STRUCTURAL GENERAL NOTES - IBC 2018

1. GENERAL

a. Provide construction conforming to the 2018 International Building Code with the latest State Amendments. Reference to other standards, specifications, or codes means the latest standard or code published and adopted. b. The structural general notes apply except where indicated otherwise on the drawings or in the specifications. A detail shown for one condition

applies for all like or similar conditions even though not specifically indicated on the drawings. c.Verify all existing conditions, dimensions, and elevations before starting work. Notify the Architect and Structural Engineer of Record in writing of any discrepancy.

d. The structure is able to resist design loads only when structural work is complete. During construction, the structure is not self-supporting. The Contractor is solely responsible for the design, adequacy, and safety of erection bracing, shoring, temporary supports, and all other means, methods, techniques, sequences, and procedures of construction. e. Coordinate the structural contract documents with documents from architectural, mechanical, electrical, plumbing, civil, and all other

consultants. Notify the Architect and Structural Engineer of Record in writing of any conflict and/or omission.

f. Coordinate and verify floor and roof opening sizes and locations with architectural, mechanical, plumbing, and electrical drawings. For additional openings not shown on the structural drawings refer to the architectural and mechanical drawings. g.Review of the submittals and/or shop drawings by the Structural Engineer of Record is only for general conformance with the contract documents and does not relieve the Contractor of the responsibility to review and check shop drawings before submittal to the Structural

Engineer of Record. The Contractor must review and stamp all submittals prior to submission. The Contractor remains solely responsible for errors and omissions associated with the preparation of shop drawings as they pertain to member sizes, details, and dimensions specified in the contract documents. Do not begin fabrication until shop drawings are completed and reviewed by the Structural Engineer of Record. h.Electronic drawing files or model files will not be provided to the Contractor or subcontractors, unless agreed to otherwise for additional costs.

i. Do not make shop drawings using reproductions of the contract documents or referencing the contract documents. j. Provide an allowance of 5% of all structural materials including labor to be fabricated and placed during progress of work as may be directed by the Structural Engineer of Record in addition to all structural materials indicated on the contract documents. Credit any unused quantity to the owner at the end of the project.

2. EXISTING CONDITIONS

- a.Renovation of existing structures requires thorough coordination of the contract documents with existing conditions. The Contractor must verify all relevant existing conditions, dimensions, and details prior to beginning construction. Report any deviations from conditions or dimensions shown on the contract documents to the Architect and Structural Engineer of Record for review of the design and possible revision of the contract documents.
- b. The nature of structural demolition and stabilization is inherently uncertain. The exact condition and capacity of each structural element cannot be verified prior to the commencement of work. As a result, it is imperative to report any discrepancies between the contract documents and actual field conditions, as well as any element of questionable structural integrity immediately to the Architect and Structural Engineer of Record for review.

c.No attempt has been made to define each specific structural element that must be removed, enhanced, or replaced. It is the responsibility of the Contractor to review the condition of individual elements, particularly rafters, joists, and structural deck boards, to determine which elements can be salvaged, which elements must be replaced, and which elements are guestionable. The Contractor should consult with the Architect and Structural Engineer of Record to determine the appropriate procedure for handling elements in questionable condition. d.Dimensions of or to existing elements shown on design drawings may not be accurate to necessary construction tolerances. Contractor to verify conditions in field and coordinate with design drawings, particularly for elements that will be fabricated off-site.

3. REINFORCED CONCRETE

a.Provide reinforced concrete conforming to the following standards: • ACI 301-14, Specifications for Structural Concrete for Buildings

 ACI 318-14, Building Code Requirements for Structural Concrete • ACI 302.1R-15, Guide for Concrete Floor and Slab Construction

ACI 360R-10, Guide to Design of Slabs-on-Ground

b.Unless noted otherwise,	provide concrete with	n the following minimu	um Exposure	Classes, Type, minimum 28-day compressive strengths, and		
maximum water-to-cementitious materials ratio:						
Location	Exposure Class	Туре	Strength	w/cm		
Foundations	F0 S0 P0 C1	Normal Weight	3000 PSI	0.55		
Ext. Slabs on Grade	F2 S0 P0 C1	Normal Weight	4500 PSI	0.45		
Int. Slabs on Grade	F0 S0 P0 C0	Normal Weight	3000 PSI	0.55		
c.For Exposure Classes F1, F2, and F3, provide entrained air by volume in concrete based on ACI 318 Table 4.4.1, shown below:						
Nominal Maximum Ag	ggregate Size, in.	Exposure Class F1	Exposure C	lass F2 and F3		
3/8		6	7.5			
1/2		5.5	7			
3/4		5	6			
1		4.5	6			
1 1/2		4.5	5.5			
2		4	5			
3		3.5	4.5			

d.Fully document and submit for review the proposed materials and mix design for all concrete. The Contractor is responsible for obtaining the required design strength. All concrete test data must be available at the job site.

e. The use of calcium chloride, chloride ions, or other salts is not permitted. f. Place concrete at a slump of $5'' \pm 1''$.

g.Unless noted otherwise, provide construction or contraction joints in slabs-on-grade such that the maximum area between joints does not exceed 225 square feet with the length not exceeding twice the width. **h.** The location of construction joints requires the approval of the Structural Engineer of Record. Unless noted otherwise, thoroughly

roughen by mechanical means and clean construction joints. i. Chamfer or round all exposed corners a minimum of 3/4".

j. Detail concrete reinforcement according to ACI SP-66 detailing manual. Submit shop drawings for approval, showing all fabrication dimensions and locations for placing concrete reinforcing and accessories. Do not begin fabrication until shop drawings are completed and reviewed by the Structural Engineer of Record. Unless specifically approved otherwise, detail all concrete walls and beams in elevation.

k.Unless noted otherwise, provide reinforcing steel conforming to ASTM A615, Grade 60. I. Provide welded wire fabric mesh in flat sheets conforming to ASTM A1064. Rolls are not permitted. Lap welded wire fabric a minimum of 6" at each splice.

m. Fiber reinforcing may be substituted for welded wire fabric in slabs-on-grade with the approval of the Structural Engineer of Record. Provide macro fiber reinforcing conforming to ASTM C1116, Type III. Use Strux 90/40, Forta Ferro, or Fibermesh 650; 100% virgin polypropylene fibrillated fibers as directed by the fiber reinforcing manufacturer with approval of the Structural Engineer of Record.

n. Tie all reinforcing steel and embedded items securely in place prior to placing concrete. Provide sufficient supports to maintain the position of the reinforcement within specified tolerances during all construction activities. "Sticking" dowels, anchor rods, or other embedded items into wet concrete is not permitted.

o.Lap concrete reinforcing as shown in the "Concrete Lap Splice Length Schedule." p. The placement of all reinforcing steel must be reviewed by a Professional Engineer registered in the Project State or by a representative

responsible to him per ACI 318, 1.3.1. q.Unless noted otherwise, provide the following concrete cover on all reinforcing steel:

Concrete against earth (not formed):.... Formed concrete exposed to earth or weather:

..... 1 1/2" #5 bars and smaller:.....

r. Do not place pipes or ducts with a maximum dimension exceeding one-third the slab or wall thickness within the slab or wall unless specifically shown and detailed on the structural drawings. s.Do not weld or tack weld reinforcing steel unless approved or directed by the Structural Engineer of Record. Provide reinforcing steel conforming to ASTM A706, Grade 60 where welding is approved or directed.

4. STRUCTURAL STEEL

t. Provide structural steel detailing, fabrication, and erection conforming to the following standards:

• AISC 303-05, Code of Standard Practice for Structural Steel Buildings and Bridges • AISC 325-17, Steel Construction Manual, 14th Edition

• AISC 326-09, Detailing for Steel Construction, 3rd Edition

• AISC 360-16, Specification for Structural Steel Buildings AWS D1.1-10, Structural Welding Code - Steel

b.Provide steel shapes made of material conforming to the following standards, unless noted otherwise: Wide Flange Shapes and WT Shapes..... ASTM A992 ASTM A36 Angles and Channels......

Plates	ASTM A572, Grade 50
Hollow Structural Sections (HSS)	ASTM A500, Grade C
Steel Pipe	ASTM A53, Type E or S, Grade B
Headed Studs	ASTM A108, Grade 1010 - 1020
Deformed Bar Anchors	ASTM A1064

c.Unless noted otherwise, provide anchor rods for cast-in-place conditions in concrete that conform to ASTM F1554, Grade 36 or Grade 55-S1. Unless noted otherwise, install connections so they are snug-tight. d.Unless noted otherwise, provide anchors for post-installed conditions in concrete that conform to manufacturer's requirements. Install

connections so they are pre-tensioned per manufacturer's specifications. e.Unless noted otherwise, make all connections with 3/4" minimum diameter ASTM F3125 Grade A325 bolts with threads included in the shear plane. Unless noted otherwise, install connections so they are pre-tensioned. Calibrate tightening methods used so they are in conformance with Section 8, Installation and Tightening of RCSC "Specification for Structural Joints using High Strength Bolts", 2009. Use one of the following tightening methods: calibrated wrench, direct tension indicator, or alternative bolt with twist off element. Do not use turn of the nut method, unless continuously observed by testing agency.

f. Make all welded connections in accordance with AWS D1.1, using type E70XX electrodes. Use only certified welders. Proof of certification must be maintained at the job site.

h.Submit shop drawings prepared in accordance with AISC 326. Provide complete welding information using AWS symbols. Use prequalified welded joints per the Steel Construction Manual and AWS D1.1. Do not begin fabrication until shop drawings are completed and reviewed by the Structural Engineer of Record.

i. The design of special connections between steel framing components (including but not limited to braced end connections, moment-resisting connections, modified beam seat connections, and member splice connections) not designed by the Structural Engineer of Record must be performed by a Professional Engineer registered in the Project State.

j.Do not use gas cutting torches to correct fabrication errors in structural steel framing.

k.Provide temporary bracing for structural steel framing until all permanent bracing, moment connections, and floor/roof decks (diaphragms) are completely installed. I. Paint structural steel in accordance with the project specifications. Do not paint steel surfaces to be encased in concrete, surfaces to receive

fireproofing, connections designated as friction type, surfaces to be welded, or surfaces receiving welded studs or DBAs in the field. m. Unless noted otherwise by the Architect, consider steel that is exposed to the public to be Architecturally Exposed Structural Steel (AESS) and should be fabricated per those requirements.

5. COLD FORMED STEEL FRAMING

k.Provide cold formed steel framing detailing, fabrication, and erection conforming to the following standards: • AISI S100, North American Specification for the Design of Cold-formed Steel Structural Members

• AISI S200, North American Standard for Cold-formed Steel Framing - General Provisions

 AWS D1.1-15, Structural Welding Code - Steel • AWS D1.3-18, Structural Welding Code - Sheet Steel

I. Provide studs, runner track, and associated accessories of the type and thickness indicated on the drawings or as recommended by the

manufacturer for the indicated application. m. Provide studs, joists, runner track, and accessories manufactured of hot dip galvanized ASTM A1003 steel with the following yield strenath:

33,000 PSI...... 33-mil and 43-mil members 50,000 PSI..... 54-mil, 68-mil, and 97-mil members

n.Provide minimum #12 (S-12) cadmium or zinc coated screws.

o.Install all cold-formed steel framing in accordance with the manufacturer's recommendations.

p.Provide reinforcement for any member cut for the installation of plumbing or wiring such that the member is of equal strength to the member prior to cutting.

q.Provide lateral bridging in load bearing walls consisting of 1 1/2" cold-rolled channels at 4'-0" on center vertically. Insert channels through stud web holes and screw or weld to each stud using 1 1/2" x 1" x 54-mil (16 gage) clip angles. Provide clip angles 1/4" less than the stud width.

r. Provide joist bridging at 8'-0" on center maximum. Install joist bridging in accordance with the manufacturer's recommendations. s.Provide un-punched material for all joists and headers.

v.Provide curtain wall framing installation to accommodate vertical displacement of the primary structure.

6. OTHER COMPONENTS

through 2403.4 for butt joined glazing. 7. FOUNDATIONS

Allowable Soil Bearing Pressure:..... Equivalent Lateral Fluid Pressure - Active Case:........ 40 PSF/FT Coefficient of Sliding Friction:.....

Soil Density:.... Redesign of foundations may be required if the actual conditions are different than the values listed above. The following conditions could also stated by a Geotechnical Engineer.

footings, slabs, walls, etc.

redesigned as required.

minimum densities: • Within 18" of finished grade:...

g.Field density tests must be made as described by the Geotechnical Engineer to verify adequate compaction and design bearing pressure.

placement. i. Where footing steps are necessary, slope no steeper than one vertical to two horizontal.

8. DESIGN LOADS

a.Live Loads:

Roof.... b.Dead Loads: Roof....

c.Wind Design Data: Risk Category:....

> Exposure Category:..... Basic Design Wind Speed, Allowable Stress Design Wi

e.Snow Loads: Snow Load Importance Fact

Analysis Procedure:..... Ground Snow Load:.....

Snow Exposure Factor:..... Thermal Factor:..... Flat-Roof Snow Load:....

Mapped Spectral Response Site Class:..... Spectral Response Coefficien

Enclosure Classification:... Internal pressure Coefficie d.Seismic Design Data:

Components and Cladding P

Risk Category:.... Seismic Importance Factor:.

Seismic Design Category:... Basic Seismic Force Resisting

Response Modification Factor Seismic Response Coefficient Design Base Shear:.....

w. Submit shop drawings showing the size of all members and all connections sealed by a Professional Engineer registered in the Project State. Review of shop drawings by the Structural Engineer of Record is for general conformance with the contract documents regarding arrangement and sizes of members and the Contractor's interpretation of the design loads and contract document details.

p. Provide shop drawings for construction of all applicable specialty items including but not limited to concrete pilings, curtain wall glazing systems, light gage steel framing, ornamental guardrails, guards, handrails, pre-engineered wood trusses, skylights, and signage. Shop drawings must indicate the required materials, sizes, and locations for all posts and pickets including anchorage at the base of the posts. Shop drawings must be sealed by a Professional Engineer registered in the Project State. q. Provide curtain wall glazing system shop drawings that clearly indicate the attachment to the structure on all sides of the exterior glazing system required to adequately resist the applicable wind design pressures.

r. The Glazing Contractor must provide engineering calculations to document compliance with 2012 International Building Code, Sections 2403.2

a. The design of foundations, retaining walls, and slabs-on-grade is based on the following presumed criteria: ... 2000 PSF

Equivalent Lateral Fluid Pressure - At-Rest Case:...... 60 PSF/FT Equivalent Lateral Fluid Pressure - Passive Case:...... 150 PSF/FT0.25 110 PCF

result in redesign of foundations: presence of expansive soils, high water table, potential for large settlements, or any other recommendations

a. A Geotechnical Engineer must verify the condition and/or adequacy of all subgrades, fills, and backfills prior to the placement of foundations, b. If any interference appears between existing foundations and the specified design, notify the Architect so that the foundations may be c.Coordinate top of footing elevations with the requirements of other trades including but not limited to plumbing, mechanical, or electrical.

d.Place all column footings and wall footings monolithically with adjacent footings at the same elevation. e. All footings must bear on original undisturbed soil where possible. f. Remove all organic soils and replace with clean structural fill at the direction of the Geotechnical Engineer. Place fill soils in 10" maximum (loose) lifts at moisture contents within 4% of optimum moisture content. Compact all fill within 10'-0" of the building limit to the following

....98% of maximum Standard Proctor

• Below 18" of finished grade:.....95% of maximum Standard Proctor

h. Sides of foundations must be formed unless conditions permit earth forming. Foundations placed against the earth require the following precautions: slope sides of excavations as approved by the Geotechnical Engineer and clean up sloughing before and during concrete

j.Do not backfill against basement walls (walls supported at the top and bottom) until slabs, framing, and diaphragms are in place to provide

support at top and bottom of wall. Concrete diaphragms must reach 65% of their design 28 day compression strength prior to backfilling. k.Deposit backfill evenly against both sides of the wall until the lower finished grade is reached. I. Unless noted otherwise, place all slabs on grade on a 10 mil polyethylene vapor retarder and a crushed stone base over a properly compacted subgrade. Lap joints of vapor retarder a minimum of 6 inches and seal watertight by taping edges and ends.

. 20 PSF

10 PSF

	Categ	ory II
	Expos	ure C
	V: 10	бРН
nd Speed,	Vasd:	82 MPH
	Enclos	sed Building
t:	± 0.13	8
Pressures:	See T	able
	Categ	ory II
	I = 1.	0
Accelerations:	Ss = 0 S1 =	0.185g 0.085g
		Site Class D
nts:		Sds = 0.197g Sd1 = 0.137g
		Category C
ng System:		Concrete shear walls
or		R = 2.5
nt:		Cs = 0.079
		Structure complies with ASCE 7-16, Appendix 11B, Section 4- Alterations.
		Loadings and member capacities change less than 10%. Seismic Retrofit
		Not Required.
		Equivalent Lateral Force Procedure
		Pg = 5PSF
tor:		I = 1.0
		Ce = 1.0
		Ct = 1.0

.. Pf = 5 PSF











 \Box \Box \Box INDICATES EXISTING WALLS.

INDICATES NEW 600S162-43 METAL STUDS @ 16" o/c w/600T162-68 TOP & BOTTOM TRACK. PROVIDE 7/16" APA RATED PLYWOOD SHEATHING FASTENED TO STUDS w/ S12 SCREWS @ 6" o/c IN PERIMETER AND IN FIELD.

H INDICATES HEADER AT OPENING FOR MECHANICAL LOVUER. COORDINATE w/ MECHANICAL AND ARCHITECTURAL. SEE 1/S001 FOR HEADER SIZE AND ADD'L INFORMATION FOR CFS HEADER. SEE 10/S401 FOR DETAIL AT LOVUER.

PARTIAL PLAN	CHIMNEY FRAMING EXISTING ROOF	G PLAN AT FRAMING	3
	SCALE:	1/2"=1'-0"	S101
<u>NOTES:</u> 1. SEE ARCHITECTURA SLOPES, AND OTHE (F.V.) ALL ELEVATIO 2. REF. LEVEL 1 ELEVA	L DRAWINGS FOR D R INFORMATION NC DNS AND DIMENSIO TION= 0'-0".	DIMENSIONS, E DT SHOWN. FIE NS.	LEVATIONS, LD VERIFY
INDICATES EXISTING	WALLS.		
INDICATES NEW (2) 60 w/600T162-68 TOP & F	00S162-43 METAL S BOTTOM TRACK. PRO	TUDS @ 16" o/ OVIDE 7/16" AF	′c PA RATED

IN PERIMETER AND IN FIELD.

PLYWOOD SHEATHING FASTENED TO STUDS w/ S12 SCREWS @ 6" o/c

PARTIAL PLAN	CHIMNEY ROOF FRAMING PLAN	4
	SCALE: 1/2"=1'-0"	S101

- NOTES: 1. SEE ARCHITECTURAL DRAWINGS FOR DIMENSIONS, ELEVATIONS, SLOPES, AND OTHER INFORMATION NOT SHOWN. FIELD VERIFY (F.V.) ALL ELEVATIONS AND DIMENSIONS.2. REF. LEVEL 1 ELEVATION= 0'-0".
- INDICATES NEW (2) 600S162-43 METAL STUDS @ 16" o/c w/600T162-68 TOP & BOTTOM TRACK. PROVIDE 7/16" APA RATED PLYWOOD SHEATHING FASTENED TO STUDS w/ S12 SCREWS @ 6" o/c IN PERIMETER AND IN FIELD.
- INDICATES 3/4" THICK APA RATED PLYWOOD SHEATHING FASTENED TO METAL JOISTS w/ S12 SCREWS @ 6" o/c IN FIELD AND AT PERIMETER.

