

TESLA POWERWALL BATTERY SYSTEM

494 HOBSON RD, DUNN, NC 28334, USA



202 NORTH DIXON AVENUE,
CARY, NC 27513 USA
PHONE: 919-804-1490
LICENSE: 67356

SYSTEM SUMMARY:

- (N) 01 - TESLA POWERWALL 3 (1707000-XX-Y) BATTERY
- (N) 200A TESLA GATEWAY 3 (1841000-X1-Y)
- (E) 200A MAIN SERVICE PANEL WITH (E) 200A MAIN BREAKER
- (N) 60A NON FUSED AC DISCONNECT

EXISTING SYSTEM SUMMARY:

- (E) 50 - SILFAB SOLAR SIL-370 HC (370W) MODULES
- (E) 50 - ENPHASE ENERGY IQ7PLUS-72-2-US MICRO-INVERTERS
- (E) AC DISCONNECT
- (E) ENPHASE IQ COMBINER BOX
- (E) BREAKER BOX

DESIGN CRITERIA:

STORY: - ONE STORY
SNOW LOAD : - 10 PSF
WIND SPEED :- 120 MPH
WIND EXPOSURE:- C
EXPOSURE CATEGORY:- II
COORDINATES:- 35.359342, -78.597885

GOVERNING CODES:

2018 NORTH CAROLINA ADMINISTRATIVE CODE
2018 NORTH CAROLINA BUILDING CODE
2018 NORTH CAROLINA RESIDENTIAL CODE
2018 NORTH CAROLINA ENERGY CONSERVATION CODE
2018 NORTH CAROLINA EXISTING BUILDING CODE
2018 NORTH CAROLINA FIRE CODE
2018 NORTH CAROLINA FUEL GAS CODE
2018 NORTH CAROLINA MECHANICAL CODE
2018 NORTH CAROLINA PLUMBING CODE
2017 NORTH CAROLINA ELECTRICAL CODE
2018 NORTH CAROLINA ACCESSIBILITY CODE

SHEET INDEX

PV-0	COVER SHEET
PV-1	SITE PLAN WITH ROOF PLAN
PV-1.1	ENLARGE VIEW
PV-2	BATTERY MOUNTING DETAIL
PV-3	ELECTRICAL LINE DIAGRAM WIRE CALCULATION
PV-4	PLACARD & WARNING LABEL
PV-5+	EQUIPMENT SPEC SHEETS

GENERAL NOTES

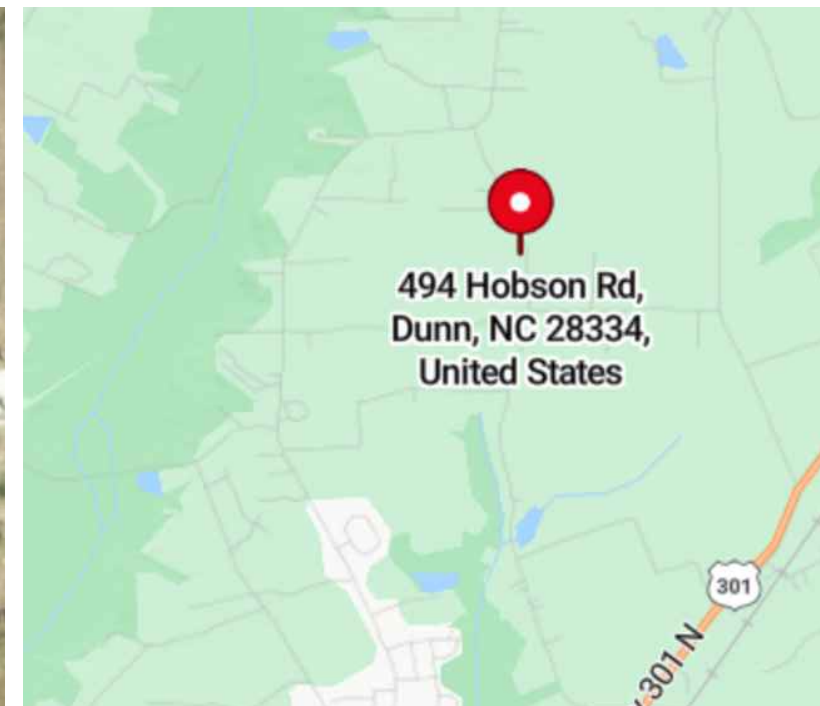
- THE CONTRACTOR/INSTALLER OF THE SOLAR PV SYSTEM OVER EXISTING ROOF SHALL CONFORM TO OSHA REQUIREMENTS DURING THE CONSTRUCTION PHASE. JOB SAFETY AND CONSTRUCTION PROCEDURES ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR/INSTALLER.
- REFER TO ELECTRICAL DRAWING PV-3 FOR PANEL DETAILED INFORMATION.
- IN CASE OF CONFLICT BETWEEN STRUCTURAL DRAWINGS AND ELECTRICAL DRAWINGS, THE MOST RIGID REQUIREMENTS SHALL GOVERN.
- THE CONTRACTOR/INSTALLER SHALL VERIFY ALL EXISTING BUILDING INFORMATION SHOWN (DIMENSIONS, ROOF TOP PROJECTIONS, ETC.) AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO INSTALLATIONS OF PV SYSTEM.
- THE CONTRACTOR/INSTALLER SHALL VERIFY AND COORDINATE EXISTING OPENINGS, ROOF TOP UNITS, VENT PIPES, ETC. SHOWN ON DRAWINGS. IF THERE IS A DISCREPANCY BETWEEN DRAWINGS, IT IS THE CONTRACTORS/INSTALLER'S RESPONSIBILITY TO NOTIFY ENGINEER PRIOR TO PERFORMING THE WORK.
- ALL CONSTRUCTION IS TO BE PERFORMED IN STRICT CONFORMANCE WITH ALL APPLICABLE TOWN, COUNTY & STATE REGULATIONS AND/OR ANY OTHER GOVERNING BODIES.
- DO NOT SCALE THESE DRAWINGS, USE DIMENSIONS. CONTRACTOR MUST CONDUCT ROOF SURVEY TO VERIFY DIMENSIONS SHOWN ON PLAN PRIOR TO INSTALLATION. IF THERE IS A DISCREPANCY IT IS CONTRACTOR/INSTALLER'S RESPONSIBILITY TO NOTIFY THE ENGINEER IMMEDIATELY.

ELECTRICAL NOTES

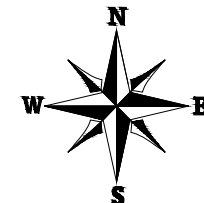
- 1.) ALL EQUIPMENT TO BE LISTED BY UL OR OTHER NRTL, AND LABELED FOR ITS APPLICATION.
- 2.) ALL CONDUCTORS SHALL BE COPPER, RATED FOR 600 V AND 90 & 75 DEGREE C WET ENVIRONMENT.
- 3.) WIRING, CONDUIT, AND RACEWAYS MOUNTED ON ROOFTOPS SHALL BE ROUTED DIRECTLY TO, AND LOCATED AS CLOSE AS POSSIBLE TO THE NEAREST RIDGE, HIP, OR VALLEY.
- 4.) WORKING CLEARANCES AROUND ALL NEW AND EXISTING ELECTRICAL EQUIPMENT SHALL COMPLY WITH NEC 110.26.
- 5.) DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS. CONTRACTOR SHALL FURNISH ALL NECESSARY OUTLETS, SUPPORTS, FITTINGS AND ACCESSORIES TO FULFILL APPLICABLE CODES AND STANDARDS.
- 6.) WHERE SIZES OF JUNCTION BOXES, RACEWAYS, AND CONDUITS ARE NOT SPECIFIED, THE CONTRACTOR SHALL SIZE THEM ACCORDINGLY.
- 7.) ALL WIRE TERMINATIONS SHALL BE APPROPRIATELY LABELED AND READILY VISIBLE.
- 8.) MODULE GROUNDING CLIPS TO BE INSTALLED BETWEEN MODULE FRAME AND MODULE SUPPORT RAIL, PER THE GROUNDING CLIP MANUFACTURER'S INSTRUCTION.
- 9.) MODULE SUPPORT RAIL TO BE BONDED TO CONTINUOUS COPPER E.G.C. VIA WEEB LUG OR ILSCO GBL-4DBT LAY-IN LUG.
- 10.) THE POLARITY OF THE GROUNDED CONDUCTORS IS NEGATIVE



1 | AERIAL PHOTO
PV-0 | SCALE: NTS



2 | VICINITY MAP
PV-0 | SCALE: NTS



VERSION		
DESCRIPTION	DATE	REV
INITIAL RELEASE	10/01/2024	UR

PROJECT NAME

KASPER, KAREN
494 HOBSON RD,
DUNN, NC 28334, USA
APN# 021518013202
UTILITY: N/A
AHJ: HARNETT COUNTY

SHEET NAME

COVER SHEET

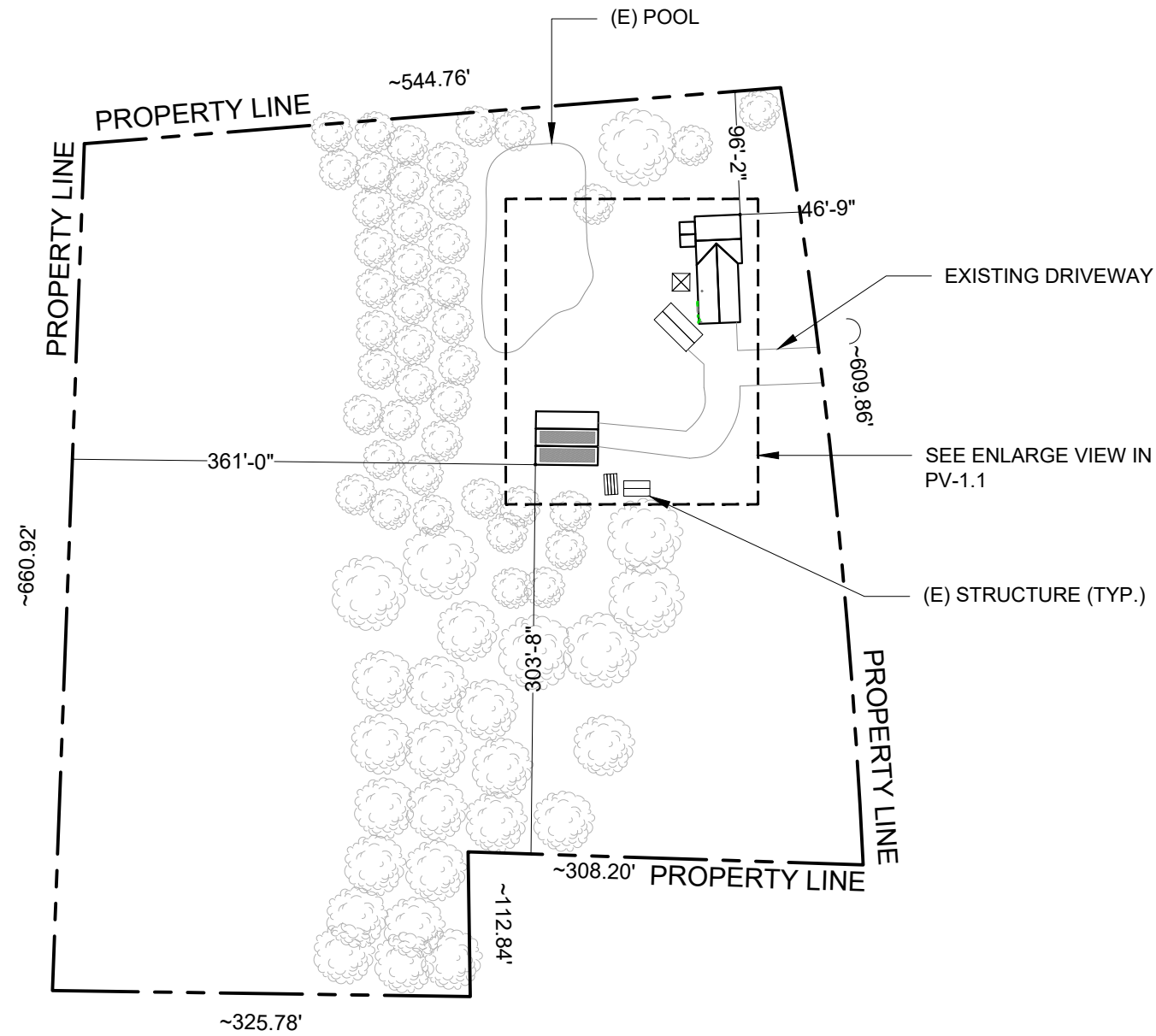
SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-0

NOTE:
• ALL ELECTRICAL EQUIPMENT, INVERTERS, DISCONNECTS, MAIN SERVICE PANELS, ETC. SHALL NOT BE INSTALLED WITHIN 3' OF THE GAS METERS' SUPPLY OR DEMAND PIPING.



HOBSON RD

LEGEND	
	UTILITY METER
	MAIN SERVICE PANEL
	EXISTING AC DISCONNECT
	EXISTING COMBINER BOX
	EXISTING BREAKER BOX
	TESLA POWERWALL 3 (1707000-XX-Y) BATTERY
	TESLA GATEWAY 3 (1841000-X1-Y)
	AC DISCONNECT
	PROPERTY LINE
	VENT, ATTIC FAN (ROOF OBSTRUCTION)
	TREE

VERSION		
DESCRIPTION	DATE	REV
INITIAL RELEASE	10/01/2024	UR

PROJECT NAME
KASPER, KAREN
494 HOBSON RD,
DUNN, NC 28334, USA
APN# 021518013202
UTILITY: N/A
AHJ: HARNETT COUNTY

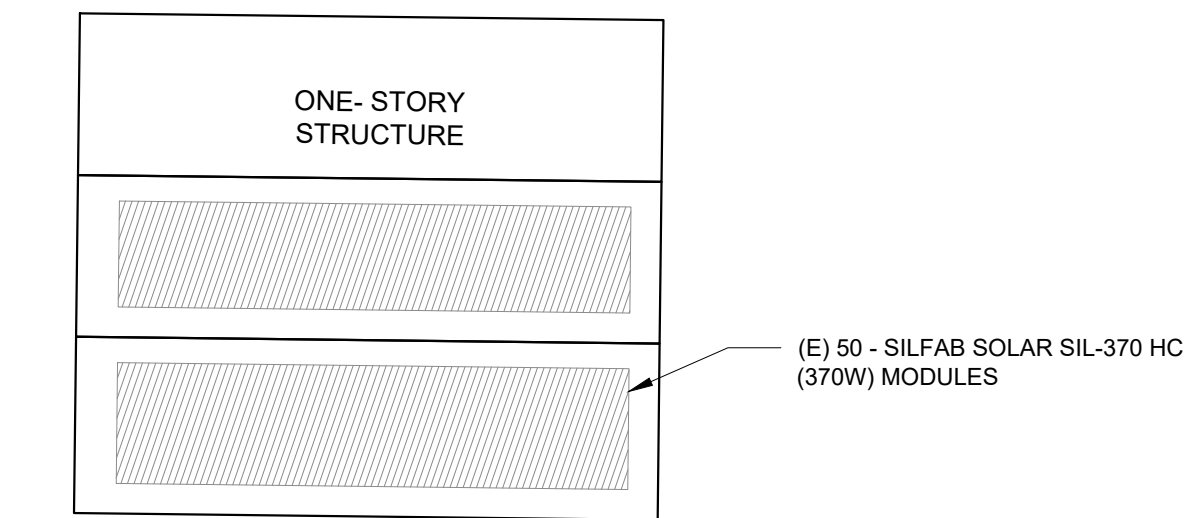
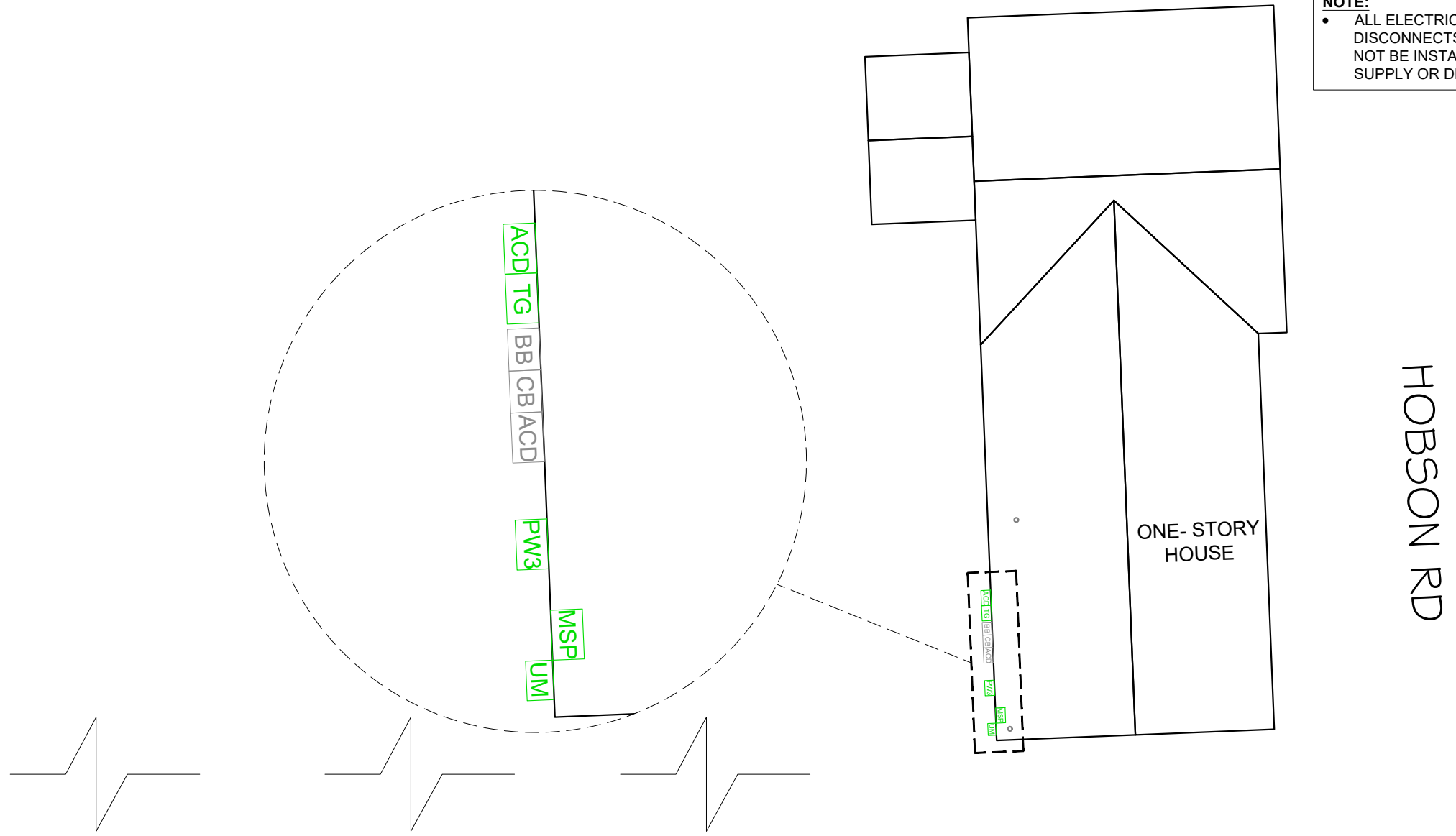
SHEET NAME
SITE PLAN WITH
ROOF PLAN

SHEET SIZE
ANSI B
11" X 17"

SHEET NUMBER
PV-1



NOTE:
• ALL ELECTRICAL EQUIPMENT, INVERTERS, DISCONNECTS, MAIN SERVICE PANELS, ETC. SHALL NOT BE INSTALLED WITHIN 3' OF THE GAS METERS' SUPPLY OR DEMAND PIPING.



HOBBSON RD

VERSION		
DESCRIPTION	DATE	REV
INITIAL RELEASE	10/01/2024	UR

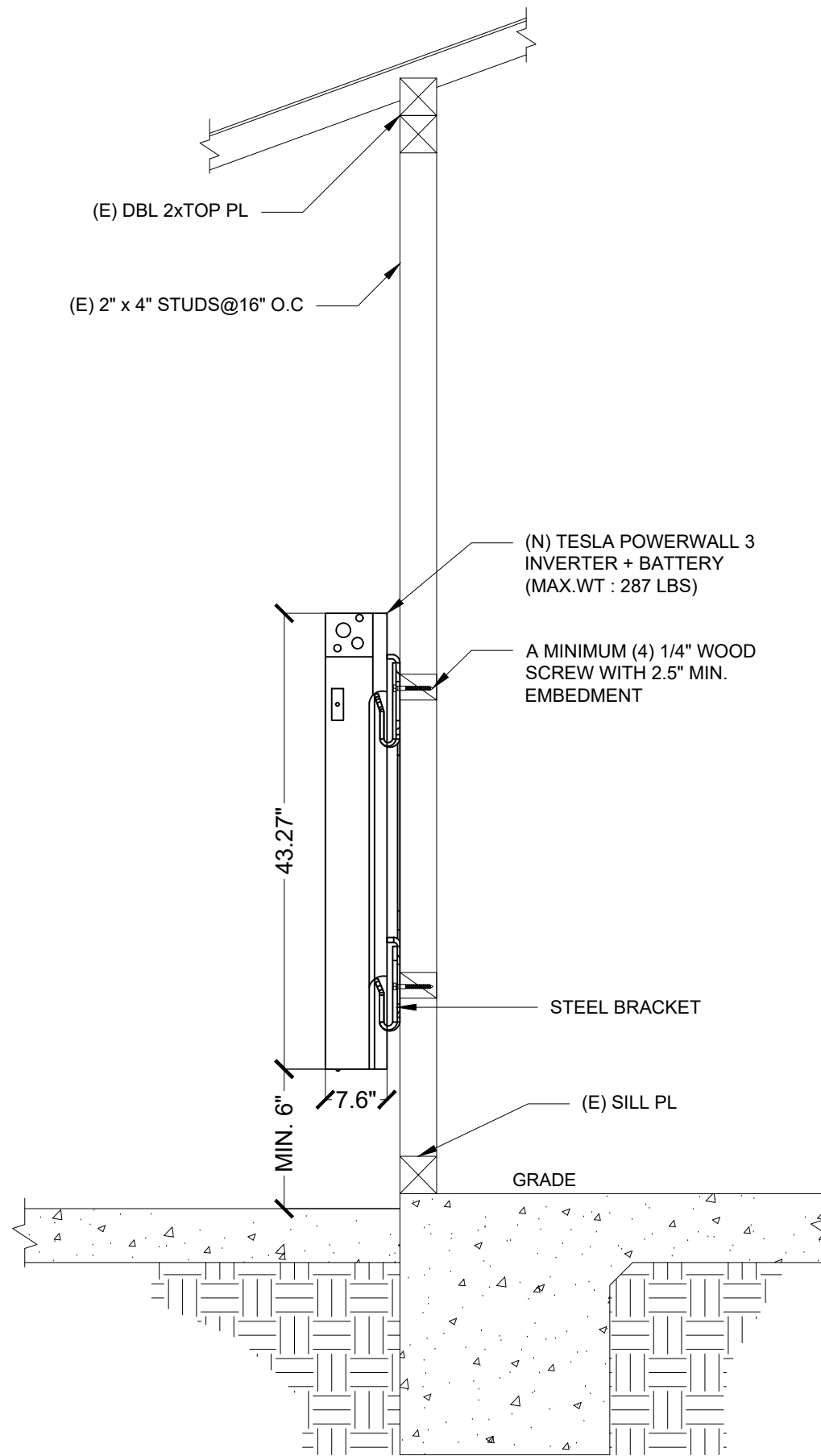
PROJECT NAME
KASPER, KAREN
494 HOBSON RD,
DUNN, NC 28334, USA
APN# 021518013202
UTILITY: N/A
AHJ: HARNETT COUNTY

LEGEND	
	UTILITY METER
	MAIN SERVICE PANEL
	EXISTING AC DISCONNECT
	EXISTING COMBINER BOX
	EXISTING BREAKER BOX
	TESLA POWERWALL 3 (1707000-XX-Y) BATTERY
	TESLA GATEWAY 3 (1841000-X1-Y)
	AC DISCONNECT
	VENT, ATTIC FAN (ROOF OBSTRUCTION)

SHEET NAME
ENLARGE VIEW

SHEET SIZE
**ANSI B
11" X 17"**

SHEET NUMBER
PV-1.1



SIDE VIEW
SCALE: NTS

1 BATTERY MOUNTING DETAIL
SCALE: NTS

VERSION		
DESCRIPTION	DATE	REV
INITIAL RELEASE	10/01/2024	UR

PROJECT NAME

KASPER, KAREN
494 HOBSON RD,
DUNN, NC 28334, USA
APN# 021518013202
UTILITY: N/A
AHJ: HARNETT COUNTY

SHEET NAME
**BATTERY MOUNTING
DETAIL**

SHEET SIZE
**ANSI B
11" X 17"**

SHEET NUMBER
PV-2

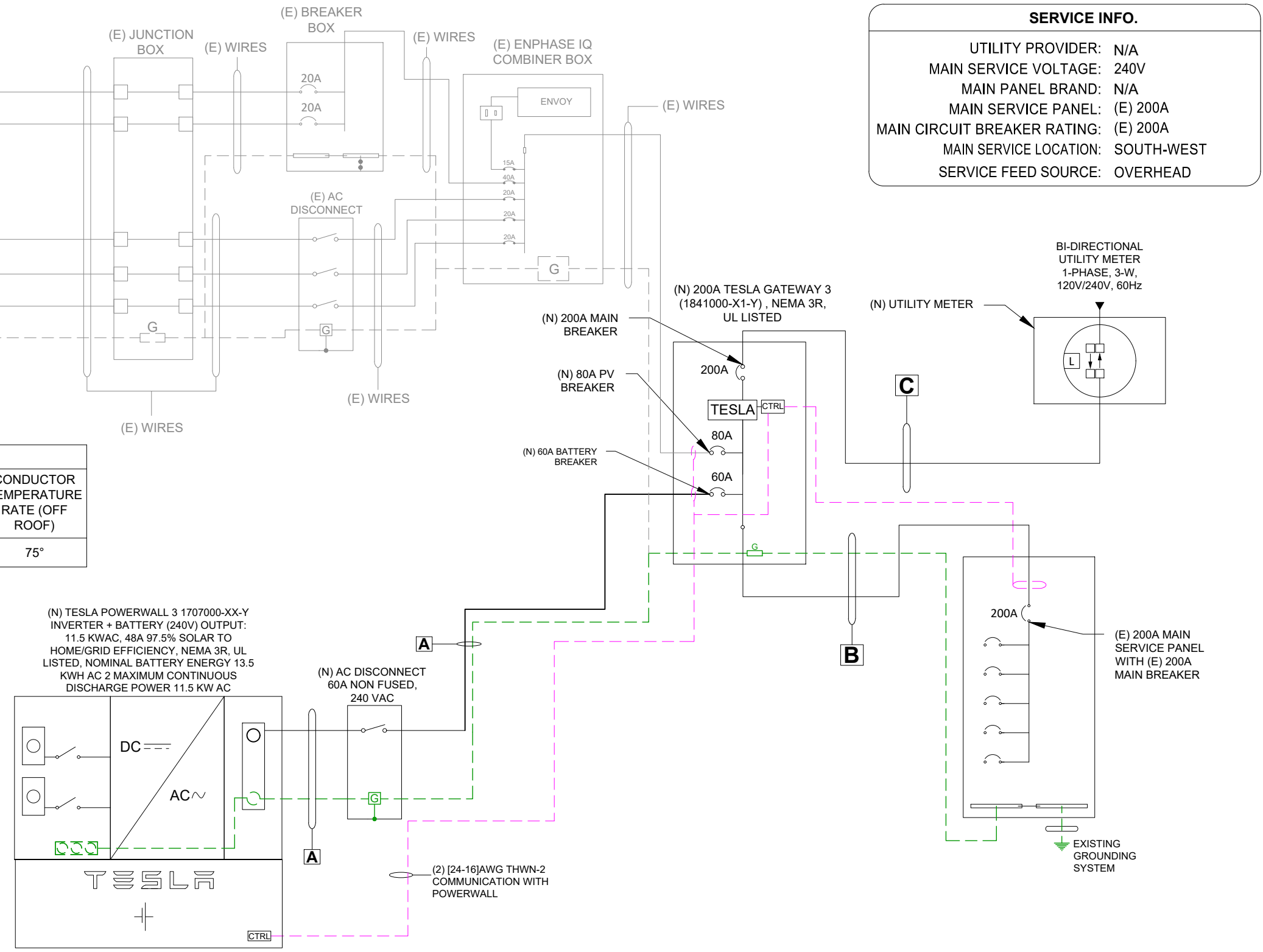
EXISTING SYSTEM SUMMARY:

- (E) 20 - SILFAB SOLARSIL-370 HC (370W) MODULES WITH (E) 20 - ENPHASE ENERGY IQ7PLUS-72-2-US MICRO-INVERTERS
- (E) 30 - SILFAB SOLAR SIL-370 HC (370W) MODULES WITH (E) 30 - ENPHASE ENERGY IQ7PLUS-72-2-US MICRO-INVERTERS

AMBIENT TEMPERATURE SPECIFICATIONS				
RECORD LOW TEMP	AMBIENT TEMP (HIGH TEMP 2%)	CONDUIT HEIGHT	CONDUCTOR TEMPERATURE RATE (ON ROOF)	CONDUCTOR TEMPERATURE RATE (OFF ROOF)
-10°	35°	7/8"	90°	75°



07-OCT-2024
Engineering Alliance, Inc
NC Firm Reg. # C-4982



SERVICE INFO.	
UTILITY PROVIDER:	N/A
MAIN SERVICE VOLTAGE:	240V
MAIN SERVICE PANEL BRAND:	N/A
MAIN SERVICE PANEL:	(E) 200A
MAIN CIRCUIT BREAKER RATING:	(E) 200A
MAIN SERVICE LOCATION:	SOUTH-WEST
SERVICE FEED SOURCE:	OVERHEAD

VERSION		
DESCRIPTION	DATE	REV
INITIAL RELEASE	10/01/2024	UR

PROJECT NAME
KASPER, KAREN
494 HOBSON RD,
DUNN, NC 28334, USA
APN# 021518013202
UTILITY: N/A
AHJ: HARNETT COUNTY

Wire Tag	Conduit	Wire Qty	Wire Gauge	Wire Type	Temp. Rating	Wire Ampacity (A)	Temp. Derate	Conduit Fill Derate	Derated Ampacity (A)	NOC (A)	NEC Correction	Design Current (A)	Ground Size	Ground Wire Type
A	3/4" EMT	3+G	6 AWG	THWN	75°C	65	0.94	1.0	61.10	48	1.25	60.00	10 AWG	THWN
B	2" EMT	3+G	4/0 AWG	THWN	75°C	230	0.94	1.0	216.20	-	-	200.00	6 AWG	THWN
C	2" EMT	3	4/0 AWG	THWN	75°C	230	0.94	1.0	216.20	-	-	200.00	-	-

1 ELECTRICAL LINE DIAGRAM WITH WIRE CALCULATION
SCALE: NTS

SHEET NAME
ELECTRICAL LINE DIAGRAM WITH WIRE CALCULATION

SHEET SIZE
ANSI B 11" X 17"

SHEET NUMBER
PV-3

**ENERGY STORAGE SYSTEM
DISCONNECT**

NOMINAL VOLTAGE: 240 VAC
 MAX AVAILABLE ISC: [REDACTED] AAC
 ISC CLEAR TIME: [REDACTED] MS
 DATE: [REDACTED]

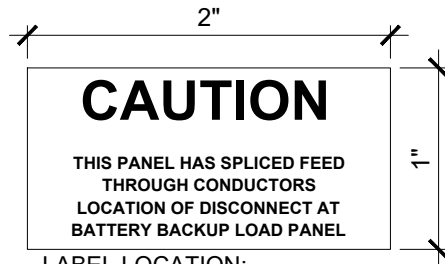
REQ'D BY NEC 706.7(D)

APPLY TO:
 BATTERY

**CAUTION
 TRI POWER SOURCE**

FIRST SOURCE IS UTILITY ELECTRICAL GRID
 SECOND SOURCE IS AC BATTERY
 THIRD SOURCE IS PV INVERTER

LABEL LOCATION:
 POINT OF INTERCONNECTION
 MAIN SERVICE PANEL
 (NEC 705.12(C) & NEC 690.59)



LABEL LOCATION:
 TESLA BACKUP GATEWAY 2

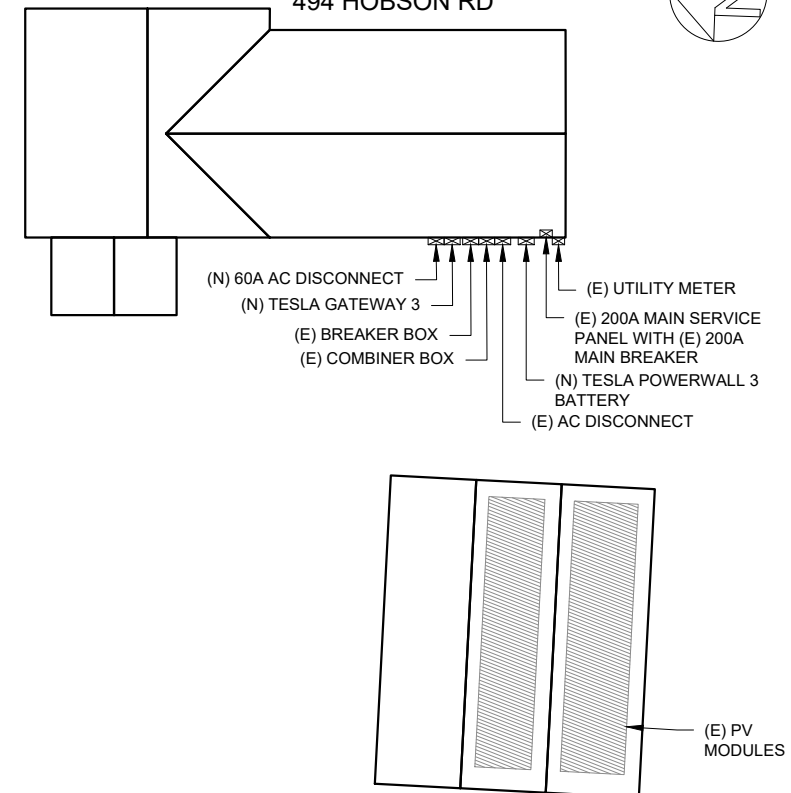


07-OCT-2024
 Engineering Alliance, Inc
 NC Firm Reg. # C-4982

**CAUTION !
 MULTIPLE SOURCES OF POWER**

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN

AT: [Symbol] MAIN SERVICE PANEL, UTILITY METER, TESLA POWERWALL 3, TESLA GATEWAY 3
 494 HOBSON RD



202 NORTH DIXON AVENUE,
 CARY, NC 27513 USA
 PHONE: 919-804-1490
 LICENSE: 67356

VERSION		
DESCRIPTION	DATE	REV
INITIAL RELEASE	10/01/2024	UR

PROJECT NAME
 KASPER, KAREN
 494 HOBSON RD,
 DUNN, NC 28334, USA
 APN# 021518013202
 UTILITY: N/A
 AHJ: HARNETT COUNTY

SHEET NAME
 WARNING LABELS &
 PLACARD
 SHEET SIZE
 ANSI B
 11" X 17"
 SHEET NUMBER
 PV-4

Powerwall 3

Power Everything

Powerwall 3 is a fully integrated solar and battery system, designed to accelerate the transition to sustainable energy. Customers can receive whole home backup, cost savings, and energy independence by producing and consuming their own energy while participating in grid services. Once installed, customers can manage their system using the Tesla App to customize system behavior to meet their energy goals.

Powerwall 3 achieves this by supporting up to 20 kW DC of solar and providing up to 11.5 kW AC of continuous power per unit. It has the ability to start heavy loads rated up to 185 LRA, meaning a single unit can support the power needs of most homes. Powerwall 3 Expansions make it easier and more affordable to scale up customers' systems to meet their current or future needs. Powerwall 3 is designed for fast and efficient installations, modular system expansion, and simple connection to any electrical service.



Powerwall 3 Technical Specifications

System Technical Specifications

Model Number	1707000-xx-y			
Nominal Grid Voltage (Input & Output)	120/240 VAC			
Grid Type	Split phase			
Frequency	60 Hz			
Nominal Battery Energy	13.5 kWh AC ¹			
Nominal Output Power (AC)	5.8 kW	7.6 kW	10 kW	11.5 kW
Maximum Apparent Power	5,800 VA	7,600 VA	10,000 VA	11,500 VA
Maximum Continuous Current	24 A	31.7 A	41.7 A	48 A
Overcurrent Protection Device ²	30 A	40 A	60 A	60 A
Maximum Continuous Charge Current / Power	20.8 A AC / 5 kW			
Output Power Factor Rating	0 - 1 (Grid Code configurable)			
Maximum Output Fault Current (1 s)	160 A			
Maximum Short-Circuit Current Rating	10 kA			
Load Start Capability	185 LRA			
Solar to Battery to Home/Grid Efficiency	89% ^{1,3}			
Solar to Home/Grid Efficiency	97.5% ⁴			
Power Scalability	Up to 4 Powerwall 3 units supported			
Energy Scalability	Up to 3 Expansion units (for a maximum total of 7 units)			
Supported Islanding Devices	Gateway 3, Backup Switch, Backup Gateway 2			
Connectivity	Wi-Fi (2.4 and 5 GHz), Ethernet, Cellular (LTE/4G ⁵)			
Hardware Interface	Dry contact relay, Rapid Shutdown (RSD) certified switch and 2-pin connector, RS-485 for meters			
AC Metering	Revenue Grade (+/- 0.5%, ANSI C12.20)			
Protections	Integrated arc fault circuit interrupter (AFCI), Isolation Monitor Interrupter (IMI), PV Rapid Shutdown (RSD) using Tesla Mid-Circuit Interrupters			
Customer Interface	Tesla Mobile App			
Warranty	10 years			

Solar Technical Specifications

Maximum Solar STC Input	20 kW
Withstand Voltage	600 V DC
PV DC Input Voltage Range	60 – 550 V DC
PV DC MPPT Voltage Range	60 – 480 V DC
MPPTs	6
Maximum Current per MPPT (I_{mp})	13 A ⁶
Maximum Short Circuit Current per MPPT (I_{sc})	15 A ⁶

¹Values provided for 25°C (77°F), at beginning of life. 3.3 kW charge/discharge power.

²See [Powerwall 3 Installation Manual](#) for fuse requirements if using fuse for overcurrent protection.

³Typical solar shifting use case.

⁴Tested using CEC weighted efficiency methodology.

⁵The customer is expected to provide internet connectivity for Powerwall 3; cellular should not be used as the primary mode of connectivity. Cellular connectivity subject to network operator service coverage and signal strength.

⁶Where the DC input current exceeds the MPPT rating, a jumper can be used to combine two MPPTs into a single input to intake DC current up to 26 A I_{mp} / 30 A I_{sc} .

VERSION		
DESCRIPTION	DATE	REV
INITIAL RELEASE	10/01/2024	UR

PROJECT NAME

KASPER, KAREN
494 HOBSON RD,
DUNN, NC 28334, USA
APN# 021518013202
UTILITY: N/A
AHJ: HARNETT COUNTY

SHEET NAME

SPEC SHEETS

SHEET SIZE

ANSI B
11" X 17"

SHEET NUMBER

PV-5

Gateway 3

Tesla Gateway 3 controls connection to the grid in a Powerwall system, automatically detecting outages and providing seamless transition to backup power. It provides energy monitoring that is used by Powerwall for solar self-consumption, time-based control, and backup operation.

Performance Specifications

Model Number	1841000-x1-y	AC Meter	+/- 0.5%
Nominal Grid Voltage	120/240 V AC	Communication	CAN
Grid Configuration	Split phase	User Interface	Tesla App
Grid Frequency	60 Hz	Backup Transition	Automatic disconnect for seamless backup
Continuous Current Rating	200 A	Overcurrent Protection Device	100–200 A Service entrance rated Eaton CSR, BWH, or BW, or Square D QOM breakers
Maximum Supply Short Circuit Current	22 kA with Square D or Eaton main breaker 25 kA with Eaton main breaker ¹⁵	Internal Panelboard	200 A 8-space/16 circuit breakers Eaton BR, Siemens QP, or Square D HOM breakers rated to 10–125A
IEC Protective Class	Class I	Warranty	10 years
Overvoltage Category	Category IV		

¹⁵ Only Eaton CSR or BWH main breakers are 25 kA rated.

Environmental Specifications

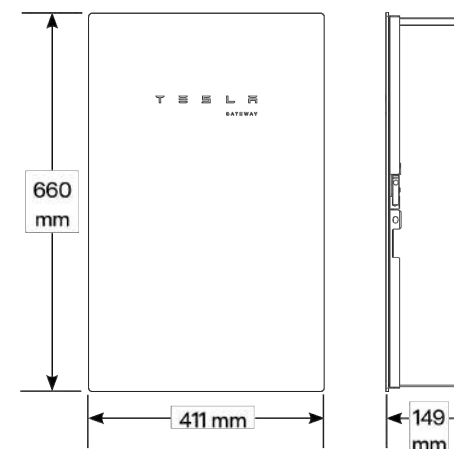
Operating Temperature	–20°C to 50°C (–4°F to 122°F)
Operating Humidity (RH)	Up to 100%, condensing
Maximum Elevation	3000 m (9843 ft)
Environment	Indoor and outdoor rated
Enclosure Type	NEMA 3R

Compliance Information

Certifications	UL 67, UL 869A, UL 916, UL 1741 PCS, CSA 22.2 107.1, CSA 22.2 29
Emissions	FCC Part 15, Class B, ICES 003

Mechanical Specifications

Dimensions	660 x 411 x 149 mm (26 x 16 x 6 in)
Weight	16.3 kg (36 lb)
Mounting options	Wall mount



VERSION		
DESCRIPTION	DATE	REV
INITIAL RELEASE	10/01/2024	UR

PROJECT NAME

KASPER, KAREN
 494 HOBSON RD,
 DUNN, NC 28334, USA
 APN# 021518013202
 UTILITY: N/A
 AHJ: HARNETT COUNTY

SHEET NAME

SPEC SHEETS

SHEET SIZE

ANSI B
 11" X 17"

SHEET NUMBER

PV-6