



**U.S. Department of
Transportation**

Office of the Secretary
of Transportation

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GENERAL COUNSEL

1200 New Jersey Ave. S.E.
Washington, D.C. 20590

April 2, 2009

Catherine McMullen
Chief, Disclosure Unit
U.S. Office of Special Counsel
1730 M Street, N.W. Suite 218
Washington, DC 20036

Re: OSC File Nos. DI-08-0497, DI-08-0550; DI-08-0494

Dear Ms. McMullen:

This is to follow-up on recent communications between Department of Transportation (DOT) staff and Office of Special Counsel (OSC) staff concerning DOT's investigative report of whistleblower allegations relating to mold and moisture problems at the air traffic control tower at Detroit Metropolitan Airport. Please treat as supplemental reports to DOT's Investigative Report dated August 21, 2008, the following documents which we have recently provided to your office:

- 1) Recommendation Tracking Sheet, dated February 11, 2009;
- 2) Report of evaluation of Leo Daly type towers, dated December 28, 2008. (Note: There was a minor technical revision made to the Executive Summary of this report on March 25, 2008, to delete erroneous statements that DOT's Office of Inspector General conducted the DTW mold investigation pursuant to a congressional request. As you know, this investigation was assigned to DOT's Assistant Secretary for Administration/Designated Agency Safety and Health Official and conducted pursuant to OSC's referral.);
- 3) Communication Plan, dated September 25, 2008;
- 4) Employee information memoranda on roof replacement, dated October 24 and December 5, 2008;
- 5) Rosen e-mail to Gorman, dated March 20, 2009.

Please call me on 493-0992 or Debra Rosen on 366-9165 should you have any further questions.

Sincerely,

Judith S. Kaleta
Assistant General Counsel for
General Law

DTW: OST RECOMMENDATIONS TRACKING SHEET

February 11, 2009

	OST Recommendations and FAA Responses	Due Date/Date Completed	Status
A	<p>OST Recommendation (ATCT): "Conduct a comprehensive inspection of the wall cavities on every floor of the air traffic control tower, making sure to inspect the wall cavity from the unoccupied room side of the elevator shaft."</p> <p><u>FAA Response:</u> The FAA will retain a Certified Industrial Hygienist experienced with mold and indoor air quality issues to complete the recommended action.</p>	<p>December 31, 2008</p> <p>Completed</p> <p>December 12, 2008</p>	<p>The inspection was completed by a 3rd party consultant (CIH). Additional mold growth was found in a number of wall cavities, however the amount at these locations was not significant. The drywall in some areas did not meet the correct fire rating. Refer to Recommendation B.</p>
B	<p>OST Recommendation (ATCT): "Based on the comprehensive inspection, remove all visibly contaminated (molded and water damaged porous materials) from the air traffic control tower."</p> <p><u>FAA Response:</u> The FAA will develop and implement projects to remove molded and water damaged porous materials identified from the inspection. Action: Design and engineering will begin immediately upon completion of the inspection with contract work following as soon as possible.</p>	<p>Target Goal FY09</p>	<p>A contract had been awarded to remediate the ATCT, however, due to a recent verbal agreement between NATCA and the FAA, the project is being reevaluated to ensure that NATCA's concerns are taken into account in the planning. A meeting between the FAA and NATCA is currently being scheduled to collect input from the union.</p>

C	<p>OST Recommendation (ATCT): "Develop a mold remediation project communication plan for the facility to improve communication efforts between FAA management and union employees."</p> <p><u>FAA Response:</u> The FAA will develop a plan to improve communication.</p>	<p>October 1, 2008</p> <p>Completed Sep. 25, 2008</p>	<p>A plan was drafted by P&R and reviewed by local Terminal and Tech Ops managers. Comments were received and modifications were made to the plan. The plan is a "living document" and will be implemented for all mold remediation projects.</p>
D	<p>OST Recommendation (ATCT): "<i>Remove all unnecessary wallboard and carpeting from unoccupied areas of the air traffic control tower.</i>"</p> <p><u>FAA Response:</u> The FAA will assess which wallboard and carpeting is not needed in the unoccupied areas of the ATCT. A project will be developed to remove these items.</p>	<p>(Refer to Recommendation B)</p>	<p>Will be incorporated into the project scope described in Recommendation B.</p>
E	<p>OST Recommendation (ATCT): "<i>Evaluate the fire rating of cement backer board and mold resistant/paperless wallboard.</i>"</p> <p><u>FAA Response:</u> The FAA will evaluate wallboard that needs to be replaced in the ATCT and attempt to substitute with fire-rated, mold-resistant products. When the wallboard is replaced, a gap will be left between the concrete floor slab and new wallboard to prevent wicking of moisture into the panel.</p>	<p>(Refer to Recommendation B)</p>	<p>Will be incorporated into the project scope described in Recommendation B.</p>

<p>F</p>	<p>OST Recommendation (ATCT): <i>"Continue efforts to prevent moisture intrusion into the air traffic control tower and prevent condensation from forming."</i></p> <p><u>FAA Response:</u> The FAA will continue to prevent water intrusion and condensation issues in the ATCT. Comments and recommendations were submitted to the OST indicating that the corrective measures identified were completed and controlling the ATCT moisture issues. Further preventative measures such as gaps between the drywall and the concrete slab floors, removal of unnecessary wallboard and carpeting, and monitoring the environmental conditions (i.e., with sensors) in various areas will be pursued by the FAA.</p>	<p><i>(Refer to Recommendation B)</i></p>	<p>Monitoring is on-going (See Recommendation G). Other items will be incorporated into the project scope described in Recommendation B.</p>
<p>G</p>	<p>OST Recommendation (ATCT): <i>"Actively monitor moisture in the elevator shaft and unoccupied areas of the air traffic control tower and implement corrective actions as necessary."</i></p> <p><u>FAA Response:</u> The monitoring is currently in progress. To date, there are no indications of excessive moisture and/or humidity.</p>	<p>Ongoing</p>	<p>Data is currently being captured. No evidence of high moisture issues. Local Tech Ops will continue to oversee these efforts.</p>
<p>H</p>	<p>OST Recommendation (ATCT): <i>"Review the policies at FAA's Detroit Air Traffic Control Tower to ensure that employees are encouraged to report work-related health and medical problems."</i></p> <p><u>FAA Response:</u> The agency will review such policies.</p>	<p>October 1, 2008</p> <p>Completed October 1, 2008</p>	<p>Local managers have reviewed the FAA's policies. Refer to Sections C and L for additional information.</p>

<p>I</p>	<p>OST Recommendation (ATCT): <i>"Evaluate other FAA air traffic control towers for mold and moisture infiltration problems. The Detroit Metropolitan Airport air traffic control tower is of a Leo Daly design. FAA operates other Leo Daly designed towers of similar construction and characteristics. It is prudent for FAA to inspect these other towers to determine if similar mold and moisture problems exist at those facilities."</i></p> <p><u>FAA Response:</u> The DTW ATCT is a Leo Daly designed tower. The FAA will inspect Leo Daly designed towers throughout the country to determine if mold and moisture problems exist at these facilities.</p>	<p>December 31, 2008</p> <p>Completed December 11, 2008</p>	<p>EOSH Services lead the effort to inspect 13 similar Leo-Daly type towers from September through December 2008. Per the report, <i>"Collectively, the inspections did not identify a consistent pattern of design or construction defects giving rise to water incursion problems and/or resulting mold growth. No reports of adverse health effects or significant occupant complaints of discomfort or other symptoms were observed in the ATCTs inspected as part of this effort."</i></p>
<p>J</p>	<p>Recommendation (Base Building): <i>"Replace the leaking base building roof."</i></p> <p><u>FAA Response:</u> A new roofing membrane will be installed by March 30, 2009.</p>	<p>March 30, 2009</p> <p>* Completed January 21, 2009</p>	<p>* The new roof membrane was installed with a 2-year contractor warranty (i.e., labor and materials). A factory representative, however, had an issue with the termination bar installation; it does not affect the roof integrity and will be addressed when outside temperatures are above 40 degrees F.</p>
<p>K</p>	<p>OST Recommendation (Base Building): <i>"Continue to immediately remove and replace water damaged building materials as necessary."</i></p> <p><u>FAA Response:</u> The FAA will continue to remove and replace such items. When such incidents arise, an investigation shall be made to identify the moisture source and correct it.</p>	<p>Continuous</p>	<p>A new roof membrane was installed. There are currently no reports of leaks. If any other water intrusion incidents take place, materials will be removed and replaced in accordance with FAA and federal policies.</p>

L	<p>OST Recommendation (Base Building): <i>"Develop a roof project communication plan for the facility to improve communication efforts between FAA management and union employees."</i></p> <p>FAA Response: Local FAA management will develop a communication plan to educate employees about the roof project and the control efforts being implemented to ensure a safe working environment.</p>	<p>October 1, 2008</p> <p>Completed Sep. 25, 2008</p>	<p>A plan was drafted by P&R and reviewed by local Terminal and Tech Ops managers. Comments were received and modifications were made to the plan. The plan was a "living document" and implemented for the DTW roof project.</p>
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**Airport Traffic Control Tower (ATCT)
Mold/Water Incursion Inspections**

**Final Report
Volume 1**

**NISC Prime Contract Number
DTFAWA-08-C-00009
Task Order WESH802A**

Subcontract Number NISC2B-LM0500568-080116

**December 18, 2008
(Revised March 25, 2009)**

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**Airport Traffic Control Tower (ATCT)
Mold/Water Incursion Inspections
Final Report - Volume 1**

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**Airport Traffic Control Tower (ATCT)
Mold/Water Incursion Inspections
Final Report - Volume 1**

EXECUTIVE SUMMARY

The FAA has observed several water intrusion and mold growth incidents at Airport Traffic Control Towers (ATCTs). The purpose of this inspection program was to conduct site visits to ATCTs having similar design features to determine if there are chronic design, construction, or operational issues resulting in or contributing to water intrusion and/or mold growth in the ATCTs. The towers evaluated under this program were designed by the Leo A. Daly Company, an architecture and engineering firm based in Omaha, Nebraska, although several ATCTs were designed by other architectural firms as modifications to the basic Leo A. Daly Design.

A visual inspection for the presence of mold was performed within all areas of each ATCT to identify areas of visible mold growth and/or moisture intrusion. Collectively, the inspections did not identify a consistent pattern of design or construction defects giving rise to water incursion problems and/or resulting mold growth. No reports of adverse health effects or significant occupant complaints of discomfort or other symptoms were observed in the ATCTs inspected as part of this effort. It appears that condensation in unheated or otherwise non-tempered interior spaces of the tower shaft creates moisture issues; especially in colder months in colder climates. For example, the MCI (Kansas City International Airport) ATCT has experienced condensation problems (and frost during winter months) within interior spaces of the tower shaft. Other towers have insulation and a vapor barrier applied to the interior concrete panels (SEA – Seattle-Tacoma International Airport and EWR-Newark Liberty International Airport as examples) which appear to be effective in controlling condensation. The MCI ATCT also reported that exterior caulk degraded over time and required replacement.

Other reported problems with water issues and mold growth have resulted from internal building issues and not water incursion through the building envelope. These include water leaks from plumbing supply and drain lines or other building equipment unrelated to design and construction. An exception to this is a significant water leak which occurred at the UGN tower (Chicago/Waukegan Regional Airport). In this instance, a vertical utility riser located within an exterior corner of the tower shaft was not adequately insulated during construction. A water line froze and burst on the 5th floor level in this chase resulting in a “cascade” of water down the tower steps and elevator shaft. This problem (inadequate insulation in a pipe chase) was not reported in any of the other towers inspected and was an isolated issue unique to UGN.

Observations made as part of the ATCT inspections suggest that either insulating interior tower shaft spaces that are unheated, or providing supplemental heat in these areas to control condensation and moisture should be considered, along with other engineering approaches. The current practice of prompt reaction to water incursion episodes, plumbing leaks, or other similar events within the towers should be maintained per existing FAA guidance.

1.0 PURPOSE AND SCOPE

The FAA has had issues with several water intrusion and mold growth incidents at Airport Traffic Control Towers (ATCTs). The purpose of this inspection program was to conduct site visits to ATCTs having similar design features to determine if there is a chronic design or operational issue. A visual inspection for the presence of mold was performed within all areas of each ATCT to identify areas of visible mold growth and/or moisture intrusion. The attached adjacent base buildings were not included in the inspection process. Inspections were conducted by Certified Industrial Hygienists (CIH), assisted by staff industrial hygienists, having mold inspection and remediation experience. The inspection team also gathered photographic evidence as needed to document the relevant conditions at each facility. For inspections conducted in the state of Texas (Houston, Dallas/Fort Worth, and Austin), the inspection team included a mold inspector licensed by the Texas Department of State Health Services (TDSHS) to assure compliance with Texas state requirements. No other states where inspected towers are located had similar state-licensure requirements.

The CIH and staff investigated the ATCTs for mold growth and water intrusion to include, but not be limited to, the walls, elevator shaft, electrical shafts, stairwells, architectural cavities, roof, caulking, Heating, Ventilation, and Air-Conditioning (HVAC) system, existing access panels, and above drop ceilings. Inspections included inspecting the elevator shaft walls, which was accomplished by engaging a qualified elevator technician to take the elevator out of service to allow the inspection team to observe the length of the elevator shaft directly from the top of the elevator cab. All appropriate safety considerations and regulations were observed.

Applied Environmental developed and provided a questionnaire to each ATCT facility prior to conducting the inspection. This questionnaire incorporated known or suspected issues with Leo A. Daly designed ATCTs (specifically the DTW-Detroit and MCI-Kansas City facilities). In addition, the inspection team reviewed existing inspection and recommendation reports from these facilities, including, but not limited to, the Office of the Secretary of Transportation (OST) Report and Jacobs Engineering Recommendations. A listing of reports reviewed is provided in tabular form as Appendix A to this report volume. Copies of the reports obtained and reviewed are provided within Volume 2 of this report. Photographs are provided as Appendix B.

Sampling of suspect mold was not performed in cases where the inspection team, based on experience, determined that sampling was not necessary to verify that the suspect growth was indeed mold growth.

1.1 Description of the Basic Leo A. Daly ATCT Design

In general, the Leo A. Daly standard ATCT design consists of an eight sided concrete shaft flaring out to support an eight sided cab. The standard configuration of this design type has six distinct

functional levels; ground level, shaft level, sub-junction level, junction level, cable access level and cab.

The ground level generally includes the stairway, elevator, elevator lobby, elevator equipment room, an electrical room, and a mechanical space. The sub-junction level is designated as an electronics equipment space, and in many towers serves as a storage area as well. The junction level typically consists of office and break areas.

The tower shaft serves as a supporting structure to give the cab level adequate height for visibility of airport movement areas. The number of levels within the tower shaft is therefore variable. The shaft includes space for the elevator, elevator lobby, stairway, and in some cases, mechanical rooms and electrical rooms. The shafts can be described as either "functional" or "non-functional" depending on if the shaft has space on each floor that is usable (e.g., offices, restrooms, break room, etc.), or non-functional spaces that are not conditioned or designated as occupiable. A tower shaft designated as non-functional will have some floors just below the cab level that are occupied and designated for such functional uses as a toilet room and limited electronic equipment needed to be located close to the air traffic operations area.

The junction level provides a transition (junction) between the main shaft stairs and the separate stairs to the cab. The junction level typically includes a mechanical room, offices/break room areas, toilet rooms, and locker spaces, as well as the main stairway, a sub-junction stairway, and elevator. Microwave/antenna balconies are typically located on this level.

The cab level contains ATC and communications consoles and windows providing a 360° view of the airport movement area, runways, and local airspace. Generally, the Airport Surface Detection Equipment (ASDE) penthouse is located on the cab roof and includes ladder access (from cab level), equipment space, and an equipment service platform.

The Leo A. Daly basic design has been modified over time such that the towers have unique features as more towers are designed and constructed.

2.0 FINDINGS

Table 2.0 presents a brief summary of the ATCT locations inspected, past reports of water incursion and/or mold growth, and a brief summary of findings:

**Table 2.0
Listing of ATCTs Inspected and General
Summary of Findings**

Loc ID:	Facility Name:	Past Mold Related Problems Reported?	Past Water Incursion Events Reported?	Summary of Findings
MCI	Kansas City International Airport	Yes	Yes - condensation on concrete surfaces continues.	Tower has undergone significant remedial activity, including mold remediation and exterior caulk replacement.
SEA	Seattle-Tacoma International Airport	No	No	No evidence of active water incursion or active mold growth were observed during the site inspection
EWR	Newark Liberty International Airport	Yes	Yes	Minor amount of visible mold observed on Ground floor. Possible window leakage in one area.
BUR	Bob Hope Airport	No	Yes – four windows on north side of tower were re-caulked to correct problem five months prior to inspection.	No areas of active water incursion observed. Very small patch (less than 3 in ²) of visible mold noted adjacent to 3 rd floor north window; not a significant finding.

Applied Environmental, Inc. ATCT Mold/Water Incursion Inspections

Loc ID:	Facility Name:	Past Mold Related Problems Reported?	Past Water Incursion Events Reported?	Summary of Findings
IAH	George Bush Intercontinental /Houston Airport	No	Yes	Levels 12 to 3 exhibit gaps in chilled water line insulation causing condensation. Levels 3 to Ground contained mold growths each less than 10ft ² . Reportedly, rain events with strong west winds (rare) allow water into the building. No moisture intrusion pathways could be identified.
DFW-MB2	Dallas / Fort Worth International Airport	No	No	Mold growth was observed on the 9 th Level and the Ground Level. A fire pipe release was responsible for growth on Ground Level and no moisture source responsible for the growth on the 9 th level could be determined.
DFW-MA2	Dallas / Fort Worth International Airport	No	No	Mold patches of <3ft ² were observed in the elevator shaft from 6 th to 2 nd Levels. Mold growths were observed on unfinished levels 5 through 3.
CVG	Cincinnati/Northern Kentucky International Airport	Yes	Yes	Cable Access level contained significant drywall moisture damage, <10ft ² mold growth, and rusted metal structural members. Small areas of mold growth observed on unoccupied areas 10 th - 7 th levels and in a plenum on the ground level.
SDF	Louisville Intl- Standiford Field Airport	Yes	Yes	No evidence of current water intrusion or any mold growth was observed. Makeshift French drain and sump pump at northeast corner of tower and link building should be replaced with a more permanent solution.

Applied Environmental, Inc. ATCT Mold/Water IncurSION Inspections

Loc ID:	Facility Name:	Past Mold Related Problems Reported?	Past Water IncurSION Events Reported?	Summary of Findings
ORD	Chicago O'Hare International Airport	Yes	Yes	No mold growth was observed. Responses to past internal water releases and water intrusions appear to have been effective in preventing mold growth. Slight condensation was observed on the Cab level above the exterior windows.
DEN	Denver International Airport	Yes	No	No mold growth observed. Condensation observed on roof hatch in penthouse. Water damaged soffit on microwave balcony.
AUS	Austin Bergstrom International Airport	Yes	No	Previous humidity and condensation issues noted on Junction Level and were eliminated. Minor mold growths likely from previous condensation were observed on a supply air diffuser and above suspended ceiling on the Junction Level. On 8 th Level room 802, 4ft ² mold growth was observed.
UGN	Chicago/Waukegan Regional Airport	Yes	Yes	Significant mold growth on ground floor. Recommend further investigation and remedial action.
STL	Lambert St. Louis International Airport	Yes	Yes	Significant past remediation successful. Minor suspect mold growth observed.

In general, tower inspections resulted in three suggested action items:

1. Where suspect mold growth was not identified, no further action would be indicated.
2. Where small amounts of visible mold (less than 10 square feet (ft²) – not requiring containment) are identified, remediation can be handled locally.

3. Where more extensive growth was observed, further investigation (beyond the scope of the visual inspections completed within the ATCTs) should be initiated, including destructive testing to determine the extent of microbial growth, and development of a scope of work and remedial specification such that a contractor can be engaged to abate the identified condition(s).

Specific findings for each of the inspected ATCTs are provided in the following sections of this report.

2.1 MCI - Kansas City International Airport

2.1.1 Tower Description

The MCI ATCT was constructed during the 1994-1995 time period, and is a standard 300-foot major level ATCT designed by the Leo A. Daly Company. The tower is a 15 story structure with an overall height of 249 feet to the top of the ASDE penthouse. The cab of the tower is an 850 ft², eight sided, major activity level cab. The tower shaft bellow the cab is unoccupied, with the exception of an electronics equipment room and a mechanical equipment room on the sub-junction level, and a smoking room, office, break room and mechanical equipment room on the junction level. The tower shaft is served by a geared traction elevator, and a single, pressurized exit stairway. The ATCT is connected to the base building via a 2 story link structure.



The MCI ATCT has experienced significant past water incurSION problems, as well as interior moisture issues that have led to mold growth and resulting remedial efforts. Reports reviewed as part of the inspection process indicate that mold remediation work was completed within the MCI tower in 2003 and 2007, and that the exterior caulking on the tower shaft was replaced in the 2004/2005 time frame. The original caulk reportedly degraded over time as a result of ultraviolet light exposure.

A report prepared by DMJM H&N/AECOM and dated January 22, 2008 (copy provided within Volume 2 of this report) provides a detailed summary of issues associated with the MCI ATCT, including interior moisture problems resulting from water incurSION through the exterior envelope, including roof areas and sealed joints between architectural pre-cast panels. According to this report, corrections were made to the building envelope, although internal sources of moisture (personnel, building systems, and poorly functioning floor drains) continue to produce condensation, especially in winter months when condensation creates a build-up of frost on the concrete panels in interior spaces of the building (within unheated spaces). Personnel at the tower interviewed as a part of the current inspection effort verified these findings.

2.1.2 Site Observations

Table 2.1 presented below, provides details regarding the site inspection. The following is a suggested action item:

1. On the junction level, in Room J10 (vestibule), a small section of suspect growth (less than six square inches) at the floor level under the sink should be cleaned using a soap solution. This activity can be completed locally.

Table 2.1
Specific Observations ATCT Site Inspection
Kansas City International Airport (MCI), Kansas City, Missouri
Airport Traffic Control Tower

Location/Floor	Observations/Comments
Cab Roof	The cab roof was not accessible for inspection.
ASDE Penthouse	The ASDE antenna rotor system has gaps through the roof where daylight is visible. There is evidence of water streaking and staining on the interior concrete surfaces in the area above the cab ceiling. No signs of (active) water incursion, visible mold growth, or unusual odors were noted.
Cab Level	A past leak from a drain trap was repaired, and affected drywall replaced. No signs of active water incursion, visible mold growth, or unusual odors were noted.
CA01 Cable Access Level	No past problems reported at this level. Rust was noted on some steel structures, and evidence of past water staining/streaking was noted on perimeter concrete walls. A small piece of drywall scrap with visible mold was observed on the floor during an inspection of the perimeter concrete walls. The drywall was secured and discarded during the site inspection. Concrete walls are not insulated. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Junction Level	<p>A break room, smoking room, and office space is present on this level. Extensive ceiling tile staining was noted in the smoking room. Further investigation revealed that uninsulated chill water lines above the ceiling are producing condensation.</p> <p>In Room J10 (vestibule), a small section of suspect growth (less than six square inches) was noted at the floor level under the sink. It is believed that this patch was missed during a prior remediation effort. No moisture, staining, or other problems were observed on the other side of this wall in Office J9.</p> <p>No signs of active water incursion, visible mold growth, or unusual odors were noted.</p>

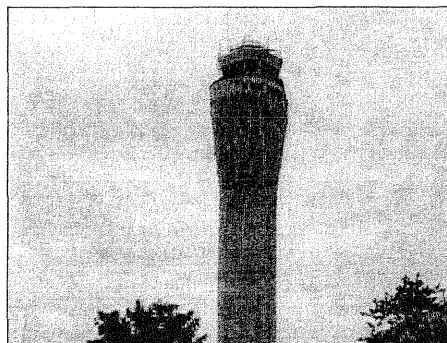
Location/Floor	Observations/Comments
Junction Level	Past water incursion problems were reported at this level, and these were corrected. Four access panels installed into the walls were opened, and the wall cavity was inspected. No signs of active water incursion, visible mold growth, or unusual odors were noted.
11 th Level	Evidence of successful mold remediation was noted at this level, with newly replaced drywall and "fire stop" material sealing the wall/floor interface. This level consists of empty space. No signs of active water incursion, visible mold growth, or unusual odors were noted.
10 th Level	Evidence of successful mold remediation was noted at this level in the elevator lobby area (2003 remediation project) with newly replaced drywall and "fire stop" material sealing the wall/floor interface. This level consists of empty space. The outer perimeter concrete wall showed evidence of past water streaking, reportedly as a result of condensation (and frost) forming on the wall surfaces. No signs of active water incursion, visible mold growth, or unusual odors were noted.
9 th Level	<p>Ceiling staining exists on this level, along with wall paint blistering reportedly from a leaking humidifier, which has since been corrected.</p> <p>Room 9TS5 had a pronounced odor which appeared to emanate from stacks of ceiling tiles stored in the area. It was recommended that the tiles be removed; or alternatively, not be stored up against the perimeter wall.</p> <p>No signs of active water incursion, visible mold growth, or unusual odors were noted.</p>
8 th Level	No evidence of mold growth was observed on this level in the past. This level consists of empty space. No signs of active water incursion, visible mold growth, or unusual odors were noted.
7 th Level	No evidence of mold growth was observed on this level in the past. This level consists of empty space. No signs of active water incursion, visible mold growth, or unusual odors were noted.

Location/Floor	Observations/Comments
6 th Level	No evidence of mold growth was observed on this level in the past. This level consists of empty space where chairs and metal lockers are stored. No signs of active water incursion, visible mold growth, or unusual odors were noted.
5 th Level	No evidence of mold growth was observed on this level in the past. This level consists of empty space where obsolete electronic equipment is stored. No signs of active water incursion, visible mold growth, or unusual odors were noted.
4 th Level	This level contains the stairwell pressurization fan. No signs of active water incursion, visible mold growth, or unusual odors were noted.
3 rd Level	This level contains fire pump equipment. Minor mold remediation was reportedly completed in this area. No signs of active water incursion, visible mold growth, or unusual odors were noted.
2 nd Level	This level contains NATCA offices which were remediated successfully. No signs of active water incursion, visible mold growth, or unusual odors were noted.
First Floor	Past mold problems inside an access panel in this area were successfully abated. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Ground Floor	No signs of active water incursion, visible mold growth, or unusual odors were noted. The elevator equipment room was clean, with no signs of water incursion or mold growth.
Elevator Shaft and Pit Area	<p>An inspection of the elevator shaft was facilitated by an elevator mechanic locking out the elevator and controlling its movement from the top of the cab. Some visible streaking on drywall (gypsum shaft liner) was observed in the elevator shaft at the 10th level on the right side (facing the front of the cab). No evidence of current water activity was noted. The streaking may be from fireproofing application during construction. Direct inspection revealed no signs of visible mold growth, and no unusual odors were observed.</p> <p>The elevator shaft pit area was examined and found to be clean and dry, with no standing water observed in the sump.</p>

3.1 SEA - Seattle-Tacoma International Airport

3.1.1 Tower Description

Construction of the SEA ATCT was started in 2000, and the tower was commissioned in 2004. It has a total height of 265 feet, with 15 levels, and was designed by URS Greiner/Woodward Clyde. The tower's exterior consists of a shaft constructed of pre-cast concrete panels, topped by an oval-shaped junction and cab structure of fiberglass-reinforced panels. The east face of the tower includes a translucent, indented, luminous glazed panel that serves as a backdrop for flags from the United States, Washington State, and Canada (the "flag pavilion").



The ATCT is connected to the base building via a two story link structure.

3.1.2 Site Observations

Table 3.1, presented below, provides details regarding the site inspection. No evidence of active water incurSION or active mold growth were observed during the site inspection, and no immediate action items are suggested based upon site observations.

Table 3.1
Specific Observations ATCT Site Inspection
Seattle-Tacoma International Airport (SEA), Seattle, Washington
Airport Traffic Control Tower

Location/Floor	Observations/Comments
Cab Roof Area	Evidence of patching of roof membrane is present, and water has pooled in some areas (intermittent rain was present during the site survey). Roof membrane in generally in good condition. Past leakage was reported during ASDE equipment installation, but this condition was corrected.
Cab Penthouse	Area contains electronic equipment racks. Ceiling is insulated with fiberglass insulation. No signs of active water incurSION, visible mold growth, or unusual odors were noted.

Location/Floor	Observations/Comments
Cab (18 th) Level	<p>Inspection included opening and inspecting perimeter electrical cabinets under equipment consoles. Insulation was visible on exterior concrete walls under the consoles. Settled dust was observed on some ceiling tiles, as reported by tower controllers. No signs of active water incursion, visible mold growth, or unusual odors were noted.</p>
CA01 Cable Access Level (17 th Level)	<p>Fireproofing was observed on steel structure with fiberglass insulation applied to exterior concrete wall. Due to the high density of HVAC ductwork and utility systems, only one exterior wall could be accessed and directly inspected. At the junction of the exterior wall and the concrete floor, signs of water staining of the floor are evident, although the area was dry. No past occurrences of water incursion were reported by the facility. It was noted that fiberglass insulation applied to the walls at this tower level (cable access level) was not noted as a common feature in all other towers of similar construction, and may have been installed at a later time. No signs of active water incursion, visible mold growth, or unusual odors were noted.</p>
Junction (16 th) Level	<p>A break room, AT offices, and lockers are present at this level. Access to the exterior balcony at this level permitted direct observation of exterior caulk, which was found to be intact and in good condition.</p> <p>Investigation of a stained (currently dry) ceiling tile in one area of the break room did not reveal a source of leakage or water incursion into the structure. It was recommended that tower management replace the ceiling tile and it was immediately removed.</p> <p>No signs of active water incursion, visible mold growth, or unusual odors were noted.</p>
15 th Level	<p>The area contains electronic equipment on a raised platform floor. Inspection of representative areas below the raised floor did not reveal evidence of water incursion or mold growth. The exterior wall is located behind a finished interior wall, and access was therefore not possible. No signs of active water incursion, visible mold growth, or unusual odors were noted.</p>

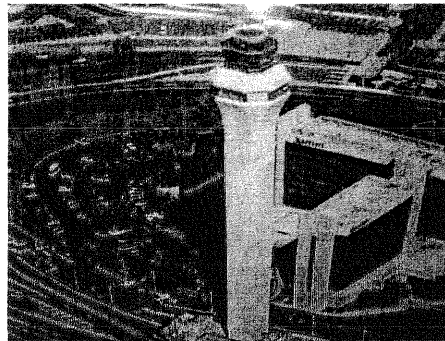
Location/Floor	Observations/Comments
14 th Level	This level consists of HVAC equipment. Fiberglass insulation is installed on the exterior concrete walls. Floor staining was observed at the junction of the exterior wall and the concrete floor. The area was dry. No past occurrences of water incurSION were reported by the facility in this area either. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
13 th Level	This level contains electrical equipment. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
12 th Level	This level contains stored ceiling tiles and other materials, as well as an exercise room. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
11 th Level	No signs of mold growth or water incurSION. Water staining appears on walls, most likely resulting from the application of fireproofing. This level is not heated. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
10 th Level	This level consists of empty space. Water staining appears on walls, most likely resulting from the application of fireproofing, although less prevalent than the level above. This level is not heated. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
9 th Level	This level consists of empty space. No signs of mold growth or water incurSION. Water staining appears on walls, most likely resulting from the application of fireproofing, although progressively less prevalent than the two levels above. This level is not heated. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
8 th Level	This level consists of empty space. No signs of mold growth or water incurSION. Very little water staining present on walls. This level is not heated. No signs of active water incurSION, visible mold growth, or unusual odors were noted.

Location/Floor	Observations/Comments
7 th Level	This level consists of empty space. No signs of mold growth or water incursion. Very little water staining present on walls. This level is not heated. No signs of active water incursion, visible mold growth, or unusual odors were noted.
6 th Level	This level consists of empty space. No signs of mold growth or water incursion. No water staining present on walls. This level is not heated. No signs of active water incursion, visible mold growth, or unusual odors were noted.
5 th Level	This level contains stored items. No signs of mold growth, water incursion or unusual odors detected.
4 th Level	This level is vacant. Significant amounts of fireproofing overspray on the concrete walls. No signs of active water incursion, visible mold growth, or unusual odors were noted.
3 rd Level	This level contains a utility room, and houses domestic water boost pump and pressure tank. This level is heated. No signs of active water incursion, visible mold growth, or unusual odors were noted.
2 nd Level	This level contains a utility room, and the stairway pressurization fan unit. This level connects to the base building. This level is heated. No signs of active water incursion, visible mold growth, or unusual odors were noted.
First Floor	No signs of active visible mold growth. No unusual odors detected. Elevator equipment room and stairway were clean and well maintained. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Elevator Shaft and Pit Area	<p>An inspection of the elevator shaft was facilitated by an elevator mechanic locking out the elevator and controlling its movement from the top of the cab. No visible streaking of drywall (gypsum shaft liner) was observed in the elevator shaft, and no evidence of water incursion was noted. Direct inspection revealed no signs of visible mold growth, and no unusual odors were observed.</p> <p>The elevator shaft pit area was examined and found to be clean and dry, with no standing water observed in the sump.</p>

4.1 EWR -Newark Liberty International Airport

4.1.1 Tower Description

Construction on The EWR ATCT was completed in 2002, and the tower was initially occupied in 2003. It is a standard major level ATCT of the Leo A. Daly design. The tower has 24 levels below the cab, and is connected to the base building on the ground floor level.



The EWR ATCT has experienced minor water incursion and moisture condensation events, and one significant plumbing leak event. The ASDE room reportedly can have minor water incursion events under high wind and rain conditions, although this condition appears to be infrequent. Past condensation problems were reported in the penthouse above the cab, but this problem has since been corrected (insulation). In November 2003, the tower apparently experienced very high wind conditions (over 70 miles per hour), resulting in a swaying motion. While plumbing lines have generally been fitted with flexible joints to protect them during anticipated tower swaying scenarios, a stand pipe that traverses the height of the tower does not. During this November 2003 wind event, the standpipe briefly separated on the 17th level, causing leakage down three levels below. The leak was repaired, damaged drywall replaced, and no mold growth was reported as a result of this incident.

A water incursion event was reported on the first floor in a workout room where a loose exterior electrical fixture cover allowed water to enter the building. This condition was corrected, and no significant damage occurred.

It was noted that in a utility chase that contains vertical plumbing risers, a convective heating system exists where circulating water keeps the chase warm. This feature was not observed in other towers of similar Leo A. Daly design.

4.1.2 Site Observations

Table 4.1, presented below, provides details regarding the site inspection. The following are suggested action items (these have been or will be addressed locally):

1. In the smoking room on the 23rd level, absorbent blankets have been placed under a window that has reportedly leaked. Tower management reported that the caulking around this window will be replaced to address the issue locally.
2. An area of discoloration on the ground floor in a stairwell was reported to the inspection team. The major area of discoloration appears to be a dirty surface. However, further

investigation, including pulling away cove base molding, revealed small patches (less than six square inches total) of suspect mold growth. Tower management was advised that this suspect growth can be cleaned using a soap solution. This activity was to be completed the evening following the site inspection and as such is not an action item.

Table 4.1
Specific Observations ATCT Site Inspection
Newark Liberty International Airport (EWR), Newark, New Jersey
Airport Traffic Control Tower

Location/Floor	Observations/Comments
Cab Roof	The cab roof was observed to be in good condition. Some pooling of water was observed, although drains appeared to be working properly. It was raining at the time of the inspection.
Cab Penthouse	The cab penthouse contains communications equipment. Penthouse walls are insulated with drywall. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Cab Level	The area above the cab ceiling was clean and in good condition, with no evidence of past leakage. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Junction Level 24	HVAC systems and plumbing lines are present at this level. The perimeter wall consists of drywall with fiberglass insulation installed on the surface of the sloping wall. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Level 23	This level contains an AF equipment room with mechanical equipment and domestic water holding tanks. A smoking room is also located on this level. In the smoking room, absorbent blankets have been placed under a window (northwest side) that has reportedly leaked. The floor, wall, and absorbent material were all dry at the time of the inspection. Tower management reported that the caulking around this window will be replaced to address the issue locally. No signs of active water incursion, visible mold growth, or unusual odors were noted.

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Location/Floor	Observations/Comments
Stairwell between Level 23 and Level 22	Streaking was observed on the walls of the landing between Levels 23 and 22. This streaking is believed to have resulted from cleaning of the floor on the level above, and is not indicative of water incursion.
Level 22	This level contains equipment storage and a radar and NAS equipment room having ASDE racks and communications equipment. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Level 21	This level contains AF air handling equipment. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the slanting walls. The exterior of the elevator shaft is visible and is constructed of drywall (green board). No signs of active water incursion, visible mold growth, or unusual odors were noted.
Level 20	This level contains mechanical equipment. Steel members have spray-applied fireproofing and fiberglass insulation has been installed on the slanting walls. The exterior of the elevator shaft is visible and is constructed of drywall (green board). No signs of active water incursion, visible mold growth, or unusual odors were noted.
Level 19	This level contains an airway facility fire suppression access room, which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible and is constructed of drywall (green board). This level also contains space used for storage. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Level 18	This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level also contains space used for storage. No signs of active water incursion, visible mold growth, or unusual odors were noted.

Location/Floor	Observations/Comments
Level 17	This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is not heated and opens to the empty space on the 16 th level. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
Level 16	This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is not heated, and opens to the empty space on the 17 th level. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
Level 15	This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is not heated, and opens to the empty space on the 14 th level. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
Level 14	This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is not heated, and opens to the empty space on the 15 th level. No signs of active water incurSION, visible mold growth, or unusual odors were noted.

Location/Floor	Observations/Comments
Level 13	This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is not heated, and opens to the empty space on the 12 th level. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
Level 12	This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is not heated, and opens to the empty space on the 13 th level. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
Level 11	This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is not heated, and opens to the empty space on the 10 th level. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
Level 10	This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is not heated, and opens to the empty space on the 11 th level. No signs of active water incurSION, visible mold growth, or unusual odors were noted.

Location/Floor	Observations/Comments
Level 9	This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is not heated, and opens to the empty space on the 8 th level. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Level 8	This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is not heated and opens to the empty space on the 9 th level. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Level 7	This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is not heated, and opens to the empty space on the 6 th level. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Level 6	This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is not heated, and opens to the empty space on the 7 th level. No signs of active water incursion, visible mold growth, or unusual odors were noted.

Location/Floor	Observations/Comments
Level 5	This level consists of a finished space with fiberglass on the ceiling. This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is heated, and opens to the empty space on the 4 th level. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Level 4	This level consists of a finished space wand equipment room housing heating and chill water piping, heat exchangers, and pumps. This level contains an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is heated, and opens to the empty space on the 5 th level. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Level 3	This level contains a fire pump and booster pump, as well as an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is heated. No signs of active water incursion, visible mold growth, or unusual odors were noted.

Location/Floor	Observations/Comments
Level 2	This level contains an electrical switchgear room, stairway pressurization equipment, and an airway facility fire suppression access room which houses vertical plumbing risers. A convective heating system exists where circulating water keeps the chase warm. Steel members have spray applied fireproofing, and fiberglass insulation has been installed on the walls. The exterior of the elevator shaft is visible in this room. This level is heated. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
First Floor	An area of discoloration on the ground floor in a stairwell was reported to the inspection team. The major area of discoloration appears to be a dirty surface. However, further investigation, including pulling away cove base molding, revealed small patches (less than six square inches total) of suspect mold growth. No signs of active water incurSION, additional signs of visible mold growth, or unusual odors were noted.
Elevator Shaft and Pit Area	An inspection of the elevator shaft was facilitated by an elevator mechanic locking out the elevator and controlling its movement from the top of the cab. Some staining of the wall was noted on the 21 st level, but close examination determined the discoloration to be neither water staining nor mold growth. No signs of active water incurSION, visible mold growth, or unusual odors were noted in the elevator shaft. The elevator shaft pit area was examined and found to be clean and dry, with no standing water observed in the sump.

5.1 BUR - Bob Hope Airport

5.1.1 Tower Description

A review of as-built drawings of the Bob Hope Airport (originally the Burbank-Glendale-Pasadena Airport until it's name change in 2003) indicates that the tower is a "Low Activity Level" ATCT with a 350 ft² cab. The tower was originally designed in 1989 by the Leo A. Daly Company, Omaha, Nebraska. The BUR ATCT consists of nine levels connected to a base building.



5.1.2 Site Observations

Table 5.1 presented below, provides details regarding the site inspection. The following is a suggested action item:

1. A small patch (less than 3 square inches) of suspect mold growth was observed on the wall surface adjacent to a window on the third level. The suspect growth was revealed to tower personnel for cleaning. This activity can be completed locally.

Table 5.1
Specific Observations ATCT Site Inspection
Bob Hope Airport (BUR), Burbank, California
Airport Traffic Control Tower

Location/Floor	Observations/Comments
Cab Roof Area	HVAC units are located on the roof. Units were found to be clean and well maintained. Roof membrane in good condition. No pooling water observed.
Area Above Cab Ceiling	Area contains HVAC ductwork and electrical systems. Area is dusty. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Cab (9 th) Level	Inspection included opening and inspecting perimeter electrical cabinets under equipment consoles. Suspended ceiling tiles and carpet (squares) showed no visible sign of water damage. Dust observed on some ceiling tiles. Examination of exterior walkway revealed that exterior caulking, including around windows are in good condition. No signs of active water incursion, visible mold growth, or unusual odors were noted.

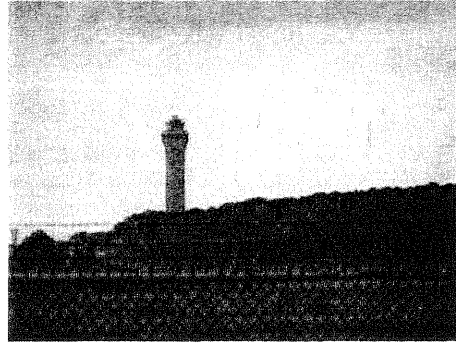
Location/Floor	Observations/Comments
CA01 Cable Access Level (8 th Level)	Small space used for storage. "Antenna Termination Access Door" (cable chase) was opened and inspected, revealing a view down several stories. No signs of active water incursion, visible mold growth, or unusual odors were noted.
J01 Junction (7 th) Level	Janitor closet clean and well maintained. Antenna cable chase inspected. No signs of active water incursion, visible mold growth, or unusual odors were noted.
6 th Level	Area is carpeted, with a suspended ceiling system, and is used as a break room with storage lockers. Investigation of a stained ceiling tile in one area revealed a sanitary drain line with rubber sleeves that may have leaked in the past, but were not leaking at present. The ceiling tile staining was not a result of water incursion into the structure. It was recommended that tower management replace the ceiling tile and investigate the drain line condition, should future leaking occur. No signs of active water incursion, visible mold growth, or unusual odors were noted.
5 th Level	This level consists of office space with a carpeted floor and suspended ceiling system. Discoloration in the antenna cable shaft appears to be fireproofing overspray, and not active mold growth. No signs of active water incursion, visible mold growth, or unusual odors were noted.
4 th Level	This level consists of a NATCA training room with a carpeted floor and suspended ceiling system. No signs of active water incursion, visible mold growth, or unusual odors were noted.

Location/Floor	Observations/Comments
3 rd Level	<p>Area is used as a break room and exercise facility. Evidence of past leakage was observed around the north window. Site personnel reported that the caulking around the window was recently replaced. Drywall around the window was evaluated with a moisture meter and found to be dry and consistent with other drywall surfaces in the room. A small patch (less than three square inches) of suspect mold growth was observed on the wall surface adjacent to the window</p> <p>The space above a stained ceiling tile was investigated, and no immediate causes for the staining were observed (no plumbing lines or evidence of water incursion observed upon inspection, and the tile itself was dry. No possible sources of water leakage or spillage were observed in the same area on the floor above (4th level). It was recommended that tower management replace the ceiling tile and conduct routine observations to determine if staining reoccurs. As this is an interior wall, the staining was not considered to be from a source outside of the building envelope. No unusual odors detected.</p>
2 nd Level	<p>This level contains a 12" x 12" tile floor and suspended ceiling system. No discolored ceiling tiles, mold growth, or signs of water incursion were observed.</p>
First Floor	<p>Elevator equipment room and stairway pressurization fan room were clean. No signs of active water incursion, visible mold growth, or unusual odors were noted.</p>
Elevator Shaft and Pit Area	<p>An inspection of the elevator shaft was facilitated by an elevator mechanic locking out the elevator and controlling its movement from the top of the cab. Some streaking of drywall (gypsum shaft liner) was observed on the right front of the elevator shaft (facing the elevator entrance doors) on the 7th through 3rd floor elevations; most likely as a result of application of fireproofing products during construction. Direct inspection (by flashlight) revealed no signs of active water incursion or visible mold growth, and no unusual odors were observed.</p> <p>The elevator shaft pit area was examined and found to be clean and dry, with no standing water observed in the sump.</p>

6.1 IAH - George Bush Intercontinental /Houston Airport

6.1.1 Tower Description

The tower was opened in 1997, and consists of 18 floors, not including the mechanical penthouse above the cab level. The tower shaft exterior is constructed of pre-cast concrete panels, which flare out to a maximum diameter at the junction level. The cab level and penthouse level exteriors are constructed of metal insulated panels. The original roof is present, and is constructed of a rubber membrane and metal flashing. The roof has a reported lifespan of 20 years. The tower shaft contains functional space, which includes several offices, a fitness room, and a smoking room. Each occupied space within the tower shaft was provided conditioned air by a ceiling mounted AHU. In addition to functional space, each floor of the tower shaft contained an electrical chase room, and a pipe chase room.



Previous water event history includes Hurricane Ike in September 2008, water pump release on the second floor in 2007, condensation occurs on poorly insulated elbows and valves of chilled water lines on Floors 3 through 12, and when significant rain events occur with a strong west wind (rare), rain water intrusion is observed on Floors 3 to ground. Hurricane Ike and the water pump failure were one time events, and repairs were made after the events. The condensation affects ceiling tiles below the chilled water pipes and is ongoing. The point(s) of water intrusion which occur during rain events with a strong west wind were unable to be determined during the inspection.

The inspection team included a mold inspector licensed by the TDSHS to assure compliance with Texas state requirements.

6.1.2 Site Observations

Table 6.1 presented below, provides details regarding the site inspection. The following are suggested action items:

1. On the 12th level, the NATCA office contained one moisture affected ceiling tile with visible growth. The ceiling tile was located directly below a poorly insulated chilled water valve, on which condensation was present at the time of the survey. Similar conditions were observed on the 11th down to the 5th levels. The insulation on the chilled water valves should be corrected, and the stained ceiling tile removed and replaced. This activity can be completed locally.

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2. Small quantities (each less than two ft²) of visible mold were observed on the second, first, and ground floors. These conditions were reported to facility management personnel for follow-up.
3. It was reported by building personnel that rain water enters an outdoor air duct penetrating through a concrete exterior panel in the fitness room, and allows rain water to leak down the duct and out of a duct seam, onto the ceiling tiles. The condition of the exterior panel should be investigated and corrected if necessary.
4. It was reported by building personnel that, during heavy rain events, water leaks down a north mullion at the cab level. Additional water leaks were reported on the north side at the Junction Level. The source of these reported leaks could not be determined during the site survey and no active leakage was observed. If these reported leaks persist, the source of the leakage should be determined and corrected.
5. An elevator shaft inspection could not be performed during the survey as an elevator technician was not available. An inspection of the elevator shaft should be completed as a follow-on effort.

Table 6.1
Specific Observations ATCT Site Inspection
George Bush International/ Houston Airport (IAH), Houston, Texas
Airport Traffic Control Tower

Location/Floor	Observations/Comments
Cab Roof Area	Evidence of patching of roof membrane is present after hurricane Ike. Roof membrane is generally in good condition. Gaps in between exterior metal panels of the cab penthouse appear to have been previously re-caulked in some areas.
Cab Penthouse	Area contains electronic equipment racks. Ceiling is insulated with fiberglass insulation. Water stains were located on the interior housing of the ASDE radar. However, the stains were dry at the time of the survey. No signs of active water incursion, visible mold growth, or unusual odors were noted.

Location/Floor	Observations/Comments
Cab Level	<p>Inspection included opening and inspecting perimeter electrical cabinets under equipment consoles. Foil-backed insulation was visible on exterior concrete walls under the consoles. It was reported that during heavy rain events, water leaks down a north mullion. However, evidence of water damage could not be observed during the survey. No signs of active water incursion, visible mold growth, or unusual odors were noted.</p>
Cable Access Level	<p>Insulation was not observed on the exterior concrete panels. Water stains were observed on the drywall wall separating the exterior unconditioned space and the interior of the cable access level. It is likely that water stains entered through unsealed crevices in the cab catwalk. The water stains were dry at the time of the survey. No signs of active water incursion, visible mold growth, or unusual odors were noted.</p>
Junction Level	<p>Moisture drip stains were observed on the top of the metal window frames in the male and female restrooms and the stairwell. An unsealed gap between the window frame and the building was observed in the stained areas. It is likely that the source of the water drip stains was rain entering the building or condensation occurring from outdoor air entering near ceiling perimeter supply air diffusers. Condensation on metal manual dampers on in Rooms J8 and J9 resulted in stained ceiling tiles but no visible mold growth. One water stained ceiling tile was observed in the break room and was located immediately below a water pipe.</p> <p>In the mechanical room, two inch fiberglass insulation covers the exterior wall. It was reported by on-site personnel that water intrusion along the north wall occurs during some rain events. The wall was covered with insulation at the time of the survey, and the source could not be determined.</p> <p>No signs of visible mold growth, or unusual odors were noted.</p>
Sub-Junction Level	<p>The area contains electronic equipment on a raised platform floor. The mechanical room, which was the only place the exterior wall could be observed, contained plywood covering over the exterior concrete panels. No signs of active water incursion, visible mold growth, or unusual odors were noted.</p>

Location/Floor	Observations/Comments
13 th Level	This level consists of transformers and mechanical equipment. The areas are finished with drywall, and no access to the exterior wall was present. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
12 th Level	This level consists of a NATCA office (12S5), an electrical room (12S4), and a pipe chase room (12S3). The NATCA office contained one moisture affected ceiling tile with visible growth. The ceiling tile was located directly below a poorly insulated chilled water valve, which condensation was present at the time of the survey. No signs of mold growth, water incurSION or unusual odors detected in Rooms 12S4 and 12S3.
11 th Level	This level contains a fitness room (11S5) an electrical room (11S4), and a pipe chase room (11S3). The fitness room contained one moisture stained ceiling tile with visible mold growth and was located directly beneath a sweating chilled water valve. It was reported by building personnel that rain water enters an outdoor air duct penetrating through a concrete exterior panel in the fitness room, and allows rain water to leak down the duct and out of a duct seam onto the ceiling tiles. No signs of mold growth, water incurSION or unusual odors detected in Rooms 11S4 and 11S3.
10 th Level	The exterior concrete panel wall was exposed and uninsulated in Room 10S4. In Room 10S3, fiberglass insulation covers the exterior wall. No signs of active water incurSION, visible mold growth, or unusual odors were noted.
9 th Level	In Room 9S3, a slowly leaking fire pipe was identified. The slowly leaking pipe was not impacting any building materials prone to harboring microbial growth. No odors associated with microbial growth were detected on the level.
8 th Level	This level contains an office room (8S5), an electrical room (8S4), and a pipe chase room (8S3). The office room was conditioned and contained one water stained ceiling tile with visible microbial growth below a poorly insulated chilled water valve. No other signs of water damage or microbial growth were identified.

Location/Floor	Observations/Comments
7 th Level	This level contains a smoking room (7S5), an electrical room (7S4), and a pipe chase room (7S3). The office room was conditioned, and contained one water stained ceiling tile with visible microbial growth below a poorly insulated chilled water valve. No other water damaged building materials or mold growth were observed.
6 th Level	This level contains an office room (6S5), an electrical room (6S4), and a pipe chase room (6S3). The office room was conditioned, and contained one water stained ceiling tile with visible microbial growth below a poorly insulated chilled water valve. No other signs of water damage or microbial growth were identified.
5 th Level	This level contains an office room (5S5), an electrical room (5S4), and a pipe chase room (5S3). The office room was conditioned, and contained one water stained ceiling tile with visible microbial growth below a poorly insulated chilled water valve. No other signs of water damage or microbial growth were identified.
4 th Level	This level contains an office room (4S5), an electrical room (4S4), and a pipe chase room (4S3). No signs of active water incursion, visible mold growth, or unusual odors were noted.
3 rd Level	<p>This level contains an office room (3S5), an electrical room (3S4), and a pipe chase room (3S3). The office room was conditioned, and contained one water stained ceiling tile with visible microbial growth below a poorly insulated chilled water valve.</p> <p>In Room 3S4, slight water streaking was identified on a drywall wall, but was dry at the time of the survey, and did not contain any visible mold growth. No other signs of water damage or microbial growth were identified.</p>

Location/Floor	Observations/Comments
2 nd Level	<p>This level contains the water pump room (2S5), an electrical room (2S4), and a pipe chase room (2S3). In Room 2S4, less than 2 ft² of visible mold growth was identified on the drywall near the cement floor. On an adjacent wall in Room 2S4, less than 1 ft² of visible mold growth was identified on the drywall near the cement floor. The affected drywall appeared dry at the time of the survey, and the moisture source could not be determined. In Room 2S3, 8 ft² of visible mold growth was observed on the drywall wall near the cement floor. No microbial growth was observed in the water pump room.</p>
1 st Level	<p>This level contains an office room (1S5), an electrical room (1S4), and a pipe chase room (1S3). The office room was conditioned, and contained one water stained ceiling tile with visible microbial growth below a poorly insulated chilled water valve. In Room 1S4, less than 2 ft² of visible microbial growth was identified on the drywall wall near the cement floor. The wall appeared dry at the time of the survey, and the moisture source resulting in the mold could not be identified.</p>
Ground Floor	<p>Near the door to outdoors is less than 1 ft² of visible mold growth. The likely source of the mold growth is water entering through the door seal during rain events. The wall was dry at the time of the survey.</p> <p>The ground floor mechanical areas did not contain any water damaged building materials or visible mold growth.</p>
Elevator Shaft and Pit Area	<p>An inspection of the elevator shaft was not completed during the survey, as an elevator technician could not be scheduled for the survey date.</p>

7.1 DFW-MB2 - Dallas / Fort Worth International Airport

7.1.1 Tower Description

The DFW Airport has two towers designated MA2 (east) and MB2 (west). The MB2 tower consists of 13 levels; not including a penthouse mechanical room. The tower was opened in 1994. The tower shaft exterior is constructed of pre-cast concrete panels, which flare out to a maximum diameter at the junction level. The cab level and penthouse level exteriors are constructed of metal insulated panels. The rubber membrane roof was replaced less than five years prior to the inspection date. All finished tower interiors including the cab level were remodeled in 2007. The tower shaft from the 10th floor to the 3rd floor contains unoccupied space, is unconditioned, and each floor is divided into Rooms TS5, TS4, and TS3. TS3 contains electrical and communication chase, TS4 contains a pipe chase, and TS5 is an empty room.



The inspection team included a mold inspector licensed by the TDSHS to assure compliance with Texas state requirements.

7.1.2 Site Observations

Table 7.1 presented below, provides details regarding the site inspection. The following are suggested action items:

1. The condition of exterior caulk on the cab level balcony and cable access level should be evaluated and addressed appropriately.
2. The only noted water damage by personnel on-site was a fire pipe leak on the ground mechanical floor. Minor mold growth was identified on the drywall near the fire piping, where the water release occurred. Small sections of visible mold were identified on the junction, 9th, and ground floor levels. These conditions were reported to facility management personnel for follow up.

Table 7.1
Specific Observations ATCT Site Inspection
Dallas/Fort Worth International Airport (DFW), Fort Worth, Texas
West Airport Traffic Control Tower

Location/Floor	Observations/Comments
Cab Roof Area	Roof consists of rubber membrane and with a metal flashing on the parapet wall. Reportedly a new roof was installed approximately five years ago. The roof appeared to be in acceptable condition without any cracks or gaps.
Cab Penthouse	Area contains electronic equipment racks. Ceiling is insulated with two inch thick fiberglass panel insulation. No evidence of water damage or visible mold was identified. No odors commonly associated with mold growth were detected.
Cab Level	Inspection included opening and inspecting perimeter electrical cabinets under equipment consoles, and above the suspended ceiling. The cab level was remodeled one year prior to the survey date. The exterior walls under the consoles were metal panel walls, which contained foam insulation. Metal panel exterior walls were observed above the suspended ceiling. No mold growth was identified on the cab level.
Cab Level Balcony	The balcony consists of a concrete floor, concrete panel wall, which flares out to the junction level below, and metal panel exterior wall below the windows of the cab. Degraded caulking between the concrete panels revealed the sponge spacer between panels. In addition, caulked joints between the cement floor and the metal panel walls of the cab appeared deteriorated in some areas.
Cable Access Level	Insulation was not observed on the exterior concrete panels. A wall composed of metal studs, fiberglass batting, and a single layer of green board separated the exterior unconditioned area from the interior of the cable access level. Breaks in the caulking allowed light, and presumably water, into the exterior perimeter area. Additionally, water damage to the green board was observed at joints where walls meet. It is likely that the joints allow rainwater to enter from the cab balcony above. No visible mold growth was identified in the Cable Access Level.

Location/Floor	Observations/Comments
Junction Level	<p>The level consists of restrooms, break rooms, offices, and a mechanical and janitorial room. In the restrooms, water drip stains were observed on the top of the metal window frame. It is likely that the drip stains were a product of condensation, with the perimeter ceiling supply air diffusers in close proximity.</p> <p>Two ft² of visible mold growth was identified below the humidifier in the J10 vestibule. A prior humidifier water pipe leak was the cause of the growth, which was dry at the time of the survey. Mold growth was also observed in the mechanical room on chilled water pipe insulation.</p>
Microwave (Junction) Balcony	<p>No standing water was observed on the balcony. No moisture entry points on the balcony were identified.</p>
Sub-junction Level	<p>The sub-junction contains one mechanical room, one work room, and a large room housing computer equipment. A raised platform floor is located in the computer and work rooms. Water damaged ceiling tiles were observed directly below penetrations for microwave conduit on the microwave balcony. It is likely that rainwater drips down unsealed penetrations onto the affected ceiling tiles.</p> <p>In the mechanical room, a clogged condensate drip pan or drain line has caused condensate to puddle on the floor before flowing to floor drain.</p> <p>No visible mold growth was identified on the sub-junction level.</p>
10 th Level	<p>This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall, and no access to the exterior wall was present. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing. No signs of water incursion, mold growth, or unusual odors were detected.</p>

Location/Floor	Observations/Comments
9 th Level	<p>This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall, and no access to the exterior wall was present. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing. In Room TS5, less than 16 ft² of visible mold growth was identified on the drywall near the floor. In Room TS4, 8 ft² of mold growth was observed on the drywall along the floor. The affected drywall appeared dry at the time of the survey, and no moisture source could be identified.</p>
8 th Level	<p>This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall, and the exterior wall was not insulated in TS5, TS4, or the connecting hallway. Room TS3 contained two inch thick foam insulation on exterior wall. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing. No visible mold growth was identified within the level.</p>
7 th Level	<p>This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall and the exterior wall was not insulated in TS5, TS4, or the connecting hallway. Room TS3 contained two inch thick foam insulation on exterior wall. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing. No visible mold growth was identified within the level.</p>
6 th Level	<p>This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall, and the exterior wall was not insulated in TS5, TS4, or the connecting hallway. Room TS3 contained two inch thick foam insulation on exterior wall. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing. No visible mold growth was identified within the level.</p>

Location/Floor	Observations/Comments
5 th Level	This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall, and the exterior wall was not insulated in TS5, TS4, or the connecting hallway. Room TS3 contained two inch thick foam insulation on exterior wall. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing. No visible mold growth was identified within the level.
4 th Level	This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall and the exterior was not accessible on the level. The rooms are not under HVAC control with the exception of a heater in the pipe chase room to keep the pipes from freezing. No visible mold growth was identified within the level. A stairwell pressurization fan was located in Room TS3.
3 rd Level	This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall, and the exterior was not accessible on the level. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing. No visible mold growth was identified within the level.
2 nd Level	The second level contains an office and a water pump station in a mechanical room. In the office, a water damaged ceiling tile was observed beneath a chilled water pipe. Condensation likely dripped from the pipe, resulting in the stain. No visible mold growth or evidence of water intrusion was observed on the floor.
1 st Level (Ground Floor)	This level is the ground floor and contains elevator equipment in the mechanical room. Visible mold growth was observed on drywall chase enveloping fire piping. A previous fire pipe release resulted in the moisture source responsible for the mold observed. The drywall appeared dry at the time of the survey.

Location/Floor	Observations/Comments
Elevator Shaft and Pit Area	The elevator shaft was constructed of one inch thick fire rated green board and metal structural members coated in fireproofing. Water streak stains were commonly observed in the chase, and appeared to be the result of fireproofing application. No evidence of water incursion or visible mold growth was observed within the elevator shaft.
Stairwell	Water streaking originating from a window frame was observed in the stairwell below the junction level. Deteriorated window caulking was identified as the source of moisture intrusion. A few water stains were present on walls on the sub-junction, 9 th , and 8 th levels. No source could be identified for these stains. However, at other inspected ATCTs, mopping of the stairwell was cited as the cause of stairwell water stains. No visible mold growth was identified within the stairwell and all water stained drywall was dry at the time of the survey.

8.1 DFW-MA2 Dallas / Fort Worth International Airport

8.1.1 Tower Description

The DFW Airport has two towers designated MA2 (east) and MB2 (west). The MA2 tower consists of 13 levels; not including a penthouse mechanical room. The tower was opened in 1994. The tower shaft exterior is constructed of pre-cast concrete panels which flare out to a maximum diameter at the junction level. The cab level and penthouse level exteriors are constructed of metal insulated panels. The rubber membrane roof was replaced less than five years prior to the inspection date. All finished tower interiors including the cab level were remodeled in 2007. The tower shaft from the 10th floor to the 3rd floor contains unoccupied, unconditioned space, and each floor is divided into Rooms TS5, TS4, and TS3. TS3 contains an electrical and communication chase, TS4 contains a pipe chase, and TS5 is an empty room.



Previous water damage included a condensate drain overflow in the sub-junction level mechanical room, and a water release on the 10th floor. Both events occurred greater than six months prior to the survey. Visible mold growth was identified on in the elevator shaft from Floors 6 to 2, and in unoccupied rooms on Floors 5, 4, and 3. The mold growth was observed on the bottom 12" of drywall in each instance, and appeared to be the result of a water event pooling and cascading down the floors. The mold growth observed may be the result of the water events noted above.

The inspection team included a mold inspector licensed by the TDSHS to assure compliance with Texas state requirements.

8.1.2 Site Observations

Table 8.1 presented below, provides details regarding the site inspection. The following are suggested action items:

1. The condition of exterior caulk on the cab level balcony and cable access level should be evaluated and addressed appropriately.
2. Potential sources of water incurSION exist on the sub-junction level. These should also be evaluated and addressed as appropriate.
3. Sections of visible mold growth were identified on the fifth through second levels and elevator shaft. These conditions were reported to facility management personnel for follow-up.

Table 8.1
Specific Observations ATCT Site Inspection
Dallas/Fort Worth International Airport (DFW), Fort Worth, Texas
East Airport Traffic Control Tower

Location/Floor	Observations/Comments
Cab Roof Area	Roof consists of rubber membrane, with a metal flashing on the parapet wall. The roof appeared to be in acceptable condition without any observed water incursion pathways.
Cab Penthouse	Area contains electronic equipment racks. Ceiling is insulated with two inch thick fiberglass panel insulation. No evidence of water damage or visible mold was identified. No odors commonly associated with mold growth were detected.
Cab Level	Inspection included opening and inspecting perimeter electrical cabinets under equipment consoles and above the suspended ceiling. The exterior walls behind the consoles were metal panel walls, which contained foam insulation. Metal panel exterior walls were also observed above the suspended ceiling. No mold growth was identified on the Cab Level.
Cab Level Balcony	The balcony consists of a concrete floor, concrete panel wall, which flares out to the junction level below, and metal panel exterior wall below the windows of the cab. Degraded caulking between the concrete panels revealed the sponge spacer between panels. In addition, caulked joints between the cement floor and the metal panel walls of the cab appeared deteriorated in some areas.
Cable Access Level	The level consists of mechanical and electrical systems. Insulation was not observed on the exterior concrete panels. A wall composed of metal studs, fiberglass batting, and a single layer of green board separated the exterior unconditioned area from the interior of the cable access level. Breaks in the caulking allowed light, and presumably water, into the exterior perimeter area to flow down the green board wall. Additionally, water damage to the green board was observed in numerous locations, and principally at joints where walls meet. It is likely that where the walls meet allows rainwater to enter from the cab balcony above. No visible mold growth was identified in the Cable Access Level.

Location/Floor	Observations/Comments
Junction Level	<p>The level consists of restrooms, break rooms, offices, and a mechanical and janitorial room. In the mechanical room, chilled water pipe insulation contained visible mold growth. In the mechanical room, the exterior wall was insulated with two inch thick fiberglass insulation.</p> <p>No evidence of water incurSION or mold growth was observed on the junction level.</p>
Microwave (Junction) Balcony	<p>No standing water was observed on the balcony. No moisture entry points were identified.</p>
Sub-Junction Level	<p>The sub-junction contains one mechanical room, one work room, and a large room housing computer equipment. A raised platform floor is present in the computer and work rooms. Water damaged ceiling tiles were observed in Room SJ3, directly below penetrations for microwave conduit on the microwave balcony. It is likely that rainwater drips down unsealed penetrations onto the affected ceiling tiles.</p> <p>In Room SJ3, a water stain was observed on the carpet tile around the door to the SJ8 outdoor airshaft. It is likely that the door seal failed, and allowed rainwater to enter during rain events.</p> <p>No visible mold growth was identified on the sub-junction level.</p>
10 th Level	<p>This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall and green board. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing. The exterior wall was not insulated.</p> <p>No signs of water incurSION, mold growth, or unusual odors were detected.</p>

Location/Floor	Observations/Comments
9 th Level	<p>This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall and green board. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing. The exterior wall was not insulated. No signs of water incursion, mold growth, or unusual odors were detected. However, water stains were observed on the hallway drywall wall, and were dry at the time of the survey.</p>
8 th Level	<p>This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall and green board. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing. The exterior wall was not insulated. No signs of water incursion, mold growth, or unusual odors were detected.</p>
7 th Level	<p>This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall, and the exterior wall was not insulated in TS5, TS4, or the connecting hallway. Room TS3 contained two inch thick foam insulation on exterior wall. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing. No visible mold growth was identified within the level.</p>
6 th Level	<p>This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall, and the exterior wall was not insulated in TS5, TS4, or the connecting hallway. Room TS3 contained two-inch thick foam insulation on exterior wall. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing. No visible mold growth was identified within the level.</p>

Location/Floor	Observations/Comments
5 th Level	<p>This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall, and the exterior wall was not insulated in TS5, TS4, or the connecting hallway. Room TS3 contained two inch thick foam insulation on exterior wall. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing.</p> <p>In Room TS5, 17 ft² of mold growth was observed on shared wall with elevator. Two 10 ft² mold growths were identified on the other two drywall walls in the room. The mold growths were only present along the bottom two feet of the walls, and appeared dry at the time of the survey.</p>
4 th Level	<p>This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall, and the exterior was not accessible on the level. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing.</p> <p>In Room TS5, 6 ft² of visible mold growth was observed on drywall wall near the cement floor.</p> <p>In Room TS4, 2 ft² of mold growth was identified on the west wall along the floor.</p>
3 rd Level	<p>This level consists of an unoccupied room (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). The areas all were built out with unfinished drywall, and the exterior was not accessible on the level. The rooms are not under HVAC control, with the exception of a heater in the pipe chase room to keep the pipes from freezing. No visible mold growth was identified within the level.</p> <p>In Room TS5, 10 ft² of mold growth was identified on the north wall shared with the elevator. In Room TS4, 10 ft² mold growth was identified along west wall. Pattern of moisture staining and growth indicates moisture source may originate from a level above. In the north end of the hallway less than 1 ft² mold growth was observed.</p>

Location/Floor	Observations/Comments
2 nd Level	The second level contains an office (TS5), a pipe chase room (TS3), and an electrical chase room (TS4). Interior finishing materials within the office included wainscoting and wallpaper. In Room TS4, less than 2 ft ² of visible mold growth was observed in a corner near the cement floor.
1 st Level (Ground Floor)	This level is the ground floor and contains elevator equipment in the mechanical room. No evidence of water damage or mold growth was observed.
Ground Floor	The ground floor consists of elevator machinery in a mechanical room, and an elevator lobby. No evidence of water damage or mold growth was observed.
Elevator Shaft and Pit Area	The elevator shaft was constructed of one inch thick fire rated green board, and metal structural members coated in fireproofing. Water streak stains were commonly observed in the chase and appeared to be the result of fireproofing application. Visible mold growth was observed on the green board paper exterior on Levels 6 through 2. The mold growth was located near the deck of each floor, and appeared dry at the time of the survey. The moisture source could not be identified from inside or outside of the elevator shaft.
Stairwell	The stairwells were inspected and contained minor water streaks along some of the walls. Periodic mopping of the stairwell may account for the minor water stains observed. No visible mold growth or signs of water intrusion were identified within the stairwells.

9.1 CVG - Cincinnati/Northern Kentucky International Airport

9.1.1 Tower Description

The CVG ATCT is a 15 story structural steel and concrete structure, with an ASDE penthouse level. The exterior of the tower shaft is bare concrete. The tower cab, junction, and subjunction levels of the tower are occupied. The other floors of the tower shaft are unoccupied. The tower shaft is served by a geared traction elevator and a single, pressurized exit stairway. The ATCT is connected to the base building via a two story link structure.



The CVG ATCT was built approximately 15 years ago, but remained vacant and unconditioned for the next five years. Water released from a clogged drain on the tenth floor also resulted in drywall damage and fungal growth that was later remediated. Finally, high humidity on the sub-junction level promoted fungal growth that was remediated. A dehumidifier was subsequently installed.

9.1.2 Site Observations

Table 9.1 presented below, provides details regarding the site inspection. The following are suggested action items:

1. Elevated moisture and intermittent fungal growth were present in some locations along the drywall wall on the Cable Access Level. Condensation appeared to be the major source of water affecting this wall. Condensation in this area should be controlled and the intermittent fungal growth remediated. This activity can be completed locally.
2. On the Junction (13th) Level, in the junction vestibule area, a small section of fungal growth was observed on the floor near the drain of a humidifier. Stained ceiling tiles were observed on this level. The sources of water staining the ceiling tiles should be determined and corrected and the affected tiles replaced. The observed growth should be remediated. This activity can be completed locally.
3. A small quantity of fungal growth was observed on the east wall of the mechanical room near the floor on the Subjunction (12th) Level. More fungal growth was observed on this level on the south wall below an I-beam that penetrated the wall. Intermittent fungal growth was observed in three locations in Room 10TS5, and in two locations in Room 10TS3. The observed growth should be remediated. This activity can be completed locally.

4. A large section of fungal growth was observed on the unfinished side of hallway drywall in a pipe plenum on one side of the Ground Floor. Additional (intrusive) inspections should be completed in this area to determine the quantity of mold present. This inspection will determine if this condition can be addressed locally, or if remediation by a qualified contractor is required.

Table 9.1
Specific Observations ATCT Site Inspection
Cincinnati – Northern Kentucky International Airport (CVG), Covington, Kentucky
Airport Traffic Control Tower

Location/Floor	Observations/Comments
Cab Roof Area	Roof membrane appeared to be in good condition. No significant standing water was observed. Sufficient caulking appeared to be present between metal panels and windows. Roof flashing appeared to be in good condition.
Cab Penthouse	The penthouse contains an equipment room and the ASDE drive room. A minor water stain was observed on drywall adjacent the catwalk door. No other water damaged materials and no microbial growth were observed in the penthouse.
Cab (15 th) Level	The cab inspection was performed by opening and inspecting perimeter electrical cabinets under equipment consoles. A minor water stain was observed in cabinetry below the sink. No other water damage and no microbial growth were observed in the cab level.
CA01 Cable Access Level (14 th Level)	The central portion of the cable access level is environmentally controlled. A drywall wall separates the conditioned space from the unconditioned space at the exterior of the level. Elevated moisture and intermittent fungal growth were present in some locations along the drywall wall. Condensation appeared to be the major source of water affecting this wall. No other water damage was identified on the floor.

Location/Floor	Observations/Comments
Junction (13 th) Level	<p>The junction level contains a break room, offices, restrooms, and a mechanical room. The mechanical room contains AHUs 13 and 14. All accessible HVAC system components appeared to be clean and well maintained.</p> <p>In the junction vestibule area, a small section of fungal growth was observed on the floor near the drain of a humidifier. In the hallway, wallpaper was becoming detached in some areas. Stained ceiling drywall was observed in the men's restroom. An insulated pipe runs above this area. A stained ceiling tile was also observed in the southwest corner office. Ductwork and piping were above this stain. Two stained ceiling tiles were observed in the break room. These tiles were below a hot water line valve.</p>
Junction Balcony	<p>Standing water was observed on some areas of the balcony. Water damaged drywall forming the bottom of two soffits above the balcony was also observed. These soffits appeared to form unconditioned space. Condensation inside the soffits, or weather, could have damaged the drywall.</p>
Sub-Junction (12 th) Level	<p>This level contains a mechanical room with two AHUs (11 and 12), an equipment room, and shop. All inspected HVAC system equipment appeared to be clean and well maintained. A small quantity of fungal growth was observed on the east wall of the mechanical room near the floor. More fungal growth was observed on the south wall below an I-beam that penetrated the wall. Both walls were visibly water stained, though low moisture content was measured in both. No water damage or mold growth was observed in the equipment room or shop.</p>
11 th Level	<p>This level contains Rooms 11TS3, 11TS4, and 11TS5. The level is unoccupied and unconditioned. Green board is installed along all exterior walls. The level also has an exterior wall plenum on one side that could be entered and inspected. No indications of water intrusion or mold growth were observed on this level.</p>

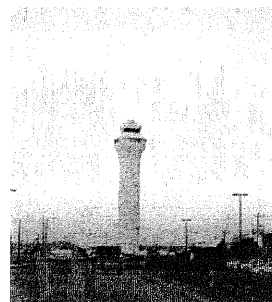
Location/Floor	Observations/Comments
10 th Level	This level contains Rooms 10TS3, 10TS4, and 10TS5. It is also unoccupied and unconditioned. A water stain was observed on drywall below the fire hydrant in the stairwell vestibule. This likely occurred during testing of the system. Intermittent fungal growth was observed in three locations in Room 10TS5, and in two locations in Room 10TS3. Water stained drywall was observed in the first room as well. No moisture source could be identified in these affected areas.
9 th Level	This level also contains three rooms; (9TS3, 9TS4, and 9TS5) and is unoccupied and unconditioned. An exterior wall plenum is also present. Minor superficial fungal growth was observed in one location in Room 9TS5. No water damage was observed.
8 th Level	This level is configured the same as the 9 th level. A small water stain and minor superficial fungal growth was observed on a wall in Room 8TS3. No other water damage or fungal growth was observed on the floor.
7 th Level	This level is configured the same as the 8 th level. Discoloration was observed on one wall in Room 8TS3. No other water damage or fungal growth was observed on the floor.
6 th Level	This level has the same configuration as the previous. No water damage or mold growth was observed.
5 th Level	This level is unconditioned and has the same configuration as the previous floor. No indications of water intrusion or mold growth were observed on this level.
4 th Level	This level has the same configuration as the previous floors. No water damage or mold growth was identified.
3 rd Level	On this level, water stains and minor fungal growth were observed on two walls in Room 3TS5. Water may have entered the room through an outdoor air intake on the exterior wall. No indications of water intrusion or mold growth were observed on this level.
2 nd Level	This level contains a pump station in Room 2TS5. The room is lined with foam glass insulation blocks. Some water staining was observed on the west wall. No other indications of water intrusion and no mold growth were identified.

Location/Floor	Observations/Comments
First Floor	A water stain and minor fungal growth were observed on the Room ITS5 wall adjacent the elevator shaft. The water source was likely the elevator shaft. In Room ITS3, minor water stains were observed along one wall. No additional fungal growth was identified.
Ground Floor	A large section of fungal growth was observed on the unfinished side of hallway drywall in a pipe plenum on one side of the floor. A valve was near the affected area, but no active leaks were observed.
Elevator Shaft and Pit Area	<p>The inspection of the elevator shaft was performed from the top of the car, with the help of an elevator mechanic. The elevator shaft was lined green board. No significant water streaking or damage was observed. No microbial growth was identified.</p> <p>No standing water was observed in the elevator shaft pit. No water damage was identified.</p>

10.1 SDF - Louisville Intl-Standiford Field Airport

10.1.1 Tower Description

The SDF ATCT is a 22 story structural steel and concrete structure, with a mechanical penthouse level. The exterior of the tower shaft is composed of pre-cast concrete panels, while the cab level and penthouse level exteriors are composed of metal insulated panels and glass windows. The tower cab, junction, and sub-junction levels of the tower are occupied. The remaining floors of the tower shaft are unoccupied, and not under HVAC control. Odd numbered Levels 5 through 15 in the tower shaft are mezzanine levels, and overlook the even numbered floors below. Foil-backed interior insulation was observed on the exterior wall of the cable access and sub-junction levels. Each of the pipe access chase rooms throughout the tower shaft were insulated with foil-backed insulation. With the exception of the insulated pipe chase rooms, all of the exterior walls in the tower shaft were bare. The tower shaft is served by a geared traction elevator and a single, pressurized exit stairway. The ATCT is connected to the base building via a link structure.



The SDF ATCT was completed in 1998. Reportedly, the only significant past water intrusion in the tower's history included rainwater entering through the roof and floor at the connection of the base building, to the tower at the ground level. The problem occurred in 2006, and the roof was immediately repaired to halt water intrusion. Outdoor grading issues allowed rainwater to pool against the ground level northeast exterior and infiltrate into the building. A French drain with a sump pump was installed outdoors to collect and pump excess rain water away from the tower and link building perimeters. Internal past water release events included a fire pipe water seal on the third floor that failed, and allowed water to leak to floors below.

10.1.2 Site Observations

Table 10.1 presented below, provides details regarding the site inspection. The following are suggested action items:

1. Replace the interim French drain and sump pump with a long term solution. Potential solutions may include grading the soil away from the building and the professional installation of a suitable outdoor drainage system to prevent rain water from standing near the building.

Table 10.1
Specific Observations ATCT Site Inspection
Louisville International Airport (SDF), Louisville, Kentucky
Airport Traffic Control Tower

Location/Floor	Observations/Comments
Cab Roof Area	Roof consists of a rubber membrane and metal flashing covering the parapet wall. Moderate standing water was observed in some areas, but did not appear to be leaking into the interior below. The penthouse exterior consisted of metal insulated panels, which were caulked in some locations and not in others.
Cab Penthouse	Area contains electronic equipment racks. Ceiling is insulated with foil-backed fiberglass insulation. No visible signs of water intrusion or mold growth were identified within the penthouse level.
Cab Level	Inspection included opening and inspecting perimeter electrical cabinets under equipment consoles. The exterior walls under the consoles were inaccessible. However, foil-backed fiberglass insulation was observed on supply ductwork terminating at perimeter diffusers below the cab windows. No signs of water intrusion or mold growth were identified on the cab level.
Cab Level Balcony	The balcony consists of a concrete floor, concrete panel wall which flares out to the junction level below, and metal insulated panel exterior wall below the windows of the cab. No gaps in the building envelope were identified.
Cable Access Level	No wall was present separating an outer unconditioned area from the interior of the level, which is common at other Leo A. Daly towers. Foil-backed fiberglass insulation was observed on the exterior concrete panels. In addition, metal structural members in close proximity to the exterior wall were wrapped in foil-backed fiberglass insulation. No evidence of water intrusion, condensation, or visible mold growth were identified on the level.
Junction Level (19 th Level)	The level consists of restrooms, break rooms, offices, fitness room, janitorial room, and a mechanical room. No water damaged building materials or visible mold growth was observed on the level.

Location/Floor	Observations/Comments
Junction Microwave Balcony	No standing water was observed on the balcony. No deficiencies or moisture entry pathways were identified on the balcony.
Sub-Junction Level (18 th Level)	The sub-junction contains one mechanical room, one shop room, and a large room housing computer equipment. A raised platform floor is located in the computer and shop rooms. Drywall covered the exterior pre-cast concrete panels. No signs of water damage or visible mold growth were observed.
17 th Level	This level contains two AHUs. Both AHUs had clean filters, and the front surface of the cooling coils were clean. The condensate drip pan and rear surface of the coils were inaccessible. Green board prohibited access to the exterior wall. No signs of water incursion, mold growth, or unusual odors were detected.
16 th Level	This level consists of the battery transformer room (1602) and the pipe chase room (1603). In Room 1602, the exterior wall was inaccessible, and in Room 1603, the exterior wall was insulated with foil-backed fiberglass insulation. No signs of mold growth, water incursion or unusual odors detected on the 16th level.
15 th Level	The 15 th level is a mezzanine level and is open to the floor below. The level consists of an empty room (1502) and a pipe chase room (1503). The exterior wall is bare, except for the pipe chase room, which is insulated with foil-backed fiberglass insulation. The floor is not under HVAC control, and is not occupied. No signs of water damage or visible mold growth were identified.
14 th Level	The level consists of a large, unoccupied room (1402) and a pipe chase room (1403). The exterior concrete panel walls in Room 1402 were exposed and bare, while the exterior walls in the pipe chase room were insulated with foil-backed fiberglass insulation. None of the rooms were occupied or under HVAC control. No water damaged materials or visible mold growth were observed on the level.

Location/Floor	Observations/Comments
13 th Level	The 13 th level is a mezzanine level, and is open to the floor below. The level consists of an empty room (1302) and a pipe chase room (1303). The exterior wall is bare, except for the pipe chase room, which is insulated with foil-backed fiberglass insulation. The floor is not under HVAC control and is not occupied. No signs of water damage or visible mold growth were identified.
12 th Level	The 12th level consists of a large, unoccupied room (1202) and a pipe chase room (1203). The exterior concrete panel walls in Room 1202 were exposed and bare, while the exterior walls in the pipe chase room were insulated with foil-backed fiberglass insulation. None of the rooms were occupied or under HVAC control. No water damaged materials or visible mold growth were observed on this level.
11 th Level	The 11 th level is a mezzanine level, and is open to the floor below. The level consists of an empty room (1102) and a pipe chase room (1103). The exterior wall is bare, except for the pipe chase room, which is insulated with foil-backed fiberglass insulation. The floor is not under HVAC control and is not occupied. No signs of water damage or visible mold growth were identified.
10 th Level	The 10 th level consists of a large, unoccupied room (1002) and a pipe chase room (1003). The exterior concrete panel walls in Room 1002 were exposed and bare, while the exterior walls in the pipe chase room were insulated with foil-backed fiberglass insulation. None of the rooms were occupied or under HVAC control. No water damaged materials or visible mold growth were observed on the level.
9 th Level	The 9 th floor is a mezzanine level, and was inaccessible due to a broken lock mechanism. The 9th floor could not be inspected during the survey.
8 th Level	The level consists of a large, unoccupied room (802) and a pipe chase room (803). The exterior concrete panel walls in Room 802 were exposed and bare, while the exterior walls in the pipe chase room were insulated with foil-backed fiberglass insulation. None of the rooms were occupied or under HVAC control. No water damaged materials or visible mold growth were observed on the level.

Location/Floor	Observations/Comments
7 th Level	The 7 th level is a mezzanine level, and is open to the floor below. The level consists of an empty room (702) and a pipe chase room (703). The exterior wall is bare, except for the pipe chase room, which is insulated with foil-backed fiberglass insulation. The floor is not under HVAC control and is not occupied. A minor water stain was observed below the fire valve. However, the stain was dry at the time of the survey and contained no visible mold growth. No visible mold growth was identified on the 7th level.
6 th Level	The 6 th level consists of a large, unoccupied room (602) and a pipe chase room (603). The exterior concrete panel walls in Room 602 were exposed and bare, while the exterior walls in the pipe chase room were insulated with foil-backed fiberglass insulation. None of the rooms were occupied or under HVAC control. No water damaged materials or visible mold growth were observed on this level.
5 th Level	The 5 th level is a mezzanine level, and is open to the floor below. The level consists of an empty room (502) and a pipe chase room (503). The exterior wall is bare, except for the pipe chase room, which is insulated with foil-backed fiberglass insulation. The floor is not under HVAC control and is not occupied. No water damaged materials or visible mold growth were identified on the 5th level.
4 th Level	The 4 th level consists of a chilled water pump room (402) and a pipe chase room (403). The exterior concrete panel walls in Room 402 were exposed and bare, while the exterior walls in the pipe chase room were insulated with foil-backed fiberglass insulation. None of the rooms were occupied or under HVAC control. No water damaged materials or visible mold growth were observed on this level.
3 rd Level	The 3 rd level consists of a fire sprinkler pump room (302) and a pipe chase room (303). The exterior concrete panel walls in Room 302 were exposed and bare, while the exterior walls in the pipe chase room were insulated with foil-backed fiberglass insulation. None of the rooms were occupied or under HVAC control. No water damaged materials or visible mold growth were observed on this level.

Location/Floor	Observations/Comments
2 nd Level	The 2 nd level consists of stairwell pressurization fan room (202) and a pipe chase room (203). The exterior concrete panel walls in Room 202 were exposed and bare, while the exterior walls in the pipe chase room were insulated with foil-backed fiberglass insulation. None of the rooms were occupied or under HVAC control. No water damaged materials or visible mold growth were observed on this level.
1 st Level	The 1 st level consists of an elevator lobby, elevator room, Room 104, Room 105, and access to the base building. Slight water damage was observed on drywall in Room 105. However, the damage was dry at the time of the survey, and did not feature any visible mold growth. No visible mold growth was observed on this level.
Elevator Shaft	The elevator shaft was lined with green board. No evidence of water incursion or microbial growth was observed on any of the levels. Minor water staining to the green board was observed at the top of the shaft and at the 3 rd level.

11.1 ORD - Chicago O'Hare International Airport

11.1.1 Tower Description

The ORD South ATCT is an 18 story structural steel and concrete structure, with a mechanical penthouse level. The exterior of the tower shaft is lined with glass panels to match the architectural style of the surrounding airport. The tower exterior above the junction level is constructed of metal insulated panels. On the cable access level, AHUs provide heated air to the cavity between the exterior metal insulated panels and the interior insulation. The purpose of the heated panels is to reduce the likelihood of snow and ice accumulations falling and potentially harming those below. The interior of the cavity is composed of metal studs, fiberglass batting, and a plastic sheet vapor barrier. Unlike many other Leo Daly towers inspected, the microwave balcony or junction level balcony is not present, and the area is enclosed within the building.



The tower cab, junction, and sub-junction levels of the tower are occupied. The other floors of the tower shaft are unoccupied. The tower shaft is served by a geared traction elevator, and a single, pressurized exit stairway. The ATCT is connected to the base building via a two story link structure.

The ORD South ATCT has experienced water intrusion/release problems in the past. Condensation in the ASDE penthouse was a significant issue until spray on thermal insulation was applied to all penthouse metal surfaces and surfaces above the cab suspended ceiling in 1998. In 2006, a sprinkler failure on the cable access level (17th level) caused damage to many of the lower floors. The remnants of this damage, in the form of visible drywall patches, are present on most floors. And finally in the summer of 2008, ground water flooded the ground level of the tower during heavy precipitation.

11.1.2 Site Observations

Table 11.1, presented below, provides details regarding the site inspection. No evidence of active water incursion or active mold growth were observed during the site inspection, and no immediate action items are suggested based upon site observations.

Table 11.1
Specific Observations ATCT Site Inspection
Chicago – O’Hare International Airport (ORD), Chicago, Illinois
South Airport Traffic Control Tower

Location/Floor	Observations/Comments
Cab Roof Area	Roof membrane appeared to be in good condition. Ice and snow accumulations were present in some areas. Modifications had been performed on the metal panel exterior to form a “drip curtain” that carries water away from the panel exterior.
Cab Penthouse	Spray on thermal insulation had been installed to all metal surfaces to solve a past condensation issue. No active condensation was observed. No indications of water intrusion or visible mold growth were observed.
Cab (18 th) Level	The tower cab had been reconfigured approximately one year prior to this inspection. Exterior finishing materials and insulation were obscured by metal electrical cabinets below control consoles. Active condensation was observed above some windows. No water damage or visible mold growth were observed.
CA01 Cable Access Level (17 th Level)	Most of this level is environmentally controlled with fireproofing applied to structural steel and fiberglass insulation covered by a plastic moisture barrier installed to the exterior metal panel wall. No indications of water intrusion or microbial growth were observed in the conditioned space. On the east side of the floor along the exterior, a space constructed of drywall and Dura-Rock panels acts as make-up air intake chamber. The space contains a heating unit. Water stains were observed on drywall near the outside air intake. No other water damage was observed and no microbial growth was present. A sprinkler system failure on this level approximately two years prior to this inspection affected most of the lower floors of the tower.

Location/Floor	Observations/Comments
Junction (16 th) Level	<p>The junction level contains a break room, offices, a smoking lounge, restrooms, and a mechanical room. The mechanical room contains AHUs 7 and 8. All accessible HVAC system components appeared to be clean and properly maintained. An active water leak was observed from a chilled water line entering AHU 8. The released water was exiting the room through a floor drain.</p> <p>Following the sprinkler failure described above, water damaged drywall and ceiling tiles were removed from the junction level. No water damage or microbial growth was observed during the inspection.</p>
Sub-Junction (15 th) Level	<p>This level contains a mechanical room with two AHUs, an electrical room, and an equipment room. Water flowing into the floor drain of the 16th floor mechanical room was entering the 15th floor mechanical room and spilling onto a drywall wall. Elevated moisture was measured in the affected material. Additionally, a pre-air filter in AHU 6 was water stained from what appeared to be a valve failure above the AHU. No active water flow was observed in this area. No other water damage and no visible mold growth were observed on this level.</p>
14 th Level	<p>This level contains a transformer room, cable room, elevator lobby, and stairwell vestibule. Dura-Rock panels and fiberglass insulation are installed along the exterior wall of the transformer room. Drywall patches were observed in the vestibule, a remnant of the past sprinkler failure. No indications of water intrusion or mold growth were observed on this level.</p>
13 th Level	<p>This level contains a main room, cable room, and stairwell vestibule. Drywall patches were visible in the vestibule. No water damage or mold growth was observed. The 13th Level has no elevator access. No indications of water intrusion or mold growth were observed on this level.</p>
12 th Level	<p>This level contains a main room, cable room, elevator lobby, and stairwell vestibule. Drywall patches were observed in the stairwell vestibule. No indications of water intrusion or mold growth were observed on this level.</p>

Location/Floor	Observations/Comments
11 th Level	This level contains a main room, cable room, and stairwell vestibule. Again drywall patches were visible in the vestibule. No water damage or mold growth was observed. The 11 th Level has no elevator access.
10 th Level	This level has a similar layout to that of the 12 th floor. Drywall patches were observed in the stairwell vestibule. No indications of water intrusion or mold growth were observed on this level.
9 th Level	This level has a similar layout to the 11 th floor, and no elevator access. Again drywall patches were visible in the vestibule. No indications of water intrusion or mold growth were observed on this level.
8 th Level	This level has a similar layout to that of the 12 th floor. Drywall patches were observed in the stairwell vestibule. No indications of water incursion or mold growth were observed on this level.
7 th Level	This level has a similar layout to the 11 th floor, and no elevator access. Again drywall patches were visible in the vestibule. No indications of water incursion or mold growth were observed on this level.
6 th Level	The main room of this level contains the stairwell vestibule pressurization fan. No indications of water incursion or mold growth were observed on this level.
5 th Level	The main room of this level contains the stairwell pressurization fan. No indications of water incursion or mold growth were observed on this level.
4 th Level	This level has a similar layout to that of the 12 th floor. No indications of water incursion or mold growth were observed on this level.
3 rd Level	This level contains a mechanical room and electrical room. No indications of water incursion or mold growth were observed on this level.
2 nd Level	This level has a similar layout to that of the third floor. No indications of water incursion or mold growth were observed on this level.
First Floor	The first floor contains two rooms. No indications of water incursion or mold growth were observed on this level.
Ground Floor	Stairwell drywall was clear of fungal growth and water damage.

Location/Floor	Observations/Comments
Elevator Shaft and Pit Area	<p>The inspection of the elevator shaft was performed from the top of the car, with the help of an elevator mechanic. The elevator shaft was lined on three sides by common drywall. The exterior wall was bare concrete through most of the shaft. No water streaks were observed. Small areas of discoloration were observed on drywall at the 17th level, and again at the top of the shaft. No indications of active water incurion or mold growth were observed in the elevator shaft.</p> <p>The elevator shaft pit was dry. It contained no sump. No water damage was observed.</p>

12.1 DEN - Denver International Airport

12.1.1 Tower Description

The DEN ATCT was designed by the Leo A. Daly Company and served as a prototype for future tower construction. Construction of the tower began in May 1991, and was finished in November 1992. The tower was placed in operation in February 1995.



The tower consists of 18 floors; not including the mechanical penthouse above the cab level. The tower shaft exterior is constructed of pre-cast concrete panels which flare out to a maximum diameter at the junction level. The cab level and penthouse level exteriors are constructed of metal insulated panels. The cab, junction, and sub-junction levels are the only occupied areas within the tower. Each floor of the unoccupied tower shaft contains an unmarked empty room, electrical chase room, electrical chase room vestibule, stairwell vestibule, and a corridor connecting the rooms. No conditioned air is provided to any floors within the tower shaft below the sub-junction level, except for the ASDE-X room on the 10th floor.

On-site personnel reported a broken condensate drain line on the first floor, which resulted in water damaged drywall. According to on-site personnel, the drywall was promptly dried; however, mold was later discovered behind wall coverings, was sampled, and found to not be actively growing. The wall was painted with a microbial inhibiting paint.

12.1.2 Site Observations

Table 12.1 presented below, provides details regarding the site inspection. The following are suggested action items:

1. Crevices open to the outdoors were observed on the cable access level between the metal panels above the wall separating the exterior space from the interior space. Snow blown in from a recent storm was observed on the concrete floor of the exterior space. This condition should be further evaluated, as it presents a potential water incursion pathway.
2. Potential sources of water incursion exist on the sub-junction level. These should also be evaluated and addressed as appropriate.

Table 12.1
Specific Observations ATCT Site Inspection
Denver International Airport (DEN), Denver, Colorado
Airport Traffic Control Tower

Location/Floor	Observations/Comments
Cab Roof Area	Roof consists of concrete pavers over tar sheet. Reportedly a rubber membrane is present underneath the tar sheet. Recent snowfall was present on the roof at the time of the inspection and appeared to be melting and draining through roof drains properly. Metal panel penthouse exterior had caulked joints, which appeared to be weathering satisfactorily.
Cab Penthouse	Area contains electronic equipment racks. Ceiling is insulated with foil backed fiberglass insulation. Water stains were located on the interior housing of the ASDE radar. However, the stains were dry at the time of the survey, and no visible mold growth was detected. Condensation was observed on the roof hatch on the ceiling of the cab penthouse. The cold snow in contact with the metal hatch and indoor humidity contributed to the condition. The condensation was not impacting any building materials and appeared to be evaporating rapidly. No evidence of active water incursion or visible mold growth was identified within this level.
Cab Level	Inspection included opening and inspecting perimeter electrical cabinets under equipment consoles. The exterior walls under the consoles were inaccessible. Metal panel exterior walls were observed above the suspended ceiling at a distance, and appeared to have slight water streaking with rust residue. No evidence of active water incursion or visible mold growth was identified within this level.
Cab Level Balcony	The balcony consists of a concrete floor, concrete panel wall which flares out to the junction level below, and metal panel exterior wall below the windows of the cab. Degraded caulking between the concrete panels revealed the sponge spacer between panels.
Cable Access Level	Insulation was not observed on the exterior concrete panels. A wall composed of metal studs, fiberglass batting, and a single layer of gypsum board separated the exterior unconditioned area from the interior of the cable access level. Crevices open to the outdoors were observed between

Location/Floor	Observations/Comments
	<p>the metal panels above the wall separating the exterior space from the interior space. Snow blown in from a recent storm was observed on the concrete floor of the exterior space. None of the gypsum board was water stained, and no visible mold growth was identified. All of the gypsum board was dry at the time of the survey.</p>
Junction Level	<p>This level consists of restrooms, break rooms, offices, and a mechanical and janitorial room. Interior walls were finished with wood wainscoting and woven wallpaper. A suspended ceiling, and carpet or tile over concrete floors was also present. Three stained ceiling tiles were observed in the large break room. Above the two water stained ceiling tiles were penetrations, and the third water stained ceiling tile was below piping.</p> <p>In the mechanical room, two inch thick sulfur foam insulation covers the exterior wall. Accessible portions of AHUs 13 and 14 appeared clean and to be functioning properly. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.</p>
Microwave (Junction) Balcony	<p>A gypsum board soffit located on the east side of the tower was water stained with deteriorated, peeling paint. The soffit on the north side of the tower was slightly peeling, with no water stains observed. Metal grating was present instead of gypsum board on the south and west sides of the building. No standing water was observed on the balcony.</p>
Sub-Junction Level	<p>The sub-junction contains one mechanical room, one shop room, and a large room housing computer equipment. A raised platform floor is located in the computer and shop rooms. Water damaged ceiling tiles were observed in the SE corner of the large computer room directly below a ceiling penetration to the microwave balcony. Rain water likely leaks down through the penetration, and onto the affected ceiling tiles.</p> <p>The mechanical room, which was the only place the exterior wall could be observed, contained plywood covering over the exterior concrete panels, and in between the plywood and the concrete exterior wall was a sheet of polyethylene sheeting. Accessible portions of AHUs 11 and 12 were clean</p>

Location/Floor	Observations/Comments
	and appeared to function properly. A minor water leak was observed from hot water return piping. No visible mold growth or odors associated with mold growth were identified on the sub-junction level.
13 th Level	This level consists of transformers and mechanical equipment. The areas are finished with drywall, and no access to the exterior wall was present. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.
12 th Level	This level consists of the emergency communication radio room, an electrical room vestibule, and the electrical room vestibule. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.
11 th Level	<p>The level contains a radar equipment room, which is finished with carpet, painted drywall, and suspended ceiling. The room is under HVAC control. The exposed uninsulated concrete panels were observed in the electrical room, the electrical room vestibule, and the hallway.</p> <p>In the stairwell vestibule, water stained drywall was observed on the ceiling, and streaking down the walls. The chill water supply, return, and condensate drain line for the AHU supplying the radar equipment room is located above the ceiling of the stairwell vestibule. Condensation from poorly insulated pipe components or a leak likely resulted in the water staining. The affected drywall was dry at the time of the survey. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.</p>
10 th Level	The exterior concrete panel wall was exposed and uninsulated in the hallway, the large room, the electrical room, and the electrical vestibule room. None of the rooms were occupied, or under HVAC control. Slight discoloration of the drywall was observed in the stairwell vestibule, but was dry at the time of the survey. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.

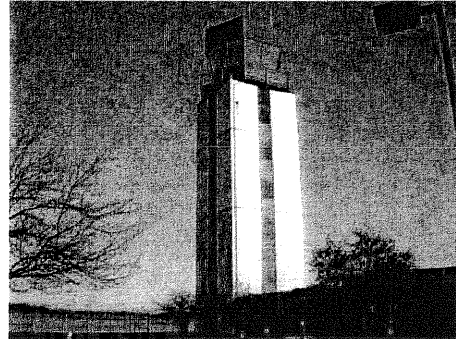
Location/Floor	Observations/Comments
9 th Level	The level consists of unoccupied, empty space that is not under HVAC control. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.
8 th Level	The level consists of unoccupied, empty space that is not under HVAC control. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.
7 th Level	The level consists of unoccupied, empty space that is not under HVAC control. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.
6 th Level	The level consists of unoccupied, empty space that is not under HVAC control. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.
5 th Level	The level consists of unoccupied, empty space that is not under HVAC control. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.
4 th Level	The level consists of unoccupied, empty space that is not under HVAC control. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.
3 rd Level	The level consists of unoccupied, empty space that is not under HVAC control. A stairwell pressurization fan is present in the electrical vestibule room. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.
2 nd Level	This level contains a water pump room, electrical room, electrical vestibule room, hallway, and stairwell vestibule room. In the water pump room, slight water staining was evident on the drywall near the cement floor. The affected drywall was dry at the time of the survey, and the likely cause of the water stained drywall was a past water release from the water pumps or associated piping. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.

Location/Floor	Observations/Comments
1 st Level	The first floor did not contain any evidence of water damage or mold growth. No odors commonly associated with mold growth were detected.
Ground Floor	Previous mold water damage and mold growth had occurred on this level, was remediated and the moisture source was eliminated. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.
Elevator Shaft and Pit Area	The elevator shaft was constructed of one inch thick fire rated green board and metal structural members coated in fireproofing. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected. The sump was dry at the time of the survey.
Stairwell	The stairwell extending from the junction level to the ground level was inspected. Water streak stains on drywall immediately below the stairwell landings, stairwell steps, and water drip stains on the underside of the stairs were observed consistently from Floor 13 to the ground floor. It was reported by personnel that the probable cause of the staining was the periodic mopping of the stairwell. On-site personnel could not recall any issues of condensation in the stairwell. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.

13.1 UGN - Chicago/Waukegan Regional Airport

13.1.1 Tower Description

The Waukegan Regional Airport is a general aviation facility characterized by the FAA as a “reliever airport” for Chicago O’Hare International Airport. The UGN ATCT is a Leo A. Daly design, with a 250 ft² cab at a height of 68 feet (ground to cab floor). It is designated as a “low activity” ATCT. The tower was commissioned in 1988.



The UGN ATCT reportedly has a history of problems, including past flooding, exterior caulk failures, and window leakage. It was reported that exterior wall insulation exhibits two to four inch gaps in some places, suggesting construction defects. A significant flood event occurred in the tower in December 2007. The flood occurred when a domestic water line burst on the fifth level during a severe winter storm. Due to the storm, response to the leak was delayed over two hours, during which water “cascaded” down the tower stairs and elevator shaft, and flooded ground floor areas. The cause of the pipe bursting is believed to be the result of inadequate insulation of a utility shaft that is located on an exterior wall and travels vertically virtually the entire shaft height. Extensive drywall removal/replacement work was completed following the flood event; however, significant quantities of visible mold currently exist on the first floor in the elevator lobby and stairway pressurization fan room. The UGN tower also exhibits problems with exterior window frames; including leakage and caulking failures. A project is reportedly planned to refurbish the exterior skin of the tower.

13.1.2 Site Observations

Table 13.1 presented below, provides details regarding the site inspection. The following are suggested action items:

1. It is recommended that a more extensive (intrusive) mold inspection be completed to determine the quantity and extent of mold growth, principally on the ground floor of the UGN tower. The inspection should be utilized to develop a specific scope of work for a remediation effort. Building issues causing and/or contributing to water incurSION and flooding should be corrected prior to replacement of removed drywall or other building components.
2. Although not a mold or water incurSION issue, the window on the 5th level currently held in place by wire should be repaired as it presents a significant safety hazard.

Table 13.1
Specific Observations ATCT Site Inspection
Waukegan Regional Airport (UGN)
Airport Traffic Control Tower

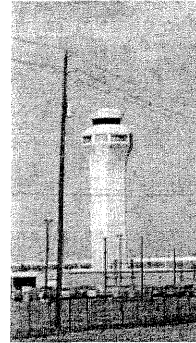
Location/Floor	Observations/Comments
Cab Level	Inspection included opening and inspecting perimeter electrical cabinets under equipment consoles. It was reported that a "one time event" occurred where water ran down the inside of the cab windows (northwest side) and pooled on the sill. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Junction Level	No reported flood damage on this level. Condensate reportedly pools on window sills, most likely due to inadequate insulation. No signs of active water incursion, visible mold growth, or unusual odors were noted.
Sub Cab Level	Gaps in exterior insulation three to four inches wide reported on this level. No signs of active water incursion, visible mold growth, or unusual odors were noted.
5 th Level	This level consists of a kitchen and break area. A significant amount of drywall has been removed, to repair plumbing lines that burst in this area. Cold air can be felt around the convector unit on an exterior wall. This condition suggests inadequate insulation, and potential defects with the seal around the exterior of the convector unit. No signs of active water incursion, visible mold growth, or unusual odors were noted.
4 th Level	Extensive flooding occurred on this level, and the ceiling sagged and fell. Wet drywall was removed. Evidence exists of past water leaks above the window on the northwest side. The interior wall appeared to currently be dry. The other window in this room is held in place by wires attached to the window and secured to the interior wall. The carpeting remains in the space, and no visible mold was observed under areas of the carpet inspected. No signs of active water incursion, visible mold growth, or unusual odors were noted.

Location/Floor	Observations/Comments
3 rd Level	This level is similar in condition to the 4 th level, where drywall and ceiling tiles have been removed. Noticeable drafts of cold air can be observed on both sides of the window at this level. No signs of active water incurion, visible mold growth, or unusual odors were noted.
2 nd Level	Drywall has been removed from around electrical panels and a corner pipe chase. Evidence of past water movement is observed in the cable shaft adjacent to the elevator shaft. No signs of active water incurion, visible mold growth, or unusual odors were noted.
Ground Floor	Drywall has been removed from the elevator lobby and significant areas of visible mold can be observed. These are currently "sealed" with polyethylene sheeting and duct tape. Visible mold growth was noted in the stairway pressurization fan room as well. No signs of active water incurion or unusual odors were noted.
Elevator Shaft and Pit Area	No arrangements had been made for an elevator mechanic during the inspection, so an inspection of the interior of the elevator shaft from the top of the cab was not possible. Limited access to the shaft interior was possible from the ground floor, and no visible streaking of drywall (gypsum shaft liner) was observed from that viewpoint. It was noted that there was water present in the sump pit at the bottom of the shaft; however, the source of this water could not be determined. No visible mold growth and no unusual odors were observed.

14.1 AUS - Austin Bergstrom International Airport

14.1.1 Tower Description

The tower was completed in 1998, and consists of 13 floors; not including the mechanical penthouse above the cab level. The tower shaft exterior is constructed of pre-cast concrete panels which flare out to a maximum diameter at the junction level. The cab level and penthouse level exteriors are constructed of metal insulated panels. The tower shaft contains functional space, which includes several offices, a fitness room, and a smoking room. Each occupied space within the tower shaft was provided conditioned air by a ceiling mounted AHU. In addition to functional space, each floor of the tower shaft contained an electrical chase room and a pipe chase room.



As reported by on-site personnel, the junction level has had a history of elevated relative humidity levels and condensation on the exterior of supply air ductwork and poorly insulated chilled water pipes, particularly in Room J8. A dehumidifier was installed in Room J8 and catch pans were installed beneath sweating valves to remedy the issues.

14.1.2 Site Observations

Table 14.1 presented below, provides details regarding the site inspection. The following are suggested action items:

1. The condition of exterior caulk on the cab level balcony and cable access level should be evaluated and addressed appropriately.
2. Visible mold was observed in the following locations:
 - A relatively small quantity (3 ft²) of visible mold was observed on the junction level.
 - In sub-junction level Room SJ8, three linear feet of mold affected pipe insulation was observed.
 - In Room 804, 5 ft² of visible mold growth was identified on the drywall near the cement floor.
 - In Room 204, less than 4 ft² of microbial growth was observed on the wall near the floor, and two linear feet of pipe insulation with visible growth was observed.

- On the ground floor, water stained drywall and less than 1 ft² of visible mold growth were identified below a poorly insulated chilled water line. Cleaning of this growth may be completed locally.
3. On the 8th level, Fitness Room 805 contained one moisture affected ceiling tile with visible growth. The ceiling tile was located directly below a poorly insulated chilled water valve, on which condensation was present at the time of the survey. The insulation on the chilled water valves should be corrected, and the stained ceiling tile removed and replaced. This activity can be completed locally.
 4. In Room 103, water damaged drywall was observed near the door to outdoors. It is likely that failing weather stripping allows rainwater to enter and affect the drywall. This condition represents a potential water incursion pathway, and should be further investigated and corrected.

Table 14.1
Specific Observations ATCT Site Inspection
Austin-Bergstrom International Airport (AUS), Austin, Texas
Airport Traffic Control Tower

Location/Floor	Observations/Comments
Cab Roof Area	Roof consists of rubber membrane and metal flashing on the parapet wall. No gaps or crevices in the roof that would facilitate water incursions were identified.
Cab Penthouse	Area contains electronic equipment racks. Ceiling is insulated with foil-backed fiberglass insulation. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.
Cab Level	Inspection included opening and inspecting perimeter electrical cabinets under equipment consoles. The exterior walls under the consoles were inaccessible. Metal panel exterior walls were observed above the suspended ceiling. No evidence of active water incursion or visible mold growth was identified within this level. No unusual odors were detected.
Cab Level Balcony	The balcony consists of a concrete floor, concrete panel wall which flares out to the junction level below, and metal panel exterior wall below the windows of the cab. Degraded caulking between the concrete panels revealed the sponge spacer between panels.

Location/Floor	Observations/Comments
Cable Access Level	<p>Insulation was not observed on the exterior concrete panels. A wall composed of metal studs, fiberglass batting, and a single layer of green board separated the exterior unconditioned area from the interior of the cable access level. One water stain was evident on the exterior of the green board. The likely cause of the water stain is rainwater infiltration from the cab level balcony directly above. No visible mold growth was identified in the cable access level.</p>
Junction Level	<p>This level consists of restrooms, break rooms, offices, and a mechanical and janitorial room. Previously the junction level had problems with elevated humidity levels in excess of 75%. Elevated temperatures and relative humidity levels encouraged condensation on supply ductwork components. A dehumidifier was installed in Room J8 to remedy the issue.</p> <p>Three ft² of visible mold growth was identified above the doorway wall suspended ceiling in the J6 break room. The mold growth was directly below a supply air duct, which reportedly had condensation issues.</p> <p>In the mechanical room, accessible portions of the AHUs appeared clean and were functioning properly. The exterior wall in Mechanical Room J10 was accessible, and was blanketed in two inch thick foil-backed fiberglass insulation. In Room J8, six linear feet of visible mold growth was identified on the wood trim of the ceiling perimeter supply air diffuser. The moisture source responsible for the observed mold growth was likely previous condensation. All building materials tested for moisture content were dry at the time of the survey, and no condensation was observed.</p>

Location/Floor	Observations/Comments
Sub-Junction Level	<p>The sub-junction contains one mechanical room, one work room, and a large room housing computer equipment. A raised platform floor is located in the computer and work rooms. The exterior wall was not insulated on the sub-junction level. Peeling paint on drywall surfaces was observed in several locations, but appeared to not be related to moisture issues. In Room SJ8, three linear feet mold affected pipe insulation was observed. No other visible mold growth or odors associated with mold growth were identified on the sub-junction level.</p>
9 th Level	<p>This level consists of an office (905), a pipe chase room (903), and an electrical chase room (904). The areas are finished with drywall, and no access to the exterior wall was present. The office was unoccupied, but was under HVAC control. No signs of water incursion, mold growth, or unusual odors were detected.</p>
8 th Level	<p>This level consists of a fitness room (805), a pipe chase room (803), and an electrical chase room (804). The areas are finished with drywall, and no access to the exterior walls was present. The fitness room contained water stained ceiling tiles directly below a chilled water valve.</p> <p>In Room 804, 5 ft² of visible mold growth was identified on the drywall near the cement floor. Reportedly a water release from water tanks in Room 803 occurred, and may be the moisture source responsible for the minor mold growth observed in Room 804. All drywall was dry at the time of the survey.</p>
7 th Level	<p>This level consists of a NATCA office (705), a pipe chase room (703), and an electrical chase room (704). The NATCA office was finished and under HVAC control. In Room 704 the exterior concrete wall was not insulated, and was painted white. No evidence of moisture issues or visible mold growth were observed on this level.</p>
6 th Level	<p>This level consists of a PASS office (605), a pipe chase room (703), and an electrical chase room (704). The PASS office was finished and under HVAC control. No water damaged building materials or visible mold growth were observed on the level.</p>

Location/Floor	Observations/Comments
5 th Level	This level consists of an office (505), a pipe chase room (503), and an electrical chase room (504). The office was finished and under HVAC control. No water damaged building materials or visible mold growth was observed on the level.
4 th Level	This level consists of an office (405), a pipe chase room (403), and an electrical chase room (404). The office was finished and under HVAC control. No water damaged building materials or visible mold growth was observed on the level.
3 rd Level	This level consists of an office (305), a pipe chase room (303), and an electrical chase room (304). The office was finished and under HVAC control. The pipe chase room also contains a stairwell pressurization fan. No water damaged building materials or visible mold growth was observed on the level.
2 nd Level	This level consists of water pump room (205), a pipe chase room (203), and an electrical chase room (204). In the water pump room, slight water staining was evident on the drywall near the cement floor. The affected drywall was dry at the time of the survey, and the likely cause of the water stained drywall was a past water release from the water pump systems. In Room 204, less than 4 ft ² of microbial growth was observed on the wall near the floor. The affected drywall contained low moisture content at the time of the survey, and was dry. Two linear feet of pipe insulation also contained visible mold growth.
1 st Level	This level consists of smoking room (105), a pipe chase room (103), and an electrical chase room (104). In Room 103, water damaged drywall was observed near the door to outdoors. It is likely that failing weather stripping allows rainwater to enter and affect the drywall. No visible mold growth was observed on the level.
Ground Floor	The ground floor consists of an elevator lobby and three mechanical rooms. Mechanical Room G4, which houses the elevator equipment, was under HVAC control, and was maintained extremely cool. Water stained drywall and less than 1 ft ² visible mold growth were identified below a poorly insulated chilled water line. The affected wall portion is scheduled to be removed for elevator repairs.

Location/Floor	Observations/Comments
Elevator Shaft and Pit Area	The elevator shaft was constructed of one inch thick fire rated green board and metal structural members coated in fireproofing. On the junction level, a 2 ft ² area of visible mold growth was identified on the green board paper. Similar minor mold growth was observed on green board paper on the sub-junction level and 9 th level. All green board was dry at the time of the survey. The elevator pit and sump were dry and clean at the time of the survey.
Stairwell	The stairwell extending from the junction level to the ground level was inspected. A few water streak stains were present on walls. No source could be identified for these streaks. No visible mold growth was identified within the stairwell, and all water stained drywall was dry at the time of the survey.

15.1 STL - Lambert Saint Louis International Airport

15.1.1 Tower Description

A review of as-built drawings of the Lambert-St. Louis International Airport ATCT indicates that the tower is a "Major Activity Level" ATCT originally designed in 1994 by Holmes & Narver of Orange, California. The drawings reflect a revision date of February 1999, and an "as-built" date of November 1998. The STL ATCT consists of eleven levels below the cab, and it is connected to a base building.



15.1.2 Site Observations

Table 15.1 presented below, provides details regarding the site inspection. During the site inspection, it was reported that mold remediation was completed in ATCT Rooms G6, 3TS5, and SJ7 (along with several areas within the base building). The Statement of Work for the remediation is provided within Volume 2 of this report. Five very small patches (each less than one ft²) of suspect mold growth were observed on the 7th and 6th levels of the elevator shaft. No sources of moisture or water incurSION were noted in the shaft. This was not a significant finding. No evidence of active water incurSION or (other) active mold growth were observed during the site inspection.

Table 15.1
Specific Observations ATCT Site Inspection
Lambert St. Louis International Airport (STL)
Airport Traffic Control Tower

Location/Floor	Observations/Comments
Cab Roof Area	Roof membrane in good condition. No pooling water observed.
Cab Penthouse Area	"AHV" room – drywall, with drywall ceiling, with fiberglass above. Clean, with no evidence of water incurSION or mold growth. A past roof leak was reported in the ASDE-X electrical equipment room after ASDE equipment was installed. Roof was repaired successfully.
Cab Level	No signs of water damage or visible mold growth. No unusual odors detected. Inspection included opening and inspecting perimeter electrical cabinets under equipment consoles; however, consoles have solid backs, so exterior wall could not be accessed for inspection. Ceiling tiles and carpet showed no visible sign of past water damage.

Location/Floor	Observations/Comments
Cable Access Level	Unique configuration not observed in similar tower designs where the exterior ring area has drywall walls (with a vapor barrier and fiberglass insulation) that forms two concentric rings; the interior cable access area (heated) and an exterior ring where the exterior concrete is visible. The outer ring is not heated, and is in fact ventilated to the outdoors. This configuration was not observed in other towers inspected as a part of this effort. No signs of water damage or visible mold growth. No unusual odors detected.
10 th Level	This level consists of lockers, offices, a smoking room, and a kitchen. Areas are generally carpeted, with the exception of the kitchen (vinyl composite floor tile), and mechanical/utility areas. The J12 mechanical room houses HVAC equipment, and a pressure tank. All areas were without visible mold or evidence of water incursion. Access to the perimeter catwalk from the smoking room revealed that exterior window and panel caulk was in good condition.
9 th Level	This level consists of an equipment room area. Remediation work was previously successfully completed within Room SJ4 on this level. Also, drains located in Airshafts SJ8 and SJ4 were modified to improve drainage. No signs of water damage or visible mold growth. No unusual odors detected.
8 th Level	This level contains mechanical and electrical equipment. No mold reported to be identified previously on this level. No signs of water damage or visible mold growth. No unusual odors detected.
7 th Level	This level contains storage and a small work area with a tool bench. No mold reported to be identified previously on this level. No signs of water damage or visible mold growth. No unusual odors detected.
6 th Level	ASDE-X equipment located on this level. The room is conditioned, with a drop ceiling and carpeted floor. No mold reported to be identified previously on this level. No signs of water damage or visible mold growth. No unusual odors detected.
5 th Level	No mold reported to be identified previously on this level. No signs of water damage or visible mold growth. No unusual odors detected.

Location/Floor	Observations/Comments
4 th Level	No mold reported to be identified previously on this level. No signs of water damage or visible mold growth. No unusual odors detected.
3 rd Level	This level contains storage and domestic water boost pumps. Remediation work was previously successfully completed within Room TS5 on this level. No signs of water damage or visible mold growth. No unusual odors detected.
2 nd Level	This level contains workout room. A 2 foot by 2 foot stained ceiling tile was found stored in this room, and should be discarded. No visible mold growth, or signs of water incurion were observed.
Ground Floor	No signs of active visible mold growth. No unusual odors detected. Elevator equipment room was found to be clean, with no signs of water incurion or mold growth. A sprinkler saddle valve leaked in this area several years ago, and was repaired. Mold was also previously successfully abated above the ceiling in this area.
Elevator Shaft and Pit Area	<p>An inspection of the elevator shaft was facilitated by an elevator mechanic locking out the elevator and controlling its movement from the top of the cab. Small patches of suspect mold growth (all less than 1 ft² in size) were noted at the following elevations: Seventh level elevation; small discolored patches on the front left of door, and left and right rear of shaft; 6th level elevation; small patches of discoloration noted in the front left corner and right rear corner of shaft. These were not significant areas of potential mold growth and can be easily remediated.</p> <p>No signs of active moisture, staining, or water incurion were noted in the shaft, and no unusual odors were observed.</p> <p>The elevator shaft pit area was examined and found to be clean and dry, with no standing water observed in the sump.</p>

3.0 CONCLUSION

Collectively, the inspections did not identify a consistent pattern of design or construction defects giving rise to water incursion problems and/or resulting mold growth. No reports of adverse health effects or significant occupant complaints of discomfort or other symptoms were observed in the ATCTs inspected as part of this effort. It appears that the formation of condensation in unheated or otherwise non-tempered interior spaces of the tower shaft creates moisture issues; especially in colder months in colder climates. The MCI ATCT also reported that exterior caulk degraded over time and required replacement.

Other reported problems with water issues and mold growth have resulted from internal building issues and not water incursion through the building envelope. These include water leaks from plumbing supply and drain lines or other building equipment unrelated to design and construction.

Observations made as part of the ATCT inspections suggest that either insulating interior tower shaft spaces that are unheated, or providing supplemental heat in these areas to control condensation and moisture should be considered, along with other engineering approaches. The current practice of prompt reaction to water incursion episodes, plumbing leaks, or other similar events within the towers should be maintained per existing FAA guidance.

APPENDIX A

LIST OF RELEVANT DOCUMENTS REVIEWED

APPENDIX B
PHOTOGRAPHS

VOLUME 2

HARD COPIES OF RELEVANT DOCUMENTS REVIEWED

DTW Project Communication Plan

September 25, 2008

The purpose of this communication plan is to ensure that project information is effectively communicated between managers, employees, Environmental and Occupational Safety and Health (EOSH) professionals, project Resident Engineer (RE) and site contractors. This plan specifically addresses projects associated with mold remediation, roof repair, and other efforts to address water intrusion and/or condensation.

1. Prior to Project Commencement

- a. Pre-Construction Meeting: Local management shall hold a Pre-Construction meeting prior to the start of each project. The meeting shall include the project RE, an EOSH professional, contractor(s) representatives, contracting officer, local management, and shall be made open to union (NATCA/PASS) attendance. The topics that shall be covered include the: 1) scope of work, 2) location(s), 3) project schedule, 4) potential hazards, including a review of the completed risk assessment plan, 5) controls to be used, 6) sampling plan (if applicable), 6) communication of project status and data to employees, 7) pre-construction checklist, 8) potential impacts to employees, 9) applicable Material Safety Data Sheets (MSDSs), 10) contingency plans, and 11) applicable background and historical information pertaining to project. A question and answer session shall take place afterwards. If necessary, a walkthrough of the affected areas may be conducted to further clarify the project scope.
- b. Memorandum to Employees: Each employee will be notified of an upcoming project via memorandum from local management. The memorandum shall address the following: 1) scope of work, 2) locations(s), 3) project schedule, 4) potential hazards, and 5) location where project information will be posted. The project RE and/or EOSH professional will assist local management in drafting the memorandum to ensure the appropriate information is captured in the document.
- c. Pre-Construction Checklist: In accordance with FAA order 3900.57, an FAA Preconstruction and Maintenance Project Safety and Health Checklist shall be completed prior to the start of the project. Please refer to the attached document. The purpose of the checklist is to identify potential safety and environmental hazards that may impact facility employees and the National Airspace System (NAS).

- d. MSDSs: The contractor shall provide all MSDSs to the project RE. The MSDSs will be reviewed during the pre-construction meeting and be made available to employees for their review.

2. During the Project

During the project, the RE shall maintain communication with the EOSH professional and local management. In the event that NAS operations may be adversely impacted by the project, the RE shall immediately notify local management.

After each shift, the contractor and/or RE shall provide a written briefing to local management to include the following: 1) summary of work accomplished, 2) upcoming schedule (e.g., next shift), 3) monitoring results, and 4) significant changes to the project. Local management will post these briefings in a designated location for employees to review. Local management shall host daily or periodic meetings to further communicate the project status and upcoming events.

Employees may contact their supervisor if any questions or concerns arise before or during the project. Supervisors will then forward those questions to the DTW Terminal Manager/DTW GNAS Manager. If requested, the RE and/or EOSH professional will provide input to the Terminal/GNAS managers.

3. Project Completion

The RE will notify the EOSH professional, contracting officer, and local management when the project is completed. This information will be communicated from local management to the employees. Local management shall notify employees when the project is completed.



Federal Aviation Administration

Memorandum

Date: October 24, 2008
To: All Employees
From: Manager, Motown District, Joseph Figliuolo
Manager, E. Michigan GNAS, Dave Sanders
Subject: **INFORMATION:** DTW Base Building Roof Project

The DTW Base Building Roof Project is scheduled to begin construction on November 12, 2008. A pre-construction meeting will be held in the basement conference room at 1:00 p.m., November 5, 2008.

In an effort to improve facility communication during this, and other future projects, we have developed a project communication plan that includes daily briefings that are open to all employees where we will discuss daily project evolutions, as well as risk-mitigating efforts that will be employed during the project to reduce and/or eliminate adverse impacts to employees and to facility operations. Employees are encouraged to participate in these meetings and to ask questions and/or raise project safety-related concerns. This project is currently scheduled to occur between the hours of 10:00 p.m. and 6:00 a.m. each night of scheduled work. Daily briefings will therefore occur at approximately 10:00 p.m. in the basement conference room each night prior to work. Questions and Answers from these meeting will be placed in the R&I Binders, and posted on the Technical Operations Employee Bulletin Board. A detailed work schedule will likewise be posted when made available by the contractor.

If at any time during construction you see, or become aware of any safety-related issue, please immediately notify your FLM, or the facility POC for project, Mr. Ken Peters at (734) 955-5120.

Should you have any questions or concerns about this notice, you may call me or Mr. Dave Sanders at (734) 955-5101.



Federal Aviation Administration

Memorandum

Date: December 5, 2008

To: All Employees

From: Manager, Motown District, Joseph Figliuolo
Manager, E. Michigan GNAS, Dave Sanders

Subject: **INFORMATION**: DTW Base Building Roof Project Update

Contractors will resume work tonight at 10:00 p.m. constructing a debris barrier to alleviate the potential of FOD impacting airport operations during roof work. Actual roof replacement work however, will not take place tonight. Actual roof replacement work will resume Sunday night at 10:00 p.m.

As an added precautionary measure, TRACON operations will be relocated to the tower each night of roof work from 12:00 a.m. to 5:30 a.m. Prior to relocating employees back into the TRACON, indoor air-quality will be tested and confirmed acceptable. In addition, NATCA representatives suggested the use of air scrubbers during roof work. It is unclear what benefit this measure would provide beyond the measures employed however, to continue our efforts toward building a collaborative relationship, the FAA will employ air scrubbers during roof work. NATCA representatives did further suggest the use of Poly Hangers and/or a Smart Seal System however, because employing either of these measures would reduce indoor air quality and increase the likelihood of adverse impacts to National Airspace System (NAS) systems and operations, neither of these measures will be employed.

Employees are encouraged to attend daily briefings 15 minutes prior to work. These meetings will take place in the Technical Operations Conference Room, Room 126. As a reminder, project work will occur between 10:00 p.m. and 6:00 a.m. each night of scheduled work. Questions and Answers from project daily briefings will be placed in the R&I Binders, and posted on the Technical Operations Employee Bulletin Board.

If at any time during construction you see, or become aware of any safety-related issue, please immediately notify your FLM, or the facility POC for this project, Mr. Ken Peters at (734) 955-5120.

Should you have any questions or concerns about this notice, you may call me at (734) 955 -5101, or Mr. Joseph Figliuolo at (734) 955-5002.

Wilson, Kevin

From: Debra.Rosen@dot.gov
Sent: Friday, March 20, 2009 12:17 PM
To: Gorman, Karen; Wilson, Kevin
Subject: FW: Sugent Mold

Karen,

I thought it might be helpful to recap some of the main points of our discussion on Monday about DOT's investigation into the mold and moisture problems at the air traffic control facility at Detroit Metropolitan Airport. You indicated that you were in the process of reviewing our investigative report to ensure that it met the applicable reasonableness standard. Your main concerns relate to whether a health survey should be conducted and also whether the report made a finding on the impact of the mold on employee health.

Regarding a health survey, we advised you that we had carefully considered the question of whether to conduct a health survey. It was one of the first matters raised by Mr. Sugent in our discussions with him. However, after careful consideration, we decided that it would not be beneficial to conduct such a survey at this point. Tom Black, the Department's Safety and Occupational Health Manager, informed you that he discussed this specific issue with the National Institute for Occupational Safety and Health (NIOSH - we were considering asking NIOSH to conduct the survey). NIOSH advised that health surveys are typically conducted early in the process when people are ill and the source of the problem is unknown. Here, we already know that there is a moisture and mold problem at the Detroit facility and are making every effort to remedy the problem. This would be the case whether 15 employees were exhibiting adverse health effects or 50 employees were exhibiting such effects. Thus, NIOSH did not recommend that we conduct a health survey and we determined that it would not be beneficial; that the most prudent use of resources would be to focus on remediation. (Nonetheless, we understand that FAA is in the process of developing a questionnaire to obtain health information from employees at Detroit). The person Tom spoke to at NIOSH is Jean Cox-Ganser (304-285-5818). Another point of contact at NIOSH is Airlsey Weston (304-285-6221). Both individuals work in the NIOSH Office of Respiratory Disease Studies. We encourage you to contact NIOSH to discuss this issue further.

With respect to a finding on the impact of the mold on employee health, we explained that we carefully considered the employee health concerns as discussed on pages 6 -9 of the Report, as well as the whistleblowers' claims that employees did not report health symptoms for fear of losing their jobs. We discussed the whistleblowers' health symptoms during our interviews with each of them and also reviewed extensive medical documentation submitted by Mr. Sugent. While we do not dispute the employees' health concerns, our investigation did not establish a direct link between the mold at the facility and employee health and we stated this in Finding no. 2 in the report, e.g. "the concentrations of airborne fungal spores was considered insignificant and do not indicate elevated mold spore concentrations within the tower or base building that would be likely to adversely impact employee health." (Finding No. 2, p. 10). As we discussed, there are no legal or regulatory standards or limits for determining mold exposure, making it very difficult to establish a link between adverse health effects and mold. Moreover, mold was found at the facility in unoccupied areas and we determined that the tower elevator shaft was not a conduit for mold spores to travel within the facility since the air monitoring that was done by an independent Industrial Hygienist did not show elevated mold spore concentration within any occupied areas of the tower or base building. Indeed mold spore concentrations within the tower cab were much lower than that found outdoors. For all of these reasons, we could not directly link the mold to the employees' health issues, although at the same time we did not want to invalidate the employees' health concerns. If we had found visible mold growth or elevated mold spore concentrations in occupied areas it is likely that we would have made the link between the mold and the adverse health effects. Regardless, it is clear that the mold and moisture problems at the facility must be fully remediated and the focus of our report was on ensuring complete remediation, as well as open communication with employees and ensuring that employees are encouraged to report work related health problems.

We will forward to you shortly a copy of the December 18, 2008, report on the Leo Daly designed towers as well as a project communication plan and other memos communicating with employees about the remedial work. I hope this information is helpful.

Please feel free to call me with any questions.

Debbie
X69165