### SCOPE OF WORK

TO INSTALL A SOLAR PHOTOVOLTAIC (PV) SYSTEM AT THE ALLISON RESIDENCE, LOCATED AT 81 CHICORA CLUB DRIVE, DUNN, NORTH CAROLINA. THE POWER GENERATED BY THE PV SYSTEM WILL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH THE EXISTING ELECTRICAL SERVICE EQUIPMENT. THE PV SYSTEM DOES INCLUDE STORAGE BATTERIES.

# **EXISTING SYSTEM RATING**

kW DC STC 19.200 kW AC

# **EXISTING EQUIPMENT SUMMARY**

(50)SUNPOWER SPR-M435-H-AC PV MODULES

(50) TYPE H MODULE-INTEGRATED MICRO-INVERTERS: ENPHASE IQ7HS [240V] PV INVERTERS

(387)(36 X 10.75') LINEAR FEET SUNPOWER INVISIMOUNT

## **NEW EQUIPMENT SUMMARY**

TESLA POWERWALL 2.0 BATTERY

# SHEET INDEX

PV-0 COVER

PV-1 SITE MAP AND PV LAYOUT

PV-2 ELECTRICAL DIAGRAM

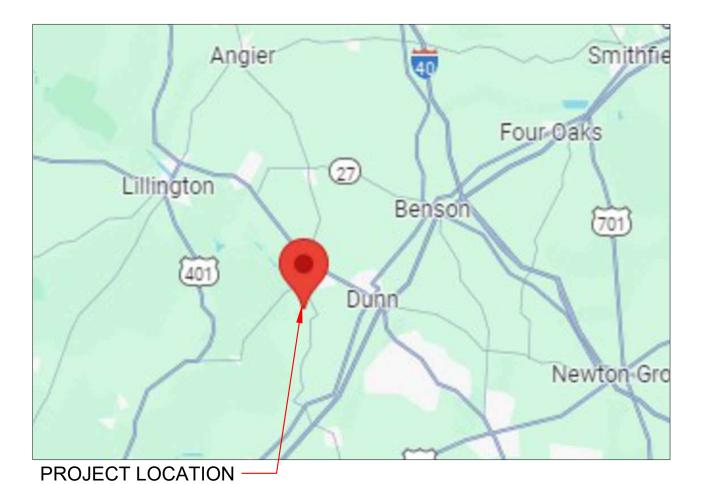
PV-3 EQ WALL
PV-4 SYSTEM LABELING DETAIL

PV-5 SITE DIRECTORY PLACARD

PV-6 SAFETY PLAN

# **GOVERNING CODES**

2017 NATIONAL ELECTRICAL CODE 2018 NORTH CAROLINA RESIDENTIAL CODE 2018 NORTH CAROLINA STATE BUILDING CODE UNDERWRITERS LABORATORIES (UL) STANDARDS OSHA 29 CFR 1910.269





**VICINITY MAP** 



REVI	SIONS	
DESCRIPTION	DATE	REV
DESIGN PACKET	02/29/2024	-

PE STAMP

PROJECT NAME

DUNN, NORTH CAROLINA, 28334 CHICORA CLUB DRIVE

DAVID ALLISON

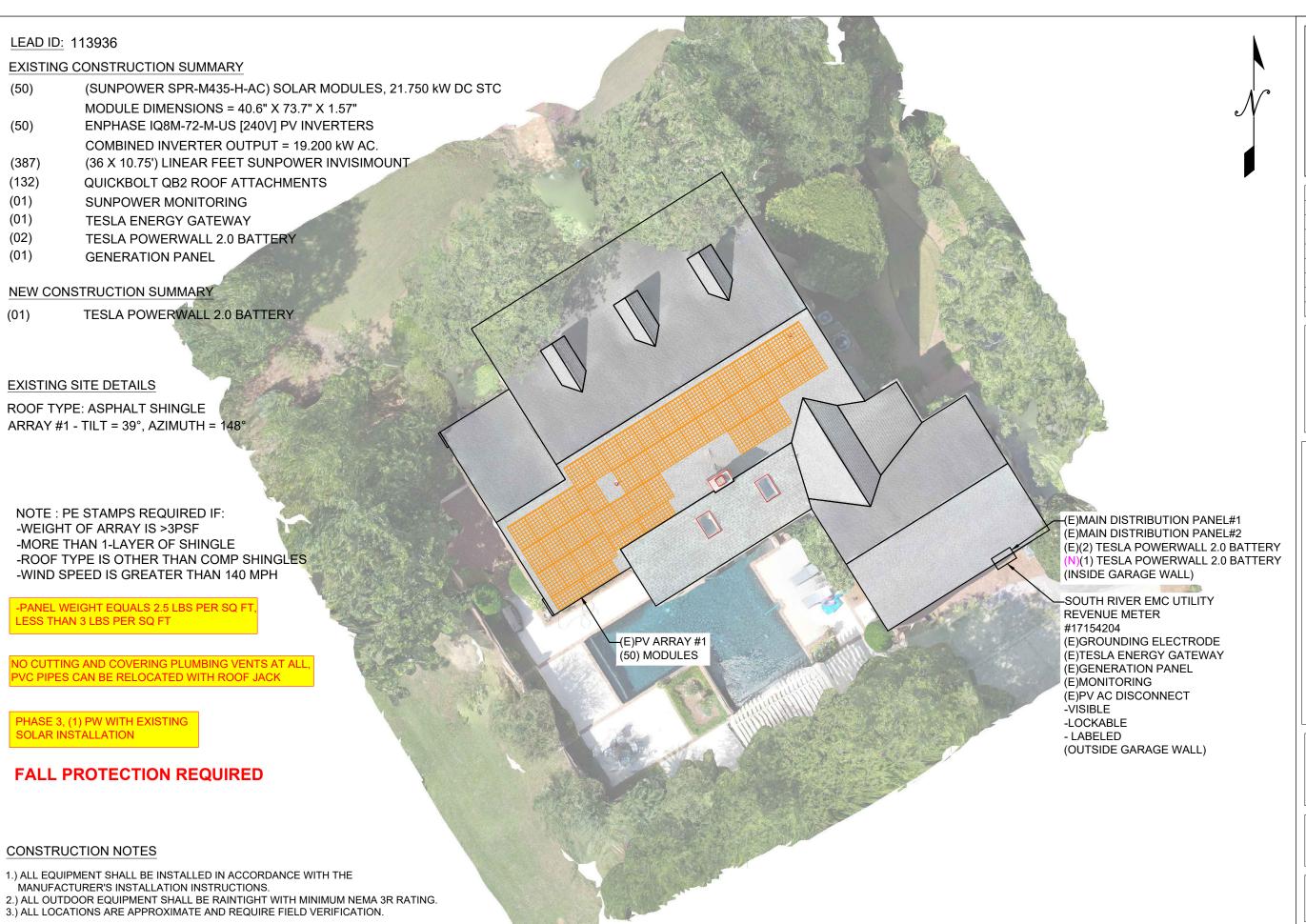
(910) 261-9553, (910) 766-7059

SHEET NAME

**COVER** 

SHEET SIZE ANSI B 11" x 17"

SHEET NUMBER





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PE STAMP

PROJECT NAME

81 CHICORA CLUB DRIVE DUNN, NORTH CAROLINA, 28334 910) 261-9553, (910) 766-7059

DAVID ALLISON

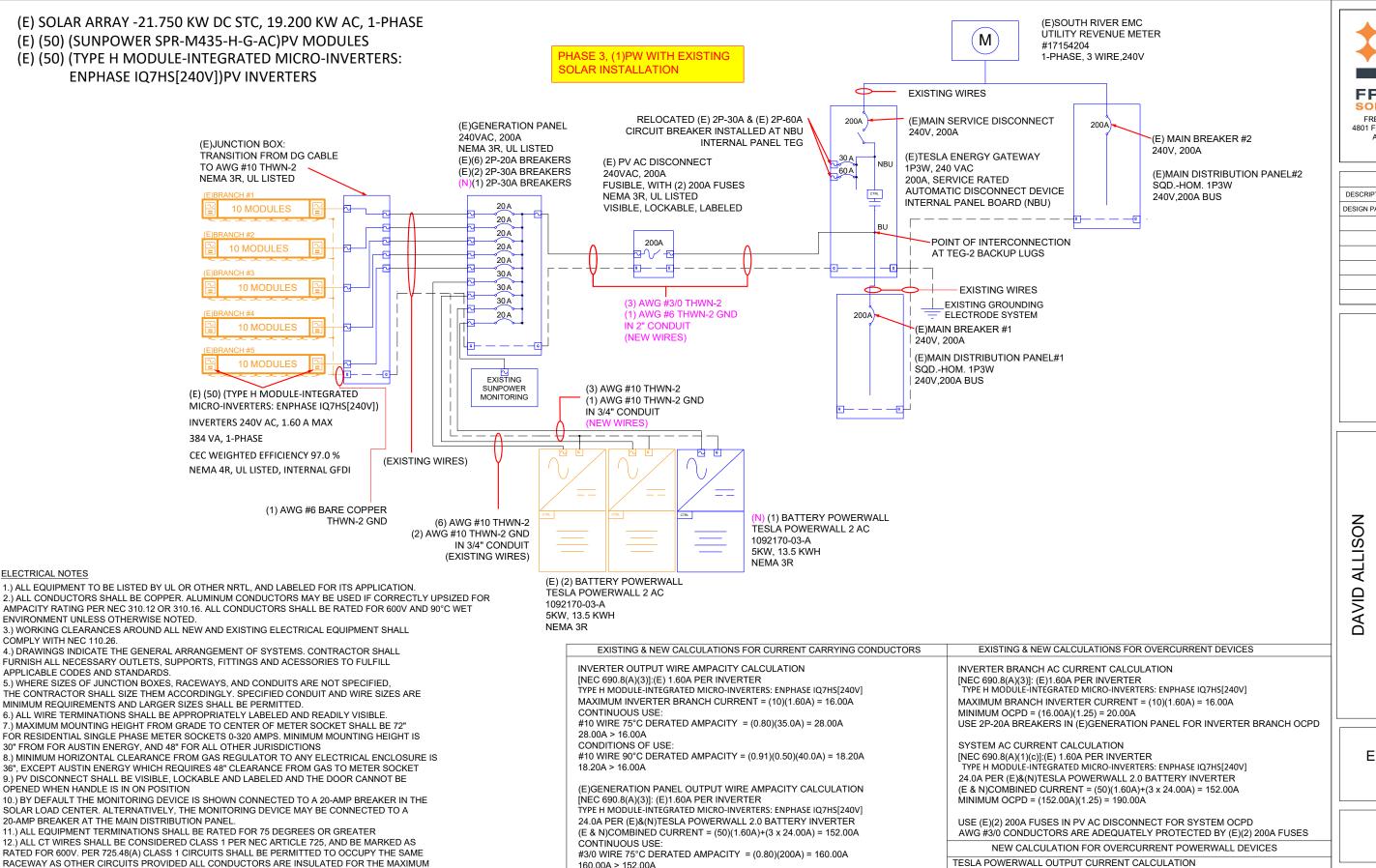
SHEET NAME

SITE MAP & PV LAYOUT

SHEET SIZE

ANSI B 11" x 17"

SHEET NUMBER



CONDITIONS OF USE

204.75A > 152.00A

#3/0 WIRE 90°C DERATED AMPACITY = (0.91)(225A) =204.75A

VOLTAGE OF ANY CONDUCTOR IN THE RACEWAY.

13.) AWG #10 COPPER CONDUCTORS ARE SPECIFIED AS THE DEFAULT WIRE REQUIRED FROM THE PV

ARRAY TO THE SOLAR LOAD CENTER, HOWEVER, AWG #12 COPPER CONDUCTORS MAY BE UTILIZED IF

AND THERE ARE LESS THAN 8 CURRENT-CARRYING CONDUCTORS WITHIN THE RACEWAY.

BOTH OF THE FOLLOWING CONDITIONS ARE MET: THE LENGTH OF THE CONDUCTOR IS LESS THAN 75 FT

CONTRACTOR

FREEDOM™

SOLAR POWER

FREEDOM SOLAR LLC

4801 FREIDRICH LN, STE 100

AUSTIN, TX 78744

512-759-8313

TECL # 28621

REVISIONS		
DESCRIPTION	DATE	REV
DESIGN PACKET	02/29/2024	-

PE STAMP

PROJECT NAME

766-7059

(910)

261-9553,

(910)

DAVID ALLISON 81 CHICORA CLUB DRIVE DUNN, NORTH CAROLINA, 28334

SHEET NAME

ELECTRICAL DIAGRAM

SHEET SIZE ANSI B

11" x 17"

SHEET NUMBER

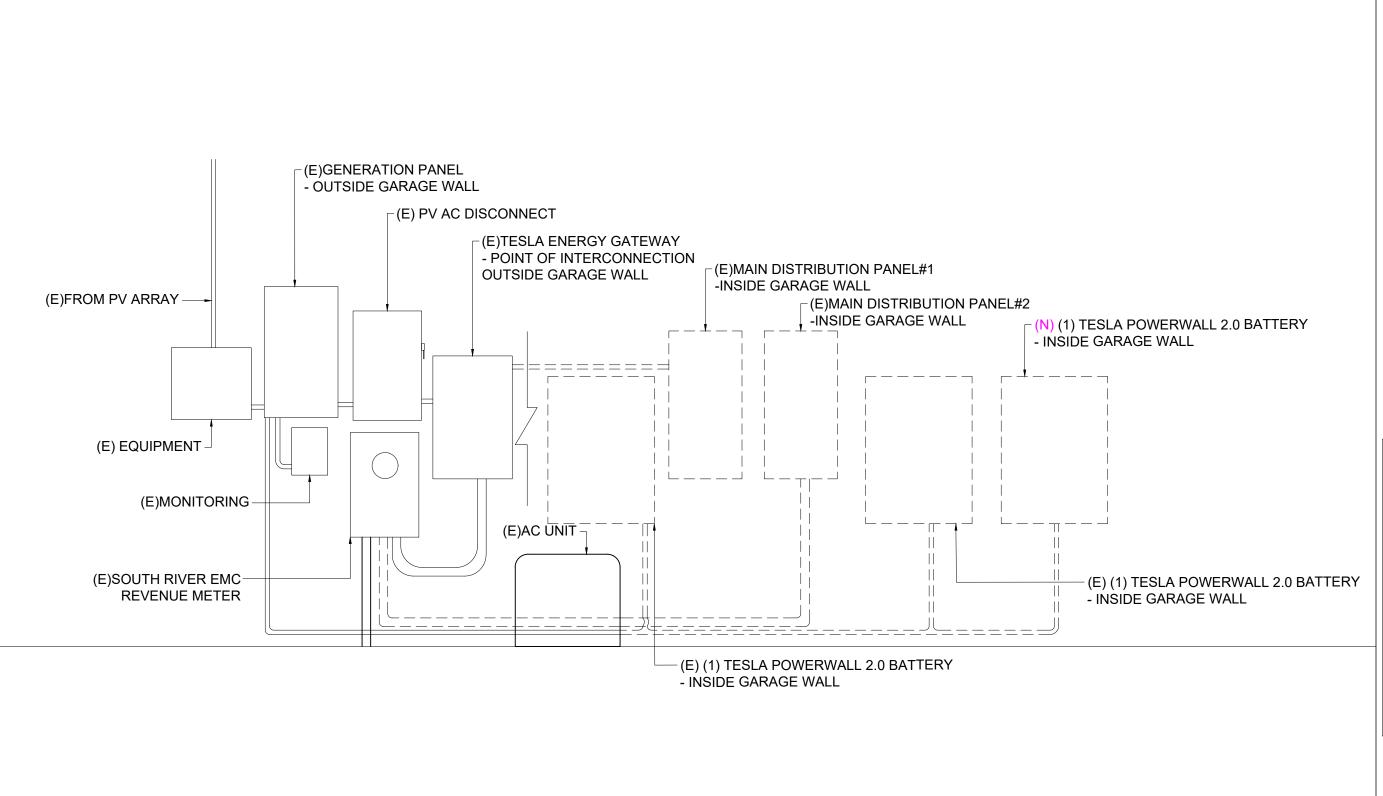
24.0A PER TESLA POWERWALL 2.0 BATTERY INVERTER

USE (E)(2) 2P-30A BREAKER IN GENERATION PANEL FOR POWERWALL OCPD

USE (N)(1) 2P-30A BREAKER IN GENERATION PANEL FOR POWERWALL OCPD

COMBINED CURRENT = (1)(24.0A) = 24.0A

MINIMUM OCPD = (24.0A)(1.25) = 30.0A





REVISIONS		
DESCRIPTION	DATE	REV
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PE STAMP

PROJECT NAME

DAVID ALLISON
81 CHICORA CLUB DRIVE
DUNN, NORTH CAROLINA,
28334

(910) 261-9553, (910) 766-7059

SHEET NAME

EQ.WALL

ANSI B

SHEET NUMBER

NOTE: NOT ALL LABELS MAY BE APPLICABLE SIGNAGE REQUIREMENTS > RED BACKGROUND > WHITE LETTERING > MIN. 3/8" LETTER HEIGHT > ALL CAPITAL LETTERS > ARIAL OR SIMILAR FONT > REFLECTIVE. WEATHER RESISTANT MATERIAL, UL 969 WARNING **ELECTRIC SHOCK HAZARD.** DO NOT TOUCH TERMINALS. WARNING **TERMINALS ON THE LINE AND POWER SOURCE OUTPUT LOAD SIDES MAY BE CONNECTION. DO NOT ENERGIZED IN THE OPEN** RELOCATE THIS **WARNING: PHOTOVOLTAIC** POSITION. **OVERCURRENT DEVICE POWER SOURCE** PV SYSTEM DISCONNECT REQ'D BY: NEC 705.12(B)(2)(3)(b) REQ'D BY: NEC 690.13(B) REQ'D BY: NEC 690.13(B) REQ'D BY: NEC 690.31(G)(3) Α D В С **APPLY TO: APPLY TO: APPLY TO: APPLY TO:** RACEWAYS, CABLE TRAYS, PV DISCONNECT PV DISCONNECT **DISTRIBUTION EQUIPMENT** OTHER WIRING METHODS, AND ADJACENT TO BACK-FED BREAKER **ENCLOSURES THAN CONTAIN** PV SYSTEM DC CONDUCTORS **REVENUE METER** 2" ADDRESS NUMBERS **MONITORING** RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM REQ' BY: AHJ REQ'D BY: AHJ REQ'D BY: FREEDOM SOLAR REQ'D BY: NEC 690.56(D)(2) Ε F G Н APPLY TO: APPLY TO: APPLY TO: APPLY TO: REVENUE METER SOCKET **REVENUE METER SOCKET** PV DISCONNECT MONITORING DEVICE ENCLOSURE (IF APPLICABLE) (IF APPLICABLE) SOLAR PV SYSTEM EQUIPPED **CAUTION** WITH RAPID SHUTDOWN REQ'D BY: 705.10 Κ POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE PHOTOVOLTAIC SYSTEM FOLLOWING SOURCES WITH DISCONNECTS AS SHOWN: APPLY TO: **AC DISCONNECT** TURN RAPID SHUTDOWN SWITCH TO THE "OFF" MAIN DISTRIBUTION PANEL **OPERATING CURRENT: 152.00A** POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY. **OPERATING VOLTAGE: 240 VAC UTILITY SUPPLY & CUSTOMER** (\*ONLY REQUIRED IF PV SYSTEM **SERVICE PANEL** DISCONNECT IS NOT GROUPED WITH MAIN SERVICE DISCONNECT) **PV AC DISCONNECT SEE SHEET PV-6 FOR SITE** REQ'D BY: 690.56(1)(a) REQ'D BY: NEC 690.56(C)(1)(a) J **RAPID SHUTDOWN SWITCH SPECIFIC LABELS APPLY TO: APPLY TO: FRONT** PV DISCONNECT UTILITY AC DISCONNECT



REVISIONS

DESCRIPTION DATE REV

DESIGN PACKET 02/29/2024 -

PE STAMP

PROJECT NAME

DAVID ALLISON
81 CHICORA CLUB DRIVE
DUNN, NORTH CAROLINA,
28334

766-7059

(910) 261-9553, (910)

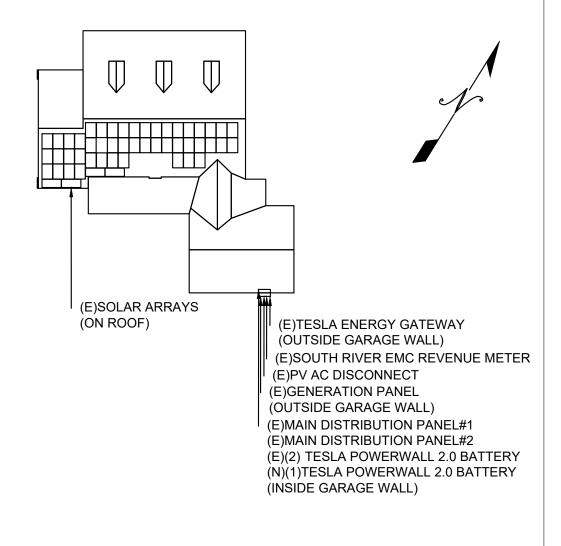
SHEET NAME
SYSTEM

LABELING DETAIL

ANSI B

SHEET NUMBER





QUESTIONS, CALL: 800-504-2337 www.freedomsolarpower.com



81 CHICORA CLUB DRIVE PROJECT ID: 113936



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DESCRIPTION	DATE	REV	
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PROJECT NAME

DAVID ALLISON
81 CHICORA CLUB DRIVE
DUNN, NORTH CAROLINA,
28334

(910) 261-9553, (910) 766-7059

SITE
SITE
DIRECTORY
PLACARD

SHEET SIZE

ANSI B

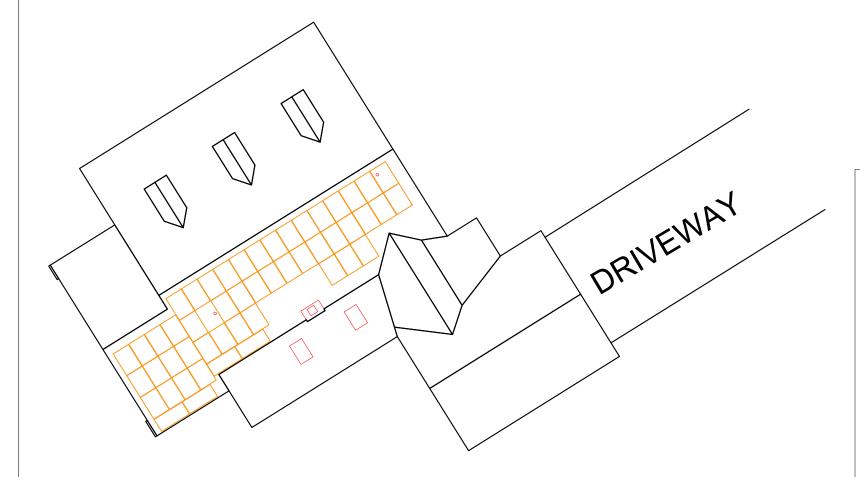
11" x 17"

SHEET NUMBER

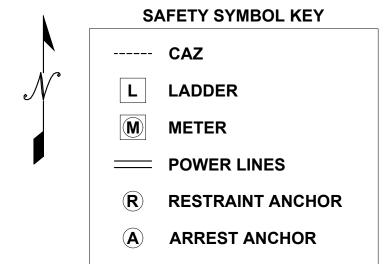
USE THE SAFETY SYMBOL KEY TO DRAW IN THE CONTROLLED ACCESS ZONE (CAZ), LADDER PLACEMENT, METER LOCATION, FALL PROTECTION ANCHOR POINT, AND ANY OTHER HAZARD.

HARD HAT IS REQUIRED AT ALL TIMES IN CAZ

COMPETENT PERSON: \_\_\_\_\_



JOB START DATE:



CONDUCT SAFETY MEETING WITH ALL CREW MEMBERS ON SITE AT THE BEGINNING OF EAC USE SIGN IN SHEET BELOW.	Н ЈОВ.
1	_
2	_
3	_
4	_
5	_



REVISIONS		
DESCRIPTION	DATE	REV
DESIGN PACKET	02/29/2024	-

PE STAMP

PROJECT NAME

DAVID ALLISON
81 CHICORA CLUB DRIVE
DUNN, NORTH CAROLINA,
28334
(910) 261-9553, (910) 766-7059

SHEET NAME

SAFETY PLAN

ANSI B

SHEET NUMBER

#### POWERWALL

Tesla Powerwall is a fully-integrated AC battery system for residential or light commercial use. Its rechargeable lithium-ion battery pack provides energy storage for solar self-consumption, time-based control, and backup.

Powerwall's electrical interface provides a simple connection to any home or building. Its revolutionary compact design achieves market-leading energy density and is easy to install, enabling owners to quickly realize the benefits of reliable, clean power.



#### PERFORMANCE SPECIFICATIONS

AC Voltage (Nominal)	120/240 V
Feed-In Type	Split Phase
Grid Frequency	60 Hz
Total Energy	14 kWh
Usable Energy	13.5 kWh
Real Power, max continuous	5 kW (charge and discharge)
Real Power, peak (10 s, off-grid/backup)	7 kW (charge and discharge)
Apparent Power, max continuous	5.8 kVA (charge and discharge)
Apparent Power, peak (10 s, off-grid/backup)	7.2 kVA (charge and discharge)
Maximum Supply Fault Current	10 kA
Maximum Output Fault Current	32 A
Overcurrent Protection Device	30 A
Imbalance for Split-Phase Loads	100%
Power Factor Output Range	+/- 1.0 adjustable
Power Factor Range (full-rated power)	+/- 0.85
Internal Battery DC Voltage	50 V
Round Trip Efficiency <sup>1,3</sup>	90%
Warranty	10 years

<sup>&</sup>lt;sup>1</sup>Values provided for 25°C (77°F), 3.3 kW charge/discharge power.

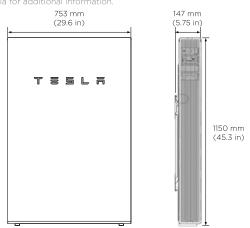
#### COMPLIANCE INFORMATION

Certifications	UL 1642, UL 1741, UL 1973, UL 9540, IEEE 1547, UN 38.3
Grid Connection	Worldwide Compatibility
Emissions	FCC Part 15 Class B, ICES 003
Environmental	RoHS Directive 2011/65/EU
Seismic	AC156, IEEE 693-2005 (high)

#### MECHANICAL SPECIFICATIONS

Dimensions <sup>1</sup>	1150 mm x 755 mm x 147 mm (45.3 in x 29.6 in x 5.75 in)
Weight <sup>1</sup>	114 kg (251.3 lbs)
Mounting options	Floor or wall mount

<sup>1</sup>Dimensions and weight differ slightly if manufactured before March 2019. Contact Tesla for additional information.



### **ENVIRONMENTAL SPECIFICATIONS**

Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Recommended Temperature	0°C to 30°C (32°F to 86°F)
Operating Humidity (RH)	Up to 100%, condensing
Storage Conditions	-20°C to 30°C (-4°F to 86°F) Up to 95% RH, non-condensing State of Energy (SoE): 25% initial
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R
Ingress Rating	IP67 (Battery & Power Electronics) IP56 (Wiring Compartment)
Wet Location Rating	Yes
Noise Level @ 1m	< 40 dBA at 30°C (86°F)

#### POWERWALL

#### Backup Gateway 2

The Backup Gateway 2 for Tesla Powerwall provides energy management and monitoring for solar self-consumption, time-based control, and backup.

The Backup Gateway 2 controls connection to the grid, automatically detecting outages and providing a seamless transition to backup power. When equipped with a main circuit breaker, the Backup Gateway 2 can be installed at the service entrance. When the optional internal panelboard is installed, the Backup Gateway 2 can also function as a load center.

The Backup Gateway 2 communicates directly with Powerwall, allowing you to monitor energy use and manage backup energy reserves from any mobile device with the Tesla app.



#### PERFORMANCE SPECIFICATIONS

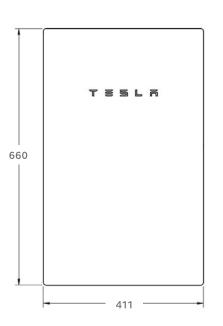
AC Voltage (Nominal)	120/240V
Feed-In Type	Split Phase
Grid Frequency	60 Hz
Current Rating	200 A
Maximum Input Short Circuit Current	10 kA <sup>1</sup>
Overcurrent Protection Device	100-200A; Service Entrance Rated
Overvoltage Category	Category IV
AC Meter	Revenue accurate (+/- 0.2 %)
Primary Connectivity	Ethernet, Wi-Fi
Secondary Connectivity	Cellular (3G, LTE/4G) <sup>2</sup>
User Interface	Tesla App
Operating Modes	Support for solar self-consumption time-based control, and backup
Backup Transition	Automatic disconnect for seamless backup
Modularity	Supports up to 10 AC-coupled Powerwalls
Optional Internal Panelboard	200A 6-space / 12 circuit Eaton BR Circuit Breakers
Warranty	10 years

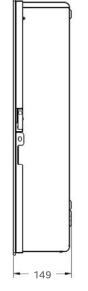
<sup>1</sup> When protected by Class J fuses, Backup Gateway 2 is suitable for use in circuits capable of delivering not more than 22kA symmetrical amperes.

<sup>2</sup> The customer is expected to provide internet connectivity for Backup Gateway 2; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

#### MECHANICAL SPECIFICATIONS

Dimensions	660 mm x 411 mm x 149 mm (26 in x 16 in x 6 in)
Weight	20.4 kg (45 lb)
Mounting options	Wall mount, Semi-flush mount





#### COMPLIANCE INFORMATION

Certifications	UL 67, UL 869A, UL 916, UL 1741 PCS CSA 22.2 0.19, CSA 22.2 205
Emissions	FCC Part 15, ICES 003

#### ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Operating Humidity (RH)	Up to 100%, condensing
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R

TESLA.COM/ENERGY TESLA.COM/ENERGY NA 2020-05-23 TESLA.COM/ENERGY

<sup>&</sup>lt;sup>2</sup>In Backup mode, grid charge power is limited to 3.3 kW.

<sup>&</sup>lt;sup>3</sup>AC to battery to AC, at beginning of life.