**DOCUMENT 00 50 20**

**BID ADDENDUM NO. ___3____**

**PROJECT TITLE:** San Bruno Corporation Yard EV Charger Project Phase 2

**PROJECT NO.** 51035_____

**DATE**: Thursday, March 26, 2026___

**TO:** All Prospective Bidders and Plan Holders of Record

BY THIS NOTICE, the City of San Bruno hereby amends the referenced project bid documents as follows:

**A. CHANGES TO DRAWINGS:**

Additions are indicated by revision clouds.

1. Drawing Sheet E-502 shall be replaced with Sheet E-502 attached hereto.

**B. RESPONSES TO CONTRACTOR QUESTIONS:**

1. Can the City confirm whether the proposed routing of conduits along the exterior garage wall is acceptable, specifically given asphalt storage and current operations in that area?

**Answer:** No, the exterior conduits currently shown within a trench shall be installed inside an underground trench. The conduit run has been modified to avoid the asphalt storage area and the new route will instead go through the unused storage pit. Refer to attached plan showing the modified conduit run.

2. Can the City confirm the thickness of the CMU wall where conduits are proposed to penetrate?

**Answer:** Assume 16-inch CMU wall thickness.

3. Can the City confirm the thickness of the exterior concrete pad behind the equipment storage building and interior slab thickness?

**Answer:** 14-inch thick pad in the exterior storage area and 12-inch thick interior slab.

4. Will vehicles currently stored at the Corporation Yard be relocated for the duration of construction?

**Answer:** Most vehicles will need to remain. The City will relocate equipment that is not utilized daily to an offsite storage location. Vehicles in the corners that are used daily will be relocated during working hours, but, each evening, the area will need to be returned to a state where the vehicles can go back to their initial location.

5. Once mobilized, where will be the contractor's staging area?

**Answer:** This is dependent on the Contractor's equipment; however, it will likely be adjacent to where the work is being performed.

6. Are contractors required to provide steel plates to cover trenches at the end of each workday?

**Answer:** All open trenches must be covered or filled at the end of each workday. Methods may include plating or backfilling. Means and methods are at the contractor's discretion, provided site safety and operational requirements are maintained.

7. What is considered the end of the day for purposes of securing the site?

**Answer:** City operations conclude at approximately 3:00 PM. Contractors are permitted to work from 7:00 AM to 6:00 PM, Monday through Thursday. Work on Fridays may be permitted upon request. Site conditions must be made safe in coordination with ongoing City operations.

8. Do the designs meet electrical code requirements, particularly with respect to the number of 90-degree conduit turns?

**Answer:** The conduit routes shown in the design are diagrammatic and do not include exact pull box locations. To comply with Electrical Code requirements, the contractor shall not have more than 360 degrees of bends in a single conduit run. If pull boxes need to be installed, the contractor shall coordinate pull box locations with facility personnel.

9. What are the expectations for the contractor's responsibility when it comes to coordinating and communicating with PG&E?

**Answer:** The contractor will be responsible for coordinating directly with PG&E for all required inspections and approvals related to the work. Contractors will be provided with the appropriate PG&E contact. PG&E inspection requirements are anticipated to include, but are not limited to:

i. Inspection of conduits stubbed out five feet from new panel/switchgear, including verification of conduit size, depth, and quantity, through photos shared with PG&E contact.

ii. Confirmation of sufficient clearances between proposed PG&E transformer pad and contractors work.

Prior to procurement, contractor shall submit switchgear cut sheets to the City for review and the City will forward to PG&E for review and approval. Ordering of equipment shall not proceed until PG&E approval is obtained.

10. Will schedule delays caused by PG&E inspections or work be considered excusable?

**Answer:** Delays attributable solely to PG&E will be treated in accordance with the Contract Documents, including applicable provisions in the Special Conditions. The contractor will not be held responsible for delays outside of their control.

11. What is the engineered probable cost estimate?

**Answer:** The Engineer's Estimate is $380,000.

12. When is the City looking to start and complete this project?

**Answer:** The City intends to proceed with construction as soon as practicable following award. The target completion is by the end of August.



567 El Camino Real, San Bruno, California 94066-4299
Voice: (650) 616-7065 Fax: (650) 794-1443
http://sanbruno.ca.gov

13. Can the materials located in the garage interior be relocated?

**Answer:** Yes, City will relocate materials currently inside the garage.

14. With regards to Bid Item No. 7, what equipment and materials will the City provide for the Automatic Load Management System and what is the contractor responsible for?

**Answer:** The City, through PCE/Optony will provide all the components listed in the ChargePilot Standard Components table on page 3 of the attached Pre-Commissioning Documentation. The Contractor will be responsible for providing all other equipment, material, and labor for the complete installation of the system. The Contractor shall install the Chargepilot Kit, all communication and networking infrastructure, and all other components as detailed in the attached Pre-Commissioning Documentation.

This Bid Addendum No. __3__ shall become part of the Contract Documents and all provisions of the Contract shall apply thereto. This Bid Addendum has been provided to all plan holders of record**. For a bid to be considered as responsive for the purposes of an award of contract, this Bid Addendum shall be acknowledged in the appropriate section of the Bid Form, Document 00 41 70 (Addenda Acknowledgement).**

DocuSigned by:
ISSUED BY: Ana Morales 8DC36FCA11BA49A...
Ana Morales, Management Analyst

Date: 3/26/2026

Attachments:
1. Sheet E-502
2. ChargePilot Pre-Commissioning Documentation

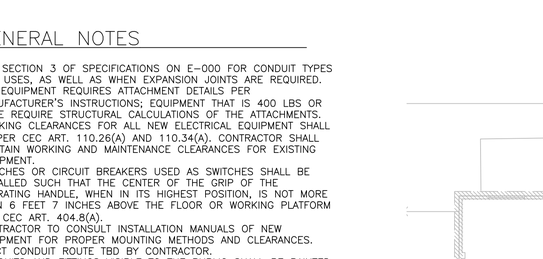
-END OF DOCUMENT-

## GENERAL NOTES

1. SEE SECTION 3 OF SPECIFICATIONS ON E-000 FOR CONDUIT TYPES AND USES, AS WELL AS WHEN EXPANSION JOINTS ARE REQUIRED.
2. ALL EQUIPMENT REQUIRES ATTACHMENT DETAILS PER MANUFACTURER'S INSTRUCTIONS; EQUIPMENT THAT IS 400 LBS OR MORE REQUIRE STRUCTURAL CALCULATIONS OF THE ATTACHMENTS.
3. WORKING CLEARANCES FOR ALL NEW ELECTRICAL EQUIPMENT SHALL BE PER CEC ART. 110.26(A) AND 110.34(A). CONTRACTOR SHALL MAINTAIN WORKING AND MAINTENANCE CLEARANCES FOR EXISTING EQUIPMENT.
4. SWITCHES OR CIRCUIT BREAKERS USED AS SWITCHES SHALL BE INSTALLED SUCH THAT THE CENTER OF THE GRIP OF THE OPERATING HANDLE, WHEN IN ITS HIGHEST POSITION, IS NOT MORE THAN 6 FEET 7 INCHES ABOVE THE FLOOR OR WORKING PLATFORM PER CEC ART. 404.8(A).
5. CONTRACTOR TO CONSULT INSTALLATION MANUALS OF NEW EQUIPMENT FOR PROPER MOUNTING METHODS AND CLEARANCES.
6. EXACT CONDUIT ROUTE TBD BY CONTRACTOR.
7. CONDUITS AND FITTINGS VISIBLE TO THE PUBLIC SHALL BE PAINTED TO MATCH THE EXISTING BUILDING IF REQUIRED BY THE JURISDICTION OR OWNER.

## (#) KEYNOTES

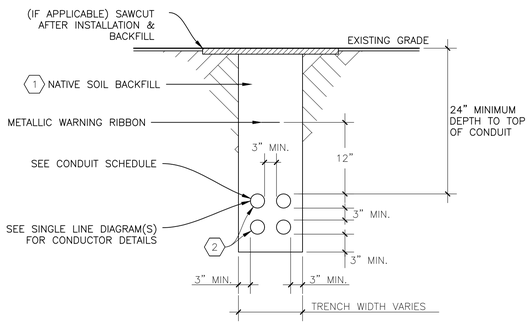
1. THE BOTTOM OF THE TRENCH RECEIVING CONDUIT SHALL BE SMOOTH, UNDISTURBED, WELL-TAMPED EARTH WITHOUT EXPOSED ROCKS. WHEN EXCAVATION IS IN ROCK OR ROCKY SOILS, THE CONDUIT SHALL BE LAID ON A PROTECTIVE LAYER OF WELL-TAMPED BACKFILL. BACKFILL SHALL BE COMPACTED TO 95% UNLESS STATED OTHERWISE IN GEOTECH REPORT. BACKFILL WITHIN 6 INCHES OF CONDUIT SHALL BE FREE OF MATERIALS THAT MAY DAMAGE THE CONDUIT. MACHINE COMPACTION SHALL NOT BE USED WITHIN 6 INCHES OF THE CONDUIT.
2. CONDUITS SHALL BE STACKED TWO HIGH MAXIMUM USING DUCT BANK SPACERS. DUCT BANK SPACERS SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
3. ROUTE CONDUIT OVERHEAD, TIGHT TO BUILDING STRUCTURE.
4. CONDUIT RISER AT EXTERIOR WALL. ROUTE CONDUIT UNDERGROUND BETWEEN BUILDINGS.
5. TURN UP CONDUITS AT EXTERIOR FACE OF WALL INTO NEMA 3R PULLBOX OR LB CONDUIT BODIES. STUB CONDUITS THROUGH CMU WALL TO REACH EQUIPMENT INSIDE GARAGE.
6. ELECTRICAL CONTRACTOR SHALL PROVIDE 36" RADIUS 90-DEGREE CONDUIT SWEEPS OUT OF MAIN SWITCHBOARD PULL SECTION AND CAP CONDUITS AT LEAST 3'-0" AWAY FROM MSB FOOTPRINT. PG&E SHALL PICK UP THOSE CONDUITS AT LATER DATE AND EXTEND THEM TO NEW SERVICE TRANSFORMER. SEE SHEET E-601 FOR MORE INFO.




TRENCH SECTION FOR NON-VEHICLE TRAFFIC LOCATIONS

SCALE: NTS

NT –



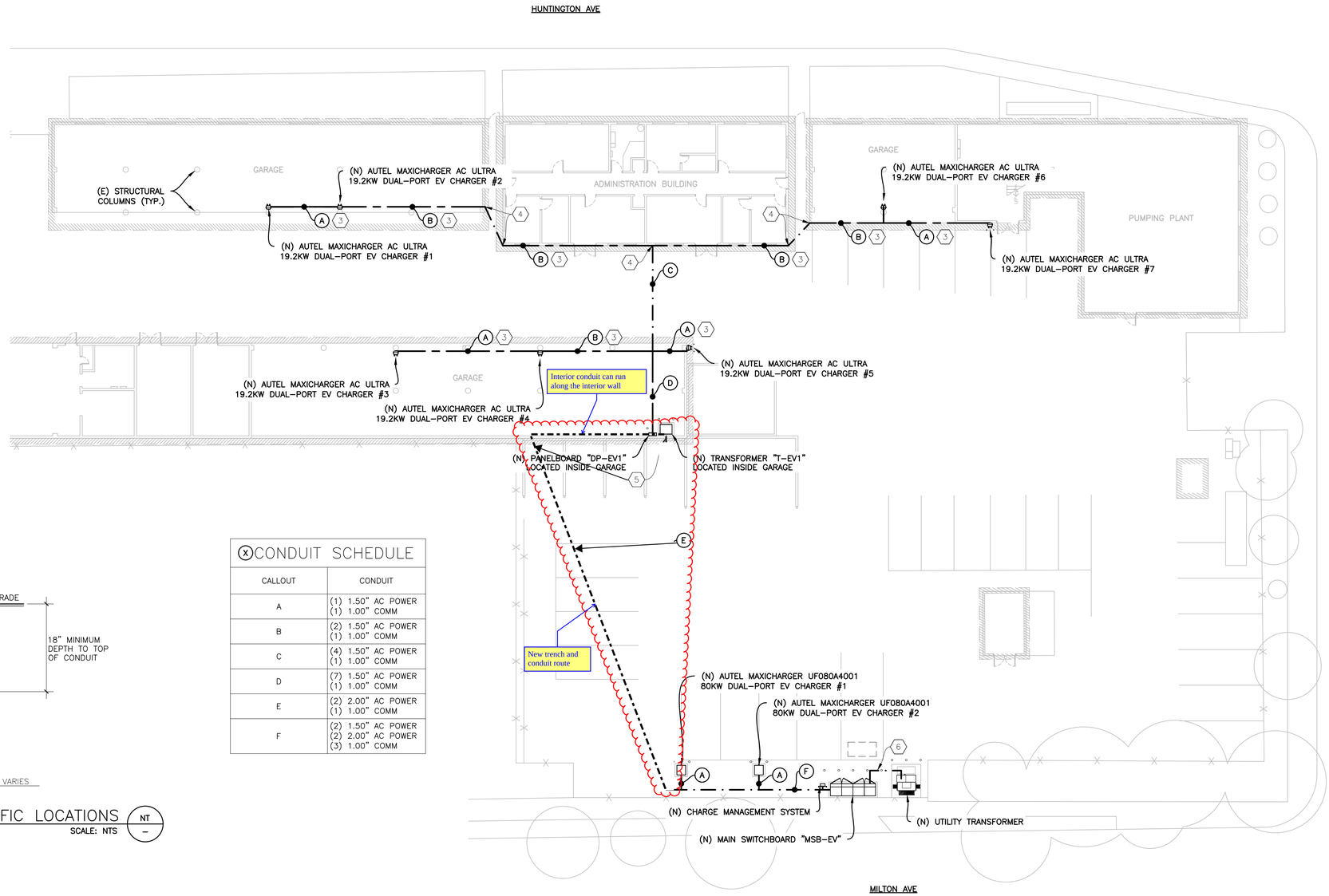

TRENCH SECTION FOR VEHICLE TRAFFIC LOCATIONS

SCALE: NTS

VT –

## (X) CONDUIT SCHEDULE

| CALLOUT | CONDUIT |
|---|---|
| A | (1) 1.50" AC POWER<br>(1) 1.00" COMM |
| B | (2) 1.50" AC POWER<br>(1) 1.00" COMM |
| C | (4) 1.50" AC POWER<br>(1) 1.00" COMM |
| D | (7) 1.50" AC POWER<br>(1) 1.00" COMM |
| E | (2) 2.00" AC POWER<br>(1) 1.00" COMM |
| F | (2) 1.50" AC POWER<br>(2) 2.00" AC POWER<br>(3) 1.00" COMM |




## 02 TRENCH AND CONDUIT ROUTE DETAIL

(X) SEE CONDUIT SCHEDULE FOR DETAILS

0'-0" 16'-0" 32'-0"

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

McCalmont Engineering
info@mccalmont.net
(408) 871-9600
1624 DELL AVENUE
CAMPBELL, CA 95008
www.mccalmont.net

| REV. | DATE | DESCRIPTION |
|---|---|---|
| 0 | 02/19/26 | PERMIT SUBMITTAL |

CITY OF SAN BRUNO
567 EL CAMINO REAL
SAN BRUNO, CA 94066
P: (650) 616-7058

TRENCH AND CONDUIT ROUTE DETAIL

225 HUNTINGTON AVE
SAN BRUNO, CA 94066

PROJECT NAME: SAN BRUNO CORP YARD EV CHARGERS PHASE 2

| | | |
|---|---|---|
| DESIGNER | MCCALMONT ENGINEERING | DATE: 08/21/2024 |
| DRAFTER | T. KOCSIK | FILENAME: E-100.500 |
| CHECK | N. LOVGREN | SCALE: AS NOTED |
| SIGNATURE | N. LOVGREN | PLOT DATE: 02/19/2026 |
| PROJECT NUMBER | MEC-1304-02549 | SHEET SIZE: 24" X 36" |

STAMP

REGISTERED PROFESSIONAL ENGINEER
NICHOLAS KEITH LOVGREN
No 20849
Exp 08/31/2026
ELECTRICAL
STATE OF CALIFORNIA

E-502

THE MOBILITY HOUSE

# Pre-Commissioning Documentation

ChargePilot – Charge and Energy Management System

# Contents

THE MOBILITY HOUSE

## Installation Manual

# ChargePilot

## Safety Instructions

- The steps described in this manual may only be carried out by a qualified electrician who, due to their professional training, experience, and knowledge of the relevant standards, is able to safely assess and carry out the steps described in the installation manual.
- Installation must be carried out according to the described steps to ensure correct functionality. Documentation of the installation should be made according to the enclosed installation and configuration checklist.
- If steps described in these instructions are not carried out or documented correctly, this may lead to faults in the operation of ChargePilot. Adverse effects may include overloading of the panel, damage to the installed systems and/or charging stations, and shock/fire hazard.
- ChargePilot can only be activated after digital or postal delivery of the enclosed pre-installation configuration checklist to The Mobility House. If submitted digitally, ChargePilot can be commissioned within just 2 weeks, schedule allowing.
- The following liability warning must be observed:

Liability: The Mobility House is not liable for damages caused by faulty installations or incorrect documentation during commissioning.

## ChargePilot Standard Components

| **Component** | **Standard Size**<br>**L x H x D (in.)** |
|---|---|
| The Mobility House Smart Charging Controller - Kunbus RevPi Connect | 1.81 x 4 x 4.63 |
| Power supply 120 VAC → 24 VDC<br>w/ power cable NEMA 5-15 plug | 1.57 x 3.5 x 3.84<br>6 ft. or 8 ft. cord |
| Hinged Outdoor-Rated Junction Box | 11.24 x 13.24 x 7.70 * |
| 5-port ethernet switch | 1.16 x 4.63 x 3.88 |
| 8-port ethernet switch | 1.69 x 3.56 x 3.89 |
| 16-port ethernet switch | 1.78 x 7 x 4.75 |
| LTE Connectivity Router** | 0.98 x 2.91 x 3.27<br>10.69 in height w/ antennae |

** Size of junction box and switch may be adjusted based components selection for a particular site. **Optional, provided if cellular connectivity kit is purchased.*

# Installation Preparation

The following requirements must be met and verified prior to installation of TMH ChargePilot system.

## Electricity Supply

A 120VAC power outlet must be available at point of use in order to install ChargePilot components. If using the local facility/customer network, instead of TMH-provided LTE connectivity router, 120VAC power may alternatively be provided via a hardwired connection instead of outlet.

## Component Spacing and Temperature Requirements

The components of ChargePilot need be protected from water and dust. We recommend installation inside an electric cabinet or enclosure with ingress protection rating IP54 or higher. The mobility house can also provide the enclosure if needed. The standard enclosure we provide is 13.24" x 11.24" x 7.70" with DIN rails to mount all components. If the enclosure will be installed outdoors, the ambient temperature range must be between -4°F and +122°F.

When installed inside an existing electrical cabinet, the ChargePilot components require approx. 10"x 12"x 8.5" of space (L x H x D). To allow for heat dissipation, ensure there is at least 1-inch space between the components.

## Charging Infrastructure and EVs

The charging stations must be installed beforehand in accordance with the official installation instructions of the respective manufacturer. **Charging stations must be powered on, clear of errors, and able to initiate a charge session with an EV in "free-vendor" mode prior to the commissioning of the ChargePilot system. It is strongly preferred that this test be performed with an EV that will belong to this site and/or will be available during TMH Commissioning.** Additionally, to commission TMH ChargePilot system, each charger's serial number (and asset ID's, if they differ) should be shared with TMH Implementation team member ahead of commissioning. This may require reaching out to the Charger Manufacturer for some models. A simple excel list of Charger SNs/Asset IDs will suffice.

For sites that will be authenticating EVs using a MAC or Vehicle ID, it is preferred to receive these ahead of time as well.

**Each charger should be updated with the TMH approved Firmware and OCPP (Open Charge Point Protocol) WebSocket configuration to the TMH backend (ws://….:9000) before being shipped to the site. If chargers shipped a long time in the past, they would likely require a firmware update from the EVSE prior to TMH ChargePilot Commissioning.**

### Data connection of the charging stations

*Each* charging station must be connected *radially* to the network switch via Ethernet cable, ***CAT5e minimum required, CAT6 recommended***. RJ45 plug on each end of cable. Use of Shielded Twisted Pair (STP) versus Unshielded Twisted Pair (UTP) to be determined by EPC based on other site factors, per normal best practices.

**Note: When rigid cables are used, a more flexible patch cable should be used at both ends of the cable to avoid strain at connection points on either side of cable run.**

### Integration of Charging Stations

Each charging station type that will be installed must be integrated with The Mobility House's backend. Even for the same manufacturer, different charger models (e.g., AC vs. DC) may have separate integrations.

For any new chargers that will be integrated by The Mobility House for a given project, *this process should be started at least 2 months before ChargePilot will be implemented on site.* Each charger should be updated with the correct firmware and OCPP WebSocket configuration before being shipped to the site. If chargers shipped a long time in the past, they will likely require a firmware update from the EVSE prior to TMH ChargePilot Commissioning.

## Network Requirements

If using the customer's network (rather than a TMH- supplied router), TMH requires:

- an ethernet cable terminating in the enclosure with no less than 10 mbps up/down connectivity
- correct ports have been opened to allow for outbound connections, with correct sites whitelisted, and no firewall restrictions for TMH smart charging local controller.
- See port/whitelisting charts below

| **Sites to be whitelisted** |
|---|
| *.balena-cloud.com |
| *.docker.com |
| *.docker.io |
| *.tmhusa.energy |
| No firewalls blocking TMH outbound connections |

| **Ports to be opened** |
|---|
| 53 UDP |
| 123 UDP |
| 443 TCP |
| 5671 TCP |

## Helpful Notes

1. Try to locate The Mobility House enclosure and the chargers as close to the main panel as possible to limit digging and trenching.
2. Typically, when The Mobility House components are in a garage or warehouse, the cables to the enclosure are run aboveground.
3. Try to avoid breaking through walls.
4. If lines to the chargers are very long, it may be easier to install a sub-cabinet closer to the charger.

# Pre-Commissioning Checklist

Sign-off on the following checklist indicates that each item meets the installation and preparation requirements as described above. Note: some fields do not require action, just info.

Prior to The Mobility House (TMH) arriving at your site, please return the following completed checklist to us-operations@mobilityhouse.com.

# Physical Requirements

Please provide a signature that each item has been completed.

| | |
|---|---|
| Chargers are installed in the ground / on concrete pad | |
| Chargers are plugged in and all breakers and disconnects have been turned on- chargers fully energized and without errors. Charging session w/ EV successfully completed in “free-vendor” mode. | |
| Spreadsheet or List has been attached to this form with all charger Serial Numbers (and Asset IDs if they differ) | |
| Chargers configured to TMH OCPP backend (ws://….:9000) | |
| DIN rails with sufficient space for ChargePilot components have been mounted in existing electrical cabinet, in enclosure which meets listed requirements, or in The Mobility House-provided enclosure | |
| Power to enclosure provided via one of the following options:<br>→ IF using connectivity package: 120V outlet w/ two plugs inside enclosure<br>→ IF customer is providing internet: one 3-phase hard wired connection terminating in enclosure for TMH 24V power supply<br>→ IF the customer is providing internet and installation is in electrical cabinet: one breaker (120V/15-20A) to connect power supply | |
| Cat5e (or higher) cables with RJ45 connectors have been installed, running from each charger to The Mobility House enclosure<br>*Connections must be per charger as we do not support daisy-chaining* | |
| Photo of enclosure / DIN rails, showing cables, has been attached to this form | |
| IF customer is providing internet:<br>→ Ethernet cable w/ RJ45 plug is connected to customer LAN and run to TMH enclosure<br><br>*See next section for additional requirements* | |

# Electrical

| | | |
|---|---|---|
| What is the current grid connection (A) and (V)? | | |
| IF chargers are on existing site load meter: 15-minute site load data provided? | ☐ Yes | ☐ Not Applicable |
| IF rate optimization will be enabled: | | |

| | |
|---|---|
| Which electric utility serves this site? | |
| What electricity tariff (name) is at this site? | |
| Vehicle schedule data provided? | ☐ Yes ☐ Not Applicable |

## Internet

The following is only required if the customer will be providing a LAN connection to TMH controller. If you have selected the connectivity package, you may skip this section.

Please provide a signature that each item has been completed.

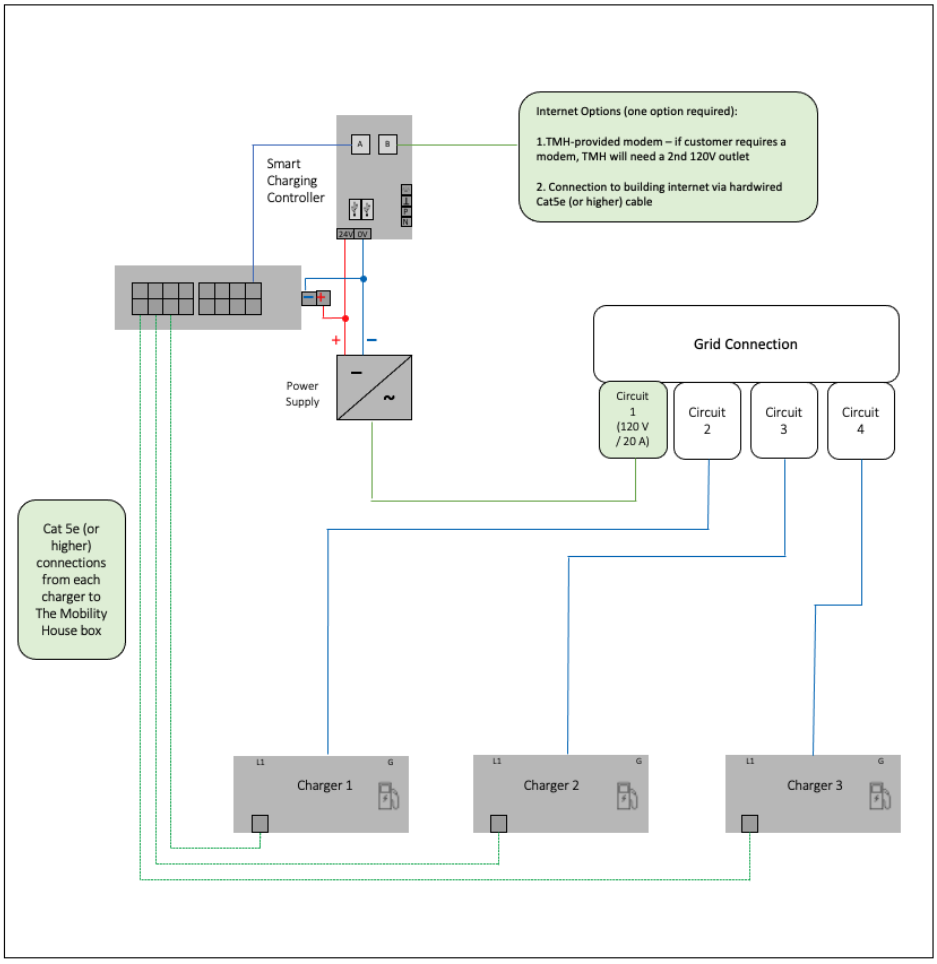
| | |
|---|---|
| Ethernet of no less than 10mbps with CAT5e or higher connection provided to enclosure | |
| Following ports opened to all outbound connections: | |
| 53 UDP | |
| 123 UDP | |
| 443 TCP | |
| 5671 TCP | |
| Following sites whitelisted: | |
| *.balena-cloud.com | |
| *.docker.com | |
| *.docker.io | |
| *.tmhusa.energy | |
| No firewalls blocking outbound connections | |

# High Level Circuit Diagram

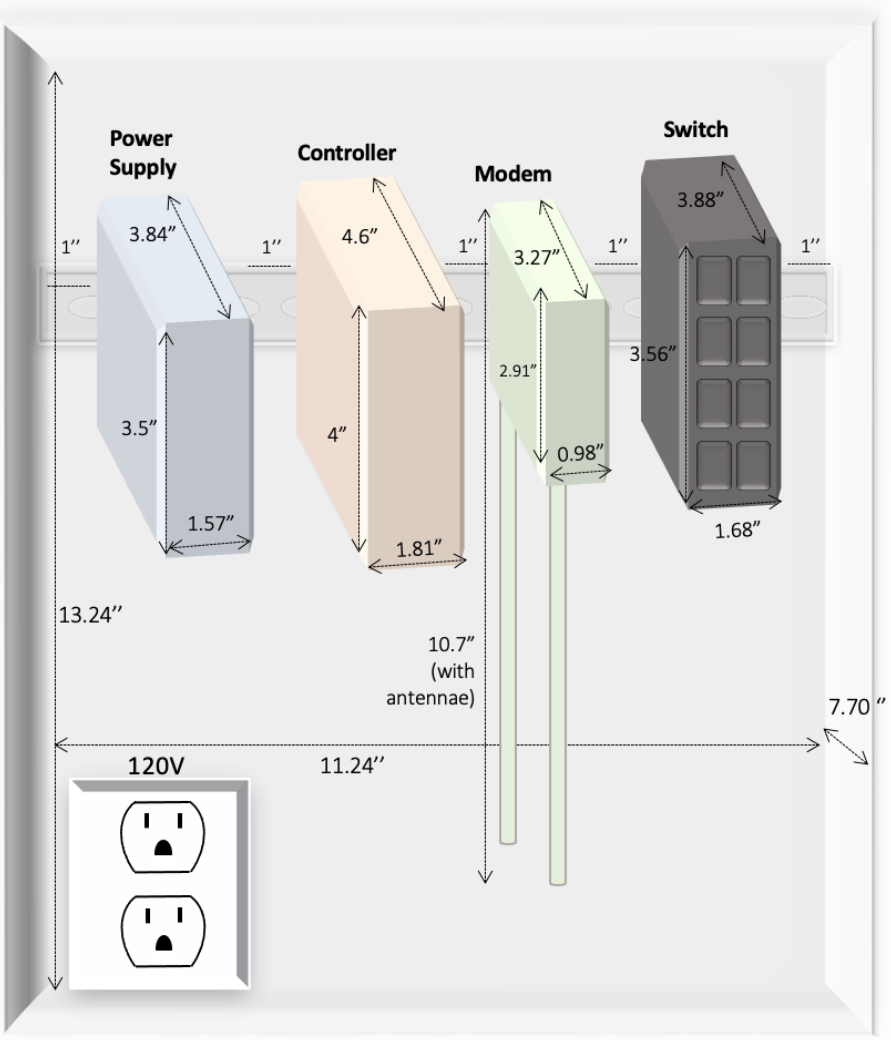
| Smart Charging Controller | |
|---|---|
| **Port/ Symbol** | Function |
| RJ45 A | Connection via Ethernet to network switch |
| RJ45 B | Connection to internet |
| RS485 P | Free |
| RS485 N | Free |
| 24 V | V+ Power supply |
| 0 V | V- Power supply |

| 24V Power Supply | |
|---|---|
| **Symbol** | Function |
| ⏚ | grid; PE |
| N | grid; L2 |
| L | grid; L1 |
| V+ | Power supply smart charging controller 24 V |
| V- | Power supply smart charging controller 0 V |
| V+ | Power supply network switch / + |
| V- | Power supply network switch / - |

| Network switch | |
|---|---|
| **Port/ Symbol** | Function |
| - | Power supply V- |
| + | Power supply V+ |
| RJ45 | Smart Charging Controller RJ45 A |
| RJ45 | RJ45 Port Charger 1 |
| RJ45 | RJ45 Port Charger 2 |
| ... | ... |
| RJ45 | RJ45 Port Charger X |



# Sample* ChargePilot Setup




***not to scale*

- The Mobility House-provided enclosure size is configurable; components can also be placed in electrical cabinet or customer-provided enclosure with DIN rail
- Switch size/number of ports will depend on number of chargers installed; switch can also be placed in separate customer IT closet with Cat5e (or higher) running to enclosure
- Modem is optional as part of Connectivity Kit

*Enclosure (Junction Box) and switch requirements subject to change dependent on number of chargers included in installation.

# Component Datasheets

Smart Charging Controller, Kunbus RevPi Connect

| | |
|---|---|
| **Link** | https://revolution.kunbus.com/revpi-connect/?noredirect=en_US |


Power Supply, MEAN WELL MDR-60-24

| | |
|---|---|
| **Link** | https://www.alliedelec.com/product/mean-well/mdr-60-24/70069741/ |

WIWAV Unmanaged 5-Port, 8-Port or 16-Port Network Switch*

| Links | 5-port, 8-port, 16-port |
|---|---|



**Switch size/ # of ports can be increased to accommodate facilities with larger numbers of chargers*

Teltonika RUT240 LTE Router

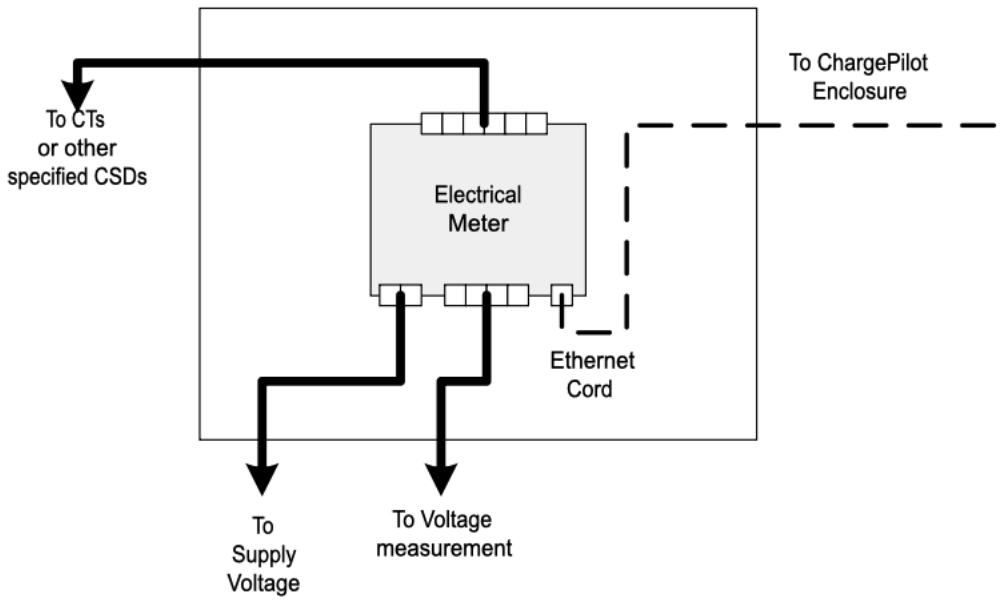
| | |
|---|---|
| Link | https://www.streakwave.com/amfile/file/download/file/12590/product/32469/ |

# Metering Requirements for ChargePilot

## ChargePilot's Meter Logic

Chargers have internal, often "revenue grade" meters inside them that monitor and report to ChargePilot, via OCPP, the amount of power used by the chargers. To monitor other uncontrolled load or generation, ChargePilot uses additional onsite meters. ChargePilot's metering logic is subtractive, meaning ChargePilot's meter should be placed to measure aggregate load data. This subtractive approach allows for the lowest number of meters onsite. A good rule of thumb is that any panel that has both a significant uncontrolled load and a controlled charger load should have a meter.

Please note: regulations and other standards may require additional meter placement above and beyond this rule of thumb.




*Meter Connections Diagram*

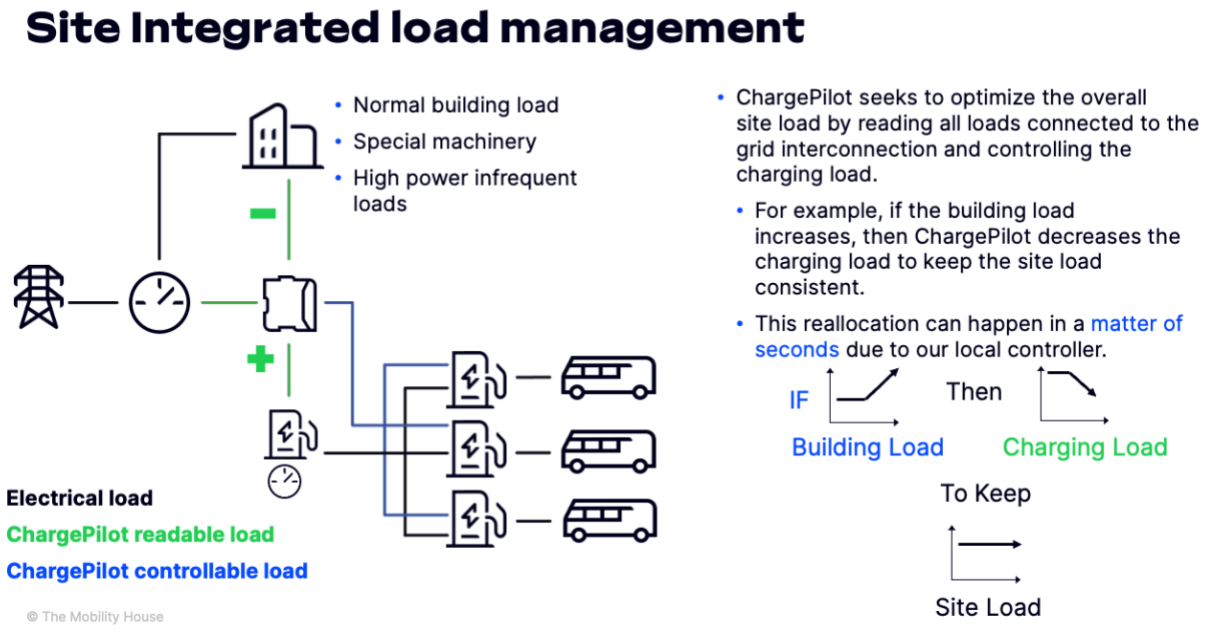
## Example Use Cases

ChargePilot uses meter(s) for multiple different customer use cases. The following are examples.

**Time-of-use rate optimization around changing uncontrolled building load:** A group of chargers may share an interconnection with uncontrolled load such as a building's lighting load, HVAC load, or other load. In this case, a meter and current sensing devices would be installed on the main panel to watch the live value of this other sum of load. ChargePilot could then ramp charging up and down accordingly to help reduce the operational cost of time-of-use rates and demand charges. In this example, the main use of the meters is to help reduce operational costs through peak shaving and shifting.

**Solar or other DER integrations such as BESS:** ChargePilot can prioritize self-consumption of onsite generated power; to do so, one meter or multiple meters will be placed on various panels throughout the site's electrical infrastructure. For more information, see our DER+EV white paper. In this example, the main use of the meters is to help encourage the self-consumption of onsite generated power, thereby reducing the CO2 emissions and also reducing the cost of charging.

**Automated Load Management (ALM):** ChargePilot is an ALM capable device, per the NEC, that can be used to "oversubscribe" an electrical panel(s)/conductor(s) or overcurrent protection device(s). In these cases, the EMS set point (per code) affects how various load calculations are done. In order to give the chargers the highest amount of power on a second-by-second basis, meter(s) are used to watch the live aggregate load in various locations in the electrical infrastructure and then allocate any additional unused capacity to the chargers. For more questions, see our ALM white paper. In this example, the main use of the meters is to influence the load calculations per the NEC, thereby affecting the design, permitting and interconnection process of the site. ALM can drastically reduce the capital cost of installing or expanding a charging site, and even reduce the lead time for an entire project by reducing the need to upgrade site infrastructure such as circuit breakers, panels, and even site-level transformers; however, ALM does require strict adherence to local, state and national electrical installation codes and additional engineering and electrician's expertise and time to be administered safely and legally.




*Explanation of the Site Integrated Load Management Feature*

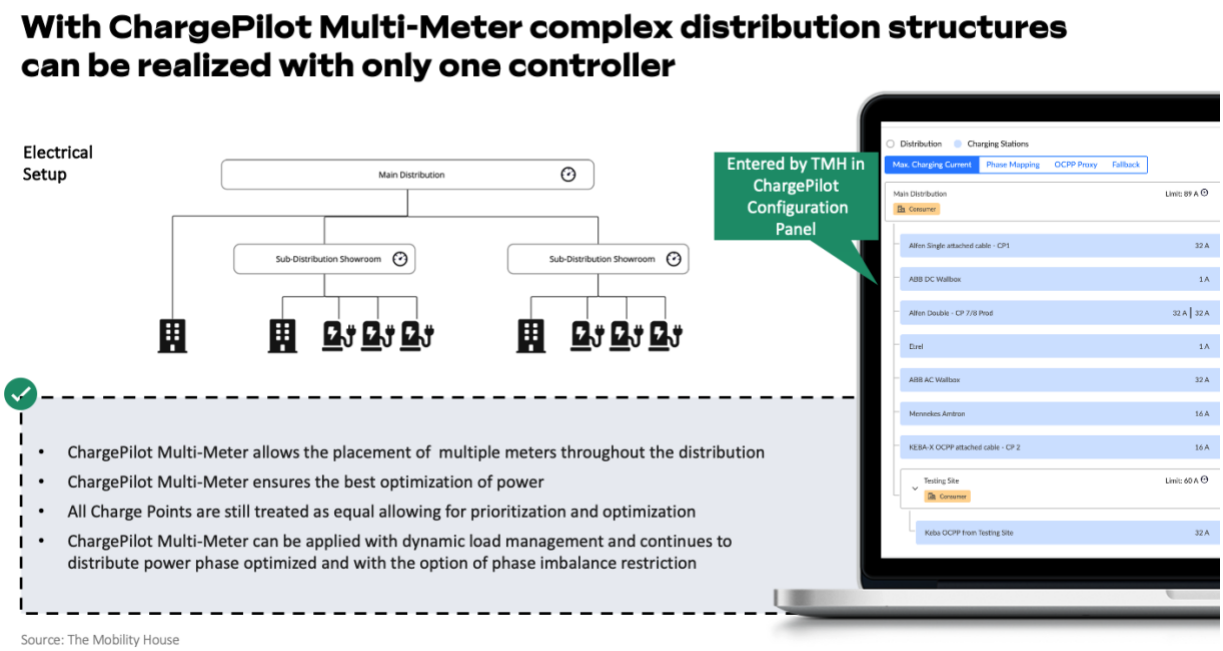
## Where and How Many?

ChargePilot can be installed with up to three meters. The exact placement and number of meters will be communicated to you by The Mobility House's delivery or applications engineering team. The placement is unique to each site and electrical information, such as single line diagrams or equivalent, is required in order to properly determine meter quantity and placement. Various regulations may also affect the quantity and placement of meters. Accurate and complete electrical information is critical to ensuring sites are both safe and optimized for cost.

Please note: A lack of electrical information can lead to additional cost through the use of additional meters or the inability to safely install ChargePilot.

## ChargePilot Meter Fallback Value

A fallback value should be set in ChargePilot to represent the maximum of the uncontrolled loads on the circuit. This is key to safety: if ChargePilot were to ever lose connection with its meter, it would then revert back to a safe state.




*Explanation of the Multi-Meter Feature*

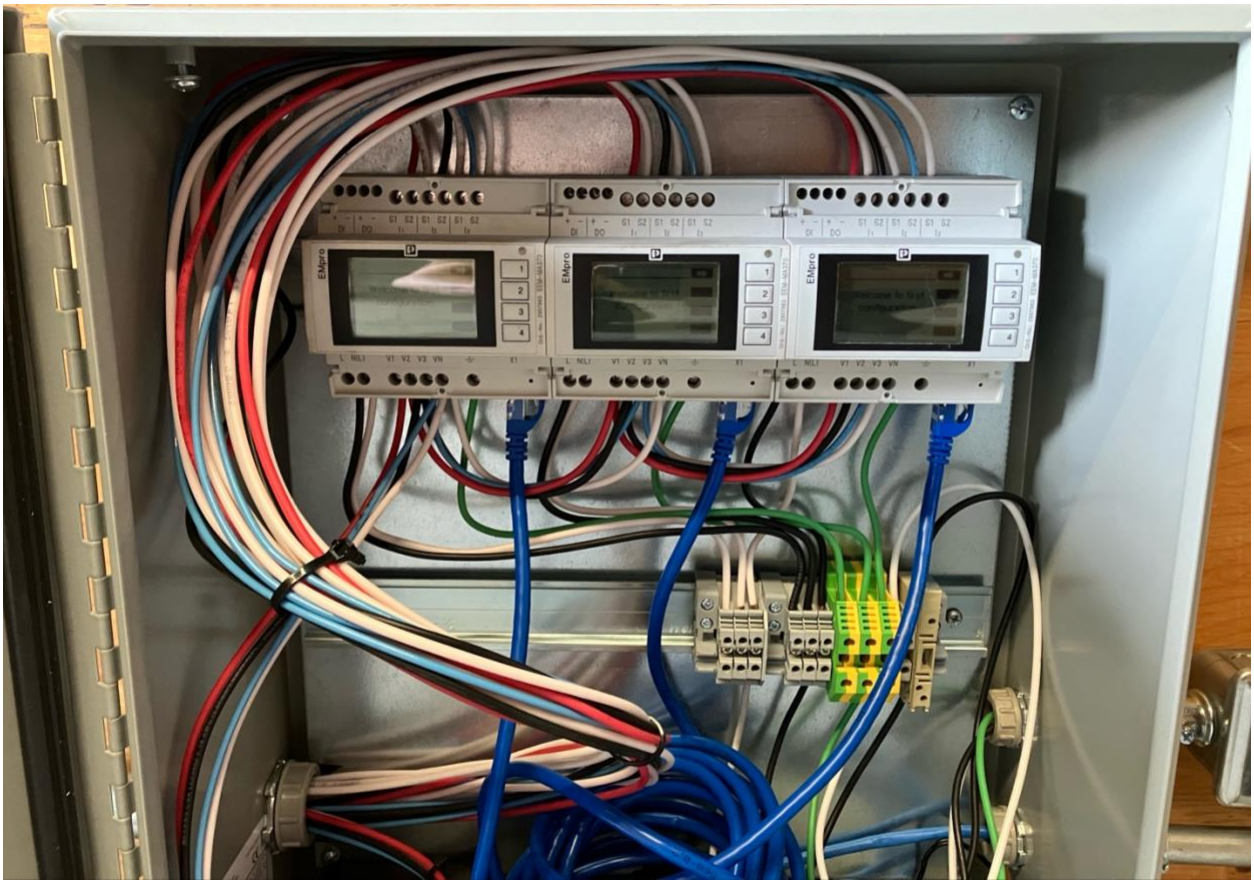


*Photo of Multi-Meter Installation*

# ChargePilot Metering Components

Per meter, ChargePilot requires the following:

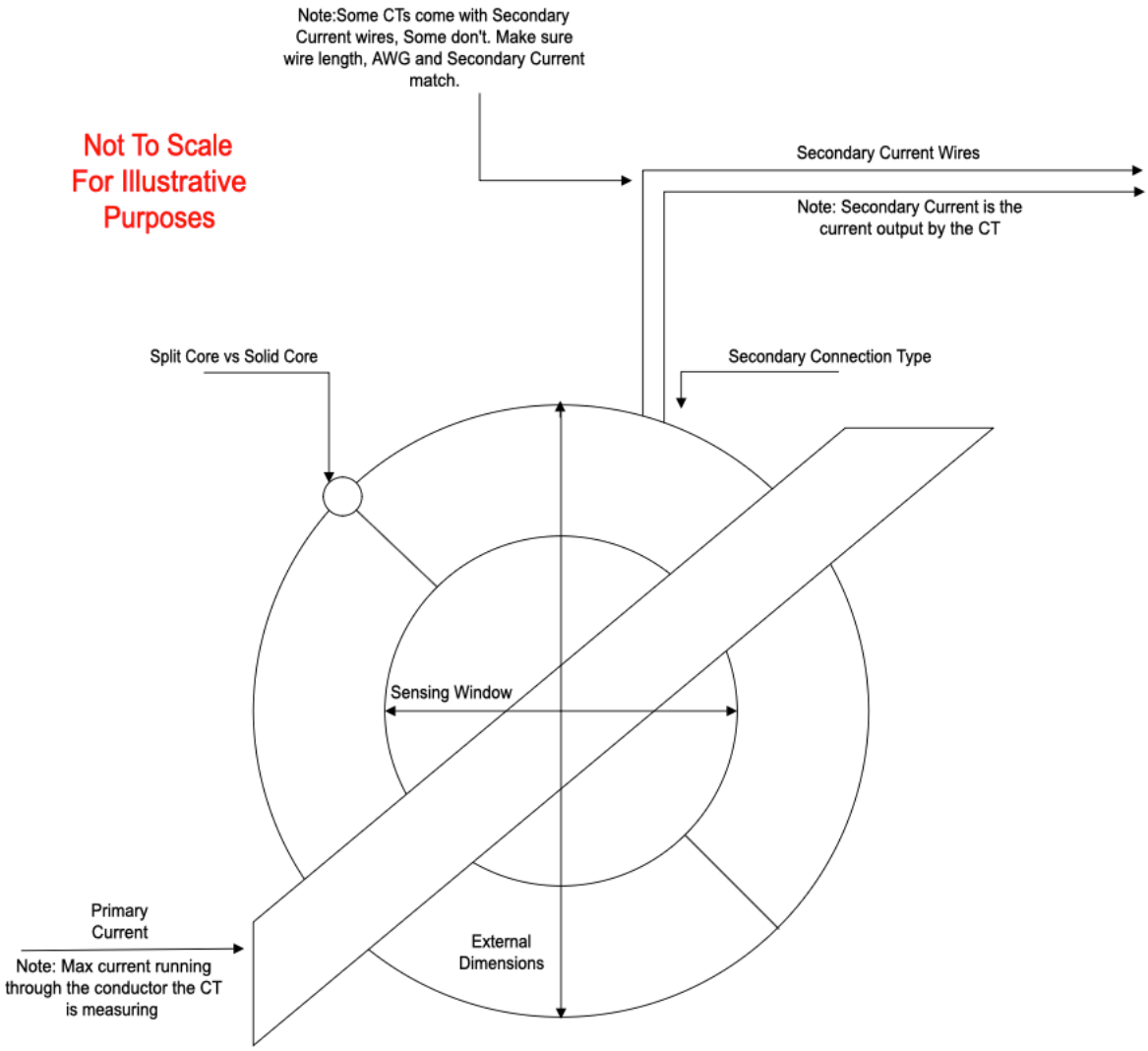
- Current transformer per phase (supplied by customer unless stated otherwise)
    - 5A max secondary with 12-24 AWG wires; ensure sizing and mounting requirements as described below are tailored to the needs of the site
- Voltage reference (supplied by customer)
    - 12-24 AWG wires; see wiring diagrams below or the meter documentation linked below
- Surge protection for meter power supply (supplied by the customer)
    - See requirements by meter below
- Wires from the CT to the meter (sometimes supplied with the CT)
    - 12-24 AWG
- A meter (supplied by The Mobility House with the ChargePilot kit)
- Power to the meter (supplied by the customer)
- Meter enclosure (supplied by The Mobility House)
- Ethernet connection from the meter to ChargePilot controller (supplied by customer)
    - Be advised, an unpowered ethernet run max length is 100 meters or 328 feet; a powered ethernet switch can extend/reset this distance

## Information Per Subcomponent

**Current Transformer (CT):** A current transformer is a common current sensing device. Current sensors pick up the changing electromagnetic fields of AC electricity, then generate a fractional linear related current in their secondary conductors. Current transformers are a type of instrument transformer. They are used for the instrumentation or measuring of circuits. Because CTs rely on electromagnetic properties to do their conversation, they do not require power. Current transformers must be sized per the unique site requirements. Important specifications are:

- **Body Type—Split core vs Solid core:** Split core can be installed around a wire, as they are hinged where a solid core CT must have power turned off and the wire must be threaded through the solid core CT.
- **Primary current:** This is the current rating of the device, the rating of the wire/panel/OCPD should be close to (equal to or slightly lower) than the primary current rating of the CT.
- **Secondary current:** This is the max current that the CT will output, it must match with the meters ability to read current. Many meters have programable ranges, in this case it must be in the range and the meter must be programed for it.

- **Sensing window:** This is the internal hole dimensions. This dimension must fit around the wire that is being measured.
- **External dimensions:** This must fit inside the panel (distance between front and back of panel) and must fit the distance in between the other wires.
- **Secondary conductors:** These are the wires that run to the meter. Some CTs come with wires, and some do not. The AWG sizing of the wire must be able to be accepted by the CT & the Meter. Please see meter information for AWG capability.
- **Secondary connection type:** This explains how the secondary conductors are attached to the CT.
- **Mounting:** This explains how the CT is mounted inside the panel.




*Current Transformer Diagram*

**Meters:** Meters are monitoring devices that convert input signals from current, voltage, power, etc. sensing devices into readings. Meter readings are then turned into signals understood by the ChargePilot local controller. Meters must be placed relatively close to the current sensing/circuit they are measuring. They also have their own power requirements.

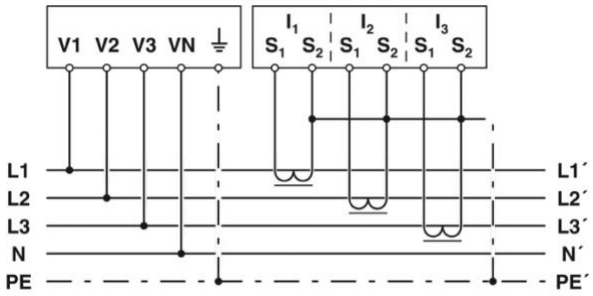


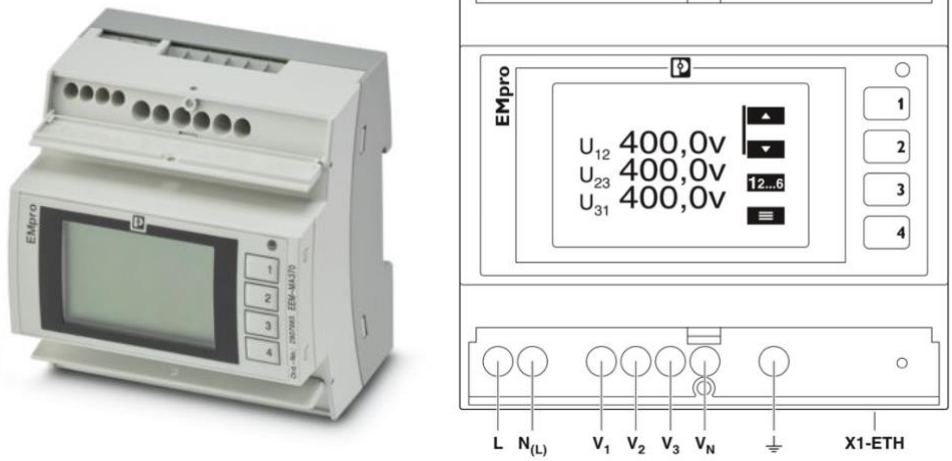

*Diagram shows a 3PH-4W setup; for any alternative set-ups please see the respective metering instruction manuals*

**Meter integrations:** ChargePilot currently is integrated with two meters for use in the US and Canada:

### Integrated meter: Janitza Meter UMG 604


- UL and cUL listed.
- Current Input 0-5A
- 12-28 AWG input
- Dimensions: (4.23 in x 3.23 in x 3.54 in)
- Horizontal Din Rail Mounted
- Measurement Voltage range: 0- 277/480V AC
- Power required: 3.2W at 240 V/ 208V/120V
- Protection of supply voltage 6A line circuit breakers with tripping characteristic B
- Measuring Voltage Input for 3 phase 4 conductor systems L-N/L-L max: 277 V/480V
- Temperature: -4 F to 70 F (-20 C to 70C)

## Integrated meter: Phoenix Meter (EEM-MA-370)



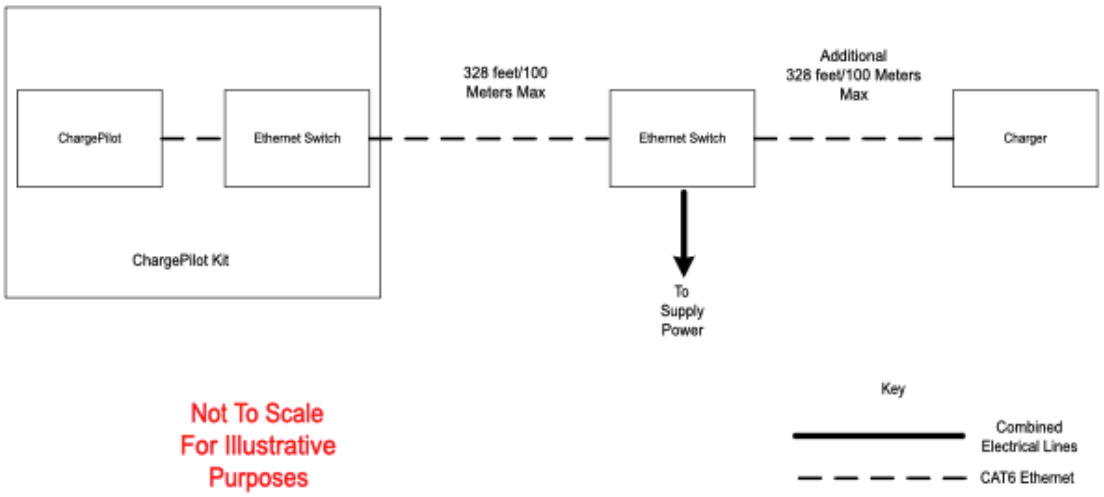

- UL Listed and cUL Listed
- Current Input 0- 5A input
- 10-24 AWG input
- Dimensions: (3.54in x 3.54in x 2.83in)
- Horizontal Din rail Mounting
- Supply Voltage range 100 VAC- 230V AC +_ 20%(L-L or L-N) Or 150V DC – 250V DC +- 20%
- Supply voltage fuse <= 16A
- Measurement Voltage range: 25 VAC-690 AC (L-L) and (20V AC-400V AC L-N)
- Temperature: -13 F to 158F (-25C to 70C)

**Meter enclosure:** The Mobility House does supply an enclosure for the meter(s). The enclosure must be supplied with power.

Please note: certain applications may require an uninterruptable power supply for the meter.

**Ethernet connection between the meter and the ChargePilot enclosure:** The meter shall be hardwired to the ChargePilot local controller using a Cat5e or above ethernet connection. The cables shall be Shielded Twisted Pair and should be tested upon installation.

Please note: unpowered ethernet has a max distance of 100 meters or 328 feet. For longer distances, The Mobility House suggests the use of additional powered switches or the use of fiber with ethernet converters on the ends.




*Ethernet Extension Diagram*

# Commonly Asked Questions

*Q: What does the project manager from The Mobility House install and what is required to be installed by an electrician?*

A: While our project managers are experts in the installation and testing of the ChargePilot kit, they are not trained electricians or general contractors. Therefore, the following must be installed by the site electrical contractors or general contractors:

- Current transformers (wired up)
- Power to the meter (wired up)
- Voltage reference to the meter (wired up)
- Enclosures
- Wires from the current transformers to the meter (wired up)
- Ethernet connection between meter and ChargePilot kit and associated conduit
    - Connections on each end physically plugged in by The Mobility House
- Meter

*Q: Do I really need this meter?*

A: ChargePilot uses meters for both safety and functionality reasons. If a site has been designed with a meter, please reach out to your delivery manager at The Mobility House for any questions. Failure to install a meter at the predetermined point, unless approved by The Mobility House implementation team, may make the site no longer electrically compliant and may put the site in an unsafe electrical state.

*Q: Who supplies the meter?*

A: The Mobility House supplies the meter as part of the overall ChargePilot offering.

*Q: Who supplies the enclosure?*

A: The Mobility House.

*Q: Who supplies the ethernet cord and conduit?*

A: Unless told otherwise, The Mobility House does not supply or install the ethernet cord and conduit.

*Q: Can I supply my own meter? Can you connect to my utility meter?*

A: No, ChargePilot is not configured to work with meters other than those that are supplied by the Mobility House. If you wish to supply one of the meters listed, please work with your delivery manager.

*Q: Who supplies the current transformers?*

A: Unless otherwise informed, The Mobility House does not supply ChargePilot with current transformers. Please use the information and requirements inside this document to procure the required current transformers. If, in your specific case, The

Mobility House is providing the current transformer, please provide the implementation manager with the information discussed above.

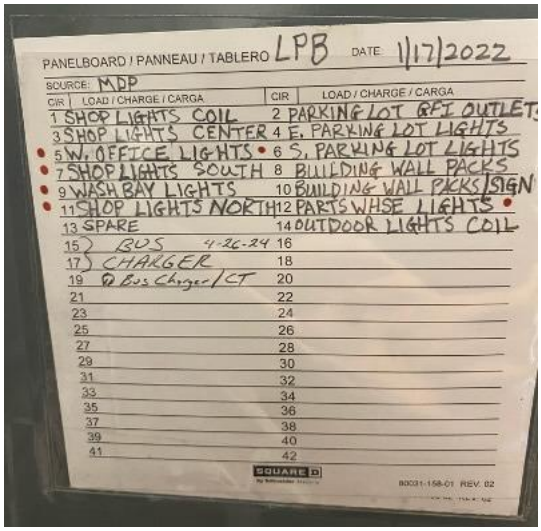
## Installation Photo Checklist

Please send us the following visual documentation:

1. A photo of the ChargePilot's Meter Kit, as shown in the example below with the meter turned on (text on the screen)

2. A photo of the CTs installed and wired up; photos showing the CT's direction

3. A photo of the breaker panel schedule/panel name that the meter is installed*




*The chargers are shown on line 17 and ChargePilot and associated metering CTs are shown on line 19

4. A photo of the ethernet cable (terminated) inside the meter box.