Stucco over Insulation Board Vs. EIFS with Drainage

MINNESOTA LATH & PLASTER BUREAU

Stucco

- Over 100 year track record of success
- Projected 100 year life cycle.
  - Today's stucco uses EIFS finish.
  - Subject to the same maintenance and resurface/ re-dash schedule as EIFS.
  - Life cycle not quantified over insulation board.
- Good puncture resistance.
- Poor blunt impact resistance.
  - Brittle.
- High percentage of naturally abundant material.
  - Sand
  - Cement
- Environmental Impact: Life Cycle Analysis
  - Materials Extraction: 46.29 Grams of CO2 Emissions / SF of Wall Area.
  - Number of truckloads to supply 25,000 SF of wall area: 6
  - CO2 Emissions all stages of life cycle: 4906 grams CO2 / SF of Wall Area.
- Lapped Water-Resistive Barriers (WRB)
  - Building paper, polymeric wraps.
- WRB affected by exposure to weather.
  - Building Paper: 30 days.
  - Polymeric wrap: 4 months
- WRB punctured by fasteners
  - Staples, discs.
  - Lath attachment
- Crack Resistance
  - Brittle nature subject to minor structural movement.

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EIFS

- EIFS has now been a part of the U.S. Construction market for 42 years.
- Projected life cycle has not been quantified
  - There are many local anecdotal examples of buildings 30 years or older.
- Puncture resistance: Can equal stucco's puncture resistance with additional reinforcing mesh.
- Good blunt impact resistance.
- Small amount of naturally abundant materials.
  - Sand
  - Cement
- Environmental Impact : Life Cycle Analysis
  - Materials Extraction: 27.39 Grams of CO2 Emissions/ SF Wall Area
  - Number of truckloads to supply 25,000 SF of wall area: 1
  - CO2 Emissions all stages of life cycle: 1686 grams CO2/ SF of Wall Area.
- Seamless Water-Resistive Barrier (WRB)
- WRB Unaffected by exposure to weather.
- WRB Minimal punctures by fasteners
  - Insulation board adhered by notched trowel.
  - PVC track fastened.
- Crack Resistance
  - Coating flexible to accept minor structural movement.

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Stucco

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- Minimal fastener installation of insulation board transfers stress to coating.
- Susceptible to shrinkage cracks due to volumetric change.

- Thermal bridging
  - Lath fastener attachments
  - Z-furring if necessary.

- Heavy
  - 10.3 lbs./ sf at 7/8" thickness

- Deflection Criteria Framed Walls
  - L/360. Higher for multi-story

- Accessories (Metal)
  - Weep screeds
  - Casing Beads
  - Control joints
  - Expansion Joints

- Labor processes
  - Building paper, polymeric wrap Water-Resistive Barrier (WRB)
  - Integration of flashing
  - Mechanical Fasten Insulation board
  - Accessories: Control Joints, Expansion Joints, Weep Screeds
  - Lath
  - Scratch coat
  - Brown Coat
  - Aesthetic Features
  - Finish.

- Ease of Installation
  - Difficult skill sets
  - Multiple trades involved

- Method of attachment
  - Mechanical fasteners
  - Risk of deflection for long fasteners through insulation board

- Field mixing, measuring and batching of cement, sand, lime, fibers, water.
  - Dependent upon laborer to ensure proper amounts.

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EIFS

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- Notched trowel adhesion of insulation board minimizes transference of stress to coating.

- Eliminates Thermal Bridging
  - Adhesive attachment

- Light
  - 2 lbs./ sf

- Deflection Criteria Framed Walls
  - L/ 240

- Accessories
  - PVC Casing beads (optional)

- Labor processes
  - Trowel/ spray/ roller applied WRB
  - Integration of flashing
  - Backwrapping
  - Adhere Insulation board
  - Aesthetic Grooves/ Features
  - Base coat and reinforcing mesh
  - Finish.

- Ease of installation
  - Medium skill set
  - One trade involved

- Method of Attachment
  - Adhesive

- With the exception of water, most materials are pre-blended.
  - Some base coat materials may require measuring cement.

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Stucco

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- Curing
  - Interlacing of hydrated crystals (hydration)
  - 40°F or better during application.
  - Must be kept from freezing for 24 hours.
  - Requires water misting
  - Polymer modification (optional)
  - Must cure 7-14 days before finish
- Water Management
  - Building paper disengages from stucco after full cure.
  - Tyvek Stucco Wrap or channeled insulation board.
- Design details need to be properly addressed
  - Penetrations and openings
  - Terminations
  - Flashing
  - Ledges
  - Features
- Warranty
  - None implied
- Maintenance
  - Sealants.
  - Dirt can become engrained in surface
  - Cracking can be particularly problematic.
  - Medium difficulty patch and repair
- No System Approach
  - Lath, cement, aggregates, accessories may come from all different sources.
- Design Flexibility
  - EIFS Architectural plant-on features can be added.
  - EIFS color options available
  - EIFS finish options available.
  - Control joints required every 144 SF
  - Reveals: Fry Reglets

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EIFS

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- Curing
  - Evaporation
  - 40°F or better for 24 hours.
  - Ready to finish in 24 hours.
- Water Management
  - Adhesive is applied with notched trowel vertically to create drainage channels.
- Design details need to be properly addressed
  - Penetrations and openings
  - Terminations
  - Flashing
  - Ledges
  - Features
- Warranty
  - Dependent upon system components
  - Material
  - Material and Labor
  - Up to 15 years
- Maintenance
  - Sealants
  - Maintains fresh appearance with minimal cleaning.
  - Impacts
  - Medium difficulty patch and repair
- System Approach
  - Insulation board made by another party with EIFS manufacturers labels.
  - All other components by single manufacturer.
- Design Flexibility
  - Architectural plant-on features
  - Color options
  - Many New Finish options available
  - Aesthetic grooves/ reveals easily fabricated

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Stucco

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- Control and Expansion
  - Needs to be broken up into 144 sf panels with control and expansion joints
  - 100 sf for soffits
- Finishes
  - Mixture of white cement, pigment, silica sand and lime.
  - Limited to pastels.
  - Capable of heavy textures
  - Prone to inconsistency, blotchiness, variance.
  - Accepts EIFS Finishes.
- Performance Issues
  - Control joint intersections prone to pinching/ moisture
  - Control Joints shoulders/ grounds susceptible to separation
  - Reveals constructed with reglets prone to separation.
- <u>No fire tested assemblies with insulation board.</u>
- Limitations to use
  - Questionable beyond three-four stories.
  - Lath required for most substrates.

EIFS

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- Control and Expansion
  - No control joints needed
  - Large monolithic wall planes should have expansion joints every 75 feet.
  -
- Finishes
  - Pigmented acrylic and aggregate to provide texture.
  - Myriad of colors
  - Texture limited to 1/4” or less
  - Consistent color
- Performance Issues
  - Sharp Corners in reveals prone to cracking.
  - Flat ledges prone to moisture
  - Backwrapping needs to be executed correctly to encapsulate insulation board edge.
- Fire tested assemblies.
- Limitations to use
  - Limit exposure to pedestrian contact
  - Poor substrates
  - High abuse/ loading docks, heavy equipment.