

# Building Defect Analysis Report

## Root Cause Analysis

Report Generated: 1/28/2026, 9:40:05 AM  
Property ID: P6  
Historical Data Analyzed: 3 records

### Identified Root Causes

#### 1. Differential Foundation Settlement

Confidence: HIGH

Reasoning: The large diagonal crack (approximately 3mm wide) running from the ceiling corner to the window frame in Room R1, coupled with the observation of 'signs of recent structural movement,' is a classic and severe indicator of differential foundation settlement. This is a fundamental issue with the building's primary support system, where one part of the foundation is settling more or at a different rate than another. This uneven movement induces significant stress in the superstructure, leading to shear cracks that commonly originate from corners of openings (like windows). The 'Region: South' can often imply challenging geotechnical conditions such as expansive clay soils or poorly compacted fill, which are common contributors to foundation settlement. This is a root cause because it represents a failure in the building's ability to maintain its structural integrity and stability.

##### Affected Systems:

- Foundation System
- Structural Framing
- Exterior Envelope
- Interior Finishes

#### 2. Active Plumbing System Leak

Confidence: HIGH

Reasoning: The 'significant water staining on ceiling near bathroom area,' 'visible discoloration and paint peeling,' and subsequent 'black mold growth' in Room R2 are direct and severe consequences of an active and prolonged water intrusion. The location 'near bathroom area' strongly implicates a leak originating from the plumbing system within or directly above the bathroom. This could involve supply lines, drain lines, fixture connections (e.g., toilet, sink), or a failure in the waterproofing system of a shower or tub. The mold growth further confirms that moisture has been present for an 'extended period,' which is a direct result of a persistent leak. This is a root cause because it identifies the primary source of moisture that is causing both the material degradation (water damage) and the biological growth (mold).

##### Affected Systems:

- Plumbing System
- Interior Finishes
- Indoor Air Quality
- Building Envelope (localized)

## Ø=Üj Immediate Action Recommendations

1. Immediately engage a qualified structural engineer to conduct a thorough assessment of the crack in R1, determine the extent of structural movement, and identify the precise underlying cause of foundation settlement. Follow their recommendations for monitoring, temporary shoring, and permanent remedial actions.
2. Promptly locate and repair the source of the active plumbing leak in the bathroom area (R2). This will likely require opening up the ceiling or wall to access and inspect pipes, fixtures, and waterproofing membranes.
3. Isolate the affected area in R2 to prevent further spread of mold spores. Initiate professional mold remediation services following industry standards (e.g., IICRC S500/S520) to safely remove all contaminated building materials, clean affected surfaces, and ensure thorough drying of the structure.
4. After the leak repair and mold remediation, ensure all affected building materials in R2 are completely dry using appropriate dehumidification and air movement equipment before any reconstruction or finishing work is performed.
5. Consider investigating and improving the ventilation system in the bathroom (R2) to help manage ambient moisture levels and reduce the risk of future mold growth, especially after the primary leak source has been resolved.



