

# Inclusion of Cool Ducts in Nonresidential Title 24 Mandatory Requirements

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# Cool Duct Benefits

- 👉 Ducts stay cool in sun if they have
  - high thermal emittance ( $\geq 0.7$ ) and high solar reflectance ( $\geq 0.75$ )
- 👉 Cool ducts reduce
  - building cooling electricity use
  - peak power demand



# Scope

- ☞ Cool ducts for non-residential buildings
  - New study
  - Both small and large buildings
  - Exposed rooftop ducts
- ☞ Cool ducts also applies to residential buildings



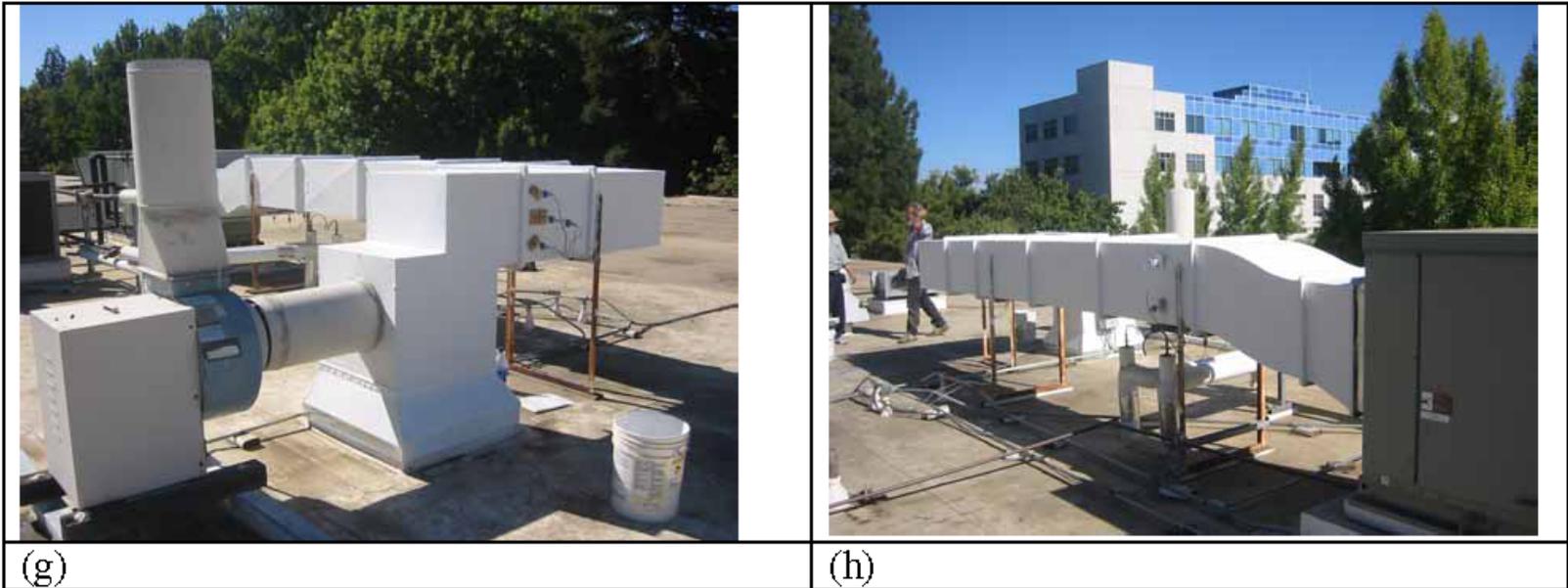
# Methodology

- ☞ Review measure availability and cost
  - technologies, market share
  - manufacturers, distribution
  - availability, cost
  - useful life
- ☞ Perform building cost/benefit analysis
  - evaluate measured energy savings
  - use DOE-2 to simulate cooling and heating energy use
  - net savings = cooling savings - heating penalty
- ☞ Project state-wide savings



# Measured Data

- ☞ Three systems at California State University, Sacramento; with R6 nominal insulation



- ☞ Estimated annual savings 5-20 MJ per m<sup>2</sup> of duct surface area
- ☞ In new applications, simple payback 2-5 years



# Air Temperature Rise in the Ducts

Facilities Building: System A

