

**Section 1082**

**(D) Prequalification**

Refer to Subarticle 1081-1(E)

**(E) Acceptance**

Refer to Subarticle 1081-1(F)

**SECTION 1082  
STRUCTURAL TIMBER AND LUMBER**

**1082-1 GENERAL**

Use Southern Pine timber and lumber graded in accordance with the current grading rules of the Southern Pine Inspection Bureau unless otherwise specified or approved by the Engineer. Use stress rated grades equal to or higher than the grades specified. For temporary crossings, the use of stress rated lumber having stress ratings below those specified may be used if approved by the Engineer.

Have all timber and lumber, including any preservative treatment, inspected and/or tested at no cost to the Department by an NCDOT approved commercial inspection company before it is delivered to the project. Provide industry standard commercial inspection reports for each shipment of untreated timber or lumber before its use on the project. Provide industry standard commercial inspection reports and treatment test reports for each shipment of treated timber or lumber before its use on the project. Perform all timber and lumber treatment inspections in accordance with Standard M2 (Part A) of the AWWA Specifications. In addition, brand, hammer mark, ink stamp or tag each piece of timber or lumber with the approved commercial inspection company's unique mark to indicate it has been inspected.

**1082-2 UNTREATED TIMBER AND LUMBER**

Lumber that is 2 to 4 inches thick and 2 inches to 4 inches wide shall conform to Structural Light Framing, Grade No. 1 Dense MC19. Lumber that is 2 inches to 4 inches thick and 6 inches wide or wider shall conform to Structural Joists and Planks, Grade No. 1 Dense MC19. Lumber that is 5 inches and thicker along the least dimension shall conform to #1 Dense or Dense Select Structural (DSS). Rough lumber will be acceptable except where surfacing is called for by the contract. Rough lumber may vary  $\pm 1/4$  inch from the dimensions shown on the contract or bill of material.

**1082-3 TREATED TIMBER AND LUMBER**

**(A) General**

Grade marked lumber will not be required. Brand or ink stamp each piece of treated lumber in accordance with the AWWA Standard M6.

**(B) Bridges, Fender Systems and Piles**

Lumber for bridges that is 2 inches to 4 inches thick and 2 inches to 4 inches wide shall conform to Structural Light Framing, Grade No. 1 Dense. Lumber for bridges that is 2 inches to 4 inches thick and 6 inches wide and wider shall conform to Structural Joists and Planks, Grade No. 1 Dense. Lumber for bridges that is 5 inches and thicker along the least dimension shall conform to Structural Lumber, #1 Dense or Dense Select Structural (DSS). Lumber for fender systems shall conform to Structural Lumber, #1 Dense or Dense Select Structural (DSS).

Timber for piles shall meet ASTM D25 except that the timber shall be Southern Pine, and have at least a 2 inches sap ring or a 3 inches sap ring where called for by the contract or where the preservative is creosote and the retention is greater than 18 lbs/cf.

Rough lumber will be acceptable except where surfacing is called for by the contract or bills of material. Rough lumber may vary  $\pm 1/4$  inch from the dimensions shown in the

1 plans or bill of material. Dressed lumber may be 1/8 inch scant from the dimensions  
2 shown in the plans or bill of material. A 1/4 inch tolerance in length will be permitted.

3 **(C) Guardrail Posts**

4 Lumber for guardrail posts shall conform to Timbers, Grade No.1. Rough lumber will be  
5 acceptable. An allowable tolerance of 3/8 inch scant will be permitted from nominal  
6 dimensions.

7 **(D) Fence Posts and Braces**

8 Sawed fence posts and braces no larger than 4 inches x 4 inches shall conform to  
9 Structural Light Framing, Grade No. 2. Sawed fence posts and braces larger than  
10 4 inches x 4 inches shall conform to Timbers, Grade No. 1.

11 Round lumber shall meet Subarticle 1050-2(A).

12 Use fully dressed S4S lumber for fence posts.

13 An allowable tolerance of 1/2 inch scant will be permitted from nominal dimensions of  
14 sawed and dressed lumber.

15 **(E) Sign Posts and Battens**

16 Lumber for sign posts no larger than 4 inches x 4 inches shall conform to Structural Light  
17 Framing, Grade No. 1 MC19. Lumber for sign posts larger than 4 inches x 4 inches and  
18 lumber for sign battens shall conform to Timbers, Grade No. 1. Use fully dressed S4S  
19 lumber for sign posts and battens.

20 An allowable tolerance of 1/2 inch scant will be permitted from nominal dimensions of  
21 sign posts. A tolerance of 1 inch under and 3 inches over will be permitted in the length  
22 of the post.

23 **(F) Poles**

24 Timber for poles shall meet ANSI O5.1 except the timber shall be treated Southern Pine  
25 or treated Douglas Fir. Use 40 feet Class 3 poles unless otherwise specified in the  
26 contract.

27 **1082-4 PRESERVATIVE TREATMENT**

28 **(A) General**

29 Give all timber and lumber required to be treated a preservative treatment in accordance  
30 with AWPAs Standards. The required retention of chromated copper arsenate is specified  
31 on the oxide basis. Preservative retention will be determined by the assay method.

32 After treatment, handle the timber and lumber carefully with rope slings, without sudden  
33 dropping, breaking of the fibers, bruising or penetrating the surface with tools or hooks.

34 Treated timber and lumber will not be accepted for use unless it has been inspected and  
35 found satisfactory, both before and after treatment, and shall be delivered to the project  
36 site in a condition acceptable to the Engineer.

37 Use treating plants that have laboratory facilities at the plant site for use of the inspector  
38 in accordance with AWPAs Standard T1.

39 **(B) Timber Preservatives**

40 Use timber preservatives conforming to AWPAs Standard U1 and T1.

41 **(C) Bridges, Fender Systems and Piles**

42 Treat timber and lumber for bridges and fender systems in accordance with  
43 AWPAs Standard U1, except the type of preservative and the retention of preservative will  
44 be as required by the contract.

## Section 1082

1 Treat piles in accordance to AWP Standard U1 and T1, except the type of preservative  
2 and the retention of preservative will be as required by the contract.

### 3 **(D) Guardrail Posts**

4 Treat guardrail posts in accordance to AWP Standard U1 and T1, except require  
5 retention of preservative as below.

6 Give all guardrail posts a preservative treatment of creosote, pentachlorophenol or  
7 chromated copper arsenate. The same type of preservative is to be used throughout the  
8 entire length of the project.

9 Minimum retention for creosoted timber will be 12 lbs. of preservative per cubic foot of  
10 wood. Minimum retention for timber treated with pentachlorophenol will be 0.6 pound  
11 of dry chemical per cubic foot of wood. Minimum retention for timber treated with  
12 chromated copper arsenate will be 0.6 lb. of dry chemical per cubic foot of wood.

### 13 **(E) Fence Posts and Braces**

14 Treat sawed posts and braces in accordance with AWP Standard U1 and T1, except  
15 require retention of preservative as below.

16 Treat round posts and braces in accordance with AWP Standard U1 and T1, except  
17 require retention of preservative as below.

18 Before treatment, peel round posts and braces cleanly for their full length, remove all  
19 bark and innerskin, and trim all knots and projections flush with the surface of the  
20 surrounding wood. Machine peeling will be permitted. Cut the ends to the proper length  
21 before treatment.

22 Give all fence posts and braces a preservative treatment of either creosote,  
23 pentachlorophenol, or chromated copper arsenate. The same type of preservative shall be  
24 used throughout the entire length of the project.

25 Minimum retention for creosoted sawed timber will be 10 lbs. of preservative per cubic  
26 foot of wood. Minimum retention for sawed timber treated with pentachlorophenol will  
27 be 0.5 lb. of dry chemical per cubic foot of wood. Minimum retention for sawed timber  
28 treated with chromated copper arsenate will be 0.5 lb. of dry chemical per cubic foot of  
29 wood.

30 Minimum retention for creosoted round timber will be 8 lbs. of preservative per cubic  
31 foot of wood. Minimum retention for round timber treated with pentachlorophenol will  
32 be 0.4 lb. of dry chemical per cubic foot of wood. Minimum retention for round timber  
33 treated with chromated copper arsenate will be 0.4 lb. of dry chemical per cubic foot of  
34 wood.

### 35 **(F) Sign Posts and Battens**

36 Treat sign posts and battens in accordance with AWP Standard U1 and T1, except  
37 require retention of preservative as below.

38 Give all sign posts and battens a preservative treatment of either pentachlorophenol or  
39 chromated copper arsenate. The same type of preservative shall be used throughout the  
40 entire length of the project.

41 Minimum retention for timber treated with pentachlorophenol will be 0.6 lb. of dry  
42 chemical per cubic foot of wood. Minimum retention for timber treated with chromated  
43 copper arsenate will be 0.6 lb. of dry chemical per cubic foot of wood.

44 All timber shall have moisture content of not greater than 19% before treatment. Redry  
45 timber treated with chromated copper arsenate after treatment until it has moisture  
46 content of not greater than 25%.

**(G) Poles**

Treat poles in accordance with AWWA Standard U1 and T1, except require retention of preservative as below.

Give all poles a preservative treatment of either pentachlorophenol, or chromated copper arsenate. The same type of preservative shall be used throughout the entire length of the project.

Minimum retention for poles treated with pentachlorophenol will be 0.45 lb. by assay of dry chemical per cubic foot of wood. Minimum retention for poles treated with chromated copper arsenate will be 0.6 lb. by assay of dry chemical per cubic foot of wood.

## SECTION 1084 PILES

**1084-1 PILES****(A) Treated Timber Piles**

Timber for treated timber piles shall meet Article 1082-3. Give treated timber piles a preservative treatment in accordance with Article 1082-4.

**(B) Steel Piles**

See Section 1076 for galvanized steel piles. Before incorporating steel piles into the work, obtain all applicable certified mill test reports clearly identifiable to the lot of material by heat numbers, submit these reports to the Engineer for review and analysis and receive approval of such test reports from the Engineer. These requirements apply to both domestic. Transfer the heat number of each painted pile to the newly painted surface with a permanent marker of a color contrasting to the paint once the paint has fully cured.

**(1) Steel H-Piles**

Steel H-piles shall meet ASTM A572 Grade 50 or ASTM A588.

**(2) Steel Pipe Piles**

Steel pipe piles shall be of uniform diameter and conform to ASTM A252 Grade 3 modified (50,000 psi). Make all joints and seams in the pipe pile watertight. Unless otherwise indicated by the contract, the ends of pipe pile may be flame cut. Square flame cut ends with axis of the pile to provide a full uniform bearing over the entire end area when the pile is being driven. Welding procedure qualification for AWS D1.1 is required for pipe piles requiring splicing. The welding shall be performed by a Department certified welder.

**(C) Prestressed Concrete Piles**

Prestressed concrete piles shall meet Section 1078.

**1084-2 STEEL SHEET PILES**

Steel sheet piles detailed for permanent applications shall be hot rolled and meet ASTM A572 or ASTM A690 unless otherwise required by the plans. Steel sheet piles shall be coated as required by the plans. Galvanized sheet piles shall be coated in accordance with Section 1076. Metallized sheet piles shall be metallized in accordance with the Thermal Sprayed Coatings (Metallization) Program. Any portion of the metallized sheet piling encased in concrete shall receive a barrier coat. The barrier coat shall be an approved waterborne coating with a low-viscosity which readily absorbs into the pores of the aluminum thermal sprayed coating. The waterborne coating shall be applied at the spreading rate that results in a theoretical 1.5 mil dry film thickness. The manufacturer shall issue a letter of certification