Pole Inspection Guidelines

Revision Date
February 6, 2017

DOCUMENT CONTROL

AUTHORITIES

Prepared by	Role	Date Completed
Antonio Alvarado	Senior Engineer – Overhead Engineering	1/6/2016

APPROVALS

Reviewed by	Role	Date Approved
Adam Marin	Manager – Overhead Engineering	1/6/2016
George Tamez	Director - Distribution Engineering	1/6/2016

DISTRIBUTION LIST

Name	Organization

The Manual Change History below reflects changes to the Manual or its structure. Issue dates, release dates, and approvals for individual procedures contained herein.

MANUAL CHANGE HISTORY

Revision	Reason for Issue	Issue Date	Next Review Date
0	Initial Release	05/20/2011	As Needed
1	Guidelines revised to capture current Pole Inspection Practices	1/6/2016	
2	Priority Levels added to Table 2. Pole Numbering label revised.	2/5/2016	As Needed
4	Updated Circuit Inspection List, Updated Pole Labeling & Resistograph section	2/6/2017	As Needed

Contents

1. INTRODUCTION

Inspection and treatment of CPS Energy Distribution System power poles (Support Structures) is necessary to determine the serviceability of a pole. Proactive identification of poles in need of replacement will help ensure the safety of CPS Energy personnel and the General Public. In addition, identification and replacement of defective support structures will help reduce the number of power outages caused by fallen poles helping maintain reliable service to our customers. The RUS Bulletin 1730B-121 (Dated 8/13/13) recommends a pole inspection cycle of 10 years for Decay Zone 3. The CPS Energy Service Territory lies within the Decay Zone 3 boundaries. For this reason, CPS Energy is working toward completing a 10 year pole inspection cycle. Pole Inspection of power poles within the CPS Energy Service Territory does not include inspection of the CPS Energy owned metal streetlight standards.

1.1 Overview

The inspection and treatment of Distribution System power poles will be conducted by a qualified Pole Inspection Contractor with activities directed and overseen by the combined efforts of the Overhead Engineering and Outside Services departments. The inspection will consist of both a visual inspection of the above ground conditions of the Distribution Power pole and a below ground inspection of any CPS Energy owned Power pole (in service for ten (10) or more years) using the IML Resistograph testing method. In some cases, the power poles will be excavated to conduct a visual inspection of the poles below ground condition with application of a ground wrap in every instance where excavation around the pole ground line occurs.

1.2 Scope / Purpose

The guidelines captured in this document are intended to provide guidance in conducting visual and Resistograph inspections of Distribution System power poles. The pole inspection process will begin with CPS Energy providing the Pole Inspection Contractor a list of distribution circuits indicating the sequence in which the poles are to be inspected (see Figure 2). Pole inspection crews will conduct a visual inspection of all CPS Energy owned, AT&T owned, and private customer owned power poles with CPS Energy attachments. A below ground inspection of all CPS Energy owned wood power poles with 10 or more years of service will be conducted using the IML Resistograph pole testing method. The Pole inspection process ends with the Pole Inspection Contractor submitting all paperwork used and pole inspection data collected to the Outside Services department. CPS Energy will select a sampling of the poles inspected for every circuit and conduct a Quality Audit of the pole inspection services conducted by pole inspection crew. See Figure 21.

1.3 References

This section contains a list of references useful in understanding this document.**Reference Index**

Reference	Revision/Issue Date	Location
Pole Inspection Sequence List by Distribution Circuit **(Created 12/16/15)**		X:\Overhead\oheng\Pole Replacement Program\Program Files\Inspection Guidelines\FY17-FY20 Pole Inspection Sequence.pdf
RUS Standards Document **(Link Downloaded 1/5/16)**		http://www.rd.usda.gov/files/UEP_Bulletin_1730B-121.pdf
IML Resistograph Equipment Manual **(Copy of this document received from IML 5/4/15)**		IML-RESI PD-Series Wood Inspector Manual.pdf
Pole & Streetlight Labeling Memo G-0002		http://cpsnet/virtualwebs/overheaddist/memos/G-0002.pdf

2. VISUAL INSPECTION OF DISTRIBUTION POWER POLES

2.1 Definitions

1. VISUAL INSPECTION – Inspection conducted on a Power pole from top of the pole to ground level. Visual inspection shall include, but not be limited to, GIS Support structure number (pole number), pole ownership, pole size, class, installation date, pole material type, original treatment, woodpecker damage, evidence of ants or termites, split pole tops, lightning damage or other physical damage, broken ground wire, broken or split crossarms, broken/slack guy wire, broken/missing insulator, tree limbs, leaking distribution transformers, failed lightning arrestors, excessive leaning, and other damage visible from the ground. Poles discovered with a CPS Energy yellow design tag will be noted on the comments but the pole will not be rejected. Poles with a "Sister" pole adjacent to them will be noted for follow up. Poles with concrete collars will be documented and tagged/reported as reject poles (RP). Pole inspection notes will be documented for customer owned poles with issues but no type of inspection tag is to be applied.

   If the GIS Support structure (pole number), overhead or underground fuse (R-switch) number, primary disconnect switch number (A-switch, P-switch, or AM Switch) or protective device (Electronic or Hydraulic Recloser (RE or RO), or S-Switch) is missing or not clearly visible, it shall be noted on the inspection documentation. It is CPS Energy's goal to have all support structures (distribution power poles) and street light locations labeled with the GIS Support structure facility ID number and streetlight facility ID number (where applicable). The pole inspection crews will attach pole numbers to poles not already labeled. See Construction Memo G-0002 on how the GIS Support structure & street light facility ID numbers are to be installed on those poles not already labeled. The GIS Support Structure (pole number) will not be placed on poles that are identified for replacement (See Level 1-3 Priority Replacement Levels in Table 2).

   At CPS Energy's option, each pole shall have its ground resistance taken and recorded. In the instances where the ground wire connection is broken, the pole inspector will attempt to repair the connection. If repair is not possible, it shall be noted in the pole inspection documentation.

   Pole and equipment conditions that are determined unable to perform as intended or create a public hazard will be reported to CPS Energy within forty-eight (48) hours of discovery. These conditions include: failed fused switches on capacitor banks or overhead fused disconnects, broken cross arms, insulators, or brackets, electrical equipment leaking oil, broken/slack guy wires, excessive leaning poles, primary neutral or conductors, or secondaries out of their normal pole positions.

2. REJECT POLE (RP) - A pole which has been visually inspected and/or Resistograph tested and found to be deteriorated below required strength and not treated further. Examples of Reject Poles include the following:

Examples of Reject Poles
Pole reinforced with Steel Trusses installed >10 years ago
Poles with Split Tops or Lightning Damage
Poles with Excessive Bend at the Neutral position or above
Poles with Excessive Lean
Poles with Bayonet Extensions
Poles with Excessive Wood Pecker Holes
Poles with Concrete Collars installed at base
Poles that Fail IML Resistograph Testing

Table 1 Reject Pole Examples

In years past, all poles in service 40 or more years were automatically identified as Reject Poles. A query of the CPS Energy GIS Mapping System found 60,000 plus poles in service for 40 or more years. The current inspection process is now condition based testing of these older power poles and identification of poles truly in need of replacement. Age is no longer a factor for rejection of a pole.

3. PRIORITY REJECT POLE (PR) – A pole identified as unsafe and in need of immediate attention that will be reported to CPS Energy System Operations by the Pole Inspection Contractor within forty-eight (48) hours of discovery. The Pole Inspection Contractor will use a CPS Energy-approved visual indicator to mark the Priority Reject Pole for easy identification by CPS Energy repair crews. In cases where a numbered switch or other numbered device is located on the pole, both the pole number (GIS Support Structure Number) and device number will be used when reporting the PR pole to CPS Energy. A physical address can also be provided to System Operations for ease of locating the pole. Poles deemed as Priority Rejects will be included in the inspection documentation to include the Work Order number that will be used by repair crews to replace/repair the pole (Work Order number shall be obtained from CPS Energy Emergency point of contact) for the purposes of follow-up. If no Work Order number is obtained at least document the date, time, and person to whom the PR pole was reported. Since the Pole Inspection crew will continue inspecting power poles in the same area they will monitor the progress of the pole replacement on behalf of CPS Energy to ensure that its replacement is completed.

4. YELLOW TAG POLE – Pole tagged with a square yellow tag that typically indicates the pole has been identified by CPS Energy design personnel for replacement.

Poles found "yellow tagged" will be noted in the pole inspection data but not marked as reject poles.

5. INSPECTION DOCUMENTATION – Inspection paper work that will be submitted to CPS Energy documenting the results of the pole inspections. Documentation includes hard copy pole inspection maps and electronic copies of pole inspection data and Resistograph signatures.

6. POLE TAGGING – All inspected poles shall be marked with an aluminum tag indicating the Pole Inspection Company's name (or initials) and year the inspection was performed. Tags shall be supplied by the Pole Inspection Contractor and placed approximately seven (7) feet above groundline on the road side of each pole. See Table 2 below for tagging for each type of pole condition.

Replacement Priority Level	Pole Condition	Tag to be Used	Replacement Cycle Time
N/A	Pass Testing	1 Silver Tag	N/A
1	Priority Reject Pole	2 Red Tags & Orange Ribbon	1 week
2	Failed IML	2 Red Tags	3-9 Months
3	Reject Pole	1 Red Tag	18-24 Months

Table 2 Pole Tagging Indicators

7. REPORT LINE CLEARANCE - Pole Inspection Contractor, at option of CPS Energy, shall report line clearance utilizing opticals, acoustical instrumentation, or telescoping fiberglass measuring sticks.

8. SPAN LENGTH MEASUREMENT - Pole Inspection Contractor, at option of CPS Energy, shall measure the span length. Measurement is to be accomplished utilizing optical devices, steel tapes, or measuring wheels.

9. HAND-HELD COMPUTER - Hand-held computer data collection and an information management system can be utilized. The advantages range from the validity checks performed on information as it is entered at the inspection site, to the final analysis and presentation. All data collected shall be electronically transferred to CPS Energy as per CPS Energy instructions. Data shall be in a format that allows direct import of data into the CPS Energy's Geographic Information System (GIS) without modification. Currently, CPS Energy utilizes an Environmental Systems Research Institute (ESRI) GIS system.

10. DAMAGED GROUND WIRE – Pole Inspection Contractor shall report broken ground wires in the groundline areas. At the option of CPS Energy, Pole Inspection Contractor will repair and restore pole grounds. For those pole grounds

removed by theft or vandalism, additional staples will be placed over wood molding to prevent future removals (See Figure 8).

11. DAMAGED GROUND CONNECTION - Damaged ground wire to ground rod shall be documented by the Pole Inspection Contractor. At the option of CPS Energy, Pole Inspection Contractor will repair and restore ground rod clamp (See in Figure 8).

12. POLE NUMBERING - Pole Inspection Contractor, at the option of CPS Energy, shall permanently affix a tag to the pole with a CPS Energy-provided unique identifiable number. Tags shall be supplied by CPS Energy and placed seven (7) feet above the ground line on the road side of each pole. See Construction Memo G-0002. All CPS owned poles not already labeled or labeled incorrectly in the field will have facility IDs applied.

13. POLE LOCATION - Pole Inspection Contractor, at the option of CPS Energy, will provide the GPS location of each pole inspected.

14. POLE ATTACHMENTS – Pole Inspection Contractor, at the option of CPS Energy, will identify and electronically supply CPS Energy with all current attachments on all poles inspected.

15. GUY-WIRE-GUARD APPLICATION – Pole Inspection Contractor, at the option of CPS Energy, will install yellow guards on CPS Energy guy wires that have fallen off or have been removed by acts of vandalism. Guy-wire guards will be supplied by CPS Energy.

16. STUB POLE (SISTER POLE) – Extra power pole that is topped off near the neutral location with no CPS Energy attachments. This pole is located adjacent to a more recently replaced pole. The stub pole may still have telecom transfers pending or no telecom contacts but may only need to be pulled (removed). The need to transfer telecommunications or removal of sister pole are to be noted in the pole inspection records.

17. AT&T OWNED POLE – Distribution power pole shown as owned by AT&T in the CPS Energy GIS Mapping System. The AT&T owned poles are denoted with a “T” in front of the text string that indicates the pole height and installation year. Example: “T-30-63.” Typically (but not always), an AT&T owned pole that has been replaced by CPS Energy has the pole branding removed. See Figure 19.

18. CUSTOMER OWNED POLE – Customer installed and owned meter power pole used in installations where attachment of metering equipment to a customer structures is not allowed. In the CPS Energy GIS Mapping System, these poles are denoted by an “L” next to the support structure symbol. Pole inspection notes

will be documented for customer owned poles with issues but no type of inspection tag is to be applied. See Figures 4 through 7 and 20.

2.2 Visual Inspection Requirements

1. CPS Energy will provide the Pole Inspection Contractor with a list of distribution circuits indicating the sequence in which the poles are to be inspected. The Pole Inspection Contractor personnel will be granted access to the CPS Energy GIS Mapping System so that the hard copy pole inspection maps (to be used by pole inspection crews) can be generated.
2. In an effort to improve the reliability performance of the Poor Performing Circuits, pole inspection efforts will be focused on inspection of the distribution power poles as defined in items 3-5 of this section. In some cases, pole inspectors may be asked to inspect only portions of a Power pole line that may be experiencing pole failures. CPS Energy reserves the right to alter the pole inspection sequence as needed.
3. Unless instructed otherwise, a visual inspection shall be conducted on all distribution power poles (see items 4-5) with CPS Energy equipment attachments on them regardless of age, while below ground level inspections and treatment shall only be conducted on CPS Energy owned distribution wood poles that have been in service ten (10) or more years. Visual inspection will also be conducted on all distribution power poles regardless of material type (composite, concrete, steel, and wood) checking the condition of the CPS Energy equipment on the poles. Pole Inspection of power poles within the CPS Energy Service Territory does not include inspection of the CPS Energy owned metal streetlight standards.
4. Pole inspections are to be conducted on all power poles that are part of the distribution circuit that is being inspected. Although CPS Energy owns the majority of the distribution power poles in its Service Territory, there are some power poles owned by either AT&T or private customers. All power poles with CPS Energy Attachments (primary & secondary wires, span guys, etc.) will be visually inspected to determine condition of both the Power pole and the CPS Energy attachments. Data will be collected and comments documented. All non-CPS Energy owned poles with CPS Energy attachments will not be excavated or Resistograph tested.
5. All power poles located on light taps or break-offs are to be inspected. All CPS Energy poles carrying secondaries to customer sites or street light equipment (Secondaries, ANSLs, or STLTs) will also be inspected.
6. CPS Energy recommendation for inspecting power poles is to begin at the substation exit riser pole and continue out to the ends of the circuit inspecting poles on unfused light taps or break-offs as they are encountered. The Pole Inspection Contractor may elect any method of their choice provided all of the circuit's power poles are inspected.

7. Any pole identified as a Priority Reject (PR) pole will be reported to CPS Energy System Operations personnel within forty-eight (48) hours of discovery. The Pole Inspection Contractor will use a CPS Energy-approved visual indicator to mark the PR pole for easy identification by CPS Energy repair crews. In cases where a numbered switch or other numbered device is located on the pole, both the pole number (GIS Support Structure Number) and device number will be used when reporting the PR pole to CPS Energy. A physical address can also be provided to System Operations for ease of locating the pole. Poles deemed as a PR will be included in the inspection documentation to include the Work Order number that will be used by repair crews to replace/repair the pole (Work Order number shall be obtained from CPS Energy Emergency point of contact) for the purposes of follow-up. If no work request number is obtained at least document the date, time, and person to whom the PR pole was reported. Since the Pole Inspection crew will continue to inspect other power poles in the same area they will monitor the progress of the pole replacement to ensure that the pole is replaced.

3. BELOW GROUND LEVEL INSPECTION OF DISTRIBUTION POWER POLES

3.1 Below Ground Level Inspection Requirements

1. CPS Energy owned distribution system wood poles that have been in service ten (10) or more years and not rejected by a visual inspection shall be inspected and treated as explained below:
   Utilizing Resist graph Testing Equipment, one (1) measurement will be taken at 90 degrees a few feet above ground level and three (3) additional measurements shall be taken at ground level at an angle of 45 degrees in the downward direction. The three (3) measurements are to be taken at 120 degrees apart at ground level. Each Resistograph Signature will be labeled with the appropriate pole (support structure) number for ease of identification. The current settings on the IML Resistograph equipment register an IML Testing failure when a 50% reduction in pole strength occurs because of a 20% cavity measurement.
   CPS Energy owned distribution system wood poles set in concrete or poles with underground power cables (Underground to Overhead Risers) that have been in service ten (10) or more years and not rejected by a visual inspection shall be inspected using the IML Resistograph Testing equipment.

2. When a pole inspection is to be performed in the back yard of a customer home or deep into customer property, the property owner shall be notified of the need to access pole(s) on their property for inspection. Once permission from the property owner is granted, any obstacles will be removed from around the pole to allow for proper excavation, inspection, and treatment. If permission is not granted to remove obstacles from around the pole, the pole will be sounded and bored and noted for future treatment and reported to CPS Energy for follow-up with the property owner.
   Pole Inspection Contractor shall exercise extra care not to break or disconnect the ground wires from the ground rods. Where these conditions exist, Pole Inspection Contractor shall carefully pull ground wires away from the poles so as not to interfere with the work and shall restore ground wires back to their original location when work is completed. In cases where the customer isn't available (not at home) preventing access to a Power pole, the Pole Inspection Contractor will leave a CPS Energy supplied door knocker asking the customer to contact the Pole Inspection Pole Inspection Contractor. If Pole Inspector is unable to make contact with the customer, a visual inspection of the pole is to be conducted (where possible) and noted in the inspection documentation. Poles unable to be accessed for inspection will be noted as "No Access" in the inspection data.

3. When excavation is deemed necessary to visually evaluate the below ground condition of a Power pole or for application of pole treatment , a hole shall be dug all the way around the pole to a depth of twelve (12) inches, wide enough at the top and bottom to facilitate proper inspection, decay removal and treatment. For excavations in lawns or gardens, care will be taken to keep the surrounding areas as clean as possible and the sod around poles shall be carefully cut and neatly stacked. Spoil materials shall be placed on canvas-type material to ensure that area is left as clean as possible.

4. When using the excavation method, the following steps shall be taken to measure the Minimum Circumference. The Pole Inspection Contractor shall perform the following activities:

   a) Measure and record the minimum circumference of the pole at groundline. This measurement will be the original circumference.
   b) Make adjustments in pole circumference by removing external and internal decay below groundline.
   c) Measure and record the adjusted pole circumference. This measurement will be the effective circumference.
   d) Check the effective circumference against circumferences in table supplied by CPS Energy in Reference Figures section, "Southern Yellow Pine Poles Table," or an approved equivalent.
   e) Treat poles with an effective minimum shell thickness in accordance with, "Southern Yellow Pine Poles Table" in Reference Figures section.
   f) Tag and report as a Reject Pole, poles with an effective shell thickness smaller than the stipulated minimum according to "Southern Yellow Pine Poles Table" in Reference Figures section.
   g) Tag and report as a Priority Reject Pole, poles with a minimum shell thickness of fifty percent (50%) of the original circumference.

3.2 Wood Pole Treatment

1. All poles suitable for treatment shall be treated in accordance with item 6 in this section. If internal decay is evident, an appropriate internal treatment shall be selected and applied.

2. Any pole that cannot be properly excavated around the entire circumference for reasons beyond the Pole Inspection Contractor's control (such as concrete, macadam, tree roots, etc.), the pole shall be bored above ground and treated with an insect treatment having an EPA-registered label stipulating its end use.

   For insect treatment application, borings, hole lengths and application rates shall be as specified on EPA-registered labels. Borings shall be directed towards the center of each pole at an angle of no less than forty-five (45) degrees, and care shall be taken to

avoid going through seasoning checks. Borings shall start at the appropriate location and shall be evenly spaced up the pole in a spiral pattern. No less than four (4) vertical inches shall separate adjacent holes.

3. Treatment for internal decay shall be a Hollow Heart solution or equivalent, as approved by CPS Energy. Poles containing internal decay shall be treated by pumping the preservative into the bottom hole until it runs out the next higher hole. This hole is then plugged and additional preservatives are pumped into the cavity until they run out the next higher hole. This procedure is followed until the cavity is filled or a maximum of one (1) gallon is used. If the preservative has not flowed out of the top hole, a maximum of one (1) gallon shall be pumped into the top hole. All holes that have not been previously plugged shall be plugged at this time with tight-fitting creosote-treated dowels.

4. Ant treatment application shall be the same as in item 3 of this section. Ant treatment shall consist of locating the top gallery of interconnected ant galleries by boring holes in the pole and pumping the preservative solution into the pole. When the cavities are filled, or a maximum of one (1) gallon of solution has been used, the holes are tightly plugged with creosote-treated dowels.

5. Termite treatment application shall be the same treatment solution as item 3 of this section. Subterranean termites are usually found from below the ground line to five (5) feet above. Termite treatment shall consist of locating the top gallery of interconnecting chambers by boring holes in the pole and pumping the preservative solution into the holes. When the cavities are filled, or a maximum of one (1) gallon of solution has been used, the holes are tightly plugged with creosote-treated dowels.

6. External Groundline Treatment shall be applied every time an excavation is conducted around a Power pole.

    a. Wood Preservative Application. The wood preservative shall be applied in accordance with manufacturer recommendations. Approved manufacturers are listed below:

        1. Osmose

        2. Genics

    b. Wrapping. A shield-moisture barrier shall be applied over the pole in accordance with manufacturer recommendations.

        In locations where livestock has access to a treated pole, a suitable cattle wrap shall be applied.

4. DOCUMENTATION AND SUBMISSION OF COMPLETED POLE INSPECTION PAPERWORK

4.1 All inspected power poles shall be marked with an aluminum tag indicating the Contract Pole Inspection Company name (or initials) and year the pole inspection was conducted. Tags shall be supplied by the Pole Inspection Contractor and placed seven (7) feet above groundline on the road side of each pole. See Table 2 for tagging for each type of pole condition.

4.2 Reports and Electronic Data.

a) Weekly Reporting. Pole Inspection Contractor will provide weekly pole inspection update with quantity of poles that were visually inspected, resistograph tested, and rejected.

b) Computer Reports. Accurate field data is to be submitted to the CPS Energy field representative using the Microsoft EXCEL 2003 or later spreadsheet format. Only completed distribution circuit pole inspection data shall be submitted and invoiced.

The Microsoft EXCEL 2003 or later spreadsheet should have the following list of categories:

Map Number, Pole Number, Date, Reject Type (RP, PR,), Pole Location, Height, Year Set, Class, Map Area, Original Circumference, Effective Circumference, Treated Pole, Sound and Bore, Visual, Cable Attachments, Internal Treat, Set in Concrete, Remarks, GPS Location, CPS Energy unique pole number, and all current attachments to the pole. See example of Pole Inspection and Treatment Report in Reference Figures section.

b) Electronic Reports. The Pole Inspection Contractor shall electronically record all Services on the Pole Inspection and Treatment Report form furnished by Pole Inspection Contractor. Reports shall be submitted to CPS Energy on a monthly basis covering the most recent Services completed.

c) Photos – At CPS Energy's option, a digital photo showing Services performed in jpg format will be provided for each pole that is invoiced. File names of photo shall be named so that CPS Energy personnel can identify photo with invoiced entry.

REFERENCE FIGURES
Southern Yellow Pine Pole Table

DIAMETERS IN INCHES

FEET FROM TOP	CL-1	CL-2	CL-3	CL-4	CL-5
0	8.6	7.9	7.3	6.7	6.0
2	8.8	8.2	7.5	6.9	6.3
5	9.3	8.6	7.9	7.3	6.6
10	9.9	9.2	8.5	7.8	7.2
15	10.6	9.9	9.1	8.4	7.8
20	11.3	10.5	9.7	9.0	8.3
25	12.0	11.1	10.3	9.6	8.9
30	12.6	11.8	11.0	10.2	9.5
35	13.3	12.4	11.6	10.7	10.0
40	13.9	13.1	12.1	11.3	10.5
45	14.5	13.6	12.6	11.8	11.0
50	15.1	14.1	13.2	12.3	11.5
55	15.7	14.6	13.7	12.8	12.0
60	16.3	15.2	14.2	13.2	12.4
65	16.9	15.8	14.7	13.7	
70	17.4	16.2	15.2	14.1	

CIRCUMFERENCES IN INCHES

FEET FROM TOP	CL-1	CL-2	CL-3	CL-4	CL-5
0	27.0	24.8	22.9	21.1	18.9
2	27.7	25.8	23.6	21.7	19.8
5	29.2	27.0	24.8	22.9	20.7
10	31.1	28.9	26.7	24.5	22.6
15	33.3	31.1	28.6	26.4	24.5
20	35.5	33.0	30.5	28.3	26.1
25	37.7	34.9	32.4	30.2	28.0
30	39.6	37.1	34.6	32.0	29.8
35	41.8	39.0	36.4	33.6	31.4
40	43.7	41.2	38.0	35.5	33.0
45	45.6	42.7	39.6	37.1	34.6
50	47.4	44.3	41.5	38.6	36.1
55	49.3	45.9	43.0	40.2	37.7
60	51.2	47.8	44.6	41.5	39.0
65	53.1	49.6	46.2	43.0	
70	54.7	50.9	47.8	44.3	

Fig. 1

Circuit #	Estimated Qty. Poles	FY	Circuit #	Estimated Qty. Poles	FY	Circuit #	Estimated Qty. Poles	FY	Circuit #	Estimated Qty. Poles	FY	Circuit #	Estimated Qty. Poles	FY	Circuit #	Estimated Qty. Poles	FY
X232	3,284	17	F840	1,085	19	W221	115	21	Q144	2,985	23	P533	2	25	J321	578	27
T221	267	17	F839	791	19	R221	1,117	21	M233	395	23	P534	501	25	J322	309	27
T021	703	17	S432	404	19	R222	866	21	M231	236	23	S314	665	25	J324	311	27
T023	868	17	S434	115	19	R223	983	21	M232	1	23	O341	627	25	J311	408	27
W211	2,715	17	W444	468	19	R224	1,246	21	A024	331	23	O342	650	25	J312	162	27
G113	383	17	W441	880	19	A041	462	21	A021	251	23	O344	285	25	J313	392	27
O232	607	17	W442	239	19	A042	518	21	A022	128	23	W132	1,873	25	J314	187	28
Y132	1	17	W443	431	19	A043	575	21	A023	432	23	A522	103	25	M321	83	28
S413	357	17	D222	497	19	A044	192	21	V224	1,106	23	A522	103	25	M322	291	28
M212	2,640	17	D221	392	19	J013	1,309	21	V221	3	23	A532	69	25	M323	489	28
S411	723	17	D223	580	19	J011	1,013	21	V222	1,204	23	F529	721	25	M324	376	28
S412	486	17	D224	268	19	J012	860	21	V223	757	23	F540	161	25	G214	300	28
S414	350	17	P023	856	19	J014	382	21	Z011	866	23	F605	836	25	G224	20	28
X442	505	17	P021	613	19	J043	265	21	Z012	2,188	23	V532	309	25	V033	361	28
X441	69	17	P022	687	19	J041	731	21	Z013	1,226	24	V533	3,838	25	V034	153	28
X443	634	17	P024	1,032	19	J044	754	21	J032	596	24	V531	482	26	J231	440	28
F834	363	17	P012	701	19	H341	3,384	21	J031	622	24	X343	477	26	J232	434	28
F835	320	17	P011	814	19	H343	370	21	C041	444	24	W122	2,652	26	J233	338	28
F836	136	17	P013	1,411	19	H342	709	22	C044	182	24	L234	817	26	J234	114	28
F837	112	17	P014	1,174	19	V411	605	22	K221	559	24	Q121	4,108	26	H311	340	28
M211	355	17	F720	156	20	V412	638	22	K223	728	24	Q123	230	26	H312	574	28
M213	2	17	F722	865	20	V413	57	22	Z433	822	24	Y434	319	26	H314	411	28
M214	265	17	E134	900	20	Z443	695	22	Z431	550	24	Y432	486	26	S323	137	28
D212	549	17	E131	992	20	Z441	676	22	Z434	1,361	24	Y433	626	26	B232	89	28
D211	538	17	E133	955	20	Z442	414	22	X123	434	24	Y431	274	26	B233	73	28
D213	1	17	E124	397	20	Z444	466	22	X121	313	24	R444	1,262	26	B234	41	28
D214	195	17	E122	778	20	Z421	30	22	X122	7	24	R423	359	26	V333	316	28
D031	1,016	17	E123	1,158	20	P333	633	22	X124	696	24	D313	2,909	26	B242	44	28
D032	677	17	J432	713	20	P331	728	22	E344	1,236	24	F575	332	27	B243	7	28
D033	237	17	J431	301	20	P332	550	22	Y421	594	24	F528	484	27	Q145	4	28
A051	927	17	J434	565	20	F798	634	22	Y422	157	24	F576	169	27	W524	48	28
A052	692	17	X112	605	20	F797	130	22	P511	226	24	F577	67	27			
A053	62	17	X111	611	20	F796	4	22	P512	263	24	F606	567	27			
G034	1,489	17	X113	3	20	K213	440	22	P523	429	24	F607	81	27			
A521	1,565	18	Z412	654	20	K211	800	22	P524	510	24	F689	271	27			
A531	486	18	Z411	1,105	20	M163	1,348	22	M111	571	24	F821	314	27			
J433	472	18	Z413	423	20	M161	228	22	Y223	306	24	F820	436	27			
P514	694	18	B325	406	20	M162	523	22	Y221	546	24	B423	827	27			
P515	297	18	B324	451	20	M164	175	22	Y222	305	24	B424	890	27			
P522	544	18	Q224	1,156	20	X213	1,607	22	Y224	510	24	B444	211	27			
E132	960	18	Q221	354	20	X211	2,793	22	F666	881	24	F023	1,649	27			
F841	1,023	18	Q222	748	20	X212	2,351	23	K243	1,062	25	F021	600	27			
S433	303	18	Q223	465	20	X214	179	23	D231	666	25	F022	846	27			
Z434	1,361	18	W222	376	20	V231	107	23	D232	269	25	M422	1,018	27			
F041	3,665	18				V232	237	23	G133	522	25	R232	1,004	27			
J313	392	18				D045	53	23	G134	635	25	F536	1	27			
H341	3,384	18				F804	205	23	G131	438	25	F530	7	27			
M224	105	18				F805	345	23	G132	327	25	F571	1	27			
M221	838	19				F806	74	23	A443	708	25	Q143	4	27			
M222	15	19				U134	2,526	23	A441	329	25	Q141	8	27			
M223	98	19				U133	11	23				Q142	3,329	27			
Q521	587	19				B422	990	23									
Q522	497	19				B421	155	23									

Verify if Pole Inspections Completed (yellow) — Circuit Identification change (orange) — Revised: 2/6/17

Figure 2 FY17-FY20 Pole Inspection Sequence by Distribution Circuit

Date:	9/14/15
Inspector:	Rocky/Mario/KC
Page: x of x	
TPCL#:	
CPS Grid #:	
Client:	CPS Energy
Circuit Number:	G111

Species	**Treatment**
SP - Southern Pine	C - Cresote
WP - Western Pine	P - Pentachlorophenol
DF - Douglas Fir	N - Copper Napthenate
WC - Western Cedar	X - Creosote Petroleum
C - Concrete	U - Untreated
S - Steel	

DAMAGE CODES

SR - Shell Rot	RA - Rusted or Broken Anchor
BA - Broken or Bad Arm	BLA - Bad Lighting Arrestor
RB - Rotten Butt	MD - Mechanical Damage
ST - Split Top	PC - Pole Checks
DP - Decay Pocket	CD - Climbing Damage
FD - Fire Damage	HR - Heart Rot
RS - Ring Shakes	SG - Slack Guy
ID - Insect Damage	WH - Woodpecker Hole
LD - Lighting Damage	RT - Rotten Pole Top
TT - Tree Trimming	BI - Broken Insulator
BB - Broken or Bad Brace	DPM - Damaged Pole Molding
DGW - Damaged Ground Wire	DGR - Damaged Ground Rods
CTV - Cable TV Contact	TC - Telephone Contact
RP - Reject Pole	PR - Priority Reject

Texas Utility Engineering, Inc.

Pole NO.	Circuit Number	Inspect Date	Birth Act / Est	**Ownership**	POLE TYPE & TREATMENT	HEIGHT & CLASS	A. VISUAL INSPECTION	B. RESISTOGRAPH	E. FULL EXCAVATION	F. PARTIAL EXCAVATION	G. INTERNAL TREATMENT	H. EXT GROUND LINE TREATMENT	I. INSECT TREATMENT	K. EXCAVATION OF POLE SET IN CONCRETE	L. REPORT LINE CLEARANCE	P. POLE ATTACHMENT ID (TELECOMS)	R. GROUND WIRE REPAIR	S. REPAIR GROUND WIRE MOLDING	T. GUY GUARD INSTALLATION	POLE REPLACEMENT	**DAMAGE CODES**	**TELECOMS**	**NOTES**
1742398	G111	9/14/15	2014	CPS	SP/C	45/3	1						1			1					TT	CPS Energy	
199312	G111	9/14/15	1989	CPS	SP/C	45/3	1	1					1			1					TT,PC	Grande Communication, ATT/SBC, Time Warner Cable	
199313	G111	9/14/15	1989	AT&T	SP/C	45/3	1	1					1			1					TT,PC	Grande Communication, Time Warner Cable	
199314	G111	9/14/15	1991	CPS	SP/C	45/3	1	1					1			1					TT,PC	Grande Communication, Time Warner Cable	
199316	G111	9/14/15	2003	CPS	SP/C	50/2	1	1					1			1					TT	Grande Communication, CPS Energy, Time Warner Cable	
202158	G111	9/14/15	1990	CPS	SP/C	40/3	1	1					1			1					TT,PC	Grande Communication, Time Warner Cable	
202161	G111	9/14/15	1972	CPS	SP/C	40/4	1	1	1							1				1	BA,ST,TT,PC,CD,RT,RP	Grande Communication, Time Warner Cable	Failed iml
202162	G111	9/14/15	1987	CPS	SP/C	45/3	1	1					1			1					PC	Grande Communication, Time Warner Cable	
202163	G111	9/14/15	1950	CPS	SP/C	40/3	1	1	1							1				1	ST,TT,PC,CD,RT,RP	Grande Communication, Time Warner Cable	Failed iml
204967	G111	9/14/15	1992	CPS	SP/C	40/3	1	1					1			1					TT,PC	ATT/SBC, Grande Communication, Time Warner Cable	
207715	G111	9/14/15	1991	CPS	SP/C	45/3	1	1					1			1					TT	Grande Communication, Time Warner Cable	
207718	G111	9/14/15	1972	CPS	SP/C	40/4	1	1	1							1				1	BA,ST,TT,PC,CD,HR,RT,RP	Grande Communication, Time Warner Cable	Failed iml
207719	G111	9/14/15	1950	CPS	SP/C	45/4	1	1	1							1				1	BA,ST,TT,PC,CD,HR,WH,RT,RP	Grande Communication, Time Warner Cable	Failed iml
207720	G111	9/14/15	1997	CPS	SP/C	40/3	1	1					1			1					TT	ATT/SBC, Grande Communication, Time Warner Cable	
210436	G111	9/14/15	1984	CPS	SP/C	40/4	1	1					1			1		1			TT	Grande Communication	210436 Time Warner Cable
212548	G111	9/14/15	1980	CPS	SP/C	45/3	1	1					1			1					BA,ST,PC,CD,RT	Time Warner Cable	
213245	G111	9/14/15	1984	CPS	SP/C	45/4	1	1					1			1					TT,PC,CD	Grande Communication, Time Warner Cable	
213246	G111	9/14/15	1984	CPS	SP/C	35/5	1	1					1			1		1			TT,PC		
213247	G111	9/14/15	1981	CPS	SP/C	45/4	1	1					1			1					TT,PC	Grande Communication, Time Warner Cable	
213248	G111	9/14/15	1950	CPS	SP/C	25/5	1													1	RB,ST,PC,CD,RT,RP		No cps contact/the pole isfalling over/pole needs to be pulled/did not drill
216003	G111	9/14/15	2002	CPS	SP/C	40/2	1	1					1			1					TT	AT&T Long Distance, Time Warner Cable	216003 Grande Communication
218724	G111	9/14/15	1984	CPS	SP/C	45/4	1	1					1			1					TT,PC,CD	Grande Communication, Time Warner Cable	
218725	G111	9/14/15	1985	CPS	SP/C	45/4	1	1					1			1					LD,PC,CD		
218727	G111	9/14/15	1960	CPS	SP/C	45/3	1	1	1							1				1	ST,PC,CD,RT,RP	ATT/SBC, Grande Communication, Time Warner Cable	Failed iml
221456	G111	9/14/15	1950	CPS	SP/C	50/3	1	1		1	1	1	1			1					TT,PC,CD,RT	Grande Communication, Time Warner Cable	
221457	G111	9/14/15	1997	CPS	SP/C	40/3	1	1					1			1						Grande Communication, Time Warner Cable	
224297	G111	9/14/15	1997	CPS	SP/C	40/3	1	1					1								TT		
224299	G111	9/14/15	1973	CPS	SP/C	45/3	1	1	1		1	1	1			1					TT,PC,CD,RT	Grande Communication, Time Warner Cable	
224300	G111	9/14/15	1981	CPS	SP/C	45/4	1	1					1			1					TT,PC,CD	Grande Communication, Time Warner Cable	
227069	G111	9/14/15	1992	CPS	SP/C	40/3	1	1					1			1					ST,TT,PC	ATT/SBC, Grande Communication, Time Warner Cable	
227070	G111	9/14/15	1991	CPS	SP/C	40/3	1	1					1			1					TT,PC	Grande Communication, Time Warner Cable	
227071	G111	9/14/15	1984	CPS	SP/C	45/4	1	1					1			1					TT,PC,CD	Grande Communication, Time Warner Cable	
227072	G111	9/14/15	1979	CPS	SP/C	45/3	1	1					1			1					BA,TT,PC,CD	Grande Communication, Time Warner Cable	

Figure 3 Pole Inspection Data Report

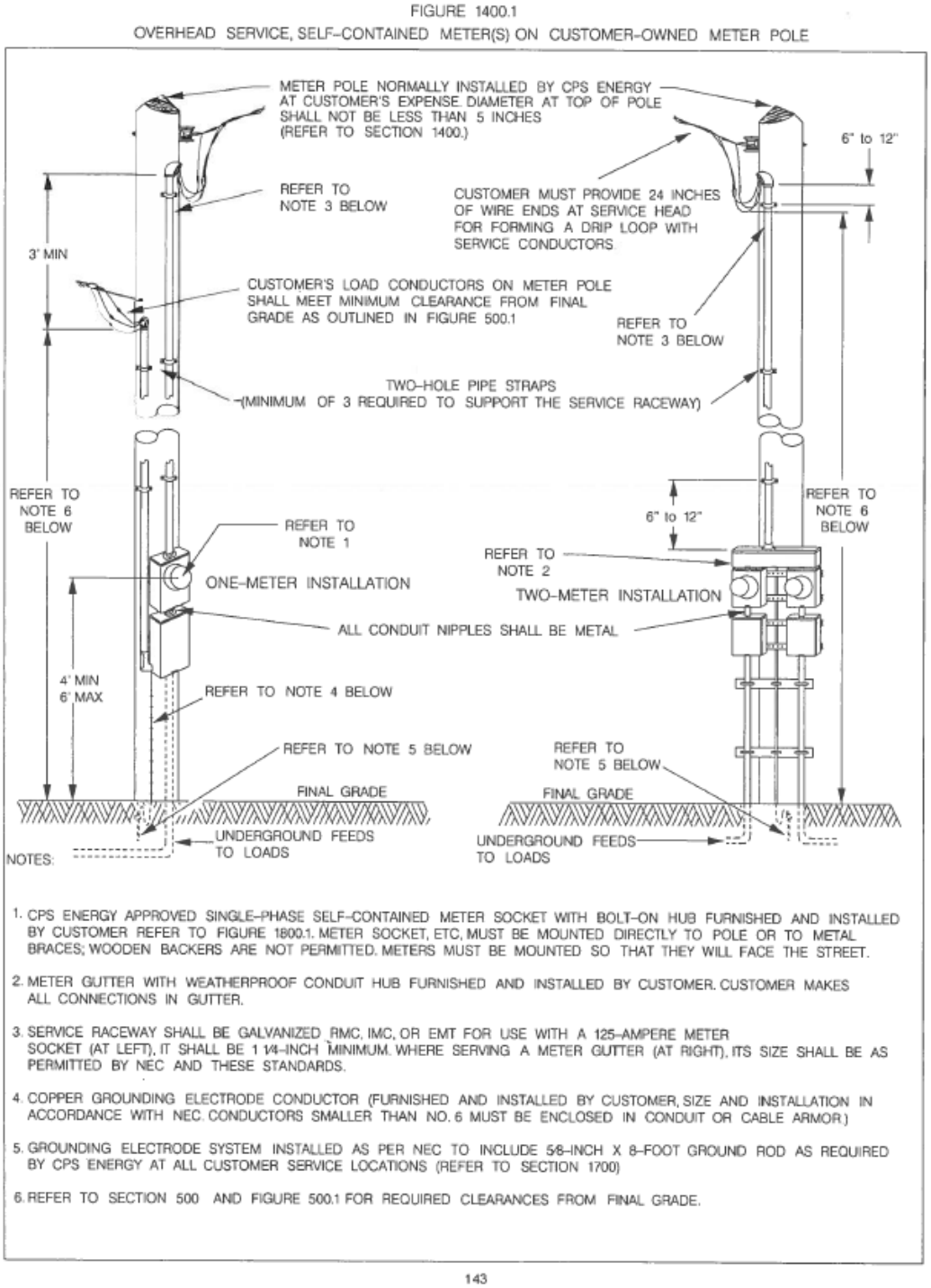


Figure 4 Customer Owned Pole Drawing from CPS Energy Electric Service Standards 2012 Edition

Figure 5 Customer Owned Pole

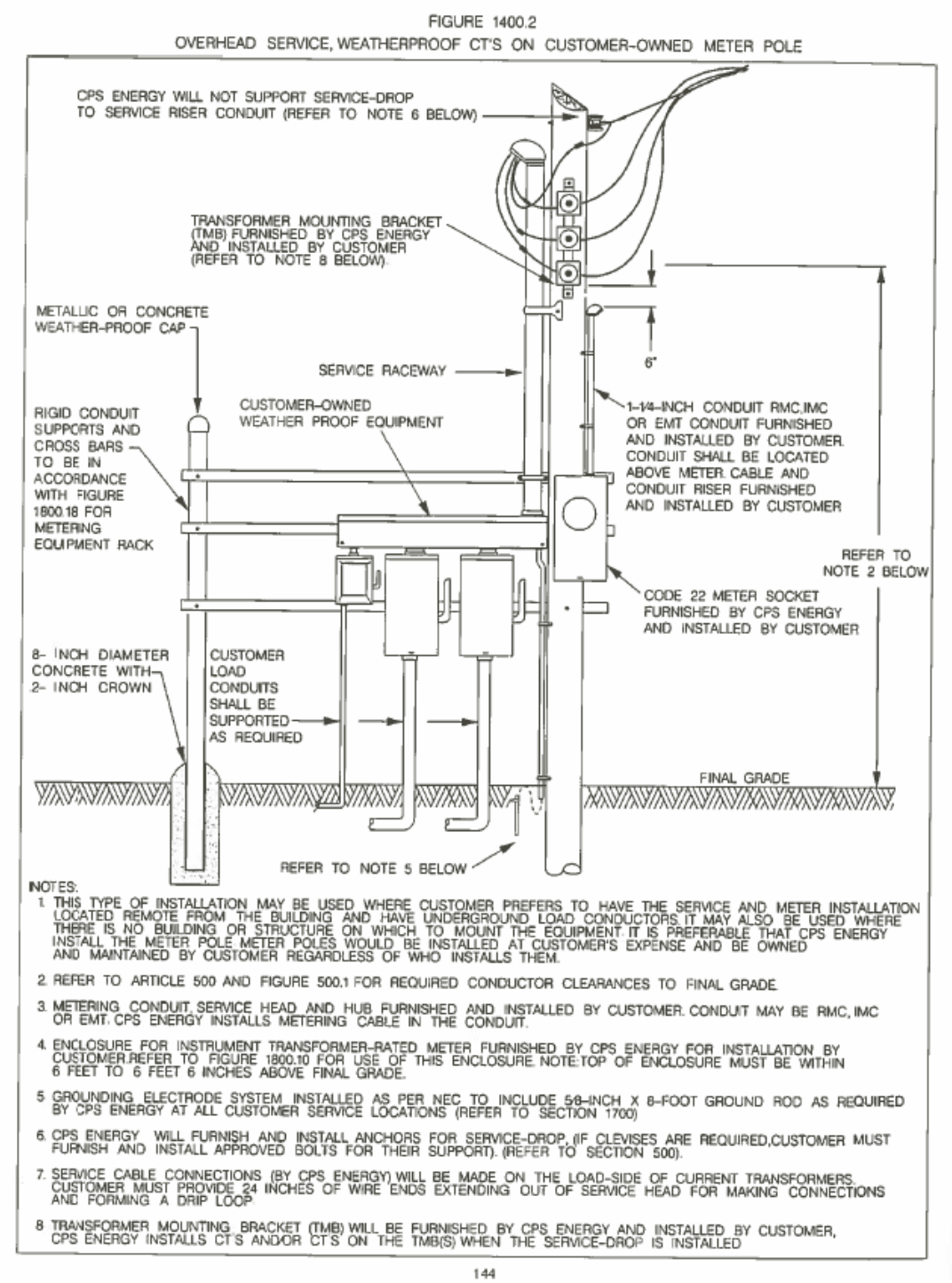


Figure 6 Customer Owned Pole Drawing from CPS Energy Electric Service Standards 2012 Edition

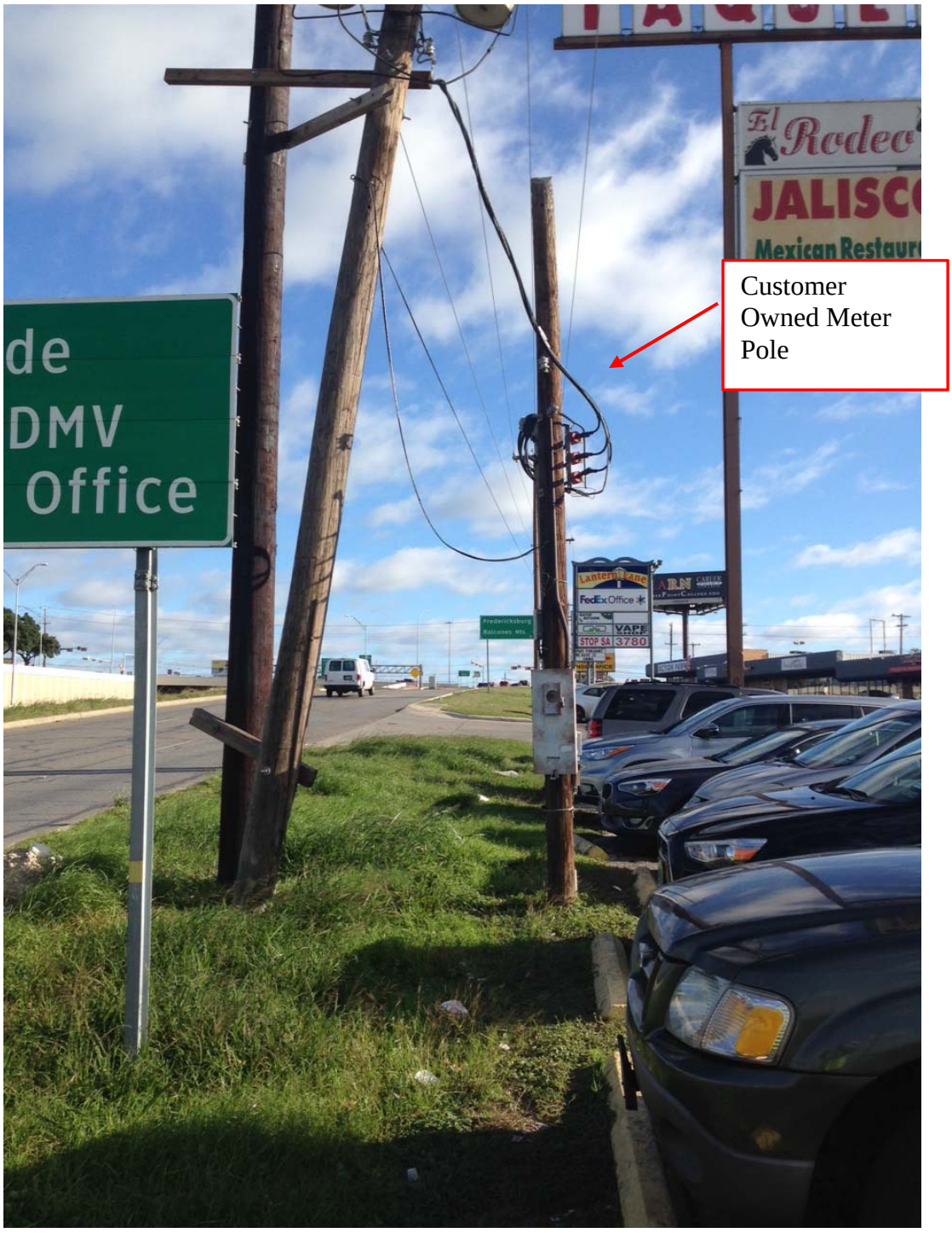
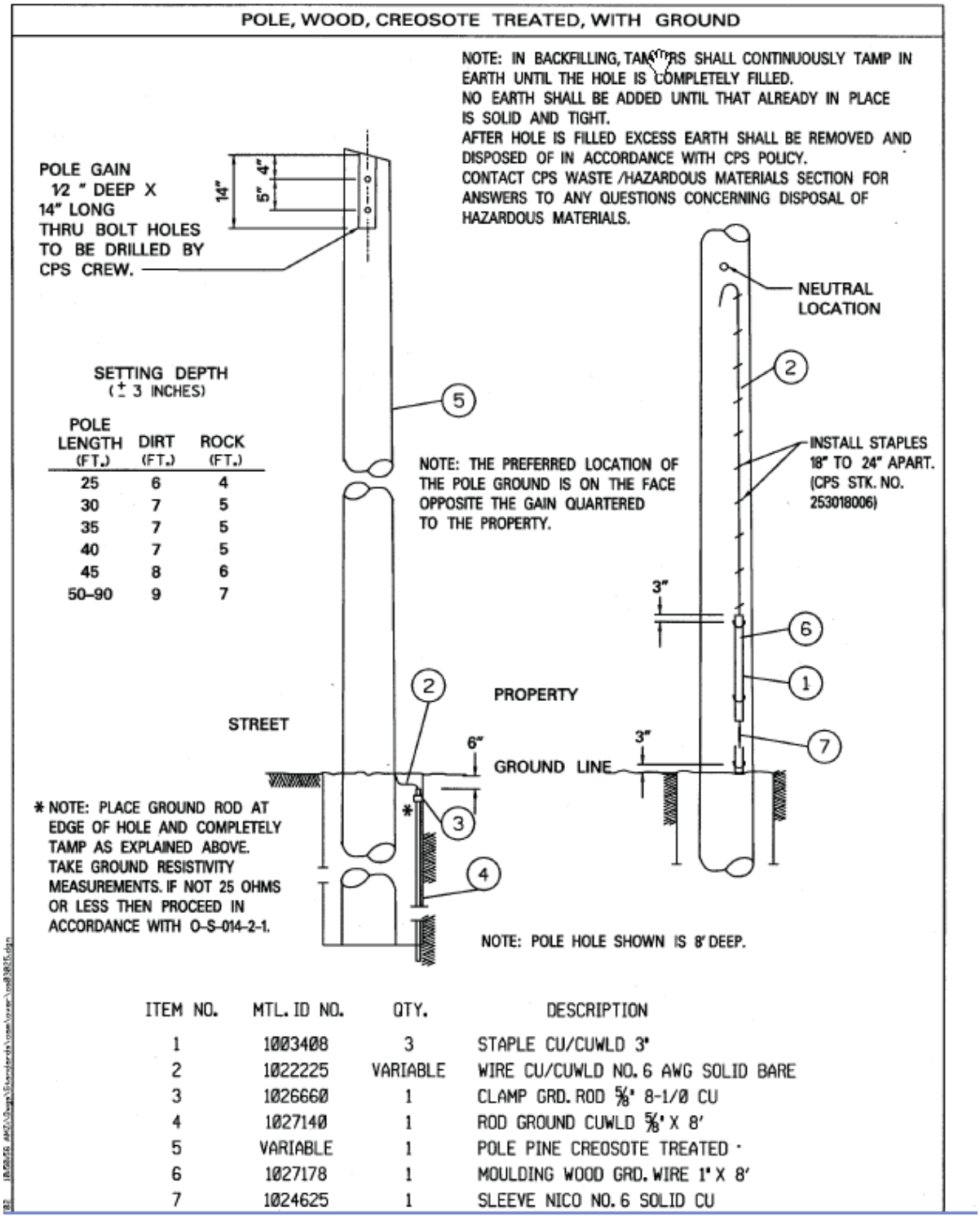


Figure 7 Customer Owned Pole for Commercial Service



ITEM NO.	MTL. ID NO.	QTY.	DESCRIPTION
1	1003408	3	STAPLE CU/CUWLD 3"
2	1022225	VARIABLE	WIRE CU/CUWLD NO. 6 AWG SOLID BARE
3	1026660	1	CLAMP GRD. ROD 5/8" 8-1/0 CU
4	1027140	1	ROD GROUND CUWLD 5/8" X 8'
5	VARIABLE	1	POLE PINE CREOSOTE TREATED
6	1027178	1	MOULDING WOOD GRD. WIRE 1" X 8'
7	1024625	1	SLEEVE NICO NO. 6 SOLID CU

Figure 8 CPS Energy Wood Pole Ground Application Information

Figure 9 Photo of Pole with Support Structure and Streetlight Number Applied

Figure 10 Pole with Steel Truss Installed

Figure 11 Pole with Lightning Damage

Figure 12 Pole with Excessive Bend at Neutral

Figure 13 Pole with Excessive Lean

Figure 14 Three Transformer Pole with Excessive Lean

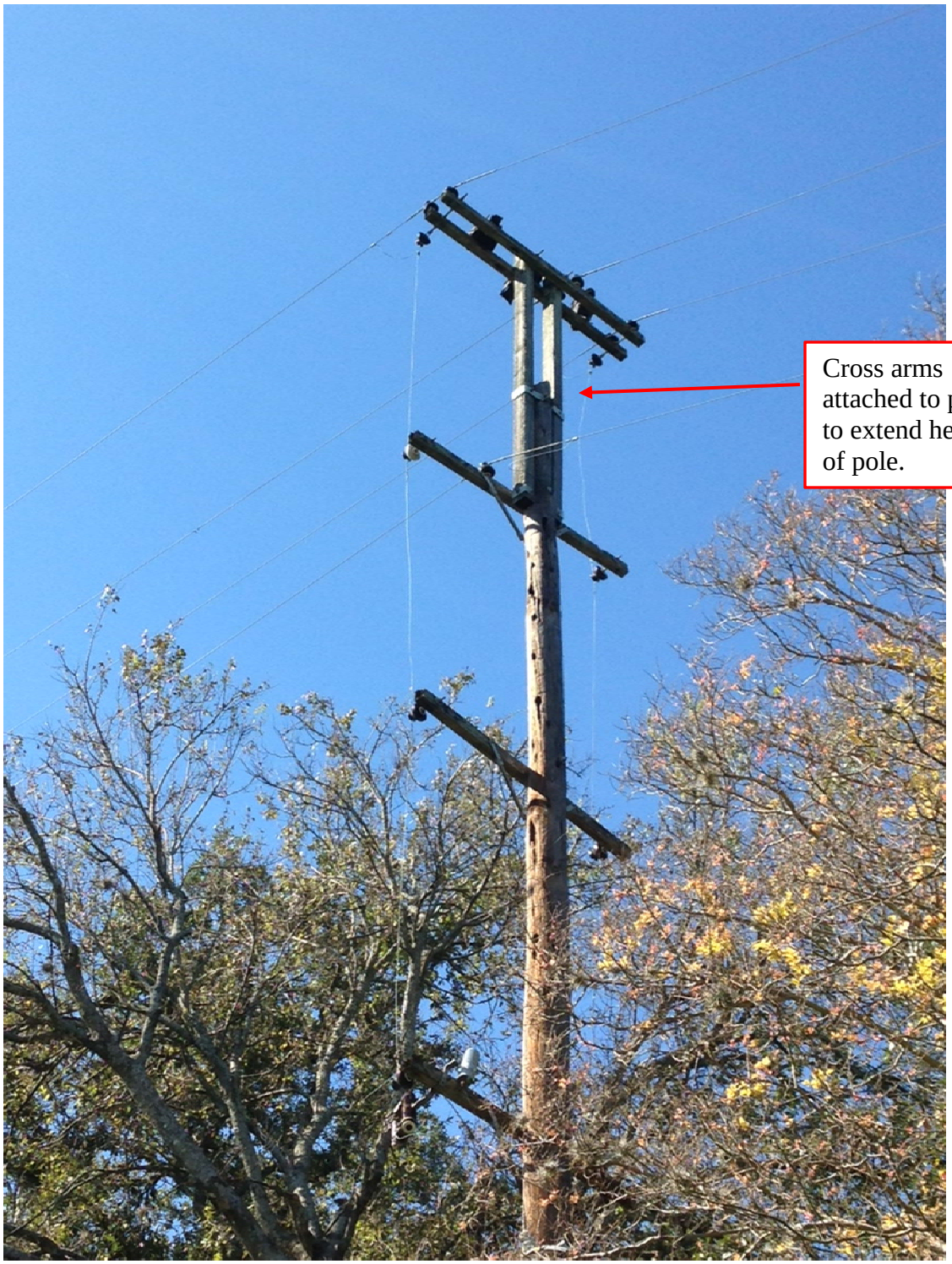


Figure 15 Pole with Bayonet Extension

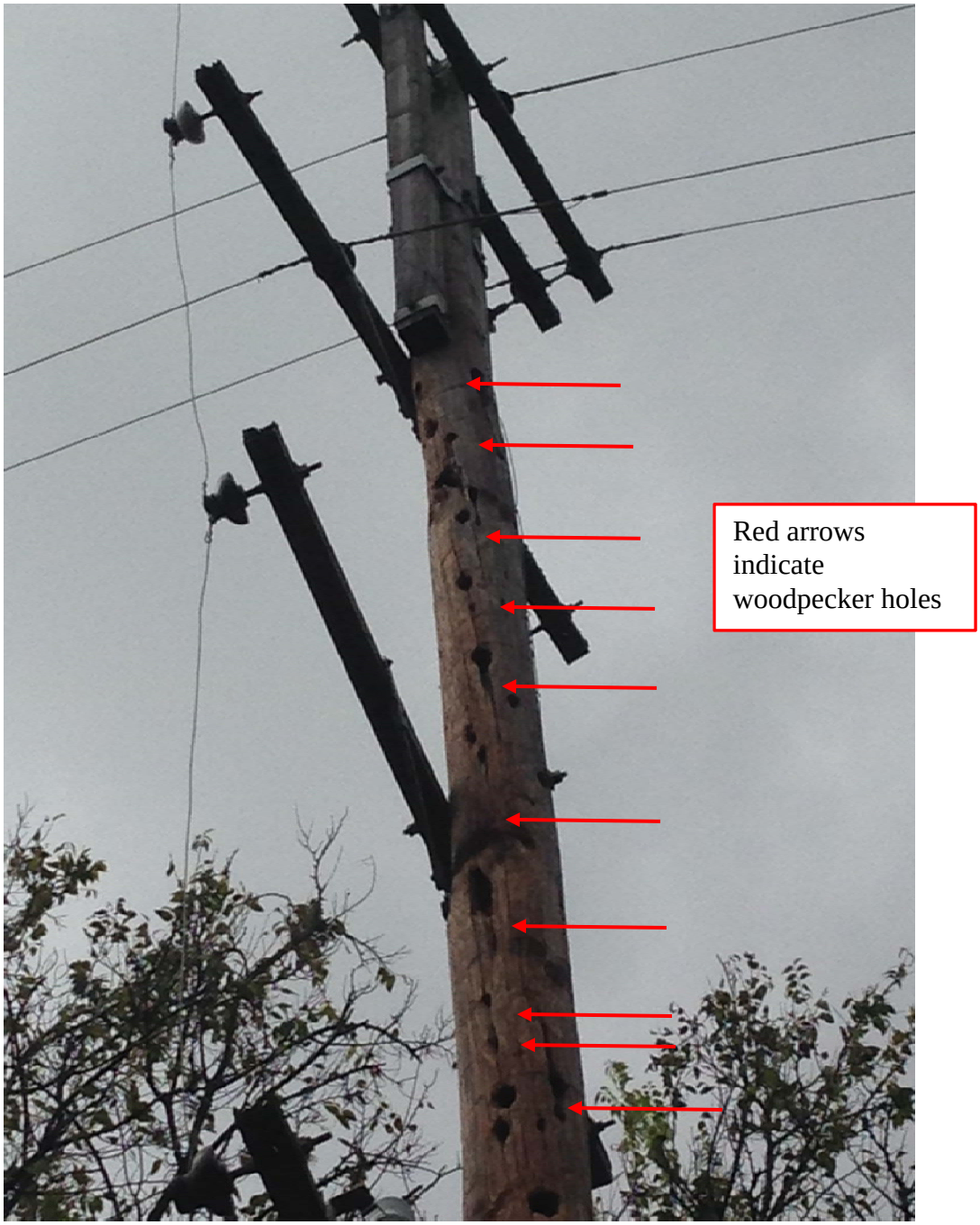


Figure 16 Pole with Excessive Wood Pecker Holes

Figure 17 Pole with Concrete Collar at Base

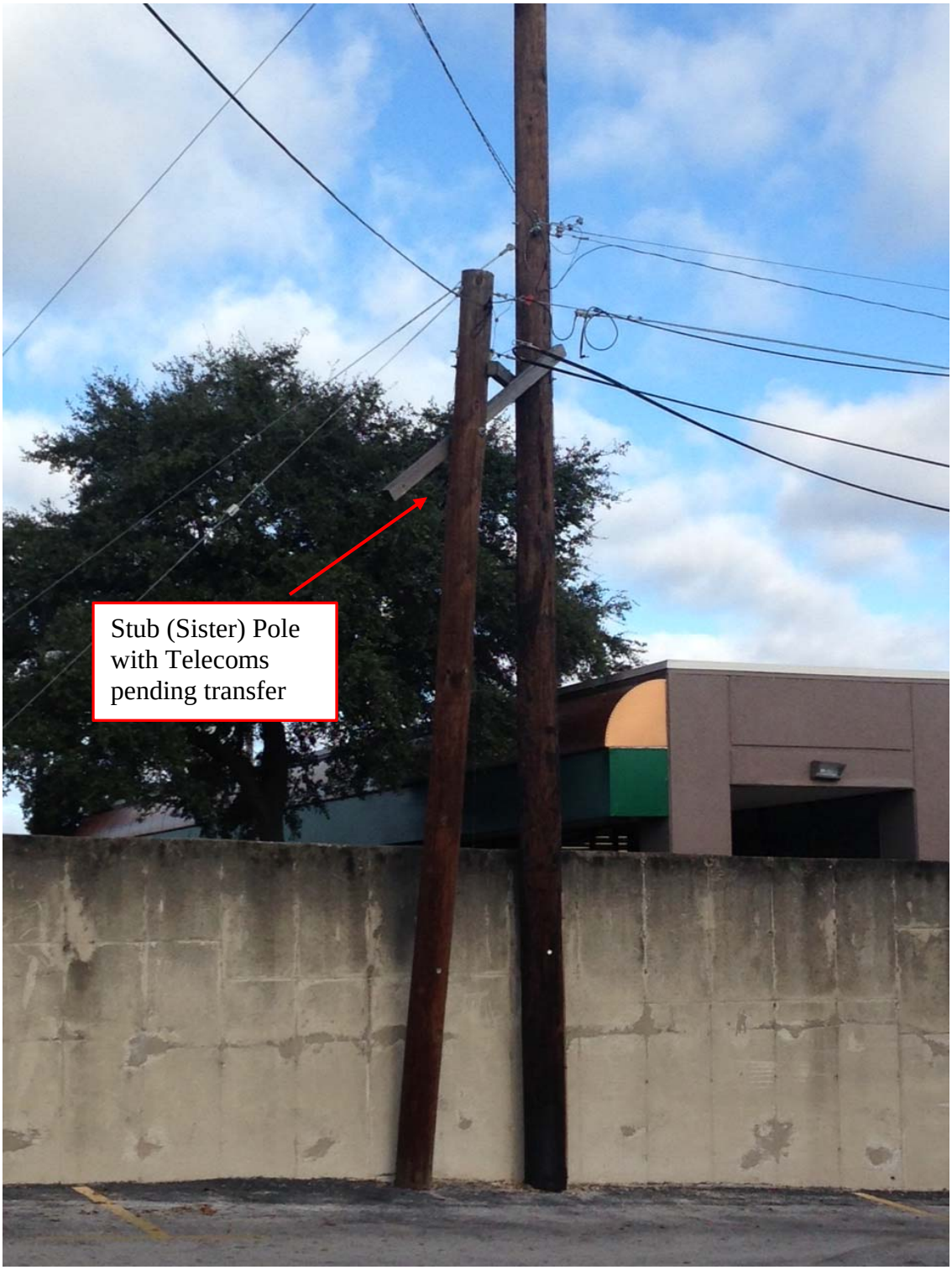


Figure 18 Stub (Sister) Pole with Telecom Cable Transfers Pending

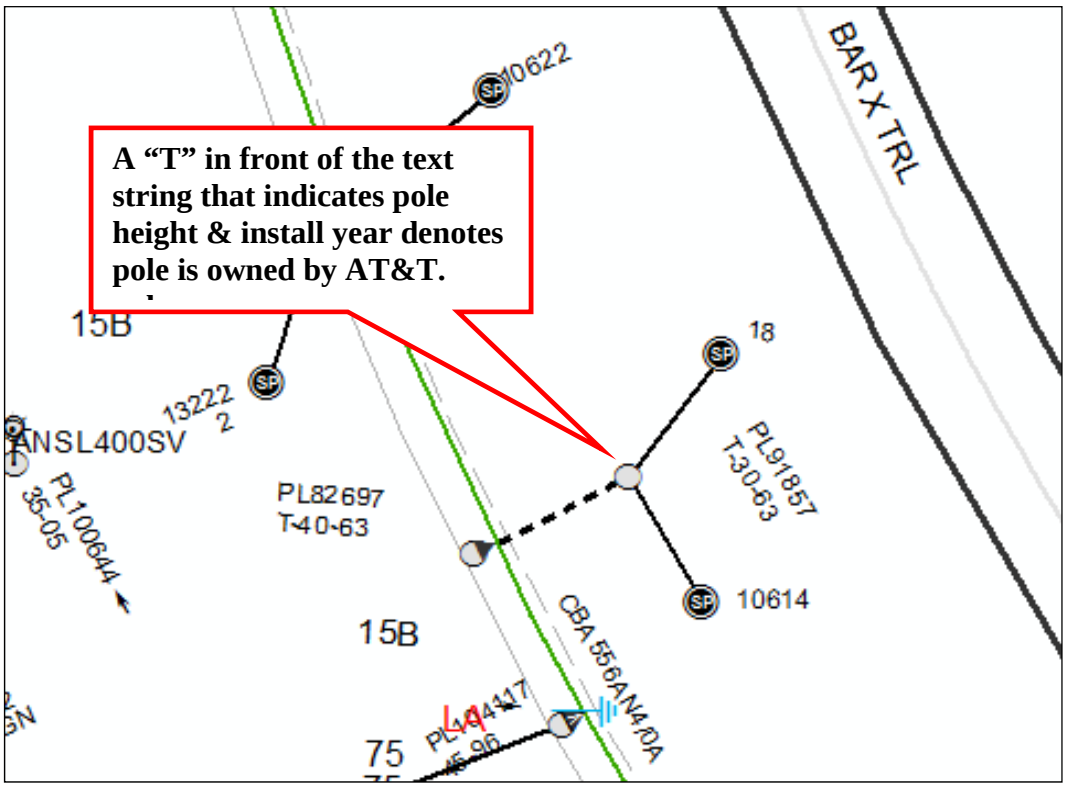


Figure 19 CPS Energy GIS Mapping AT&T Owned Pole Example

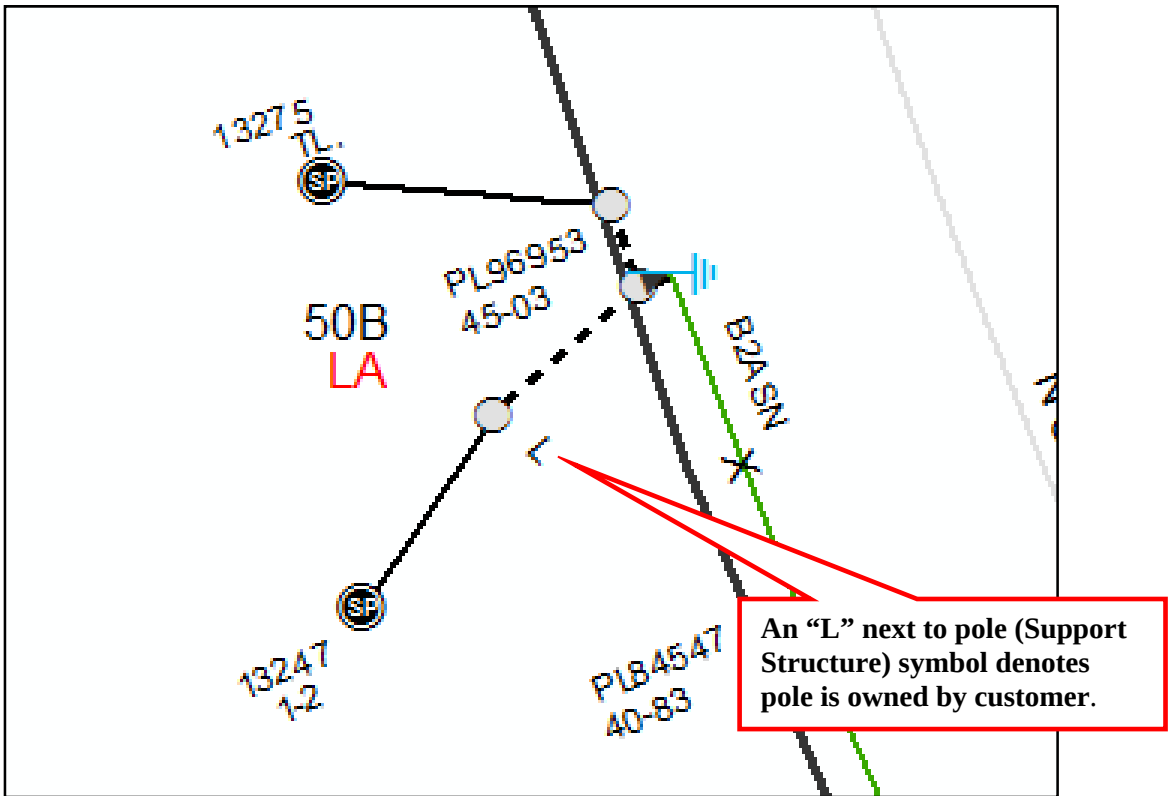


Figure 20 CPS Energy GIS Mapping Customer Owned Pole Example

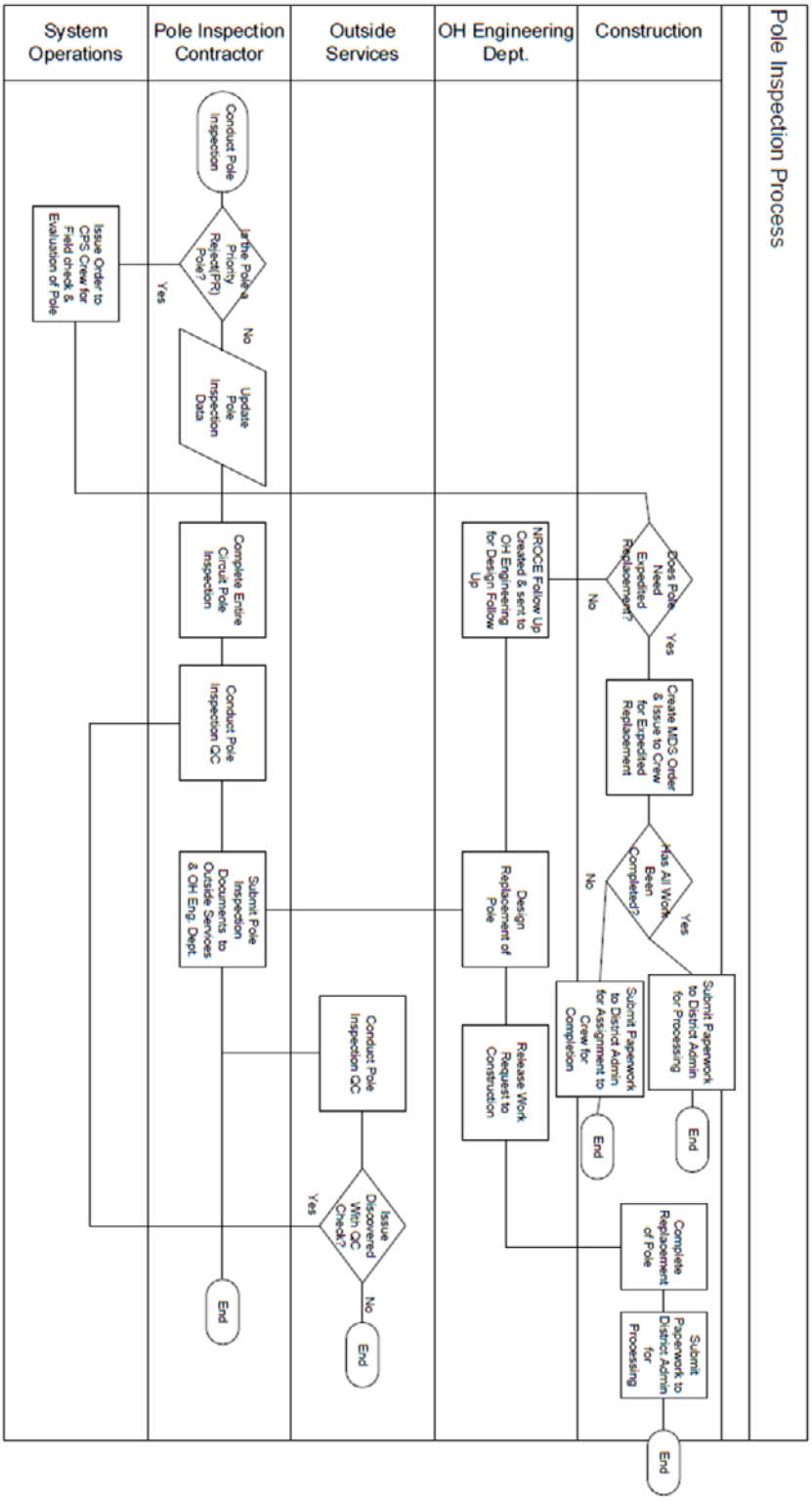


Figure 21 Pole Inspection Process Flow