STRUCTURAL NOTES

MATERIALS

Rebar Grade 60
Concrete f 'c = compressive strength in 28 days
4,000 psi unless noted otherwise
3,000 psi for footings
3,000psi for masonry grout
Concrete Masonry Units f 'm = 2,000 psi
Dimensional lumber#2 Spruce Pine Fir (SPF) or Hem Fir
Pressure Treated lumber#2 Southern Pine or equal
Laminated Veneer Lumber (LVL) E = 1,900,000 psiFb = 2600 psi
Laminated Strand Lumber (LSL)E = 1,550,000 psiFb = 2,325 psi
Parallel Strand Lumber (PSL) BeamE = 2,000,000 psiFb = 2900 psi
Parallel Strand Lumber (PSL) ColumnE = 1,800,000 psi Fb = 2,400 psi

DESIGN LOADS

Roof Snow 40 psf
Floor Live40 psf
Wind15 psf

DESIGN CODES

Minnesota Residential Building Code (latest adoption)
International Residential Code (latest adoption)
International Building Code (latest adoption)

EXISTING CONDITIONS

Contractor to be verify all dimensions, elevations, and details of existing structure and site where they affect this construction prior to fabrication. Remove and replace existing architectural, electrical, mechanical, structural, civil, and miscellaneous as necessary.

TEMPORARY BRACING

Contractor is responsible for bracing, without overstressing, all structural elements as required at all stages of construction until completion of this project. Provide temporary lateral support for walls until walls are adequately braced by permanent structure. Shore foundation walls retaining earth until floor framing and basement slab are in place. Use caution when operating equipment adjacent to foundation walls.

GENERAL SOIL NOTES

The structure has been designed using a presumptive load-bearing value of 2000 psf in accordance with Table R401.4.1 of the 2006 IRC on virgin soil or compacted granular fill for footings. Remove all top soil, uncompacted fill, or other poor soil from the construction area. Slope the site to drain away from the building. Install drain tile. Backfill with granular soils.

FOOTINGS/FOUNDATIONS

All footings are to be formed and placed on virgin soil or compacted granular fill. Wall footings are cast-in-place concrete with continuous reinforcing placed 3" clear of bottom and 2" clear at top and sides. Wall footings are centered under walls and column footings under columns. Wall footings to be a minimum of 10" thick with a 4" projection each side of wall. Reinforce with 2 - #4 continuous bottom bars. Column footings to be a minimum of 12" thick, with plan dimensions as shown on drawing. Reinforce with #4 bottom bars at 10" max on-center each way. Provide 30 bar diameter lap at splices and full crossing lap at corners and intersections. Tie all reinforcing in place. Set footing reinforcing on chairs or masonry brick to obtain 3" clearance from bottom of footing. Maintain minimum frost depth of 42" for all exterior footings. Footing elevations, if shown on the plan, indicate top of footing. Step footings in a uniform manner using a 2:1 horizontal to vertical slope. Cast dowels in footing for foundation walls above. Contractor to be responsible for implementing hot weather concrete requirements per ACI 305 and cold weather concrete requirements per ACI 306.

CONCRETE

Provide ready-mixed concrete per ASTM C94. Portland cement to be ASTM C150, Type I. Use only one brand of cement throughout the work. Provide concrete aggregates meeting the requirements of ASTM C33. All concrete exposed to weather, freeze-thaw conditions or de-icing chemicals to be contain 5% - 7% entrained air. Concrete to be not be placed when the temperature of the outside air is below 40 degrees Fahrenheit, unless approved methods are used during construction to prevent damage to the concrete. All materials used and surfaces built upon to be free of snow and ice. Concrete to be not bear permanently on wood members.

SLABS ON GRADE

Slabs on grade to be reinforced with either WWF6x6-W1.4 x W1.4 in center of slab or 3.0 pounds per cubic yard polypropylene fiber reinforcement. Slabs on grade adjacent to foundation walls retaining earth to be a minimum of 3 1/2" thick. Construction and/or control joints to be occur at a maximum of 10'-0" on center at exterior slabs on grade, and at a maximum of 16'-0" on center at interior slabs on grade. Construction and/or control joints to be laid out in a rectangular pattern with long to short side ratio less than or equal to 1.5 and with no re-entrant corners. Control joints for slabs on grade to be saw cut as soon as concrete can accept it without raveling. All control/construction joints to be continuous and not staggered or offset. Control joints to be cleaned and sealed for curing purposes as soon as possible. Verify floor finishes and control/construction joint locations with owner and architect.

REINFORCED CONCRETE MASONRY WALLS

Hollow unit concrete masonry to be ASTM C90. Mortar to be per ASTM C270: Type M or S for below-grade and exterior masonry; Type N for all interior above-grade masonry. All masonry units to be placed in running bond. See plans for location and spacing of reinforcement in walls. Vertical steel to be lapped 48 bar diameters at all splices. Provide full mortar bedded face shells and webs around all grouted cells for full bearing and to prevent leakage into adjacent cells. Grout to be per ASTM C476. Wall construction to be not exceed heights of 5'-4" before placement of core grout unless cleanout holes are provided at the bottom of each grout lift, then a maximum height of 8'-0" before placement of core grout. Provide ladder or truss style horizontal joint reinforcing, fabricated with galvanized 9 gauge wire, placed every 2nd course. Provide corner bars with 2'-0" legs for each horizontal bar in all bond beams at corners and intersecting walls. Masonry not to be placed or grouted when the temperatures of the outside air is below 40 degrees Fahrenheit, unless approved methods are used during construction to prevent damage to the masonry. All materials used and surfaces built upon to be free of snow and ice. Solid grout the masonry voids below beam a minimum of 2 courses below beam and post bearing locations. Masonry to be not bear permanently on wood members.

MASONRY LINTELS

All openings in concrete masonry walls not specifically indicated to have other types of lintels to be have 8" deep, solid grouted masonry lintels reinforced w/ 2-#4 bottom bars. Extend all lintels a minimum of 8" beyond opening and fill two masonry courses below lintel bearing with grout.

STRUCTURAL STEEL

All structural steel to be designed, fabricated, and erected according to the specifications of the American Institute of Steel Construction (A.I.S.C.) Latest Adoption. Structural steel supplier to be supply all cap plates, bearing assemblies, base plates, stiffeners, splices, and connections, and to be design same unless noted on drawings. All welding to be match filler materials in accordance with the rules of the American Welding Society (A.W.S.) Structural Welding Code, Latest Adoption. All welders to be certified by the rules of the American Welding Society. Tighten anchor bolts and grout column base plates before installing steel beams. Provide complete detailed shop drawings to the contractor for review and approval prior to fabrication.

DIMENSION LUMBER

Design is based on lumber free of significant splits and checks, contractor to visually inspect lumber during installation. Sills and all other lumber in contact with concrete or masonry and within 8" of finished grade to be preservative treated wood. All lumber is to be grade stamped, which is to contain grading agency, mill number or name, grade of lumber, species or species grouping or combination designation, rules under which graded, where applicable, and condition of seasoning at time of manufacture. All lumber to be seasoned to a moisture content of 19% or less, with the indication of "S-Dry" on the grade stamp. All lumber to be protected from the elements on site. Sill plates to be bolted to foundation wall with 5/8" diameter anchor bolts at 4'-0" on center maximum. Bolts to extend 6" minimum into concrete or solidly grouted CMU foundation wall. Each sill plate to have a minimum of 2 bolts with one bolt located not more than 12 inches or less than 4 1/2 inches from each end of the plate section. Use 1/8" x 2" washers, slightly crushing plate. Minimum nailing to be in accordance with Table R602.3(1) of the 2006 IRC unless noted otherwise. All walls to have a single bottom plate and a double top plate. Studs to be spaced at 16" o.c. maximum. Wood headers to be have a minimum 3" length of bearing at each end or bear the entire length of the bearing studs. Beams to bear on a minimum of 3" along their length and fully along their width and have a minimum of 2 typical wall studs supporting them. Joists to bear the full width of supporting members (stud wall, beams, etc.). Provide solid vertical blocking at all joist spaces below wood columns. Provide matching columns to foundation at lower levels below columns comprised of 3 or more studs. All beams and joists not bearing on supporting members to be framed with prefabricated joist hangers. All fasteners and hangers in contact with treated lumber to be G185 hot dipped galvanized or equal. Wood beams pocketed into concrete or CMU to be provided with a 1/2" air space on top, end, and sides unless treated wood or steel plates are used.

WALL SHEATHING

Wall sheathing to be minimum 15/32" thick APA rated panels, rated for spacing of supporting members. A minimum 32/16 span rating is recommended. Provide Exterior or Exposure 1 grade. Panels to be continuous over two or more spans, and long dimension of panel to be either perpendicular or parallel to supports. Fasten wall sheathing with 8d nails (.131" diameter x 2 1/2") spaced at 4" on center at supported edges and 8" on center at intermediate supports. Leave an 1/8" gap at all end and edge joints to allow for expansion. Stagger end joints of panels. Refer to plan and notes for any special shear wall nailing and bolting conditions. Gypsum sheathing to be a minimum of 1/2" thick fastened with 6d cooler or wallboard nails at 7" on center to all framing members unless noted otherwise.

ROOF SHEATHING

Roof sheathing to be minimum 19/32" thick APA rated panels, rated for spacing of supporting members. A minimum of 40/20 span rating is recommended. Provide panel clips, one between each support, for supports spaced greater than 16" on center. Provide Exterior or Exposure 1 grade. Panels to be continuous over two or more spans, and long dimension of panel to be perpendicular to supports. Fasten roof sheathing with 8d nails (.131" diameter x 2 1/2") spaced at 6" on center at supported edges and 12" on center at intermediate supports. Leave an 1/8" gap at all end and edge joints to allow for expansion.

FLOOR SHEATHING

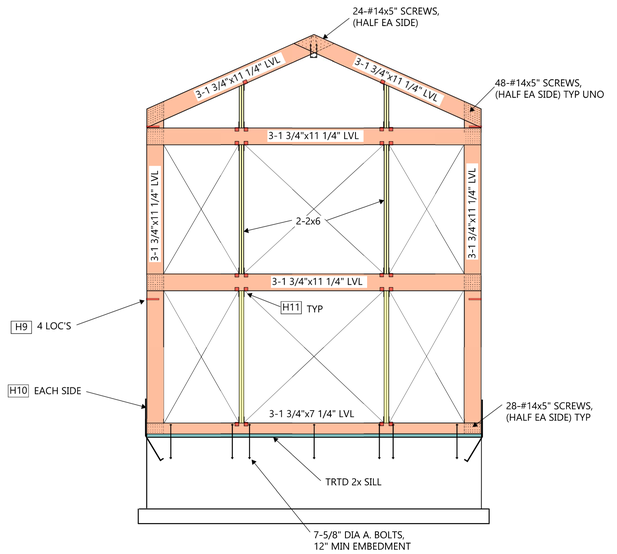
Floor sheathing to be minimum 23/32" thick tongue and groove APA rated panels, rated for spacing of supporting members. A minimum of 48/24 span rating is recommended. Provide Exposure 1 grade. Panels to be continuous over two or more spans, and long dimension of panel to be perpendicular to supports. Fasten sheathing with construction adhesive and 10d nails (.148" diameter x 3") spaced at 6" on center at supported edges and 12" on center at intermediate supports.

ENGINEERED LUMBER I-JOISTS

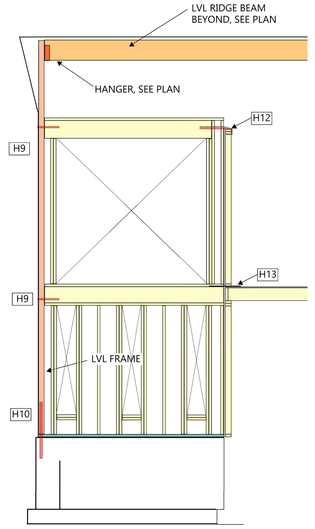
I-joist members noted on drawings are manufactured by the iLevel - Weyerhaeuser Company. Alternate at contractors option of equal design properties. Depths shown on plan are actual. Notching or cutting of I-joist flanges is not permitted. Web openings may occur under strict limitations by the joist manufacturer. I-joists to bear the full width of supporting members. Install web stiffeners, blocking between members, and nail to supporting members as per manufacturers recommendations. I-joist manufacturer to be provide a layout and certified drawings prior to beginning construction. Depths shown on plan are actual. Live load deflection of roof joists to be limited to 1/360 of the span. Live load deflection of floor joists to be limited to 1/480 of the span. Design I-joists bearing conditions as shown on drawings. I-joists to bear the full width of supporting members. Install web stiffeners, blocking between members, and nail to supporting members as per manufacturers recommendations. I-joist manufacturer to be provide connection hangers as required. No cutting, notching, or modifications of I-joists will be allowed without the manufacturer's written approval. Notching or cutting of I-joist flanges is not permitted. Web openings may occur under strict limitations indicated by the joist manufacturer.

ADHESIVE/MECHANICAL ANCHORS

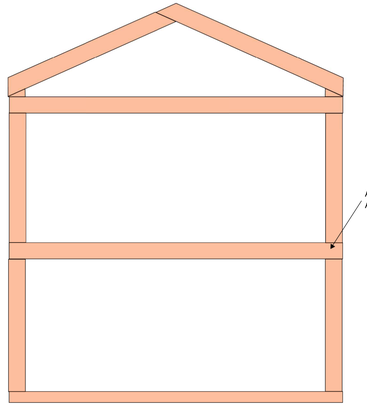
Adhesive and mechanical anchors to be provided and installed in strict accordance with the manufacturer's instructions.



WIND FRAME EAST WALL OF ATRIUM

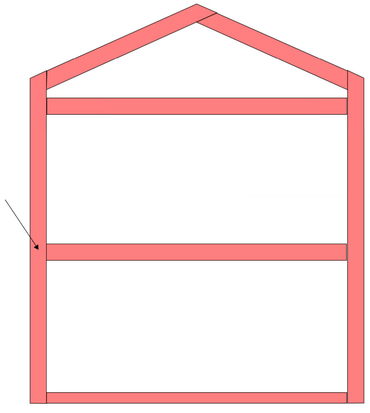


NORTH & SOUTH WALL OF ATRIUM



FRONT AND BACK PLY LVL LAYOUT

ALL JOINTS TO BE LAPPED AND SCREWED TOGETHER



CENTER PLY LVL LAYOUT

RFD
Riedel-Fall Designs

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I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

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SECTIONS AND DETAILS

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