BUILDINGENERGY BOSTON

Are You Smarter Than a Phius Reviewer?

Molly Craft, New Ecology
Betsy Cooke, PCA
Margaret Goetsch, Phius
Nicole Schuster, Positive Trace

Curated by John Loercher

Northeast Sustainable Energy Association (NESEA) | March 24, 2026

Are You Smarter Than a Phius Reviewer?

Building Energy Boston 2026

Agenda

Introduction – Our Panelists

Instructions

The Game!

Your Host

Molly Craft: New Ecology, Inc.

Project Manager, CPHC, LEED AP Homes, Rater Field Inspector

New Ecology works where the climate and housing crises converge. We deliver building performance solutions that lower utility bills, reduce greenhouse gas emissions, and improve health outcomes for low-income communities. Our work protects and preserves affordable housing, making it more resilient and livable.

Our multidisciplinary team includes building scientists, architects, engineers, housing experts, and urban planners who bridge the gap between technical solutions and community needs.

We are headquartered in Boston, MA, with offices in Baltimore, MD and Wilmington, DE.

NEW ECOLOGY
Community-Based Sustainable Development

Our Panelists

Betsy Cooke: PCA

Associate + Senior Project Manager, AIA and CPHC

PCA is recognized as one of Greater Boston's most responsive and innovative design firms. We bring an uncommon blend of business insight and creative problem-solving to each of our projects. With expertise in architecture, planning and interior design, the results speak for themselves: thoughtful, award-winning design that has generated one success after another for our clients.

As a Senior Project Manager, Betsy has a passion for sustainable, well-integrated, place-based design. She strives to create high-performing structures with an emphasis on habitable, scale-appropriate spaces that contribute to the character of their community.

PCA Architecture, Interiors + Planning

Nicole Schuster: Positive Trace

Principal - AIA, CPHC, LEED AP

Positive Trace is built around the drive to maximize positive impact by providing assistance to a wide variety of project teams striving to achieve high performance goals. Together, we identify targeted interventions based on the specifics of each project, whether it's WUFI modeling to understand Building Science and durability, Passive House certification for minimizing energy use, or Sustainability Master Planning for a holistic approach. Each step we take brings us closer to a better world.

POSITIVE
TRACE

Maggie Goetsch – Phius

Building Certification Associate, CPHC

Phius is a non-profit 501(c)(3) organization committed to decarbonizing the built environment by making high-performance passive building the mainstream market standard. We train and certify professionals, maintain and update the Phius climate-specific passive building standard, certify and quality assure passive buildings, certify high-performance building products and conduct research to advance high-performance building.

Passive building utilizes five core principles to create safe, resilient, comfortable and – most importantly – energy efficient structures, from commercial to residential to multifamily. Phius sets the standard for passive house in North America and has certified 3,000+ professionals.

Our headquarters are in Chicago, IL, but have staff throughout the states, as well as in Canada and Columbia.

phius

How to Play!

Instructions

Five Phius Details → Five Volunteers

Identify the Issue

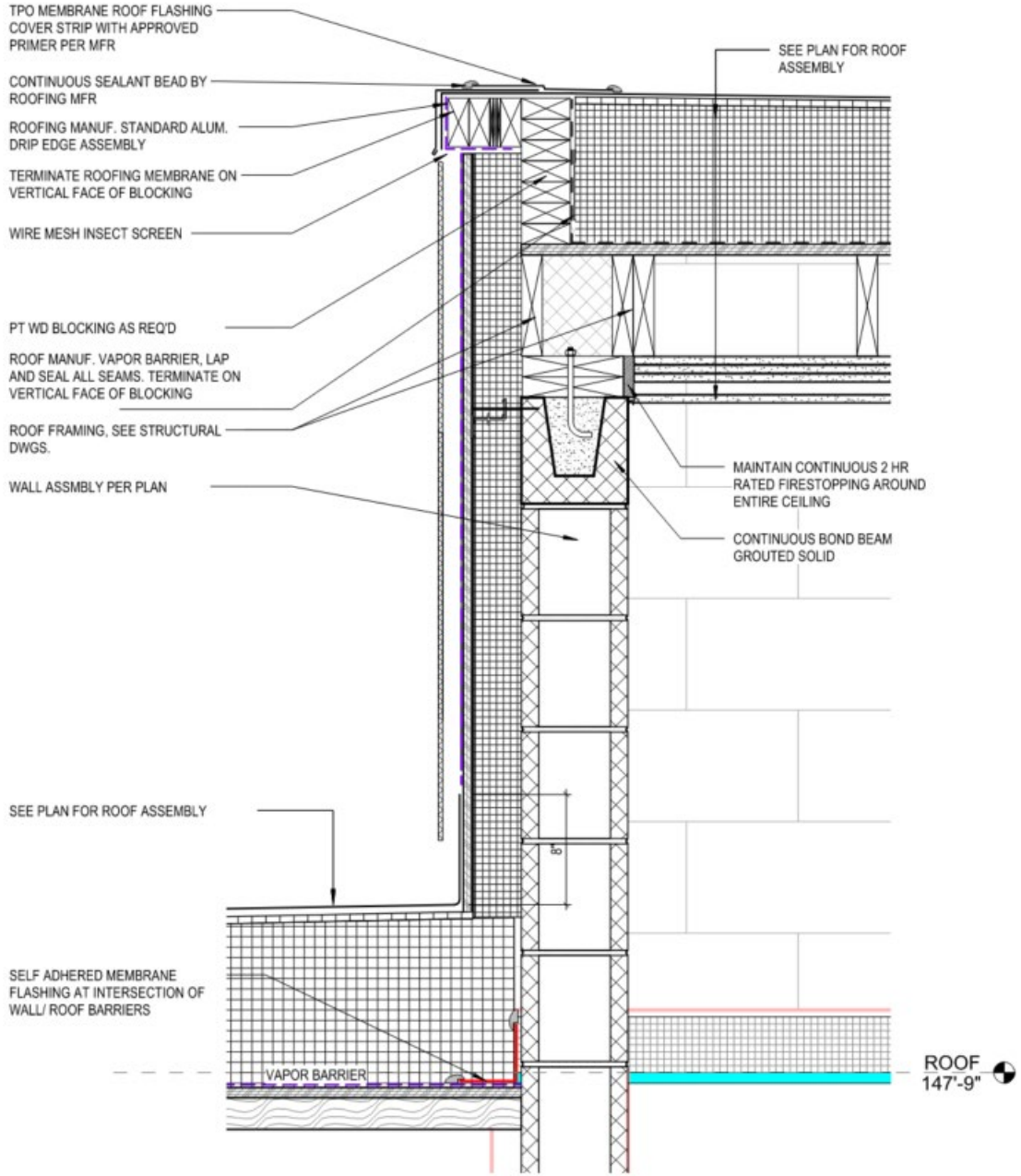
Identify the Solution

3 Hints Available from the Panelists

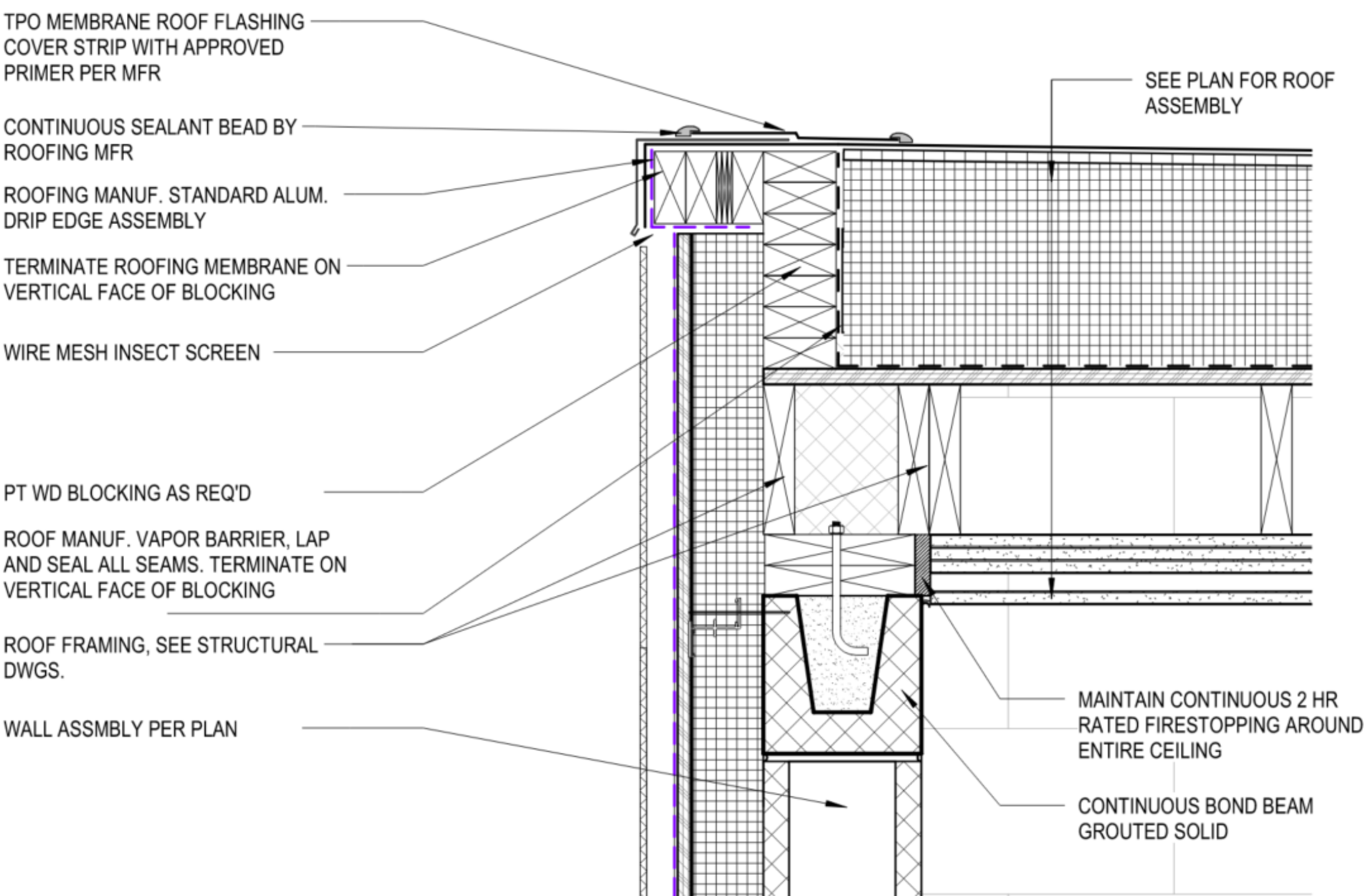
Need help at any point?

Unlimited Phone a Friend: Ask the Audience

Let's Begin!
Question 1



1 ELEVATOR AND STAIR 1 OVERRUN, SECTION
1 1/2" = 1'-0"

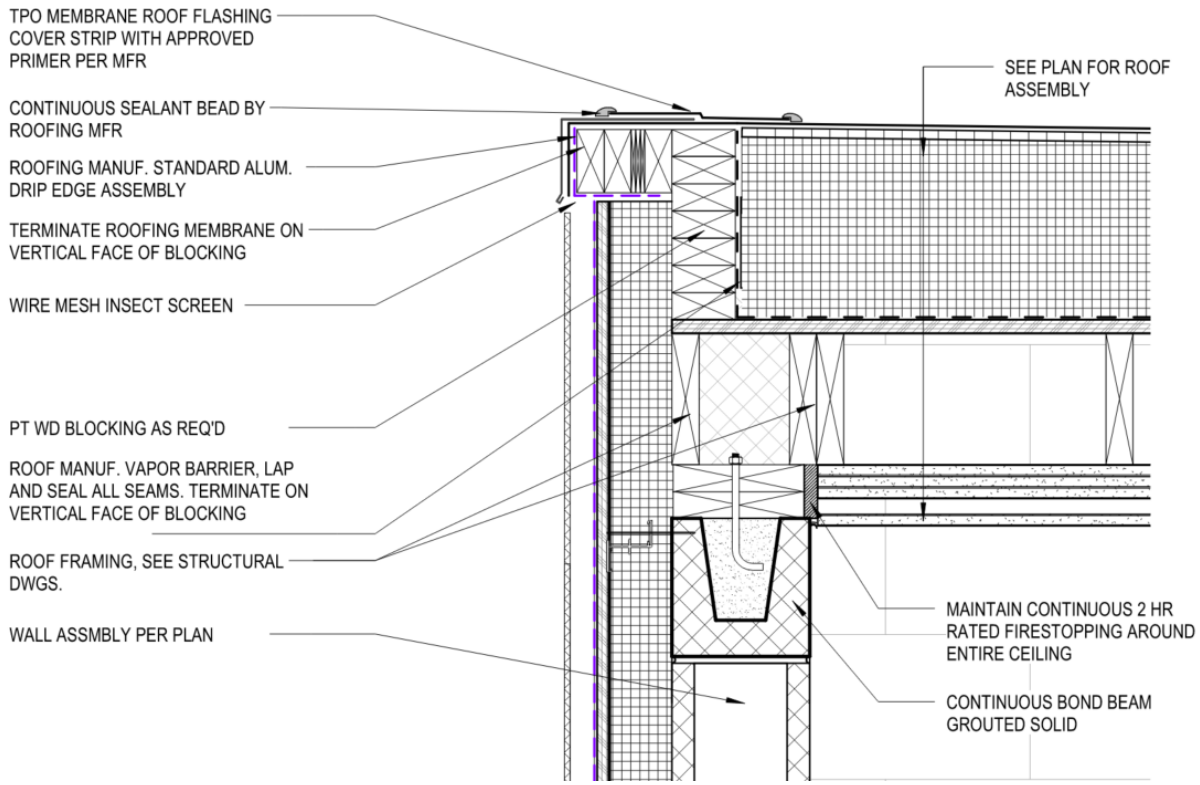

TPO MEMBRANE ROOF FLASHING COVER STRIP WITH APPROVED PRIMER PER MFR
CONTINUOUS SEALANT BEAD BY ROOFING MFR
ROOFING MANUF. STANDARD ALUM. DRIP EDGE ASSEMBLY
TERMINATE ROOFING MEMBRANE ON VERTICAL FACE OF BLOCKING
WIRE MESH INSECT SCREEN
PT WD BLOCKING AS REQ'D
ROOF MANUF. VAPOR BARRIER, LAP AND SEAL ALL SEAMS. TERMINATE ON VERTICAL FACE OF BLOCKING
ROOF FRAMING, SEE STRUCTURAL DWGS.
WALL ASSMBLY PER PLAN
SEE PLAN FOR ROOF ASSEMBLY
MAINTAIN CONTINUOUS 2 HR RATED FIRESTOPPING AROUND ENTIRE CEILING
CONTINUOUS BOND BEAM GROUTED SOLID

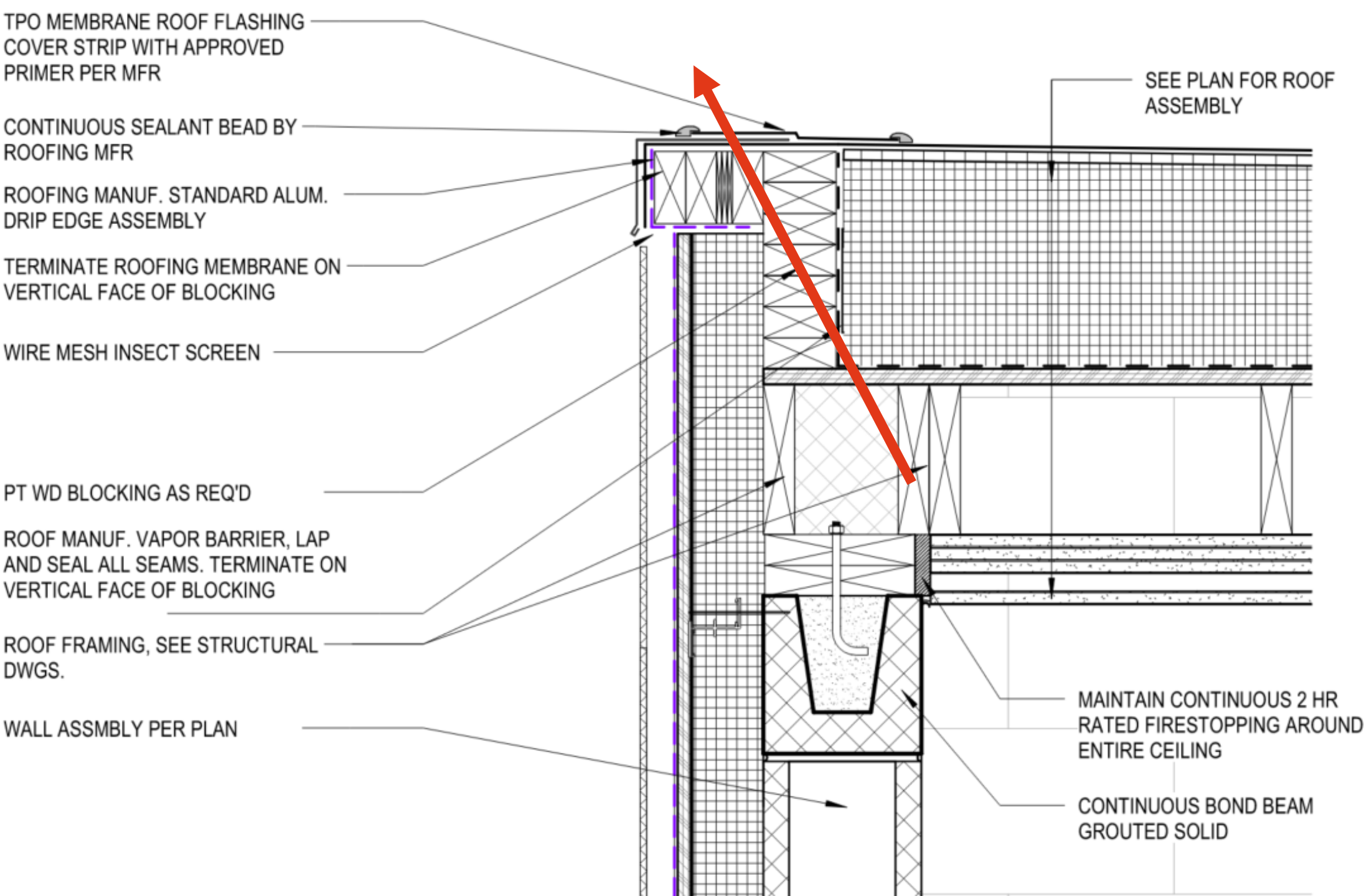
What is the Issue?

A. There is a hole in the air barrier

B. There is a thermal bridge

C. There is an issue with prescriptive insulation requirements

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MAINTAIN CONTINUOUS 2 HR RATED FIRESTOPPING AROUND ENTIRE CEILING
CONTINUOUS BOND BEAM GROUTED SOLID

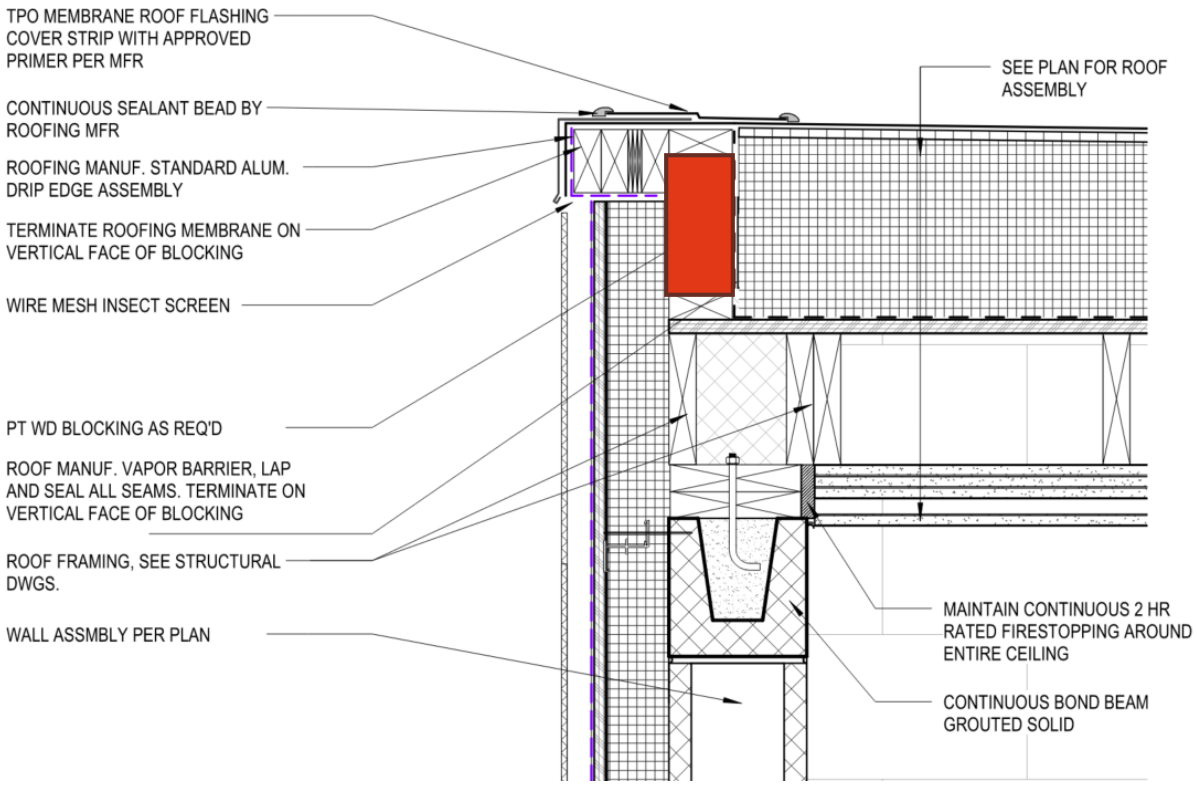
What was the Solution?

A. Replace some of the blocking with CCSPF

B. Extend the rigid polyiso to the wall assembly and get rid of the blocking entirely

C. Fill the horizontal cavity with mineral wool batts

Option A



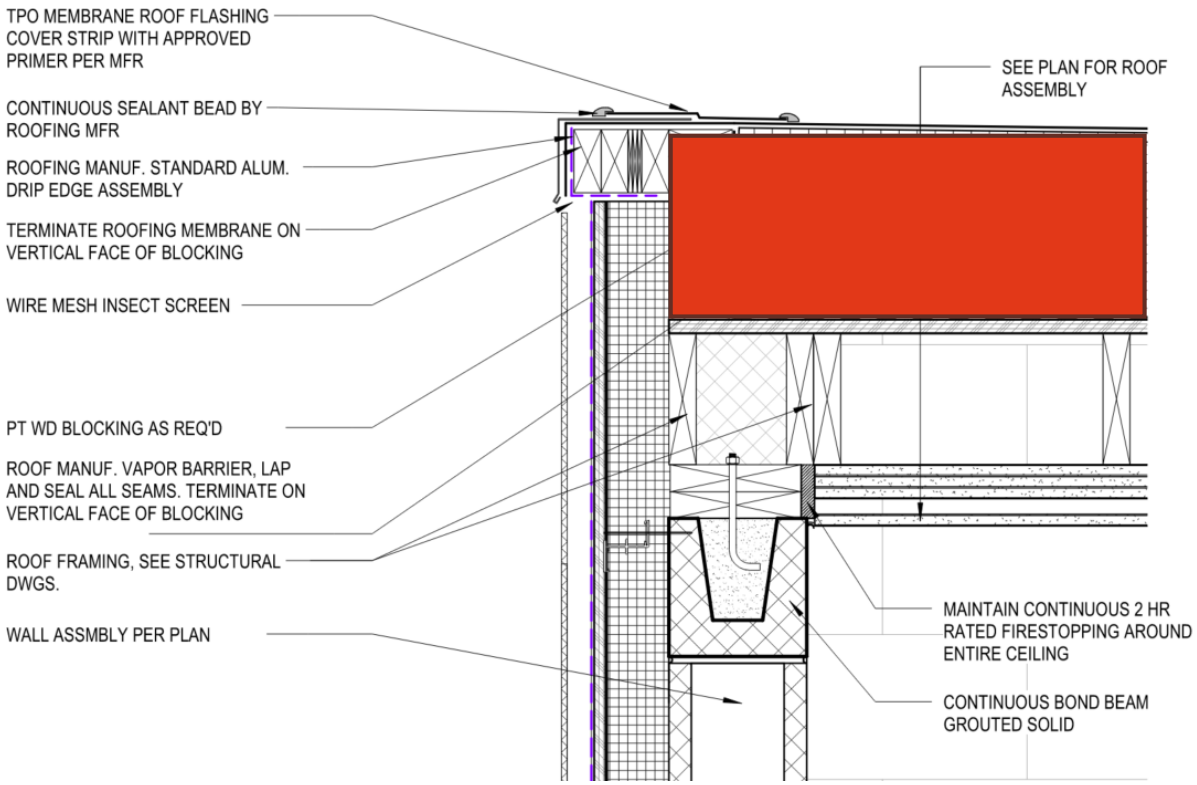
What was the Solution?

A. Replace some of the blocking with CCSPF

B. Extend the polyiso to the wall assembly and get rid of the blocking entirely

C. Fill the horizontal cavity with mineral wool batts

Option B



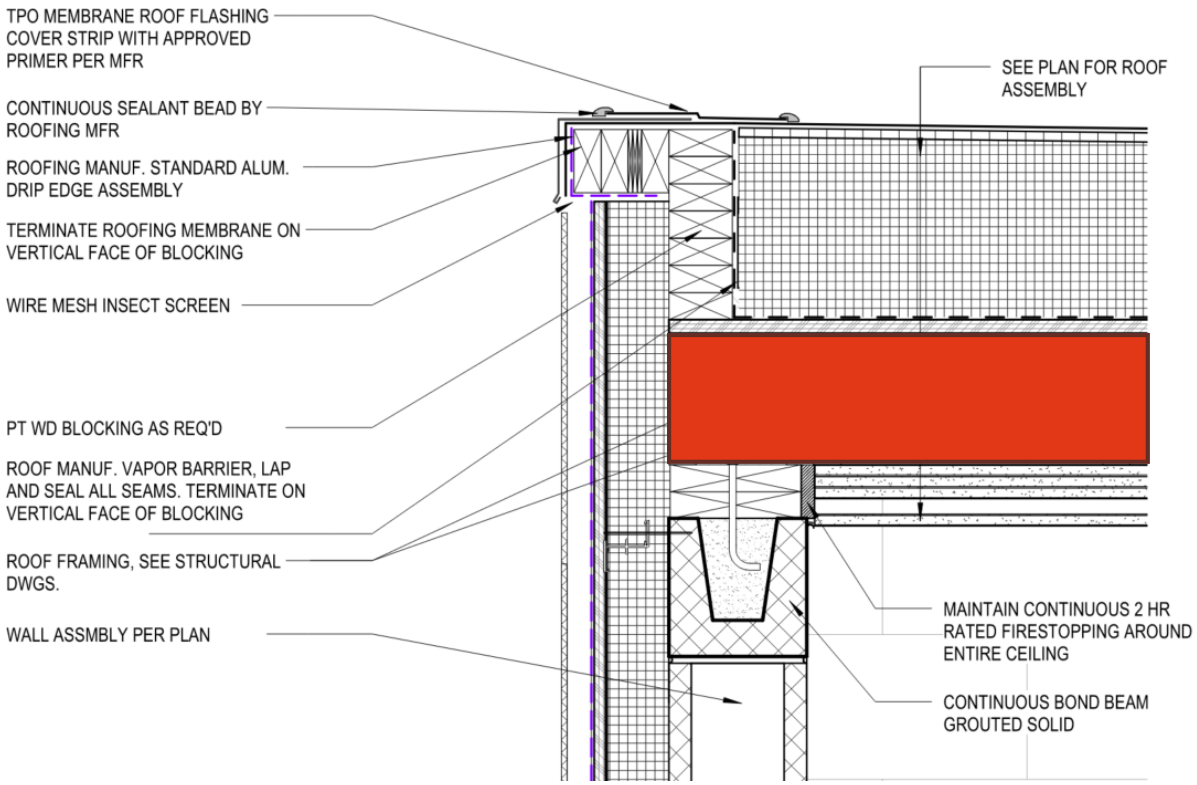
What was the Solution?

A. Replace some of the blocking with CCSPF

B. Extend the polyiso to the wall assembly and get rid of the blocking entirely

C. Fill the horizontal cavity with mineral wool batts

Option C



What was the Solution?

A. Replace some of the blocking with CCSPF

B. Extend the polyiso to the wall assembly and get rid of the blocking entirely

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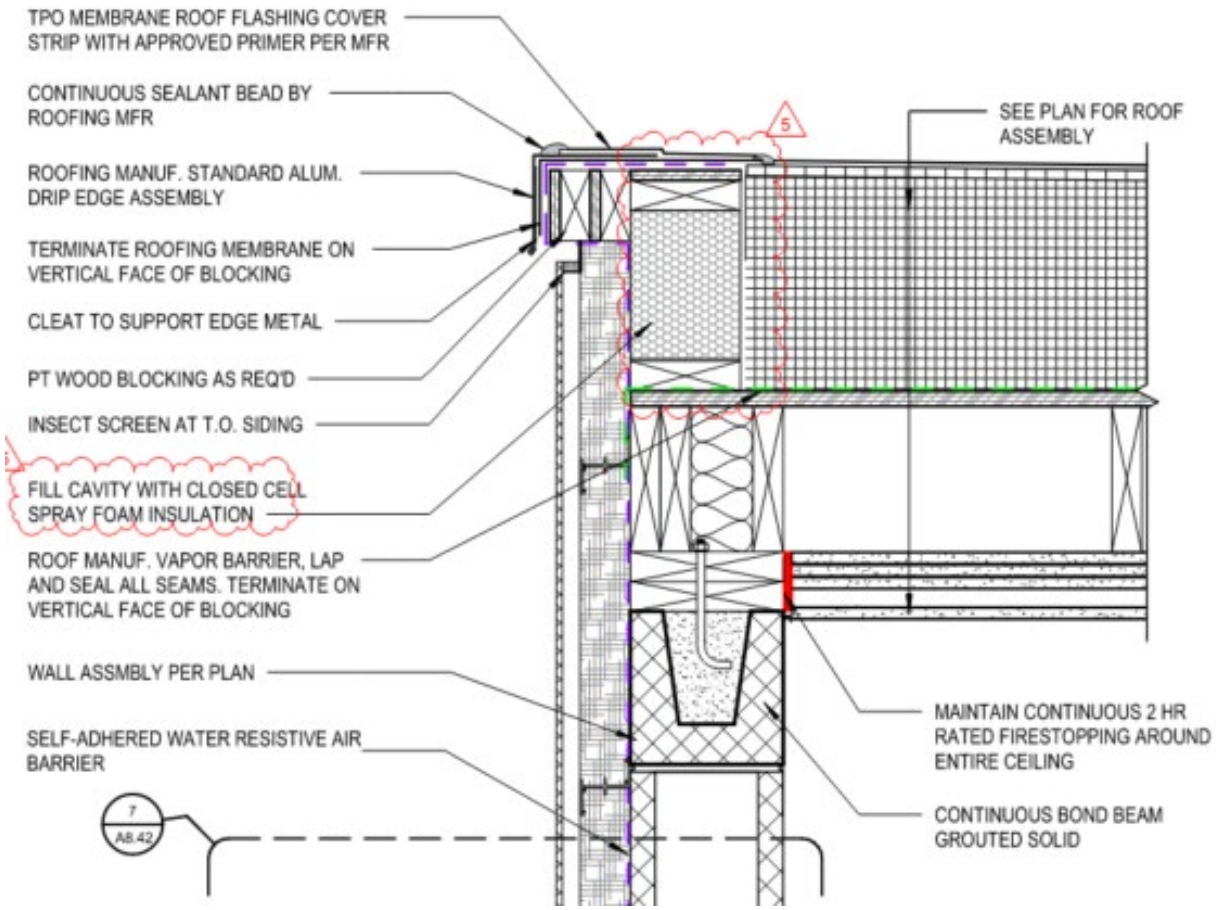
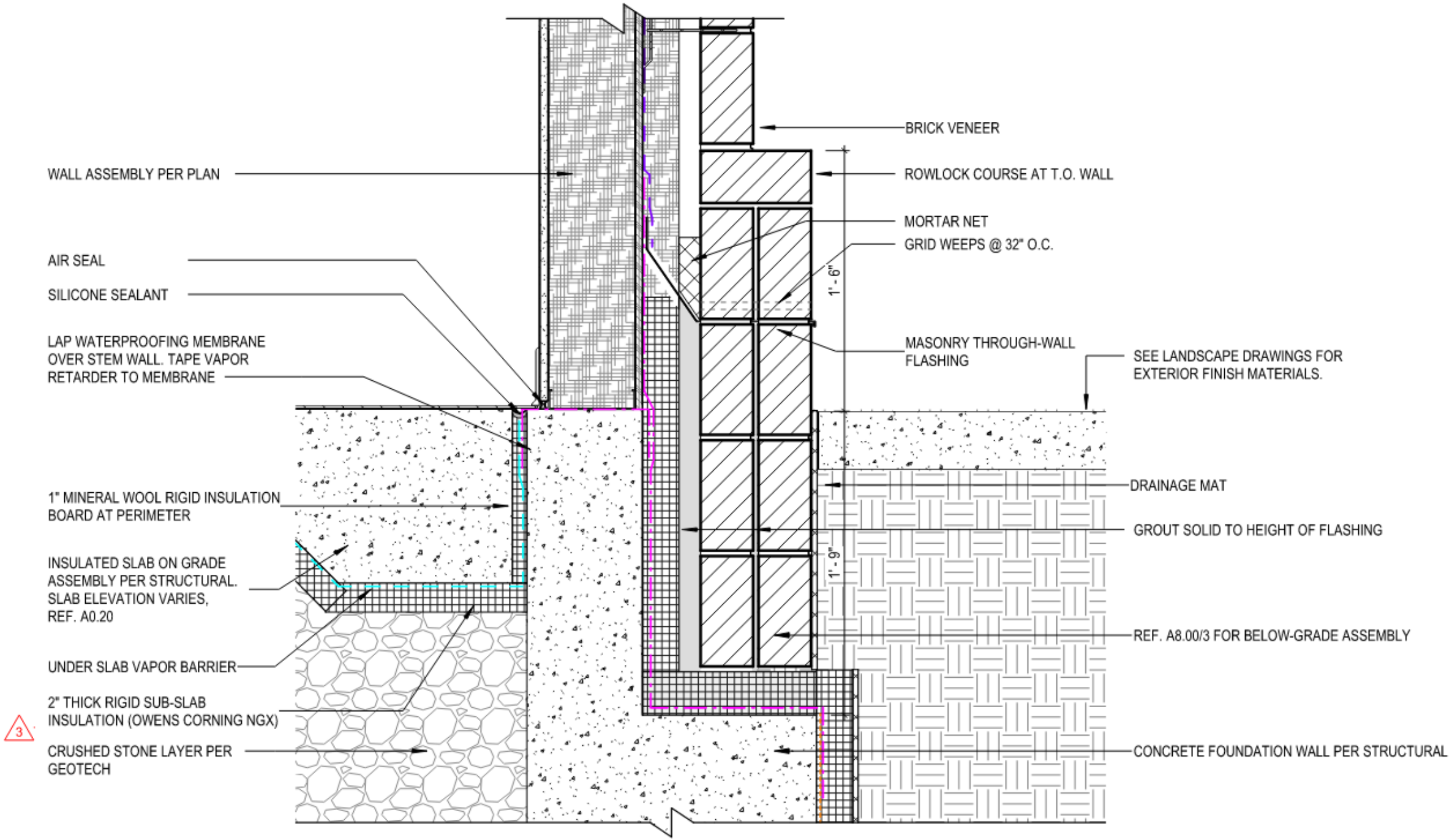


Question 2

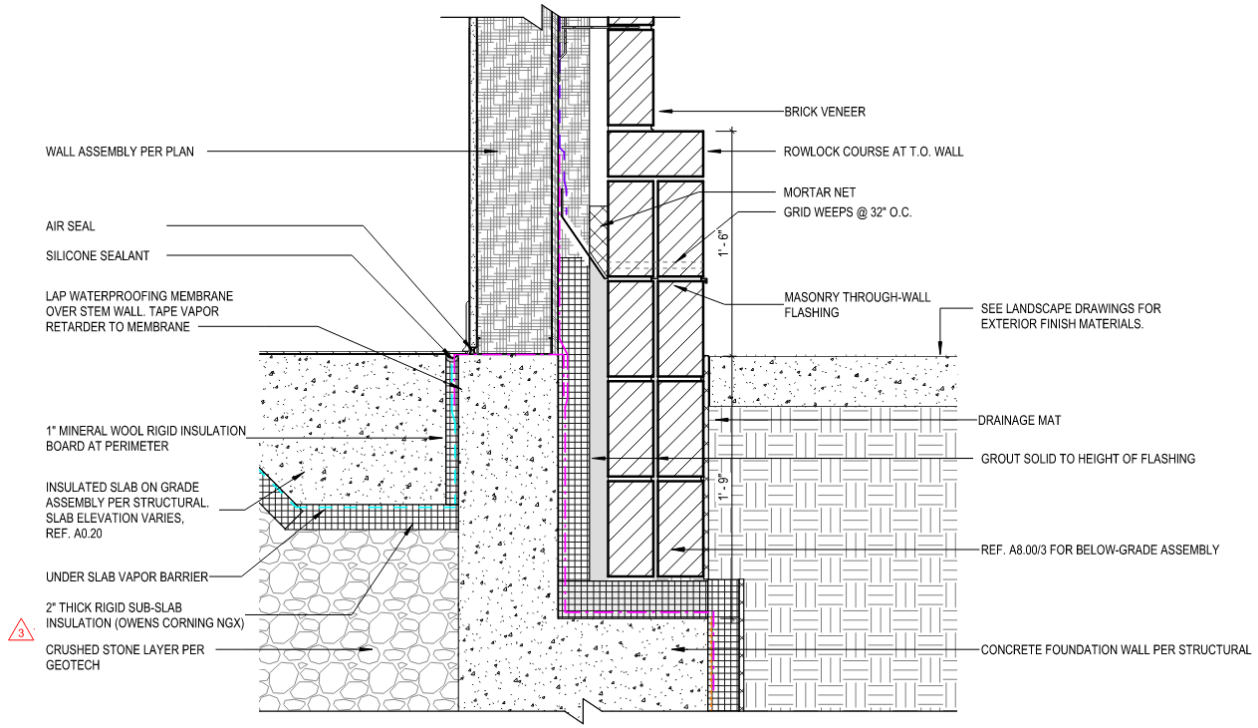

BRICK VENEER
WALL ASSEMBLY PER PLAN
ROWLOCK COURSE AT T.O. WALL
MORTAR NET
GRID WEEPS @ 32" O.C.
AIR SEAL
SILICONE SEALANT
1' - 6"
LAP WATERPROOFING MEMBRANE OVER STEM WALL. TAPE VAPOR RETARDER TO MEMBRANE
MASONRY THROUGH-WALL FLASHING
SEE LANDSCAPE DRAWINGS FOR EXTERIOR FINISH MATERIALS.
DRAINAGE MAT
1" MINERAL WOOL RIGID INSULATION BOARD AT PERIMETER
GROUT SOLID TO HEIGHT OF FLASHING
INSULATED SLAB ON GRADE ASSEMBLY PER STRUCTURAL. SLAB ELEVATION VARIES, REF. A0.20
1' - 9"
REF. A8.00/3 FOR BELOW-GRADE ASSEMBLY
UNDER SLAB VAPOR BARRIER
2" THICK RIGID SUB-SLAB INSULATION (OWENS CORNING NGX)
3
CRUSHED STONE LAYER PER GEOTECH
CONCRETE FOUNDATION WALL PER STRUCTURAL

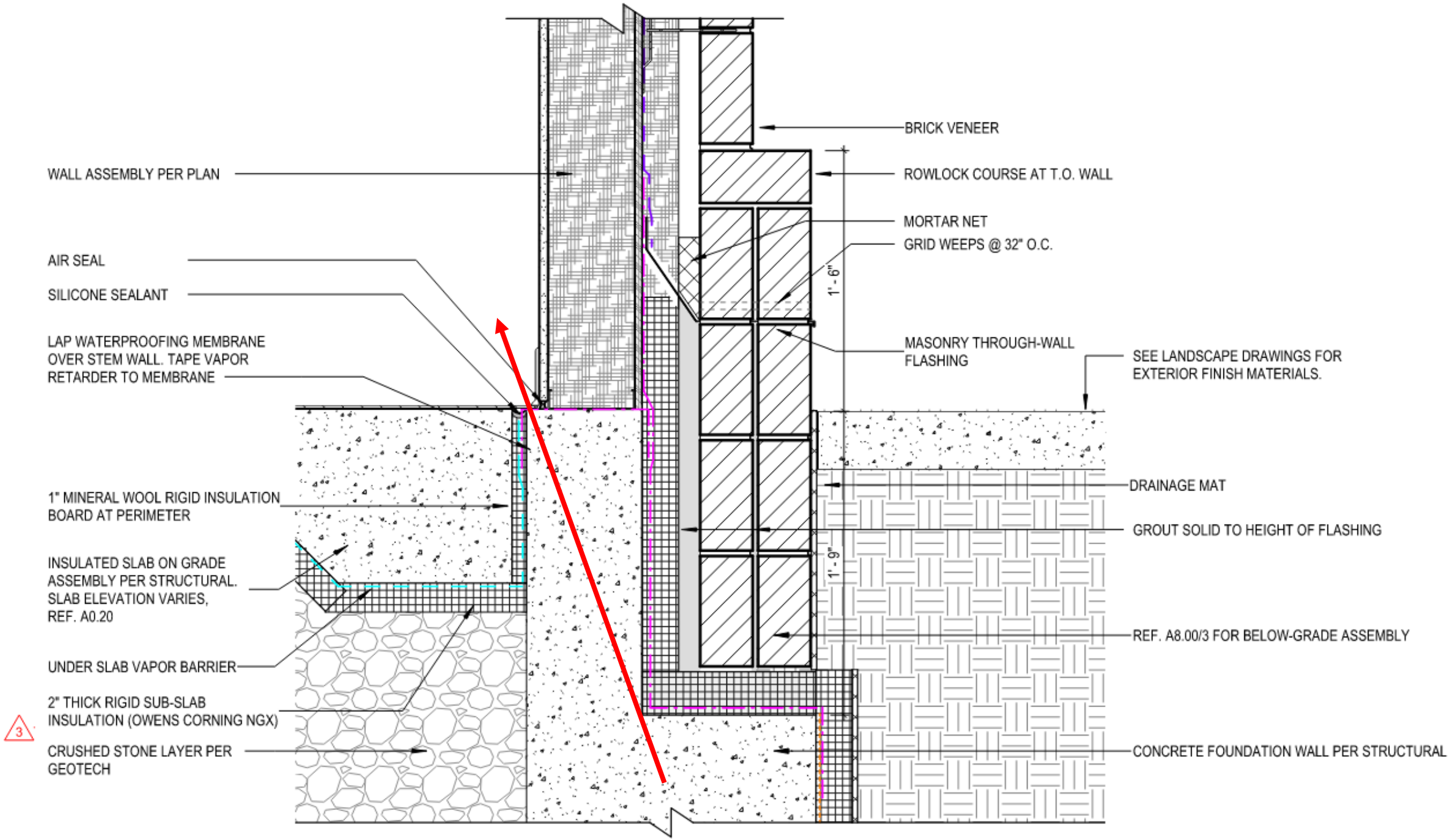
What is the Issue?

A. The waterproofing membrane should lap up to the wall instead of down to the footing

B. There is a thermal bridge

C. The brick should not extend below grade

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2" THICK RIGID SUB-SLAB INSULATION (OWENS CORNING NGX)
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CRUSHED STONE LAYER PER GEOTECH
CONCRETE FOUNDATION WALL PER STRUCTURAL

What was the Solution?

A. Perform a THERM Model

B. Move the wall assembly to the left by 3”

C. Add a bead of CCSPF to run along that area

Phius Thermal Bridge Calculator

phius

Project Information

Project Number:	[redacted]	Project Name:	[redacted]
Date:	1/29/2026	Company Name:	Phius

Detail Information

Detail Name:	Foundation	Drawing File Name:	[redacted]
Detail Number:	4	THERM File Names:	[redacted]
Sheet Number:	A8-00		

THERM: 2D Model Results

Detail Name	U-Factor Surface	U - Factor [Btu/hr.sf.F]	Delta T [F]	Length [in]	Error	ULdT [btu/hr.ft]
Foundation	Interior	0.0587	54	96.88	3.40%	25.59
	Exterior	0.0143	54	397.50	3.40%	25.58

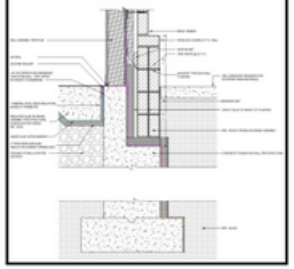
THERM: Individual Component Model Results

Component Name	U-Factor Surface	U-Factor [Btu/hr.sf.F]	Delta T [F]	Length [in]	Error	ULdT [btu/hr.ft]	R-Value (reference)
Wall	Exterior	0.0441	54	55.00	0.00%	10.91	22.7
Slab	Exterior	0.0878	27	59.00	0.00%	11.66	11.4

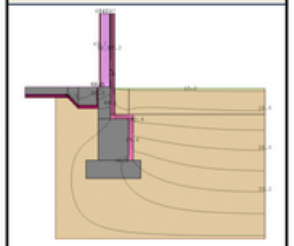
Psi-Value Calculation for WUFI Passive / METr

Name	Linear Thermal Transmittance [Btu/hr.ft.F]	Length [ft]	Attachment
4 / A8-00: Foundation	0.056	Pending takeoff	Perimeter

Detail View



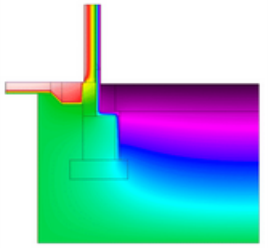
Isotherm View



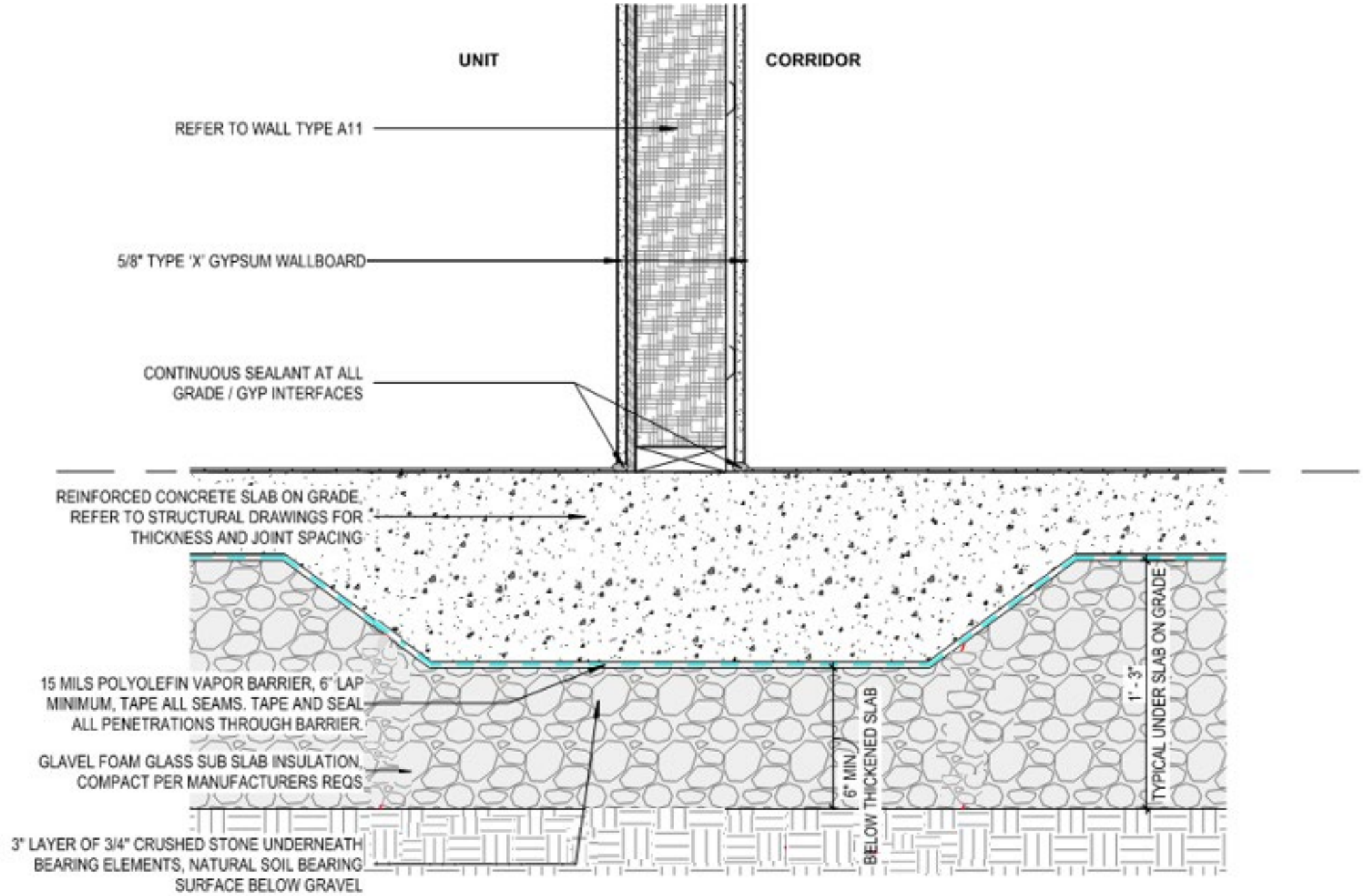
Comp. A: Wall

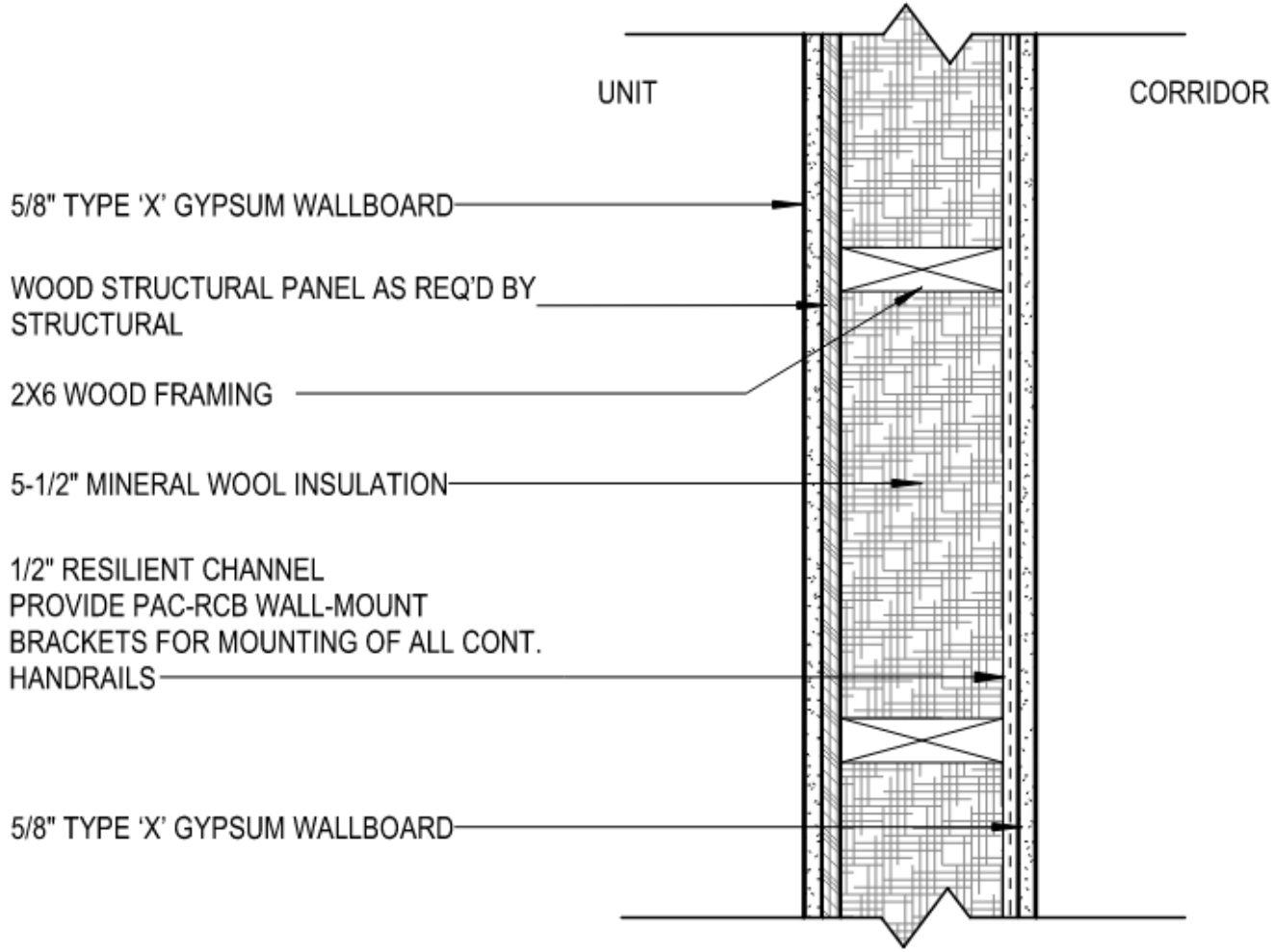
Comp. B: Slab

Infrared View



Question 3


UNIT
CORRIDOR
REFER TO WALL TYPE A11
5/8" TYPE 'X' GYPSUM WALLBOARD
CONTINUOUS SEALANT AT ALL GRADE / GYP INTERFACES
REINFORCED CONCRETE SLAB ON GRADE, REFER TO STRUCTURAL DRAWINGS FOR THICKNESS AND JOINT SPACING
15 MILS POLYOLEFIN VAPOR BARRIER, 6" LAP MINIMUM, TAPE ALL SEAMS. TAPE AND SEAL ALL PENETRATIONS THROUGH BARRIER.
GLAVEL FOAM GLASS SUB SLAB INSULATION, COMPACT PER MANUFACTURERS REQS
3" LAYER OF 3/4" CRUSHED STONE UNDERNEATH BEARING ELEMENTS, NATURAL SOIL BEARING SURFACE BELOW GRAVEL
6" MIN.
BELOW THICKENED SLAB
1' - 3"
TYPICAL UNDER SLAB ON GRADE



PLAN

2X6 WOOD STUD - UNIT TO CORRIDOR - 60 MIN FIRE PARTITION

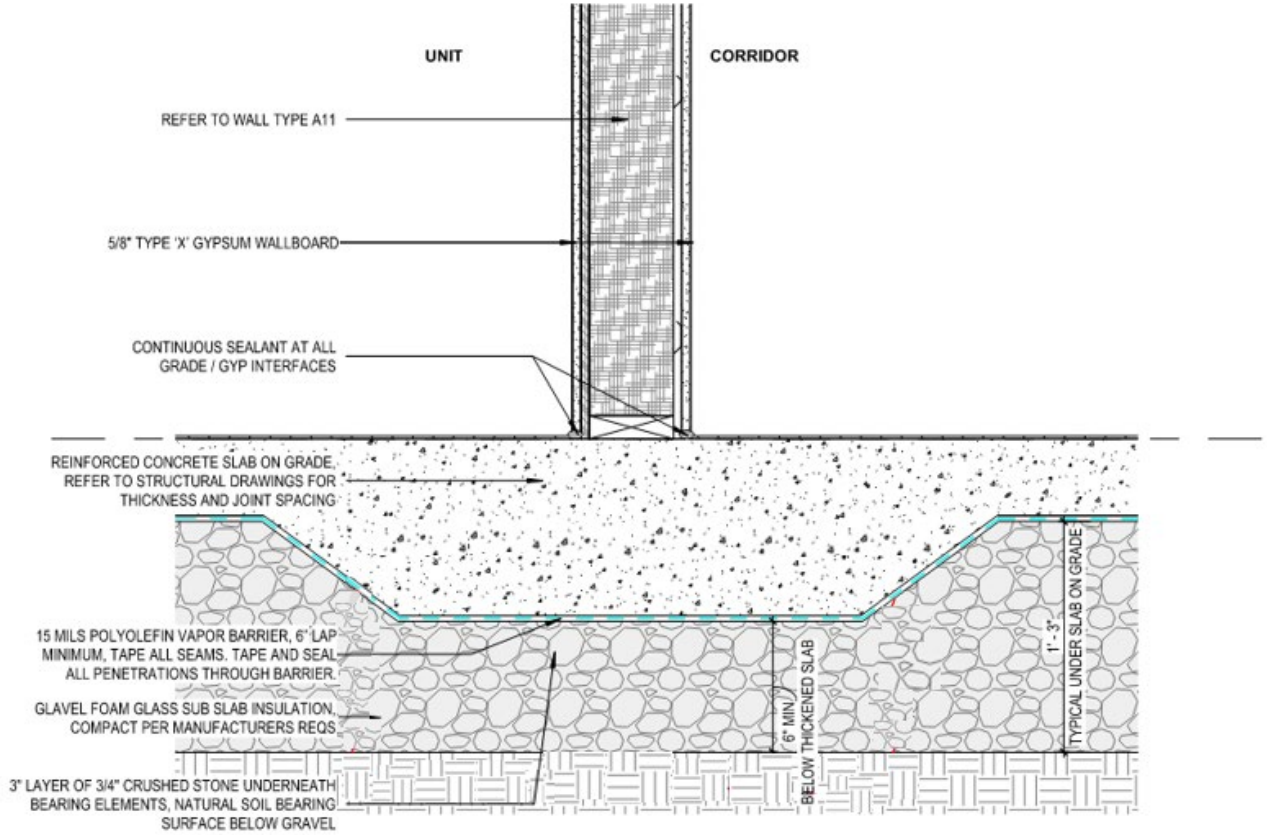
TYPE	R VALUE	FIRE RATING (MINUTES)	FIRE TEST REF	STC RATING	STC TEST REF
A11		60	UL DESIGN NO. U305	53	UL DESIGN NO. U305

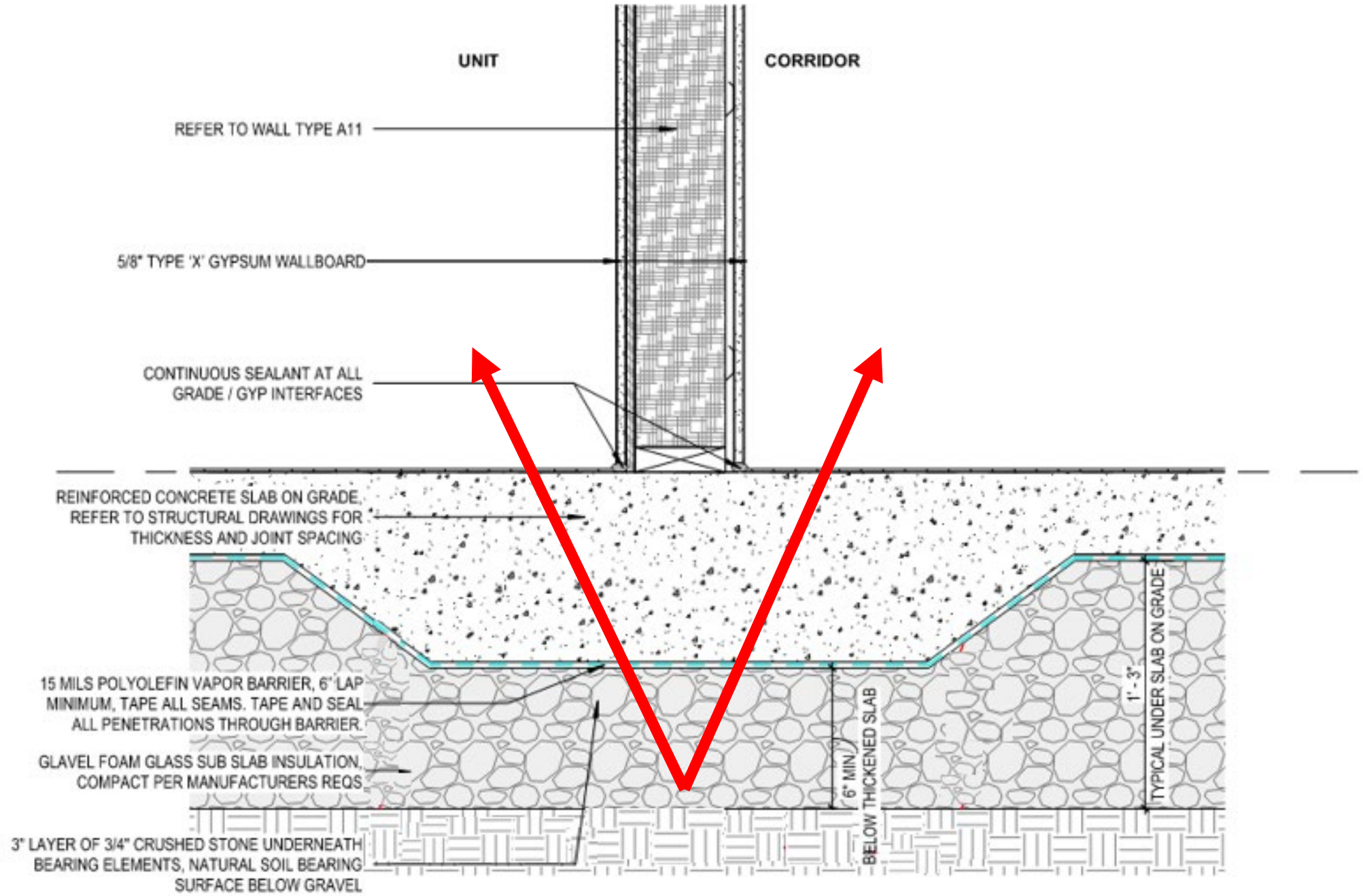
What is the Issue?

A. Vapor barrier needs to turn up through the foundation to the wall

B. Thermal Bridge at the haunch

C. There is missing waterproofing between the foam glass insulation layer and the crushed stone beneath it




UNIT
CORRIDOR
REFER TO WALL TYPE A11
5/8" TYPE 'X' GYPSUM WALLBOARD
CONTINUOUS SEALANT AT ALL GRADE / GYP INTERFACES
REINFORCED CONCRETE SLAB ON GRADE, REFER TO STRUCTURAL DRAWINGS FOR THICKNESS AND JOINT SPACING
15 MILS POLYOLEFIN VAPOR BARRIER, 6" LAP MINIMUM, TAPE ALL SEAMS. TAPE AND SEAL ALL PENETRATIONS THROUGH BARRIER.
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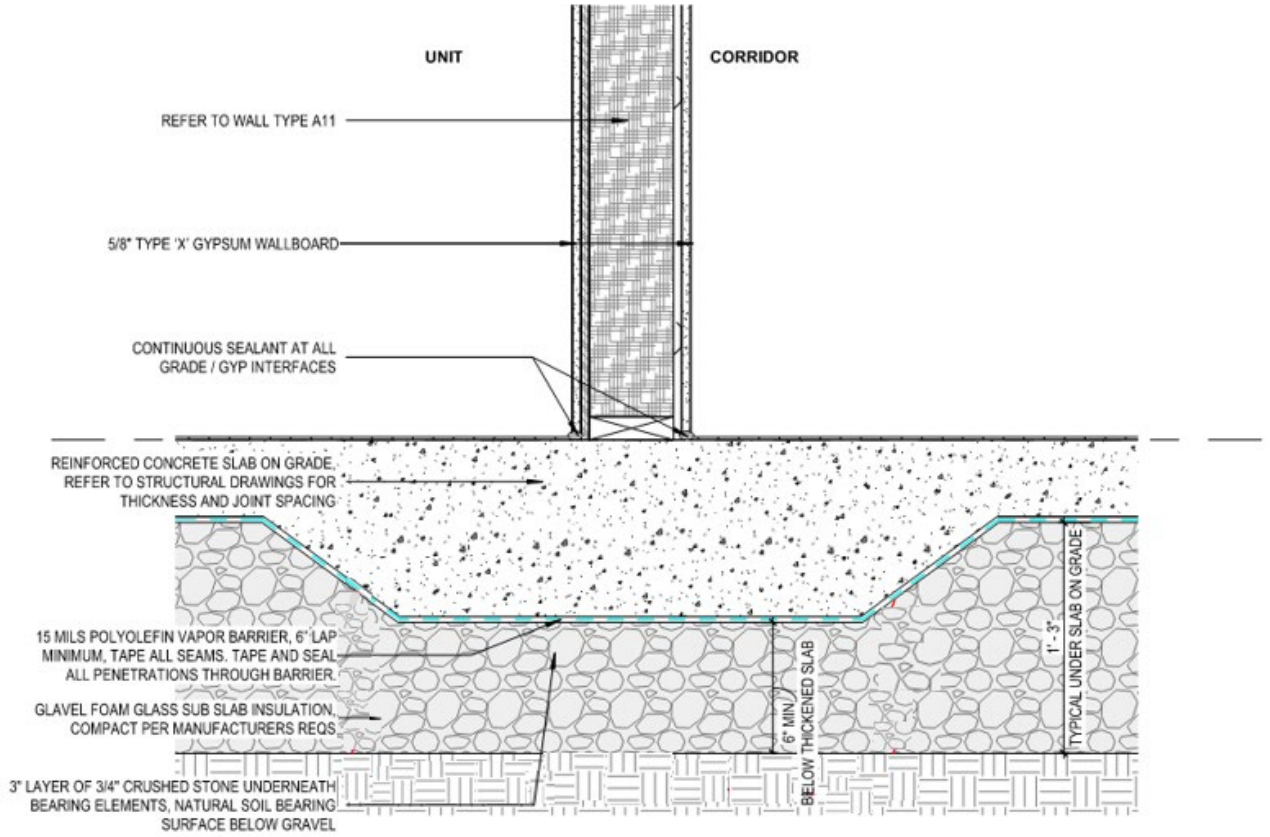
3" LAYER OF 3/4" CRUSHED STONE UNDERNEATH BEARING ELEMENTS, NATURAL SOIL BEARING SURFACE BELOW GRAVEL
6" MIN.
BELOW THICKENED SLAB
1' - 3"
TYPICAL UNDER SLAB ON GRADE

What was the Solution?

A. Derate the slab

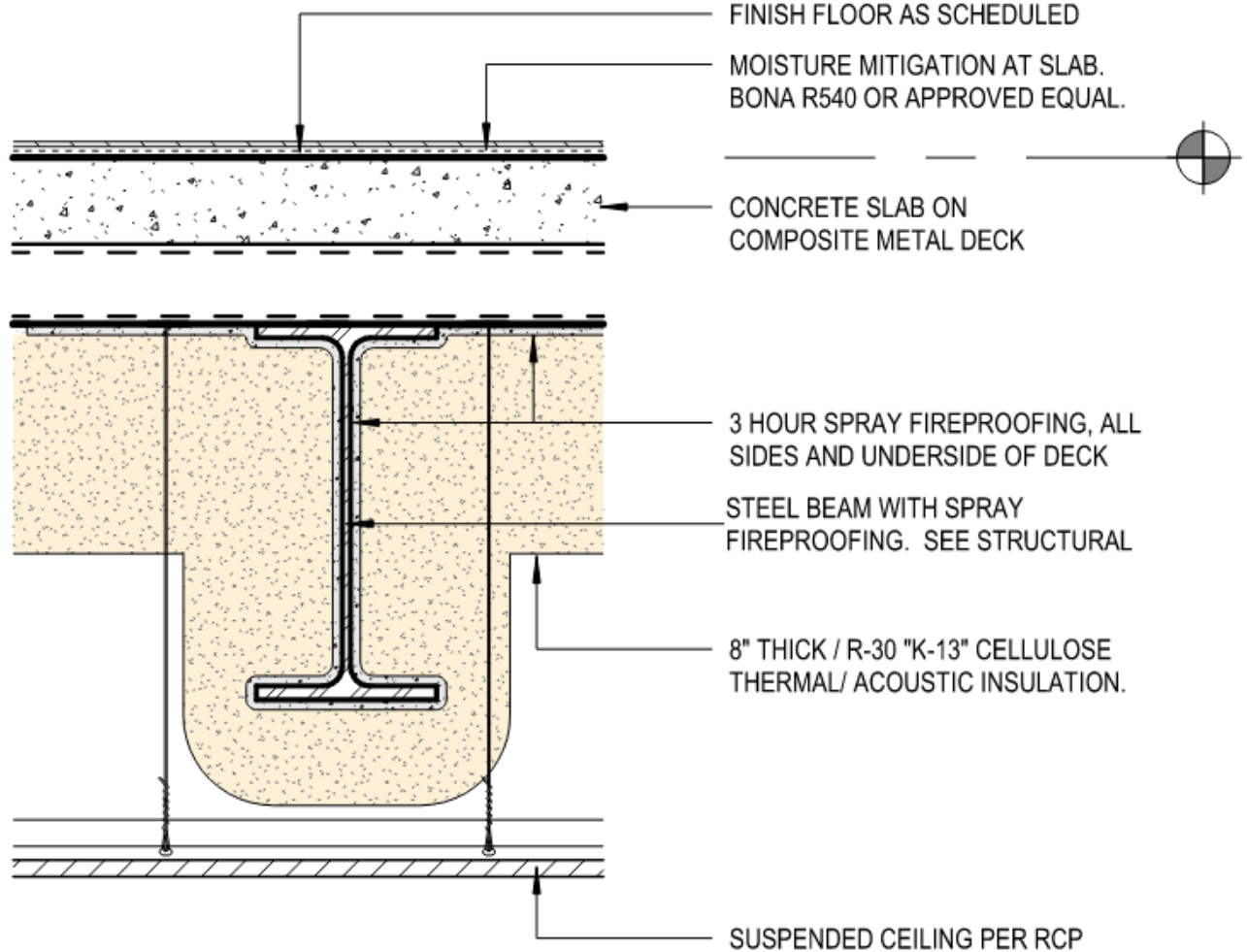
B. Add 2” of horizontal, rigid insulation to the floor above the slab

C. Switch from foam glass insulation to XPS



Question 4

CONDITIONED INTERIOR SPACE



UNCONDITIONED ENCLOSED SPACE

PODIUM ASSEBMLY - CONDITIONED OVER UNCONDITIONED SPACE

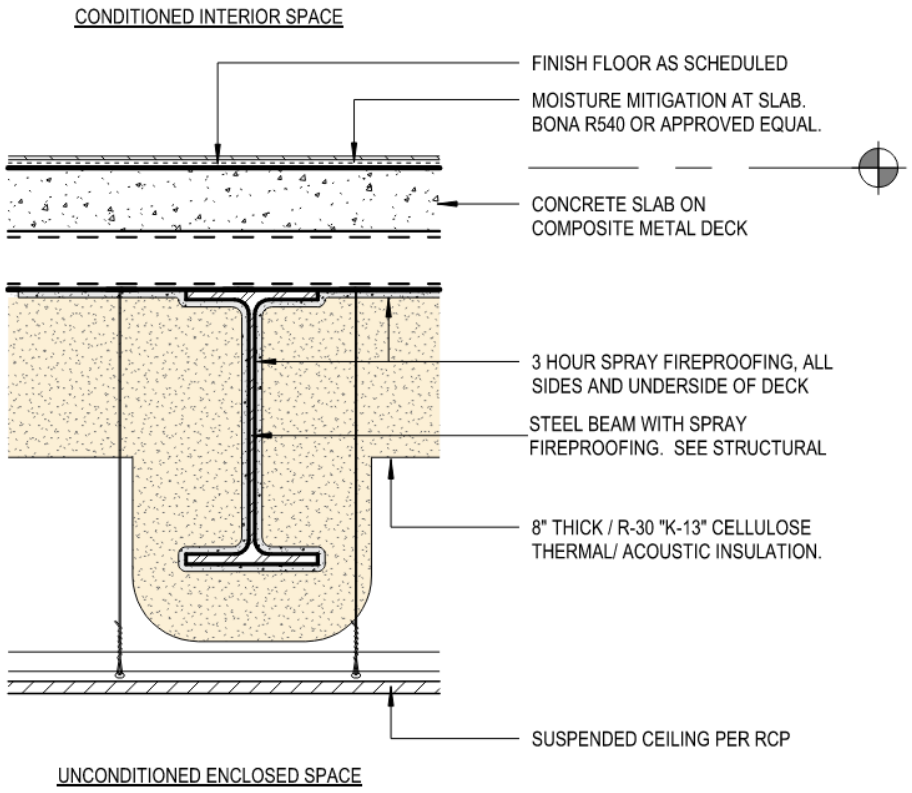
TYPE	R VALUE	FIRE RATING	FIRE TEST REF	STC RATING	STC TEST REF	IIC RATING	IIC TEST REF
FL4	R-30	3	UL DESIGN NO. D759	-	-	-	-

What is the Issue?

A. There is a thermal bridge

B. R-30 is not enough insulation around the beam

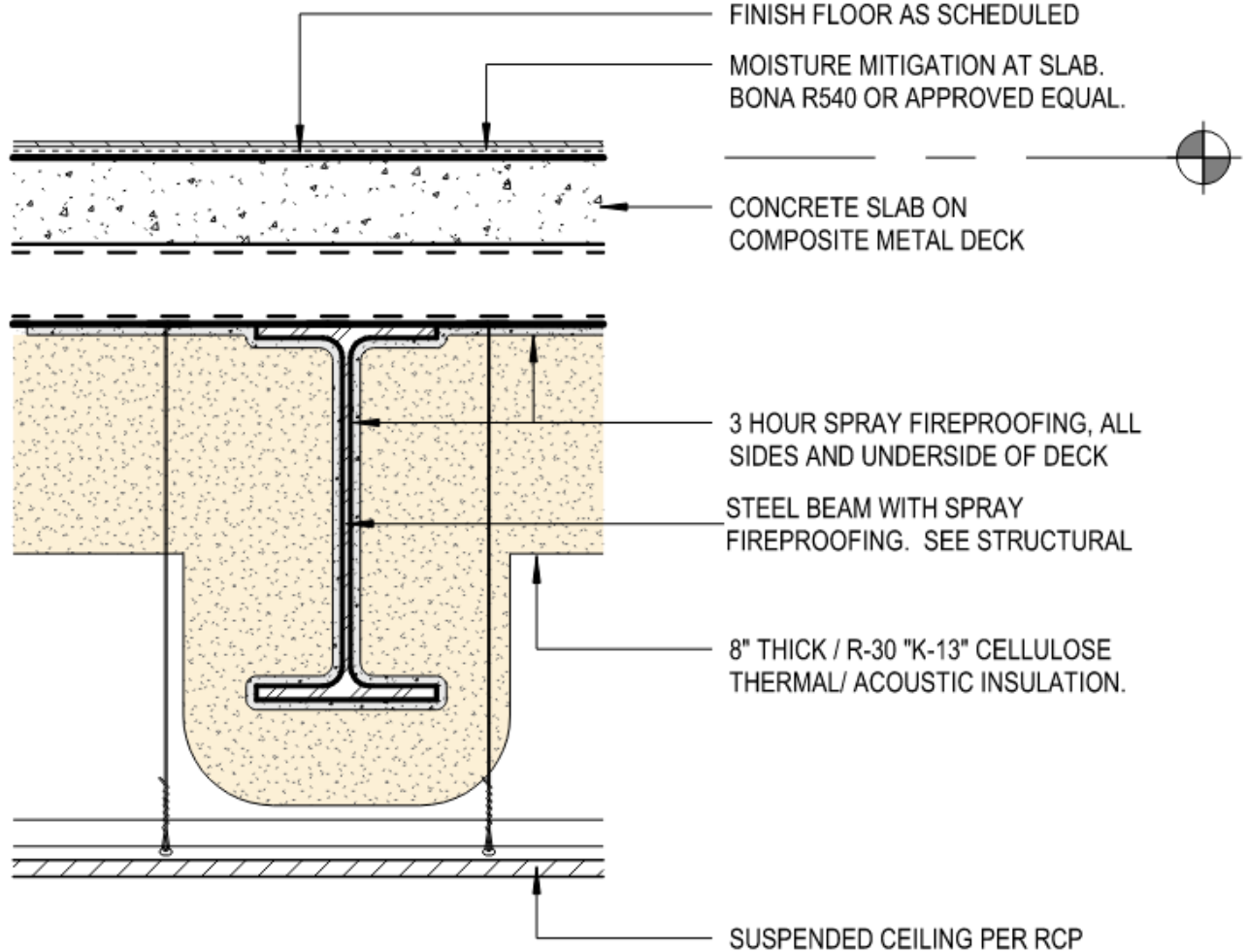
C. There should be an air and water barrier at the concrete slab



PODIUM ASSEBMLY - CONDITIONED OVER UNCONDITIONED SPACE

TYPE	R VALUE	FIRE RATING	FIRE TEST REF	STC RATING	STC TEST REF	IIC RATING	IIC TEST REF
FL4	R-30	3	UL DESIGN NO. D759	-	-	-	-

CONDITIONED INTERIOR SPACE



UNCONDITIONED ENCLOSED SPACE

PODIUM ASSEBMLY - CONDITIONED OVER UNCONDITIONED SPACE

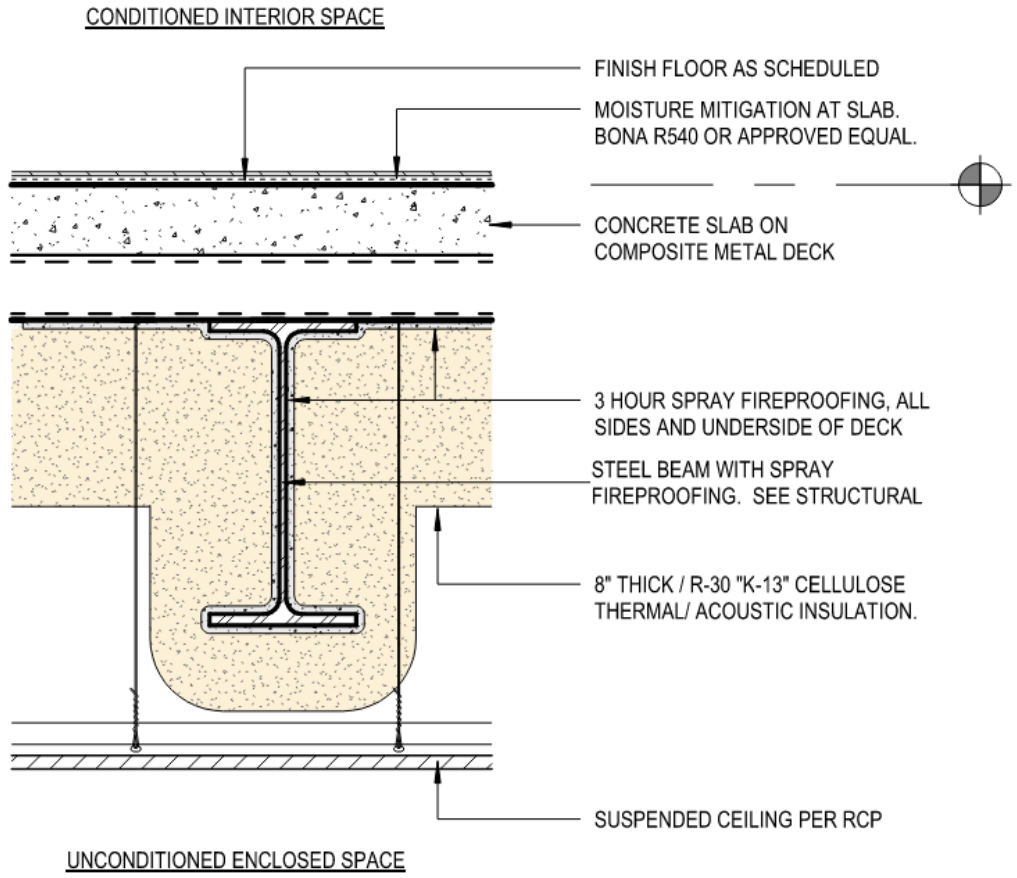
TYPE	R VALUE	FIRE RATING	FIRE TEST REF	STC RATING	STC TEST REF	IIC RATING	IIC TEST REF
FL4	R-30	3	UL DESIGN NO. D759	-	-	-	-

What was the Solution?

A. Model the steel beam in THERM as noted – 8” all around

B. Model the steel beam in THERM with 12” of K-13 insulation

C. Model the steel beam in THERM with various depths of insulation

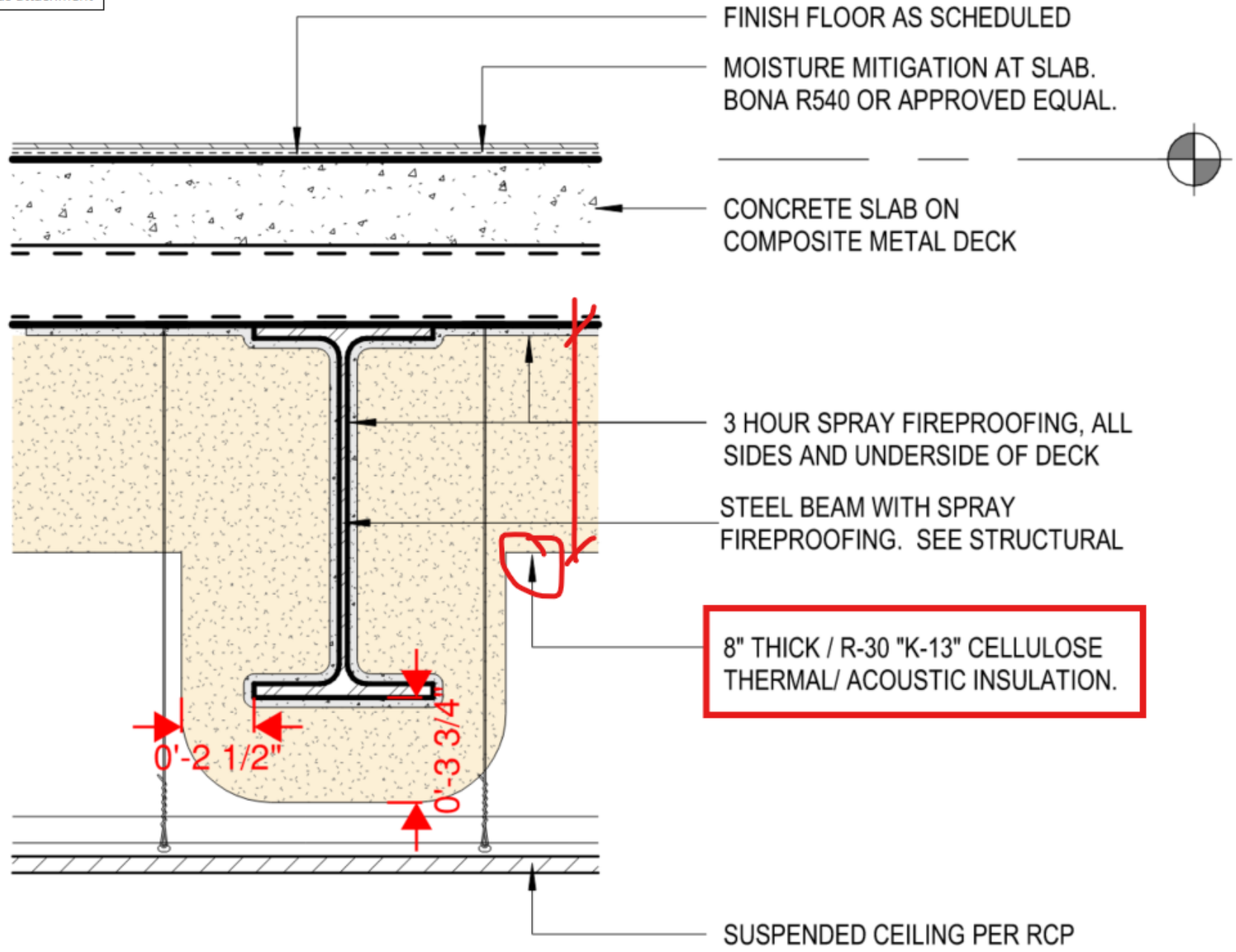


PODIUM ASSEBMLY - CONDITIONED OVER UNCONDITIONED SPACE

TYPE	R VALUE	FIRE RATING	FIRE TEST REF	STC RATING	STC TEST REF	IIC RATING	IIC TEST REF
FL4	R-30	3	UL DESIGN NO. D759	-	-	-	-

CONDITIONED INTERIOR SPACE

Previous attachment



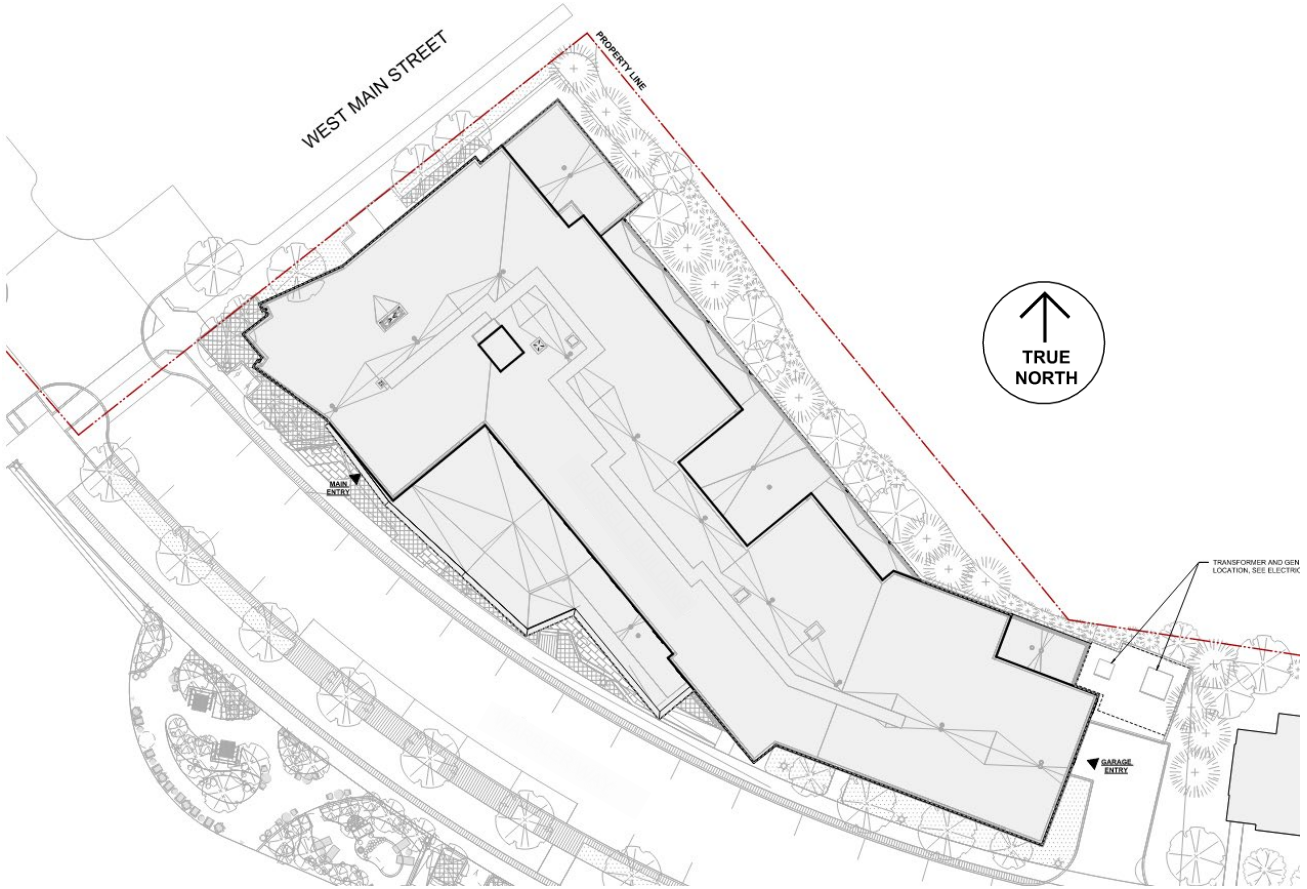
UNCONDITIONED ENCLOSED SPACE

Question 5

The Issue:

The WUFI modeler completes the model and the Cooling Load is too high.

What are some of the solutions?

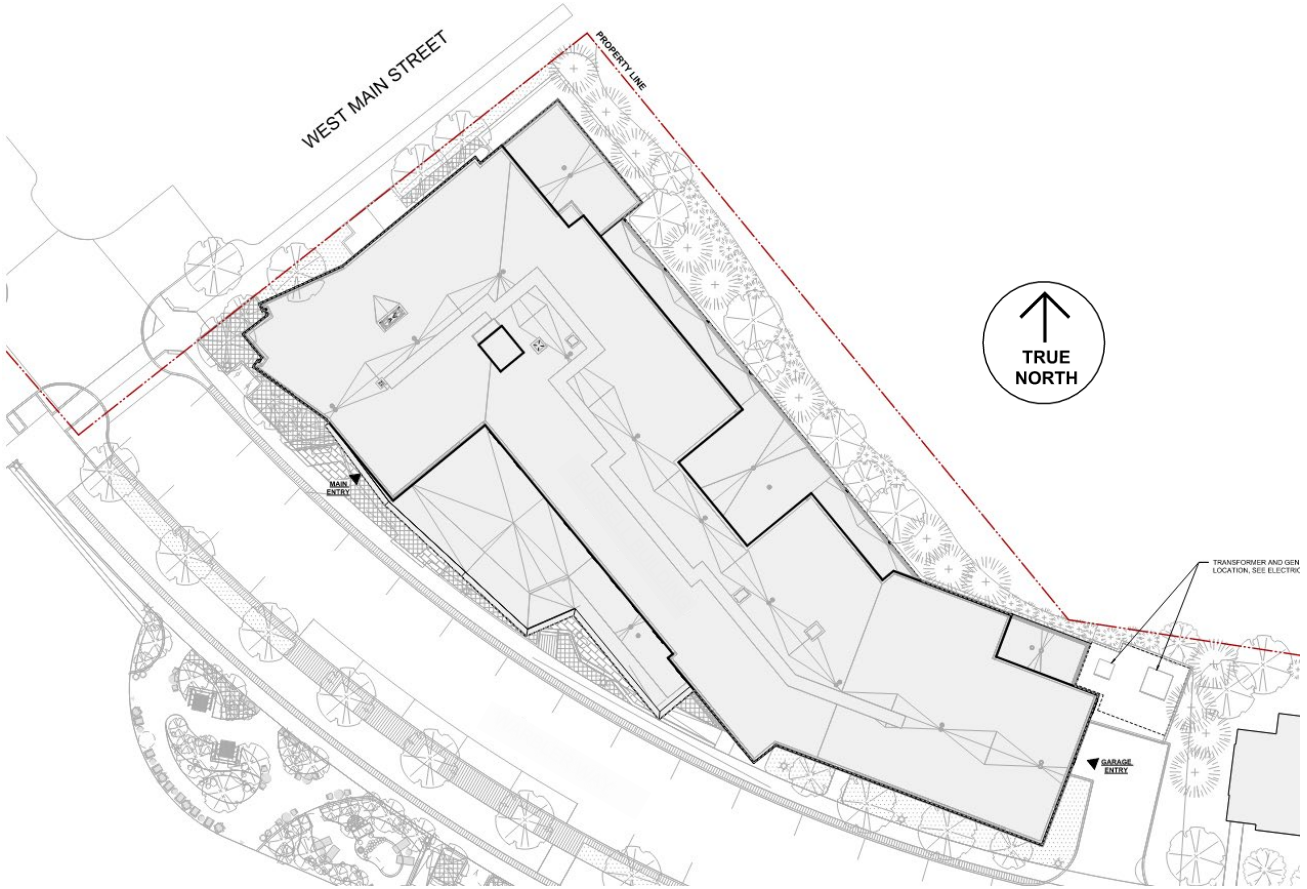


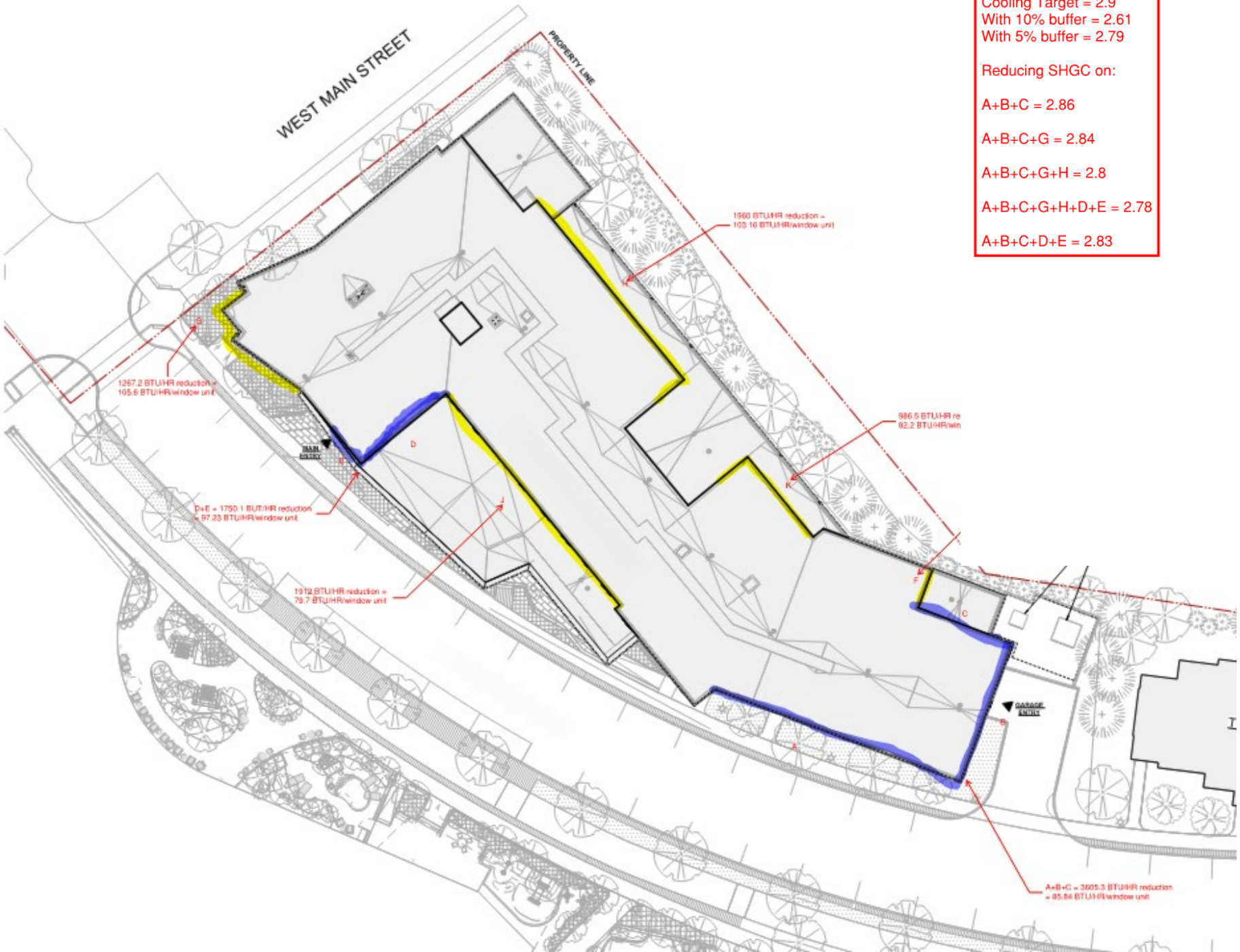
What was the Solution?

A. Reduce ventilation rate by half, increase SHGC on all windows to .42

B. Ensure Window to Wall ratio is 23%, and increase first floor wall insulation

C. Raise the sill height by 6”, tweak the SHGC of various windows.





Cooling Target = 2.9
With 10% buffer = 2.61
With 5% buffer = 2.79

Reducing SHGC on:

A+B+C = 2.86

A+B+C+G = 2.84

A+B+C+G+H = 2.8

A+B+C+G+H+D+E = 2.78

A+B+C+D+E = 2.83

A only = 1820.9 BTU/HR reduction
72 IGUs, 24 window units = 76 BTU/HR/window unit reduction

B only = 1107.3 BTU/HR reduction
30 IGUs, 9 window units = 123 BTU/HR/window unit reduction

C only = 677.1 BUT/HR reduction
25 IGUs, 9 window units = 75.2 BTU/HR/window unit reduction

A+B+C (grouped together) = 3605.3 BTU/HR reduction
42 window units = 85.84 BTU/HR/window unit reduction

D only = 888.8 BTU/HR reduction
36 IGUs, 12 window units = 74 BTU/HR/window unit reduction

E only = 861.3 BTU/HR reduction
24 IGUs, 6 window units = 143.55 BTU/HR/window unit reduction

D+E (grouped together) = 1750.1 BTU/HR reduction
18 window units = 97.23 BTU/HR/window unit reduction

G only = 1267.2 BTU/HR reduction
42 IGUs, 12 window units = 105.6 BTU/HR/window unit reduction

H only = 1960 BTU/HR reduction
50 IGUs, 19 window units = 103.16 BTU/HR/window unit reduction

J only = 1912 BTU/HR reduction
78 IGUs, 24 window units = 79.7 BTU/HR/window unit reduction

K only = 986.5 BTU/HR reduction
34 IGUs, 12 window units = 82.2 BTU/HR/window unit reduction

Bonus Round: Rapid Fire!

1. What is the cloud-based software that will be replacing WUFI?
2. Under Phius ZERO 2024, is the Source Energy or Site Energy required to be off set completely by renewables?
3. Do pet doors need to be included in the condensation risk assessment under Performance Path of Phius 2024?
4. According to the Phius 2024 Guidebook table, what is the R-value/inch of wood framing?
5. Guess! How many humans are estimated by New Ecology as the equivalent to a 500lb North American black bear, in order to determine internal gain rates for the enclosure?

Thank you

Molly Craft, New Ecology

Molly.Craft@NewEcology.org

Betsy Cooke, PCA Design

Bcooke@PCADesign.com

Nicole Schuster, Positive Trace

Nicole@Positive-Trace.com

Maggie Goetsch, Phius

MGoetsch@Phius.org

BUILDINGENERGY BOSTON

Please fill out an evaluation for this session

or: *nesea.org/eval*

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