

ARCHITECTURAL NOTES:

- ALL DIMENSIONS ARE TO FACE OF INTERIOR WALL STUD AND EXTERIOR WALL STUD. FIELD VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION. REPORT ANY DISCREPANCIES TO ARCHITECT/DESIGNER.
- PLUMBING FIXTURES, APPLIANCES, CABINETS AND LIGHTING FIXTURES TO BE DETERMINED BY OWNER.
- ROOF CONSTRUCTION TO COMPLY WITH R-49 REQUIREMENTS. PROVIDE 24" MIN. OF ICE AND WATERSHIELD AT RIDGE, VALLEYS AND EDGE OF ROOF. PROVIDE CONTINUOUS AIR FLOW FROM SOFFIT VENTS TO RIDGE VENTS.
- CONTRACTOR TO COMPLY WITH LOCAL BUILDING CODES & VERMONT ENERGY CODES.
- ALL BATHROOM WALLS & CEILINGS TO BE 1/2" MOISTURE RESISTANT GWB. BATHROOM WALLS TO BE SOUND INSULATED.
- ALL HEADERS OVER OPENINGS TO BE SIZED BY CONTRACTOR.
- G4 DESIGN STUDIOS IS NOT RESPONSIBLE FOR FRAMING DETAILS, STRUCTURAL DETAILS, FINISH WORK, MILLWORK, WEATHER TIGHT CONSTRUCTION, FINISH GRADING OR CONCRETE WORK.
- GENERAL CONTRACTOR TO COORDINATE WITH CONCRETE CONTRACTOR AND OWNER FOR PENETRATIONS THROUGH CONCRETE SLAB OR WALLS.
- IF OWNER/CONTRACTOR MAKE CHANGES DURING THE CONSTRUCTION PROCESS WITHOUT WRITTEN AUTHORIZATION FROM G4 DESIGN STUDIOS (G4), G4 IS NOT LIABLE FOR ERRORS OR OMISSIONS THAT MAY OCCUR TO THE CONSTRUCTION DRAWINGS.
- OWNER TO SELECT WINDOW MANUFACTURER, VERIFY WITH OWNER PRIOR TO ORDERING WINDOWS.
- GENERAL CONTRACTOR TO COORDINATE WITH MECHANICAL CONTRACTOR FOR HVAC SYSTEM.
- GENERAL CONTRACTOR TO COORDINATE WITH ELECTRICAL CONTRACTOR & OWNER FOR LOCATIONS OF OUTLETS, LIGHTING FIXTURES, CABLE, INTERNET & LIGHT SWITCH LOCATIONS.
- GENERAL CONTRACTOR TO COORDINATE W/ OWNER FOR ALL INTERIOR MATERIAL/FINISH SELECTIONS

2020 VERMONT RESIDENTIAL BUILDING ENERGY STANDARDS:

NEW CONSTRUCTION SHALL COMPLY WITH THE FOLLOWING R-VALUES (BASED ON PACKAGE 4: CAVITY ONLY)

CEILING:	R-60 (ATTIC), R-49 (SLOPE)
WOOD FRAME WALLS:	R-20 (CAVITY)
COMMON WALL INSULATION:	R-10
FLOOR:	R-38
BASEMENT/CRAWL SPACE WALL:	R-20 (CONTINUOUS) OR R-13+10
SLAB EDGE:	R-15 (FOR 48") OR R-10 (PERIMETER) + R-7.5 (UNDER ENTIRE REST OF SLAB)
HEATED SLAB:	R-15 (EDGE & UNDER)
FENESTRATION (WINDOW & DOOR):	U-0.28 MAX.
SKYLIGHT:	U-0.55 MAX.
AIR LEAKAGE:	≤ 3.0 ACH50 (TESTED)
DUCT LEAKAGE:	INSIDE THERMAL BOUNDARY
PERCENT HIGH EFFICACY LAMPS:	100%

CONTRACTOR TO COMPLY WITH LISTED THERMAL VALUES AND WITH ALL ADDITIONAL REQUIREMENTS OF THE 2020 VTRBES



38 LATHAM COURT

NEW ADDITION
BURLINGTON, VERMONT

INDEX OF DRAWINGS:

- A-0 COVER
- A-1 SCHEMATIC SITE PLAN/BUILDING PLANS
- A-2 EXTERIOR ELEVATIONS

STAIR NOTES:

- NEW HANDRAILS SHALL BE NOT LESS THAN 34" AND NOT MORE THAN 38" ABOVE THE SURFACE OF THE TREAD, MEASURED VERTICALLY TO THE TOP OF THE RAIL FROM THE LEADING EDGE OF THE TREAD.
- HANDRAILS SHALL HAVE A CIRCULAR CROSS SECTION WITH AN OUTSIDE DIAMETER OF NOT LESS THAN 1 1/4" AND NOT MORE THAN 2".
- PER LIFE SAFETY SECTION 7.2.2.3.5: RISER HEIGHT SHALL BE MEASURED AS THE VERTICAL DISTANCE BETWEEN TREAD NOSINGS. TREAD DEPTH SHALL BE MEASURED HORIZONTALLY, BETWEEN THE VERTICAL PLANES OF THE FOREMOST PROJECTION OF ADJACENT TREADS AND AT A RIGHT ANGLE TO THE TREAD'S LEADING EDGE, BUT SHALL NOT INCLUDE BEVELED OR ROUNDED TREADS SURFACES THAT SLOPE MORE THAN 20 DEGREES, AT TREAD NOSINGS, SUCH BEVELED OR ROUNDING SHALL NOT EXCEED 1/2" IN HORIZONTAL DIMENSIONS.
- THE VARIATION BETWEEN THE SIZES OF THE LARGEST AND SMALLEST RISER OR BETWEEN THE LARGEST AND SMALLEST TREADS DEPTH SHALL NOT EXCEED 3/8" IN ANY FLIGHT.
- MAXIMUM HEIGHT BETWEEN LANDINGS CAN ONLY BE 12'-0".
- MINIMUM HEADROOM MUST BE 6'-8"
- MAXIMUM HEIGHT OF RISERS SHALL ONLY BE 7.75"
- MINIMUM TREAD DEPTH SHALL BE 10"
- HANDRAILS TO PROVIDE A CLEARANCE OF NOT LESS THAN 2 1/4" BETWEEN THE HANDRAIL AND THE WALL/GUARDRAIL TO WHICH IT IS FASTENED.
- REQUIRED GUARDS AND HANDRAILS SHALL CONTINUE FOR THE FULL LENGTH OF EACH FLIGHT OF STAIRS. AT TURNS OF NEW STAIRS, INSIDE HANDRAILS SHALL BE CONTINUOUS BETWEEN FLIGHTS AT LANDINGS.
- OPEN GUARDS SHALL HAVE INTERMEDIATE RAILS OR BALUSTERS SUCH THAT A SPHERE 4" IN DIA. IS NOT ABLE TO PASS THROUGH ANY OPENING UP TO A HEIGHT OF 34".
- THE TRIANGULAR OPENING FORMED BY THE RISERS, TREAD AND BOTTOM ELEMENT OF THE GUARDRAIL AT THE OPEN SIDE OF A STAIR SHALL BE OF SUCH THAT A SPHERE 6" IN DIA. IS NOT ABLE TO PASS THROUGH THE TRIANGULAR OPENING.
- THE MINIMUM STAIR WIDTH CLEAR OF ALL OBSTRUCTION, EXCEPT PROJECTION NOT MORE THAN 4 1/2" AT OR BELOW HANDRAIL HEIGHT ON EACH SIDE, SHALL BE 36".

DRAWING FOR CONSTRUCTION

SCALE: 1/8" = 1'-0"
DATE: 7/14/2021
DRAWN BY: WGT
CHECKED BY: SG
PROJECT: 38 LATH.

SHEET TITLE:

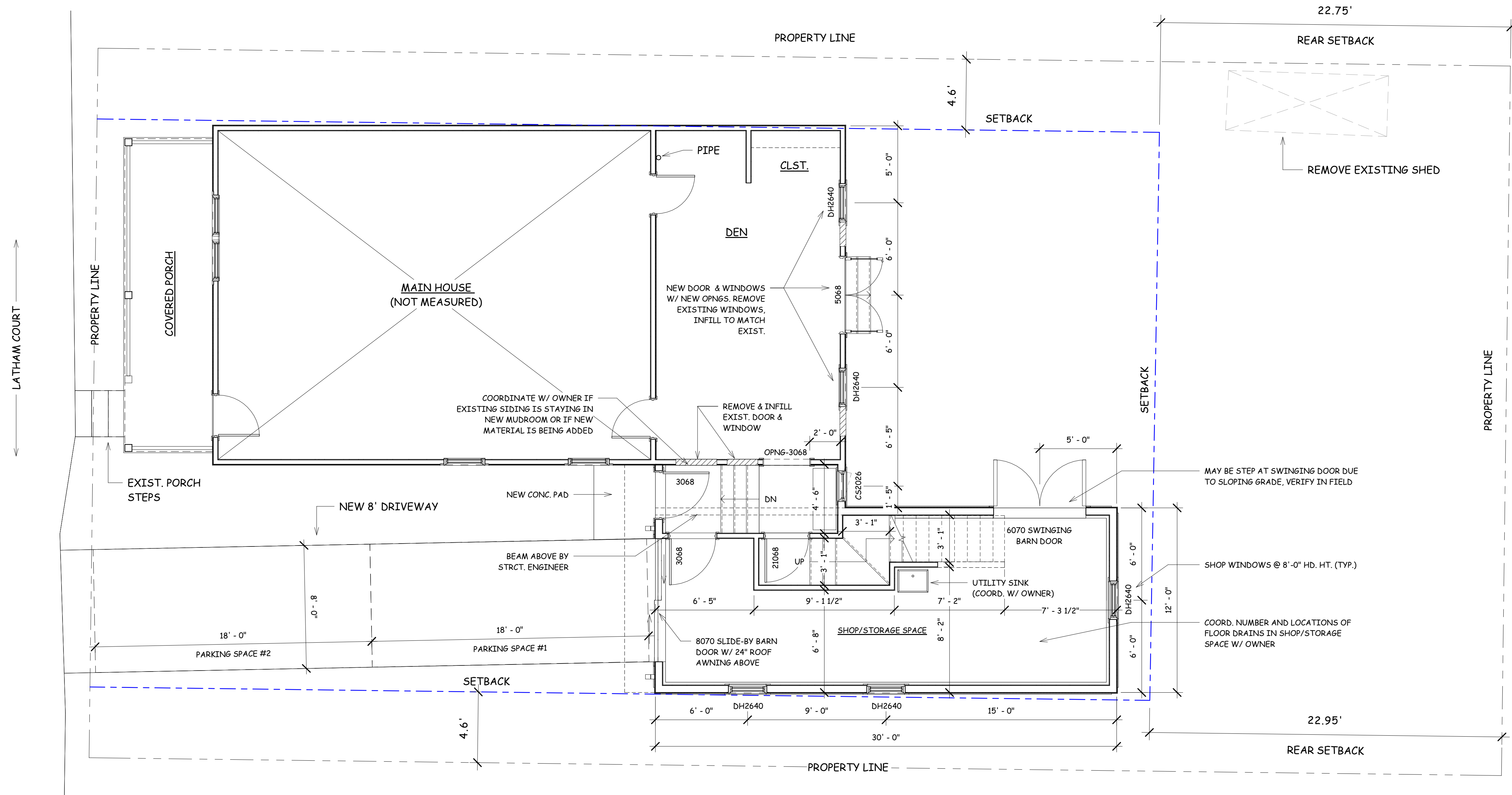
COVER

A-0

THIS DRAWING IS THE PROPERTY OF G4 DESIGN STUDIOS, LLC AND IS NOT TO BE COPIED, REPRODUCED, OR THE CONTENT THEREOF USED, IN WHOLE OR IN PART, WITHOUT THE PRIOR WRITTEN CONSENT OF STEVE GUILD

G4 Design Studios
77 College Street, Ste. 2A Burlington, VT 05401
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38 LATHAM COURT
MARK MCCREE
BURLINGTON, VERMONT



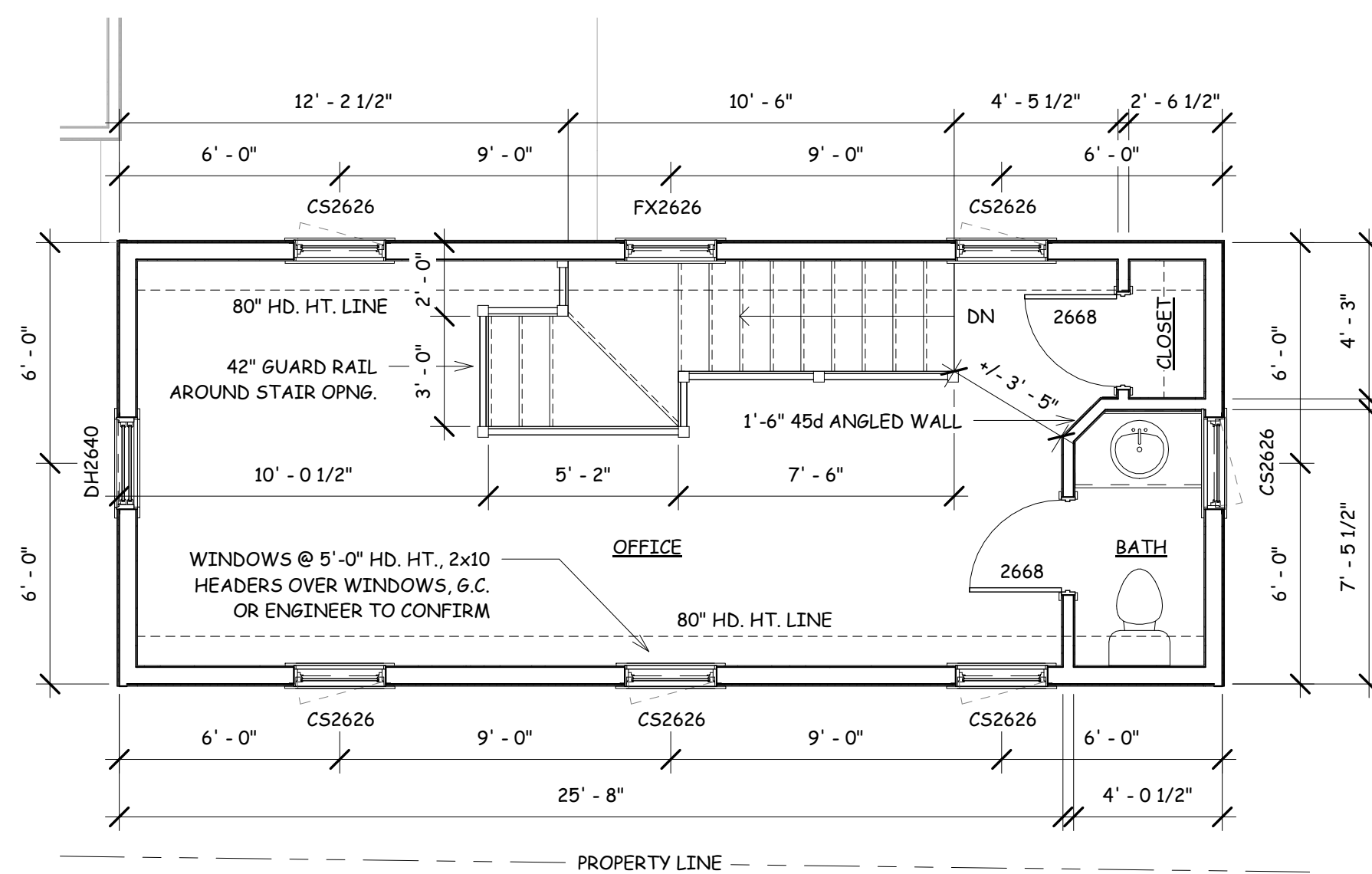
1 PROPOSED SHOP/SITE
1/4" = 1'-0"

NOTES

- 1) WINDOW & DOOR SIZES NOTED IN FEET & INCHES, WIDTH & HEIGHT. FOR EXAMPLE DH2640 MEANS: DOUBLE HUNG 2'-6" WIDE BY 4'-0" TALL.
- 2) G4 DESIGN IS NOT RESPONSIBLE FOR ACCURACY OF ANY SITE FEATURES SHOWN, EXISTING OR PROPOSED. REFER TO LICENSED SURVEY FOR OFFICIAL SITE PLAN.
- 3) BOUNDARIES SHOWN HEREON WERE DERIVED FROM REFERENCE #1

REFERENCES

- 1) A PLAT ENTITLED "PLAT OF LANDS OF MARK R.J. McGEЕ & VALERIE A. RACINE, 38 LATHAM COURT, BURLINGTON, VERMONT", PREPARED BY VERMONT MAPPING & SURVEY CO., LLC, DATED DECEMBER, 2020, AND PROVIDED BY VERMONT MAPPING & SURVEY CO., LLC.



2 PROPOSED SHOP 2ND FLOOR
1/4" = 1'-0"

ZONING INFORMATION:

ZONE: RESIDENTIAL LOW DENSITY (RL)

MAX LOT COVERAGE: 39.69% (EXISTING IS GRANDFATHERED)
- 39.69% OF +/- 4,223 sqft = 1,675.9 sqft MAX COVERAGE

MAX ACCESSORY LOT COVERAGE: 10%
- 10% OF +/- 4,223 sqft = 422 sqft MAX ACCESSORY COVERAGE

SIDE SETBACK: 10% OF LOT WIDTH (OR AVG. OF 2 ADJACENT LOTS EACH SIDE)
- 10% OF 46' = 4.6' SIDE SETBACK

REAR SETBACK: 25% OF LOT DEPTH (NO LESS THAN 20')
- 25% OF NORTH (91') = 22.75' NORTH REAR SETBACK
- 25% OF SOUTH (91.8') = 22.95' SOUTH REAR SETBACK

EXISTING LOT COVERAGE:

- EXISTING HOUSE =	+/- 935 sqft
- EXISTING GARAGE =	+/- 225 sqft
- EXISTING DRIVEWAY =	+/- 496 sqft
- EXISTING FRONT STEPS =	+/- 5.8 sqft
- EXISTING SIDE STEPS =	+/- 14.1 sqft
TOTAL =	+/- 1,675.9 sqft (39.69%)

PROPOSED LOT COVERAGE:

- EXISTING HOUSE =	+/- 935 sqft
- PROPOSED SHOP & CONNECTOR =	+/- 399 sqft
- PROPOSED DRIVEWAY [36'-8" x 8'] =	+/- 294 sqft
- EXISTING FRONT STEPS =	+/- 5.8 sqft
- PROPOSED REAR STEPS =	+/- 8 sqft
- PROPOSED SIDE CONC. PAD =	+/- 19.4 sqft
TOTAL =	+/- 1,657.2 sqft (39.24%)

ACCESSORY LOT COVERAGE:

- FRONT PORCH =	+/- 119.2 sqft (2.8%)
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38 LATHAM COURT
MARK McGEЕ
BURLINGTON, VERMONT

SCALE: As indicated
DATE: 7/14/2021
DRAWN BY: WGT
CHECKED BY: SG
PROJECT: 38 LATH.

SHEET TITLE:

PROPOSED
CONDITIONS

A-1

DRAWING FOR CONSTRUCTION

7/14/2021 11:36:55 AM



1 WEST ELEVATION
1/4" = 1'-0"



2 EAST ELEVATION
1/4" = 1'-0"

NOTE
ONLY EXISTING FIRST FLOOR EXTERIOR VERIFIED,
2ND FLOOR, DORMER, AND ROOF ARE SHOWN
SCHEMATICALLY ONLY BASED ON PHOTOGRAPHS.



3 SOUTH ELEVATION
1/4" = 1'-0"



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

DRAWING FOR CONSTRUCTION

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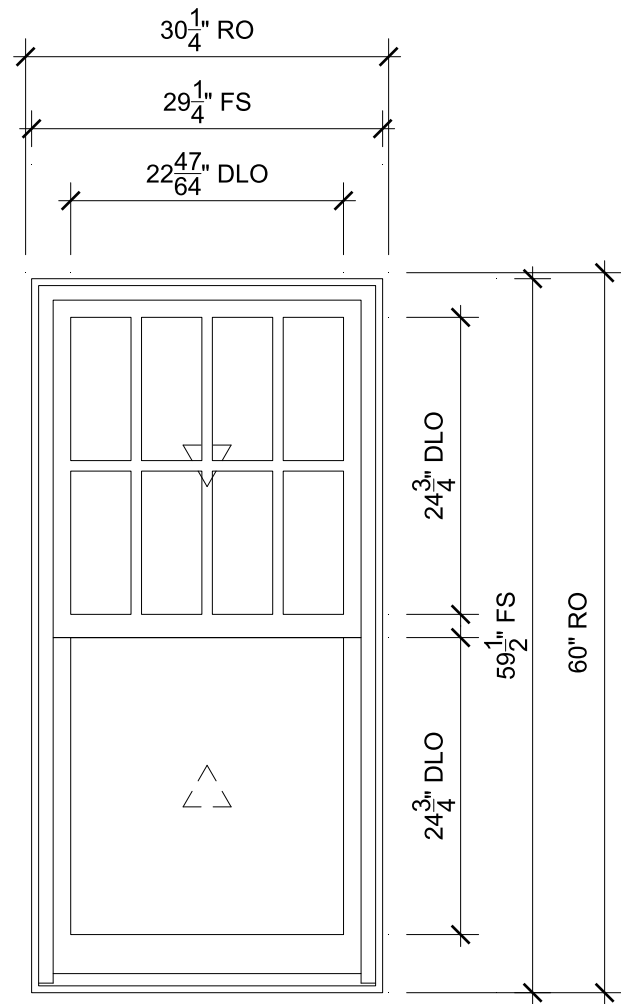
38 LATHAM COURT
MARK MCGEE
BURLINGTON, VERMONT

SCALE: 1/4" = 1'-0"
DATE: 7/14/2021
DRAWN BY: WGI
CHECKED BY: SG
PROJECT: 38 LATH.

SHEET TITLE:
PROPOSED
ELEVATIONS

A-2

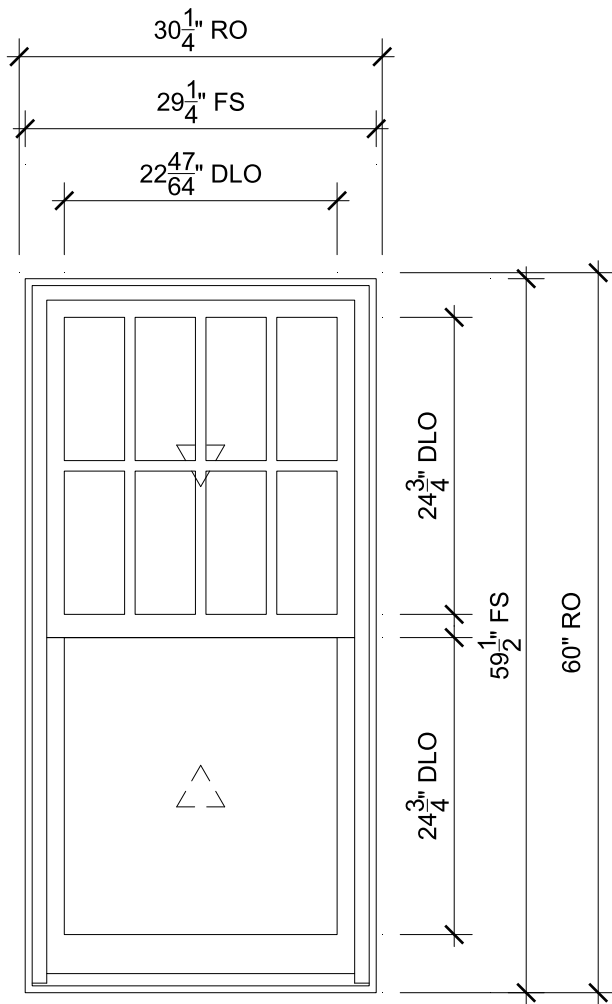
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NORTH - OFFICE

SCALE: 3/4" = 1'-0"

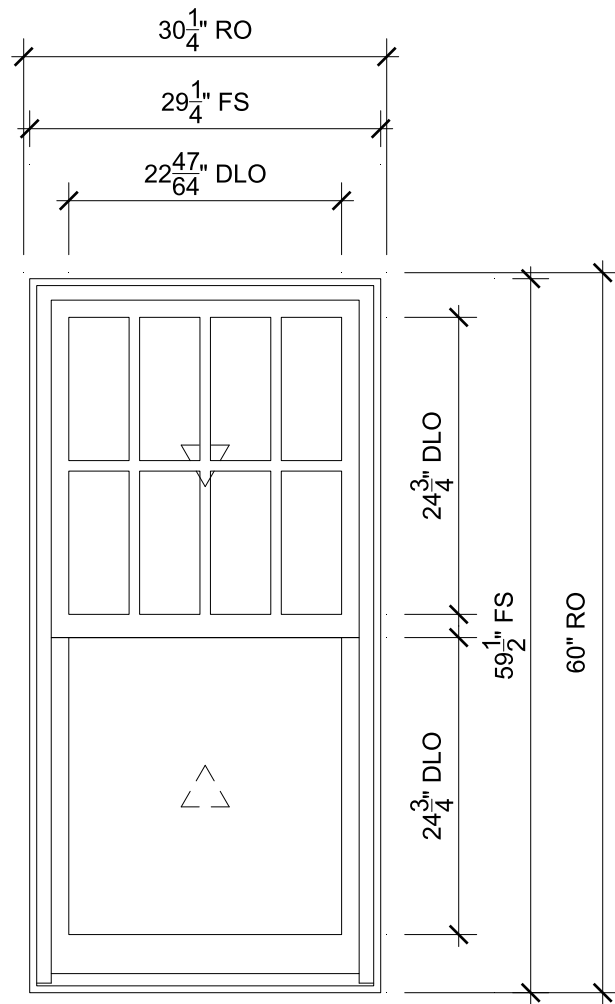
- | | |
|-------------------------|----------------------------|
| $\frac{1}{4}$ Head | $\frac{2}{4}$ Jamb |
| $\frac{3}{4}$ Sill | $\frac{4}{4}$ Divided Lite |
| $\frac{5}{4}$ Checkrail | |



EAST - SHOP

SCALE: 3/4" = 1'-0"

- | | |
|-------------------------|----------------------------|
| $\frac{1}{4}$ Head | $\frac{2}{4}$ Jamb |
| $\frac{3}{4}$ Sill | $\frac{4}{4}$ Divided Lite |
| $\frac{5}{4}$ Checkrail | |



EAST - DEN

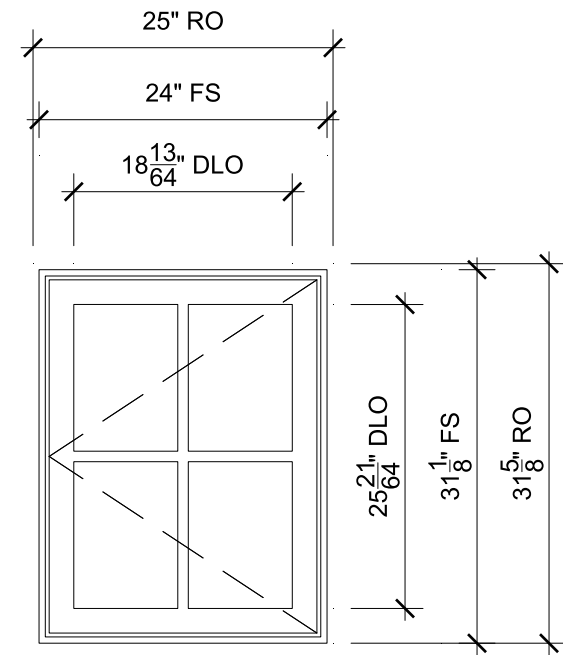
SCALE: 3/4" = 1'-0"

- | | |
|-------------------------|----------------------------|
| $\frac{1}{4}$ Head | $\frac{2}{4}$ Jamb |
| $\frac{3}{4}$ Sill | $\frac{4}{4}$ Divided Lite |
| $\frac{5}{4}$ Checkrail | |



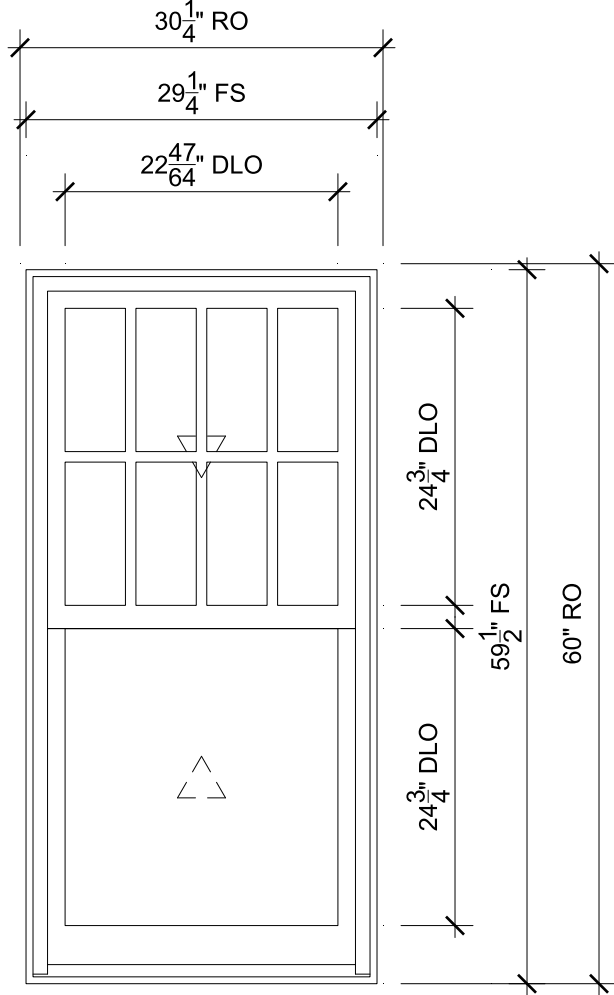
ORDERING PRODUCTS WITH REFERENCE TO SHOP DRAWINGS:
Before ordering the Marvin products illustrated within these shop drawings, a copy of these drawings accompanied by an approved signature of the purchaser must be returned to the Architectural Division at Marvin Windows & Doors, P.O. Box 100, Warroad, Minnesota 56763. If the Marvin products included herein are ordered without reference to the approved shop drawings, Marvin Windows and Doors assumes no responsibility in guaranteeing product coordination with the drawings.

PROJ/JOB: Vermont Construction / 38 Latham Court
DIST/DEALER: WINDOWS & DOORS BY BROWNELL-GO
DRAWN: TED SAY
QUOTE#: PBYB3BS PK VER:0003.08.01 CREATED: 05/06/2021 REVISION:



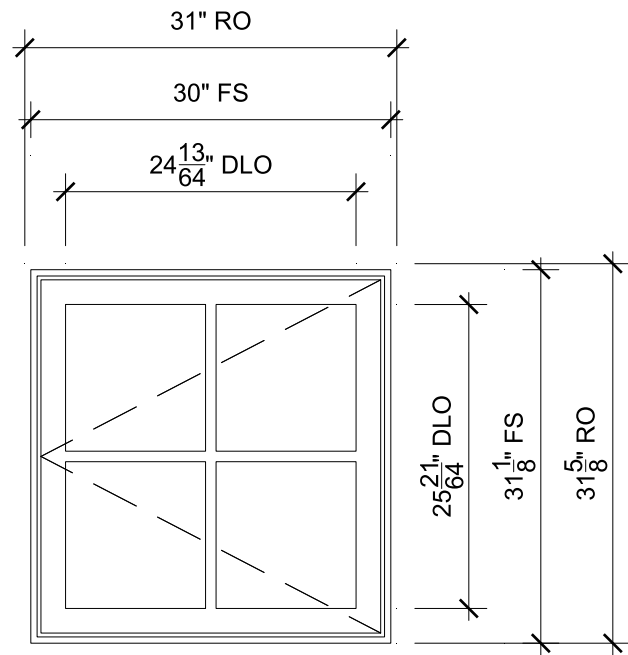
EAST - STAIRS
SCALE: 3/4" = 1'-0"

- $\frac{6}{4}$ Head
- $\frac{7}{4}$ Jamb
- $\frac{8}{4}$ Sill
- $\frac{1}{5}$ Divided Lite



SOUTH - SHOP
SCALE: 3/4" = 1'-0"

- $\frac{1}{4}$ Head
- $\frac{2}{4}$ Jamb
- $\frac{3}{4}$ Sill
- $\frac{4}{4}$ Divided Lite
- $\frac{5}{4}$ Checkrail



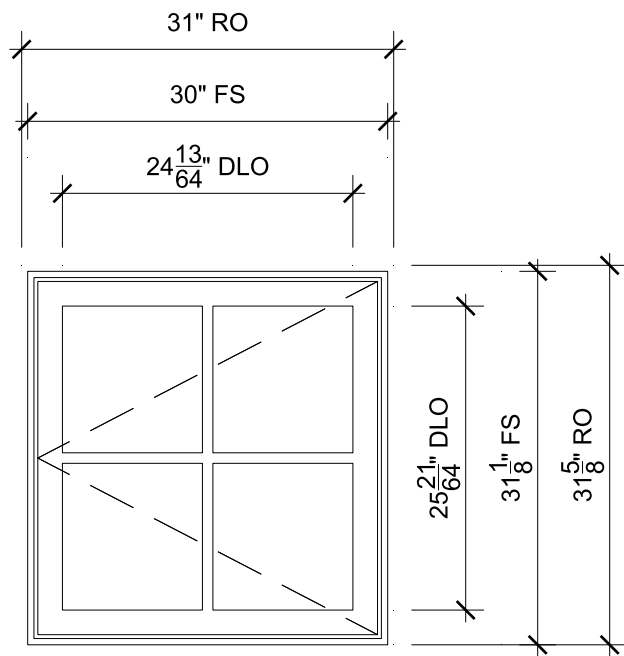
SOUTH - OFFICE
SCALE: 3/4" = 1'-0"

- $\frac{6}{4}$ Head
- $\frac{7}{4}$ Jamb
- $\frac{8}{4}$ Sill
- $\frac{1}{5}$ Divided Lite



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DIST/DEALER: WINDOWS & DOORS BY BROWNELL-GO
DRAWN: TED SAY
QUOTE#: PBYB3BS PK VER:0003.08.01 CREATED: 05/06/2021 REVISION:

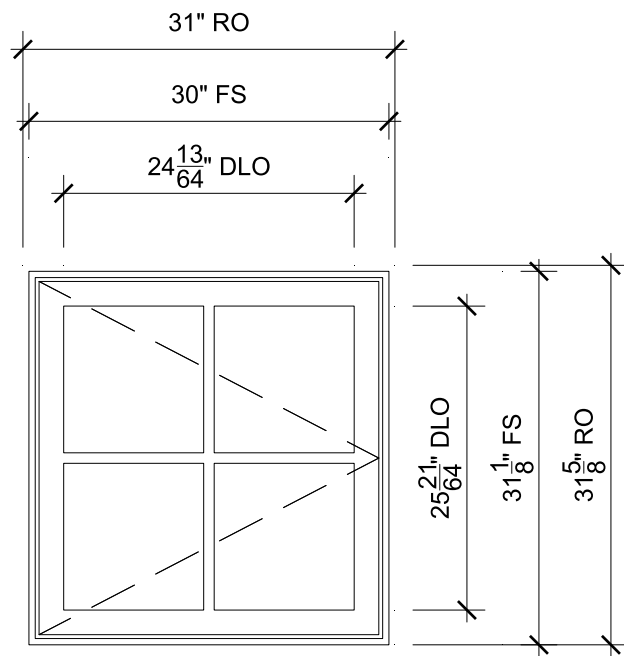


SOUTH - OFFICE (FIXED)

SCALE: 3/4" = 1'-0"

$\frac{6}{4}$ Head
 $\frac{8}{4}$ Sill

$\frac{7}{4}$ Jamb
 $\frac{1}{5}$ Divided Lite

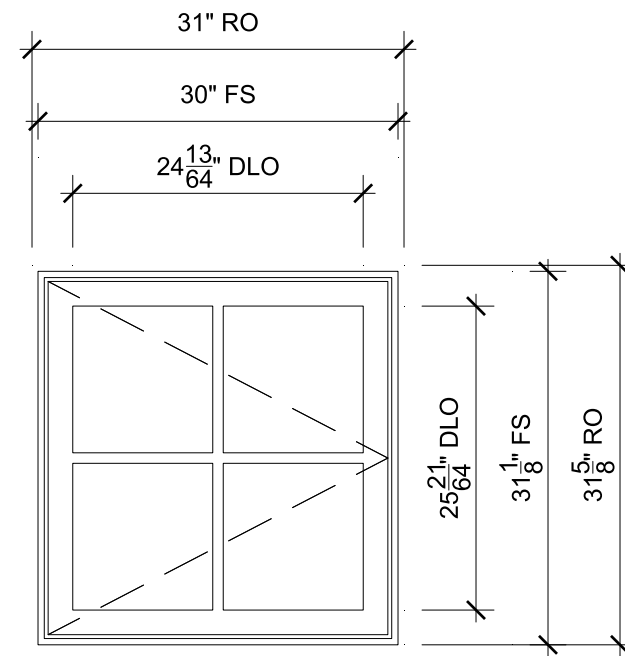


NORTH - OFFICE

SCALE: 3/4" = 1'-0"

$\frac{6}{4}$ Head
 $\frac{8}{4}$ Sill

$\frac{7}{4}$ Jamb
 $\frac{1}{5}$ Divided Lite



NORTH - OFFICE (TEMP)

SCALE: 3/4" = 1'-0"

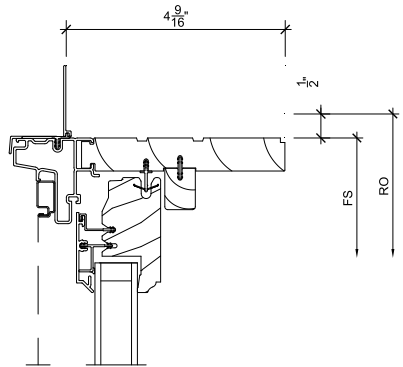
$\frac{6}{4}$ Head
 $\frac{8}{4}$ Sill

$\frac{7}{4}$ Jamb
 $\frac{1}{5}$ Divided Lite

PROJ/JOB: Vermont Construction / 38 Latham Court
DIST/DEALER: WINDOWS & DOORS BY BROWNELL-GO
DRAWN: TED SAY
QUOTE#: PBYB3BS PK VER: 0003.08.01 CREATED: 05/06/2021 REVISION:

SHEET
3
OF 5

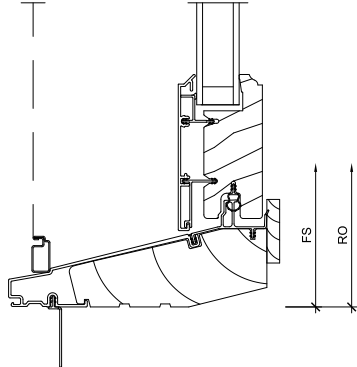
MARVIN
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1
4

Head

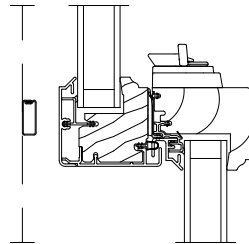
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3
4

Sill

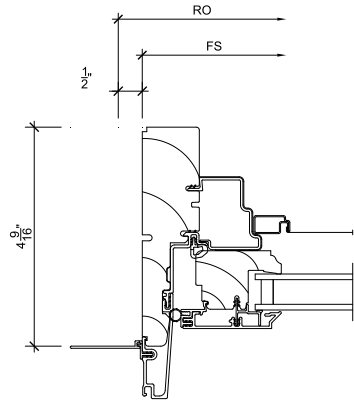
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5
4

Checkrail

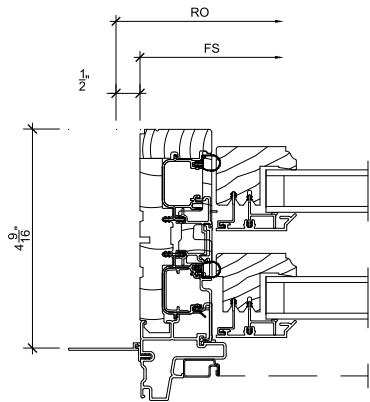
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7
4

Jamb

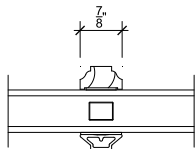
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2
4

Jamb

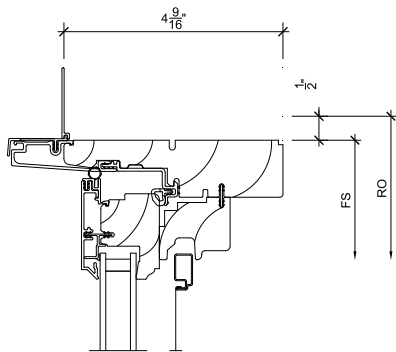
SCALE: 3" = 1'-0"



4
4

Divided Lite

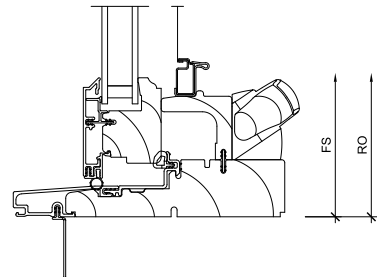
SCALE: 3" = 1'-0"



6
4

Head

SCALE: 3" = 1'-0"



8
4

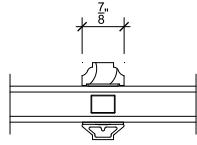
Sill

SCALE: 3" = 1'-0"



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PROJ/JOB: Vermont Construction / 38 Latham Court
DIST/DEALER: WINDOWS & DOORS BY BROWNELL-GO
DRAWN: TED SAY
QUOTE#: PBYB3BS PK VER:0003.08.01 CREATED: 05/06/2021 REVISION:



1
5

Divided Lite

SCALE: 3" = 1'-0"

3
5

NOT USED

SCALE: 3" = 1'-0"

5
5

NOT USED

SCALE: 3" = 1'-0"

7
5

NOT USED

SCALE: 3" = 1'-0"

2
5

NOT USED

SCALE: 3" = 1'-0"

4
5

NOT USED

SCALE: 3" = 1'-0"

6
5

NOT USED

SCALE: 3" = 1'-0"

8
5

NOT USED

SCALE: 3" = 1'-0"



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DIST/DEALER: WINDOWS & DOORS BY BROWNELL-GO
DRAWN: TED SAY
QUOTE#: PBYB3BS PK VER:0003.08.01 CREATED: 05/06/2021 REVISION:

NOTES

- 1) BEARINGS ARE BASED ON MAGNETIC OBSERVATIONS TAKEN AT THE TIME OF THIS SURVEY.
- 2) OTHER EASEMENTS, RECORDED OR UNRECORDED, MAY EXIST.
- 3) POSSIBLE ENCROACHMENTS ARE AS DEPICTED HEREON.
- 4) ALL STRUCTURES SHOWN HEREON EXISTED AT THE TIME OF THIS SURVEY.

PARCEL #046-2-032-000
N/F 243 COLCHESTER AVENUE, LLC
VOL. 1160, PG. 139
VOL. 176, PG. 113
VOL. 83, PG. 537
VOL. 20, PG. 346

PARCEL #046-2-038-000
MARK R.J. McGEE &
VALERIE A. RACINE
VOL. 1041, PG. 176
4223±Sq. Feet
0.10± Acres
VOL. 90, PG. 98

PARCEL #046-2-039-000
N/F STANLEY W. & NACEY P. MIKUT
VOL. 1010, PG. 620
VOL. 83, PG. 546
VOL. 85, PG. 383
VOL. 164, PG. 634

PARCEL #046-2-037-000
N/F 34 LATHAM, LLC
VOL. 1199, PG. 90
VOL. 87, PG. 649

SHED
(TEMPORARY PALLET STRUCTURE)

CONCRETE
PAD

GARAGE
226±Sq. Feet

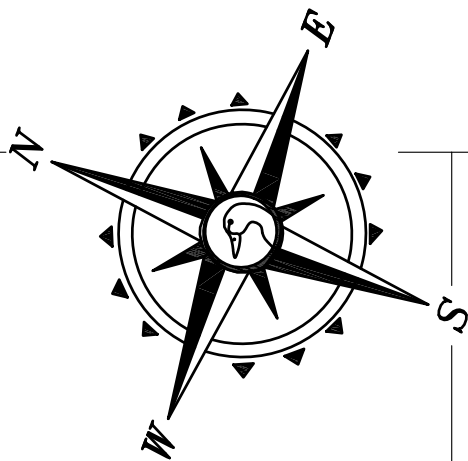
EXISTING
BUILDING
934±Sq. Ft.

GRAVEL
DRIVE
496±Sq. Ft.

I.R.F.
1-1/2" DIA.
0.1' BELOW GRADE

I.R.F.
#4 REBAR
FLUSH / BENT

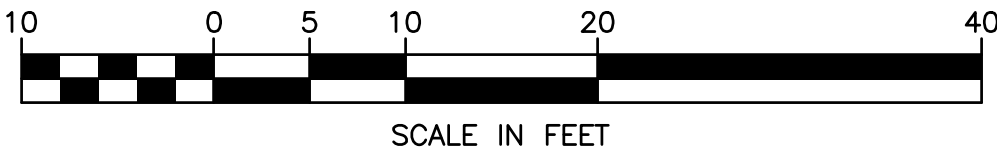
I.P.F.
1" DIA. W/ ELBOW
0.8' ABOVE GRADE



LOCUS
NOT TO SCALE

LEGEND

- — — — — PROPERTY LINE
- — — — — RIGHT OF WAY OR PARCEL LINE
- x — — — WIRE FENCE
- □ — — — WOOD FENCE
- UTILITY POLE
- ⊠ GAS SHUTOFF
- I.R.F. IRON ROD FOUND
- I.R.S. IRON ROD SET
- I.P.F. IRON PIPE FOUND
- VOL. XX, PG. XX KEY DEED



CERTIFICATION

I CERTIFY THAT THE SUBJECT PARCEL BOUNDARIES SHOWN HEREON ARE TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF. SAID BOUNDARIES WERE DETERMINED FROM PERTINENT RECORDS AND RESOURCES AND EVIDENCE FOUND IN THE FIELD. THIS SURVEY WAS PERFORMED WITH AN ELECTRONIC TOTAL STATION WITH A POSITIONAL TOLERANCE LEVEL EXCEEDING 95%. I FURTHER CERTIFY THAT THIS PLAT MEETS ALL THE REQUIREMENTS OF TITLE 27 V.S.A. SECTION 1403.

DATED DEC. 21, 2020

TERRY W. WILSON, L.S. #60812 VT

© COPYRIGHT 2020

PROJ. #20761

DATE: DECEMBER, 2020

SCALE: 1"=10'

SURVEYED BY: TWW/MLC

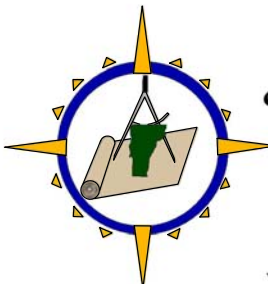
DRAWN BY: TWW

CHECKED BY: TWW

PLAT OF LANDS OF
MARK R.J. McGEE &
VALERIE A. RACINE
38 LATHAM COURT
BURLINGTON, VERMONT

SHEET 1 OF 1

DWG. # M-761



Vermont Mapping
& Survey Co., LLC

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(802) 857-5207
www.vermontmapping.com

I CERTIFY THAT THIS PLAT IS AN ORIGINAL INK ON MYLAR DRAWING. TERRY W. WILSON, L.S.

Department of Permitting and Inspections

Zoning Division
645 Pine Street
Burlington, VT 05401
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William Ward, Director
Scott Gustin, AICP, CFM, Principal Planner
Mary O'Neil, AICP, Principal Planner
Ryan Morrison, Associate Planner
Vacant, Planning Technician
Alison Davis, Zoning Clerk
Theodore Miles, Zoning Specialist
Charlene Orton, DPI Administrator



MEMORANDUM

To: The Design Advisory Board
From: Mary O'Neil, AICP, Principal Planner
RE: ZP21-475; 221-223 North Champlain Street
Date: July 13, 2021, **August 10, 2021**

File: ZP21-475 OG

Location: 221-223 North Champlain Street

Zone: RM **Ward:** 3C

Parking District: Neighborhood

Date application accepted: June 3, 2021; revised plans received June 17, **and July 19, 2021.**

Applicant/ Owner: Lewis Creek Builders Zechariah Brewton / Matthew and Carrie Napolitan

Request: Remove single story rear addition; construct new two story addition onto existing single family home. House is listed on the Vermont State Register of Historic Resources.

Background:

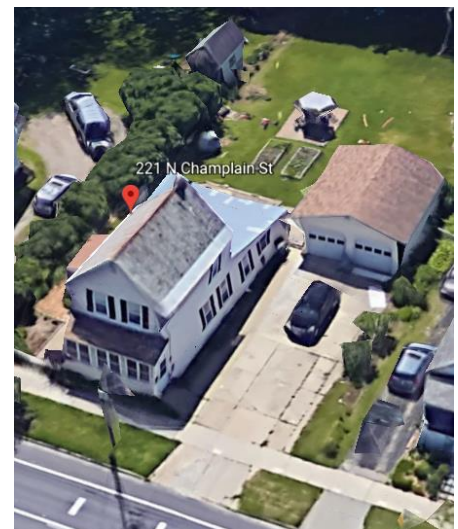
- **Zoning Permit 08-916CA;** demolish and remove existing shed. Retain 10' 7" x 12' concrete slab beneath part of shed. July 2008.
- **Zoning Permit 84-246;** dig out the basement and make a couple of feet deeper and to construct a new foundation out of concrete block and to change the location of the bulkhead. June 1984.

Overview: The applicants seek to remove the existing rear single story addition and replace it with a two story addition on the same footprint. No change is proposed to lot coverage. As the increase to living space is less than 50% of the gross area of the existing dwelling, there is Administrative Authority for the decision. Staff seeks a recommendation from the Design Advisory Board on the conformance to the Standards.

The submitted site plan is not consistent with the 2008 approved site plan nor photographic images of the site. The site plan and coverage calculations will need to be revised.

Part 1: Land Division Design Standards

Not applicable.



Part 2: Site Plan Design Standards
Sec. 6.2.2 Review Standards

(a)Protection of Important Natural Features:

The addition is proposed on the same foundation as the existing single story. No changes are proposed to natural features.

(b) Topographical Alterations:

As proposed on an existing foundation, no changes to the topography are proposed.

(c)Protection of Important Public Views:

There are no protected important public views from or through this parcel.

(d) Protection of Important Cultural Resources:

Burlington's architectural and cultural heritage shall be protected through sensitive and respectful redevelopment, rehabilitation, and infill. Archeological sites likely to yield information important to the city's or the region's pre-history or history shall be evaluated, documented, and avoided whenever feasible. Where the proposed development involves sites listed or eligible for listing on a state or national register of historic places, the applicant shall meet the applicable development and design standards pursuant to Sec. 5.4.8(b).

See Section 5.4.8, below.

(e) Supporting the Use of Renewable Energy Resources:

No part of this application will preclude the use of wind, water, solar, geothermal, or other renewable energy resource.

(f) Brownfield Sites:

This is not an identified Brownfield site with the Department of Environmental Conservation. Not applicable.

(g) Provide for nature's events:

Special attention shall be accorded to stormwater runoff so that neighboring properties and/or the public stormwater drainage system are not adversely affected. All development and site disturbance shall follow applicable city and state erosion and stormwater management guidelines in accordance with the requirements of Art 5, Sec 5.5.3.

As no ground disturbance is proposed, no additional review for Stormwater is required.

Design features which address the effects of rain, snow, and ice at building entrances, and to provisions for snow and ice removal or storage from circulation areas shall also be incorporated.

The only exterior door is proposed for the west (rear) of the new addition. It has no canopy or roof cover to offer respite from inclement weather. A transom window above will hinder that opportunity, and may in fact be preferred by the homeowner for its opportunity to allow more

light into the interior. A roof covering, however, would allow some snow and rain protection at the rear entry stairs that will be welcome in severe weather.

(h) Building Location and Orientation:

There is no change to the building location and orientation.

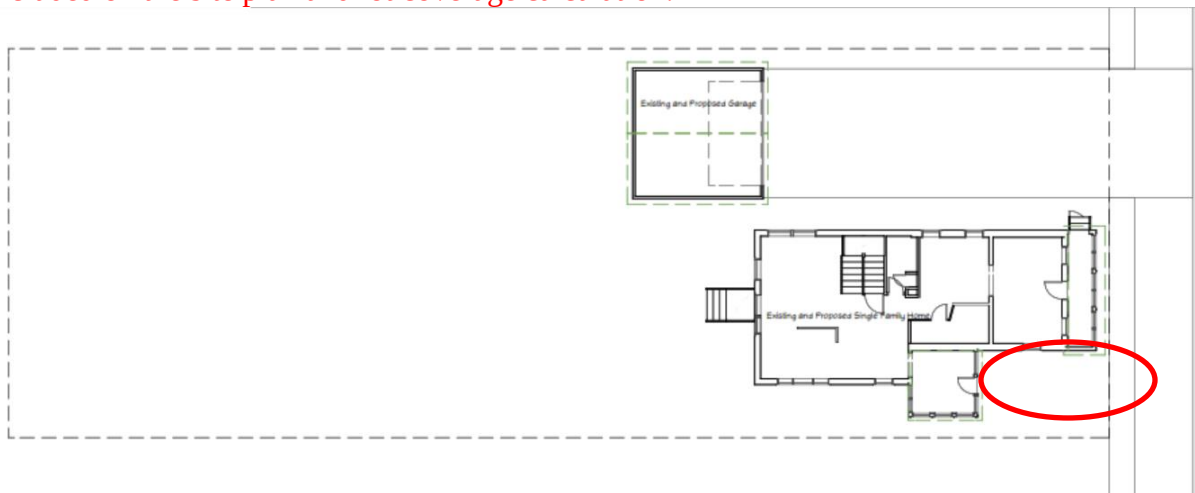
(i) Vehicular Access:

The access from North Champlain Street via a residential driveway will remain.

(j) Pedestrian Access:



There is currently a pedestrian walkway from the public sidewalk to a side porch. **This should be included on the site plan and lot coverage calculation.**



(k) Accessibility for the Handicapped:

Although encouraged, this is not a requirement for a single family home.

(l) Parking and Circulation:

No change is proposed.

(m) Landscaping and Fences:

No landscaping plan has been provided. As this addition is located atop an existing foundation, the homeowners are likely to maintain the landscaping currently in place.

(n) Public Plazas and Open Space:

Not applicable.

(o) Outdoor Lighting:

Where exterior lighting is proposed the applicant shall meet the lighting performance standards as per Sec 5.5.2.

No information has been provided about intended lighting. If light fixtures are proposed, specification sheets and illumination levels shall be submitted for staff review.

(p) Integrate infrastructure into the design:

Exterior storage areas, machinery and equipment installations, service and loading areas, utility meters and structures, mailboxes, and similar accessory structures shall utilize setbacks, plantings, enclosures and other mitigation or screening methods to minimize their auditory and visual impact on the public street and neighboring properties to the extent practicable.

Utility and service enclosures and screening shall be coordinated with the design of the principal building, and should be grouped in a service court away from public view. On-site utilities shall be place underground whenever practicable. Trash and recycling bins and dumpsters shall be located, within preferably, or behind buildings, enclosed on all four (4) sides to prevent blowing trash, and screened from public view.

Any development involving the installation of machinery or equipment which emits heat, vapor, fumes, vibration, or noise shall minimize, insofar as practicable, any adverse impact on neighboring properties and the environment pursuant to the requirements of Article 5, Part 4 Performance Standards.

Meters and utility connections shall be illustrated on the site plan and/or building elevations as appropriate. No mechanical equipment is included within the plans. If any is proposed, they, too shall be illustrated on plans.

Part 3: Architectural Design Standards

Sec. 6.3.2 Review Standards

(a) Relate development to its environment:

1. Massing, Height and Scale:

The proposed replacement addition has been modified; its height largely springing from a full dormer on the south elevation. The addition no longer exceeds the height of the existing structure.



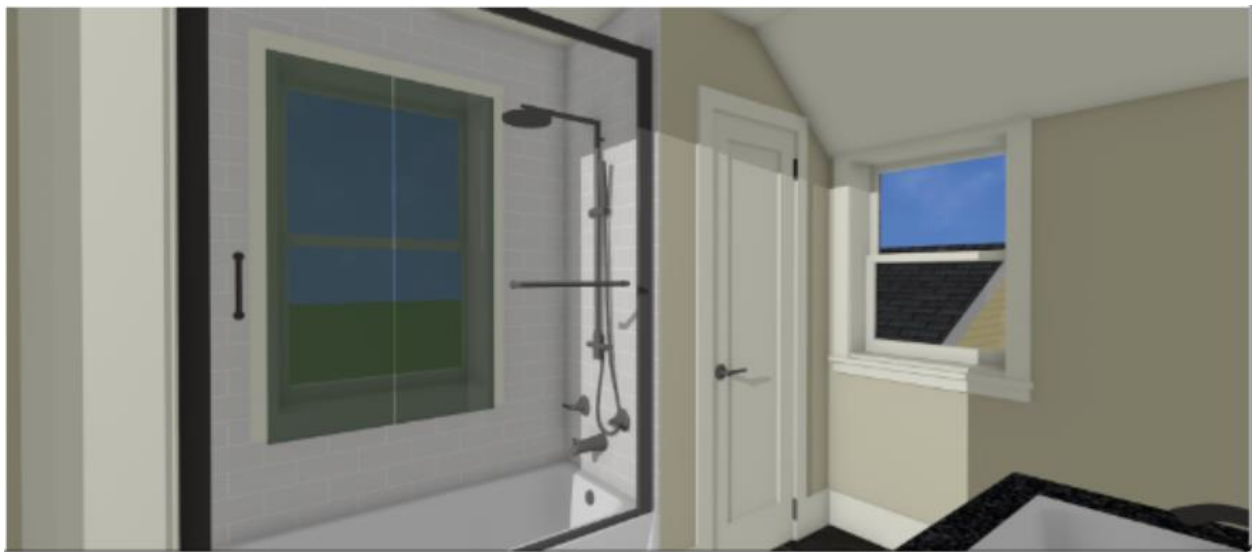
2. Roofs and Rooflines.

A gable and eave arrangement with the addition of a full shed dormer is now proposed.

3. Building Openings

The plan includes a mixture of fenestration styles and arrangement; double hung, transom, casement, triple mulled and one sash set on diagonal. They are fairly well placed across floor plates, however irregular in style and size. If the kitchen/mudroom have no interior dividing wall, the exterior door would be better placed in the mudroom to allow for more counter space and circulation area and limit any tracking to the mudroom.

The addition of a full size window within the shower of the master bath may need reconsideration.



(b) Protection of Important Architectural Resources:

Burlington's architectural and cultural heritage shall be protected through sensitive and respectful redevelopment, rehabilitation, and infill. Where the proposed development involves buildings listed or eligible for listing on a state or national register of historic places, the applicant shall meet the applicable development and design standards pursuant to Sec. 5.4.8. The introduction of new buildings to a historic district listed on a state or national register of historic places shall make every effort to be compatible with nearby historic buildings.

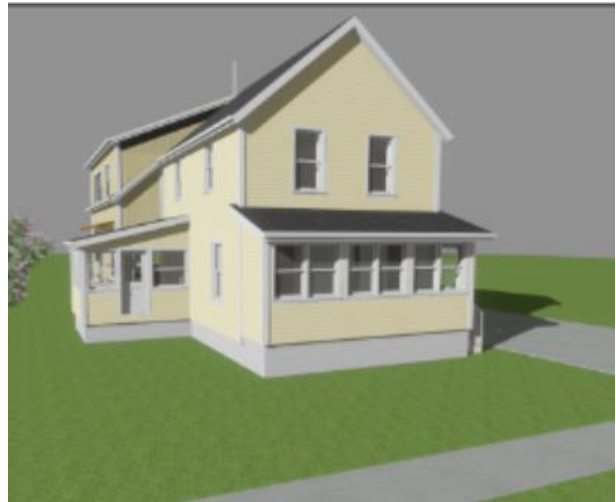
See Section 5.4.8.

(c) Protection of Important Public Views:

There are no protected important public views from or through this parcel. Not applicable.

(d) Provide an active and inviting street edge:

The principal, historic structure will continue to front North Champlain Street. **The reduced massing of the addition has softened the impact of the new living space, and appears to be a more organically grown living addition.**



(e) Quality of materials:

All development shall maximize the use of highly durable building materials that extend the life cycle of the building, and reduce maintenance, waste, and environmental impacts. Such materials are particularly important in certain highly trafficked locations such as along major streets, sidewalks, loading areas, and driveways. Efforts to incorporate the use of recycled content materials and building materials and products that are extracted and/or manufactured within the region are highly encouraged.

Owners of historic structures are encouraged to consult with an architectural historian in order to determine the most appropriate repair, restoration or replacement of historic building materials as outlined by the requirements of Art 5, Sec. 5.4.8.

No specifics are provided to sheathing materials. Images show vertical siding on the rear, with narrow corner boards and fascia. **More details about proposed sheathing materials are required.**

(f) Reduce energy utilization:

All new construction shall meet the Guidelines for Energy Efficient Construction pursuant to the requirements of Article VI. Energy Conservation, Section 8 of the City of Burlington Code of Ordinances. Solar is always encouraged.

(g) Make advertising features complementary to the site:

Not applicable.

(h) Integrate infrastructure into the building design:

See Section 6.2.2. (p), above.

(i) Make spaces secure and safe:

All requirement of life safety and building code as directed by the building inspector shall be observed.

Sec. 5.4.8 Historic Buildings and Sites

The City seeks to preserve, maintain, and enhance those aspects of the city having historical, architectural, archaeological, and cultural merit. Specifically, these regulations seek to achieve the following goals:

To preserve, maintain and enhance Burlington's historic character, scale, architectural integrity, and cultural resources;

To foster the preservation of Burlington's historic and cultural resources as part of an attractive, vibrant, and livable community in which to live, work and visit;

To promote a sense of community based on understanding the city's historic growth and development, and maintaining the city's sense of place by protecting its historic and cultural resources; and,

To promote the adaptive re-use of historic buildings and sites.

(a) Applicability:

These regulations shall apply to all buildings and sites in the city that are listed, or eligible for listing, on the State or National Register of Historic Places.

221-223 North Champlain Street, constructed c. 1888 and home to Patrick Doyle, a Central Vermont Railroad employee, is listed on the Vermont State Register of Historic Resources. See attached narrative.

(b) Standards and Guidelines:

The following development standards, following the Secretary of the Interior's Standards for the Treatment of Historic Properties, shall be used in the review of all applications involving historic buildings and sites subject to the provisions of this section and the requirements for Design Review in Art 3, Part 4. The Secretary of the Interior's Standards are basic principles created to help preserve the distinctive character of a historic building and its site. They are a

series of concepts about maintaining, repairing and replacing historic features, as well as designing new additions or making alterations. These Standards are intended to be applied in a reasonable manner, taking into consideration economic and technical feasibility.

1. *A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.*

The property was constructed as a single family home; a use that continues.

2. *The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.*

The addition of a single story kitchen and service addition was quite typical in the 19th and early 20th century. **The addition of living space on the rear elevation can be accomplished in a sensitive manner. This reduced massing has lessened the impact of the greater building volume proposed.**



3. *Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.*

The revised rear addition is more sensitively scaled, and reflects a typical organic expansion of Burlington's older housing stock.

4. *Changes to a property that have acquired historic significance in their own right will be retained and preserved.*

None are identified here.

5. *Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.*

The principal house will remain; the only alteration is to the point of contact with the proposed addition.

6. *Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials recognizing that new technologies may provide an appropriate alternative in order to adapt to ever changing conditions and provide for an efficient contemporary use. Replacement of missing features will be substantiated by documentary and physical evidence.*

The application is not to address deterioration, but to maximize living space on the existing foundation footprint. There is no inclusion of replacement of missing features.

7. *Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.*

No chemical or physical treatments are proposed, other than the removal of the existing single story rear addition.

8. *Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.*

No archaeological resources have been identified at this location. As the foundation will remain, no subsurface disturbance is proposed.

9. *New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale, and proportion, and massing to protect the integrity of the property and its environment.*

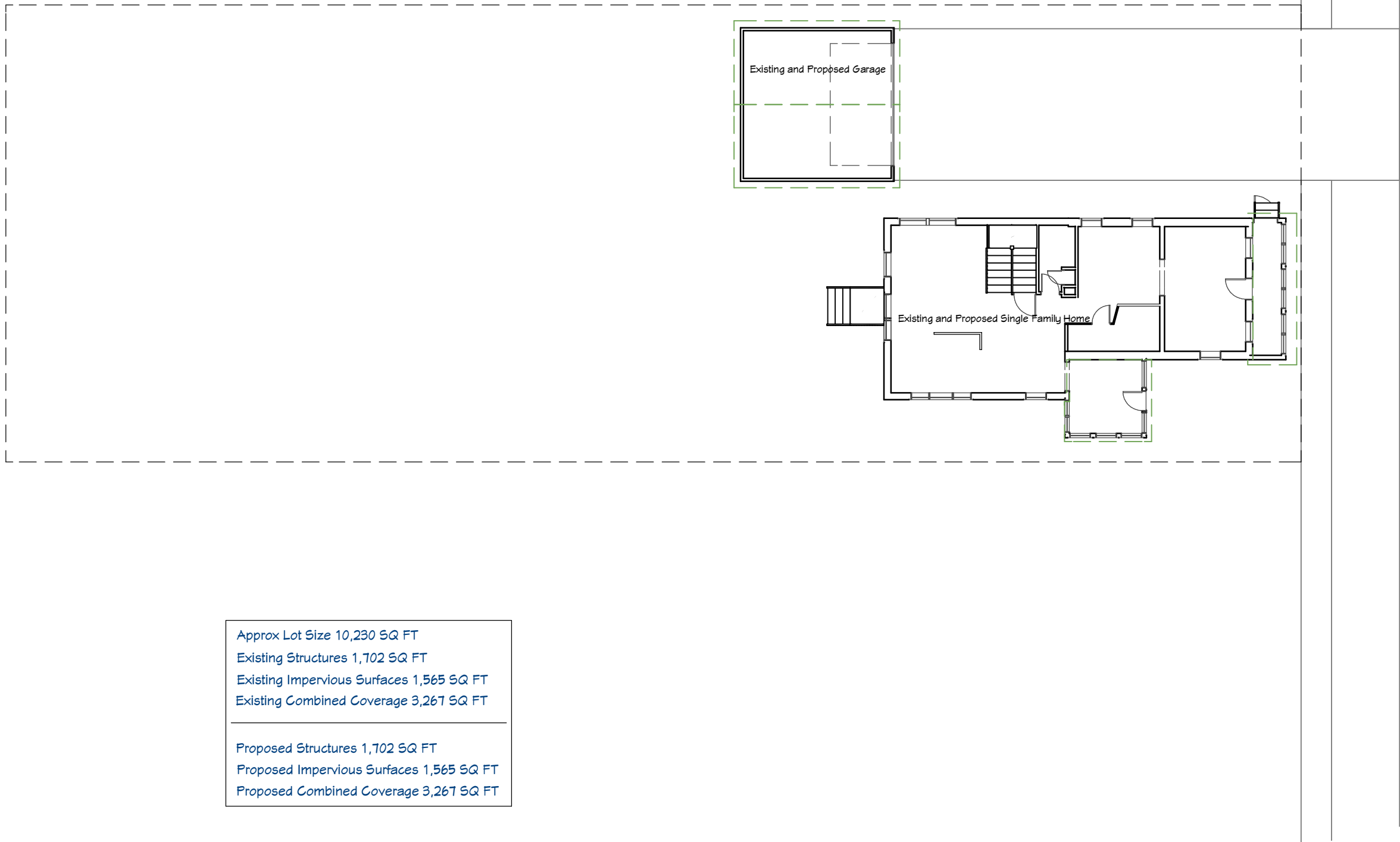
The proposed two story addition will **replace a single story addition, but will be clearly differentiated from the old in articulation, configuration, design and appearance. The size and scale are more compatible with the historic structure after plan revision. Materials characteristics have not been defined.**

10. *New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.*

While unlikely, it is possible to consider the removal of the rear addition and retention of the existing dwelling.

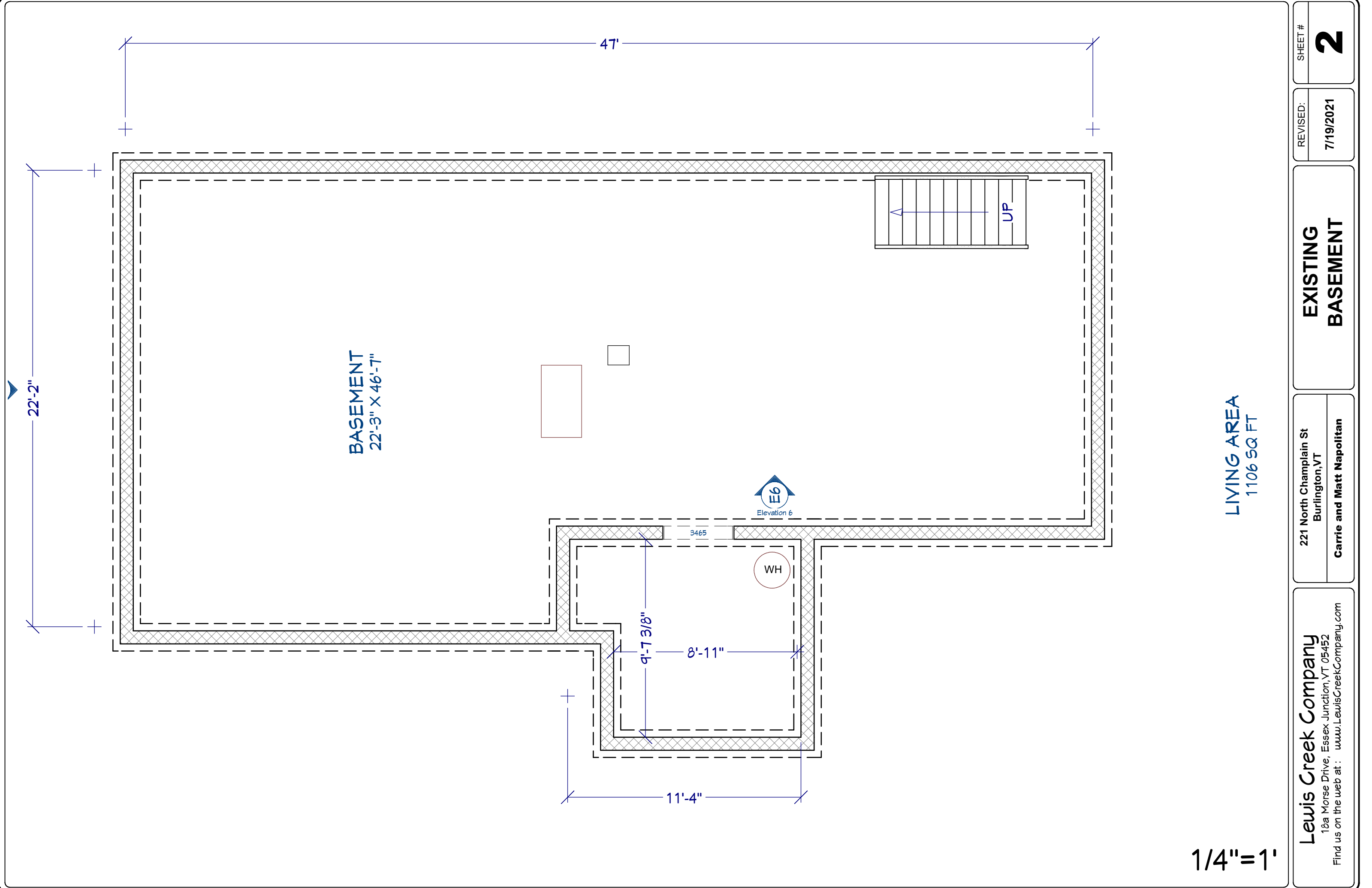
Items for the Board's consideration:

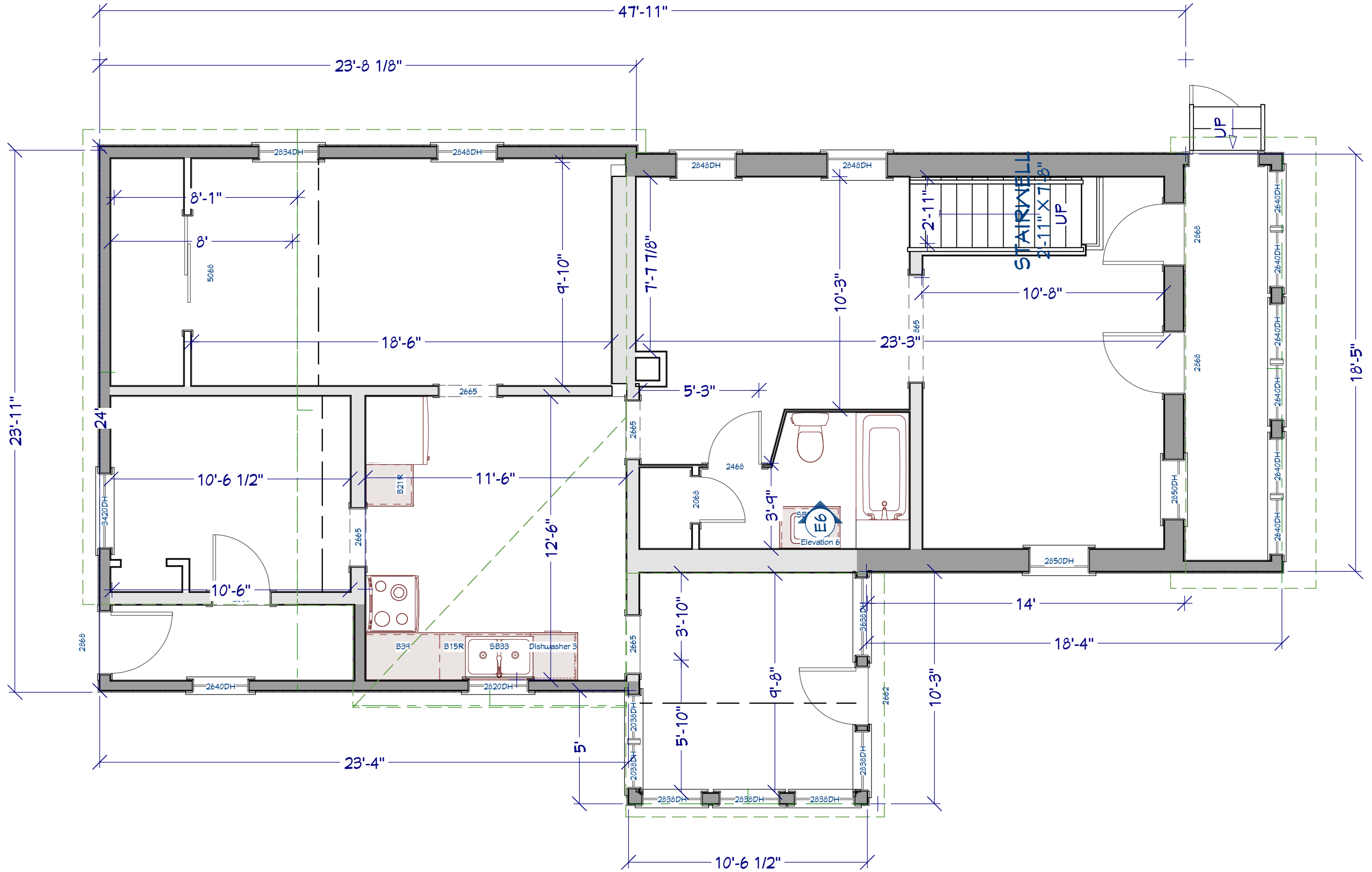
1. If light fixtures are proposed, specification sheets and illumination levels shall be submitted for staff review.
 2. Meters and utility connections shall be illustrated on the site plan and/or building elevations as appropriate. No mechanical equipment is included within the plans. If any is proposed, they, too shall be illustrated on plans.
 3. Specific sheathing materials shall be defined. Window specs are required.
 4. All new construction shall meet the Guidelines for Energy Efficient Construction pursuant to the requirements of Article VI. Energy Conservation, Section 8 of the City of Burlington Code of Ordinances.
1. Standard Permit Conditions 1-15.



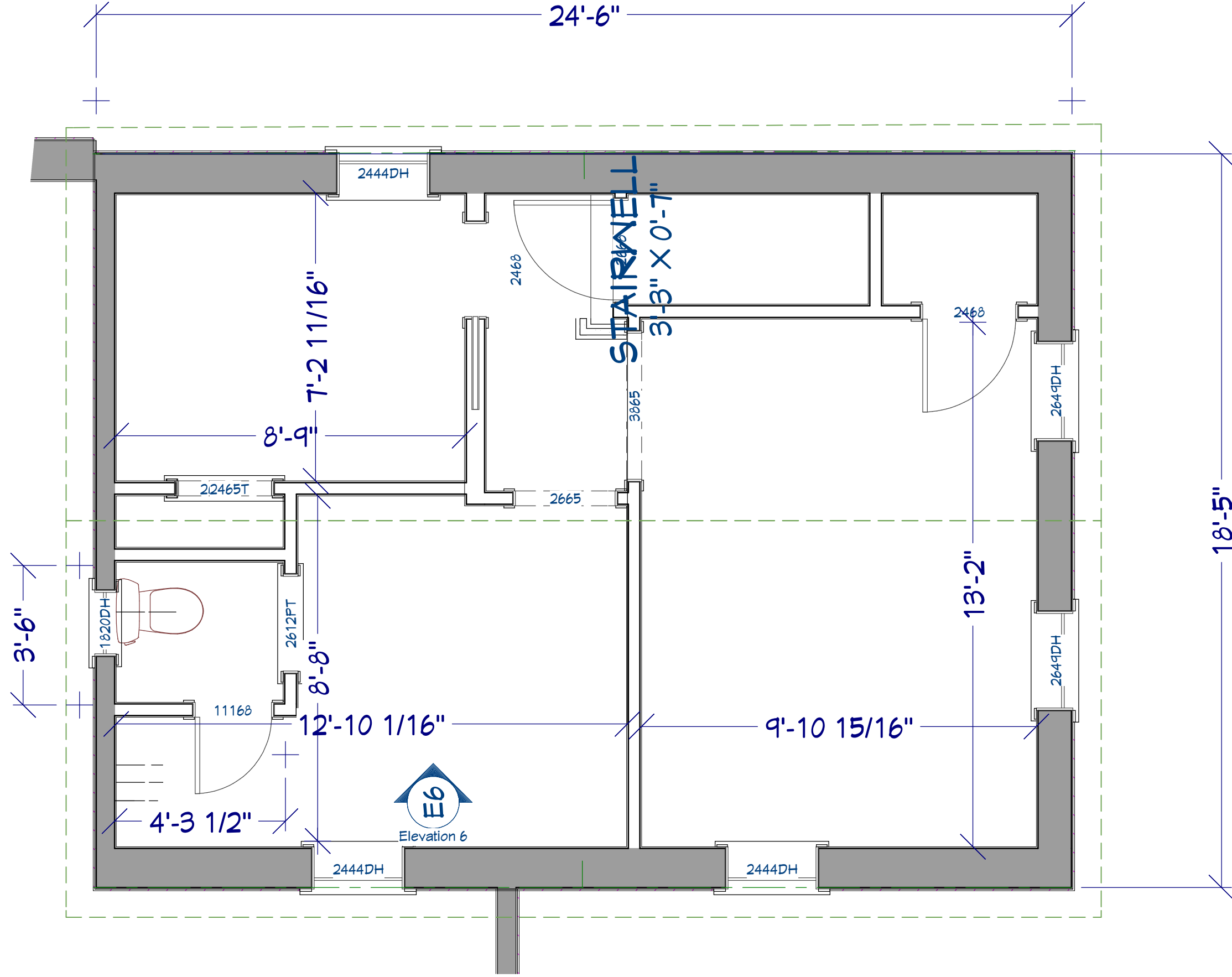
Approx Lot Size 10,230 SQ FT
Existing Structures 1,702 SQ FT
Existing Impervious Surfaces 1,565 SQ FT
Existing Combined Coverage 3,267 SQ FT
Proposed Structures 1,702 SQ FT
Proposed Impervious Surfaces 1,565 SQ FT
Proposed Combined Coverage 3,267 SQ FT

1"=15'



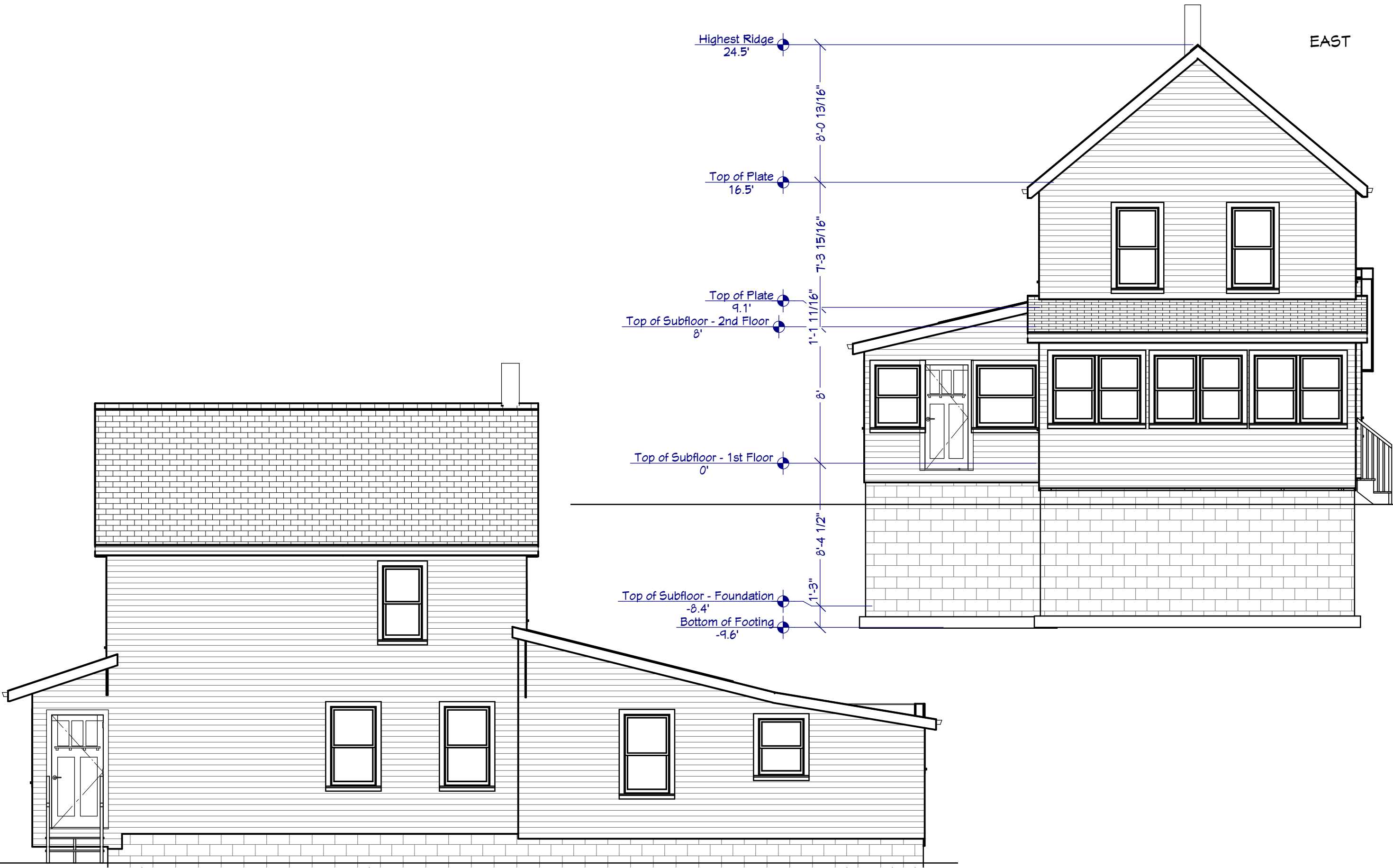


1/4"=1'



3/8"=1'

LIVING AREA
448 SQ FT



NORTH

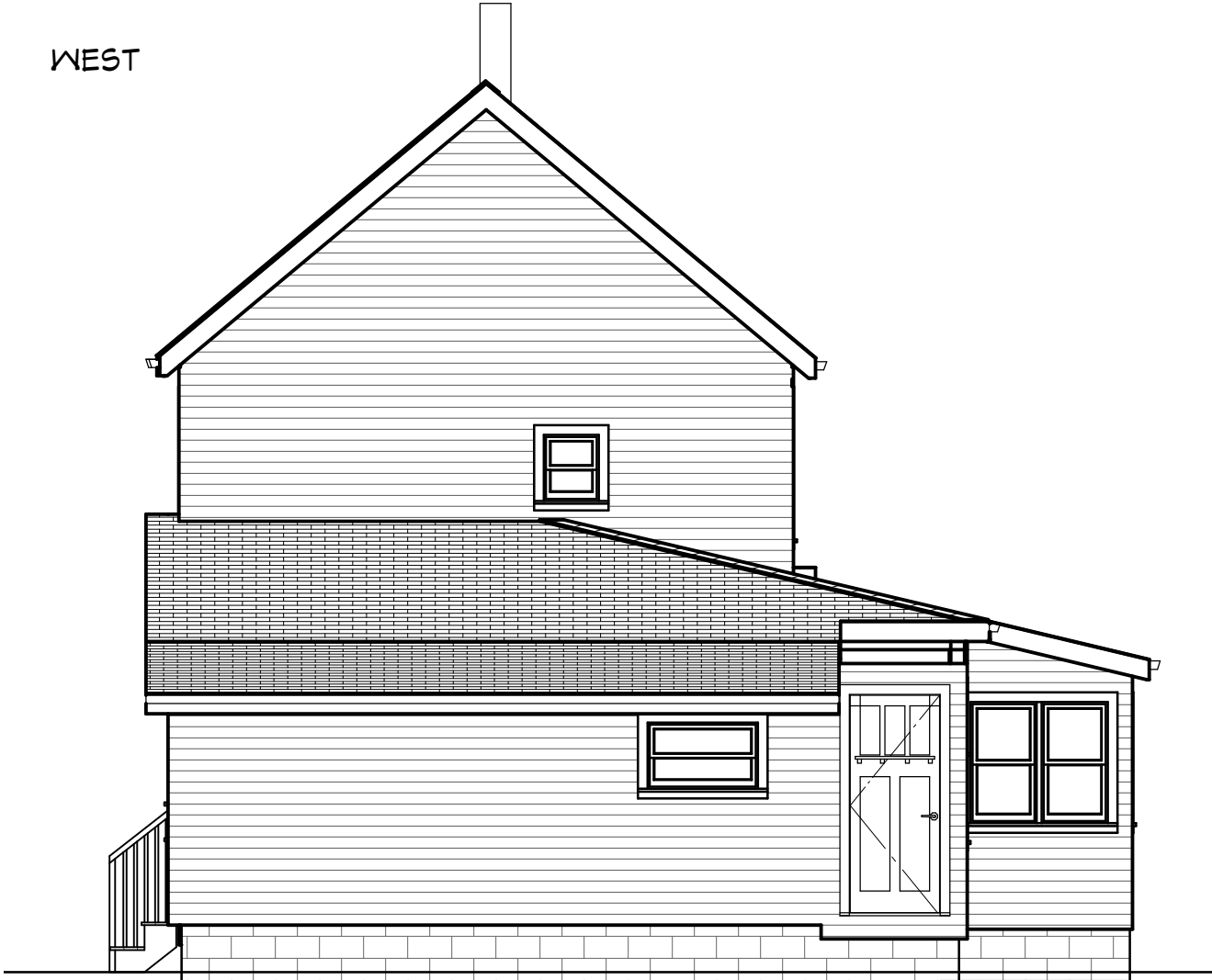
EAST

3/16"=1'

SHEET # 5	
REVISED: 7/19/2021	
EXISTING ELEVATIONS	
221 North Champlain St Burlington, VT	
Carrie and Matt Napolitan	
Lewis Creek Company 18a Morse Drive, Essex Junction, VT 05452 Find us on the web at: www.LewisCreekCompany.com	

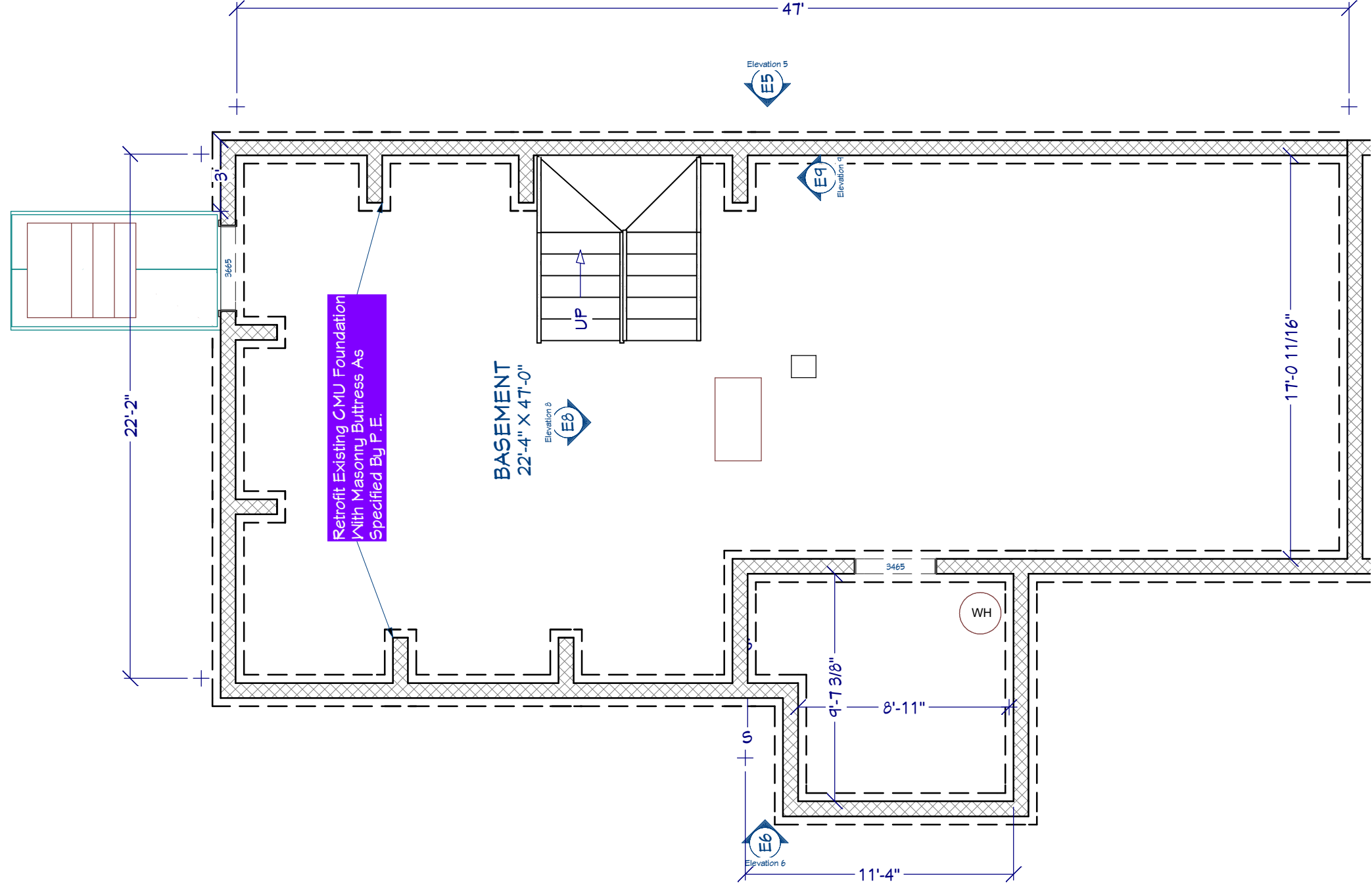
WEST

3/16"=1'

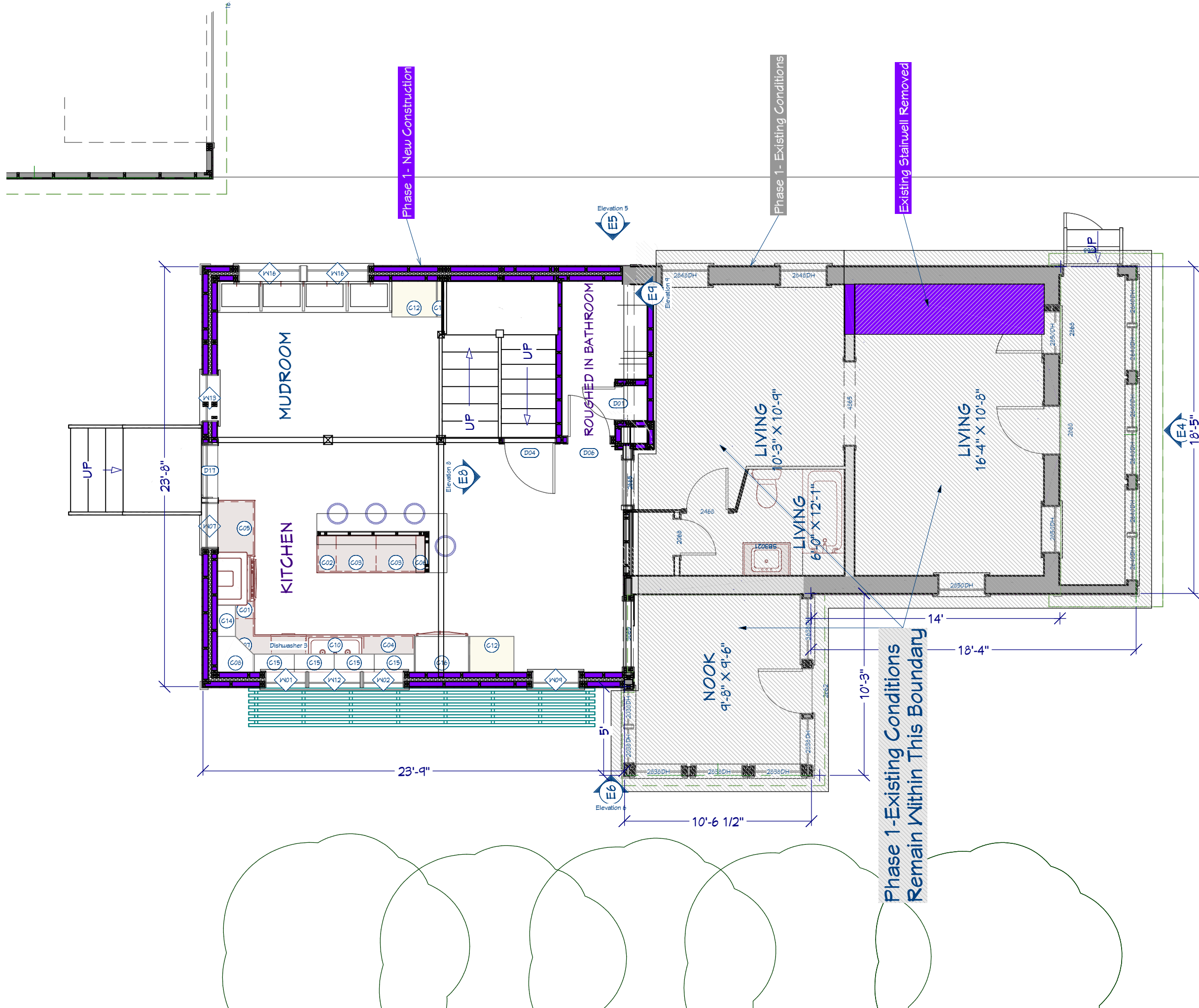


SOUTH

SHEET # 6	
REVISED: 7/19/2021	
EXISTING ELEVATIONS	
221 North Champlain St Burlington, VT	Carrie and Matt Napolitan
Lewis Creek Company 18a Morse Drive, Essex Junction, VT 05452 Find us on the web at: www.LewisCreekCompany.com	

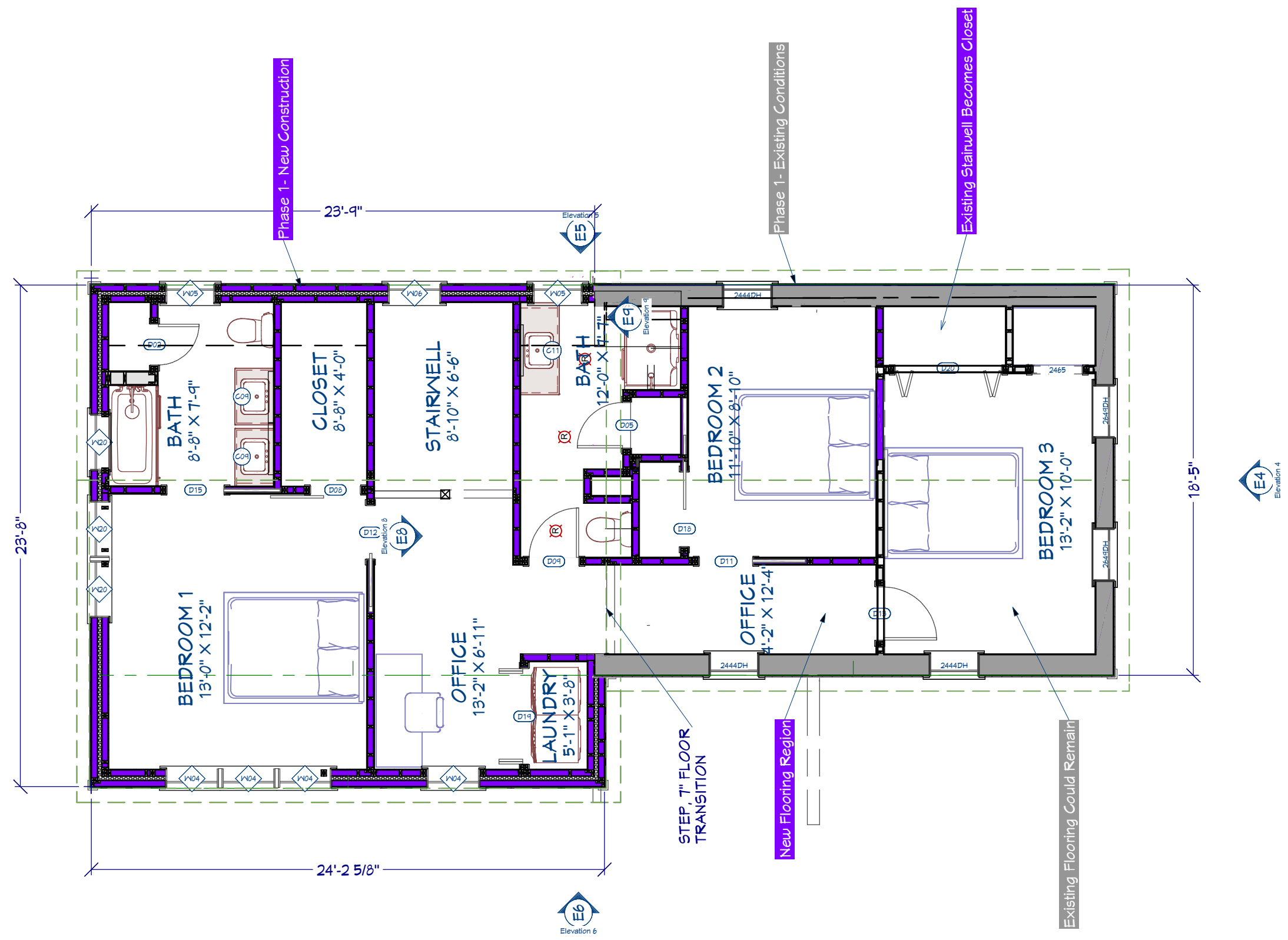


3/16"=1'



3/16"=1'

Lewis Creek Company 18a Morse Drive, Essex Junction, VT 05452 Find us on the web at : www.LewisCreekCompany.com	221 North Champlain St Burlington, VT Carrie and Matt Napolitan	PROPOSED-1ST FLOOR	REVISED: 7/19/2021	SHEET # 8
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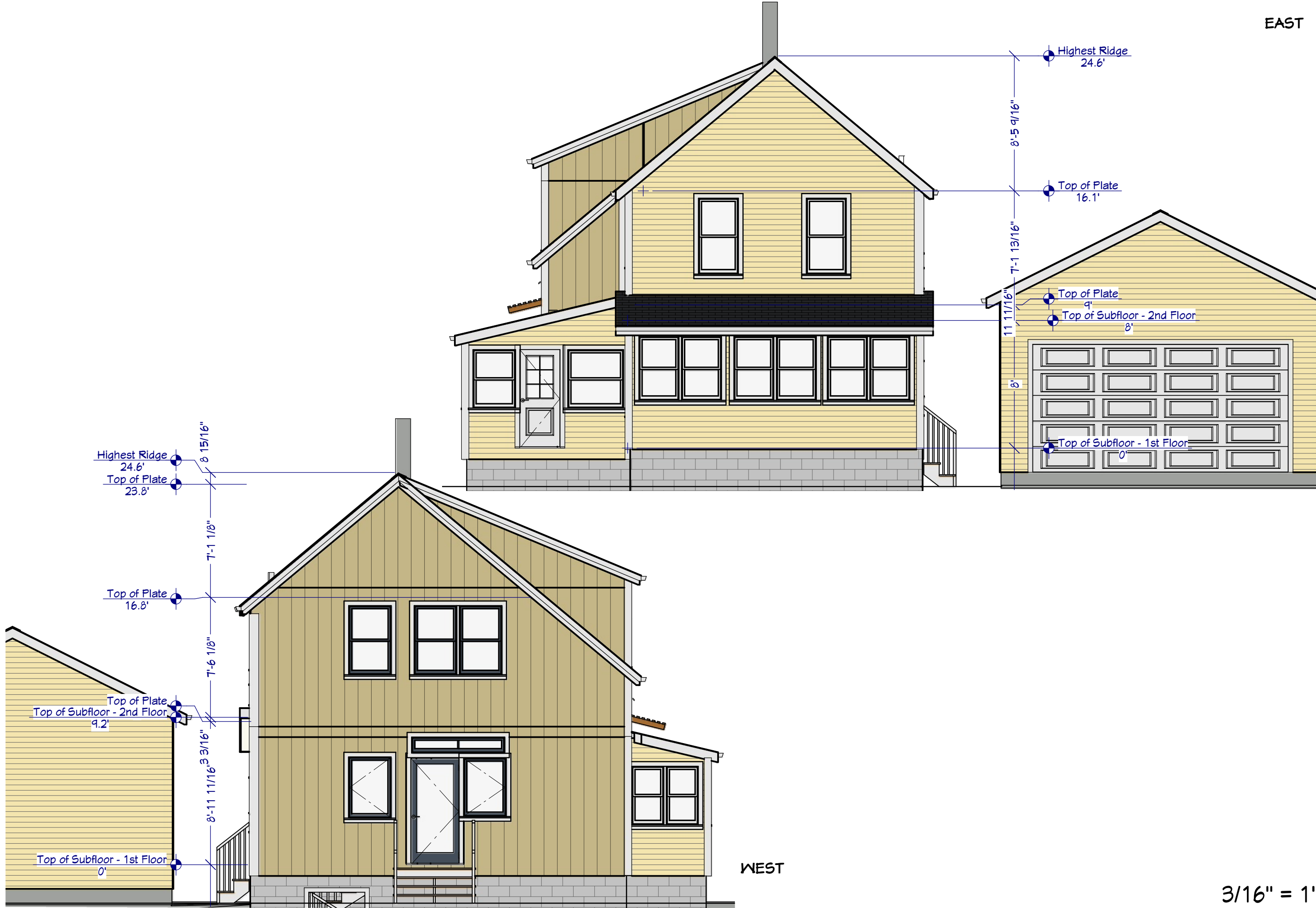
3/16"=1'

EAST

**PROPOSED
ELEVATIONS**

221 North Champlain St
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WEST

3/16" = 1'















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MEMORANDUM

To: The Design Advisory Board
From: Mary O'Neil, AICP, Principal Planner
RE: ZP21-0918CA/CU ZP21-213OG
38 Latham Court
Date: June 22, 2021 **July 27, 2021 (no quorum), August 10, 2021.**



File: ZP21-0918CA/CU ZP21-213OG

Location: 38 Latham Court

Zone: RL **Ward:** 1E

Parking District: Neighborhood

Date application accepted: April 21, 2021

Applicant/ Owner: G4 Design Studios (Steve Guild) / Mark McGee

Request: Demolish existing garage, construct two story addition with homeowner shop on first floor and home office on 2nd floor. New roof at existing rear single story, new patio door and two new windows.

New information is in **red**.

This project was reviewed at the Jun 22, 2021 DAB meeting.

Motion by Ron Wanamaker: I move we table the application and ask the applicant to come back with a revised design that is both distinct from and sympathetic to the existing design.

2nd: Jay White.
Vote 3-2.
Motion carries.

Background:

- There are no zoning permits on file for 38 Latham Court.

Overview:

The application proposes removal of an existing, 1925 single bay automotive garage and replacement with a two story addition to the single family home. The house and garage are listed on the Vermont State Register of Historic Resources. See attached narrative. Demolition of a historic structure requires Conditional Use review by the DRB.

Part 1: Land Division Design Standards

Not applicable.

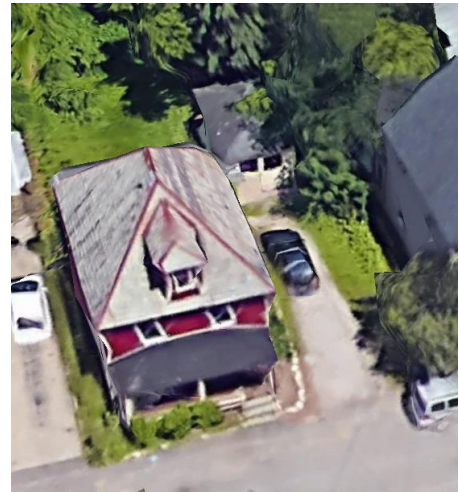
Part 2: Site Plan Design Standards

Sec. 6.2.2 Review Standards

a) Protection of Important Natural Features:

A Google Earth image illustrates mature plantings and trees next to the garage. The applicant will be required to submit a landscaping plan, and, if appropriate, a tree removal plan. Tree removal requires a permit for the following:

Tree removal involving six (6) or more trees, each of ten (10) inches or greater in caliper or the removal of ten (10) or more trees, each of which is three (3) inches or greater in caliper during any consecutive twelve (12) month period.



b) Topographical Alterations:

There is no identified alteration to the topography with the submitted plans.

c) Protection of Important Public Views:

There are no protected important public views from or through this property.

d) Protection of Important Cultural Resources:

Burlington's architectural and cultural heritage shall be protected through sensitive and respectful redevelopment, rehabilitation, and infill. Archeological sites likely to yield information important to the city's or the region's pre-history or history shall be evaluated, documented, and avoided whenever feasible. Where the proposed development involves sites listed or eligible for listing on a state or national register of historic places, the applicant shall meet the applicable development and design standards pursuant to Sec. 5.4.8(b).

See Section 5.4.8, below.

e) Supporting the Use of Renewable Energy Resources:

No part of the application prevents the use of water, wind, geothermal, solar or other renewable energy resources.

f) Brownfield Sites:

38 Latham Court is not an identified Brownfield with the Department of Environmental Conservation. Not applicable.

g) Provide for nature's events:

Special attention shall be accorded to stormwater runoff so that neighboring properties and/or the public stormwater drainage system are not adversely affected. All development and site disturbance shall follow applicable city and state erosion and stormwater management guidelines in accordance with the requirements of Art 5, Sec 5.5.3.

Design features which address the effects of rain, snow, and ice at building entrances, and to provisions for snow and ice removal or storage from circulation areas shall also be incorporated.

The new entrance to the addition will be under a small pent roof. The newly proposed patio door will be situated under an eaveline, with a modicum of protection from inclement weather.

There is limited room for snow storage north of the driveway unless the garden area may provide such space. South of the driveway has approximately 4'7" that could accommodate snow storage needs.

h) Building Location and Orientation:

No change is proposed to the building orientation; it will continue to front the public way.

i) Vehicular Access:

The existing driveway will remain and continue to serve the single family home. It will accommodate two on-site parking spaces.

j) Pedestrian Access:

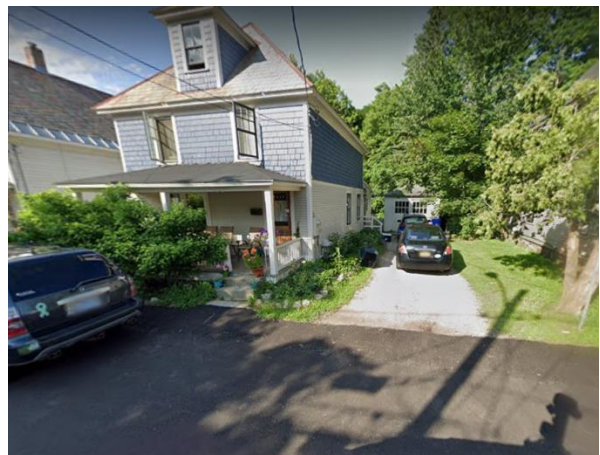
There is no public sidewalk on Latham Court. The parcel immediately fronts the public ROW.

k) Accessibility for the Handicapped:

ADA access is not a requirement for single family homes, but is encouraged.

l) Parking and Circulation:

Parking will be located in the existing driveway. Zoning Amendment 20-04 now



allows all required parking to be located in a driveway. Barn doors have been modified to allow parking of 2 vehicles in the driveway.

m) Landscaping and Fences:

As noted, a landscaping plan shall be required to define tree removal and new plantings.

n) Public Plazas and Open Space:

Not applicable.

o) Outdoor Lighting:

Where exterior lighting is proposed the applicant shall meet the lighting performance standards as per Sec 5.5.2.

No lighting information has been provided. Anticipating the need for lighting at building entrances, fixture information and illumination levels shall be provided prior to review by the DRB.

p) Integrate infrastructure into the design:

Exterior storage areas, machinery and equipment installations, service and loading areas, utility meters and structures, mailboxes, and similar accessory structures shall utilize setbacks, plantings, enclosures and other mitigation or screening methods to minimize their auditory and visual impact on the public street and neighboring properties to the extent practicable.

Utility and service enclosures and screening shall be coordinated with the design of the principal building, and should be grouped in a service court away from public view. On-site utilities shall be placed underground whenever practicable. Trash and recycling bins and dumpsters shall be located, within preferably, or behind buildings, enclosed on all four (4) sides to prevent blowing trash, and screened from public view.

Any development involving the installation of machinery or equipment which emits heat, vapor, fumes, vibration, or noise shall minimize, insofar as practicable, any adverse impact on neighboring properties and the environment pursuant to the requirements of Article 5, Part 4 Performance Standards.

Meters, utility connections, and any mechanical equipment **must be** illustrated on building elevations or site plan as appropriate.

Part 3: Architectural Design Standards

Sec. 6.3.2 Review Standards

(a) Relate development to its environment:

1. Massing, Height and Scale:

38 Latham Court has a pattern of two story homes, most gable or hipped roof; many with one story single or two car garages. The garage at 38 Latham is certainly the most intact for its period of construction. The demolition of this “automotive shed” and replacement with a two story residential addition proposes a structure of more significant massing than currently



56 Latham Ct.



48 Latham Ct.



57 Latham Ct.

exists.

The proposed addition is readable as new.

2. Roofs and Rooflines.

The roof has been modified to be a full gable and eave structure. The west gable end has been extruded, with decorative brackets below.

3. Building Openings

The proposed addition has glazing each gable end, with three windows in each eaves side of the structure. The replacement of two double hung windows in the principal structure and the addition of a French door are included. See plan A-2.

(b) Protection of Important Architectural Resources:

Burlington’s architectural and cultural heritage shall be protected through sensitive and respectful redevelopment, rehabilitation, and infill. Where the proposed development involves buildings listed or eligible for listing on a state or national register of historic places, the applicant shall meet the applicable development and design standards pursuant to Sec. 5.4.8. The introduction of new buildings to a historic district listed on a state or national register of historic places shall make every effort to be compatible with nearby historic buildings.

See Section 5.4.8.

(c) Protection of Important Public Views:

Not applicable.

(d) Provide an active and inviting street edge:

The design introduces the addition as set back from the principal structure; with entrances enjoying an abbreviated pent roof. Materials, fenestration pattern and colors are intended to be sympathetic with the principal residence.

(e) Quality of materials:

All development shall maximize the use of highly durable building materials that extend the life cycle of the building, and reduce maintenance, waste, and environmental impacts. Such materials are particularly important in certain highly trafficked locations such as along major streets, sidewalks, loading areas, and driveways. Efforts to incorporate the use of recycled

content materials and building materials and products that are extracted and/or manufactured within the region are highly encouraged.

Owners of historic structures are encouraged to consult with an architectural historian in order to determine the most appropriate repair, restoration or replacement of historic building materials as outlined by the requirements of Art 5, Sec. 5.4.8.

Clapboard siding with shake detail in the gable end, and a standing seam roof are intended for the addition.

Replacement windows are wood core. Window pattern, as illustrated in Plan A-2, represent a mix of 6/1 on the first floor and second floor west gable end, and four-lite window sash on the 2nd floor. Egress may be required from the second floor as it is intended to be habitable space. The applicant/design team shall confer with the building inspector to determine whether the proposed windows will meet life safety requirements.

(f) Reduce energy utilization:

All new construction shall meet the Guidelines for Energy Efficient Construction pursuant to the requirements of Article VI. Energy Conservation, Section 8 of the City of Burlington Code of Ordinances.

(g) Make advertising features complementary to the site:

Not applicable.

(h) Integrate infrastructure into the building design:

See Section 6.2.2. (p) above.

(i) Make spaces secure and safe:

Construction shall adhere to all applicable building and life safety code as defined by the building inspector.

Section 5.4.8 Historic Buildings and Sites

The City seeks to preserve, maintain, and enhance those aspects of the city having historical, architectural, archaeological, and cultural merit. Specifically, these regulations seek to achieve the following goals:

To preserve, maintain and enhance Burlington's historic character, scale, architectural integrity, and cultural resources;

To foster the preservation of Burlington's historic and cultural resources as part of an attractive, vibrant, and livable community in which to live, work and visit;

To promote a sense of community based on understanding the city's historic growth and development, and maintaining the city's sense of place by protecting its historic and cultural resources; and,

To promote the adaptive re-use of historic buildings and sites.

(a) Applicability:

These regulations shall apply to all buildings and sites in the city that are listed, or eligible for listing, on the State or National Register of Historic Places.

38 Latham Court and its garage are listed individually on the Vermont State Register of Historic Resources. See attached narrative.

(b) Standards and Guidelines:

The following development standards, following the Secretary of the Interior's Standards for the Treatment of Historic Properties, shall be used in the review of all applications involving historic buildings and sites subject to the provisions of this section and the requirements for Design Review in Art 3, Part 4. The Secretary of the Interior's Standards are basic principles created to help preserve the distinctive character of a historic building and its site. They are a series of concepts about maintaining, repairing and replacing historic features, as well as designing new additions or making alterations. These Standards are intended to be applied in a reasonable manner, taking into consideration economic and technical feasibility.

1. *A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.*

Constructed as a single family dwelling, the use shall continue.

2. *The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.*

While the original historic residence is not proposed for alteration, the proposed demolition of the single bay garage alters the features, spaces and spatial relationship that characterizes the property. Demolition of the garage is subject to discretionary review of the Development Review Board. See Section 5.4.8 (d).

3. *Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.*

The proposed addition is not a conjectural feature, but readable as new construction.

4. *Changes to a property that have acquired historic significance in their own right will be retained and preserved.*

Early automotive sheds are identified as significant within their context, and a tangible remnant of early automobile ownership. This application proposes demolition, which is under discretionary review by the DRB.

5. *Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.*



The Vermont State Register listing details the automobile shed as c 1925; contemporary with the home. It is highly possible that the home and garage were the result of “kit house plans”, pre-fabricated house and garage plans popularized by retailers like Sears and Roebuck, Aladdin, Gordon Van Tine and Bennett’s among others. The Gordon Van Tine Garage No. 102 (left) seems a close match, available in 1923.

6. *Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement*

of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials recognizing that new technologies may provide an appropriate alternative in order to adapt to ever changing conditions and provide for an efficient contemporary use. Replacement of missing features will be substantiated by documentary and physical evidence.

The application proposes demolition with the addition of a substantial residential addition. Demolition is under discretionary review by the DRB.

7. *Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.*

Demolition is the most serious and irreversible of physical treatments.

8. *Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.*

No archaeological resources have been identified at this site.

9. *New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale, and proportion, and massing to protect the integrity of the property and its environment.*

The new addition is proposed to replace the c. 1925 garage. It will be differentiated from the historic home. The DAB must assess the compatibility in materials, features, size, scale, proportion and massing.

10. *New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.*

If considered, the proposed addition may be removed in the future retaining the essential form and integrity of the historic home. The context will be altered, however, with removal of the original garage.

Section 5.4.8 (d) Demolition of Historic Buildings:

The purpose of this subsection is:

- *To discourage the demolition of a historic building, and allow full consideration of alternatives to demolition, including rehabilitation, adaptive reuse, resale, or relocation;*
- *Provide a procedure and criteria regarding the consideration of a proposal for the demolition of a historic building; and,*
- *To ensure that the community is compensated for the permanent loss of a historic resource by a redevelopment of clear and substantial benefit to the community, region or state.*

1. Application for Demolition.

For demolition applications involving a historic building, the applicant shall submit the following materials in addition to the submission requirements specified in Art. 3:

- A. *A report from a licensed engineer or architect who is experienced in rehabilitation of historic structures regarding the soundness of the structure and its suitability for rehabilitation;*

The applicant has provided a letter from Marc Dowling, Licensed Architect (5.24.2021). His analysis determined the structure to be in stable condition. The remainder of the letter is relative to the community benefit of owner instruction in bicycle repair.

- B. *A statement addressing compliance with each applicable review standard for demolition;*
The application includes supporting information only relative to the owner's desire to create a home office and bicycle repair workshop.

- C. *Where a case for economic hardship is claimed, an economic feasibility report prepared by an architect, developer, or appraiser, or other person experienced in the rehabilitation and adaptive reuse of historic structures that addresses:*

(i) the estimated market value of the property on which the structure lies, both before and after demolition or removal; and,

(ii) the feasibility of rehabilitation or reuse of the structure proposed for demolition or partial demolition;

There is no claim for economic hardship, and no market value provided. There is no analysis about rehabilitation and reuse, **although the owner has made inquiries about relocation.** Mr. Dowling's communication notes that building relocation would "greatly exceed...economic practicality."

- D. *A redevelopment plan for the site, and a statement of the effect of the proposed redevelopment on the architectural and historical qualities of other structures and the character of the neighborhood around the sites;*

A redevelopment plan has been provided. See 38 Latham Court Final Permit Set (*as revised 7.14.2021*).
and,

- E. *Elevations, drawings, plans, statements, and other materials which satisfy the submission requirements specified in Art. 3, for any replacement structure or structures to be erected or constructed pursuant to a development plan.*

Elevations, drawings, plans and statements have been submitted for the new development.

2. Standards for Review of Demolition.

Demolition of a historic structure shall only be approved by the DRB pursuant to the provisions of Art. 3, Part 5 for Conditional Use Review and in accordance with the following standards:

- A. *The structure proposed for demolition is structurally unsound despite ongoing efforts by the owner to properly maintain the structure;*

The submitted architect's opinion indicates the garage is structurally stable.
or,

- B. *The structure cannot be rehabilitated or reused on site as part of any economically beneficial use of the property in conformance with the intent and requirements of the underlying zoning district; and, the structure cannot be practicably moved to another site within the district;*

The desire is for an expansion to the existing home, not reuse of the garage. The owner has shared his effort to offer the building for relocation, but has not received any interest.
or,

- C. *The proposed redevelopment of the site will provide a substantial community-wide benefit that outweighs the historic or architectural significance of the building proposed for demolition.*

The application weighs on the "community wide benefit" provision, as they intend to offer bicycle repair workshops. Of course any change in use of the property will require separate permitting.

The value of the redevelopment is primarily to enhance the use and enjoyment of the single family home.

And all of the following:

- D. *The demolition and redevelopment proposal mitigates to the greatest extent practical any impact to the historical importance of other structures located on the property and adjacent properties;*

The existing single family home is impacted only with minor surface attachment by the proposed addition. *The City continues to experience an increasing loss of early 20th century automotive sheds:* When land values increase, available developable land on individual parcels becomes *targeted* for desired expansion. Coupled with their typical

diminutive size that no longer accommodates a full size vehicle, these early garages face extinction by the greater value in their footprint and loss of original function. As fewer remain, those still standing increase in importance.

E. All historically and architecturally important design, features, construction techniques, examples of craftsmanship and materials have been properly documented using the applicable standards of the Historic American Building Survey (HABS) and made available to historians, architectural historians and others interested in Burlington's architectural history;

As an accessory structure to an existing single family home, building demolition does not warrant documentation by HABS standards. This small structure is likely associated with the national proliferation of pre-fabricated structures or kit house plans, a phenomena already identified in Burlington. (See *A Guide to the Catalogue Houses in Burlington Vermont.*) Therefore, if approved, photo documentation of the existing structure for the zoning record will be required.

and,

F. The applicant has agreed to redevelop the site after demolition pursuant to an approved redevelopment plan which provides for a replacement structure(s).

This application includes a redevelopment plan that includes a replacement structure.

(i) *Such a plan shall be compatible with the historical integrity and enhances the architectural character of the immediate area, neighborhood, and district;*
The DAB shall discern the compatibility of the replacement structure within the context of the architectural character of the home itself.

(ii) *Such plans must include an acceptable timetable and guarantees which may include performance bonds/letters of credit for demolition and completion of the project;*
The zoning permit, if approved, will have a three year life. All work must be completed within that timeframe.
and,

(iii) *The time between demolition and commencement of new construction generally shall not exceed six (6) months.*
This shall be a condition of approval.

This requirement may be waived if the applicant agrees to deed restrict the property to provide for open space or recreational uses where such a restriction constitutes a greater benefit to the community than the property's redevelopment.

The applicant does not intend to deed-restrict the property to provide for open space.

3. Deconstruction: Salvage and Reuse of Historic Building Materials.

The applicant shall be encouraged to sell or reclaim a structure and all historic building materials, or permit others to salvage them and to provide an opportunity for others to

purchase or reclaim the building or its materials for future use. An applicant may be required to advertise the availability of the structure and materials for sale or salvage in a local newspaper on at least three (3) occasions prior to demolition.

Items for the Board's consideration, if recommended for approval:

- A landscaping and tree removal plan will be required (as appropriate) for DRB review.
- Lighting information, including fixture specs, illumination levels and intended location are needed.
- Meters, utility connections, and any mechanical equipment must be illustrated on building elevations or site plan as appropriate.
- The time frame between building demolition and new construction shall not exceed 6 months.
- No change in use is included within this proposal
- All building materials shall be disposed of in a safe and legal manner.
- Standard Permit Conditions 1-15.



CITY OF BURLINGTON **HISTORIC BUILDINGS'** PATH TO NET ZERO ENERGY

A GUIDE FOR BUILDING AND HOMEOWNERS

ACKNOWLEDGMENTS

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WHY THE GUIDE?

Burlington, Vermont is a city with a unique history reflected in its buildings and homes. The architectural and visual character of Burlington depends on the sustainability of its historic buildings and homes, and the City is committed to ensuring their longevity.

Energy efficiency will provide long term benefits to both the Burlington historic buildings and their owners in reduced energy consumption, improved thermal comfort, and increased health of the buildings and occupants all while reducing our carbon emissions.

In addition, the City of Burlington is committed to upholding its ambitious climate goal of [Net Zero Energy \(NZE\) by 2030](#), established in 2019. To reach this goal, much of Burlington's existing housing stock will require energy efficiency and electrification measures.

To support these efforts, this guide was developed as a resource for historic building and homeowners to foster understanding of the processes, strategies, and benefits involved in the pursuit of the path to NZE.





HOW TO USE THE GUIDE

The information in this guide introduces opportunities that exist for City of Burlington historic buildings, and ways that homeowners can work to increase the energy efficiency of their property and begin on the path to NZE. The following pages are meant to offer a comprehensive overview of the processes, strategies, and benefits involved, while the appendix expands on these topics for those interested in a more detailed explanation.

KEY TERMS

Net Zero Energy (NZE)

Reducing and eventually eliminating fossil fuels. Burlington currently sources all its electricity from renewable resources, but heating and ground transportation still need to be addressed to meet this City-wide goal.

Energy Retrofit

Retrofit/retrofitting as we'll use it in this context refers to the modification or addition of equipment or systems to improve energy efficiency and reduce carbon emissions in existing historic homes or buildings.

QUESTIONS?

If you have additional questions, please reach out to the Burlington Electric Department's Energy Efficiency team!

efficiency@burlingtonelectric.com

BENEFITS OF AN ENERGY RETROFIT

Success in reducing carbon emissions from the built environment will require improving energy efficiency, beneficial electrification of heating and cooling systems, and increasing renewable energy sources. Retrofitting Burlington's existing housing stock to become Net Zero is a huge opportunity for reducing community-wide emissions. It may also result in the following positive outcomes:

- Reducing energy costs for owners
- Improving thermal comfort
- Quieter systems
- Improving indoor air quality
- Reducing structural degradation due to mold
- Maximizing the use and life of materials





SO, YOU WANT TO RETROFIT YOUR BUILDING...

GETTING STARTED

You are likely reading this guide because you own a historic home or building, and you'd like to know how you can make it more energy efficient or begin on the path to NZE. Perhaps you already have a project in mind or have heard of systems like heat pumps and are wondering if it's the most cost-effective and energy efficient option for your property. The following pages will help you identify what action you can take, and how best to achieve optimal energy efficiency.



DETERMINING HISTORIC STATUS

Is my home or building considered “historic”?

Why does it matter?

My property is not considered historic. Now what?



OPPORTUNITIES FOR ENERGY EFFICIENCY IN HISTORIC HOMES & BUILDINGS

Prioritizing projects for long-term efficiency and cost-savings.

Practical approaches to energy efficiency.



PERMITTING

Determining if your project requires permitting.

Burlington's permitting process.



DETERMINING HISTORIC STATUS

IS MY HOME OR BUILDING CONSIDERED “HISTORIC”?

“Historic” properties have been evaluated for inclusion on the State or National Register of Historic Places and are listed here:

[National Register of Historic Places](#)

[Vermont State Register of Historic Places](#)

[Historic Sites and Structures Survey](#)

There are three criteria when determining historic status: age, historic significance, and integrity. If your property is 50 years or older, and can meet the other two criteria, it may be considered historic. Visit the City's [historic resources page](#) for more information.

WHY DOES IT MATTER?

Knowing whether your property is listed as historic is important information when considering any retrofit. There are special considerations and guidelines in place for projects that alter an historic building to ensure preservation of its integrity and character. Learn more about repairs and restoration for historic properties [here](#).

MY PROPERTY IS NOT CONSIDERED HISTORIC. NOW WHAT?

If your property is not currently listed as historic, it may be eligible, and there are [benefits](#) to pursuing historic status. Reach out to the [Permitting & Inspections](#) department for more information.

If you do not meet the requirements for official historic status, your home or building may warrant the same considerations when it comes to energy efficiency. In this case, this guide is still relevant and useful.



OPPORTUNITIES FOR ENERGY EFFICIENCY IN HISTORIC HOMES & BUILDINGS

PRIORITIZING PROJECTS FOR LONG-TERM EFFICIENCY AND COST-SAVINGS

[Planning for your retrofit project](#) is a critical first step in ensuring your project is efficient and cost-effective long-term. A thorough planning process will help you uncover aspects of your home or building you may not have been aware of and foster an understanding of the basics of building science before you set out on a specific project. This will go a long way in helping you avoid inefficient strategies or costly mistakes. For example, electrification is a popular topic and, in the rush to move toward it, owners may opt to pursue a heat pump for their heating or cooling needs. While this is an excellent way to reduce your reliance on fossil fuels, it may be inefficient to do so if you haven't addressed your home or building's insulation. It is recommended that insulation come before electrification, because in order for a heat pump to provide optimal efficiency and thermal comfort, your building must be sufficiently airtight.

ENERGY EFFICIENCY STRATEGIES

There are many options for implementing energy efficiency in your home or building that will serve as steppingstones on the path to NZE. These options range from simple and inexpensive to more complex and costly, and address components of your home or building and their related energy usage including:

Building Envelope

- Windows and doors
- Roof
- Insulation

Mechanical Systems

- Heating, Ventilation, and Air Conditioning (HVAC)

See the [Strategies for You Retrofit](#) section of the appendix for in-depth information on addressing these and more.



PERMITTING

DETERMINING IF YOUR PROJECT REQUIRES PERMITTING

Below are a few examples of projects that **require** a zoning permit in Burlington before the start of construction. For a full list of projects that require a zoning permit, visit the City's [Zoning Division page](#).

- New buildings or additions to existing buildings, garages, accessory buildings, or other structures.
- Alterations to building elevations/appearances including, but not limited to, re-siding or window replacement (or addition) or other changes that alter trim details or otherwise change the exterior appearance.
- Any form of demolition on the exterior of the building.
- Altering existing or construction of new porches, patios, and decks.
- Increase in habitable living space (including, but not limited to, attic, bedroom, basement, garage, and winterizing or otherwise enclosing a porch).

Below are a few examples of projects that **do not require** a zoning permit in Burlington. Find out more [here](#).

- Normal repairs, maintenance, and weatherization that do not involve any change of materials, dimensions, or design features
- Repairs required to comply with a Written Order of the Building Inspector
- Painting
- Replacement of a building feature that do not involve any change of materials, dimensions, or design features
- Tree removal on lots smaller than 3/4 acre with a single-family home
- Temporary signs, structures or uses (30 days or less)
- Design changes to the face or roof of a building (including heat pumps) that is not a historic building or within the Design Review District

PERMITTING CONTINUED

CITY OF BURLINGTON PERMITTING PROCESS

This is a simplified step-by-step overview of the process for a typical project requiring permitting in Burlington. Depending on the project, the process may take longer or have more requirements than demonstrated here. Contact [Permitting and Inspections](#) and speak with the staff about what to expect for your specific project.

01

Contact the Department of [Permitting & Inspections](#) or [apply online](#) for a Zoning Permit and pay the applicable fees.

02

90% OF ALL APPLICATIONS
RECEIVED ARE DECIDED BY STAFF
WITHIN 1-2 WEEKS.

The permit application is processed by the City's Zoning staff. Simple projects are approved administratively by Zoning staff, while more complex projects must be reviewed by the Development Review Board (DRB).

03

Application for trade permits may be made simultaneously as zoning. This includes applications for your [Construction Permits](#) (building, electrical, plumbing, mechanical, fire suppression, curb cuts, excavation, etc.).

04

Once an application has been approved, there is an appeal period required by state law before you can get your permit.

05

After the appeal period ends, your Zoning Permits may be released electronically. Be sure you have completed any pre-release permit conditions and pay any outstanding fees. Post the "Z" Card public notice where it is easily seen from the street.

06

With your Construction Permits in-hand, you can get to work!

07

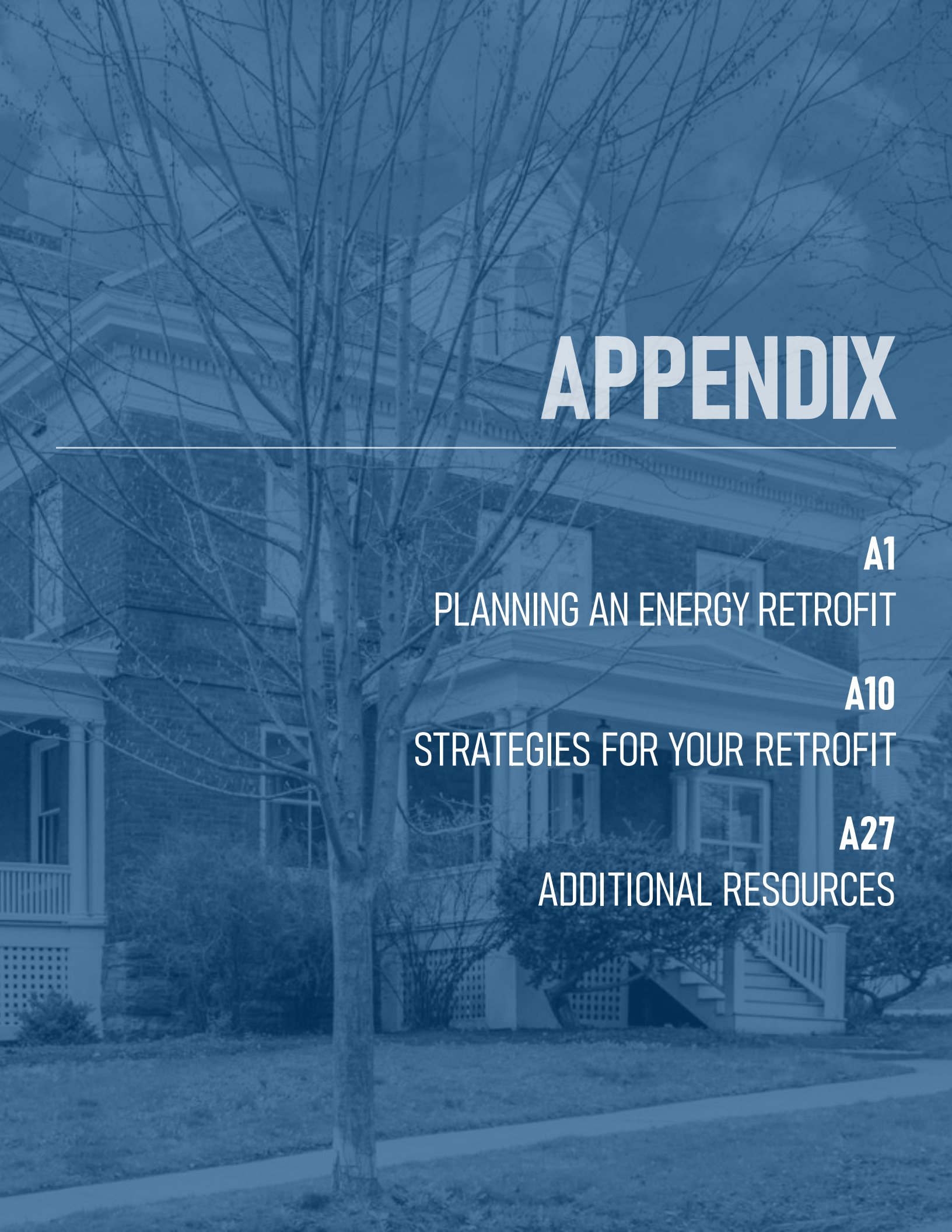
During the project one or more construction [permit inspections](#) can take place. If changes are made that alter what was approved on your Permit, consult with the Zoning staff so you understand how this may affect your permit.

08

Request a final inspection to close out your Construction Permit ([schedule online](#)). Once your Construction Permit has been closed-out, request a final [Unified Certificate of Occupancy \(UCO\)](#) from the Department of Permitting & Inspections.

09

File the Unified Certificate of Occupancy in your records and enjoy the result of all your hard work!



APPENDIX

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PLANNING AN ENERGY RETROFIT

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PLANNING AN ENERGY RETROFIT

STEP 1 KNOW YOUR BUILDING

Before initiating a retrofit you must determine the buildings needs, your project goals, financing, and the best strategies to incorporate into your retrofit.

What is your building...

- Type and use
- Historic status
- Location and orientation
- Construction methods
- Character defining features
- Inherently sustainable features
- Existing mechanical systems

STEP 2 EVALUATE PERFORMANCE

Evaluating the current performance of your building envelope and systems will identify inefficiencies and help determine your priorities and goals for your retrofit.

Energy Assessment

- Measures energy use & identifies problems & solutions

Blower Door Test

- Measures the quantity & location of air leakage

Thermal Imaging

- Determine locations of air leakage or inadequate thermal insulation

STEP 3 ESTABLISH GOALS

Possible goals may include:

- Reach a specific energy usage target
- Meet code requirements or specific standards
- Reduce monthly energy costs

- Improve comfort
- Specific return on investment goals for potential renovations
- Produce renewable energy
- Meet specific air infiltration requirements

STEP 4 DEVELOP A PLAN

There are lots of sustainable retrofit [strategies](#) that are both low and high cost that can be used in your home. It's important to understand all the options available.

STEP 5 MONITOR PERFORMANCE

After implementing upgrades, your building should be monitored for performance to determine how the strategies are working and if adjustments still need to be made in the long-term.



1. KNOW YOUR BUILDING

Before initiating an energy retrofit, it is crucial that you gain a better understanding of your building. Answering the following questions will help you determine needs, project goals, financing, and the best strategies to incorporate into your retrofit.

HISTORIC STATUS

Depending on your project you may require review by the Zoning and Trades Division to assure that alterations and deep energy retrofit strategies do not negatively impact the historic character of the structure.

- Is your property listed on the State or National Register of Historic Places?

BUILDING TYPE & USE

The type of building, its use, and activities will play a large role in the type and amount of energy used and as a result, the best strategies to implement in your deep energy retrofit.

- Is your building use residential, mixed use, or commercial?
- If residential, is it single-family or multi-family?
- If commercial or mixed use, is it occupied by a retail store, restaurant, or office?

CONSTRUCTION

The most common building materials on older existing buildings in Burlington are wood and brick. Different materials and construction methods will require different retrofit and upgrade strategies to reach the same energy efficiency levels.

- When was your building constructed and what are its primary materials?
- Alterations may help you identify areas of flexibility or any areas that may need attention during the retrofit.
- Are there any noticeable alterations?
- How many stories is your building? Does it have a basement or attic? What is the roof shape and structure?

Different window materials and types may lend themselves to different retrofit strategies.

- What type of windows does the building have? What is the material?
- Are they functional?
- Are they double-hung, casement, fixed, or other?

LOCATION & ORIENTATION

Location and orientation can influence a property's visibility, sun exposure, shading, potential moisture issues and more.

- How is your building oriented towards the sun?
- Where is it located on the block or in relationship to its neighbors? Is it detached, or semidetached, part of a row?
- Where is it located in relation to a public street or way and rivers?



1. KNOW YOUR BUILDING

CONTINUED

EXISTING SYSTEMS

- How do you heat and cool your house? Forced hot air, water pipes, or steam pipes?
- Are your existing systems operating effectively?
- Did you identify inherently sustainable features that you can take advantage of for passive heating and cooling?

CONDITIONS ASSESSMENT

The assessment of the following existing conditions should occur before treatments are planned. Learn more about energy efficiency improvements [here](#).

Have the condition of your building assessed by a qualified professional to determine where there may be any active deterioration or materials in poor condition or that may have hazardous materials.

- Is lead paint present?
- What is the condition of the roof?
- What is the condition of the siding?
- What is the condition of the masonry?
- What is the condition of the windows and doors?
- What is the condition of the porch?
- Are there structural issues?
- Are there drainage issues?
- Are trees or shrubs too close to the building?

CHARACTER DEFINING FEATURES

Regardless of whether a building is designated historic, older existing buildings contribute to the character and diversity of Burlington's neighborhoods. Character is defined by the elements that make a building unique or special, including distinctive materials, features and spaces, architectural styling or design, and unique construction methods. These character defining features should be identified during the planning phase and preserved when implementing the retrofit.

- What are the unique character-defining features on your building?

INHERENTLY SUSTAINABLE FEATURES

Inherently sustainable features should be identified and incorporated into your overall plan, so they work in cooperation with other strategies implemented. These features can include operable windows, operable shutters, attic vents, storm windows, screens, awnings, porches, permeable surfaces, and landscaping. Maintaining and using these efficient features will improve sustainability and reduce unnecessary waste.

- What passive systems and inherently sustainable features exist in your building and what is their condition? Are there passive systems that could be integrated into the retrofit?

2. EVALUATE PERFORMANCE

Evaluating the current performance of your building envelope and systems will identify inefficiencies and help determine your priorities and goals for your retrofit. Your home also may be eligible for rebates for making energy efficiency improvements. The evaluation can provide an understanding of how the building is operating and will help identify improper equipment performance. It can also determine what equipment or systems need to be rehabilitated, retrofitted, or replaced. In these cases, there are opportunities for saving energy and money.

ENERGY ASSESSMENT

An energy assessment can help determine how much energy your home or building uses, where it's losing energy, and which problem areas and fixes you should prioritize to make it more efficient and comfortable. An energy assessment should be your first step before making improvements.

BLOWER DOOR TEST

Blower door tests are performed by certified energy auditors to determine to what degree a building is airtight. A temporary "blower door" equipped with a powerful fan is fitted into the frame of an existing front or back door, and when the fan is turned on, it sucks the air out of the building to find where it leaks in. Digital gauges compare the difference in air pressure between the inside air and the outside air to determine how much air is leaking into the house. The goal is to learn where your building is leaking to make it as airtight as possible to conserve energy.

THERMAL IMAGING

Thermal imaging can be performed on the interior or exterior of a building to determine locations of air leakage or inadequate thermal insulation. Addressing these locations is a productive first step in an energy retrofit.





3. ESTABLISH GOALS

Once you have evaluated your current performance it is important to define the goals and priorities you want to achieve in your retrofit. This will determine which deep energy retrofit strategies you will begin to implement into your historic or older home. You should identify your goals with the concept of “do no harm”, meaning you do not want to create new problems in the process of integrating your strategies like trapping moisture, creating condensation, or causing deterioration. There are several goals that you may want to achieve but choose the ones that apply directly to what you want and could apply to your building.

EXAMPLES OF GOALS

- Reaching a specific energy usage target or a specific percentage in reduction.
- Meeting code requirements or specific standards such as LEED or Passive House.
- Reducing monthly energy costs.
- Improving comfort and overall livability.
- Setting specific return on investment goals or payback periods for potential renovations.
- Producing renewable energy.
- Meeting project-specific air infiltration requirements.
- Transitioning to Net Zero Energy.



4. DEVELOP A PLAN

PLANNING FOR MAJOR UPGRADES

When planning a deep energy retrofit, keep in mind that there are ideal circumstances and points in time where major upgrades could save you money and time. By planning for when these conditions occur or significant replacements are needed, you may be able to include supplementary improvements at a minimal additional cost.

Major Renovation of Improvements

When planning a major renovation project or replacing mechanical equipment that is near the end of its service life, energy-efficient upgrades, such as a ground or air-source heat pump, could be incorporated at minimal additional cost.

Building Envelope Improvements

When combined with major end-of-life equipment upgrades, like HVAC, improvements to the building envelope, such as improving wall and roof insulation and weatherstripping windows and doors, can offer opportunities for reduced costs. Additional insulation and air-sealing that improve the efficiency of your building envelope could result in reduced heating and cooling loads and smaller less expensive mechanical equipment.

Life Safety & Code Requirements

When implementing life safety or code requirement upgrades that require a high cost and effort, consider installing energy-efficient upgrades that could be incorporated with minimal additional investment. This can include improved insulation, ventilation, or the implementation of energy efficient mechanical systems.

Hazardous Materials Abatement

Lead can be found in many things, but in Burlington the biggest problem is the lead-based paint used before 1978. Vermont has an extremely old housing stock, and more than 80% of the houses in Burlington can have lead-based paint hazards. For more information contact the [Burlington Lead Program](#).

Building Purchasing or Refinancing

When financing, a retrofit can be included in the transaction cost.

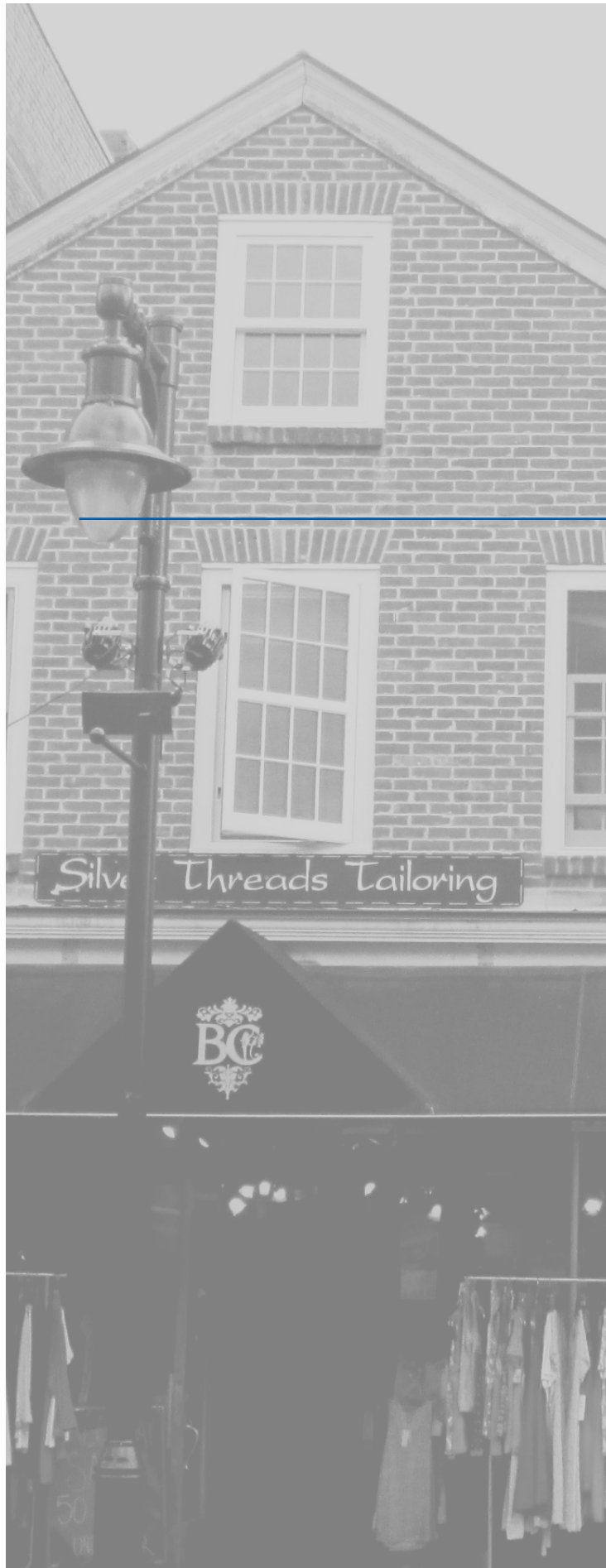


4. DEVELOP A PLAN CONTINUED

CONSIDER MATERIALS LIFESPAN & IMPACT

While considering strategies you should also recognize the lifespan of your building's materials and components, such as the following:

- Certain materials are intended to be repairable and have a long lifespan such as: masonry walls, slate roofs, and wood windows. You should try to minimize intrusions, alterations, and long-term impacts to these features.
- Passive and inherently sustainable features require little energy and maintenance to perform however, complex systems will require more maintenance to operate properly. Preserve and restore sustainable features that provide daylighting and ventilation such as windows, shutters, attic vents, storm windows, and awnings/porches.
- Consider design systems that can allow repairs and replacements without disrupting the entire building or damaging historic features. Some improvements can be very intrusive to a home especially when installing mechanical systems, consider the consequences of installing these systems if repairs or replacements take place in the future. Simple repairs to inherently sustainable features can be very effective and are less invasive and damaging to the home.
- Throughout the retrofit process, if new materials will be installed within your building it is important to be aware of the health and environmental impacts these materials may have. The following should be considered:
 - Preserve existing materials when possible. Replace with similar materials that do not disrupt the building's character-defining appearance when needed.
 - Try to use locally sourced materials when able. This makes the product "greener" by reducing transportation distances, which lowers greenhouse gas emissions.
 - Avoid building materials and products that contain toxins or have high VOC emissions.
 - Select and specify healthy building products. Seek out materials and products that are free of toxins, socially responsible and respects the rights of workers, and are sustainable with net energy positive and benefits both people and the environment.



4. DEVELOP A PLAN CONTINUED

FINANCING OPPORTUNITIES

When planning for a retrofit it is important to consider the long-term savings and ease of maintenance when budgeting. The initial cost of a product or design is only part of the true cost and owners should consider the costs and savings over the lifetime of the upgrade. Analyze prospective investments based on their expected financial and environmental benefits (maintenance savings, utility bills, comfort). There are a wide range of [incentives, resources, and financing opportunities](#) available to Burlington residents for implementing certain energy efficient upgrades.

PROFESSIONAL SERVICES

Depending on the size and scope of your project, you may want to consider consulting a professional to address specific retrofit strategies or design challenges. Larger projects require integrated teams that should be formed early in the planning process. It is also important when picking out consulting professionals that they have experience working with historic buildings AND sustainable design. You want someone who is willing to answer your questions and willing to let you be involved throughout the project. Typical professionals involved in energy retrofits include:

- Energy Auditor
- Historic Preservationist
- Licensed Architect
- Structural Engineer
- General Contractor



5. MONITOR & MAINTAIN PERFORMANCE

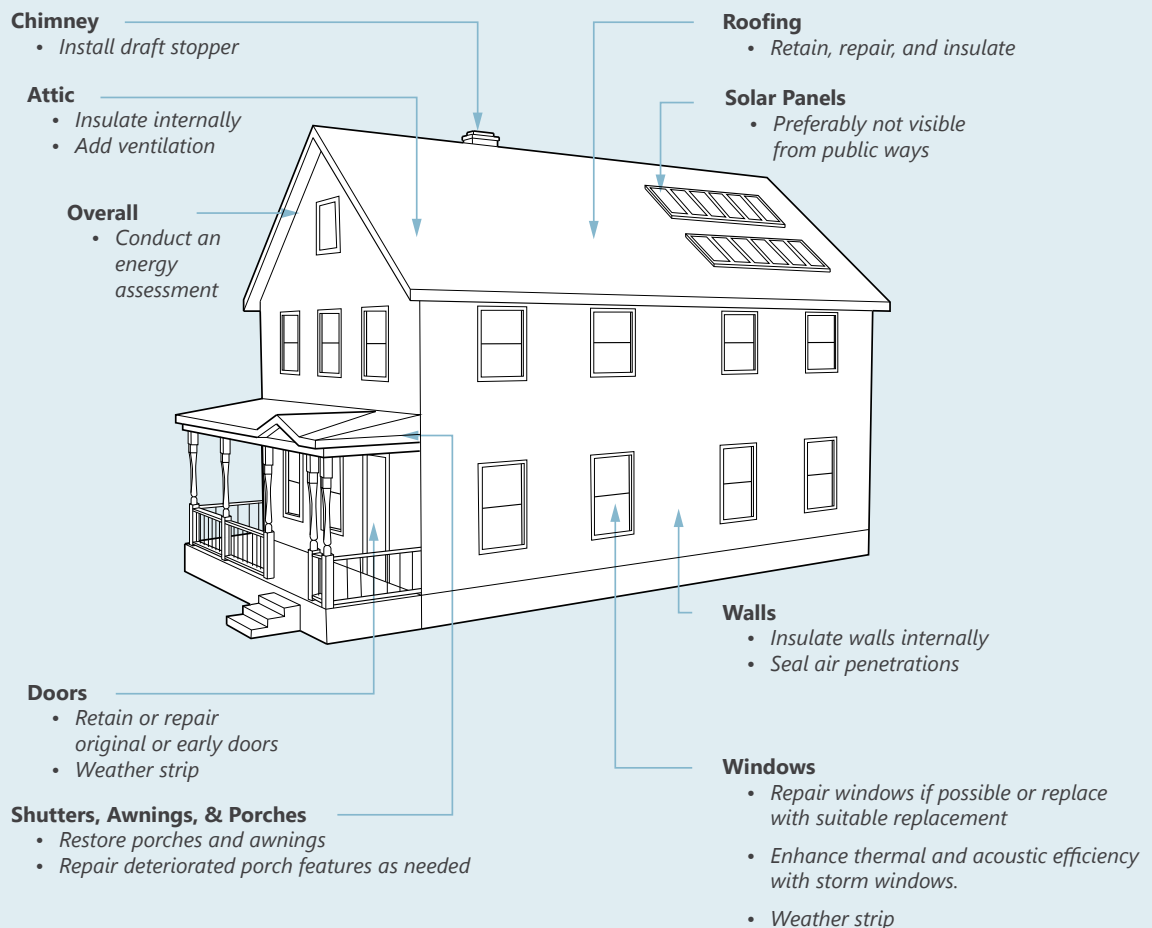
After an energy retrofit, your building should be regularly monitored for its performance to determine how the strategies are working and if adjustments still need to be made in the long-term. The Burlington 2030 District uses the [Energy Star Portfolio Manager \(ESPM\)](#), an online tool you can use to measure and track energy and water consumption, as well as greenhouse gas emissions. You can use the ESPM to manage the energy and water use of your building. All you need are your energy bills and some basic information about your building to get started.

Although it is important to monitor your building, it is equally important to maintain the improvements that have been made. Existing buildings must be maintained regularly to preserve their historic character and maximize their reliability, performance, and efficiency. This includes routine maintenance such as:

- **Gutters and Down Spouts.** Clean all debris from gutters and ground spouts.
- **Roofing and Flashings.** Clean all debris and remove any standing leaves or debris from all flashings and valleys. Check for any settling water, rust or damaged flashing or roofing materials.
- **Chimney Bases and Foundations.** Check for any cracks, loose mortar, or damaged bricks.
- **Painted Wood.** Apply any caulk or silicone as needed prior to painting. Fading and sun damaged paint should be touched up with a matching paint product.
- **Chimney Tops.** Look for loose bricks, weak mortar and flashing damages like rust. Inspect the inside of the chimney for leaks or hidden mortar damages.
- **Painted and Unpainted Masonry.** Pitted and decaying masonry, cracks or scaling should all be noted. A stiff bristled brush and some oxygenated bleach can help remove any stains or debris.
- **Mortar Joints.** Inspect all [mortar joints](#) especially where moisture may enter and where structural movements may occur for cracks, loose pieces, or spalling mortar. Mortar joints should be repointed with mortars that have the appropriate color, texture, hardness, and joint profiles.
- **Windows and Doors.** Check for any air leaks, water damage, loose panes, or crumbling glazing putty. Paint the [windows](#) and doors that are faded to prevent future damage from sun, wind, and rain.
- **Claddings (Siding).** Peeling paint and sun damage can be easily repaired with paint. Cupping, splitting, or loose nails are all signs that your siding may need some professional help. Beware of [lead paint](#) as it is common in older homes in Burlington and can be very poisonous.

STRATEGIES FOR YOUR RETROFIT

After evaluating the current performance of your building envelope and systems you will be able to identify inefficiencies and help determine your priorities and goals for your retrofit. This section discusses a variety of energy retrofit strategies that can be used to improve your buildings efficiency and is organized by building components. It provides a variety of techniques in making these improvements as well as lower and higher cost options.

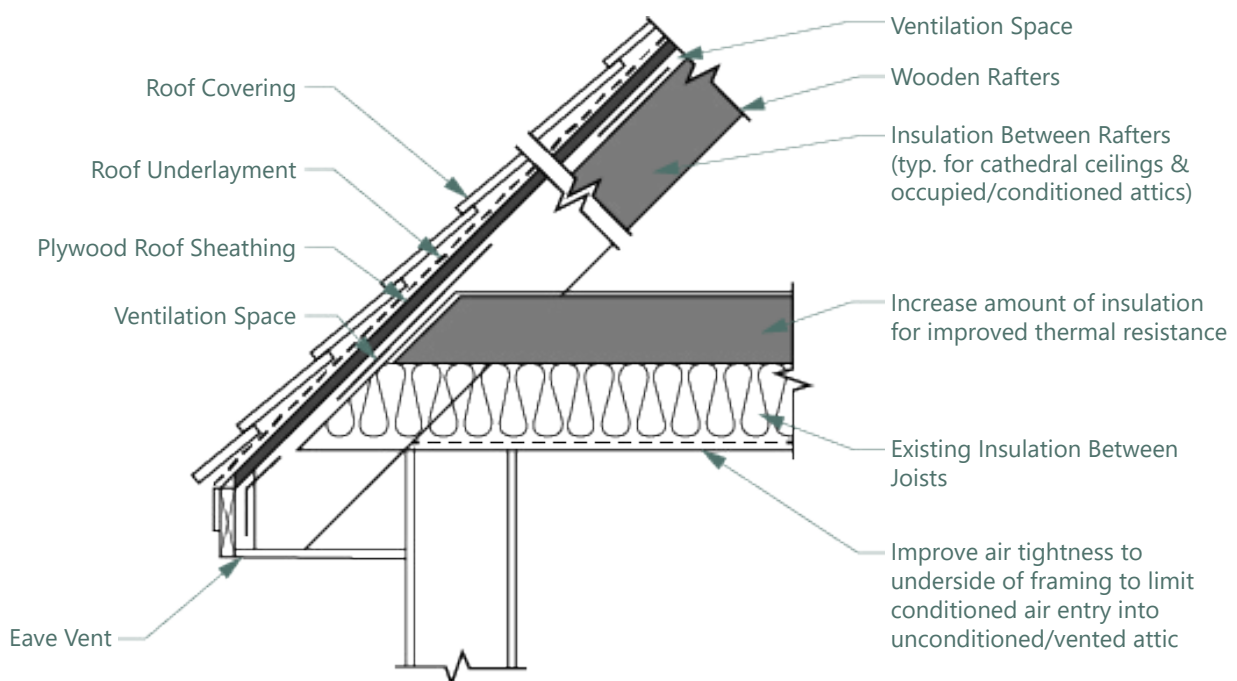


Exterior walls and roofs are the most visible components of a building, and for historic buildings are also important aspects of the building's character. Typical wall materials of older buildings in Burlington include brick and wood. Wood framed houses are generally covered with clapboard siding and shingles. Older brick buildings generally consist of multiwythe walls, meaning a wall consisted of multiple thicknesses of brick. The typical interior wall finish for both construction types is plaster on lath unless later replaced with drywall. Roofs are also often distinctive features of historic buildings. Their shape, materials, and detailing contribute to a building's appearance and character. Roofs can be flat, low-sloped, or steep-sloped and can be covered with metal, slate, asphalt, or wood shingles. Providing proper ventilation and insulation for walls and roofs is one of the most cost-effective strategies for improving the energy efficiency of older buildings. Improving ventilation and insulation are also easy to do without impacting the exterior character of older and historic buildings.

VENTILATION

A common problem that occurs when retrofitting older buildings is inadequate ventilation. Older buildings were built to “breathe” and designed to use passive ventilation but when they are sealed up for energy

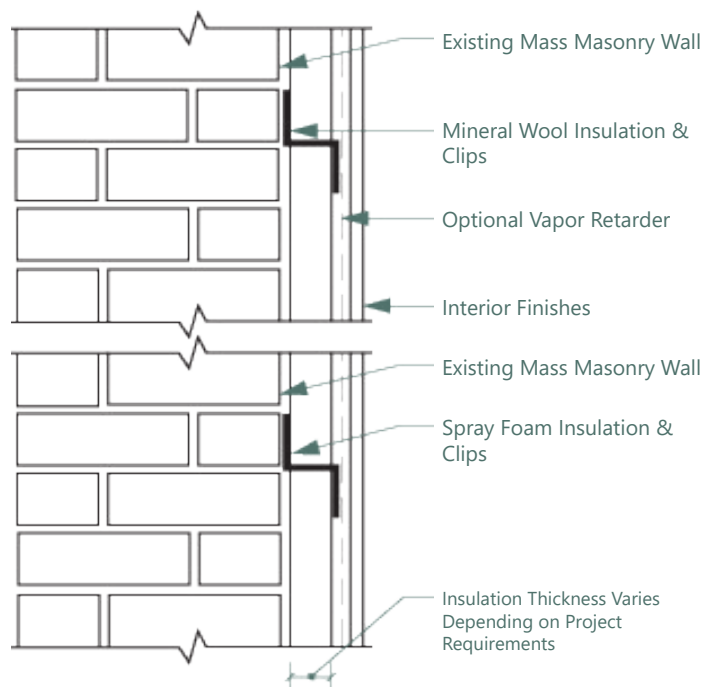
efficiency the stagnant air can cause an increase in moisture and heat build-up in interior spaces. This moisture and heat can flow into the attic when there is no dedicated air seal provided between the attic and living space below. A simple solution is venting the attic using louvers in gable ends, ridge vents, and soffit or eave vents which can increase air flow and help control moisture and heat build-up. However, venting can negate whole-building air sealing and result in energy loss from unwanted air exfiltration or infiltration. Roof eaves and attics are common areas for thermal and air barrier inefficiencies, allowing for conditioned interior air to escape. Improving the air tightness of the ceiling assembly or providing a dedicated air barrier above the conditioned space can improve energy efficiency while maintaining passive ventilation. To avoid energy loss, one solution is to install air sealing and insulation to separate the attic from interior living spaces to prevent interior conditioned air from flowing into the attic. That way attic venting can be installed to prevent moisture build-up and keep the space cooler. Improving ventilation both to attics and interior living spaces, with a combination of appropriate natural (passive) and mechanical (active) ventilation can improve air circulation, keep the building cooler, and reduce moisture build-up.



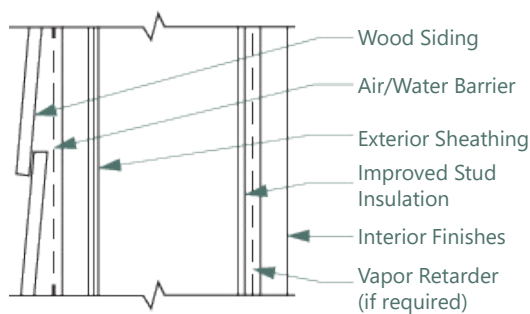
WALL INSULATION

When adding insulation to your historic building it is important to preserve the exterior walls of your home as to not affect the historic appearance. Adding continuous exterior insulation to walls may be an effective increase in thermal efficiency, however, this will typically have a harmful impact on the exterior aesthetic and character of a historic building and should not be undertaken on primary elevations. Installing insulation from the interior is the more appropriate option for older buildings. Before installing interior insulation, it is important to confirm that the installation will not cause damage to the existing historic materials.

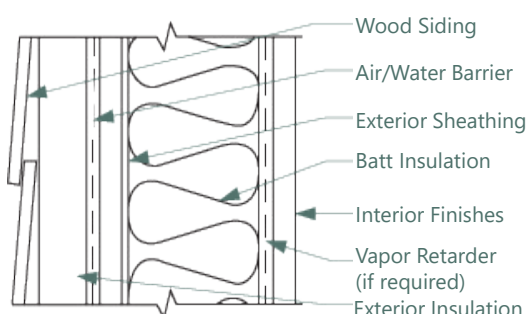
Before insulating the interior of masonry walls, you should have your home reviewed by a building envelope professional. Masonry walls are built to “breathe”, this allows them to absorb, store, and evaporate moisture on both the interior and exterior. Insulation on the interior may hinder needed evaporation, causing the wall to stay wet for a longer period and potentially leading to damage by the freeze/thaw cycle. A building envelope professional can evaluate whether an existing masonry wall is durable enough to allow for interior insulation.



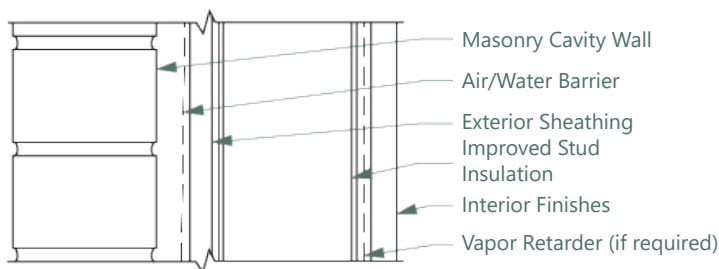
Mass Masonry Wall with Interior Insulation



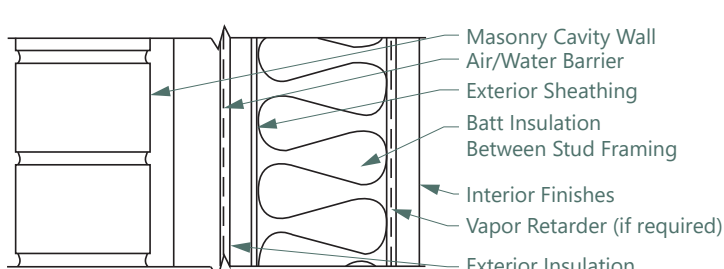
Framed Wall with Veneer



Framed Wall with Veneer



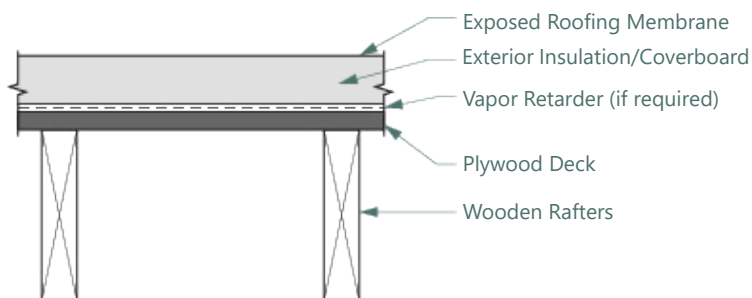
Framed Wall with Masonry Veneer



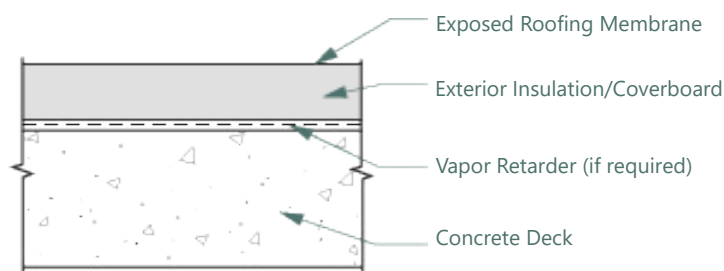
Framed Wall with Masonry Veneer

ROOF INSULATION

Insulating a roof or attic space is typically the most important step towards increasing energy efficiency within buildings. There are several options for adding additional insulation to existing roof assemblies including insulation above the roof deck, insulation below the roof deck, or insulation in the attic space below a roof. Installation of rigid insulation above a roof deck works best for low-sloped roof assemblies, a wood-framed structure typical of residential row houses. The insulation may also go below the roofing membrane. Insulation installed below the roof deck is typically used on steep-sloped roof assemblies. Insulating along the underside of the roof deck between the rafters increases the total conditioned space in the building and is required when temperature or moisture-sensitive mechanical equipment is placed in the attic space. Alternatively, insulating the attic floor with batt insulation between the ceiling joists can be used when it is not necessary to condition the attic space. Regardless of the insulation arrangement, ventilating the space above the insulation by way of eave, gable and ridge vents is critical for passive ventilation.



Wood Framed Roof Assembly



Concrete Roof Assembly

WALLS & ROOF GUIDELINES & TIPS

- Coordinate strategies with information learned from a home energy assessment.
- Consider continuous or comprehensive insulation layouts and their appropriateness for repairs, additions, and new buildings.
- Identify and preserve inherent thermal properties of the building and determine appropriate insulating measure for the characteristic features and climate.
- Evaluate material durability and expected service life of existing and replacement materials when considering repairs, rehabilitation, or replacement of walls and roofing. For example, a slate roofing shingle, which has a high upfront cost, can have a 75+ year lifetime, compared to an asphalt roofing shingle, which has a 10+ year lifetime.
- Retain, preserve, and repair character-defining features of walls and roofs, including finish materials, functional elements, and decorative features.
- Avoid making new penetrations or cuts through primary elevations, limiting air intake and ventilation through secondary elevations or through the roof. Seal new penetrations appropriately to prevent air and water entry.
- Install insulation and ventilation features so that it will not damage or result in loss of character-defining features of the building.
- New exterior wall and roof finish materials should convey a similar scale, texture, and visual appearance to those originally found on the building.
- Properties with significant historic interiors, avoid changes to the proportional relationships of wall to trim and wall to window.

LOWER COST STRATEGIES

ROOF INSULATION

- Consider adding either batt insulation in the attic floor to prevent heat gain and loss through the attic space or insulation hung along a sloped roof deck (be sure to allow for ventilation) to have a conditioned attic space.

ROOF VENTS & AIR CIRCULATION

- Provide attic vents to allow for air flow within the attic so moisture and condensation does not build-up. This could include louvers in gable ends, ridge vents, or soffit vents.
- Attic and ceiling fans can help vent and circulate air to improve the comfort of occupant.

ROOF & WALL AIR SEALING

- Evaluate areas that could have improper connections such as wall-to-roof connections. Improving these areas could reduce air leakage or heat transfer.
- Replace interior and exterior perimeter sealant, weather stripping, or loose and missing wall and roof sheathing.

HIGHER COST STRATEGIES

WALLS (WOOD FRAMED BUILDINGS)

- Provide additional wall insulation. Either from the exterior cavity insulation or interior insulation between the stud framing to increase thermal performance. When possible, provide continuous insulation without thermal breaks (such as studs or similar wall elements) interrupting the insulation.

WALLS (MASONRY BUILDINGS)

- Repoint exterior masonry to provide increased wall durability and limit the air and water infiltration to your building.
- Consult a building professional when considering insulation to avoid negative impacts to the durability of the masonry walls.

ROOF MEMBRANE

- Install a “cool-roof” membrane that reflects the sun and absorbs less solar radiation.

ROOF INSULATION

- Add roof insulation in conjunction with a roofing-membrane/system replacement project.

WINDOWS & DOORS

Windows and doors are important architectural features of older buildings in providing a sense of scale, craftsmanship, proportion, and architectural style. Historic windows come in a variety of styles and configurations and are typically constructed of wood with a painted finish. Windows require regular maintenance and repair. Replacement windows are a large expense and will only improve a limited area of the exterior enclosure. The typical ratio of fenestration to exterior wall surface area on historic buildings is around 20%, meaning the expense for full window replacements may not be a cost-effective solution given the long pay-back period based on the projected energy savings from the upgrade. Replacement windows may be justifiable if there is window failure. Upgrading the solid area of the exterior walls and roof and only performing moderate improvements to existing windows may provide better return on investment while preserving important character-defining features.

WINDOWS

Typical concerns regarding windows include operability, air infiltration, maintenance, and appearance. Generally, the appearance of a window that has not been properly maintained can seem significantly worse than its actual condition. Replacement of an entire window because of a deteriorated component, typically the sill or bottom rail, is rarely necessary. In many instances, selective repair or replacement of damaged parts and the implementation of a regular maintenance program is all that is required. It is generally possible to repair windows in fair or good condition relatively economically.

Maintenance

- Regularly review condition, repair, and repaint windows
- See NPS Preservation Brief 9 The Repair of Historic Wooden Windows

Improve Operation

- Verify that sash cords, chains and weights are functional- Install metal sliders or sash tape, balances, or operators at jambs if repair is not practical

- Repair or replace deteriorated components such as parting beads that separate window sash
- Remove built-up paint, particularly at jambs

Reduce Air Infiltration

- Replace broken glass (glazing)
- Install weather-stripping snugly between moving parts- Quality metal weather-stripping can last 20 years
- Re-caulk perimeter joints and remove and replace missing or cracked glazing putty
- Add sash locks to tighten windows
- Add interior or exterior storm window- A storm window can achieve similar R-values to a new thermal window

Reduce Solar Heat Gain or Loss

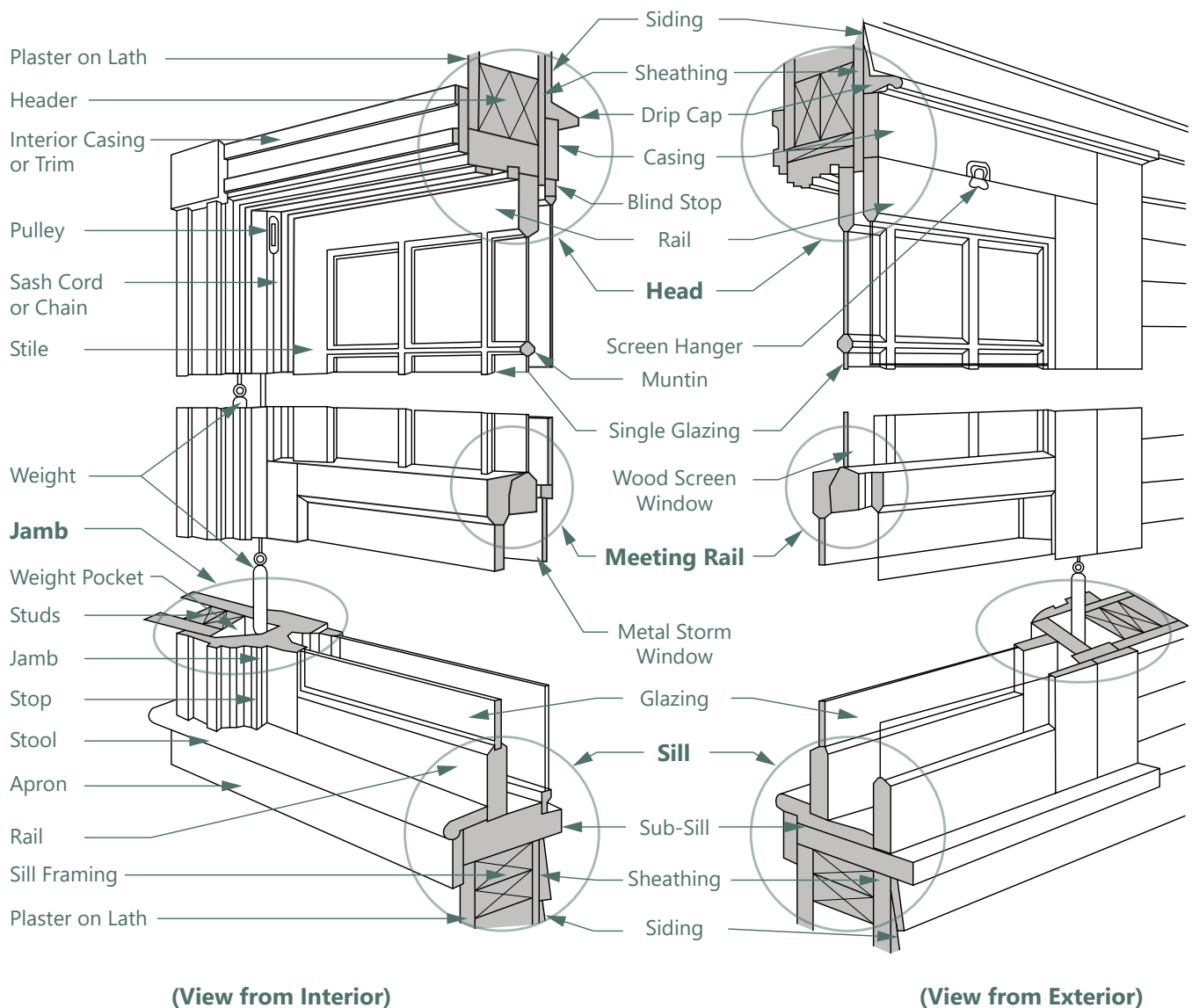
- Install and utilize operable exterior shutters where historically appropriate
- Install interior blinds, curtains, or UV window shades
- Plant deciduous trees at south and west elevations to block summer sun and allow in winter sun, and plant conifer trees at north to reduce effect of winter winds

Repair or Replace Existing Window Components

Deteriorated sills, sash and muntins are repairable by a craftsman with wood consolidate or replacement parts, retaining original fabric and function. In-kind replacement sash components and sills can be custom-made to replace deteriorated elements if necessary. Property owners are strongly encouraged to explore repair and selective replacement parts options prior to considering whole sash or frame replacement, particularly at historically significant buildings.

- **Sash-Only Replacement** - Installation of new sash in existing frame. Can include new jamb liners
- **Window Replacement Insert** - Installation of new sash and frame unit within existing opening. This typically reduces the overall size of the sash and glass, reducing interior daylight

WINDOWS & DOORS CONTINUED



Double-Hung Window Components

WINDOWS & DOORS CONTINUED

DOORS

Historic wood doors are also significant features and should be retained where possible. Historic doors have similar maintenance as windows. Regular painting and renewed weather stripping are the most effective low-cost strategies for improving energy performance. Replacement doors may have more thermal resistance, but doors are only a small area of the total exterior wall surface meaning it may not have a significant effect on the overall building energy performance. Regular maintenance and replacement of interior and exterior perimeter seals, gaskets, and weather stripping around windows and doors can significantly improve their energy performance.

Common Door Types

- **Hinged** – Swings to close at opposite jamb – almost always mounted at interior thickness of wall swinging inward
- **Double or Paired** – A pair of swinging doors that close an opening by meeting in the middle – includes French doors
- **Sliding** – Either a fixed panel with a horizontally sliding door or overlapping horizontally sliding doors – includes patio doors
- **Overhead** – Horizontal sections that open upward by sliding on tracks – most often found at garages

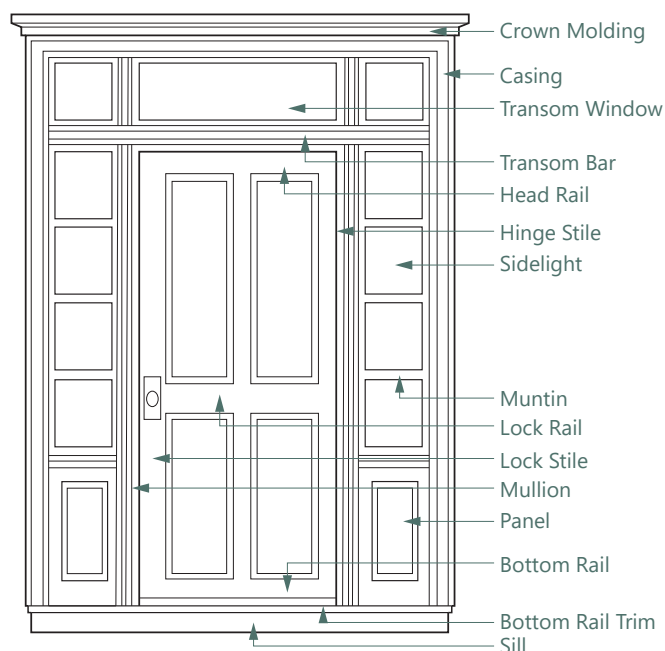
Common Door Styles

All door styles can have glazing installed in different configurations.

- **Batten** – Full height boards attached edge to edge with horizontal boards nailed to the verticals
- **Paneled** – A frame of solid wood parts with either glass or wood panels
- **Flush** – A single plain surface on its face, typically wood veneer

WALLS & ROOF GUIDELINES & TIPS

- Perform regular maintenance on older windows and doors to ensure functionality and weather tightness.
- Apply weather stripping, install storm windows and doors, and undertake basic repairs to windows and doors to improve thermal efficiency.
- Repair or reopen transoms to improve air flow and cross ventilation.
- Maintain, repair, or reinstall operational shutters and awnings.
- Retain, preserve, and repair original windows and doors unless repair is not a reasonable option.
- Replacement windows and doors on primary elevations should closely match the historic appearance. New windows and doors should fit properly within the original openings, replicate the pane configuration, dimensions and profiles of sash or door leaf, and match the finish and visual qualities of the historic windows and doors.



LOWER COST STRATEGIES

WEATHER STRIPPING

- Add weather stripping to existing windows, this can increase the energy efficiency of windows by up to 50%.
- Tighten and seal around the window and between the upper and lower sash to make the windows more energy efficient. Most of the heat loss through older and historic windows occur around the perimeter of the sash.
- Replace interior and exterior perimeter sealant and putty glazing, these components have significantly shorter lifespans than the wood and glass components.
- Use joint filler, caulk, glazing putty and sealants to seal cracks and opening on non-moving parts such as around frames and glazing.
- Use metal, silicone, rubber, or felt weather stripping on moving window elements to provide a tighter fit without sealing them shut.

LOCKING MECHANISMS

- Repair or replace locking mechanisms to prevent excess air and heat loss through the window perimeter.

WINDOW TREATMENTS

- Add interior shading or drapes to minimize heat gain or loss through windows.

HIGHER COST STRATEGIES

STORM WINDOWS/DOORS

- Install storm windows on the interior or exterior of an older window to improve thermal efficiency. Storm windows provide additional insulation in the air space between the existing window and the storm window. To be effective, ensure proper seal between both the glass and the frame and the frame of the wall.
- Install storm doors to improve the thermal performance of historic doors. Storm doors should be compatible with the appearance of the historic door, such as a fully glazed storm door with a frame that matches the existing door.

WINDOW REPLACEMENT

- If original windows are deteriorated beyond repair, replace existing windows with new insulated windows. Replacement windows should closely resemble the existing windows.
- When selecting replacement windows and doors considering choosing ones that are durable, repairable, and recyclable.

WINDOW RESTORATION

- If original windows are not deteriorated beyond repair, restoring the window is the best option for historic homes within the historic districts with original windows.

MECHANICAL SYSTEMS

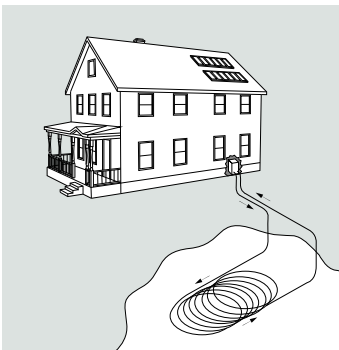
When considering installing or replacing mechanical systems in your historic home it is important to understand your options as mechanical system updates can have a large cost impact. Try to retrofit or update your mechanical systems when they are close to end of life use. Do not assume you have to replace an older system with the same type of older system. There are newer HVAC technologies that have significant benefits for historic buildings and the environment. An air-source heat pump system is one option; these systems do not necessarily require ductwork, which can be helpful when trying to limit damage to existing walls, ceilings, and building structures. These systems are also extremely quiet, energy efficient and customizable for zoned operation. Both air-source and ground-source heat pump systems do not burn fossil fuels; they use electricity to run a compressor. Ground-source heat pumps take advantage of the stable, underground temperature of the earth, ground-source heat pumps are the most efficient heating and cooling system available.

GROUND SOURCE HEAT PUMPS

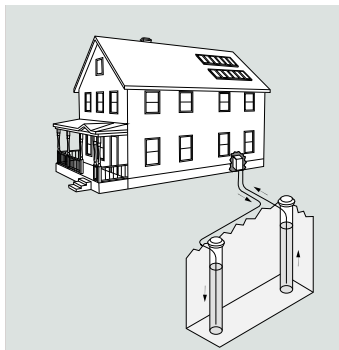
A ground-source heat pump (GSHP) is a central heating and cooling system that transfers heat to or from the ground. It uses the earth as a heat source or a heat sink. This design takes advantage of the moderate

temperatures in the ground to boost efficiency and reduce the operational costs of heating and cooling systems. A ground loop is a heat exchanger, like a cooling coil, that either extracts or adds heat to the ground. There are four types ground loop systems: horizontal, vertical, and pond/lake (closed-loop systems), and open loop. The type of system used depends on the climate, soil conditions, available land, and installation costs. The most common system for historic homes is generally vertical, closed loop.

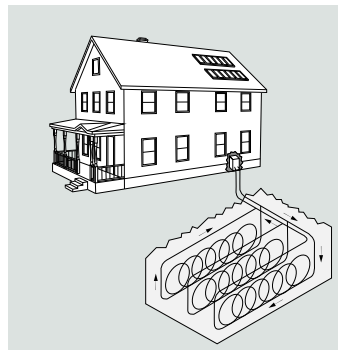
GSHPs are extremely efficient, last a long time, and are typically well suited for historic buildings because they require little equipment and are not visually intrusive to the historic character. Please note that the location of exterior mechanical unit is regulated by the zoning ordinance; and prohibited from a primary façade in Burlington. Screening may be required elsewhere. GSHP's require less equipment, have fewer moving parts, provide better zone space conditioning, and maintain better internal humidity levels than traditional HVAC systems. GSHPs can cut energy bills by up to 65%. The cost for a ground-source heat pump system can be high as they require drilling and placement of wells deep below grade, though typically, energy cost savings allow the investment to be recouped within two to ten years.



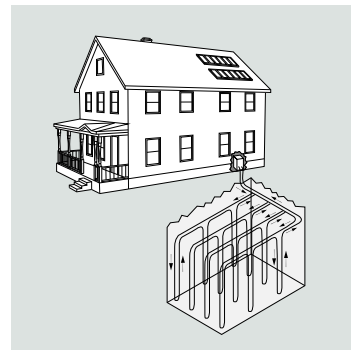
Pond/Lake Closed Loop System



Vertical Open Loop System



Horizontal Closed Loop System



Vertical Closed Loop System

AIR-SOURCE HEAT PUMPS

Air-Source Heat Pumps (ASHP) are heating and cooling systems that move heat into a home in the winter and draw heat out of the home in the summer. Instead of burning fossil fuels, they operate on the same principle as your refrigerator: using a refrigerant cycle, powered by electricity, to move heat and to keep your home at a comfortable temperature year-round. They are much more efficient than electric resistance (electric baseboard) heating and provide highly efficient air conditioning.

There are two main system types of air-source heat pumps: ducted or ductless. Ducted systems have an outdoor unit (like a central air conditioner), which is connected to an indoor air handling unit that connects to the home's ductwork. Ducted systems can work well for homes that already have ducts or where the homeowner is planning to install ducts. A version of ducted systems known as "compact-ducted" uses much smaller air handlers that usually serve two to four rooms.

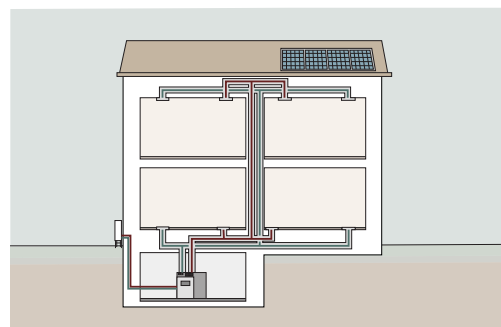
Ductless systems (including "mini-splits") have an outdoor unit which is connected to one or more indoor units (or "heads") by small copper refrigerant pipes. Each head typically serves one room or area of a house. Ductless heads can be mounted on a wall, mounted to the floor, or embedded in the ceiling. Ductless systems are a great option for houses that have no existing ductwork. Homes can be outfitted with a combination of ducted and ductless systems for a custom configuration that meets a home's needs.

The cost to install an air-source heat pump in your home will depend on the specific characteristics of the building, how much of your home's heating and cooling you want to cover with your heat pump system, the kind of system and the features you choose, and your installer. Air-source heat pumps have the lowest up-front installation cost of any low carbon heating or cooling solution and are also cost-competitive to operate compared to oil, propane, or electric heat.

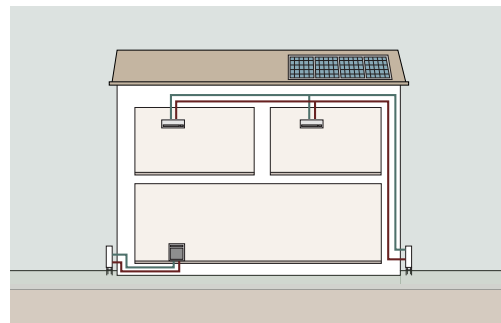
MECHANICAL SYSTEMS GUIDELINES & TIPS

- Determine which mechanical system is the best fit for your home and your home energy priorities
- Understand the costs of the mechanical system that is best for your home and plan how you will finance the project.

- Try contacting at least three installers to learn more about installing ground source or air-source heat pumps in your home. Installers may also give multiple quotes for different installation or unit configurations so you can understand all your options.
- If necessary, take preliminary measures to get your home ready for a new heating system, such as upgrading your electrical service or completing any weatherization work recommended in your home energy assessment, like sealing air leaks or installing insulation. If you are planning to improve the weatherization of your home, make sure your installer is aware so that they take the reduced heating and cooling needs of your home into account when designing your ground-source heat pump system.
- Talk to your installer about how long installation will take. Ground-source heat pump installations typically take between 2-4 weeks and air-source heat pump installations typically take between 3 days and 2 weeks, depending on home size, system complexity, and schedules of the driller and installer.



Ducted System



Ductless System

MECHANICAL SYSTEMS CONTINUED

DUCTLESS AIR-SOURCE HEAT PUMP

LOWER COST STRATEGIES

- If you're looking to use a ductless air source heat pump as your sole source of heating and cooling, an entire ductless system is going to be much more varied in cost because the required number of internal and external units will change based on the unique characteristics of your home.
- These units will have to be installed throughout the home in each zone you are looking to heat, or cool, so overall costs can range considerably.

DUCTED AIR SOURCE HEAT PUMP

HIGHER COST STRATEGIES

- Ducted (or central) systems tend to be more expensive, but more standardized in cost since the installer will simply need to replace your old air handling unit that is already connected to your existing ductwork with an air source heat pump.
- If your home does not have a duct system already, installing a complete duct network in your home will add a significant extra cost.

GROUND SOURCE HEAT PUMP

- Geothermal heating systems price varies depending on the type of loop system, vertical or horizontal are most common depending on available space. Horizontal loops are typically more cost effective than vertical loop systems, but you need adequate space to have a horizontal loop system installed.

SOLAR & GREEN ROOF SYSTEMS

There are a few different roof installations that can be implemented into your historic home that can be used to capture storm water or to generate renewable energy. Installations of such systems need to consider the building's structural capacity and architectural character.

PHOTOVOLTAIC (PV)/SOLAR SYSTEMS

Solar photovoltaic (PV) systems capture sun rays and convert the sunlight into electricity. These systems have the potential to be cost-effective and reliable producers of electricity for your home. When installing these systems in Burlington there may not be a perceptible change in the building's massing, height, or roofline, as seen from any major public street. These systems also cannot cover or obscure distinctive roof features or finishes on primary elevations. It is NOT recommended to install solar panels on slate roofs as they can be prone to damage during the installation process. If the primary roof of your building is slate, you may install solar on shed and porch roofs.

The PV system is built from solar cells, which consist of semiconductor materials that absorb sunlight and convert it into energy for immediate use or storage in batteries. There are a variety of solar cell materials available which vary in their appearance and efficiency. PV systems can be designed to meet the specific energy needs of a building and its users. Solar cells are interconnected with other cells to form flat-plate panels or modules that are installed on a building or in a rack to form a PV array. Panels can either be fixed in place or installed to track the movement of the sun throughout the day. Thin-film PVs make it possible for solar cells to double as roof shingles, roof tiles, building facades, and even glazing for skylights. These systems are new to the residential market but are increasing in popularity and effectiveness. Products such as solar roof shingles have the potential to integrate renewable solar energy in a subtle and attractive way on older existing buildings.



Solar array mounted on an historic home.



Solar shingles.

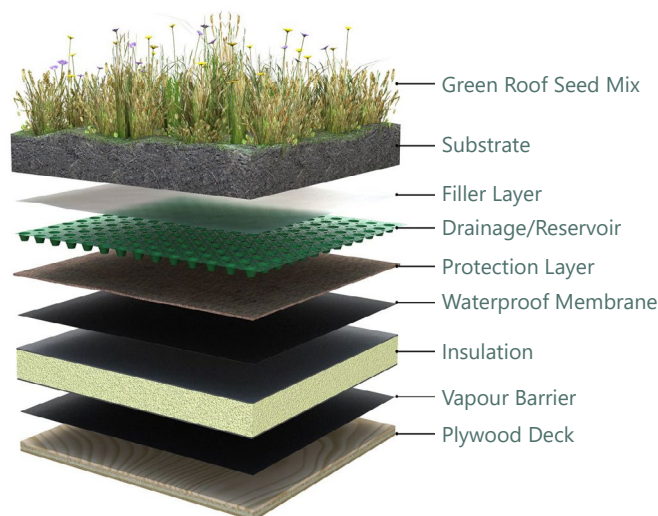
GREEN ROOFS

Green roofs can have many environmental benefits, they capture and slow storm water run-off, provide insulating qualities to a building, and reduce urban heat-island effect. A green roof typically includes the following components: a supporting structure, continuous waterproofing membrane, root barrier, a drainage layer/ moisture retention mat system, insulation, and soil and plantings. To provide a durable watertight long-term roofing assembly, the selection of an appropriate waterproofing membrane and the proper construction of detailing and base flashing is crucial. The soil media, insulation, and drainage/ moisture retention systems must all be designed to reduce the volume of runoff.

It's important to consult a licensed architect or engineer as a first step to determine whether the structural capacity of the existing roof can support the green roof installation. It may be necessary to supplement the existing structure. Additionally, a licensed roofing contractor or vegetative roofing supplier should be involved to assist in reviewing the relevant details, drainage, installation, and any suggested quality control measures for testing of the system.

SOLAR & GREEN ROOF GUIDELINES & TIPS

- Consult a structural engineer or architect to assess the roof's structural capacity when considering installing a green roof or roof-top solar array.
- Consult a specialist in green roofs or solar installations to ensure that the system is professionally designed and scaled for your building.
- Consider the life-expectancy of the existing roof and whether replacement should be undertaken prior to installing a green roof or solar array. The roof should be watertight and have adequate slope and drainage.
- When implementing roof installations retain original character-defining roof features and finish materials.
- Install green roofs and solar panels so that they do not result in a perceptible change in the building's massing, height or roofline, as seen from public street view, and do not cover or obscure distinctive roof features or finishes on primary elevations.
- For buildings with flat roofs, locate green roofs and solar installations back from the front edge of the roof (and from the exposed side edge for corner properties) to minimize their visibility from public street view.
- For buildings with sloped roofs, locate solar installations on secondary elevations to minimize their visibility from public street view, away from roof edges and ridges. Use low-profile panels set flush with the roof and in a complementary color with the roof finish to avoid a discordant or visually obtrusive appearance.



SOLAR & GREEN ROOF SYSTEMS CONTINUED

LOWER COST STRATEGIES

ROOF FINISH
GREEN ROOF

- Install a white roof finish to deflect sun and reduce heat gain.
- Install on a secondary building, such as a shed or garage.

HIGHER COST STRATEGIES

GREEN ROOF
SOLAR SYSTEM

- Install a green roof on the primary building.
- Install a solar photovoltaic system or solar thermal system.

LANDSCAPE & SITE FEATURES

Landscape and site features can cost effectively reduce energy use, resource consumption, and heating and cooling costs as well as improve the appearance of a property. These features can also help manage storm water and reduce heat island effect. Heat island effect is a phenomenon where extensive paved surfaces in urban areas raise the ambient temperature above the surrounding region. As a result, downtown is sometimes 10-15 degrees hotter than surrounding neighborhoods. Incorporating more vegetation in dense areas can reduce this effect.

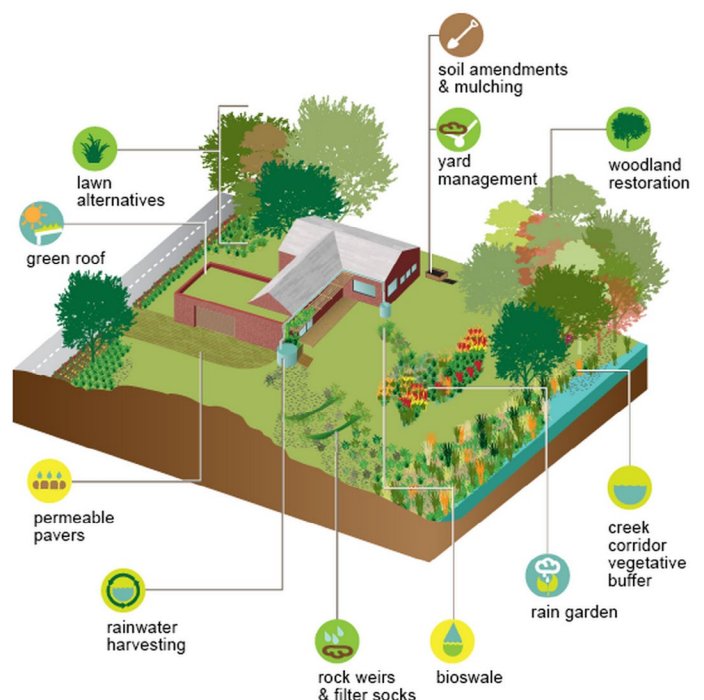
Existing landscape and site features that enhance building performance, manage storm water, and improve interior comfort should be maintained and supplemented. Strategies could include removal of paving and/or installation of permeable paving, installation of green roofs, reestablishment of tree canopy, incorporating bioswales or rain gardens and planter boxes, and rainwater harvesting. Bioswales are landscape elements designed to concentrate or remove debris and pollution out of surface runoff water. They consist of a swale drainage course with gently sloped sides (less than 6%) and filled with vegetation, compost and/or riprap. As the roofs of most buildings drain to the rear (rather than to the front) rainwater harvesting and the installation of bioswales and cisterns are most appropriate on side or rear yards. Paving should be limited in front yards to reduce impervious surfaces and to retain neighborhood character.

LANDSCAPE & SITE FEATURES GUIDELINES & TIPS

- Identify and retain existing sustainable features such as permeable paving and mature trees that block summer sun or serve as a wind break.
- Place new trees and landscaping away from foundations or basement walls to avoid moisture infiltration and damage from roots.
- Select plant and tree species according to their mature size to account for the long-term impact of mature growth.
- Prevent vines, ivy, and other plants from growing directly on the building as they can cause damage to the underlying materials.
- Consider permeable paving options when installing new or replacement paving. Avoid paving up to the building foundation with

impermeable surfaces as this can increase building temperature, cause damage to the foundation, and trap moisture.

- Ensure protection of nearby buildings, trees, site features, and known archaeological features when undertaking excavation or regarding for the installation of an underground cistern.
- Identify, preserve, and repair character-defining landscape features such as masonry walls, walkways, topographical features, plantings, or other man-made and natural features.
- Install new paving that is compatible with the character of the building and surroundings, using permeable paving if appropriate, for walkways, driveways, and patios.
- Install rain gardens, bioswales, and cisterns or other rainwater harvesting systems in a manner that is compatible with the landscape character of the property and surrounding context. Side and rear yards are typically the most appropriate place for larger landscape features that require substantial excavation or changes in topography.



Landscape and site features that can be integrated into your property to help reduce energy use and manage storm water.

LANDSCAPE & SITE FEATURES CONTINUED

LOWER COST STRATEGIES

LANDSCAPING

- Preserve existing trees and plants, particularly mature trees.
- Use native plants, shrubs, and well-placed trees to reduce water consumption and provide shade and wind protection.
- Maintain trees to promote health and avoid property damage.

COMPOSTING

- Compost food and yard scraps to enrich soil instead of using store-bought chemical fertilizers.

RAINWATER HARVESTING

- Collect and store rainfall from rooftops or other impervious surfaces in rain barrels or below ground cisterns for on-site use.
- Non-potable uses include irrigation, washing sidewalks cars or pets, refilling water features or swimming pools.

WATER EFFICIENT IRRIGATION SYSTEMS

- Install systems that reduce water consumption such as drip irrigation, soaker hoses, moisture sensors, and timers.

HIGHER COST STRATEGIES

PERMEABLE PAVING

- Install permeable paving materials to allow stormwater to filter through voids or pervious joints in the surface where it is captured in underground layers of soil and gravel.
- Examples include porous asphalt, porous concrete, brick pavers, vegetated permeable pavement, and interlocking pavers.

RAIN GARDENS AND PLANTER BOXES

- Use shallow vegetated basins or planter boxes to capture and store stormwater runoff and pass it through a filter bed of engineered soil composed of sand, soil, and organic matter. Filtered runoff may be collected and returned to a storm sewer or allowed to infiltrate into the soil.

RAINWATER HARVESTING- UNDERGROUND CISTERNS

- Install an underground cistern to collect and store rainfall from rooftops or other impervious surfaces for later use.
- Residential cisterns typically have a capacity between 1,500-5,000 gallons. Most cisterns have a standard pressurized plumbing system that conveys water to the house or wherever needed for use.



ADDITIONAL RESOURCES

GENERAL RESOURCES

- [Burlington Electric Department](#)
 - › [Net Zero Energy Roadmap](#)
 - › [Energy Efficiency Annual Report \(2020\)](#)
- [Burlington 2030 District](#)
- [Vermont Green Building Network](#)
- [Efficiency Vermont](#)
- [Vermont Gas](#)
- [Department of Public Service – Vermont Energy Saver](#)
- [City of Burlington Department of Permitting and Inspections](#)
- [Burlington Lead Program](#)

FINANCING RESOURCES

- [Burlington Electric Department Energy Efficiency Audit Program](#)
- [Burlington Electric Department Rebates](#)
- [Efficiency Vermont Rebates](#)
- [Vermont Gas Residential Rebates](#)
- [Vermont Gas Commercial Equipment Rebates](#)
- [Vermont Renewable Energy Resource Center](#)
- [VEDA Energy Financing](#)
- [VEDA Commercial Energy Loan Program](#)

HISTORIC PRESERVATION RESOURCES

- [National Park Service Preservation Briefs](#)
- [NPS Standards for Rehabilitation](#)
- [City of Burlington Historic Preservation](#)
- [State of Vermont Historic Preservation](#)
- [Building Green](#)

Burlington Design Advisory Board

645 Pine Street
Burlington, VT 05401
www.burlingtonvt.gov/DPI/DAB
Phone: (802) 865-7188

Matthew Bushey
Ron Wanamaker
Karyn Norwood
Emily Morse
Vacant
Jay White, Alt.
Kathleen Ryan, Alt.



DESIGN ADVISORY BOARD Tuesday August 10, 2021 3:00 PM Hybrid remote/in person meeting

Zoom Invite:

Please click the link below to join the webinar:

<https://us02web.zoom.us/j/86291869006?pwd=RjRxNWxYM0xmcTlob2paUGhHaUdmUT09>

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International numbers available: <https://us02web.zoom.us/j/86291869006>

Agenda

Session I – 3:00 PM – 3:30 PM

ZP-21-213; 38 Latham Court (RL, Ward 1E) Mark McGee

Continued review for demolition of garage and construction of two-story addition on existing single family home: First floor shop and second floor office space. Roof replacement, patio door and window replacements on rear of existing house. (Project Manager, Mary O'Neil)

Session II – 3:30 PM – 4:00 PM

ZP-21-475; 221-223 North Champlain Street (RM, Ward 3C) Matthew Napolitan and Lewis Creek Builders

Continued review from July 13, 2021: Removal of rear first story and build new two story addition on existing foundation. (Project Manager, Mary O'Neil)

Session II - I 4:00-4:30

Historic Preservation Review Committee

Final Review of Historic Preservation / Energy Efficiency document, prepared in partnership with Burlington Electric under grant funding 07110-VT-20-10004 (2020.)

Non-Discrimination

The City of Burlington will not tolerate unlawful harassment or discrimination on the basis of political or religious affiliation, race, color, national origin, place of birth, ancestry, age, sex, sexual orientation, gender identity, marital status, veteran status, disability, HIV positive status, crime victim status or genetic information. The City is also committed to providing proper access to services, facilities, and employment opportunities. For accessibility information or alternative formats, please contact Human Resources Department at (802) 540-2505.

The programs and services of the City of Burlington are accessible to people with disabilities. Individuals who require special arrangements to participate are encouraged to contact the Department of Permitting & Inspections at least 72 hours in advance so that proper accommodations can be arranged. For information call 865-7188.

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Burlington Design Advisory Board

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Burlington, VT 05401

<http://www.burlingtonvt.gov/DPI/Boards/Design-Advisory-Board/>

Telephone: (802) 865-7188

Matt Bushey, Chair
Ron Wanamaker
Karyn Norwood
Emily Morse
vacant
Jay White, Alternate
Kathleen Ryan, Alternate



DESIGN ADVISORY BOARD

Tuesday August 10, 2021

645 Pine Street and via Zoom

Present: Karyn Norwood, Ron Wanamaker, Matthew Bushey, and Kathleen Ryan (alternate)

Absent: Jay White (alternate), Emily Morse

Staff present: Scott Gustin

Agenda

Session I – 3:00 PM – 3:30 PM

1. ZP-21-213; 38 Latham Court (RL, Ward 1E) Mark McGee

Continued review for demolition of garage and construction of two-story addition on existing single family home: First floor shop and second floor office space. Roof replacement, patio door and window replacements on rear of existing house. (Project Manager, Mary O'Neil)

Present: Mark McGee and Warren Irish.

Motion by Matt Bushey: I move we recommend project approval per the staff comments and forward to the Development Review Board.

2nd: Ron Wanamaker

Vote: 3-1-0.

Motion carries.

Session II – 3:30 PM – 4:00 PM

2. ZP-21-475; 221-223 North Champlain Street (RM, Ward 3C) Matthew Napolitan and Lewis Creek Builders

Continued review from July 13, 2021: Removal of rear first story and build new two story addition on existing foundation. (Project Manager, Mary O'Neil)

Present: Chris Swasey and Jackie Esperti.

Motion by Ron Wanamaker: I move we recommend approval of the revised project plans. We encourage the applicant to center the dormer and to widen the lower exterior walls relative to the upper exterior walls.

2nd: Karyn Norwood

Vote: 4-0-0.

Motion carries.

Session III – 4:00 PM – 4:30 PM

Historic Preservation Review Committee

Final review of Historic Preservation/Energy Efficiency document, prepared in partnership with Burlington Electric under grant funding 07110-VT-20-10004 (2020).

This item was deferred to the next DAB meeting.

3. Adjournment

3:50 PM.