

Oregon Joint Use Association Standards Committee

Minutes—May 9, 2024
Via Zoom

Chair Peter Kalnins called the meeting to order at 10:01 a.m.

Present:

Peter Kalnins, Chair
Justin Reynolds, Comcast Co-Chair
Chad Altherr, PGE
Chris Barley, Oregon Aerial
Terry Blanc, PGE
Craig Commerford, PGE
Adam Deshon, Salem Electric
Cody Mabee, PacifiCorp
Robb Robison, OPUC
Wayne Ronke, K&B Tech Solutions

Not Present:

Chad Beam, LS Networks
Leon Grumbo, OPUC
Jesse Keyes, Gary Lee & Assoc.
Alex Chaney, OPUC

Staff:

Genoa Ingram

Approval of Minutes The Committee reviewed the minutes of the March 14, 2024, meeting.

MOTION: Moved by Cody Mabee and seconded by Craig Commerford to approve the March 14, 2024 minutes as corrected to reflect Central Lincoln PUD (rather than PUC)..

Motion passed.

Electric Vehicle Charging Presentation Terry Blanc provided an overview of Portland General Electric's electric vehicle charging program. PGE is putting in place new specification for electric charging stations attached to utility poles. Relates to PGE's initiative to electrify transportation, sharing decarbonization goals with the State of Oregon and other partners. The intent is to provide charging poles in key locations to provide access throughout communities where they currently are not available. The above-ground design includes a retractable charging port and is aimed at a cleaner, more low impact design. Charging facilities will be monitored for efficiency and other data. He offered to make information available for the OJUA Standards Manual. The Committee discussed whether there was any impact on climbing space. Terry confirmed that there was no impact. The stations will be owned and maintained by PGE. Terry responded to additional questions including space on the pole and how the charging mechanism works. There is no exposed conductor.

Old Business

Framing of Comm Lines Deferred to report from Leon Grumbo at a later date.

Loading Zone Districts Chair Kalnins noted that the visual had been updated in the Manual and thanked Justin for his input. He recalled that there had been discussion about adding the wind charts and offered to prepare slides for review at the next meeting.

Discussion of OPUC Verbiage for Storage Loops Chair Kalnins asked for additional feedback on information presented by the PUC and asked if there was feedback and consensus. The Executive Committee will also review. Robb Robinson confirmed that it continues to be worked. Once approved, the Committee agreed that it should be included in a separate chapter in the Manual.

Terry Blanc recalled that two remaining issues included the figure 8 loop and the appropriate time and place for mule tape. Robb confirmed that those issues are being worked through.

New Business

NESC Tabs Chair Kalnins noted he had forwarded the tabs to Committee members prior to Spring Training but had not received much feedback. Staff confirmed that the feedback had been positive and that they are ready for distribution as presented.

NESC Code Revision/Comment Review The Committee reviewed the proposed response to revisions to NESC Rule No. 323B, NESC Page No.: 227, from PGE, previously presented by Terry Blanc.

MOTION: Moved by Robb Robison and seconded by Justin Reynolds to recommend to the OJUA Executive Committee that the Ieee NESC Code Revision comments proposed by PGE be adopted and submitted by the OJUA. **Motion passed.**

Other Chair Kalnins reported that he had been approached at Spring Training that the Tri-Fold may be out dated. He asked Committee members to review the Tri-fold for any discrepancies. Terry Blanc suggested that the date of the document referenced be verified for the latest version, which was revised March 9, 2017 under Jerry Donovan.

Adam Deshon also noticed that the Standards Brochure had been updated May 2021 and wanted to make certain that the most current was being used, as with the Tri-Fold.

Future agenda item: Staff reminded the Chair that Terry Blanc had previously asked if ODOT has provided technical guidance or requirements for wireless build locations in the state right of way. Craig Commerford offered that he had recent interactions with ODOT and offered to follow up with the question.

Future Meetings

Future meetings are as follows:

- July 11
- September 12
- November 14

Adjournment

There was no further business, and the meeting was adjourned at 11:17 a.m.

**Template for Change Proposals
Revise 2023 NESC®
To Develop the 2028 NESC**

Name: Genoa Ingram
Email: genoa@ojua.org
Company or Affiliation: Oregon Joint Use Association
NESC Rule No.: 323B
NESC Page No.: 227

Change Proposal Text:

323B. Manhole and vault dimensions

Manholes ~~and vaults~~ shall meet the following requirements: A clear working space sufficient for performing the necessary work shall be maintained. The horizontal dimensions of the clear working space shall be not less than 3 ft (900 mm). The vertical dimensions shall be not less than 6ft (1.83m) except in manholes ~~and vaults~~ where the opening is within 1 ft (300 mm), horizontally, of the adjacent interior side wall of the manhole ~~or vault~~.

EXCEPTION 1: Where one boundary of the working space is an unoccupied wall and the opposite boundary consists of cables only, the horizontal working space between these boundaries may be reduced to 30 in (750mm).

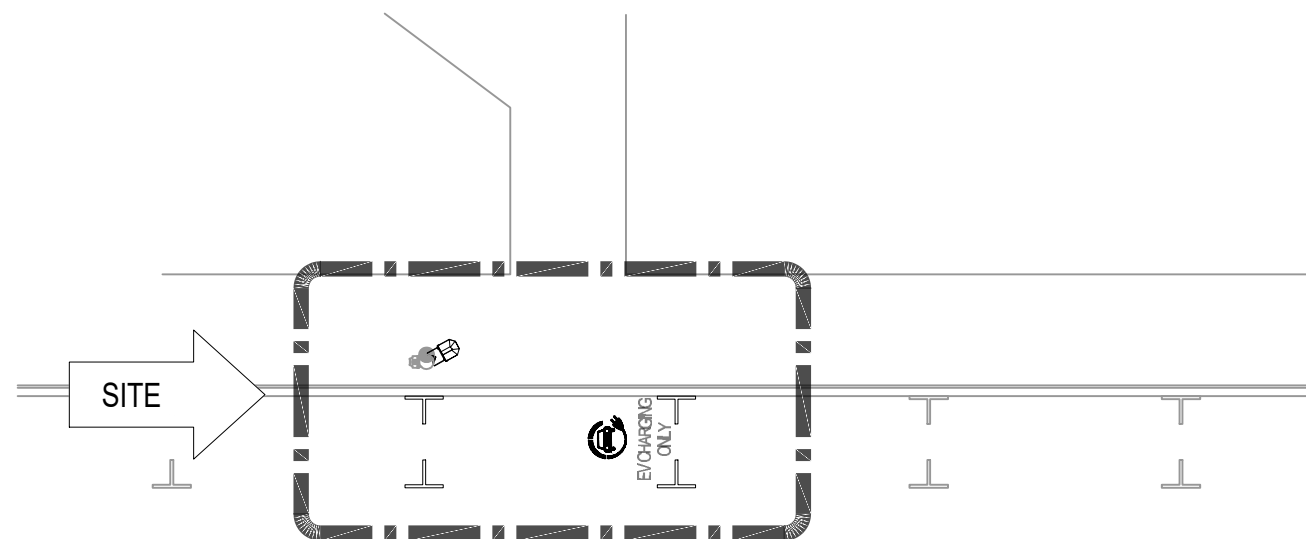
EXCEPTION 2: In manholes ~~and vaults~~ containing only communication cables, equipment, or both, one horizontal dimension of the working space may be reduced to not less than 2 ft (600 mm), provided the other horizontal dimension is increased so that the sum of the two dimensions is at least 6 ft (1.83 m).

Vaults shall meet the following requirements: A clear working space sufficient for performing the necessary work shall be maintained.

Supporting Comment: Working space is not clearly defined within the NESC and may have different interpretations depending on the installation, operation/maintenance, and/or removal of equipment. For example, the working space required for installation of equipment may be different than the working space required for the maintenance and operation of equipment. The working space for equipment located in a vault that is operated with a 'hot-stick' is not equal to the working space required to install or remove the same equipment. The worker can remain outside the vault to operate but would have to enter the vault to install or remove. This leads to many conflicting scenarios where clear interpretation of the rule is challenging. Also, available space for vault installations are typically restricted by right of way (ROW) and easement limitations and may not allow for the adequate sized vaults for all applicable instances of working space

**Note: Exhibits A and B are included as separate documents.*

PGE POLE CHARGER INSTALLATION DRAWINGS



LAYOUT PLAN

PROJECT DESCRIPTION:

- INSTALL (1) LEVEL 2 CHARGING PORT
- INSTALL (1) 100A, 240/120V, 1-PHASE METER

APPLICABLE CODES:

ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

- LOCAL CODES
- 2023 NATIONAL ELECTRICAL SAFETY CODE (NESC)
- 2023 OREGON ELECTRICAL SPECIALTY CODE (OESC)
- 2021 INTERNATIONAL BUILDING CODE
- 2022 OREGON BUILDING CODE

IN THE EVENT OF CONFLICT, THE MOST RECENT OR RESTRICTIVE CODE SHALL PREVAIL

SHEET INDEX

- T1.0 TITLE SHEET
- T2.0 GENERAL NOTES
- T2.1 GENERAL NOTES (CON'T)
- C1.0 SITE LAYOUT
- C2.0 GENERAL DETAILS
- C2.1 MOUNTING BRACKET DETAILS
- E1.0 SINGLE LINE DIAGRAM, PANEL SCHEDULE
- E2.0 ELECTRICAL DETAILS
- R1.0 REFERENCE
- R2.0 REFERENCE
- R3.0 REFERENCE



PORTLAND GENERAL ELECTRIC
121 SW SALMON STREET
PORTLAND, OR 97204

PROJECT NO:

DRAWN BY:

CHECKED BY:

REV	DATE	DESCRIPTION

PGE ACCEPTANCE STAMP

CONTRACTOR NOTE

CONTRACTOR SHALL COMPLETE INSTALLATION PER THE SIGNED AND SEALED SET OF DRAWINGS. ANY NECESSARY DEVIATIONS FROM THE DRAWINGS MUST BE SUBMITTED AS A FORMAL REQUEST FOR INFORMATION (RFI) IN WRITING TO PGE PRIOR TO THE CONTRACTOR PROCEEDING WITH ANY DEVIATION FROM THIS SIGNED AND SEALED SET OF DRAWINGS.

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PROPOSED, EXISTING DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE PGE & THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T1.0

GENERAL CONSTRUCTION NOTES

1.

FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWINGS SHALL APPLY, CONTRACTOR (CONSTRUCTION)
SPONSOR PORTLAND GENERAL ELECTRIC
2.

THE GENERAL CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE THEMSELVES WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
3.

ALL MATERIALS FURNISHED AND INSTALLED SHALL BE NEW, FREE OF DEFECTS AND IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
4.

ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
5.

UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6.

PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.
7.

THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8.

IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY PGE PRIOR TO PROCEEDING.
9.

THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
10.

THE GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.
11.

WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
12.

THE CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
13.

THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
14.

THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
15.

THE GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.
16.

THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.
17.

THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
18.

THE CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2-A: 10-B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.
19.

ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME

CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. THE CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.

20.

CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.
21.

ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
22.

THE CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.
23.

CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY PGE IMMEDIATELY.
24.

THE CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
25.

CONTRACTOR SHALL NOTIFY PGE OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
26.

CHARGER SHALL NOT BE MOUNTED ON A POLE WITHIN 30 FEET OF A FIRE HYDRANT EXCEPT BY SPECIFIC PERMISSION OF LOCAL FIRE AUTHORITY.

ELECTRICAL NOTES

1.

THE ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ANY/ALL ELECTRICAL WORK INDICATED. ANY/ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH DRAWINGS AND ANY/ALL APPLICABLE SPECIFICATIONS. IF ANY PROBLEMS ARE ENCOUNTERED BY COMPLYING WITH THESE REQUIREMENT, CONTRACTOR SHALL NOTIFY 'CONSTRUCTION MANAGER' AS SOON AS POSSIBLE, AFTER THE DISCOVERY OF THE PROBLEMS, AND SHALL NOT PROCEED WITH THAT PORTION OF WORK UNTIL THE CONSTRUCTION MANAGER HAS DIRECTED THE CORRECTIVE ACTIONS TO BE TAKEN.
2.

THE ELECTRICAL CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE THEMSELVES WITH ANY/ALL CONDITIONS AFFECTING ELECTRICAL INSTALLATION AND MAKE PROVISIONS AS TO THE COST THEREOF. THE CONDITION OF EXISTING ELECTRICAL EQUIP., LIGHT FIXTURES, ETC., THAT ARE PART OF THE FINAL SYSTEM. SHALL BE VERIFIED BY THE CONTRACTOR, PRIOR TO THE SUBMITTAL OF BID. FAILURE TO COMPLY WITH THIS PARAGRAPH WILL IN NO WAY RELIEVE THE CONTRACTOR OF PERFORMING ALL WORK NECESSARY FOR A COMPLETE WORKING SYSTEM.
3.

ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE ADOPTED EDITION OF THE NEC AND ALL CODES AND LOCAL ORDINANCES OF THE LOCAL POWER COMPANIES HAVING JURISDICTION AND SHALL INCLUDE BUT NOT BE LIMITED TO:

UL-UNDERWRITERS LABORATORIES

NEC-NATIONAL ELECTRICAL CODE

NEMA-NATIONAL ELECTRICAL MANUFACTURERS ASSOC.

OSHA-OCCUPATIONAL SAFETY AND HEALTH ACT

SBC-STANDARD BUILDING CODE

NFPA-NATIONAL FIRE PROTECTION ASSOCIATION

PGE STANDARDS

ANSI / IEEE-AMERICAN NATIONS STANDARD INSTITUTE / INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS

NESC- NATIONAL ELECTRICAL SAFETY CODE
4.

DO NOT SCALE ELECTRICAL DRAWINGS, REFER TO SITE PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT, BUT CONFIRM WITH 'CONSTRUCTION MANGER' ANY SIZES AND LOCATIONS WHEN NEEDED.
5.

EXISTING SERVICES: THE CONTRACTOR SHALL NOT INTERRUPT EXISTING SERVICES WITHOUT WRITTEN PERMISSION OF THE OWNER.
6.

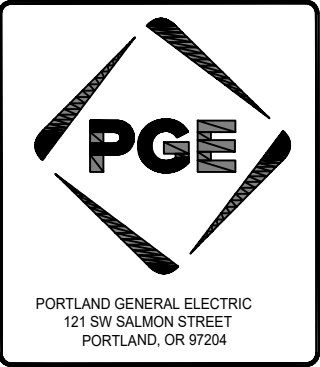
THE CONTRACTOR SHALL PAY FOR ANY/ALL PERMITS, FEES, INSPECTIONS AND TESTING. THE CONTRACTOR IS TO OBTAIN PERMITS AND APPROVED SUBMITTALS PRIOR TO THE WORK BEGINNING OR ORDERING THE EQUIPMENT.
7.

THE TERM 'PROVIDE' USED IN CONSTRUCTION DOCUMENTS AND SPECIFICATIONS, INDICATES THAT THE CONTRACTOR SHALL FURNISH AND INSTALL.
8.

THE CONTRACTOR SHALL CONFIRM WITH LOCAL UTILITY COMPANY ANY/ALL REQUIREMENTS SUCH AS THE : LUG SIZE RESTRICTIONS, CONDUIT ENTRY, SIZE OF TRANSFORMERS, SCHEDULED DOWNTIME FOR THE OWNERS; CONFIRMATION, ETC. ANY/ALL CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER, PRIOR TO BEGINNING ANY WORK.
9.

CONDUCTORS: CONTRACTOR SHALL USE 98% CONDUCTIVITY COPPER WITH TYPE (THWN-2) INSULATION, 600 VOLT, COLOR CODED UNLESS SPECIFIED DIFFERENTLY ON DRAWINGS WHERE COLOR CODED WIRE INSULATION IS UNAVAILABLE.
10.

ALL (THWN-2) WIRING INSTALLATIONS TO FOLLOW MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.



PROJECT NO:

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GENERAL NOTES

SHEET NUMBER

T2.0

ELECTRICAL NOTES (CON'T)

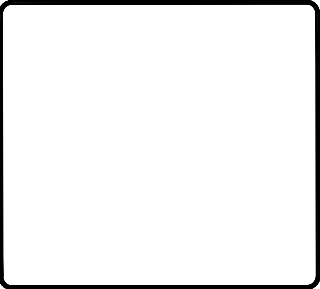
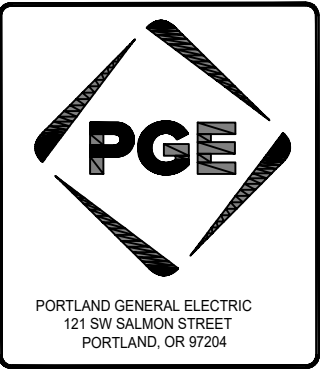
11. CONTRACTOR SHALL ENSURE THAT ALL TERMINATIONS ARE COMPATIBLE WITH THE CONDUCTORS USED.
12. OUTLET BOXES SHALL BE PRESSED STEEL IN DRY LOCATIONS, CAST ALLOY WITH THREADED HUBS IN WET/DAMP LOCATIONS AND SPECIAL ENCLOSURES FOR OTHER CLASSIFIED AREAS.
13. IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF THE CONSTRUCTION. CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND PROVIDE ALL REQUIREMENTS FOR THE EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER. CONTRACTOR IS TO PROVIDE ALL ELECTRICAL EQUIPMENT UNLESS OTHERWISE DIRECTED.
14. ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR IN A FIRST CLASS, WORKMANLIKE MANNER. THE COMPLETED SYSTEM SHALL BE FULLY OPERATION AND SUBJECT TO REGULATORY INSPECTION AND APPROVAL BY CONSTRUCTION MANAGER.
15. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES AND WORK FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE YEAR.
16. CONTRACTOR SHALL GUARANTEE ANY/ALL MATERIALS AND WORK FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE YEAR FROM DATE OF ACCEPTANCE.
17. THE CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ANY ADDITIONAL CHARGE AND SHALL INCLUDE THE REPLACEMENT OR THE REPAIR OF ANY OTHER PHASE OF THE INSTALLATION, WHICH MAY HAVE BEEN DAMAGED THEREIN.
18. ADEQUATE AND REQUIRED LIABILITY INSURANCE SHALL BE PROVIDED FOR PROTECTION AGAINST PUBLIC LOSS AND ANY/ALL PROPERTY DAMAGE FOR THE DURATION OF WORK.
19. PROVIDE AND INSTALL CONDUIT, CONDUCTORS, PULL WIRES, BOXES, COVER PLATES AND DEVICES FOR ALL OUTLETS INDICATED.
20. TRENCHING AND BACKFILL; THE CONTRACTOR SHALL PROVIDE FOR ALL UNDERGROUND INSTALLED CONDUIT AND/OR CABLES INCLUDING EXCAVATION, BACKFILLING AND COMPACTION. REFER TO GENERAL NOTES.
21. MATERIALS, PRODUCTS AND EQUIPMENT, INCLUDING ALL COMPONENTS THEREFOR, SHALL BE NEW AND SHALL APPEAR ON THE LIST OF U.L. APPROVED ITEMS AND SHALL MEET OR EXCEED THE REQUIREMENTS OF THE NEC, NEMA AND IEEE.
22. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OR MANUFACTURERS CATALOG INFORMATION OF ANY/ALL LIGHTING FIXTURES. SWITCHES AND ALL OTHER ELECTRICAL ITEMS FOR APPROVAL BY THE CONSTRUCTION MANAGER PRIOR TO INSTALLATION.
23. THE ELECTRICAL CONTRACTOR SHALL LABEL ALL PANELS WITH ONLY TYPEWRITTEN DIRECTORIES.
24. DISCONNECT SWITCHES SHALL BE H.P. RATED HEAVY-DUTY, QUICK-MAKE AND QUICK-BREAK ENCLOSURES, AS REQUIRED BY EXPOSURE TYPE.
25. ALL CONNECTIONS EXCEPT THE EV CHARGER CABLE TERMINATION IN THE CHARGER POST SHALL BE MADE WITH A PROTECTIVE COATING OF AN ANTI-OXIDE COMPOUND SUCH AS "NOALOX" BY IDEAL INDUSTRIAL INC., COAT ALL WIRE SURFACES BEFORE CONNECTING. EXPOSED ALUMINUM & COPPER SURFACES, INCLUDING GROUND BARS, SHALL BE TREATED-NO SUBSTITUTIONS.
26. ALL EXTERIOR AND INTERIOR ABOVE GROUND CONDUIT SHALL BE RIGID UNLESS SPECIFIED OTHERWISE.
27. SUPPORT OF ALL ELECTRICAL WORK SHALL BE AS REQUIRED BY NEC.
28. CONNECTORS FOR POWER CONDUCTORS: CONTRACTOR SHALL USE PRESSURE TYPE INSULATED TWIST-ON CONNECTORS FOR NO. 10 AWG AND SMALLER. USE SOLDERLESS MECHANICAL TERMINAL LUGS FOR NO. 8 AWG AND LARGER.
29. ALL MATERIALS AND EQUIPMENT SUPPLIED AND INSTALLED BY THE CONTRACTOR SHOULD BE NEW AND UNUSED.
29. ALL ELECTRICAL WORK SHALL BE PERFORMED ON DE-ENERGIZED CIRCUITS UNLESS AUTHORIZED TO BE SO ON ENERGIZED CIRCUIT.
30. GROUND WIRES AND CONNECTIONS SHALL BE VISIBLE FOR INSPECTION.

PART 1-GENERAL

- 1.1 REFERENCES:
- A. DOT (STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION-CURRENT EDITION).
- B. ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS).
- C. OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION).
- D. NEC (NATIONAL ELECTRICAL CODE)

ELECTRICAL NOTES (CON'T)

- 1.2 INSPECTION AND TESTING:
- A. GENERAL CONTRACTOR SHALL PERFORM ALL WORK IN CONFORMANCE WITH THE PLANS AND SPECIFICATIONS. PERFORM INSPECTIONS BEFORE CONCEALING WORK WITH FOLLOW-ON ACTIVITIES (BACKFILL, CONCRETE POUR, ETC.)
- 1.3 SITE MAINTENANCE AND PROTECTION:
- A. KEEP SITE FREE OF ALL PONDING WATER.
- B. PROVIDE EROSION CONTROL MEASURES IN ACCORDANCE WITH STATE DOT, LOCAL PERMITTING AGENCY AND EPA REQUIREMENTS.
- C. PROVIDE AND MAINTAIN ALL TEMPORARY FENCING, BARRICADES, WARNING SIGNALS AND SIMILAR DEVICES NECESSARY TO PROTECT AGAINST THEFT FROM PROPERTY DURING THE ENTIRE PERIOD OF CONSTRUCTION. REMOVAL ALL SUCH DEVICES UPON COMPLETION OF THE WORK.
- D. EXISTING UTILITIES: DO NOT INTERRUPT EXISTING UTILITIES SERVING FACILITIES OCCUPIED BY THE OWNER OR OTHERS, EXCEPT WHEN PERMITTED IN WRITING BY THE CONSTRUCTION MANAGER AND THEN ONLY AFTER ACCEPTABLE TEMPORARY UTILITY SERVICES HAVE BEEN PROVIDED.
- E. PROVIDE A MINIMUM 48-HOUR NOTICE TO THE CONSTRUCTION MANGER AND RECEIVE WRITTEN NOTICE TO PROCEED BEFORE INTERRUPTING ANY UTILITY SERVICE.
- 1.4 LABELING
- 1.4.1 LABEL EQUIPMENT WITH NAME, AMPERAGE, VOLTAGE, PHASE AND WIRES (I.E. PANEL "A", 100A, 120, 120/240V, 1ϕ, 4w)
- 1.4.2 ALL JUNCTION BOXES SHALL BE LABELED WITH CIRCUITS INSTALLED (I.E. 'LB1' -1,3,5) WITH INDELIBLE BLACK INK ON THE BOX COVER.
- 1.4.3 PROVIDE ARC FLASH SIGNAGE ON ALL ELECTRICAL EQUIPMENT PER NEC 110.16.
- 1.4.4 LABEL BREAKERS WITH CORRESPONDING CIRCUITS.
- 1.5 DRAWINGS OF RECORD (AS-BUILT)
- 1.5.1 AS-BUILT DRAWINGS SHALL BE SUBMITTED IN ACCORDANCE WITH PGE ELECTRIC DISTRIBUTION REQUIREMENTS TO PROJECT CONTACT FROM PGE CUSTOMER GRID SOLUTIONS DEPARTMENTS.
- 1.6 AVAILABLE FAULT CURRENT
- 1.61.1.1. PER NEC 110.24, FIELD MARKING. SERVICE EQUIPMENT AT OTHER THAN DWELLING UNITS SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE AVAILABLE FAULT CURRENT. THE FIELD MARKING(S) SHALL INCLUDE THE DATE THE FAULT CURRENT CALCULATION WAS PERFORMED AND BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED. THE CALCULATION SHALL BE DOCUMENTED AND MADE AVAILABLE TO THOSE AUTHORIZED TO DESIGN, INSTALL, INSPECT, MAINTAIN, OR OPERATE THE SYSTEM. SEE ALSO NEC 408.6 AND NEC 110 (B) (3).



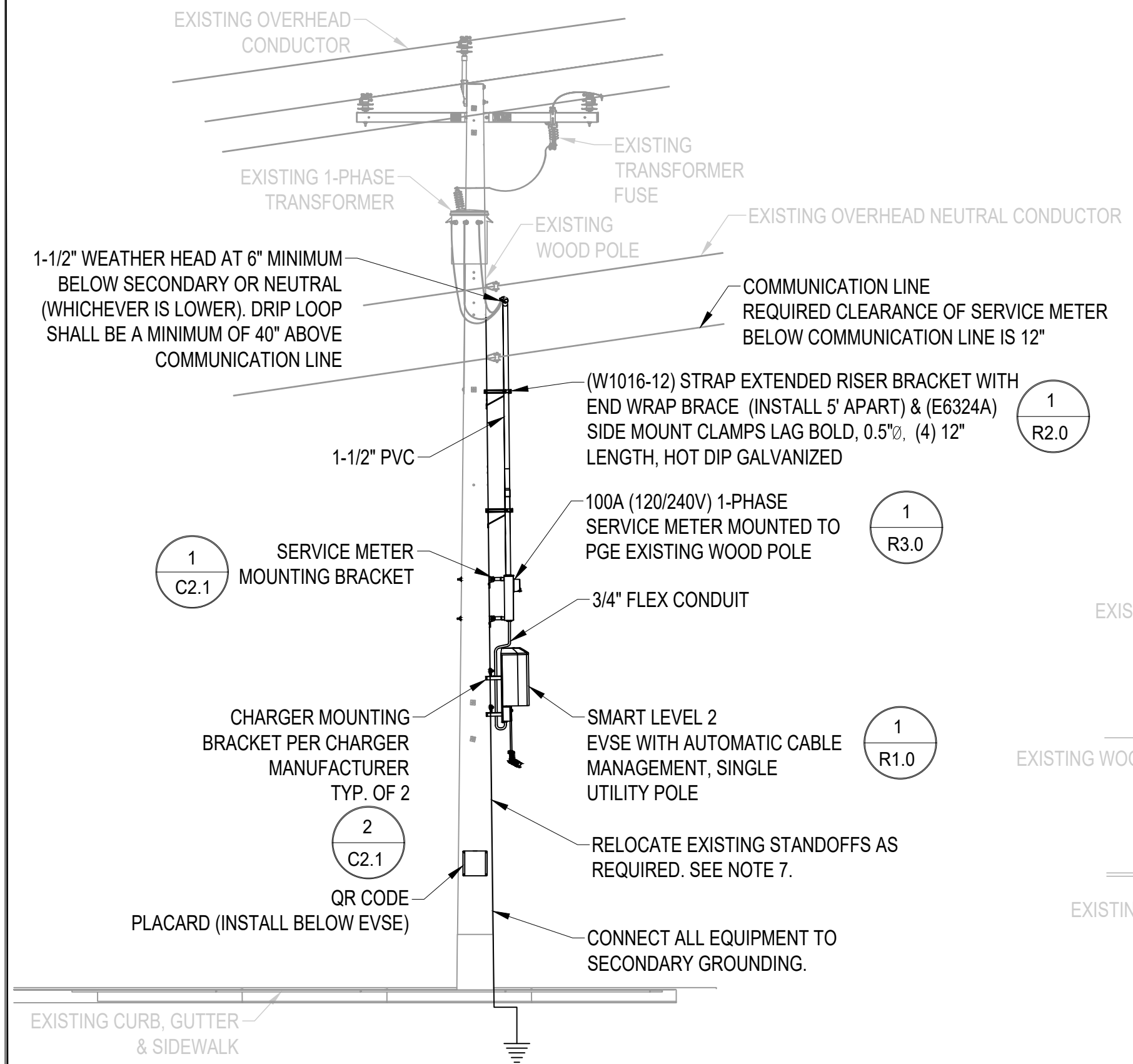
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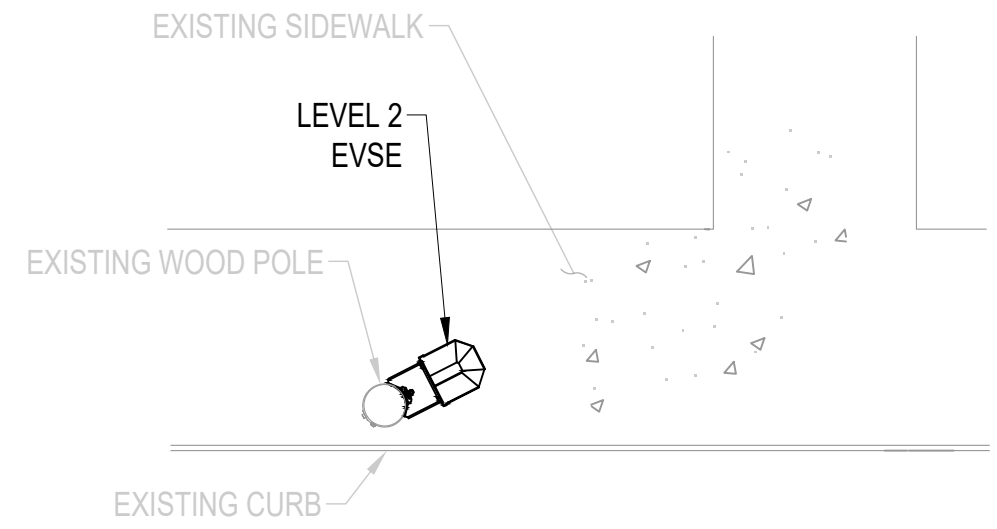
SHEET TITLE
GENERAL NOTES

SHEET NUMBER
T2.1



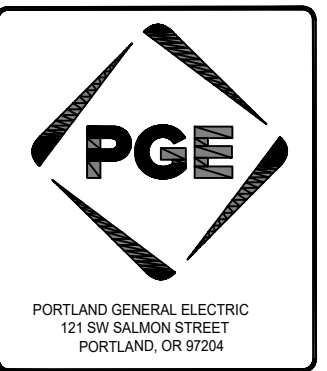
NOTES:

1. EQUIPMENT CLEARANCE SHALL COMPLY WITH NESC, NEC, PGE AND GOVERNING AGENCY STANDARDS.
2. CLEARANCE FROM TOP OF METER TO COMMUNICATION LINE SHALL BE A MINIMUM OF 6".
3. CLEARANCE FROM TOP OF METER MOUNTING BRACKET TO COMMUNICATION LINE SHALL BE A MINIMUM OF 12".
4. CLEARANCE FROM FLEX CONDUIT TO POLE SHALL BE A MINIMUM OF 5".
5. EQUIPMENT SHOULD BE PLACED IN A QUADRANT ON THE SIDEWALK OR FIELD SIDE. COORDINATE EXACT PLACEMENT WITH DPM AND UAM PRIOR TO INSTALL.
6. EQUIPMENT PLACEMENT SHALL BE SUCH THAT CLIMBING SPACE IS RETAINED IN COMPLIANCE WITH NESC 236.
7. IF THERE ARE EXISTING RISERS OR OTHER EQUIPMENT MOUNTED ON THE POLE, ANY STANDOFF BRACKETS WITHIN 8 FEET OF THE GROUND SHALL BE REMOVED OR LOWERED TO A POSITION LESS THAN 2 FEET ABOVE GRADE. (REF. NESC 217.A.2(c))



EXAMPLE PARKING LAYOUT
N.T.S

SEE C2.0 FOR INSTALLATION HEIGHTS



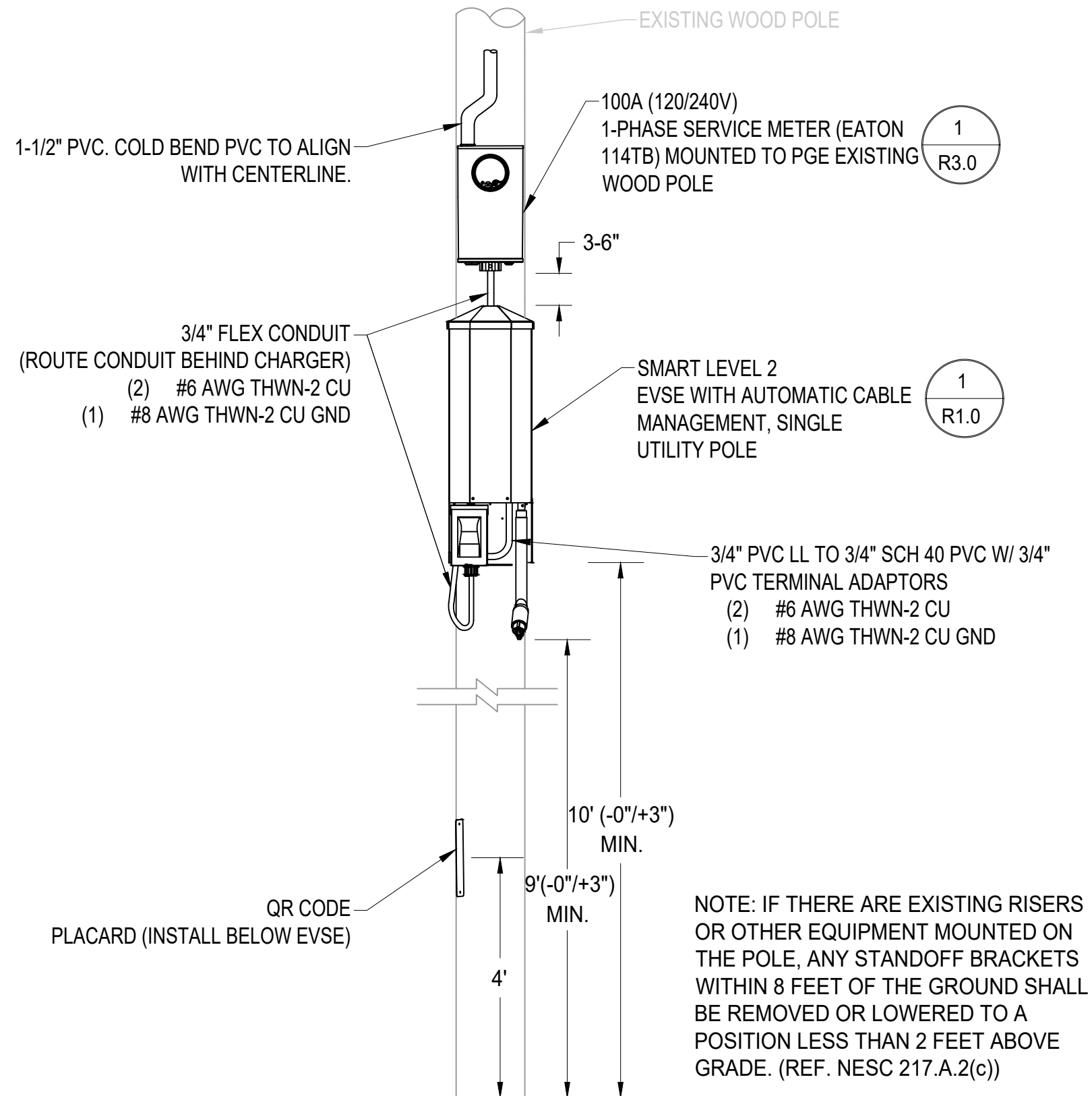
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DRAWN BY: _____
CHECKED BY: _____

REV	DATE	DESCRIPTION

PGE ACCEPTANCE STAMP

SHEET TITLE
SITE LAYOUT

SHEET NUMBER
C1.0



1
-
INSTALLATION HEIGHT
NO SCALE



PORTLAND GENERAL ELECTRIC
121 SW SALMON STREET
PORTLAND, OR 97204

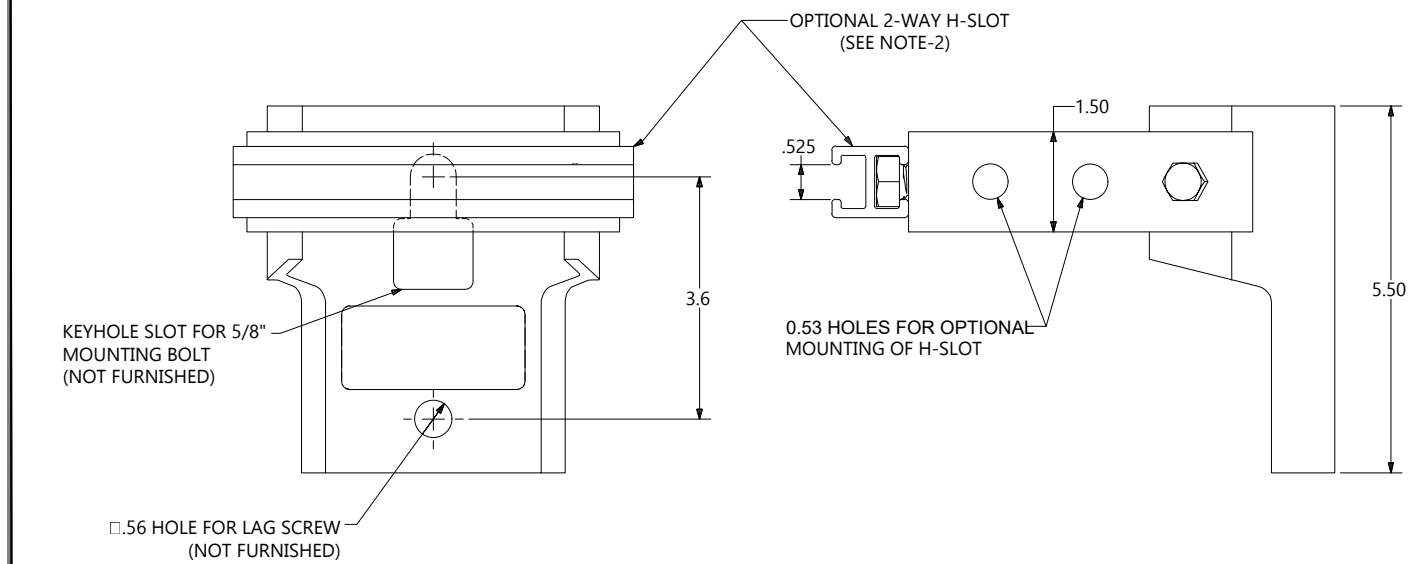
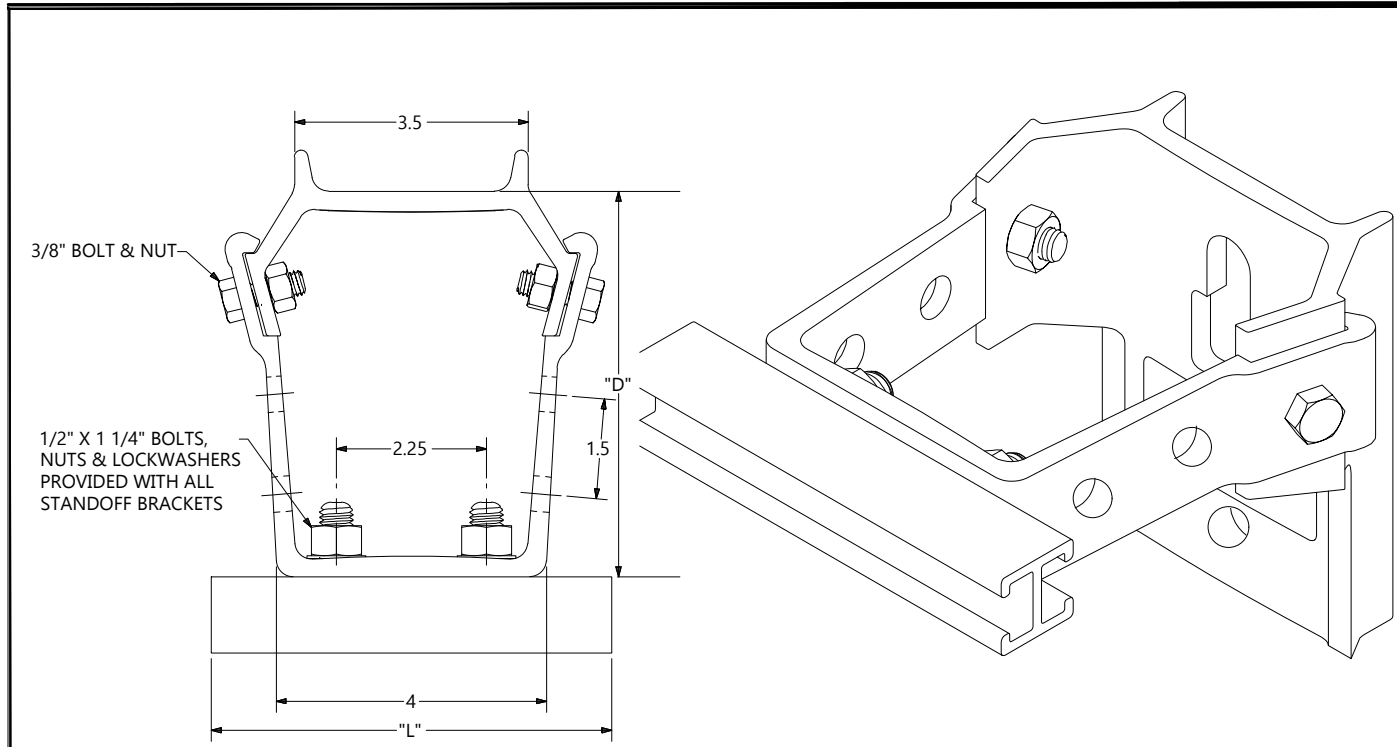
PROJECT NO:
DRAWN BY:
CHECKED BY:

REV	DATE	DESCRIPTION

PGE ACCEPTANCE STAMP

SHEET TITLE
GENERAL DETAILS

SHEET NUMBER
C2.0



- NOTES-
- BRACKET MATERIAL: ALUMINUM.
HARDWARE MATERIAL: GALVANIZED STEEL.
 - BRACKETS AVAILABLE WITH NO H-SLOT OR WITH
STANDARD LENGTH 12, 24, AND 36 INCH 2-WAY H-SLOT.

CATALOG NUMBER	DESCRIPTION	"D"	"L"
C6CSO	6" BRACKET W/O H-SLOT	6	-
C6CSO6	6" BRACKET 6" H-SLOT	6	6
C6CSO8	6" BRACKET 8" H-SLOT	6	8
C6CSO12	6" BRACKET 12" H-SLOT	6	12
C6CSO18	6" BRACKET 18" H-SLOT	6	18
C6CSO24	6" BRACKET 24" H-SLOT	6	24
C6CSO36	6" BRACKET 36" H-SLOT	6	36
C6CSO48	6" BRACKET 48" H-SLOT	6	48
C9CSO	9" BRACKET W/O H-SLOT	9	-
C9CSO12	9" BRACKET 12" H-SLOT	9	12
C9CSO24	9" BRACKET 24" H-SLOT	9	24
C9CSO36	9" BRACKET 36" H-SLOT	9	36

1

C2.1

SERVICE METER MOUNTING BRACKET
(HUBBEL POWER SYSTEMS)
NO SCALE

5068-053/054 EV Charger Mounting Instructions

This document provides instructions for installing the 5068-053/054 EV charger mounting assembly to a wooden utility pole. The 5068 is used for mounting a single 3704 charger.

- The 5068-053 includes one 40A breaker for 30A vehicle charging. (SCCR or AIC is 10K)
- The 5068-054 includes one 50A breaker for 40A vehicle charging. (SCCR or AIC is 10K)

Note: The 5068 wooden utility pole mount is intended for CMI/EVSE LLC Electric Vehicle chargers only. The total weight of the mounting panel and brackets is 12 lbs.

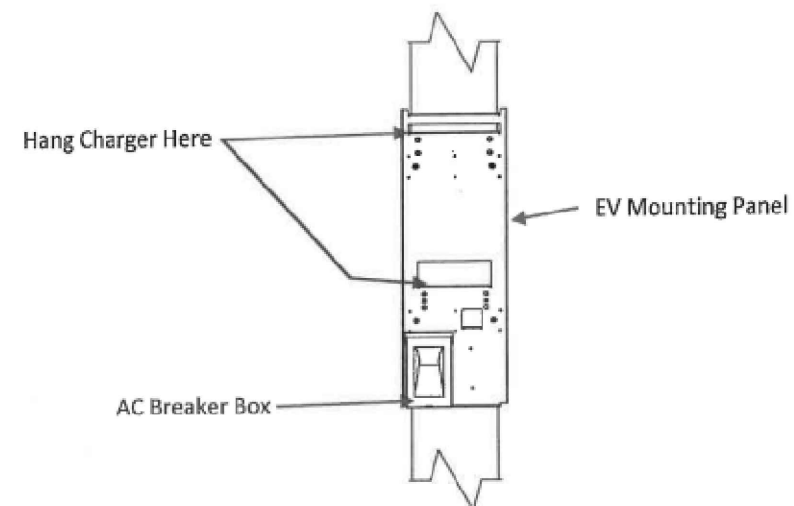


Figure 1: Mounting Panel Configuration

Items Provided by Installer

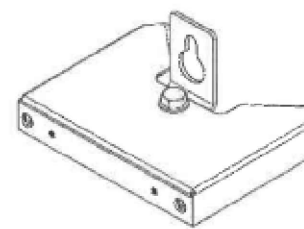
- Utility power meter socket
- Two 5/8" galvanized pole thru bolts (length based on pole OD) with (4) square washers and (4) nuts
- Hammer drill for drilling through holes
- Socket set with ratchet for securing through bolts
- Tape measure (at least 15 feet) and level
- Screwdrivers: large Phillips, T25 pin-in Torx

Items Provided by CMI

- One EV mounting panel with breaker box mounted
- Two Strut Brackets
- Four ¼-20 x 3/4" Flat head screws (secures mounting panel to struts)
- Two ¼-20 x 5/8" Pan head screws (secures charger to mounting panel)



EV Mounting Panel



Strut Bracket

2

C2.1

CHARGER MOUNTING BRACKET
NO SCALE



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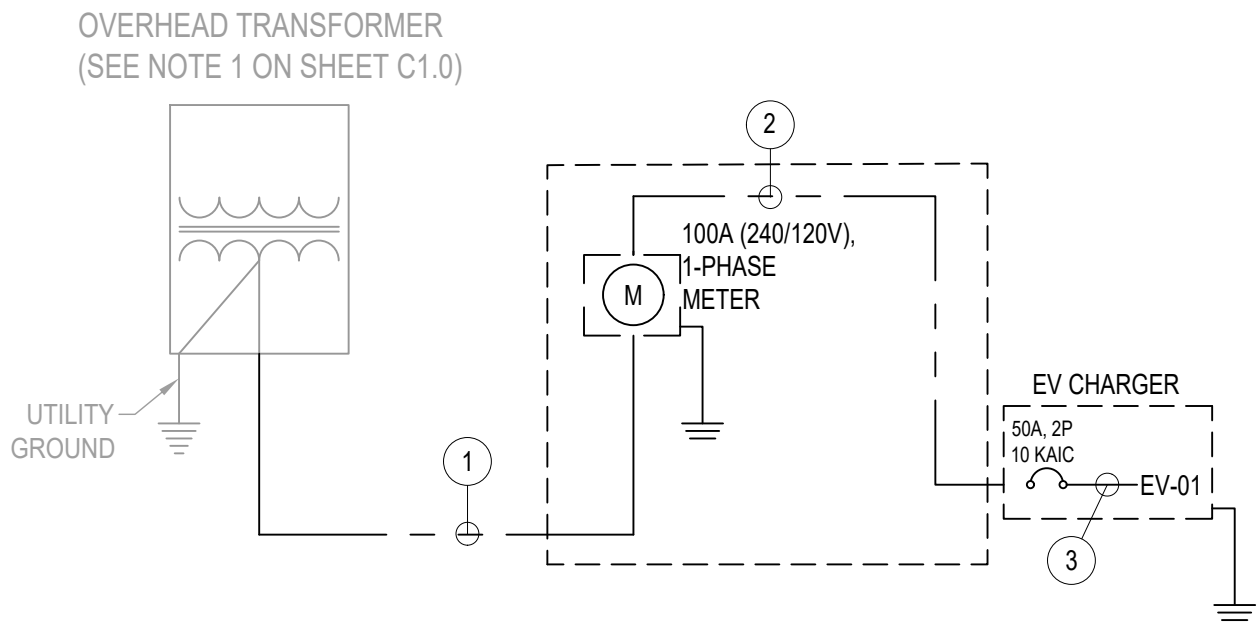
PROJECT NO: _____
DRAWN BY: _____
CHECKED BY: _____

REV	DATE	DESCRIPTION

PGE ACCEPTANCE STAMP

SHEET TITLE
GENERAL DETAILS

SHEET NUMBER
C2.1



Panel: EV
Voltage: 120/ 240
Bus Rating: 100
Main Fuse JJN: 50
Phase: 1
Location:

Volts AC
Amps per Phase
Amps
Wire: 3

Model Number: EATON 114TB
Enclosure Type: NEMA 3R
Mount: POLE MOUNT
Panel Status: New

CKT	Description	Trip	Load	Phase A (VA)
1	EV-1	50A	4800	4800
3		50A	4800	4800
			9600	

Total VA	9600.00	PHASE A WITH 125% DF ≤ 100% OF MAIN BREAKER
Total KVA	12.00	
Total AMPS	50.00	



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NOTES

- CONDUCTOR LENGTHS ARE ESTIMATES ONLY. LENGTHS ARE BASED ON DIAGRAMMATICAL MEASUREMENTS. THE EXACT ROUTING PATH, CONDUCTOR RUN LENGTHS AND INSTALLATION SHALL BE DETERMINED BY THE CONTRACTOR IN THE FILED BASED ON EXISTING SITE CONDITIONS AND PHYSICAL MEASUREMENTS. CONTRACTOR TO ORDER CONDUCTOR BASED ON FIELD MEASUREMENTS.
- CHARGING UNITS ARE EQUIPPED WITH AN INTEGRATED CONTACTOR TO PREVENT BACK FEEDING OF POWER TO THE SOURCE.
- FOR ADDITIONAL GROUNDING INFORMATION, SEE GROUNDING DETAIL ON SHEET E2.0 DETAIL 1

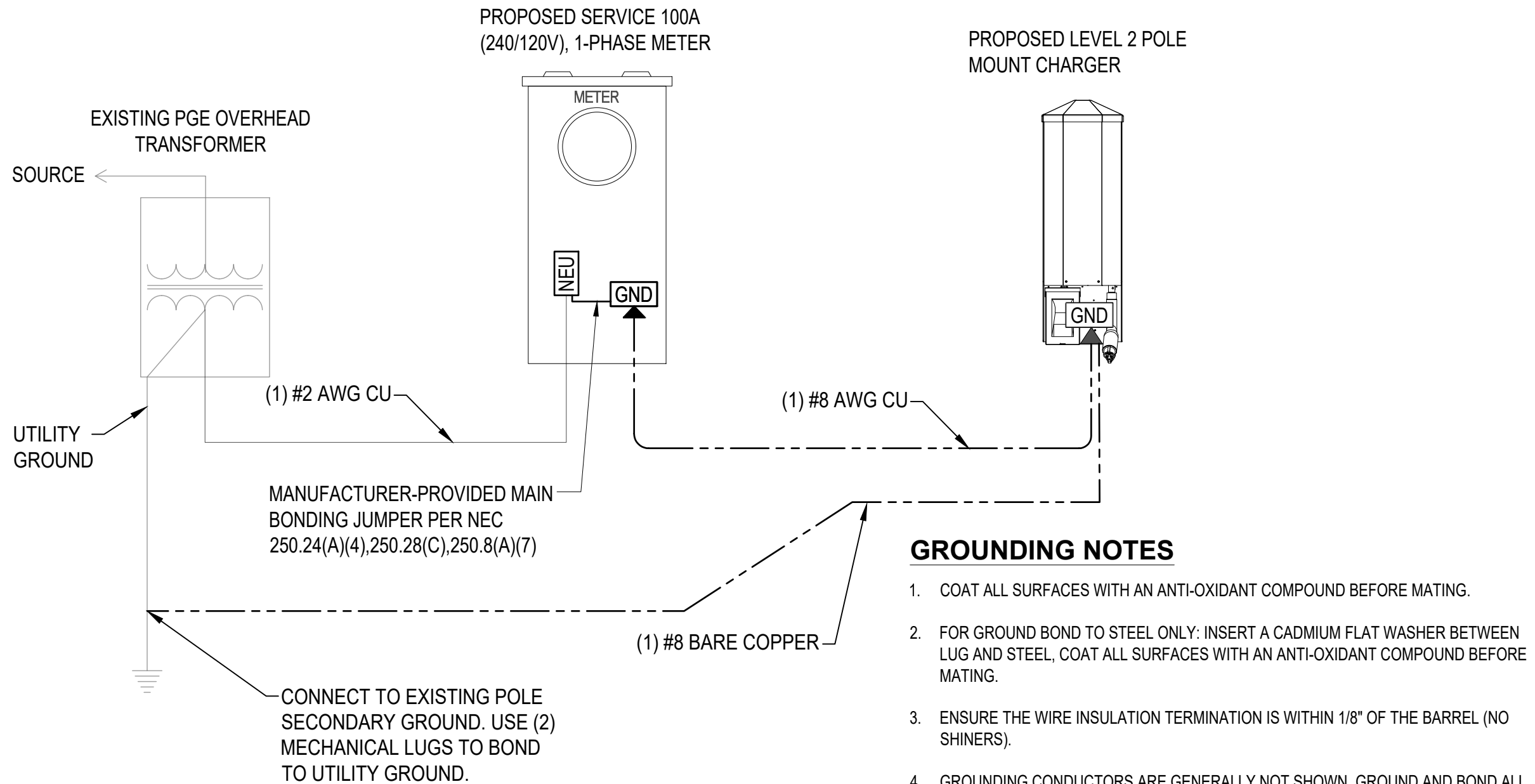
TABLE A - SINGLE CHARGERS
<180'
(2) #6 AWG THWN-2 CU + (1) #8 AWG THWN-2 CU GEC IN 3/4" PVC CONDUIT

* SEE NOTE 2

CIRCUIT SCHEDULE			
NO	FROM	TO	CONFIGURATION
1	UTILITY TRANSFORMER	METER PANEL	(1) 1-1/2" PVC C (2) #2 AWG CU (1) #2 AWG CU NEUTRAL
2	METER PANEL	EV CHARGER CIRCUIT BREAKER	(1) 3/4" SEAL TIGHT PVC (2) #6 AWG CU (1) #8 AWG CU GEC 3-HOLE GROUND BAR
3	EV CHARGER CIRCUIT BREAKER	EV CHARGER	(1) 3/4" PVC LL TO 3/4" SCH 40 PVC W/ 3/4" PVC TERMINAL ADAPTORS (2) #6 AWG CU (1) #8 AWG CU GND

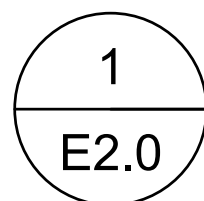
SHEET TITLE
SINGLE LINE DIAGRAM
PANEL SCHEDULE

SHEET NUMBER
E1.0



GROUNDING NOTES

1. COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
3. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).
4. GROUNDING CONDUCTORS ARE GENERALLY NOT SHOWN. GROUND AND BOND ALL EQUIPMENT, RACEWAYS, MOTORS, PANELBOARDS AND SWITCHBOARDS, ETC. IN ACCORDANCE WITH 2023 OESC (NEC), ARTICLE 250.
5. DO NOT INSTALL BRACKETS OVER POLE GROUND.
6. USE EXISTING POLE SECONDARY GROUND BOND WITH SOLID #8 COPPER CONDUCTOR.



GROUNDING DETAIL

NO SCALE



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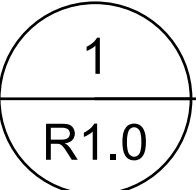
SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER

E2.0

 		PRODUCT SPECIFICATION	
Smart Level 2 EVSE with Automatic Cable Management, Wall/Single Pole/Dual Pole Mount		Product Line: EVSE Product: 3704 Series	
The Model 3704 Series electric vehicle charger provides 208 - 240V AC up to 40A. Designed as per the SAE J1772 requirements to meet or exceed all safety codes specified by UL and NEC, the unit is engineered for either exterior curbside pole mounting (single or dual) or wall mounting, while meeting or exceeding all NEMA 3R specifications. In addition, a power disconnect switch is installed to easily remove input power to the charger for any maintenance or cycle testing. The charger is equipped with a state of the art cable management system, which fully retracts and protects both the cable and the connector from harsh weather and vandals. The cable management system is ADA compliant and eliminates tripping hazards. Modular in design, the charger can be configured for simple On-Off control, or for more demanding requirements of credit/debit and ID card processing through the addition of an optional Payment Module. Serial or Zigbee connections are available for facilitating communication between the 3704 and Payment Module. A single serial Payment Module can support from one to eight 3704s, depending upon its configuration. ZigBee networks, allowing wireless connections, are secured by 128-bit symmetric encryption keys, so security is assured. A single ZigBee Payment Module can support up to 32 remote 3704s.			
Description: The Model 3704 is a 9.6 kW wall- or pole-mounted EVSE charger with AutoCoil™ cable retraction, capable of providing up to 40A at 208-240VAC, single phase at 50/60 Hz. It is also available in a 7.2 kW version, capable of providing up to 30A at 208-240VAC, single phase, 50/60 Hz. It is configurable as a single wall mount, or a single or dual pole mount. This unit complies with the SAE J1772 specifications for supplying electrical power to a J1772-compatible Electric Vehicle (EV). When the 3704 has been activated for a charge cycle, the user simply pushes the button on the J1772 connector and the charger will automatically dispense the cable until the button is released. Data Router: The Data Router in the charger can be supplied with a basic ON/OFF keyboard for either free use or use in conjunction with an optional Payment Module. The charger can also be equipped with a Data Router with an RFID card activation, and a Handbook 44-compliant display module to display Kilowatts (kW) used and the associated cost. The Handbook 44-compliant Data Router displays the data collected by an EUMD Module (End-User Measurement Device), which is an internal revenue-grade meter that measures power dispersed to the vehicle during a session with 1% or better accuracy. The EUMD can also be installed and used by itself to send power measurements back to the host. Cable Management: The J1772 power cable is stored in a weatherproof enclosure when not in use, and locked in place for protection from vandals. When a valid charge activation is received, the connector is released, the user simply pushes the button on the J1772 connector, and the cable is automatically dispensed. When the button is released, the cable stops. Before plugging into the vehicle, the button can be depressed again if more cable is required.		When the connector is removed from the vehicle, the cable automatically retracts to the stored position. Power Management: The charger provides up to 9.6 kW (208/240 VAC @ 40A) to the electric vehicle when activated. It is also available at 7.2 kW (208/240 VAC @ 30A). Power is continually monitored and the charger disconnects power to the vehicle if the voltage deviates from the acceptable range, or if the load current exceeds the maximum level. Three re-closures are attempted to prevent nuisance service breaker trips. The charger can also receive Load Shed commands via host communication networks, signaling it to reduce power by either percent of total or to designated current levels, including simulated Level 1 (7A). In addition, a Control Module Power Share cable can be installed to allow two 3704 chargers mounted on a pole to operate off a single service panel breaker. For 9.6 kW, if a 50A breaker is used, both chargers can be used to provide 20A to the vehicles (or the full 40A when only one charger is being used). If a 60A breaker is installed, both chargers can be used to provide 24A to the vehicles (or the full 40A when only one charger is being used). For 7.2 kW, if a 40A breaker is used, both chargers can be used to provide 16A to the vehicles (or the full 30A when only one charger is being used). If a 50A breaker is installed, both chargers can be used to provide 20A to the vehicles (or the full 30A when only one charger is being used). The 3704 also includes a Random Start feature. In the event of a deep voltage sag or momentary power outage, it delays its restart for a random time period of between two to five minutes after the power has been restored. Once the charger restarts, it ramps up to the required maximum power at a rate of 1A/second. This prevents power surges when restoring power to multiple chargers.	
Label Description: Intelligent Power Controller EVSE		Product Code: 3704-Axxxx	
© EVSE LLC 2020. All Rights Reserved. This specification is confidential and shall not be duplicated, published or disclosed, in whole or in part, without prior written permission of EVSE LLC. This specification is subject to change without notice.		Marketing: DS	Engineering: GC
		Date: 7/20/20	Date: 7/20/20
EVSE LLC, 89 PHOENIX AVE., ENFIELD, CT 06082 PHONE (860) 745-2433		10/15/2020	Page 1 of 4

	Specifications
Electrical Input:	
Power Input:	9.6 kW (or 7.2 kW)
Voltage Input:	208-240 VAC 50/60Hz
Current Input:	40A (or 30A)
Breaker:	2 pole 50A (or 40A) breaker Non-GFCI on a dedicated circuit (1 breaker for a single pole/wall; 2 breakers for a dual, each supporting an EVSE)
Stand By Power:	Less than 9W typical (without communication operating)
Electrical Output:	
Power Output:	9.6 kW (or 7.2 kW)
Voltage Output:	208-240 VAC
Current Output:	40A (or 30A)
Charging Connector:	SAE J1772 EV Connector on an 20' retractable cord
Safety:	
Compliance:	IEC/UL/CSA C22.2 NO. 61010-1, UL2594, UL2231-1&2, NEC Article 625, SAE J1772
EMC Compliance:	FCC Part 15 Class A, Canadian ICES-003
Surge Protection:	6KV @ 3000A
Ground Fault:	Internal 20 MA CCID with auto re-closure (three attempts)
Ground Wire Detection:	Continuous Monitoring
Over Current Protection:	42A for 1 min. with auto-reset when disconnected
Plug Out Detection:	Power terminates as per SAE J1772
Functional Interfaces:	
Local Area Network:	ZigBee mesh protocol@ 2.4Ghz ISM (Serial, hard wired also available) FCC ID: MCQ-PROS2B, IC: 1846A-PRO S2B
Environmental:	
Enclosure:	NEMA 3R
Vandal Proof:	Cable is locked when stored
Operating Temp:	-22°F to 122° F (-30° C to 50° C)
Operating Humidity:	Up to 95% non-condensing
Wind Loading:	Up to 160 MPH
General:	
Dimensions	37 in (h) x 10.5 in (w) x 10.5 in (d) (Excluding Pole)
Weight	34 lbs. (Excluding Pole)



EVSE SMART LEVEL 2 W/ AUTOMATIC CABLE MANAGEMENT

NO SCALE

PRODUCT SPECIFICATION (Continued)



PORTLAND GENERAL ELECTRIC
121 SW SALMON STREET
PORTLAND, OR 97204

PROJECT NO:

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PGE ACCEPTANCE STAMP

SHEET TITLE

REFERENCE

SHEET NUMBER

R1.0

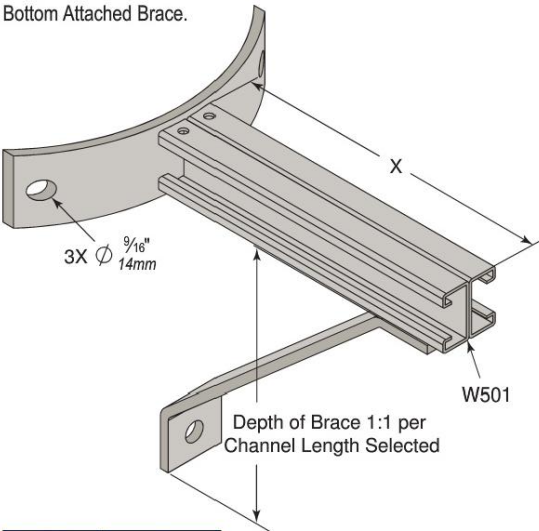
Utility Brackets

Standard Finish: Hot Dip Galvanized (HG)



W1013-X

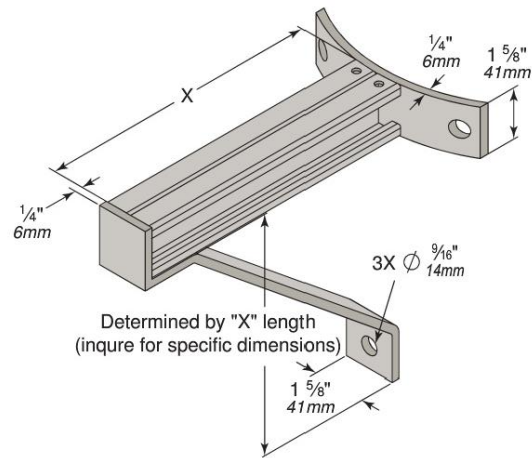
Strap Back Extended Riser Bracket with Bottom Attached Brace.



Part No.	X
W1013-6	6" (152mm)
W1013-8	8" (203mm)
W1013-10	10" (254mm)
W1013-12	12" (305mm)
W1013-16	16" (406mm)
W1013-18	18" (457mm)
W1013-24	24" (610mm)

W1016-X

Strap Back Extended Riser Bracket with End Wrap Brace



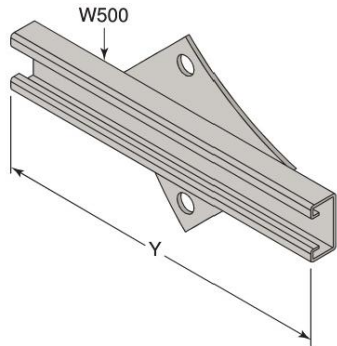
Part No.	X
W1016-6	6" (152mm)
W1016-8	8" (203mm)
W1016-10	10" (254mm)
W1016-12	12" (305mm)
W1016-16	16" (406mm)
W1016-18	18" (457mm)
W1016-24	24" (610mm)

W1019-Y

Low Profile Diamond Back with Horizontal Strut Riser.

Standard channel 4" square plate horizontally radiused (5-5/8" nominal corner to corner).
Welded top and bottom at apex of radiused back plate.

Part No.	X
W1019-6	6" (152mm)
W1019-8	8" (203mm)
W1019-10	10" (254mm)
W1019-12	12" (305mm)
W1019-16	16" (406mm)
W1019-18	18" (457mm)
W1019-24	24" (610mm)

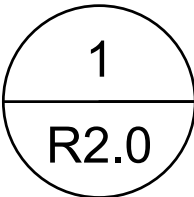


Typical: Weep Holes top and bottom (optional)
Appropriate (hot dipped galvanized) end caps available on any unit (optional)

ZSi-Foster Engineering Catalog

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WARNING: These products can expose you to chemicals including lead, which is known to the State of California to cause cancer, and which is known to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.



UTILITY BRACKET AND SUPPORT

NO SCALE

Strut Clamps

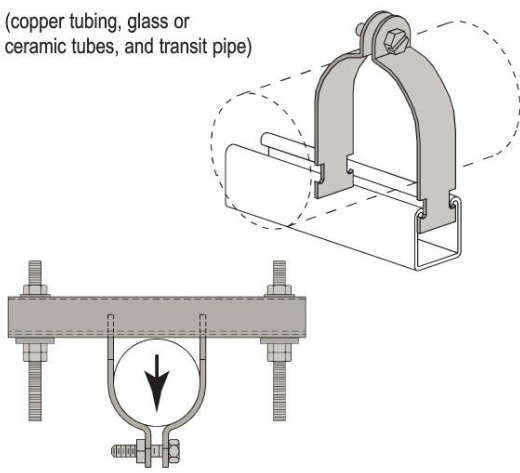
Standard Finish: Electro Galvanized (EG)



W6224A to W6282A

O.D. Tubing Series

(copper tubing, glass or ceramic tubes, and transit pipe)



Allowable Load (Safety Factor: 5)

Part No.	O.D. Size	Gauge	Allowable Load (ea.)	Slotted Indented Hex Screw
W6224A	1/4" (6mm)	16	400 (1.78 kN)	1/4" x 3/4"
W6225A	3/8" (10mm)			
W6226A	1/2" (13mm)			
W6227A	5/8" (16mm)			
W6228A	3/4" (19mm)			
W6229A	7/8" (22mm)			
W6230A	1" (25mm)	14	600 (2.67 kN)	1/4" x 3/4"
W6231A	1-1/8" (29mm)			
W6232A	1-1/4" (32mm)			
W6233A	1-3/8" (35mm)			
W6234A	1-1/2" (38mm)			
W6235A	1-5/8" (41mm)			
W6034A	1-3/4" (44mm)	12	800 (3.56 kN)	5/16" x 1"
W6237A	1-7/8" (48mm)			
W6238A	2" (51mm)			
W6239A	2-1/8" (54mm)			
W6240A	2-1/4" (57mm)			
W6138A	2-3/8" (60mm)			
W6242A	2-1/2" (64mm)			
W6243A	2-5/8" (67mm)			
W6244A	2-3/4" (70mm)			
W6142A	2-7/8" (73mm)			
W6246A	3" (76mm)			
W6247A	3-1/8" (79mm)			
W6248A	3-1/4" (83mm)	10	1,000 (4.45 kN)	3/8" x 1-1/4"
W6249A	3-3/8" (86mm)			
W6146A	3-1/2" (89mm)			

Special Materials Pipe Clamps (Universal Clamps excluded)		
Material	Add Suffix to Part Number	Example
Steel Clamp Everdur Hardware	-E	W6130-E
Aluminum	AL	W6130 AL
Stainless steel type 304	st-304	W6130 st-304
Stainless steel type 316	st-316	W6130 st-316
For assembled clamps	-A	W6130-A
Stainless Uses: Slotted Ind. Hex Screw and Hex Nut		

Part No.	O.D. Size	Gauge	Allowable Load (ea.)	Slotted Indented Hex Screw
W6251A	3-5/8" (92mm)	11	400 (1.78 kN)	1/4" x 3/4"
W6252A	3-3/4" (95mm)			
W6253A	3-7/8" (98mm)			
W6150A	4" (102mm)			
W6255A	4-1/8" (105mm)			
W6256A	4-1/4" (108mm)			
W6257A	4-3/8" (111mm)			
W6154A	4-1/2" (114mm)			
W6259A	4-5/8" (118mm)			
W6260A	4-3/4" (121mm)			
W6261A	4-7/8" (124mm)			
W6262A	5" (127mm)	10	1,000 (4.45 kN)	3/8" x 1-1/4"
W6263A	5-1/8" (130mm)			
W6264A	5-1/4" (133mm)			
W6265A	5-3/8" (137mm)			
W6266A	5-1/2" (140mm)			
W6267A	5-5/8" (143mm)			
W6268A	5-3/4" (146mm)			
W6269A	5-7/8" (149mm)			
W6270A	6" (152mm)			
W6271A	6-1/4" (159mm)			
W6271BA	6-3/8" (162mm)			
W6271CA	6-1/2" (165mm)			
W6275A	6-5/8" (168mm)	8	800 (3.56 kN)	5/16" x 1"
W6271DA	6-3/4" (171mm)			
W6279A	6-7/8" (175mm)			
W6272A	7" (177mm)			
W6281A	7-1/8" (181mm)			
W6280A	7-3/8" (187mm)			
W6281BA	7-7/8" (200mm)			
W6274A	8" (203mm)			
W6276A	8-1/8" (206mm)			
W6276BA	8-3/8" (213mm)			
W6277A	8-1/2" (222mm)			
W6277CA	8-3/4" (216mm)			
W6278A	10" (254mm)	6	600 (2.67 kN)	1/2" x 3/4"
W6282A	12" (305mm)			

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WARNING: These products can expose you to chemicals including lead, which is known to the State of California to cause cancer, and which is known to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.



PORTLAND GENERAL ELECTRIC
121 SW SALMON STREET
PORTLAND, OR 97204

PROJECT NO:
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CHECKED BY:

REV	DATE	DESCRIPTION

PGE ACCEPTANCE STAMP

SHEET TITLE
REFERENCE

SHEET NUMBER
R2.0

Test Block Bypass TB Series

100 Amp/600 Volt Socket Only/Self-Contained



114TB

APPLICATION

- Single meter position
- Designed to receive watt-hour meters that meet ANSI C12.10
- Overhead/underground feed
- Surface mount
- Top or bottom load exit

CONSTRUCTION

- Type 3R construction
- Safety socket with factory installed test/bypass facilities¹
- Snap type sealing ring included
- 5th jaw provision at nine o'clock – 114TB only
- Provisions for 2 AW base caps or hub kits on top
- Padlock provision
- Ring style

STANDARDS

- UL 414 listed, complies with ANSI C12.7

FINISH

- ANSI 61 gray acrylic electrocoat finish

ACCESSORIES

- Fifth jaw kit — catalog #50371
- Center and offset pole mounting brackets
- Bussed gutters, see page 68
- AW hubs
- Screw type sealing ring — catalog #25016D
- Steel or clear lexan covers for socket opening

Test Block Bypass TB Series

100 Amp/600 Volt Socket Only/Self-Contained

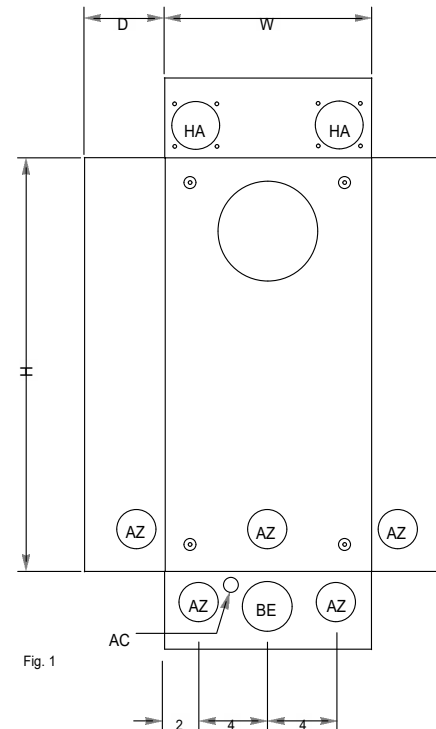


Fig. 1

Test Block Bypass

4



PORTLAND GENERAL ELECTRIC
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PORTLAND, OR 97204

PROJECT NO:
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CHECKED BY:

REV	DATE	DESCRIPTION

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REFERENCE

SHEET NUMBER
R3.0

Test Block Bypass

4

Overhead/Underground–Surface Mount

PART NUMBER	CATALOG NUMBER	AIC BRANCH RATING (CIRCUITS)	AMPACITY MAX. CONT. TYPE OF JAWS PROVIDED	VOLTAGE	SERVICE LOAD	NUMBER	HUB	CONDUCTOR LUG RANGE		FIGURE NUMBER	DIMENSIONS (INCHES)		
								PHASE CONDUCTOR	NEUTRAL CONDUCTOR		HEIGHT (H)	WIDTH (W)	DEPTH (D)
78205147005	114TB	NONE	125 100	600	1Ø 3W	4	AW 14	14 AWG - 2/0 AWG	14 AWG - 1/0 AWG	Fig. 1	24	12 4/5	8
	115TB	NONE	125 100	600	3Ø 3W	5	AW 14	14 AWG - 2/0 AWG	14 AWG - 1/0 AWG	Fig. 1	24	12 4/5	8
	117TB	NONE	125 100	600	3Ø 4W	7	AW 14	14 AWG - 2/0 AWG	14 AWG - 1/0 AWG	Fig. 1	24	12 4/5	8

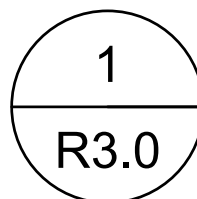
¹ = 60-in. lbs torque recommended for circuit-closing nut

= Meter sockets on this page have certain short circuit current ratings when used in conjunction with the tables on page 72

Note: For 208/120V, 1Ø 3W systems, order 4-jaw unit and a 5th jaw kit

Knockouts — Conduit Sizes

AC = 1/2" – 1/4"
AZ = 2" – 1 1/2" – 1 1/4" – 1"
BE = 2 1/2" – 2" – 1 1/2" – 1 1/4"
HA = AW HUB



EATON 114TB METER

NO SCALE



Utility Safety & Enforcement

OJUA 2024 Spring Training

Leon Grumbo

Electric Safety Program Manager

Utility Safety, Reliability & Security Division

This content reflects particular rule references, field observations and notations which are potentially subject to amendment at a future date.



What's the OPUC Role?

- Safety, Reliability and Security for Oregon IOU's, COU's and Communication Operators
- Economic Regulation of IOU's
- Joint-Use
- Disaster Mitigation, Emergency Preparedness, and supporting the Office of Emergency Management in the ESF-2 Communications and ESF-12 Energy positions
- Enforcement of Oregon Dig Safe (811) Regulations

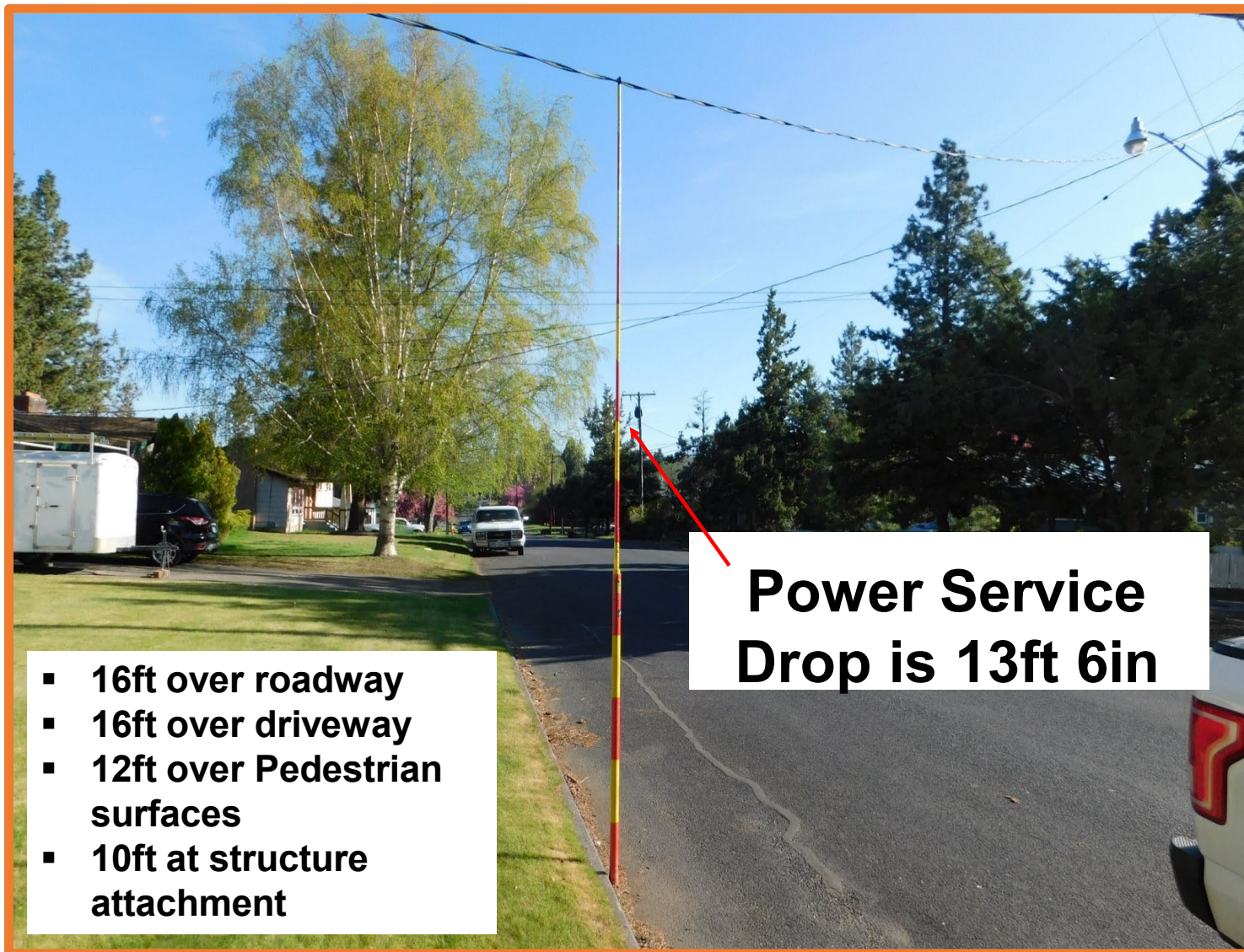
What is Safety Staff Finding

2023 Inspection Results of NESC Violations Identified

1. **Road Clearances**, (NESC Rule: 232, Table 232-1, Footnote 7&8)
2. **Overhead communication cables with inadequate attachment to support structures**, (NESC Rules: 014, 217A4, 230A2d, 311C and 352D1)
3. **Abandoned Facilities**, (NESC Rules: 012C and 214B)
4. **Pole Transfers Identified in Staff Audits**, (NESC Rules: 214A5, 214B3, and OAR 860-028-0120)
5. **Communication messengers not bonded to pole ground**, (NESC Rule: 097G)
6. **Mid Span violations**, (NESC Rules: 233C1, Table 233-1, 235C2b(1) and Exception)
7. **Deteriorated Poles / X-arms, and hardware**, (NESC Rules: 214, 252D, 260B, 261A2, 261D and OAR 860-024-0011)
8. **C.W.S.Z. (Pole Verticals, Luminaires)**, (NESC Rules 235C1, 238E, Table 235-5, Table 238-1)
9. **Old pole butts not removed**, (NESC Rules: 214A5, 214B3)
10. **Guys**, (NESC Rules: 012C, O92C, 214A, 215C2, 217C1, 235, 279A, and Table 235-6)

**Inadequate vertical clearance of wires,
conductors and equipment above
ground, roadways, rail or water
surfaces.**

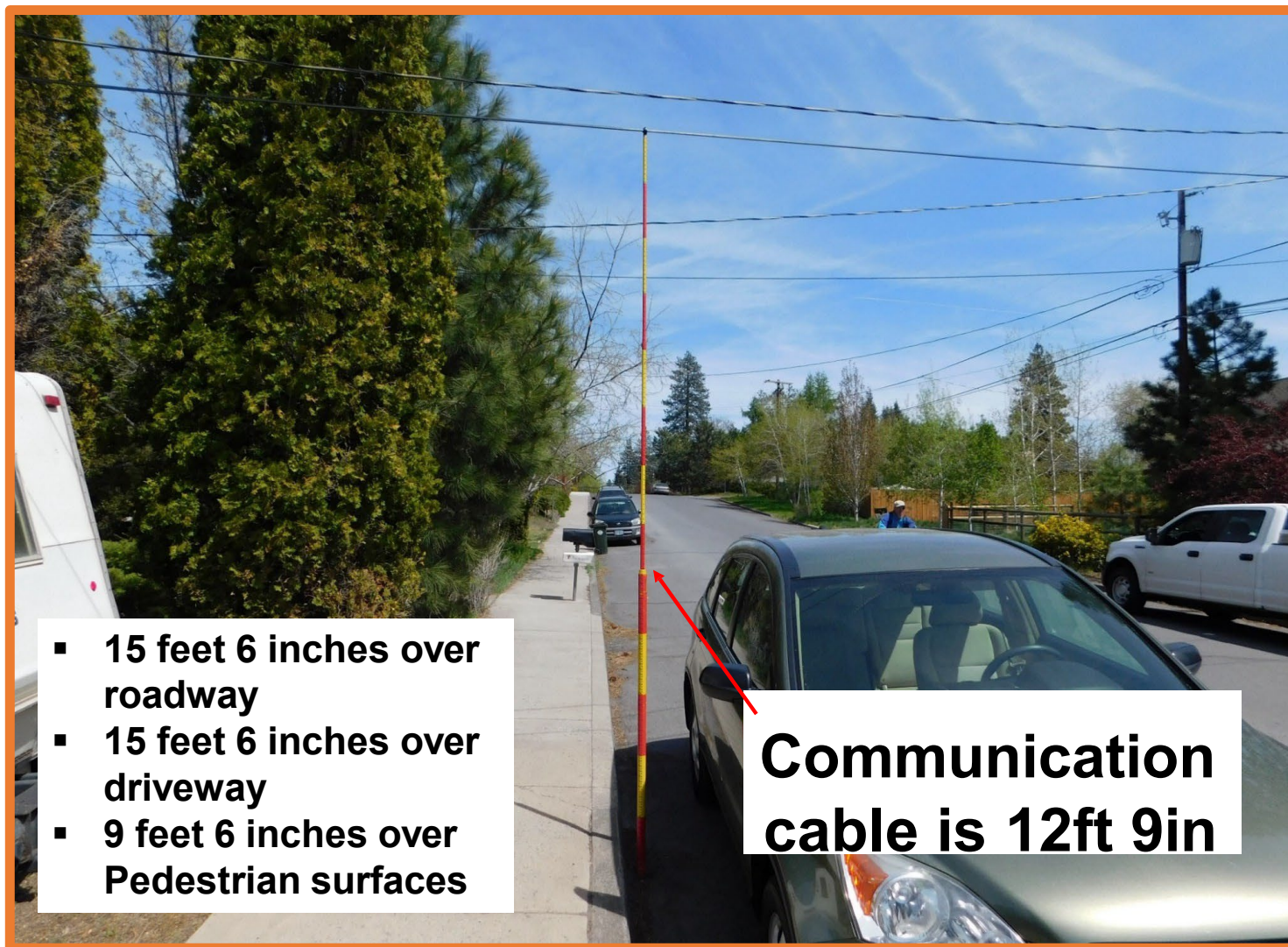
NESC Rule Number: 232, Table 232-1
#1 rule used across the nation



- 16ft over roadway
- 16ft over driveway
- 12ft over Pedestrian surfaces
- 10ft at structure attachment

**Power Service
Drop is 13ft 6in**

Vertical road clearances are measured from the lowest section in the span over a drivable surface.



- 15 feet 6 inches over roadway
- 15 feet 6 inches over driveway
- 9 feet 6 inches over Pedestrian surfaces

Communication cable is 12ft 9in

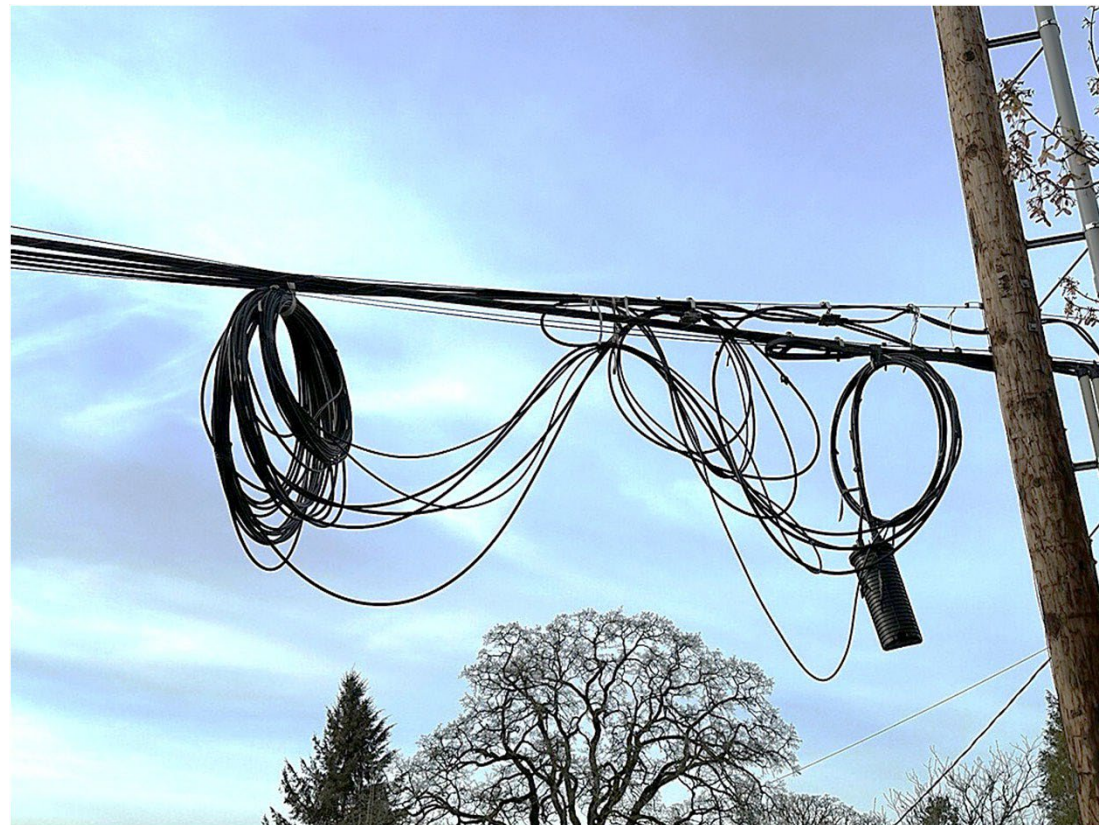
Vertical road clearances are measured from the lowest section in the span over a drivable surface.



Inadequate Overhead Attachments

**NESC Rule Numbers:
012C, 014B, 214 and
239A**

Inadequate Overhead Attachments





Good examples of long-term aerial storage



Other examples of inadequate attachments to support structure.





Abandoned Facilities

NESC Rule Numbers:
012C and 214B



Facilities laying on the ground are considered a tripping hazard and will have a 30-day correction timeframe.

Pole Transfers

NESC Rule Number: 214A5, 214B3, 234B and OAR 860-028-0120



Communication messengers not bonded to pole ground.

NESC Rule: 097G



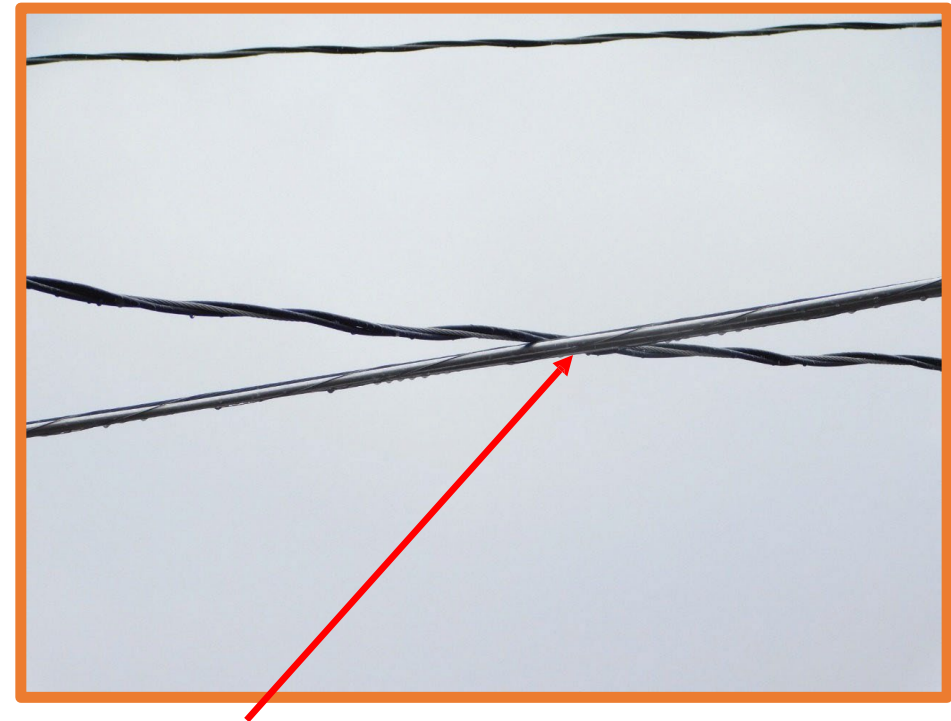
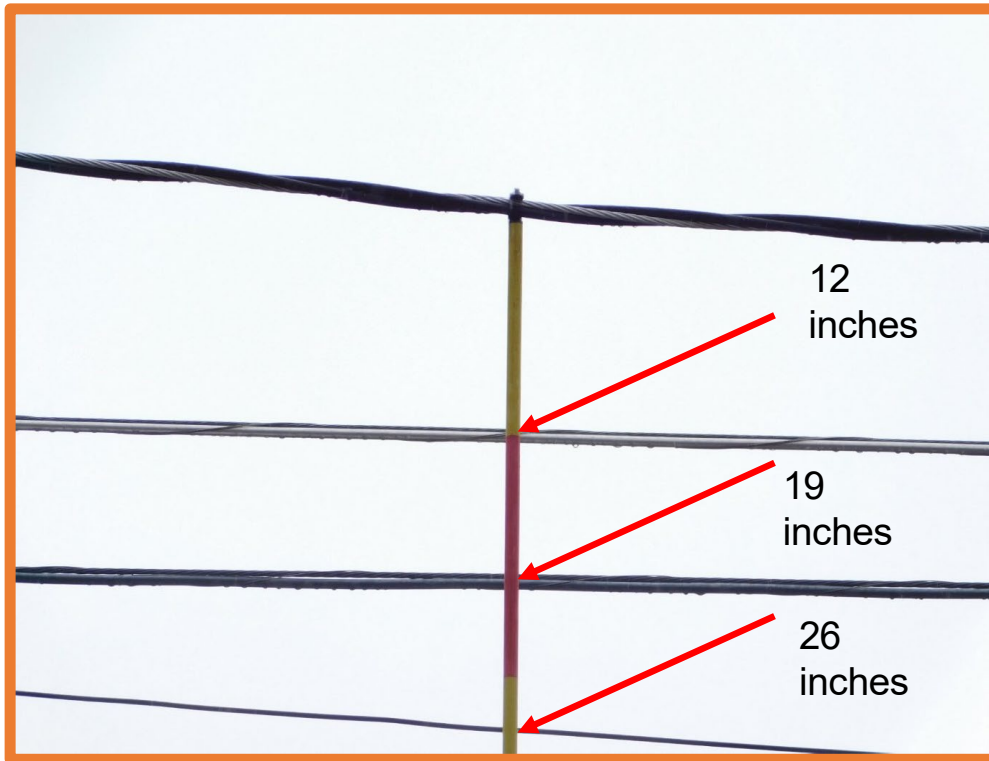


**Inadequate vertical mid-span clearance
between power supply conductors and
communication cables.**

**NESC Rule Numbers: 235C2b(1) and Exception and 233C1,
Table 233-1**

NESC Rule Number: 235C2b(1)(a)

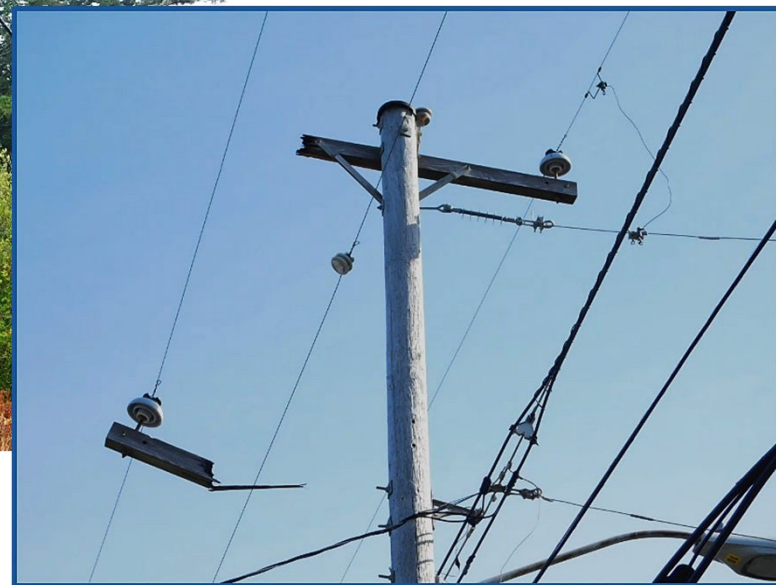
Example of three Communication Cables that are less than 30 inches to Power Secondary Mid-Span on the same structure.



NESC Rule Number: 233C1, Table 233-1
Power Service Drop is less than 24 inches
to Communication Cables Mid-Span on
different supporting structures.

Deteriorated or Damaged Poles, Crossarms & Hardware

NESC Rules: 214, 252, 260B, 261A2, 261D and OAR 860-024-0011



Examples of Deteriorated or Damaged Hardware

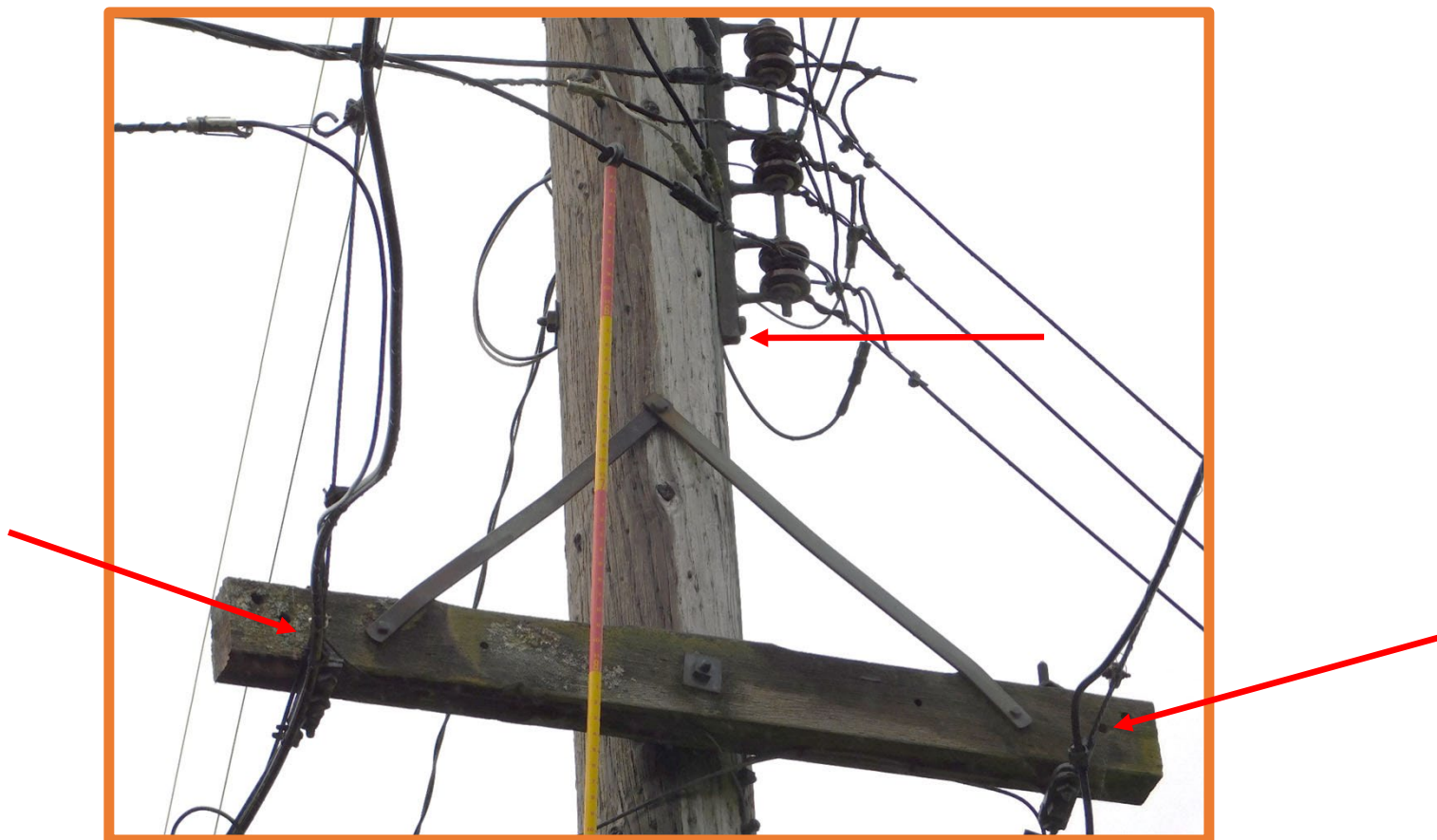


Communication Worker Safety Zone NESC Rule Number 235C1, Table 235-5, 238E, Table 238-1

Communication worker's head has potential to make contact with energized power supply cables.



Needs a 40-inch separation between power supply cables and equipment and communication cable and equipment.

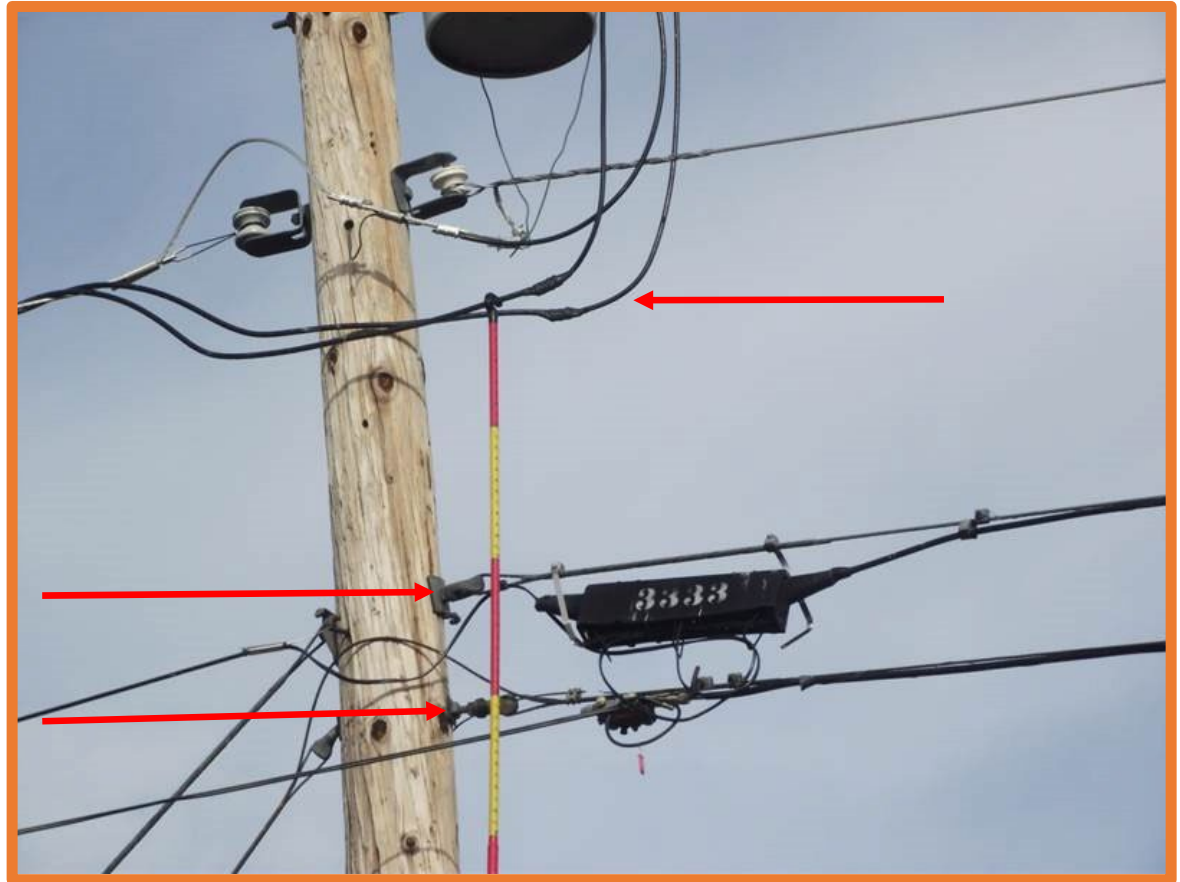


**Communication crossarm and braces are compromising the CWSZ.
All communication attachments to this crossarm are in violation.**

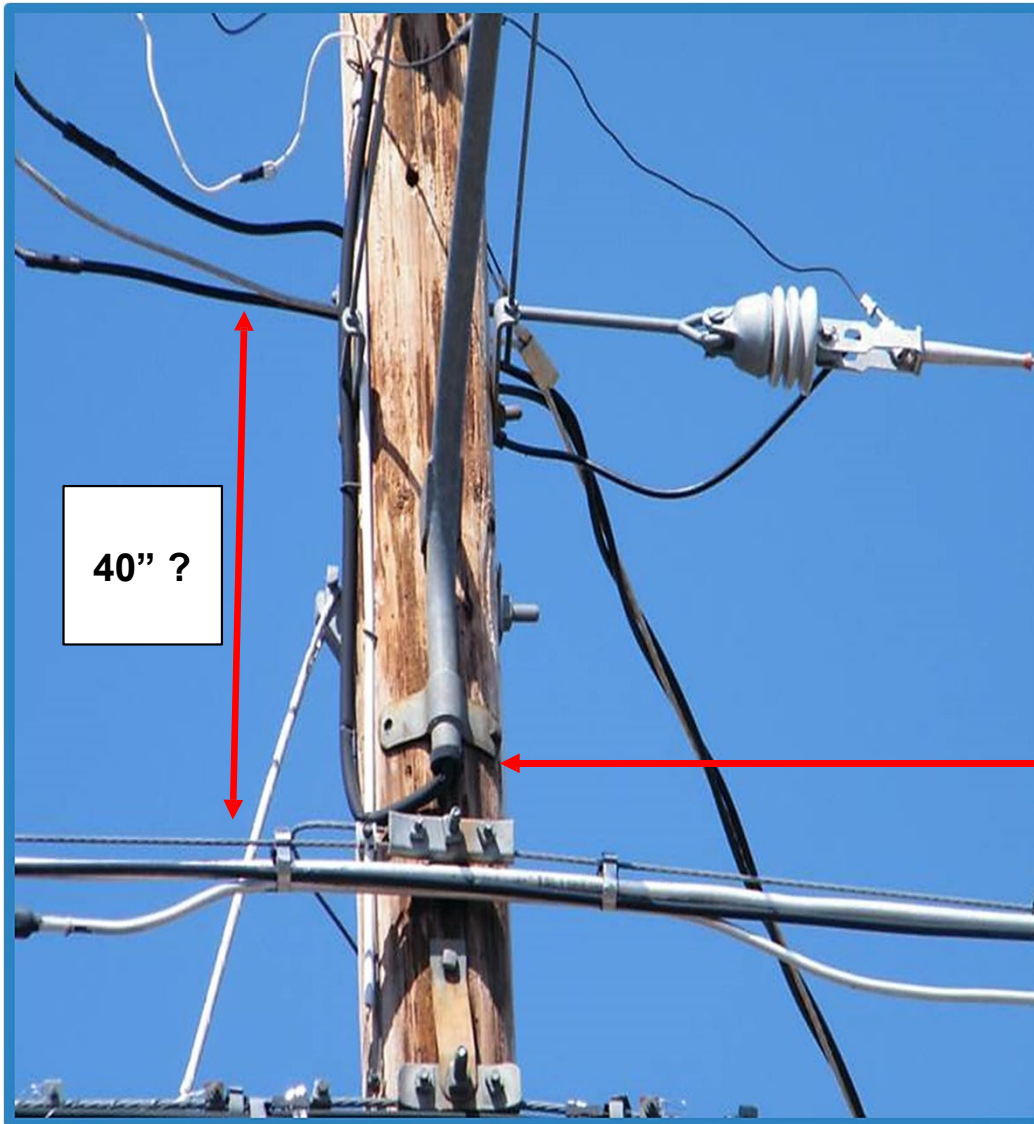
**Inadequate vertical clearance
between power supply
conductors/equipment and
communication cable
attachments carried on the
same support structure.**

**NESC Rule Numbers: 235C1,
Table 235-5, 238E and Table
238-1**

*OPUC Safety Staff does not assign
correction responsibility on joint use
probable violations.*



**Minimum vertical clearance between power supply facilities and
communication facilities on the poles is 40 inches.**



The street light mast must be a minimum of 40 inches and the drip loop must be a minimum of 12 inches from communication facilities. Exception: If the drip loop is covered by suitable non-metallic covering that extends at least 2 inches into the mast, the drip loop clearance may be reduced to 3 inches. Mast can be mounted 4 inches from communication facilities if it's effectively grounded.

NESC Rule Number 238C, 238D,
238E Table 238-2

Old pole butts not removed



Anchor guys.

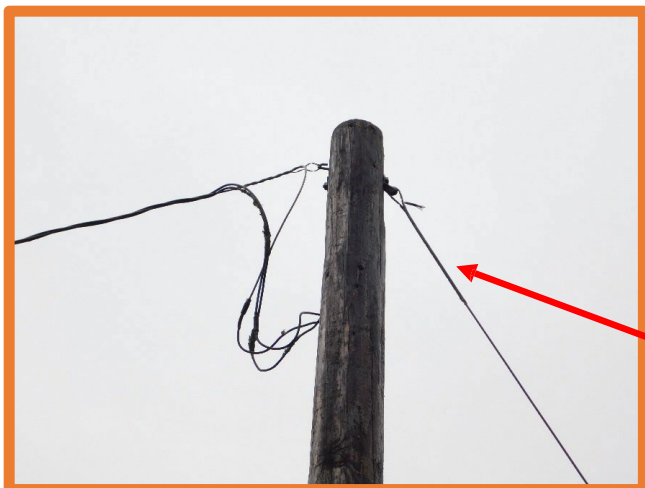
**NESC Rule Numbers: 012C,
092C, 214A, 215C2, 217C1,
235, 279A, and Table 235-6**





Untrimmed guy tails

NESC Rule Number 012C



Inadequate guy installation

NESC Rule Number 012C and 214A

Anchor guys shall be effectively bonded or insulated

NESC Rule Number 092C, 215C2, and 279A

**Other commonly
observed situations**



“Emergency” Ground Laid Facilities

NESC Rules: 014, 230A2d, 311C



What's new in the right of way?





Rule 236D1
Location of equipment
relative to climbing space.
All supply and
communications
equipment such as
amplifiers, antennas,
power supplies, switches,
PV panels when located
below conductors or
other attachments, shall
be mounted outside the
climbing space.

Weather Stations



Pole mounted EV Chargers





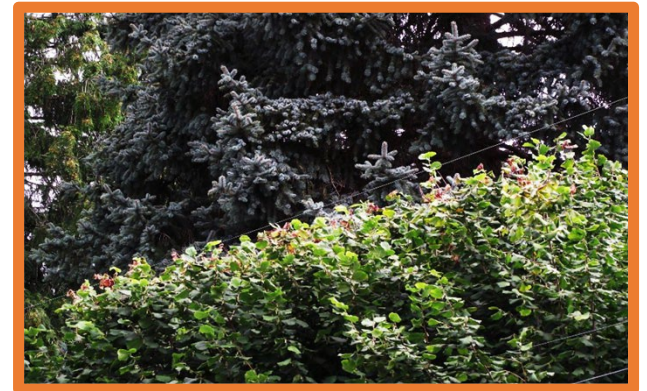
Oregon Rules Regarding Vegetation Clearance.

OAR Chapter 860, Division 024

860-024-0016 Minimum Vegetation Clearance Requirements

- ▶ Under reasonably anticipated operational conditions, an operator of electric supply facilities must maintain the following minimum clearance of vegetation from conductors:
 - ▶ Ten feet for conductors energized above 200,000 volts.
 - ▶ Seven and one-half feet for conductors energized at 50,001 through 200,000 volts.
 - ▶ Five feet for conductors at 600 through 50,000 volts
 - ▶ The five feet clearance may be reduced to three feet if the vegetation is not readily climbable.
 - ▶ Intrusion of limited small branches and new growth into this minimum clearance area is acceptable provided the vegetation does not come closer than six inches to the conductor.
 - ▶ For conductors energized below 600 volts, the vegetation must be trimmed to prevent it from causing strain or abrasion on electric conductors. Where trimming or removal of vegetation is not practical, the operator must install suitable material or device to avoid insulation damage by abrasion.

860-028-0120 (7) Vegetation around communications lines must not pose a foreseeable danger to the pole and electric supply operator's facilities.



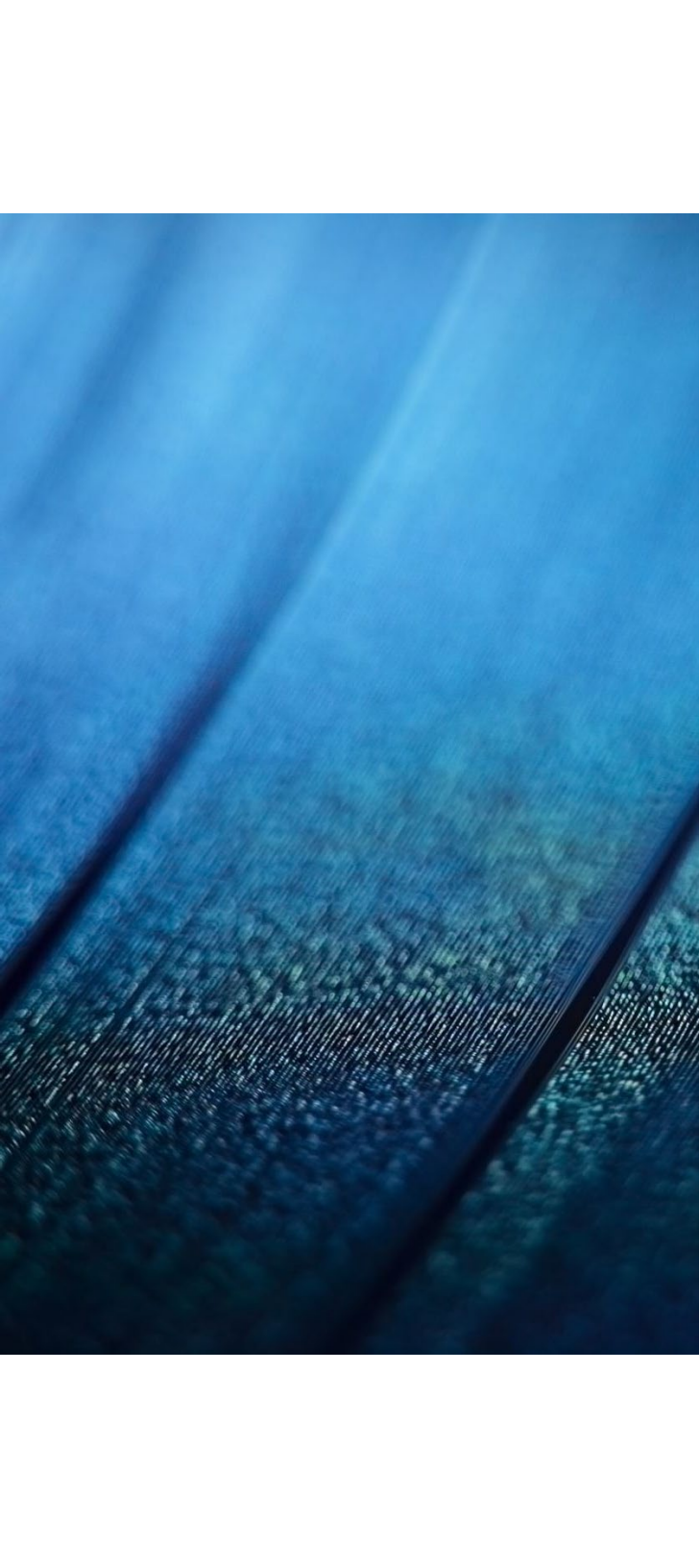
Oregon Rules Regarding Vegetation Clearance.

OAR Chapter 860, Division 024 Cont

860-024-0016(1)(b)

- ▶ (b) “**Readily climbable**” means vegetation having both of the following characteristics:
 - ▶ **A.** Low limbs, accessible from the ground and sufficiently close together so that the vegetation can be climbed by a child or average person without using a ladder or other special equipment; and
 - ▶ **B.** A main stem or major branch that would support a child or average person either within arms reach of an uninsulated energized electric line or within such proximity to the electric line that the climber could be injured by direct or indirect contact with the line.





High Fire Risk Zones

OAR 860-024-0061

Resolution of Violations of Commission Safety Rules in High Fire Risk Zones.

- The complaint may be filed by an Owner, Occupant, or Operator.
- Limited process; only relates to HFRZs.
- Focused occurrences. Specific to ignition risks.
- New process, subject to evolving as we learn.

www.oregon.gov/puc/Safety

Utility Safety & Enforcement

Safety Reports & Forms

HFRZ Foreign Owned Facilities Complaint Form

HFRZ Foreign Owned Facilities Complaint Form



HFRZ Foreign-Owned Facilities Complaint Form

This form has been developed to ensure that the complaint process outlined in OAR 860-024-0061 can be conducted in a manner as expedited and streamlined as possible. Complainants should be aware that it is possible that the Commission will need to contact the Complainant further to request additional information to adjudicate this Complaint, and it is also possible that the Commission will need to employ formal procedures to gather additional evidence.

This form can be used for multiple violations of Commission rules and for violations associated with multiple notices to or received by the owner of the foreign-owned facility when located in a designated high fire risk zone (HFRZ).

If you have questions about the information that should accompany this form or the complaint process in general, please contact Consumer Services at (503) 378-6600 or puc.consumer@puc.oregon.gov.

- 1) *Name of Complainant:*
- 2) *Name of Respondent:*
- 3) *List each violation for which a notice was sent (notices may include multiple violations) by pole number and location. If this complaint involves more than one notice, identify which violations correspond with which notice (e.g., by date of notice.)*
- 4) *Action taken and relief sought.*
 - a. *If you are a utility filing a complaint about an ignition risk in a HFRZ, state whether you have repaired the violation(s) and seek reimbursement or whether you seek to compel the owner to remedy the violation(s).*
 - b. *If you are a third-party pole or equipment owner contesting a notice or bill for repairs, please explain why the notice or bill is in error.*

- 5) *If you are seeking reimbursement or are contesting a bill, what is the dollar amount? Please break this out in itemized form (i.e., labor, parts, and any applicable surcharge).*
- 6) *Who at your organization can Commission Staff contact with additional questions about this Complaint? This person should be able to answer questions about, for instance, the names of potential witnesses such as the inspector who discovered the violation(s).*
- 7) *To the best of your knowledge, have you previously submitted complaints against this respondent or are other related proceedings currently before the Commission? If so, please attach those complaints or provide the relevant docket number.*

The following documentation should be attached to this form where relevant:

- a. All notices sent regarding the violation(s) or alleged violation(s);
- b. Any additional correspondence with the respondent in question about the violations;
- c. Any supporting documentation that allows verification of the amount of reimbursement sought or contested;
- d. Any other complaints filed against the third party, if links or citations to those complaints are not provided above; and
- e. Any other information currently in your possession that is relevant to the Commission's determination and was not included with the notice (e.g., photographs of the violation(s)).

Please contact OPUC Consumer Services at
(503) 378-6600 or puc.consumer@puc.oregon.gov

What's below the surface? Are you calling in and getting locates?



**Know what's below.
Call before you dig.**

**OPUC / OSHA
Interagency
Agreement**

Incident Report Form

Phone: (503) 378-6964

Email reports to: PUC.FilingCenter@state.or.us

Fax reports to: (503) 378-6163

Mail reports to: Administrator, SRSD (Filing Center)

Oregon PUC

P.O. Box 1088

Salem, OR 97308-1088



ELECTRIC AND COMMUNICATION INCIDENT REPORT

TO SAFETY DIVISION STAFF -- CONFIDENTIAL per ORS 654.720
Requirements and Definitions -- see page 3 -- OAR 860-024-0050

(Complete all fields -- if unknown or not applicable, insert "n/a")

Section 1 (Immediate Notice -- Phone/Fax)

For PUC Staff Only	
Time Received: _____ a.m./p.m.	Date: ____/____/____ Received By: _____
Today's Date: _____	
Utility or Operator: _____	Reported By: _____
Phone Number: _____	Incident Date: _____ Time: _____ a.m./p.m.
Location of Incident -- City: _____ County: _____ Address or Directions: _____	
Description of Incident: _____	

If Personal Injury or Contact (Also complete Section 2)	If Property Damage (over \$100,000)
Name: _____ Age: _____ Sex: M ☐ F ☐	Estimated amount \$: _____
Injury Severity: Fatal ☐ *Hospital ☐ *Minor Injury ☐ No Injury ☐	
Name: _____ Age: _____ Sex: M ☐ F ☐	
Injury Severity: Fatal ☐ *Hospital ☐ *Minor Injury ☐ No Injury ☐	
Name: _____ Age: _____ Sex: M ☐ F ☐	
Injury Severity: Fatal ☐ *Hospital ☐ *Minor Injury ☐ No Injury ☐	
Name: _____ Age: _____ Sex: M ☐ F ☐	
Injury Severity: Fatal ☐ *Hospital ☐ *Minor Injury ☐ No Injury ☐	
Facility Type: *OH ☐ *UG ☐ Substation ☐	
Other: _____ Voltage: _____	
Work Related: Yes ☐ No ☐ Worker's Trade: _____	
Employed By: _____	
Utility notified of activity prior to incident: Yes ☐ No ☐	

If Service Outage
Date: ____/____/____
Time Out: _____ a.m./p.m.
Time In: _____ a.m./p.m.
Customers Out: _____
Number of Circuits: _____
Reportable:
- Utility serving over 15,000 customers with 500 customers or more out over two hours. - Utility serving less than 15,000 customers with 500 customers or more out over five hours.
Exception:
Not reportable if outage is restricted to a single feeder and outage is less than four hours.

OAR 860-024-0050

Incident Reports

(1) As used in this rule:

(a) "Serious injury to person" means, in the case of an employee, an injury which results in hospitalization. In the case of a non-employee, "serious injury" means any contact with an energized high-voltage line, or any incident which results in hospitalization. Treatment in an emergency room is not hospitalization.

(b) "Serious injury to property" means:

(A) Damage to operator and non-operator property exceeding \$100,000; or

(B) In the case of a gas operator, damage to property exceeding \$5,000; or

(C) In the case of an electricity service supplier (ESS) as defined in OAR 860-038-0005, damage to ESS and non-ESS property exceeding \$100,000 or failure of ESS facilities that causes or contributes to a loss of energy to consumers; or

(D) Damage to property which causes a loss of service to over 500 customers (50 customers in the case of a gas operator) for over two hours (five hours for an electric operator serving less than 15,000 customers) except for electric service loss that is restricted to a single feeder line and results in an outage of less than four hours.

(2) Except as provided in section (5) of this rule, every reporting operator must give immediate notice by telephone, by facsimile, by electronic mail, or personally to the Commission, of incidents attended by loss of life or limb, or serious injury to person or property, occurring in Oregon upon the premises of or directly or indirectly arising from or connected with the maintenance or operation of a facility.

(3) Except as provided in section (5) of this rule, every reporting operator must, in addition to the notice given in section (2) of this rule for an incident described in section (2), report in writing to the Commission within 20 days of the occurrence. In the case of injuries to employees, a copy of the incident report form that is submitted to Oregon OSHA, Department of Consumer and Business Services, for reporting incident injuries, will normally suffice for a written report. In the case of a gas operator, copies of incident or leak reports submitted under 49 CFR Part 191 will normally suffice.

(4) An incident report filed by a public or telecommunications utility in accordance with ORS 654.715 cannot be used as evidence in any action for damages in any suit or action arising out of any matter mentioned in the report.

(5) A People's Utility District (PUD) is exempt from this rule if the PUD agrees, by signing an agreement, to comply voluntarily with the filing requirements set forth in sections (2) and (3).

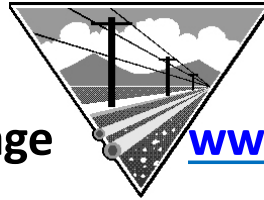
(6) Gas operators have additional incident and condition reporting requirements set forth in OARs 860-024-0020 and 860-024-0021.

What's new in 2024

- **Staff started helping OPUC Consumer Services department by investigating complaints more frequently to help resolve and close filed complaints in a timely manner.**
 - Be aware this will result in additional OPUC reports issued.
- **OPUC Reports will look different than the past historical report format.**
 - Cover letter and report analysis will be one document.
 - Attachment A will include probable violation locations, details and pictures.
 - Attachment B will be in a spreadsheet format so probable violations can easily be extracted and assigned for repair.
- **Historically staff has only requested information for poles where we witnessed probable violations during our audits, but we are expanding our request to include an additional random selection of poles in the inspection area to help establish a better understanding and recognition of the interaction between joint users in correcting violations and the operators program effectiveness.**
 - Instead of requiring a longform every 5 years for 50% of the poles, this method lets Staff request more time-accurate and localized views of the inspection programs, and only requires you to submit that information for about 5% of poles.
- **Communication Operator audits.**
 - Staff will be requesting maps where detailed inspections occurred and two years have elapsed, and corrections should have been made.
 - Staff then will audit those areas to determine if the Operator's inspect and correct program is compliant.
 - Note, all Operators that have facilities in those areas will also be subjected to the audit and probable violations will be recorded and reports sent for corrections to be made.



Commission Web Page



www.oregon.gov/puc

Oregon Public Utility Commission
Safety, Reliability & Security Division
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Salem OR 97301-2551

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