Whipple Memorial Town Hall

Existing Conditions Analysis & Recommendation

December 2014

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697 Union Street, Manchester, NH

Whipple Memorial Town Hall
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Executive Summary

Whipple Memorial Town Hall is located on the corner of Seamans Road and Main Street in New London. In addition to the meeting hall, the building houses the New London Police & Dispatching Department and Recreation Department (accessed via 25 Seamans Road entrances). The original Town Hall was built in 1917 and additions were constructed in 1985 and in 1999. Portions of the lower level of Town Hall were renovated in 2008.

In general, the building condition is what you would expect for a building of this age with very little maintenance. The biggest issue seems to have been the fact that the mechanical units are in the attic with disturbed insulation which results in ice dams that need to be addressed every winter. Codes have changed since the building was completed so as more significant work is done the building will need to be brought up to current codes.

The Recreation Department occupied the area vacated by the Court system. No work was done to modify the layout. The program requirements of the former court system such as the dedicated area for judges are no longer required. The available space could be used much more efficiently for the new programs.

Given the historic significance of Town Hall we assumed that would continue as a multi-purpose community space. Going forward both the Police Department and Recreation Department have space needs. Much of the Police Department infrastructure is in place here. It would seem logical their needs could be addressed by expanding into the current Recreation Department area. This would mean the Recreation Department would need to find a home elsewhere. When that kind of renovation takes place (next 3-5 years) the new mechanical system and code issues could be addressed in one project.

The near term investment may need to be in some deferred maintenance items, immediate code issues, finalizing a plan for the Recreation Department elsewhere and developing the long range plan for the Police Department at this location.

In the section on 'Items that need to be addressed' there is a more detailed description of the work that needs to be done. In addition a dollar value has been estimated in today's dollars for accomplishing the work. An estimated time frame for that work is also identified. It generally breaks down into work that should be done now and work that can take a little more time to plan and get done in the next 3-5 years and beyond. One could therefore imagine an immediate project and a project in the not to distant future. Both are summarized below by totaling the 'now' activities from the list for the immediate project and the 3-5 and beyond activities for the future project. Most of the work in the immediate project should be done soon with the Life Safety and Exit components being the most urgent.

The Immediate Project

Para.	a	Envelope Improvements	$ 17,000
Para.	b	Roofing work	9,000
Para.	c	Exterior Finishes	20,000
Para.	d	Exit Components	7,000
Para.	e	Waterproofing	2,000
Para.	f	Life Safety Code	47,600
Para.	g	Interior - Exterior Damage Covered in f.	0
Para.	h	Building Components	19,500
Para.	i	Visible Structural Deficiencies Covered in h	0
Para.	j	General Improvements Longer Term	0
Para	k		0
Para	l		0
Para	m		0
Para	n		0
Para	o		0
		Subtotal	$122,100
		G.C. OH&P @ 15%	18,315
		+ Contingency @ 10%	14,000
		A & E Fees	10,000
		Total Project Budget	$164,415

The Longer Term Project 3-5 Years & Beyond

Para.	a	Envelope Improvements & Mechanical Systems	$ 190,000
Para.	b	Roofing work	23,500
Para.	c	Exterior Finishes	19,000
Para.	d	Exit Components	5,000
Para.	e	Water Infiltration	0
Para.	f	Life Safety Code	4,000
Para.	g	Interior - Exterior Damage	0
Para.	h	Building Components	24,000
Para.	i	Visible Structural Deficiencies	0
Para.	j	General Improvements	35,000
Para	k		0
Para	l		0
Para	m		0
Para	n		0
Para	o		0
		Subtotal	$ 300,500
		G.C. OH&P @ 15%	45,075
		+ Contingency @ 10%	34,500
		A & E Fees	30,000
		Total Project Budget	$410,075

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Items that need to be addressed

The following information is a list of issues identified in the request at the outset that needed to be addressed.

a. Energy audit of building envelope including an infrared scan and blower door test.

1. See Envelope Assessment, Exhibit A prepared by Margaret Dillon of S.E.E.DS.

The report identifies a number of issues that can be addressed immediately. They all are geared to improve the envelope and most address the "leaks" around doors and windows. The other most significant area for benefit is the scaling of the ceiling plane, its insulation overlap with the outside wall and a 12" of cellulose insulation across the entire plane.

Related to the improvements of sealing and insulating the attic is the fact that the mechanical units are currently in the attic with extensive poorly insulated duct work creating significant heat loss. The recommendation as detailed in the Mechanical Report, Exhibit D, is to change the HVAC system in the Police/Recreation Department portion of the building to a new low temperature variable refrigerant flow (VRE) system. This would get all the mechanical equipment and duct work out of the attic. These improvements would be expected to reduce the total heating costs by over 50% to approximately $7,500 per year at current costs. Not only does this reduce costs but it saves energy, improves comfort and eliminates ice dams.

The envelope items that can be done now are itemized in the Envelope Assessment page 11 under "Wall Plane Thermal Barrier" and "Community Hall Improvements" and total approximately $17,000.

The "Attic Thermal Barrier" recommendations that total approximately $10,000 are best done in concert with the new mechanical system. The new mechanical system should be programmed for execution in the next three to five years and is currently budgeted at $180,000. This work should be coordinated with partition changes as a result of program needs. This could be combined into a capital project that addresses energy issues, program issues and current code issues.

	Summary		Estimate	Time Frame
I.	Wall plane thermal barrier		$ 6,000	
	Community Hall Improvements		11,000	
		Subtotal	$ 17,000	Now
II.	Attic thermal barrier		$ 10,000	
	Replace Mechanical system		180,000	
		Subtotal	$190,000	3 - 5 years

b. Current Condition of Existing Roof

1. Historic Town Hall

Existing slate roofing looks generally sound enough, but it is often what you can't see that causes failure. A review of the history (see NHDHR Inventory form, Exhibit B) indicates that chimney repairs have been completed at various times over the years, 1977, 2004, but the only roof repairs were reported in 1948 and 1960. There has been no evidence of slates falling off the roof which is often an indication it is time to replace the roofing. Given the age of the roof and expected wearing of the slate, but particularly the fasteners, it is time to have a detailed roof inspection by an experienced installer of slate roofs. Any minor repairs should be done at that time. Based on that inspection, a realistic time frame for replacing the roofing could be established.

2. Police Department & Recreation Department

The existing asphalt shingle roofing was new at the time of the addition and renovations in 1999. Three feet of ice and watershield was called for around the eaves and under the shingles. Significant ice dams caused that to be redone by taking ice and water shield further up the roof and reroofing. Asphalt shingles should have an expected useful life of at least 20 years and usually 25 years. The roof is approximately 15 years old so one would expect another 5 - 10 years of useful life. Given the history of ice dams and stories of people on the roof shoveling, one might expect to replace the roof in approximately 5 - 7 years. At that time the sheathing should be inspected and replaced where required.

The 'box' in the middle of the roof where the two ridges come together was originally envisioned as a way to resolve the different ridge heights. With its different material and flashing conditions it's another potential for leaks. When the roof is replaced it may be better to eliminate the 'box' and use ice and water shield and roofing to bring the higher ridge over the low ridge to a gable vent protected by an extended rake. See also para. N. Coordinate with Mechanical Report.

The membrane roof over the Sallyport appears to be shedding water and should last at least another 5 - 10 years. Its problem is at the scupper drains. It appears water is getting under the one piece scuppers and getting into the masonry wall below and showing up on the interior of the Sallyport. The membrane of the roof needs to be brought into the scupper as a continuous membrane and terminated with a positive drip. It also needs to be well sealed up the inside of the parapet wall as one could imagine these scuppers being blocked with snow and ice in the winter. It's a difficult condition. Another long term solution may be to remove the parapet on that low side of the roof and bring the roof over the wall with a built in gutter and downspouts. When the roofing solution is complete, the brick should be cleaned and coated with a penetrating water repellant.

	Summary	Estimate a.	b.	Time Frame
I.	Slate roof inspection (2 days)	$ 4,000	$ 4,000	Now
II.	Remove 'box' where ridges meet	$ 3,500		When reroof
	Replace asphalt shingle roof	20,000		5 - 7 years
III.	a. Reflash scuppers	$ 4,000		Now
	b. Remove parapet 1 side, provide gutter and downspouts		$ 9,000	Now
	c. Clean brick and coat	$ 1,000	$ 1,000	After a or b above
	Subtotal a.	$ 9,000		Now
	b.		$14,500	Now
		$23,500		5 - 7 years

c. All Exterior Finishes

1. Historic Town Hall

The brick appears in good condition except where water stains from gutters and downspouts have darkened the brick. These areas can be cleaned after the source of the water is replaced. The areas that need to be put on a maintenance schedule include the cupola, gutters and downspouts, and painted doors and wood trim. At this time the paint is deteriorating under window sills and starting to fail. The vents above the basement windows that were never finished and at the gutters where water penetration is pushing paint off and deteriorating the joints in the gutters and junctions with down spouts also need attention. The short term fix may involve cleaning the gutters, repairing the joints, replacing the section at the downspout connection and sealing the inside of the gutter with a penetrating sealer. The longer term solution may be to replace all gutters when the roofing is replaced and that can be determined after the detailed roofing inspection.

The cupola appears to need to be addressed in the near future. It would involve inspecting and repairing the metal roof as required, reglazing the window panes, sealing the sash to the frame, preparing all surfaces and painting with a good three coat system. Base flashing should be inspected and repaired as required. The schedule for this work may also best be determined after the results of the roofing inspection where they can also do a close up inspection of the cupola conditions.

2. Police Department & Recreation Department

The brick appears to be in good condition with some staining near the base of the wall at roof/valley conditions with splashback. Serious staining exists at the scupper locations from the Sallyport roof. After the roof fixes described in b.2 above the brick can be cleaned and sealed with a penetrating water repellant. Roof trim, facia and soffits that are painted will need to be on maintenance cycle. Today the paint generally looks sound.

Item	Estimate	Time Frame
Town Hall		
Fix gutters and downspouts & repaint	$10,000	Now
Refinish cupola	$12,000	With roof repair
Repaint trim	$10,000	Now with gutter repair & storm windows
Police		
Repaint trim	$ 5,000	3 - 5 years
Clean & treat brick	$ 2,000	3 - 5 years
Subtotals	$20,000	Now
	$ 7,000	3 - 5 years
	$12,000	With roofing

d. All Exit Components

The exterior exit doors have appropriate hardware in good working order in the current configuration. The Code Review Exhibit C indicates the existing exit across the roof of the Sallyport is no longer required. Therefore, the door should be replaced with a window and the decking, handrails, and steps can be eliminated. This would allow the wall at the door to be properly flashed with the roof and keep from having to clear the snow in Winter. We have given this a 3-5 year time frame since it currently is used as a secondary entry for the Police officers. Should the Police Department expand that might be rethought. Under the current code for new construction, the exterior door at the accessible entry to the Recreation Department and the Town Hall requires an automatic door operator. Since this is an ADA requirement this improvement should be done now.

The electrical components of exits are generally addressed under the Life Safe Code para. F. What we will add here and is still a life safety code requirement are the exterior emergency lights at each exit. These can be heads off of an emergency battery unit (EBU) located on the inside of the building.

Summary

Item	Estimate	Time Frame
Automatic door operator	$ 5,000	Now
Exterior emergency heads at exits	$ 2,000	Now
Replace Exit doors with window and remove walk, railings, and steps at Exit to Sallyport roof	$ 5,000	3 - 5 years
Subtotal	$ 7,000	Now
	$ 5,000	3 - 5 years

e. Lower Level Water Infiltration

The drawings indicate foundation drains and there are some catch basins around the building, as well as a working area drain outside the exterior entry to the lower level Training Room. These seem to be working with the primary issue being lower level exterior walls adjacent to the generator pad. It looks as if some attempt has been made by applying an exterior coating to a portion of the building foundation wall. The situation is aggravated by the failed gutter and downspout directly above at the high roof and possibly the lack of a snow guard along this portion of the high roof. In order to address this localized issue a waterplug type material should be applied at the joint between the generator pad and foundation wall, as well as all pipe penetrations through the wall from the generator. Then use a water resistive coating from the brick to and over the slab/wall joint from the Training Room door to the Sallyport wall.

Item	Estimate	Time Frame
Waterproofing	$ 2,000	Now
High roof fix addressed above in b1		
Subtotals	$ 2,000	Now

f. Life safety code as it applies to the current condition of the building.

A detailed code review can be found in Exhibit C with particular attention paid to the Summary at the end of that review. Electrical issues are discussed in Exhibit E, Electrical Report and summarized at the end of that report.

In summary, buildings that met the code at the time of their construction do not need to be brought up to current code unless there is a change of use or significant renovation or addition work being proposed.

The long term question of code compliance is related to the expected use of the Hall. No longer a court room, the code indicates we can have a capacity of 216 in this multi-purpose space. If we try and furnish the space theatre style we might get 154 seats. The current use schedule (see chart in p. 5 of Envelope Assessment Exhibit A) indicates fewer occupants than that at any one time. Given the limited parking and other venues in Town it is important to determine the potential uses for the Hall. When we exceed 130 occupants the code requires us to add toilet fixtures to support that population. They could be added to the toilet facilities in the lobby or possibly downstairs in the unfinished area. The decision will be based on the programmed capacity of the Hall and its related toilet room requirement.

The code review indicates the current building exceeds the maximum fire area of 12,000sf (all floors) without a sprinkler system. The solution is to provide sprinklers throughout the entire building or separate the building into compartments that do not exceed the 12,000sf limit. The logical location for that separation is at the rear masonry wall of the Hall. Provide a B label door and frame at the doorways from the Hall to the lobby at the first floor and at the bottom of the ramp at the lower level. This would provide code compliance without providing full sprinklers in the rest of the building. In order to provide a fully compliant sprinkler system the attics also have to be treated which means a dry system. A dry system is kept dry by being charged with air by a compressor. When a head opens the air escapes and the water flows. The system, therefore, requires more maintenance. In addition you may want to provide concealed heads in the historic Town Hall. This can add to the cost but does provide full sprinkler coverage of the building.

Given that we have identified safety issues that should be addressed now and other long term code compliance issues that can be addressed as part of a larger renovation project, the following represent the items that should be addressed now.

Item	Estimate		Time Frame
I. – Finish unfinished area in basement of Hall to enclosed stair and activate sprinkler heads 3,500sf	$16,000		Now
– Build closed, secure storage along west wall of Sallyport so no maintenance materials/tools are exposed	$ 6,000		Now
II. Electrical			
– Replace and add exit and emergency lights	$10,000		Now
– Replace hallway fixtures either side of stage	$ 1,400		Now
– Replace and rewire dimmers at stage and reclamp Hall fixtures with LED	$ 5,000		Now
– Upgrade stage lighting	$ 8,000		Now
– Replace, rewire lights on west wall of Sallyport (After wall fixed)	$ 1,200		Now
Bring the building up to code as part of a larger project			
III. a. Install a sprinkler system throughout the building		$35,000	3-5 years
Or			
b. Provide B label doors, frames and hardware at doors from Hall to lobby and bottom of ramp in Basement	$15,000		3-5 years
Provide toilet rooms to meet hall design load 1 fixture/65 women 1 fixture/125 men	$25,000		3-5 years

Summary

I & II		$47,600		Now
III	a.	$40,000		3-5 years
or	b.		$60,000	3-5 years

g. Interior and Exterior Damage

Exterior Damage: Exterior issues noted above under b & c are generally maintenance and repair items that are budgeted under those line items.

Interior Damage: There isn't so much interior damage as the unfinished areas of the lower level of the historic town hall between the Training Room and the south egress stair. That area needs to be thought through and finished so walls can be closed up and the sprinklers activated to provide a code compliant condition. See line item I above in para. f.

h. Building Components and Finishes Nearing End of Life Cycle

This building is generally about 15 years old or 15 years since its had any significant work done except for the lower level of the Town Hall, which is more recent. Finishes of floors, walls and ceilings are generally good for 15 - 20 years and are often changed for aesthetic reasons before they need to be redone for wear.

Therefore we would recommend upgrading these finishes in the next 3-5 years when other significant work is scheduled to be done.

Item	Estimate	Time Frame
Finishes		
Flooring	$ 7,000	3-5 years
Ceiling	$ 6,000	3-5 years
Paint	$ 6,000	3-5 years
Mechanical (see detailed report Exhibit D)		
Plumbing maintenance and repair	$ 5,000	Now
Additional heat in Training Room	$ 5,000	Now
Add mini splits in IT; Radio	$ 8,000	Now
Replace seal at ejector in Janitor Room below Stair in Police	$ 500	Now
Electrical (see detailed report Exhibit E particularly summary at end of report)		
Town Hall		
Remove lamps to reduce energy conservation (over___)	$ 1,000	Now
Reevaluate lighting when layer project is done	TBD	3-5 years
Subtotal	$19,500	Now
	$24,000	3-5 years

i. Visible Structural Deficiencies

No visible structural deficiencies were noted. There is an issue where the joint between the slab on grade 1999 addition and the basement framed floor meet that tends to move and is noticed by a separation or crack in the floor. The concrete slab doesn't move and the wood frame shrinks and expands and contracts. Most of the movement should be done by now but a small expansion joint can be installed when the flooring is replaced. This work is accounted for in the finish budget 3-5 years in h above.

The structural issue that will need to be confirmed is to balance the sealing and better insulation of the ceiling plane with the structural capacity of the roof trusses. The attic insulation of continuous blown in cellulose not to exceed 12" is accounted for in Energy Envelope in a above.

j. Recommended General Improvements

The space that is currently occupied by the Recreation Department was originally laid out for the court system with dedicated space for the judge, etc. There should be a detailed review of the needs and program for both the Police Department and Recreation Department to determine how best to reconfigure the space to be more efficient programmatically. With that renovation would be the appropriate time to change the mechanical system as recommended in Exhibit D, seal the ceiling as recommended in Exhibit A, address the upgraded code issues as identified in Exhibit C and address the lighting and switching issues identified in Exhibit E.

In order to project an anticipated cost of reworking that area to benefit program, we have identified a value based on an cost/sf as summarized below:

Renovated approximately 1,200sf	$35,000	3 - 5 years

k. Maintenance Recommendations

Exterior
- Periodically inspect landscape to insure shrubs and trees are not touching building.
- Be sure accessible walk along north side of building is clear of leaves and snow to facilitate drainage from entry to police station.
- Periodically inspect painted trim to develop a touch up and/or repainting schedule.

Interior
- Develop a regular inspection and service program for the mechanical system based on the recommendations of the manufacture of the proposed system.
- Periodically test emergency lighting system and develop a schedule for battery replacement.
- Inspect ejector pumps once a year.

l. Moisture Infiltration Through the Building Envelope

The biggest impact on this issue will be to get the mechanical units out of the attic and properly seal and insulate at the bottom chord of the trusses. These issues are addressed under para. a. Moisture migration in Sallyport is addressed under para. b2 as a result of failed flashings at the scuppers. To avoid additional migration from splash back as identified in c2 above the brick can be cleaned and sealed with a penetrating sealer which is budgeted under c above.

m. Visual Inspection of Electrical, Communications & Fire Suppression Systems

- The fire suppression system entrance is located in what's labeled Radio Room, lower level, on our plan A1.
- See Electrical Report, Exhibit E. Life Safety issues are covered in para. f. Other issues are covered in para. h.
- The electric service is a 400 amp single phase service and based on historic peak loads has plenty of available capacity. There is a 75KW generator that provides backup for the entire building.
- The fire suppression system is for the basement only and appears in good shape. Heads need to be added at the plugged locations in the unfinished areas. See Life Safety para. f.
- The fire alarm system, installed with the 1999 work, appears to be fine.

n. Coordinate with Mechanical Report

The energy audit consultant and mechanical engineer have discussed the issues and all are in agreement to change the system as recommended in the Mechanical Report and properly seal and insulate at the bottom chord of the trusses.

o. Interview Staff

Police Chief, Ed Andersen, was interviewed on December 12, 2014. We discussed how right sizing Police Departments are often measured in officers per capita or officers per square foot. Special characteristics for New London that influence those ratios are the significant increase in population during the summer and the year round student population from Colby Sawyer College. Current year round population is approximately 4500. Officers represent approximately 9 FTE. The other distinguishing characteristic is that New London provides dispatch for the surrounding towns. Department has about 14,000 calls per year. As one evaluates the Police Department needs going forward an indepth analysis of these issues can help in right sizing the ongoing department.

In discussion and with a guided tour the following needs were noted:

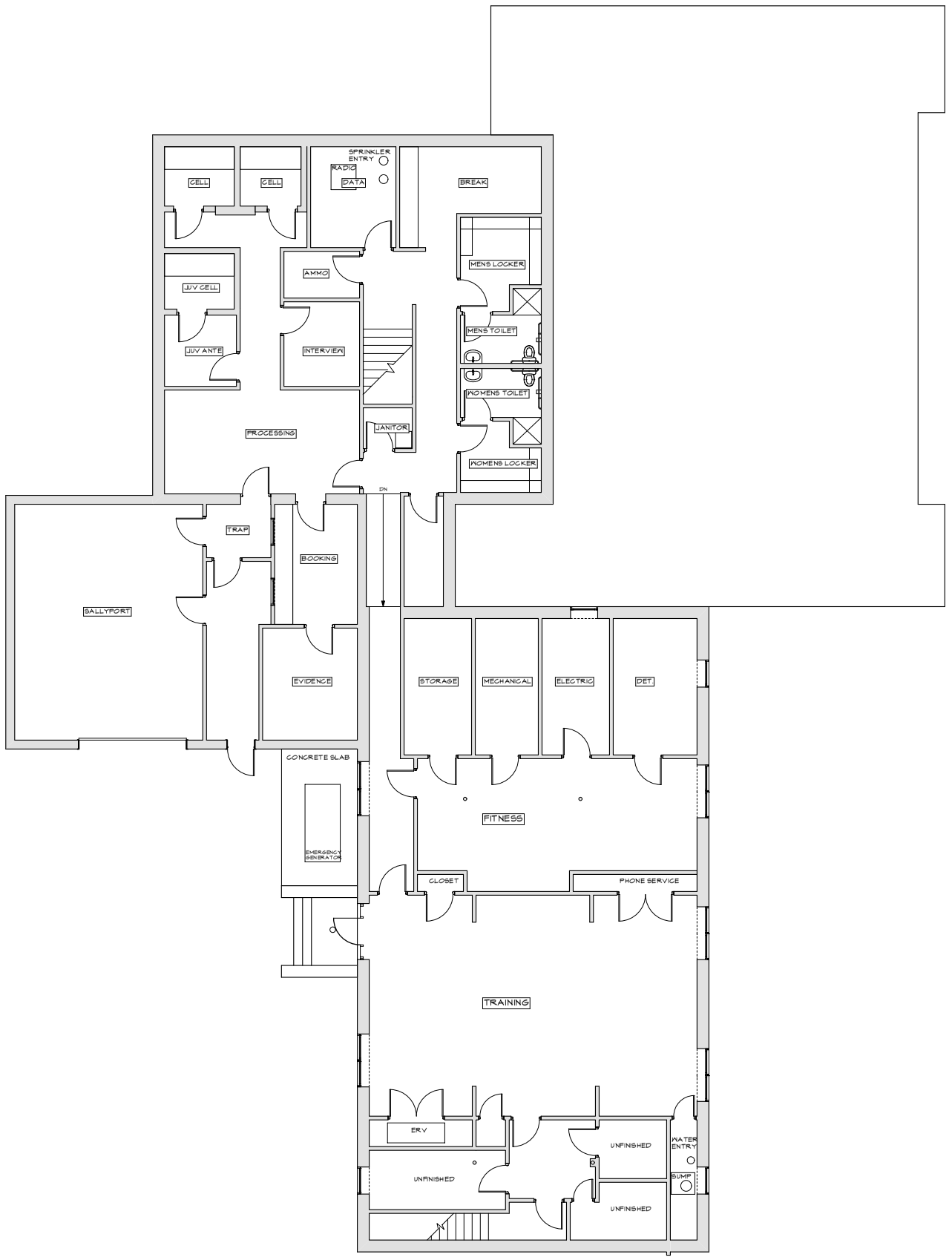
- Provide a secure location for the cruiser download computer.
- Dispatch needs more space and better designed to be able to accommodate 2 -3 people and support the 24 hour service.
- Need conference room to meet with public.
- Need storage space for evidence, seasonal equipment, training aids, etc. Storage currently in room on Recreation Department side, on floor of Training Room and in corridors.
- Need to secure Sallyport so as to have no accessible storage.
- When evaluating space it is important to note that the booking and holding cell area is well done and in many ways more generous than some other departments. It is a result of the available basement space under the operations area and adjacent to Sallyport. It is expensive space and there seems to no reason to change it.

Scott Blewitt, Recreation Director, was interviewed on December 12, 2014. The Recreation Department occupied this space vacated by the court system without modification approximately two years ago. It is better space than he had and people are still discovering where he is located. Currently the Department schedules the Hall and uses it for several different kinds of activities serving residents of all ages. The large conference room is used for classes and he could use another classroom space. As is painfully evident, walking around, there is serious need for appropriate storage space for all sorts of equipment and materials used on site, as well as equipment that is used outdoors off site.

There was some discussion of a long history of looking at making some or all of the remaining space at the former elementary school a Community Center that could house the Recreation Department and serve all ages of the Community. That location would have the benefit of parking. The lack of parking at this location severely limits full participation in programs.

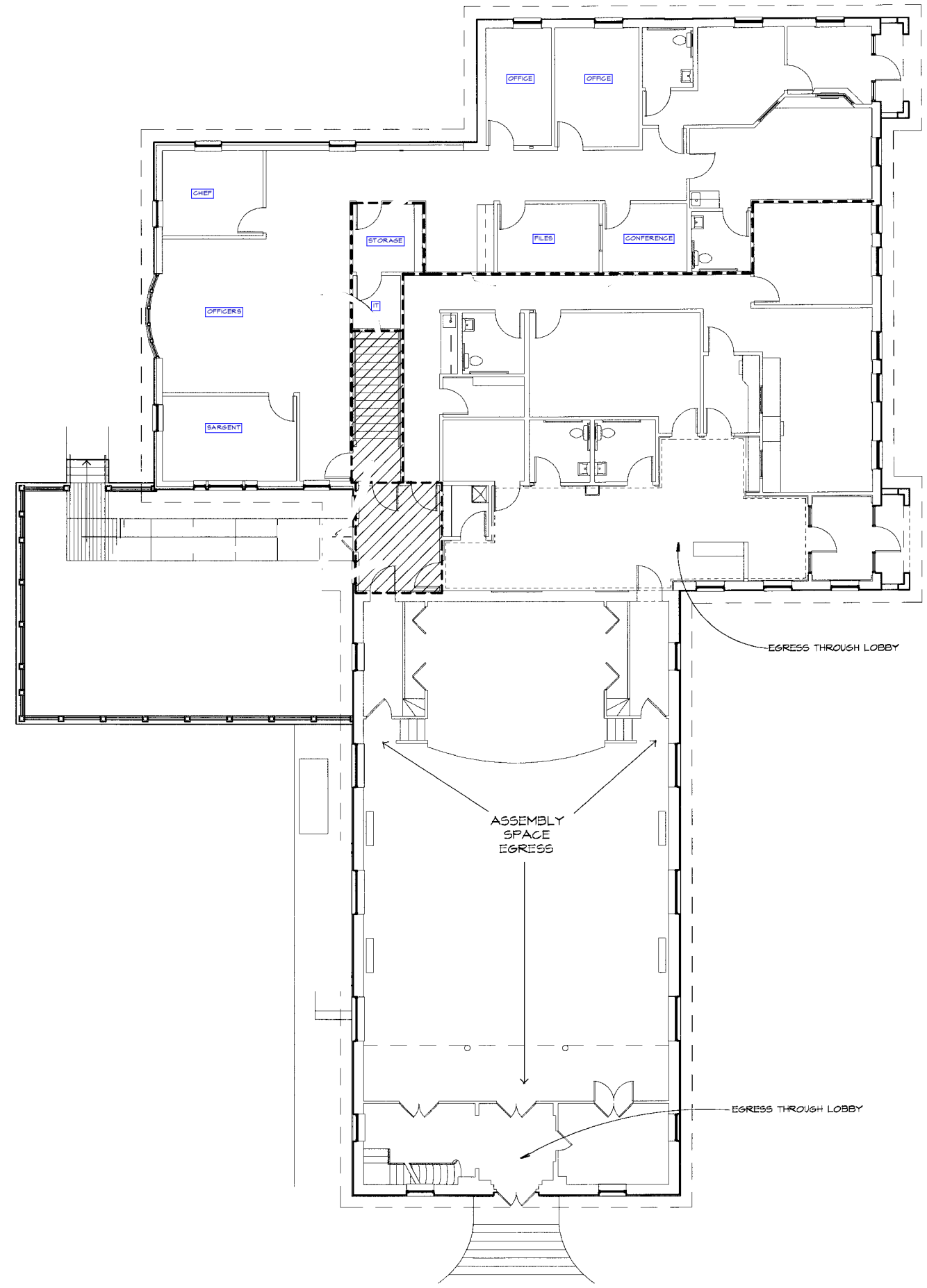
Richard Lee, Director of Public Works, and Jim Perkins, Town Archivist, provided a guided tour with commentary on December 12, 2014.

DRAWINGS



EXISTING CONDITIONS LOWER LEVEL

0 8 16 32



EXISTING CONDITIONS UPPER LEVEL

WHIPPLE MEMORIAL TOWN HALL

BUILDING ASSESSMENT AND CODE REVIEW

MAIN STREET

NEW LONDON NEW HAMPSHIRE

THE DENNIS MIRES, P.A. ARCHITECTS
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EXISTING CONDITIONS

revisions:

1-5-2015

date:

proj. no.: 2014.042

A1

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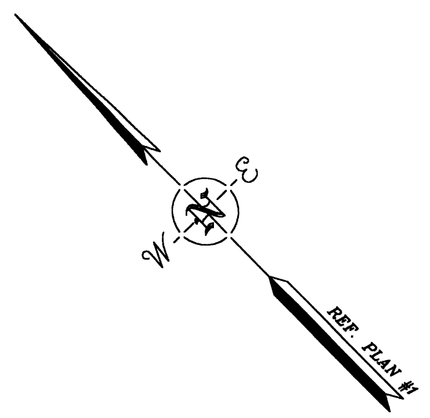

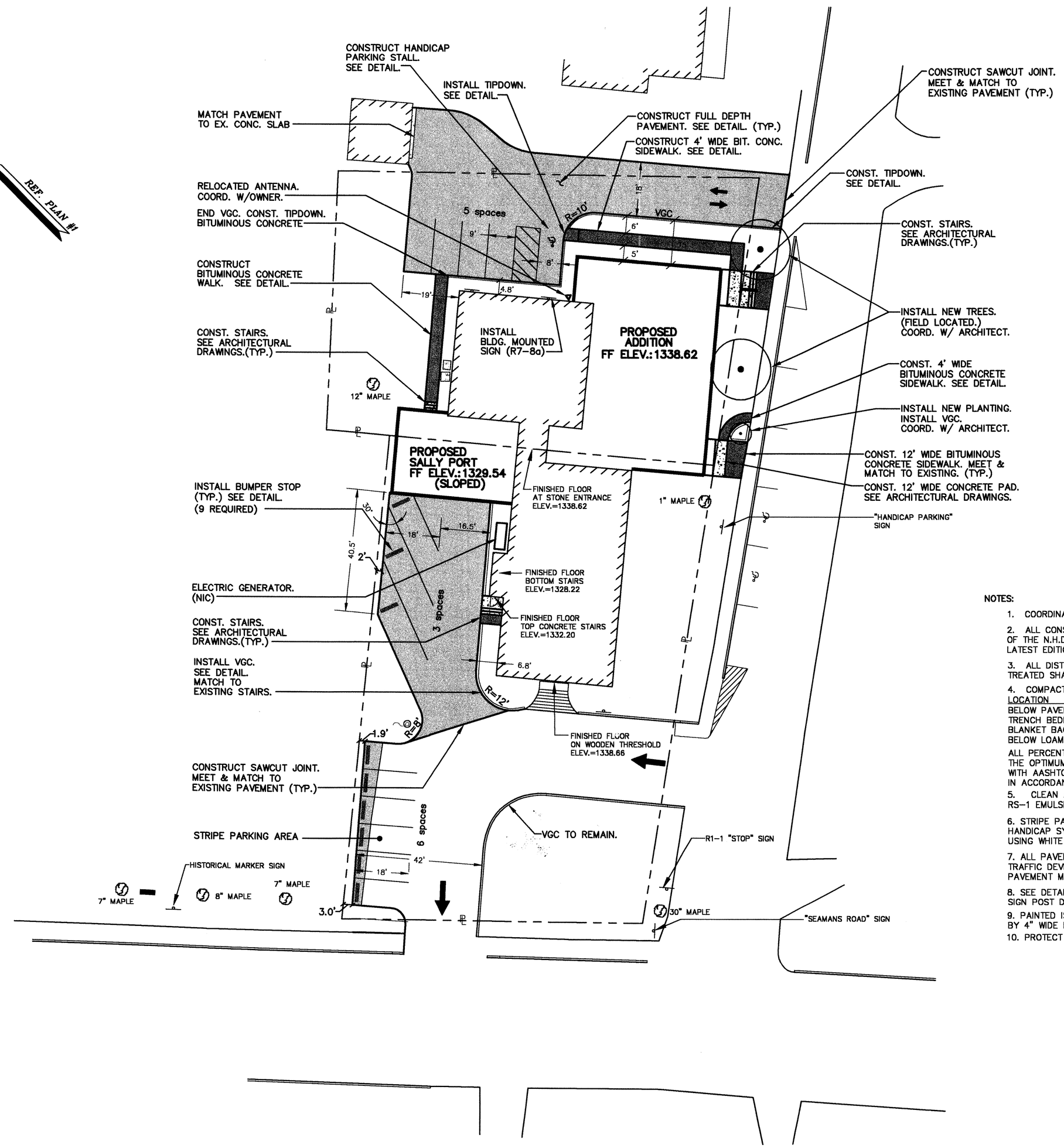

LEGEND

- EXISTING SIGN
- PROPERTY LINES
- DECIDUOUS TREE
- PROPOSED FULL DEPTH PAVEMENT
- PROPOSED CONCRETE PAD/STAIRS
- NIC — NOT IN CONTRACT

NOTES:

1. COORDINATE ALL WORK WITHIN 5' OF BUILDING WITH ARCHITECTURAL DRAWINGS.
2. ALL CONSTRUCTION SHALL MEET THE MINIMUM CONSTRUCTION STANDARDS OF THE N.H.D.O.T.'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION, LATEST EDITION.
3. ALL DISTURBED AREAS NOT INTENDED TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 4" LOAM, LIMESTONE, FERTILIZER, SEED AND MULCH.
4. COMPACTION REQUIREMENTS:

LOCATION	COMPACTION
BELOW PAVED OR CONCRETE AREAS	95%
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL	95%
BELOW LOAM AND SEED AREAS	90%

ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MINIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH AASHTO STANDARD T-99, METHOD C. FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH AASHTO STANDARD T-191, T-204, OR T-238 AND T-239.

5. CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAWCUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW PAVEMENT.
6. STRIPE PARKING AREAS AND DRIVES AS SHOWN INCLUDING PARKING SPACES, HANDICAP SYMBOLS, AND PAINTED ISLANDS. ALL MARKINGS TO BE CONSTRUCTED USING WHITE TRAFFIC PAINT, MEETING THE REQUIREMENTS OF AASHTO M248, TYPE F.
7. ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" LATEST EDITIONS, AND THE ADA REQUIREMENTS.
8. SEE DETAILS FOR PARKING STALL MARKINGS, HANDICAP SYMBOLS, SIGNS AND SIGN POST DETAILS.
9. PAINTED ISLANDS SHALL BE 4" WIDE DIAGONAL LINES 3'-0" O.C. BORDERED BY 4" WIDE LINES.
10. PROTECT ROOTS SYSTEM DURING CONSTRUCTION OF ALL TREES SCHEDULED TO REMAIN.

STATE OF NEW HAMPSHIRE — ERIC D. WEINRIEB NO. 7654 — LICENSED PROFESSIONAL ENGINEER

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

1 / C-2A SITE PLAN

1"=20'

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phone: 603.437.5992
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MILESTONE ENGINEERING & CONSTRUCTION, INC.
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DOUCET SURVEY, INC.
76 EXETER STREET . PO BOX 163 . NEWMARKET, NH 03857-0163 . PHONE 659.6560 . FAX 659.4118

civil engineer:
ALTUS ENGINEERING, INC.
133 COURT STREET . PORTSMOUTH, NH 03801 . PHONE 433.2335 . FAX 433.4194

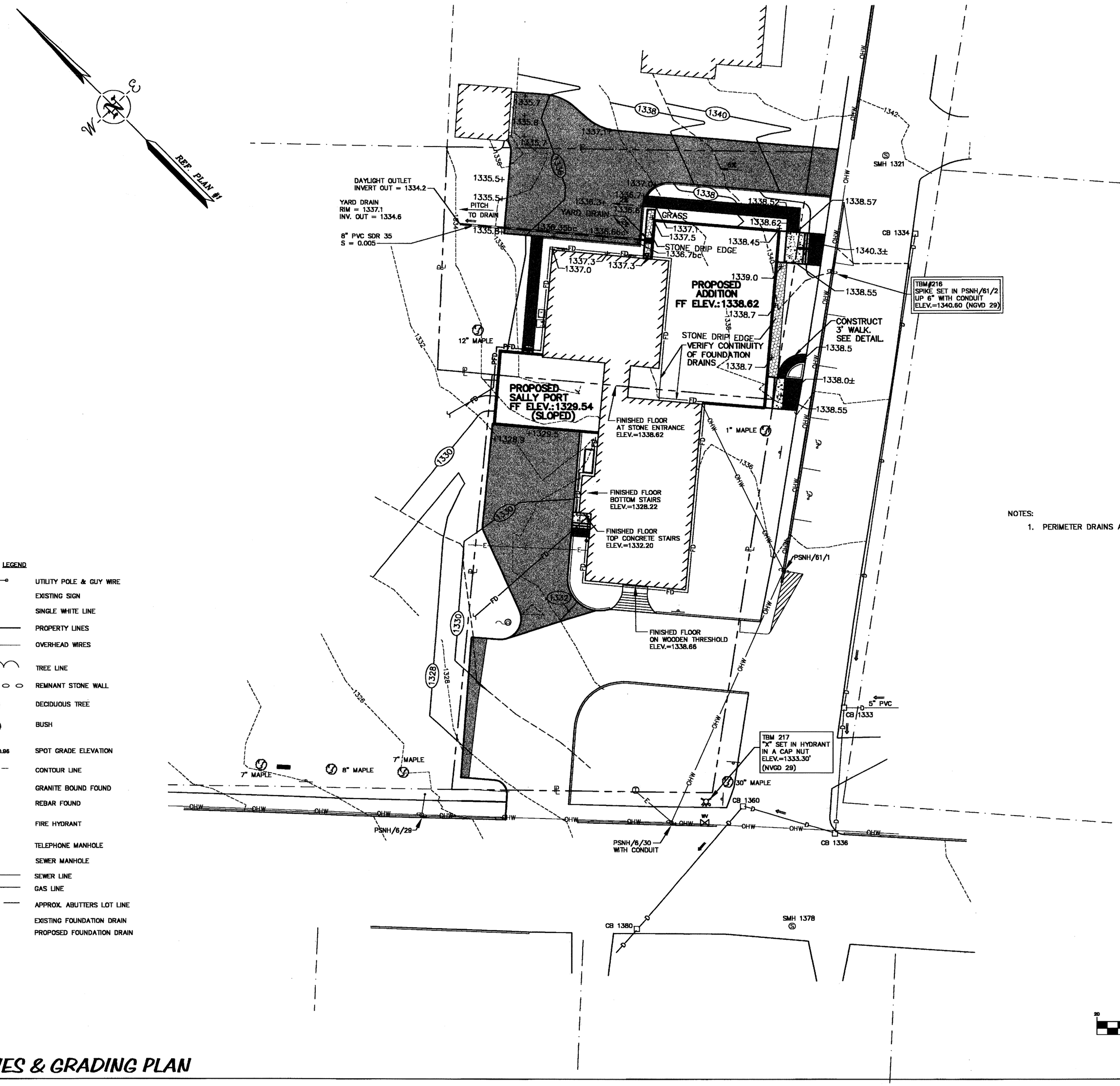
DIGNARD ARCHITECTURAL SERVICES
156 JOE ENGLISH ROAD
NEW BOSTON, NH 03070

RENOVATION OF TOWN OFFICES AND COURT HOUSE
NEW LONDON, NEW HAMPSHIRE

DATE: SEPTEMBER 17, 1999
DRAWN BY: EDW / RLH
SUBMITTALS-

REVISIONS-

C-2p
SITE PLAN



NOTES:

1. PERIMETER DRAINS AND UNDERDRAINS PER VERBAL DESCRIPTION BY TOWN EMPLOYEES.

LEGEND

	UTILITY POLE & GUY WIRE
	EXISTING SIGN
SWL	SINGLE WHITE LINE
	PROPERTY LINES
OHW	OVERHEAD WIRES
	TREE LINE
	REMNANT STONE WALL
	DECIDUOUS TREE
	BUSH
x 1310.96	SPOT GRADE ELEVATION
100	CONTOUR LINE
	GRANITE BOUND FOUND
	REBAR FOUND
	FIRE HYDRANT
	TELEPHONE MANHOLE
	SEWER MANHOLE
S	SEWER LINE
G	GAS LINE
	APPROX. ABUTTERS LOT LINE
FD	EXISTING FOUNDATION DRAIN
PFD	PROPOSED FOUNDATION DRAIN

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

1 / C-3P UTILITIES & GRADING PLAN

1"=20'

C:\Jobs\3273.dwg 12/13/99 01:14:51 PM EST (C:\RLH\LAND DESKTOP\PLOT\NBOSTON.PCP)

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DIGNARD ARCHITECTURAL SERVICES
156 JOE ENGLISH ROAD
NEW BOSTON, NH 03070

RENOVATION OF
TOWN OFFICES
AND
COURT HOUSE
NEW LONDON, NEW HAMPSHIRE

DATE: DECEMBER 13, 1999
DRAWN BY: EDW / RLH
SUBMITTALS-

REVISIONS-

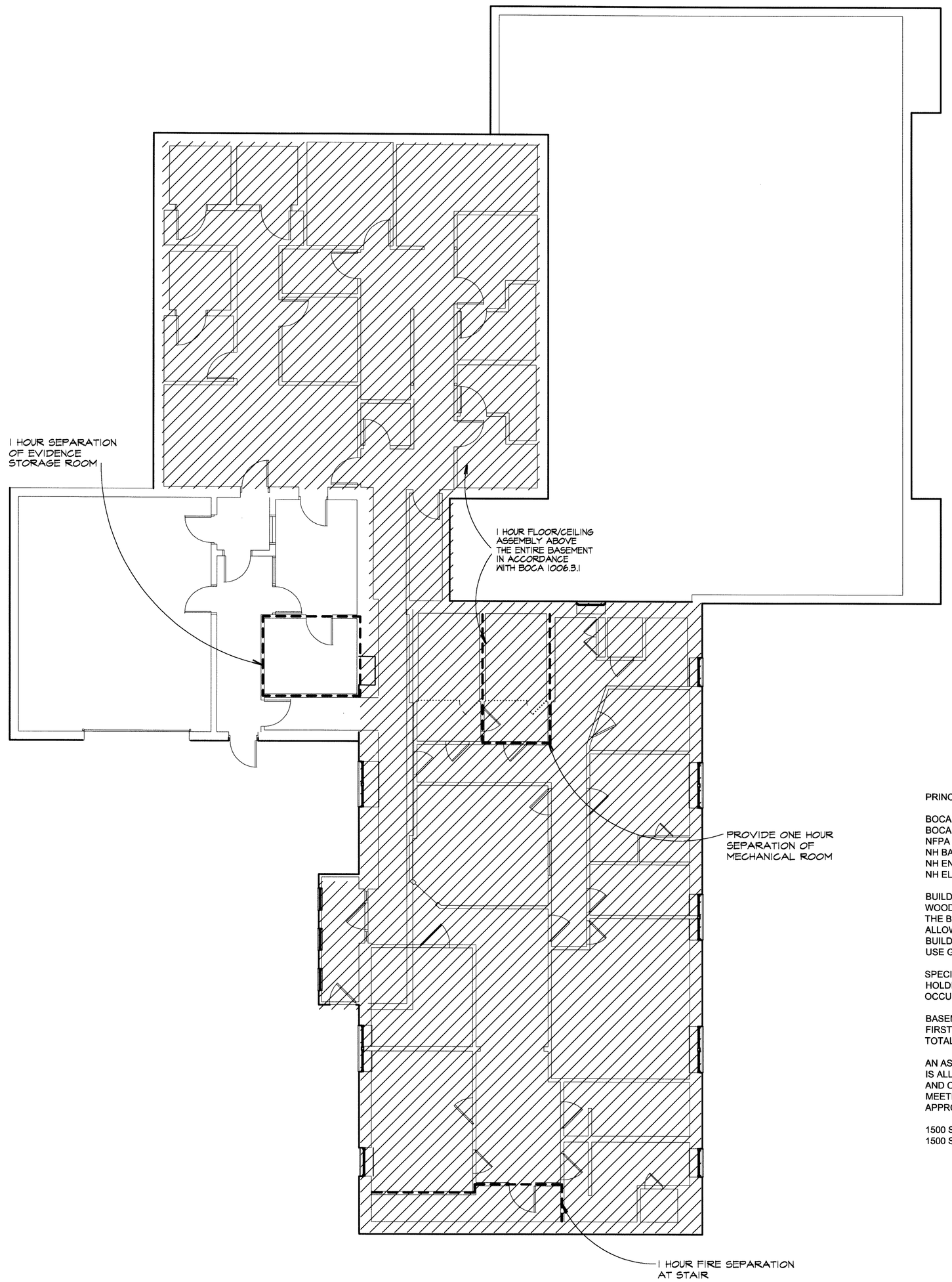
STATE OF NEW HAMPSHIRE
ERIC D. WEINRIEB
NO. 7634
LICENSED
PROFESSIONAL ENGINEER

C-3p

UTILITIES & GRADING PLAN

KEY:

- - - - - - 1 HOUR ENCLOSURE



PRINCIPAL APPLICABLE BUILDING CODES:

BOCA BASIC BUILDING CODE, 1996 EDITION
BOCA PLUMBING CODE, 1993 EDITION
NFPA 101, LIFE SAFETY CODE, 1997 EDITION
NH BARRIER FREE DESIGN CODE
NH ENERGY CODE
NH ELECTRICAL CODE 1999

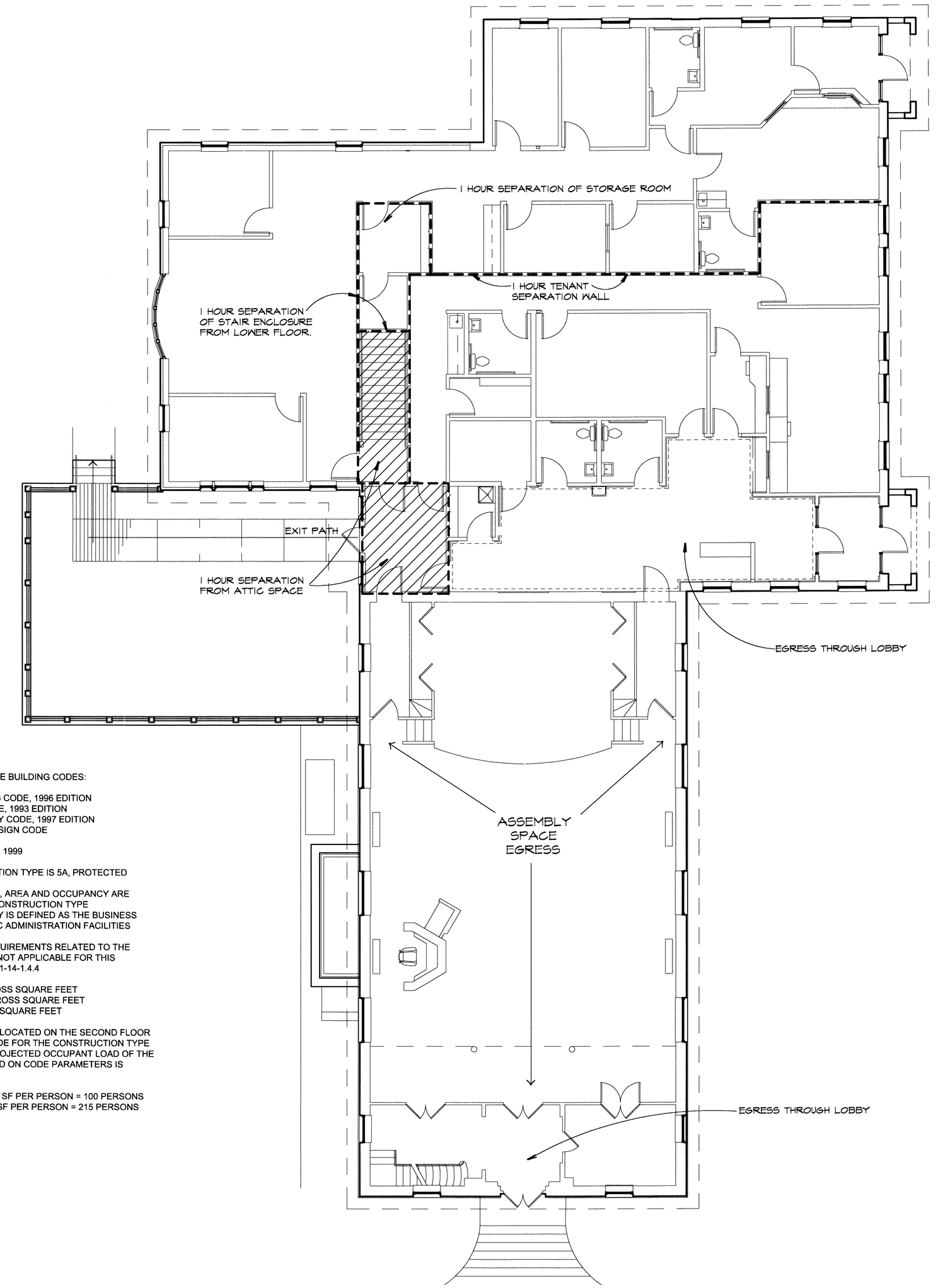
BUILDING CONSTRUCTION TYPE IS 5A, PROTECTED WOOD FRAME
THE BUILDING HEIGHT, AREA AND OCCUPANCY ARE ALLOWED FOR THIS CONSTRUCTION TYPE
BUILDING OCCUPANCY IS DEFINED AS THE BUSINESS USE GROUP FOR CIVIC ADMINISTRATION FACILITIES

SPECIAL EGRESS REQUIREMENTS RELATED TO THE HOLDING CELLS ARE NOT APPLICABLE FOR THIS OCCUPANCY. NFPA 101-14-1.4.4

BASEMENT 8,900 GROSS SQUARE FEET
FIRST FLOOR 8,900 GROSS SQUARE FEET
TOTAL 17,800 GROSS SQUARE FEET

AN ASSEMBLY SPACE LOCATED ON THE SECOND FLOOR IS ALLOWABLE BY CODE FOR THE CONSTRUCTION TYPE AND OCCUPANCY. PROJECTED OCCUPANT LOAD OF THE MEETING ROOM BASED ON CODE PARAMETERS IS APPROXIMATELY:

1500 SQUARE FEET/15 SF PER PERSON = 100 PERSONS
1500 SQUARE FEET/7 SF PER PERSON = 215 PERSONS



J1 / AO-1 LOWER LEVEL CODE DIAGRA,M
1/8" = 1'-0"

J7 / AO-1 UPPER LEVEL CODE DIAGRAM
1/8" = 1'-0"

project north N

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RENOVATION AND ADDITION TO THE
TOWN OF NEW LONDON
POLICE STATION AND DISTRICT COURT
MAIN STREET AND SEAMANS ROAD
NEW LONDON, NEW HAMPSHIRE

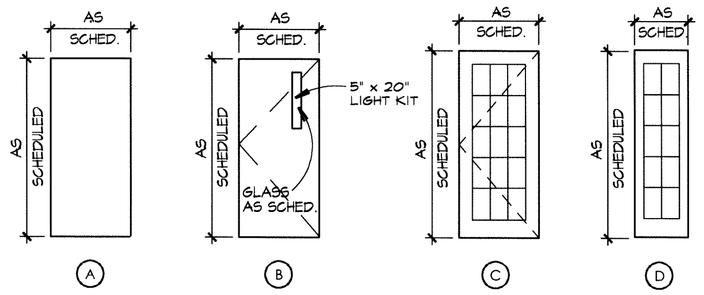
DIGNARD ARCHITECTURAL SERVICES
156 JOE ENGLISH ROAD
NEW BOSTON, NH 03070

DATE: DECEMBER 14, 1999
DRAWN BY: RD / JN / PV
SUBMITTALS:
12.14.99 - ISSUED FOR PRICING

REVISIONS:

AO-1

CODE DIAGRAMS



GLASS AS SCHEDULED
DOOR MATERIAL AS SCHEDULED
DOOR SIZE AS SCHEDULED

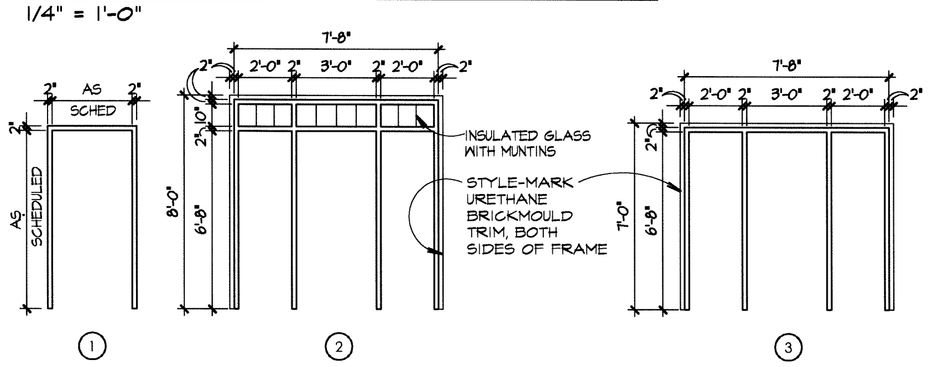
DOOR TYPES

1/4" = 1'-0"

WINDOW SCHEDULE			
	R.O: W X H	NORCO NO.	NOTES
A	5'-2 1/8" X 5'-4 5/16"	SCDH 3228	AUXILIARY CASING THREE SIDES
B	3'-2 1/8 "X 3'-0 5/16"	SCDH 3-0/2-10	AUXILIARY CASING THREE SIDES

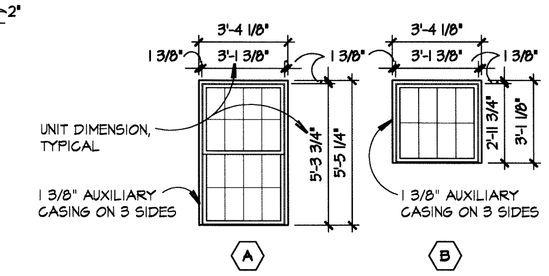
NOTE:

SCHEDULED UNITS ARE AS MANUFACTURED BY NORCO. ALUMINUM CLAD, WHITE FINISH, INSULATED LOW-E GLAZING, SIMULATED 7/8" DIVIDED LITES OF PATTERN AS ILLUSTRATED ON WINDOW TYPE. INSECT SCREENS FURNISHED WITH ALL OPERABLE UNITS, WHITE HARDWARE AND JAMBLINER, PRIMED WOOD INTERIOR FINISH.



FRAME TYPES

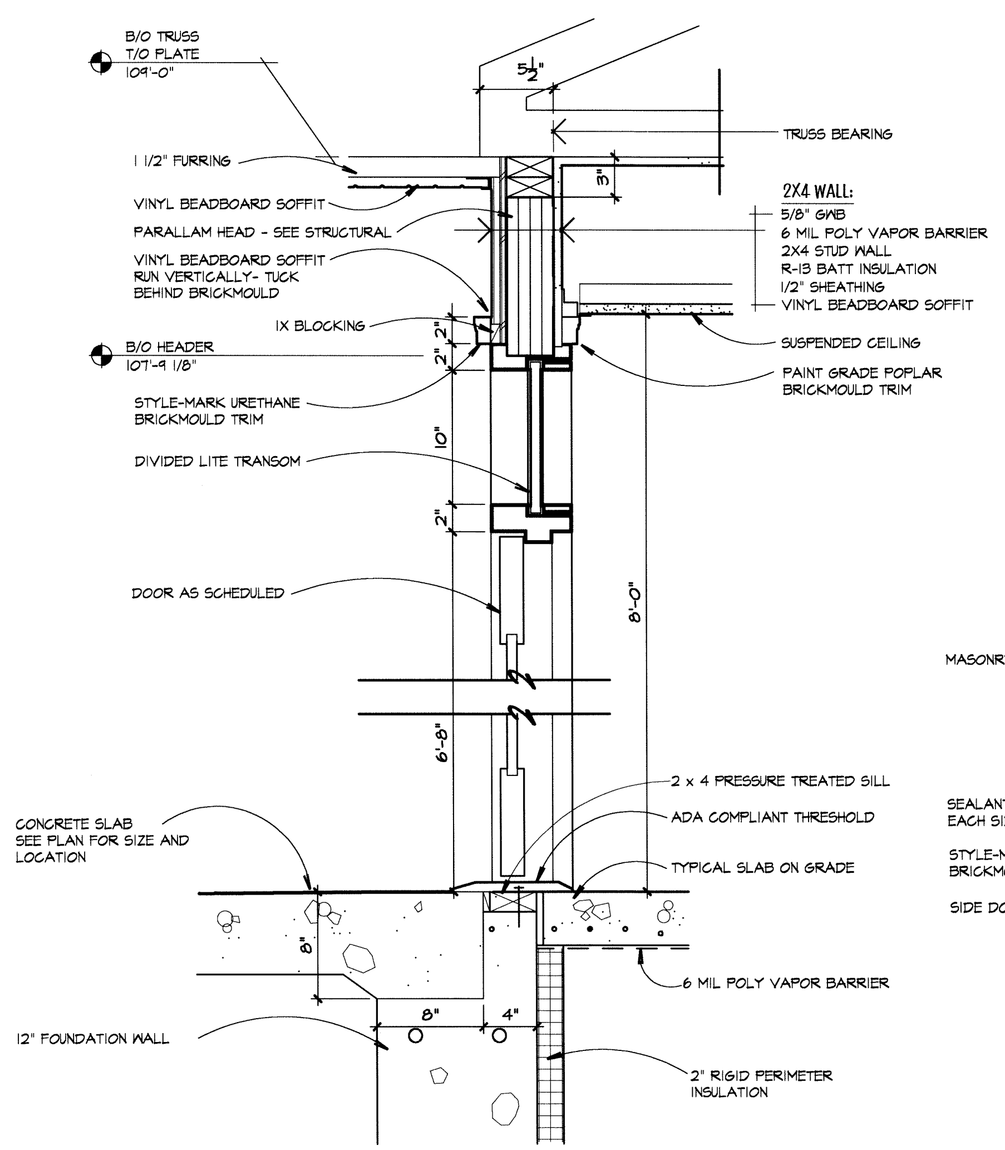
1/4" = 1'-0"



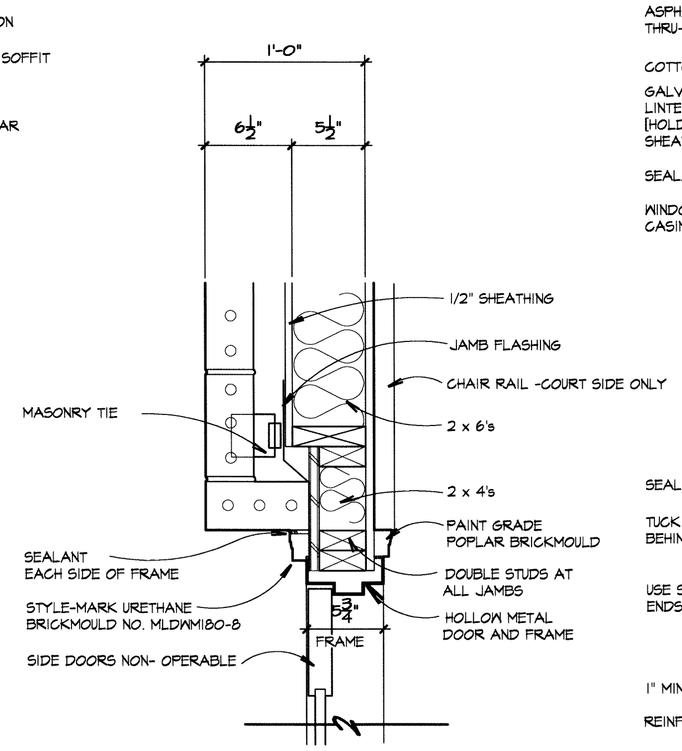
UNIT SIZE IS SHOWN, TYPICAL.
SEE PLANS FOR NOMINAL MASONRY OPENINGS

WINDOW TYPES

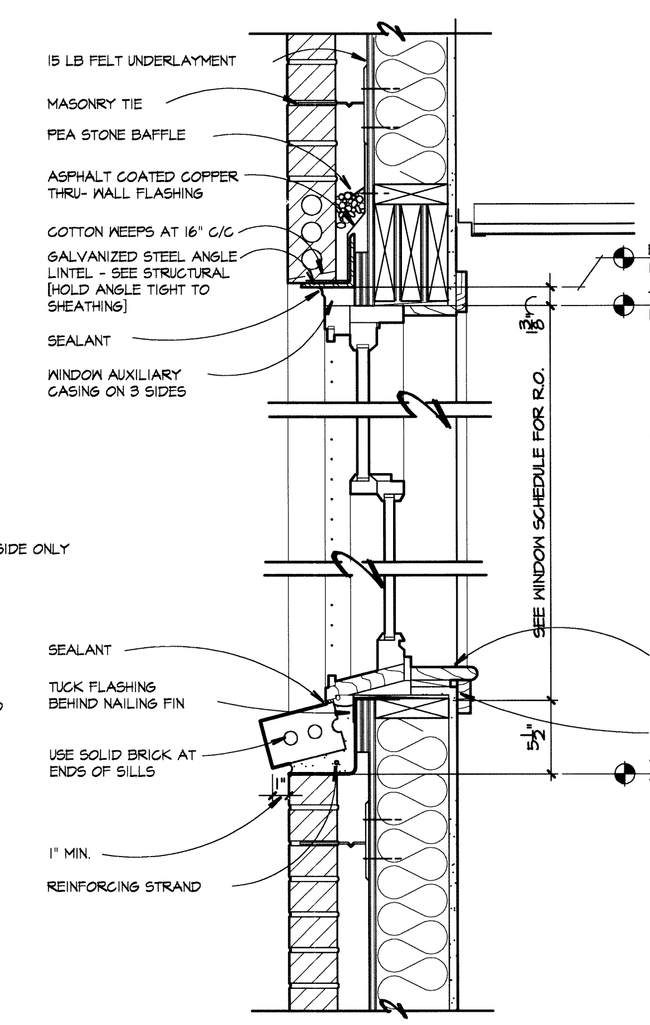
1/4" = 1'-0"



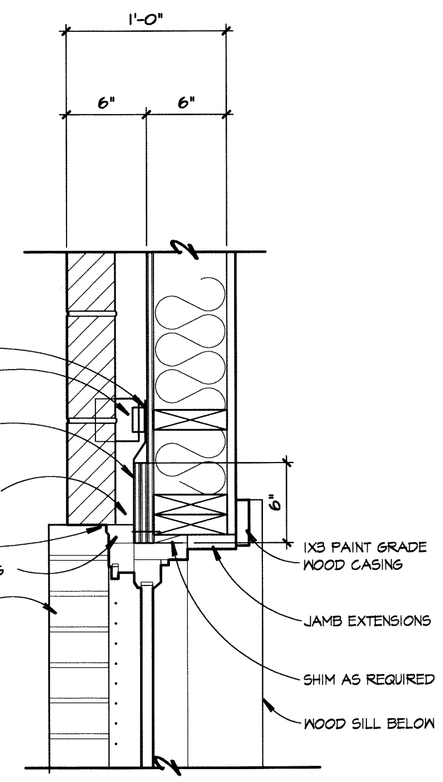
HEAD / SILL



JAMB



HEAD / SILL



JAMB

EXTERIOR DOOR DETAILS

J1 / AO-2

1 1/2" = 1'-0"

EXTERIOR WINDOW DETAILS

J7 / AO-2

1 1/2" = 1'-0"

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RENOVATION AND ADDITION TO THE
TOWN OF NEW LONDON
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MAIN STREET AND SEAMANS ROAD
NEW LONDON, NEW HAMPSHIRE

DIGNARD ARCHITECTURAL SERVICES
156 JOE ENGLISH ROAD
NEW BOSTON, NH 03070

DATE: DECEMBER 14, 1999
DRAWN BY: RD / JN / PV
SUBMITTALS:
12.14.99 - ISSUED FOR PRICING

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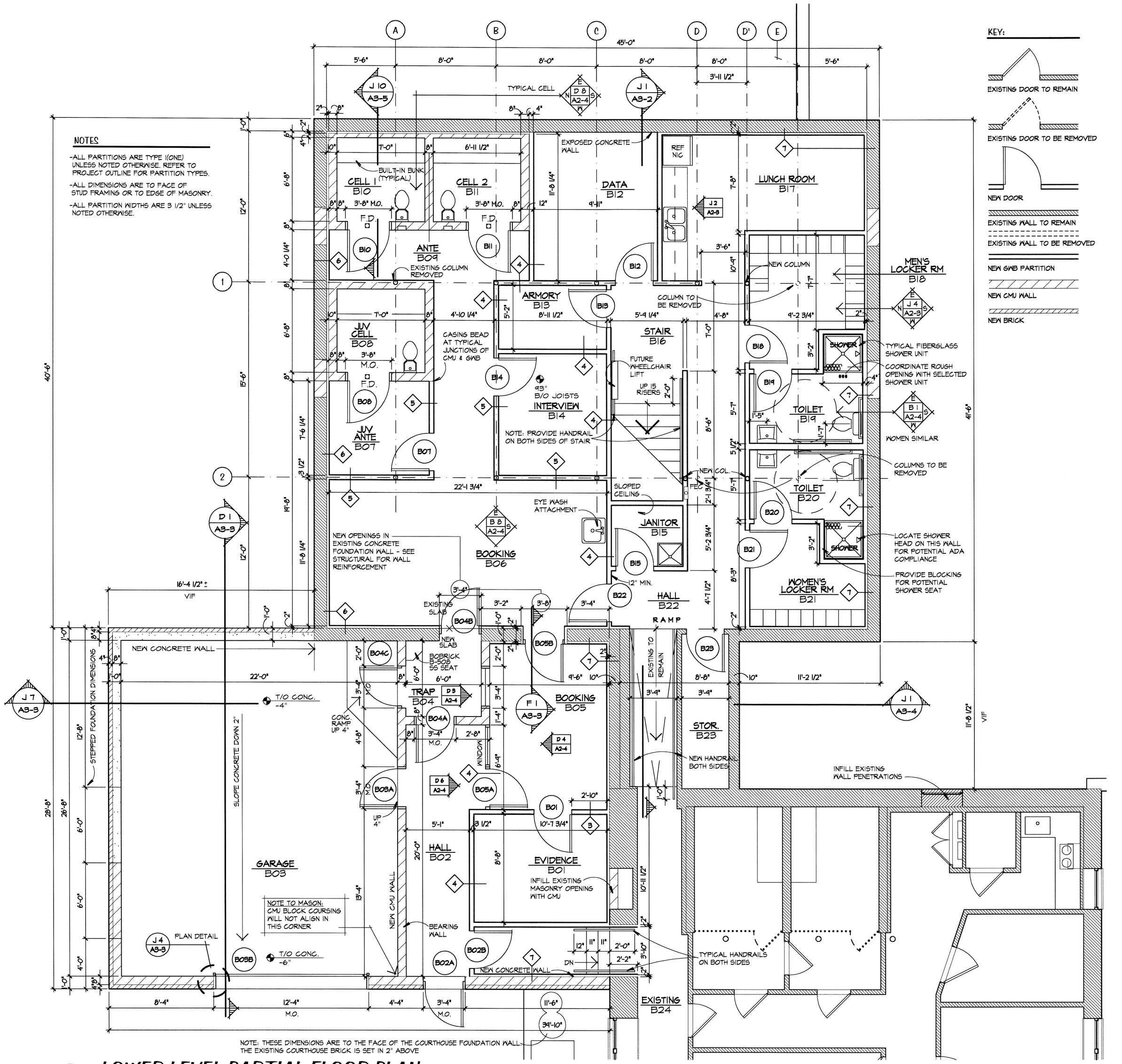
AO-2

WINDOW SCHEDULE
HEAD/JAMB DETAILS

NOTES

- ALL PARTITIONS ARE TYPE 1(ONE) UNLESS NOTED OTHERWISE. REFER TO PROJECT OUTLINE FOR PARTITION TYPES.
- ALL DIMENSIONS ARE TO FACE OF STUD FRAMING OR TO EDGE OF MASONRY.
- ALL PARTITION WIDTHS ARE 3 1/2" UNLESS NOTED OTHERWISE.



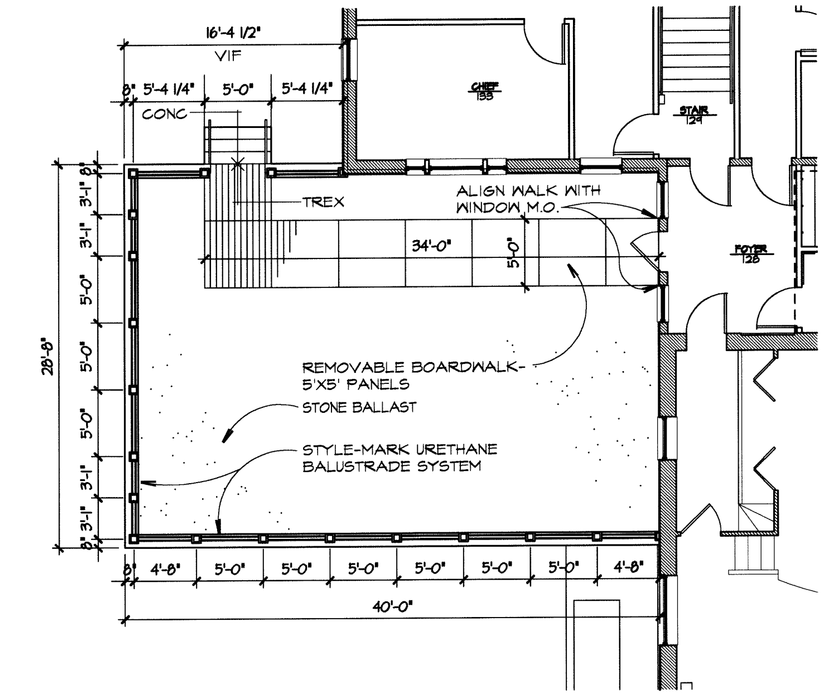
NOTE: THESE DIMENSIONS ARE TO THE FACE OF THE COURTHOUSE FOUNDATION WALL. THE EXISTING COURTHOUSE BRICK IS SET IN 2" ABOVE

J1 / A1-1 **LOWER LEVEL PARTIAL FLOOR PLAN**

1/4" = 1'-0"

KEY:

- EXISTING DOOR TO REMAIN
- EXISTING DOOR TO BE REMOVED
- NEW DOOR
- EXISTING WALL TO REMAIN
- EXISTING WALL TO BE REMOVED
- NEW GWB PARTITION
- NEW CMU WALL
- NEW BRICK



D10 / A1-1 **SALLYPORT ROOF PLAN**

1/8" = 1'-0"

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RENOVATION AND ADDITION TO THE
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NEW LONDON, NEW HAMPSHIRE

DIGNARD ARCHITECTURAL SERVICES
156 JOE ENGLISH ROAD
NEW BOSTON, NH 03070

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SUBMITTALS:
12.14.99 - ISSUED FOR PRICING

REVISIONS:

A1-1

BASEMENT PLAN

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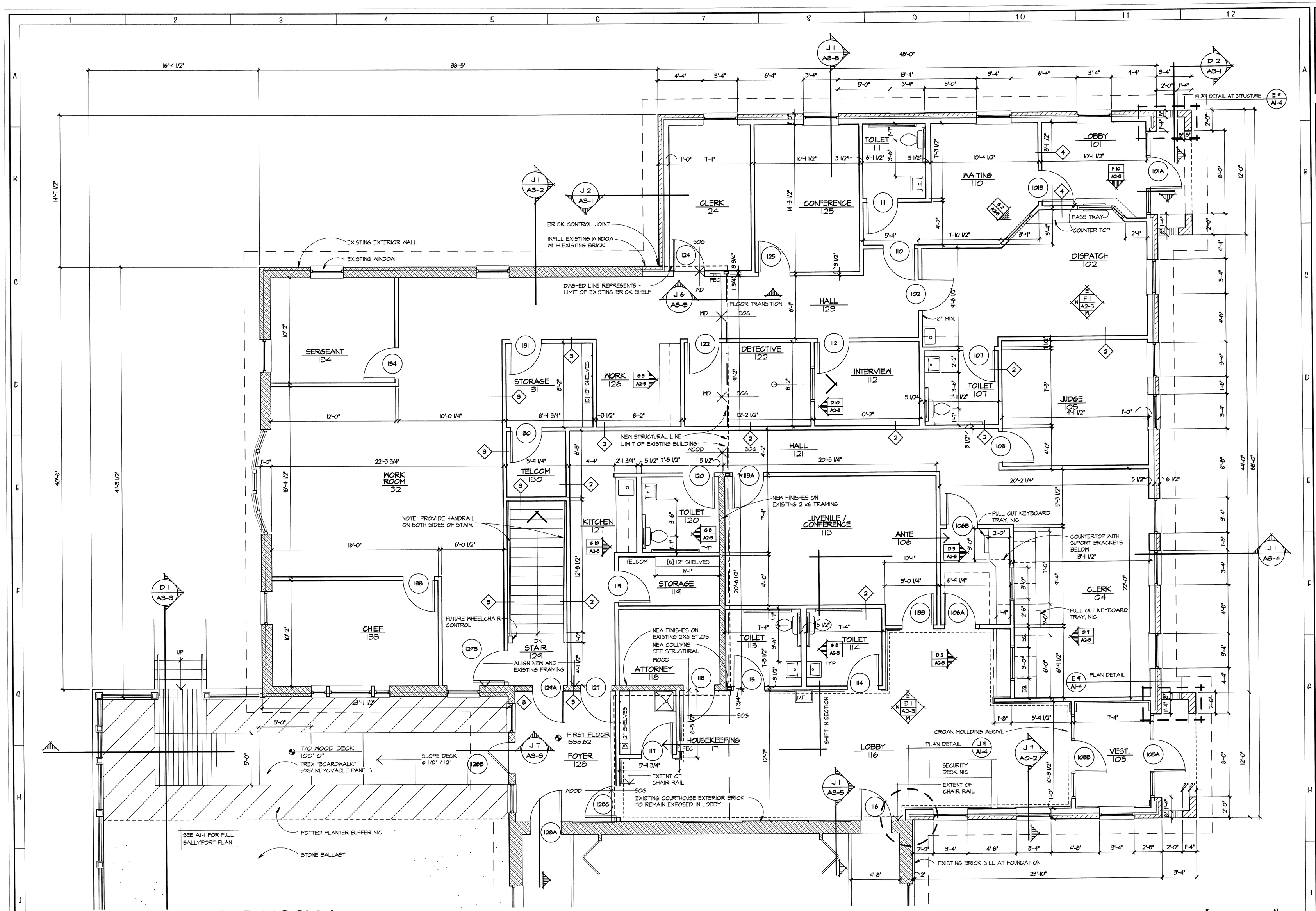

PARTIAL FIRST FLOOR PLAN

J1 / A1-2

1/4" = 1'-0"

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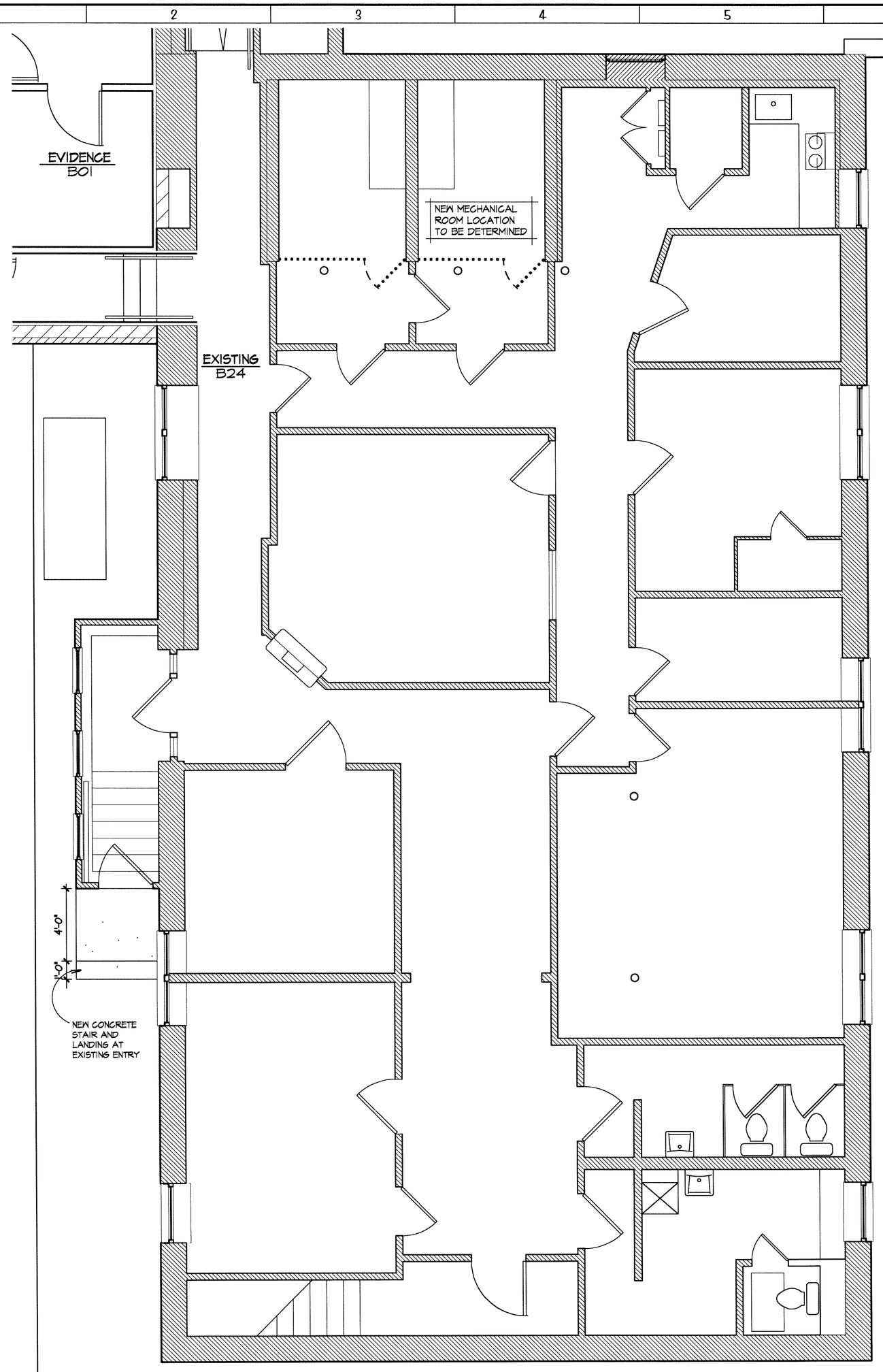
REVISIONS:

A1-2

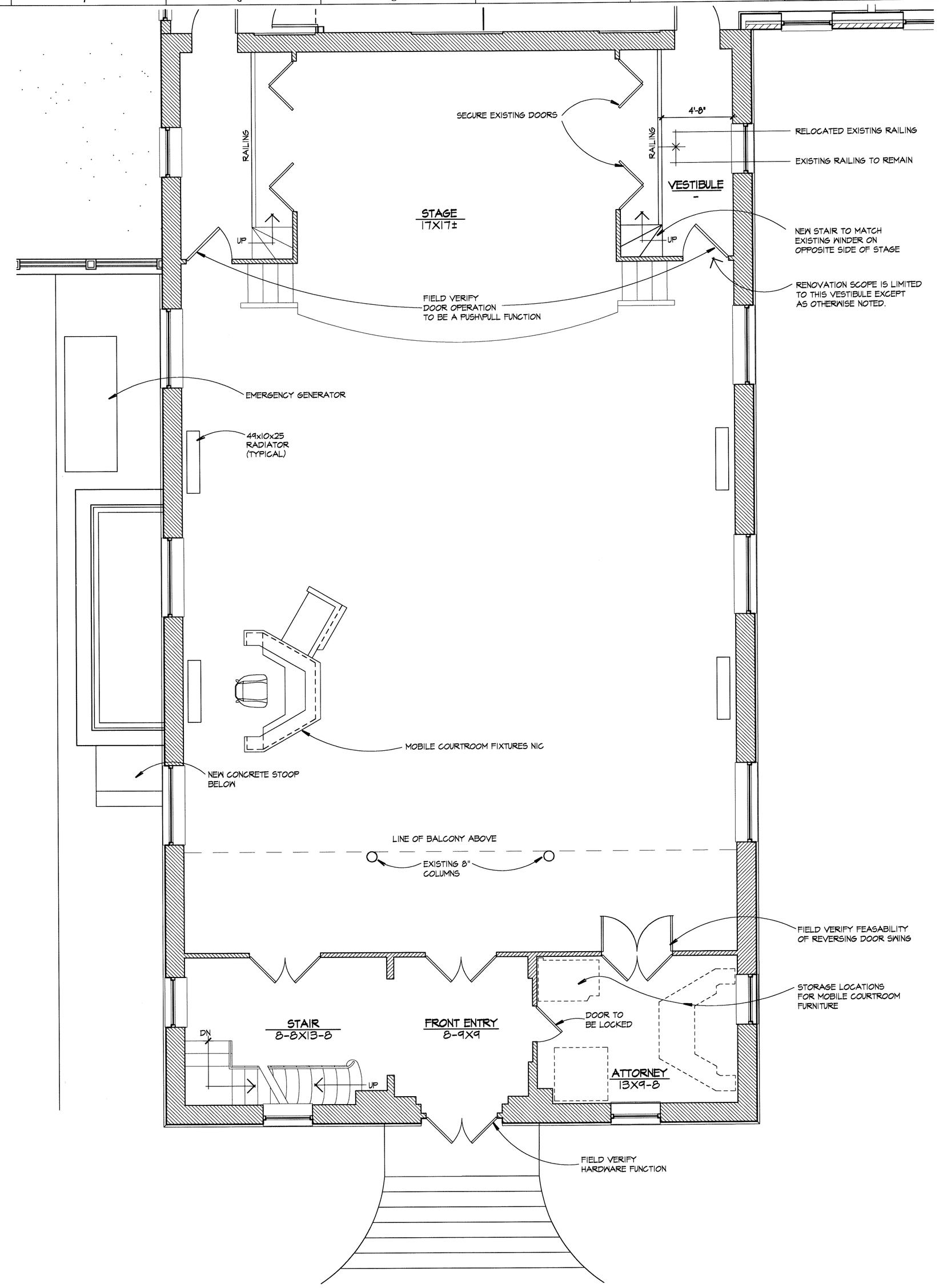
FIRST FLOOR PLAN



RENOVATION SCOPE OF EXISTING BASEMENT IS LIMITED TO ONLY THOSE ITEMS SPECIFICALLY NOTED.

J1 / A1-3 **COURTHOUSE BASEMENT**

1/4" = 1'-0"



J7 / A1-3 **COURTHOUSE FIRST FLOOR**

1/4" = 1'-0"

project north

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RENOVATION AND ADDITION TO THE
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156 JOE ENGLISH ROAD
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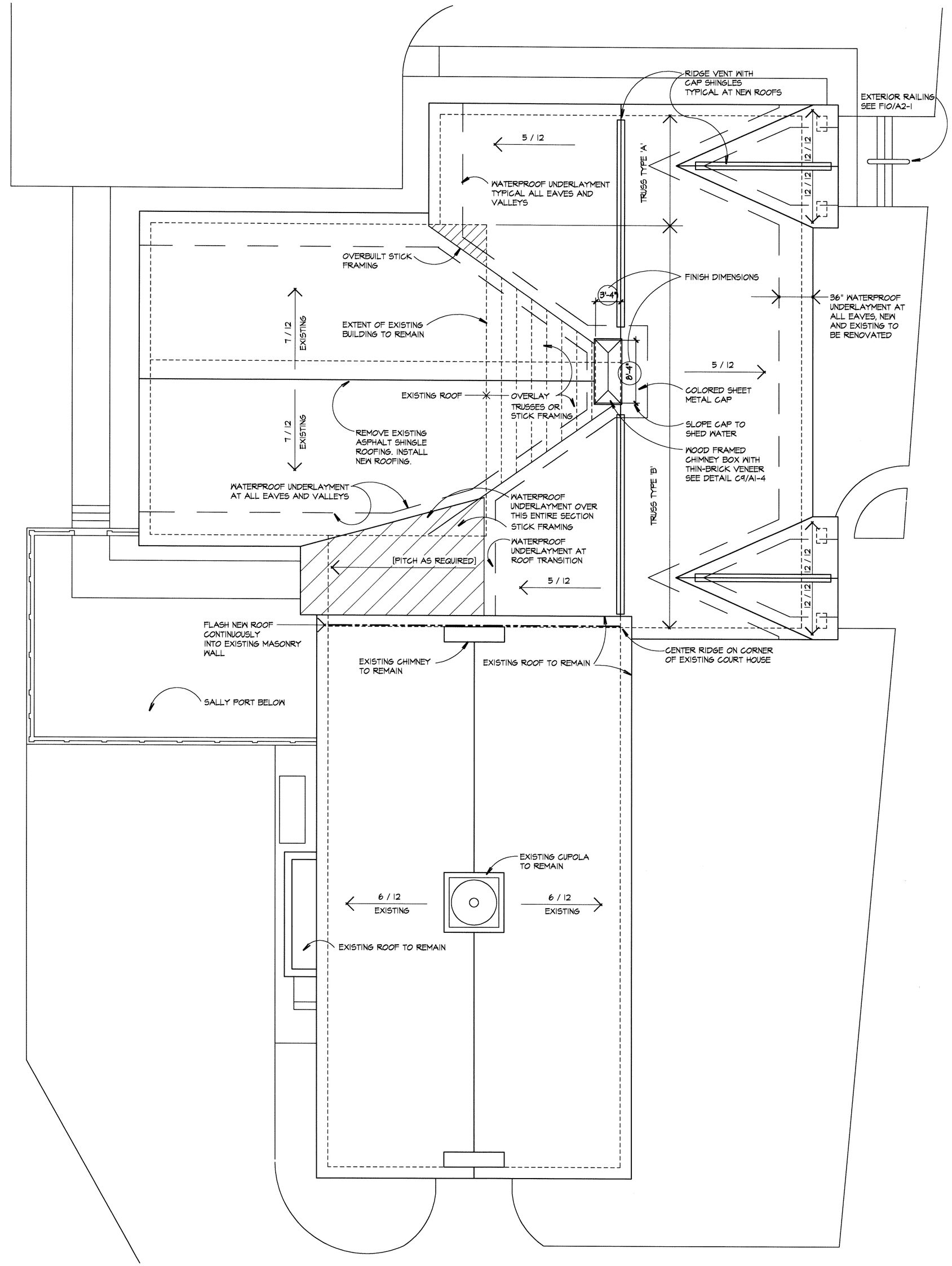
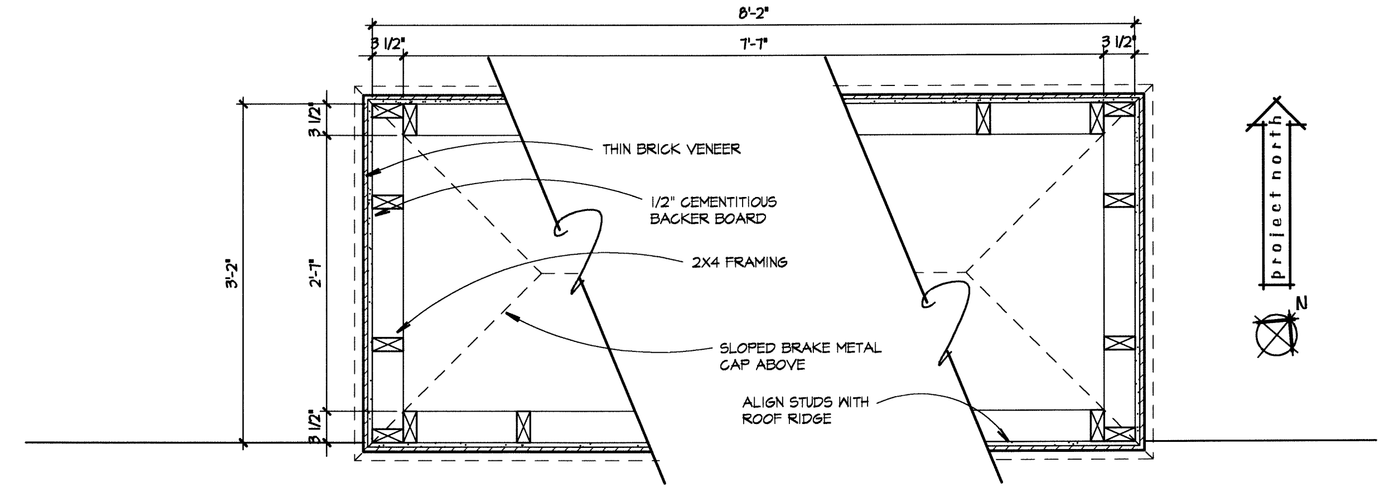
REVISIONS:

A1-3

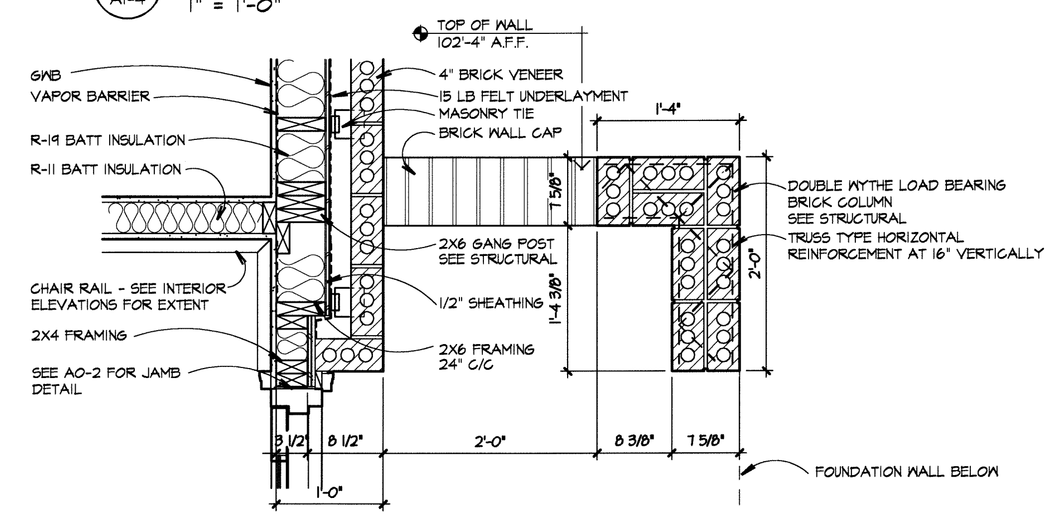
COURTHOUSE PLANS



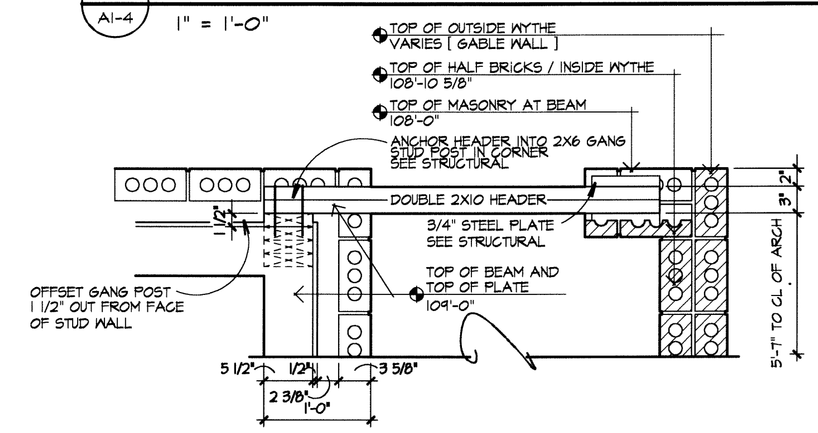
J1 / A1-4 **ROOF PLAN**
1/8" = 1'-0"



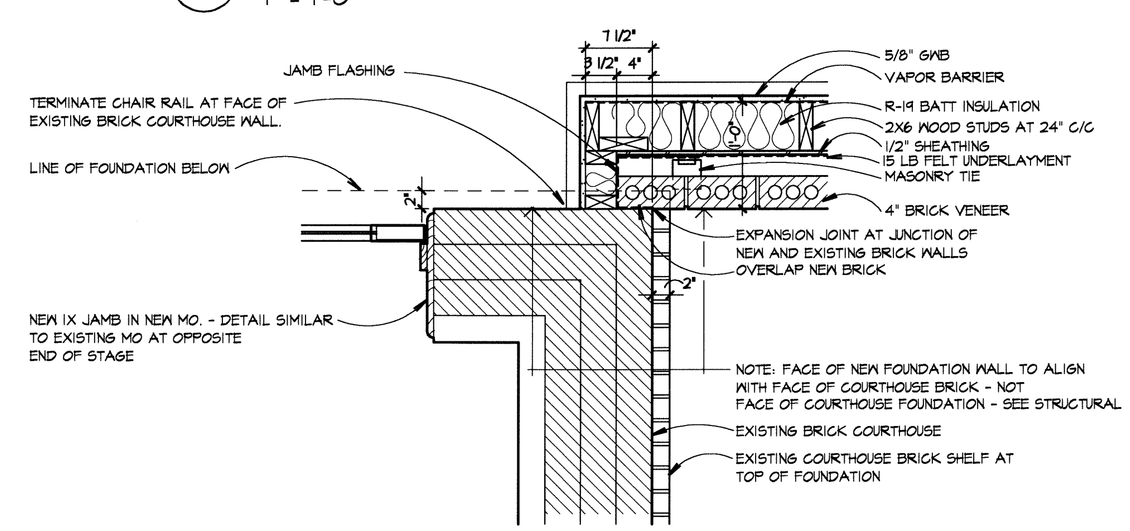
C9 / A1-4 **CHIMNEY PLAN**
1" = 1'-0"



E9 / A1-4 **ENTRANCE MASONRY DETAIL**
1" = 1'-0"



G9 / A1-4 **CANOPY PLAN DETAIL AT STRUCTURE**
1" = 1'-0"



J9 / A1-4 **COURTHOUSE / ADDITION TRANSITION**
1" = 1'-0"

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DATE: DECEMBER 14, 1999
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SUBMITTALS:
12.14.99 - ISSUED FOR PRICING

REVISIONS:

A1-4
ROOF PLAN

KEY:

- $ SINGLE POLE SWITCH
- $3 3 POLE SWITCH
- EXIT SIGN
- DIRECTIONAL CAN LIGHT
- FLUORESCENT CAN LIGHT
- WALL MOUNTED LIGHT
- SURFACE MOUNTED CEILING FIXTURE
- 2X2 RECESSED PARABOLIC
- 2X4 RECESSED PARABOLIC
- 1X4 RECESSED PARABOLIC
- SURFACE MOUNTED FIXTURE SEE FIXTURE SCHEDULE
- UNDER COUNTER STRIP FLUORESCENT
- FAN

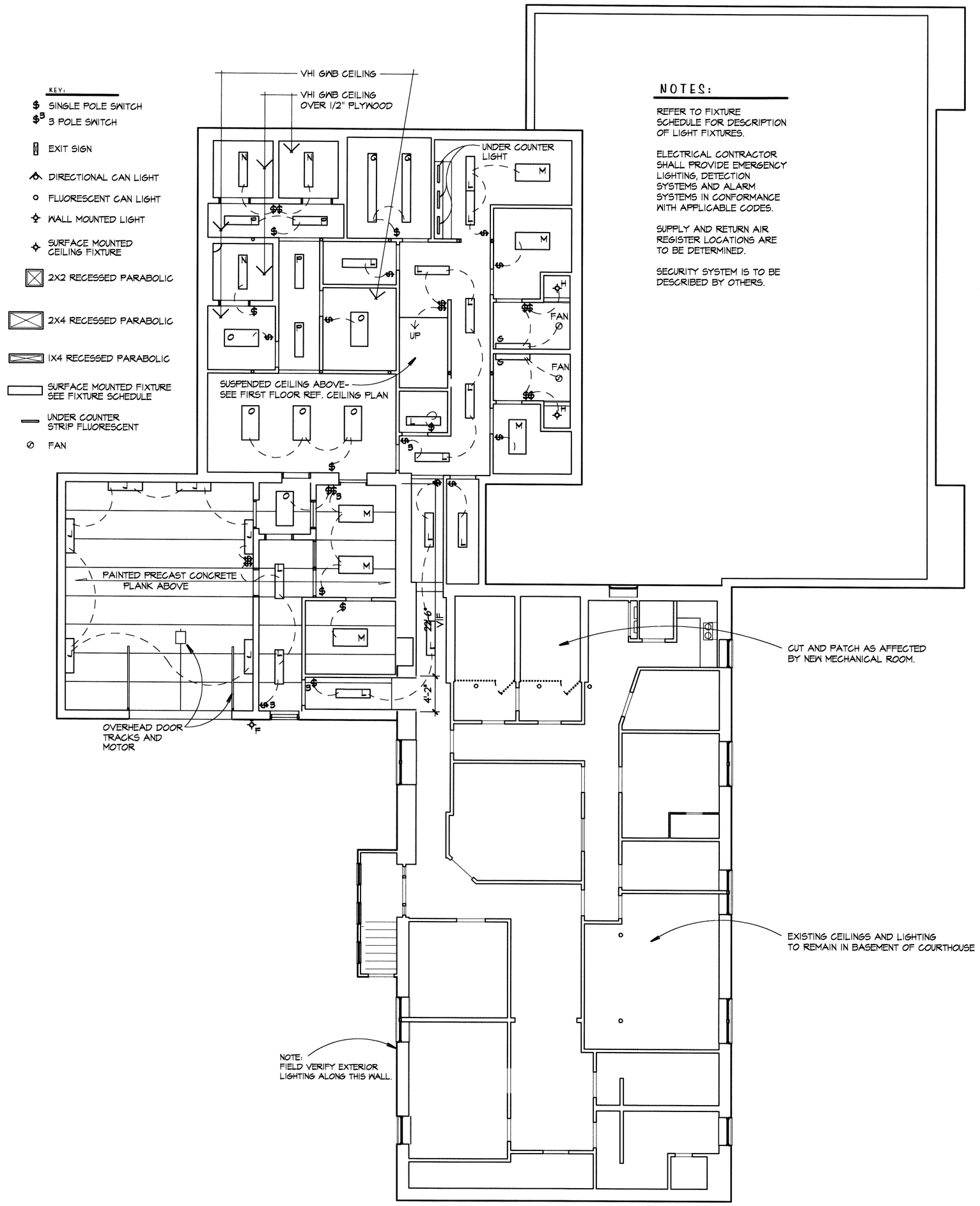
NOTES:

REFER TO FIXTURE SCHEDULE FOR DESCRIPTION OF LIGHT FIXTURES.

ELECTRICAL CONTRACTOR SHALL PROVIDE EMERGENCY LIGHTING, DETECTION SYSTEMS AND ALARM SYSTEMS IN CONFORMANCE WITH APPLICABLE CODES.

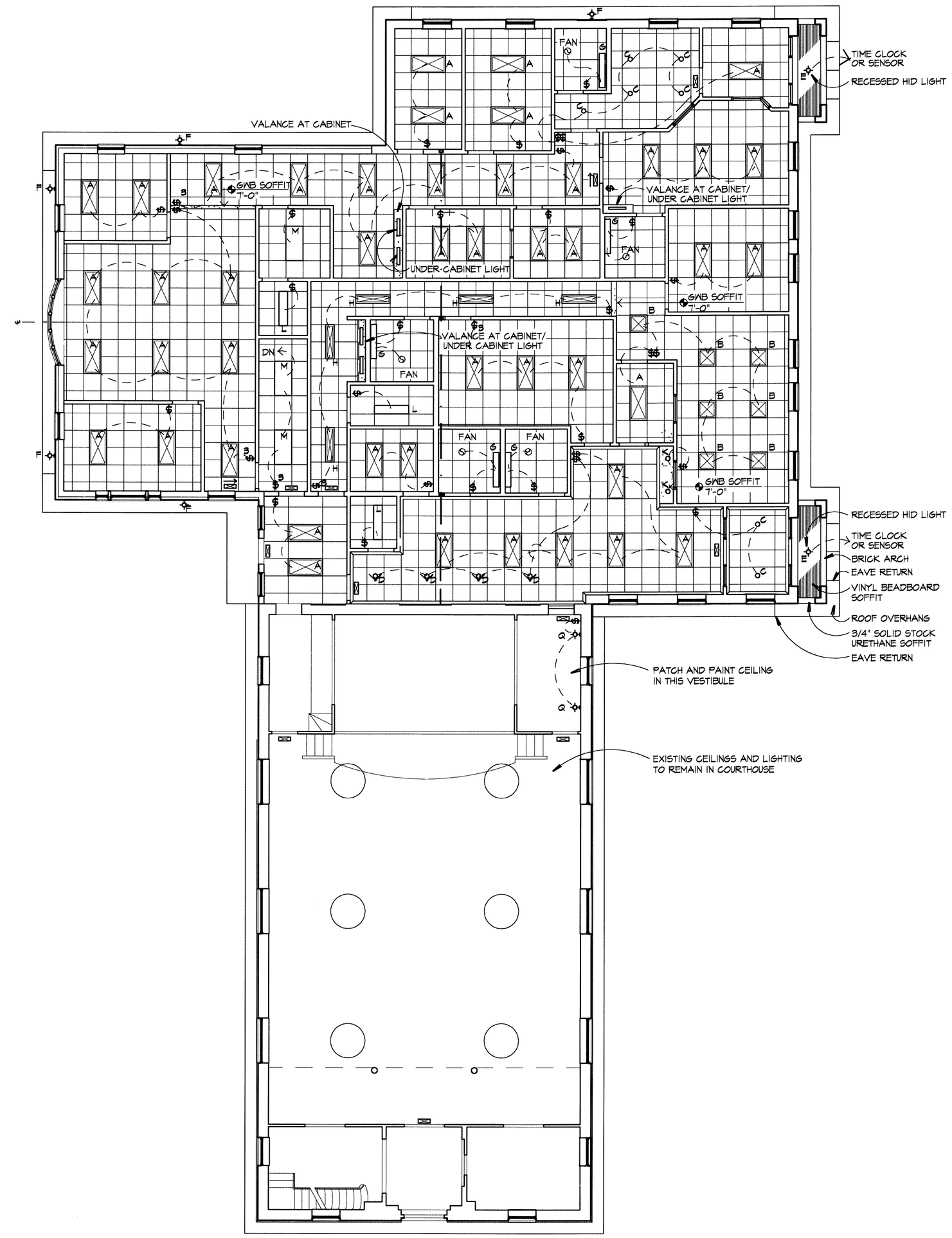
SUPPLY AND RETURN AIR REGISTER LOCATIONS ARE TO BE DETERMINED.

SECURITY SYSTEM IS TO BE DESCRIBED BY OTHERS.



J1 / A1-5 **BASEMENT REFLECTED CEILING PLAN**

1/8" = 1'-0"



J8 / A1-5 **FIRST FLOOR REFLECTED CEILING PLAN**

1/8" = 1'-0"

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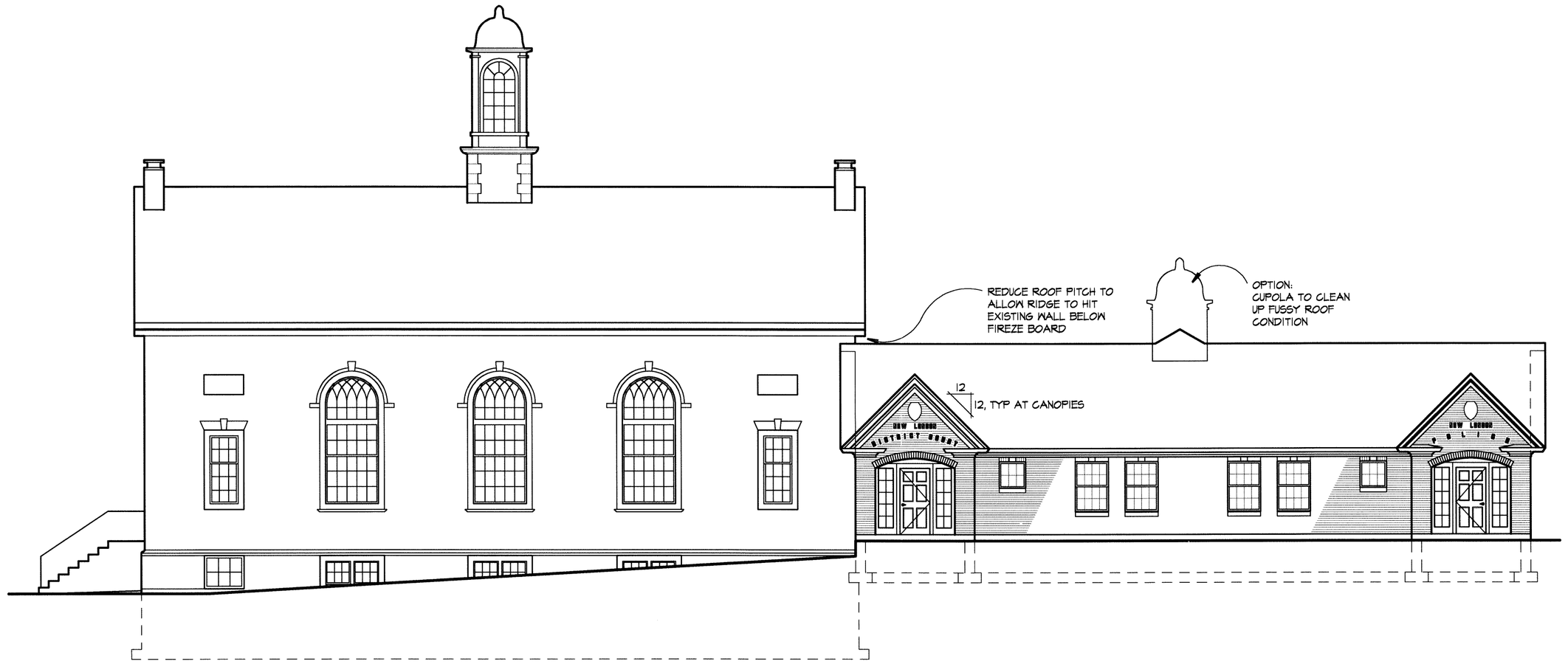
REVISIONS:

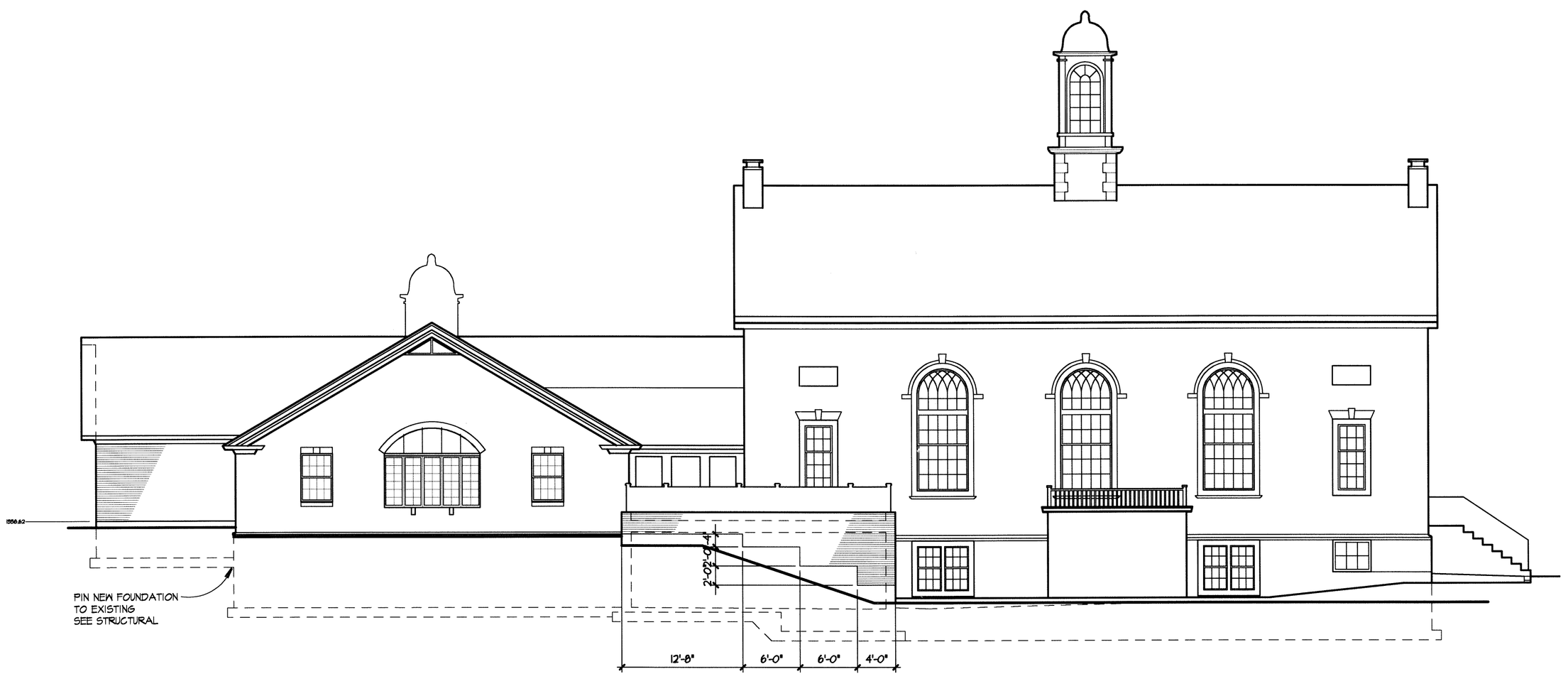
A1-5

REF. CEILING PLANS



1 / A2-1 **SOUTH ELEVATION**

1/8" = 1'-0"



2 / A2-1 **NORTH ELEVATION**

1/8" = 1'-0"

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DIGNARD ARCHITECTURAL SERVICES
156 JOE ENGLISH ROAD
NEW BOSTON, NH 03070

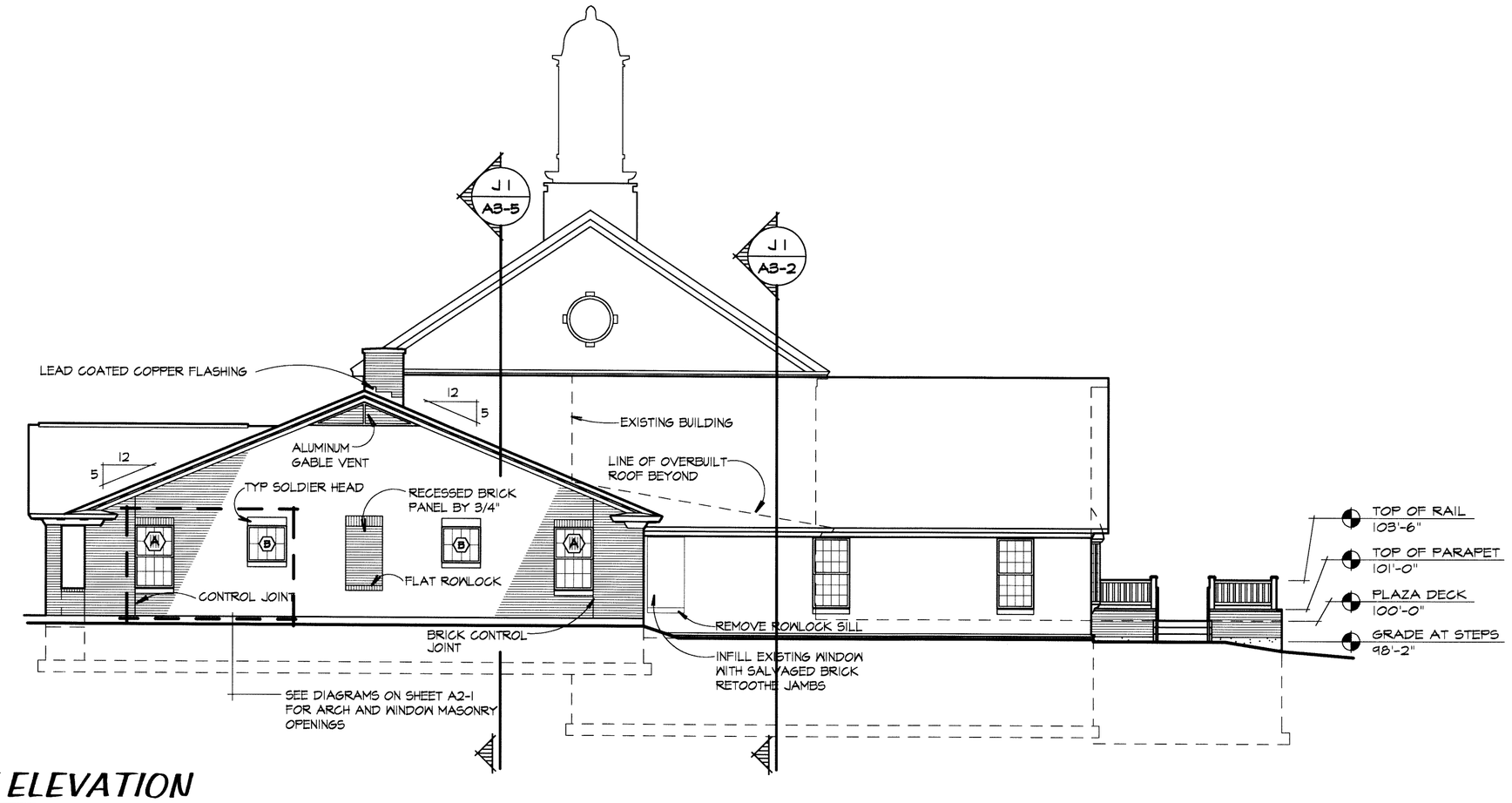
DATE: NOVEMBER 9, 1999
DRAWN BY: RD / JN / PV
SUBMITTALS.

REVISIONS.

PROGRESS
NOT FOR CONSTRUCTION

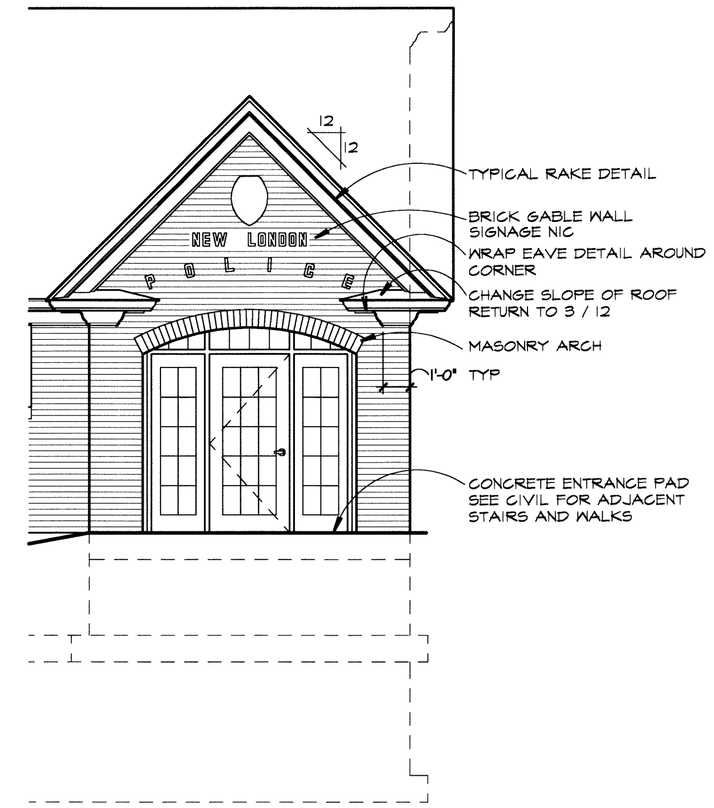
A2-1

BUILDING ELEVATIONS



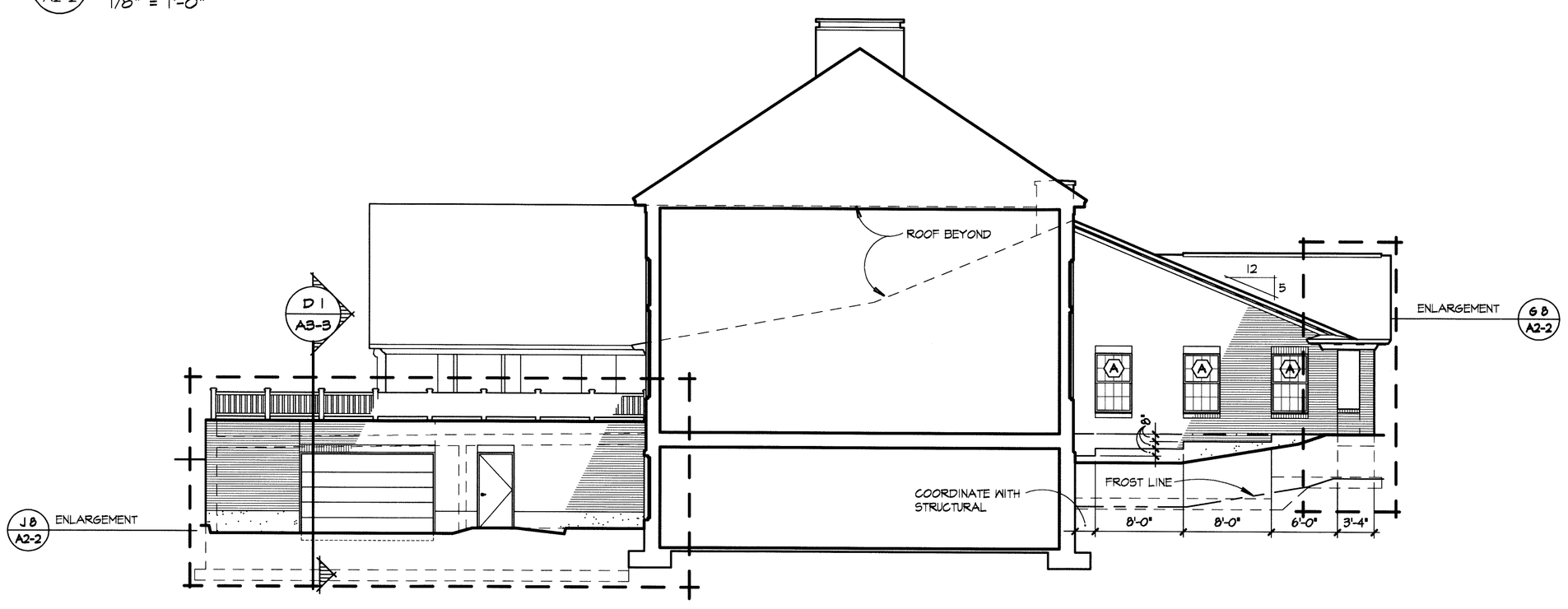
D 1 / A2-2 **EAST ELEVATION**

1/8" = 1'-0"



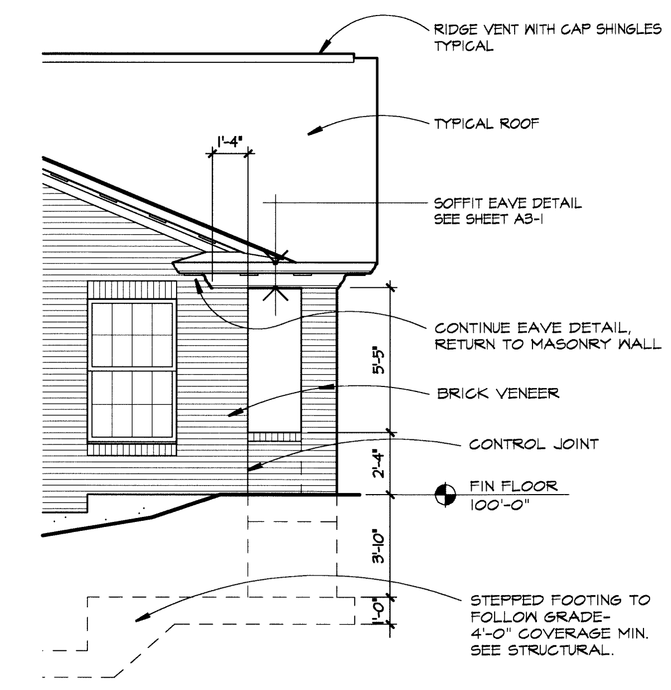
D 8 / A2-2 **ENTRY GABLE ENLARGEMENT**

1/4" = 1'-0"



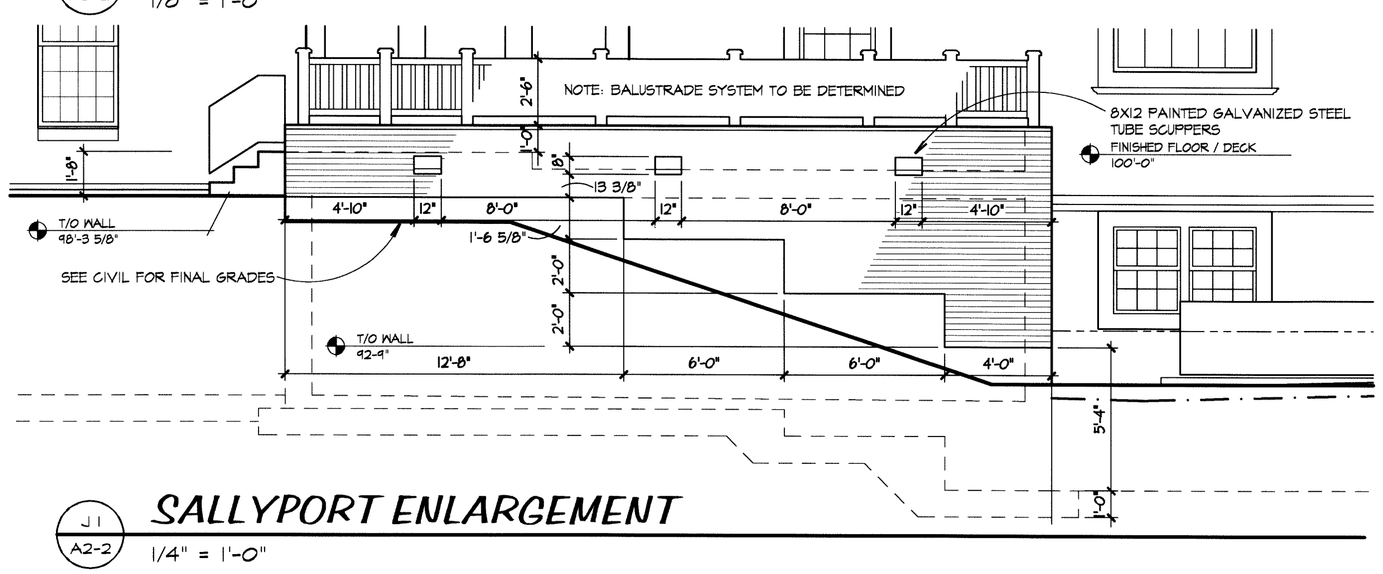
G 1 / A2-2 **WEST ELEVATION**

1/8" = 1'-0"



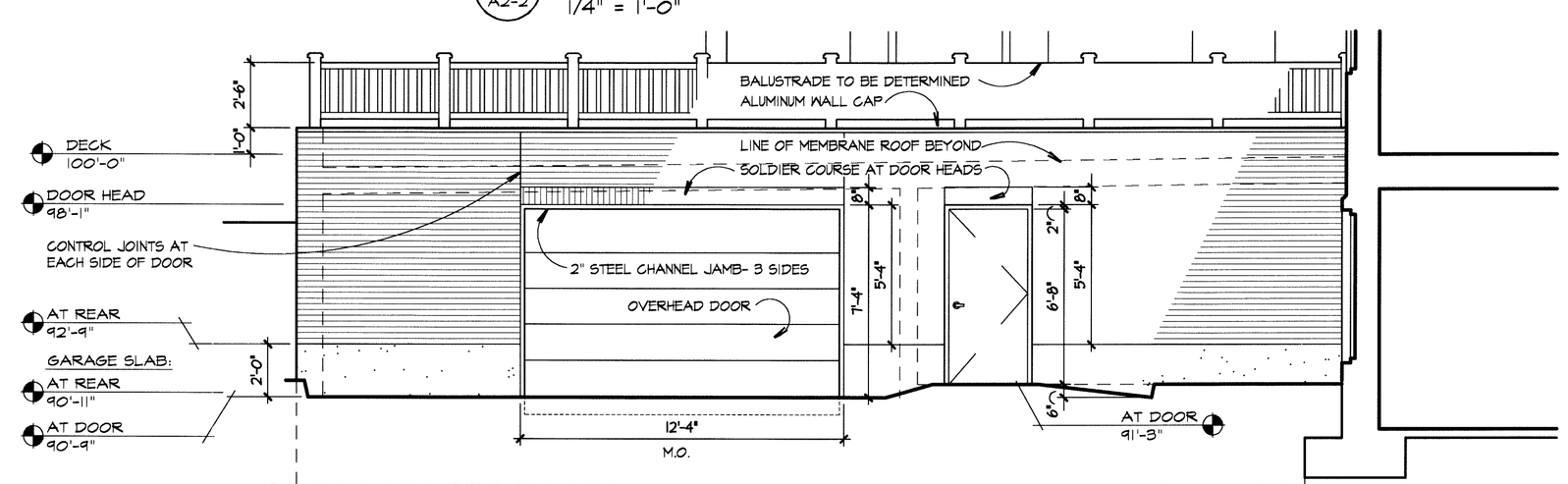
G 8 / A2-2 **ENTRY ENLARGEMENT**

1/4" = 1'-0"



J 1 / A2-2 **SALLYPORT ENLARGEMENT**

1/4" = 1'-0"



J 8 / A2-2 **SALLYPORT ENLARGEMENT**

1/4" = 1'-0"

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RENOVATION AND ADDITION TO THE
TOWN OF NEW LONDON POLICE STATION AND DISTRICT COURT
MAIN STREET AND SEAMANS ROAD
NEW LONDON, NEW HAMPSHIRE

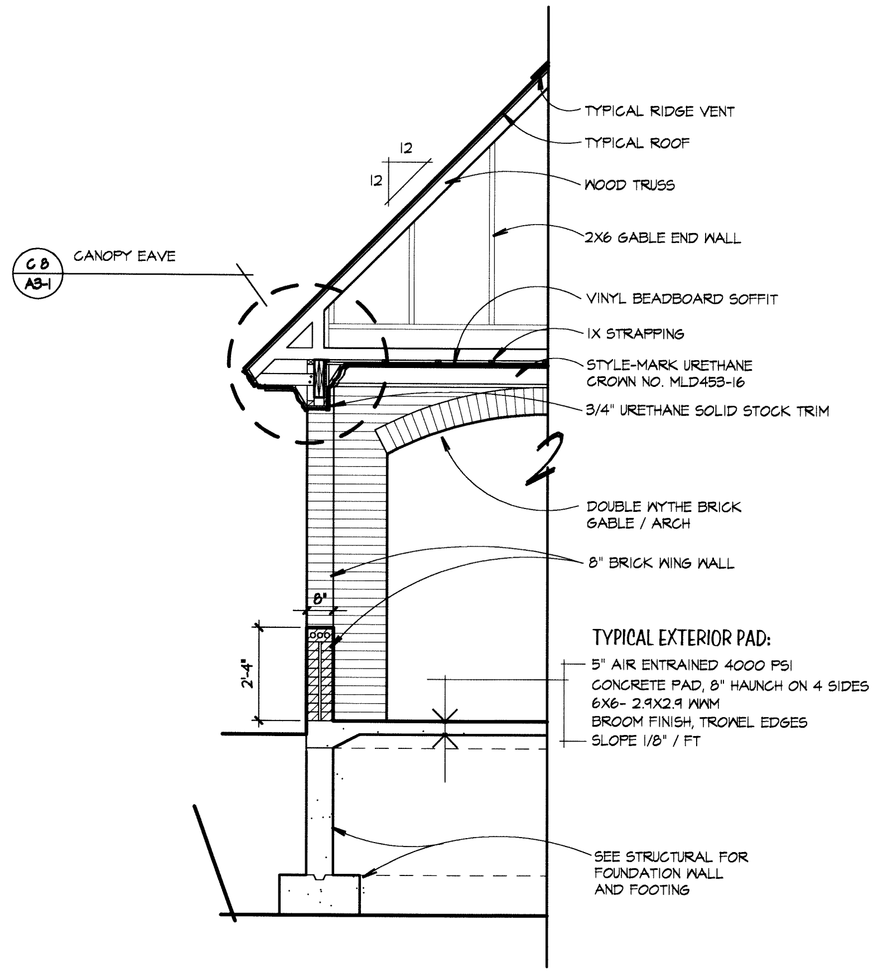
DIGNARD ARCHITECTURAL SERVICES
156 JOE ENGLISH ROAD
NEW BOSTON, NH 03070

DATE: DECEMBER 14, 1999
DRAWN BY: RD / JN / PV
SUBMITTALS:
12.14.99 - ISSUED FOR PRICING

REVISIONS:

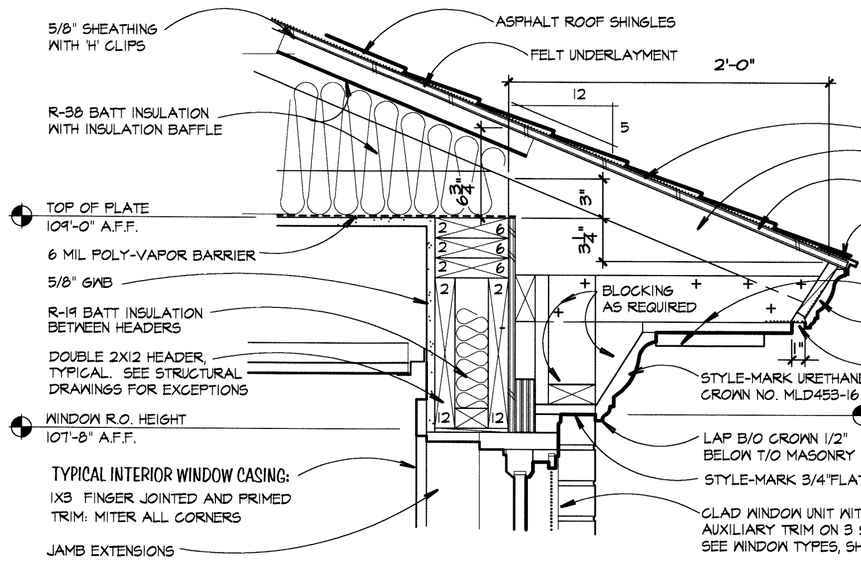
A2-2

BUILDING ELEVATIONS



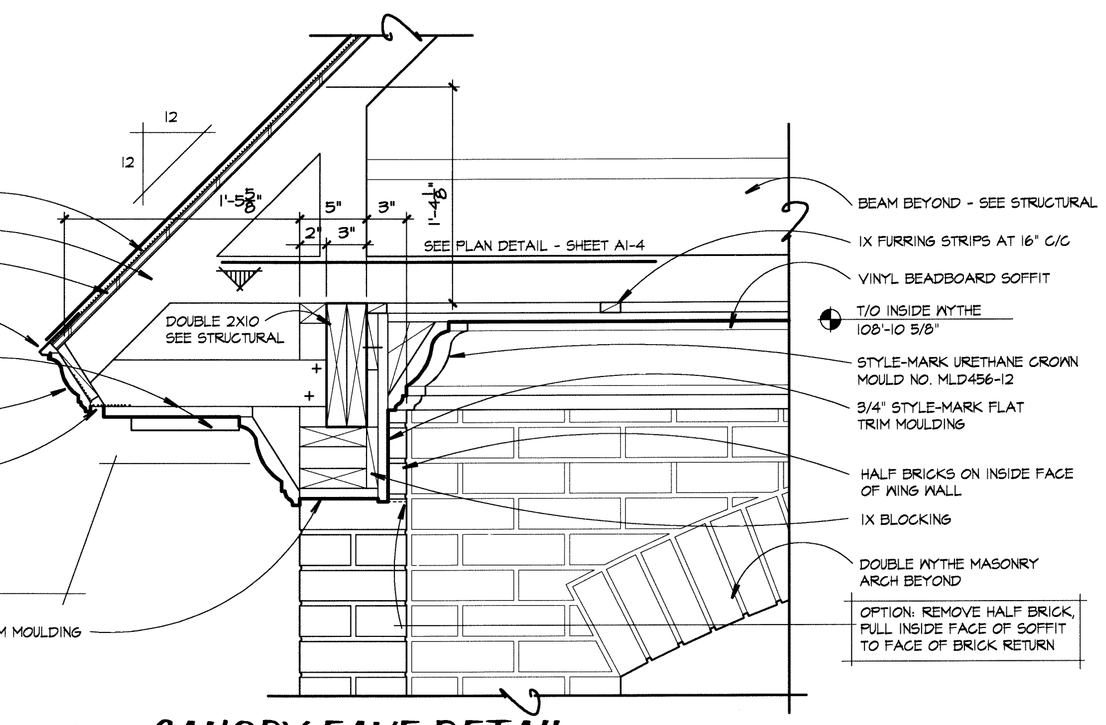
SECTION THRU CANOPY

D 2 / A3-1 3/8" = 1'-0"



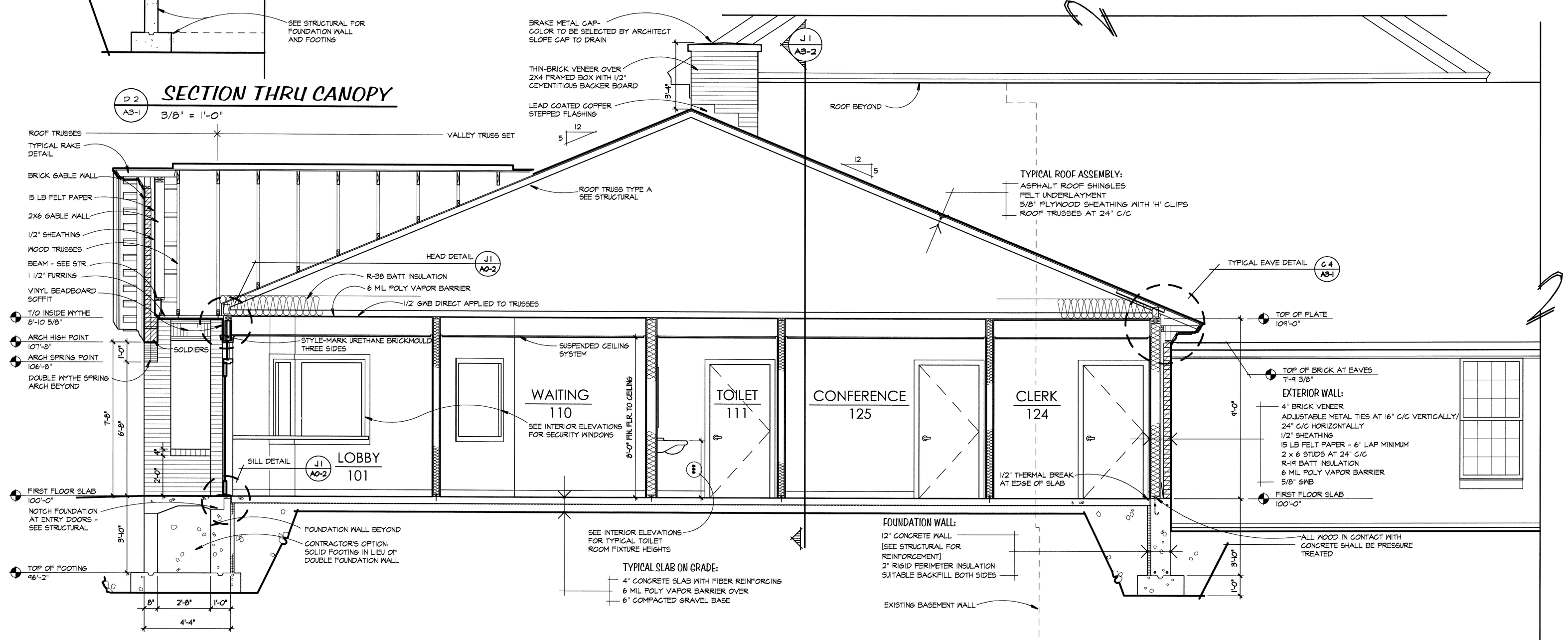
TYPICAL EAVE DETAIL

C 4 / A3-1 1 1/2" = 1'-0"



CANOPY EAVE DETAIL

C 8 / A3-1 1 1/2" = 1'-0"



BUILDING SECTION

J 2 / A3-1 3/8" = 1'-0"

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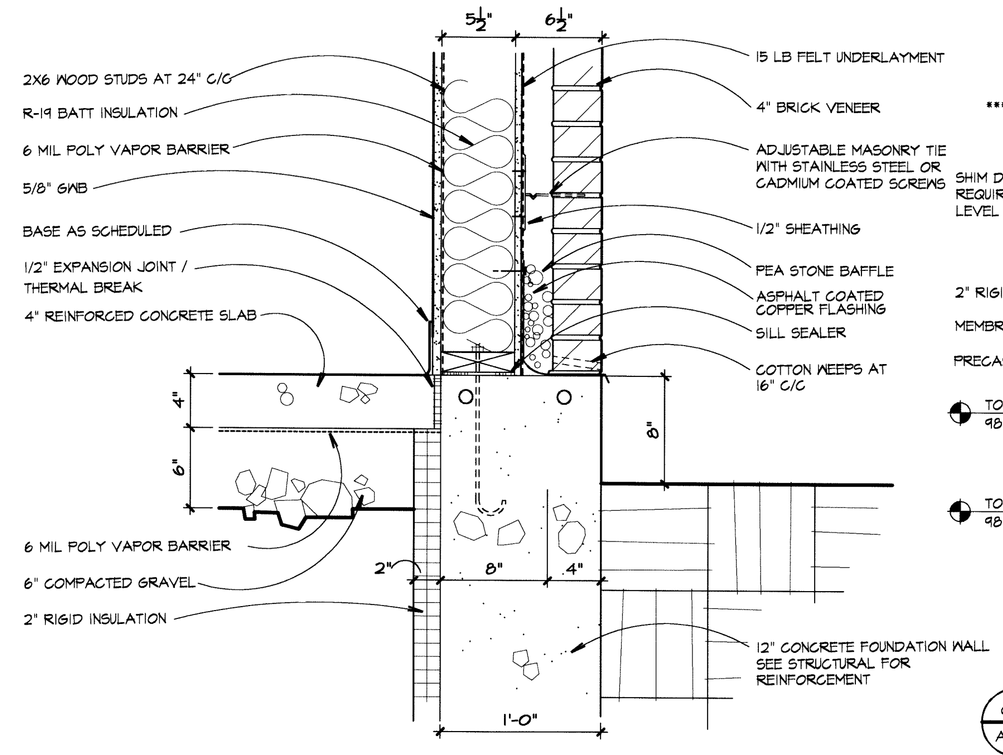
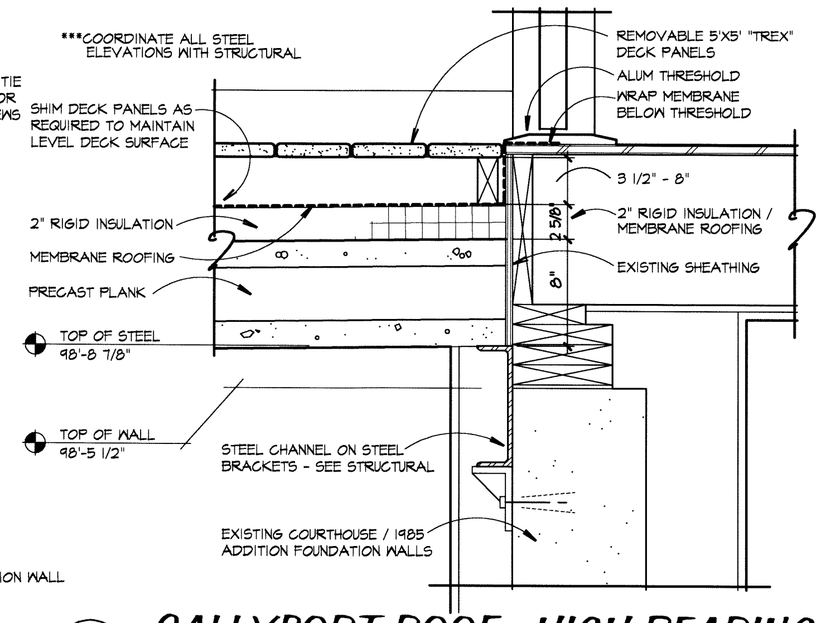
REVISIONS:

A3-1

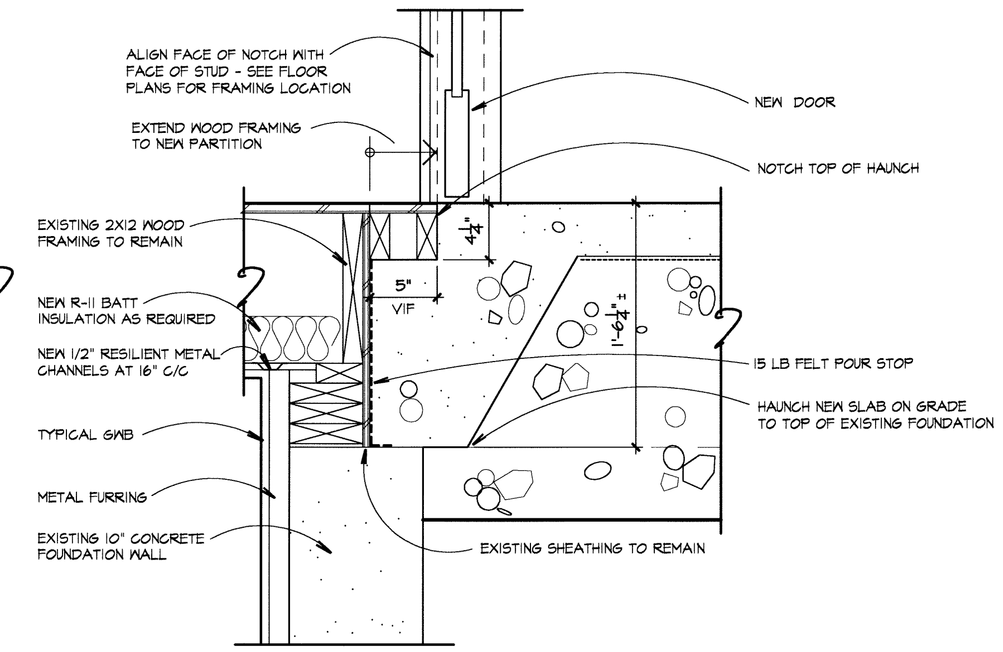
BUILDING SECTION



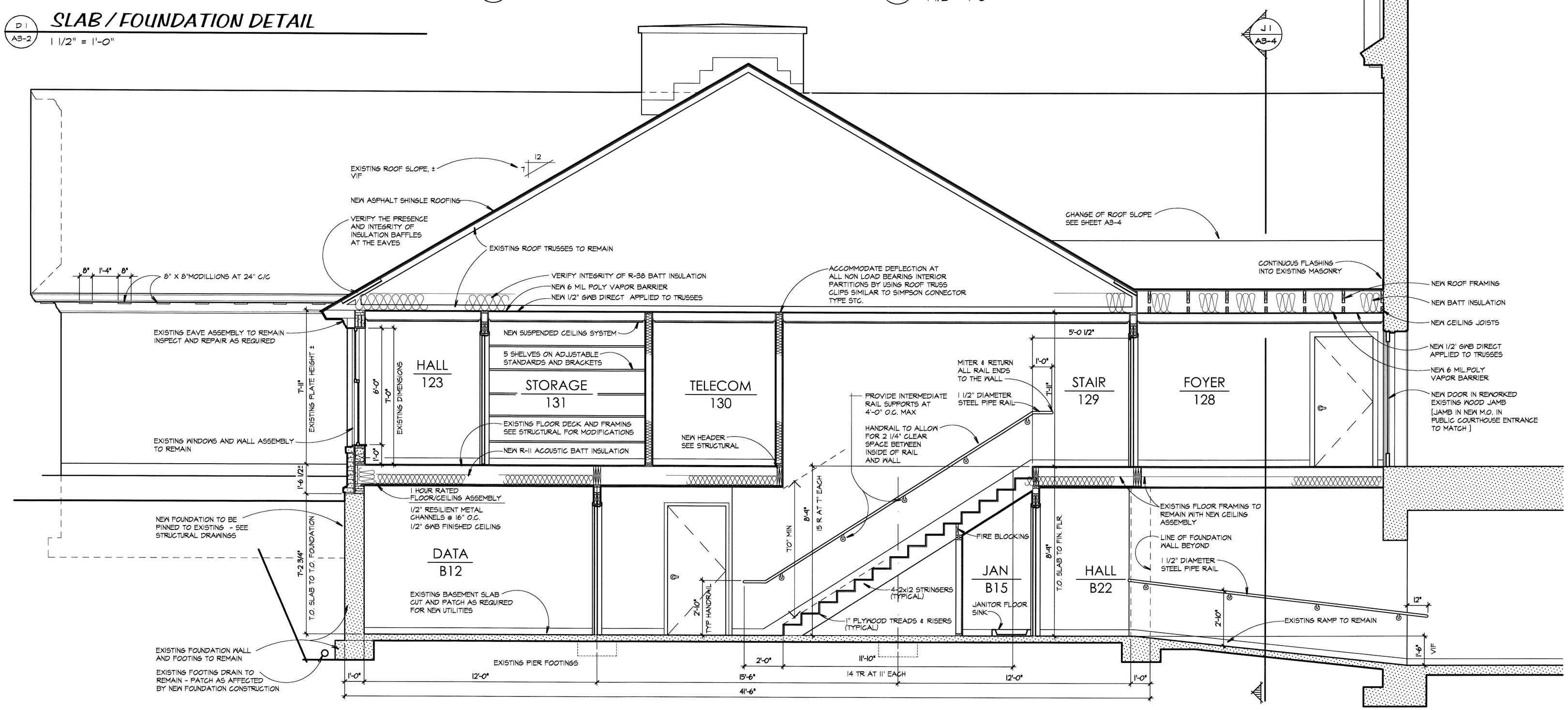
D 1 / A3-2 **SLAB / FOUNDATION DETAIL**
1 1/2" = 1'-0"



C 4 / A3-2 **SALLYPORT ROOF - HIGH BEARING**
1 1/2" = 1'-0"



C 7 / A3-2 **WOOD / SLAB TRANSITION**
1 1/2" = 1'-0"



J 1 / A3-2 **BUILDING SECTION**
3/8" = 1'-0"

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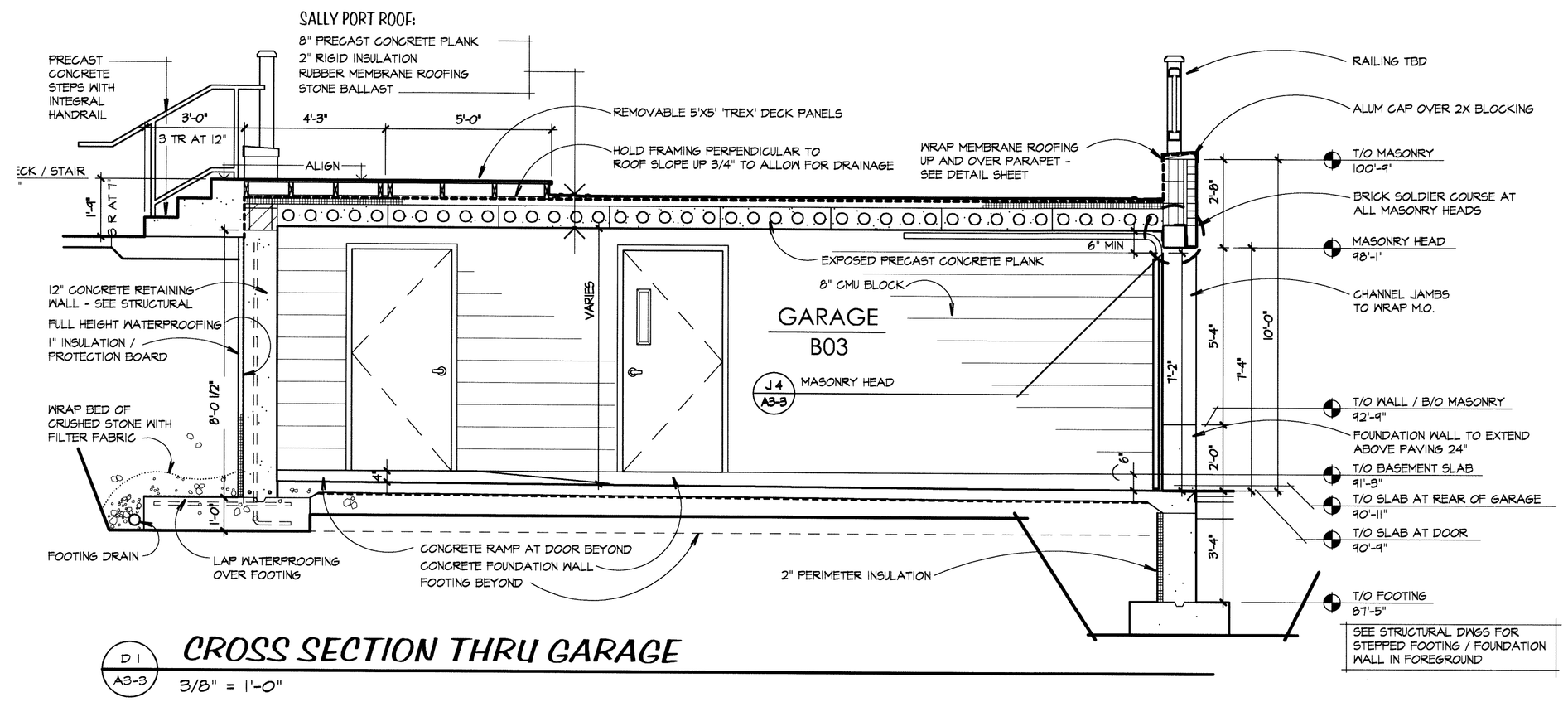
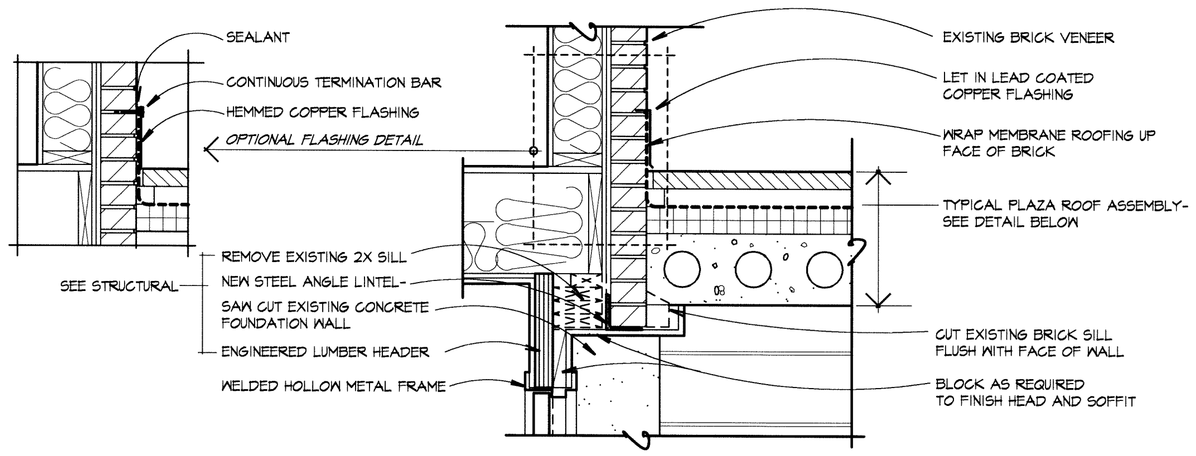
A3-2

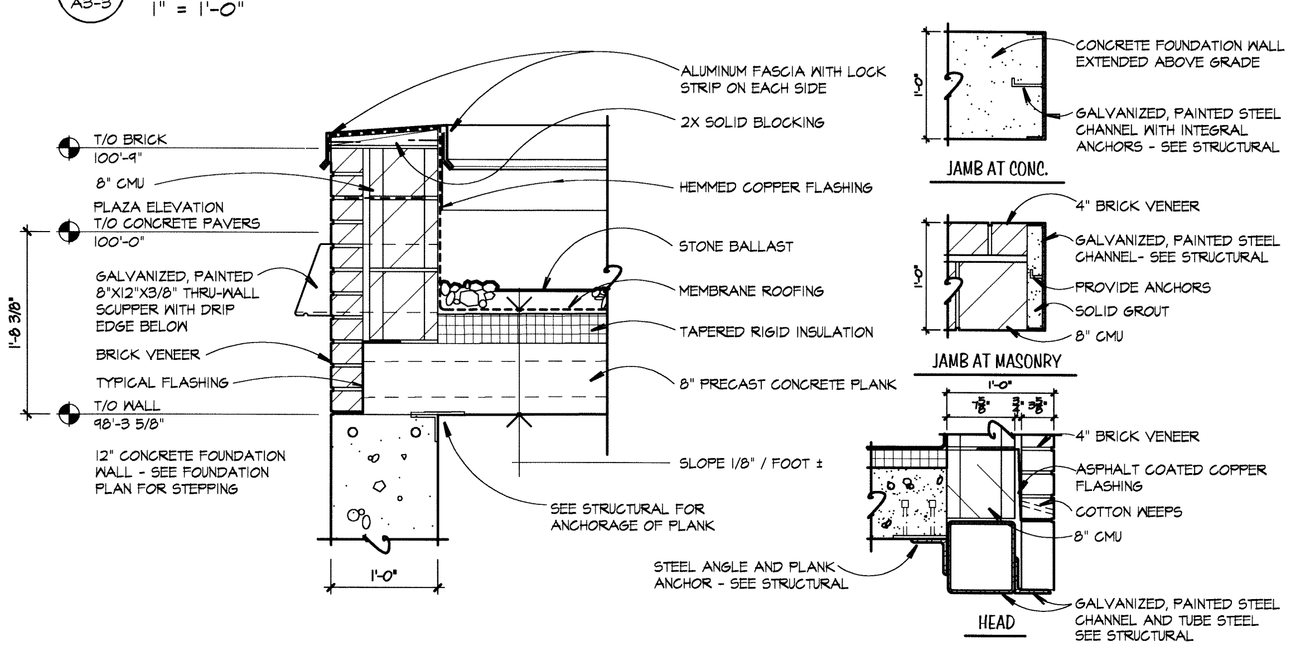
BUILDING SECTION



D1 / A3-3 **CROSS SECTION THRU GARAGE**
3/8" = 1'-0"

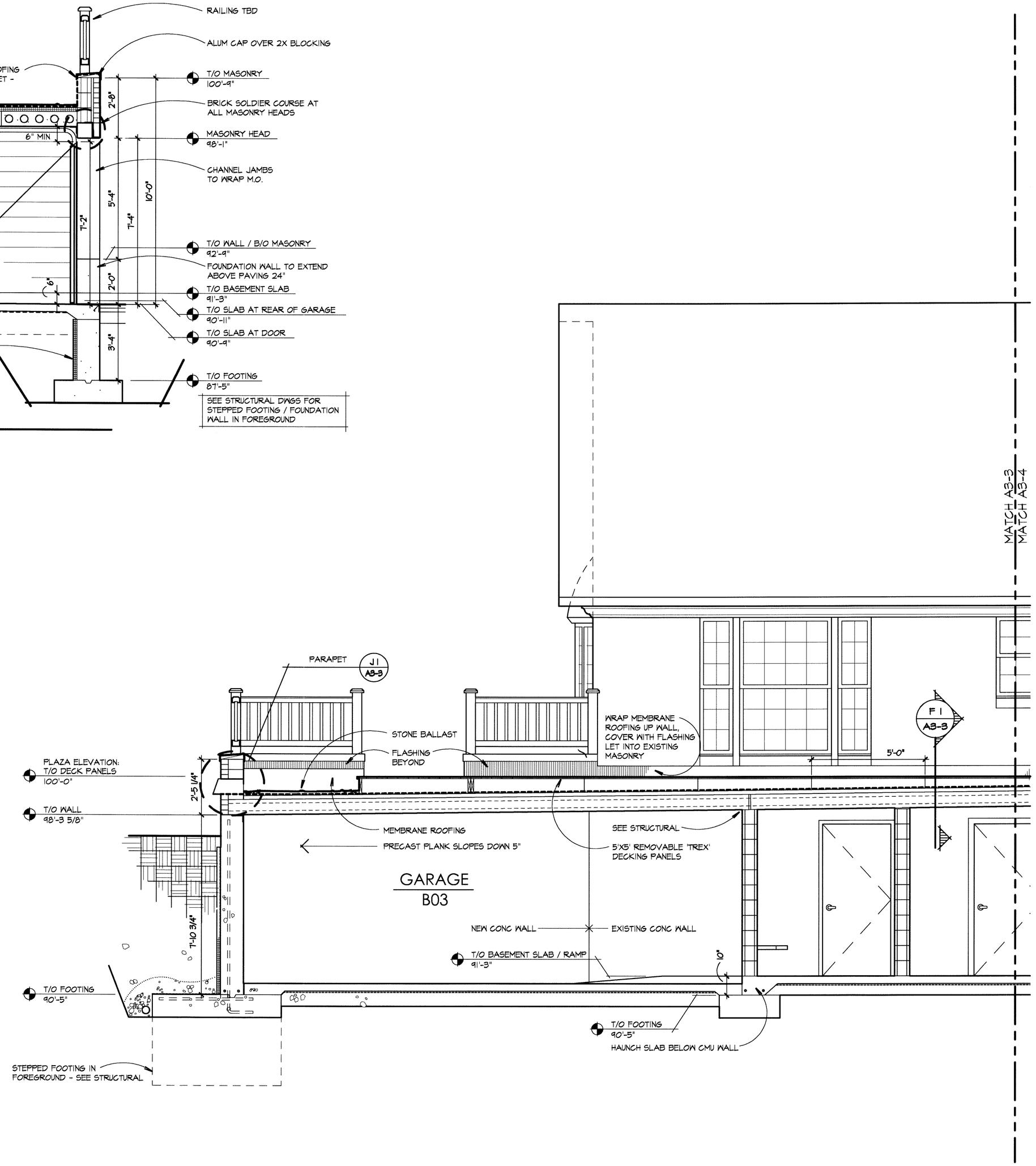


F1 / A3-3 **SALLYPORT ROOF AT EXISTING MASONRY WALL**
1" = 1'-0"



J1 / A3-3 **SALLYPORT ROOF AT LOW BEARING**
1" = 1'-0"

J4 / A3-3 **GARAGE M.O. DETAILS**
1" = 1'-0"



J7 / A3-3 **SECTION THRU GARAGE / LOBBY [SEE SHEET A3-4 FOR CONTINUATION]**
3/8" = 1'-0"

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NEW BOSTON, NH 03070

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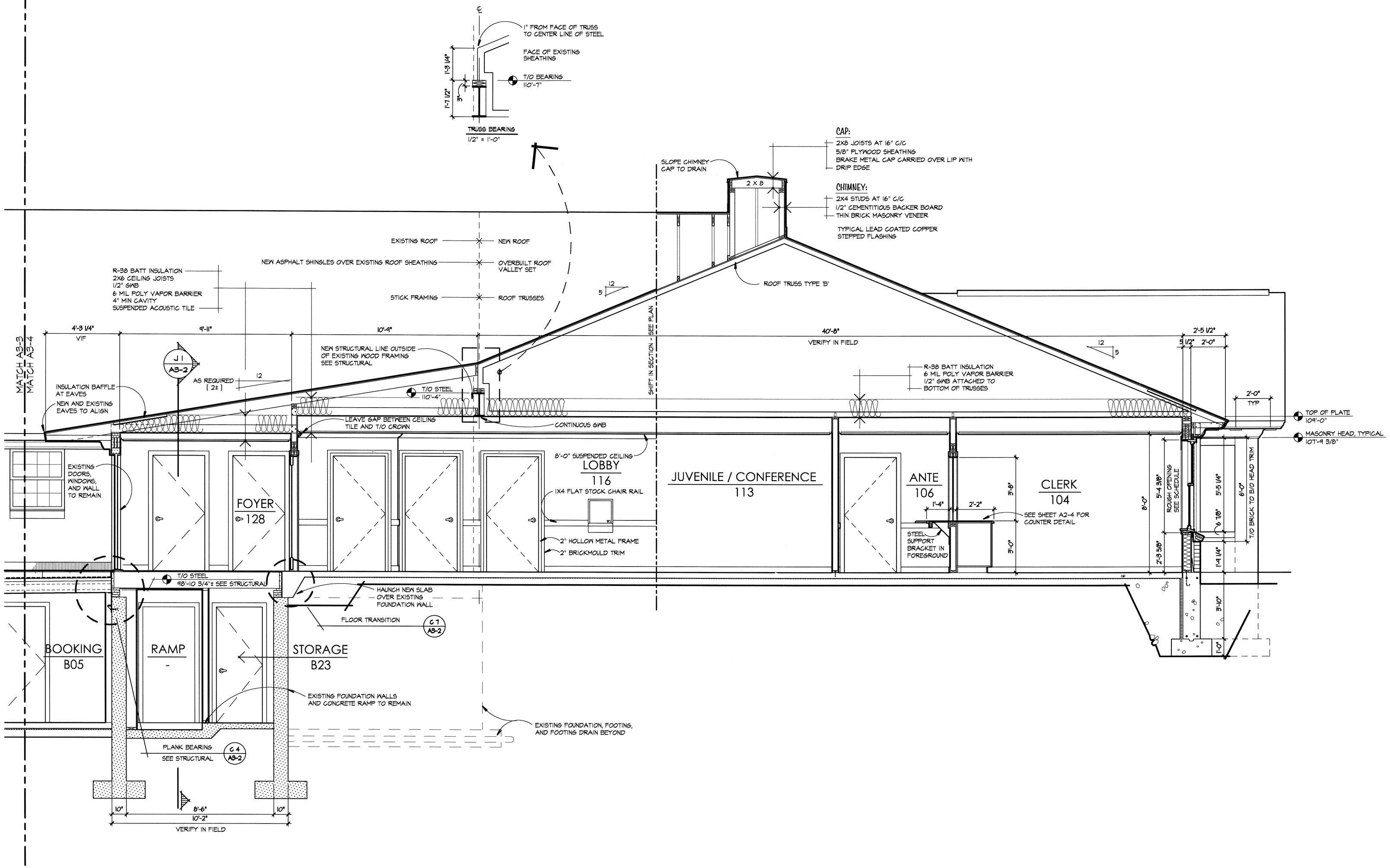
A3-3

BUILDING SECTION



J1
A3-4

BUILDING SECTION

3/8" = 1'-0"

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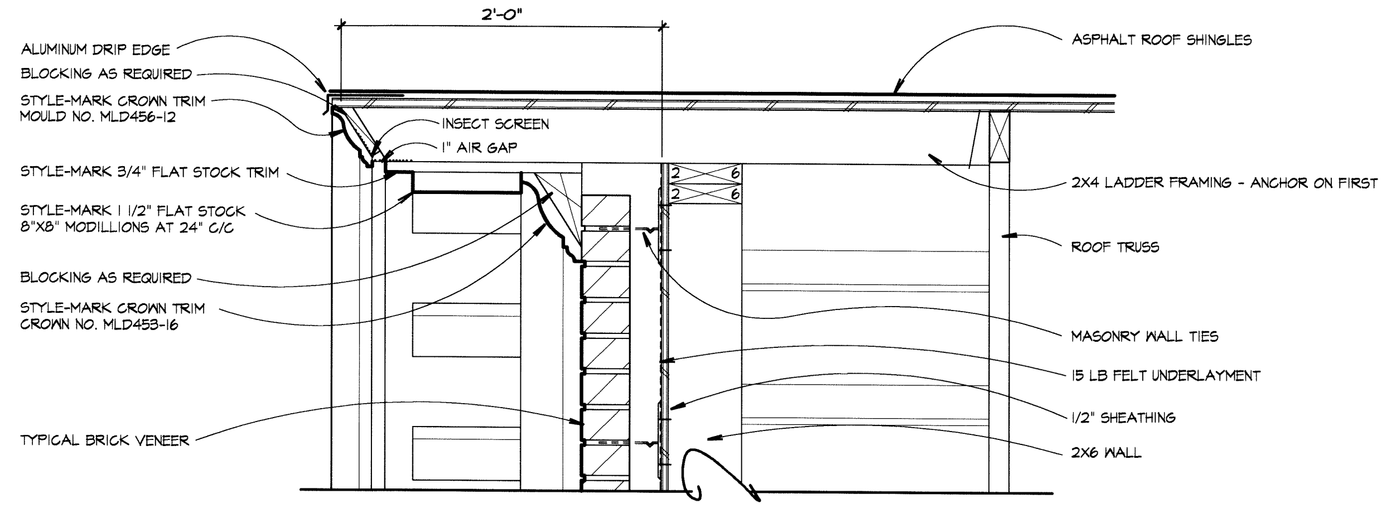
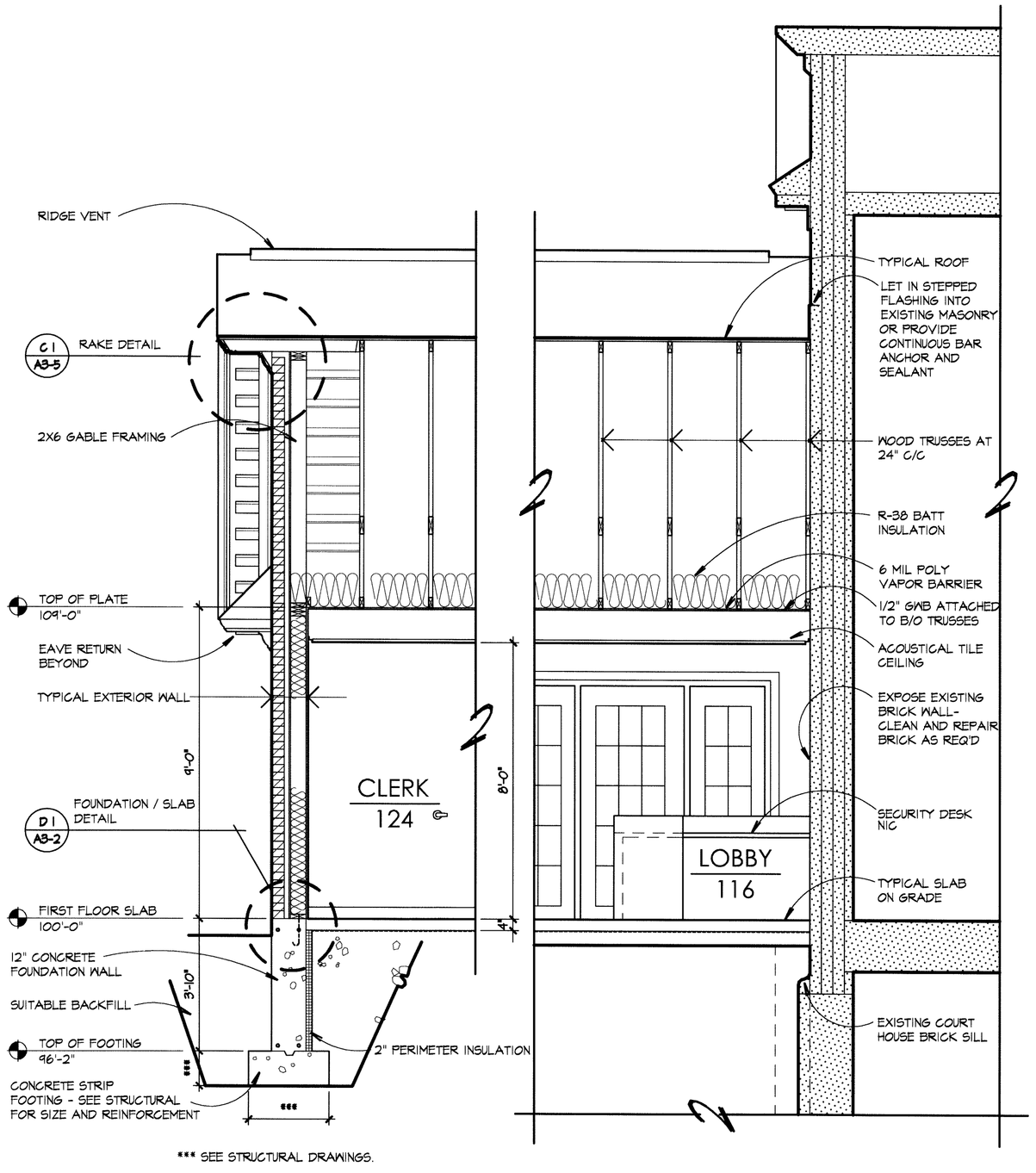
BUILDING SECTION



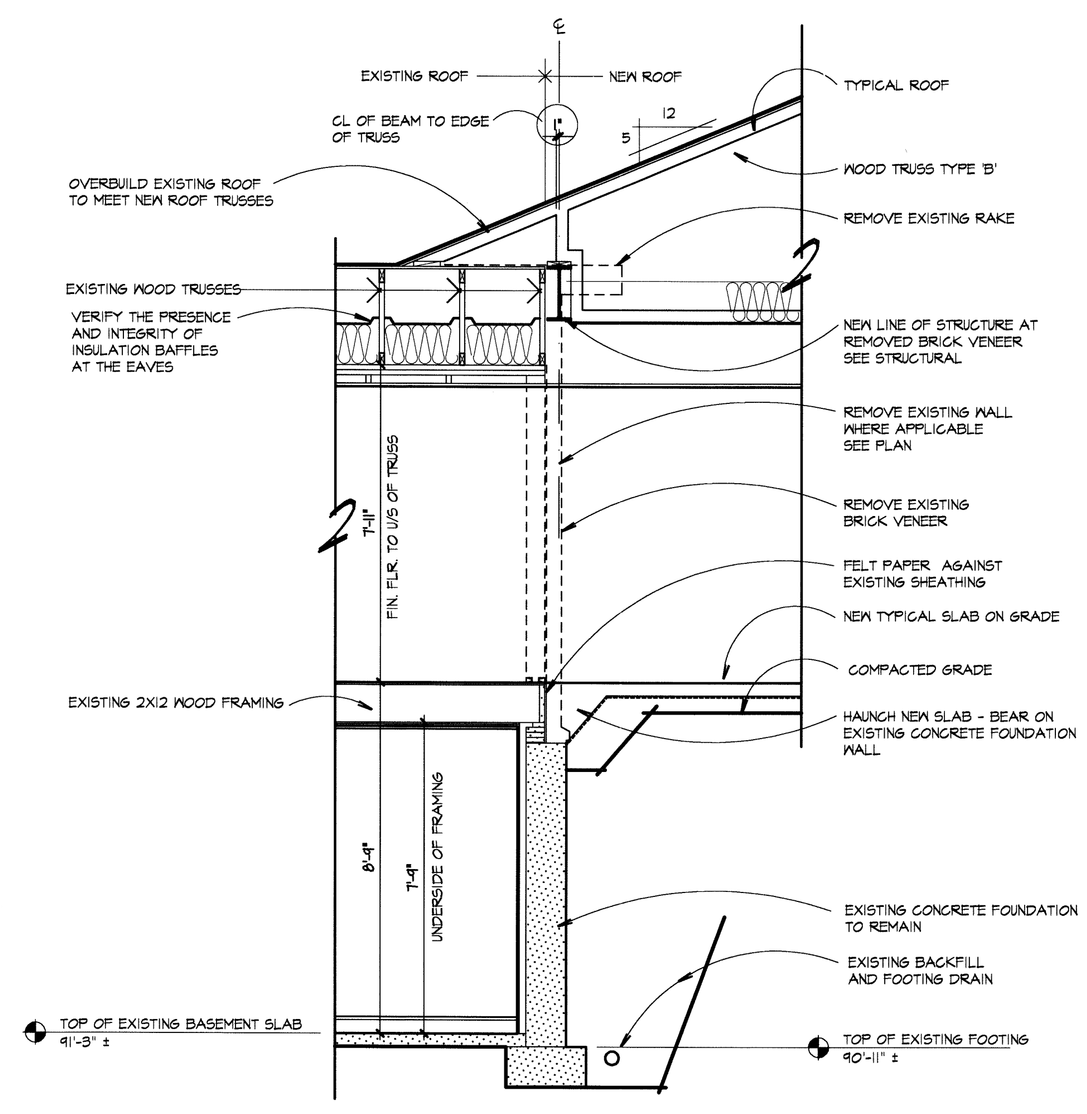
C1 / A3-5 **RAKE DETAIL**

1 1/2" = 1'-0"



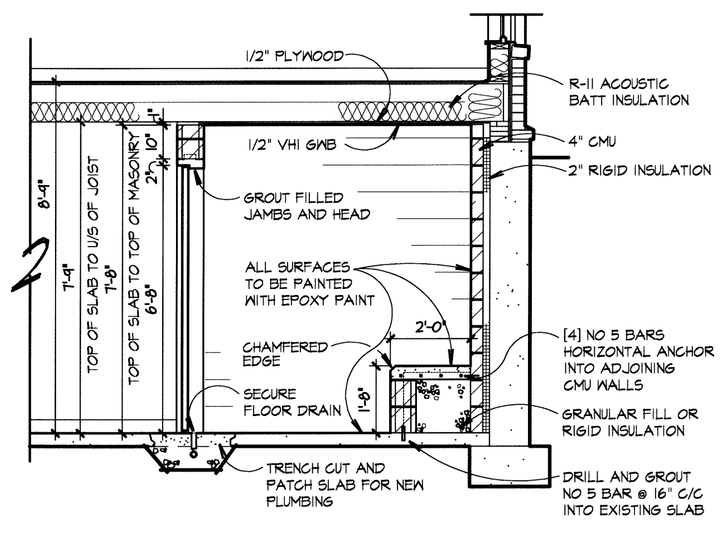
J1 / A3-5 **LOBBY/COURTHOUSE JUNCTION**

3/8" = 1'-0"



J6 / A3-5 **SLAB / WOOD FRAME JUNCTION**

3/8" = 1'-0"



J10 / A3-5 **SECTION THRU TYPICAL JAIL CELL**

3/8" = 1'-0"

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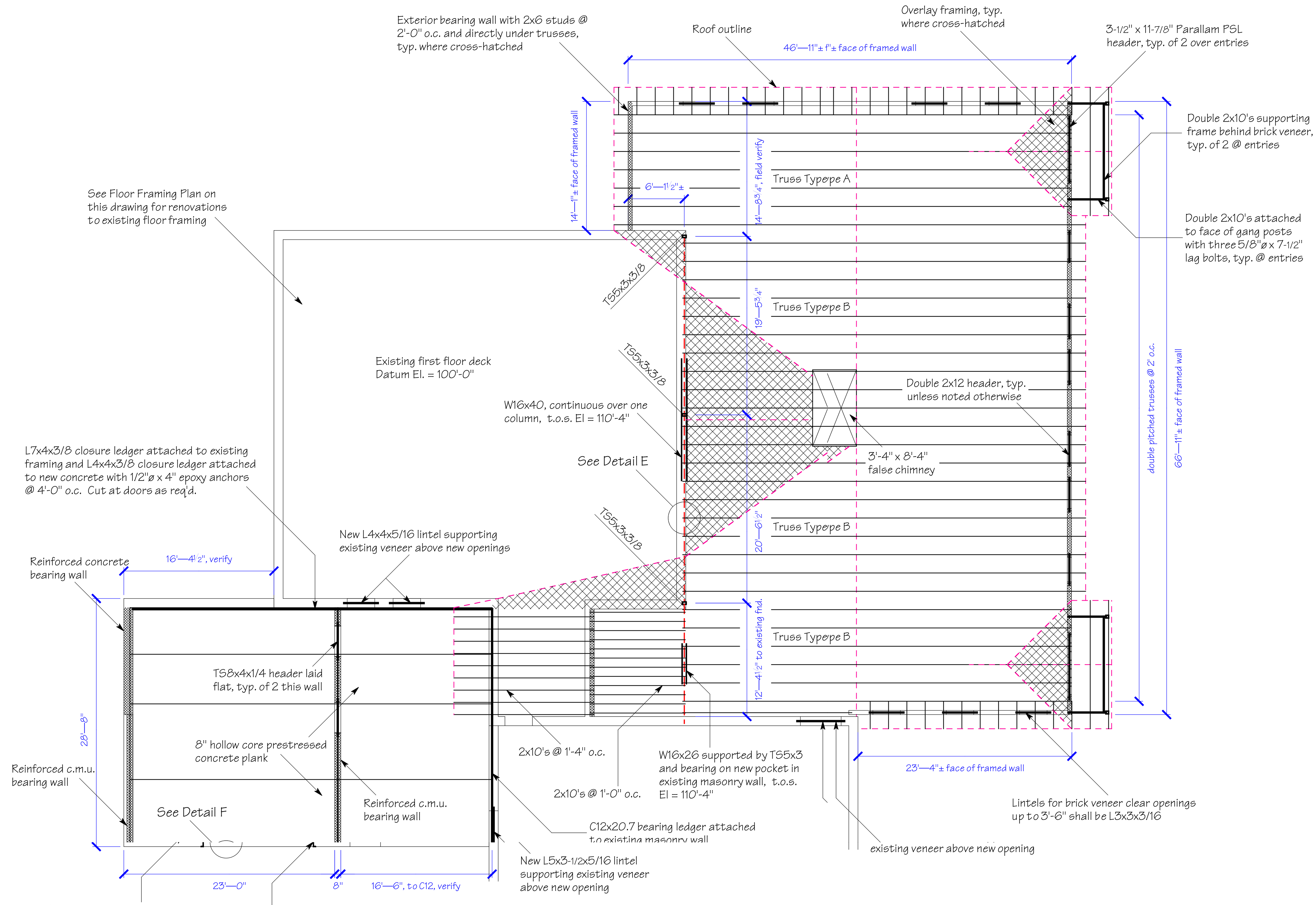
A3-5

BUILDING SECTION

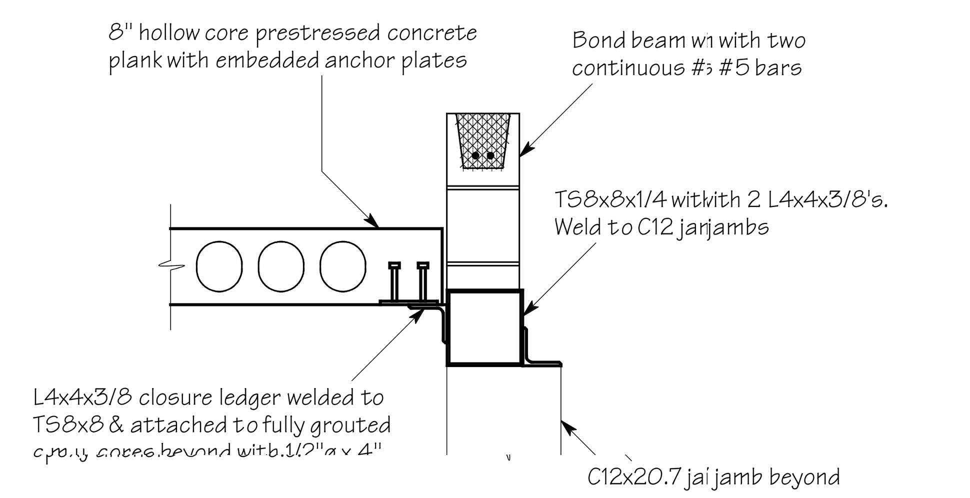


Roof Framing Plan
Scale: 1/8" = 1'-0"

Structural Notes:

Masonry Notes:
1. Masonry was designed and shall be constructed in conformance wi with criteria set forth in the Masonry Structures Building Code - ACI 530 and Masonry StStructures Specifications - ACI 530.1 prepared by the American Concrete Institute.
2. Masonry shall be Type I hollow concrete masonry units, shall be loaoad bearing, shall conform to ASTM C90-90, and shall have a minimum compressive strengthgth of 2,000 psi. Mortar shall be Type S, shall conform to ASTM C270, and shall have a maxaximum compressive strength of 2,000 psi. Grout shall be non-shrink and shall have a a minimum compressive strength of 2,500 psi and shall conform to ASTM C476. Mortar ar and concrete for masonry units shall have a water repellent admixture for moisture re protection. Admixture shall be selected by Contractor, subject to review and approval by by Architect and Engineer.
3. Vertical reinforcement shall be fully grouted in wall cavities, shall be be #5 bars placed on each side of corners, adjacent to window & door openings and @ 4'-0" o.' o.c. Vertical reinforcement shall be continuous from footing to top bond beam. n. Laps in vertical reinforcing shall be a minimum of 36 bar diameters.
4. Cells shall be grouted using low lift grouting procedures, with 4' mamaximum lifts between consolidation. Grout shall be consolidated by vibration or rodding.ng. Each lift shall stop a minimum of 1" below top of c.m.u. to form a keyway. After reaching ng its initial set, grout shall not be re-tempered.
5. Joint reinforcement shall be wire truss type, composed of No. 9 gagage wire conforming to ASTM A82, and placed at 16" o.c. vertically.
6. All concrete masonry units shall be laid in running bond.
7. Bond beams shall be placed at the top course.
8. Vertical control joints shall be placed as shown on the Architecturural Drawings.

Prestressed Concrete Plank Notes:
1. Concrete planks shall be 8" deep non-composite hollow core prestrestressed sections capable of supporting 80 psf dead and 100 psf live. Plank weight shall be le less than 65 psf. Plank sizes shall be determined by the manufacturer as required to fit di dimensions shown on the plan and details of this drawing.
2. Maximum live load long-term deflection shall be less than the span an divided by 240. Initial camber shall be set to offset long term dead load deflection.
3. Concrete compressive strength as measured by 28 day tests shalhall be no less than 5,000 psi. Reinforcing steel shall have an minimum ultimate strength of of 270 ksi.
4. Initial prestress shall be 75% of the ultimate steel strength.
5. Embedded steel for connections shall conform to requirements for or ASTM A36. Embedment details shall be determined by the plank manufacturerer.



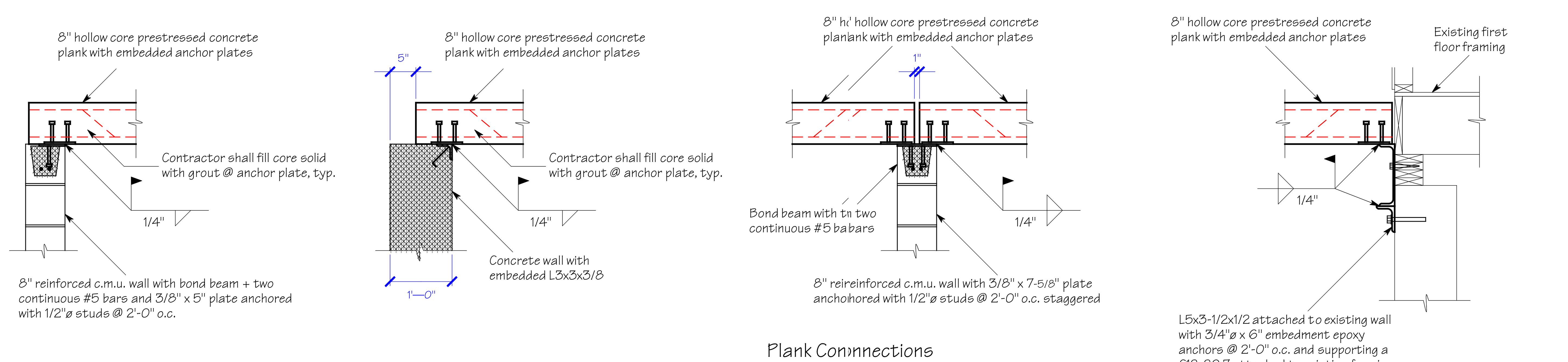
Detail F
Scale: 3/4" = 1'-0"

Structural Notes:

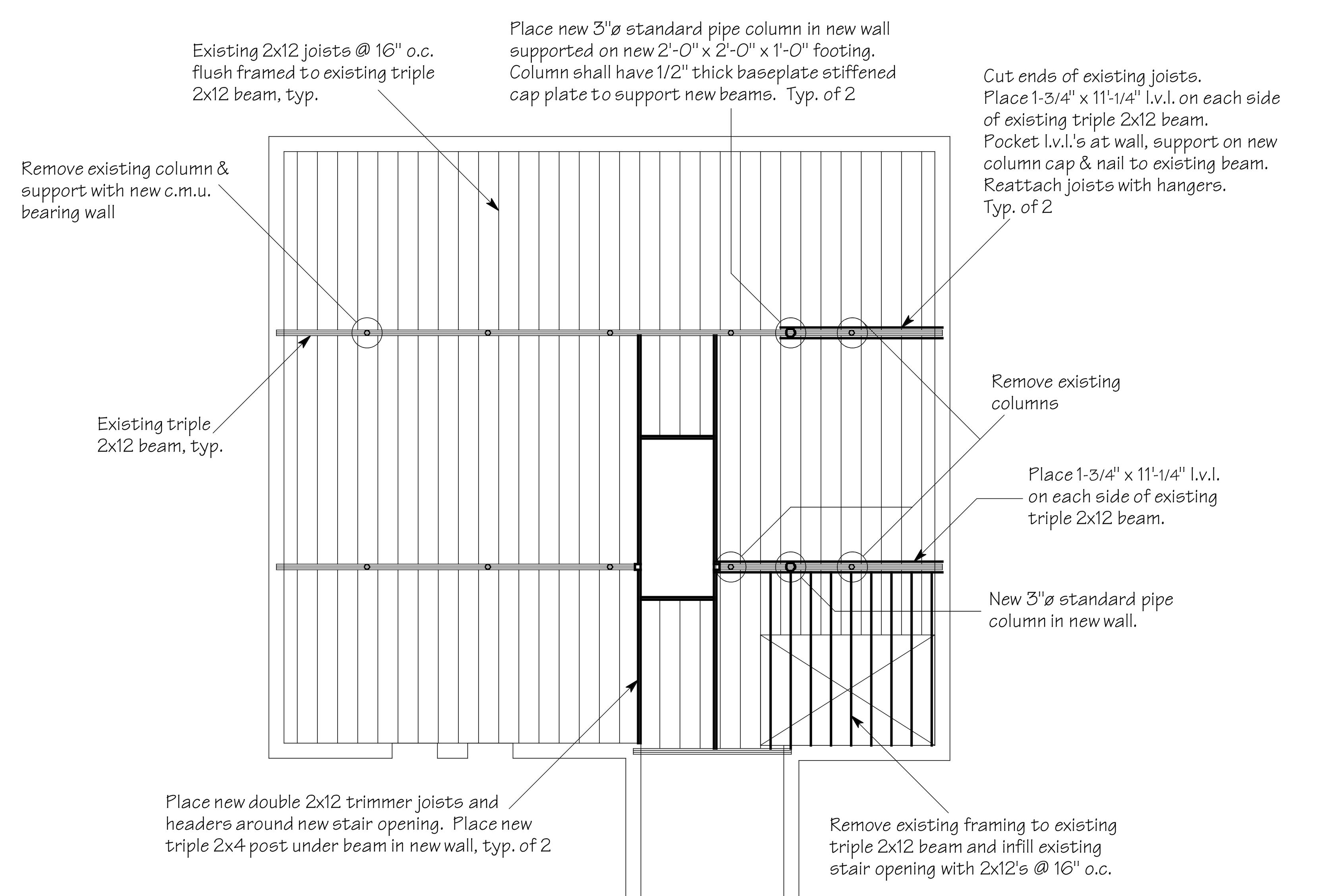
General:
1. Prior to construction, all dimensions necessary for the prosecution of the work shall be field verified. Any discrepancies shall be brought to the attention of the Architect for resolution.
2. All work shall conform to criteria set forth in BOCA National Building Code / 1996.
3. Wood framing sections were designed to support 15 psf roof dead load, 10 psf ceiling dead load, 50 psf balanced snow load, 61 psf unbalanced snow load, 70 psf maximum drifting load and lateral and uplift loads from 90 mph winds. Precast concrete planks shall be designed to support 80 psf dead and 100 psf snow/drifting or live.
4. All incidental items required for construction but not shown on the drawings shall be furnished, installed, and/or constructed by the Contractor.
5. The Contractor shall be responsible for establishing baselines and laying out the work so that construction conforms to dimensions and elevations shown on the drawings.
6. The Contractor shall keep work area clean throughout job, shall repair all damage, if any, to existing facilities and shall remove all construction debris prior to completion of work.

Timber Notes:
1. Sections were designed and construction shall be in conformance with criteria set forth in the National Design Specification (NDS) for Wood Construction, 1997 Edition.
2. Minimum strength properties of all solid sawn members shall conform to criteria for #1/#2 spruce-pine-fir with Fb = 875 psi, Fv = 70 psi and E = 1,400 ksi.
3. Parallam PSL lumber shall be fabricated by Trus Joist MacMillan, Boise, Idaho and shall have minimum strength properties of Fb = 2,900 psi, Fc = 2,500 psi, Fv = 290 psi, and E = 2,000 ksi. All connections of Parallam members shall use appropriately sized Simpson Strong Tie connectors.
4. Roof shall be sheathed with 5/8" APA rated plywood and exterior walls shall be sheated with 1/2" APA rated sheathing. Roof and walls shall act as diaphragms to resist lateral loads. Plywood or OSB panels shall be installed so that the long dimension is perpendicular to supports provided by studs, rafters and joists. Blocking is not required. The nailing schedule for all shear walls shall be 10d @ 6" max or 8d @ 4" max, edges & field.
5. The Contractor shall furnish and install manufactured roof trusses for the locations shown on the Drawings that are designed to meet the following requirements and shall furnish engineered certified drawings for each type of truss supplied.
   - roof dead load = 15 psf top chord + 10 psf bottom chord
   - roof snow load = 50 psf balanced, 61 psf unbalanced
   - roof snow drifting load = 70 psf adjacent to existing courthouse wall
   - wind uplift = 21 psf
   - maximum total load vertical deflection = span/300
   - maximum snow load vertical deflection = span/360
   - span and geometry, see architectural drawings
   - width of top plate of wall = 5.5" minimum
6. Trusses shall be erected in conformance to the manufacturer's requirements for handling, erection, temporary bracing during erection and permanent lateral bracing.
7. Contractor shall select truss connectors capable of withstanding a minimum of 600 pounds uplift and 600 pounds of lateral force.

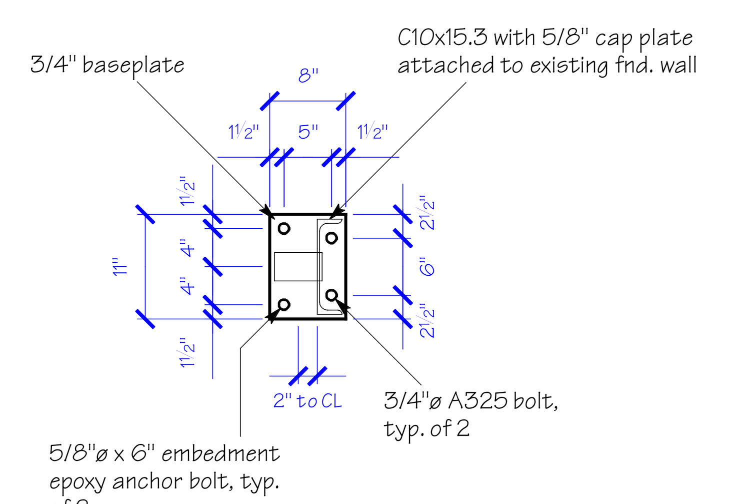
Steel Notes:
1. Members were designed and shall be fabricated and erected in conformance with criteria set forth in the Specification for the Design, Fabrication and Erection of Structural Steel for Buildings contained in the American Institute of Steel Construction "Manual of Steel Construction, Allowable Stress Design, Ninth Edition".
2. All steel shall be new. All steel shall conform to requirements for ASTM A36 except for TS sections. TS sections shall shall conform to requirements for ASTM A500, Grade B.
3. All bolts shall be 3/4" in diameter and shall conform to the requirements of ASTM A325N. All bolts shall be installed to the snug tight condition as defined in Section 8.c of the American Institute of Steel Construction "Specification for Structural Joints Using ASTM A325 or A490 Bolts".
4. All welding shall conform to criteria set forth in the "Structural Welding Code", ANSI/AWS D1.1-90, of the American Welding Society. Electrodes shall be E70XX.
5. Baseplates, cap plates and thru-plates shall be fully welded to column sections.
6. All steel surfaces exposed to the weather shall be galvanized.



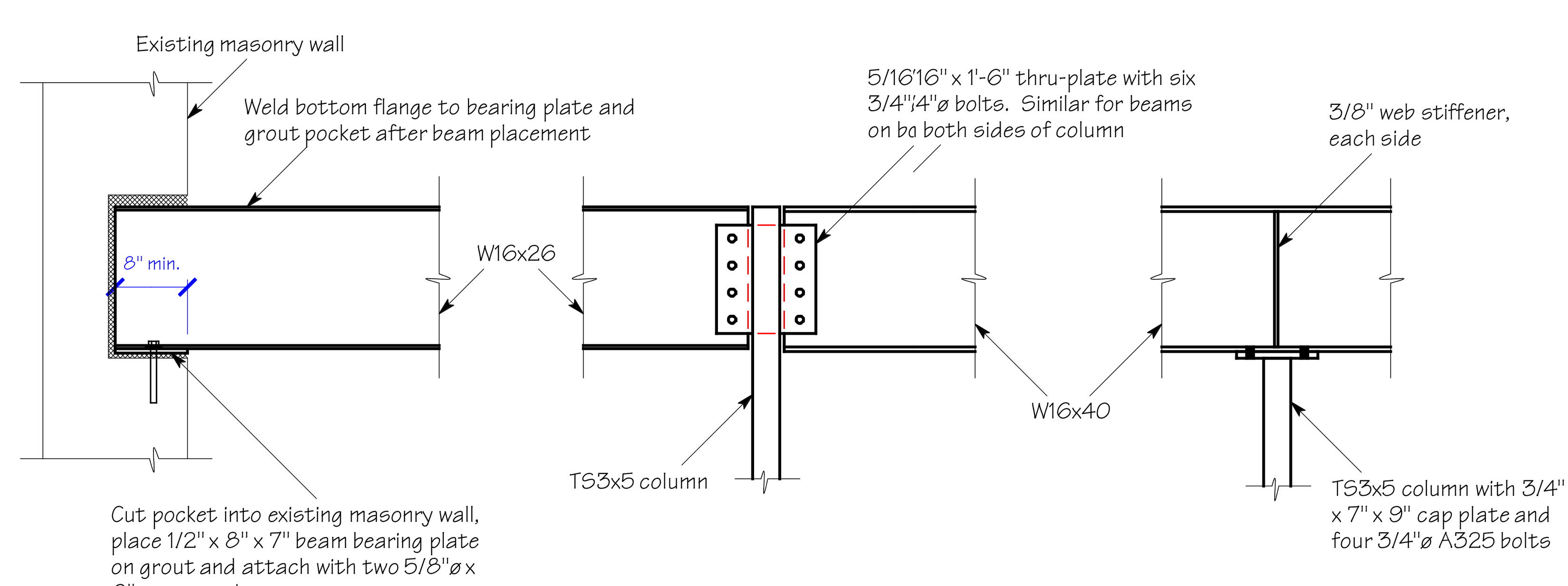
Plank Connnections
Scale: 3/43/4" = 1'-0"



Floor Framing Plan
Scale: 1/8" = 1'-0"

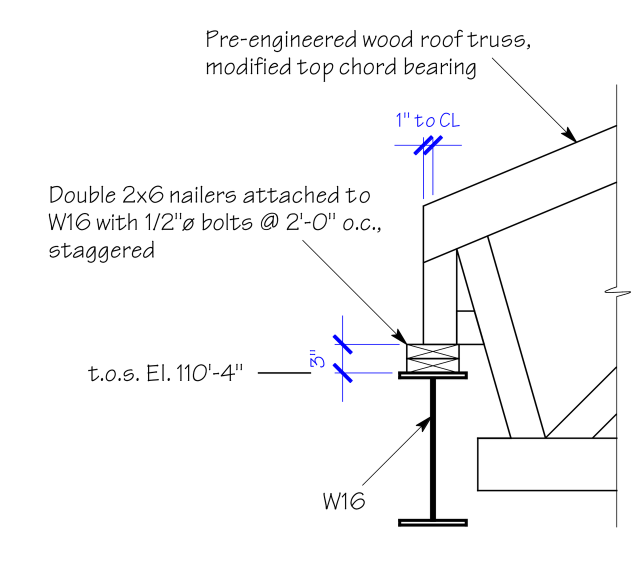


Column Baseplate Detail
Scale: 3/4" = 1'-0"



Beam Connections
Scale: 3/4" = 1'-0"

N. Note:
B. Beam & column CL should be 4" from e. exterior face of existing wall sheathing



Detail E
Scale: 3/4" = 1'-0"

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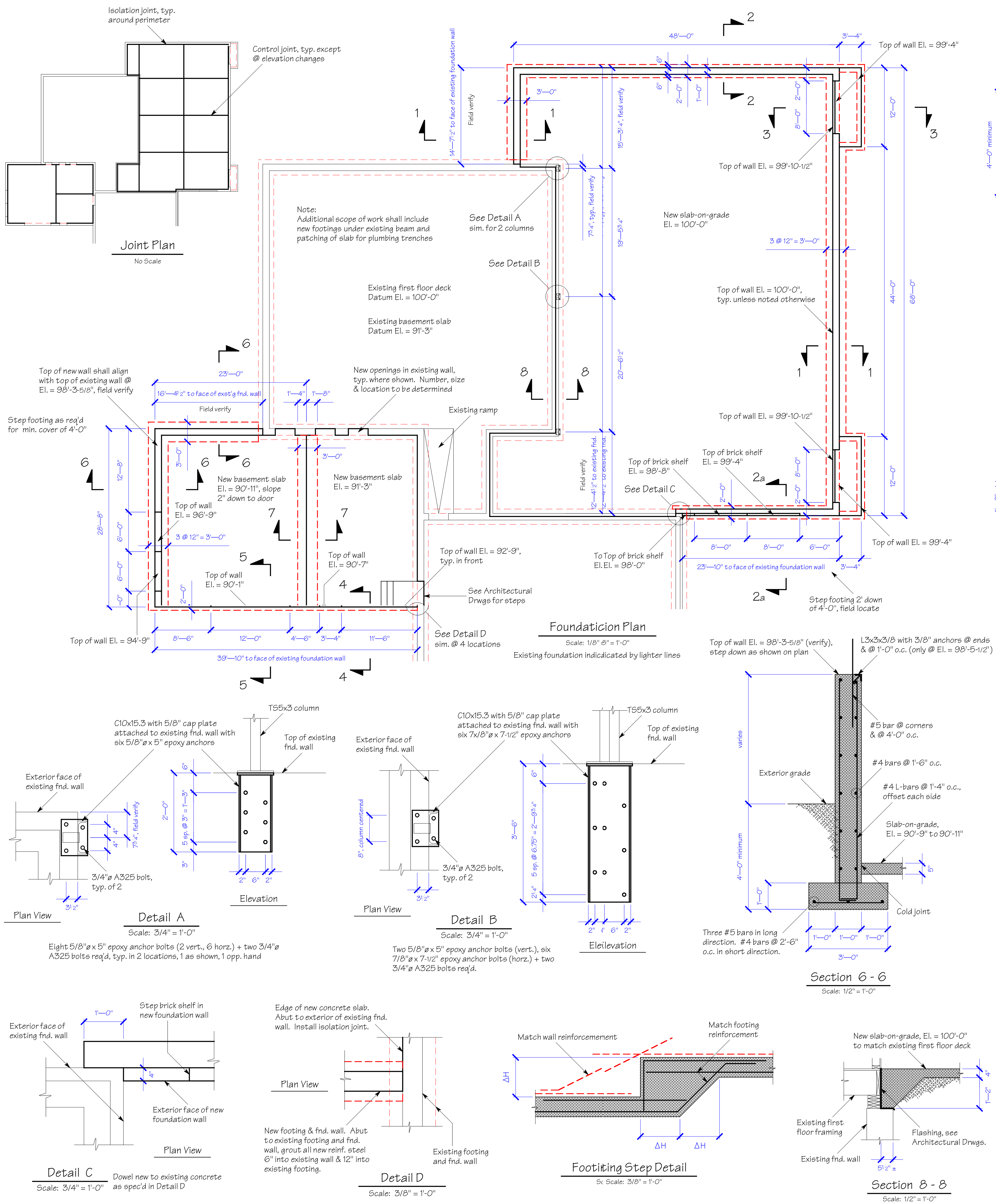
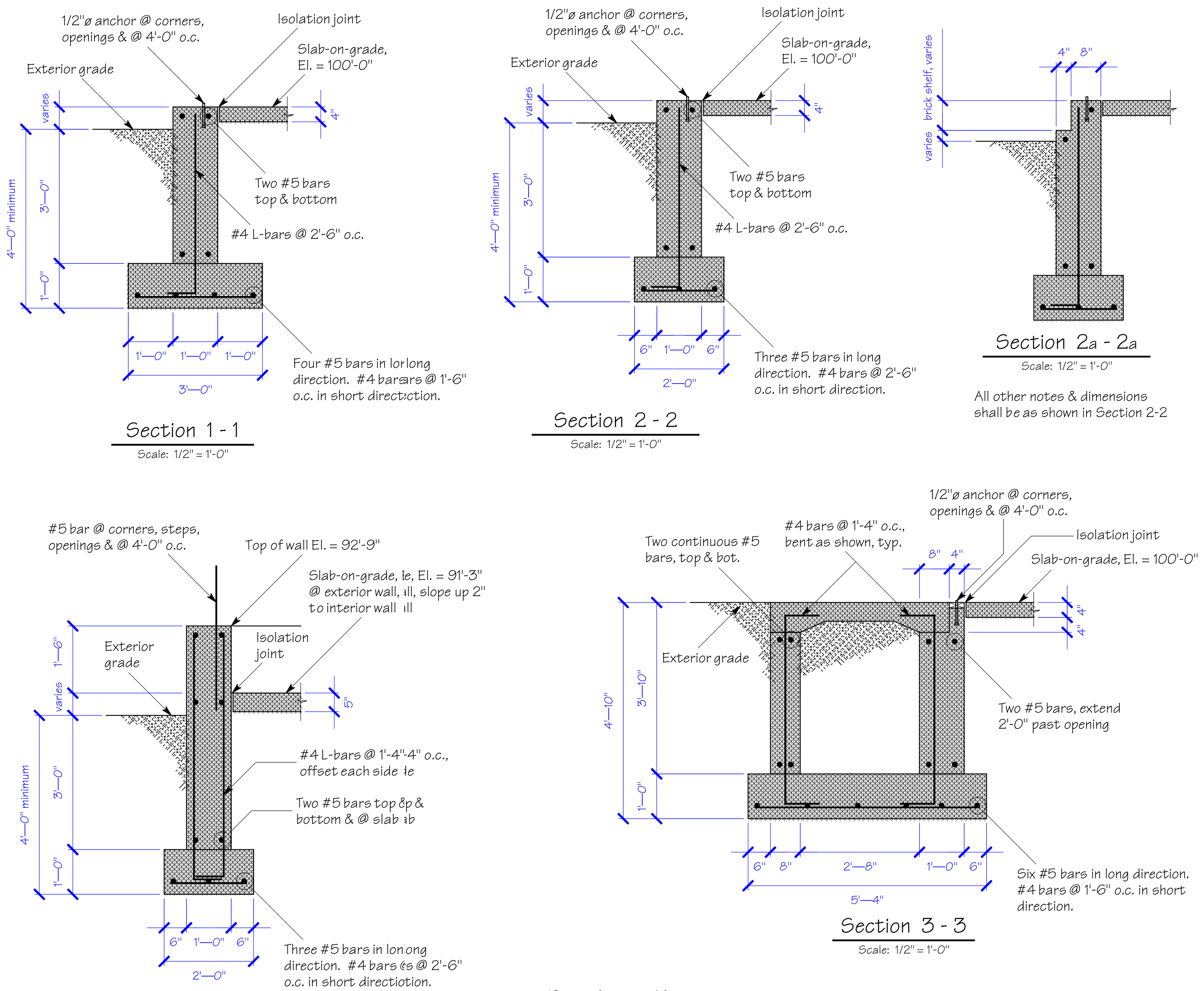
RENOVATION AND ADDITN TO THE
TOWN OF NEWLONDON
POLICE STATON &
DISTRICT COURT
MAIN STREET AND SEAMANS ROAD, NEW LONDON, NH

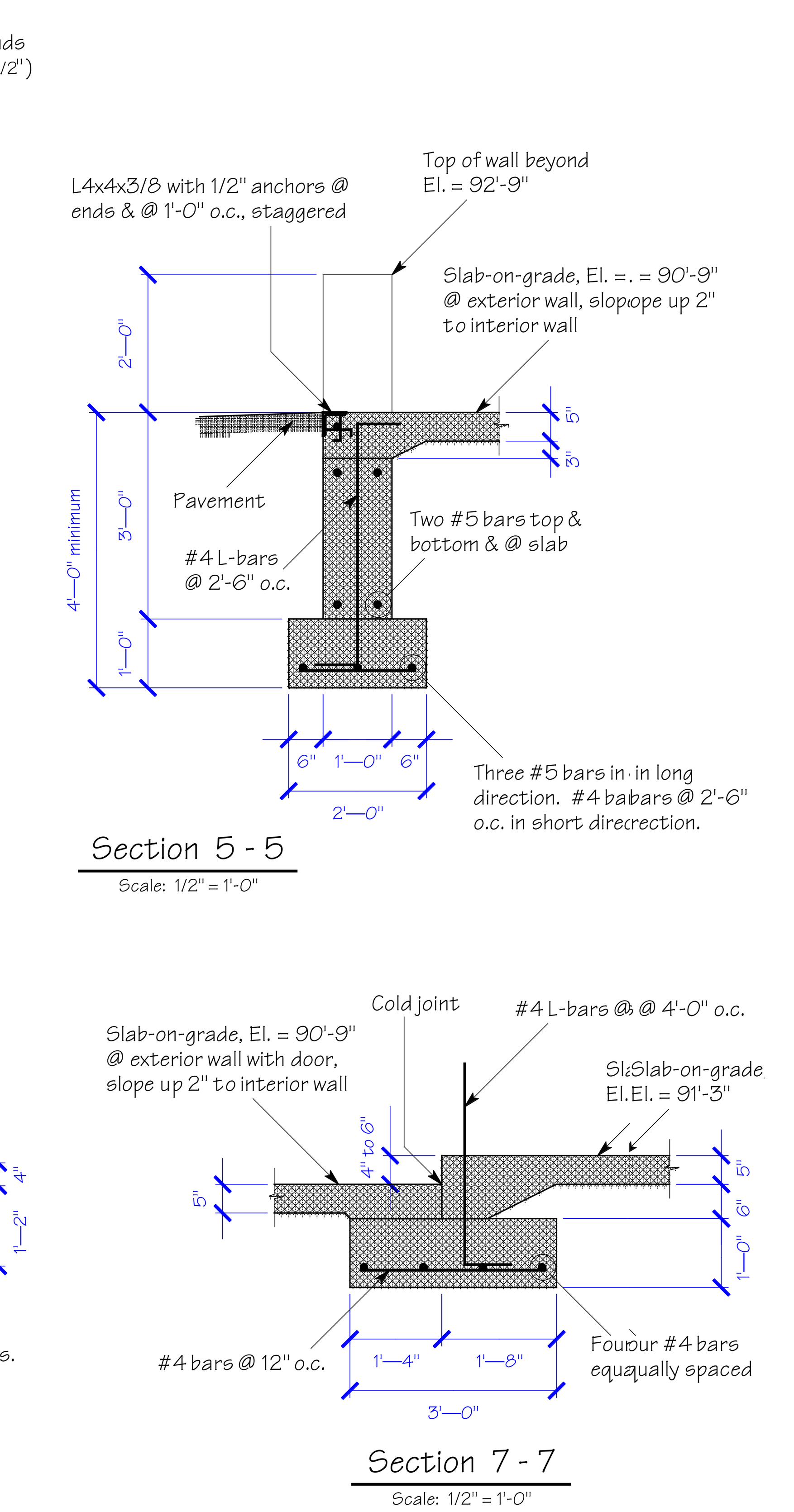
DIGNARD
ARCHITECTURAL
SERVICES
150 OLD ENGLISH ROAD
NEW BOSTON, NH 03070

DATE: 9 DECEMBER 99
DRAWN BY: RPB
SUBMITTALS:
REVISIONS:

S - 2
FRAMING
PLAN, DETAILS AND NOTES







Foundation Notes:

General:

1. Prior to construction, all dimensions necessary for the prosecution of the work shall be field verified. Any discrepancies shall be brought to the attention of the Architect for resolution.
2. All work shall conform to criteria set forth in BOCA National Building Code / 1996.
3. Foundation sections were designed to support 25 psf dead, 50 psf snow, and 20 psf wind (wind is the governing lateral load).
4. All incidental items required for construction but not shown on the drawings shall be furnished, installed, and or constructed by the Contractor.
5. The Contractor shall be responsible for establishing baselines and laying out the work so that construction conforms to dimensions and elevations shown on the drawings.
6. The Contractor shall keep work area clean throughout job, shall repair all damage, if any, to existing facilities and shall remove all construction debris prior to completion of work. Disposal according to NH regulations of excavated material not used on site shall be the Contractor's responsibility.

Concrete:

1. Furnish all materials, tools and labor to construct reinforced concrete footings, foundation walls (including placement of anchor bolts) and slabs-on-grade as shown on this drawing and as specified herein.
2. Concrete was designed and construction shall conform to criteria set forth in the American Concrete Institute "Specifications for Structural Concrete for Buildings" (ACI 301-89) and "Building Code Requirements for Reinforced Concrete" (ACI 318-89.
3. Compressive strength for footings and walls as measured by 28 day tests shall be no less than 3,000 psi with a maximum slump during placement of 3.5". Compressive strength for the slab as measured by 28 day tests shall be no less than 3,500 psi with a maximum slump during placement of 4.5". Concrete compression tests according to ACI critieria shall be used to ascertain that strength requirements are met. Slump shall be determined according to criteria set forth in ASTM C143.
4. Cement shall be Portland cement, Type II, meeting ASTM C150. Concrete shall be normal weight and maximum aggregate size shall be 3/4". Required air-entraining admixture shall conform to ASTM C260 and shall result in 4.5 % to 6.5 % entrained air, with the higher percentage used for exterior concrete and the lower percentage used for interior slabs.
5. All reinforcing bars shall be deformed and shall be grade 60, conforming to ASTM A615. Welding of reinforcing bars required by design and shown on the drawings is not permitted. Concrete for interior slabs-on-grade shall be reinforced with 100% virgin polypropylene collated, fibrillated fibers as manufactured by Fibermesh Co., Chattanooga, TN at the rate of 1.5 pounds per cubic yard. Concrete for exterior slabs shall be reinforced with welded wire fabric (grade 70, smooth, conforming to ASTM A82).
6. Reinforcing bars shall be placed with the following minimum concrete cover: 3" when concrete is placed against the ground; 2" for formed surfaces exposed to weather or in contact with the ground; 1 1/2" in all other situations unless noted otherwise. Welded wire fabric shall be placed at mid-depth of the slab and shall be secured on chairs to prevent movement prior to concrete placement.
7. Detailing of concrete reinforcement and accessories shall conform to criteria set forth in the American Concrete Institute "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI-315). Reinforcement shall be continuous through all construction joints. Minimum laps for deformed bars shall be as required for a Class B splice defined in Section 12.15.1 of ACI 318-89. Minimum laps in welded wire fabric shall be 1.5 times one mesh length. All hooks shall be standard hooks.
8. Cast-in-place and epoxy anchor bolts shall conform to ASTM A307 or A36. Epoxy anchor bolts shall use the Hilti HIT HY 150 injection adhesive system and shall be installed according to Hilti requirements.
9. Place construction, isolation and control joints in the slab as required. Joints shall be perpendicular to the main reinforcement. Control joints shall be 1/4th the slab depth and shall be formed by saw cutting within twelve hours after concrete placement or by insertion of a premolded plastic strip. If saw cut, joints shall be filled with Sikadur 51, a flexible epoxy sealer produced by and installed according to instructions of the Sika Corporation. Isolation joints shall be placed in the floor adjacent to all abutting walls. Surfaces of construction joints shall be thoroughly cleaned prior to placement of adjacent concrete.
10. Design and construction of formwork to result in the required finished dimensions shall be the responsibility of the Contractor.
11. Concrete shall be placed continuously, without formation of seams or planes of weakness within the section being placed. Concrete shall be placed without causing material segregation. All concrete shall be properly consolidated by vibration and thoroughly worked around reinforcement, embedded items and into corners of forms. Vibration shall not be used to move the concrete to a desired location.
12. Footings shall be placed on undisturbed soil and excavation shall be finished by hand. If original soil encountered during excavation is very loose, non-granular, or unsuitable for supporting 3,000 pounds per square foot, it shall be replaced with structural fill, which shall be crushed bank run gravel with maximum aggregate size of 3/4" compacted to a minimum of 95% of the original in-situ density as defined by ASTM 1556-64. Ledge or boulders shall be removed to a depth at least one foot below the footings. Minimum soil cover to bottom of concrete footings shall be 4'-0".
13. Concrete shall not be placed on frozen ground. Concrete shall not be placed when ambient temperature is less than 40 degrees F or greater than 90 degrees F without taking special precautions approved in advance by the Architect.
14. Structural fill, as defined in note 12, shall be placed 12" deep below the slab to bring finish grade to the proper elevation.
15. The floor surface shall receive a Class 4 (normal steel trowel) finish as defined in ACI publication 302.1-R89. Floor finish tolerance as measured in accordance with ASTM E 1155-87 shall meet requirements of ACI 117 for conventional straightedged floors. Exterior slabs shall receive the same finish and shall be roughened to produce a non-slip surface. Any defects of sufficient magnitude beyond the tolerances specified shall be removed by grinding.
16. Pipes and conduits placed within floor slab shall not be placed closer together than three pipe diameters on center, shall have minimum concrete cover equal to 3", and shall not interfere with reinforcement. Aluminum conduits shall not be placed in concrete.
17. All defective new concrete, shall be repaired. Defective material shall be removed to sound concrete. Edges shall be perpendicular to the surface. The area to be patched and the surrounding concrete shall be thoroughly wetted and allowed to dry prior to placing portland cement mortar or concrete up to the original surface. Tie holes shall be plugged.
18. Immediately after placement concrete shall be protected from premature drying, excessively hot or cold temperatures, and mechanical injury. Concrete shall be wet-cured for a minimum of seven days. Alternate curing method(s) shall be as approved by the Architect.
19. General fill shall be bank run gravel, with maximum stone size of 4", free of non-granular materials and shall be compacted in 12" layers to a minimum of 95% of the original in-situ density as defined by ASTM 1556-64. Where both sides of foundations require backfilling, gravel shall be placed and compacted simultaneously on both sides.

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RENOVATIONND ADDITION TO THE
TOWN OF NEW LONDON
POLICESTATION &
DISTRICT COURT
MAIN STREET AND ELKINS ROAD, NEW LONDON, NH

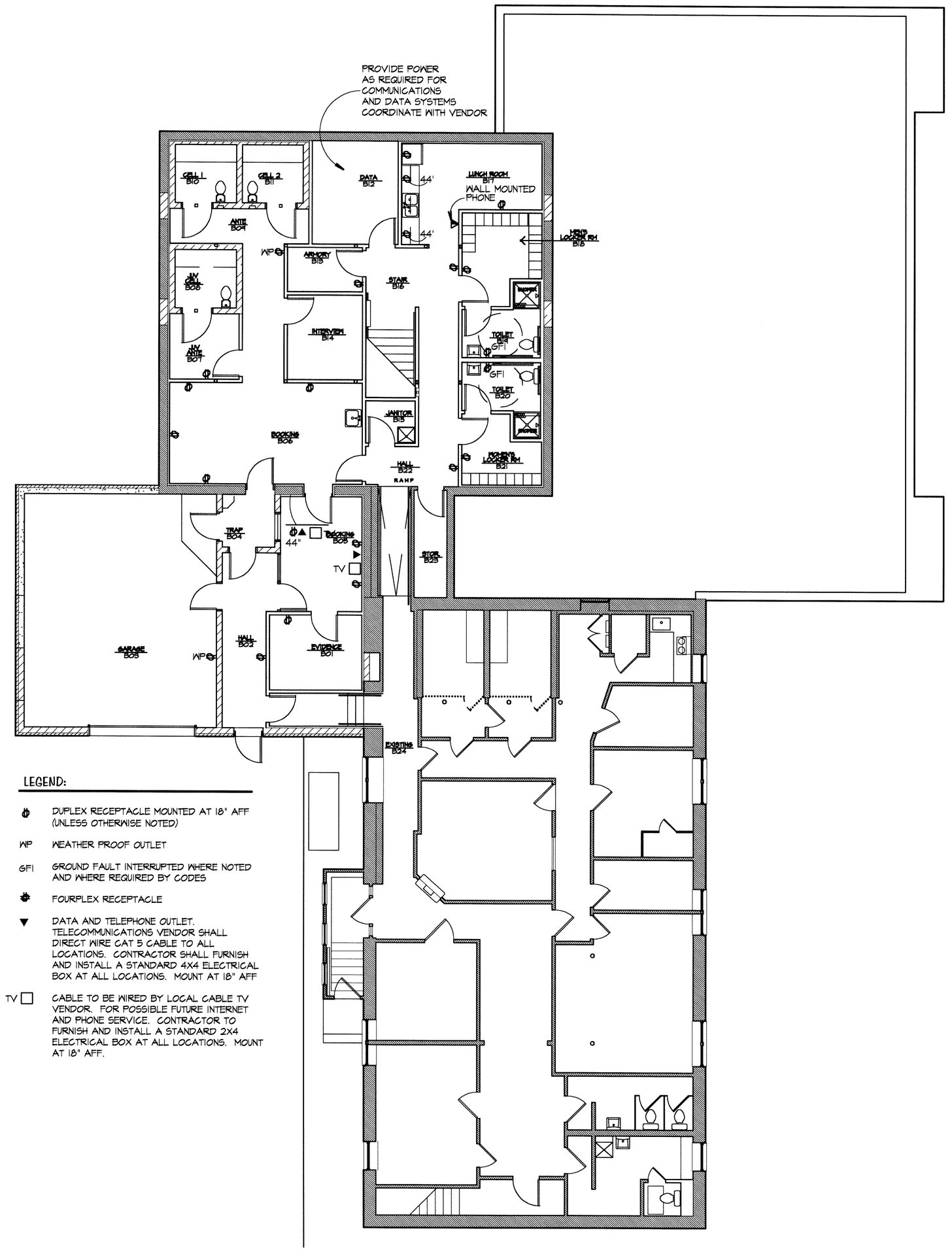
DIGNARD ARCHITECTURAL SERVICES
150 JOE ENGLISH ROAD
NEW BOSTON, NH 03070

DATE: 17 NOVEMBER 99
DRAWN BY: RPB
SUBMITTALS:

REVISIONS:
Rev. #1 9 DECEMBER 99
TOP OF CONCRETE. ELEVS.
BASEMENT DIMENSIONS
SLAB JOINT LAYOUT.

S - 1

FOUNDATION
PLAN, DETAILS AND NOTES

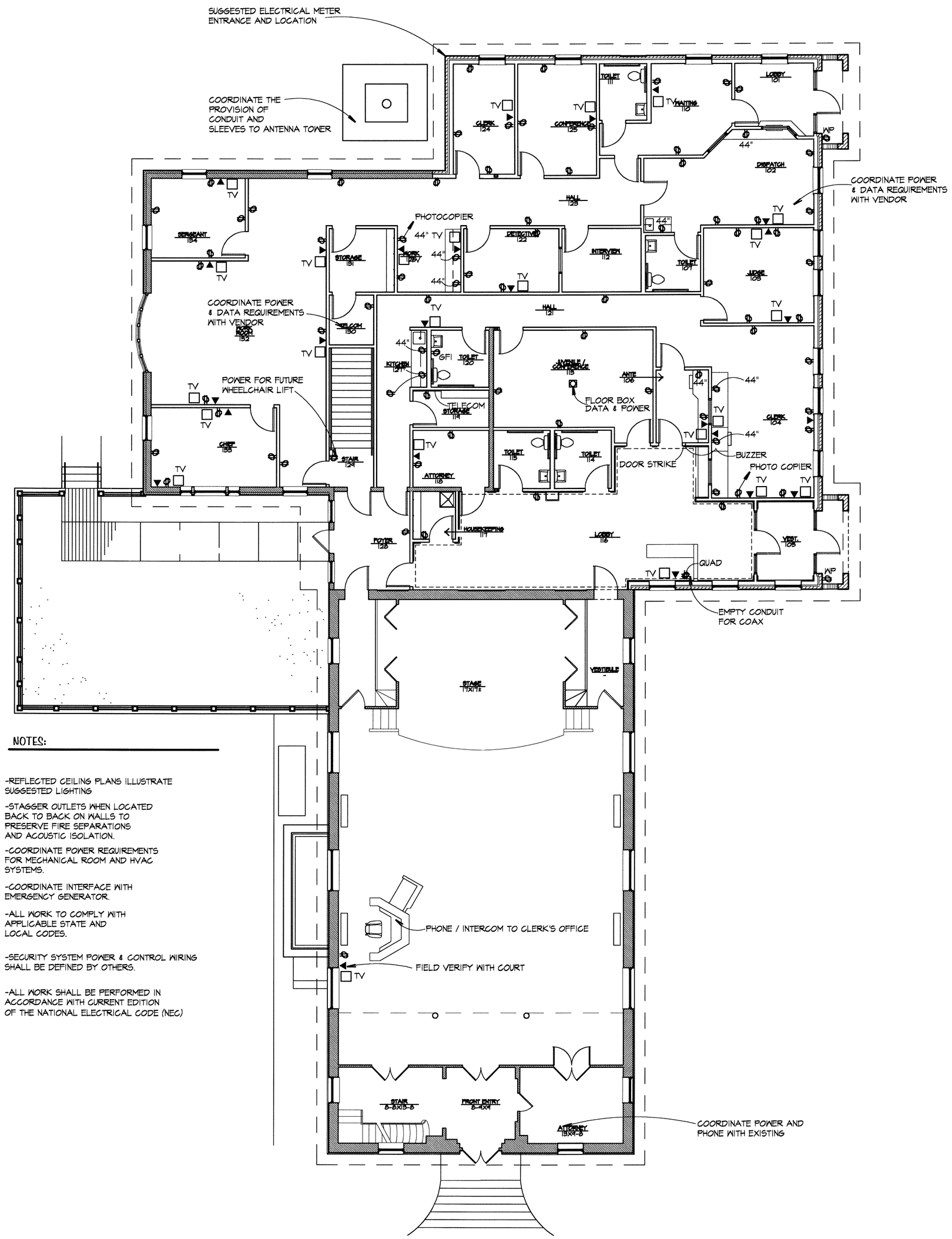


LEGEND:

- DUPLEX RECEPTACLE MOUNTED AT 18" AFF (UNLESS OTHERWISE NOTED)
- WP WEATHER PROOF OUTLET
- GFI GROUND FAULT INTERRUPTED WHERE NOTED AND WHERE REQUIRED BY CODES
- FOURPLEX RECEPTACLE
- ▼ DATA AND TELEPHONE OUTLET. TELECOMMUNICATIONS VENDOR SHALL DIRECT WIRE CAT 5 CABLE TO ALL LOCATIONS. CONTRACTOR SHALL FURNISH AND INSTALL A STANDARD 4X4 ELECTRICAL BOX AT ALL LOCATIONS. MOUNT AT 18" AFF
- TV □ CABLE TO BE WIRED BY LOCAL CABLE TV VENDOR. FOR POSSIBLE FUTURE INTERNET AND PHONE SERVICE. CONTRACTOR TO FURNISH AND INSTALL A STANDARD 2X4 ELECTRICAL BOX AT ALL LOCATIONS. MOUNT AT 18" AFF.

J1 / E-1 **BASEMENT POWER / TELECOM PLAN**

1/8" = 1'-0"



NOTES:

-REFLECTED CEILING PLANS ILLUSTRATE SUGGESTED LIGHTING

-STAGGER OUTLETS WHEN LOCATED BACK TO BACK ON WALLS TO PRESERVE FIRE SEPARATIONS AND ACOUSTIC ISOLATION.

-COORDINATE POWER REQUIREMENTS FOR MECHANICAL ROOM AND HVAC SYSTEMS.

-COORDINATE INTERFACE WITH EMERGENCY GENERATOR.

-ALL WORK TO COMPLY WITH APPLICABLE STATE AND LOCAL CODES.

-SECURITY SYSTEM POWER & CONTROL WIRING SHALL BE DEFINED BY OTHERS.

-ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE (NEC)

J7 / E-1 **FIRST FLOOR POWER / TELECOM PLAN**

1/8" = 1'-0"

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RENOVATION AND ADDITION TO THE
TOWN OF NEW LONDON POLICE STATION AND DISTRICT COURT
MAIN STREET AND SEAMANS ROAD
NEW LONDON, NEW HAMPSHIRE

DIGNARD ARCHITECTURAL SERVICES
156 JOE ENGLISH ROAD
NEW BOSTON, NH 03070

DATE: DECEMBER 14, 1999
DRAWN BY: RD / JN / PV
SUBMITTALS-
12.14.99 - ISSUED FOR PRICING

REVISIONS-

E-1

ELECTRICAL PLANS

EXHIBIT A
ENVELOPE ASSESSMENT

Envelope Assessment

December 2014

Whipple Town Hall

BUILDING STRATEGIES FOR AN AFFORDABLE FUTURE

S.E.E.D.S.

SUSTAINABLE ENERGY EDUCATION DEMONSTRATION SERVICES

Margaret Dillon—603-532-8979—MDILLON@myfairpoint.net

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As an independent energy consultant doing business as Sustainable Energy Education & Demonstrations Services (S.E.E.D.S.), I have prepared this envelope assessment with the best of intentions to deliver a comprehensive and thoughtful document to assist the rest of the Team and the Town of New London in making informed decisions regarding energy improvements to the Whipple Town Hall. Cost estimates are for planning purposes only. Estimated savings from improvements can be included within the context of HVAC changes or improvements. I do not make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed.

Historic Energy Usage

The chart below represents the electric usage from December 2013 through November 2014.

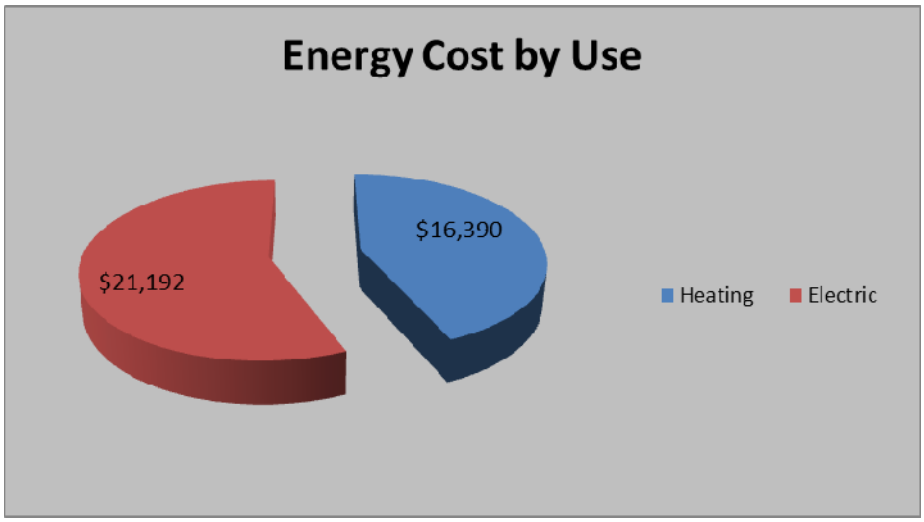
Heating fuel represents a four year average of propane usage. Deliveries from November 2013 through October 2014 totaled nearly 8400 gallons, but the winter of 2014 was unusually long and cold so a four year average consumption and dollar costs are represented below.

Electric resistance baseboards are used in several offices in the building., accounting for an estimated 9,960kWh, so $1800 has been added to heating costs and subtracted from other electric in the Energy Cost by Use graphic below.

	LP Gallons Delivered
2013/2014	8,085
2012/2013	6,872
2011/2012	7,683
2010/2011	7,137

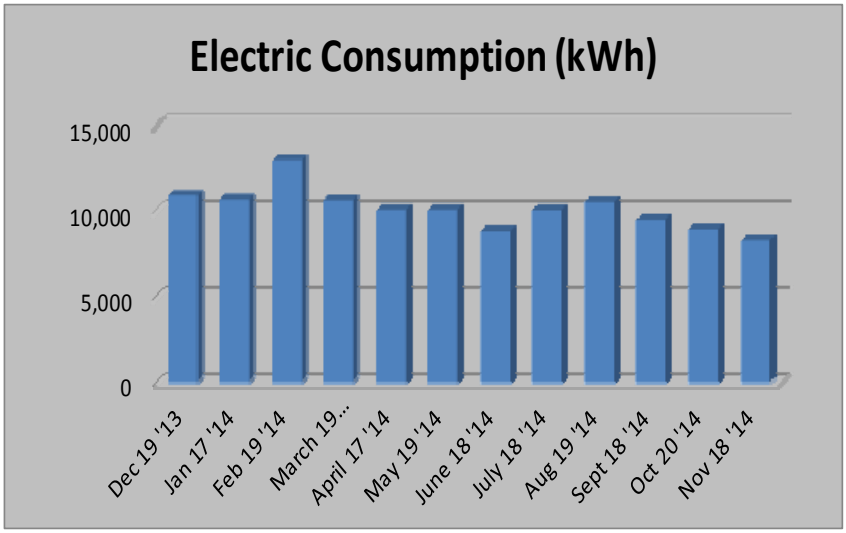
Energy and Units	Quantity	Site Btu	Source Btu	Costs
Electric kWh	121,360	414,080,320	1,378,770,960	$22,992
Propane	7,444	679,637,200	787,019,878	$14,590
Totals		**1,093,717,520**	**2,165,790,838**	**$37,582**
MMBtu's		**1,094**	**2,166**	
KBtu & $ /13,500 sq ft		**81.0**	**160.4**	**$2.78**

The chart above offers a snap shot of the building's Energy Utilization Index (EUI) by converting all sources of energy into Btu's and dividing by the square footage of floor area. The Site EUI of Whipple Town Hall is 81K Btu/ft2. This refers to the energy used on site. Source Energy includes transmission losses, especially from electrical transmission lines. Both the Site EUI and cost per square foot are higher than the average NH building in this use category, particularly electrical usage. However, benchmarking data is limited and based on building use, such as 'Police Stations" or "Historic Town Halls". Therefore it is impossible to make an apples to apples comparison with unique combinations.



Historic Energy Usage

Month		Electric Consumption (kWh)	Demand	PSNH Delivery	Supply Costs Integry	TOTAL COSTS
Dec 19 '13		10,920	22.8	$1,272.47	$898.72	$2,171.19
Jan 17 '14		10,680	22.8	$1,264.48	$878.96	$2,143.44
Feb 19 '14		12,960	28.0	$1,550.52	$1,066.61	$2,617.13
March 19 '14		10,640	22.0	$1,259.40	$875.67	$2,135.07
April 17 '14		10,040	22.8	$1,215.95	$826.29	$2,042.24
May 19 '14		10,040	20.0	$1,178.04	$826.29	$2,004.33
June 18 '14		8,840	18.8	$1,053.24	$727.53	$1,780.77
July 18 '14		10,000	24.0	$1,191.21	$823.00	$2,014.21
Aug 19 '14		10,520	24.0	$1,210.61	$865.80	$2,076.41
Sept 18 '14		9,440	24.0	$1,118.61	$776.91	$1,895.52
Oct 20 '14		8,960	19.6	$356.26	$737.41	$1,093.67
Nov 18 '14		8,320	18.4	$333.46	$684.74	$1,018.20
Totals:		**121,360**		**$13,004.25**	**$9,987.93**	**$22,992.18**

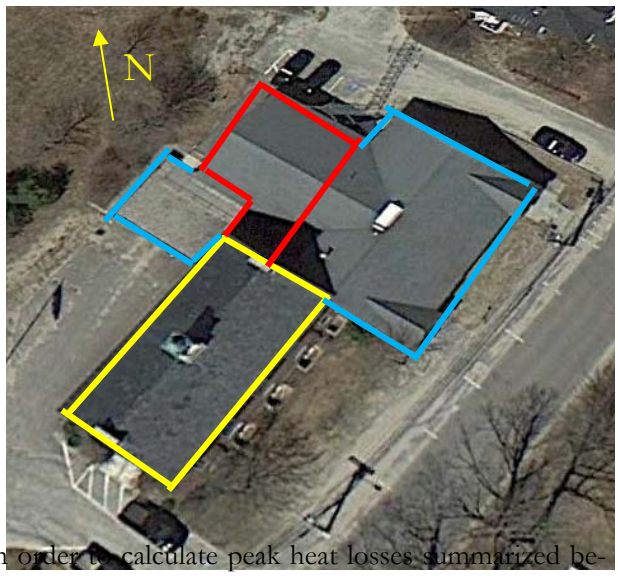


Estimated Winter Occupancy Schedule

Time	Monday	Tuesday	Wed	Thurs	Friday	Sat	Sun
6am	Arts		Arts				
7am	6-7 am		6-7am				
8am						Farmer's	
9am						Market	Performing
10am	Pre-					8-2PM	Arts
11am	school					one Sat	9-5PM
NOON	10-11:30					each	Sat & Sun
1PM						month	at least
2PM							once a
3PM			Karate				month
4PM			4 hours		Special		
5PM			Wed.		Programs		
6PM				Arts	2-3 winter		
7PM				Program	4-8PM	Dancing	
8PM				2x week			
9PM							
10PM							
11PM							
MIDNIGHT							
1am							
2am							
3am							
4am							
5am							

	Hours
Weekly	14
Once a month	28

Summary of Findings



The building is comprised of three construction periods: the original 1958 brick court house (Yellow); a mid 80's structure (Red approx.) and a 1999 renovation and addition and sally port (Blue).

The thermal performance of a building depends on a variety of factors from materials used to care of design and installation to existing energy codes (or lack thereof) to accepted practices of the time. The latter of which is also impacted by budget constraints.

This report reflects a through inspection of each en- assigned an as installed effective performance value in order to calculate peak heat losses summarized below. Descriptions are organized by building use or occupancy. More detailed analysis of each component is reported on pages 10-13.

With a total peak heat loss of just under 207,000 Btu's per hour, the total envelope heating demand is estimated at about 310,000,000 Btu's. With an average annual consumption of nearly 700,000,000 Btu's, it is presumed that the HVAC systems are operating very inefficiently.

The recommended improvement areas to reduce the building's heating load and propane usage focus on reducing uncontrolled air infiltration through windows and doors and establishing a continuous air barrier at the ceiling plane.

An alternate plan would move the ceiling's thermal barrier to the roof in order to bring the HVAC equipment in the attic within the thermal envelope. To do this without a high risk of moisture damage and/or mold is considerably more expensive than improving the existing ceiling thermal plane. Low risk strategies are described on pages five and six. The best combination of recommendations requires conversation.

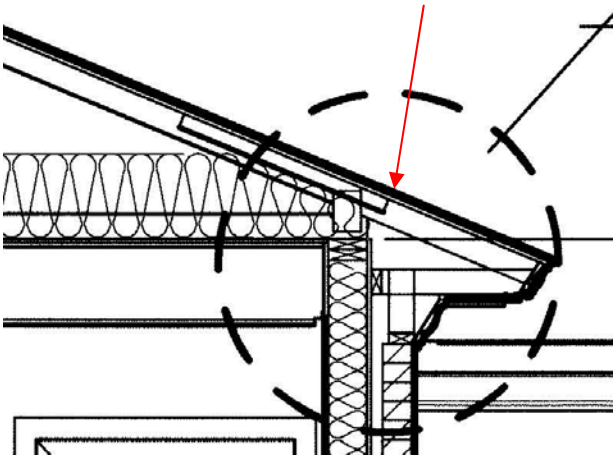
Peak Heat Losses

AREA -	Walls	Windows	Doors	Ceiling	Slab	Air Leak	TOTAL	%
Recreation Department	2,436	3,687	1,527	4,101	432	9,243	**21,426**	10.4%
PD Main Floor	7,099	4,209	1,629	4,039	1,078	12,894	**30,948**	15.0%
PD Basement	26,070	3,154	4,282	-	6,260	13,618	**53,384**	25.8%
Community Hall	29,886	24,090	2,329	12,465	-	32,188	**100,958**	48.8%
WHOLE BUILDING	**65,491**	**35,140**	**9,767**	**20,605**	**7,770**	**67,943**	**206,716**	100.0%
Ratios	31.7%	17.0%	4.7%	10.0%	3.8%	32.9%	100.0%	

The chart above is a summary of the calculated peak heat losses by building area, based on the assessment of all envelope components and at an indoor design temperature of 70° and outside temperature of –3°F. Room by room peak heat losses are indicated on the floor plans on pages eight and nine. A more detailed break down by envelope component and air leakage can be found on the last two pages of this report.

Existing strategy

No air barriers specified



One of the details in the 1998 plans shows what has been the conventional approach to insulating attic floors and roof eaves with batt or loose fill insulation. Propa vents (or similar) are intended as vent chases from soffit to underside of roof deck. However they routinely fail as an air barrier between outside air and the insulation and yet sometimes don't allow adequate venting for moisture control. Even when installed properly, the lack of a continuous air barrier at framing connections and the outside edge of the insulation allows warm air migration to the roof deck—the primary cause of icicles and ice dams.

The conventional solution has been to add more ventilation in order to overwhelm the heat loss and effect a cold roof. This strategy may (or may not) be effective in reducing ice dams but most certainly increases heat loss and energy usage. In this case, evidently, and in an attempt to reduce ice dams, 3-5" of cellulose insulation was blown in on top of the faced 8" fiberglass batts. This had little effect on ice dams because a) it didn't establish the all important air barrier and b) heat losses the heating equipment in the attic contributes to warming the deck.

Best practices involve:

1. Installing effective levels of continuous, high density insulation in direct contact with an air barrier on all six sides.

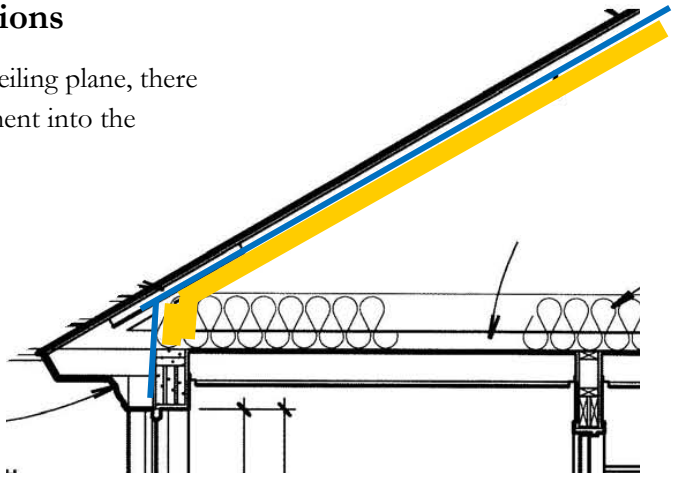
2. Balanced venting the roof deck with at least 1.5" vent opening at bottom opening and an equal or smaller (not greater) sum total amount of opening at the ridge or gable ends. Venting a roof is always preferred if it can be done effectively (hip valleys and other complicated roof lines make effective venting a challenge) and if it does not diminish thermal performance.

3. Keep all heating and ventilation equipment inside the thermal envelope. If it is not possible to bring in below a ceiling thermal plane, then move the thermal plane to the roof. If that is not possible, then do diligent air sealing of all duct work and insulate ducts with a minimum R8.

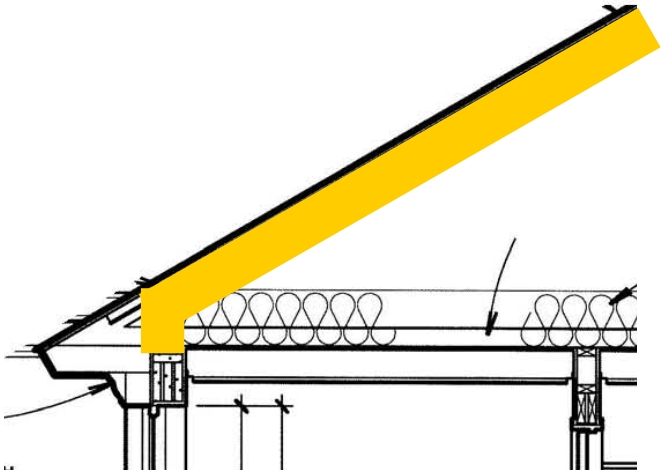
Solution Strategies for the PD and Rec Department attics: At a bare minimum, effect a continuous air and thermal barrier at the ceiling plane, including over the perimeter top plate to underside of propa vents, above interior wall connections and seal all wiring and duct ceiling penetrations. Remove all duct insulation, mastic seal all seams, then install minimum R8 duct insulation and tape all seams with appropriate tape.

Insulating at the Roof Plane—3 Options

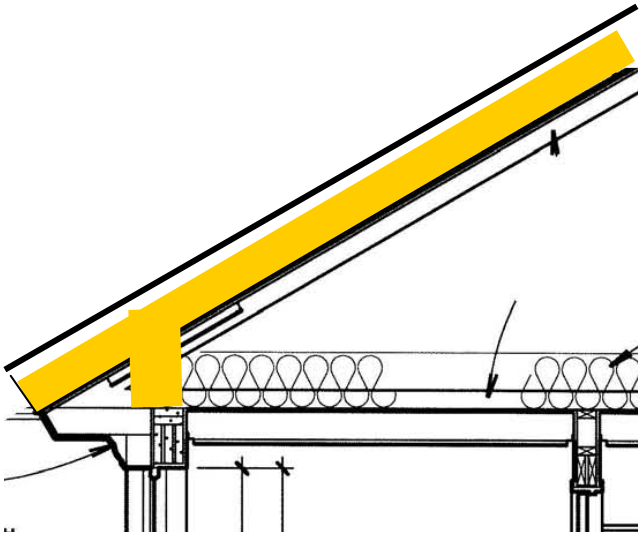
Other than moving HVAC equipment below the ceiling plane, there are three other options to bring the HVAC equipment into the thermal envelope:



1. Best interior performance: Install a continuous, rigid, air sealed roof vent from soffit to ridge vent in each bay. Spray 5" closed cell foam on underside of vent, extending to cover full width of top plate. This assures a properly vented roof deck by continuous air barrier between the vent chase and the insulation and on all six sides of the insulation for optimal thermal performance. This is labor intensive, though lowest risk.



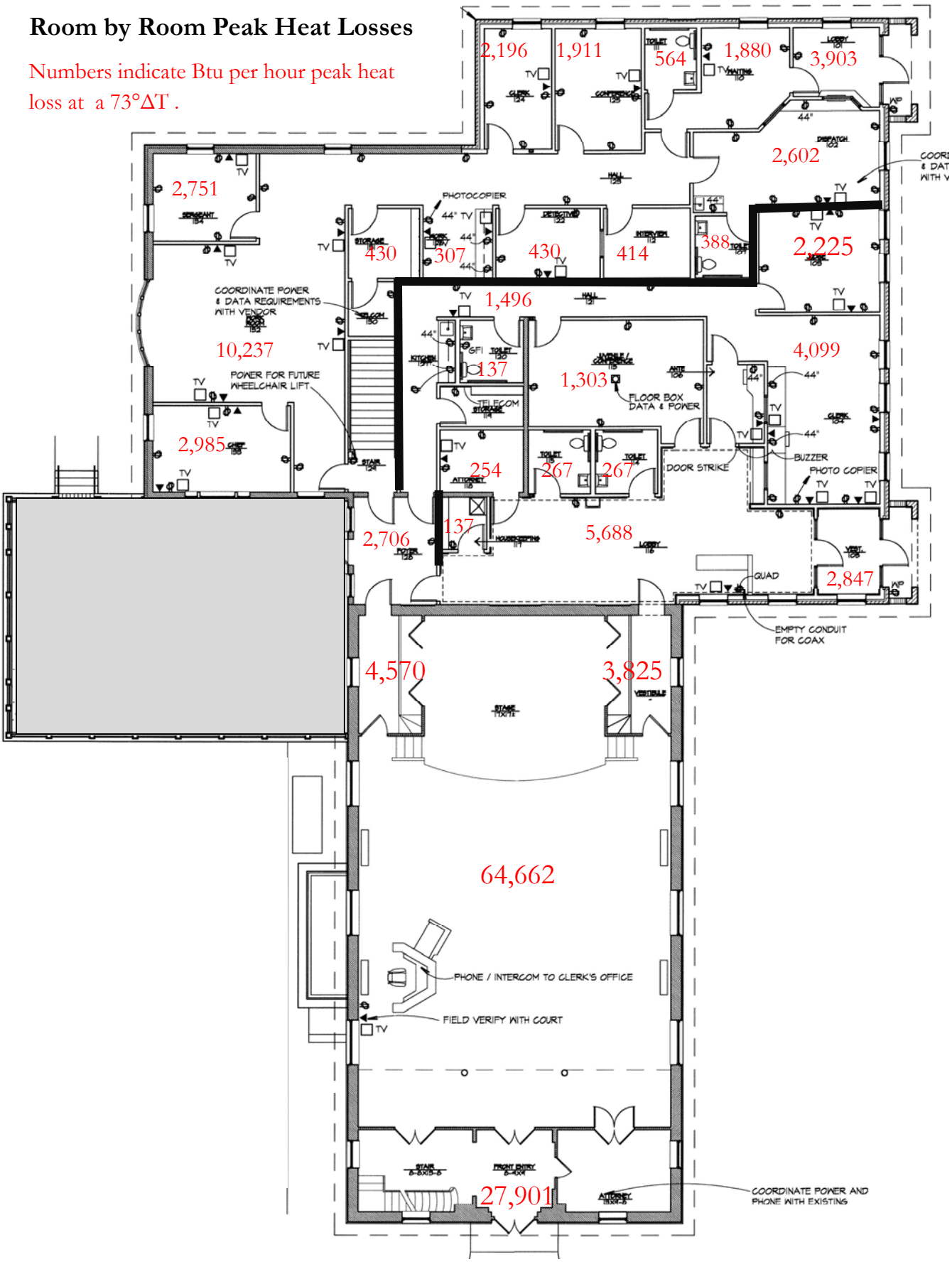
2. Easier install, though costly: Eliminate interior deck venting by spraying a minimum of 7" closed cell foam against roof deck, assuring continuous coverage to minimize vapor migration to deck and thermal bridging. The thickness is important for the moisture control layer; less critical for thermal control.



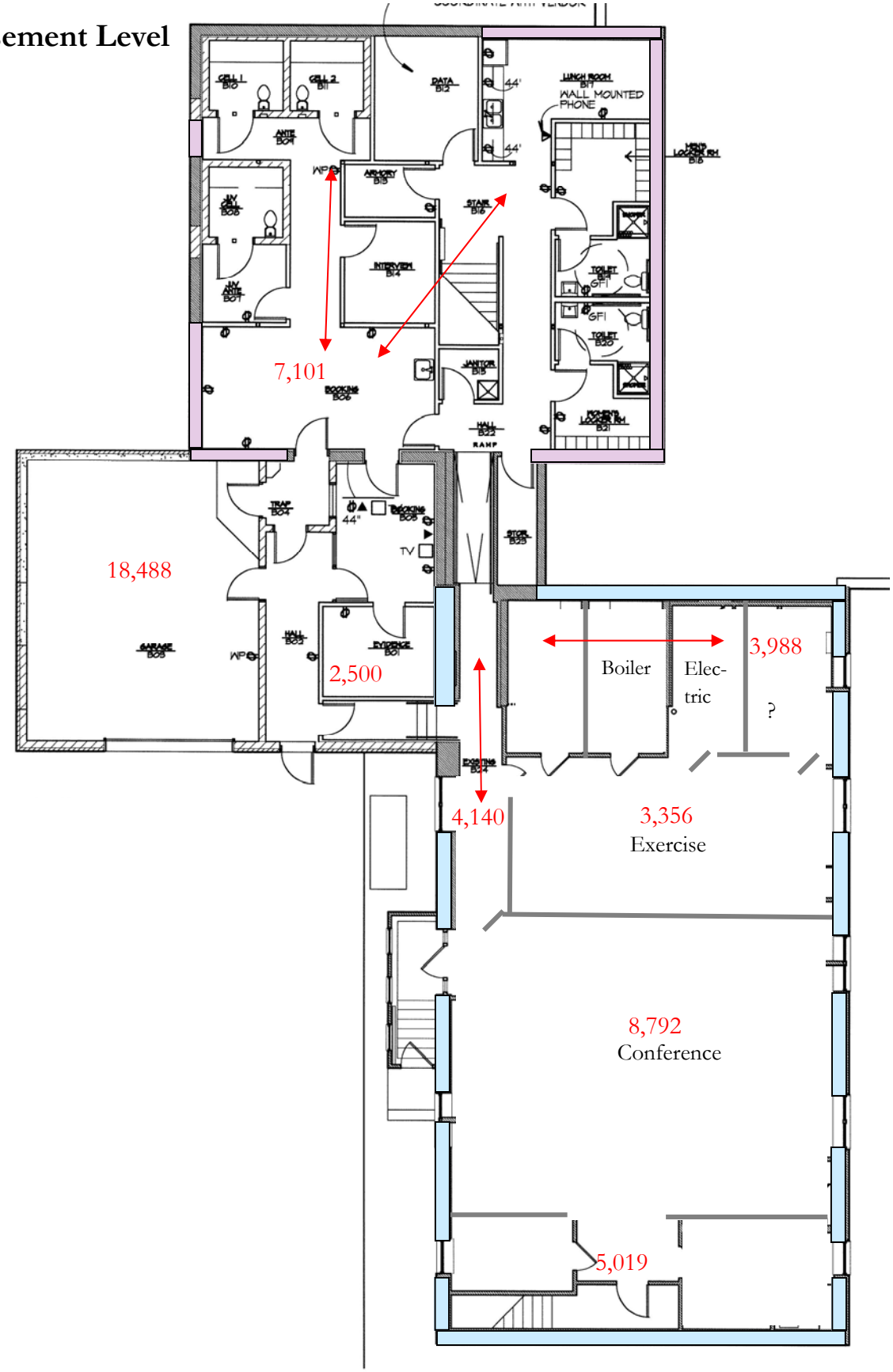
3. Best overall performance and cost effective if installed as part of a necessary re-shingling project: Insulate on the outside of the roof deck with minimum two staggered layers of 2" rigid polyisocyanurate (6" recommended) - strap foam board and install second roof deck, with vapor open underlayment, and shingles. Interior SPF over top plate to deck is important for continuity and prevent thermal by-passes.

Room by Room Peak Heat Losses

Numbers indicate Btu per hour peak heat loss at a 73°ΔT .



Basement Level



Recommended Improvements to the Envelope

#	Envelope Improvements for PD and Rec Dept	Est. Cost
	Wall Plane Thermal Barrier	
A1	Weatherstrip all (5) exterior doors	$550
A2	Weatherstrip (28) windows	$700
A3	Install deadlight, low e interior glazing unit in Sargent's Office	$135
A4	SPF all accessible rim joists and seams in Hall basement	$450
A5	Weatherstrip overhead door to Sally Port	$250
A6	Replace exterior door to PD conference room	$1,700
A7	Replace (5) casements at bay window and SPF around sill bench	$2,150
	Sub Total Wall Improvements for PD & Rec Dept	$5,935
	Attic Thermal Barrier	
C	*Option One - Ceiling Plane (Recommended)*	
HVAC 1	Remove all HVAC equipment from attic	N/A
HVAC 2	Install ERV's and ducts above suspended ceiling	N/A
HVAC 3	Install ductless VRF ASHP in PD and Rec Dept	N/A
	HVAC design and estimate needed	
C1	Install door between Hall and Rec Office	$700
C2	Construct R20 air tight thermodomes for access hatches (2)	$200
C3	Spray 4" SPF over all perimeter top plates	$1,875
C4	Air seal all penetrations and interior walls in ceiling sheet rock	$2,750
C5	Remove damaged fiberglass and blow in 12" cellulose	$5,040
	Ceiling Plane Thermal Barrier Total	$9,865
R	*Option Two - Roof Plane*	
R1	Spray minimum 7" continuous closed cell foam (SPF) against roof deck with thermal barrier paint cover	$54,840
R2	SPF over top plate to seal to foamed deck	$1,400
R3	Apply 2" Thermax to exterior end wall of Hall	$1,015
R4	Spray 3" SPF to all other attic end walls	$5,400
R5	Remove all duct insulation; mastic seal and install R8 and wrapp	$6,000
	Total Option Two	$68,655
	Community Hall Improvements	
H1	Weatherstrip front doors	$600
H2	Replace lower storm sashes with Harvey Low E True Channel	$2,520
H3	Weatherstrip all windows & Replace rope & pull w/ spring balances	$2,900
H4	Air Seal ceiling plane	$1,250
H5	Blow in additional 10" cellulose on flat and top 2' of wall	$3,000
	Total Hall Envelope Improvements	$10,270

Notes for Recommendations

A1 Professionally weatherstrip five exterior doors with durable gasket material.

A2 Apply long lasting v-groove weather-stripping for all casement and double hung windows.

A3 Install interior window glazing, tightly sealed to prevent condensation on existing fixed window. Harvey offers reasonably priced deadlight windows with low e coating.

A4 Foam seal or tape all seams of installed XPS foam and remove all fiberglass in rim joists and replace with minimum 4" SPF foam.

A5 Replace overhead door gasket with tight fitting gasket to form a continuous seal when closed.

A6 Replace exterior door to conference room with insulated, thermally broken metal door with minimal, double paned glazing as desired.

A7 Casement windows are in decent shape but higher performing glazing with low e coating will improve this large glazing area; in addition to spraying SPF on the back of the bench top and side.

Option C: Overall goal is to eliminate HVAC equipment in the attic and establish a continuous air barrier and effective levels of insulation at the rigid ceiling plane, above relocated ERV units and ductwork.

C1 Door between Hall and Rec department allows for more aggressive Hall set backs without penalizing the COP of the newly installed VRF, ductless minisplit, air source heat pumps.

C2—C4 Establish a continuous air barrier at the ceiling plane by using silicone and spray foam to seal all penetrations and openings above interior wall framing as it connects to attic joists. Perimeter foam should fully cover top plates and seal to propa vents for effecting a continuous barrier between roof ventilation and insulation layers.

C5 Fiberglass is best removed entirely as its performance is greatly diminished when compressed, however if unfaced fiberglass is placed on top of 10" of cellulose with a 4" top coating, it can have a positive effect on insulation layer. It is a labor intensive project but "squishing" fiberglass batts under other materials reduces the thermal performance over 50%. Faced batts (class II vapor retarder) need to be removed or left in contact with sheetrock.

H1 Weatherstrip oversized wood doors to Hall with durable gasket material.

H2 Storm sashes on the large Hall windows appear to be installed backwards to they have to be closed from the outside. Five of the seven do not close fully. Tight fitting Harvey True Classic storms with Low E coatings have demonstrated to be as effective as traditional replacement windows. Work with their engineering department for the optimal approach to these windows, which may include also involving Modern Manufacturing of Worster, Ma to custom make the rounded top sections.

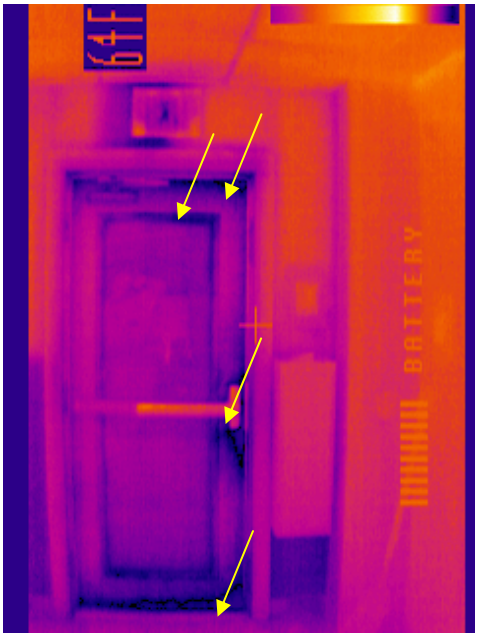
H3 Pullman Spring Balances can replace rope and pulley mechanisms for sashes up to 100 lbs. Remove weights and dense pack chase with cellulose and weatherstrip sash edges with durable gaskets.

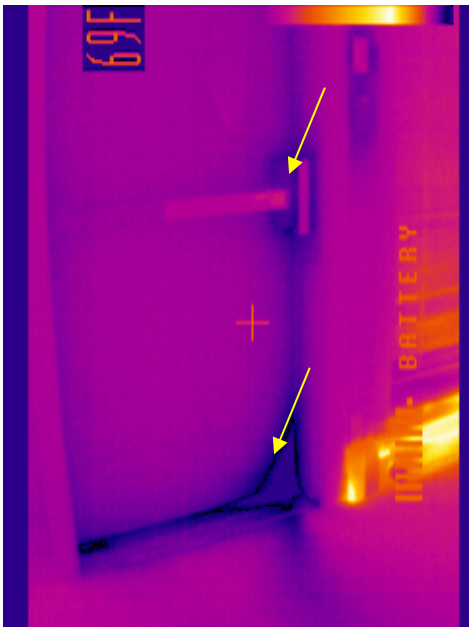
H4–H5 Surgically air seal penetrations and air pathways in the Hall ceiling plane, then dense pack cellulose above the top plates of exterior walls and add 10" in an even layer over the entire attic floor.

Police Department Doors

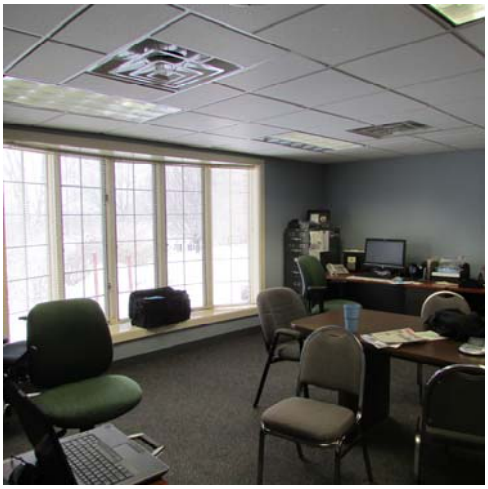
Infra red images depict anomalies in surface temperature, with darker colors indicating cooler surfaces and more rapid heat loss to the outside. Very dark areas or "streaking" usually indicate cold air infiltration as highlighted by the arrows below.

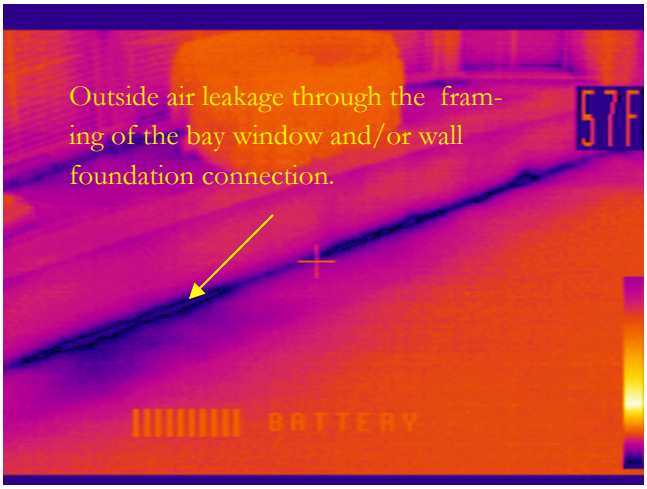
Exterior doors appear to be uninsulated steel, with or without glazing. Solid doors perform only slightly better in terms of heat loss, mostly due to the fact that glazing creates more edges, therefor cracks or gaps through which air can flow.



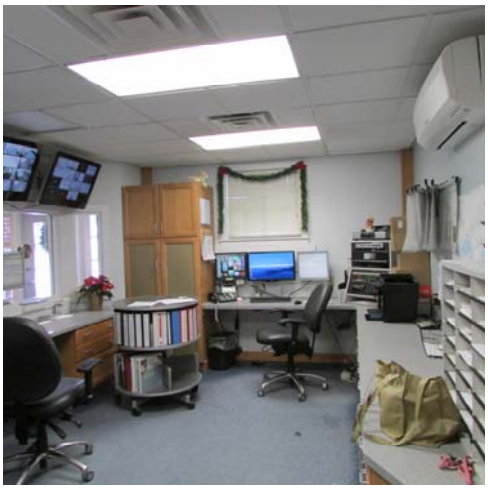


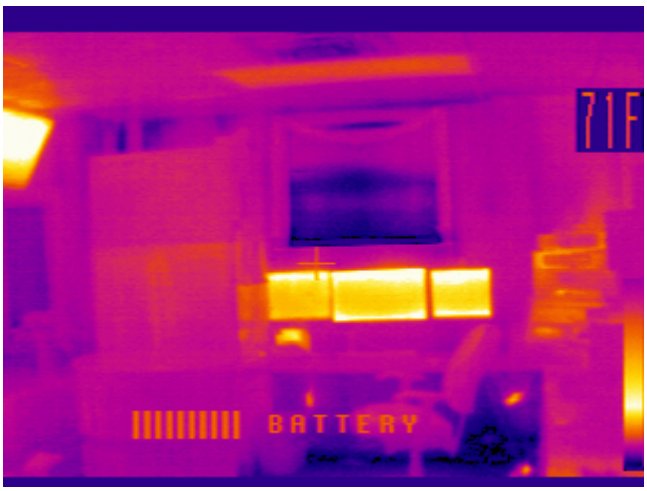
Police Department Windows





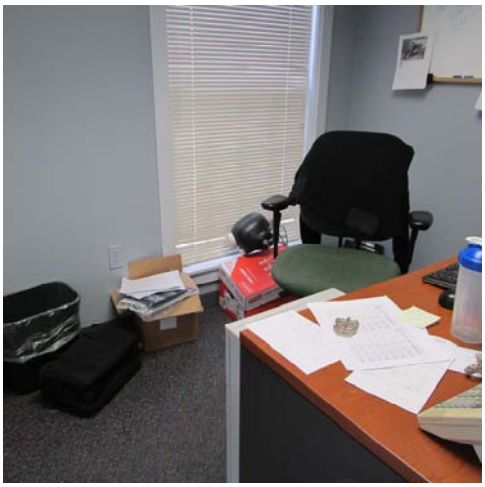
A number of windows were found closed but not latched or locked. Locking them greatly reduces air leakage, though all windows were found to be very 'leaky'. Cold air infiltration under the bay window is likely from the rough opening and very difficult to seal post construction.

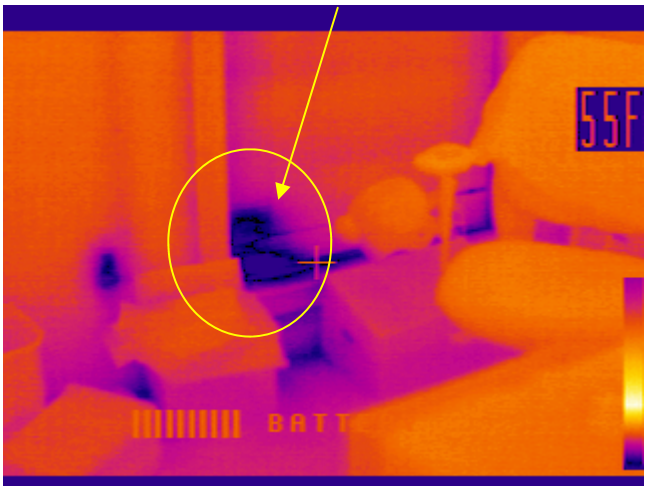




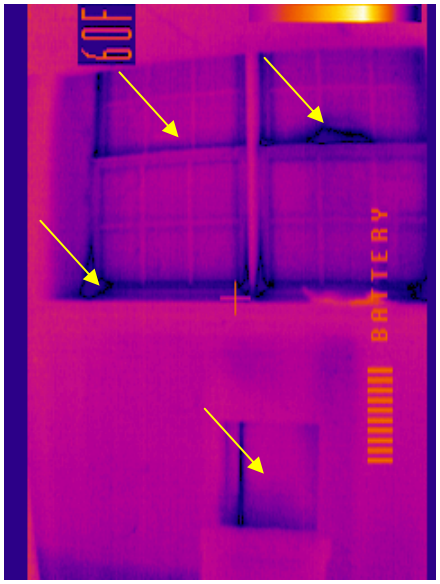
Police Department Windows

Cold outside air infiltration



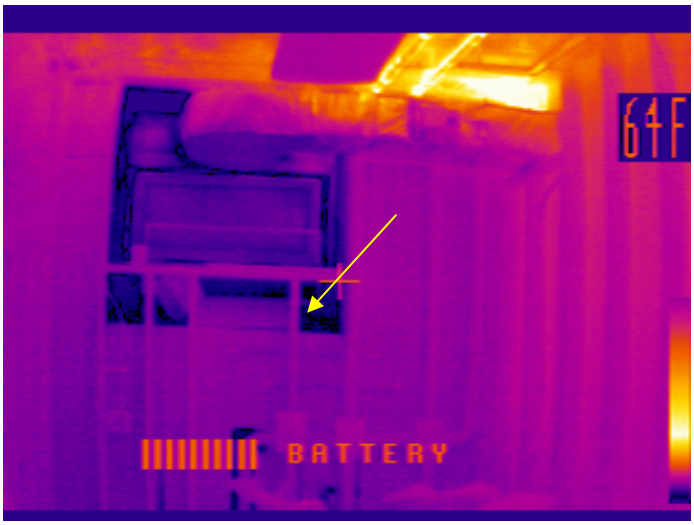


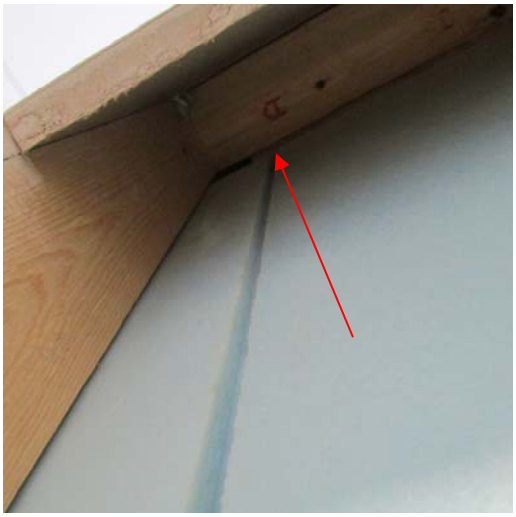
Neither the window above right or the right sash of the double window of were locked shut at the time of the photo. Note the sash on the left leaks as much air at the bottom sash, but less near the lock.



A one inch thick layer of extruded polystyrene (XPS) is evident on all exterior wall surfaces of the Hall basement. Note that the studs below appear brighter or warmer as they actually slightly improve the R-value of the wall a little.

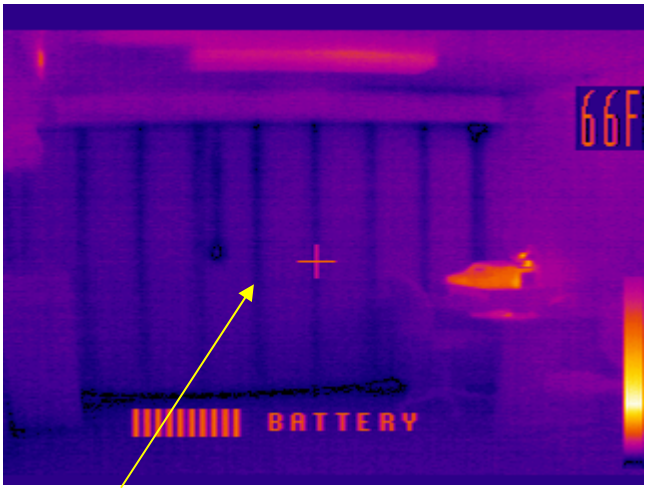
Hall Basement –PD Dept



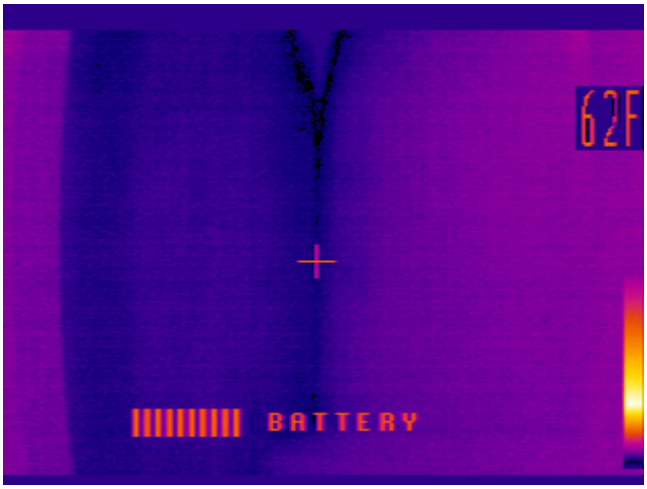


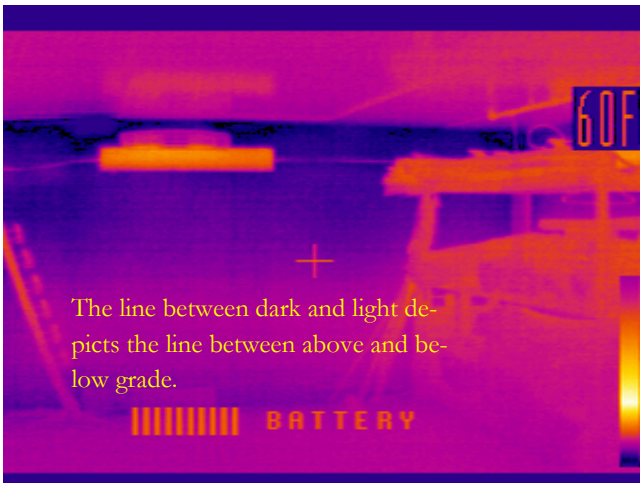
Rigid foam board adhered to a concrete foundation wall is an excellent choice for below grade walls, however foam sealing all joints, and insulating the rim joists and top plates with SPF (closed cell spray foam) is key for optimal thermal performance and to reduce the risk of condensation forming behind the 'cracks' and gaps.

Police Department Basement



The walls in the basement are either exposed concrete block (below) or block with 2x4 steel studs with fiberglass batts in the cavity. Note the thermal bridging from the highly conductive steel in contact with the concrete, leaving the surface area in contact with the metal studs far colder (darker) than the insulated cavity bays.





Police Department Above Grade Walls

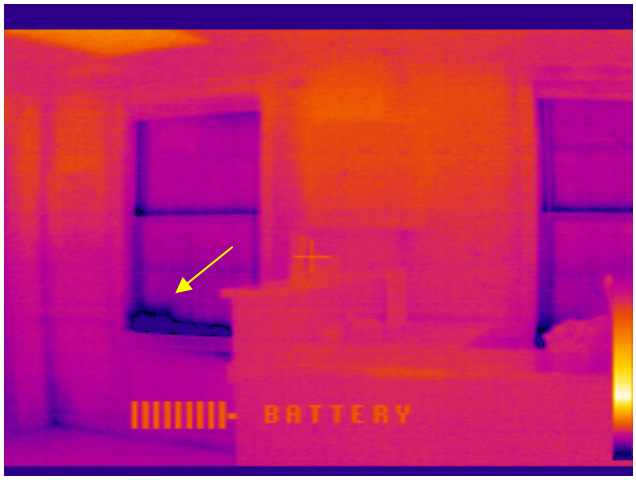
Architectural plans called for 2x6 studs at 24"OC with "R19" batts in the cavities. Note the areas of 'coolth' (circled) depict deficiencies in the thermal effectiveness of the insulation: around outlet boxes and areas where the fiberglass has been compressed, not fully lofted during install, or potentially where it has gotten wet from condensation or water leakage from above.

It is not cost effective to upgrade this type of installation at this time, unless perhaps there appear other indications of water damage. However, it is worth selecting more effective materials and installation practices for any future construction project. The cost difference at the time of original construction is minimal.

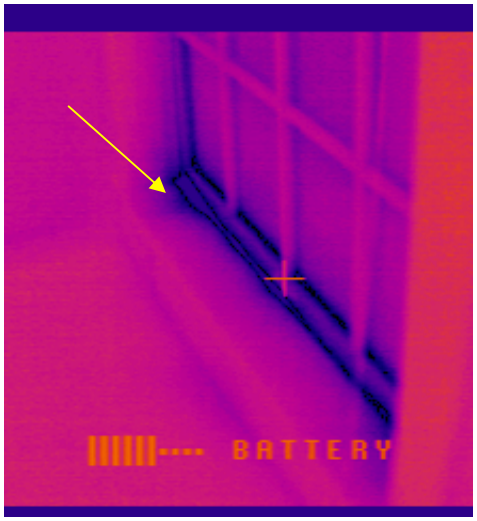
Recreation Department

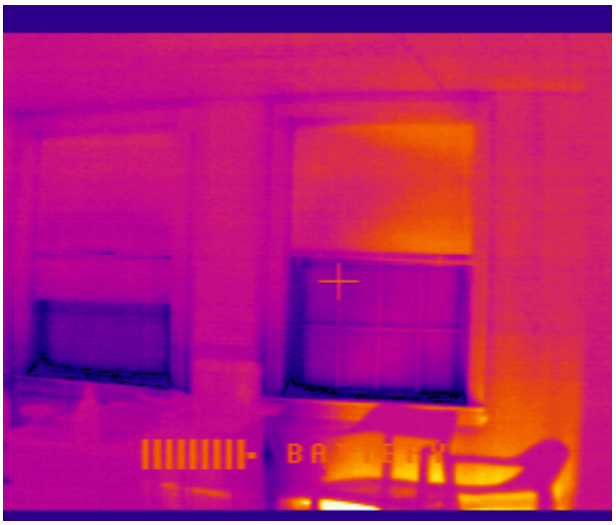
Walls of the 1999 addition are constructed with 2x6 wood studs and five and a half inch fiberglass batts.

Windows leak considerable air, even after being closed and latched locked. (Many were found partially open and unlatched in December site visits).

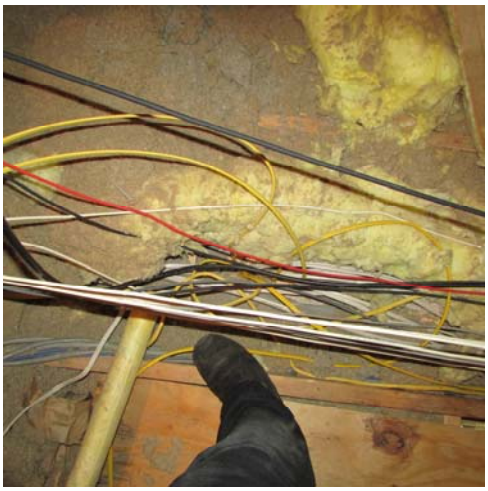


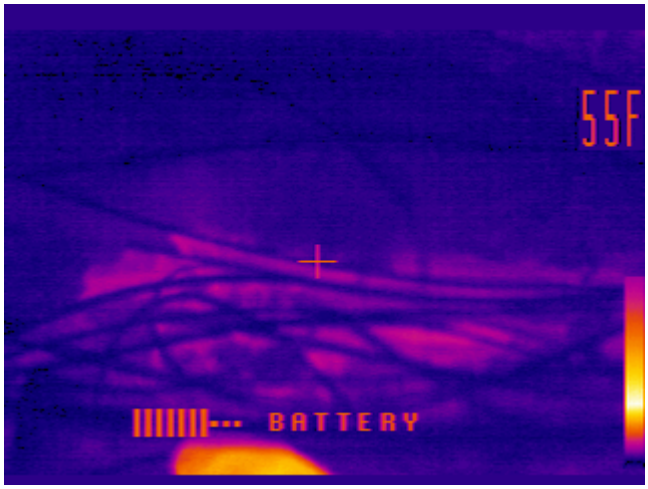
Window air leakage

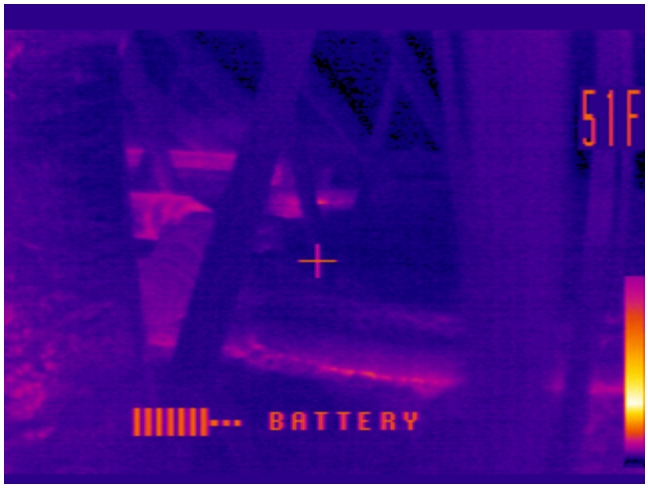




PD and Recreation Department Ceilings



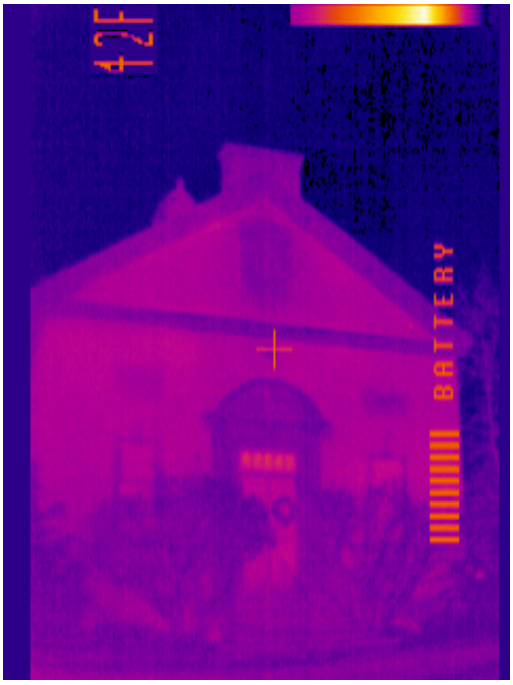




When standing in the attic on a cold day, heat loss from conditioned space below appears as bright, lighter colors.

While suspended ceilings exist through most of the 1998 addition, taped sheetrock secured below the trusses forms a fairly continuous air barrier and is an important component to the thermal envelope. Unfortunately, there are many penetrations for wires and duct work, etc, as well as above interior walls and at the perimeter top plate. These air gaps allow tremendous heat loss as well as vapor migration and sealing them is recommended, even if the thermal envelope is relocated to the roof plane.

The Community Hall



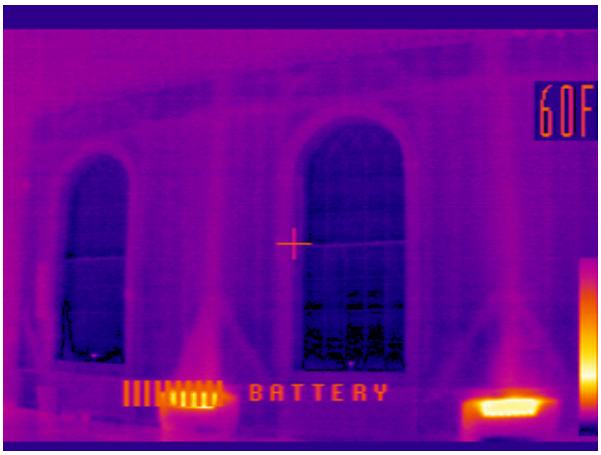
The exterior walls of the Hall appear to be brick with 2x6 wood framing to support lathe and plaster interior surfaces. There does not appear to be any insulation in the cavities. While this means substantial heat loss, filling those voids with loose fill material creates a high risk of moisture problems in the future, as water wicks easily though brick and needs to be able to dry to the interior or exterior. The risk is that warmer moist air will migrate through the cellulose (or other) material to the colder brick walls and condense.

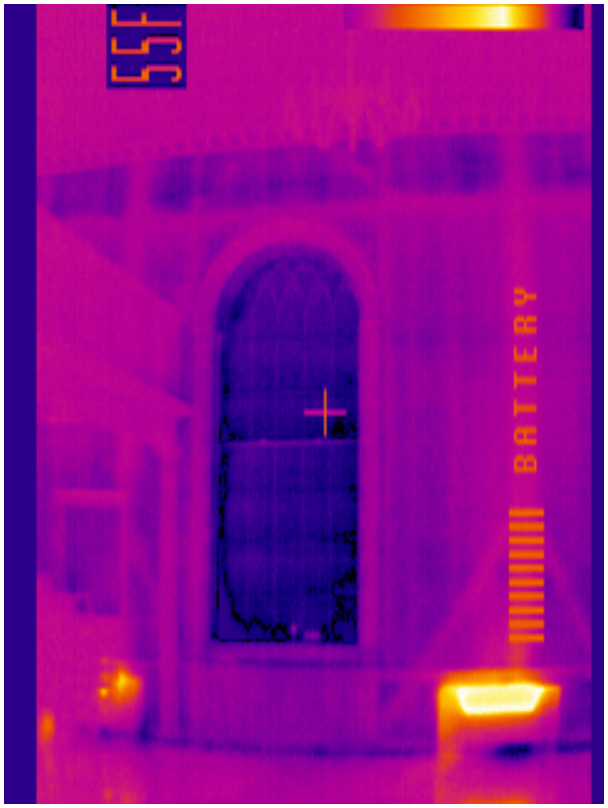
A lower risk strategy is to spray 2" closed cell foam directly on the brick to form an air barrier and semi permeable vapor barrier in addition to an R12 cavity. Thicker levels of foam could create a freeze thaw problem with the then very cold brick. This would involve gutting the existing interior surface and resurfacing at a very high cost with long pay back estimated at this time.

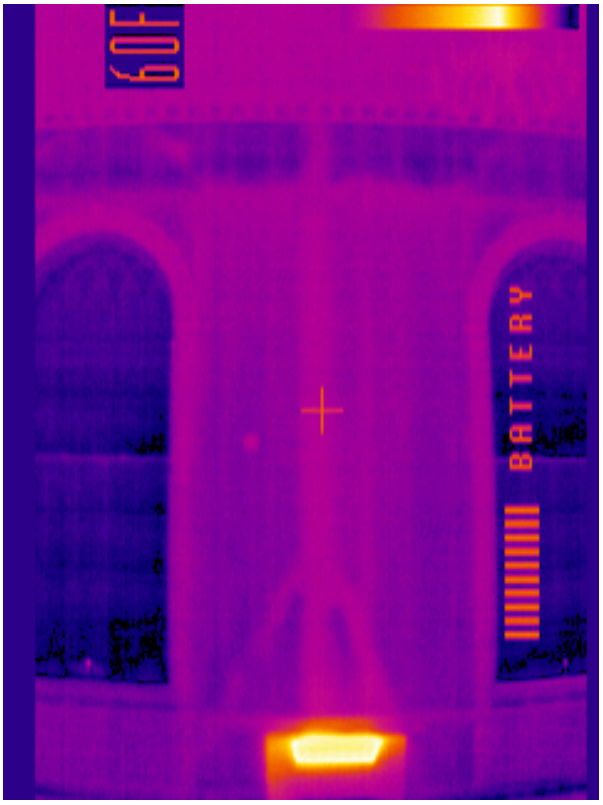
Should the interior surfaces need to be replaced in the future—insulating the walls would be advised at that time.

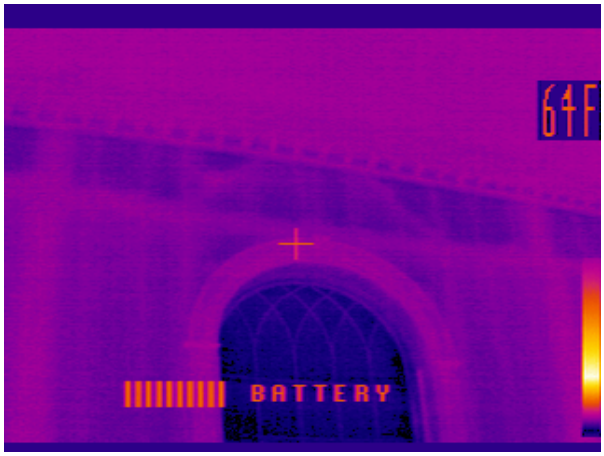
Hall walls

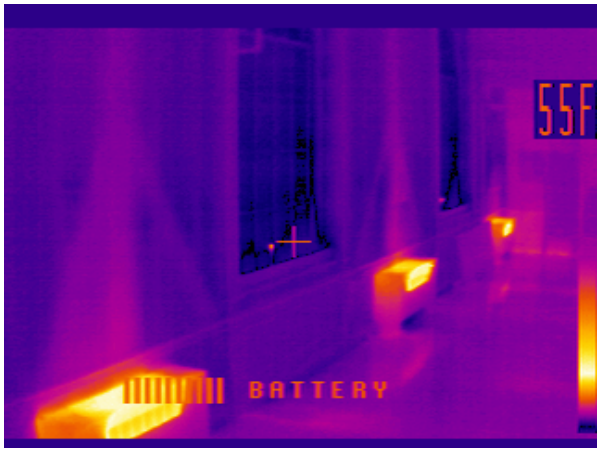
Appearing to be void of insulation, the top 18" can be accessed from the attic and would be worth the minimal risk of dense packing to help achieve a more robust air and thermal barrier at the ceiling plane.





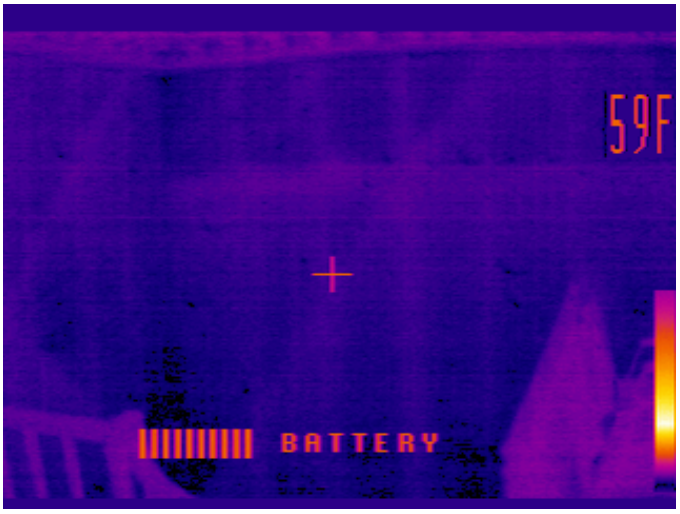


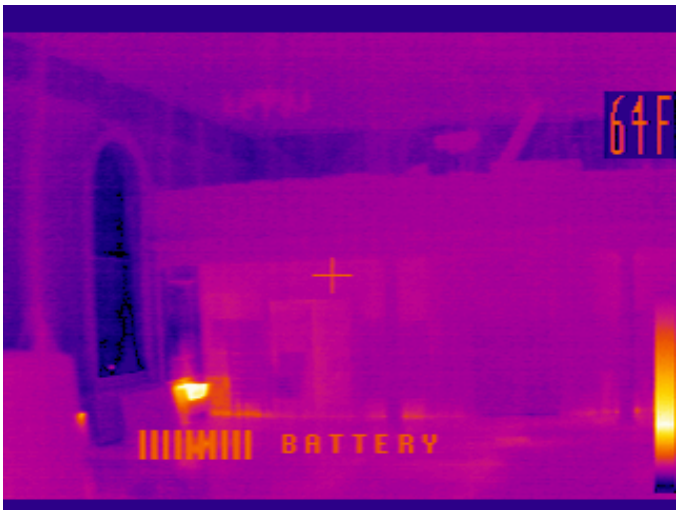




Hall walls

For reference.

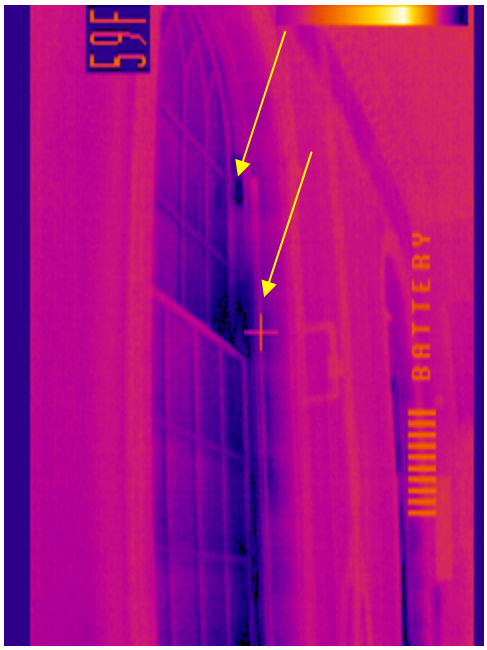


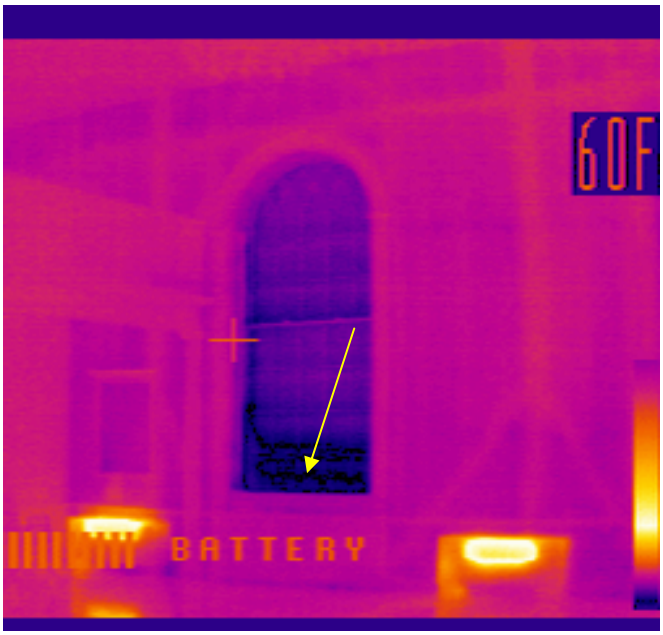


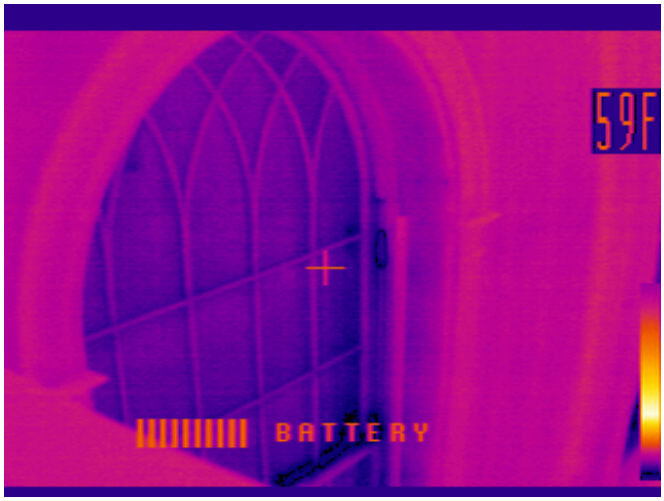
Hall Doors

The large front doors to the Community Hall have large air gaps which may require a skilled carpenter to adjust so they can close tightly before installing an effective weather-stripping the edges and sealing the panels.

Hall Windows

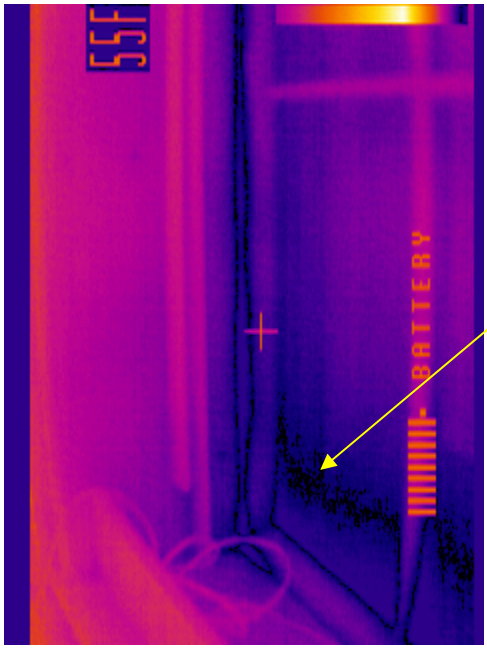


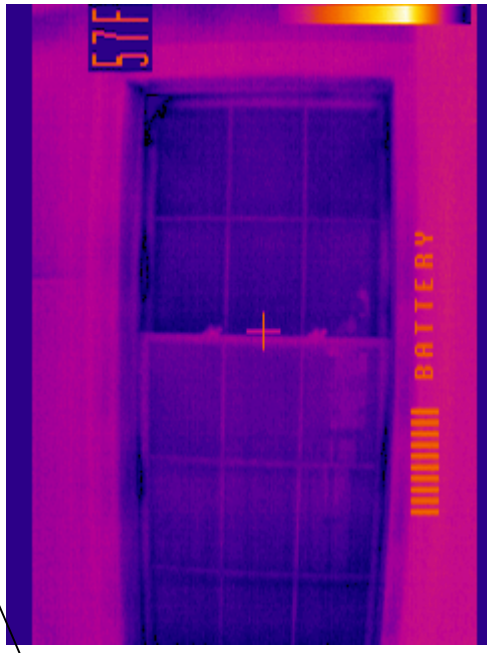




These lovely, large single pane windows account for substantial conductive and convective heat loss. The exterior storms have warped and do not close completely. Rope and pulley chases leak a lot of air (one rope is broken). Windows opened in the summer for cooling and fresh air make interior removable window glazing impractical.

Hall Windows

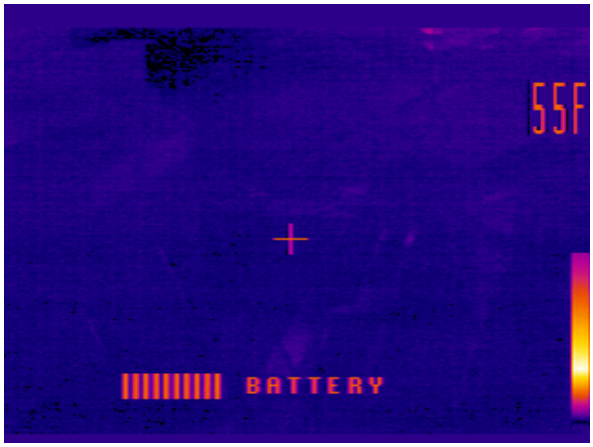


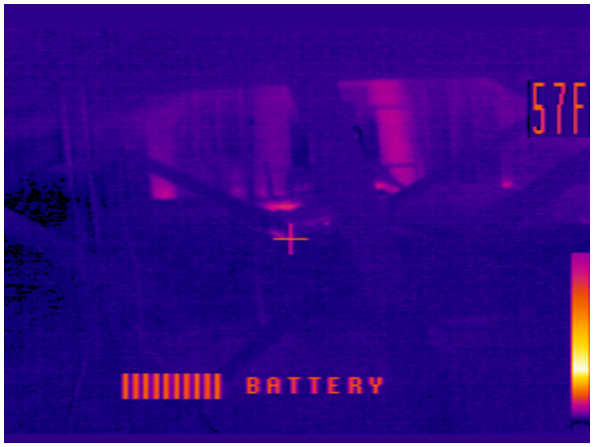


Cold air

Daylight

Hall Ceiling





The ceiling plane is fairly tight and with 8-9" of cellulose performing relatively well. Some minor voids can be improved through caulk and adding insulation.

Thermal analysis of Envelope Components

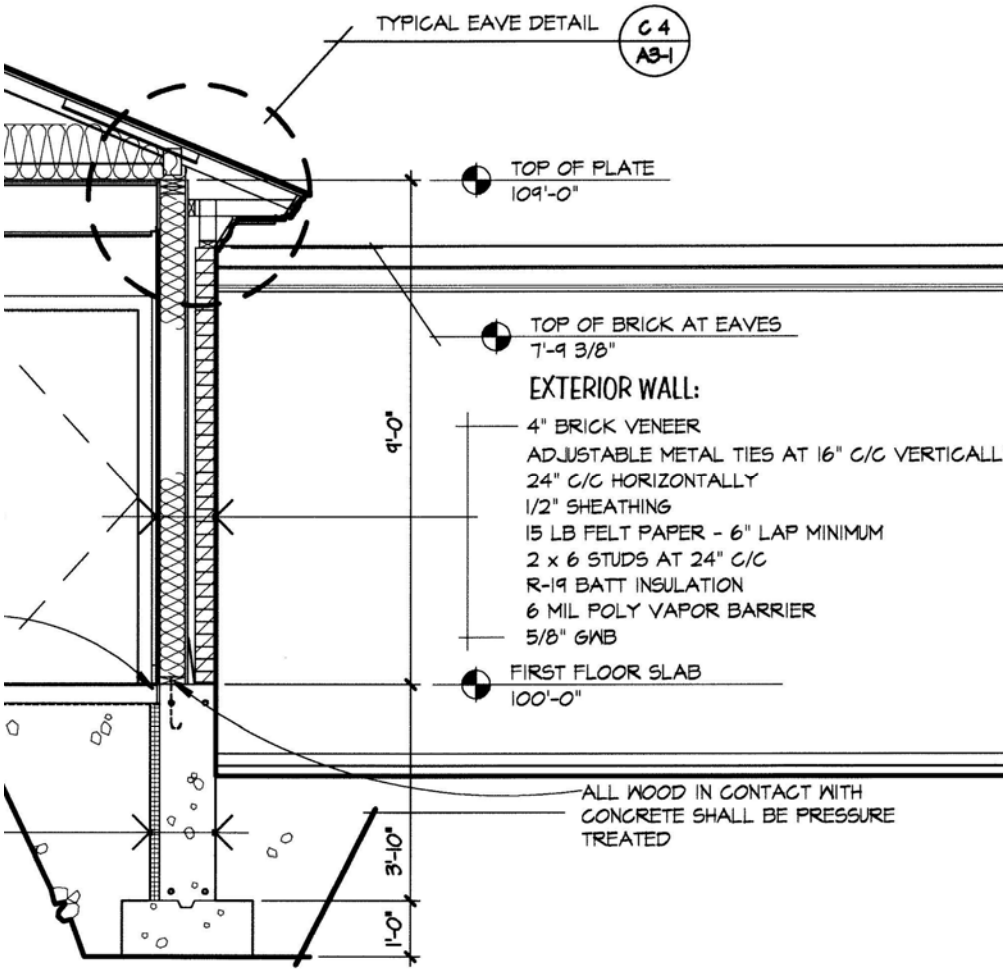
Recreation Department				
Walls	**R-Value**	**Ft2 SA**	**Coverage**	
air spacebehind brick veneer	0.17			
1/2" sheathing	0.59			
15lb felt paper	0.21			
2x6 wood studs at 24" OC	6.71		16%	of wall SA
5.5" fiberglass	16.5		84%	of wall SA
6 mil poly class I vapor barrier				
5/8" gypsum	0.46			
air space	0.68			
Total Wall R-Value	**15.0**	**574**	**13%**	**of Shell SA**
Windows		**112**	**2.5%**	**of Shell SA**
DP with 1/2" air space; low e	**2.85**			
SHGC - med (low-e -surface 1)	0.45			
Doors		**19**	**0.4%**	**of Shell SA**
Steel	**0.61**			
Glazing	**2.1**			
Ceiling (presumed)		**2,232**	**50.4%**	**of Shell SA**
8" HD fiberglass batt	**30**		75%	of ceiling SA
2x6 joists				
Compromised FG batt	**8**		15%	of ceiling SA
Floor	**10**	**553**	**12.5%**	**of Shell SA**
Slab / Perimeter	**5**	**935**	**21.1%**	**of Shell SA**
	UA			
TOTAL HALL		**4,425**	**100%**	

Police Department				
Walls	**R-Value**	**Ft2 SA**	**Coverage**	
air space behind brick veneer	0.17			
1/2" sheathing	0.59			
15lb felt paper	0.21			
2x6 wood studs at 24" OC	6.71		16%	of wall SA
5.5" fiberglass	16.5		84%	of wall SA
6 mil poly class I vapor barrier				
5/8" gypsum	0.46			
air space	0.68			
Total Wall R-Value	**15.0**	**1,670**	**13%**	**of Shell SA**
Windows		**184**	**2.5%**	**of Shell SA**
DP with 3/8" air space; low e	**2.85**	101		
SHGC - high	0.5			
DP 3/8" air space, clear glass	2.2	83		
SHGC - high	0.6			
Doors		**43**	**0.4%**	**of Shell SA**
Steel	**0.61**			
Glazing	**2.1**			
Ceiling		**2,272**	**50.4%**	**of Shell SA**
8" HD fiberglass batt	**28**		75%	of ceiling SA
2x6 joists				
Compromised FG batt	**8**		15%	of ceiling SA
Floor	**10**		**12.5%**	**of Shell SA**
Slab / Perimeter	**5**	**896**	**21.1%**	**of Shell SA**
	UA			
TOTAL Rec Department		**5,065**	**100%**	

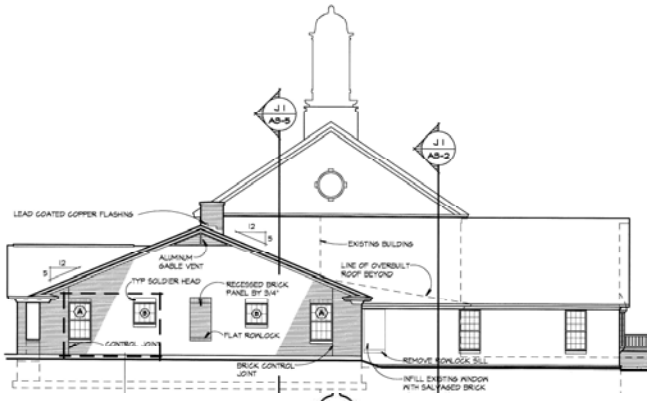
	Basement - PD and Hall						
Type	Below Grade	R-Value	Perimeter	Ft2 SA Above Grade	Ft2 SA AG to 2'BG	Ft2 SA 2'-4'BG	Ft2 SA 4'-Slab
1	Concrete	1.15	32	16	64	64	96
	Block	0.59					
	air space	0.68					
	Total Wall R-Value	**2.42**		2.4	**4**	**9**	**13**
2	Concrete	1.15	47	90	235	470	1410
	Steel Studs	0.01					
	5.5" fiberglass	15					
	6 mil poly class I VB						
	5/8" gypsum WB	0.46					
	air space	0.68					
	Total Wall R-Value	**7.0**		**7**	**9**	**14**	**18**
3	Concrete	**1.2**	**166**	**560**	**332**	**144**	
	1" XPS	**5.0**					
	Strapping						
	5/8" gypsum WB	**0.5**					
	air space	**0.7**					
	Total Wall R-Value	**7.3**		**7**	**9**	**14**	**18**
			Ft2 SA				
	Windows						
	DP w/ 3/8" air space; low e	**2.85**	**130**				
	SHGC - med	0.45					
	Doors		**276**				
	Steel Swing	**1.1**	46				
	Overhead	**5**	240				

Community Hall				
Walls	**R-Value**	**Ft2 SA**	**Coverage**	
air space	0.17			
12 inches brick	2.52			
2x6 wood	8.54		17%	of wall SA
Cavity Air Space	2.78		83%	of wall SA
lathe & plaster	1.1			
air space	0.68			
Total Wall R-Value	**7.7**	**2,697**	**45%**	**of Shell SA**
Windows		**528**	**10%**	**of Shell SA**
single pane/ext storm	**1.9**			
Doors		**67**	**1%**	**of Shell SA**
Wood	**2.8**			
Steel	**0.61**			
Ceiling		**2,652**	**44%**	**of Shell SA**
6" cellulose	**24**		42%	of ceiling SA
2x6 joists				
disturbed cellulose	**6**		2%	of ceiling SA
	UA			
TOTAL HALL		**5,944**	**100%**	

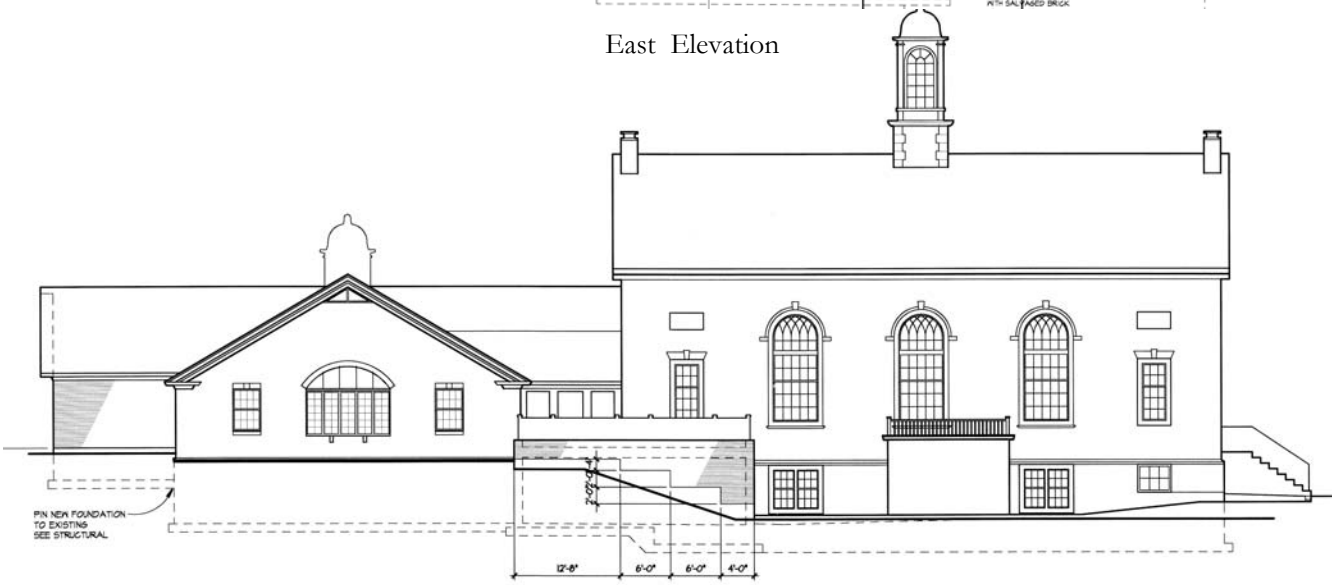
From 1999 Architectural Plans



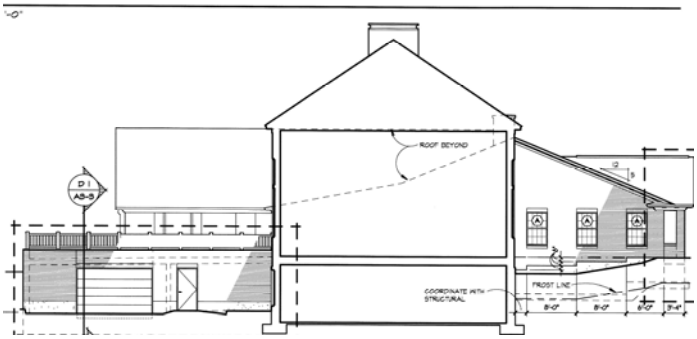
South Elevation



East Elevation



North Elevation



West Elevation

Peak Heat Loss Summary—in Btu's per Hour at 73°

AREA -	Walls	Windows	Doors	Ceiling	Slab	Air Leak	TOTAL	%
Recreation Department								
Vestibule	621	300	874	148	85	819	2,847	13.3%
Lobby	546	750		1,192	92	3,108	5,688	26.5%
Office	700	1,037		760	103	1,499	4,099	19.1%
Director's Office	336	750		393	92	654	2,225	10.4%
Center Room				413	60	830	1,303	6.1%
Restroom				110		157	267	1.2%
Restroom				110		157	267	1.2%
"Attorney"				127		127	254	1.2%
Hallways w/ Kitchen				528		968	1,496	7.0%
Housekeeping				60		77	137	0.6%
Foyer	233	850	653	200		770	2,706	12.6%
Restroom				60		77	137	0.6%
Totals	***2,436***	***3,687***	***1,527***	***4,101***	***432***	***9,243***	***21,426***	100.0%
Ratio	11.4%	17.2%	7.1%	19.1%	2.0%	43.1%	100.0%	
PD Main Floor								
Lobby	979	206	1,629	153	225	711	3,903	12.6%
Dispatch	466	206		407	135	1,388	2,602	8.4%
Dispatch Restroom				91	50	197	338	1.1%
Waiting	451	206		256	332	635	1,880	6.1%
Restroom	254			71	65	174	564	1.8%
Admin Assistant	379	206		260	101	965	1,911	6.2%
Investigations	874	386		242	95	599	2,196	7.1%
Conference				172	50	192	414	1.3%
Records				185	25	220	430	1.4%
Work Area				137		170	307	1.0%
Storage/Telecom				188		242	430	1.4%
Chief's	835	771		260		885	2,751	8.9%
Work Room	1,853	1,842		1,301		5,241	10,237	33.1%
Sargents	1,008	386		316		1,275	2,985	9.6%
Totals	***7,099***	***4,209***	***1,629***	***4,039***	***1,078***	***12,894***	***30,948***	100.0%
Ratio	22.9%	13.6%	5.3%	13.1%	3.5%	41.7%	100.0%	
PD Basement								
Sally Port	9450		2520		1120	5398	18,488	34.6%
Booking	819		567		420	694	2,500	4.7%
PD Basement	4,998				883	1,220	7,101	13.3%
Hall and Exit	1,060	521	1,195		960	404	4,140	7.8%
Utility Rooms	2,090	235			645	1,018	3,988	7.5%
Exercise	953	521			419	1,463	3,356	6.3%
Conference Room	3,302	1,564			1,167	2,759	8,792	16.5%
Storage and Stairwell	3,398	313			646	662	5,019	9.4%
Totals	***26,070***	***3,154***	***4,282***		***6,260***	***13,618***	***53,384***	100.0%
Ratio	48.8%	5.9%	8.0%		11.7%	25.5%	100.0%	

AREA -	Walls	Windows	Doors	Ceiling	Slab	Air Leak	TOTAL	%
Hall								
NW Entry	741	1,049	660	280		1,840	4,570	4.5%
SE Entry	955	1,049		244		1,577	3,825	3.8%
Hall	16,285	17,794		9,601		20,982	64,662	64.0%
Front Entry & Stairwell	11,905	4,198	1,669	2,340		7,789	27,901	27.6%
Totals	***29,886***	***24,090***	***2,329***	***12,465***		***32,188***	***100,958***	100.0%
%	29.6%	23.9%	2.3%	12.3%		31.9%	100%	
TOTALS								
REC DEPT	2,436	3,687	1,527	4,101	432	9,243	**21,426**	10.4%
PD MAIN FLOOR	7,099	4,209	1,629	4,039	1,078	12,894	**30,948**	15.0%
PD BASEMENT	26,070	3,154	4,282	-	6,260	13,618	**53,384**	25.8%
HALL	29,886	24,090	2,329	12,465	-	32,188	**100,958**	48.8%
WHOLE BUILDING	**65,491**	**35,140**	**9,767**	**20,605**	**7,770**	**67,943**	**206,716**	100.0%
Ratios	31.7%	17.0%	4.7%	10.0%	3.8%	32.9%	100.0%	

As summarized on page six, the chart above (starting on page 34) provides details for each room or area's 'peak heat loss'. This refers to the amount of heat, measured in Btu's, estimated to be lost to the outside during one of the coldest hours of a winter in New London and equals the amount of heat which needs to be supplied to that room or area in order to maintain comfort.

Heat loss is determined by mathematical formulas involving the conductivity and thickness of a material or assembly of materials, the surface area of the material(s), and the temperature difference between inside and outside. This is an important step to properly size heating equipment and the amount of distributed heat into each room or area.

The chart above reflects the calculated peak heat losses for each area, but also broken down by envelope component. Based on these calculations, the total amount of heat to be lost to the outside during a one hour period with a 73 degree temperature difference between inside and outside, is estimated to be 206,716Btu's. Almost 33 % of that heat would be through warm air exfiltration, 32% through the walls, 17% through the windows, and so forth.

This is helpful in determining opportunities for envelope improvements, though also somewhat misleading as air infiltration and exfiltration involves gaps and cracks in the air barrier at the walls, windows, doors, ceiling, and floor. So all those components share the responsibility for those nearly 68,000 Btu's from air leakage. The reason for a detailed and thorough envelope inspection and analysis (by an envelope specialist such as myself) is to a) assess the effective performance of each envelope component and b) interpret the mathematical data for more informed recommendations.

It should also be noted that buildings operate as systems and there are many factors which determine how much energy is actually used for heating and cooling. This envelope assessment focuses on the building's heating load or demand, based on heat loss through the envelope. In addition to the actual weather, how much is supplied depends on the efficiency of the heating equipment and distribution, controls, and occupancy patterns and behaviors. Therefore savings from envelope upgrades also depend on those factors.

EXHIBIT B
NHDHR INVENTORY

Name, Location, Ownership

1. Historic name Whipple Memorial Town Hall
2. District or area None
3. Street and number 429 Main Street
4. City or town New London
5. County Merrimack
6. Current owner Town of New London

Function or Use

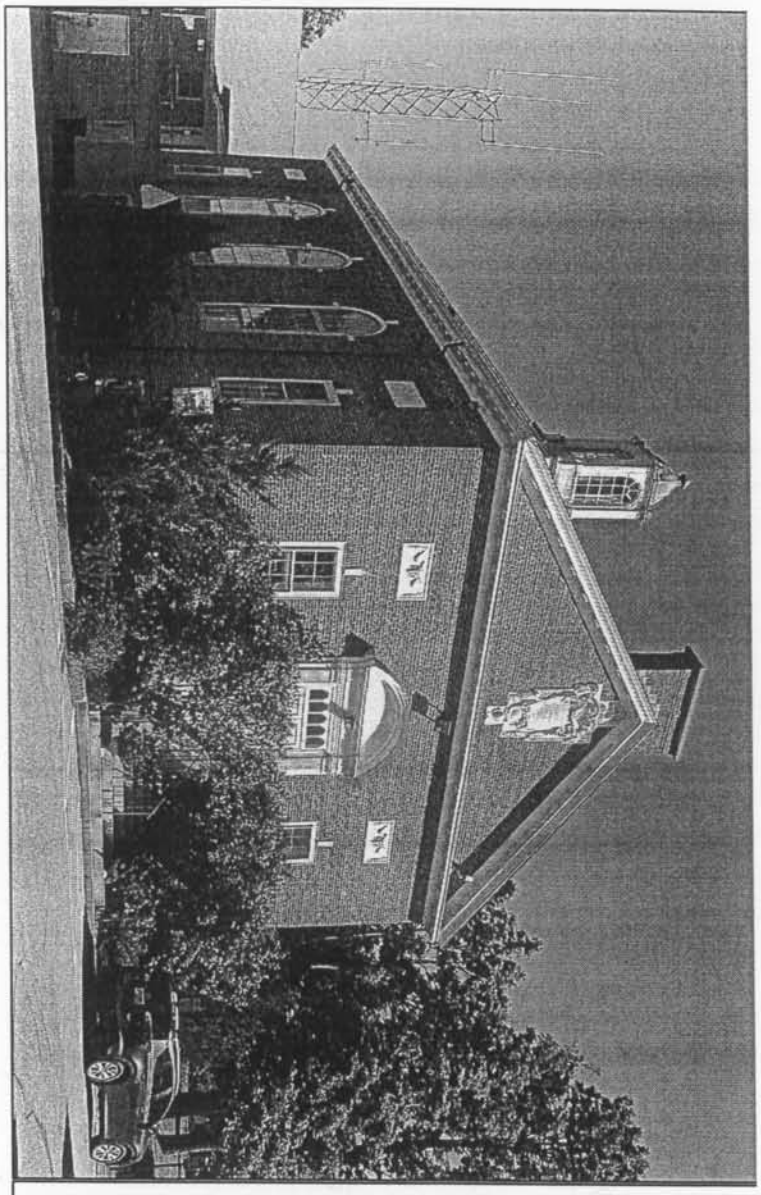
7. Current use(s) Town hall; police station; jail; theater, auditorium; meeting hall; other.
8. Historic use(s) Town hall; jail; theater, auditorium; meeting hall; courthouse; other.

Architectural Information

9. Style Classical Revival
10. Architect/builder Sidney Strickland/Horace Stanley
11. Source Original plans
12. Construction date 1917–18
13. Source Town records
14. Alterations, with dates
    Rear addition (town offices; 1985)
    Rear addition (court offices, police station; 1999)
15. Moved? No

Exterior Features

16. Foundation Concrete, poured
17. Cladding Brick
18. Roof material Slate
19. Chimney material Brick
20. Type of roof Front gable
21. Chimney location Both ends
22. Number of stories 2, full basement



35. Photo #1 Direction: View to NE
36. Date: September 19, 2014
37. Reference (file name or frame#): WMTH_01.JPG

23. Entry location Facade, center
24. Windows Double-hung; round arch
    Replacement? Basement (1999, 2010)

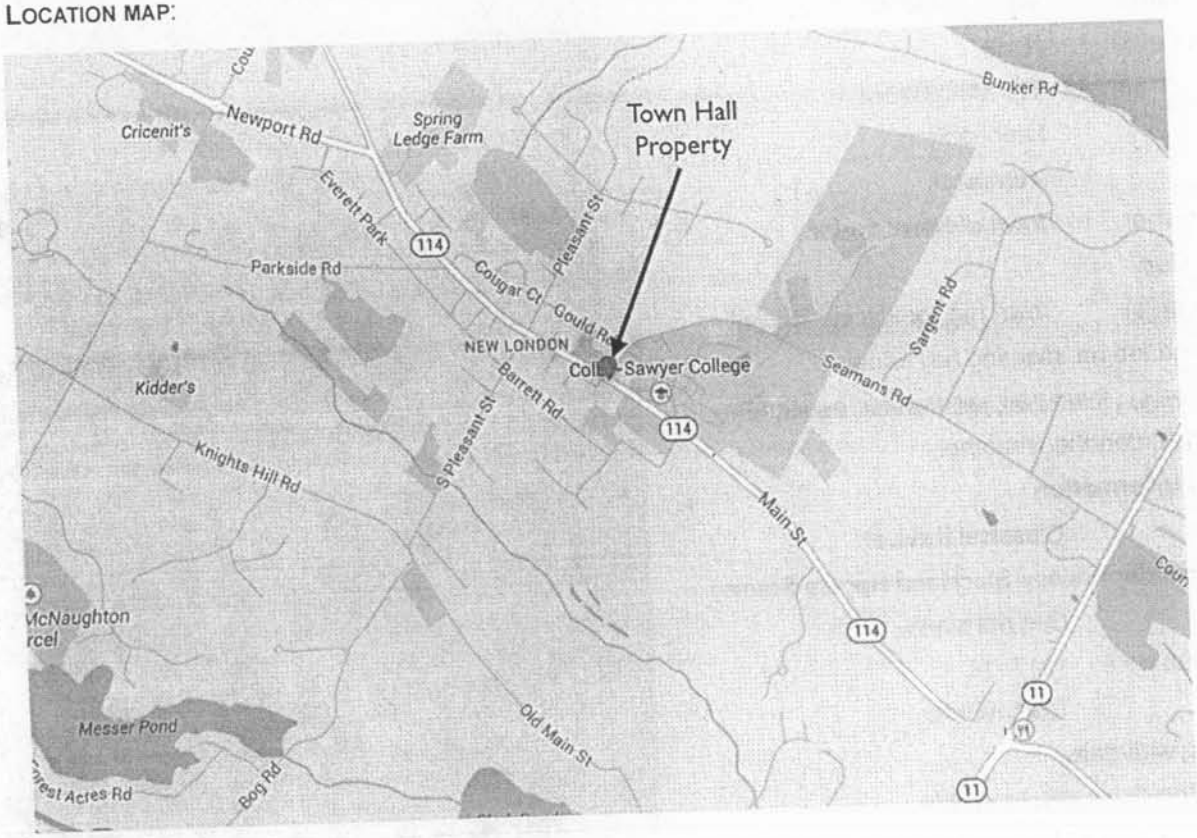
Site Features

25. Setting Institutional
26. Outbuildings None
27. Landscape features Monument (1914)
28. Acreage 0.68
29. Tax map/parcel # 085-002-000
30. Map reference 19N 258677 4810995
31. USGS quadrangle New London, 7.5 Minute

Form prepared by

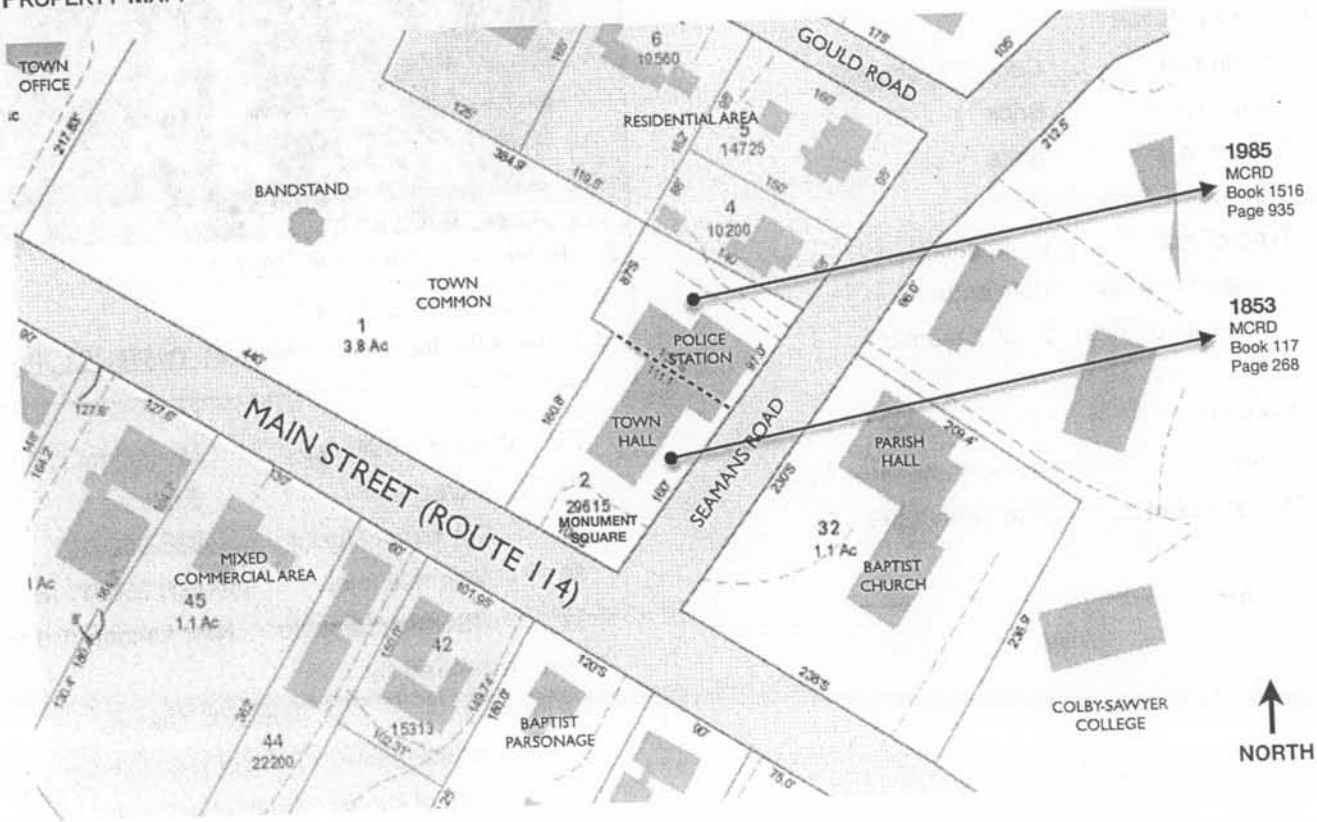
32. Name James M. Perkins
33. Organization Town of New London
34. Date of survey September 2014

39. LOCATION MAP:



NORTH

40. PROPERTY MAP:



NORTH

41. Historical Background and Role in the Town or City's Development:

> "In designing his gift, my brother Amos had in his mind two principal objects,—to do honor to the memory of his parents and to give the citizens of this Town something that would be useful to them, something that would give them pleasure, advantage and benefit, and something that would fittingly express the regard in which he held its citizens."
>
> — *Sherman L. Whipple, dedication address, June 1918*

The town of New London, New Hampshire, was incorporated in 1779. Construction of its first meeting house began in 1788 at the site of today's Old Main Street Cemetery. The work proceeded slowly, and the building was not completed until 1818, though it had been used through much of the period in an unfinished state. [TABLE 1] By 1820, the town's residential and commercial development was shifting uphill, largely through the efforts of Joseph Colby (1762–1843). Colby owned extensive property there and was an influential deacon of the Baptist church. In 1826, he arranged for the construction of a new Asher Benjamin-style church on the hill, near his homestead, his store, and his son-in-law's tavern.[1]

For the first year or two, worship services alternated between old and new meeting houses, but soon the Baptists' use and support of the old building ended, leaving the town to maintain the building. By the 1850s the town center had been fully relocated, and the former meeting house was falling into disrepair. A new town house was built next to the Baptist Church on a small corner lot purchased from Greenwood & Burpee, merchants (and Colby relations), and in 1854 the old meeting house was sold to Anthony Colby (1792–1873), son of Joseph Colby.[2] He purchased the building for use as a boys dormitory for Colby Academy, which he had established with his daughter in 1837. The building was moved up the hill to the school's campus, where it stood next to the town hall until 1934, when the dormitory was dismantled.[3]

Smaller than the old meeting-house, the town house of 1853 was a wooden, story-and-a-half, gable-front structure, costing taxpayers $1,042.[4] It contained an auditorium and stage on the first floor, and upstairs a meeting room, known as "Armory Hall" by the McCutcheon's Guards militia. At that time, there was little need for administrative office space, as those functions were conducted at the homes and businesses of elected officials. In the 1870s, however, a safe was purchased for the storage of town records, so the building also served as a document repository from that time forward. By 1910 some considered the building inadequate, despite recent improvements like acetylene gas lighting in 1906 and replacement of its shingled roof in 1904. The town was growing restive, and constables were hired. In 1910, the town erected a tramp house for the transient population drifting through the countryside. Twice the town house was vandalized by local students, who were apprehended and made reparations. In 1911, A. B. Stimson was paid

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[1] In 2005 the church was listed on the New Hampshire State Register of Historic Places as "Baptist New Meeting House" (NWL0002).

[2] After abandonment by the church, the original meeting-house was thereafter called the "town house." In 1853, the new "town house" was constructed and was not called a "town hall" in annual reports until 1859. It was then generally but not consistently referred to as the "town hall." To avoid confusion, the 1853 structure will hereafter be called the "town house" and the 1917-18 building on the same site will be called the "town hall" or "Whipple Hall." The lot for the new town house was purchased for $60 from merchants Nahum Greenwood and Anthony Burpee, brothers-in-law who had purchased the land as part of a larger parcel just months earlier.

[3] Portions of its frame have been used twice more: at the former Colby Lodge on Little Lake Sunapee and at Lethbridge Lodge on the Colby-Sawyer College campus.

[4] The town house construction coincided with the Baptist takeover of the New London Academy (renamed the New London Literary and Scientific Institution) and the consequent expansion of the 1826 Baptist Church building in order to accommodate the students' daily chapel services. Like the church itself, the town house auditorium next door became a quasi-school facility, used regularly for performances.

$20.24 for "transportation of drunks to jail." That same year the town purchased a jail cell for $99.15. It seems unlikely that it was installed in the town house, but certainly any new building would need such accommodations. In 1913, Justin Wellman, principal of Colby Academy, proposed that the town house be replaced. Warrant article #10 directed a committee to investigate the options, and they seem to have pursued two courses at once, by expending funds on repairs to the existing building and purchasing plans for a new one. In 1914, a Soldiers' Memorial was installed directly in front of the town house, focusing even more public attention on the building, seen by many as unsuitable for a memorial site. Then, in 1916, in the same year the town house was wired for electricity and new chairs were purchased, the town received an unexpected bequest from a native son, Amos Whipple.

Amos Hersey Whipple, benefactor

Born and raised in New London, Amos Hersey Whipple (1856–1916) left the state in the mid-1890s, selling his interest in a summer hotel, livery stables and stage coach service, and pharmacy. He soon became proprietor and manager of Boston's Copley Square Hotel. His hometown connections remained strong, and by his will, he offered the town $15,000 and land on which to build a new public library in his parents' honor.[5] The town, however, had already determined that a new town hall was a greater need, so the selectmen asked Sherman Whipple, Amos's younger brother and executor, whether the bequest might be altered to provide the new town hall instead.[6] By interpreting his brother's will more generally as a municipal building (or "something that would be useful"), Sherman agreed, and in 1917 voters accepted the revised bequest, authorizing construction on the property given for the library. Once again, the bequest was altered and the existing town hall site near the Soldiers' Monument was chosen instead.[7] The 1853 town house was promptly auctioned off and its materials used to expand the Kidder Garage (built in 1911).[8] Amos Whipple's bequest became the "Whipple Memorial Town Hall," and it fell to his brother to carry out the revised plans.

During most of his career as a Boston trial lawyer, Sherman Whipple also served as a trustee of Colby Academy from 1892 to 1929, and he must have visited New London regularly, keeping abreast of town affairs even after his mother's death in 1910. This connection may explain his willingness to alter Amos's bequest. He understood that a new town hall, conveniently situated between Colby Academy's lower and upper campuses, would be an asset not only to the

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[5] Both Amos and Sherman Whipple had contributed to furnishing the new library reading room in the 1905 Central School building. Amos Whipple also made an individual gift of "four handsome chandeliers," according to the Librarian's Report of 1907.

[6] Sherman Leland Whipple (1862–1930) attended the Colby Hill School, separated from his house only by an empty lot. At age 15, he graduated from Colby Academy across Main Street, and he then went to New Haven, where he distinguished himself at Yale and Yale Law School. After law school, Sherman spent the next fall and winter with Judge David Cross in Manchester, New Hampshire. He then rented a desk at the Boston office of Charles R. Train and was admitted to the Massachusetts bar. An outsider practicing alone, Whipple soon built a fearsome reputation as a litigator and won several record-setting judgements.

[7] The land included in Amos Whipple's bequest was adjacent to the school lot. It was accepted and immediately deeded back to Sherman Whipple in 1923. In 1938, Sherman's heirs donated the property to the town, in whose possession it remains.

[8] During the winter months, when automobiles could not travel on snow-covered roads, Kidder Garage Co. wired houses for electricity. Early in 1916 it electrified the town house, converting its lighting from acetylene gas for $71.13. (Local gas generation had proven unreliable in cold temperatures.) The next year Kidder purchased the town hall building for $166.80 and moved the materials down the street. The new electrical fixtures, however, remained behind and were used to light the basement of Whipple Hall. Footlights from the old town house stage were also to be reused, according to the architect's notes.

town but also to the school, and, like its predecessor, the building was used often for performances and events — until the construction of the Sawyer Performing Arts Center in 1959.[9]

The extent to which the old town house and new town hall were shared with the school has never been explored, but oral history interviews refer to dances and movies used to entertain students. Most sources date motion picture projection from 1922, but the fact that a projection booth was included in the architectural plans suggests that such activity pre-dated Whipple Hall. Between 1922 and 1948, movies were generally shown on Wednesday and Saturday nights, with an occasional Saturday matinee. During the winter months of the 1930s, William M. Kidder, who operated the theater, and Dr. Leslie Sawyer, principal of Colby Academy, would jointly decide how to distribute profits from the Saturday night shows to needy families in the form of clothing, food, or other items.[10]

Accommodation for the courts ultimately led to the second building addition (in 2000), but it brought earlier changes too. The New London Municipal Court was established by town voters in 1934. The number of court cases heard was small but increased steadily. In 1963, the state legislature voted to abolish the municipal courts by merging them into districts. This consolidation took place upon the resignation or death of the sitting judge, so its statewide impact was gradual. In New London, Judge Squires stayed in office until the appeal for a New London District Court, covering New London, Newbury, Sutton, and Wilmot, had been granted. This was accomplished in 1969, but it soon put the court's facilities under the watchful eye of the New Hampshire Court Accreditation Commission. Seeing the caseload more than double and unable to separate police, judges and prosecutors in the basement corridor, Judge Shovan requested that the "spacious and unused" auditorium upstairs be converted into a proper courtroom and a judge's office be constructed in the rear. The town demurred until the court was discredited by the Commission in 1973. The following year, the town permitted the court to meet upstairs, after courtroom furniture had been outfitted with casters for easy reconfiguration of the public space. The judge's office remained in the basement.[11]

Sherman Whipple's dedicatory remarks did not enumerate the many uses to which the new town hall would be put. The new town hall provided space for both live entertainment and motion pictures; it provided space for the town selectmen; it provided space for town records; it provided space for the jail cell; and it provided a kitchen and dining hall to feed the community during town meeting adjournments.[12] A memorial building, it is a monument to Dr. Solomon Whipple and Mrs. Henrietta Hersey Whipple, and, with its raised gable entrance facing Main Street, the building serves as a formal backdrop for the Soldiers' Monument of 1914 and the war memorials added later.

Since 1918 the hall has served as an entertainment venue and polling place, but it has also housed other important government, judicial, and cultural functions: municipal court, civil defense headquarters, police station, recreation center, and farmers' marketplace among them. While these may have been unanticipated by the architect and builders in 1917, they are all found in the multi-purpose market halls of England dating from the 1400s and transplanted to the New England colonies. The focus of activity within Whipple Memorial Town Hall has changed through time, reflecting the town's development. The building was expanded in 1985 and 2000, and already both additions have been turned over to new uses. [PHOTO #4, #5] Still, the auditorium remains intact and regularly used as "something that

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[9] Amos Whipple might not have objected to the change to his bequest in any case. As a young man, he acted in at least one production staged at the town house, and from 1880 to 1887 the town regularly paid him for care of the building, which was located across the street from Whipple's pharmacy. See appended Table 1.

[10] Sold by Kidder's wife, admission tickets were 35 cents for adults and 25 cents for children. Tickets were taken at the door by the policeman, whom Kidder was required to hire for each movie screening. Although Kidder stopped showing movies regularly in the late 1940s, images (of some sort) have been projected since; a new movie screen was purchased by the Town Hall Refurbishers in 1978.

[11] Still more pressure was put on the building when the Accreditation Commission required the Court Clerk to move her office from a nearby private residence into the town hall.

[12] This tradition continues, but in a different location. A community pot-luck supper precedes the annual town meeting.

would give [citizens] pleasure, advantage and benefit." That the hall continues to meet these goals is a credit to its architectural design.

Sidney Talbot Strickland, architect

Sidney Talbot Strickland (1880–1954) seems to have pursued architecture from an early age. Born in Cincinnati but relocated to Illinois, Sidney and his older siblings were moved to Brookline, Massachusetts, by their mother, widowed in 1892. There he attended high school, graduating in 1901. He then entered the Massachusetts Institute of Technology, completing its architecture program in 1905. In July of the same year he married Elsie Rutan of Brookline, and took her to Paris, where a daughter, Jane, was born in February, 1906. A son, Charles, was born during a sojourn in Brookline on October 12, 1907. Five days later Sidney applied for a passport to return the young family to Paris for two more years. Between 1905 and 1909, he attended the École des Beaux-Arts and traveled widely throughout Europe. By 1910 the family was back in the United States and living in Brookline at the Rutan household. For the next three years Sidney worked with his father-in-law at the architectural firm of Shepley, Rutan and Coolidge, successors to H. H. Richardson, for whom they all worked at the time of Richardson's death in 1886. Architect Charles Rutan died early in 1914, and Strickland almost immediately took a brief trip to Europe, returning in April to establish his own architectural firm.[13] He was by then 34 years old.

His business partner was Alexander Francis Law (1888–1966), about whom little is known. Born in Scotland, Law immigrated to the United States with his mother and siblings aboard the *Ivernia*, crossing from Liverpool to Boston, landing on January 25, 1910. On the alien passenger manifest, Alexander's stated occupation was revised from "student" to "architect." Census data indicate that the family was reunited with his father at a house in Winthrop, where Alexander may have lived for the next decade; he became a naturalized citizen in 1917. In 1921, he married Rosamond Elliott, a social worker from Keene, New Hampshire, and the couple moved to 99 Fairmont Street in Brookline after a four month trip to Europe to "visit relatives and study."

The firm of Strickland & Law Architects was established in Room 802 at 68 Devonshire Street in Boston but soon moved to 26 Pemberton Square. Theirs was one of hundreds of architectural firms in the city and distinguished only by Strickland's connection to Charles Rutan. We may never learn how Strickland & Law was chosen for the Whipple Memorial Town Hall project in New London, New Hampshire. Perhaps Strickland and Whipple knew each other through the Episcopal church in Brookline. Or perhaps their paths crossed down in Plymouth, Massachusetts, where both the Whipples and Rutans kept summer residences. Or perhaps Strickland had already done some interior hotel renovation work for Amos Whipple. The tone of the one surviving letter from Strickland to Whipple, regarding the dedication ceremony for the town hall building, suggests that their relationship was not familiar.

In any event, Sidney Strickland, 37, designed the Whipple Memorial Town Hall in a style befitting such a public building. The design reflected Strickland's extensive education in classical architecture and his prior study of this particular building type. In 1905, Strickland submitted a course thesis entitled "A City Hall for a city of 25,000 to 35,000 people." Although his thesis describes a comparatively monumental building, he had clearly studied the forms and symbols of government, and in the New London project he took up the challenge of reducing those ideas to a much smaller scale and budget.[14]

Most blueprint notations for Whipple Hall appear in Strickland's handwriting. The plans are numbered sequentially but otherwise undated, and many were simply folded and mailed directly to the general contractor, Horace C. Stanley

[13] Strickland may have traveled to Paris only to receive his formal degree from the École de Beaux-Arts.

[14] By 1920, New London's decennial population would trough at 701 residents, just a few more than the number counted a century earlier.

(1880–1954).[15] Local newspaper accounts indicate that construction was underway by early October, 1917, with the concrete foundation poured and brick masonry begun. As a convenience to Sherman Whipple and other trustees, the dedication ceremony was held on the evening of June 17, 1918, following Colby Academy's graduation exercises earlier in the day. Ten days later, Sidney Strickland reported for duty as a Military Intelligence staff member at its Washington headquarters; he was discharged on March 31, 1919.

Upon his return, William Blodget joined the firm, which was renamed Strickland, Blodget & Law in 1919. It would go on to build a number of private residences and public, commercial, and academic structures until its dissolution in the early 1930s. Among these were: the Elizabeth Arden Building (Boston, 1921), the Sheraton Hotel (Boston, 1923), the Ashburton Apartments (Boston, 1923), the Mount Prospect School for Boys (Waltham, 1923), the Ritz-Carlton Hotel (Boston, 1927), the Crosby Engineering Laboratory (University of Maine, 1926–28), the Junior League Building (Boston, 1929), and Brookline Fire Station "D" (Brookline, 1930).[16] [TABLE 2]

The many smaller, private commissions of the period included two in New London, New Hampshire. Mrs. Jane Allyn Tracy hired Strickland to convert the 1823 Everett-Morgan Homestead on Main Street into a public library and community center.[17] The Olmsted Bros. provided landscape design services. Walter S. Bucklin, also a Brookline resident, hired Strickland to convert the 1832 Sargent-Messer farmstead in New London into a summer home and working dairy farm.[18] Around 1932, the firm of Strickland & Strickland was created when Sidney was joined by his son, Charles R. Strickland. They continued to design some public structures and private houses, but increasingly focused on historic rehabilitations, on colonial interiors, on commercial storefronts, and on the creation of Henry Hornblower II's Plimoth Plantation in Plymouth, Massachusetts.[19] As chairman and executive director of the Massachusetts State Board of Housing, Sidney Strickland also developed several designs for model homes to address the state's housing needs.[20]

Whipple Memorial Town Hall represents an early milestone in Strickland's long and productive career. Working within the constraints of a limited budget, Strickland demonstrated his understanding of classical architecture by translating

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[15] Like Sherman Whipple, Horace Stanley was an alumnus and trustee of Colby Academy; he served from 1915 to 1954.

[16] All of these buildings are extant (but under new ownership); several exhibit both Art Deco and Classical Revival influence.

[17] Jane Tracy (1857–1944), window of Cleveland capitalist James Jared Tracy, purchased the building in 1917 but agreed to sell it to the Nursing Association for use as a hospital, which operated there from 1918 to 1923. After construction of a new hospital, ownership of this building reverted to Mrs. Tracy, who funded its renovation. The library opened in 1926 and was renamed the Tracy Memorial Building in 1951 following the town's acceptance of a Tracy bequest creating a library endowment.

[18] Strickland also designed a bank branch building for the National Shawmut Bank of Boston, where Walter S. Bucklin served as president from 1923 to 1952.

[19] Hornblower's first waterfront exhibits opened in 1947, but the larger Plantation opened in 1956, two years after Sidney Strickland's death. Charles Strickland remained actively involved in the living history museum during his own lifetime, and Sidney's grandson, architect Chris Hussey, has continued the legacy. The archives at Plimoth Plantation holds a large collection of Strickland materials related to work in Plymouth. The Pilgrim John Howland Society, also in Plymouth, holds materials regarding Strickland's archaeology at the Howland site at Rocky Nook and renovation of the Jabez Howland House, now a museum. The Jabez Howland and Richard Sparrow Houses, both Strickland rehabilitations, were added to the National Register in 1974.

[20] The precise dates of Strickland's tenure at the Board of Housing are unknown, but he served as chairman and then as executive director for over a decade, starting by 1934. He was engaged in public housing issues both at the state and national levels. These issues included specialized housing for wheelchair-bound veterans. One was built in Needham, Massachusetts, in 1948, and was reportedly the first such house in the country. Strickland & Strickland, working with advisory architect John M. Gray, created a series of sketches and model homes for both single and multi-family dwellings; these appear in albums held in the Strickland Collection, Fine Arts Department, Boston Public Library.

its forms into modern construction materials and methods, well within the experience and capability of the local contractor, Horace Stanley. Strickland's monumental city hall thesis project of 1905 would have been entirely out of place in rural New Hampshire, but this design has provided a lasting and useful public building, just as Amos Whipple had intended.

42. Applicable NHDHR Historic Contexts

Politics and Government; #107 — Local government, 1630–present.

Entertainment and Recreation; #79 — Theaters, opera houses, and movie theaters in New Hampshire.

43. Architectural Description and Comparative Evaluation:

Whipple Memorial Town Hall is a gable-front, brick building in a Classical Revival style built in 1917–18. The original structure measures nearly 39' x 72', and rises 21' from its water table to eaves. This design is the earliest known work of Sidney Strickland (Strickland & Law Architects, Boston), and he took great care in simplifying classical elements to adorn a modern and versatile structure in rural New Hampshire. Except at the basement level, the building retains most of its original architectural features and building materials.

The cupola is one such prominent feature, traceable through centuries to the English market cross, signifying the location of the marketplace. [PHOTO #2, #8] The market cross was displaced by the elevated town hall building of one or two stories, usually with a cupola or lantern above. Open ground floors offered merchants shelter from the weather behind arcades supporting enclosed official and ceremonial spaces above. Whipple Hall's large arched windows and cupola recall that architectural legacy, both in its early English form and as it was carried to the New England settlements of Boston, Newport, and Portsmouth.

Whipple Hall's raised, gable-front orientation was necessitated by the narrow site, but Strickland probably would not have chosen otherwise. The Greek temple form was employed for municipal buildings long after its appeal in residential design had faded.[21] Within the pediment above the front door is a cartouche, made of five abutted limestone panels, into which is inscribed "Whipple Memorial Town Hall A.D., 1917". The surrounding imagery seems to advertise the building's dual purpose: civic-military activity, in the form of a unicorn-lion wielding a sword; and entertainment, represented by winged, singing cherubs against a curtained backdrop. [PHOTO #18]

At the time of construction, Whipple Hall was one of just two brick buildings on New London's Main Street. Today it lies at the periphery of a row of brick dormitories belonging to Colby-Sawyer College, but in 1918 it stood surrounded by clapboarded buildings, with the brick Colgate Hall farther to the east.[22]

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[21] By contrast, the Classical Revival public libraries built during the early 1900s were predominantly hip-roofed, with their central entrances under the eaves facing the street, often with Beaux Arts details. The Greek Revival style remained favored for town halls: the Old Town Hall in Columbia (1899) and Whitcomb Hall in Swanzey (1916), both clapboarded, are examples.

[22] A third brick structure, on Morgan Hill, predates the others. It was the Sylvanus Sargent homestead of 1832, which Strickland would soon enlarge for a client, Walter S. Bucklin. A brick-maker, Sargent manufactured his own bricks at the house site. A brick academy building was constructed in 1872, but it burned in 1892 and sat in ruins until work began on Colgate Hall in 1911.

Exterior and Interior

In exterior design and decoration, the building is rigidly symmetrical. Within a segmental arch and pilaster surrounds are central double doors, with 6/9 windows at either hand. Above these windows are placed bucrania, ox skulls and drapery carved into limestone panels. [PHOTO #15] The opposing rear facade lacked openings, but the front fenestration was imitated by false openings in the brickwork. Much of that detail has been obstructed by later additions. [PHOTO #19]

On the northwest and southeast elevations are the three large windows, arched and headed with tracery. [PHOTO #12, #13] These demarcate the central auditorium space, designated "Assembly Hall" on the plans. On either end is a 6/9 sash window with a bucranium above, bookending the arched windows. [PHOTO #2] Directly below the arched windows and matching their width, are paired, double-hung windows, modern replacements for earlier 6/6 sashes. Along the higher, southeast side, these basement windows are set within concrete wells. Overhead, the cornice recedes from the integral gutter edge, meeting the brick wall through a series of diminishing ogees, facia, and ending with a quirked bead. Modillions are spaced at regular intervals on the soffits.

The structure stands over two stories high, with 4" wood studded interior walls and 8" exterior brick walls; these are separated by a 2" gap, according to the architect's plans. The exterior brick walls are set in a common bond pattern, with header courses placed after every third row of stretchers.[23] The brickwork is patterned, as a majority of the header bricks appears darker than the stretchers, creating horizontal bands which encircle the building. The slate roof is supported by a series of four roof trusses, evenly spaced, above 8" x 8" posts transferring the load through wall cavities to the foundation. [PHOTO #17]

The highest point on the site lies at the northeast corner, where the poured concrete foundation is barely visible below the molded brick water table, capping the foundation, which projects 2" beyond the plane of the brick walls. (On the facade only, brickwork masks the concrete foundation.) Across the diagonal, at the the southwest corner, almost 5' of the foundation is visible — yielding a basement entrance requiring just a few steps. This level was designed for the central dining area and kitchen, a records storage room, a jail cell, two restrooms, and two furnace rooms for steam heat. The basement has been gutted and reconfigured at least twice since the mid-1950s.

On the facade, the first floor door threshold lies 4'-7" above the asphalt driveway and is reached by a flight of eight granite steps, with wrought iron handrails curving inward as they gain elevation. On this level, the plan is divided among the auditorium (or "Assembly Hall"), the stage (with ante-rooms on either hand), selectmen's office (now used for storage of polling and recreation equipment), vestibule, and an internal stairwell leading from basement to gallery.[24]

The second level is mostly void, with the exception of a seating gallery descending in four stages from the building's front wall and extending into the auditorium space as far as the first arched window. [PHOTO #7, #16] At the time of construction, a projection booth was included for "moving pictures," and into the 1970s at least, the hall was often used for movies. The gallery stairs descend to the vestibule, just outside the auditorium, accessible by the central double doors, composed of three, flat horizontal panels. (When closed, they give the appearance of a single six-panel door.) Regarding the stairs, the architect instructed the carpenter to "work out an easy curve for [the] rail." The geometry was made more complex by the outward flare of the lower steps. [PHOTO #10, #11]

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[23] Within the front and rear gables brick veneer is visible against horizontal wood sheathing, loosely spaced.

[24] Another stairwell led from the northeast corner ante-room to the basement, making that area accessible to performers for "backstage" use. During the renovations of 2000, that internal stairwell was eliminated, and the ante-room became a corridor leading to new court offices, with a wheelchair-accessible entrance on Seamans Road.

Chief among the interior features is the performance stage. [PHOTO #6] In one sense, the entire building emanates from that focal point.[25] Its simple decorative panels are created by the shadows of drilled holes, varying in depth and diameter according to the architect's plan. The holes are arranged in ovals and swags. [PHOTO #14] Full-size blueprints of these decorative details were drawn as an aid for the builders, and those sheets show punctures where a marking tool was used to transfer the pattern directly onto the wood panels. Pilasters at either side of the stage are echoed at the rear by columns, set on octagonal plinths, under the edge of the gallery.

Building Additions

The single-story additions at the rear of the property are of brick veneer under a low-pitched, asphalt shingle roof. They make no pretense of belonging to the original structure and are easily differentiated by their brickwork, modern materials, and simplified ornament. [PHOTOS #4, #5] Two identical, recessed entrances face Seamans Road with segmental arches and prominent gable returns; one now provides street-level access to Whipple Hall and the other serves the police station and emergency dispatcher. The roofline of the additions lies below the pediment of Whipple Hall, preserving as much of its visibility as possible.[26]

Built in 1985, the first addition measured 45' x 42' and included a first floor and full basement.[27] It accommodated the selectmen's office, town clerk's office upstairs; police and archives spaces in the basement were furnished by 1987. The addition was attached to Whipple Hall's north corner at both levels by a passageway, measuring about 8' x 10'. [FIGURE 3]

The addition of 1999/2000 enlarged the previous addition in two directions, creating new first-floor space for police and court offices to the southeast, measuring approximately 66' x 48', and connecting a new sally port (secure prisoner transfer and processing area, measuring 40' x 28') to the exposed basement.[28] [FIGURE 4]

The town offices were moved to the renovated Old Academy building across Sargent Common. A freestanding communications tower erected just north of the addition allowed the antennae formerly attached to Whipple Hall's cupola to be relocated behind the building; today one monopole antenna remains within the cupola.

Comparable Structures

In both framing and finish work, the original Whipple Memorial Town Hall exhibits a high degree of architectural design, engineering, and workmanship. There are few comparable town hall structures in New Hampshire, but in size and construction, a host of public libraries might be considered, despite their differing function and almost uniformly side-gable orientation. After 1900, many of those libraries were designed in a Classical Revival style. The Boscawen Library & Town Records Building, designed by Guy Lowell in 1915, and the Peterborough Historical Society building of 1916 are two brick structures of similar size and style in the vicinity. Much closer, however, is Colgate Hall, designed by another MIT-trained architect, George C. Harding (1867–1921) of Pittsfield, Massachusetts. [FIGURE 2] This

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[25] Among the surviving architectural plans for the new building is a measured plan of the 1853 town house stage, so Strickland clearly looked at the existing structure for guidance, shortcomings, or both, and it probably ranked highest on the town's list of functional requirements.

[26] The two-story house that previously occupied the site of the additions may have obscured even more of the building than do its current additions.

[27] The plans held at the New London Town Archives were drawn by Richard Gregor Associates, New London, New Hampshire, and are dated between late June and mid-July, 1985.

[28] These plans, dating from December, 1999, were drawn by Dignard Architectural Services of New Boston, New Hampshire, with Milestone Engineering of Manchester serving as construction manager.

Colonial Revival academic building was completed in 1912, having been constructed by Horace C. Stanley, the local contractor also chosen for Whipple Hall.[29]

44. National or State Register Criteria Statement of Significance:

The property is significant under Criterion A (local history).

This town hall building, New London's third, reflects the changing nature of local government. The original meetinghouse was primarily a religious structure until its abandonment by the Baptist Church in 1826. Its inconvenient location and the reluctance of citizens to fund its maintenance ultimately led to its disposition. It was replaced by a purpose-built town house using public funds. Colby Academy (at that time called the New London Literary & Scientific Institution) made frequent use of the building for concerts, dances, and drama productions. The school also made almost daily use of the Baptist Church next door, for regular chapel services, in addition to convocations, commencements, and baccalaureates.

The donation of the new town hall mirrored a pattern seen in many New Hampshire towns. Native sons (and occasionally daughters) found fortune elsewhere and then created public monuments back home in the form of libraries, hospitals, and public structures. It is no accident that the bequest by Amos Whipple specified a library. By that time the library movement was well established, and many New Hampshire towns had gained impressive new masonry libraries, some designed in a Classical Revival style, and others, a decade or more older, designed in the Richardsonian manner.

The revision of Amos Whipple's bequest by his brother was a practical decision. Residents had already voted to replace the 1853 town house and so considered it a greater priority than its public library, which, though small, was comparatively new, having been established in the basement of the Central School building of 1905. The multi-purpose town hall, shared by the Academy and town, represented a continuation of the town-gown partnership that had helped sustain both town and school during the 19th century. The relationship continues today, with Colby-Sawyer College offering public access to many of its facilities. Whipple Memorial Town Hall is a manifestation of that longstanding partnership.

The property is significant under Criterion C (architecture).

The architectural significance of Whipple Memorial Town Hall is imparted first by its design and workmanship, representing a fine example of a public building in the Classical Revival style, appropriately adapted to rural New Hampshire. Its significance is also imparted by the Boston architect, Sidney Strickland, as the first documented commission of his architectural firm, Strickland & Law Architects. The design exhibits his formal architectural training at MIT and the École des Beaux-Arts—as well as his experience in civil and academic architecture gained at the firm of Shepley, Rutan and Coolidge, successors to H. H. Richardson. Strickland's work has never been fully cataloged due to the loss of his earlier records, but the fraction that remains is impressive in scope, leading from this town hall in central

[29] Harding's own design for the Lenox Town Hall (1901) included an auditorium wing and performance stage at the rear, illuminated by tall, arched windows quite similar to those used by Strickland at Whipple Hall. See "Town Building, Lenox, Mass." in *The Brickbuilder* (December 1909, plate 159).

New Hampshire to the Ritz-Carlton Hotel (now Taj) in Boston's Back Bay to the crude, reproduction dwelling houses at Plimoth Plantation.[30]

45. Period of Significance:

Criterion A: For its role in town affairs and development, the building's significance extends from its dedication in 1918 to fifty years ago, or 1964.

Criterion C: As an example of Classical Revival public architecture and as the earliest public commission of an accomplished architect, the building's significance is limited to its period of design and construction, from 1917 to 1918.

46. Statement of Integrity:

The building remains in its original location, occupying the site of the 1853 town house. The exterior design of the building is nearly true to its construction plans, although the 1985 and 1999-2000 additions obstruct much of the rear facade. (A portion of the original lower exterior wall is now exposed within the 1999-2000 addition.) The front facade and elevations of Whipple Hall are intact and highly visible from Main Street, Seamans Road, and Sargent Common. The basement has been reconfigured several times and bears little resemblance to original plans for a community kitchen and dining room. On the exterior, the basement windows (most set below grade within window wells) and the basement entrance are not original. The auditorium ("Assembly Hall") and theatrical stage are intact, but the movie projection booth at the gallery level has been removed. The materials and workmanship of the 1918 structure are still evident, though the chimneys have been rebuilt above the roofline using a different profile with enlarged chimney hoods. The setting of the property has changed since construction, as buildings that formerly stood to either side have been removed; as a result, Whipple Hall is more visible today than at the time of its construction. Nevertheless, the feeling remains as the architect and donor/executor intended. Few of today's residents know of the Whipple family's many contributions to New London, but the nominal association is perpetuated, as the building is commonly called "Whipple Hall" if only to distinguish it from the nearby Town Offices — often (and erroneously) called the "Town Hall."

47. Boundary Discussion:

The original town house property boundary of 1853 was expanded in 1984 by the purchase of an abutting residence, then owned by Colby-Sawyer College. This northward acquisition made room for the 1985 addition of new town offices, linked by a hyphen to the original Whipple Memorial Town Hall. Most of the later 2000 addition also lies on the expanded property. [PROPERTY MAP] Because these rear additions do not materially detract from the integrity of the original structure, the entire tax parcel is considered historic.

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[30] The houses portrayed at Plimoth Plantation today have become even more crude than Strickland envisioned. His conception of a 1627 house, timber-framed with a massive stone chimney at one end, was probably incorrect for the Plantation, in which earthfast (post-in-hole) construction is now considered typical. The Strickland-designed houses have been entirely replaced, in conformity with more recent archaeological and vernacular evidence. For more, see James Baker's article "'As Time Will Serve': The Evolution of Plimoth Plantation's Recreated Architecture" published in *Old-Time New England* (Spring 1996, 49–76).

48. Bibliography and/or References:

The construction, maintenance, and alteration of Whipple Memorial Town Hall is well documented by town reports, town histories, photographs, and architectural blueprints held at the New London Town Archives. Several of Whipple Hall's original architectural drawings, ink on drafting linen, are held at the Boston Public Library. Property deeds have been retrieved from the Merrimack County Registry of Deeds, while boundary maps are available from the New London Assessor's GIS website.

The building's architect, Sidney Strickland, has never been thoroughly researched, though some effort was made in the mid-1970s by archivist Mildred Tunis, whose modestly-titled article "The Most Beautiful Public Building in Our State" was published locally in the *Blackwater Gazette*. Her research notes mention a telephone conversation with Charles Strickland, who stated that his father's files and drawings had been lost to a fire in Plymouth, Massachusetts. Fortunately much remains. Sidney Strickland's surviving work may be found among the archival collections held at the Boston Public Library (Fine Arts Department), Massachusetts Institute of Technology and MIT Museum, and Plimoth Plantation Library. Together, these sources provide a clear if incomplete picture of Strickland's career.

Profiles of the Whipple brothers have largely been gathered from Boston and New London newspaper articles and from the New London town histories. The archives at Colby-Sawyer College has records of their student enrollment and records of Sherman's longtime service as trustee. The college archives undoubtedly has much more material regarding the historic cooperation between the town and school which might allow researchers to chronicle the school's use of Whipple Hall.

The history of the town hall building type has not been researched in northern New England. Kevin Sweeny's *Winterthur Portoflio* article about Massachusetts, Connecticut, and Rhode Island buildings is informative, but because of the much later settlement of inland New Hampshire, much of his inquiry is not applicable. Because town halls often contained courtrooms, police stations, and theaters, surveys of those building types are sometimes helpful as in Martha McNamara's *From Tavern to Courthouse*. A particularly thorough catalog of Canadian town halls compiled by Parks Canada contains one essay on their relation to town halls in the United States, and it shows the wide variety of architectural examples found in rural locations. For background on the English town hall from medieval to colonial times, Robert Tittler's *Architecture and Power* is an excellent resource. For a survey of civic building types constructed during the late 19th and early 20th centuries, chapter 13 of William Rhoad's published dissertation, *The Colonial Revival*, cites many examples, most located in Massachusetts and Connecticut.

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Surveyor's Evaluation:

NR listed:	individual	____	NR eligible:		NR Criteria:	A	X
	within district	____	individual	X		B	____
			within district	____		C	X
Integrity:	yes	X	not eligible	____		D	____
	no	____	more info needed	____		E	____

Table 1: Town Building Timeline

Aside from its schoolhouses, the town of New London constructed three structures for public assembly: the meetinghouse (1788), town house (1853), and town hall (1917). The following timeline presents a building history of all three structures, illustrating the alterations and improvements made in response to the growth of the town and changes in building use.

1786	**Meetinghouse** and burying ground authorized.
1788	Building framed, sided, and roofed. Religious service held on September 28; Rev. Job Seamans, Baptist minister, called.
1793	Pulpit installed; glazing approved.
1798	Voted not to finish meetinghouse.
1799	Permission granted for "singing pew" construction.
1803	Windows completed.
1806	Lathing and plastering completed. Horse sheds built nearby.
1809	First stove installed.
1818	Roofing and other repairs; cost $300. Meetinghouse completed.
1826	Cornerstone for new Baptist church laid July 4.
1827	New Baptist meetinghouse dedicated on January 11.
1837	Horse sheds built at new Baptist church.
1853	Land for new **town house** purchased from Greenwood & Burpee, merchants.
1854	New town house building completed; oil lamps purchased and hung.
1855	Old meetinghouse sold to Gov. Anthony Colby for $100 (plus $10 for "stone under same"); relocated and remodeled as Colby Hall, boys dormitory. Pews removed by town.
1856	Landscaping around town house.
1871	Shingles purchased and installed.
1873	Chimneys, stoves installed; other improvements made; project cost $213.45.
1878	New door, casings, and lock installed.
1880	Firewood purchased from **Amos Whipple**.
1882 to 1887	**Amos Whipple** paid for care of the town house.
1892	Shingles purchased and installed.
1893	Improvements made; vestibule added; project cost $803.39.
1900	Chandelier purchased and installed.

Table 1: Town Building Timeline, continued.

1904	Shingles purchased and installed; painting.
1906	Gas light fixtures installed; fire insurance purchased (annually thereafter).
1907	Damage to town house by "students."
1911	Jail cell purchased.
1912	Damage to town house; "boys" arrested.
1913	Town house repair or replacement considered.
1914	Soldier's Monument for Revolutionary and Civil War veterans installed; cost $800.
1915	Grading and landscaping around monument; new chairs, building plans purchased.
1916	Death of **Amos Whipple**; library bequest (Nelson lot and $15,000) offered. Town house property boundaries surveyed by Ira Littlefield; paid $3. Town house (and surrounding buildings) wired for electricity by Kidder Garage Co.
1917	Town house auctioned and removed by Kidder Garage Co.; town furniture stored at Odd Fellows Hall. Oct. 1. Foundation laid by Horace Stanley; upper work commenced. Oct. 8. Subfloor laid; roof timbers cut; walls studded; architect **Sidney Strickland** inspected the work. Oct. 15. Masons laying bricks on lower walls.
1918	Jun. 17. **Whipple Memorial Town Hall** dedicated at 8 PM.
1919	Building valued at $26,000; another $1,000 for furniture.
1922	Exterior painted; $211.10 expense.
1934	New London Municipal Court established; Fred S. Lovely, judge.
1948	Roof and doors repaired; $155.95 expense.
1955	Driveway work performed; $106.20 expense.
1957	Cupola overhauled; new light installed above entrance.
1958	Basement renovated for new Selectmen's Office, Municipal Court; expenses of $1.967.84.
1960	Roof inspected and damaged slate repaired.
1961	Civil Defense Control Center opened in basement; weekly radio drill on Tuesday nights.
1963	Improvements made to basement Courtroom.
1965	Courtroom bench and enclosure; also, insurance claim for unspecified damages, $200.
1968	New London Garden Club plantings installed around building.
1969	Municipal Court converted to District Court (New London, Newbury, Sutton, Wilmot).
1971	District Court judge first requests use of auditorium and new office addition at rear of building.

Table 1: Town Building Timeline, continued.

1973	New London District Court discredited because of inadequate facilities.
1974	Courtroom moved upstairs to Assembly Hall; legal counsel's office in original selectmen's office; judge's office remained in basement; energy crisis limits heat.
1977	Town Hall Refurbishers committee formed; new chairs; exterior painting and chimney work.
1978	Stage curtain, movie screen, pull-up shades, new lighting.
1980	Court Clerk moved to new basement office from private residence, by state recommendation.
1981	Proposal for rear access ramp rejected by voters.
1982	Proposal to rent adjacent house for Town Offices, leaving entire basement to Police, Dispatch, Court.
1983	Kearsarge Amateur Radio Club installed transmitter, shared by Civil Defense.
1984	Proposal to buy adjacent property; house removed for Town Office addition.
1985	Town Office to be joined with Whipple Hall by "accessible connector."
1986	Area behind Town Office addition paved for parking lot.
1987	Mention of Whipple Hall roofing problems. Town Office addition fully completed: selectmen and clerk upstairs; archives and court offices downstairs; police remain in renovated basement of Whipple Hall.
1989	World War II, Korean War monument dedicated near earlier Soldier's Monument.
1990	Whipple Hall windows refurbished; floor heating registers removed and patched; plaster repaired; interior painted; front doors replaced after accidental damage.
1998	Citizens Advisory Committee reports police and other areas space-constrained.
1999	Town negotiates gift of Old Academy from Colby-Sawyer College; approves $1,650,000 bond issue for renovations to Academy and addition to Whipple Hall complex.
2000	Complaints that new radio tower and sallyport are too visible from Sargent Common; trees planted.
2004	Whipple Hall chimney repairs reported.
2005	Whipple Hall basement gutted; no plans drawn for renovation. Whipple Hall interior painting: ceilings, walls, windows; new chairs and stage curtain.
2009	Basement renovation completed; new police training room, evidence locker. New London District Court closed.
2012	Recreation Dept. moved from Old Academy into vacant court offices.
2013	Police Dept. submits list of building needs.

SOURCES: The first meetinghouse events were noted in Lord's *History of New London*; all other items appear in town reports, published annually from 1847.

Table 2: Major Commissions of Sidney Strickland

The scope of Sidney Strickland's work was broad but always focused on the interpretation of historic architectural forms. This is reflected in his Classical Revival designs and in his extensive work on the Colonial architecture of the Plymouth Colony in Massachusetts. The following table illustrates some of his larger public, commercial, and academic commissions.

1917 Whipple Memorial Town Hall
429 Main Street
New London, New Hampshire

1921 Elizabeth Arden Building
20 Newbury Street
Boston, Massachusetts

1923 Sheraton Hotel
91 Bay State Road
Boston, Massachusetts

1923 Mt. Prospect School for Boys
90 Worcester Lane
Waltham, Massachusetts

1926 Crosby Engineering Lab
University of Maine
Orono, Maine

1927 Ritz-Carlton Hotel
15 Arlington Street
Boston, Massachusetts

1929 Junior League Building
0 Marlborough Street
Boston, Massachusetts

1930 Fire Station "D"
827 Boylston Street
Brookline, Massachusetts

FIGURE 1: Postcard image of Whipple Hall in 1918.

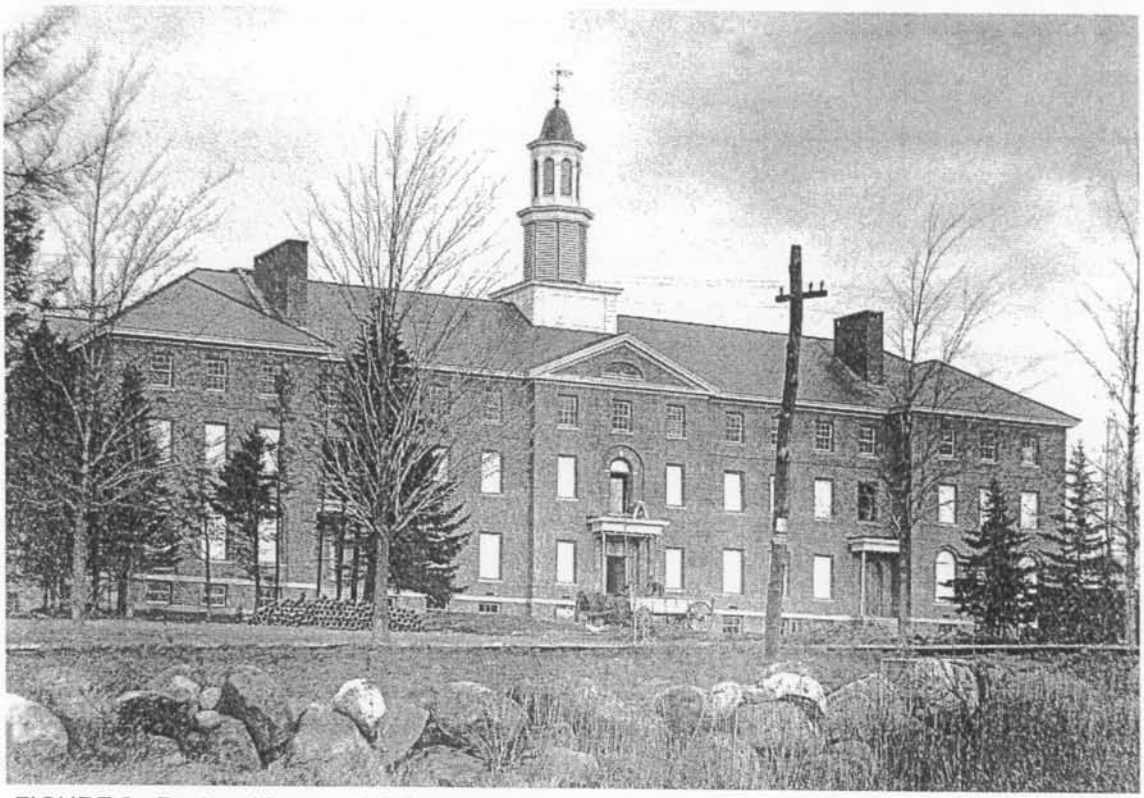


FIGURE 2: Postcard image of Colgate Hall, nearing completion in 1912.

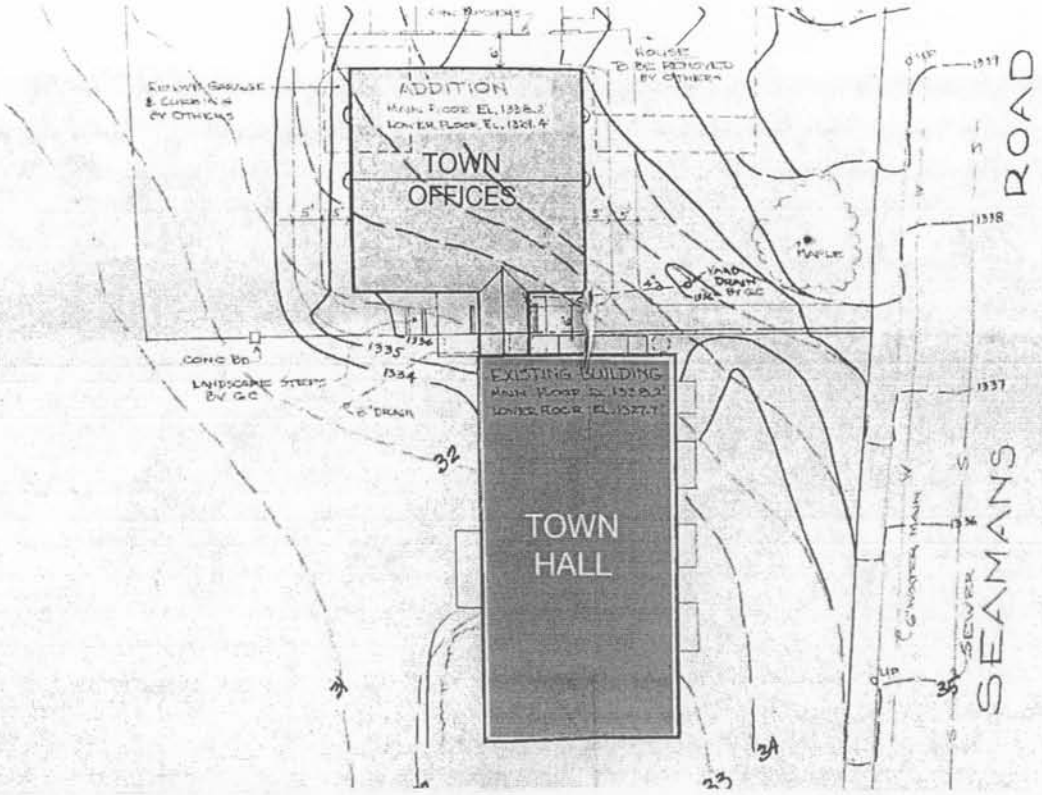


FIGURE 3: Site plan for 1985 addition to Whipple Hall.

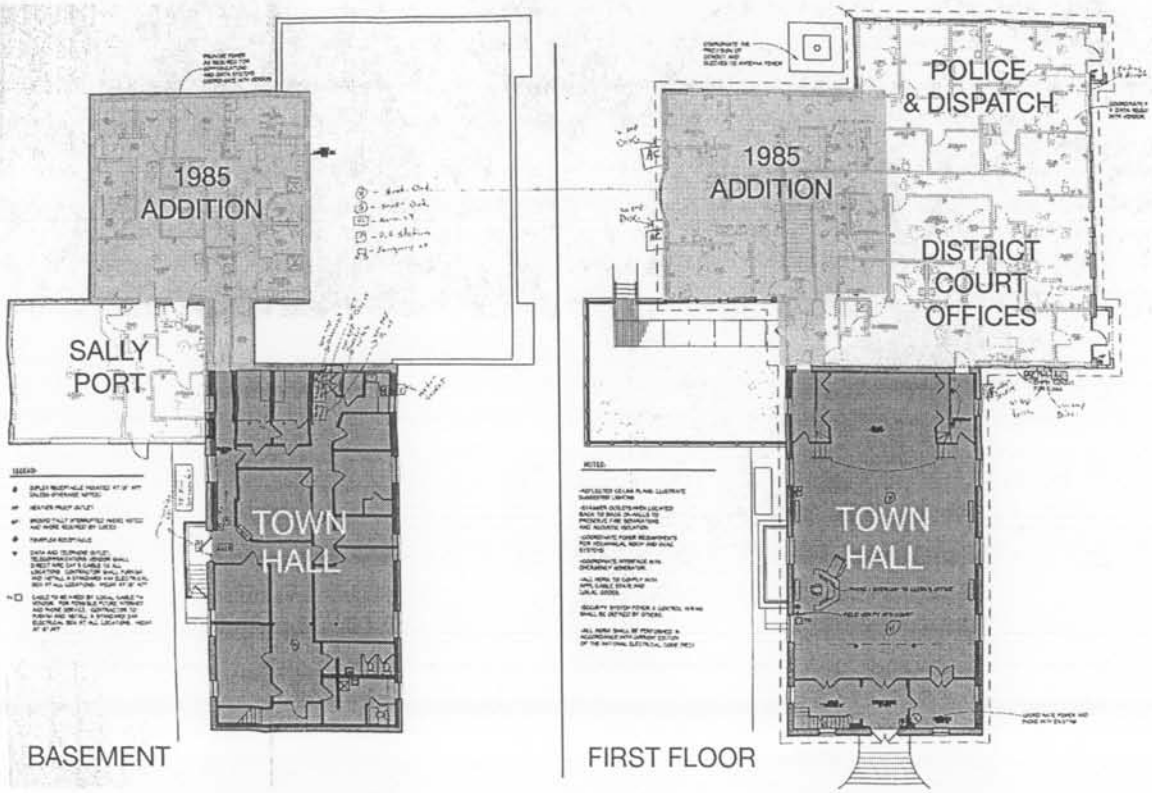
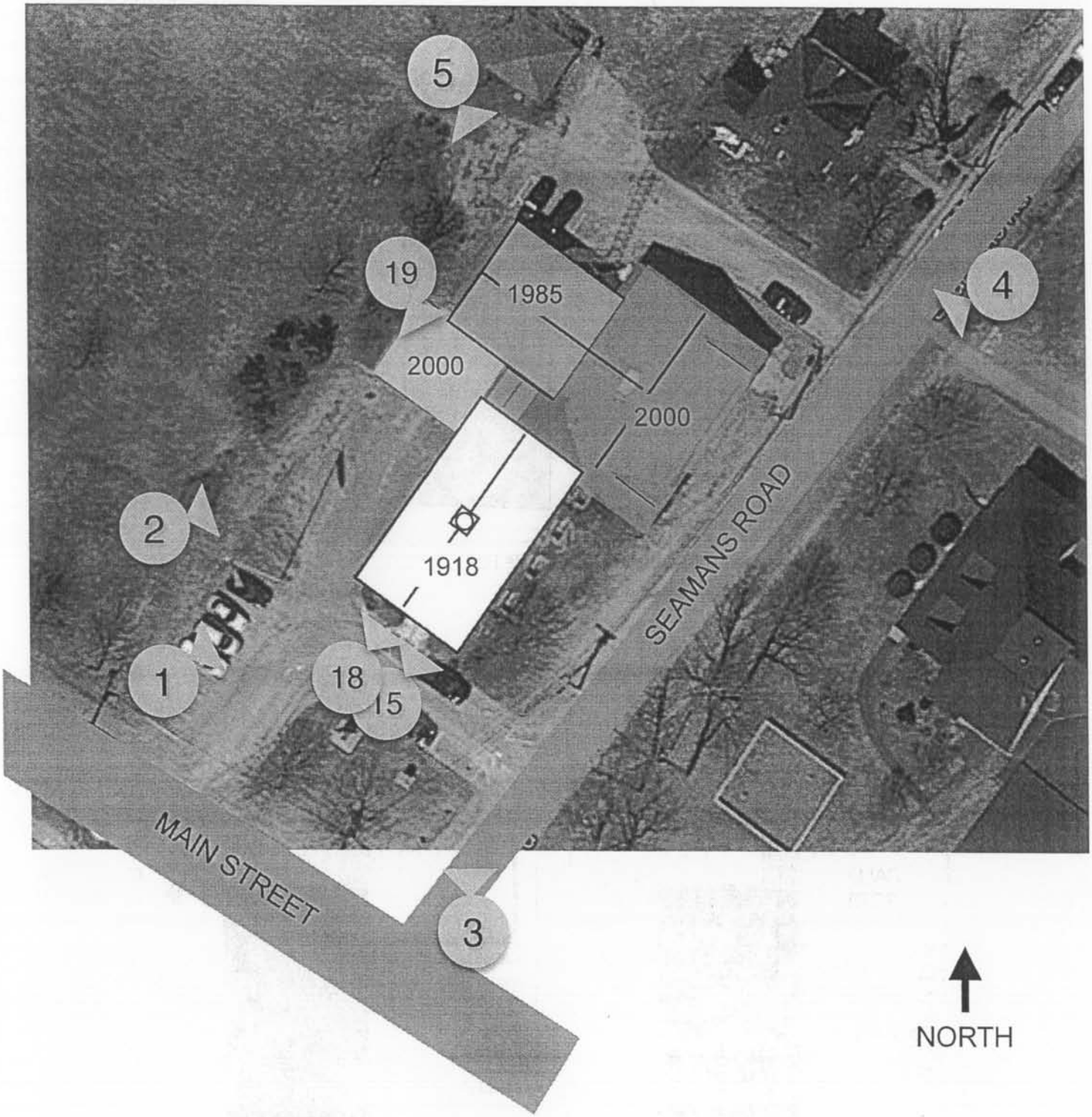


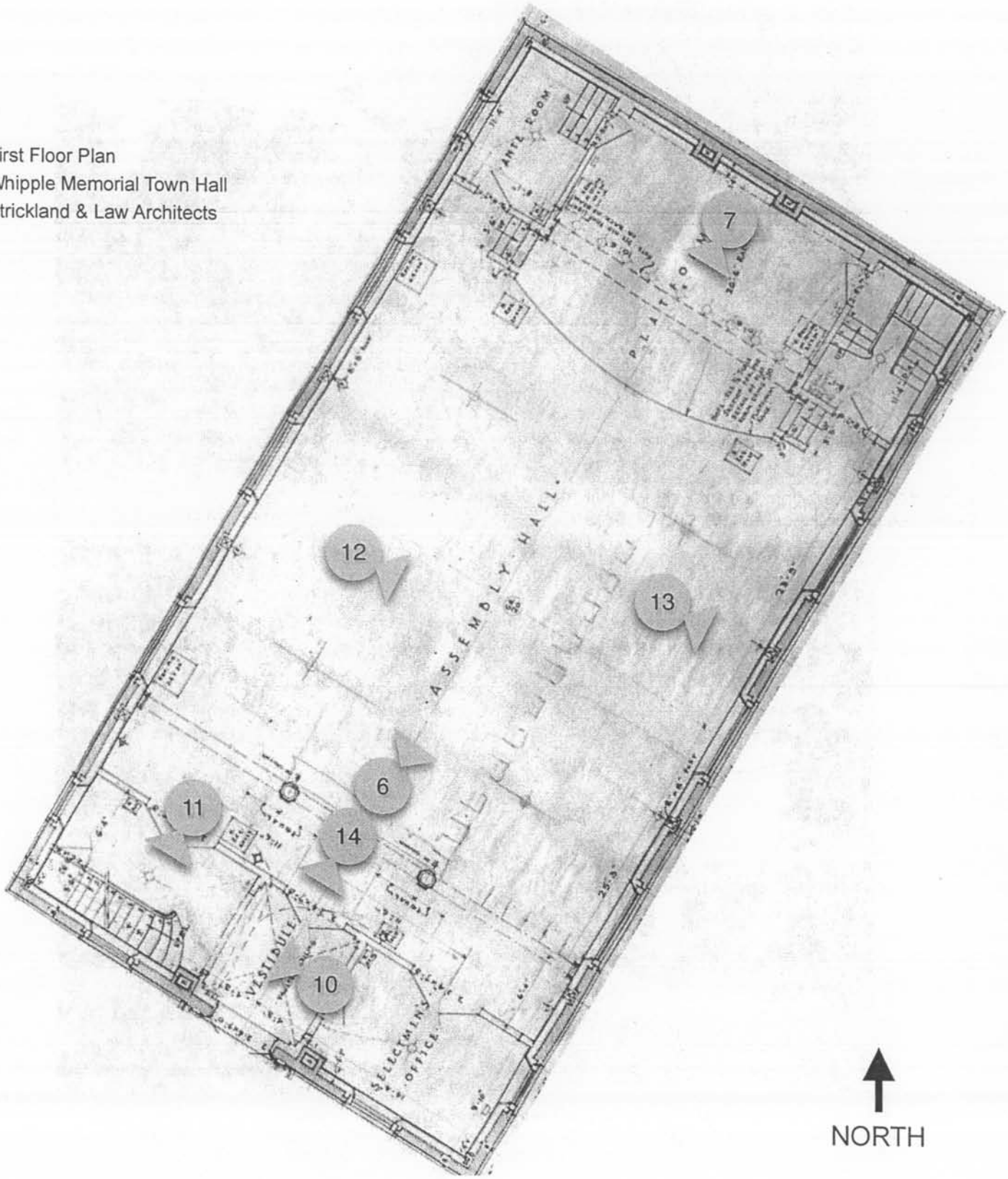
FIGURE 4: Basement and first floor plans of 1990-2000 expansion; sally port addition

EXTERIOR PHOTO KEY:



INTERIOR PHOTO KEY:

First Floor Plan
Whipple Memorial Town Hall
Strickland & Law Architects



Date photos taken: September 2014

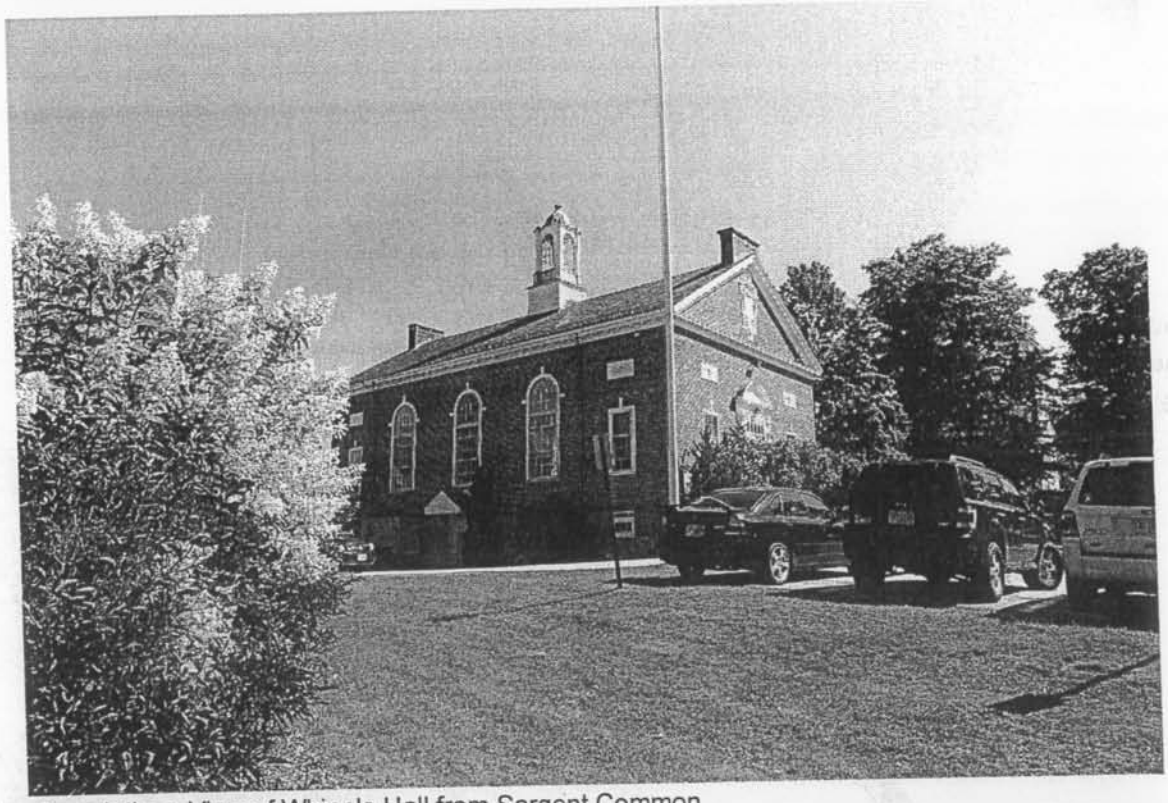


Photo # 2 Description: View of Whipple Hall from Sargent Common
Reference (file name or frame#): WMTH_02.JPG

Direction: E

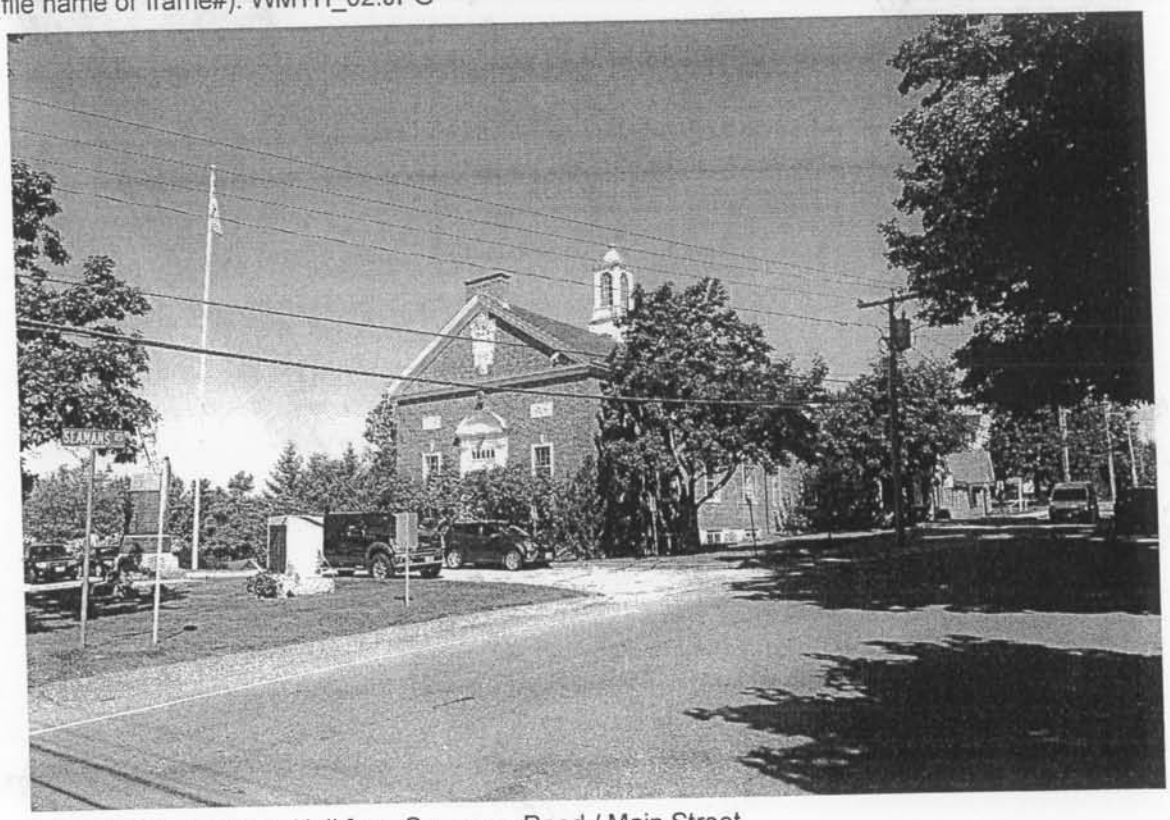


Photo # 3 Description: Whipple Hall from Seamans Road / Main Street
Reference (file name or frame#): WMTH_03.JPG

Direction: N

Date photos taken: July 2013

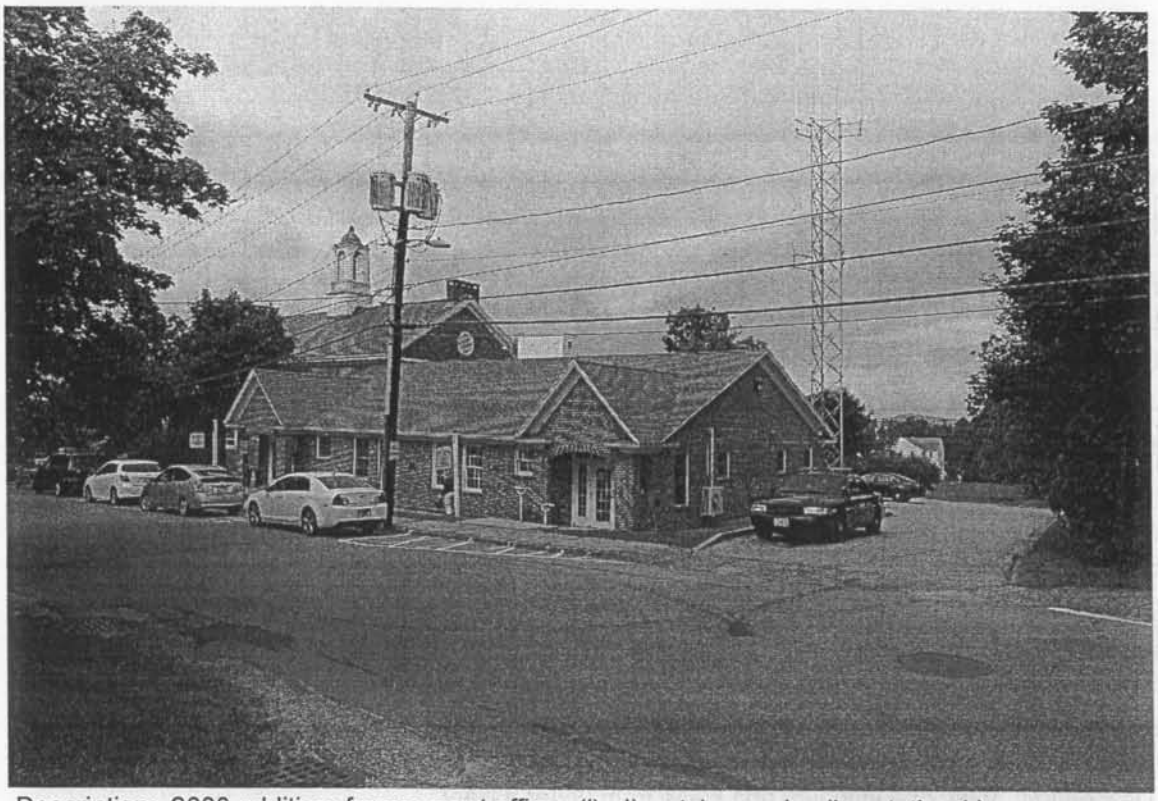


Photo # 4 Description: 2000 addition; former court offices (l), dispatcher and police station (r)
Reference (file name or frame#): WMTH_04.JPG

Direction: W

Photo # 5 Description: 1985 addition; former town offices, now police station
Reference (file name or frame#): WMTH_05.JPG

Direction: SE

Date photos taken: August 2013

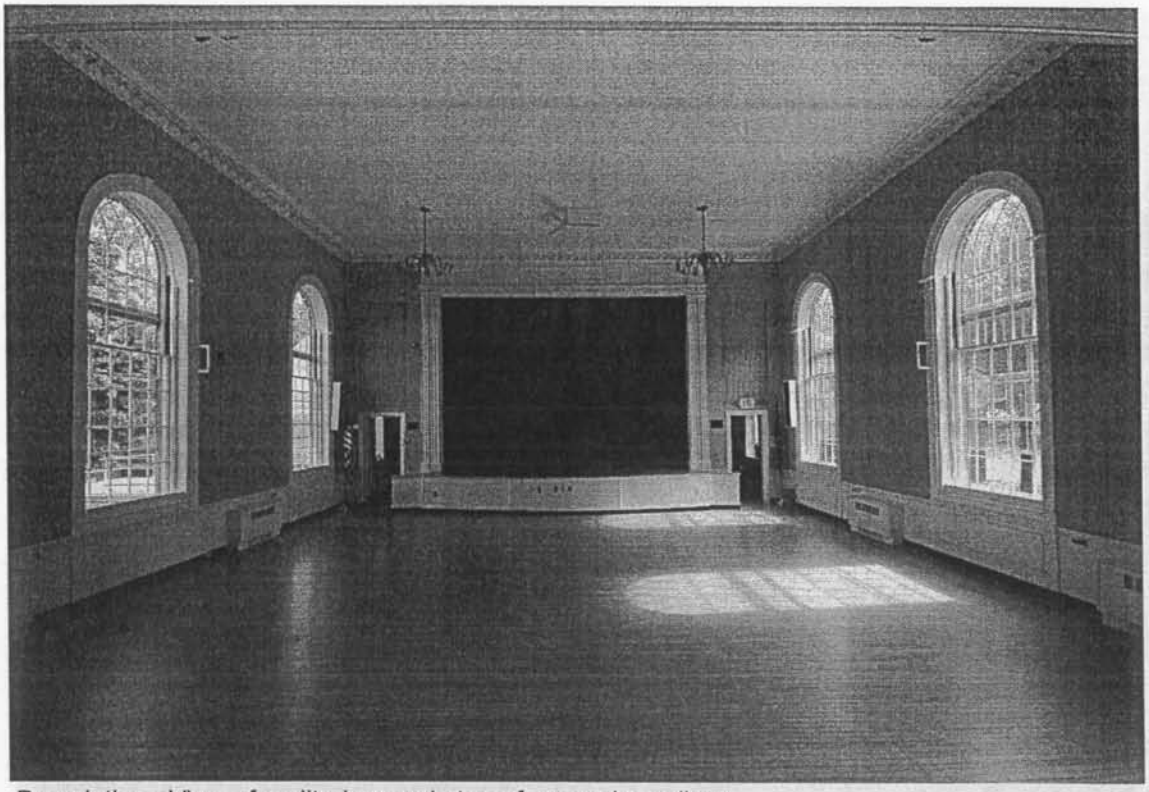


Photo # 6 Description: View of auditorium and stage from under gallery
Reference (file name or frame#): WMTH_06.JPG Direction: NE

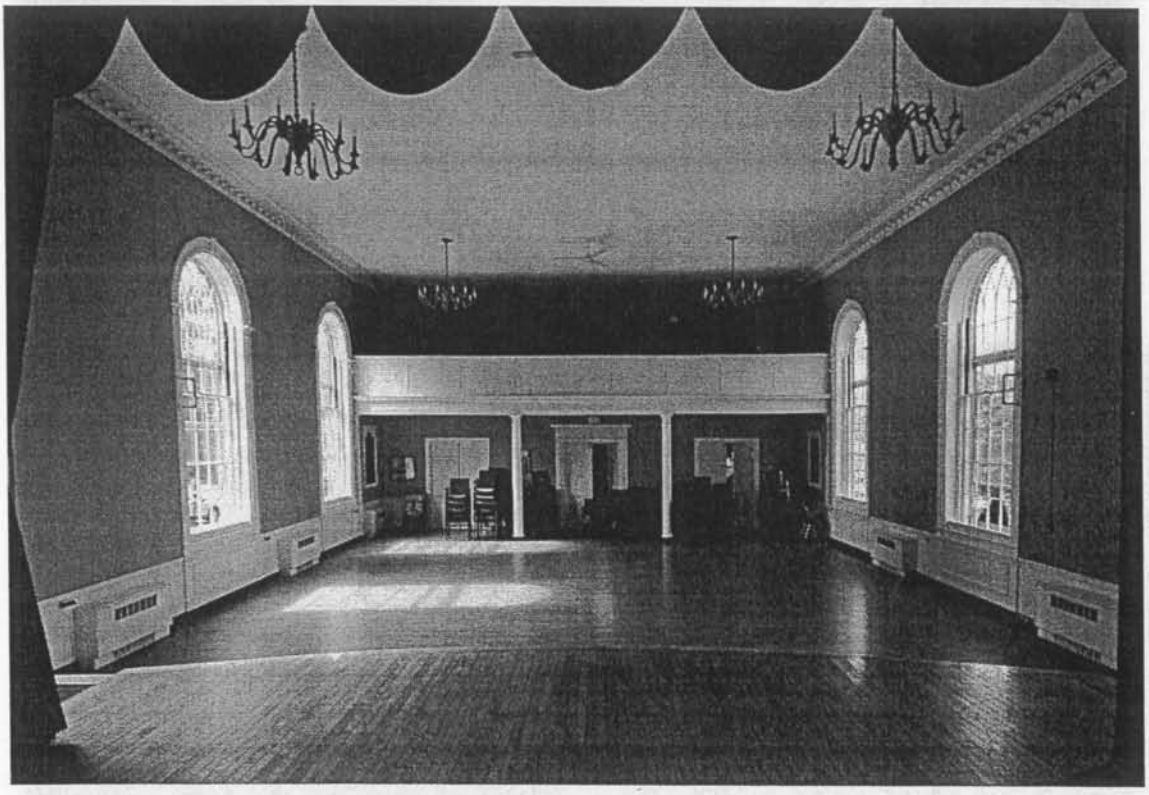


Photo # 7 Description: View of auditorium and gallery from stage
Reference (file name or frame#): WMTH_07.JPG Direction: SW

Date photos taken: August 2013

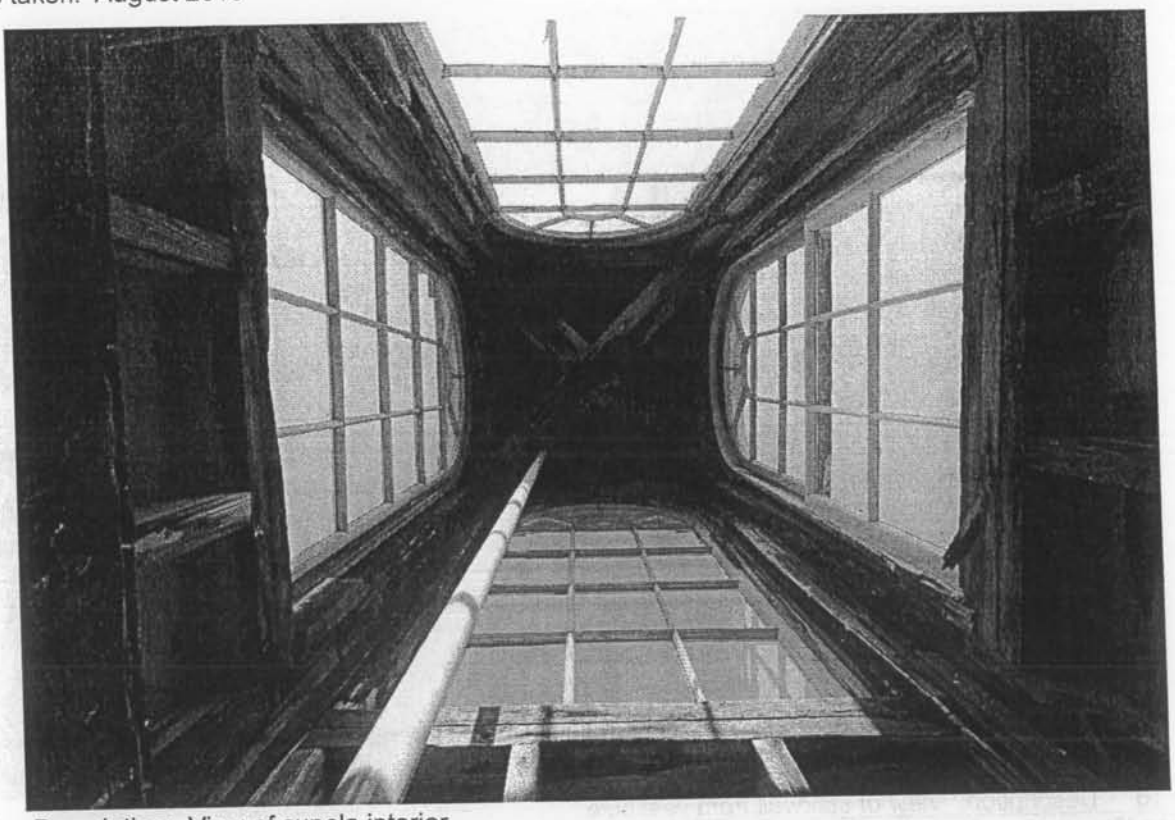


Photo # 8 Description: View of cupola interior
Reference (file name or frame#): WMTH_08.JPG

Direction: NA

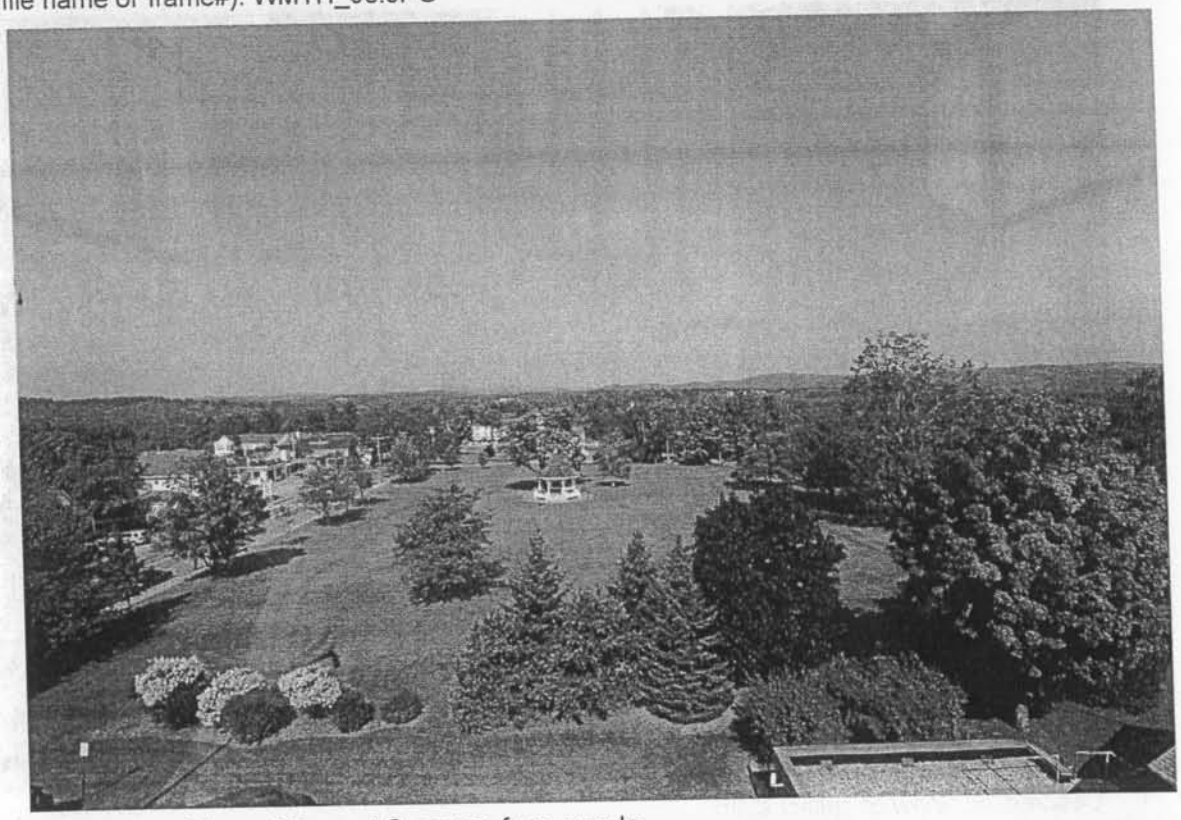


Photo # 9 Description: View of Sargent Common from cupola
Reference (file name or frame#): WMTH_09.JPG

Direction: NW

Date photos taken: August 2013

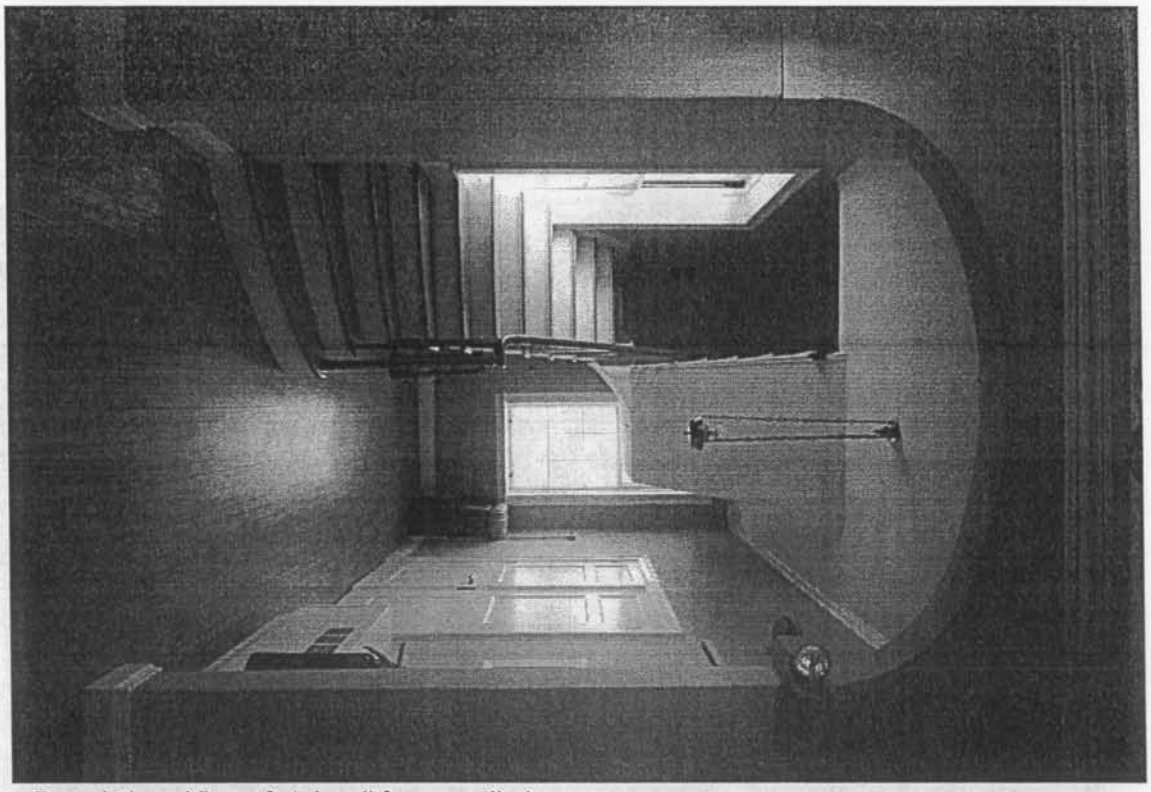


Photo # 10 Description: View of stairwell from vestibule
Reference (file name or frame#): WMTH_10.JPG Direction: NW

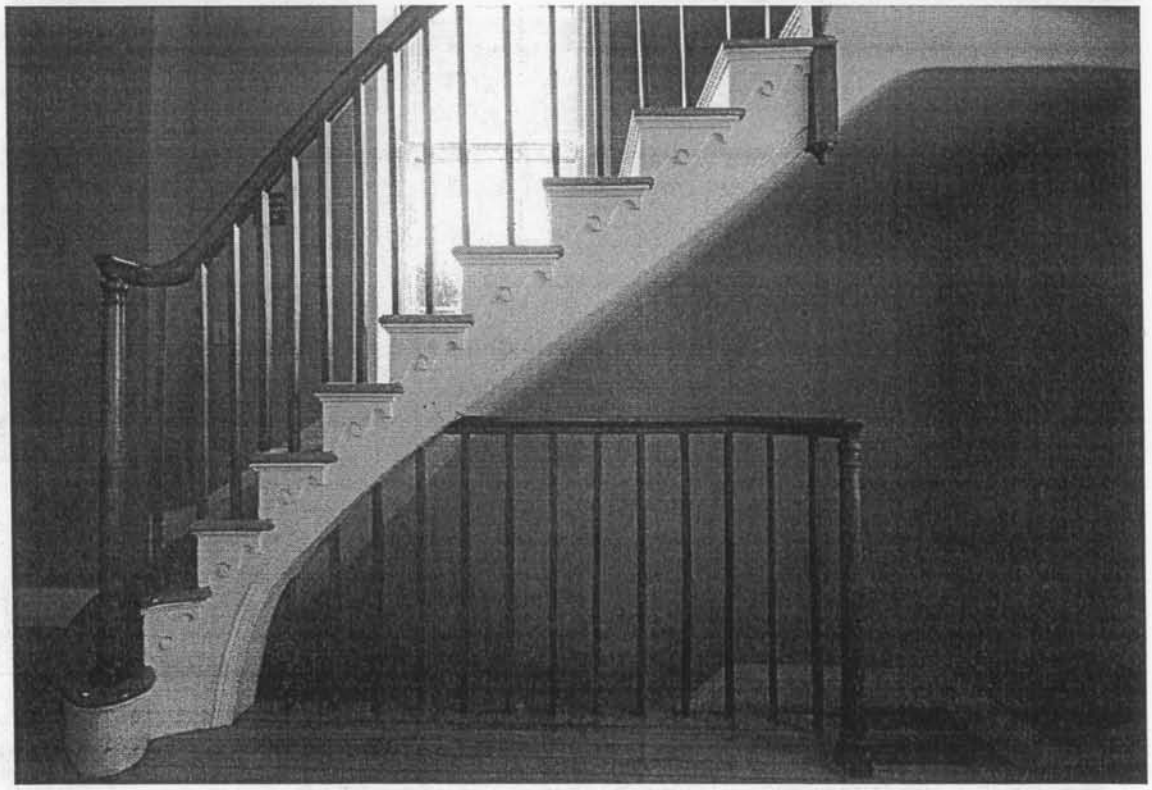


Photo # 11 Description: View of gallery stairs
Reference (file name or frame#): WMTH_11.JPG Direction: SW

Date photos taken: August 2013

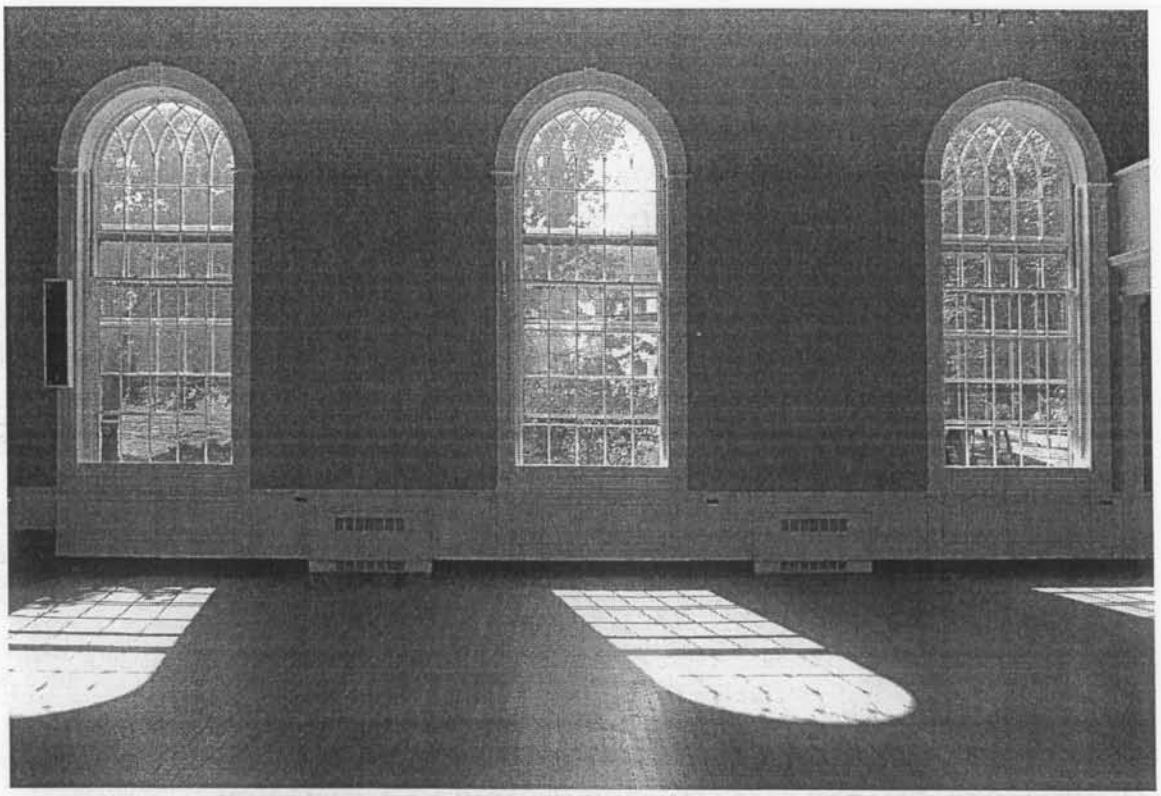


Photo # 12 Description: View of arched windows
Reference (file name or frame#): WMTH_12.JPG
Direction: SE

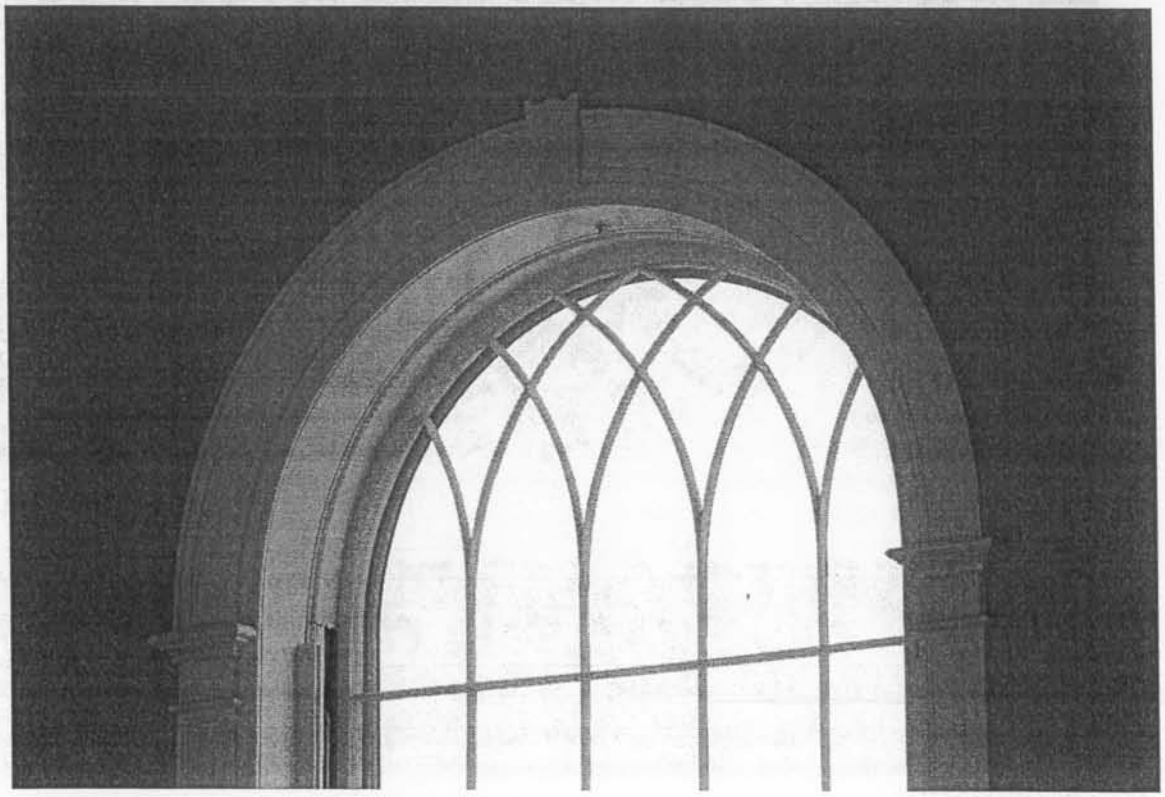


Photo # 13 Description: Detail of window arch, interior
Reference (file name or frame#): WMTH_13.JPG
Direction: SE

Date photos taken: August 2013

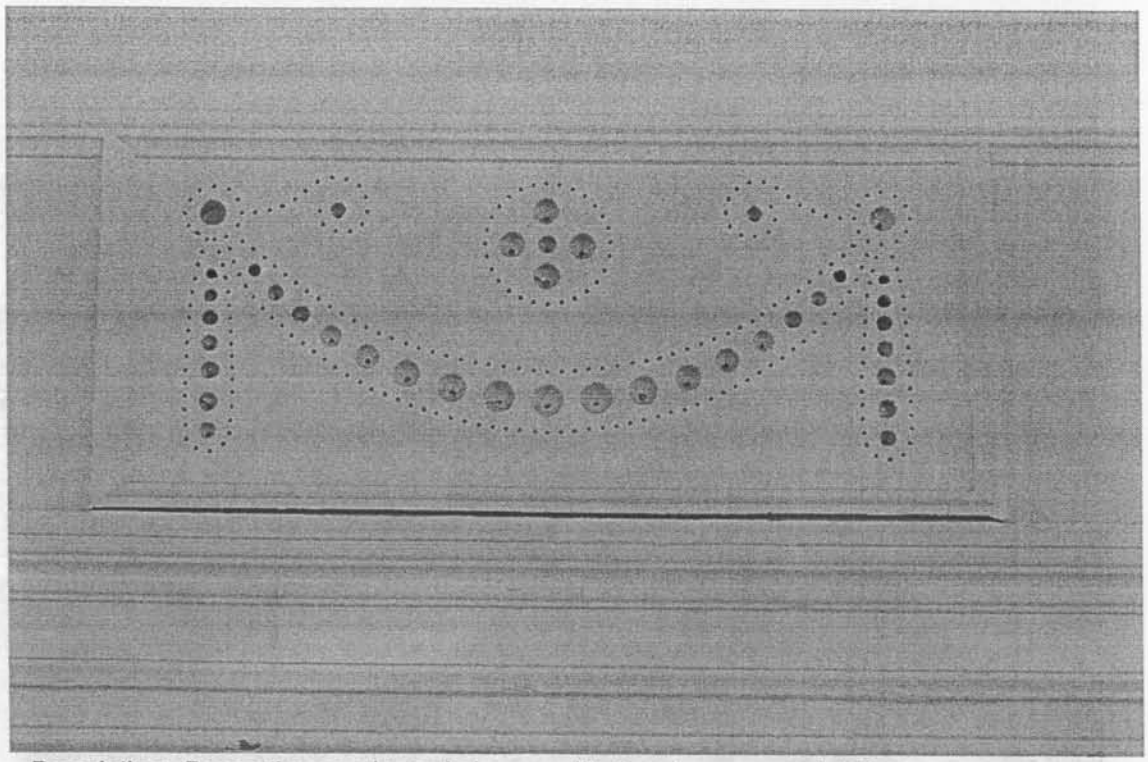


Photo # 14 Description: Decorative wood panel above auditorium doors, room interior
Reference (file name or frame#): WMTH_14.JPG Direction: SW

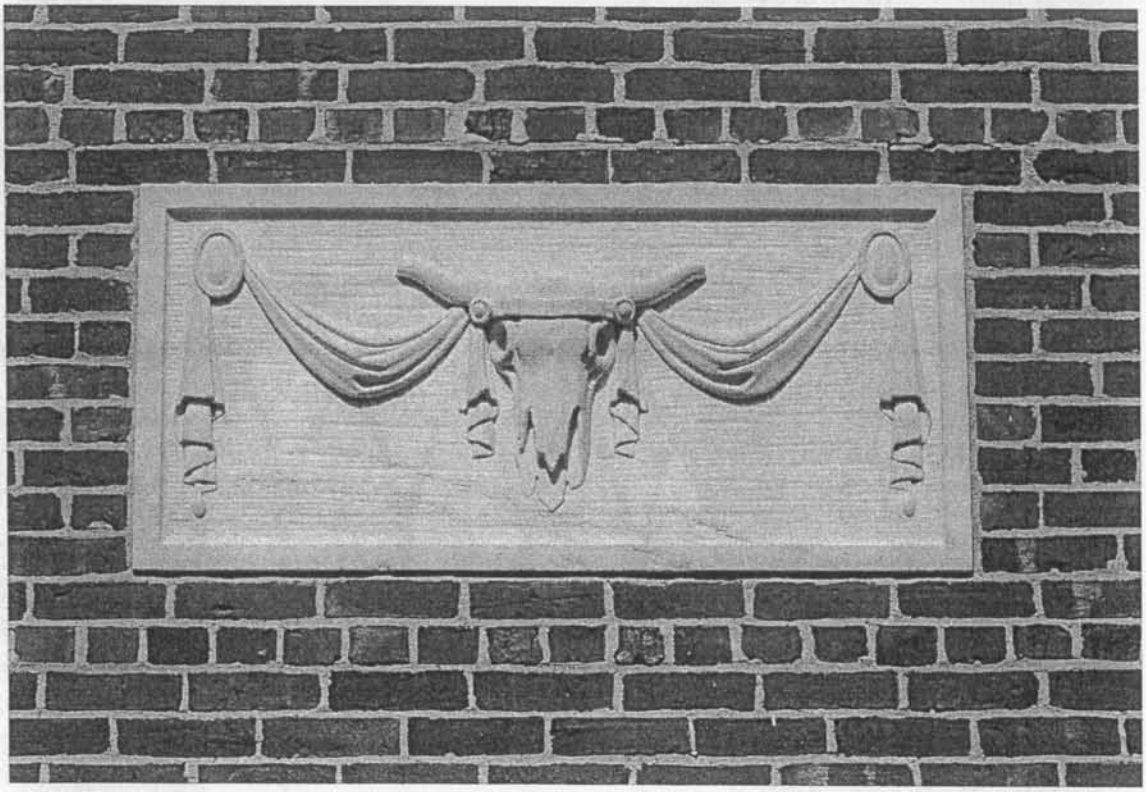


Photo # 15 Description: Bucranium above corner window
Reference (file name or frame#): WMTH_15.JPG Direction: NE

Date photos taken: August 2013

Photo # 16 Description: Gallery and former motion picture projection booth area
Reference (file name or frame#): WMTH_16.JPG Direction: SE

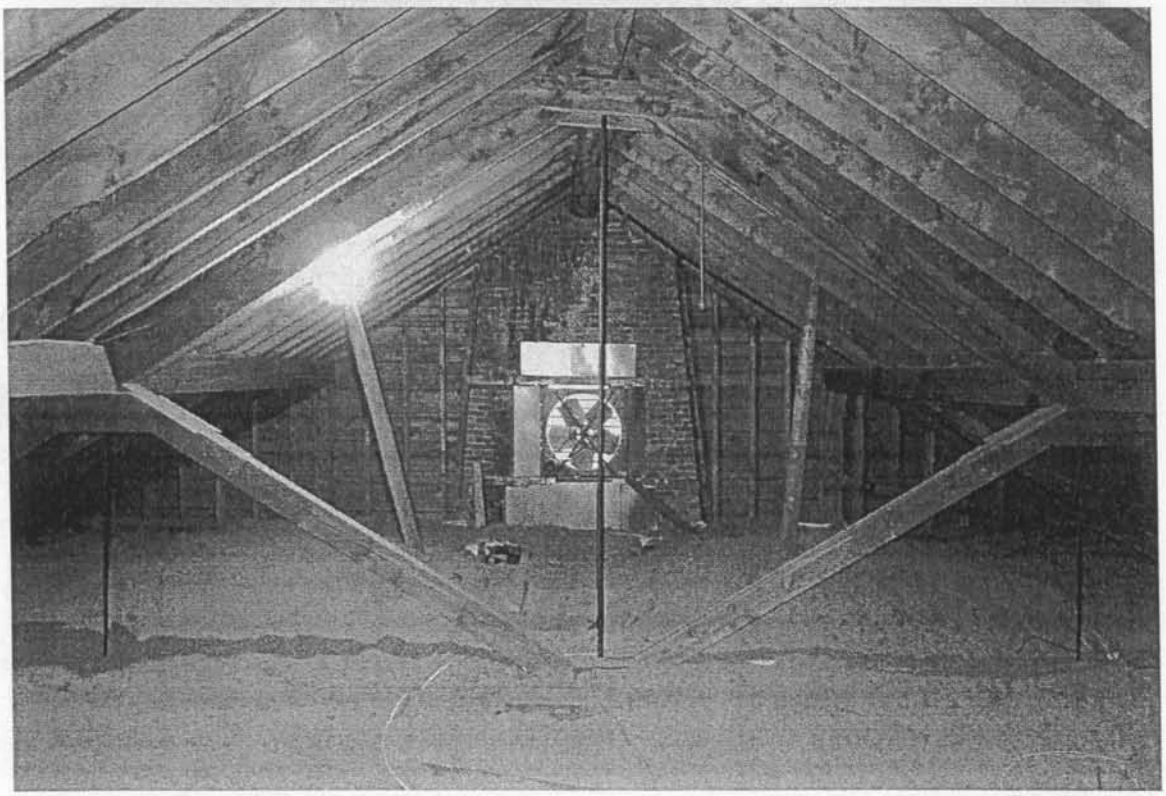


Photo # 17 Description: Roof framing and truss system with iron suspension bars
Reference (file name or frame#): WMTH_17.JPG Direction: NE

Date photos taken: August 2013

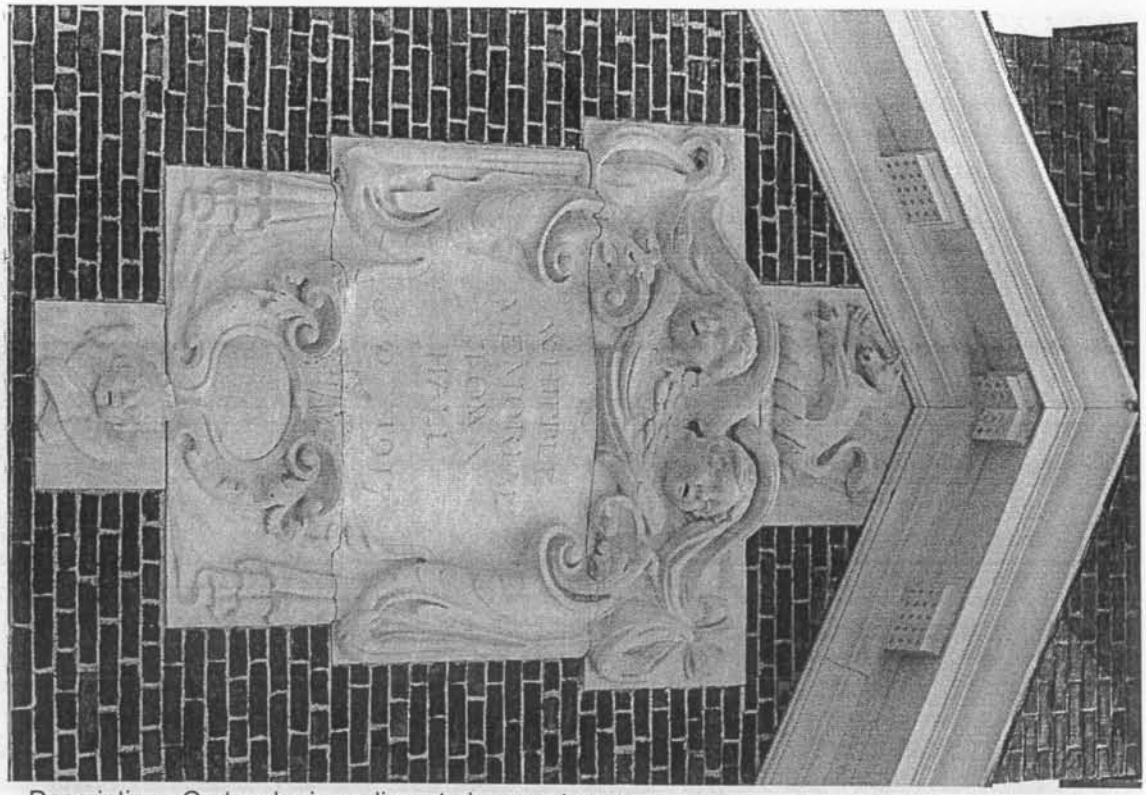


Photo # 18 Description: Cartouche in pediment above entrance
Reference (file name or frame#): WMTH_18.JPG

Direction: NE

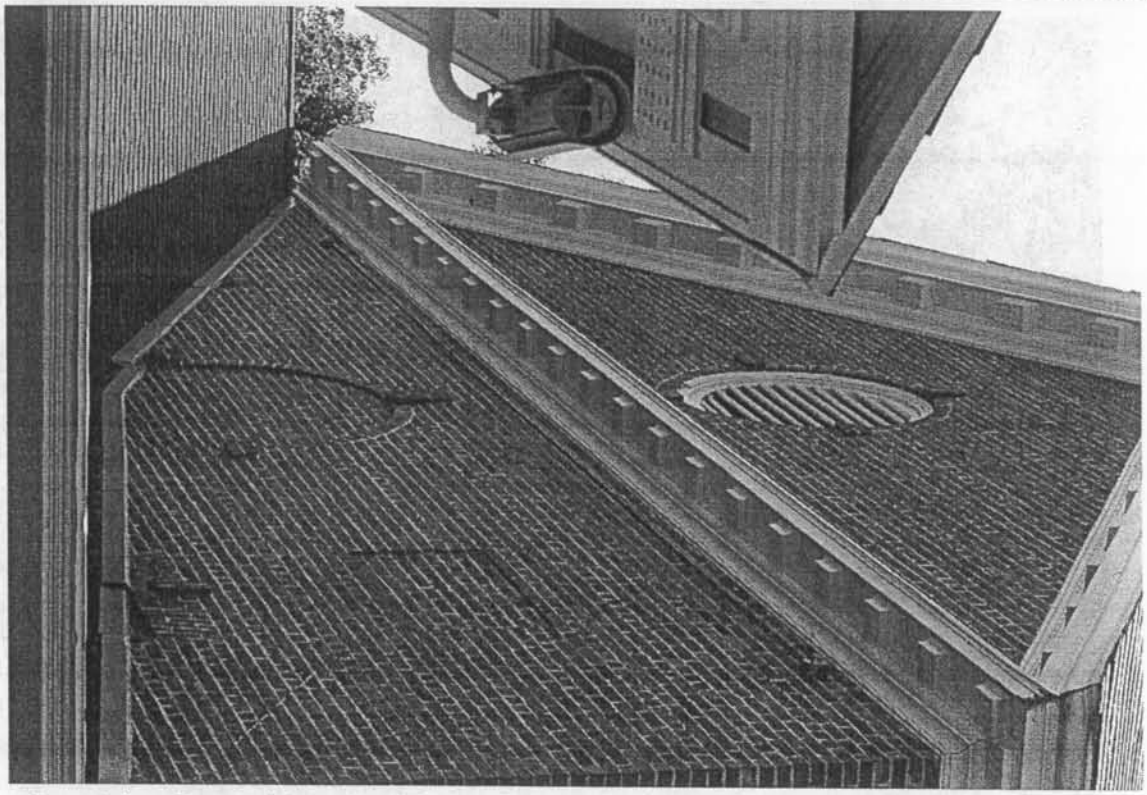


Photo # 19 Description: Rear gable and wall, false openings, now obstructed by 2000 addition
Reference (file name or frame#): WMTH_19.JPG

Direction: S

PHOTO KEYS ARE LOCATED ON PAGES 22 and 23

I, the undersigned, confirm that the photos in this inventory form have not been digitally manipulated and that they conform to the standards set forth in the NHDHR Photo Policy. These photos were printed at the following commercial printer OR were printed using the following printer, ink, and paper:Flash Photo, Newport Road, New London, NH 03257. (Color photos must be professionally printed.)
The negatives or digital files are housed at/with: New London Town Archives.

SIGNED:

FOR STATE REGISTER LISTING ONLY!
If this inventory form is being submitted for consideration of New Hampshire State Register listing, have you included:

✔ a photo CD with digital images included in the nomination (does not apply if film photography was used)

✔ the State Register Contact Information sheet

EXHIBIT C
CODE REVIEW

CODE REVIEW

WHIPPLE MEMORIAL TOWN HALL, MAIN STREET AND SEAMANS ROAD, NEW LONDON, NH

Original brick courthouse (2 story masonry exterior with wood timber frame) built approximately 1958, a mid 1980's addition (2 story concrete masonry and wood frame), and the 1999 renovation for the Police Department (multilevel wood frame).

The Town of New London has applied for the inclusion of this building on the New Hampshire Register of Historic Places. As an Historic Building, Section 3409 of the International Building Code : Historic Buildings, allows that certain provisions of the Code not be mandatory " where such buildings are judged by the building official to not constitute a distinct life safety hazard ".

Note that this Code Review is based on the March 14, 2014 New Hampshire Building Code Review Board reinstatement of Section 503 Allowable Building Heights and Areas and 506 Building Area calculations and requirements as formulated and described within the 2009 edition of the IBC without State of New Hampshire amendments.

GENERAL BUILDING INFORMATION

Floor Area:

LEVEL	EXISTING	DEMOLITION	PROPOSED	TOTAL
LOWER LEVEL POLICE & MULTIPURPOSE	5,983 gross SF	----------	----------	5,983 gross SF
UPPER LEVEL POLICE, RECREATION, AND HALL	7,924 gross SF	----------	----------	7,924 gross SF
TOTAL	13,907 SF	----------	----------	13,907 SF

Building Height: 33 feet +/- to mean roof height of main roof, measured from average grade plane.

2009 INTERNATIONAL BUILDING CODE: (IBC)

NFPA 101 2009 LIFE SAFETY CODE_ (LSC)

304 USE GROUP:
Assembly: A3, Lecture Halls, etc: Community Hall.

503 GENERAL HEIGHT & AREA LIMITATIONS:

Assembly Use: Height: 40 feet 1 story (IBC Table 503)
Area: 6,000 sf per floor (IBC Table 503)

Lower Level is considered a Basement (a story that is not a story above the grade plane) since a story above grade plane is… "any story having its finished floor surface entirely above grade plane, or in which the finished surface of the floor next above is: 1. *More than 6 feet above grade plane*; or 2. More than 12 feet above the finished ground level at any point."

The grade plane (502.1) is the reference plane representing the average of finished ground level adjoining the building. 80% of the adjoining grade is within 2 feet of the upper level with 20% at 9 feet from the upper level. The average plane is therefore approximately 3.4 feet below the Upper Level allowing the Lower Level to meet the definition above for a Basement and not a story above grade plane.

504 HEIGHT MODIFICATIONS:

504.2 Allows the addition of 1 story and 20 feet with Automatic Fire Suppression. However, IBC Table 503 allows a 1 story height of 40 in VB construction, therefore the height of the building is in compliance based on Assembly occupancy.

Defining the Lower Level as a Basement allows the Assembly Occupancy at the Upper Level without the addition of a sprinkler system since the Upper Level would be considered the one story at grade. Currently the Lower Level only has a sprinkler system installed, as required for Basements.

505 MEZZANINES:

Area to be less than 1/3 of area open to below. Single exit acceptable per 1015.1 with Occupancy less than 50 and common path of travel is less than 75 feet.

506 BUILDING AREA MODIFICATIONS:

Area modification with 378 foot open perimeter to open space at least 30 feet wide. No increase factor for Automatic Sprinkler System. Adjusted allowable area per floor is 9720 sf. Existing footprint area of 7924 sf is allowable.

508.3 NON-SEPARATED OCCUPANCIES

Multiple occupancies with Assembly at lower level multi-purpose room, upper level Hall and Business Use by Police Department to be considered non-separated with more stringent Assembly area and height limits applied. No rated separation required between the two occupancies.

See recommended fire rated separation assembly for reducing fire area as applied to Fire Suppression System requirement.

602 CONSTRUCTION CLASSIFICATION

Type VB

Combustible, non-protected structure, walls, and floor. 1999 renovation Construction Documents define construction type as VA, combustible, protected. All structure, bearing walls, floor, and roof construction would require a 1 hour fire protected assembly. This review and analysis assumes the VB construction as site observation suggests that the non rated assemblies exist.

TABLE 601 FIRE RESISTANCE RATINGS OF STRUCTURE ELEMENTS:

Structural Frame: 0 hour
Bearing Walls: Exterior: 0 hour
Bearing Walls: Interior: 0 hour
Nonbearing walls and partitions interior: 0 hour
Floor Construction: 0 hour
Roof Construction: 0 hour

705.8 EXTERIOR WALL OPENINGS:

No openings currently need be protected.

708.2 SHAFT ENCLOSURE:

1 hour fire rated enclosure at internal stair to be maintained with rated doors and closers. Front exit stair at Hall requires wall assembly modifications; addition of 5/8" gypsum wallboard at both sides of wall.

715.4 FIRE DOOR RATINGS

Shaft, exit enclosure & exit passageway walls with 1 hr ratings require minimum 60 minute fire door rating.
Other fire barriers requiring 1 hr fire rating to have 45 minute fire door rating.

See comments below at Fire Sprinkler System/Fire Areas regarding rated doors at new Fire Separation Assembly. A 90 min rating is required at the Fire Doors within the 2 hour fire rated separation assembly (Table 715.4).

903 FIRE SPRINKLER SYSTEM:

A fire sprinkler system is currently installed at Lower Level only. Current code requires that the entire building be protected by an Automated Sprinkler System per IBC 903.2.1.3 items 1, 2 and 3 if Fire Area is greater than 12,000 sf and the occupant load is greater than 300. Currently Lower and Upper levels are non-separated by rated horizontal assembly (2 hour separation is required) therefore both levels are included in aggregate floor area equaling 13,887 sf. See below for building occupancy expressed by Fire Area and total building, showing that occupancy is less than 300 in each Fire Area.

We recommend that a fire rated assembly be provided between the existing original brick building and the more recent additions to subdivide the fire area into two smaller areas. The addition of 90 minute fire rated doors and frames with panic hardware at the existing brick wall at both levels would effectively separate the Police Area from the 2864 sf per floor Hall. The maximum fire area would therefore be 5728 sf at the Hall and 8159 sf at the Police Area and the occupancy in each fire area would be less than 300. This separation negates the requirement for the full building fire sprinkler system based on fire area and occupancy per Section 903.2.1.3.

IBC AND LIFE SAFETY CODE OCCUPANT LOADS & EGRESS COMPONENTS CALCULATIONS

1004 OCCUPANT LOAD: IBC & LSC (7.3.1.2)

Space/Room	Area	Area per occupant	Occupants in Police Fire Area	Occupants in Hall Fire Area
Lower Level Assembly occupancy	900 sf	15 sf unconcentrated - tables & chairs		**60**
Lower Level Business occupancy	2097 sf	100 sf gross per occupant	**21**	
Lower Level Business at Hall Lower Level	1080 sf	100 sf gross per occupant		**11**
Upper Level Assembly occupancy	1512 sf	Occupancy based on seating layout (Occupancy based on 1512sf/7sf per person = 216 occupants)		**154**
Upper Level Lobby Assembly occupancy	185 sf	5 sf concentrated-standing = 37; not included in count due to redundancy		
Upper Level Stage occupancy	378 sf	15 sf unconcentrated		**25**
Upper Level Mezzanine	576 gross sf	49 occupancy maximum		**49**
Upper Level Business occupancy	5926 sf	100 sf gross per occupant	**59**	
FIRE AREA SUBTOTAL			**80**	**299**
TOTAL BUILDING			**379 occupants**	

1005.1 CAPACITY OF EGRESS COMPONENTS: IBC & LSC (7.3.3.1)

Lower Level: 92 occupants x .2 = 18.4 inches: 3 x 34 inch exits provided = 102 exit inches
One exit from the lower multipurpose room exits up the stairs to the upper hall lobby.
Existing door and stair widths within the historic building are allowed to remain per 1103.3 IBC and 43.10.4.3 LSC if in the opinion of the Code Official sufficient width and height exist for a person to pass through the opening or traverse the means of egress. The walls however would require remediation to obtain a 1 hour fire rating.

Upper Level Assembly Space & Mezzanine: 265 occupants x .2 = 53 exit door inches required:
2 x 34 inch wide doors provided = 68 door exit inches provided. One existing 4'-6" wide double door in historic building providing 52 inch clear exit door. At least half the occupancy can exit via the level of exit discharge through the existing rear lobby.

Upper Level Business: 60 occupants with 2 – 36" exit doors.

The incorporation of the proposed 90 minute rated doors at the existing brick wall between the original Town Hall and the wood frame additions provides a horizontal exit for each separated occupancy space and a higher degree of egress safety.

1019.1 NUMBER OF EGRESS EXITS:

3 Provided for Lower Level
3 Provided for Upper Level

1103 ACCESSIBILITY

Existing buildings shall conform to Section 3411 IBC and Chapter 11 Historic Buildings Section 1104 Alterations in the Existing Building Code. Various levels of accessibility are required, unless technically infeasible, based on the level of alteration. Primarily, at least one main entrance shall be accessible, and an accessible route shall be provided from the public entrance to the public space, and at least one accessible family or assisted-use toilet room shall be provided.

Per Section 206.2.3 of the Americans with Disabilities Act an accessible route is not required to stories above or below the accessible story when the exceptions for alterations to qualified historic buildings or facilities are permitted.

An accessible entrance should be provided to the Lower Level public multi-purpose room. This would involve the building of an accessible ramp at the lower grade entry door.

If an addition is proposed the provisions for new construction shall apply to the addition.

3411.8.6 PERFORMANCE AREAS

Chapter 11 and Chapter 34 for Existing Buildings requires the performance area to be accessible to the assembly area and any ancillary spaces. Possible relief from this requirement is available through application of the Historic Building Section of the IBC and through 206.2.3 Item 7 of the ADA. If any alteration or addition work is contemplated within the historic Hall then accessibility to the stage should be provided.

PLUMBING FIXTURE COUNT: Table 403.1 International Plumbing Code (2009)

Lower Level:
32 business occupants, 60 assembly occupants
Upper Level and Mezzanine:
60 business occupants, 228 assembly occupants (154 Seating, 49 Mezzanine, 25 Stage, 37 at Lobby not included as occupants are redundant to Hall)

USE	OCCUPANTS	WATER CLOSET	LAVATORY	DRINKING FOUNTAIN
ASSEMBLY 288 TOTAL	144 M/125	1.15M*	.72M (1 PER 200)*	288/500 = .58
	144 F/65	2.22F*	.72F*	
BUSINESS 92 TOTAL	46 M	1.00M	1.00M	96/100 = .96
	46 F	1.00F	1.00F	
TOTAL REQUIRED		3 M	2 M	2
		4 F	2 F	
EXISTING ASSEMBLY		1M	1M	1
		1F	1F	
EXISTING BUSINESS/STAFF TOILETS		2M	2M	
		2F	2F	

* Plumbing Code requires any fraction to be rounded up.

Existing Business occupancy fixture count is acceptable. Assembly occupancy requires 2M and 3F water closets, 1M and 1F lavatory, and a drinking fountain. The existing single user toilet rooms at the current Recreation Area (Lobby) provide one fixture each. **1M and 2F water closets should be added** to service both levels of assembly on the unsecure side of the Police Station business occupancy. An additional water fountain should also be added. Existing Service sinks at each level are adequate.

SUMMARY

- Full building fire suppression system is required unless 90 minute fire doors are added between Hall and later additions. Occupancy numbers would also need to be reviewed with Fire Department/Building Code officials to confirm a maximum occupancy of 300 at the Hall side of the fire separation assembly.

- Calculated total assembly occupancy of 288 requires the addition of 1 male and 2 female water closets.

- Front stairwell wall construction must be completed with gypsum drywall installed at each side of studs to provide a one hour fire rated assembly to protect exit way.

- Lower multipurpose/conference room must be provided with an accessible entry if it is to be used as a space open to the public. An accessible entry would entail the construction of an accessible ramp (slope 1:12), railings, and landings at each end. Ramp and lower landing would involve excavation and drainage. If the room is to be open to the Police Department only then access could be provided through their secure space with grade access via the Sally-port.

- The occupant load of the main upper hall is critical to this code review. A large occupant load (greater than 154) would require a full building fire suppression system. Our review is based on a seating layout plan for 154. A strict gross area calculation as described below would have 216 occupants in the upper hall. Our understanding of the actual use of the hall would place the total occupant load at less than the 154. A posted occupant load at the hall 130, would allow the building to be safely occupied as an assembly occupancy once the fire door separation is provided and also allow the existing toilet rooms to remain without adding more fixtures as their capacity is for 65 female and 125 male occupants.

  SECTION 1004 OCCUPANT LOAD (2009 IBC)

  1004.1 Design occupant load. In determining *means of egress* requirements, the number of occupants for whom *means of egress* facilities shall be provided shall be determined in accordance with this section. Where occupants from accessory areas egress through a primary space, the calculated *occupant load* for the primary space shall include the total *occupant load* of the primary space plus the number of occupants egressing through it from the accessory area.

  1004.1.1 Areas without fixed seating. The number of occupants shall be computed at the rate of one occupant per unit of area as prescribed in Table 1004.1.1. For areas without fixed seating, the *occupant load* shall not be less than that number determined by dividing the floor area under consideration by the occupant per unit of area factor assigned to the occupancy as set forth in Table 1004.1.1. Where an intended use is not listed in Table 1004.1.1, the *building official* shall establish a use based on a listed use that most nearly resembles the intended use.

  Exception: Where *approved by* the *building official,* the actual number of occupants for whom each occupied space, floor or building is designed, although less than those determined by calculation, shall be permitted to be used in the determination of the design *occupant load*.

  1004.3 Posting of occupant load. Every room or space that is an assembly occupancy shall have the *occupant load* of the room or space posted in a conspicuous place, near the main *exit* or *exit access doorway* from the room or space. Posted signs shall be of an *approved* legible permanent design and shall be maintained by the owner or authorized agent.

  The Life Safety Code is more stringent regarding the adjustments to the occupancy load:

  A.7.3.1.2 The normal occupant load is not necessarily a suitable criterion, because the greatest hazard can occur when an unusually large crowd is present, which is a condition often difficult for authorities having jurisdiction to control by regulatory measures. **The principle of this *Code* is to provide means of egress for the maximum probable number of occupants, rather than to attempt to limit occupants to a number commensurate with available means of egress**. However, limits of occupancy are specified in certain special cases for other reasons.

  We recommend that a building occupancy review be made by the Fire and Building officials. The egress widths exist for the total calculated occupancy of 216 occupants (gross area divided by 7sf concentrated use-loose chairs). However this gross occupancy would necessitate the addition of a full building sprinkler system and the renovation of and addition to the existing toilet rooms to add 1 male and 2 female water closets.

EXHIBIT D
MECHANICAL REPORT

DESIGN DAY
MECHANICALS INC

3/26/2014

Whipple Building HVAC and Domestic Hot Water Heating Systems Report

Existing Conditions

Central Heating Plant

A Weil McLain Model 778 propane fired cast iron boiler with a gross heating capacity of 764,000 Btu/h provides heat for the majority of this building. There are five hot water circulator pumps, one for the three air handlers with hot water coils, one for the two (2) floor mounted hot water cabinet unit heaters in the two connectors leading to the Old Meeting/ Court House, one for the six (6) six floor mounted hot water cabinet unit heaters in the two connectors leading to the Old Meeting/ Court House, one for what appears to be abandoned for heating in the old lower level cell area, and one new unlabeled pump that is apparently for the baseboard and hot water coil associated with the newer lower level Police Department meeting room. Originally this system was reported to have glycol installed because of the hot water coils in the three attic mounted air handlers. As indicated with the circulator description, this boiler provides hot water for the following terminal heating elements:

Three (3) air handling units with hot water coils located in the attic serving the Police Department, and Recreation Department, on the upper level.

Eight (8) floor mounted hot water cabinet unit heaters in the connector hallways and Old Meeting/ Court House.

Residential grade fin tube, hot water baseboard radiation in the Police Department meeting room and entry hallway in the lower level under the Old Meeting/ Court House.

A duct mounted hot water coil in the Energy Recovery Ventilator (ERV) for the lower level police department meeting room

Additional Terminal Heating Elements

The lower level of the Police Department, but not their meeting room, is heated with an electric coil mounted in an air handling unit located in the attic over the upper level of the Police Department.

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Smaller individual offices on the upper level Police Department and Recreation Department have individually control electric baseboard units. One exterior space that does not have a permanently installed electric heater is Dispatch. However, a portable electric heater was present in that room.

Air Conditioning

The three (3) air handlers with hot water heating coils serving the upper level Police Department and Recreation Department and the one (1) air handler with electric heat serving the lower level Police Department, but not the lower level Police Department Meeting Room, all have outside compressor condensing units, 5 ton units for three of the units, and a 4 ton unit for the unit that serves the Northeast section of the Upper Level Police Department.

The Dispatch has it own 2 ton ductless air conditioning unit.

Ventilation and Exhaust

Each of the four air handling units has an outside air duct connection that would introduce ventilation air if their manual dampers were opened, and if the air handler blower were running.

The previously referenced ERV serves only the lower level Police Department meeting room. It is apparently controlled by a wall mounted air quality sensor labeled "AirSense".

There is an in-line fan mounted in the attic, apparently with ducted connections to toilets and shower areas. It was running on the day the survey was performed.

Domestic Hot Water

A 40 gallon electric domestic water heater with two non-simultaneous 4500 watt coils provides domestic hot water for all the plumbing fixtures, including two showers in the lower level Police Department locker room area. Due to the distance from the heater to the furthest fixture, which is probably the sink in the toilet are adjacent to the Police Department Waiting Room on the upper level, there is re-circulation pump. This pump is supposed to keep hot water available at that sink without having to run the hot water for a long period of time, waiting for hot water to flow from the heater. There is no connection from the heating boiler to this water heater.

Reported Deficiencies, *Observations and Analysis*

Some of the system deficiencies that have been reported are:

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One of the hot water coils in the one of the attic air handlers froze and burst, then caused significant water damage when it thawed.

It appears that the original intent of the system was to have the hot water heating solution be protected with an anti-freeze solution, probably propylene glycol. Over time this solution may have become diluted, or broken down enough to become ineffective. Anti-freeze solutions should be checked for viability once a year before heating seasons as a part of preventative maintenance, and replenished or replaced as required.

With an anti-freeze solution the air handlers could operate with their blowers during the occupied mode to both blend the air in all spaces and provide code required ventilation. Heat would only be delivered when the space mounted thermostat calls for heat and a hot control valve opens to allow hot water flow through the air handler hot water coils. It appears that after the freeze-up there is no anti-freeze in the hot water heating system, the hot water control valves are all opened, hot water flows through the heating coils on a continuous basis to prevent freezing, the outside air intake dampers have been closed and the space mounted thermostats cycle the air handler blowers on and off to control heat. There are several unintended consequences for this new operating sequence, which will be addressed further on. One of the ignored consequences is that there is now no mechanical ventilation provided to the occupied space as required by code, unless you are relying on "natural ventilation' with opened windows during the winter.

The electric baseboard heaters are often needed to supplement the heat from the heating coils in the attic mounted air handlers.

With the air handlers no longer able to operate with a continuous blower operation during the winter, the thermostats, which are located on interior wall, and not sensing exterior heating demands, will also not sense the blended air temperatures from those exterior portions of the building, and therefor rarely operate in the heating mode, especially with the electric baseboard units operating.

All four of the air handling units, the three with hot water coils and the one with the electric heating coil, have their thermostats located on interior walls, far removed from the heat loss of the outside walls and windows. These would all be the last places that would detect a requirement for heat, especially when the air is not being continuously circulated, as is the case now. The solution isn't quite as easy as just moving the thermostat to an outside exposed room. Since all the air handlers handle rooms that have multiple exterior exposures, cold sunless north, sunny, solar gain south, heat rejecting copier room interiors, calling for heat with a thermostat in the cold sunless north could cause all the other areas to overheat. The answer would involve multiple zone damper controls for each air handler. This could cost in the neighborhood of $15,000 per air handler.

Significant ice dams form at some of the roof eaves.

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I have, unfortunately, seen much worse attic insulation jobs over the years, but with the passage of time part of the attic insulation system has been compromised. This commonly happens when new wiring systems are installed and the with service people who are not as careful as they may be. I appreciate good service people who leave a job site looking neat, picked up and in order, as if they take pride in the work they do and as if the condition of the systems upon which they work reflects on their reputation. Unfortunate I did not appreciate what I saw in the two attic spaces, and would be happy to give a tour to anyone who can follow this 61 year old up the ladders into these spaces, including the aforementioned service people.

One of the systems that has also ben compromised over the years is the ductwork insulation. I'm not sure exactly when this was installed, but it would not meet the current R-8 code requirement, even if it were not compromised. The little bit of hot water pipe insulation leading to the coils is also compromised and insufficient by today's standards. All that being written, even with ALL the ductwork and piping being insulated to today's standards, there will always be some heat loss off of all the ductwork and equipment in the attic, and the "normal" amount of attic ventilation is rarely enough to keep snow from melting and ice dams from re-freezing at the eaves. Because of this fact, I always cringe when an architect expects attic mounted equipment and ductwork. The only exception to that is when the attic is insulated at the roof deck.

The cost for insulating these two attics at the roof deck, but not the Old Meeting/ Court Room, would be approximately $70,000.

Domestic water froze in the Toilet adjacent to the Police Department Waiting Room.

Because there is not regular heated airflow from the air handling unit serving this room, due to the unintended consequences described above, and there is no supplemental heat in the Toilet Room as there is in the other exterior rooms, the temperature could get cold enough, and apparently did, to allow the water in this room to freeze. This might also have been exacerbated by the portable supplemental electric heat in the Dispatch Room, as will be explained below.

<u>The Dispatch office was cold until a supplemental electric heater was utilized.</u>

It appears that the door to the Dispatch room may be opened enough, maybe all the time, to allow the heat from the electric heater to impact the thermostat for the air handler with hot water coil serving this area. That thermostat is located in the hallway right outside the Dispatch Room. With that thermostat satisfied by the heat from the electric heater, the air handler thermostat would rarely, if ever call for heat to be delivered to all the rooms in this area, including the Waiting Room Toilet.

This room has its own "heat" thermostat. This thermostat controls a zone damper that is only intended to shut-off heat in the event that there is enough heat rejection from the electronics in this room and so would not need or want additional heat delivered from the central heating system. The heat rejection from the electronics is also the reason that this room has it own ductless air conditioner.

There is insufficient hot water for the Police Department showers.

The electric domestic water heater is similar in capacity and size, if operating correctly, to handle most normal house, including those with two showers. Both electric elements should be tested to see if they are operational. If this is not the problem, then the shower mixing valves may be faulty. These valve are relatively easily replaced and do fail or become plugged with debris that prevents them from mixing properly. They would most likely be designed to fail in the too cold position to prevent scalding lawsuits.

There is insufficient exhaust in the lower level Police Department.

The in-line fan was running in the attic. I did not look to see if it is a belt driven fan. If it is, then the belt could be loose. After checking the belt, a balancing contractor, or a mechanical contractor with a flow hood, can provide measurements at the grilles to determine what flow there is, and then determine if it is up to code.

There is insufficient heat in the lower level Police Department meeting room.

After doing heating and cooling load calculations for the entire building, the cooling capacity, if not control, and heating capacity of the boiler are sufficient, the boiler very much sufficient. However, the amount of residential grade baseboard in the lower level Police Department is not sufficient. I can not tell exactly what insulation was installed in those wall, but assuming that it is not that great, as in not code compliant, the capacity appears to be about 50% of what I would recommend. But, before just installing twice as much fin tube, I'd like to have the control contractor ProControls out of Bow, NH check to make sure that the control system is also working properly and that the system is balanced to be delivering the proper amount of hot water.

Future HVAC System Replacement

The current HVAC system is utilizing a standard efficiency propane boiler and electric resistance heat. With the cost of propane rising, the cost of utilizing this energy source, especially with standard efficiency equipment, is approaching that of resistance electricity. When the time comes to replace the heating and air condition system, I would recommend considering the new low temperature variable refrigerant flow (VRF) systems. This system would be about 2.5 times more efficient in operating cost than the electric heat system that is now primary being used, and would provide much better individual control.

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At today's cost a system like this would be in the range of $20/ square foot. Without the Old Meeting/ Court House, the installed cost would be around $180,000.

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Summary

This is a lot of information to digest. After everyone who is interested has had a chance to read and think about it, I'd be happy to meet informally to answer questions and perhaps provide more insight.

DESIGN DAY MECHANICALS, INC.

Douglas C. Waitt

EXHIBIT E
ELECTRICAL REPORT

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December 2014

WHIPPLE TOWN HALL, NEW LONDON
REPORT ON EXISTING ELECTRICAL SYSTEMS

Introduction:

On Monday, November 24, 2014 and Friday, December 5, 2014, I visited the Whipple Town Hall and examined the electrical systems. The building consists of the original meeting hall and rooms in the basement, the offices and rooms in the middle that are now the Recreation Department, and the Police facilities on two levels. This report documents my findings and makes suggestions for upgrades and improvements both to meet current Codes and to save energy. There are some annotated photos in the appendix to illustrate some of the points in the report.

When reference is made to "Code" requirements, generally they refer to the National Electric Code (NEC) unless the NFPA 101 Life Safety Code or NFPA 72 Fire Alarm Codes are specifically referenced.

General Conditions for the Overall Building:

I believe the original brick building with the historic meeting room was constructed around 1918. The added court space (now the Recreation Dept.) and the Police facilities were added @ 1999.

- The electrical service to the building is 120/240 volt, 400 amps, single phase. It comes in underground to an electrical room in the basement of the Police Department. It is obviously a new service provided during the last renovation and additions.
- There is a 75kW generator that provides back up power for the entire building.
- The service enters the electric room in two 3" conduits into a CT cabinet (where there are current transformers that monitor/meter the energy use) – then to a 400 amp, two pole circuit breaker/main disconnect – then into an automatic transfer switch (ATS) which is also fed from the generator – and then into a 400 amp, 42 position main distribution panel which feeds several sub panels in that room and around the building.
- From Utility records, the peak power usage over the past 12 months was 28kW or 116 amps, occurring in February of 2014. Generally both the peak power (in kW) and the energy use (in kWH) is fairly consistent from month to month, varying by less than 20% from the average. The energy and peak demands come primarily from the Police

department which is occupied and used a majority of the time with consistent electrical loads (lighting, plug loads, heating and cooling).

- In fact, the February, 2014, higher peak (28kW) and energy usage (12,960kWH) is an anomaly and something of a mystery. The peak power and energy use usually occurs in the late summer months due to air conditioning, and if you separate out the February usage, the rest of the months exhibit very uniform usage and peak power with the highest peaks occurring in July and August. Overall energy use in kWH is very consistent over every month. With the exception of February, energy use varies by less than 18%.
- With the 400 amp service and the building peak load at only 116 amps, there is clearly plenty of spare capacity for added loads in the future.
- Most of the building wiring is done with non-metallic sheathed cable known as NM or "Romex". This includes wiring above the dropped ceilings in the newer part of the facility. This type of wiring is not legal above dropped ceilings according to current NEC Code. However, it is an existing condition and is not particularly dangerous so it is not necessary to change it.

<u>The Original Building, Historic Hall and accompanying spaces in the basement</u>:

This part of the building, with the meeting hall and stage on the main level and the meeting room and ancillary rooms on the basement level are used much less than the rest of the building and use proportionally much less energy than the rest of the building. The only real electrical load here is the heating system and some lighting. From the Hall "Winter Occupancy Schedule", it appears that the Hall is only used about 20 hours per week including opening, warm up and closing time with additional time of 15 to 16 hours once every month (Farmer's Market and Performing Arts)

It appears that the wiring is being upgraded, at least in the basement, with some renovations on-going. However, there are numerous indications that there is still old wiring with two wire, ungrounded circuits and receptacles. There are also very old push button switches in the entry and other areas.

It should be noted that there are open electrical boxes in the main vestibule/hall with exposed wires. This is not Code legal and might be hazardous if those wires are still electrically "hot" or energized. These exposed wires should be covered and areas of construction with exposed electrical work should be protected and off limits to the general public.

All the wiring and devices in the building should be upgraded to current Code standards (which may be underway).

Lighting:

There is quite a variety of light fixtures here.

- The main meeting hall has four (4) pendant "chandeliers" with twelve candelabra based decorative incandescent lamps in each. There is a dimmer for these fixtures, located stage left, which does not work properly and is potentially dangerous, possibly overheating and causing a fire. The least cost energy measure would be to change the incandescent lamps to LED lamps (that are dimmable). The dimmer for these fixtures as well as the dimmers for the stage lighting should be upgraded. This would involve first determining the lamping for the chandeliers and then finding an appropriate dimmer to handle the load and that works with the new LED replacement lamps.
- The stage has "homemade" site built lighting consisting of boards with lamp sockets and various incandescent PAR and R lamps on different circuits. It does not appear that the wiring for these lights is Code legal. I realize that real stage lighting can be very expensive. At the very least, the wiring for the stage lights should be checked by a licensed electrician and fixed or upgraded as necessary and the incandescent lamps should be replaced with dimmable LED PAR lamps and new dimmers to control them should be installed to replace the old dimmers.
- There are two wall mounted up light fixtures in the hall to the Rec Dept area. These fixtures have old quartz lamps in them. They tend to collect dirt and bugs and the quartz lamps get very hot, potentially becoming a fire hazard if the fixtures aren't cleaned regularly. In addition, the quartz lamps are very inefficient and do not last very long. These fixtures should be changed to new LED fixtures, thereby saving operating costs and maintenance.

- The exterior lights also vary in style and lamping. On the historic front of the building, there is a traditional lantern style incandescent fixture which provides relatively little light. Above this in the middle of the beautiful brick façade of the Meeting House is a really ugly HID flood light, apparently to throw more light on the front area of the building and grounds. This flood light would blind anyone trying to approach the building at night (unless you shield your eyes). This light fixture should be removed and the front area should be lit with new post lights or at the least from cut-off (optically controlled) wall fixtures on either front corner of the building.
- The remaining exterior wall fixtures should be replaced with LED wall fixtures. This would improve the lighting and the appearance of the building overall at night. It would also save on operating energy and costs and dramatically save on maintenance since the LED exterior wall lights would last upward of 70,000 to 100,000 hours compared to 10,000 to 20,000 hours for HID lamps.

- Exit Signs and Emergency Lighting – There are exit signs and emergency lighting from emergency battery units (EBUs) located around the building but not enough exit signs or emergency lighting to meet current NFPA Life Safety 101 Code requirements. Most of the EBUs I tried, did not work at all! I understand that the building is backed up by an emergency generator, however, the configuration of the generator power distribution and wiring does not meet the NFPA 101 or NEC requirements for Life Safety lighting. It is important that the emergency lighting be fixed and in some cases added to in order to bring the building up to current Code standards. At the very least, all the existing EBUs should be repaired or replaced. It may actually be less expensive to just replace them with new units. Further, NFPA 101 Life safety Code

requires emergency lighting outside at exit doors in order to get exiting people "a safe distance from the building or to a public way ..". There is currently no Code legal emergency lighting outside exit doors. Emergency lighting should be added at these doors. The least expensive options to accomplish this would be to install an EBU inside and use two remote emergency heads outside the door powered from the new EBU. Another option would be to provide a new light fixture at these exit doors that have a self contained battery back-up to serve as emergency light. This discussion relates to the entire building, not just the original hall.

- In the Basement rooms and spaces, there are newer fluorescent light fixtures. In the large meeting room downstairs, there are 2'x2' parabolic fixtures with two 32 watt U tube fluorescent lamps. While replacing these fixtures with new LED fixtures would save money and maintenance for the future, the initial cost and the relatively infrequent use of the spaces would really not justify the change since the payback would be years out – at least 8 to 10 years or more. The best measure that can be done to save money in the basement is to make sure the lighting in all the rooms and spaces is controlled with occupancy or vacancy sensors.

<u>The Recreation Offices and Spaces</u>

This is an addition that is relatively new. Once again, the only appreciable electrical loads are the HVAC systems and the lighting.

- The lighting consists primarily of 2'x4', 3 lamp parabolic fixtures with 32 watt T8 lamps. There are some compact fluorescent recessed down lights
- The potential for energy savings here comes from the fact that many of the areas and rooms are over lit (too much light). Specifically, the Hall/Lobby which is ~ 44' x 12' has five (5) 2'x4', 3 lamp parabolic fixtures and ~ 35 footcandles (fc) of illumination on the floor. Most of the time, this space is really not used as a work space and serves only as a pedestrian travel way. As such, it only needs @ 10 fc of light. I suggest the 2'x4' fixtures be wired so they can be double switched, controlling the center lamp only for normal use, and then the outer 2 lamps in each fixture if higher light levels are needed. This will reduce the lighting and energy/operating costs by a third.
- I also suggest the recessed compact fluorescent wall wash fixtures (which are apparently there to highlight wall mounted artwork) in the Hall/Lobby be changed to LED fixtures which will save on operating costs but especially on maintenance since the LED fixtures will last about ten times longer that the compact fluorescent lamps.
- There is a small "Conference Room" which is now used as storage and has two 2'x4', 3 lamp fixtures. One lamp on in each fixture is more than enough and the other two lamps in each fixture should be disabled or removed to save energy.
- The large Conference room has three 2'x'4', 3 lamp fixtures and these should be wired for dual level lighting control – 1 lamp/2 lamp.
- All spaces should be controlled by occupancy or vacancy controls.
- See the discussions above for relevant information on the emergency and exit lighting.

The Police Station

The Police Station has by far the greatest use as it is occupied in one form or another 24/7. Generally plug loads consist of equipment and devices that are necessary and required.

The primary potential for energy savings comes from the lighting systems. Most of the lighting comes from 1'x4' or 2'x4', 3 lamp fluorescent fixtures.

- The common area corridors, stairs and certain other areas are considerably over lit. The corridors would be more than adequately illuminated with a half or less of the current light levels. This could be achieved by eliminating one of the lamps in each fixture or changing to new LED fixtures with considerably less light and much lower energy use.
- The exercise room is way over lit. There are six (6) 2'x4', 3 lamp parabolic in this room. The lights are controlled by a wall mounted occupancy switch that is partially hidden behind a table. I strongly urge that the fixtures be rewired so there is control of the center lamp in each fixture, and a separate switch for the two outside lamps in each fixture. Clear or relocate the occupancy sensor to control the one lamp circuit, add a switch for the two lamp circuit and then educate the users to leave the 2 lamp circuit off unless there is some real reason to have higher light levels in this room.
- The Records Room, with its two 2'x4', 3 lamp fixtures, would best be on a vacancy sensor – if someone enters and needs light, they turn the lights on. When they leave they hopefully turn the lights off, but if they don't the vacancy sensor will automatically turn the lights off.
- The Corridors are over lit – reduce the amount of light and operating energy.
- The large open work area which is ~ 20' x 22', has six (6) 2'x4', 3 lamp parabolic fluorescent fixtures which are all controlled together and are generally all on even though it is rare that there are people sitting at all the desks. This area lighting should be rewired for separate lighting control circuits to allow for limited lighting on desks and areas most often used, allowing the rest of the space to be shut off.
- The large stairway to the lower level is considerably over lit with more than 35 fc. There are two 1'x4', 3 lamp surface fluorescent fixtures in there and two of the lamps in each fixture should be removed or disabled. I am recommending the one lamp option based on Industry recommended light levels in this type of space. However, the best thing to do is to try the one lamp light level and if the staff believes it is not enough light, then use the 2 lamps – just NOT the three lamps which is too much light and more energy wasted.
- The downstairs Booking and Holding areas are lit as they need to be. However, the lights were all on when I was there even though there was no one in the cells or generally using the spaces. Because of the sensitive nature and security issues involved in the use of these spaces, lighting control is important and the light is necessary – when the spaces are being used. Perhaps a discussion with the Officers and staff about trying to make sure lights are out when not in use might be helpful and beneficial.

- There are a few compact fluorescent recessed down lights in the corridor to the cells. These should be changed to LED down lights.
- Generally, all the fluorescent fixtures could have the lamps changed to the new, lower wattage F25 or F28 watt energy saving, long lasting fluorescent lamps which would reduce energy consumption in the fixtures by 10% to 15% and still leave plenty of light.

- See previous discussions about emergency and exit lighting which is relevant to these spaces.

SUMMARY

1. Service entrance and available power – 400 amp, 120/240 volt, single phase service is relatively new and in good shape. The building peak power usage has only reached ~20% of available power so there is considerable capacity for additions and expansion. Please note that the service is single phase and NOT three phase so this would limit the ability to add large motor loads or equipment that generally require three phase power, such as elevators or large air conditioning units.
2. Some of the existing wiring and devices in the original building are old and not properly grounded and need upgrading and/or replacing. This work appears to be ongoing?
3. Original Town Hall – a comprehensive review of the lighting and lamps used should be undertaken in conjunction with a lighting designer/expert or a knowledgeable distributor or manufacturer's representative to identify the best new lamps to use in the existing fixtures, or new fixtures should be considered. In the large Meeting Hall, this should be done in view of the need to dim the lights.
   This is an energy conservation measure. The review and recommendations of lamping by a distributor or Manufacturer's Representative would be free. Having a lighting designer/engineer review would cost between $400 and $800. The LED lamps themselves would be @ $10-$15 each.
4. The Stage lights should be examined and upgraded or replaced.
   This would be both a Code issue and an energy conservation issue. I would suggest this be done in conjunction with a lighting professional and an electrician. The evaluation would cost between $300 and $500. Recommendations and specifications for revised Stage lighting would cost between $500 and $1000. The new/revised Stage lighting could cost anywhere from several thousand dollars to upgrade the existing to @ $20,000 for new stage lighting, dimmer rack and control /dimmer board.
5. The dimmers for the Hall and Stage should be replaced.
   This is a safety issue. At the very least, the existing dimmers should be replaced after new lamping is chosen for the Hall and Stage. This could run @ $800-$1500. New stage lighting controls with a dimmer rack and control/dimmer board would be @ $6000 to $8000.
6. The two wall fixtures in the corridor from the Hall to the Rec Dept should be replaced.
   This is an energy conservation measure and a safety measure. New fixtures properly chosen for the task would cost between $400 and $700 each.

7. The exterior wall light fixtures should be replaced with new LED fixtures and the flood light on the front of the building should be removed and replaced with different fixtures in different locations.

   This is an energy conservation measure and an aesthetic issue. Each new LED fixture can cost as little as $200 for smaller fixtures where less light is required to $800-$1000 for larger, higher output fixtures where more light is needed.

8. The exit and emergency lighting should be addressed with the existing emergency lights being fixed or replaced and some additional exit signs and emergency lighting being added to bring the emergency Life Safety systems up to current Code requirements.

   This is a Code and Life Safety issue. At the very least, the failed emergency battery units (EBUs) should be replaced at ~ $60 -$100 each. Adding additional exit signs and emergency light could cost between $3000 and $5000.

9. The lighting in the Recreation Department should be reviewed and revised to provide just the light that is needed with options for control of multiple levels of light for different uses. This will entail the reduction of lamps and/or fixtures in certain rooms and areas. Automatic control (occupancy and vacancy sensing) should be added where appropriate.

   This is an energy conservation measure. You could have your maintenance person do a review of the building lights and remove lamps where appropriate. A better, more comprehensive approach would be to have a more detailed analysis of the lighting done by a lighting professional with recommendations and specifications that can be implemented by an electrical contractor. The recommendations and specifications would cost @ $1000- $1500. It is difficult to estimate the work itself since there would be several options available.

10. The lighting in the Police Department should be reviewed and revised to provide just the light that is needed with options for control of multiple levels of light for different uses. This will entail the reduction of lamps and/or fixtures in certain rooms and areas. Automatic control (occupancy and vacancy sensing) should be added where appropriate.

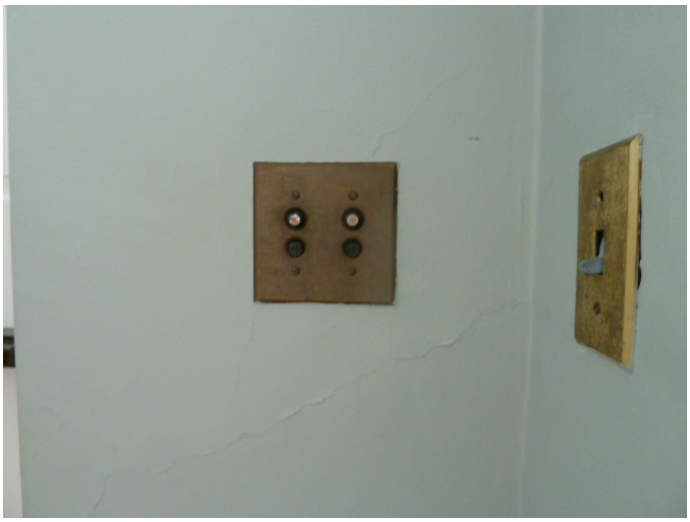
    This is an energy conservation measure. You could have your maintenance person do a review of the building lights and remove lamps where appropriate. A better, more comprehensive approach would be to have a more detailed analysis of the lighting done by a lighting professional with recommendations and specifications that can be implemented by an electrical contractor. The recommendations and specifications would cost @ $1000- $1500. It is difficult to estimate the work itself since there would be several options available.

END OF WRITTEN REPORT

PHOTOGRAPHS

Exposed wires in Hall/Lobby

Exposed rewiring in progress in basement of Original Building



Old pushbutton switches in Front Entry/Lobby

Over lit exercise room

Old plug and switch 2 wire ungrounded

Entry light – fix or replace

Old exit sign – not Code compliant and should be replaced

Over lit storage area in Rec Dept – use only one lamp in each fixture – and turn them off when not in use!

Over lit Rec Dept. Lobby – double switch lights for low/medium and high light levels

Dangerous dimmers for Stage & Hall

Front façade flood light

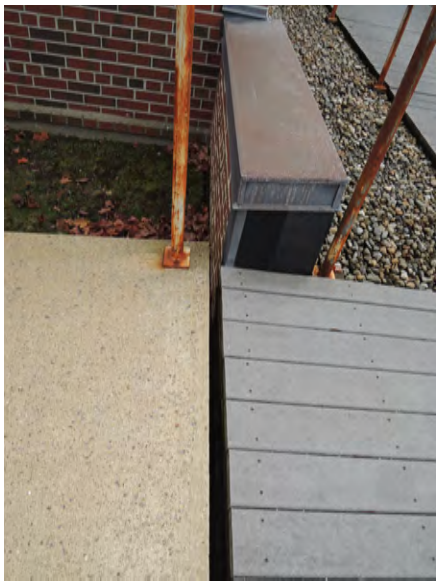
Exterior lights to be replaced with LED units and emergency lighting to be added

PICTURES

Roof geometry and water drainage is contributing to splash back staining of brick. Mortar and brick damage is evident with possible cavity moisture damage. Recommend clearing out organic matter at grade and re-grade stone drip area lowering catch basin cover if possible.

Staining of brick and concrete wall at scupper drainage is evidence of deteriorated scupper and flashing which is contributing to wall cavity moisture and possible interior damage.

Efflorescence at brick veneer is evidence of water penetration into the brick cavity and possible water damage to interior at scupper and flashing.



Gap at roof exit way is dangerous and unacceptable per code. Recommend closing roof walk exit walkway. Exit at roof is not a code requirement for egress from main floor.

Failed gutter and downspout; trim and paint in failure is evidence of possible internal moisture damage. Recommend that gutters be cleaned, joints caulked and flashing repaired. This section of gutter and trim to be replaced.

Trim paint failure. Material deterioration is leading to moisture penetration and window jamb damage. Storm window is open during heating season. Recommend trim preparation; scraping and priming, then paint to maintain brick mold trim and windows. Storm windows should be seasonally adjusted to a closed position.

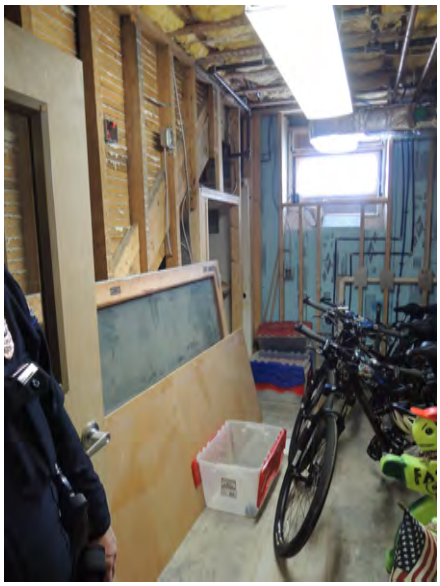
Deteriorated paint finish and leaching of paint finish on brick veneer. Condition suggests moisture penetration at window sill and possible wall damage below. Recommend adding a sill drip at wood sill during preparation of woodwork before painting. Unfinished material requires preparation and painting at lower louver work.

Failed wiring on Sallyport west wall due to water penetration at scupper roof drains and/or flashing.

Storage in corridor is unsafe, a code violation, and suggests inadequate storage capacity in building.

Storage in training/meeting room is evidence of inadequate storage space and is a safety hazard.

Unfinished areas with storage and equipment. Exposed kraft faced insulation is a hazard.



Unfinished area is a safety hazard and could contribute to an unhealthy building environment.

Unfinished area used for bike storage; exposed insulation; unfinished stair exit wall that requires 5/8” fire code drywall finish for rated stair exit wall assembly.