STRUCTURAL NOTES

GENERAL

1. These notes set minimum standards for construction. The drawings govern over these notes to the extent shown. Coordinate these drawings with architectural specifications and notify Lewis & Van Vleet Inc. Engineers (LVI) of any discrepancies prior to beginning work.
2. These drawings have been prepared solely for use in construction of the Wallowa Medical Office Building Expansion project located in Enterprise, Oregon. Possession of these drawings does not grant license to construct or fabricate the whole or parts of this project in other locations.
3. The contractor shall verify all dimensions and conditions on drawings and in field. Coordinate locations of openings through floors, roofs, and walls with architectural, mechanical, plumbing and electrical drawings. Notify engineer of any discrepancies.
4. The contractor shall be responsible for providing all temporary support prior to completion of the vertical and lateral load systems. LVI has not been retained to provide any services pertaining to job site safety precautions, or to review means, methods techniques, sequences, or procedures for performing the work. Unless we are specifically retained and compensated to do otherwise, our work is limited to the design of work described on our drawings.
5. Where reference is made to ACI, AISC, ASTM, or other standards or codes, the latest edition shall apply.
6. Inspection and or job supervision is not provided by LVI.
7. All work shall be in strict compliance with the latest edition of the International Building Code (IBC) and all other state and local codes which apply
8. Any mechanical equipment, piping, ductwork, etc. which applies a load of 150 pounds or more shall be hung from a system approved by LVI.

DESIGN CRITERIA

1. Gravity Loads:
a. Snow Load -------------------------- 25 psf + Drifting
2. Wind Load:
a. Basic Wind Speed: ASCE 7-10 110 mph (ultimate)
b. Occupancy Category II, Risk Category II
c. Exposure: B
3. Seismic Load:
a. Occupancy Category II, Importance Factor: 1.0
b. Site class D
c. Spectral Response Coefficients: SDS= 0.453, SD1= 0.226
d. Seismic Design Category D
e. Wood Shear Panel Walls, R= 6 1/2
f. Analysis Procedure: Equivalent Lateral Force

SITEWORK

1. Remove all organic material, topsoil and any fill from under building and slab areas.
2. All fill material under structure to be "structural fill". Structural fill to consist of compacted granular material or approved conditioned site material. Place all fill in lifts not to exceed 8" and compact to 92% relative compaction per ASTM D-1557.
3. Base material directly below slab to be 6" thick (minimum) layer of compacted crushed rock. Base rock to have a maximum aggregate size between 3/4" and 1 1/2" and shall contain not more than 5% passing the No. 200 sieve.
4. See architectural specifications for additional information.

FOUNDATIONS

1. Design soil bearing pressure equals 1500 psf live plus dead load
2. All footings to bear on firm, undisturbed native soils or structural fill a minimum of 18" below finish exterior grade. Notify engineer before proceeding if any unusual conditions are encountered in footing excavations.
3. Do not excavate closer than 2:1 slope adjacent to footing excavations.
4. Clean all footing excavations of loose material by hand. Remove all wet, soft soil from footing excavations prior to placing concrete.
5. Earth form footings may be provided at the contractor's option and risk. All earth formed footings should be oversized 6" in each direction.
6. Excavations may be made under footings for pipes. Backfill to be "structural fill" as defined above.

CONCRETE

1. Average concrete strength to be as indicated below and determined by job cast lab cured cylinder at 28 days plus increase depending on plant's standard deviation as specified in ACI 318. Provide mix designs to engineer for review prior to placing any concrete. CLEARLY LABEL ALL MIX DESIGNS AS TO PROPOSED AREA OF USE. Supplier to label all mix designs with an identification number. Mix number should be referenced in all subsequent concrete test reports.
2. Minimum mix requirements:

Location	Compressive strength (psi)	Minimum cement content	Admixtures
Footings	3000	5	none
Slabs on grade (interior)	3500	5 1/2	WRA (a)
Slabs on grade (exterior)	3000	5 1/2	WRA,AE (b.)
Miscellaneous	3000	5	none

a. WRA= Water Reducing Admixture
b. AE= Air Entrainment
c. Provide an accelerator in all concrete placed below 40 degrees.

3. Use Type I cement, per ASTM C-150 unless otherwise approved. Water cement ratio to be 0.46 maximum for all slabs on grade, tilt walls, precast columns. Water cement ratio to be 0.50 maximum for all other concrete. Do not add water to mix at jobsite. Flyash meeting ASTM C 618 may be substituted for up to 20% of the cement content in all mixes.
4. Aggregate to be per ASTM C-33.
5. Water Reducing Agent (WRA). Comply with ASTM C-494.
6. Air Entrainment (AE) shall comply with ASTM C-260. Provide 3-5% when specified.
7. Accelerators: Dosage to be determined by contractor.
8. Calcium Chloride shall not be used in any concrete, for any purpose, on this project.

REINFORCING

1. All reinforcing steel to be ASTM A615, Grade 60.
2. Fabricate and install all reinforcing steel according to the "Manual of Standard Practice for Detailing Reinforcing Concrete Structures" ACI Standard 315.
3. Provide 2'-0" x 2'-0" corner bars to match horizontal reinforcement in poured in place walls and footings at all corners and intersections.
4. Splices in slab on grade reinforcement shall be lapped 30 diameters or 2'-0" minimum and shall be staggered at least 4'-0" at alternate bars. All other splice locations for #6 bars or smaller, lap bars 58 diameters or 2' 0" minimum and stagger the splices at least 4'-0" at alternate bars.
5. Provide (2)-#4 bars at top, bottom, and ends of all walls unless otherwise indicated on plans.
6. Provide dowels to match all vertical reinforcement in walls. Lap 58 diameters or 24" minimum for #6 bars or smaller.
7. All wall reinforcement to be placed in middle of wall unless otherwise noted on drawings.
8. Provide shop drawings of all reinforced concrete items to engineer for review prior to construction of these items.

WOOD FRAMING

1. All lumber to be species and minimum grades as follows (unless otherwise noted in drawings:
a. Joists, rafters, --Douglas Fir #2
b. Beams and stringers, 4x and larger------------------Douglas Fir #1
c. Bucks, blocking, bridging & misc.---------------Doug. Fir or Hem Fir #3
d. 2 x 4 studs----------------------------Doug. Fir "STUD" or "STD"
e. 2 x 6 studs and larger--------------------Douglas Fir #2
f. Sills, ledgers, plates, etc. in contact w/ concrete--P.T. Douglas Fir #2 (unless noted otherwise on plans)
g. Posts-------------------------------------Douglas Fir #1
2. Roof and wall sheathing to be APA rated sheathing, Exposure 1, conforming to APA performance standard PS 1-83 and to ICC NER-108. See drawings for required thickness of sheathing and/or span rating. Install roof sheathing with long dimension perpendicular to supports and stagger end joints (unless noted otherwise on drawings). Use spacer tool to ensure 1/8" end and edge joints, including tongue and groove joints. Install 2 x 4 or thicker blocking at unsupported joints in wall sheathing.
3. Framing hardware to be Simpson or prior approved equal. Fill all nail holes unless noted otherwise in drawings or manufacturer's literature. Use largest nail size indicated in manufacturer's literature. Provide hardware size to match member size (I.E. 'HU410' hanger for 4x10 header, 'LSSU28' for 2x8 rafter, etc.).
4. All bolt heads and nuts bearing on wood to be provided with a washer.
5. All fasteners (hangers, clips, screws, nails, bolts, washers etc.) in contact with pressure treated or fire treated wood to be stainless steel or hot dipped galvanized material. Do not mix stainless steel and galvanized steel in the same connection.
6. All nailing to be per IBC Table 2304.9.1. Obtain engineer's prior approval for all proprietary nailing or stapling systems.
7. All nails to be common wire unless noted otherwise. Staples are not an acceptable substitute without Engineer's prior written approval. Minimum nail diameters are as follows:
a. 8d = .131"
b. 10d = .148"
c. 12d = .148"
d. 16d = .162"
e. 20d = .192"
8. Cutting and notching of joists is not permitted without engineer's prior approval. One inch diameter holes may be drilled in the center 1/3 of the member depth, but all other holes to be approved prior to drilling.
9. Studs may be notched in the lower 1/5 of the height of stud for electric conduit and plumbing pipes, but no part of the notch is to be greater than 1/4 of stud depth. Holes with diameters up to 1/3 of stud depth may be drilled in stud.
10. Laminated beams to be Douglas Fir (Fb= 24 ksi) per AITC 117 specification. Unless noted otherwise, simple span beams to be Combination 24F-V4 and all other beams (beams cantilevered or continuous over supports, etc.) to be 24F-V8. Appearance grade to be architectural for all beams exposed to view and industrial elsewhere, unless noted otherwise in drawings. AITC or APA/EWS certificate required. Use waterproof glue..

ENGINEERED WOOD PRODUCTS

1. All engineered wood products (PSL, LVL, LSL) to be designed and manufactured to the standards of the Weyerhaeuser Corporation. Other product manufacturers shall submit a request for substitution prior to bidding.
2. Allowable increase in wood member stresses due to duration of loading shall be 15% maximum for snow load only (roof) and 33 % for loads including wind or seismic. Design members for any additional loads indicated on drawings.
3. All hangers, clips, nails, screws and other fasteners or hardware in contact with pressure treated or fire treated wood to be stainless steel or hot dipped galvanized. Do not mix stainless steel and galvanized steel in the same connection.

LIGHT METAL PLATE-CONNECTED WOOD ROOF TRUSSES

1. All light metal plate-connected wood roof trusses specified shall be designed by a licensed engineer (see note below) and shall be manufactured by a prior-approved truss manufacturer. The trusses shall be designed for the following load requirements:

Roof Joists
a. 25 psf snow load + applicable drifting per IBC
b. 10 psf dead load top chord
c. 10 psf dead load bottom chord
d. Uplift as specified in IBC unless otherwise noted in the drawings.

2. Allowable increase in wood member stresses due to duration of loading shall be 15% maximum for snow load only.
3. All hangers, clips, nails screws and other fasteners or hardware in contact with pressure treated or fire treated wood to be stainless steel or hot dipped galvanized. Do not mix stainless steel and galvanized steel in the same connection.
4. All truss top chord members shall be Doug Fir material with a minimum specific gravity of .49.
5. All bridging, bearing clips, blocking, hangers, etc. that are required to meet truss design criteria shall be included in the truss shop drawings and shall be provided by the truss manufacturer.
6. Truss erector shall exercise the utmost care during the erection of trusses to prevent the trusses from buckling laterally. Stockpile, lift and laterally brace the truss as directed on manufacturer's erection drawings. Use spreader bars for lifting and laterally brace as necessary. Remove any damaged trusses from the jobsite. Do not attempt to reinforce any damaged trusses except as approved in writing by the project engineer and by the truss manufacturer.
7. Shop drawings and calculations shall be submitted and calculations shall be stamped by an engineer registered in the State of Oregon. Truss supplier name, address, and phone number; grids, north arrow or other reference to building layout and construction documents; truss piecemarks in reference to the calculation; truss layout and spacing; all truss bridging, blocking, etc. required to meet truss design criteria; all hangers hurricane clips, etc. required to be a part of the truss connection whether specified on the construction documents or by the truss supplier; any pertinent information as to erection.
8. A representative of the truss manufacturer shall inspect all trusses after erection is complete and sheathing, bridging, blocking, etc. have been installed. Inspector shall submit a report to the engineer stating that the inspection was made and that truss condition and installation are acceptable and conform to the manufacturer's requirements.

POST-INSTALLED ANCHORS

1. All post-installed anchors in contact with pressure treated wood to be hot dipped galvanized or stainless steel.
2. All drilled expansion anchors in concrete to be "Kwik Bolt TZ" by Hilti, Inc. (ICC ESR-1917) or "Strongbolt 2 Wedge Anchor" by Simpson Strong Tie (ICC ESR-3037) only. Other expansion anchors in concrete with written approval of engineer only. All anchors to be installed following manufacturer's instructions. Provide minimum embedment, spacing, and edge distance as specified by the manufacturer for anchor size noted unless otherwise indicated on drawings. All drilled expansion anchors in concrete require special inspection during installation.
3. All drilled adhesive anchors in concrete to use "SET-XP Epoxy Adhesive" by Simpson Strong-Tie Company Inc. (ICC ESR-2508) or "HIT-HY 200 Adhesive Anchoring System" by Hilti, Inc. (ICC ESR-3187) only. Other adhesive anchors in concrete with written approval of engineer only. All anchors to be installed following manufacturer's instructions. Provide minimum embedment, spacing, and edge distance as specified by the manufacturer for anchor size noted unless otherwise indicated on drawings. All drilled adhesive anchors in concrete require special inspection during installation.
4. All Screw Anchors in concrete to be "Titen HD Screw Anchor" by Simpson Strong-Tie Company Inc. (ICC ESR-2713) or "KWIK HUS-EZ / KWIK HUS-EZ 1Carbon Steel Screw Anchors" by Hilti, Inc. (ICC ESR-3027) only. Other screw anchors in concrete with written approval of engineer only. All anchors to be installed following manufacturer's instructions. Provide minimum embedment, spacing, and edge distance as specified by the manufacturer for anchor size noted unless otherwise indicated on drawings. All screw anchors in concrete require special inspection during installation.
5. All drilled adhesive anchored reinforcement dowels in concrete to use "SET-XP Epoxy Adhesive" by Simpson Strong Tie (ICC ESR-2508) or the "HIT HY 200 Adhesive Anchoring System" by Hilti, Inc. (ICC ESR-3187). Other adhesive anchored reinforcement with written approval of engineer only. Install all anchors per adhesive manufacturer's instructions using ASTM A615 grade 60 dowels unless noted otherwise on plans. Provide minimum edge distance and spacing indicated by manufacturer for anchor size noted unless otherwise indicated on drawings. Provide minimum embedment noted on plans. All drilled adhesive anchored reinforcement requires special inspection during installation.
6. See drawings for anchor types required. Substituting expansion anchors for adhesive anchors, screw anchors, or cast-in anchors; adhesive anchors for expansion anchors, screw anchors, or cast-in anchors; or cast-in anchors for adhesive anchors, expansion anchors, or screw anchors is acceptable with written approval of engineer only.
7. Contractors wishing to substitute alternate anchors should submit written request, including current ICC ESR reports to engineer for approval.

STRUCTURAL AND MISCELLANEOUS STEEL

1. Detailing, fabrication and erection of steel to conform to the Steel Construction Manual of the AISC.
2. All steel to be A36 except as noted.
3. All wide flange and WT sections to be A992.
4. All welds to be made with E70XX electrodes by welders certified by AWS Standards.
5. Unless noted otherwise, all bolts to be A325N for steel to steel connections and A307 for anchor bolts and connections to wood. All steel to steel connections to be snug tight only. Torqueing of bolts not required unless specifically noted in detail. Provide standard plate washers under all bolt heads and nuts bearing on wood. All anchor bolts in contact with pressure treated wood to be hot dipped galvanized.
6. All structural tubing to be ASTM A500 Grade B, Fy = 46 ksi. All steel pipe to be ASTM A501 (Fy = 36 ksi) or ASTM A53, Type E or S, Grade B (Fy = 35 ksi).
7. Do not oversize drilled or punched holes with a torch.
8. All welded reinforcing noted to be ASTM grade A706. All headed stud anchors to be Nelson or approved equal. Weld all studded anchors and reinforcing noted, all around, with 1/4" fillet weld for 1/2" diameter anchors, 5/16" fillet weld for 3/4" diameter anchors, and 3/8" fillet weld for 1" diameter anchors, or alternately, use a Nelson stud welding unit.
9. All fasteners (hangers, clips, screws, nails, bolts, washers etc.) in contact with pressure treated or fire treated wood to be stainless steel or hot dipped galvanized material. Do not mix stainless steel and galvanized steel in the same connection.
10. Provide shop drawings of all structural steel items to engineer for review prior to fabrication.

STRUCTURAL SPECIAL INSPECTIONS

The following special inspections are required and shall be performed by a qualified independent testing agency in compliance with the requirements of IBC Chapter 17. The testing agency shall provide copies of all test reports to the project engineer in a timely manner. Additional special inspections for non-structural elements not listed in this section are to be per the project specifications.
1. Special inspection and testing of concrete is required during the taking of test specimens and placing of all reinforced concrete per the special inspection table.
2. Special inspection is required for all structural welding and high strength bolting unless welding is performed in a shop approved by the building official. All field welding requires special inspection.
3. Special inspection is required of all post-installed anchors in concrete or masonry and drilled anchor bolts in concrete. Inspection to be continuous during the anchor installation to insure installation meets all manufacturer's instructions and minimum embedment noted on drawings. See "POST INSTALLED ANCHORS" section of notes for more information.
4. Periodic special inspection is required of all wood shear walls with edge fastening at 4" O.C. or less, holdowns, sill plate anchorages at designated shear wall locations. Periodic special inspection is required of all collectors, collector strapping and/or attachment, blocking/rim joist attachments, and wall top plate splices in shear wall lines at all locations in the building. Periodic special inspection is required of wood diaphragms or portions of with edge fastening of 4" O.C. or less.
5. Periodic special inspection is required of the anchorage of emergency power systems and piping or mechanical equipment, or ductwork containing flammable or hazardous materials. Periodic special inspection is required of the anchorage of all electrical equipment. The anchorage shall be in compliance with approved details provided by the component manufacturer.
6. Periodic special inspection is required of the anchorage of suspended ceilings, access floors, and steel storage racks 8 feet or taller. The anchorage shall be in compliance with approved details provided by the component manufacturer.

REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION – 2014 OSSC

VERIFICATION AND INSPECTION		CONTINUOUS	PERIODIC	VERIFY	REFERENCED STANDARD
1. Material verification of high-strength bolts, nuts and washers:	a. Identification markings to conform to ASTM standards specified in the approved construction documents.	–		X	AISC 360, Section A3.3 and applicable ASTM material standards.
	b. Manufacturer's certificate of compliance required	–		X	–
2. Inspection of high-strength bolting:	a. Snug-tight joints	–	X	–	AISC 360, Section M2.5
	b. Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist-off bolt or direct tension indicator methods of installation	–	X	–	
	c. Pretensioned and slip-critical joints using turn-of-nut without matchmarking or calibrated wrench methods of installation	X	–	–	
3. Material verification of structural steel:	a. For structural steel, Identification markings to conform to AISC 360	–	X	–	AISC 360, Section M5.5
	b. For other steel, Identification markings to conform to ASTM standards specified in the approved construction documents.	–	X	–	Applicable ASTM material standards
	c. Manufacturer's certified test reports	–	X	–	–
4. Material verification of cold-formed steel deck:	a. Manufacturer's certified test reports	–	X	–	–
5. Material verification of weld filler materials:	a. Identification markings to conform to AWS specification in the approved construction documents.	–	–	X	AISC 360, Section A3.5 and applicable AWS A5 documents.
	b. Manufacturer's certificate of compliance required.	–	–	X	–
6. Inspection of welding:	a. Structural steel and cold-formed steel deck:				AWS D1.1
	1) Complete and partial penetration groove welds.	X	–	–	
	2) Multipass fillet welds.	X	–	–	
	3) Single-pass fillet welds > 5/16"	X	–	–	
	4) Plug and slot welds.	X	–	–	
	5 Single-pass fillet welds ≤ 5/16"	–	X	–	
	6) Floor and roof deck welds.	–	X	–	AWS D1.3
	b. Reinforcing steel:				AWS D1.4, ACI 318: Section 3.5.2
	1) Verification of weldability of reinforcing steel other than ASTM A706	–	–	X	
	2) Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	–	–	
	3) Shear reinforcement	X	–	–	
	4) Other reinforcing steel	–	X	–	
7. Inspection of steel frame joint details for compliance:	a. Details such as bracing and stiffening.	–	X	–	–
	b. Member location.	–	X	–	
	c. Application of joint details at each connection.	–	X	–	

REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION – 2014 OSSC

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD	IBC REFERENCE
1) Inspection of reinforcing steel and placement.	–	X	ACI 318: 3.5, 7.1-7.7	1910.4
2) Inspection of reinforcing steel welding in accordance with required verification and inspection of steel construction.	–	X	AWS D1.4 ACE 318: 3.5.2	
3) Inspect bolts to be installed in concrete prior to and during placement of concrete where noted on drawings.	–	X	ACI 318: 8.1.3, 21.1.8	1908.5, 1909.1
4) Inspection of anchors post-installed in hardened concrete members.	–	X	ACI 318: 8.1.3, 21.1.8	1908.5, 1909.1
5) Verifying use of required design mix.	–	X	ACI 318: Ch. 4, 5.2-5.4	1904.2, 1910.2, 1910.3
6) At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	–	ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8	1910.10
7) Inspection of concrete and shotcrete placement for proper application techniques.	X	–	ACI 318: 5.9, 5.10	1910.6, 1910.7, 1910.8
8) Inspection for maintenance of specified curing temperature and techniques.	–	X	ACI 318: 5.11-5.13	1910.9
9) Inspection of prestressed concrete:				
a. Application of prestressing forces.	N/A	–	ACI 318: 18.20	
b. Grouting of bonded prestressing tendons in the seismic force-resisting system.	N/A	–	ACI 318: 18.18.4	
10) Erection of precast concrete members.	–	N/A	ACI 318: Ch. 16	
11) Verification of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	–	N/A	ACI 318: 6.2	
12) Inspect formwork for shape, locations, and dimensions of the concrete member being formed.	–	N/A	ACI 318: 6.1.1	1910.6, 1910.7, 1910.8

NOTE:
ALL FASTENERS IN CONTACT WITH PRESSURE TREATED OR FIRE TREATED WOOD TO BE STAINLESS STEEL OR HOT DIPPED GALVANIZED MATERIAL. THIS INCLUDES NAILS, SCREWS, BOLTS, ANCHOR BOLTS, WASHERS, HANGERS, HURRICANE CLIPS AND OTHER METALS IN CONTACT WITH SILL PLATES, LEDGERS AND OTHER PRESSURE TREATED WOOD.

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STRUCTURAL REGISTERED PROFESSIONAL ENGINEER 15,099 OREGON JAN. 23, 2001 GARY JAMES LEWIS
EXPIRES 12-31-2020

Wallowa MOB Addition
Wallowa County Health Care District
603 Medical Pkwy, Enterprise, OR 97828

ISSUE DATE: 01.25.2019
REVISIONS:

Bid / Permit Set

STRUCTURAL NOTES

S1.00