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This MANU-SPEC® utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM), including *MasterFormat*™, *SectionFormat*™ and *PageFormat*™. A MANU-SPEC is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes typically precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate trademark and registration symbols, product model numbers, styles and types are used in Specifier Notes and in the specification text Article titled "Acceptable Material." Trademark and registration symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

This MANU-SPEC specifies laminated strand lumber (LSL) as manufactured by LP - Building Products. Revise MANU-SPEC section number and title below to suit project requirements, specification practices and section content. Refer to CSI *MasterFormat* for other section numbers and titles.

SECTION 06 17 00
SHOP-FABRICATED STRUCTURAL WOOD

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Laminated Strand Lumber.

Specifier Note: Revise paragraph below to suit project requirements. Add section numbers and titles per CSI *MasterFormat* and specifier's practice.

- B. Related Requirements:

Specifier Note: Include in this Paragraph only those sections and documents that directly affect the work of this section. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the paragraph below. Do not include Division 00 documents or Division 01 sections since it is assumed that all technical sections are related to all project Division 00 documents and Division 01 sections to some degree. Refer to other documents with caution since referencing them may cause them to be considered part of the Contract.

- 1. Section [06 10 00 Rough Carpentry] [_____].

Specifier Note: Paragraph below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain References paragraph when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Division 01 References Section may establish the edition date of standards. This paragraph does not require compliance with standard. It is a listing of all references used in this section. Only include here standards that are referenced in the body of the specification in PARTS 1, 2 and/or 3. Do not include references to building codes at any level.

1.02 REFERENCES

- A. International Code Council (ICC-ES):
 - 1. Report Number: ICC-ES ESR-2403.
- B. Canadian Construction Materials Centre (CCMC):
 - 1. Report Number: CCMC 13319-R.



Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor, either before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Conditions of the Contract and Section [01 33 00 - Submittal Procedures].

1.03 SUBMITTALS

- A. General: Submit listed submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].
- B. Product Data: Submit the following for specified products:
 - 1. Product data, including manufacturer's data sheet, for specified products.
 - 2. Manufacturer's installation instructions.
 - 3. Catalog pages illustrating products to be incorporated into project.
 - 4. Material Safety Data Sheets (MSDS).
- C. Shop Drawings: Indicate information on shop drawings as follows:
 - 1. Provide drawings indicating lumber grade, size, location and connection details.
- D. Design Data: Submit design calculations signed and sealed by a professional engineer registered in the State of [_____].
- E. Test Reports: Certified test reports from recognized testing laboratories showing compliance with specified [structural] [fire] [sound] [and] [_____] performance characteristics and physical properties.
- F. Qualification Statements:
 - 1. Submit letter of verification for Manufacturer's Qualifications.
 - 2. Submit letter of verification for Installer's Qualifications.
- G. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics, criteria and physical requirements.
- H. Closeout Submittals:
 - 1. Warranty: Submit warranty documents specified.

Specifier Note: Article below should include prerequisites, standards, limitations and criteria that establish an overall level of product and workmanship quality for this section. Coordinate article below with Division 01 Quality Assurance Section.

1.04 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer:
 - a. Having minimum [5] [_____] years experience manufacturing components similar to or exceeding requirements of project.
 - b. Having sufficient capacity to produce and deliver required materials without causing delay in work.
 - 2. Installer:
 - a. Experienced in performing work of this section and who has specialized in installation of work similar to that required for this project.
 - b. Acceptable to the manufacturer.

Specifier Note: Retain the following Paragraph when certification related to sustainability submittals is a project requirement.

- B. Sustainability Standards Certification: Provide certification for [_____] materials certified by [insert certification organizations name] in accordance with [certification organizations standard].

1.05 DELIVERY, STORAGE & HANDLING

- A. Delivery and Acceptance Requirements:
 - 1. Deliver material in accordance with Section [01 61 00 - Common Product Requirements] and in accordance with manufacturer's written instructions.
 - 2. Deliver materials in manufacturer's original packaging with identification labels intact and in sizes to suit project.

- a. Carefully unload lumber by lifting, using forklifts or cranes to avoid damage.
- B. Storage and Handling Requirements:
 1. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
 - a. Keep materials dry and store on a hard, dry, level surface not in contact with the ground.
 - b. Store materials in wrapped and strapped bundles stacked no more than 10 feet (3 m) high.
 - c. Support bundles to prevent excessive bowing. Support and separate bundles with 2 x 4 or larger dimension lumber spaced no more than 10 feet (3 m) apart. Keep supports in line vertically.
 2. Handle individual pieces in a manner to prevent physical damage during measuring, cutting and erection.
- C. Packaging Waste Management:

Specifier Note: The disposal of packaging waste into landfill sites demonstrates an inefficient use of natural resources and consumes valuable landfill space. Specifying appropriate packaging and construction waste management and disposal procedures may contribute to points required for USGBC's LEED® construction project certification.

Specifier Note: Include the following Articles to specify information that will provide direction to the Contractor for the disposal of construction waste materials using environmentally responsible methodology other than landfill resources.

1. Separate waste materials for [reuse] [and] [recycling] in accordance with [Section 01 74 19 - Construction Waste Management and Disposal].

Specifier Note: USGBC's LEED® certification includes credits for the diversion of construction waste from landfill. Diversion can be tracked by either weight or volume but must be consistent for all materials. Manufacturer may reclaim packaging and delivery materials for recycling.

2. Remove packaging materials from site and dispose of at appropriate recycling facilities.
3. Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate onsite bins] for recycling.
4. Fold metal and plastic banding, flatten and place in designated area for recycling.

Specifier Note: Add additional Subparagraphs to include pallets, crates, padding and other packing materials that are typically associated with the specified products.

5. Remove:
 - a. Pallets from site [and return to supplier or manufacturer].
 - b. [_____].

1.06 WARRANTY:

- A. Refer to Contract Conditions and Section [01 78 36 - Warranties] for project warranty provisions
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and does not limit, other rights Owner may have under other Contract Documents.
 1. Warranty Term: Limited lifetime warranty commencing on date of substantial completion.

PART 2 PRODUCTS

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal" or "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.01 LAMINATED STRAND LUMBER

Specifier Note: Paragraph below is an addition to CSI *SectionFormat* and a supplement to MANU-SPEC. Retain or delete paragraph

below per project requirements and specifier's practice.

A. Manufacturer: LP - Building Products.

1. Contact: 414 Union St., Nashville, TN 37219; Telephone: (800) 999-9105, (910) 762-9878; Fax: (910) 763-8178; E-mail: customer.support@lpcorp.com; website: www.lpcorp.com.

Specifier Note: If a Division 01 Section covers substitutions on a project-wide basis, do not repeat the requirement here. Do not include substitution procedures here unless they are not defined elsewhere.

2. Single Source Responsibility: Provide components and materials specified in this section from a single manufacturer.
3. Substitution Limitations:
 - a. Substitutions: [In accordance with Section 01 25 13 - Product Substitution Procedures] [_____] [No substitutions permitted].

Specifier Note: Include an overall description of the system, assembly, product or material. Include required properties or characteristics that do not obviously belong under other titles. Examples: configuration, size and color.

B. Description: Laminated Strand Lumber, including the following:

Specifier Note: LSL is limited to a maximum of 4 plies for thicknesses of 1 3/4 inches (44.5 mm) and less and to 2 plies for all other thicknesses.

1. LP LSL 1730F_b-1.35E:
 - a. Material: Strands arranged parallel to the finished product's length.
 - b. Adhesive: MDI, bonded and cured under pressure and heat.
 - c. Thickness: [1 1/4 inches (31.8 mm)] [1 1/2 inches (38.1 mm)] [1 3/4 inches (44.5 mm)] [3 1/2 inches (90 mm)].
 - d. Plies: [1] [2] [3] [4].
 - e. Depth: [3 1/2 inches (90 mm)] [4 1/4 inches (108 mm)] [4 3/8 inches (111 mm)] [5 1/2 inches (140 mm)] [7 1/4 inches (184 mm)] [9 1/4 inches (235 mm)] [9 1/2 inches (241 mm)] [11 1/4 inches (286 mm)] [11 7/8 inches (302 mm)] [14 inches (356 mm)] [16 inches (406 mm)] [18 inches (457 mm)] [20 inches (508 mm)] [22 inches (559 mm)] [24 inches (610 mm)].
 - f. Water Resistant Coating: [Provide proprietary edge and end seal coating] [No coating required].
2. LP LSL 2360F_b-1.55E:
 - a. Material: Strands arranged parallel to the finished product's length.
 - b. Adhesive: MDI, bonded and cured under pressure and heat.
 - c. Thickness: [1 1/4 inches (31.8 mm)] [1 1/2 inches (38.1 mm)] [1 3/4 inches (44.5 mm)] [3 1/2 inches (90 mm)].
 - d. Plies: [1] [2] [3] [4].
 - e. Depth: [3 1/2 inches (90 mm)] [4 1/4 inches (108 mm)] [9 1/4 inches (235 mm)] [9 1/2 inches (241 mm)] [11 1/4 inches (286 mm)] [11 7/8 inches (302 mm)] [14 inches (356 mm)] [16 inches (406 mm)].
 - f. Water Resistant Coating: [Provide proprietary edge and end seal coating] [No coating required].
3. LP LSL 2640F_b-1.75E:
 - a. Material: Strands arranged parallel to the finished product's length.
 - b. Adhesive: MDI, bonded and cured under pressure and heat.
 - c. Thickness: [1 1/4 inches (31.8 mm)] [1 1/2 inches (38.1 mm)] [1 3/4 inches (44.5 mm)] [3 1/2 inches (90 mm)].
 - d. Plies: [1] [2] [3] [4].
 - e. Depth: [3 1/2 inches (90 mm)] [4 1/4 inches (108 mm)] [9 1/4 inches (235 mm)] [9 1/2 inches (241 mm)] [11 1/4 inches (286 mm)] [11 7/8 inches (302 mm)] [14 inches (356 mm)] [16 inches (406 mm)] [18 inches (457 mm)].
 - f. Water Resistant Coating: [Provide proprietary edge and end seal coating] [No coating required].

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Contract Conditions and Section 01 41 00 - Regulatory Requirements. Repetitive statements should be avoided.

C. Regulatory Requirements:

1. In accordance with Section [01 41 00 - Regulatory Requirements].
2. [_____].

D. Sustainability Characteristics:

1. [_____].

Specifier Note: Performance requirements are usually stated with some form of evaluation or verification.

E. Performance Requirements: Provide laminated veneer lumber systems with the following performance properties:

Specifier Note: Select and/or insert loading criteria to conform to project requirements.

1. Design Loads: [_____].
2. Allowable Stresses for Beams:
 - a. Grade: [2640F_b-1.75E] [2360F_b-1.55E] [1730F_b-1.35E].
 - b. Bending (F_b): [2640] [2360] [1730].
 - c. Modulus of Elasticity (×10⁶): [1.75] [1.55] [1.35].
 - d. Compression (Parallel to Grain) (F_c): [2450] [2175] [1650].
 - e. Compression (Perpendicular to Grain) (F_{cp}): [950] [875] [750].
 - f. Shear (F_v): [410] [410] [410].
3. Section Properties:
 - a. Weight (lb/ft): [_____].
 - b. Maximum Moment (lb-ft): [_____].
 - c. Maximum Shear (lb): [_____].
 - d. Moment of Inertia (inch⁴): [_____].

Specifier Note: The term "design criteria" is used when describing the intended characteristics of a product for which the Contractor is assigned design responsibility.

F. Design Criteria: Provide laminated strand lumber to meet the following criteria:

Specifier Note: Select and/or insert deflection criteria to conform to project requirements.

1. Deflection Requirements:
 - a. Live load deflection limit of no more than [1/600] [1/480] [1/360] [specify limit] of span or a maximum of [_____] inches (mm) of deflection.
 - b. Total load deflection limit of no more than [1/360] [1/240] [1/180] [specify limit] of span or a maximum [_____] inches (mm) of deflection.

2.02 ACCESSORIES

A. Proprietary products/systems to assist in the installation of laminated strand lumber, including:

1. Framing Connectors:
 - a. Manufacturer: [Simpson Strong-Tie] [USP Lumber Connectors] [_____].
 - b. Manufacturer Type Designation: [Top-mount] [Face-mount] [45 degree skewed] [Rafter-to-ridge] [Rafter-to-plate] [_____].

- c. Acceptable Material: [_____].
- 2. Nails:
 - a. Type: [Common] [Box] [Sinker].

Specifier Note: For 1 3/4 inch (44.5 mm) LSL, manufacturer recommends 16d (3 1/2 inch nails). For 1 1/2 inch (38.1 mm) LSL, manufacturer recommends 10d (3 inch nails).

- b. Size: [16d (3 1/2 inch)] [10d (3 inch)].
- 3. Bolts:
 - a. Type: [_____].
 - b. Size: [_____].
 - c. Coating: [_____].

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine conditions, substrates and work. Coordinate with Section [01 71 00 - Examination and Preparation].
 - 1. Inform [Owner] [Architect] [Consultant] of unacceptable conditions immediately upon discovery.
 - 2. Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval from [Owner] [Architect] [Consultant]].
 - 3. [_____].
- B. Verification of Conditions: Verify that conditions of substrates previously installed under other sections or contracts are acceptable for product installation in accordance with manufacturer's instructions prior to installation of [describe product].
 - 1. [_____].

3.02 PREPARATION

Specifier Note: Specify preparatory work, such as selective removal of existing work, required prior to execution of new work. Specify requirements for exposure or removal of existing assemblies, components, products or materials.

- A. Demolition/Removal:
 - 1. [_____].

3.03 ERECTION

- A. Coordinate erection of Laminated Strand Lumber with Section [01 73 00 - Execution] and Section [01 73 16 - Erection].
- B. [_____].

3.04 INSTALLATION

- A. Coordinate installation of laminated strand lumber in accordance with Section [01 73 00 - Execution] and Section [01 73 19 - Installation].
- B. Coordinate laminated strand lumber work with work of other trades for proper time and sequence to avoid construction delays.
- C. Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions and approved shop drawings.
 - 1. Install laminated strand lumber plumb and level.
 - 2. Accurately fit, align, securely fasten and install free from distortion or defects.
 - 3. Temporary Bracing:
 - a. Securely brace LSL during construction by anchoring to the ground, foundation, a braced wall or other completed, stable section of the structure.
 - b. Support members laterally at end bearings and cantilevers.
 - c. Install all rim joists, blocking, connections and temporary bracing before erectors are allowed on the structure.

- d. Impose no loads other than the weight of the erectors on the structure before it is permanently sheathed.
- e. Exercise caution when removing temporary bracing to apply sheathing.
- f. After sheathing, do not exceed design loads on members with construction materials.
- g. All conditions calling for notched or drilled beams must be reviewed and approved by a licensed professional engineer.

D. [_____].

3.05 CLEANING

- A. Perform cleanup in accordance with Section [01 74 00 - Cleaning and Waste Management] and Section [01 74 13 - Progress Cleaning].
- B. Upon completion, remove surplus materials, rubbish, tools and equipment.

Specifier Note: Specify special measures needed to minimize waste, collect recyclable waste and dispose of or recycle field-generated construction waste created during demolition, construction or final cleaning.

C. Waste Management:

- 1. Coordinate recycling of waste materials with Section [01 74 00 - Cleaning and Waste Management] and Section [01 74 19 - Construction Waste Management and Disposal].
- 2. Collect recyclable waste and dispose of or recycle field-generated construction waste created during demolition, construction or final cleaning.
- 3. Remove recycling containers and bins from site.
- 4. [_____].

3.06 PROTECTION

Specifier Note: Coordinate the following Article with Section 01 76 00 - Protecting Installed Construction.

- A. Protect installed product from damage during and after construction in accordance with Section [01 76 00 - Protecting Installed Construction] [_____].
- B. Repair damage to adjacent materials caused by laminated strand lumber installation.
- C. [_____].

END OF SECTION