GENERAL NOTES

The information on these drawings applies solely to this project.

Do not scale the drawings. If a required dimension is not indicated, please request the missing information.

The engineering design is based on drawings provided by others. **It is the responsibility of the purchaser (owner and/or contractor) to verify all dimensions indicated on the timber frame system drawings.**

These drawings are for the heavy timber superstructure only as herein defined below for the structure or structures indicated. Architectural details such as waterproofing, flashing, roofing, finishes, coatings; the design of the chimney and fireplace; the design of hvac, plumbing, and electrical systems and the site work are the responsibility of others.

Timbers will shrink after installation until they reach the EMC (Equilibrium Moisture Content). This will cause the loosening of bolts and threaded connectors. Periodic tightening of these connections by the end user during the first several years of the structure’s service life may be required. See technical specifications hereinbelow.

Normal construction tolerances/dimensional variations can be expected in the completed structure as well as dimensional changes due to shrinkage and swelling throughout the life of the structure. For these reasons, details of adjoining surfaces and materials must be able to accommodate these variations and changes. Expect joinery to ‘open’ somewhat due to shrinkage from initial moisture content at the time of fabrication until EMC (Equilibrium Moisture Content) is reached.

The key to the long-term survivability of the structure depends on keeping the timbers sealed, dry and well ventilated. These design details are the responsibility of others

DESIGN ASSUMPTIONS and RELATED DETAILS

To resist lateral wind loads, this heavy timber framed roof system requires shear walls and the roof diaphragm to be designed and installed by others including all connections between them and the timber framing system and foundation to have been completed.  Adequate bracing must be installed and maintained to resist wind loads and erection loads until all of the structural systems defined on the drawings herein have been completely installed.

The load bearing timber system as described in these documents and being supplied by this manufacturer is designed to resist vertical, in-plane loads only, as specified above. It is the responsibility of the engineer of record to design all supporting elements including but not limited to roof structural decking/sheathing system (to transfer roof diaphragm shear), the shear wall system, load bearing walls and posts, and the foundation system to resist the lateral, uplift and gravity loads indicated.

The timber knee braces may provide some lateral stability during erection depending on wind direction.  It is the responsibility of the erector/installer of the timber frame system to provide temporary lateral bracing and guying systems until the structural components of the exterior wall system have been completely installed.

The exterior wall and roof framing and sheathing systems and connections between them and the timber frame system shall be designed and installed by “others” to transfer lateral loads due to wind or seismic forces thru the roof and timber frame system to the wall system and the foundation.

Continuous double 2x top plates are assumed and required for anchorage of specified screws to resist uplift. It is the responsibility of others to design and install any connections required to transfer these loads to the foundation.

Any required spacers between the timber frame and the wall system to tuck dry wall sheathing behind the timber frame must be structural plywood or oriented strand board. Drywall/gypsum board spacers are not permitted for the transfer of lateral loading between the timber frame and stud framed or SIP wall systems.

OSB or structural plywood sheathing must be designed and installed by others to be  fastened directly to the 2x6 T and G decking  to resist wind uplift and develop roof diaphragm shear.

Shear walls must be balloon framed to extend to the underside of the overlaid 2x6 decking (which shall be made to lap over the top of these walls) and fastened  to transfer roof diaphragm shear to the walls.  Shear walls must “follow” all gabled profiles.

Nothing contained herein or indicated hereon shall infer or imply any responsibility on the part of the timber frame manufacturer or supplier or their component/system engineer for such design or for the analysis of those supporting elements which have been or are to be prepared by others.

TEMPORARY SUPPORT OF THE HEAVY TIMBER SYSTEM/S

Temporary support of the heavy timber system including, but not limited to, lateral bracing, bridging, blocking, strong-backs (or other devices as required) on frames and trusses shall be installed and maintained while the remainder of construction is completed and the permanent connections from the timber frame system to the lateral force resisting system (structural insulated panels or other structural framing/walls) have been completed. Once all construction is completed, the temporary support system components may be removed and returned to the supplier of that material.

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TIMBER FRAME SYSTEM ENGINEERING DRAWING NOTES

This is a Load Bearing/Non-Load Bearing/Self Supporting (as applicable) Heavy Timber System only. No other systems or materials are included.

Other included systems (if any) are: T&G Roof Decking/OSB Diaphragm Sheathing/SIPs Wall and/or Roof Panels/Glulam Elements (etc) SIPs Roof and Wall Enclosure are to be designed, furnished and installed By Others. See “BOXED NOTES” elsewhere on this sheet for installation requirements of Supplemental Roof Decking Systems included with the Timber Frame System.

APPLICABLE STRUCTURAL CODES:

2015 International Residential/Commercial Building Code with local and state amendments, ASCE 7-10, AF&PA NDS 2015, TFEC 1-2010 (Draft for Standard for Design of Timber Frame Structures)

QUALITY CONTROL CRITERIA

TFEC 2-2018 Code of Standard Practice for Timber Frame Structures

DESIGN CRITERIA

WIND LOADS:

Design Wind Speed: 115 MPH, 3-Second Gust

Exposure Category: C

 Building Classification: II

Wind Importance Factor: 1.0

Enclosure Classification: Enclosed with protected openings.

SEISMIC LOADS: Not Applicable/Not Controlling

ROOF SNOW LOAD

 Ground Snow Load: 35 PSF (Controls Roof Design)

 Exposure Factor, Ce: 1.2 (assumed ‘sheltered’)

 Thermal Factor, Ct: 1.0

 Roof Slope Factor, Cs: 1.0

 Importance Factor, I: 1.0

 ROOF LIVE LOAD: 20 PSF (Not Controlling)

 ROOF DEAD LOAD: 20 PSF Horizontal Projection Plus Weight Of Timber

 FLOOR LIVE LOAD: 40 PSF

 FLOOR DEAD LOAD: 20 PSF Plus Weight Of Timber

 NOTE: Concentrated Loads and Construction Loads must not exceed design loads above.

TIMBER

INTERIOR: Douglas Fir, #1 and Better, WCLIB Grading Rules, “Green” at time of fabrication and expected to be less than 19% moisture content in service, free of heart center and finished S4S in accordance with NDS 2012 Table 1B.

Note: Douglas Fir is not a “naturally durable wood” as defined in Section 202 and as may be required by Section 2304.11 of the International Building Code. Its use in exposed locations requires special care in providing protective flashing, sealing or oiling of timbers, and ongoing/active maintenance and observation to prevent premature deterioration from rot, decay and UV degradation. The design and detailing of such system and coatings and inspection/maintenance procedures is the responsibility of others.

EXTERIOR: White Oak, #2, NELMA, “Green” at time of fabrication and expected to be less than 19% moisture content in service, box-heart, S4S in accordance with NDS 2012 Table 1B.

Timbers to be cut, trial fitted, sanded and shipped F.O.B. jobsite for installation. Any special coatings are ‘by others’ or as otherwise required by the heavy timber purchase agreement. The use of end grain sealer is recommended for all timbers to help resist end checking. Surface sealers to resist moisture penetration are recommended for all timber exposed to weather.

Special Truss Fabrication Note: Parallel Chord Trusses with tension splices shall be cambered L/180 where L is the span in inches.

Note: Some warping, twisting, checking, and splitting of timbers as they reach equilibrium moisture content can be expected.

CONNECTORS

1. SCREWS:
	1. 'RSS' (Rugged Structural Screws) high tensile/bending yield strength by GRK FASTENERS, or equal. Screws shall be washer-headed. Shaft diameters shall be 5/16" diameter up to 7 ¼” long and 3/8" diameter from 8” long and above. Screws shall penetrate a minimum of 4” in receiving timber. Where heads would be visible, screws shall be installed in counter-bored holes to clear the head and allow approximately 1/2” for plugging. See www.grkfasteners.com for additional information.
	2. “ASSY-VG-CSK all-threaded, zinc plated (electroplated with a zinc layer thickness of 5-8 micro meters), self-countersinking screws (ICC/ESR #3178) provided by My-Ti-Con Timber Connectors ([my-ti-con.com](http://my-ti-con.com/)),
	3. Lag Screws: Lag screws shall be ‘galvanized’ unless otherwise noted. Drill two lead holes: the first for the threads at 65% to 85% of the shank diameter in wood with a specific gravity (SG) greater than 0.60; 60% to 75% for an SG between 0.50 and 0.60; and 40% to 70% for an SG equal to or less than 0.50 to insure a ‘tight grip’ into the timber receiving the threads; and, the lead hole for the smooth shank equal to the diameter of the shank.

2. PEGS: 1" Diameter, Structural, Straight Grained, Black Walnut, White Oak, Red Oak or Locust treated with paraffin, linseed oil or similar sealing substance.

3. TENONS: (minimum dimensions unless otherwise noted)

STUB TENONS: 2” Thick By 3/4" Long

FULL TENONS: 2” Thick By 4-1/2” Long (1 ½” tenons into 51/2” thick timber) SPACING: End Distance: 2 ½”, Edge Distance: 2”; Spacing: 2 ½” to 3”

4. BOLTS and PINS: ASTM Grade A307 (Interior) or Grade 316 Stainless Steel (Exterior) unless otherwise noted. (Installer Note: At least two full threads shall extend past the face of any nuts.) Bolt holes in timber shall be drilled to yield a tight fit requiring ‘moderate’ driving force with a mallet to seat the bolts. To compensate for the effects of cross grain shrinkage on bolted connections in ‘green’ timber, re-tighten all bolts: a) immediately prior to occupancy; b) six months after occupancy; and, c) 18 months after occupancy. Where the equilibrium moisture content is equal to or less than 19%, re-tighten bolts: a) immediately prior to occupancy; and, b) 12 months after occupancy.

5. Timberlinx™ by [www.timberlinx.com](http://www.timberlinx.com) of the type and size noted on the details.

6. DOWELS AND THREADED ROD TENSION TIE BOLTS: ASTM Grade A36 (Installer Note: At least two full threads shall extend past the face of any nuts or threaded turn-buckle sleeves.) Hi-Strength rods where noted shall be ASTM Grade A572 Gr 50.

7. CONCRETE ANCHOR SYSTEM: Cold Weather: Simpson AT-XP Acrylic Adhesive (14 degree limit); Warm Weather: Simpson SET-XP (45 degree limit) or SET-3G (40 degree limit)

All installed in strict accordance with Simpson instructions. Installer Note: Temperatures are ‘base material temperatures NOT air temperature with differences in cure time vs temperature.

8. STEEL ANGLES, PLATES AND FABRICATED CONNECTIONS: ASTM Grade A36

9. POST BASES/BRACKETS: As detailed.

10. FINISHES: All steel connections and hardware exposed to weather to be hot-dip galvanized, electrostatically coated or stainless steel unless otherwise noted.

TF JOINERY/CONNECTIONS (As noted below and on the drawings and details)

1. Housings/Connections
	1. Rafters:  ¾” unless otherwise noted w/2-9” screws LogHogs or GRK-RSS Screws
	2. Floor Joists:  3/4” unless otherwise noted w/2-9” screws LogHogs or GRK-RSS Screws
	3. Non-load bearing beams and connecting girts:  1” plus 3 ½” tenon as described below (unless otherwise noted) w/ 2 pegs or connecting splines as shown plus two (2) GRK RSS Screws from top of beam 3 ½” min. into receiving timber
	4. Load bearing beams:  1 ½” plus 3 ½” tenon as described below (unless otherwise noted) w/2 pegs or connecting splines as shown plus two (2) GRK RSS Screws from top of beam 3 ½” min. into receiving timber
2. Rafters to Posts:  1 ½” housings with 2-Peg M&T connection or two (2) GRK RSS screws with 3 ½” min. into receiving timber.
3. Pegs:  Quantity Shown (see specs for mortise and tenon sizes and peg spacing)

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“SUPPLEMENTAL SYSTEM NOTES” – (add as required)

CONCRETE MONOLITHIC FOOTINGS AND SLAB

1. Remove all organic material within five feet (5’) away from the perimeter of the foundation and slab area.
2. Grade site ‘level’ and with appropriate drainage (1/2” /foot away from the perimeter of the slab for at least ten feet(10’).
3. Insure the exposed subsurface soils are compacted to at least 98% of the ’standard proctor density’ and will support a minimum soil bearing load of 2,000 pounds per square foot. Engage a qualified soils testing lab for this purpose.
4. Insure that footings are inspected by the appropriate building inspection department.
5. Wood form all exposed edges ‘straight and true’.
6. Reinforcing: ASTM Grade 60
7. Concrete: 4,000 PSI in 28 days
8. Slabs exposed to ‘weather’ should be sloped to drain 1/8” per foot over anticipated exposure area.
9. Steel trowel finish slab as soon as slab will support troweling equipment
10. Saw cut control joints 1 ½” deep as soon as slab will support equipment and joints can be cut without ‘raveling’

SIP SYSTEM REQUIREMENTS

1. Material:
	1. Roof Panels: 10 ¼” thick (nominal) with 7/16 OSB skins and EPS foam core, installed where noted.
	2. Wall Panels: 6 ½” thick (nominal) with 7/16” OSB skins and EPS foam core, installed where noted.
2. Design and Installation Standards: Structural insulated panels (SIPs) shall be provided by a firm with demonstrated experience in the fabrication and installation of that system. Membership in SIPA (Structural Insulated Panel Association will satisfy this requirement). The firm shall have a current code certification report (NTA or similar) with sizes, and span and load tables.
3. The SIP system shall be designed to resist required design loads as indicated or referenced above.
4. Where SIP systems are installed on framing by others, fastening requirements shall be designed to resist gravity loads, wind uplift, and diaphragm shear.
5. SIP system shop drawing shall be provided with a summary of the location, thicknesses and types of panels (type of foam core) with to-scale drawings of all supporting elements, layout of panels, sections, and details with fastening requirements on the details on in appropriate tables.
6. Select panel screws of sufficient length to provide full thread penetration into receiving timbers such that threads are excluded from the shear plan to maximize shear strength.
7. Provide 15# rolled felt or synthetic vapor barrier over sheathing to provide temporary protections from the elements prior to installation of finished roof system designed and installed by others.
8. The SIP system shop drawings and a copy of the current code certification report shall be submitted to the Timber Frame Specialty Engineer for review and approval prior to fabrication and installation of the SIP system

SOLID WOOD DECKING REQUIREMENTS

1. Material: Tongue and Groove 2x6 #2 Western Red Cedar, WCLIB Grading Rules, S4S, controlled random layup, groove side down, installed where noted.
2. Design and installation standards: “Tongue and Groove Roof Decking” (copyright 2003) by the American Forest & Paper Association, Inc. and the American Wood Council.
3. Material to be furnished and installed unless otherwise agreed in writing.
4. Fasten decking to each timber rafter, purlin or other support with two (2) 3 ½” stainless steel ‘deck screws’; or two (2) 16d galvanized ring shank nails; or, three (3) .131 x 3 ¼” galvanized, full-headed RS gun nails in each board at each support unless otherwise indicated.
5. Overlay solid wood decking with a minimum of one layer of properly 15# rolled felt to protect wood decking from the elements and provide a vapor barrier under any OSB/CDXC/Nail Base over-layment. Alternatively, recommend ‘synthetic’ membrane under metal roofing, hard tile or slate designed and installed by others.

OSB/CDX SHEATHING OVERLAYMENT REQUIREMENTS (To develop diaphragm shear)

1. Material: 4’ x 8’ sheets of 7/16 OSB or CDX plywood over-layment on solid wood decking described above and installed where noted.
2. Fasten sheathing to 2x decking with N10d (1 ½” common nails) or 1 ½” ‘wide crown’ staples at 6” on center around all edges and 12” on center in rows at 24” on center.
3. Lay long axis of sheathing perpendicular to long axis of 2x decking.
4. Stagger butt joints in sheathing a minimum of 24”.
5. Provide adequate expansion joints between sheets to prevent buckling.
6. Design and installation standards: American Plywood Association
7. Material to be furnished and installed unless otherwise agreed in writing.
8. Install sheathing over solid wood decking as one continuous operation or provide temporary protection from the elements with a one layer of 15# rolled felt.

SPECIAL SHEAR WALL SYSTEMS

1. Frame walls as indicated.
2. Studs and top of wall plates: #2 SPF and 1.9E LVL material as indicated.
3. Sill plates: #2 pressure treated southern yellow pine (SPIB Grading Rules)
4. Sheathing: 15/32” minimum (5/8 indicated by architect) OSB or CDX
5. Hold Downs: Simpson (no substitutes!)
6. Fasteners: Hot dip galvanized nails where required.
7. Unless otherwise noted, fasten to solid wood decking with 1 ½” wide-crown staples at 6” on center on edges and in rows spaced 24” on center across sheet with 8d nails at 12” on center in this “field”.
8. Stagger end joints of sheathing 24” to 48”.
9. Provide 15# rolled felt or synthetic vapor barrier over sheathing to provide temporary protections from the elements prior to installation of finished roof system designed and installed by others.

NAIL BASE INSULATION OVERLAYMENT REQUIREMENTS

1. Material: 4” nominal 4’x8’ sheets with 7/16” thick OSB skin (one side only) and 3 5/8” EPS foam core over-layment on solid wood decking described above and installed where noted.
2. Design and installation standards: Panels should be produced in accordance with standards promoted by the Structural Insulated Panel Association and by a member firm of that association. See [www.sipproducts.com](http://www.sipproducts.com) for typical installation details.
3. Material to be furnished and installed unless otherwise agreed in writing.
4. Install nail base insulation directly over solid wood decking as one continuous operation or provide temporary protection from the elements with a one layer of 15# rolled felt.
5. Install panels with 3/16” gaps (recommend ‘OSB Clips’) between panels filled with three or four passes of “gun-installed, low-expanding, polyurethane foam (Hilti, or equal) installed as the panels are joined.
6. Stagger end joints of panels 24” to 48”.
7. Fasten panels to solid lumber roof decking with “panel screws” with 5/8” diameter pancake heads by Screwfast, FastenMaster, or equal with a minimum of 1” of thread penetration into receiving wood member (excluding points) to maximize uplift resistance.
8. Unless otherwise noted, install panels with three rows of five (5) screws at each end and in the middle of the panel. Install screws at 6” on center along ridge lines, hips, and outer perimeter of roof.
9. Unless otherwise noted, provide 2x4 inset spline around perimeter of roof fastened to skin with 8d nails at 6” on center.
10. Provide 15# rolled felt or synthetic vapor barrier over sheathing to provide temporary protections from the elements prior to installation of finished roof system designed and installed by others.

GLULAM SYSTEM REQUIREMENTS

1. Glulam components shall be produced by a Specialty Glulam Manufacturing facility (Manufacturer) with: a) demonstrated experience in the manufacture of comparably sized components for a period of not less than five (5) years; and, b) has a continuous quality control program with periodic auditing and a currently applicable audit by an accredited inspection agency (such as AITC). Bidders shall submit evidence of their current certification with the bid.
2. Glulam components shall be Southern Pine 24F-V8 layup or equivalent.
3. Appearance Grade shall be “Architectural” in accordance with AITC 110, “Standard Appearance Grades for Structural Glue Laminated Timber”
4. Sizes for the Arch Beams shall be verified by the manufacturers engineer to satisfy the design load requirements stated above in accordance with AITC Section 8.3.4, ‘Design Procedure for Pitched and Tapered Curved Beams’
5. Camber is not required for the 8.5” x 33” (before trimming) Connecting Girts
6. Components shall be pre-cut to fit (except for recesses for connection plates) in accordance with the dimensions shown herein. The selected manufacturer shall submit their own dimensioned ‘production drawings’ for final review and approval by the Architect.
7. Housings for the connection plates will be routed and chisel-shaped by “others” at the jobsite.
8. Bids shall include shipment “F.O.B. Trucks, Jobsite” for installation “by others” including coordination of unloading by “by others” with the Project Manager or other designated representative.
9. Bids shall include all applicable taxes and fees which shall be paid by the Manufacturer.
10. Arch Beams may be provided with internal, fully concealed moment splices to facilitate shipping to the jobsite. It is assumed that, if this is desired, it is preferred that there would be two (2) such splices in each beam, ie, three (3) separate pieces per Arch Beam. If so, the manufacturer shall include in his cost and provide: a) the engineering design and detailing of such splices; b) complete factory preparation and trial assembly of the connections before shipment; and, c) final assembly of the three components into a single Arch Beam at the jobsite for installation by others.
11. Every bid proposal shall be specific and complete and enumerate all inclusions and exclusions.
12. The Project Manager will make every effort to insure that all bidders are made aware of any changes.
13. The Project Manager reserves the right to award the supplying of the Glulam Components to any bidder of his choosing regardless of cost.
14. If there are any questions, please direct them to the Project Manager in writing via email.

END OF SUPPLEMENTAL SYSTEM NOTES