

Title	Date	Number
Design Criteria	12- 11	103- 105
Design Criteria (Continued)	12- 11	103- 106
Design Criteria (Continued)	12- 11	103- 115
Design Criteria (Continued)	12- 11	103- 116
Design Criteria (Continued)	12- 11	103- 117
Design Criteria (Continued)	12- 11	103- 119
Location of Vertical Runs	12- 11	103- 205
Climbing Space through Communication Drop Wires	12- 11	103- 210
Communication Attachment & Service Drop.....	12- 11	103- 215
Supply and Communication Clearances.....	12- 11	103- 220
Supply and Communication Clearances For Shielded Construction	12- 11	103- 222
Supply and Communication Clearances (Cont'd).....	12- 11	103- 225
Supply and Communication Clearances at Pole	12- 11	103- 227
Supply and Communication Clearances at Midspan.....	12- 11	103- 228
Supply and Communication Clearances at Midspan (Cont'd)	12- 11	103- 229
Supply and Communication Facilities Tagging.....	12- 11	103- 230
Supply and Communication Equipment	12- 11	103- 235
Temporary Communication Company Attachment for Fiber Optic Cable	12- 11	103- 237
Method for Transitioning Position of Communication Company Attachment on Tangent		
Pole	12- 11	103- 238
Method for Transitioning Position of Communication Company Attachment on Deadend		
Pole	12- 11	103- 239
Supply and Communication Down Guys	12- 11	103- 240
Communication Company Strand Bonding to Pole Ground	12- 11	103- 245
Crossarm Construction Pole Top Antenna	12- 11	103- 255
Antenna Mounted in Communication Space.....	01- 12	103- 256
Antenna Mounted in Supply Space.....	12- 11	103- 257
Antenna Mounted on Street Light Bracket Arm	12- 11	103- 258
Common Use Pole Method of Marking – Oncor Electric Delivery Facilities	12- 11	103- 507
Common Use Pole Crossarm Construction Tangent.....	12- 11	103- 510
Common Use Pole Crossarm Construction Small Angle Double Pin.....	12- 11	103- 512
Common Use Pole Crossarm Construction Deadend	12- 11	103- 515
Common Use Pole Crossarm Construction Double Deadend.....	12- 11	103- 520
Common Use Pole Crossarm Construction Corner.....	12- 11	103- 525
Common Use Pole Crossarm Construction Three Phase Tap.....	12- 11	103- 530
Common Use Pole Crossarm Construction Four Way Crossing.....	12- 11	103- 535

Index
Section 3
Joint Use Common Use

Title	Date	Number
Common Use Pole Single Phase Typical Crossing	12- 11	103- 539
Common Use Pole Crossarm Construction Typical Crossing	12- 11	103- 540
Common Use Pole Crossarm Construction 90° Secondary Crossing.....	12- 11	103- 541
Common Use Pole Crossarm Construction Single Phase Tap	12- 11	103- 545

1.0 General Requirements for Attachments to Oncor Poles

- 1.1 This Section is not intended to promote third party attachment to Oncor facilities. However, where such attachments are necessary and approved, the requirements of this Section shall be applied in conjunction with the requirements in the Joint Use Policies and Procedures Manual (JU P&P Manual) and attachment agreements to ensure that construction meets Oncor requirements and generally accepted electric utility industry guidelines.
- 1.2 Oncor requirements for third party Supply and Communication attachments are based in part on the latest revision of the National Electrical Safety Code (NESC). Where Oncor requirements exceed the NESC, Oncor requirements shall govern.
- 1.3 The lawful requirements of state or local authorities shall govern where they exceed Oncor and NESC requirements.
- 1.4 Installations shall be made in accordance with Oncor Distribution Construction Standards and other Oncor requirements (Standards). If specific installations are not covered by Oncor Standards, the latest revision of the NESC shall apply.
- 1.5 Existing installations, including maintenance replacements, which comply with the clearance requirements at the time of their original installation, do not have to be reconstructed or modified to comply with the current clearance requirements except as required for safety reasons.
- 1.6 Each company (Oncor and third party attachers) shall install independent guys and anchors for their respective facilities. Guying is required for third party attachments in all cases where such facilities add an unbalanced tension load to a pole. Third party guys and anchors shall be placed in accordance with Oncor Standards (refer to 103-240 for an illustration of correct placement).
- 1.7 Oncor will consider, but not necessarily allow, attachments to non-wood poles (i.e. concrete, steel, and fiberglass). Where such attachments are requested, the attacher shall provide any and all information required by Oncor for the completion of a detailed engineering analysis of the pole. The attachment will not be allowed if adequate information regarding the pole is unable to be determined.
- 1.8 Prior to attaching to a pole, the attaching party shall inspect the pole to ensure that the structural integrity of the pole is sufficient to support the load being added by their attachment and to withstand the forces applied during installation. No attachments shall be made to a pole whose strength has deteriorated below the levels defined by the NESC.
- 1.9 Oncor Standards, Section 106, define span length limitations for NESC Grade B and C construction for various combinations of conductors, attachments, and pole classes. When the addition of an attachment to a pole causes the span length limitations to be exceeded, the attachment will only be allowed if the pole is changed out to an appropriate class of pole, an inter-span pole is added to reduce the span lengths, or an engineering analysis demonstrating structural sufficiency is performed as specified by the JU P&P Manual.
- 1.10 Communications wires and equipment shall be bonded to the pole ground on every pole using #6 S.D. bare copper wire (refer to drawings in this Section and the NESC).

2.0 Requirements for Communication Line Attachments to Oncor Poles

- 2.1 Attachments shall be arranged vertically on the pole and mounted directly to the pole. Crossarms, extension arms, and standoff brackets shall not be utilized to meet clearance requirements. Use of this equipment for purposes other than to meet clearance requirements shall be approved by Oncor Distribution Standards and requires a comprehensive mechanical loading analysis for all affected facilities.
- 2.2 New attachments shall be placed on the pole in accordance with the following rules.
 - 2.2.1 If a pole already has lines (Supply and/or Communication) installed on opposite sides of the pole (i.e. the pole is boxed), the new Communication attachment shall always be made on the street side of the pole.
 - 2.2.2 If a pole is not already boxed, the new Communication attachment shall always be made on the same side of the pole as the existing attachments.
- 2.3 To reduce the impact of Communication attachments on mechanical pole loading and to preserve Oncor's ability to place facilities on its poles, attachments should be installed as low as permissible on the pole. Where there are no previous attachments on the pole, the first attachment shall always be placed at the lowest position which complies with the greater clearance requirements specified by either the NESC or Oncor. In such cases, subsequent Communication attachments shall be made above the previous attachments and be as low as possible to maintain required clearances from Supply and Communication facilities.
- 2.4 **No Communication lines shall be attached to Oncor metal or fiberglass street light poles.**

3.0 Requirements for Wireless Communication Equipment Attachments to Oncor Poles

3.1 General

- 3.1.1 The design and mounting requirements of equipment shall be approved by Distribution Standards prior to installation.
- 3.1.2 Any work done in the supply space must be performed by an Oncor approved contractor that is qualified to work in the supply space.
- 3.1.3 No work shall be initiated in the supply space without prior approval of the local Oncor Line Clearance Representative.
- 3.1.4 All poles selected for installation of equipment must be approved by Oncor prior to installation.
- 3.1.5 All additional equipment installed on Oncor poles must comply with Oncor Standards (see Paragraph 1.1 and 1.4).
- 3.1.6 Wireless communication applicants **shall provide an evaluation of proposed wireless units to determine compliance with FCC guidelines for human exposure to radiofrequency fields**. Evaluations shall be performed with regards to uncontrolled exposure in the near field and far field regions. Evaluations shall be provided for new installations and whenever the transmitting power of existing equipment is increased.
- 3.1.7 When required, 2 RF warning signs shall be installed. One sign shall be installed near the pole top at the level where the safe approach distance ends for FCC General Population/Uncontrolled power levels. The second sign shall be installed near the base of the pole. This sign shall read, "Warning Antenna Approach Distance Is XX Feet". The sign shall include the antenna owner's name and phone number.
- 3.1.8 Means shall be provided to safely disconnect equipment to limit exposure to radiation per FCC OET Bulletin 65 when evaluations of emitted radiation exceed the limits for uncontrolled exposure. The antenna power source shall have a lockable disconnect installed to allow the antenna to be de-energized before work can be performed within the area designated by the RF warning signs.
- 3.1.9 Disconnect, meter and antenna boxes shall be installed in accordance with Oncor Construction Standard 103-235, "Supply and Communication Equipment".

3.2 Connection to Power Source

- 3.2.1 Power for equipment installed on a street light pole must be obtained from an existing photocell socket. Decorative street light poles generally have post top luminaires and do not facilitate connection of external equipment to the photocell.
- 3.2.2 Insulated conductors with a jacket enclosing the entire cable assembly shall be used.
- 3.2.3 Power cable assemblies installed on the exterior of bracket arms shall be wrapped on the bracket arm and secured using durable cable ties.
- 3.2.4 On a wood pole, the power cable assemblies must be enclosed in 1-inch, Schedule 80 PVC conduit between the power source and the wireless unit. The conduit shall be attached to the pole with straps installed every 5 feet.

3.3 Equipment Mounting - Wood Poles

- 3.3.1 Equipment shall only be installed on poles which do not have power utility equipment installed (i.e. transformers, capacitors, conduit risers, etc.). Exceptions must be evaluated on a case by case basis and approved by Distribution Standards.
- 3.3.2 All Communications attachments shall be mounted in a configuration which preserves the climbability of the pole. New equipment boxes shall be mounted on the same side of the pole as preexisting equipment boxes. Where possible, equipment boxes should be mounted on an inline pole surface.
- 3.3.3 Equipment may be attached on an approved bracket arm or may be attached directly to the pole provided appropriate standoff requirements are met. Dedicated equipment/antenna support brackets shall not exceed eighteen inches in length unless the bracket meets the requirements outlined in 103-256 or 103-257. The use of pole top extensions is prohibited.
- 3.3.4 Extension arms or standoff brackets will be permitted contingent upon an engineering analysis by the wireless attacher demonstrating that the NESC pole loading requirements have been met as approved by Oncor. The extension arm or standoff bracket shall not be used to meet vertical clearance requirements.
- 3.3.5 If a pole is topped for any reason the untreated pole top must be treated and covered in accordance with construction standard 106-270, "Top Treatment for Wood Pole".
- 3.3.6 Antennas may be installed only on **tangent wood distribution poles that have a maximum of one (single-phase) primary conductor**, no power space equipment and must be bucket truck accessible. **Maximum antenna height permitted is 55"**.
- 3.3.7 Antennas may be installed only on **tangent wood distribution poles that have two (open-wye) or three (three-phase) primary conductors**, no power space equipment and must be bucket truck accessible. **Maximum antenna height permitted is 24"**.
- 3.3.8 Antenna installations at the top of Oncor poles and above supply space conductors require the installation of a 5' taller pole. The increased pole height coupled with the height of any foreign equipment or antenna shall not cause the structure to exceed a maximum of 60'.

3.4 Equipment Mounting - Metal or Fiberglass Street Light Poles

- 3.4.1 A 100 MPH wind load plus 30% gust factor shall be utilized in calculating the strength requirements of streetlight poles. The streetlight pole must be able to support any ancillary attachments under those conditions without structural failure of the pole, the foundation, or any of its components. The weight and exposed cross sectional area of any proposed attachments shall be analyzed before approval.
- 3.4.2 If the pole is direct embedded, Oncor Standards 213-317 require that the pole be stabilized. The wireless attacher will be responsible for all charges related to this work.
- 3.4.3 The training of communication cables, wires, or fiber through the interior of streetlight poles is prohibited.

- 3.4.4 Drilling of **any** additional holes into metal or fiberglass streetlight poles or associated equipment is prohibited. Any equipment to be mounted on such poles must be banded to the pole using stainless steel banding material. The only exception permitted is the use of a set screw for grounding of equipment on metal poles.
- 3.4.5 A self tapping set screw must be used for grounding on metal streetlight poles. No grounding is required for equipment installed on fiberglass poles.

3.5 Equipment Mounting - Decorative Street Light Poles

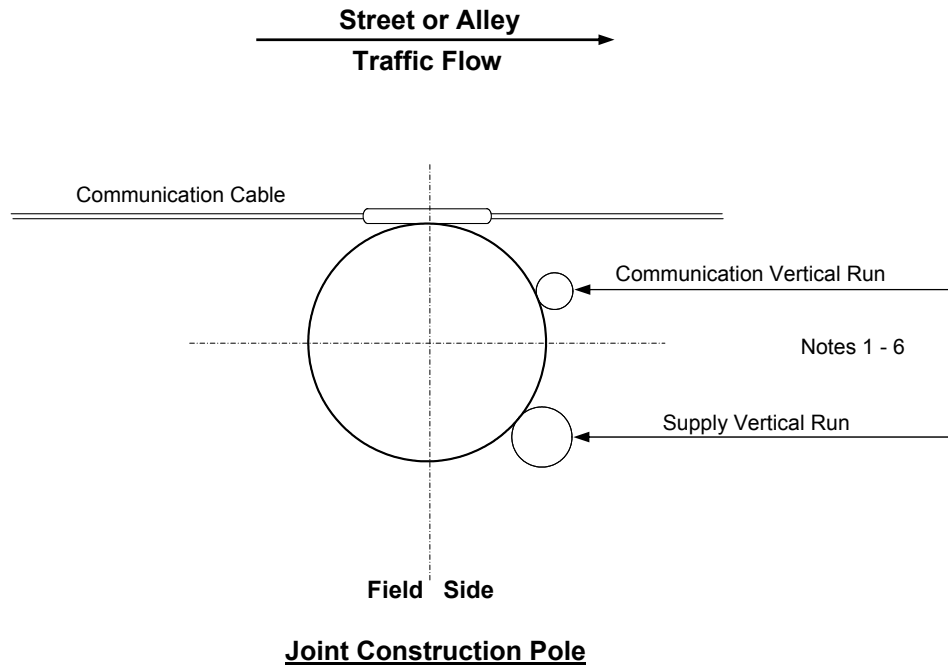
- 3.5.1 Antique Historical poles and most other decorative poles are typically not tall enough to allow the installation of additional equipment on the pole and meet required clearance guidelines.
- 3.5.2 Because the decorative historical type poles are usually installed for aesthetic reasons, the wireless attacher should notify the associated City of its intent to attach to these types of poles.

3.6 Equipment Mounting - Metal Street Light Bracket

- 3.6.1 A wireless unit may be attached to a streetlight bracket arm or directly to the pole. The impact of the additional weight from the unit will be evaluated to determine if the unit can be mounted on the bracket or must be mounted on the pole.
- 3.6.2 If attached to the street light bracket arm, the wireless unit must be located no more than 3 feet outward on the arm and no less than 6 inches from the pole the bracket arm is mounted to.

4.0 Requirements for Foreign Utility Common Use Attachments to Oncor Poles

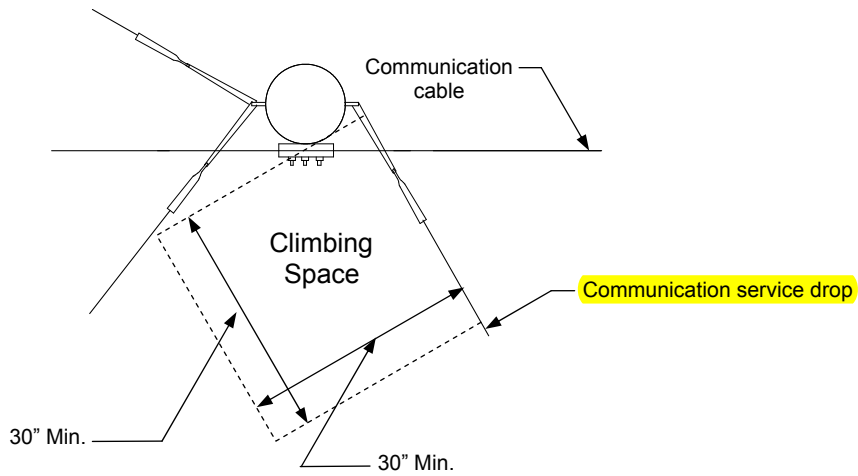
- 4.1 Common Use lines shall be jointly designed accounting for design requirements of each electric utility.
- 4.2 The line installed at the highest position on the pole should be an express circuit, which should not serve local load. The installation of equipment and pole risers associated with the line installed in the highest position should be avoided.
- 4.3 The line with the highest voltage and/or largest conductor size should be placed at the upper position on the pole.
- 4.4 Span length should not exceed 250 feet for urban construction and 350 feet for rural construction.
- 4.5 Vertical and armless construction should be avoided.
- 4.6 A common neutral shall be used and designed considering the fault current of both lines.
- 4.7 A minimum of a class 3 pole shall be used with pole stabilization.
- 4.8 A minimum of 72 inches of vertical spacing on the pole shall be maintained between each utility. The vertical spacing shall be increased as necessary to maintain the mid-span clearances required by the NESC as a result of the tensions and sags of both utilities conductors. Additional spacing may be required to provide required clearances when equipment is attached to a pole.
- 4.9 Anchors and guys shall not be common between companies.



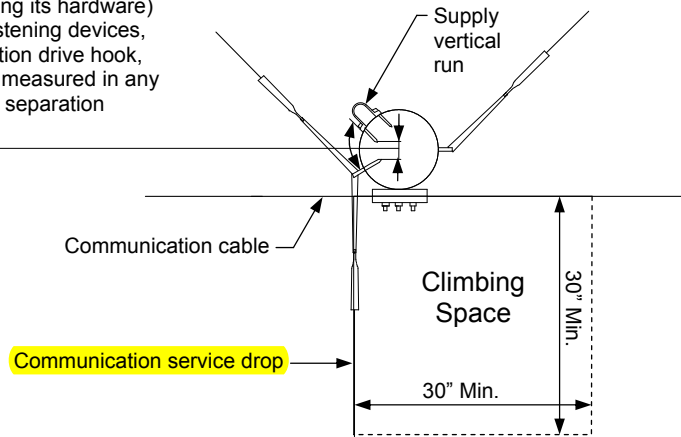
Notes:

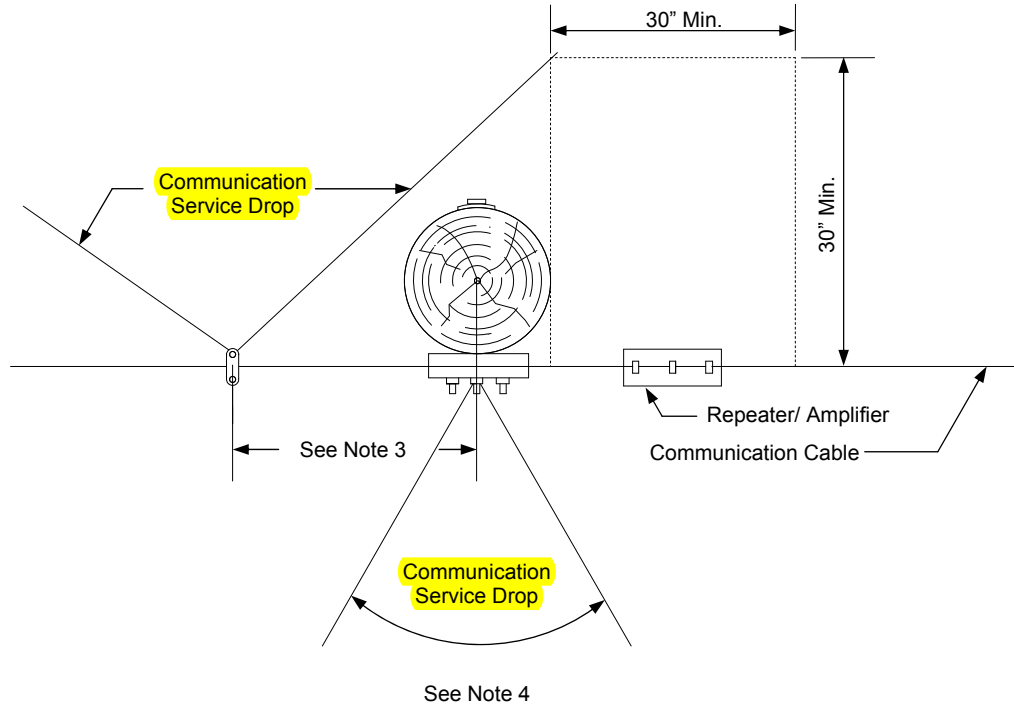
1. Supply and communication vertical runs shall not be made on the same pole where it is practicable to place them on separate poles.
2. Supply vertical runs shall be on quarter of pole opposite communication cable if existing, otherwise on field quarter of pole when along street or alley.
3. Locate supply vertical runs on side of pole away from the normal traffic flow where practicable.
4. Communication vertical runs shall be made on quarter of pole adjacent to communication cable and on side of pole away from the normal traffic flow where practicable.
5. All vertical runs shall be so arranged as not to interfere with climbing or working space. When the addition of a communication vertical run on pole with an existing supply vertical run obstructs more than 25% of the pole surface, the additional communication vertical run shall be mounted on standoff brackets a minimum of 4" and a maximum of 12" off the pole. Vertical runs facilitate climbing space as per the NESC. Vertical runs on standoff brackets should be in conduit as approved by the NESC.
6. Consult section 239 of the NESC for situations not covered by this standard.

Climbing Space Thru Communication Service Drops



The separation between supply vertical run (including its hardware) and other bolts, fastening devices, and/or communication drive hook, shall be at least 2" measured in any direction, including separation within the pole.

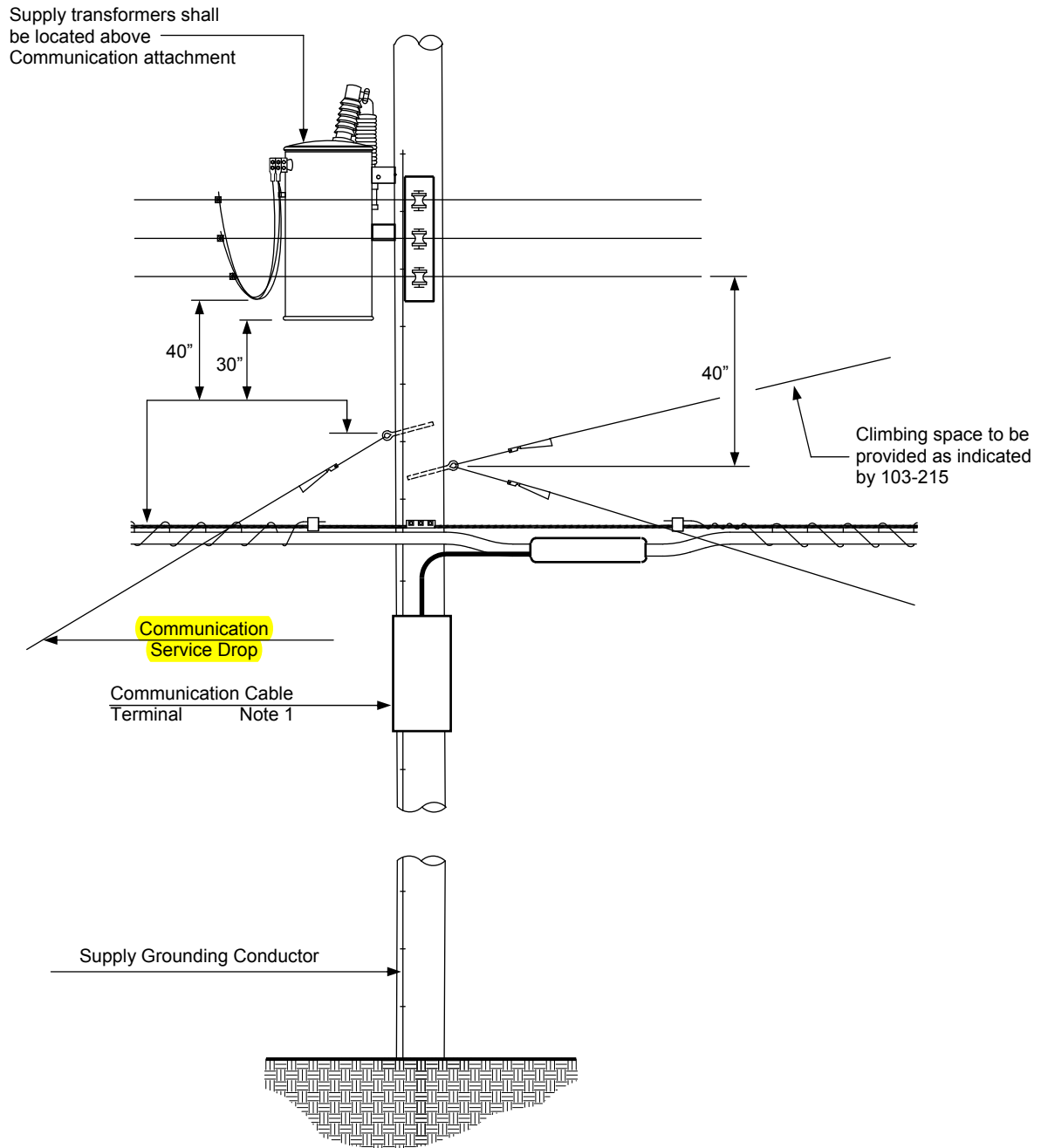




Notes:

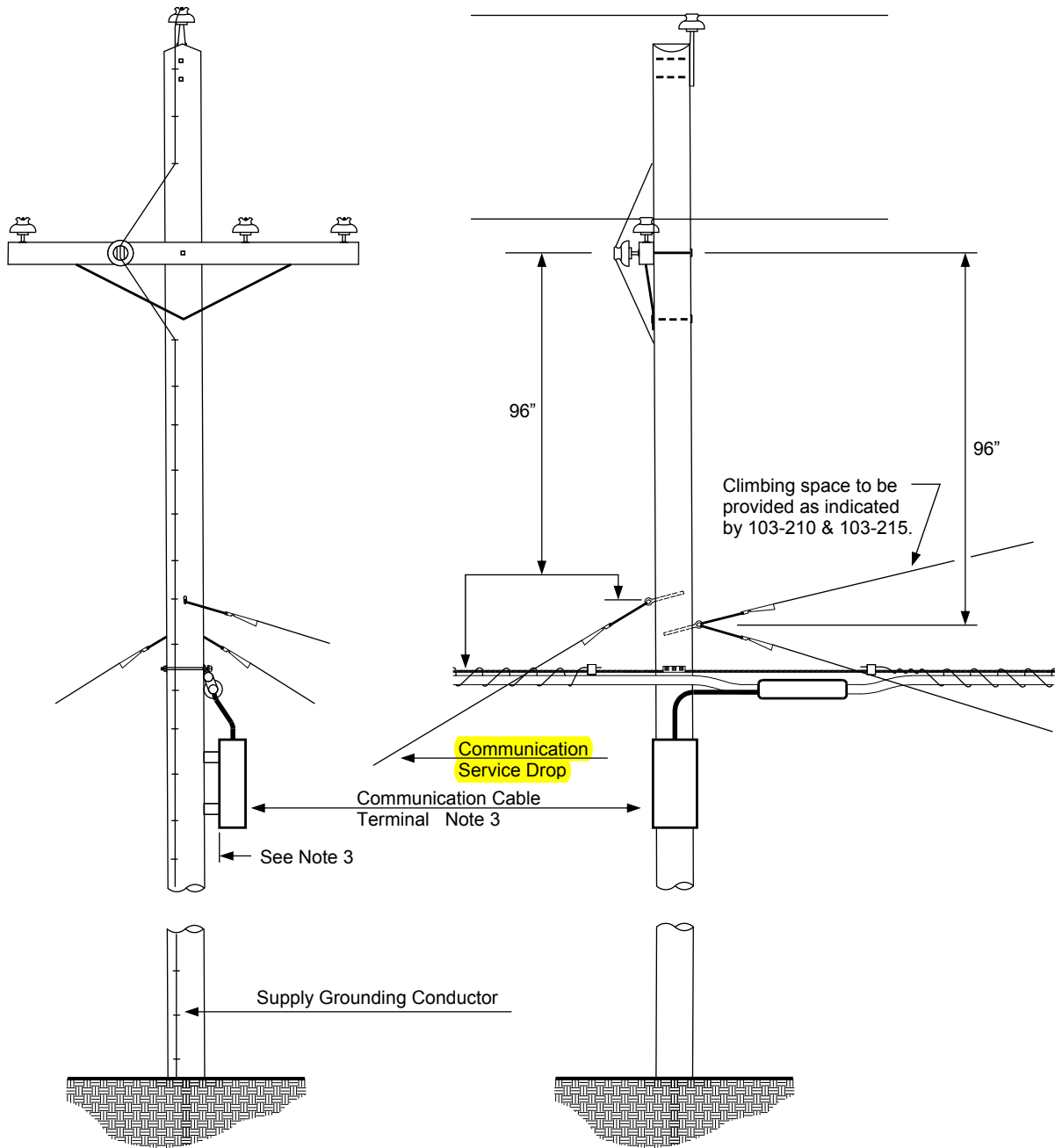
1. See 103-205 for placing vertical runs on poles.
2. See 103-106 for requirements on which side of pole attachment must be made.
3. Make this distance sufficient to clear the climbing space with the nearest service drop.
4. Service drops on the street or alley side of poles should be pulled off the pole.

Supply and Communication Clearances



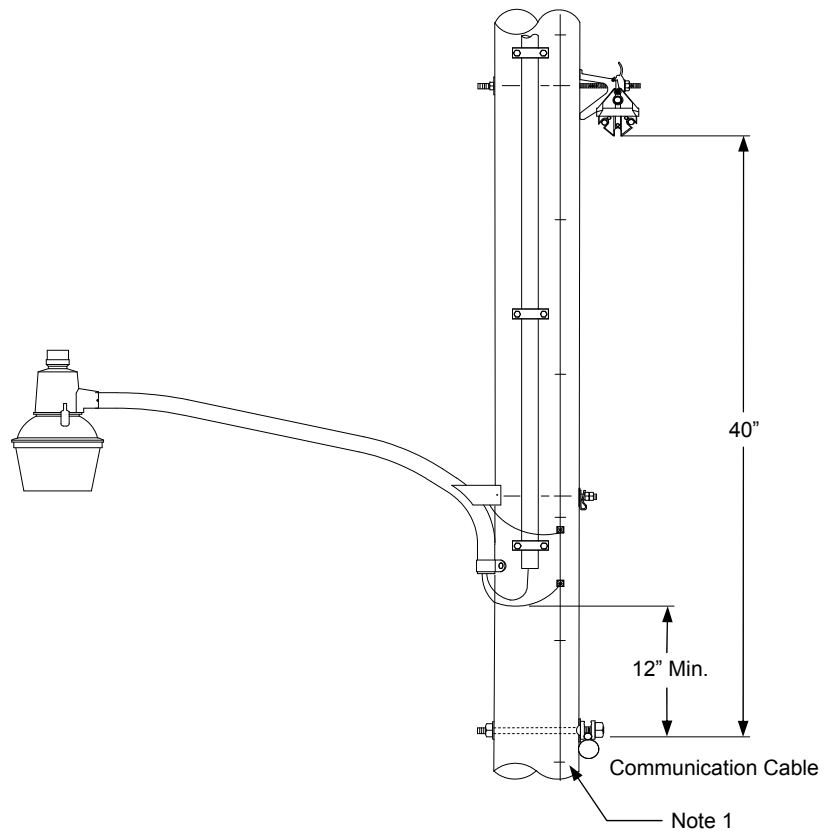
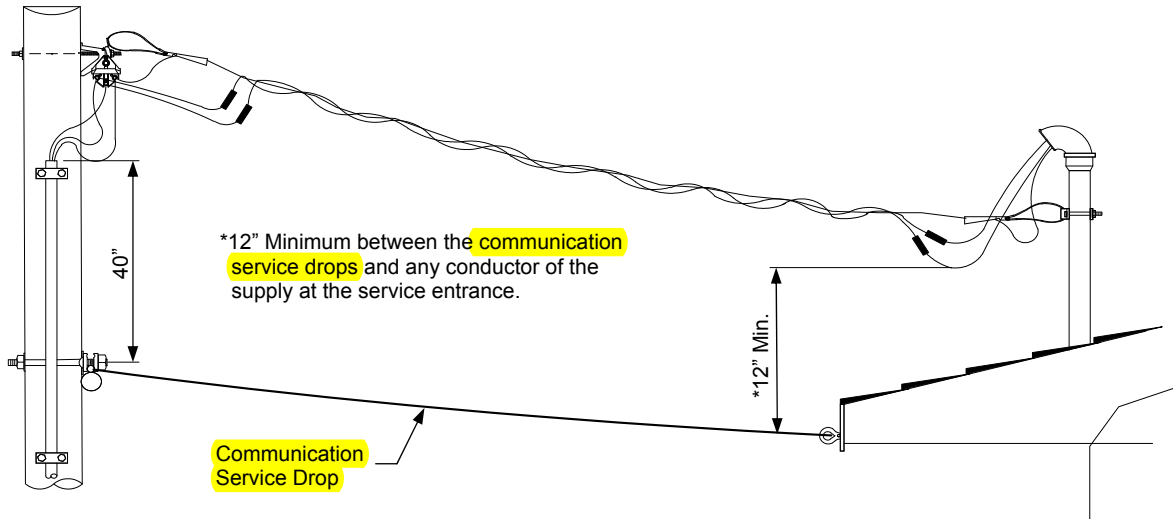
Notes:

1. When communication cable terminal obstructs more than 25% of pole surface, the terminal shall be placed on standoff brackets a minimum of 4" and a maximum of 12" from the pole to facilitate climbing space as per the NESC.



Notes:

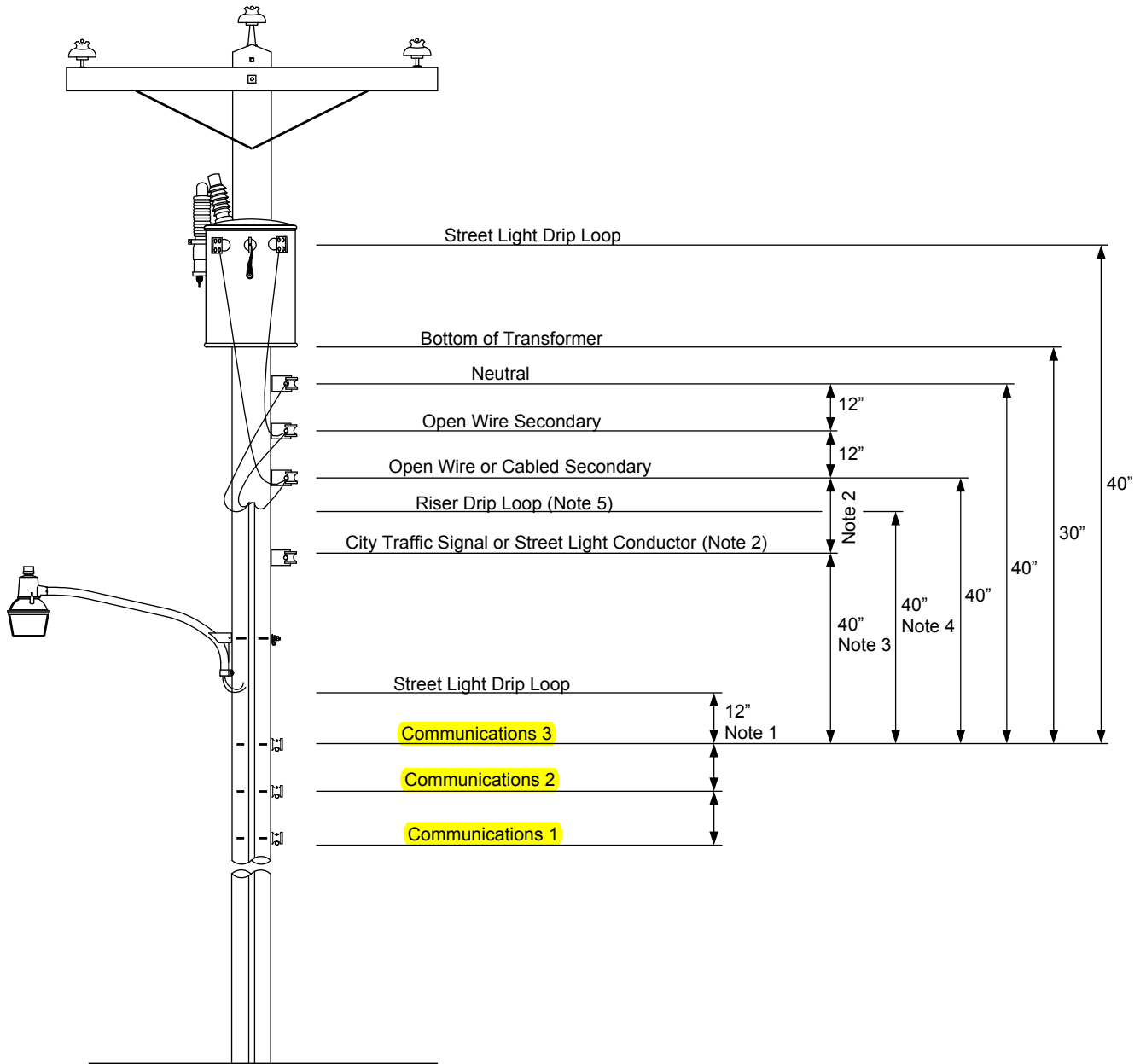
1. Communication cables contacting poles framed for shielded construction shall maintain the clearances as shown when there is no supply neutral, secondary or transformer.
2. For communication cable clearances contacting poles with supply neutral, secondary or transformer, reference 103-220.
3. When communication cable terminal obstructs more than 25% of pole surface, the terminal shall be placed on standoff brackets a minimum of 4 inches and a maximum of 12 inches from the pole to facilitate climbing space as per the NESC.



Notes:

1. Minimum clearance of 2" of air or wood between all hardware and grounds.

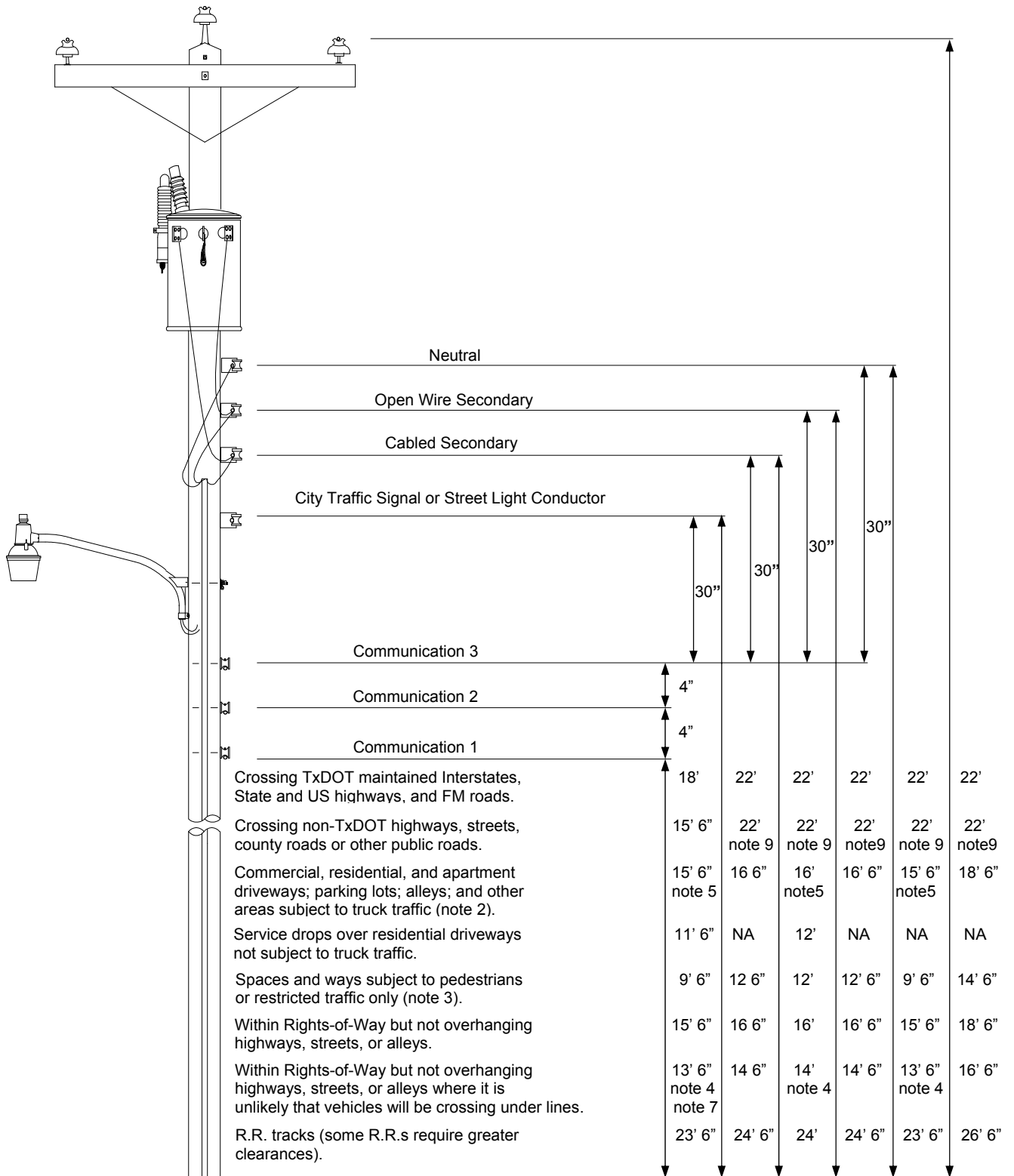
Supply and Communication Clearances at Pole



Notes:

1. May be reduced to 3" if street light drip loop covered entirely with a non-metallic covering.
2. City traffic signal or street light conductor (including drip loop) is to be 16" below secondary conductor or the top of secondary supply risers (whichever is lower).
3. Communication cable shall be minimum 40" below city traffic signal or city street light conductor.
4. Communication shall be minimum 40" below supply drip loops.
5. Includes the top of primary and secondary risers, including drip loops (whichever is lower).

Supply and Communication Clearances at Midspan



For notes see 103-229.

**Supply and Communication
Clearances at Midspan
(Cont'd)**

Notes:

1. General
 - a. Vertical clearances shall be maintained under the following conductor temperature and loading conditions whichever produces the largest final sag:
 1. 120° F, no wind.
 2. The maximum conductor temperature for which the line is designed to operate, if greater than 120° F, no wind.
 3. 32° F, no wind with ½" radial thickness of ice.
 - b. Greater clearances than shown on 103-228 shall be provided where required by local codes and ordinances or crossing permits issued by other companies or governmental agencies.
2. Trucks are defined as any vehicle exceeding 8 feet in height. Areas not subject to truck traffic are areas where truck traffic is not normally encountered nor reasonably anticipated.
3. Spaces and ways subject to pedestrians or restricted traffic only are those areas where riders on horseback or other large animals, vehicles or other mobile units exceeding 8 feet in height are prohibited by regulation or permanent terrain configurations or are otherwise not normally encountered nor reasonably anticipated.
4. Where a supply or communication line along a road is located relative to fences, ditches, embankments, etc, so that the ground under the line would not be expected to be traveled except by pedestrians, this clearance may be reduced to the following values:

a. Insulated communication conductor and communication cables	9.5 ft.
b. Cabled supply conductors 0-150 V to ground	10.0 ft.
c. Insulated supply conductors 0-300 V to ground	12.5 ft.
d. Grounded guys	9.5 ft.
e. Neutral supply conductor	9.5 ft.
5. Where this construction crosses over or runs along driveways, parking lots or alleys not subject to truck traffic, this clearance may be reduced to 15 feet.
6. When designing a line to accommodate oversized vehicles, these clearance values shall be increased by the difference between the known height of the oversized vehicle and 14 feet.
7. This clearance may be reduced to 13 feet for insulated communication conductors and communication guys.
8. See 103-225 for clearance between supply and communication service drops.
9. Existing installations in non-TxDOT rights of way that meet the clearances of the applicable edition of the NESC are acceptable. If the pole is replaced, all electric and communication facilities shall be adjusted to meet current Oncor standards.

Communication Facilities Tagging

To facilitate identification of attachments to Oncor Electric Delivery poles, the following standards apply to all joint use attachers. These requirements will also assist in contacting the attached party as needed.

A tag must be installed which includes the following information:

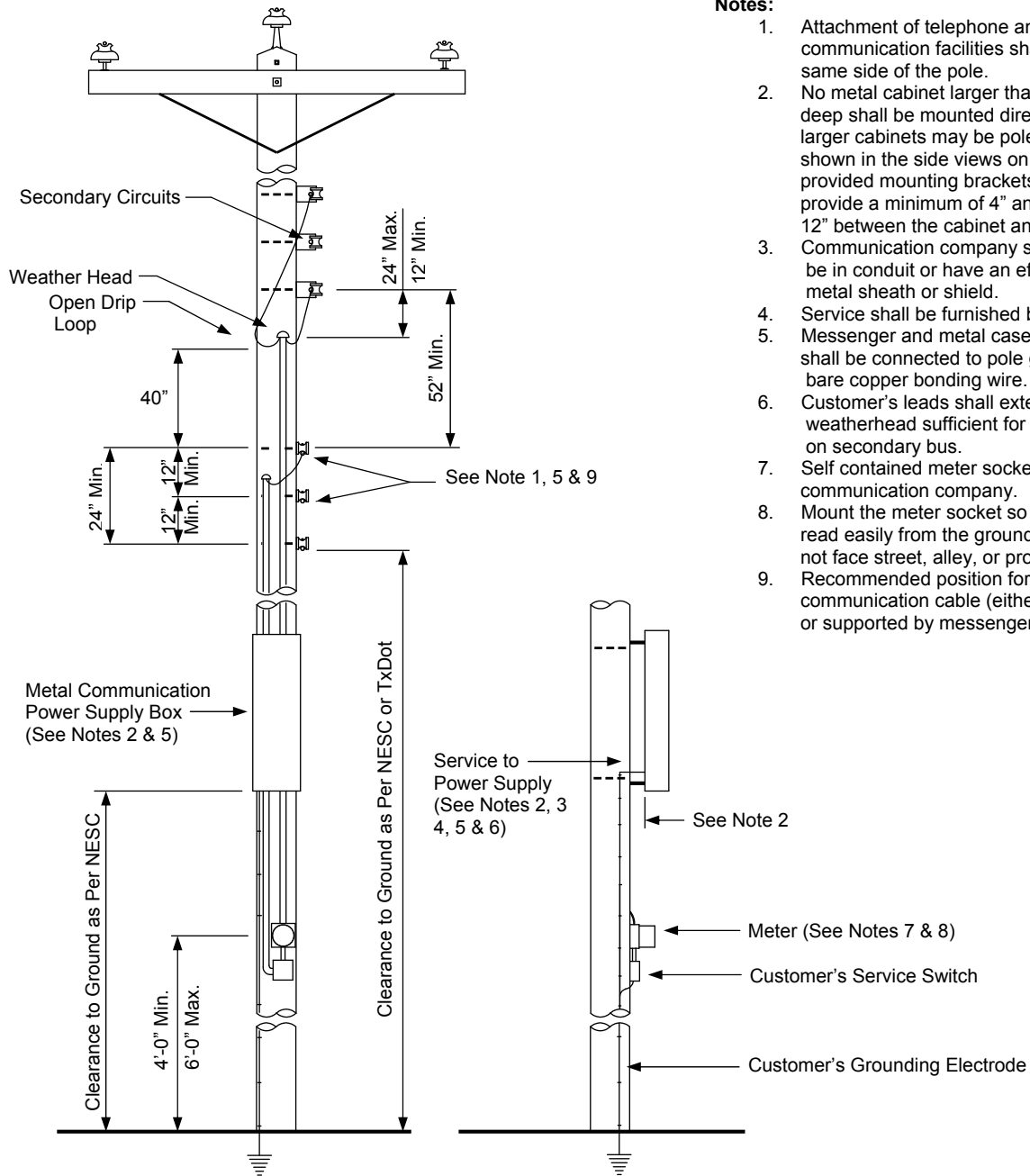
1. Company name or generally recognizable company logo
2. Emergency telephone number

Tagging requirements:

1. Locations:
 - a. The starting and deadend poles of all attached facilities
 - b. The beginning of all lateral taps
 - c. All overhead to underground transitions
 - d. All roadway crossings

Tags should be installed on a minimum of every fourth pole.

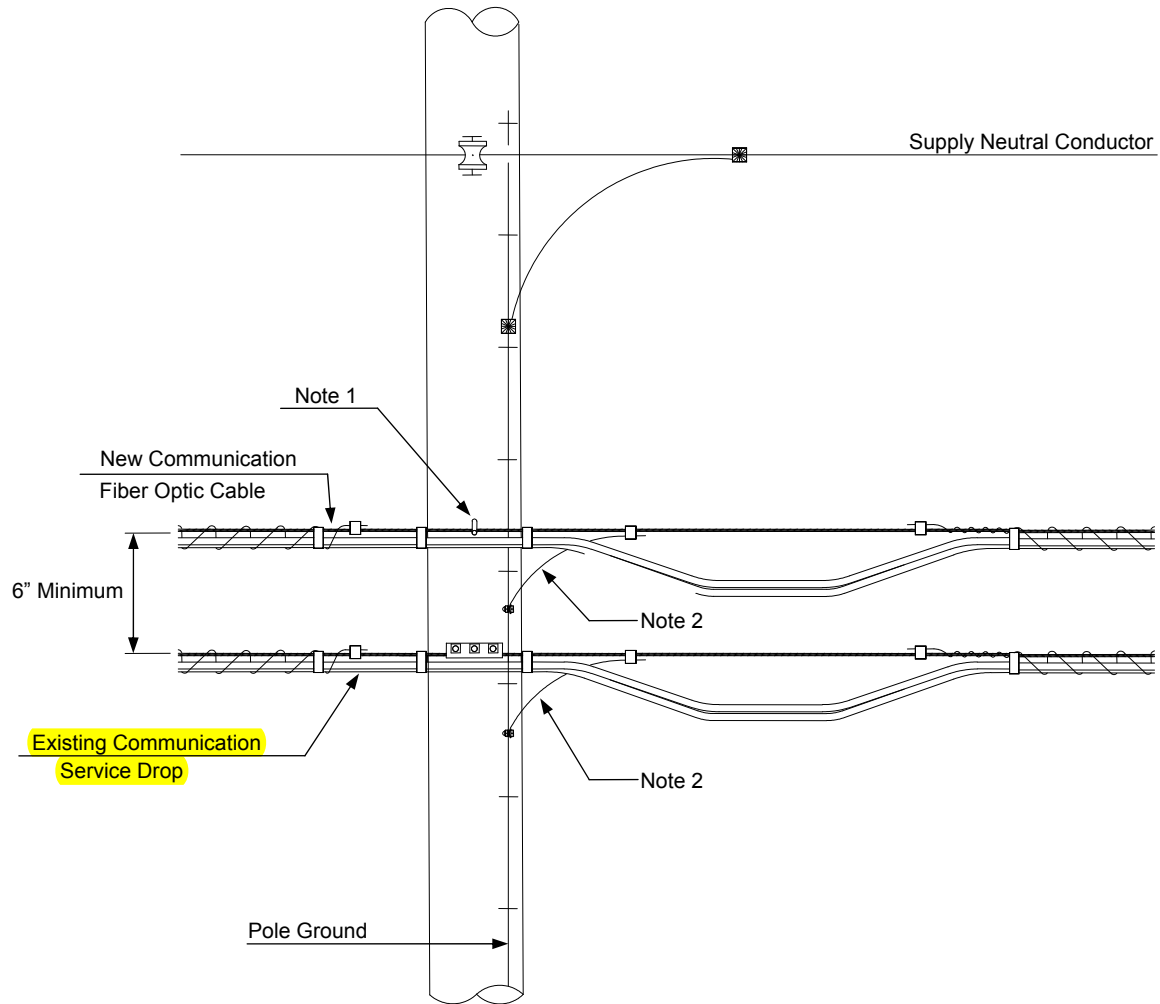
2. Tagging must take place upon installation of facilities.
3. Companies are required to tag their facilities as an ongoing practice in order to meet these requirements.
4. Tag must be replaced when the company name and/or contact number are no longer legible from the ground
5. Missing tags must be replaced as soon as possible.
6. The attaching company may choose the method, color, material, construction and dimensions of the tag as long as the following requirements are met:
 - a. Tags to remain permanently affixed to the attaching company's facilities.
 - b. Color and text must be designed to last at least 5 years.
 - c. The company name and contact number must be easily readable and visible from the ground. A minimum of ½ inch high lettering is required.
 - d. Avoid the use of sharp edges and corners if constructed of metal.
 - e. Tags should be consistent in appearance for a given company throughout Oncor Electric Delivery's service territory.



Notes:

1. Attachment of telephone and other communication facilities shall be same side of the pole.
2. No metal cabinet larger than 6" x 12" x 4" deep shall be mounted directly on the pole. Larger cabinets may be pole mounted as shown in the side views on this sheet provided mounting brackets are used which provide a minimum of 4" and a maximum of 12" between the cabinet and the pole.
3. Communication company supply cable shall be in conduit or have an effectively grounded metal sheath or shield.
4. Service shall be furnished by customer.
5. Messenger and metal case of power supply shall be connected to pole ground with #6 SD bare copper bonding wire.
6. Customer's leads shall extend out of weatherhead sufficient for making connections on secondary bus.
7. Self contained meter socket furnished by communication company.
8. Mount the meter socket so the meter can be read easily from the ground. Meter should not face street, alley, or property side of pole.
9. Recommended position for attachment of communication cable (either self-supporting or supported by messenger).

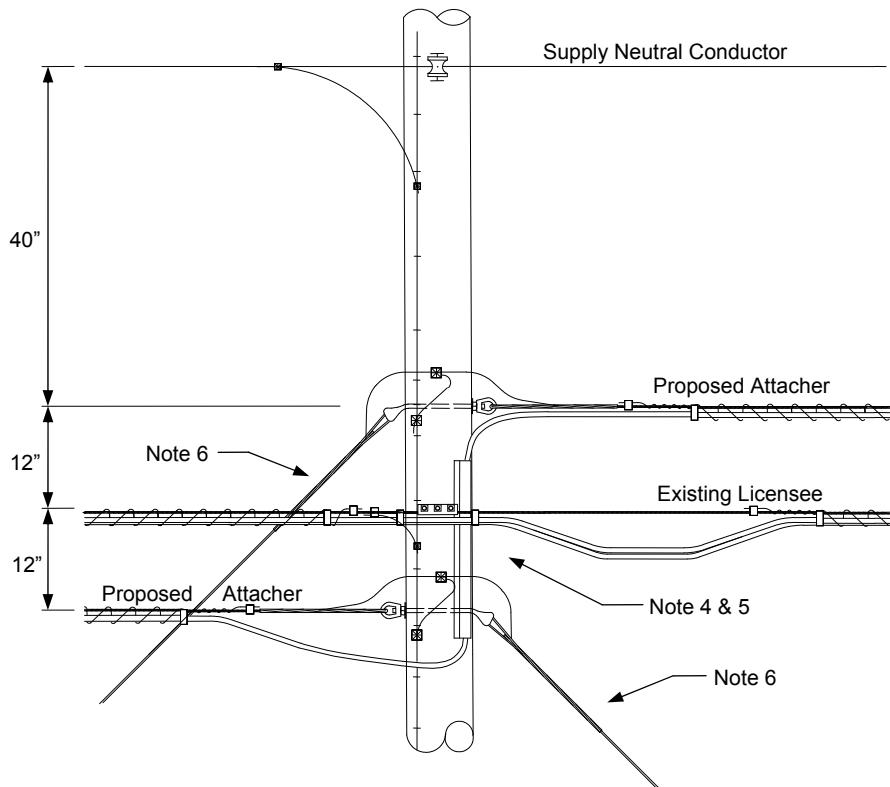
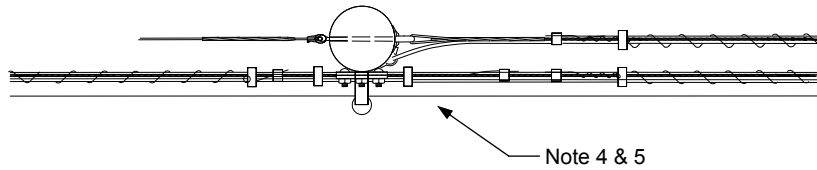
Temporary Communication Company
Attachment for
Fiber Optic Cable



Notes:

1. This type temporary construction of communication company fiber optic cable on Joslyn j-hook to be used on all tangent construction except street crossings shall be attached with three bolt clamp as per existing coaxial cable.
2. Communication cable company to furnish #6 S.D. bare copper bonding wire and connectors and connect to pole ground as per 103-245.
3. Communication company to treat all leftover holes with Osmose Osmoweld upon permanent attachment of fiber optic cable.

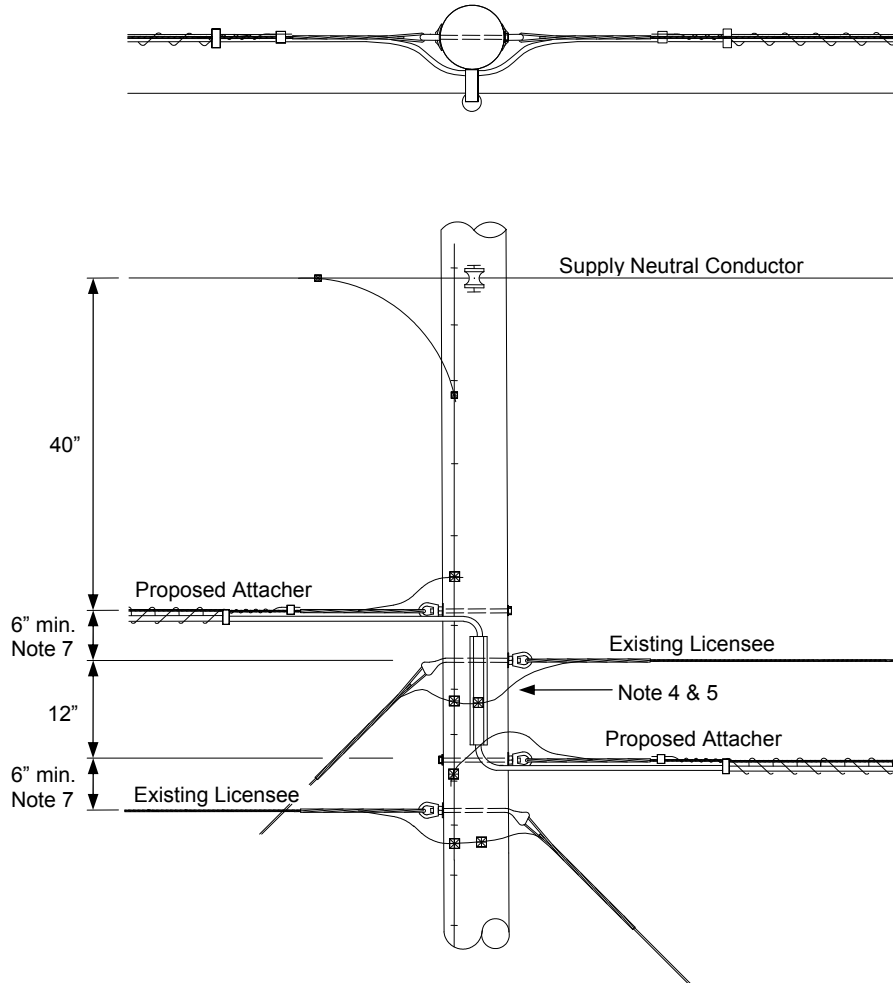
Method for Transitioning Position of Communication Company Attachment on Tangent Pole



Notes:

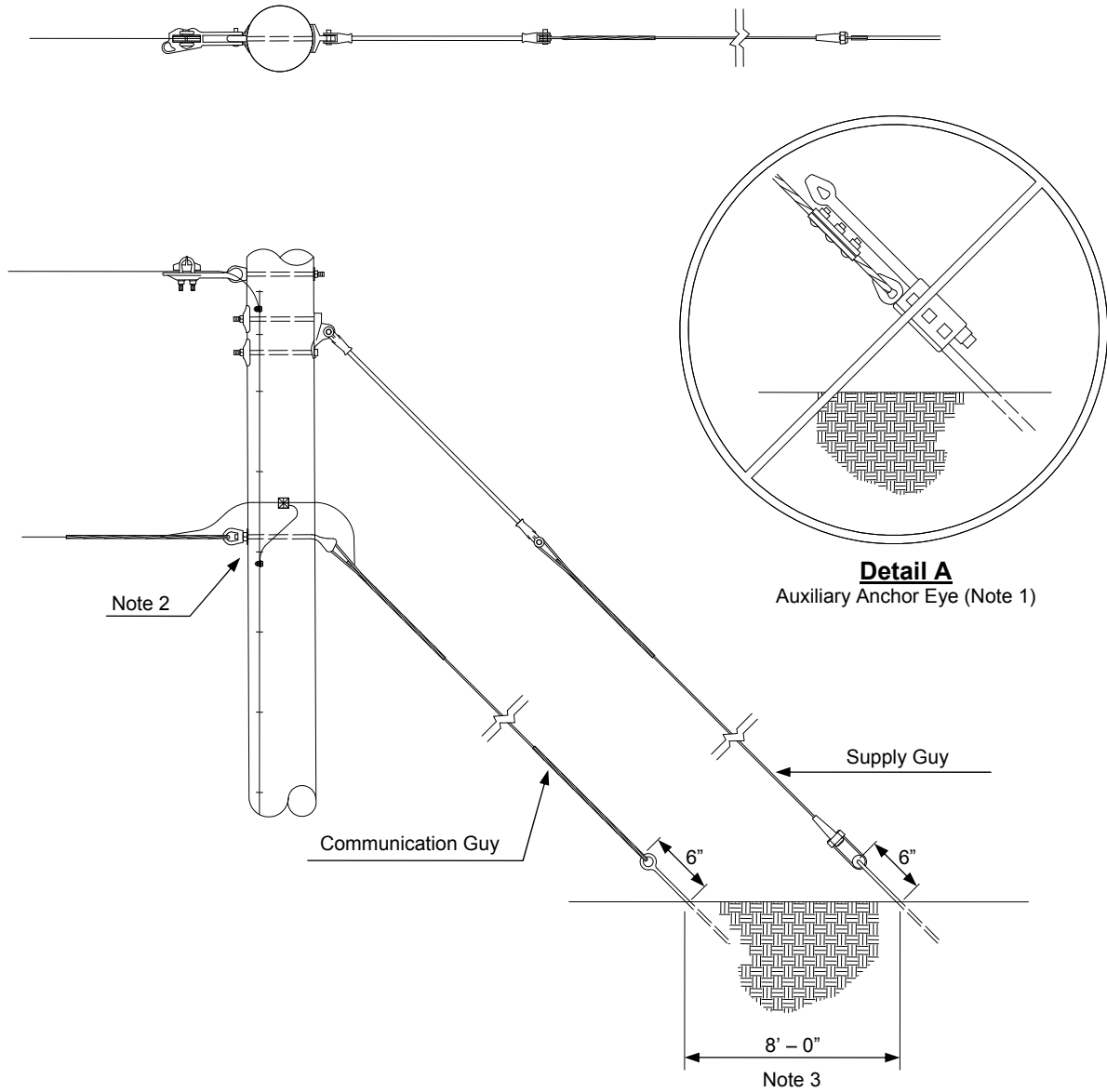
1. This method of making third party attachments to Oncor Electric Delivery poles is discouraged.
2. Pole must be inspected to assure that all codes and standards are met before attachment may be made.
3. Attacher shall provide 20 spans minimum between transition points to avoid excessive guying and congestion.
4. Communication riser cable(s) must be covered with an approved non-metallic material.
5. All vertical runs shall be so arranged as not to interfere with climbing or working space.
6. Guying must be used on poles where the attachment distance is 12" or greater unless waived by Oncor Electric Delivery. Both bottom and top transition points must have a down guy. A span guy will be allowed if all clearance requirements are met.
7. All midspan clearance requirements must be maintained.
8. Facilities at both levels of the transition must have identification tagging at the pole.

Method for Transitioning Position of Communication Company Attachment on Deadend Pole



Notes:

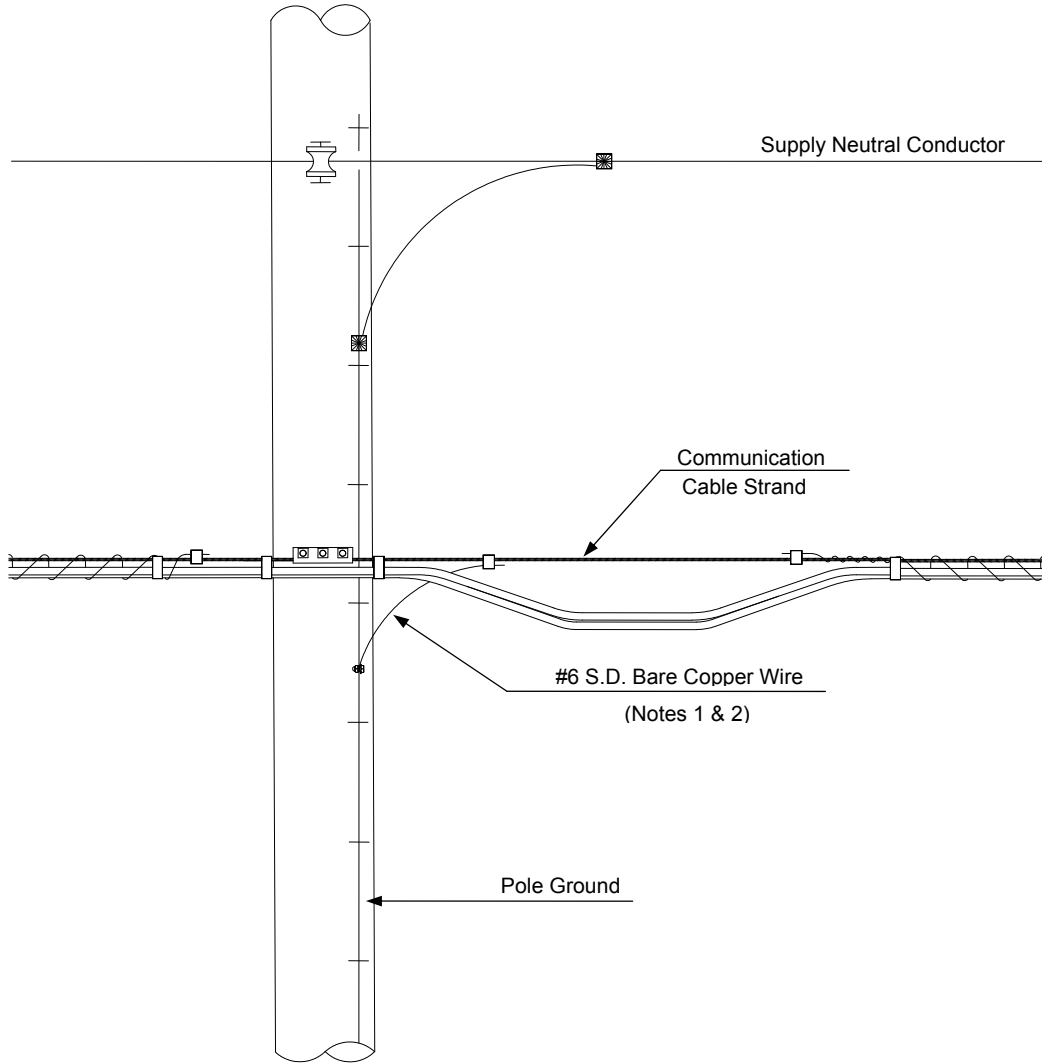
1. This method of making third party attachments to Oncor Electric Delivery poles is discouraged.
2. Pole must be inspected to assure that all codes and standards are met before attachment may be made.
3. Attacher shall provide 20 spans minimum between transition poles to avoid excessive guying and congestion.
4. Communication riser cable(s) must be covered with an approved non-metallic material.
5. All vertical runs shall be placed so as not to interfere with climbing or working space.
6. Guying must be used on poles where the attachment distance is greater than 12" unless waived by Oncor Electric Delivery. Both bottom and top transition points must have a down guy. A span guy will be allowed if all clearance requirements are met.
7. A minimum 6" vertical clearance shall be maintained between thru bolts. Permission in writing from existing licensee shall be obtained if attaching to their thru bolt.
8. All midspan clearance requirements must be maintained.
9. Facilities at both levels of the transition must have identification tagging at the pole.



Notes:

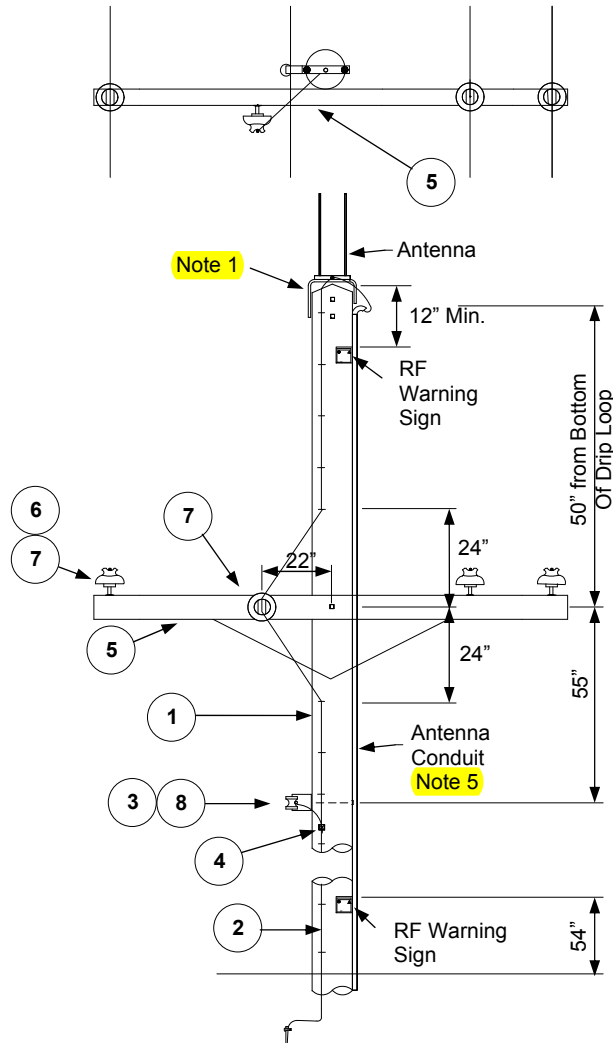
1. Each company (supply and communication) shall install independent guys and anchors for their respective facilities. **Auxiliary anchor eyes on supply anchor rods shall not be allowed (see details above).**
2. Communication cable strand and down guy shall be bonded and connected to pole ground. Communication company to furnish #6 SD bare copper wire and connectors and connect to pole ground.
3. Every effort should be made to place the anchors 8' apart. However, a minimum spacing of 5' can be used in situations where spacing must be reduced. **Multiple communication company guy attachments to common communication anchors shall be designed as a system to support the total loads applied.**

Communication Company Strand Bonding to Pole Ground



Notes:

1. Communication cable strand shall be bonded to pole ground on every pole.
2. Communication cable company to furnish #6 S.D. bare copper bonding wire and connectors and connect to pole ground.



General Notes:

1. The design and mounting requirements of all antennas must be approved by Oncor Electric Delivery- Distribution Standards prior to installation.
2. Antennas shall be installed on tangent poles only. Antennas shall not be installed on equipment poles. All poles must be bucket truck accessible.
3. The minimum size of all antenna poles will be ANSI class 3.
4. Only one (1) antenna shall be installed per pole.
5. Antenna coax cable must be installed in one (1) inch maximum diameter sch. 80 PVC conduit. Conduit attachment straps should be installed every five (5) feet.
6. Disconnect, meter, and antenna boxes must be installed in accordance with construction standard 103-235, "Supply and Communication Equipment."
7. See Oncor standard sheets 103-106, 103-115 and 103-116 for additional requirements.

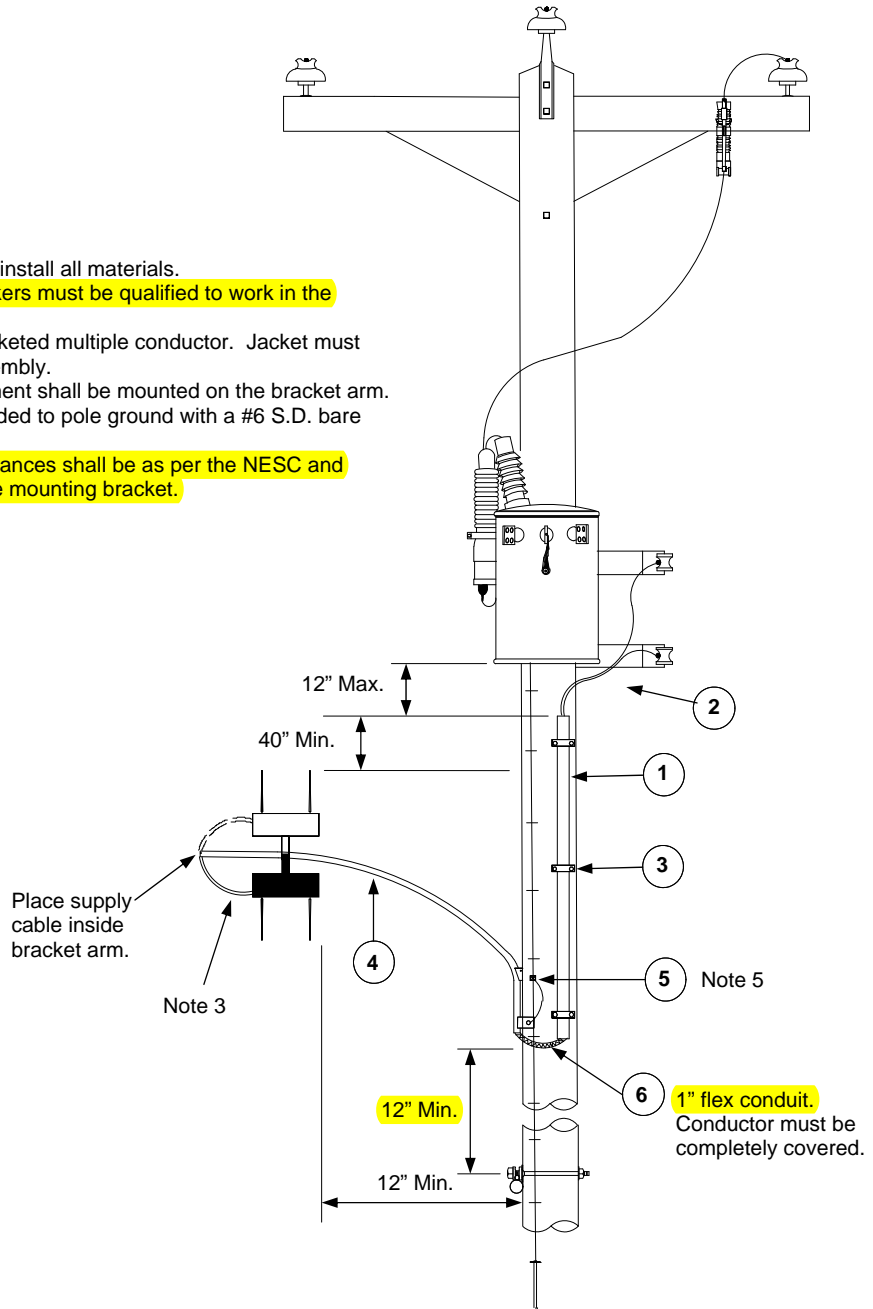
Construction Notes:

1. Double staple to secure pole ground.
2. Disconnect antenna power when working within safe approach distance defined on RF warning sign.
3. Driven pole ground required at each antenna pole.

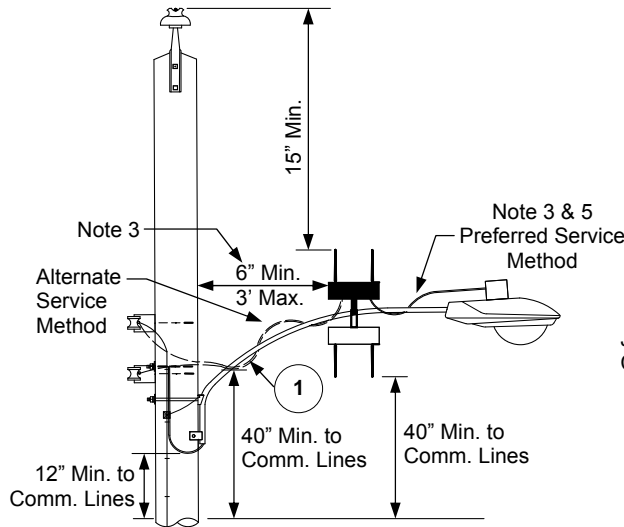
Item	Qty	Description	TSN/Ref	CU	MU
1	1	Pole (As Req'd)	Section 6	PWO_ _ _	PW_ _ _
2	1	Ground, driven	105-400	GDR16365	
3	1	Rack, secondary 1 point	105-110	ROP	
4	2	Connectors	Section 9		
5	1	Single 10' std. xarm, heavy construction	108-140	CSSH10	
6	4	Ties, conductor	109-205	CTPIT_ _	
7	4	Insulator, crossarm pin assembly, 14.4/ 24.9 kV	108-100	PIS25	
8	1	Ties, neutral	109-211	SIT_ _	

Notes:

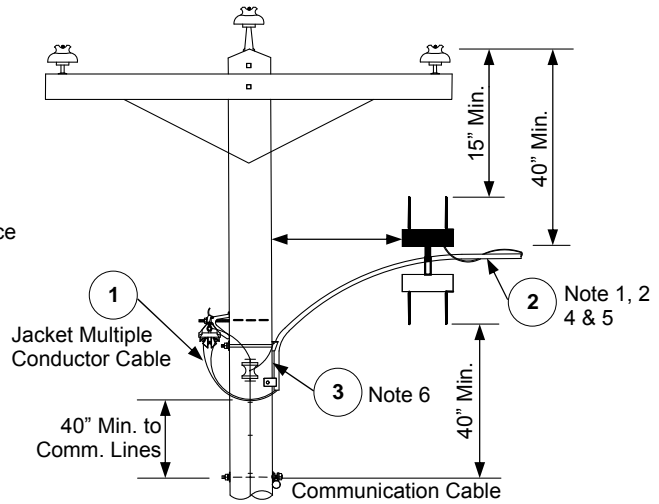
1. Customer to provide and install all materials.
2. To install equipment workers must be qualified to work in the supply space.
3. Supply cable must be jacketed multiple conductor. Jacket must enclose entire cable assembly.
4. Only one piece of equipment shall be mounted on the bracket arm.
5. Bracket arm shall be bonded to pole ground with a #6 S.D. bare copper conductor.
6. Communication line clearances shall be as per the NESC and shall not interfere with the mounting bracket.



Item	Qty	Description	TSN/Ref	CU	MU
1	As Reqd	Molding, 1" wood or 1" sch 40 PVC			
2	As Reqd	Jacketed multiple conductor cable			
3	3	Staples, wood molding or galv. pipe strap , 2 hole for 1" conduit			
4	1	Bracket, 4' wood pole mount, 1.25" dia, 19" rise,galv.			
5	1	Connector to attach to pole ground			
6	As Reqd	Conduit, flex 1"			
7					



**Existing Open Wire Secondary
& Street Light**



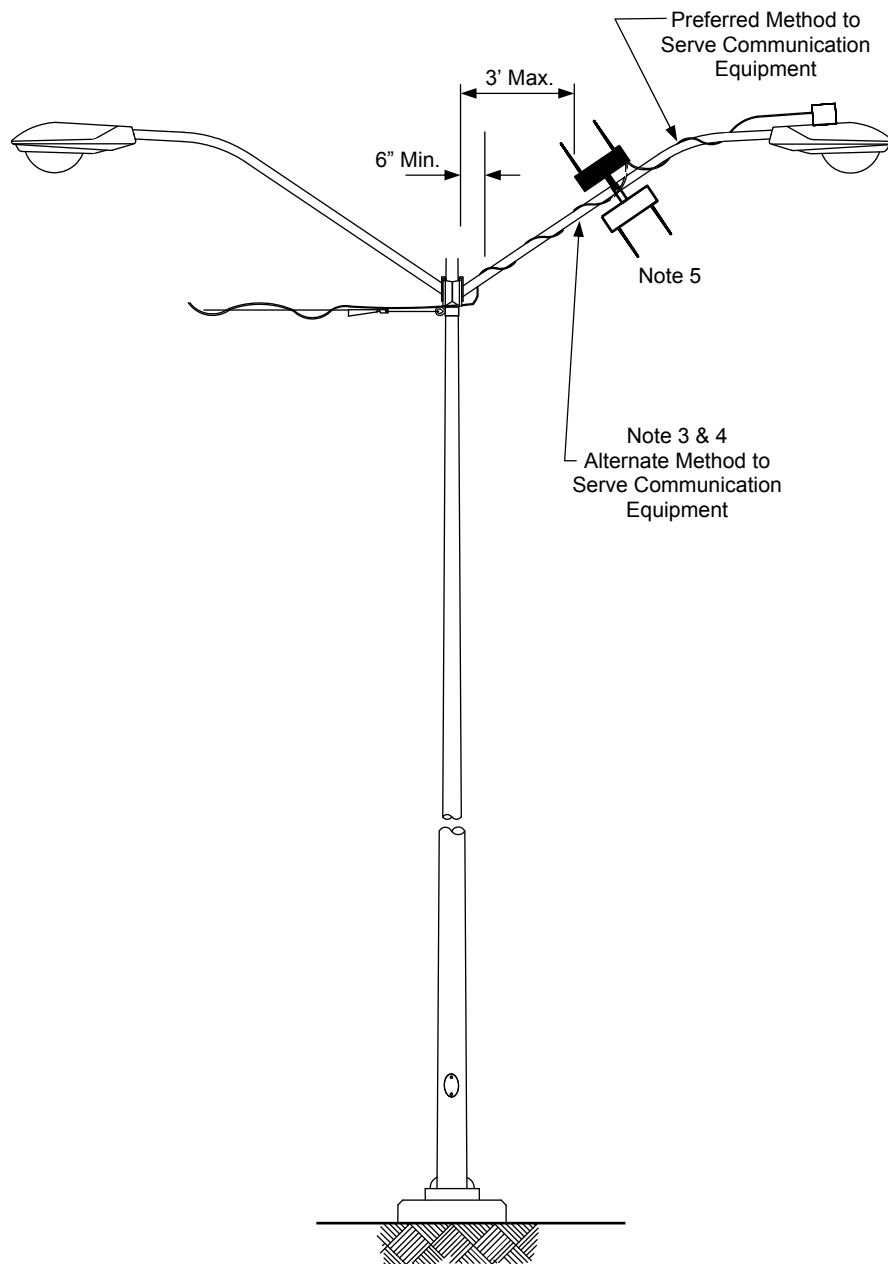
Cable Secondary, No Street Light

Notes:

1. Supply cable for packet antenna & communication equipment to be jacketed multiple conductor cable.
2. If there is no existing streetlight bracket arm use bracket arm listed in item. When a bracket arm is installed solely to mount communication equipment the jacketed multiple conductor supply cable should be installed inside the bracket arm. See sheet 103-256.
3. Max. weight of communication equipment not to exceed 15 lbs. when installed on existing street light bracket arm. Communication equipment to be installed a maximum of 3' from pole on existing bracket arm.
4. Customer to provide & install bracket arm, connectors & jacketed multiple conductor cable as required.
5. To install & maintain equipment workers must be qualified to work in supply space & use supply work rules & methods.
6. Bracket arm shall be bonded to pole ground with #6 S.D. bare cooper conductor.

Item	Qty	Description	TSN/Ref	CU	MU
1		Jacket Multiple Conductor Cable			
2	1	Bracket, 4ft., Wood Pole Mount, 1.25in. Dia., 19in. Rise, Galv.			
3	1	Connector to Attach to Pole Ground			

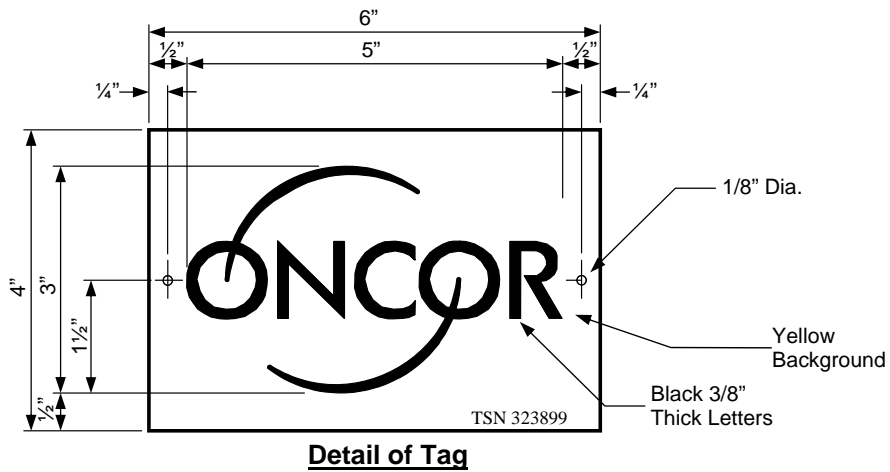
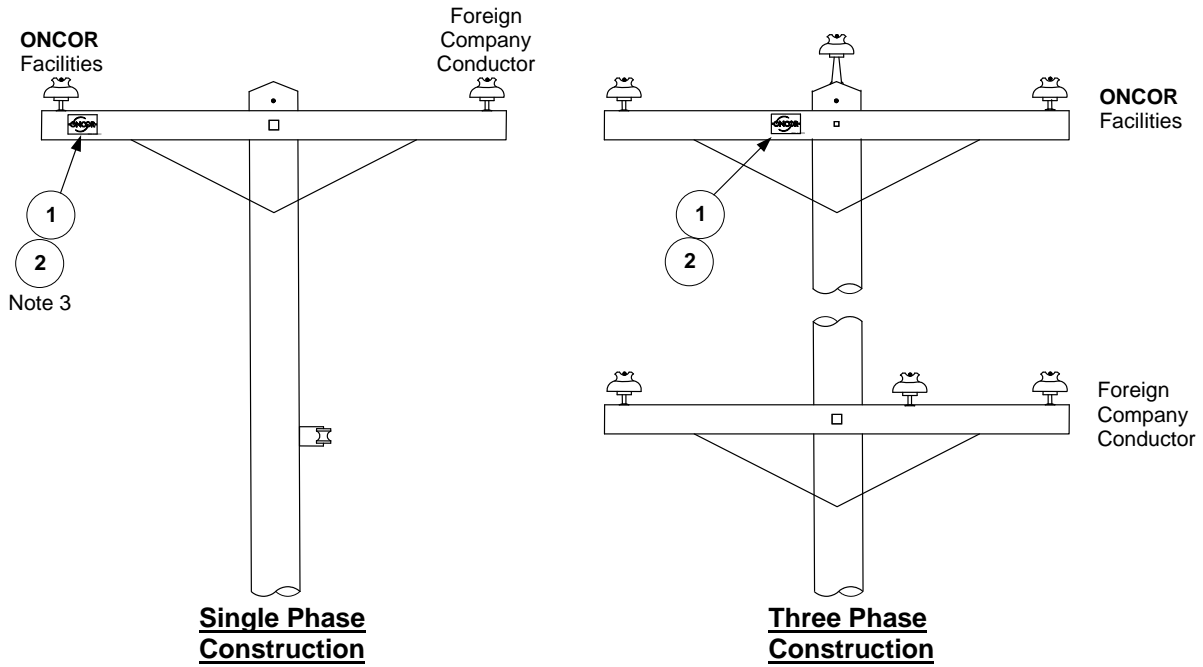
Antenna Mounted on Street Light Bracket Arm



Notes:

1. Max. weight of communication equipment mounted on bracket arm to be 15 lbs. when installed on existing street light bracket arm.
2. Only 1 piece of communication equipment can be mounted on a street light pole or bracket arm.
3. Supply cable must be jacketed multiple conductor. Jacket must enclose entire cable assembly.
4. To install and maintain equipment, workers must be qualified to work in the supply space & use supply work rules & methods.
5. Metal enclosures shall be bonded to street light mast arm by an approved method.

Common Use Pole Method of Marking Oncor Facilities

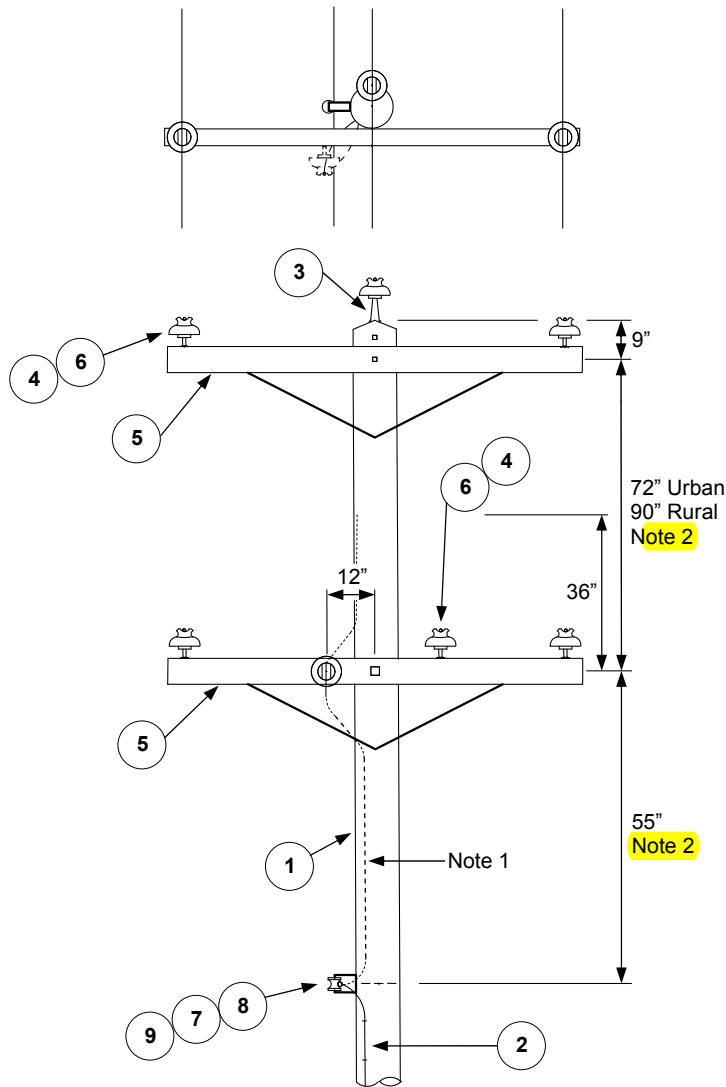


Notes:

1. Install marker so it is visible from roadway.
2. Install two markers per pole (one on each side crossarm).
3. On single phase common use construction, place tag as close to Oncor conductor as practicable.

Item	Qty	Description	TSN/Ref	CU	MU
1	2	Tag, Black "ONCOR" on Yellow Background, Polycarbonate	323889	ONCORTAG	
2	4	Nail, #4D, Common, Galvanized	314431		

Common Use Pole Crossarm Construction Tangent

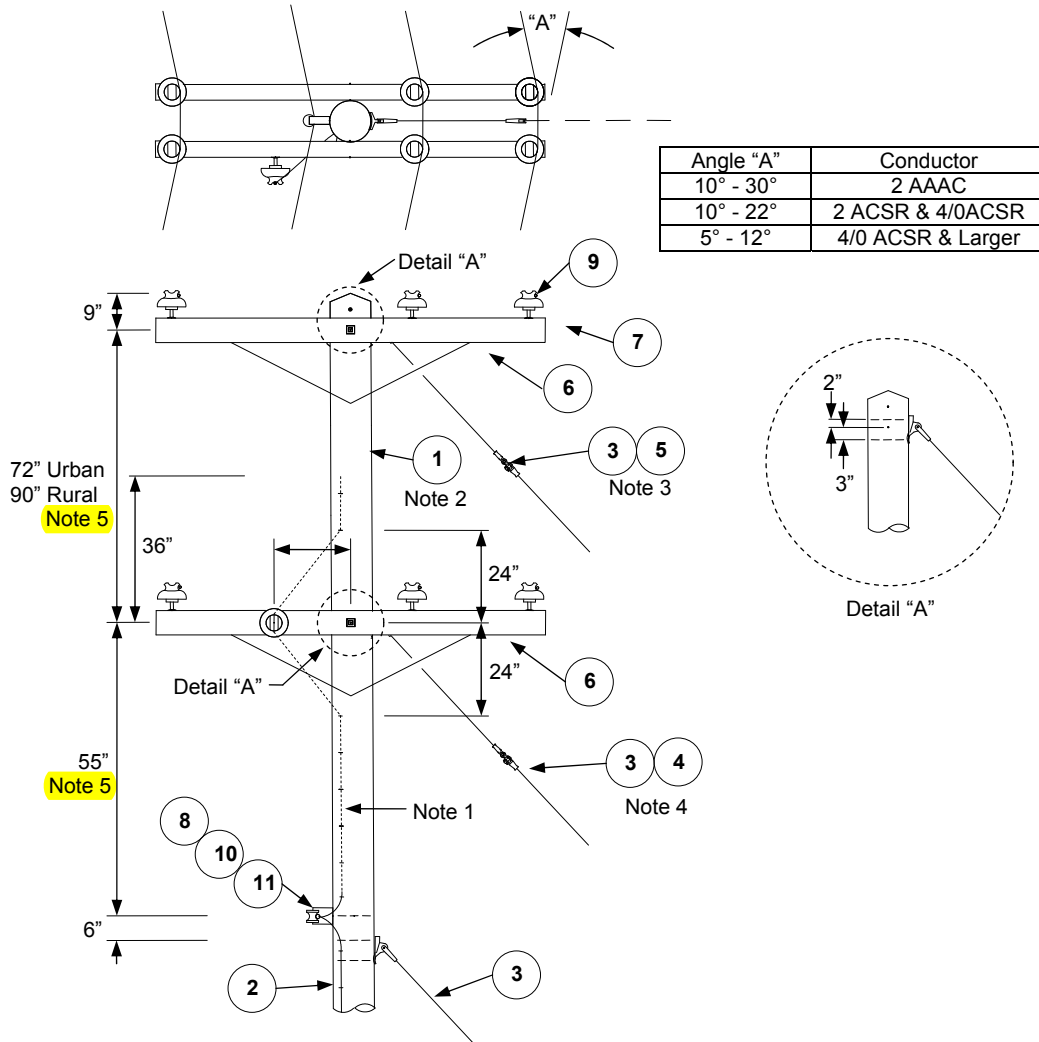


Notes:

1. When required, utility with primary on top will extend ground wire up pole.
2. Spacings indicated are based on standard Oncor sag values. Actual sags need to be verified to determine appropriate spacing. Consult Distribution Standards.

Item	Qty	Description	TSN/Ref	CU	MU
1	0-1	Pole (As Req'd)	Section 6	P_____	P_____
2	0-1	Pole Ground	105-300	GWP	
3	0-1	Insulator, Pole Top Pin Assembly	108-115	PPS25	108305_____
4	2-3	Insulator, Crossarm Pin Assembly	108-100	PIS25	
5	0-1	Single Std. Xarm, Light Construction	108-125	CSSL	
5	0-1	Single Std. Xarm, Heavy Construction	108-140	CSSH	
6	3-4	Ties, Conductor	109-205	CTPIT	
7	0-1	Rack, Secondary, 1 Point	108-115	ROP	
8	0-1	Ties, Neutral	109-211	SIT	
9	0-2	Connectors	Section 9		

Common Use Pole Crossarm Construction Small Angle Double Pin

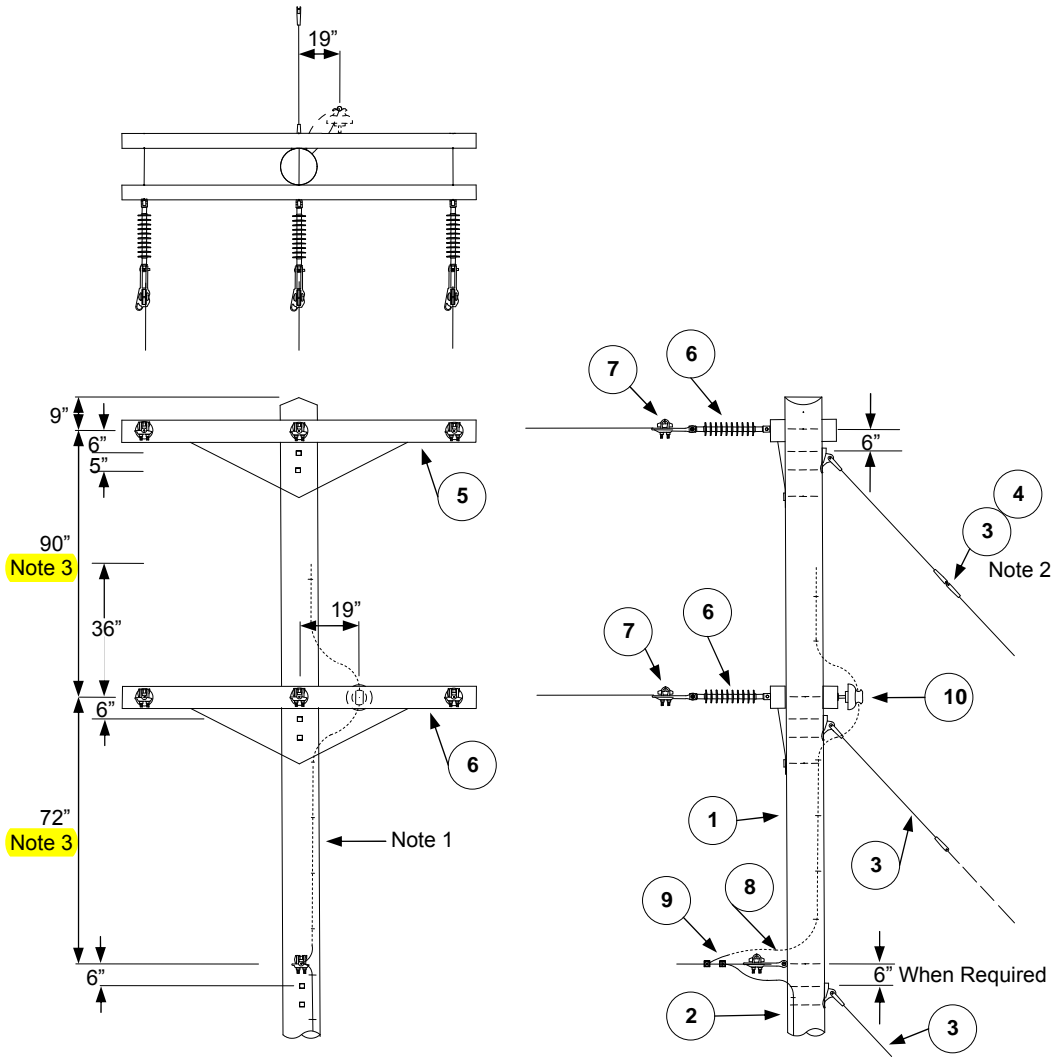


Notes:

1. When required, utility with primary on top will extend ground wire up pole.
2. Minimum class 3 pole required.
3. One 72" guy extension required.
4. One 36" guy extension required.
5. Spacings indicated are based on standard Oncor sag values. **Actual sags need to be verified to determine appropriate spacing. Consult Distribution Standards.**

Item	Qty	Description	TSN/Ref	CU	MU	
1	0-1	Pole (As Req'd)	Section 6	P_____	P_____	
2	0-1	Pole Ground	105-300	G_____		
3	1-2	Guy	Section 7	G____; A_____	G_____	
4	0-1	Extension, Guy Strain Insulator, 36 in.	107-300	GIE_3		
5	0-1	Extension, Guy Strain Insulator, 72 in.	107-300	GIE_7		
6	0-1	Double, Std Xarm, Light Construction	108-135	CDSL	108320_____	
6	0-1	Double, Std Xarm, Heavy Construction	108-145	CDSH		
7	6-7	Insulator, Crossarm Pin Assembly	108-100	PIS25		
8	0-1	Rack, Secondary, 1 Point	108-110	ROP		
9	6-7	Ties, Conductor	109-205	CTPIDS__		
10	0-1	Ties, Neutral	109-211	SIT____		
11	0-2	Connectors	Section 9			

Common Use Pole Crossarm Construction Deadend

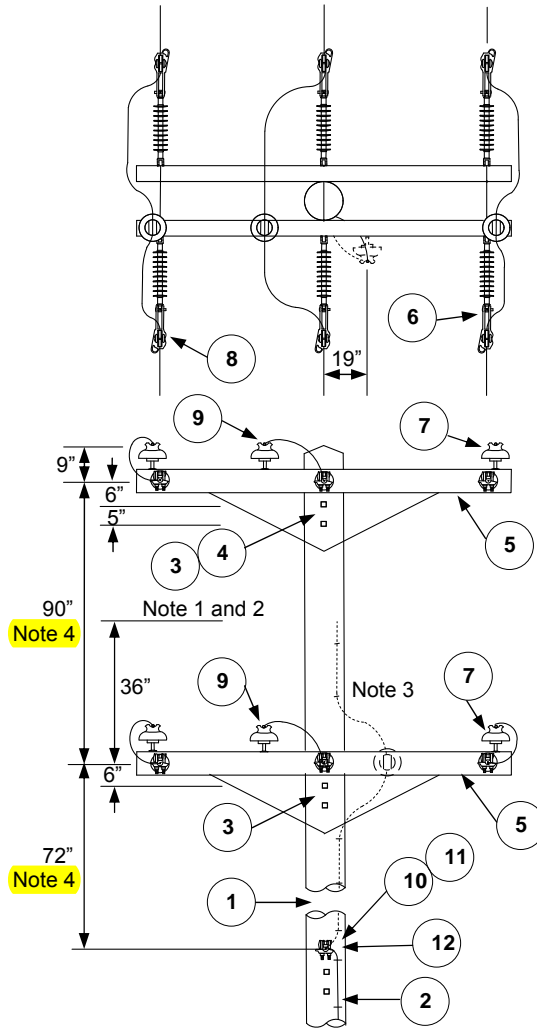


Notes:

1. When required, utility with primary on top will extend ground wire up pole.
2. One 78" guy strain insulator extension required.
3. Spacings indicated are based on standard Oncor sag values. **Actual sags need to be verified to determine appropriate spacing. Consult Distribution Standards.**

Item	Qty	Description	TSN/Ref	CU	MU	
1	0-1	Pole (As req'd)	Section 6	P_	P_	
2	0-1	Pole Ground	105-300	G_	G_	
3	1-2	Guy	Section 7	G_ ; A_	G_	
4	0-1	Extension, Guy Strain, 78 in.	107-300	GIE_ 7		
5	0-1	Double Std. Xarm, Light Construction	108-135	CDSL2	108335_	
5	0-1	Double Std. Xarm, Heavy Construction	108-150	CDHH		
6	3	Insulator, Deadend Assembly, Crossarm	108-107	D_P25		
7	3	Clamp, Deadend	109-285	PDES_		
8	1	Clamp, Neutral Deadend	113-100	CSDE		
9	0-2	Connectors	Section 9			
10	0-1	Insulator, Crossarm Pin Assembly	108-100	PI_25		

Common Use Pole Crossarm Construction Double Deadend



Notes:

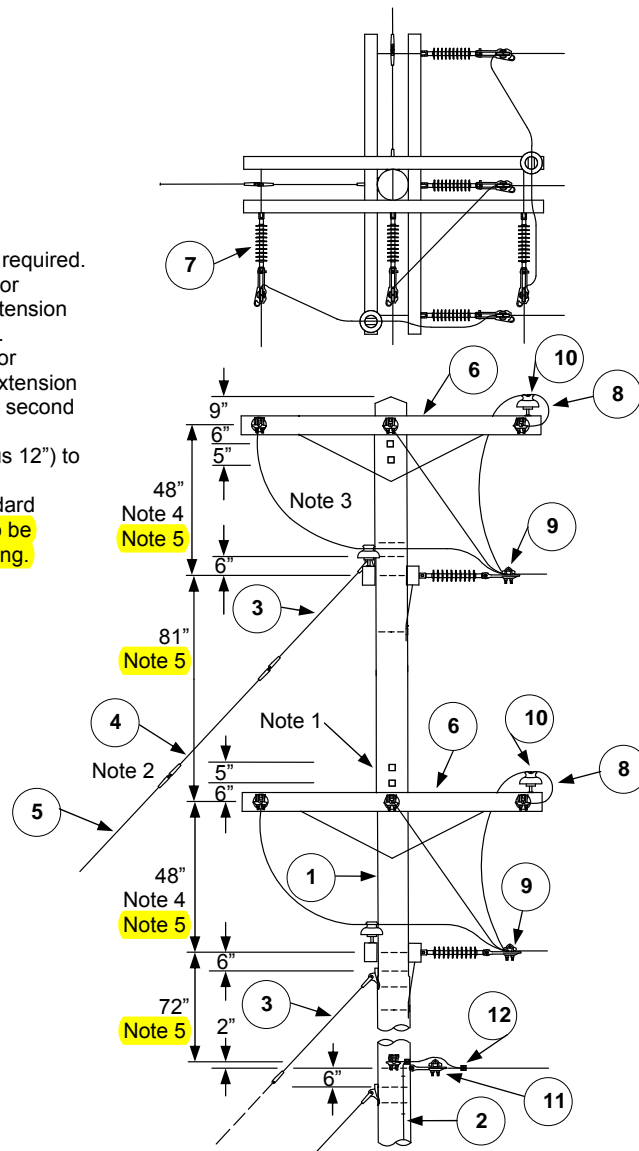
1. Guy as required where conductors change size. Guy is required when total guying tension is greater than 500 lbs.
2. One 78" guy strain insulator extension required with guy.
3. When required, utility with primary on top will extend ground wire up pole.
4. Spacings indicated are based on standard Oncor sag values. **Actual sags need to be verified to determine appropriate spacing. Consult Distribution Standards.**

Item	Qty	Description	TSN/Ref	CU	MU
1	0-1	Pole	Section 6	P_____	P_____
2	0-1	Pole Ground	105-300	G_____	G_____
3	0-2	Guy	Section 7	G____; A_____	G_____
4	0-1	Insulator, Guy Strain Extension, 78 in.	107-300	GIE__7	108340_____
5	0-1	Double Std. Xarm, Light Construction	107-300	CDSL2	
5	0-1	Double Std. Xarm, Heavy Construction	108-150	CDHH	
6	6	Insulator, Deadend Assembly, Crossarm	108-107	D_P25	
7	3-4	Insulator, Crossarm Pin Assembly	108-100	PI_25	
8	6	Clamp, Deadend	109-285	PDES_____	
9	3-4	Ties, Conductor	109-205	CTPIT_____	
10	1	Clamp, Deadend	113-100	CDSE_____	
11	1	Clamp, Deadend, Backup	113-100	CDSEB_____	
12	3-6	Connectors	Section 9		

Common Use Pole Crossarm Construction Corner

Notes:

1. One 78" guy strain insulator extension required.
2. One 36" and one 78" guy strain insulator extension required. Attach 36" GSI extension first (high) and 78" GSI second (lower).
3. One 36" and two 78" guy strain insulator extensions required. Attach 36" GSI extension first (high) and two 78" GSI extensions second and third (lower).
4. This dimension may be adjusted (minus 12") to provide for minimum clearances.
5. Spacings indicated are based on standard Oncor sag values. Actual sags need to be verified to determine appropriate spacing. Consult Distribution Standards.

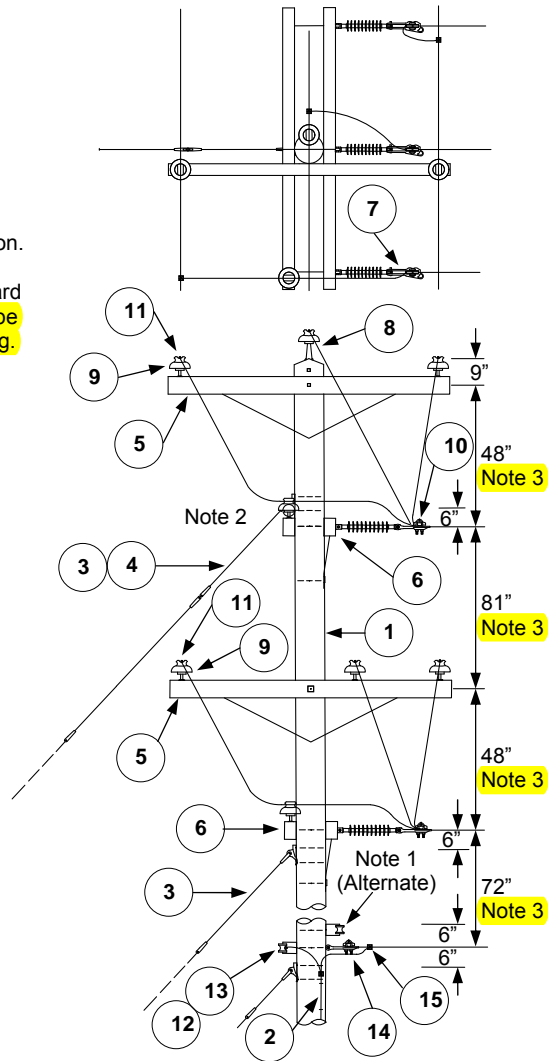


Item	Qty	Description	TSN/Ref	CU	MU
1	0-1	Pole (As Required)	Section 6	P	P_ _ _ _
2	0-1	Pole Ground	105-300	G	G_ _ _ _
3	2-4	Guy	Section 7	G ; A	G_ _ _ _
4	0-2	Insulator, Fiberglass Guy Stain Extension, 36 in.	107-300	GIE_3	
5	1-3	Insulator, Fiberglass Guy Stain Extension, 78 in.	107-300	GIE_7	
6	0-1	Double, Std. Xarm, Light Construction	108-135	CDSL2	
6	0-1	Double, Std. Xarm, Heavy Construction	108-150	CDHH	
7	6	Insulator, Deadend Assembly	108-107	D_P25	
8	2	Insulator, Crossarm Pin Assembly	108-100	PI_25	
9	6	Clamp, Deadend	109-285	PDES	
10	2	Ties, Conductor	109-205	CTPIT	
11	2	Clamp, Deadend	113-100	CSDE	
12	3-5	Connector	Section 9		

Common Use Pole Crossarm Construction Three Phase Tap

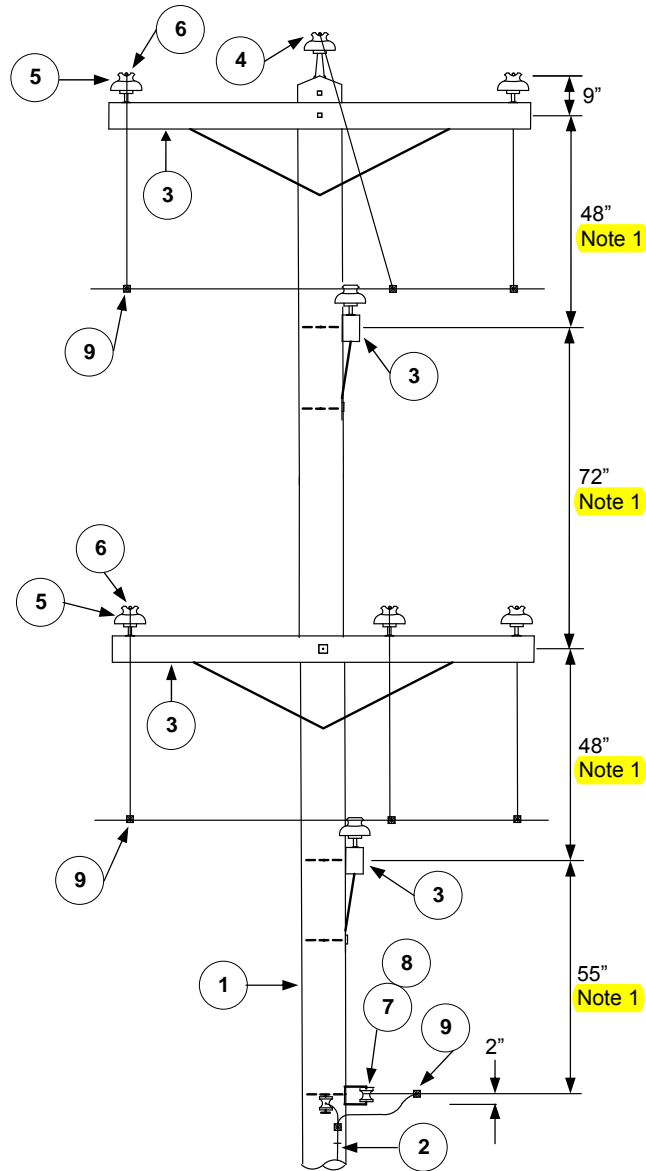
Notes:

1. Alternate position for existing construction.
2. One 78" guy strain extension required.
3. Spacings indicated are based on standard Oncor sag values. **Actual sags need to be verified to determine appropriate spacing. Consult Distribution Standards.**



Item	Qty	Description	TSN/Ref	CU	MU
1	0-1	Pole (As Required)	Section 6	P_ _ _ _	P_ _ _ _
2	0-1	Pole Ground	105-300	G_ _ _ _	G_ _ _ _
3	1-2	Guy	Section 7	G_ _ _ ; A_ _ _	G_ _ _ _
4	0-1	Insulator, Fiberglass Strain Extension, 78 in.	107-300	GIE_ 7	
5	0-1	Single, Std. Xarm, Light Construction	108-125	CSSL	108350_ _ _ _
5	0-1	Single, Std. Xarm, Heavy Construction	108-140	CSSH	
6	0-1	Double, Std. Xarm, Light Construction	108-135	CDSL2	
6	0-1	Double, HD Xarm, Heavy Construction	108-150	CDHH2	
7	3	Insulator, Deadend Assembly	108-107	D P25	
8	0-1	Insulator, Pole Tap Pin Assembly	108-115	PPS25	
9	3-4	Insulator, Crossarm Pin Assembly	108-100	PI 25	
10	3	Clamp, Deadend	109-285	PDES_ _ _ _	
11	4	Ties, Conductor	109-205	CTPIT	
12	0-1	Rack, Secondary, 1 Point	108-110	ROP	
13	0-1	Ties, Neutral	109-211	SIT_ _ _ _	
14	0-1	Clamp, Deadend, Backup	113-100	CSDE_ _ _ _	
15	3-5	Connector	Section 9		

Common Use Pole Crossarm Construction Four Way Crossing

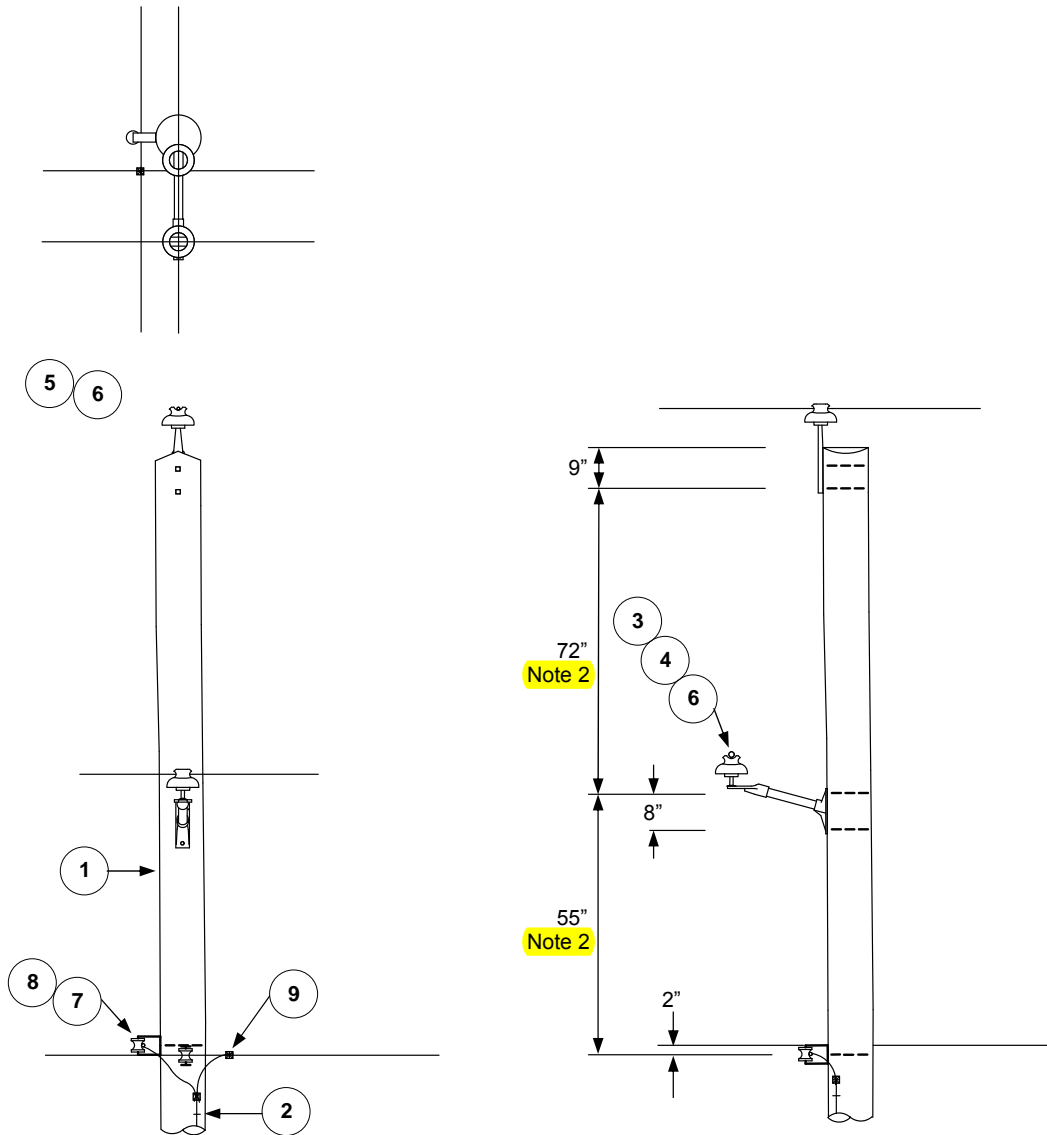


Notes:

1. Spacings indicated are based on standard Oncor sag values. Actual sags need to be verified to determine appropriate spacing. Consult Distribution Standards.

Item	Qty	Description	TSN/Ref	CU	MU
1	0-1	Pole (As Required)	Section 6	P_ _ _ _	P_ _ _ _
2	0-1	Pole Ground	105-300	G_ _ _ _	
3	0-2	Single, Std. Xarm, Light Construction	108-125	CSSL	108355_ _ _ _
3	0-2	Single, Std. Xarm, Heavy Construction	108-140	CSSH	
4	0-1	Insulator, Pole Top Pin Assembly	108-115	PPS25	
5	5-6	Insulator, Crossarm Pin Assembly	108-100	PIS25	
6	6	Ties, Conductor	109-205	CTPIT_ _	
7	2	Rack, Secondary, 1 Point	108-110	ROP	
8	0-2	Ties, Neutral	109-211	SIT_ _ _	
9	6-9	Connector	Section 9		

Common Use Pole Single Phase Typical Crossing

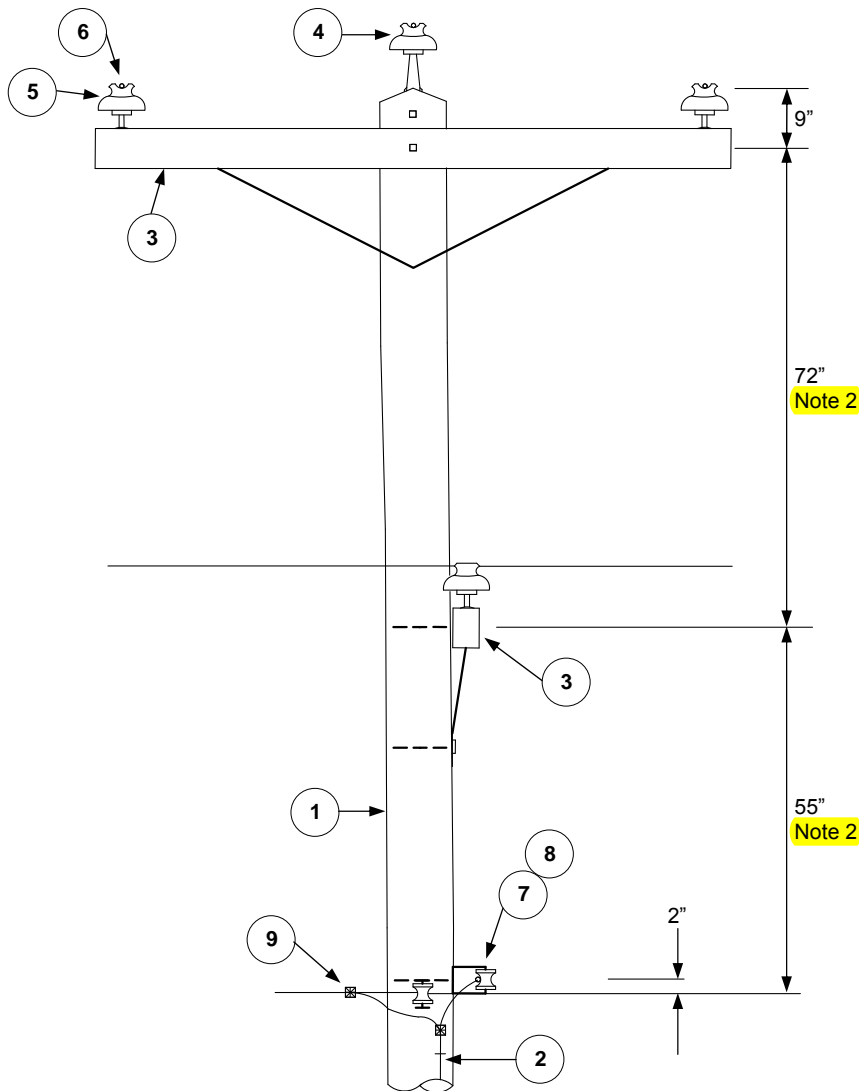


Notes:

1. Each neutral shall be bonded to pole ground with a minimum #6 SD bare copper bonding wire.
2. Spacings indicated are based on standard Oncor sag values. Actual sags need to be verified to determine appropriate spacing. Consult Distribution Standards.

Item	Qty	Description	TSN/Ref	CU	MU
1	0-1	Pole (As Required)	Section 6	P_ _ _ _	P_ _ _ _
2	0-1	Pole Ground	105-300	G_ _ _ _	
3	0-1	Bracket, Fiberglass Standoff, 18 in. Standard	108-165	BSSF	
4	0-1	Insulator, Fiberglass Standoff Pin Assembly	108-160	PIB25	
5	0-1	Insulator, Pole Top Pin Assembly	108-115	PPS25	
6	0-1	Ties, Conductor, Pin Insulator	109-205	CTPIT_ _	
7	1	Rack, Secondary, 1 Point	108-110	ROP	
8	1	Ties, Conductor, Spool Insulator	109-211	SIT_ _ _	
9	1-2	Connectors	Section 9		

Common Use Pole Crossarm Construction Typical Crossing

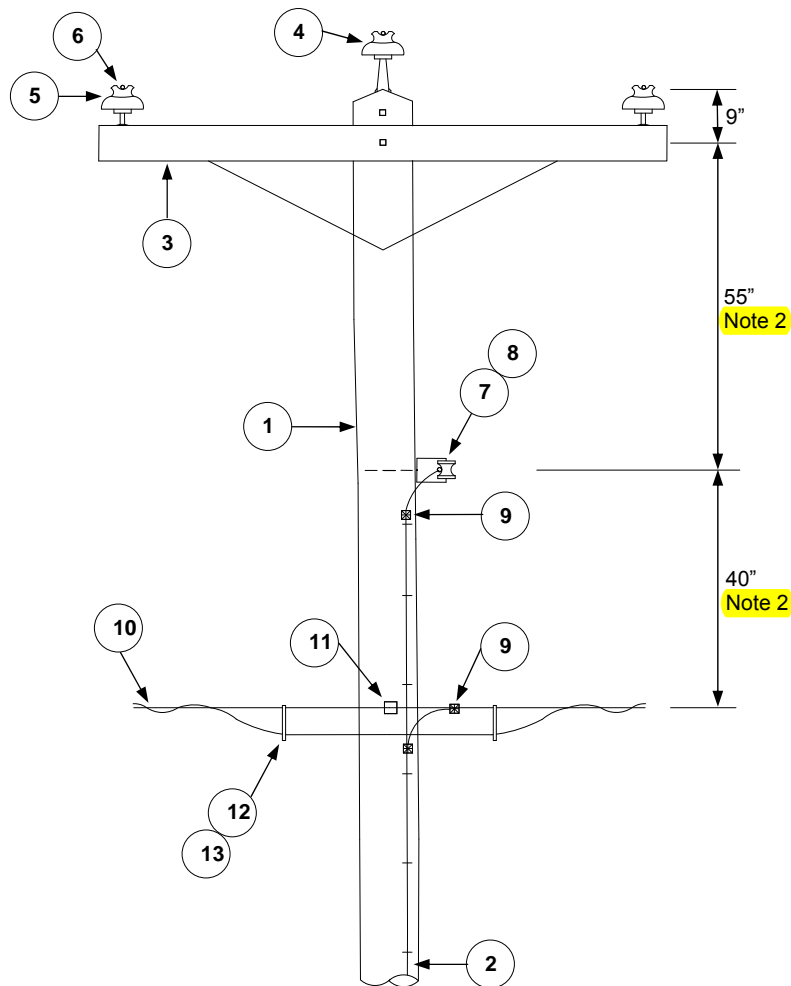


Notes:

1. Each neutral shall be bonded to pole ground with a minimum #6 SD bare copper bonding wire.
2. Spacings indicated are based on standard Oncor sag values. **Actual sags need to be verified to determine appropriate spacing. Consult Distribution Standards.**

Item	Qty	Description	TSN/Ref	CU	MU
1	0-1	Pole (As Required)	Section 6	P_ _ _ _	P_ _ _ _
2	0-1	Pole Ground	105-300	G_ _ _	
3	0-1	Single, Std. Xarm, Light Construction	108-125	CSSL	108305_ _ _
3	0-1	Single, Std. Xarm, Heavy Construction	108-140	CSSH	
4	0-1	Insulator, Pole Top Pin Assembly	108-115	PPS25	
5	2-3	Insulator, Crossarm Pin Assembly	108-100	PIS25	
6	3	Ties, Conductor	109-205	CTPIT_ _ _	
7	1	Rack, Secondary, 1 Point	108-110	ROP	
8	1	Ties, Neutral	109-211	SIT_ _ _	
9	1-2	Connector	Section 9		

Common Use Pole Crossarm Construction 90° Secondary Crossing



Notes:

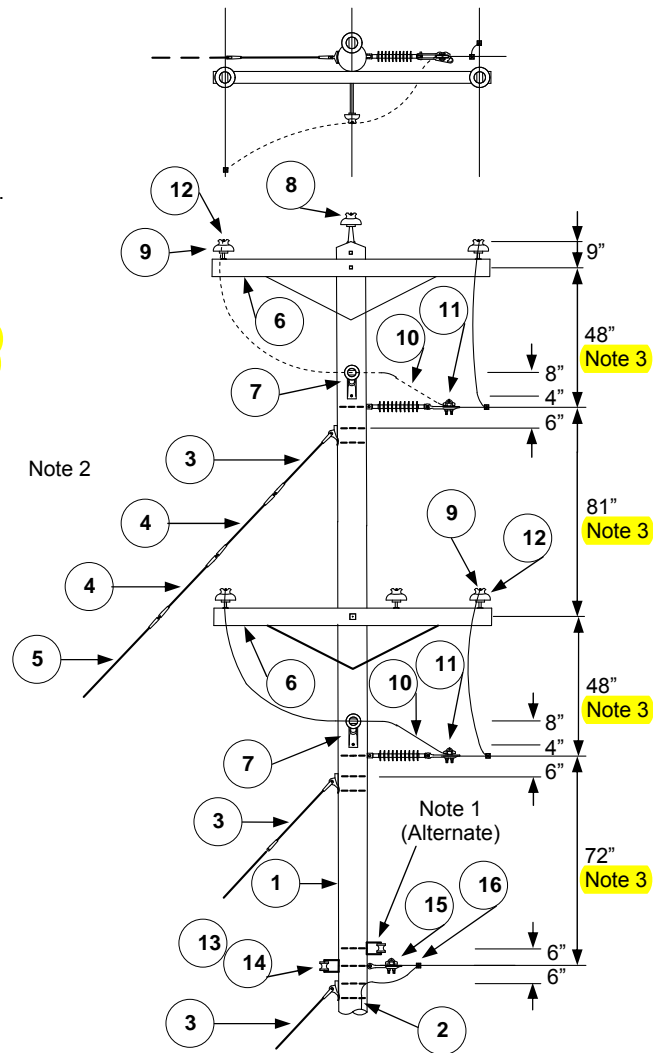
1. Neutral and messenger shall be bonded to pole ground with minimum #6 SD bare copper bonding wire.
2. Spacings indicated are based on standard Oncor sag values. **Actual sags need to be verified to determine appropriate spacing. Consult Distribution Standards.**

Item	Qty	Description	TSN/Ref	CU	MU
1	0-1	Pole (As Required)	Section 6	P_____	P_____
2	0-1	Pole Ground	105-300	G_____	
3	0-1	Single, Std. Xarm, Light Construction	108-125	CSSL	108305____
3	0-1	Single, Std. xarm, Heavy Construction	108-140	CSSH	
4	0-1	Insulator, Pole Top Pin Assembly	108-115	PPS25	
5	0-2	Insulator, Crossarm Pin Assembly	108-100	PIS25	
6	0-3	Ties, Conductor	109-205	CTPIT_____	
7	0-1	Rack, Secondary, 1Point	108-110	ROP	
8	0-1	Ties, Neutral	109-211	SIT_____	
9	1-2	Connector	Section 9		
10	As Req'd	Cable, Secondary	113-200	AL_____	
11	0-1	Clamp, Messenger Bracket	113-100	CSTPS4	
12	0-2	Spreader, Cable Secondary	113-110		
13	0-1	Wire, Tie, #4 Al.	305448		

Common use Pole Crossarm Construction Single Phase Tap

Notes:

1. Alternate position for existing construction.
2. Two 36" and one 78" guy strain insulator extensions required. Attach 2-36" GSI extensions first (higher) and 1-78" GSI extension last (lower).
3. Spacings indicated are based on standard Oncor sag values. Actual sags need to be verified to determine appropriate spacing. Consult Distribution Standards.



Item	Qty	Description	TSN/Ref	CU	MU
1	0-1	Pole (As Required)	Section 6	P	
2	0-1	Pole Ground	105-300	G	
3	1-2	Guy	Section 7	G ; A	
4	0-2	Insulator, Fiberglass Strain Extension, 36 in.	107-300	GIE_3	
5	0-1	Insulator, Fiberglass Strain Extension, 72 in.	107-300	GIE_7	
6	0-1	Single, Std. Xarm, Light Construction	108-125	CSSL	
6	0-1	Single, Std. Xarm, Heavy Construction	108-140	CSSH	
7	1	Bracket, Fiberglass Standoff	108-170	BSJ25	
8	0-1	Insulator, Pole top Pin Assembly	108-115	PPS25	
9	2-3	Insulator, Crossarm Pin Assembly	108-100	PIS25	
10	1	Insulator, Suspension	108-105	DPP25	
11	1	Clamp, Deadend	109-285	PDES	
12	3	Ties, Conductor	109-205	CTPIT	
13	0-1	Rack, Secondary, 1 Point	108-110	ROP	
14	0-1	Ties, Neutral	190-211	SIT	
15	0-1	Clamp, Messenger Bracket	113-100	CSDE	
16	1-2	Connector	Section 9		