SECTION 054400
LIGHT-GAUGE STEEL TRUSS SYSTEMS

PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Section includes all work and supplementary items required to complete the proper design, fabrication and erection of the light gauge truss system as shown on the Contract Documents and specified herein, including headers, outriggers, supplemental rafters, temporary and permanent bracing, blocking, ridge members, valley members, incidental framing, and connections to the structure for a complete assembly within the extents shown on the Drawings.
B. Light gauge steel trusses include planar structural units consisting of welded, screwed or bolted connected members which are fabricated, cut and assembled either prior to delivery or at the job site.
1.2 RELATED SECTIONS
A. Section 013330 - Structural Submittals.
B. Section 014525 - Structural Testing/Inspection Agency Services.
C. Section 051000 - Structural Steel.
D. Section 053000 - Metal Decking.
1.3 REFERENCES
A. AISI - Specification for the Design of Cold-Form Steel Structural Members.
B. ASTM A653 - Specification for Sheet Steel, Zinc-Coated (Galvanized) by the Hot Dip Process, Physical (Structural) Quality.
C. AWS D1.0 - Code for Welding in Building Construction
D. ANSI Z49.1 - Safety in Welding and Cutting
1.4 SUBMITTALS
A. Submit fabricator's technical data covering materials, shapes, hardware, fabrication process, handling and erection.
B. Submit certificate indicating that trusses to be supplied for project comply with indicated requirements.
C. Submit shop drawings showing shapes and dimensions of members to be used including pitch, span, camber configuration and spacing for each type or configuration of truss required. Show all bearing and anchorage details. Specify and detail all supplemental strapping, bracing clips and other accessories required for proper installation. Shop drawings shall include placement sequences and instructions.
D. Shop drawings shall be signed and sealed by a Structural Engineer registered in the project state.
E. Basis of Design shall be indicated on shop drawings.
F. Submit certification that the fabricator meets the required qualifications. If fabricator must have an independent testing agency to inspect fabrication as required by these specifications, submit the name and qualifications of the independent testing agency.
G. For each approved fabricator that is exempt from Special Inspections of shop fabrications and implementation procedures in accordance with Section 1704.2 of the Building Code, submit "Fabricator's Certificate of Compliance". Provide copies of fabricator's certification or building code evaluation services report and fabricator's quality control manual.
1.5 QUALITY ASSURANCE
A. The Structural Testing / Inspection Agency shall provide special inspections as required by Chapter 17 of the building code as required by Specification 01 4525.
1.6 QUALIFICATIONS
A. Trusses shall be designed, fabricated, and erected by a firm which has a minimum of five years of successfully designing, fabricating and erecting trussed assemblies similar to scope required and which practices a quality control program which includes inspection by an independent inspection and testing agency acceptable to the Design Professional and authorities having jurisdiction.
1.7 DELIVERY, STORAGE AND HANDLING
A. Deliver, store and handle products in exact accordance with the manufacturer's latest published requirements and specifications to avoid damage from bending, overturning, or other cause for which truss is not designed to resist or endure. Storage shall be off-ground in a dry ventilated space for protect with waterproof coverings.

PART 2 - PRODUCTS
2.1 TRUSS SYSTEM PERFORMANCE REQUIREMENTS
A. Light gauge steel truss system shall be designed for the loads defined on the Drawings.
B. Calculations and procedures pertaining to design, analysis, and computation of section properties shall be in accordance with the Specification for the Design of Cold-Formed Steel Structural Members of the American Iron and Steel Institute.
C. Structural components shall be galvanized with a zinc coating conforming to Coating Class G-60 and shall be manufactured from steel that conforms to the requirements of ASTM A653, Grade A (33 ksi min. yield) for 18 gauge and lighter and ASTM A653, Grade D (50 ksi min. yield) for 16 gauge and heavier.
2.2 FASTENERS
A. Framing components shall be field or shop fabricated and joined to one another by means of welding or through the use of screws as recommended by the component provider.

PART 3 - EXECUTION
3.1 EXAMINATION
A. Visually examine and verify that receiving surfaces of the substructure have no apparent defects or errors which would result in substandard workmanship.
B. Report any unsatisfactory conditions to the Design Professional.
3.2 PREPARATION
A. Contractor shall prepare the structure to ensure proper and adequate structural support for the materials specified.
3.3 FABRICATION
A. Light gauge steel trusses may be fabricated either on the job site or at the fabricator's shop.
B. Trusses shall be fabricated and erected in strict accordance with the current printed instructions of the approved subcontractor or fabricator.
C. Truss components shall be straight and true prior to fabrication. Flattening or straightening of components, when necessary, shall be accomplished in a manner so as to not damage the component.
D. Truss components shall be cut neatly to fit snugly against adjacent members.
E. No splices will be allowed in trusses except as authorized in writing by the Design Professional or as shown on the approved shop drawings.
F. Provide all clips, angles, herways and other miscellaneous pieces necessary to attach light gauge steel trusses to the substructure or to attach other components within this section to one another.
G. Trusses shall be erected true and plumb and properly bridged and braced in accordance with the approved shop drawings.
H. Truss components shall be connected to one another by means of screw attachment or by welding.
I. Completed trusses shall be free from twists, bends, or open joints with all members straight and true to line.
J. If the truss components have been welded to one another then all welds must be thoroughly cleaned and wire brushed and primed and painted with a high zinc content paint capable of providing an equal or greater degree of protection than the original G-60 galvanized coating.
3.4 ERECTION
A. Trusses shall be erected by approved methods using equipment of adequate capacity to safely perform the work. Lifting of trusses shall be done so as to not cause local distortion in any member.
B. Trusses shall be braced against racking.
C. Contractor is responsible for checking the dimensions and assuring the fit of all members and trusses before erection begins.
D. Work shall be erected plumb and level and to dimensions, spacings indicated on the drawings.
E. Components shall be of the size and spacing shown on the approved shop drawings.
F. Provide web stiffeners and reinforcement at reaction points where required by analysis or to suit details.
G. Anchor trusses securely at all bearing points to comply with methods and details
H. Install permanent bracing and related components to enable trusses to maintain design spacing, withstand live and dead loads, and comply with other indicated requirements.
I. Do not cut or remove truss members.

END OF SECTION

SECTION 061000
ROUGH CARPENTRY

PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Section includes wood framing and sheathing to form the superstructure of a wood framed building as indicated on the Drawings.
1.2 RELATED SECTIONS
A. Section 013330 - Structural Submittals.
B. Section 014525 - Structural Testing/Inspection Agency Services.
C. Section 061753 - Fabricated Wood Trusses.
1.3 REFERENCES
A. APPA (American Forest and Paper Association) - National Design Specification for Wood Construction.
B. ALSC - American Lumber Standards Committee: Softwood Lumber Standards.
C. ANSI A208.1 - Mat-Formed Wood Particleboard.
D. ANSI/AHA A135.4 - Basic Hardboard.
E. APA: American Plywood Association.
F. AWPA (American Wood Preservers Association) C1 - All Timber Products Preservative Treatment by Pressure Process.
G. AWPA C20 - Structural Lumber Fire Retardant Treatment by Pressure Process.
H. RIS: Redwood Inspection Service.
I. SPIB: Southern Pine Inspection Bureau.
J. WCLIB: West Coast Lumber Inspection Bureau.
K. WWPA: Western Wood Products Association.
1.4 DEFINITIONS
A. Structural Panel is a panel product composed primarily of wood and meeting the requirements of United States Voluntary Product Standard PS 2-92 "Performance Standard for Wood-Based Structural-Use Panels". Structural panels include all-veneer plywood, composite panels containing a combination of veneer and wood-based material, and malformed panels such as oriented strand board and waferboard.
1.5 SUBMITTALS
A. For treated materials, submit certification by treating plant stating chemicals and process used, net amount of preservative retained and conformance with applicable standards.
1.6 QUALITY ASSURANCE
A. The Structural Testing / Inspection Agency shall provide special inspections as required by Chapter 17 of the building code as required by Specification 01 4525.
B. Comply with National Design Specification For Wood Construction.
C. Perform work in accordance with the following agencies:
1. Lumber Grading Agency: Certified by ALSC.
2. Plywood Grading Agency: Certified by APA.
D. Identify all structural panels by official grade mark.
1. Lumber: Grade stamp to contain symbol of grading agency, mill number or name, grade of lumber, species or species grouping or combination designation, and notes under which graded, where applicable and condition of seasoning at time of manufacture.
2. Structural Panel: Panel grade, span rating, exposure durability classification, product standard thickness, and mill number.
1.7 REQUIREMENTS OF REGULATORY AGENCIES
A. Pressure treated material - American Wood Preservers Bureau Standards.
B. Span tables - National Forest Products Association.
C. Working stresses - Softwood Lumber, National Design Specification, National Forest Products Association.
1.8 PROTECTION
A. Deliver, store, and handle all materials in such a manner to protect against damage and the weather.
B. Use all means necessary to protect the installed work and materials of all other trades.
1.9 REPLACEMENTS
A. In the advent of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 - PRODUCTS
2.1 LUMBER
A. Nominal sizes are indicated, except as shown by detail dimensions. Provide actual size as required by PS 20, for moisture content specified for each use.
B. Provide dressed lumber, S4S, unless otherwise indicated.
C. Provide seasoned lumber No. 2, Southern Pine with 15% maximum moisture content at time of dressing unless noted otherwise on the Drawings.
D. Lumber Grading Rules and Wood Species to be in conformance with Voluntary Product Standard PS 20: Grading rules of the following associations apply to materials furnished under this section:
1. Northeastern Lumber Manufacturer's Association, Inc. (NELMA).
2. Southern Pine Inspection Bureau (SPIB).
3. West Coast Lumber Inspection Bureau (WCLIB).
4. West Wood Products Association (WWPA).
2.2 STRUCTURAL PANEL
A. Provide Roof, Wall and Floor Sheathing thickness as noted on the drawings.
B. For backing panels for electrical or telephone equipment, provide fire-retardant treated structural panel with exterior glue.
2.3 PARALLEL STRAND LUMBER
A. Provide Parallel Strand Lumber (PSL) as specified on Drawings as manufactured by Trus Joist MacMillan.
2.4 FASTENERS AND ANCHORAGES
A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel unless noted otherwise in the drawings.
B. Nails, Brads, and Staples: ASTM F1667.
C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC58, ICC-ES AC193, or ICC-ES AC308 as appropriate for the substrate.
1. Material: Carbon-steel components, zinc plated to comply with ASTM B633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2.
E. Metal framing connector anchors:
1. Allowable design loads, as published by manufacturer, shall meet or exceed those of basis-of-design products. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Fasteners shall be punched for fasteners adequate to withstand same loads as framing anchors.
2. Provide connectors as noted in manufacturer's instructions.
2.5 WOOD-PRESERVATIVE-TREATED LUMBER
A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
B. Kiln-dry lumber after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
1. For exposed lumber indicated to receive a stained or natural finish, omit marking and provide certificates of treatment compliance issued by inspection agency.
D. Application: Treat items indicated on Drawings, and the following:
1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, [furring,] [stripping,] and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.
E. Complete fabrication of treated items prior to treatment, wherever possible. If cut after treatment, apply one coat of same chemical used for treatment in accordance with manufacturer's instructions. Allow preservative to dry prior to erecting members. Inspect each piece of lumber or structural panel after drying and discard damaged or defective pieces.
2.6 FIRE-RETARDANT-TREATED MATERIALS
A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
1. Treatment shall not promote corrosion of metal fasteners.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use where exterior type is not indicated.
4. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D5664 and design value adjustment factors shall be calculated according to ASTM D6841.[For enclosed roof framing, framing in attic spaces, and where high temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.]
C. Kiln-dry lumber after treatment to maximum moisture content of 15 percent. Kiln-dry plywood after treatment to maximum moisture content of 15 percent.
D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
1. For exposed lumber indicated to receive a stained or natural finish, omit marking and provide certificates of treatment compliance issued by testing agency.
E. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not bleed through, contain colorants, or otherwise adversely affect finishes.
F. Application: Treat items indicated on Drawings, and the following:
1. Framing for raised platforms.
2. Framing for stages.

PART 3 - EXECUTION
3.1 GENERAL
A. Set structural members level and plumb, in correct position.
B. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
C. Discard unit of material with defects which might impair quality of work, and units which are too small to fabricate work with minimum joints or optimum joint arrangement.
D. Installer must examine the substrate structure and the conditions under which the carpentry work is to be installed and notify the Contractor in writing of conditions detrimental to the work. Do not proceed with the installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer.
E. Coordinate carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow proper attachment of other work.
3.2 JOIST FRAMING
A. Provide framing of sizes and spacings shown.
B. Install with crown edge up and support ends of each member with not less than 1-7/8 inches of bearing on support.
C. Attach to wood bearing members by toe nailing or galvanized metal connectors. Provide blocking of joist at ends of joists unless nailed to header or supported by metal joist hanger.
D. Do not notch joists.
E. Do not bore holes in PSL which violate manufacturer's recommendations.
F. Provide bridging between joists as noted on drawings.
3.3 STRUCTURAL PANELS
A. Secure roof sheathing perpendicular to framing member with ends staggered and sheet ends over firm bearing. Provide solid edge blocking between sheets. Secure to wood framing with nails of size and spacing shown on Drawings.
B. Secure wall sheathing with long dimension parallel to wall studs, with ends over firm bearing. Provide solid blocking at ends of sheets. Secure to wood framing with nails of size and spacing shown on Drawings.
C. Secure floor sheathing perpendicular to framing members with ends staggered and sheet ends over firm bearing. Attach to framing with subfloor glue and drywall screws.
D. Oriented strand board with laminated face shall be attached to wood with laminated face against wood framing.
E. Install sheets with 1/8" gap between panels.
3.4 WOOD GROUND, NAILERS, BLOCKING AND SLEEPERS
A. Provide wherever shown and where required for screening or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.
B. Attach to substrate as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise shown. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.
C. Provide permanent grounds of dressed, preservative treated, key-beveled lumber not less than 1-1/2" (38mm) wide and of thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.
3.5 WOOD FURRING
A. Install plumb and level with closure strips at edges and openings. Shim with wood as required for true alignment of finished work.
3.6 MISCELLANEOUS FRAMING
A. Firestops:
1. Stud walls: Two inches thick by depth of member blocking at each floor level, top story ceiling level, and soffits as required.
2. Floor and ceiling framing: Two inches thick by depth of wood member blocking, fitted to fill openings from one space to another to prevent drafts.
B. Framing for mechanical work:
1. Frame members for passage of pipes and ducts to avoid cutting structural members.
2. Reinforce framing members where damaged by cutting.
C. Blocking: Locate blocking to facilitate installation of finish materials, casework, fixtures, specialty items and trim railings.

END OF SECTION

SECTION 061753
FABRICATED WOOD TRUSSES

PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Section includes all work and supplementary items required to complete the proper design, fabrication and erection of the fabricated wood truss system as shown on the Contract Documents and specified herein, including headers, outriggers, supplemental rafters, temporary and permanent bracing, blocking, ridge members, valley members, incidental framing, and connections to the structure for a complete assembly within the extents shown on the Drawings.
B. Fabricated wood trusses include planar structural units consisting of metal plate connected members which are fabricated from dimension lumber and which have been cut and assembled prior to delivery to the job site.
1.2 RELATED SECTIONS
A. Section 013330 - Structural Submittals.
B. Section 014525 - Structural Testing/Inspection Agency Services.
C. Section 061000 - Rough Carpentry.
1.3 REFERENCES
A. AFPA - National Design Specification for Wood Construction.
B. ANSI/TPI 1 — National Design Standard for Metal Plate Connected Wood Truss Construction
C. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
D. ASTM A240 - Standard Specification for Chromium and Chromium Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
E. ASTM A666 — Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar.
F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
G. TPI DSB — National Design Standard for Bracing Metal Plate Connected Wood Trusses.
H. SBCA BCSI - Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining & Bracing Metal Plate Connected Wood Trusses.
1.4 DESIGN REQUIREMENTS
A. Design of wood trusses, including header truss units at openings or change of framing, is the sole responsibility of the Contractor.
B. Fabricated wood trusses shall be designed by a Structural Engineer licensed in the project state for the loads shown on the Drawings.
C. Design shall comply with the National Design Specification for Wood Construction (NDS) published by American Forest and Paper Association (AFPA), the National Design Standard for Metal-plate-connected Wood Truss Construction published by the Truss Plate Institute (TPI), and the requirements of the Building Code.
1.5 SUBMITTALS
A. Submit shop drawings (sealed by an engineer licensed in the project state) showing loads, species, sizes and stress grades of lumber to be used; pitch, span camber configuration and spacing for each type of truss required; type, size, material, finish, design value, and location of metal connector plates; bearing and anchorage details; and temporary bracing requirements.
B. Submit calculations sealed by an engineer licensed in the project state for each specific truss design showing loads, deflections and reactions.
C. Submit fabricator's specification and installation instructions for required work, covering lumber, metal plates, hardware, fabrication process treatment (if any), handling and erection.
D. Submit certification, signed by an officer of fabricating firm, indicating that trusses to be supplied for the project comply with indicated requirements.
E. Submit certification by treating plant that required treatment complies with specified standards, if applicable.
F. Submit certification that the fabricator meets the required qualifications. If fabricator must have an independent testing agency to inspect fabrication as required by these specifications, submit the name and qualifications of the independent testing agency.
G. For each approved fabricator that is exempt from Special Inspections of shop fabrications and implementation procedures in accordance with Section 1704.2 of the Building Code, submit "Fabricator's Certificate of Compliance". Provide copies of fabricator's certification or building code evaluation services report and fabricator's quality control manual.
1.6 QUALITY ASSURANCE
A. The Structural Testing / Inspection Agency shall provide special inspections as required by Chapter 17 of the building code as required by Specification 01 4525.
1. Verify that temporary installation restraint/bracing and the permanent individual truss member restraint/bracing are installed in accordance with the approved truss submittal package.
1.7 FABRICATOR'S QUALIFICATIONS
A. Minimum of three years' experience in successful fabrication of trusses comparable to type indicated for this project.
1.8 STORAGE AND HANDLING
A. Handle and store trusses to comply with recommendations in TPISBCA BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining & Bracing Metal Plate Connected Wood Trusses." and in accordance with manufacturer's instructions to avoid damage from bending, overturning or other cause for which truss is not designed to resist or endure.
1. Store trusses flat, off of ground, and adequately supported to prevent lateral bending.
2. Protect trusses from weather by covering with waterproof sheeting, securely anchored.
3. Provide for air circulation around stacks and under coverings.
B. Inspect trusses showing discoloration, corrosion, or other evidence of deterioration. Discard and replace trusses that are damaged or defective.

PART 2 - PRODUCTS
2.1 PERFORMANCE REQUIREMENTS
A. Structural Performance: Structural Performance: Metal-plate-connected wood trusses shall be capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1 unless more stringent requirements are specified below.
1. Design Loads: As indicated.
2. Maximum Deflection under Design Loads:
a. Roof Trusses: Vertical deflection of L/240 of span for total load.
B. Comply with applicable requirements and recommendations of TPI 1, TPI DSB, and SBCA BCSI.
C. Wood Structural Design Standard: Comply with applicable requirements in AFPA National Design Specifications for Wood Construction.
2.2 LUMBER
A. Lumber used for truss members shall be in accordance with published values of lumber rules writing agencies approved by the board of review of American Lumber Standards Committee. Lumber shall be identified by Grade mark of a lumber inspection bureau or agency approved by the Board and shall be as shown on the Drawings.
1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, omit grade stamp and provide certificates of grade compliance issued by grading agency.
B. Provide seasoned lumber with no less than 7 percent moisture content nor greater than 15 percent moisture content at time of fabrication.
C. Minimum Specific Gravity for Top Chords: 0.50
D. Minimum Chord Size for Roof Trusses: 2 by 6 inches nominal for both top and bottom chords.
2.3 CONNECTOR PLATES
A. Fabricate connector plates to comply with National Design Specification for Wood Construction, published by the American Forest and Paper Association and the National Design Standard for Metal Plate Connected Wood Truss Construction, published by the Truss Plate Institute.
B. Connector plates shall have a minimum thickness of 0.036 inch (20 gauge).
C. Steel connector plates shall conform to ASTM A653, Type A, and shall be hot-dip galvanized, unless noted otherwise.
1. Stainless Steel Sheet: ASTM A240 or ASTM A666, Type 304 for exterior locations, wood-preservative-treated lumber, fire retardant treated lumber and where indicated.
2.4 FASTENERS
A. Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
1. Provide fasteners for use with metal framing anchors that comply with written recommendations of metal framing manufacturer.
2. Where trusses are exposed to weather, in ground contact, made from pressure-preservative treated wood, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.
B. Nails, Brads, and Staples: ASTM F1667.
2.5 WOOD-PRESERVATIVE-TREATED LUMBER
A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
2. For exposed trusses indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
B. Kiln-dry lumber after treatment to a maximum moisture content of 15 percent. Do not use material that is warped or does not comply with requirements for untreated material.
C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
1. For exposed trusses indicated to receive a stained or natural finish, omit marking and provide certificates of treatment compliance issued by inspection agency.
D. Provide stainless steel connector plates with wood-preservative-treated lumber.
E. Application: Treat trusses where indicated on Drawings.
2.6 FIRE-RETARDANT-TREATED WOOD
A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products according to test method indicated by a qualified testing agency.
B. Fire-Retardant-Treated Lumber by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
1. Use treatment that does not promote corrosion of metal fasteners. Provide stainless steel connector plates with fire retardant lumber.
2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity. Use for interior locations where exterior type is not indicated.
4. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D5664, and design value adjustment factors shall be calculated according to ASTM D6841. For enclosed roof framing and framing in attic spaces, and where high-temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.
C. Kiln-dry lumber after treatment to a maximum moisture content of 15 percent.
D. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.
E. For exposed trusses and bracing indicated to receive a stained or natural finish, omit marking and provide certificates of treatment compliance issued by inspection agency.
F. For exposed trusses indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
G. Application: Treat trusses as indicated on Drawings.

PART 3 - EXECUTION
3.1 FABRICATION
A. Cut truss members to accurate lengths, angles and sizes to produce close fitting joints with proper wood-to-wood bearing in assembled units.
B. Fabricate metal connector plates to size, configuration, thickness and anchorage details required for types of joint designs indicated.
C. Assemble truss members in design configuration indicated on the structural drawings using jigs or other means to ensure uniformity and accuracy of assembly with close fitting joints. Position members to produce design camber indicated.
1. Fabricate wood trusses within manufacturing tolerances in TPI 1.
D. Connect truss members by means of metal connector plates accurately located and securely fastened to wood members by means indicated or approved.
3.2 ERECTION
A. Erect and brace trusses to comply with recommendations of manufacturer and the Truss Plate Institute.
B. Erect trusses with plane of truss webs vertical (plumb) and parallel to each other, located accurately at design spacings indicated.
C. Hoist units in place by means of proper lifting equipment suited to sizes and types of trusses required, applied at proper lift points as recommended by fabricator, exercising care not to damage truss members or joints by out-of-plane bending or other causes.
D. Install wood trusses within installation tolerances in TPI 1.
3.3 BRACING
A. Provide erection bracing as required to maintain trusses plumb, parallel and in proper location, until permanent bracing is installed.
B. Install permanent bracing and related components to enable trusses to maintain design spacing, withstand live and dead loads including lateral loads, and to comply with TPI-DSB National Design Standard for Bracing Metal Plate Connected Wood Trusses.
3.4 BEARING
A. Anchor trusses securely at all bearing points to comply with methods and details indicated. Install fasteners through each fastener hole in metal framing anchors according to manufacturer's fastening schedules and written instructions.
3.5 CUTTING
A. Cutting, drilling, notching or altering of truss members is not permitted.
3.6 REPLACEMENT
A. Replace wood trusses that are damaged or do not comply with requirements.
1. Damaged trusses may be repaired according to truss repair details signed and sealed by the qualified professional engineer responsible for truss design, when approved by the Design Professional.
3.7 REPAIRS AND PROTECTION
A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
B. Protect wood trusses from weather. If, despite protection, wood trusses become wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
C. Repair damaged galvanized coatings on exposed surfaces according to ASTM A780/A780M and manufacturer's written instructions.

END OF SECTION

SECTION 312301
EXCAVATING, BACKFILLING, AND COMPACTING FOR STRUCTURES

PART 1 - GENERAL
1.1 SECTION INCLUDES
A. Section includes the excavation, backfilling and compacting required for the structures shown in the Contract Drawings.
1.2 RELATED SECTIONS
A. Section 013330 - Structural Submittals.
B. Section 014525 - Structural Testing/Inspection Agency Services.
1.3 REFERENCES
A. ASTM D422 - Standard Test Method for Particle-Size Analysis of Soils.
B. ASTM D698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3).
C. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
D. ASTM D3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
E. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
1.4 DEFINITIONS
A. Granular subbase: Granular fill directly beneath slabs-on-grade.
B. Backfill: Fill immediately behind foundation elements or retaining walls.
C. Structural fill: Fill under the structure other than the granular subbase.
1.5 SUBMITTALS
A. Upon request, submit soil test reports performed by the Structural Testing/Inspection Agency.
1.6 QUALITY ASSURANCE
A. Structural Testing/Inspection Agency shall perform the following quality related items:
1. Verify structural fill complies with specifications.
2. Determine particle size, liquid limit, plastic limit, plasticity index and maximum density of each type of soil.
3. Observe proofrolling.
4. Perform a sufficient number of field density tests to verify compaction of structural fill. As a minimum, perform one test per lift for every 2500 square feet of fill placed.
5. Verify foundation bearing capacity.
6. Verify quantities of material removed and quantities of material placed where Unit Prices are involved.
1.7 SURVEY
A. Prior to construction, have structure location staked and certified by a licensed surveyor. If discrepancies between actual lines and elevations exist, notify Design Professional before proceeding with layout of structure.
1.8 SUBSURFACE CONDITIONS
A. Copies of a subsurface investigation of the site will be made available upon request. The data is not intended as a representation or warranty of the continuity of such conditions. Owner will not be responsible for interpretation or conclusions drawn therefrom by the Contractor. The data is made available for the convenience of the Contractor and is not guaranteed to represent all conditions that may be encountered.
B. Contractor may examine the site and make his own subsurface explorations at no additional cost to the Owner. Notify Owner prior to making any subsurface explorations.
1.9 EXISTING UTILITIES
A. Locate existing underground utilities by careful hand excavation. If utilities are to remain in place, provide protection from damage during construction operations.
B. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Do not interrupt existing utility service facilities occupied and used by Owner or others, unless written permission is given by the Design Professional and then only after temporary utility services have been provided.
C. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the Design Professional immediately for directions.
D. Repair damaged utilities to satisfaction of utility owner.
1.10 NOTICE
A. Notify the Design Professional 48 hours prior to the beginning of any excavation work.

PART 2 - PRODUCTS
2.1 GRANULAR SUBBASE
A. Granular subbase shall be sound and free-draining, such as sand, gravel or crushed stone with less than 10% passing the 200 sieve. Maximum diameter shall be 1-1/2 inches.
2.2 BACKFILL
A. Backfill shall meet the requirements of the granular subbase.
2.3 STRUCTURAL FILL
A. Structural fill shall be free of rock boulders/cobbles larger than 2 inches in nominal size and relatively non-plastic with plasticity indices less than 20.
B. Structural fill shall be free of organics, debris and deleterious materials.

PART 3 - EXECUTION
3.1 STRIPPING
A. Strip vegetation, topsoil, roots, and other unsuitable material to a depth determined by the Structural Testing/Inspection Agency but not less than one foot, nor less than 10 feet outside the perimeter of the structure.
B. Stockpile sufficient amounts of topsoil as required to cover areas to be landscaped with a minimum of six inches of material.
3.2 EXCAVATION
A. Excavation shall be considered unclassified.
B. Perform excavation to the depths and limits on the Drawings and as specified herein.
C. Do not excavate to full depth when there is probability of frost forming or ground freezing in excavation before concrete is placed.
3.3 PROOFROLLING
A. After stripping or excavation and before any fill placement, fill areas shall be proofrolled with a minimum of two coverages of a loaded dump truck or scraper in each of two perpendicular directions.
B. Areas found to be soft or pumping shall have the soft soil removed and replaced with structural fill and compacted as outlined herein.
3.4 PLACEMENT OF STRUCTURAL FILL
A. Do not place structural fill on subgrade that contains frost, mud or is frozen.
B. Structural fill shall be placed and compacted in 8 -inch thick loose layers.
C. Compact structural fill to 98 percent of the maximum dry density as measured by Standard Proctor, ASTM D698, with water content within +/-3 percent of the optimum moisture content.
3.5 PLACEMENT OF GRANULAR SUBBASE
A. Do not place granular subbase on subgrade that contains frost, mud or is frozen.
B. Compact granular subbase to 95 percent of the maximum dry density as measured by Standard Proctor, ASTM D698, with the water content within +/-3 percent of the optimum moisture content.
3.6 PLACEMENT OF BACKFILL
A. Backfill behind wall shall be placed in layers of six inches.
B. Compact backfill behind walls to 95 percent of the maximum dry density as measured by Standard Proctor, ASTM D698, with water content within +/-3 percent of the optimum moisture content.
3.7 CLEAN UP
A. Remove excess excavated materials from job site and upon completion leave site in clean condition.

END OF SECTION

JERICHO design group
208 Pirkle Ferry Road, Suite C
Cumming, GA 30040

georgia civil
CIVIL ENGINEERING
LANDSCAPE ARCHITECTURE
LAND SURVEYING

SHEAR STRUCTURAL

TOTAL ENGINEERS

Electrical Engineers

FIRE STATION #23

City of Covington
HIGHWAY 36
COVINGTON, GA 30014

PRINT RECORD

No.	DATE	DESCRIPTION
	07/22/2026	ISSUED FOR PERMIT

Drawn By BS & SRC
Checked By HJ
Date 07/02/2026
Job No. 25033

Sheet Title
SPECIFICATIONS

Sheet No.
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