

# Stucco and EIFS Wall Systems



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**NORWOOD**  
a r c h i t e c t u r e

# Historic background<sup>1</sup>

- Historic stucco
- “Lime” based plaster
- Used until late 1800’s
- Mix of slaked lime, water and sand
- Incorporated straw or animal hair as binder
- Used as coating for brick, stone, and logs

<sup>1</sup> Preservation Briefs, Technical Preservations Services, National Park Service US Department of the Interior.

# Historic background

- Could have mud, clay, marble or brick dust, sawdust, animal blood, urine, eggs, varnish, sugar, salt, oils, beeswax, wine, or even whiskey
- ‘Stone’ like limestone-broken down to a powder- mixed with water- applied as a coating- hardens to a ‘Stone-like’ coating
- Lime plaster takes a month to cure replaced by drywall for interiors. Dries through reaction with Carbon dioxide in the atmosphere, reaction moves Calcium hydroxide into calcium carbonate (limestone)

# Historic background

- Stucco' originally denoted interior ornamental plasterwork
- As an example “Rococo” Architecture
- Came to mean exterior plaster
- Could be tinted



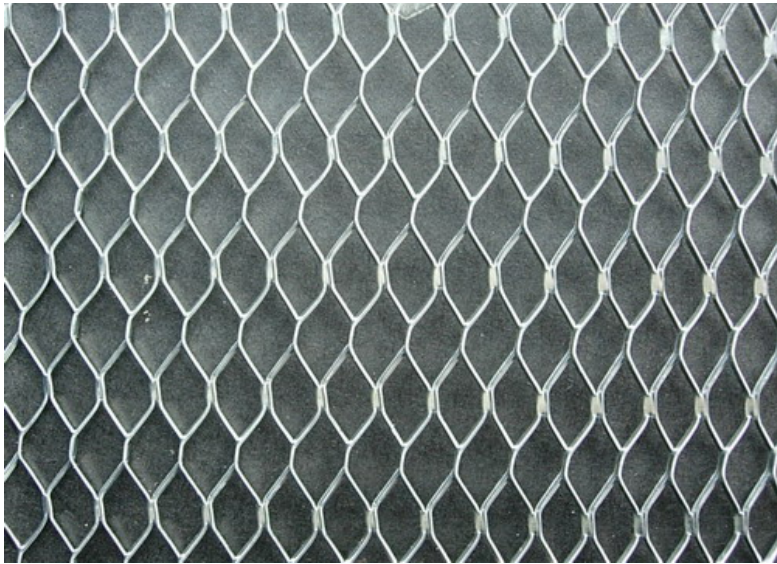
# Modern Stucco

- Portland cement based plaster
- Started in US in 1870's
- Portland Cement: Mix of limestone and clay/shale, some gypsum
- Cement internal hydration is a chemical process (can cure underwater)

# Modern Stucco

- ‘Stucco’ now refers to Exterior Portland Cement Plaster
- Called a “Hard-Coat” or traditional Stucco
- Harder than lime based plaster
- Stronger, could be applied over lath (wood or metal)
- Used over brick, stone, CMU as well

# Modern Stucco

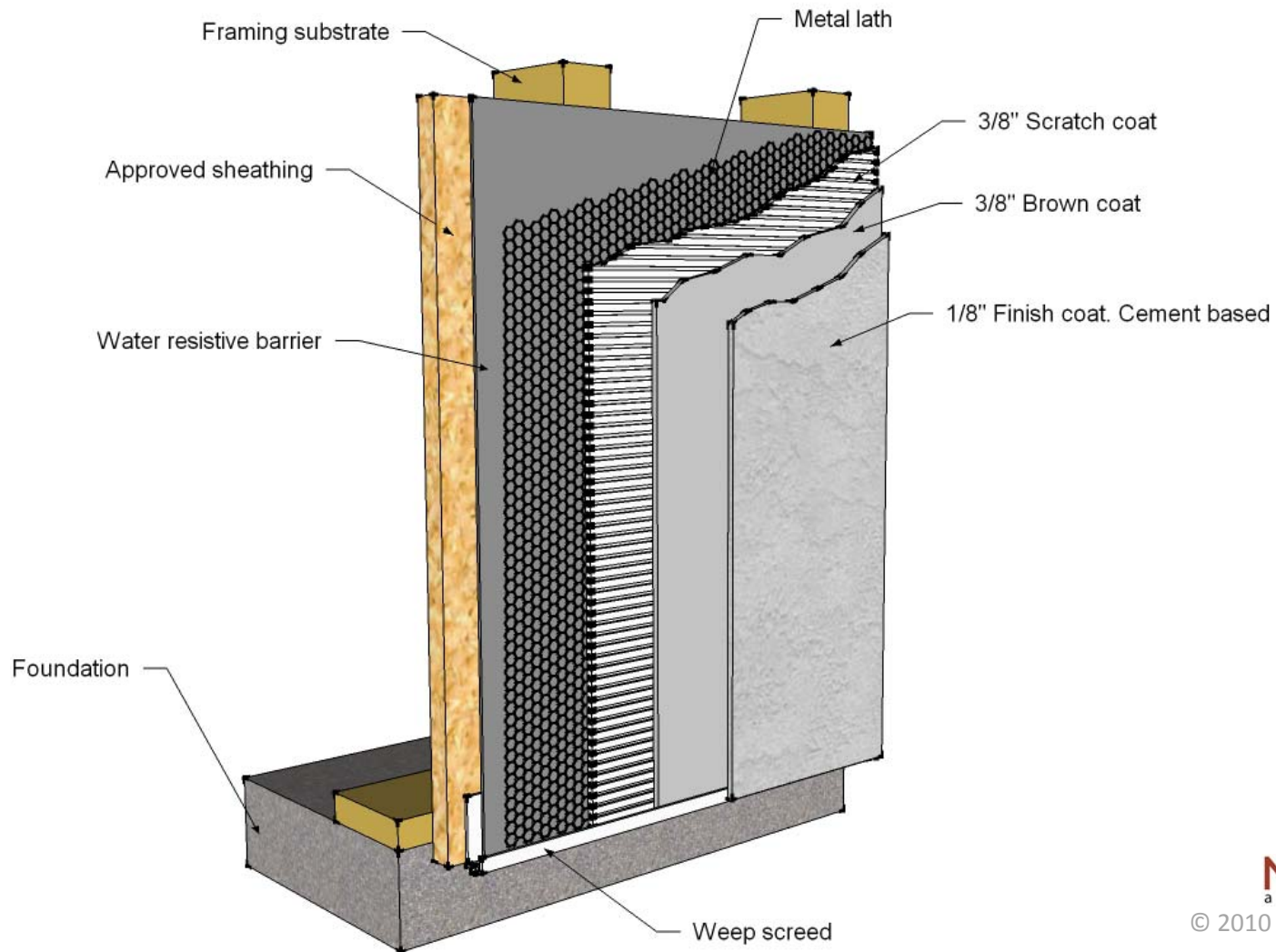


Metal Lath



Wood Lath

# Modern Stucco: Moisture Managed





# Modern Stucco

- Often uses fiber glass reinforcement
- Some finish coats are plasticized
- Can have integral color
- Requires careful curing

# Potential Stucco Issues

- Plastic shrinkage, cracks, crazing, “dime” standard.
- Complex forms difficult to weatherproof. Poor horizontal performance.
- Relies on building paper to weatherproof.
- Missing weeps, issues with control joints.



# Benefits of Stucco

- Fire resistance
- Durability, good U.V. resistance
- Low maintenance
- Some shear value

# Code requirements 1997 UBC

## SECTION 2506 — EXTERIOR LATH

**2506.1 General.** Exterior surfaces are weather-exposed surfaces as defined in Section 224. For eave overhangs required to be fire resistive, see Section 705.

**2506.2 Corrosion Resistance.** All lath and lath attachments shall be of corrosion-resistant material. See Section 2501.4.

**2506.3 Backing.** Backing or a lath shall provide sufficient rigidity to permit plaster application.

Where lath on vertical surfaces extends between rafters or other similar projecting members, solid backing shall be installed to provide support for lath and attachments.

Gypsum lath or gypsum board shall not be used, except that on horizontal supports of ceilings or roof soffits it may be used as backing for metal lath or wire fabric lath and cement plaster.

Backing is not required under metal lath or paperbacked wire fabric lath.

**2506.4 Weather-resistive Barriers.** Weather-resistive barriers shall be installed as required in Section 1402.1 and, when applied over wood base sheathing, shall include two layers of Grade D paper.

**2506.5 Application of Metal Plaster Bases.** The application of metal lath or wire fabric lath shall be as specified in Section 2505.3 and they shall be furred out from vertical supports or backing not less than 1/4 inch (6.4 mm) except as set forth in Table 25-B, Footnote 2.

Where no external corner reinforcement is used, lath shall be furred out and carried around corners at least one support on frame construction.

A minimum 0.019-inch (0.48 mm) (No. 26 galvanized sheet gage) corrosion-resistant weep screed with a minimum vertical attachment flange of 3 1/2 inches (89 mm) shall be provided at or below the foundation plate line on all exterior stud walls. The screed shall be placed a minimum of 4 inches (102 mm) above the earth or 2 inches (51 mm) above paved areas and shall be of a type that will allow trapped water to drain to the exterior of the building. The weather-resistive barrier shall lap the attachment flange, and the exterior lath shall cover and terminate on the attachment flange of the screed.

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# Code requirements

- EIFS not directly addressed in UBC
- ICBO reports often used

# EIFS

- E.I.F.S. = Exterior Insulation and Finish System
- Developed after WWII for use on damaged Masonry buildings
- Added insulation to Masonry buildings
- More decorative in the US, thinner insulation used

# EIFS

- Original EIFS was 'barrier' system
- Dryvit Outsulation is an example
- Systems have evolved, now many are 'moisture managed' systems

# Code requirements

- IBC requires tested assembly, section 1403
- 2006 IRC requires EIFS to be installed per manufacturer installation requirements



# Potential issues with EIFS

- Can trap water, plastic skin, problems with wood frame
- Openings such as windows are problematic
- Incidental water penetration has to dry to the interior
- Plastic skin is soft, degrades on horizontal surfaces

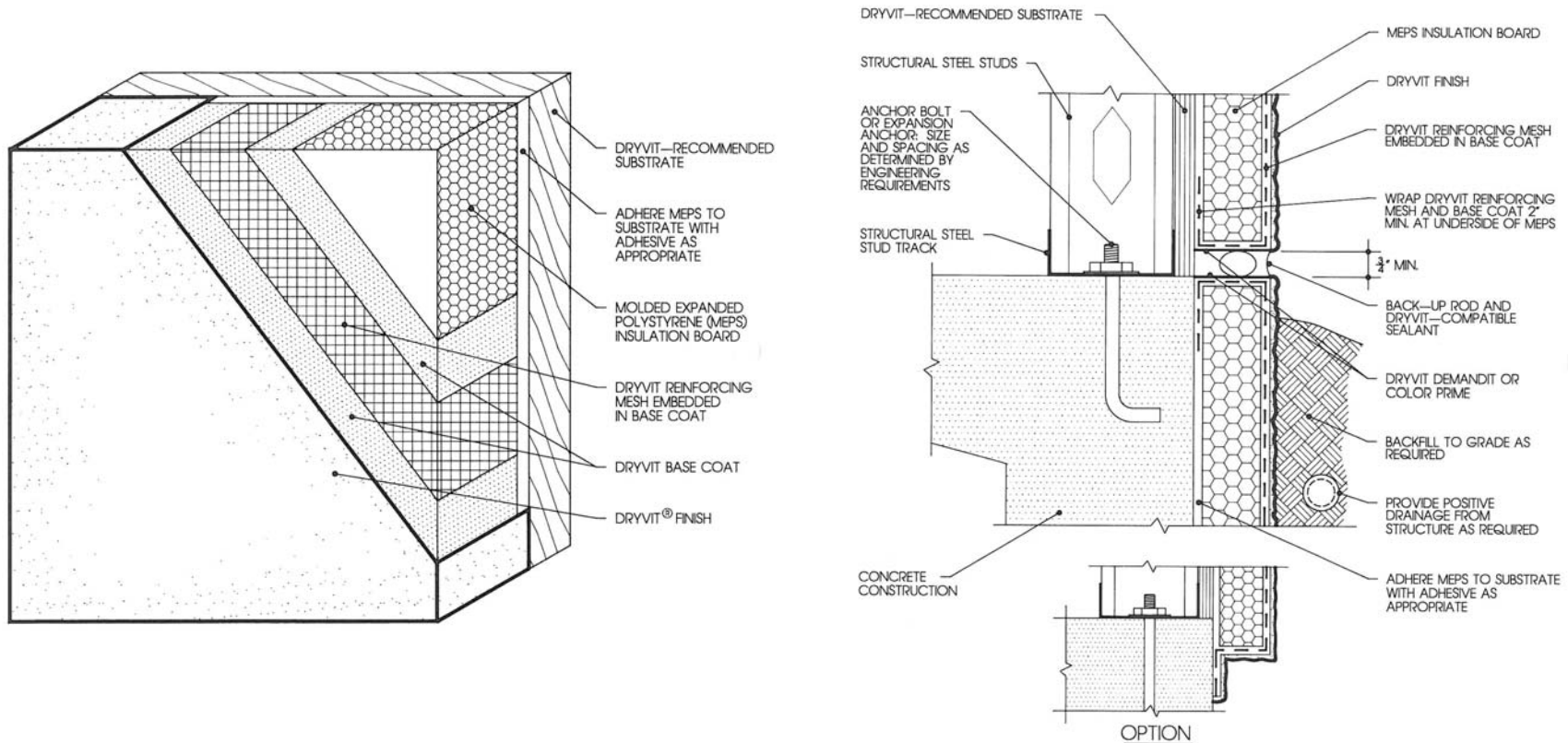
# Potential issues with EIFS

- Heat sensitive, EPS board and Lamina can soften at high temperatures
- Often requires light color to reflect heat
- Hail damage, impact damage, bird damage

# Benefits of EIFS

- Decorative shapes
- Fewer cracks
- Thermal resistance
- Can be lower cost than stucco

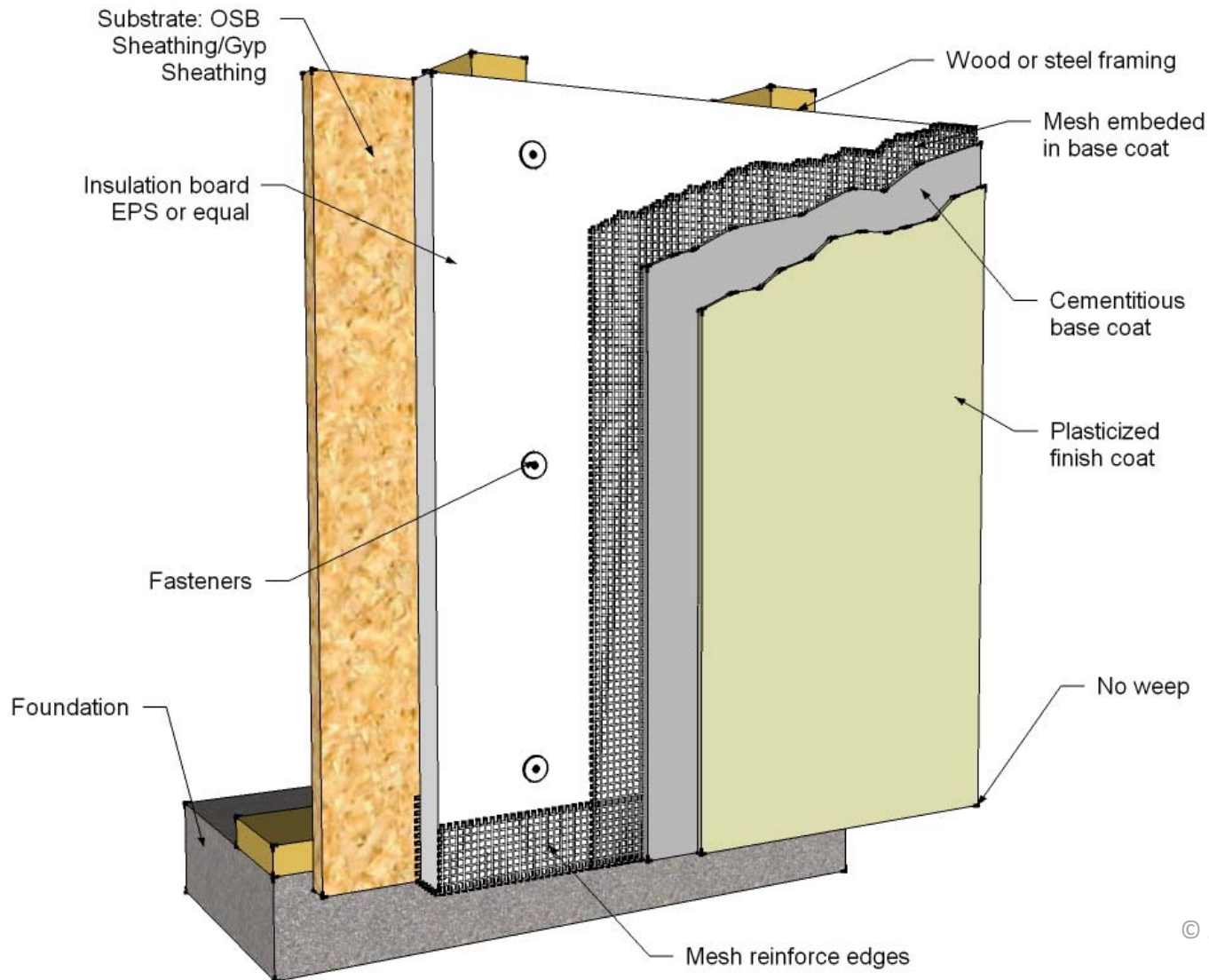
# EIFS Barrier System



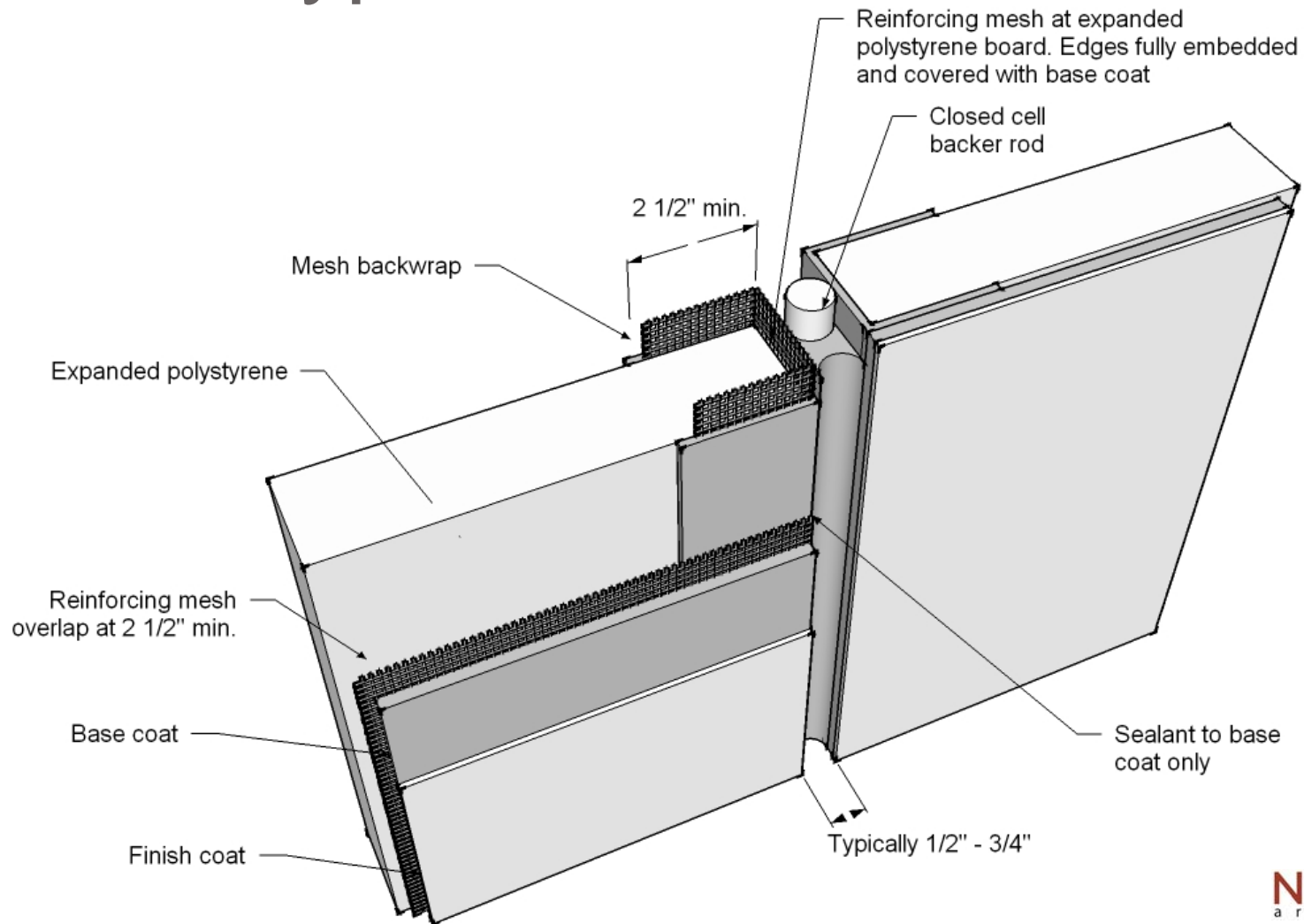
## Outsulation System



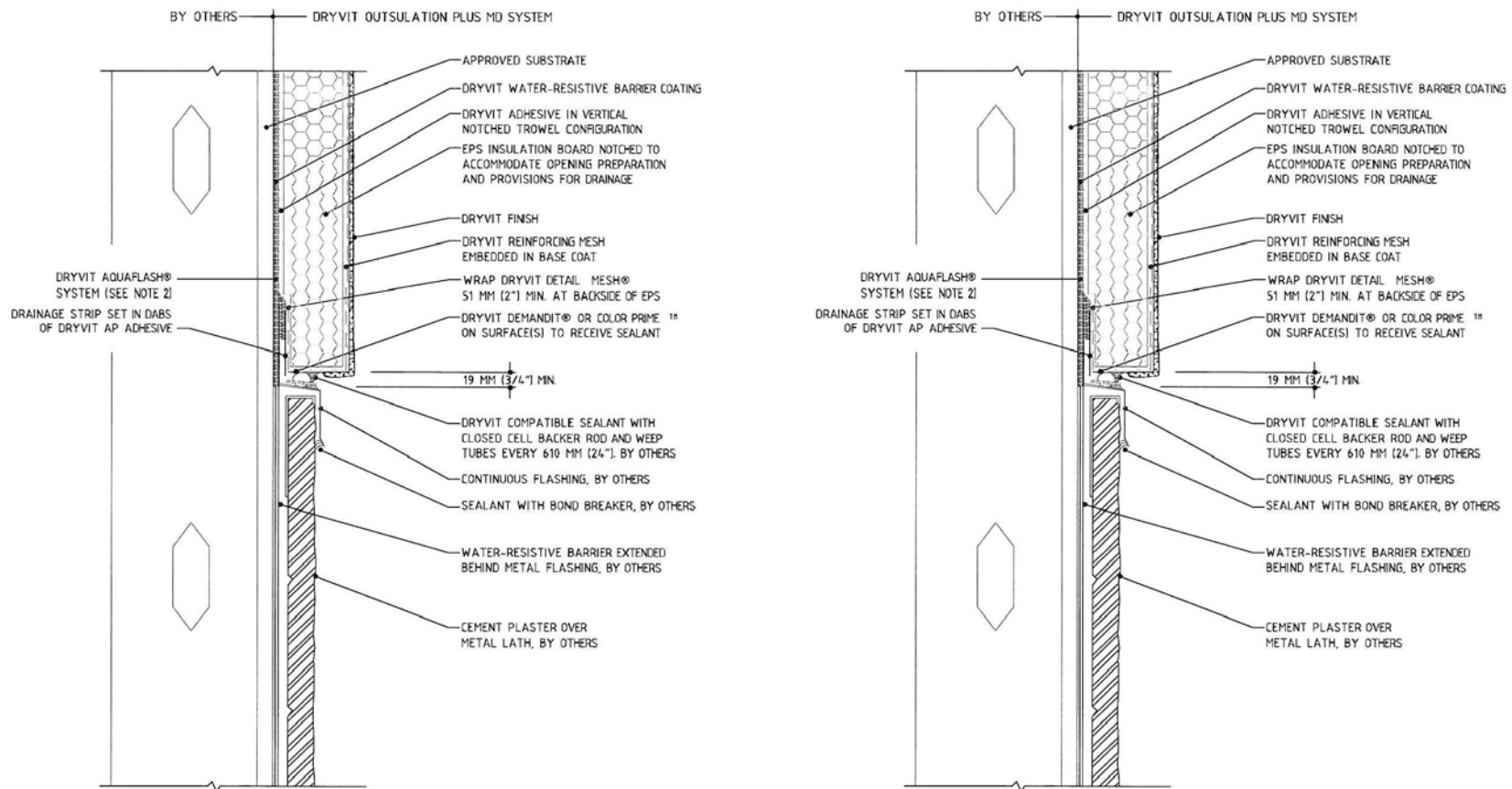
# EIFS: Old Barrier System



# EIFS: Typical Joint



# EIFS: Moisture Managed



## Outsulation Plus MD System



# Potential EIFS issues

- Sealant to finish coat
- Window, door, and other joints are critical
- Defects at insulation boards
- Low slope or flat shelves
- Failure to embed mesh



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