



KEM
Kynoch Environmental Management

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Innovative Environmental Solutions



Mid Atlantic **Construction Safety**
Conference

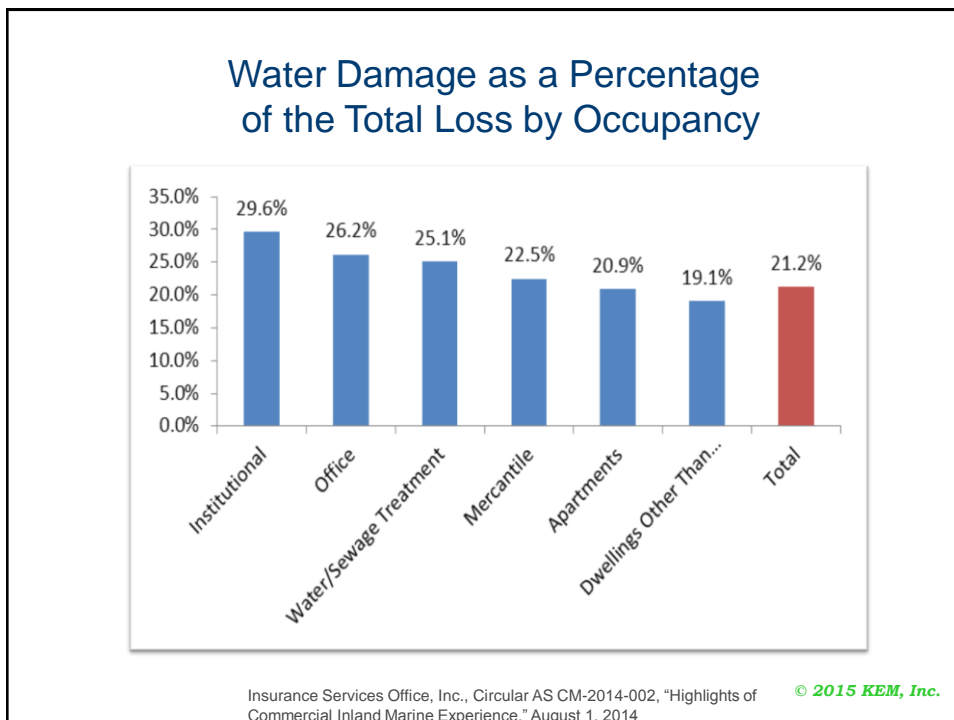
Water Intrusion Management and Mold Prevention

Presented by
J. Brent Kynoch
KEM, Inc.
May 5, 2015

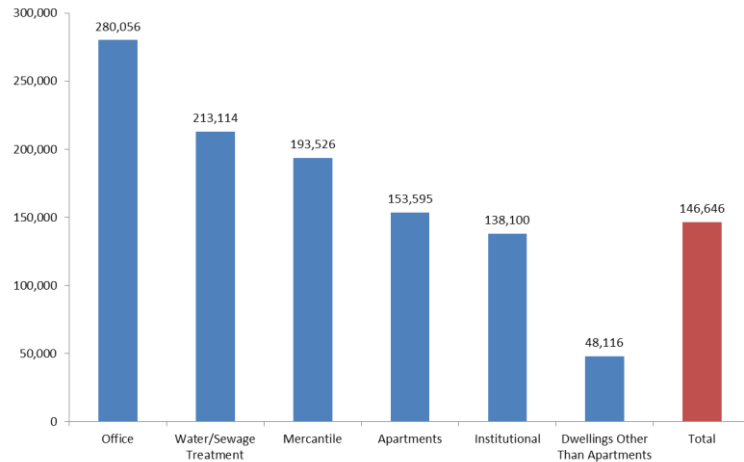




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Water Damage Loss Severity

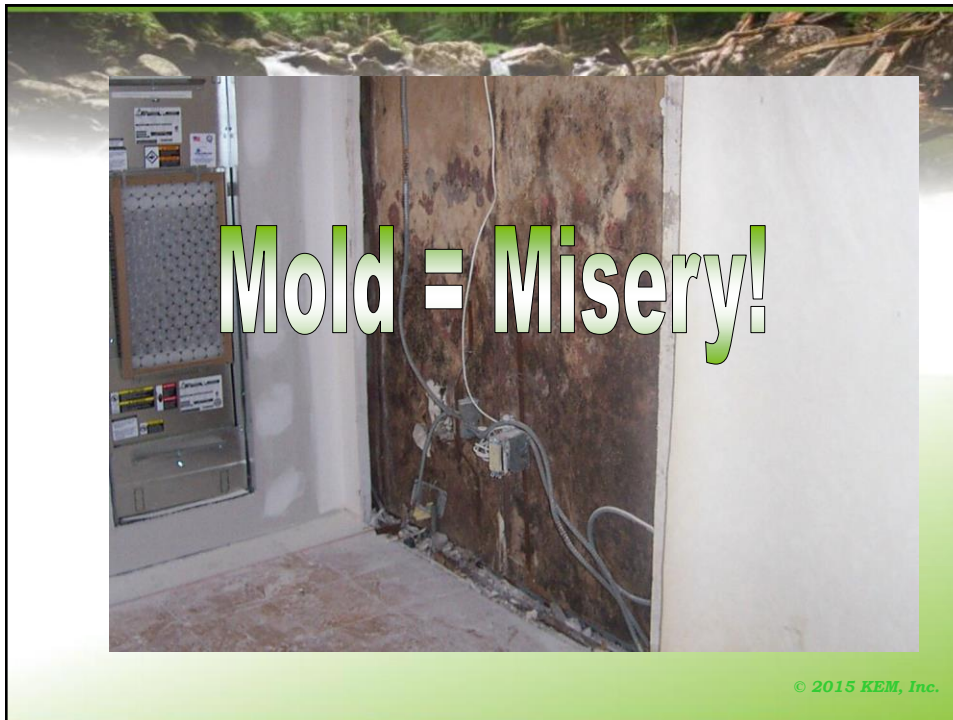


Insurance Services Office, Inc., Circular AS CM-2014-002, "Highlights of Commercial Inland Marine Experience," August 1, 2014

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Water = Mold
Mold = Water

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Seminar Overview

- What causes mold growth;
- Liability and costs associated with mold;
- Health concerns related to mold;
- How to prevent mold;
- What to do if there is mold growth;
- How to execute and manage your MMP Program.

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What Mold Needs to Grow

- Water
- Organic material – drywall, ceiling tile, carpet padding
- Temperature range between 40° and 100° F

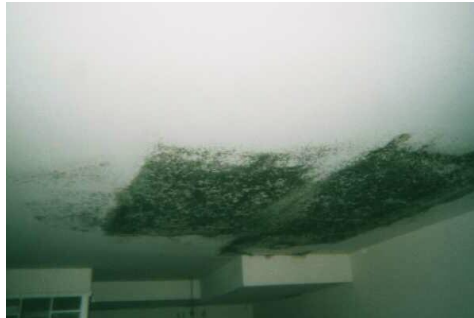


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Food Sources in Buildings

- Drywall
- Wood
- Paper
- Ceiling Tiles
- Carpeting
- Carpet padding
- Cork underlayment



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Some important realities about water and mold

- Mold spores are all around us
- We will always have organic materials in buildings (drywall, wood studs, etc.)
- Water (in the form of rain and weather) is a fact of life

SO One **MUST** keep water away from organic material in a building.

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Huge Legal Awards

- \$32.2 million jury verdict – Ballard v. Farmer's Insurance
- Single family home awards generally range from \$200,000 to \$400,000
- More than 9,000 claims are currently pending in U.S. Courts
- Mold has been called “the asbestos of the new millennium”

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Convinced Yet??

- Mold damage claims (insurance) in Texas have risen over 500% in two years.
- Guidelines for mold remediation
 - NYC Guidelines
 - EPA Guidelines
 - House Bill 5040 proposed in 2003
- **ALL** guidance requires removal of affected drywall – no bleach

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What is Mold?

- Fungi – all molds are fungi, not all fungi are molds
- Mold is everywhere !
- Break down organic material for recycling
- Play an important role in some circumstances - medicinal
- Commonly found in cheese, beer, etc.
- Most are harmless

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What is Mold?

“Molds are simple, microscopic organisms found virtually everywhere, indoors, & outdoors”

California Department of Health

“Molds can be found almost anywhere; they can grow on virtually any organic substance, as long as moisture and oxygen are present. ”

EPA

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What makes a “Toxic Mold”

- Produce mycotoxins
- Concentrate in fungal spores
- Can have very serious effects on humans
- Severe effects in immune compromised persons

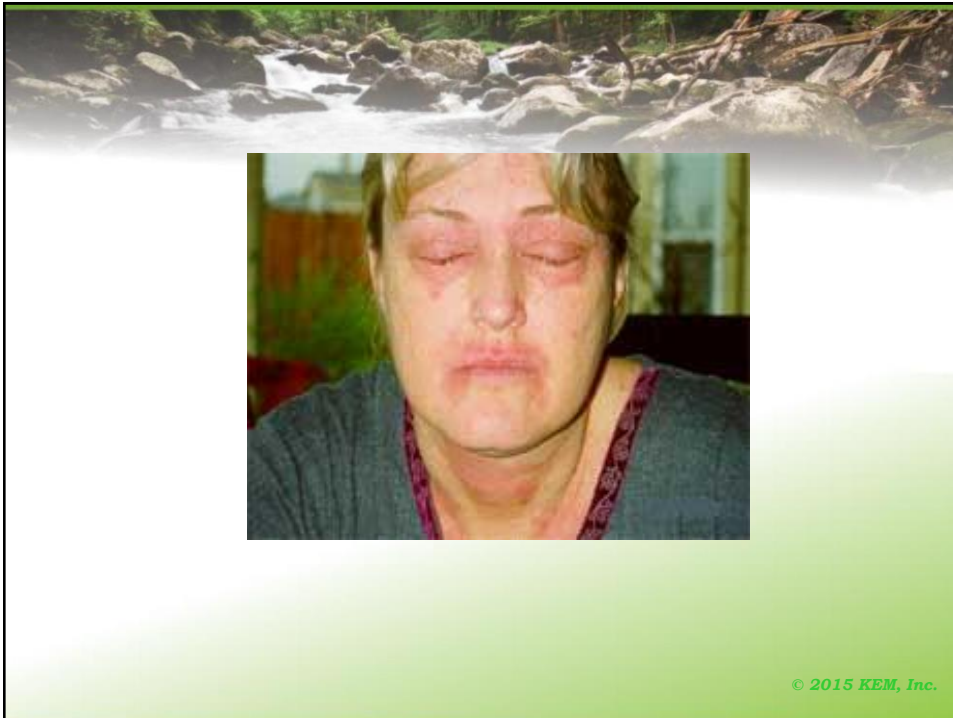
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When is Mold Toxic ?

- **Molds and fungus often release highly toxic gases often as a by product of the metabolic processes.**
- **Mold growing on wallpaper can release arsine gases if the wallpaper contains arsenic pigments for coloring.**
- **Mold which dries out does not stop being hazardous.**
- ***Indoor air quality becomes a greater risk when the mold dries out.***

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Toxic Varieties

- Stachybotrys
- Aspergillus
- Penicillium
- Fusarium





Common Myths about Mold

- Can be killed using bleach
- Dead spores – no longer a concern
- Paint will act as a mold encapsulant
- Mold growth is due to poor housekeeping


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How to Prevent Mold Growth

- Prevent water intrusion
- Clean up water intrusion
- Dry out materials that become wet
- Cut out wet material before it becomes moldy
- Treat water with respect
- Get religion about this

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How do you “get religion?” (i.e. What does this mean to you?)

Must create and implement a

“Control of Moisture and Mold
Prevention Plan”

COMMP

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Theory behind a COMMP Plan

- Designed for designated purpose
 - Construction
 - Occupied Building

PREVENT MOLD!!

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Purpose of the MMP

- Develop a program to create respect for the effects of water/moisture.
- Prevent/minimize water intrusion/incursion to organic materials
- Clean up water intrusion/incursion events
- Respond to water intrusion/incursion events before mold is a problem
- Proper handling of mold

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Main Aspects of the MMP

- Training
- Preventing water intrusion/incursion
- Routine inspections
- Clean up of water intrusion/incursion events
- Third party inspections
- Preventing mold growth
- Handling mold events properly



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Basics of the MMP

- **Keep the building and porous organic materials dry**
If we fail at that . . .
- **Clean up water intrusion promptly and effectively**
If we fail at that . . .
- **Cut out water damaged materials (within 72 hours)**
If we fail at that . . .
- **Mold remediation project**

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Aggressive!

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Controlling Water Intrusion \$10
Cleaning/Drying Water Intrusion \$100
Mold Remediation \$1,000
A mold-related lawsuit priceless

For every project, keep it dry or dry it out – FAST!!

MasterCard

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Preventing Water Intrusion

- Water = Mold
- Prevent moisture and water intrusion into the building - prevent mold growth
- Key areas to focus prevention:
 - Controlling moisture from entering building
 - Checking for and repairing plumbing leaks
 - Safeguarding uninstalled building materials
 - Proper construction sequencing

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Control Moisture from Entering

- Proper roof maintenance
- Site Drainage – Keep foundation / basement / underground dry
- During construction, provide for weather protection as quickly as possible
- Use ingenuity and creativity to create and maintain a dry environment

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Construction Concerns

- Proper sequencing of work – keep interior materials away from exterior conditions
- Inspect materials at delivery
 - Pre-existing mold
 - Proper moisture content per manufacturer
- Storage
 - Dry location
 - Off the ground
 - Keep moisture from absorbing through bottom of stored material

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Prevent Water Intrusion

Double check points where moisture may enter

- Doors
- Windows
- Flashings and caulking
- Waterproof membranes (proper lapping at joints and corners)
- Roofing systems and penetrations
- Balconies and decks

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The Phases of Construction

Exposed Phase of Construction

Partially Enclosed Phase

Controlled Phase

Excavation

Below Grade Structure

Above Grade Structure

Building Envelope

Core Rough In

Wall Rough In

Finishes

Vertical Transportation

Furnishings & Testing

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Exposed Phase

- Foundation pouring
- No overhead protection
- No protection from the elements
- Mold spore count = outdoors
- Cost of controlling water intrusion high




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Partially Enclosed

- Some protection from the elements
- Ambient moisture and moisture intrusion impossible to control
- Porous materials being installed
- Must implement program to check on porous materials



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Controlled Phase

- Building envelope completed and sealed
- First opportunity to building environment
- May be possible to start HVAC



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What does this mean to YOU?

- Promptly clean up water and dry out wet materials
- Make sure all personnel realize the consequences of moisture intrusion
- If there is a leak or intrusion, have definitive, independent testing performed to “clear” your company.
- Document everything

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What to do if you have mold growth?

- Put the *Clorox* away!!!
- Hire a professional to locate and remediate mold
- Cut out/replace all affected materials
- Use containments
- Negative pressure in some cases
- Obtain clearance samples

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Specifics of a COMMP Program

- Written program to dovetail with operations.
- Routine inspections by superintendent.
- Defined response procedures.
- Forms for documentation.
- Third party inspections.
- Specific procedures for handling mold.

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Superintendent Responsibilities

- Water/moisture inspections
- Check weather forecasts
- Identifying & responding to water intrusion
- Ensuring proper cleanup of water
- Contacting third party inspector for mold or significant water event
- Maintaining documentation

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Preventing Water Intrusion, cont.

- Weather Tight Buildings
 - No entry point for water to enter from outside the building
 - Don't install highly susceptible materials until 100% weather tight
 - Doors, windows, roof, exterior sheathing installed & sealed
 - If not, use temporary barriers
 - » Polyethylene sheeting & duct tape

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Superintendent Inspections, cont.

- Use of Moisture Meter during inspections and to test materials being delivered
 - Find “hidden moisture”
 - Non-destructive testing
 - Demonstration of Moisture meter



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Superintendent's
Water Intrusion Inspection Form

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Site: _____ Date: _____ Time: _____

REQUIREMENT	YES	NO	N/A	REMARKS
Plumbing risers free of leaks				
Building materials adjacent to plumbing risers free of water damage and fungal growth				
Exterior drainage areas free of pooling water				
HVAC system components free of condensation and moisture accumulation				
Basements and crawlspaces free of moisture accumulation				
Basements and crawlspaces free of groundwater seepage				
Attics free of moisture accumulation from humidity or roof leaks				
Windows and doors maintain weather tight sealing				
Windows, doors, and adjacent building materials are free of water damage				
Uninstalled building materials are properly stored (indoors or securely covered)				
Remainder of building structure free of moisture accumulation				
Other:				
<u>Additional Comments/Corrective Actions for Deficiencies</u>				
Inspector: _____				

Attachment A

Third party inspections

- Inspections for water intrusion and mold growth.
- Generally, third party inspections occur once each month.
- Check over Superintendent's inspection records and records of water intrusion events.

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Managing Water Intrusion, cont.

- Documentation
 - Form in Attachment B of MMP
 - Kept on site throughout construction
 - Available for review by KEM during inspections
 - Maintained in company files for 3 years after project completion

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Attachment A: Water Intrusion Log

Property Address: _____

Floor/ Area or Room Number	Source & Cause of Water Infiltration	Material Impacted and Location	Photo Date & Number	Moisture Reading	Date of Reading	Action Taken	Date of Follow-Up Inspection	Moisture Reading	Issue Resolved? (Yes/No & Date of Final Inspection)

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All attempts to prevent mold growth have failed

Remediation Guidance

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Remediation “Standards”

- New York City
 - Guidelines on Assessment and Remediation of Fungi in Indoor Environments
- EPA
 - Mold Remediation in Schools and Commercial Buildings

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Highlights

Both Standards

- Must remove and replace all affected porous materials
- Respiratory protection required
- Recommend solving water problem first
- No bleach
- No sampling if you see mold

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New York City Standard

- 3 divisions of remediation project sizes
 - <10 sq. ft.
 - 10 – 100 sq. ft.
 - >100 sq. ft.
- Provides a procedure for remediation of HVAC systems
- Mentions hazard communication


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EPA Guidance

- 3 divisions of remediation project sizes
 - <10 sq. ft.
 - 10 – 100 sq. ft.
 - >100 sq. ft.
- Good charts and guidance
- Sections on Containments, Equipment and Cleaning Methods

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Procedures

Procedure A <10 sq. ft.

- Respiratory protection
- Drop cloth
- HEPA vac
- Anti-microbial cleaner
- Restrict access
- Wrap all removed materials

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Procedures

Procedure B 10-100 sq. ft.

- All of "A" procedures
- Critical barriers to space

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Procedures

Procedure C >100 sq. ft.

- All of "A" and "B" procedures
- Negative pressure containment
- Decontamination chambers

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Clearance Criteria

1. Visual inspection to assure that all dust, debris and moisture have been removed.
2. Testing with moisture meter or through use of a IR Camera to assure that there is no elevated moisture content in remaining materials.

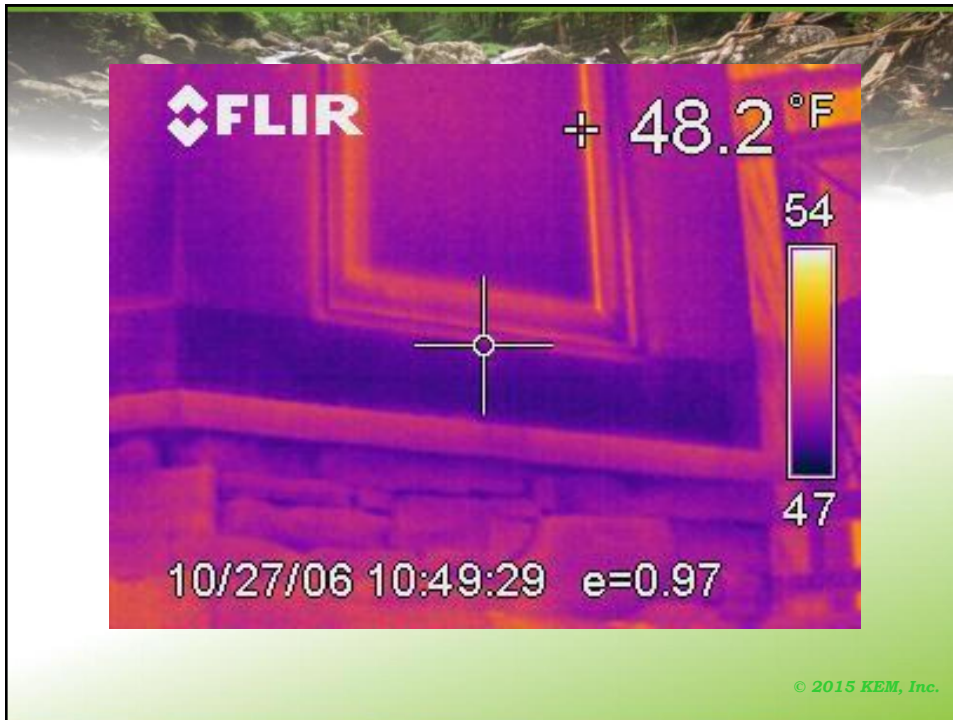
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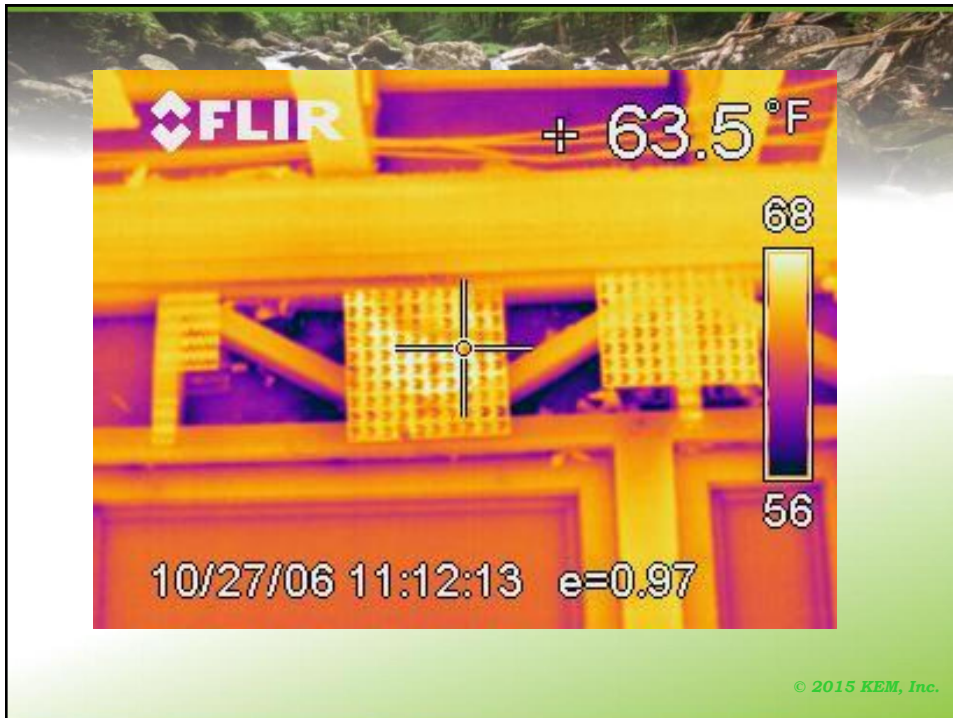


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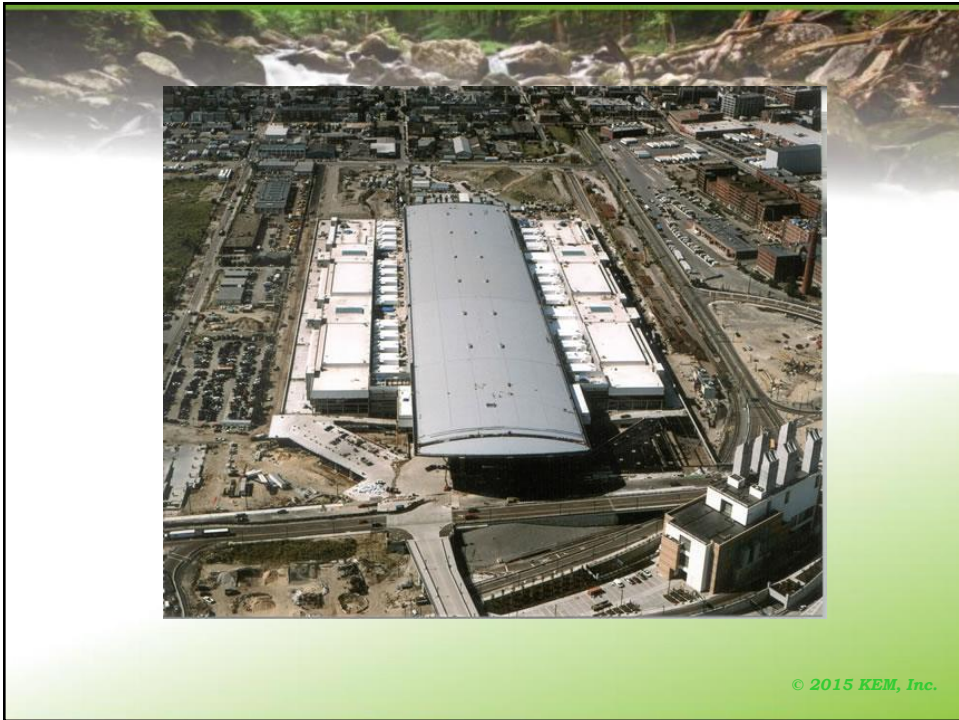












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This is real!
Don't blow it off!

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Thanks for attending!

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