



IN THE WOODS-
ALEX CARVER
NORTHERN TIMBERS
CONSTRUCTION



RIVER VIEW-
TOM LEOEUF
NORTHEAST CRAFTSMEN GROUP
AND H.J. LEOEUF INC.



LAKE DUNMORE-
JARED MOATS
STRUCTURAL ENERGY
CORPORATION

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THREE HIGH-PERFORMANCE HOMES, THREE APPROACHES

PRESENTATION GOALS

EXPLAIN BASIC PERFORMANCE TARGETS OF HIGH PERFORMANCE HOME DESIGN

ELEMENTS OF A HIGH PERFORMANCE ENVELOPE SYSTEM

- COMPARE PERFORMANCE, COST AND CONSTRUCTABILITY
- CONSTRUCTION CHALLENGES AND TRADE-OFFS

DESIGN ELEMENTS FOR UNIQUE HIGH PERFORMANCE HOMES

- TAKING ADVANTAGE OF SOLAR AND SITE FEATURES
- MEETING CLIENTS' NEEDS, PERSONALITIES AND LIFESTYLES



COMMON FEATURES & GOALS

SMALL LOTS WITH NEIGHBORS

INDOOR/ OUTDOOR CONNECTION TO LAND

FULL TIME RESIDENCES FOR EMPTY
NESTERS OR RETIREES

DESIRE FOR OPEN LIVING SPACE

NEED FOR OFFICE/STUDY/STUDIO ENTRY/
MUDROOM

POTENTIAL FOR SINGLE LEVEL LIVING

MINIMIZE ENERGY AND MAINTENANCE COSTS

HELP COMBAT CLIMATE CHANGE



EFFICIENCY VERMONT HIGH PERFORMANCE HOME SUMMARY

(VERMONT CLIMATE: 6500-8000+ HHD DEPENDING ON LOCATION AND ELEVATION)

ENVELOPE:

R-30 BASEMENT WALLS, SLAB PERIMETER AND UNDER SLAB

R-40 ABOVE GRADE WALLS

R-40 EXPOSED FLOORS

R-60 CEILINGS- FLAT OR SLOPED

R-5 WINDOWS (MAX U= .21)

R-4 DOORS (MAX U= .25)

1 ACH50 MAX. BLOWER DOOR RESULT

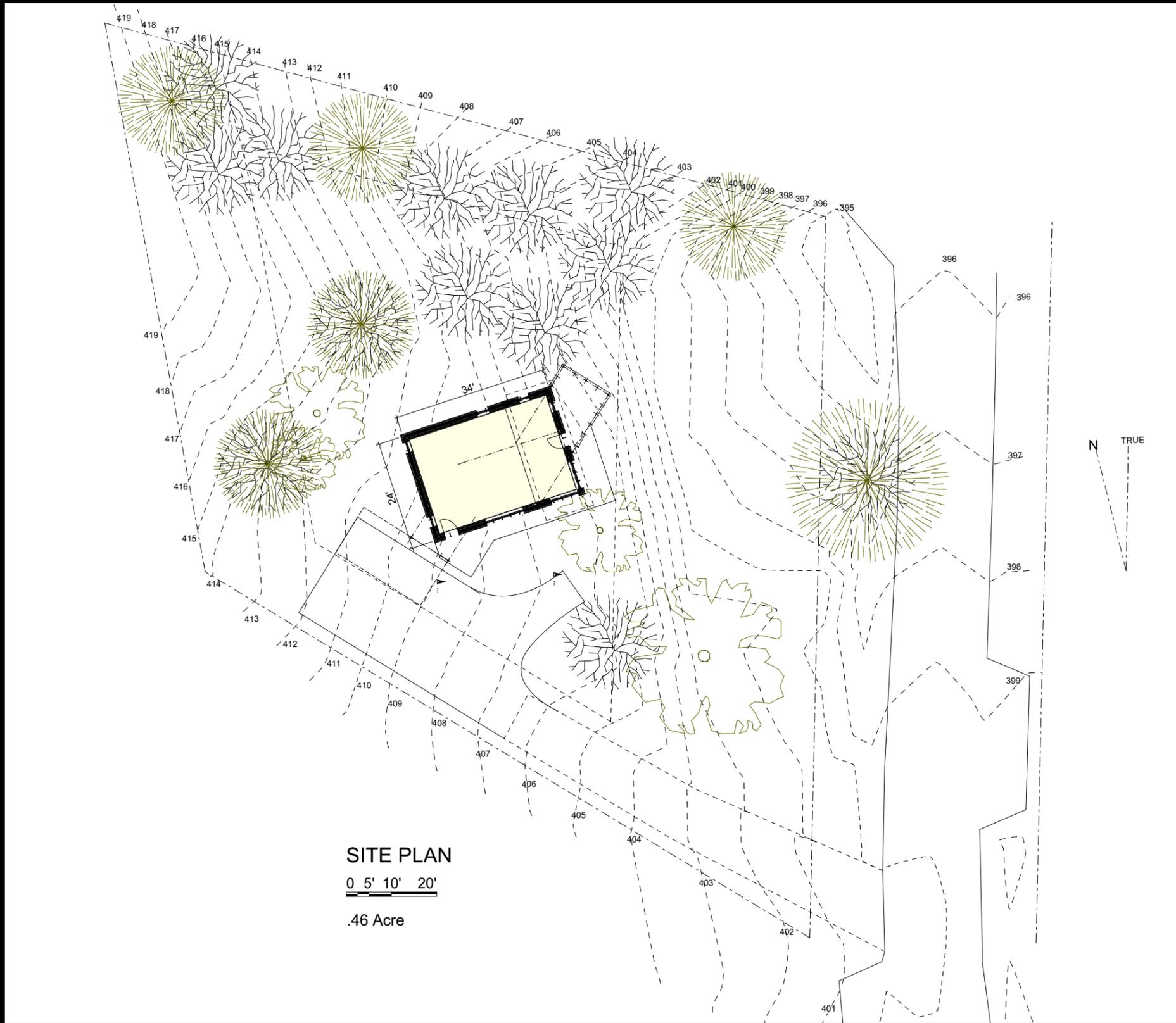


EFFICIENCY VERMONT HIGH PERFORMANCE HOME SUMMARY

SYSTEMS:

- EFFICIENT HEAT RECOVERY VENTILATION
- HEAT PUMP or ENERGY STAR RATED HEATING SYSTEM
- HEAT PUMP HOT WATER HEATER or ELECTRIC HOT WATER WITH DRAIN WATER HEAT RECOVERY
- ENERGY STAR APPLIANCES
- 95% ENERGY STAR LED AND/OR CFL LIGHTING





IN THE WOODS
SITE AND SITE PLAN

Program:

Home and yoga studio

Small lot .4 acres

Sun and Privacy

2 BR

Place to write

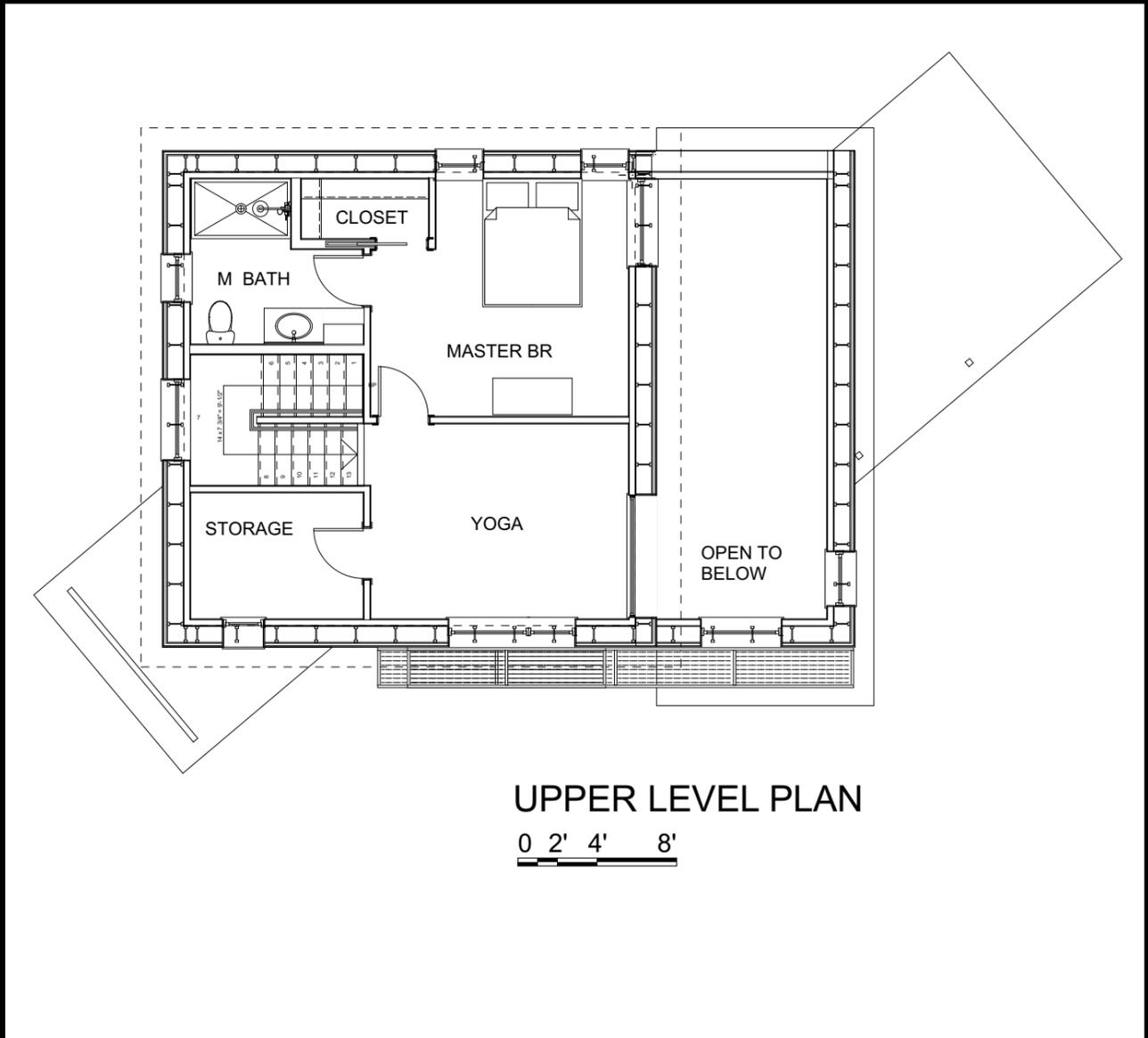
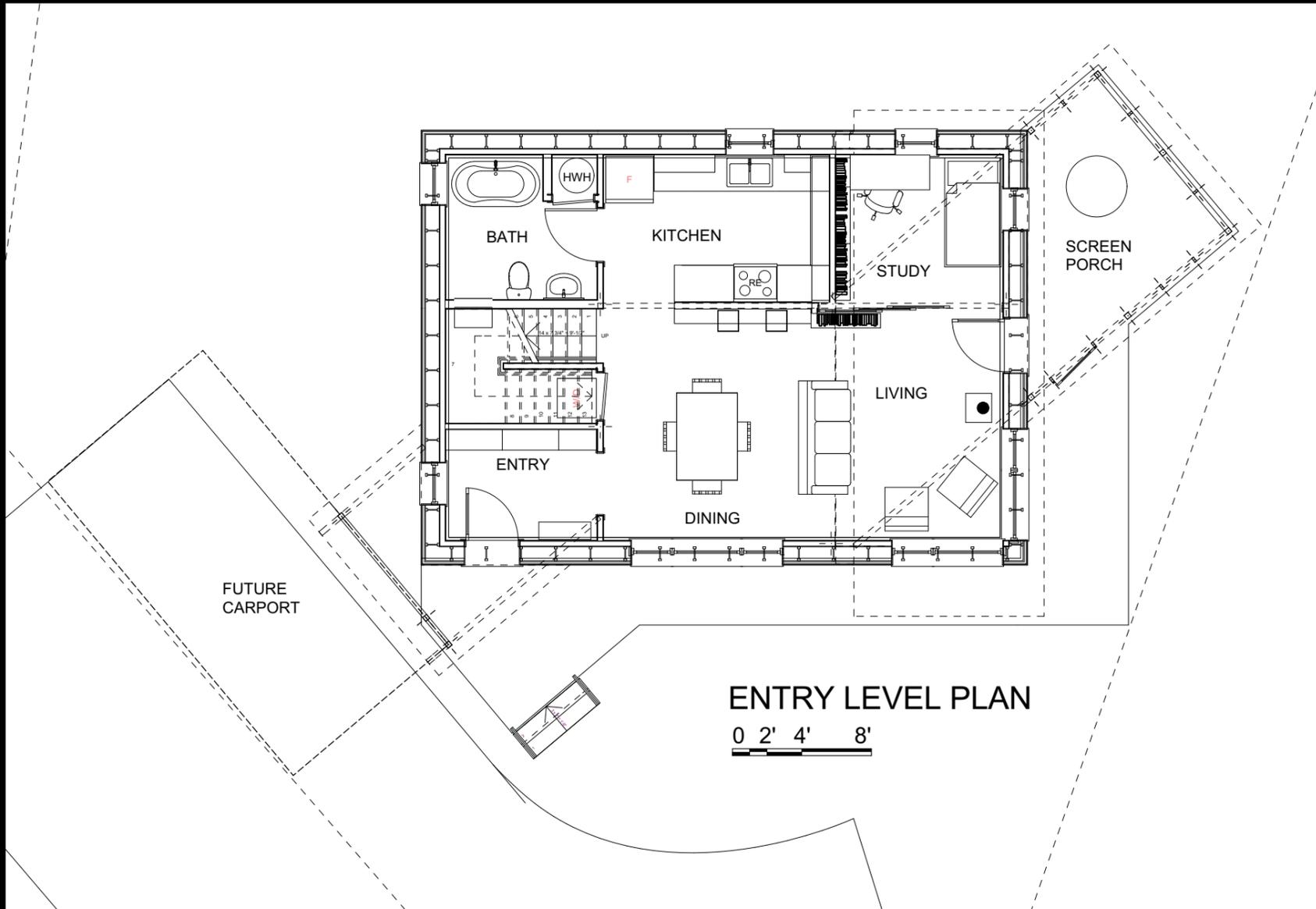
Desire for angle in design

Cathedral ceiling



IN THE WOODS

GOALS, INSPIRATION & CONSTRAINTS





HVAC:

2 pair Lunos E2 and bathroom fans

2 heat pump heads

Small woodstove with dedicated outdoor air

Electric hot water heater with drainwater heat recovery

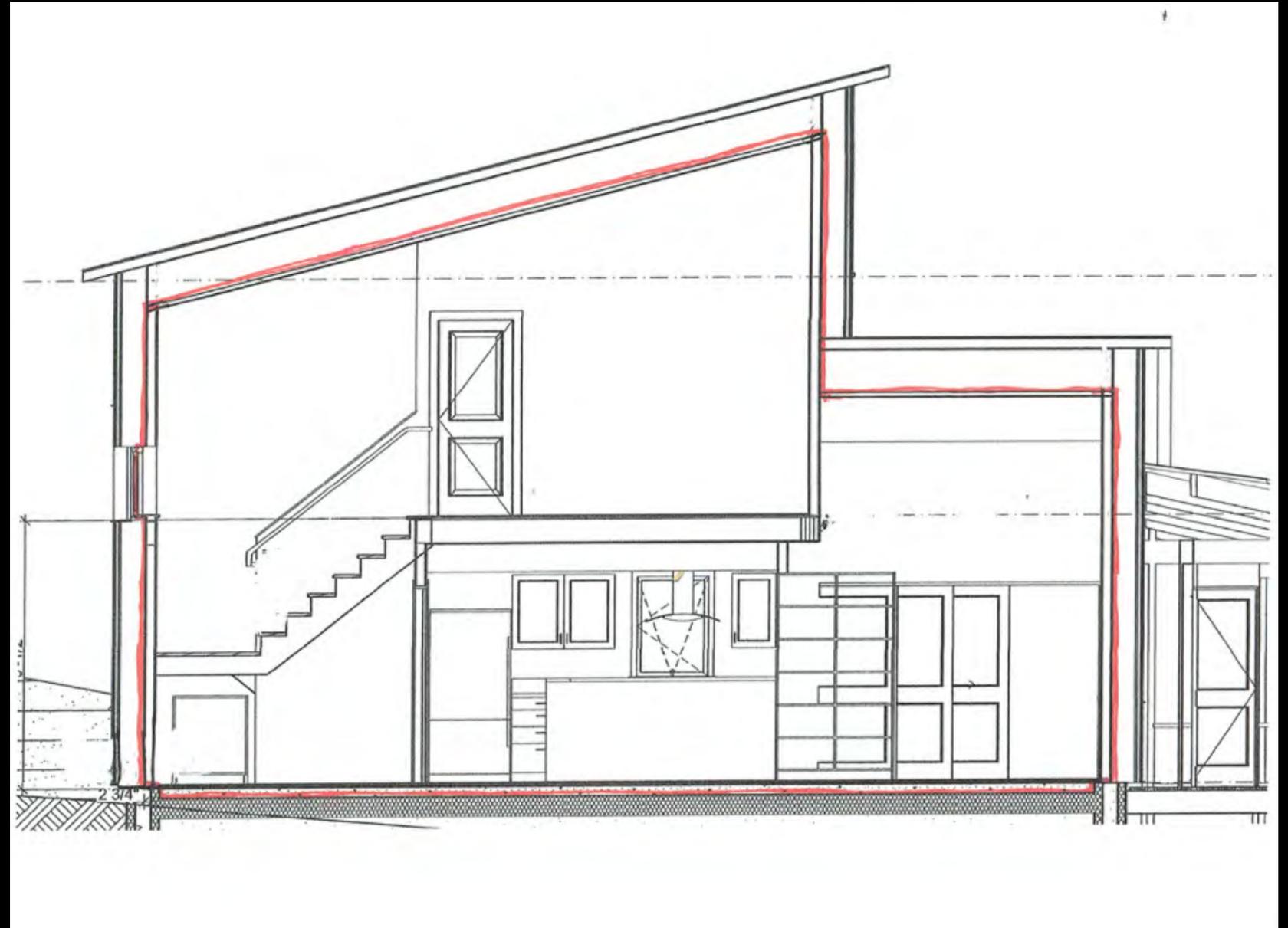
HERS: 42

(Home Energy Rating System)

Square Feet: 1445 sf. Volume: 12645 cu. ft.
Blower Door: 155 cfm50, .74 ACH50

Predicted Energy Use:
31.2 MMBtu, \$1500
5.9 MMBtu heating

Energy Use:
26 MMBtu,
19.1 kbtu/sf/yr,
\$1260, 6905 kwh/yr electric,
1/10 cord wood



ENVELOPE SYSTEMS:

Foundation:

Concrete footing and ICF frost wall for 4' grade change
 Extra interior insulation at slab edge
 Slab on grade- 8" EPS under 4" concrete

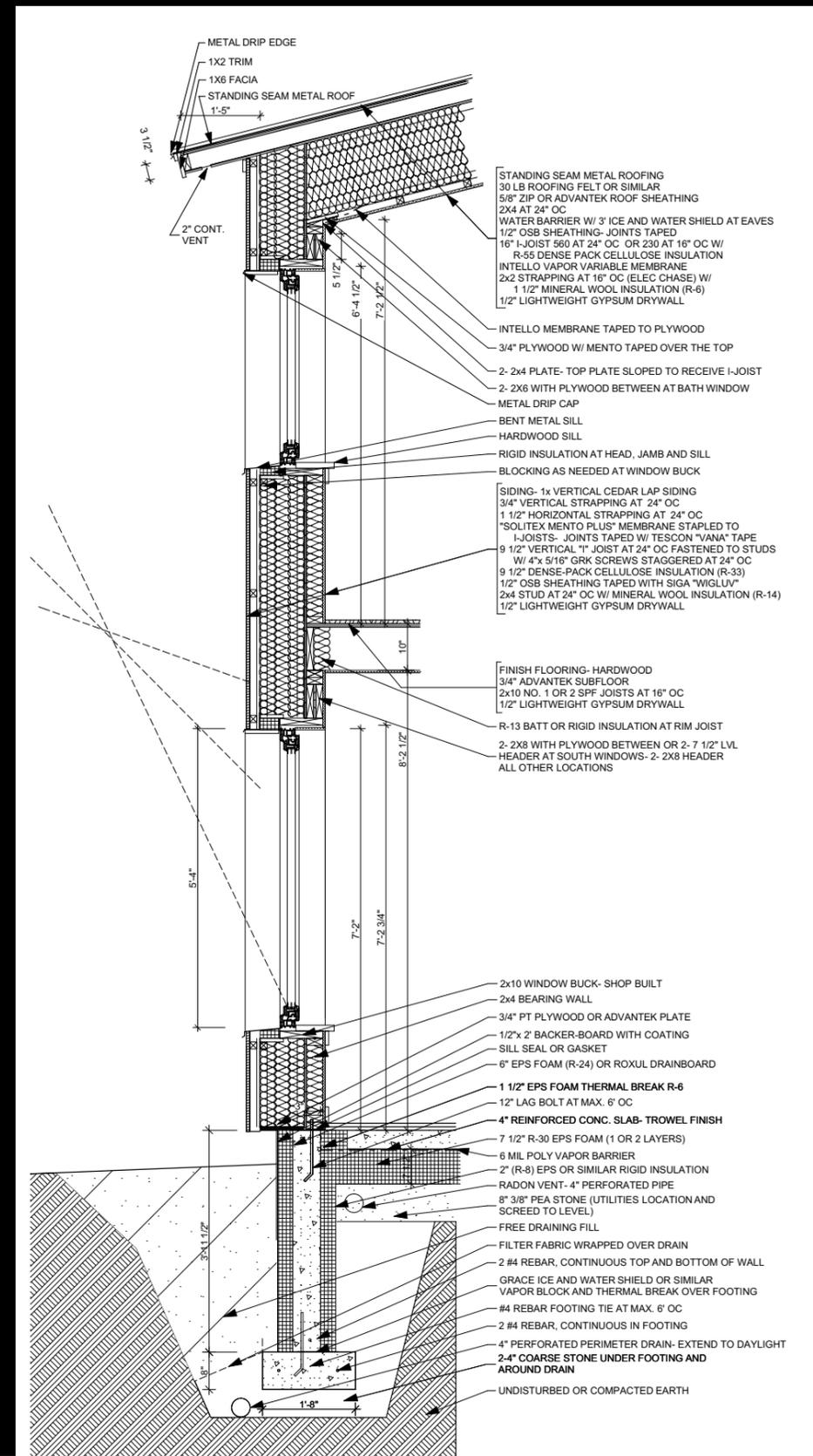
Arctic wall:

2x4 at 24" oc
 OSB sheathing (taped as air barrier)
 9 1/2" continuous I-joists
 Cellulose outer contained by Mento Plus water barrier
 Mineral wool in mechanical cavity
 Corrugated metal siding

Roof:

16" I-joist with dense pack cellulose
 Intello inner vapor/ air control layer
 1 1/2" strapping with mineral wool batt,
 2x4 framing above sheathing for vent cavity and eaves;
 Standing seam metal roof

Stick framed entry and screen porch- local hemlock



ARCTIC WALL COMPONENTS

2 x 4 frame
OSB Sheathing
2x for Bucks



Double wall spans several floors

Bulk of insulation outside the air barrier

Vented siding



Interior Roxul insulation or Damp spray

External & Internal chase and mechanicals

Expedites building process



- R-60 Roof
- Continuous vapor barrier
- Cold roof assembly
- Overhangs

