

Big Cypress & Brighton Projects

RURAL RESERVATION
RESILIENCY INITIATIVE

PRESENTED BY:
HARVEY RAMBARATH



Agenda

- ▶ Introduction
- ▶ Problems and Potential Solutions
- ▶ Big Cypress (BC) Project
 - ▶ Project Partners
 - ▶ BC Solar Project Overview
 - ▶ Material Costs Escalation & Delays
 - ▶ Lessons Learned
 - ▶ Status/Activities Yet to be Completed
 - ▶ Planned VS Actual
 - ▶ How System Works
 - ▶ Energy Usage Comparison at Public Safety Building
- ▶ Brighton (BR) Project
 - ▶ Project Partners
 - ▶ BR Solar Project Overview
 - ▶ Activities Yet to be Completed

Introduction



Seminole Tribe of Florida Reservations

Seminole Tribe of Florida is a Federally Recognized Indian Tribe and is the only Tribe in America that never signed a peace treaty.

Approx. 4,240 Tribal members

Approx. 94,555 acres land base

- Big Cypress 56,752 acres
- Brighton 35,805 acres
- Fort Pierce 60 acres
- Hollywood 497 acres
- Immokalee 600 acres
- Lakeland 802 acres
- Tampa 39 acres



Brief History

- Exercised sovereign authority over territories in Southeast US from time immemorial
- Resisted US political and military removal efforts throughout 19th Century
- Organized under Indian Reorganization Act in 1957
 - IRA Section 16: Tribal Council governs Seminole Tribe of Florida
 - IRA Section 17: Board of Directors manages business arm, Seminole Tribe of Florida, Inc. ("STOF, Inc.")
- Recognized for leadership in advancing sovereignty
 - First Smoke Shops (1976)
 - First High-Stakes Bingo (1979)
 - First Guitar Shaped Hotel (2019)



Problems & Potential Solutions



Dependence

- Tribe depends on outsiders for energy for governmental operations and economic development.
- Tribe has no authority over state-regulated utilities and are subject to rate increases and supply interruptions.
- Tribe's ability to plan long-term is impaired because of unknown future energy costs.



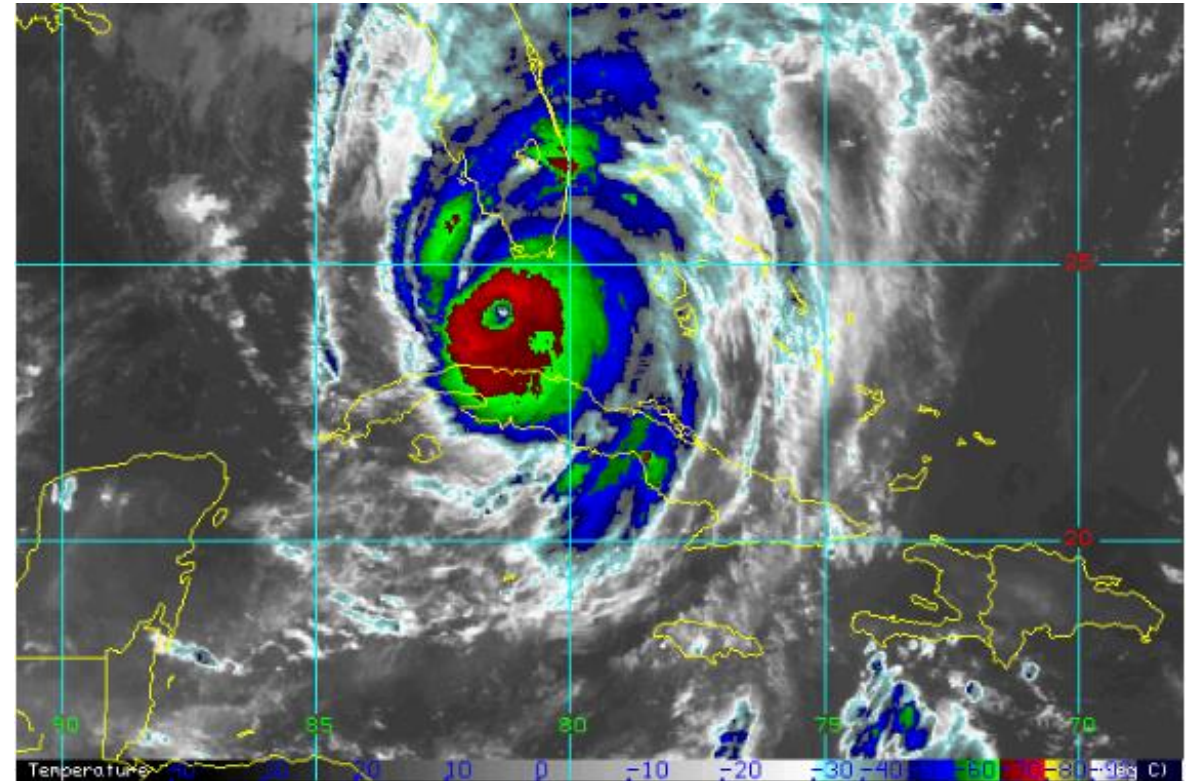
Costs

- Retail prices that utilities charge tribes are high and generally increasing.
- Even though natural gas has been cheaper, electric rates have generally continued to rise.
- Costs may rise as users leave utility system.



Hurricanes

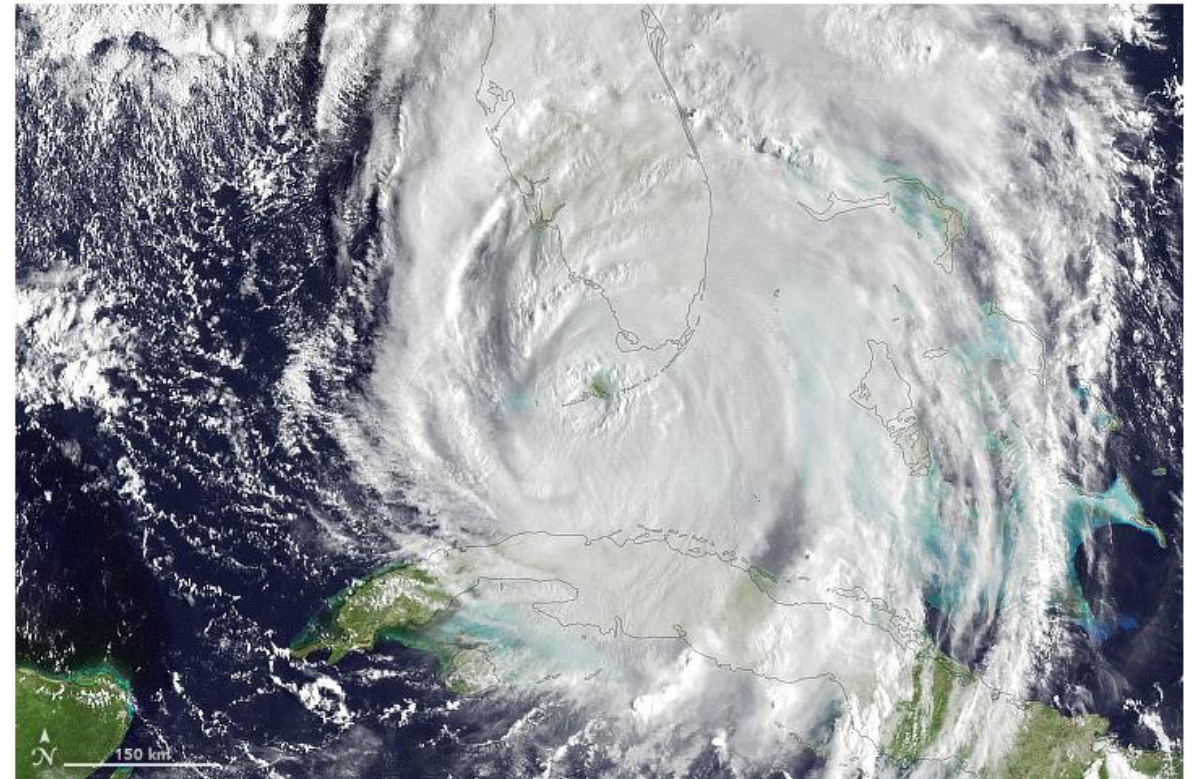
- Hurricane Irma was extremely powerful and catastrophic
- It made landfall in September 10, 2017 and impacted the entire State of Florida
- Most of the Tribe's reservation communities, businesses and government operations were affected
- Several facilities across the Tribe's reservations sustained severe damage



Source: [Hurricane Irma Local Report/Summary \(weather.gov\)](#)

Hurricanes (Continued)

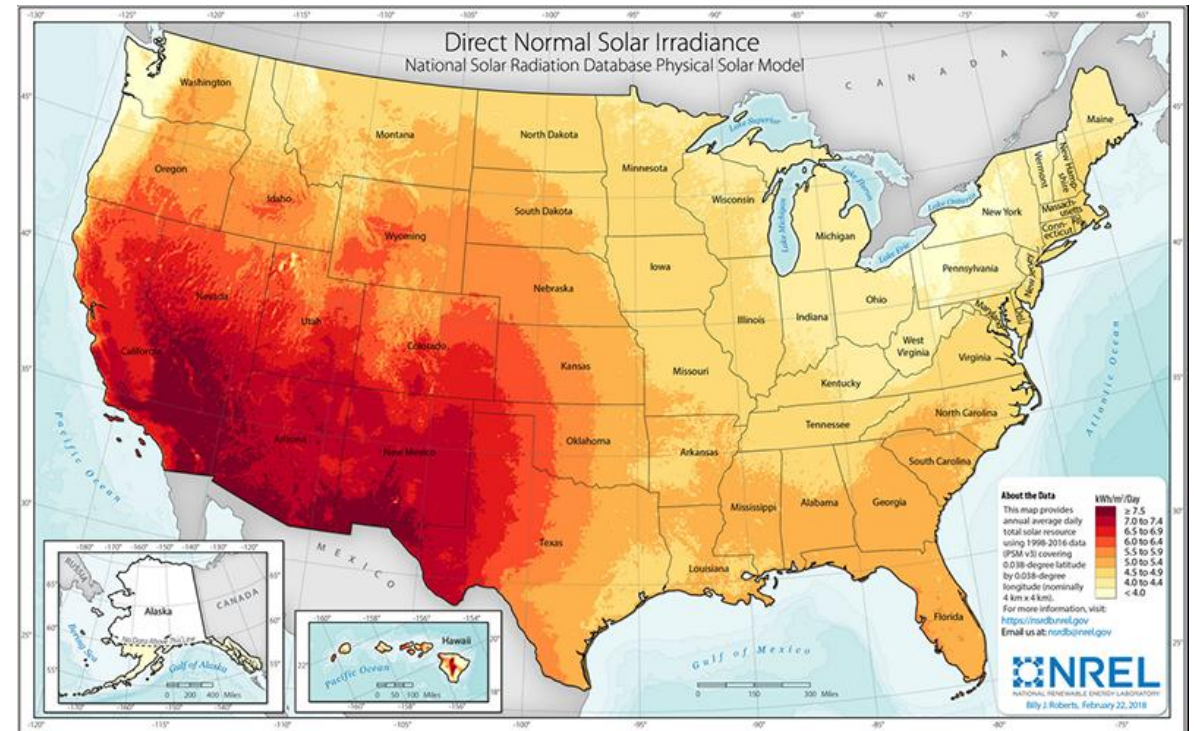
- The Tribe had to close and discontinue its government operations for several weeks and in some cases months until recovery
- There were approximately 680 Tribal members living in the Big Cypress (BC) Reservation, and 690 living in the Brighton (BR) reservation who were particularly impacted by grid resiliency issues and outages
- In the aftermath of Hurricane Irma, the Tribe was the largest purchaser of propane and diesel for generators in Florida
- Even commercial generators are not designed to run for weeks non-stop



Source: <https://earthobservatory.nasa.gov/images/90948/hurricane-irma-strikes-florida>

Potential Solutions

- In January 2018 the Chairman and the Tribal Council formed the Renewable Energy Committee with key people across the Tribe including a representative from the Chairman's office
- The Committee was charged with:
 - Ensuring power continuity across critical Tribal operations to the extent possible during and after a storm
 - Identifying solutions to mitigate and limit power outages as a result of a storm
 - Identifying opportunities that would allow the Tribe to be as self sufficient as possible in meeting its energy demands



Florida is the Sunshine State and has great potential for harnessing energy from the sun

Big Cypress Solar Project



Project Partners

- Seminole Tribe of Florida
- DOE Office of Indian Energy
- Consultants (Godfrey Kahn, Baker Tilly, Sandia Labs, Jacobs Engineering Group)
- Contractor (Advanced Green Technologies)
- Glades Electric



BC Solar Project Overview

- STOF was awarded a grant to design and build approximately 445 kW of solar facilities and 1,510 kWh battery energy storage system (BESS), with transfer switches and control systems to serve 4 essential facilities in the Big Cypress Reservation.
- The systems will be interconnected to the grid and the backup generators
- During outage BESS will be able to run the facilities for approx. 3 hours before generator kicks in
- Generator runs facility and recharges BESS then cuts off and switches over to BESS during extended outages

<u>Big Cypress</u>	<u>kW Peak Demand</u>	<u>Battery Peak Power, kW</u>	<u>Battery Capacity, kWh</u>	<u>Type of Solar Mount</u>	<u>Solar Capacity, kW dc</u>	<u>Solar kWh, year 1 estimate</u>	<u>Percent of Building's annual kWh from Solar</u>
Big Cypress Frank Billie Field Office	138.9	180.0	320	Carport	100	159,600	32%
Big Cypress Senior Center	83.9	110.0	150	Carport	40	63,840	28%
Big Cypress Health Clinic	201.9	260.0	640	Roof	170	271,320	22%
Big Cypress Public Safety Complex	140.3	180.0	400	Ground & Carport	135	215,460	32%
TOTALS	564.9 kW	730.0 kW	1510 kWh		445 kW	710,220 kWh	



BC Frank Billie Field Office Final Design

Ground mounted Solar Panels

BESS proposed location

Existing generator & Breaker

Existing Electrical Room

GROUND MOUNTED SYSTEM SUMMARY

NO. OF PANELS	100
NO. OF STRINGS	10
NO. OF INVERTERS	10
NO. OF BESS UNITS	1
NO. OF BREAKERS	1
NO. OF ELECTRICAL ROOMS	1

LEGEND

- Ground Mounted Solar Panels
- BESS Proposed Location
- Existing Generator & Breaker
- Existing Electrical Room

FRANK BILLIE ADMINISTRATION

Advanced Green Tech
1950 NW 22ND AVE
FT. LAUDERDALE

31277 JOSIE BILLIE HWY, T. LEWISTON, FL 33140

MODULE LAYOUT

DATE	NOV 14 2022
BY	SHAWN
NO.	10022/01

Q.PEAK DUO L-G8.2 420-435
ENDURING HIGH PERFORMANCE

Q-ANTUM TECHNOLOGY

- ENDURING HIGH PERFORMANCE:** Long term yield stability with Anti-CT Technology, anti-PID Technology, Hot Spot Protection and Temperature Stability Tech.
- EXTREME WEATHER RATING:** High-tech aluminum frame, certified for High Winds (160 mph) and Hail (1.5 inch).

THE IDEAL SOLUTION FOR:

- Commercial and Industrial
- Utility Scale
- Government

Engineered in Germany

CPS 36kW, 1000Vdc String Inverters for North America

The 36kW medium power CPS three phase inverter has been designed for small commercial rooftop, ground mount and carport applications. Featuring dual MPPT, 98.5% peak efficiency, and a wide operating window, the CPS 36kW performs well across a variety of applications. The inverter includes a variable string size with generator wiring gain to reduce installation time, the ability to mount the inverter 15-90 degrees from horizontal allowing greater design options and integrated AC and DC disconnect as standard features. The CPS Fusion Gateway enables monitoring and controls through any major PV system.

Efficiency Curve
CPS SC60KTL000US48E

High Efficiency

- Maximum efficiency of 98.5% (DC efficiency of 98%)
- 3-level technology and enhanced control resolution for enhanced high efficiency over wide load range
- 2 MPPTs to achieve higher system efficiency
- Transformerless design

High Reliability

- Standard warranty: 10 years, extensive up to 20 years
- Advanced thermal design, with an active speed fan
- General fault detection and interconnection circuit
- ATC Integrated (per UL 1699C)
- UL9541 (UL Certified CA-Listed)

Broad Adaptability

- IEEE488 (RS485) rated for outdoor applications
- 100% interactive capacity. Active power sharing, reactive power control
- Separable wiring bus design for customization
- Integrated DC & AC disconnect switches
- Wide MPPT range for flexible string sizing
- 1000V Max. DC input voltage for flexible configuration
- 15 - 90 degree from horizontal installation angle
- AC output terminal compatible with UL488C1 cable

BC Frank Billie Field Office Construction Photos



BC Frank Billie Field Office Construction Photos



BC Frank Billie Field Office Construction Photos



BC Frank Billie Field Office Finished Photos



BC Senior Center Construction Photos



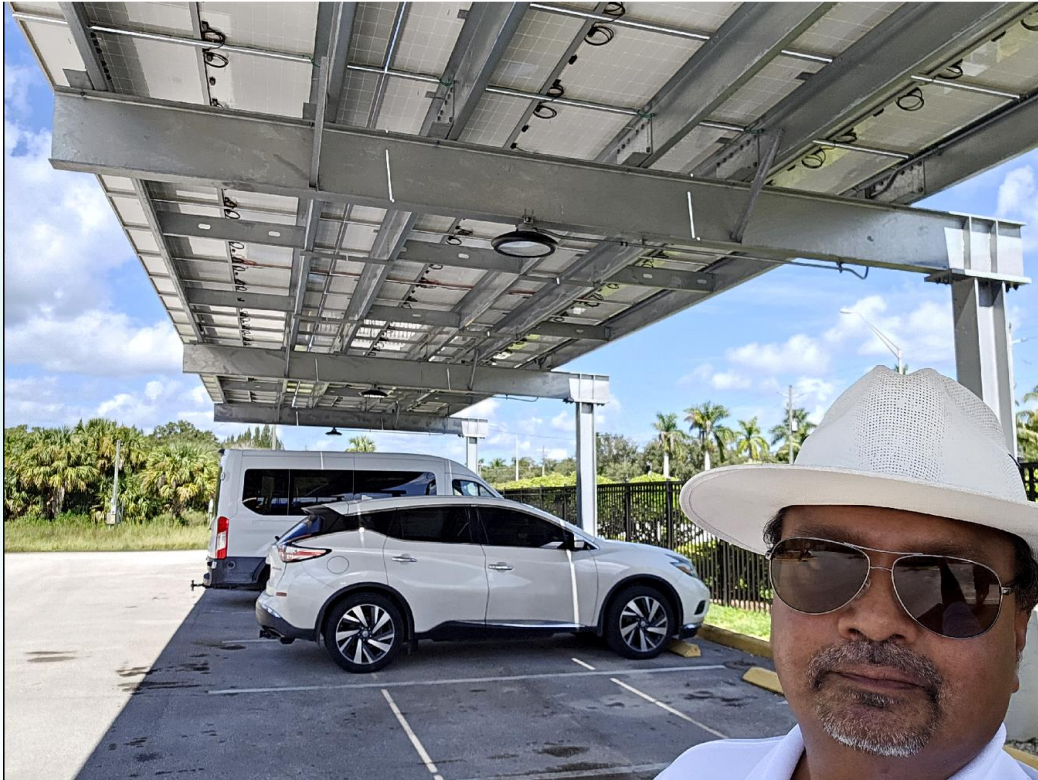
BC Senior Center Construction Photos



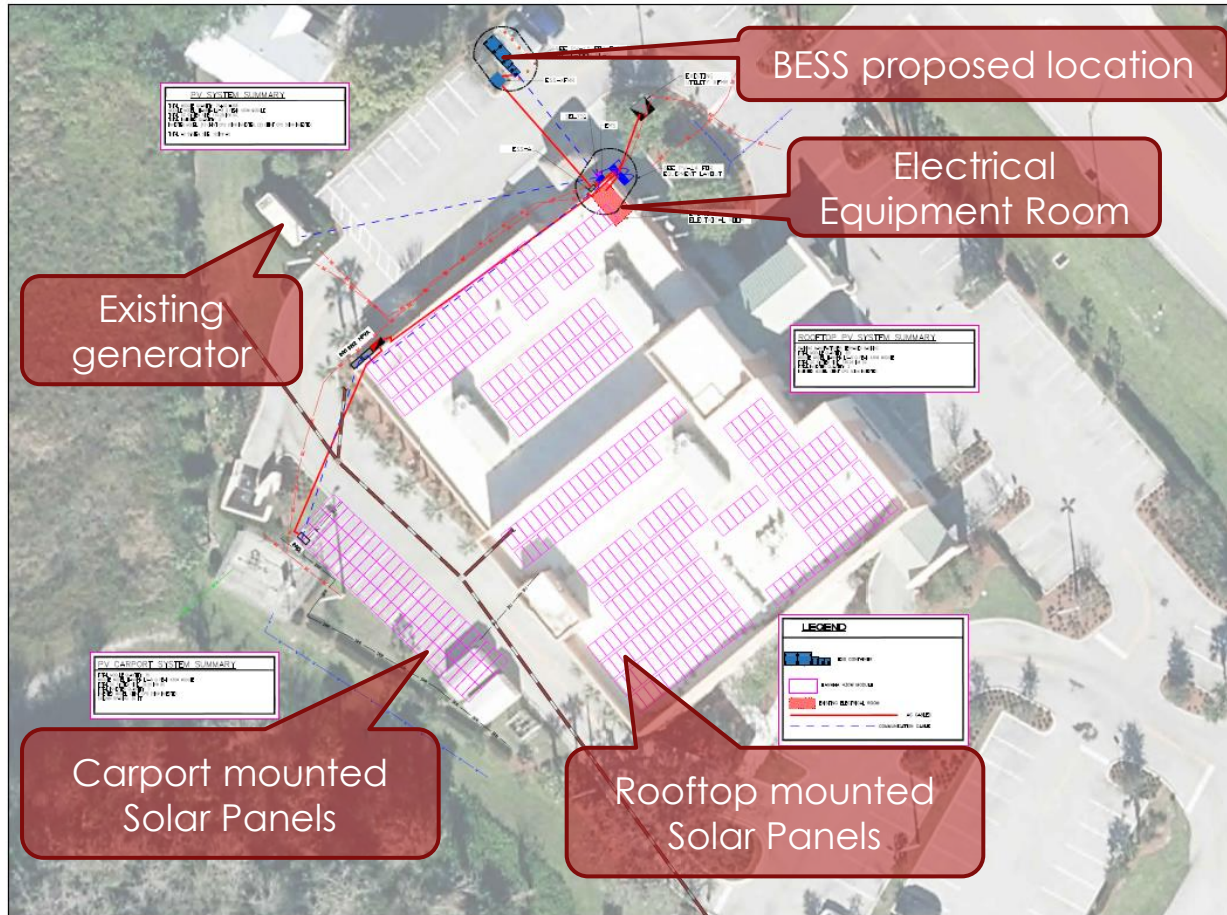
BC Senior Center Construction Photos



BC Senior Center Finished Photos



BC Health Clinic: Final Design



Existing generator

BESS proposed location

Electrical Equipment Room

Carport mounted Solar Panels

Rooftop mounted Solar Panels

1 SITE PLAN
SCALE: 1/16"=1'-0"

UET

 COORDINATOR: W. W. WEISS, P.E. # 26832

 ADVISOR: ROOFING: CA NUMBER: 34378

BIG CYPRESS HEALTH CLINIC

 PROJECT:

 DATE:

 PV MODULE LAYOUT

 DRAWN BY:

 DATE:

 AS SHOWN

Q.PEAK DUO L-G8.2

 420-435 WATT

 ENDURING HIGH PERFORMANCE

 Q-ANTUM TECHNOLOGY LOW LEVELLED COEF OF ELECTRICITY

 Higher and per surface area, lower COE, lower power losses, more efficiency rate of up to 30.3%

 INNOVATIVE ALL-WEATHER TECHNOLOGY

 Optimized cells, withstand the weather with excellent low light and low temperature tolerance

 ENDURING HIGH PERFORMANCE

 Long term yield security with Anti-UV Technology, anti PID Technology, low S-PH

 EXTREME WEATHER

 High-We-A-protecting High-power (3000W)

 A RELIABLE SYSTEM

 Includes 12-year product linear performance warranty

 MADE OF THE BEST

 Q-ANTUM DUO L-G8.2

 147mm anti-reflection coating (ARC)

 THE IDEAL SOLUTION FOR:

 Engineered in Germany

50/60kW, 1000Vdc String Inverters for North America

 The 50k & 60kW (50 & 60kW) medium power CPS three phase string inverters are designed for ground mount, large rooftop and carport applications. The units are high performance, advanced and reliable inverters designed specifically for the North American environment and grid. High efficiency at 99.9% peak and 99.9% CE, wide operating voltage, broad temperature range and a NEMA Type 4X enclosure make this inverter platform operate at high performance across many applications. The CPS 50/60kW products ship with either the Standard wire bus or the Rapid Shutdown wire bus, each fully integrated and separate with touch safe fuses, monitoring, and AC and DC Disconnect switches. The integrated DC Disconnects are fully integrated with the CPS 50/60kW AC disconnects, and the CPS 50/60kW AC disconnects are fully integrated with the CPS 50/60kW AC disconnects.

Key Features

- NEMA 4X IP65 Certified Rapid Shutdown
- 50 & 60kW string inverter maximum Active Power (kW) 50/60kW
- SolarSafe Plus AC, Apparent Power of 50/60kW and 60/60kW
- NEMA 4X IP65 enclosure & 1.5m rated for outdoor production
- 10-100° Mounting/adjustable for best profile installation
- Optional Firearmless modules remote PIR upgrade
- Integrated AC & DC Disconnect switches
- 8 MPPT's with 4 inputs each for maximum flexibility
- Copper and Aluminum compatible DC connections
- NEMA Type 4X outdoor rated, tough weather-resistant
- UL 1741 SA Compliant (A, B, C), including SA 1147 and SA 1107
- Separable wire bus design for full service
- Standard 30 year warranty with extensions to 30 years
- Generac 10 and 1.5 kW/Charger load balancer

 CPS 50kW/60kW 50/60-480

 CPS 50kW/60kW 50/60-480

 Standard Wire Bus

 Rapid Shutdown Wire Bus

BC Health Clinic Construction Photos



BC Health Clinic Construction Photos



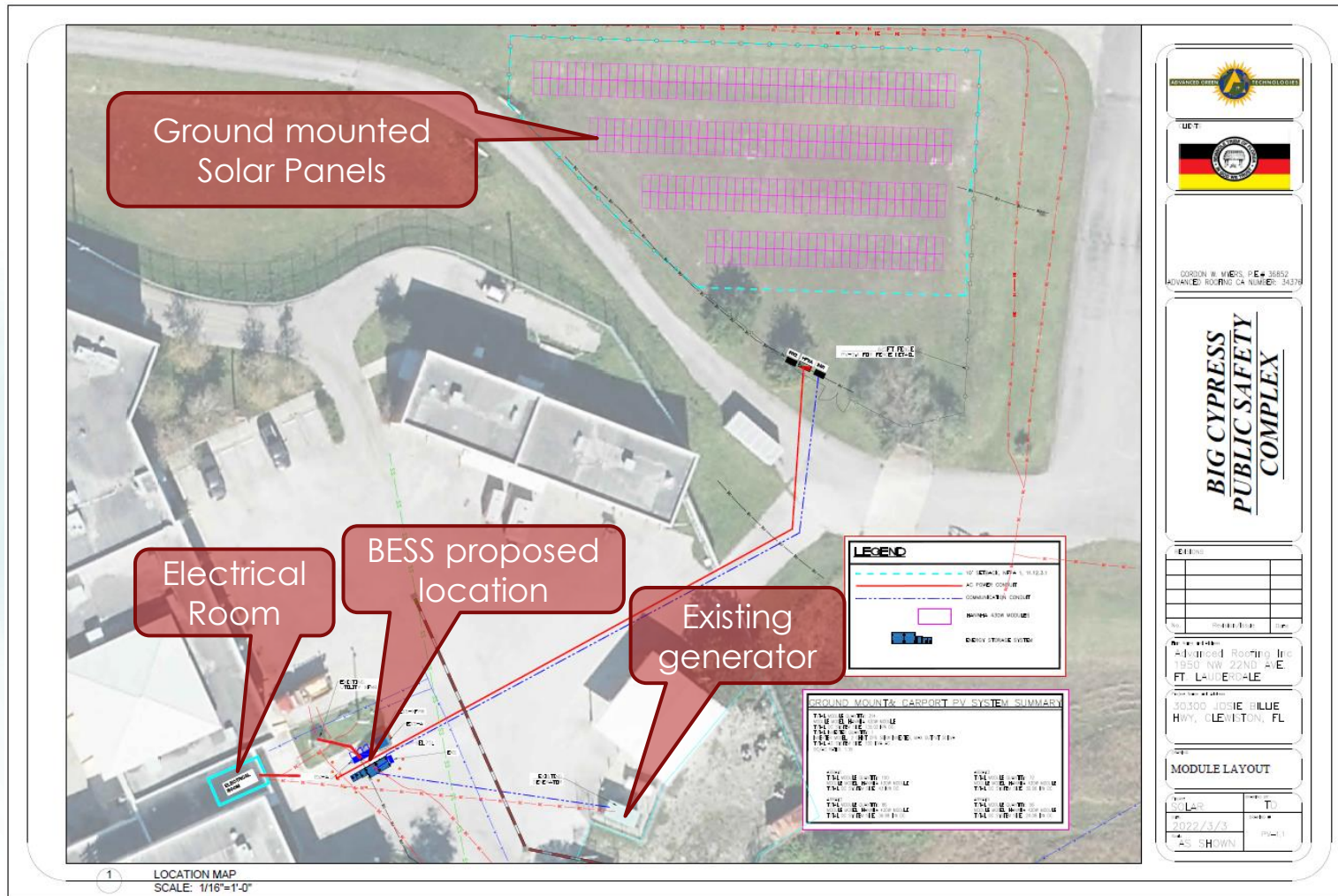
BC Health Clinic Construction Photos



BC Health Clinic Finished Photos



BC Public Safety Building: Final Design



ADVANCED ENERGY TECHNOLOGIES

UET

BIG CYPRESS PUBLIC SAFETY COMPLEX

CORON W. WISER, P.E. # 38552
ADVANCED ROOFING CA NUMBER: 34378

Advanced Roofing Inc.
1950 NW 22ND AVE
FT. LAUDERDALE

30300 JOSIE BILUE HWY, DELEWTON, FL

MODULE LAYOUT

NO.	DATE	BY	CHKD.
1	2022/3/3		

Q. PEAK DUO L-G8.2 420-435
ENDURING HIGH PERFORMANCE

Q. ANTUM TECHNOLOGY LOW LEVELLED COEF OF ELECTRICITY
Higher and per surface area, lower COC, higher power classes, with an efficiency rate of up to 20.5%.

INNOVATIVE ALL-WEATHER TECHNOLOGY
Optimal results, whatever the weather with excellent low light and low temperature tolerance.

ENDURING HIGH PERFORMANCE
Long term yield security with Antum's Technology, and IVD Technology, for 30 years.

SIZE OF THE ART
Q. ANTUM DUO L-G8.2 is a high performance solar panel designed for high performance across many applications. The Q. ANTUM DUO L-G8.2 products ship with either the Standard wire bus or the Rapid Shutdown wire bus, each fully integrated and separate with touch safe fusing, monitoring, and AC and DC Disconnect protection. The integrated IVD system allows the Rapid Shutdown wire bus enables PVMS or third module level rapid shutdown when used with the Q. ANTUM DUO L-G8.2 AC conductors, and Q. ANTUM DUO L-G8.2 AC products, and PVMS products. The Q. ANTUM DUO L-G8.2 enables monitoring, control and remote product reliability.

THE IDEAL SOLUTION FOR:

- Commercial and Industrial
- Government and Public
- Residential

Engineered in Germany

CPS 50/60kW, 1000Vdc String Inverters for North America

The Q. ANTUM DUO L-G8.2 and Q. ANTUM DUO L-G8.2 AC products are designed for ground mount, large rooftop and current applications. The units are high performance, advanced and reliable inverters designed specifically for the North American environment and grid. High efficiency at 98.0% peak and 98.0% CE, with operating voltage, broad temperature range and a NEMA Type 4X enclosure enable this inverter platform to operate at high performance across many applications. The CPS 50/60kW products ship with either the Standard wire bus or the Rapid Shutdown wire bus, each fully integrated and separate with touch safe fusing, monitoring, and AC and DC Disconnect protection. The integrated IVD system allows the Rapid Shutdown wire bus enables PVMS or third module level rapid shutdown when used with the Q. ANTUM DUO L-G8.2 AC conductors, and Q. ANTUM DUO L-G8.2 AC products, and PVMS products. The CPS Flex Gateway enables monitoring, control and remote product reliability.

Key Features

- NEMA 4X IP66 Certified Rapid Shutdown
- 50 & 60kW string inverter maximum Active Power (kW) 50/60kW
- Solarable Max AC Apparent Power of 50/60kW and 80/90kVA
- NEMA 4X IP66 Certified & UL listed for fire and arc flash protection
- 10-100 Mounting configurations for best profile installation
- Optional Flex Gateway enables remote PV upgrade
- Integrated AC & DC Disconnect switches
- 4 MPPT's with 4 inputs each for maximum flexibility
- Copper and Aluminum compatible DC connections
- 400V Type 40 conductor rated, touch safe construction
- 400V AC Conductor (A-Bus) 2", including 1/4" H-Fin and 5/8" SWG
- Separable wire bus design for full service
- Standard 30 year warranty with extensions to 30 years
- Generac 10 and 1.5 DC/AC Chiller load relief

Q. ANTUM DUO L-G8.2-420
Q. ANTUM DUO L-G8.2-435

Standard Wire Bus

Rapid Shutdown Wire Bus

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BC Public Safety Building Construction Photos



BC Public Safety Building Construction Photos



BC Public Safety Building Construction Photos



Material Costs Escalation & Delays

ISSUES

- Project started in the midst of Supply Chain disruptions
- Materials prices increased dramatically
- Delivery times increased significantly
- Resulted in the need for a Change Order for Time and Money

CHANGE ORDER 1

- Original Contract Amount: \$2,945,017
- Net Change Order: \$584,794.80
- New Contract Amount: \$3,529,811.80
- Original Contract Time: 184 days
- Net Time Change: 165 days
- New Contract Time: 349 days

Material Availability Delays

ISSUES

- Motorized Breakers long lead time items
- Automatic Transfer Switches (ATS)
- Temporary ATS required to switch between Generator and Grid during rewiring
- Motorized breakers failures

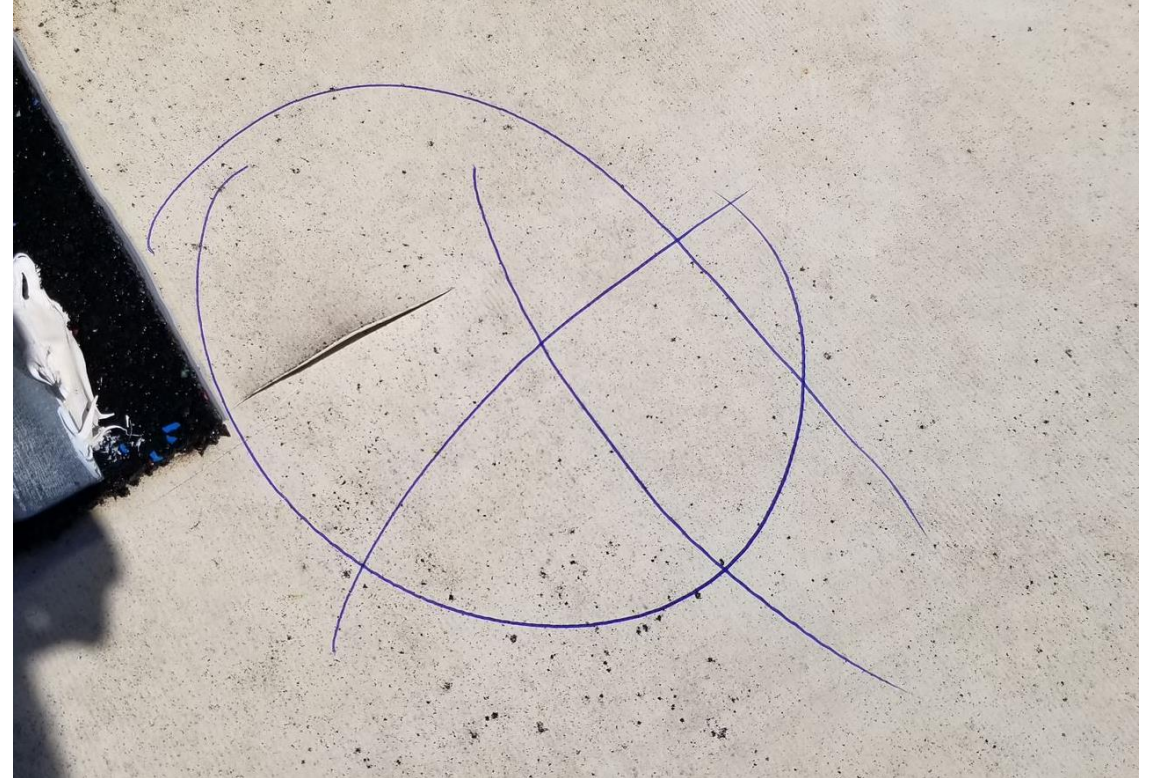
CHANGE ORDER 2

- Revised Contract Amount: \$3,529,811.80
- Net Change Order: \$0
- New Contract Amount: \$3,529,811.80
- Revised Contract Time: 349 days
- Net Time Change: 223 days
- New Contract Time: 572 days

Unforeseen Circumstances

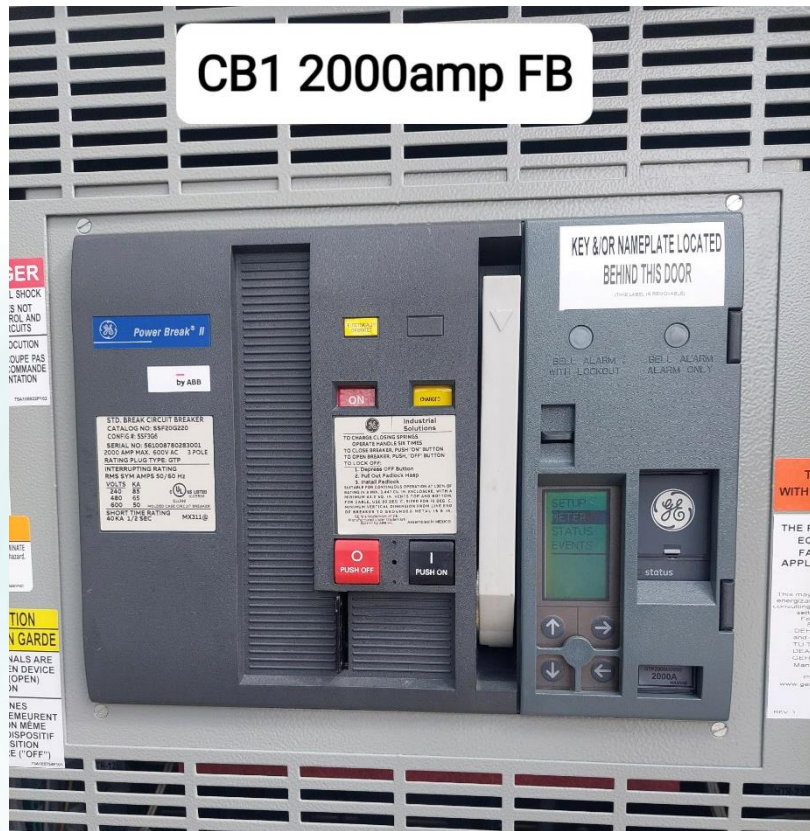


Unmarked sanitary sewer line conflict



Roof membrane damage that caused leak into BC Health Clinic

Unforeseen Circumstances



Motorized Breaker missing USP backup



Cellular Modem not transmitting when enclosed in cabinet. Needed antenna.

Lessons Learned

- Double check PV and BESS Storage needs to provide desired resilience
- Balancing size of BESS to allow for desired duration of battery only energy without oversizing can be hard to explain
- Getting Design/Build contract award through Legal and Procurement is very time consuming
- Expect delays due to unforeseen circumstances and be flexible
 - Supply Chain Issues
 - Cost & Time Increase
- Keep DOE informed
- Underground locates are never 100% accurate
- Dry retention areas can be used for installation of Solar Panel Arrays
 - Try to time work before rainy season
 - Have alternative plan in place in case of pile refusals
- Roof can be damaged during installation
- Torque testing of connections is very important, especially with carports
- Start working on interconnection agreement early
- Expect resistance to service interruption for interconnection from facility users

Lessons Learned

- Backup Generators can fail
- Temporary ATS and wiring is very expensive
- Cellular modems are not very reliable when placed inside cabinets. Add antenna
- Motorized breakers need USP type backup
- Punch list items can take longer than anticipated to get completed because key staff get reassigned to other projects
- Commissioning can take much longer than anticipated
- Getting real time access to monitoring system can take longer than anticipated

Activities Yet to be Completed

- ~~Completion of Construction~~
- ~~Battery Delivery~~
- ~~Motorized Breaker Delivery~~
- ~~Interconnection~~
- ~~Commissioning~~
- ~~Executed Interconnect Agreements~~
- ~~Project Acceptance & Closeout~~
- First year production reporting



Planned VS Actual

PLANNED

Big Cypress	kW Peak Demand kW	Battery Peak Power, kW	Battery Capacity, kWh	Type of Solar Mount	Solar Capacity, kW dc	Solar kWh, year 1 estimate	Average Percent of Building's annual kWh from Solar
Big Cypress Frank Billie Field Office	138.9	180	320	Carport	100	159,600	32%
Big Cypress Senior Center	83.9	110	150	Carport	40	63,840	28%
Big Cypress Health Clinic	201.9	260	640	Roof	170	271,320	22%
Big Cypress Public Safety Complex	140.3	180	400	Ground & Carport	135	215,460	32%
TOTALS	564.9	730	1510		445	710,220	27%

ACTUAL PROJECTIONS

Big Cypress	kW Peak Demand kW	Battery Peak Power, kW	Battery Capacity, kWh	Type of Solar Mount	Solar Capacity, kW dc	Solar kWh, year 1 estimate	Average Percent of Building's annual kWh from Solar
Big Cypress Frank Billie Field Office	138.9	250	500	Ground	103	158,017	32%
Big Cypress Senior Center	83.9	125	250	Carport	40	60,547	27%
Big Cypress Health Clinic	201.9	250	500	Roof & Carport	170	257,871	21%
Big Cypress Public Safety Complex	140.3	250	500	Ground	135	216,483	32%
TOTALS	564.9	875	1750		448	692,918	26%



Add Link To Monitoring Dashboard

CERTIFICATE OF COMPLETION


Seminole Tribe of Florida
 Tribal Inspector's Department
 

This certifies that the referenced building or portion thereof, as noted below, has been inspected and found to be in compliance with the requirements of the code noted below with the laws and ordinances regulating building construction and use, and is hereby issued a Certificate of Occupancy.

Permit Type	COMMERCIAL	Bldg. Permit No.	SOL-03-22-010268
Owner	FRANK BILLIE FIELD OFFICE	Contractor	ADVANCED GREEN TECHNOLOGIES
Group Occupancy	(FBC 2020 7th Edition)	Date Issued	October 19, 2023
Construction Type	N/A	Work Desc.	ADMIN BLDG INSTALLATION OF SOLAR GROUND MOUNT ARRAY

Any deviation after approval is entirely at risk of the property owner.

31000 Josie Billie Hwy Clewiston, FL 33440
 Location _____

David Burgueno 

Print Name _____ Certified Building Official

**Not Transferable
POST IN A CONSPICUOUS PLACE**

CERTIFICATE OF COMPLETION


Seminole Tribe of Florida
 Tribal Inspector's Department
 

This certifies that the referenced building or portion thereof, as noted below, has been inspected and found to be in compliance with the requirements of the code noted below with the laws and ordinances regulating building construction and use, and is hereby issued a Certificate of Occupancy.

Permit Type	COMMERCIAL	Bldg. Permit No.	SOL-03-22-010269
Owner	STOF SENIOR CENTER - BC	Contractor	ADVANCED GREEN TECHNOLOGIES
Group Occupancy	(FBC 2020 7th Edition)	Date Issued	October 19, 2023
Construction Type	N/A	Work Desc.	INSTALLATION OF SOLAR CARPORT - SENIOR CENTER

Any deviation after approval is entirely at risk of the property owner.

30988 Josie Billie Hwy Clewiston, FL 33440
 Location _____

David Burgueno 

Print Name _____ Certified Building Official

**Not Transferable
POST IN A CONSPICUOUS PLACE**



CERTIFICATE OF COMPLETION


Seminole Tribe of Florida
 Tribal Inspector's Department
 

This certifies that the referenced building or portion thereof, as noted below, has been inspected and found to be in compliance with the requirements of the code noted below with the laws and ordinances regulating building construction and use, and is hereby issued a Certificate of Occupancy.

Permit Type	COMMERCIAL	Bldg. Permit No.	SOL-03-22-010267
Owner	BC MEDICAL CENTER.	Contractor	ADVANCED GREEN TECHNOLOGIES
Group Occupancy	(FBC 2020 7th Edition)	Date Issued	October 20, 2023
Construction Type	N/A	Work Desc.	INSTALL SOLAR CARPORT & SOLAR ARRAY ON BLDG ROOFTOP

Any deviation after approval is entirely at risk of the property owner.

31055 Josie Billie Hwy Clewiston, FL 33440
 Location _____

David Burgueno 

Print Name _____ Certified Building Official

**Not Transferable
POST IN A CONSPICUOUS PLACE**

CERTIFICATE OF COMPLETION


Seminole Tribe of Florida
 Tribal Inspector's Department
 

This certifies that the referenced building or portion thereof, as noted below, has been inspected and found to be in compliance with the requirements of the code noted below with the laws and ordinances regulating building construction and use, and is hereby issued a Certificate of Occupancy.

Permit Type	COMMERCIAL	Bldg. Permit No.	SOL-03-22-010266
Owner	- PUBLIC SAFETY COMPLEX - BC	Contractor	ADVANCED GREEN TECHNOLOGIES
Group Occupancy	(FBC 2020 7th Edition)	Date Issued	October 19, 2023
Construction Type	N/A	Work Desc.	INSTALLATION OF GROUND MOUNT SOLAR ARRAY PUBLIC SAFETY BLDG

Any deviation after approval is entirely at risk of the property owner.

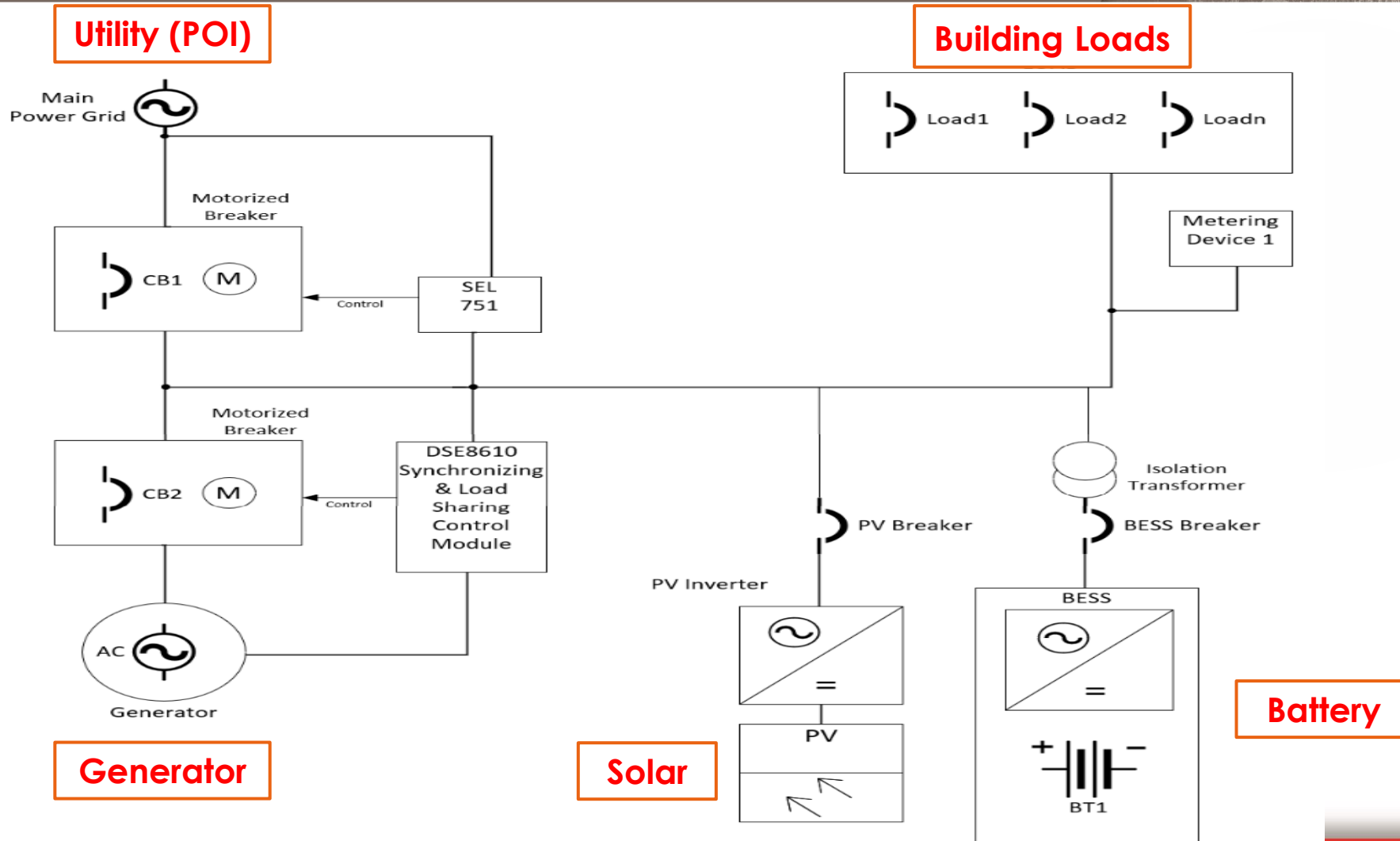
30300 Josie Billie Hwy Clewiston, FL 33440
 Location _____

David Burgueno 

Print Name _____ Certified Building Official

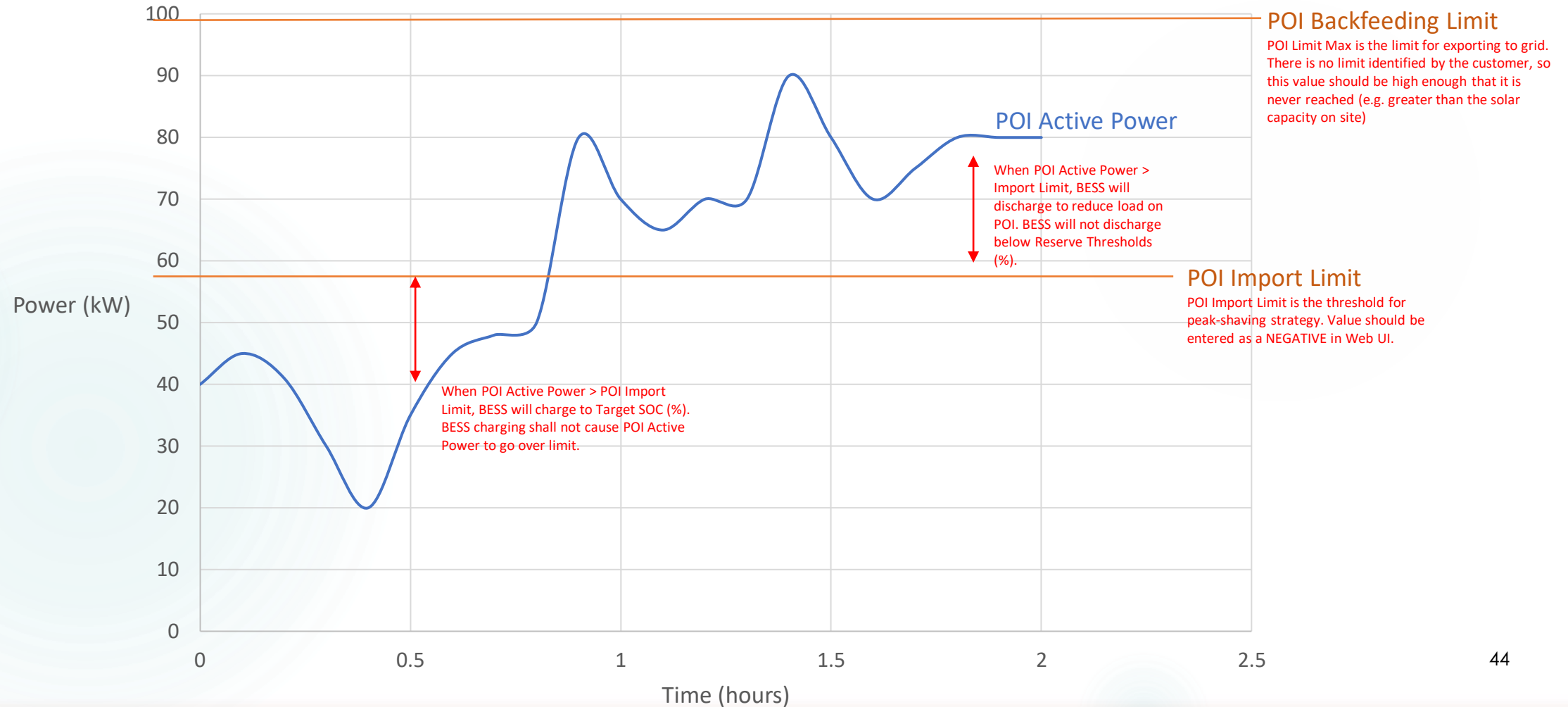
**Not Transferable
POST IN A CONSPICUOUS PLACE**

How System Works

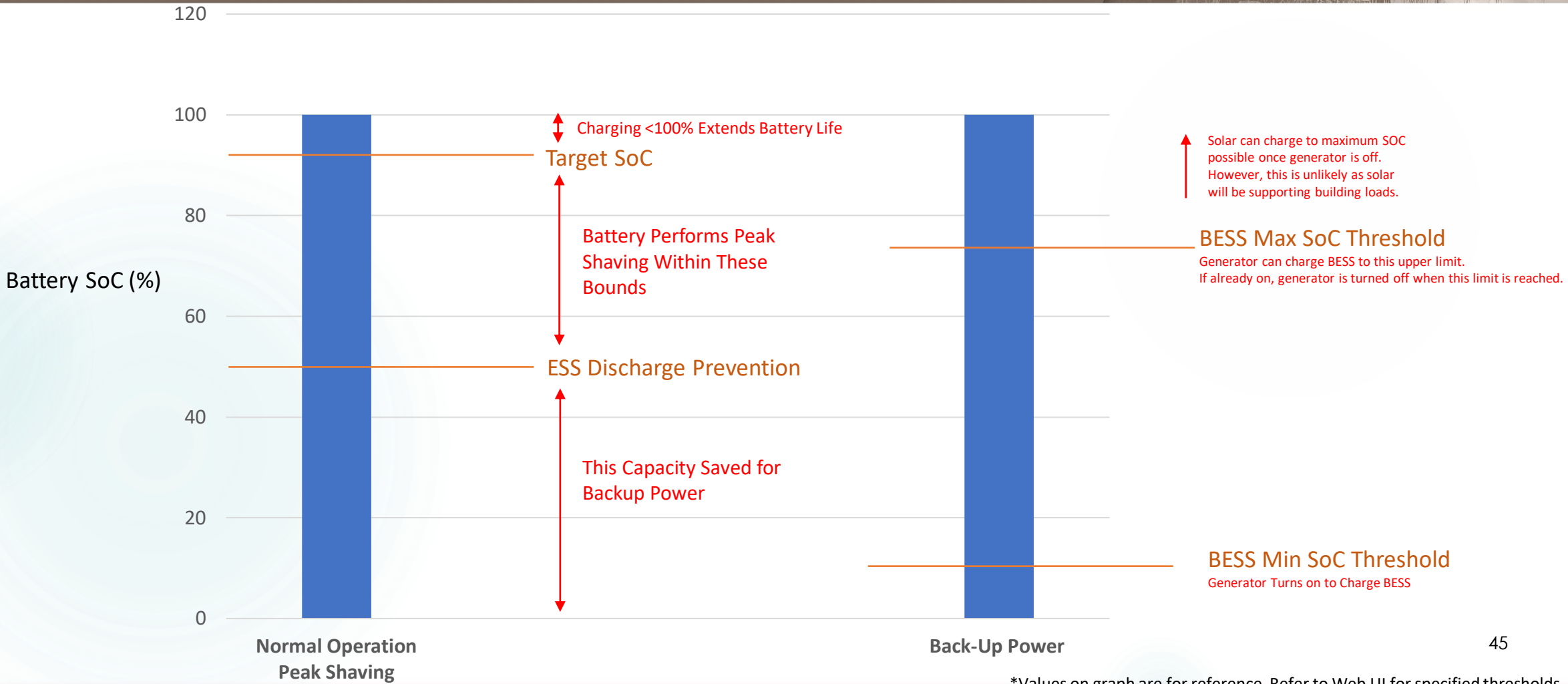


Normal Operations- Peak Shaving Thresholds

Normal Operation – Peak Shaving Thresholds

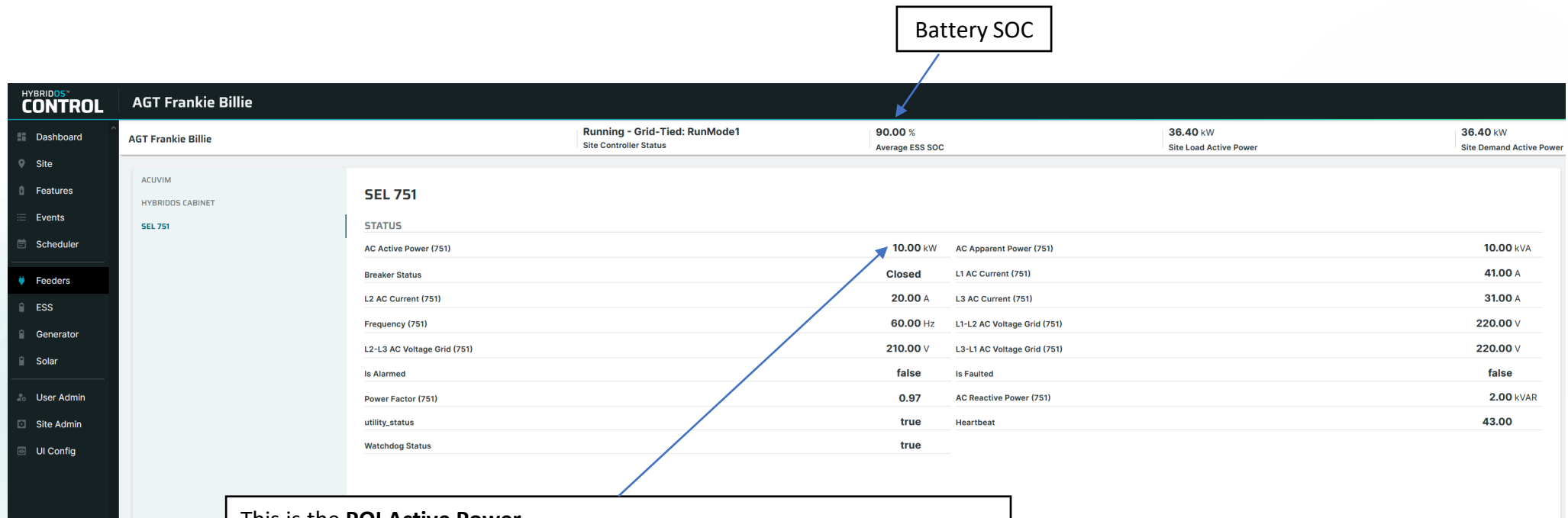


Battery SoC Thresholds



*Values on graph are for reference. Refer to Web UI for specified thresholds.

Monitoring Dashboard Grid



This is the **POI Active Power**.

- When POI Active Power > Threshold, BESS will discharge (peak shaving)
- When POI Active Power < Threshold, BESS will charge.

In this case, the POI Active Power (10kW) is less than the threshold (60kW) – so battery should be charging at the difference (50kW). Battery is not charging because it reached the Target SOC (90%).

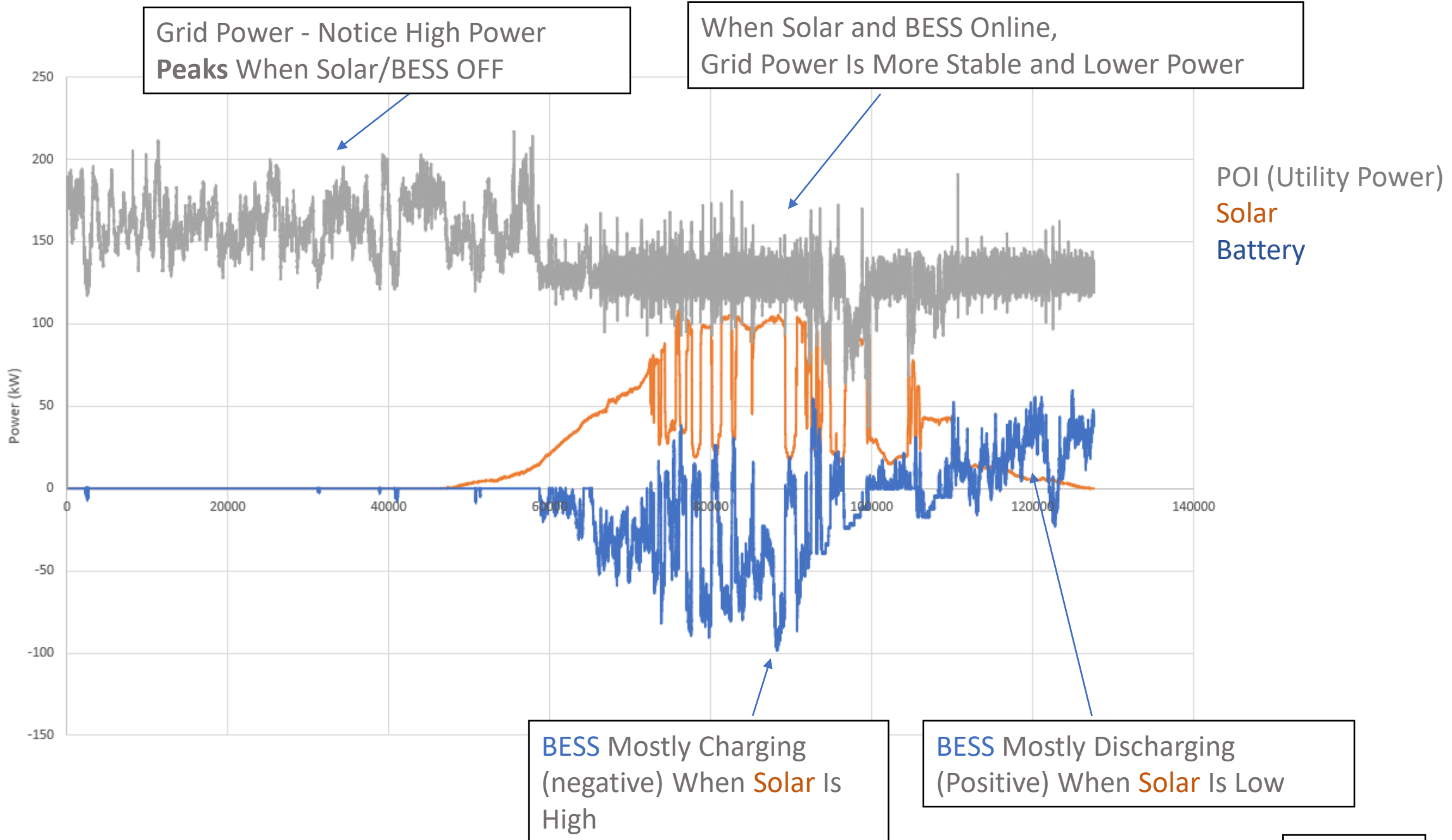
Monitoring Dashboard Solar

Solar Generation

The dashboard displays the following information:

- Header:** HYBRIDOS CONTROL, AGT Frankie Billie, 12:22:22 EST Time Zone.
- Site Status:** Running - Grid-Tied: RunMode1, Site Controller Status.
- Key Metrics:** 90.00 % Average ESS SOC, 36.53 kW Site Load Active Power, 36.53 kW Site Demand Active Power.
- RunMode1:** A red button indicating the current system mode.
- Solar 1 Data Table:**

Solar 1			
STATUS			
Active Power	13.00 kW	Active Power Setpoint	36.00 kW
Apparent Power	13.00 kVA	L1 AC Current	14.50 A
L2 AC Current	15.00 A	L3 AC Current	15.00 A
Alarms Present	false	Faults Present	false
Power Factor	1.00	Reactive Power	0.00 kVAR
Reactive Power Setpoint	0.00 kVAR	Status	Running
L1-L2 AC Voltage	505.40 V	L2-L3 AC Voltage	501.60 V
- Solar 1 Controls:** Maintenance Mode (off), START, STOP, CLEAR FAULTS buttons, and input fields for Active Power Setpoint (0.00 kW) and Reactive Power Setpoint (0.00 kW).



Energy Usage Comparison Public Safety Building

NNNN

Page 1 of 1



PO Box 519
Moore Haven FL 33471-0519

"Neighbors Working for Neighbors"

Pay By Phone: 1-844-201-7203
Office Hours: Monday-Thursday 7am - 6pm
Phone: 863-946-6200 (24/7 Outage Reporting)
Fax: 1-866-233-2117 www.gladeselectric.com

SEMINOLE TRIBE OF FLORIDA
BUILDING & GROUNDS
6300 STIRLING ROAD
HOLLYWOOD FL 33024-2153

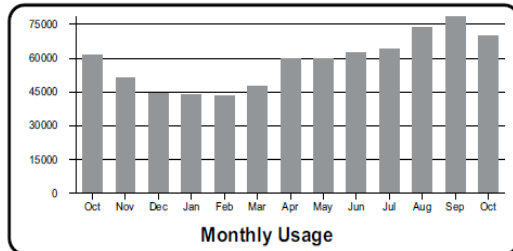
Account Number 108000016	
Statement Date 10/28/2022	Due Date 11/20/2022

Billing Summary	
Balance From Last Billing	11,357.75
Payment Received 10/20/22	11,357.75 CR
Balance Forward	0.00
Current Charges	10,247.37
Account Balance	10,247.37

Messages	
Enroll in paperless billing to enter our quarterly drawing for a \$100 bill credit. Call us at 863-946-6200 or sign up in SmartHub.	

Average Temperature: 78 F

Serv Add: 30300 JOSIE BILLIE HWY				Rate Class: 80		Rate: Large Power Service Demand		
Meter	Type	From	To	Days	Prev Rdg	Pres Rdg	Usage	Multiplier
60861334	kWh	09/23/22	10/23/22	30	71804	72676	69760	80
	KW					1.79	143	80



Details of Electric Charges

kWh Charge	69,760 kWh @ 0.10400	7,255.04
Power Cost Adjustment	69,760 kWh @ 0.00935	652.26
TIER Tracker	69,760 kWh @ 0.01130	788.29
Demand Charge	143.20 kW @ 8.00	1,145.60
Base Charge		150.00
Florida Gross Receipts		256.18
Total This Service		10,247.37

To Be Paid by Draft

Current Month Average kWh Per Day: 2325
Current Average Cost Per Day: \$341.58

NNNN



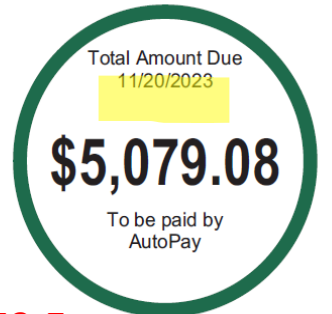
gladeselectric.com | 863-946-6200

SEMINOLE TRIBE OF FLORIDA
BUILDING & GROUNDS
6300 STIRLING ROAD
HOLLYWOOD FL 33024-2153
ACCOUNT NUMBER: 108000016

See back of bill for account summary and payment options

Message Center

- The SmartHub website is getting a new look on December 12. Log on with your computer to gladeselec.smarthub.coop to check out the simplified design.
- Shorter days and longer nights are coming, but we have outdoor lighting solutions to help. Call us at 863-946-6200 for details or to report maintenance needs for existing lighting.
- Enroll in paperless billing to enter our quarterly drawing for a \$100 bill credit. Call us at 863-946-6200, sign up in the SmartHub app, or use the contact form on our website.
- High-speed fiber internet is coming to all GEC members. For details, visit www.conexonconnect.com or call 844-542-6663.

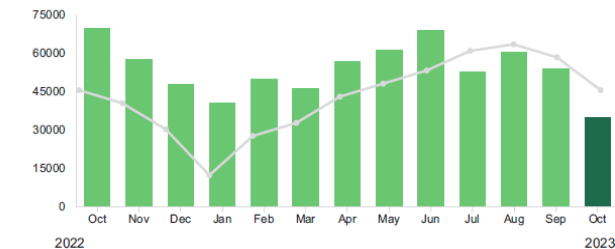


Average Temperature: 79 F

Your Energy Snapshot

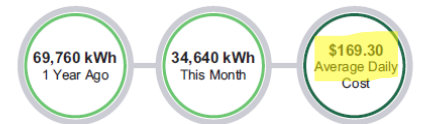
Learn more at gladeselec.smarthub.coop or download the SmartHub app.

KILOWATT HOURS Average Outdoor Temperature (°F) TEMPERATURE



Your Energy Breakdown

This month's energy use compared to this month last year.



Brighton 4 Solar Project



Project Partners

- Seminole Tribe of Florida
- DOE Office of Indian Energy
- Consultants (Baker Tilly, Sandia Labs, Jacobs Engineering Group)
- Contractor (Advanced Green Technologies)
- Glades Electric



BR 4 Solar Project Overview

- The Seminole Tribe of Florida was awarded a contract to design and build approximately 475 kW of solar facilities and 1,810 kWh battery energy storage system (BESS), with transfer switches and control systems that will serve 4 essential facilities in the Brighton Reservation.
- The systems will be interconnected to the grid and the backup generators
- During outage BESS will be able to run the facilities for approx. 3 hours before generator kicks in
- Generator runs facility and recharges BESS then cuts off and switches over to BESS during extended outages

<u>Brighton</u>	<u>kW Peak Demand</u>	<u>Battery Peak Power, kW</u>	<u>Battery Capacity, kWh</u>	<u>Type of Mount</u>	<u>Solar Capacity, kW dc</u>	<u>Solar kWh, year 1 estimate</u>	<u>Percent of Building's annual kWh from Solar</u>
Brighton Health Clinic	70.8	90.0	150	Ground	100	159,600	73%
Brighton Administration Building	179.6	230.0	570	Carport / Roof	125	199,500	29%
Brighton Public Safety Building	286.7	360.0	740	Carport / Roof	125	199,500	15%
Brighton Veterans Building	140.2	180.0	350	Carport	125	199,500	34%
TOTALS	677 kW	860 kW	1810 kWh		475 kW	758,100 kWh	26%

BR Public Safety & Administration Buildings: Concept



Brighton Public Safety and Administration Sites

600 E Harney Pond Road, Okeechobee, FL 34974

650 E Harney Pond Road, Okeechobee, FL 34974

Public Safety

(goal dc)

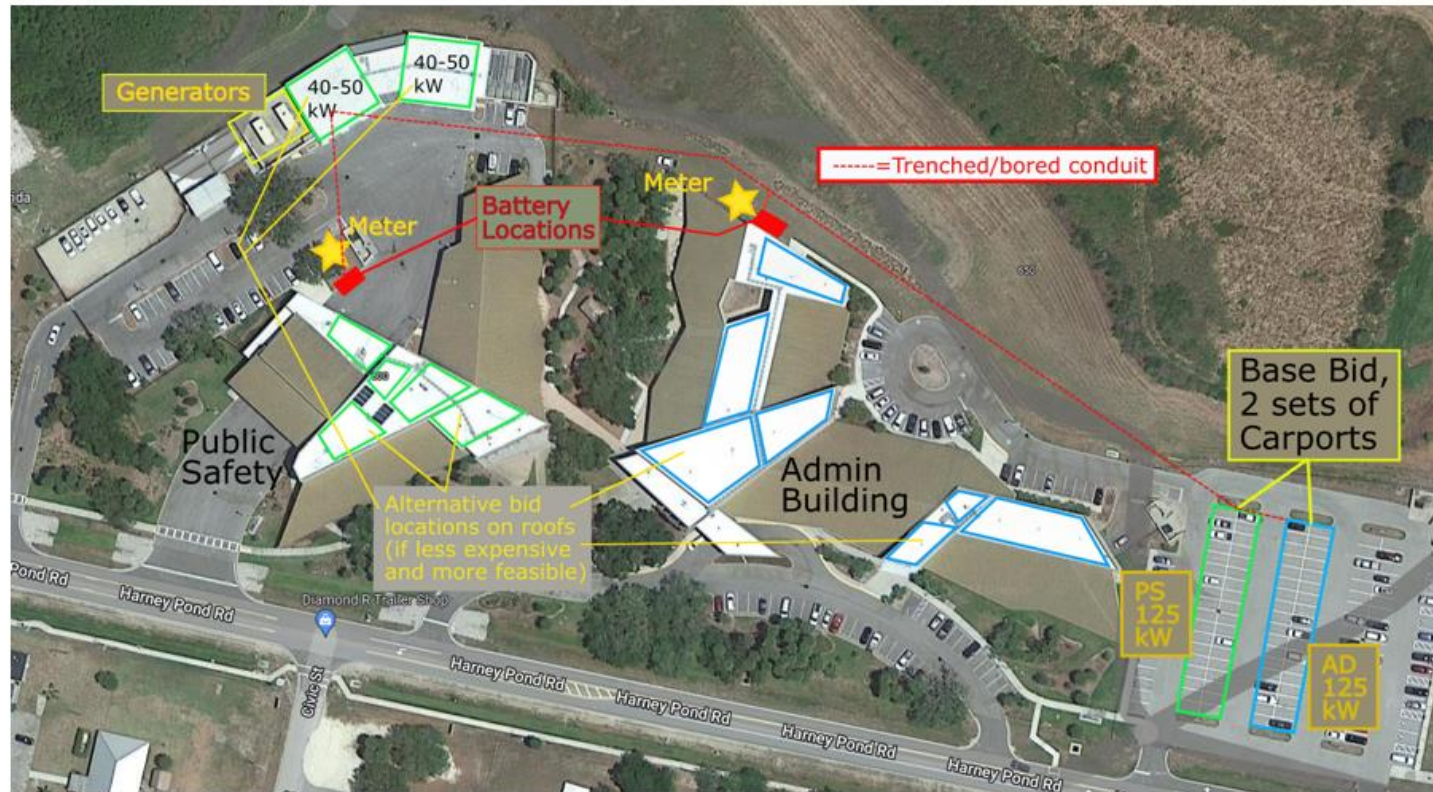
125 kW minimum
200 kW maximum

(estimated ac)

740 kWh Battery Capacity
360 kW Power Supply

Note:

Carport Solar is part of the Base Bid,
Rooftop Solar is an Alternate Bid



Brighton Administration

(goal dc)

125 kW Minimum
150 kW Maximum

(estimated ac)

570 kWh Battery Capacity
230 kW Power Supply

Note:

Carport Solar is part of the Base Bid,
Rooftop Solar is an Alternate Bid

BR Veterans Building: Concept

Brighton Veterans Center

800 E Harney Pond Road, Okeechobee, FL 34974

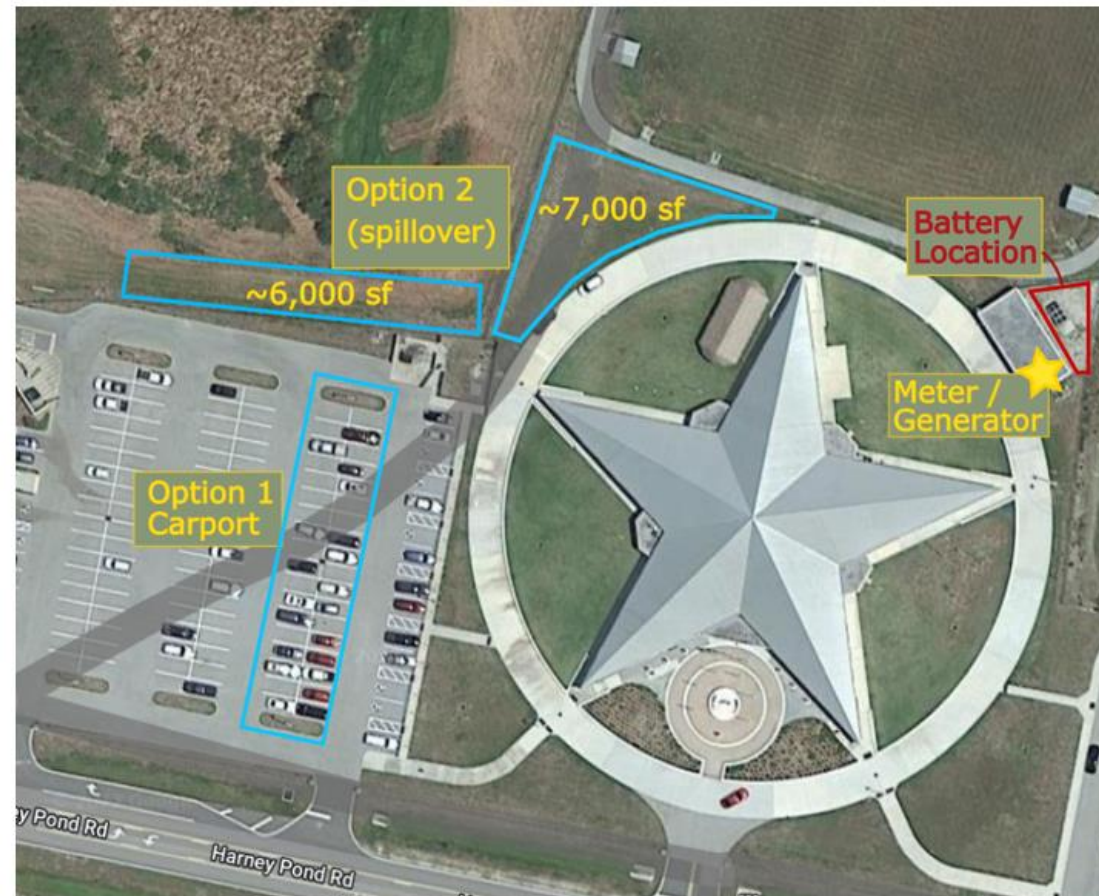
BR Veterans Center

(goal dc)

100 kW minimum
150 kW maximum

(estimated ac)

350 kWh Battery Capacity
180 kW Power Supply



Note:

Recommend to walk the site to verify best layout. It gets wet to the north the farther you move away from the parking lot.

BR Health Clinic: Concept



Brighton Health Clinic
Street, Okeech



BR Health Clinic

- Keep in
- There is a

(goal dc)
100 kW PV

(estimated ac)

150 kWh Battery Cap
90 kW Power Sup

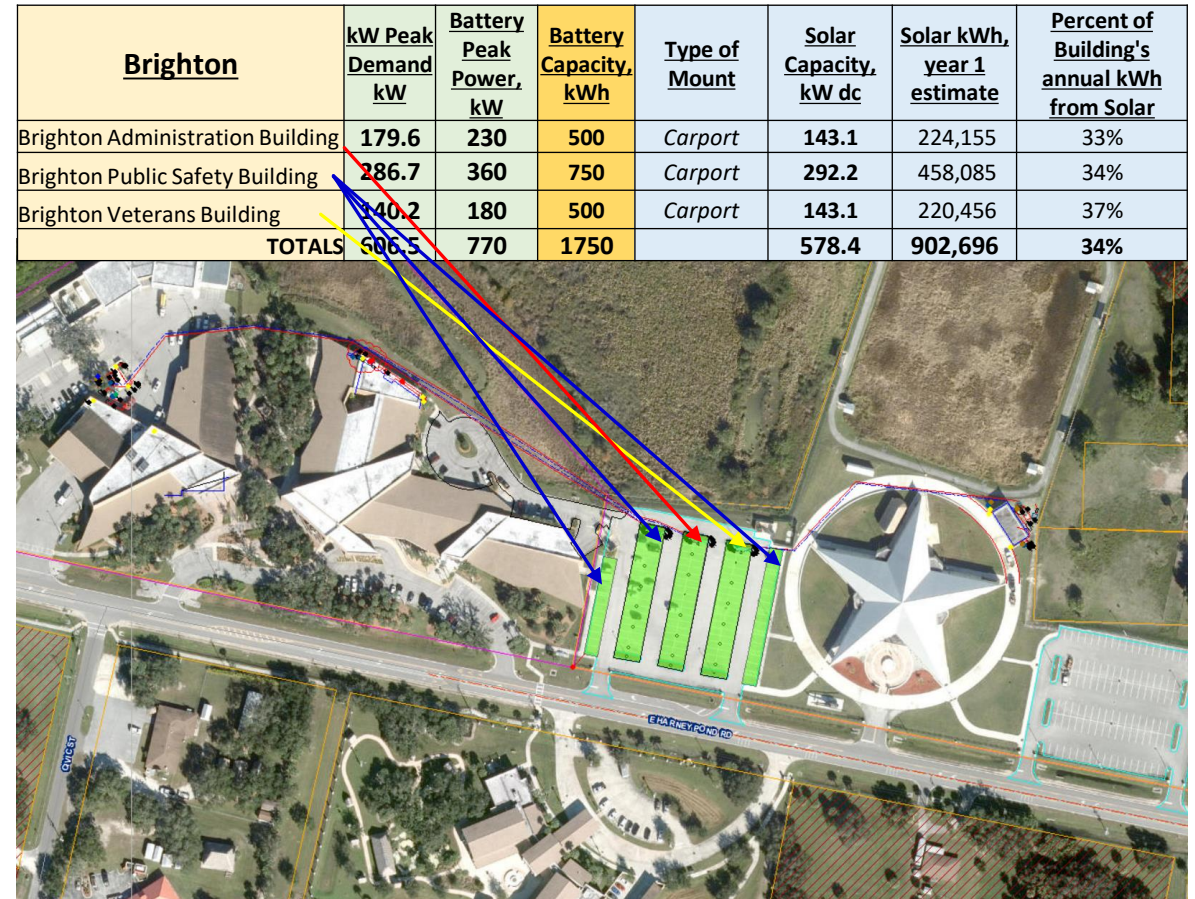
Note:
Recommend to walk
the site to verify
best layout. Indicate
what trees (if any)
need to be removed.

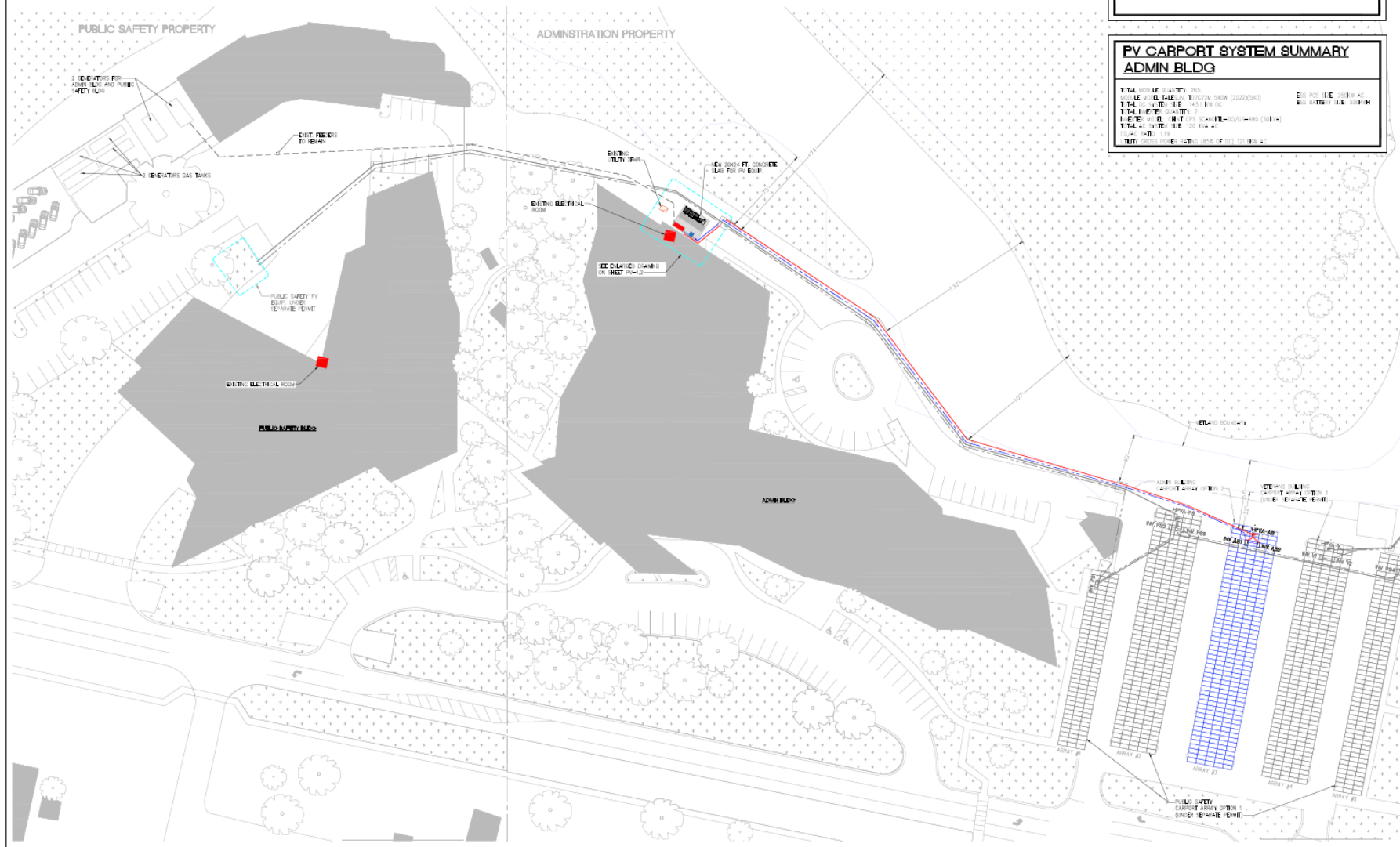
PV Array
Goal = 100 kW
array require tree removal



BR Solar Project Revised scope

- The Seminole Tribe of Florida will design and build approximately 578 kW of solar facilities and 1,750 kWh battery energy storage system (BESS), with transfer switches and control systems that will serve 3 essential facilities in the Brighton Reservation.
- The systems will be interconnected to the grid and the backup generators
- During outage BESS will be able to run the facilities for approx. 3 hours before generator kicks in
- Generator runs facility and recharges BESS then cuts off and switches over to BESS during extended outages





LEGEND

	AC POWER CONDUIT
	COMM. CABLE CONDUIT

**PV CARPORT SYSTEM SUMMARY
ADMIN BLDG**

TOTAL MODULE QUANTITY: 285	ESS PUBLIC AC INVERTER
TOTAL DC WIRE LENGTH: 100000 FT	ESS BATTERY A/C INVERTER
TOTAL AC WIRE LENGTH: 100000 FT	
TOTAL PV SYSTEM DC VOLTAGE: 480V	
TOTAL PV SYSTEM AC VOLTAGE: 240V	
TOTAL PV SYSTEM AC CURRENT: 100A	

1 MODULE LAYOUT
SCALE: 1/4" = 1'-0"

90% ELECTRICAL DESIGN PACKAGE
NOT FOR CONSTRUCTION



GORDON W. MYERS, P.E. # 36952
ADVANCED ROOFING, CA NUMBER: 34376

BRIGHTON ADMINISTRATION BUILDING

REVISIONS

No.	Description	Date

Advanced Green Tech.
1950 NW 22nd Ave.
Ft. Lauderdale, FL 33311

650 E. HARNEY POND RD.
CHEEHOBBE, FL 34874

MODULE LAYOUT

Project No.	22P827	Client	AR
Date	11/03/2023	Sheet No.	PV-1.1
Scale	AS SHOWN		





GORDON W. MYERS, P.E. # 36882
 ADVANCED ROOFING CA NUMBER: 34376

BRIGHTON VETERANS BUILDING

REVISIONS

No.	Description	Date

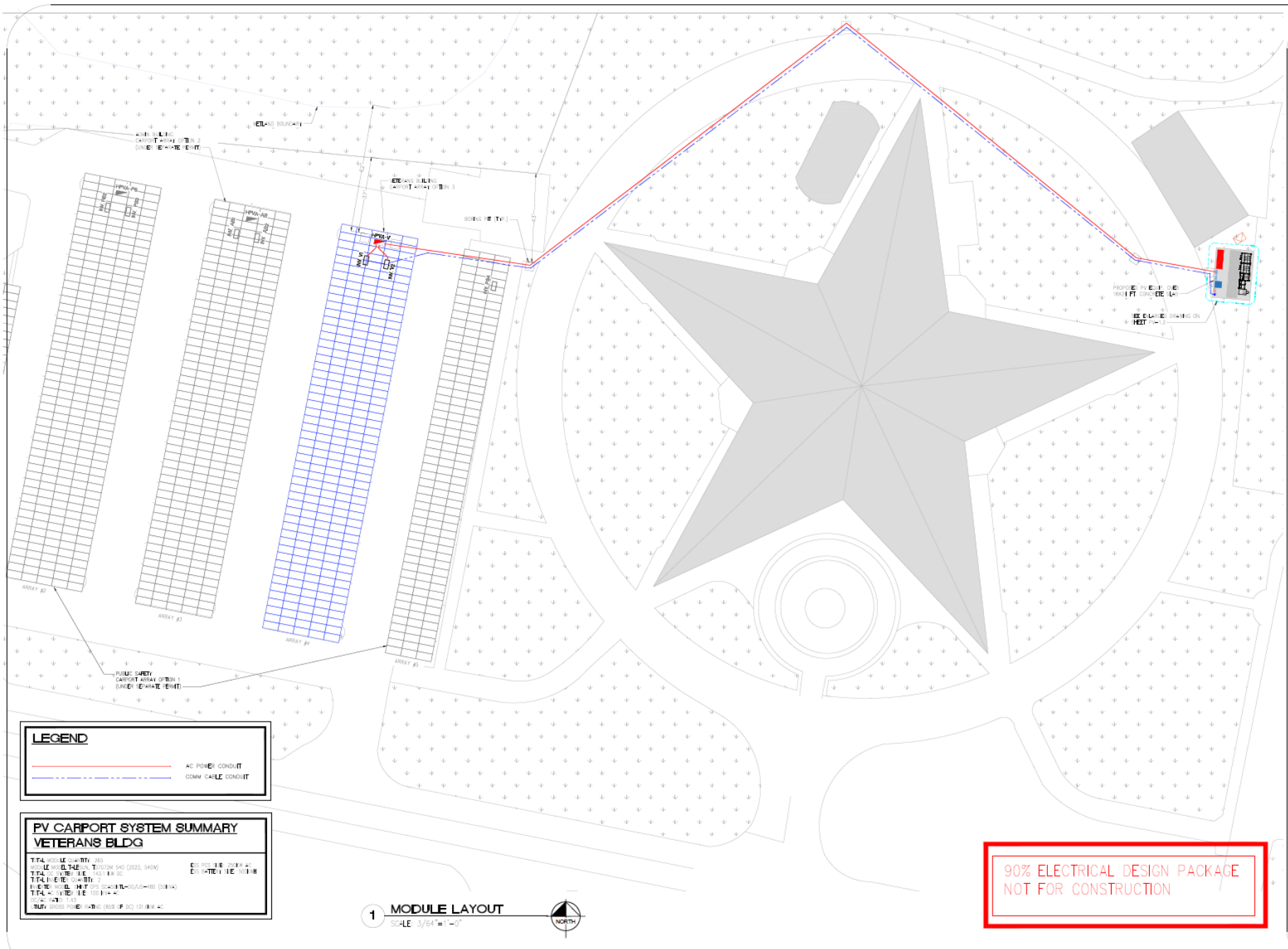
Advanced Green Tech,
 1950 NW 22nd Ave.,
 Ft. Lauderdale, FL 33311

800 E. HARNEY POND RD,
 BRIGHTON, FL 33971

MODULE LAYOUT

Project No.	22P827	Drawn By	AR
Date	11/03/2023	Checked By	PV-1.1
As Shown			

90% ELECTRICAL DESIGN PACKAGE
 NOT FOR CONSTRUCTION



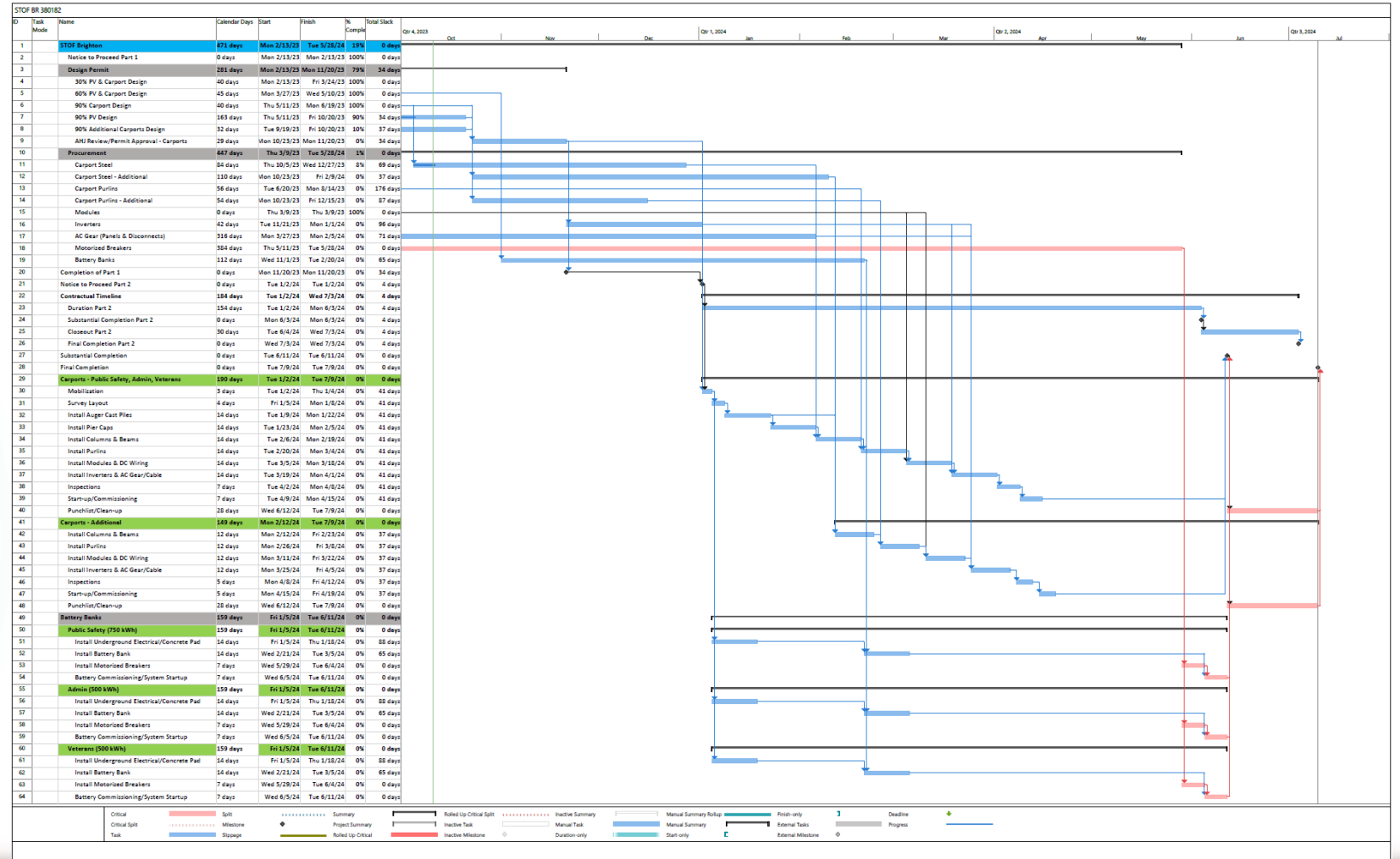
LEGEND	
—	AC POWER CONDUIT
- - -	COMM. CABLE CONDUIT

PV CARPORT SYSTEM SUMMARY VETERANS BLDG	
TOTAL MODULE QUANTITY	265
MODULE INSTALLATION TOTAL (SQ FT)	20705.540 (2022, 540W)
TOTAL SYSTEM VOLTAGE	150 VDC
TOTAL SYSTEM CURRENT	10.00 A
TOTAL SYSTEM POWER	1500 W

1 MODULE LAYOUT
 SCALE: 3/64"=1'-0"

Activities Yet to be Completed

- Execution of contract and issue NTP
- Completion of design 90%
- Issuance of Building Permits
- Construction
- Commissioning
- Executed Interconnect Agreements
- Closeout
- Project Acceptance & Closeout
- First year production reporting



Closing Thoughts

GOING SOLAR

What you need to know about Solar Energy

Every second, our sun produces enough energy to sustain Earth's needs for 500,000 years.

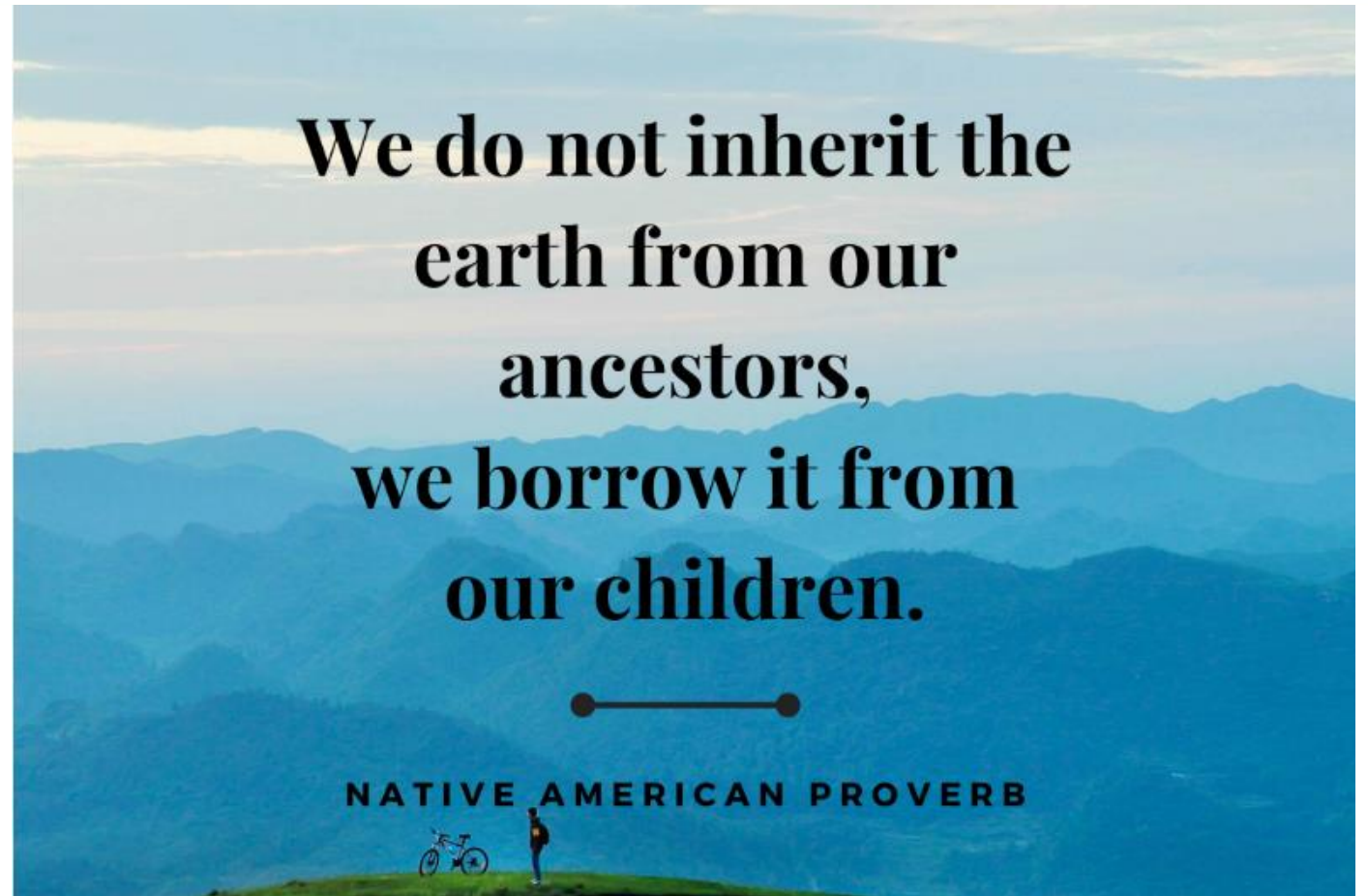
How do we harness this power?

SOLARIZE IT

100 square miles of solar panels can supply enough energy to fuel the entire United States.



Charles Fritts invented the first solar cell. **1883** The first solar heated office building. **1955**



Source: <https://brandongaille.com/41-excellent-solar-energy-slogans-and-taglines/>

Source: <https://thedailyquotes.com/we-do-not-inherit-the-earth-from-our-ancestors-we-borrow-it-from-our-children/>

Thank you – Questions?

