

SECTION 023080
TIMBER FOUNDATION PILING (S-95)

1. DESCRIPTION

This specification shall govern all work necessary for furnishing and installing timber piles required to complete the project.

2. EQUIPMENT

Equipment used shall be of current design, safe, and of the required capacity and condition necessary to complete the project.

The driving equipment shall meet the energy requirements set forth as follows:

Average Pile Diameter (Inches)	Minimum Energy Requirements (foot-pounds)
8 and less	7,000
8 to 18	15,000
Over 18	22,000

3. MATERIALS

Piles shall be southern yellow pine of size and length indicated on the drawings. Piles shall be branded in accordance with A.W.P.A. Standard ML. Piles shall comply with physical requirements of ASTM D25 "Standard Specification for Round Piles".

Foundation piles shall be treated in accordance with A.W.P.A. Standards C1-82 and C3-81 (or latest revision) to a minimum final retention of 12 pounds per cubic foot with creosote conforming to A.W.P.A. Standard P1-78 (or latest revision).

4. CONSTRUCTION METHODS

It is the intent of this specification that all proposed piles be driven to the capacity indicated in the drawing while also achieving maximum penetration. The determination of the optimum amounts of jetting and driving shall be done by the Engineer during the pile driving operation. The Engineer will establish jetting and driving lengths that will result in minimal pile splicing. Each pile shall initially jetted to an elevation or depth indicated by the Engineer. The pile shall then be driven until it achieves the capacity indicated in the drawing. The bearing capacity, R (tons), of the pile shall be determined by the "Engineer News" formula given as follows:

$$R = 2(WxH)/(S+1) \quad \text{For Drop Hammer}$$

$$R = 2(WxH)/(S+.1) \quad \text{For Single-Action Steam Hammer}$$

$$R = 2E/(S+.1) \quad \text{For Double-Action Steam Hammer}$$

where: W = weight of hammer (tons)
 H = length of drop (feet)
 R = pile bearing capacity (tons)
 S = final driving penetration (inches per blow)

If the pile is driven to the cut-off elevation and has achieved at least 80% of the specified capacity at the cut-off elevation, the pile shall be immediately spliced and driving continued until capacity is achieved. Splices shall not be allowed.

Final trim shall be treated in accordance with A.W.P.A. M4-80.

All piles (batter piles excluded) shall be driven vertically. Before beginning of the driving operation, lead shall be checked for plum. At cut-off, the piles shall not be over 3 inches from the position indicated on the drawing.

It shall be the responsibility of the contractor to select appropriate hammer, pile caps, tips, etc., as required to place the pile. All piles damaged during handling or placement shall be replaced by the contractor at no additional cost to the City.

The contractor shall cooperate with the Engineer during driving operation. No piling shall be driven in the absence of the Engineer. The contractor shall keep an accurate record of the pile driving operation. The records shall be kept on the jobsite by the contractor for the Engineer to review and shall be submitted to the Engineer, upon completion of the project.

5. CERTIFICATION & TESTING

Piles shall be branded in accordance with A.W.P.A. Standard M6 (latest revision). Compliance with specifications regarding physical characteristics and preservative retention shall be verified by lab reports from an independent testing lab. The reports shall be delivered with the material shipment. Failure to comply with these specifications will be cause to reject the shipment. The City reserves the right to have additional lab testing performed prior to acceptance of materials.

6. MEASUREMENT & PAYMENT

Unless indicated otherwise in the Proposal, piles will be measured by the linear foot along the centerline from the point at which the pile cut-off to the point of maximum penetration. Any length above cut-off elevation will not be measured for pay. Payment shall include, but not be limited to, transporting, storing, cutting, splicing, and placement of piles.