Mold Operations and Maintenance (O&M) Programming

Prepared for
ROUNDTABLE 216
Successful Mold Remediation: Challenges and Barriers

10:30am-12:30pm PM
Tuesday June 5, 2007

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DISCLAIMER

• There is no one right way to operate a Mold O&M Program

• Information presented is brief introduction to Mold operations and maintenance and is not direction, case specific, medical, legal, basic mold or compliance advice

• Further research coupled with professional and regulatory consultation are necessary for the foundation of your own successful Mold O&M program

• Presentation is a call to the profession to perpetuate more efficient O&M programming and less of the resource intensive remediation and abatement remediation focus
Charlotte Mecklenburg Schools

• One of 25 largest school districts in USA
  • 129,011 Students; 16,325 Staff; 45,000 Volunteers
  • 18.8 Million square feet of floor space
  • 585+ buildings and 1100+ mobile/modular units
  • 161 Schools 94 ES, 32 MS, 25 HS, 10 Special
• 7 Learning Communities (Property Management Regions)
  • 700+ custodians, 230+ Maintenance staff
  • Annual Budget ~$1.05 Billion
  • Annual Growth of ~5450 students per year
USEPA IAQ Tools For Schools

• National Program Provides Schools Tools to Identify and Resolve IAQ Problems
• IAQ Teams Made Up of Teachers, Administrators, Custodians, Students and Parents
• Action Checklists to Identify Problems that may lead to Poor IAQ
• CMS EHS Office is IAQ TFS Coordinator and Mold Program HUB
• Projects beyond routine maintenance are escalated to EHS issues

USEPA awarded CMS with an Excellence Award for IAQ Management Planning
What is Mold O&M Programming

Mold operations and maintenance (O&M) is a proactive facilities management practice designed to maintain safe and healthy environments while controlling the escalating cost of mold and moisture events.

- Official channels of communication
- Service request procedures
- Staff training for defined response
- Routine and special facility inspections
- Planned systematic response actions
- Prevention & repair of root causations
- Preventive maintenance procedures
- Energy management integration
- Outsourcing of large scale response
- Record keeping

Before O&M Program

After O&M Treatment
Initial Communication & Reporting Procedure

BUILDING SERVICE SUPPORT REQUEST PROCEDURE

SCHOOL/CLASSROOM MAINTENANCE SUPPORT NEEDED

TEACHER, TEACHER ASSISTANT, NURSE, ASSISTANT PRINCIPAL, PRINCIPAL, SUPERINTENDENT .......... OR OTHERS NOTIFY NEED FOR SUPPORT EXISTS

FRONT OFFICE AND OR MAINTENANCE LIAISON REQUESTS SUPPORT

REGIONAL PROPERTY MANAGERS, EHS OFFICE AND OTHERS .... ROUTINELY ENTER SUPPORT REQUESTS RESULTING FROM REGULAR BUILDING INSPECTIONS

IMMEDIATELY REPORT NEED TO FRONT OFFICE OR MAINTENANCE LIAISON DESIGNATED BY PRINCIPAL

SCHOOL REPORTS SERVICE NEED TO BUILDING SERVICES VIA COMPUTER WEB LINK OR BUILDING SERVICES CUSTOMER SERVICE CALL CENTER

SUPPORT REQUEST IS DIRECTED TO APPROPRIATE SERVICE RESPONDER(S) FOR RESPONSE

CUSTODIAL SERVICES  ENVIRONMENTAL HEALTH & SAFETY  MAINTENANCE SHOPS

PROCEDURE: A MAINTENANCE OR CUSTODIAL NEED EXISTS AT THE SCHOOL. 1) A TEACHER OR OTHER PERSON REPORTS THE NEED TO THE SCHOOL FRONT OFFICE AND OR MAINTENANCE LIAISON DESIGNATED BY THE PRINCIPAL. 2) THE FRONT OFFICE OR MAINTENANCE LIAISON THEN REPORTS THE NEED VIA WEB LINK OR BY CALLING THE BUILDING SERVICES CUSTOMER SERVICE CALL CENTER. 3) THE REQUEST IS DIRECTED TO THE APPROPRIATE RESPONDER(S) FOR SERVICE.
Mold Event Characterization & Response

Mold Observed or Reported

Call Center Routes Call

CUSTODIAL  EHS  HVAC/SHOP

Evaluate Size of Growth

Level I – Less than 10 Square feet
- Awareness Trained School Staff to Clean Using Level 1 Procedure, Mark Location and Report
- Level 1 Local Staff
  - Clean, Mark, Report*
  - Shop Response

Level II – Greater than 10 but less than 30
- Level II Trained School Staff to Clean Using Level 2 Procedure, Mark Location and Report
- Level 2 Local Staff
  - Protect Surfaces
  - Clean, Mark, Report*
  - Shop Response

Level III – 30-100 Square Feet
- CMS Mold Operations Trained Personnel to Clean Using Level 3 Procedure, Mark Location and Report
- Level 3 Staff
  - Protect Surfaces
  - Clean, Mark, Report*
  - Critical Barriers
  - Shop Response

Greater than 100 Square Feet
- CMS Operations Trained Personnel to Clean Using Level 4 Procedure, Mark Location and Report
- Level 4 Staff/Contract
  - Protect Surfaces
  - Clean, Mark, Report*
  - Critical Barriers
  - Full Containment
  - Shop Response

*Clean following mold cleaning procedure. Then mark the exact location of the growth. Report to communicate specifics of issue and generate the appropriate follow-up response.
O&M Training Program

CMS provides mold/IAQ training for custodial, maintenance, and property mgmt staff. IAQ conferences and presentations add training for nurses, teachers, administrative staff and outside groups e.g. health department and peer districts.

Training Considerations
• Training in-house and/or outsourced?
• HAZCOM for fungicides, disinfectants, detergents and other chemicals used in the program
• Personal protective equipment and limitations
• Dust control and or containment procedures
• Health effects, medical clearance, sampling
• Workplace hygiene issues and methodologies
• Regulations, OSHA 5(a)(1) considerations

CMS Presents Regularly in NC and US
Routine Facility Inspections

CMS Regional Property Managers conduct monthly inspections of all facilities keying, in part, on moisture issues or events

- Occupant concerns
- Fresh air source location and condition
- Water marks on ceiling tiles
- Musty odors
- Damp carpets
- HVAC condensate issues
- Water accumulations & events

EHS Surveys Conducted When Needed
Preventive Maintenance

CMS maintenance, custodial services and engineering participate in the Mold O&M including: paint, grounds, carpentry, roofing, sheet metal, plumbing, special projects, and HVAC

Custodian first responders - 700 sets of eyes

HVAC system issues
  • Dew point issues
  • Ventilation issues
  • Exhaled breath as humidity source!

Building envelope issues
  • Windows, weather stripping, roofing
  • Irrigation and lawn maintenance

Site work issues
  • Grading
  • Weep Holes

Prompt Shop Response is Key
Prompt Drying of Moisture Events

Drying out moisture events promptly prevents mold issues from taking hold.

Failure to dry out wet building materials is an open invitation for colonization and loss which may have been prevented.

Sprinkler malfunction results in weekend flood...survey identified water logged drywall & insulation.

Moisture Meter

Removal of wet drywall and insulation assists in preventing future hidden colonization.

Mold Growth Issue Prevented Through Prompt Response
Hidden Mold is Problematic

Mold may be hiding where visible water damage is observed or where there is no indication of growth

Typical O&M Level Issues
Typical O&M Level Issues

Beanbags for special needs placed in bag wet and stored file cabinet

Clogged condensate drain or improperly insulated valve result in condensate to ceiling tile

Clogged gutters prevent proper water run off

Standing water on the roof may get inside

Routine Issues May Become Mold Issues
Mold on the building may get inside through the air handling system.

This air supply gets air from the intake to the left.

What is Outside Gets Inside
Typical O&M Level Issues

- Moisture Damaged Books
- Moisture Damaged Ceiling Tile
- Efflorescence
- Colonization on Wall
Outsourcing Remediation Issues

• At what level of colonization should outsourcing be implemented? (NY Guidelines, EPA, OSHA...)

• What credentials should be required for outside firm(s) to conduct remediation? Insurance type and amount, experience, certification, references?

• What are the clearance criteria and are they established prior to remediation? (Surface, Air, Visual)

• Will remediator conduct corrective action to remedy moisture source(s) or others?

• What disclaimers and releases from liability does remediator request in contract?

Contractors are in Business to Make Money
Outsourcing of Large Issues

Exterior control joint left open. Moisture enters building here.

Odor with no visible signs of moisture intrusion.

Growth identified.

Project outsourced.

Strong odor located behind Albert Einstein poster.

Large scale determined >100 sq ft.

Multiple layers of growth.

Interior metal stud wall terminated at open control joint.

Scale of Project Beyond Maintenance.
Outsourcing of Large Issues

Expansion Joint Sealed Where Visible

Multiple species with extensive colonization

Plume indicates moisture pathway

Photomicrograph
Hyphae 100X

Photomicrograph
Spores 400X

Concealed Construction Flaw Root Causation
Mold Sampling Issues

- CMS O&M responds to mold without requiring sampling...if it can be seen or smelled it, CMS responds and it must go!

- Some consulting firms found using substandard sample collection, survey and reporting methodology
  - Inside air samples, but no outside air samples
  - Reports do not indicate quantification, methodology or background information, incorrect assumptions
  - Specify response action without presence of mold
  - Some Doctors making remote diagnosis without data

- CMS conducts post action clearance sampling when large scale operations take place using MPAT proficient laboratories and third party collection techniques
IAQ Summer Energy Management Program Integration
Mold Issue Frequency June 1 to September 30
Number of Mold Issues Decreased 54% Under Previous Year although Awareness Level Has Increased (Positive Trend)

Data from CMS System MP2 Computer Tracking
Sample of Program Achievement
Additional Resources

Mold Remediation in Schools and Commercial Buildings
U.S. Environmental Protection Agency, Office of Air and Radiation, Indoor Environments Division (6609-J) EPA 402-K-01-001 March 2001
http://www.epa.gov/mold/mold_remediation.html

NY City Dept. of Health and Mental Hygiene Guidelines on Assessment and Remediation of Fungi in Indoor Environments (REV 2002)

A Brief Guide to Mold in the Workplace Safety and Health Information Bulletin
http://www.osha.gov/dts/shib/shib101003.html

Preventing Mold Related Problems in the Indoor Workplace: A Guide for Building Owners, Managers and Occupants (SHIB 03-10-10 OSHA -2006)
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