): The building is serviced by natural gas. The gas meter is located at the south elevation adjacent to the offices under a lean-to roof. Gas is supplied to the unit heaters at the garage bays and domestic water heater. The gas piping is steel pipe with screwed joints.

Treatment Recommendation:

Renovate existing Toilet Rooms and Kitchenette to meet ADA/MAAB requirements and water conservation mandates. Install separate facilities for the public and staff. Install thermostatic mixing valve at domestic water heater to prevent scalding if not already present. The waste water system appears adequate for the current use. The gas service would need to be reviewed further for an expansion.

D30 Heating Ventilating and Air Conditioning (HVAC)

D3020 Heat Generating System: The existing heating system consists of electric baseboard heat in the office area under the loft with baseboards in the two offices and restroom (photos 11, 14). The baseboards are individually controlled via dial on the units in each space. Garage areas are heated via suspended gas fired unit heaters. The vehicle storage bays and maintenance/repair bay are on two separate zones. Maintenance/repair bay is served by two Reznor units (photo 23) that are vented via flue through the roof. These units appear to be newer than the original construction and no issues were reported by staff. Vehicle storage bays are heated by two Modine unit heaters suspended at either end of the garage (photo 31). There is also one bay with an engine block heater. These appear older and are likely at the end of their life. The loft area is unheated. Staff have placed portable radiator units in the break area, but they are undersized for the space served.

Air Conditioning: Cooling is provided via portable units in the second office (photo 8) and the loft break area. In the second office a window unit utilizes the entire area of operable sash, removing the ability to have fresh air without running the unit fan. A through wall unit is provided in the loft area through the east gable wall. Both units are old, inefficient, and not insulated during the cooler months.

Automatic Temperature Control: There is no automatic temperature control system in place.

Ventilation: No mechanical means of providing fresh air ventilation are in place at the DPW. Offices each have windows which are in disrepair and utilized by window A/C unit. The window area in the superintendent's office provides more than the code required 4% floor area of ventilation. The single window in the second office is too small to provide the required ventilation and is currently filled with a window A/C unit. The loft area is served by a single slider window and is also undersized for the area it serves. The restroom has an exhaust air fan that is activated with the light switch.

The vehicle repair bay has a direct vent exhaust fan on the east wall (photo 3). When the unit is in operation it draws all conditioned air directly out of the space with no heat exchange. Fresh air is only provided with the bay door or man door are opened.

Vehicle storage bays have no ventilation other than via opening bay or man doors. Air is moved via seven ceiling suspended fans, three of them caged small blade units and four of them long blade and appear of residential quality.

HVAC Treatment Recommendation:

Install a new HVAC system with separate zone control for the different functions. Ventilation of garage bays and office areas should be separated. Ensure that air is not transferred between the administration, repair and garage spaces. Consideration should be given to installing a direct vehicle exhaust ventilation system to improve energy efficiency and comfort in the repair bay. This system would also be useful to serve a couple of bays of the vehicle storage to allow for keeping vehicle engines warm without needing to open the doors.

D40 Existing Fire Protection Systems

D4020 Standpipes: There is no fire sprinkler system. The building is currently 7880 square feet, over the MA law threshold of 7500 square feet requiring a sprinkler system. Any expansion to the building area (inside or outside the footprint) would require the addition of a fire sprinkler system.

Treatment Recommendation:

Installation of a new sprinkler system is not required unless changes are made to the existing building triggering such system. A system would require a cistern, fire pump, backflow preventer, standpipe, and all new piping and heads. Interior piping and devices could be exposed given nature of this building. A sprinkler system would also require a new digital fire alarm system.

D50 Electrical

The existing electrical service overhead wire to the building which feeds the existing main breaker panel board located in the northeast corner of the repair garage

(photos 3 and 24). The existing electrical equipment (main breaker panel board) is in good condition. Although the emergency power switch is a Square-D unit should be replaced. The fire alarm system likely needs additional devices to provide the required coverage. Additional emergency lights and exit signs are likely required to provide full coverage.

The lighting throughout the building consists of fluorescent fixtures. Most of the lighting in the building is still original. Light fixtures are 1x4, two lamp, T8 fluorescent tubes. The vehicle garage fixtures are exposed lamp and are surface mounted, running with the slope of the ceiling. Those in the repair bay are exposed lamp and are suspended. And, the office lighting are surface mounted with pebble diffusers. All of the garage bay lighting is on occupancy sensors. Exterior lighting is via LED wall packs mounted to the building.

D5010 Electrical Distribution System: Existing service consists of an above ground service rated at 225A, 120/208V, 3Ø, 4 wire. The meter is located on the exterior of the building below the panel. The main service consists of a 2225A main circuit breaker panel located in the northeast corner of the repair bay (photo 21). The emergency power panel is rated at 200A, 120/208V, 3Ø, 4 wire. Switching is done via a Square-D switch which should be replaced.

D5020 LIGHTING AND BRANCH WIRING

D5021 Branch Wiring: Most of the wiring devices are old with insufficient number of outlets located throughout the building. Wiring installed at the time of original construction is concealed and was not observed. Wiring in the garages is in exposed metal conduit and has been installed piecemeal over time. Given the age of the building, it is likely that the wiring is copper, but aluminum wiring is possible. The connections between copper on devices and any aluminum wiring should be checked for corrosion/deterioration.

D5022 Lighting: Interior lighting consists of 1x4 surface and pendant mounted fluorescent fixtures with pebbled plastic lenses in offices, break room and bathrooms. Garage bays and workroom have 1x4 surface mounted fluorescent fixtures with no

lenses. All are on standard switches with occupancy sensors. The lamps are T8 size. Exterior lighting consists mainly of surface LED fixtures mounted at all exterior walls.

D5030 COMMUNICATIONS AND SECURITY

D5032 Security System: A NuTone Scovill Model S-2100 security panel is located in the superintendent's office (photo 32). It appears to be operational, though a keypad was not observed.

D5033 Telephone System: The building is served by a copper line. There is a connection between the DPW and Police/Fire dispatch at the Police Station. There is also a building PA system. It is a Motorola system with exposed wiring and surface mounted speakers on walls in each space (photo 32).

D5037 Fire Alarm: There is a fire alarm system is an analog, non-addressable system. The Simplex 4001 control panel located in the northeast corner of the repair bay adjacent to the electrical panels. Pulls and horns are located by the exit doors. The system was not reviewed in detail, but noted to be present, and is not up to the most current code.

D5090 OTHER ELECTRICAL SYSTEMS

D5091 Generators: The building is served by a diesel generator that is about 30 years old. It sits to the north of the fuel storage tanks (photo 6). Testing is done regularly.

D5092 Emergency Lighting: Emergency lighting was not reviewed, but it is assumed that the fixtures are run off of the emergency generator. No dedicated emergency lighting was observed. Exit signs are present at man doors but are not lighted.

Timeclock System: A timeclock system is utilized for tracking employee hours. The timeclock is located in the corridor outside the restroom. There is no central control for clocks in the building.

Treatment Recommendation:

All electrical, data and communication systems are outdated and would require updating with any expansion or renovation. The connections between copper on devices and any aluminum wiring should be checked for corrosion/deterioration. The Square-D emergency electrical switch should be replaced. Lighting should be upgraded to LED throughout. Convenience and data outlets should be augmented.

Emergency lighting and exit signs should be installed meeting current code. Fire alarm requires no change at this time, but should be upgraded to current code; and would be required if a sprinkler system is added. The generator is at the end of its useful life and should be replaced.

E. Equipment and Furnishings

E10 Equipment

E1090 Other Equipment: The southeastern corner of the vehicle storage bay is utilized for materials storage, including a flammables cabinet (photo 22). The cabinet is a two door, lockable unit manufactured by 'Justrite'. It is not separately ventilated. Gasoline canisters and insecticide canisters are stored on three shelves. The unit appears in serviceable condition.

There is a vehicle lift in the repair bay that was installed within the last few years. No problems have been reported and it appears in good condition.

F. Special Construction and Demolition

F10 Special Construction

F1010 Special Structures: Two additional separate pre-engineered structures also occupy the DPW site. To the east of the main building is the wood framed salt shed; year built unknown. To the south is a vehicle and bulk materials storage garage; a wood framed Morton building built in 1998.

The salt shed (photo 33) is a wood pole structure with a pre-engineered truss roof. It is founded on a poured concrete slab and footings at the posts. Painted plywood clads the walls which are framed with horizontal 2x lumber. The cladding is in need of paint. Many of the plywood panels from the ground to just above the buttresses have rot from constant damp and age. Three sides of the structure are fully clad and enclosed, leaving the west gable end open to the weather. Corrugated roofing spans between the joists on 2x wood purlins. Roofing appears in good condition. The lower eight feet of the shed are reinforced with paired 2x diagonal buttresses. Several of these buttresses have failed or are rotting (photo 36). They should be replaced and reinforced. Planks clad the interior of the structure at the bottom 8' for

reinforcing and ease of loading and unloading salt by loader. These planks are in fair condition, however they don't currently go as high as the salt is piled. Some of the lowest planks have been badly damaged via a combination of rot and vehicle impacts (photos 34, 35). Planks should be replaced and should be installed to a greater height to prevent further damage to the shed's structure and cladding. Continuous overloading of the shed will lead to further structural and cladding damage by rot and impact. The structure is undersized by about 50% for its current demand.

To the south of the DPW building is another garage (photo 37) used primarily for storing vehicles and bulk items for Town events. It is a Morton pre-engineered building built in 1998. There are large sliding barn doors at the northeast and northwest facades. Seasonal vehicles for the DPW as well as an antique fire truck and vans for the Council on Aging are stored here (photos 39-41). Tables and chairs, Town Hall files, and some decorations are stored in segregated bays along the northeast wall. The building is framed of laminated wood posts, 2x bracing and studs, and pre-engineered wood trusses and wood purlins at the roof. The entire exterior is clad in wide-corrugated metal siding. Corrugated roofing is on OSB underlayment. Floor is a poured in place concrete slab. Posts are founded on full pier footings. Lighting is mounted to the underside of roof trusses and is via paired, two lamp, 1x4, exposed bulb fluorescent fixtures. There are also skylights flanking the roof ridge. Overall the building is in good shape. Some minor metal panel damage was observed to the side of the northwest door (photo 38). The panels are not rusting, but should be replaced. The building is at capacity. Possible work to expand other Town Facilities to store their vehicles elsewhere would free up space for DPW vehicles currently parked outside.

F1040 Special Facilities: Two above ground fuel storage tanks occupy part of the northeast corner of the site (photo 6). Both the 2000 gallon gas and 2000 gallon diesel tanks were installed in 2006. They replaced tanks that were formerly underground. Tanks are in good condition and are checked regularly.

G. Building Sitework

G20 Site Improvements

G2010 Roadways: The majority of the driveway at the DPW is compacted gravel (photos 1-4). The driveway extends the length of Morse Rd, across a culvert and loops around the main building. It is in fair condition. Drainage from paved areas has created paths of washout across the site flowing toward the wetland to the south and east of the building. The approach from Elizabeth Ridge Road is paved in bituminous concrete and extends to create a large apron in front of the salt shed. Paving is in poor condition in front of the salt shed (photo 33). A large area of the wearing course is missing in the area where loaders turn most frequently. The only other hard surface is a concrete apron in front of the fuel storage tanks. This is in good condition, though often covered in gravel from truck travel.

The septic system and leaching field are located under the gravel loop to the north east of the building. It is unknown if the top of the system was designed with the loading of large trucks travelling over the system, but no problems have been reported.

G2030 Surfacing and Exterior Steps: There are no paved walkways other than those discussed above.

Treatment Recommendation:

Pavement in front of the salt shed should be removed, the gravel base rebuilt for heavy commercial loading, then binder and wearing courses of sufficient thickness laid. A paved parking space and walkway should be added for public accessibility to the office area. Gravel drive requires regular regrading to maintain a flat and properly pitched surface. Areas that have been washed out should be filled and recompact to prevent further erosion.

Existing Conditions Photographs



1. East Elevation and office entrance



2. North Elevation and garage bay doors



3. Northeast corner and repair bay doors



4. Northwest corner and outside storage



5. Southwest corner – paint failure



6. North yard with fuel tanks and generator



7. Paint failure and damaged cladding



8. Office windows – window A/C unit



9. Damaged overhead door jamb and slab



10. Exterior lighting and cladding paint failure



11. Superintendent's office



12. Flooring failure at superintendent's office



13. Existing office ceiling and lighting



14. First floor restroom



15. Office area corridor



16. Second floor restroom



17. Second floor break room south corner



18. Second floor break room north corridor



19. Existing spiral stair to second floor



20. Locker and shower room



21. Break area in vehicle storage bay



22. Locker, tool, and equipment storage in vehicle storage bay



23. Vehicle repair bay



24. Vehicle repair bay door and lift



25. Vehicle storage bay ceiling (looking west)



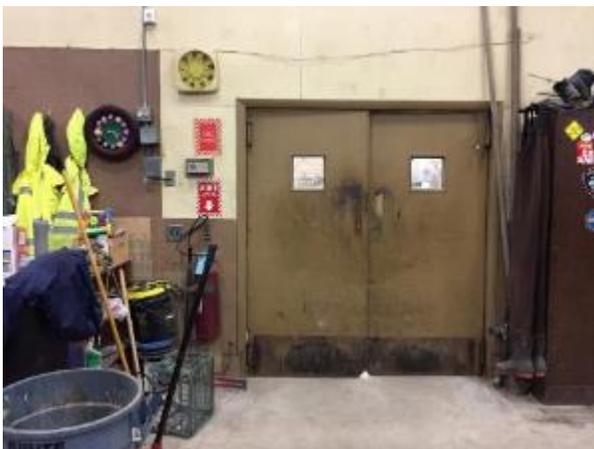
26. Vehicle storage bay looking west



27. Equipment storage at south wall of vehicle bay



28. Egress door at west end of vehicle bay



29. Doors between repair and storage bays



30. Repair bay – unit heater, trench drain, lighting



31. Unit heater in vehicle storage bay



32. Security system panel and PA system speaker



33. Salt shed open end



34. Salt shed structure and top of salt pile



35. Salt shed sidewall



36. Salt shed buttress and sidewall failure



37. Morton building gable end



38. Morton building sidewall – damage panel



39. Morton building vehicle storage



40. Morton building bulk storage – multi-department



41. Morton building structure and antique fire truck

Accessibility Conditions

As a public building under CMR 521 Architectural Access Board Regulations, the DPW is required to conform to MAAB rules and regulations. The current DPW building is not fully accessible. A variance could possibly be obtained that would exempt areas not used or available to the public from being accessible. The office area entries, doors and clearances at doorways all would require modification. The restrooms are not currently accessible and would require expanding rooms and new fixtures to comply. Likely the second level would be required to be accessible. This would entail new stairways, a new lift, and appropriately sized doors and clearances. Any planned renovation would require compliance with the current regulations. Further per the provisions of 521 CMR 3.3 for existing buildings, modifications to existing systems may be required when alterations:

1. exceed 30% of the full and fair cash value of the building; or
2. are in excess of \$500,000; or
3. when exempted work (e.g. electrical, mechanical and window replacement) is part of a larger project including nonexempt work; or
4. if the work is considered technically infeasible.

Driveway: Delineated parking space(s) are needed with close proximity to the main entrance. The path from these spaces to the entrance needs to be sloped appropriately and of a firm surface.

Entrance: A four foot wide level landing pad is needed at the exterior. The door lockset needs changing to a lever handle and the door itself cannot require more than 15 lbs of pulling force to open. Cover over the doorway and some protection from vehicles in the driveway loop should be considered. The clear area in the vestibule needs to be widened and clearances to the side of the door at the corridor need widening as well.

Stairs: The current spiral stair is not appropriate or compliant as the only means of accessing and egressing the second floor area. The loft is no longer used for storage only, so a stair with a rise to run of 7:11 is required along with railings and guards.

Program Review

There are currently 11 staff and a need for one more. All require locker space, an area for break and rest (especially during storm and emergency events), access to showers and restrooms. There are 26 DPW vehicles in addition to multiple attachments (salters, plow blades, chippers) and small engine equipment.

All areas of the building appear to be in need of more space and in need of updating (photos 11, 18, 20, 21, 27). It was reported that the maintenance bay is in the most need of more space. However, we observed 7 rows of trucks and other vehicles parked two and three vehicles deep in the vehicle storage bays that are only served by three overhead doors. This requires careful maneuvering and ordering of vehicles to ensure the most efficient operation. It doesn't allow for ease of use, response, or ability to attach or load equipment inside. Office areas are cramped and the need for a second office has pushed the break and locker areas to the former storage loft and to the vehicle storage bays. Additionally desks and workbenches are placed in vehicle bays.

The facility is dated and lacks necessary staff and vehicle spaces. There is no appropriate office space for serving the public or with sufficient area for work and storage of items for staff. The facility should have a dedicated break room separated from the vehicle bays; dedicated and separate bunk rooms for male and female staff for rest; dedicated and separated locker areas with restrooms and shower facilities for male and female staff; a woodworking and signmaking shop; vehicle bays with space for connecting equipment and easier movement in and out; and, a truck wash bay. The facility should be designed such that vehicle and staff spaces are separated with controlled connections.

Any expansion of square footage, inside or out, would require the addition of a sprinkler system as the current facility is over the statutory 7,500 sf trigger for such a system.

Offices

The office area should have a code compliant stair added. The existing layout could be reconfigured to allow for more office space and modernized accessible bathrooms. A second

bathroom should be added. Heat should be added to the second level and the area reconfigured to create a better rest area and storage areas.

The second floor area could be expanded to allow all of the break and locker functions to be within the office area rather than the vehicle bays. This would free up the vehicle bays for more equipment and working space.

Maintenance/Repair Bay

If the break area were condensed or consolidated then there is the opportunity to expand the width of the repair bay inside the existing footprint of the building. This would provide more space for tool and equipment storage to the sides and open working area in the space.

Vehicle Storage Bays

Moving of the break area would free up space for small engine equipment and tools. If the south wall was freed from being for storage, then vehicles would not need to be stored as tightly. Consideration could be given to making one or more of the bays drive through which could allow easier in-and-out access. The area outside the building to the west that is currently used for storage in trailers and sheds could be used for expansion of the building without impacting the driveway loop. This area could be utilized by either a lean-to like shed for better storage of small engines or other equipment from the outside; or, another full width bay could be added allowing for more vehicles to be stored. An additional bay could be a drive-through bay with a chainfall and allow for connection and disconnection of attachments or allow for another repair/maintenance bay.

Site

The salt shed should be expanded. Current overloading is accelerating the building's deterioration. Staff estimates that 50% increase is needed. Expansion is easiest at either of the gable ends and would involve adding bays in a similar construction as exists. There appears to be some room on the site that would allow for this expansion without impacting current vehicle travel lanes.

Clear demarcation of parking for visitors and staff is needed. Visitor parking should be provided with an accessible parking space with an accessible path to the main entrance.

4. Building and Site Plans
Existing Conditions Plans
Programming Plans



SCALE : 1" = 50'-0"

CARLISLE FACILITIES STUDY
CARLISLE TOWN HALL

66 WESTFORD ST.
CARLISLE, MA

TH-1.0

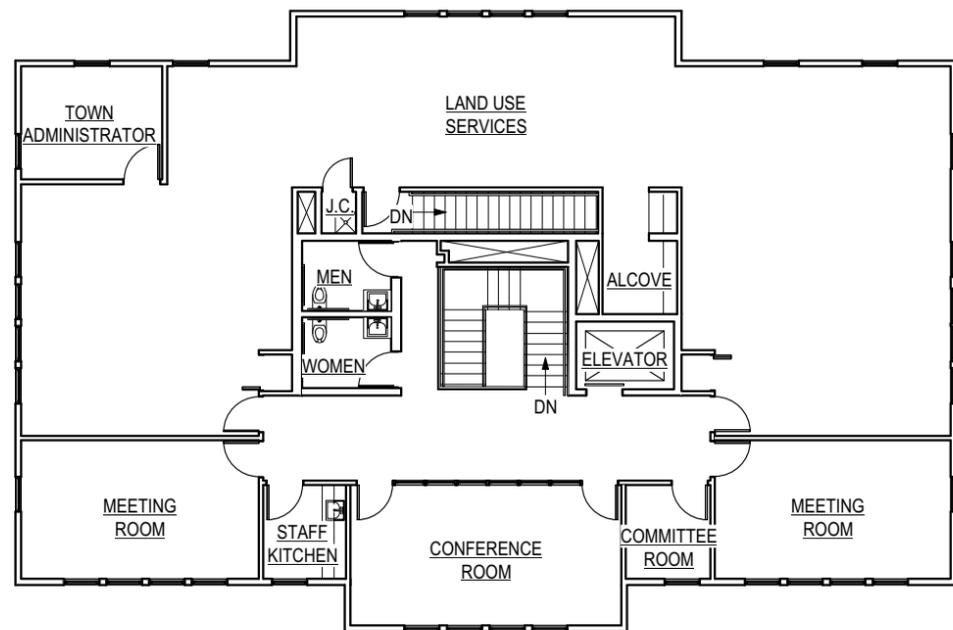
EXISTING SITE PLAN



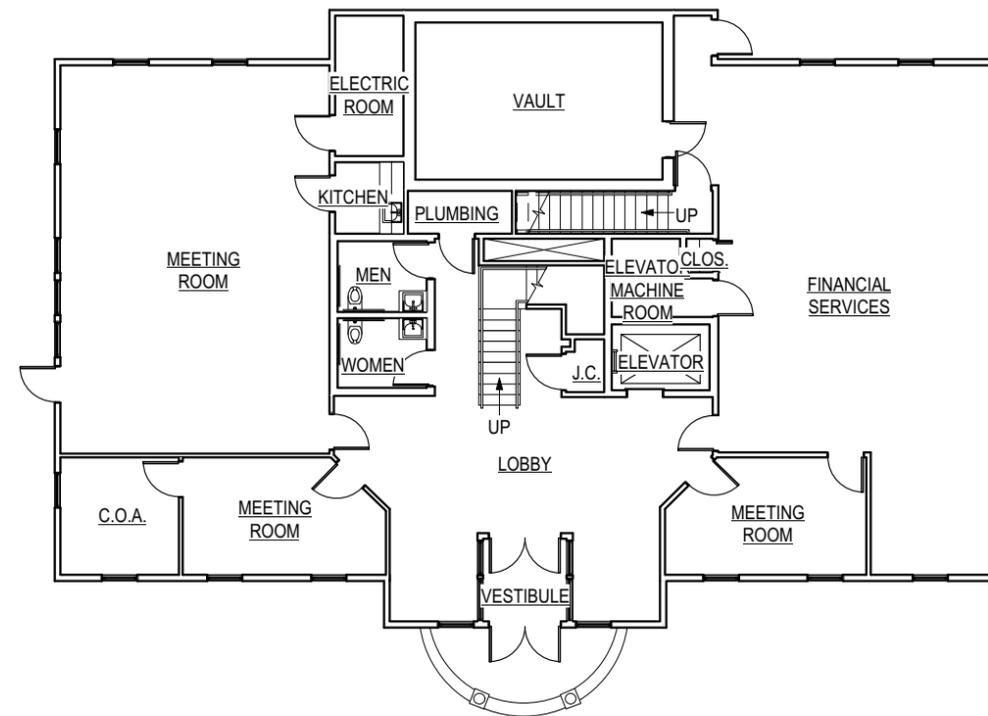
21 DECEMBER 2016
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NOT FOR CONSTRUCTION

TBA ARCHITECTS, INC.
ARCHITECTURE
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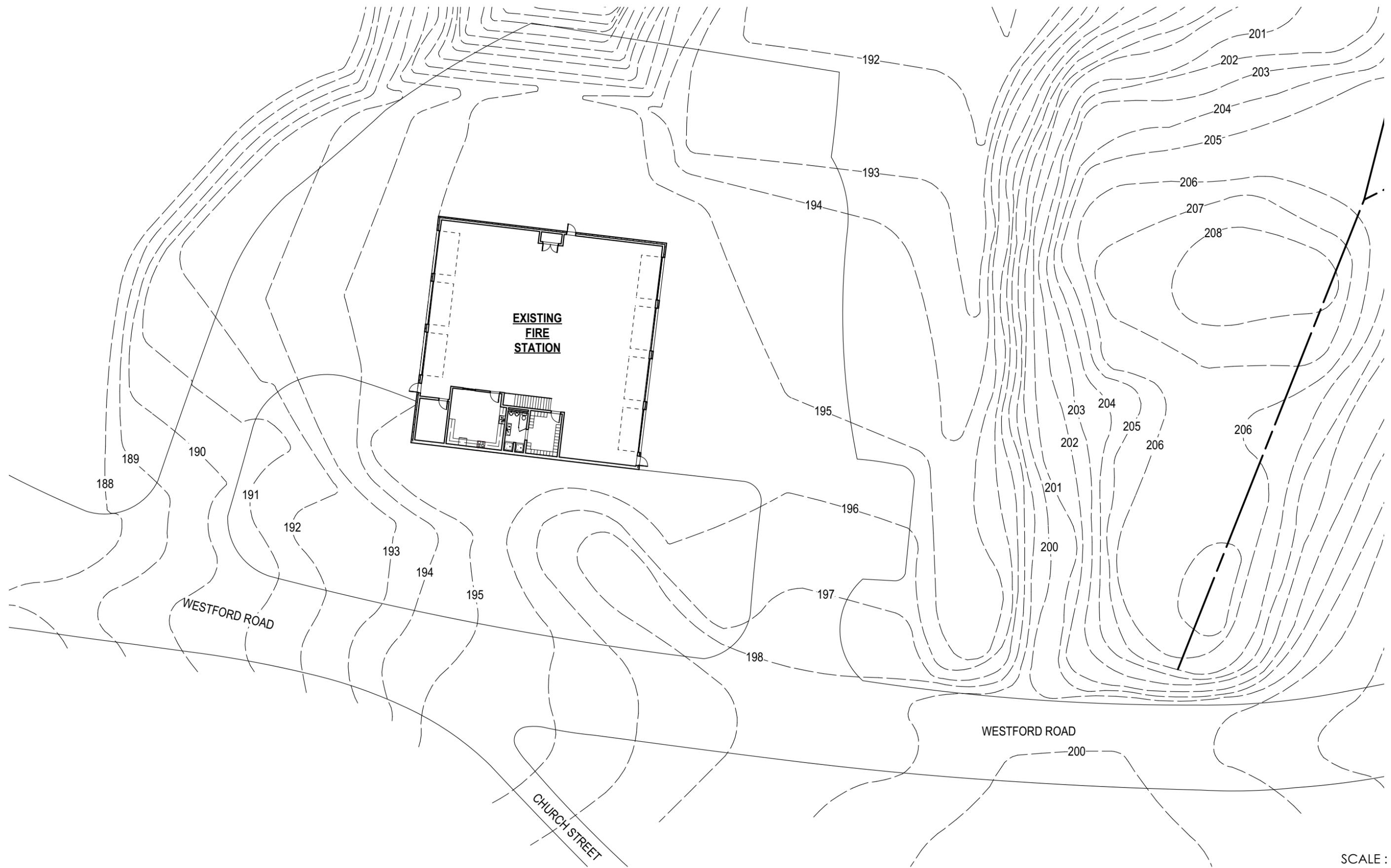
EXISTING SECOND FLOOR PLAN



EXISTING FIRST FLOOR PLAN

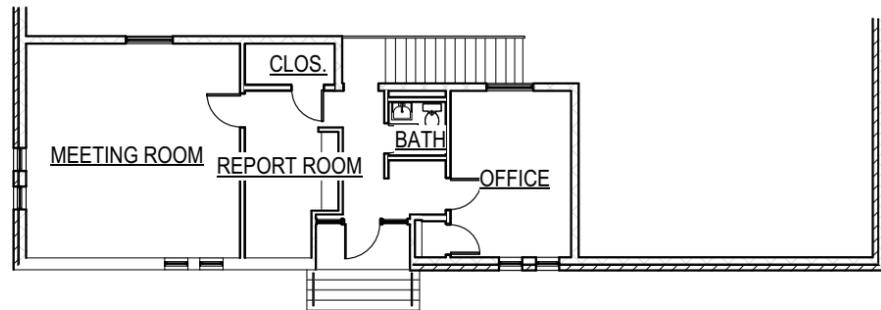
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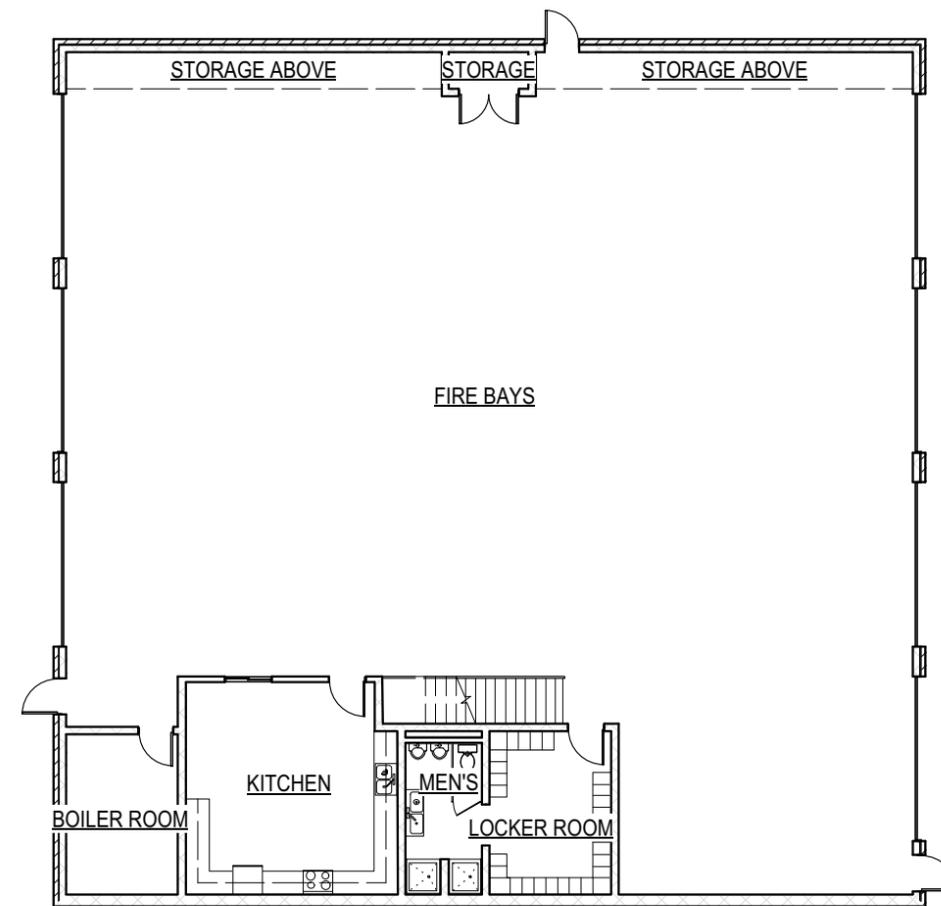


SCALE : 1" = 30'-0"





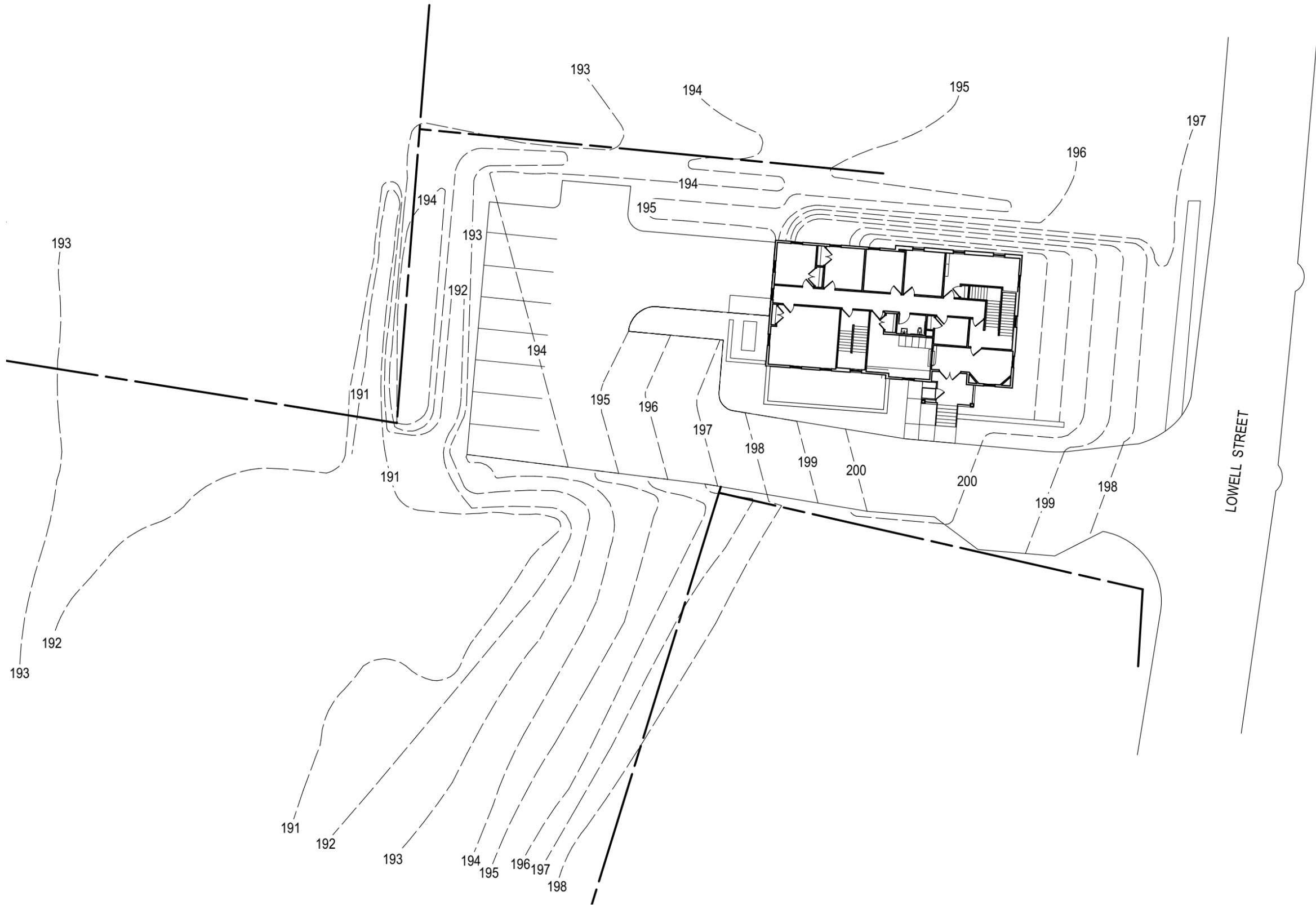
EXISTING SECOND FLOOR PLAN



EXISTING FIRST FLOOR PLAN

SCALE : 1/16" = 1'-0"





SCALE : 1" = 30'-0"

CARLISLE FACILITIES STUDY
CARLISLE POLICE STATION

41 LOWELL ST.
CARLISLE, MA

PD-1.0

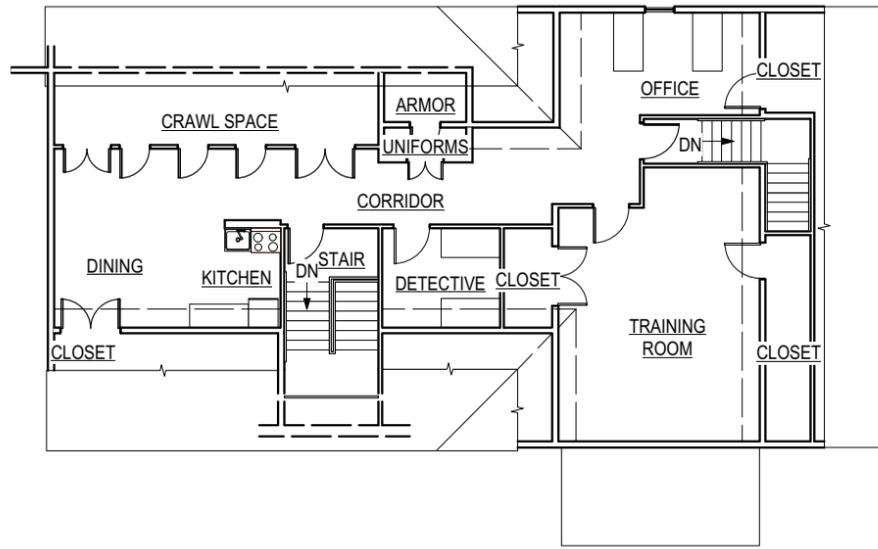
EXISTING SITE PLAN



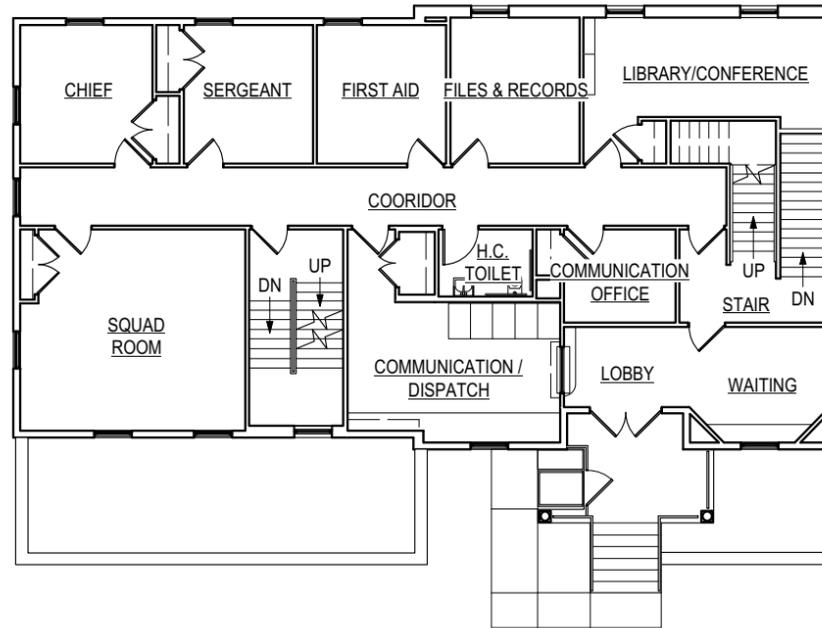
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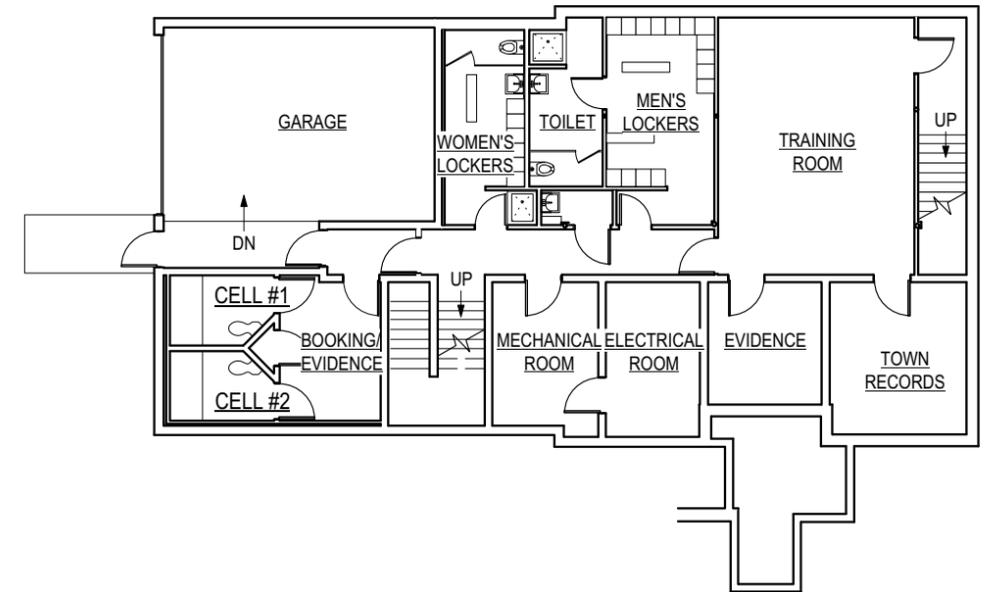




EXISTING SECOND FLOOR PLAN



EXISTING FIRST FLOOR PLAN



EXISTING BASEMENT FLOOR PLAN

SCALE : 1/16" = 1'-0"



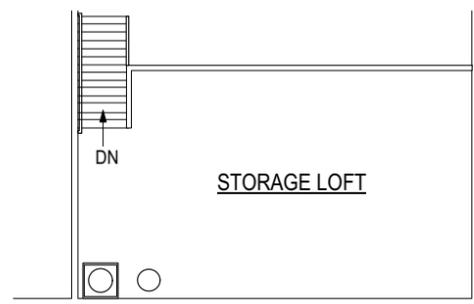


SCALE : 1" = 40'-0"

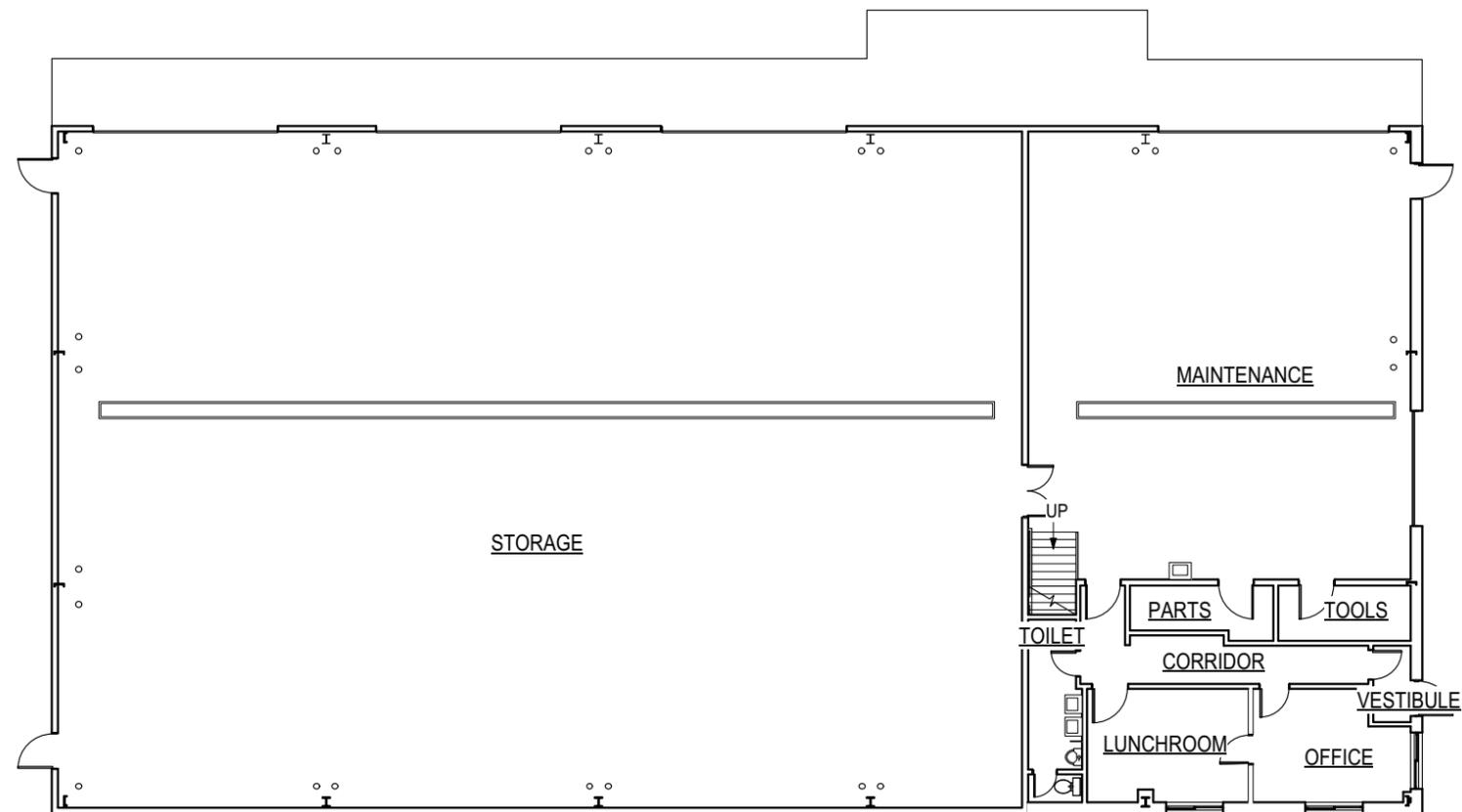


NORTH





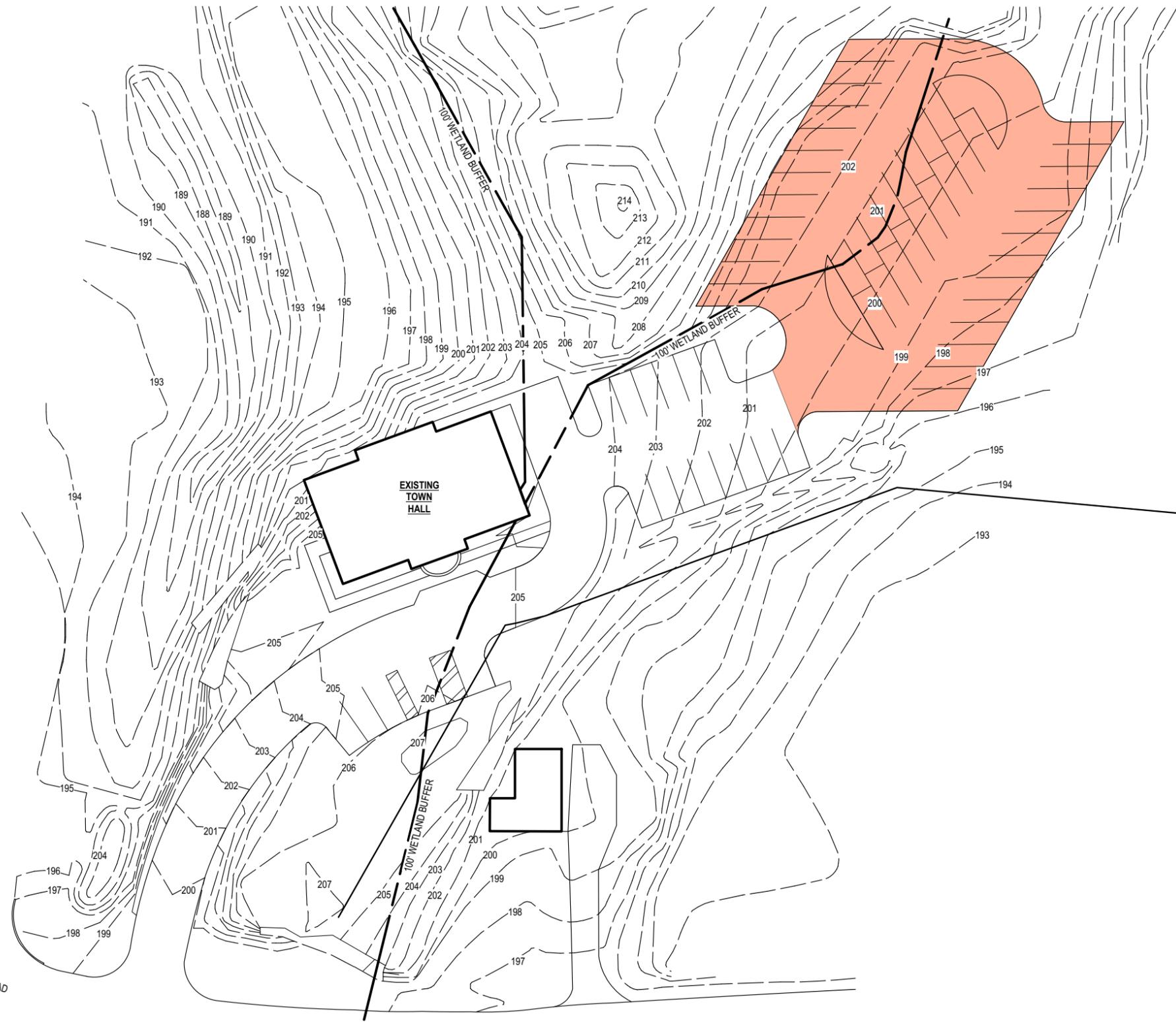
EXISTING STORAGE LOFT PLAN



EXISTING FIRST FLOOR PLAN

SCALE : 1/16" = 1'-0"





- ADDITION
- RENOVATION

SCALE : 1" = 50'-0"

CARLISLE FACILITIES STUDY
CARLISLE TOWN HALL

66 WESTFORD ST.
CARLISLE, MA

TH-2.0

CONCEPTUAL SITE PLAN



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- ADDITION
- RENOVATION

SCALE : 1" = 30'-0"

CARLISLE FACILITIES STUDY
CARLISLE FIRE STATION

80 WESTFORD ST.
CARLISLE, MA

FD-2.0

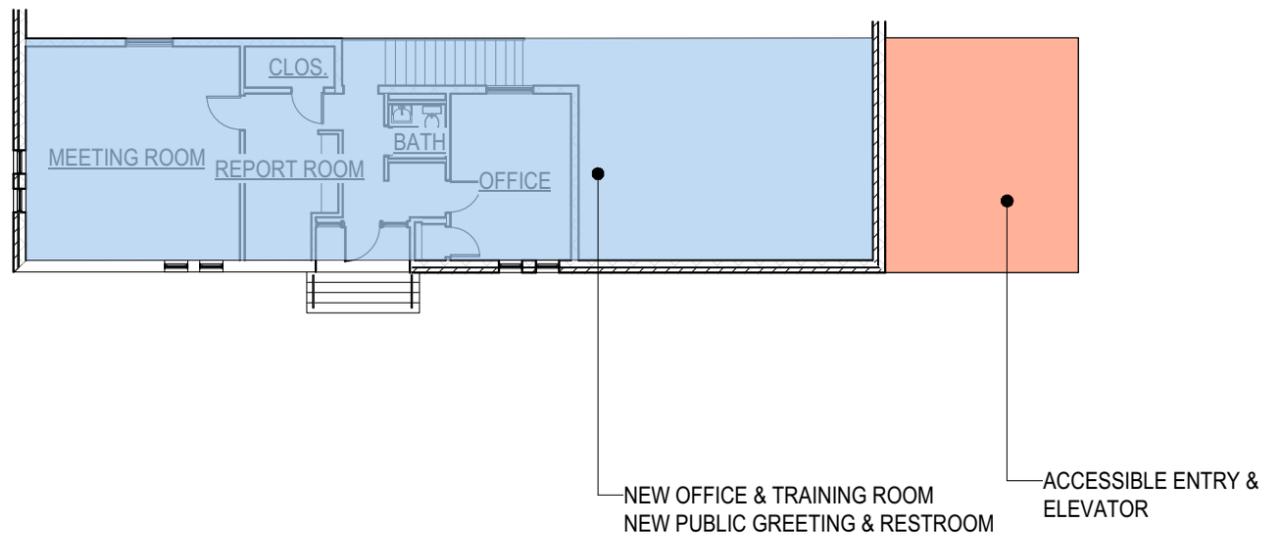
CONCEPTUAL SITE PLAN



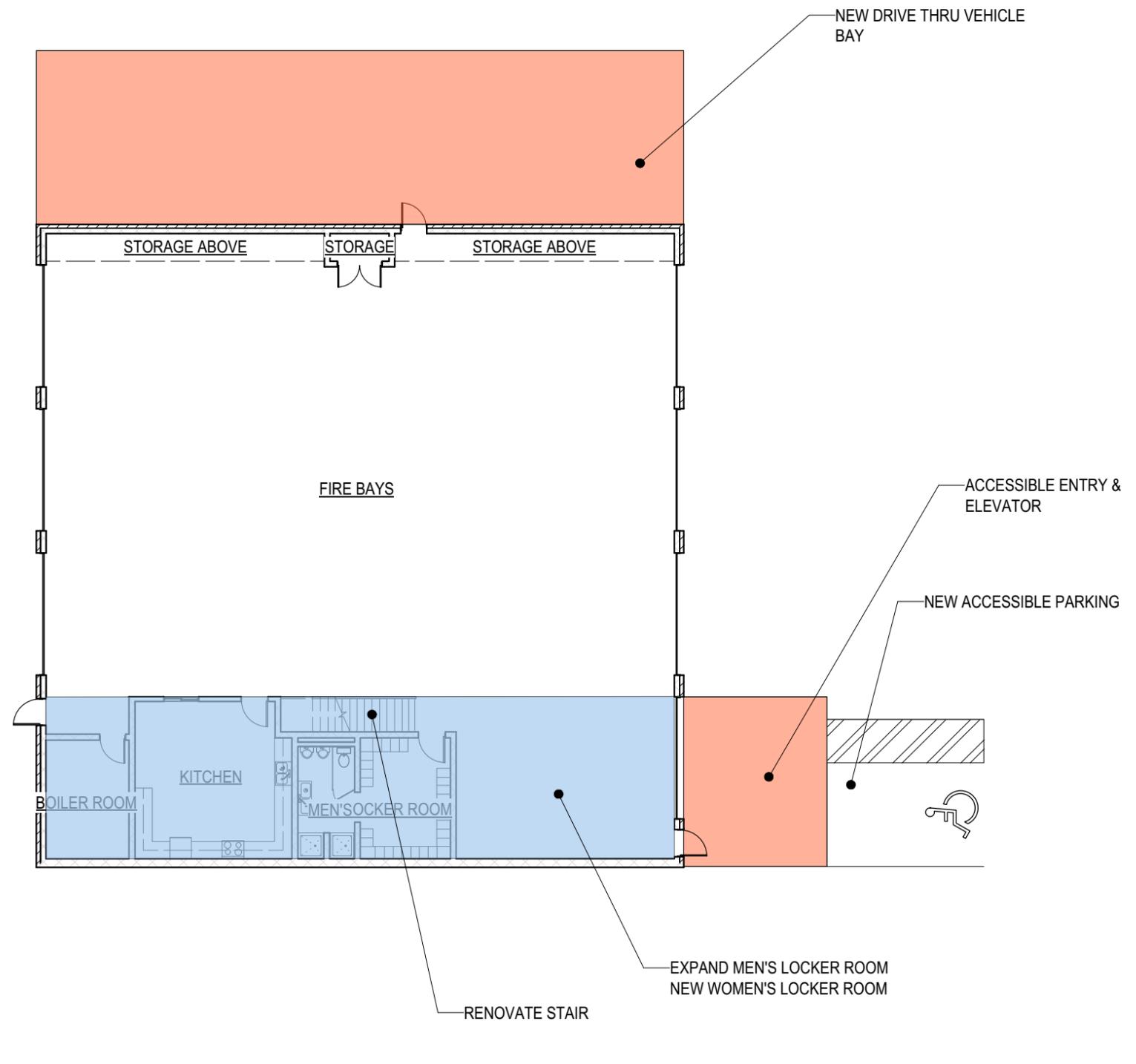
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CONCEPTUAL SECOND FLOOR PLAN

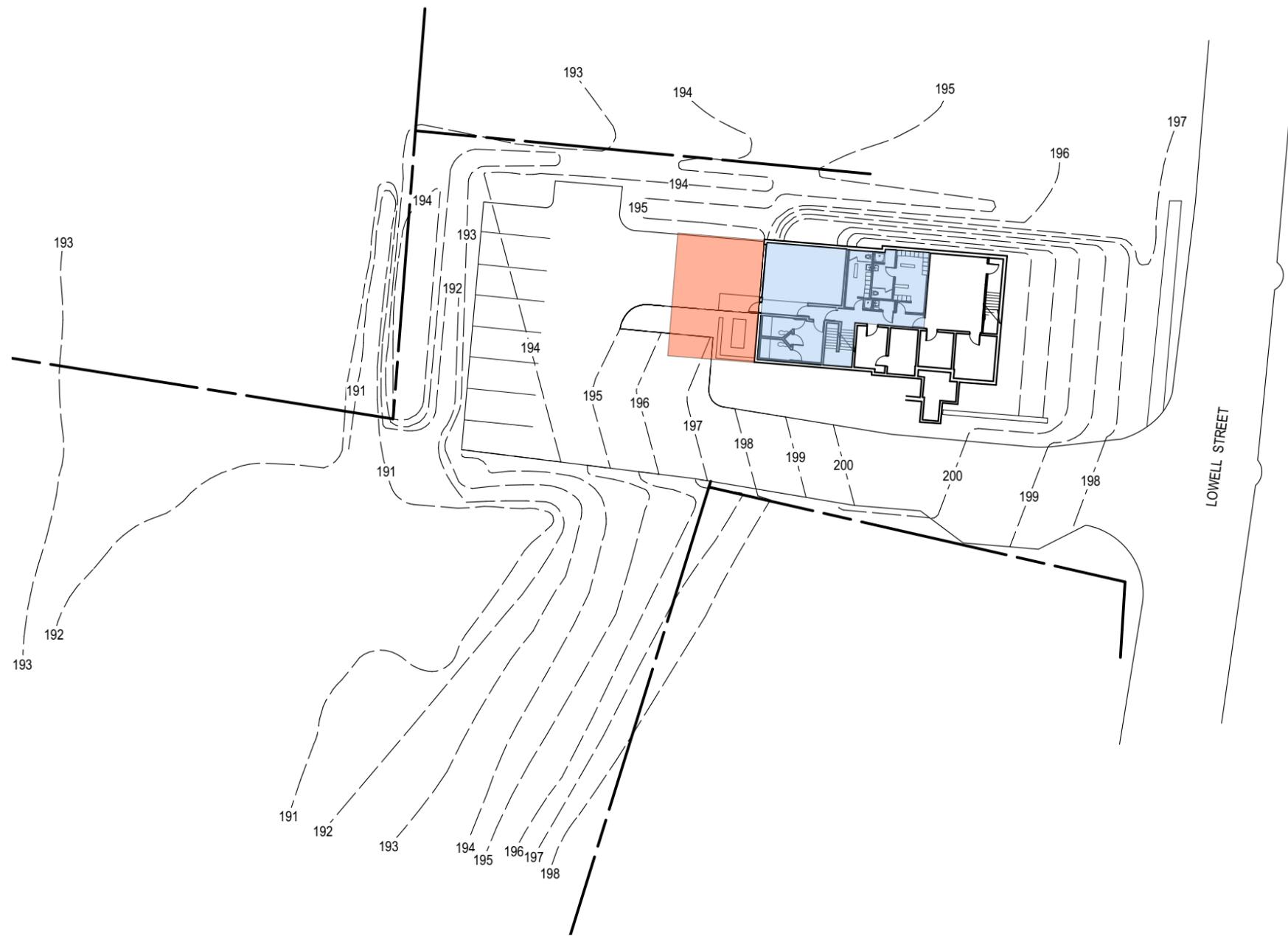


CONCEPTUAL FIRST FLOOR PLAN

- ADDITION
- RENOVATION

SCALE : 1/16" = 1'-0"





- ADDITION
- RENOVATION

SCALE : 1" = 30'-0"

CARLISLE FACILITIES STUDY
CARLISLE POLICE STATION

41 LOWELL ST.
CARLISLE, MA

PD-2.0

CONCEPTUAL SITE PLAN

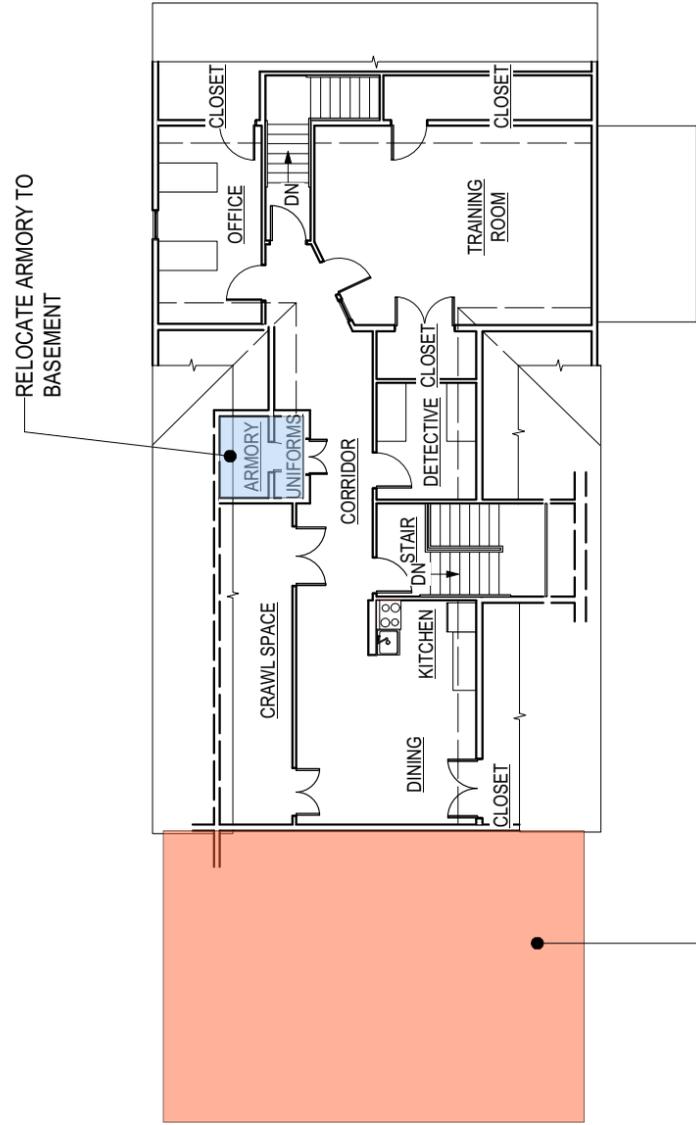


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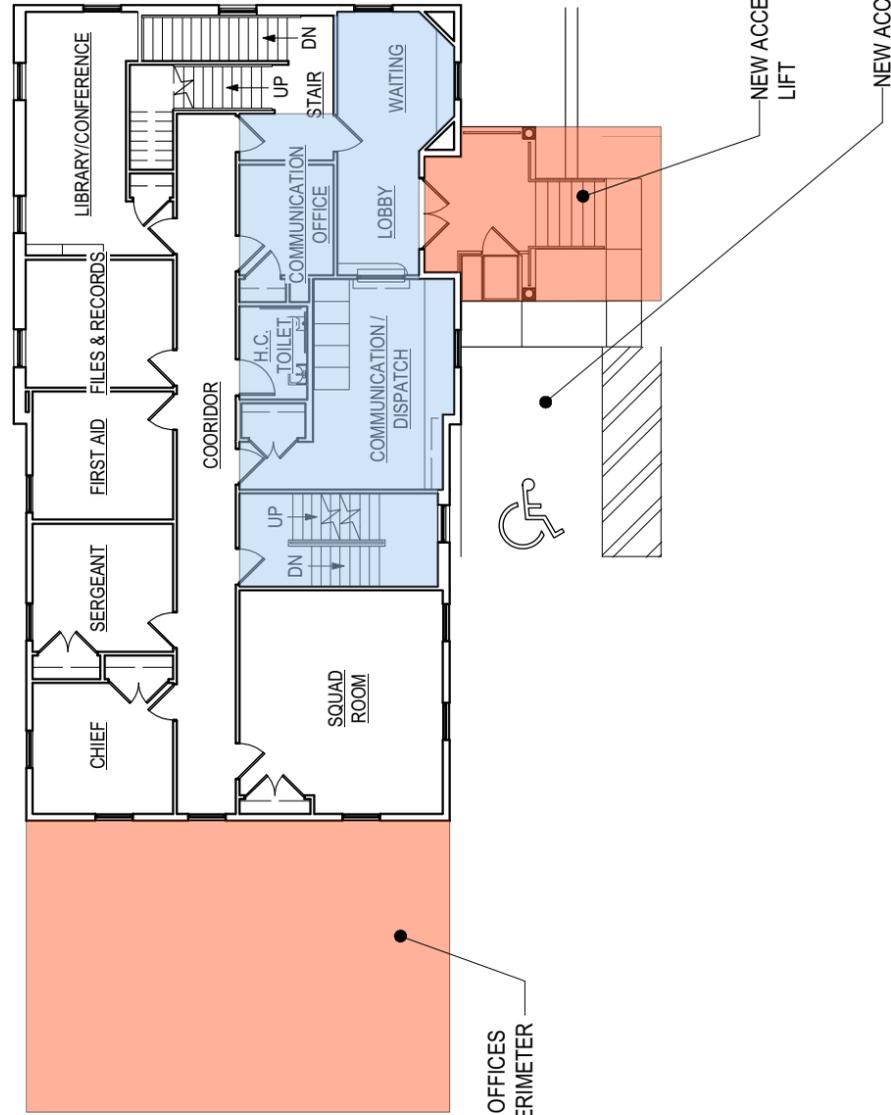


- ADDITION
- RENOVATION



NEW DETECTIVE & INTERVIEW
NEW STORAGE

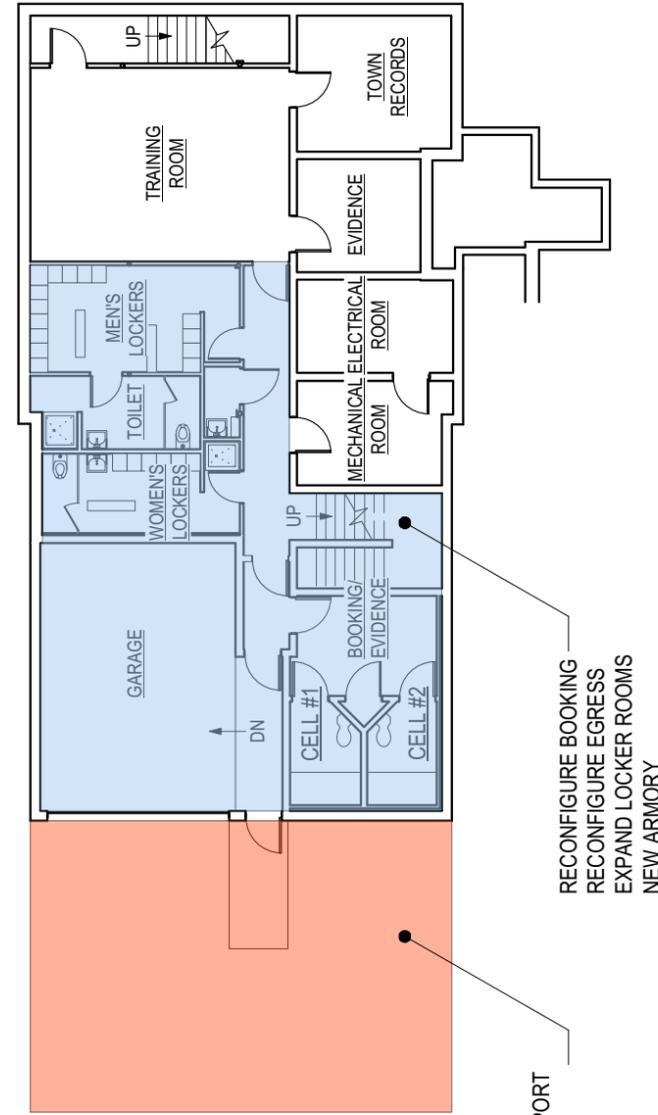
CONCEPTUAL SECOND FLOOR PLAN



EXPAND ADMINISTRATION OFFICES
RECONFIGURE SECURE PERIMETER

NEW ACCESSIBLE ENTRY W/
LIFT
NEW ACCESSIBLE PARKING

CONCEPTUAL FIRST FLOOR PLAN



NEW 2 BAY SALLY PORT

RECONFIGURE BOOKING
RECONFIGURE EGRESS
EXPAND LOCKER ROOMS
NEW ARMORY

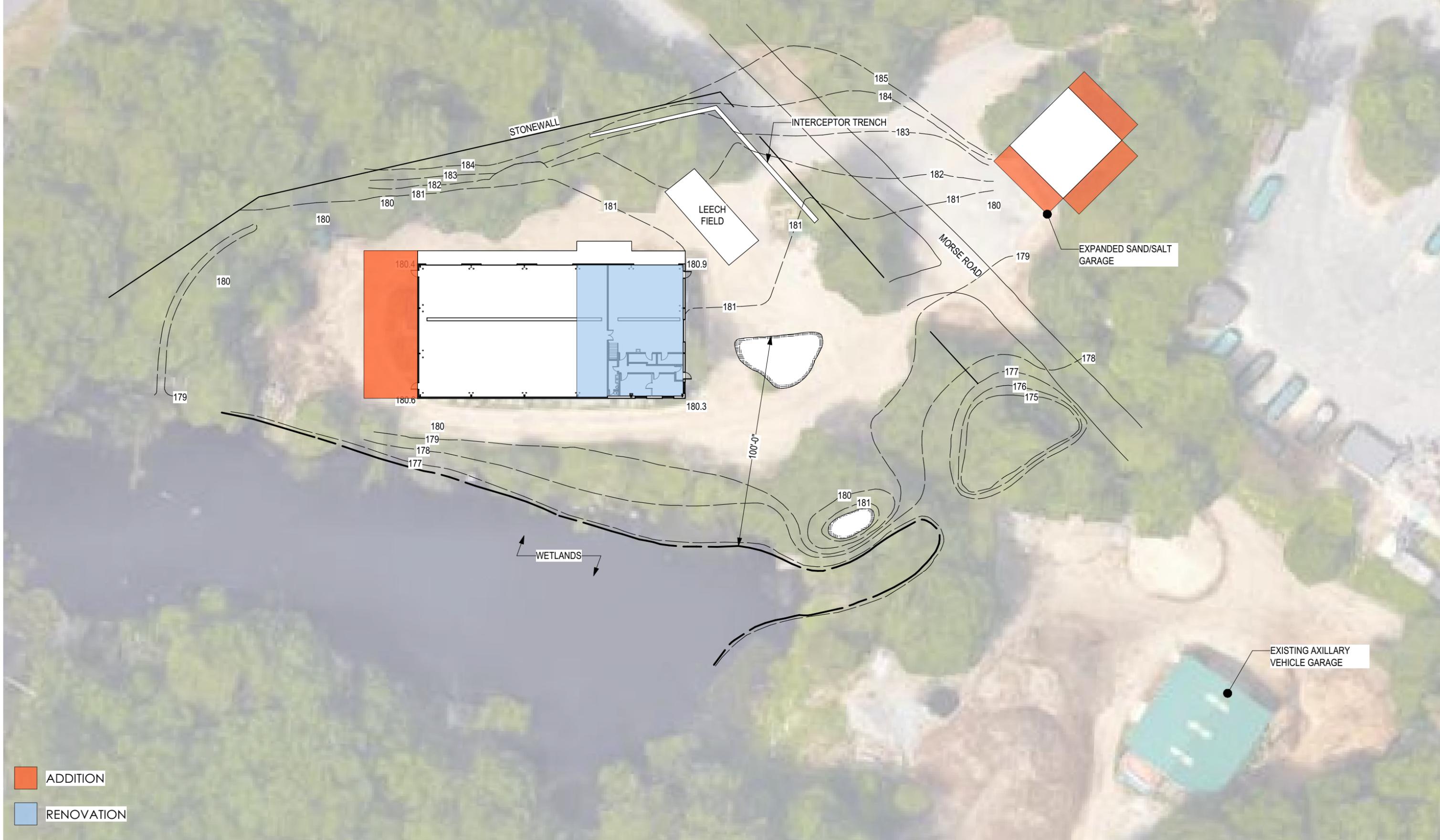
CONCEPTUAL FIRST FLOOR PLAN

SCALE : 1/16" = 1'-0"



NORTH

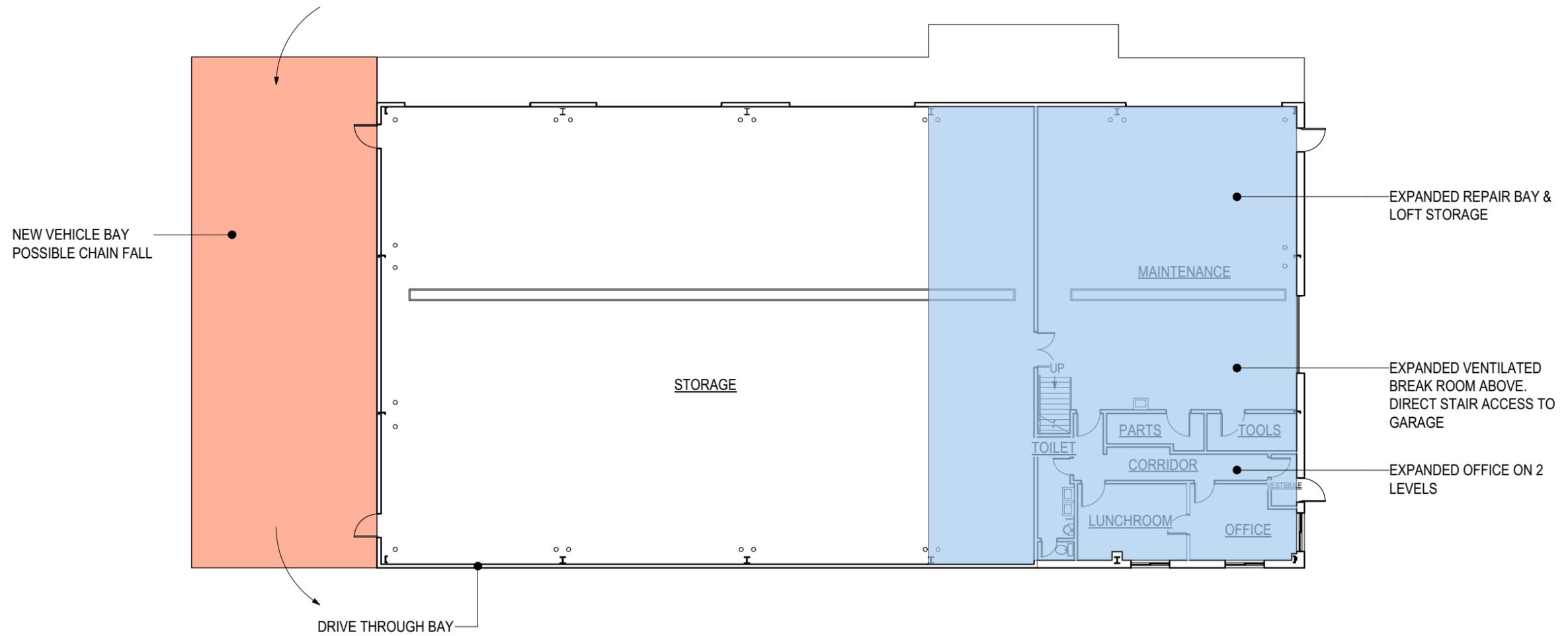




- ADDITION
- RENOVATION

SCALE : 1" = 40'-0"





- ADDITION
- RENOVATION

SCALE : 1/16" = 1'-0"



5. Cost Estimates and Project Priorities

Cost Estimate

What follows is a conceptual estimate for each structure as follows:

Building #	
1	Town Hall
2	Fire Station
3	Police Station
4	Dept. of Public Works

Costs are presented for each line item identified in the Conditions and Treatment Report above and are based on costs per square foot and whole building systems that assumes a single general construction contract publicly procured under the provisions of MGL chapter 149. Inasmuch as the timing of any proposed renovations is unclear, we have not adjusted the estimates for inflation.

Work includes materials, trade labor, general conditions and subcontractor overhead and profit markups, which form the Total Estimated Construction Cost. This represents the cost of the work by each trade as received by a general contractor. The costs to the Town of Carlisle will depend on the size and complexity of each individual contract.

We have provided in the Estimated Project Cost a conservative projection of 50% of the Total Estimated Construction Cost to include the general contractor's costs of mobilization, general conditions, profit and overhead; as well as design and engineering fees, and soils and hazardous materials testing. This estimate does not include the costs of project management, furniture, fixtures and equipment (FF&E), temporary facilities or moving expenses if required to maintain operations during renovation.

Priority of Work

We have ranked each proposed work line item in priority reflecting the following criteria:

1. Regulatory - Life Safety: including any work currently required to meet building code to protect life safety, or to avoid significant environmental damage.
2. Regulatory - ADA: including any work required to achieve accessibility as required by the Massachusetts Architectural Access Board (MAAB) or by the Americans' with Disabilities Act (ADA);
3. Building Stabilization: deferred maintenance work required to stabilize the buildings against weather or deterioration;
4. Operating Efficiencies: work that would improve departmental operation, energy performance or otherwise lower operating costs;
5. Life Cycle Maintenance: work recommended in light of the age of existing systems in anticipation of equipment failure or obsolescence;
6. Program: work that expands or reconfigures existing facilities to address reported deficiencies or required to meet accreditation standards of state or national authorities having jurisdiction.

All work identified in this report is recommended to the Town. However, not everything is equally necessary. Based on the above criteria, we established priority categories 1 through 5 to assist the Town in planning for the work and establishing a timetable for implementation.

Priority 1: Work that should be performed immediately.

Priority 2: Highly recommended due to deferred maintenance but not required to address life or environmental safety, or building stabilization; work that addresses serious operating deficiencies or which is required to maintain approvals by regulators overseeing departmental operations.

Priority 3: Recommended to improve operations and/or site design.

Priority 4: Work that would improve operations and facility longevity or which addresses the impending end of product or equipment life cycles.

Priority 5: Work that may be required in the medium-term but which does not affect operations at this time.

Carlisle Facilities Study
 Capital Projects Estimate
 Summary by Building and Priority

		Estimated Const. Cost	Priority				
			1	2	3	4	5
1	Town Hall	\$ 530,000	\$ 30,000	\$ 178,700	\$ 299,600	\$ -	\$ 21,300
2	Fire Station	\$ 1,695,000	\$ 85,600	\$ 1,552,100	\$ 43,100	\$ 2,600	\$ 11,100
3	Police Station	\$ 2,378,000	\$ 1,552,400	\$ 636,200	\$ 61,500	\$ 126,200	\$ 1,400
4	Public Works	\$ 1,647,000	\$ 456,700	\$ 236,300	\$ 953,900	\$ -	\$ -
All Buildings		\$ 6,249,000	\$ 2,124,700	\$ 2,603,400	\$ 1,358,100	\$ 128,800	\$ 33,700
Estimated Project Cost		\$ 9,373,500	\$ 3,187,050	\$ 3,905,100	\$ 2,037,150	\$ 193,200	\$ 50,550

Carlisle Facilities Study
Capital Projects Estimate

Item	Description	Value	Draft Priority				
			1	2	3	4	5
1	Town Hall						
1	Replace EPDM, reinsulate; no structural damage	\$ 19,349	\$ -	\$ 19,349	\$ -	\$ -	\$ -
2	Wall damage: new siding, replace insulation	\$ 6,003	\$ 6,003	\$ -	\$ -	\$ -	\$ -
3A	Eave, soffit, fascia repair SOUTH	\$ 7,183	\$ -	\$ 7,183	\$ -	\$ -	\$ -
3B	Eave, soffit, fascia, lean-to repair E & N	\$ 10,774	\$ 10,774	\$ -	\$ -	\$ -	\$ -
4A	Replace WEST windows with new DH fiberglass	\$ 10,266	\$ 10,266	\$ -	\$ -	\$ -	\$ -
4B	Replace SOUTH windows with new DH fiberglass	\$ 18,821	\$ -	\$ 18,821	\$ -	\$ -	\$ -
4C	Replace E & N windows with new DH fiberglass	\$ 19,677	\$ -	\$ 19,677	\$ -	\$ -	\$ -
5	Door repair	\$ 3,000	\$ 3,000	\$ -	\$ -	\$ -	\$ -
6	New HVAC RTU, new DDC controls	\$ 113,698	\$ -	\$ 113,698	\$ -	\$ -	\$ -
7	Reconfigure open offices	\$ 212,500	\$ -	\$ -	\$ 212,500	\$ -	\$ -
8	New private offices	\$ 21,250	\$ -	\$ -	\$ -	\$ -	\$ 21,250
9	Expand, reconfigure rear parking lot	\$ 83,600	\$ -	\$ -	\$ 83,600	\$ -	\$ -
10	Modify entry parking area	\$ 3,500	\$ -	\$ -	\$ 3,500	\$ -	\$ -
	Subtotal, Town Hall	\$ 529,620	\$ 30,043	\$ 178,727	\$ 299,600	\$ -	\$ 21,250

Carlisle Facilities Study
Capital Projects Estimate

Item	Description	Value	Draft Priority					
			1	2	3	4	5	
2	Fire Station							
1	Roof drainage discharge changes	\$ 4,000	\$ -	\$ -	\$ 4,000	\$ -	\$ -	
2	Basement wall spalling, block repair	\$ 1,500	\$ 1,500	\$ -	\$ -	\$ -	\$ -	
3	OH door trim, seals repair	\$ 5,250	\$ -	\$ -	\$ 5,250	\$ -	\$ -	
4	New entry door system		\$ -	\$ -	\$ -	\$ -	\$ -	
5	Paint concrete block	\$ 1,755	\$ -	\$ -	\$ 1,755	\$ -	\$ -	
6	Paint doors and trim	\$ 1,323	\$ -	\$ -	\$ -	\$ 1,323	\$ -	
7	Recaulk exterior joints	\$ 1,320	\$ -	\$ -	\$ -	\$ 1,320	\$ -	
8	New handrails, guardrails (?)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
9	New carpet	\$ 4,447	\$ -	\$ -	\$ 4,447	\$ -	\$ -	
10	New solid rubber tile	\$ 18,648	\$ -	\$ -	\$ 18,648	\$ -	\$ -	
11	New ACT ceilings	\$ 9,658	\$ -	\$ -	\$ -	\$ -	\$ 9,658	
12	Entrance access: new lift	\$ 400,000	\$ -	\$ 400,000	\$ -	\$ -	\$ -	
13	Public toilet room; women's locker/bath room	\$ 110,000	\$ -	\$ 110,000	\$ -	\$ -	\$ -	
14	DHW mixing valves	\$ 1,400	\$ -	\$ -	\$ -	\$ -	\$ 1,400	
15	New HVAC, full zone controls (expansion)	\$ 120,000	\$ -	\$ 120,000	\$ -	\$ -	\$ -	
16	New sprinkler system: cistern, pumps (expansion)	\$ 186,303	\$ -	\$ 186,303	\$ -	\$ -	\$ -	
17	Replace electrical service	\$ 8,130	\$ -	\$ 8,130	\$ -	\$ -	\$ -	
18	New phone system	\$ 5,500	\$ -	\$ 5,500	\$ -	\$ -	\$ -	
19	New fire alarm system	\$ 22,006	\$ -	\$ 22,006	\$ -	\$ -	\$ -	
20	New emergency lighting	\$ 12,188	\$ -	\$ 12,188	\$ -	\$ -	\$ -	
21	New LED lighting system	\$ 4,729	\$ -	\$ -	\$ 4,729	\$ -	\$ -	
22	Augment electrical outlets	\$ 7,500	\$ -	\$ 7,500	\$ -	\$ -	\$ -	
23	Bollards at fuel pumps	\$ 3,600	\$ -	\$ -	\$ 3,600	\$ -	\$ -	
24	Remove u/g fuel tank; new above-ground tank	\$ 72,028	\$ 72,028	\$ -	\$ -	\$ -	\$ -	
25	New paved accessible route	\$ 4,000	\$ -	\$ 4,000	\$ -	\$ -	\$ -	
26	New accessible entry	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
27	Repair SE retaining wall	\$ 700	\$ -	\$ -	\$ 700	\$ -	\$ -	
28	Oil water separation	\$ 12,083	\$ 12,083	\$ -	\$ -	\$ -	\$ -	
29	Reconfigured building entries	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
30	New fire equipment bay	\$ 405,000	\$ -	\$ 405,000	\$ -	\$ -	\$ -	
31	New lockers/showers/baths	\$ 97,500	\$ -	\$ 97,500	\$ -	\$ -	\$ -	
32	New administrative facilities	\$ 174,000	\$ -	\$ 174,000	\$ -	\$ -	\$ -	
	Subtotal, Fire Station	\$ 1,694,568	\$ 85,611	\$ 1,552,127	\$ 43,128	\$ 2,643	\$ 11,058	

Carlisle Facilities Study
Capital Projects Estimate

Item	Description	Value	Draft Priority					
			1	2	3	4	5	
3	Police Station							
1	Repair cracking and corrosion in foundation wall	\$ 1,500	\$ -	\$ 1,500	\$ -	\$ -	\$ -	\$ -
2	Roof drainage reconfiguration	\$ 6,724	\$ -	\$ 6,724	\$ -	\$ -	\$ -	\$ -
3	Spot scrape prime and paint at North wall	\$ 3,500	\$ -	\$ 3,500	\$ -	\$ -	\$ -	\$ -
4	Scrape, prime and paint trim	\$ 611	\$ -	\$ 611	\$ -	\$ -	\$ -	\$ -
5	Replace wood stops at overhead doors	\$ 750	\$ -	\$ -	\$ 750	\$ -	\$ -	\$ -
6	Replace five screens	\$ 1,000	\$ -	\$ -	\$ -	\$ 1,000	\$ -	\$ -
7	Caulk joint between clapboards and trim	\$ 625	\$ -	\$ 625	\$ -	\$ -	\$ -	\$ -
8	Replace deteriorated window heads	\$ 1,400	\$ -	\$ 1,400	\$ -	\$ -	\$ -	\$ -
9	Replace main entry door with thermally broken	\$ 3,883	\$ -	\$ 3,883	\$ -	\$ -	\$ -	\$ -
10	Replace overhead door seals	\$ 750	\$ -	\$ -	\$ 750	\$ -	\$ -	\$ -
11	Upgrade hardware at secure perimeter	\$ 30,000	\$ 30,000	\$ -	\$ -	\$ -	\$ -	\$ -
12	New stair and handrail to current code	\$ 10,000	\$ 10,000	\$ -	\$ -	\$ -	\$ -	\$ -
13	Repair grout at tile areas	\$ 1,000	\$ -	\$ -	\$ 1,000	\$ -	\$ -	\$ -
14	Replace all vinyl base	\$ 13,173	\$ -	\$ -	\$ -	\$ 13,173	\$ -	\$ -
15	Replace all carpet with carpet tile	\$ 61,144	\$ -	\$ -	\$ -	\$ 61,144	\$ -	\$ -
16	Replace all vinyl flooring with rubber	\$ 46,620	\$ -	\$ -	\$ 46,620	\$ -	\$ -	\$ -
17	Replace all ACT ceilings	\$ 50,874	\$ -	\$ -	\$ -	\$ 50,874	\$ -	\$ -
18	Upgrade lighting to LED	\$ 7,350	\$ -	\$ -	\$ 7,350	\$ -	\$ -	\$ -
19	Install new lift with enclosure	\$ 25,000	\$ 25,000	\$ -	\$ -	\$ -	\$ -	\$ -
20	Renovate public restroom to MAAB standards	\$ 15,000	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ -
21	DHW mixing valves	\$ 1,400	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,400
22	Replace fan coil unit AC to handle E911	\$ 15,000	\$ 15,000	\$ -	\$ -	\$ -	\$ -	\$ -
23	Install ventilation to all spaces via ERV	\$ 25,000	\$ 25,000	\$ -	\$ -	\$ -	\$ -	\$ -
24	New sprinkler system: cistern, pumps	\$ 238,613	\$ 238,613	\$ -	\$ -	\$ -	\$ -	\$ -
25	New fire alarm system	\$ 22,006	\$ 22,006	\$ -	\$ -	\$ -	\$ -	\$ -
26	Augment electrical outlets	\$ 5,000	\$ -	\$ 5,000	\$ -	\$ -	\$ -	\$ -
27	Repair and resurface antenna base	\$ 1,000	\$ 1,000	\$ -	\$ -	\$ -	\$ -	\$ -
28	Accessible parking and route to entry	\$ 2,500	\$ -	\$ 2,500	\$ -	\$ -	\$ -	\$ -
29	Regrade and stabilize embankment at north wall	\$ 5,000	\$ -	\$ -	\$ 5,000	\$ -	\$ -	\$ -
30	Expansion	\$ 1,134,375	\$ 1,134,375	\$ -	\$ -	\$ -	\$ -	\$ -
31	Renovation (for expansion)	\$ 562,500	\$ -	\$ 562,500	\$ -	\$ -	\$ -	\$ -
32	Replace generator	\$ 36,360	\$ 36,360	\$ -	\$ -	\$ -	\$ -	\$ -
33	Parking	\$ 48,000	\$ -	\$ 48,000	\$ -	\$ -	\$ -	\$ -
	Subtotal, Police	\$ 2,377,659	\$ 1,552,354	\$ 636,243	\$ 61,470	\$ 126,192	\$ 1,400	\$ -

Carlisle Facilities Study
Capital Projects Estimate

Item	Description	Value	Draft Priority					
			1	2	3	4	5	
4	DPW							
1	New floor finishes, trench cover	\$ 4,397	\$ -	\$ 4,397	\$ -	\$ -	\$ -	\$ -
2	OH door slab modifications	\$ 1,000	\$ -	\$ 1,000	\$ -	\$ -	\$ -	\$ -
3	New roof, insulation, gutters	\$ 148,262	\$ 148,262	\$ -	\$ -	\$ -	\$ -	\$ -
4	New wall panels, insulation	\$ 87,437	\$ 87,437	\$ -	\$ -	\$ -	\$ -	\$ -
5	OH door frame repair, bollards	\$ 10,000	\$ 10,000	\$ -	\$ -	\$ -	\$ -	\$ -
6	New windows, caulking	\$ 2,861	\$ 2,861	\$ -	\$ -	\$ -	\$ -	\$ -
7	Rehab entry doors, frames	\$ 12,500	\$ 12,500	\$ -	\$ -	\$ -	\$ -	\$ -
8	New stair to loft	\$ 13,020	\$ -	\$ -	\$ 13,020	\$ -	\$ -	\$ -
9	Replace damaged GWB	\$ 6,000	\$ -	\$ 6,000	\$ -	\$ -	\$ -	\$ -
10	Repaint interior	\$ 15,750	\$ -	\$ 15,750	\$ -	\$ -	\$ -	\$ -
11	New floor finishes	\$ 4,589	\$ 4,589	\$ -	\$ -	\$ -	\$ -	\$ -
12	Refinish concrete slabs	\$ 31,500	\$ -	\$ -	\$ 31,500	\$ -	\$ -	\$ -
13	New ACT, insulation above	\$ 56,069	\$ 56,069	\$ -	\$ -	\$ -	\$ -	\$ -
14	New toilet rooms, kitchenette	\$ 135,000	\$ 135,000	\$ -	\$ -	\$ -	\$ -	\$ -
15	New office HVAC	\$ 15,945	\$ -	\$ 15,945	\$ -	\$ -	\$ -	\$ -
16	New garage bay ventilation	\$ 5,685	\$ -	\$ 5,685	\$ -	\$ -	\$ -	\$ -
17	New vehicle exhaust system	\$ 24,879	\$ -	\$ 24,879	\$ -	\$ -	\$ -	\$ -
18	New sprinkler system: cistern, pumps	\$ 205,365	\$ -	\$ -	\$ 205,365	\$ -	\$ -	\$ -
19	New fire alarm system	\$ 22,006	\$ -	\$ 22,006	\$ -	\$ -	\$ -	\$ -
20	New LED lighting	\$ 1,862	\$ -	\$ -	\$ 1,862	\$ -	\$ -	\$ -
21	New electrical, data systems	\$ 5,000	\$ -	\$ 5,000	\$ -	\$ -	\$ -	\$ -
22	New emergency lighting	\$ 17,428	\$ -	\$ 17,428	\$ -	\$ -	\$ -	\$ -
23	Repave in front of salt shed	\$ 19,040	\$ -	\$ 19,040	\$ -	\$ -	\$ -	\$ -
24	Repave around office access	\$ 9,000	\$ -	\$ -	\$ 9,000	\$ -	\$ -	\$ -
25	Reconfigure office, expand loft	\$ 357,200	\$ -	\$ -	\$ 357,200	\$ -	\$ -	\$ -
26	Drive through bays	\$ 12,000	\$ -	\$ -	\$ 12,000	\$ -	\$ -	\$ -
27	New vehicle bay expansion	\$ 324,000	\$ -	\$ -	\$ 324,000	\$ -	\$ -	\$ -
28	Expand salt shed	\$ 99,125	\$ -	\$ 99,125	\$ -	\$ -	\$ -	\$ -
	Subtotal, DPW	\$ 1,646,920	\$ 456,718	\$ 236,255	\$ 953,948	\$ -	\$ -	\$ -



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