**AGENDA SUMMARY**
**TAVARES CITY COUNCIL**
**DATE OF MEETING: June 19, 2013**

**AGENDA TAB NO. 10**

**SUBJECT TITLE: Appointment of Delegate to Florida League of Cities Annual Conference and Discussion of Resolutions**

## OBJECTIVE:

To determine interest by any councilmember to attend and be the voting delegate for the City of Tavares at the Florida League of Cities Annual Conference August 15-17, 2013 and to discuss whether Council wishes to submit a resolution on a commemorative, constitutional or federal issue to the conference. Although the submission date is July 10th, the City may send a letter of intent to do a resolution.

## SUMMARY:

At the annual Florida League of Cities conference cities can submit resolutions to support positions on commemorative, constitutional or federal issues. In addition, the League requests that the city designate a voting representative. See attached letter.

## OPTIONS:

1) Discuss and designate a voting representative and whether or not to do a letter of intent regarding a resolution
2) Do not discuss or designate a representative/resolution

## STAFF RECOMMENDATION:

N/A

## FISCAL IMPACT:

N/A

## LEGAL SUFFICIENCY:

Legally sufficient

FLORIDA LEAGUE OF CITIES, INC.
301 South Bronough Street • Suite 300 • P.O. Box 1757 • Tallahassee, FL 32302-1757 • (850) 222-9684 • Fax (850) 222-3806 • www.floridaleagueofcities.com

TO: Municipal Key Official

FROM: Michael Sittig, Executive Director

DATE: May 29, 2013

SUBJECT: 87th Annual FLC Conference – "Great Cities Make a Great State"
VOTING DELEGATE AND RESOLUTION INFORMATION
August 15-17, 2013 – World Center Marriott, Orlando

As you know, the Florida League of Cities' Annual Conference will be held at the World Center Marriott, Orlando, Florida on August 15-17. This year we are celebrating Great Cities Make a Great State which will provide valuable educational opportunities to help Florida's municipal officials serve their citizenry more effectively.

It is important that each municipality designate one official to be the voting delegate. Election of League leadership and adoption of resolutions are undertaken during the business meeting. One official from each municipality will make decisions that determine the direction of the League.

In accordance with the League's by-laws, each municipality's vote is determined by population, and the League will use the Estimates of Population from the University of Florida for 2012, which are the same as the 2012 Census.

Registration materials will be sent to each municipality the week of June 1st. Materials will also be posted on-line. Call us if you need additional copies. The League adopts resolutions each year to take positions on commemorative, constitutional or federal issues. We have attached the procedures your municipality should follow for proposing resolutions to the League membership. A resolution is not needed to become a voting delegate. If you have questions regarding resolutions, please call Allison Payne at the League at (850) 701-3602 or (800) 616-1513, extension 3602. Proposed resolutions must be received by the League no later than July 10, 2013.

If you have any questions on voting delegates, please call Gail Dennard at the League (850) 701-3619 or (800) 616-1513, extension 3619. Voting delegate forms must be received by the League no later than August 12, 2013.

Attachments: Form Designating Voting Delegate
Procedures for Submitting Conference Resolution

President **Manny Maroño,** Mayor, Sweetwater
First Vice President **P.C. Wu,** Council President, Pensacola • Second Vice President **Lori C. Moseley,** Mayor, Miramar
Executive Director **Michael Sittig** • General Counsel **Harry Morrison, Jr.**

**Procedures for Submitting Resolutions**
**Florida League of Cities' 87th Annual Conference**
**World Center Marriott**
**Orlando, Florida**
**August 15-17, 2013**

In order to fairly systematize the method for presenting resolutions to the League membership, the following procedures have been instituted:

(1) Proposed resolutions must be submitted in writing, to be received in the League office by July 10, 2013, to guarantee that they will be included in the packet of proposed resolutions that will be submitted to the Resolutions Committee.
(2) Proposed resolutions will be rewritten for proper form, duplicated by the League office and distributed to members of the Resolutions Committee. (Whenever possible, multiple resolutions on a similar issue will be rewritten to encompass the essential subject matter in a single resolution with a listing of original proposers.)
(3) Proposed resolutions may be submitted directly to the Resolutions Committee at the conference; however, a favorable two-thirds vote of the committee will be necessary to consider such resolutions.
(4) Proposed resolutions may be submitted directly to the business session of the conference without prior committee approval by a vote of two-thirds of the members present. In addition, a favorable weighted vote of a majority of members present will be required for adoption.
(5) Proposed resolutions relating to state legislation will be referred to the appropriate standing policy committee. Such proposals will not be considered by the Resolutions Committee at the conference; however, all state legislative issues will be considered by the standing policy councils and the Legislative Committee, prior to the membership, at the annual Legislative Conference each fall. At that time, a state Legislative Action Agenda will be adopted.

Municipalities unable to formally adopt a resolution before the deadline may submit a letter to the League office indicating their city is considering the adoption of a resolution, outlining the subject thereof in as much detail as possible, and this letter will be forwarded to the Resolutions Committee for consideration in anticipation of receipt of the formal resolution.

**87th Annual Conference**
**Florida League of Cities, Inc.**
**August 15-17, 2013**
**Orlando, Florida**

It is important that each member municipality sending delegates to the Annual Conference of the Florida League of Cities, designate one of their officials to cast their votes at the Annual Business Session. League By-Laws requires that each municipality select one person to serve as the municipalities voting delegate. Municipalities do not need to adopt a resolution to designate a voting delegate.

Please fill out this form and return it to the League office so that your voting delegate may be properly identified. Voting delegate forms must be received by the League no later than August 12, 2013.

**Designation of Voting Delegate**

Name of Voting Delegate: _____

Title: _____

Municipality of: _____

**AUTHORIZED BY:**

_____
Name

_____
Title

Return this form to:
Gail Dennard
Florida League of Cities, Inc.
Post Office Box 1757
Tallahassee, FL 32302-1757
Or Fax to Gail Dennard at (850) 222-3806

# Important Dates

**May 24, 2013**
Notice to Local and Regional League Presidents and Municipal Associations regarding the Resolutions Committee

**June 22**
Appointment of Resolutions Committee Members

**July 10**
Deadline for Submitting Resolutions to the League office

**August 15**
League Legislative Policy Committee Meetings
Resolutions Committee Meeting
Voting Delegates Registration

**August 17**
Immediately Following Breakfast – Pick Up Voting Delegate Credentials
Followed by Annual Business Session

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TAVARES

America's Seaplane City™

**AGENDA SUMMARY**
**TAVARES CITY COUNCIL**
**DATE OF MEETING: June 19, 2013**

**AGENDA TAB NO. 11**
**SUBJECT TITLE: Appointments to Florida League of Cities Policy Committees**

## OBJECTIVE:

To determine if any councilmember would like to serve on a Florida League of City Policy Committee for 2013-2014 and designate any councilmembers and/or staff members who are interested in being appointed.

## SUMMARY:

The Florida League of City has five legislative policy committees:

- Energy and Environmental Quality
- Finance, Taxation and Personnel
- Growth Management and Economic Development
- Transportation and Intergovernmental Relations
- Urban Administration

Committee members are required to sign up every year. Currently the City's members are:

Lori Houghton – Finance, Taxation & Personnel
Jacques Skutt – Transportation & Intergovernmental Relations
Richard Keith – Urban Administration

## OPTIONS:

1. Discuss and determine if any Councilmembers or staff members would like to serve and/or continue to serve on one of these committees
2. Do not discuss

## STAFF RECOMMENDATION:

Discuss and determine if councilmembers and/or staff members are interested and ratify appointments.

**FISCAL IMPACT:** Travel costs will be budgeted in FY 2014 budget.

**LEGAL SUFFICIENCY:** Legally sufficient

## Nancy Barnett

**From:** FLC E-News Blast [subscriptions@flcities.com]
**Sent:** Monday, June 03, 2013 1:57 PM
**To:** Nancy Barnett
**Subject:** 2013-2014 FLC Policy Committee Sign-up form
**Attachments:** 2013-2014 Sign up form.pdf

Good afternoon!

The Florida League of Cities is pleased to announce the start of the League's legislative policy process for 2013 – 2014. The policy committees develop the Leagues legislative priorities and help League staff understand the real world implications of proposed legislation. In an effort to get more cities involved, the League is requesting that each city be represented on one or more of the League's Legislative policy committees.

Please see the attached sign-up form and return it to Rachel Tala as soon as possible. If you have any questions Rachel Tala can be reached at 850.222.9684 or by email at rtala@flcities.com

Have a great day!

**Memorandum**

**To:** **Florida League of Cities Membership**

**From:** **C. Scott Dudley, Legislative Director**
**Legislative Affairs**

**Date:** **June 3, 2013**

**Re:** **FLC Legislative Policy Development Process**

The Florida League of Cities is pleased to announce the start of the League's legislative policy process for 2013 – 2014. The policy committees develop the Leagues legislative priorities and help League staff understand the real world implications of proposed legislation. In an effort to get more cities involved, the League is requesting that each city be represented on one or more of the League's Legislative policy committees.

Due to potential Sunshine Law issues, it is recommended that only one elected city official be represented on each committee, but a city could have both an elected and appointed city official on each of the five committees. This year, in an effort to better understand the areas of expertise of our policy committee members, we are asking applicants to provide a little more background information. **Please fill out the attached form and return it to Rachel Tala by August 21, 2013.**

**Legislative Policy Committee Meeting Dates:**

- September 20, 2013 – Hyatt Regency Riverfront, Jacksonville
- October 18, 2013 – Orlando World Center Marriott, Orlando
- November 21, 2013 – Hyatt Regency Orlando International Airport
  (In conjunction with FLC Legislative Conference)
- August 15, 2014 – Westin Diplomat, Hollywood
  (In conjunction with FLC Annual Conference)

Attached is a listing of the five League policy committees and the issues that fall within the purview of those committees. Should you have any questions or require additional information, please contact Rachel Tala at the League at (850) 222-9684 or by e-mail at rtala@flcities.com. We look forward to your city's involvement developing the Leagues legislative agenda for the 2014 Legislative Session.

301 South Bronough Street ◆ Post Office Box 1757 ◆ Tallahassee, FL 32302-1757

Telephone (850) 222-9684 ◆ Suncom 278-5331 ◆ Fax (850) 222-3806 ◆ Website:www.flcities.com

## Florida League of Cities Legislative Committee Sign-Up Form

**Return this completed form to the attention of Rachel Tala by fax (850) 222-3806 or email: rtala@flcities.com ASAP.**

City/Town/Village of: _____

Name: _____ Title: _____

Address/Zip Code: _____

Phone: _____ Fax: _____

E-mail: _____

Do you use the FLC website to view legislative information? _____

The FLC Legislative Department delivers legislative information to you during session via the Legislative Bulletin, weekly "On Tap at the Cap" emails, legislative alerts and the Live at the Capitol video. Which form of information do you use the most? _____

_____

---

**Please rank 1 - 5**
**(1 being your first choice, and 5 being your last choice)**

___ Energy & Environmental Quality

___ Finance, Taxation and Personnel

___ Growth Management & Economic Development

___ Transportation and Intergovernmental Relations

___ Urban Administration

# 2013 -2014 FLC Legislative Committees

## Energy & Environmental Quality Committee

- coastal management
- energy
- environmental permitting
- hazardous and toxic wastes
- recycling
- solid waste collection and disposal
- stormwater
- wastewater treatment and reuse
- water management
- water quality
- water quantity
- wetlands permitting

## Finance, Taxation and Personnel Committee

- general finance & tax issues
- home rule revenues
- infrastructure funding
- insurance
- local option revenues
- pension issues
- personnel and collective bargaining issues
- revenue sharing
- tax and budget reform
- workers' compensation

## Growth Management & Economic Development Committee

- charter schools
- community redevelopment
- economic development
- growth management and land use planning issues
- affordable housing/foreclosures
- special districts

## Transportation and Intergovernmental Relations Committee

- annexation
- billboards
- charter counties
- eminent domain
- ethics/elections
- general utilities
- property rights
- rights-of-way
- sunshine law
- telecommunications
- tort liability
- transportation and highway safety

## Urban Administration Committee

- building & fire safety codes
- building codes and construction
- code enforcement
- homeland security
- public meetings
- public property management
- public safety

**AGENDA SUMMARY**
**TAVARES CITY COUNCIL**
**DATE OF MEETING: June 19, 2013**

**AGENDA TAB NO. 12**

**SUBJECT TITLE: Report on Air Quality Assessment of Tavares Fire Department Station 28 and Station 29, and Request City Council to Authorize Funds for Air Quality Remediation at Both Fire Stations.**

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## OBJECTIVE:

The objective of this agenda item is to present the recommendations of a professional air quality assessment on both fire stations of Tavares Fire Department, and to seek City Council authorization to fund an emergency air quality remediation at both fire stations (Fire Station 28 – the old train depot station on Alfred Street, and Fire Station 29 – on Lane Park Cut-Off Road).

## SUMMARY:

Over the last year and compared to previous years, Tavares Fire Department employees have encountered a seemingly inordinately elevated amount of respiratory ailments among the Department's 24 employees. Additionally, both stations have experienced various episodes of water intrusion problems, some of which was the result of plumbing and air conditioning system malfunctions, and others of which were rain and storm related. Responding to employee complaints about the possibility of air quality problems in both stations, a professional air quality assessment contractor (IAQS – Indoor Air Quality Solutions), who has done other assessments for the City, was contracted (for $1,250) to assess air quality at both fire stations.

The air quality assessment for both stations took place on May 15, 2013. The results of those reports confirm that there are issues with both stations. It is important to note that the reports indicate that while the air quality in both stations have issues that need to be addressed, the air quality in both stations is <u>not</u> immediately dangerous to life and health. These air quality issues, although serious, do not create a situation wherein the buildings have to be evacuated immediately. However, if left unattended the problems could become exasperated and result in a need to vacate the buildings.

Fire Department Administrative Staff, such as the Fire Chief and the Administrative Assistant, because of their work hours, have less exposure to the buildings then do the 24-hour shift personnel. 24-hour shift personnel have a

much longer exposure to the buildings. The safety of these personnel is our greatest concern.

Additionally, it is important to note that both buildings will remain in City ownership. Even after the old train depot is occupied by the Tavares Historical Society and converted into a City museum, the building will still belong to the City, so maintaining these buildings is in the best interest of the City.

The reports, which are attached, include a list of recommendations that, when followed, is expected to improve the air quality in both buildings.

Key staff members met recently to develop an action plan for the remediation of these air quality issues based on the recommendations of the report. A general review of this action plan, with the responsible party designated to address each issue, is indicated below. Staff anticipates the cost to be less than $20,000 to remediate the air quality issues. The purchasing Department is in the process of obtaining quotes and bids to do the work.

**FIRE STATION 28 (the old train depot)**

**Removing wallpaper from the exterior walls** *(This is actually referring to interior walls that are immediately adjacent to exterior walls)***:** (a wallpaper contractor)

**Remove/replace the failing shower stall:** (Tile contractor and/or plumber)

**Remove the exterior planter:** (City's General Services)

**Sealing penetrations between the attic and office space, sealing the air handler closet, upgrade to MERV 8 filters, seal or replace the HVAC ducts, and install a humidistat type thermostat:** (Pro Tec – the City's regular contracted HVAC contractor)

**Remove paint from exterior brick and repoint** *(repair and/or replace the mortar joints between the exterior bricks)* **the exterior brick:** (Staff discussed these items at length. Staff felt that the action of removing the paint from the exterior brick could be a major project that could potentially cause additional damage to the building and ruin the exterior brick. Staff's collective decision was to hold off, for now, on removing the paint, and focus our initial efforts on addressing the other issues. Staff felt that the improvements in air quality anticipated by addressing the other issues may make the removing of the paint from the exterior brick, ultimately unnecessary.)

Staff does not anticipate that Fire Department personnel would need to be temporarily displaced while some of this work is taking place. However, should the need arise, Fire Department leadership will coordinate that.

**FIRE STATION 29 (on Lane Park Cut-Off Road)**

Note: The air quality issue at Station 29 is not as serious as is the condition at Station 28.

**Caulk areas around the windows that have none, seal exterior penetrations, clean the air handler and upgrade to MERV 8 filters, and ensure all gaps to attic at the air handler closet are sealed:** (City's General Services)

**Install a mechanical dehumidifier for outside air intake, and install a large cfm bath exhaust fan that is activated by a humidistat:** (Pro Tec – the City's regular contracted HVAC contractor)

**Install a gutter system to help divert rain water flow away from the building, and install roof kickouts to help divert water away from the building:** (Purchasing Manager John Rumble is getting bids from a rain gutter contractor for this work.)

**Option 1:**

Approve a budget amendment in the amount of $20,000 from reserves to address this unforeseen emergency and authorize staff to immediately correct the deficiencies as described above.

**Option 2:**

Do not approve a budget amendment and direct Staff to pursue a different course of action.

## STAFF RECOMMENDATION:

Staff recommends that Council move to approve a budget amendment in the amount of $20,000 from reserves to address this unforeseen emergency and authorize staff to immediately correct the deficiencies as described above. Once the work is completed, staff will provide a report to Council on cost and any unused funds from the $20,000 appropriation will be returned to reserves.

## FISCAL IMPACT:

$20,000 from general fund reserves, which leaves a balance in General fund reserves of $1,138,950 or 9%.

**Note**: Pursuant to Council's Direction, in next year's FY 14 budget the General Fund reserve account will be broken up into two categories as follows:

Reserves for Emergencies and natural disasters = 90% of the Reserve Account
Reserves for unforeseen expenditures = 10% of the Reserve Account.

**LEGAL SUFFICIENCY**: Yes.

Station 28

Indoor Air Quality Solutions

"Healthier Air Starts Here"

# 424 E. Alfred Street

# Fire Station 28

## Indoor Environmental and Building Envelope Assessment

Indoor environmental and building envelope assessment of the building located at 424 Alfred St. Tavares, FL 32778 to identify the possible presence of microbial growth, wet or damaged building material, and/or elevated particulate matter within the building.

A Division of
**Microshield Environmental Services, LLC.**
1170 Tree Swallow Dr. Suite 330 Winter Springs FL. 32708
407-383-9459 Info@FloridaIAQ.com www.FloridaIAQ.com

# Table of Contents


Client's Areas of Concern ..... 3

Executive Summary ..... 3

Indoor Environmental Assessment ..... 3

Indoor Environmental Measurements ..... 4

- Table A: Indoor Environmental Measurements ..... 5
- Indoor Environmental Measurement Summary: ..... 6

Humidity Bloom ..... 6

- Humidity ..... 6
- Desirable Humidity Levels ..... 7

General IAQ Improvement Recommendations: ..... 8

- Particulate Reduction; ..... 8
- Relative Humidity ..... 10
- Window Condensation, Causes and Cures ..... 11
  - What Causes "Excessive" Condensation? ..... 11
- Air Filtration; ..... 13

Report summary ..... 14

Specific Recommendations ..... 15

Report Limitations & Exclusions ..... 15

- References Documents: ..... 16

Floor Plan ..... 17

Inspection Pictures ..... 18

- Exterior ..... 19
- Interior ..... 20
- HVAC ..... 22

Indoor Air Quality Solutions
"Healthier Air Starts Here"

1170 Tree Swallow Dr. Suite 330
Winter Springs, Florida 32708
Office (407) 383-9459 Fax (321) 206-4534
Info@FloridaIAQ.com www.FloridaIAQ.com

**ATTN:** Ms. Helen Vilissov

May 29, 2013

**REF:** Indoor Environmental Assessment

On May 15th, 2013, Microshield Environmental Services, LLC conducted an Indoor Environmental and Building Envelope Assessment of located at 424 Alfred St. Tavares, FL 32778 (property) and prepared this report for City of Tavares (client) summarizing the findings and indoor environmental reading results.

## Client's Areas of Concern

The City of Tavares would like to determine if there are any indoor environmental concerns with Station 28.

## Executive Summary

The indoor environmental and building envelope assessment identified several areas of the building envelope that were failing and allowing water intrusion. This water intrusion is causing the exterior wall paper to fail as the moisture condenses on the back of the wallpaper. This area can support mold growth though none was identified at the time of the assessment. The interior of the building has been retrofitted to accommodate the 24 hour use by the fire department which included the addition of a kitchen and bathrooms. The bathroom shower is failing and causing substantial water damage to the bathroom and adjoining walls. The planter at the exterior of the station is trapping water against the bathroom exterior wall and causing water damage to the bathroom exterior wall. The stations HVAC system is in need of improvement and is elevating the indoor relative humidity as well as the .3 µm airborne particulates. This is due to the unsealed air handler cabinet and unsealed areas of the office that are allowing communication between the attic and occupied space. The inspection of the air handler closet found signs of rodent access from the attic into the air handler cabinet. There were signs of substantial rodent activity in the attic and rodent feces identified in the kitchen and air handler closet.

To continue to utilize the building as a fire station, the building would require substantial improvements to areas necessary for the fire station and not necessary for other use such as a museum. These areas include the kitchen, bathrooms, and bunk room. Returning the building to its original design would eliminate these areas and only require the removal of the water damaged building material without the need for the costly replacement of the kitchen, bathrooms, and bunk room.

We understand that this building is currently occupied 24 hours a day, seven days a week as a fire station. We also understand this building is slated to become a historical society museum in the near future with only occasional occupancy. We believe that, as long as corrections are made in accordance with our recommendations, the air quality of this building will be completely suitable for the occasional occupancy that we would expect of a museum.

## Indoor Environmental Assessment

A visual inspection is the most important initial step in identifying a possible Indoor Environmental concern within the building. The extent of any potential Indoor Environmental Concerns were

visually assessed by a Certified Indoor Environmental Consultant. This assessment is important to determining the cause and origin of the indoor environmental concern within the building.

Factors such as barometric pressure, inside and outside temperatures and humidity, HVAC settings and frequency of use, and occupant activity levels, may dramatically reduce or increase the particulate counts within a building.

Our indoor environmental assessment of the building included the indoor environmental readings of temperature, relative humidity, particulate matter, and visual inspection. The indoor environment was assessed using a hand held laser particulate counter, hygrometer, boreoscope (fiber optics), and a protimeter (moisture meter), where necessary to detect the moisture the walls and building materials to determine if there were areas of continued moisture penetration. The use of the handheld laser particle counter helped to determine the areas within the building that had elevated particulate levels.

The visual inspection focuses on identifying any areas of the building or building envelope that could be a source of indoor contaminants. We inspect for areas that can produce, collect, or hold respirable particulate matter and/or areas that could be the source of contamination and potential exposure. During the visual inspection we develop a sampling plan and/or as necessary.

We look for visible mold growth or conditions conducive to mold growth within the building to determine the presence of mold or mold precursors such as water-damaged building materials, or water infiltration. We can then assess the approximate extent of the impact on the station and its occupants.

## Indoor Environmental Measurements

The measuring of the indoor environmental conditions (volatile organic compounds-VOC's, temperature, humidity, airborne particulates) at the time of the inspection showed that the station had no detectable VOC's; slightly elevated relative humidity and elevated particulates when the station is at rest and active as indicated in Table A.

Volatile organic compounds (VOCs) are emitted as gases from certain solids or liquids. VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects. Concentrations of many VOCs are consistently higher indoors (up to ten times higher) than outdoors. VOCs are emitted by a wide array of products numbering in the thousands.

Examples include: paints and lacquers, paint strippers, cleaning supplies, pesticides, building materials and furnishings, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions.

Organic chemicals are widely used as ingredients in household products. Paints, varnishes, and wax all contain organic solvents, as do many cleaning, disinfecting, cosmetic, degreasing, and hobby products. Fuels are made up of organic chemicals. All of these products can release organic compounds while you are using them, and, to some degree, when they are stored. Microbial volatile organic compounds (MVOCs) are low molecular weight (MW) chemicals present in the indoor environment primarily as the result of the metabolic actions of bacteria and fungi.

Particle pollution, also called particulate matter or PM, is a complex mixture of extremely small particles and liquid droplets in the air. When breathed in, these particles can reach the deepest regions of the lungs. Exposure to particle pollution is linked to a variety of significant health problems such as asthma. Particulates are a mixture of organic and inorganic substances suspended in the air. They can be solids and/or liquids and exist in a range of sizes. Particulate size is measured in micrometers (μ m), one millionth of a meter. The EPA refers to different groups of particulates that include:

Total suspended particulates (TSP) - representing the range of particulate matter normally found in the urban atmosphere. TSP generally includes from 1µm to 50µm. $PM_{10}$ - refers to particulate matter of less than 10m m in diameter. $PM_{10}$ is generally considered the most useful particulate measure. Particles less than 10µm in diameter can be inhaled and have the potential to reach the tracheo-bronchial region of the lung. $PM_{2.5}$ - comprises of fine particulate matter less than 2.5µm in diameter. Particles of this size are capable of deep lung penetration.

Total suspended particulates (TSP) - representing the range of particulate matter normally found in the urban atmosphere. TSP generally includes from 1µm to 50µm. The Occupational Safety and Health Administration have a recommendation for 8 hour exposure for particles in the **.3** µm size which is a recommended 0-40,000 particles/cc this is found in the OSHA Technical Manual.

**Table A: Indoor Environmental Measurements**

| | STATION AT REST (A/C Off) | | | | STATION ACTIVE (Air Handler Running) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Location | °F | RH | Particulate Levels .3 µm | .5µm | 1. µm | 2.5µm | 5µm | 10µm | VOC ppm |
| | **Outside** | **80.0** | **48.1** | **102,431** | **7,059** | **2,188** | **899** | **89** | **10** | **0** |
| 1 | Reception | 72.5 | 52.2 | 59,908 | 4,187 | 1,110 | 453 | 70 | 22 | 0 |
| | | 70.3 | **53.0** | **64,812** | 4,116 | 844 | 239 | 18 | 4 | 0 |
| 2 | Lt. Office | 72.9 | 50.5 | 57,251 | 3,834 | 892 | 328 | 53 | 10 | 0 |
| | | 70.8 | **50.8** | **63,556** | **4,260** | 741 | 186 | 10 | 0 | |
| 3 | Lounge | 73.1 | 51.1 | 58,475 | 3,697 | 721 | 291 | 36 | 9 | 0 |
| | | 70.3 | **52.6** | **64,887** | **4,338** | 919 | 312 | 50 | 14 | 0 |
| 4 | Battalion Chiefs Office | 73.4 | 48.4 | 58,821 | 3,645 | 618 | 218 | 30 | 9 | 0 |
| | | 70.0 | **51.0** | **62,706** | 3,578 | 542 | 107 | 1 | 0 | 0 |
| 5 | Chiefs Office | 74.1 | 48.6 | 57,773 | 3,975 | 928 | 389 | 69 | 27 | 0 |
| | | 70.5 | **51.5** | **60,959** | 3,889 | 747 | 199 | 17 | 7 | 0 |
| 6 | Administrative Office | 74.5 | 49.1 | 58,026 | 4,105 | 1,022 | 447 | 86 | 35 | 0 |
| | | 71.5 | **49.3** | **61,679** | 3,942 | 649 | 141 | 19 | 10 | 0 |
| 7 | Kitchen | 74.5 | 50.4 | 61,480 | 4,533 | 1,242 | 549 | 87 | 26 | 0 |
| | | 69.9 | **50.4** | **69,246** | **6.756** | 1,549 | 376 | 18 | 5 | 0 |
| 8 | Restroom | 73.3 | 54.1 | 65,920 | 4,584 | 1,212 | 511 | 63 | 23 | 0 |
| | | 68.5 | **52.6** | **69,086** | **6,322** | 1,235 | 280 | 25 | 5 | 0 |
| 9 | Sleeping Quarters | 72.5 | 53.6 | 63,988 | 4,479 | 1,137 | 473 | 36 | 5 | 0 |
| | | 67.4 | **53.9** | **66,093** | **5,176** | 843 | 157 | 10 | 2 | 0 |
| 10 | Shower | 71.5 | 58.5 | 69,342 | 6,120 | 2,359 | 1,350 | 241 | 60 | 0 |
| | | 67.2 | **58.8** | **69,451** | 5,449 | 956 | 200 | 13 | 3 | 0 |
| | Recommended | 74- 78 | <50.0 | <40,000 | | | <200 | | | <.5 |

## Indoor Environmental Measurement Summary:

The indoor environment was measured with a laser particle counter. These measurements were taken to establish the Temperature, Humidity, and Particulate Levels within the station. These indoor environmental measurements help to identify any elevations that could be considered indoor environmental concerns as well as directing us to a possible cause and origin of an indoor environmental contaminant.

- The station had zero VOC's in parts per million (ppm) in the station when at rest and active.
- The measurements showed the station had slightly elevated relative humidity that stayed the same or increased when active.
- The station had elevated particulate matter while at rest and decreased in all areas except areas shown in red in Table A.

Respirable particulate matter may include but not be limited to pet dander, dust mites, skin particles, pollen, and mold spores. Keeping the particulate matter at acceptable levels can be obtained by following our specific recommendations and the general recommendations in this report.

## Humidity Bloom

A humidity bloom is the growth of mold within a living space due to the elevation of indoor relative humidity at or above 60 percent relative humidity for a period of time greater than 72 hours and must be maintained for growth to continue. When the humidity is above 60 percent relative humidity molds will germinate causing what is referred to as a "Mold Bloom". These molds can bloom in many colors and are often confused with dust, dirt, foxing, or cobwebs.

Mold and mildew are words that refer to more than 100,000 species of fungi. Mold spores are present everywhere in our environment, generally in a dormant state where they do little damage. Spores require moisture to become active. They do not require light.

When water or high relative humidity provides the necessary moisture, dormant spores will germinate, grow fine web-like structures, and eventually produce fruiting bodies that release more spores. Most molds will germinate at 60 percent relative humidity. Increases in temperature can speed the growth rate of active mold.

There are 4 critical requirements for mold growth – available mold spores, available mold food, appropriate temperatures and considerable moisture. The removal of any one of these items will prohibit mold growth.

The only way to reduce the threat of mold in the station is to maintain an environment that is not hospitable for the germination of mold spores. The temperature should be 74-78 degrees F, and the relative humidity of 60% or less. It is important that the air conditioning system (HVAC) be kept on 24 hours a day, 7 days a week. Inconsistent operation or fluctuations in the temperature and humidity are the cause of many serious mold outbreaks.

## Humidity

Humidity is simply vaporized water in the air. Your breath contains hundreds of droplets of invisible water vapor. You can see them when you breathe on a pair of cold glasses.

The term most often used to define the amount of water vapor in the air is "relative humidity." Relative humidity is the percentage of water vapor in the air at a specific temperature, compared to the amount of water vapor the air is capable of holding at that temperature. Warm air holds more water vapor than cold air. When air at a certain temperature contains all the water vapor it can hold

at that temperature, its relative humidity is 100 percent. If it contains only half the water vapor it is capable of holding at that temperature, the relative humidity is 50 percent.

If the outside air temperature in winter is 0°F and the relative humidity is 75 percent, that same air inside the 70°F station will have a four percent relative humidity. The Sahara Desert has an average relative humidity of 25 percent.

When air is saturated with water vapor, it has reached the dew point; at this point, water vapor condenses and produces visible water or "condensation." In winter it usually occurs first on windows. When warm, moist air comes in contact with a cold window, air temperature drops and it can no longer hold the water vapor; condensation results.

**Desirable Humidity Levels**

The human body is comfortable when relative humidity ranges between 20 and 60 percent. In the station, an average relative humidity of 35 to 40 percent is appropriate when the outside temperature is 20°F or above. However, during cold weather, higher humidity ranges may cause structural damage because of condensation on windows and on the inside of exterior walls. As outdoor temperatures fall, condensation problems inside may develop.

The construction of the station also influences how much humidity is desirable. Tightly constructed buildings with properly installed vapor barriers and tight fitting doors and windows retain more heat and moisture. This is where mechanical ventilation becomes important. If the station does not have the proper mechanical ventilation, excess water vapor can move through walls and ceilings, causing wet insulation, peeling paint, and mold on walls and woodwork.

The following table shows recommended indoor humidity levels in relation to outdoor temperatures.

| Outside temperature (0°F) | Recommended relative humidity |
|---|---|
| +20° and above | 35% to 40% |
| +10° | 30% |
| 0° | 25% |
| -10° | 20% |
| -20° | 15% |

Maintaining relative humidity below 50% inhibits mold and mildew growth, dust mite infestations, and bacteria. This lower relative humidity also reduces the out-gassing of volatile organic compounds (VOC's). Molds are incapable of obtaining the moisture needed for their development directly from the atmosphere, but they can obtain it from a substrate, which has absorbed moisture from moist air (60% to 100% relative humidity). The relative humidity of the air has an indirect effect on fungal growth, and the more hygroscopic a material is, the more susceptible it is to mold growth. The minimum moisture content at which mold growth occurs depends on the material and usually ranges from 10% to 14%. Suitable substrates include carpet fibers, gypsum, concrete, bricks, etc.

Mold spores are everywhere all the time, entering from outdoor air as well as on pets and clothing. A mold spore landing on an indoor surface is likely to be insignificant and amount to little more than a common component of indoor dust, *until* such a mold spore lands on a moist organic surface (such as drywall.) *High indoor* humidity causes the surface moisture level to be sufficient

for mold sporulation. Since a mold spore requires moisture to propagate and grow, the indoor humidity level is a key gating factor in the control of indoor mold (and dust mites) in buildings.

Certain common mold genera and species, such as some members of the *Aspergillus sp.* and others grow readily on common building materials if they also have enough moisture. While there are fungal species that are able to grow under a remarkably wide range of environmental conditions, keeping indoor humidity at the appropriate level will reduce the chances of growth of the most common indoor problem molds. High indoor humidity can encourage more issues than indoor mold. The same moisture conditions that support growth of problematic indoor molds also encourage the development of bacterial hazards, dust mite populations, mite fecal allergen problem, and possibly other insect problems in buildings.

The same measures of humidity control to prevent mold growth are needed to discourage the dust mite population that exists in all living areas. Measures including choosing and maintaining the proper humidity level to avoid indoor mold will also work to minimize the level of dust mites and dust mite allergens. Keep the indoor humidity level in the mid-comfort range. A *maximum* indoor relative humidity of 50% RH may be acceptable, 45% RH better. At 60% indoor RH, we're entering the indoor mold-formation risk zone of high interior moisture in building wall or ceiling cavities or on wall and floor surfaces, possibly conducive to mold growth.

## General IAQ Improvement Recommendations:

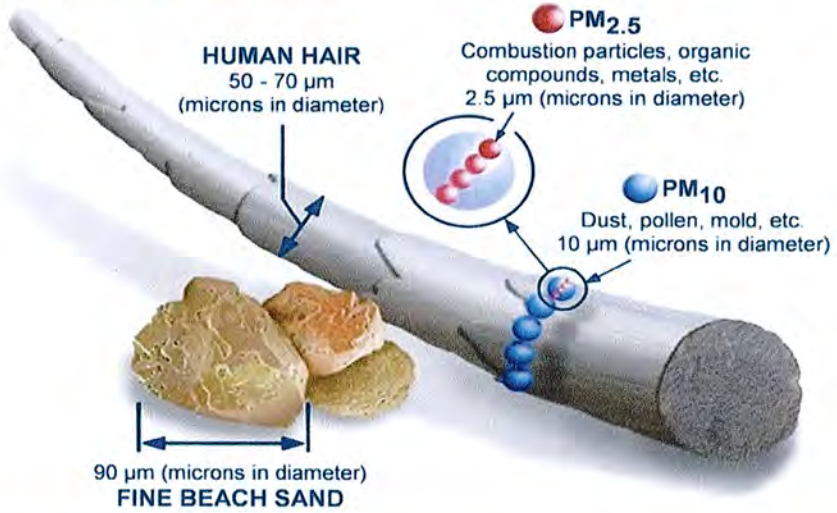
### Particulate Reduction;

The goal of improving the Indoor Air Quality is going to begin with particulate reduction. Particulate matter (PM) is the name for a wide range of particles that are small enough to be carried by the air, therefore; breathed in by people. They can be solid or liquid, or a mixture of both.

The size of particles may range from 0.005 µm to 100 µm in diameter. In comparison, the average size of a human hair is 60 µm. $PM_{10}$ are particles that are 10 µm or less in diameter. $PM_{2.5}$ are particles of 2.5 µm or less in diameter. The finer particles pose the greatest threat to human health because they can travel deepest into the lungs.

Indoor particulate matter is a mixture of substances like these:

- Carbon (soot) emitted by combustion sources;
- Tiny liquid or solid particles in aerosols;
- Fungal spores;
- Pollen; and
- A toxin present in bacteria (endotoxin).

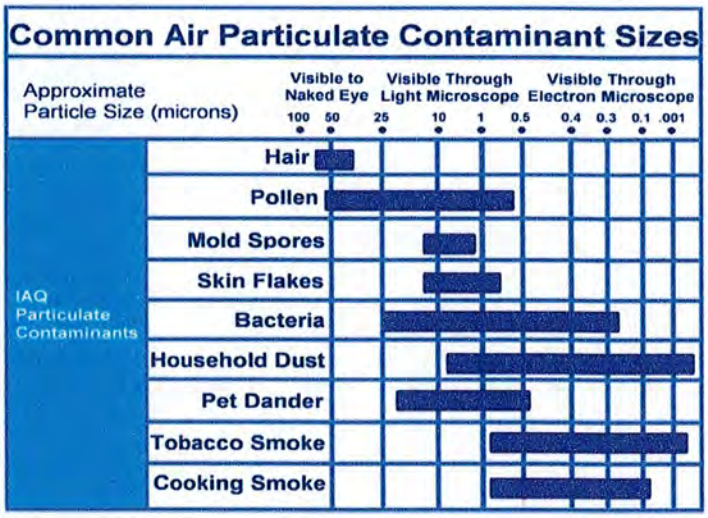


In a properly-maintained building, most of the airborne particulate matter comes from the outside. However, some buildings do have significant sources of indoor particulate matter which come from the following sources:

- **Cigarette smoking** is the greatest single source of particulate matter in homes and buildings where people smoke;
- **Cooking:** especially frying and sautéing;
- **Malfunctioning combustion appliances:** for example, furnaces without a proper air filter;
- **Non-vented combustion appliances** like gas stoves;
- **Wood-burning appliances** like wood stoves and fireplaces: especially if the smoke leaks or *back drafts* into the building; and
- **Mold growth**.

**Reducing concentrations of particulate matter in the building;**

1. **Furnaces and ventilation systems:** Make sure that furnaces and ventilation systems are properly maintained, and that you replace filter screens as often as recommended by the manufacturer. All combustion appliances, including furnaces, should be inspected by a qualified technician yearly.
2. **Cooking:** Turn your exhaust fan on when you are cooking, and especially when frying.
3. **Woodstoves:** Choose properly sized woodstoves and make sure that the doors close tightly. Have your chimney cleaned yearly, too.
4. **Mold:** Prevent mold growth and the release of mold spores into your indoor air by controlling humidity and fixing water leaks and water-damaged areas
5. **Smoking:** Don't allow people to smoke indoors because particulate matter levels increase with every smoker in the building.
6. **Clean:** Use your HEPA vacuum cleaner regularly.

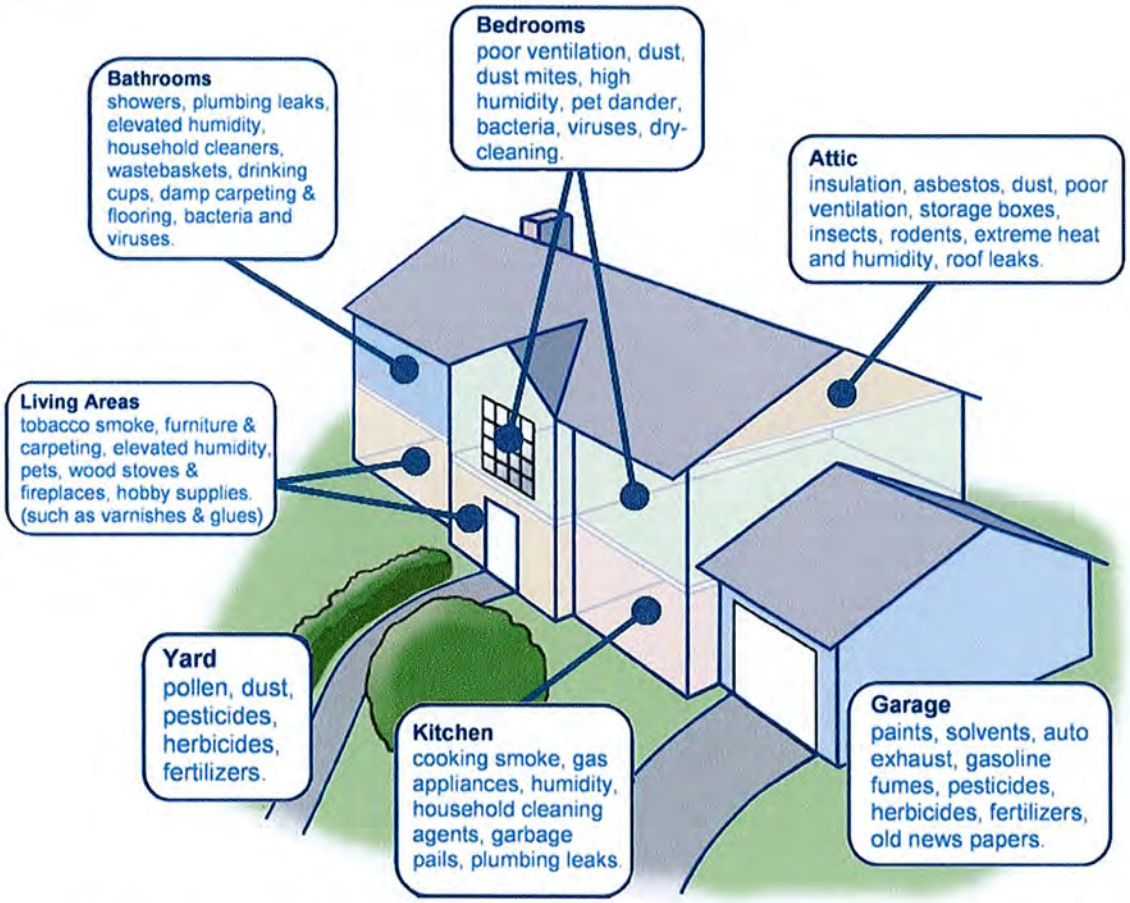



Your vacuum cleaner, as a general rule, is really only efficient at trapping particles that have settled onto the floor or whatever surface you're vacuuming. Even many room air cleaners are of limited effectiveness in typical building environments, because every time someone walks across a room, opens a door or window, or flips on the central air handling, thousands if not millions of superfine particles are introduced into the breathing space as the room air is disturbed or exchanged. Since portable air cleaner airflow rates are often fairly low in relation to the rate of room contamination, many people with portable air cleaners may still end up breathing more dust than they realize.

Can you stop or prevent dust? no, you can't, at least not completely, since even humans produce their own organic dust and the surfaces within the building are also constantly "shedding" micro-particles. Of course, you can make sure you have good entrance matting in place, so outdoor contaminants and dusts are not tracked in as much. You can also try to cleanup or contain other sources of fine particles finally, you can make sure that the processes you use to clean you're the building removes rather than redistribute dust as much as possible. This would include vacuuming surfaces with an HEPA (high efficiency particulate air) filtered vacuum cleaner. Use HEPA vacuum cleaners or high efficiency vacuum cleaner bags. These dramatically reduced the amount of dust, allergen and pollens pumped back into the air by the vacuum cleaner.

## Relative Humidity

Maintaining relative humidity below **50%** inhibits mold and mildew growth, dust mite infestations, and bacteria. This lower relative humidity also reduces the out-gassing of volatile organic compounds (VOC's). Molds are incapable of obtaining the moisture needed for their development directly from the atmosphere, but they can obtain it from a substrate, which has absorbed moisture from moist air (60% to 100% relative humidity). The relative humidity of the air has an indirect effect on fungal growth, and the more hygroscopic a material is, the more susceptible it is to mold growth. The minimum moisture content at which mold growth occurs depends on the material and usually ranges from 10% to 14%. Suitable substrates include carpet fibers, gypsum, concrete, bricks, etc.

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Measures discussed in this report including choosing and maintaining the proper humidity level to avoid indoor mold will also work to minimize the level of dust mites and dust mite allergens. Keep the indoor humidity level in the mid-comfort range. A *maximum* indoor relative humidity of 50% RH may be acceptable, 45% RH better. At 60% indoor RH, we're entering the indoor mold-formation risk zone of high interior moisture in building wall or ceiling cavities or on wall and floor surfaces, possibly conducive to mold growth.

## Window Condensation, Causes and Cures

Each winter more and more building owners become interested in the subject of window condensation. It's not a happy interest. It stems from bad experiences with window condensation, which range from irritating to downright expensive.

Many building owners seem to believe that it's a windows problem, a cheap or single pane window issue. They call their builder or the window supplier and say, "My windows are all wet, and it must be the fault of the builder or the windows." Well, not quite... Water on windows is condensation, and it can be a problem. However, it's not a window problem, and the solution does not come from the windows.

It may strike you as odd, but the growing condensation problems of the nation are caused by progress and improvements in the construction of the building. Yes, if you have trouble with window condensation it's probably because you live in a "tight" modern building that you can heat and cool for a fraction of the cost it took to heat and cool the house your parents lived in.

This article explains the moisture problems of the "tight" building that lead to window condensation. It offers suggestions for curing condensation problems in existing buildings and provides suggestions for those who are planning on building. Your new building will be a "tight" building and there are more changes or upgrades that you can add to the building during construction that will help to prevent excessive moisture. This can be a bit more difficult in an existing building where the problem already exists.

### What Causes "Excessive" Condensation?

Condensation is the result of high humidity that produces a "fog" once it hits a colder surface. The humidity is caused by excess water vapor in the building. This is commonly seen in a foggy mirror after a hot shower. Condensation usually occurs first on windows because glass surfaces have the lowest temperature of any of the interior surfaces in the building.

A little condensation on the lower corners of your windows now and then probably doesn't bother you and shouldn't. By the time you've thought about it a second time it has usually gone.

What we're talking about is excessive condensation, condensation that runs down the windows and pools on the sills, condensation that runs off windows and stains woodwork... or in serious cases even damages the walls and possibly the floors.

If you have this kind of condensation on your windows, you have a good reason to worry and a good reason to act.

It's natural and easy in such cases to blame the builder or the windows. But it's wrong to blame them.

The real villain is invisible. Its water vapor...too much water vapor. The best and usually the ONLY way to prevent this trouble is to get rid of excess water vapor.

If you have too much water vapor (humidity) in your building there isn't anything you can do to the windows to stop condensation.

**What is Humidity?**

Humidity, water vapor, moisture, steam, they're all the same. They're all a form of water. Humidity is an invisible gas. It's present in varying quantities in nearly all air. This moisture in wet air tries to flow toward drier air and mix with it to reach equilibrium.

Scientists describe the movement of water vapor as "vapor pressure'. It's often a very powerful force indeed. It can act independently of the flow of the air, which holds the moisture. Vapor pressure can force moisture easily through wood, drywall, cement and brick. Right through most of the materials we use to build our buildings. That's exactly what happens when moisture seeks to escape from the humid air. The moisture is moving from an area of greater concentration to an area of lesser concentration.

Here in Florida, the hot humid south, the area of greater concentration is generally the exterior of the building. However during the winter the opposite is true. During the winter the exterior is dryer than the interior of your building. In addition you aren't running the air conditioner which during the summer removes some of the indoor water vapor from the air.

So we have the same daily activities in the winter as the summer. We're creating the same amount of water vapor but we're not removing any of water vapor. So in the winter the humidity in our buildings rises and the outdoor temperature and humidity lowers. And the result is condensation on your windows. The amount of condensation will be directly related to the amount of available water vapor or amount of indoor relative humidity.

Daily occupant activity such as cooking, washing, bathing, showers, as well as the use of household appliances such as dishwashers and clothes dryers and washing machines, all introduce water vapor into buildings. Typical amounts of water vapor include:

- One person's breathing produces 1/4 cup of water per hour.
- Cooking for a family of four produces approximately 5 pints of water in 24 hours.
- Showering puts 1/2 pint of water into the air.
- Bathing puts 1/8 pint of water into the air.

Adding only four to six pints of water to the air raises the relative humidity in a 1,000 square foot building from 15 to 60 percent, assuming the temperature is constant.

So you see that the modern family of four can easily release 150 pounds or more than 18 GALLONS of water per week into the air in their building!

Old drafty windows allow moisture to escape through inefficient seals and cracks. Today's technology produces more energy efficient, "tighter" buildings. This is great for keeping your building more comfortable, quieter, and cleaner, BUT by sealing your building you are also keeping moisture in. In today's buildings it is very easy to build up extremely high levels of humidity.

Since the 1970's energy crisis we've been working very hard to create an energy efficient building. Part of that energy efficiency is to prevent air infiltration by sealing buildings which has created the modern "tight" building. Moisture created by bathrooms, kitchens, laundry rooms and daily occupant activity no longer flows easily to the outside.

Modern insulation and construction that keep the hot and cold air outside also keep moisture in; so, it is very easy to build up excessive and even harmful moisture levels in our buildings. The condensation is a big red flag that you have way too much humidity trapped in your building.

## How to Reduce Humidity

Be the Master of your Domain and take control of your indoor environment: For instance, venting all bath vents, clothes dryers, kitchen exhaust hoods to the exterior of your building. And of course you have to use your kitchen or bathroom exhaust fans. We strongly encourage you to consider purchasing or upgrading to bathroom exhaust fans that are humidity controlled. That's right started and stopped automatically based on the amount of humidity in the bathroom.

Now, before we summarize specific steps for reducing humidity in your building, let's include some basic data about recommended indoor relative humidity. You can refer to it if you are inclined to test the moisture levels in your own building.

Here are a few easy steps you can take to reduce condensation on your windows.

1. Install a humidistat
2. Do not install wallpaper on exterior or bathroom walls
3. Do not place furniture in front of windows.
4. Do not keep window coverings such as curtains and blinds fully closed
5. Ensure that your bathroom exhaust fan is ducted to the exterior of your building
6. Run your bathroom exhaust fan
7. Run your bath exhaust fan some more
8. If possible duct your kitchen exhaust fan to the exterior
9. Run your kitchen exhaust fan while cooking
10. Ensure that your dryer vent is clean

You see, the basic principle of reducing window condensation is extremely simple. When there is too much condensation on your windows, it means that humidity is too high in your building. You should take necessary steps to reduce humidity until condensation disappears.

While we have been discussing the control of condensation we've mentioned just about everything except windows. There's a good reason.

There just is nothing much that can be done with windows to cut down condensation. As the building experts have often pointed out, the windows are not to blame for condensation. In the moisture content of the inside air, lies both the cause and the cure.

**Air Filtration;**

To improve air quality in Florida, the biggest benefits come from investments in curbing air and moisture infiltration, reducing internal moisture production and controlling indoor sources of air pollutants. If you control sources, there is far less need (and cost) to remove moisture and indoor pollutants (particulates) mechanically at the A/C system. This can be accomplished with a humidistat and a mechanical dehumidifier that control both temperature and humidity. Along with the humidistat to control temperature and humidity a *media filter* is recommended. When determining which filter to purchase it is important to understand how filters are rated. Most filters will have a MERV rating a Minimum Efficiency Reporting Value.

MERV 8 pleated filters are an ideal upgrade from standard disposable panel filters. Pleated filters use a finer mesh, which catches smaller particles. Because the finer mesh also creates more resistance to air flow, the surface is "extended" to offer more surface area for air to pass through which does not restrict the air flow. Pleated filters are one to six inches thick. One or two inch filters will fit in the filter rack of most air handlers. MERV rated filters greater than MERV 8 are more effective, but may require modification to allow for a thicker filter with increased surface area or duct modifications to prevent damage to the air handler due to restricted air flow and increased condensation.

Wherever higher efficiency air filtration is desired to remove pollens and allergens restriction to air flow while providing high efficiency must be taken into consideration. *Check with your AC service provider and equipment manufacturer before using a filter with a MERV rating above MERV 8.*

MERV ratings are used to rate the ability of an air conditioning filter to remove dust from the air as it passes through the filter. MERV is a standard used to measure the overall efficiency of a filter. Higher MERV ratings mean fewer dust particles and other airborne contaminants pass through the filter. MERV ratings are determined by adding particles of varying sizes (1-12) into a controlled testing environment. The particles are added upstream of the test filter and a laser particle counter samples the air before it enters the filter and after it leaves the filter. The two particle counts are compared to calculate the Particle Size Efficiency of the tested filter. Once this is determined, a MERV Parameters chart is used to determine the MERV rating. MERV ratings range from 1 - 16 and measurements are in microns. Some of the common particles related to MERV ratings are pet dander, insecticide dust, smog, dust, viruses, wood, tobacco smoke, spores, bacteria and pollen.

Some of the most common filters found in residential use only have a MERV rating of 1 to 4. These are typically disposable panel type filters and do not do a good job of filtering the air because they will not stop particles smaller than 10 microns. MERV 5 to 8 rated filters are a better choice and are more commonly found in commercial applications. These filters will collect particles as small as 3 microns and are a good choice for building owners also. MERV 8 is more efficient when compared to standard pleated filters and has a high dust holding capacity that does not sacrifice air flow.

Filters with a MERV rating of 9 to 12 will stop particles in the 1 to 3 micron range. These filters are a great choice for building owners who want the best dust control possible. When using filters with MERV 9 ratings and above it is important to clean or replace them when recommended by the manufacturer because they will have a negative effect on air flow when they become dirty. This can lead to performance problems and decreased operating efficiency.

For this reason it is important to check with your AC service provider and equipment manufacturer before using a filter with a MERV rating above MERV 8. The most efficient filters have MER ratings of 13 to 16 and will stop particles as small as .3 microns. These filters are used in hospitals and other super clean environments.

## Report summary

The indoor environmental and building envelope assessment identified several areas of the building envelope that were failing and allowing water intrusion. This water intrusion is causing the exterior wall paper to fail as the moisture condenses on the back of the wallpaper. This area can support mold growth though none was identified at the time of the assessment.

The interior of the building has been retrofitted to accommodate the 24 hour use by the fire department which included the addition of a kitchen and bathrooms. The bathroom shower is failing and causing substantial water damage to the bathroom and adjoining walls. The planter at the exterior of the station is trapping water against the bathroom exterior wall and causing water damage to the bathroom exterior wall.

The stations HVAC system is in need of improvement and is elevating the indoor relative humidity as well as the .3 µm airborne particulates. This is due to the unsealed air hander cabinet and unsealed areas of the office that are allowing communication between the attic and occupied space.

We understand that this building is currently occupied 24 hours a day, seven days a week as a fire station. We also understand this building is slated to become a historical society museum in the near future with only occasional occupancy. We believe that, as long as corrections are made in

accordance with our recommendations, the air quality of this building will be completely suitable for the occasional occupancy that we would expect of a museum.

## Specific Recommendations

The building has areas that can be addressed which will have immediate impact on the indoor air quality.

These areas include;

1. Remove the wallpaper from the exterior walls.
2. Remove the failing shower stall
3. Remove the exterior planter against the bathroom wall
4. Seal all penetrations between the attic and office space
5. Seal the air handler closet; upgrade to MERV 8 filter
6. Seal or replace the HVAC ducts
7. Install a humidistat
8. Remove the paint from the exterior brick
9. Repoint the exterior brick

## Report Limitations & Exclusions

All the professional opinions presented in this report are based solely on the scope of work conducted and sources referred to in our report. The data presented by the certified indoor environmental consultant in this report was collected and analyzed using generally accepted industry methods and practices at the time the report was generated.

This report represents the conditions, locations and material that were observed at the time the fieldwork was conducted. The scope of work for this project did not include an assessment of other environmental conditions which might exist on the property. This report was prepared for the sole use of our client. The use of this report by anyone other than our client or the certified inspector is strictly prohibited without the expressed written consent of the certified inspector. Portions of this report may not be used independently of the entire report.

Thank you for allowing us to provide you with this service.

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Certified Indoor Environmental Consultant
**Microshield Environmental Services, LLC**
Certification by American Council for Accredited Certification ACAC CIEC #0711048
Council-certified Environmental Thermography Consultant ACAC CETC #1005013
Accreditation by Council for Engineering and Scientific Specialty Boards (CESB)
Florida State License Mold Assessor MRS4

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   - *Residential Indoor Air Quality Guidelines*
2. HEALTH CANADA
   - *Exposure Guidelines for Residential Indoor Air Quality*
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4. THE INSTITUTE OF MEDICINE
   - *Damp Indoor Spaces and Health report*
5. WORLD HEALTH ORGANIZATION **WHO**
   - *Guidelines for Indoor Air Quality: Dampness and Mould*
6. ENVIRONMENTAL PROTECTION AGENCY **EPA**
   - *Tools for Schools*
7. ENVIRONMENTAL PROTECTION AGENCY **EPA**
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10. S-520 ANSI APPROVED NATIONAL STANDARD **IICRC**
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11. S-500 ANSI APPROVED NATIONAL STANDARD **IICRC**
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13. AMERICAN INDUSTRIAL HYGIENE ASSOCIATION **AIHA**
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    - *Position Paper on Chemical Product Applications in HVAC Systems*
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20. NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH **NIOSH**
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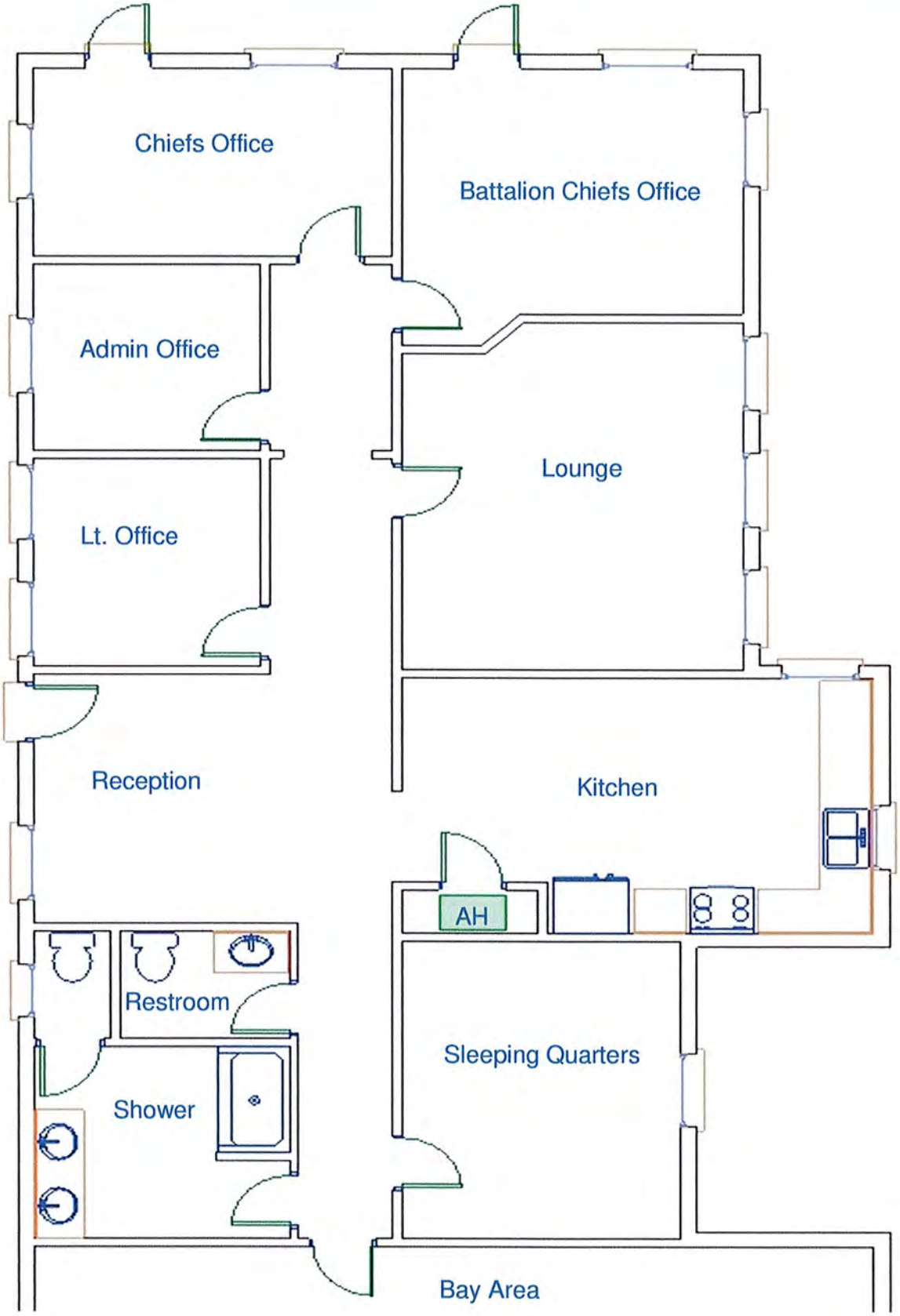
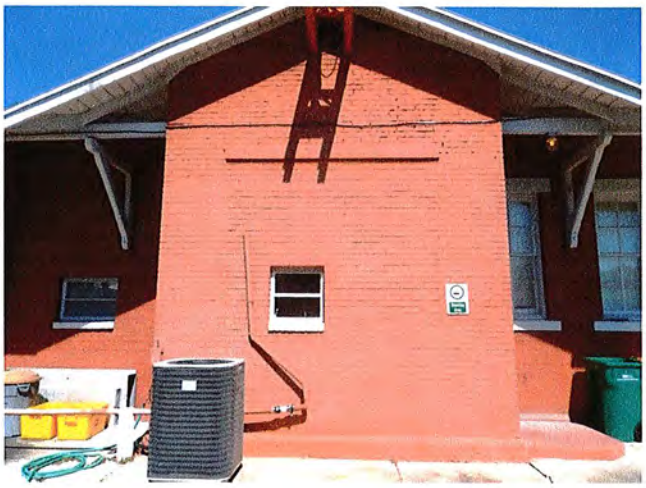
## Floor Plan


Chiefs Office
Battalion Chiefs Office
Admin Office
Lounge
Lt. Office
Reception
Kitchen
AH
Restroom
Sleeping Quarters
Shower
Bay Area

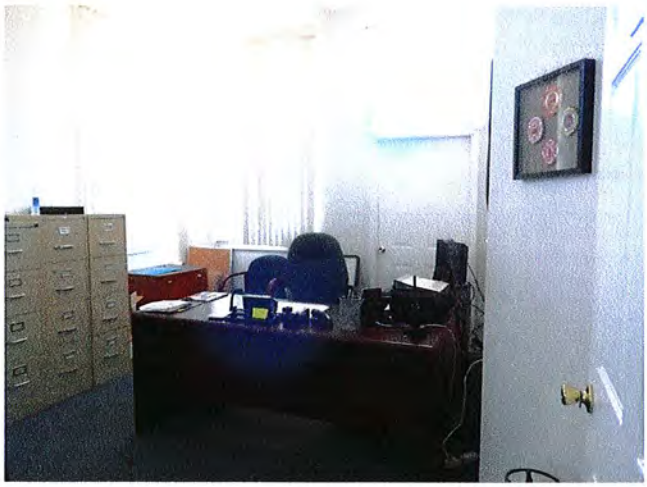
## Inspection Pictures

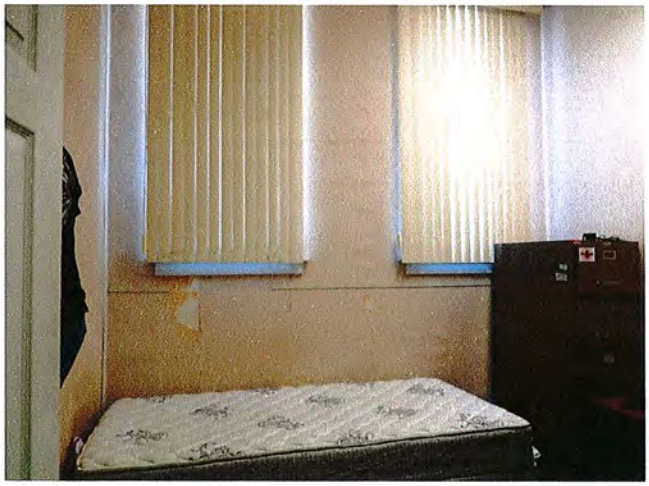
## Exterior



Planter holding water against exterior wall which forces drying to the interior.

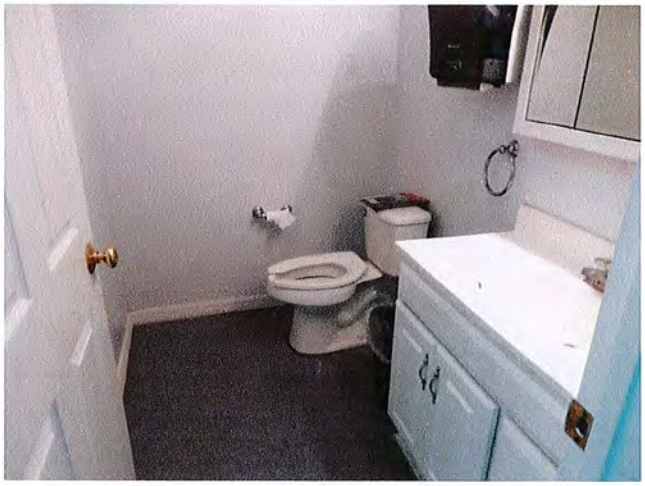
## Interior





Lt. Office has wall paper trapping moisture and peeling off wall.

Shower water damage



## HVAC

Filter can be upgraded to a higher MERV rating. Visible microbial growth underside of coils.

Air Handler Closet is open to attic and interstitial wall cavity. Visible rodent droppings in closet.

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TAVARES

America's Seaplane City™

Station 29

Indoor Air Quality Solutions

"Healthier Air Starts Here"

# 1720 Lane Park Cut-Off Road

# Fire Station 29

## Indoor Environmental and Building Envelope Assessment

Indoor environmental and building envelope assessment of the home located at 1720 Lane Park Cutoff Rd. Tavares, FL 32778 to identify the possible presence of microbial growth, wet or damaged home material, and/or elevated particulate matter within the home.

A Division of
**Microshield Environmental Services, LLC.**
1170 Tree Swallow Dr. Suite 330 Winter Springs FL 32708
407-383-9459 Info@FloridaIAQ.com www.FloridaIAQ.com

# Table of Contents


Client's Areas of Concern ..... 3

Executive Summary ..... 3

Indoor Environmental Assessment ..... 3

Visual Inspection ..... 4

- Exterior ..... 4
- Interior ..... 4
- HVAC ..... 4

Indoor Environmental Measurements ..... 4

- Table A: Indoor Environmental Measurements ..... 6
- Indoor Environmental Measurement Summary: ..... 6

Humidity Bloom ..... 7

- Humidity ..... 7
- Desirable Humidity Levels ..... 8
- Relative Humidity ..... 9
- Window Condensation, Causes and Cures ..... 9
  - What Causes "Excessive" Condensation? ..... 10
- Air Filtration; ..... 12

Report summary ..... 13

Specific Recommendations ..... 13

Report Limitations & Exclusions ..... 14

- References Documents: ..... 15

Inspection Pictures ..... 16

- Exterior ..... 16
- Interior ..... 19
- HVAC ..... 21
- Attic ..... 23
- Roof Flashing Repair; Kick-Out Install Recommendation ..... 24

AC System recommendations for improved Indoor Air Quality (IAQ). ..... 25

- Humidistat ..... 25
- Outside Air Intake ..... 25
- Mechanical Dehumidifier ..... 25

Honeywell Filtration ..... 25

- Option 1 F200 Whole-House Media Air Cleaner ..... 25

Indoor Air Quality Solutions
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Info@FloridaIAQ.com www.FloridaIAQ.com

**ATTN:** Mr. and Mrs. Marsico

April 3, 2013

**REF:** Indoor Environmental Assessment

On May 15th, 2013, Microshield Environmental Services, LLC conducted an Indoor Environmental and Building Envelope Assessment of the building located at 1720 Lane Park Cutoff Rd. Tavares, FL 32778 (property) and prepared this report for The City of Tavares (client) summarizing the findings and indoor environmental reading results.

## Client's Areas of Concern

The City of Tavares would like to determine if there are any indoor environmental concerns with Station 29.

## Executive Summary

The inspection of the firehouse found there to be no indoor environmental concerns of active microbial growth. However, the inspection of the firehouse HVAC system identified constant supply of outside air. This outside air supplied is not pre-filtered, not dehumidified, and un-dampered; therefore, allowing a substantial amount of outdoor respirable particulates and relative humidity to be introduced into the occupied space of the firehouse.

By reducing the relative humidity in the firehouse, the temperature of the firehouse can be raised while maintaining the thermal comfort for the occupants. This can be accomplished by pre-filtering and dampering the outside air supplied to the air handler supplying the occupied space. It is also recommended to install a humidistat to help control humidity levels.

By pre-filtering the outside air intake and increasing the MERV rating of the air handler filtration, the accumulation of indoor respirable particulate matter can be greatly reduced. In addition, by pre-filtering, dampering, and dehumidifying the outside air intake, the air handler will work more efficiently and less often to maintain the necessary thermal comfort of the firehouse occupants.

On the exterior, the roof is missing kickouts to divert water away from the building. It is also recommended to install a gutter system to divert water away from the building. The windows are missing caulking which leads to water intrusion.

## Indoor Environmental Assessment

A visual inspection is the most important initial step in identifying a possible Indoor Environmental concern within the building. The extent of any potential Indoor Environmental Concerns were visually assessed by a Certified Indoor Environmental Consultant. This assessment is important to determining the cause and origin of the indoor environmental concern within the building.

Factors such as barometric pressure, inside and outside temperatures and humidity, HVAC settings and frequency of use, and occupant activity levels, may dramatically reduce or increase the particulate counts within a building.

Our indoor environmental assessment of the building included the indoor environmental readings of temperature, relative humidity, particulate matter, and visual inspection. The indoor environment

was assessed using a hand held laser particulate counter, hygrometer, boreoscope (fiber optics), and a protimeter (moisture meter), where necessary to detect the moisture the walls and building materials to determine if there were areas of continued moisture penetration. The use of the handheld laser particle counter helped to determine the areas within the building that had elevated particulate levels.

## Visual Inspection

The visual inspection focuses on identifying any areas of the building or building envelope that could be a source of indoor contaminants. We inspect for areas that can produce, collect, or hold respirable particulate matter and/or areas that could be the source of contamination and potential exposure. During the visual inspection we develop a sampling plan and/or as necessary.

We look for visible mold growth or conditions conducive to mold growth within the building to determine the presence of mold or mold precursors such as water-damaged building materials, or water infiltration. We can then assess the approximate extent of the impact on the building and its occupants.

### Exterior

The inspection of the exterior of the building found it to have missing caulk around the windows, exterior penetrations, lack of roof kick out flashing and gutters.

### Interior

The building had ceiling tile stains in the corner of the lieutenant's office.

### HVAC

The building has one air handler unit to service the building. Outside air intake is not dehumidified and creating excessive condensation within the air handler cabinet which is raising the indoor relative humidity.

## Indoor Environmental Measurements

The measuring of the indoor environmental conditions (volatile organic compounds-VOC's, temperature, humidity, airborne particulates) at the time of the inspection showed that the building had no detectable VOC's; acceptable relative humidity that increased when active and slightly elevated particulates when the building is at rest and active as indicated in Table A.

Volatile organic compounds (VOCs) are emitted as gases from certain solids or liquids. VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects. Concentrations of many VOCs are consistently higher indoors (up to ten times higher) than outdoors. VOCs are emitted by a wide array of products numbering in the thousands.

Examples include: paints and lacquers, paint strippers, cleaning supplies, pesticides, home materials and furnishings, office equipment such as copiers and printers, correction fluids and carbonless copy paper, graphics and craft materials including glues and adhesives, permanent markers, and photographic solutions.

Organic chemicals are widely used as ingredients in household products. Paints, varnishes, and wax all contain organic solvents, as do many cleaning, disinfecting, cosmetic, degreasing, and hobby products. Fuels are made up of organic chemicals. All of these products can release organic compounds while you are using them, and, to some degree, when they are stored. Microbial volatile organic compounds (MVOCs) are low molecular weight (MW) chemicals present in the indoor environment primarily as the result of the metabolic actions of bacteria and fungi.

Particle pollution, also called particulate matter or PM, is a complex mixture of extremely small particles and liquid droplets in the air. When breathed in, these particles can reach the deepest

regions of the lungs. Exposure to particle pollution is linked to a variety of significant health problems such as asthma. Particulates are a mixture of organic and inorganic substances suspended in the air. They can be solids and/or liquids and exist in a range of sizes. Particulate size is measured in micrometers (µ m), one millionth of a meter. The EPA refers to different groups of particulates that include:

Total suspended particulates (TSP) - representing the range of particulate matter normally found in the urban atmosphere. TSP generally includes from 1µm to 50µm. $PM_{10}$ - refers to particulate matter of less than 10m m in diameter. $PM_{10}$ is generally considered the most useful particulate measure. Particles less than 10µm in diameter can be inhaled and have the potential to reach the tracheo-bronchial region of the lung. $PM_{2.5}$ - comprises of fine particulate matter less than 2.5µm in diameter. Particles of this size are capable of deep lung penetration.

Total suspended particulates (TSP) - representing the range of particulate matter normally found in the urban atmosphere. TSP generally includes from 1µm to 50µm. The Occupational Safety and Health Administration have a recommendation for 8 hour exposure for particles in the **.3** µm size which is a recommended 0-40,000 particles/cc this is found in the OSHA Technical Manual.

## Table A: Indoor Environmental Measurements

| | BUILDING AT REST (A/C Off) | | | | BUILDING ACTIVE (Air Handler Running) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Location | °F | RH | Particulate Levels .3 µm | .5µm | 1. µm | 2.5µm | 5µm | 10µm | VOC ppm |
| | Outside | 89.5 | 37.4 | 92.007 | 5,599 | 1,262 | 385 | 30 | 11 | 0 |
| 1 | Day Room | 77.8 | 43.4 | 77,111 | 4,952 | 1,089 | 358 | 51 | 15 | 0 |
| | | 74.6 | **43.0** | 66,574 | 3,317 | 404 | 76 | 4 | 0 | 0 |
| 2 | Lt. Office | 77, 3 | 44.3 | 78,417 | 4,994 | 1,134 | 413 | 61 | 21 | 0 |
| | | 73.1 | **44.2** | 63,988 | 3,243 | 459 | 117 | 15 | 10 | 0 |
| 3 | Kitchen | 77.8 | 43.6 | 77,298 | 4,814 | 1,069 | 378 | 44 | 16 | 0 |
| | | 73.3 | **44.9** | 66,225 | 3,370 | 535 | 160 | 28 | 14 | 0 |
| 4 | Fire fighter Office | 77.6 | 44.6 | 77,883 | 5,590 | 1,533 | 659 | 118 | 52 | 0 |
| | | 72.8 | **44.3** | 62,573 | 3,037 | 428 | 121 | 22 | 9 | 0 |
| 5 | Sleeping Quarters | 77.7 | 43.1 | 70,931 | 5,378 | 1,482 | 643 | 106 | 34 | 0 |
| | | 71.2 | **46.1** | 62,490 | 2,941 | 337 | 64 | 4 | 1 | 0 |
| 7 | Female locker Room | 76.2 | 44.2 | 72,483 | 6,029 | 2,003 | 983 | 209 | 57 | 0 |
| | | 71.9 | **45.0** | 60,861 | 2.880 | 336 | 69 | 5 | 2 | 0 |
| 6 | EMS Day Room | 78.4 | 47.4 | 79,512 | 4,833 | 926 | 318 | 46 | 18 | 0 |
| | | 72.1 | **47.2** | 59,364 | 3,489 | 782 | 268 | 31 | 8 | 0 |
| 8 | EMS Kitchen | 78 | 43.3 | 74,713 | 4,548 | 864 | 289 | 35 | 13 | 0 |
| | | 72.5 | **43.8** | 57,648 | 2,986 | 634 | 186 | 22 | 7 | 0 |
| 9 | EMS Restroom | 77.8 | 44.4 | 74,868 | 4,366 | 747 | 161 | 7 | 4 | 0 |
| | | 72.6 | **44.5** | 59,659 | 3,281 | 476 | 103 | 4 | 2 | 0 |
| 10 | Male Locker Room | 75.3 | 52.5 | 79,977 | 7,058 | 1,840 | 618 | 63 | 22 | 0 |
| | | 71.9 | 46.1 | 60,873 | 3,322 | 682 | 300 | 82 | 42 | 0 |
| | Recommended | 74- 78 | <50.0 | <40,000 | | | <200 | | | <.5 |

## Indoor Environmental Measurement Summary:

The indoor environment was measured with a laser particle counter. These measurements were taken to establish the Temperature, Humidity, and Particulate Levels within the building. These indoor environmental measurements help to identify any elevations that could be considered indoor environmental concerns as well as directing us to a possible cause and origin of an indoor environmental contaminant.

- The building had zero VOC's in parts per million (ppm) in the building when at rest and active.
- The measurements showed the building had acceptable relative humidity; although, increased or stayed about the same with the building active.

- The building had elevated particulate matter while at rest and decreased in all areas to an acceptable level

Respirable particulate matter may include but not be limited to pet dander, dust mites, skin particles, pollen, and mold spores. Keeping the particulate matter at acceptable levels can be obtained by following our specific recommendations and the general recommendations in this report.

## Humidity Bloom

A humidity bloom is the growth of mold within a living space due to the elevation of indoor relative humidity at or above 60 percent relative humidity for a period of time greater than 72 hours and must be maintained for growth to continue. When the humidity is above 60 percent relative humidity molds will germinate causing what is referred to as a "Mold Bloom". These molds can bloom in many colors and are often confused with dust, dirt, foxing, or cobwebs.

Mold and mildew are words that refer to more than 100,000 species of fungi. Mold spores are present everywhere in our environment, generally in a dormant state where they do little damage. Spores require moisture to become active. They do not require light.

When water or high relative humidity provides the necessary moisture, dormant spores will germinate, grow fine web-like structures, and eventually produce fruiting bodies that release more spores. Most molds will germinate at 60 percent relative humidity. Increases in temperature can speed the growth rate of active mold.

There are 4 critical requirements for mold growth – available mold spores, available mold food, appropriate temperatures and considerable moisture. The removal of any one of these items will prohibit mold growth.

The only way to reduce the threat of mold in a building is to maintain an environment that is not hospitable for the germination of mold spores. The temperature should be 74-78 degrees F, and the relative humidity of 60% or less. It is important that the air conditioning system (HVAC) be kept on 24 hours a day, 7 days a week. Inconsistent operation or fluctuations in the temperature and humidity are the cause of many serious mold outbreaks.

## Humidity

Humidity is simply vaporized water in the air. Your breath contains hundreds of droplets of invisible water vapor. You can see them when you breathe on a pair of cold glasses.

The term most often used to define the amount of water vapor in the air is "relative humidity." Relative humidity is the percentage of water vapor in the air at a specific temperature, compared to the amount of water vapor the air is capable of holding at that temperature. Warm air holds more water vapor than cold air. When air at a certain temperature contains all the water vapor it can hold at that temperature, its relative humidity is 100 percent. If it contains only half the water vapor it is capable of holding at that temperature, the relative humidity is 50 percent.

If the outside air temperature in winter is 0°F and the relative humidity is 75 percent, that same air inside your 70°F building will have a four percent relative humidity. The Sahara Desert has an average relative humidity of 25 percent.

When air is saturated with water vapor, it has reached the dew point; at this point, water vapor condenses and produces visible water or "condensation." In winter it usually occurs first on windows. When warm, moist air comes in contact with a cold window, air temperature drops and it can no longer hold the water vapor; condensation results.

## Desirable Humidity Levels

The human body is comfortable when relative humidity ranges between 20 and 60 percent. In your building, an average relative humidity of 35 to 40 percent is appropriate when the outside temperature is 20°F or above. However, during cold weather, higher humidity ranges may cause structural damage because of condensation on windows and on the inside of exterior walls. As outdoor temperatures fall, condensation problems inside may develop.

The construction of a building also influences how much humidity is desirable. Tightly constructed buildings with properly installed vapor barriers and tight fitting doors and windows retain more heat and moisture. This is where mechanical ventilation becomes important. If a building does not have the proper mechanical ventilation, excess water vapor can move through walls and ceilings, causing wet insulation, peeling paint, and mold on walls and woodwork.

The following table shows recommended indoor humidity levels in relation to outdoor temperatures.

| Outside temperature (0°F) | Recommended relative humidity |
|---|---|
| +20° and above | 35% to 40% |
| +10° | 30% |
| 0° | 25% |
| -10° | 20% |
| -20° | 15% |

Maintaining relative humidity below 50% inhibits mold and mildew growth, dust mite infestations, and bacteria. This lower relative humidity also reduces the out-gassing of volatile organic compounds (VOC's). Molds are incapable of obtaining the moisture needed for their development directly from the atmosphere, but they can obtain it from a substrate, which has absorbed moisture from moist air (60% to 100% relative humidity). The relative humidity of the air has an indirect effect on fungal growth, and the more hygroscopic a material is, the more susceptible it is to mold growth. The minimum moisture content at which mold growth occurs depends on the material and usually ranges from 10% to 14%. Suitable substrates include carpet fibers, gypsum, concrete, bricks, etc.

Mold spores are everywhere all the time, entering from outdoor air as well as on pets and clothing. A mold spore landing on an indoor surface is likely to be insignificant and amount to little more than a common component of indoor dust, *until* such a mold spore lands on a moist organic surface (such as drywall.) *High indoor* humidity causes the surface moisture level to be sufficient for mold sporulation. Since a mold spore requires moisture to propagate and grow, the indoor humidity level is a key gating factor in the control of indoor mold (and dust mites) in buildings.

Certain common mold genera and species, such as some members of the *Aspergillus sp.* and others grow readily on common building materials if they also have enough moisture. While there are fungal species that are able to grow under a remarkably wide range of environmental conditions, keeping indoor humidity at the appropriate level will reduce the chances of growth of the most common indoor problem molds. High indoor humidity can encourage more issues than indoor mold. The same moisture conditions that support growth of problematic indoor molds also encourage the development of bacterial hazards, dust mite populations, mite fecal allergen problem, and possibly other insect problems in buildings.

The same measures of humidity control to prevent mold growth are needed to discourage the dust mite population that exists in all living areas. Measures including choosing and maintaining the proper humidity level to avoid indoor mold will also work to minimize the level of dust mites and dust mite allergens. Keep the indoor humidity level in the mid-comfort range. A *maximum* indoor relative humidity of 50% RH may be acceptable, 45% RH better. At 60% indoor RH, we're entering the indoor mold-formation risk zone of high interior moisture in building wall or ceiling cavities or on wall and floor surfaces, possibly conducive to mold growth.

## Relative Humidity

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Measures discussed in this report including choosing and maintaining the proper humidity level to avoid indoor mold will also work to minimize the level of dust mites and dust mite allergens. Keep the indoor humidity level in the mid-comfort range. A *maximum* indoor relative humidity of 50% RH may be acceptable, 45% RH better. At 60% indoor RH, we're entering the indoor mold-formation risk zone of high interior moisture in building wall or ceiling cavities or on wall and floor surfaces, possibly conducive to mold growth.

## Window Condensation, Causes and Cures

Each winter more and more building owners become interested in the subject of window condensation. It's not a happy interest. It stems from bad experiences with window condensation, which range from irritating to downright expensive.

Many building owners seem to believe that it's a windows problem, a cheap or single pane window issue. They call their builder or the window supplier and say, "My windows are all wet, and it must be the fault of the builder or the windows." Well, not quite... Water on windows is condensation,

and it can be a problem. However, it's not a window problem, and the solution does not come from the windows.

It may strike you as odd, but the growing condensation problems of the nation are caused by progress and improvements in the construction of your building. Yes, if you have trouble with window condensation it's probably because you live in a "tight" modern building that you can heat and cool for a fraction of the cost it took to heat and cool the house your parents lived in.

This article explains the moisture problems of the "tight" building that lead to window condensation. It offers suggestions for curing condensation problems in existing buildings and provides suggestions for those who are planning on building a building. Your new building will be a "tight" building and there are more changes or upgrades that you can add to the building during construction that will help to prevent excessive moisture. This can be a bit more difficult in an existing building where the problem already exists.

**What Causes "Excessive" Condensation?**

Condensation is the result of high humidity that produces a "fog" once it hits a colder surface. The humidity is caused by excess water vapor in the building. This is commonly seen in a foggy mirror after a hot shower. Condensation usually occurs first on windows because glass surfaces have the lowest temperature of any of the interior surfaces in the building.

A little condensation on the lower corners of your windows now and then probably doesn't bother you and shouldn't. By the time you've thought about it a second time it has usually gone.

What we're talking about is excessive condensation, condensation that runs down the windows and pools on the sills, condensation that runs off windows and stains woodwork... or in serious cases even damages the walls and possibly the floors.

If you have this kind of condensation on your windows, you have a good reason to worry and a good reason to act.

It's natural and easy in such cases to blame the builder or the windows. But it's wrong to blame them.

The real villain is invisible. Its water vapor...too much water vapor. The best and usually the ONLY way to prevent this trouble is to get rid of excess water vapor.

If you have too much water vapor (humidity) in your building there isn't anything you can do to the windows to stop condensation.

**What is Humidity?**

Humidity, water vapor, moisture, steam, they're all the same. They're all a form of water. Humidity is an invisible gas. It's present in varying quantities in nearly all air. This moisture in wet air tries to flow toward drier air and mix with it to reach equilibrium.

Scientists describe the movement of water vapor as "vapor pressure'. It's often a very powerful force indeed. It can act independently of the flow of the air, which holds the moisture. Vapor pressure can force moisture easily through wood, drywall, cement and brick. Right through most of the materials we use to build our buildings. That's exactly what happens when moisture seeks to escape from the humid air. The moisture is moving from an area of greater concentration to an area of lesser concentration.

Here in Florida, the hot humid south, the area of greater concentration is generally the exterior of the building. However during the winter the opposite is true. During the winter the exterior is dryer than the interior of your building. In addition you aren't running the air conditioner which during the summer removes some of the indoor water vapor from the air.

So we have the same daily activities in the winter as the summer. We're creating the same amount of water vapor but we're not removing any of water vapor. So in the winter the humidity in our buildings rises and the outdoor temperature and humidity lowers. And the result is condensation on your windows. The amount of condensation will be directly related to the amount of available water vapor or amount of indoor relative humidity.

Daily occupant activity such as cooking, washing, bathing, showers, as well as the use of household appliances such as dishwashers and clothes dryers and washing machines, all introduce water vapor into buildings. Typical amounts of water vapor include:

- One person's breathing produces 1/4 cup of water per hour.
- Cooking for a family of four produces approximately 5 pints of water in 24 hours.
- Showering puts 1/2 pint of water into the air.
- Bathing puts 1/8 pint of water into the air.

Adding only four to six pints of water to the air raises the relative humidity in a 1,000 square foot building from 15 to 60 percent, assuming the temperature is constant.

So you see that the modern family of four can easily release 150 pounds or more than 18 GALLONS of water per week into the air in their building!

Old drafty windows allow moisture to escape through inefficient seals and cracks. Today's technology produces more energy efficient, "tighter" buildings. This is great for keeping your building more comfortable, quieter, and cleaner, BUT by sealing your building you are also keeping moisture in. In today's buildings it is very easy to build up extremely high levels of humidity.

Since the 1970's energy crisis we've been working very hard to create an energy efficient building. Part of that energy efficiency is to prevent air infiltration by sealing buildings which has created the modern "tight" building. Moisture created by bathrooms, kitchens, laundry rooms and daily occupant activity no longer flows easily to the outside.

Modern insulation and construction that keep the hot and cold air outside also keep moisture in; so, it is very easy to build up excessive and even harmful moisture levels in our buildings. The condensation is a big red flag that you have way too much humidity trapped in your building.

**How to Reduce Humidity**

Be the Master of your Domain and take control of your indoor environment: For instance, venting all bath vents, clothes dryers, kitchen exhaust hoods to the exterior of your building. And of course you have to use your kitchen or bathroom exhaust fans. We strongly encourage you to consider purchasing or upgrading to bathroom exhaust fans that are humidity controlled. That's right started and stopped automatically based on the amount of humidity in the bathroom.

Now, before we summarize specific steps for reducing humidity in your building, let's include some basic data about recommended indoor relative humidity. You can refer to it if you are inclined to test the moisture levels in your own building.

Here are a few easy steps you can take to reduce condensation on your windows.

1. Install a humidistat
2. Do not install wallpaper on exterior or bathroom walls
3. Do not place furniture in front of windows.
4. Do not keep window coverings such as curtains and blinds fully closed
5. Ensure that your bathroom exhaust fan is ducted to the exterior of your building
6. Run your bathroom exhaust fan
7. Run your bath exhaust fan some more
8. If possible duct your kitchen exhaust fan to the exterior
9. Run your kitchen exhaust fan while cooking

10. Ensure that your dryer vent is clean

You see, the basic principle of reducing window condensation is extremely simple. When there is too much condensation on your windows, it means that humidity is too high in your building. You should take necessary steps to reduce humidity until condensation disappears.

While we have been discussing the control of condensation we've mentioned just about everything except windows. There's a good reason.

There just is nothing much that can be done with windows to cut down condensation. As the building experts have often pointed out, the windows are not to blame for condensation. In the moisture content of the inside air, lies both the cause and the cure.

**Air Filtration:**

To improve air quality in Florida, the biggest benefits come from investments in curbing air and moisture infiltration, reducing internal moisture production and controlling indoor sources of air pollutants. If you control sources, there is far less need (and cost) to remove moisture and indoor pollutants (particulates) mechanically at the A/C system. This can be accomplished with a humidistat and a mechanical dehumidifier that control both temperature and humidity. Along with the humidistat to control temperature and humidity a *media filter* is recommended. When determining which filter to purchase it is important to understand how filters are rated. Most filters will have a MERV rating a Minimum Efficiency Reporting Value.

MERV 8 pleated filters are an ideal upgrade from standard disposable panel filters. Pleated filters use a finer mesh, which catches smaller particles. Because the finer mesh also creates more resistance to air flow, the surface is "extended" to offer more surface area for air to pass through which does not restrict the air flow. Pleated filters are one to six inches thick. One or two inch filters will fit in the filter rack of most air handlers. MERV rated filters greater than MERV 8 are more effective, but may require modification to allow for a thicker filter with increased surface area or duct modifications to prevent damage to the air handler due to restricted air flow and increased condensation.

Wherever higher efficiency air filtration is desired to remove pollens and allergens restriction to air flow while providing high efficiency must be taken into consideration. *Check with your AC service provider and equipment manufacturer before using a filter with a MERV rating above MERV 8.*

MERV ratings are used to rate the ability of an air conditioning filter to remove dust from the air as it passes through the filter. MERV is a standard used to measure the overall efficiency of a filter. Higher MERV ratings mean fewer dust particles and other airborne contaminants pass through the filter. MERV ratings are determined by adding particles of varying sizes (1-12) into a controlled testing environment. The particles are added upstream of the test filter and a laser particle counter samples the air before it enters the filter and after it leaves the filter. The two particle counts are compared to calculate the Particle Size Efficiency of the tested filter. Once this is determined, a MERV Parameters chart is used to determine the MERV rating. MERV ratings range from 1 - 16 and measurements are in microns. Some of the common particles related to MERV ratings are pet dander, insecticide dust, smog, dust, viruses, wood, tobacco smoke, spores, bacteria and pollen.

Some of the most common filters found in residential use only have a MERV rating of 1 to 4. These are typically disposable panel type filters and do not do a good job of filtering the air because they will not stop particles smaller than 10 microns. MERV 5 to 8 rated filters are a better choice and are more commonly found in commercial applications. These filters will collect particles as small as 3 microns and are a good choice for building owners also. MERV 8 is more efficient when compared to standard pleated filters and has a high dust holding capacity that does not sacrifice air flow.

Filters with a MERV rating of 9 to 12 will stop particles in the 1 to 3 micron range. These filters are a great choice for building owners who want the best dust control possible. When using filters with MERV 9 ratings and above it is important to clean or replace them when recommended by the manufacturer because they will have a negative effect on air flow when they become dirty. This can lead to performance problems and decreased operating efficiency.

For this reason it is important to check with your AC service provider and equipment manufacturer before using a filter with a MERV rating above MERV 8. The most efficient filters have MER ratings of 13 to 16 and will stop particles as small as .3 microns. These filters are used in hospitals and other super clean environments.

## Report summary

The inspection of the firehouse found there to be no indoor environmental concerns of active microbial growth. However, the inspection of the firehouse HVAC system identified constant supply of outside air. This outside air supplied is not pre-filtered, not dehumidified, and un-dampered; therefore, allowing a substantial amount of outdoor respirable particulates and relative humidity to be introduced into the occupied space of the firehouse.

By reducing the relative humidity in the firehouse, the temperature of the firehouse can be raised while maintaining the thermal comfort for the occupants. This can be accomplished by pre-filtering and dampering the outside air supplied to the air handler supplying the occupied space. It is also recommended to install a humidistat to help control humidity levels.

By pre-filtering the outside air intake and increasing the MERV rating of the air handler filtration, the accumulation of indoor respirable particulate matter can be greatly reduced. In addition, by pre-filtering, dampering, and dehumidifying the outside air intake, the air handler will work more efficiently and less often to maintain the necessary thermal comfort of the firehouse occupants.

On the exterior, the roof is missing kickouts to divert water away from the building. It is also recommended to install a gutter system to divert water away from the building. The windows are missing caulking which leads to water intrusion as well as exterior penetrations which lead to water intrusion.

## Specific Recommendations

The building has areas that can be addressed which will have immediate impact on the indoor air quality.

These areas include;

1) Caulk areas around the windows that have none.
2) Seal exterior penetrations.
3) Install a mechanical dehumidifier for outside air intake.
4) Clean the air handler and increase filtrations to a MERV 8 filter.
5) Ensure all gaps to attic and interstitial cavities of the air handler closet are sealed.
6) Install a larger cfm bath exhaust fan that is activated by a humidistat
7) Install a gutter system to help divert water flow away from building.
8) Install roof kickouts to help divert water away from building.

## Report Limitations & Exclusions

All the professional opinions presented in this report are based solely on the scope of work conducted and sources referred to in our report. The data presented by the certified indoor environmental consultant in this report was collected and analyzed using generally accepted industry methods and practices at the time the report was generated.

This report represents the conditions, locations and material that were observed at the time the fieldwork was conducted. The scope of work for this project did not include an assessment of other environmental conditions which might exist on the property. This report was prepared for the sole use of our client. The use of this report by anyone other than our client or the certified inspector is strictly prohibited without the expressed written consent of the certified inspector. Portions of this report may not be used independently of the entire report.

Thank you for allowing us to provide you with this service.

**John P. Lapotaire, CIEC**
Certified Indoor Environmental Consultant
**Microshield Environmental Services, LLC**
Certification by American Council for Accredited Certification ACAC CIEC #0711048
Council-certified Environmental Thermography Consultant ACAC CETC #1005013
Accreditation by Council for Engineering and Scientific Specialty Boards (CESB)
Florida State License Mold Assessor MRS4

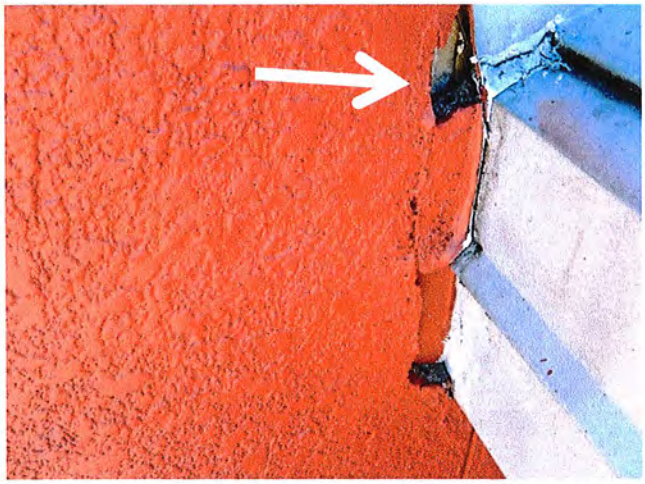
## References Documents:


1. HEALTH CANADA
   - *Residential Indoor Air Quality Guidelines*
2. HEALTH CANADA
   - *Exposure Guidelines for Residential Indoor Air Quality*
3. HEALTH CANADA
   - *Fungal Contamination in Public Buildings: Health Effects and Investigation Methods, Environmental*
4. THE INSTITUTE OF MEDICINE
   - *Damp Indoor Spaces and Health report*
5. WORLD HEALTH ORGANIZATION **WHO**
   - *Guidelines for Indoor Air Quality: Dampness and Mould*
6. ENVIRONMENTAL PROTECTION AGENCY **EPA**
   - *Tools for Schools*
7. ENVIRONMENTAL PROTECTION AGENCY **EPA**
   - *The Inside Story, A Guide to Indoor Air Quality*
8. ENVIRONMENTAL PROTECTION AGENCY **EPA**
   - *Mold Remediation in Schools and Commercial Buildings*
9. ENVIRONMENTAL PROTECTION AGENCY **EPA**
   - *402-K-01-001 Mold Remediation in Schools and Commercial Buildings*
10. S-520 ANSI APPROVED NATIONAL STANDARD **IICRC**
    - *S-520 2nd Edition Standard and Reference Guide for Professional Mold Remediation*
11. S-500 ANSI APPROVED NATIONAL STANDARD **IICRC**
    - *Standard and Reference Guide for Professional Water Damage Restoration*
12. AMERICAN INDUSTRIAL HYGIENE ASSOCIATION **AIHA**
    - *Recognition, Evaluation, and Control of Indoor Mold*
13. AMERICAN INDUSTRIAL HYGIENE ASSOCIATION **AIHA**
    - *Assessment, Remediation, and Post-Remediation Verification of Mold in Buildings*
14. AMERICAN INDUSTRIAL HYGIENE ASSOCIATION **AIHA**
    - *Field Guide for the Determination of Biological Contaminants in Environmental Samples*
15. NATIONAL AIR DUCTCLEANERS ASSOCIATION **NADCA**
    - *Position Paper on Chemical Product Applications in HVAC Systems*
16. NATIONAL AIR DUCTCLEANERS ASSOCIATION **NADCA**
    - *HVAC Assessment, Cleaning & Restoration (ACR) Standard 2006*
17. AIR CONDITIONING CONTRACTORS OF AMERICA **ACCA**
    - *Restoring the Cleanliness of HVAC Systems, Residential & Commercial HVAC*
18. OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION **OSHA**
    - *Preventing Mold-Related Problems in the Indoor Workplace*
19. NYC DEPARTMENT OF HEALTH AND MENTAL HYGIENE **NYCDH**
    - *Guidelines on Assessment and Remediation of Fungi in Indoor Environments*
20. NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH **NIOSH**
    - *Indoor Air Quality Investigations*
21. NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH **NIOSH**
    - *Building Air Quality, A Guide for Building Owners and Facility Managers*
22. AMERICAN SOCIETY FOR TESTING AND MATERIALS INTERNATIONAL **ASTM**
    - *D7338-10 Standard Guide for Assessment of Fungal Growth in Buildings*
23. AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS **ACGIH**
    - *Bioaerosols: Assessment and Control*
24. AMERICAN SOCIETY OF HEATING REFRIGERATING & AIR-CONDITIONING ENGINEERS **ASHRAE**
    - *55-2004 Thermal Environmental Conditions for Human Occupancy*
25. AMERICAN SOCIETY OF HEATING REFRIGERATING & AIR-CONDITIONING ENGINEERS **ASHRAE**
    - *62-2001 Ventilation for Acceptable Indoor Air Quality*

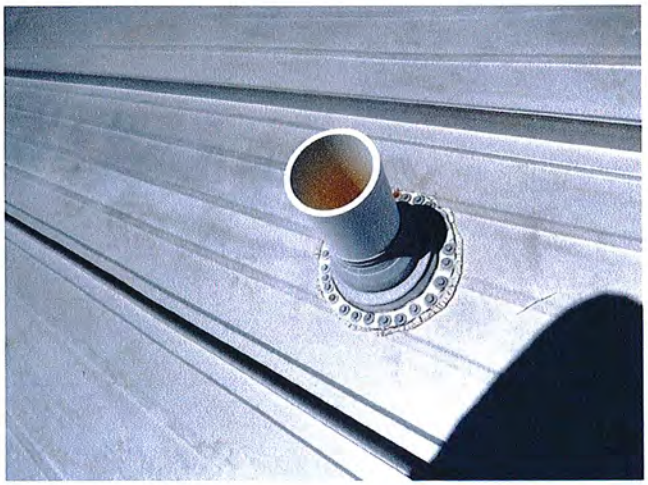
## Inspection Pictures

## Exterior

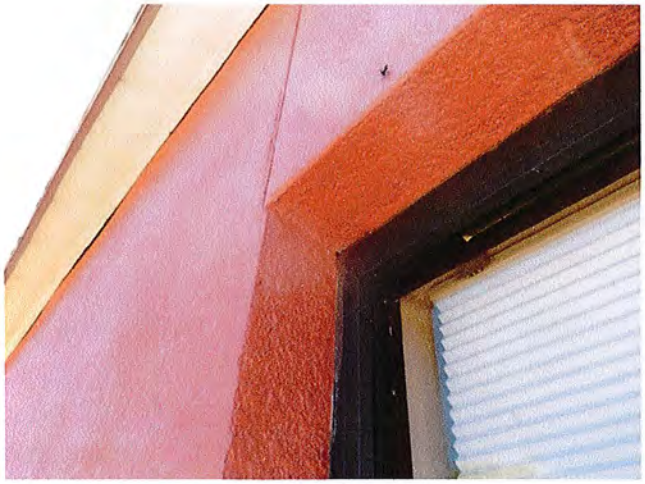
Seal Exterior Penetrations



Seal Windows

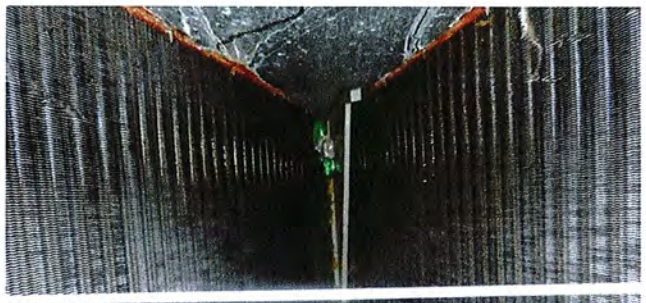


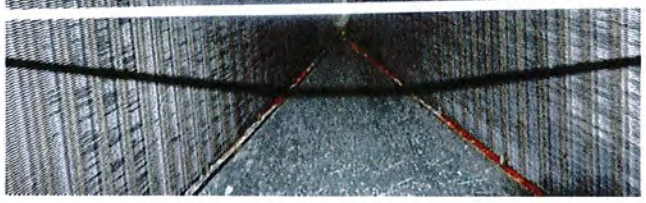
Missing Kickout



## Interior

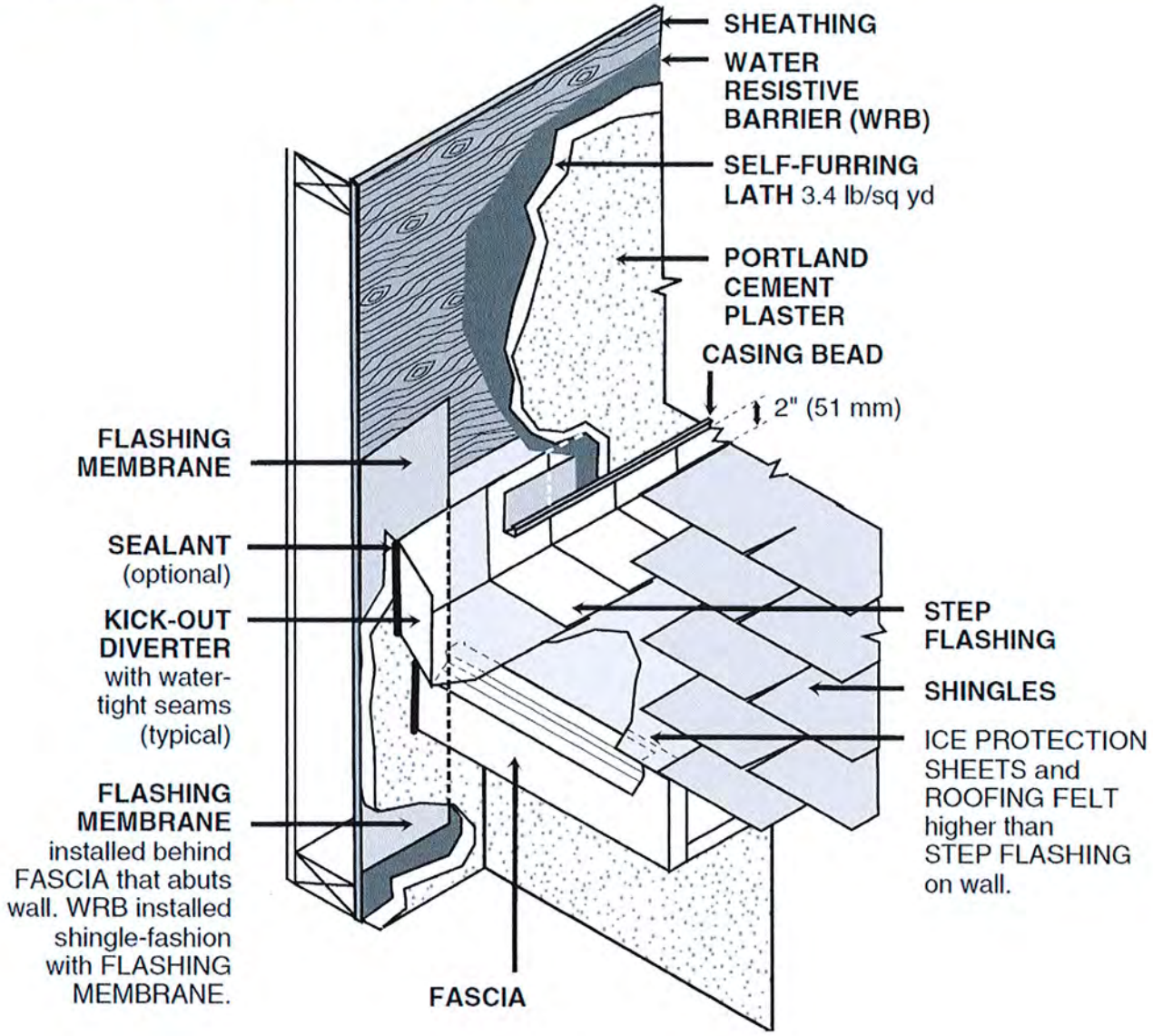
## HVAC





## Attic

## Roof Flashing Repair; Kick-Out Install Recommendation



## AC System recommendations for improved Indoor Air Quality (IAQ).

### Humidistat

Prestige IAQ Programmable Thermostat

Manages temperature, humidification, dehumidification and ventilation - all from a single control.

Large, easy-to-read full color display shows current indoor temperature and humidity, temperature setting, date and time on the home screen. Also displays outdoor temperature and humidity on home screen if wireless outdoor sensor is installed. Controls multistage equipment, humidification, dehumidification and ventilation

### Outside Air Intake

Honeywell Fresh Air Intake System - Y8150A1009

The Y8150 Fresh Air Ventilation System provides fresh air to a building. The control operates a fresh air intake damper and, when necessary, activates the main HVAC blower to efficiently meet ASHRAE ventilation rates.

**FEATURES:**

• Designed to help meet local ventilation codes and standards, including ASHRAE standard, Ventilation and Acceptable Indoor Air Quality

• Microcontroller optimizes the air delivery schedule to make efficient use of normal HVAC run times.

### Mechanical Dehumidifier

**TrueDRY DR120**

Increased comfort and energy efficiency, and with Honeywell TrueDRY™ DR120, you can offer both. TrueDRY DR120 efficiently removes excessive moisture from the air each day. In addition to dehumidification, TrueDRY DR120 also features an integrated ventilation control that introduces fresh, filtered air into the building as stale air and excessive moisture is removed.

All-in-one dehumidification, ventilation, and filtration.

### Honeywell Filtration

### Option 1 F200 Whole-House Media Air Cleaner

Maintains excellent airflow. Captures up to four times more airborne particles passing through the filter than the F100 Media Air Cleaner Pressure sensor in door indicates pressure drop and transmits to wireless receiver Includes Wireless AirWatch™ Filter Replacement Indicator 5-Year warranty

**AGENDA SUMMARY**
**TAVARES CITY COUNCIL**
**DATE OF MEETING: June 19, 2013**

**AGENDA TAB NO. 13**
**SUBJECT TITLE: Annual Council Collective Goals**

**OBJECTIVE:** To discuss the annual Council's collective goals for the City Administrator to work on.

**SUMMARY:**

Each Council member has developed goals for the City Administrator to work on over the next year. An opportunity is provided for the Council to review their collective goals and then set them for the Administrator to work on as a Council approved collective set of goals.

The goals submitted by Council members for next year are as follows:

1) Work on 2013 goals that are not completed (see attached listing)
2) Plan out SR 19 and 561
3) Maintain the historical integrity of the city
4) Pursue the establishment of more retail businesses in the downtown
5) Pursue a downtown community theater
6) Re-institute the façade program in the CRA
7) Plan out Old 441 corridor eastward towards Mt. Dora
8) Approach the School Board to have them contribute their fair share towards fire protection costs
9) Apply for TDC funding for the pavilion seaplane boat dock
10) Implement the hardscape portion of branding (signs)

**OPTIONS:**

1. Discuss and then set the collective goals for the City Administrator to work on over the next year.
2. Do not set the goals for next year.

**STAFF RECOMMENDATION:**

That Council discuss and then establish the collective goals for the City Administrator to work on over the next year.

**FISCAL IMPACT** Where each goal will have a fiscal impact that is addressed during the normal budget workshop process, the establishment of a list of goals does not have a fiscal impact.

**LEGAL SUFFICIENCY**: Legal sufficiency

# Status Of 2012-2013 Council Goals
# For
# City Administrator to work on

1. **Secure additional funding for Public safety Complex**: The Design Team was selected and notice to proceed issued. Once the design team completes the preliminary design a cost estimate will be created after which funding options will be provided to Council including the submittal of grant applications.
2. **Complete Wooton Park improvements:** Phase I is complete (Terminal building, fueling, docks, special events, seaplane ramp etc....). The Pavilion On The Lake is under construction and should be completed by March/April 2014. Land for the expansion area has been secured and design and permitting under way after which construction of the expanded are will take place (boat ramp, restrooms, open space, enhanced shoreline, Tav-Lee trail expansion etc...).
3. **Work with County to have them contribute their fair share of fire protection for County buildings:** A presentation to the Commission was made. Commission indicated a willingness to entertain partial funding to be ramped up over time. City Attorney is working with County Attorney to develop an agreement of 50% funding for year one, 75% for year 2and 100% for year three. Once developed and approved by Council, it will be presented to County Commission for consideration.
4. **Establish a Golden Triangle Fire District**. All three City Councils have effectively voted to move forward. Several meetings with the County were held to see if they were interested in participating in the creation of a fire district by letting the District serve and respond to the county enclaves in-between the three cities for a fee of 50% of what they collect from those enclaves (Villages model). County is not interested at this time, so City Managers are meeting with City Attorneys to develop the necessary draft agreements to create the district without the County enclaves. Once the agreements are created they will be presented to the three City Councils for approval.
5. **Secure TDC funding for Tavares Pavilion on the Lake:** Application went for consideration by TDC but was not recommended by a 4 to 5 vote. Application goes to County Commission in June for final consideration.
6. **Pursue acquisition of Automobile repair business next to proposed Public Safety Complex**: In the works. City Fire Chief has met with the owner and City attorney has transmitted communication to the owner but at this time owner is not interested in selling the property. Options are being developed for council's consideration.
7. **Complete the Railroad Train Station:** This project is 95% complete with both tenants moved in. Water tower, landscaping and signage are under development.
8. **Plan out the Lane Park side of Tavares (SR 19,561,448)** – Tavares Planning Department evaluating an Interlocal Service Boundary Agreement with the County for the city to consider. Recently city secured the Big House Sports complex in this

area, are pursuing a Publix Location in the area and are working with the State to repave State Road 19 all the way to 441.

9. **Ruby Street Upgrade:** More recently we had RR install black fencing and upgrade every crossing including the creation of a new pedestrian crossing. A sidewalk has been designed from O'keefe to ALS and is under construction with improved lighting. The Storm water improvement project calls for re-doing the pavement of Ruby Street. Once funding is secured, plans and options for re-paving/bricking the road will be presented Council for consideration.
10. **Library upgrade/expansion:** The tripping carpet hazard has been removed with flooring put in its place. No expansion has been budgeted at this time.
11. **Golf carts:** State has approved crossing at State Road 19. After one year of operations, they are willing to re-look at 441 crossing.
12. **Branding and signage**: Two_Kiosks have been installed in down town. The way finding signs for 441 have been designed and are in the final approval process with FDOT district 5. No money is available for further wayfinding signs at this time. Approval for two signs on Florida's Turnpike received with signage scheduled for installation this summer. City attorney is researching the process of getting a mock seaplane installed in the fountain pond along 441 for Councils consideration.
13. **Insure that infrastructure of downtown is adequate for growth**: Many projects related to infrastructure are in the works including: Reconstructing Alfred Street, CRA water and Sewer and CRA Storm Water projects. We are also upgrading the RR tracks from bolted to continuous weld tracks from Eustis through Tavares to Apopka. Apopka to Orlando is completed.
14. **Maintain the storm water drainage grants**: Done
15. **Move forward with Alfred Street project until it is complete:** Out to Bid.
16. **Work closely with the County and State governmental entities so that the needs of Tavares are met**. We completed Golf Cart Crossing approval on SR 19, round about is completed, SR 19 being overlaid, request to County on paying their fair share of Fire protection.
17. **Bring more business into the city** Many new businesses have come into the city including Hotel, medical, retail and restaurant. We expect mixed use development in down town to be the next wave of investors: Below is a listing of some (not all) of the new businesses that have arrived in Tavares over the past five years:

**New Restaurants in Downtown:**

1. AL'S
2. AL'S Sand Bar
3. AL'S Top Shelf
4. Casa Mia
5. Corner Bakery
6. Energy Drinks Store – Across from City Hall
7. Health Food Store – smoothies and sandwiches
8. Ice Cream Place
9. Lake Dora Sushi
10. Mexican Restaurant on Alfred Street

11. Pastore's Pizza
12. Pressed for Time
13. Ruby Street Grill
14. Tasso's

**New Businesses in Downtown:**

1. Ameriprise Financial Planning
2. Ballroom Dance Studio
3. Bonnie Whicher Photography
4. Dress Shop - Pat's Fabulous Finds
5. EZ Weight Loss 101 (Alfred Street)
6. FOCUS Magazine
7. Gause and Hargrove – law office
8. Hoity Toity Antique Shop
9. Judy Stewart – law office
10. Lady Bug Gift Shop
11. Lake View Inn – East
12. Lake View Inn – West
13. New Railroad hobby store where TE&G offices were located
14. Outdoor Kitchen place
15. Property Management Company
16. Raymond James Financial
17. Rick Gonzalez – Realtor
18. Southeastern Underground
19. Tattoo Parlor
20. Tavares Area Chamber of Commerce
21. Cannon Ball Train
22. Two separate law offices in Belton Building
23. Women Spa – Alfred Street
24. R Car – Alfred Street

**New Businesses off 19 and new 441**:

Kohl's
Fire House Subs
Dollar General
Dollar Tree
Hurricanes Restaurant
Hibbits Sports
Big House
Osprey Lodge
Jungle Zone
Winn-Dixie's new liquor store
Walgreens
Buzzard's Beach Bar and Grill

Two surgical outpatient facilities
Several doctor offices
Massey Service
Quality Design & Printing
R&J Gas and Air
Central Florida Auto Wholesale

**AGENDA SUMMARY**
**TAVARES CITY COUNCIL**
**June 19, 2013**

**AGENDA TAB NO. 14**

**SUBJECT TITLE: City Administrator Report**

**OBJECTIVE:**

To inform Council on city related matters.

**SUMMARY: Will be presented at meeting**

**UPCOMING MEETINGS: (check with Susie Novack for any last minute changes)**

- City Council Regular Meeting – July 3, 2013
- Code Enforcement – Special Magistrate Hearing – July 23, 2013 – 5:30 pm
- Lake County League of Cities – July 12, 2013 – 11:30 a.m.
- Lake Sumter MPO – July 24, 2013 – 4 p.m. – MPO Board Room – 1616 South 14th Street, Leesburg, FL –
- Library Board – July 12, 2013 – 8:30 a.m. Library Conference Room
- Planning & Zoning Board – July 18, 2013 – City Council Chambers

**OTHER EVENTS**

July 4 – 4th of July Celebration

September 14-15, Florida Bass Nation

September 27-29 – Rifles, Rails & History

October 5-6 – Fashion Designer's Showcase

October 19 – Z-Fest 2013

October 25-26 – Howl O Fest

October 26 – The Monster Splash

November 8-10 – Fall Thunder Regatta

December 7 – Christmas Parade & Celebration

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TAVARES

America's Seaplane City™

**AGENDA SUMMARY**
**TAVARES CITY COUNCIL**
**June 5, 2013**

**AGENDA TAB NO. 15**

**SUBJECT TITLE: City Councilmembers Report**

**OBJECTIVE:**

To inform Council on city related matters.

**SUMMARY:**

Council will be offered an opportunity to provide a report at the meeting.

**OPTIONS:**

N/A

**STAFF RECOMMENDATION:**

N/A

**FISCAL IMPACT:**

N/A

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