SECTION  – glue-laminated construction

1. General
   1. summary
      1. Supply all labour, materials, equipment, services and perform all operations required to complete all glued-laminated construction, including modifications to existing glued-laminated members, including the complete installation of all hardware all other items, to the full intent of the Drawings and as herein specified herein.
      2. Cooperate with other trades for satisfactory completion of the Work.
      3. Related Requirements:
         1. Section 05 50 00 – Metals Fabrications.
         2. Section 06 10 00 – Rough Carpentry.
         3. [Section 09 91 00 – Painting.] [Section 09 91 13 – Exterior Painting.] [Section 09 91 23 – Interior Painting.]
   2. QUALITY ASSURANCE
      1. Certification:
         1. The glued-laminated elements shall be fabricated and erected by a manufacturing plant certified by the Canadian Standards Association in the appropriate category(ies) according to CSA Standard 0177-06 (R2011), Class X, Qualification Code for Manufacturers of Structural Glued-Laminated Timber.
         2. The glued-laminated timber manufacturer shall be certified in accordance with CSA's certification procedures for glued-laminated timber plants prior to submitting his tender and shall specifically verify as part of his tender that his plant is currently certified in the appropriate category(ies).
         3. Only glued-laminated elements fabricated in such certified plants shall be acceptable to the Owner and plant certification shall be maintained for the duration of the fabrication and erection for this project.
      2. Contractor executing Work of this Section shall have a minimum of five (5) years continuous Canadian experience in successful manufacture/fabrication and installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.
      3. Follow applicable requirements of CSA Standard 0122-06 (R2011) Structural Glued-Laminated Timber, including all supplements and modifications.
      4. Structural steel elements shall conform to requirements of CAN/CSA-S16-09, Design of Steel Structures, and CAN/CSA-S136-07, Cold Formed Steel Structural Members.
      5. Any organization undertaking to weld under this contract shall be fully approved by the Canadian Welding Bureau under the requirements of CSA W47.1-09 and W55.3-08.
      6. Supplements and modifications to the above standards as indicated on the Drawings or as specified herein shall govern Work of this Section.
   3. SUBMITTALS
      1. Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.
      2. Shop Drawings:
         1. Prepare and submit shop and erection drawings which conform to the requirements of the General Instructions, CAN3-086M, and as specified herein.
         2. Shop drawings for glued-laminated structural units shall indicate the size, stress grade, service grade, and appearance grade, shop applied finishes, camber, cuts, holes, and connection details. Include necessary plans, elevations, and details. Indicate size and type of fastening. For weld connections use welding symbols in compliance with AWS and indicate clearly net weld lengths.
         3. Submit typical details of connections and any special connections for approval before preparation of shop drawings.
         4. Review of shop drawings by the Consultant will not absolve the Contractor from the responsibility of providing materials and equipment to complete and finish the work in accordance with the architectural and structural drawings. Departures or differences from the referenced drawings shall be approved in writing by the Consultant.
         5. The Subcontractor shall include in his delivery schedule a minimum of two (2) weeks for Consultant review of shop drawings.
      3. Samples:
         1. Submit two (2) samples of glued-laminated material showing quality, texture, finish and colour, representative of proposed glued-laminated members, for approval prior to fabrication.
   4. DELIVERY, STORAGE, HANDLING and PROTECTION
      1. Coordinate deliveries to comply with construction schedule and arrange ahead for strategic off-the-ground, under cover storage locations. Do not load any area beyond the design limits.
      2. Wrap glued-laminated members prior to leaving the plant with a suitable non-staining, waterproof covering.
      3. Materials shall be carefully checked, unloaded, stored, and handled to prevent damage. Use padded non-marring slings for handling glued-laminated members. Protect corners from crushing with wood blocking.
      4. Store glued-laminated members blocked off the ground and separated with wood strips away from high traffic areas. Ensure air may circulate around all faces of members.
      5. Slit underside of waterproof covering during storage on site. Do not deface member.
      6. Unsatisfactory materials shall be promptly removed from the site.
      7. Maintain waterproof coverings until members are completely installed, then remove coverings, completely.
      8. Adequately protect the structure and work of other sections during delivery, storage, handling, and execution of the Work of this Section.
      9. Provide tools, plant and other equipment required for the proper execution of the Work of this Section.
2. Products
   1. MATERIALS
      1. Glued-Laminated Timbers:
         1. Unless otherwise indicated on Drawings, all glued-laminated timber shall be quality appearance grade, stress grade as required, in accordance with CSA standards.
         2. Laminating stock to match existing.
         3. Depths of lumber laminations to match existing lamination depths.
         4. Finish and colour of glued-laminated timbers to match existing.
      2. Steel for connections: to CSA G40.21-04 (R2009), Type 300W.
      3. Shop coat primer for steel: to CGSB 1-Gp-40M.
      4. Galvanizing for steel: to CSA G164(Cannot find standard), hot dipped, minimum zinc coating of 600 g/sq.m.
   2. FABRICATION AND WORKMANSHIP
      1. Work shall be executed by skilled workers under the supervision of a competent foreman. All items shall be shop assembled, insofar as is practical.
      2. Make thorough examination of Drawings and details, check anchorage, interfacing with work of other Sections and other factors influencing the installation of the work, and be fully cognizant of requirements.
      3. Glued-Laminated Timbers:
         1. Finished glued-laminated timbers shall be free from bruises, blemishes, mineral marks, knots, shakes and other defects and shall be selected for uniformity of colour, grain, and texture.
         2. Be responsible for methods of construction and for ensuring that materials are rigidly and securely attached and will not be loosened by the work of other sections.
         3. Machine dressed work shall be properly machined, using sharp cutters, the finished work shall be free from drag, feathers, slivers, or roughness of any kind. Remove machine marks by sanding.
         4. Finished glued-laminated timbers shall be carefully sanded after fabrication to remove roughness and planer marks to leave a smooth scratch-free surface suitable to receive the stain/natural finishes to be applied over as specified in Section 09 91 00 – Painting.
      4. Connectors and Anchorage:
         1. Fabricate work to be concealed in final assembly where possible and where exposed, to be neat appearance, laid out in uniform and consistent manner acceptable to Consultant.
   3. MOISTURE CONTENT
      1. Moisture content of glued-laminated timbers shall be between 7% and 15%.
   4. FINISHES
      1. Finish of new glued-laminated members shall match existing. Wood items provided under this Section shall be finished as part of the Work of this Section.
      2. Apply stain to items where scheduled, indicated or as directed Consultant, providing uniform required stain colour(s).
      3. Provide finishes as indicated on Drawings and scheduled, in accordance with requirements of [Section 09 91 00 – Painting.] [Section 09 91 13 – Exterior Painting.] [Section 09 91 23 – Interior Painting.]
3. Execution
   1. PREPARATION RELATED TO OTHER TRADES
      1. As the work of the other trades progresses, supply anchor bolts, bearing plates and other members required to be built-in with the work of other trades.
      2. Give necessary instructions to other trades for setting bearing plates, anchor bolts and other members to be built in with the work of other trades.
   2. CONDITION OF SURFACES
      1. Inspect and verify the locations and elevations and check surfaces of elements which the Work of this Section is dependent for any irregularities detrimental to the application and performance of the work. Notify Consultant in writing of all conditions which are at variance with those on the Contract Documents and/or detrimental to the proper and timely installation of the Work of this Section. The decision regarding correct measures shall be obtained from the Consultant prior to proceeding with the affected work.
      2. Commencement of Work indicates acceptance of surfaces and conditions.
   3. INSTALLATION - GENERAL
      1. Make adequate provision for horizontal and vertical erection loads and for sufficient temporary bracing to keep structural glue-laminated timbers plumb and in true alignment until the completion of erection and installation of other work and roof decks which provide the necessary permanent bracing. Any failure to make proper and adequate provisions for erection stresses shall be entirely at the risk and responsibility of the Contractor.
      2. The erection sequence shall not place undue or eccentric stresses on the connections.
      3. When temporary members are required for erection purposes, such members shall be provided, and removed when no longer required.
      4. Do not field cut or alter members without Consultant's written approval.
      5. Handle and store structural glued-laminated members on the job site in such a manner that no damage shall be caused to the material, or the structure.

END OF SECTION