

air barrier
abaa
association of
america
**CONFERENCE
& TRADE SHOW**
APRIL 18-20
2017
RESTON, VA
AIR BARRIER EDUCATION TRACKS FOR
THE CONSTRUCTION INDUSTRY

MANAGING PROJECT SPECIFIC DETAILS

real-time collaboration between the design professional and product
specialists

Guy Long

Building Envelope Technical Specialist



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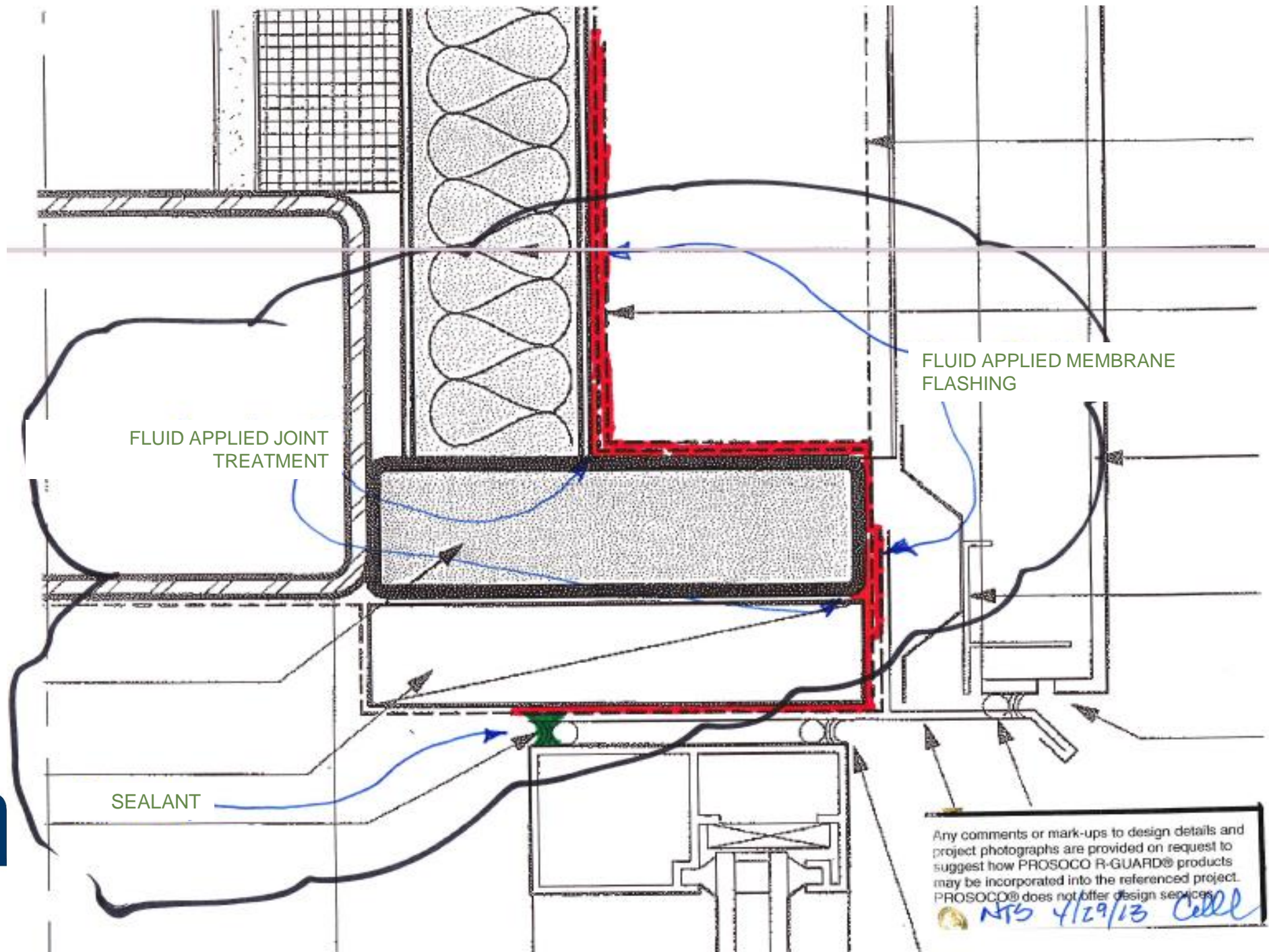
OBJECTIVES

Explain how architectural drawings are sometimes lacking in structure amenable to air-barrier and waterproofing detailing.

Demonstrate how simple modifications can greatly enhance constructability and detailing to prevent water intrusion and air leakage.

Show how to draw air / water barrier details to facilitate use of fluid-applied products rather than self-adhered membranes and building wrap.

Explain how to work with manufacturers to optimize preparation of details for implementation by contractors.



SEALANT

FLUID APPLIED JOINT
TREATMENT

FLUID APPLIED MEMBRANE
FLASHING

Any comments or mark-ups to design details and
project photographs are provided on request to
suggest how PROSOCO R-GUARD® products
may be incorporated into the referenced project.
PROSOCO® does not offer design services.

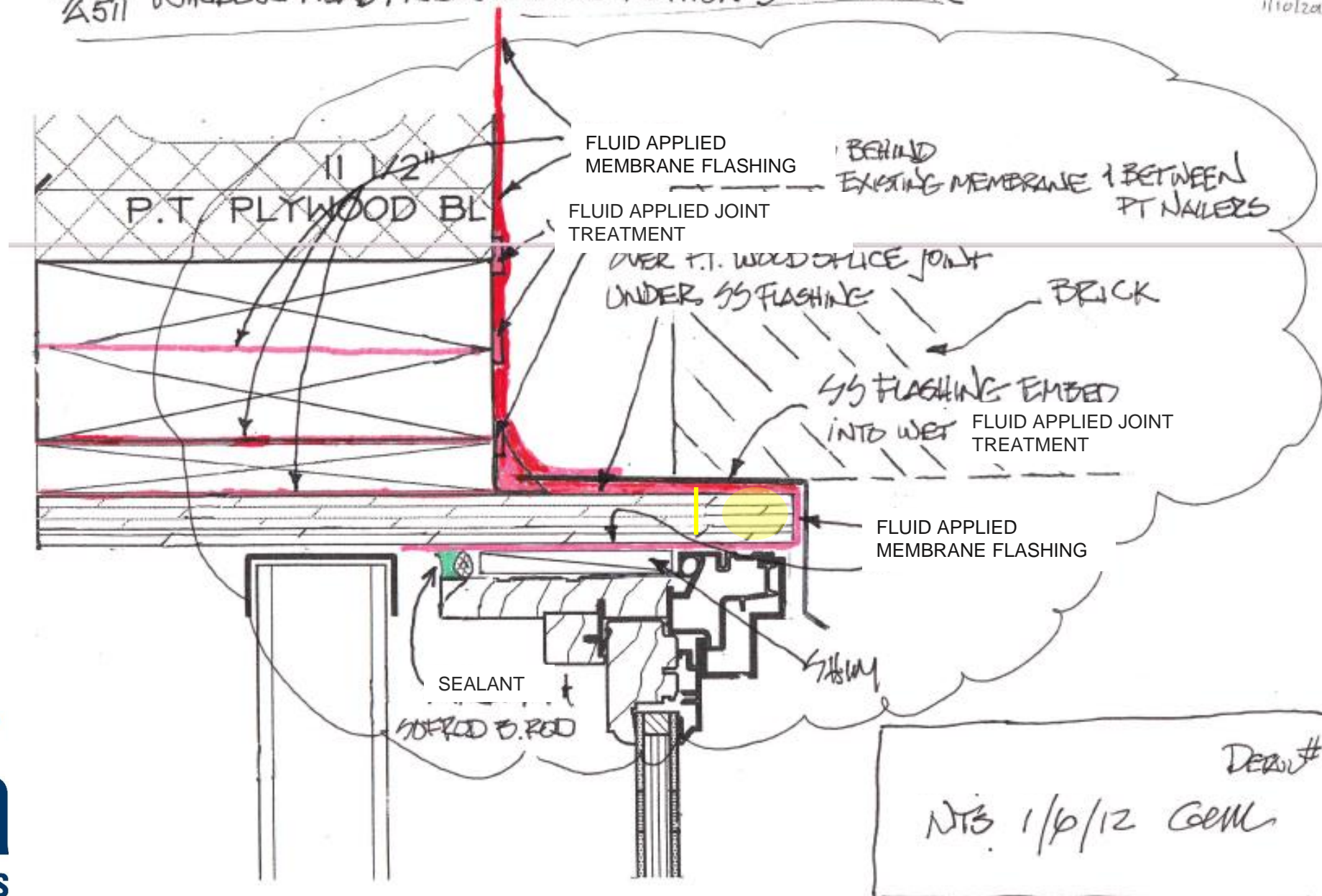


NPS 4/29/13 Celd

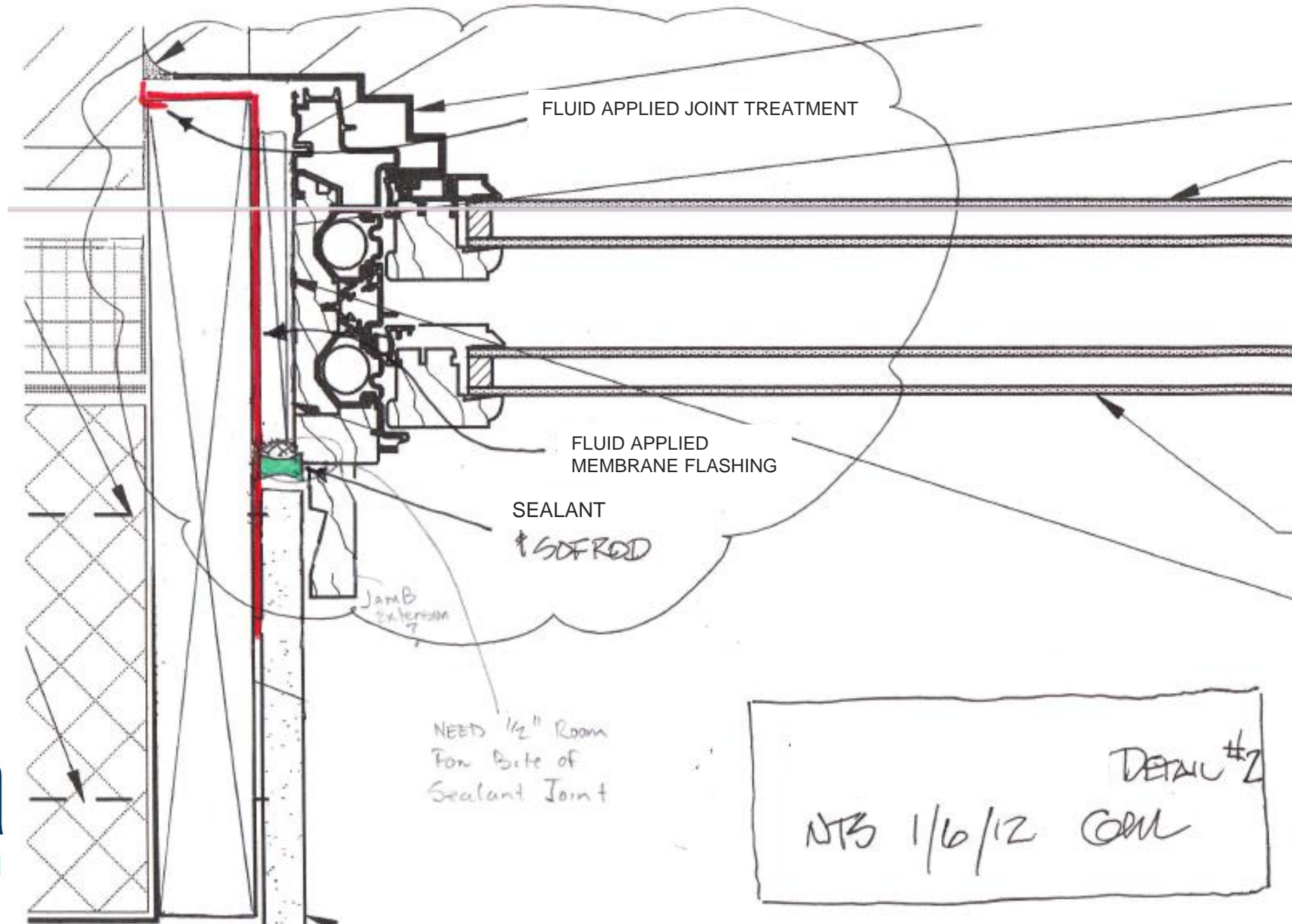
NOT 5/12/13 call

2/4511 WINDOW HEAD; NEW BRICK CONDITION 3RD FLOOR

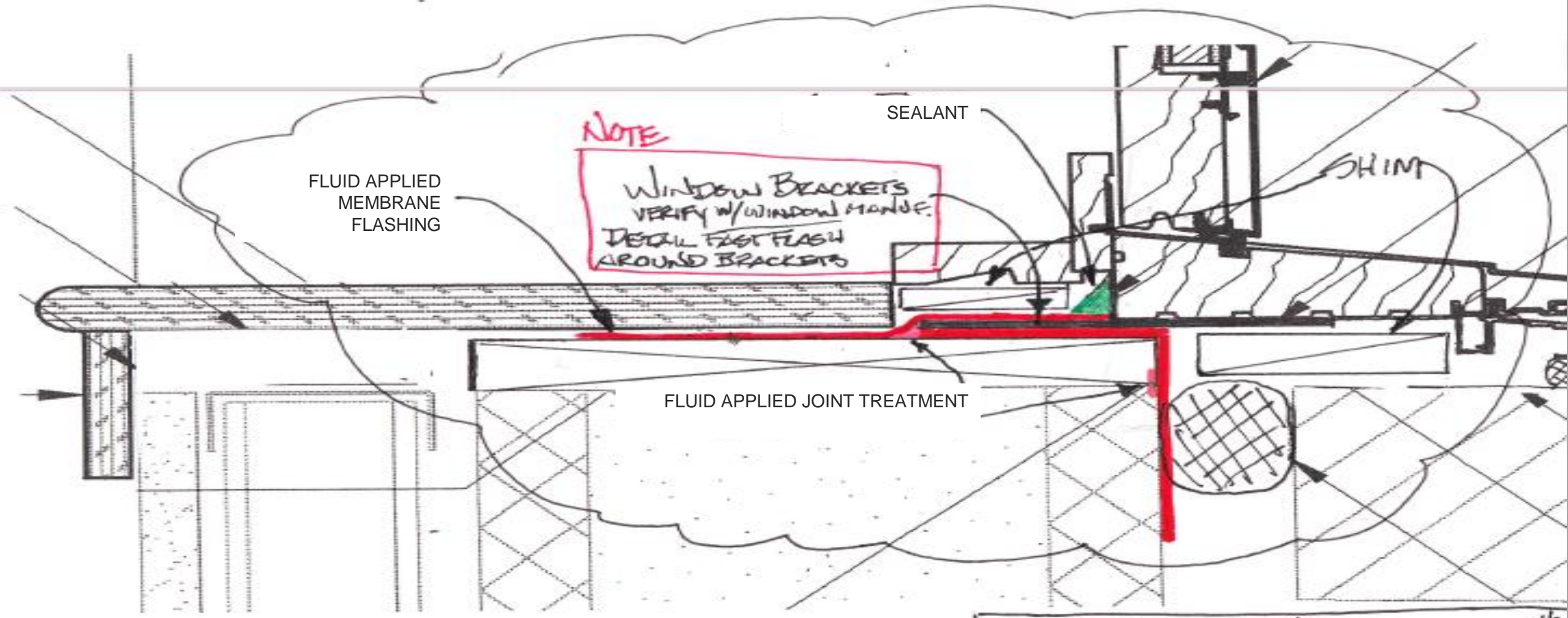
✓ AGREED S.G.
11/01/2012



5/A511 WINDOW JAMB: NEW BRICK CONDITION 3RD FLOOR



Need Approx
75% of Window
Sill on R.O.
For Structural
Concern.



FLUID APPLIED
MEMBRANE
FLASHING

NOTE

WINDOW BRACKETS
VERIFY W/WINDOW MANUFACT.
DETAIL FAST FLASH
AROUND BRACKETS

SEALANT

SHIM

FLUID APPLIED JOINT TREATMENT

DETAIL #

NTS 1/6/12 GMM

5/A513 NEW 3RD FLOOR DOOR SILL
@ LARGE BALCONY: UNIT #32
#8/A513
SIMILAR

TRANSITION
BOARD

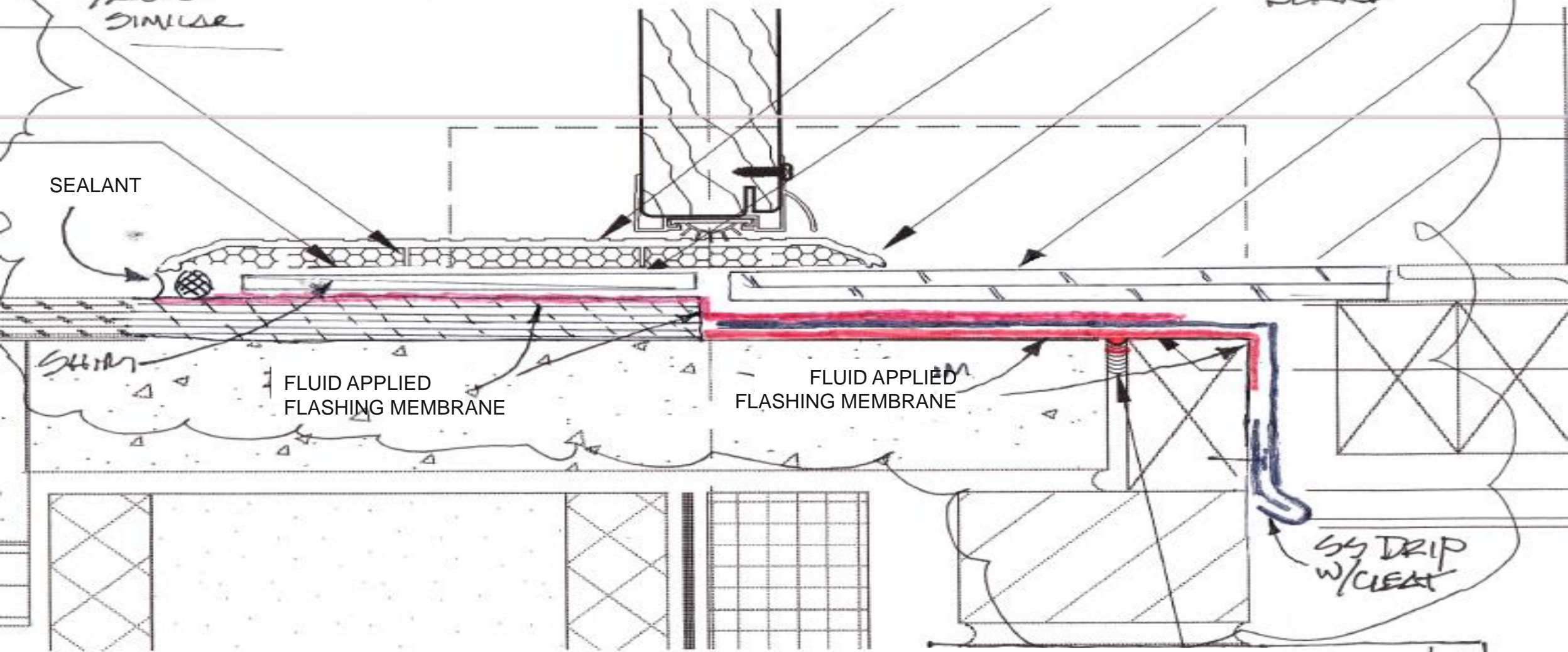
SEALANT

FLUID APPLIED
FLASHING MEMBRANE

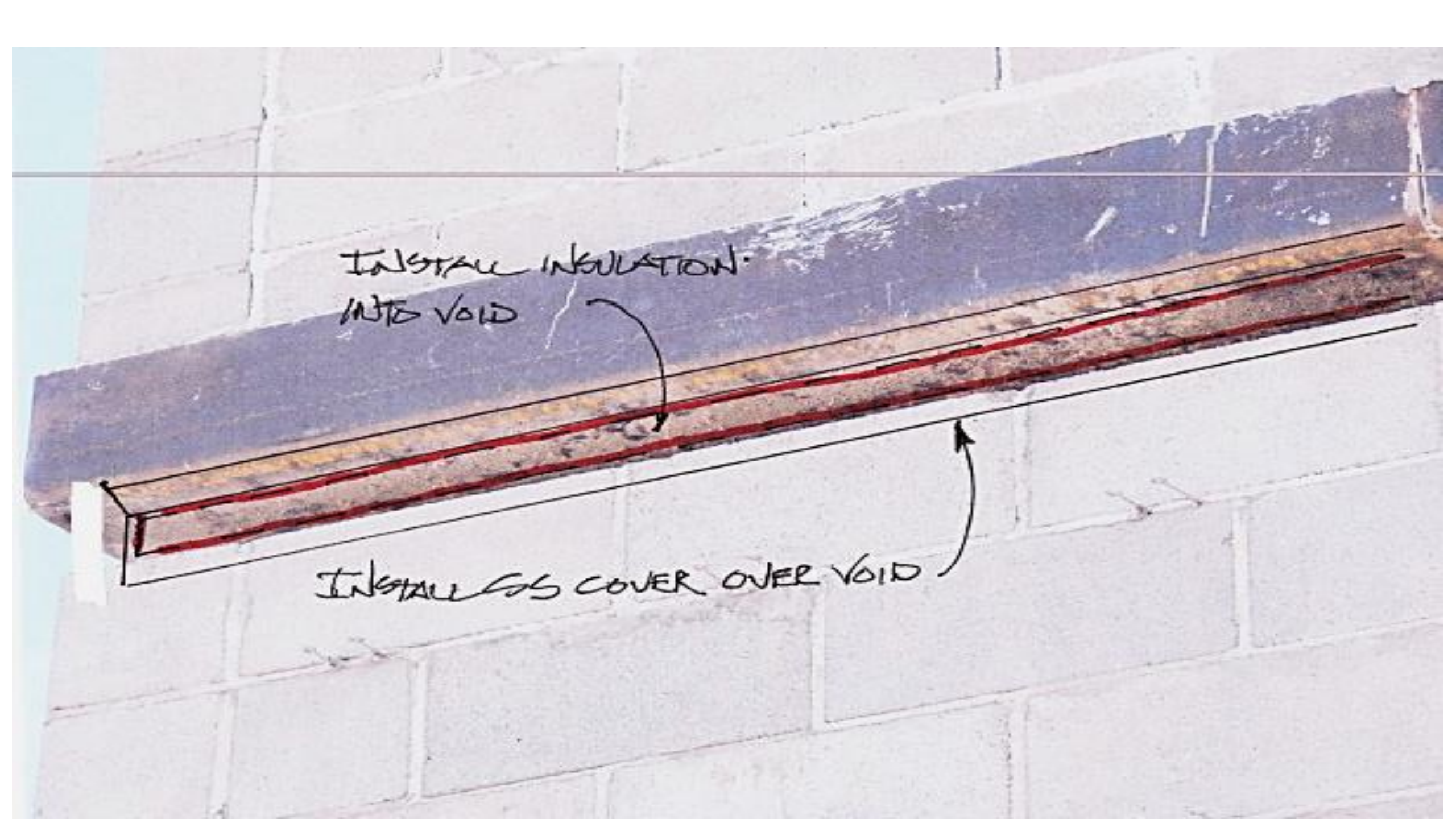
FLUID APPLIED
FLASHING MEMBRANE

65 Drip
w/ CLEAR

DRAIN #4



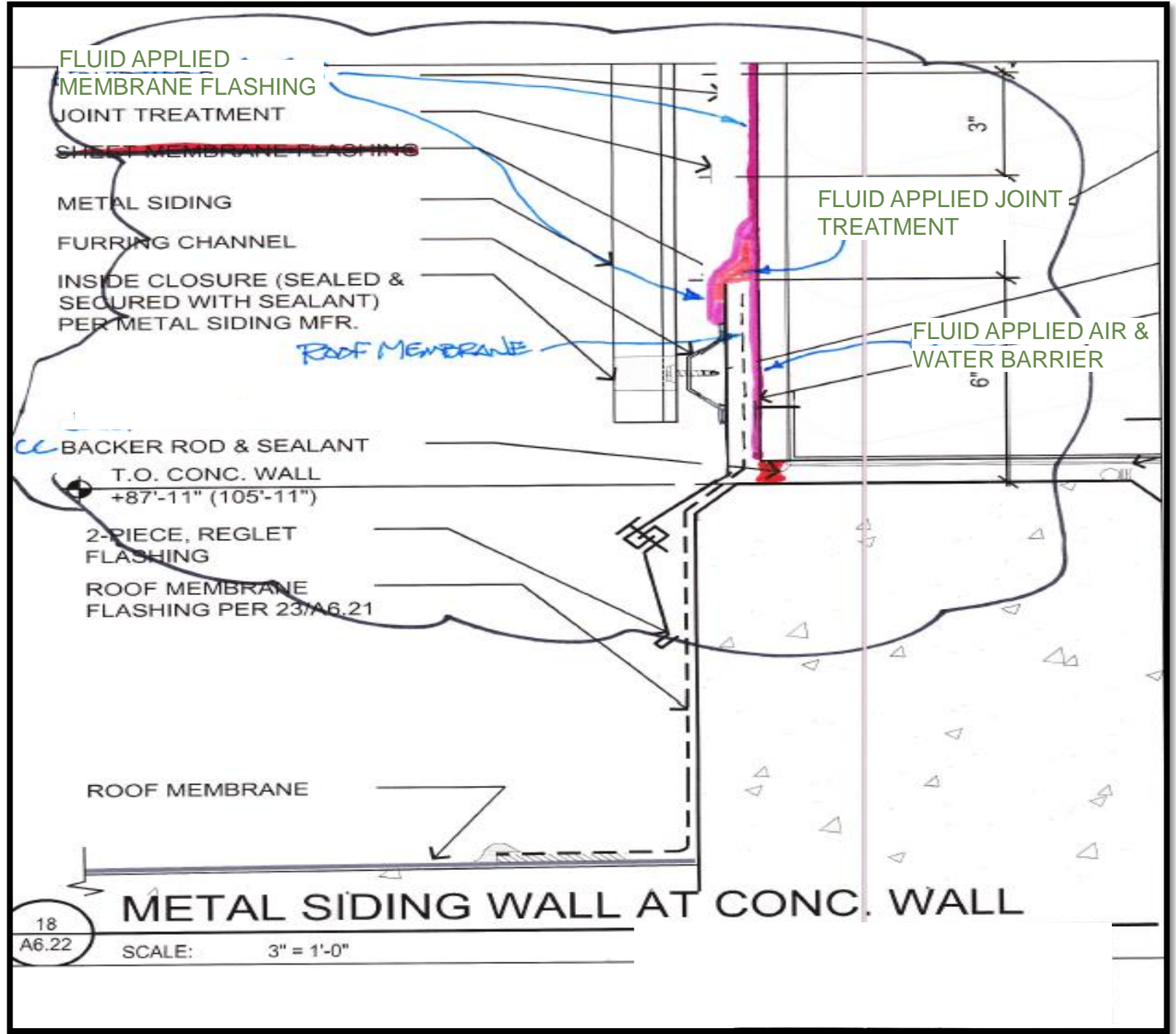
-
1. GRANT I BEAM OPENINGS
2. INSTALL INSULATION INTO VOID
3. INSTALL SS COVER OVER OPEN VOID
- The image shows a construction site with a blue tarp covering a roof or wall. Handwritten instructions in black marker are overlaid on the tarp. Three arrows point from the instructions to specific areas: the first arrow points to a horizontal I-beam, the second points to the space above it, and the third points to the I-beam again. In the foreground, several construction workers wearing hard hats and high-visibility vests are standing near a large opening in a concrete wall. A red scissor lift is visible on the right side of the frame.

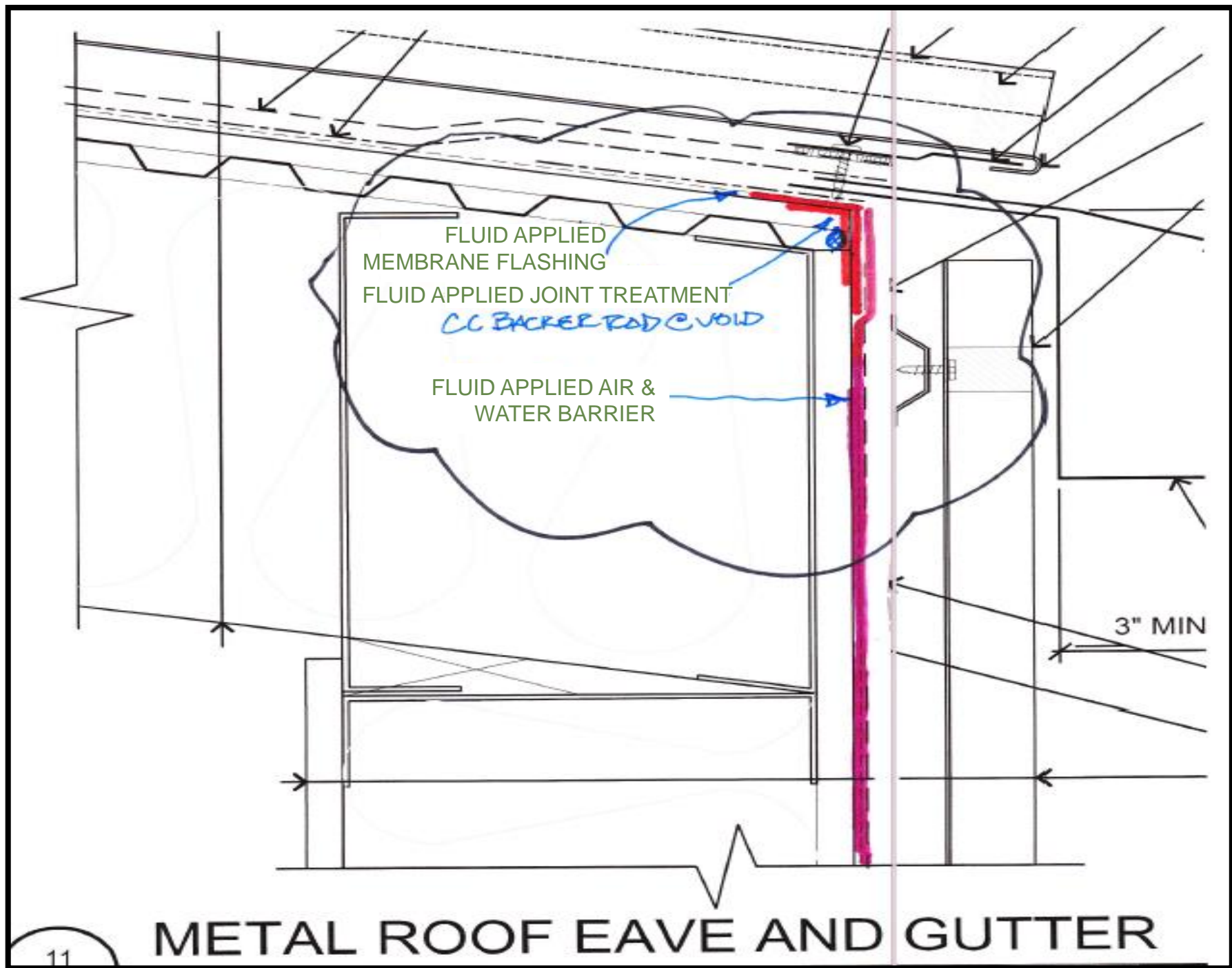


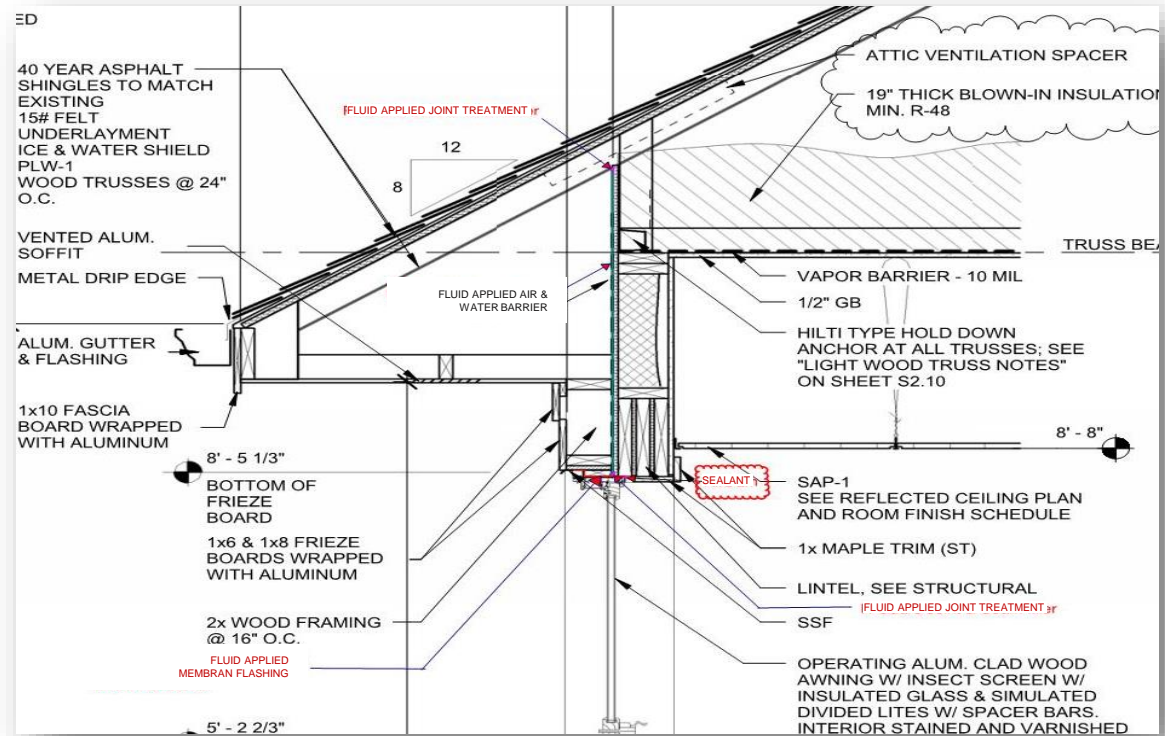
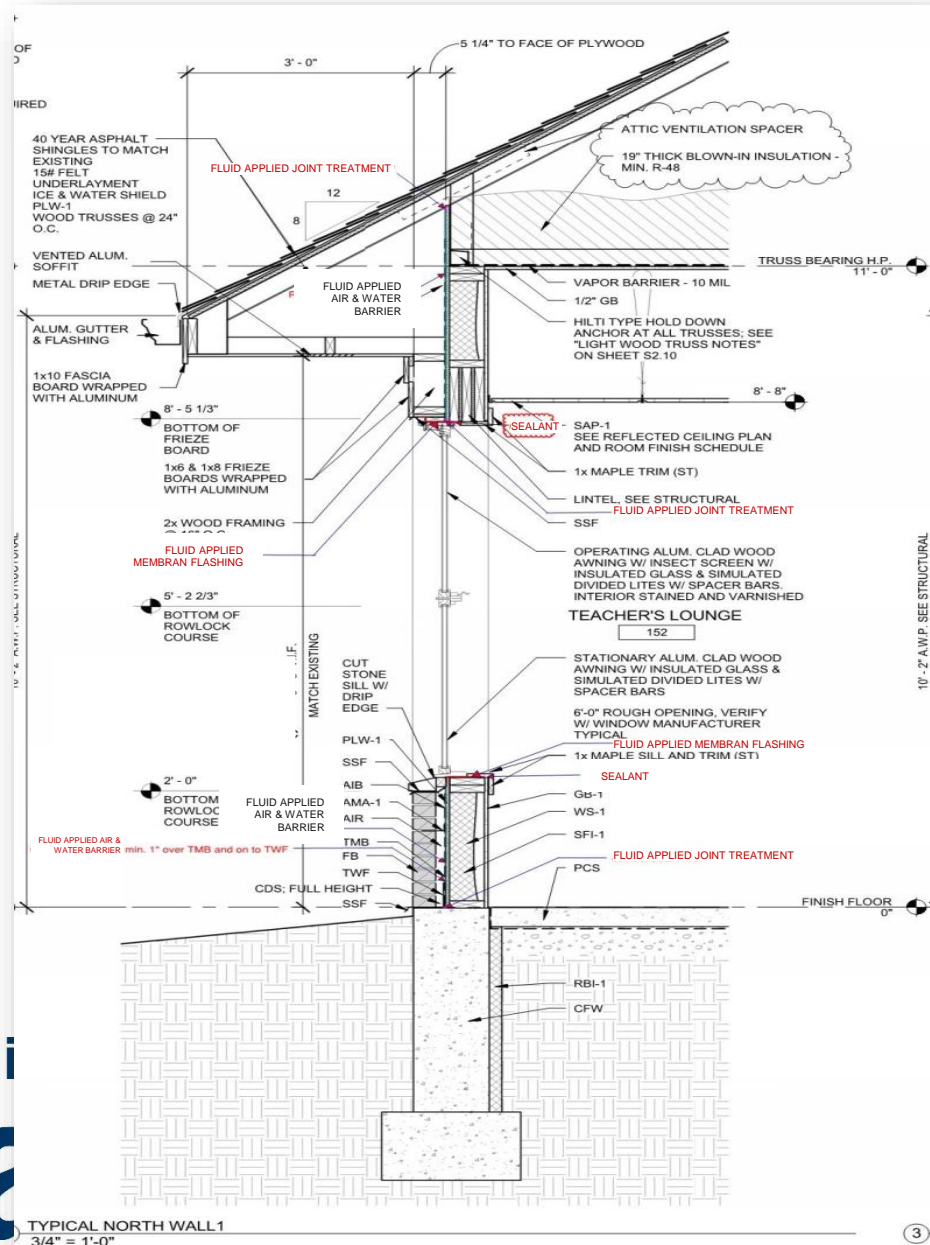
INSTALL INSULATION
INTO VOID

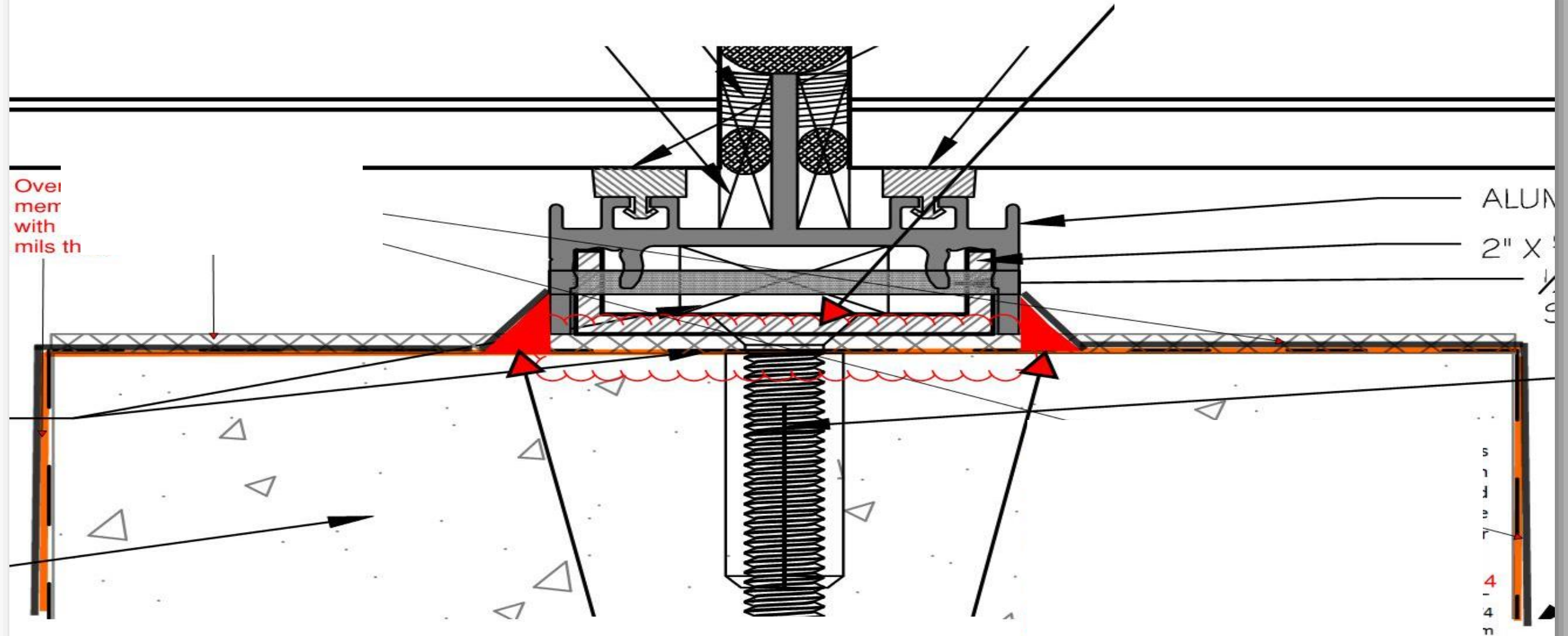
The diagram shows a cross-section of a roof assembly. A dark, textured layer represents the insulation, which is being installed into a void space. Below the insulation, a red line indicates the placement of a stainless steel cover. The entire assembly is shown against a background of light-colored bricks. Hand-drawn lines and arrows indicate the installation process.

INSTALL SS COVER OVER VOID

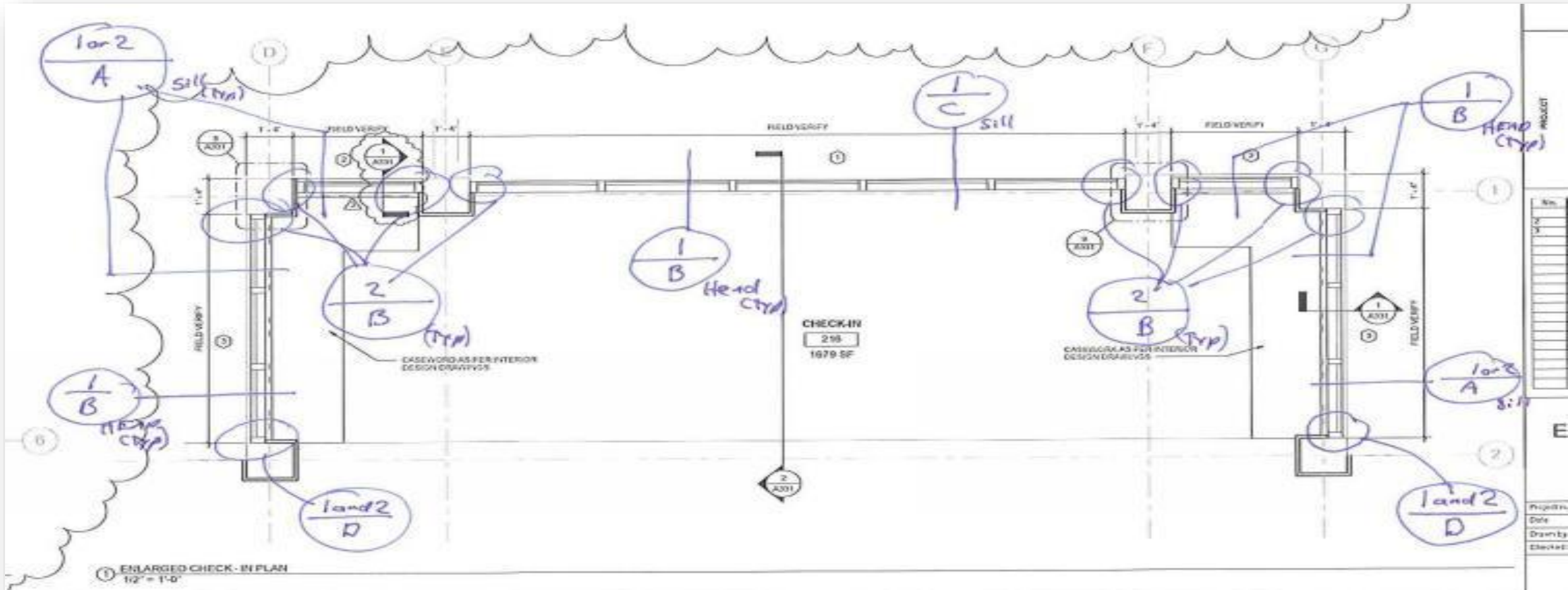




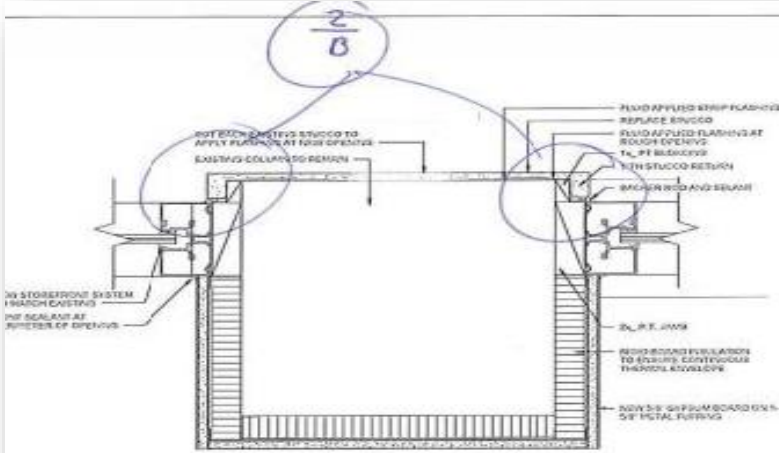




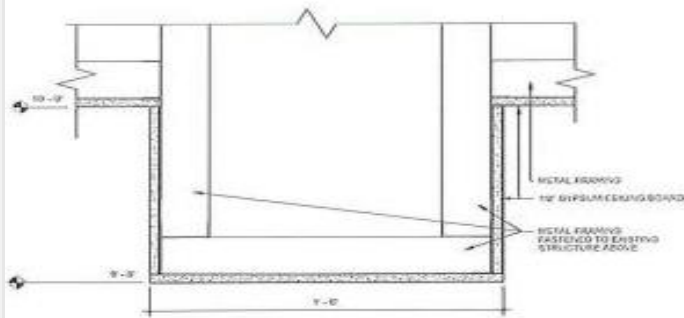
framework. Overcoat with Cat 5
RainScreen @ 25-30 mils thick.



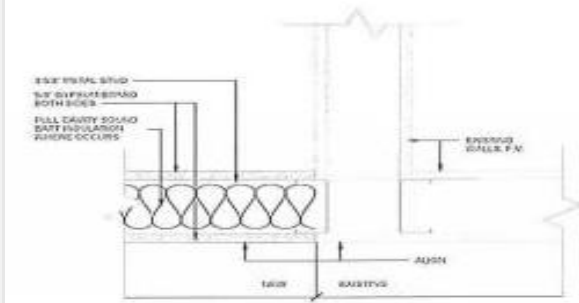
air barrier



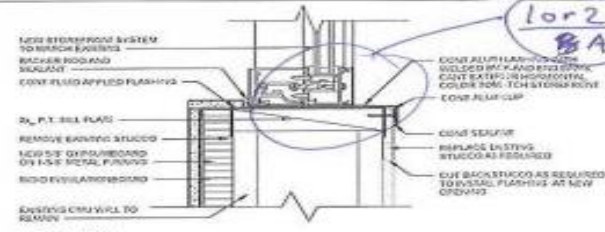
8 COLUMN WRAP DETAIL
3' = 1'-0"



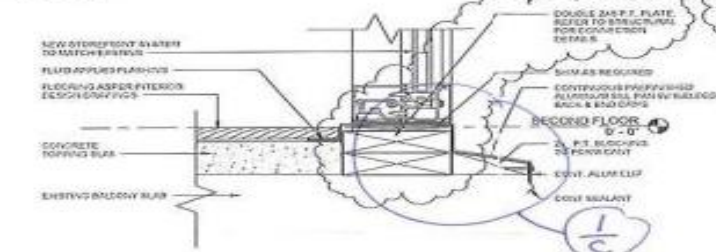
9 SOFFIT SECTION
3' = 1'-0"



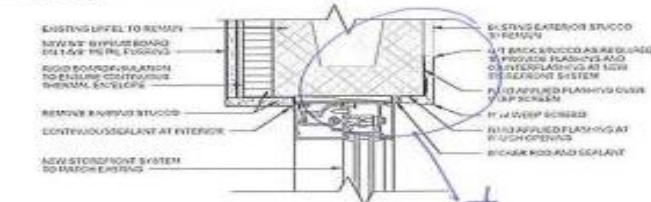
10 CONNECTION DETAIL
3' = 1'-0"



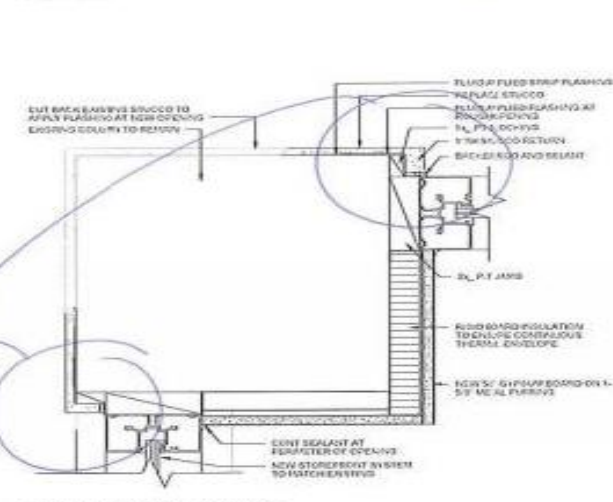
11 DETAIL 1
3' = 1'-0"



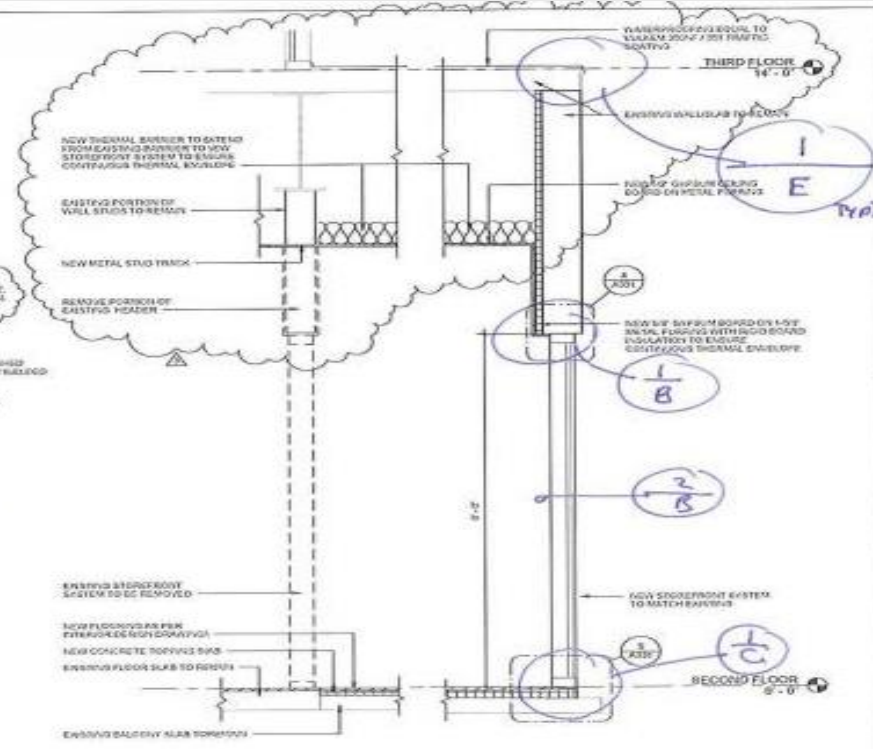
12 CURTAIN WALL SILL DETAIL
3' = 1'-0"



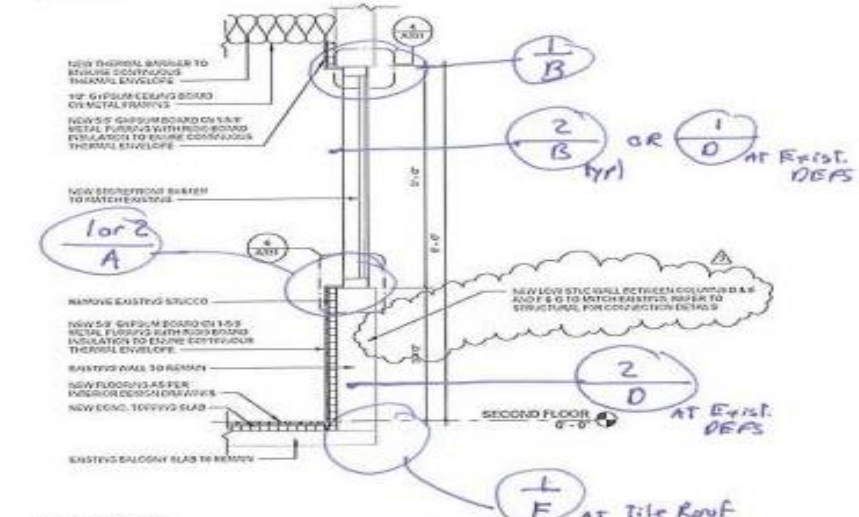
13 CURTAIN WALL HEAD DETAIL
3' = 1'-0"



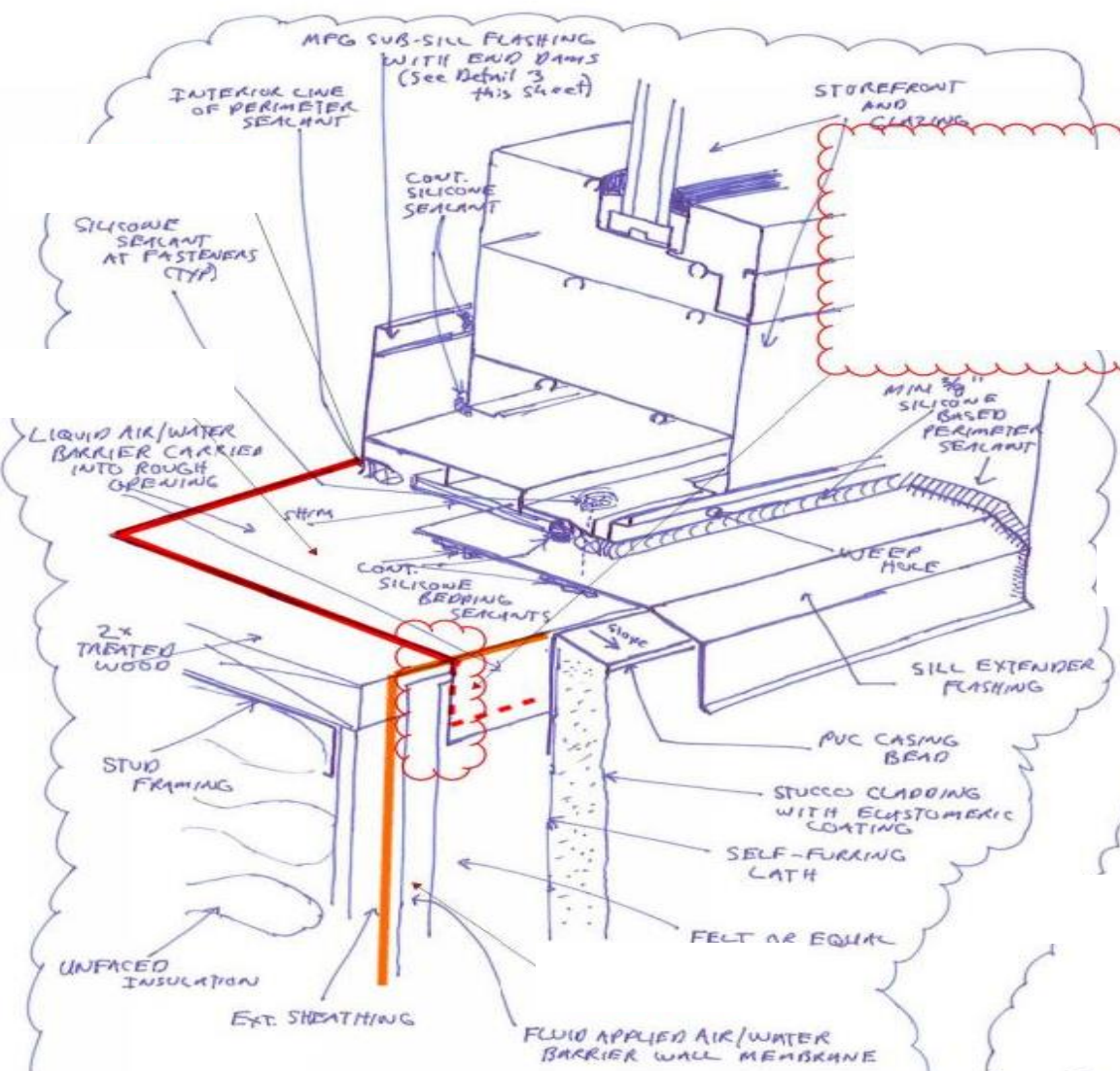
14 COLUMN WRAP DETAIL AT CORNER
3' = 1'-0"



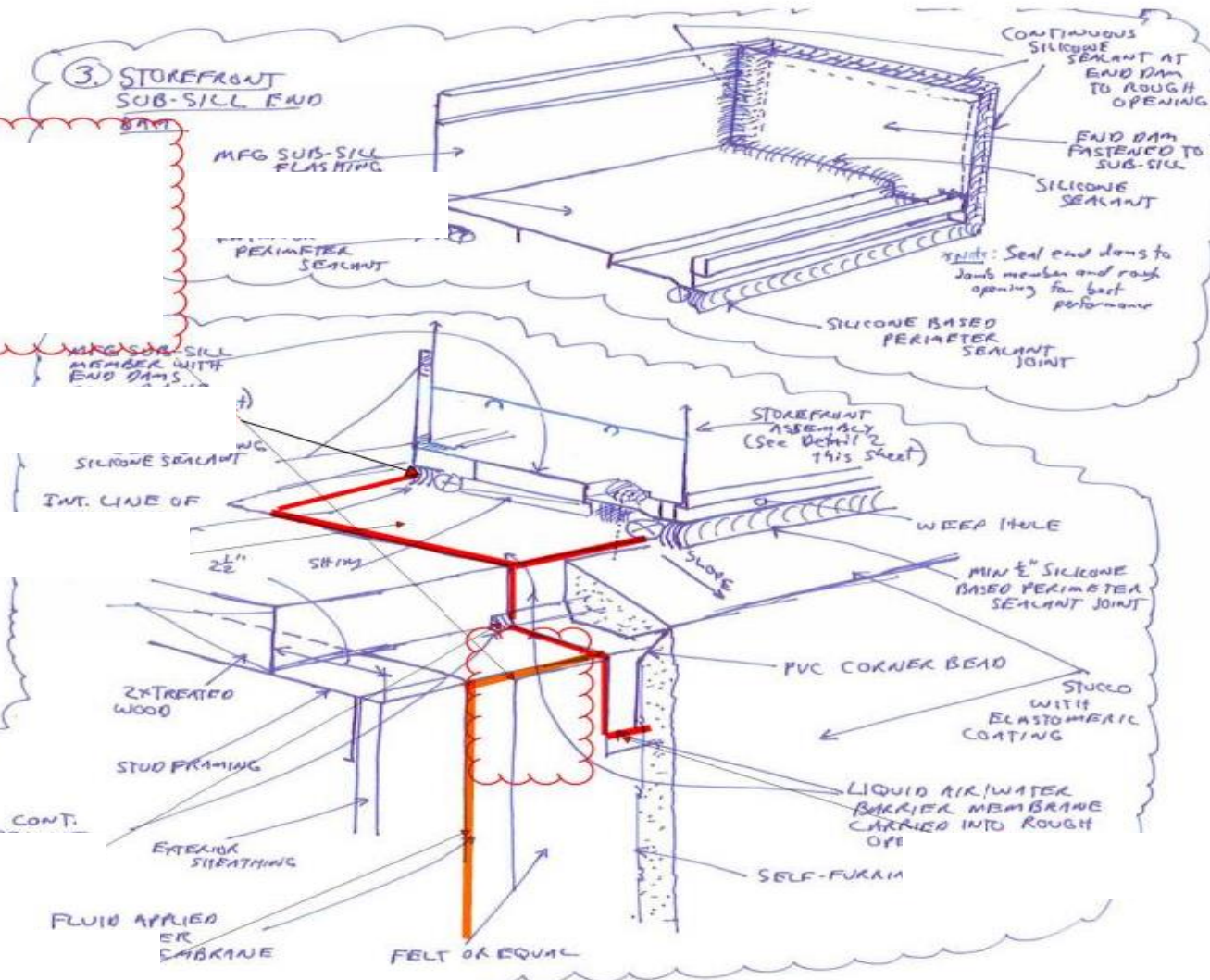
15 ENCLOSED BALCONY SECTION
3/4" = 1'-0"



16 WALL SECTION
3/4" = 1'-0"

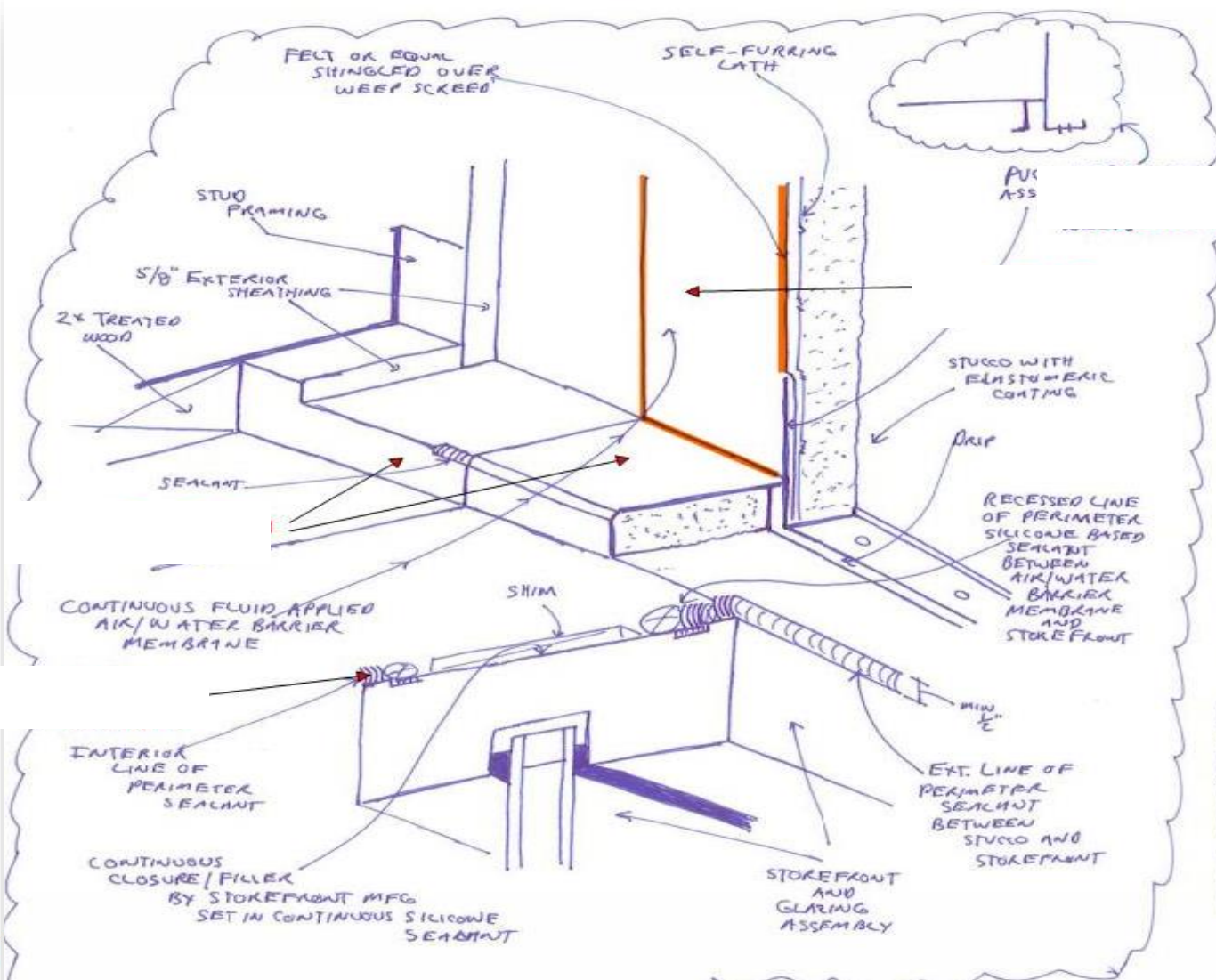


① SILL OF STOREFRONT AT KNEE WALL
(Option One)

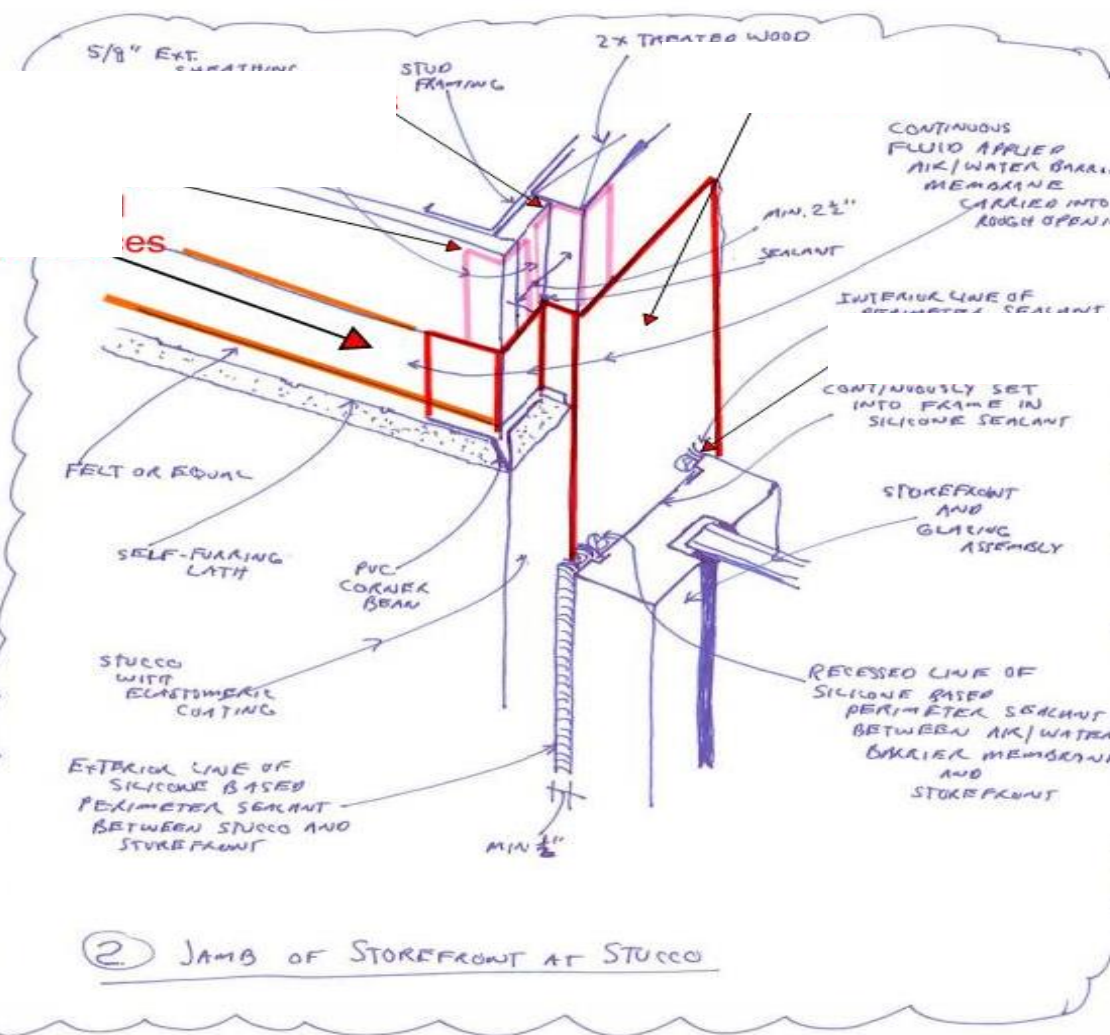


② SILL OF STOREFRONT AT KNEE WALL
(Option Two)

SHEET NO: A	JOB NO: W4A 214-206.1
PROJECT: THE FOUNTAINS CLUBHOUSE RENOVATIONS	
SCALE: NOT TO SCALE	DATE: OCT. 24, 2014



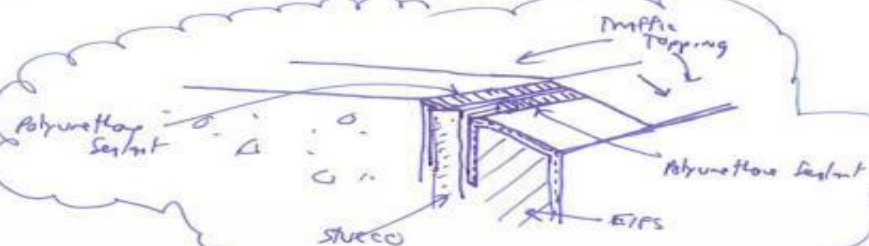
① HEAD OF STOREFRONT AT STUCCO



② JAMB OF STOREFRONT AT STUCCO

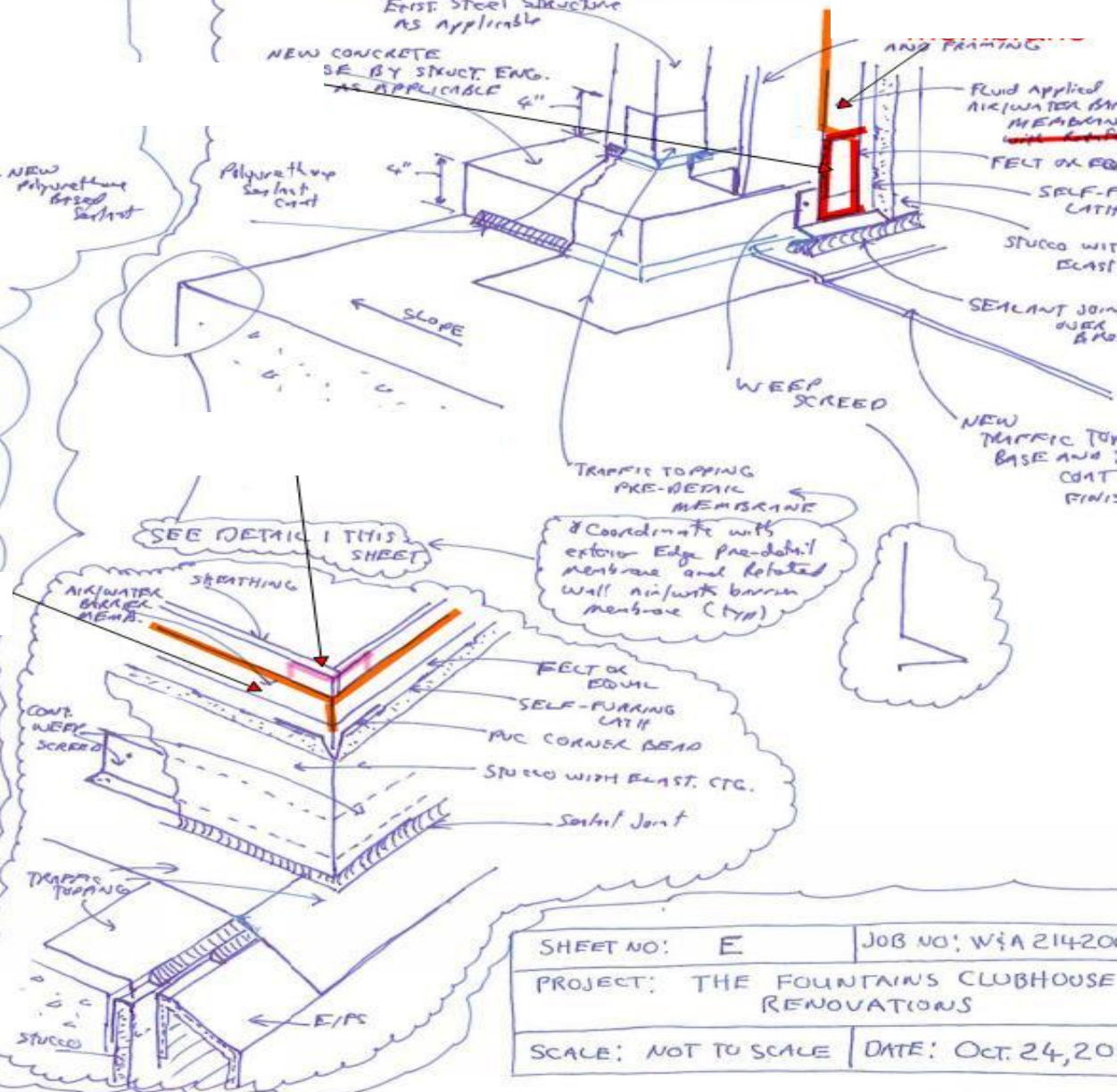
SHEET NO: B	JOB NO: W4A 214206.1
PROJECT: THE FOUNTAINS CLUBHOUSE RENOVATIONS	
SCALE: NOT TO SCALE	DATE: OCT. 24, 2014

detail note for overlapping
on Sheet no A



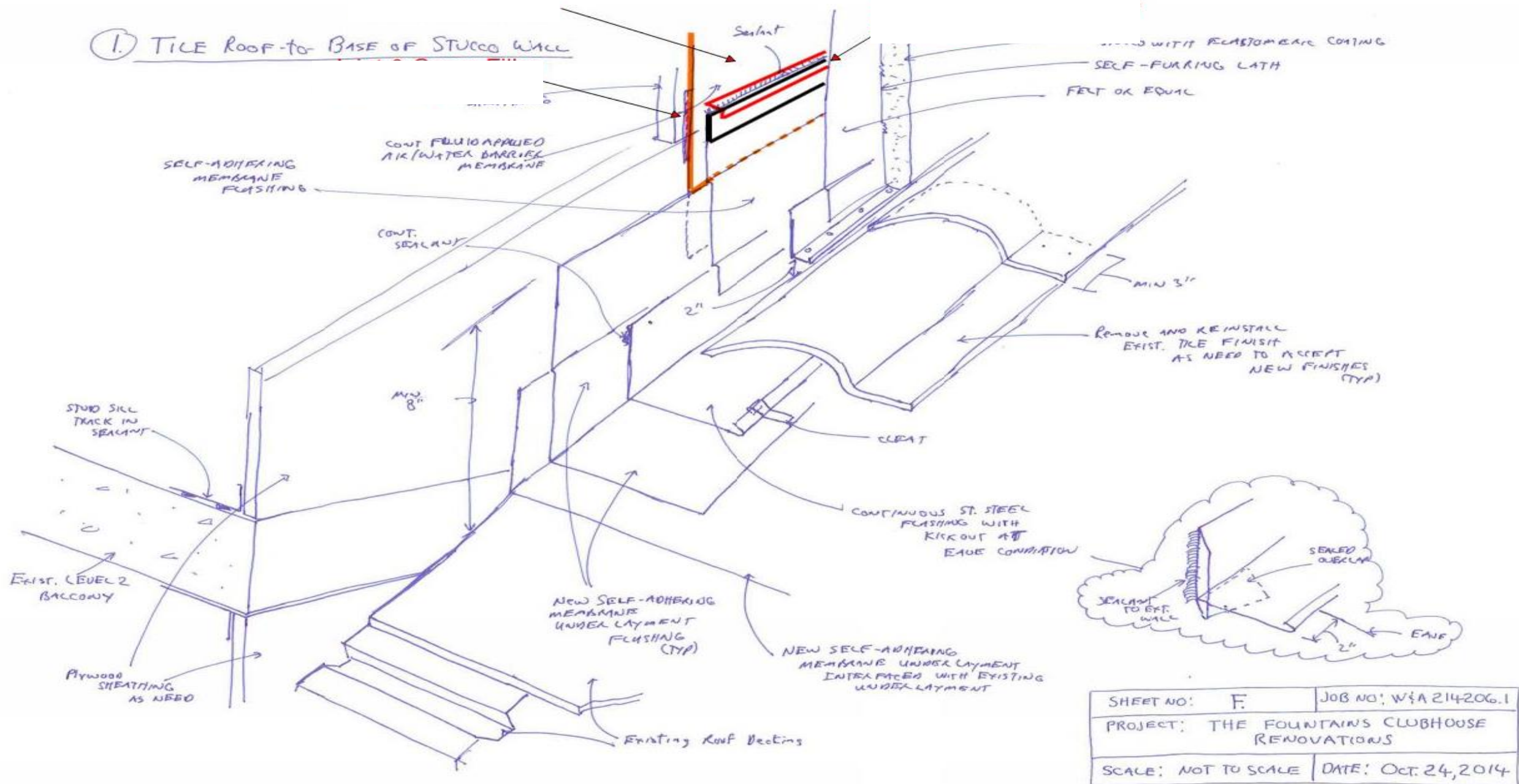
EXIST. Steel Structure
AS APPLICABLE

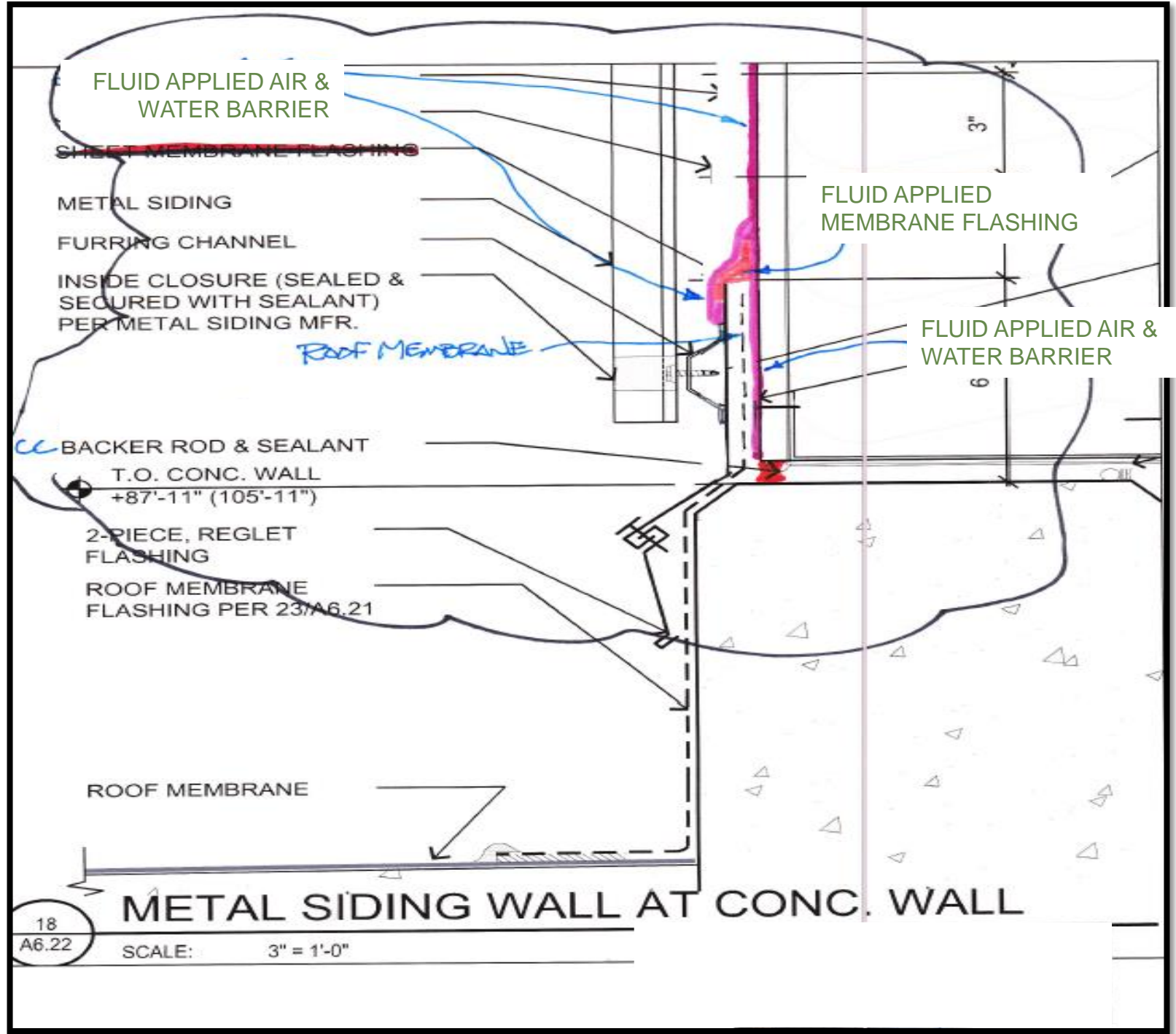
NEW CONCRETE
SE BY STRUCT. ENG.
~~AS APPLICABLE~~

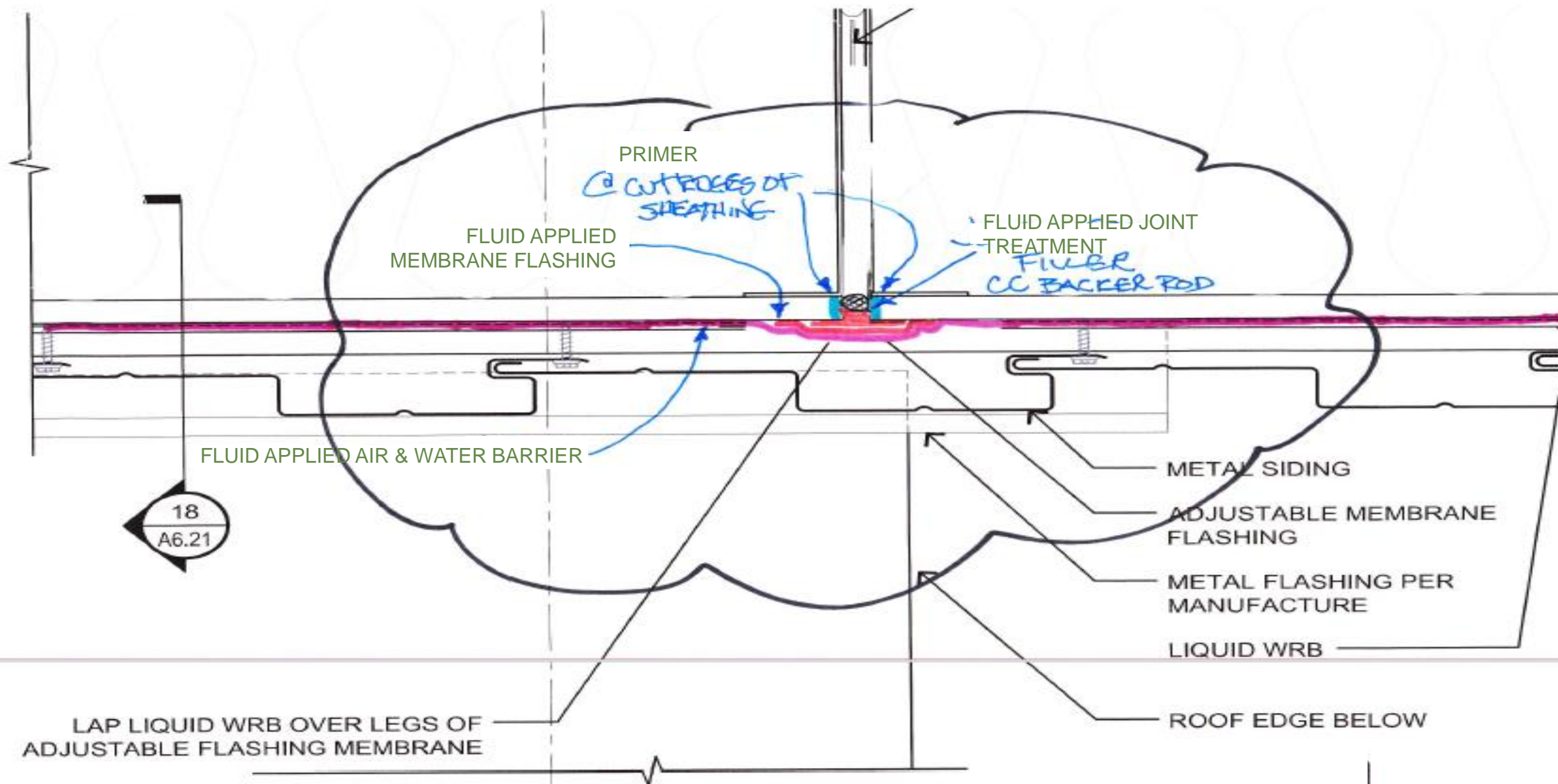


SHEET NO: E	JOB NO: W&A 214-20
PROJECT: THE FOUNTAINS CLUBHOUSE RENOVATIONS	
SCALE: NOT TO SCALE	DATE: OCT. 24, 20

1. TILE ROOF-TO-BASE OF STUCCO WALL





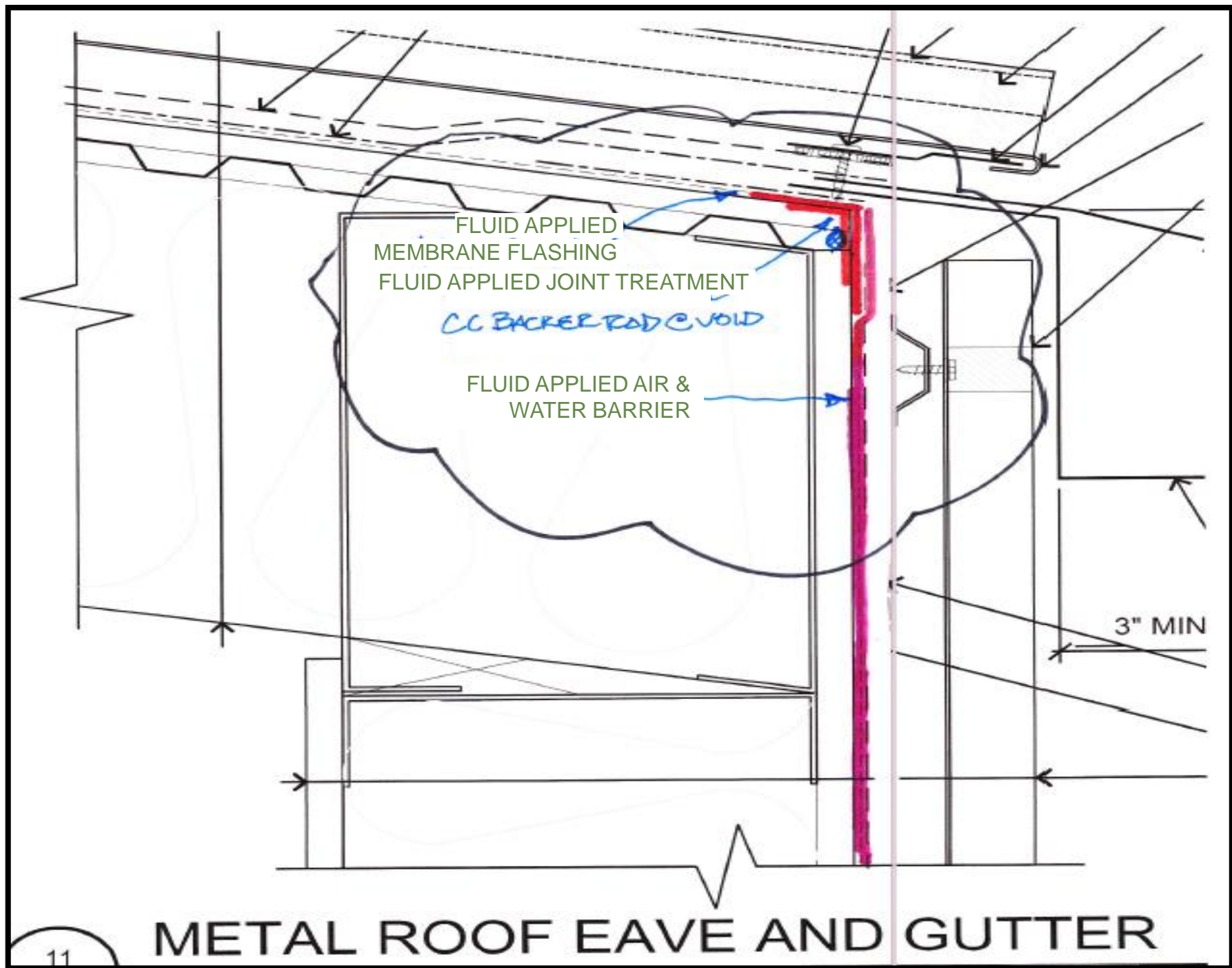


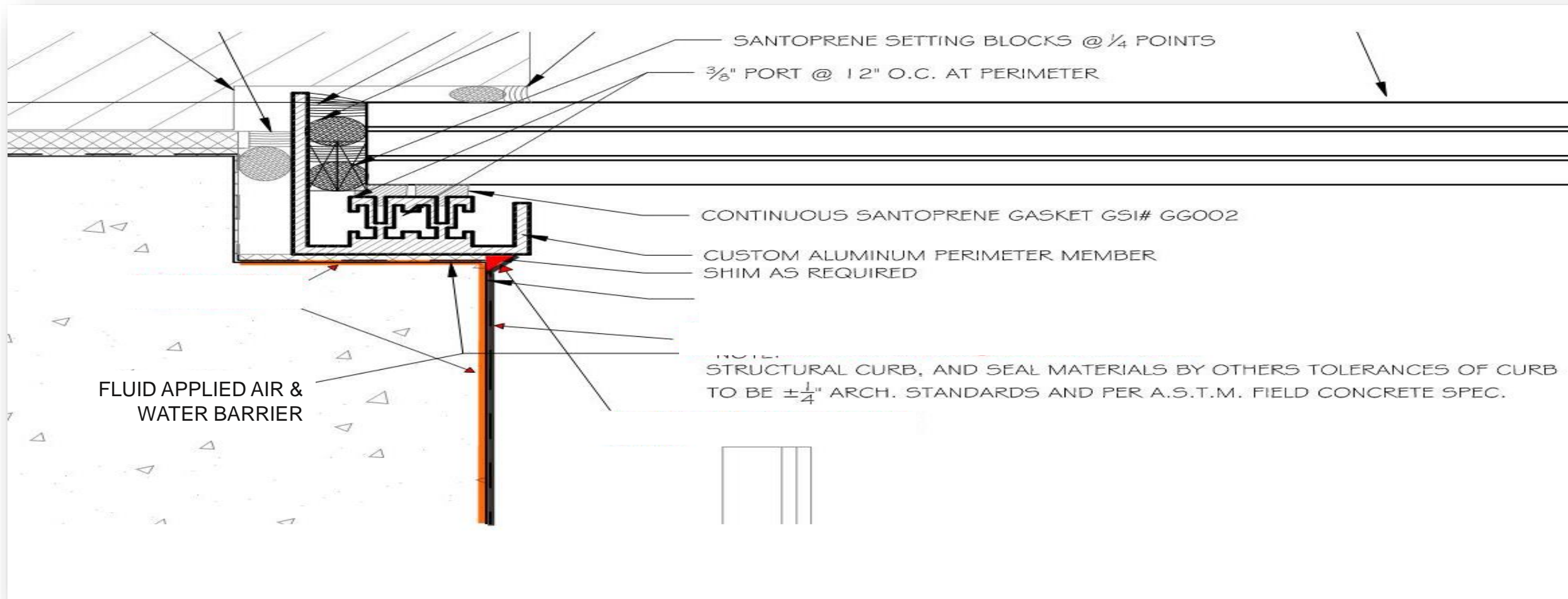
18
A6.21

15
A6.22

METAL SIDING PANEL @ ROOF

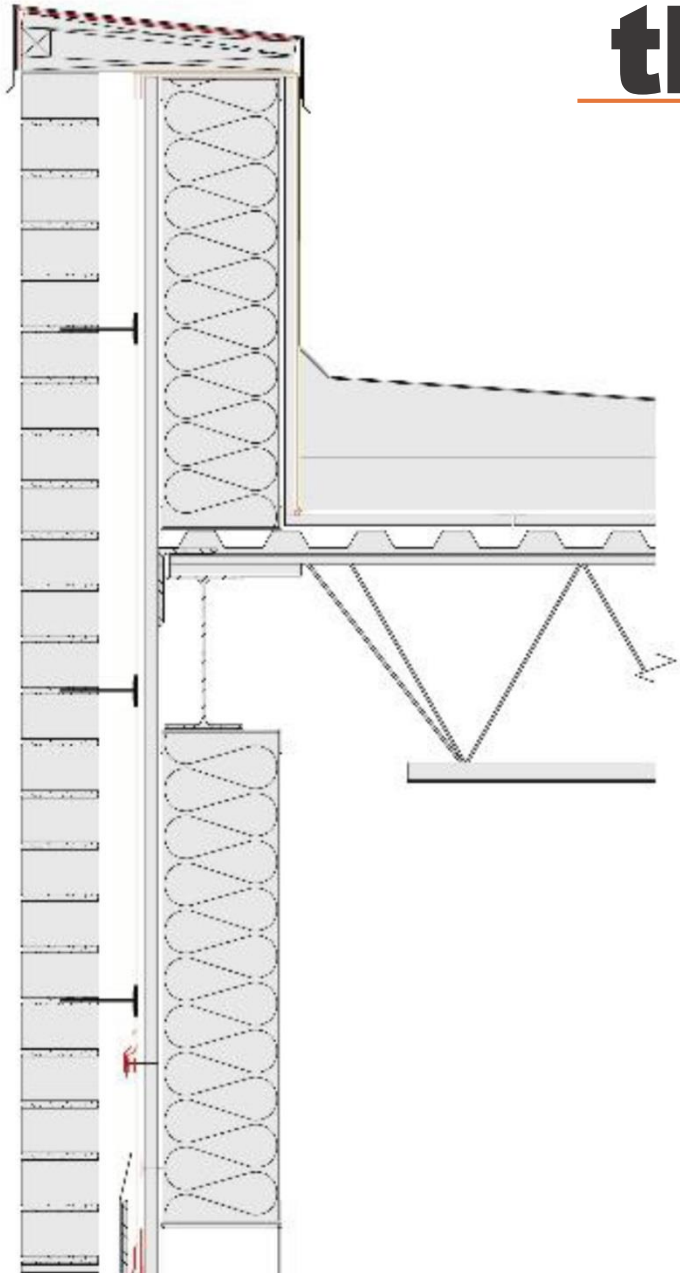
SCALE: 3" = 1'-0"





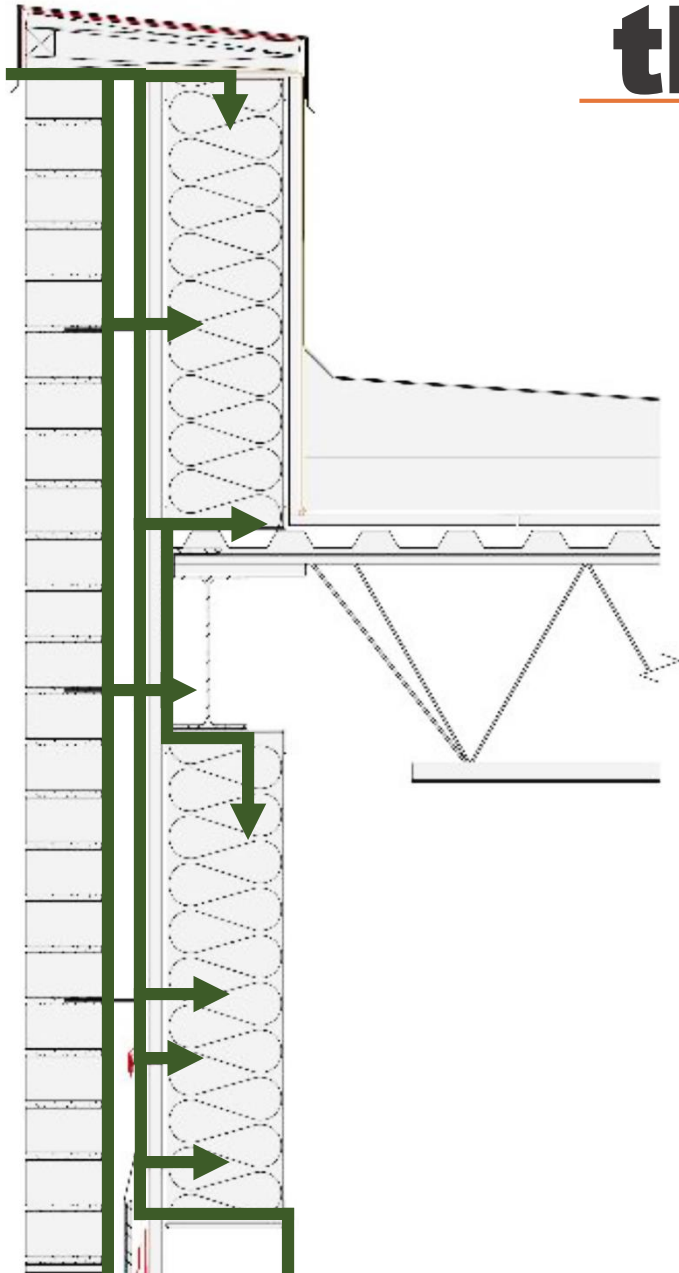
the devil is in the details

(the air and water is too)



the devil is in the details

(the air and water is too)



Most common threats to the structural integrity and performance of the building envelope

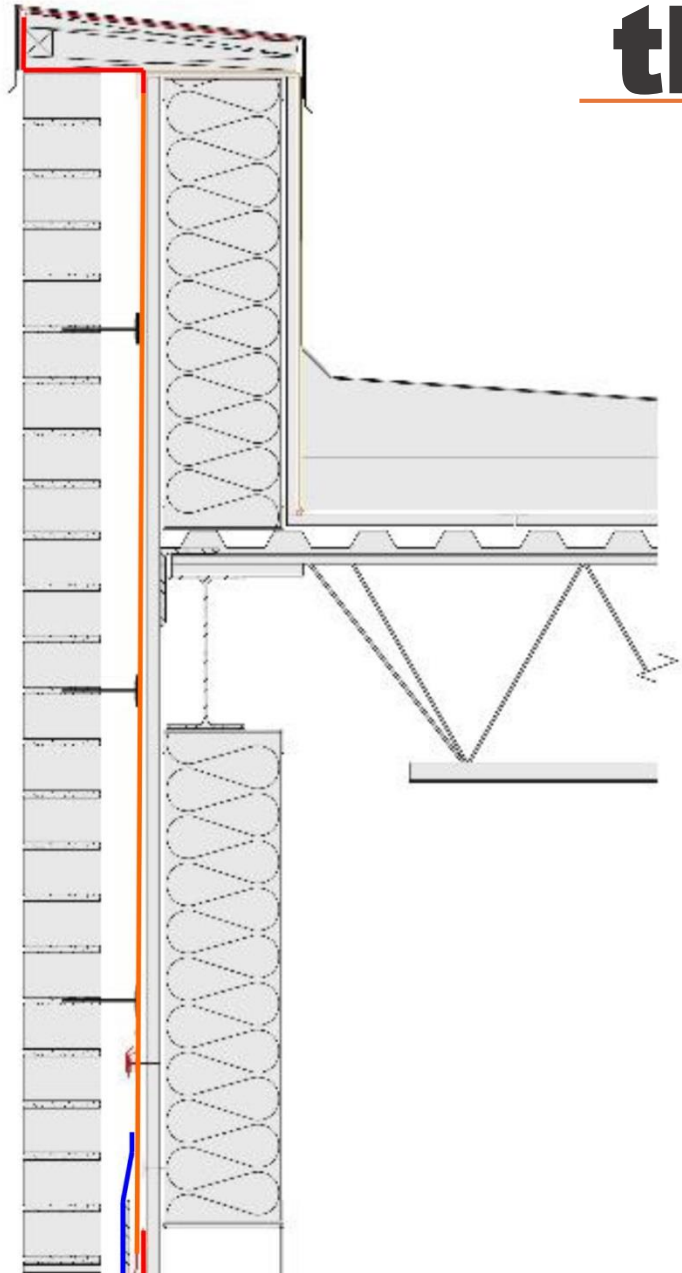
- uncontrolled rainwater penetration
- moisture ingress through moisture-laden air intrusion

Together, they represent up to 80% of all construction-related claims in the United States.

Bomberg, M.T. and Brown, W.C. (1993), "Building Envelope and Environmental Control: Part 1-Heat, Air and Moisture Interactions" *Construction Canada* 35 (1), 15-18.

the devil is in the details

(the air and water is too)

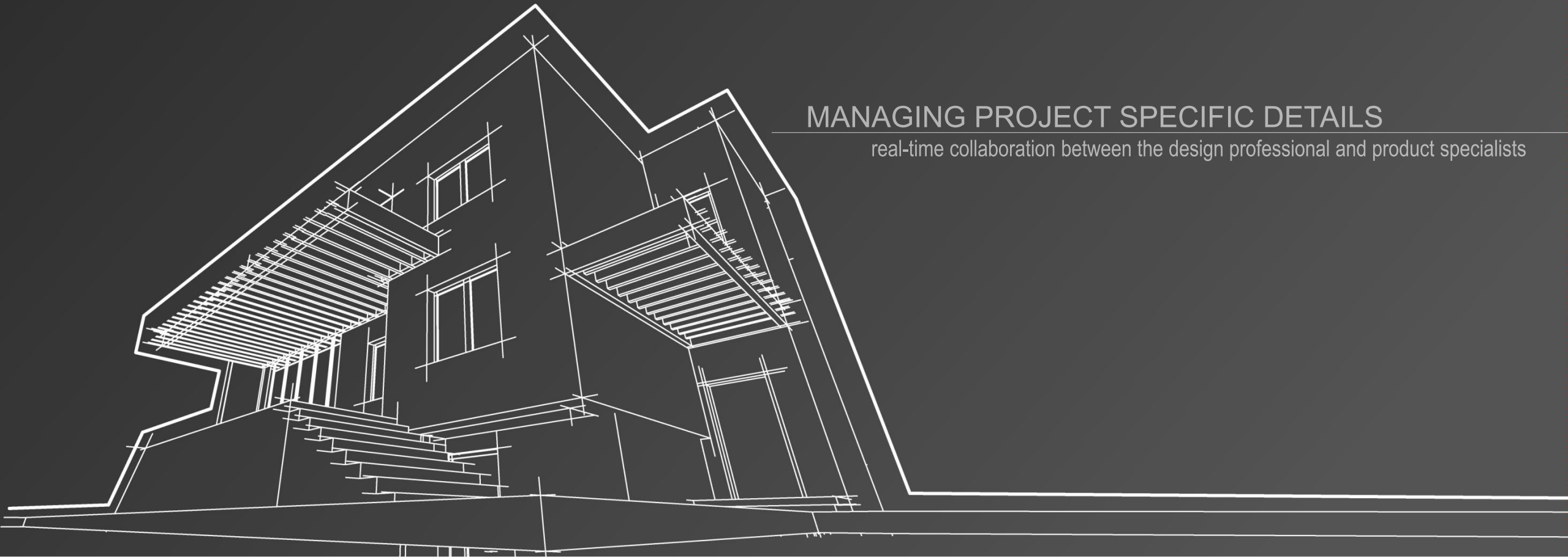


Moisture transfer and air infiltration can occur within a building through multiple mechanisms. Moisture and air intrusion related problems are perhaps the largest set of problems buildings experience within the United States. The design community needs to have a better understanding and employ better design practices to reduce the number of moisture related and air infiltration problems that buildings within the United States experience.

THE PROCESS OF DEVELOPING DETAILS

MANAGING PROJECT SPECIFIC DETAILS

real-time collaboration between the design professional and product specialists



The sad truth...

Often, the proper integration of related components of a building facade is doomed from the start. All too frequently, the demands of both time and budget combine to create an environment where architects are forced to develop a series of largely generic building envelope details in a short period of time in order to get a project out to bid. While this approach may be successful in bringing the design phase in "on time and under budget," it often proves short-sighted and costly for an owner when an incomplete set of construction documents is the result.

the dilemma...



ARCHITECTS

are not specialists
(manufacturers and consultants are)



MANUFACTURERS

may know a certain part well
(but they don't know the whole picture)

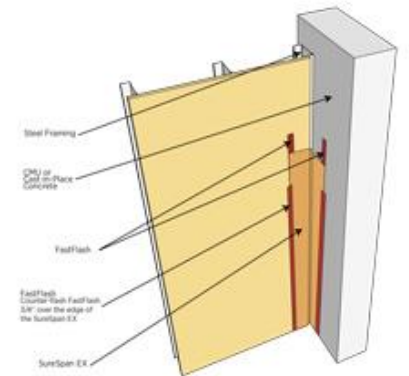
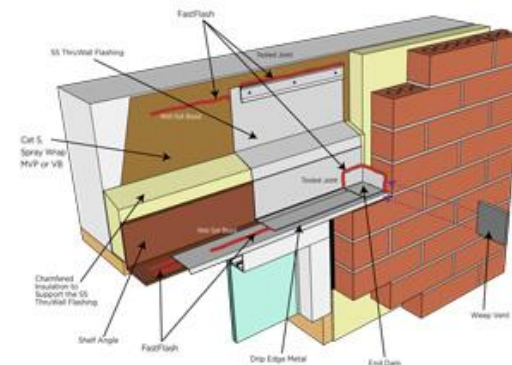
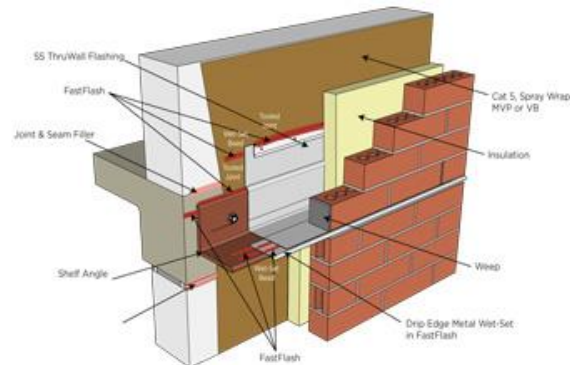
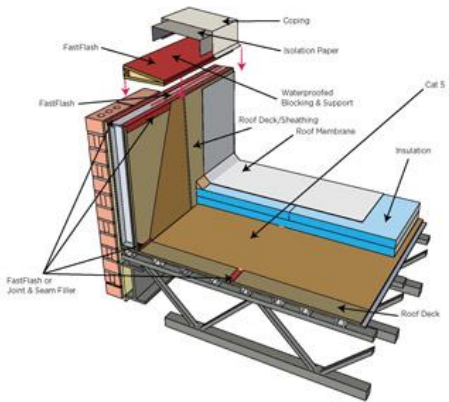


CONSULTANTS

Historically recommend what has worked for them in
the past
(Construction materials ecosystem move fast)

the dilemma...

Generic building condition details rarely work
project specific detail needs to be created



the dilemma...

Specifications are often unclear

BEMIDJI UPPER ELEMENTARY SCHOOL
BEMIDJI, MINNESOTA

40-14153-00

PART 2 - PRODUCTS

2.1 FLUID-APPLIED MEMBRANE AIR BARRIER

A. Fluid-Applied, Vapor-Non-permeable Membrane Air Barrier: Synthetic polymer membrane.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Synthetic Polymer Membrane:

- 1)
- 2)

2. Physical and Performance Properties:

- a. Membrane Air Permeance: Not to exceed 0.004 cfm/ sq. ft. of surface area at 1.57-lbf/sq. ft. (0.02 L/s x sq.m of surface area at 75-Pa) pressure difference; ASTM E 2178.
- b. Membrane Vapor Permeance: Not less than 10 perms (580 ng/Pa x s x sq. m); ASTM E 96.



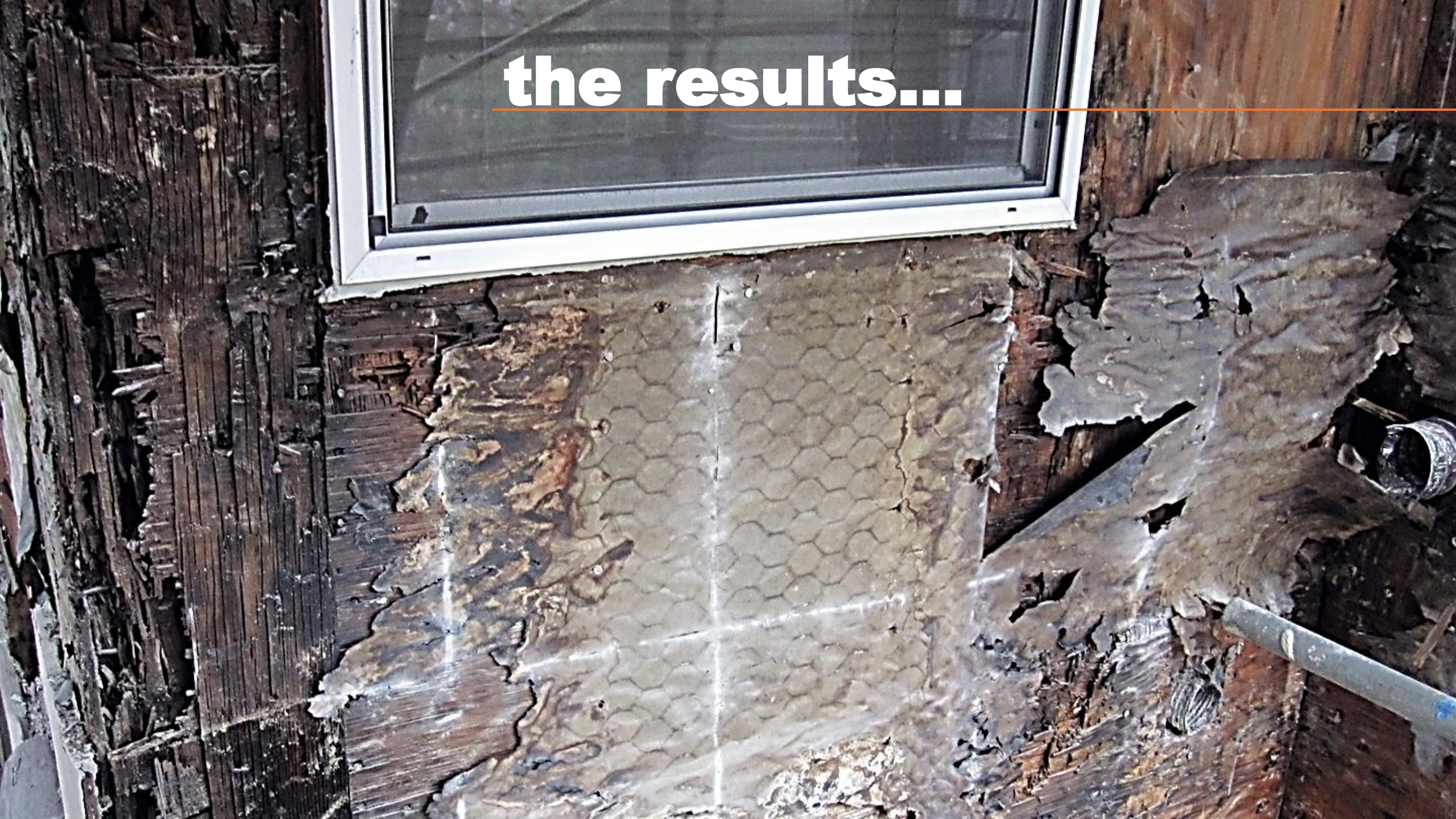
the results...



the results...



the results...



the ultimate...



ARCHITECTS

consultant and product specialist work together
to achieve architect's goal
everyone is involved early on in the process (50% DD)



MANUFACTURERS



CONSULTANTS

the ultimate...



ARCHITECTS

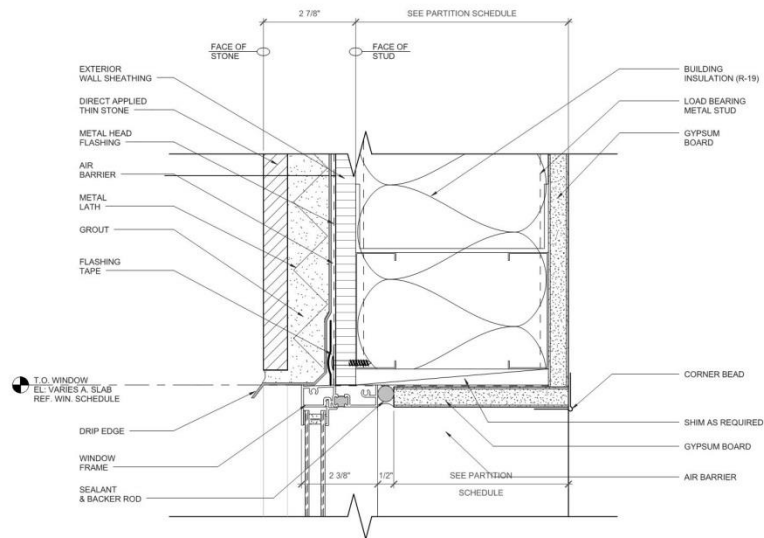
what
where
how
why certain products



MANUFACTURERS



CONSULTANTS

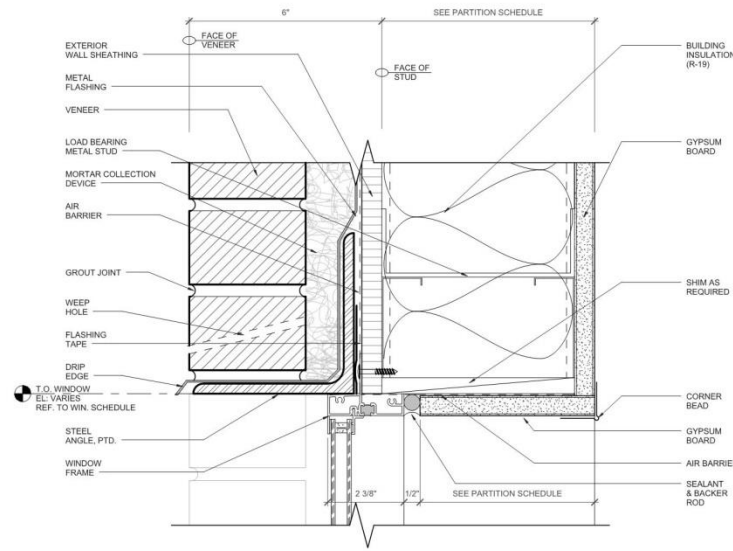


Window - Window Head @ Stone

9

Scale: 6" = 1'-0"

NOTE: REFER TO SHT. A7.04, AIR BARRIER DETAILS, FOR ADDITIONAL INFORMATION

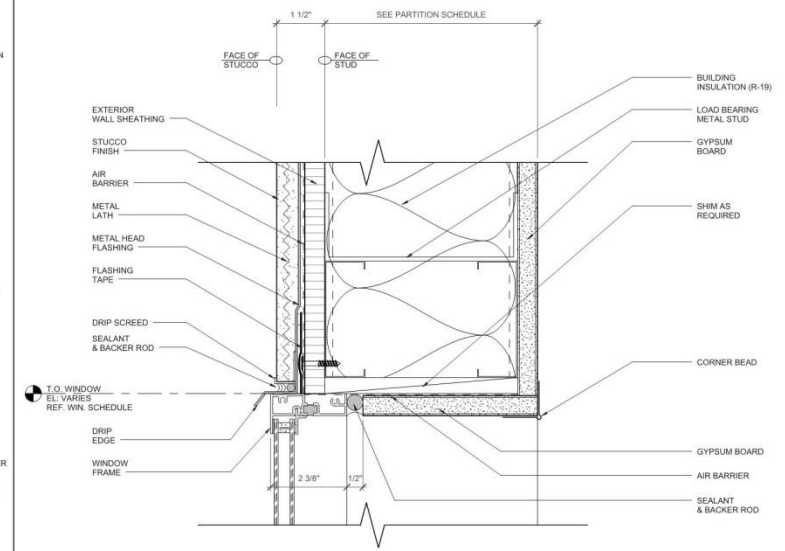


Window - Window Head @ Brick - Veneer

6

Scale: 6" = 1'-0"

NOTE: REFER TO SHT. A7.04, AIR BARRIER DETAILS, FOR ADDITIONAL INFORMATION

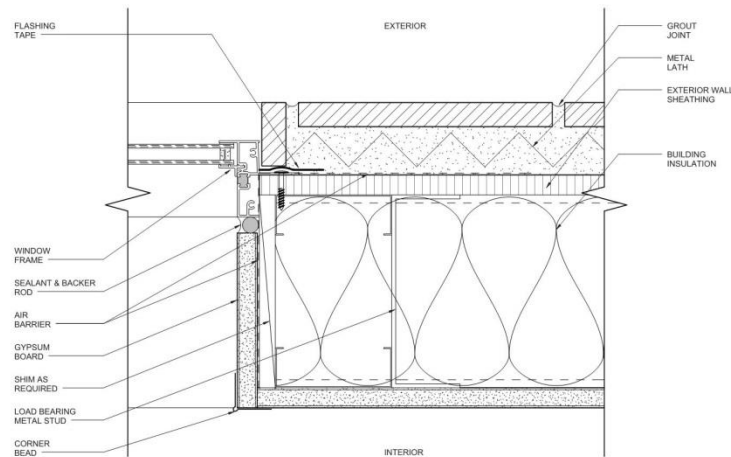


Window - Window Head @ Stucco

3

Scale: 6" = 1'-0"

NOTE: REFER TO SHT. A7.04, AIR BARRIER DETAILS, FOR ADDITIONAL INFORMATION

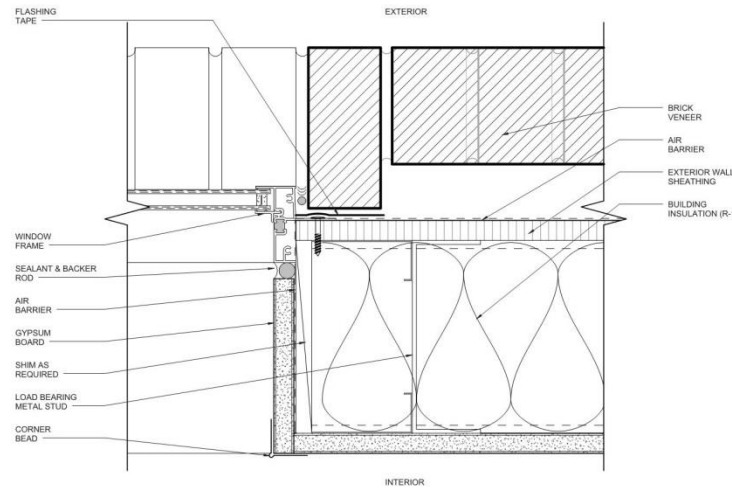


Window - Window Jamb @ Stone

8

Scale: 6" = 1'-0"

NOTE: REFER TO SHT. A7.04, AIR BARRIER DETAILS, FOR ADDITIONAL INFORMATION

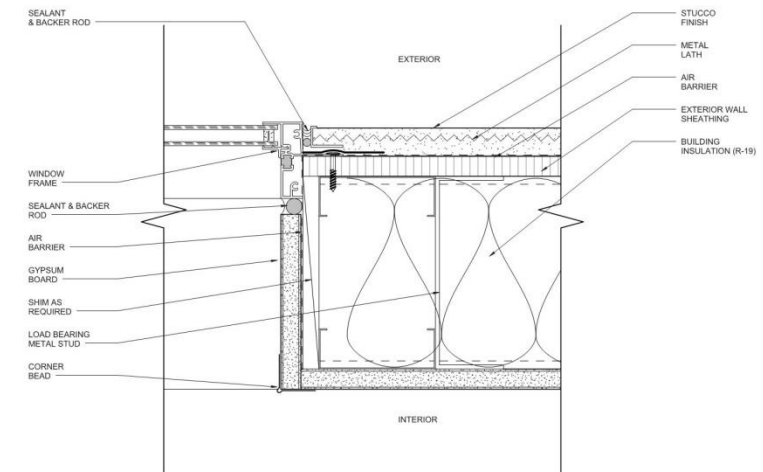


Window - Window Jamb @ Brick Veneer

5

Scale: 6" = 1'-0"

NOTE: REFER TO SHT. A7.04, AIR BARRIER DETAILS, FOR ADDITIONAL INFORMATION

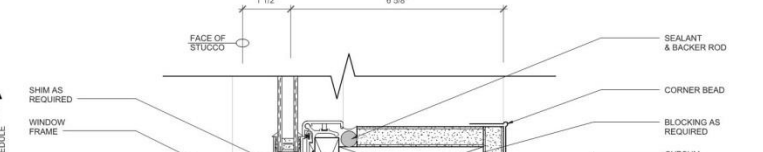
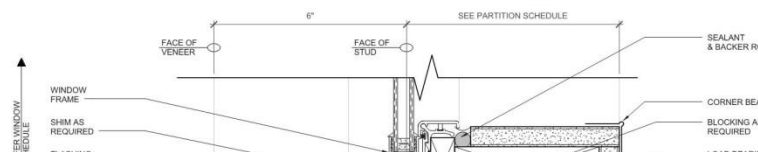
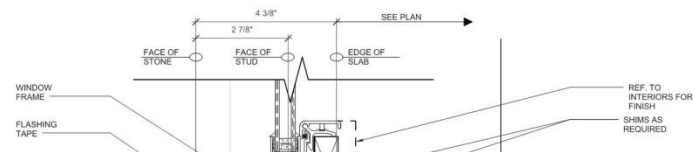


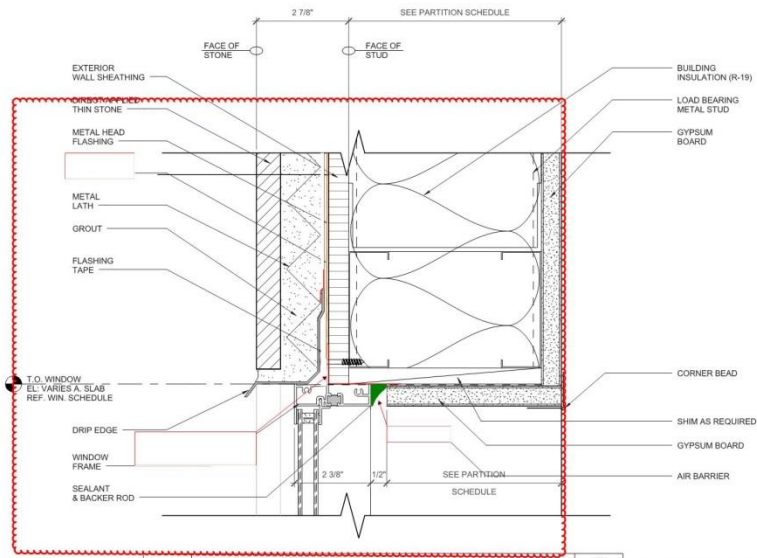
Window - Window Jamb @ Stucco

2

Scale: 6" = 1'-0"

NOTE: REFER TO SHT. A7.04, AIR BARRIER DETAILS, FOR ADDITIONAL INFORMATION



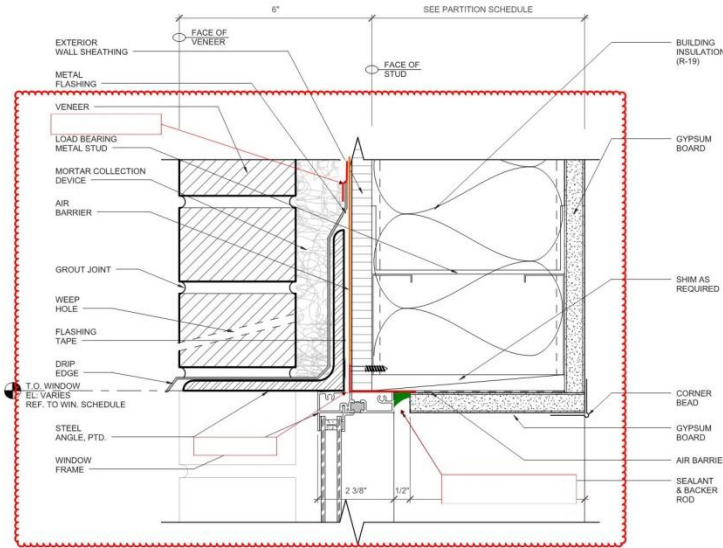


Window - Window Head @ Stone

9

NOTE: REFER TO SHT. A7.04, AIR BARRIER DETAILS, FOR ADDITIONAL INFORMATION

Scale: 6" = 1'-0"

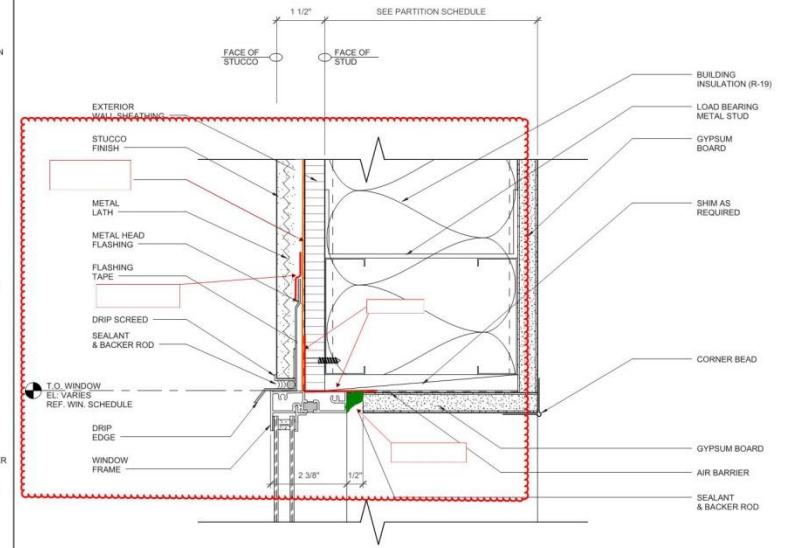


Window - Window Head @ Brick - Veneer

6

NOTE: REFER TO SHT. A7.04, AIR BARRIER DETAILS, FOR ADDITIONAL INFORMATION

Scale: 6" = 1'-0" 2 / A6.11

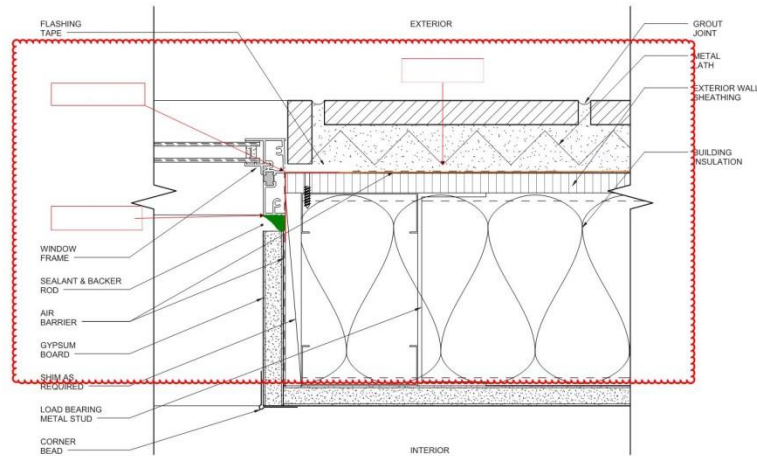


Window - Window Head @ Stucco

3

NOTE: REFER TO SHT. A7.04, AIR BARRIER DETAILS, FOR ADDITIONAL INFORMATION

Scale: 6" = 1'-0" 1 / A6.11

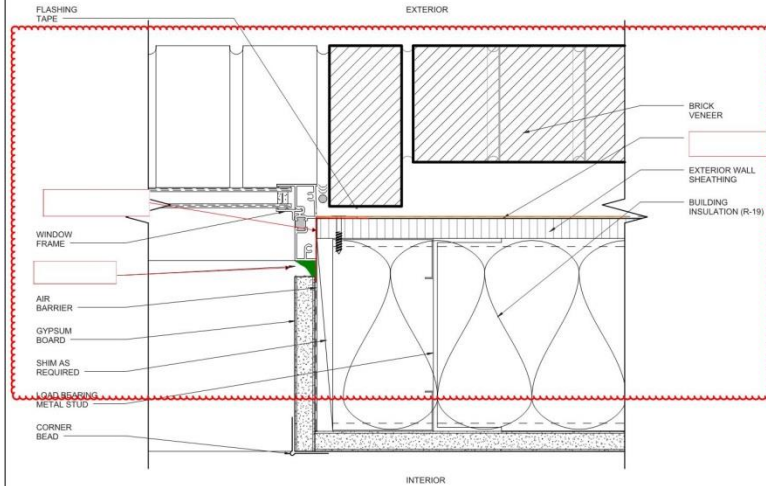


Window - Window Jamb @ Stone

8

NOTE: REFER TO SHT. A7.04, AIR BARRIER DETAILS, FOR ADDITIONAL INFORMATION

Scale: 6" = 1'-0" 1 / A6.12

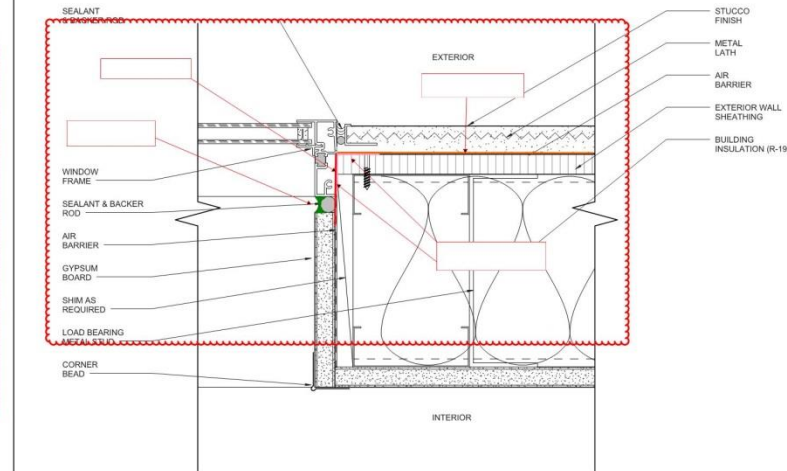


Window - Window Jamb @ Brick Veneer

5

NOTE: REFER TO SHT. A7.04, AIR BARRIER DETAILS, FOR ADDITIONAL INFORMATION

Scale: 6" = 1'-0"

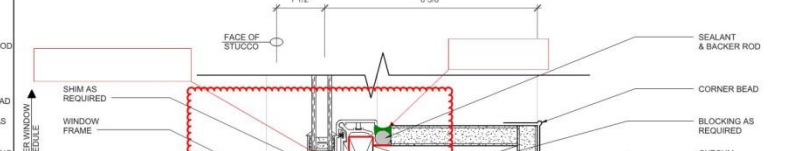
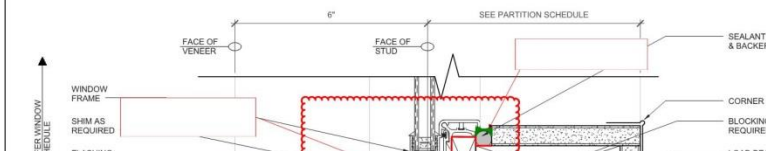
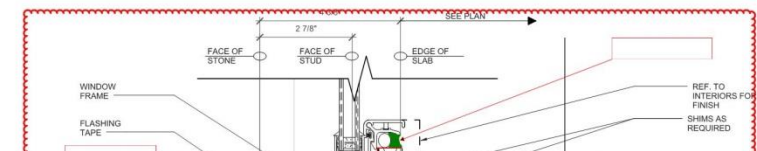


Window - Window Jamb @ Stucco

2

NOTE: REFER TO SHT. A7.04, AIR BARRIER DETAILS, FOR ADDITIONAL INFORMATION

Scale: 6" = 1'-0"



the ultimate...

Elements of success

Take in to account compatibility

(especially components at the roof, window penetrations, below grade to wall interface)

the ultimate...

Elements of success

Take in to account compatibility

(especially components at the roof, window penetrations, below grade to wall interface)

Consultant & manufacturer must have broad knowledge of construction details

(waterproofing, how building components are installed & function through life of the building)

Proper sequencing is of upmost importance

(the design intent many times get compromised due to improper sequencing)

the ultimate...

Concurrent with the architect of record and engineer of record review of shop drawings, the commissioning agent/building envelope consultant will need to review shop drawings prior to release and fabrication for building envelope requirements and provide written comments to the owner and architect of record.

Depending upon the scale and complexity of the project, the commissioning agent/building envelope consultant should be retained to assist the architect/engineer of record with his/her review of contractor submittals pertaining to the building envelope **to verify their conformance with the contract documents and owner requirements.**

the ultimate...



ARCHITECTS

Pre-Construction Coordination Meeting



MANUFACTURERS

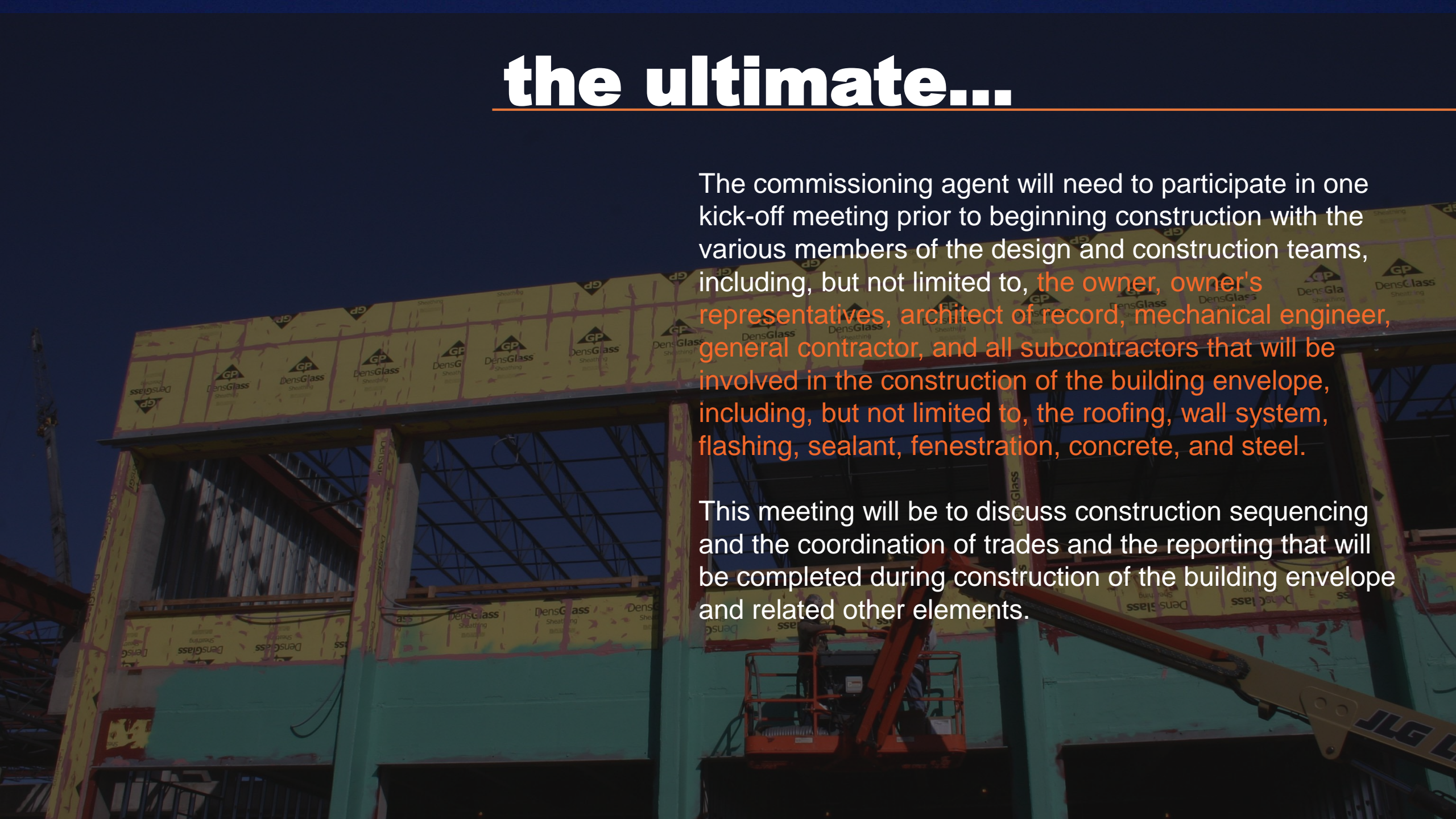


CONSULTANTS

the ultimate...

The commissioning agent will need to participate in one kick-off meeting prior to beginning construction with the various members of the design and construction teams, including, but not limited to, the owner, owner's representatives, architect of record, mechanical engineer, general contractor, and all subcontractors that will be involved in the construction of the building envelope, including, but not limited to, the roofing, wall system, flashing, sealant, fenestration, concrete, and steel.

This meeting will be to discuss construction sequencing and the coordination of trades and the reporting that will be completed during construction of the building envelope and related other elements.

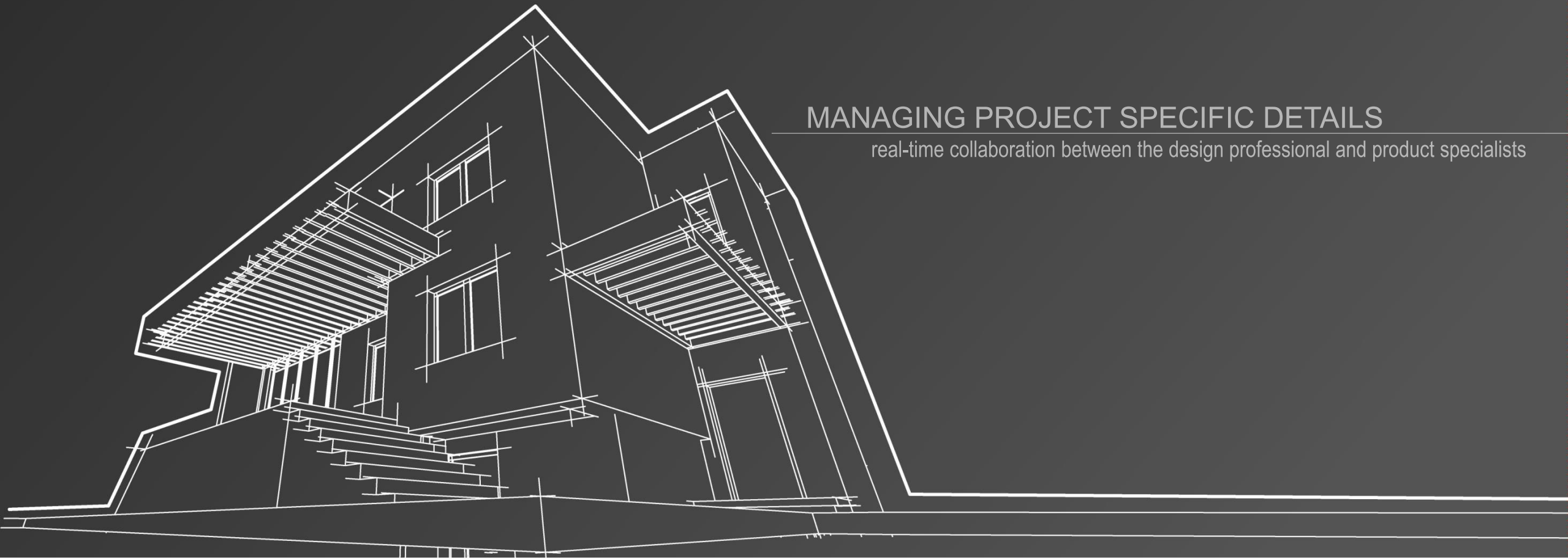


how it normally happens...



MANAGING PROJECT SPECIFIC DETAILS

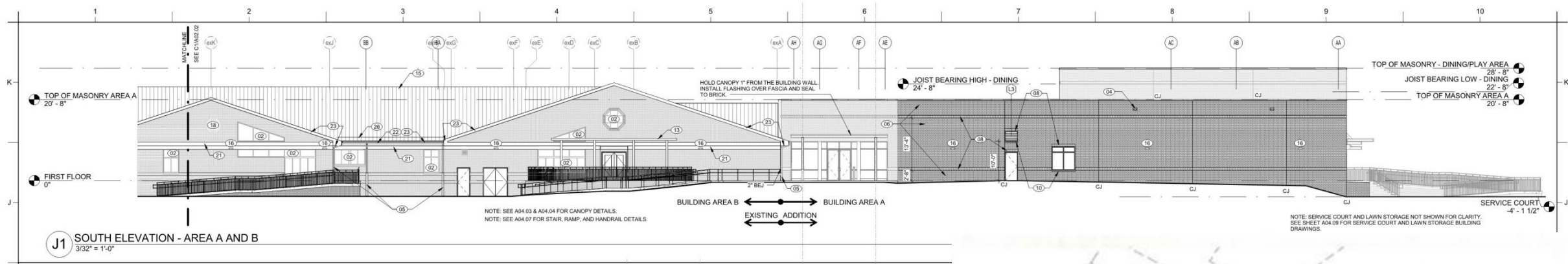
CASE STUDY #1 –ROLESVILLE ELEMENTARY SCHOOL



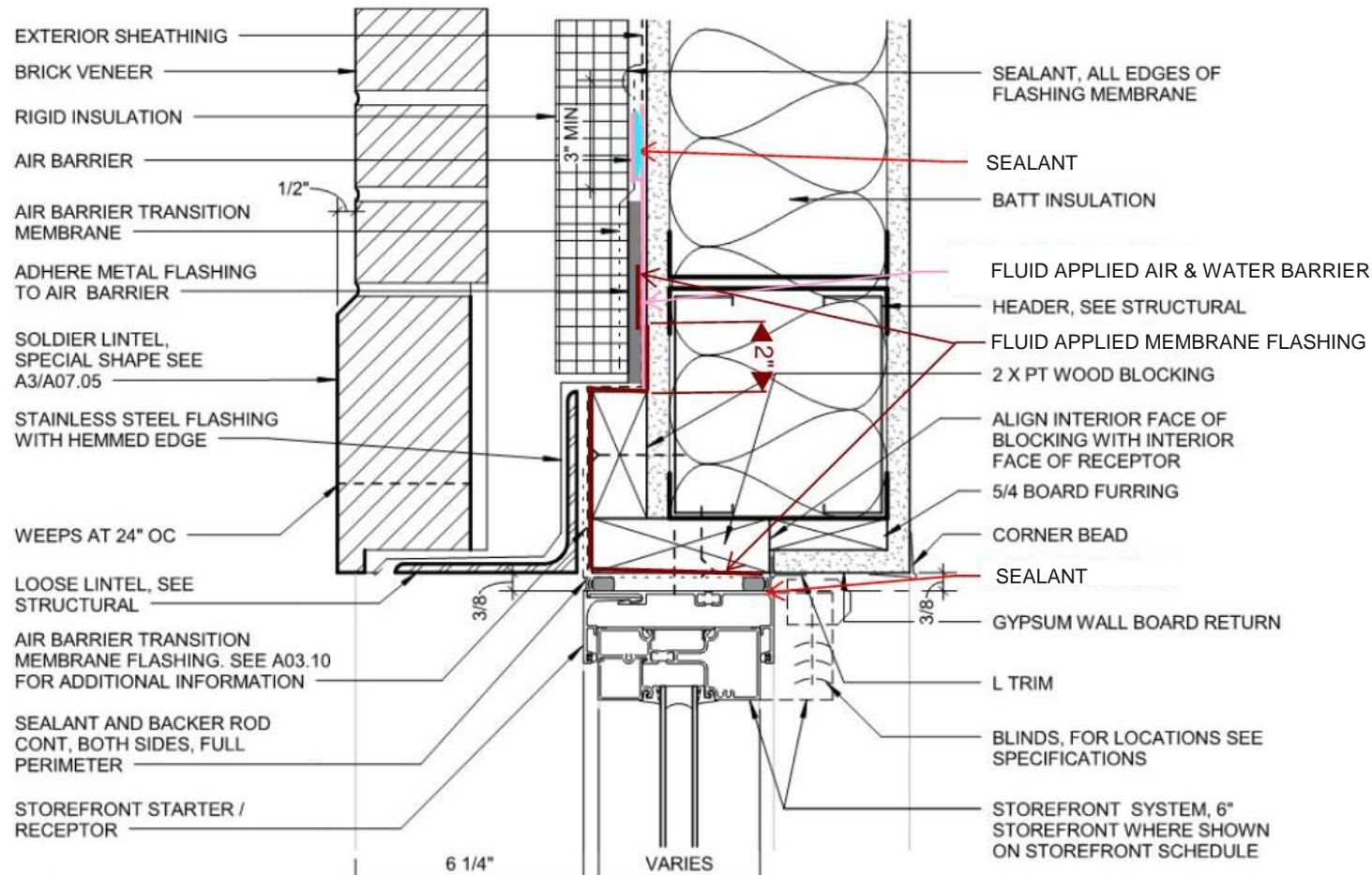
MANAGING PROJECT SPECIFIC DETAILS

real-time collaboration between the design professional and product specialists

CASE STUDY #1 –ROLESVILLE ELEMENTARY SCHOOL

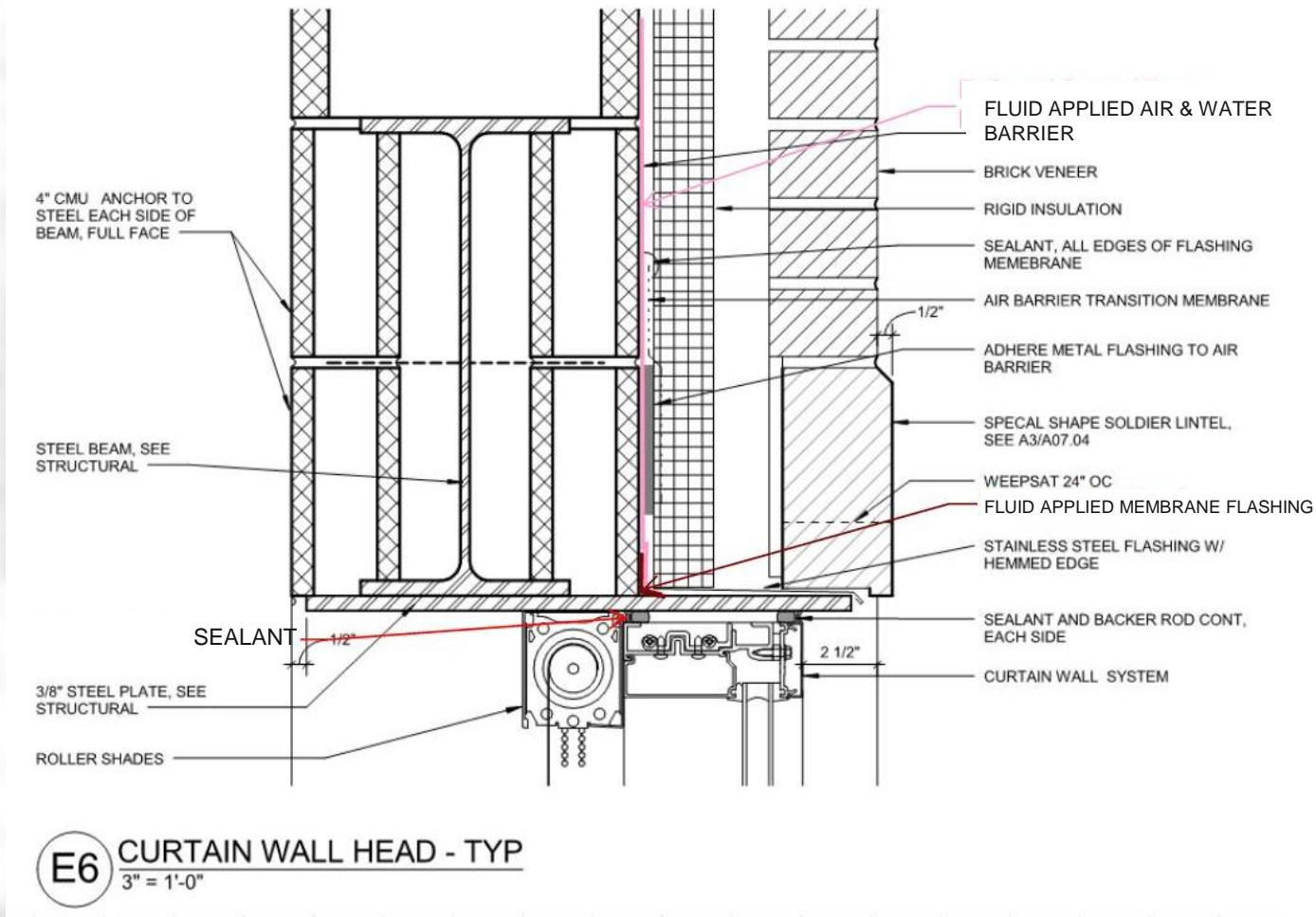


CASE STUDY #1 -ROLESVILLE ELEMENTARY SCHOOL

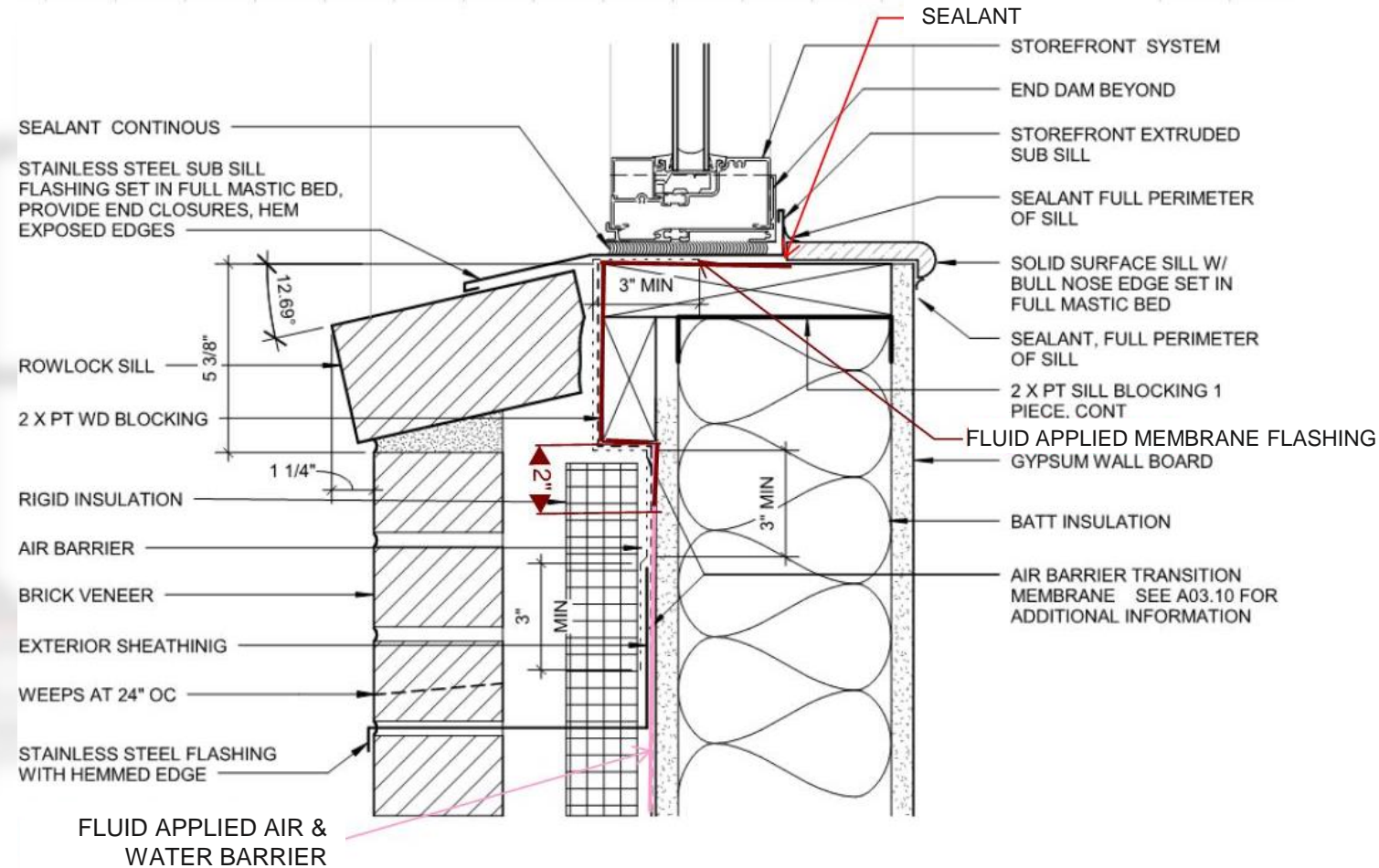


H1 STOREFRONT HEAD AT MTL STUD WALL - TYP
3" = 1'-0"

CASE STUDY #1 -ROLESVILLE ELEMENTARY SCHOOL



CASE STUDY #1 –ROLESVILLE ELEMENTARY SCHOOL

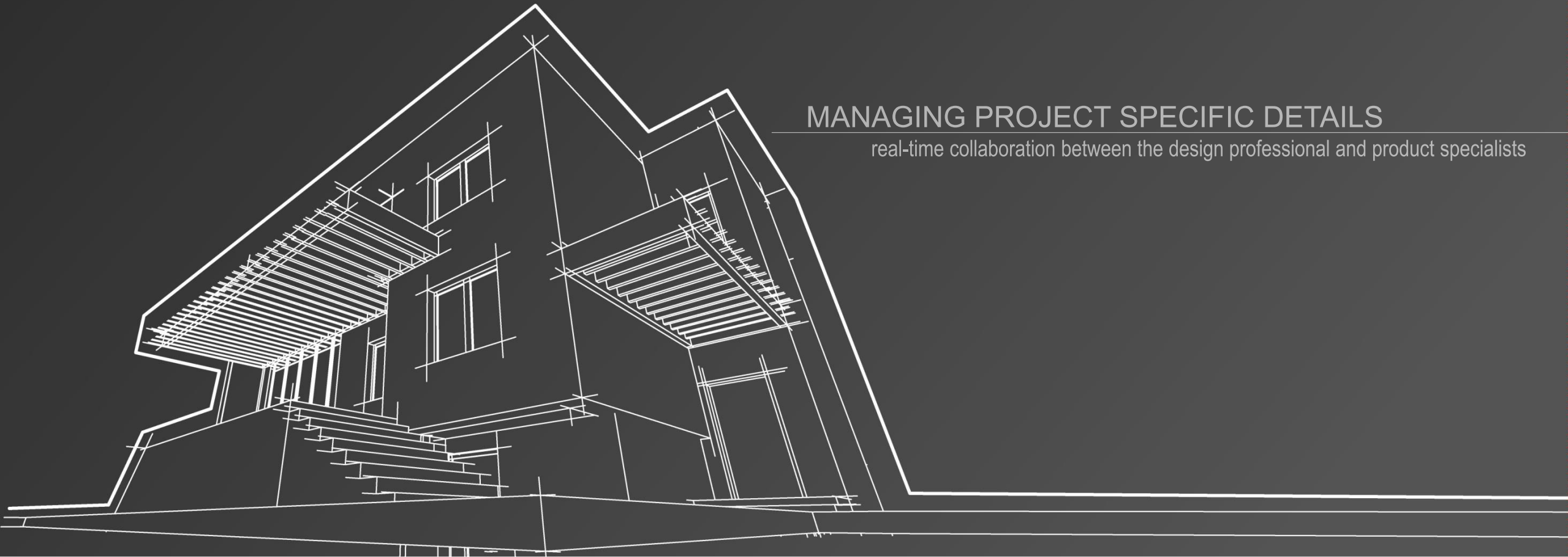


C1 STOREFRONT SILL 4 1/2" AT MTL STUD WALL - TYP
3" = 1'-0"

CASE STUDY #2 - MERCY JEWISH HOSPITAL

MANAGING PROJECT SPECIFIC DETAILS

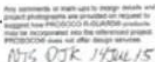
real-time collaboration between the design professional and product specialists



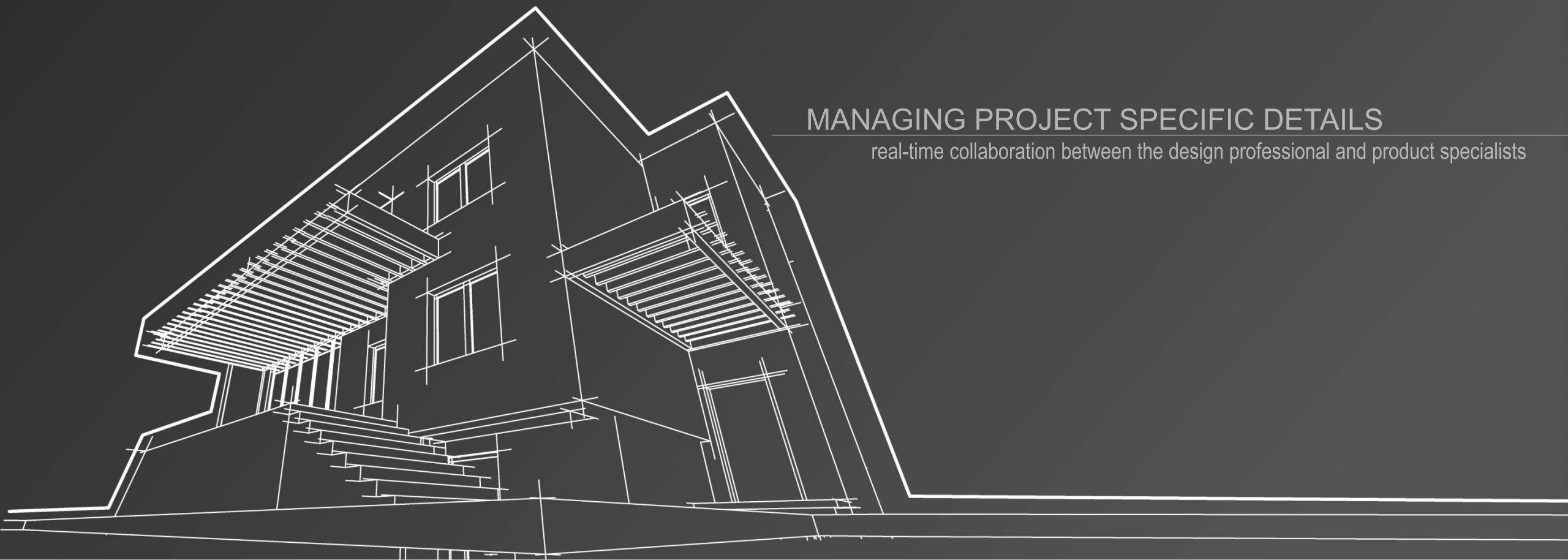
air barr
ab
association of
america

CONCRETE F
TO S-SERIES

10	SECTION
AE631	3" = 1'-0"



CASE STUDY #3 – BUILDING RETROFIT



MANAGING PROJECT SPECIFIC DETAILS

real-time collaboration between the design professional and product specialists

CASE STUDY #3 – BUILDING RETROFIT



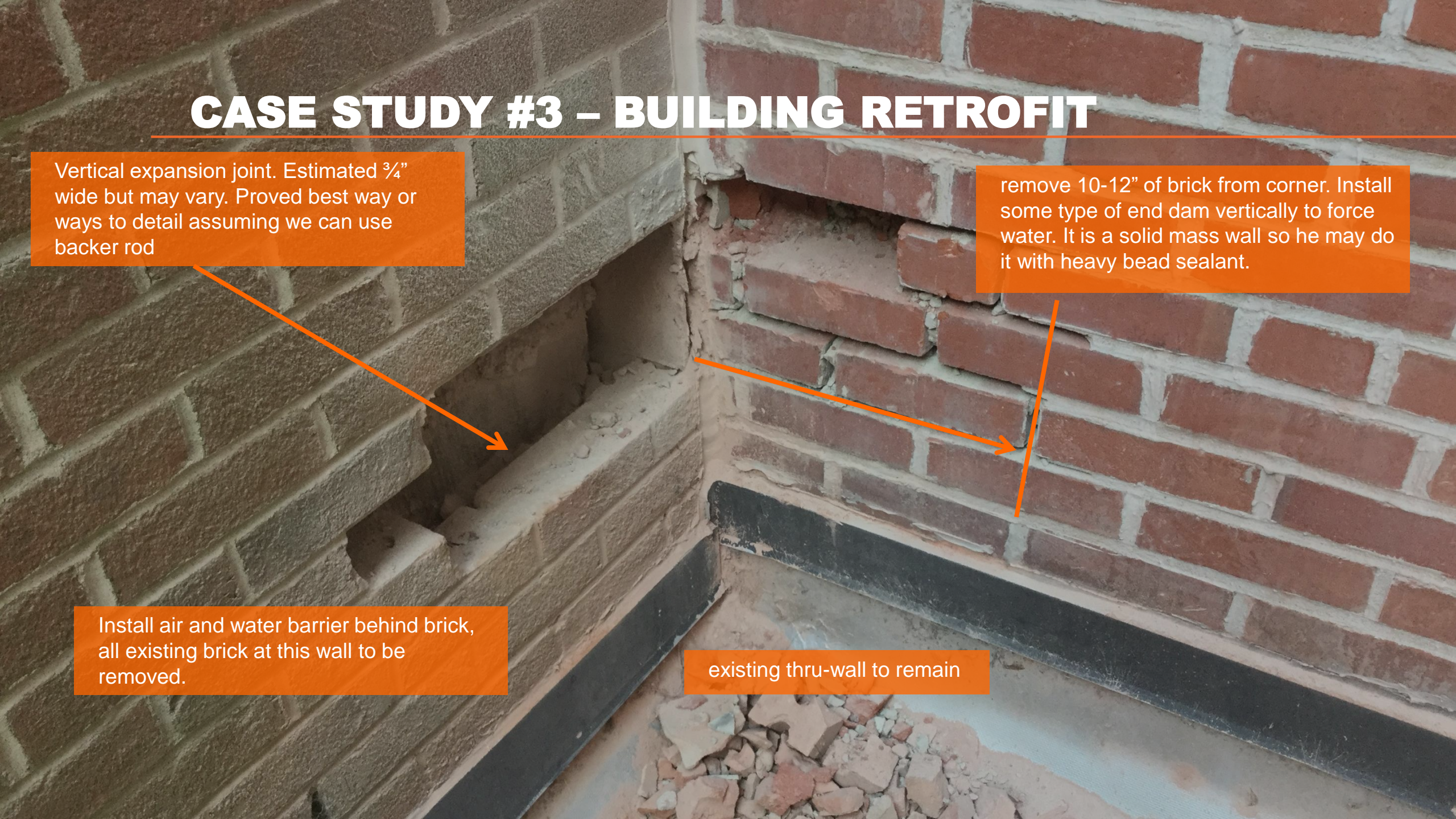
CASE STUDY #3 – BUILDING RETROFIT

Vertical expansion joint. Estimated $\frac{3}{4}$ " wide but may vary. Proved best way or ways to detail assuming we can use backer rod

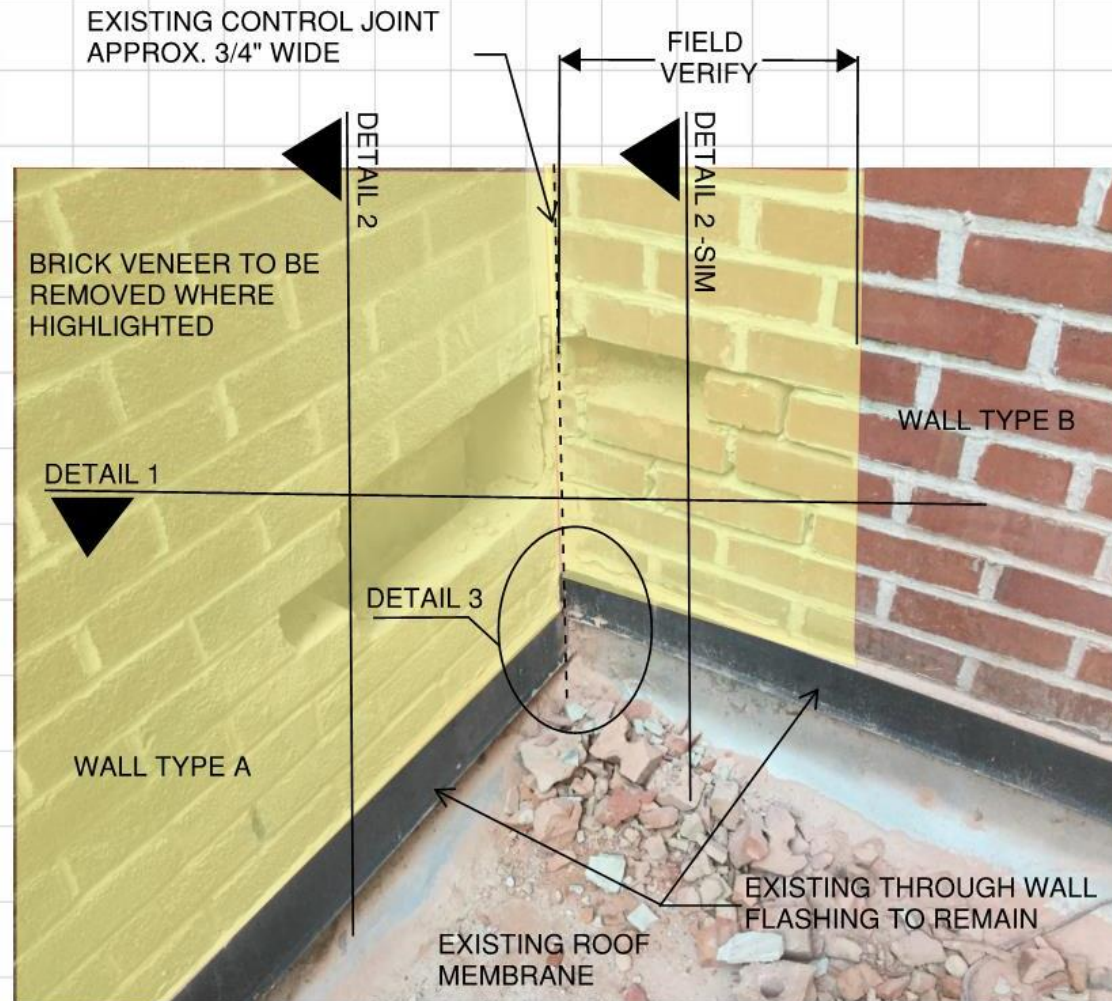
remove 10-12" of brick from corner. Install some type of end dam vertically to force water. It is a solid mass wall so he may do it with heavy bead sealant.

Install air and water barrier behind brick, all existing brick at this wall to be removed.

existing thru-wall to remain



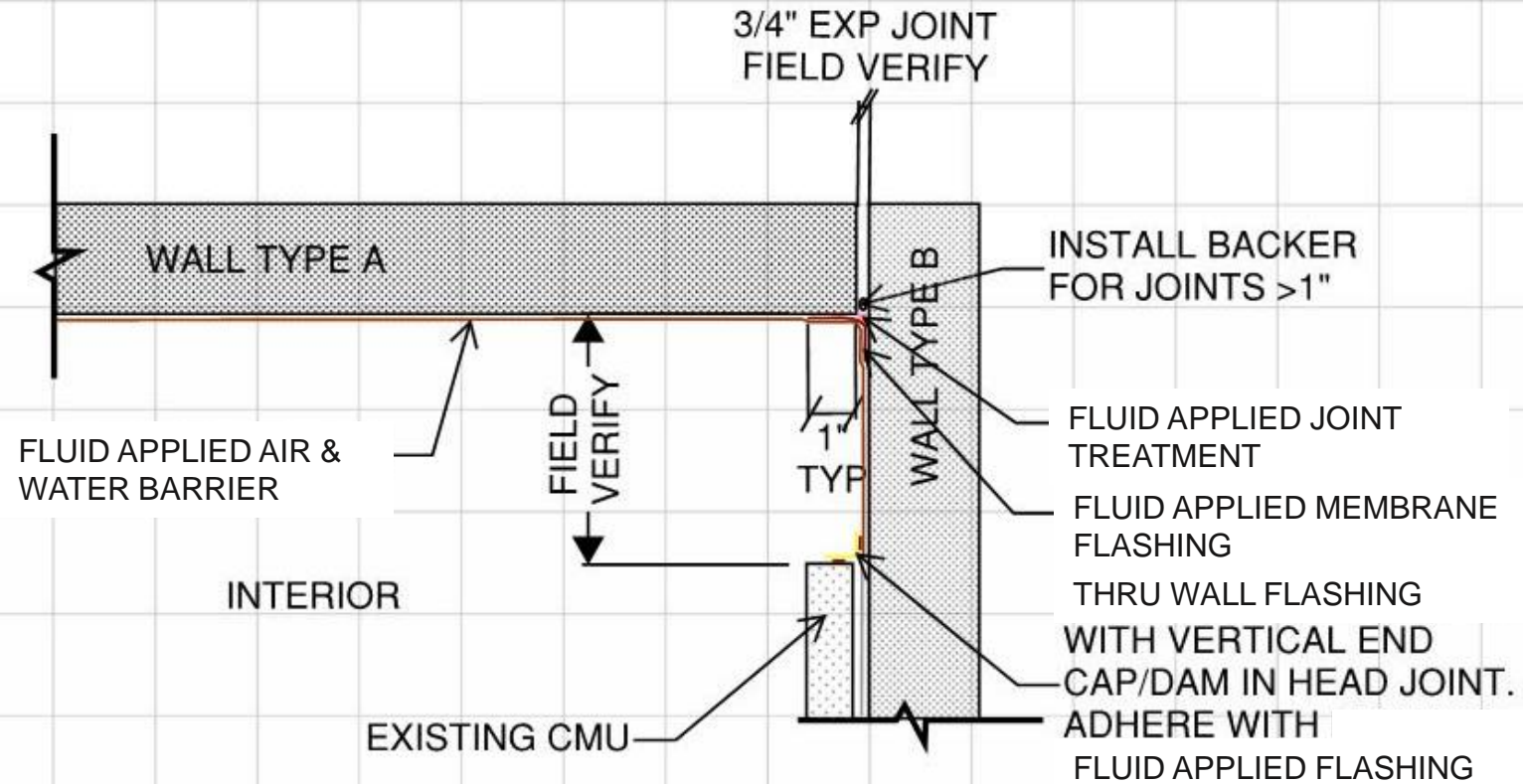
CASE STUDY #3 – BUILDING RETROFIT



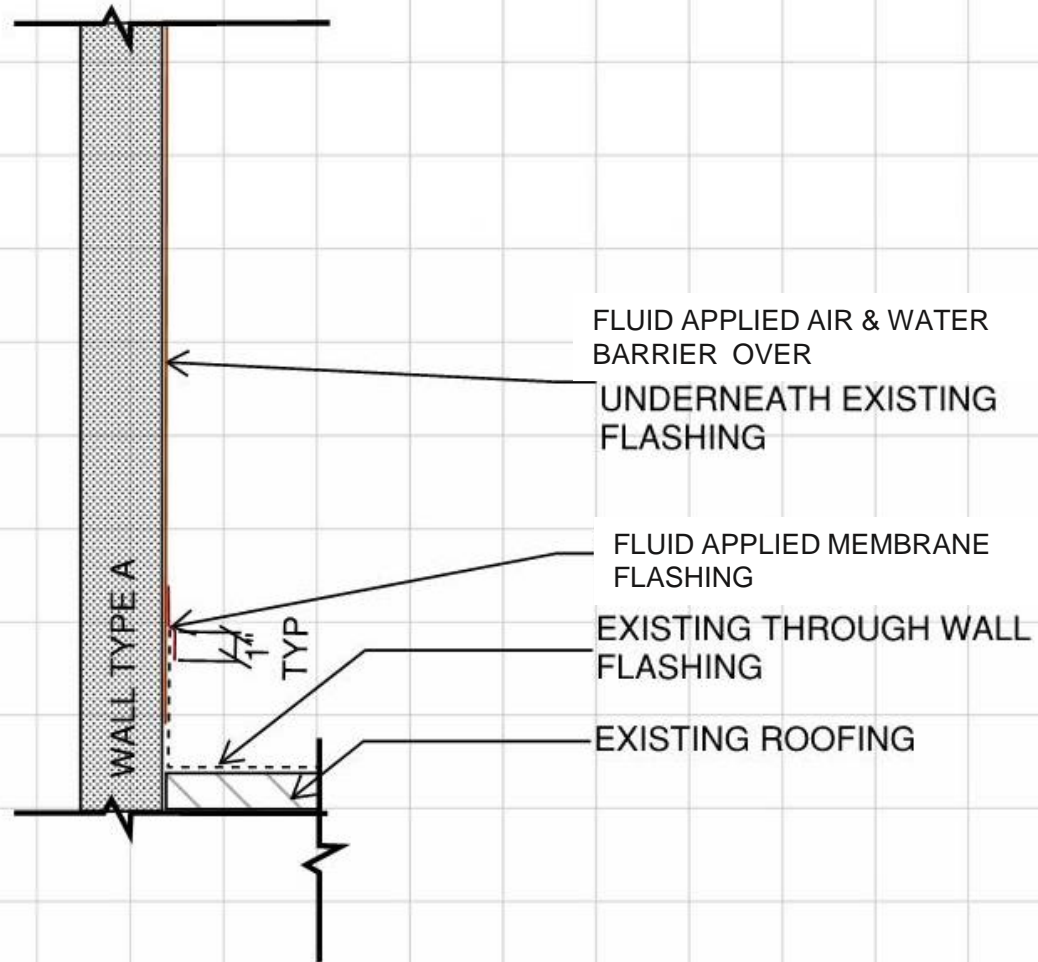
PARAPET CONDITION- EXISTING TO NEW
CONDITION

Any comments or mark-ups to design details

CASE STUDY #3 – BUILDING RETROFIT



CASE STUDY #3 – BUILDING RETROFIT

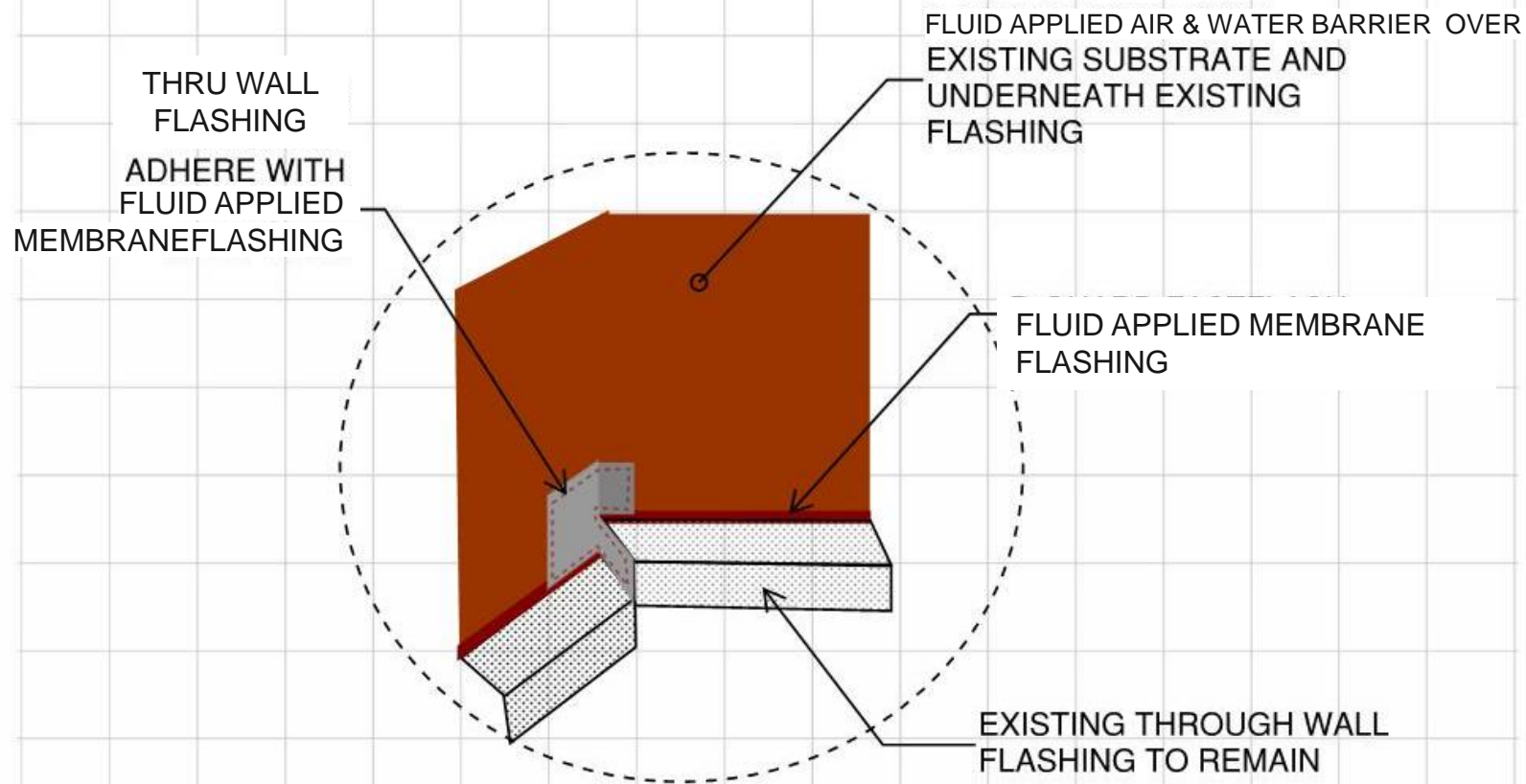


DETAIL 2

PARAPET CONDITION- EXISTING TO NEW
CONDITION

Any comments or mark-ups to design details
and project photographs are provided on

CASE STUDY #3 – BUILDING RETROFIT



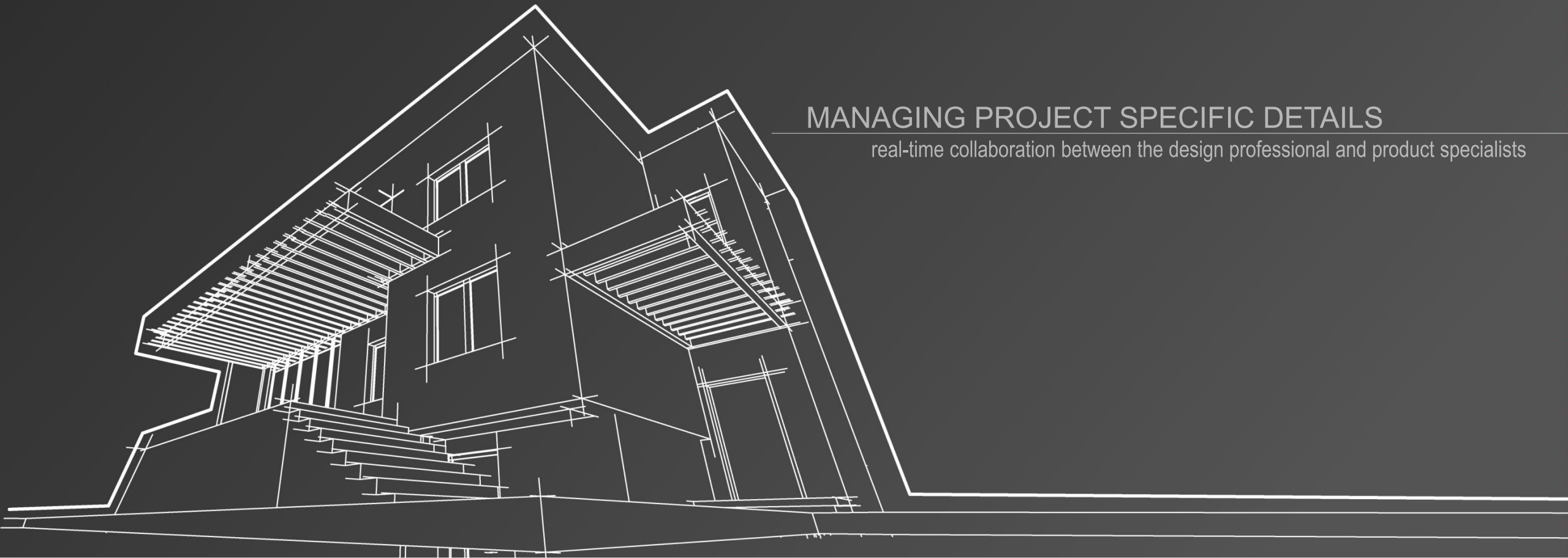
DETAIL 3

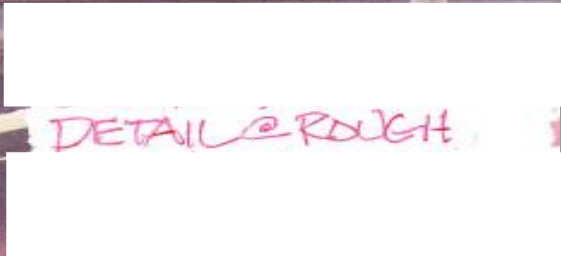
PARAPET CONDITION- EXISTING TO NEW
CONDITION

CASE STUDY #4

MANAGING PROJECT SPECIFIC DETAILS

real-time collaboration between the design professional and product specialists

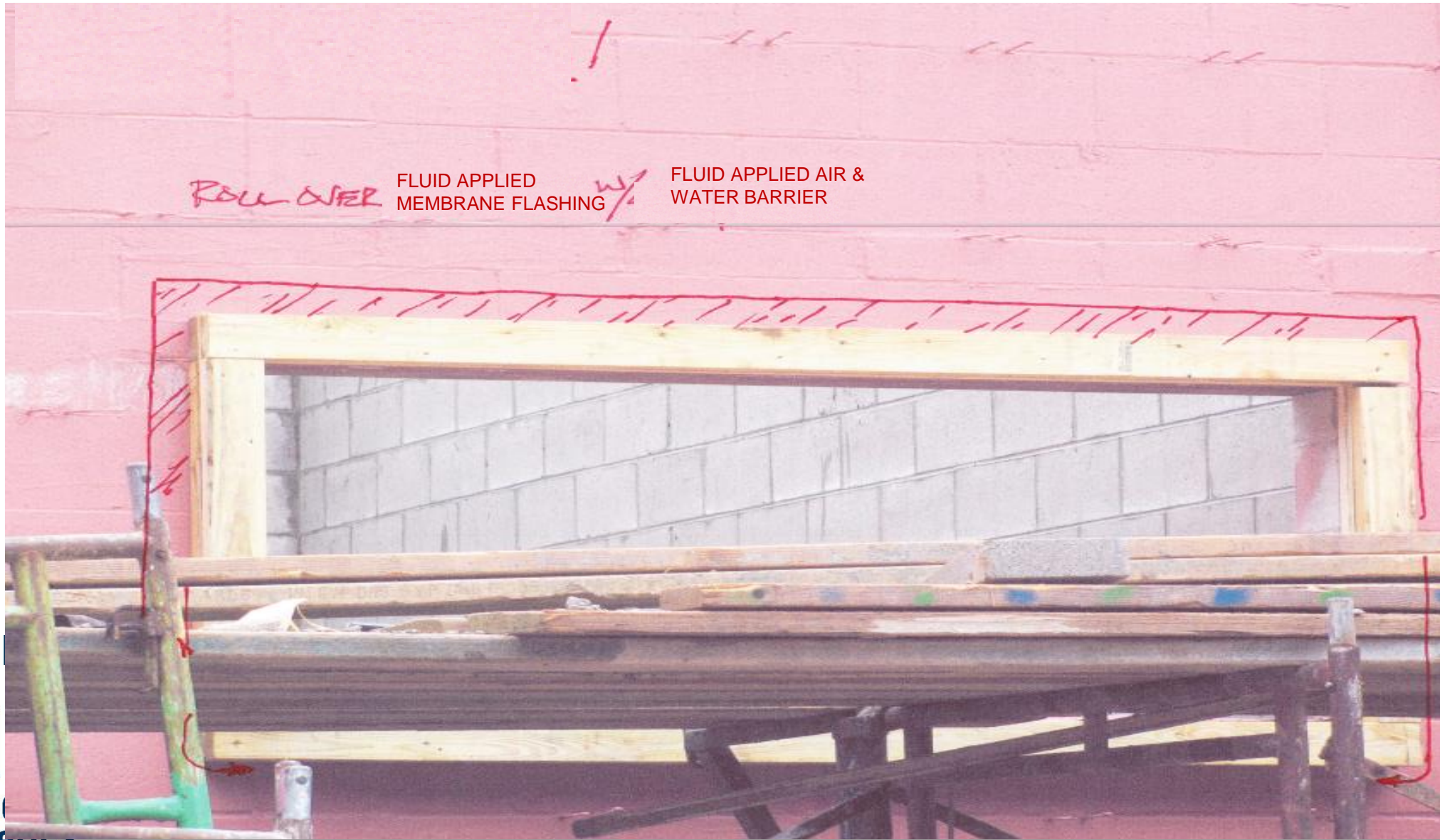




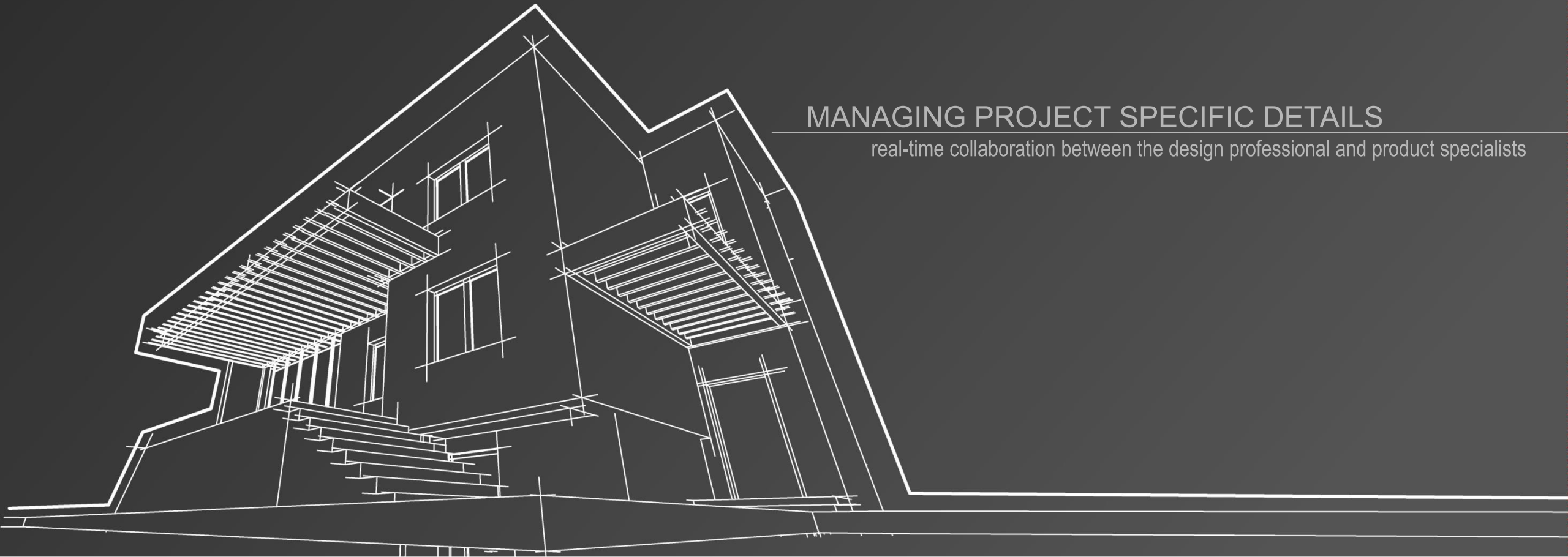
Step 2 Protect the Opening



Step 2 Protect the Opening



CASE STUDY #5- FIELD MODIFICATIONS



MANAGING PROJECT SPECIFIC DETAILS

real-time collaboration between the design professional and product specialists



INSTALL INSULATION BLANKET
AROUND STEEL BEAMS FILLING
INTERSTITIAL SPACE PRIOR
TO INSTALLATION OF SADDLE FLASHING.
THICKNESS TO BE DETERMINED BY
DESIGN PROFESSIONAL FOR R-VALUE &
FIRE SAFING RELATED ISSUES!

DETAIL #1

FLUID APPLIED JOINT
TREATMENT

SADDLE FLASHING
OF STEEL BEAM
PENETRATIONS

INSTALL BOTTOM
FLANGE FIRST. SET IN
BEAD OF FLUID APPLIED JOINT
TREATMENT

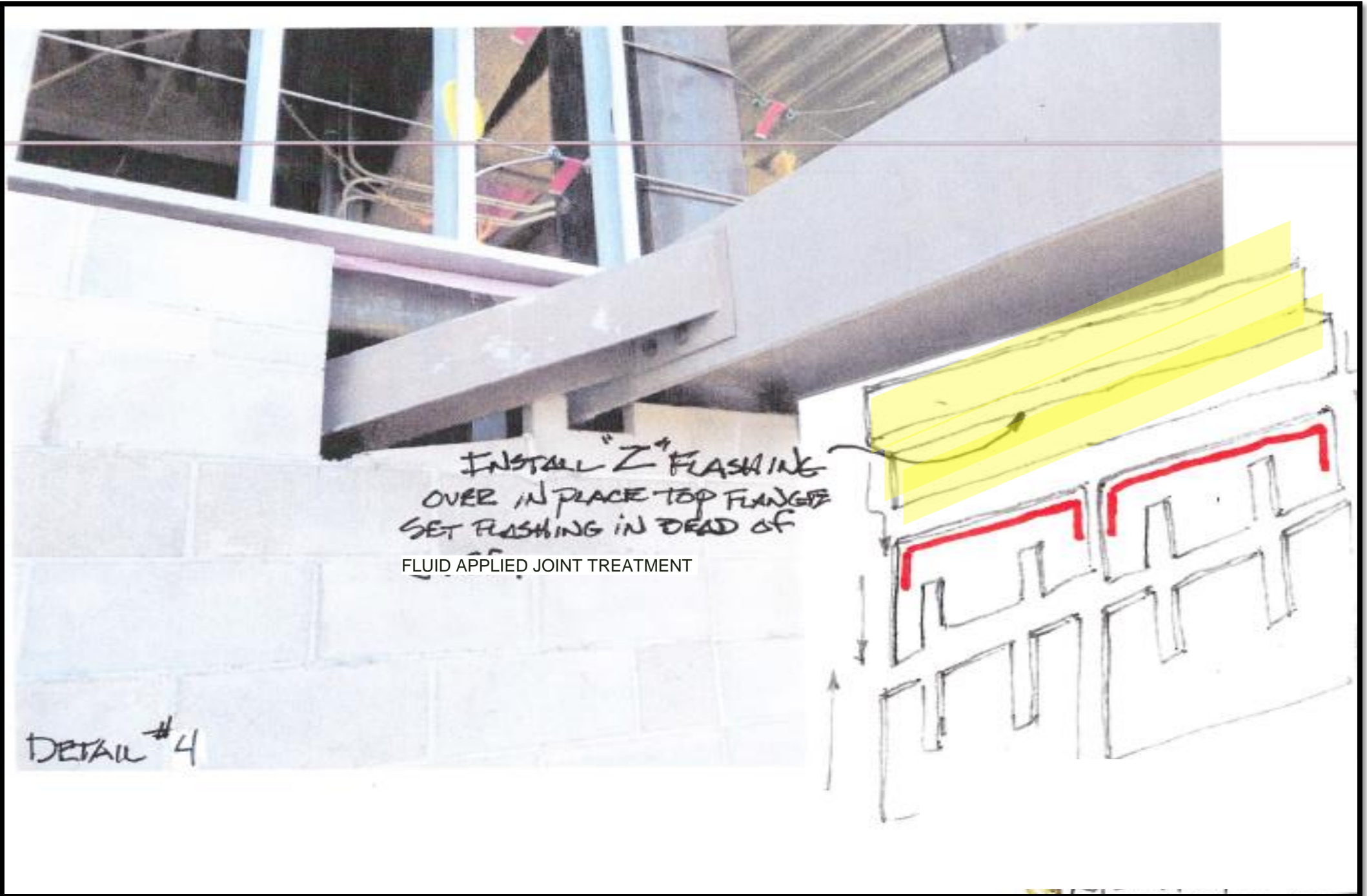
DETAIL #2

FLUID APPLIED
JOINT TREATMENT

INSTALL TOP FLANGE
OVER IN-PLACE BOTTOM
FLANGE. SET IN DEAD
OF FLUID APPLIED JOINT TREATMENT

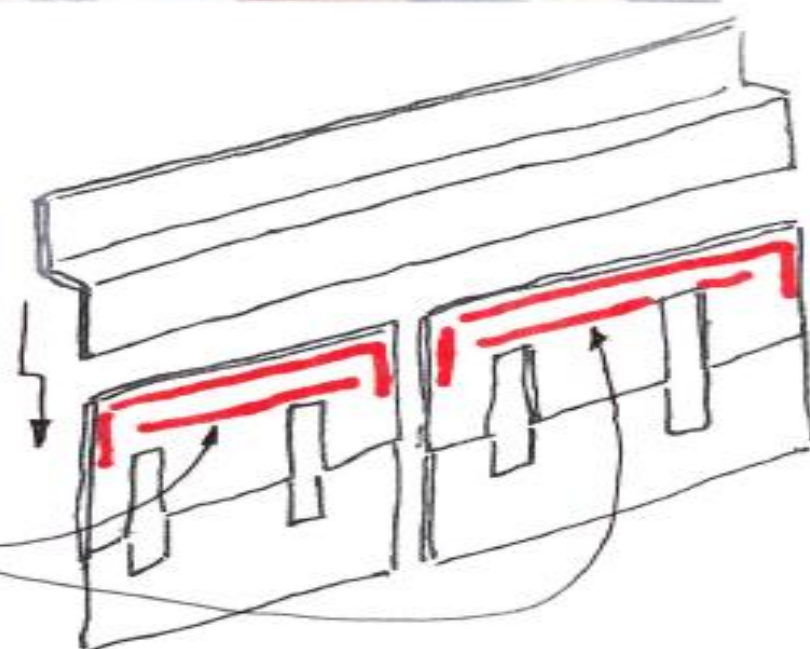
FLUID APPLIED JOINT
TREATMENT

DETAIL #3

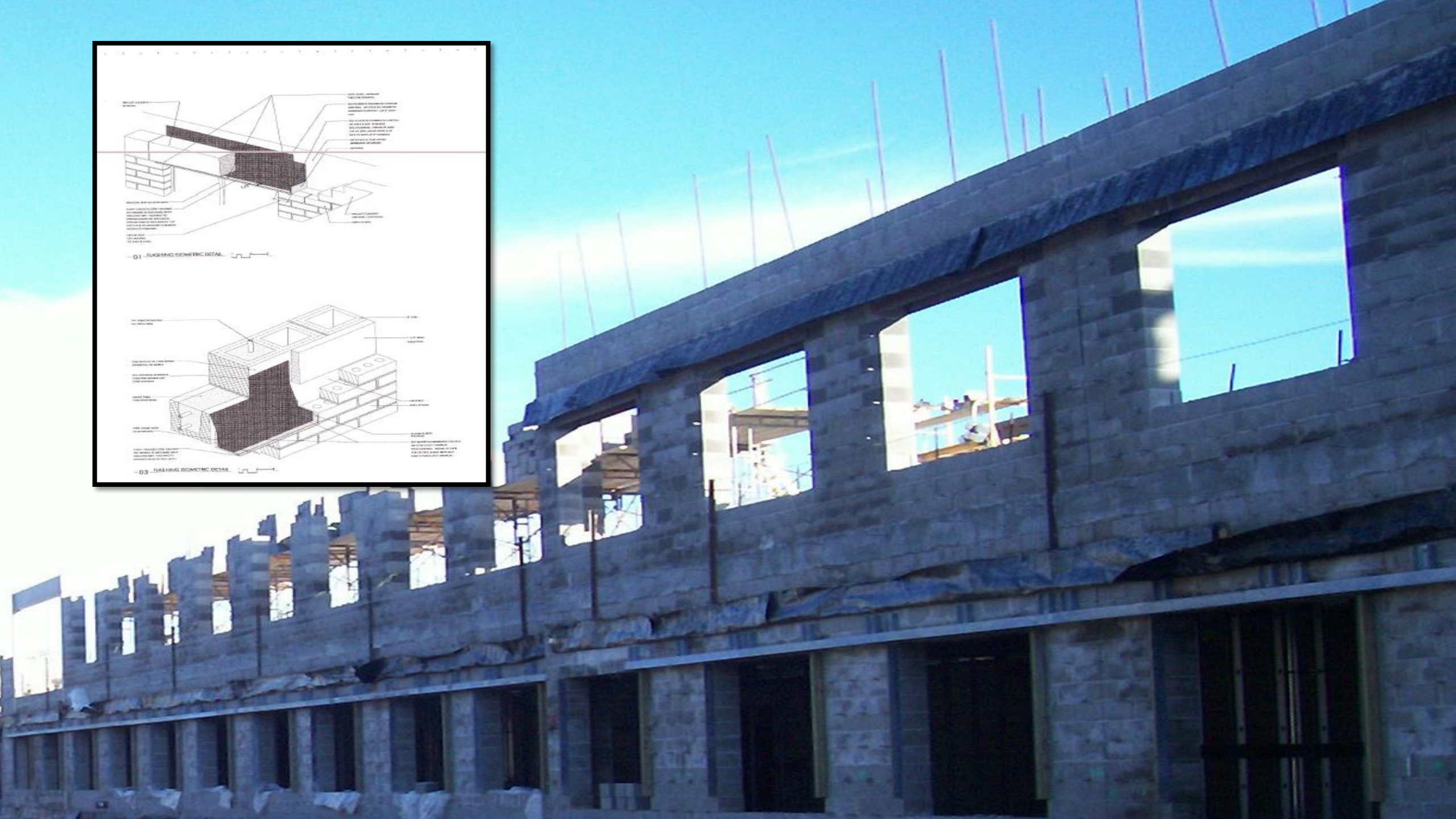
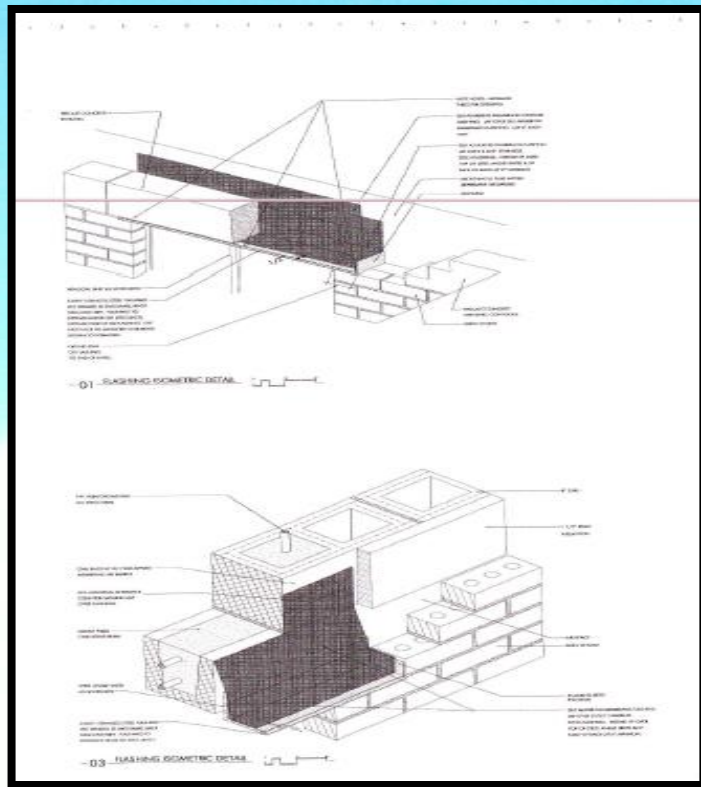


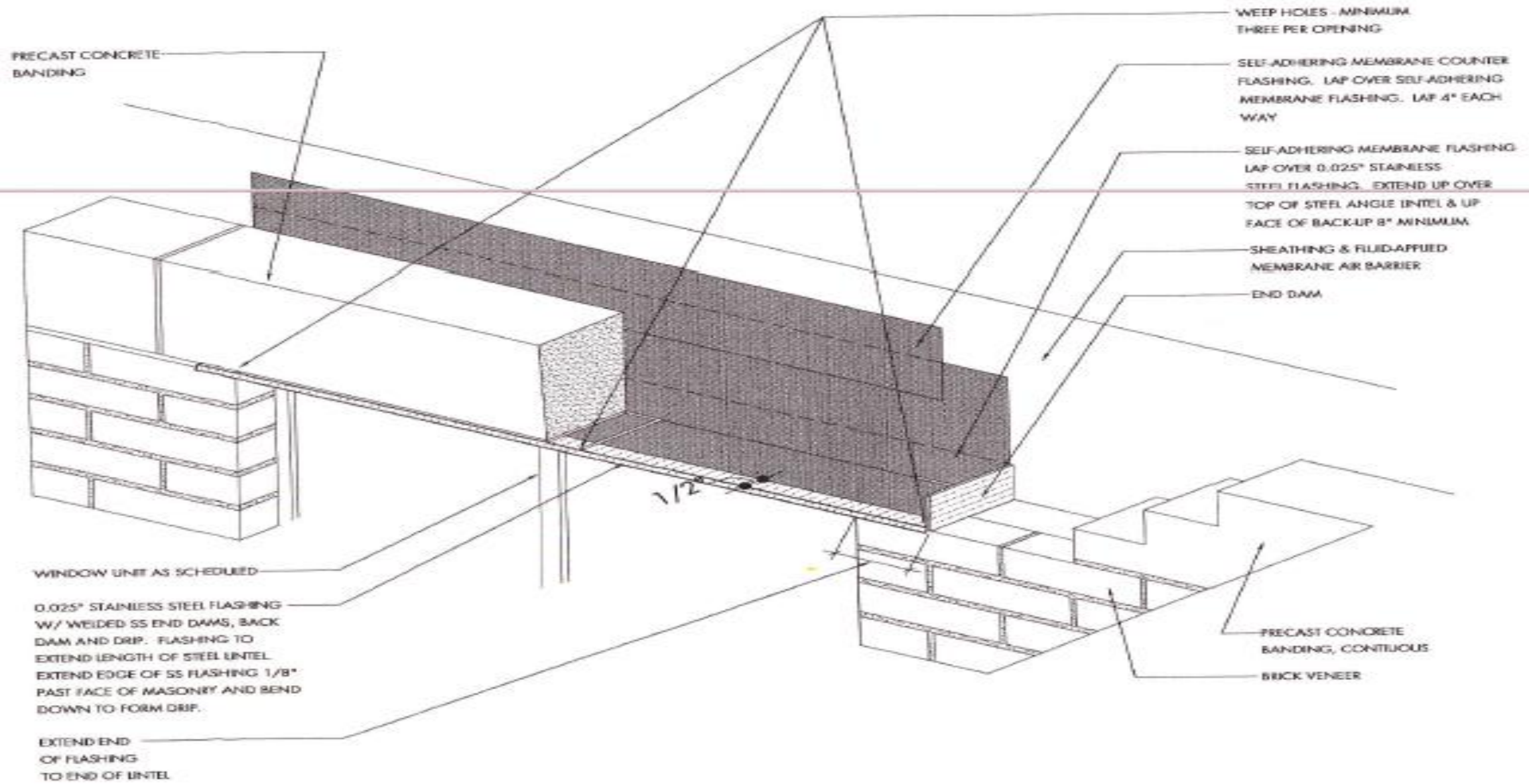


DETAIL #5



FLUID APPLIED JOINT TREATMENT

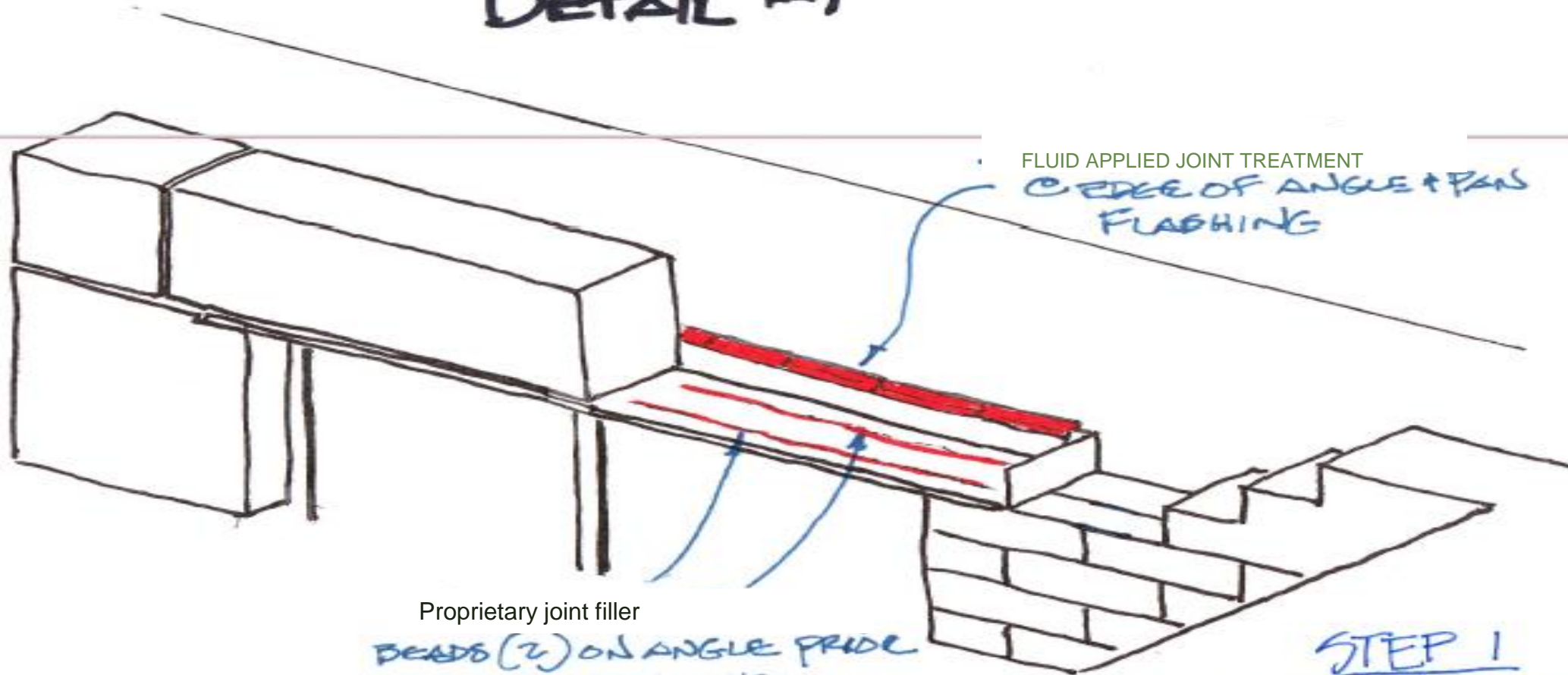




- 01 FLASHING ISOMETRIC DETAIL



HEAD CONDITION DETAIL #1



BEADS (2) ON ANGLE PRIOR
TO SETTING PAN @ HEAD

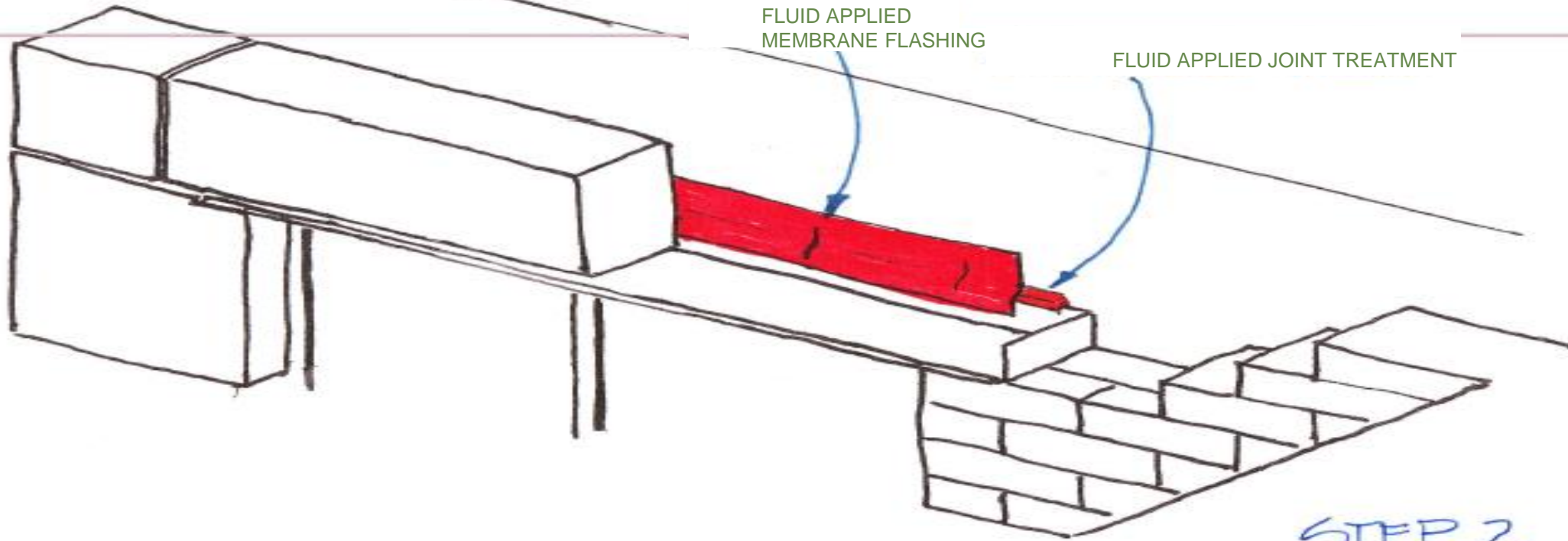
STEP 1

- APPLY 2 BEADS OF J&SF ON ANGLE PRIOR TO SETTING HEAD FLASHING PAN ON SHE
- SEAL EDGE OF PAN FLASHING SHOOT & TOOL J&SF OVER EDGE OF PAN FLASHING.

HEAD CONDITION DETAIL #1

FLUID APPLIED
MEMBRANE FLASHING

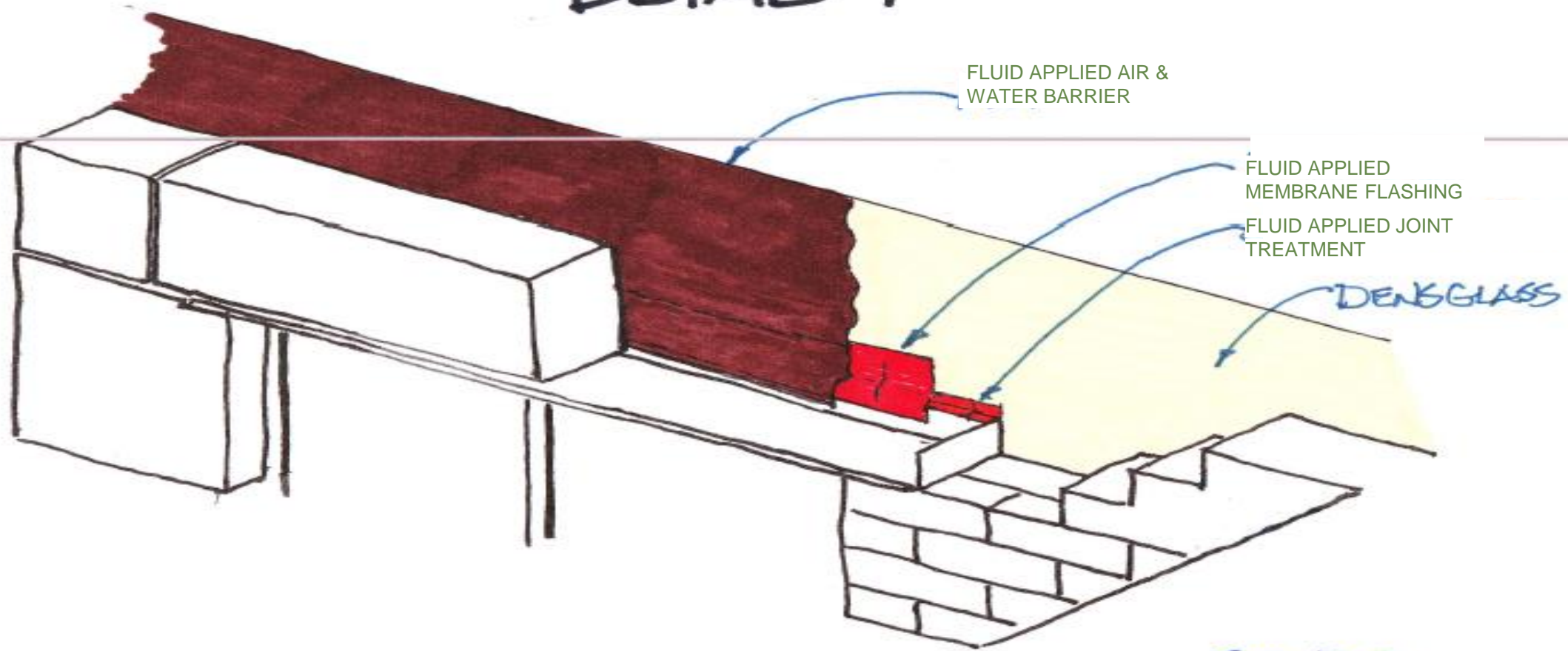
FLUID APPLIED JOINT TREATMENT



STEP 2

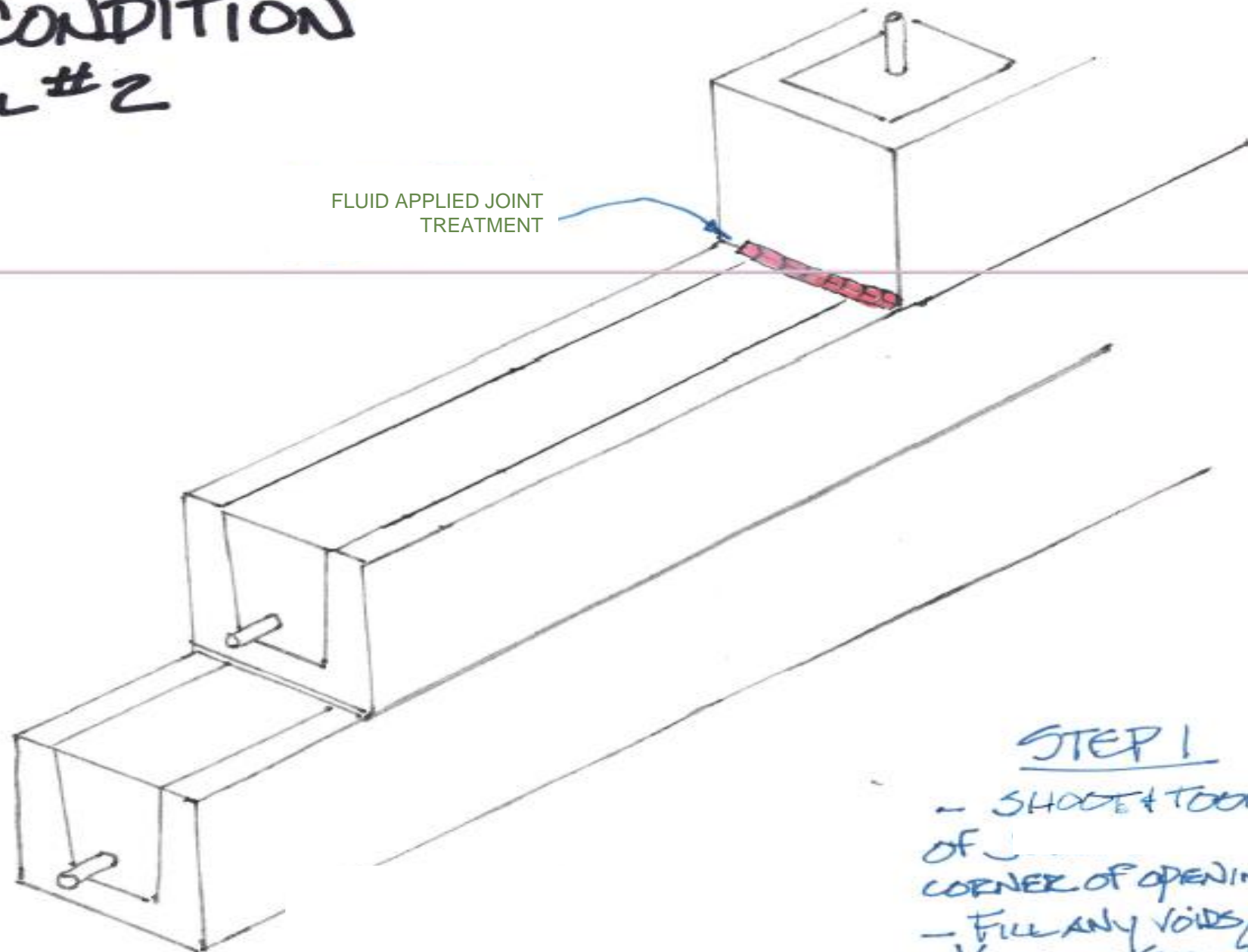
- APPLY JOINT FILLER OVER CURED JOINT FILLER DOWN INTO S.S. METAL PAN FLASHING (APPROX 2" ONTO VERTICAL LEG OF BACK DAM OF THE S.S. FLASHING PAN.)

HEAD CONDITION DETAIL #1



STEP 3
- SPRAY-APPLY -
TO PREPARED SHEATHING
BOARDS

SILL CONDITION DETAIL #2

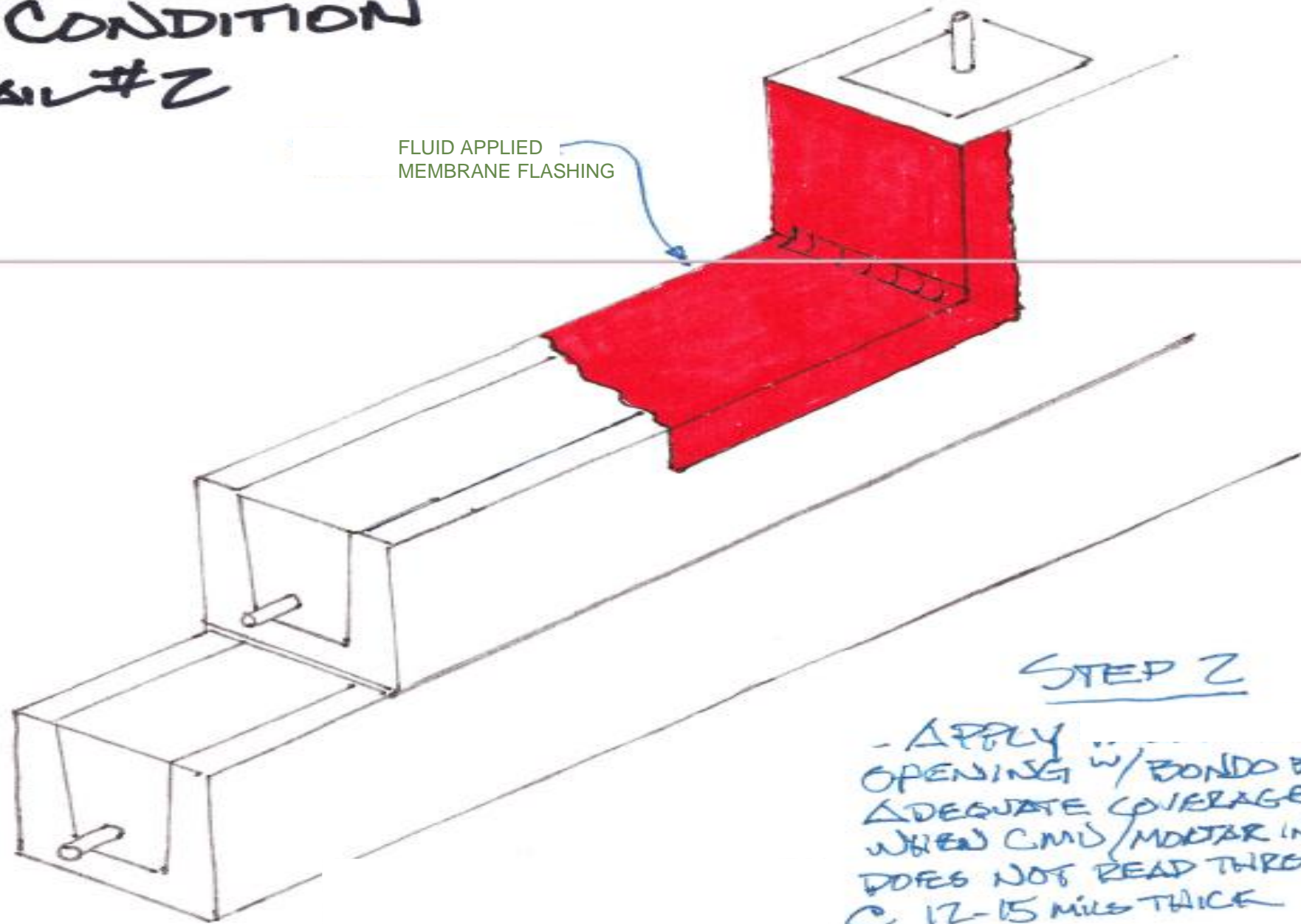


FLUID APPLIED JOINT
TREATMENT

STEP 1

- SHOOT & TOOL A BEAD OF 2 INCH CORNER OF OPENING
- FILL ANY VOIDS/IMPERFECTIONS W/ JOINT & SEAM FILLER

SILL CONDITION DETAIL #2

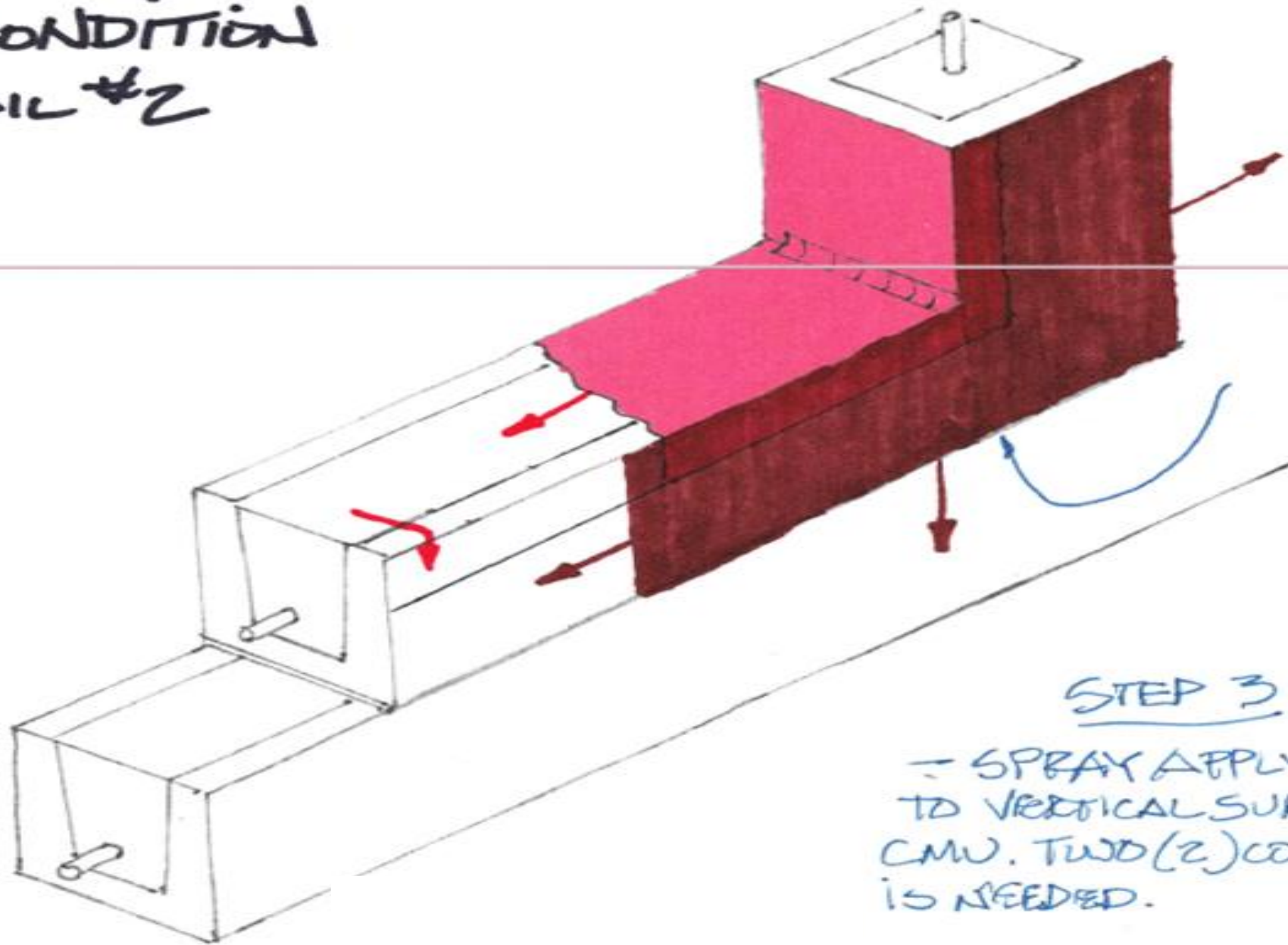


FLUID APPLIED
MEMBRANE FLASHING

STEP 2

- APPLY TO ROUGH
OPENING w/ BOND BLADE.
ADEQUATE COVERAGE IS ACHIEVED
WHEN CMU/MORTAR INFILL COULD
DOES NOT READ THROUGH MEMBRANE
C 12-15 MILS THICK

SILL CONDITION DETAIL #2



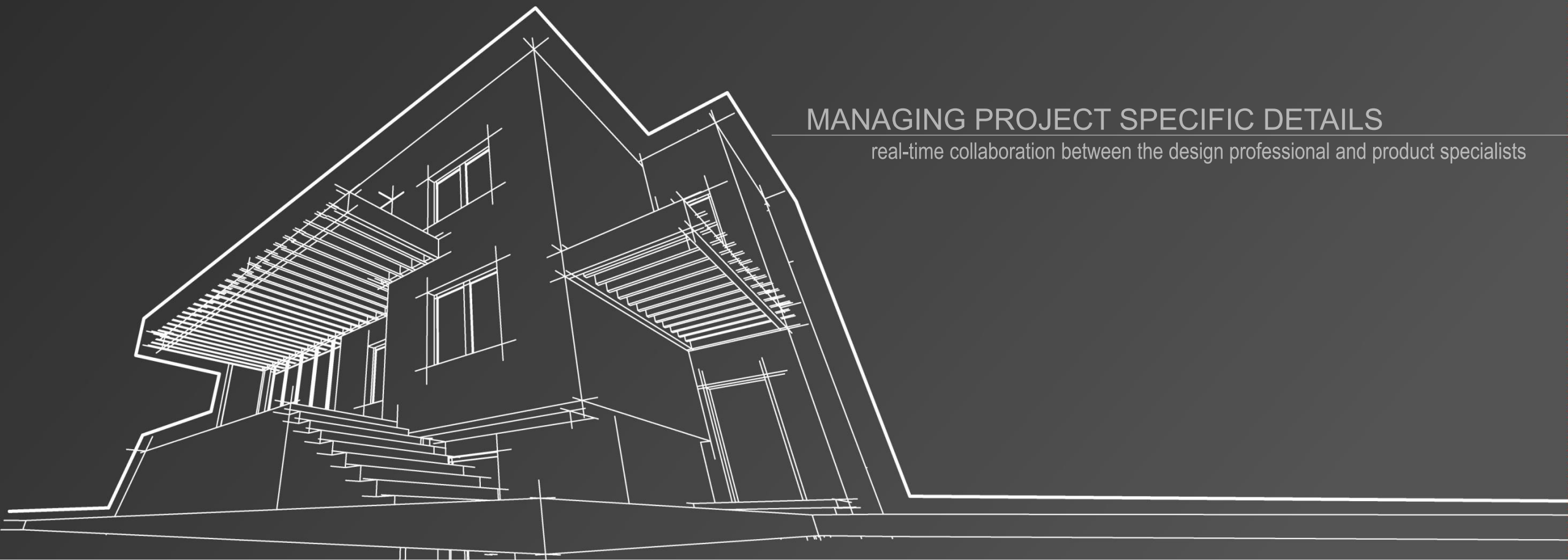
STEP 3

= SPRAY APPLY
TO VERTICAL SURFACE OF
CMU. TWO (2) COATS @ 10M
IS NEEDED.

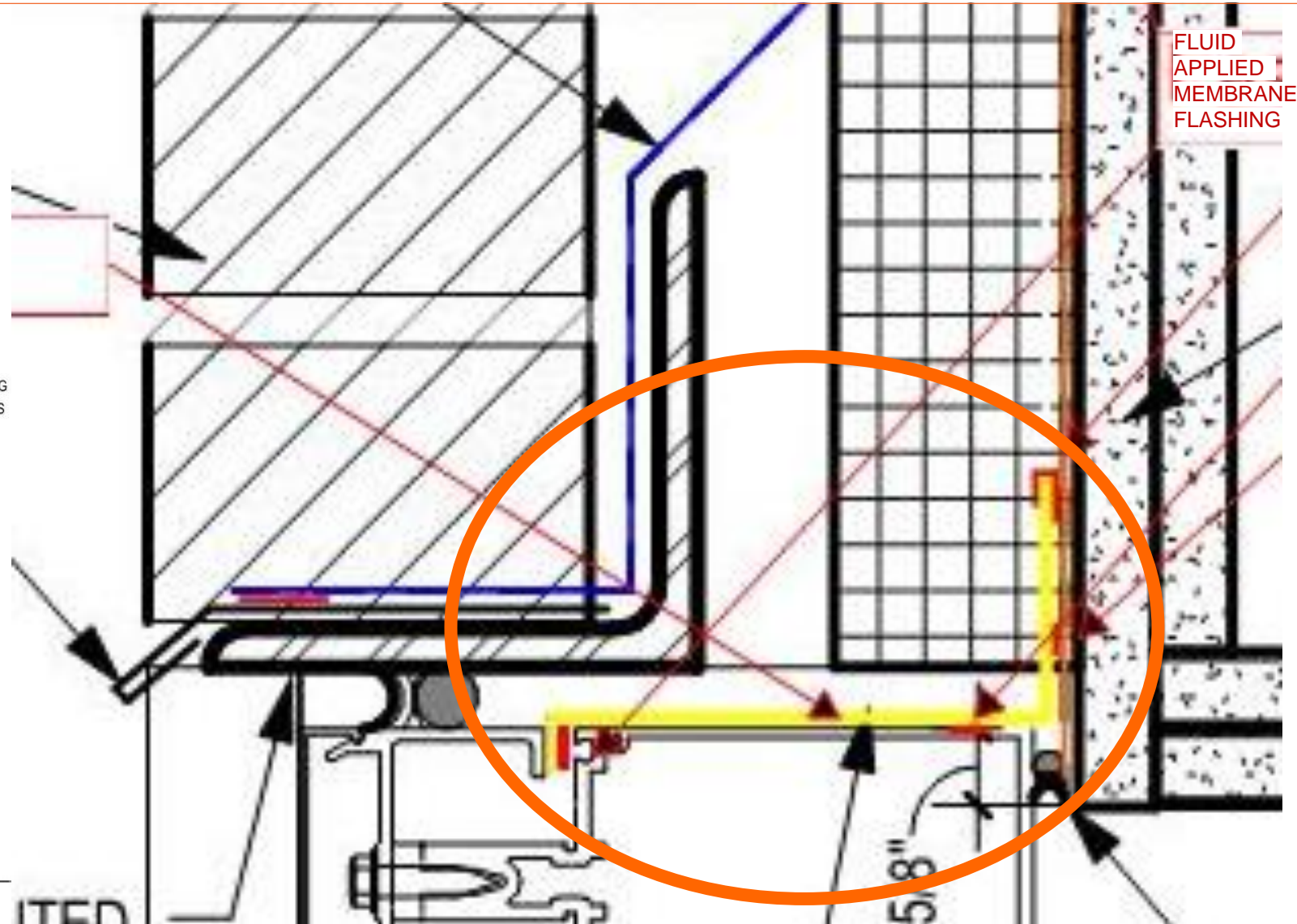
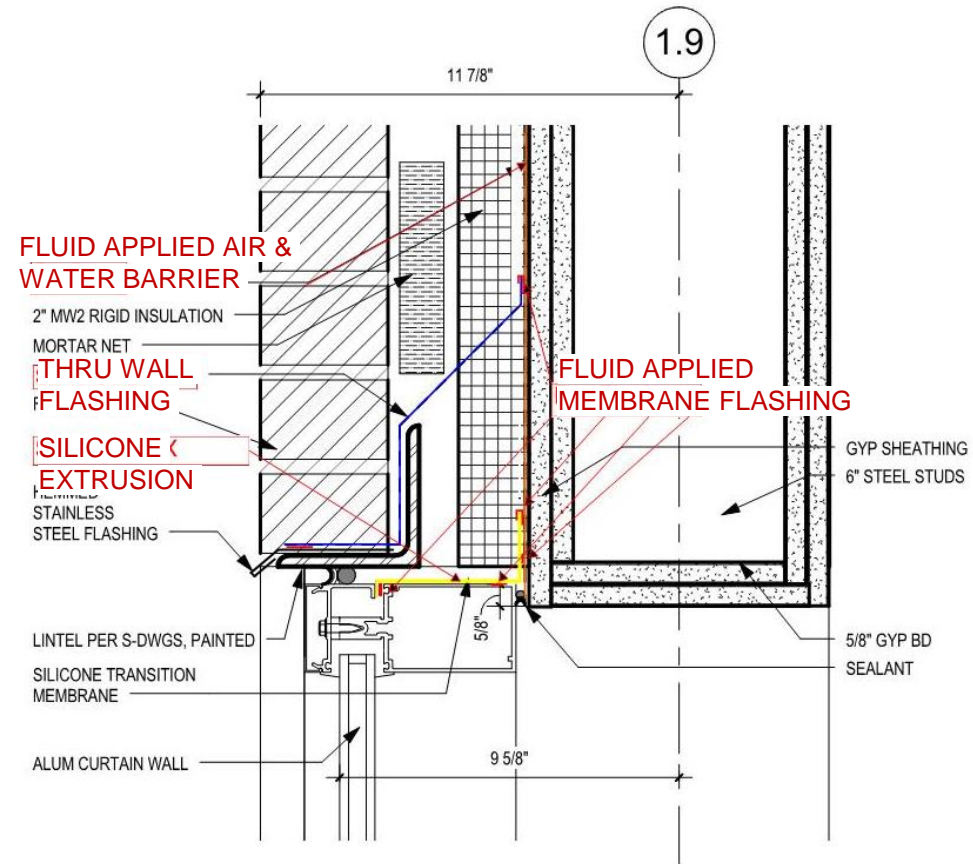
CASE STUDY #6- SILICONE EXTRUSION

MANAGING PROJECT SPECIFIC DETAILS

real-time collaboration between the design professional and product specialists

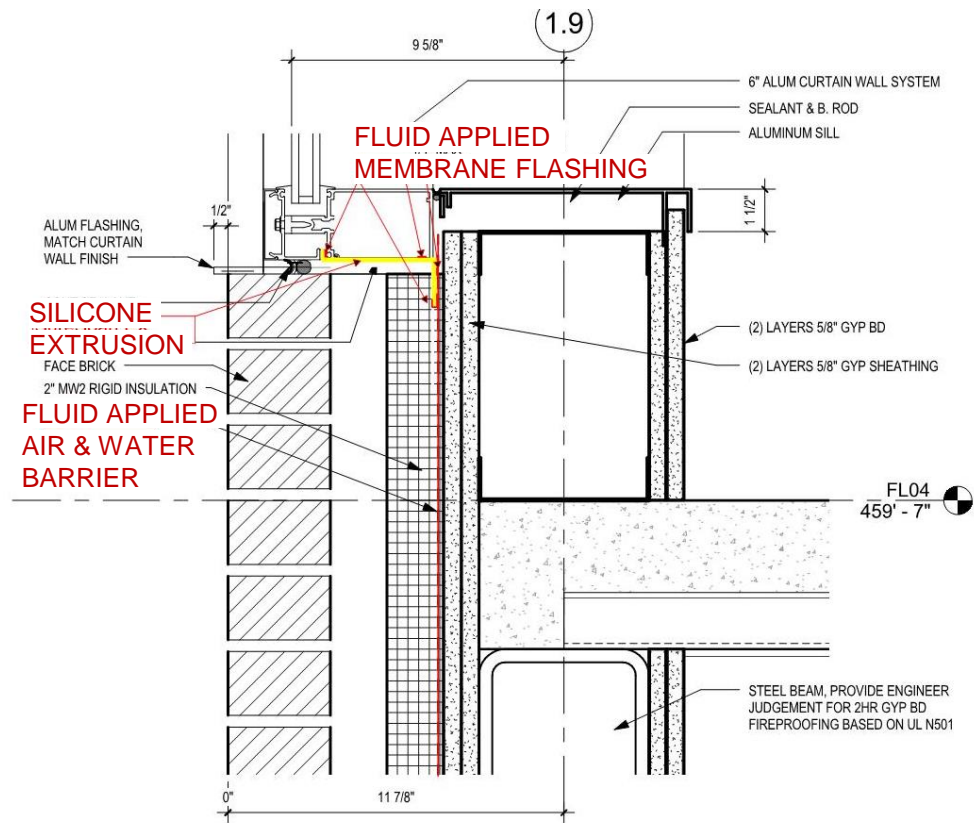


CASE STUDY #6- SILICONE EXTRUSION

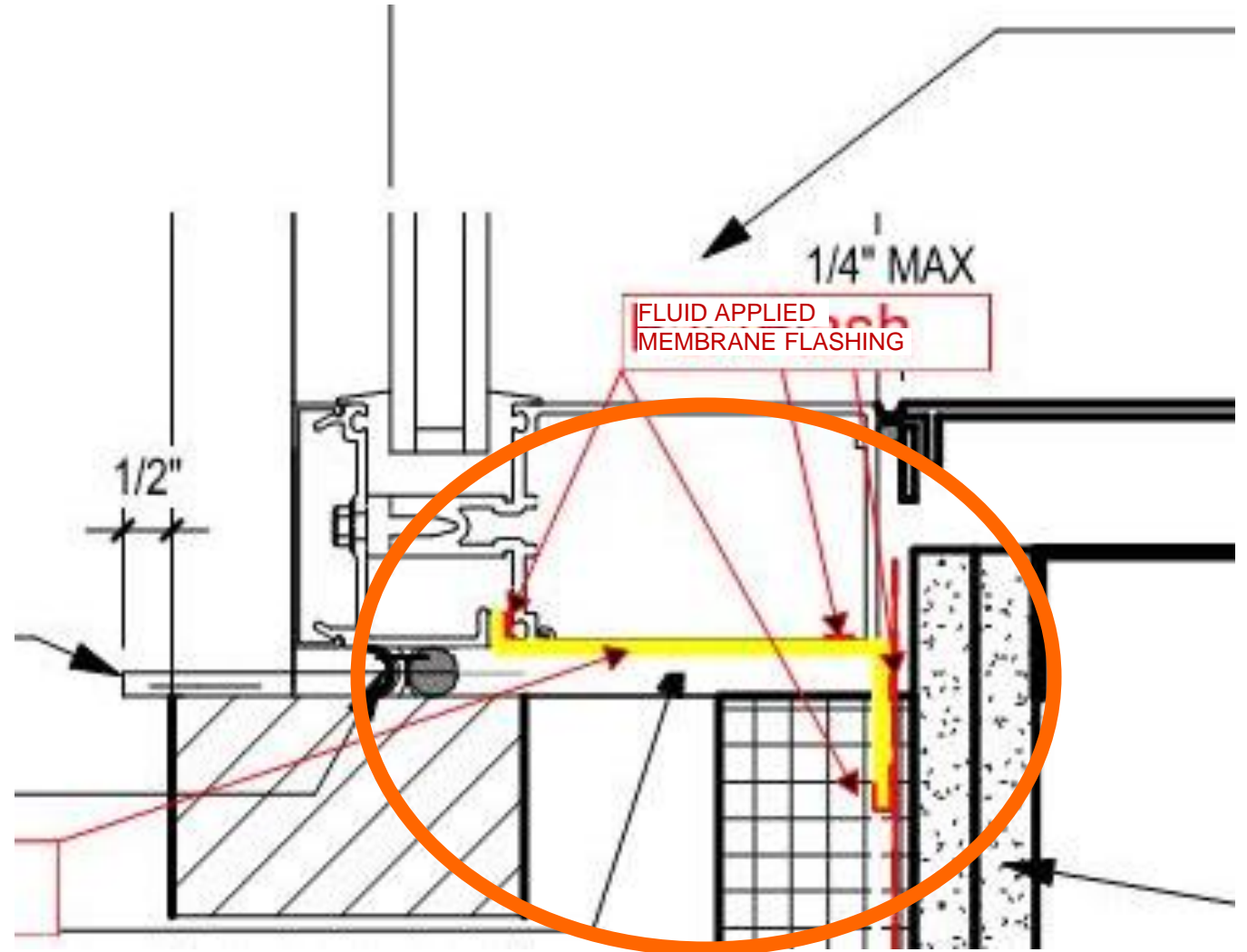


D2 STAIR CW - TYP HEAD
A5502 3" = 1'-0"

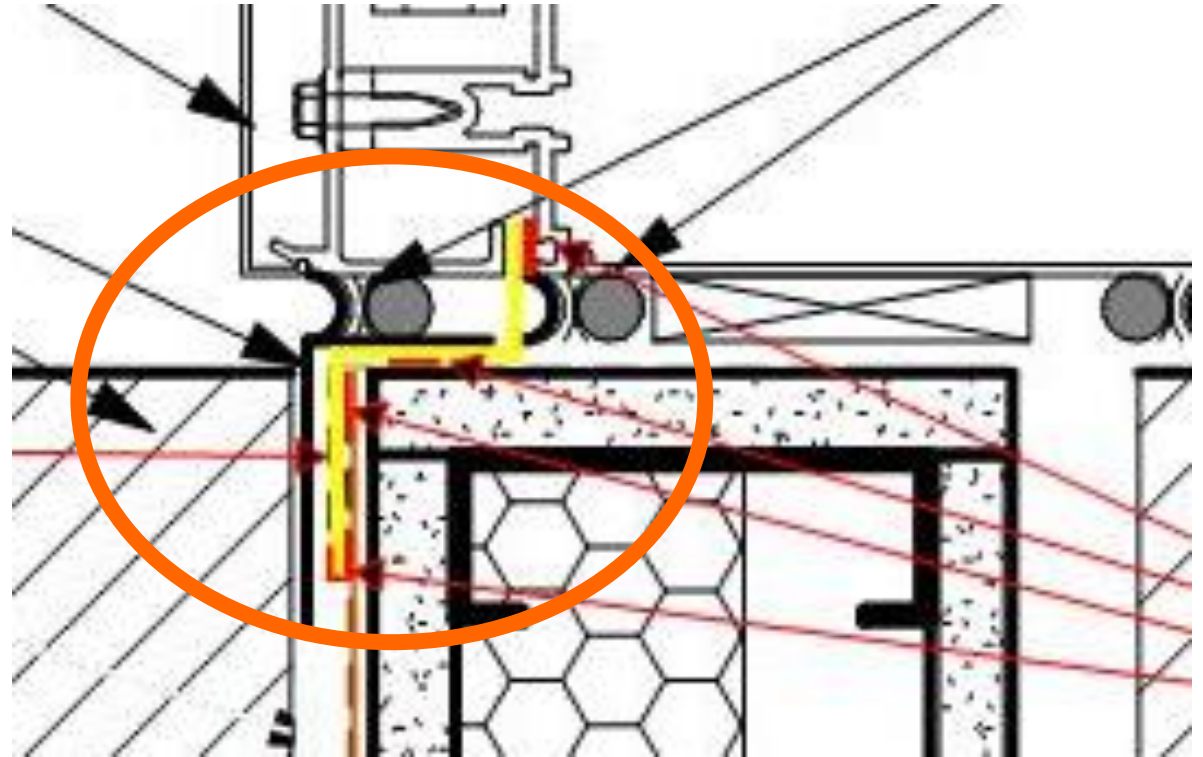
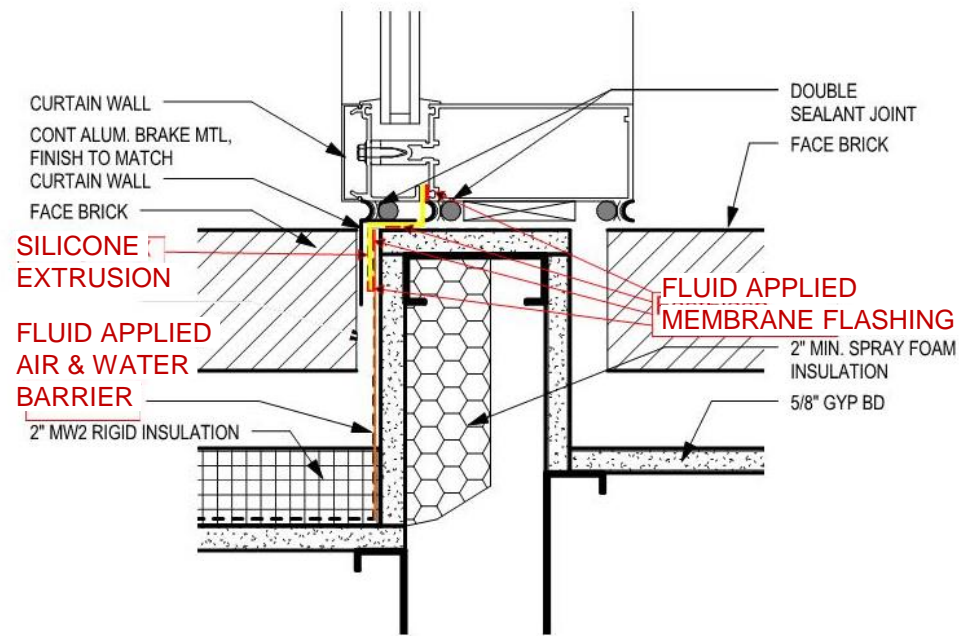
CASE STUDY #6- SILICONE EXTRUSION



C2
A5502
STAIR CW - TYP SILL
3" = 1'-0"



CASE STUDY #6- SILICONE EXTRUSION



JAMB DETAIL

3" = 1'-0"



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Guy Long

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air barrier
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This concludes the American Institute of Architects
Continuing Education System Program