LDa
ARCHITECTURE & INTERIORS

5 BROAD STREET
Re-Use Feasibility Study

City of Salem, Massachusetts

March 26, 2010

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CODE REFERENCES

521 CMR Jan, 27, 2006; Massachusetts Architectural Access Board

780 CMR 7th Edition; Massachusetts State Building Code

248 CMR 1.00 -7.00; Massachusetts State Plumbing Code

2008 National Electric Code

City of Salem Zoning Ordinance; Sept 10, 2009

City of Salem Historical Commission Guidelines Notebook; amended 2004

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INTRODUCTION

The purpose of this study is to determine the feasibility of re-use for the building located at 5 Broad Street, Salem, Massachusetts. The study was driven by the following:

- The Salem City Council has determined the building at 5 Broad Street as surplus public property.
- It is the City's intention to identify potential re-use options.
- Options may entail the renovation and relocation of the City Hall Annex to this location or the sale of the building to a private developer for renovation and re-use.
- The Re-use Feasibility Study will be utilized in the process of locating interested buyers, assisting potential buyers in evaluating the potential of the building and evaluating bids.

STUDY GOALS

- Review Existing Conditions
- Evaluate Building Systems
- Assess Re-use alternatives
- Present and Report

PROCESS

LDa has utilized a process that is analogous to a funnel, where the information collected has been used to narrow down feasible re-use options. The process was divided into two parts for two public meetings.

- Part one identifies the goals, opportunities and constraints from which several potential re-use groups are identified. Then with feedback from the public, we further narrowed the re-use scenarios to those deemed most desirable by the City and Community.
- Part two presents the re-use options as four scenarios and provides a cost estimate for Core & Shell repairs and rehabilitation and City Hall Annex fit-out.

EXISTING CONDITIONS

Building Evaluation
LDa has evaluated existing building finishes, structural elements, and mechanical, electrical, plumbing and fire protection systems, as well as existing site and context. Our evaluation and recommendations are based on our experience with Historic buildings, and follow the City of Salem's Historical Commission Guidelines.

Structural systems appear sound and in good condition. However, any re-use option that increases the building occupancy load or hazard index may require structural upgrades. See Appendix 7.1 for report provided by Roome & Guarracino, LLC.

Mechanical & Electrical system appear outdated and in poor condition. Our engineer has recommended a full replacement of the existing systems. Our recommendations aspire for the highest possible energy efficiency. Renewable energy systems such as solar electrical or solar hot are not recommended due to the historic nature of the building. Ground source heating/cooling systems are encouraged and will minimize cooling equipment on the exterior of the building. See Appendix 7.2 for the report provided by Norian Siani Engineering, Inc.

Salem Historical Commission
5 Broad Street is located within the McIntire Historic District, and falls under the jurisdiction of the Historical Commission design review process. All proposed modifications and repairs will be required to follow the Historical Commission Guidelines.

A summary of the requirements and elements that fall under the jurisdiction of the Commission are provided in section 3.2 in this report.

An Adobe PDF of the Historic Commission Guidelines can be downloaded at: www.salem.com/pages/salemMA_Historic/index

Code Analysis
A code analysis has been provided for the existing building use, and for potential re-use options. This analysis is provided as a means to identify potential re-use options. It is the responsibility of the developer to verify all code constraints that may apply to their proposed re-use.

Zoning Analysis
A developer may apply to the Board of Appeals for a Special Permit to change a nonconforming use. The Board of Appeals may award a special permit only if it determines that such change shall not be substantially more detrimental than the existing nonconforming use to the neighborhood.

An Adobe PDF of the City of Salem Zoning Ordinance can be downloaded at: www.salem.com/pages/salemMA_DPCD/recode

RE-USE SCENARIOS

The study has explored possible plan layouts for four potential re-use scenarios, which were identified by the City and the Public. They consider multi-family residential uses, and mixed used schemes that mix residential use with business uses. Another scenario explores the notion of relocating the City Hall Annex to this address.

Residential Use
We have explored options that maximize the number of residential units allowed based on the number of parking spaces available. The schemes are comprised of a mix of studio, 1 bedroom, 2 bedroom and 3 bedroom units ranging from 450 square feet to 2,200 square feet. Layouts were driven by existing structure, stair core, and windows and doors. The public responded favorably to residential solutions, and suggested fewer larger units rather than a higher quantity of smaller units.

Business Use
Two business types were considered for the study, Office Suites and Restaurant, and Mixed with Residences. In both scenarios, existing on site parking, fire separation, security, accessibility, and egress requirements limited the square footage of business use to the West half of the first floor. Although the business use was initially recommended by the public at our first public meeting, it was disqualified at the second public meeting for its perceived impact on the building and neighborhood.

City Hall Annex
The study explores moving the City Hall Annex from its current location at 120 Washington Street to this location. Our study assumes the nine departments that occupy space at 120 Washing Street will need to occupy the same square footage at 5 Broad Street. Our study has revealed that the building at 5 Broad Street will not accommodate every department, and falls short by roughly 16,000 square feet. This translates to two departments that cannot be accommodated, and must be located elsewhere. The study does not analyze the currentutilization of space at 120 Washington Street.

COST ESTIMATES

We have provided cost estimates for repairs and rehabilitation of the Core and Shell of 5 Broad Street as well as the renovation and fit-out costs to install the City Hall Annex. See Appendix 7.5 for the detailed cost estimate.

- Core & Shell $2,765,702
- City Hall Annex fit-out $2,370,190

1.1 INTRODUCTION

The Salem City Council has determined the building at 5 Broad Street as surplus public property. It is the City's intention to identify potential re-use options. (City of Salem Zoning Ordinance, Section 3.3.2) "A developer may apply to the Board of Appeals for a Special Permit to change a nonconforming use. The Board of Appeals may award a special permit only if it determines that such change shall not be substantially more detrimental than the existing nonconforming use to the neighborhood."

Options may entail the renovation and relocation of the City Hall Annex to this location or the sale of the building to a private developer for renovation and re-use. The Re-use Feasibility Study will be utilized in the process of locating interested buyers, assisting potential buyers in evaluating the potential of the building and evaluating bids.

1.2 GOALS

- Review Existing conditions
- Evaluate Building Systems
- Assess Re-use alternatives
- Present and Report

1.3 METHODOLOGY

LDa has utilized a process that is analogous to a funnel, where the information collected has been used to narrow down feasible re-use options. Our first step identifies the goals, opportunities and constraints, from which several potential re-use groups are identified. Then with feedback from the public, we further narrowed the re-use scenarios to those deemed most desirable by the City and Community.

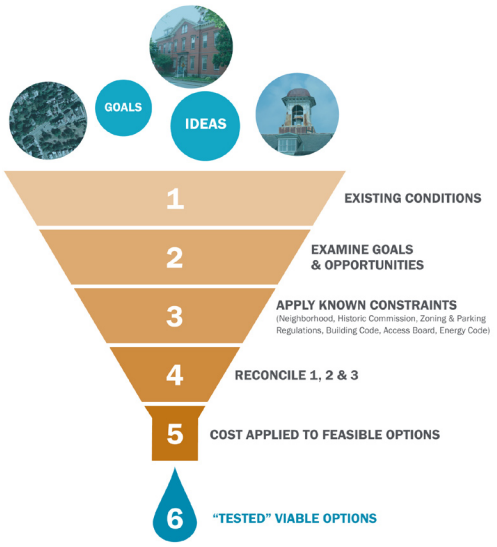

Figure 1. Delivery Funnel

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1.5 TWO PART PROCESS

LDa has utilized a process that is analogous to a funnel, where the information collected has been used to narrow down feasible re-use options. The process was divided into two parts for two public meetings.

Part 1

- Identify Goals
- Evaluate Existing conditions
  - Site
  - Core & Shell
  - Structure
  - MEP/FP
- Analyze Opportunities & Constraints
  - City of Salem Historical Commission Guidelines
  - Massachusetts Building Code (780 CMR 7th edition)
  - Massachusetts Architectural Access Board (521 CMR)
  - City of Salem Zoning Ordinance
- Identify potential use groups
- Present evaluation, analysis and potential re-use groups to the public, solicit feedback to identify desired use groups – SRA public meeting #1, November 04, 2009

Part 2

- Study desired re-use scenarios identified at Public Meeting #1
- Study City Hall Annex relocation
- Present desired re-use scenarios studied, solicit feedback – SRA public meeting #2, January 13, 2010.
- Provide Cost estimates to Core & Shell and Fit-out for City Hall Annex.

2.1 SITE AND BUILDING USAGE

As part of the study, LDa has examined the site constraints from a macro to micro level, starting at the city context, then narrowing our focus to the neighborhood, street, site, and the building. This allowed us to determine walking distances, proximity to City Hall and public parking, traffic patterns, private on site parking and local available street parking, surrounding neighborhood zoning, schools, & historic districts.

Walking Distances			
City Hall	to	City Hall Annex at 120 Washington St.	.06 mi
City Hall	to	5 Broad Street	.37 mi
Museum Place Parking	to	City Hall Annex at 120 Washington St.	.20 mi
Museum Place Parking	to	5 Broad Street	.47 mi

Table 1. Walking Distances

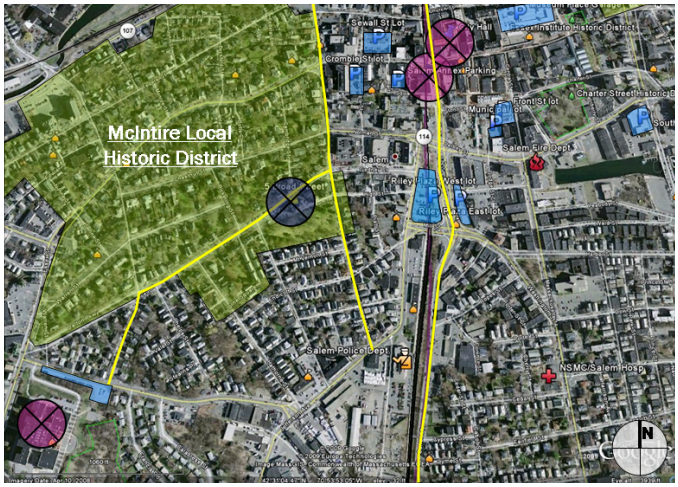

Figure 2. City

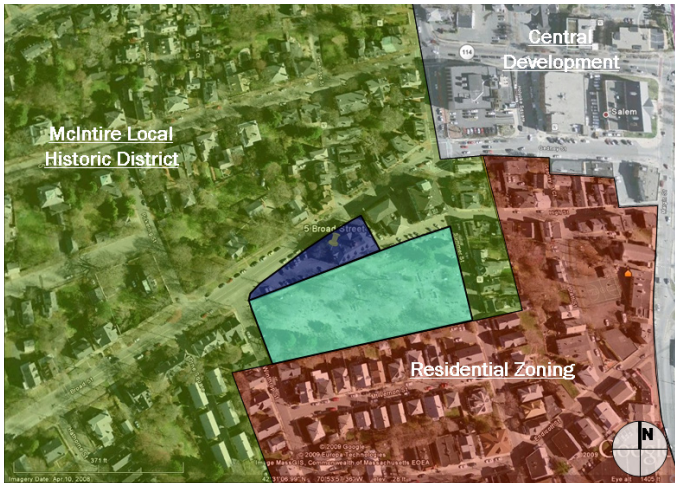

Figure 3. Neighborhood

Figure 4. Street

Figure 5. Site

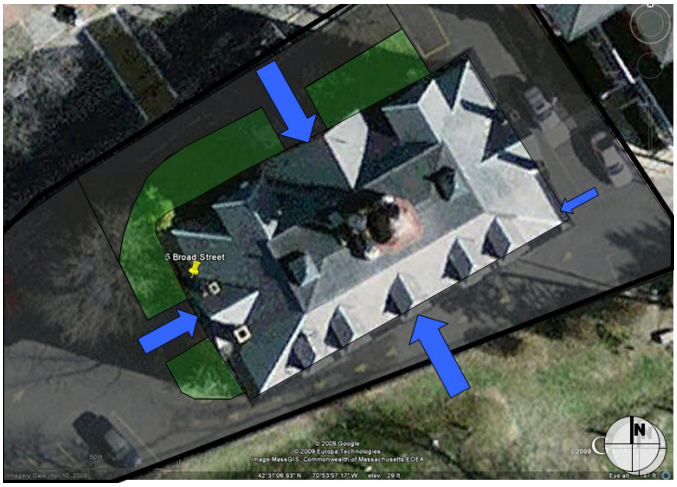

Figure 6. Building

KEY

McIntire Historic District	Cemetery
Residential Zone R-2	5 Broad Street Site
Central Development	Municipal Parking
Public Buildings: City Hall, Annex, Schools	

Current Building Usage Summary
The current occupants are the Department of Park, Recreation, and Community Services. Parking lot and building usage data was collected and provided by the City of Salem.

The weekdays with the heaviest usage and overflow parking are Mondays, followed by moderate usage with full parking on Thursdays, and light usage with some available parking on Tuesdays, Wednesdays, Saturdays, Sundays, and all evenings.

Weekday	Time Period		Building		Parking
Monday 8 am - 4 pm	Morning		Heavy		Heavy
	Afternoon		Moderate		Moderate
	Evening		Light		Light
Tuesday & Wednesday 8 am - 4 pm	Morning		Light		Light
	Afternoon		Light		Light
	Evening		Light		Light
Thursday 8 am - 4 pm	Morning		Moderate		Moderate
	Afternoon		Moderate		Moderate
	Evening		Light		Light
Friday 8 am - 4 pm	Morning		Moderate		Moderate
	Afternoon		Moderate		Moderate
	Evening		Insignificant		Insignificant
Saturday & Sunday	Morning		Light/Insignificant		Light/Insignificant
	Afternoon		Insignificant		Insignificant
	Evening		Insignificant		Insignificant
	Heavy	**Moderate**	**Light**	**Insignificant**	
Building:	100+	50-99	10-49	0-10	
Parking Lot:	Full+	Full	25%-Full	0-25%	

Table 8. Current Building Usage

2.2 ARCHITECTURE

We have evaluated existing conditions and made recommendations to repair & restore architectural elements, identify existing structural systems, and evaluate existing mechanical, electrical and plumbing systems. Our recommendations assume that all work will be executed under the City of Salem Historical Commission Guidelines and the Secretary of Interior's Standards for Historic Preservation Projects. Careful consideration must be given to all exterior repairs & modifications to maintain the historic integrity of the existing materials and finishes. All exterior alterations and repairs must go through a review process.

Image 9. Front view from Broad Street

General Information

Location	McIntire Historic District
Year Built	1855-58
Original Use	The Salem Classic High School
Lot Size	19,000 Square feet (sf)
Gross Building Area	5,500 gross sf/ floor - 3 stories 16,400 sf + 5,500 sf basement
Construction Type	Exterior walls are brick, interior are wood framing and various finish materials
Fire Protection	None
Accessibility	Fully Accessible with elevator (elevator is non-conforming)

Table 2. General Information

Current Occupancy

The current occupants are the Department of Park, Recreation, and Community Services. The East half on all floors above grade functions as Assembly space with movable seats and tables. The West half on all floors above grade functions as civil administration offices.

Image 11. Rear view from Cemetery

Image 12. Main Entrance

Existing Exterior Materials

List of Existing Exterior Materials	
Site	Asphalt Paving, granite curbing, some lawn with hedges at front, a few overgrown trees
Roof	Purple slate, copper and rubber
Walls	Brick, brownstone details
Trim	Painted wood, brownstone details
Windows	Painted wood, True Divided single-pane double hung with weight & pulley balances

Table 3. Exterior Materials

Figure 7. Cupola

Figure 8. Dormers

Figure 9. Cornice

Figure 10. Typical Exterior Finishes/Windows

Figure 11. Typical Exterior Finishes/Windows

Exterior Repair Recommendations
All recommendations are based on a visual inspection of existing conditions visible from the ground. Items not visible from the ground (i.e. roof) assume repair as needed. Any repairs and modifications made to the exterior shall follow the Historical Commission Guidelines.

Exterior Repair Recommendations	
a.	Replace Roofing with Copper
b.	Remove sheet metal, repair wood, repair wood details
c.	New paint - Assume existing lead paint
d.	Remove & close defunct vent stack in cupola
e.	Repair slate cladding
f.	Replace copper roofing roof accessories
g.	Repair/replace wood trim in kind
h.	Replace all windows at third floor dormers
i.	Re-point brick in many areas on all sides
j.	Remove “glossy” sealer at left side of Front façade
k.	All new bricks to match existing
l.	Mortar to be lime-based to match existing color and texture.
m.	Soffits & corbels & dentils shall be catalogued and matched to be replaced with rot-resistant materials. (i.e. mahogany, Spanish cedar)
n.	Single pane windows to be restored and weather stripped
o.	Replace damaged or missing hardware, weights, pulleys & chains, etc.
p.	Replace wood brick molds in kind
q.	Add new wood or aluminum triple track storm windows
r.	Replace all copper gutters & downspouts in kind
s.	Waterproof foundation
t.	Repair all downspout connections to new perimeter drainage
u.	New Perimeter Drainage System
v.	Restore brownstone entry with new brownstone or, Restore brownstone entry with pre-approved brownstone repair compound
x.	Restore brownstone details at windows and doors

Table 4. Exterior Repair Recommendations

Existing Plans

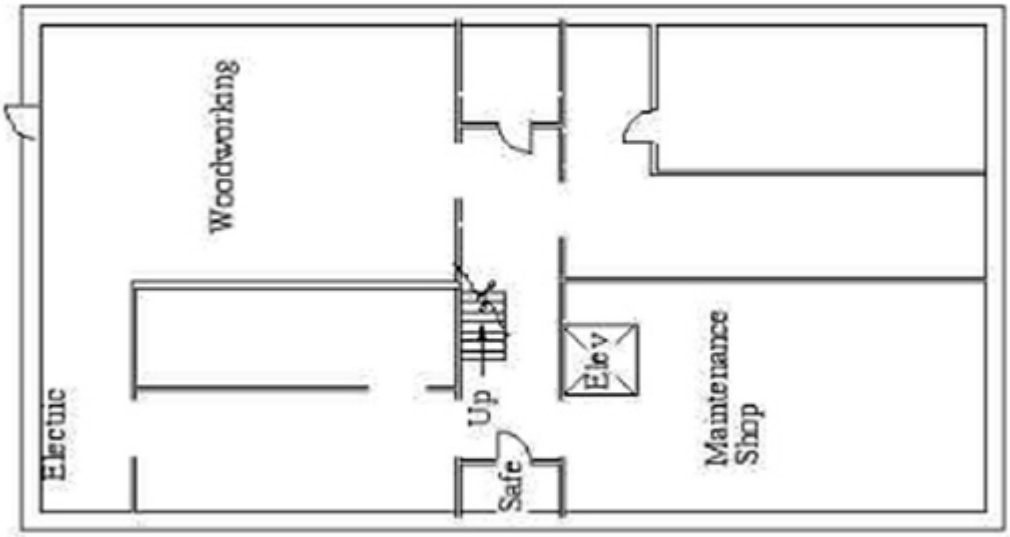

Figure 12. Basement Plan

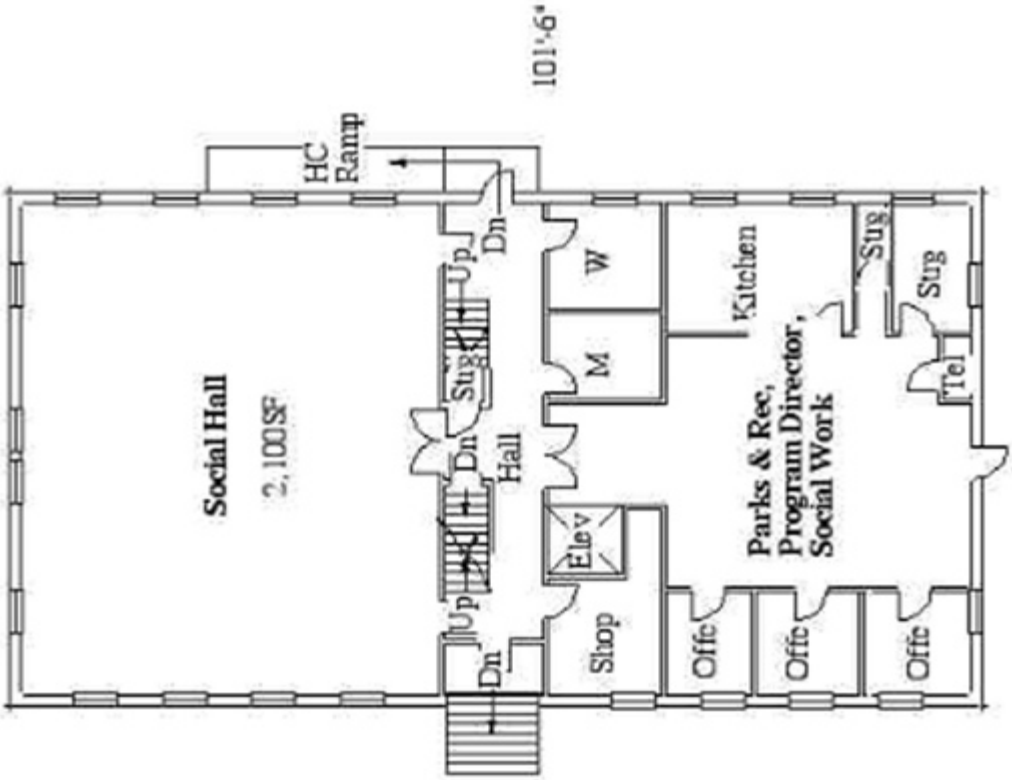

Figure 13. First Floor Plan

Existing Plans

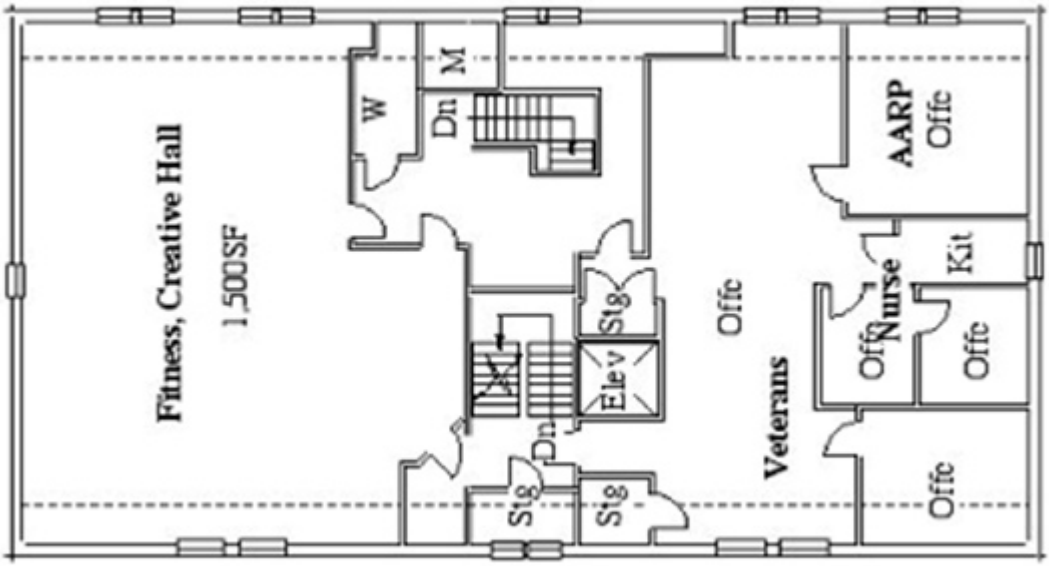

Figure 14. Second Floor Plan

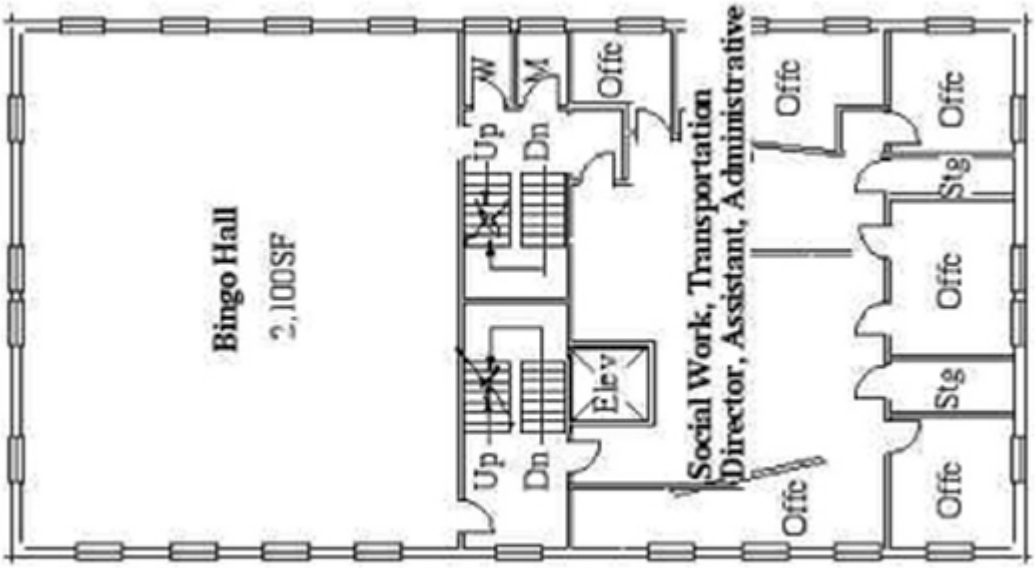

Figure 15. Third Floor Plan

Existing Plans

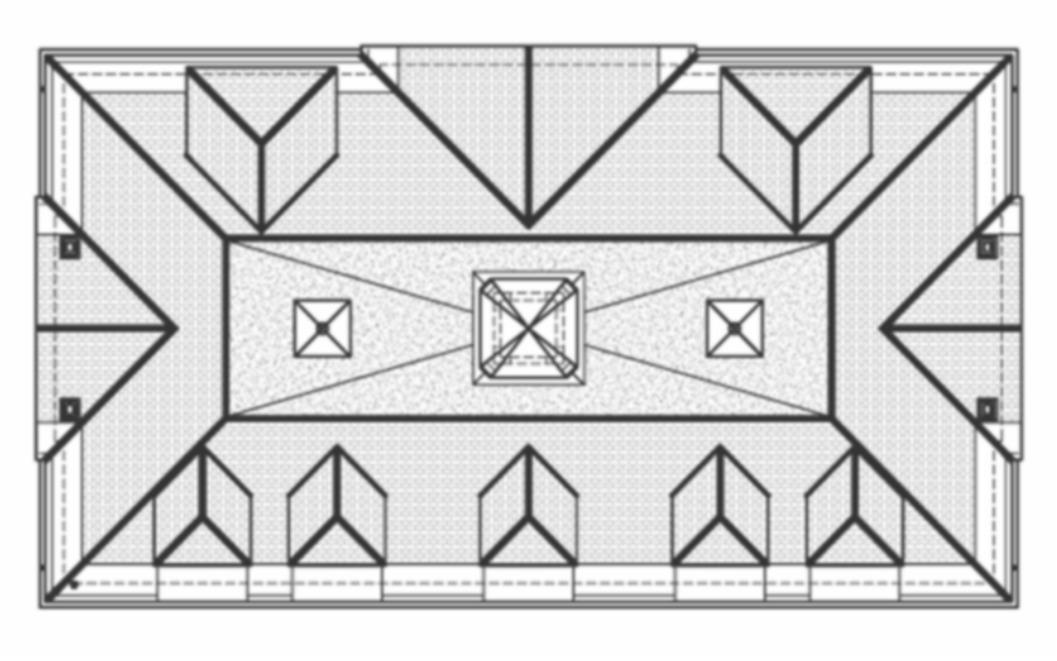

Figure 16. Roof Plan

****NOTE:**
Plan Layouts are diagrammatic,
Interior dimensions not verified.

Interior Materials

First Floor	
Ceilings	Suspended Ceilings with acoustic ceiling tile
Flooring	Vinyl composite tile flooring
Walls	Plaster walls
Trim	Painted wood

Second Floor	
Ceilings	Plaster
Flooring	Vinyl composite tile flooring & Hardwood
Walls	Plaster
Trim	Painted Wood

Third Floor	
Ceilings	Plaster
Flooring	Vinyl composite tile flooring & hardwood, carpet
Walls	Plaster
Trim	Painted Wood

Table 5. Interior Materials

Figure 16. First Floor Offices - West Half

Figure 17. Third Floor Offices - West Half

Figure 18. Third Floor Assembly Space - East Half

Figure 19. Typical Heating Radiator

Image 29. Existing Back Stair

Image 30. Typical Lavatory

Interior Repair Recommendations

Interior repair recommendations are based on visual inspection of the existing conditions. Although most finishes may be removed, it is highly recommended to maintain as much of the historic detail as possible. Historic Salem, Inc. has provided a letter expressing their wishes for maintaining historic details. See section 3.3 for more information on Historic Salem, Inc.

Interior Repair Recommendations	
a.	Remove all hazardous materials, Asbestos, Lead Paint, etc.
b.	Replace all water-damaged finishes
c.	Replace heating systems as recommended by HVAC engineer - add cooling system
d.	Repair and refinish wood flooring - stair core
e.	Repair transitions where materials change, max ½” in height
f.	Most existing fixtures appeared to be serviceable. Re-use when practical
g.	Replace all flushometers with low-flow or dual flush valves
h.	Replace all faucets with low flow faucets - 1.5 gpm
i.	Existing stairs has a slight lean - repair
j.	Risers greater than 7”, do not meet current new construction code requirements. Will be allowed as existing building if hazard index not increased
k.	Repair and Refinish Tread, Risers, Railings & Balusters
l.	All interior trim at doors and windows to be de-leaded and left in place when possible
m.	New wood trim shall make attempt to match existing window details
n.	New wood trim in public areas shall match existing
o.	Evaluate and repair existing elevator. Increase cab size to meet minimum code requirements.

Table 6. Interior Repair Recommendations

2.3 STRUCTURAL REPORT

The structural report has been provided by Carmine Guarracino, PE of Roome & Guarracino, Inc., and re-formatted for consistency. See Appendix 7.1 for the original document.

Overview

This letter summarizes the findings regarding the present condition of the structure for the "Council on Aging Building" located at 5 Broad Street in Salem, Massachusetts, as well as recommendations regarding future uses of this structure. These observations and recommendations are based on information provided by LDa, as well as field observations on October 13, 2009. No existing structural drawings are available for the original building, and as such, comments are based solely on field observations and experience. The field observations were only visual surface observations and no holes were cut in building finishes to verify structure, nor was testing done to determine the structures underlying condition.

Existing Conditions

The original building was a former school built in the mid – 19th century and consists of a two story masonry structure with a basement and a partially finished third floor space. The framing consists of wood joists and timber beams and wood stud bearing walls supported onto timber beams over cast iron columns or brick piers. The exterior walls are multi-wythe masonry bearing walls over stone foundations with a slab on grade at the basement floor. The roof is a hip roof with a flat roof in the center, multiple dormers and a center bell tower. The main roof is framed with story deep timber trusses with the bottom chord at the third floor supported by steel hanger rods from the top chord panel points.

The building is comprised of three sections: The middle section or the "stair core" has bearing walls on each side and is the narrowest part of the three sections. The other two sections are the "east" and "west" sections which are the larger sections. The framing is symmetrical about the stair core with the joists spanning parallel to Broad Street. (See attached schematic framing diagrams)

The field observations began in the basement, heading toward the east section to view the framing. Two interior beam and column lines were noted. The beams and posts consisted of newer steel, which was part of an earlier renovation. At the "east" section, the framing bears from the exterior masonry walls to an interior beam and column line about 12 feet away, then approximately 16 feet to another beam and column line and lastly another 16 feet to the stair core walls. (See attached schematic framing diagrams) Floor joists were not visible in this area due to a finished ceiling.

Figure 20.

In the west section of the basement, the floor joists were exposed since there is no ceiling. Again, the joists span 12 feet from end wall to interior timber beam and columns and 16 feet twice to the stair core wall. The framing connections are mortise and tenon, which was standard construction for that period of time. The beams are heavy timbers spanning over masonry piers. The spacing of masonry piers ranges from 7 to 10 feet. Of note were some locations where joists are split (See Figure 20.) and the bases of the masonry piers are deteriorated (See Figure 21.) Also noted was an area of framing whereby a joist is interrupted by a header, which is smaller in size than the joist and adjacent framing. (See Figure 22.) Lastly, some joists and timber beams have developed horizontal splits as a result of shear stresses

Figure 21.

developed in the reduced sections of the mortise and tenon connections. (See Figures 23. and 24.)

Figure 22.

Figure 23.

The basement at the time of the visit appeared to be relatively dry. The basement floor is a concrete slab on grade which appears to be worn with some cracks and settlement in some areas. It was noted that the foundations consist of stones of various sizes for the lower half with brick for the upper half of the walls. At several basement windows, signs of efflorescence is noted, which is indicative of water and moisture infiltration. (See Figure 25.) The mortar around the windows also appears to be deteriorated and loose.

A walk through the upper floors (first, second and third floors) revealed little or no structural information, since most of the structure is covered by finish and ceilings. The floors in various areas exhibit sags and dips. Several posts are noted within the first floor space called the Social Hall to support the second floor framing, however, the second floor framing was not visible due to the intact ceiling. Ceiling tiles were removed and deeper beams installed below the second floor as part of a renovation which took place in the late 1990s were noted. The columns and beams noted are consistent with report and drawings prepared by Structures North, who was the consultant hired to investigate the removal of bearing walls in the first floor space.

Figure 24.

Figure 25.

After reviewing the report prepared by Structures North, it appears that the walls were not intended to be bearing and that the second floor joists spanned 32 feet from the bearing line 12 feet away from the exterior wall to the wall adjacent to the stairs. This seems to be the case on the west side as well, where a ceiling tile was removed and a beam line with posts 12 feet away from the exterior wall and no indication of support between the aforementioned beam line and the stair core was noted.

Upstairs on the second floor (bingo room), the space is column free with floors which are noticeably sagging. In the third floor exercise room, evidence of water and moisture is noted in the ceiling with some cracks in the plaster ceiling.

Near the Veterans Office on the third floor, the visual observation continued through a ceiling hatch into the attic space to view the roof framing. The space was tight and confined and 2x8 rafters and ridge with several beams and collar ties were noted. (See Figure 26.) No evidence of damage or distress is noted in the framing.

Figure 26.

Figure 27.

In the closet spaces on the third floor, steel tubes are noted to be in place below the existing roof hips. The tubes are anchored to the exterior masonry walls (See Figure 27.) and appears to run directly up to the top of the roof just below the existing hip rafter. (See Figure 28). The tube supports at the hips may have been an attempt to limit roof deflection, which may have occurred in the past.

The observation proceeded outside and around the perimeter of the building to view the exterior conditions and noted that the masonry walls are three wythes of brick or 12 inches thick. Also noted was that there is only some step cracking in the masonry joints at the front, sides and rear of the building. Some cracks in the cast stone lintels above windows were noted. (See Figure 29.) Signs of deterioration and spalling of cast stone around door openings are also noted. (See Figure 31.) The soffit conditions at the eaves are in poor condition. The wood trim and pediments below the overhanging eaves appear to be wet with significant rot and deterioration.

Figure 28.

Assessment of Existing Conditions

While the structure of most of building is not visible from inside, as walls and ceiling finishes cover the framing, there is no evidence of major structural distress and generally the building appears to be in good condition. However, the major structural concern is regarding the deficiencies noted in the first floor framing described above. Reinforcing damaged joists and beams, re-building masonry piers and adding face mount joist hangers to all flush framed mortise and tenon connections is required to properly fix the existing deficiencies in the framing.

The framing for the first floor has the capacity to support 100 psf live load, however, it appears from the information gained in the Structure North report, the upper floor framing with the longer spans, appear to have been designed for classroom loading of 50 psf. The deflection of this framing, however, is an issue, which is clearly evident from the sags and dips viewed in the floors. The walls below appear to provide additional support, thus reducing the deflection. If the walls below the framing are acting as true “bearing walls”, then these loads must be accounted for in the design of the framing below.

Since deficiencies were noted in the first floor framing, the same may be true for the upper floors as well. In order to evaluate the framing properly, the entire ceiling must be removed to expose all the framing at all floors. Only then can a proper determination and evaluation of the existing framing can be performed.

Figure 29.

There are two options for reinforcing the floor: Reinforcing in place or replacement and re-building. Reinforcing the joists and or adding supplemental beams, posts and footings may be accomplished, however, the deflection in the floor will still exist, unless all the decking is removed and supplemental framing is installed in such a way that a level floor is achieved. Removal and replacement of the existing framing is also, an alternate solution, which may be more cost effective.

The other issues we see require repairs, such as the exterior cracks located around the perimeter of the exterior masonry walls could be repaired by re-pointing and the cracked cast stone lintels and door jambs could be replaced to match.

Addition/Renovation Feasibility

It is the understanding that the City of Salem is interested in a number of possible options for renovating and/or adding to the existing structure, for re-using the existing structure for various possible future uses. Review of the existing structure indicates that minor renovations to the existing structure are possible as long as the exterior masonry bearing walls of the building are basically left in tact. Any additions attached directly to the existing structure would have to be kept small, so as to not trigger a complete seismic upgrade of the building. Any larger addition would need to be separated from the existing structure by an expansion joint.

Figure 30.

Figure 31.

Generally, minor structural changes required to add or modify stairs, elevators, add mechanical openings, or add roof skylights are fairly simple, and do not have a major impact on the structure. However, any additions and alterations to the existing structures must be kept to less than 10% of the existing building's area and mass, or a major seismic upgrade would be required by the Massachusetts State Building Code. Such an upgrade to the structure would be prohibitively expensive, and must be avoided.

This is one reason why any proposed new additions will have to be separated from the existing building structure by an expansion joint. Any new structure could then be as large as desired and still be in accordance with the latest codes. The architecture, location, and intended use of any new addition will influence the structural framing system, whether timber or structural steel. Based on the information that we were able to glean from our visit to the

site, it appears that any new foundations would be spread footings.

Based upon the gravity load capacities of the floors noted above, it appears that the first floor is capable of supporting the live loads required for assembly type uses. However, the load carrying capacity of the upper floors is significantly below that required for assembly type uses. Without additional structure or reinforcing, the floors in question are suitable for residential uses only.

Existing Structural Plans

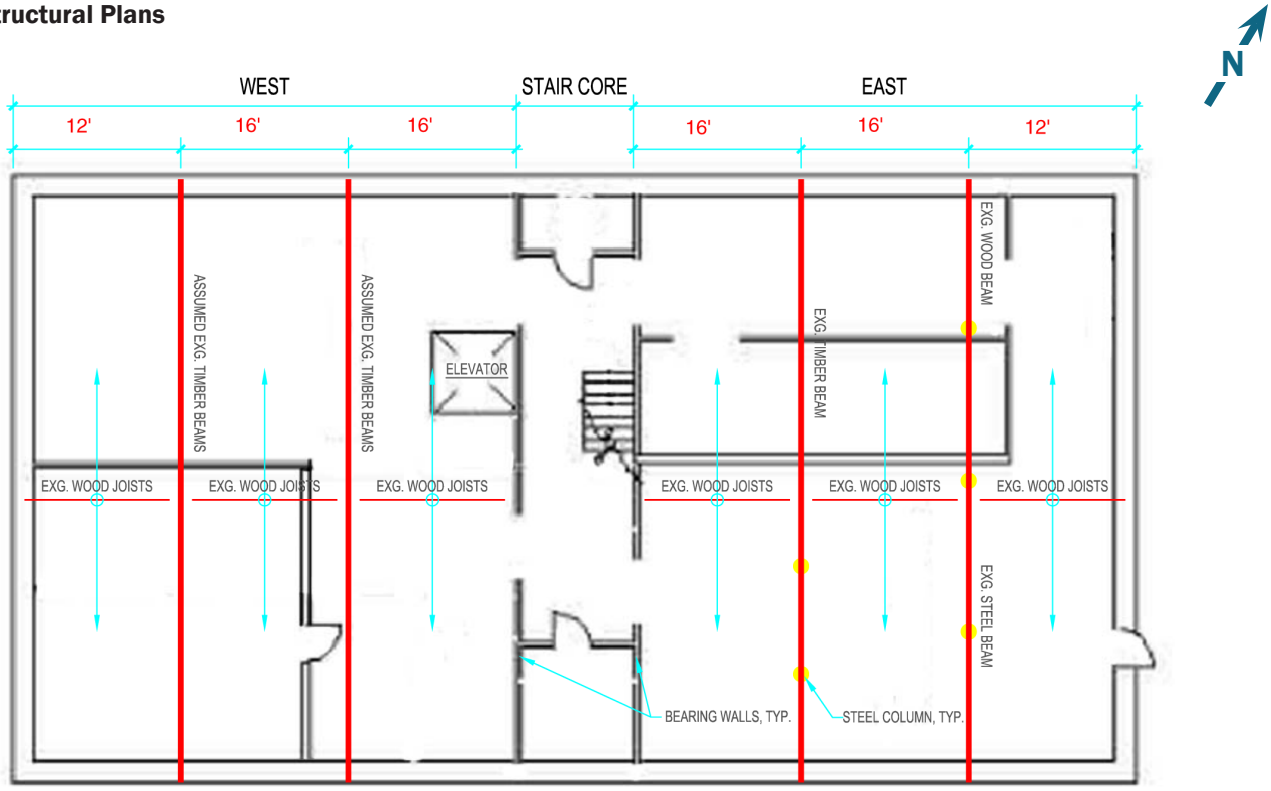

Figure 32. Existing First Floor Framing Plan

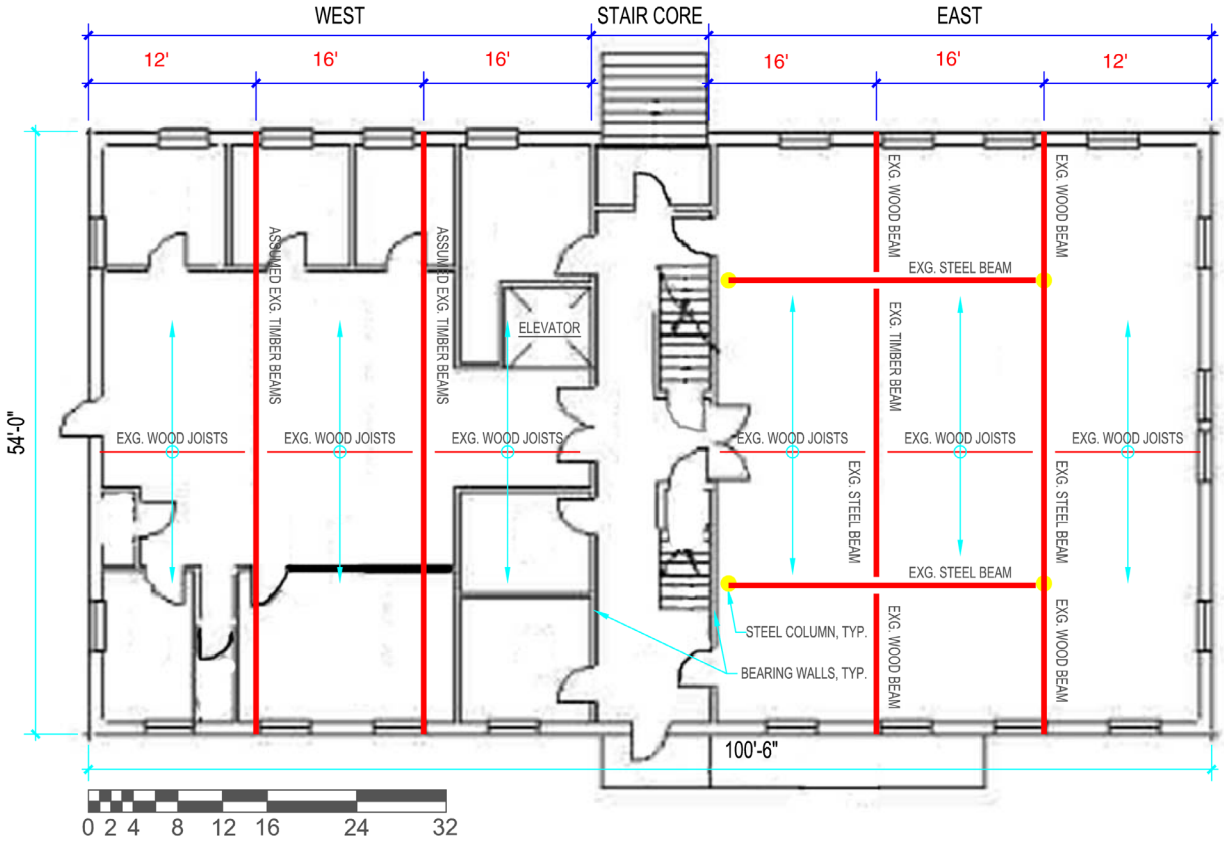

Figure 33. Existing Second Floor Framing Plan

Existing Structural Plans

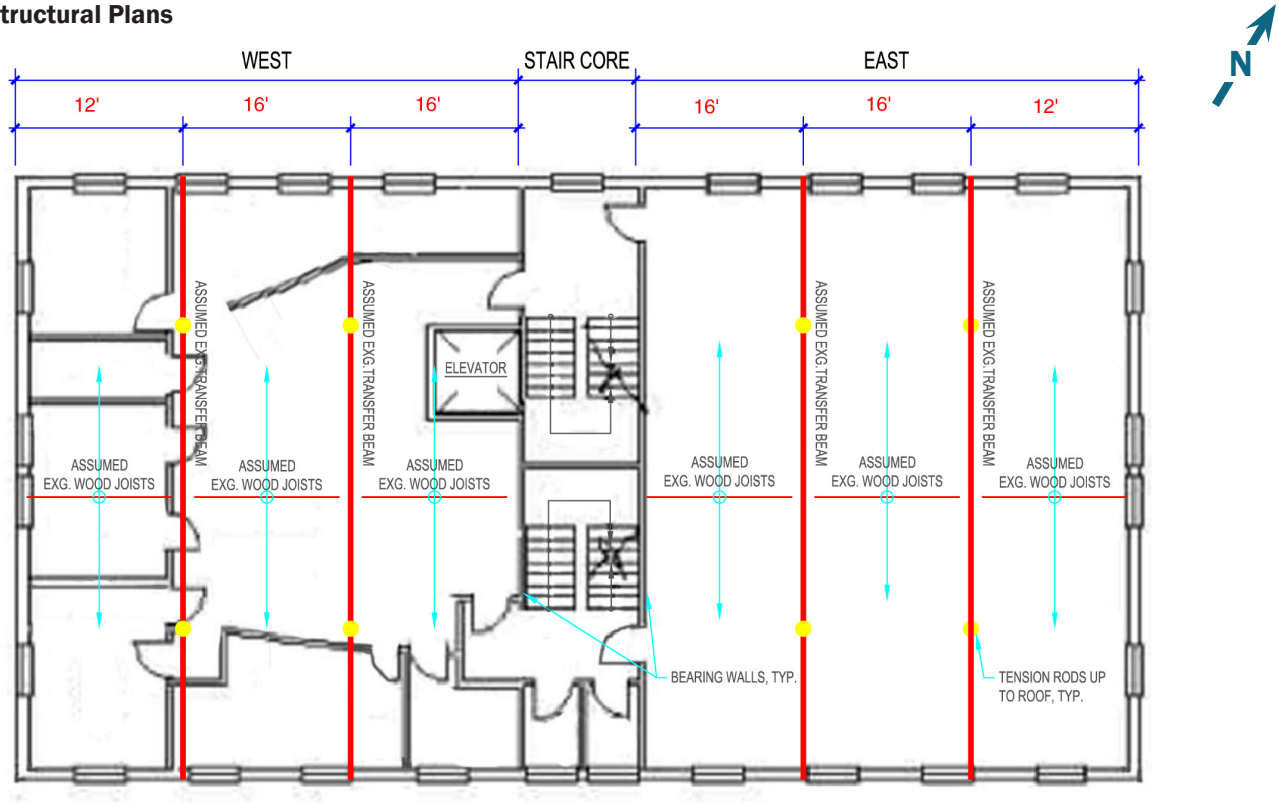

Figure 34. Existing Third Floor Framing Plan

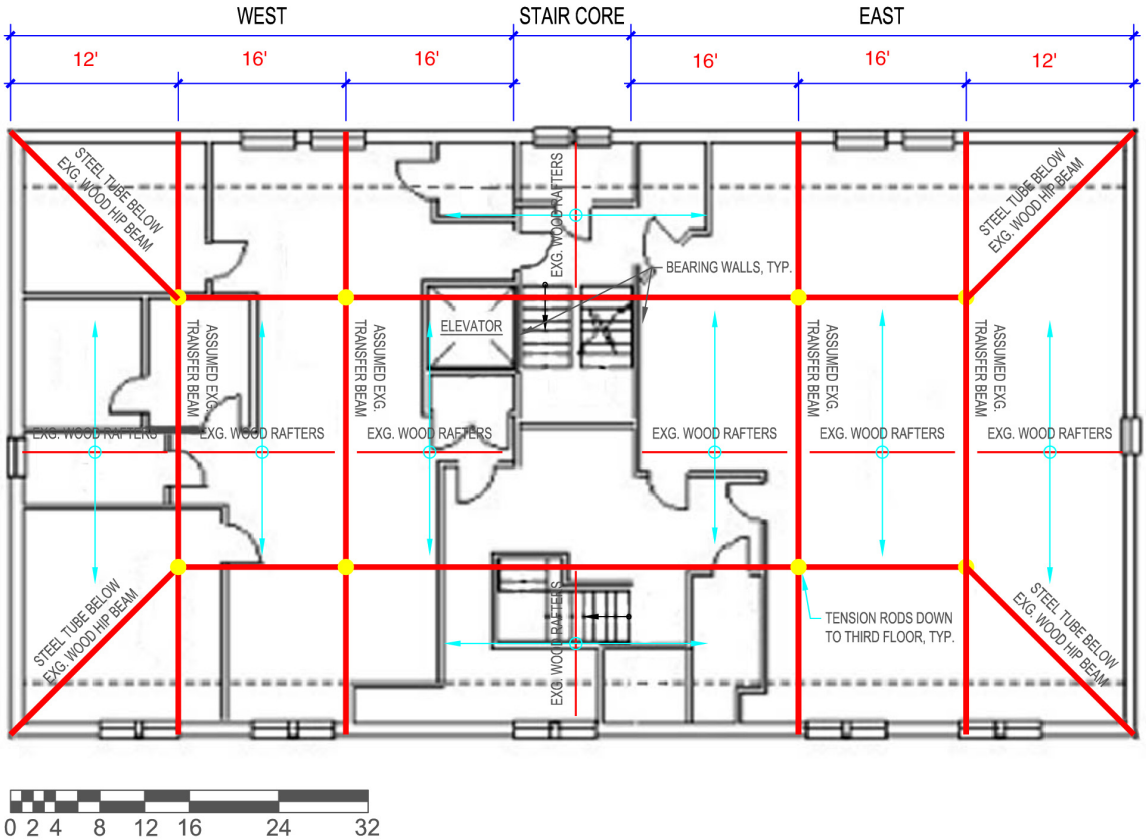

Figure 35. Existing Roof Framing Plan

2.4 MECHANICAL ELECTRICAL, PLUMBING AND FIRE PROTECTION REPORT

Mechanical, electrical, plumbing and fire protection systems have been evaluated by George Comatas, PE of Norian Siani Engineering, Inc. See Appendix 7.2 for the original document. HVAC alternates can be found in the Cost Estimate, Appendix 7.5.

MECHANICAL

Heating
The system includes an oil fired steam boiler and cast iron radiators. The boiler appears to be approximately 5 years old and should be in good condition. The burner seems to be older unit that was probably removed and re-used from the former boiler.

The existing piping system is in poor condition, repairs both large and small are visible throughout. Where the piping is insulated, the insulation is suspected to contain asbestos.

Generally, there is no zoning, the entire building functions as a single zone with the exception of a few radiators that have local thermostatic radiator valves.

System is inefficient and uncomfortable and should be considered for replacement.

Air Conditioning
There is no permanently installed air conditioning to provide cooling. Window air conditioners of various ages, capacities and efficiencies were observed throughout the building.

Ventilation
The building relies on operable windows in an attempt to satisfy the ventilation air requirements for occupancy. Transfer grilles exist at some perimeter offices but have a limited effectiveness to communicate fresh outdoor air from windows to interior spaces.

A ventilation shaft terminating at the cupola and exterior grilles in the brick facade hint to a former school house ventilation system that was probably abandoned in place long ago.

Mechanical ventilation should be provided to support occupancy.

Exhaust
Several bathrooms do not have exhaust fans to provide mechanical exhaust as required by code. In the ground floor men's room a ceiling mounted exhaust fan was installed but the unit appeared to be inoperable. Mechanical exhaust for bathrooms should be provided.

Cafeteria
Cafeteria equipment consists of commercial electric appliances including warming tray, cold tray, refrigerators and an electric range. The range does not have an exhaust hood as required by code.

PLUMBING

The water piping from the meter is to the building is 1-1/4", this is pipe is undersized by current codes to support flushometer valve operated fixtures.

Domestic hot water is produced by a 30 gallon oil fired water heater. The unit appears to be about five years old and is expected to be in good condition. A domestic hot water return system was not observed and is required to maintain hot water at distant fixtures.

Plumbing fixtures of various ages and types exist throughout the building. Some toilets are flushometer valve operated, others are tank type. Many do not appear to be low volume, water conserving types or handicapped accessible as required.

The building includes a commercial style dishwasher with hooded exhaust and a three bowl sink with grease trap.

ELECTRICAL

Power
The electrical service to the building includes an overhead drop from a pole mounted transformer. The main disconnect and main distribution panel are rated at 120V/208V 400 amperes, 3 phase and manufactured by FPE (Federal Pacific Electric). This equipment is obsolete.

Load centers include a mix of circuit breaker type equipment and obsolete fuse type equipment.
A mix of wiring methods have been installed as the system has evolved throughout the years.

Any significant upgrade should include replacement of the electrical system.

Lighting
Interior lighting generally includes fluorescent type fixtures. Most fixtures appeared to include relatively inefficient T-12 lamps. However, the lighting fixtures on the third floor offices did have more efficient T-8 lamps. Lighting is operated through manual wall switches, no occupancy sensors or other automatic controls were observed.

Exterior lighting fixtures are inefficient and in poor condition. Wall hung battery pack emergency lights exist to illuminate path of egress. Not all exit signs are the illuminated type as required.

Boiler room lighting was not functional at the time of our visit.

Any significant upgrade should include replacement of the lighting fixtures and controls.

FIRE PROTECTION

Fire Alarm
Fire alarm system includes a Notifier System 500. This is a conventional (non addressable) system that includes up to 8 zones. Bathrooms did not have notification appliances.

Building upgrades should include replacing this system with an addressable system.

Sprinkler
The building does not have an automatic sprinkler system. Because the building is greater than 12,000 square feet, significant renovation must include installation of an automatic sprinkler system for most use groups.

Existing MEP/FP Plans

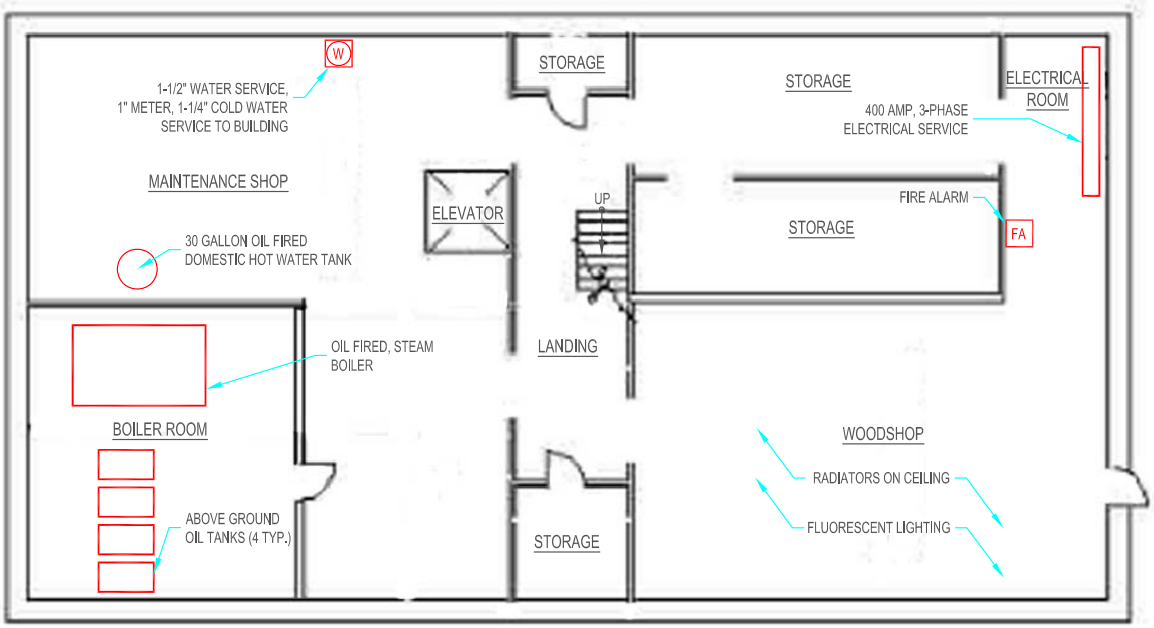

Figure 36. Existing Basement Mechanical/Electrical Plan

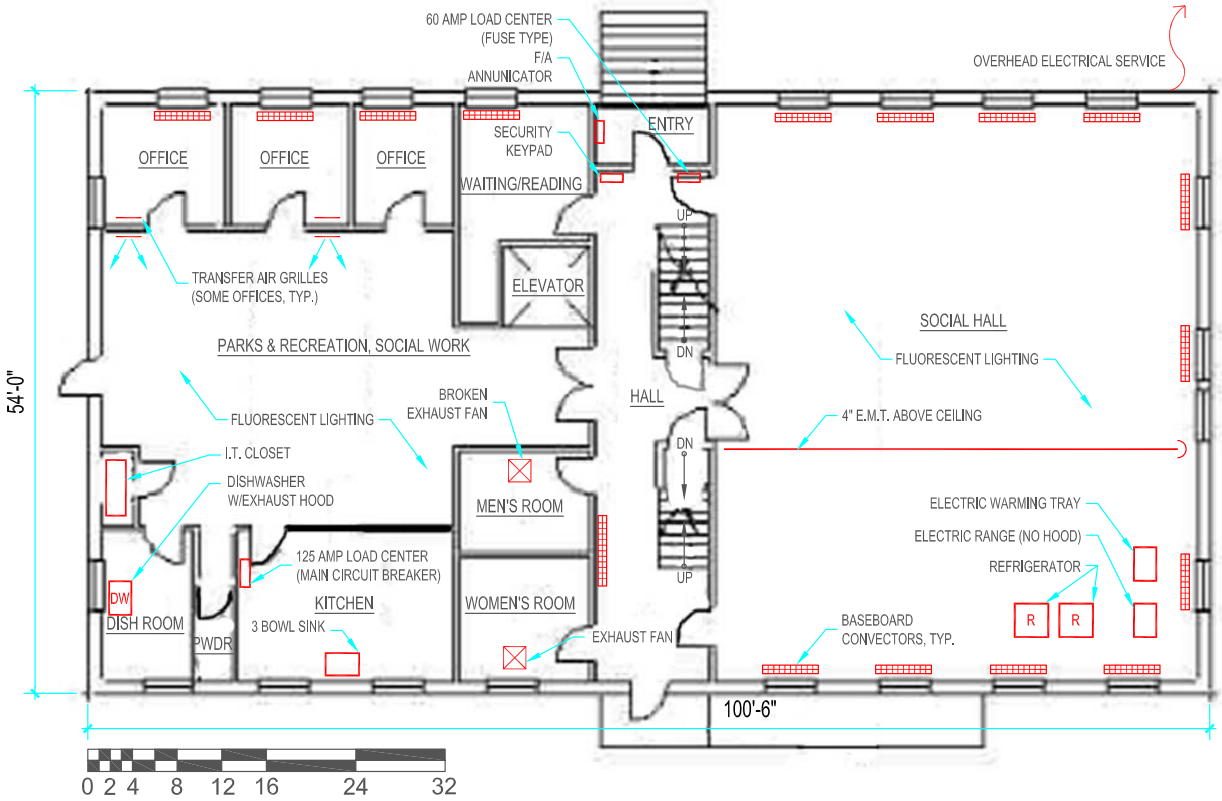

Figure 37. Existing First Floor Mechanical/Electrical Plan

Existing MEP/FP Plans

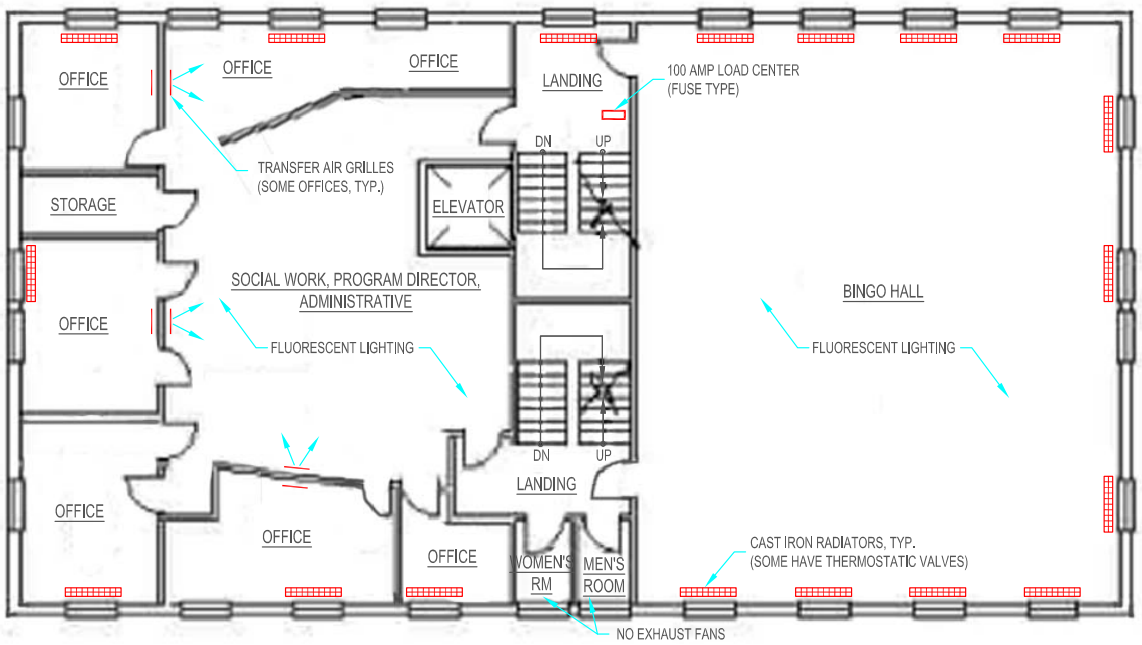

Figure 38. Existing Second Floor Mechanical/Electrical Plan

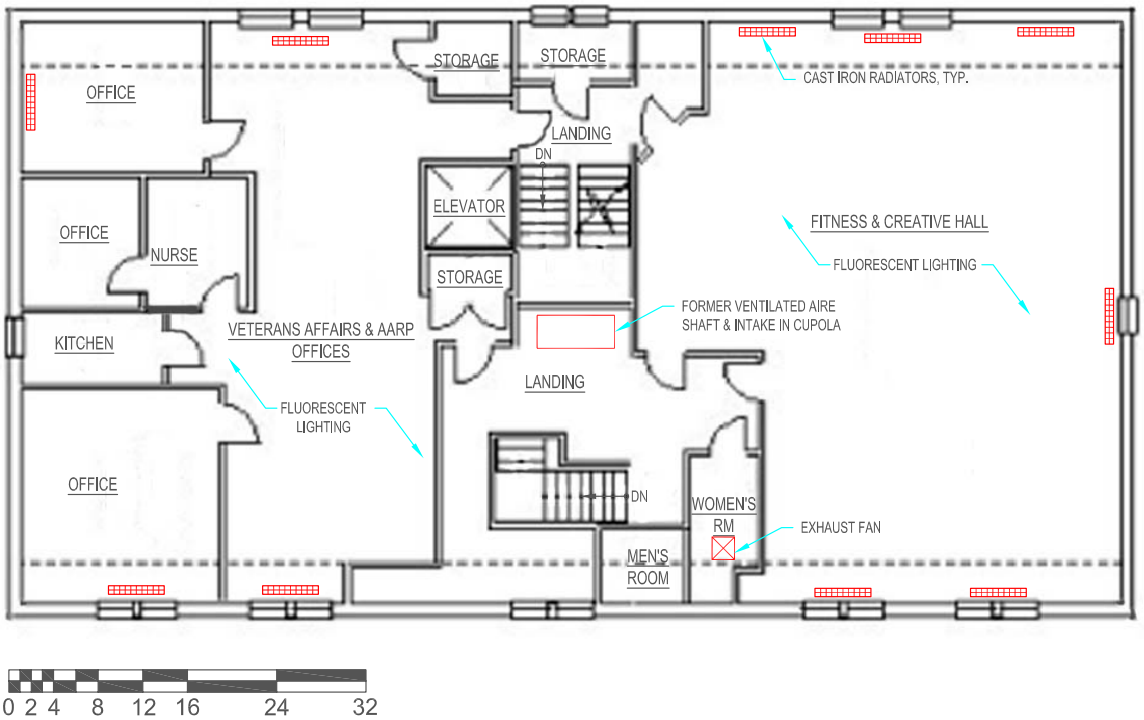

Figure 39. Existing Third Floor Mechanical/Electrical Plan

3.1 MCINTIRE HISTORIC DISTRICT

This densely settled residential area of the city contains one of the greatest concentrations of notable pre-1900 domestic structures extant in the U.S. Collectively, they stand as a monument to the mercantile and maritime ascendancy of Salem in the latter 18th and early 19th centuries and constitute one of the most beautiful streetscapes in America.

Established in 1981, this district incorporates two previously established districts, the Chestnut Street Historic District (1971) and the Federal Street Area Historic District (1976), with the addition of some 249 structures on upper Essex, Broad, and Warren Streets, Dalton Parkway, and various cross and side streets in between. The district is named for Salem's celebrated architect-carver, Samuel McIntire, who lived at 31 Summer Street.

The district also includes three churches, the Broad Street Burial Ground (1655) and Friends' Cemetery, several monuments, and the first Salem State Normal School Building (1854).

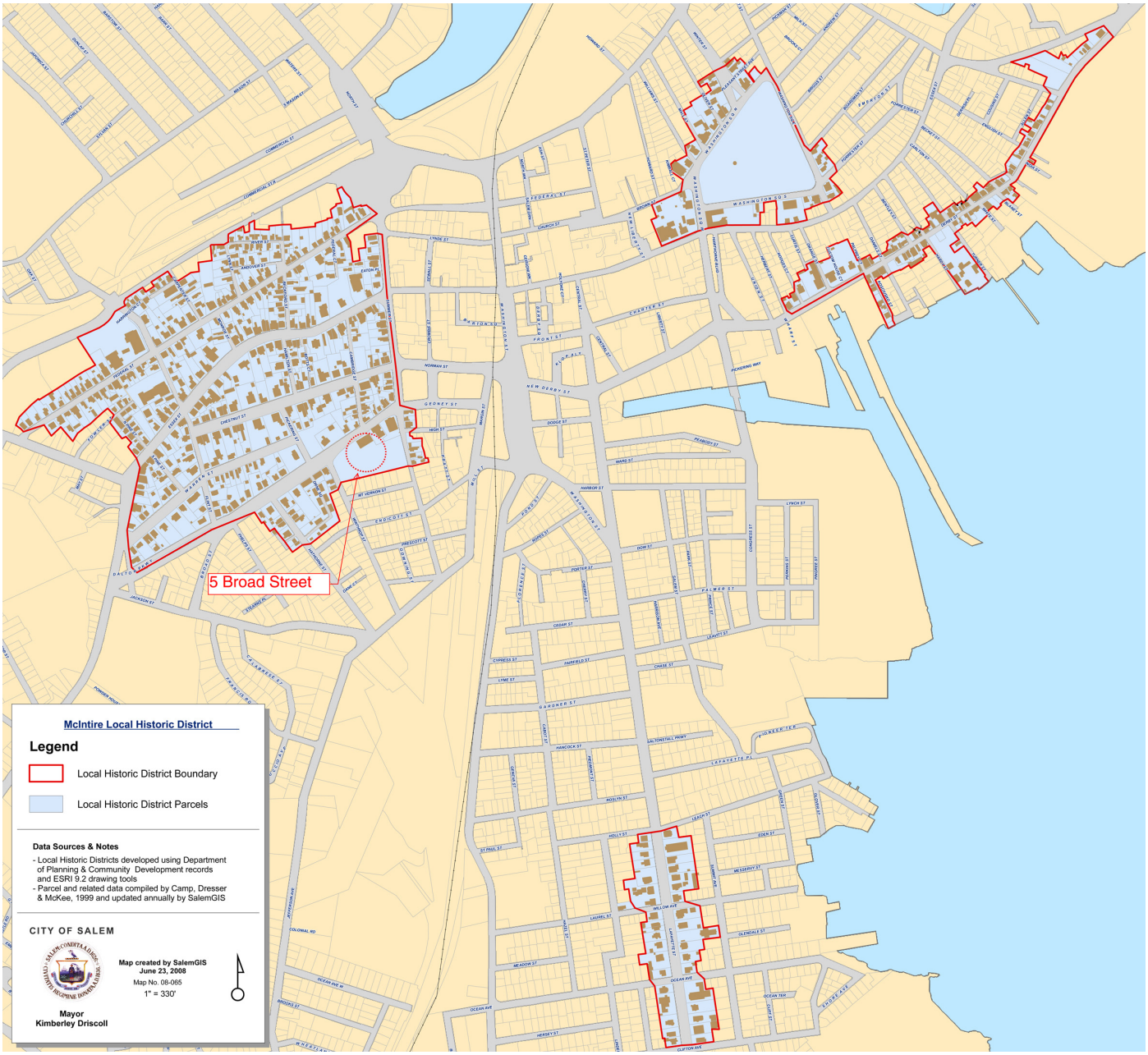

Figure 40. McIntire Historic District Map

3.2 HISTORICAL COMMISSION JURISDICTION

Historical Commission Review Summary
The Salem Historical Commission is a volunteer board of Salem residents appointed by the Mayor and approved by the City Council. Design review by the Salem Historical Commission is mandated under Chapter 40C of the Massachusetts General Laws and the Salem Historical Commission Ordinances which established Salem's historic districts. The Commission is responsible for the review and approval of all proposed exterior alterations to properties located in a local historic district. The property owner must receive Commission approval before undertaking work.

Through these guidelines, the Commission works to preserve and protect the distinctive characteristics of buildings and sites within the historic districts, to maintain and improve the settings of these buildings, and to encourage new design compatible with existing structures. The guidelines are based on the Secretary of Interior's Standards of Rehabilitation which encourage the retention of existing historic materials and architectural features whenever possible. When replacement is necessary, new materials should be historically appropriate. New building elements should be designed with architectural compatibility in mind so that the harmonious exterior relationships of a given building or buildings are preserved.

The Secretary of the Interior is responsible for establishing standards for all national preservation programs under Departmental authority and for advising Federal agencies on the preservation of historic properties listed or eligible for listing in the National Register of Historic Places. The Standards for Rehabilitation, a section of the Secretary's Standards for Historic Preservation Projects, address the most prevalent preservation treatment today: rehabilitation.

Rehabilitation is defined as the process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions and features of the property which are significant to its historic, architectural and cultural uses.

In addition to the Secretary of Interior's Standards, the Commission's guidelines reflect Salem's architectural traditions so as to encourage preservation of those elements that make Salem unique.

The Salem Historical Commission is responsible for the review and approval of all proposed exterior alterations to properties located in a local historic district. Their jurisdiction is focused on:

- Architectural Trim and Siding
- Barrier Free Access
- Doors, Doorways, Porticos
- Fences
- House Numbers
- Masonry
- Mechanical Equipment
- Parking Solutions
- Roofing
- Satellite Dishes and Solar Collectors
- Secondary Egress
- Skylights
- Utilities
- Windows
- Paint Colors

The Historical Commission has no jurisdiction over the following:

- Terraces, walks, driveway materials, sidewalks and similar structures provided that any structure is substantially at grade level.

- Storms doors, storm windows, screens, window air conditioners, lighting fixtures attached to the building, antennae and similar appurtenances. (Note that the Commission does have jurisdiction over the paint colors of storm doors and storm windows. Note that the Commission does have jurisdiction over satellite dishes and solar collectors.)

- Interior work that does not affect the exterior in material, design or outward appearance.

- Landscaping. (Note that the Commission does have jurisdiction over retaining walls - e.g. railroad ties.)

(Source: City Of Salem Historical Commission Guidelines Notebook 1984 W/ Amendments 2004)

3.3 HISTORICAL SALEM INC.

Historic Salem Inc. is a non-profit architectural preservation organization whose volunteers are interested in keeping intact the historic resources of Salem's neighborhoods and buildings. They are not legally affiliated with the City, but often work with the City and the Historic Commission with respect to historic resources of Salem.

Mission statement: "HSI's mission is to ensure that the historic resources of Salem, which are the key to its identity, its quality of life, and its economic vitality, are preserved for future generations and that new development complements the historic character of the city." (Source: http://www.historicsalem.org)

Historic Salem Inc. attended Public Meetings, conducted an interior assessment of historically significant material, and summarized their findings in a letter. See Appendix 7.3

3.4 BUILDING CODE REVIEW

CODE REVIEW SUMMARY - EXISTING USE (780 CMR 7TH EDITION WITH AMENDMENTS)

The code review for existing use establishes baseline limits and identified current conformance/non-conformance to the building code. This review helped establish goals and needs and identified the various re-use options identified in this report.

Occupancy Review (780 CMR 300)
Primary Occupancy Classification:
Use Group A3 (community hall) & B (civic administration)
780 CMR 303 & 304

Accessory Occupancy Classifications:
Use Group S-1 area: (limited basement storage)
7810 CMR 311

General Building Heights and Areas
Area: 19,800 sf + 6,600 sf basement
Height: 3 stories

Construction Type Review
Construction Type:
Type IIIB (unprotected)

Fire Resistance Ratings of Structural Elements:
All building elements 0-hour (Table 601)

Means of Egress Review (780 CMR CHAPTER 10)

Maximum Floor Area Allowances per Occupant (Table 1004.1.2)		
Assembly	1/15 net	420 Occupants (140 per Floor)
Business	1/100 gross	63 Occupants (21 per Floor)

Minimum Number Of Exits For Occupant Load (Table 1018.1)		
Assembly	1-500	2 exits
Business	1-500	2 exits

Table 7. Means of Egress Review

Accessibility

- Fully accessible with elevator (elevator is non-conforming)
- Ramp to basement is non-compliant, not used as an accessible entrance
- Ramp from grade to first floor back entrance is non-compliant, railing does not comply with 780 CMR.

CODE REVIEW SUMMARY - NEW USE GROUPS (780 CMR 7TH EDITION W/ AMENDMENTS)

The code review for existing use establishes baseline limits and identified current conformance/non-conformance to the building code. This review helped establish goals and needs and identified the various re-use options identified in this report.

Occupancy Review (780 CMR 300)

Use Group R2 Residential occupancies containing sleeping units or more than two dwelling units where the occupants are primarily permanent in nature.

Use Group A3

Occupancy Load		
Residential	1/200 gross	63 Occupants (21 per Floor)
Business	1/15 net	840 Occupants (280 per Floor)
Assembly	1/100 gross	6126 Occupants (42 per Floor)

Table 8. Occupancy Loads

Fire Protection
Use Group R: Type 13 sprinkler system is required if over 7,500 sf is renovated. (MGL 148.26G) If a new sprinkler system exceeds 15% of overall construction cost, then sprinkler not required unless over 7,500 sf is renovated.

Assembly & Business: Type 13 sprinkler system is required if over 5,000 sf is renovated. (MGL 148.26G) If a new sprinkler system exceeds 15% of overall construction cost, then sprinkler not required unless over 5,000 sf is renovated.

Fire Separation
Thirty Minute minimum rated separation required where sprinklers are installed.

Means Of Egress Review (780 CMR CHAPTER 10)

A, B, or R Occupancy 1-500: 2 exits

Minimum required egress width

All use groups except I-2 or H

0.3" per occupant = 18.9" Use Group R
252" Use Group A
37.8" Use Group B

Energy
It is strongly recommended that all proposed re-use options incorporate requirements from the 2010 Massachusetts Residential Energy Code.

Accessibility
Occupancy not required to be fully accessible if privately owned. If rental units, a minimum of 5% of each unit type must be accessible.

All other use groups where public will access the building, the building must be fully accessible. The ramp to the basement must be replaced with code compliant steps or ramp.

Elevator must be replaced to meet current MAAB requirements, minimum 48x48. Current cab measures 46x47.

Code Relief for Existing Buildings
Chapter 34 of the code provides relief for renovations to existing buildings which can be helpful in reducing cost for replacing historic non-conforming conditions. This chapter establishes a hazard index for each use group. A change in the existing hazard index of 2 or more requires compliance with the code for new construction which is more stringent.

Use Group	Hazard Index	West	East
R2 (4 or more dwellings)	4	+2	0
R2 (3 Dwellings)	2	0	-2
A3 (no fixed seats)	4*	+2	0
B	2*	0	-2
I4	4	+2	0
E (K-12)	4	+2	0
M	3	+1	-1
* Existing Uses" West Half = 2, East Half = 4			

Table 9. Code Relief for Existing Buildings

3.5 CITY OF SALEM ZONING ORDINANCE REVIEW

(City of Salem Zoning Ordinance, Section 3.3.2)

A developer may apply to the Board of Appeals for a Special Permit to change a nonconforming use. The Board of Appeals may award a special permit only if it determines that such change shall not be substantially more detrimental than the existing nonconforming use to the neighborhood.

3.6 SALEM ZONING MAP

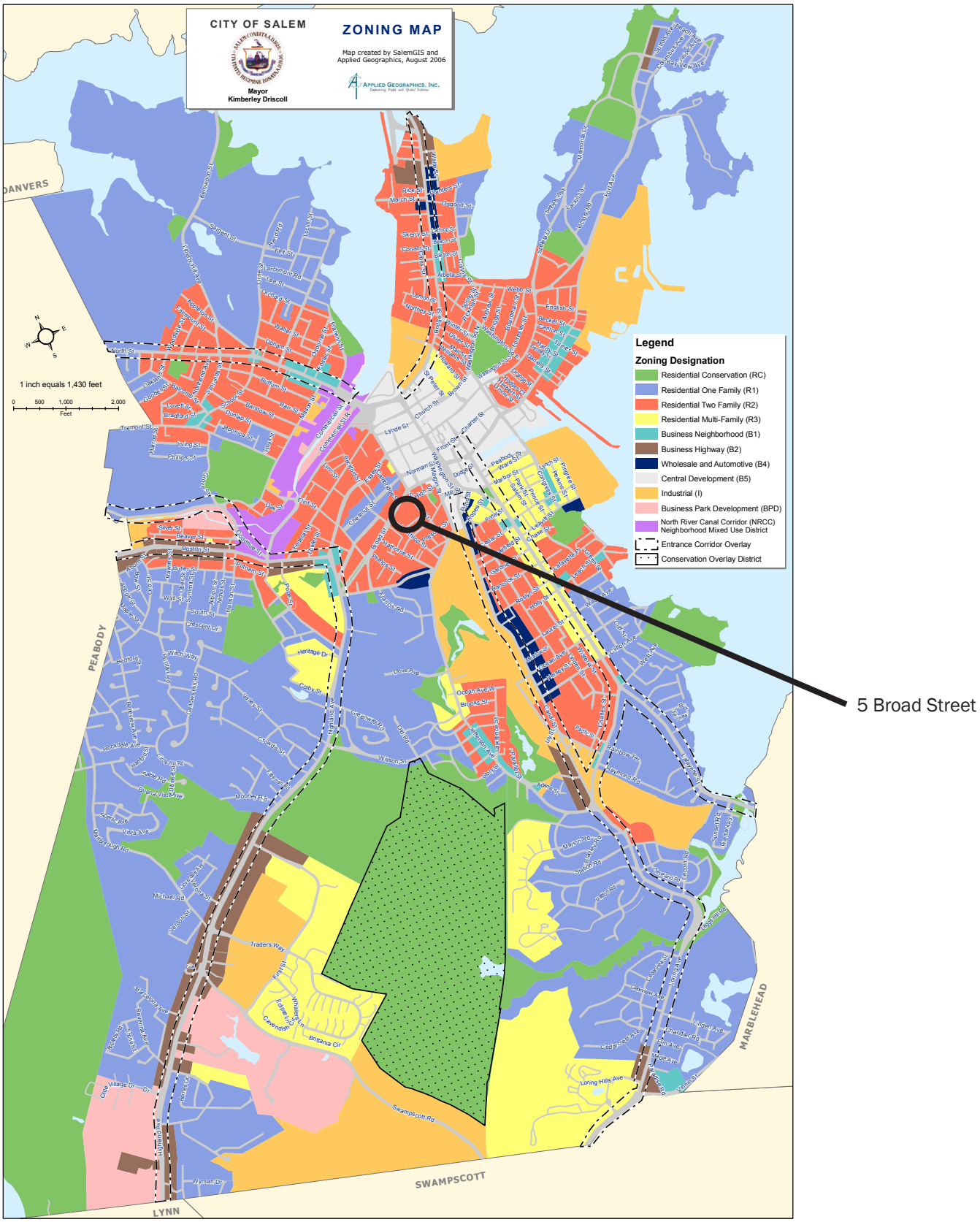

Figure 41. City of Salem Zoning Map

3.7 PARKING REVIEW SUMMARY

Current on-site parking spaces = 25, off-site parking on adjacent streets & municipal lots, nearest Riley Plaza.

Use Group		Spaces Required
R2	Residential Multi-Family	1.5 spaces / unit
A3	Assembly without fixed seating uses intended for worship, recreation or amusement...	1 space / 4 seats + 1 space / 2 employees
B	Private Offices	1 space / employee
I4	Day Care Center	Loading zone required, spaces reviewed by ZBA
E	Educational K-12	Loading zone required, spaces reviewed by ZBA
M	Merchant/Retail	1 space / 150 gsf

Table 10. Parking Review Summary

3.8 POTENTIAL FUTURE RE-USE GROUPS

Based upon existing Code and Zoning constraints, we've identified the following potential future re-use groups:

Re-Use Group	Public/Private	Feasibility	Notes
Public Offices & Assembly	Publicly Funded	Yes	Occupancy and Hazard Index not changed. Parking for City Hall Annex must be supplemented with street and municipal lot parking.
Private Offices	Privately Funded	Yes	Occupancy and Hazard Index decreased. Parking cannot be accommodated on site. Board of Appeals could approve less parking as part of a Special Permit.
Residential Multi-Family	Privately Funded	Yes	Occupancy load decreased & Hazard Index increased on West half only, structural upgrades may be required. Parking can be accommodated on Site.
Historic Building/Museum	Privately Funded	Yes	Occupancy load and Hazard Index increased on West half only, structural upgrades will be required. Parking cannot be accommodated on site. Board of Appeals could approve less parking as part of a Special Permit.
Educational or Institutional	Privately Funded	Yes	Occupancy load & Hazard Index increased on West half only, structural upgrades will be required. Parking can likely be accommodated on-site with some overflow to the street.
Merchant/Retail	Privately Funded	Yes	Occupancy and Hazard index decreased. Parking cannot be accommodated on site. Board of Appeals could approve less parking as part of a Special Permit.

Table 11. Potential Future Re-use Groups

4.1 PUBLIC MEETING #1

Summary

Part 1 of the study culminated at a public meeting where LDa presented our evaluation of existing conditions, and analysis of the opportunities and constraints. We provided a list of possible re-use options to a small public audience which received the following feedback and input:

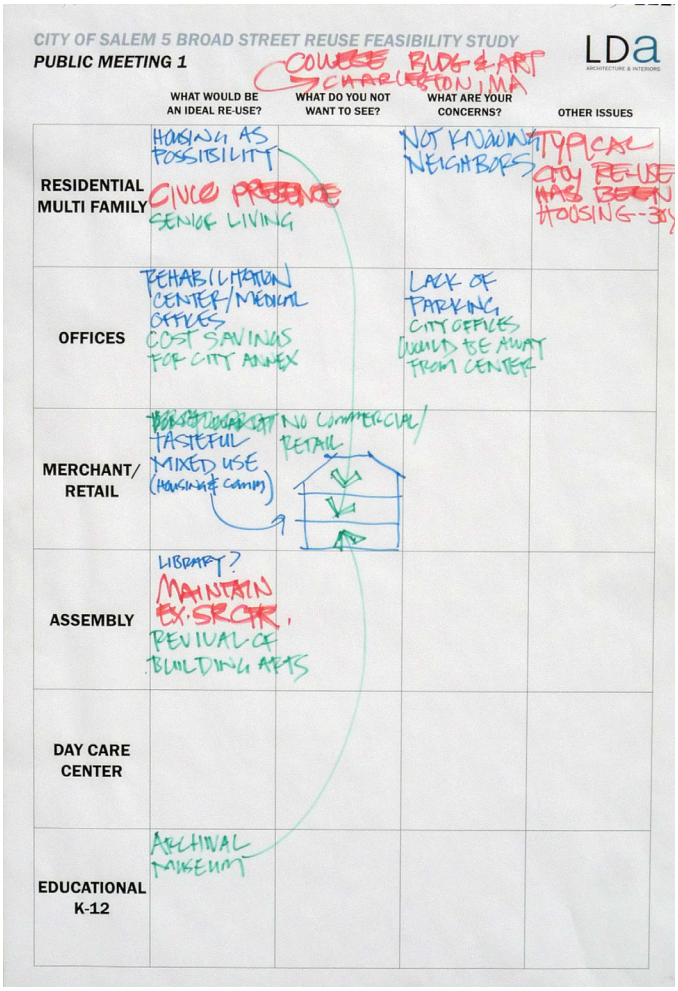

Figure 42. Matrix Board

General Historical concerns

- Maintain Historical quality of the building.
- Repair deficiencies to exterior finishes.

Neighborhood concerns

- Don't want increased traffic, truck traffic.
- Parking lot is available to the public during snow emergencies, nights and weekends.
- Want to maintain public access to Cemetery.
- Don't want re-use to have detrimental impact on Historical neighborhood.

Re-use options

- Relocation if City Hall Annex to this address received mixed reviews.
- Mixed use options received positive feedback.
- Residential solutions also received positive feedback.
- Historical building/museum re-use was proposed and may be feasible.
- A private vocational school was also proposed and may be feasible.
- Merchant/Retail was not well received.

Also see Appendix 7.4.1 for more detailed notes)

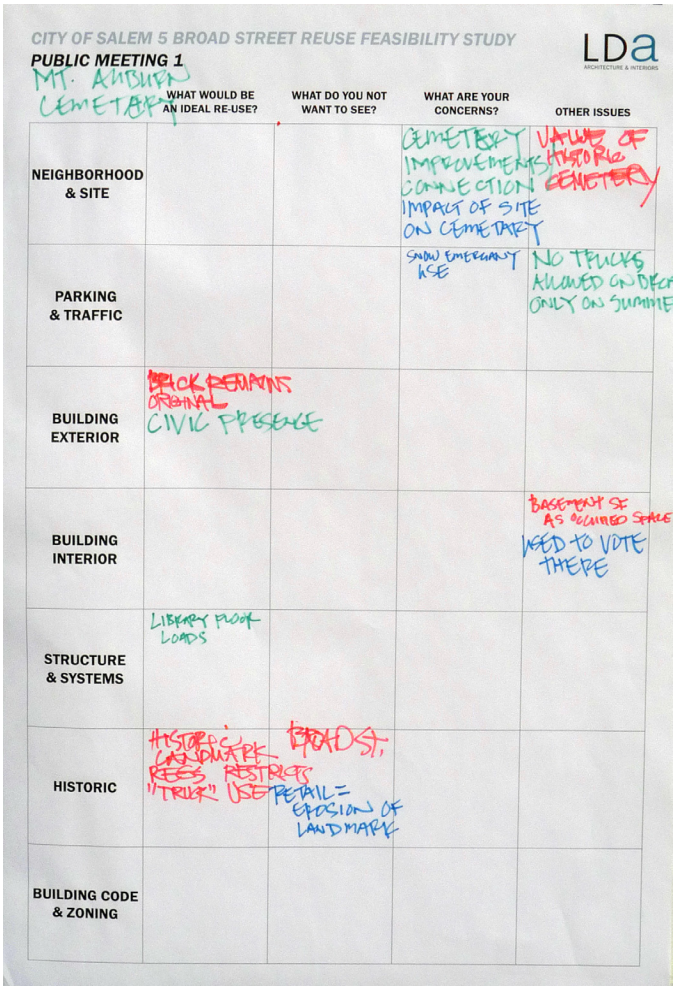

Figure 43. Matrix Board

5.1 INTRODUCTION

Based on the information gathered during the first part of the study, LDa has studied three re-use scenarios. We have provided diagrammatic plans illustrating possible solutions that maximize unit quantities using available on site parking as the common factor.

5.2 COMMON SITE RECOMMENDATIONS

For all possible re-use scenarios, common site recommendations are shared.

Site Recommendations
Increase green space at rear and parking area
Replace ramp to 1st floor with new ramp
Replace ramp to basement with new stair
Remove and replace trees close to building
Repave parking area - Restripe

Table 12. Site Recommendations

5.3 POTENTIAL OPTIONS

The following re-use options were identified at the public meeting on November 4th, 2009:

Scenario 1
Residential (Based on feedback from Public)
Multi-family housing on all floors

Scenario 2
Mixed Use (Based on feedback from Public)
Multi-family housing on partial ground floor level, and the 2nd & 3rd floor levels, and 2A = Professional offices or 2B = Restaurant on the ground floor level.

Scenario 3
Relocate City Hall Annex (as directed by the City of Salem)

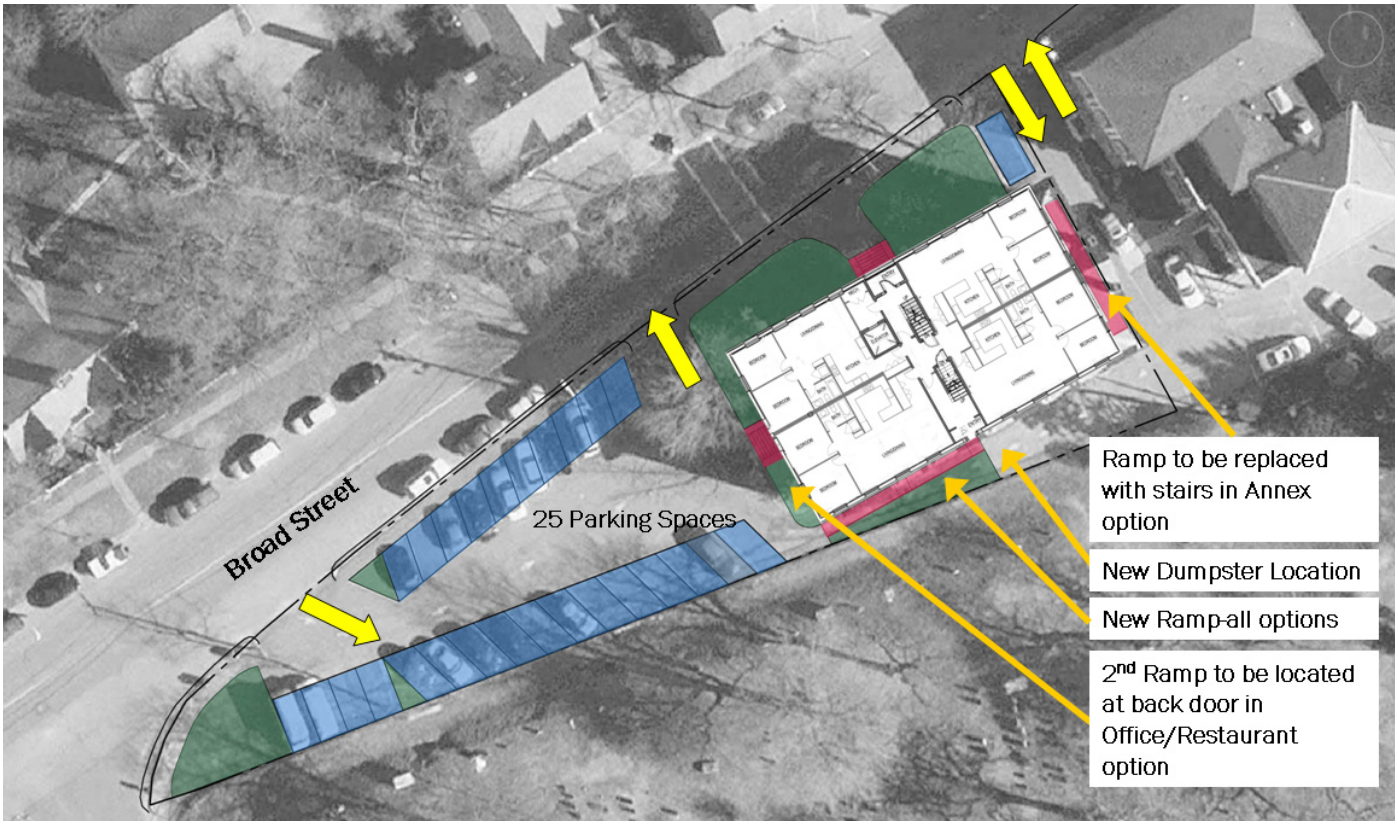

Figure 44. Site Diagram

5.4 SCENARIO 1 - RESIDENTIAL

Scenario 1 explores a building re-use consisting entirely of privately owned residential apartments. The scenario explores maximizing the number of units allowed by the available number of on site parking spaces. Layouts were informed by exterior conditions, assumption that the stair core will remain intact, and the locations of existing windows will remain unchanged.

Available Parking Governs\:, 25 available parking spaces will allow up to 16 residential units (1.5/unit).

The unit layouts are dictated by existing stair core & required egress, existing windows and skylights which results in 15 units of various types.

Unit Types	Net Area	Quantity
2 Bedroom/1 Bath	875-1000 sf	5
1 Bedroom/1 Bath	850-1100 sf	4
Studio/1 Bath	440-480 sf	6
	Total	**15**

Table 13. Unit Types

If rental units, a minimum of 5% of each unit type would be required to be accessible. This is not required for privately owned condominiums.

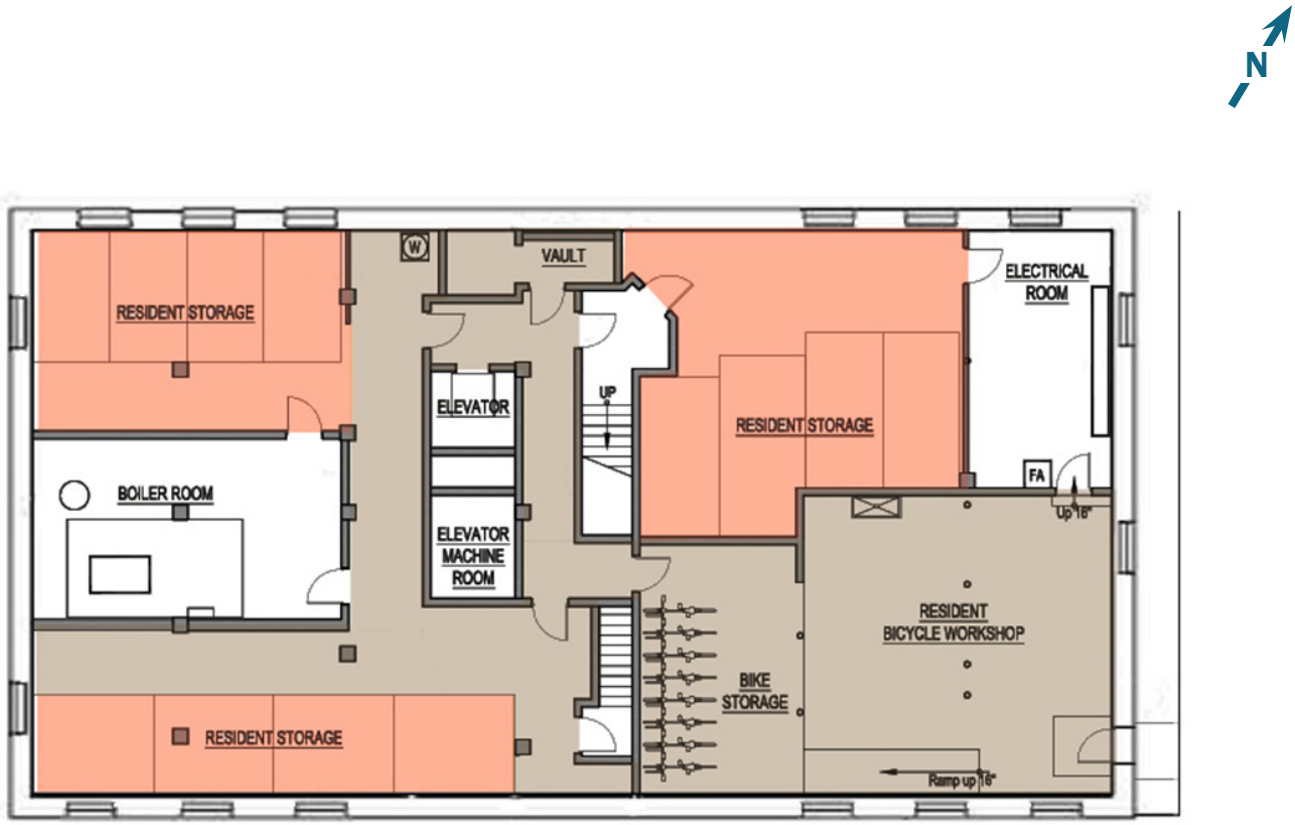

Figure 45. Basement Floor Plan

Residential Floor Plans

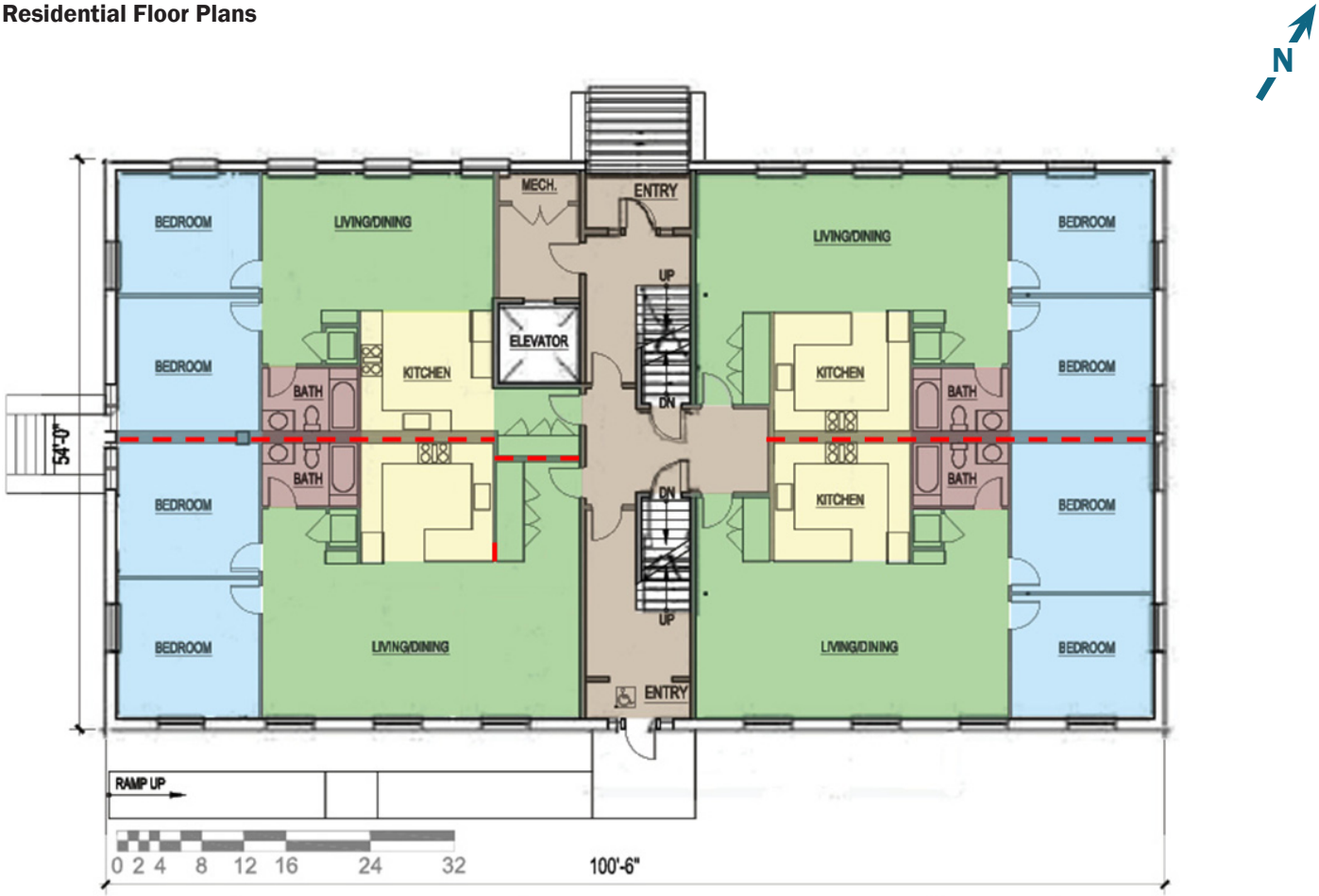

Figure 46. First Floor Plan

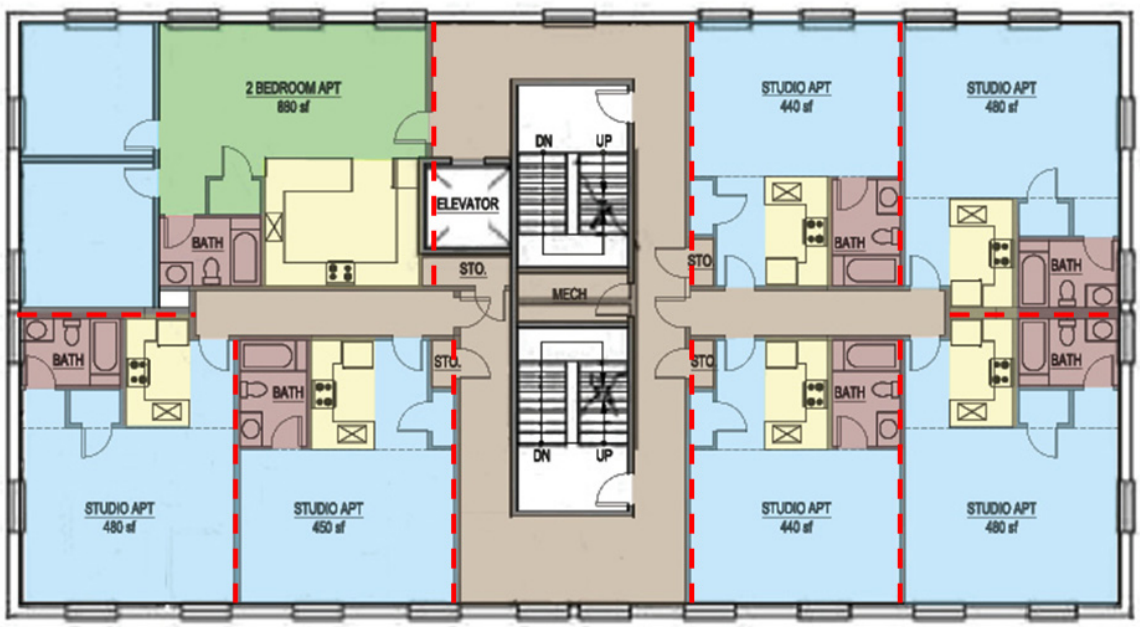

Figure 47. Second Floor Plan

Residential Floor Plans

Figure 48. Third Floor Plan

5.5 SCENARIO 2A - MIXED USE: OFFICE & RESIDENTIAL

Scenario 2A explores a building re-use consisting of office suites and privately owned residential apartments. The scenario explores a balance of office space and the maximum number of units allowed by the available number of on-site parking spaces. Layouts were informed by exterior conditions, assumption that the stair core will remain intact, and the locations of existing windows will remain unchanged. Accessibility and egress requirements differ slightly between the 2 use groups and are identified in the plan diagrams provided.

Available parking governs:
25 available parking spaces will allow:
10 residential units at 1.5 spaces per unit with 2000 square feet of offices at 1 space per 200 sf of office space.

The layouts are dictated by existing stair core & required egress, security, fire separation, existing windows and skylights.

Western half of the 1st floor as offices space, utilizes existing third entrance – accessibility required.

Eastern half of 1st floor and upper floors as residential use.

Unit Types	Net Area	Quantity
2 Bedroom/1 Bath	875-1000 sf	6
1 Bedroom/1 Bath	850-1100 sf	4
	Total	**10**

Table 14. Unit Types

Figure 49. Basement Plan

Mixed Use: Office & Residential Floor Plans

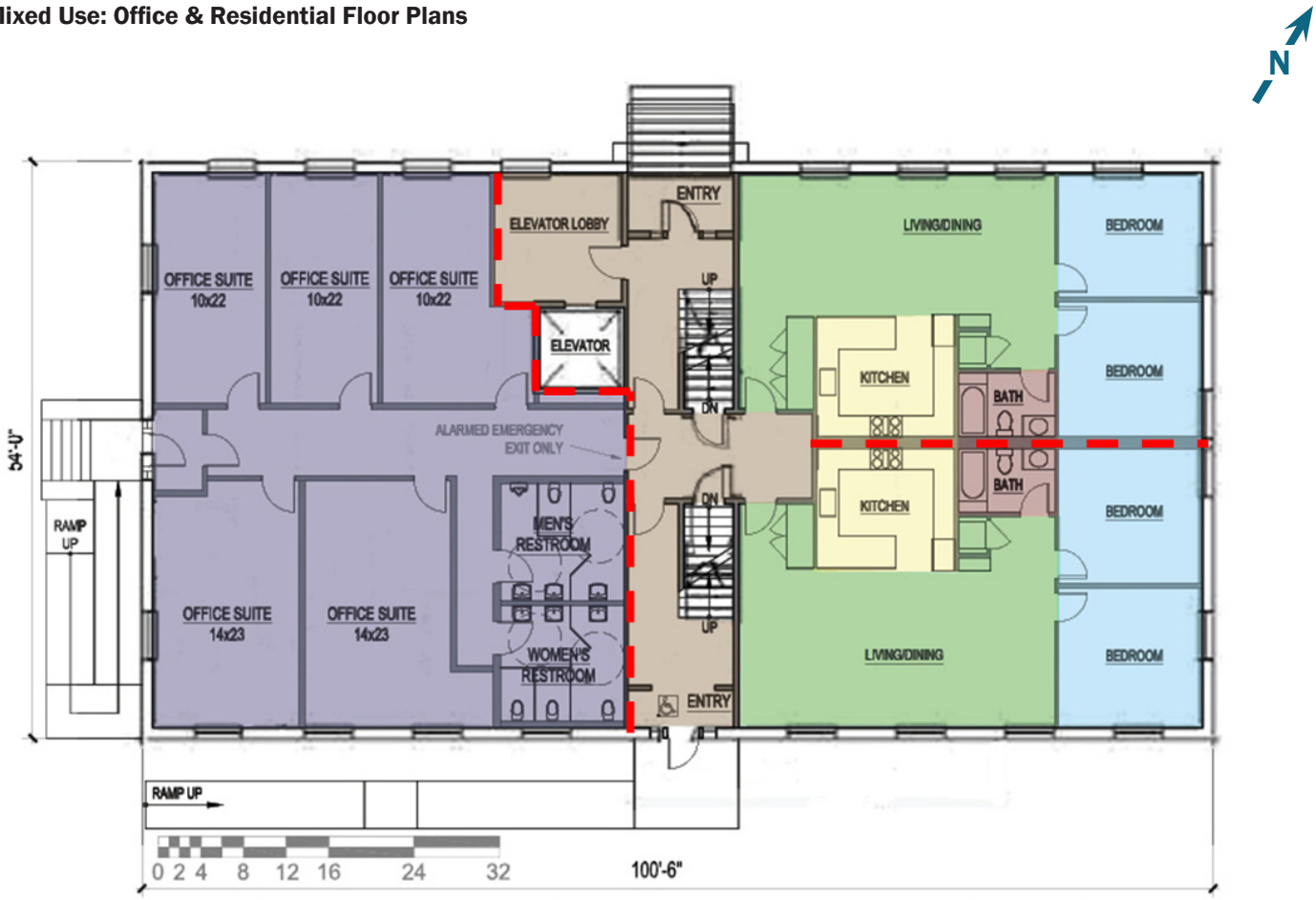

Figure 50. First Floor Plan

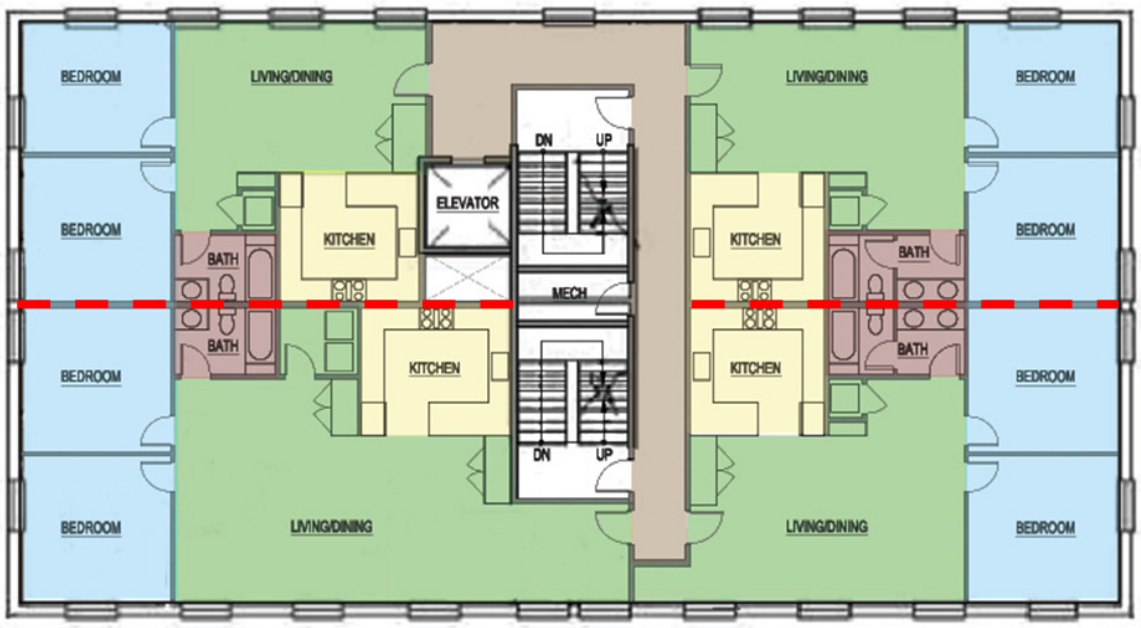

Figure 51. Second Floor Plan

Mixed Use: Office & Residential Floor Plans

Figure 52. Third Floor Plan

5.6 SCENARIO 2B - MIXED USE: RESTAURANT & RESIDENTIAL

Scenario 2B explores a building re-use consisting of a restaurant and privately owned residential apartments. The scenario explores maximizing the square footage and number of units allowed by the available number of on site parking. Layouts were informed by exterior conditions, assumption that the stair core will remain intact, and the locations of existing windows will remain unchanged. Accessibility and egress requirements differ slightly between the 2 use groups, and are identified in the plan diagrams provided.

Available parking governs.
25 available parking spaces will allow:
7 residential units at 1.5 spaces per unit with a 40 seat restaurant with 8 employees on duty which totals 14 required spaces.

The layouts are dictated by existing stair core & required egress, security, fire separation, existing windows and skylights.

Western half of the 1st floor as restaurant space, utilizes existing third entrance – accessibility is required.

Eastern half of 1st floor and upper floors as residential use.

Unit Types	Net Area	Quantity
2 Bedroom/1 Bath	875-1000 sf	4
3 Bedroom/2 Bath	2200 sf	3
	Total	**7**

Table 15. Unit Types

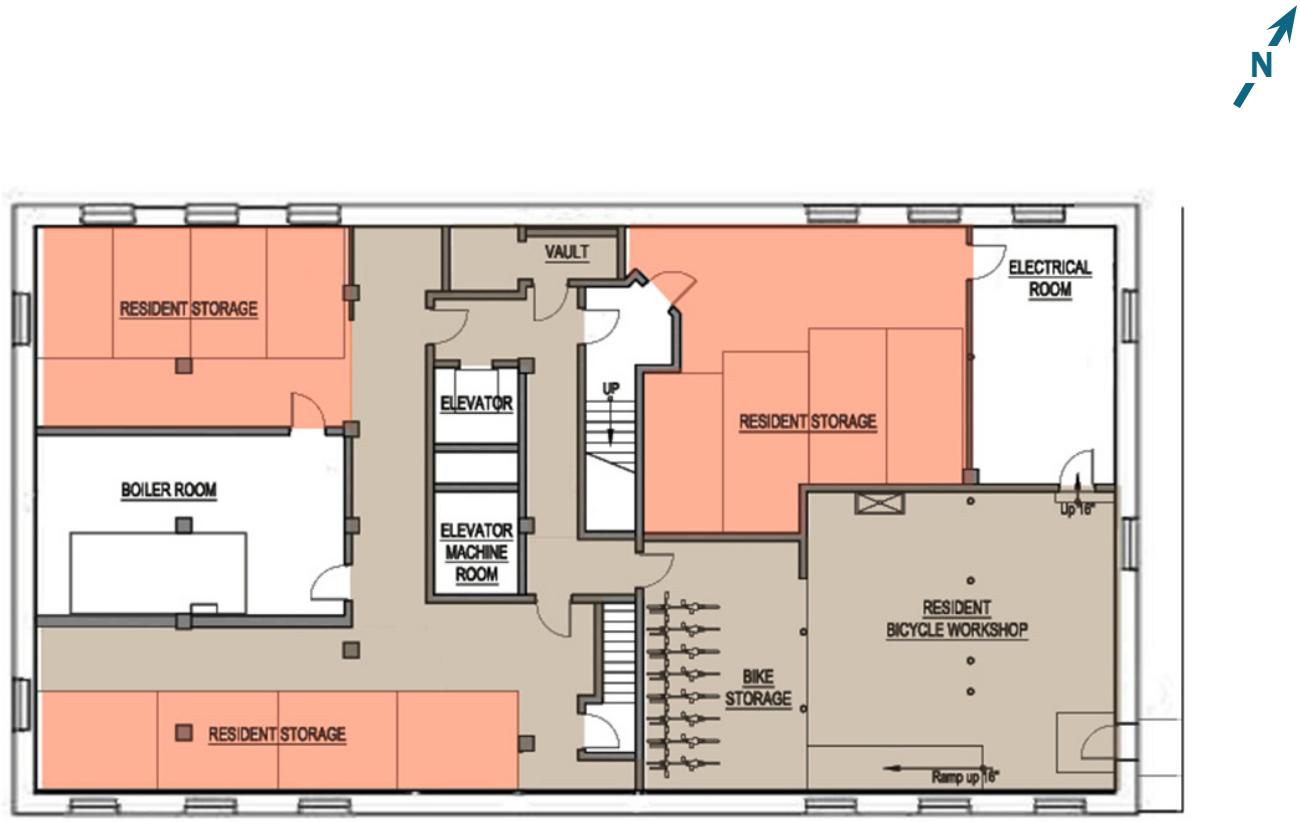

Figure 53. Basement Floor Plan

Mixed Use: Restaurant & Residential Floor Plans

Figure 54. First Floor Plan

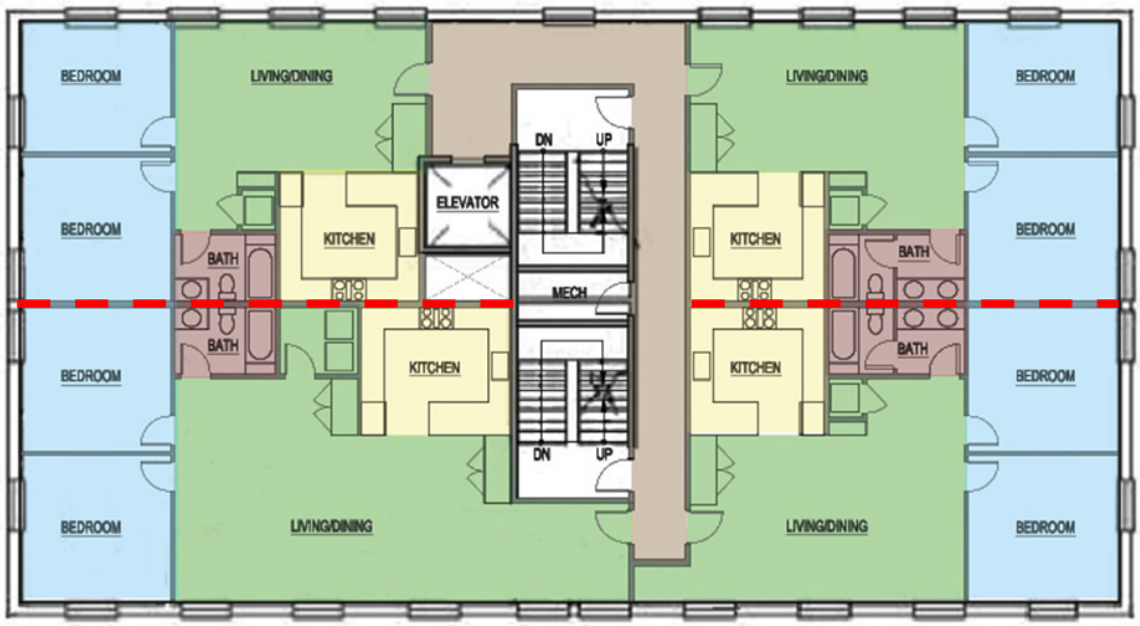

Figure 55. Second Floor Plan

Mixed Use: Restaurant & Residential Floor Plans

Figure 56. Third Floor Plan

5.7 SCENARIO 3: CITY HALL ANNEX

Scenario 3 explores moving City Hall Annex from its current location at 120 Washington Street to this location. Our study assumes the nine departments that occupy space at 120 Washington Street will need to occupy the same square footage at 5 Broad Street. Our study has revealed that the building at 5 Broad Street will not accommodate every department, and falls short by roughly 1600 square feet. This translates into two departments that cannot be accommodated, and must be located elsewhere, the study does not analyze the current utilization of space at 120 Washington Street.

This scenario utilizes the entire building at 5 Broad Street for the new location of the City Hall Annex.

Department space allocations and groupings are based on current configuration at 120 Washington Street.

Employees	52-55 employees
Visitors	80-90 Visitors per day
Available on-site Parking	25 spaces at 5 Broad St.

Constraints that will influence the Annex relocation analysis

- Available on site parking at 5 Broad St.
- Available space at 5 Broad St.
- Increased distance to City Hall & affect on productivity.
- Increased distance to employee parking at Museum Place Garage.
- Cost to renovate 5 Broad St and move from 120 Washington.
- Government services separated over a greater distance will impact ability to serve the public.

City Hall Annex Comparison

	120 Washington St	5 Broad St
Net Square Footage - Total Departments	14,830	13,905
Number of Departments	9	7
Available On Site Staff Parking	7	25
Available On Site Visitor Parking	0	0
Walking Distance to City Hall	.06 mi	.37 mi
Walking Distance to Museum Place Parking Garage	.20 mi	.47 mi

Department	120 Washington St	5 Broad St
Data Processing & Training	1300	1422*
Treasurer/Deputy Collector	1145	1145*
3 Meeting Rooms Occupancy	10 occupants 40 occupants 75 occupants	17 occupants 41 occupants 69 occupants
Building Department	1550	1768
Planning	2600	2525
Engineering	2000	2000
Health	1900	1980
Lunch Room	415	698
Human Resources	625	0 (space not available)
Purchasing	1050	0 (space not available)
* Denotes Departments that are divided over multiple floors		

Table 16. City Hall Annex Comparison

City Hall Annex Floor Plans

Figure 57. Basement Plan

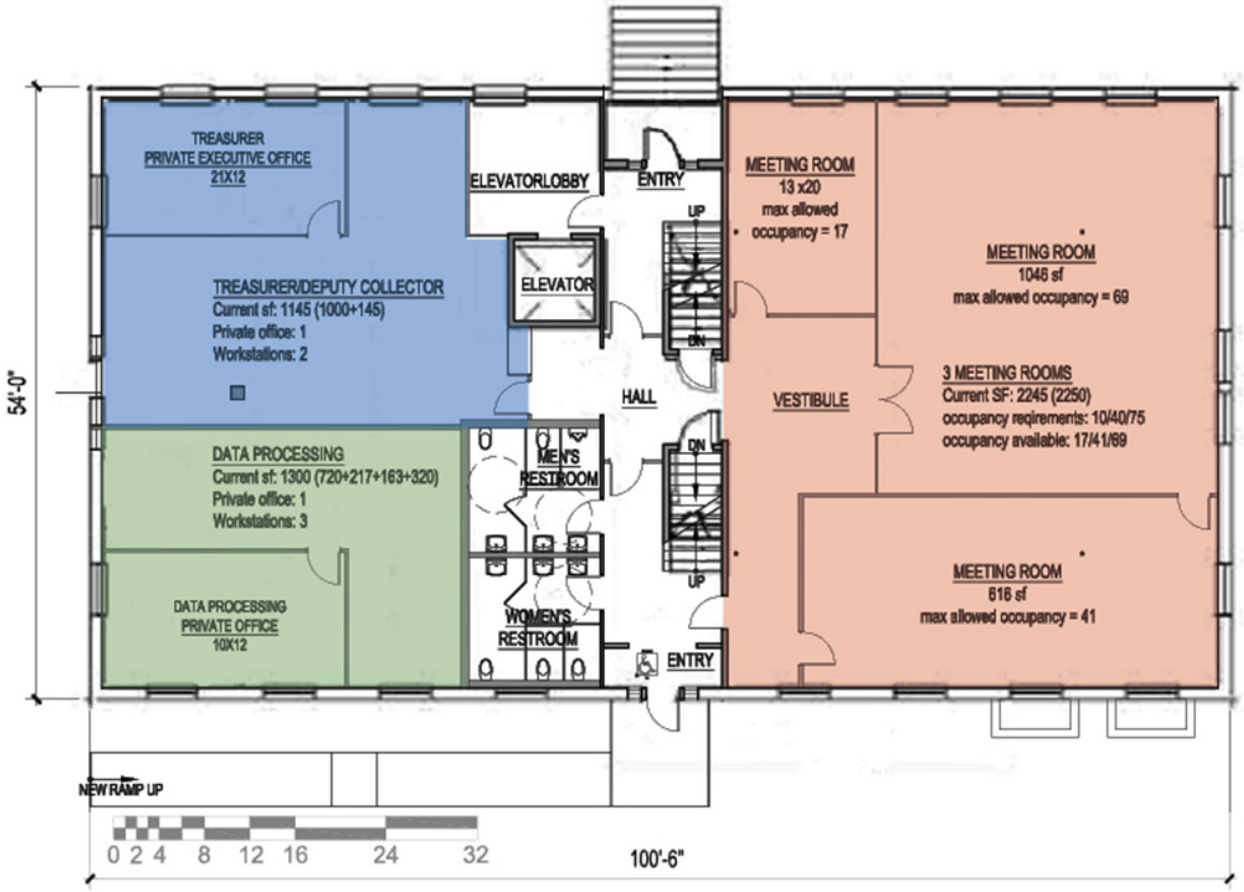

Figure 58. First Floor Plan

City Hall Annex Floor Plans

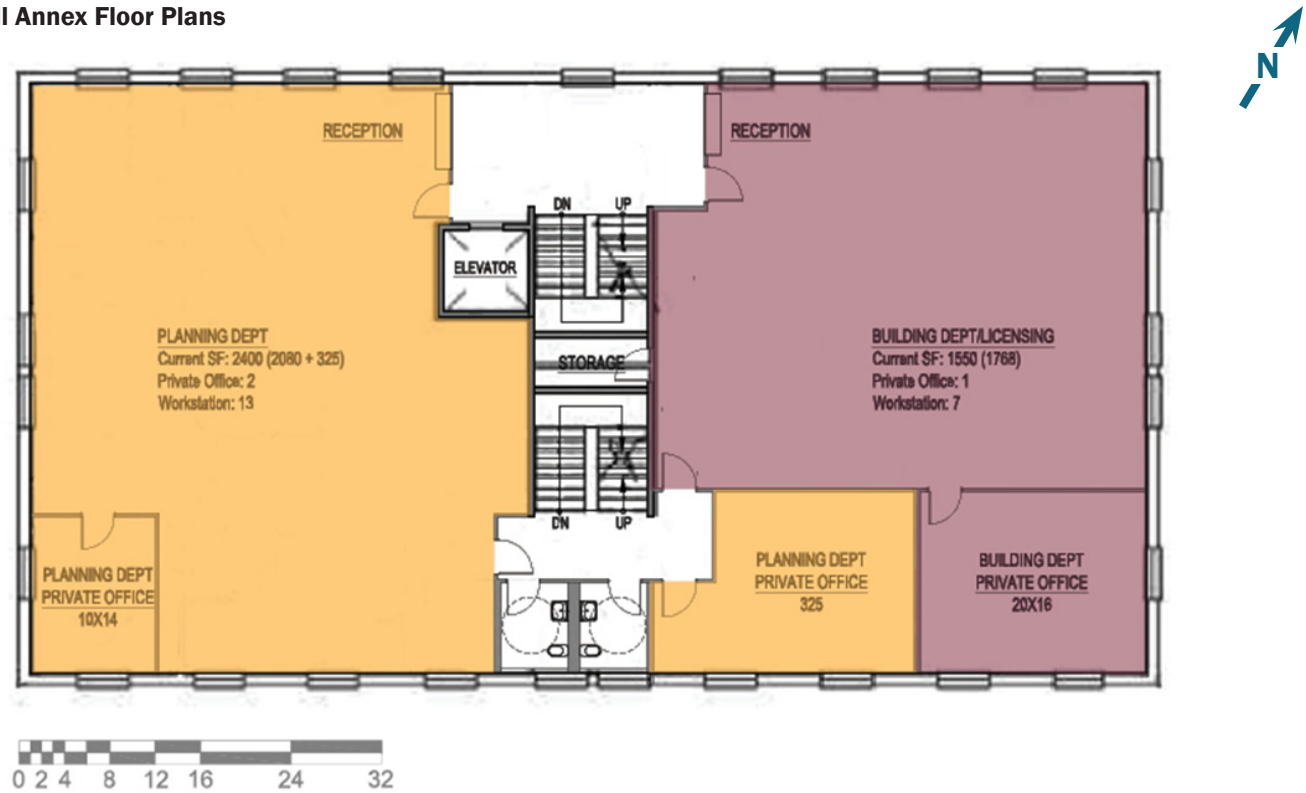

Figure 59. Second Floor Plan

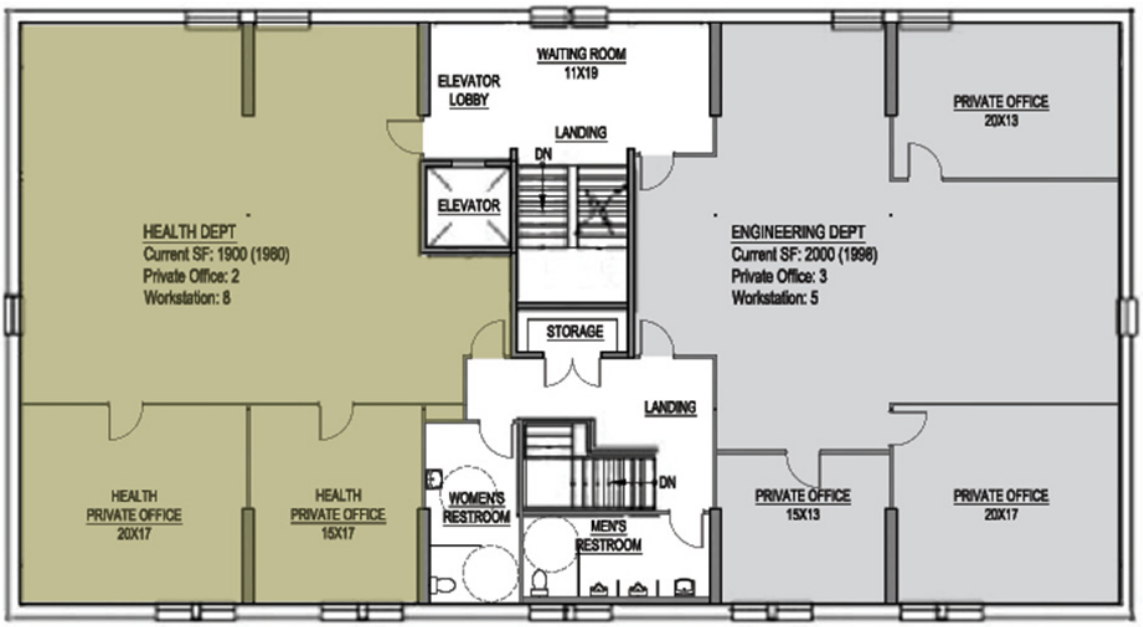

Figure 60. Third Floor Plan

6.0 PUBLIC MEETING #2

Summary

Part 2 of the feasibility study culminated in a public meeting where LDa presented a study of four re-use scenarios identified by the City and Public during Public meeting #1 on November 04, 2009. The use groups studied were Residential, Business, and Assembly in four varied scenarios. The study received the following feedback and input:

Residential

- Generally accepted with some concerns toward density, and unit size.
- Smaller units result in more units, which require more parking spaces.
- Larger units would have less impact on the building, neighborhood.
- Fewer larger units were preferred although it was noted that the smaller units located in at 1 Broad Street have not had a negative impact on the neighborhood.

Assembly & Business

- These use groups were studied in mixed use Scenarios 2A & 2B and as part of the City Hall Annex in Scenario 3
- Assembly use in a mixed use setting was generally met with skepticism.
- There were concerns regarding marketability and success of a private business.
- Concerns with building impact and required modifications and how they would impact historical aesthetic of the existing building.
- Concerns with neighborhood impact with increased traffic and parking requirements.
- City Councilors were also concerned with the City Hall Annex (Scenario 3) as it separated the City Government services over a greater distance, which had negative implications to better serving the public.

Other uses not studied

Educational uses were not studied, but received positive public input. This group covers several possible types of educational use including, but not limited to; private K-12, private vocational education, daycare, preschool, etc.

While these options are feasible from a code perspective, there are specific program elements that made this re-use group impossible to study at a general level. Structural upgrades would be necessary in most cases, and a life safety code analysis would vary greatly between the educational uses.

It was noted that the industrial nature of a vocational school may have a greater impact on the historic fabric of the building, and would require structural upgrades.

(Also see Appendix 7.4.2 for more detailed notes)

7.0 COST ESTIMATES

LDa has provided cost estimates for repairs and rehabilitation of the Core and Shell of 5 Broad St as well as the renovation and fit-out costs to install the City Hall Annex. The estimates are based on an outline specification which listed the repair recommendations provided in this report. Core and Shell costs are broken out and may apply to any re-use scenario as they would remain more or less consistent in any case.

Except for the City Hall Annex scenario, fit-out cost estimates are not provided as they could vary dramatically depending on the proposed use, number & size of units, quality and types of finishes and fixtures installed. Any cost estimates provided by a developer for Core and Shell work must include the same scope of work and make the same qualifications and assumptions listed in this report and Appendix 7.5.

A cost estimate was provided upon request from the City of Salem for the fit-out & renovation of 5 Broad St for Scenario 3, the relocation of City Hall Annex, and is provided to assist the City of Salem in determining their final approach on re-use or disposition of the building.

Core & Shell rehabilitation =	$2,765,702
(may apply to any re-use scenario)	
City Hall Annex fit-out =	$2,370,190