STUCCO FAILURES and REMEDIATION

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Florida Environment

- Hot Humid
- High ground water
- Irrigation
- Mold, rot, rust, corrosion, insect infestation
Florida Moisture Dynamics

• Water intrusion in order of magnitude
  – Liquid water
  – Air infiltration
  – Water vapor diffusion

• Typically water vapor becomes part of cooling load

• Risk of condensation
Florida Building Construction

- Single Wythe Masonry
- Stucco exterior
- Drywall interior
Window
Base Of Wall
Moisture Pathways Florida House

Water intrusion in order of magnitude
  • Liquid water
  • Air infiltration
  • Water vapor diffusion
Moisture Pathways Base Of Wall
Moisture Pathways
Window Head
Moisture Pathways
Top of Wall/Roof
Stucco as Waterproofing

- Specified thickness typically $\frac{5}{8}”$ to $\frac{3}{4}”$
- Frequently $\frac{1}{4}”$ or less thick
- Microcracking
- Map cracking
- Stress cracks
- Shrinkage cracks
- Expansion joints
Map
Cracking
Settlement Crack
Shrinkage Crack
Shrinkage Cracks
Typical Arrangement of Control Joints

- Mitered Control Joint
- Vertical Control Joint
- Corner Bead
- Horizontal Control Joint

DRAWING 4: Typical Arrangement of Control Joints
Control Joint Cross Section

- MASONRY
- STUCCO
- PAINT
- METAL OR PLASTIC CONTROL JOINT
- VOID BEHIND CONTROL JOINT

DRAWING 5: Control Joint Cross Section
PAINT
Stucco
Accessories
Unprotected
Top Edge of Stucco
Horizontal CJ Intersects Window Corner Bead
Efflorescence from water Penetration
Water Blister in Paint
Water Blister in Paint
Summing Up

- Construction Moisture
- RH higher immediately after construction
- Rain during construction
- Base of wall more wet due to gravity
- No vapor retarder – RH becomes part of cooling load
- Components of the outside wall, such as wood trim and gypsum board,
- Windows leak more water than walls
- Stucco not waterproof
- Stucco accessories provide water pathways
Stucco Advantages

• Rugged
• Fire resistant
• Resists hurricane damage
• Effective air barrier
Stucco Limitations

• Does not provide water/moisture barrier
• Water entry can result in IAQ issues
  – Mold
  – Bacteria
  – Insects
• Water entry can result in material damage
  – Rotting
  – Corrosion
  – Delamination
  – Swelling
Fragile

- Depends on moisture storage capacity of masonry and concrete
- Frequently found moisture levels near problem levels
  - Particularly at base of walls
- Can be tipped over edge by small amount of additional water
  - Sprinkler misdirected
  - Window leak
  - Sealant defect
  - Heavy rain
- Higher incidence of damage where stucco alone is relied on for moisture management
New Construction

- Weep holes at the base of walls
- Use of less moisture-sensitive interior materials at the base of walls
  - mold/moisture resistant drywall,
  - pressure treated wood,
  - non-corroding metals such as aluminum and stainless steel materials,
  - synthetic carpet
  - tile.
- Water-resistive coatings on the inside of walls, particularly at the base of the wall.
- Monitoring of the moisture content of slabs and masonry
  - dry before installation of drywall, insulation, and interior finishes
  - particularly finishes such as ceramic tile, that restrict drying.
Stucco Remediation

- Install drainage plane
- New stucco
- Weeps
Stucco Amelioration

• Reduce water intake
  – Patch missing or loose stucco
  – Repair cracks
  – Restoration and/or installation of sealants
  – Restoration and/or installation of coatings
  – Remediation of accessories
  – Retrofitting of weep holes.
Mitered Control Joint

- Horizontal joint empties into vertical joint.
- Vertical joint open to water intrusion.
Remediation of Mitered Control Joint

- Vertical Cap Continuous Through Intersection
- Butt Horizontal Joint Cover to Vertical
- Completely fill space below covers with sealant.
Remediation Of Horizontal Control Joint

- MASONRY
- SAW CUT INTO CMU
- INSTALL NEW CAP WITH HOOKED END
- NEW DRIP EDGE OVER EXPOSED JOINT
- STAINLESS STEEL SCREW AT 16" O.C.
- HEMMED EDGE
- DRILL NEW ¼" Ø DIAMETER WEEP HOLE AT 16" O.C.
- INSTALL SCREEN ACCESSORY
Remediation Of Vertical Control Joint
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