Moisture Intrusion through a Cavity Wall with Fill Insulation

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Problem

• Moisture intrusion –
  – inside face of exterior wall damp
  – staining and efflorescence
• Efflorescence on exterior face of wall
• Cavity insulation vermiculite pour insulation, which may contain asbestos
Typical Wall Construction
Wall cavity filled with vermiculite
Cavity Extends Below Grade To Top of Footing

Filled with vermiculite
Pour insulation
Sidewalks Barely Below Floor Elevation

FIN. FL.

FIN. FLOOR VARIES SEE ROOM FIN. SCHEDULE

SIDEWALK LOCATIONS VARY (SEE FL. PLAN)

DAMP PROOFING MEMBRANE (TYPICAL ALL SLABS)

4" CONC. BLOCK

4-2-4

46
A17

46A
A17
Wall Ties
Covered with
Mortar Droppings

4" UTILITY BRICK
4" x 4" x 12" NORM.

GALV. DUR-O-WALL
EVERY THIRD COURSE

9 1/2"
Typical Wall
Elevated Moisture & Efflorescence
Water Staining On Inside Face of Wall
Weep Hole From Previous Repair
Horizontal Crack
And
Efflorescence
Missing Sealant
Observations

• Cracks in mortar joints
• Ant traffic into some weep holes
• Weep holes in face of brick rather than at joint
• Weep holes about 5” above finish floor
• Moisture issues most severe where:
  – Exposed to weather
  – Exterior wythe more porous
• Verified that cavity extend below grade in some locations
• Exterior damproofed below grade
• No footing drains
• Sealant removed from vertical expansion joints by students
Tests

- Vermiculite negative for asbestos
- RELIM tubes drained very rapidly, particularly at head joints of brick
- Interior face of exterior wall damp in some locations
Reports

- Masonry waterproofing treatment 5 years previous
- Weep holes drilled at time waterproofing installed
- Water came out of holes under a head
- Conditions inside gradually becoming worse
General Recommendations

• Repoint mortar joints
• Reapply masonry waterproofing
• Replace failed sealants
• Install covers on vertical expansion joints to prevent vandalism
Remediation Scheme 1

- Remove vermiculite
- Fill bottom of cavity
- Install weep holes at base of wall
- Reinsulate wall with frothed foam insulation
Remediation Scheme 2

- Excavate base of wall and install footing drains
- Install weeps at top of footing coupled to footing drain
Budget Wins

• Budgetary constraints prevented remediation

• Condition ameliorated:
  – Cracks in mortar repaired
  – Reapply masonry waterproofing
  – Replace failed sealants
  – Install covers on vertical expansion joints to prevent vandalism
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