

INTEGRAL GROUP

Revolutionary Engineering

trust | nurture | inspire

JOHN ANDARY, PE, LEED AP
Senior Principal : Bioclimatic Design Leader



ALL ELECTRIC ZERO ENERGY RETROFITS

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INTEGRAL GROUP SAN JOSE OFFICE :: EHDD ARCHITECTS



ZERO
ENERGY
CERTIFIED
2007

DESIGN

EUI = 24.8

RPI = 29.1

MEASURED

EUI = 22.6

RPI = 23.2

NET = -0.6

DPR CONSTRUCTION SF OFFICES :: FME ARCHITECTS



ZERO
ENERGY
CERTIFIED
2014

DESIGN

EUI = 21.6

RPI = 23.2

MEASURED

EUI = 21.6

RPI = 22.1

NET = -0.5

CA LOTTERY SANTA FE OFFICE :: LPAS ARCHITECTS



ZERO
ENERGY
VERIFIED
2015

DESIGN

EUI = 22.2

RPI = 22.3

MEASURED

EUI = 22.1

RPI = 22.2

NET = -0.1

PITZER REDFORD CONSERVANCY :: CARRIER JOHNSON



ZERO
ENERGY
CERTIFIED
2018

DESIGN

EUI = 15.0

RPI = 21.1

MEASURED

EUI = 15.8

RPI = 26.6

NET = -10.8

LINKEDIN OFFICES :: STUDIOS ARCHITECTURE

ZERO ENERGY
DESIGNED
2016

DESIGN
EUI = 30.0
RPI = 30.0

MEASURED
EUI = 29.1
RPI = 20.8
NET = +8.3

CASE STUDY : SHARP DEVELOPMENT



100+ ZERO ENERGY PROJECTS!

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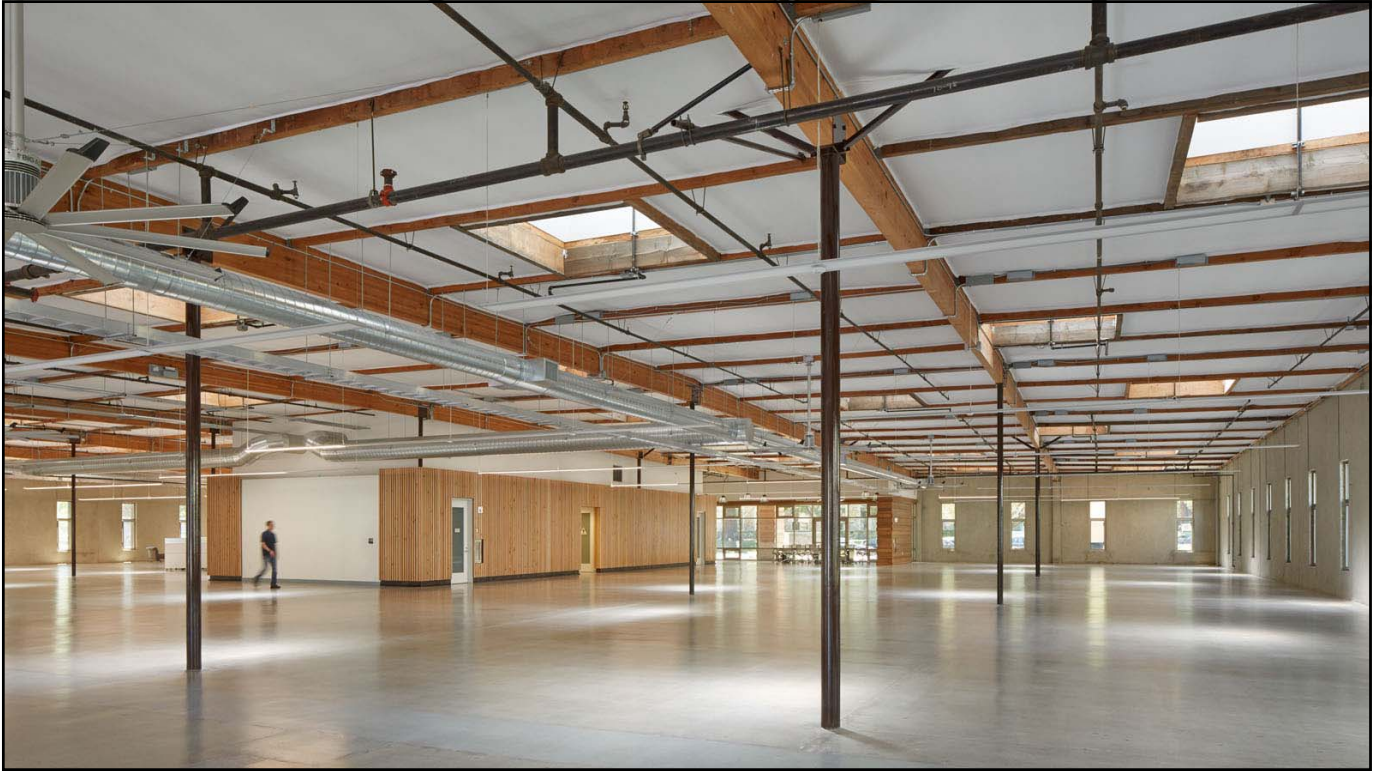


Existing Conditions



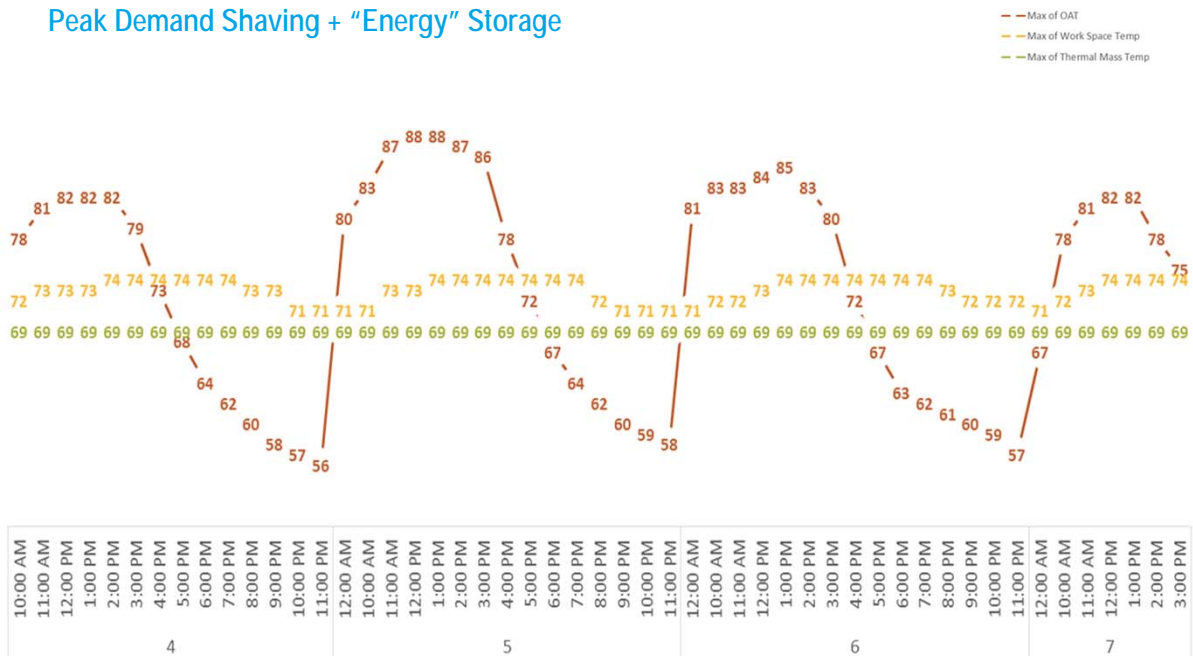
- 30,000 SF square one-story office warehouse circa 1970
- Uninsulated concrete walls, wood roof and single pane windows
- DARK, DINGY, DERELICT and UNRENTABLE!



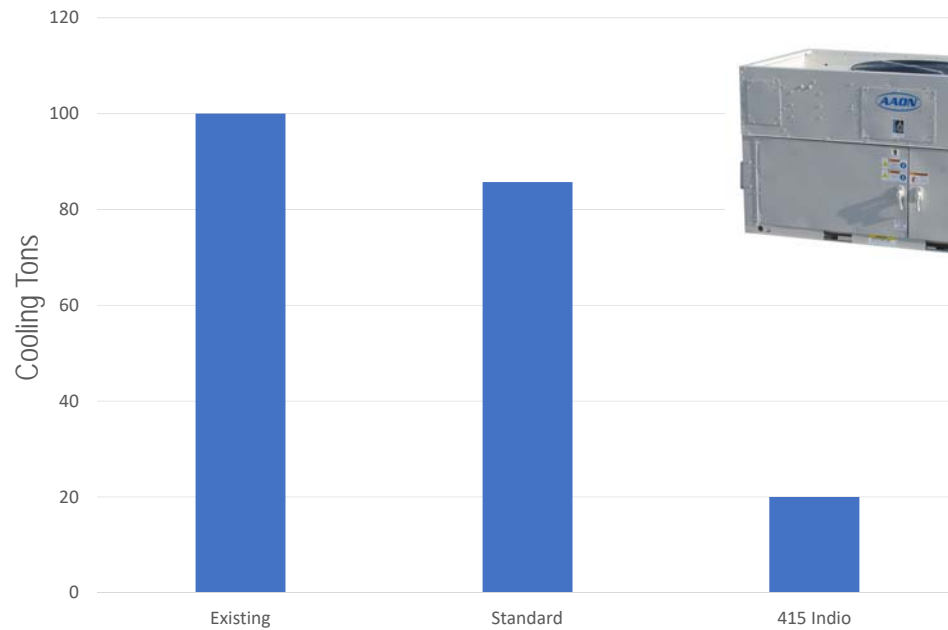




Peak Demand Shaving + "Energy" Storage

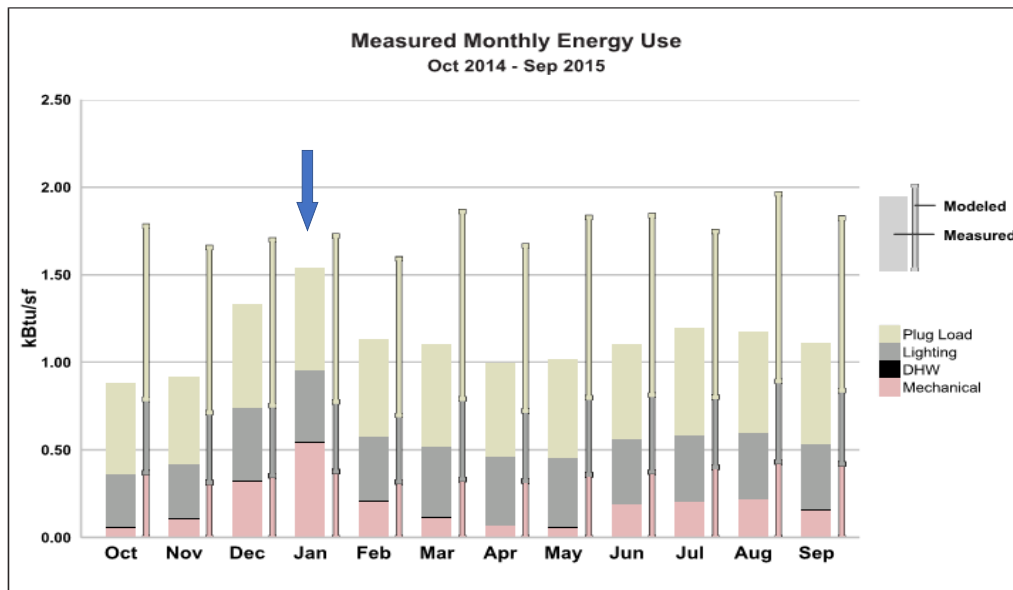


All Electric Rooftop Heat Pump : Dramatically Reduced Size



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Winter Peak Energy Demand!



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INDIO



2014

ZERO ENERGY
CERTIFIED

SILICON VALLEY BUSINESS JOURNAL BEST REUSE PROJECT AWARD 2014 • ACTERRA SUSTAINABLE BUILT ENVIRONMENT AWARD 2015
ASHRAE NATIONAL FIRST PLACE TECHNOLOGY AWARD 2016

MATHILDA



2015

ZERO ENERGY
DESIGNED

SILICON VALLEY BUSINESS JOURNAL GREEN PROJECT OF THE YEAR 2015 • ACTERRA SUSTAINABLE BUILT ENVIRONMENT AWARD 2016
CORENET GLOBAL SUSTAINABLE LEADERSHIP AWARD 2016 • ENR BEST REGIONAL PROJECT MERIT AWARD 2016

AP + I



2016

ZERO ENERGY
VERIFIED

SILICON VALLEY BUSINESS JOURNAL GREEN PROJECT OF THE YEAR RUNNER UP 2015 • AIA SILICON VALLEY CITATION AWARD 2016

PASTORIA



2017

ZERO ENERGY
DESIGNED

SILICON VALLEY BUSINESS JOURNAL BEST REUSE PROJECT AWARD 2017

CASE STUDY : ASHRAE HEADQUARTERS



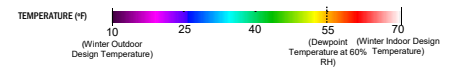
100+ ZERO ENERGY PROJECTS!

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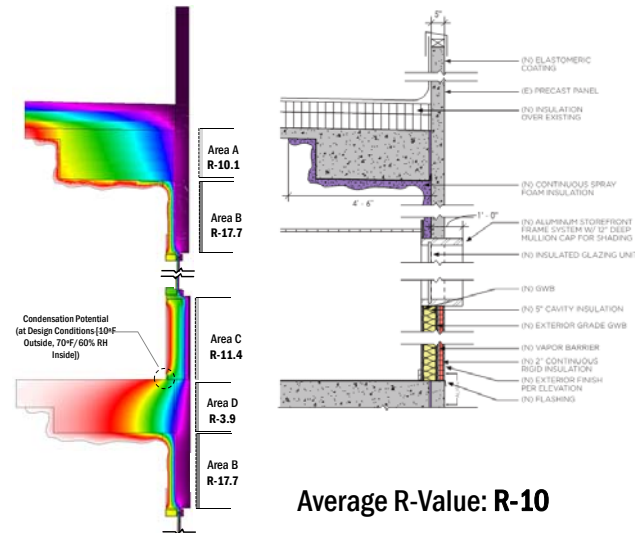


THERM Analysis: Wall Assembly R-value

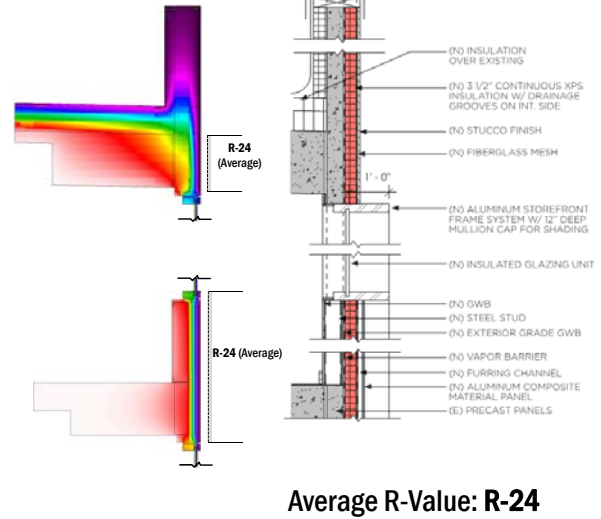
Impacts of Insulation: Option A vs. Option C/D



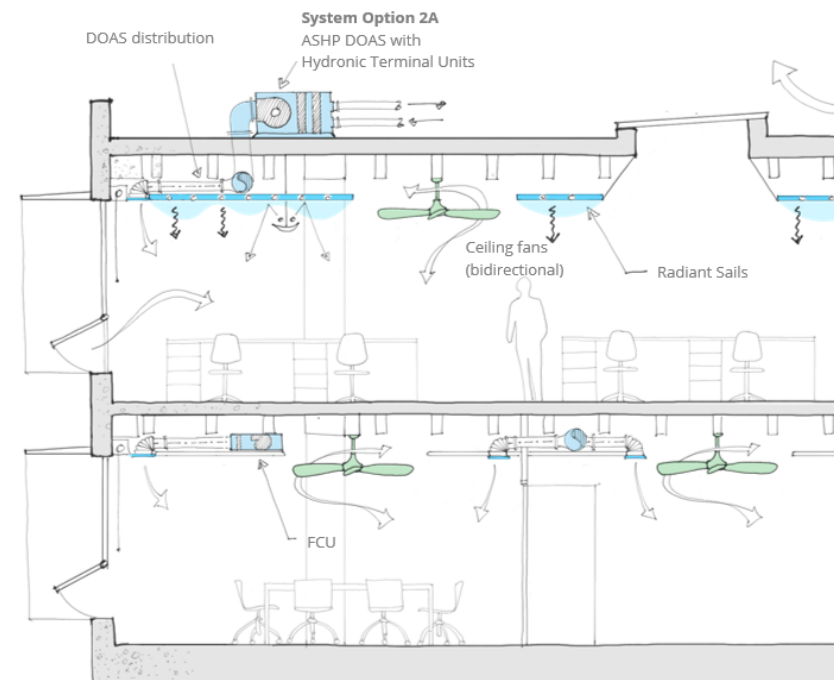
Option A: Insulate From Interior, Maintain Precast



Option C & D: Continuous Exterior Insulation Over Precast



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