

# **Multipurpose Building Specifications**

## **8,000 - 8,300 sq. ft. Structure with 250 sq. ft. Attached Addition**

### **Part One - GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Pre-Engineered factory and field fabricated Timber Column Structure.
- B. Prefinished metal roofing and siding panels.
- C. Prefinished metal trim items.
- D. Prefinished soffits.
- E. Prefinished gutters and down spouts.
- F. Insulation, interior framing and liner package.
- G. Minor interior construction ( stud walls on exterior).
- H. Concrete floor
- I. Doors and Windows

#### **1.02 REFERENCE STANDARDS**

- A. Preservative Treated Lumber
  - 1. American Wood Protection Association ( AWPA )
    - a. Commodity specification C2 ( 2001 ).
    - b. Use category system : user specification for treated wood
      - 1. UC4B ( ground contact or fresh water ).
    - c. Treated item shall bear the quality mark of an independent testing agency or service certified by the AWPA to inspect preservative-treated wood.
  - 2. Federal Specification TT-W-571-J.
- B. Framing Lumber
  - 1. Lumber Grading Rules and Wood Species:
    - a. National Design Specification For Wood Construction, current edition
    - b. Northeastern Lumber Manufacturer's Association, Inc. (NELMA)
    - c. Southern Pine Inspection Bureau (SPIB): Southern Pine.
    - d. West Coast Lumber Inspection Bureau (WCLIB): Douglas Fir.
    - e. Western Wood Products Association (WWPA): Douglas Fir and Ponderosa Pine.
- C. Wood Trusses
  - 1. All lumber used in the design of wood trusses shall be kiln dried and graded in accordance with the current grading rules. Design stresses allowed are those listed in the current editions of the respective Lumber Association's grading rules.
  - 2. The design of wood members shall be in accordance with the formulas published in the 2001 edition of the National Design Specification for Wood Construction.
  - 3. Light metal toothed connector plates and joint design shall conform to specifications as set forth in the 2002 edition of TRUSS PLATE INSTITUTE'S Design Specification for Metal Plate Connected Wood Trusses ( TPI - 2002 ).
    - a. Connector plates shall be fabricated from ASTM A 653, Grade A, or better, 18 and 20 gauge steel sheets with a G60, or better, metallic ( zinc ) coating.
  - 4. Truss members and joints shall be designed in accordance with TPI - 2002. All truss designs shall be accompanied by complete and accurate shop drawings and contain the following information:
    - a. Slope or depth, span and spacing of the truss.
    - b. Heel bearing height.
    - c. Design loading to include:
      - 1. Top chord live load
      - 2. Top chord dead load
      - 3. Bottom chord dead load
      - 4. Concentrated loads and their points
    - d. Adjustments to lumber and plate design values for conditions of use.

- e. Plate type, thickness of gauge, and size.
- f. Lumber size, species and grade for each member.

### **1.03 SYSTEM DESCRIPTION**

- A. Clear span
- B. Bay spacing of 7'-6" o.c.
- C. Primary framing
  - 1. Columns.
  - 2. Trusses.
  - 3. Wind bracing.
- D. Secondary framing
  - 1. Perimeter baseboards.
  - 2. Wall girts.
  - 3. Purlins.
  - 4. Overhang rafters and fascia.
  - 5. Ancillary blocking, furring and grounds as required.
- E. Roof Covering
  - 1. Prefinished ribbed metal panels.
- F. Wall Covering
  - 1. Prefinished ribbed metal panels.
- G. Insulation and liner package
  - 1. Wall insulation.
  - 2. Ceiling insulation.
  - 3. Air deflectors.
  - 4. Vapor retarder.
  - 5. Wall stripping.
  - 6. Prefinished ribbed metal panels.
- H. Concrete
  - 1. Flooring slab
- I. Doors and Windows
  - 1. Double doors, provided by Owner
  - 2. Single pass-through doors, provided by Owner
  - 2. Windows, provided by Owner

### **1.04 DESIGN REQUIREMENTS**

- A. Roof design loads (as indicated on manufacturer plans)
  - 1. Top Chord Live Load
  - 2. Top Chord Dead Load
  - 3. Bottom Chord Dead Load
  - 4. Bottom Chord Point Loads
  - 5. Unbalanced Snow Loads
- B. Wind speed
  - 1. 90 MPH ( V3s ), Exposure " B "
- C. Roof and wall system shall be able to withstand the imposed loads with maximum allowable deflection of L/180.
- D. Assembly shall permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.
- E. Size and fabricate wall and roof system to be free of distortion or defects that would be detrimental to appearance or performance.
- F. Concrete design
  - 1. Design the required footings, foundations and floors to meet the applicable building code.

G. Doors

1. Doors will be purchased by Owner, locations will be determined during initial construction. Installation and exterior finish work will be performed by contractor.

H. Windows

2. Windows will be purchased by Owner, locations will be determined during initial construction. Installation and exterior finish work will be performed by contractor.

**1.05 SUBMITTALS**

A. Submittals as requested by Owner.

B. Provide three (3) sets of the following, bearing the seal of a Professional Engineer, registered in the State of Minnesota.

1. Provide detailed shop and erection drawings showing size and location of each part and component; certifying that the building design complies with all structural load requirements (roof, wind, snow, concrete footings/foundation, etc...)
2. Truss Engineering analysis and design data, include the following:
  - a. Axial forces and bending moments for each member.
  - b. Basic plate design value.
  - c. Design analysis of each joint showing that proper plates have been used.
3. Manufacture's standard color chart for owner to choose from.

**1.06 PROJECT RECORD DOCUMENTS**

- A. Submit upon Owners requests.

**1.07 QUALITY ASSURANCE**

- A. Fabricate members in accordance with standard industry practices.

**1.08 QUALIFICATIONS**

- A. Contractor shall have documented experience in the manufacture and erection of this type of structure.
- B. Design structural components under direct supervision of a Professional Engineer experienced in design of this work and licensed in the State of Minnesota.
- C. Employ adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work.
- D. Contractor shall be responsible for all materials, whether furnished by himself or a subcontractor, and proper storage of the same.

**1.09 REGULATORY REQUIREMENTS**

- A. Contractor shall be responsible for compliance with all applicable Federal and State building codes and/or City ordinances covering the work.
- B. Cooperate with regulatory agency or authority to provide data as requested.

**1.10 PRE BID MEETING**

- A. A pre-bid meeting will be held to allow contractors a site visit, collect measurements, and meet with Owner(s). Any questions shall be addressed during the meeting. Contractor's shall have no more than five working days following the pre-bid meeting for additional questions. Contractors, as well as all subcontractors, are subject to passing a security background investigation prior to entrance into the secure perimeter, if necessary.

### **1.11 FIELD MEASUREMENTS**

- A. Verify that field measurements are as on shop drawings.

### **1.12 DELIVERY, STORAGE AND HANDLING**

- A. Deliver and store prefabricated components (trusses, columns, steel sheeting and other items) so that they will not be damaged or deformed.
- B. Stack materials on platforms, pallets or other structures covered with tarpaulins or other suitable weather tight ventilated covering. Handle and store structural parts in a manner that will avoid deforming members or subjecting parts to excessive stresses.
- C. Store roofing and siding panels so that water will drain freely.
- D. Do not store panels in contact with other materials which may cause staining or discoloration.
- E. Any on site storage will be at the determination of the Owner. If on site storage is not allowed, contractor will ensure off site storage will not impede progress.

### **1.13 PROJECT CONDITIONS**

- A. Coordination
  - 1. Fit carpentry work to other work, scribe and cope as required for an accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow for attachment of other work

### **1.14 CERTIFICATIONS**

- A. Post award, the contractor shall furnish the following items:
  - 1. Certification of sheet steel supplier stating :
    - a. Minimum thickness of metallic coated steel in inches.
    - b. Identification of all metallic coatings.
    - c. Coating weight range.
    - d. Verification that material supplied is in conformance with the applicable ASTM standard as stated in the technical specification.
  - 2. Certification of paint supplier stating :
    - a. Generic chemistry of topcoat.
    - b. Trade name of topcoat.
    - c. Percentage of Polyvinylidene Fluoride in resin.
  - 3. Certification of sheet steel coater stating :
    - a. Nominal paint film thickness IN MILS.
  - 4. Certification of treated lumber supplier stating:
    - a. Preservative type
    - b. Preservative retention in pounds per cubic foot of wood.
    - c. Depth of assay zone
    - d. Treatment is in accordance with AWPA standard C2 and Federal Specification TT-W-571J.
  - 5. Warranty :
    - a. Sample copy of warranty to be issued at completion of project.
    - b. Verification that warranty meets or exceeds the requirements stated in the technical specification.

## **1.15 WARRANTY**

- A. The Building Manufacturer shall supply a warranty to the Owner which shall provide that the Manufacturer will :
1. For a period of fifty (50) years :
    - a. Absorb repair or replacement costs, including material and labor, if any preservative treated lumber fails due to decay or insect attack.
    - b. Repair, or at its discretion, replace free of charge the building framework, including and roofing and/or siding panels, if directly damaged by snow loads.
  2. For a period of thirty-five (35) years:
    - a. Repaint any roofing or siding panel on which, under conditions of normal weathering, the paint has separated from the panels due to flaking or peeling.
    - b. Repaint any roofing or siding panels on which, under conditions of normal weathering, chalking greater than a rating of 8 ( ASTM D4212 Method " A " ) or color change greater than 5 units ( ASTM D2244 ) has occurred.
  3. For a period of ten (10) years:
    - a. Repaint any roofing or siding panel on which, under conditions of normal weathering, exhibit corrosion resulting in red rust greater than 1/2" from any sheared edge which is clearly visible in casual observation.
  4. For a period of five (5) years :
    - a. Repair, or at its discretion, replace free of charge the building framework, including roofing and / or siding panels, if directly damaged by wind loads, unless damage is caused by flying or falling objects.
    - b. Repair any roof leaks due to defects in materials or workmanship.
  5. For a period of one (1) year :
    - a. Repair other building parts that prove to be defective in materials or workmanship.
  6. The Manufacturer shall not be liable for damage due to deterioration caused by interior chemical vapors and/or dust, damage by flying or falling objects, or collateral damage to interior walls, ceiling, partitions, equipment and/or contents, or cost of preparation of the site.

## **Part Two - PRODUCTS**

### **2.01 MANUFACTURERS - BUILDING SYSTEM**

- A. Morton type building, or other manufacturers offering similar systems.

### **2.02 MATERIALS - FRAMING**

- A. Columns
1. Lower portion
    - a. Factory fabricated from minimum 3 ply No.1 or better SYP.
    - b. The area in contact with the ground shall be pressure treated with a wood preservative to a net retention of .8 pounds per cubic foot and kiln dried after treating to 19% maximum moisture content.
    - c. The wood preservative shall be Chromated Copper Arsenate Type "C" (Oxide type) as listed in Federal specification TT-W-571J.
    - d. The preservative shall penetrate 100% of the sapwood.
    - e. The treated portion of the column shall be laminated with stainless steel nails.

2. Upper portion
  - a. Factory fabricated from minimum 3 ply No.1 or better SYP.
  - b. Attach upper column to lower column with appropriate numbers and size pneumatically driven fasteners.
  - c. Provide factory installed blocking on outside face of column between nailers.
- B. Wood Trusses
  1. Lumber
    - a. Top Chord : No. 1 or better SYP.
    - b. Bottom Chord : 1950 MSR or better SPF.
    - c. Webs : No. 1 or better SYP.
  2. Trusses shall be constructed of surfaced lumber, smooth and free of all cracks, checks, and blemishes.
  3. Plates: Connector plates shall be fabricated from ASTM 653, Grade A, or better, 18 and 20 gauge steel sheets with a G60, or better, metallic ( zinc ) coating.
  4. Design and fabricate trusses and connections to withstand snow and wind loads and all dead loads.
  5. Fabricate trusses in plant, using mechanical or hydraulic fixtures as required to bring members into contact. Install plates in accordance with manufacturer's instructions.
- C. Baseboards
  1. 2" x 8" No. 2 or better SYP with 1/2" x 3/4" notch in top.
  2. Pressure treated with a wood preservative to a retention commensurate with applicable AWWA standards and kiln dried after treating to 19% maximum moisture content.
  3. The preservative shall penetrate 100% of the sapwood.
- D. Wall girts
  1. First nailer above baseboard: 2" x 6" No. 2 or better SPF with 1/2" x 3/4" notch in bottom.
  2. Balance of nailers: 2" x 4" 2100f MSR or better SPF.
  3. Overhang top nailer: 2" x 6" No. 2 or better SPF.
- E. Base reinforcement
  1. 7/16" x 32" OSB panels installed between the baseboard and first nailer.
- F. Purlins and truss ties
  1. 2" x 4" No. 2 or better SPF.
- G. Overhang framing
  1. Provide factory fabricated rafter frames.
  2. Provide 2" x 6" No. 2 or better SPF factory beveled fascia boards.
- H. Wind Bracing
  1. 2" x 6" No. 2 or better SPF from endwall column to first truss back.
- I. Framing around openings
  1. 2" x 4" No. 2 or better SPF around personnel doors.
  2. 2" x 6" No. 2 or better SPF around overhead door openings.
- J. Headers
  1. Provide built-up headers as required for a proper installation.
- K. Incidental framing
  1. 2" x 4" and/or 2" x 6" No. 2 or better SPF.
- L. Interior framing
  1. 2" x 4" No. 2 or better SPF.

## 2.03 MATERIALS - PREFINISHED METALS

### A. Roofing panels

1. Panel substrate shall be .019" minimum thickness commercial steel sheet with a G90 (Zinc) coating (ASTM A525 ).
2. The weather side of the panel shall receive a nominal two tenths mil Polyurethane primer and a nominal eight tenths mil topcoat of 70% Polyvinylidene Fluoride Resin (\* KYNAR 500 / HYLAR 5000), or equivalent, to achieve a total paint film thickness of one mil.
3. The non weather side paint system shall consist of a two coat finish with a total nominal thickness of one half mil.

### B. Siding panels

1. Panel substrate shall be .019" minimum thickness commercial steel sheet with a G90 (Zinc) coating (ASTM A525).
2. The weather side of the panel shall receive a nominal two tenths mil Polyurethane primer and a nominal eight tenths mil topcoat of 70% Polyvinylidene Fluoride Resin (\*KYNAR 500 / HYLAR 5000), or equivalent, to achieve a total nominal paint film thickness of one mil.
3. The non weather side paint system shall consist of a two coat finish with a total nominal thickness of one half mil.

### C. Wainscot panels

1. Panel substrate shall be .019" minimum thickness commercial steel sheet with a G90 (Zinc) coating (ASTM A525)
2. The weather side of the panel shall receive a nominal two tenths mil Polyurethane primer and a nominal eight tenths mil topcoat of 70% Polyvinylidene Fluoride Resin (\*KYNAR 500/HYLAR 5000), or equivalent, to achieve a total nominal paint film thickness of one mil.
3. The non-weather side paint system shall consist of a two coat finish with a total nominal thickness of one half mil.

\*Kynar 500 is a registered trademark of Arkema, Inc. for its brand of Polyvinylidene Fluoride Resin.

Hylar 5000 is a registered trademark of Solvay Solexis for its brand of Polyvinylidene Fluoride Resin.

### D. Interior panels

1. Panel substrate shall be .019" minimum thickness commercial steel sheet with a G90 (Zinc) coating (ASTM A525).
2. The weather side of the panel shall receive a nominal two tenths mil acrylic primer and a nominal eight tenths mil topcoat of white polyester paint to achieve a total nominal paint film thickness of one mil.
3. The non weather side paint system shall consist of a two coat finish with a total nominal thickness of one half mil.

### E. Metal trim items

1. Die-formed steel from the same quality material as the siding panels.

### F. Soffits

1. Prefinished aluminum soffit, as manufactured by Alcoa Building Products, or equivalent to meet same quality material.
  - a. Provide solid soffit for end overhangs.
  - b. Provide perforated soffit for vented side overhang.

G. Ridge Vent

1. Prefinished aluminum Vent-A-Ridge as manufactured by Alcoa Building Products, or equivalent to meet same quality material.

H. Gutters and down spouts

1. Provide 5" O.G. (style "K") .030" minimum thickness 3004 H36 tempered aluminum alloy gutters on both sides of building. Gutters shall be finished with \*KYNAR 500/HYLAR 5000, or equivalent, paint system with total nominal thickness of one mil on the visible side.
2. Interior paint finish shall be a nominal one half mil polyester wash coat.
3. Silicone sealant and silicone rubber gaskets shall be used at laps to maintain leak prevention and to relieve stress due to thermal movement.
4. Provide one 3" x 4" down spout with appropriate elbows and conductor bands per 1800 square feet of roof area.

**2.04 MATERIALS - OTHER**

A. Corner bracing

1. Provide 1-1/2" wide high tensile steel strapping in all unobstructed corners in an "X" configuration.

B. Roofing and siding fasteners

1. EPDM washered, painted, center drive stainless steel screws for ribbed steel panels.

C. Closure strips

1. Closed cell foam.

D. Sealant

1. Paintable silicone.

E. Insulation

1. Minimum 6" thick, R19 fiberglass blankets in walls.
2. Minimum R 30 blown fiberglass in ceiling.

F. Vapor retarder

1. 4 mil thick polyethylene sheets.

**Part Three - EXECUTION**

**3.01 EXAMINATION**

- A. Verify site conditions with Owner.

**3.02 ERECTION - FRAMING - GENERAL**

- A. Erect framing in accordance with manufacturers established construction procedures.
- B. Make all components and building plumb, square, straight and true to lines.
- C. Provide adequate temporary bracing to assure structure remains plumb and square until permanent bracing is installed.
- D. Altering of structural members will not be permitted.

### **3.03 ERECTION - FRAMING**

- A. Lower Column
  1. Auger a hole 48" deep, of the diameter required by the building manufacturer.
  2. Place a 12" thick ready mix concrete pad in the bottom of the hole.
  3. Install a base anchor of galvanized steel angle to the bottom of the timber columns.
  4. Accurately position lower column in the hole.
  5. Place additional concrete mix around the bottom of the column.
  6. Backfill with dry soil, compacted in 8" lifts.
  7. Remove excess portions of lower column to provide 18" staggers beginning 18" above grade.
- B. Upper Column
  1. Set upper column to positively interlock with lower column.
  2. Install manufacturers recommended quantity and size pneumatically driven fasteners.
- C. Baseboards
  1. Install 2" x 8" treated plank, at grade, using manufacturer recommended fasteners.
- D. Wall girts
  1. Install 2" x 6" notched nailer to receive OSB panel.
  2. Install 2" x 4" nailers at 32" o.c.
  3. Install 2" x 6" overhang nailer at the top.
- E. Trusses
  1. Set trusses in plane with the center member of the upper column using lifting methods as approved by the manufacturer.
  2. When properly positioned, install two 1/2" diameter machine bolts and manufacturer recommended 20d ring shank nails through two of the upper column laminates and the truss heel.
  3. Brace trusses as recommended by manufacturer.
- F. Purlins
  1. Install 2" x 4" purlins at 24" o.c. and attach to trusses with 60d ring shank nails.
- G. Truss ties
  1. Install 2" x 4" truss ties at locations recommended by manufacturer.
  2. Truss ties shall run from endwall to endwall.
- H. Wind bracing
  1. Install 2" x 6" angled bracing at locations recommended by manufacturer.
- I. Incidental framing
  1. Install 2" x 4" or 2" x 6" blocking as required according to building recommendations.
- J. Interior framing
  1. Install 2" x 4" baseboard at 4" above grade and case in metal trims.
  2. Install 2" x 4" horizontal stripping at 36" o.c. (max.) in areas receiving ribbed steel panels.
  3. Install 2" x 4" horizontal stripping at 16" o.c. and 2" x 4" vertical blocking at 48" o.c. in areas receiving gypsum board, if applicable.

### **3.04 ERECTION - PREFINISHED METALS - GENERAL**

- A. Install prefinished metal parts in accordance with manufacturers established construction procedures.
- B. Make all components plumb, square, straight and true to lines.
- C. Exercise care when cutting prefinished materials to ensure cuttings do not remain on finished surface.

- D. Install fasteners properly. Do not under or over drive.
- E. Install all components to assure freedom from rattles, noise due to thermal movement and wind whistles.

### **3.05 ERECTION - PREFINISHED METALS**

- A. Roofing panels
  - 1. Install panels perpendicular to supports, aligned straight with end fascias.
  - 2. Fasten panels to purlins with screw fasteners.
- B. Siding and wainscot panels
  - 1. Install panels perpendicular to supports, aligned level and plumb.
  - 2. Fasten panels to wall girts with screw fasteners.
- C. Trim items
  - 1. Install trim items at the base, wainscot transition, corners, top of steel siding, fascias, gables and ridge using appropriate fasteners.
- D. Vent-A-Ridge
  - 1. Install over ridge trim using screw fasteners.
  - 2. Insure that a minimum of 2" clear throat opening is maintained.
- E. Soffits
  - 1. Install soffits to interlock with trim items at top of steel siding and at fascias.
  - 2. Use solid soffit at end overhang.
  - 3. Use a combination of solid and perforated soffits to provide balanced ventilation at side overhangs.
- F. Gutters and down spouts
  - 1. Install gutters with spikes and ferrules spaced 24" o.c.
  - 2. Silicone sealant and silicone rubber gaskets shall be used at laps to maintain leak prevention and to relieve stress due to thermal movement.
- G. Filler strips
  - 1. Provide closed cell foam filler strips at the top and bottom of the roofing panels.
- H. Interior panels
  - 1. Install panels perpendicular to supports, aligned level and plumb.
  - 2. Fasten panels to wall girts with 2 1/4" EPDM washered ring shank nails.
  - 3. Fasten panels to lower truss chords with 1" painted screws.

### **3.08 TOLERANCES**

- A. Framing Members
  - 1. 1/4" from level.
  - 2. 1/8" from plumb.
- B. Siding and roofing
  - 1. 1/8" from true position