Transmission & Distribution
Material & Installation Specification

Wood Poles

I. Quantity

The base bid shall include the indicated quantities of the specified sizes of wood pole supplied and installed as hereinafter specified.

II. Material

GENERAL

A. Poles conforming to the Division of Power pole specification and approved shop drawings shall be installed where indicated on the project drawings.

PRODUCT REQUIREMENTS

A. Poles 35 through 60 feet shall be Southern Pine. Poles 65 feet or taller shall be Douglas Fir.

B. Poles shall be fabricated from the raw timber as defined by the *American National Standards Institute, Inc. (ANSI)* in their most recent copy in effect of *American National Standard Specifications and Dimensions for Wood Poles, ANSI 05.1*. Strict adherence shall be given to Sections pertaining to pole classes, prohibited defects, dimensions, manufacturing requirements and storage and handling. This shall include all applicable tables and figures.

C. Poles shall be framed and marked or branded before treatment as provided by Drawing TDMIS-1. The pole butt shall also include the Inspector's stamp.

D. Poles shall be cured and have all manufacturing processes completed prior to treatment. Poles shall be cured and treated full length in accordance with the latest revision of the *American Wood Preservers Association (AWPA)* guidelines as published in the latest revision of their Book of Standards. Treatment shall be accomplished using pentachlorophenol or chromated copper arsenate with methods, preparation and solvents as directed in the AWPA Book of Standards.

Retentions for ***Chromated Copper Arsenate*** (35' poles only) shall be as follows:

SPECIES	ASSAY ZONE (ins.)	MINIMUM RETENTION
Southern Pine	0.50 - 2.00	0.60

Retentions for ***Pentachlorophenol*** (all poles except 35' poles) shall be as follows:

SPECIES	ASSAY ZONE (ins.)	MINIMUM RETENTION
Southern Pine	0.50 - 2.00	0.45
Douglas Fir	0.25 - 1.00	0.60

E. Treated poles shall be tested for penetration and retention using AWPA Standards. Treatment reports shall be approved by the inspector and shall be furnished with the pole shipment to the contractor with a copy given to the DOP engineer.

F. All poles shall be inspected 100% prior to and after treatment and shipment by an independent agency, selected using REA guidelines. The inspector shall hammer stamp the butt and top of each pole to indicate its conformance to the specifications and therefore its approval. A certificate of inspection shall also be furnished with each shipment of poles to the contractor with a copy given to the DOP engineer.

SAMPLING, INSPECTION, AND TEST PROCEDURES

A. Any pole, which has been delivered to the job site and is found to not meet the specifications, will be rejected. Poles so rejected will be replaced by the contractor at his expense.

B. Reasons to reject a pole shall be as follows: If pole does not meet ANSI 05.1 Standard or appears to be releasing treatment solution (aka bleeding). If pole has a sweep or crook and is determined upon delivery by a DOP engineer or project inspector(s) to be unacceptable. If pole has been damaged while in transit or during the loading and unloading process and has been determined to be structurally unsound.

DELIVERY, STORAGE, AND HANDLING

A. Do not drag poles along the ground. Do not apply cant hooks, pole tongs, or other pointed tools to the ground line section of poles.

B. Lift and handle poles with care and in such a way as to avoid damage to the pole.

WARRANTY

A. Poles shall be warranted for a minimum of one and one half (1 1/2) years from date of delivery or one (1) year from date of installation, whichever is greater. Should any problems occur during the warranty period, the contractor shall, upon written notification and entirely at their expense, correct the problem by replacing the defective pole within sixty (60) days of receipt of the written notification.

III. **Installation**

A. Setting: Except where specified otherwise, the depth for setting poles shall be as follows:

Length of Pole (feet)	Setting in Soil (feet)	Setting in Solid Rock (feet)
20	4.0	3.0
25	5.0	3.5
30	5.5	3.5
35	6.0	4.0
40	6.0	4.0
45	6.5	4.5
50	7.0	4.5
55	7.5	5.0
60	8.0	5.0
65	8.5	6.0
70	9.0	6.0
75	9.5	6.5
80	10.0	6.5
85	10.5	7.0
90	11.0	7.5
95	11.0	7.5
100	11.0	7.5
105	12.0	8.0
110	12.0	8.0

B. Setting in soil applies:

1. Where poles are to be set in soil.
2. Where there is a layer of soil of more than 2 feet in depth over solid rock.
3. Where the hole in solid rock is not substantially vertical or the diameter of the hole at the surface of the rock exceeds approximately twice the diameter of the pole at the same level.

C. Setting in solid rock applies where the hole is substantially vertical, approximately uniform in diameter, and large enough to permit the use of tamping bars the full depth of the hole. Where there is a layer of soil 2 feet or less in depth over solid rock, the depth of the hole shall be the depth of the soil in addition to the depth specified under “Setting in Solid Rock” provided, however, that such depth shall not exceed the depth specified under “Setting in Soil.”

D. Where the pole is to be set in soil and the ground slopes away from the pole perpendicular to the line, setting depth shall be increased to account for the reduced volume of bearing soil at ground line. The additional depth of setting shall be equal to the drop in elevation in 5 feet measured horizontally.

E. On sloping ground, the setting depth shall be measured from the low side of the pole ground line. Where multiple pole structures are placed on sloping ground, uphill pole setting depths shall be increased as necessary to level the pole tops.

F. Set poles in augered holes approximately 8 inches larger in diameter than the pole butt. Other methods of pole installation shall be as approved by Engineer.

G. For crossarm construction, set wood poles so that alternate crossarm gains face in opposite directions, except at terminals and dead-ends where the gains of the last two poles shall be on the side facing the terminal or dead-end. On unusually long

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spans, the poles shall be set so that the crossarm is installed on the side of the pole away from the long span. Where pole top pins are used, they shall be on the opposite side of the pole from the gain, with the flat side against the pole.

H. Rake and Offset: Set poles in alignment and plumb except at corners, terminals, angles, junctions, or other points of strain, where they shall be offset if necessary to maintain conductors on the centerline and raked against the strain.

I. Rake poles against the conductor strain not less than 1 inch for each 10 feet of pole length nor more than 2 inches for each 10 feet of pole length after conductors are installed at the required tension.

J. Field cutting of Wood Poles: Where new gains or holes are required, paint gains with 5 percent pentachlorophenol preservative compound and the holes treated with 5 percent pentachlorophenol preservative compound.

K. Do not cut the tops of wood poles except under very exceptional conditions and only upon approval of Engineer. If cutting is deemed necessary, the pole top shall be covered with a mastic type cap manufactured for this purpose. Do not cut the butt of wood poles.

L. Unused Holes: In wood poles, plug unused or abandoned holes using treated wood dowel pins. For holes in used poles where the hole has been enlarged, treat the hole with 5 percent pentachlorophenol preservative compound.

M. If the pole is set in a concrete sidewalk, the section of the sidewalk shall be replaced in accordance with Item 208. Concrete sidewalks shall be sawcut at the joints.

N. If the pole is set in a brick sidewalk or other paved area, the surface shall be restored with similar materials as shown on the plans and as directed by the Engineer.

O. The location of the poles shall be as shown on the drawings and as located in the field by the Engineer.

BACKFILL

A. Remove organic materials and trash from the excavation before placing backfill. At grade level, earth backfill shall be banked and tamped around the base of each pole.

B. Earth Backfill: Install at pole locations except where gravel backfill is indicated. Place material in lifts of maximum 6-inch depth and compact each lift to 95 percent of maximum density at optimum moisture content as determined by AASHTO T99, Method A. Maintain material at optimum moisture content for compaction.

C. Concrete Backfill: Place concrete backfill only in dry pole holes. Where pole holes are augered with a driller's mud and water mixture filling the entire hole, tremie placing of the concrete backfill is permitted. Concrete placed by tremie (through water) shall have one additional sack of cement per cubic yard. Hold poles backfilled with concrete plumb and motionless until concrete has set.

D. Gravel Backfill: Place pea gravel or #8 limestone backfill in maximum 6-inch lifts and compact each lift to 85 percent of relative density.

E. The excess earth and materials shall be disposed of by the contractor as specified in section 203.05 of the City of Columbus Construction and Materials Specifications.

COMPACTION EQUIPMENT

A. Compaction equipment shall be of suitable type and adequate to obtain the densities specified and approved.

B. Operate compaction equipment in strict accordance with the manufacturers instructions and recommendations.

C. Maintain equipment in such condition that it will deliver manufacturers rated compactive effort.

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FIELD QUALITY CONTROL

A. Compaction Tests: Engineer will, at Engineer's option, confirm in-place density and moisture content by one or a combination of the following methods: AASHTO T99, T191, 204, 205, or 238.

B. Disposal of Excess Excavation: Dispose of all excess excavated materials, not required for backfill or fills, by carefully spreading in an approved location or haul offsite.

C. Settlement in backfill that occurs within 1 year after Substantial Completion will be considered caused by improper placement or compaction.

POLE GROUNDING

A. Immediately after setting, install pole grounding as specified in TDMIS-7,8 or 9 as applicable.

IV. Method of measurement

Shall be measured as complete units for each size and class, and will include excavation, installation, backfilling and transportation.

V. Basis of payment

Items	Unit	Description
TDMIS-1	Each	__class, __ ft. wood pole

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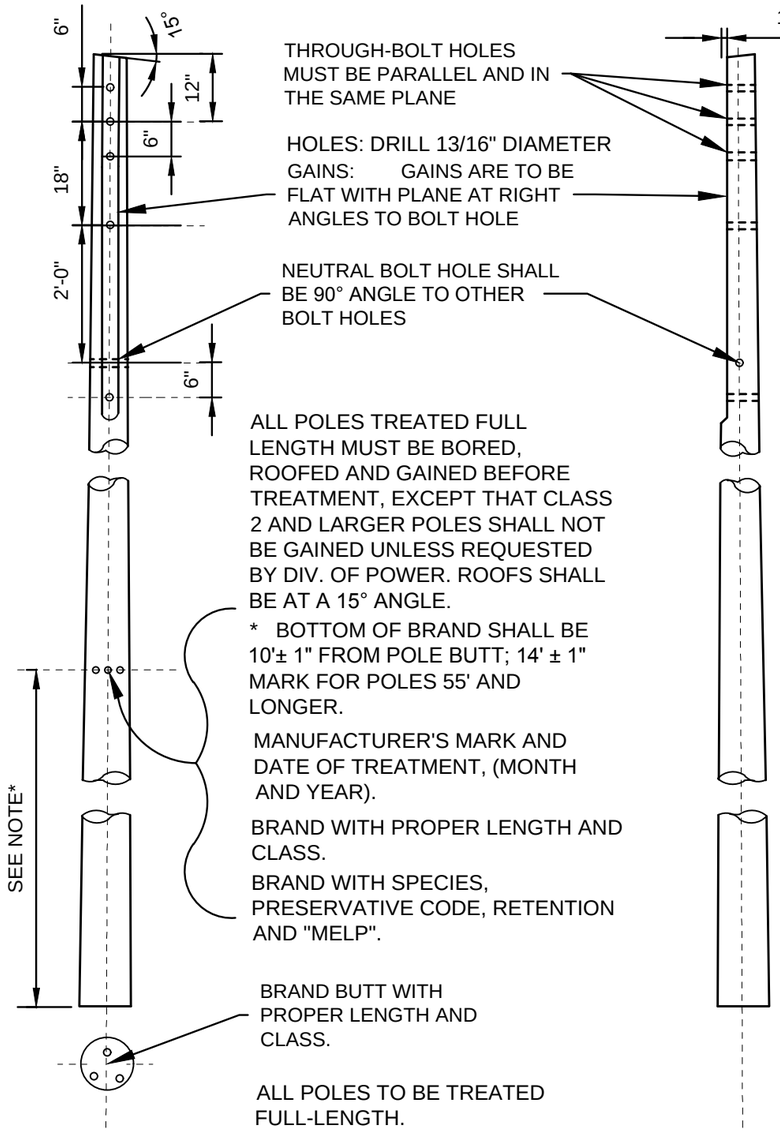
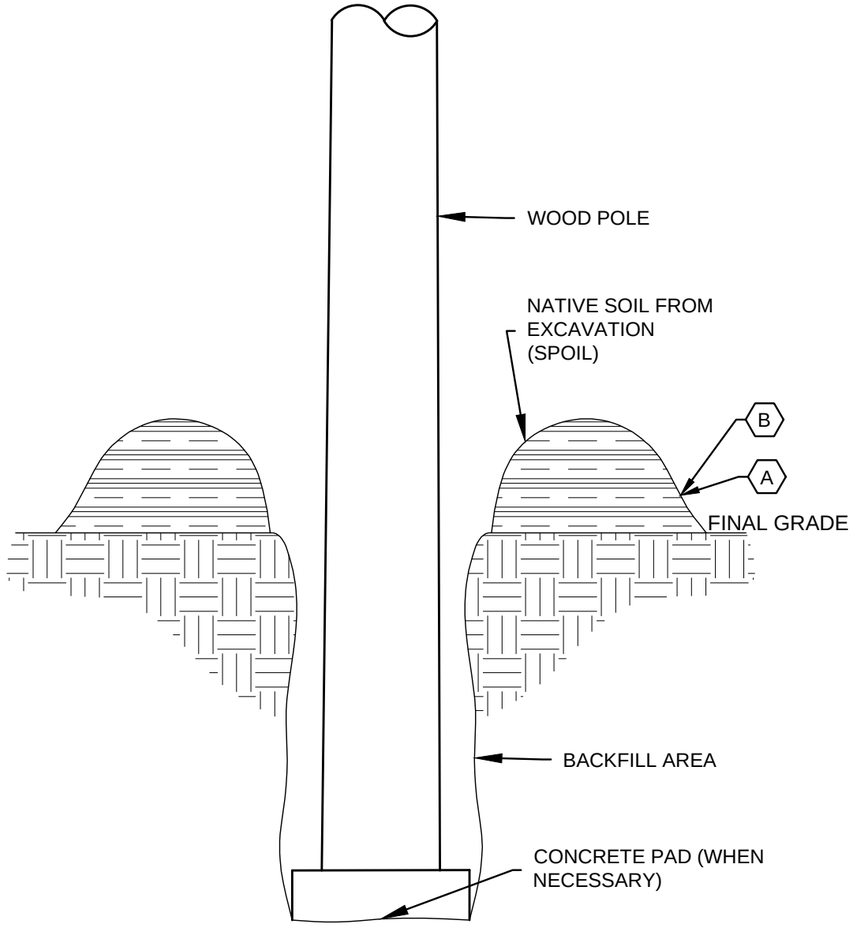


DETAIL 1
POLE FRAMING



DETAIL 2
POLE SETTING

CODED NOTES:

(A) USE SPOIL FOR BACKFILL UNLESS OTHERWISE SPECIFIED BY ENGINEERING. IF WATER IS PRESENT IN SPOILS (MUD) OR IN EXCAVATION, BACKFILL WITH #8 LIMESTONE OR PEA GRAVEL, SEE SPECIFICATIONS.

(B) SPOIL AND LIMESTONE AGGREGATE BACKFILL IS TO BE TAMPED IN 6" LIFTS. POWER TAMPING SHOULD BE USED IF AVAILABLE.

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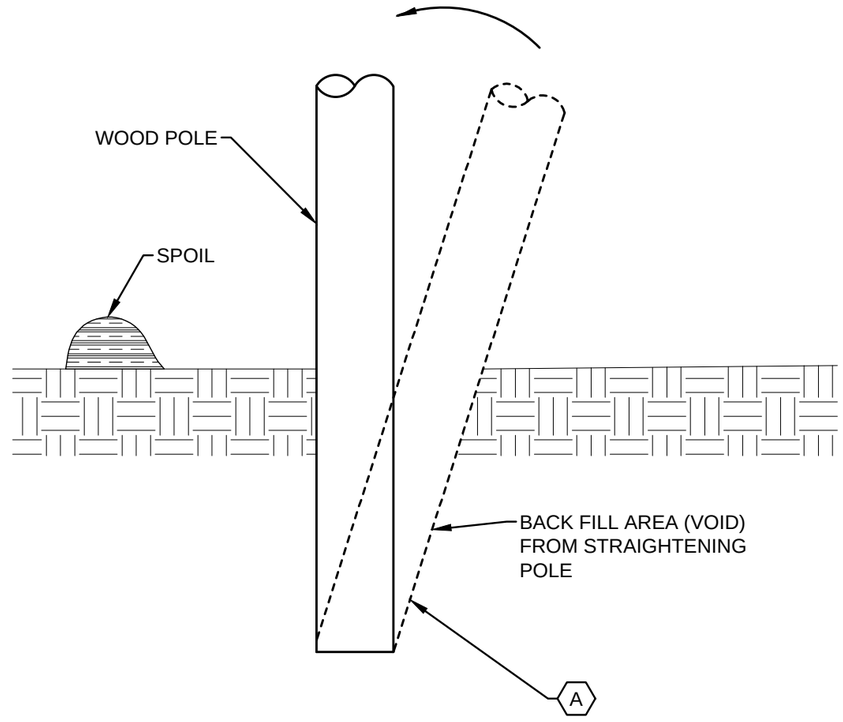
CODED NOTES:

(A) BACK FILL WITH #8 LIMESTONE COMPACTED IN 6" LIFTS WITH HYDRAULIC TAMPER.



DETAIL 3
POLE STRAIGHTENING

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