
The Pretty Good House
A GUIDE TO CREATING BETTER HOMES

THE **PRETTY GOOD** HOUSE **RENOVATION**

Most of building-science discussion is about new construction... That's because it's easier: you're starting with a blank slate and can design all the details to work together. We know, though, that the vast majority of people are moving into an existing house, and the number of renovations dwarfs the number of new house builds.

The building science of renovation is much trickier... There are innumerable conditions you can't be sure of without demolition. You are retrofitting solutions onto existing conditions. However, there is no question that buying an existing house is much better for the planet. You are avoiding the carbon load of an entire house (or at the very least what you save of the house). It will take a long time for even a superefficient new home to save the carbon already in place in an existing home. And if there's one thing we know we don't have much of, it is time. Still, if the vast majority of people are moving into existing houses... why wasn't the Pretty Good House book written as the Pretty Good Renovation book? **Mostly because it's much harder to come up with general rules about renovation.**

That's why, instead of writing a one-size-fits-all guide, we've put together a collection of case studies. These stories start in the Northeast and will grow to include homes across the country. By looking closely at each renovation—its location, its challenges, and the choices made along the way—we can better understand what made it thoughtful, resilient, and yes, a pretty good renovation. It's in the nuances of what's already there that we start to see shared lessons—and, hopefully, find a bit of inspiration too...

ROUGH DRAFT
5 JUNE 2025

A COMPENDIUM OF

PRETTY GOOD RENOVATIONS

IN THE NORTHEAST

"The greenest building is the one that is already built."

Carl Elefante, preservation architect

There are over 85 million existing single-family houses in America. Roughly 40 million of them were built before the 1970's oil crises... and the increased use of insulation and double-pane windows that followed. These old houses comprise the fabric of our neighborhoods, towns and cities. Most are well constructed. Many have elegant architectural details. These are the places that many of us call home. They are worth preserving.

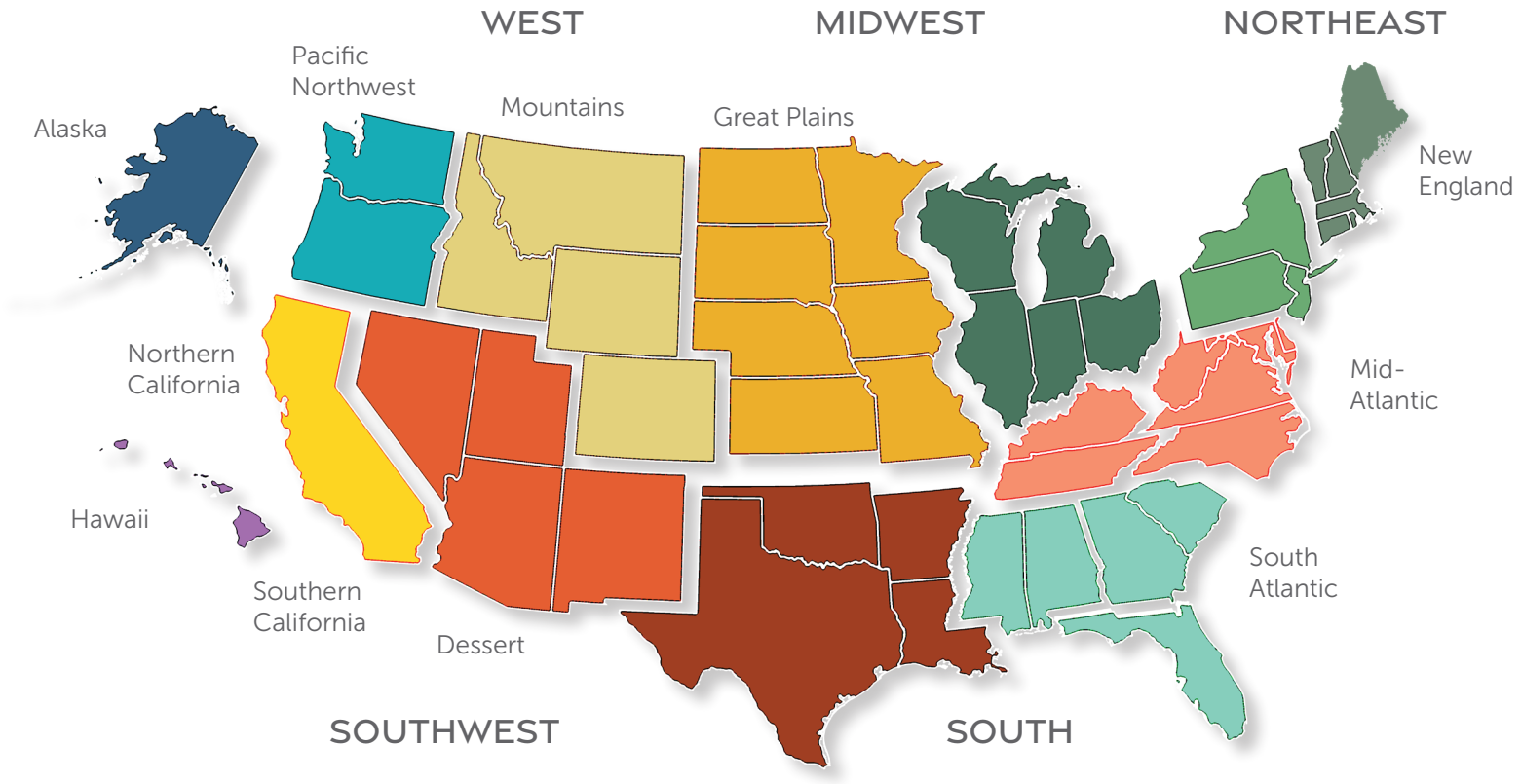
Cities and states are setting energy efficiency and decarbonization targets for the years 2030 and 2050. Much attention is being given to new construction, but it has been projected that 80% of the houses in 2050 already exist. What are the best practices for stewarding existing homes for the 21st century?

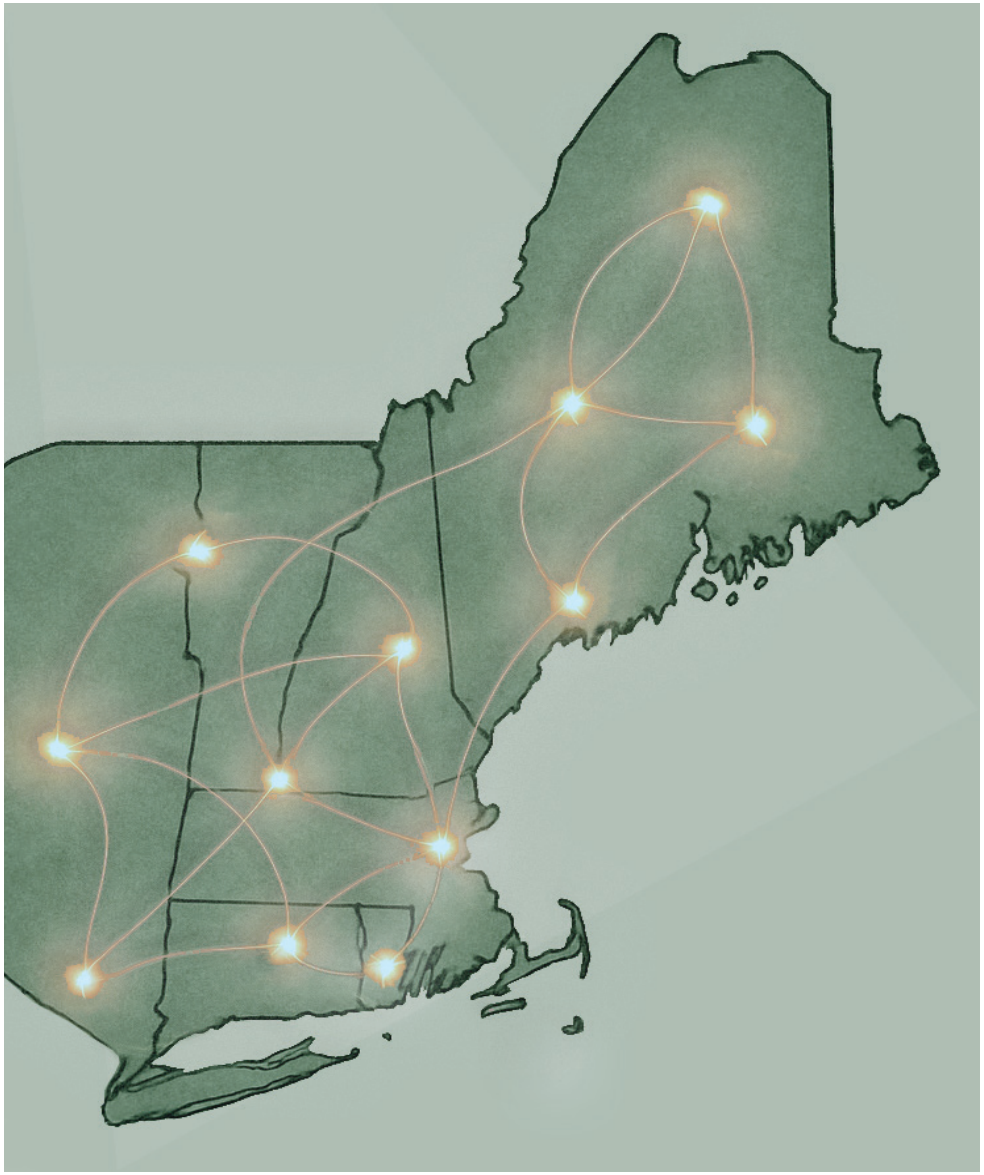
- *How should we prioritize our actions, when undertaking a renovation?*
- *How do we strike a balance between the concerns of historical commissions and the new energy codes that are being enacted?*
- *What is the best way to weatherize a damp fieldstone basement?*
- *In the end, how do we know if we have done a good job?*

The mission of this Compendium is to share the good work being done by contractors, architects, designers and homeowners around the Northeast. We are all in this together. By sharing what we got right... and what we got wrong... we will all get better faster.

CASE STUDIES by US REGIONS

To ground each renovation in its unique context, this compendium is organized by region. Climate, culture, materials, and building traditions all vary by place—and so do the challenges and opportunities of renovation. Grouping projects regionally allows readers to see how designers, contractors, and homeowners responded to local conditions, codes, and community needs. It's a way to highlight what makes each solution not only pretty good—but also perfectly suited to its place.





NORTHEAST REGION

RENOVATION	TYPE
ENERGY RETROFIT, *minimal renovations to house*	I
LIGHT TO MODERATE RENOVATIONS, *ittle change to house footprint*	II
EXTENSIVE RENOVATIONS, *typically with additions to house footprint*	III

1. CONNECTICUT
a. TBD

2. MAINE
a. Portland

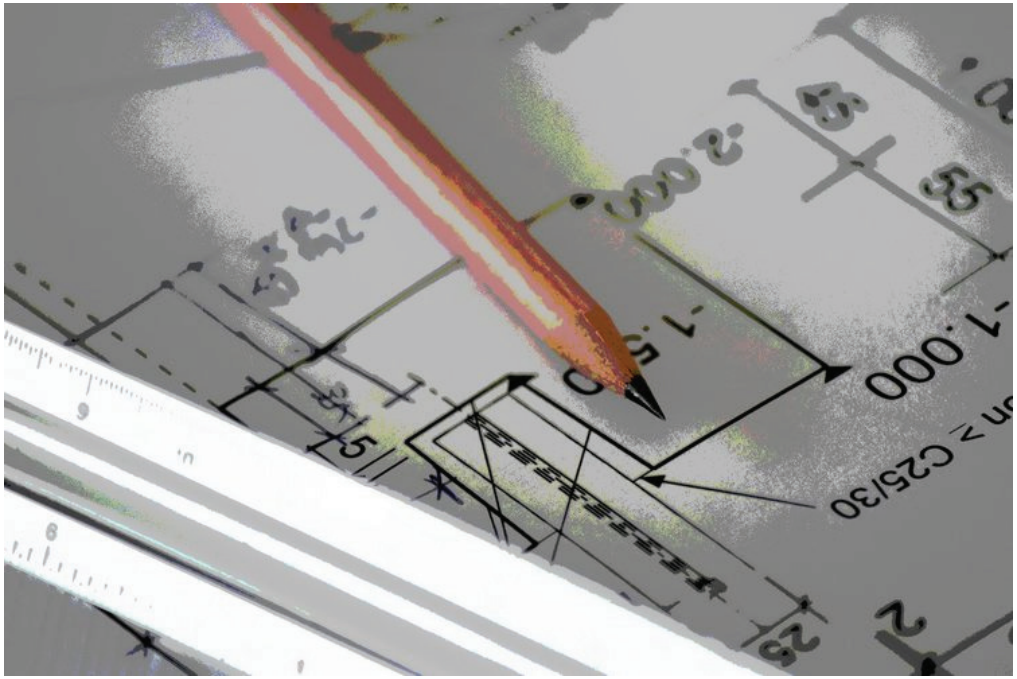
3. MASSACHUSETTS
a. Arlington — II
b. Great Barrington — II
c. Sherborn
d. Somerville — III

4. NEW HAMPSHIRE
a. TBD

5. NEW YORK
a. Germantown
b. Stone Ridge

6. RHODE ISLAND
a. Providence 1 — II
b. Providence 2

7. VERMONT
a. Bellows Falls — III
b. Dorset — III
c. Montpelier



RENOVATION METHODOLOGY

1. Assessment of Existing Conditions

2. Enclosure retrofits

a. Air sealing of envelope
b. Roof & attic insulation
c. Wall insulation
d. Windows & exterior doors
e. Basement insulation

3. Mechanical upgrades

a. HVAC system
b. Energy recovery ventilation (ERV)
c. Domestic water heater
d. Major appliances

4. Solar & Renewables

a. Solar voltaic panels (PV)
b. Solar batteries

PERFORMANCE VERIFICATION

1. Blower door testing
a. Before
b. After

2. Infrared camera diagnostics
a. Before
b. After

3. HERS Index & HERS Carbon Index
a. Before
b. After

4. Utility Bills
a. Before
b. After

5. Air Monitor
a. Before levels of indoor air pollution
b. After levels of indoor air pollution

RESOURCES

BOOKS

- PRETTY GOOD HOUSE: A Guide to Creating Better Homes
- SUSTAINABLE PRESERVATION: Greening Existing Buildings
- RENOVATION 5th Edition
- BUILDINGS DON'T LIE: Better Buildings by Understanding Basic Building Science

WEBSITES

- GREEN BUILDING ADVISOR
- BUILDING SCIENCE CORPORATION
- PHIUS REVIVE
- FINE HOMEBUILDING

ARTICLES & PAPERS

- NPS Preservation Briefs

ORGANIZATIONS

- CLIMATE HERITAGE NETWORK
- APTNE - Association for Preservation Technology Northeast
- NESEA - Northeast Sustainable Energy Association

A COMPENDIUM OF

PRETTY GOOD RENOVATIONS

IN THE NORTHEAST

CASE STUDY 3d

Type III

Somerville
MASSACHUSETTS

1874 Eastlake Victorian Style balloon-framed house
Full renovation in 2021

PROJECT TEAM

Architect: ROYER ARCHITECTS

Contractor: UBR GROUP LLC

HERS Rater: ADVANCED BUILDING ANALYSIS

PROJECT OVERVIEW

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5 JUNE 2025

BEFORE | FRONT VIEW

AFTER | FRONT VIEW

The house is a three-story single family with a finished basement. While built in the 1874, it was gut-renovated in 2021.

A small expansion was made on the South side to add space and sunlight to the Kitchen and Primary Bedroom.

Details that were inspired by the Owner's European ancestry and American Victorian architecture were added to the exterior and interior.

Closed cell foam insulation was sprayed into the walls and roofs. Exterior insulation was applied to parts of the house. New Andersen A-Series windows were installed.

FLOOR PLANS

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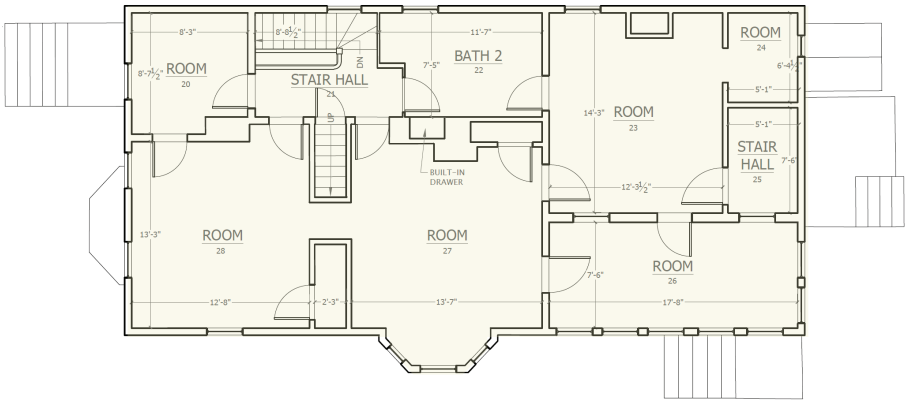
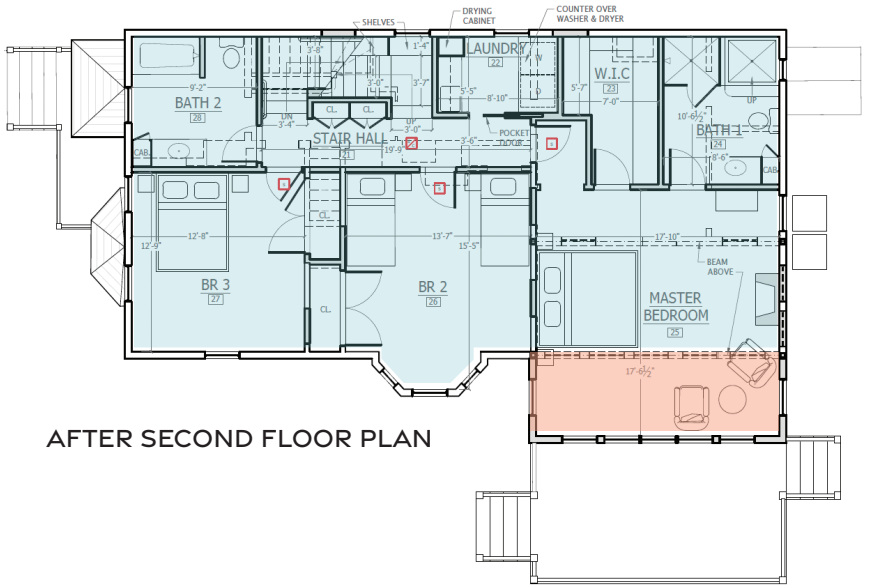
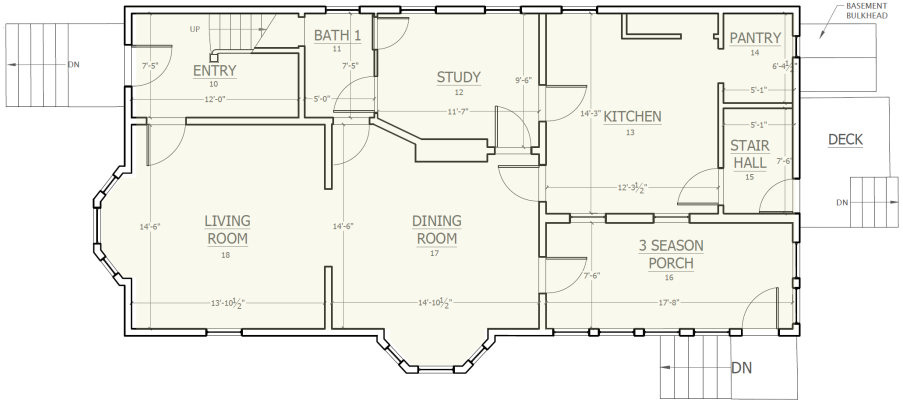
5 JUNE 2025



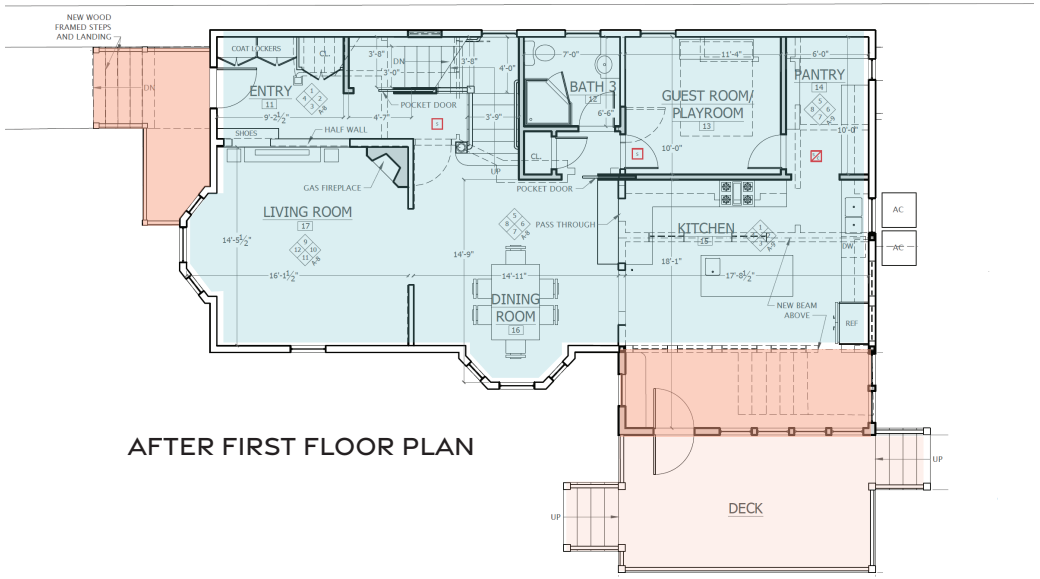
BEFORE SECOND FLOOR PLAN



AFTER SECOND FLOOR PLAN



BEFORE FIRST FLOOR PLAN



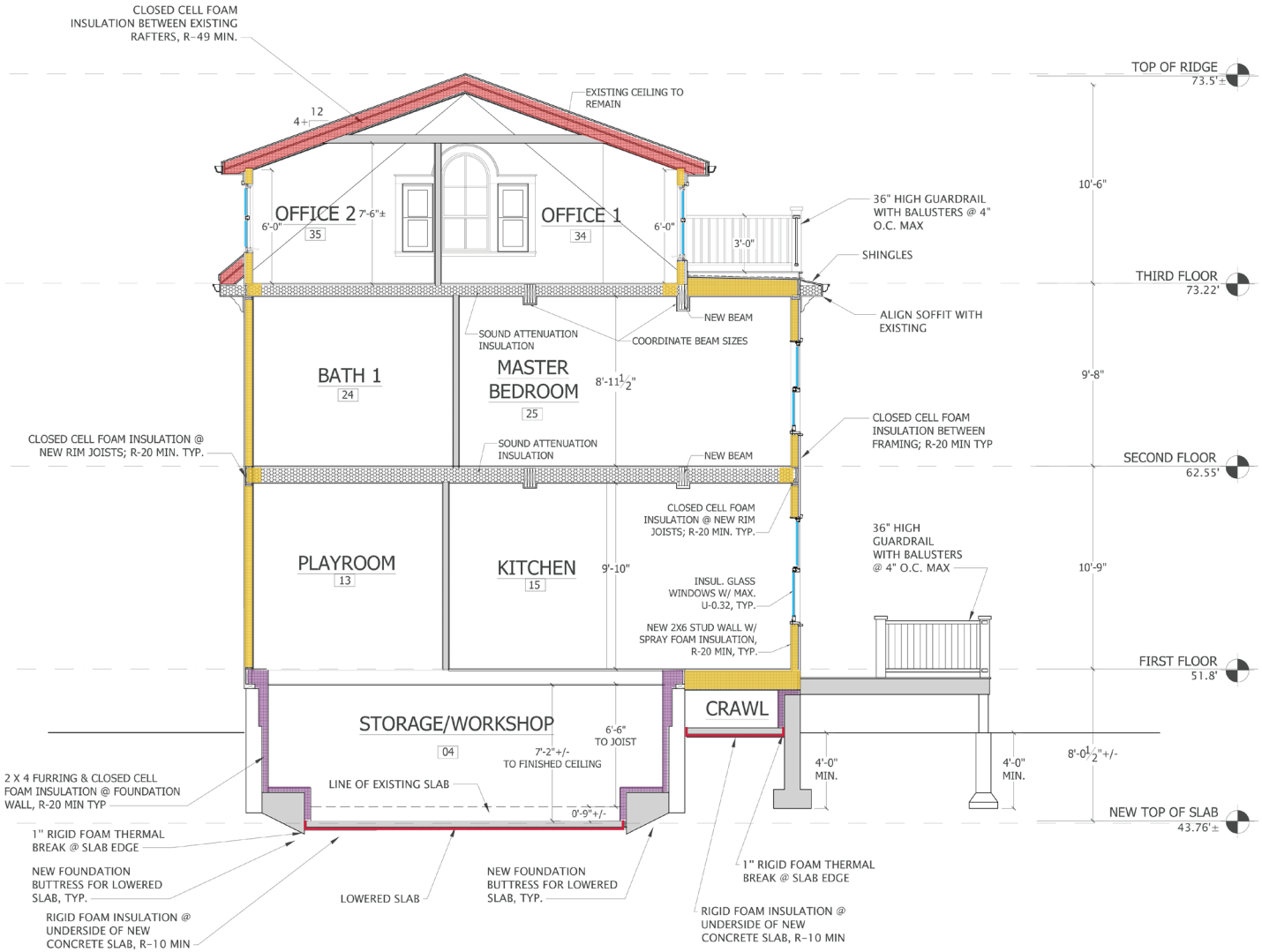
AFTER FIRST FLOOR PLAN

EXISTING
RENOVATION
NEW CONSTRUCTION

0’ 10’ 20’ 30’

N

BUILDING SECTION



CLOSED CELL FOAM INSULATION BETWEEN EXISTING RAFTERS; R-49 MIN.

CLOSED CELL FOAM INSULATION BETWEEN FRAMING; R-20 MIN.

2X4 FURRING & CLOSED CELL FOAM INSULATION @ FOUNDATION WALL; R-20 MIN. TYP.

RIGID FOAM INSULATION @ UNDERSIDE OF NEW CONCRETE SLAB; R-10 MIN.

INSULATED GLASS WINDOWS W/MAX. U-32, TYP.

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PROJECT DATA SUMMARY

1. **LOCATION:** Somerville, MA
2. **IECC CLIMATE ZONE:** 6A
3. **YEAR BUILT:** 1874
4. **YEAR RENOVATED:** 2021
5. **LIVING AREA:**
   BEFORE: *AFTER:*
6. **BEDROOMS/BATHROOMS:**
   BEFORE: *AFTER:*
7. CONSTRUCTION
   FOUNDATION:
   WALLS:
   ROOF:
8. INSULATION
   SUBSLAB:
   FOUNDATION:
   ABOVE-GRADE WALL:
   ATTIC FLOOR/ROOF:
9. **HVAC:**
   BEFORE: *AFTER:*
10. **MECHANICAL VENTILATION:**
    BEFORE: NONE *AFTER:*
11. **DOMESTIC HOT WATER:**
    BEFORE: *AFTER:*
12. **PV SYSTEM CAPACITY:**
    BEFORE: NONE *AFTER:*
13. **AIR LEAKAGE:**
    BEFORE: *AFTER:*
14. **HERS INDEX:**
    BEFORE: *AFTER:*

(NOT AVAILABLE)

Home Energy Rating Certificate

Final Report

Rating Date: 2021-09-21
Registry ID: 738325040
Ekotrope ID: zLOBYOp2

HERS® Index Score: 36

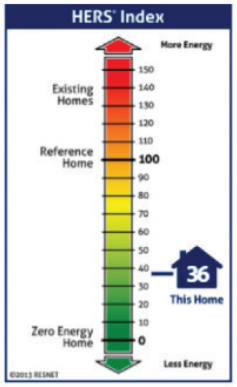
Your home's HERS score is a relative performance score. The lower the number, the more energy efficient the home. To learn more, visit www.hersindex.com

Annual Savings $7,077

*Relative to an average U.S. home

Your Home's Estimated Energy Use:

	Use [MBtu]	Annual Cost
Heating	30.5	$1,060
Cooling	1.5	$106
Hot Water	31.5	$413
Lights/Appliances	28.4	$1,999
Service Charges		$214
Generation (e.g. Solar)	15.7	-$1,106
Total:	**91.9**	**$2,685**



Home Feature Summary:

Home Type:	Single family detached
Model:	remodeled existing home
Community:	N/A
Conditioned Floor Area:	4,358 ft²
Number of Bedrooms:	3
Primary Heating System:	Air Source Heat Pump • Electric • 3.81008206 COP
Primary Cooling System:	Air Source Heat Pump • Electric • 24 SEER
Primary Water Heating:	Boiler • Natural Gas • 0.8075 Energy Factor
House Tightness:	1109 CFM50 (1.54 ACH50)
Ventilation:	51 CFM, 53 CFM • 49.6 Watts, 47.9 Watts
Duct Leakage to Outside:	Untested Forced Air
Above Grade Walls:	R-20
Ceiling:	Vaulted Roof, R-49
Window Type:	U-Value: 0.29, SHGC: 0.3
Foundation Walls:	R-20

ekotrope

IMAGES

BEFORE | SOUTH SIDE VIEW

AFTER | SOUTH SIDE VIEW

BEFORE | INTERIOR VIEW

AFTER | INTERIOR VIEW

LESSONS LEARNED SUMMARY

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I. INSULATION PERFORMANCE & THERMAL BRIDGING

What Worked: Closed-cell foam insulation in walls and roofs significantly improved airtightness and thermal resistance.

Challenges: Some areas with only exterior insulation may still experience thermal bridging, particularly at structural connections and transitions between materials. Future renovations could focus on continuous insulation strategies.

2. AIR SEALING & MOISTURE MANAGEMENT

What Worked: Closed-cell foam insulation provided an effective air barrier, reducing drafts and potential heat loss.

Challenges: Older homes often have complex framing and hidden air gaps. Verifying the effectiveness of air sealing with a blower door test ensures there are no unintended leaks.

3. WINDOW UPGRADES & PERFORMANCE

What Worked: Andersen A-Series windows improved energy efficiency while maintaining historic aesthetics. Their low-E coatings and tight seals contribute to better temperature regulation.

Challenges: Window installations in older homes must be carefully flashed and sealed to prevent air and moisture infiltration, particularly where new materials meet existing structures.

4. BASEMENT CONDITIONING & ENERGY EFFICIENCY

What Worked: Insulating a finished basement helps maintain comfortable temperatures and prevents heat loss.

Challenges: Ensuring proper moisture control is critical in basements. A vapor barrier or proper drainage may be needed to prevent condensation issues.

5. IMPACT ON HERS RATING & FUTURE IMPROVEMENTS

What Worked: These upgrades likely resulted in a significantly lower HERS Index Score than a typical 1880s home.

Challenges: Further improvements, such as high-efficiency HVAC systems, solar panels, or heat pump water heaters, could enhance energy performance even more.