

BUILDINGENERGY BOSTON

Building In & Building Out: Lessons Learned from Deep Energy Retrofits

Thursday, June 4, 2020

The Webinar Will Begin At 2:00pm

Brought to you by:



BUILDING IN & BUILDING OUT:

Lessons Learned from Deep Energy Retrofits

POLL

When tackling a deep energy retrofit, what do you believe motivates yourself or your clients most?

PASSIVE HOUSE PRINCIPLES

Super Insulation
No Thermal Bridging
Triple Pane Windows
Air Tightness
Mechanical Ventilation
Energy Modeling
Passive Solar Gain



Restaurant:
Oxford, Maine



Residence:
Greenwood, Maine

OXBOW BEER GARDEN



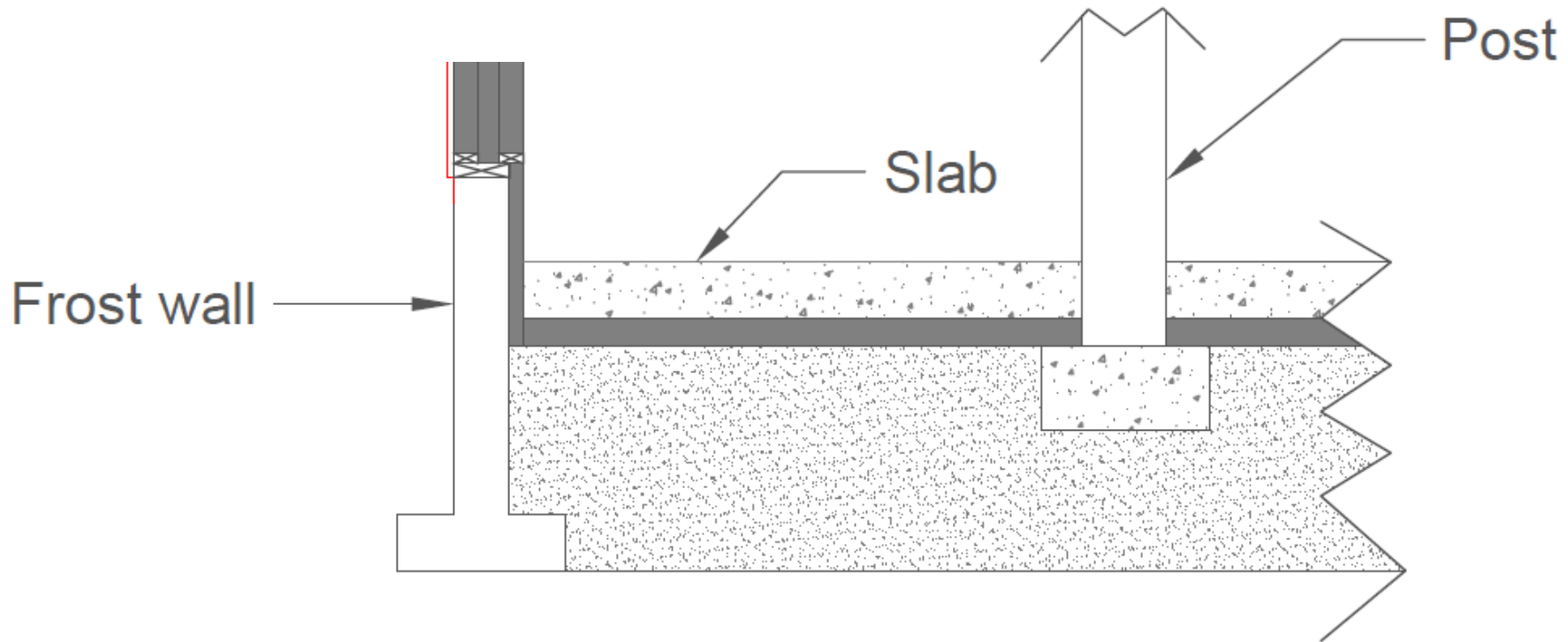
FOUNDATION

BUILDING IN

Frost Wall







ALTERNATIVE FOUNDATION

BUILDING IN

Full basement



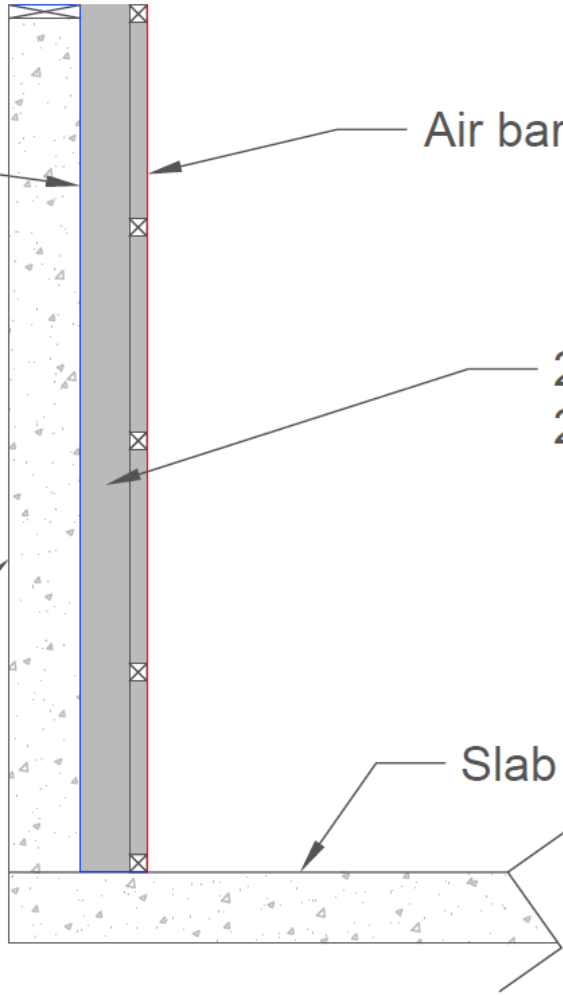
Vapor Barrier

Air barrier

2x4 wall with
2x2 battens

Full basement wall

Slab

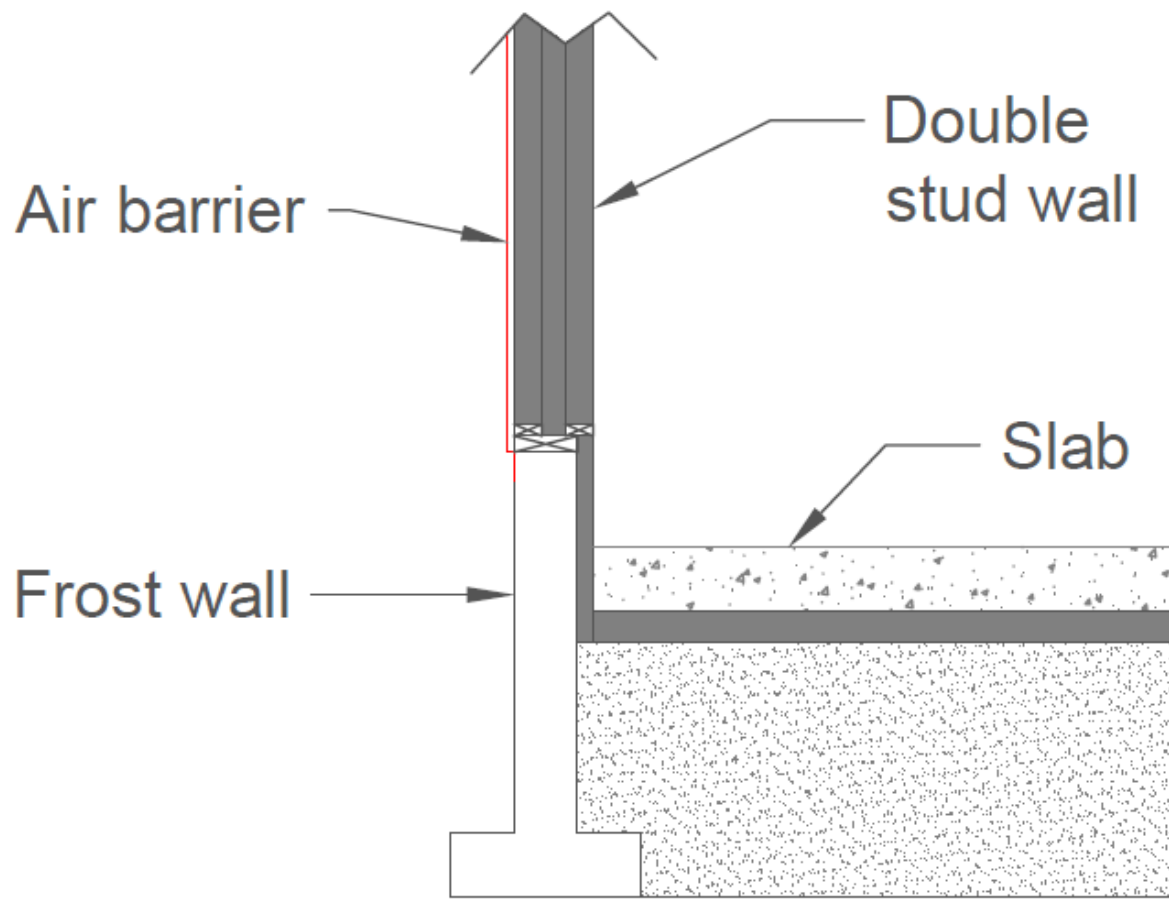


WALLS

BUILDING IN

Double Studs









ROOF

BUILDING OUT

Larsen Trusses









**NEXT UP:
JESPER KRUSE,
OWNER OF
MAINE PASSIVE HOUSE**



KRUSE RESIDENCE



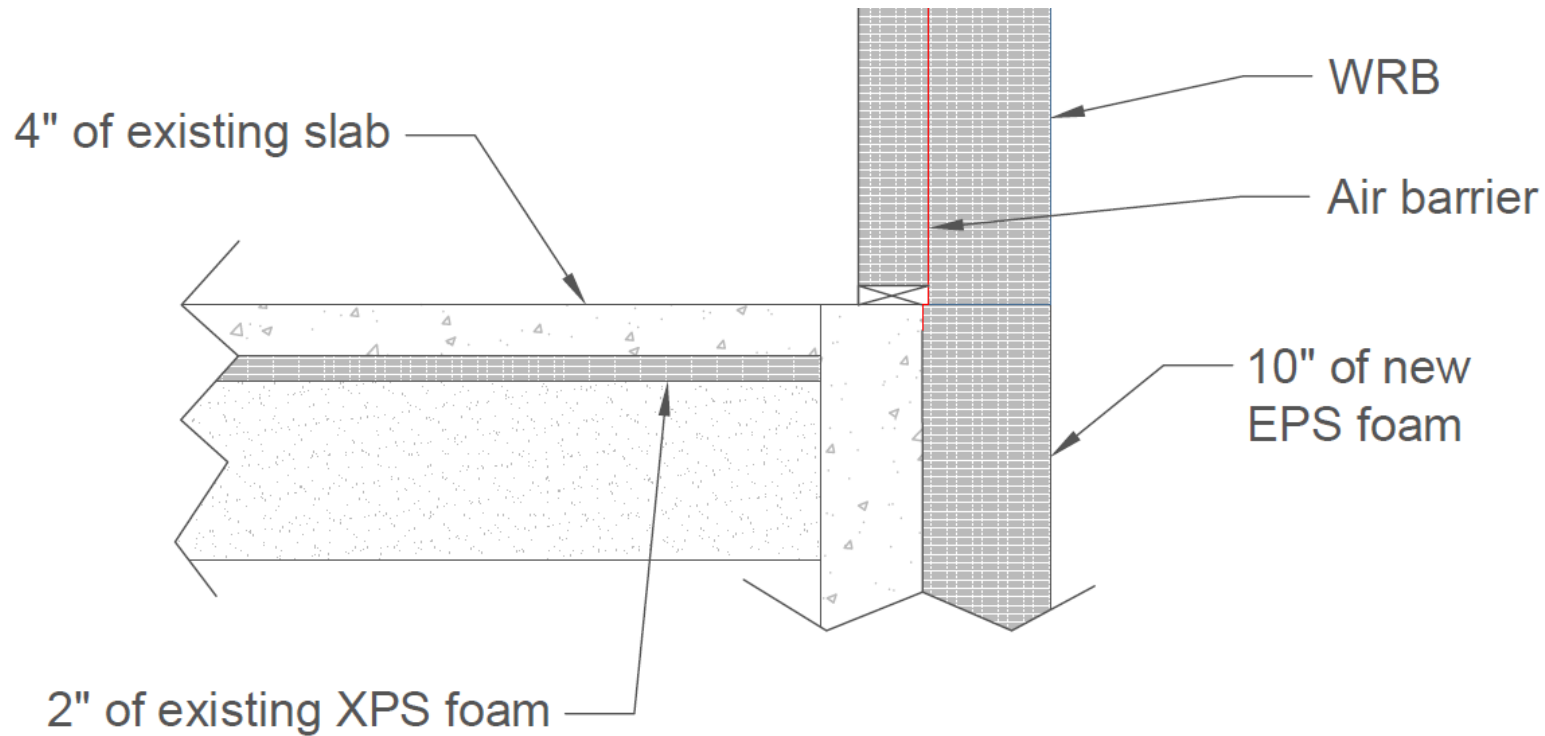
FOUNDATION

BUILDING OUT

Foam outside







WALLS

BUILDING OUT

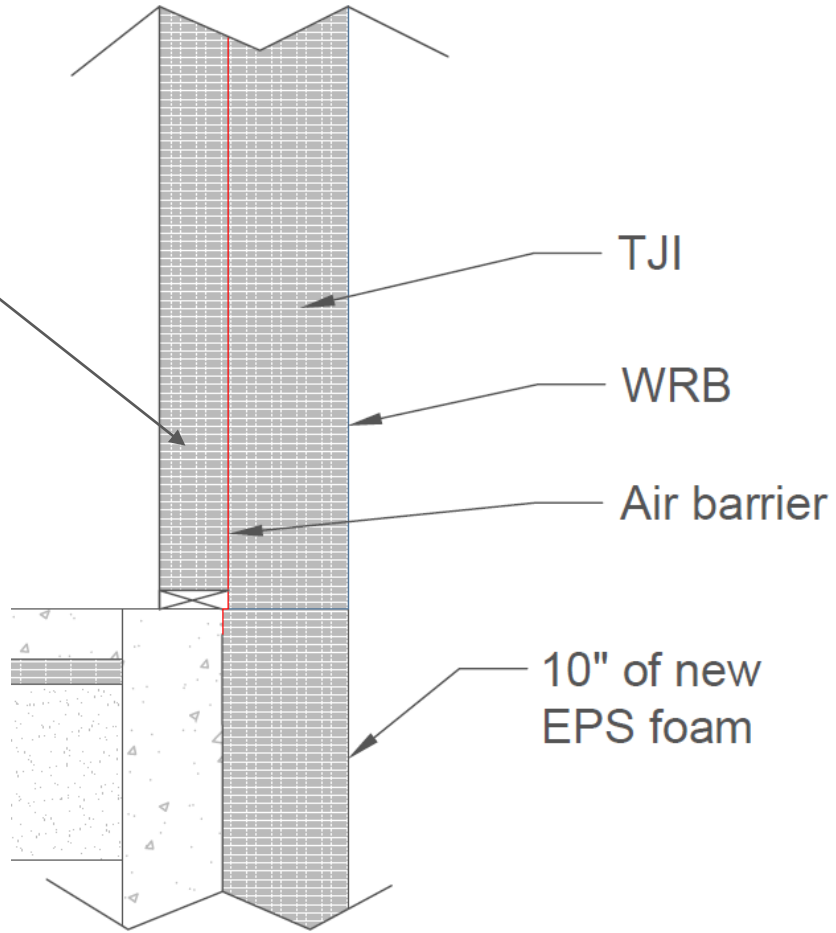
Larsen Trusses







Existing 2x6 wall





ALTERNATIVE WALL

BUILDING OUT

Homemade Larsen
Trusses



BUILDING OUT

EPS foam



ROOF

BUILDING IN

Attic sealing





developed and produced by pro clima
MOLL Bauverpackungen Produkte GmbH
68723 Schweitzingen
Made in Germany
www.proclima.com

g-value = 0,25 MNkg
erture à la diffusion, $s_p / \mu_a = 0,05 \text{ m}$
= 0,05 m

graftare nella fascia di sovrapposizione per assicurare
nieten of vernagden

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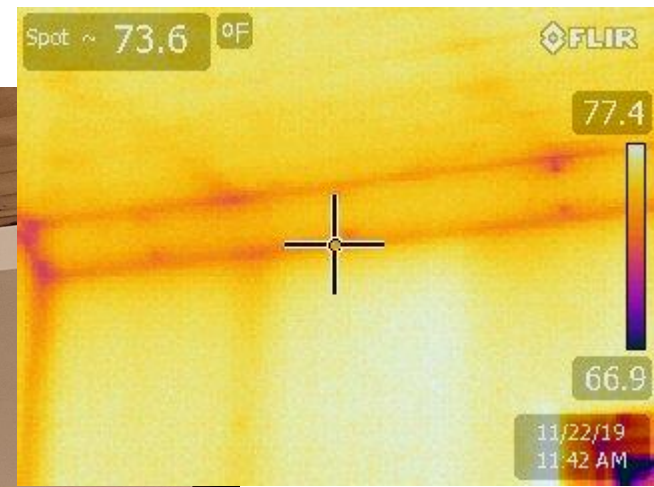
**Worst day
ever!**

**BACK TO:
ANNA HEATH,
CARPENTER WITH
MAINE PASSIVE HOUSE**





2"x2" EPS foam



Spot ~ 73.6 °F

FLIR

77.4

66.9

11/22/19
11:42 AM

ALTERNATIVE ROOF

BUILDING IN

Drop ceilings



MECHANICAL VENTILATION

DUCTED ERV

Pros

- Better quality
- Quiet

Cons

- Expensive to hide ductwork



LUNOS

Pros

- Less invasive
- Less expensive

Cons

- Noisy
- Condensation issues in cold climates



**AND FINALLY:
JESPER KRUSE,
OWNER OF
MAINE PASSIVE HOUSE**



INSULATION

CELLULOSE

- Recycled material
- Low toxicity
- Low embodied carbon
- Holds moisture without condensing
- Carbon sink
- Inexpensive



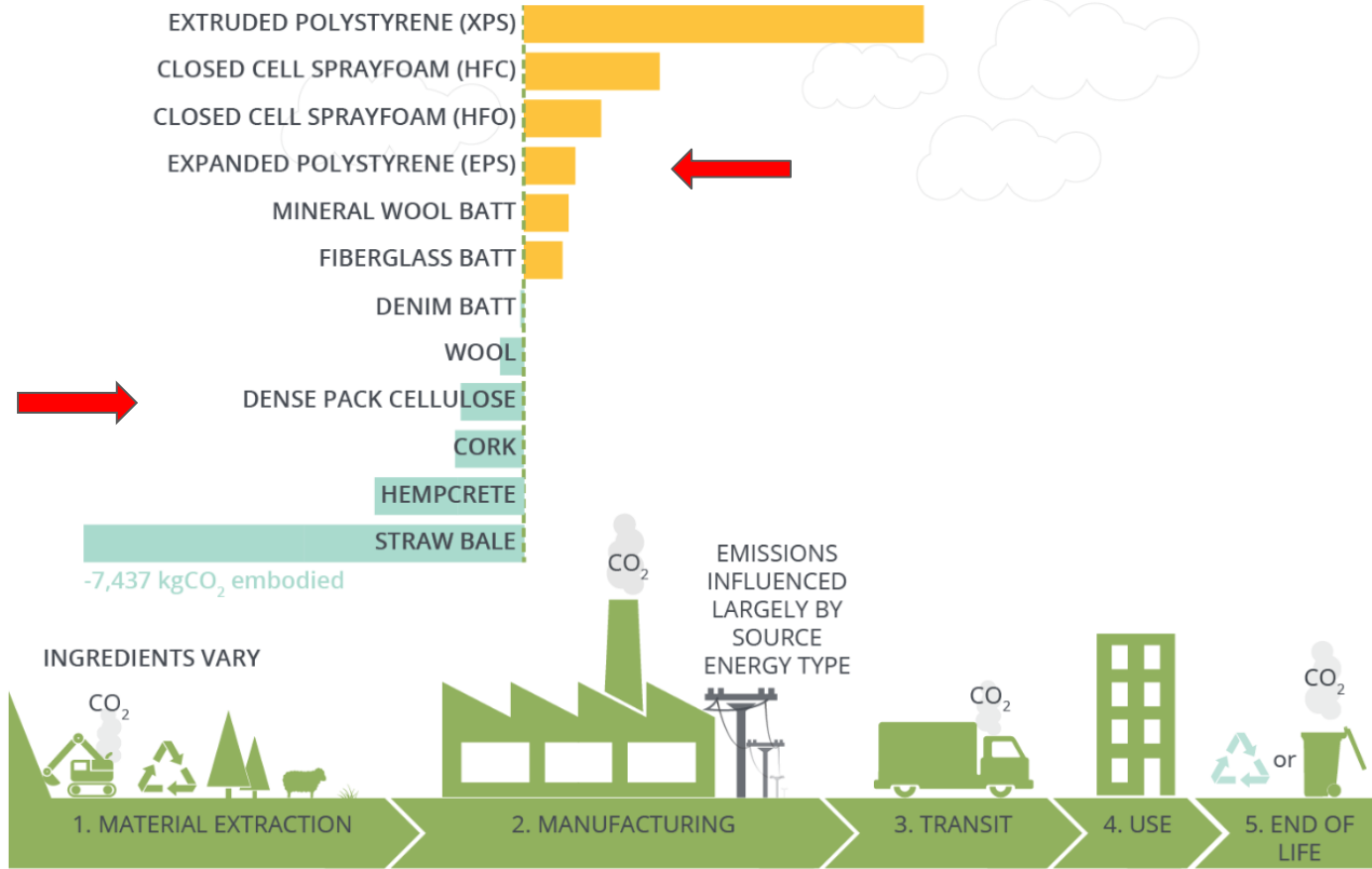
EPS FOAM

- Comparatively low embodied carbon
- Use below grade
- Impervious to weather
- Quick install
- No equipment rental

CARBON IMPACTS OF INSULATION

kgCO₂ represents R-20 at 234 m²

6,735 kgCO₂ emitted



THE MONEY PART...

ROWE HILL ENERPHIT

Total Cost \$159,000 (\$81/SF)



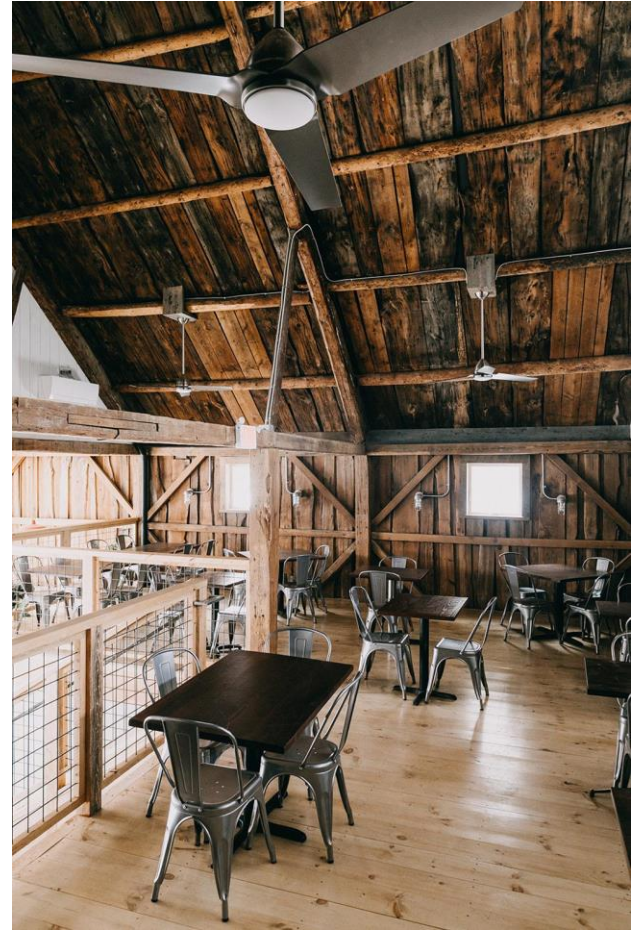
OXBOW BEER GARDEN

Total Cost \$447,000 (\$172/SF)

Without Sitework \$ 391,100 (\$151/SF)

Without Electric & HVAC \$269,900 (\$104/SF)

Without and Interior Finishes \$212,300 (\$81/SF)





THANKS!



Q&A