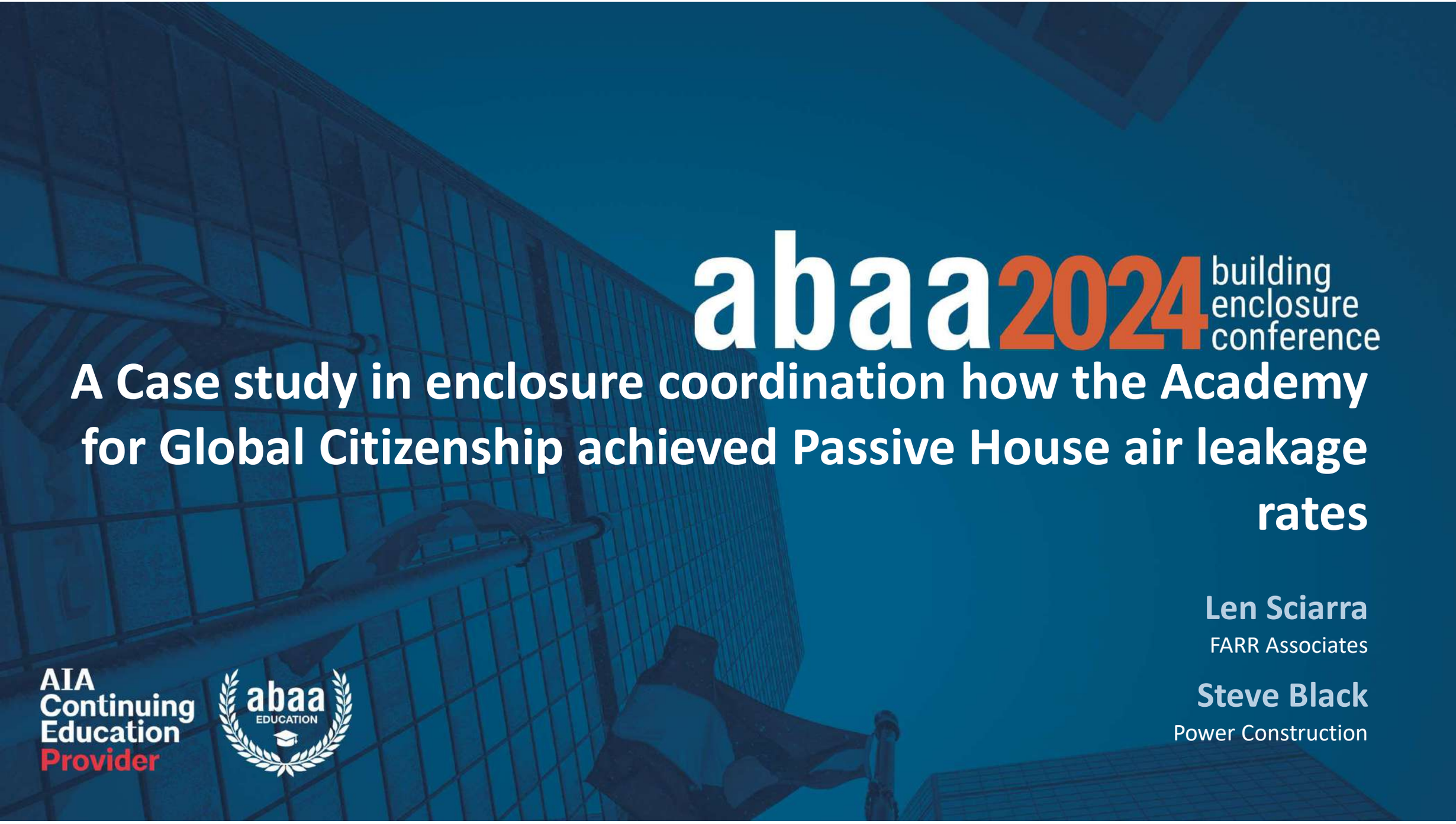


abaa 2024 building enclosure conference

A Case study in enclosure coordination how the Academy for Global Citizenship achieved Passive House air leakage rates

Len Sciarra
FARR Associates

Steve Black
Power Construction

AIA Continuing Education Provider

abaa EDUCATION

A Case study in enclosure coordination: How the Academy for Global Citizenship achieved Passive House air leakage rates

This presentation will showcase the process which allowed this 70,000 square foot two story K-8 school located on the Southwest Side of Chicago, to achieve the air tightness required to achieve both Living Building Challenge and PHIUS 2021. The team will discuss strategies employed and challenges faced from design and procurement to construction and site observation. We will discuss the multiple types of envelope components, complex geometries, and penetrations through different materials encountered, each of which required specific attention to detail, specific observations and material compatibility. Any project of this size involves multiple trades, and we will discuss the communication and strategy involved in managing that process. Material choices were further complicated as the project required limited Red List materials. We will discuss bidding and estimating concerns as this project was delivered on budget and in a shorter timeframe than a typical CPS school, with a high percentage of local MWBE contractors.

abaa building enclosure conference

Learning Objectives

1. Describe the key communication strategies for a successful air barrier installation program.
2. How to organize your design documents for a successful air barrier procurement.
3. How to prepare a large project for a successful air leakage test.
4. Summarize the benefits of early design and pre-construction strategies such as energy modeling and mock-ups.

abaa EDUCATION

Leonard Sciarra
AIA, ASHRAE,
LEED ap, CPHC

Architect
FARR Associates

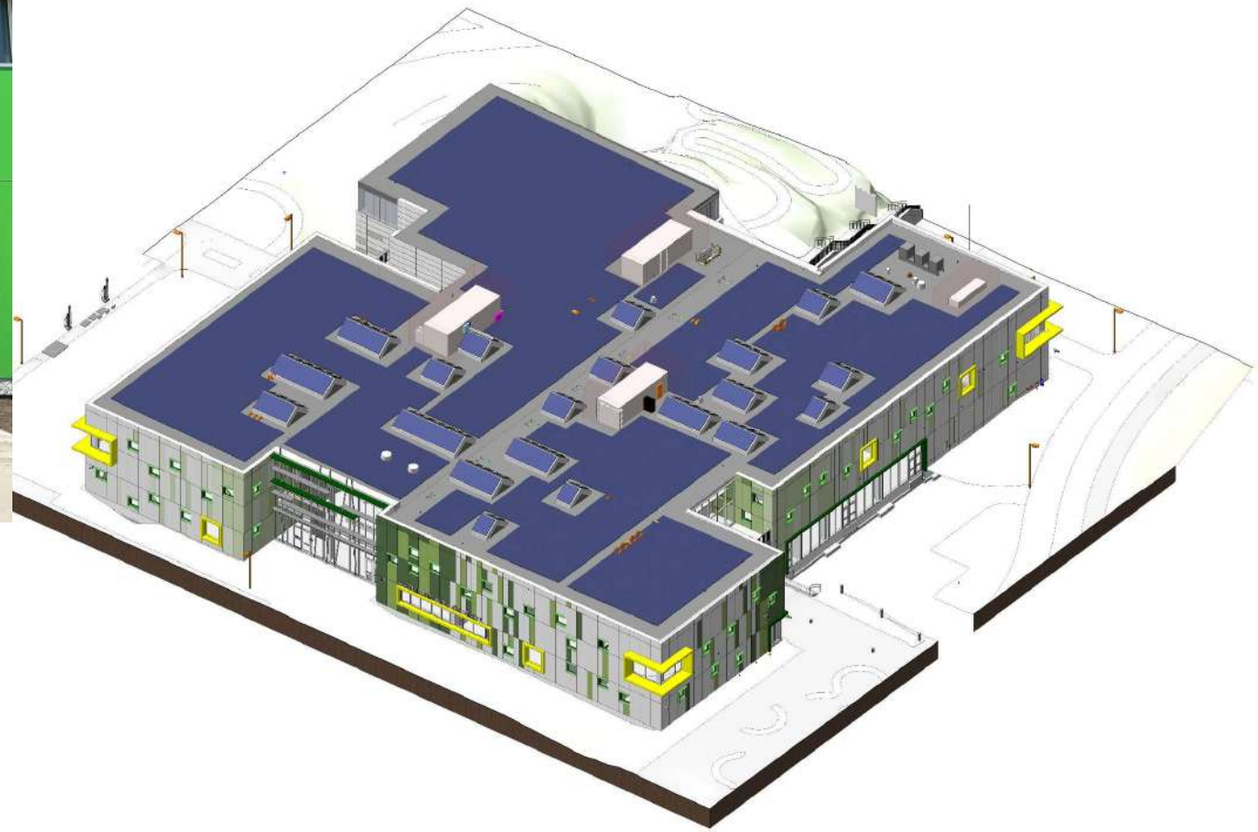
Steve Black
LEED BD+C

Quality Support Director
Power Construction

- K-8 School
- 5 “tenants”
- 70,000 square feet
- 2 stories
- 6 acres

phius

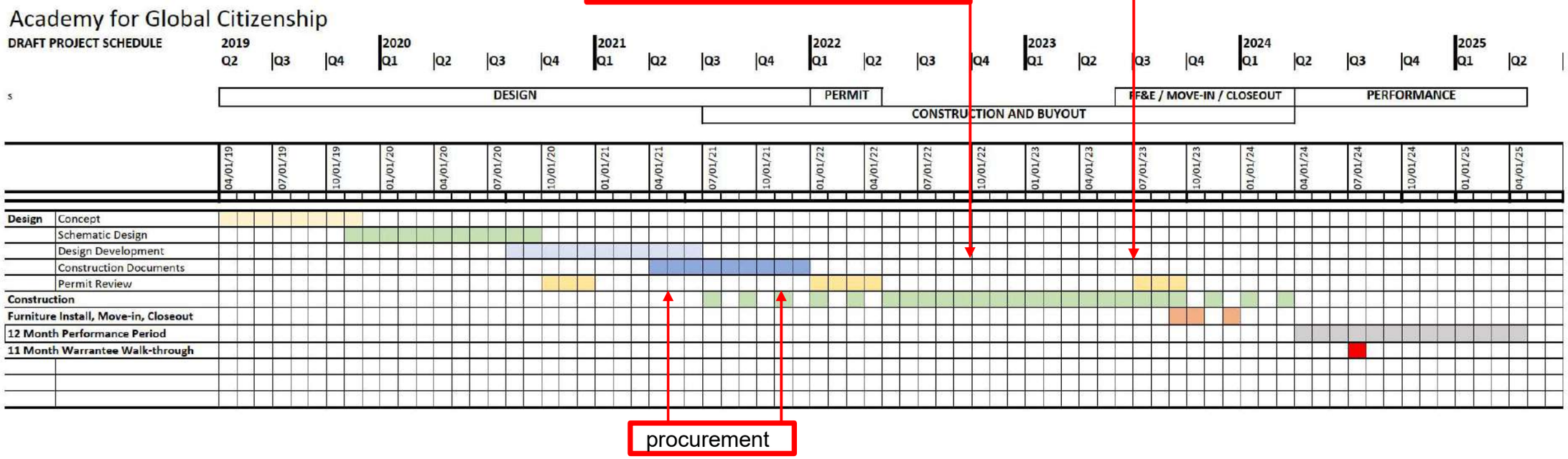
LIVING BUILDING CHALLENGE



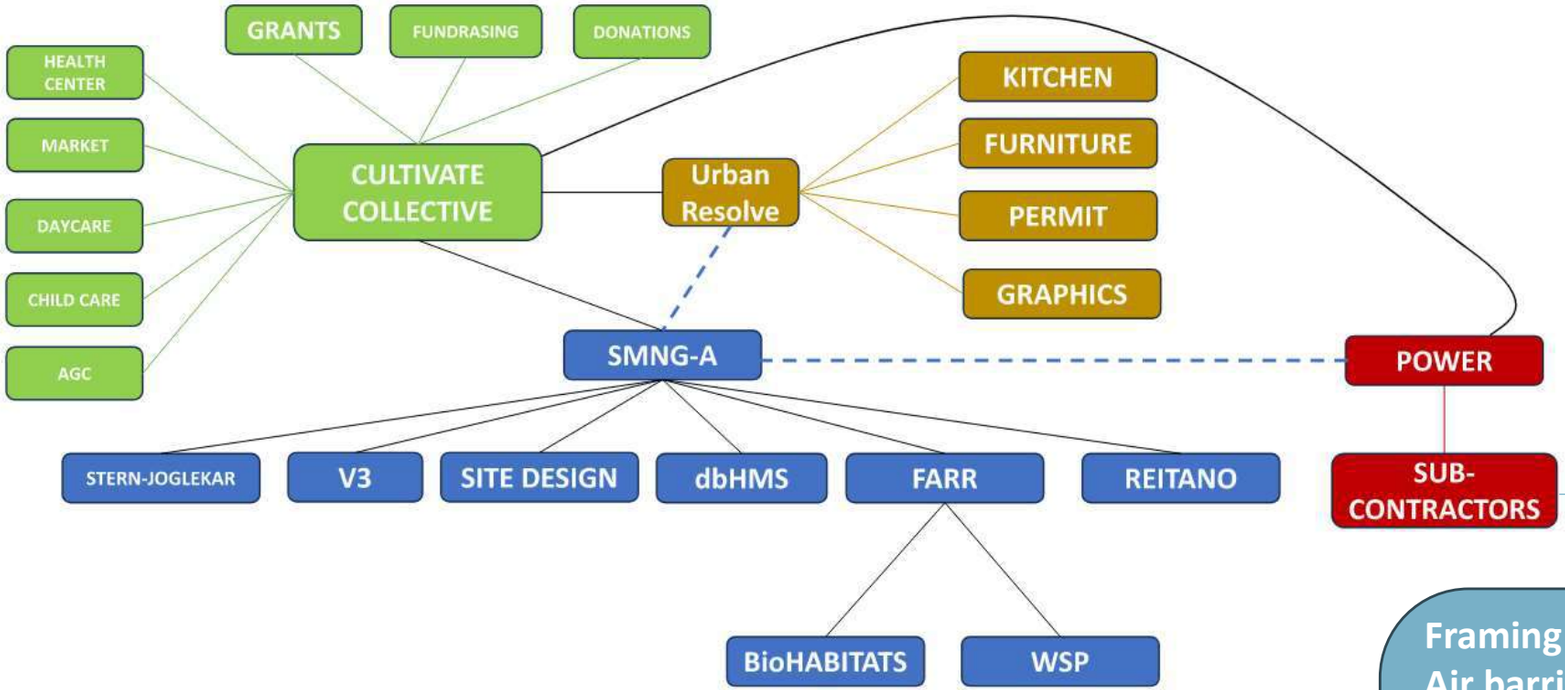
The timeline

Blower Door Test - final

Mid Construction Blower Door Test

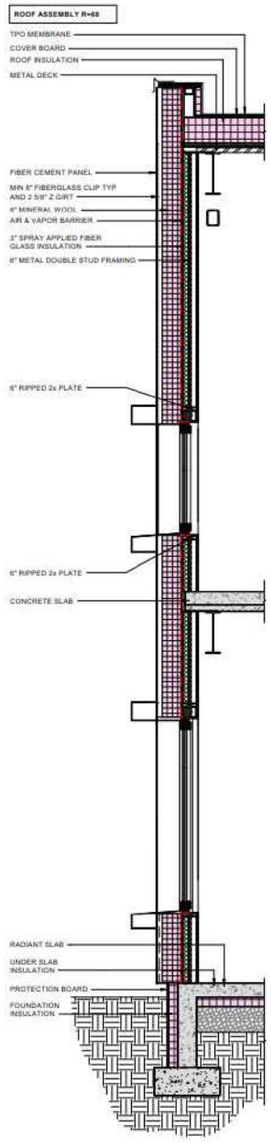


procurement

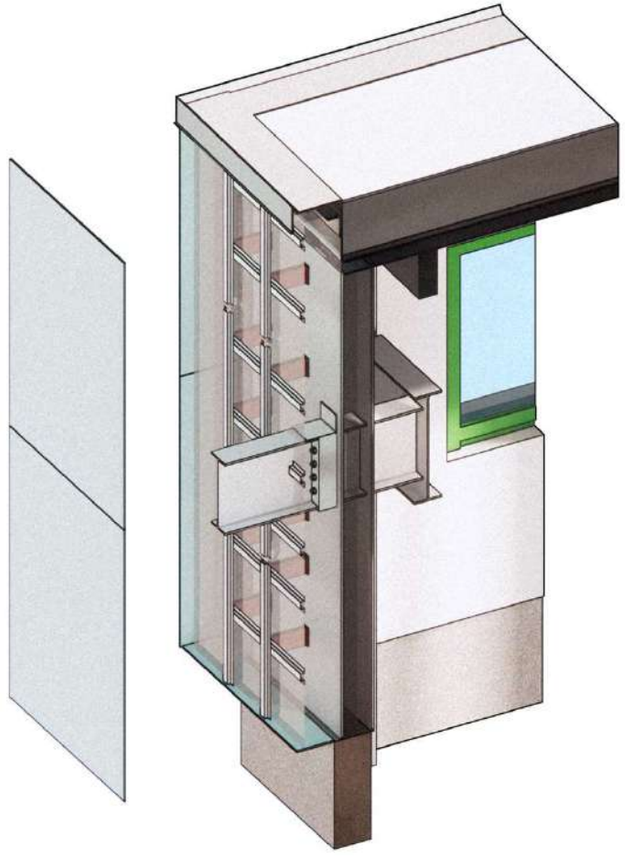


Framing and sheathing – RG Construction
Air barrier installation - Kedmont
Concrete and associated thermal – Cerami
Punched windows – Alpen installed by Northern Glass
Curtain wall – Gateway
Roof - Bennet and Brousseau
Skylights – Velux installed by Whited Brothers
Plumbing and Mechanical – AMS
Electrical – G&M Electic

The team



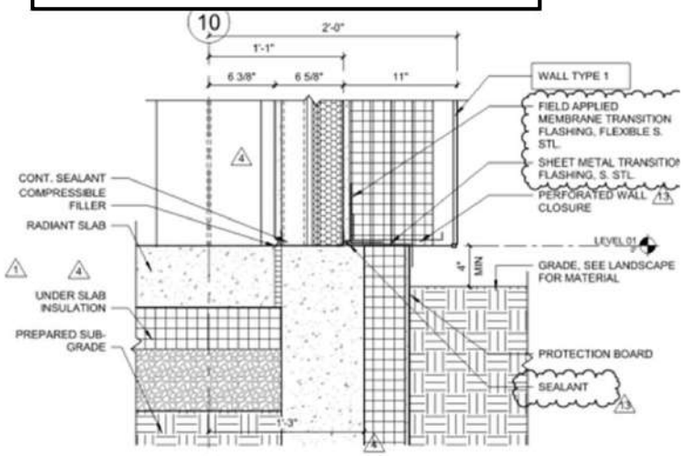
The wall section



The mock up

The mock up - Tested

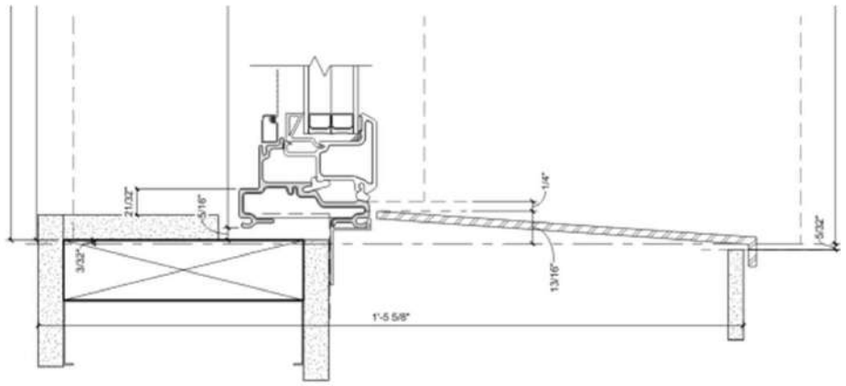
The details

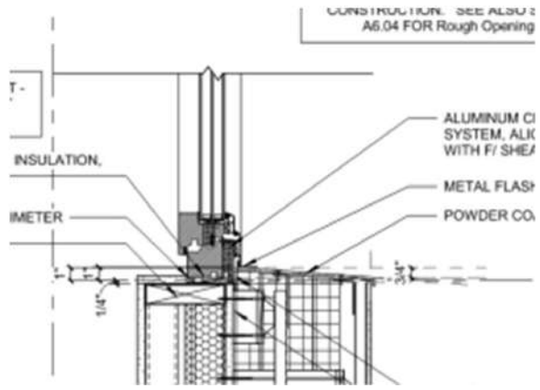

10
2'-0"
1'-1"
6 3/8"
6 5/8"
11"
WALL TYPE 1
FIELD APPLIED MEMBRANE TRANSITION FLASHING, FLEXIBLE S. STL.
SHEET METAL TRANSITION FLASHING, S. STL.
PERFORATED WALL CLOSURE
CONT. SEALANT
COMPRESSIBLE FILLER
RADIANT SLAB
LEVEL 01
4" MIN
GRADE, SEE LANDSCAPE FOR MATERIAL
UNDER SLAB INSULATION
PREPARED SUB-GRADE
PROTECTION BOARD
SEALANT
1'-3"


Perm-A-Barrier NPS

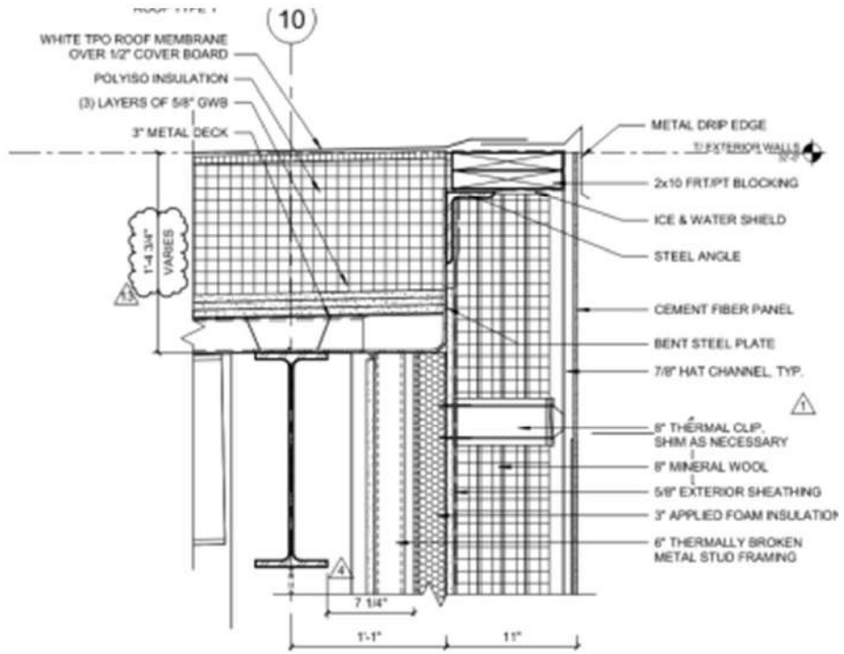
The details


ALPEN
HIGH PERFORMANCE PRODUCTS


21/32"
5/16"
1/4"
13/16"
5/32"
3/32"
1'-5 5/8"


A6.04 FOR Rough Opening
INSULATION,
METAL FLASH
POWDER CO
1/4"
3/4"

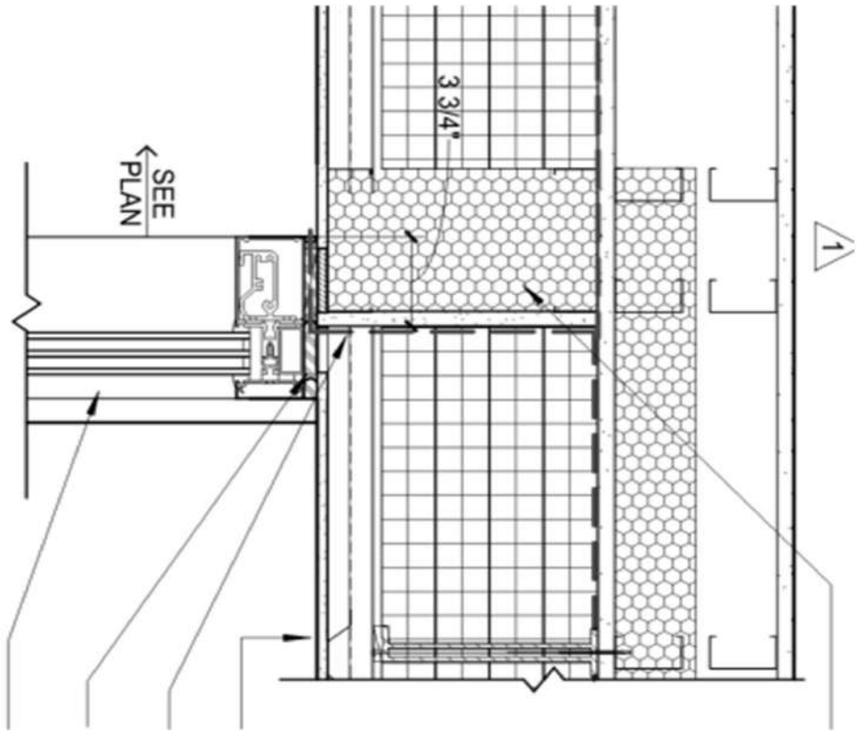
The Roof


10
WHITE TPO ROOF MEMBRANE OVER 1/2" COVER BOARD
POLYISO INSULATION
(3) LAYERS OF 5/8" GWB
3" METAL DECK
1'-4 3/4" VARIES
METAL DRIP EDGE
2x10 FRT/PT BLOCKING
ICE & WATER SHIELD
STEEL ANGLE
CEMENT FIBER PANEL
BENT STEEL PLATE
7/8" HAT CHANNEL, TYP.
8" THERMAL CLIP, SHIM AS NECESSARY
8" MINERAL WOOL
5/8" EXTERIOR SHEATHING
3" APPLIED FOAM INSULATION
6" THERMALLY BROKEN METAL STUD FRAMING
7 1/4"
1'-1"
11"


Perm-A-Barrier NPS

The Roof

The details

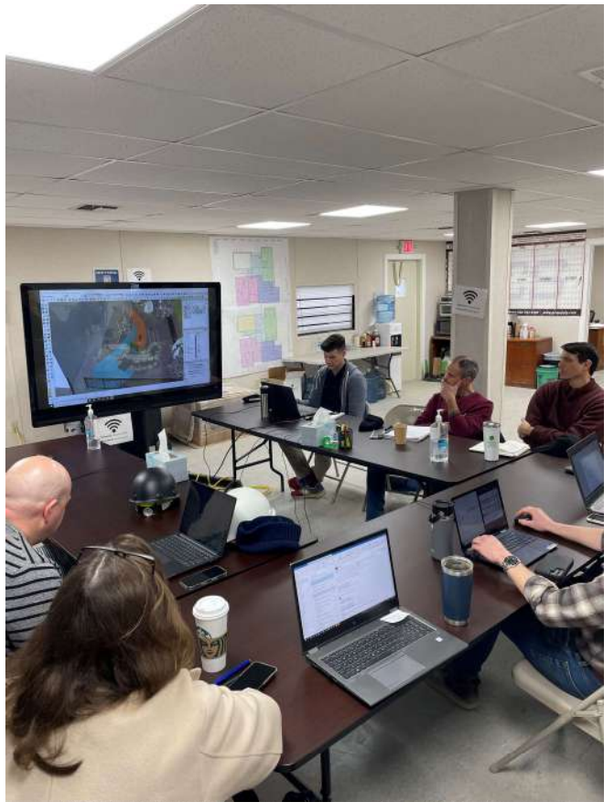


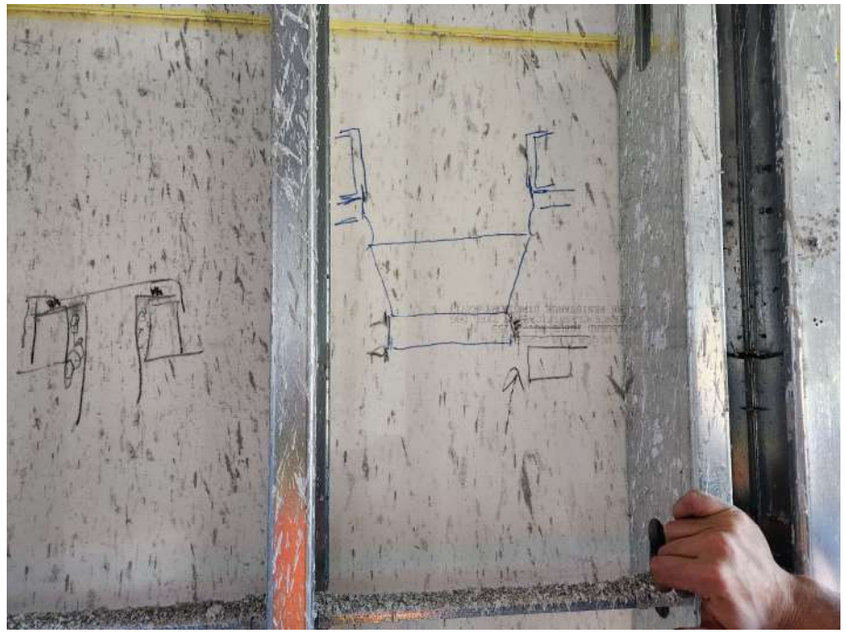
The unexpected

The unexpected

The unexpected

The trades





The materials

The tests….

1. ASTM E1105 – Static Water Test – No penetration of uncontrolled water beyond plane parallel to innermost glazing edge.

2. ASTM E783 – Static Air Test – Air infiltration not exceeding 0.1 CFM/SF at 75 PA

3. ASTM E1186 – Bubble Test – No leakage detected via visible bubbles in the detection fluid

4. ASTM D4541 – Pull Test – Meets manufacturer's rated pull-off strength within repeatability and reproducibility limits specified in ASTM D4541 Tables 1-5

5. AAMA 501.2 – Hose Test – No visible leakage detected at interior

6. ASTM D5957 – Flood Test – No visible leakage detected at interior

7. ASTM E779 – Blower Door Test – Air infiltration not exceeding 0.6 ACH at 50 PA

The tests….

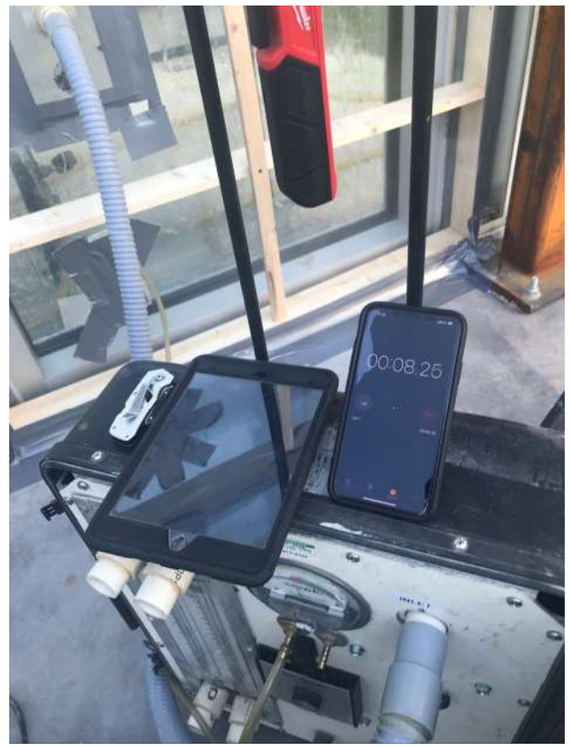
ASTM D4541 – Pull Test – Meets manufacturer’s rated pull-off strength within repeatability and reproducibility limits specified in ASTM D4541 Tables 1-5

ASTM E783 – Static Air Test – Air infiltration not exceeding 0.1 CFM/SF at 75 PA

The tests….

ASTM E1105 – Static Water Test – No penetration of uncontrolled water beyond plane parallel to innermost glazing edge.

ASTM E783 – Static Air Test – Air infiltration not exceeding 0.1 CFM/SF at 75 PA

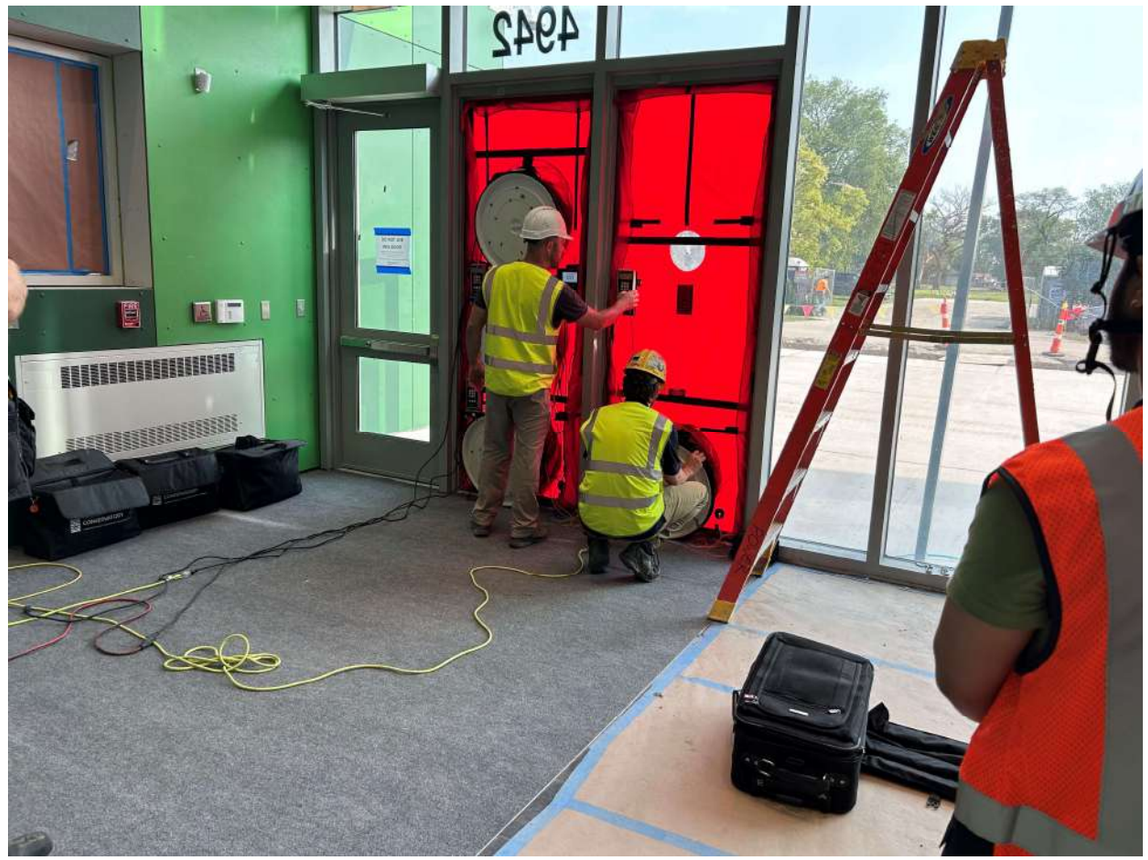


Mid Construction Test

The tests….

ASTM E779 – Blower Door Test – Air infiltration not exceeding 0.6 ACH at 50 PA

This is the final exam...



Our grade...

MID - **0.063 cfm/ft²@50pa**

0.082 cfm/ft²@75Pa

FINAL - **0.059 cfm/ft²@50pa**

0.077 cfm/ft²@75Pa

(envelope surface area)

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abaa building enclosure conference


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building
enclosure
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