



IQ
GREEN BUILDING SOLUTIONS
*Intelligent Green Building Solutions for
Indoor Environmental Quality*



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JOINT COMMITTEE ON ENERGY AND ENVIRONMENTAL POLICY



A White Paper

**Applicability of Home Energy Rating System (HERS) Programs to Reduce
Air Leakage and Energy Consumption in Nonresidential HVAC Systems**
By James Woods, Ph. D., PE

Presented by

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Joint Committee on Energy and



Environmental Policy



CAL SMACNA:

- Jim Hussey Co-chair
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Joint Committee on Energy and



Environmental Policy



Mission:

The Mission of the Joint Committee on Energy and Environmental Policy is to promote responsible environmental policy in the State of California and encourage efficient HVAC market transformation through collaboration with industry stakeholders and regulatory agencies.





The Commissioning Puzzle Our Part.....



- Independent 3rd Party
- Duct Leakage Testing
- System Leakage Verification

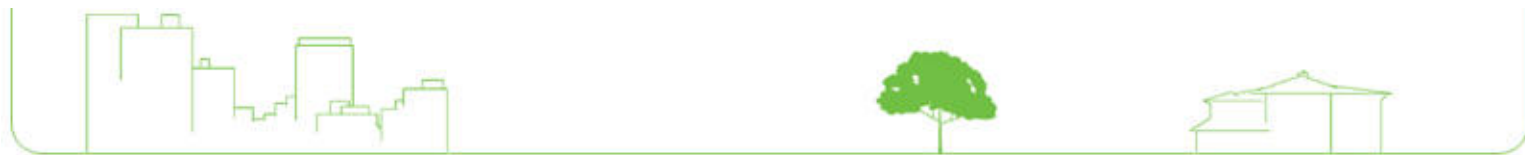




Preaching to the Choir.....

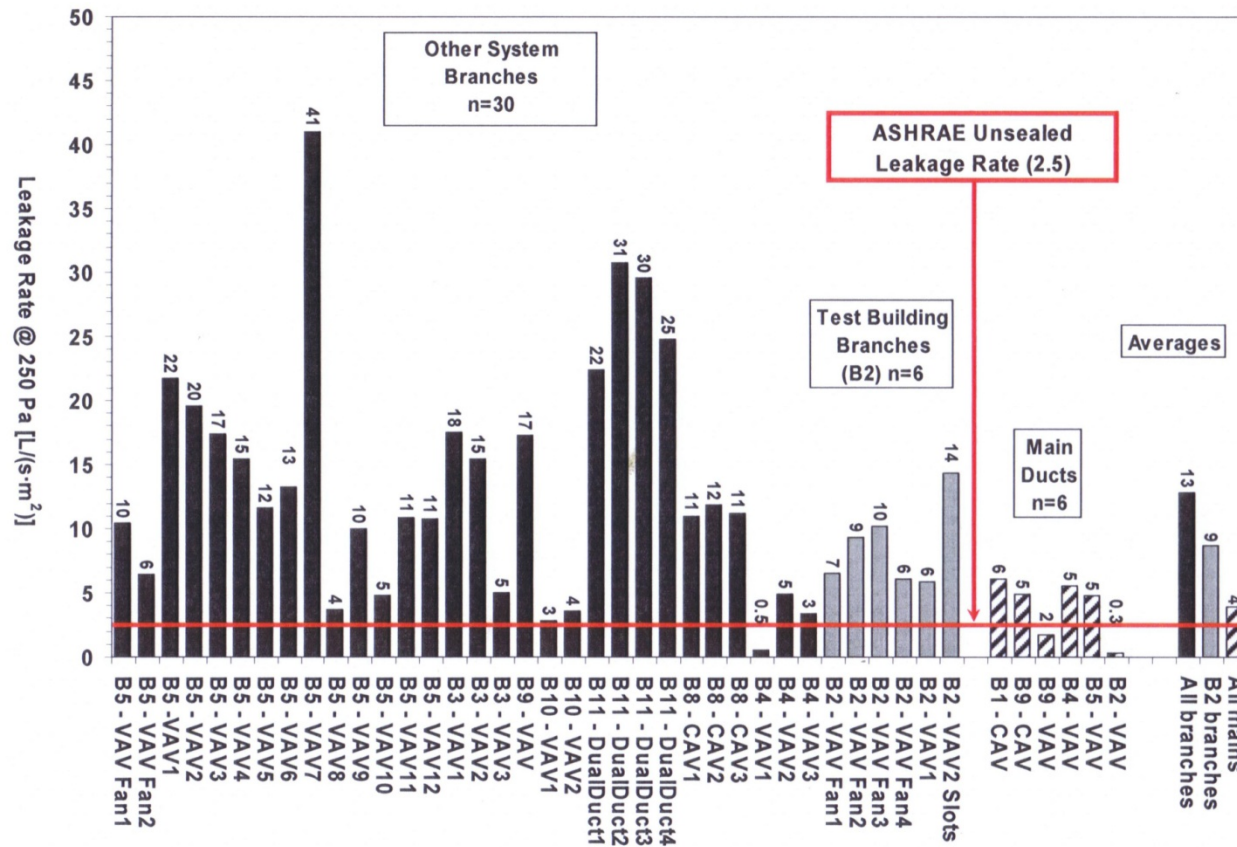


- Ducts Leak...
- Some ducts leak a LOT!!!
- Leakage is not good.





Non-Residential Duct Leakage Study





Leakage Costs \$\$ (& Carbon!!)



- 20% Annual Cooling Consumption (for 144(k) systems)
- Which is... 3,600 GWh
- Which is... 1.25 million lbs of carbon....
- Which is 231,000 Trees!!





T24 HVAC Systems:

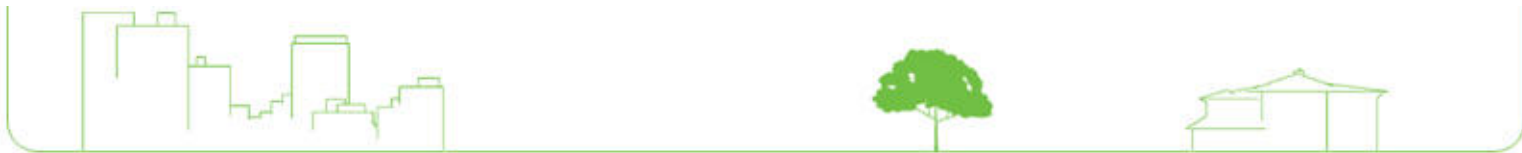
- #1 Packaged Single Zone Gas Furnace and AC.
- #2 Packaged Single Zone Heat Pump and AC.
- #3 Packaged VAV (Reheat/DX Cooling)
- #4 Built-up VAV (Reheat/Chilled Water)
- #5 Built-up single Zone (4-pipe)





HERS Testing Limitations

- Only for Systems #1&2 of the ACM.
- < 5,000 sq ft.
- > 25% of the Duct located:
 - Outdoors
 - Under a roof w/ > U factor than ceiling
 - Under a roof, ventilated attic
 - Unconditioned crawl space
 - Other unconditioned spaces





White Paper Executive Summary

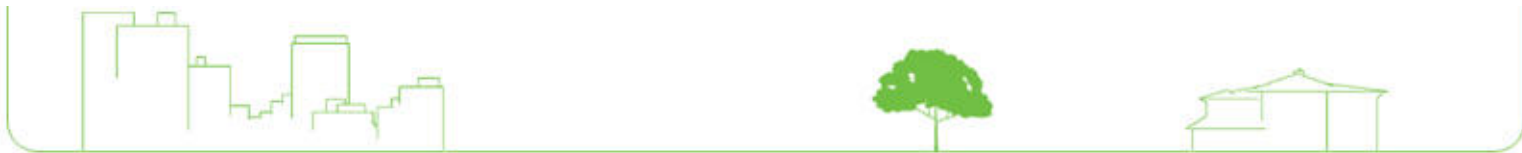
- Air Leakage is significant, a valid and reliable method of system leakage testing is needed for non-residential.
- The HERS methodology is limited in non-residential applications.
- A concentrated effort is needed to define and implement a standard set of means and methods for system leakage testing in the non-residential arena.

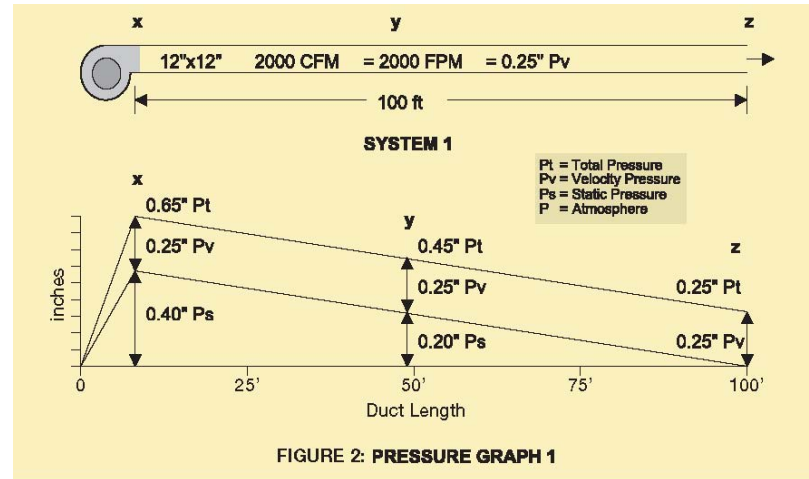




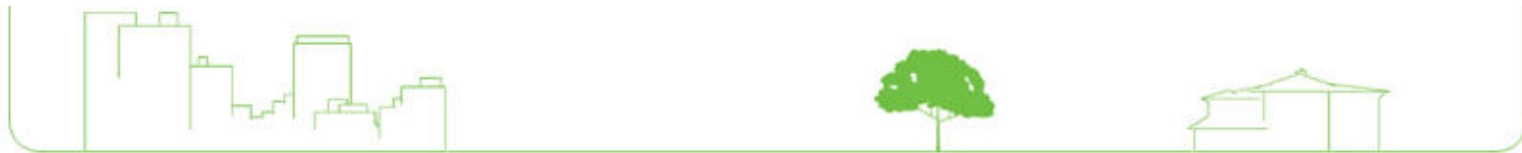
What about the other 3 systems ??

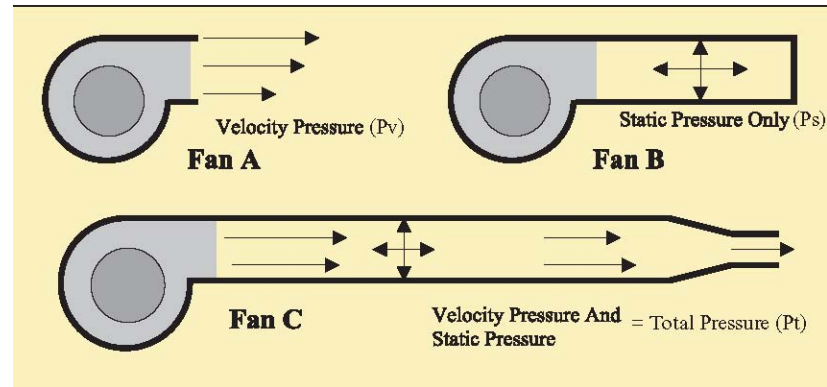
- Higher Pressures
- Longer Duct Runs
- Fabricated Duct
- More Accessories (VAV boxes, control dampers, fire dampers, smoke detectors, flow stations, control sensors.....)
- Larger, More Complicated Fan Systems





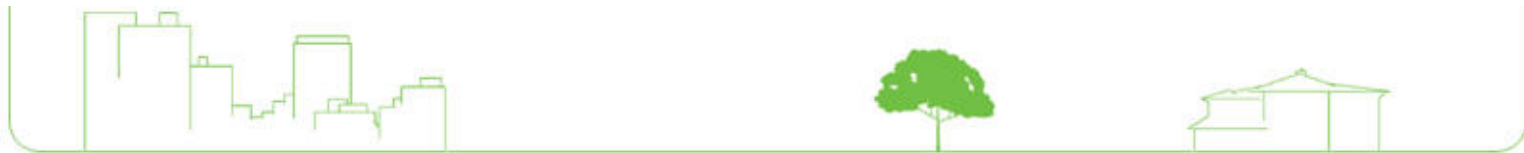
Do we need a “Non-Residential Building Rating System?”





**What will be the protocol for non residential
HVAC System verification?**

**Who will develop this non residential building
rating system?**





Collaboration.....



- SMACNA
- State Agencies
- Public Utilities
- California
Commissioning
Collaborative
- AABC, NEBB, TABB
- ??????



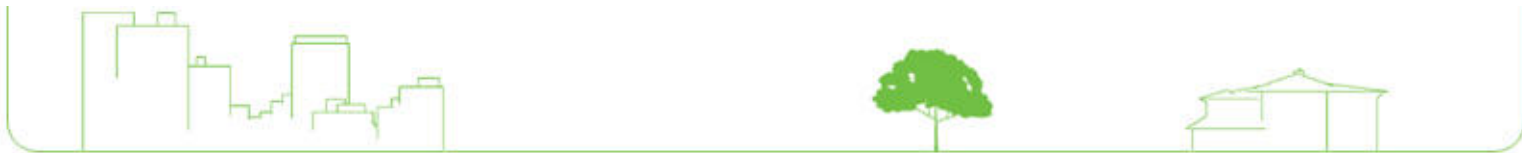


Accuracy and Reliability



The Reliability of the data...

Relies on the ethics and professional training of the technicians applying the protocols...





Collaboration.....

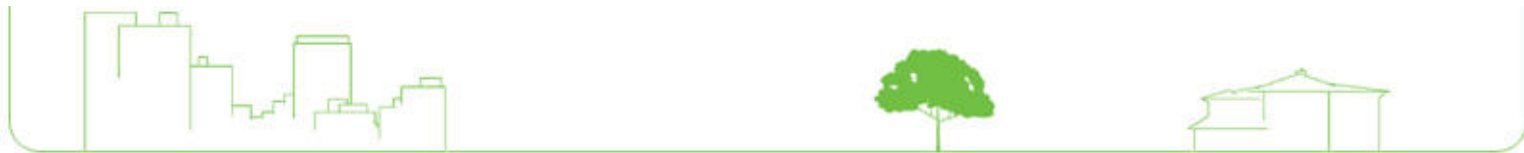


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Questions & (hopefully) Answers.....





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