

GENERAL STRUCTURAL NOTES

PART 1 - GENERAL REQUIREMENTS AND DESIGN CRITERIA

1.1 GENERAL

- A. These notes are the structural specifications for the project.
- B. Unless otherwise noted, details, sections and notes contained in the structural contract documents shall be considered typical for all similar conditions even if not explicitly referenced.
- C. Deficient work and/or work not in conformance with the contract documents shall be repaired at the contractor's expense. The contractor shall compensate the client for services arising from deficient work, review of modifications/contractor substitution, or expediting of submittals.
- D. Cost of investigation and/or redesign incurred by the Engineer of Record due to contractor errors will be at the contractor's expense.
- E. The contractor shall submit a single dimensioned and coordinated drawing for each level showing the locations of all sleeves and openings required by all trades prior to initiating any work.
- F. Loads imposed on the base building structure and temporary conditions intended to accommodate construction means and methods are not explicitly considered in this design. The contractor shall advise the Engineer of Record regarding construction loads and temporary conditions imposed on the building structure and shall compensate the Engineer of Record for reviewing these conditions.

1.2 ELEVATIONS & DIMENSIONS

- A. All dimensions, elevations, and conditions shall be verified in the field by the contractors and any discrepancies shall be brought to the attention of the engineer for clarification before proceeding with the affected part of the work. Dimensions and elevations noted in the contract documents as (+/-) and all field conditions shall be verified in the field (V.I.F.) by the contractors prior to the submissions of shop drawings. Upon receipt of shop drawings, the engineer has the right to assume that all field dimensions, elevations and conditions have been verified by the contractors and that the shop drawings accurately reflect such verifications unless stated otherwise on the shop drawings.

1.3 BUILDING CODES AND REFERENCED STANDARDS

- A. 2009 International Residential Code, (IRC)
- B. Massachusetts Residential Code (MSBC), 8th Edition
- C. ASCE/SEI 7-05, Minimum Design Loads for Buildings and Other Structures
- D. ANSI/AF&PA NDS 2005, National Design Specification for Wood Construction
- E. ACI 318-05, Building Code Requirements for Structural Concrete
- F. ANSI/AISC 360-05, Specification for Structural Steel Buildings

1.4 DESIGN LOADS

Edit this section as necessary for specific project conditions and parameters.

- A. Dead Loads:
All permanent stationary construction including mechanical equipment and their weights where noted on the structural drawings.
- B. Floor Live loads (uniform/concentrated)

Where appropriate, these loads have been reduced in accordance with Section 1607.9 of the Building Code.

1. Sleeping Rooms	30 psf
2. Rooms Other than Sleeping Rooms	40 psf
3. Attics Without Storage	10 psf
4. Attics With Limited Storage	20 psf
5. Habitable Attics/Attics Served with Fixed Stairs	30 psf
6. Balconies (Exterior) and Decks	40 psf
7. Guardrails and Handrails	200 lbs
8. Guardrail In-Fill Components	50 psf
9. Stairs	40 psf
10. Roof	See Snow Load

C. Roof Snow Load Parameters

Where appropriate, drifting snow loads have been considered in accordance with Section 7.7 of ASCE/SEI 7-05.

1. Ground Snow Load, Pg	40 psf
2. Flat Roof Snow Load, Pf	28 psf
3. Snow Exposure Factor, Ce	1.00
4. Snow Load Importance Factor, IS	1.00
5. Thermal Factor, Ct	1.00

D. Wind Load Parameters

1. Basic Wind Speed (3 second gust), V 100 mph
2. Wind Importance Factor, IW 1.0
3. Wind Exposure B
4. Internal Pressure Coefficient ±0.18
5. Design Wind Pressure: Components and Cladding
- a. To be determined in accordance with the governing building code as required.

E. Seismic Load Parameters

1. Detached one- and two-family dwellings are exempt from seismic provisions

Insert special loads here as required in project.

1.5 LATERAL LOAD RESISTING SYSTEM

- A. All lateral load resistance and stability of the new building in the completed structure is provided by plywood sheathed, wood stud bearing/shear walls, framed in each orthogonal direction. The plywood roof sheathing serves as horizontal diaphragm that distribute the lateral wind forces horizontally to the vertical shear walls. The vertical shear walls carry the applied lateral loads to the building foundation.

PART 2 - FOUNDATIONS

2.1 FOUNDATION DESIGN

- A. Foundation design is in accordance with Table R401.4.1 for Sandy gravel and/or gravel
1. Load Bearing Pressure = 3,000 lbs/sf

2.2 EXCAVATION

- A. The elevations shown on the drawings are anticipated and actual elevations are to be established in the field by the contractor, but in no case shall the bottom of footing be located less than 4 feet below the lowest adjacent surface exposed to freezing.

2.3 BACKFILL UNDER SLAB ON GRADE

- A. Backfill where required below slabs with first a layer of 18 in of approved granular soil placed and compacted to 98% density at optimum moisture content as defined by ASTM D-1557, Method D and then in 10 to 12 in layers of approved granular soil placed compacted to 98% density at optimum moisture content as defined by ASTM D-1557, Method D

2.4 FOUNDATION PLACEMENT & PROTECTION

- A. Do not place foundation concrete in water or on frozen ground.
- B. Protect in-place foundations and slabs from frost penetration until the project is complete. Do not use salt or chloride compounds to de-ice the site.

PART 3 - CONCRETE WORK

3.1 CONCRETE MIX PROPERTIES

Element	28 day strength	W/C
Air Content	(Max.)	
1. Footings	4,000 psi	0.45 6% +/- 1.5
2. Foundation Piers	4,000 psi	0.45 6% +/- 1.5
3. Foundation Walls:	4,000 psi	0.45 6% +/- 1.5
4. First Floor Slab	5,000 psi	0.40 3% +/- 1.5
B. Portland Cement:	ASTM C150, Type II.	
C. Density		
1. Normal weight = 145 pcf		
2. Lightweight = 115 pcf		

3.2 BASE PLATE GROUT:

- A. 8,000 psi 28-day compressive strength.

3.3 STEEL REINFORCEMENT

- A. ASTM A615 Grade 60, deformed.
- B. Do not tack or spot-weld crossing bars.

3.4 REINFORCEMENT AT OPENINGS

- A. U.O.N., provide 2 - #6 at each side of all openings in walls and slabs and extend 2 ft-6 in. beyond the opening or as detailed, except vertical bars at sides of openings in walls are to extend from floor to floor.
- B. Bars may be moved aside at openings or sleeves, but do not cut or omit.

3.5 SPLICING OF REINFORCEMENT

- A. As shown on drawings but not less than 50 bar diameters for slabs and beam bottom bars, and not less than 65 bar diameters for walls and beam top steel.
- B. Tie bars together at lap.

3.6 REINFORCEMENT SHOP DRAWINGS

- A. Submit for approval, complete bending and placing details of all reinforcement including welded wire reinforcement, indicating position of splices.
- B. Include accessory drawings.

3.7 MINIMUM CONCRETE CLEAR COVER

A. Concrete placed against earth in.	3
B. Slabs-on-grade bottom	3 in.
C. Slabs-on-grade top	2 in.
D. Formed concrete exposed to earth, water or weather in.	2
E. Interior faces of walls	2 in.
F. Formed slabs, top	1 in
G. Formed slabs, bottom	1 in.

Add project specific concrete notes below. Be careful not to conflict typical details and specifications. Epoxy dowels are an example - note embedment of 10 db develops yield for this particular anchor up to and including a #9 bar. Other examples follow.

3.8 POST-INSTALLED ANCHORS

- A. Expansion Anchors: Hilti Kwik Bolt 3.

1. Install per Hilti installation recommendations.
2. Provide standard depth of embedment as listed by Hilti, U.O.N.
3. Provide Stainless Steel anchors and hardware in all exterior applications.

B. Adhesive Anchors: Hilti HIT HY 150 Injection Adhesive Anchors

1. Install per Hilti installation recommendations.
2. Provide standard depth of embedment as listed by Hilti, U.O.N.
3. Do not use in an overhead application.
4. Provide Stainless Steel anchors and hardware in all exterior applications.

3.9 EXISTING SURFACE TREATMENT

- A. Roughen all existing concrete surfaces common with new concrete to amplitude of 1/4 inch.
- B. Existing concrete shall also be considered concrete on this job at construction joints or where a secondary pour is required.

3.10 CONCRETE REPAIR

- A. Cracks in concrete
1. Assume 200 linear feet of concrete will require routing and sealing.
2. Provide a unit price for this work.

3.11 STANDARD SPECIFICATIONS AND REFERENCE STANDARDS

- A. ACI 301 Specification for Structural Concrete
- B. CRSI Manual of Standard Practice
- C. Follow the latest recommendations and specifications of the American Concrete Institute:
1. ACI 302 Concrete Floor and Slab Construction
2. ACI 304 Measuring, Mixing, Transporting and Placing Concrete
3. ACI 305 Hot Weather Concreting
4. ACI 306 Cold Weather Concreting
5. ACI 315 Detailing for Reinforcing
6. ACI 318 General Design of Items Not Otherwise Specified
7. ACI 347 Formwork

PART 4 - STRUCTURAL STEEL

4.1 STRUCTURAL SHAPES

- A. Wide Flange Shapes ASTM A992 (Fy = 50 ksi)
- B. Hollow Structural Sections ASTM A500, Gr. B (Fy = 46 ksi)
- C. Angles ASTM A36, U.O.N. (Fy = 36 ksi)
- D. Channels ASTM A36, U.O.N. (Fy = 36 ksi)
- E. Plate ASTM A36, U.O.N. (Fy = 36 ksi)
- F. Pipe ASTM A53, Type E, Grade B or ASTM A501 (Fy=42ksi)

4.2 BOLTED CONNECTIONS

- A. ASTM A325 and A490.

4.3 ANCHOR RODS

- A. ASTM F1554 Grade 55 bolts (U.O.N.) with Supplementary Requirement S1 (weldability).

4.4 WELDING ELECTRODES

- A. Conform to AWS Specifications for electrodes based on welding process and the type and grade of steel. E70XX electrodes (MIN.) for fillet welds.

4.5 FABRICATION

- A. Shop fabricate to greatest extent possible by welding including beam stiffeners, column caps and bases, holes and connections.
- B. Submit complete shop drawings from field dimensions for the Architect's approval of all structural steel prior to fabrication.

4.6 ERECTION

- A. Provide anchor rods, steel wedges, threaded screws or shims to support and plumb all columns.
- B. Grout solid under base plates immediately after columns are plumb.
- C. Provide bearing plates and wall anchors or anchor rods for all beams resting on concrete and all other necessary connecting hardware.
- D. Set anchor rods using template.
- E. Do not field cut or field modify any structural steel without prior written approval by architect for each specific case.

4.7 STEEL COATING

- A. Paint all steel with the following base coat:
1. Tnemec 90-97
- B. Paint all exterior steel with the additional coats noted below:
1. Tnemec FASCURE Series 161
2. Tnemec Series 73
3. Tnemec Series 1079
- C. Colors as chosen by the architect.

4.8 STANDARD SPECIFICATIONS

- A. AWS D1.1 Structural Welding Code - Steel

Add project specific notes below.

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STRUCTURAL GENERAL
NOTES

SEAL & SIGNATURE:

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