



**AS-EPA**

# **LEED PLATINUM GREEN BUILDING**





# HISTORY







# GROUNDBREAKING





# PLANNING & DESIGN







# PLANNING & DESIGN

## WHAT MAKES THIS BUILDING GREEN?

### ENERGY EFFICIENCY ELEMENTS:

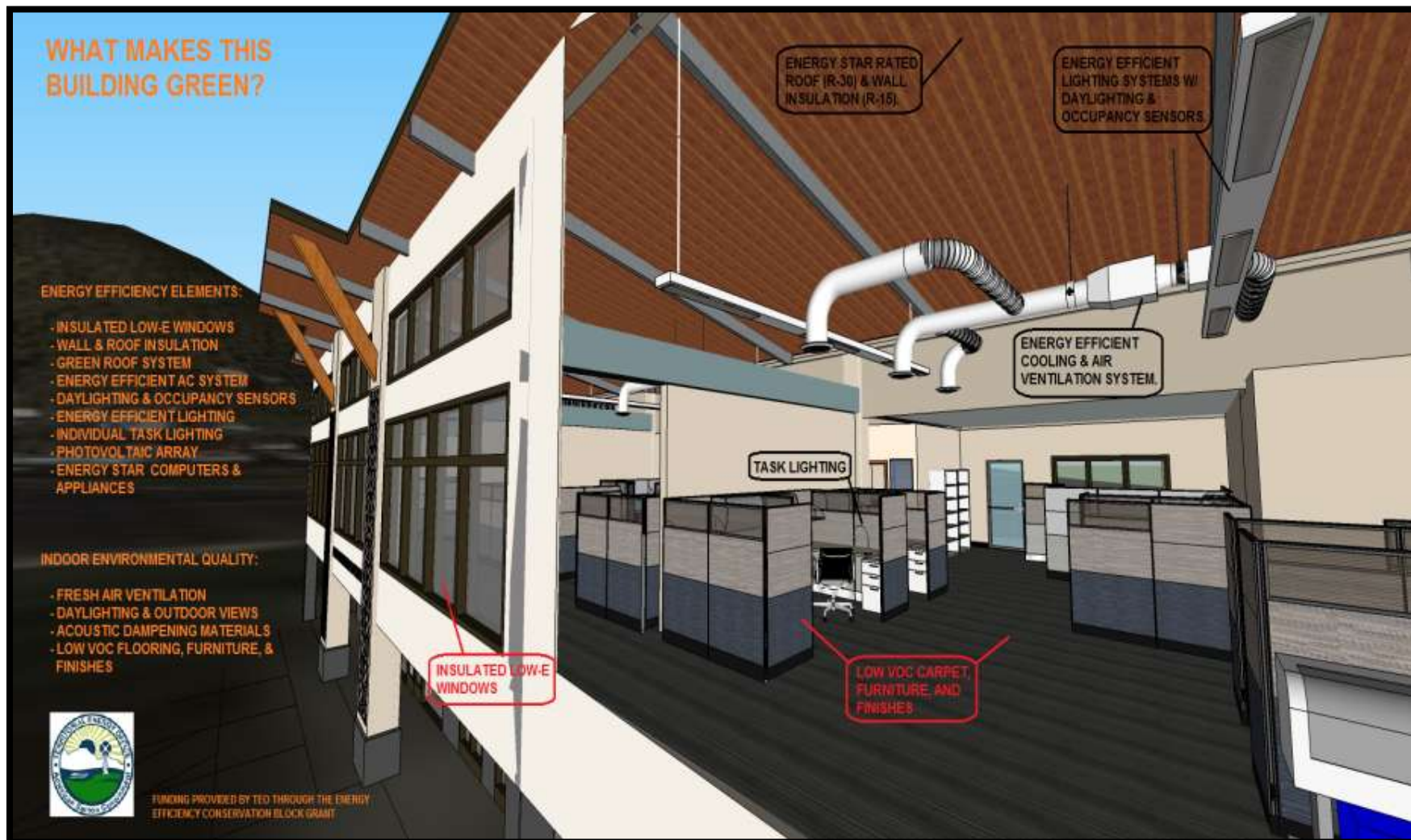
- INSULATED LOW-E WINDOWS
- WALL & ROOF INSULATION
- GREEN ROOF SYSTEM
- ENERGY EFFICIENT AC SYSTEM
- DAYLIGHTING & OCCUPANCY SENSORS
- ENERGY EFFICIENT LIGHTING
- INDIVIDUAL TASK LIGHTING
- PHOTOVOLTAIC ARRAY
- ENERGY STAR COMPUTERS & APPLIANCES

### INDOOR ENVIRONMENTAL QUALITY:

- FRESH AIR VENTILATION
- DAYLIGHTING & OUTDOOR VIEWS
- ACOUSTIC DAMPENING MATERIALS
- LOW VOC FLOORING, FURNITURE, & FINISHES



FUNDING PROVIDED BY TED THROUGH THE ENERGY EFFICIENCY CONSERVATION BLOCK GRANT





# PLANNING & DESIGN

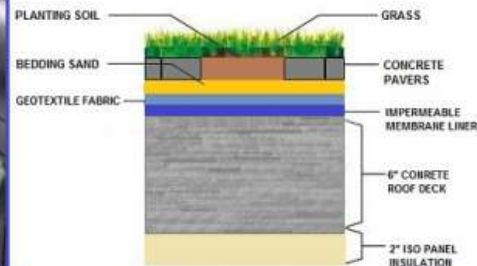
## AMERICAN SAMOA ENVIRONMENTAL PROTECTION BUILDING STORMWATER DEMONSTRATION PROJECT

HOW THIS BUILDING CAPTURES AND TREATS 100% OF THE RAINFALL RUNOFF

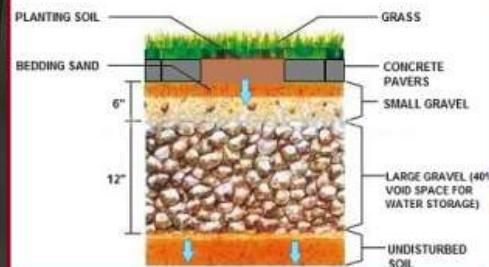
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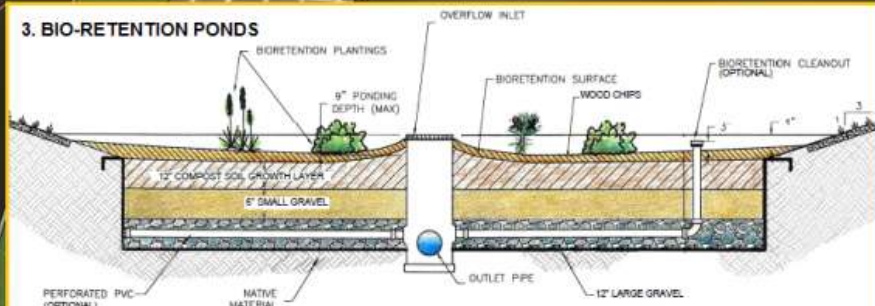
### 1. VEGETATED ROOF



### 2. GRASS PAVERS



### 3. BIO-RETENTION PONDS







# CONSTRUCTION PHASE





# CONSTRUCTION PHASE



Bio-retention Pond &  
Block Pavers

PV Panels

Bio-retention Pond







# GREEN FEATURE COMPONENTS

## HOW THIS BUILDING USES THE SUN'S ENERGY TO PRODUCE ELECTRICITY

THE AMERICAN SAMOA ENVIRONMENTAL PROTECTION BUILDING IS A ZERO ENERGY BUILDING. THIS MEANS THAT THE BUILDING'S ANNUAL ENERGY CONSUMPTION AND CARBON EMISSIONS ARE NET ZERO THROUGH ON-SITE RENEWABLE ENERGY GENERATION.



1. SOLAR PV ARRAY SUPPLIES DIRECT CURRENT (DC).

2. INVERTERS CONVERT DC TO ALTERNATING CURRENT (AC).

3. ELECTRICAL PANEL / SWITCHBOARD DIRECTS POWER TO BUILDING WITH ADDITIONAL DEMAND SUPPLIED BY THE GRID.

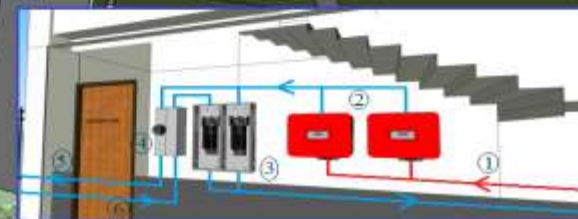
4. METER MEASURES ELECTRICITY PRODUCTION & CONSUMPTION.

5. ANY EXCESS POWER IS EXPORTED TO THE GRID (ASPA).

6. ADDITIONAL ELECTRICITY DEMAND IS SUPPLIED BY THE GRID.



FUNDING PROVIDED BY TEO THROUGH THE ENERGY EFFICIENCY CONSERVATION RESEARCH GRANT (AARH2)



1. Energy Efficiency and Renewable Energy
2. Water Efficiency
3. Environmentally Preferable Building materials and Specifications
4. Waste Reduction

5. Indoor Air Quality
6. Smart Growth and Sustainable Development
7. Regional Innovation



# GREEN FEATURES



**BIORETENTION  
POND 1**



**BIORETENTION  
POND 2**



**BIORETENTION  
POND KIOSK**



**CONCRETE PAVERS**







LABORATORY



MOTION SENSOR



# BENEFITS

AIR QUALITY



UV SENSOR



LIGHTING



WORKING SPACE





# BENEFITS





# The Goal



To produce more energy, using solar power, than we consume over a period of 12 months.



# GREEN ROOF







# LEED Certification Award Scale



Certified

40 – 49 Points

Silver

50 – 59 Points

Gold

60 – 79 Points

Platinum

80 – 100 Points

**AS-EPA Building**

**83 Points (Platinum!)**



# MAJOR CHALLENGES

- **Administrative**
  - Multiple funding sources
  - Federal process
  - Local process
- **Logistical**
  - Schedule Inconsistencies
- **Weather**
  - Unexpected
- **Limited local knowledge**







# POST CONSTRUCTION

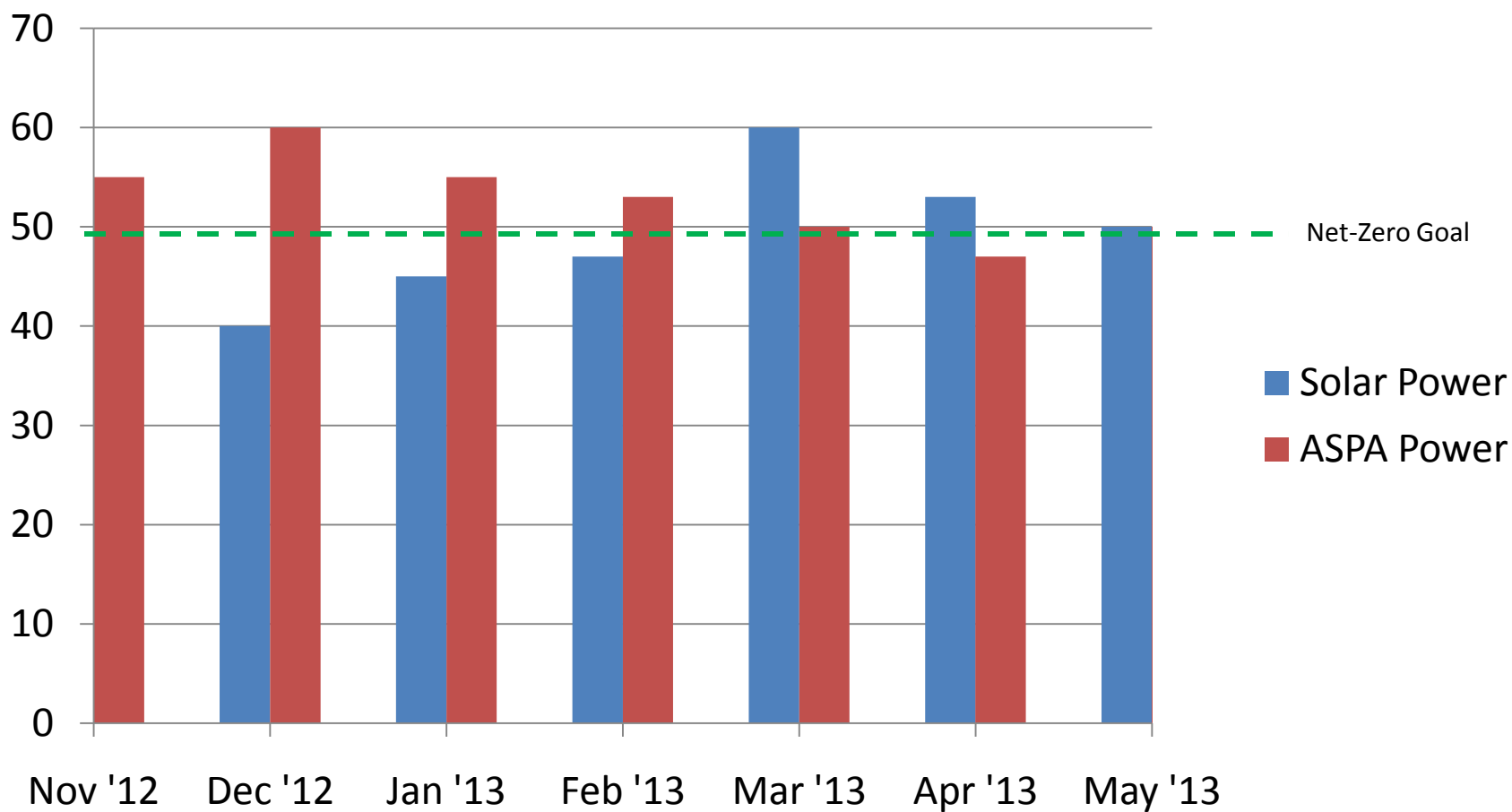


- EPA OCCUPANCY TRAINING
- GREEN BUILDING MANUAL
- GREEN TEAM
- ACHIEVED LEED PLATINUM STATUS
- AIM TO ACHIEVE NET ZERO





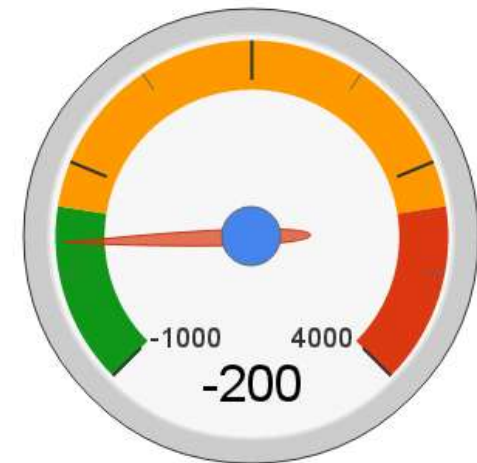
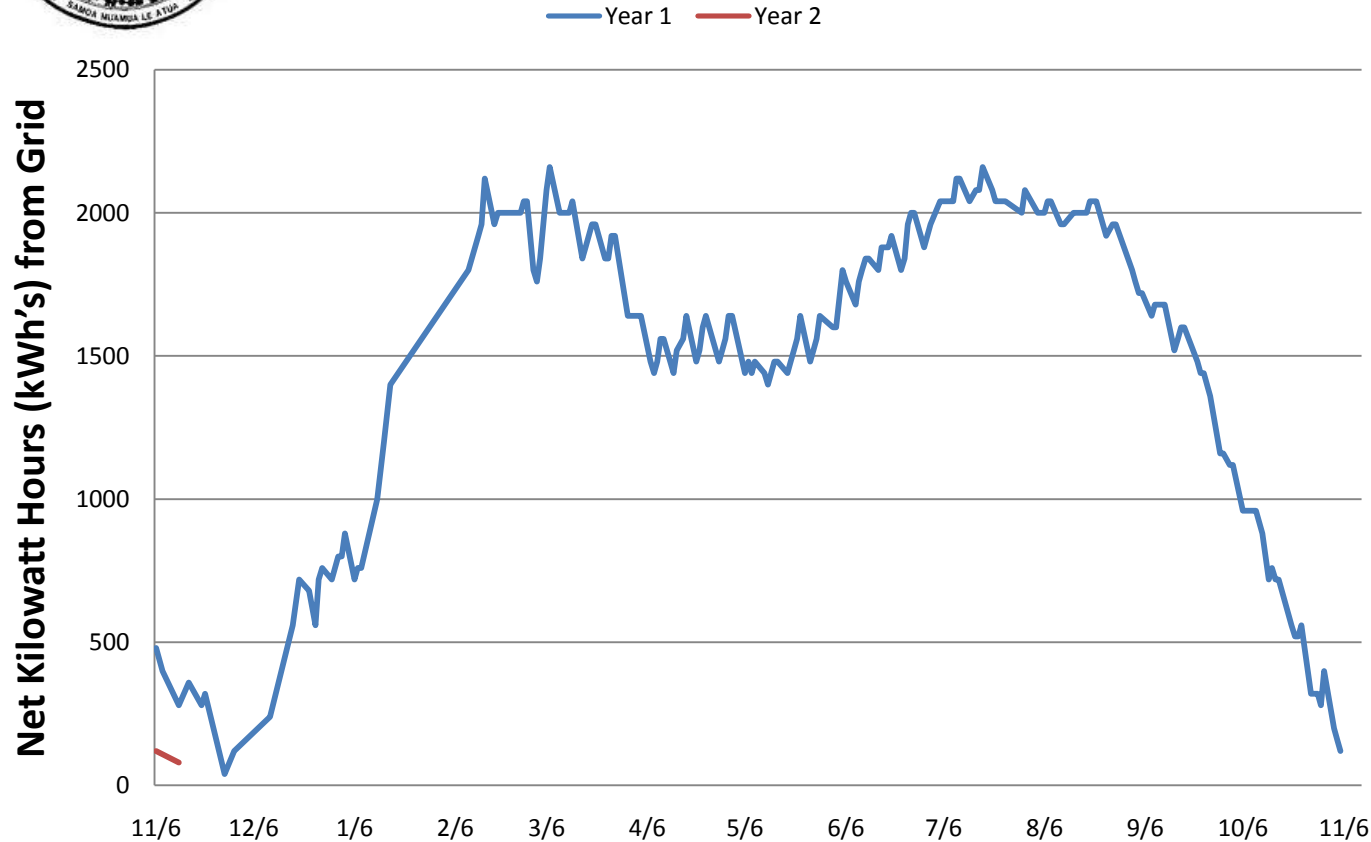
# AS-EPA Net-Zero Timeline







# Where We Are Today



Net zero gauge

- Between 11/14/2012 and 11/14/2013 we used a net total of -200 kWh's from the grid. This means not only were we net zero but we put 200 kWh's back into the grid for use elsewhere.



# CURRENT STATUS







# ACKNOWLEDGEMENTS



## DESIGN TEAM

- **Project Leader:**  
Brian Rippy, LEED AP
- **Project Engineer:** Tim Bodell, PE
- **Mechanical Engineer:**  
AMEL Tech.
- **Structural Engineer:**  
Tinai Gordon

## FUNDING SOURCES

- TERRITORIAL ENERGY OFFICE (TEO) \$1.4MILLION
- FEMA \$98,000
- USEPA NATIONAL ENVIRONMENTAL INFORMATION EXCHANGE GRANT \$70,415
- AS-EPA \$2.5 MILLION
- NOAA \$100, 000



# SPECIAL FA'AFETAI



- Fanuatele Dr. Toafa Vaiaga'e, Former AS-EPA Director
- US-EPA counterparts:
  - Mr. Jared Blumenfeld Region 9 Regional Administrator
  - Mr. John Mc Carroll, Manager for Pacific Islands Office
  - Mr. Carl Goldstein, Program Manager for CNMI
- **Especially Mr. Michael Wolfram, Program Manager for American Samoa**



**FAAFETAI TELE LAVA**

AMERICAN SAMOA  
ENVIRONMENTAL PROTECTION



**SOIFUA**