

# ALABAMA DEPARTMENT OF TRANSPORTATION

DATE: May 10, 2012

Special Provision No. 12-0292

EFFECTIVE DATE: September 1, 2012

SUBJECT: Fencing Materials.

Alabama Standard Specifications, 2012 Edition, SECTION 871 shall be replaced by the following:

## SECTION 871 FENCING MATERIALS

### 871.01 Chain Link Fence.

Materials for chain link fence unless specified otherwise on the plans shall conform to the following:

(a) FABRIC.

Fence fabric shall meet the requirements of AASHTO M 181 using 2 inch uniform square mesh made from 0.148 inch (9 gage) {3.75 mm} wire with either a Type I, Class D (zinc coated steel); or Type II (Aluminum coated steel) finish. When a polyvinyl chloride coating is specified either a Class A or a Class B coating will be acceptable.

(b) SUPPORTS.

Supports shall meet the requirements of AASHTO M 181 and be either metallic coated steel Grade 1 or Grade 2, or Aluminum. Minimum sizes and weights of posts, rails and framing for all steel elements shall be as follows:

Steel Fence Supports & Framing	
Line Post 3-6 ft. {1 - 2 m} high fence	1.90" O.D. Grade 1 Pipe @ 2.72 #/ft. {48 mm O.D. Grade 1 Pipe @ 4.05 kg/m}
	1.90" O.D. Grade 2 Pipe @ 2.28#/ft. {48 mm O.D. Grade 2 Pipe @ 3.39 kg/m}
	1.875" x 1.625" x .105" "C" Section @ 1.85 #/ft. {47 mm x 41 mm x 2.5 mm "C" Section @ 2.75 kg/m}
Line Post 7-12 ft. {2.1 - 4 m} high fence	2.375" O.D. Grade 1 Pipe @ 3.65 #/ft. {60 mm O.D. Grade 1 Pipe @ 5.43 kg/m}
	2.375" O.D. Grade 2 Pipe @ 3.12 #/ft. {60 mm O.D. Grade 2 Pipe @ 4.64 kg/m}
	2.25" x 1.70" x .121" "C" Section @ 2.64 #/ft. {57 mm x 43 mm x 3 mm "C" Section @ 3.93 kg/m}
	2.25" x 1.70" x .143" "H" Section @ 3.26 #/ft. {57 mm x 43 mm x 3.5 mm "H" Section @ 4.85 kg/m}
Corner & Pull Posts 3-6 ft. {1 - 2 m} high fence	2.375" O.D. Grade 1 Pipe @ 3.65 #/ft. {60 mm O.D. Grade 1 Pipe @ 5.43 kg/m}
	2.375" O.D. Grade 2 Pipe @ 3.12 #/ft. {60 mm O.D. Grade 2 Pipe @ 4.64 kg/m}
	2.5" x 2.5" Sq. Tubing @ 5.70 #/ft. {63 mm x 63 mm Sq. Tubing @ 8.48 kg/m}
Corner & Pull Posts 7-12 ft. {2.1 - 4 m} high fence	2.875" O.D. Grade 1 Pipe @ 5.79 #/ft. {73 mm O.D. Grade 1 Pipe @ 8.62 kg/m}
	2.875" O.D. Grade 2 Pipe @ 4.64 #/ft. {73 mm O.D. Grade 2 Pipe @ 6.90 kg/m}
	3" x 3" Sq. Tubing @ 9.10 #/ft. {75 mm x 75 mm Sq. Tubing @ 13.54 kg/m}

Steel Fence Supports & Framing (continued)	
Gate Post for Gate Leaf Width 6 ft. {2 m} and less	2.875" O.D. Grade 1 Pipe @ 5.79 #/ft. {73 mm O.D. Grade 1 Pipe @ 8.62 kg/m}
	2.875" O.D. Grade 2 Pipe @ 4.64 #/ft. {73 mm O.D. Grade 2 Pipe @ 6.90 kg/m}
	2.5" x 2.5" Sq. Tubing @ 5.70 #/ft. {63 mm x 63 mm Sq. Tubing @ 8.48 kg/m}
Gate Post for Gate Leaf Width Over 6 ft. to 13 ft. {2 m to 4 m}	4.0" O.D. Grade 1 Pipe @ 9.11 #/ft. {102 mm O.D. Grade 1 Pipe @ 13.56 kg/m}
	4.0" O.D. Grade 2 Pipe @ 6.56 #/ft. {102 mm O.D. Grade 2 Pipe @ 9.76 kg/m}
Gate Post for Gate Leaf Width Over 13 ft. to 18 ft. {4 m to 6 m}	6.625" O.D. Pipe @ 18.97 #/ft. {168 mm O.D. Pipe @ 28.3 kg/m}
Gate Top & Middle Rail	1.660" O.D. Grade 1 Pipe @ 2.27 #/ft. {42 mm O.D. Grade 1 Pipe @ 3.38 kg/m}
	1.660" O.D. Grade 2 Pipe @ 1.84 #/ft. {42 mm O.D. Grade 2 Pipe @ 2.74 kg/m}
Gate Frames	1.660" O.D. Pipe @ 2.27 #/ft, {42 mm O.D. Pipe @ 3.38 kg/m}
	1.660" O.D. Grade 2 Pipe @ 1.84 #/ft. {42 mm O.D. Grade 2 Pipe @ 2.74 kg/m}
	2" x 2" Sq. Tubing @ 3.85 #/ft. {50 mm x 50 mm Sq. Tubing @ 5.73 kg/m}

Tolerances for Steel Tubing and Shapes		
Shape and Size	Dimension	Weight {Mass}
Tubular, to and incl. 1 1/2" {38 mm}	+ 1/64", - 1/32" {+ 0.5 mm, - 1 mm}	± 5%
Tubular, larger than 1 1/2" {38 mm}	± 1%	± 5%
"C" Section, to and incl. 2.25"x 1.70" {57 mm x 43 mm}	± 0.0625 { ± 1.5 mm}	± 5%
"H" Section, 2.25"x 1.70" {57 mm x 43 mm} & larger	± 0.0937 { ± 2.5 mm}	± 5%

Minimum sizes and weights {masses} of posts, rails and framing for all aluminum elements shall be as follows:

Aluminum Fence Supports & Framing	
Line Post 3-6 ft. {1 - 2 m} high fence	2.375" O.D. Pipe @ 1.25 #/ft. {60 mm O.D. Pipe @ 1.86 kg/m}
	2.25" x 1.95" "H" Section @ 1.25 #/ft. {57 mm x 49 mm "H" Section @ 1.86 kg/m}
Line Post 7-12 ft. {2.1 - 4 m} high fence	2.875" O.D. Pipe @ 2.00 #/ft. {73 mm O.D. Pipe @ 2.98 kg/m}
	2.5" x 2.5" Sq. Tubing @ 1.25 #/ft. {63 mm x 63 mm Sq. Tubing @ 1.86 kg/m}
Corner & Pull Posts 3-6 ft. {1 - 2 m} high fence	3.0" O.D. Pipe @ 2.62 #/ft. {75 mm O.D. Pipe @ 3.90 kg/m}
Corner & Pull Posts 7-12 ft. {2.1 - 4 m} high fence	3.0" O.D. Pipe @ 3.00 #/ft. {75 mm O.D. Pipe @ 4.46 kg/m}
Gate Post for Gate Leaf Width 6 ft. {2 m} and less	3.0" O.D. Pipe @ 2.62 #/ft. {75 mm O.D. Pipe @ 3.90 kg/m}
	3.0" x 3.0" Sq. Tubing @ 2.0 #/ft. {75 mm x 75 mm Sq. Tubing @ 2.98 kg/m}

Aluminum Fence Supports & Framing (continued)	
Gate Post for Gate Leaf Width Over 6 ft. to 13 ft. {2 m to 4 m}	4.0" O.D. Pipe @ 3.0 #/ft. {100 mm O.D. Pipe @ 4.46 kg/m}
Gate Post for Gate Leaf Width Over 13 ft. to 18 ft. {4 m to 6 m}	6.625" O.D. Pipe @ 7.0 #/ft. {168 mm O.D. Pipe @ 10.42 kg/m}
Gate Top & Middle Rail	1.660" O.D. Pipe @ 0.786 #/ft. {42 mm O.D. Pipe @ 1.17 kg/m}
Gate Frames	1.660" O.D. Pipe @ 0.786 #/ft. 42 mm O.D. Pipe @ 1.17 kg/m
	1.5" x 1.5" Sq. Tubing @ 0.684 #/ft. {38 mm x 38 mm Sq. Tubing @ 1.02 kg/m}

(c) **HARDWARE AND FITTINGS.**

Hardware and fittings shall meet the requirements of AASHTO M 181 and be either metallic coated steel or Aluminum.

(d) **MISCELLANEOUS WIRE.**

Tension wire shall be metallic coated steel or aluminum as per AASHTO M 181. Wire used for tying shall be either No. 11 gage {3 mm} metallic coated steel or aluminum.

**871.02 Woven Wire Fence.**

Materials for woven wire fence unless specified otherwise on the plans shall conform to the following:

(a) **FABRIC.**

Fence fabric shall meet the requirements of ASTM A 116, Zinc Coated Steel Woven Wire Fabric, 1047-6-9, Grade 60, Class 3, or ASTM A 584, Aluminum Coated Steel Woven Wire Fabric, 1047-6-9.

When so designated on the plans for replacement of farm fencing, or fencing placed as a right-of-way consideration, etc., the Contractor may at his option use fabric as listed above or zinc coated steel wire, ASTM A 116, 1047-6-12 ½, Class 1 coating unless otherwise noted on the plans.

(b) SUPPORTS AND FRAMING.

Supports for woven wire fence shall be either wood or steel as noted on plan details and if not specified either may be used. Support requirements are as follows:

1. STEEL.

Steel supports shall meet the requirements of either AASHTO M 181, metallic coated steel posts, rails, or gate frames, Grade 1 or Grade 2, or posts meeting AASHTO M 281, 8 feet {2.4 m} long, galvanized to AASHTO M 111, with anchor plates.

When so designated on the plans for replacement of farm fencing, or fencing placed as a right-of-way consideration, etc., the Contractor may at his option use posts as listed above or painted steel posts meeting AASHTO M 281, unless otherwise noted on the plans.

Minimum sizes and weights of posts, braces and framing for all steel elements shall be as follows:

Steel Fence Supports & Framing	
Line Post	1.90" O.D. Grade 1 Pipe @ 2.72 #/ft. {48 mm O.D. Grade 1 Pipe @ 4.05 kg/m}
	1.90" O.D. Grade 2 Pipe @ 2.28 #/ft. {48 mm O.D. Grade 2 Pipe @ 3.39 kg/m}
	1.875" x 1.625" x .105" "C" Section @ 1.85 #/ft. {47 mm x 41 mm x 2 mm "C" Section @ 2.75 kg/m}
	Studded "T" Post with Spade Plate @ 11.3 #/post {Studded "T" Post with Spade Plate @ 5.1 kg/post}
Corner, End & Pull Posts	2.375" O.D. Grade 1 Pipe @ 3.65 #/ft. {60 mm O.D. Grade 1 Pipe @ 5.43 kg/m}
	2.375" O.D. Grade 2 Pipe @ 3.12 #/ft. {60 mm O.D. Grade 2 Pipe @ 4.64 kg/m}
Brace Posts	1.660" O.D. Grade 1 Pipe @ 2.27 #/ft. {42 mm O.D. Grade 1 Pipe @ 3.38 kg/m}
	1.660" O.D. Grade 2 Pipe @ 1.84 #/ft. {42 mm O.D. Grade 2 Pipe @ 2.74 kg/m}
Gate Post, Hinge Side	4.0" O.D. Grade 1 Pipe @ 9.11 #/ft. {102 mm O.D. Grade 1 Pipe @ 13.56 kg/m}
	4.0" O.D. Grade 2 Pipe @ 6.56 #/ft. {102 mm O.D. Grade 2 Pipe @ 9.76 kg/m}
Gate Post, Latch Side	2.375" O.D. Grade 1 Pipe @ 3.65 #/ft. {60 mm O.D. Grade 1 Pipe @ 5.43 kg/m}
	2.375" O.D. Grade 2 Pipe @ 3.12 #/ft. {60 mm O.D. Grade 2 Pipe @ 4.64 kg/m}
Gate Frames	1.90" O.D. Grade 1 Pipe @ 2.72 #/ft. {48 mm O.D. Grade 1 Pipe @ 4.05 kg/m}
	1.90" O.D. Grade 2 Pipe @ 2.28 #/ft. {48 mm O.D. Grade 2 Pipe @ 3.39 kg/m}

Tolerances in dimensions and weight shall be the same as specified in Subarticle 871.01(b). Weight tolerance for "T" posts shall be ± 5%.

2. WOOD.

Wood supports shall meet the requirements noted herein except as modified by details shown on the plans. Posts shall be sound and free from decay, other defects, or loose knots. Posts may be round or square sawed meeting the applicable requirements of Section 833. The slope of the grain in sawed posts shall not exceed one in ten. All posts shall be reasonably straight. Round posts shall be free of multiple crooks and in no case will posts, where the geometric center lies more than 1 inch {25 mm} outside of a straight line drawn from the center of the post at the butt end, less the burying depth to the center of the tip end, be acceptable. Square sawn posts shall not have crooks in excess of

1 inch in 5 feet {25 mm in 1.5 m}. The length and sizes of wood posts shall be as detailed on the plans within the following tolerances.

When so designated on the plans for replacement of farm fencing, the Contractor may at his option use posts as listed above or wood posts purchased from local dealers, unless otherwise noted on the plans.

a. Round Posts.

The furnished posts may include posts from the minimum diameter specified up to, but not to include, those 1 inch {25 mm} or larger than the minimum diameter designated. When tapered posts are furnished, the diameter at the butt end should not be more than one and one-half inches larger than the diameter measured at the tip end.

b. Sawed Posts.

The furnished posts shall be of the dimensions shown on the plans, plus 1/2 inch {12 mm} or minus 1/4 inch {6 mm}.

c. Lengths.

The furnished posts shall not measure over one inch less than specified on the plans. Lengths greater than those shown on plans may be acceptable at the discretion of the Engineer, if not detrimental to the appearance of the fence.

All posts shall be pressure treated in accordance with the provisions of Section 833. All job cuts shall be painted with three coats of hot preservative composed of 60 percent Creosote Oil and 40 percent roofing pitch.

The Contractor shall have the choice of selecting one of the types of treated timber posts shown on the plans. Once a choice is made and erection begun, the Contractor will not be permitted to change to another type without the written permission of the Engineer.

(c) FASTENERS.

Fasteners for attaching fencing fabric and wire to wooden posts shall be staples formed from 0.148 inch (9 gage) {3.75 mm} diameter galvanized wire, approximately 1.5 inches {38 mm} long. Fasteners for attaching wire to steel posts shall be as designated in Subarticle 871.01(d).

**871.03 Barbed Wire Fence.**

Materials for Barbed Wire Fence shall be as follows, except as modified by plan details:

(a) BARBED WIRE.

Barbed wire shall meet the requirements of AASHTO M 280 with a Class 3 galvanized coating, or Aluminum coated steel barbed wire, Type I (Standard), ASTM A 585.

When so designated on the plans for replacement of farm fencing, or fencing placed as a right-of-way consideration, etc., the Contractor may at his option use wire as listed above or substitute wire meeting AASHTO M 280, with a Class 1 coating unless otherwise noted on the plans.

(b) SUPPORTS AND FRAMING.

Supports and framing shall meet the requirements of Item 871.02(b)2.

(c) FASTENERS.

Fasteners shall meet the requirements of Subarticle 871.02(c).

**871.04 Gates.**

Gates, where required, shall be swing gates as detailed or specified on the plans. The gate frames shall be the height of the top of the posts and covered with the same wire and fabric used on the fence. The frames shall be formed from tubular shapes meeting the requirements noted in Subarticle 871.01(b) complying with plan details, with all joints welded, or otherwise constructed, to form a rigid unit.

Gates for woven wire fencing of another acceptable design may be permitted provided that the gates are so constructed that they will not sag and the design has been approved in writing.

All gates shall be furnished complete with approved (tamper-proof) hinges, latches, auxiliary braces, and all other necessary fittings, including a heavy padlock with two keys and one master key for each gate furnished.

**871.05 Concrete For Setting Posts.**

Concrete for setting posts, etc., shall be Class A concrete complying with applicable portions of Section 501, with the following modifications.

The concrete may be dry batched at a central mixing plant and delivered to the project. Before the concrete is placed water shall be added. This may be done in small amounts as needed and mixed on a mixing board or mortar box. After water is added, the mix shall be used within sixty (60) minutes. Posts, braces and brace struts shall be held in proper position until the concrete hardens. The concrete for all corner, brace and line posts shall have cured for 72 hours before any strain is placed on them.