

services

Risk Case Study: Condo HVAC Issue

Project Overview

IBACOS building performance specialists were asked to execute risk management services for a multi-story condominium on the east coast of Florida. Their immediate task was to investigate the causes of organic growth issues within the walls of the structure and then develop and deliver remediation measures. Homeowners reported the existence of mold, generally around the HVAC unit as well as some bathroom fans throughout this six-story building. IBACOS found that the problem ranged from non-existent to major depending on the location of individual units.

Investigation

- + Prior to the field visit IBACOS analyzed the HVAC designs and determined that less than 25% of the units were undersized to meet the peak load, but the majority were twice the size needed, providing no opportunity for the system to run long enough to effectively contribute to dehumidification.
- + On-site observations and tests were conducted to review the structure type, HVAC layouts, building envelope and extensive measurements of interior space conditions.
- + Test data collected over extended periods verified that interior humidity levels were not being controlled by the AC equipment.
- + Field construction, thermal envelope, and moisture experts modeled thermal characteristics of the structure, unit-by-unit, to accurately understand the appropriate equipment sizing for a six-story.

Continued on reverse.



(Above) Mold and other water damage found in most affected units. (Below) New, correctly-sized air conditioning units addressed key remediation issues.



Builder Savings:
\$833,000

The Problem

Air quality within affected condos was too humid. Forensic investigation determined:

- + Over-sizing of air conditioning units resulted in operation not meeting space demands.
- + Lack of adequate humidity control – AC units were short-cycling and not removing humidity.
- + Poor air sealing of penetrations occurred between living spaces and common shafts.
- + Empty units within the building created varying ambient interior conditions.
- + Different compass orientations created different sun, shading and temperature profiling around the building.
- + Living units were of five different configurations.
- + Humid air from bathrooms, dryers, etc. was not being exhausted properly.

The Solution

Mold remediation was needed within interior spaces, where common utility shafts were used to run AC lines as well as bathroom and dryer exhaust. To accomplish that:

- + Smaller air conditioning equipment was installed to better match the individual unit loads.
- + A stand alone dehumidification unit was placed in each condo to better control interior space humidity levels and distribution balance between rooms.
- + Air conditioning ducts were sealed.
- + A rooftop fan was installed on the common bath exhaust shaft to promote better removal of high humidity air from all bathrooms.



(Above) New dehumidifiers such as this one were installed in all units to avoid future risk.

Results

- + **IBACOS reduced remediation costs from \$10,000 per unit to \$2,000.**
- + Newer, smaller air conditioning equipment reduced the number of mold occurrences and occupant complaints.
- + Relative humidity was reduced 15-20%.
- + Better air quality balance was established throughout the entire structure.
- + IBACOS saved the builder about \$833,000 in future remediation by stopping the issue before spreading to other units.

IBACOS building performance specialists found that while the original HVAC design was done to acceptable industry standards it proves that traditional methods are not always sufficient. **Quality assurance** measures in the planning and specification stages

could have stopped this issue before it started. Contact us to ensure your project performs as you intend. Our goal is to save your money.

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