

# INTEGRAL

## Revolutionary Engineering

trust | nurture | inspire

JOHN McDonald, PE, LEED AP  
Principal : Mechanical Engineer





MECHANICAL + ELECTRICAL ENGINEERS

ENERGY + WATER EFFICIENCY CONSULTANTS

SUSTAINABILITY + LEED CONSULTANTS

350+ STAFF IN SIXTEEN OFFICES

35+ LEED PLATINUM CERTIFIED

8+ LIVING BUILDING PROJECTS

15+ AIA COTE TOP TEN BUILDINGS

60+ NET ZERO ENERGY PROJECTS...*1M SF OCCUPIED*



INTEGRAL GROUP ZERO NET ENERGY RENOVATION PROJECTS



# NET ZERO ENERGY EXPERTS

## ILFI CERTIFIED

945 Front Street, DPR Construction Office,  
San Francisco, CA

Packard Foundation Headquarters  
LEED Platinum Certified  
Los Altos, CA

IDeAs “Z Squared” Integral Group Office  
San Jose, CA

## COMPLETED PROJECTS

### NZE Verified

J. Craig Venter Institute  
LEED Platinum Certified  
La Jolla, CA

Tah.Mah.Lah. Residence  
LEED Platinum Certified  
Northern CA

UniverCity Childcare Facility  
Scale Jumping, Living Building Challenge  
Burnaby, BC

Watsonville Water Resources Center | LEED  
Platinum Certified,  
Watsonville, CA

415 Mathilda  
Sunnyvale, CA

435 Indio  
Sunnyvale, CA

### NZE Designed

117 Easy Street  
Sunnyvale, CA

Aquarium of the Pacific  
LEED Platinum Certified  
Long Beach, CA

Bishop O’Dowd High School  
Environmental Science Center  
Oakland, CA

Blackford Elementary School  
Campbell, CA

California Lottery Office  
Santa Fe Springs, CA

California State Polytechnic University  
Pomona, Student Center  
Pomona, CA

Castlemont Elementary School  
Campbell, CA

Del Mar High School  
Science Education Facility  
CHPS Certified,  
Campbell, CA

Exploratorium  
LEED Platinum Certified  
San Francisco, CA

Hawaii Portable  
Oahu, HI

Kaneda Residence  
LEED Platinum Certified  
Cupertino, CA

Leyva Middle School Administration  
San Jose, CA

Lynhaven Elementary School Multi-Purpose  
Campbell, CA

McClellan Ranch  
Cupertino, CA

Millennium Water (Southeast False Creek)  
LEED Platinum Certified  
Vancouver, BC

Montenay Office Building  
LEED Platinum Certified, Burnaby, BC

OUSD, Downtown Educational Complex  
CHPS Certified Pending  
Oakland, CA

Regent College Library  
Vancouver, BC

San Jose Environmental Innovation Center  
San Jose, CA

Sherman Oaks Elementary School Multi-Use  
Facility Campbell, CA

VanDusen Visitor Centre  
Living Building Challenge  
Vancouver, BC

Vernonia K-12 School  
Vernonia, OR

Watsonville Water Resources Center | LEED  
Platinum Certified,  
Watsonville, CA

Westmont High School  
Science Education Facility  
Campbell, CA

## DESIGN COMPLETED

### NZE Designed

Clif Bar Headquarters  
LEED Platinum Certified  
Emeryville, CA

### NZE Ready

2 Bryant, Perkins + Will Office  
San Francisco, CA

Samsung Research Center  
Mountain View, CA

## UNDER CONSTRUCTION

Confidential Medical Lab  
Inland Empire, CA

LinkedIn Office Renovation  
Sunnyvale, CA

Metalsa Research Building  
Mexico

Xilinx Headquarters Renovation  
San Jose, CA

Yosemite Institute  
Yosemite National Park, CA

### IN DESIGN

380 Pastoria Office Building Renovation  
Sunnyvale, CA

895 Emerson, Schmidt Family Foundation  
Offices  
Palo Alto, CA

Boulder Commons  
Boulder, CO

City Place Development  
Santa Clara, CA

Confidential Urban Campus  
Los Angeles, CA

Denver Water  
Denver, CO

Hanover Page Mill  
Palo Alto, CA

Hayward Library  
Hayward, CA

Kaiser Baldwin Hill Medical Office Building  
Baldwin Hills, CA

Kaiser Santa Rosa Medical Office Building  
Santa Rosa, CA

Mark Day School Administration Building  
San Raphael, CA

OUSD Madison High School  
Oakland, CA

Rowland Hall-St. Mark’s School  
Salt Lake City, UT

Sacramento Market Co-Op  
Sacramento, CA

San Francisco International Airport  
Consolidated Administration Campus  
San Francisco, CA

Stanford University Living Lab  
Palo Alto, CA

UC Davis California Avenue Lecture Hall  
Davis, CA

UC Merced Downtown Campus  
Merced, CA

UC Santa Cruz, Big Creek  
Santa Cruz, CA

## MASTERPLAN

Fort Collins Net Zero Energy Eco-District  
Ft. Collins, CO

OUSD Fremont High School Master Plan  
Oakland, CA

Station Pointe Sustainable Master Plan  
Edmonton, AB

UC Berkeley Global Campus  
Richmond, CA

Accelerating the  
adoption of  
sustainable building  
design

that mitigates global environmental  
impacts and reduces ecological  
degradation.

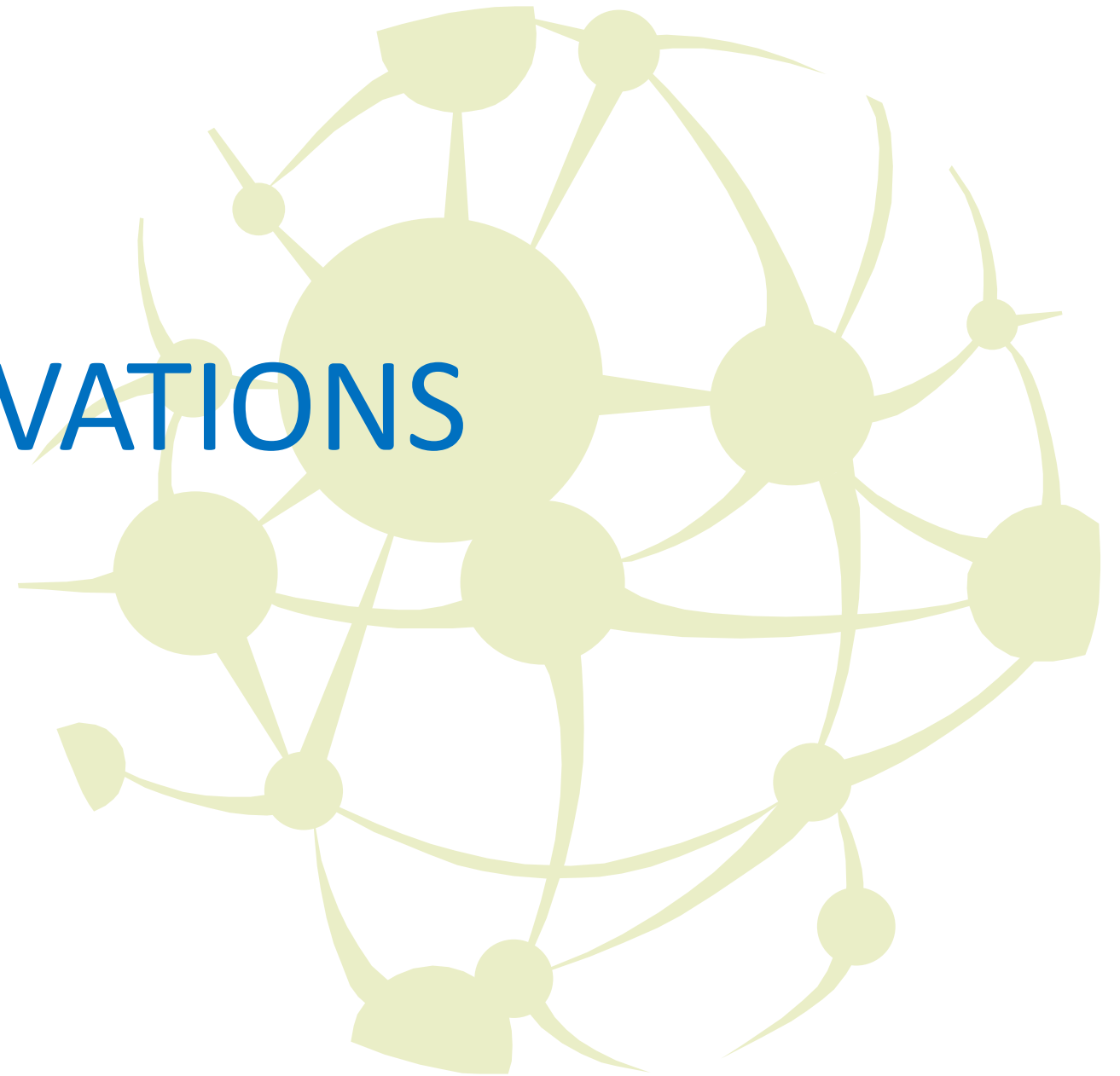


OUR APPROACH :: MEASURED. METERED. VERIFIED. REAL.



INTERNATIONAL  
**LIVING FUTURE**  
INSTITUTE<sup>SM</sup>

# ZERO NET ENERGY RENOVATIONS







INTEGRAL GROUP SAN JOSE OFFICE







CLIF BAR HEADQUARTERS





CA LOTTERY SANTA FE SPRINGS OFFICE :: LPAS ARCHITECTURE





LINKEDIN MAUDE AVENUE :: STUDIOS ARCHITECTS





EXPLORATORIUM MUSEUM :: EHDD







# SILICON VALLEY ZNE RETROFITS







INDIO BUILDING :: RMW ARCHITECTS

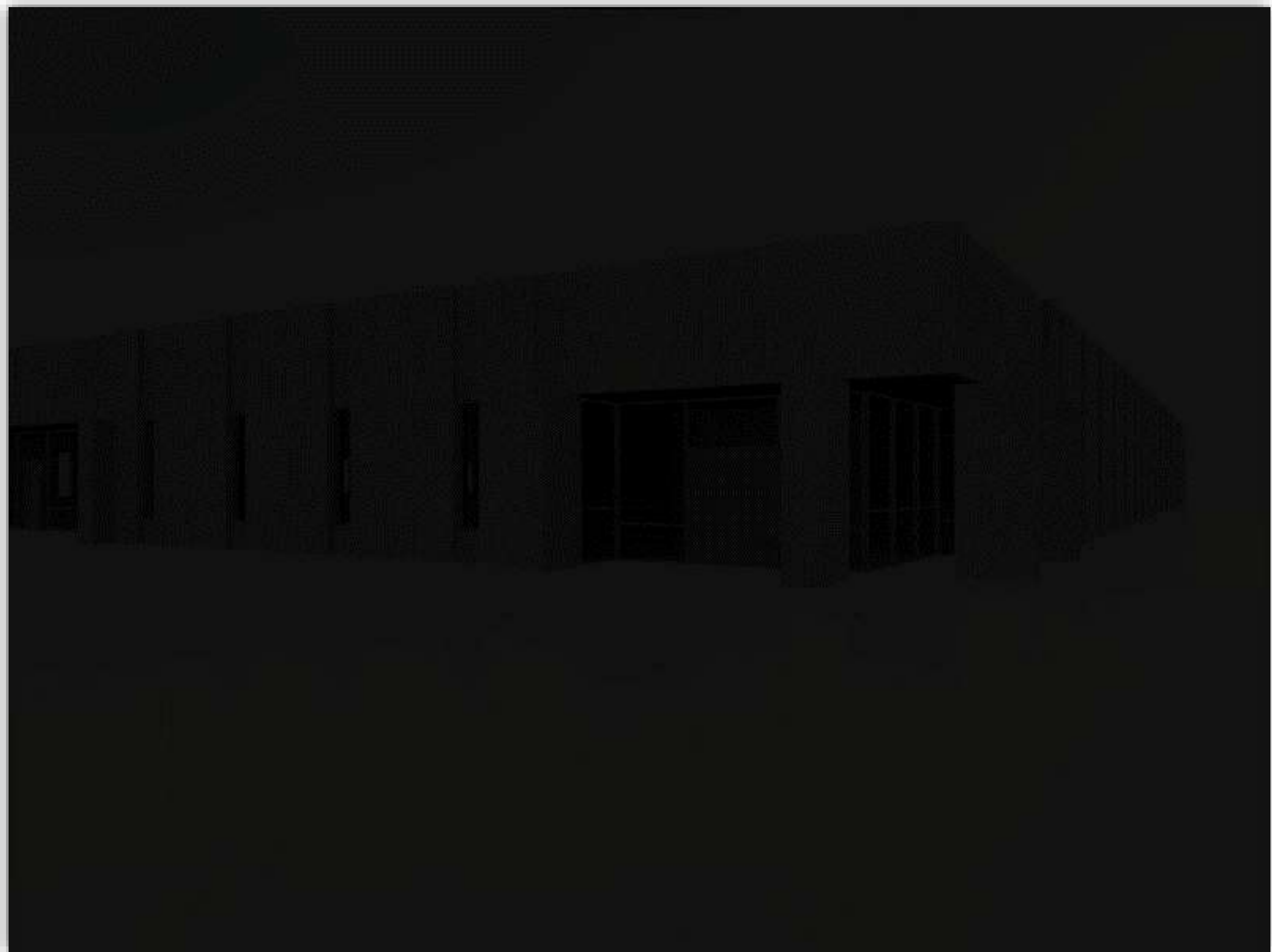


# Existing Conditions



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





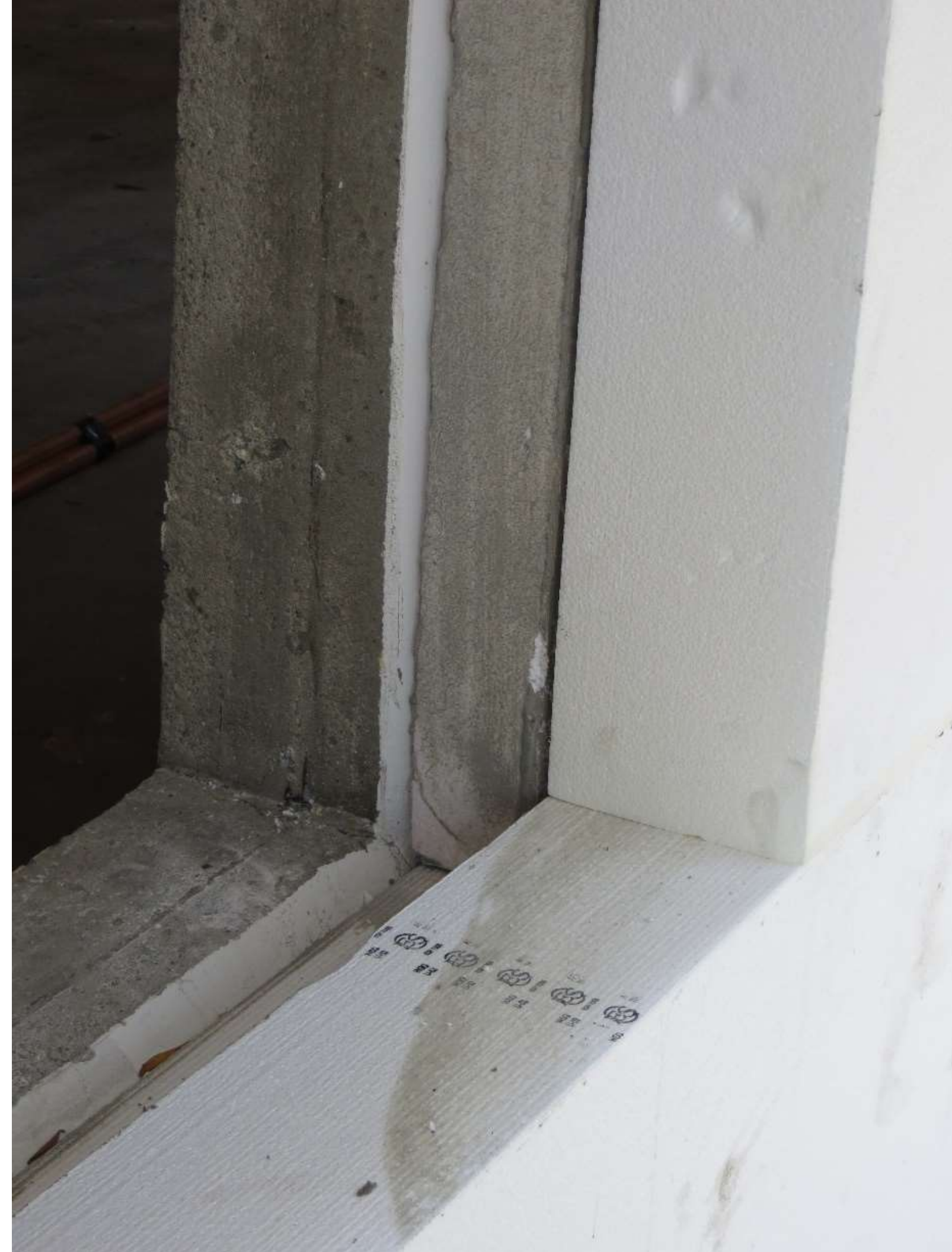




INDIO BUILDING :: RMW ARCHITECTS





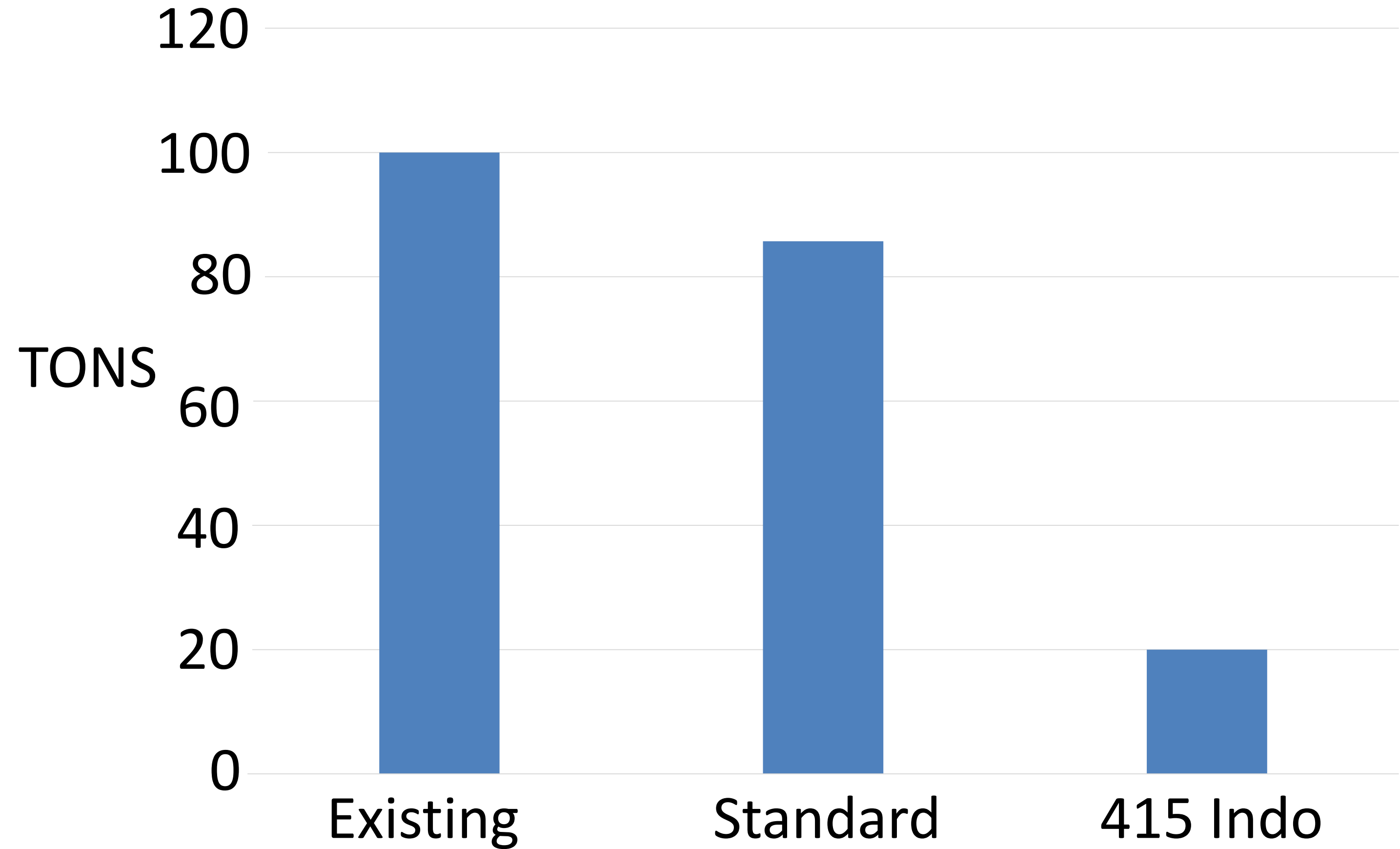






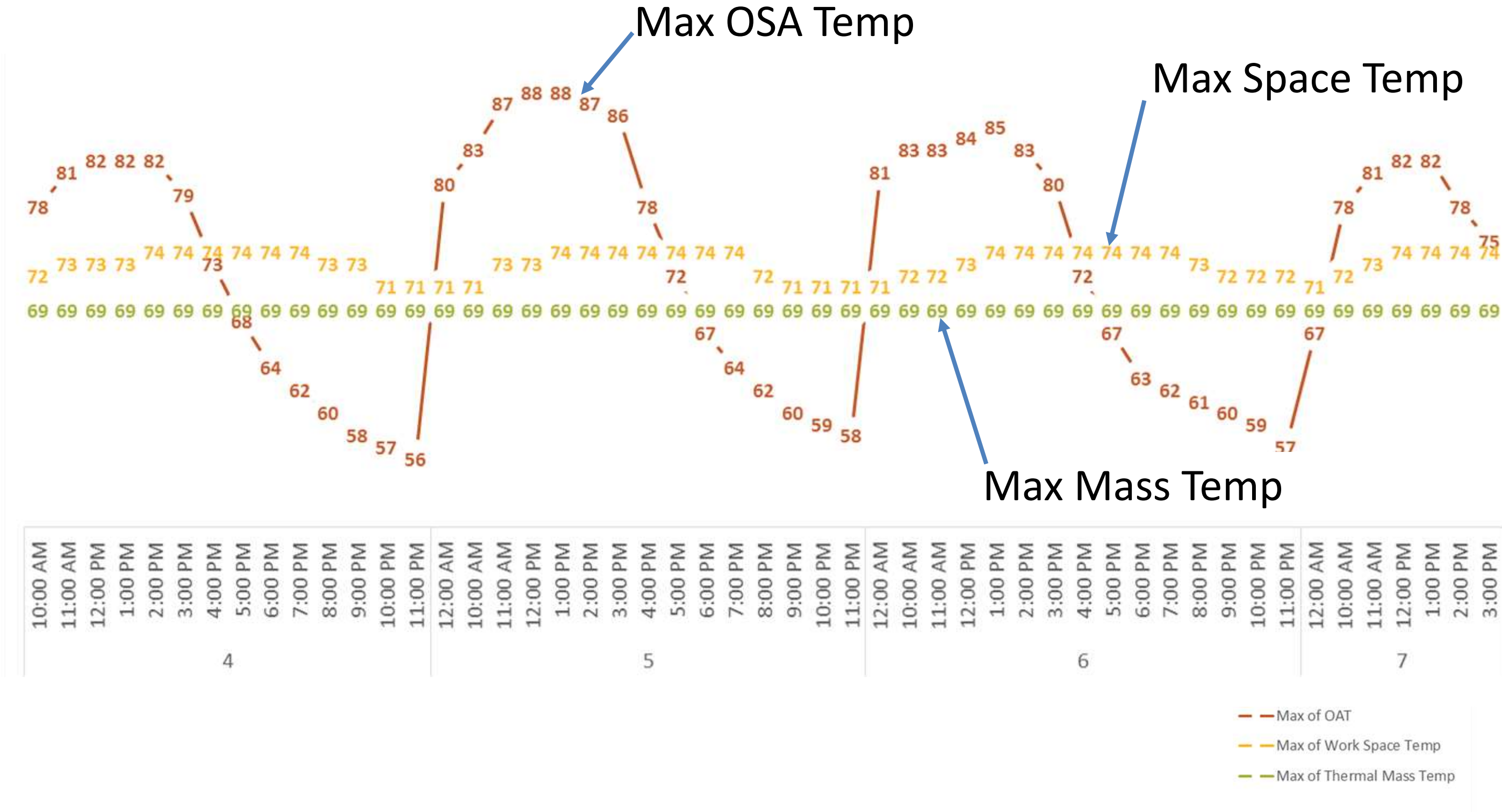


# REDUCED HVAC SIZE





# Indio Building – November 2015









# BUSINESS CASE FOR ZERO NET ENERGY

- ADDITIONAL COST TO RENOVATE SUSTAINABLY VS. LESS EXPENSIVE STANDARD METHOD OF RENOVATING => (\$49.84 / SF)
- ADDITIONAL VALUE CREATED DUE TO A REDUCTION IN OPERATING EXPENSES AND RESERVE REQUIREMENTS => \$52.94 / SF
- ADDITIONAL VALUE DUE TO ACCELERATED LEASE-UP TIME VS. AVERAGE MARKET DOWNTIME => \$22.81 / SF
- ADDITIONAL VALUE DUE TO RECEIVING A PREMIUM IN RENT OVER THE TOP OF THE MARKET RENTS => \$34.47 / SF



# ACCELERATE

Taking Net Zero Energy from Replication to *Production*

INDIO



2014

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

MATHILDA



2015

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

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

PASTORIA



2017

SILICON VALLEY BUSINESS JOURNAL BEST REUSE PROJECT AWARD 2017





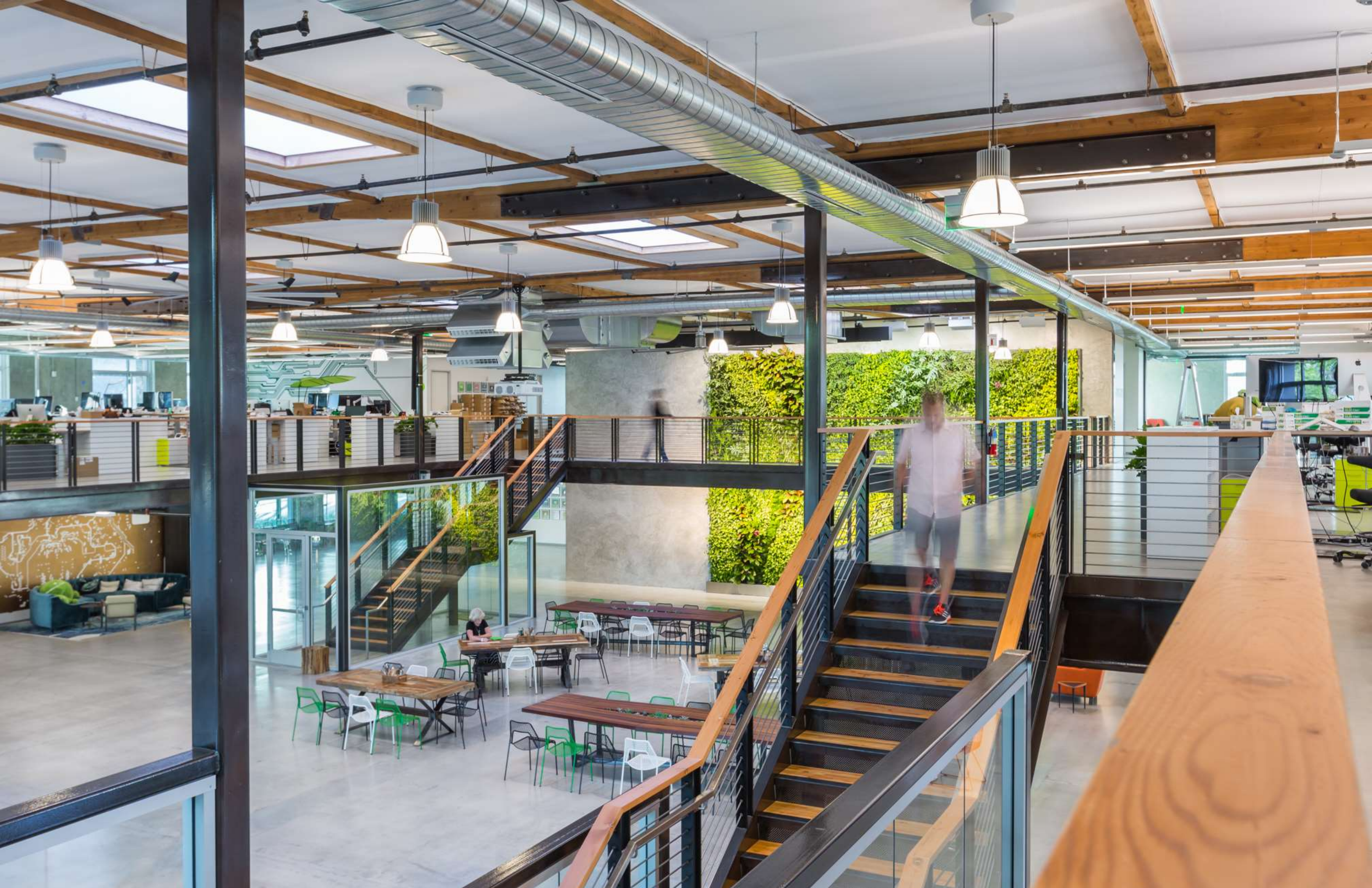
MATHILDA BUILDING





MATHILDA BUILDING :: STUDIO G ARCHITECTS









PASTORIA BUILDING





PASTORIA BUILDING : WRNS STUDIO











# Wellness

## Human-centric Electric Light



Cool white light for concentration work.



Warm white light for relaxation.



# URBAN ZNE RETROFIT















DPR CONSTRUCTION SAN FRANCISCO :: FORM 4 ARCHITECTS







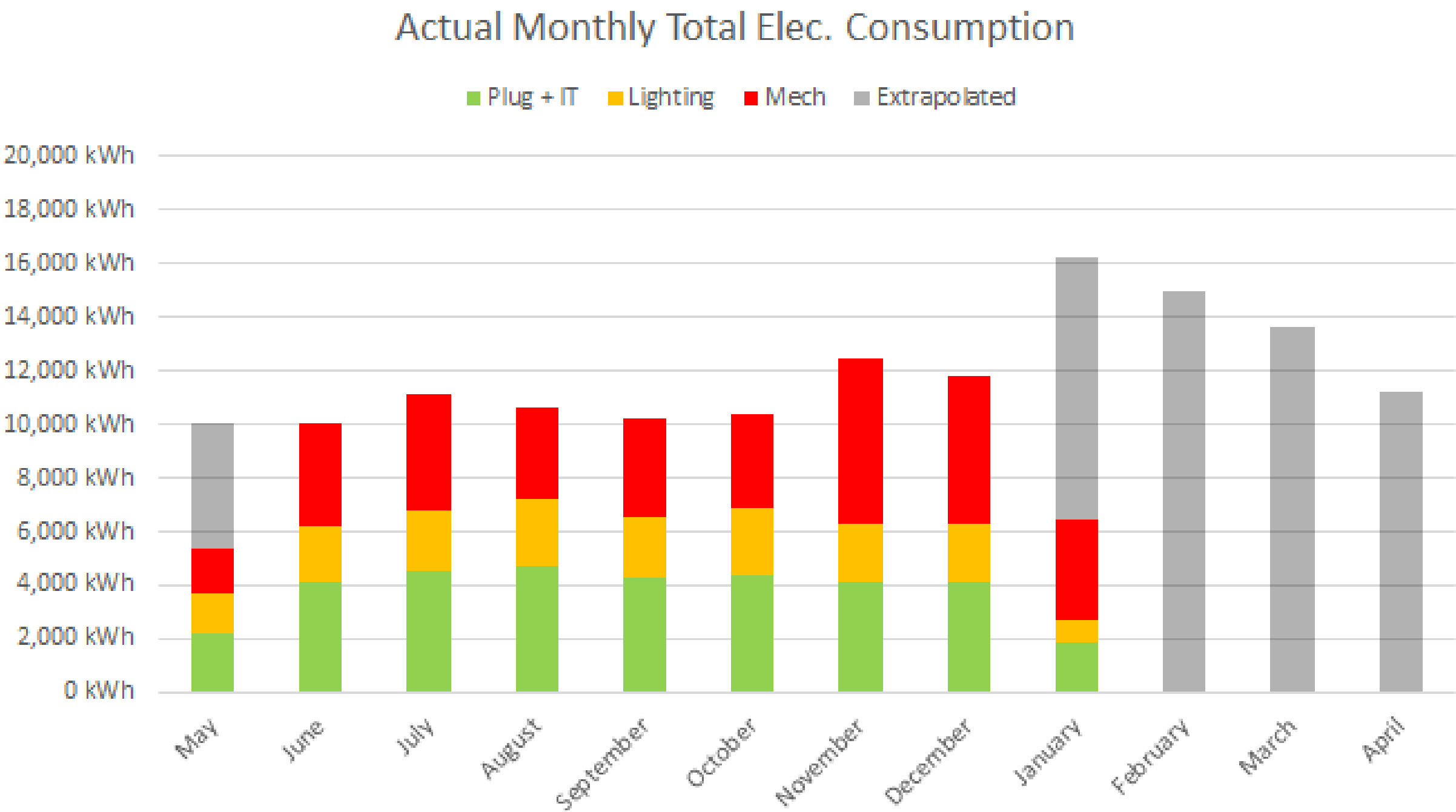
# Front End Building Dashboard



buildingdashboard



# Actual Monthly Energy





# Lessons Learned



1 Don't Install an ICE MACHINE!

2 Smart plug strips can be a little complicated.



3 Getting data out of a BMS is a pain – cloud based is ideal



4 Right Size the PV



5 The earlier you complete Cx - the better

6 Popularity Curse of Net Positive



7 Submeters for subtenants too.





# THANK YOU

*Check out our book.*

INTÉGRAL

## Revolutionary Engineering



MOLLY MILLER