

Troubleshooting Exterior Insulation and Finish Systems (EIFS) Cladding



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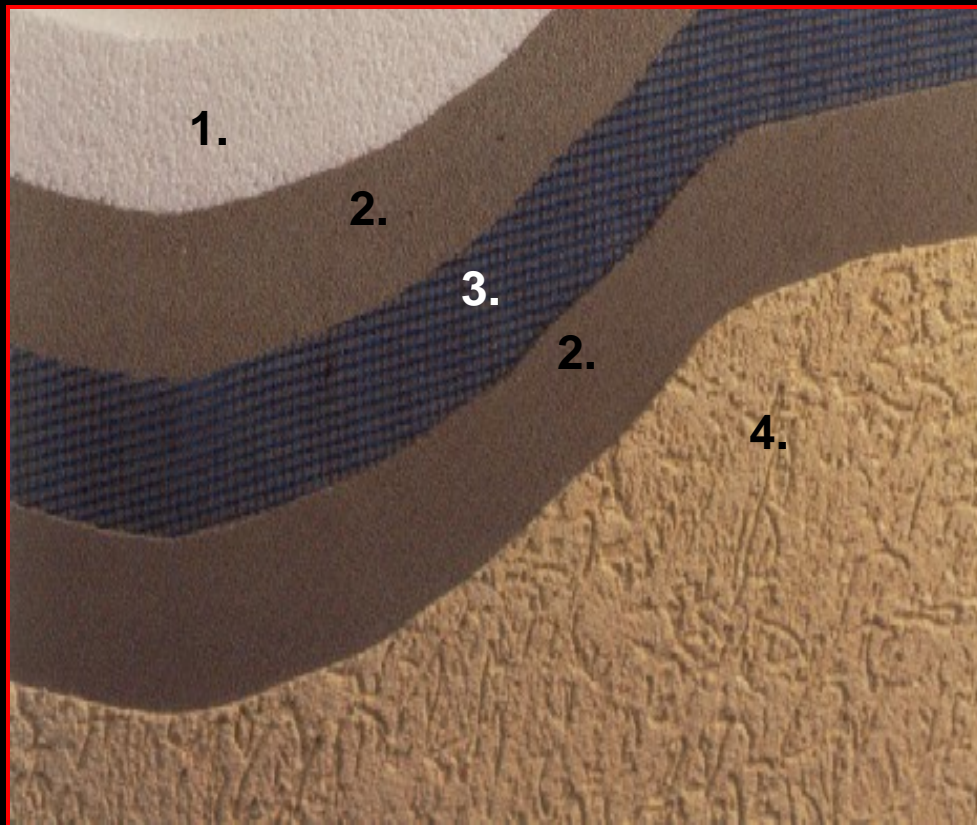
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Introduction / Objectives

- **Exterior Insulation and Finish Systems (EIFS)**
 - Barrier Type vs. Drainage Type
- **Why EIFS Renewal?**
- **EIFS Clad Envelope Renewal Program**
- **Inspection – What Could I Find?**
- **EIFS Problem Prevention**
 - “It is all in the details”

Barrier Type EIFS

Exterior Insulation and Finish Systems



1. Expanded Polystyrene Insulation Board (EPS)
2. Base Coat
3. Reinforcing Mesh embedded in base coat (for impact and moisture resistance)
4. Integrally colored acrylic finish

Typically “adhered” or “mechanically attached” directly to an underlying / approved substrate

Drainage Type EIFS



1. Flashing at Rough Opening
2. Grid Tape Reinforcing
3. Secondary Weather-Resistive Barrier (WRB)
4. Vertical Notch Trowel Adhesive
5. Drainage Plane
6. Horizontal Weep Detailing*

* plastic track is not appropriate
in fire-rated construction

Positive Attributes of EIFS

HOW much EIFS is out there?

- Is found on 8% of all Buildings
- Represents approximately 20% of all new commercial building envelope / opaque wall
- There are well over 1,000,000 EIFS clad structures in the United States and growing

Why So Much EIFS?

- Integrates continuous insulation (CI) and WRB
- Complies with all building and energy codes
- Improves energy efficiency of building envelope
- Lowers energy consumption
- Reduces environmental impact
- Manages air / moisture infiltration and condensation
- Lightweight – no required costly structure
- Cost effective – initial and life of building
- Offers freedom for architectural appearance and style
- Supports sustainable design practices and achieving LEED Certification

EIFS Substantial Growth / Use

Public Acceptance

Bellagio Resort and Casino / Las Vegas, NV

- Number 22 out of 150 – America's Favorite Buildings
 - Only building recognized built in the last decade
 - American Institute of Architects (AIA) survey – Feb. 2007



EIFS in the Built Environment

Educational



Residential



Multi-Family

Public



Hospitality



Retail



EIFS Cladding Renewal

EIFS Building Envelope Renewal Program

- Provides building owners, corporate architects and facility managers an overall plan that supports awareness, guidance, support and education they need to properly maintain and when necessary repair their EIFS clad buildings



EIFS Cladding Renewal

Five (5) primary steps to formulating a comprehensive EIFS Clad Building Envelope Renewal Program

1. Inspection, Observation and Assessment
2. Cleaning
3. Sealant Joint Repair / Replacement
4. Surface Repair
5. Architectural Color Coating or Overcladding



EIFS Cladding Renewal

I – Inspection - Annual

- Conduct visual inspection of EIFS clad building envelope to identify any possible issues
 - Surface damage / Sealant joint failure
- Performed by facility manager or other qualified personnel
- Address any identified issues
 - Consult EIFS cladding manufacturer



EIFS Cladding Renewal

I – Inspection - Comprehensive

- Conduct visual and physical inspection of EIFS clad building
 - Underlying wall issues / moisture intrusion, etc.
- Performed by an Envelope Forensics Specialist
 - Trained and experienced in EIFS cladding
- Develop comprehensive “assessment and scope of work”



EIFS Clad Renewal

II – Cleaning

- Initial step of scope of work
 - May expose underlying / hidden conditions
- Clean with benign detergents, low-pressure / high-volume water and non-abrasive techniques
 - Utilize a trained professional to perform cleaning
- Conduct additional inspections if any additional signs of damage are found



EIFS Cladding Renewal

III – Sealant / Replacement

- Defective / aged sealant to be properly identified / removed
 - New sealant with primer to be replaced
- Verify joint pocket / bonding surfaces are sound and acceptable for the new sealant – repair as necessary
- Likely require trained “waterproofing” / restoration contractor



EIFS Cladding Renewal

IV –Surface Damage Repair

- Where EIFS surface is damaged it must be repaired
 - Utilize proper EIFS repair procedures
- Repair may be simple - surface treatment – or more complex – removal and replacement
- Trained EIFS installation contractors “may” be needed for repairs



EIFS Cladding Renewal

V – Architectural Recoating / Overcladding

- **Recoating**: Using surface compatible primers and coatings to coat the existing EIFS lamina and repaired sealant
 - Utilize a professional coatings contractor



EIFS Cladding Renewal

V – Architectural Recoating / Overcladding

- **Overcladding**: Using EPS shapes, reinforcing mesh, base coat and “new” finish colors / textures to create an entirely new look
 - Utilize a trained EIFS installation contractor
- Complete Make-Over if you will



Existing EIFS Surface



Recoating or Overcladding


Recoating or Overcladding

- Dark Colors require primer



Mix / Match – Colors and Textures

Overcladding Options



New Specialty Finishes to replicate the look of stucco, brick, limestone, granite or metal in almost any color imaginable

New Specialty Finish Options

Overcladding Options



Limestone

- The Look of Natural Limestone
- Light Weight Wall Assembly
- Cost Savings vs. Limestone
- Excellent Accent



Overcladding Options

Polished Granite



- The Look of polished granite
- Light Weight Wall Assembly
- Cost Savings vs. conventional granite
- Excellent Accent

Overcladding Options

Brick Veneer



- The look of brick veneer
- Light Weight Wall Assembly
- Cost Savings vs. Traditional Brick
- Excellent Accent

Overcladding Options

Stone Aesthetic



- The Look of Natural Stone
- Light Weight Wall Assembly
- Cost Savings vs. Stone
- Excellent Accent
- **Ideal for Interior Application**
 - **Exceptional abrasion resistance**

Overcladding Options

Non-Polished Granite



- The Look of “fired” granite
- Light Weight Wall Assembly
- Cost Savings over slab granite
- Excellent Accent

Overcladding Options

Metal



- The look of metal panel
- Light Weight Wall Assembly
- Cost Savings vs. Traditional metal
- Excellent Accent

The End Result?

Warranty

- Participation in an EIFS renewal program can lead to renewal of the building's "original" EIFS cladding warranty
- Commitment to a comprehensive program can lead to a "Life-Time Warranty" for the building



Inspection – What Could I Find?

- **Sealant Issues**

- Sealant incorrectly installed
- Joint pocket not properly prepared
- Adhesive / cohesive and/or substrate failure
- Improper proportioning of joint
 - Joint too narrow to handle movement
- Wrong backer rod – “closed cell”
- No sealant at all



Inspection – What Could I Find?

- **Original “EIFS” Architectural Details were not correct**

- Improper slope of horizontal EIFS surfaces
- Lack of expansion joints
 - Stress / compression / movement cracks
- Improper insulation board thickness
 - Minimum $\frac{3}{4}$ "
 - Behind aesthetic grooves
- EIFS used as “parapet”



Inspection – What Could I Find?

- **Penetrations & terminations not detailed or installed correctly**
 - Parapet copings improperly designed / sized
 - Flashings omitted
 - Windows installed in wrong plane
 - EIFS terminated tight to roof



Inspection – What Could I Find?

- Original building “design” did not anticipate / support ability to:
 - Physically “inspect” the exterior envelope
 - Proximity to adjacent buildings limiting access
 - No roof mounted swing staging
 - Easily implement repairs
 - Shed storm water & dirt build-up
 - Provide for general maintenance



Inspection – What Could I Find?

- **EIFS surface damage**
 - Impact / abuse
 - Storm
 - Improper fixture attachment
- **Moisture intrusion**
 - Leaking windows
 - Sealant / flashing failure
 - Roof coping
 - Other envelope component failure
 - Improper installation
 - Degradation of underlying building materials



EIFS Renewal Program

- **All of these conditions can be addressed**
 - Cleaning
 - Sealant Replacement
 - Surface Damage Repair
 - Recoating
- Best to have started early
- **Overcladding** as an option
 - Enhance / change curb appeal / brand image
- ***Renewal program can be applied to Conventional Stucco Clad buildings as well***

Problem Prevention

- Prevention can be addressed through three (3) critical means (New or Restoration / Renovation):
 - Comprehensive Contract Documents
 - Drawings / specifications
 - Bidder Qualifications
 - Experienced, competent, trained, has done similar work
 - Coordination / Supervision / Third Party Inspection
 - Before, during and after
 - Pre-installation conference
 - Interim site visits / observations
 - Project close-out verification

It Is All In The Details

- **Proper Detailing lends to Quality Application**
 - Support future performance
 - Supports interface to other cladding
 - EIFS Critical Details
 - Penetration Flashing
 - Terminations to Dissimilar Materials
 - Metal Coping / Parapet
 - Expansion Joint at Floor Lines
 - Slopes / Projections / Aesthetic Grooves
- **A Comprehensive Specification**
 - Specification must coincide with design & detailing

EIFS Durability / Maintenance

- EIFS is engineered for the “life of the building”
 - 45 year old industry in the US / 65 years in Europe
- Considered a Low Maintenance material
 - Cleaning / color coating over time
 - Dependent on environmental exposure
 - ***Sealant replacement is the real maintenance issue***
- Durability is directly related to design strategies / product use and maintenance
 - Impact Resistance
 - High impact EIFS assembly is strongly recommend
 - Circulation areas / columns / grade areas / service areas, etc.

EIFS Durability / Maintenance

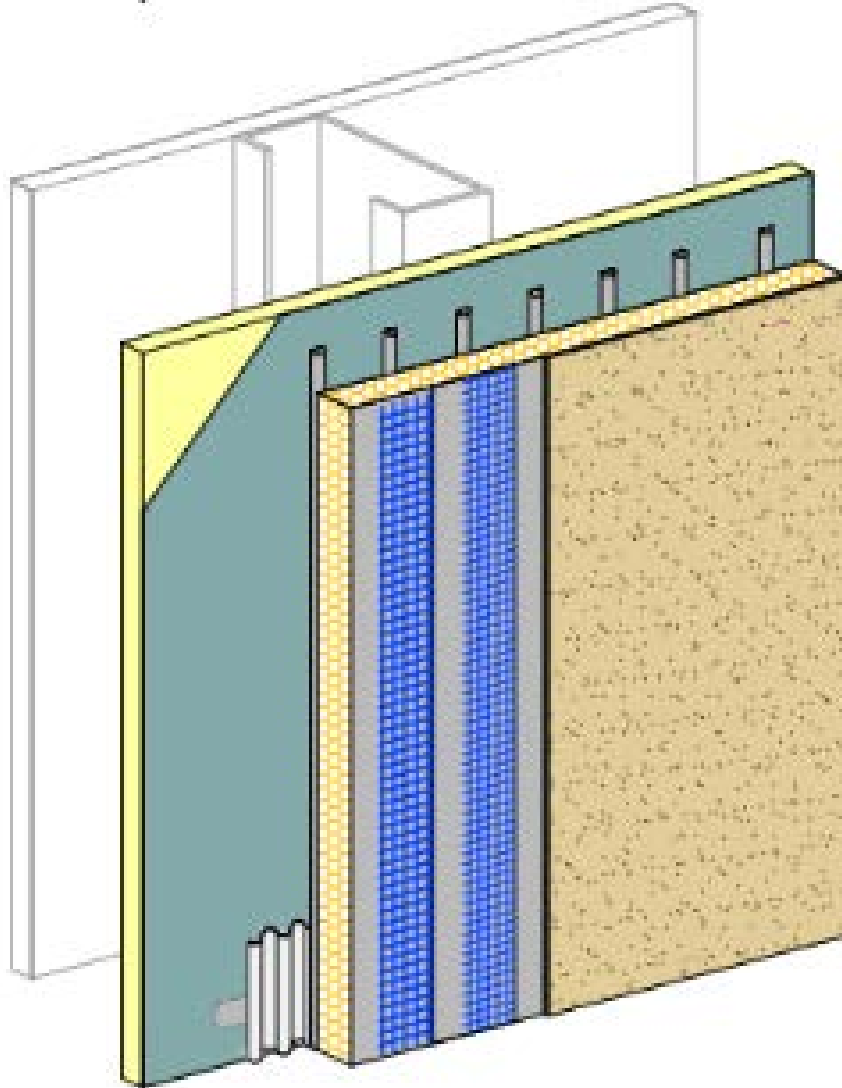
Specify

- For high

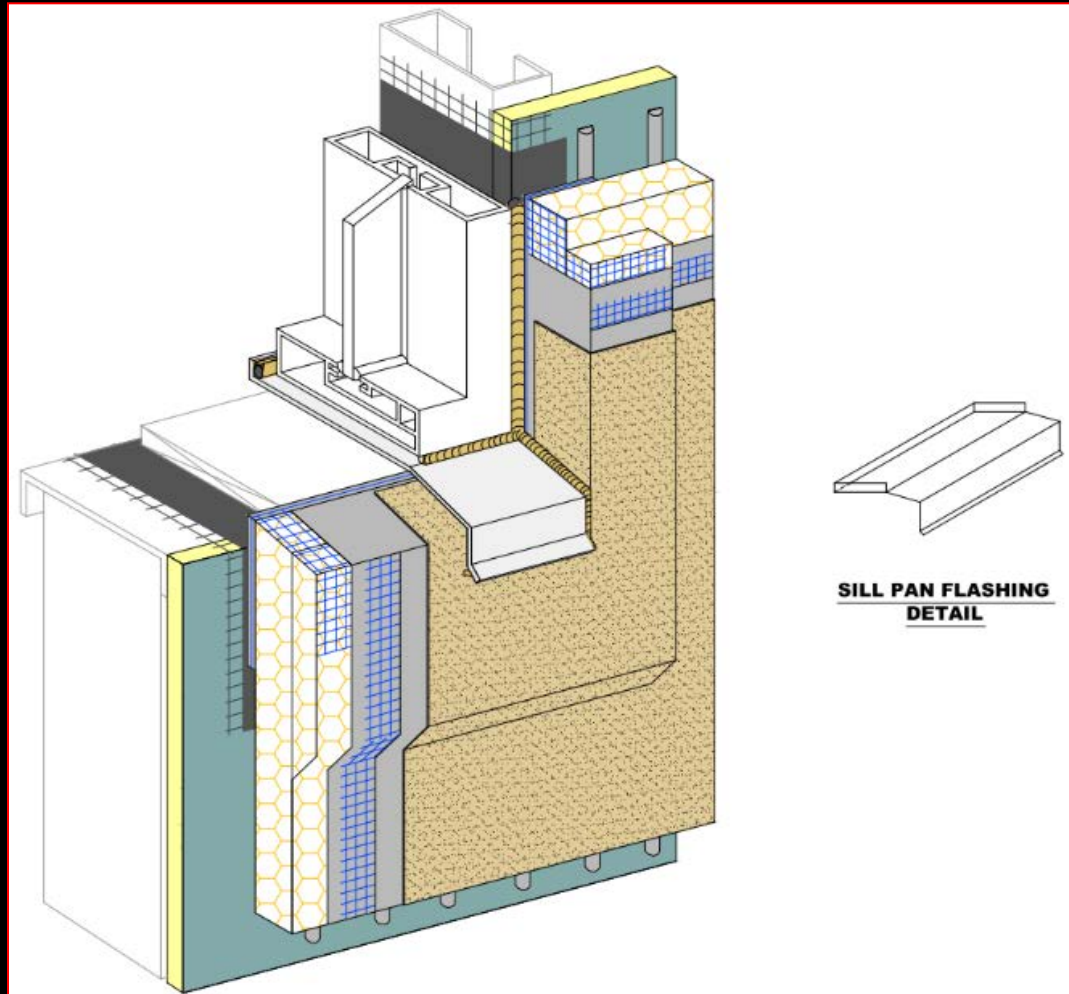
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Inch Pounds

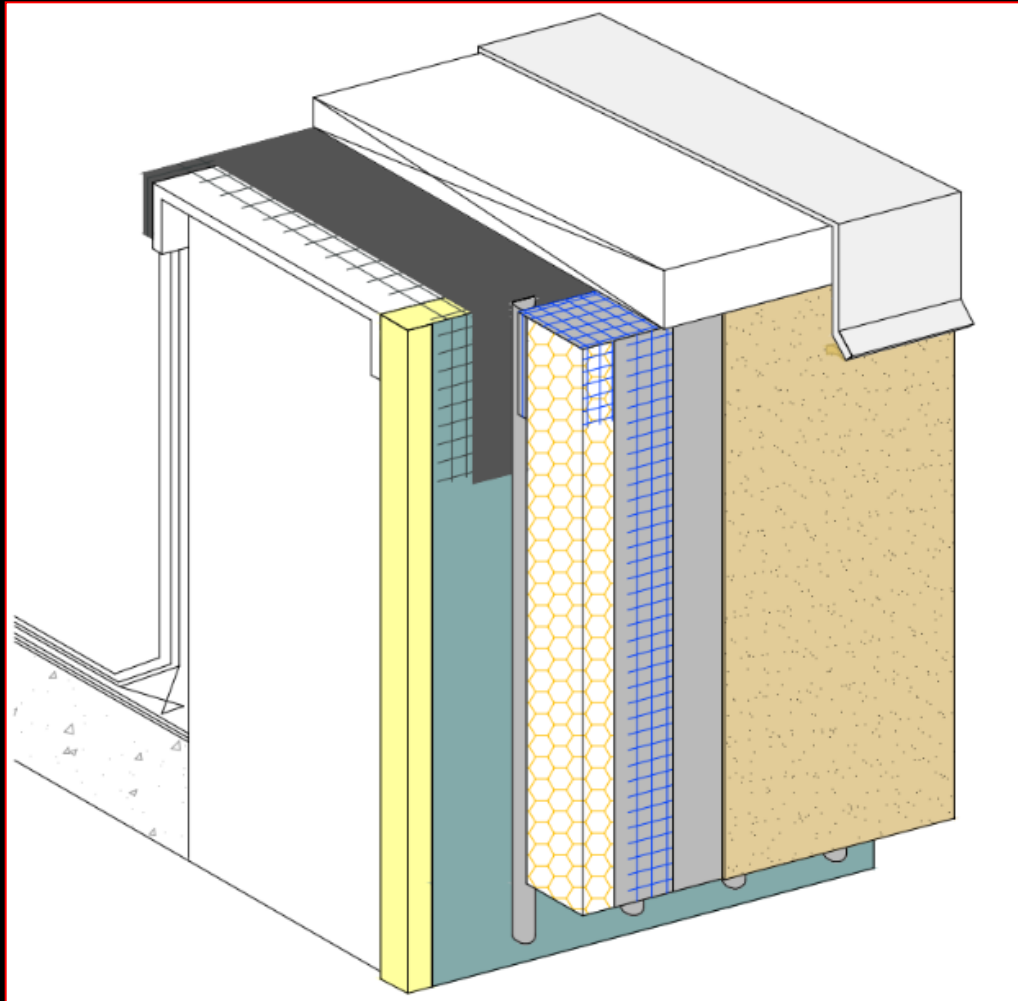


Window Penetration / Flashing



Windows must set in Sill Pan Flashing – required by code

Metal Coping at a Parapet



Min. 2-1/2" coping coverage over EIFS / Flash top of wall

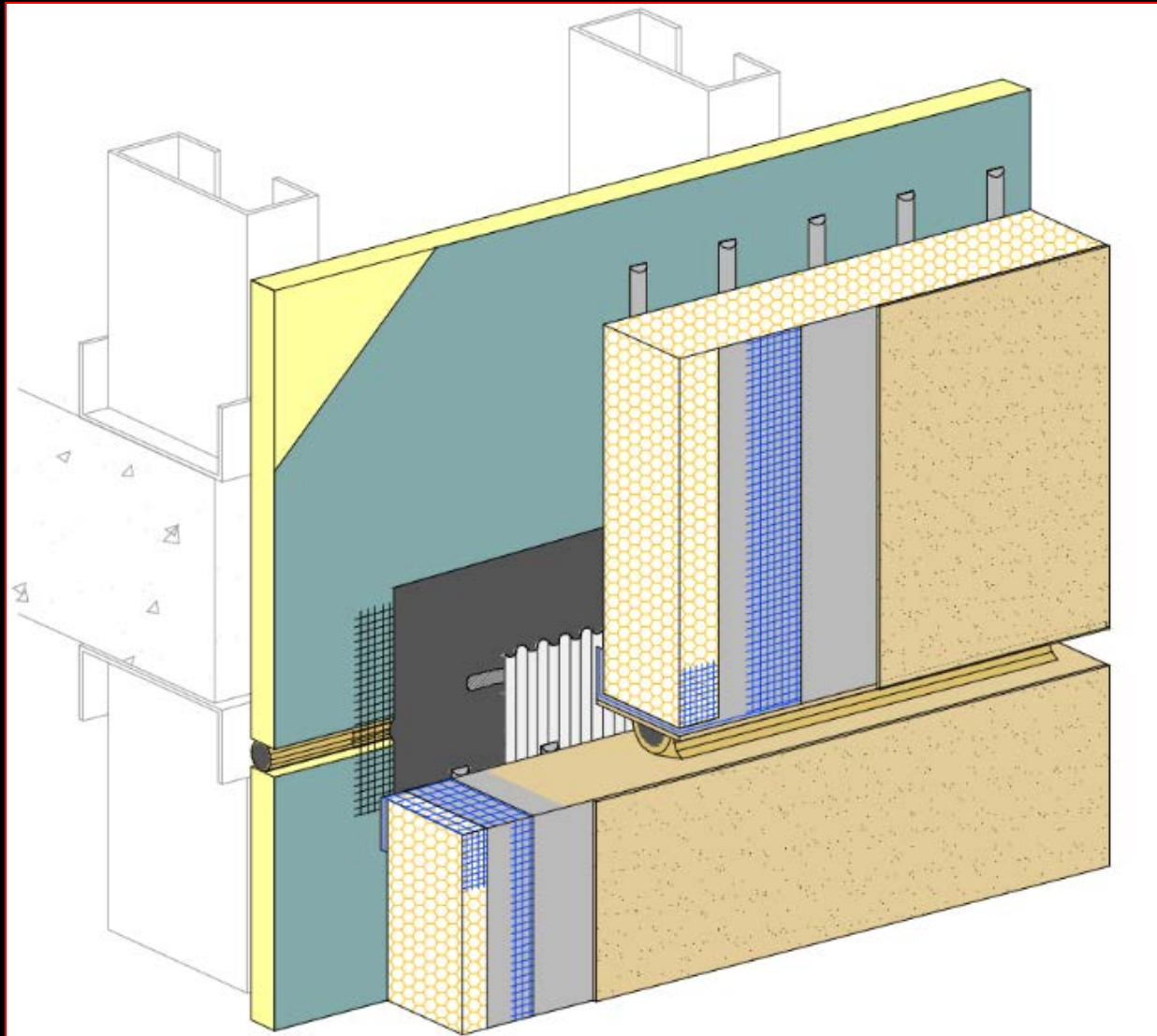
Metal Coping at Parapet



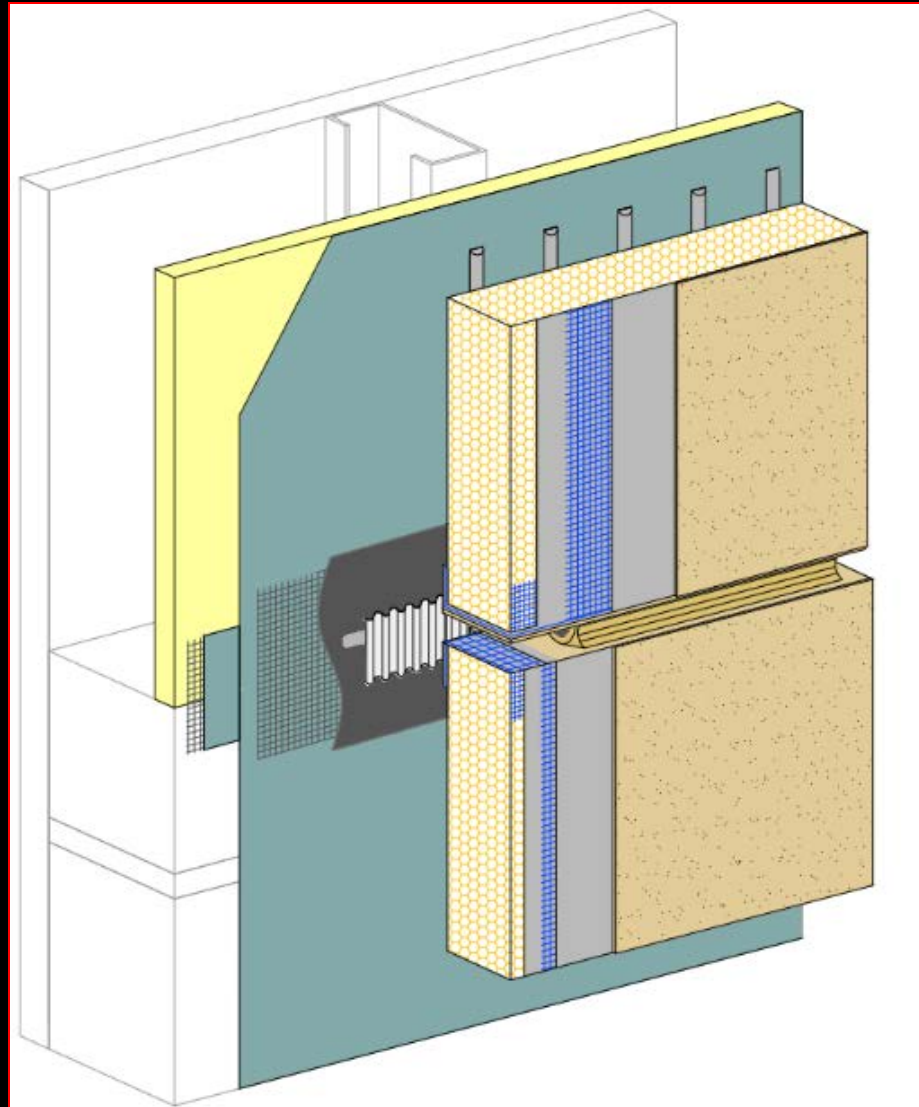
EIFS Coping Repair



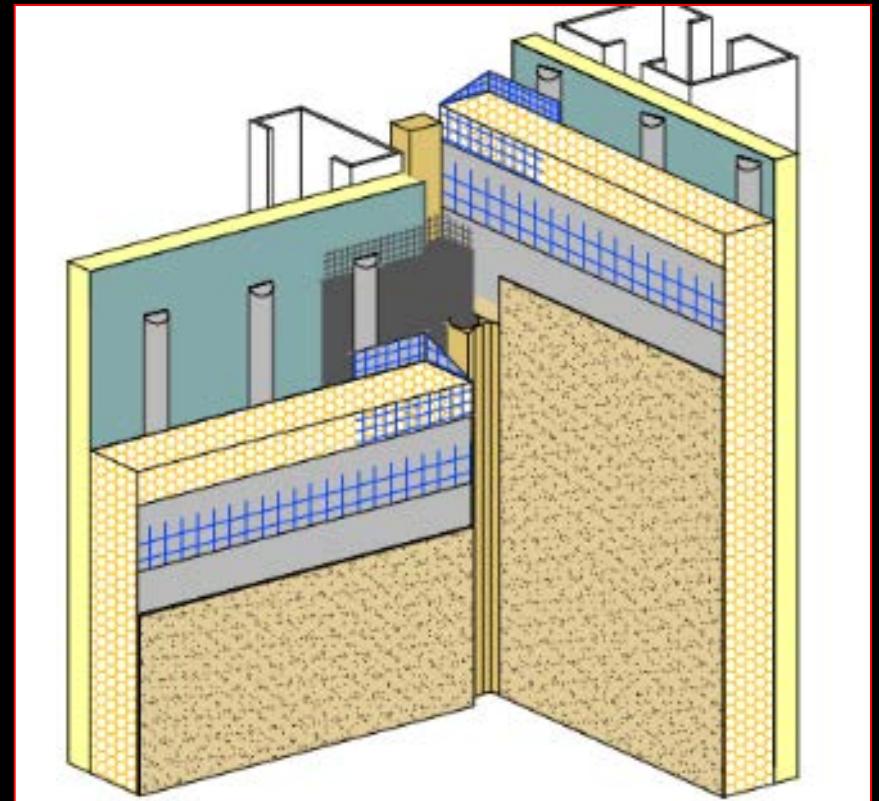
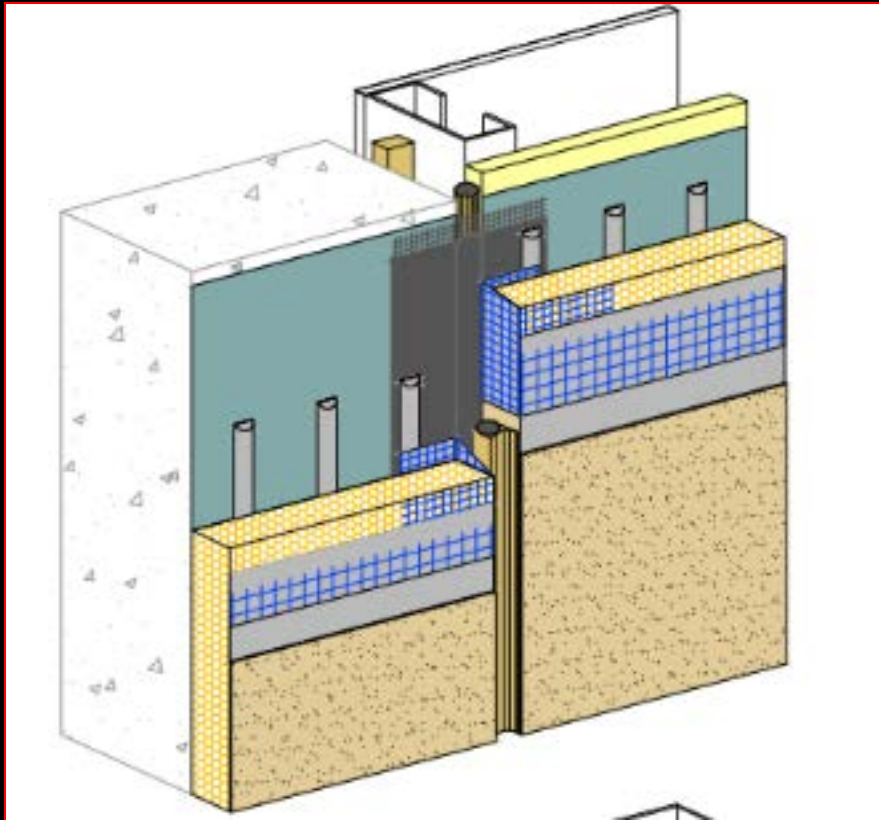
Expansion Joint - Floor Line



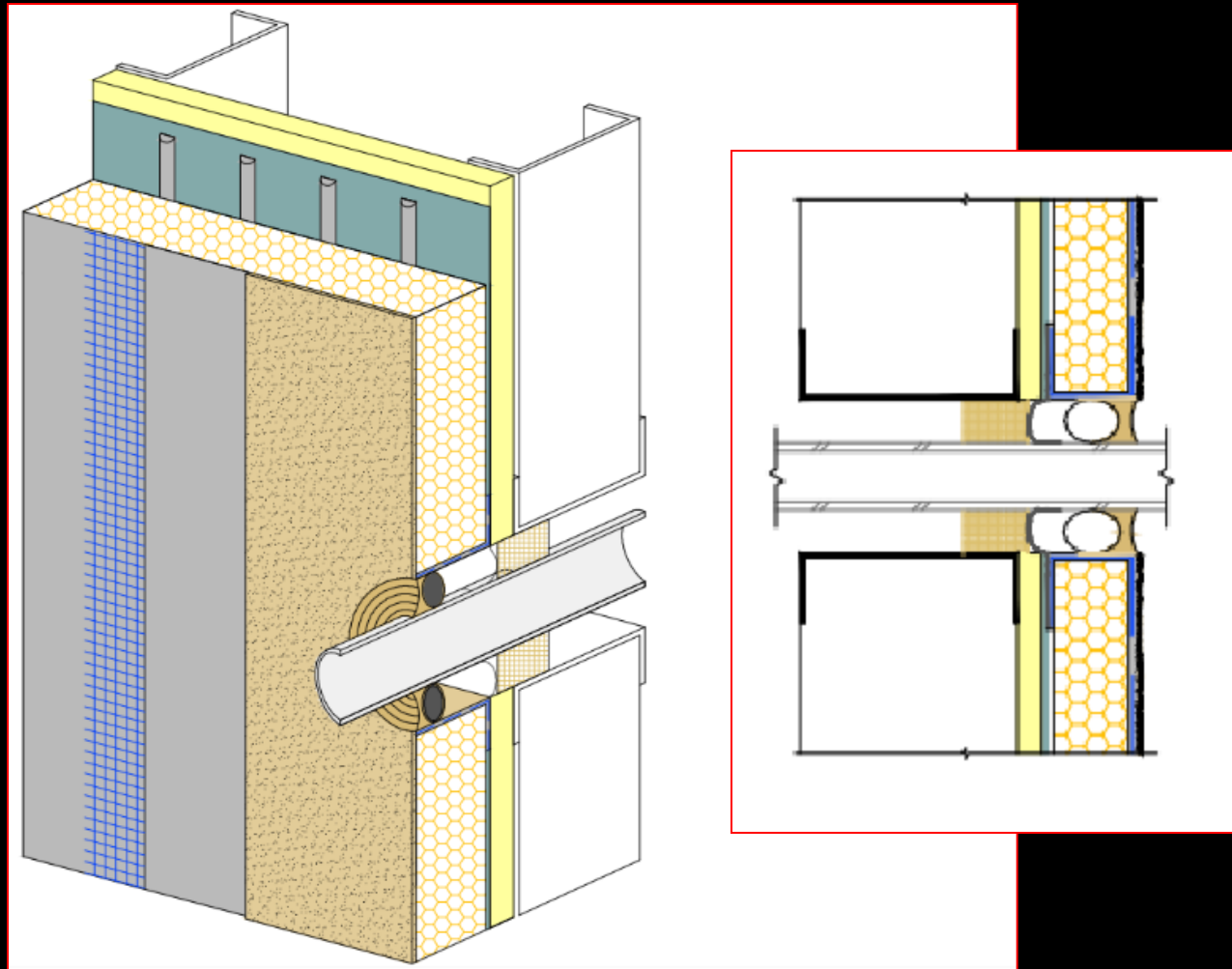
Expansion Joint - Change of Substrate



Expansion Joint - Change of Substrate



Pipe / Conduit Penetration



Min. $\frac{3}{4}$ " Insulation thickness behind groove

Pipe / Conduit Penetration



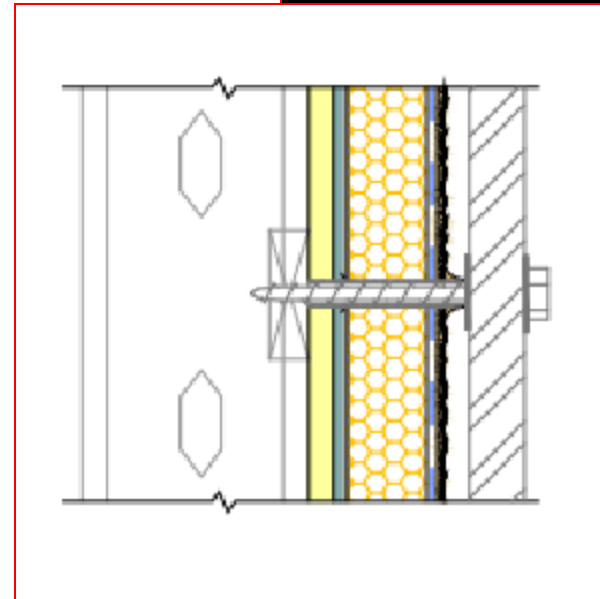
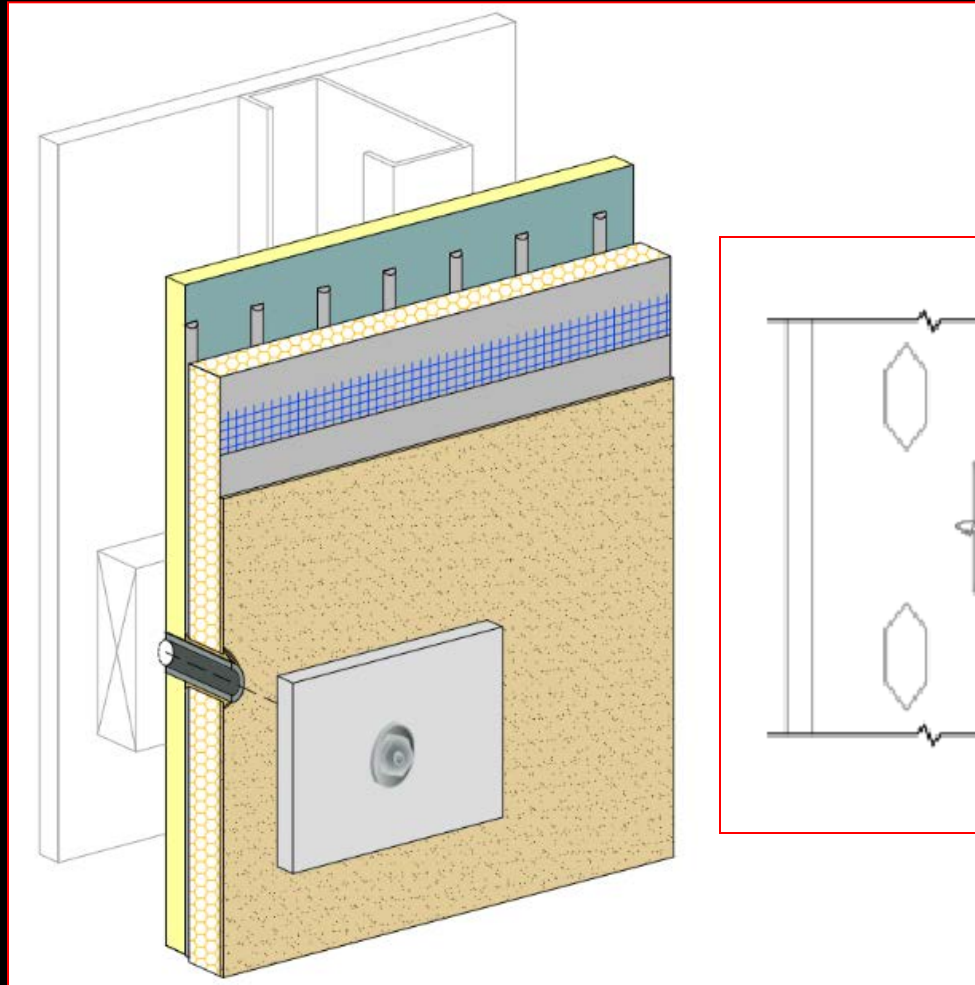
Signage attachment / penetration coordination is critical - or else 46

Pipe / Conduit Penetration



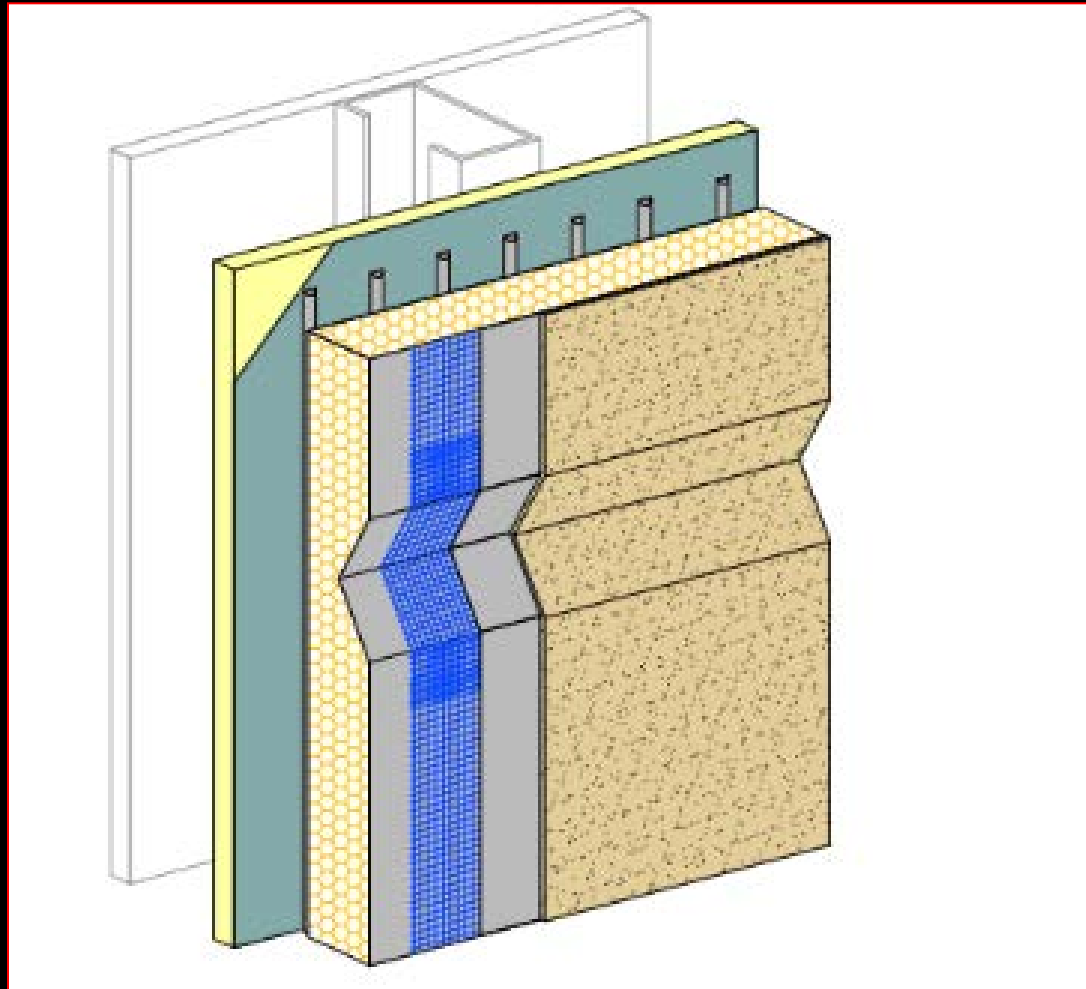
Result of 'zero' coordination for penetrations

Signage / Fixture Attachment



Provide “compression sleeve” at fastener point

Aesthetic Groove



Min. $\frac{3}{4}$ " Insulation thickness behind groove

Slopes / Projections / Trims



- **DO NOT specify or accept “Urethane Coated” shapes** - not fire tested / non-compatible
- **Slope horizontal surfaces min. 1:2 ratio** - dirt build-up / streaking
- **Limit sloped surface projection to 12”**

Before and After – Cleaning



Before and After - Overcladding



Before and After - Renovation



Before and After - Renovation



After



Before

Before and After

High atop Beacon
Towers, a high-rise
Housing Au



Before



Before



After



In Summary

- EIFS – Not so bad once you get to know it
- Today's trend is toward **Drainage Type EIFS**
- Use is prevalent across the United States
- Energy Efficient, Environmentally Friendly
- Multiple System and Finish Options
- Cost Effective – initial and life of building
- Comprehensive Maintenance / Renewal Program
- Warrantable for the Life of the Building

Thank You for Your Time

Questions? – Chat Box

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