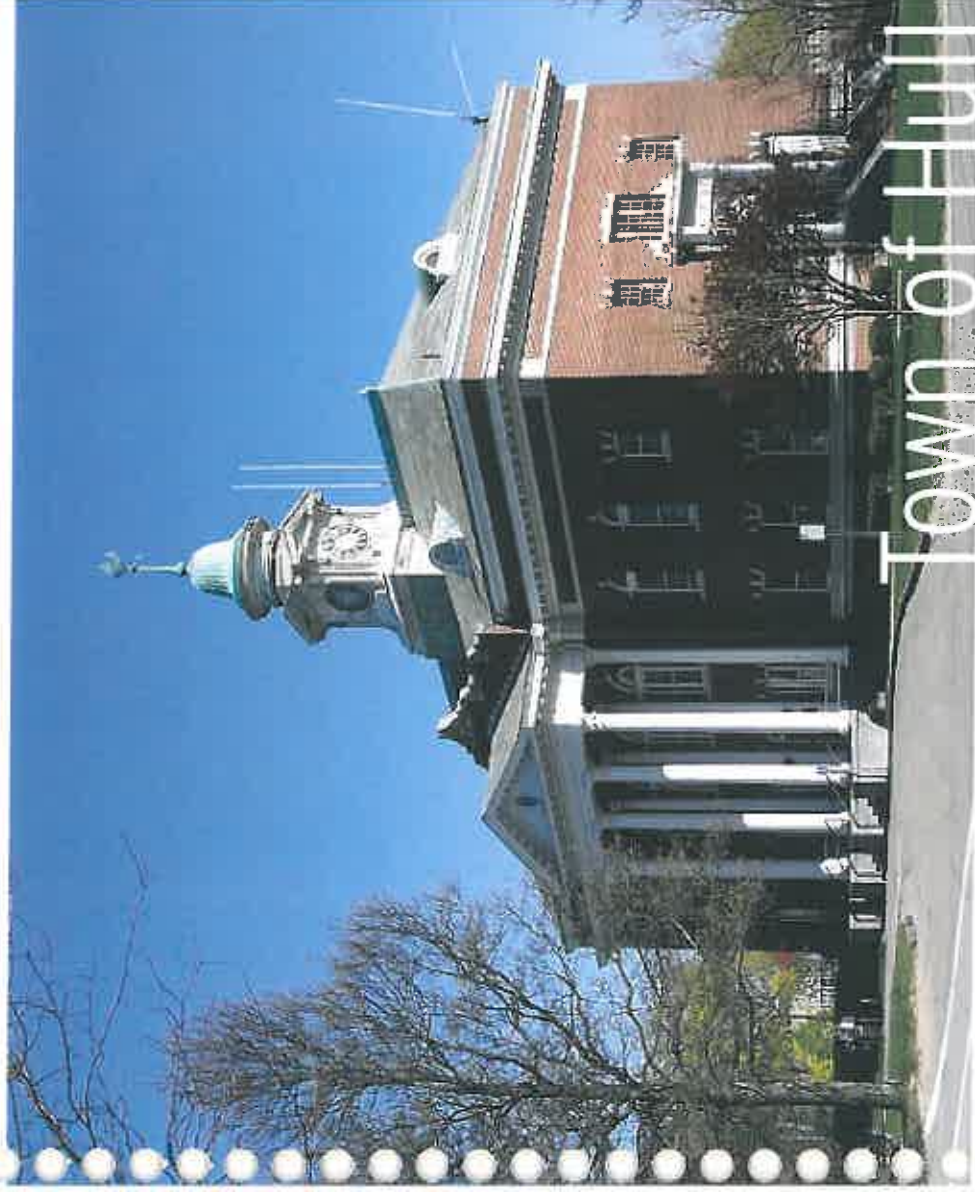


Feasibility Study

Town Hall - Police - Fire Complex



Report Prepared by:

Ai3 Architects, LLC
526 Boston Post Road
Wayland, MA 01778

Project Number: 1302.00

May 2013

Report Prepared for:

Phillip Lemnios, Town Manager
Town of Hull
253 Atlantic Ave
Hull, MA 02045

Evaluation Team:

Architects:

Ai3 Architects, LLC
526 Boston Post Road
Wayland, MA 01778

Structural Engineer:

PARE Coporation
8 Blackstone Valley Place
Lincoln, RI 02865

Mechanical, Electrical, Plumbing & Fire Protection Engineers:

Griffith & Vary, Inc.

12 Kendrick Road
Wareham, MA 02571

Police & Fire Programming Consultant:

Municipal Resources, Inc.
120 Daniel Webster Highway
Meredith, NH 03253

Table of Contents

I.	Executive Summary and Recommendations	
	a. Project Background and Introduction	
	b. Summary and Recommendations	
II.	Existing Building Evaluation	
	a. Evaluation Matrix	
	b. Site Plan	
	c. Floor Plans	
	d. Existing Program & Space Tabulation	
	e. Existing Condition Assessment	
	i. Overview	
	ii. Historical Description and Review	
	iii. Architectural Review (Exterior/Interior)	
	iv. Structural Review	
	v. Plumbing Review	
	vi. Fire Protection Review	
	vii. Mechanical Review	
	viii. Electrical Review	
	f. Building Code Analysis (including energy code)	
	g. Handicap Accessibility Review (MAAB & ADA)	
III.	Proposed Building Program	
	a. Addition/Renovation Diagrams	
IV.	Recommended Emergency Repairs (1-2 year)	
V.	Cost Analysis (Cost/SF)	

Appendix A - Photo documentation of the existing conditions

Executive Summary

introduction and background

In March of 2013 the Town of Hull contacted Ai3 Architects, LLC to conduct a feasibility study of the existing Town Hall, Police Station, and Fire Station (Green Hill Station). The study was conducted with specific emphasis on assessing the current physical conditions of the existing building as well as the current condition of the building's mechanical, electrical, plumbing and fire protection systems, reviewing the current space program, and evaluating the future program needs for the building. The specific goals of the study included:

- Assessment of the current physical conditions of the existing Town Hall, Police Station, and Green Hill Fire Station (Architectural, Structural, Mechanical, Electrical, Plumbing, and Fire Protection)
- Identify any required short-term “emergency repairs” that should be implemented within the next 1-2 years
- Review current space program
- Review future space program needs
- Review the facility for comprehensive renovation needs based on future space program requirements

Ai3 Architects, LLC and the consulting engineers completed the following tasks:

1. Evaluated the physical condition of the existing Town Hall, Police Station, and Green Hill Fire Station (Architectural – Exterior and interior)
2. Evaluated the physical condition of the existing structural system
3. Evaluated the physical condition of the existing mechanical, electrical, plumbing and fire protection systems
4. Evaluated the existing building for current building code deficiencies
5. Evaluated the existing building for current energy code deficiencies
6. Evaluated the existing building for handicap accessibility deficiencies
7. Developed an evaluation matrix for assessing the current physical conditions of the existing building and systems
8. Identified required “emergency repairs” that should be implemented within the next 1-2 years
9. Reviewed and confirmed the existing space program and square footages
10. Evaluated the current capacity of the existing building
11. Reviewed the long-term space program needs with the Town Manager
12. Evaluated the capacity of the existing building relative to the long-term space program needs
13. Developed renovation and renovation/addition options for resolving space needs constraints and future program needs
14. Developed cost analysis (cost/sf) for the following options:
 - a. Comprehensive renovation of the existing building
 - b. Comprehensive renovation and addition to the existing building
 - c. Construction of a new building

The compilation of all of the work completed is included herein as part of the completed feasibility study. The Executive Summary is included to allow the reader to understand the detail and breadth of the work completed without the need to review the detail contained within the individual sections.

summary and recommendations

In March and April of 2013, the feasibility study review team, consisting of a team of architects and engineers led by Ai3 Architects, LLC, performed a needs assessment and feasibility study of the existing Hull Town Hall/Police/Fire Complex.

The scope of work for this assessment included the evaluation of the physical condition of the existing building structure, exterior envelope and interior spaces, mechanical, electrical, plumbing, and fire protection systems, accessibility of the building, and the historic nature of the existing building. The assessment also reviewed the existing uses, building code compliance, and proposed future uses in order to determine its present conditions and future needs.

This assessment took the form of meetings with the Town Manager, Police Chief, Building Commissioner, historic research, review of the existing drawings (provided by the Town of Hull) and visual examination of the existing building and building systems.

The assessment led to the following conclusions:

- The existing Town Hall building is an excellent example of Classical – Federal Style architecture, and the integrity of the historic building should be preserved and protected. The historic exterior and significant interior spaces and materials should be retained (details replicated with new materials or restoration of existing materials).
- The Town Hall building is sited with ideal civic presence along Atlantic Ave and the “Atlantic Hill” neighborhood.
- In general, the existing exterior brick masonry is in good condition, requiring areas of minor repointing and patching.
- In general, the existing concrete framing, wood timber and structural steel structural system is in fair-to-good condition (Reference the structural report for detailed information and building code analysis).
- Structural deficiencies related to the re-enforced concrete beams and slab beneath the cell blocks and the exterior steel fire escape should be rectified.
- The existing slate roof is nearing the end of its useful life and requires removal and replacement, including the roof’s gutters and downspouts.
- The existing cupola and clock needs to be repaired and restored.
- The exterior windows require removal and replacement with energy efficient window systems.
- The existing wood trim and detailing has significant deterioration and requires removal and replacement.
- There is no fire protection sprinkler system installed anywhere in the Town Hall, Police and Fire complex. A complete, code-compliant, wet-pipe and dry-pipe (attic) fire protection system will need to be installed when major renovations occur.
- The Town Hall building has a permanent heating system and no air-conditioning except where individual window A/C units have been installed. The system is archaic and inefficient. The overall system is inadequate as a cohesive system and fails to provide adequate heat to all spaces without auxiliary local heaters.
- The air conditioning system is comprised of multiple window type AC units.

The Police Department offices are served by a heat pump with the condensing unit that is rusted and in poor condition. This system is inadequate for the requirements of the spaces and has no provisions for the introduction of fresh air into the spaces.

- The building ventilation system, which relies mainly on operable windows, is severely inadequate and does not conform to the current building code.
- The plumbing system is adequate for the current sanitary arrangement and requirements. When the bathrooms are reconfigured and relocated, the plumbing system will need to be replaced.
- In general, the overall normal power distribution system is in poor condition. The electrical system should be upgraded for compliance with the current electrical code and the existing overhead electric service should be replaced with new and sized to reflect proper load requirements.
- The lighting system is archaic and energy-inefficient. Any renovation will require complete replacement of the lighting system for energy efficiency, cost savings and proper task lighting.
- The existing fire alarm system does not meet current codes and should be replaced.
- Emergency egress lighting and exit signage is inadequate. The egress lighting and exit signs should be upgraded to meet the current code.

Recommendation:

The architectural integrity of the existing Town Hall building should be preserved and protected. A significant number of non-compliance issues related to the existing building in comparison to the requirements of the current State Building Code have been identified within this report, including but not limited to; energy efficiency issues, handicap accessibility issues, no fire protection system, building system issues (MEP/FP), building envelope/water infiltration issues, and program adjacency issues.

During the needs assessment and building evaluation process, conceptual-brainstorming discussions occurred between the evaluation team and town officials related to possible programming options that will be further evaluated as an independent phase of this process. Some of the options discussed included:

1. Renovation of the existing facility to accommodate Town Hall, Police and Fire as they currently exists.
2. Renovation of the existing Town Hall building for Police and Fire only.
3. Renovation of the existing Town Hall, demolition of the existing Police, and an addition for the Police and Fire Departments.
4. Construction of a new facility for Police and Fire Departments and move Town Hall to the current Memorial Middle School building.

In any scenario, the existing Town Hall building requires a comprehensive gut renovation / restoration of this facility.

Existing Building Evaluation

evaluation matrix

NOMENCLATURE

Nomenclature used in the Architectural assessment is generally defined as follows:



Good: Architectural elements have little to no observed deterioration and can perform their intended function. Finishes or materials may have some light wear. Masonry surfaces are clean with little to no cracking or spalling. Wood is clean with no staining or mold. Plaster surfaces are firm and crack free. This would result in a rating of 1.



Fair: Architectural elements have low levels of deterioration and can perform their intended function, but may have some minor reduction in capacity. Masonry elements may have hairline cracks and localized spalling, efflorescence, and staining, but surfaces are largely intact and clear. Wood members may have some checking and localized staining/mold, but appear sound. Plaster surfaces may have some staining and minor cracking at corners, but surfaces are firm. This would result in a rating of 2.



Poor: Architectural elements show advanced loss or deterioration. Large cracks may be observed in concrete or masonry elements. Wood may be stained and/or damp with mold and/or small areas of rot. Vertical elements may be out of plumb and have lost veneer elements. Floors/roofs may have rotted/missing finishes and/or are easily deflected. This would result in a rating of 3.



Very Poor: Architectural elements show severe loss or deterioration and can no longer safely perform their intended function. Large, extensive cracking and loss of masonry units may be observed in concrete or masonry elements. Wood members may have extensive mold and rot along their length and/or at their supports. Floors/roofs and vertical elements may exhibit large, permanent deflections. This would result in a rating of 4.

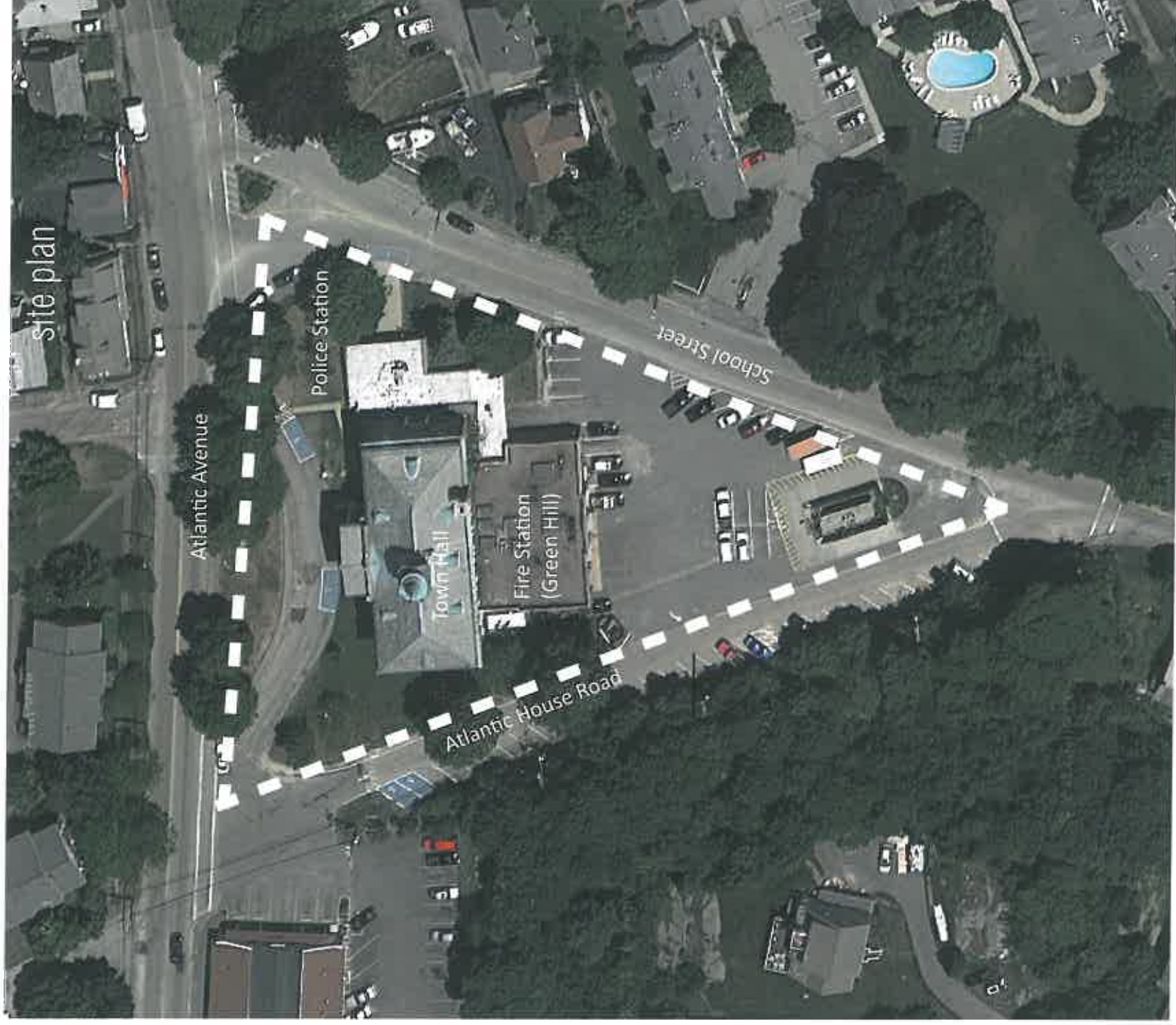


Failed: Architectural elements have lost the ability to perform their intended function. Elements are severely damaged, broken or missing or are near that stage and do not function as required or intended. Item is non-compliant with the most current applicable code. This would result in a rating of 5.

evaluation matrix (cont'd)

Item	Deficiency	Rating
Exterior		
E1	Exterior brick masonry at the 1920's Town Hall building (good condition - minor repointing required)	1-2
E2	Exterior brick masonry at the Fire Department (Spalling brick and mortar over fire apparatus room has deteriorated.)	3
E3	Precast Concrete banding and window heads	1-2
E4	Exterior windows and storefront systems	4
E5	Exterior window - steel lintels	2
E6	Exterior wood trim - General (deteriorated and/or missing in numerous locations)	4
E7	Exterior wood cornice at the perimeter of the existing 1920's building	4
E8	Exterior wood egress door columns and head detailing	4
E9	Existing cupola wood trim and copper flashing	4
E10	Existing wood pilasters and columns at the 1920's Town Hall main entrance (Engaged pilaster on east façade is cracked for 2/3rds height)	4
E11	Existing wood pediment at the 1920's Town Hall main entrance	3
E12	Slate Roof (Approaching the end if its useful life)	4
E13	Copper flashing and trim (deterioration and failure in various locations resulting in water infiltration into the building)	4
E14	Existing roof rain leaders and downspout (not connected to grade)	3
E15	Existing membrane roof area (1970 addition) and ballasted roof area (1920's roof at Police and Fire) requires removal and replacement	3
E16	Exterior fire escape (significantly deteriorated - Reference PARE structural report for details)	5
E17	Existing exterior concrete entry / egress stairs (deterioration and spalling)	3
E18	Existing building envelope does not comply with the current energy code	5
E19	Existing building envelope does not comply with the current energy code	5
Interior		
I1	Interior Floor finishes (Carpet / tile) are 'tired' and require removal and replacement	3
I2	Interior terrazzo floor finish with the Town Hall first floor requires updating	3
I3	Interior stair treads are deteriorated and non-compliant and require replacement	3
I4	Numerous marble thresholds throughout the building are greater than 1/2" height - the condition is non-compliant with the Massachusetts Architectural Access Board (MAAB) regulations	5
I5	Plaster wall finish has failed due to moisture in numerous locations.	2
I6	Interior wood paneling at the main floor level have fallen away and exposed back-up wall material	4
I7	Plaster ceiling finishes have been compromised and/or stained in many locations due to water infiltration	3
I8	MAAB: Interior door hardware and stair handrails are non-compliant with current regulations	5
I9	MAAB: counters in most public offices are not accessible height.	5
I10	MAAB: Handicapped sink on 2nd Floor was obstructed by vertical 2x4 temporary support.	5
I11	MAAB: Handicapped accessible restroom on Floor Level 2 was not accessible hardware.	5
I12	MAAB: counters in most public offices are not accessible height.	5
I13	Egress door hardware is non-compliant with current Massachusetts State Building Code egress requirements	5
I14	Wall penetrations in numerous locations are not sealed to prevent passage of smoke/fire	4
I15	Combustible materials are being stored in corridors in many areas	5
I16	The ceiling above the cell blocks and adjacent to an in-filled skylight opening	5
I17	Third floor level door hardware to stairway is lockable and not permitted.	5
I18	Potential building code required separation requirements for garage/maintenance spaces that appear to currently be not separated.	3
I19	Potential mold issue below cell area in crawl space.	5
I20	Fire separation of boiler room to adjacent spaces. Door/frame has failed.	5
I21	MAAB: noncompliant door hardware at men's toilet room at police	5
I22	At fire chief's car garage, ceiling not sealed- exposed hole to structure above.	4
I23	At fire chief's car garage, door not on closer control. Not rated. Door hardware has failed.	5
I24	At fire chief's car garage corridor- storage of (oxygen) tanks and scrape wood trim.	5
I25	At fire chief's car garage corridor- no handrails at steps.	3
I26	At fire chief's car garage corridor- unsealed opening in wall and opposite side at old fire pole to adjacent room. Storage of materials in corridor.	4
I27	Tank storage room: numerous pipe/conduit penetrations are not sealed.	4
I28	Fire area: unsealed opening to over framed skylight.	5

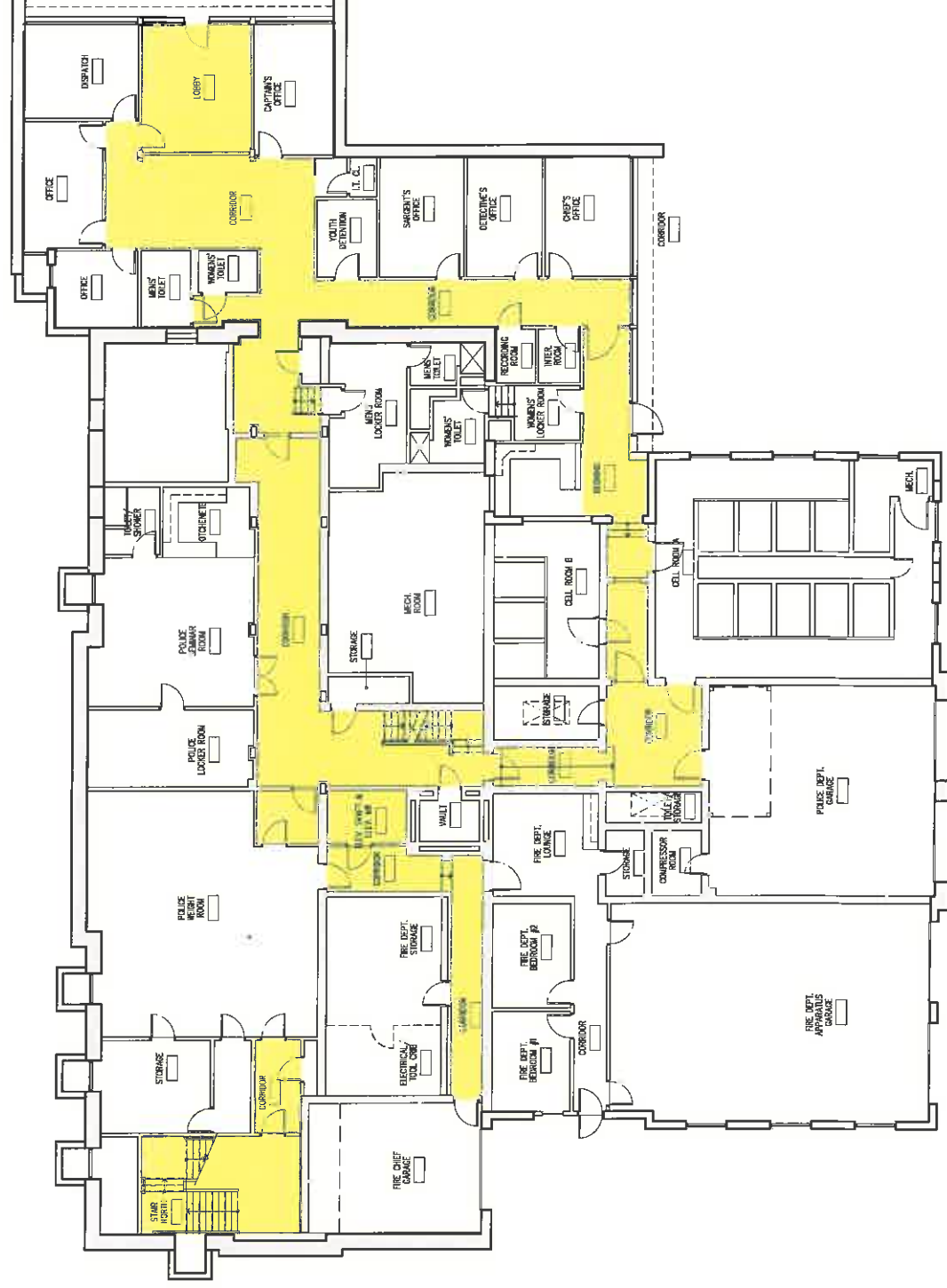
* Please note: The above list is a sampling of the features within the existing building to provide the reader with a general understanding of the current condition of the building and examples of current deficiencies and non-compliant conditions. It is not intended to be a complete list of all the deficiencies within the existing building.



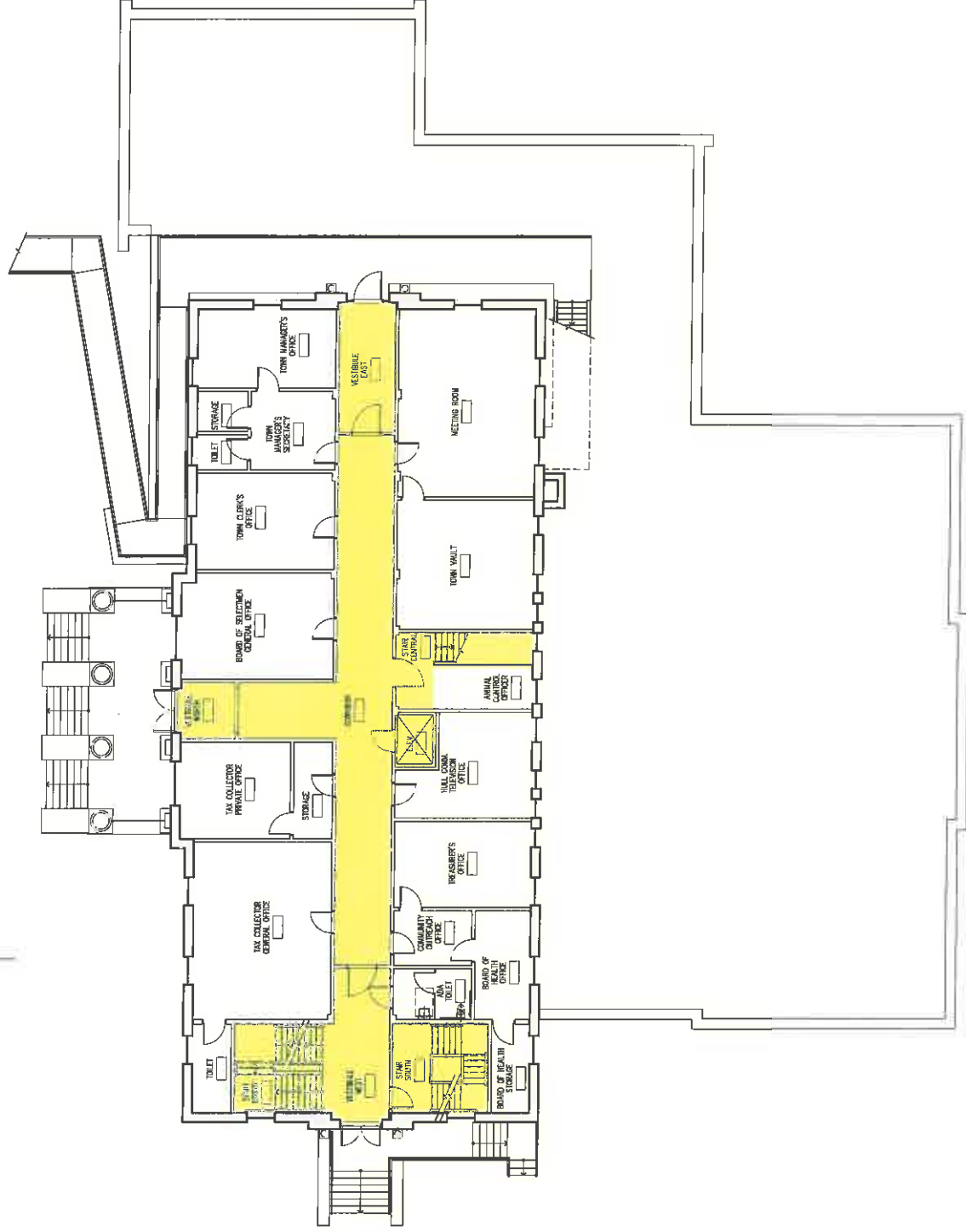
existing floor plans

For purposes of this report, the building's existing condition floor plans were generated from two sets of paper drawings provided to Ai3 Architects by Town personnel, along with photographic images that were taken during the on-site building walk. The first set of drawings was representative of the 1920's Main Town Hall and Fire Station. The architectural firm listed on the drawings is Penn Varney Architects from Lynn, Massachusetts. The floor plans are not dated. The second set of drawings was representative of the addition for the Police Station along with space reconfiguration to the existing Main Town Hall and Fire Station. The architectural firm listed is Paul Wiers Associates from Hull, Massachusetts. The drawings are dated October 1977.

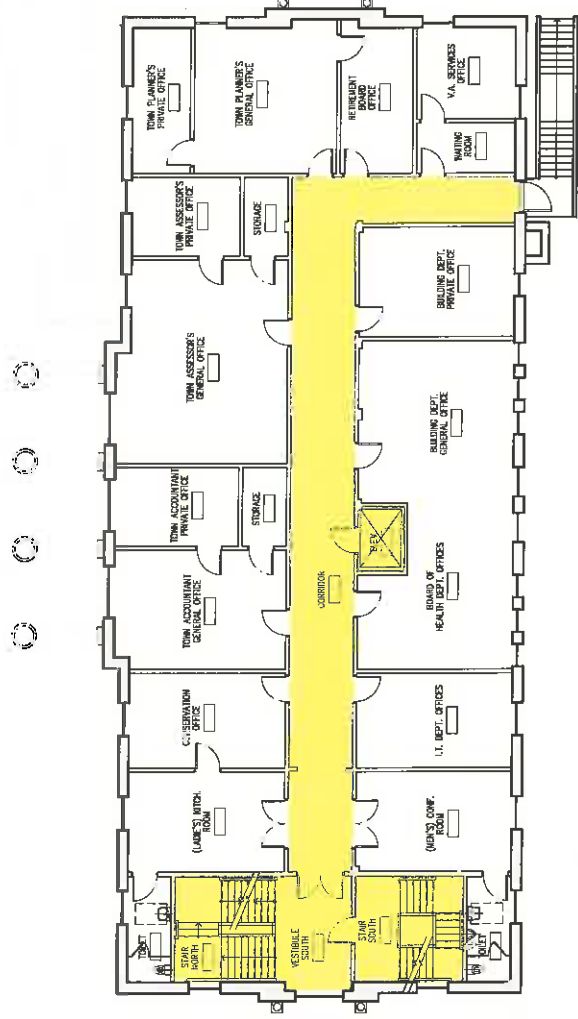
While we strive to ensure that the existing conditions drawings are complete and whole, for the purposes of the feasibility study a full on site existing conditions survey was not conducted to confirm exact locations and dimensions of every wall, door or other element. What these plans do provide us with is a starting point to begin to evaluate the overall goals of the study within a given set of parameters which aid us and the Town with evaluating current space allocation and proposed future plans.



existing lower floor plan



existing first floor plan



existing second floor plan

existing program & space tabulation

ROOM TYPE	Existing Conditions		
	ROOM NFA ¹	# OF RMS	area totals
Hull Town Hall-Police-Fire Complex			
POLICE DEPARTMENT			6,554
Lobby	234	1	234
Dispatch Office	180	1	180
Police Captain's Office	173	1	173
Office	168	1	168
Office	105	1	105
Toilet (M)	63	1	63
Toilet (F)	42	1	42
I.T. Closet	18	1	18
Youth Detention	77	1	77
Interrogation Room	38	1	38
Recording Room	35	1	35
Chief's Office	170	1	170
Detective's Office	151	1	151
Sergeant's Office	169	1	169
Storage Closet	14	1	14
Male Locker room	168	1	168
Toilet (M)	47	1	47
Female Locker room	74	1	74
Toilet (F)	71	1	71
Booking Area	184	1	184
Cell Room A	962	1	962
Mechanical Closet	48	1	48
Cell Room B	275	1	275
Storage Closet	96	1	96
Police Garage	801	1	801
Storage Closet (Compressor Room)	55	1	55
Mezzanine Storage	137	1	137
Toilet (U)	50	1	50
Police Seminar Room	396	1	396
Police Locker room	217	1	217
Kitchenette	106	1	106
Toilet/Shower (U)	64	1	64
Police Weight Room	876	1	876
Storage Closet	58	1	58
Storage Closet	232	1	232
FIRE DEPARTMENT			2,520
Fire Apparatus Garage	1,181	1	1,181
Mezzanine Storage	127	1	127
Fire Lounge	182	1	182
Fire Tank/Storage Room	383	1	383
Fire Bunk Room 1	137	1	137
Fire Bunk Room 2	132	1	132
Fire Chief's Car (Garage)	378	1	378

Feasibility Study - Town of Hull - Town Hall

TOWN HALL				9,824
Elevator / Elev. Machine Room	70	1		70
Vault	41	1		41
Storage Closet	96	1		96
Boiler Room	805	1		805
Coel Room (Oil Tank)	316	1		316
Animal Control Officer	120	1		120
Treasurer's Office	243	1		243
Tax Collector General Office/Parking Clerk	498	1		498
Tax Collector Private Office	217	1		217
Storage Closet	76	1		76
Board of Selectman General Office	328	1		328
Town Clerk's Office	271	1		271
Town Vault	369	1		369
Vestibule (East)	148	1		148
Vestibule (West)	173	1		173
Vestibule (North)	61	1		61
(Louis C. Costa) Meeting Room	527	1		527
General Conference Room	124	1		124
Board of Health Office	70	1		70
Board of Health Storage	87	1		87
Community Outreach Office	221	1		221
Town Manager's Office / Conference	135	1		135
Town Manager's Secretary	41	1		41
Storage Closet	245	1		245
Hull Community Television Office				
Elevator				
Toilet (Unisex)				
Toilet (Handicapped)				
Toilet (Unisex)				
Veteran's Affairs Office	138	1		138
Waiting Room	75	1		75
Building Dept. Private Office	261	1		261
Building Dept. (General Office)	384	1		384
Fire Prevention Private Office				
Planning Dept. General Office	318	1		318
Planning Dept. Private Office	128	1		128
Retirement Board Office	163	1		163
Accountant Dept. (General Office)	308	1		308
Accountant Dept. (Private Office)	147	1		147
Storage Closet	51	1		51
Assessor's Dept. (General Office)	510	1		510
Assessor's Dept. (Private Office)	129	1		129
Storage Closet	51	1		51
Board of Health Dept.	333	1		333
"Men's Room" (Conference Room)	236	1		236
"Ladies Room" (Kitchenette)	236	1		236
Toilet (M)				
Toilet (F)				
Janitor's Closet	43	1		43
Conservation Office	224	1		224
Information Technology (IT)	224	1		224
Balcony (Storage)	733	1		733
Communications Room	50	1		50
Total Building Net Floor Area (NFA)				18,898
Total Building Gross Floor Area (GFA) ²				27,517
Grossing factor (GFA/NFA)				1.46

Existing Building Gross Square Footage

Ground Floor Level	14,484 GSF
First Floor Level	6,125 GSF
Second Floor Level	6,125 GSF
Third Floor Level / Balcony	783 GSF
Total Gross Square Footage	27,517 GSF

* included within Grossing Factor
50 1 50

600 1 600
315 1 315

150 1 150
250 1 250
500 1 500
200 1 200
75 1 75

600 1 600
400 1 400
150 1 150
175 1 175
60 1 60
800 1 800

150 1 150
70 1 70
150 1 150
500 1 500
250 1 250
50 1 50
250 1 250

* included within Grossing Factor
* included within Grossing Factor
* included within Grossing Factor
* included within Grossing Factor

225 1 225
275 1 275
350 1 350

300 1 300
150 1 150
150 1 150
500 1 500
150 1 150
50 1 50
50 1 50
400 1 400
250 1 250
200 1 200

* included within Grossing Factor
* included within Grossing Factor
50 1 50
200 1 200
200 1 200

300 1 300
100 1 100

1.51

8,050 19,467
19,467 20,767

Existing Conditions Assessment

Overview

Overall, the condition of the exterior of the Town Hall building is in reasonably good condition. A few items listed below under the Architectural Exterior Review section indicate that certain materials, due to age and life expectancy of that particular material or assembly, have or will be shortly reaching the end of their useful life. Other items listed indicate that they are in need of immediate attention to avoid additional damage to the building or to safety of the public.

The exterior was examined from the ground utilizing a digital photographic camera with zoom lens in bright sunlight. Photographs were taken at both the “overall” scale and “detailed” scale to show the certain locations where attention needs to be paid to systems or assemblies which are failing. Paint, sealant or other materials were not sampled or analyzed as a part of this assessment. Certain areas of the roof were not entirely visible from the ground level, but we feel based on the photographic documentation gathered, an overall sense as to the status of the roof assembly can be made.

The interior was examined from the floor level utilizing a digital photographic camera with zoom lens in available artificial light or were enhanced via the camera flash. Photographs were taken at both the “overall” scale and “detailed” scale to show the certain locations where attention needs to be paid to systems or assemblies which are failing. Paint, sealant or other materials were not sampled or analyzed as a part of this assessment. Certain areas of the building were not entirely accessible (ie: locked storage room) but we feel based on the photographic documentation gathered, an overall sense as to the status of the interior finishes can be made.

ASSESSMENT LIMITATIONS

This architectural exterior and interior assessment is meant only as a guide to understanding the current condition of the building. It is not an airtight assessment. This was a visual investigation, general in nature, limited to reasonably safe and accessible portions of the building. Destructive investigation (e.g. removal of finishes) was not performed, and not all conditions were visually accessible. The assessment is based on general observations, reasonable assumptions, professional judgment, and experience with similar structures.

Except as otherwise noted below, the exposed architectural elements are typically in fair-to-good condition.

historical description and review

Early History of Settlement of Hull

The date of the establishment of Hull is not definitely known. On May 20, 1642, a report of a committee was made to the General Court concerning the allotment of lands at Nantasket. On May 10, 1643, Nantasket was again mentioned as being within the shire of Suffolk. On September 7, 1643, a former grant to “Nantascot” was confirmed. On May 29, 1644, it was ordered that “Nantascot shall be called Hull.” On May 26, 1647, Hull is mentioned as a town.

National Register of Historic Places

The existing Town Hall, Police Station, and Green Hill Fire Station are not currently listed on the National Register of Historic Places. The National Register of Historic Places is the official list of the Nation’s historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the National Park Service’s National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America’s historic and archaeological resources.

This is separate from a place identified to be “Historically Important” either regionally or locally. The town of Hull may identify this structure as being historically important, as it played an important role in the history of the town and is “seen” as being significant due to its prominent location in the town.

The way a property gets listed in the National Register of Historic Places is that the forms and documentation go to the State Historic Preservation Office (SHPO) of the state where the property is located. The SHPO can take one of several options: reject the property, ask for more information, list the property just with the state, or send the forms to National Park Service for listing in the National Register of Historic Places. Once they receive the forms, they conduct a similar review process.

Generally, properties eligible for listing in the National Register are at least 50 years old. Properties less than 50 years of age must be exceptionally important to be considered eligible for listing.

Hull Historical Commission

The Hull Historical Commission provides for the preservation, protection and development of the historic and archaeological assets of Hull. It is responsible for community-wide preservation planning and is an advocate for historic preservation in Hull, including working for historic preservation in planning and development of the community.

In accomplishing this mission, the Commission creates and maintains an inventory of historic assets, including houses, barns, commercial buildings, cemeteries, military sites and artifacts, monuments and markers, railroad artifacts, landscapes, and more. It seeks to protect the town’s historic assets from neglect, deterioration from the elements, development, inappropriate uses, etc. and provides educational opportunities to increase public understanding of the history of the town and the historic context of important assets.

The Town of Hull Historical Commission works with other Town boards, committees, commissions and officials to fulfill their mission. The Historical Commission is NOT the same as the Hull

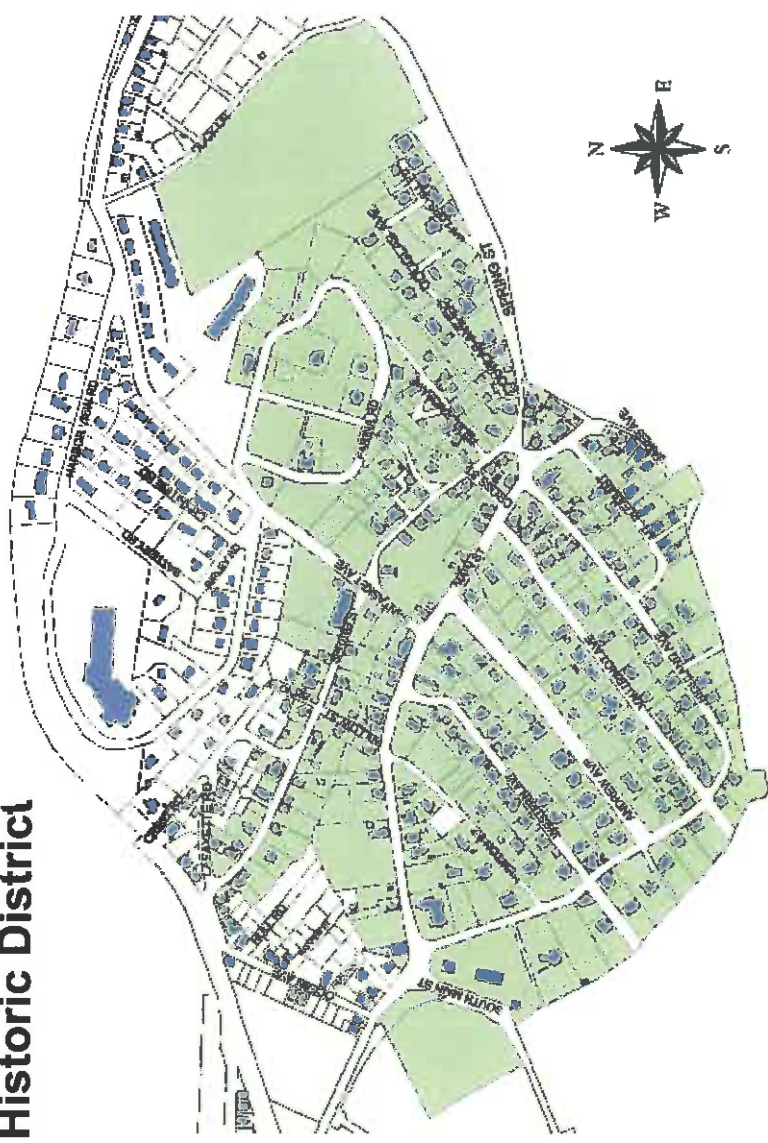
Historic District Commission (HDC) or the Hull Historical Society, though they work cooperatively and share many goals related to the town's historic character.

Historic District Commission

Currently the property is not located on the Hull Village Historic District Map, however the Hull Historical Commission and the Hull Historic District Commission have both indicated that the building is a matter of concern for all citizens of Hull. It has been indicated through a letter from the Hull Historic Commission to Town Personnel (dated March 12, 2012) that both the interior and exterior of the building are significantly important to the history of the Town of Hull, there are several concerns with focusing on the exterior of the building.

The Town takes pride in the appearance of the community and acknowledges that the present state of the Town Hall is in disrepair and in need of immediate repair and maintenance to limit future damage. It was stated that rejuvenating the Town Hall's presence as a public building will create an intangible sense of pride of place and a great benefit to the Town of Hull.

Hull Village Historic District



architectural review (exterior / interior)

For purposes of this report, the building is assumed to face north (Atlantic Avenue). The subject property consists of two structures – an original structure built circa 1920 and an addition built circa 1970.

- Original 1920 Structure: The original structure consists of two areas: a two-story portion that currently houses town offices and a single-story portion that currently houses a fire department, emergency vehicle garages, and cell blocks. The original structure has a basement (approximate 6'-0" clear height) with an unfinished floor and concrete columns, concrete or masonry walls, and concrete beams that support the first floor. The first floor is elevated. The high roof covering is slate; the low roof covering is ballasted membrane. A timber-framed cupola/clock tower is located in the middle of the roof.
- 1970 Addition: The 1970 addition is a single-story structure that currently houses the town police department. According to existing plans, the first floor consists of a concrete slab-on-grade and the roof is constructed with steel bar joists supporting a concrete slab on metal deck.

Exterior Review

Original 1920 Structure

The exterior of the 1920 structure consists of brick masonry walls with limestone base, limestone window sills, window accents and upper continuous banding. There is intricate painted wood architectural trim work around the cornice, at the main portico at the Atlantic Avenue entrance, engaged trim work at each of the two side entrances, the curved eyebrow dormers and at the roof and at the cupola. The existing roof over the two-story building consists of a slate roof, vintage to the building with exposed copper flashing, copper finished ridge cap, copper finished hip caps, dormer roofs, gutters and downspouts, cupola roof and finial. There are several locations that have painted metal handrails leading from the elevated first floor down to grade.

The roof over the single story fire apparatus garage is a built-up ballasted roof that has mechanical equipment mounted on it and several old skylight openings which have been covered over by wood structures and asphalt shingles.

The roof over the single story police station was recently repaired. One item to note is the ADA ramp was not removed during this repair and we noticed at the corner under the fire escape there appears to be a pocket which could eventually fail due to water penetration.

1970 Addition

The exterior of the 1970 addition consists of a combination of brick masonry walls and exposed aggregate concrete walls and aluminum storefront window and door framing.

- A brick parapet is present along the west, south, and east sides of the 1920 structure's low roof. According to town personnel, this parapet once had a stucco veneer that was recently removed. The brick was deteriorated at numerous locations where this stucco veneer was removed.
- The wood fascia along the hip roof of the 1920 structure is rotted in various





locations.

Exterior Deficiencies

Exterior painted wood trim is showing signs of deterioration, either from water damage or from age. Several locations have deteriorated to the point of not being secure to the façade and risk coming loose and potentially falling to below. The trim locations include around doors, windows, overhead garage door frames, roof cornice and cupola. This trim should be repaired if feasible or replaced.

- There is an engaged column on the east façade which is cracked. This should be repaired to prevent future deterioration and repainted to protect the wood.
- While not a physical deficiency, there is one column and capitol on the north façade which we were informed was a “quick fix” and aesthetically detracts from the overall appearance of Hull Town Hall to its residents and visitors alike.

The existing slate roof has held up very well for 80-90 years; a typical slate roof has a life expectancy of 100 years. The slate roof does show signs of nearing the end of its useful life; there are numerous tiles which are missing or are up-turned and not protecting the structure from the weather elements, leading to water infiltration and further damage.

- One item to repair immediately is the missing downspout on the north east corner adjacent to the portico.
- Above the portico roof, there are several pieces of through wall flashing which are turned upwards. These should be fastened down to ensure that moisture is being properly diverted.



The existing modified bitumen ballasted roof over the one story police and fire apparatus room is showing signs of its age.

- The vertical surface of the parapet has severely deteriorated from our visible observation.
- Debris is observed on this roof and should be cleared to maintain proper drainage. Note that it appears slate roof tiles have fallen onto this lower roof, and it should be noted that this has the potential to puncture the roof membrane and create potential locations for moisture to enter the building. There also appears to be abandoned wire and or cable which should be removed.



The existing brick for a large portion of the building is in great shape for its age. Areas of concern include:

- On the Atlantic Ave façade, on the east facade of the main portico there are several bricks, which are missing, at an area that appears to usually be covered with wood trim. New brick should be installed to prevent moisture, animals or pests from entering the building wall cavity.
- Near the existing exterior fire escape where some brick has cracked, spalled or otherwise is damaged.
- The existing parapet over the single-story police and fire apparatus garage was, according to town personnel, once covered with stucco and has since been removed. The brick is severely damaged in this location and the faces of the bricks have spalled off.
- On the Atlantic Ave façade, under the main portico there are several large round holes in the brick, most likely from some ornamental decoration which



has since been removed. The voids should be properly filled to prevent premature degradation of the brick.

The mortar appears to be in decent shape and will need a few areas of minor repointing to repair areas which have lost mortar over time. One area of concern is:

- The existing parapet over the single-story police and fire apparatus garage was, according to town personnel, once covered with stucco and has since been removed. The brick is severely damaged in this location and the faces of the bricks have spalled off. The mortar has also been damaged and should be repaired.

The existing windows are mostly single glazed, single wood windows. We were informed by town personnel that there are certain locations where an additional width of glazing was added which helps in the insulating properties of the windows.

There are 5 existing overhead garage bay doors. Two of the five doors which occur in the fire apparatus bays appear to be newer installations. These doors will have a higher insulating quality. The 2 doors which occur in the police maintenance bays appear to be of older age, and are most likely less insulating than newer doors would be. The last door occurs on the south west corner of the building and appears to be a newer, insulated door similar to the ones which occur on the fire apparatus bays.

The existing limestone banding and accents appear to be in reasonably good shape for the age of the building. There are several locations that could benefit from repointing the mortar joints and overall cleaning, and on the south west corner there are signs of spalled limestone. This should be repaired to avoid further damage and to prevent spalled pieces from potentially falling to below.

The existing main concrete steps at each of the entrances are painted and the current finish is showing signs of wear and should be properly prepped and repainted. This is an aesthetic repair; it is not a safety issue. It should be noted that the new finish shall meet ADA requirements for a slip resistant surface.

The existing metal fire escape is showing signs of its age and is in need of repairs as outlined in the structural assessment portion of this report. It also shall be properly prepped and repainted, and the areas immediately surrounding the existing fire escape should be cleaned to get rid of the rust staining.

Interior Deficiencies

The interior deficiencies that occur appear to be mainly due to the age of the structure and its use. A majority of the finishes appear to be original including plaster walls, architectural wood trim and paneling, floors in the corridors of the first and second floor. The items that are listed below like door hardware upgrades or sealing wall penetration holes are fairly straightforward repairs. Other items like water damaged plaster or removing stored items from corridors may take additional planning.

- The existing door hardware on the second floor pair of doors exiting into the stairway is not ADA compliant nor is Code compliant; it is a life safety issue and should be addressed immediately.
- There are numerous wall penetrations are not sealed to prevent passage of smoke/





fire. Generally when a pipe, conduit or other similar item penetrates a wall, the void created around that pipe should be sealed properly to stop smoke, sound or other smells from transferring to the adjacent side of the wall.

- There are numerous locations where combustible materials are being stored in corridors. This is a life safety issue and should be addressed immediately. Generally items can not be stored in any manner which, in the event of a fire or other scenario which requires rapid exiting of the building, could get in the way of those trying to exit quickly. Boxes, old furniture, old computer equipment, etc. all should be removed.
- Plaster wall finish has failed due to what is assumed to be moisture infiltration in numerous locations. This may take more investigation as to water source, and if found to be the roof, should not be corrected until larger (water source) is repaired as subsequent damage may still occur.
- Stairs connecting more than two floors are not in a rated enclosure. While this is typically permitted in existing use structures, if a renovation or addition is planned this will need to be addressed.
- Guardrail height at stairs is not at acceptable height per code. While this is typically permitted in existing use structures, if a renovation or addition is planned this will need to be addressed.
- Potential fire rated separation requirements for garage/maintenance spaces that appear to currently be not separated. This includes walls, doors, frames and door hardware.
- Interior wood paneling at the second floor level have fallen away and exposed potentially questionable material in the adhesives which may have been used.
- Potential mold issue below cell area in crawl space. This area was observed from the cell block floor, as we were informed by Town Personnel of the potential inhalation hazard. Protective gear was not available at the time of our visit.
- The ceiling above the cell blocks and adjacent to an in-filled skylight opening has partially failed. This appears to be due to water infiltration. It is also not clear as to the timing of the water infiltration. The existing opening was a skylight at one time. A question to ask maintenance personnel is if they have observed active water infiltration or was resolved when the skylight was removed and opening capped.
- The Elevator Machine Room had a chair in front of the machine unit. Code does not permit any items in the shaft/machine room that are not part of the elevator equipment.
- Fire separation required between the boiler room to adjacent spaces. Door/frame has failed.
- ADA/Life Safety: Non accessible route from cells/lower floor to exterior of building; numerous steps, no handrails..
- ADA/IBC: No handrail at ramp near back of cells. Numerous items of storage on ramp. Non-compliant door hardware at top of ramp.
- At Fire Chief's car garage, interior communicating door is not on closer. Door/frame does not appear to be fire rated. Door hardware has failed. This is a life safety code item.
- At Fire Chief's car garage corridor- no handrails at steps. This is a code item.
- Fire area: unsealed opening to over framed (wood) skylight.
- Roof vent penetration in attic does not appear to be properly sealed from weather as water staining is visible and apparent.



structural review

In accordance with our agreement for professional engineering services, Pare Corporation (PARE) has completed a structural assessment for the building located at 253 Atlantic Avenue in Hull, Massachusetts. The structural assessment consists of two parts:

- **Structural Condition Survey and Recommended Repairs:** A condition survey of the building's structural system was performed to document its current condition. The scope of this survey did not include any destructive investigation (i.e. removal of finishes) to observe the structure. Therefore, it was restricted to the "visually accessible" portions of the interior and exterior areas deemed safe and accessible. No evaluation of roof-top equipment or investigation for the presence of hazardous materials was performed. Observed conditions were documented with field notes, photographs, and sketches. PARE personnel was accompanied by members of Ai3 Architects (Ai3) and Town of Hull personnel.

Based on the condition survey, PARE has identified "short-term" repairs recommended to be completed within the next calendar year. An "order-of-magnitude" opinion of probable construction costs associated with the recommended repairs is also provided.

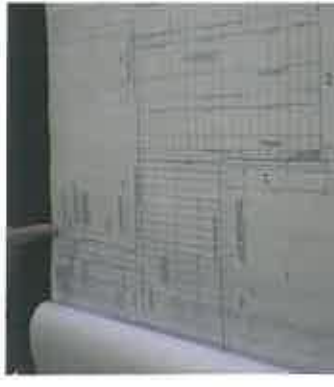
- **Building Code Review:** A review of the structural system relative to building code compliance for potential future alterations was performed.

Existing plans illustrating some, but not all, of the structural system were made available for this investigation. Note that the basement below the 1920 structure was not accessible at the time of the survey due to the presence of mold and air quality issues. Conditions described herein are based upon limited observations made from an opening at the southeast corner of the structure and digital photographs provided by town personnel.

PROPERTY DESCRIPTION

For purposes of this report, the building is assumed to face north (Atlantic Avenue). The subject property consists of two structures – an original structure built circa 1920 and an addition built circa 1970.

- **Original 1920 Structure:** The original structure consists of two areas: a two-story portion that currently houses town offices and a single-story portion that currently houses a fire department, emergency vehicle garages, and cell blocks. The original structure has a basement (approximate 6'-0" clear height) with an unfinished floor and concrete columns, concrete or masonry walls, and concrete beams that support the first floor. The first floor is elevated concrete slab, approximately 6 inches thick. The roof of the single-story portion and the second floor of the two-story portion are constructed with 6" +/- wide concrete joists spaced approximately 2'-0" on-center supporting a concrete slab. The concrete joists are supported by load-bearing masonry walls along the building's exterior and concrete girders and columns along the interior. Interior partitions are constructed of either hollow clay tile or studs covered with gypsum or plaster. The high roof is constructed with horizontal plank sheathing supported by 2x8 wood joists in a hip configuration. The wood joists are supported by large timbers located at the ridge and the roof's mid-height. The large timbers are supported by clear-spanning steel trusses spaced approximately 13'-0" on-center. The trusses are supported by masonry walls along the building's exterior. The high roof covering is slate; the low roof covering is ballasted membrane. A timber-framed cupola/clock tower is located in the middle of the roof.





According to existing plans, the second floor was originally used as an auditorium. A concrete mezzanine is present at the west end of the structure and is currently used for storage. The auditorium's barrel-shaped ceiling is still in place. The stage at the east end of the structure has been demolished. A lower ceiling constructed with 2x wood framing and gypsum board is present above the second floor offices. According to town personnel, this lower ceiling was constructed circa 1970 when the second floor was converted to town office space.

- **1970 Addition:** The 1970 addition is a single-story structure that currently houses the town police department. According to existing plans, the first floor consists of a concrete slab-on-grade and the roof is constructed with steel bar joists supporting a concrete slab on metal deck. The bar joists are supported by interior steel girders and concrete columns and exterior load-bearing concrete or masonry walls.



In general, the visible portions of the building's structural systems are in fair-to-good condition with some observed structural deficiencies.

NOMENCLATURE

Nomenclature used in the structural assessment is generally defined as follows:

- **Good:** Structural elements have little to no observed deterioration and can perform their intended function. Steel members may have some light rusting. Concrete and masonry surfaces are clean with little to no cracking or spalling. Wood is clean with no staining or mold. Plaster surfaces are firm and crack free.
- **Fair:** Structural elements have low levels of deterioration and can perform their intended function, but may have some minor reduction in capacity. Steel members may have localized, minor corrosion. Concrete and masonry elements may have hairline cracks and localized spalling, efflorescence, and staining, but surfaces are largely intact and clear. Wood members may have some checking and localized staining/mold, but appear sound. Plaster surfaces may have some staining and minor cracking at corners, but surfaces are firm.
- **Poor:** Structural elements show advanced section loss or deterioration and have moderate to large reductions in capacity. Steel members may have extensive corrosion or delamination. Concrete may exhibit large spalls and/or extensive efflorescence. Large cracks may be observed in concrete or masonry elements. Wood may be stained and/or damp with mold and/or small areas of rot. Vertical elements may be out of plumb and have lost veneer elements. Floors/roofs may have rotted/missing finishes and/or are easily deflected.
- **Very Poor:** Structural elements show severe section loss or deterioration and can no longer safely perform their intended function. Steel members may have severe levels of corrosion and/or delamination, resulting in complete loss of section in some locations. Concrete may have extensive spalling and deterioration with corroded reinforcement. Large, extensive cracking and loss of masonry units may be observed in concrete or masonry elements. Wood members may have extensive mold and rot along their length and/or at their supports. Floors/roofs and vertical elements may exhibit large, permanent deflections.
- **Failed:** Structural elements have lost the ability to perform their intended function. Elements have collapsed or are near collapse.



CONDITION SURVEY - OBSERVATIONS

Note that many areas of the structural floor, roof, and wall systems are obscured by finishes such as wallboard, plaster, carpet, and tile. Except for indications of water staining, sagging, or failures of the finished surfaces, this investigation can only speculate on the condition of the unexposed floors, roofs, and other structural elements.

A summary of observations made during a site visit to the property on March 29, 2013 follows.

Basement

A basement is present below the original 1920 structure. The basement area was not accessible at the time of the condition survey, for reasons described at the beginning of this letter.

- Based on limited observations made during the survey and digital photographs provided by town personnel, significant spalling with exposed steel reinforcement is present along some concrete beams, columns, and the underside of the concrete slab.

Interior (First and Second Floor)

The structural components within the first and second floor are typically covered with wallboard, ceilings, carpet, and tile. Interior finishes are generally in fair-to-good condition.

- The ceiling above the cell blocks and adjacent to an in-filled skylight opening has partially failed. The concrete roof structure visible at this failure appears sound.
- Map cracks and shrinkage cracks are present along the first floor slab at the emergency vehicle garages.

Roof

According to town personnel, the roof above the 1970 addition was repaired approximately one year ago. The hip roof above the two-story portion of the original 1920 structure was not accessible at the time of the visit.

- Various structural deficiencies were observed along a metal fire escape providing access from the second floor of the 1920 structure to the roof of the 1970 addition. These deficiencies include:
 - o Approximately 3 treads are deteriorated or no longer securely attached to the escape stringers.
 - o The angle securing the south side of the bottom of the escape to the low roof is deteriorated.
 - o The north side of the bottom of the escape rests on a piece of rebar on the building's coping. The rebar is not attached to the coping.
 - o Cracking was observed along the building's exterior brick wall at anchorage points supporting the escape.
 - o Steel shims between the parapet coping and a column baseplate are deteriorated.
 - o The guardrail is detached at the top of the fire escape.
 - o Two anchor bolts securing the escape frame to the exterior brick wall are missing.





- Skylights above the low roof of the 1920 structure have been in-filled with plywood sheathing and dimensional lumber. Where visible, the infill framing appears sound. Minor water staining was observed in some areas.
- Numerous water stains were observed along the barrel-shaped ceiling above the second floor of the 1920 structure. Some water staining was also observed along the roof framing above these locations; however the roof framing appeared sound.
- Some water staining was observed along the timber framing within the cupola; however this framing appeared sound. The fascia lumber around the cupola was rotted in some locations.

Exterior

The exterior of the 1920 structure consists of brick masonry walls with wood fascia and copper trim. The exterior of the 1970 addition consists of a combination of brick masonry walls and exposed aggregate concrete walls.

- A brick parapet is present along the west, south, and east sides of the 1920 structure's low roof. According to town personnel, this parapet once had a stucco veneer that was recently removed. The brick was deteriorated at numerous locations where this stucco veneer was removed.
- The wood fascia along the hip roof of the 1920 structure is rotted in various locations.

CONDITION SURVEY - REPAIR RECOMMENDATIONS

In general, the building's structural systems are in fair-to-good condition with some observed structural deficiencies. However, PARE recommends that the following structural items be repaired within the calendar year. PARE believes that addressing these issues on a short-term repair plan will increase the service life of the facility. If deferred, these items could develop into larger deficiencies or failures that are more costly to address.



- **Basement Concrete Framing:** Based on limited observations made during the survey and digital photographs provided by town personnel, significant spalling with exposed steel reinforcement is present along some concrete beams, columns, and the underside of the slab. PARE recommends that spalled or deteriorated areas of concrete be removed to sound concrete. Exposed reinforcement shall be cleaned and/or replaced. The repair areas should be patched with a polymer-based repair mortar (small or overhead areas) or cast-in-place concrete (larger areas), as appropriate.



While the exact limits of repair are not known, an opinion of the probable construction cost for a repair of this type is \$1,500 to \$3,000 per beam or column repair and \$50 to \$100 per square foot for slab repairs.

- **Fire Escape:** Various structural deficiencies (described above) were observed along a metal fire escape providing access from the second floor of the 1920 structure to the roof of the 1970 addition. The recommended repairs are as follows:
 - o Deteriorated or detached treads should be removed and replaced.
 - o The angle securing the south side of the bottom of the escape to the low roof should be removed and replaced in-kind. A similar support should be installed at the north side of the bottom of the escape.
 - o Two missing anchor bolts along the escape frame should be replaced.
 - o The guardrail should be removed and replaced where detached or



damaged.

- o Deteriorated steel shim plates should be removed and replaced with non-shrink grout.
- o Brick cracks at escape support locations should be repaired with a structural adhesive, such as epoxy injection.
- o The fire escape should be cleaned of all rust/corrosion and painted.

PARE's opinion of probable construction cost for the fire escape repairs described above is between \$5,000 and \$7,000.

BUILDING CODE REVIEW

Ai3 has indicated that significant renovations are anticipated for the building in the near future and will qualify as Level 3 Alteration work per the Massachusetts Building Code (State Code) - 2009 International Building Code (IBC) and 2009 International Existing Building Code (IEBC) with state amendments. No Change of Occupancy, as defined by the IEBC, is anticipated. Based on the observed structural systems and information depicted on available existing plans, PARE anticipates the following structural code provisions to apply:

- The building contains a fire station, police headquarters, and emergency vehicle garage. Therefore, the building qualifies as an Occupancy Category IV per the Massachusetts Building Code. Per state amendments to the IEBC, the building must be retrofitted to comply with the code-prescribed lateral (seismic, wind) loads for new structures (IBC) as it contains at least one load-bearing unreinforced masonry wall. As the existing plans made available by the town do not detail the structural systems of the 1920 building, this will require an extensive investigative effort during the design phase to determine exact retrofit requirements. This includes (but not necessarily limited to): additional site visits; destructive investigation; material sampling and testing for structural properties; and structural modeling of the existing structure. Required retrofits may include, but not be limited to: adding or strengthening existing braced frames, moment frames, or shear walls; strengthening existing or adding new foundations to support these elements; strengthening existing diaphragms; strengthening existing or adding new diaphragm anchorages; strengthening/bracing or removing chimneys, parapets, and non-loadbearing masonry partitions.
- The capacity of the existing floor system will need to be reviewed/analyzed and retrofitted (if deemed necessary) for the proposed floor loads based on space programming.
- If an alteration increases the load to an existing element (e.g. existing roof member carrying a heavier or larger mechanical unit) by more than 5%, then that element will need to be evaluated and retrofitted if necessary to comply with the current IBC gravity load requirements. Likewise, the current capacity of an element cannot be decreased without demonstrating compliance with the current IBC gravity load requirements.

ASSESSMENT LIMITATIONS

This structural assessment is meant only as a guide to understanding the current condition of the building. It is not an airtight assessment. This was a visual investigation, general in nature, limited to reasonably safe and accessible portions of the building. Destructive investigation (e.g. removal of finishes) was not performed, and not all conditions were visually accessible.



The assessment is based on general observations, reasonable assumptions, professional judgment, and experience with similar structures.

A structural analysis of the existing building was not performed as part of this assessment. Except as otherwise noted above, the exposed structural elements are typically in fair-to-good condition and appear capable of supporting the existing loads.

plumbing review

PLUMBING

SANITARY DRAINAGEExisting System Summary:

- a. The existing sanitary, waste, and vent system of the building flows by gravity out the School Street side of the building to the municipal sewer system.
- b. The system is primarily of cast iron construction with some sections of threaded steel piping for the vent lines.
- c. There is an existing sump pit with a submersible pump located in a pit in the Boiler Room. The pump discharge is directed to the building sanitary system.
- d. The occupants of the Police Station stated that the first floor bathroom floor drains require regular filling of water to prevent sewer gas odors. Trap primers should be installed to prevent this from occurring.

Recommendations:

- a. Replace existing cast iron piping and associated fittings.
- b. Clean and scope any remaining sanitary pipe going out to the street to eliminate any blockages.
- c. Repair and replace damaged floor drains.
- d. Remove and replace piping vent piping.
- e. Install floor drain trap inserts where required.
- f. Install new interior storm drain piping to replace existing.
- g. Install a proper Boiler Room floor drain and sump pump water collection system.

DOMESTIC WATERExisting System Summary:

- a. The building domestic water service enters the building from the South side of the boiler room after being routed under a floor section of the Police Department.
- b. The water service is a 2" galvanized steel pipe. The section under the Police Station floor appears to be sleeved. The incoming water pipe is reduced to a 1-1/2" into the Neptune, RW2F41, meter dated 1/22/99. The 1-1/2" pipe out of the meter is expanded back to a 2" copper line and then to galvanized pipe with screwed fittings. This water service serves the Town Hall, Police Department, and the Fire Department areas.
- c. The water distribution system in the building is a composite of several different materials and joint methods. There are numerous sections of piping which are of threaded brass and some sections of threaded steel for the larger sizes. These pipes appear to be part of the original construction. There are also sections of copper tubing with sweat brass fittings. These appear to have been installed during several improvement projects.
- d. Domestic hot water is generated primarily from a Bock, model 72E, ser 98123216T, oil-fired water heater installed in the boiler room. This unit has a model MSR burner rated at .5 – 2.75 GPH. This water heater tank is a replacement for the original tank. The data plate was covered by the Fire-Matic sensor. The former tank had a capacity of 70 gallons.





- e. A small electric water heater supplies the hot water to the second floor Women's toilet room.
- f. A JetGlas, model M-I 30S5LN-8, ser HA9269879, 30 gallon, 30 MBH, installed in 1989, serves the Police Department Assembly / Break room area.

Recommendations:

- a. Install new domestic water distribution system with insulated copper piping with sweat joints.
- b. Install a new natural gas fired water heater system with recirculation piping loop.
- c. Install vacuum breakers on outside hose bibb locations.

NATURAL GAS

Existing System Summary:



- a. Natural gas is supplied to the Town Hall from meter #05471473, size 560 installed on the Atlantic House Road side of the building. The incoming service pipe is a 1" and a 2" pipe services the building. From this meter location the gas enters the building and feeds the emergency generator in the rear garage of the Town Hall and a unit heater in the Fire Department. The Fire Department unit heater is a Modine, NG, model PA225AF, ser 15012020488, 225 MBH in, 173.3 MBH out.
- b. A second natural gas service meter, Actaris, 12/07, # 14548500, is located outside of the garage area for the Police Department. The inlet pipe is a 3/4" and a 1" serves the building. This natural gas services the Police building rooftop air-handling unit, boiler, water heater, and Break Room 4-burner stove.



Recommendations:

- a. Install new natural gas meter and service pipe from the existing main pipe in the street. New piping and meter shall be capable of servicing all new and existing natural gas equipment in the building.

PLUMBING FIXTURES

Existing System Summary:



- a. The plumbing fixtures on the second level of the building are a mixture of original and replaced units. New fixtures are required to comply with the most recent Code standards for plumbing.
- b. Several of the toilet rooms on the first and second floors have had new fixtures installed approximately 20 years ago. These fixtures are more efficient than the originals but these do not comply with the current Code standards for water conservation.
- c. Only two (2) hose bibs were noted on the exterior of the building. There are no vacuum breakers installed on these devices. The hose bibb on the front of the building also serves as a hose connection to local lawn sprinkler heads in that area. Another remote hose connection is at the corner of Atlantic Ave. and School Street where the hose is used to water the landscaping items in the island in the middle of the street. The installation of the backflow

preventers is required by Code on all directly piped irrigation feeds.

Recommendations:

- a. Install new water conserving water closets and urinals.
- b. Install new lavatories with metering type faucets.
- c. Install new drinking fountains in the corridors as required by Code.

STORM DRAINAGE

Existing System Summary:

- a. The building has gutters that run to either internal rain leaders or to exterior downspouts. The drains appear to be routed to two (2) dry wells. One is located on the southwest side and the other is on the southeast side.

Recommendations:

- a. Replace existing storm drain piping with new.

BOILER AND HEATING SYSTEMS

BOILER ROOM EQUIPMENT

Existing System Summary:

- a. There are two (2) original HB Smith, 11-section, 861.2 MBH, 25 Mills boilers which operate on No. 2 fuel oil that provide steam for the entire building. Each boiler has a Carlin Oil burner, model 600, CRD, capable of firing from 7.0 to 12.0 GPH of oil. The boiler appears to be producing 10-11 PSI steam pressure. The exhaust flue breeching of each boiler includes a barometric damper. The barometric damper for Boiler 1 binds and does not appear to be operate freely as required.
- b. The boiler flue breeching and combustion air penetrate the south wall of the building. The flue ducting is routed inside of the chimney to the roof.
- c. Boiler 1 is the primary unit and Boiler 2 is only used for standby backup operation. The operating switch for Boiler two is presently turned off.
- d. Automatic boiler control system is not installed. The boiler operations require that one of the employees check every morning to be sure the lead boiler is turned on and is operating correctly. One boiler appears to be able to meet the heating demands of the building. The boilers appear to require regular attention and maintenance.
- e. Steam from both boilers is fed to a common header which appears to have four (4) zones with control valves. Three of the thermostats controlling these valves were located. One thermostat is installed in the Town Mgr Office. This is an interior office with no heating elements but this Honeywell thermostat controls the heat in several perimeter offices on this floor and also the Veteran's offices on the second floor. Another thermostat is located in the second floor Women's break room area. This thermostat controls the heat in several offices on this floor. A third thermostat is located in the Tax Collector office and controls only the heat in that area.
- f. The condensate flows back to the Boiler Room from all of the wall radiators



installed in the Town Hall building. The condensate is routed to a condensate tank located in the basement Boiler room. The original 50-gallon tank has been replaced in the past. There are two, Marathon, Jet Pumps, 1/3 HP, model JQM56C34D1200HK, condensate pumps installed to deliver the returning condensate to the boilers.

- g. No. 2 fuel oil is stored in a 1000 gallon tank located in an adjacent room to the boilers.
- h. The boiler combustion air ducts are installed in the back wall of the Boiler room.
- i. A HB Smith, hot water, natural gas-fired boiler is located in the Police Department. Data plate information is not available. A 1" natural gas pipe serves this unit. The hot water discharge pipe is a 1-1/2". Two circulator pumps are installed in the area of the boiler.

Recommendations:

- a. Replace both steam boilers and all associated piping, valves, controls, and ductwork complete. Install new natural gas fired hot water boilers sized to provide adequate capacity to meet all of the building heating requirements. Remove the existing 1000 gallon oil storage tank.
- b. Install new hot water heating circulating pumps for the distribution of the heating hot water. These pumps shall be capable of variable flow operation to properly meet the flow requirements of the building.
- d. Install a new automatic DDC boiler and pump control system. New system shall monitor and control all equipment connected to the system and adjust the flow rates as required. New control system shall be capable of occupied and unoccupied control modes.

DISTRIBUTION SYSTEMS

Existing System Summary:

- a. Steam is supplied through a system of main pipes and branch pipes. These are generally threaded steel pipe routed to cast iron radiators primarily installed below each exterior perimeter window of the building.
- b. Most of the perimeter radiator units have been converted to utilize a self-contained thermostatic control valve to regulate the heat. These are manually adjusted locally by the office personnel. These valves are over 20 years old and many appear to be in need of replacement.
- c. The perimeter radiator units have thermostatic condensate traps. Most of these are original and have exceeded their normal service life.
- d. The heating system is not controlled well in each area of coverage. During the heating season there are many windows cracked open in the building to reduce the effects of the excess heat.

Recommendations:

- a. Remove existing steam radiators and all associated piping complete. Install new high-capacity hot water baseboard heating units. Each respective room and office shall be furnished with a dedicated zone valve and zone thermostat.



SHORT-TERM RECOMMENDATIONS

PLUMBING

- a. Install a backflow preventer on each of the exterior hose bibbs that are connected to the irrigation system, lawn sprinkler system. The installation of the backflow preventers are required by Code.

BOILER AND HEATING

- a. Boiler 1 is the primary heating unit. This unit will require additional repairs to assure it will remain operational for the next few years. The barometric damper needs to be repaired. Additional preventative maintenance is required for this boiler to remain in service.
- b. Boiler 2 is the backup heating unit. This unit presently is not used. This unit will require additional repairs to assure it will remain operational for the next few years. Additional preventative maintenance is required for this boiler to remain in service.



fire protection review



FIRE PROTECTION

Existing System Summary:

- There is no fire protection sprinkler system installed anywhere in any of these buildings.

Recommendations:

- a. Install a complete combined wet-pipe sprinkler / standpipe system to protect all areas of the buildings. This shall include zoned coverage, flow stations, pendant and upright heads, test valves, ports, etc to provide for a complete system.
- b. New system should include a new 6" fire water service pipe constructed of cement-lined ductile iron pipe, feeding a double-check backflow preventer. An alarm riser with a fire department connection shall be installed after the backflow preventer. The fire water system shall consist of two standpipe risers, one at each end of the building, and both having hose valves on each floor. A floor control valve shall be installed on each floor to supply sprinkler heads located on that floor. Sprinkler heads shall be of the quick response type installed to protect all occupied areas and in all concealed combustible spaces.
- c. Install a dry-pipe system to provide protection for the attic areas. The dry pipe valve shall be located adjacent to the alarm riser pipe.

mechanical review

HVAC

SYSTEMS

Existing System Summary:

- a. The Town Hall building has a permanent heating system installed and no air-conditioning except where individual window A/C units have been installed.
- b. The third floor of this building is not being used. At one time this used to be a theater / activity space with a mezz and balcony. The existing second floor ceiling has been installed and this third floor area is not being used. No mechanical equipment is installed in this area.
- c. The Police Department has their own rooftop air handling unit. This is an American Standard, YCC060F1MOBB, ser H39158753, natural gas, 100 MBH in, 80 MBH out, 9/1993, and has no fresh air inlet or economizer. There appears to be no mechanical ventilation air being delivered to this building. The natural gas is routed up through the roof inside of the curb.
- d. The Police Department staff offices are served by a heat pump unit installed in the corridor beneath the ceiling. The unit and ductwork are exposed. The heat pump is a Lennox, C10-41-1, B10-41-1P, ser 5480J05337, R-22. The condensing unit is on the roof and the data plate is not legible. The condensing unit is rusted and in poor condition. The heat pump has no provisions for the introduction of fresh air into the space.
- e. The Fire Department has an air-conditioning unit located in the ceiling space of the Break room. There was no access to this unit. Employees stated that the air-handler is 1-1/2 ton and the condensing unit is a two (2) ton capacity. Employees stated that this combination has created mold problems that have recently been resolved. The air-handler and condensing unit are apparently being replaced soon. Each room in the Fire Department has an electric base board heater with local wall thermostat control.
- f. The Police Department has a computer server room that used to be a Storage room. There is no dedicated unit or cooling system serving this room and the room is hot. A flexible duct in the ceiling has been cut open to deliver some cooling air into this room.

Recommendations:

- a. Construct a new mechanical mezzanine floor in the Boiler room. This platform shall contain two new split system air-handling units to separately serve the first and second floors using a ducted distribution system. The cooling for each of these air-handlers shall be DX. The respective high-efficiency condensing units shall be installed on the Police Dept flat roof area. Individual zone controls shall be installed to best serve the areas of each floor. The heating for each of the air-handlers shall be provided by the hot water heating system directly to the unit. Reheat coils located in the various areas of the building shall be served by the hot water heating system also.
- b. Two additional split-system air-handling units shall be located in the attic space above the third floor. These two units shall serve the various areas of the third floor. The condensing units shall be located on the roof above the Police Station.





- c. Rework/ replace the existing rooftop air-handling unit above the Police Station. Install a new unit of adequate capacity capable of satisfying this building. The rooftop unit shall be equipped with a fresh air economizer and comparative enthalpy controls for free-cooling.

MECHANICAL – MISCELLANEOUS ITEMS

Existing System Summary:

- The Fire Department truck garage has a PLYMOVENT vehicle exhaust removal system, model OS-3, installed. There are two trucks in this garage but only one can be connected to this system.

Recommendations:

- o A second vehicle exhaust removal system is required if this facility is to continue operating two vehicles from this space.

Existing System Summary:

- The existing bathroom exhausts are routed to the roof area but are naturally vented.

Recommendations:

- o All existing and new exhaust systems are required to be served by a dedicated powered exhaust fan system.

SHORT-TERM RECOMMENDATIONS

HVAC

- a. Install a fresh air economizer in the Police Station rooftop air-handling unit. At the present time no fresh air is being supplied to this building as required by Code.
- b. Install a fresh air duct and damper to the heat pump serving the Admin Offices and the jail cell areas. At the present time no fresh air is being supplied to these areas.
- c. Install a dedicated ductless-split A/C unit to serve the Police Department computer server room. This room presently has no dedicated system to remove heat from this converted room. The condensing unit can be installed on the roof above this space.



electrical review

ELECTRICAL SYSTEMS

NORMAL POWER

Existing System Summary:

- a. The building is fed from an electric utility co. pole mounted transformer on Atlantic House Road with overhead cabling to the main distribution panel, located in the single stall Garage of the Fire Station, via weather head.
- b. The electric utility co. meter is located in the Garage.
- c. The building has a 600 amp, 120/240 volt, single phase, three wire main distribution panel, with a 600 amp main circuit breaker, as manufactured by Federal Pacific. The main distribution panel has fusible switches labeled emergency generator 200 amp, fire department 200 amp, 911 panel dispatch 100 amp, air filling station 60 amp, gas and diesel panel 60 amp, and a spare 100 amp. The main distribution panel feeds panels and load centers in the Town Hall on all floors, the Fire Station, and the Police Station.
- d. In general the normal power distribution system appears to be in poor condition.

Recommendations:

- a. The existing overhead electric service given the condition and the fact that it is inadequately sized for a renovation should be replaced with new. A new electric utility co. pad mounted transformer and 120/208 volt, three phase electric service is anticipated.
- b. The existing power distribution should be replaced with new given the condition.
- c. New panels with integral surge protection devices for computers should be provided, fed from new computer grade K-rated transformers.
- d. New zero sequence harmonic filters connected to the computer panels should be provided to reduce neutral currents.

TELEPHONE / CABLE TV SERVICE

Existing System Summary:

- a. The building telephone and cable TV services originate from the same pole as the electric service with overhead cabling entering into the single stall Garage of the Fire Station.

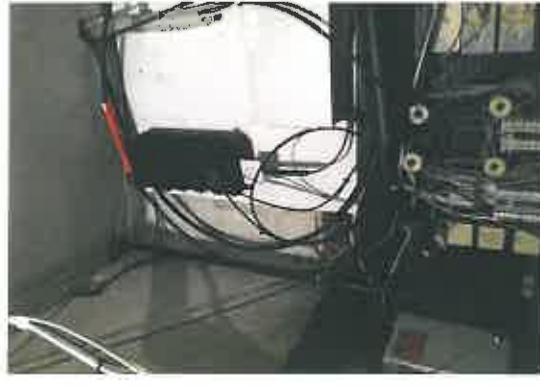
Recommendations:

- a. The existing overhead telephone and cable TV services should be replaced with new in ground services to a Demarcation Room. New conduits should be provided from point of demarcation to an MDF and IDF rooms on the floors for technology back bone cabling.

EMERGENCY POWER

Existing System Summary:

- a. The building has an 80kW, 120/240 volt, single phase, natural gas, exterior





- generator in a weatherproof enclosure, as manufactured by Kohler. It is located outside of the single stall Garage of the Fire Station.
- b. A 600 amp, 120/240 volt, single phase automatic transfer switch, as manufactured by Kohler, is located in the single stall Garage of the Fire Station. It appears that the generator and automatic transfer switch are not original to the building and serve the entire building.
- d. In general the emergency power distribution system appears to be in fair condition.

Recommendations:

- a. The existing generator and automatic transfer switch given the condition and the fact that it is inadequately sized for a renovation should be replaced with new. The existing generator and automatic transfer switch are single phase which will not integrate with new proposed three phase service. A new exterior generator in a weatherproof enclosure should be provided, with fuel source as determined by the Owner.
- b. The Owner shall determine under the design phase if the new generator is to serve the entire building as currently constituted or a portion of the building. If the generator is to serve portions of the building, then two hour rated Electric rooms will need to be created for emergency panels, fed by two hour feeders.
- c. Optional standby power distribution can be housed in Electric rooms with normal power distribution.

FIRE ALARM

Existing System Summary:

- a. The addressable fire alarm control panel as manufactured by Fire Lite serves the entire building and is located in the Main Vestibule. It appears that the original conventional fire alarm control panel was replaced with this panel, however the existing conventional devices remained so likely the panel annunciates by zone, not by device.
- b. Most of the fire alarm devices appear to be original to the building.
- c. Most of the egress doors have pull stations, except for the back door of the Police Station. The pull stations do not appear to be at ADA compliant heights.
- d. Most of the indicating devices are horn/lights, which are not ADA compliant, however there are a few horn/strobes on the Second Floor.
- e. Toilet and Conference rooms do not have strobes.
- f. The Police Station is covered by the fire alarm system, while the Fire Station does not have any system devices, other than a fire alarm annunciator in the Apparatus Bay.
- g. Most Corridors have smoke detectors, except for the Corridor between the Town Hall and the Police Station. Rooms are not protected by the fire alarm system.
- h. In general the fire alarm system appears to be in poor condition.

Recommendations:



- a. The existing fire alarm system should be replaced in its entirety with a new addressable fire alarm system, given condition and the fact that the existing fire alarm system is conventional.
- b. Smoke detectors should be provided 30'-0" on center in Corridors, in each Stair at each floor, in Electrical rooms, in Technology rooms, in the Elevator Machine Room, and at all elevator landings for early detection of smoke for recall.
- c. A remote annunciator panel should be provided in the Vestibule at the Main Lobby.
- d. A map of the entire building should be framed and mounted adjacent to the annunciator.
- e. A keyed box should be provided outside the Fire Department entry.
- f. Manual pull stations should be located within 5'-0" of each egress door and at the entrance to each Stair.
- g. A heat detector should be provided at the top of the elevator shaft.
- h. All devices including tamper, flow, pressure switches, and PIV, associated with the fire suppression system should be connected to the fire alarm system.
- i. Audio/visual appliances should be installed in the corridors 50'-0" on center, spacing as required by NFPA 72, based upon candela ratings.
- j. Visual only devices should be installed in Toilet and Conference rooms.
- k. Mechanical equipment should be shut down by the fire alarm system as required by Code.

LIGHTING / SWITCHING

Existing System Summary:

- a. Interior lighting is mostly made up of inefficient and outdated lamp sources. Lighting fixtures include RLM's, down lights, exit signs, porcelain sockets, bowls, track lighting, and pendants with incandescent lamps and 2'x4' prismatic lens troffers, industrials, strips, wraparounds, 1'x4' prismatic lens troffers, and 1'x4' micro-cubes, with largely T-12 lamps. There is a limited amount of lighting fixtures with T-8 lamps and some down lights with fluorescent lamps.
- b. Lighting fixtures are controlled by local switches. There are some emergency battery units in the building which do not appear to be functioning.
- c. Exterior lighting is made up of a site lighting pole, wall packs with high intensity discharge lamps, and traditional wall sconces and glass globes with cages with incandescent lamps. These lighting fixtures are controlled by time clocks. The site largely relies on electric utility co. owned flood lights around the site for lighting.
- d. In general the lighting/switching appears to be in poor condition.

Recommendations:

- a. The existing interior lighting should be replaced with new given its condition with new energy efficient lighting fixtures in accordance with I.E.S. (Illuminating Engineering Society of North America) recommendations and the Massachusetts State Building Code energy requirements.
- b. Volumetric 2'x4' troffers should be provided in Office and Conference rooms.



- c. Storage, Mechanical, and Electrical rooms should be provided with strip lighting fixtures.
- d. The Main Lobby should be provided with decorative lighting, probably luminous bowls, down lights, and wall sconces.
- e. Toilet rooms should be provided with 2'x4' prismatic lens troffers.
- f. The Stairs should be provided with vandal resistant wall mounted lighting fixtures.
- g. Down lights should be provided at various locations.
- h. Edge lit LED exit signs should be provided at all egress doors and at additional locations as required to identify exit discharge routes.
- i. The existing exterior lighting should be reviewed with the Owner to determine if the existing electric utility co. owned flood lighting fixtures will continue to light the site or if new lighting fixtures fed from the building will be provided.
- j. Lighting fixtures in rooms less than 900 square feet, should be controlled by room occupancy sensors, with local wall switches. Lighting fixtures nearest to the exterior window walls should be separately controlled.
- k. Larger areas not controlled by occupancy sensors and exterior lighting should be controlled through lighting relay panels and low voltage switches.
- l. Digital timer switches should be provided in Storage rooms.

RECEPTACLES

Existing System Summary:

- a. There are a limited amount of receptacles in the building, some ground type, some not grounded. Receptacles have been added over the years with the use of wiremold. In general the receptacles appear to be in poor condition.

Recommendations:

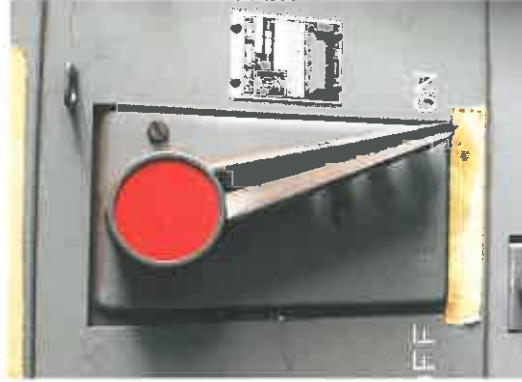
- a. General purpose receptacles should be located throughout the building as required.
- b. Duplex receptacles installed in Toilet Rooms, near sinks, and outdoors should be provided with ground fault protection.
- c. Circuiting should be provided to Mechanical, and Plumbing equipment, and miscellaneous loads as required.
- d. A typical Office should include a double duplex receptacle with a technology outlet at the desk wall circuited to computer panelboards and a duplex receptacle on every other wall circuited to general purpose receptacles.
- e. Duplex receptacles should be provided 50'-0" on center in corridors for maintenance purposes.

TECHNOLOGY

Existing System Summary:

- a. Data racks are located throughout the building.
- b. The building does not have a cable management system.

Recommendations:

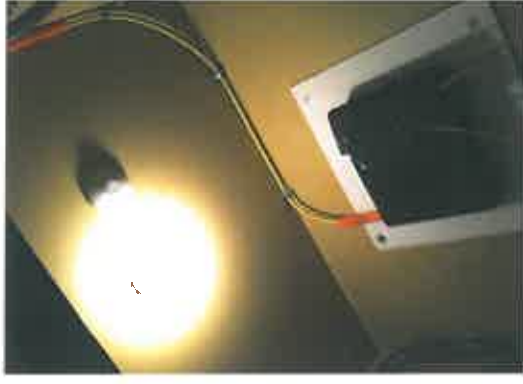


- a. A telephone/data/video/security/clock/speaker conduit system consisting of back boxes and conduit with pull strings to above accessible ceilings should be provided for Technology.
- b. Cable tray should be provided above the corridor ceilings and in MDF and IDF rooms for low voltage wiring.

SHORT-TERM RECOMMENDATIONS

ELECTRICAL

- a. The existing fire alarm system has many deficiencies as it relates to current codes. At a minimum, we would recommend the following as it relates to life safety.
 - a. Provide pull station at back door of the Police Station egressing to the exterior.
 - b. Provide strobes in Toilet and Conference rooms as required by ADA.
 - c. Provide smoke detectors in Corridor between the Town Hall and the Police Station.



building code analysis

A Complete Code analysis of the existing building was not performed as part of this assessment as the International Existing Buildings Code with Massachusetts Amendments (IEBC) permits existing legal occupancy to continue without change as stated below.

Code Requirements for Alterations to Existing Buildings

Massachusetts State Building Code (2009 International Existing Buildings Code with Massachusetts Amendments (IEBC)) states that it is the intent of the Code to provide flexibility to permit the use of alternative approaches to achieve compliance with the minimum requirements to safeguard the public's health, safety and welfare insofar as they are affected by the repair, alteration or addition of an existing building.

Section 104.4.2 of the IEBC states that "Buildings previously occupied. The legal occupancy of any building existing on the date of the adoption of this Code shall be permitted to continue without change, except as is specifically covered in this Code, the International Fire Code, or the International Property Maintenance Code, or as is deemed necessary by the code official for the general safety and welfare of the occupants and the public."

In discussions with Town Personnel, the purpose of the feasibility study is to assess the existing conditions of the building and the impact that a proposed project would involve. The gut rehabilitation of the building and systems, including selective demolition and reconstruction and/or additions and the reconfiguration of spaces to accommodate municipal offices, fire and police stations and additional programmatic requirements would require a complete Code review once programming meetings have occurred and new schematic floor plans were developed based on those programming needs.

Below are the most prevalent code topics, in our opinion, which begin to outline strategies which the Town can use to aid in the decisions or outcomes that arise from this feasibility study.

Building Codes in Effect:

780 CMR, Massachusetts Building Code, 8th Edition

2009 International Building Code (IBC)

2009 International Energy Conservation Code with Massachusetts (IECC)

Current Occupancy Type(s): Business, Type B; Storage, Type S-1; Institutional, Type I-3 Condition 5.

Current Construction Type: IIIB, Unprotected Combustible, Non-Separated Mixed Use.

Section 302.2 Mixed Use: all buildings and structures that include more than one use group shall be further designated as mixed use and shall comply with 780 CMR 313.0.

Section 313.1 Two or more groups: Where a building is occupied by two or more occupancies not included in the same group, the building or portion thereof shall comply with 780 CMR 313.1.1, 313.1.2. or 313.1.3 or with combinations of those sections.

Section 313.1.2 Separated use groups: Each portion of the building shall be individually classified in a use group and shall be completely separated from adjacent fire areas by fire separation assemblies and floor/ceiling assemblies having a fire resistance rating determined in accordance with 780 CMR 313.0.



dance with table 313.1.2.

Section 313.1.2 Exception: Where the building is equipped throughout with and automatic sprinkler system in accordance with 906.2.1, the required fire resistance rating of fire separation assemblies separating areas of other than Use Group H, shall be reduced from those indicated in Table 313.1.2 by one hour but not less than one hour and to not less than that required by Table 602 for floor construction. Sprinkler System will reduce table ratings by one hour.

Fire Protection: The building is currently not protected with a Fire Suppression System.

Accessibility: See ADA Review for commentary.

Gross Floor Area Largest Floor (Basement Level): 14,484 SF
Total Building Area All Levels: 27,512 SF

Building Height: is measured from the Grade Plane to the average height of the highest roof surface. The building can be classified as a 2-story building.

Energy Code

Since January 1, 2010 the Massachusetts Energy Code is the 2009 ICC International Energy Conservation Code (IECC) with Massachusetts Amendments. This building is a Commercial Building the IECC Chapter 5 must be adhered to.

The IBC and IECC require that if an energy component such as lighting, power supply, hot water heating or HVAC equipment of an existing building is replaced, that element must comply with the current Code. The Thermal envelope, mechanical systems, lighting, power supply and insulation requirements by component are listed below per Table 502.2 & 502.3 for Climate Zone 5.

Building Envelope Requirements - Opaque Assemblies Partial Table 502.1.2(1) for Climate Zone 5.

<u>Required</u>		<u>Current Condition</u>
Insulation entirely above deck	R-20ci	Assume R-2.5 (no ci, Slate, 15# Felt, Sheathing)
Attic and other	R-38	Assume 0 (none observed)
Mass	R-11.4ci	Assume 1.75 (based on .20 x wall thickness)
Metal Framed	R-13+R-7.5ci	Not Applicable
Wood Framed and other	R-13+R-3.8ci	Not Applicable
Below Grade Wall	R-7.5ci	Assume R-5.2 (assume no ci, based on .20 x wall thickness)
Mass	R-10ci	Assume R-4.5 (assume no ci, based on .20 x wall thickness)
Unheated Slabs	NR	
Heated Slabs	R-15 for 24 in. below	Not Applicable (currently none installed)
Doors -Swinging	U-0.70	Assume U-0.70
Doors - Roll-up or Sliding	U-0.50	Assume U-0.50

Summary of Energy Code

Based on the above information outlined in IECC Table 502.1.2(1) the current building does not comply with the energy code requirements. A comprehensive review of the existing systems should be undertaken in concert with any planned additions or renovations to ensure the completed project complies and maximizes the energy efficiencies available in newer construction practices.



handicap accessibility review (aab & ada)

ADA Review

The Architectural Access Board (AAB) is a regulatory agency within the Massachusetts Office of Public Safety. Its legislative mandate states that it shall develop and enforce regulations designed to make public buildings accessible to, functional for, and safe for use by persons with disabilities.

To carry out the board's mandate, the "Rules and Regulations", which appear in the code of Massachusetts Regulations as 521 CMR 1.00, have been developed and amended. These regulations are incorporated in the Massachusetts Building Code as a "specialized code", making them enforceable by all local and state building inspectors, as well as by the Board itself.

These regulations are designed to provide full and free use of buildings and facilities so that persons with disabilities may have the education, employment, living and recreational opportunities necessary to be as self-sufficient as possible and to assume full responsibilities as citizens.

As defined in the AAB Regulations, the subject building is defined as a "Commercial Building". The access regulations in 11.1 define a "Commercial Building" as including doctors, dentists, lawyers, accountant offices, insurance companies, realtors, travel agencies, as well as city and town hall facilities. All Commercial Buildings with spaces that are open to the public are required to be accessible.

"Full Compliance" in the AAB Regulations requires that all public entrances, and at least two exits from the building be accessible, that there be an accessible route throughout all public areas of the building and that offices, meeting spaces, hearing rooms and council chambers be fully in compliance with the AAB Regulations. In addition, synchronized fire alarm strobe lights are required throughout the building and assisted listening devices must be available for the hearing impaired.

The list of Code sections that we believe should be addressed are:

1. 521 CMR 6.00: SPACE ALLOWANCE AND REACH RANGES
2. 521 CMR 11.00: COMMERCIAL BUILDINGS
3. 521 CMR 15.00: DETENTION FACILITIES
4. 521 CMR 20.00: ACCESSIBLE ROUTE
5. 521 CMR 24.00: RAMPS
6. 521 CMR 25.00: ENTRANCES
7. 521 CMR 26.00: DOORS AND DOORWAYS
8. 521 CMR 27.00: STAIRS
9. 521 CMR 28.00: ELEVATORS
10. 521 CMR 29.00: FLOOR SURFACES
11. 521 CMR 30.00: PUBLIC TOILET ROOMS
12. 521 CMR 32.00: KITCHENS
13. 521 CMR 34.00: STORAGE
14. 521 CMR 36.00: DRINKING FOUNTAINS
15. 521 CMR 39.00: CONTROLS
16. 521 CMR 40.00: ALARMS
17. 521 CMR 41.00: SIGNAGE



The following are items that we feel are not in compliance with the AAB regulations and should be addressed:

- ADA: Counters in most public offices are not at the required accessible height. 521 CMR Section 11.6- Transaction Areas: Transaction areas in commercial buildings shall comply with 521 CMR 7.2.2.
- ADA: Currently a 4" projection exists into walkway: fire extinguisher near men's toilet room at police, file cabinet near same location.
- ADA: Noncompliant door hardware at men's toilet room door at police station office area.
- ADA/Life Safety: Non accessible route from cells/lower floor to exterior of building- numerous steps, no handrails on the steps.
- ADA/IBC: No handrail at ramp near back of cells.
- ADA/IBC: Numerous items of storage on ramp.
- ADA/IBC: Noncompliant door hardware at top of ramp and clearances at door.
- ADA: The sink at fire lounge not accessible.
- ADA: The doors into police training room not ADA compliant hardware.
- ADA: Door clearances and hardware into numerous offices throughout the facility are not ADA compliant.
- ADA: The sink in the ADA toilet room on the first floor of town hall currently seems to be supported by a vertical wood 2x4 directly under the center of the drain, this conflicts with knee clearance requirements. 521 CMR Section 11.4- Public Toilets: Wherever public toilets are provided for customers, visitors or clientele of said businesses, they are required to comply fully with 521 CMR 30.00: Public Toilets.

Currently throughout the facility there are numerous existing marble thresholds at doors which exceed the requirement maximum height defined by the AAB. The allowable height is 1/2" or less and in several cases the height of the existing threshold from the adjacent floor finish is in the range of 3/4" to 1.5", which does not comply.

Currently one (1) accessible entrance, route from Atlantic Street up to elevated first floor of town hall. Vertical access via keyed elevator to second floor only, Elevator does not connect to basement level. One accessible entrance, on grade route from School Street exists into Police Station Lobby. Police and Fire Station are not currently fully accessible, nor are they connected to the Town Hall floors above.

There may be existing variances that are in place which the assessment team was not able to confirm with Town Personnel at the time of this printing. Any current variances in place shall be reviewed along with relevant future design decisions.



Proposed Building Program

Building Program - Space Needs Study

Hull Town Hall-Police-Fire Complex		Existing Conditions			Proposed Space Requirements		
ROOM TYPE		ROOM NFA ¹	# OF RMS	area totals	ROOM NFA ¹	# OF RMS	area totals
Police Department				6,554			16,000
Lobby		234	1	234			
Dispatch Office		180	1	180			
Police Captain's Office		173	1	173			
Office		168	1	168			
Office		105	1	105			
Toilet (M)		63	1	63			
Toilet (F)		42	1	42			
I.T. Closet		18	1	18			
Youth Detention		77	1	77			
Interrogation Room		38	1	38			
Recording Room		35	1	35			
Chief's Office		170	1	170			
Detective's Office		151	1	151			
Sergeant's Office		169	1	169			
Storage Closet		14	1	14			
Male Locker room		168	1	168			
Toilet (M)		47	1	47			
Female Locker room		74	1	74			
Toilet (F)		71	1	71			
Booking Area		184	1	184			
Cell Room A		962	1	962			
Mechanical Closet		48	1	48			
Cell Room B		275	1	275			
Storage Closet		96	1	96			
Police Garage		801	1	801			
Storage Closet (Compressor Room)		55	1	55			
Mezzanine Storage		137	1	137			
Toilet (U)		50	1	50			
Police Seminar Room		396	1	396			
Police Locker room		217	1	217			
Kitchenette		106	1	106			
Toilet/Shower (U)		64	1	64			
Police Weight Room		876	1	876			
Storage Closet		58	1	58			
Storage Closet		232	1	232			
					Programming meetings with the Police and Fire Departments is currently in progress. Therefore, an approximate NSF has been inserted until the programming discussions have been finalized.		

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Feasibility Study - Town of Hull - Town Hall

Fire Department				2,520
Fire Apparatus Garage		1,181	1	1,181
Mezzanine Storage		127	1	127
Fire Lounge		182	1	182
Fire Tank/Storage Room		383	1	383
Fire Bunk Room 1		137	1	137
Fire Bunk Room 2		132	1	132
Fire Chief's Car (Garage)		378	1	378
Town Hall				9,824
Elevator / Elev. Machine Room		70	1	70
Vault		41	1	41
Storage Closet		96	1	96
Boiler Room		605	1	605
Coal Room (Oil Tank)		316	1	316
Animal Control Officer		120	1	120
Treasurer's Office		243	1	243
Tax Collector General Office/Parking Clerk		498	1	498
Tax Collector Private Office		217	1	217
Storage Closet		76	1	76
Board of Selectman General Office		328	1	328
Town Clerk's Office		271	1	271
Town Vault		369	1	369
Vestibule (East)		148	1	148
Vestibule (West)		173	1	173
Vestibule (North)		61	1	61
(Louis C. Costa) Meeting Room		527	1	527
General Conference Room				
Board of Health Office		124	1	124
Board of Health Storage		70	1	70
Community Outreach Office		87	1	87
Town Manager's Office / Conference		221	1	221
Town Manager's Secretary		135	1	135
Storage Closet		41	1	41
Hull Community Television Office		245	1	245
Elevator		* included within Grossing Factor		
Toilet (Unisex)		* included within Grossing Factor		
Toilet (Handicapped)		* included within Grossing Factor		
Toilet (Unisex)		* included within Grossing Factor		
Veteran's Affairs Office		138	1	138
Waiting Room		75	1	75
Building Dept. Private Office		261	1	261
Building Dept. (General Office)		384	1	384
Fire Prevention Private Office				
Planning Dept. General Office		318	1	318
Planning Dept. Private Office		128	1	128

Feasibility Study - Town of Hull - Town Hall

Retirement Board Office	163	1	163	150	1	150
Accountant Dept. (General Office)	308	1	308	500	1	500
Accountant Dept. (Private Office)	147	1	147	150	1	150
Storage Closet	51	1	51	50	1	50
Assessor's Dept. (General Office)	510	1	510	500	1	500
Assessor's Dept. (Private Office)	129	1	129	150	1	150
Storage Closet	51	1	51	50	1	50
Board of Health Dept.	333	1	333	400	1	400
"Men's Room" (Conference Room)	236	1	236	250	1	250
"Ladies Room" (Kitchenette)	236	1	236	200	1	200
Toilet (M)	* included within Grossing Factor			* included within Grossing Factor		
Toilet (F)	* included within Grossing Factor			* included within Grossing Factor		
Janitor's Closet	43	1	43	50	1	50
Conservation Office	224	1	224	200	1	200
Information Technology (IT)	224	1	224	200	1	200
Balcony (Storage)	733	1	733	300	1	300
Communications Room	50	1	50	100	1	100
Total Building Net Floor Area (NFA)			18,898			26,845
Total Building Gross Floor Area (GFA) ²			27,517			40,536
Grossing factor (GFA/NFA)			1.46			1.51

Existing Building Gross Square Footage

Ground Floor Level	14,484GSF
First Floor Level	6,125GSF
Second Floor Level	6,125GSF
Third Floor Level / Balcony	783GSF
Total Gross Square Footage	27,517GSF

Recommended Emergency Repairs (1-2 years)

ARCHITECTURAL

1. Replace the existing egress door hardware to comply with the current egress requirements.
2. Remove stored items from egress paths (stairs and corridors) to comply with the current egress requirements.

STRUCTURAL

1. **Basement Concrete Framing:** Based on limited observations made during the survey and digital photographs provided by town personnel, significant spalling with exposed steel reinforcement is present along some concrete beams, columns, and the underside of the slab. PARE recommends that spalled or deteriorated areas of concrete be removed to sound concrete. Exposed reinforcement shall be cleaned and/or replaced. The repair areas should be patched with a polymer-based repair mortar (small or overhead areas) or cast-in-place concrete (larger areas), as appropriate.
2. **Fire Escape:** Various structural deficiencies (described above) were observed along a metal fire escape providing access from the second floor of the 1920 structure to the roof of the 1970 addition. The recommended repairs are as follows:

- o Deteriorated or detached treads should be removed and replaced.
- o The angle securing the south side of the bottom of the escape to the low roof should be removed and replaced in-kind. A similar support should be installed at the north side of the bottom of the escape.
- o Two missing anchor bolts along the escape frame should be replaced.
- o The guardrail should be removed and replaced where detached or damaged.
- o Deteriorated steel shim plates should be removed and replaced with non-shrink grout.
- o Brick cracks at escape support locations should be repaired with a structural adhesive, such as epoxy injection.
- o The fire escape should be cleaned of all rust/corrosion and painted.

PLUMBING

1. Install a backflow preventer on each of the exterior hose bibbs that are connected to the irrigation system, lawn sprinkler system. The installation of the backflow preventers are required by Code.





BOILER AND HEATING

1. Boiler 1 is the primary heating unit. This unit will require additional repairs to assure it will remain operational for the next few years. The barometric damper needs to be repaired. Additional preventative maintenance is required for this boiler to remain in service.
2. Boiler 2 is the backup heating unit. This unit presently is not used. This unit will require additional repairs to assure it will remain operational for the next few years. Additional preventative maintenance is required for this boiler to remain in service.

HVAC

1. Install a fresh air economizer in the Police Station rooftop air-handling unit. At the present time no fresh air is being supplied to this building as required by Code.
2. Install a fresh air duct and damper to the heat pump serving the Admin Offices and the jail cell areas. At the present time no fresh air is being supplied to these areas.
3. Install a dedicated ductless-split A/C unit to serve the Police Department computer server room. This room presently has no dedicated system to remove heat from this converted room. The condensing unit can be installed on the roof above this space.

ELECTRICAL

1. The existing fire alarm system has many deficiencies as it relates to current codes. At minimum, we would recommend the following as it relates to life safety.
 - a. Provide pull station at back door of the Police Station egressing to the exterior.
 - b. Provide strobes in Toilet and Conference rooms as required by ADA.
 - c. Provide smoke detectors in Corridor between the Town Hall and the Police Station.

Cost Analysis (\$/sf)

Ai3 Architects, LLC developed the following estimated construction cost (hard costs) and total project cost analysis to provide the Town of Hull with an “order of magnitude” cost estimates associated with three possible options requested by the Town; 1) Comprehensive renovation of the existing facility, 2) Comprehensive Renovation and Addition, and 3) Construction of a new facility.

OPTION 1 – Comprehensive Renovation

This option does not include any additional space (expansion) for Police, Fire, or Town Hall needs on the current site. It ONLY includes comprehensive renovation of the existing 1920's Town Hall and 1970's Police addition. The feasibility study revealed that additional program space is required to meet current and future needs of the Town Hall, Police, and Fire Departments. However, this option assumes that the current buildings will remain the same size and the additional required space will be provided and/or constructed at a separate location. It assumes that the current Town Hall, Police and Fire Department program square footage and adjacencies would not be altered within the complex; and it only addresses the deteriorated building conditions and failing building systems. Under this option, a second facility would have to be constructed and/or acquired to house a portion of the Town Departments. In the event that this becomes the police or fire department, it would obviously be very expensive to create the necessary space at a second facility.

- Estimated Order-of-Magnitude Construction Cost (Hard Costs) (Renovation of existing 19,467 GSF building @ \$435/GSF)	\$8,468,145
- Renovation of existing single-story area of 8,050 GSF @ \$420/GSF)	\$3,381,000
- Excess Program Accommodation (Assumed that approximately 12,700 GSF of program area will have to be re-located to another property and/or facility within the Town in order to accommodate current and future programs. The cost of this additional facility will vary based on the specific program that is re-located. We are assuming that renovation of the proposed space will be required to accommodate the program.)	\$4M - \$7M
- Temporary Relocation Costs for displacement of facility occupants during the period of time when the buildings are being renovated.	\$500,000 - \$1.25M
- Soft Costs (Assumed twenty five percent (25%) is carried for Project Soft Costs that include: Project contingency, Town's Project Manager, Town's administrative costs, Design Consultant Fees, Bonds, Insurance, Site Survey, Geotechnical Evaluation, Etc.)	\$4M - \$4.7M
- Total Estimated Project Cost	\$20,349,145 - \$24,799,145*

*Option 1 assumptions:

1. No site acquisition costs are considered with this option. A new property would need to be acquired with this option because the option does not meet the proposed programmatic needs of the Town Hall, Police and Fire

Departments. The existing building gross square footage is 27,517 and the proposed program is 40,536 gross square feet, an overage of 13,019 GSF.

2. Segregation of Program: The existing Town Hall, Police and Fire complex will not accommodate the entire proposed program square footage of 40,234 GSF. As a result, the program will need to be segregated within various buildings in the Town. This likely means the Police and Fire Departments would be removed from the current configuration as separate entities/functions from the Town Hall. Also, due to the specialized equipment required by Police and Fire, these functions are very expensive to out-fit as compared to a typical program. (i.e. Town Hall space)
3. Temporary relocation costs (moving costs, lease costs, and potential renovation costs) are unknown. The renovation of the existing building will require temporary relocation costs to accommodate the construction of the proposed new building. The current Town Hall, Police and Fire Department programs would need to be temporarily relocated during the construction phase.

OPTION 2 – Comprehensive Renovation / Addition

This option assumes the revitalization and modernization of the existing 1920's Town Hall building through a comprehensive renovation and it includes the construction of a new addition which would house a 21st century Police and Fire Department facility. This new police/fire addition would be located behind the Town Hall building on the same site with street frontage on School Street and Atlantic House Road. This option consists of the demolition of the single-story portion of the existing building (currently accommodating the Police and Fire Departments), construction of a new addition, and the comprehensive renovation of the existing Town Hall building. This option would accommodate all current and future programmatic needs for Town Hall, Police, and Fire Department programs; and would allow all programs to remain on the current site.

- Estimated Order-of-Magnitude Construction Cost (Hard Costs)	
(Renovation of existing 19,467 GSF @ \$435/GSF)	\$8,468,145
(New addition of 20,767 GSF - Total 40,234 GSF @ \$450/GSF)	\$9,345,150
- Hazardous Material Abatement and demolition of the existing single story addition (Approx. 8,050 GSF)	\$120,750
(Assumed demolition and abatement of 8,050 GSF of existing Police and Fire Department GSF @ \$15/GSF)	
- Temporary Relocation Costs for displacement of facility occupants during the period of time when the buildings are being renovated	\$500,000 - \$1.25M
- Soft Costs	
(Assumed twenty five percent (25%) is carried for Project Soft Costs that include: Project contingency, Town's Project Manager, Town's administrative costs, Design Consultant Fees, Bonds, Insurance, Site Survey, Geotechnical Evaluation, Etc.)	\$4,483,511

- Total Estimated Project Cost \$22,796,806 - \$23,546,806*

***Option 2 assumptions:**

1. No site acquisition costs are considered with this option. This option would not require the need to acquire an additional property to accommodate the proposed program since the existing building and addition would be sized to adequately accommodate the Town Hall, Police and Fire program.

OPTION 3 - New Construction

This option assumes the construction of a new modern 21st Century Town Hall, Police and Fire complex on the existing Town Hall site or a proposed new site. As no appropriately sized and well-located new site was identified in the feasibility study, it is likely that this option would require the demolition of the existing Town Hall in order to create a suitable site for a new complex.

- Estimated Order-of-Magnitude Construction Cost (Hard Costs) (New 40,234 GSF building @ \$450/GSF)	\$18,105,300
-Property Purchase or Temporary Relocation Costs	\$750,000 - \$3M
- Soft Costs (Assumed twenty five percent (25%) is carried for Project Soft Costs that include: Project contingency, Town's Project Manager, Town's administrative costs, Design Consultant Fees, Bonds, Insurance, Site Survey, Geotechnical Evaluation, Etc.)	\$4,526,325
- Total Estimated Project Cost	\$23,381,625 - \$25,631,625*

***Option 3 assumptions:**

1. Site acquisition costs: The only way to eliminate acquisition costs for this option is to identify a proposed property currently owned by the Town of Hull. It is our understanding that there are currently no sites in Town that have the appropriate buildable land in the appropriate location for the functions.
2. Demolition of a structure on Town owned land: If a property is identified in the future that could be a possibility to accommodate a New Town Hall, Police and Fire, it would likely have an existing structure on it. Therefore, there likely would be hazardous material abatement and demolition costs associated with the removal of the existing structure to prepare to construct a new building. The potential cost for this is not included within the estimated project cost indicated above.
3. Hazardous material abatement and demolition costs: If the current Town Hall site is used to accommodate the construction of the proposed new building, it would require the abatement of hazardous material and demolition of the existing structure. The associated cost related to these two activities would be approximately \$14.00 - \$15.00/SF, resulting in a cost to remove the existing building between \$385,000 - \$412,500. This amount is not included within the Total Estimated Project Cost indicated above.

4. Temporary relocation costs (moving costs, lease costs, and potential renovation costs): If the current Town Hall site is used to accommodate the construction of the proposed new building, the current Town Hall, Police and Fire Department programs would need to be temporarily relocated during the construction phase. The cost for the temporary relocation of the program is assumed to be between \$750,000 - \$3M.

* The order of magnitude project cost estimates are provided in 2013 dollars and does not include inflation. This order of magnitude cost estimates were provided for purposes of this feasibility study only. It is important to note that more detailed cost estimates would need to be conducted when a specific approach is determined.

** Total SF assumes a placeholder of 16,000 GSF for the Police and Fire program as programming with the departments is currently ongoing.

Appendix A

photo documentation





