

HVAC System Inspection & Assessments



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Presenter



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Disclaimer

This presentation is not intended to be a comprehensive program covering all aspects of this topic. All technicians are encouraged to read and follow all applicable standards, codes and regulations related to this topic.

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What We'll Learn

- Purpose & Overview
- Tools of the Trade
- Commercial and Residential Inspections
- Examples From the Field



Purpose & Overview

Visual inspection of HVAC system components is the first step in the NADCA-recommended procedure for the assessment, cleaning, and restoration of HVAC systems, as outlined in ACR, the NADCA Standard.





Purpose & Overview

Why Are Inspections Needed?

HVAC inspections can objectively determine whether a system is contaminated with a significant accumulation of particulate or if HVAC performance is compromised due to contamination buildup.

-NADCA CVI Manual Forward



Main Reasons We Get Calls





Purpose & Overview

Why Are Inspections Needed?

HVAC system inspections are also recommended in the following:

- ANSI/ASHRAE/ACCA Standard 180-2012: Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 62.1 - 2013: Ventilation for Acceptable Indoor Air Quality
- Environmental Protection Agency (EPA) Building Air Quality: A Guide for Building Owners and Facility Managers



Ventilation Inspections

I finally got my first
opportunity to
inspect a system

Now what?



Digital Cameras

- ✓ Can be used during an inspection to provide photo documentation of findings



Tools for Reading Pressure Differential



Magnahelic



Manometer

Tools for Measuring Airflow



**Air flow
balancing meter**



Flow hood



Vane anemometer



**Air flow &
environmental meter**

Instrumentation & Basic Measurements

Tools for Measuring Relative Humidity



Hygrometer

Tools for Measuring Temperature & Relative Humidity



Thermo Hygrometer

Inspection Visualization Tools

Newer Technology



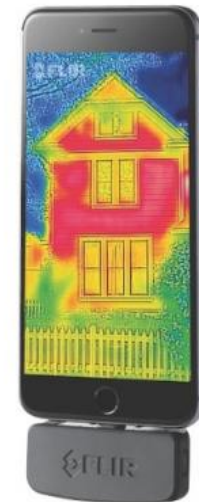
Fiber Optic Scopes



**GoPro Camera
w/Bluetooth technology**



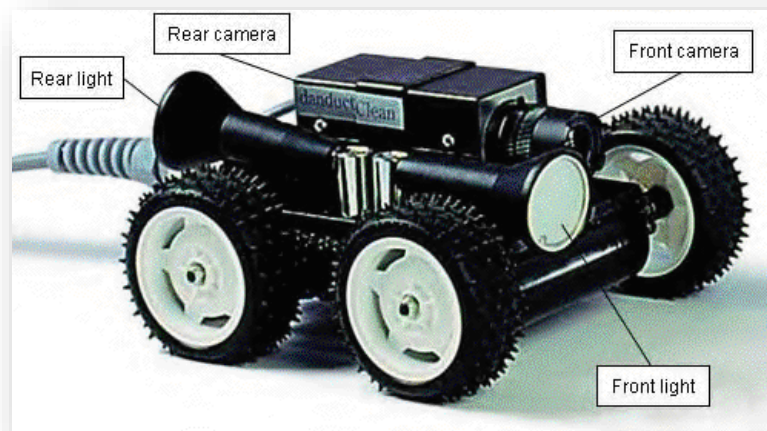
Video Borescopes



**Thermal & Infrared
Camera**

Robot/Camera Systems

**Note: These can stir up dust and
cause contamination**





Ventilation Inspections

Determining Where to Inspect In very few cases will the client request that the inspector examine every inch of ductwork and every HVAC system component.

It will be up to the inspector to determine which components are inspected and which portions of those components receive specific attention. In particular, inspectors should be aware of the potential for the following types of areas to collect significant dust and debris:

- Areas affected by gravity (bottom of a shaft, dips, and low points) or pressure drops (turns)
- Any protrusions into the air stream (sensors, smoke detectors, vanes, sound attenuators, dampers, etc.)
- Any location where there is a change from one type of ductwork material or design to another (metal to flex, metal to duct board, etc.)
- Any wet sections of the system, such as the condensate drain pan, the first several duct diameters of supply duct after the cooling coil, and humidification systems
- Any areas of the AHU where insulation is damaged
- Blower fans, filters, and the areas immediately surrounding them



Ventilation Inspections

Areas to consider during your HVAC Inspection

- Outdoor Air Intake and Dampers in AHU
- Mixing Plenum and Dampers in AHU
- Filters
- Heating Coil in AHU
- Cooling Coils and Condensate Pans in AHU
- Mechanical Room
- Steam Humidifier
- Spray Humidifier or Air Washer
- Air Ducts
- Air Plenums
- Diffusers, Grilles, and Registers
- Fan and Fan Chambers
- Exhaust Fans in Special Use Areas
- Terminal Boxes (VAV/CAV)
- Fan Coil/Unit Ventilator/Induction Units
- Heat Pump



Ventilation Inspections



Ventilation Inspections





Ventilation Inspections



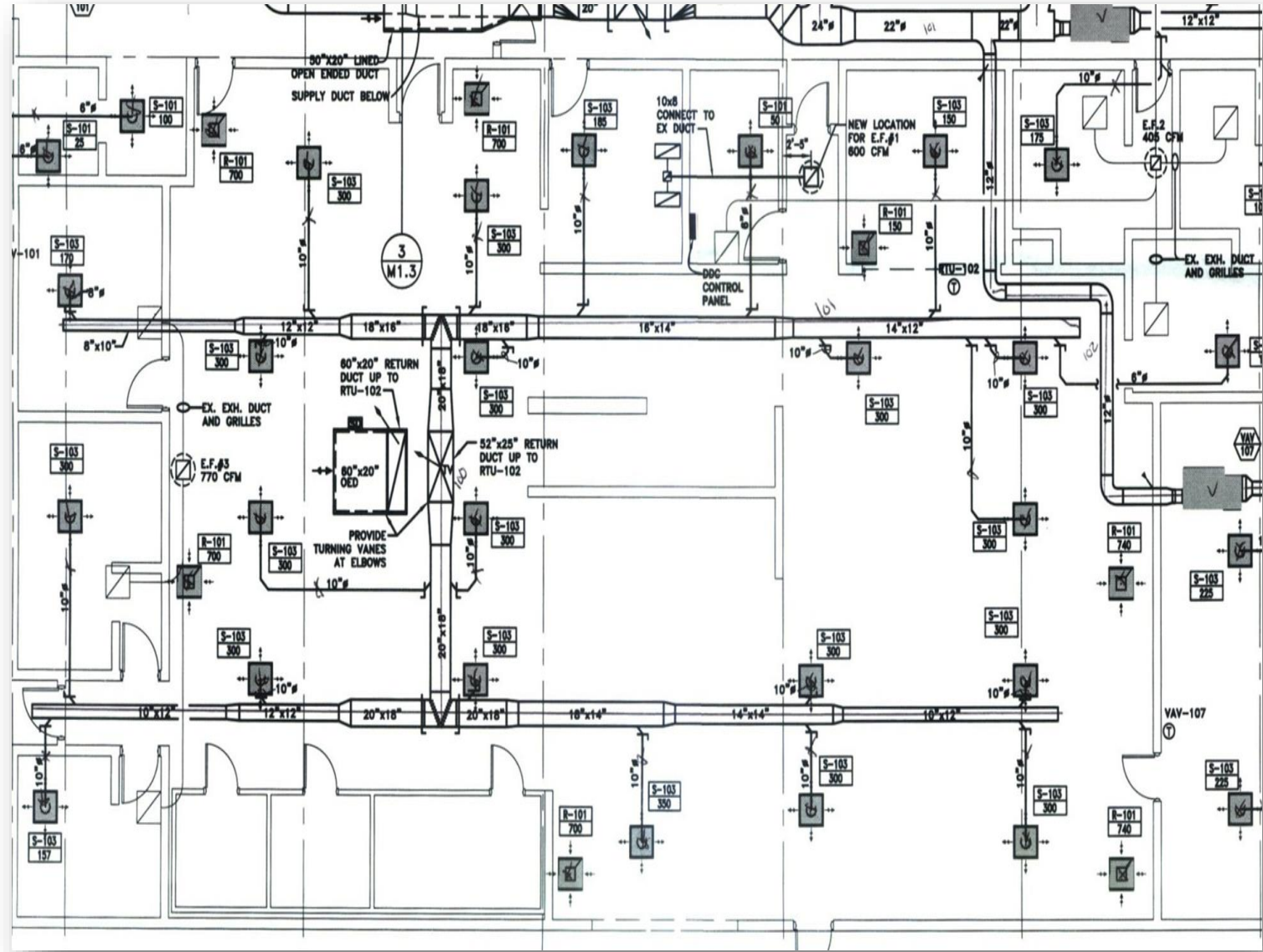
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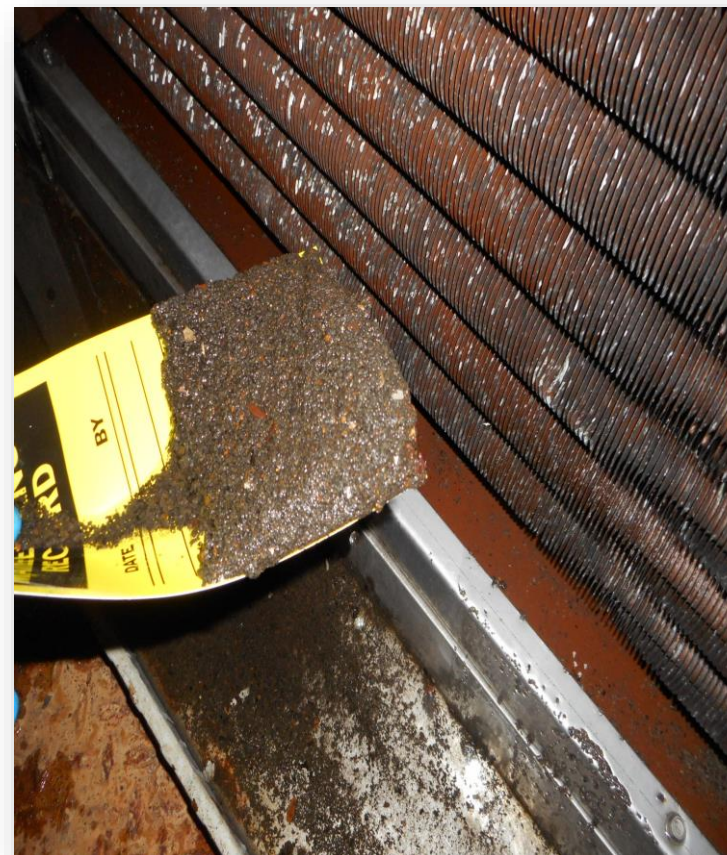
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Pressure Drop



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Airflow Meters

“Why we can’t get enough air out of our system!

Internal fiberglass liner can become a real problem, especially at transition points.



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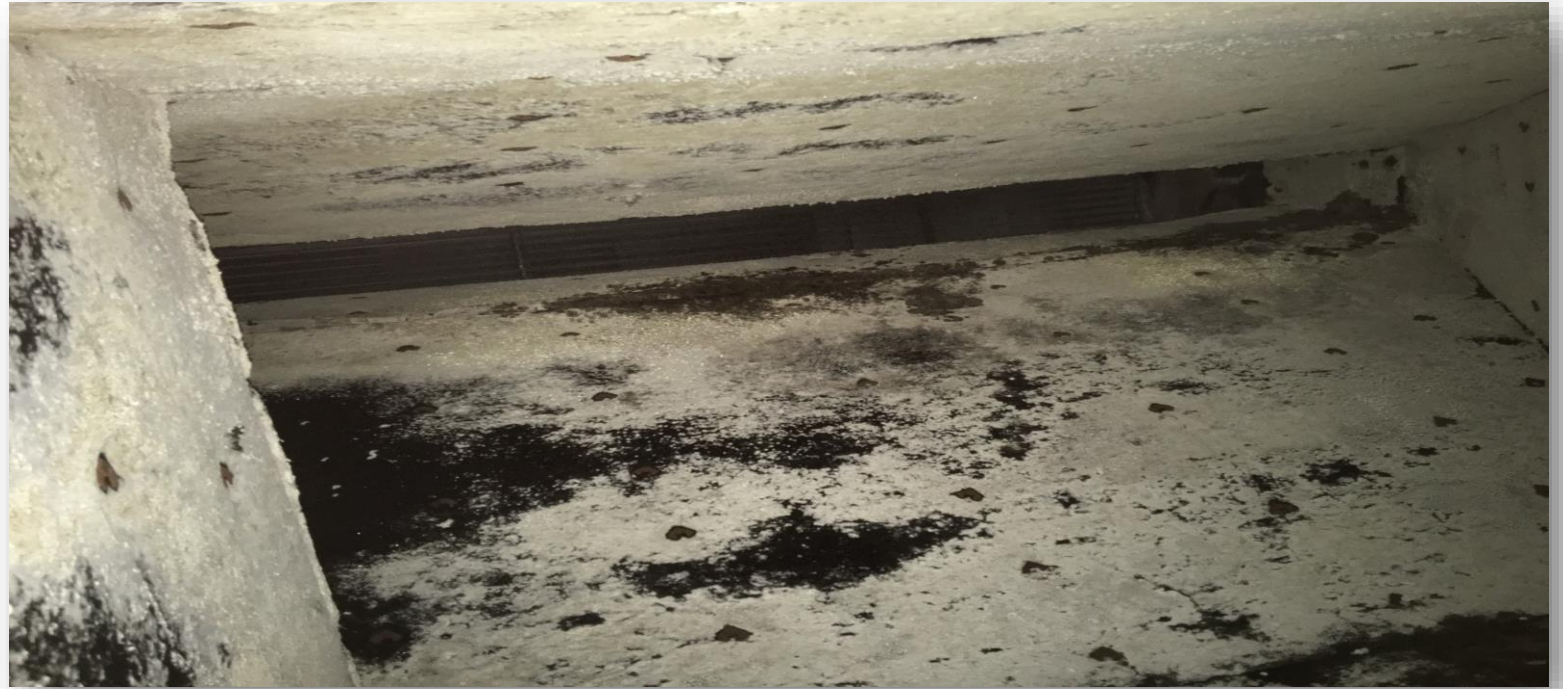




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Fan Coil Unit – Significant Microbial Growth

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Fan Terminal Unit



Fan Terminal Unit





Ventilation Inspections





Ventilation Inspections

If the inspector finds a problem that their company doesn't handle, they should recommend the client contact the appropriate company for further investigation.

- ❑ Industrial Hygiene
- ❑ Microbiology
- ❑ Bioaerosols
- ❑ Filtration Experts
- ❑ Air Balancing Contractors
- ❑ Mechanical Contractors
- ❑ Mechanical Engineers
- ❑ IAQ Consultants
- ❑ Indoor Environmental Professionals (IEP)



Ventilation Inspections

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Q&A

You have

Questions

We have

Answers



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Presenter Contact Information

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Thank you
for
Participating!

