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OST RECOMMENDATIONS TRACKING SHEET

November 4, 2008

	OST Recommendations and FAA Responses	Due Date/Date Completed	Status
A	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." FAA Response: The FAA will retain a Certified Industrial Hygienist experienced with mold and indoor air quality issues to complete the recommended action.	December 31, 2008	A 3rd party contractor has been retained to perform the inspection. A start date is being scheduled for this month. The site survey should be completed in 7 days.
B	OST Recommendation (ATCT): "Based on the comprehensive inspection, remove all visibly contaminated (molded and water damaged porous materials) from the air traffic control tower." FAA Response: 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.	None	Based on a June 2008 facility inspection, a contract has been awarded to remediate the 4th and 9th floors, including other areas of the ATCT. If additional mold growth is found during the wall cavity inspections (see line "A"), P&R will work through EOSH Services regarding funding and planning remediation efforts. Remediation start dates in December and January are being considered.

C	OST Recommendation (ATCT): "Develop a mold remediation project communication plan for the facility to improve communication efforts between FAA management and union employees." FAA Response: The FAA will develop a plan to improve communication.	October 1, 2008 Completed Sep. 25, 2008	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 mold remediation and repair projects. Prior to the remediation (and as part of the communication plan), local management will develop and post a memorandum similar to that of the base building roof project. Refer to Section L for more information.
D	OST Recommendation (ATCT): *"Remove all unnecessary wallboard and carpeting from unoccupied areas of the air traffic control tower."* FAA Response: 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.	None *(Refer to Recommendation B)*	Incorporated into the project scope described in Recommendation B.

E	OST Recommendation (ATCT): *"Evaluate the fire rating of cement backer board and mold resistant/paperless wallboard."* FAA Response: 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.	None *(Refer to Recommendation B)*	Incorporated into the project scope described in Recommendation B.
F	OST Recommendation (ATCT): *"Continue efforts to prevent moisture intrusion into the air traffic control tower and prevent condensation from forming."* FAA Response: 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.	None *(Refer to Recommendation B)*	Monitoring is on-going (See Recommendation G). Other items have been incorporated into the project scope described in Recommendation B.

G	OST Recommendation (ATCT): *"Actively monitor moisture in the elevator shaft and unoccupied areas of the air traffic control tower and implement corrective actions as necessary."* FAA Response: The monitoring is currently in progress. To date, there are no indications of excessive moisture and/or humidity.	Ongoing	Data has been obtained for June and the last part of September 2008. No evidence of high moisture issues. Increased downloads will take place to ensure all data is captured. Local Tech Ops has been trying to contact the company to establish an internet connection and address other issues – so far the company has not responded. Tech Ops will continue to pursue.
H	OST Recommendation (ATCT): *"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."* FAA Response: The agency will review such policies.	October 1, 2008 Completed October 1, 2008; refer to the status column for additional information	Local managers have reviewed the FAA's policies. An all-hands meeting was held for local Tech Ops employees on Sep 3, 2008 where safety and work-related health issues were reviewed. Refer to Sections C and L for additional information.

I	OST Recommendation (ATCT): *"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."* FAA Response: 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.	December 31, 2008	An effort is being lead by EOSH Services to conduct these inspections. Currently 13 similar Leo-Daly type towers have been identified. MCI, SEA, and BUR have been inspected. DFW (2) and IAH will be inspected this week. Tower inspections have been scheduled for 5 sites; 2 sites are currently being scheduled.
J	Recommendation (Base Building): *"Replace the leaking base building roof."* FAA Response: A new roofing membrane will be installed by March 30, 2009.	March 30, 2009	The project is scheduled to start November 12, 2008. A pre-con meeting will be held on Nov 5th. The work will occur between 10 pm – 6am. Project activities will cease during the Thanksgiving moratorium, however continue afterwards. The reported date of completion is 12/19/08 (with the exception of the lightning protection).
K	OST Recommendation (Base Building): *"Continue to immediately remove and replace water damaged building materials as necessary."* FAA Response: 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.	Continuous until March 30, 2009	Efforts are ongoing.

L	OST Recommendation (Base Building): *"Develop a roof project communication plan for the facility to improve communication efforts between FAA management and union employees."* 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.	October 1, 2008 Completed Sep. 25, 2008	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 mold remediation and repair projects. As part of the communication plan, local Tech Ops and Terminal managers developed and posted a memorandum on October 24, 2008 to notify their employees of the upcoming roof project and provide them with key information. Refer to the attached memorandum for additional information.

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WONDER MAKERS
ENVIRONMENTAL

June 26, 2009

Mr. Vince Sugent
7768 Pleasant Lane
Ypsilanti, MI 48197

RE: Review of OST RECOMMENDATIONS TRACKING SHEET dated November 4, 2008, WM project GC09-8593

Dear Vince:

As part of the FAA's response to your whistleblower complaint to the Office of Special Counsel, the Agency submitted a number of documents to support their contention that mold and other indoor air quality problems at the Detroit Metro Tower were handled properly. A review of the first set of FAA submittals revealed a number of referenced documents that were missing. Over the past weeks we have been examining the second set of documents submitted by the FAA and offer our insights regarding the Agency's response to mold at DTW and other facilities.

We have had an opportunity to review a document dated November 4, 2008, entitled OST RECOMMENDATIONS TRACKING SHEET. This document was supplied by the FAA in response to the whistleblower complaint and is likely the predecessor of a document we previously reviewed in a letter to you on April 24, 2009. The document previously reviewed was dated February 11, 2009 and was entitled DTW: OST RECOMMENDATIONS TRACKING SHEET.

As you are aware, on May 19 & 20, 2008, the Office of the Secretary of Transportation (OST) conducted a survey of the DTW ATCT. The survey consisted of a number of parameters that included:

1. Review of previous inspections conducted by other government agencies
2. Whistleblower interviews
3. Air sampling
4. Review of medical reports
5. Review of OSHA injury and illness records
6. Visual moisture and mold inspection that included invasive wall sampling and a visual inspection of the elevator shaft

At the completion of this inspection the OST made 12 recommendations; the first 9 dealt with issues in the ATCT, the last 3 dealt with issues in the base building.

Like the document dated February 11, 2009, this document is a simple table that describes the status of each of the 12 recommendations made by the OST in their report dated August 28, 2009. The OST recommendations and a description of their status as of

November 4, 2008, are listed in the attachment to this letter. Our updated comments on each of these items are in italics.

Sincerely,

Michael A. Pinto, CSP, CMP
CEO

Critique of:

OST Recommendations Tracking Sheet
Dated November 4, 2008

A. (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. STATUS – A 3rd party contractor has been retained to perform the inspection. A start date is being scheduled for this month. The site survey should be completed in 7 days. *A wall cavity inspection was conducted at the DTW ATCT the week of December 8–12, 2008. As you are aware, NATCA representatives were allowed to observe the inspection process. Observations made by NATCA during this survey identified 11 blatant violations of the standard of care for the mold remediation industry. Violations ranged from inspectors not wearing PPE during the inspection to using a shop-vacuum-style vacuum with a HEPA filter to clean debris that was created when the wall cavities were opened. It is important to note the quantity of mold identified by the inspectors was grossly underestimated in their report. Pictures taken by the inspectors during the inspection clearly indicated much larger quantities of contaminated finish building materials than described by the inspectors in their final report.*

B. (ATCT) Based on the comprehensive inspection, remove all visibly contaminated (molded and water damaged porous materials) from the air traffic control tower. STATUS – Based on a June 2008 facility inspection, a contract has been awarded to remediate the 4th and 9th floors, including other areas of the ATCT. If additional mold growth is found during the wall cavity inspections (see line "A"), P&R will work through EOSH Services regarding funding and planning remediation efforts. Remediation start dates in December and January are being considered. *This is another example of the FAA's piecemeal approach which has caused so many problems at DTW over the past five years. The Agency hires incompetent contractors to do a limited inspection, identifies a small part of the problem, writes a work plan that only addresses a part of the issue, and does not follow the industry standard of care. Then the managers are surprised when the problems suffered by the occupants are not resolved.*

Now, five years after mold was first discovered and four and a half years after NATCA began calling for a comprehensive inspection, the Agency has to again hold off on conducting mold remediation until a comprehensive mold survey of the ATCT can be conducted. In addition, the Agency agreed to let NATCA and its experts participate in the process. A kick-off meeting to discuss Phase I of the Integrated Team's inspection of the DTW ATCT is scheduled for July 21, 2009.

C. (ATCT) Develop a mold remediation project communication plan for the facility to improve communication efforts between FAA management and union employees. STATUS – 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 mold remediation and repair projects. Prior to the remediation (and as part of the communication plan), local management will develop and post a memorandum similar to that of the base building roof project. Refer to Section L for more information. *Having a plan and improving communication are two different things. Communication requires mutual respect between the parties, something the FAA has not yet demonstrated to the union. For example, the Communication Plan for the re-roofing of the base building was primarily a vehicle for the Agency to transmit information on decisions that were made without regard to the interest or input of the building occupants. We commented extensively on this plan in a letter to you dated April 24, 2009. The letter was a "Review of documents supplied by US Department of Transportation regarding two concerns raised by NATCA; ongoing mold contamination in the DTW ATCT and the roof project of the DTW ATCT base building conducted in November and December 2008." The comments appear on pages 5 & 6 of that letter.*

D. (ATCT) Remove all unnecessary wallboard and carpeting from unoccupied areas of the air traffic control tower. STATUS – Incorporated into the project scope described in Recommendation B. *While we agree with the need to remove these materials, we are very concerned about how they will be removed. All work should be conducted in accordance with the current industry standard of care for the mold remediation industry by workers that are trained in mold remediation techniques. It is also important to ensure that the causes of water infiltration into the building are identified and fixed. Until the water issues are resolved mold will continue to impact this building.*

E. (ATCT) Evaluate the fire rating of cement backer board and mold resistant/paperless wallboard. STATUS – Incorporated into the project scope described in Recommendation B. *Using finish materials that are resistant to mold growth such as paperless wallboard or cement backer board is a great idea as long as fire ratings in required areas can be maintained.*

F. (ATCT) Continue efforts to prevent moisture intrusion into the air traffic control tower and prevent condensation from forming. STATUS – Monitoring is on-going (See Recommendation G). Other items have been incorporated into the project scope described in Recommendation B. *See our response to Item G.*

G. (ATCT) Actively monitor moisture in the elevator shaft and unoccupied areas of the air traffic control tower and implement corrective actions as necessary. STATUS – Data has been obtained for June and the last part of September 2008. No evidence of high moisture issues. Increased downloads will take place to ensure all data is captured. Local Tech Ops has been trying to contact the company to establish an internet connection and address other issues – so far the company has not responded. Tech Ops will continue to pursue. *There has been a lot of documentation in the form of letters, e-mails, and memorandums that indicate that the moisture sensors in the ATCT have shown little if any indication of condensation or other moisture in the tower over the past few months. However, raw data from the sensors has never been*

shared with NATCA despite numerous requests to the FAA. The moisture readings are likely to change as humidity levels increase during the summer months. Trends regarding the amount of moisture and/or condensation in the ATCT should not be created until an entire year's worth of data from these sensors can be evaluated. Data should be shared with the union on a weekly basis with a summary provided to the Integrated Team members prior to the July 20, 2009, meeting. For example, on June 22, 2009, the controllers at DTW reported that the temperature in the elevator was 20-25 degrees warmer than surrounding areas. This temperature difference can certainly contribute to condensation and mold activity.

H. (ATCT) 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. STATUS – Local managers have reviewed the FAA's policies. An all-hands meeting was held for local Tech Ops employees on Sep 3, 2008 where safety and work-related health issues were reviewed. Refer to Sections C and L for additional information. *Employees are very likely to continue their position of not reporting work-related illnesses until they see some indication from the Agency that their health concerns will be taken seriously and that they will not be disciplined or retaliated against for reporting these concerns.*

I. (ATCT) 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. STATUS – An effort is being lead by EOSH Services to conduct these inspections. Currently 13 similar Leo Daly type towers have been identified. MCI, SEA, and BUR have been inspected. DFW (2) and IAH will be inspected this week. Tower inspections have been scheduled for 5 sites; 2 sites are currently being scheduled. *Applied Environmental developed a report for the FAA regarding mold/water incursion inspections it had conducted at 14 Leo J. Daly ATCTs across the United States. The report was originally dated December 18, 2008, and was revised on March 25, 2009. Our concerns about the thoroughness of the inspections and related findings are expressed in a letter to Pat Forrey dated June 16, 2009. You were sent a copy of this letter.*

In addition to reviewing the individual inspections conducted by Applied Environmental our letter points out two major concerns. Applied Environmental did not inspect the ATCT in Anchorage, Alaska. This ATCT Leo J. Daly design is similar to the other facilities reviewed in this report. Given that many of the towers in the report were found to have frosting and condensation issues during winter months it seems logical to include this tower in the surveys. There is no explanation as to why this tower was excluded.

The second concern relates to the fact that four Texas ATCTs were inspected in a manner that violated the Texas Mold Assessment and Remediation Rules (TMARR) as

enforced by the Texas Department of State Health Services. In addition to the inspections that were not done in accordance with the TMARR the report itself is also in violation of regulation established in the TMARR. Details about these concerns can be found in the June 16 letter to P. Forrey.

J. (Base Building) Replace the leaking base building roof. STATUS – The project is scheduled to start November 12, 2008. A pre-con meeting will be held on Nov 5th. The work will occur between 10 pm – 6 am. Project activities will cease during the Thanksgiving moratorium, however continue afterwards. The reported date of completion is 12/19/08 (with the exception of the lightning protection). *The Agency's roof replacement project was a fiasco about which both the roofing contractor and NATCA warned the FAA. The roof was installed in the dead of winter, which was a response by the Agency to a problem that should have been addressed much sooner than it was. The new roof leaked within 24 hours of the project's initial completion. It took an entire month to fix the new roof.*

K. (Base Building) Continue to immediately remove and replace water damaged building materials as necessary. STATUS – Efforts are ongoing. *Now that 14 Leo J. Daly ATCTs have been inspected and most have been found to have water- and mold-damaged finish building materials it would appear that the Agency needs to become aggressive about removing wet materials from their buildings and then determining and fixing the causes of water infiltration. Finish building materials that have been found to support fungal growth must be removed in accordance with the mold remediation industry standard of care or state law where applicable.*

L. (Base Building) Develop a roof project communication plan for the facility to improve communication efforts between FAA management and union employees. STATUS – 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 mold remediation and repair projects. As part of the communication plan, local Tech Ops and Terminal managers developed and posted a memorandum on October 24, 2008 to notify their employees of the upcoming roof project and provide them with key information. Refer to the attached memorandum for additional information. *As described in the letter to you on April 24, 2009, the communication plan used by the Agency was ineffective. We recommend that the Agency follow its original plan and hold briefings at future projects and provide daily summaries to all employees.*

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UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA
Civil Division

DENICOLE YOUNG and VANESSA GHEE	)	
Plaintiffs,	)	
v.	)	**Civil Action No. 07cv0983 (ESH)**
WILLIAM F. BURTON and LEWIS & TOMPKINS, P.C.	)	
Defendants.	)	

MEMORANDUM OPINION AND ORDER

Plaintiffs Denicole Young and Vanessa Ghee have sued William F. Burton and Lewis & Tompkins, P.C., for legal malpractice based on their failure to file a timely personal injury lawsuit. The original lawsuit would have sought recovery for damages suffered by plaintiffs as a result of exposure to toxic mold while residing at the Stanton Glen Apartments. In order to succeed on their legal malpractice claim, plaintiffs must show that their attorneys' alleged negligence adversely affected their ability to benefit from an otherwise meritorious claim. *See Niosi v. Aiello*, 69 A.2d 57, 60 (D.C. 1949). To make their case, plaintiffs rely on the testimony of Dr. Ritchie Shoemaker as to the cause, nature, and extent of their injuries. Defendants have moved to exclude Dr. Shoemaker's testimony, arguing that his opinions are not based on a reliable methodology, and that regardless, Dr. Shoemaker did not follow his own methodology with respect to plaintiffs.

Based on the record herein, including the testimony presented at a *Daubert* hearing, the Court concludes that Dr. Ritchie Shoemaker's diagnosis of plaintiffs, as well as his opinions

relating to general and specific causation, are not sufficiently grounded in scientifically valid principles and methods to satisfy *Daubert*. Therefore, defendants' motion will be granted.

BACKGROUND

I. PLAINTIFFS

Plaintiffs moved into Apartment 2A at 3064 Stanton Road, S.E. on August 19, 2002. (Compl. ¶ 8.) They resided there for approximately thirty-four days, during which time plaintiffs contend they could smell noxious fumes from raw sewage. (Pls.' Opp'n at 5; Pls.' Ex. 5 [Ghee Dep.] at 252.) In early September 2002, while investigating the smell, plaintiffs climbed through a window of the adjacent apartment, Apartment 1A, and took photographs of the extensive visible mold growth in this vacant apartment. (Defs.' Mot. at 2; Defs.' Ex. 3 [Young Dep.] at 175-78; Pls.' Ex. 7 [Photographs].) Although plaintiffs are not sure exactly how long they spent in Apartment 1A, they estimate it was no longer than one or two minutes. (Defs.' Mot. at 2; Defs.' Ex. 3 at 178.) There was no documentation of any visible mold growth in plaintiffs' apartment (Daubert Hr'g Tr. ["Tr."] at 76:2-5, June 16, 2008), and plaintiffs do not believe the two apartments shared a common air source. (Defs.' Mot. at 2; Defs.' Ex. 1 [Ghee Dep.] at 452). On September 23, 2002, plaintiffs signed a lease agreement for a different unit in the apartment complex and immediately moved into the new apartment. (Pls.' Opp'n at 5; Defs.' Ex. 2 [Lease Agreement].)

Both plaintiffs submitted extensive medical records to document the health problems that they attribute to their mold exposure. Approximately two weeks after moving into the apartment, Vanessa Ghee visited George Washington University Hospital ("GWUH") on September 6, 2002. (Defs.' Ex. 4 [Ghee Medical Records] at 19.) She complained of a productive cough that

had lasted three weeks and indicated that she had experienced a similar cough three months prior to that visit. (*Id.*) She was diagnosed with viral bronchitis and was instructed to use a humidifier at home and to quit smoking. (*Id.* at 22.) When she returned to GWUH a week later on September 13, 2002, she was given Claritin and again instructed to stop smoking. (*Id.* at 27.) After moving out of the apartment, Ghee required medical care only intermittently. (Pls.' Ex. 11 [Ghee Medical Records].)

Denicole Young's medical records indicate significant medical problems prior to moving into the apartment. She was seen for bronchitis and sinusitis as early as December 10, 1996. (Defs.' Ex. 5 [Young Medical Records] at 642.) She was seen again for sinus congestion and cough on October 21, 1997 (*id.* at 632) and July 29, 1998 (*id.* at 609), and she complained of chronic fatigue on January 9, 1998 (*id.* at 611) and March 10, 2000. (*Id.* at 602). She was also seen many times during those years for complications from her sickle cell trait. Young went to GWUH with Ghee on September 6 and 13, 2002, and was also diagnosed with bronchitis, prescribed Claritin, and told to use her inhaler. (Defs.' Ex. 5 at 656-59.) Young's medical records from the September 13 visit indicate a past history of asthma (*id.*), although it is unclear exactly when she first received that diagnosis. In the months after moving out of the apartment, Young required a few medical visits for minor problems but was hospitalized for asthma exacerbation and pneumonia on April 15, 2003. She required intubation on three separate occasions during that hospital stay. (Pls.' Ex. 12 [Young Medical Records] at 983-94.) She had regular doctors' visits over the next two years relating to asthma, sore throats, coughing, allergic reactions, and swelling in her extremities. (*Id.* at 157-52, 150-48, 145-38, 134-33, 131-27, 123-

22, 118-16, 84-80, 75-74, 971-82, 924-35, 912-23, 899-911, 1000-22, 1055-70, 1086-94, 1308-13, 1326-30, 1332-38.)

II. DR. SHOEMAKER

Dr. Shoemaker received his doctorate from Duke University. (Pls.' Ex. 15 [Shoemaker CV] at 1.) He is currently a member of the American Medical Association, the American Society for Microbiology, the American Society of Tropical Medicine and Hygiene, the International Association for Chronic Fatigue Syndrome, and the Maryland Medical Chirurgical Association. (*Id.*) He has practiced as a licensed medical doctor in Pocomoke, Maryland since 1980 (Pls.' Ex. 14 [Shoemaker Aff.] ¶ 3) and has been the treating physician for over 4,700 patients whom he has diagnosed with ailments caused by exposure to water-damaged buildings. (*Id.* ¶ 5). He has also authored numerous publications and books, including *Mold Warriors*, which was published in 2005. (*Id.*)

A. Methodology

Dr. Shoemaker described his methodology for diagnosing cases of mold illness[1] as follows. He begins by following standard diagnostic procedures with new patients: first, he takes the patient's history, and second, he performs an examination of the area that is the subject of the patient's complaint. (Pls.' Ex. 14 ¶¶ 13-14.) Then, depending on the circumstances of the illness and if there is a temporal relationship that suggests that the patient was in a location where he may have been exposed to a possible environmental contaminant, Dr. Shoemaker will turn to his own differential diagnostic procedure for mold illness. (*Id.* ¶ 15.)

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[1] "Mold illness" is a term coined by Dr. Shoemaker which he uses to describe an "acute and/or chronic, biotoxin associated illness caused by exposure to indoor environment of water-damaged buildings with resident toxigenic organisms." (Pls.' Ex. 55 [Shoemaker Report] at 6.)

That procedure involves a two-tiered analysis. (*Id.* ¶ 17.) To satisfy the first tier, all three of the following factors must be met: "(1) the potential for exposure; (2) the presence of a distinctive group of symptoms; and (3) the absence of confounding diagnoses and exposures." (*Id.* ¶ 18.) According to Dr. Shoemaker, the second tier acts as confirmation of the diagnosis arrived at in the first tier and requires that three of the following six factors be met: (1) HLA DR showing susceptibility to mold illness; (2) reduced levels of melanocyte stimulating hormone (MSH); (3) elevated levels of matrix metalloproteinase-9 (MMP9); (4) deficits in visual contrast sensitivity (VCS); (5) dysregulation of ACTH and cortisol; and (6) dysregulation of ADH and osmolality. (Defs.' Mot. at 6-7.) HLA DR refers to certain genes which Dr. Shoemaker believes are associated with a patient's susceptibility to mold illness. He claims there are certain versions of those genes, or genotypes, which render a patient more likely to have adverse health consequences from exposure to damp indoor environments. (Pls.' Ex. 14 ¶ 21.) VCS is a test of a patient's ability to detect certain visual patterns, which, in turn, is an indicator of neurologic functioning. (*Id.* ¶ 26.) The other four tests look at levels of certain hormones and enzymes in the blood which Dr. Shoemaker believes are altered by exposure to a biotoxin. (*Id.* ¶¶ 18-19.) Dr. Shoemaker refers to those hormones and enzymes as "biomarkers."

If a patient meets both tiers of this case definition, Dr. Shoemaker typically recommends treatment with Cholestyramine ("CSM"), a cholesterol-lowering drug which binds molecules in the intestinal track and prevents them from being absorbed into the body. (Defs.' Ex. 7 [Dr. S. Michael Phillips' Report] at 16.) Dr. Shoemaker uses CSM on an off-label basis, meaning he uses it for a purpose other than that for which it has been approved by the FDA. (*Id.* at 17.)

Dr. Shoemaker has published three peer-reviewed publications regarding mold illness. (Pls.' Ex. 16 [Shoemaker Mold Publications].) The first of these papers established the case definition for biotoxin illness by confirming a set of diagnostic criteria that was present in nearly all of the "cases" of biotoxin illness, and in virtually none of the "control" subjects. Ritchie C. Shoemaker, et al., *Sick Building Syndrome in Water Damaged Buildings: Generalization of the Chronic Biotoxin-Associated Illness Paradigm to Indoor Toxigenic Fungi*, in BIOAEROSOLS, FUNGI, BACTERIA, MYCOTOXINS AND HUMAN HEALTH: PATHOPHYSIOLOGY, CLINICAL EFFECTS, EXPOSURE ASSESSMENT, PREVENTION AND CONTROL IN INDOOR ENVIRONMENTS AND WORK, 66-77 (Eckhardt Johanning, ed., 2005). The second paper looked more closely at the changes in levels of certain biomarkers in biotoxin illness patients in response to treatment and re-exposure. Ritchie C. Shoemaker & Dennis E. House, *A Time-Series Study of Sick Building Syndrome: Chronic, Biotoxin-Associated Illness from Exposure to Water-Damaged Buildings*, 27(1) NEUROTOXICOLOGY AND TERATOLOGY 29 (2005). The third paper consisted of a double-blind, placebo-controlled study of the use of CSM to treat biotoxin illness and also reaffirmed his case definition. Ritchie C. Shoemaker & Dennis E. House, *Sick Building Syndrome (SBS) and Exposure to Water-Damaged Buildings: Time Series Study, Clinical Trial and Mechanisms*, 28(5) NEUROTOXICOLOGY AND TERATOLOGY 573 (2006). This third study was extremely limited; it looked at twenty-six subjects, only thirteen of whom participated in the placebo-controlled trial, and each subject served as his own control. *Id.* at 575-76.

In his studies, Dr. Shoemaker uses a five-step, repetitive exposure protocol to establish the cause of his subjects' illnesses. First, the patient is evaluated under the two tiers explained above and then diagnosed with mold illness. Second, the patient is treated with CSM and tested

to ensure that the biomarker levels have returned to normal. Third, the patient stops CSM treatment and stays away from the suspected mold environment to see if the illness returns when exposed to the variety of biotoxins which are ubiquitous in everyday life. If the patient's biomarker levels remain normal, this means that other exposures are ruled out as the source of the symptoms. Fourth, the patient then returns to the mold environment for no more than three days, and finally, the patient is re-tested to obtain final biomarker readings after having re-acquired the illness. (Pls.' Ex. 55 at 31-32.) By demonstrating that the abnormal levels of biomarkers are associated with the patient's presence in the suspected mold environment, Dr. Shoemaker claims that the illness was caused by exposure to that building.

B. Diagnosis of Plaintiffs

Plaintiffs visited Dr. Shoemaker on September 11, 2007, to obtain his expert opinion regarding the etiology of their symptoms. (Pls.' Ex. 55 at 1.) He spent roughly two hours with each plaintiff, during which time he took their medical histories and performed physical exams. (Pls.' Ex. 55 at 14.) He also performed a VCS test, pulmonary function, electrocardiogram, and pulse oximetry.[2] (*Id.*) At that time, he ordered that laboratory tests be conducted on plaintiffs' blood samples to determine plaintiffs' levels of the Tier 2 biomarkers. (*Id.*) However, even before he received the results of these tests, and thus with no information as to whether plaintiffs met the second tier of his diagnostic criteria, he concluded that "[b]oth Ms. Young and Ms. Ghee acquired a typical biotoxin-associated illness following exposure and re-exposure to the indoor

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[2] Dr. Shoemaker requests that his patients complete a number of additional tests that he finds useful in making his diagnosis, all of which plaintiffs chose not to complete. These include an MR spectroscopy, which provides information about cognitive impairment; a pulmonary stress test, which determines O_2 max; and a stress echo, which measures pressure in the pulmonary artery circuit. (Tr. at 247:18-249:9.)

air environment of their townhouse at Apt 2A 3064 Stanton Rd SE, Washington, DC." (*Id.* at 1.) The September 2007 visit, which occurred five years after plaintiffs moved out of Apartment 2A, was the only time Dr. Shoemaker examined the plaintiffs. At some point after that examination, Dr. Shoemaker received the results of plaintiffs' blood tests, which he believes confirms his initial diagnosis. According to Dr. Shoemaker, Young had four of six abnormal blood test results, and Ghee had three of six (three being the minimum required to meet the second tier). (Pls.' Ex. 14 ¶¶ 103-04.) Both plaintiffs had mold susceptible HLA DR genotypes, and both had deficits in their VCS scores, although Dr. Shoemaker was unable to provide plaintiffs' actual results for the VCS test. (*Id.*; Tr. at 157:5.) In addition to those tests, Young's tests revealed MSH of 12 pg/ml and MMP9 of 565, and Ghee's test results revealed MSH of 18 pg/ml, all of which Dr. Shoemaker classifies as abnormal. (Pls.' Ex. 14 ¶¶ 103-04.)

Dr. Shoemaker did not perform his five-step protocol on plaintiffs, and indeed could not possibly have done so, as he first met them long after they left the suspected mold environment. Nor was he able to base his causation opinion on the plaintiffs' response to treatment, for both plaintiffs chose not to take the CSM that he had prescribed for them. (Tr. at 19:20-23.) However, he is of the opinion that now that he has proven the research model for mold illness in his 2006 publication, it is no longer necessary to follow the five-step protocol with new patients, because causation necessarily follows from his diagnosis. (Pls.' Ex. 14 ¶ 93.)

III. PROCEDURAL POSTURE

At the conclusion of discovery, defendants moved for a *Daubert* hearing, relying on the affidavits of two experts. According to their expert toxicologist, Dr. Scott Phillips, since there was no evidence as to the exact substance plaintiffs were exposed to or the level at which they

were exposed, formal toxicological causation analysis could not be performed. (Defs.' Ex. 6 [Dr. Scott Phillips' Report] at 23-24.) In addition, the tests Dr. Shoemaker uses to reach his diagnosis are experimental and "not generally accepted in the toxicology community." (*Id.* at 28-29.) Dr. Phillips explained the traditional causation analysis, comprised of the nine "Hill Criteria" that are necessary to establish a causal relationship between two things,[3] and using these criteria, he opined that "there is no support for a causal association between the dark material on the adjacent apartment walls and the Plaintiffs['] health complaints." (*Id.* at 25-26.) Defendants' expert immunologist, Dr. S. Michael Phillips, walked through each of the Hill Criteria and explained how the facts of this case cannot support a finding of causation. (Defs.' Ex. 7 [Dr. S. Michael Phillips' Report] at 10-14.) He also faulted Dr. Shoemaker's conclusions on the grounds that "[b]iotoxins do not cause the spectrum of disease shown by Denicole and Vanessa"; that none of the laboratory criteria Dr. Shoemaker uses to arrive at his diagnosis has been "causally associated with specific biotoxin associated human illness"; and that "the medical community does not recognize" biotoxin-associated illness. (*Id.* at 15-17.) Also, according to Dr. Phillips, no actual exposure to mold has been demonstrated; neither plaintiff has any symptoms or test results that could be caused by biotoxins; and "allergies and infections may be plausible explanations of Denicole's major respiratory exacerbation" on April 15, 2003. (*Id.* at 17-18.)

In their opposition, plaintiffs argue that defendants' criticisms only amount to an attack on Dr. Shoemaker's conclusions, not his methodology, and therefore, defendants cannot prevail even if Dr. Shoemaker "draws *conclusions* from test methods and lab tests established for other

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[3] The nine Hill Criteria are: 1) strength; 2) consistency; 3) specificity; 4) temporality; 5) biological gradient; 6) plausibility; 7) coherence; 8) experiment; and 9) analogy. (Defs.' Ex. 6 at 25.)

purposes, and applies them to a different use." (Pls.' Opp'n at 27.) In making this argument, plaintiffs rely on Dr. Shoemaker's affidavit, in which he elaborated on his methodology and explained that he uses standard differential diagnostic procedures which are widely used and accepted in the scientific community. (Pls.' Ex. 14 ¶¶ 11-16.) Plaintiffs also submitted Dr. Shoemaker's peer-reviewed publications on "mold illness," along with numerous scientific papers explaining the human health effects of mold, in order to rebut defendants' contention that Dr. Shoemaker's testimony is not based on a scientifically valid methodology. (Pls.' Exs. 16-33.)

The Court granted a *Daubert* hearing, and both parties submitted direct testimony in the form of affidavits from their experts in advance of the hearing. During the hearing, held on June 16, 2008, Dr. Shoemaker was subjected to cross-examination, followed by the testimony of Dr. S. Michael Phillips. Based on this testimony, as well as the parties' prior submissions, the Court makes the following findings of fact and conclusions of law.

ANALYSIS

I. GOVERNING LEGAL STANDARDS

The admissibility of expert testimony in federal courts is governed by Federal Rule of Evidence 702, which provides:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert . . . may testify thereto in the form of an opinion or otherwise.

As explained by the Supreme Court, under Rule 702, "the trial judge must determine at the outset . . . whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue." *Daubert v. Merrell Dow Pharms., Inc.*,

509 U.S. 579, 592 (1993). The first prong of the analysis "establishes a standard of evidentiary reliability," *id.* at 590, while the second prong "goes primarily to relevance." *Id.* at 591.

Testimony as to the nature, cause, and extent of plaintiffs' symptoms is clearly relevant to the final determination of liability and damages. Furthermore, such testimony involves medical and scientific matters which are beyond the ken of the average juror. Thus, the only inquiry is whether Dr. Shoemaker's testimony meets the standard for evidentiary reliability under the first prong of the *Daubert* analysis.

In performing its "gatekeeping" role, "the district court must focus 'solely on principles and methodology, not on the conclusions that they generate.'" *Ambrosini v. Labarraque*, 101 F.3d 129, 133 (D.C. Cir. 1996) (quoting *Daubert*, 509 U.S. at 595). In so doing, "the district court must engage in 'a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.'" *Id.* at 133 (quoting *Daubert*, 509 U.S. at 592-93). The Supreme Court suggested several factors to be used in making that assessment: "(1) whether the theory or technique can be (or has been) tested; (2) whether the theory or technique has been subject to peer review and publication; (3) the known or potential rate of error of the methodology; and (4) the general acceptance of the methodology." *Raynor v. Merrell Pharms. Inc.*, 104 F.3d 1371, 1375 (D.C. Cir. 1997). That list of factors "is 'flexible' and . . . neither necessarily nor exclusively applies to all experts or in every case." *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 141 (1999). Nor is it a "definitive checklist" or test. *Daubert*, 509 U.S. at 593. The burden is on the proponent of the evidence to show that by a preponderance of

the evidence the opinions they seek to present are reliable. *Meister v. Med. Eng'g Corp.*, 267 F.3d 1123, 1127 n.9 (D.C. Cir. 2001).

II. APPLICATION OF *DAUBERT* TO TOXIC TORT AND MOLD CASES

Courts throughout the country have varied widely with respect to the level of certainty they require with respect to the issue of causation in toxic tort cases generally, and in mold cases specifically. *See* Jeffrey J. Hayward, *The Same Mold Story?: What Toxic Mold is Teaching us about Causation in Toxic Tort Litigation*, 83 N.C. L. Rev. 518, 536-38 (2005). One common method of attempting to demonstrate causation is showing a temporal relationship between exposure to a toxin and subsequent adverse health effects. While the circumstances of the exposure and the timing of the illness may be so compelling as to render further evidence of causation unnecessary, temporal association between exposure and illness, without more, is generally insufficient to establish causation. For example, the Fourth Circuit allowed testimony that relied heavily on temporality where the symptoms began shortly after the plaintiff started working with a toxic chemical, and where the plaintiff's symptoms increased or decreased depending on whether the plaintiff was at work or away from the job site. *Westberry v. Gislaved Gummi AB*, 178 F.3d 257, 265 (4th Cir. 1999). However, *Moore v. Ashland Chem.*, 151 F.3d 269 (5th Cir. 1998), represents a more traditional approach, in which the Fifth Circuit concluded that "[i]n the absence of an established scientific connection between exposure and illness, . . . the temporal connection between exposure to chemicals and an onset of symptoms, standing alone, is entitled to little weight in determining causation." *Id.* at 278. A district court judge in the Eastern District of Virginia applied that same logic to a mold case when he found that "[a]n

opinion based primarily, if not solely, on temporal proximity does not meet *Daubert* standards." *Roche v. Lincoln Property Co.*, 278 F. Supp. 2d 744, 764 (E.D. Va. 2003).

The most widely-used method of demonstrating causation in toxic tort cases is to present scientifically-accepted information about the dose-response curve for the toxin which confirms that the toxin can cause the health effects experienced by the plaintiff at the dosage plaintiff was exposed to. Indeed, "[s]cientific knowledge of the harmful level of exposure to a chemical, plus knowledge that the plaintiff was exposed to such quantities, are minimal facts necessary to sustain the plaintiff's burden in a toxic tort case." *Mitchell v. GenCorp, Inc.*, 165 F.3d 778, 781 (10th Cir. 1999) (quoting *Wright v. Willamette Indus., Inc.*, 91 F.3d 1105, 1106 (8th Cir. 1996)). Accordingly, the Fifth Circuit in *Moore* found an expert's testimony unreliable because he had no information about the level of plaintiff's exposure to the chemical solution and thus could not adequately support an assertion that the levels plaintiff was exposed to were sufficient to cause adverse health effects. 151 F.3d at 278.

In a similar vein, the court in *Cavallo v. Star Enterprise*, 892 F. Supp. 756 (E.D. Va. 1995), adopted the three-step methodology for toxicologists endorsed by the World Health Organization, which involves 1) evaluating the chemicals to which the individual may have been exposed and the concentrations of those chemicals in the air the individual breathed; 2) evaluating the level of exposure necessary to produce adverse health effects, according to the published scientific literature; and 3) combining the first two evaluations to estimate the likelihood that the individual actually suffered any of the harmful effects of the chemical in question. *Id.* at 764. That same court later required that any expert giving testimony as to

toxicology, even if not a toxicologist himself, must apply that same methodology in order to ensure reliability. *Roche*, 278 F. Supp. 2d at 754.[4]

Another issue that has affected the causation inquiry in many of the mold cases to date is whether the plaintiff had a proven allergy to the molds to which he or she was exposed. *See, e.g.*, *Roche*, 278 F. Supp. 2d at 751 (finding an expert's opinion that mold was the cause of an illness unreliable because the plaintiff was not allergic to the molds found in his apartment); *Flores v. Allstate Texas Lloyd's Co.*, 229 F. Supp. 2d 697, 702 (S.D. Tex. 2002) (finding testimony inadmissible in part because the medical expert had not based "his testimony on the results of any testing done to determine whether Plaintiffs [were] allergic to any specific type of mold found in their home"). In contrast, Dr. Shoemaker's theory of mold illness is based on the belief that patients have innate immune responses to mold, rather than acquired immune responses (*i.e.*, allergies), and as such, his methodology necessarily deviates from causation inquiries in prior mold cases. (Pls.' Ex. 14 ¶ 25.)

Given the unique nature of his testimony, it is hardly surprising that Dr. Shoemaker has been challenged in numerous jurisdictions throughout the country. Plaintiffs assert that Dr. Shoemaker's testimony has been challenged under *Daubert*, *Frye*, and other standards over twenty times, and they claim that he has been permitted to testify "[t]he overwhelming majority

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[4] To be sure, not every court has required the same level of specificity with regard to exposure level. The *Westberry* court, for example, considered it sufficient that plaintiffs had shown both that inhalation of high levels of talc undisputedly could cause irritation of mucous membranes, and that plaintiff had been exposed to substantial levels of talc. 178 F.3d at 264. Similarly, the Supreme Court of Delaware affirmed the admission of expert testimony about mold-related injuries despite a lack of environmental testing during certain years that the plaintiff resided in the contaminated environment. *New Haverford P'ship v. Stroot*, 772 A.2d 792, 799 (Del. 2001). However, even in those and other similar cases, there has always been at a minimum confirmation of *some* exposure to mold or the toxin in question.

of the time." (Pls.' Opp'n at 32.) However, they have submitted exhibits documenting only five such cases, none of which was decided under *Daubert*. (Pls.' Exs. 47, 48, 49, 53, 54.) Furthermore, in only one of those cases did the court issue an opinion, and in that opinion, only two paragraphs were devoted to Dr. Shoemaker. *Colaianni v. Stuart Frankel Dev. Corp., et al.*, No. 2003 051245 NO, at 3-4 (Mich. Cir. Ct., Oakland County, May 29, 2007) (opinion and order granting in part and denying in part motion in limine). As a result, this Court cannot decipher the scope of Dr. Shoemaker's proffered testimony in those cases where he has been permitted to testify, nor can the Court evaluate the reasoning of those decisions. Furthermore, Dr. Shoemaker admits that this case is different from any other case where he has testified, because he has been unable to take any of the steps of his repetitive-exposure protocol, including treatment, which he relies on in determining causation. (Tr. at 105:23-25.) As such, none of the cases where Dr. Shoemaker's testimony was admitted is particularly informative.

Furthermore, his testimony has been excluded in a number of jurisdictions, including Virginia, Florida, and Alabama, as well as several cases that are remarkably similar to this one. (*See* Defs.' Mot. at 22-24.) A D.C. Superior Court judge excluded Dr. Shoemaker's testimony because neither his theory on the effects of indoor mold exposure nor his methodology in diagnosing the plaintiffs with chronic biotoxin-associated illness ["CBAI"][5] was generally accepted within the scientific community. *Wright v. Fort Lincoln Realty Co., et al.*, No. 03ca4555, at 2-4 (D.C. Sup. Ct. Oct. 15, 2007) (order granting motion in limine). The judge found that "Dr. Shoemaker failed to confirm that the patients were actually exposed to mold in

[5] Chronic biotoxin-associated illness is the name Dr. Shoemaker used for plaintiffs' condition before switching to "mold illness." (Tr. at 28:5-11.)

their indoor environments"; the general scientific community does not recognize Dr. Shoemaker's use of CSM to treat CBAI; and "some of the tests used by Dr. Shoemaker to diagnose the Wrights with CBAI are not generally used by or generally accepted by doctors to diagnose patients with mold-related illnesses." *Id.* at 5-6.

Even more recently, in May 2008, the Ohio Court of Appeals affirmed the trial court's grant of a motion to exclude Dr. Shoemaker's testimony. *Herzner v. Fischer Attached Homes, Ltd.*, No. CA2007-08-090, 2008 WL 2004473, at *3 (Ohio Ct. App. May 12, 2008). Importantly, Ohio's evidentiary standard for admissibility of expert testimony incorporates the teaching of *Daubert*. *Id.* at *1. Applying *Daubert*'s standard, the trial court offered a host of reasons for excluding Dr. Shoemaker's testimony. First, there was insufficient evidence demonstrating actual exposure to mold toxins. The environmental tests conducted on the apartment were completed three months after the plaintiff had moved out of the apartment, and they failed to demonstrate that the mold spores present in the apartment at that time were actually producing toxic byproducts. *Herzner v. Fischer Attached Homes, Ltd.*, No. 2004CVC00564, at 11-12 (Ct. of Common Pleas, Clermont County, Ohio, May 1, 2007). The trial court also found that there had been "inadequate testing to demonstrate a causal connection between exposure to mycotoxins and human health effects" and noted the "lack of peer-reviewed medical literature on 'mold illness' and its causes as defined by Dr. Shoemaker." *Id.* at 13. Furthermore, the court considered Dr. Shoemaker's differential diagnosis process to be unreliable, largely because his "use and interpretation of the laboratory results . . . is not widely recognized in the medical community." *Id.* at 19. On appeal, the appellate court concluded that "[t]he trial court's

thorough and well-reasoned analysis exposed numerous faults in the principles and methods utilized by Dr. Shoemaker to draw his conclusions." *Herzner*, 2008 WL 2004473, at *3.

For many of the same reasons cited by the courts in Ohio and D.C., as well as those set forth herein, this Court finds that Dr. Shoemaker's testimony as to the diagnosis of mold illness, general and specific causation, and the nature and extent of plaintiffs' injuries does not satisfy *Daubert*.

III. DIAGNOSIS

A. "Mold Illness" or "CBAI"

Differential diagnosis is a process by which a physician takes a patient's history, compiles all possible explanations for the symptoms complained of, and then rules out each explanation until only the most likely diagnosis remains. (Defs.' Ex. 19 [Dr. Scott Phillips Aff.] ¶¶ 17-18.) Dr. Shoemaker asserts that he conducted a differential diagnosis, and in the case of both plaintiffs, he determined that "mold illness" was the only possible explanation for their complaints. However, in order for his diagnostic process to be considered scientifically valid, the diagnosis must be one that is recognized by the scientific community.

Based on Dr. Shoemaker's testimony, the Court cannot conclude that "mold illness" is a generally-accepted illness in the medical community. First, he admits that no one outside his practice group has published any peer-reviewed articles on "mold illness," as defined by his two-tiered case definition. (Defs.' Ex. 9 [Shoemaker Dep.] at 51:18-22.) Second, he agrees that CBAI is not generally accepted by the medical community:

> Q: And CBAI, can we say that that's not a generally-accepted diagnosis?
>
> A: No argument about that.

(*Id.* at 196:13-15.)[6] Third, Dr. Shoemaker concedes that there is no formal code in the International Classification of Diseases (ICD-9-CM) for CBAI (*id.* at 196:16-21), and that his case definition for "mold illness" is not used in any medical school in the country. (Tr. 151:16-19.) And lastly, the tests that Dr. Shoemaker uses are not intended to test for "mold illness." (Defs.' Ex. 19 ¶ 14.) Therefore, as found in other recent cases, "mold illness," as defined by Dr. Shoemaker, is not a medically-accepted diagnosis. As such, any differential diagnosis which results in the conclusion that "mold illness" is the most likely explanation for the patients' illnesses is, by definition, unreliable.

B. Case Definition

1. Tier One

a. Plaintiffs' Potential for Exposure

Perhaps more importantly, even if "mold illness" were an accepted diagnosis, Dr. Shoemaker has not shown that plaintiffs meet his case definition. In the first tier of Dr. Shoemaker's case definition, the patient must have the potential for exposure to toxigenic organisms. However, as the court in *Herzner* pointed out, "[c]learly, a person cannot be made ill by mold toxins to which she has not actually been exposed." *Herzner*, No. 2004CVC00564, at 10. No environmental tests were conducted in plaintiffs' apartment to provide actual proof that plaintiffs did, in fact, inhale toxic substances when they resided there. Despite this absence of proof, Dr. Shoemaker attempts to show that plaintiffs had the requisite exposure in two ways, neither of which is convincing.

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[6] Similarly, in a *Frye* hearing held before the D.C. Superior Court on September 27, 2007, Dr. Shoemaker acknowledged the lack of consensus within the scientific community regarding the legitimacy of CBAI. *Wright*, No. 03ca4555, at 3.

First, Dr. Shoemaker believes that his case definition allows him to use the diagnosis of the disease as evidence of actual exposure. (*See* Pls.' Ex. 14 ¶¶ 18-19.) The flaw in his logic was succinctly explained by defense expert Dr. Scott Phillips:

> [T]he alleged symptoms and ailments are used in an attempt to explain that sufficient exposure and dose have occurred. Then, it is argued that exposure has now been shown to be sufficient, and this "proof of exposure" becomes a basis for explaining the cause of the symptoms and ailments. In short, the symptoms fundamentally become the basis for explaining themselves. Such circular reasoning is not scientifically or medically acceptable.

(Defs.' Ex. 19 ¶ 23.) In order for his methodology to be considered scientifically valid and reliable, Dr. Shoemaker must show *actual* exposure to toxins, and not mere *potential* for exposure.

Dr. Shoemaker's second argument is that because plaintiffs were exposed to a water-damaged building, it is "implausible" that plaintiffs would not have had any actual exposure to toxins, and so, in effect, potential for exposure is evidence of actual exposure. (Tr. at 60:23-61:5.) As evidence of exposure to a water-damaged building, Dr. Shoemaker relies on: 1) musty smells in plaintiffs' apartment; 2) visible mold growth in the neighboring apartment; and 3) a Department of Health letter pointing to musty odors in the basement of plaintiffs' building and visible mold growth on the walls of the utility room. (Tr. at 56:10-13, 57:17-25.) What he does *not* point to, because he cannot, is any sort of environmental test showing the presence of mycotoxins or other toxins in the air plaintiffs breathed while they resided in the apartment. However, Dr. Shoemaker considers it unnecessary to have any test results confirming what substances were present in either apartment, and whether those substances were actually producing toxins at the time plaintiffs resided there. With respect to the photographs of the

microbial growth in Apartment 1A, Dr. Shoemaker opined that "if you find such microbial growth, it is implausible that they would not be making toxigenic substances at some time," and thus, "the argument cannot be sustained that you must test for mycotoxins alone to show illness." (*Id.* at 60:23-61:5.)[7] He also considers it unnecessary to know the level of toxic substances to which plaintiffs were exposed because dose response is an invalid concept when discussing genetic susceptibility. He claims that even minimal exposure to a biotoxin for someone with a genetic susceptibility to mold illness can cause a large array of severe symptoms. (Pls.' Ex. 14 ¶ 131.) This reasoning permits Dr. Shoemaker to attribute any number of symptoms to a patient with a genetic susceptibility to mold who was exposed to a water-damaged building, without any information as to the type or amount of toxins she was exposed to.

These arguments are not scientifically valid. First, as explained in Section III(B)(2), the idea of a genetic susceptibility to mold induced illness is unsupported by the scientific literature. Dr. Shoemaker therefore cannot disregard the need for information as to dosage. Second, his methodology contravenes standard toxicology. As explained by defendants' toxicology expert, Dr. Scott Phillips, the more traditional, generally-accepted theory of causation involves the presence of a substance, the opportunity for contact between the patient and that substance, a known dosage of the substance, and an illness consistent with the substance at that dosage.

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[7] Importantly, that statement was made in reference to the visible growth in Apartment 1A. No such visible growth was documented in plaintiffs' apartment, Apartment 2A (Tr. at 61:6-15), and there is no indication that the two apartments shared a common air source. The apartment complex cannot be held liable for any injuries plaintiffs may have sustained while in Apartment 1A, as plaintiffs were trespassers at that time. *Firfer v. United States*, 208 F.2d 524, 528 (D.C. Cir. 1954) ("[A trespasser] must take the premises as he finds them, and cannot hold the owner to liability based upon negligence in failing to make the premises safe."). It is therefore significant that Dr. Shoemaker admits he cannot quantify what effects going into 1A may have had on plaintiffs, as opposed to just living in the adjacent apartment. (Tr. at 242:2-5.)

(Defs.' Ex. 6 at 17.) Because scientific studies do not yet exist that demonstrate what levels of toxins produced by water-damaged buildings are harmful to humans, and what illnesses they cause, that methodology cannot currently be applied to mold. The Institute of Medicine, in a paper cited by Dr. Shoemaker, concludes that the doses of toxins found in water-damaged buildings necessary to produce adverse health effects in humans have not yet been determined. (Pls.' Ex. 20 [Damp Indoor Spaces (IOM)] at 7.) Similarly, the New York City Department of Health issued a report entitled Guidelines on Assessment and Remediation of Fungi in Indoor Environments, which states that "it is not possible to determine 'safe' or 'unsafe' levels of exposure" to fungi. (Pls.' Ex. 22 [NYC Guidelines].) Without that information, Dr. Shoemaker's testimony about the health effects of any such "exposure" cannot possibly be anything other than conjecture. Even if such knowledge existed, Dr. Shoemaker would still be unable to offer any concrete evidence as to what substances existed at what levels. Thus, there is no basis upon which to conclude that plaintiffs' exposures were sufficient to account for the variety of symptoms they have experienced.

b. Presence of Distinctive Group of Symptoms

Dr. Shoemaker's diagnosis of mold illness requires that patients display a certain pattern of symptoms. He identifies eight organ systems which are relevant to the diagnosis, and a patient must present with chronic symptoms in four of those eight organ systems in order to meet the second requirement of the first tier of his case definition.[8] He acknowledges that no one else has

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[8] The eight organ systems are: general, musculoskeletal, head, eye, respiratory, gastrointestinal, executive cognitive functioning, and neurologic. (Tr. at 41:18-44:11.) Curiously, Dr. Shoemaker's most recent scientific study, which he says reaffirmed his case definition, required that subjects have symptoms in at least five of ten organ systems. Shoemaker, *Sick Building Syndrome and Exposure to Water Damaged Buildings*, *supra*, at 575. Antiduretic

published on the use of four out of those eight organ symptoms as a diagnostic tool for mold illness:

> Q: There's no other publication that uses the four out of the eight symptoms that you've just identified to establish one leg of the mold diagnosis. Would you agree with that statement?
>
> A: I would agree that it's not been published.

(Tr. at 49:21-25.)

At the time of Dr. Shoemaker's examination, both plaintiffs had symptoms in at least four of those organ systems, and thus met the second component of Tier 1.[9] There are a number of problems with Dr. Shoemaker's reliance on those symptoms to conclude that plaintiffs are ill as a result of mold exposure. For one, plaintiffs' complex of symptoms did not begin immediately

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hormone and hypothalamic were the additional two organ systems, with headache and skin sensitivity being grouped into a "multifactorial; unique" organ system which takes the place of "head." *Id.*

[9] According to Dr. Shoemaker, plaintiff Young presented with: fatigue; weakness; aching; cramps; cramping of intrinsic muscles of hands and feet such that her digits assumed a claw-like posture; joint pains in feet, knees, and both hands; morning stiffness; unusual, sharp stabbing pain in side of chest and abdomen; headache; sensitivity to bright light; red eyes; tearing; profound shortness of breath; cough; sinus problems; abdominal pain with secretory diarrhea; difficulty handling abstract numbers in simple division, recent memory impairment; difficulty concentrating; decreased word finding; decreased assimilation of new knowledge; confusion; numbness and tingling in both feet; vertigo; tremors; mood swings; appetite swings; difficulty controlling body temperature; excessive thirst; frequent urination; increased susceptibility to static shocks; sensitivity to light touch. (Pls.' Ex. 55 at 15.)

Plaintiff Ghee presented with fatigue; aching; cramps; cramping of intrinsic muscles of hands such that thumbs assumed a claw-like posture; unusual, sharp stabbing pain in right lower back; headache; light sensitivity; red eyes; tearing; profound shortness of breath; sinus problems; joint pains in right knees; morning stiffness; difficulty handling abstract numbers in simple division; recent memory impairment; difficulty concentrating; decreased word finding; decreased assimilation of new knowledge; mood swings; night sweats; difficulty with temperature regulation; excessive thirst; frequent urination; increased susceptibility to static shocks; numbness and tingling in fingers and big toe on right foot. (*Id.* at 15-16.)

after exposure. Indeed, while living in the apartment, both plaintiffs complained only of respiratory symptoms. (Pls.' Ex. 10 [Ghee/Young Medical Records].) Second, the symptoms did not remain consistent over time. In November 2002, Young's medical records indicate that she reported feeling much better than she had in September. (Pls.' Ex. 12 at 0000168.) In virtually every medical record, Young reports slightly different symptoms, with many of her recurring symptoms, such as swelling in the extremities and rash, beginning many months after moving out of Apartment 2A. (Pls.' Ex. 12.) Furthermore, the vast majority of the symptoms Dr. Shoemaker reported for both plaintiffs five years after their supposed exposure are undocumented in any medical records that postdate their exposure in August-September 2002. (Pls.' Exs. 11, 12.) This is particularly evident with respect to Vanessa Ghee, whose brief medical records indicate only respiratory complaints and headaches, as opposed to the myriad of symptoms that Dr. Shoemaker attributed to her in 2007. (Pls.' Ex. 11.) There is simply no evidence that many of the symptoms Dr. Shoemaker reported existed at any time prior to his examination, and thus no evidence that those symptoms have been chronic in nature since plaintiffs' initial exposure to mold.

Furthermore, the suggestion that symptoms experienced five years after exposure to a biotoxin can be attributed to that biotoxin is unsupported by scientific literature. As defense expert Dr. S. Michael Phillips explained, "Dr. Shoemaker's findings in this case are . . . based on the false notion that biotoxins remain in the body for prolonged periods of time. This belief is misplaced and at variance with the known science of mycotoxin metabolism." (Defs.' Ex. 20 [Dr. S. Michael Phillips' Aff.] ¶ 23.) Rather, symptoms from exposure to mycotoxins are

"rapidly reversible" and should have remitted upon leaving the contaminated environment, "if that environment was causally related to symptoms," which did not happen here. (*Id.*)

Finally, Dr. Shoemaker is unable to determine which symptoms are actually attributable to the mold. Rather, he testified that roughly 75% of plaintiffs' symptoms are probably attributable to this mold exposure, although he cannot say which ones. (Tr. at 193:24-194:5.)[10] A diagnostic process which ultimately fails to determine which symptoms are components of the illness is inherently flawed and cannot be considered scientifically valid.

Ultimately, plaintiffs' symptoms have not had the longevity, consistency, and documentation necessary to support Dr. Shoemaker's diagnosis. Additionally, Dr. Shoemaker's assertions about the way symptoms of exposure to biotoxins present is unsupported by scientific literature.

c. Absence of Confounders

The third element of the first tier of Dr. Shoemaker's diagnostic protocol is that there be an absence of confounding diagnoses and exposures. This requirement fulfills the critical purpose of a differential diagnosis, which is to conclude that only the chosen diagnosis could be

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[10] THE COURT: Can you say to a degree of medical certainty that 75 percent of these [symptoms] were caused by the exposure [Ghee] suffered in that building?

THE WITNESS: Yes.

THE COURT: But you can't identify which ones, correct?

THE WITNESS: That's correct.

Id.

responsible for the symptoms presented. Nevertheless, Dr. Shoemaker glosses over the explanation of how he ruled out all potential confounding explanations for plaintiffs' symptoms.

At numerous points in the record Dr. Shoemaker brushes off discussion of confounding diagnoses as almost irrelevant. For instance, his report merely asserts that "[t]hey had no confounding medical illnesses or environmental exposures, as confirmed by a collection of medical records forwarded to [him] before their office visit." (Pls.' Ex. 55 at 2.) He later states that nothing other than mold illness causes patients to present with chronic symptoms in four separate organ systems. (Tr. at 51:2-17.) Similarly, in reference to patients with potential confounders such as diabetes, hypertension, smoking, anxiety, or allergies, he states that "the grouping of symptoms [his] patients have with mold illness are different and the lab abnormalities that those other patients have are different." (*Id.* at 34:15-25.) However, he does not elaborate on exactly what the symptoms or abnormalities would look like in patients with those diseases. In his affidavit, he contends that "[p]otential confounders, such as allergy to trees, dander and grasses, for example, never give any abnormalities" on his Tier 2 tests like MSH and VCS. (Pls.' Ex. 14 ¶ 103.) However, the requirement that there be no confounders is part of Tier 1 of Dr. Shoemaker's case definition and should therefore be satisfied before any blood test results are known. It is insufficient for him to rely on Tier 2 results to justify his findings with respect to Tier 1.

In *Herzner*, the trial court judge pointed out that Dr. Shoemaker "does not explore the possibility that Herzner's symptoms could have been caused by several different ailments." *Herzner*, No. 2004CVC00564, at 20. In this case, Dr. Shoemaker briefly addressed this issue by saying that in his studies he "looked at [the subjects] for symptoms to try to sort out is smoking a

confounder for mold illness, or do people actually have two things . . . ?" (Tr. at 52:18-21.) In short, although he seems to be claiming that he considered the possibility that there may be more than one cause for plaintiffs' symptoms, he provided no specific testimony as to plaintiffs, who appear to have a host of possible confounders, and he does not explain why it is implausible that several simultaneous conditions may have contributed to their symptoms.

The one potential confounder Dr. Shoemaker addresses at any length is Young's prior diagnosis of asthma. However, he manages to use that potential confounder to support his "mold illness" diagnosis. He asserts that "the fact that she, after this exposure, . . . has countless visits in 2003, '04, '05, and '06 for asthma-related conditions is consistent with the hypothesis that this exposure to the water damaged building made her lung condition much worse." (*Id.* at 214:14-18.) Rather than acknowledging that Young's asthma-related symptoms may, in fact, have been caused by the asthma, which she apparently had prior to moving into the Stanton Glen Apartments, rather than the mold, he claims that because her asthma got worse after 2002, she must be a "mold illness" patient. (*Id.* at 214:19-24.)

Overall, Dr. Shoemaker failed to adequately demonstrate his methodology for "ruling out" other possible explanations for plaintiffs' symptoms.

2. Tier 2

Even if Dr. Shoemaker could show that plaintiffs met the first tier of his diagnostic process, his assertion that plaintiffs meet the requirements of his second tier is based on a methodology that is not generally accepted in the scientific community. The first, and most fundamental, flaw in Dr. Shoemaker's Tier 2 analysis is that not one of his Tier 2 biomarker tests (VCS, MSH, MMP9, ADH, ACTH) is generally accepted or clinically-validated for the purpose

of diagnosing "mold illness." Indeed, the laboratory which performs Dr. Shoemaker's tests for MSH, Laboratory Corporation of America ["LabCorp"], includes the following disclaimer regarding the test: "the results should not be used as a diagnostic procedure without confirmation of the diagnosis by another medically established diagnostic product or procedure" (Defs.' Ex. 14 [LabCorp MSH Test for Young]), and the test for MMP9 includes a similar admonition. (Defs.' Ex. 13 [Quest Diagnostic MMP-9 Test for Ghee].) Furthermore, Dr. Shoemaker admits that none of the tests he uses can affirmatively show that a person is ill because of exposure to a water-damaged building. Rather, they can only show that an inflammatory response is present in the patient, which says nothing about the cause of that response. (Pls.' Ex. 14 ¶¶ 23, 25, 28, 30, 32, 34.)

Additionally, the idea that levels of these biomarkers five years after an exposure is in any way related to that exposure is unsupported by generally accepted science. Defendants' expert immunologist, Dr. S. Michael Phillips, explained, for example, that "ACTH rises in the body within minutes of the stress and falls in hours after the stress. . . . [I]n the light of the short biological half-life of ACTH, the measurement of ACTH taken years after a putative exposure could not be relevant to that exposure." (Defs.' Ex. 20 ¶ 20.) Dr. Phillips made similar assertions with respect to C4a, another biomarker Dr. Shoemaker looks at which, although not one of his Tier 2 tests, he nonetheless uses to confirm his diagnosis. Ghee tested within the normal range for C4a, but Young was outside the normal range. (Pls.' Ex. 14 ¶ 103.)[11] Dr. S. Michael Phillips explained that "C4a is an activation marker, which rises in seconds or minutes and falls to

[11] Dr. Shoemaker defines "normal" as less than 2830 ng/ml. Ghee tested at 2694 ng/ml, while Young had a C4a result of 10,935 ng/ml. (*Id.*)

baseline levels with[in] hours after the activation stimulus." (Defs.' Ex. 20 ¶ 21.) Based on this testimony, which the Court credits, testing for these biomarkers five years after an exposure cannot possibly reflect the effects of that exposure.

Furthermore, Dr. Shoemaker's use of HLA DR genotypes to determine mold susceptibility is completely unsupported by the scientific literature. HLA DR genes are found on Chromosome 6, and "are associated with the success or failure to clear illnesses from the body." (Pls.' Ex. 14 ¶ 20.) Dr. Shoemaker believes that certain of these genes can cause people to be susceptible to "mold illness." He estimates that 24% of the population has one mold susceptible HLA DR haplotype, which would make them more likely to develop "mold illness" after exposure to mold toxins. Additionally, 4% of the population has one of what Dr. Shoemaker calls the two "dreaded" haplotypes, so named because those patients have the worst clinical outcomes in response to mold exposure. The theory of a genetic basis for "mold illness" is critical to Dr. Shoemaker's theory, for it allows him to explain how plaintiffs' extensive symptoms can arise from a brief or mild exposure without applying the theory of a dose-response relationship. (*Id.* ¶ 131.) However, with respect to the HLA DR gene, Dr. S. Michael Phillips explained:

> It is associated with various genetic linkages and diseases but has never been shown to be important in biotoxin injury. There have never been any controlled prospective studies indicating that any specific markers in the HLA or HLA-DR loci code can be linked with any mold-associated disease. In fact, Dr. Shoemaker's "dreaded haplotypes" have previously never been linked with any mold-associated illness.

(Defs.' Ex. 20 ¶ 16.) Furthermore, even aside from HLA DR, "[t]here are no accepted genetic markers for susceptibility to mold or toxin induced diseases." (Defs.' Ex. 7 at 17.) Thus, the inclusion of a diagnostic criteria based on genetics is entirely without merit.

Finally, the parameters Dr. Shoemaker has set to determine what constitutes an "abnormal" test result on these Tier 2 tests are not universally accepted in the scientific community. Indeed, they are not even recognized by the labs which he uses to perform the tests. Dr. Shoemaker defines "normal" test results for MSH as 35-81 pg/ml and for MMP9 as 0-332. LabCorp, the lab which runs the MSH tests, recently changed its normal range from 35-81 pg/ml to 0-40 pg/ml. (Pls.' Ex. 55 at 28.) Additionally, the two labs Dr. Shoemaker regularly uses have different normal ranges for MMP9. Quest Laboratories agrees with Dr. Shoemaker that normal is 0-332, but LabCorp sets 0-983 as normal. (Defs.' Ex. 9 at 95:16-98:21.) Given that the two national laboratories that run tests on Dr. Shoemaker's blood samples disagree as to what constitutes a "normal" test result, it is impossible to conclude that Dr. Shoemaker's method of assessing abnormalities in certain biomarkers is generally accepted by the scientific community. Furthermore, if LabCorp's normal ranges are applied here, neither plaintiff has three abnormal test results, and thus, neither plaintiff meets the diagnostic criteria for Tier 2 of Dr. Shoemaker's case definition. (Tr. at 166:8-13.)

Ultimately, Dr. Shoemaker diagnosed plaintiffs with a condition that is not recognized in the scientific community. In doing so, he used circular reasoning to work backwards from diagnosis to proof of exposure, he failed to explain exactly which symptoms comprise that diagnosis, and he did not rule out confounding diagnoses. His methodology in arriving at his diagnosis of "mold illness" is therefore unreliable.[12]

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[12] Interestingly, Dr. Shoemaker does not believe his opinion was significantly affected by the five-year gap between plaintiffs' exposure and their arrival in his office. He claims that both the symptoms and the biomarker abnormalities persist over time and thus would likely have been the same very shortly after exposure as they are now. (*Id.* at 147:15-22.) The only change in his diagnosis that would occur if it had been done five years earlier is that he could have had the

IV. CAUSATION

In a toxic tort case, "[t]he plaintiff must show that the toxicant in question is capable of causing the injury complained of (general causation) and must further prove that the toxicant in fact did cause that injury in the present case (specific causation)." Hayward, *supra*, at 533. General causation must be affirmatively proven before specific causation can be shown. *See Raynor*, 104 F.3d at 1376 ("testimony on specific causation had legitimacy only as follow-up to admissible evidence that the drug in question *could* in general cause birth defects") (emphasis in original). Plaintiffs have failed to sustain their burden as to both.

A. General Causation

Satisfying the general causation inquiry in this case requires a showing that the substance plaintiffs were exposed to is capable of causing the illness they experienced.[13] The first hurdle plaintiffs must overcome is that there is no way of knowing what "substance" the plaintiffs were in fact exposed to, as Dr. Shoemaker freely admits he does not know what molds or bacteria were present in plaintiffs' apartment in 2002, or what toxic substances were being produced at the time. (Defs.' Ex. 9 at 203:13-206:6.) Dr. Shoemaker attempts to overcome this hurdle by referring to the "substance" in question as simply a water-damaged building. However,

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apartment tested to determine what toxins were actually present while plaintiffs lived there and thus would have had a greater level of confidence regarding the substances they were exposed to. (*Id.* at 147:23-148:5.) Even if such a test could have been done, the Court cannot credit his "mold illness" as a diagnosis or his conclusions regarding plaintiffs' diagnosis.

[13] Plaintiffs spend a significant portion of their Opposition citing authorities in support of the contention that mold can cause human illness. (Pls.' Opp'n at 12-21.) In so doing, plaintiffs misconstrue the nature of the general causation inquiry. Whether mold can cause any illness in humans contributes nothing to the much more specific discussion of whether toxins produced by a damp indoor environment are capable of causing the numerous, multi-system symptoms experienced by plaintiffs.

defendants' toxicology expert exposed the fallacy of referring to unspecified environmental conditions as the "substance" in view of the need to identify specific toxins and connect them to specific symptoms. (Defs.' Ex. 6 at 17.)

However, if one takes a broad view of "substance" to include "water-damaged building," and if one accepts "mold illness" as a real disease, the question that remains is whether it is generally accepted in the scientific community that exposure to a water-damaged building causes "mold illness." Even the studies cited by Dr. Shoemaker fail to establish such a connection. For example, the Environmental Protection Agency's 2004 paper, produced with the University of Connecticut, recognizes that "the notion that indoor mold growth can lead to significant toxicity in occupants of 'moldy buildings' has been very controversial in the scientific literature and likely will remain so for the foreseeable future." (Pls.' Ex. 21 [EPA/Connecticut Guidance] at 28.) Furthermore, those papers which affirm the potential for toxic effects as a result of mold exposure refer primarily to upper and lower respiratory tract symptoms (and occasionally to other symptoms such as fatigue, nausea, and headaches), but not to the multi-system symptoms that Dr. Shoemaker attributes to "mold illness." (Pls.' Ex. 22; Pls.' Ex. 23 [CDC 2005] at 24.) The Center for Disease Control also pointed out that "[the Institute of Medicine] found inadequate or insufficient evidence for a link between exposure to damp indoor environments and molds with a variety of conditions that have been attributed to toxicity." (Pls.' Ex. 23 at 24.) It is thus clear that at the present time, the scientific community is not in agreement with Dr. Shoemaker about the wide-ranging effects of exposure to non-specific toxins from water-damaged environments.

Absent a consensus in the medical community about the health effects of exposure to mold, Dr. Shoemaker is left with only his own most recent peer-reviewed publication on "mold

illness" to demonstrate general causation. However, defendants correctly highlight several deficiencies in this study. For one, the study was far too limited to stand alone as proof of general causation; only twenty-six subjects participated in the study, and the double-blinded, placebo-controlled clinical trial involved only thirteen of those subjects. (Defs.' Reply at 4.) Furthermore, at the time of publication, LabCorp had already changed its "normal range" for the MSH blood test, such that Dr. Shoemaker's diagnostic criteria were no longer in accordance with medically accepted standards. (Defs.' Reply at 4; Tr. at 164:11-17.) Additionally, in the introduction to his third article, even Dr. Shoemaker acknowledges that "[t]he hypothesis that chronic exposure to the indoor environments of water-damaged buildings (WDB) causes a multi-system illness, often referred to as "sick building syndrome" (SBS), remains controversial." Shoemaker, *Sick Building Syndrome and Exposure to Water Damaged Buildings*, *supra*, at 574.[14] Given these substantial limitations and his own admission that a causal link is not generally-accepted, this single study cannot serve to establish general causation.

B. Specific Causation

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[14] The D.C. Superior Court pointed to similar language in Dr. Shoemaker's second peer-reviewed publication on "mold illness" in finding a lack of evidence as to general causation. In the abstract to that paper, he stated: "[t]he human health risk for chronic illnesses involving multiple body systems following inhalation exposure to the indoor environments of water-damages buildings (WDBs) has remained poorly characterized and the subject of intense controversy." Shoemaker, *A Time-Series Study*, *supra*, at 29. In his affidavit, Dr. Shoemaker objects to the D.C. Superior Court's use of that sentence to discredit his theory. He argues that "[s]aying why a paper is going to be written is standard practice; citing the reason for the paper as the same as the conclusion is illogical." (Pls.' Ex. 14 ¶ 105.) However, given the obvious limitations of his third paper, this study is hardly sufficient to transform his theory from "controversial" to generally-accepted.

In the absence of sufficient proof of general causation, it goes without saying that plaintiffs cannot establish specific causation. But even if they could, plaintiffs fail to offer any evidence of specific causation.

In his studies, Dr. Shoemaker has utilized a repetitive exposure protocol ["REP"] to demonstrate causation. By showing that his study participants get better with treatment, remain healthy without treatment when away from the water-damaged building, and then experience an almost immediate return of symptoms when they return to the building, he is able to rule out other environmental exposures as the source of his patients' illnesses. (Pls.' Ex. 55 at 31-32.) Dr. Shoemaker even advises his patients that with respect to proving their mold injury claims, "the most unbeatable evidence is your response to treatment and re-exposure in the 5-step repetitive exposure protocol." (Defs.' Ex. 21 [Dr. Shoemaker Website FAQ] at 3.) However, because plaintiffs moved out of their suspected mold environment five years before they went to see Dr. Shoemaker, there was no way for him to re-create the conditions that existed there five years earlier so that plaintiffs could return to that environment to determine what would happen to their symptoms. More importantly, as explained by the court in *Herzner*, Dr. Shoemaker's use of the REP to establish causation "is supported by nothing other than a temporal relationship." *Herzner*, No. 2004CVC00564, at 26. Drawing conclusions about causation from temporality is a common logical fallacy known as *post hoc ergo propter hoc* (after the fact, therefore because of the fact), and is as unpersuasive in the courts as it is in the scientific community. *See, e.g., Rolen v. Hansen Beverage Co.*, 193 F. App'x 468, 473 (6th Cir. 2006) ("Expert opinions based upon nothing more than the logical fallacy of *post hoc ergo propter hoc* typically do not pass muster under *Daubert*.").

Furthermore, although Dr. Shoemaker prescribed Cholestyramine (CSM) to both plaintiffs, neither plaintiff followed his advice, so he was unable to see how they responded to treatment. (Tr. at 19:20-23.) Importantly, Dr. Shoemaker admits that he has never before testified in a case where the plaintiffs had not at least taken the prescribed medication and shown improvement. (*Id.* at 105:23-25.) Even in other cases where he first met the plaintiffs years after their potential exposure, he had still treated them with CSM, observed their symptoms improve, and then stopped CSM treatment and demonstrated that their condition again deteriorated.[15] (*Id.* at 106:23-107:3.) This case thus lacks any of the steps which Dr. Shoemaker himself has relied upon in the past to draw a direct link between an exposure and an illness.

Because he was unable to complete any part of his REP, Dr. Shoemaker claims that merely by diagnosing plaintiffs with "mold illness," he has established evidence of causation. He asserts that because the research model for his case definition was proven in his most recently-published study, causation is established. And "once established, causation does not have to be re-invented for each repeat case." (Pls.' Ex. 14 ¶ 109.) This assertion is entirely without merit. In actuality, the results from his third paper merely support "the general hypothesis that SBS [Sick-Building Syndrome] is associated with exposure to WDBs [water-damaged buildings]." Shoemaker, *Sick Building Syndrome and Exposure to Water Damaged Buildings*, *supra*, at 583. In other words, Dr. Shoemaker himself reports that it confirms a

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[15] Dr. Shoemaker claims his diagnosis is actually strengthened by the fact that plaintiffs have not received any treatment for their symptoms. He states that "[t]he fact they didn't get treatment from 2002 until when their lab database was accumulated in 2007 assists [him] because it shows that the lab abnormalities which should be durable without treatment are indeed durable" (Tr. at 198:7-11), and thus are consistent with his illness model. However, this runs directly counter to Dr. Shoemaker's own statement on his website that response to treatment is the best evidence of mold illness. (Defs.' Ex. 21 at 3.)

"*general* hypothesis" (one that finds no support outside of Dr. Shoemaker's research group), not proof of *specific* causation for every future patient. Indeed, as pointed out by defendants' expert immunologist, Dr. Shoemaker's assertion that he need not determine causation for future patients is contrary to accepted medical principles. (Defs.' Ex. 19 ¶ 30 ("for each new case, one must evaluate each patient on a case-by-case basis . . . to determine the most likely diagnosis and ultimately causes for that disease process").)

Given that Dr. Shoemaker arrives at his opinions as to both general and specific causation based on novel and unaccepted theories and methodologies, plaintiffs cannot sustain their burden under *Daubert* as to causation.

V. NATURE AND EXTENT OF PLAINTIFFS' INJURIES

Because the Court finds "mold illness" to be an unaccepted diagnosis, any testimony as to the nature or extent of plaintiffs' injuries relating to that illness is necessarily unsupported by reliable scientific evidence. Dr. Shoemaker himself admits that without any knowledge of how each plaintiff would respond to treatment, he cannot offer an opinion as to the permanency of their symptoms. (Defs.' Ex. 9 at 36:11-19 ("I can't give permanency in this case, because she hasn't even taken the first intervention that can correct this illness.").) And similarly, he cannot say which of plaintiffs' symptoms were caused by exposure to the damp environment of the apartment. (Tr. at 193:24-194:5.) Therefore, based on Dr. Shoemaker's own admissions, his testimony in these areas would be nothing other than speculation.

CONCLUSION

For the foregoing reasons, defendants' motion to exclude the opinion testimony of plaintiffs' expert, Dr. Ritchie Shoemaker, is **GRANTED**. A status hearing is set for July 31, 2008, at 11:00 a.m.

/s/
ELLEN SEGAL HUVELLE
United States District Judge

Date: July 22, 2008

33b

WONDER MAKERS
ENVIRONMENTAL

June 29, 2009

Mr. Vince Sugent
7768 Pleasant Lane
Ypsilanti, MI 48197

RE: Review of a Memorandum Opinion and Order from United States District Court for the District of Columbia, Civil Division, Regarding; Young & Ghee (plaintiffs) vs. W. F. Burton and Lewis & Tompkins, P.C. (defendants), Civil Action No. 07cv0983 (ESH).
WM project GC09-8593

Dear Vince:

As part of the FAA's response to your whistleblower complaint to the Office of Special Counsel, the Agency submitted a number of documents to support their contention that mold and other indoor air quality problems at the Detroit Metro Tower were handled properly. A review of the first set of FAA submittals revealed a number of referenced documents that were missing. Over the past weeks we have been examining the second set of documents submitted by the FAA and offering our insights regarding the Agency's response to mold at DTW and other facilities.

In this document it appears the FAA has once again tried to prove its position that mold in the DTW ATCT is not making controllers sick by offering up a document that has no connection whatsoever to the situation you and your co-workers have been exposed to for the past 5 years. Rather than provide their own hard evidence that refutes the volumes of data collected by experts on behalf of NATCA, the Agency has chosen once again to besmirch the good name of professionals that have provided NATCA with support for its case at the DTW ATCT.

In this case the Agency is attempting to sully the reputation of Dr. Ritchie Shoemaker. Dr. Shoemaker is a renowned medical expert who has spent much of his career studying the human health effects acquired following exposure to water-damaged buildings. Since 1997 Dr. Shoemaker has examined more than 7,200 patients that suspected their acute or chronic health symptoms were the result of exposure to water-damaged buildings. On 25 separate occasions Dr. Shoemaker was allowed to testify as an expert at trial, even after *Daubert* challenges in Michigan, Pennsylvania, New Jersey, and Mississippi.

Dr Shoemaker has provided testimony to a variety of legislative bodies and governmental agencies beginning with the House of Representatives in September 2004. He testified at the request of Rep. John Conyers (D-MI), sponsor of House legislation regarding mold problems, including human health. In January 2006 Dr. Shoemaker was asked to provide testimony before the U.S. Senate Health, Education, Labor and Pensions committee at the request of Senator Kennedy's office. Following this testimony, it was arranged for him to examine patients in New Orleans with the agreement of the State of Louisiana, Homeland Security, and FEMA. We find

it interesting that a variety of federal and state entities consider Dr. Shoemaker to be an expert in the field of mold-related illnesses and water-damaged buildings, but the FAA does not.

The Agency included this written decision in its set of information requested by the Office of Special Counsel. This document is a summary of U.S. District Judge, Ellen Segal Huvelle's decision regarding a *Daubert* hearing conducted in a civil case brought before the U.S. District Court for the District of Columbia. The purpose of the *Daubert* hearing was to determine if Dr. Shoemaker could be used as an expert witness for the plaintiffs in the case of Young & Ghee (plaintiffs) vs. W.F. Burton and Lewis & Tompkins, P.C. (defendants).

The defendants challenged Dr. Shoemaker's testimony under *Daubert* and succeeded in getting it excluded from future hearings in that case. However, it is important to note that the case of *Young, et al. v. Burton et al.* is not factually similar to the situation at DTW, in which Dr. Shoemaker has treated occupants for mold exposure. This case cited by the FAA is about two tenants that were allegedly exposed to microbiological contaminants in a water-damaged apartment located next to the one they were living in. The plaintiffs alleged after being examined by Dr. Shoemaker that exposure to the water-damaged apartment that occurred during 2002 was still causing chronic health symptoms in 2007. The court's primary concern in this matter was that it felt Dr. Shoemaker's diagnosis was based on the patients' previous exposure. According to the court this was an untenable position since there was not any form of sampling data that would support Dr. Shoemaker's findings and ultimate diagnosis. It should be noted that this decision is under appeal.

NATCA's case against the Agency is much stronger since there is a significant amount of data available from both viable and non-viable samples taken in the tower. Unlike the plaintiffs Young & Ghee, controllers are or have been exposed to the conditions in the DTW ATCT each time they report to work for the past 5 years. The symptoms they currently exhibit have been directly related to this exposure by several physicians, including Dr. Shoemaker.

The condescending attitude taken by the FAA with regard to experts used by NATCA is a misguided attempt to show that the FAA knows more about water-damaged buildings and mold than these industry experts. Imagine if NATCA tried to present Dr. Shoemaker as an expert in air traffic control. Both of these positions are ridiculous. Rather than trying to be something that it is not, the Agency should heed the advice of industry experts by determining the causes of water infiltration in the Leo Daly ATCTs around the country. Once the underlying cause has been determined, solutions can be developed and implemented to prevent recurrence and mold-contaminated finish building materials can be removed and replaced.

Sincerely,

Michael A. Pinto, CSP, CMP
CEO

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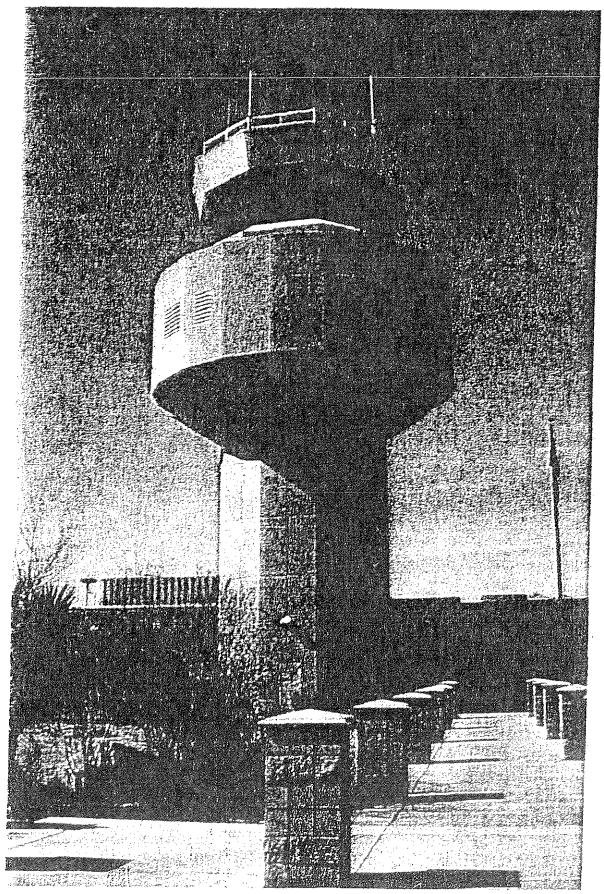
ATO-Terminal ATCT & TRACON Facility Design Types – Executive Reference Guide



(LAL Radian VGT (North Las Vegas) ATCT)

Last Updated: March 24, 2008

Table of Contents

PURPOSE

The original version of this guide provided information and definitions of terminal facility design types. This updated version provides additional reference information to further explain terminal air traffic control facilities by explaining the evolution, quantifying the number of facilities, and providing information regarding the cost of sustaining the various types of facilities.

CONTENTS

This handbook contains multiple sections and appendices. The Background Section provides a basic understanding of the FAA's history and the structure within which ATO-Terminal exists. The remainder of this handbook provides a picture and brief description of the twelve (12) Standard ATCT Design Types. The information is intended to provide a basic understanding of the standard design characteristics and size. The information provided is based on the original standard designs, even though site specific variations (such as Cab size) may exist. The first page of the "ATCT Standard Design Data Sheet" can be used to visually determine the specific type of standard ATCT's.

Several appendices are included to provide additional information for terminal facilities. Appendix A provides a listing of terminal facilities and their associated design types. Appendix B provides a summary of annual sustainment costs by design type. Appendix C provides a listing of sustainment responsibilities for terminal facilities (i.e., FAA maintained or Sponsor maintained). Appendix D a listing of Facility Assessments, by location and type of assessment, that have been completed through FY2007.

BACKGROUND

The following paragraphs provide a brief history of the FAA, and introduce the differing types of terminal facilities and their evolution.

History of the FAA

The Federal Aviation Agency (FAA) was established by the Federal Aviation Act of 1958 (49 U.S.C.A. § 106). This legislation gave the Civil Aeronautics Administration (CAA) functions to this new independent body.

The U.S. Department of Transportation (DOT) was established in 1967. This cabinet level agency was made up of numerous agencies that had responsibility for air and surface transport, including the Federal Aviation Agency, whose name was then changed to the Federal Aviation Administration.

The FAA is responsible for regulating air commerce and fulfilling the requirements of national defense; controlling the use of the navigable airspace ensuring safety and efficiency; promoting, encouraging, and developing civil aeronautics; and consolidating research and development with respect to air navigation facilities. The FAA is comprised of four lines of business and 11 staff offices that are vested with fulfillment of this mission. The Air Traffic Organization (ATO) is FAA's largest line of business and is responsible for operating the National Airspace System (NAS). The ATO's mission is to "Improve continuously the safety and efficiency of aviation, while being responsible to our customers and accountable to the public."

The ATO is comprised of four operating units and five support offices. The provision of air traffic control services occur through the collaborative efforts of the four ATO operating units (i.e., Terminal, En Route & Oceanic, System Operations, Technical Operations). Terminal provides air

traffic control service in/around the airport, En Route & Oceanic provides air traffic control service between both domestic and international airports, System Operations coordinates the overall efficiency of the NAS, and Technical Operations ensures the services/equipment needed by the three operating units are available. The five support offices provide support in Finance, Communications, Safety Oversight, Business & Acquisitions, and Operations Planning. ATO's efforts to continually improve NAS services and increase NAS capacity are drivers that fuel economic growth within the aviation sector.

Within ATO-Terminal, there are three different types of terminal facilities that are used to provide terminal air traffic control services. There are Airport Traffic Control Towers (ATCT), which are located at airports throughout the United States, Puerto Rico, Guam and American Samoa, Terminal Radar Approach Control facilities (also known as TRACON's), and Combined Control Facilities (CCF).

ATCT's provide air Traffic Controllers with the ability to manage air traffic within 5 miles of the airport at an altitude of 3,000 ft, and control air traffic to and from runways and on ramps and taxiways. An example of an Airport Traffic Control Tower is the Baltimore-Washington Airport Traffic Control Tower.

TRACON's provide air Traffic Controllers with the ability to sequence and space arriving and departing traffic and manage aircraft from 5 – 40 miles away from the airport at altitudes up to 23,000 ft. An example of a TRACON is the Southern California TRACON.

CCF's provide air Traffic Controllers with the ability to provide En Route and Terminal air traffic control services in the same facility. These facilities may be co-located with an Air Traffic Control Tower or located in a separate facility.

History of Airport Traffic Control Towers (ATCT)

First some definitions are necessary to tell this story:

- Tower Cab – Air Traffic Control (ATC) area used to control airport traffic and see movement areas
- Tower Shaft – Supporting structure to give Cab level adequate height for visibility of movement areas. Shafts are described as either functional or non-functional. Functional means the shaft has space on each floor that is usable (e.g., offices, restrooms, break room, etc.). Non-functional means that the shaft is made up of space is 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 as a toilet room and limited electronic equipment needed to be located close to the Air Traffic operations area.
- Junction Level – This floor or level is usually just below the Cab level and provides a transition (junction) between the main shaft stairs and the separate stairs to the Cab.
- Tower Cab Glass – Specially designed multi-pane glass used in the tower cab to provide to air traffic controllers a clear view of the airport and arriving/departing aircraft.
- Activity Level – The activity level is a calculation based on air traffic volume and procedural complexity. The calculated value is used to determine the initial size requirements for a Tower Cab. The height of the Tower Shaft is determined based on the location of the tower on the airport and the viewing angles needed by the air traffic controllers. An ATCT can be categorized into one of three type based on Activity Level. The Low Activity Level (LAL) ATCT is used in support of smaller airports with lower volume and less complicated traffic. The next category is the Intermediate Activity Level (IAL). The largest facilities are grouped into the Major Activity Level (MAL) category.

As the aviation industry started to grow, the need for control at airports was identified. Early control was strictly visual and communication with aircraft was accomplished with colored flags.

Prior to establishment of the Federal Aviation Agency, the requirement for Airport Traffic Control Towers was placed upon the individual air carriers. The early design of the ATCT generally consisted of a 4 sided control cab constructed atop of a square/functional shaft. Many of these structures were integrated into the airport terminal complex. As such there was almost no standardization in the design of these facilities.

With government regulations of Air Traffic Control (ATC) activities came classification and standardized requirements for support facilities. Airport Traffic Control Towers were categorized by three activity levels. Low, intermediate and major activity level facilities were selected as the classifications. In the early 1960's designs were established as the standards for these three classifications. The designs completed by I. M. Pei were (and are today) generally designated Type L (Low Activity Level), Type O (Intermediate Activity Level), and Pei (Major Activity Level). A large number of these facilities were constructed to support the FAA/ATC requirements.

With the introduction of the Commuter Airlines in the late 1960's to early 1970's the need for more facilities at smaller airports prompted the need for an ATCT to match this aviation industry growth. A new "turnkey" ATCT was developed and supplied by the Hunt Corp. (the design was later modified and supplied by AVCO). This ATCT was classed as a Low Activity Level facility and designed to be easily adapted for nearly any geographic location. This design is designated as a Hunt/AVCO ATCT.

In the 1970's siting and design standards were developed that required varying Cab floor heights and room for facility expandability. The Type L and Type O designs did not allow adequate variation in Cab floor height. The Pei and Hunt/AVCO designs provided little or no provisions for facility expansion. To conform to these requirements, new standard designs were developed through the late 1970's and early 1980's. The Mock design was developed to fill the need for a Major Activity Level ATCT and the Welton Becket design was developed for a Major Activity Level ATCT/TRACON. The Golemon & Rolfe design was used for Intermediate Activity Level facilities. Note that with a reduction in commuter routes (airports), there was not a significant need for additional Low Activity Level facilities.

In the early 1990's the existing design standards were updated with new designs by Leo Daly. The design set included a Low Activity Level standard and a Major Activity Level standard (designated LAL Daly and MAL Daly). The Daly set included an Intermediate Activity Level ATCT, but due to the flexibility of the LAL design, the IAL ATCT design was not included in the FAA ATCT inventory (and as such is not depicted within this document). Although Leo Daly designs for ATCT's had been used by airport developers since the 1960's, it wasn't until this point in time that the Leo Daly designs became an integral part of the FAA Standard Designs.

In the late 1990's the requirement to reduce viewing angles through the Cab glass prompted a new series of Standard ATCT Designs that are in use today. The current design standard is designated as CLAT or Radian and more approximates a "round" ATCT configuration. From Low to Major Activity Levels, the Cabs range from 10 to 16 sides. To maximize expandability, the design set is based on a non-functional shaft (a minimum of occupied floors) with a base building designated for each activity level category. The additional number of sides to the Cab reduces the incidence of parallax when looking through multiple panes of glass at larger angles.

In summary, the early design of ATCT's generally consisted of a 4 sided control cab constructed position on top of a square/functional shaft. As the number of operations increased, the need for larger Tower Cabs and better sight lines was needed. The 4-sided Tower Cab grew to 5-side, then 6-sided, then 8-sided and even now there are 10/12/16 sided Tower Cabs.

In the early 1960's three types of standard 5-sided Tower Cab designs began to emerge. They were Type L, Type O and I.M. Pei (commonly referred to as Pei). Then in the late 1960's and early 1970's the Hunt/AVCO design began to emerge introducing a 6-sided Tower Cab, and the Mock Tower Cab design introduced another 5-sided cab. The Golemon-Rolfe 8-sided Tower Cab

was introduced in the mid-1970's. The Welton-Beckett 8-sided Tower Cab emerged in the early 1980's. In the early to mid-1980's the Leo Daly 8-sided Tower Cab was introduced. A variation on the 8-sided Leo Daly Low Activity Level Tower Cab design was introduced in this same timeframe by HNTB. Since then, ATO-Terminal has settled on three standard Tower Cab designs commonly referred to as LAL Radian (Low Activity Level-Radian), IAL Radian (Intermediate Activity Level-Radian) and MAL Radian (Major Activity Level-Radian) all of which approximate a "round" ATCT Cab design.

Even with these differing design types being introduced since the early 1960's, the largest number of terminal facilities, and for the most part the oldest, fall into the "Non-Standard ATCT" design category. These are most often sponsor built, intended to be aesthetically pleasing, and an integral part of the Airport Terminal environment. These facility types fall outside the "12 Standard" design types and also include military ATCT designs.

TRACON's and CCF's

Terminal RADAR Approach Controls (TRACON's) have been an integral part of the ATC system since the FAA was established. For example, in 1965 the Small TRACON's serving Newark, Kennedy and LaGuardia were collocated into one facility. In 1981, the New York TRACON was established becoming the first Large TRACON. Since then several other smaller TRACON's have been combined into Large TRACON's.

TRACON's that are part of a combined ATCT/TRACON are not categorized separate from the ATCT. TRACON's that are Stand-Alone facilities have a unique location identifier and are categorized as either a "Large TRACON" or "Small TRACON" design type. These two categories are based on the number of operating positions in the TRACON. Large TRACON's have 15 or more positions and Small TRACON's have less than 15.

Combined Control Facilities (CCF) are unique terminal facilities where En Route and Terminal air traffic control services are provided. There are only two CCF's in ATO-Terminal. One CCF is in Honolulu, Hawaii and provides ATCT, TRACON and En Route services. The other CCF is at Edwards Air Force Base, California and provides TRAON and En Route services.

Other Terminal Facility Types

Besides the ATC, TRACON and CCF's, there are "Mobile" ATCT and TRACON facilities. These are portable facilities, most often trailer mounted structures, usually designated for temporary deployment. These facilities are used as a temporary ATCT or TRACON supporting special needs (e.g., air shows, disaster recovery, fire-fighting operations, etc.) or modernization projects.

OVERVIEW

For purposes of tracking and reporting, terminal facilities have been categorized into one of sixteen types. The two tables below identify the different types, including twelve (12) standard designs and four other types mentioned previously.

Twelve Standard ATCT Design Types	
Design Type	
Type L	Type O
Pei	Hunt/AVCO
Mock	Golemon & Rolfe
Welton Becket	LAL Daly/HNTB
MAL Daly	LAL Radian
IAL Radian	MAL Radian

Four Additional Terminal Facility Types	
Non-Standard ATCT*	Small TRACON
Large TRACON	Mobile ATCT/Mobile TRACON

**Non-Standard ATCT includes any unique tower design that is not associated with one of the twelve standard design types.*

STANDARD ATCT DESIGN TYPES

This section provides a brief overview of each of the 12 standard ATCT design types previously discussed. The first sheet provides a "quick reference" for generic identification of ATCT types. The description for each of the design types provides space and configuration information and an explanation of the more common design options utilized.

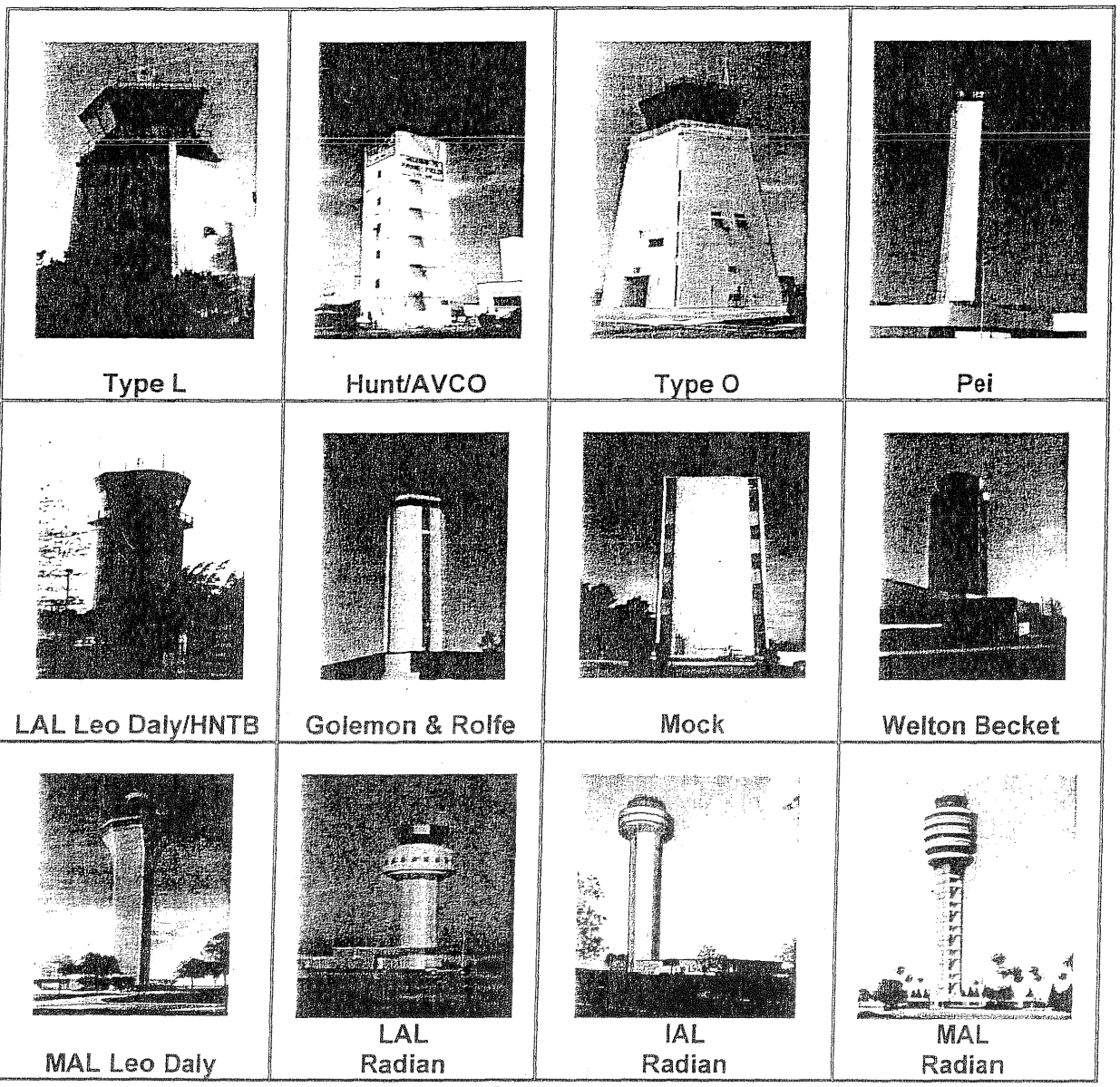


Figure 1. ATCT Standard Design Types

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Type L

Description: The Type L standard ATCT design consists of a square (functional) concrete shaft supporting a 5-sided (pentagon shaped) Cab. The shaft corners are finished with concrete buttress structural features (see attached picture). The standard design does not signify a "Junction Level" floor as the Cab access is via the single facility stairway. For that reason, the following description does not note a junction level.

Shaft Floor Space: The gross footprint area of the shaft is 441 square feet (21'x21' shaft measured from the wall centerline).

The first floor includes an entrance vestibule of approximately 70 square feet, the stairway of 84 square feet, and a room with a gross area of 287 square feet. In the first floor room is a cable shaft which reduces the floor area by 9 square feet resulting in a room floor area of 279 square feet.

Each floor above the first floor up to the Cab floor (2, 3, 4... as dictated by the specific facility configuration) has a nearly identical pre-occupancy layout. These floors consist of a stairway of 107 square feet and a room with a gross area of 334 square feet. In each room is a cable shaft and mechanical duct space which reduces the area by 12 square feet resulting in a room floor area of 322 square feet. On those floors (usually the level below the Cab floor) where a toilet room is included in the space of the room, that toilet room would account for approximately 43 square feet of the total room space.

Cab Floor Space: The Type L ATCT has a 5 sided (pentagon) Cab. Each wall segment measures 16' (measured along wall centerline) for a gross area of approximately 440 square feet. The Cab stairs reduce this by 50 square feet for a net Cab floor area of 390 square feet.

Elevations: The ground floor elevation will generally be 0'-6" above grade. Each subsequent shaft floor elevation will be 12' above the floor below. The Cab floor is 16' above the top shaft floor. As an example for a facility with two (2) floors plus a Cab, the Cab floor elevation would be 28'-6" above grade. With four (4) shaft floors this elevation would change to 52'-6".

For determination of the "highest point", the hand rail (where antennas and air terminals may be mounted) is 16'-6" above the Cab floor elevation. This provides a reference point for determination of the height of the highest point (antenna/lightning protection air terminal). In the examples above, the handrail elevations would be 45' and 69' above grade respectively.

The attached picture shows a 4 floor plus Cab with a resulting handrail height of 69' above grade. The picture shows standard antennas (3' in length, with a 12" mount) and a center mounted air terminal (approx. 14 feet from the antenna). A 1:1 cone of protection (rule of thumb) would result in an air terminal height of approximately 87' above grade.

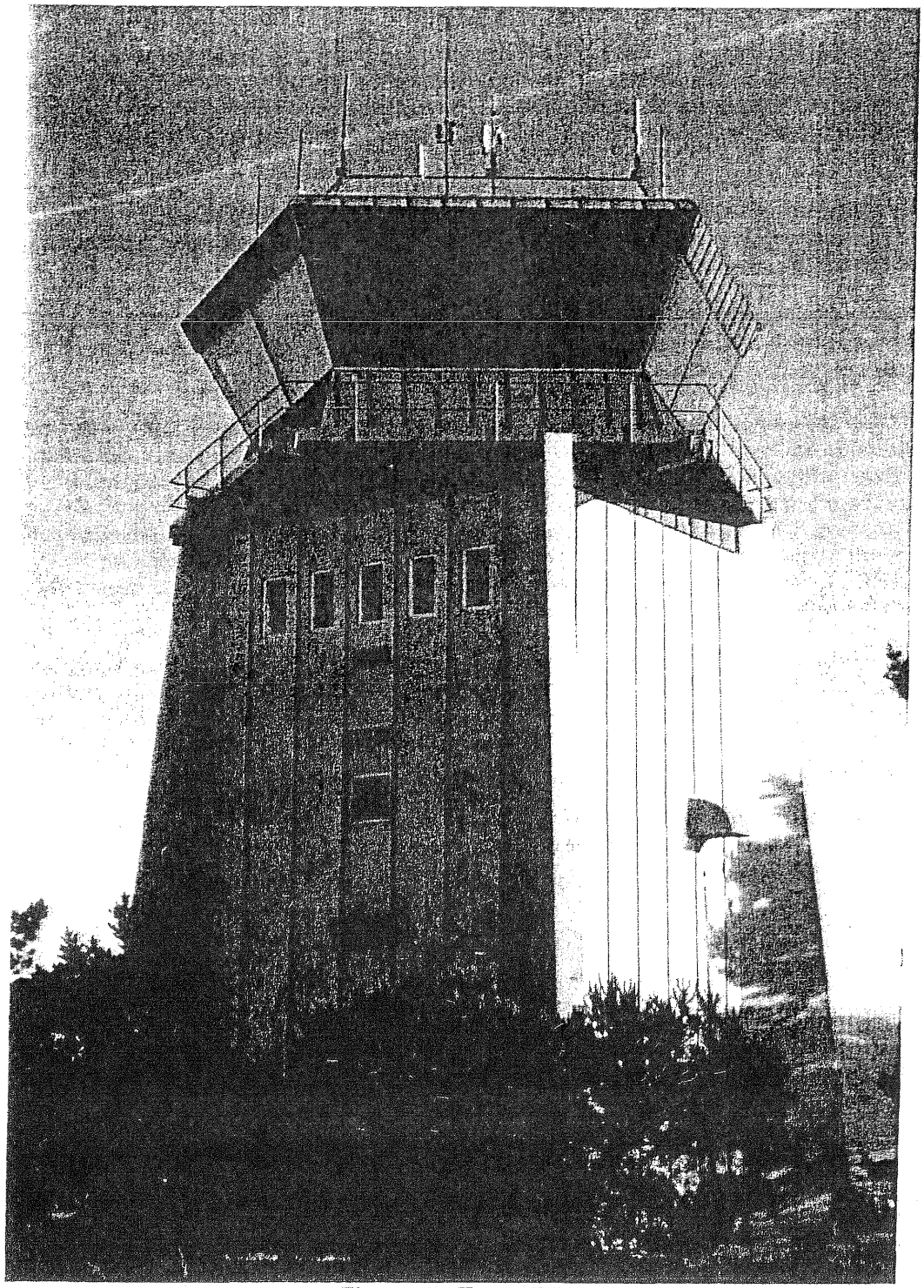

Figure 2. Type "L"

Hunt/AVCO

The Hunt and AVCO standard ATCT design are functionally the same design. The space, elevations, and layout are the same except for the location of the junction level toilet room. Given the similarities, the two design types are combined under a single description for this document. (This design type is also referred to as a "Turnkey" design.)

Description: The Hunt and AVCO standard ATCT design consists of a square (functional/occupied) steel framed metal covered shaft supporting a 6-sided (hexagonal shaped) Cab (see attached picture).

Shaft Floor Space: The gross footprint area of the shaft is 306 square feet (17'-6"x17'-6" shaft measured from the wall interior). The wall interior is used to measure area as space is reduced by internal steel structural framing.

Each floor (except the junction level) is identical in layout. The only variation is from the presence or absence of an elevator (based on ATCT height configuration). Each floor consists of the stairway, mechanical chase, cable chase, small room and large room. If an elevator was included in the facility construction, it replaces the small room. Of the 306 square feet per floor, 94 square feet is taken by the stairway. The cable chase (by the stairway) and mechanical chase (by the small room) reduce the usable area by an additional 11 square feet. The small room (or elevator) has an area of 43 square feet and the large room has an area of 158 square feet.

The junction level floor is similar to the lower floors in that it includes the main stairway, chases, and small room (or elevator). The junction level also includes the Cab access stairs (reducing the usable floor space by 24 square feet) and a toilet room (approximately 30 square feet). The available space for equipment and personnel lockers is only 104 square feet.

Cab Floor Space: The Hunt (and AVCO) ATCT has a 6 sided (hexagonal) Cab. Each wall segment measures 9'-4"' (measured from wall interior) for a gross area of approximately 225 square feet. The Cab stairs reduce this by 36 square feet for a net Cab floor area of 189 square feet.

Elevations: The ground floor elevation will generally be 0'-6" above grade. Each subsequent shaft floor elevation will be 10' above the floor below. The Cab floor is 14' above the top shaft floor. As an example for a facility with four (4) floors plus a Cab, the Cab floor elevation would be 44'-6" above grade.

For determination of the "highest point", the hand rail (where antennas and air terminals may be mounted) is 16' above the Cab floor elevation. This provides a reference point for determination of the height of the highest point (antenna/lightning protection air terminal).

The attached picture shows a 7-floor plus Cab with a resulting handrail height of 90' above grade. The picture shows standard double stack antennas (6' in length, with a 12" mount) and a center mounted air terminal (approx. 11 feet from the antenna). A 1:1 cone of protection (rule of thumb) would result in an air terminal height of approximately 108' above grade.

Figure 3. Hunt/AVCO ATCT

Type O

There are two distinct models of the Type O ATCT. The first has a Cab floor elevation of 48'-10" above grade and the second (Type O1) has a Cab floor elevation of 60' above grade (and includes an elevator). Beyond those major differences, shaft floor areas do vary between the two types. Both types will be discussed.

Description; The Type O standard ATCT design consists of a 5-sided (pentagonal shaped) functional/occupied shaft supporting a 5-sided (pentagonal shaped) Cab. The shaft is steel framed and steel sided and tapered toward to top (see attached picture).

Shaft Floor Space; The Type O ATCT shaft is 5–sided and tapers from the base to the Cab level. The center of each level includes the stairway, mechanical chase, and cable chase. This center feature has an area of approximately 250 square feet.

The first floor has a gross area of 1490 square feet that includes the entrance area/vestibule and center section. Adjusting for those items leaves an area of 1100 square feet.

The second, third, and fourth floors have gross areas of 1300, 1170, and 1050 square feet respectively. When adjusted for the center section, the second floor area is 1050 square feet, the third floor area is 920 square feet, and the fourth floor area is 800 square feet.

The space on the fifth floor (Junction level) is taken up with the shaft stairs, Cab access stairway, toilet room and junction room. The toilet room is approximately 20 square feet, and the junction room (which also contains the Cab HVAC supply duct) is approximately 100 square feet.

Cab Floor Space; The Type O ATCT has a 5 sided (pentagon) Cab. Each wall segment measures 16' (measured from wall centerline) for a gross area of approximately 440 square feet. Access to the Cab level is via a center circular stairway.

Elevations; The ground floor elevation will generally be 0'-6" above grade. The following floor elevations are based on the first floor being 0'-6" above grade. The second floor elevation is at 13'-6", the third floor elevation is at 22'-10", the fourth floor elevation is at 32'-2", and the fifth floor elevation is at 40'-4" above grade. The Cab floor elevation is 48'-10" above grade.

Type O1

Description; The Type O1 standard ATCT design consists of a 5-sided (pentagonal shaped) functional/occupied shaft supporting a 5-sided (pentagonal shaped) Cab. The shaft is steel framed and steel sided and tapered toward to top (see attached picture).

Shaft Floor Space; The Type O1 ATCT shaft is 5–sided and tapers from the base to the Cab level. The center of each level includes the elevator, stairway, mechanical chase, and cable chase. This center feature has an area of approximately 250 square feet.

The first floor has a gross area of 1560 square feet that includes the entrance area/vestibule and center section. Adjusting for those items leaves an area of 1170 square feet.

The second, third, fourth, and fifth floors have gross areas of 1460, 1320, 1200 and 1070 square feet respectively. When adjusted for the center section, the second floor area is 1210 square feet, the third floor area is 1070 square feet, the fourth floor area is 950 square feet, and the fifth floor area is 820 square feet.

The space on the sixth floor (Junction level) is taken up with the shaft stairs, Cab access stairway, toilet room and junction room. The toilet room is approximately 20 square feet, and the junction room (which also contains the Cab HVAC supply duct) is approximately 100 square feet.

Cab Floor Space; The Type O1 ATCT has a 5 sided (pentagon) Cab. Each wall segment measures 16' (measured from wall centerline) for a gross area of approximately 440 square feet. Access to the Cab level is via a center circular stairway. The Cab stairs reduce this by 26 square feet for a net Cab floor area of 414 square feet.

Elevations; The ground floor elevation will generally be 0'-6" above grade. The following floor elevations are based on the first floor being 0'-6" above grade. The second floor elevation is at 13'-6", the third floor elevation is at 23', the fourth floor elevation is at 32'-6", the fifth floor elevation is at 42', and the sixth floor is 51'-6" above grade. The Cab floor elevation is 60' above grade.

For determination of the "highest point", the hand rail (where antennas and air terminals may be mounted) is 16' above the Cab floor elevation. This provides a reference point for determination of the height of the highest point (antenna/lightning protection air terminal).

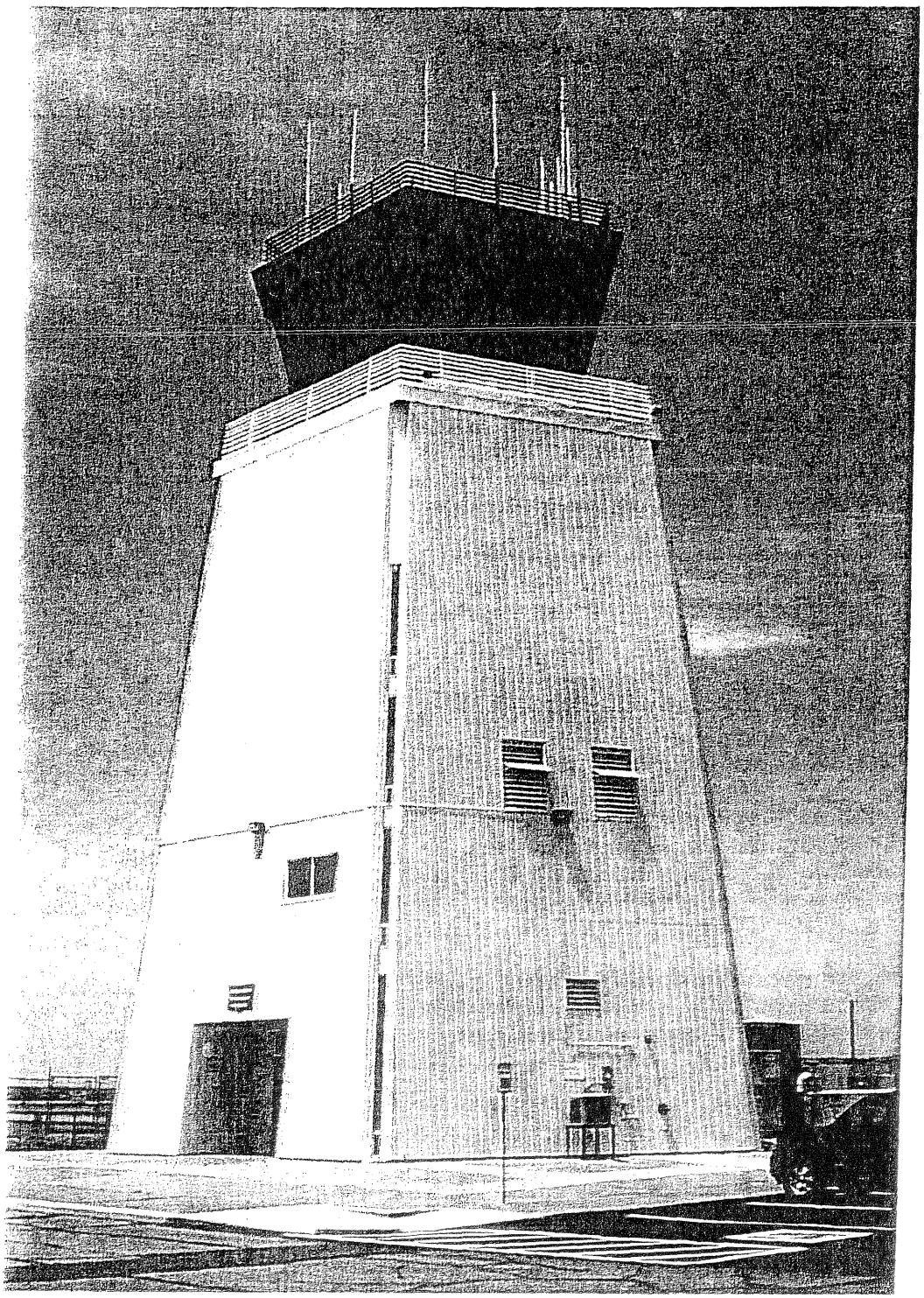

Figure 4. Type O ATCT

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Pei

Description; The Pei standard ATCT design consists of a 5-sided (pentagonal shaped) non-functional concrete shaft supporting a 5-sided (pentagonal shaped) Cab (see attached picture).

Shaft Floor Space; The Pei ATCT shaft is 5–sided measuring 12'-8" per side from the base to the Transfer level. The shaft flares out from the Transfer level to the top of the shaft (Cab level) to a side dimension of 16'. The only occupied area in the shaft is the Junction level (immediately below the Cab level). The shaft includes a center elevator, cable chases, and mechanical duct space surrounded by an access stairway up to the Junction level. The elevator provides access from the Base level to just below the Transfer level (1-1/2 floors below the Junction level). The shaft has a footprint of approximately 275 square feet. Below the ground/base floor level is an elevator equipment room having an area of approximately 85 square feet.

The only occupied area in the ATCT shaft is the Junction level. The Junction level includes the shaft access stairway, Cab stair/foyer area, space for mechanical ducting, equipment space, assignable space, and a toilet room. The equipment space/room has an area of approximately 20 square feet, the toilet room has an area of approximately 16 square feet, and the assignable space (Junction room) has an area of approximately 60 square feet.

Cab Floor Space; The Pei ATCT has a 5 sided (pentagon) Cab. Each wall segment measures 16' (measured from wall centerline) for a gross area of approximately 440 square feet. Access to the Cab level is via a center circular stairway. The Cab stairs reduce this by 26 square feet for a net Cab floor area of 414 square feet.

Elevations; For standard stairway configuration, the ATCT shaft is built in 15' increments (shaft stair landing spacing is 15'-0"). This is the standard configuration up to the Top Elevator Landing level. From the Top Elevator Landing to the Transfer level is 9'-0". The Transfer level to the Junction level is 6'-5", and from the Junction level to the Cab level (floor elevation) is 8'-11".

For determination of the "highest point", the hand rail (where antennas and air terminals may be mounted) is 16' above the Cab floor elevation. This provides a reference point for determination of the height of the highest point (antenna/lightning protection air terminal).

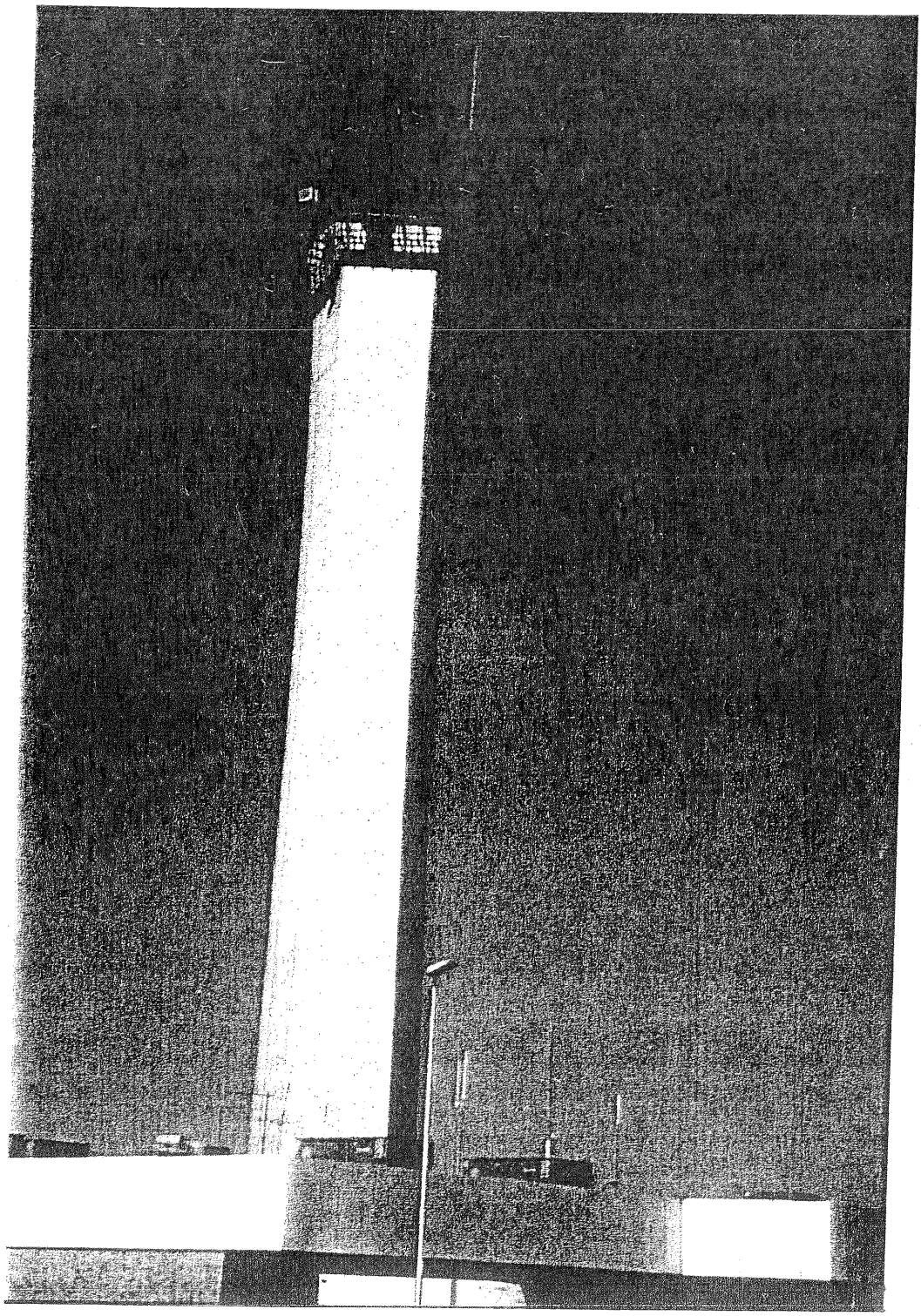

Figure 5. Pei ATCT

LAL Leo Daly/HNTB

Description; The HNTB standard ATCT design consists of a square functional steel structure/concrete panel shaft supporting an 8-sided Cab (see attached picture).

Shaft Floor Space; The gross footprint area of the shaft is 510 square feet (22'-5"x22'-5" shaft measured from the wall exterior). The gross inside area of the shaft is 400 square feet (measured from the wall interior). There are four (4) distinct floor layouts; the ground level, intermediate levels, the junction level, and the cable access level (each shaft level has the same footprint).

The ground level area is divided in the stairway (with stair pressurization equipment) of 140 square feet, elevator of 50 square feet, entrance lobby of 50 square feet, elevator equipment room of 40 square feet, a 30 square foot janitors closet, and 90 square feet for the electrical room. Each intermediate level has a gross area of 400 square feet. That area is reduced by 50 square feet from the elevator, 140 square feet from the stairway, and 10 square feet from cable and plumbing chases. This leaves 200 square feet assignable to various ATCT support functions. The Junction level has a similar layout to the intermediate levels except that approximately 40 square feet (of the 200 square foot assignable area) is dedicated to the toilet room. The cable access level has the same foot print and gross area as the other shaft levels, but since the elevator only goes to the Junction level, additional space is available at this level. The 400 square feet at the cable access level is reduced by only the 140 square feet of stairway, leaving 260 square feet available for ATCT support assignment.

Cab Floor Space; The HNTB ATCT has an 8-sided Cab with a gross area of approximately 385 square feet. The Cab stairs reduce this by 20 square feet for a net Cab floor area of 365 square feet.

Elevations; Each floor of the ground and intermediate floors raises an elevation of 10'-0" up to the Junction level (Ground floor at 0' elevation, 2nd floor at 10' elevation, 3rd floor at 20' elevation...). From the Junction level to the Cable Access level is 9'-10" and from the Cable Access level to the Cab floor is 8'-0". As a result, the Cab floor elevation will be a 10' increment plus 7'-10" (based on the total number of floors). As an example, An ATCT with six floors (including Junction and Cable Access) would have a Cab floor elevation of 57'-10".

For determination of the "highest point", from the Cab floor to the top of the raceway (where antennas would be mounted) is 18'-7". This provides a reference point for determination of the height of the highest point (antenna/lightning protection air terminal). In the example above, that elevation would be 76'-5". From that point, the highest point on the structure would be based on the location and configuration of any items mounted on the ATCT roof.

Figure 6. LAL Leo Daly/HNTB ATCT

Golemon & Rolfe

Description; The Golemon & Rolfe standard ATCT design consists of an 8-sided functional/occupied concrete shaft supporting an 8-sided Cab (see attached picture). A modified version of the Golemon & Rolfe design supports the 8-sided (525 sq. ft.) Cab designed for the Welton Beckett ATCT.

Shaft Floor Space; The Golemon & Rolfe ATCT has an 8-sided functional concrete shaft with a gross area footprint of 445 square feet (22'x22' shaft measured from the wall exterior). The gross interior space in the shaft is 380 square feet (measured from the wall interior). The standard configuration of the shaft includes five (5) distinct floor layouts. These configuration layouts are labeled as the basement level, ground level, intermediate level, sub-junction level, and walkway/junction level.

The basement level generally contains the elevation equipment and has a net floor area (less elevator pit and stairway) of 270 square feet. The ground floor includes an elevator and elevator entrance area, stairway (with exterior exit area), cable chase, and janitor's closet. The only space that can be counted as functional is the 25 square feet of the janitor's closet. Each floor above the first floor up to the sub-junction floor has an identical layout. These floors consist of a cable chase, elevator (with elevator lobby), stairway, and a small assignable room. The small room has an area of 60 square feet. The final two (2) floors at the top of the shaft are the sub-junction and junction/walkway levels. The sub-junction level for this design type includes a cable chase, elevator (with elevator lobby), cable chase, and a toilet room. The toilet room has an area of approximately 25 square feet. In addition, a part of the elevator lobby may be utilized for personal lockers (for Cab level personnel). The junction/walkway level includes a cable chase, stairway, and a facility assignable room. The available room has a floor area of approximately 185 square feet and though the ceiling height is lower than a normal room, the room is suitable for equipment installations.

Cab Floor Space; The Golemon & Rolfe ATCT has an 8-sided Cab with a gross area of approximately 385 square feet. The Cab stairs reduce this by 20 square feet for a net Cab floor area of 365 square feet.

Elevations; Each floor of the ground, intermediate, and sub-junction level floors raises an elevation of 16'-0" up to the junction/walkway level (Ground floor at 0' elevation, 2nd floor at 16' elevation, 3rd floor at 32' elevation...). From the junction/walkway level to the Cab floor is 12'-11". As a result, the Cab floor elevation will be a 16' increment plus 12'-11" (based on the total number of floors). As an example, An ATCT with six floors (including sub-junction and junction/walkway) would have a Cab floor elevation of 92'-11".

For determination of the "highest point", the raceway (where antennas and air terminals may be mounted) is 17'-7" above the Cab floor elevation. This provides a reference point for determination of the height of the highest point (antenna/lightning protection air terminal). In the example above, that elevation would be 111'-6". From that point, the highest point on the structure would be based on the location and configuration of any items mounted on the ATCT roof.

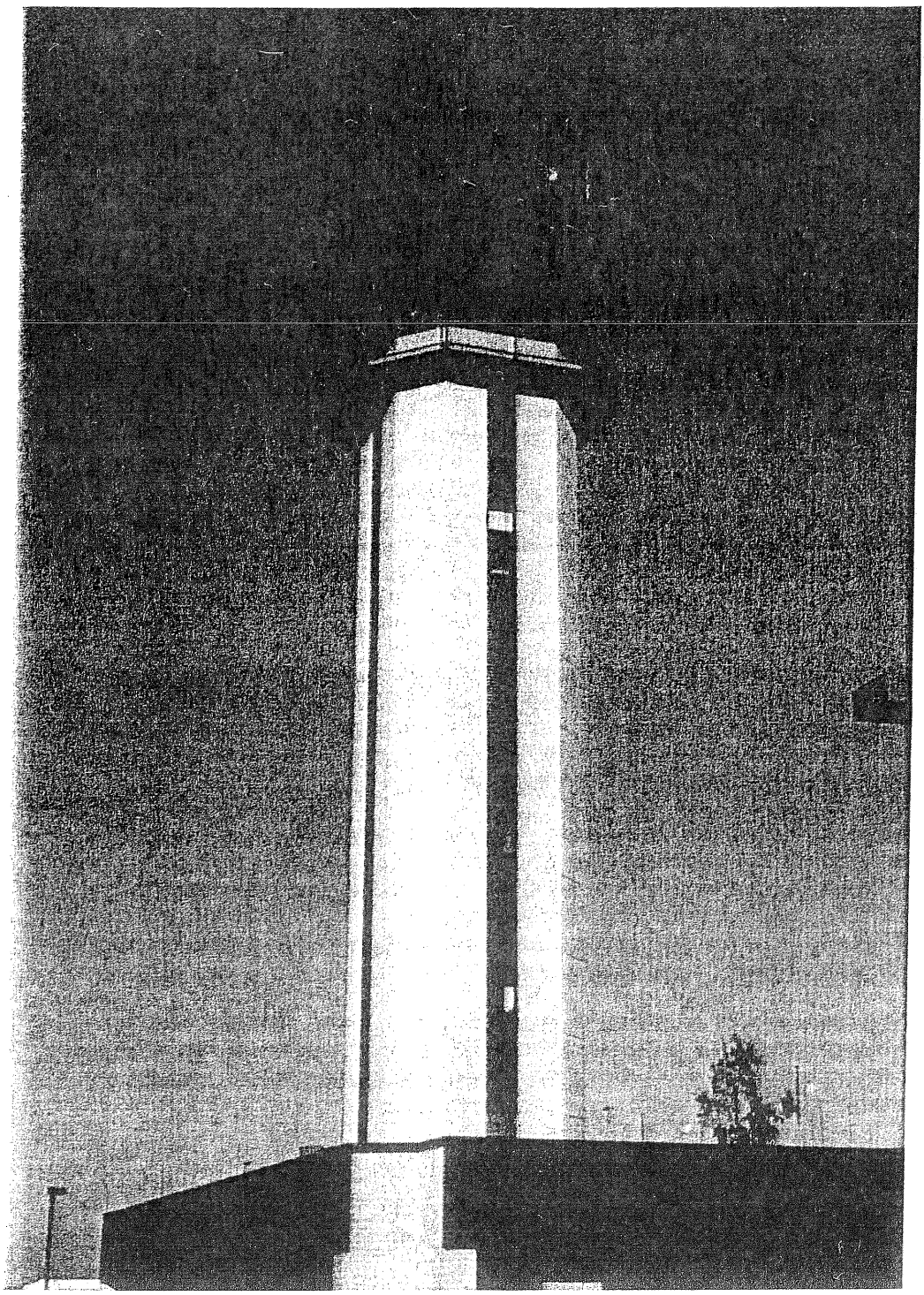

Figure 7. Golemon & Rolfe ATCT

Mock

Description; The Mock standard ATCT design consists of a 4-sided functional/occupied structural steel shaft supporting a 5-sided (pentagonal shaped) Cab (see attached picture).

Shaft Floor Space; The gross footprint area of the shaft is 1078 square feet (32'-10"x32'-10" shaft measured from the wall exterior). The gross interior space in the shaft is 990 square feet (measured from the wall interior). The standard configuration of the shaft includes three (3) distinct floor layouts. These configuration layouts are labeled as the ground level, intermediate level, and junction level.

The ground floor includes an entrance vestibule, elevator, elevator equipment room, stairway, cable chase, generator room, and two (2) rooms. Of the 990 square feet of interior space, the entrance vestibule, elevator, cable chase, and stairway reduce this amount by 275 square feet. The elevator equipment generator room equal approximately 240 square feet. This leaves 475 square feet between the two rooms. Each intermediate floor is configured to include the elevator (with vestibule), cable chase, stairway, and three (3) rooms. The three rooms can be site configured into as few as a single room, and account for approximately 740 square feet of functional space per floor. The junction level (floor just below the Cab) is similar to the intermediate levels except that an additional stairway (Cab access) reduces the floor area from 740 square feet to 630 square feet (110 square feet for the stairway).

Cab Floor Space; The original Mock ATCT design has a 5-sided (pentagon shaped) Cab. Each wall segment measures 14'-3" (measured from wall centerline) for a gross area of approximately 350 square feet. The Cab stairs reduce this by 30 square feet for a net Cab floor area of 320 square feet. The original design was later modified to use the 8-sided Cab from the Golemon & Rolfe design.

Elevations; Each floor of the ground, intermediate, and sub-junction level floors raises an elevation of 12'-1" up to the junction level (Ground floor at 0' elevation, 2nd floor at 12'-1" elevation, 3rd floor at 24'-2" elevation...). From the junction level to the Cab floor is 13'-3". As a result, the Cab floor elevation will be a 12'-1" increment plus 13'-3" (based on the total number of floors). As an example, an ATCT with six floors (including junction) would have a Cab floor elevation of 73'-8".

For determination of the "highest point", the hand rail (where antennas and air terminals may be mounted) is 16' above the Cab floor elevation. This provides a reference point for determination of the height of the highest point (antenna/lightning protection air terminal).

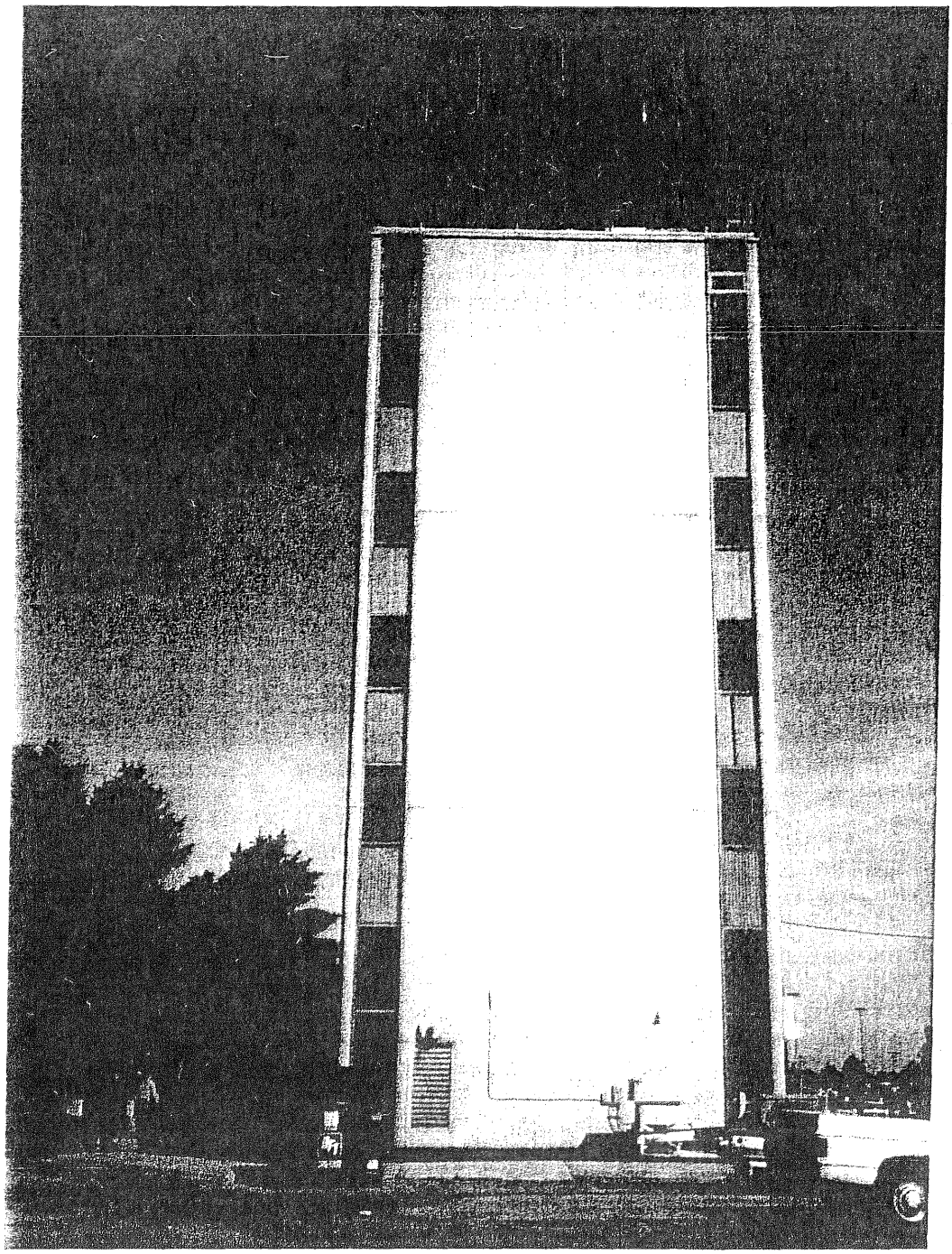

Figure 8. Mock ATCT

Welton Becket

Description; The Welton Becket standard ATCT design consists of four pre-cast concrete legs (non-functional) supporting the sub-junction and junction levels and an 8-sided Cab (see attached picture).

Shaft Floor Space; The four (4) legs of the shaft cover an area of approximately 1600 square feet (40'x40' measured from the leg exteriors). The four legs making up the shaft include a stairway, an elevator, and two (2) legs assigned as cable chases. Each leg measures 10'x10' (measured to the leg exterior). The top two (2) levels of the shaft (legs) are functional space designed as a sub-junction level and junction level. The Cab sits on top of the legs. There are four distinct level layouts within the (4 legs) shaft, the ground level, cable access level, sub-junction level, and junction level. The ground level is the elevator entrance vestibule and has an area of approximately 385 square feet. Each of the cable access levels has a grating platform within the two (2) legs utilized as cable chases. The intermediate levels may also have stair and elevator access to an exposed grated platform between legs. All of the area on each cable access level is non-functional space. The sub-junction level (with total area of 385 square feet) includes an elevator/stair lobby (highest point of elevator access to the Cab) and an equipment room (designation per original plans). The sub-junction equipment room has an area of approximately 310 square feet. If the interior partition between the elevator lobby and the equipment room has been removed, the area for the sub-junction level would equal 385 square feet. The junction level includes stairs to the Cab, a mechanical equipment room, and machine room. In addition, the junction level utilizes space above two (2) of the shaft legs. One contains a toilet room and the other contains elevator equipment. Each of the mechanical/machine rooms has approximately 100 square feet of space. The elevator machine room (above the shaft leg) has 65 square feet of area. The toilet room (above the other shaft leg) is 50 square feet in area.

Cab Floor Space; The Welton Becket ATCT has an 8-sided Cab with a gross area of approximately 500 square feet. The Cab stairs reduce this by 40 square feet for a net Cab floor area of 460 square feet.

Elevations; Each subsequent shaft level elevation above the ground level will be 15' above the level below. Additionally there are two (2) pre-cast concrete leg sections per level (each pre-cast concrete leg section measures 7'-6"). These dimensions include the sub-junction to junction to Cab (floor) levels. The Cab floor elevation (AGL) will be at a 15' multiple of levels or a 7'-6" multiple of pre-cast concrete leg sections (including the Cab catwalk ring as a leg section).

For determination of the "highest point", the raceway (where antennas and air terminals may be mounted) is 18'-0" above the Cab floor elevation. This provides a reference point for determination of the height of the highest point (antenna/lightning protection air terminal). From that point, the highest point on the structure would be based on the location and configuration of any items mounted on the ATCT roof.

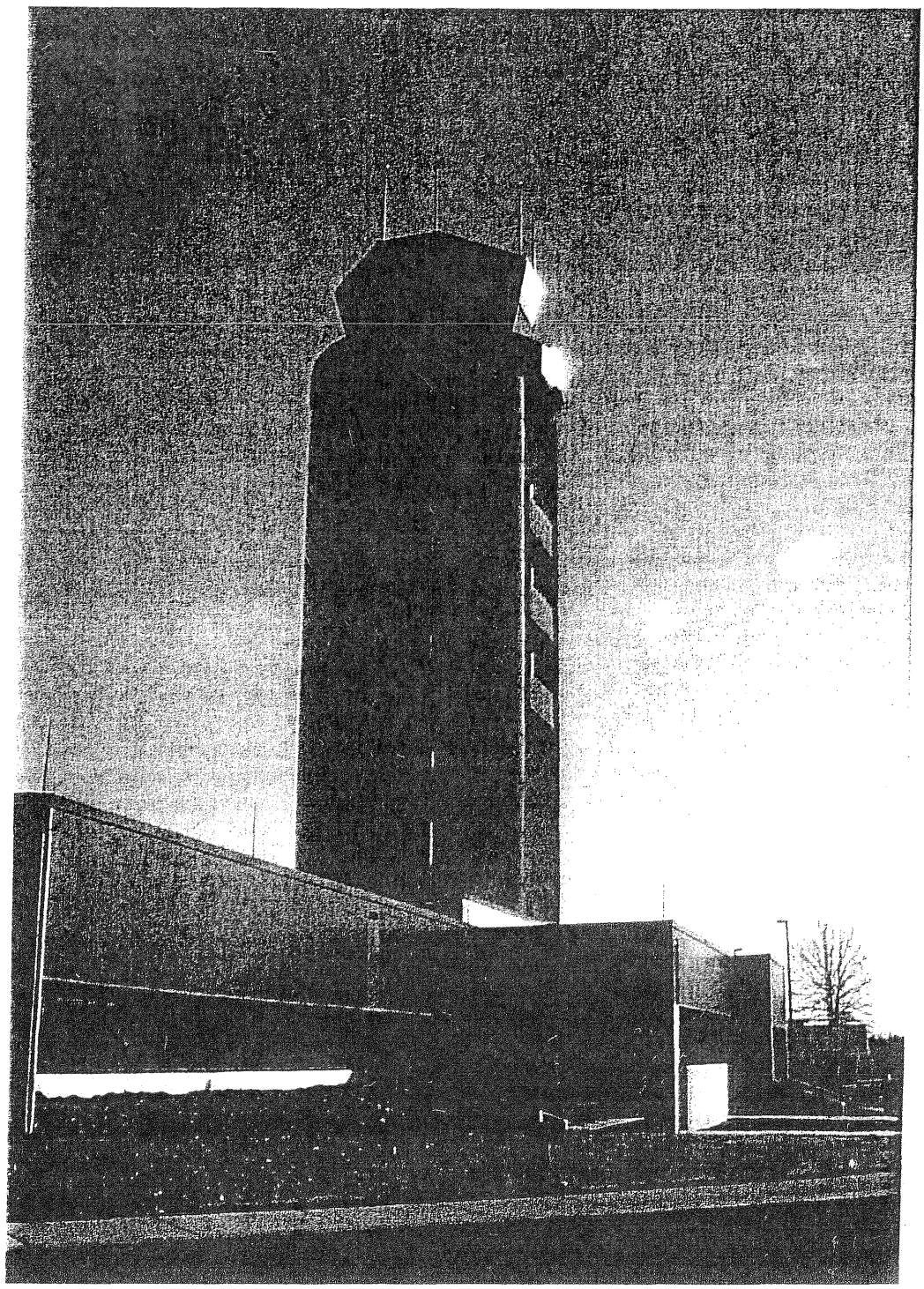

Figure 9. Welton Becket ATCT

MAL Leo Daly

Description; The Leo Daly standard ATCT design consists of an 8-sided concrete shaft flaring out to support an 8-sided Cab (see attached picture).

Shaft Floor Space; The 8-sided shaft has a gross square footage of 1016 (32'x32' overall shaft measured from the inside of the exterior wall). The standard configuration of this design type has five (5) distinct floor layouts: Ground level, Shaft level, Sub-junction level, Junction level, and Cable Access level. Also, noted here is the ASDE Penthouse (located directly above the Cab level).

The Ground level includes the stairway, elevator, elevator lobby, elevator equipment room (220 square feet), electrical room (100 square feet), and mechanical space (135 square feet).

Each of the Shaft levels (1st - 13th floors) has a similar layout and space configurations. The shaft level includes space for the elevator, elevator lobby, stairway, mechanical room (60 square feet), electrical room (110 square feet), and an unassigned room (240 square feet).

The Sub-junction level is designated as an electronics equipment room (1215 square feet). This total excludes the main stairway, a stairway to the junction level, the elevator, and elevator lobby.

The Junction level includes a mechanical room (315 square feet), two (2) offices (155 square feet each), a break room (315 square feet), two (2) toilet rooms (with a small locker area equaling 225 square feet), and vestibules and wall locker spaces (320 square feet). The remaining interior Junction level space (365 square feet is filled with the main stairway, sub-junction stairway, and elevator. Surrounding the junction level space (at the same elevation) are four microwave/antenna balconies (totaling 460 square feet).

The Cable Access level (1170 square feet excluding the stairway and elevator shaft) is located directly below the Cab. The ASDE penthouse (470 square feet of space designed for equipment) is located on the Cab roof and includes ladder access (from Cab level), equipment space, and an equipment service platform.

Cab Floor Space; The Leo Daly ATCT has an 8-sided Cab with a total area of 850 square feet (measured from the wall interior). The Cab stairs reduce this by 50 square feet for a net Cab floor area of 800 square feet.

Elevations[1]**;** The Ground floor and Shaft level 1 through 4 have floor heights of 12' per floor. Each subsequent Shaft level is 24' above the next lower floor. The Sub-junction level is 16'- 3" above the last Shaft level. The Junction level is 11'-9" above the Sub-junction level. The Cable Access level is 12'- 4" above the Junction level. The Cab floor is 20' above the Junction level. The top of the ASDE penthouse is 23'-6 ½" above the Cab floor, with the air terminals being approximately 40' above the Cab floor elevation.

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[1] Example of floor elevations: Ground floor (0'), Shaft level 5 (60'), Shaft level 13 (252'), Sub-junction (268.25'), Junction (280'), Cable Access (292.33'), Cab floor (300').

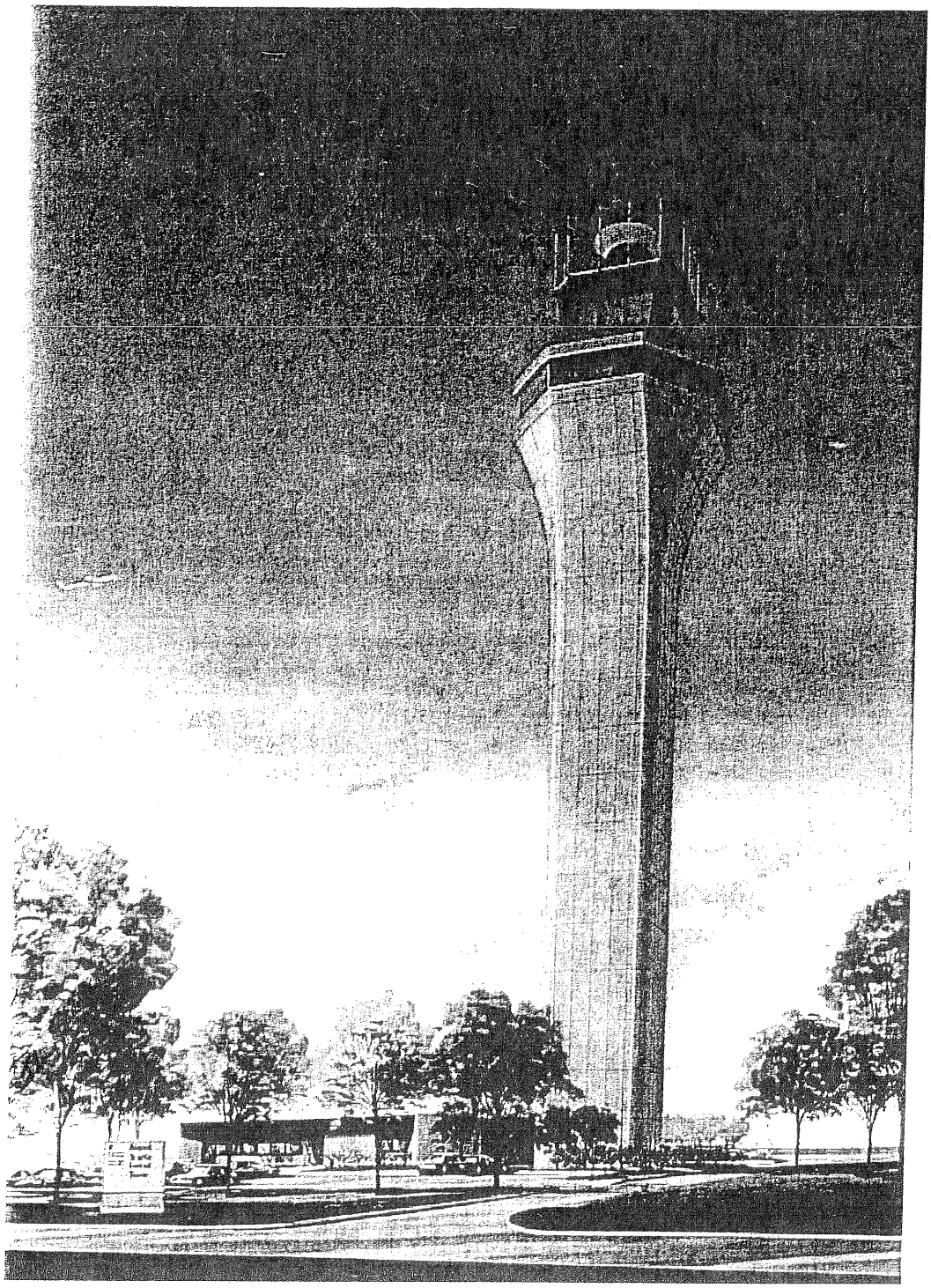

Figure 10. MAL Leo Daly ATCT

LAL Radian

Description; The Radian LAL (Low Activity Level) standard ATCT design consists of a 10-sided (decagonal non-functional) concrete shaft supporting a 10-sided (decagonal) Cab (see attached picture).

Shaft Floor Space; The only occupied (functional) space in the shaft is at the Junction level. The junction level is an oversized annulus ring (approximately 45' diameter) located just below the Cab level. The gross area of the junction level is 1440 square feet (45'-3" dia. shaft measured from the wall exterior). The center of the junction level includes access vestibules, stairways, cable shaft, and the elevator. These reduce the available floor space by approximately 370 square feet. The remaining area (1070 square feet) is designated for electronic equipment, break room, toilet rooms, and storage closets.

Cab Floor Space; The Radian LAL ATCT is available in two (2) Cab size designs (395 square feet and 525 square feet) as required by the specific facility needs. Each is a 10-sided (decagonal) Cab. Each wall segment measures 8'-1" for the 395 sf or 9'-1" for the 525 sf (measured from wall exterior). The Cab area is calculated from the interior of the wall. The Cab stairs reduce this by 70 square feet or 85 square feet (for the 395 or 525 respectively) for a net Cab floor area of 325 or 440 square feet.

Elevations; Due to the configuration of the shaft stairway, ATCT heights will increase in increments of 32'8". The ATCT configuration would include a ground floor level, an odd number of intermediate shaft floors (1, 3, 5, 7, or 9 floors), a junction level, and Cab. Based on this configuration, the Cab floor heights would be 67'-8", 100'-4", 133'-0", 165'-8" or 198'-4" respectively. Based on the standard design drawings, the air terminal heights for these Cab floor elevations would be 30'-1" above the Cab floor elevation (97'-9", 130'-5", 163'-1", 195'-9", or 228'-5").

The Cab floor and air terminal heights are determined from the standard design drawings. The Cab floor heights are based on the standard stairway configuration and a first floor ground level of 0'-0". The Cab floor elevation should be verified from the specific facility design drawings. The air terminal heights need to be verified from the actual facility configurations.

Figure 11. LAL Radian ATCT

IAL Radian

Description; The Radian IAL (Intermediate Activity Level) standard ATCT design consists of a 12-sided (dodecagonal non-functional) concrete shaft supporting a 12-sided (dodecagonal) Cab (picture not available at this time).

Shaft Floor Space; The only occupied (functional) space in the shaft is at the Junction level. The junction level is an oversized annulus ring (12-sided configuration measuring 52'-4" across the outside walls) located just below the Cab level. The gross area of the junction level is 2030 square feet (based on interior dimensions). The center of the junction level includes an access vestibule, dual stairways, cable shaft, and the elevator. These reduce the available floor space by approximately 750 square feet. The remaining area (1280 square feet) is designated for electronic equipment, mechanical equipment, break room, toilet rooms, and storage closets.

Cab Floor Space; The Radian IAL ATCT is designed with a 12-sided (dodecagonal) 550 square foot Cab. The Cab area is calculated from the interior of the wall. The Cab stairs reduce this by 60 square feet for a net Cab floor area of 490 square feet.

Elevations; The standard design drawing set shows four different ATCT heights for this design. The height to the Cab floor for these is 214'-1", 242'-1", 270'-1", and 298'-1". Shorter ATCT configurations are possible and would be configured in shaft height increments of 28'-0" to match the configuration of the shaft stairway. Based on the standard design drawings, the air terminal heights for these Cab floor elevations would be 30'-1" above the Cab floor elevation (244'-2", 272'-2", 300'-2", or 328'-2").

The Cab floor and air terminal heights are determined from the standard design drawings. The Cab floor heights are based on the standard stairway configuration and a first floor ground level of 0'-0". The Cab floor elevation should be verified from the specific facility design drawings. The air terminal heights need to be verified from the actual facility configurations.

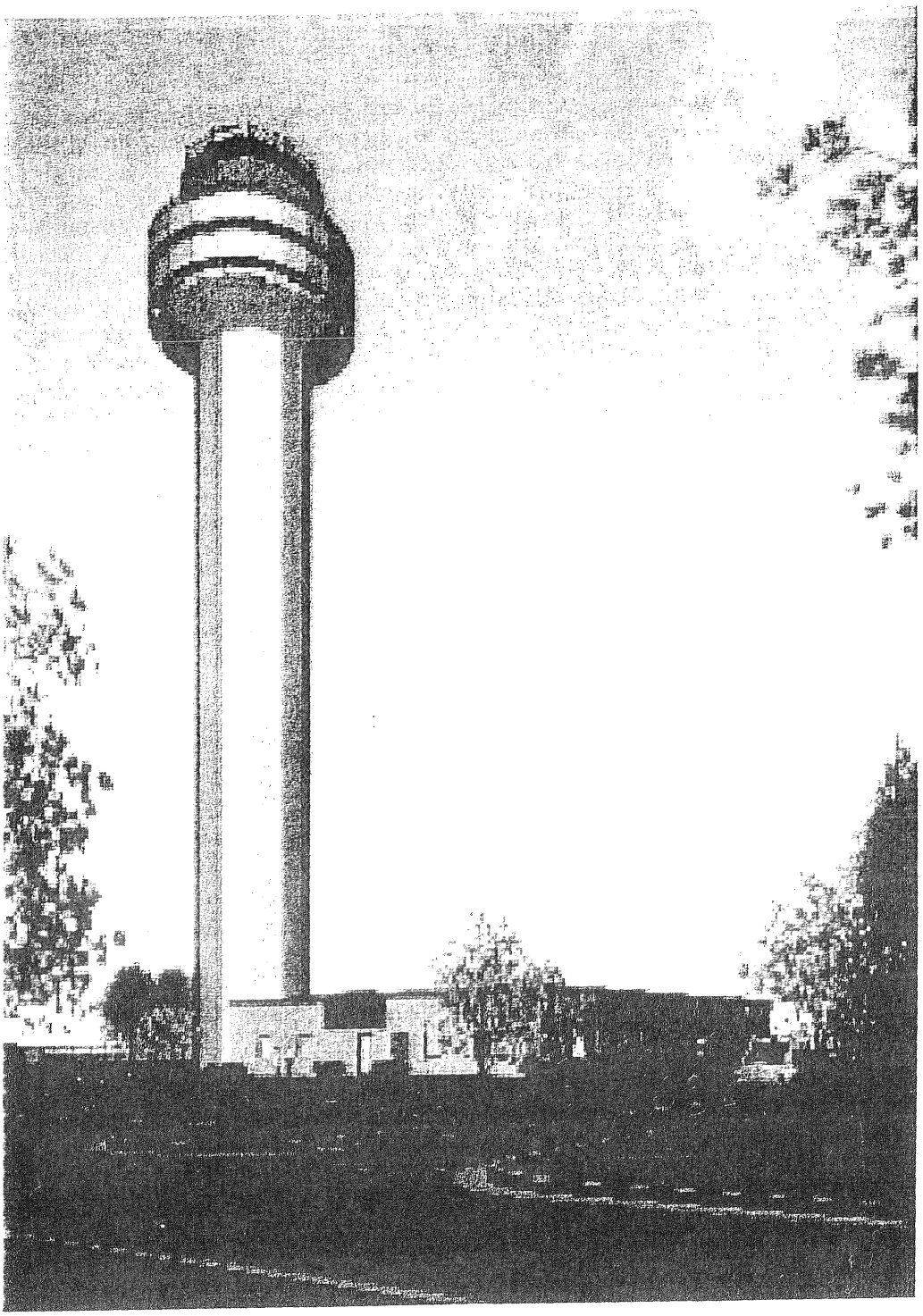

Figure 12. IAL Radian ATCT

MAL Radian

Description; The Radian MAL (Major Activity Level) standard ATCT design consists of a 16-sided (hexadecagonal non-functional) concrete shaft supporting a 16-sided (hexadecagonal) Cab (picture not available at this time).

Shaft Floor Space; The only occupied (functional) space in the shaft is a three floor oversized annulus ring (32-sided configuration measuring 64'-8" across the outside walls) below the Cab level. The three floors (from lower to upper) include an antenna/mechanical level, electronic equipment level, and the junction level. The gross area of the each floor of this annulus ring is 4010 square feet (based on interior dimensions). At the center of each level is an area that includes access vestibules, dual stairways, cable shaft, and the elevator. These reduce the available floor space by approximately 1130 square feet. The remaining area (2880 square feet) is designated for the function of that floor. The antenna/mechanical level is an unoccupied level finished with microwave fabric walls designated for mounting antennas and facility mechanical equipment. The electronic equipment level is designated for both FAA and non-FAA equipment, and includes a equipment work area. The junction level includes Air Traffic office space, break room, toilet rooms, and storage closets

Above the Cab level is additional functional space designated and indicated on the design drawings as an ASDE (3) penthouse. The penthouse is a 8-sided (hexagonal) room with a gross area of 340 square feet (stair access reduce this by 40 square feet leaving 300 square feet for equipment).

Cab Floor Space; The Radian MAL ATCT is designed with a 16-sided (hexadecagonal) 850 square foot Cab. The Cab area is calculated from the interior of the wall. The Cab stairs reduce this by 65 square feet for a net Cab floor area of 785 square feet.

Elevations; The standard design drawing set shows three different ATCT heights for this design. The height to the Cab floor for these is 263'-8", 291'-8", and 319'-8". Shorter ATCT configurations are possible and would be configured in shaft height increments of 28'-0" to match the configuration of the shaft stairway. Based on the standard design drawings, the air terminal heights for these Cab floor elevations would be 33'-4" above the Cab floor elevation (297'-4", 325'-4", or 353'-4"). Note that this ATCT configuration includes an ASDE (3) penthouse. With this configuration, the air terminal height above the Cab floor is usually a fixed dimension.

The Cab floor and air terminal heights are determined from the standard design drawings. The Cab floor heights are based on the standard stairway configuration and a first floor ground level of 0'-0". The Cab floor elevation should be verified from the specific facility design drawings. The air terminal heights need to be verified from the actual facility configurations.

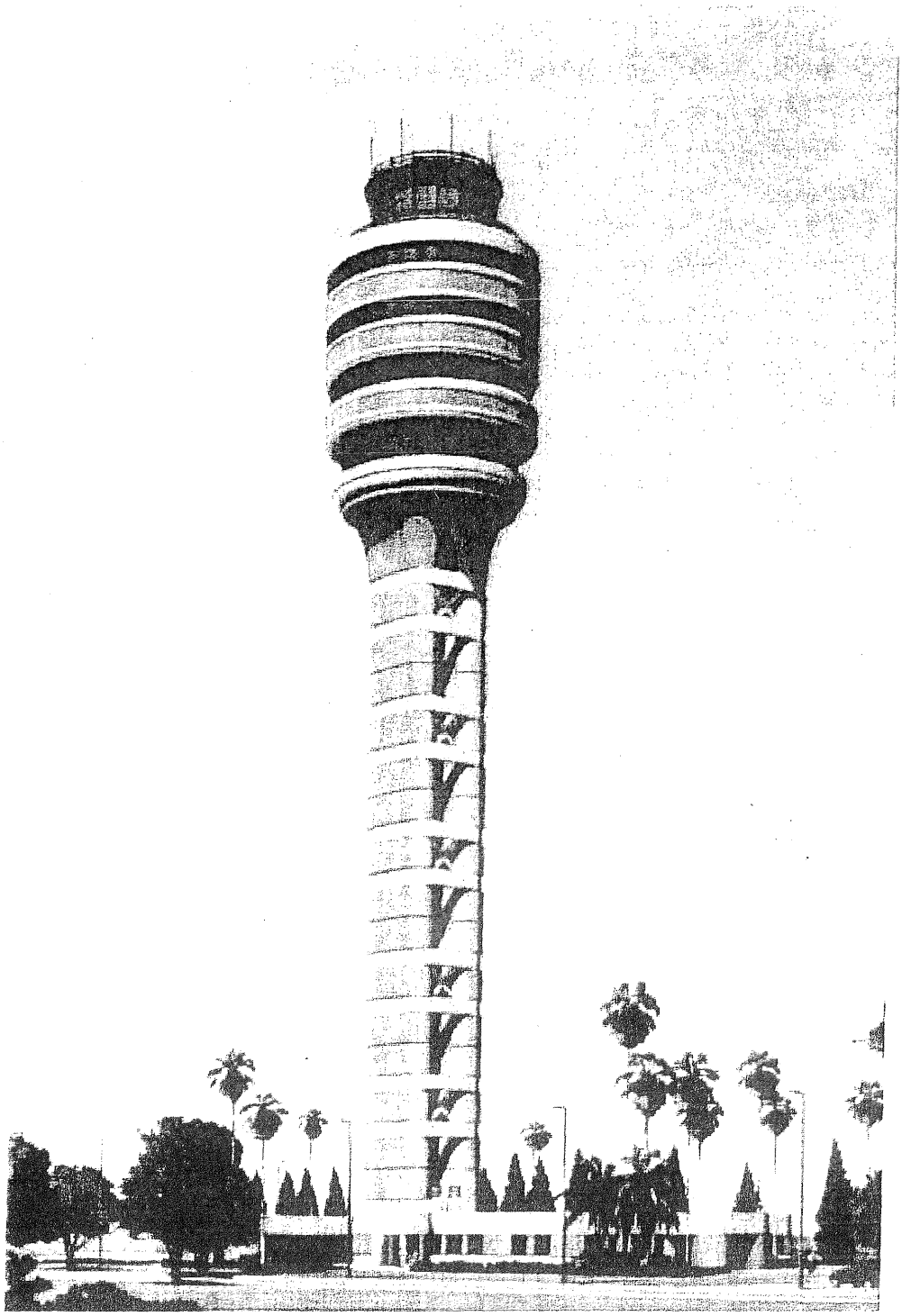

Figure 13. MAL Radian ATCT

Appendix A: ATCT Design Types/Quantities/ Maintenance & Ownership

ATCT Design Type	Total Quantity in Terminal	# FAA Maintained		# Sponsor Maintaned
		# FAA Owned	# Sponsor Owned - FAA Operated	# Sponsor Maintained - Non-FAA Operated
Type L	3	3	0	0
Hunt/AVCO	92	88	1	3
Type O	31	31	0	0
Pei	17	16	1	0
HNTB	4	3	0	1
Goleman & Rolfe	35	33	2	0
Mock	42	41	1	0
Welton Beckett	25	23	1	1
Leo Daly	16	15	1	0
LAL	3	2	1	0
IAL	0	0	0	0
MAL	1	0	1	0
Non-Standard	234	60	51	123
Large TRACONs	9	9	0	0
Small TRACONs	18	12	6	0
Mobile				
Totals	530	336	66	128

Appendix B: List of Completed Facility Condition Assessments (As of 12/31/2007)

LocID:	City:	State:	Confirmed Design Type
ACY	Atlantic City	NJ	GOLEMAN-ROLFE
AGS	Augusta	GA	MOCK
AHN	Athens	GA	HUNT/AVCO
AKN	King Salmon	AK	Non-Standard
ALN	Alton/St Louis	IL	Type "O"
ANC	Anchorage	AK	Leo Daly
APC	Napa	CA	Type "O"
BFL	Bakersfield	CA	MOCK
BGR	Bangor	ME	GOLEMAN-ROLFE
BIS	Bismarck	ND	MOCK
BNA	Nashville	TN	WELTON-BECKETT
BTR	Baton Rouge	LA	GOLEMAN-ROLFE
CAE	Columbia	SC	Pei
CDW	Caldwell	NJ	HUNT/AVCO
CHS	Charleston	SC	WELTON-BECKETT
CIC	Chico	CA	HUNT/AVCO
CLT	Charlotte	NC	WELTON-BECKETT
COS	Colorado Springs	CO	WELTON-BECKETT
CRQ	Carlsbad	CA	HUNT/AVCO
D01	Denver	CO	Large TRACON
DEC	Decatur	IL	Type "O"

LocID:	City:	State:	Confirmed Design Type
DXR	Danbury	CT	HUNT/AVCO
EMT	El Monte	CA	HUNT/AVCO
ENA	Kenai	AK	HUNT/AVCO
EUG	Eugene	OR	GOLEMAN-ROLFE
EVV	Evansville	IN	MOCK
FAI	Fairbanks	AK	MOCK
FTW	Fort Worth	TX	Type "O"
FYV	Fayetteville	AR	HUNT/AVCO
GEG	Spokane	WA	Non-Standard
GON	Groton New London	CT	HUNT/AVCO
GRR	Grand Rapids	MI	Non-Standard
GSP	Greer	SC	Non-Standard
GTF	Great Falls	MT	Pei
HIO	Portland	OR	Type "O"
HLN	Helena	MT	MOCK
HPN	White Plains	NY	Pei
IAH	Houston	TX	Leo Daly
ITO	Hilo	HI	MOCK
L30	Las Vegas	NV	Small TRACON
LAS	Las Vegas	NV	WELTON-BECKETT
LAW	Lawton	OK	Type "O"
LBB	Lubbock	TX	Pei
LGB	Long Beach	CA	Pei
LNK	Lincoln	NE	MOCK

LocID:	City:	State:	Confirmed Design Type
LNS	Lancaster	PA	Type "O"
LOU	Louisville	KY	Type "O"
LVK	Livermore	CA	HUNT/AVCO
MDH	Carbondale/Murphysboro	IL	HUNT/AVCO
MEI	Meridian	MS	Type "O"
MEM	Memphis	TN	Pei
MKE	Milwaukee	WI	WELTON-BECKETT
MKK	Kaunakakai	HI	HUNT/AVCO
MMU	Morristown	NJ	Non-Standard
MOD	Modesto	CA	Type "O"
MWA	Marion	IL	HUNT/AVCO
MYF	San Diego	CA	Type "O"
N90	Westbury	NY	Large TRACON
OGD	Ogden	UT	HUNT/AVCO
OKC	Oklahoma City	OK	Pei
OLM	Olympia	WA	HUNT/AVCO
ONT	Ontario	CA	GOLEMAN-ROLFE
ORD	Chicago	IL	Leo Daly
OWD	Norwood	MA	HUNT/AVCO
PAH	Paducah	KY	HUNT/AVCO
PAO	Palo Alto	CA	TYPE "L"
PHL	Philadelphia	PA	WELTON-BECKETT
PHX	Phoenix	AZ	WELTON-BECKETT
PIH	Pocatello	ID	HUNT/AVCO

LocID:	City:	State:	Confirmed Design Type
POC	La Verne	CA	Type "O"
POU	Poughkeepsie	NY	HUNT/AVCO
PSC	Pasco	WA	HUNT/AVCO
PSP	Palm Springs	CA	Type "O"
PWM	Portland	ME	MOCK
RAL	Riverside	CA	Type "O"
RAP	Rapid City	SD	Type "O"
RDD	Redding	CA	HUNT/AVCO
RDG	Reading	PA	Type "O"
RHV	San Jose	CA	TYPE "L"
ROC	Rochester	NY	WELTON-BECKETT
SAT	San Antonio	TX	WELTON-BECKETT
SDM	San Diego	CA	HUNT/AVCO
SIG	San Juan	PR	HUNT/AVCO
SJU	San Juan	PR	Non-Standard
SMF	Sacramento	CA	Pei
SMO	Santa Monica	CA	Type "O"
SMX	Santa Maria	CA	HUNT/AVCO
SNA	Santa Ana	CA	GOLEMAN-ROLFE
SNS	Salinas	CA	TYPE "L"
SRQ	Sarasota	FL	MOCK
TRI	Bristol/Johnson/Kingsport	TN	Mock
TUS	Tucson	AZ	Non-Standard
UGN	Chicago/Waukegan	IL	HUNT/AVCO

LocID:	City:	State:	Confirmed Design Type
VNY	Van Nuys	CA	Type "O"
WDG	Enid	OK	HUNT/AVCO
WJF	Lancaster	CA	HUNT/AVCO
YKM	Yakima	WA	HUNT/AVCO

Appendix C: Design Type Quantity/Sample Size/Assessments Completed

ATCT Design Type	FAA Maintained Quantity	Recommended Sample Size of FAA Maintained Quantity (25%)	# of Life Cycle Assessments
Type L	3	2	3
Hunt/AVCO	89	23	28
Type O	31	8	18
Pei	17	5	8
HNTB	3	2	0
Goleman & Rolfe	35	9	6
Mock	42	11	11
Welton Beckett	24	6	10
Leo Daly	16	4	3
LAL	3	2	0
IAL	0	0	0
MAL	1	1	0
Non-Standard	111	28	7
Large TRACONs	9	3	2
Small TRACONs	18	5	1
Mobile			
Totals	402		97

34b

WONDER MAKERS
ENVIRONMENTAL

June 29, 2009

Mr. Vince Sugent
7768 Pleasant Lane
Ypsilanti, MI 48197

RE: Review of ATO – Terminal ATCT & TRACON Facility Design Types – Executive Reference Guide, Last Updated: March 24, 2008; WM project GC09-8593

Dear Vince:

As part of the FAA's response to your whistleblower complaint to the Office of Special Counsel, the Agency submitted a number of documents to support their contention that mold and other indoor air quality problems at the Detroit Metro Tower were handled properly. A review of the first set of FAA submittals revealed a number of referenced documents that were missing. Over the past weeks we have been examining the second set of documents submitted by the FAA and offering our insights regarding the Agency's response to mold at DTW and other facilities.

We have reviewed this document and find that it provides a basic level of information regarding the structure of 12 standard airport traffic control tower (ATCT) design types.

The first section of the document reviews the history of both the FAA and ATCTs, and includes a description of Terminal RADAR Approach Controls (TRACON's) and Combined Control Facilities (CCF). The rest of the document provides a basic description of how each of the 12 standard towers is constructed. In addition, a full page picture or drawing of each design is included.

Three appendices are included at the end of the document. Each appendix provides a simple table of information. Appendix A is entitled ATCT Design Types/Quantities/Maintenance & Ownership. Appendix B is entitled List of Completed Facility Condition Assessments (As of 12/31/2007). Appendix C is entitled Design Type Quantity/Sample Size/Assessments Completed.

During our review we identified a deficiency in the description of the major activity level (MAL) Leo Daly designed towers like DTW that appears in some of the other design descriptions. For most tower designs the document uses two terms to describe the habitability of floors in the tower shaft. The term "functional" means that the tower shaft floors were intended for some level of human occupancy and "non-functional" means that they were not intended for occupancy. For example, the tower shaft floors in the Pei

design ATCT are considered non-functional spaces, whereas the shaft floors in the Golemon & Rolfe design are considered functional areas. This description is missing from the MAL Leo Daly description.

At this point NATCA has not been provided with any written confirmation that the shaft rooms are to be unoccupied. A review of the inspection report of other towers built with the Daly design indicate that a number of facilities have shaft rooms that are occupied. Therefore, we recommend that NATCA request confirmation from the FAA as to the reason that the shaft rooms are not considered appropriate for occupation.

Regardless of whether the rooms in the shaft area of a Daly-design tower can be occupied or not, the FAA's argument that mold and other problems in the shaft rooms are not hazardous because the areas are not occupied, is misguided. It has been amply demonstrated that air migrates throughout the tower and the base building and that contamination sources in one area can contribute to problems in occupied areas.

Please let me know if you have any questions.

Sincerely,

Michael A. Pinto, CSP, CMP
CEO