

## **PART 1 - GENERAL**

### **1.1 SUMMARY**

- .1 Related Sections:
  - .1 Section 01 33 00 - Submittal Procedures.
  - .2 Section 01 35 29 - Health and Safety Requirements.
  - .3 Section 01 61 00 - Common Product Requirements.
  - .4 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .5 Section 06 10 00 – Rough Carpentry.

### **1.2 REFERENCES**

- .1 Canadian Standards Association (CSA International)
  - .1 CSA O80 Series-08(R2012), Wood Preservation.
  - .2 CAN/CSA-O86-09, Engineering Design in Wood.
  - .3 CAN/CSA-O141-05(R2009), Softwood Lumber.
  - .4 CSA S307-M1980(R2005), Load Test Procedure for Wood Roof Trusses for Houses and Small Buildings.
  - .5 CSA S347-99(R2004), Method of Test for Evaluation of Truss Plates Used in Lumber Joints.
  - .6 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel.
- .2 National Lumber Grades Authority (NLGA)
  - .1 NLGA-03, Standard Grading Rules for Canadian Lumber.
- .3 Truss Plate Institute of Canada (TPIC)
  - .1 TPIC - 1996 (R2001), Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses (Limit States Design).

### **1.3 DESIGN REQUIREMENTS**

- .1 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for wood truss chords and webs in accordance with engineering properties in CAN/CSA-O86.
  - .2 Design light metal plate connected wood trusses in accordance with TPIC truss design procedures for truss joint designs to test engineering properties in accordance with CSA S347 and listed in CCMC Registry of Product Evaluations.
  - .3 Design trusses, bracing, bridging, in accordance with CAN/CSA-O86.1 for building locality as ascertained by NBC, Climatic Information for Building Design in Canada and minimum uniform and minimum concentrated loadings stipulated in NBC commentary.
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- .4 Design Truss system to withstand dead loads and live loads including sprinklers, mechanical and electrical systems as follows:
  - .1 Design Wind: Design loads for wind loading shall follow those given in the National Building Code of Canada 2010 and its supplement:
    - .1 Hourly wind pressures (1/50 year): 0.78 kPa, (1/10 year): 0.60 kPa for St. John's Newfoundland and Labrador.
    - .2 Wind Exposure Factor ( $C_e$ ) as per NBCC: Importance Category: Normal.
  - .2 Seismic zone: Design loads for seismic loading shall follow those given in the National Building Code of Canada 2010, for St. John's Newfoundland and Labrador:
    - .1  $S_a(0.2) = 0.17$
    - .2  $S_a(0.5) = 0.12$
    - .3  $S_a(1.0) = 0.076$
    - .4  $S_a(2.0) = 0.025$
    - .5  $PGA = 0.057$
    - .6 Site classification for Seismic response is "C" and corresponding factors  $F_a=1.0$ ,  $F_v=1.0$ .
    - .7 SFRS ductility related force modification factors as per Table 4.1.8.9 of National building Code of Canada 2010, Volume 1 Importance Category: Normal.
  - .3 Snow Loads: Ground snow load as per National Building Code of Canada 2010, for St. John's Newfoundland and Labrador.
    - .1  $S_s = 2.9$  kPa
    - .2  $S_r = 0.7$  kPa
    - .3 Wind exposure factor  $C_w = 1$
    - .4 Importance Category: Normal
  - .4 Mechanical and Electrical: Superimposed dead loads at ceiling are as follows: Uniformly distributed service load of 0.25 kPa OR point loads due to mechanical services/electrical fixtures hanger loads, whichever is greater. See mechanical and electrical drawings for location and size of services hanging from ceiling. Prefabricated Supplier to coordinate hanger locations with mechanical and electrical contractors.
  - .5 Live Load for Roof Maintenance allow for 1.0Kpa additional loading.
- .5 Limit live load deflection to 1/360th of span where plaster gypsum board ceilings are hung directly from trusses.
- .6 Limit live load deflections to 1/240th of span unless otherwise specified or indicated.
- .7 Provide camber for trusses as indicated.

## **1.4 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Fabricator for trusses to show evidence of quality control program such as provided by regional wood truss associations, or equivalent.
  - .2 Fabricator for welded steel connections to be certified in accordance with CSA W47.1.
  
- .2 Pre-Installation Meeting:
  - .1 Convene pre-installation meeting one week prior to beginning work of this Section.
    - .1 Verify project requirements.
    - .2 Review installation and substrate conditions.
    - .3 Co-ordination with other building subtrades.
    - .4 Review manufacturer's installation instructions and warranty requirements.
  
- .3 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

## **1.5 SUBMITTALS**

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
  
  - .2 Product Data:
    - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - Submittal Procedures.
    - .2 Submit two copies of Workplace Hazardous Materials Information System WHMIS MSDS. Indicate VOCs during application and curing.
  
  - .3 Shop Drawings:
  
  - .4 Each shop drawing submission showing connection details to be signed and stamped by professional engineer registered or licensed in Province of Newfoundland and Labrador, Canada.
  
  - .5 Indicate special structural application and specification as according to local authorities having jurisdiction.
  
  - .6 Indicate TPIC Truss Design Procedure and CSA O86 Engineering Design in Wood and specific CCMC Product Registry number of the truss plates
  
  - .7 Indicate species, sizes, and stress grades of lumber used as truss members. Show pitch, span, camber, configuration and spacing of trusses. Indicate connector
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- types, thicknesses, sizes, locations and design value. Show bearing details. Indicate design load for members.
- .8 Submit stress diagram or print-out of computer design indicating design load for truss members. Indicate allowable load and stress increase.
  - .9 Do load testing on representative trusses selected by Departmental Representative. Provide certification that trusses meet requirements of CSA S307 and CSA S347.
  - .10 Indicate arrangement of webs or other members to accommodate ducts and other specialties.
  - .11 Show location of lateral bracing for compression members.
  - .12 Show lifting points for storage, handling and erection.
  - .13 Refer to drawings and specifications for special requirements.
  - .14 Submit truss clip and hanger shop drawings as part of shop drawing submission.
  - .15 Test reports: submit certified test reports for prefabricated wood trusses from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
  - .16 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .17 Instructions: submit manufacturer's installation instructions.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
  - .2 Storage and Protection:
    - .1 Store trusses on job site in accordance with manufacturer's instructions. Provide bearing supports and bracings. Prevent bending, warping and overturning of trusses.
  - .3 Waste Management and Disposal:
    - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
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- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).
- .4 Fold up metal and plastic banding, flatten and place in designated area for recycling.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Lumber: SPF species, 2 or better grade, with maximum moisture content of 19 % at time of fabrication and to following standards:
  - .1 CAN/CSA-O141.
  - .2 NLGA (National Lumber Grading Association), Standard Grading Rules for Canadian Lumber.
- .2 Fastenings: to CAN/CSA-O86.
- .3 Refer to drawings and specifications for special material and finish requirements.
- .4 Truss clips and hangers: Simpson Strong-Tie Connectors or approved equal.

### **2.2 FABRICATION**

- .1 Fabricate wood trusses in accordance with reviewed shop drawings.
- .2 Provide for design camber and roof slopes when positioning truss members.
- .3 Connect members using metal connector plates.

### **2.3 SOURCE QUALITY CONTROL**

- .1 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board.

## **PART 3 - EXECUTION**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheet.
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### **3.2 ERECTION**

- .1 Erect wood trusses in accordance with reviewed shop drawings.
- .2 Handling, installation, erection, bracing and lifting in accordance with manufacturer's instructions.
- .3 Make adequate provisions for handling and erection stresses.
- .4 Exercise care to prevent out-of-plane bending of trusses.
- .5 Install temporary horizontal and cross bracing to hold trusses plumb and in safe condition until permanent bracing and decking are installed.
- .6 Install permanent bracing truss clips and hangers in accordance with reviewed shop drawings, prior to application of loads to trusses.
- .7 Do not cut or remove any truss material without approval of Departmental Representative.
- .8 Remove chemical and other surface deposits on treated wood, in preparation for applied finishes.
- .9 All trusses are to be fastened to supporting members with framing anchors.
- .10 Provide all additional diagonal and lateral bracing required by truss manufacturer.

### **3.3 FIELD QUALITY CONTROL**

- .1 Manufacturer's Field Services:
    - .1 Have manufacturer of products supplied under this Section review work involved in handling, installation/application, protection and cleaning of its products, and submit written reports, in acceptable format, to verify compliance of work with Contract.
    - .2 Manufacturer's field services: provide manufacturer's field services, consisting of product use recommendations and periodic site visits for inspection of product installation, in accordance with manufacturer's instructions.
    - .3 Schedule site visits to review work at stages listed:
      - .1 After delivery and storage of products, and when preparatory work on which work of this Section depends is complete, but before installation begins.
      - .2 Twice during progress of work at 25% and 60% complete.
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- .2 Upon completion of work, after cleaning is carried out.
- .3 Obtain reports within three days of review and submit immediately to Departmental Representative.

### **3.4 CLEANING**

- .1 Remove surplus materials, excess materials, rubbish, tools and equipment on completion of installation.