

# VERMONT CONSTRUCTION SPECIFICATION

## 48 – TIMBER FABRICATION, INSTALLATION AND PAINTING

### 1. Scope

The work shall consist of the construction of timber structures and timber parts of composite structures. The work shall also consist of cleaning and preparing wood surfaces and applying protective paint coatings.

### 2. Material

#### A. Structural Timber and Lumber

**Grading** - Structural timber and lumber shall be graded in accordance with the grading rules and standards, applicable to the specified species adopted by a lumber grading or inspection bureau or agency recognized as being competent and that conform to the basic principles of ASTM Standard D245. The material supplied according to the commercial grading rules shall be of equal or greater stress value than the specified stress-grade.

**Quality of material** - All material shall be sound wood free from decay and disease damage. Boxed heart pieces of Douglas fir or redwood shall not be used in stringers, floor beams, caps, posts, sills, or other principal structural members. Boxed heart pieces are defined as timber so sawed that at any section in the length of a sawed piece the pith lies entirely inside the four faces.

**Heartwood requirements** - All timber and lumber specified for use without preservative treatment shall contain a minimum of 75 percent heartwood on any diameter or on any side or edge, measured at the point where the greatest amount of sapwood occurs. This requirement shall not apply to timber and lumber for which pressure treatment with wood preservative is specified.

**Sizes** - The sizes specified are nominal sizes. Unless otherwise specified on the drawings, the material shall be furnished in American Standard dressed sizes.

**Marking** - Each piece of timber and lumber shall be legibly stamped or branded with an official grade identification. Plywood shall be legibly stamped with an official mark designating the grade, type, and surface finish as described in the cited Product Standard.

#### B. Wood Preservatives and Treatment

**Treating practices** - Treating practices and sampling, inspection, and test procedures shall conform to the requirements of ASTM D1760, "Standard Specification for Pressure Treatment of Timber Products."

**Preservatives** - The wood shall be treated with the specified type of preservative. Wood preservatives shall conform to the requirements of the applicable specifications list in ASTM D1760.

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**Quality of treated material** - Treated lumber, timber, piles, poles, or posts shall be free from heat checks, water bursts, excessive checking, results of chafing, or from any other damage or defects that would impair their usefulness or durability for the purpose intended. The use of s-irons is not permitted. Holes bored for tests shall be filled with tight fitting, treated wood plugs.

**Marking** - Each treated wood item delivered to the job site shall be marked as specified in ASTM D1760, unless otherwise specified on the drawings.

### C. Metal

Structural grade steel shall conform to the requirements of the applicable ASTM listed below:

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<u>Product</u>	<u>ASTM Specification</u>
Structural Steel	A36
High Strength Low-Alloy Structural Steel	A242, or A588
Carbon Steel Plates of Structural Quality to be Bent, Formed, Shaped Cold	A283, Grade C
Carbon Steel Sheets of Structural Quality	A570, Grade 40, or A611, Grade D
Carbon Steel Strip of Structural Quality	A570, Grade 36

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Commercial or merchant quality steel shall conform to the requirements of the applicable ASTM listed below:

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<u>Product</u>	<u>ASTM Specification</u>
Carbon Steel Bars	A575, Grade M1015 to M1031
Carbon Steel Sheets	A569
Carbon Steel Strips	A569
Zinc-coated Carbon Steel Sheets	A653, or A924

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Aluminum alloy products shall conform to the requirements of the applicable ASTM standard listed below. Unless otherwise specified, alloy 6061-T6 shall be used.

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<u>Product</u>	<u>ASTM Specification</u>
Standard Structural Shape	B308
Extruded Structural Pipe and Tube	B429
Extruded Bars, Rods, Shapes and Tubes	B221
Drawn Seamless Tubes	B210
Rolled or Cold Finished Bars, Rods and Wire	B211
Sheet and Plate	B209

Hardware, except cast iron, shall be galvanized as specified for iron and steel hardware. Unless otherwise specified on the drawings, structural steel shapes, plates, and rods shall not be galvanized. Nuts, driftbolts, dowels, and screws shall be either wrought iron or steel.

Steel bolts shall conform to the requirements of ASTM Standard A307. High-strength bolts shall conform to the requirements of ASTM A325. The zinc coating for galvanized or zinc-coated bolts shall conform to the requirements of ASTM Standard A153 except that bolts 0.5 inch or less in diameter may be coated with electro-deposited zinc or cadmium coating conforming to the requirements of ASTM Standard B633, Service Condition SC 3, or ASTM A65, Type TS.

Washers shall be ogee gray iron castings or malleable iron castings unless washers cut from medium steel or wrought iron plate. Cast washers shall have a thickness equal to the diameter of the bolt and a diameter equal to four times the thickness. The thickness for plate washers shall be equal to half the diameter of the bolt, and the sides of the square shall be equal to four times the diameter of the bolt. Holes in washers shall have a maximum diameter of 1/8 inch larger than the diameter of the bolt. Split ring connectors, tooth ring connectors, and pressed steel shear plate connectors shall be manufactured from hot-rolled, low carbon steel conforming to the requirements of ASTM A711, Grade 1015. Malleable iron shear plate connectors and spike grid connectors shall be manufactured in conformance with the requirements of ASTM A47, Grade No. 35018. All connectors shall be of approved design and the type and size specified.

Steel welding electrodes shall conform to the requirements of American Welding Society Specification AWS A5.1, "Specification for Mild Steel Covered Arc-Welding Electrodes," except that they shall be uniformly and heavily coated (not washed) and shall be of such a nature that the coating does not chip or peel while being used with the maximum amperage specified by the manufacturer. No welds are permitted in truss rods or other main members of trusses or girders.

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Aluminum welding electrodes shall conform to the requirements of American Welding Society Specification AWS A5.10, "Specification for Aluminum and Aluminum-Alloy Welding Rods and Bare Electrodes."

Zinc coatings shall conform to the requirements of ASTM A123 for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products or as otherwise specified in the items of work and construction details of the Construction Specification.

### D. Paint

Unless otherwise specified on the drawings, painting material shall meet the following requirements:

- Exterior paint primer shall conform to the requirements of Federal Specification TT-P-25.
- Exterior oil paint shall conform to the requirements of Federal Specification TT-P-102. Unless otherwise specified, the color shall be white. The second coat of exterior oil paint may be thinned with mineral spirits conforming to the requirements of ASTM D235 or with pure gum turpentine. The amount of thinner shall not exceed 1 pint per gallon of paint.
- When tinting is required, it shall be accomplished by the addition of pigment-in-oil tinting colors conforming to the requirements of Federal Specification TT-P-381.

### 3. Workmanship

All framing shall be true and exact. Timber and lumber shall be accurately cut and assembled to a close fit and shall have even bearing over the entire contact surface. No open or shimmed joints will be accepted. Nails and spikes shall be driven with just sufficient force to set the heads flush with the surface of the wood. Deep hammer marks in wood surfaces shall be considered evidence of poor workmanship and may be sufficient cause for rejection of the work.

Holes for round driftpins and dowels shall be bored with a bit 1/16 inch smaller in diameter than that of the driftpin or dowel to be installed. The diameter of holes for square driftpins or dowels shall be equal to one side of the driftpin or dowel. Holes for lag screws shall be bored with a bit not larger than the body of the screw at the base of the thread.

Washers shall be used in contact with all bolt heads and nuts that would otherwise be in contact with wood. Cast iron washers shall be used when the bolt will be in contact with earth. All nuts shall be checked or burred effectively with a pointed tool after finally tightened.

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Unless otherwise specified on the drawings, surfacing, cutting, and boring of timber and lumber shall be completed before treatment. If field cutting or field repair of treated timber and lumber is approved, all cuts and abrasions shall be carefully trimmed and coated with two paint-on or swab-applied applications of a wood preservative that is not less than 5 percent (by weight) pentachlorophenol. A copper metal solution of 2 percent (by weight) copper naphthenate may be used as a replacement for pentachlorophenol, which is a controlled substance. After timber assembly, any unfilled holes shall be plugged with tightly fitting wooden plugs that have been treated with preservative as specified.

### 4. Handling and storing material

All timber and lumber stored at the site of the work shall be neatly stacked on supports a minimum of 12 inches above the ground surface and protected from the weather by suitable covering(s). Untreated material shall be staked and stripped to permit free circulation of air between the tiers and courses. Treated timber may be close-staked. The ground surface for the stockpile of timber and lumber shall be free of weeds and rubbish. The use of cant hooks, peavies, or other pointed tools except end hooks is not permitted in the handling of structural timber and/or lumber. Treated timber shall be handled with rope slings or by other methods that prevent the breaking or bruising of outer fibers or penetration of the surface in any manner.

### 5. Painting

#### A. Surface preparation

All surfaces to be painted/primed shall be thoroughly cleaned before the application of paint/primer. Pitch pockets and knots shall be scraped and sealed with a shellac varnish conforming to the requirements of ASTM D360. Previously painted surfaces shall be scraped and brushed to remove any checked or blistered paint and all excess chalk.

#### B. Application of paint/primer

Surfaces shall be clean and dry during paint/primer application. Surfaces of new wood shall be painted with 1 brush coat of exterior primer paint and two brush coats of exterior oil paint unless otherwise specified.

Paints/primers shall be thoroughly mixed at the time of application.

Each paint and primer coat shall be applied in such a manner as to produce a coating film of uniform thickness with a finished surface free of runs, drops, ridges, laps, or excessive brush marks. The minimum drying time between applications shall be as prescribed by the manufacturer of the paint/primer and not before the previous paint/primer application being thoroughly dry.

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The surface of each dried coating shall be cleaned as necessary before application of the next coat.

The first coat of exterior oil paint shall be tinted off-color by the addition of 3 ounces of an appropriate tinting color per gallon of paint.

### **C. Atmospheric conditions**

Unless otherwise specified by the manufacturer of the coating products, paint and primer shall not be applied when the temperature of the wood surface or of the surrounding air is less than 45 degrees Fahrenheit. Coatings shall not be applied when atmospheric conditions result in moisture condensation on the surface to be painted/primed. Surfaces protected from atmospheric conditions by special cover or enclosure, heating, or ventilation shall remain to provide full protection until the paint/primer is thoroughly dry.